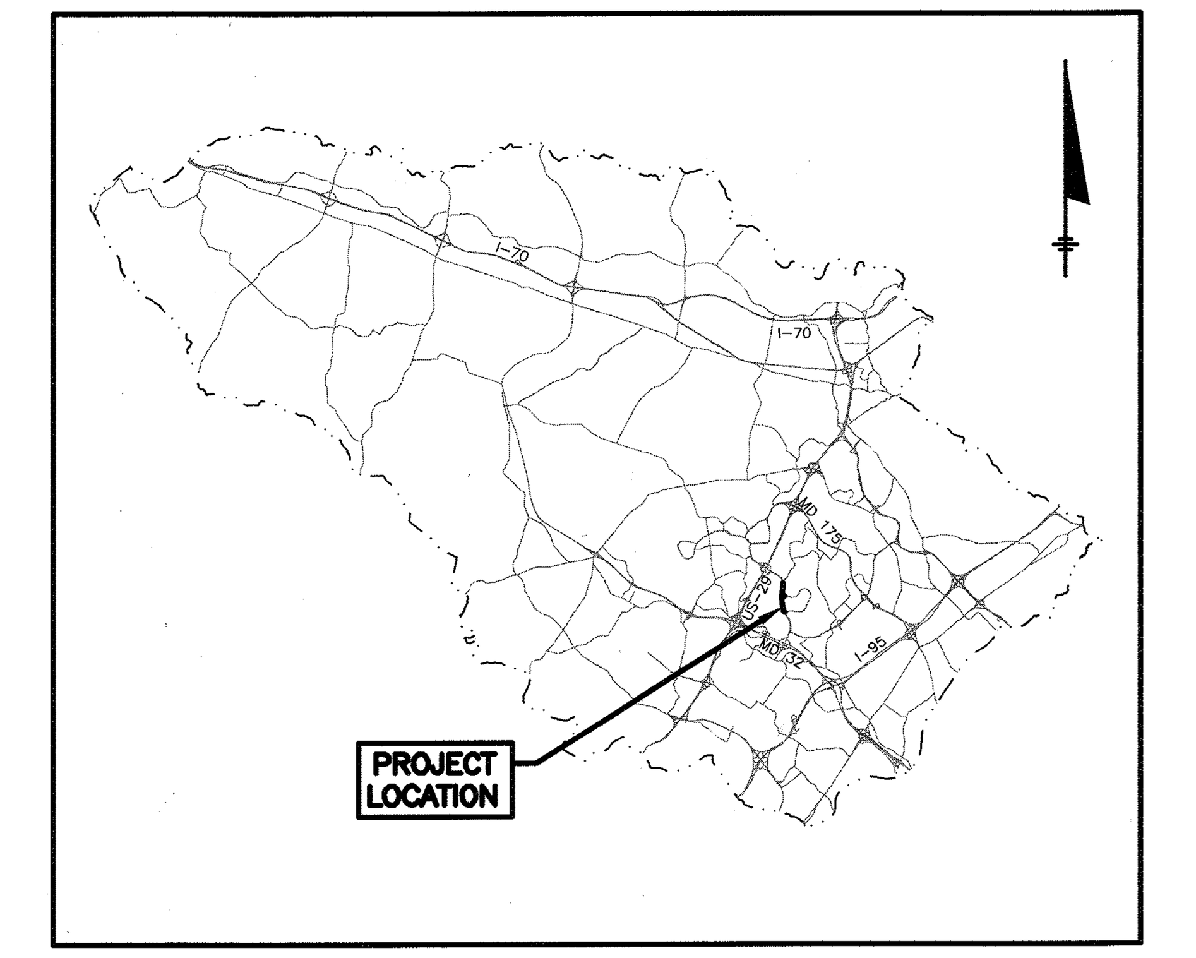
I:\HOWARD-CO.2343\69520.BROKEN-LAND-PKW\DOCS\DWG\SHEETS\51204-001.DWG

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION

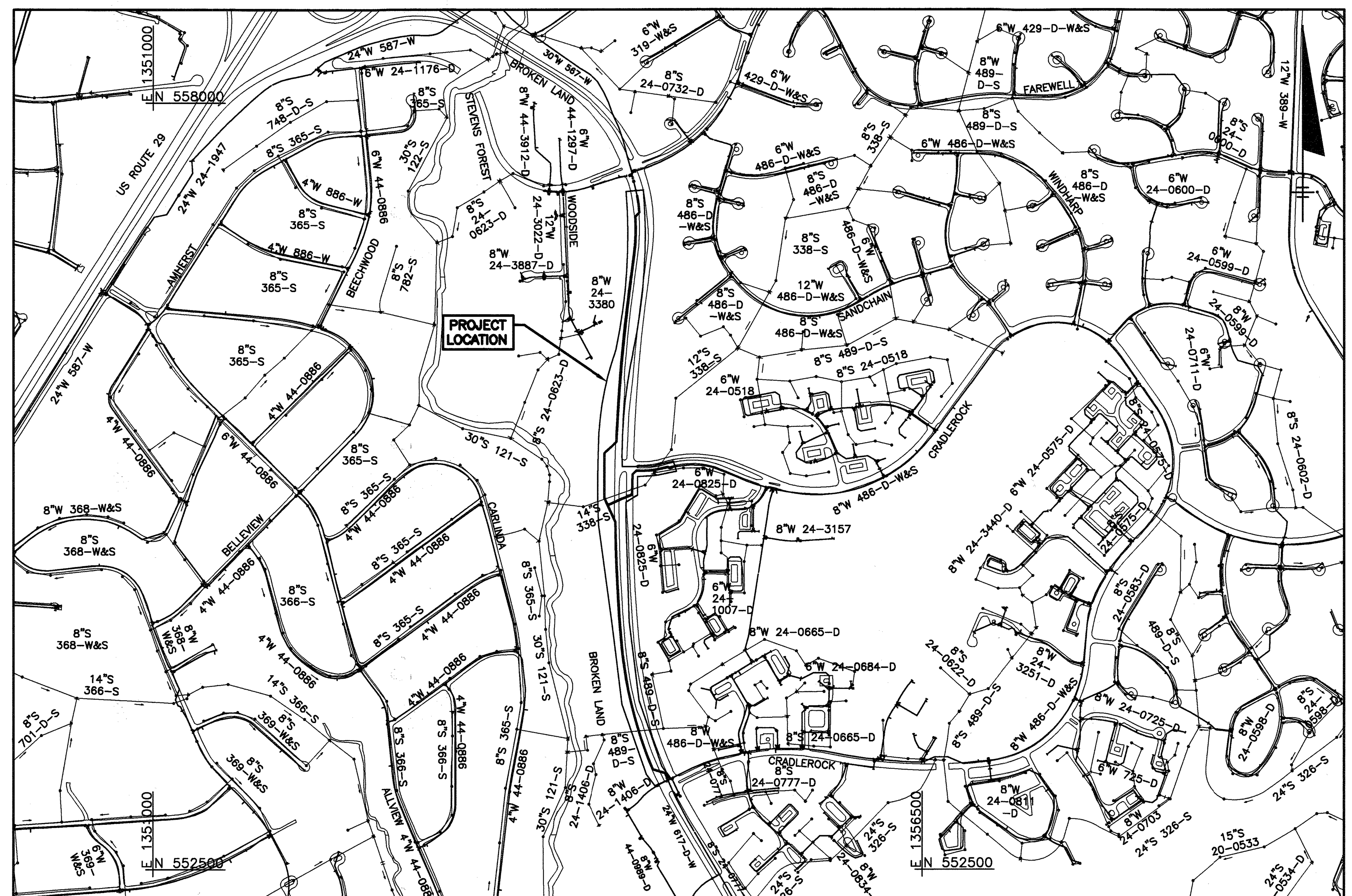
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS



LOCATION MAP
NOT TO SCALE

QUANTITIES

ITEM	BID AMOUNT	UNIT	AS-BUILT AMOUNT	MATERIAL	SUPPLIER
30" WATER RJ	2,382	LF	2,278	ZINC COATED DUCTILE IRON	AMERICAN
30" WATER	1,960	LF	1,981	ZINC COATED DUCTILE IRON	AMERICAN
24" WATER RJ	8	LF	8	ZINC COATED DUCTILE IRON	AMERICAN
8" WATER RJ	625	LF	375	PVC	NORTH AMERICAN PIPE
8" WATER	0	LF	240	PVC	NORTH AMERICAN PIPE
AIR RELEASE/ACCESS MANHOLE ASSEMBLY	1	EA	1	CONCRETE MANHOLE/ DUCTILE IRON TEE/ CAST IRON ARV	ATLANTIC CONCRETE/ TYLER UNION/ VALMATIC
BLOW OFF/ACCESS MANHOLE ASSEMBLY	1	EA	1	CONCRETE MANHOLE/ DUCTILE IRON TEE	ATLANTIC CONCRETE/ TYLER UNION
ACCESS MANHOLE	2	EA	1	CONCRETE MANHOLE/ DUCTILE IRON TEE	ATLANTIC CONCRETE/ TYLER UNION
30" RSGV	2	EA	2	DUCTILE IRON	MUELLER
8" RSGV	1	EA	1	DUCTILE IRON	MUELLER
FIRE HYDRANT ASSEMBLY	10	EA	9	CAST IRON	MUELLER



WATER AND SEWER CODE:	E-13
NO. OF WATER CONNECTIONS:	0
NO. OF SEWER CONNECTIONS:	N/A
DRAINAGE AREA:	LITTLE PATUXENT
PRESSURE ZONE:	550
TESTING GRADIENT:	726'
TYPE OF BUILDING:	N/A
NO. OF PARCELS:	N/A

VICINITY MAP
SCALE: 1" = 600'

INDEX OF DRAWINGS

EP-17-51

SEDIMENT CONTROL MEASURES FOR THIS CONTRACT WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 308 OF THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS.

HOWARD SOIL CONSERVATION DISTRICT:

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

Howard Soil Conservation District — Date: 1/18/17

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.

50399 — 01/16/18
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.

Jan. 16, 2018
Signature of Developer — Date

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE
ENGINEERS, INC.

By: ______

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/18/17
CHIEF - BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-17-18
CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/18

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. 50399, EXPIRATION DATE 12/28/2018 — 01/16/18

STATE OF MARYLAND — LOUIS RAGOZZINO — No. 50399 — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	SLS/CTP
DRN. BY:	RPW/IH
CHK. BY:	RJD
DATE:	01/18

BY	NO.	REVISION	DATE
CTP	1	RECORD DRAWINGS	10/16/19

COVER SHEET

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

FILE NO. 51204-001

I:\HOWARD-CO.2343\69520.BROKEN-LAND-PKWY\DOCS\DWG\SHEETS\51204-002.DWG

LEGEND
(PLAN AND PROFILE SHEETS)

	SIDEWALK		MAIL BOX
EP	PAVEMENT (EDGE)		VENT
	GRAVEL (EDGE)		STORM DRAIN MH
	CONCRETE (EDGE)		HEADWALL/ENDWALL
	BUILDING		DROP INLET GRATE
	CENTERLINE		DROP INLET
	SHA THRU HIGHWAY RIGHT-OF-WAY		ROAD SIGN
	PROPERTY LINE/RIGHT-OF-WAY		TELE. JUNC. BOX
	EASEMENT		UTILITY POLE
	GUARDRAIL		LIGHT POLE
	FENCE (WOOD)		LAMP POST
	FENCE IRON, RAIL		GUY WIRE
	FENCE(CHAINLINK)		GROUND LIGHT
E E	UNDERGROUND ELECTRIC LINE		ELEC. TRANSFORMER
T T	UNDERGROUND TELEPHONE LINE		ELEC. MH
C C	UNDERGROUND CABLE LINE		ELEC. JUNC. BOX
FO FO	UNDERGROUND FIBER OPTIC LINE	x325.5	SPOT ELEVATION
OHU OHU	OVERHEAD UTILITIES	CATV	CABLE BOX
S S	EX. SANITARY SEWER		SAN. SEW. MH
	STORM DRAIN		CLEAN OUT
W	EX. WATER MAIN		EX. WATER VALVE
	PROPOSED WATER MAIN		PROP. WATER VALVE
WL	WETLANDS BOUNDARY		WATER METER
WB	WETLANDS BUFFER BOUNDARY	IRR	WATER MAIN VALVE VAULT
	GAS		IRRIGATION VALVE
	DITCH		EX. FIRE HYDRANT
	STREAM		PROP. FIRE HYDRANT
	WOODLINE		GAS VENT PIPE
	BUSH		GAS VALVE
	RIP-RAP DITCH	GP	GAS PUMP
	MILL AND OVERLAY		GAS LINE MARKER
SB#	BORING LOCATION	IPF	IRON PIPE FOUND
TP#	TEST PIT LOCATION	RBC	REBAR AND CAP
	BM #		TRAVERSE STATION
		CP	CATHODIC PROTECTION SYSTEM TEST STATION
		CT	CONTINUITY TEST STATION
		AM	ACIPCO CORROSION MONITORING STATION
REBAR	REBAR	P	POINT OF CONNECTION
FLY	FLY STATION	1 / 12	DETAIL OR SECTION IDENTIFICATION / SHEET NO.
	ABANDON IN PLACE EX. WM		
	ASPHALT PAVEMENT		

ABBREVIATIONS:

APPROX.	APPROXIMATE
ARV MH	AIR RELEASE MANHOLE
BE	BURY ELEVATION
BFV	BUTTERFLY VALVE
BGE	BALTIMORE GAS & ELECTRIC
BL	BURY LENGTH
BLDG.	BUILDING
BOT	BOTTOM
C&G	CURB AND GUTTER
CMP	CORRUGATED METAL PIPE
CONC.	CONCRETE
CONSTR.	CONSTRUCTION
CONTR.	CONTRACT
CPLG.	COUPLING
DEG.	DEGREE
DET OR DTL.	DETAIL
DIP	DUCTILE IRON PIPE
DR	DRIVE
E OR ELEC	ELECTRIC
EA	EACH
ELEV	ELEVATION
ESMT	EASEMENT
EX	EXISTING
FH	FIRE HYDRANT
FLG	FLANGE
FMV	FLOW METER VAULT
G	GAS
GCS	GEODETIC CONTROL SYSTEM
GV	GATE VALVE
HB	HORIZONTAL BEND
HD	HIGH DEFLECTION
HC	HOWARD COUNTY
HCR	HORIZONTAL CURVE RADIUS
HDP	HORIZONTAL DEFLECTION POINT
HDPE	HIGH DENSITY POLYETHYLENE
HORIZ	HORIZONTAL
INV	INVERT
JT	JOINT
LF	LINEAR FOOT
LOD	LIMIT OF DISTURBANCE
MAC	MACADAM
MBR	MINIMUM BENDING RADIUS
MD	MARYLAND
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
NIC	NOT IN CONTRACT
NO	NUMBER
PC	POINT OF CURVE
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PE	PLANE END
PED	PEDESTAL
PO	POST OFFICE OR PUSH ON
PROP	PROPOSED
PT	POINT OR POINT OF TANGENCY
PVC	PVC PIPE OR POINT OF VERTICAL CURVATURE
PVD	POINT OF VERTICAL DEFLECTION
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
PVT	POINT OF VERTICAL TANGENCY
R/W	RIGHT OF WAY
RAD OR R	RADIUS
RCP	REINF. CONC. PIPE
RD	ROAD
REQD	REQUIRED
RJ	RESTRAINED JOINT
ROW	RIGHT-OF-WAY
RSGV	RESILIENT SEAT GATE VALVE
RSWV	RESILIENT WEDGE GATE VALVE
S	SEWER
SAN	SANITARY
SB	SOIL BORING
SD	STORM DRAIN
SHA	STATE HIGHWAY ADMINISTRATION
SHC	SEWER HOUSE CONNECTION
SHT	SHEET
S.S.	STAINLESS STEEL
STA	STATION
STD	STANDARD
TB RENO	TO BE RENOVATED (FUTURE)
TBR	TO BE REMOVED (FUTURE)
TELE	TELEPHONE
TEMP	TEMPORARY
TP	TEST PIT
TRANS	TRANSFORMER
UNF	UTILITY NOT FOUND
VB	VERTICAL BEND
VCR	VERTICAL CURVE RADIUS
VERT	VERTICAL
W	WATER
W/	WITH
WHC	WATER HOUSE CONNECTION
WM	WATER MAIN
WV	WATER VALVE

LANDSCAPING

APP	APPLE
BPE	BRADFORD PEAR
CHE	CHERRY
DEC	DECIDUOUS
DOG	DOGWOOD
HEM	HEMLOCK
HIC	HICKORY
HOL	HOLLY
LOC	LOCUST
MAG	MAGNOLIA
MAP	MAPLE
MUL	MULBERRY
PIN	PINE
POP	POPLAR
SPR	SPRUCE
SYC	SYCAMORE
WAL	WALNUT
WIL	WILLOW

GENERAL NOTES:

1. THE LOCATIONS, ELEVATIONS OR STATIONING SHOWN FOR THE EXISTING MAINS AND UTILITIES ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE EXISTING (INCLUDING LOCATION AND ELEVATION) OF ALL BURIED UTILITIES. NOTE ALSO THAT OTHER BURIED UTILITIES MAY EXIST WITHIN THE WORK AREA THAT ARE NOT SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING MAINS AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.

2. TOPOGRAPHIC FIELD SURVEYS WERE PERFORMED IN DECEMBER, 2013 BY NXL CONSTRUCTION, INC. PHONE (703) 961-8127.

3. HORIZONTAL AND VERTICAL SURVEY CONTROLS:

   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. 41FA AND NO. 42R1.
   ALL VERTICAL CONTROLS ARE BASED ON NAVD '88. VERTICAL CONTROLS PROVIDED ON THE DRAWINGS ARE LISTED ON SHEET 3.

4. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

5. CLEAR ALL UTILITIES BY A MINIMUM OF 12 INCHES. CLEAR ALL POLES BY 5'-0" MINIMUM OR TUNNEL AS REQUIRED UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO SCHEDULE THE BRACING OF THE POLES AS REQUIRED.

6. 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.

7. 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 PIT OR PITS IS INCLUDED ON THE DRAWINGS OR WITHIN 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.

8. 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).....410-637-8713
   BGE (EMERGENCY).....410-685-0123
   BUREAU OF UTILITIES.....410-313-4900
   COLONIAL PIPELINE CO.....410-795-1390
   MISS UTILITY.....1-800-257-7777
   STATE HIGHWAY ADMINISTRATION.....410-531-5533
   VERIZON.....1-800-743-0033

9. TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS LOCATED WITHIN THE TEMPORARY CONSTRUCTION STRIPS ARE TO BE REPLACED IN KIND (10" CALIPER MINIMUM).

10. THE CONTRACTOR SHALL REMOVE TREES, STUMPS AND ROOTS ALONG THE LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF THE MAIN.

11. 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.

12. WATER MAIN DESIGN CRITERIA:
   a. THIS PROJECT MAY BE BID USING THE FOLLOWING PIPE MATERIALS FOR THE PROPOSED 30-INCH WATER MAIN (PCCP, BWCCP, TAPE COATED DIP, OR ZINC COATED DIP WITH V-BIO® ENHANCED POLYETHYLENE ENCASEMENT).
   b. RESTRAINED JOINTS ARE TO BE USED ON THE 30-INCH MAIN PER THE LIMITS SHOWN ON THE DESIGN PLANS.
   c. ALL FITTINGS ON THE 30-INCH MAIN SHALL BE RESTRAINED JOINT UNLESS OTHERWISE NOTED. ALL FITTINGS ON SMALLER MAINS SHALL BE RESTRAINED JOINT OR BUTTRESSED/ANCHORED WITH CONCRETE IN ACCORDANCE WITH THE STANDARD DETAILS UNLESS OTHERWISE PROVIDED FOR ON THE DRAWINGS.
   d. LAYOUT SHOWN ON THE CONTRACT DRAWINGS FOR 30-INCH MAIN IS BASED ON DIP. IF DIFFERENT PIPE MATERIAL IS SELECTED THEN THE LAY SCHEDULE SHALL BE CAD BASED WITH ABILITY TO TIE INTO CONTRACT DRAWINGS TO ENABLE ENGINEER TO REVIEW THE IMPACT OF ALIGNMENT CHANGES. CAD DRAWINGS SHALL BE ON MARYLAND STATE PLANE COORDINATES MATCHING THE CONTRACT DRAWINGS.

13. TOPS OF ALL WATER MAINS SHALL HAVE A MINIMUM OF 3'-6" OF COVER UNLESS OTHERWISE NOTED.

14. VALVES ADJACENT TO TEES SHALL BE STRAPPED TO TEES.

15. THE CONTRACTOR SHALL NOT OPERATE ANY WATER MAIN VALVES ON THE EXISTING WATER SYSTEM.

16. TRACER WIRE AND CONTINUITY TEST STATIONS SHALL BE INSTALLED ALONG THE LENGTH OF ALL NEW PIPE INSTALLED, REGARDLESS OF MATERIAL. CONTINUITY TEST STATIONS SHALL BE LOCATED ADJACENT TO EACH FIRE HYDRANT.

17. 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.

18. 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.

19. EXISTING STORM DRAINS DISTURBED BY THE CONSTRUCTION SHALL BE REPLACED IN KIND AT THE SAME LINE AND GRADE AS THE EXISTING STORM DRAINS.

20. THE CONTRACTOR MUST FOLLOW ALL CONDITIONS AND REQUIREMENTS AS SET FORTH IN THE REQUIRED PERMITS FOR THIS PROJECT AND PROVIDED IN THE PROJECT SPECIFICATIONS.

21. ANY SECTIONS OF THE EXISTING WATER MAINS REMOVED AS PART OF THIS PROJECT SHALL BE DISPOSED OF IN ACCORDANCE WITH APPLICABLE REGULATIONS.

22. CONTRACTOR SHALL NOT EXCEED 80% OF MANUFACTURER'S ALLOWABLE MAXIMUM JOINT DEFLECTION FOR PIPING SPECIFIED.

23. EXCEPT AS INDICATED ON THE PLANS ALL MAINS SHALL BE RATED FOR A WORKING PRESSURE OF 120-PSI WITH AN ADDITIONAL SURGE ALLOWANCE OF 80-PSI AND A FACTOR OF SAFETY OF 1.30, AND THE HOWARD COUNTY DESIGN MANUAL VOLUME IV - STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND ALL SUBSEQUENT AMENDMENTS THERETO.

24. ALL CONNECTIONS TO EXISTING WATER MAINS SHALL BE FULLY RESTRAINED.

25. THE CONTRACTOR SHALL PROVIDE SURVEY CONSTRUCTION STAKEOUT FOR ALL NECESSARY LINES, GRADES AND ELEVATIONS OF THE PROPOSED FACILITIES.

26. IN ACCORDANCE WITH THE 10 STATE STANDARDS: WATER MAINS CROSSING SEWERS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SEWER. AT CROSSINGS, ONE FULL LENGTH OF WATER PIPE SHALL BE LOCATED SO BOTH JOINTS WILL BE AS FAR FROM THE SEWER AS POSSIBLE.

27. NO WATER SHALL BE DISCHARGED FROM THE EXISTING WATER MAIN TO THE ENVIRONMENT WITHOUT FIRST DECHLORINATING. THE CONTRACTOR SHALL SUBMIT THE DECHLORINATION METHOD TO THE OWNER AND IT'S ENGINEER FOR REVIEW.

28. FIRE HYDRANTS SHALL BE SET TO THE BURY LINE ELEVATIONS SHOWN ON THE DRAWINGS. ALL FIRE HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD DETAILS. THE SOIL AROUND THE FIRE HYDRANT SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 1000 AND SECTION 1005 OF THE STANDARD SPECIFICATIONS.

29. ANY TREES, OUTSIDE OF EXISTING OR PROPOSED EASEMENTS, DISTURBED BY CONSTRUCTION SHALL BE REPLACED IN KIND (3" CALIPER MINIMUM).

30. IN ACCORDANCE WITH THE 10 STATE STANDARDS: NEW, CLEANED AND REPAIRED WATER MAINS SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA STANDARD C651. THE SPECIFICATIONS INCLUDE DETAILED PROCEDURES FOR THE ADEQUATE FLUSHING, DISINFECTION, AND MICROBIOLOGICAL TESTING OF ALL WATER MAINS. IN AN EMERGENCY OR UNUSUAL SITUATION, THE DISINFECTION PROCEDURE SHALL BE DISCUSSED WITH THE REVIEWING AUTHORITY.

31. IN COMPLIANCE WITH COMAR 09.20.01.03 AND THE SAFE DRINKING WATER ACT (SECTION 1417(A)(4)(B), MATERIALS THAT COME IN CONTACT WITH WATER INTENDED FOR USE IN PUBLIC WATER SUPPLY SHALL COMPLY WITH THE REDUCTION OF LEAD IN DRINKING WATER ACT, WHICH WENT INTO EFFECT IN MARYLAND IN JANUARY 2012.

32. THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) CONSTRUCTION PERMIT NUMBER FOR THIS PROJECT IS 16-11-1106. THE LITTLE PATUXENT RIVER AND ITS TRIBUTARIES IN THE PROJECT LOCATION ARE CLASSIFIED AS USE IV-P (RECREATIONAL TROUT AND PUBLIC WATER SUPPLY) WATERS. NO IN-STREAM WORK MAY BE CONDUCTED DURING THE PERIOD OF MARCH 1 THROUGH MAY 31, INCLUSIVE, DURING ANY YEAR.

RECORD DRAWINGS
This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided, Those relying on this record document are advised to obtain independent verification of its accuracy.
O'BRIEN & GERE ENGINEERS, INC.
By: _____

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	DATE	CHIEF - BUREAU OF ENGINEERING	DATE
CHIEF, BUREAU OF UTILITIES	DATE	CHIEF, UTILITY DESIGN DIVISION PSD	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. 50399, EXPIRATION DATE 12/28/2018
STATE OF MARYLAND · LOUIS RAGOZZINO · REG. NO. 50399 · PROFESSIONAL ENGINEER
01/16/18

DSN. BY:	SLS/CTP
DRN. BY:	IH
CHK. BY:	RJD
DATE:	01/18

BY	NO.		DATE
CTP	2	RECORD DRAWINGS	10/16/19
LR	1	ADDENDUM NO. 3	2/21/18

GENERAL NOTES
LEGEND, ABBREVIATIONS

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 2 OF 41

FILE NO. 51204-002

I:\HOWARD-CO.2343\69520.BROKEN-LAND-PKW\DOCS\DWG\SHEETS\51204-003.DWG

SOIL BORINGS

BORING NUMBER	NORTHING	EASTING	DESCRIPTION
B-1	554066.44	1354356.83	MINIMUM DISTANCE BETWEEN BORINGS
B-2	555117.18	1354247.87	30"x8" TEE
B-4	555448.31	1354227.27	MINIMUM DISTANCE BETWEEN BORINGS
B-4B	555448.31	1354227.27	MINIMUM DISTANCE BETWEEN BORINGS
B-5	556159.00	1354354.31	MINIMUM DISTANCE BETWEEN BORINGS
B-7B	555354.23	1354598.36	MINIMUM DISTANCE BETWEEN BORINGS

TEST PITS

ID	NORTHING	EASTING
TP-1	553156.49	1354661.35
TP-2	553641.45	1354428.69
TP-3	553675.48	1354420.15
TP-4	554103.26	1354352.40
TP-5	555183.50	1354304.67
TP-6	556576.28	1354399.33
TP-7	557334.38	1354463.93
TP-8	555135.60	1354301.76
TP-9	555224.31	1354427.09
TP-10	555229.33	1354428.65
TP-11	555337.60	1354430.77
TP-12	555348.98	1354458.30
TP-13	555370.83	1354691.09
TP-13A	555381.67	1354686.67
TP-13B	555376.32	1354688.82
TP-13C	555375.44	1354688.85
TP-14	553145.68	1354666.58
TP-15	554997.65	1354299.29

30" DIA. WATER MAIN COORDINATE TABLE

STA	ITEM	NORTHING	EASTING
0+17.00	24" SOLID SLEEVE	553167.65	1354656.41
0+23.75	30" X 24" RED.	553173.33	1354653.92
0+36.75	30" 45° HB	553185.07	1354648.54
1+16.54	30" 45° HB	553214.47	1354574.38
1+18.35	PC	553216.05	1354573.51
1+26.50	30" X 6" FH TEE	553223.56	1354570.35
6+72.50	30" X 6" FH TEE	553743.59	1354406.92
10+58.70	PT	554125.42	1354349.89
10+95.41	PC	554162.00	1354346.84
11+07.50	30" X 6" FH TEE	554174.05	1354345.83
15+43.50	30" X 8" FH TEE	554609.13	1354317.79
16+65.02	PT	554730.54	1354312.75
19+07.50	30" X 8" FH TEE	554972.93	1354306.22
19+22.98	30" 22.5° HB	554988.49	1354305.71
20+38.43	30" RSGV	555093.72	1354258.43
20+57.28	30" X 8" TEE	555110.98	1354250.66
21+13.88	30" 22.5° HB	555162.88	1354228.14
22+03.88	BLOW OFF / ACCESS MANHOLE	555252.89	1354227.68
24+36.94	30" 45° HB	555485.93	1354228.62
25+59.16	30" 45° HB	555569.30	1354317.83
25+90.68	ACCESS MANHOLE	555600.76	1354319.59
28+00.68	30" RSGV	555810.39	1354332.04
29+50.68	30" X 8" FH TEE	555960.16	1354340.18
30+35.85	PC	556046.66	1354344.00
36+06.22	PT	556614.05	1354403.39
36+07.00	30" X 8" FH TEE	556614.66	1354403.46
39+18.16	PC	556923.50	1354441.35
39+45.46	ARV / ACCESS MANHOLE	556950.81	1354444.42
40+80.00	30" X 8" FH TEE	557085.44	1354451.40
41+50.51	PT	557155.39	1354449.23
41+77.05	30" 45° HB	557181.97	1354447.84
42+37.00	30" 45° HB	557255.40	1354485.07
42+59.00	30" SLEEVE & 30" ADAPTOR	557253.05	1354479.94

SURVEY CONTROL DATA

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
900	552978.3616	1354677.9034	313.429	HOWARD CO. CONTROL MONUMENT
912	557315.6930	1354421.8490	345.460	ROD AND CAP
913	556872.3293	1354466.9084	353.319	ROD AND CAP
914	556432.9950	1354369.8871	337.642	ROD AND CAP
915	555982.9703	1354380.2274	317.781	ROD AND CAP
916	555541.5471	1354304.3433	296.541	ROD AND CAP
917	555089.9353	1354337.2193	292.044	ROD AND CAP
918	554617.3132	1354301.8039	296.371	ROD AND CAP
919	554159.9037	1354378.8895	297.043	ROD AND CAP
920	553713.3074	1354403.1992	294.693	ROD AND CAP
921	553345.8396	1354510.9872	299.772	ROD AND CAP

8" DIA. WATER MAIN COORDINATE TABLE

STATION	ITEM	NORTHING	EASTING
0+00.00	30"x8" TEE	555110.98	1354250.66
0+01.60	8" RSGV	555112.77	1354254.58
1+85.52	8" 45° HB	555184.67	1354420.88
1+99.44	8" 22.5° HB	555197.45	1354426.36
3+36.61	8" 45° HB	555334.60	1354428.55
3+74.52	8" 45° HB	555361.18	1354455.57
4+00.61	8"x6" FH TEE	555362.91	1354481.70
5+86.40	8" 45° HB	555382.55	1354665.72
6+04.25	8" 45° HB	555373.53	1354681.09
6+15.00	8" SOLID SLEEVE	555376.29	1354691.66

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 11/26/19
CHIEF - BUREAU OF ENGINEERING — DATE 11/7/18
CHIEF, BUREAU OF UTILITIES — DATE 1-17-18
CHIEF, UTILITY DESIGN DIVISION — DATE 11/7/18

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. 50399, EXPIRATION DATE 12/28/2018 — 01/10/18

STATE OF MARYLAND · LOUIS RAGOZZINO · No. 050399 · PROFESSIONAL ENGINEER

DSN. BY:	SLS/CTP
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	01/18

BY	NO.	REVISION	DATE
CTP	3	RECORD DRAWINGS	10/16/19
LR	2	DESIGN REVISION NO. 2	6/1/18
LR	1	DESIGN REVISION NO. 1	4/25/18

SCHEDULES AND TABLES

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

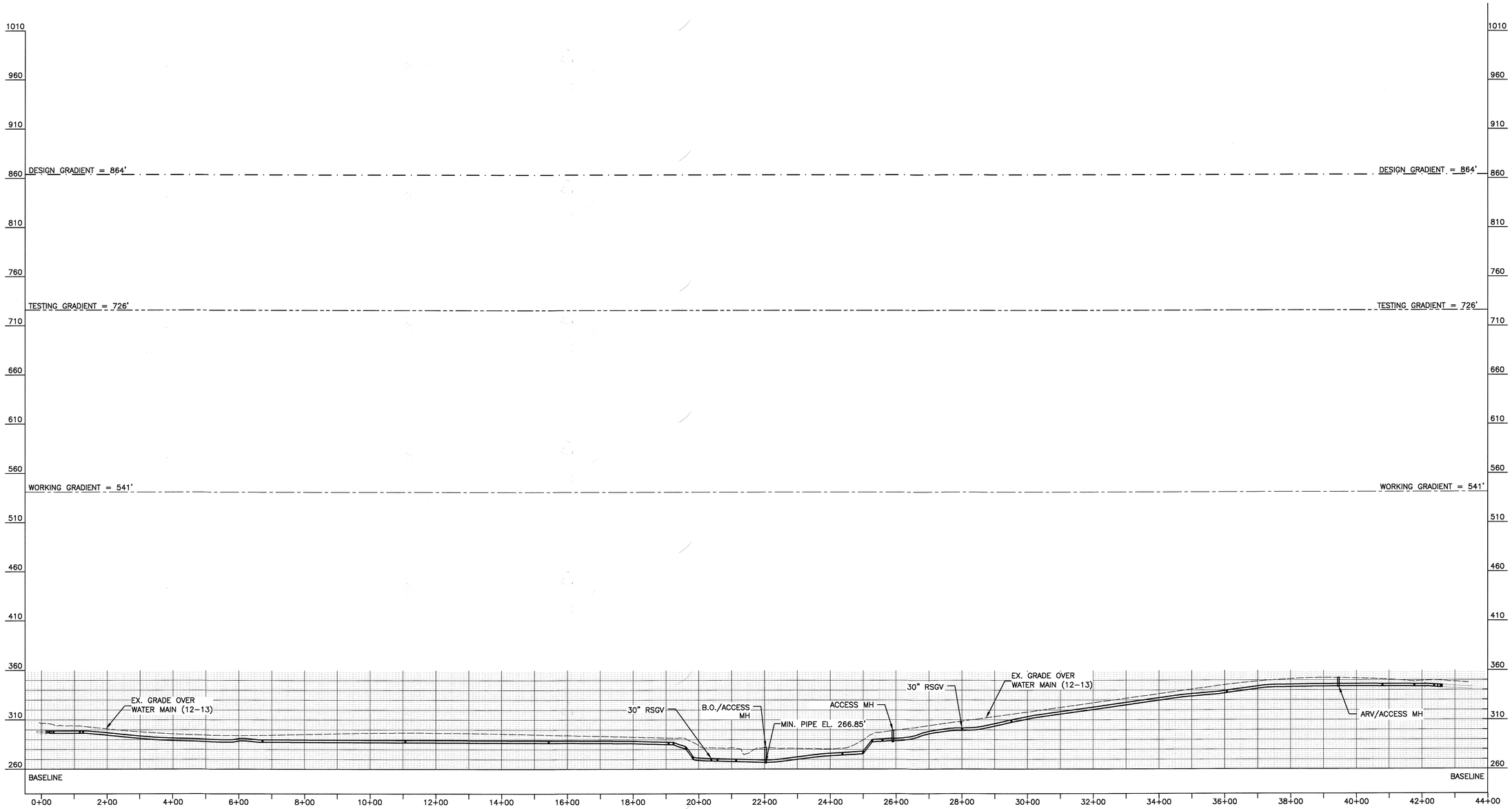
BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 3 OF 41

FILE NO. 51204-003

I:\HOWARD-CO.2343\69520.BROKEN-LAND-PKWY\DOCS\DWG\SHEETS\51204-004.DWG



HYDRAULIC PROFILE

HORIZ. SCALE: 1"=150'
VERT. SCALE: 1"=50'

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.
O'BRIEN & GERE ENGINEERS, INC.
By:

SCALES
1"=100' 100 0 100 200
1"=50' 50 0 50 100

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/12/19
CHIEF - BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-18-18
CHIEF, UTILITY DESIGN DIVISION PSD — DATE 1/17/18

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. 50399, EXPIRATION DATE: 12/28/2018 01/16/18

STATE OF MARYLAND — LOUIS RAGOZZINO — REG. NO. 50399 — PROFESSIONAL ENGINEER

DSN. BY:	SLS/CTP
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	01/18

BY	NO.	REVISION	DATE
CTP	1	RECORD DRAWINGS	10/16/19

HYDRAULIC PROFILE

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

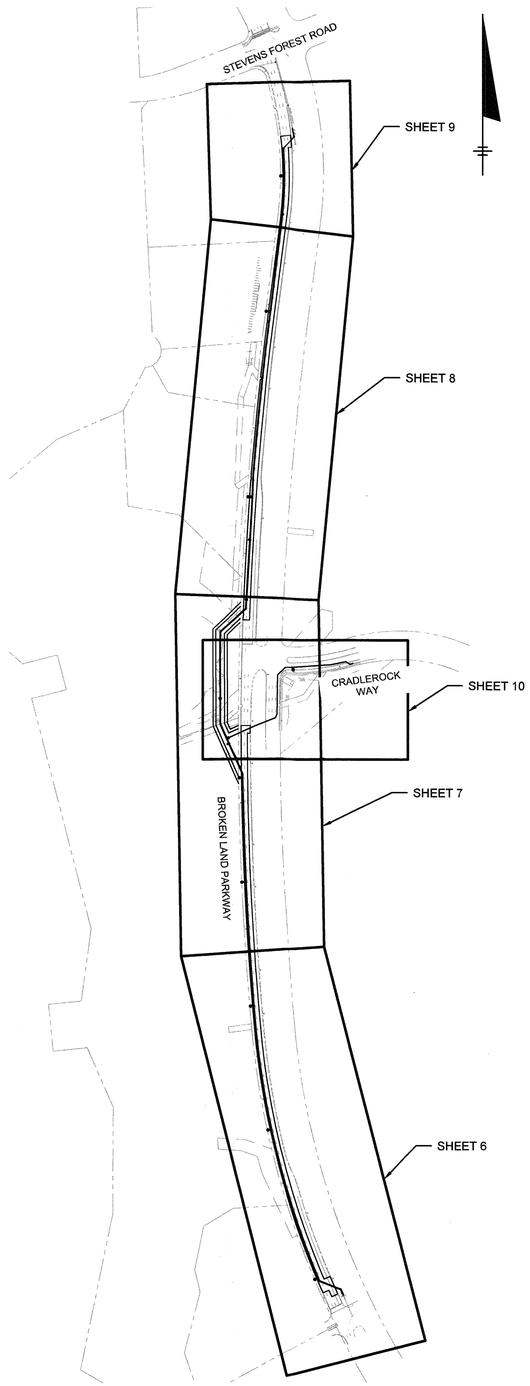
BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 4 OF 41

FILE NO. 51204-004

I:\HOWARD-CO.2343\69520.BROKEN-LAND-PKWY\DOCS\DWG\SHEETS\51204-005.DWG



KEY MAP
SCALE: 1"=250'

SCALE 1"=250' 250 0 250 500

RESTORATION SCHEDULE ALONG 30" WATER MAIN

STATION* FROM	STATION* TO	DESCRIPTION OF LOCATION/RESTORATION TYPE
-0+08	0+57	DESCRIPTION: GRASSED AREA IN ROADWAY MEDIAN RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH HOWARD SOIL CONSERVATION DISTRICT REQUIREMENTS AND SEED SUMMARIES (SHEET 22).
0+57	19+36	DESCRIPTION: PAVED AREA RESTORATION: RESTORE PAVEMENT PER DETAILS ON SHEET 14. RESTORE CONCRETE CURB & GUTTER PER HOWARD COUNTY STANDARD DETAILS. RESTORE STRIPING PER SPECIFICATIONS.
19+36	21+28	DESCRIPTION: GRASSED AREA RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH HOWARD SOIL CONSERVATION DISTRICT REQUIREMENTS AND SEED SUMMARIES (SHEET 22).
21+28	21+65	DESCRIPTION: STREAM CROSSING RESTORATION: RESTORE STREAM BANKS WITH IMBRICATED RIPRAP PER MGWC DETAIL 2.2 ON SHEET 19.
21+65	22+29	DESCRIPTION: GRASSED AREA RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH HOWARD SOIL CONSERVATION DISTRICT REQUIREMENTS AND SEED SUMMARIES (SHEET 22).
22+29	24+37	DESCRIPTION: WETLAND AREA RESTORATION: RESTORE ENTIRE DISTURBED AREA PER NOTES AND DETAILS ON SHEETS 20 AND 21.
24+37	25+44	DESCRIPTION: GRASSED AREA RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH HOWARD SOIL CONSERVATION DISTRICT REQUIREMENTS AND SEED SUMMARIES (SHEET 22).
25+44	42+16	DESCRIPTION: PAVED AREA RESTORATION: RESTORE PAVEMENT PER DETAILS ON SHEET 14. RESTORE CONCRETE CURB & GUTTER PER HOWARD COUNTY STANDARD DETAILS. RESTORE STRIPING PER SPECIFICATIONS.
42+16	43+42	DESCRIPTION: GRASSED AREA RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH HOWARD SOIL CONSERVATION DISTRICT REQUIREMENTS AND SEED SUMMARIES (SHEET 22).

RESTORATION SCHEDULE ALONG 8" WATER MAIN

STATION* FROM	STATION* TO	DESCRIPTION OF LOCATION/RESTORATION TYPE
0+00	0+53	DESCRIPTION: GRASSED AREA RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH HOWARD SOIL CONSERVATION DISTRICT REQUIREMENTS AND SEED SUMMARIES (SHEET 22).
0+53	0+92	DESCRIPTION: PAVED AREA RESTORATION: RESTORE PAVEMENT, CONCRETE CURB & GUTTER, AND STRIPING PER HOWARD COUNTY STANDARD DETAILS.
0+92	1+48	DESCRIPTION: GRASSED AREA IN ROADWAY MEDIAN RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH HOWARD SOIL CONSERVATION DISTRICT REQUIREMENTS AND SEED SUMMARIES (SHEET 22).
1+48	5+93	DESCRIPTION: PAVED AREA RESTORATION: RESTORE PAVEMENT, CONCRETE CURB & GUTTER, AND STRIPING PER HOWARD COUNTY STANDARD DETAILS.
5+93	6+24	DESCRIPTION: GRASSED/SIDEWALK AREA RESTORATION: SEED DISTURBED, GRASSED AREA IN ACCORDANCE WITH HOWARD SOIL CONSERVATION DISTRICT REQUIREMENTS AND SEED SUMMARIES (SHEET 22). RESTORE SIDEWALK PER HOWARD COUNTY STANDARD DETAILS.

*NOTE: SEE SHEETS 6-10 FOR AS-BUILT WATER MAIN ALIGNMENT AND STATIONING.

RECORD DRAWINGS
This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.
O'BRIEN & GERE ENGINEERS, INC.
By: _____

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/16/18
CHIEF - BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-17-18
CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/18

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. 50399, EXPIRATION DATE 12/28/2018 01/16/18

STATE OF MARYLAND — LOUIS RAGO ZINO — REG. NO. 50399 — PROFESSIONAL ENGINEER

DSN. BY:	SLS/CTP
DRN. BY:	IH
CHK. BY:	RJD
DATE:	01/18

BY	NO.	REVISION	DATE
CTP	1	RECORD DRAWINGS	10/16/19

KEY MAP AND RESTORATION SCHEDULE

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 5 OF 41

FILE NO. 51204-005

I:\HOWARD-CO.2343\69520.BROKEN-LAND-PKW\DOCS\DWG\SHEETS\51204-006.DWG

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others, While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.
O'BRIEN & GERE ENGINEERS, INC.
By: _____

NOTE: REMNANT STORM DRAIN INLET STRUCTURE ENCOUNTERED AT APPROX. STA. 6+00 DURING EXCAVATION FOR WM INSTALLATION. STRUCTURE WAS FOUND TO BE ACTIVE (PIPES CONNECTED) BUT IS INACCESSIBLE FROM THE SURFACE. TOP OF STRUCTURE WAS PREVIOUSLY REMOVED AND WAS COVERED WITH A CONCRETE SLAB. THE AREA ABOVE THE SLAB WAS PREVIOUSLY BACKFILLED AND THE SURFACE WAS RESTORED. REMNANT STRUCTURE WAS RETURNED TO THESE CONDITIONS UPON COMPLETION OF WM INSTALLATION.

COLUMBIA ASSOCIATION, INC
L:3324 F:191
36-14-0402

GATEWAY CONNECTICUT PROPERTIES, INC
C/O MCSHEA MANAGEMENT
L:3817 F:146
42-03-0392

GATEWAY CONNECTICUT PROPERTIES, INC
C/O MCSHEA MANAGEMENT
L:3817 F:146
42-03-0392

BROKEN LAND PARKWAY
(150' R.O.W.)

MATCH LINE STA. 13+00
FOR CONTINUATION SEE SHEET 7

CONCRETE MORTAR INSTALLED AROUND EXISTING 15" STORM DRAIN PIPE JOINT

STA. 0+17.00
24" SOLID SLEEVE

STA. 0+13.00
CONNECTION TO EX. 24" WATER MAIN
SEE SHEET 11 FOR DETAILS

STA. 1+16.54
30° 45° HB

STA. 1+26.50
FH BURY ELEV.=303.52'
FH BURY LENGTH=9.0'

STA. 1+26.50
30"x6" FH TEE & VALVE

APPROX. EXTENTS OF RIP-RAP ASSOCIATED W/ STORM DRAIN EXT.

REMOVE FLARED END SECTION AND EXTEND 15" RCP STORM DRAIN

STA. 0+36.75
30" 45° HB
WITH THRUST BLOCK
SEE SHEET 14 FOR DETAILS

STA. 0+23.75
30"x24" REDUCER

REMOVE EX. 24" WM, CONC. BUTTRESS, AND 24" CAP
SEE SHEET 11 FOR DETAILS

PARTIALLY REMOVE EX. SPLIT BEAM BUTTRESS
SEE SHEET 11 FOR DETAILS

100-YEAR FLOOD PLAIN

REMNANT STORM DRAIN INLET STRUCTURE (SEE NOTE ABOVE)

STA. 6+72.50
FH BURY ELEV.=294.77'
FH BURY LENGTH=7.5'

L=940.35, R=2983
D=018°03'45"

EXTENTS OF ASPHALT PAVEMENT RESTORATION FOR 30" WM

EXTENTS OF ASPHALT PAVEMENT RESTORATION FOR 30" WM

STA. 6+72.50
30"x6" FH TEE & VALVE

30" WATER MAIN

STA. 11+07.50
FH BURY ELEV.=296.67'
FH BURY LENGTH=11.0'

100-YEAR FLOOD PLAIN

STA. 11+07.50
30"x6" FH TEE & VALVE

L=569.61, R=12170
D=002°40'54"

EX. PERPETUAL DRAINAGE EASEMENT L:23 F:20

EX. 20' PERPETUAL DRAINAGE EASEMENT L:23 F:20

EX. 8" PVC IN (B) = 276.75
EX. 8" PVC OUT = 276.71

N: 553500 E: 1354250
N: 553250 E: 1354250
N: 553500 E: 1354625

TRAVERSE 900
HOWARD COUNTY CONTROL MONUMENT

TRAVERSE 919
ROD AND CAP

TRAVERSE 920
ROD AND CAP

TRAVERSE 921
ROD AND CAP

LIMITS OF RESTRAINED JOINTS - STA. 0+13 TO STA. 2+67

SEE SHEET 11 FOR REVISED RECORD DRAWING OF EX. SPLIT BEAM BUTTRESS

STA. 0+13.00
CONNECTION TO EX. 24" WATER MAIN
SEE SHEET 11 FOR DETAILS

MATCH LINE THIS SHEET

MATCH LINE THIS SHEET

MATCH LINE STA. 13+00
FOR CONTINUATION SEE SHEET 7

GRAPHIC SCALES
VERTICAL 1"=5'
HORIZONTAL 1"=50'

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/16/18
CHIEF – BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-17-18
CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/18

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. 50399, EXPIRATION DATE 12/28/2018
01/16/18

DSN. BY: SLS/CTP
DRN. BY: RPW
CHK. BY: RJD
DATE: 01/18

BY	NO.	REVISION	DATE
CTP	4	RECORD DRAWINGS	10/16/19
CTP	3	DESIGN REVISION NO. 4	2/26/19
LR	2	DESIGN REVISION NO. 1	4/25/18
LR	1	ADDENDUM NO. 1	2/8/18

PLAN AND PROFILE
STA. -0+08 TO STA. 13+00

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

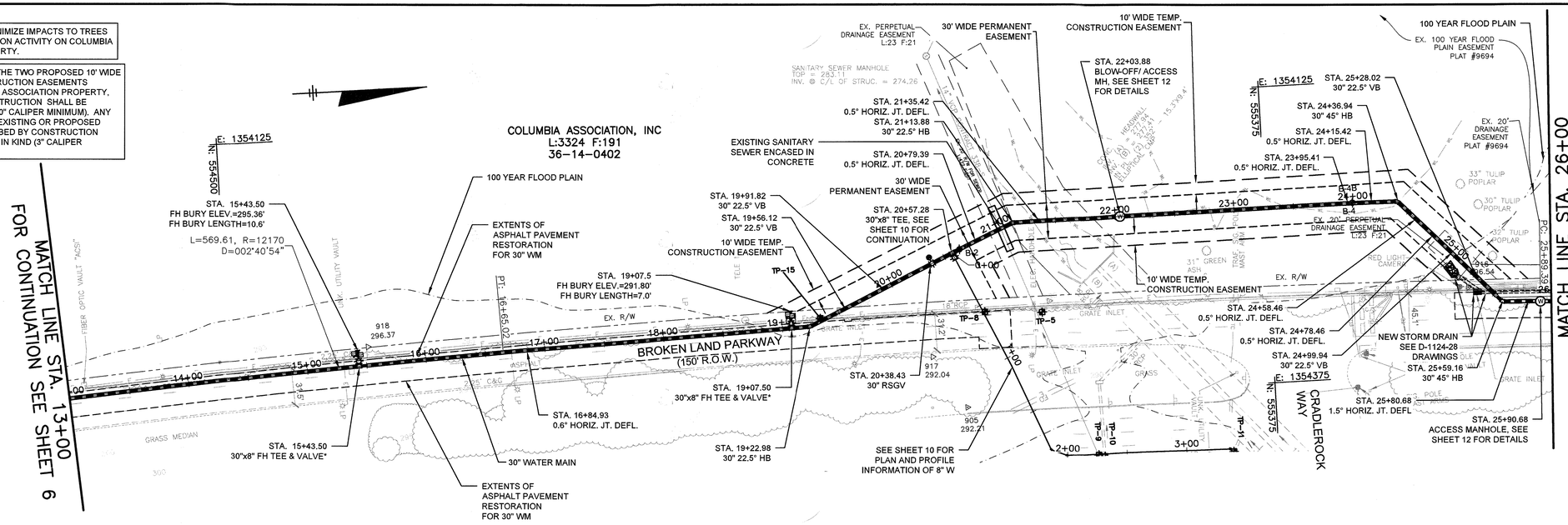
SHEET 6 OF 41

FILE NO. 51204-006

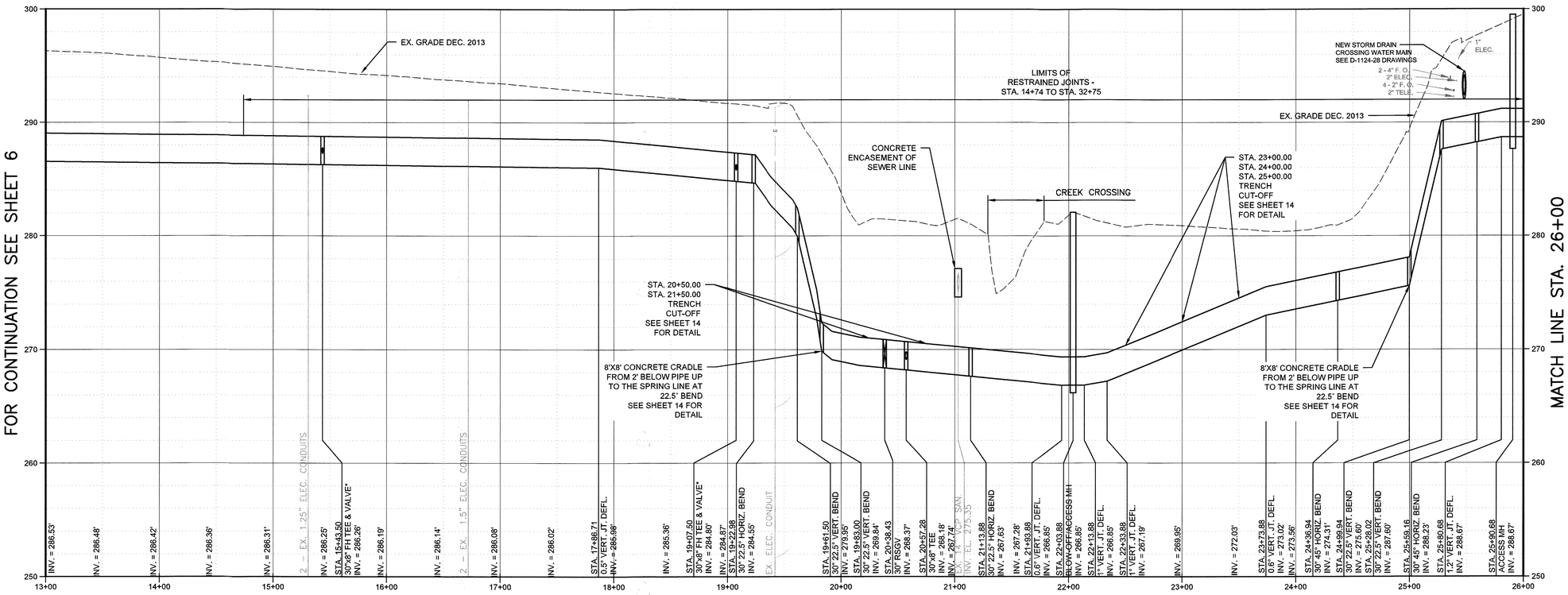
I:\HOWARD-CO.2343\68920.BROKEN-LAND-PKW\DOCS\DWG\SHEETS\51204-007.DWG

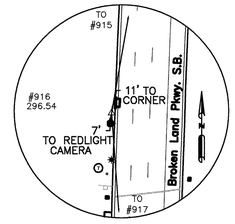
CONTRACTOR TO MINIMIZE IMPACTS TO TREES DUE TO CONSTRUCTION ACTIVITY ON COLUMBIA ASSOCIATION PROPERTY.

ANY TREES, WITHIN THE TWO PROPOSED 10' WIDE TEMPORARY CONSTRUCTION EASEMENTS THROUGH COLUMBIA ASSOCIATION PROPERTY, DISTURBED BY CONSTRUCTION SHALL BE REPLACED IN KIND (10" CALIPER MINIMUM). ANY TREES, OUTSIDE OF EXISTING OR PROPOSED EASEMENTS, DISTURBED BY CONSTRUCTION SHALL BE REPLACED IN KIND (3" CALIPER MINIMUM).

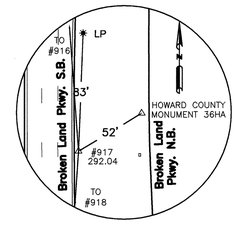


*NOTE: 30"x8" FH TEE W/ 8"x6" REDUCER

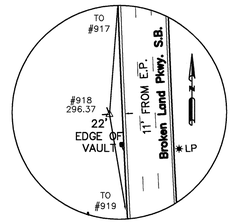




TRAVERSE 916
ROD AND CAP



TRAVERSE 917
ROD AND CAP



TRAVERSE 918
ROD AND CAP

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

GRAPHIC SCALES

VERTICAL 1"=5' (5 0 5 10)

HORIZONTAL 1"=50' (50 0 50 100)

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/12/18

CHIEF – BUREAU OF ENGINEERING — DATE 1/17/18

CHIEF, BUREAU OF UTILITIES — DATE 1-17-18

CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/18

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. 9039, EXPIRATION DATE 12/28/2018 — 01/10/18

STATE OF MARYLAND · LOUIS RAGOZZINO · 9039 · REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	SLS/CTP
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	01/18

BY	NO.	REVISION	DATE
CTP	3	RECORD DRAWINGS	10/16/19
LR	2	DESIGN REVISION NO. 2	6/1/18
LR	1	ADDENDUM NO. 1	2/8/18

PLAN AND PROFILE
STA. 13+00 TO STA. 26+00

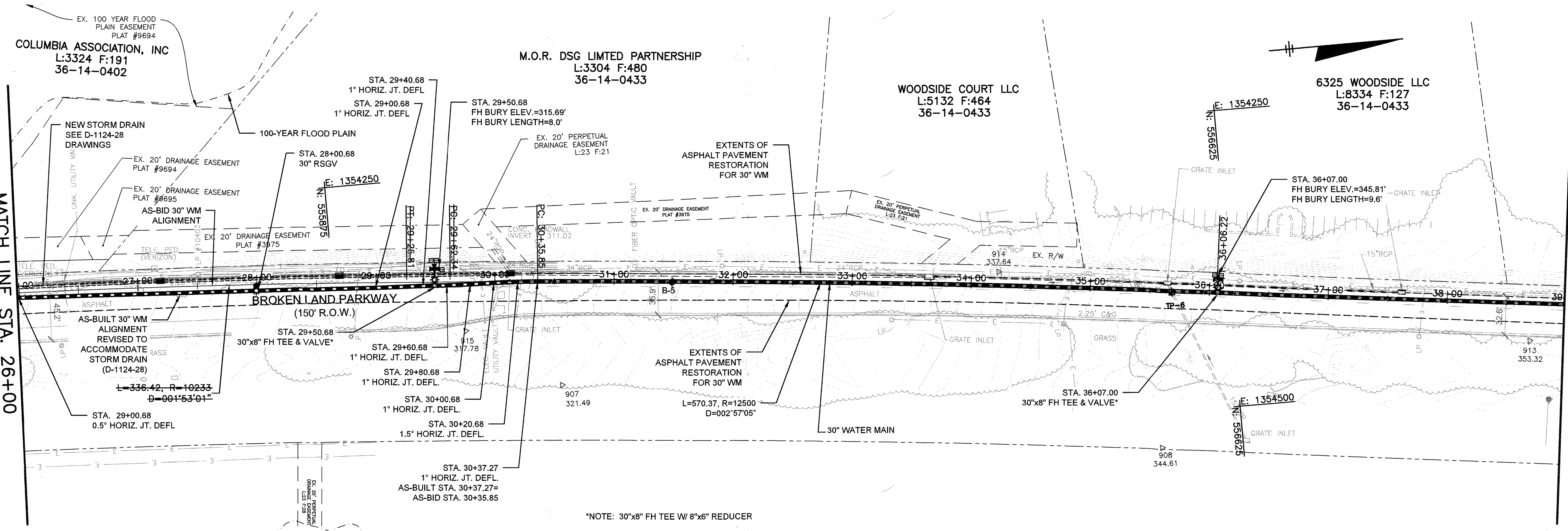
600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 7 OF 41

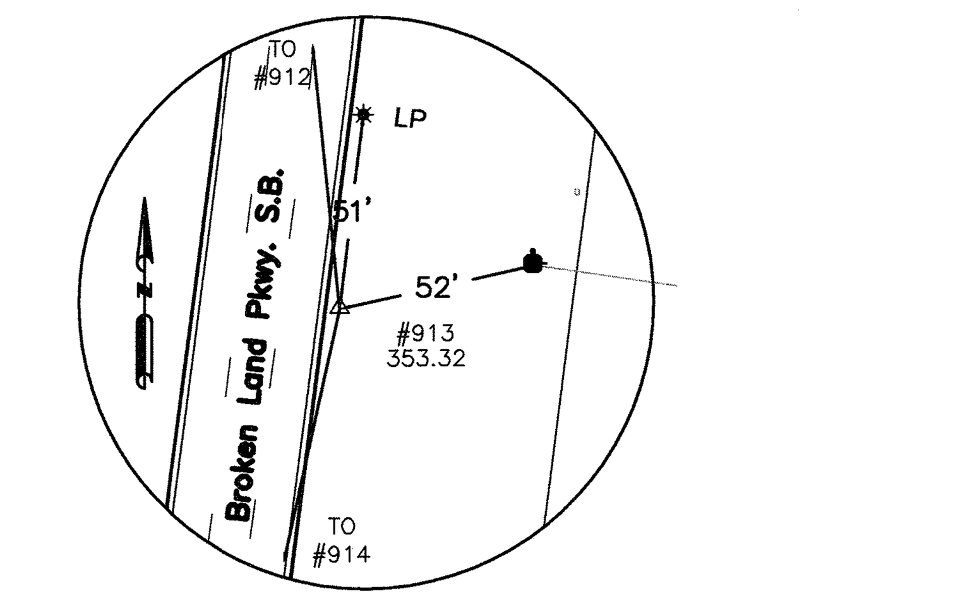
FILE NO. 51204-007



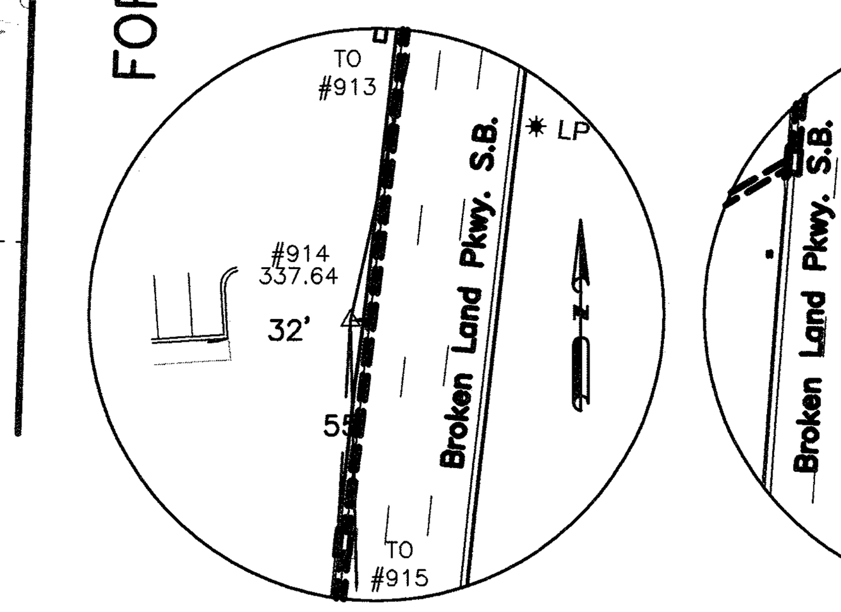
RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.
O'BRIEN & GERE ENGINEERS, INC.

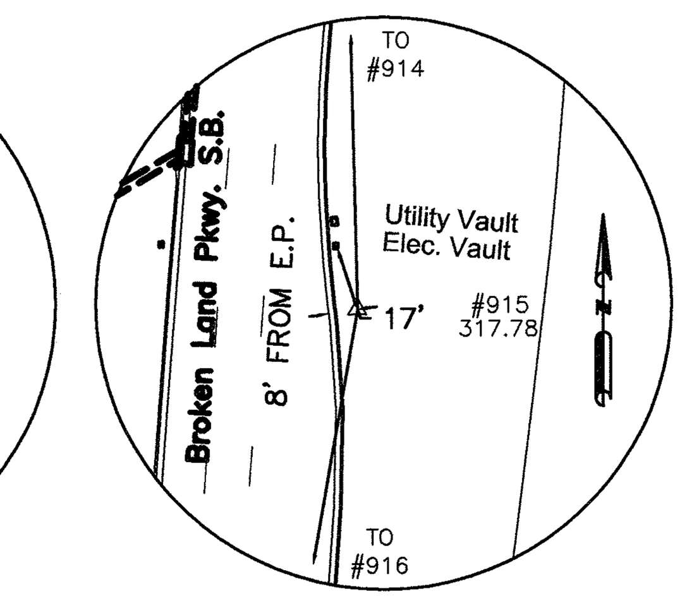
By: ____________



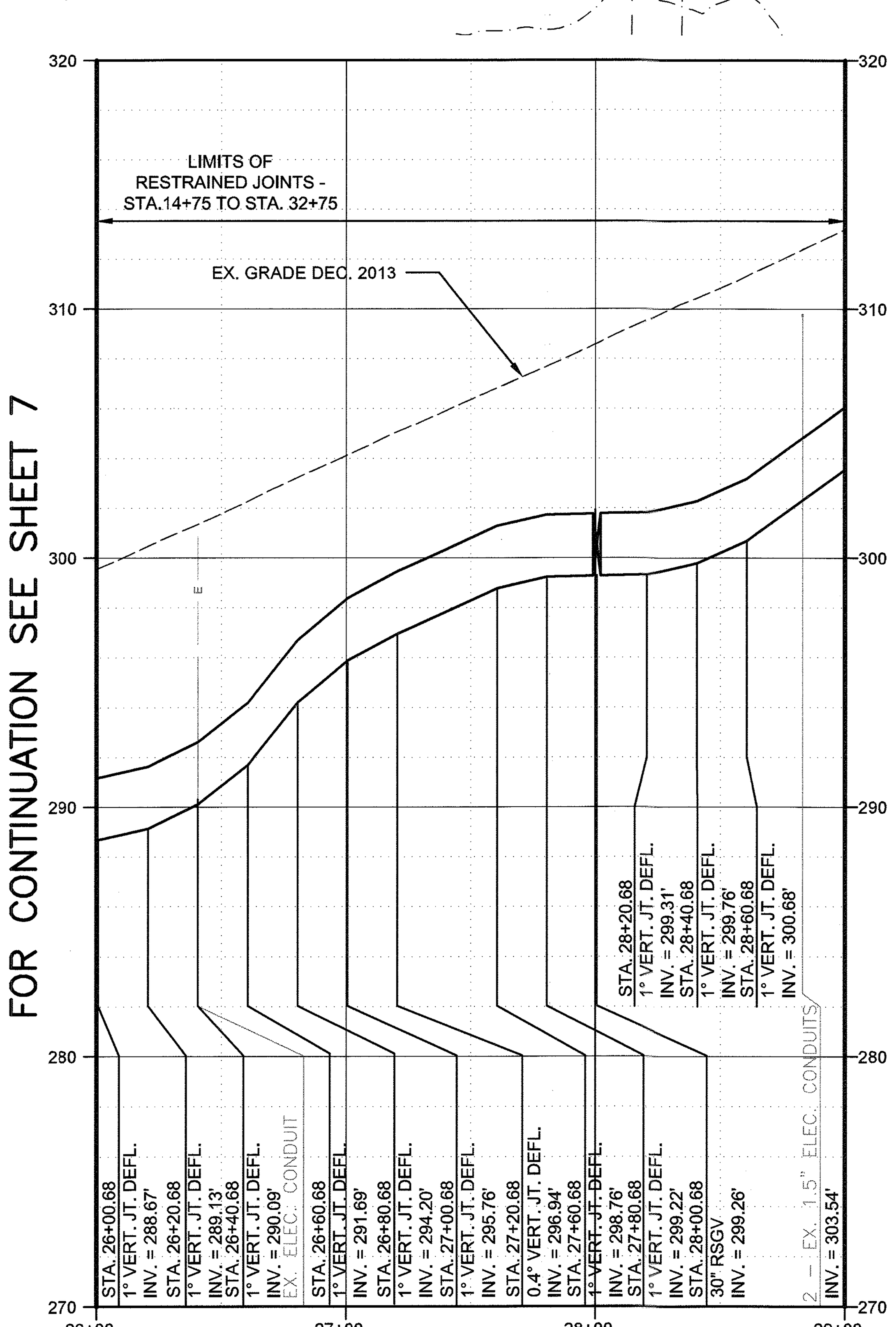
TRAVERSE 913
ROD AND CAP

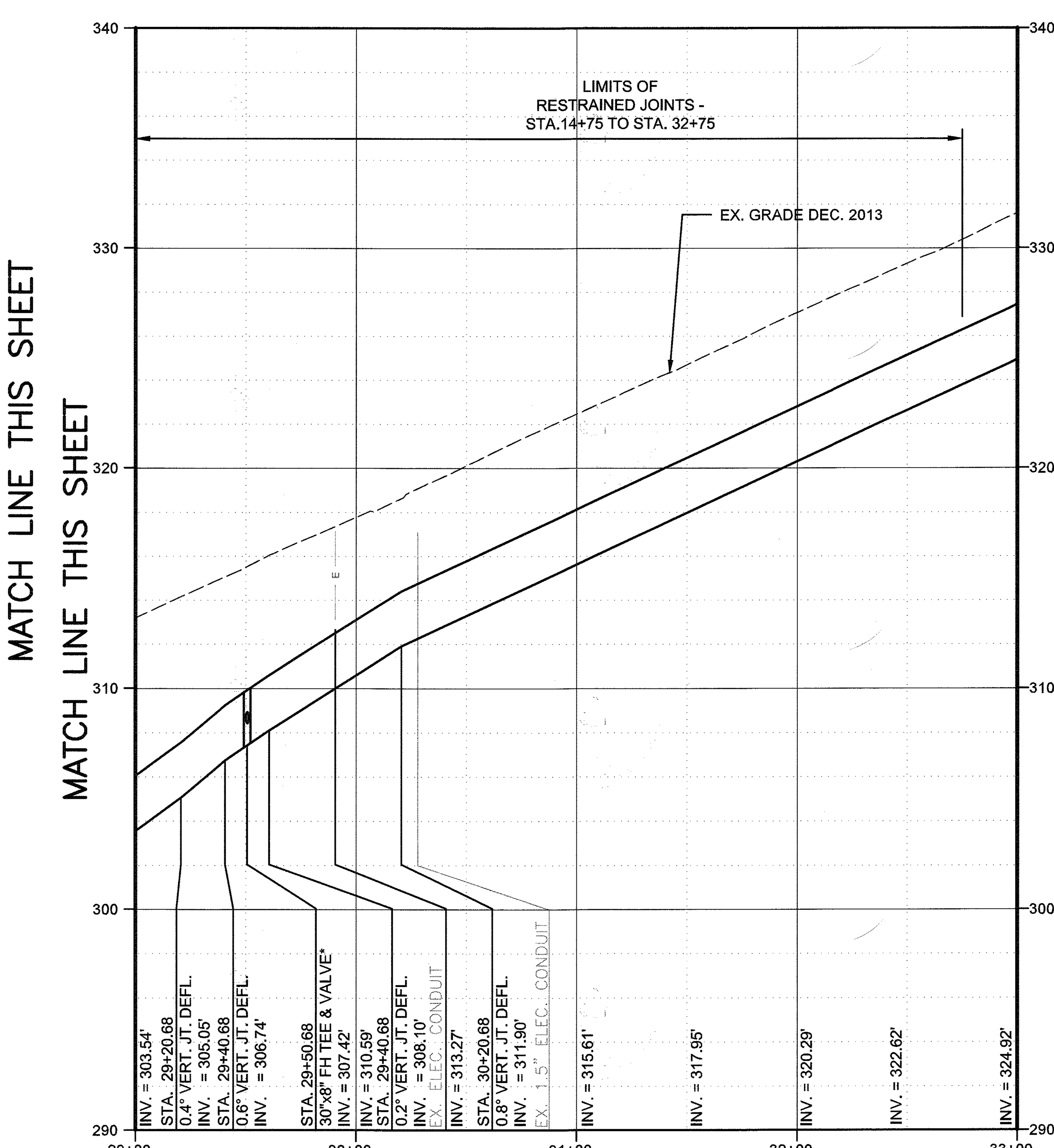


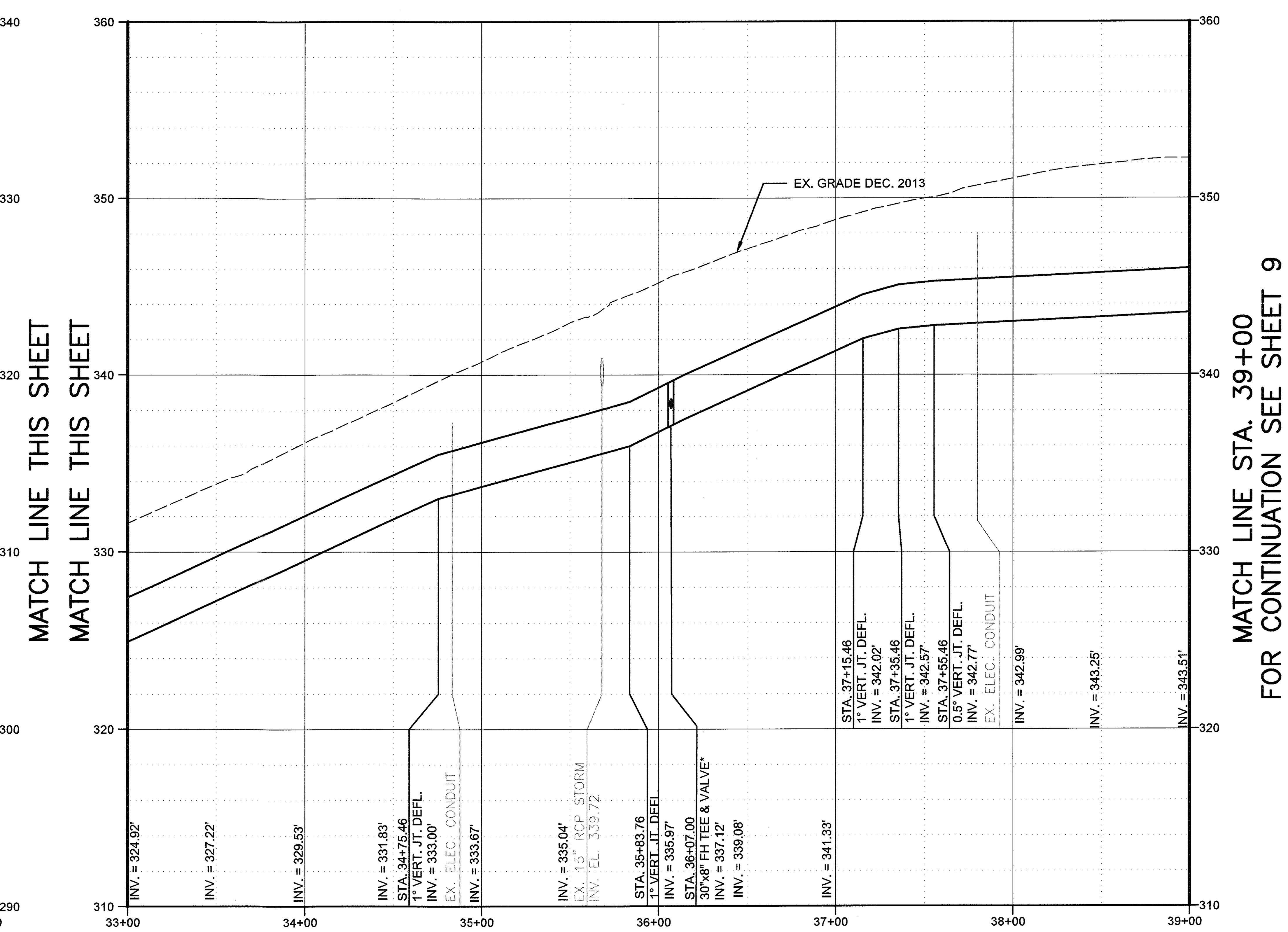
TRAVERSE 914
ROD AND CAP



TRAVERSE 915
ROD AND CAP







GRAPHIC SCALES
VERTICAL 1"=5' (5, 0, 5, 10)
HORIZONTAL 1"=50' (50, 0, 50, 100)

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	DATE 1/18/19	CHIEF - BUREAU OF ENGINEERING	DATE 1/17/18
CHIEF, BUREAU OF UTILITIES	DATE 1-17-18	CHIEF, UTILITY DESIGN DIVISION	DATE 1/17/18

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 DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 50399, EXPIRATION DATE 12/28/2018 01/16/18

DSN. BY:	SLS/CTP
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	01/18

BY	NO.	REVISION	DATE
CTP	3	RECORD DRAWINGS	10/16/19
LR	2	DESIGN REVISION NO. 2	6/1/18
LR	1	DESIGN REVISION NO. 1	4/25/18

PLAN AND PROFILE
STA. 26+00 TO STA. 39+00

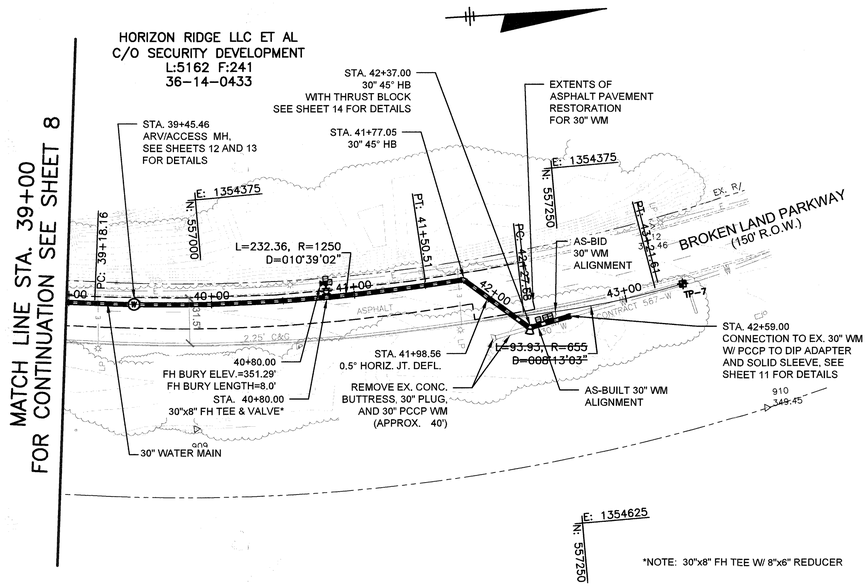
600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

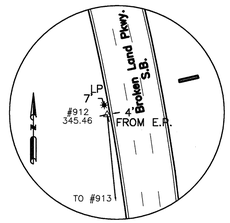
BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

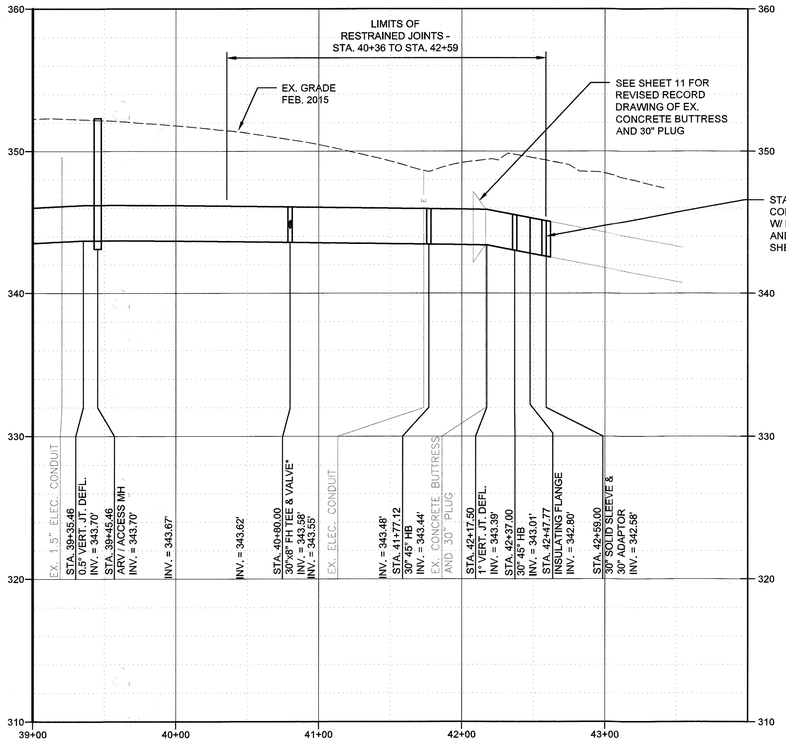
FILE NO. 51204-008

I:\HOWARD-CO.2343\69520.BROKEN-LAND-PKW\DOCS\DWGS\SHEETS\51204-009.DWG





TRAVERSE 912
ROD AND CAP



RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

GRAPHIC SCALES

VERTICAL 1"=5' (5 0 5 10)

HORIZONTAL 1"=50' (50 0 50 100)

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 11/16/18

CHIEF – BUREAU OF ENGINEERING — DATE 11/17/18

CHIEF, BUREAU OF UTILITIES — DATE 11-13-18

CHIEF, UTILITY DESIGN DIVISION — DATE 11/14/18

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. 50399, EXPIRATION DATE 12/28/2018

STATE OF MARYLAND — LOUIS RAGOZZINO — REG. NO. 50399 — PROFESSIONAL ENGINEER — 01/10/18

DSN. BY:	SLS/CTP
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	01/18

BY	NO.	REVISION	DATE
CTP	4	RECORD DRAWINGS	10/16/19
CTP	3	DESIGN REVISION NO. 4	2/26/19
LR	2	DESIGN REVISION NO. 2	6/1/18
LR	1	DESIGN REVISION NO. 1	4/25/18

PLAN AND PROFILE
STA. 39+00 TO STA. 43+41.38

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

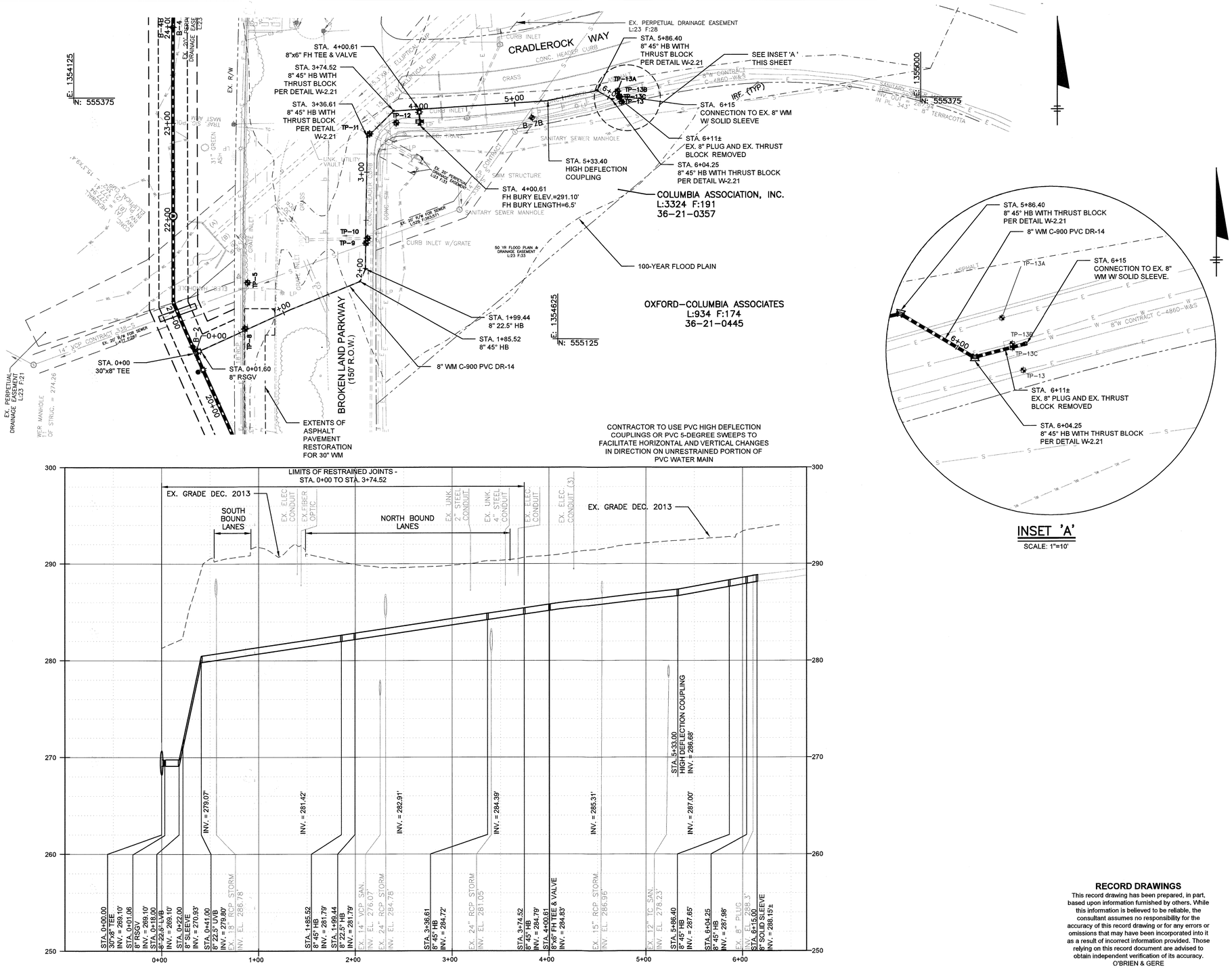
BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 9 OF 41

FILE NO. 51204-009

I:\HOWARD-CO.234\969520.BROKEN-LAND-PKWY\DOCS\DWGS\SHEETS\51204-010.DWG



INSET 'A'

SCALE: 1"=10'

CONTRACTOR TO USE PVC HIGH DEFLECTION COUPLINGS OR PVC 5-DEGREE SWEEPS TO FACILITATE HORIZONTAL AND VERTICAL CHANGES IN DIRECTION ON UNRESTRAINED PORTION OF PVC WATER MAIN

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

GRAPHIC SCALES

VERTICAL 1"=5' 5 0 5 10

HORIZONTAL 1"=50' 50 0 50 100

HORIZONTAL 1"=10' 10 0 10 20

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/9/18

CHIEF - BUREAU OF ENGINEERING — DATE 1/17/18

CHIEF, BUREAU OF UTILITIES — DATE 1-17-18

CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/18

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. 150399, EXPIRATION DATE 12/28/2018

STATE OF MARYLAND — LOUIS RAGOZZINO — PROFESSIONAL ENGINEER — 01/16/18

DSN. BY:	SLS/CTP
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	01/18

BY	NO.	REVISION	DATE
CTP	2	RECORD DRAWINGS	10/16/19
LR	1	DESIGN REVISION NO. 1	4/25/18

PLAN AND PROFILE STA. 0+00 TO STA. 6+24.07 (8" WM)

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION

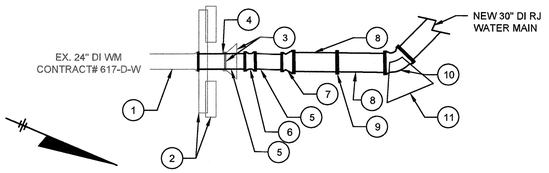
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 10 OF 41

FILE NO. 51204-010

I:\HOWARD-CO.2343\8520.BROKEN-LAND-PKW\DOCS\DWGS\SHEETS\51204-011.DWG



EXISTING:

1. EX. 24" DI MJ WATER MAIN (TO REMAIN)
2. EX. SPLIT BEAM BUTTRESS (CENTER SECTION OF SPLIT BEAM AROUND EXISTING WATER MAIN TO BE REMOVED, SEE REVISED RECORD DRAWING BELOW)
3. EX. CONCRETE BUTTRESS AND 24" CAP (TO BE REMOVED, SEE REVISED RECORD DRAWING BELOW)
4. EX. 24" DI MJ WATER MAIN (TO BE REMOVED)

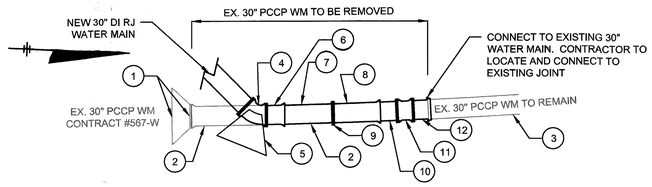
PROPOSED:

5. 24" DI PExPE WATER MAIN, RESTRAINED
6. 24" DI MJ SOLID SLEEVE, RESTRAINED
7. 30"x24" DI MJ ECCENTRIC REDUCER, RESTRAINED
8. 30" DI PExFL WATER MAIN, RESTRAINED
9. INSULATING FLANGE
10. 30" DI 45° MJ HORIZONTAL BEND, RESTRAINED
11. THRUST BLOCK (SEE THRUST BLOCK DETAIL ON C-14)

CONNECTION AT STATION ~~0+08.00~~ 0+13.00

CONNECTION NOTES (30" WM STATIONS ~~0+08.00~~ & ~~43+41.36~~ 0+13.00 42+59.00; 8" WM STATION ~~6+24.07~~ 6+15.00)

1. FOR ALL CONNECTIONS - THE CONTRACTOR SHALL EXCAVATE AT THE SPECIFIED POINT OF CONNECTION AT LEAST 60 DAYS PRIOR TO MAKING THE ACTUAL CONNECTION OR EARLIER, IN ORDER TO FABRICATE THE NECESSARY FITTINGS. THE CONTRACTOR SHALL OBTAIN ALL INFORMATION NECESSARY TO ACHIEVE A SUCCESSFUL CONNECTION (E.G. PIPE MATERIAL, JOINT LOCATIONS, DEPTHS, PIPE CONDITION, OUTSIDE DIAMETER, TYPE OF JOINT, TYPE OF RESTRAINT, AND SIMILAR). THE FINDINGS SHALL BE SUBMITTED IN LETTER FORM FOR ENGINEER'S REVIEW.
2. INSULATED JOINTS SHALL BE PROVIDED AT ALL FLANGED CONNECTIONS TO EXISTING WATER MAINS PER SHEET 41.
3. THE COUNTY WILL OPERATE ALL VALVES ON EXISTING WATER MAINS AND WILL DEPRESSURIZE MAINS PRIOR TO CONNECTION. THE CONTRACTOR SHALL DECHLORINATE ALL WATER FROM EXISTING MAINS PRIOR TO DISCHARGE.
4. FOR BWCCP OR PCCP OPTIONS, ANY ADAPTERS REQUIRED FOR EACH CONNECTION SHALL BE PROVIDED BY BWCCP OR PCCP MANUFACTURER (PAID FOR AND INSTALLED BY THE CONTRACTOR IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS). WELDS SHALL BE IN ACCORDANCE WITH BWCCP OR PCCP MANUFACTURER'S RECOMMENDATIONS. COAT ADAPTERS WITH TWO COATS OF CARBOLINE 300M OR EQUAL.
5. IN ADDITION TO THE CLOSURE PIECES REQUIRED, THE CONTRACTOR SHALL INCLUDE FOUR ADDITIONAL CLOSURE PIECES FOR THE 30" WATER MAIN INSTALLATION TO BE USED AT THE COUNTY'S DISCRETION FOR UNFORESEEN CIRCUMSTANCES.
6. OVER-EXCAVATED AREAS AND VOIDS SHALL BE FILLED WITH COMPACTED BORROW MATERIAL AT THE CONTRACTOR'S EXPENSE.
7. CONCRETE THRUST BLOCK SHALL BE INSTALLED IN PREVIOUSLY UNDISTURBED SOIL.



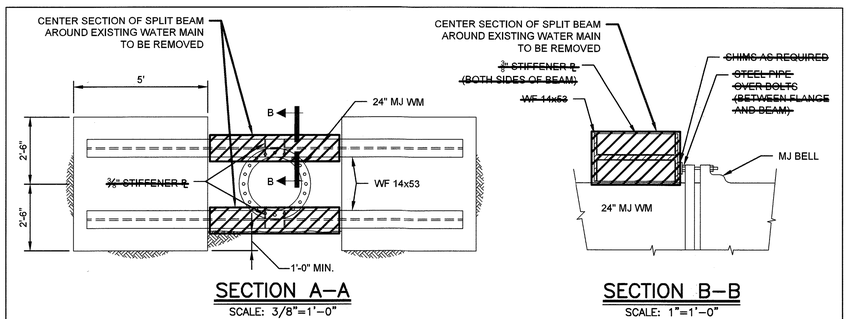
EXISTING:

1. EX. CONCRETE BUTTRESS AND 30" PLUG (TO BE REMOVED, SEE REVISED RECORD DRAWING BELOW)
2. EX. 30" PCCP WATER MAIN (TO BE REMOVED, SEE REVISED RECORD DRAWING BELOW)
3. EX. 30" PCCP WATER MAIN (TO REMAIN)

PROPOSED:

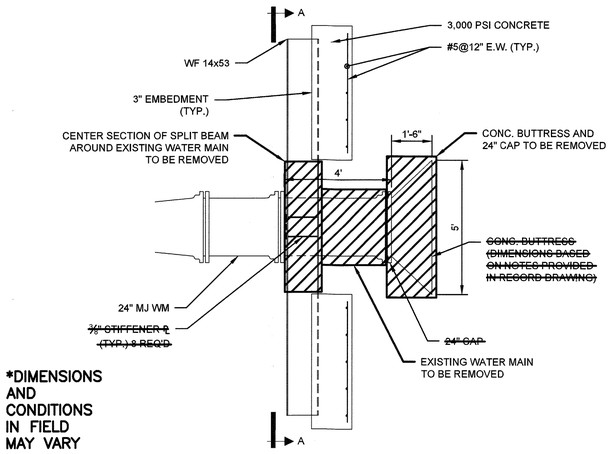
4. 30" DI 45° MJ HORIZONTAL BEND, RESTRAINED
5. THRUST BLOCK (SEE THRUST BLOCK DETAIL ON C-14)
6. 30" DI PExBL WATER MAIN, RESTRAINED
7. 30" DI PExFL WATER MAIN, RESTRAINED
8. 30" DI FLxBL WATER MAIN, RESTRAINED
9. INSULATING FLANGE
10. 30" DI PExPE WATER MAIN, RESTRAINED
11. 30" DI MJ SOLID SLEEVE, RESTRAINED
12. 30" PCCP TO DI ADAPTOR (PE X PE)

CONNECTION AT STATION ~~43+41.38~~ 42+59.00



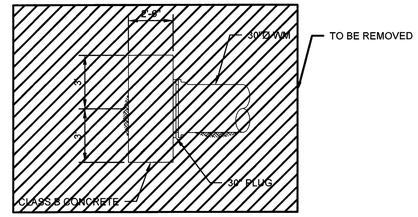
SECTION A–A
SCALE: 3/8"=1'–0"

SECTION B–B
SCALE: 1"=1'–0"

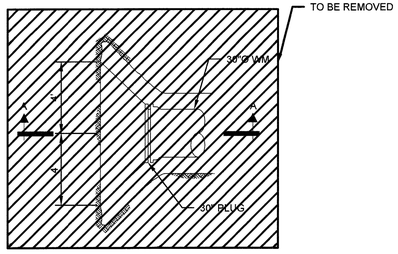


*DIMENSIONS AND CONDITIONS IN FIELD MAY VARY

EXISTING SPLIT BEAM BUTTRESS, CONCRETE BUTTRESS, AND 24" CAP (REVISED RECORD DRAWING)
SCALE: 3/8"=1'–0"

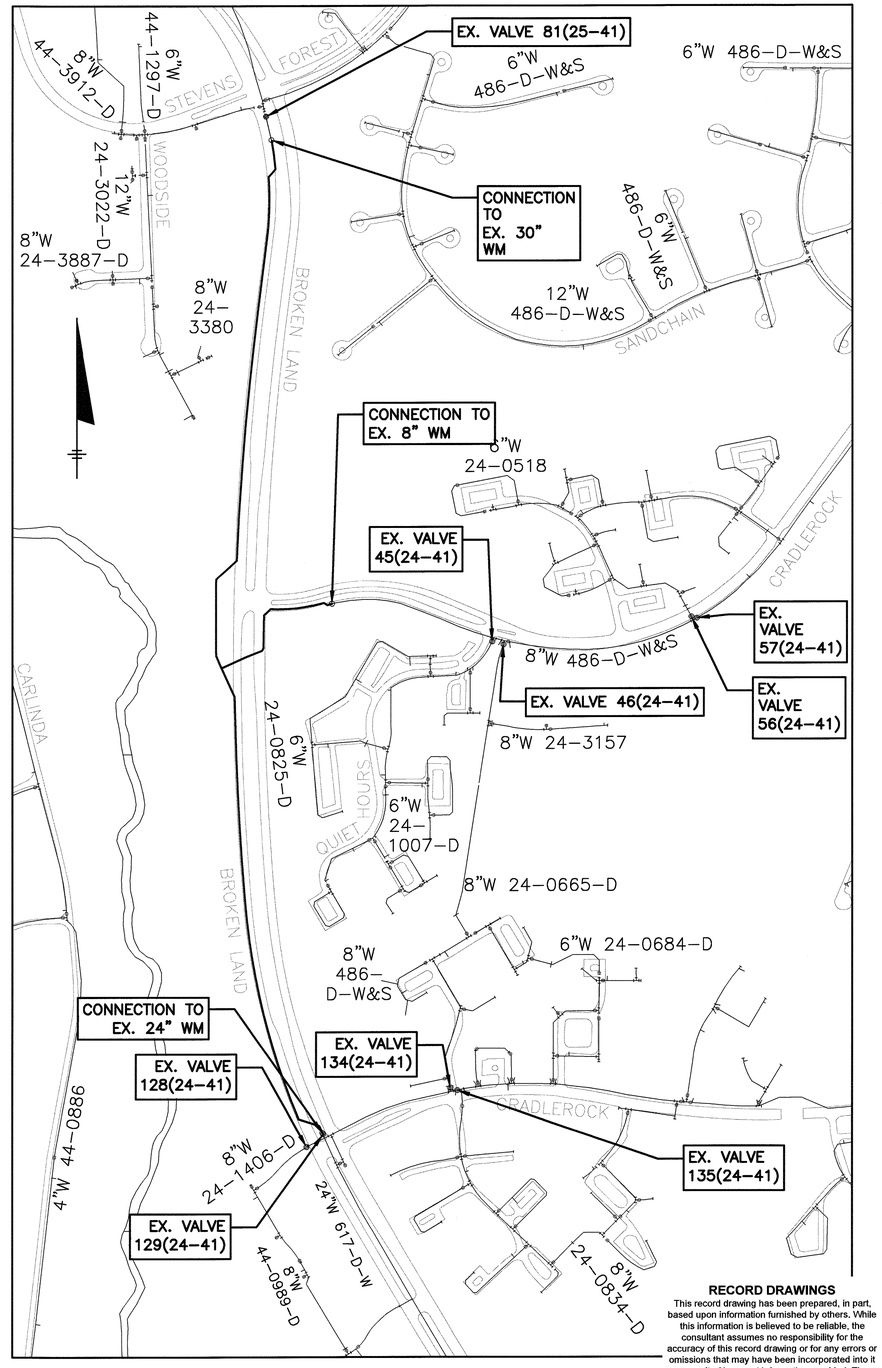


SECTION A–A
SCALE: 1/4"=1'–0"



EXISTING CONCRETE BUTTRESS AND 30" PLUG (REVISED RECORD DRAWING)
SCALE: 1/4"=1'–0"

*DIMENSIONS AND CONDITIONS IN FIELD MAY VARY



SHUTDOWN SCHEMATIC
SCALE: 1" = 300'

RECORD DRAWINGS
This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.
O'BRIEN & GERE ENGINEERS, INC.
By:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 11/9/18
CHIEF – BUREAU OF ENGINEERING — DATE 11/7/18
CHIEF, BUREAU OF UTILITIES — DATE 11-12-18
CHIEF, UTILITY DESIGN DIVISION — DATE 11/7/18

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. 50399, EXPIRATION DATE 12/28/2018 — 01/16/18

STATE OF MARYLAND · LOUIS RAGOZZINO · REG. NO. 50399 · PROFESSIONAL ENGINEER

DSN. BY:	SLS/CTP
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	01/18

BY	NO.	REVISION	DATE
CTP	2	RECORD DRAWINGS	10/16/19
CTP	1	DESIGN REVISION NO. 4	2/26/19

DETAILS OF CONNECTION POINTS AND SHUTDOWN SCHEMATIC

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

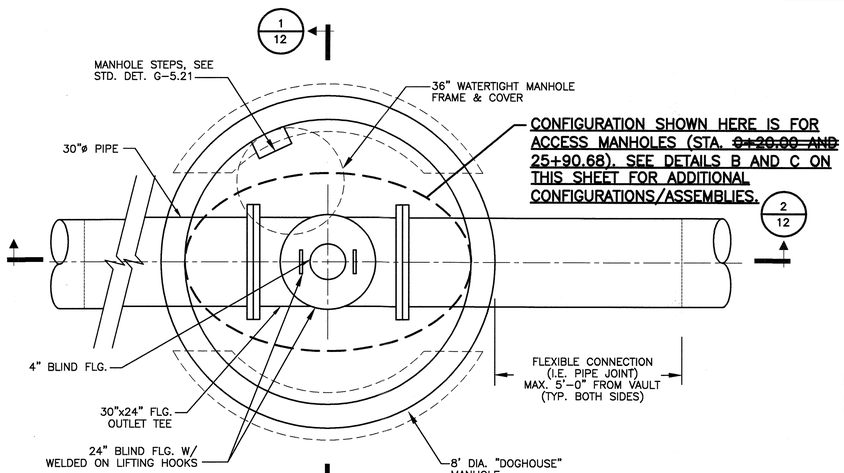
BROKEN LAND PARKWAY
30–INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W–8307
CONTRACT NO.: 44–4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 11 OF 41

FILE NO. 51204–011

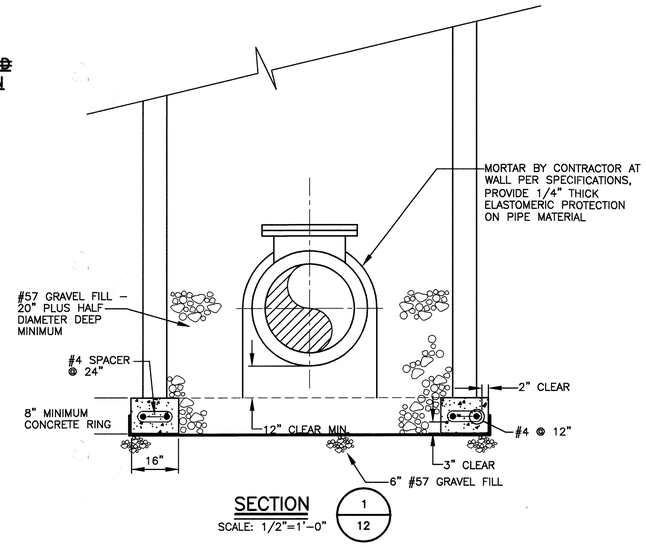
I:\HOWARD-CO.2343\69520.BROKEN-LAND-PKW\DOCS\DWG\SHEETS\51204-012.DWG



PLAN

DETAIL NOTE:

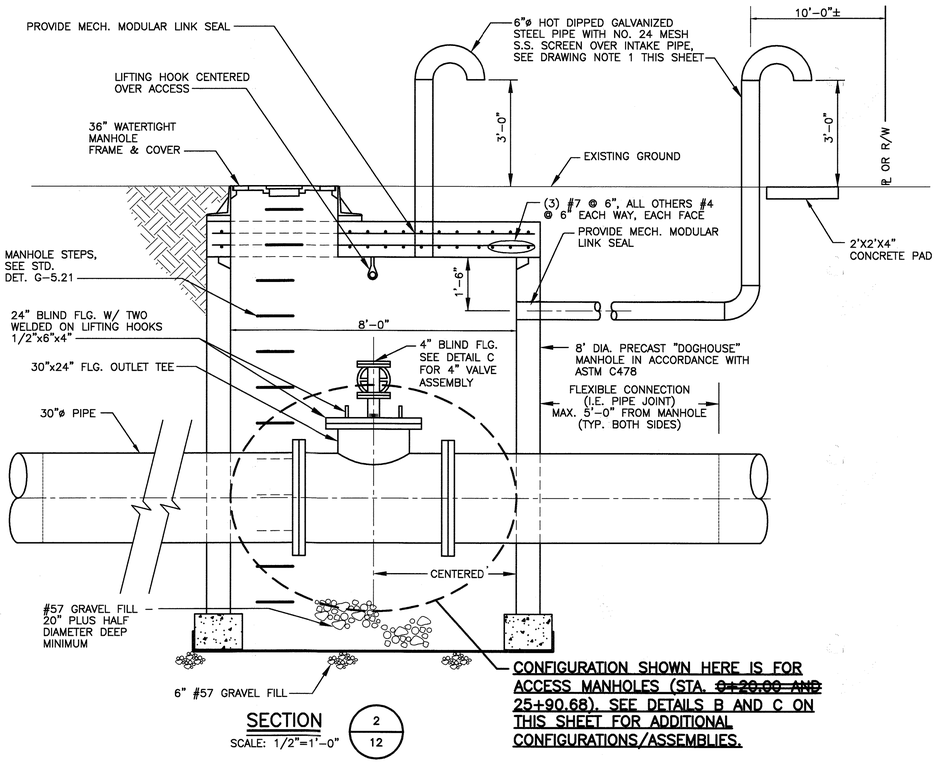
1. CONTRACTOR SHALL FIELD LOCATE AIR INTAKE ENTRANCE/EXIT LOCATION AS DIRECTED BY ENGINEER.



SECTION
SCALE: 1/2"=1'-0" 1/12

TYPICAL ACCESS MANHOLE – DETAIL A

DIP OPTION
SCALE: 1/2"=1'-0" A/12



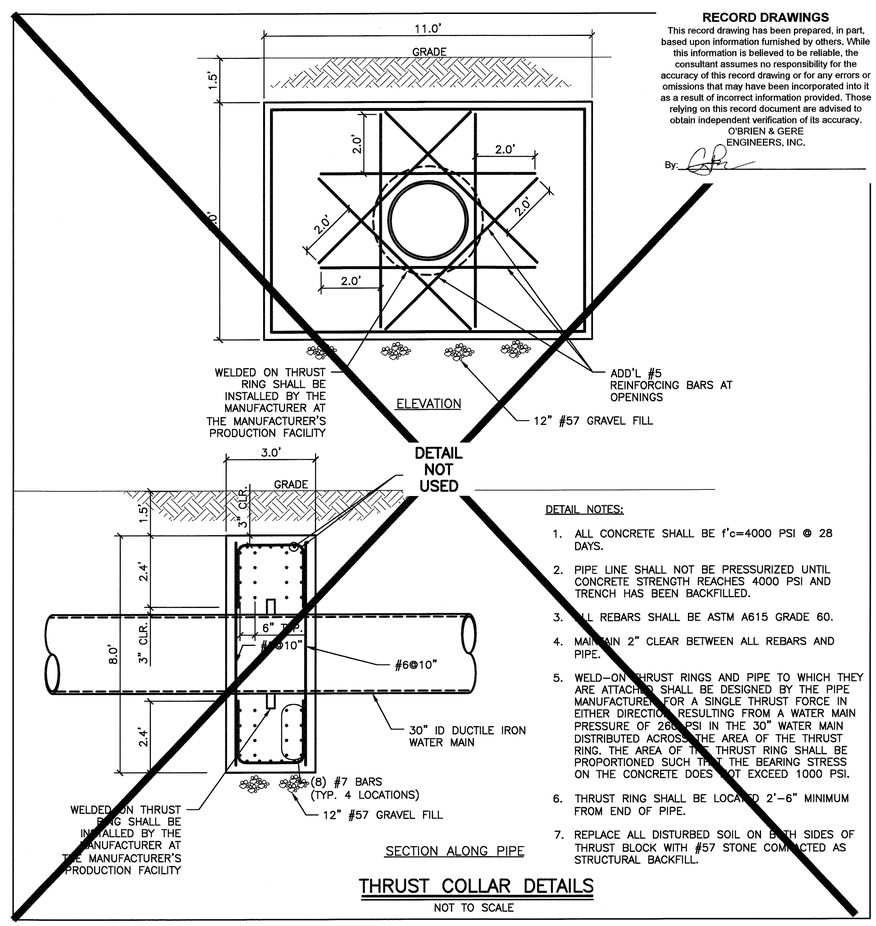
SECTION
SCALE: 1/2"=1'-0" 2/12

CONFIGURATION SHOWN HERE IS FOR ACCESS MANHOLES (STA. ~~0+20.00 AND~~ 25+90.68). SEE DETAILS B AND C ON THIS SHEET FOR ADDITIONAL CONFIGURATIONS/ASSEMBLIES.

DRAWING NOTES:

1. FOR AIR VALVE MANHOLES WITHIN PAVED SURFACES, PROVIDE OFFSET FOR INTAKE PIPING AS SHOWN.
2. COAT EXPOSED STEEL FITTINGS WITH 2 COATS OF ROYSTON R-28 MASTIC, PER MANUFACTURERS RECOMMENDATIONS.

1/2"=1'-0" 1 0 1 2 3 4 5

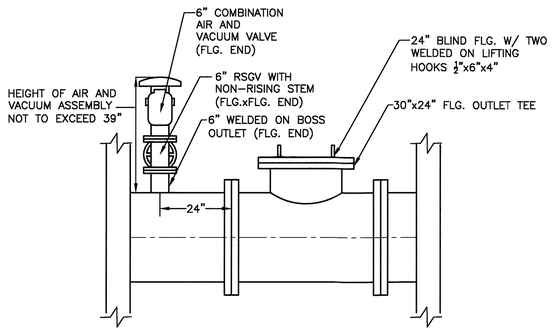


DETAIL NOTES:

1. ALL CONCRETE SHALL BE f'c=4000 PSI @ 28 DAYS.
2. PIPE LINE SHALL NOT BE PRESSURIZED UNTIL CONCRETE STRENGTH REACHES 4000 PSI AND TRENCH HAS BEEN BACKFILLED.
3. ALL REBARS SHALL BE ASTM A615 GRADE 60.
4. MAINTAIN 2" CLEAR BETWEEN ALL REBARS AND PIPE.
5. WELD-ON THRUST RINGS AND PIPE TO WHICH THEY ARE ATTACHED SHALL BE DESIGNED BY THE PIPE MANUFACTURER FOR A SINGLE THRUST FORCE IN EITHER DIRECTION RESULTING FROM A WATER MAIN PRESSURE OF 260 PSI IN THE 30" WATER MAIN DISTRIBUTED ACROSS THE AREA OF THE THRUST RING. THE AREA OF THE THRUST RING SHALL BE PROPORTIONED SUCH THAT THE BEARING STRESS ON THE CONCRETE DOES NOT EXCEED 1000 PSI.
6. THRUST RING SHALL BE LOCATED 2'-6" MINIMUM FROM END OF PIPE.
7. REPLACE ALL DISTURBED SOIL ON BOTH SIDES OF THRUST BLOCK WITH #57 STONE COMPACTED AS STRUCTURAL BACKFILL.

THRUST COLLAR DETAILS

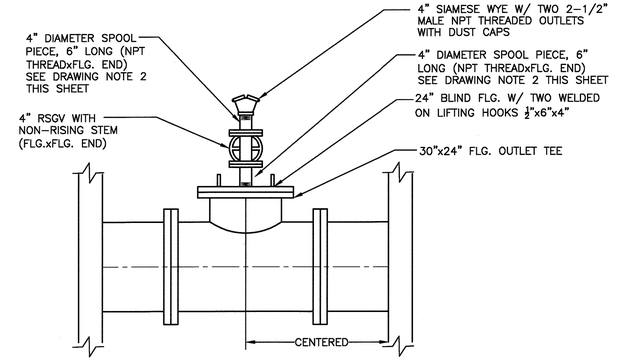
NOT TO SCALE



ARV/ACCESS MANHOLE ASSEMBLY – DETAIL B

DIP OPTION

ARV/ACCESS MANHOLE AT STA. 39+45.46
SCALE: 1/2"=1'-0" B/12



BLOW-OFF/ACCESS MANHOLE ASSEMBLY – DETAIL C

DIP OPTION

BLOW-OFF/ACCESS MANHOLE AT STA. 22+03.88
SCALE: 1/2"=1'-0" C/12

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.
O'BRIEN & GERE ENGINEERS, INC.
By:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 11/19/18
CHIEF – BUREAU OF ENGINEERING — DATE 11/17/18
CHIEF, BUREAU OF UTILITIES — DATE 11-13-18
CHIEF, UTILITY DESIGN DIVISION — DATE 11/17/18

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. 50399, EXPIRATION DATE 12/28/2018 — 01/16/18

STATE OF MARYLAND — LOUIS RAGOZZINO — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	SLS/CTP
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	01/18

CTP	1	RECORD DRAWINGS	10/16/19
BY	NO.	REVISION	DATE

ACCESS MANHOLE DETAILS FOR DIP OPTION AND THRUST BLOCK DETAILS FOR ALL PIPE MATERIAL OPTIONS

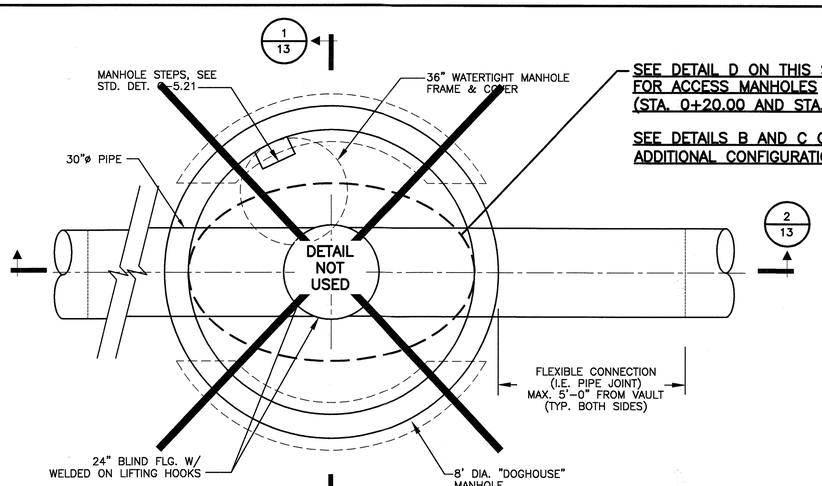
600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 12 OF 41

FILE NO. 51204-012



PLAN

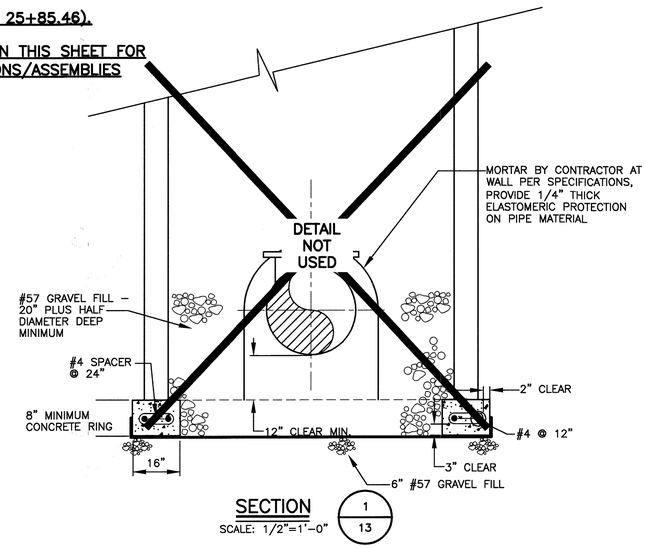
SEE DETAIL D ON THIS SHEET FOR ACCESS MANHOLES (STA. 0+20.00 AND STA. 25+85.46).

SEE DETAILS B AND C ON THIS SHEET FOR ADDITIONAL CONFIGURATIONS/ASSEMBLIES

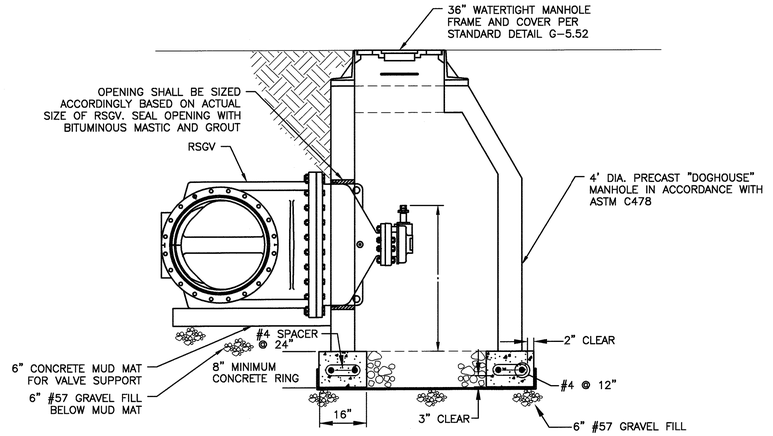
DETAIL NOTE:

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

TYPICAL ACCESS MANHOLE – DETAIL A
BWCCP/PCCP OPTIONS
SCALE: 1/2"=1'-0" (A/13)



SECTION
SCALE: 1/2"=1'-0" (1/13)



30" RSGV WITH ACTUATOR ACCESS MANHOLE
SCALE: 1/2"=1'-0"

SECTION
SCALE: 1/2"=1'-0" (2/13)

SEE DETAIL D ON THIS SHEET FOR ACCESS MANHOLES (STA. 0+20.00 AND STA. 25+85.46).

SEE DETAILS B AND C ON THIS SHEET FOR ADDITIONAL CONFIGURATIONS/ASSEMBLIES

DRAWING NOTES:

1. FOR AIR VALVE MANHOLES WITHIN PAVED SURFACES, PROVIDE OFFSET FOR INTAKE PIPING AS SHOWN.
2. COAT EXPOSED STEEL FITTINGS WITH 2 COATS OF ROYSTON R-28 MASTIC, PER MANUFACTURERS RECOMMENDATIONS.
3. FOR ACOUSTICAL MONITORING MANHOLE ONLY, PROVIDE 4" SOLVENT WELDED PVC CONDUIT AS SHOWN. PVC CONDUIT SHALL BE PROVIDED WITH 4" THREADED CAPS ON EACH END.

ARV/ACCESS MANHOLE ASSEMBLY – DETAIL B
BWCCP/PCCP OPTIONS
ARV ACCESS MANHOLE AT STA. 39+45.46
SCALE: 1/2"=1'-0" (B/13)

BLOW-OFF/ACCESS MANHOLE ASSEMBLY – DETAIL C
BWCCP/PCCP OPTIONS
BLOW-OFF/ACCESS MANHOLE AT STA. 22+03.88
SCALE: 1/2"=1'-0" (C/13)

ACOUSTICAL MONITORING MANHOLE ASSEMBLY – DETAIL D
BWCCP/PCCP OPTIONS
SCALE: 1/2"=1'-0" (D/13)

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 11/19/18
CHIEF – BUREAU OF ENGINEERING — DATE 11/7/18
CHIEF, BUREAU OF UTILITIES — DATE 11-13-18
CHIEF, UTILITY DESIGN DIVISION — DATE 11/7/18

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. 50399, EXPIRATION DATE 12/28/2018 — 01/16/18

STATE OF MARYLAND — LOUIS RAGOZZINO — REG. NO. 50399 — PROFESSIONAL ENGINEER

DSN. BY:	SLS/CTP
DRN. BY:	RPW/IH
CHK. BY:	RJD
DATE:	01/18

CTP/BY	NO.	REVISION	DATE
CTP	1	RECORD DRAWINGS	10/16/19

ACCESS MANHOLE DETAILS FOR BWCCP/PCCP OPTIONS AND 30" RSGV MANHOLE DETAIL FOR ALL PIPE MATERIAL OPTIONS

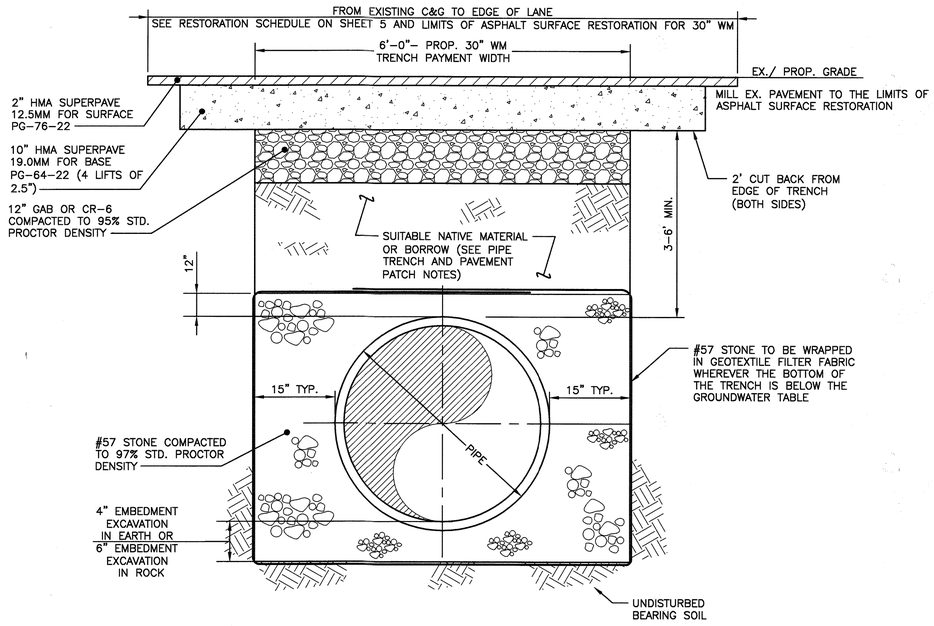
600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

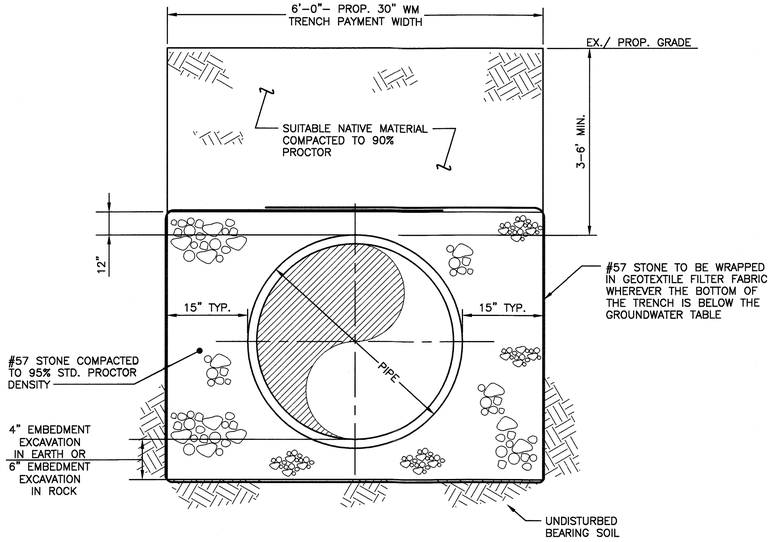
SHEET 13 OF 41

FILE NO. 51204-013



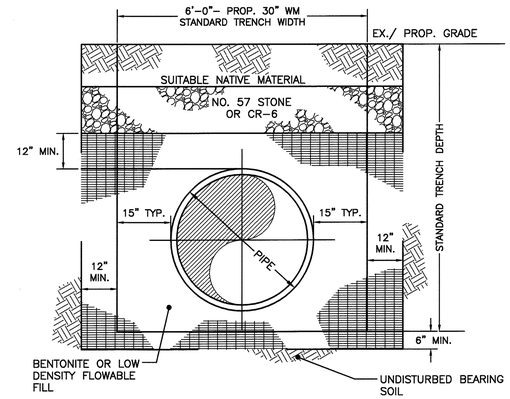
TYPICAL PIPE TRENCH DETAIL (PAVED AREA)

N.T.S.



TYPICAL PIPE TRENCH DETAIL (UNPAVED AREA)

N.T.S.

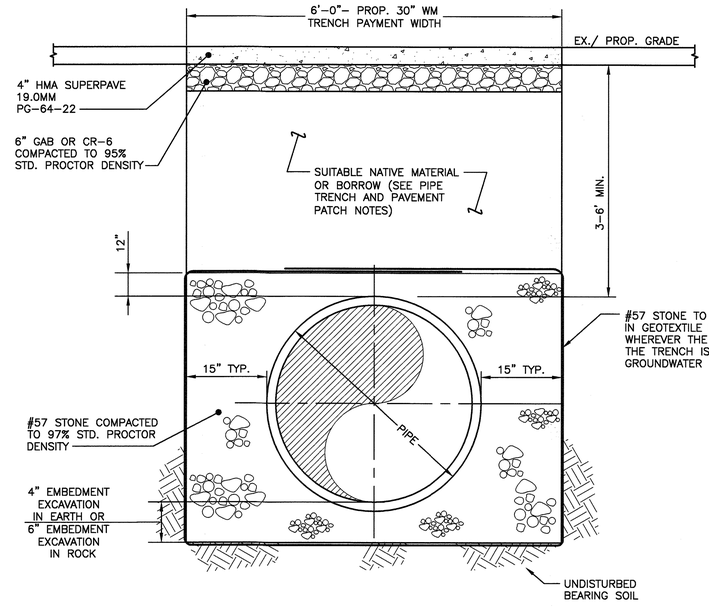


TRENCH CUT-OFF DETAIL

N.T.S.

TRENCH CUT-OFF DETAIL NOTES:

1. EXTEND STANDARD TRENCH WIDTH BY 12" MIN EACH SIDE AND 6" BELOW STANDARD DEPTH OF BACKFILL.
2. FILL TRENCH WITH BENTONITE TO 12" ABOVE PIPE. FOLLOW TRENCH DETAIL SHOWN ON THIS SHEET FOR THE REMAINING BACKFILL REQUIREMENTS. EXTEND 3' LONGITUDINALLY ALONG THE PIPE TRENCH.

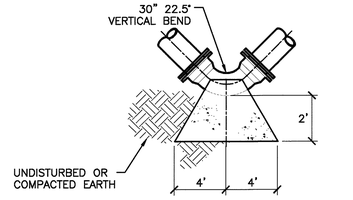


TEMPORARY PAVEMENT PATCH DETAIL

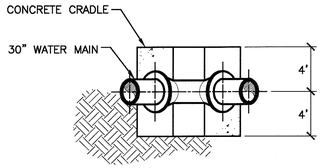
N.T.S.

PIPE TRENCH AND PAVEMENT PATCH NOTES:

1. WITHIN ROAD RIGHT-OF-WAY, SUITABLE NATIVE MATERIAL OR BORROW SHALL BE COMPACTED TO 97% OF ITS MODIFIED PROCTOR MAXIMUM DRY DENSITY AND SHALL BE PLACED IN LIFTS OF NO MORE THAN 8" THICK.
2. OUTSIDE OF ROAD RIGHT-OF-WAY, SUITABLE NATIVE MATERIAL OR BORROW SHALL BE COMPACTED TO 95% OF ITS MODIFIED PROCTOR MAXIMUM DRY DENSITY AND SHALL BE PLACED IN LIFTS OF NO MORE THAN 8" THICK.
3. CONTRACTOR SHALL REVIEW THE GEOTECHNICAL REPORT TO IDENTIFY AREAS WHERE NATIVE MATERIAL MAY NOT BE SUITABLE FOR BACKFILL, OR HAVE ABILITY TO ACHIEVE COMPACTION. WHERE UNSUITABLE MATERIAL IS IDENTIFIED, THE CONTRACTOR SHALL REPLACE WITH BORROW TO REQUIRED COMPACTION.
4. CLEAN AND WET EDGES OF CUT AND SUBGRADE BEFORE PLACING CONCRETE.
5. AGGREGATE SUB-BASE WIDTH SHALL BE 6 FT MINIMUM OR ACTUAL TRENCH WIDTH, WHICHEVER IS GREATER.
6. HOT MIX ASPHALT PAVEMENT PATCH THICKNESS SHALL BE EQUAL TO THE EXISTING PAVEMENT SECTION OR AS APPROVED BY DPW. THE MINIMUM PAVING PATCH SHALL CONSIST OF 2" HMA SURFACE COURSE. GRADED AGGREGATE BASE (GAB) SHALL BE PLACED AND COMPACTED IN 6" MAXIMUM COMPACTED THICKNESS LAYERS.
7. CLEAN EXPOSED VERTICAL SURFACE OF ADJACENT PAVEMENT AND PLACE TACK COAT ON ALL VERTICAL SURFACES PRIOR TO PLACING HMA.
8. IF THE REMAINING EXISTING PAVEMENT IS LESS THAN 4' WIDE, THE RESIDUAL PAVEMENT SHALL BE REMOVED IN ITS ENTIRETY AND REPLACED.
9. CONCRETE REPLACEMENT SHALL BE 10" MINIMUM MIX NO. 6.
10. SAW CUT FULL DEPTH ALL JOINTS OF EXISTING CONCRETE, BITUMINOUS, AND BASE PAVEMENTS.
11. REINFORCEMENT OF CONCRETE PAVING SHALL BE ACCOMPLISHED BY DOWELING. DOWELS SHALL BE CENTERED IN PAVEMENT THICKNESS. NEW REINFORCING SHALL BE TIED TO DOWELS.
12. TOTAL REPAIR WIDTH SHALL BE EQUAL TO THE LANE WIDTH IN ACCORDANCE WITH THE SPECIFICATIONS.



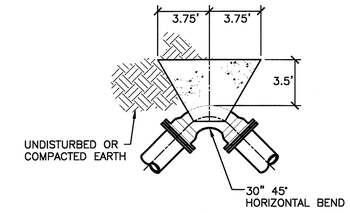
ELEVATION



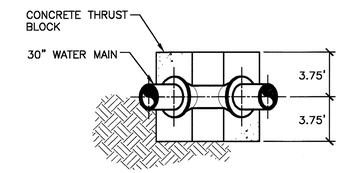
PLAN

CONCRETE CRADLE
SEE PLANS FOR LOCATIONS

NOT TO SCALE



PLAN



ELEVATION

THRUST BLOCK (30" WM)

NOT TO SCALE

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 11/9/18
CHIEF - BUREAU OF ENGINEERING — DATE 11/7/18
CHIEF, BUREAU OF UTILITIES — DATE 1-17-19
CHIEF, UTILITY DESIGN DIVISION — DATE 11/7/18

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. 50399, EXPIRATION DATE 12/28/2018 — 01/16/19

STATE OF MARYLAND — LOUIS RAGOZZINO — NO. 50399 — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	SLS/CTP
DRN. BY:	IH
CHK. BY:	RJD
DATE:	01/18

BY	NO.		DATE
CTP	3	RECORD DRAWINGS	10/16/19
CTP	2	DESIGN REVISION NO. 4	2/26/19
LR	1	ADDENDUM NO. 1	2/8/18

MISCELLANEOUS DETAILS

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

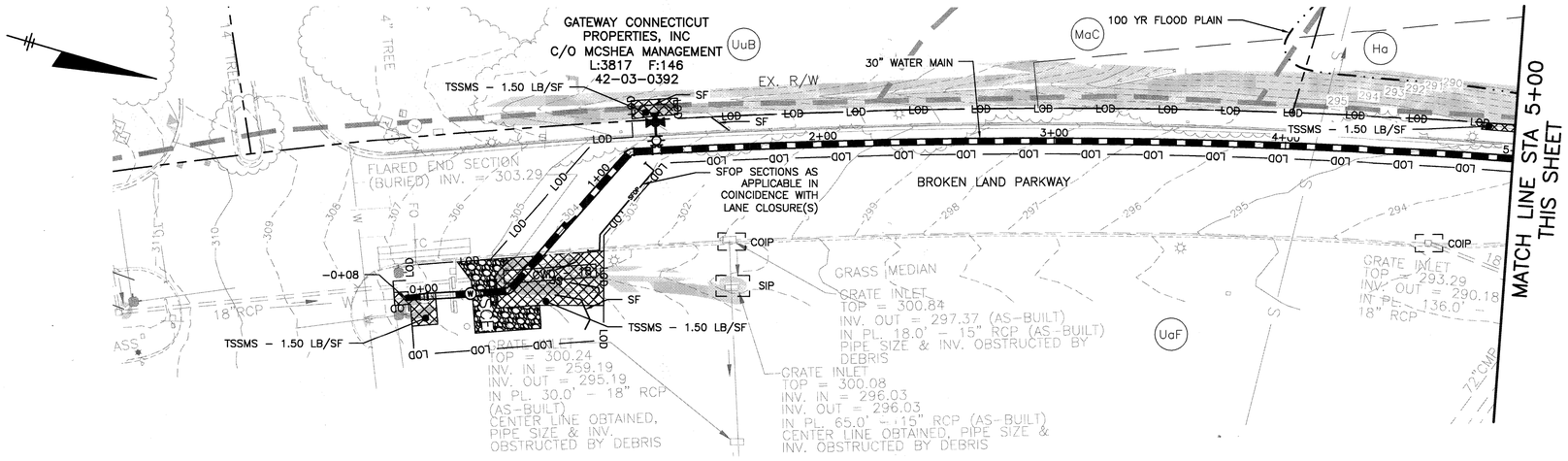
BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

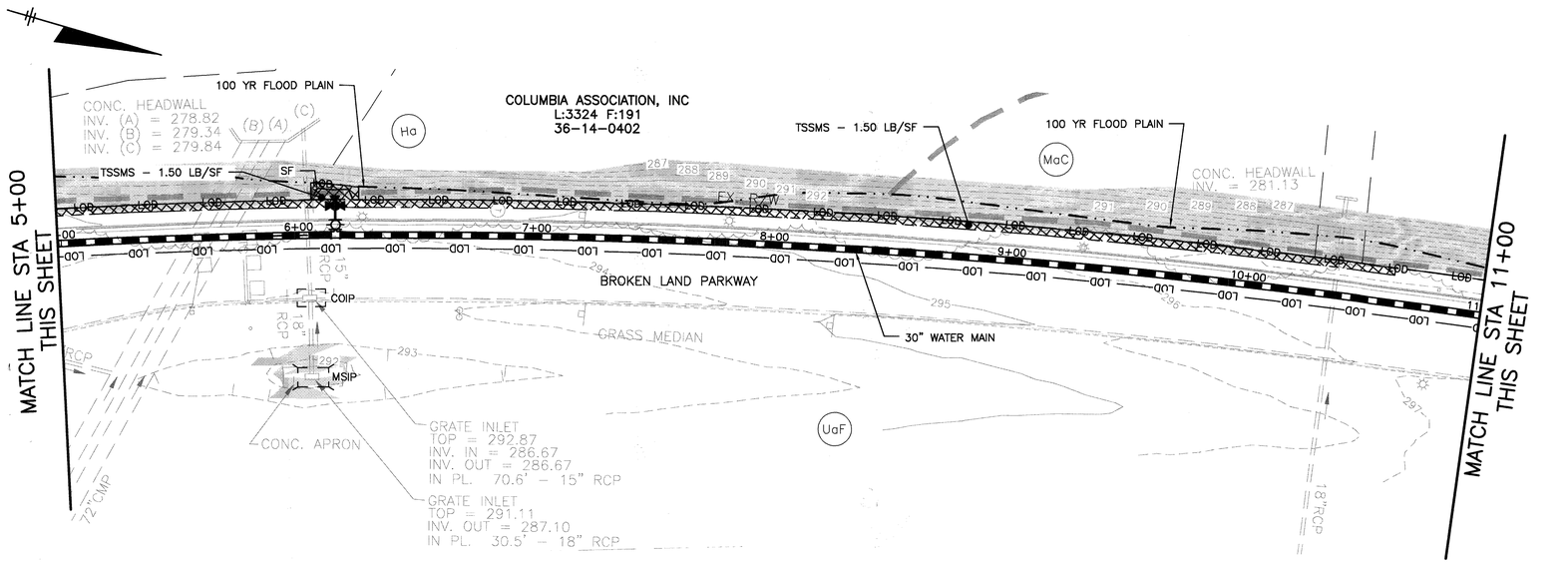
SCALE AS SHOWN

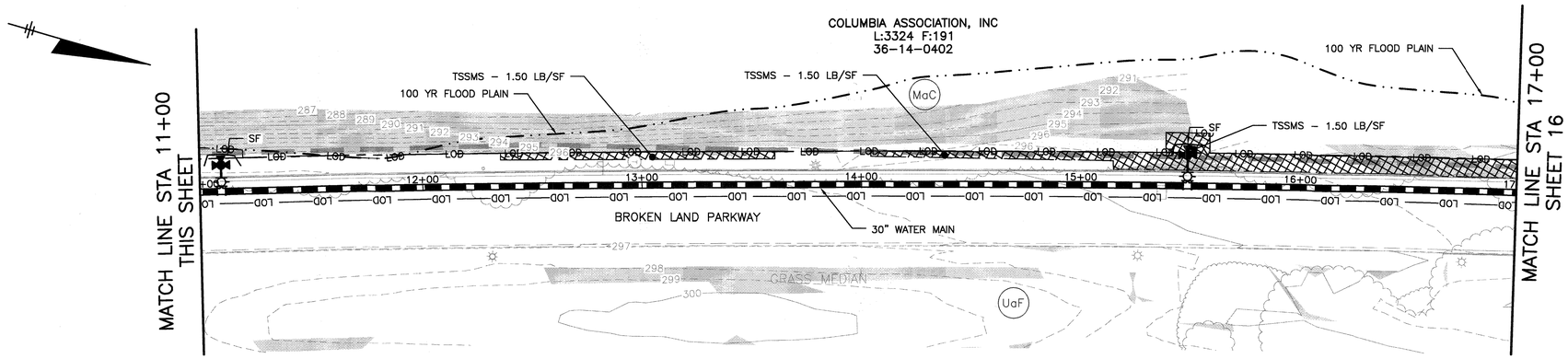
SHEET 14 OF 41

FILE NO. 51204-014

I:\HOWARD-CO.2343\69520.BROKEN-LAND-PKW\DOCS\DWG\SHEETS\SESC\51204-015.DWG



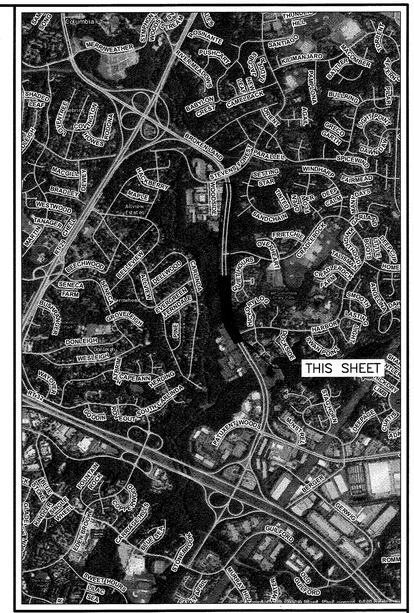




SEDIMENT CONTROL PLAN LEGEND

- PROPERTY LINE
- EASEMENT LINE
- LOD — LIMIT OF DISTURBANCE LINE
- FL–18 — FILTER LOG – 18" HEIGHT
- SF — SILT FENCE
- SSF — SUPER SILT FENCE
- SFOP — SILT FENCE ON PAVEMENT
- TEMPORARY SANDBAG/STONE DIVERSION
- (P) — DEWATERING PUMP
- FB — FILTER BAG
- STABILIZED CONSTRUCTION ENTRANCE
- TSSMS–__LB/SF — TEMPORARY SOIL STABILIZATION MATTING (SLOPE) – MINIMUM DESIGN SHEAR STRESS
- TSSMC–__LB/SF — TEMPORARY SOIL STABILIZATION MATTING (CHANNEL) – MINIMUM DESIGN SHEAR STRESS
- PROPOSED WATER MAIN
- SOIL BOUNDARY LINE
- GhC — SOIL LABEL
- FLOODPLAIN BOUNDARY
- WETLANDS AREA
- WB — WETLANDS BUFFER LINE
- AREA OF STEEP (15% OR STEEPER) SLOPES
- AREA OF ERODIBLE SOILS (K VALUE >0.35) WITH 5% OR STEEPER SLOPES
- WETLANDS RESTORATION AREA
- COIP — COMBINATION INLET PROTECTION
- CIP — CURB INLET PROTECTION
- MSIP — MEDIAN SUMP INLET PROTECTION
- SIP — STANDARD INLET PROTECTION
- CWD – 18 — CLEAR WATER DIVERSION

NOTE: SEE SHEETS 6–10 FOR AS–BUILT WATER MAIN ALIGNMENT AND STATIONING.



LOCATION AND INDEX MAP

SCALE: 1" = 2000'

NOTES

1. THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) CONSTRUCTION PERMIT NUMBER FOR THIS PROJECT IS 16–11–1106.
2. FOR ADDITIONAL SOIL EROSION AND SEDIMENT CONTROL NOTES, SEQUENCE OF CONSTRUCTION AND SOILS TABLE, LIMITATIONS AND RESOLUTIONS SEE SHEET 21.
3. THE LITTLE PATUXENT RIVER AND ITS TRIBUTARIES IN THE PROJECT LOCATION ARE CLASSIFIED AS USE IV–P (RECREATIONAL TROUT AND PUBLIC WATER SUPPLY) WATERS. NO IN–STREAM WORK MAY BE CONDUCTED DURING THE PERIOD OF MARCH 1 THROUGH MAY 31, INCLUSIVE, DURING ANY YEAR.
4. THE LITTLE PATUXENT RIVER AND ITS TRIBUTARIES IN THE PROJECT LOCATION ARE LISTED AS CATEGORY 5 (IMPAIRED) WATERS IN MARYLAND'S 2014 INTEGRATED REPORT OF SURFACE WATER QUALITY. THE WATERS ARE LISTED AS IMPAIRED FOR CHLORIDES DUE TO URBAN RUNOFF AND STORM SEWERS.
5. A TOTAL MAXIMUM DAILY LOAD (TMDL) OF SEDIMENT HAS BEEN ESTABLISHED FOR THE LITTLE PATUXENT RIVER WATERSHED IN HOWARD COUNTY.
6. TRENCHING 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.
7. UNLESS OTHERWISE NOTED, MATERIAL EXCAVATED FROM UTILITY TRENCHES SHALL BE TEMPORARILY STOCKPILED ON THE UPSLOPE SIDE OF THE TRENCH EXCAVATION. SUITABLE MATERIAL SHALL BE REUSED FOR BACKFILL. UNSUITABLE OR EXCESS MATERIAL SHALL BE REMOVED FROM ALONG THE PIPELINE ALIGNMENT AT THE END OF EACH WORKING DAY AND STOCKPILED IN A DESIGNATED ON–SITE STOCKPILE OR REMOVED FROM THE SITE AND PROPERLY DISPOSED OF AT A DESIGNATED SPOIL SITE.
8. ONCE BACKFILLED, IF CONSTRUCTION TRAFFIC MUST TRAVEL OVER DISTURBED UTILITY RIGHT–OF–WAY, CONTRACTOR SHALL PROVIDE TEMPORARY WOOD CHIP OR STONE STABILIZATION PER SECTION B–4–7 HEAVY USE AREA STABILIZATION. CONTRACTOR SHALL STABILIZE DISTURBED AREAS IMMEDIATELY ONCE CONSTRUCTION TRAFFIC OVER DISTURBED AREAS IS NO LONGER REQUIRED.

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

GRAPHIC SCALE 1"=30' (30 0 30 60)

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 of Engineer — Registration Number 50399 — Date 01/16/18

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/19/18
CHIEF – BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-17-18
CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/18

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. 50399, EXPIRATION DATE 12/28/2018
STATE OF MARYLAND — LOUIS RAGOZZINO — REG. NO. 50399 — PROFESSIONAL ENGINEER
01/16/18

DSN. BY:	CTP
DRN. BY:	IH
CHK. BY:	RJD
DATE:	01/18

BY	NO.		DATE
CTP	1	RECORD DRAWINGS	10/16/19

SOIL EROSION AND SEDIMENT CONTROL PLAN
STA. –0+08 TO 17+00

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

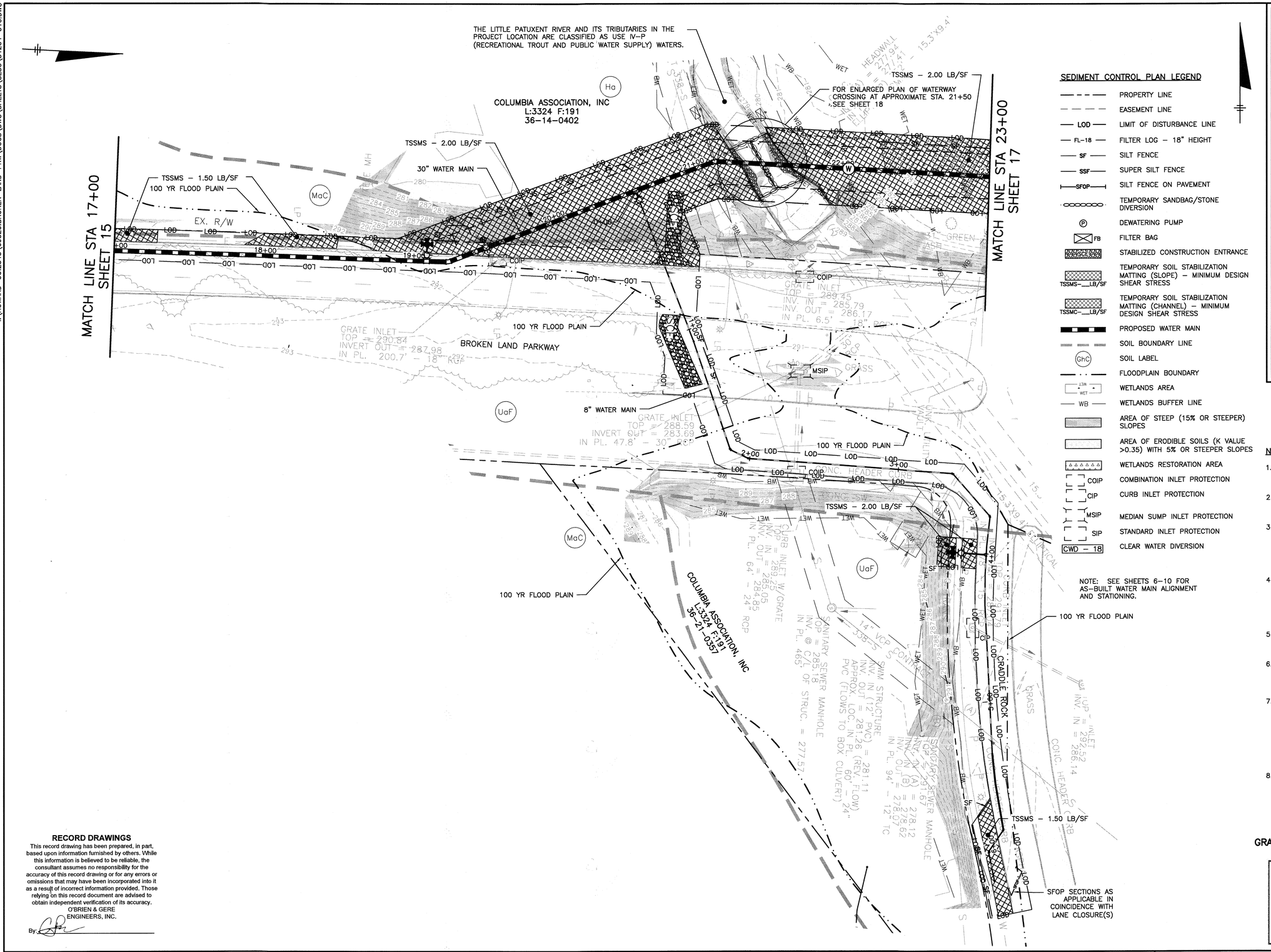
BROKEN LAND PARKWAY
30–INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W–8307
CONTRACT NO.: 44–4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 15 OF 41

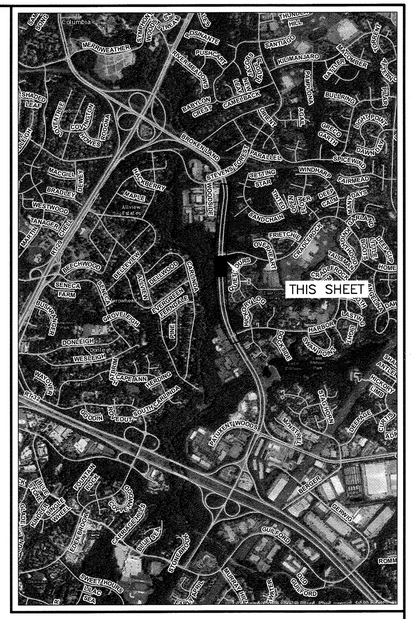
FILE NO. 51204–015

I:\HOWARD-CO.2343\69520.BROKEN-LAND-PKW\DOCS\DWG\SHEETS\SESC\51204-016.DWG



SEDIMENT CONTROL PLAN LEGEND

- PROPERTY LINE
- EASEMENT LINE
- LOD — LIMIT OF DISTURBANCE LINE
- FL-18 — FILTER LOG - 18" HEIGHT
- SF — SILT FENCE
- SSF — SUPER SILT FENCE
- SFOP — SILT FENCE ON PAVEMENT
- TEMPORARY SANDBAG/STONE DIVERSION
- DEWATERING PUMP
- FB — FILTER BAG
- SCE — STABILIZED CONSTRUCTION ENTRANCE
- TSSMS-__LB/SF — TEMPORARY SOIL STABILIZATION MATTING (SLOPE) - MINIMUM DESIGN SHEAR STRESS
- TSSMC-__LB/SF — TEMPORARY SOIL STABILIZATION MATTING (CHANNEL) - MINIMUM DESIGN SHEAR STRESS
- PROPOSED WATER MAIN
- SOIL BOUNDARY LINE
- GhC — SOIL LABEL
- FLOODPLAIN BOUNDARY
- WET — WETLANDS AREA
- WB — WETLANDS BUFFER LINE
- AREA OF STEEP (15% OR STEEPER) SLOPES
- AREA OF ERODIBLE SOILS (K VALUE >0.35) WITH 5% OR STEEPER SLOPES
- WETLANDS RESTORATION AREA
- COIP — COMBINATION INLET PROTECTION
- CIP — CURB INLET PROTECTION
- MSIP — MEDIAN SUMP INLET PROTECTION
- SIP — STANDARD INLET PROTECTION
- CWD - 18 — CLEAR WATER DIVERSION



LOCATION AND INDEX MAP

SCALE: 1" = 2000'

NOTES

1. THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) CONSTRUCTION PERMIT NUMBER FOR THIS PROJECT IS 16-11-1106.
2. FOR ADDITIONAL SOIL EROSION AND SEDIMENT CONTROL NOTES, SEQUENCE OF CONSTRUCTION AND SOILS TABLE, LIMITATIONS AND RESOLUTIONS SEE SHEET 21.
3. THE LITTLE PATUXENT RIVER AND ITS TRIBUTARIES IN THE PROJECT LOCATION ARE CLASSIFIED AS USE IV-P (RECREATIONAL TROUT AND PUBLIC WATER SUPPLY) WATERS. NO IN-STREAM WORK MAY BE CONDUCTED DURING THE PERIOD OF MARCH 1 THROUGH MAY 31, INCLUSIVE, DURING ANY YEAR.
4. THE LITTLE PATUXENT RIVER AND ITS TRIBUTARIES IN THE PROJECT LOCATION ARE LISTED AS CATEGORY 5 (IMPAIRED) WATERS IN MARYLAND'S 2014 INTEGRATED REPORT OF SURFACE WATER QUALITY. THE WATERS ARE LISTED AS IMPAIRED FOR CHLORIDES DUE TO URBAN RUNOFF AND STORM SEWERS.
5. A TOTAL MAXIMUM DAILY LOAD (TMDL) OF SEDIMENT HAS BEEN ESTABLISHED FOR THE LITTLE PATUXENT RIVER WATERSHED IN HOWARD COUNTY.
6. TRENCHING 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.
7. UNLESS OTHERWISE NOTED, MATERIAL EXCAVATED FROM UTILITY TRENCHES SHALL BE TEMPORARILY STOCKPILED ON THE UPSLOPE SIDE OF THE TRENCH EXCAVATION. SUITABLE MATERIAL SHALL BE REUSED FOR BACKFILL. UNSUITABLE OR EXCESS MATERIAL SHALL BE REMOVED FROM ALONG THE PIPELINE ALIGNMENT AT THE END OF EACH WORKING DAY AND STOCKPILED IN A DESIGNATED ON-SITE STOCKPILE OR REMOVED FROM THE SITE AND PROPERLY DISPOSED OF AT A DESIGNATED SPOIL SITE.
8. ONCE BACKFILLED, IF CONSTRUCTION TRAFFIC MUST TRAVEL OVER DISTURBED UTILITY RIGHT-OF-WAY, CONTRACTOR SHALL PROVIDE TEMPORARY WOOD CHIP OR STONE STABILIZATION PER SECTION B-4-7 HEAVY USE AREA STABILIZATION. CONTRACTOR SHALL STABILIZE DISTURBED AREAS IMMEDIATELY ONCE CONSTRUCTION TRAFFIC OVER DISTURBED AREAS IS NO LONGER REQUIRED.

GRAPHIC SCALE 1"=30' (30 0 30 60)

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

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.

Louis Ragozzino 50399 01/16/19
Signature of Engineer / Registration Number / Date

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/19/19
CHIEF - BUREAU OF ENGINEERING — DATE 1/17/19
CHIEF, BUREAU OF UTILITIES — DATE 1-17-19
CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/19

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. 50399, EXPIRATION DATE 12/28/2018 — 01/16/19

STATE OF MARYLAND · LOUIS RAGOZZINO · 50399 · REGISTERED PROFESSIONAL ENGINEER

DSN. BY: CTP
DRN. BY: IH
CHK. BY: RJD
DATE: 01/18

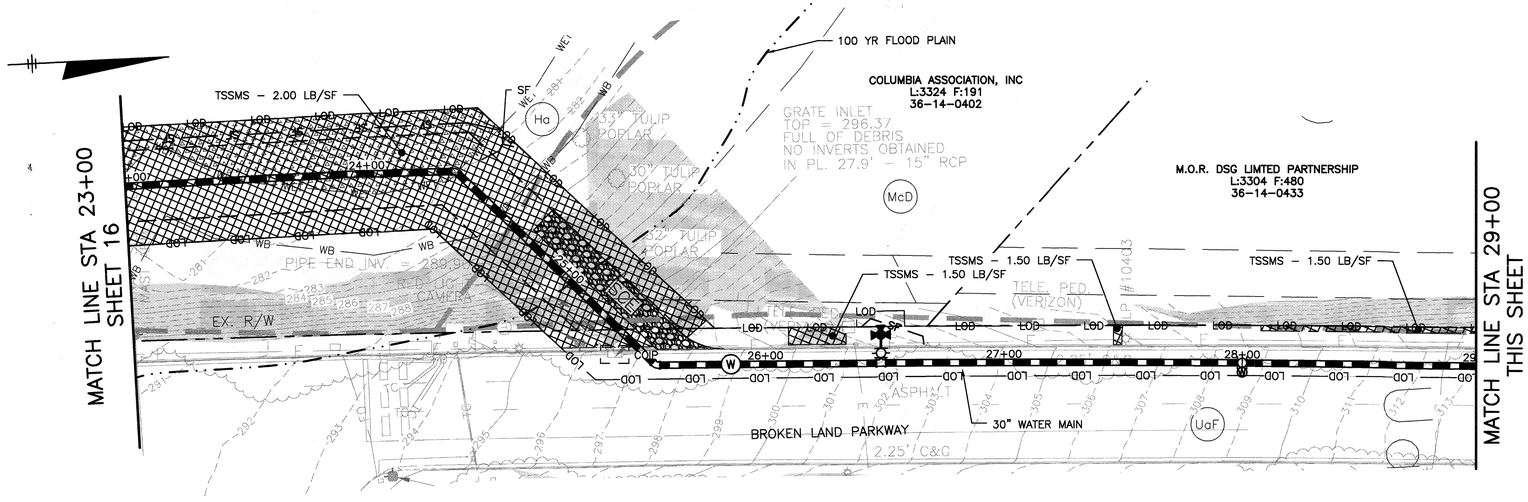
BY	NO.	REVISION	DATE
CTP	1	RECORD DRAWINGS	10/16/19

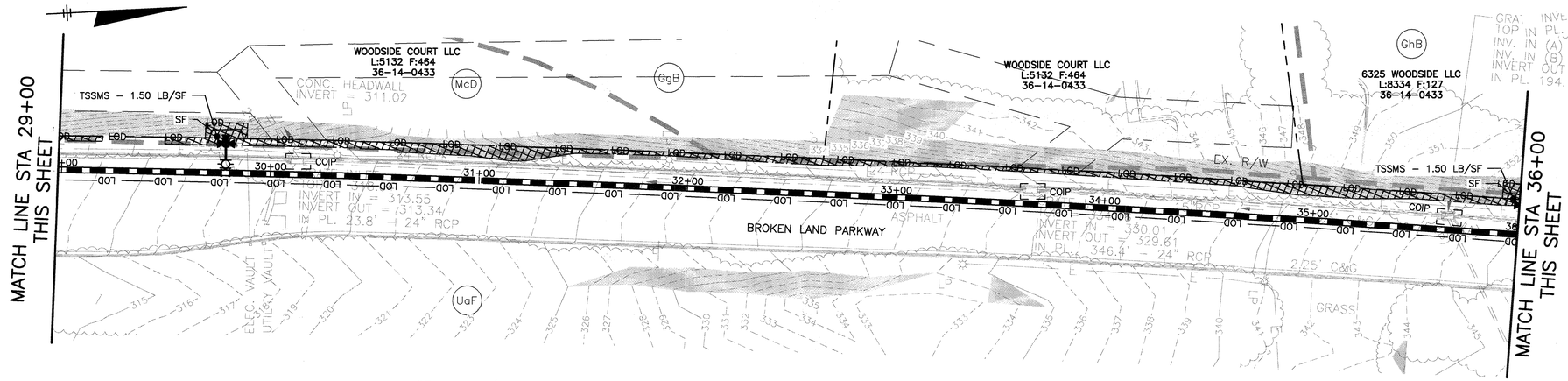
SOIL EROSION AND SEDIMENT CONTROL PLAN
STA 17+00 TO STA 23+00
STA 0+00 TO STA 6+24 (8" WM)
600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

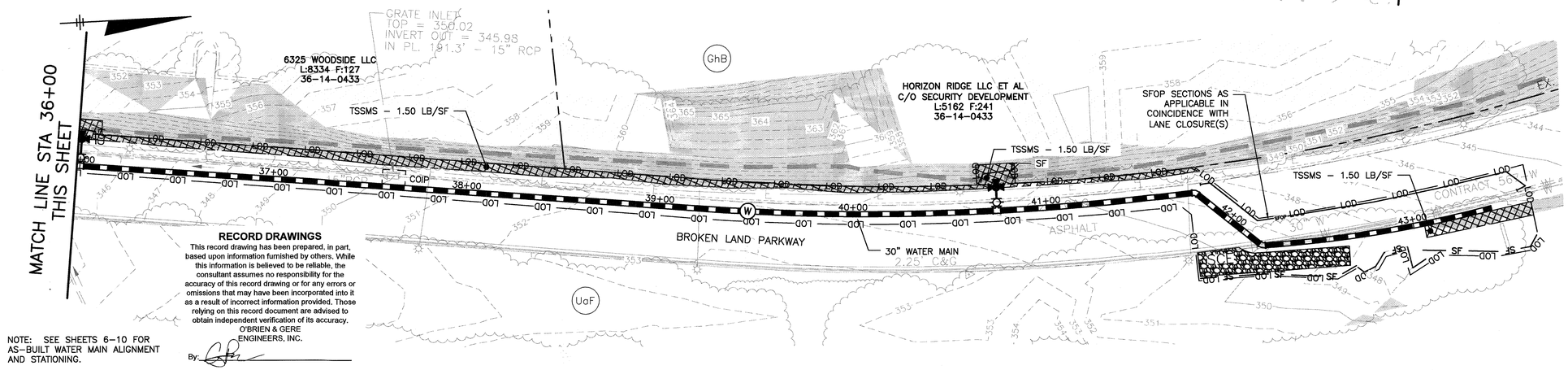
BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 16 OF 41
FILE NO. 51204-016

I:\HOWARD-CO.2343\69520.BROKEN-LAND-PKWY\DOCS\DWG\SHEETS\SESC\51204-017.DWG







RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

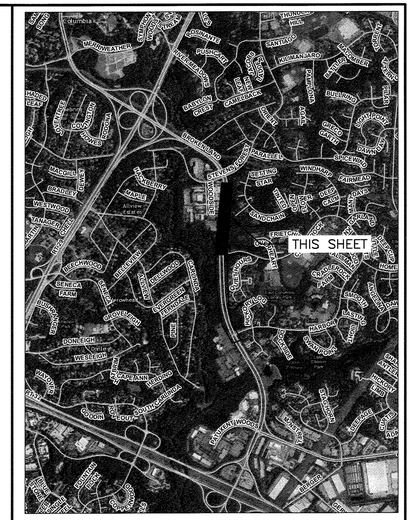
O'BRIEN & GERE ENGINEERS, INC.

By: _____

NOTE: SEE SHEETS 6–10 FOR AS–BUILT WATER MAIN ALIGNMENT AND STATIONING.

NOTES

1. THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) CONSTRUCTION PERMIT NUMBER FOR THIS PROJECT IS 16–11–1106.
2. FOR ADDITIONAL SOIL EROSION AND SEDIMENT CONTROL NOTES, SEQUENCE OF CONSTRUCTION AND SOILS TABLE, LIMITATIONS AND RESOLUTIONS SEE SHEET 21.
3. THE LITTLE PATUXENT RIVER AND ITS TRIBUTARIES IN THE PROJECT LOCATION ARE CLASSIFIED AS USE IV–P (RECREATIONAL TROUT AND PUBLIC WATER SUPPLY) WATERS. NO IN–STREAM WORK MAY BE CONDUCTED DURING THE PERIOD OF MARCH 1 THROUGH MAY 31, INCLUSIVE, DURING ANY YEAR.
4. THE LITTLE PATUXENT RIVER AND ITS TRIBUTARIES IN THE PROJECT LOCATION ARE LISTED AS CATEGORY 5 (IMPAIRED) WATERS IN MARYLAND'S 2014 INTEGRATED REPORT OF SURFACE WATER QUALITY. THE WATERS ARE LISTED AS IMPAIRED FOR CHLORIDES DUE TO URBAN RUNOFF AND STORM SEWERS.
5. A TOTAL MAXIMUM DAILY LOAD (TMDL) OF SEDIMENT HAS BEEN ESTABLISHED FOR THE LITTLE PATUXENT RIVER WATERSHED IN HOWARD COUNTY.
6. TRENCHING 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.
7. UNLESS OTHERWISE NOTED, MATERIAL EXCAVATED FROM UTILITY TRENCHES SHALL BE TEMPORARILY STOCKPILED ON THE UPSLOPE SIDE OF THE TRENCH EXCAVATION. SUITABLE MATERIAL SHALL BE REUSED FOR BACKFILL. UNSUITABLE OR EXCESS MATERIAL SHALL BE REMOVED FROM ALONG THE PIPELINE ALIGNMENT AT THE END OF EACH WORKING DAY AND STOCKPILED IN A DESIGNATED ON–SITE STOCKPILE OR REMOVED FROM THE SITE AND PROPERLY DISPOSED OF AT A DESIGNATED SPOIL SITE.
8. ONCE BACKFILLED, IF CONSTRUCTION TRAFFIC MUST TRAVEL OVER DISTURBED UTILITY RIGHT–OF–WAY, CONTRACTOR SHALL PROVIDE TEMPORARY WOOD CHIP OR STONE STABILIZATION PER SECTION B–4–7 HEAVY USE AREA STABILIZATION. CONTRACTOR SHALL STABILIZE DISTURBED AREAS IMMEDIATELY ONCE CONSTRUCTION TRAFFIC OVER DISTURBED AREAS IS NO LONGER REQUIRED.



LOCATION AND INDEX MAP

SCALE: 1" = 2000'

SEDIMENT CONTROL PLAN LEGEND

- PROPERTY LINE
- EASEMENT LINE
- LOD — LIMIT OF DISTURBANCE LINE
- FL–18 — FILTER LOG – 18" HEIGHT
- SF — SILT FENCE
- SSF — SUPER SILT FENCE
- TEMPORARY SANDBAG/STONE DIVERSION
- (P) DEWATERING PUMP
- FB FILTER BAG
- STABILIZED CONSTRUCTION ENTRANCE
- TSSMS–__LB/SF — TEMPORARY SOIL STABILIZATION MATTING (SLOPE) – MINIMUM DESIGN SHEAR STRESS
- TSSMC–__LB/SF — TEMPORARY SOIL STABILIZATION MATTING (CHANNEL) – MINIMUM DESIGN SHEAR STRESS
- PROPOSED WATER MAIN
- SOIL BOUNDARY LINE
- (GhC) SOIL LABEL
- FLOODPLAIN BOUNDARY
- J3W WET — WETLANDS AREA
- WB — WETLANDS BUFFER LINE
- AREA OF STEEP (15% OR STEEPER) SLOPES
- AREA OF ERODIBLE SOILS (K VALUE >0.35) WITH 5% OR STEEPER SLOPES
- WETLANDS RESTORATION AREA
- COIP — COMBINATION INLET PROTECTION
- CIP — CURB INLET PROTECTION
- MSIP — MEDIAN SUMP INLET PROTECTION
- SIP — STANDARD INLET PROTECTION
- SFOP — SILT FENCE ON PAVEMENT

GRAPHIC SCALE 1"=30' (30 0 30 60)

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 of Engineer 50399 Registration Number 01/16/18 Date

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/19/18
CHIEF – BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-17-18
CHIEF, UTILITY DESIGN DIVISION PSP — DATE 1/17/18

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. 50399, EXPIRATION DATE 12/28/2018 01/16/18

STATE OF MARYLAND · LOUIS RAGOZZINO · REG. NO. 50399 · REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	CTP
DRN. BY:	IH
CHK. BY:	RJD
DATE:	01/18

BY	NO.	REVISION	DATE
CTP	1	RECORD DRAWINGS	10/16/19

SOIL EROSION AND SEDIMENT CONTROL PLAN
STA 23+00 TO STA 43+41

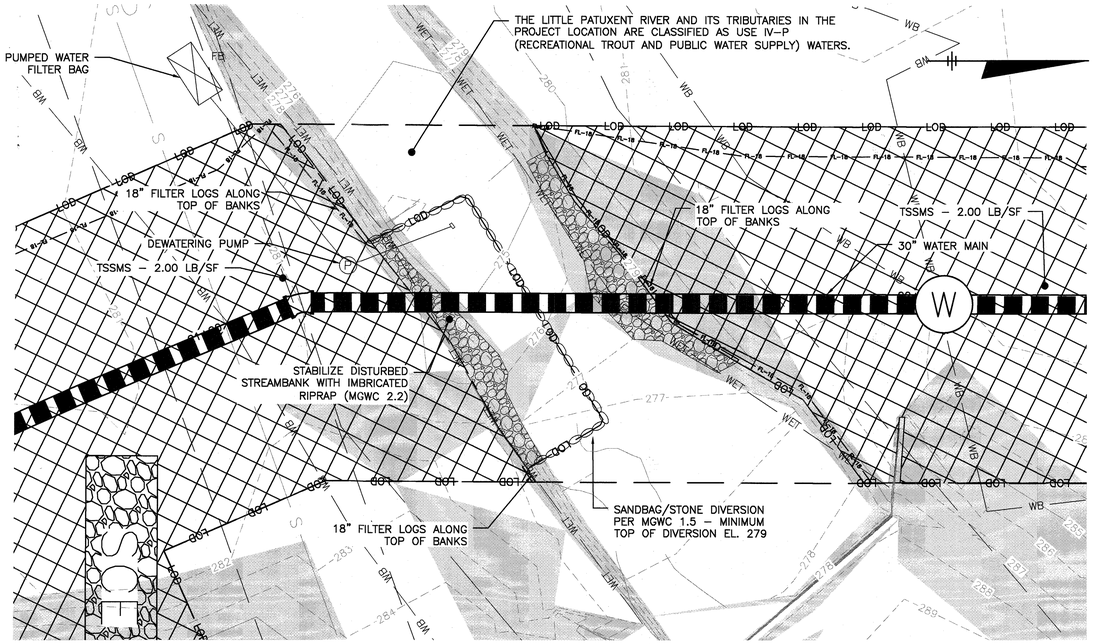
600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30–INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W–8307
CONTRACT NO.: 44–4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

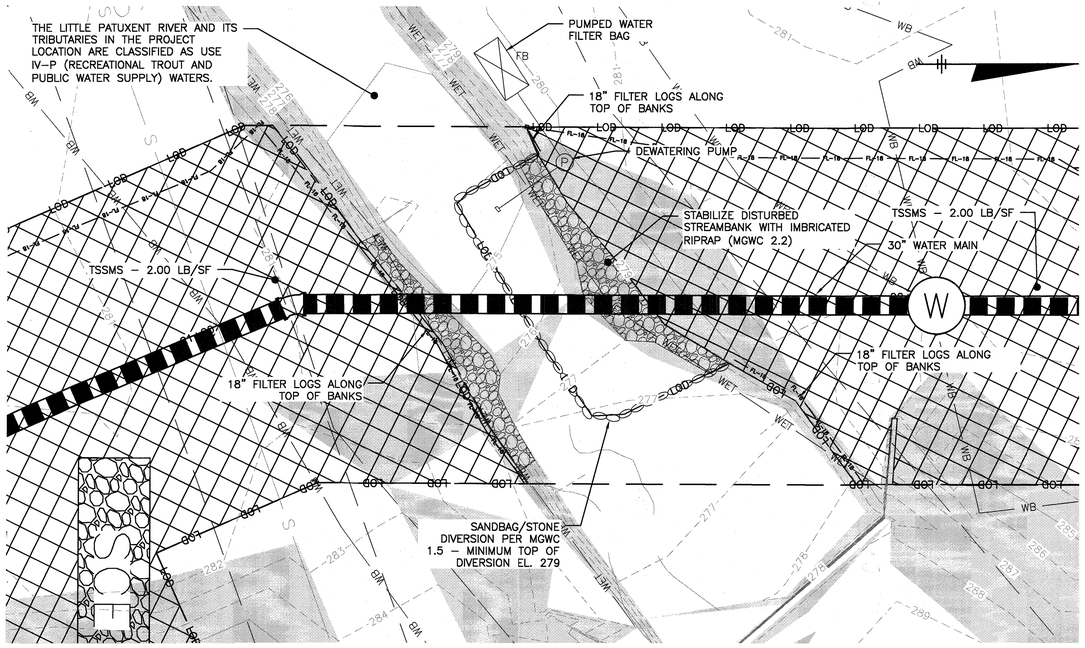
SHEET 17 OF 41

FILE NO. 51204–017



ENLARGED PLAN - CROSSING AT STA. 21+50 - STAGE 1

SCALE: 1"=10'

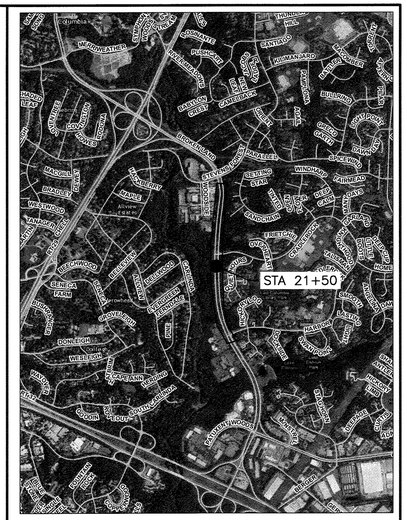


ENLARGED PLAN - CROSSING AT STA. 21+50 - STAGE 2

SCALE: 1"=10'

NOTES

1. CROSSING AT STATION 21+50 TO BE ACCOMPLISHED UTILIZING SANDBAG/STONE DIVERSION (MGWC 1.5) OR CULVERT PIPE WITH ACCESS ROAD (MGWC 1.3) PER MARYLAND'S WATERWAY CONSTRUCTION GUIDELINES. FOR DETAILS, NOTES AND SPECIFICATIONS FOR MGWC 1.5 AND MGWC 1.3, SEE SHEET 19.
2. CONTRACTOR MAY UTILIZE ALTERNATE METHODS OF STREAM DIVERSION, SUCH AS A PORTADAM SYSTEM, WITH THE APPROVAL OF THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS CONSTRUCTION INSPECTION DIVISION (CID) AND HOWARD SOIL CONSERVATION DISTRICT (HSCD) INSPECTOR.
3. IN USING MGWC 1.5, THE CONTRACTOR SHALL VERIFY THAT THE HEIGHT OF THE DIVERSION INDICATED ON THE PLANS MEETS THE REQUIRED HEIGHT OF ONE HALF THE STREAMBANK HEIGHT, MEASURED FROM THE CHANNEL BED, PLUS 1 FOOT.
4. CONTRACTOR SHALL UTILIZE TRENCH BOXES OR OTHER SHORING TO MINIMIZE THE WIDTH OF TRENCHING AND DISTURBANCE TO THE STREAMBANKS AND CHANNEL BED.
5. FOR DETAILS AND SPECIFICATIONS OF IMBRICATED RIPRAP (MGWC 2.2) SEE SHEET 19.



LOCATION AND INDEX MAP

SCALE: 1" = 2000'

SEDIMENT CONTROL PLAN LEGEND

- PROPERTY LINE
- EASEMENT LINE
- LOD — LIMIT OF DISTURBANCE LINE
- FL-18 — FILTER LOG - 18" HEIGHT
- SF — SILT FENCE
- SSF — SUPER SILT FENCE
- TEMPORARY SANDBAG/STONE DIVERSION
- (P) DEWATERING PUMP
- FB — FILTER BAG
- STABILIZED CONSTRUCTION ENTRANCE
- TSSMS-__LB/SF — TEMPORARY SOIL STABILIZATION MATTING (SLOPE) - MINIMUM DESIGN SHEAR STRESS
- TSSMC-__LB/SF — TEMPORARY SOIL STABILIZATION MATTING (CHANNEL) - MINIMUM DESIGN SHEAR STRESS
- PROPOSED WATER MAIN
- SOIL BOUNDARY LINE
- GhC — SOIL LABEL
- FLOODPLAIN BOUNDARY
- L3M / WET — WETLANDS AREA
- WB — WETLANDS BUFFER LINE
- AREA OF STEEP (15% OR STEEPER) SLOPES
- AREA OF ERODIBLE SOILS (K VALUE >0.35) WITH 5% OR STEEPER SLOPES
- WETLANDS RESTORATION AREA
- COIP — COMBINATION INLET PROTECTION
- CIP — CURB INLET PROTECTION
- MSIP — MEDIAN SUMP INLET PROTECTION
- SIP — STANDARD INLET PROTECTION

NOTE: SEE SHEETS 6-10 FOR AS-BUILT WATER MAIN ALIGNMENT AND STATIONING.

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.
O'BRIEN & GERE ENGINEERS, INC.
By: _____

GRAPHIC SCALE 1"=10' (10 0 10 20)

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.

L. Ragozzino 50399 01/16/18
Signature of Engineer — Registration Number — Date

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/18/18
CHIEF, BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-17-18
CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/18

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. 50399, EXPIRATION DATE 12/28/2018 01/16/18

STATE OF MARYLAND — LOUIS RAGOZZINO — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	CTP
DRN. BY:	IH
CHK. BY:	RJD
DATE:	01/18

BY	NO.		DATE
CTP	2	RECORD DRAWINGS	10/16/19
LR	1	DESIGN REVISION NO. 3	11/1/18

SOIL EROSION AND SEDIMENT CONTROL PLAN WATERWAY CROSSING

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

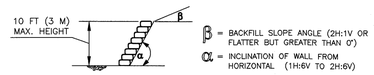
SHEET 18 OF 41

FILE NO. 51204-018

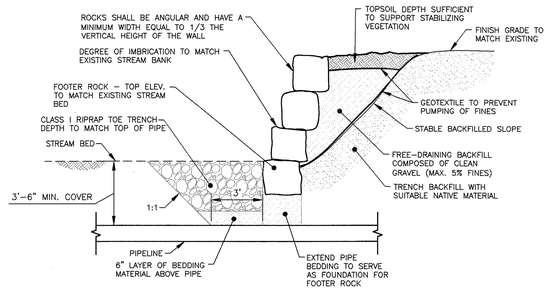
I:\HOWARD-CO.2343\69520.BROKEN-LAND-PKW\DOCS\DWG\SHEETS\SESC\51204-019.DWG

DETAIL: IMBRICATED RIPRAP
(ADAPTED FROM MGWC 2.2)

DEFINITION SKETCH

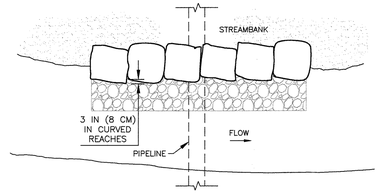


SECTION VIEW



PLAN VIEW

CONSTRUCTION NOTE: STONE BLOCKS SHALL BE ROTATED INTO THE BANK DURING PLACEMENT SUCH THAT THE UPSTREAM BLOCKS OVERLAP THE DOWNSTREAM BLOCKS BY A MINIMUM OF 3 INCHES (8 CM)



MGWC 2.2: IMBRICATED RIPRAP

FOR CROSSING AT STA. 21+50: TOE RIPRAP SHALL BE CLASS I
IMBRICATED STONES TO BE APPROX. 24"L x 18"W x 18"H

MATERIAL SPECIFICATIONS:

MATERIALS FOR IMBRICATED RIPRAP CONSTRUCTION AND INSTALLATION SHOULD MEET THE FOLLOWING REQUIREMENTS:

- FILTERS: SYNTHETIC FILTER FABRIC MAY BE USED CAUTIOUSLY BASED ON THE 2011 MD STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. WHENEVER POSSIBLE, HOWEVER, GRANULAR FILTERS WITH A MINIMUM THICKNESS OF 6 INCHES (15 CENTIMETERS) SHOULD BE USED WITH A GRADATION AS FOUND IN TABLE 2.2.

TABLE 2.2: GRANULAR FILTER MATERIAL GRADING SPECIFICATIONS

PERCENT LESS THAN	U.S. STANDARD SIEVE SIZE
100	2 1/2 IN (64 mm)
85 – 100	1 IN (25 mm)
60 – 100	1/2 IN (13 mm)
35 – 70	NO. 10
20 – 50	NO. 40
3 – 20	NO. 200

- TOE RIPRAP: THE MAXIMUM DIAMETER OR WEIGHT OF STONE FOR TOE RIPRAP SHOULD BE BASED UPON THE BANKFULL STREAM CHANNEL VELOCITY AS DETAILED IN THE MGWC 2.1: RIPRAP AND FIGURE 2.1.
- IMBRICATED STONES: IMBRICATED RIPRAP SHOULD BE ANGULAR AND BLOCKY IN SHAPE SUCH THAT THEY ARE STACKABLE AND SHOULD BE SUFFICIENTLY LARGE TO RESIST DISPLACEMENT BY BOTH THE DESIGN STORM EVENT AND THE SITE–SPECIFIC LATERAL EARTH STRESSES. THEREFORE, THE LENGTH OF THE LONGEST 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 (0.6 METERS).

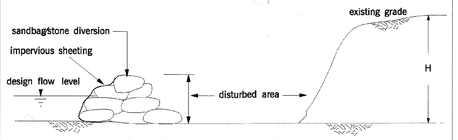
INSTALLATION GUIDELINES:

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):

1. THE STREAM SHOULD BE DIVERTED ACCORDING TO A WMA RECOMMENDED PROCEDURE (SEE SECTION 1, TEMPORARY INSTREAM CONSTRUCTION MEASURES, MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION), AND THE CONSTRUCTION AREA SHOULD BE DEWATERED.
2. ALL EXCAVATION SHOULD BE MADE IN REASONABLY CLOSE CONFORMITY WITH THE EXISTING STREAM SLOPE AND BED. THE SLOPE OF THE CUT FACE SHOULD BE IN THE RANGE OF 1H:6V TO 2H:6V. LOOSE MATERIAL AT THE TOE OF THE EMBANKMENT SHOULD BE EXCAVATED UNTIL A STABLE FOUNDATION IS REACHED, USUALLY WITHIN 2 TO 3 FEET (0.6 TO 0.9 METERS) OF THE SURFACE. THE SUBGRADE SHOULD BE SMOOTH, FIRM, AND FREE FROM PROTRUDING OBJECTS OR VOIDS THAT WOULD EFFECT THE PROPER POSITIONING OF THE FIRST LAYER OF STONES.
3. A GRADED GRANULAR FILTER OR FILTER FABRIC SHOULD BE PLACED ON THE FACE OF THE CUT SLOPE TO PREVENT THE MIGRATION OF FINE MATERIALS THROUGH THE REVETMENT. IF FILTER FABRIC IS USED, IT SHOULD BE CAREFULLY AND LOOSELY PLACED ON THE PREPARED SLOPE AND SECURED. ADJACENT STRIPS SHOULD OVERLAP A MINIMUM OF 8 INCHES (0.20 METERS). IF THE FILTER FABRIC IS TORN OR DAMAGED, IT SHOULD BE REPAIRED OR REPLACED.
4. THE ROCK LAYERS SHOULD BE NEATLY STACKED WITH STAGGERED JOINTS SO THAT EACH STONE RESTS FIRMLY ON TWO STONES IN THE TIER BELOW. ADDITIONALLY, SMALLER STONES SHOULD BE USED TO FILL VOIDS SO THAT EACH ROCK RESTS SOLIDLY ON THE PREVIOUS ROCK LAYER WITH MINIMAL OPPORTUNITY FOR MOVEMENT. UPON COMPLETION OF THE FIRST LAYER OF STONE, THE TOE TRENCH SHOULD BE FILLED WITH CLASS III RIPRAP SIZED ACCORDING TO MGWC 2.1: RIPRAP OR ADDITIONAL IMBRICATED STONE. TWO FOOTER STONES SHOULD BE USED WHERE HIGH POTENTIAL FOR CHANNEL INCISION EXISTS. THE HEIGHT OF THE IMBRICATED REVETMENT IS DICTATED BY THE SIZE OF THE STONE USED, AND THE HEIGHT SHOULD NOT EXCEED 3 TIMES THE LENGTH OF THE LONGEST AXIS AND SHOULD NOT BE GREATER THAN 10 FEET (3 METERS).
5. 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 0 DEGREES TO FACILITATE DRAINAGE. ONCE ALL OF THE BACKFILL IS IN PLACE, IT SHOULD BE COVERED WITH A FILTER LAYER AND A LAYER OF TOPSOIL SUFFICIENT TO SUPPORT A NATIVE VEGETATIVE COVER.
6. THE DISTURBED SECTIONS OF THE CHANNEL, INCLUDING THE SLOPES AND STREAM BED, SHOULD BE STABILIZED WITH METHODS APPROVED BY THE WMA.

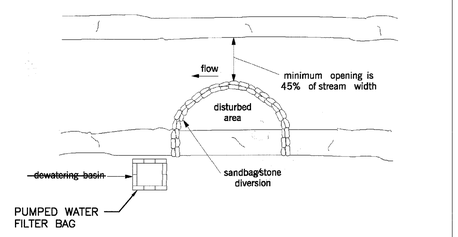
Maryland's Guidelines To Waterway Construction
DETAIL 1.5: SANDBAG/STONE DIVERSION

TRANSVERSE SECTION VIEW



H/2 + 1 ft (0.3 m) for projects of duration < 2 weeks;
2–year flood elevation for projects of longer duration

PLAN VIEW



TEMPORARY INSTREAM CONSTRUCTION MEASURES	*REVISED NOVEMBER 2000* *PAGE 1.5 – 3*	MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

MGWC 1.5: SANDBAG/STONE CHANNEL DIVERSION

MATERIAL SPECIFICATIONS:

MATERIALS FOR SANDBAG AND STONE STREAM DIVERSIONS SHOULD MEET THE FOLLOWING REQUIREMENTS:

- RIPRAP: STONE SHOULD BE WASHED AND HAVE A MINIMUM DIAMETER OF 6 INCHES (15 CENTIMETERS)
- SANDBAGS: SANDBAGS SHOULD CONSIST OF MATERIALS WHICH ARE RESISTANT TO ULTRA–VIOLET RADIATION, TEARING, AND PUNCTURE AND SHOULD BE WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF FILL MATERIAL (I.E. SAND, FINE GRAVEL, ETC.)
- SHEETING: SHEETING SHOULD CONSIST OF POLYETHYLENE OR OTHER MATERIAL WHICH IS IMPERVIOUS AND RESISTANT TO PUNCTURE AND TEARING.

INSTALLATION GUIDELINES:

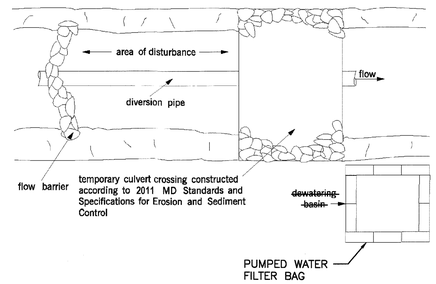
ALL EROSION AND SEDIMENT CONTROL DEVICES, INCLUDING MANDATORY DEWATERING BASINS SHOULD BE INSTALLED AS THE FIRST ORDER OF BUSINESS ACCORDING TO A PLAN APPROVED BY THE WMA OR LOCAL AUTHORITY. INSTALLATION SHOULD PROCEED FROM UPSTREAM TO DOWNSTREAM DURING LOW FLOW CONDITIONS. IF NECESSARY, SILT FENCE OR STRAW BALES SHOULD BE INSTALLED AROUND THE PERIMETER OF THE WORK AREA.

SANDBAG/STONE DIVERSIONS CAN BE USED INDEPENDENTLY OR AS COMPONENTS OF OTHER STREAM DIVERSION TECHNIQUES. INSTALLATION OF THIS MEASURE SHOULD PROCEED AS FOLLOWS (REFER TO DETAIL 1.5):

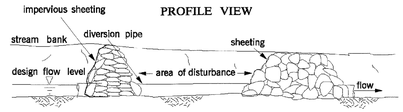
1. THE DIVERSION STRUCTURE SHOULD BE INSTALLED FROM UPSTREAM TO DOWNSTREAM.
2. THE HEIGHT OF THE SANDBAG/STONE DIVERSION SHOULD BE A FUNCTION OF THE DURATION OF THE PROJECT IN THE STREAM REACH. FOR PROJECTS WITH A DURATION LESS THAN 2 WEEKS, THE HEIGHT OF THE DIVERSION SHOULD BE ONE HALF THE STREAMBANK HEIGHT, MEASURED FROM THE CHANNEL BED, PLUS 1 FOOT (0.3 METERS) OR BANKFULL HEIGHT, WHICHEVER IS GREATER. FOR PROJECTS OF LONGER DURATION, THE TOP OF THE SANDBAG OR STONE DIVERSION SHOULD CORRESPOND TO BANKFULL HEIGHT. FOR DIVERSION STRUCTURES UTILIZING SANDBAGS, THE STREAM BED SHOULD BE HAND PREPARED PRIOR TO PLACEMENT OF THE BASE LAYER OF SANDBAGS IN ORDER TO ENSURE A WATER TIGHT FIT. ADDITIONALLY, IT MAY BE NECESSARY TO PREPARE THE BANK IN A SIMILAR FASHION.
3. ALL EXCAVATED MATERIAL SHOULD BE DEPOSITED AND STABILIZED IN AN APPROVED AREA OUTSIDE THE 100–YEAR FLOODPLAIN UNLESS OTHERWISE AUTHORIZED BY THE WMA.
4. SEDIMENT–LADEN WATER FROM THE CONSTRUCTION AREA SHOULD BE PUMPED TO A DEWATERING BASIN.
5. SHEETING ON THE DIVERSION SHOULD BE POSITIONED SUCH THAT THE UPSTREAM PORTION COVERS THE DOWNSTREAM PORTION WITH AT LEAST A 18–INCH (0.45 METERS) OVERLAP.
6. SANDBAG OR STONE DIVERSIONS SHOULD NOT OBSTRUCT MORE THAN 45% OF THE STREAM WIDTH. ADDITIONALLY, BANK STABILIZATION MEASURES SHOULD BE PLACED IN THE CONSTRICTED SECTION IF ACCELERATED EROSION AND BANK SCOUR ARE OBSERVED DURING THE CONSTRUCTION TIME OR IF PROJECT TIME IS EXPECTED TO LAST MORE THAN 2 WEEKS.
7. PRIOR TO REMOVAL OF THESE TEMPORARY STRUCTURES, ANY ACCUMULATED SEDIMENT SHOULD BE REMOVED, DEPOSITED AND STABILIZED IN AN APPROVED AREA OUTSIDE THE 100–YEAR FLOODPLAIN UNLESS AUTHORIZED BY THE WMA.
8. SEDIMENT CONTROL DEVICES ARE TO REMAIN IN PLACE UNTIL ALL DISTURBED AREAS ARE STABILIZED IN ACCORDANCE WITH AN APPROVED SEDIMENT AND EROSION CONTROL PLAN AND THE INSPECTING AUTHORITY APPROVES THEIR REMOVAL.

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

PLAN VIEW



PROFILE VIEW



TEMPORARY INSTREAM CONSTRUCTION MEASURES	*REVISED NOVEMBER 2000* *PAGE 1.3 – 3*	MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

MGWC 1.3: CULVERT PIPE WITH ACCESS ROAD

MATERIAL SPECIFICATIONS:

MATERIALS FOR CULVERTS WITH TEMPORARY ACCESS ROADS SHOULD MEET THE FOLLOWING REQUIREMENTS:

- RIPRAP: RIPRAP SHOULD BE SIZED TO RESIST A STREAM'S BASEFLOW IF THE DURATION OF THE PROJECT IS LESS THAN ONE MONTH. OTHERWISE, THE RIPRAP SHOULD BE SIZED TO RESIST BANKFULL DISCHARGE.
- SANDBAGS: SANDBAGS SHOULD CONSIST OF MATERIALS WHICH ARE RESISTANT TO ULTRA–VIOLET RADIATION, TEARING, AND PUNCTURE AND SHOULD BE WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF FILL MATERIAL (I.E. SAND, FINE GRAVEL, ETC.)
- SHEETING: SHEETING SHOULD CONSIST OF POLYETHYLENE OR OTHER MATERIAL WHICH IS IMPERVIOUS AND RESISTANT TO PUNCTURE AND TEARING.

INSTALLATION GUIDELINES:

ALL EROSION AND SEDIMENT CONTROL DEVICES, INCLUDING MANDATORY DEWATERING BASINS SHOULD BE INSTALLED AS THE FIRST ORDER OF BUSINESS ACCORDING TO A PLAN APPROVED BY THE WMA OR LOCAL AUTHORITY. INSTALLATION SHOULD PROCEED FROM UPSTREAM TO DOWNSTREAM DURING LOW FLOW CONDITIONS. ADDITIONALLY, ALL EXCAVATED MATERIAL SHOULD BE DEPOSITED AND STABILIZED IN AN APPROVED AREA OUTSIDE THE 100–YEAR FLOODPLAIN UNLESS AUTHORIZED BY THE WMA OR LOCAL AUTHORITY.

A CULVERT PIPE WITH A TEMPORARY ACCESS ROAD SHOULD BE CONSTRUCTED AS FOLLOWS (REFER TO DETAIL 1.3):

1. CULVERTS SHOULD HAVE A MINIMUM CAPACITY SUFFICIENT TO CONVEY THE STREAM'S BASE FLOW FOR PROJECTS WITH DURATION OF 2 WEEKS OR LESS. FOR PROJECTS OF LONGER DURATION, CULVERTS SHOULD HAVE A CAPACITY SUFFICIENT TO CONVEY THE 2–YEAR FLOW.
2. SANDBAG OR STONE FLOW BARRIERS SHOULD BE SIZED AND INSTALLED AS DETAILED IN MGWC 1.5: SANDBAG/STONE CHANNEL DIVERSION. THE MATERIALS SHOULD BE SIZED TO WITHSTAND NORMAL STREAMFLOW VELOCITIES.
3. ALL SEDIMENT–LADEN FLOW FROM THE CONSTRUCTION SITE SHOULD BE PUMPED TO A DEWATERING BASIN BUILT ACCORDING TO MGWC 1.1: DEWATERING BASINS PRIOR TO RE–ENTERING THE STREAM.
4. TEMPORARY CULVERT CROSSINGS SHOULD BE CONSTRUCTED IN ACCORDANCE WITH 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL (REFER TO SECTION 4, STREAM CROSSINGS, MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION).
5. VELOCITY DISSIPATION MEASURES SHOULD BE PROVIDED AT THE OUTFALL TO PREVENT AGGRAVATED EROSION OF THE STREAM CHANNEL. IF RIPRAP IS UTILIZED, IT SHOULD BE SIZED ACCORDING TO MGWC 2.1: RIPRAP.
6. SEDIMENT CONTROL DEVICES ARE TO REMAIN IN PLACE UNTIL ALL DISTURBED AREAS ARE STABILIZED IN ACCORDANCE WITH AN APPROVED SEDIMENT AND EROSION CONTROL PLAN AND THE INSPECTING AUTHORITY APPROVES THEIR REMOVAL.

NOTE: SEE SHEETS 6–10 FOR AS–BUILT WATER MAIN ALIGNMENT AND STATIONING.

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

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.

Louis Ruzzino 50399 — 01/16/18
Signature of Engineer — Registration Number — Date

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/18/18
CHIEF – BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-17-18
CHIEF, UTILITY DESIGN DIVISION — DATE 11/16/18

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. 50399, EXPIRATION DATE 12/28/2018 — 01/16/18

STATE OF MARYLAND · LOUIS RAZZINO · 50399 · REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	CTP
DRN. BY:	IH
CHK. BY:	RJD
DATE:	01/18

BY	NO.	REVISION	DATE
CTP	2	RECORD DRAWINGS	10/16/19
LR	1	DESIGN REVISION NO. 3	11/1/18

SOIL EROSION AND SEDIMENT CONTROL PLAN
WATERWAY CROSSING DETAILS

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30–INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W–8307
CONTRACT NO.: 44–4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 19 OF 41

FILE NO. 51204–019

WETLAND RESTORATION PLANTING GENERAL NOTES:

1. WETLAND RESTORATION PLANS ARE FOR LANDSCAPING PURPOSES ONLY AND ANY OTHER INFORMATION SHOWN IS FOR REFERENCE ONLY. SEE SHEET 20 FOR BEST MANAGEMENT PRACTICES FOR WORKING IN NON-TIDAL WETLANDS.
2. CALL MISS-UTILITY AT 811 OR 1-800-257-7777 TO MARK UTILITIES AT LEAST 48 HOURS BEFORE DIGGING.
3. ALL MATERIALS AND PLANTING PROCEDURES, EXCEPT AS OTHERWISE NOTED, SHALL CONFORM TO THE LATEST EDITION OF LANDSCAPE SPECIFICATION GUIDELINES BY THE LANDSCAPE CONTRACTORS ASSOCIATION MD-DC-VA.
4. PLANTS SHALL CONFORM TO THE CURRENT EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK. (ANSI Z60.1)
5. PLANT NAMES SHALL BE THOSE GIVEN IN THE LATEST EDITION OF STANDARD PLANT NAMES BY THE AMERICAN COMMITTEE ON HORTICULTURAL NOMENCLATURE.
6. TOPSOIL FOR UPLAND AREAS SHALL MEET SPECIFICATIONS AS PER THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
7. THE CONTRACTOR SHALL SUBMIT REPRESENTATIVE SOIL SAMPLES FROM BOTH IN-SITU SOILS AND SOILS BROUGHT IN FROM OFF-SITE TO A STATE LICENSED TESTING LABORATORY. THE CONTRACTOR SHALL INCORPORATE OR APPLY SOIL AMENDMENTS AND FERTILIZATION BASED ON RESULTS OF THE SOIL TESTS AND RECOMMENDATIONS BY THE TESTING LABORATORY. THE CONTRACTOR SHALL OBTAIN RECOMMENDATIONS FOR BOTH UPLANDS AND WETLANDS SOILS.
8. THE CONTRACTOR SHALL APPLY GRASS ACCORDING TO THE SEEDING SUMMARIES ON SHEET 21.
9. THE CONTRACTOR SHALL STAKE OUT ALL PLANTING BEDS AND TREE LOCATIONS AND THESE MUST BE APPROVED BY THE ENGINEER BEFORE DIGGING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE PLANTINGS WITH EXISTING UTILITIES. IF DISCREPANCIES OCCUR BECAUSE OF UTILITY LOCATIONS OR OTHER EXISTING CONDITIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY TO COORDINATE ANY NECESSARY ADJUSTMENTS.
10. ALL PLANT MATERIAL SHALL BE LABELED BY THE NURSERY AND DELIVERED WITH LABELS IN PLACE FOR INSPECTION. SUBSTITUTIONS IN PLANT SPECIES OR SIZE WILL NOT BE PERMITTED EXCEPT WITH THE APPROVAL OF THE ENGINEER. PRUNING IS NOT TO OCCUR UNTIL MATERIAL HAS BEEN PLANTED. CONTRACTOR SHALL PRUNE PLANT MATERIAL AS SOON THEREAFTER AS IS ADVISABLE UNDER STANDARD HORTICULTURAL PRACTICES.
11. IT IS OF UTMOST IMPORTANCE THAT ALL PLANT MATERIAL BE SET SLIGHTLY HIGHER IN RELATION TO GRADE THAN IT WAS GROWN IN THE NURSERY AND WITH GOOD EARTH TO ROOT CONTACT. ANY MATERIALS OR WORK MAY BE REJECTED BY THE ENGINEER IF IT DOES NOT MEET THIS OR ANY OTHER REQUIREMENT OF THE SPECIFICATIONS AND REJECTED MATERIALS SHALL BE REMOVED FROM THE SITE AT THE CONTRACTOR'S EXPENSE.
12. THE CONTRACTOR SHALL MULCH AND WATER ALL PLANTS WELL ON THE DAY THEY ARE PLANTED. THE SURFACE MULCH LAYER SHALL CONSIST OF WELL-AGED COMPOST. THE CONTRACTOR SHALL APPLY THE MULCH UNIFORMLY TO A 2 TO 3 INCH DEPTH. MULCH SHALL BE KEPT 3 TO 4 INCHES AWAY FROM ALL TRUNKS AND WOODY STEMS.
13. IN CASE OF DISCREPANCIES BETWEEN QUANTITIES ON THE PLANT LIST AND THE PLAN, THE PLAN SHALL GOVERN.
14. SEED OR SOD BARE AREAS AS DIRECTED BY OWNER FOR ALL DISTURBED AREAS TO BE STABILIZED THAT ARE NOT LANDSCAPED OR OTHERWISE COVERED.
15. WETLAND PLANTS MUST BE WET CULTURED FOR A MINIMUM OF 3 MONTHS AND SUPPLIED BY A RECOGNIZED WETLAND NURSERY THAT WILL PROVIDE CERTIFICATION OF THE CULTURE PROCESS. UPLAND PLANTS MAY BE SUPPLIED BY A STANDARD UPLAND GROWN NURSERY OPERATION. SEE LIST FOR WETLAND PLANTING SOURCES:

ENVIRONMENTAL CONCERN INC.
P.O. BOX P
210 WEST CHEW AVE.
ST. MICHAELS, MD 21663
TEL: 301-745-9620
FAX: 301-745-3517

OCTORARO WETLAND NURSERIES
P.O. BOX 24
OXFORD, PA 19363
TEL: 215-932-3762 OR
ELKTON, MD 410-392-8175

SIGNATURE HORTICULTURAL SERVICES
19960 GORE MILL ROAD
FREELAND, MD 21053
TEL: 410-329-6466
FAX: 410-329-2156

WICKLEIN'S WATER GARDENS
1820 CROMWELL BRIDGE RD.
BALTIMORE, MD 21234
TEL: 301-823-1335

ENVIRONMENTAL CONSULTANTS, INC.
P.O. BOX 3198
SUFFOLK, VA 23434
TEL: 804-539-4833

16. JOB CONDITIONS:
   A. EXAMINE AND EVALUATE GRADES, SOILS AND WATER LEVELS. OBSERVE THE CONDITIONS UNDER WHICH WORK IS TO BE PERFORMED AND NOTIFY THE ENGINEER OF UNSATISFACTORY CONDITIONS. DO NOT PROCEED WITH THE WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED IN AN ACCEPTABLE MANNER.
   B. UTILITIES: REVIEW UNDERGROUND UTILITIES LOCATION MAPS AND PLANS PROVIDED BY OWNER; DEMONSTRATE AN AWARENESS OF UTILITY LOCATIONS AND CERTIFY ACCEPTANCE OF LIABILITY FOR THE PROTECTION OF UTILITIES DURING THE COURSE OF WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO UTILITIES OR PROPERTY.
   C. EXCAVATION: WHEN CONDITIONS DETRIMENTAL TO PLANT GROWTH ARE ENCOUNTERED, SUCH AS RUBBLE FILL, ADVERSE DRAINAGE CONDITIONS OR OBSTRUCTIONS, NOTIFY ENGINEER BEFORE PLANTING.

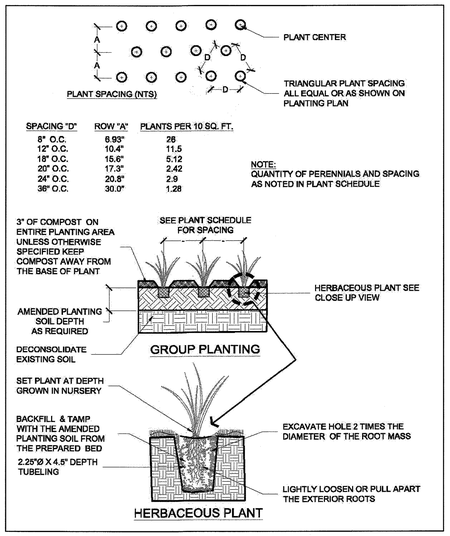
WETLAND RESTORATION PLANTING SCHEDULE

GROUND COVERS	QTY	BOTANICAL/COMMON NAME	CONT.
▽▽▽▽▽▽▽ ▽▽▽▽▽▽▽ ▽▽▽▽▽▽▽	7269 S.F.	WETLAND PLANTING MIX	TUBELINGS/PLUGS @ 12" O.C.

WETLAND PLANTING MIX: PLANT EACH SPECIES IN RANDOM GROUPS OF 4 TO 7 PLANTS.

QTY (%)	BOTANICAL NAME	COMMON NAME	SIZE
13%	Carex vulpinoidea	FOX SEDGE	TUBELING/PLUG @ 12" O.C.
13%	Juncus effusus	SOFT RUSH	TUBELING/PLUG @ 12" O.C.
13%	Panicum virgatum	SWITCHGRASS	TUBELING/PLUG @ 12" O.C.
13%	Eupatorium coelestinum	MIST FLOWER	TUBELING/PLUG @ 12" O.C.
13%	Scirpus validus	SOFT STEM BULRUSH	TUBELING/PLUG @ 12" O.C.
11%	Sagittaria latifolia	DUCK POTATO	TUBELING/PLUG @ 12" O.C.
13%	Eupatorium fistulosum	JOE PYE WEED	TUBELING/PLUG @ 12" O.C.
11%	Carex baileyi	BAILEY'S SEDGE	TUBELING/PLUG @ 12" O.C.

NOTE: SEE SHEETS 6-10 FOR AS-BUILT WATER MAIN ALIGNMENT AND STATIONING.

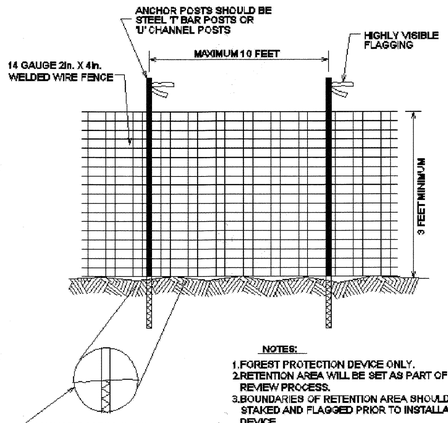


HERBACEOUS TUBELING/PLUG PLANTING DETAIL

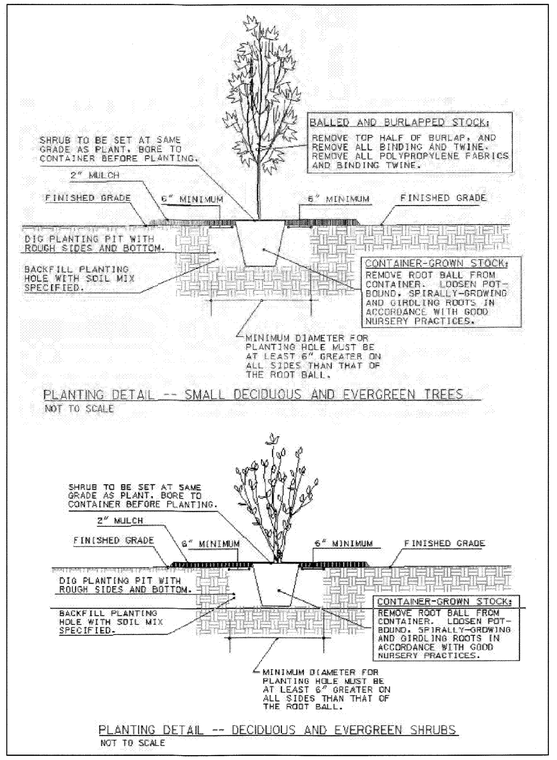
NOT TO SCALE

TREE PROTECTION FENCING

WIRE MESH



NOT TO SCALE



PLANTING DETAIL -- SMALL DECIDUOUS AND EVERGREEN TREES

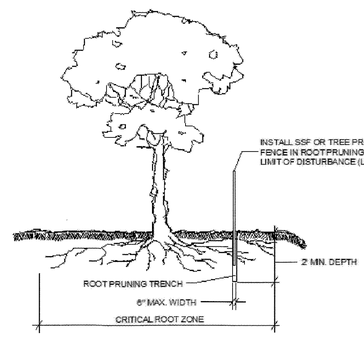
NOT TO SCALE

PLANTING DETAIL -- DECIDUOUS AND EVERGREEN SHRUBS

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.

NOT TO SCALE

TREE PROTECTION MEASURES

PROTECTION MEASURES ARE NECESSARY TO PROTECT AREAS DURING THE CONSTRUCTION PROCESS. INSTALLATION OF PROTECTION DEVICES SHALL BE COMPLETED BY THE CONTRACTOR PER THE GUIDELINES OUTLINED IN THE STATE FOREST CONSERVATION TECHNICAL MANUAL AND AS PER HOWARD COUNTY DPW GUIDELINES.

1. ALL TREE PROTECTION DEVICES AND SIGNS MUST BE INSTALLED AROUND TREE THAT ARE TO REMAIN AND ARE WITHIN CLOSE PROXIMITY TO THE LOD.
2. TEMPORARY TREE PROTECTION DEVICES SHALL BE INSTALLED BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION ACTIVITIES. TREE PROTECTION FENCING LOCATIONS SHOULD BE STAKED PRIOR TO INSTALLATION. O'BRIEN & GERE WILL INSPECT THIS FENCING PRIOR TO ANY CONSTRUCTION ACTIVITIES TO APPROVE LOCATION AND DETERMINE THE NUMBER OF TREES TO BE REMOVED. AT THIS TIME, FIELD ADJUSTMENTS MAY BE MADE TO INCREASE SURVIVABILITY OF TREES AND FOREST. TEMPORARY TREE PROTECTION DEVICES MAY INCLUDE:
   a. CHAIN LINK FENCE (FOUR FEET HIGH)
   b. SUPER SILT FENCE WITH WIRE STRUNG BETWEEN SUPPORT POLES (MINIMUM FOUR FEET HIGH) WITH VISIBILITY FLAGGING
   c. 14 GAUGE 2 INCH x 4 INCH WELDED WIRE FENCING SUPPORTED BY STEEL T-BAR POSTS (MINIMUM FOUR FEET HIGH) WITH HIGH VISIBILITY FLAGGING
3. TEMPORARY PROTECTION DEVICES SHALL BE MAINTAINED AND INSTALLED BY THE CONTRACTOR FOR THE DURATION OF THE CONSTRUCTION PROJECT. NO EQUIPMENT, TRUCKS, MATERIALS, OR DEBRIS MAY BE STORED WITHIN THE TREE PROTECTION FENCE AREAS. NO VEHICLE OR EQUIPMENT ACCESS TO THE FENCED AREA WILL BE PERMITTED.
4. WHEN TRENCH EXCAVATIONS ARE REQUIRED IN THE CRITICAL ROOT ZONE, PROPER ROOT PRUNING METHODS SHALL BE USED.

SPECIES AND LOCATION SELECTION

1. FOR EACH TREE BEING REMOVED, ONE TREE AND TWO SHRUBS SHALL BE REPLANTED, FOR A REPLACEMENT RATIO OF 3:1.
2. ALL PROPOSED SPECIES SHALL BE NATIVE AND SELECTED BASED ON THE EXISTING VEGETATIVE COMMUNITY, AVAILABLE SUNLIGHT AND SOIL CONDITIONS, AND THOSE WHICH MAY AID IN NOISE REDUCTION FROM THE NEARBY HIGHWAY.
3. TREES SHALL BE REPLACED WITH THE SAME SPECIES AS THOSE INDIVIDUALS THAT ARE REMOVED, WITH THE EXCEPTION OF NORWAY MAPLE (AN EXOTIC SPECIES), WHICH SHALL BE REPLACED WITH RED MAPLE.
4. SHRUBS SHALL BE PLACED AROUND OR AMONG EXISTING AND NEWLY REPLANTED TREES. SPECIES WILL BE SPREAD THROUGHOUT THE PLANTING AREA.
5. ACTUAL PLANTING REQUIREMENTS AND LOCATIONS SHALL BE DETERMINED IN THE FIELD BASED ON THE NUMBER OF TREES REMOVED DURING CONSTRUCTION ACTIVITIES.
6. TREES AND SHRUBS SHALL BE PLACED A MINIMUM OF 15 FEET AND 10 FEET, RESPECTIVELY, FROM THE WATER MAIN.
7. TREE AND SHRUB SPECIES MAY BE REPLACED WITH SIMILAR SPECIES BASED ON AVAILABILITY.

MATERIALS

1. IF REQUIRED, IMPORTED TOPSOIL SHALL BE UNFROZEN FRIABLE SILT LOAM FREE FROM CLAY LUMPS, STONES, ROOTS, STICKS, STUMPS, BRUSH OR FOREIGN OBJECTS. TOPSOIL SHALL HAVE MODERATE PH (5 TO 6.5) AND ORGANIC MATTER CONCENTRATION (MINIMUM OF 4%).
2. TOPSOIL SHALL BE WELL GRADED AND COMPRISED OF THE FOLLOWING PARTICLE SIZES: AT LEAST 50% SILT (0.05 TO 0.002 MM DIA) AND 12 TO 27% CLAY (LESS THAN 0.002 MM DIA) OR 50 TO 80% SILT AND LESS THAN 12% CLAY.
3. FERTILIZER SHALL BE A STANDARD QUALITY COMMERCIAL CARRIER OF AVAILABLE PLANT FOOD ELEMENTS AND SHALL CONSIST OF A COMPLETE PREPARED AND PACKAGED MATERIAL CONTAINING A MINIMUM OF 10% NITROGEN, 10% PHOSPHORIC ACID AND 10 % POTASH. LOW PHOSPHORUS FERTILIZER SHALL BE USED IN THE PROXIMITY OF CATCH BASINS OR OTHER STORMWATER INLETS. EACH BAG OF FERTILIZER SHALL BEAR THE MANUFACTURER'S GUARANTEED STATEMENT OF ANALYSIS.
4. SEED MIXTURES SHALL BE OF COMMERCIAL STOCK OF THE CURRENT OR PRIOR SEASON'S CROP AND SHALL BE DELIVERED IN UNOPENED CONTAINERS BEARING THE GUARANTEED ANALYSIS OF THE MIX. SEED SHALL BE LABELED TRUE TO SPECIES AND VARIETY. THE PERCENT OF PURE LIVE STRAIN OF THE SEED SHALL BE SUBMITTED WITH THE SEED MIXTURE.
5. SEED MIXES SHALL NOT INCLUDE SEED FROM SPECIES ON THE FEDERAL NOXIOUS WEED LIST.
6. ALL SEED SHALL MEET THE STANDARDS OF GERMINATION AND PURITY SET BY THE STATE OF MARYLAND OR THE ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES (AOSCA).
7. ALL WOODY PLANT MATERIAL WILL COMPLY WITH THE FOLLOWING GUIDELINES:
   a. ALL PLANT MATERIALS SHALL COMPLY WITH STATE AND FEDERAL LAWS WITH RESPECT TO INSPECTION FOR PLANT DISEASES AND INSECT INFESTATIONS.
   b. PLANTS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2004) UNLESS OTHERWISE SPECIFIED.
   c. WOODY PLANTS SHALL BE OF HIGH QUALITY AND SYMMETRICAL. THEY SHALL BE HEALTHY, WELL BRANCHED AND DENSELY FOLIATED WHEN IN LEAF.
   d. PLANTS SHALL BE FREE OF DISEASE AND INSECTS, EGGS, OR LARVAE, AND HAVE HEALTHY, WELL-DEVELOPED ROOT SYSTEMS SUCH THAT THE ROOT BALL DOES NOT FALL APART UPON PLANT REMOVAL FROM THE POT OR TRAY.
   e. PLANTS SHALL BE TAGGED TRUE TO SPECIES NAME AND VARIETY AND NOT CONTAIN WEEDS.
   f. PLANTS SHALL ARRIVE AT THE JOB SITE FREE FROM PHYSICAL DAMAGE.
   g. EACH SPECIES SHALL BE HANDLED AND PACKED IN A MANNER APPROVED FOR THAT PLANT. ALL PRECAUTIONS THAT ARE CUSTOMARY IN GOOD TRADE PRACTICE SHALL BE TAKEN SUCH THAT PLANTS ARRIVE AT THE SITE IN GOOD CONDITION. PLANTS THAT ARRIVE DRIED OUT, EXPOSED TO EXCESSIVE HEAT, OR THAT HAVE BEEN IN STORAGE FOR PROTRACTED PERIODS OF TIME, WILL NOT BE ACCEPTED. IF, UPON INSPECTION, THE PLANTS OR ROOT STOCKS DISPLAY MOLD OR DECAY, THE MATERIAL WILL NOT BE ACCEPTED.
   h. ALL WOODY SEEDLINGS SHALL HAVE A HEAVY FIBROUS ROOT SYSTEM THAT HAS BEEN DEVELOPED BY PROPER HORTICULTURAL TREATMENT, TRANSPLANTING, AND ROOT PRUNING.

INSTALLATION

1. PLANTING SHALL BE DONE AFTER ALL WATER MAIN CONSTRUCTION WORK HAS BEEN COMPLETED.
2. CONTRACTORS WILL RESTORE ALL DISTURBED AREAS WITH PAVEMENT OR HERBACEOUS SEEDING AND MULCHING.
3. CONTRACTORS WILL LOOSEN THE UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.
4. ALL PLANTING SHALL BE DONE BY HAND.
5. POTTED TREES AND SHRUBS SHALL BE PLANTED FROM MID-APRIL TO LATE MAY OR FROM SEPTEMBER THROUGH DECEMBER TO THE EXTENT PRACTICABLE.
6. IF PLANTING IS DONE OUTSIDE OF THE PREFERRED TIME FRAME, ANY MAINTENANCE OF PLANTS, INCLUDING WATERING, MOWING, AND WEED CONTROL SHALL BE UNDERTAKEN BY THE COUNTY.
7. TREES SHALL BE A MINIMUM OF 8 FEET IN HEIGHT.
8. THE PLANTING HOLE DIAMETER SHALL BE AT LEAST 1.5 TIMES THE DIAMETER OF THE ROOT BALL AND DUG TO A DEPTH SUCH THAT THE ROOT FLARE IS EVEN WITH THE FINISHED GRADE WHEN THE PLANT IS PLACED IN THE HOLE.
9. IF THE PLANTING HOLE IS INITIALLY DUG TOO DEEPLY, SOIL SHALL BE ADDED BACK INTO THE HOLE TO ATTAIN THE PROPER ELEVATION.
10. CUT ROOTS ENCIRCLING THE ROOT BALL WITH A SHARP KNIFE AND INSTALL THE PLANT AS SOON AS POSSIBLE ONCE IT HAS BEEN REMOVED FROM THE POT.
11. BACKFILL THE PLANTING HOLE AND FIRMLY WORK SOIL INTO AND AROUND THE ROOT BALL WITH CARE TAKEN TO FILL IN AIR SPACES.
12. TAMP THE BACKFILL WITH FOOT PRESSURE SUFFICIENT TO PREVENT THE ROOT BALL FROM SHIFTING OR LEANING.
13. LEAVE THE TOP OF THE ROOT BALL EXPOSED IN ORDER TO ALLOW WATER TO FLOW DOWN INTO IT.
14. FORM EARTHEN WATER-HOLDING SAUCERS (4 INCHES DEEP WITH A SIMILAR DIAMETER AS THE PLANTING HOLE) AROUND EACH PLANT.
15. WATER ALL PLANTS IMMEDIATELY AFTER PLANTING. APPLY WATER DIRECTLY TO THE ROOT BALL AND ADJACENT SOIL. FILL THE WATER HOLDING SAUCER WITH WATER.
16. FOLLOWING INSTALLATION, REMOVE ALL TAGS, LABELS, STRINGS, ETC. FROM ALL PLANTS.

MONITORING

1. WATERING OF WOODY SPECIES SHALL OCCUR IF ONE INCH OF RAIN IS NOT RECEIVED DURING ANY SEVEN-DAY WINDOW FROM JUNE 1 THROUGH AUGUST 31 IN THE YEAR OF INSTALLATION. WATERING EVENTS MAY BE AVOIDED IF THE WOODY PLANTS ARE NOT SHOWING MOISTURE STRESS. WATERING SHALL OCCUR IN THE FIRST JULY TO SEPTEMBER FOLLOWING PLANTING (I.E., WOODY PLANTS INSTALLED IN THE FALL SHALL BE WATERED THE FOLLOWING YEAR). SUFFICIENT WATER SHALL BE APPLIED TO EACH PLANT TO MAINTAIN PLANT HEALTH AND VIGOR.
2. TREES NOT REMOVED DURING CONSTRUCTION, BUT WHOSE ROOTS HAVE BEEN IMPACTED DUE TO EXCAVATION, SHALL BE MONITORED FOR SURVIVABILITY FOR A PERIOD OF TWO GROWING SEASONS. MONITORING SHALL BE IMPORTANT TO PREVENT PROPERTY DAMAGE AND MINIMIZE LIKELIHOOD OF INJURY FROM FALLEN LIMBS AND TREES. DAMAGED TREES SHALL BE REPORTED TO THE CONTRACTOR FOR REMOVAL.
3. MATURE TREES DAMAGED DURING CONSTRUCTION AND REQUIRING REMOVAL SHALL BE REPLACED AT A 3:1 RATIO, WITH THE SAME SPECIFICATIONS AND SPECIES CONSIDERATIONS AS THOSE REMOVED PRIOR TO CONSTRUCTION.
4. TREES AND SHRUBS REPLANTED AFTER CONSTRUCTION SHALL ALSO BE MONITORED FOR TWO GROWING SEASONS TO ENSURE SURVIVABILITY.
5. IF IS EXPECTED THAT AT LEAST 75% OF PLANTINGS WILL SURVIVE TWO GROWING SEASONS. IF SURVIVABILITY FALLS BELOW 75%, REPLACEMENT SHRUBS AND TREES SHALL BE ADDED TO MEET THAT THRESHOLD.
6. REPLACEMENTS SHALL BE OF THE SAME SIZE ORIGINALLY PLANTED AND SUBJECT TO THE FIRST YEAR MAINTENANCE EFFORTS DESCRIBED ABOVE.

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

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 of Engineer — Registration Number 50399 — Date 01/16/18

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/19/18
CHIEF - BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-17-18
CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/18

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. 50399, EXPIRATION DATE 12/28/2018 — 01/16/18

STATE OF MARYLAND — DOUG RAGOZZINO — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	CTP
DRN. BY:	IH
CHK. BY:	RJD
DATE:	01/18

BY	NO.	REVISION	DATE
CTP	1	RECORD DRAWINGS	10/16/19

SOIL EROSION AND SEDIMENT CONTROL PLAN WETLAND RESTORATION AND PLANTING PLAN NOTES & DETAILS

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION

CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 20 OF 41

FILE NO. 51204-020

I:\HOWARD-CO.2343\69520.BROKEN-LAND-PKW\DOCS\DWG\SHEETS\SESC\51204-021.DWG

HOWARD SOIL CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

1. A PRE-CONSTRUCTION MEETING MUST OCCUR WITH THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION INSPECTION DIVISION (CID), 410-313-1855 AFTER THE FUTURE LOD AND PROTECTED AREAS ARE MARKED CLEARLY IN THE FIELD. A MINIMUM OF 48 HOUR NOTICE TO CID MUST BE GIVEN AT THE FOLLOWING STAGES:
   A. PRIOR TO THE START OF EARTH DISTURBANCES,
   B. UPON COMPLETION OF THE INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING,
   C. PRIOR TO THE START OF ANOTHER PHASE OF CONSTRUCTION OR OPENING OF ANOTHER GRADING UNIT,
   D. PRIOR TO THE REMOVAL OR MODIFICATION OF SEDIMENT CONTROL PRACTICES

   OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE. OTHER RELATED STATE AND FEDERAL PERMITS SHALL BE REFERENCED, TO ENSURE COORDINATION AND TO AVOID CONFLICTS WITH THIS PLAN.

   ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.

2. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION IS REQUIRED WITHIN THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED AREAS ON THE PROJECT SITE EXCEPT FOR THOSE AREAS UNDER ACTIVE GRADING.

3. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR TOPSOIL (SEC. B-4-2), PERMANENT SEEDING (SEC. B-4-5), TEMPORARY SEEDING (SEC. B-4-4) AND MULCHING (SEC. B-4-3). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES IF THE GROUND IS FROZEN. INCREMENTAL STABILIZATION (SEC. B-4-1) SPECIFICATIONS SHALL BE ENFORCED IN AREAS WITH >15' OF CUT AND/OR FILL. STOCKPILES (SEC. B-4-8) IN EXCESS OF 20 FT. MUST BE BENCHED WITH STABLE OUTLET. ALL CONCENTRATED FLOW, STEEP SLOPE AND HIGHLY ERODIBLE AREAS SHALL RECEIVE SOIL STABILIZATION MATTING (SEC. B-4-6).

4. 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 CID.

5. SITE ANALYSIS:

TOTAL AREA OF SITE:	2.99 ACRES
AREA DISTURBED:	2.99 ACRES
AREA TO BE ROOFED OR PAVED:	0.87 ACRES (RESTORE EXISTING PAVEMENT)
AREA TO BE VEGETATIVELY STABILIZED:	2.11 ACRES
TOTAL CUT:	8268 CU. YDS.
TOTAL FILL:	7471 CU. YDS.
OFFSITE WASTE/BORROW AREA LOCATION:	TO BE DETERMINED – SITE SHALL HAVE AN ACTIVE GRADING PERMIT AND BE APPROVED BY THE CID INSPECTOR.

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

7. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE CID. THE SITE AND ALL CONTROLS SHALL BE INSPECTED BY THE CONTRACTOR WEEKLY; AND THE NEXT DAY AFTER EACH RAIN EVENT. A WRITTEN REPORT BY THE CONTRACTOR, MADE AVAILABLE UPON REQUEST, IS PART OF EVERY INSPECTION AND SHOULD INCLUDE:
   - INSPECTION DATE
   - INSPECTION TYPE (ROUTINE, PRE-STORM EVENT, POST-STORM EVENT)
   - NAME AND TITLE OF INSPECTOR
   - WEATHER INFORMATION (CURRENT CONDITIONS AS WELL AS TIME AND AMOUNT OF LAST RECORDED PRECIPITATION)
   - BRIEF DESCRIPTION OF PROJECT'S STATUS (E.G. PERCENT COMPLETE) AND/OR CURRENT ACTIVITIES
   - EVIDENCE OF SEDIMENT DISCHARGES
   - IDENTIFICATION OF PLAN DEFICIENCIES
   - IDENTIFICATION OF SEDIMENT CONTROLS THAT REQUIRE MAINTENANCE
   - IDENTIFICATION OF MISSING OR IMPROPERLY INSTALLED SEDIMENT CONTROLS
   - COMPLIANCE STATUS REGARDING THE SEQUENCE OF CONSTRUCTION AND STABILIZATION REQUIREMENTS
   - PHOTOGRAPHS
   - MONITORING/SAMPLING
   - MAINTENANCE AND/OR CORRECTIVE ACTION PERFORMED
   - OTHER INSPECTION ITEMS AS REQUIRED BY THE GENERAL PERMIT FOR STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITIES (NPDES, MDE)

8. 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.

9. ANY MAJOR CHANGES OR REVISIONS TO THE PLAN OR SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE HSCD PRIOR TO PROCEEDING WITH CONSTRUCTION. MINOR REVISIONS MAY BE ALLOWED BY THE CID PER THE LIST OF HSCD-APPROVED FIELD CHANGES.

10. DISTURBANCE SHALL NOT OCCUR OUTSIDE OF THE LOD. A PROJECT IS TO BE SEQUENCED SO THAT GRADING ACTIVITIES BEGIN ON ONE GRADING UNIT (MAXIMUM ACREAGE OF 20 AC. PER GRADING UNIT) AT A TIME. WORK MAY PROCEED TO A SUBSEQUENT GRADING UNIT WHEN AT LEAST 50 PERCENT OF THE DISTURBED AREA IN THE PRECEDING GRADING UNIT HAS BEEN STABILIZED AND APPROVED BY THE CID. UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE CID, NO MORE THAN 30 ACRES CUMULATIVELY MAY BE DISTURBED AT A GIVEN TIME.

11. WASH WATER FROM ANY EQUIPMENT, VEHICLES, WHEELS, PAVEMENT, AND OTHER SOURCES MUST BE TREATED IN A SEDIMENT BASIN OR OTHER APPROVED WASHOUT STRUCTURE.

12. TOPSOIL SHALL BE STOCKPILED AND PRESERVED ON-SITE FOR REDISTRIBUTION ONTO FINAL GRADE.

13. ALL SILT FENCE AND SUPER SILT FENCE SHALL BE PLACED ON-THE-CONTOUR, AND BE IMBRICATED AT 25' MINIMUM INTERVALS, WITH LOWER ENDS CURLED UPHILL BY 2' IN ELEVATION.

14. STREAM CHANNELS MUST NOT BE DISTURBED DURING THE FOLLOWING RESTRICTED TIME PERIODS (INCLUSIVE):
    - USE I AND IP MARCH 1 – JUNE 15
    - USE III AND IIIP OCTOBER 1 – APRIL 30
    - USE IV – MARCH 1 – MAY 31

15. A COPY OF THIS PLAN, THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, AND ASSOCIATED PERMITS SHALL BE ON-SITE AND AVAILABLE WHEN THE SITE IS ACTIVE.

GENERAL SOIL EROSION AND SEDIMENT CONTROL NOTES

1. THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) CONSTRUCTION PERMIT NUMBER FOR THIS PROJECT IS 16-11-1106.

2. THE LITTLE PATUXENT RIVER AND ITS TRIBUTARIES IN THE PROJECT LOCATION ARE CLASSIFIED AS USE IV-P (RECREATIONAL TROUT AND PUBLIC WATER SUPPLY) WATERS. NO IN-STREAM WORK MAY BE CONDUCTED DURING THE PERIOD OF MARCH 1 THROUGH MAY 31, INCLUSIVE, DURING ANY YEAR.

3. THE LITTLE PATUXENT RIVER AND ITS TRIBUTARIES IN THE PROJECT LOCATION ARE LISTED AS CATEGORY 5 (IMPAIRED) WATERS IN MARYLAND'S 2014 INTEGRATED REPORT OF SURFACE WATER QUALITY. THE WATERS ARE LISTED AS IMPAIRED FOR CHLORIDES DUE TO URBAN RUNOFF AND STORM SEWERS.

4. A TOTAL MAXIMUM DAILY LOAD (TMDL) OF SEDIMENT HAS BEEN ESTABLISHED FOR THE LITTLE PATUXENT RIVER WATERSHED IN HOWARD COUNTY.

5. UNLESS OTHERWISE NOTED, MATERIAL EXCAVATED FROM UTILITY TRENCHES SHALL BE TEMPORARILY STOCKPILED ON THE UPSLOPE SIDE OF THE TRENCH EXCAVATION. SUITABLE MATERIAL SHALL BE REUSED FOR BACKFILL. UNSUITABLE OR EXCESS MATERIAL SHALL BE REMOVED FROM ALONG THE PIPELINE ALIGNMENT AT THE END OF EACH WORKING DAY AND STOCKPILED IN A DESIGNATED ON-SITE STOCKPILE OR REMOVED FROM THE SITE AND PROPERLY DISPOSED OF AT A DESIGNATED SPOIL SITE.

6. EARTHWORK QUANTITIES SHOWN HEREIN ARE APPROXIMATE AND ARE FOR THE REVIEWING AGENCY USE ONLY. THE CONTRACTOR SHALL MAKE HIS OWN DETERMINATION OF EARTHWORK QUANTITIES.

7. CONSTRUCTION SHALL BEGIN AFTER THE RECEIPT OF ALL NECESSARY FEDERAL, STATE, COUNTY AND LOCAL PERMITS. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL PERMITS HAVE BEEN OBTAINED AND THAT COPIES ARE AVAILABLE ON THE PROJECT SITE.

8. THE SITE SHALL, AT ALL TIMES, BE GRADED AND MAINTAINED SUCH THAT ALL STORMWATER RUNOFF FROM DISTURBED AREAS IS DIVERTED TO SOIL EROSION AND SEDIMENT CONTROL FACILITIES.

9. PAVED ROADWAYS SHALL BE KEPT CLEAN AND FREE OF SEDIMENT AT ALL TIMES. ANY SEDIMENT TRACKED ONTO A PAVED ROADWAY SHALL BE COLLECTED AND RETURNED TO THE PROJECT SITE AT THE END OF EACH WORKING DAY.

10. ALL DEWATERING OPERATIONS MUST DISCHARGE TO AN APPROPRIATE SEDIMENT FILTRATION DEVICE. THE SEDIMENT FILTER MUST BE PLACED SO AS NOT TO CAUSE EROSION OF THE DOWNSTREAM AREA. FIELD PLACEMENT OF THE DEVICE MUST BE APPROVED BY THE CID PRIOR TO COMMENCEMENT OF DEWATERING OPERATIONS.

11. FOR DETAILS NOT SHOWN ON THE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS, REFER TO SECTION 308 OF THE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL MAINTAIN A COPY OF VOLUME IV ON THE JOB SITE.

12. ALL DISTURBED AREAS WITHIN STEEP, HIGHLY ERODIBLE, AND ENVIRONMENTALLY SENSITIVE AREAS (WETLANDS, STREAMBANKS, FLOODPLAINS AND WETLAND BUFFERS) SHALL BE STABILIZED WITH TEMPORARY SOIL STABILIZATION MATTING (TSSM) AND THE PERMANENT SEED MIXTURE.

SEQUENCE OF CONSTRUCTION

THE FOLLOWING IS A GENERAL SEQUENCE OF CONSTRUCTION INTENDED AS A GENERAL OUTLINE OF THE PROJECT EARTH DISTURBANCE ACTIVITIES AND INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES. THE CONTRACTOR MAY ADJUST THE TIMING, SEQUENCE AND DURATION OF CERTAIN ACTIVITIES AS NECESSARY, PROVIDED THAT THE INTENDED EROSION CONTROL MEASURES ARE IN PLACE AND FUNCTIONAL PRIOR TO EARTH DISTURBANCE ACTIVITIES OCCURRING.

CONSTRUCTION WILL BEGIN AFTER THE RECEIPT OF ALL NECESSARY FEDERAL, STATE, COUNTY AND LOCAL PERMITS. THE CONTRACTOR WILL BE RESPONSIBLE FOR ENSURING THAT COPIES OF ALL PERMITS ARE AVAILABLE ON THE PROJECT SITE AT ALL TIMES.

ALL EARTH DISTURBANCE ACTIVITIES WILL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. EACH STAGE WILL BE COMPLETED BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING AND GRUBBING WILL BE LIMITED ONLY TO THOSE AREAS DESCRIBED IN EACH STAGE.

1. PERFORM SURVEY AND STAKEOUT OF APPROVED WATERLINE ALIGNMENT. DELINEATE APPROVED LIMITS OF DISTURBANCE AND ALL WETLANDS AREAS TO BE PROTECTED WITH SURVEY STAKES AND FLAGS OR ORANGE CONSTRUCTION FENCING. CONTRACTOR SHALL NOT PERFORM ANY EARTH DISTURBANCE ACTIVITIES OUTSIDE OF APPROVED LIMITS OF DISTURBANCE. **(ESTIMATED DURATION: 40 DAYS)**

2. HOLD PRE-CONSTRUCTION MEETING ON-SITE INCLUDING THE CONTRACTOR, ALL SUBCONTRACTORS, LANDOWNERS, HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS CONSTRUCTION INSPECTION DIVISION (CID) INSPECTOR, PROJECT ENGINEER AND ALL APPROPRIATE MUNICIPAL OFFICIALS. COPIES OF ALL PERMITS INCLUDING, BUT NOT LIMITED TO, GRADING PERMIT, WETLAND AND WATERWAYS PERMIT AND NPDES PERMIT SHALL BE ON-SITE AT THE PRE-CONSTRUCTION MEETING AND REMAIN ON-SITE FOR THE DURATION OF THE PROJECT. THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) CONSTRUCTION PERMIT NUMBER FOR THIS PROJECT IS 16-11-1106. THE LITTLE PATUXENT RIVER AND ITS TRIBUTARIES IN THE PROJECT LOCATION ARE CLASSIFIED AS USE IV-P (RECREATIONAL TROUT AND PUBLIC WATER SUPPLY) WATERS. NO IN-STREAM WORK MAY BE CONDUCTED DURING THE PERIOD OF MARCH 1 THROUGH MAY 31, INCLUSIVE, DURING ANY YEAR.

3. INSTALL STABILIZED CONSTRUCTION ENTRANCES AND STABILIZED CONSTRUCTION STAGING AREAS AS INDICATED. **(ESTIMATED DURATION: 10 DAYS)**

4. INSTALL EROSION CONTROL MEASURES SUCH AS SILT FENCE, FILTER LOGS, INLET PROTECTION, ETC. AS INDICATED ALONG WATERLINE ALIGNMENT. THE CID INSPECTOR SHALL APPROVE THE LOCATION AND INSTALLATION OF ALL EROSION CONTROL MEASURES PRIOR TO PROCEEDING WITH FURTHER ACTIVITIES. **(ESTIMATED DURATION: 15 DAYS)**

5. BEGIN EXCAVATION FOR AND INSTALLATION OF 30-INCH DIAMETER WATER MAIN NEAR THE PROPOSED CONNECTION TO THE EXISTING 24-INCH DIAMETER WATER MAIN AT APPROXIMATE STATION -0+08 AND CONTINUE TO APPROXIMATE STATION 21+00. **(ESTIMATED DURATION: 100 DAYS)**

6. INSTALL 30-INCH DIAMETER WATER MAIN BENEATH THE TRIBUTARY TO LITTLE PATUXENT RIVER BETWEEN APPROXIMATE STATION 21+00 AND 22+00 USING SANDBAG/ STONE DIVERSIONS AS INDICATED PER MGWC 1.5. IN-STREAM WORK SHALL BE COMPLETED IN LESS THAN TWO WEEKS. STABILIZE BANKS WITH IMBRICATED RIPRAP PER MGWC 2.2. NO IN-STREAM WORK MAY BE CONDUCTED DURING THE PERIOD OF MARCH 1 AND MAY 31, INCLUSIVE. CROSSINGS SHALL BE PERFORMED ONLY UPON A 3-DAY CLEAR WEATHER FORECAST FROM THE NATIONAL WEATHER SERVICE AND WITH THE APPROVAL OF THE CID INSPECTOR. **(ESTIMATED DURATION: 15 DAYS)**

7. CONTINUE EXCAVATION FOR AND INSTALLATION OF NEW 30-INCH DIAMETER WATER MAIN FROM APPROXIMATE STATION 22+00 TO APPROXIMATE STATION 43+41 NEAR THE PROPOSED CONNECTION TO THE EXISTING 30-INCH DIAMETER WATER MAIN. **(ESTIMATED DURATION: 100 DAYS)**

8. BEGIN EXCAVATION FOR AND INSTALLATION OF 8-INCH DIAMETER WATER MAIN NEAR THE PROPOSED CONNECTION TO THE NEW 30-INCH DIAMETER WATER MAIN (APPROXIMATE 30-INCH DIAMETER WATER MAIN STATION 20+57, 8-INCH DIAMETER WATER MAIN STATION 0+00) AND CONTINUE TO APPROXIMATE 8-INCH DIAMETER WATER MAIN STATION 6+24 NEAR THE PROPOSED CONNECTION TO THE EXISTING 8-INCH DIAMETER WATER MAIN. **(ESTIMATED DURATION: 20 DAYS)**

9. COMPLETE CONNECTIONS TO EXISTING WATER MAINS. **(ESTIMATED DURATION: 15 DAYS)**

10. COMPLETE RESTORATION OF ALL DISTURBED AREAS WITH PAVEMENT OR SEEDING AND MULCHING OR TEMPORARY SLOPE STABILIZATION MATTING AS INDICATED. ONCE ALL DISTURBED AREAS HAVE BEEN STABILIZED WITH A UNIFORM 95% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER (I.E. PAVEMENT), REMOVE TEMPORARY BEST MANAGEMENT PRACTICES WITH THE APPROVAL OF THE CID. ANY AREA DISTURBED DURING THE REMOVAL OF A TEMPORARY BMP SHALL BE IMMEDIATELY STABILIZED WITH SEEDING AND MULCHING. **(ESTIMATED DURATION: 20 DAYS)**

TOTAL ESTIMATED DURATION: 335 DAYS

NOTE: SEE SHEETS 6-10 FOR AS-BUILT WATER MAIN ALIGNMENT AND STATIONING.

SOILS TABLE						
SYMBOL	DESCRIPTION	SLOPES	SOIL ERODIBILITY FACTOR (K)	HYDRIC COMPONENTS?	HYDROLOGIC SOIL GROUP	LIMITATIONS
BaA	Baile silt loam	0-3%	0.37	YES	D	CUTBANKS CAVE; SEASONAL HIGH WATER TABLE; SLOW PERCOLATION; PONDING
Co	Codorus and Hatboro silt loams	0-3%	0.37	YES	C	CUTBANKS CAVE; SEASONAL HIGH WATER TABLE; SLOW PERCOLATION; FLOODING
GgB	Glenelg loam	3-8%	0.28	NO	C	CUTBANKS CAVE
GhB	Glenelg-Urban land complex	0-8%	–	NO	B	CUTBANKS CAVE
GuB	Glenville-Urban land-Udorthents complex	0-8%	0.43	NO	C	CUTBANKS CAVE; SEASONAL HIGH WATER TABLE; SLOW PERCOLATION
Ha	Hatboro-Codorus silt loams	0-3%	0.37	YES	D	CUTBANKS CAVE; SEASONAL HIGH WATER TABLE; SLOW PERCOLATION; PONDING; FLOODING
MaC	Manor loam	8-15%	0.28	NO	B	CUTBANKS CAVE
McD	Manor loam, very rocky	15-25%	0.28	NO	B	CUTBANKS CAVE
UaF	Udorthents, Highway	0-65%	–	NO	–	CUTBANKS CAVE
UuB	Urban land-Udorthents complex	0-8%	–	NO	D	CUTBANKS CAVE; SLOW PERCOLATION

RESOLUTIONS TO SOIL LIMITATIONS

1. CUTBANKS CAVE: UTILIZE PROPER SLOPING AND BENCHING; SHORING; OR TRENCH BOXES TO SUPPORT EXCAVATIONS AS NECESSARY TO PREVENT CAVE-INS.

2. SEASONAL HIGH WATER TABLE: PERFORM WORK DURING DRY PERIODS TO THE EXTENT PRACTICAL. DEWATER EXCAVATIONS THROUGH AN APPROVED SEDIMENT FILTERING DEVICE AS NECESSARY.

3. SLOW PERCOLATION: PERFORM WORK DURING DRY PERIODS TO THE EXTENT PRACTICAL. DEWATER EXCAVATIONS THROUGH AN APPROVED SEDIMENT FILTERING DEVICE AS NECESSARY.

4. PONDING / FLOODING: PERFORM WORK DURING DRY PERIODS TO THE EXTENT PRACTICAL. INSTALL TEMPORARY DIVERSIONS AROUND WORK AREA AS NEEDED TO ROUTE CLEAN SURFACE WATERS AWAY FROM DISTURBED AREAS. DEWATER EXCAVATIONS THROUGH AN APPROVED SEDIMENT FILTERING DEVICE AS NECESSARY.

BEST MANAGEMENT PRACTICES FOR WORKING IN NON-TIDAL WETLANDS, WETLAND BUFFERS AND 100-YEAR FLOODPLAINS

1. FOR UTILITY LINE INSTALLATION, STRIP, STOCKPILE AND MAINTAIN SEPARATELY THE TOP 6" OF SOIL MATERIAL FROM THE NON-TIDAL WETLANDS AND BUFFER TO BE REPLACED AS THE TOP LAYER OF BACKFILL MATERIAL.

2. NO EXCESS FILL, CONSTRUCTION MATERIAL OR DEBRIS SHALL BE STOCKPILED OR STORED IN NON-TIDAL WETLANDS, NON-TIDAL WETLAND BUFFERS, WATERWAYS OR THE 100-YEAR FLOODPLAIN.

3. PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF NON-TIDAL WETLANDS, NON-TIDAL WETLANDS BUFFERS, WATERWAYS OR THE 100-YEAR FLOODPLAIN.

4. DO NOT USE EXCAVATED MATERIAL AS BACKFILL IF IT CONTAINS WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL OR ANY OTHER DELETERIOUS SUBSTANCE. IF ADDITIONAL BACKFILL IS REQUIRED, USE ONLY CLEAN FILL MATERIAL FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL OR OTHER DELETERIOUS SUBSTANCE.

5. PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO NON-TIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS OR THE 100-YEAR FLOODPLAIN.

6. REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NON-TIDAL WETLANDS, WETLAND BUFFERS, OR WATERWAYS OR PERMANENT MODIFICATION TO THE 100-YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.

7. RECTIFY ANY NON-TIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS OR 100-YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.

8. ALL STABILIZATION WITHIN NON-TIDAL WETLANDS AND NON-TIDAL WETLAND BUFFERS SHALL CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYEGRASS (LOLIUM MULTIFLORUM); MILLET (SETARIA ITALICA); BARLEY (HORDEUM SP.); OATS (UNIOLA SP.); AND/OR RYE (SECALE CEREALE). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NON-TIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEEDED AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.

9. AFTER UTILITY LINE CONSTRUCTION HAS BEEN COMPLETED, MAKE POST-CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.

10. TO PROTECT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM:
    USE I WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE DURING ANY YEAR.
    USE III WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD OCTOBER 1 THROUGH APRIL 30, INCLUSIVE DURING ANY YEAR.
    USE IV WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH MAY 31, INCLUSIVE DURING ANY YEAR.

11. STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.

12. CULVERTS SHALL BE CONSTRUCTED AND ANY RIPRAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.

13. NO REMOVAL OF VEGETATION, GRADING, FILLING, DRAINING OR OTHER ALTERATION OF NON-TIDAL WETLANDS OR BUFFER OUTSIDE THE LIMITS OF DISTURBANCE SHALL OCCUR WITHOUT WRITTEN AUTHORIZATION FROM THE COUNTY.

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.
O'BRIEN & GERE ENGINEERS, INC.
By: ____________

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.

50399 01/16/18
Signature of Engineer – Registration Number Date

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	1/19/18 DATE	CHIEF – BUREAU OF ENGINEERING	1/17/18 DATE
CHIEF, BUREAU OF UTILITIES	1-17-18 DATE	CHIEF, UTILITY DESIGN DIVISION	1/17/18 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. 50399, EXPIRATION DATE 12/28/2018 01/16/18

STATE OF MARYLAND – LOUIS RAGOZZINO – No. 50399 – REGISTERED PROFESSIONAL ENGINEER

DSN. BY: CTP
DRN. BY: IH
CHK. BY: RJD
DATE: 01/18

BY	NO.	REVISION	DATE
CTP	1	RECORD DRAWINGS	10/16/19

SOIL EROSION AND SEDIMENT CONTROL PLAN NOTES AND DETAILS – 1

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

FILE NO. 51204-021

I:\HOWARD-CO.2343\69520.BROKEN-LAND-PKWY\DOCS\DWG\SHEETS\SESC\51204-022.DWG

B-4-2 STANDARDS AND SPECIFICATIONS
FOR
SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

Definition

The process of preparing the soils to sustain adequate vegetative stabilization.

Purpose

To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies

Where vegetative stabilization is to be established.

Criteria

A. Soil Preparation

1. Temporary Stabilization
   a. Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
   b. Apply fertilizer and lime as prescribed on the plans.
   c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
2. Permanent Stabilization
   a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
      i. Soil pH between 6.0 and 7.0.
      ii. Soluble salts less than 500 parts per million (ppm).
      iii. Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if lovegrass will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
      iv. Soil contains 1.5 percent minimum organic matter by weight.
      v. Soil contains sufficient pore space to permit adequate root penetration.
   b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
   c. Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.
   d. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
   e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.

B. Topsoiling

1. Topsoil is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-NRCS.
3. Topsoiling is limited to areas having 2:1 or flatter slopes where:
   a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
   b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
   c. The original soil to be vegetated contains material toxic to plant growth.
   d. The soil is so acidic that treatment with limestone is not feasible.
4. Areas having slopes steeper than 2:1 require special consideration and design.
5. Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
   a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1½ inches in diameter.
   b. Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
   c. Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
6. Topsoil Application
   a. Erosion and sediment control practices must be maintained when applying topsoil.
   b. Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. Spreading is to be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.
   c. Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

C. Soil Amendments (Fertilizer and Lime Specifications)

1. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
2. Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.
3. Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydroseeding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
4. Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
5. Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

B-4-3 STANDARDS AND SPECIFICATIONS
FOR
SEEDING AND MULCHING

Definition

The application of seed and mulch to establish vegetative cover.

Purpose

To protect disturbed soils from erosion during and at the end of construction.

Conditions Where Practice Applies

To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.

Criteria

A. Seeding

1. Specifications
   a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed and seeding rate.
   b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
   c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
   d. Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.
2. Application
   a. Dry Seeding: This includes use of conventional drop or broadcast spreaders.
      i. Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent Seeding Table B.3, or site-specific seeding summaries.
      ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.
   b. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
      i. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
      ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.
   c. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer).
      i. If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P_2O_5 (phosphorous), 200 pounds per acre; K_2O (potassium), 200 pounds per acre.
      ii. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
      iii. Mix seed and fertilizer on site and seed immediately and without interruption.
      iv. When hydroseeding do not incorporate seed into the soil.

B. Mulching

1. Mulch Materials (in order of preference)
   a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland Seed Law and not musty, moldy, caked, decayed, or excessively dusty. **Note: Use only sterile straw mulch in areas where one species of grass is desired.**
   b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
      i. WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
      ii. WCFM, including dye, must contain no germination or growth inhibiting factors.
      iii. WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a blotter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
      iv. WCFM material must not contain elements or compounds at concentration levels that will be phyto-toxic.
      v. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.
2. Application
   a. Apply mulch to all seeded areas immediately after seeding.
   b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.
   c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to attain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
3. Anchoring
   a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
      i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.
      ii. Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
      iii. Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petroset, Terra Tax II, Terra Tack AR or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. **Use of asphalt binders is strictly prohibited.**
      iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000 feet long.

B-4-5 STANDARDS AND SPECIFICATIONS
FOR
PERMANENT STABILIZATION

Definition

To stabilize disturbed soils with permanent vegetation.

Purpose

To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

Conditions Where Practice Applies

Exposed soils where ground cover is needed for 6 months or more.

Criteria

A. Seed Mixtures

1. General Use
   a. Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
   b. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting.
   c. For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency.
   d. For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 ½ pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary .
2. Turfgrass Mixtures
   a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
   b. Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
      i. Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
      ii. Kentucky Bluegrass/Perennial Rye: Full Sun Mixture: For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
      iii. Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes; Certified Tall Fescue Cultivars 95 to 100 percent, Certified Kentucky Bluegrass Cultivars 0 to 5 percent. Seeding Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.
      iv. Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes; Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seeding Rate: 1½ to 3 pounds per 1000 square feet.

      Notes:
      Select turfgrass varieties from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland"

      Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line
   c. Ideal Times of Seeding for Turf Grass Mixtures

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

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

      Southern MD, Eastern Shore: March 1 to May 15, August 15 to October 15 (Hardiness Zones: 7a, 7b)
   d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the areas to prepare a proper seedbed. Remove stones and debris over 1½ inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.
   e. If soil moisture is deficient, supply new seedings with adequate water for plant growth (½ to 1 inch every 3 to 4 days depending on soil texture) until they are firmly established. This is especially true when seedings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

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

1. General Specifications
   a. Class of turfgrass sod must be Maryland State Certified. Sod labels must be made available to the job foreman and inspector.
   b. Sod must be machine cut at a uniform soil thickness of ¾ inch, plus or minus ¼ inch, at the time of cutting. Measurement for thickness must exclude top growth and thatch. Broken pads and torn or uneven ends will not be acceptable.
   c. Standard size sections of sod must be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section.
   d. Sod must not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
   e. Sod must be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period must be approved by an agronomist or soil scientist prior to its installation.
2. Sod Installation
   a. During periods of excessively high temperature or in areas having dry subsoil, lightly irrigate the subsoil immediately prior to laying the sod.
   b. Lay the first row of sod in a straight line with subsequent rows placed parallel to it and tightly wedged against each other. Stagger lateral joints to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots.
   c. Wherever possible, lay sod with the long edges parallel to the contour and with staggering joints. Roll and tamp, peg or otherwise secure the sod to prevent slippage on slopes. Ensure solid contact exists between sod roots and the underlying soil surface.
   d. Water the sod immediately following rolling and tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. Complete the operations of laying, tamping and irrigating for any piece of sod within eight hours.
3. Sod Maintenance
   a. In the absence of adequate rainfall, water daily during the first week or as often and sufficiently as necessary to maintain moist soil to a depth of 4 inches. Water sod during the heat of the day to prevent wilting.
   b. After the first week, sod watering is required as necessary to maintain adequate moisture content.
   c. Do not mow until the sod is firmly rooted. No more than ⅓ of the grass leaf must be removed by the initial cutting or subsequent cuttings. Maintain a grass height of at least 3 inches unless otherwise specified.

PERMANENT SEEDING SUMMARY

HARDINESS ZONE: 6B			SEEDING DATES	SEEDING DEPTHS	FERTILIZER RATE (10-20-20)			LIME RATE
MIX	SPECIES	APPLICATION RATE (LB/AC.)			N	P	K	
1	TALL FESCUE	60	3/1 – 5/15; 8/15 – 11/15	1/4" – 1/2"	45 LB/AC (1 LB/1000 SF)	90 LB/AC (2 LB/1000 SF)	90 LB/AC (2 LB/1000 SF)	2 TONS/AC (90 LB/1000 SF)
	KENTUCKY BLUEGRASS	40						
	PERENNIAL RYEGRASS	20						
2	CREEPING RED FESCUE	30	3/1 – 5/15; 8/15 – 11/15	1/4" – 1/2"	45 LB/AC (1 LB/1000 SF)	90 LB/AC (2 LB/1000 SF)	90 LB/AC (2 LB/1000 SF)	2 TONS/AC (90 LB/1000 SF)
	CHEWINGS FESCUE	30						
	KENTUCKY BLUEGRASS	20						
3	DEERTONGUE	15	3/1 – 5/15; 5/16 – 6–15	1/4" – 1/2"	45 LB/AC (1 LB/1000 SF)	90 LB/AC (2 LB/1000 SF)	90 LB/AC (2 LB/1000 SF)	2 TONS/AC (90 LB/1000 SF)
	CREEPING RED FESCUE	20						
	CANADA WILD RYE	5						

NOTES:

1. SEEDING RATES: SEEDING RATES FOR THE WARM SEASON GRASSES ARE IN POUNDS OF PURE LIVE SEED (PLS). ACTUAL PLANTING RATES MUST BE ADJUSTED TO REFLECT PERCENT SEED GERMINATION AND PURITY, AS TESTED. ADJUSTMENTS ARE USUALLY NOT NEEDED FOR THE COOL SEASON GRASSES, LEGUMES, OR WILDFLOWERS. ALL LEGUME SEEDS MUST BE INOCULATED BEFORE PLANTING WITH THE APPROPRIATE RHIZOBIUM BACTERIA. WHEN FEASIBLE, HARD-SEEDED LEGUMES SHOULD BE SCARIFIED TO IMPROVE GERMINATION.
2. TURF-TYPE CULTIVEARS OF TALL FESCUE AND KENTUCKY BLUEGRASS MUST BE SELECTED BASED ON RECOMMENDATIONS OF THE UNIVERSITY OF MARYLAND COOPERATIVE EXTENSION SERVICE, AGRONOMY MIMEO 77. RECOMMENDATIONS ARE AS FOLLOWS:

   A. KENTUCKY BLUEGRASS:

   1. THE FOLLOWING KENTUCKY BLUEGRASS CULTIVARS ARE SUITABLE FOR GENERAL USE AND ARE ALSO NOTED FOR SHADE TOLERANCE:

      AMERICA, ASCOT, BRILLIANT, CHAMPAGNE, COMPACT, COVENTRY, LIBERATOR, MOONLIGHT, NUGLADE, PRINCETON 105, QUANTUM LEAP, SHOWCASE, SR 2000, UNIQUE

   2. THE FOLLOWING KENTUCKY BLUEGRASS CULTIVARS ARE SUITABLE FOR GENRAL USE AND ARE ALSO NOTED FOR TOLERANCE OF LOW MAINTENANCE CONDITIONS:

      BARIRUS, CALIBER, EAGLETON, FREEDOM, HAGA, LIVINGTON, MERIT, MIDNIGHT, MONOPOLY, WASHINGTON

   B. TALL FESCUE – THE FOLLOWING TURF-TYPE CULTIVARS ARE SUITABLE FOR GENERAL USE:

      ALAMO E, APACHE II, AVANTI, AXIOM, BANDANA, BARLEXUS, BARRINGTON, BONANZA, BONANZA II, BULLDAWG, CHAPEL HILL, CHIEFTAIN II, CHINOOK, COCHISE II, COMSTOCK, COYOTE, CROSSFIRE, CROSSFIRE II, DEBUTANTE, DOMINION, DUKE, DUSTER, ELDORADO, EMPRESS, FALCON II, FINELAWN PETITE, GENESIS, GOOD-EN, GRANDE, GUARDIAN, HERITAGE, HOUNDOG 5, JAGUAR III, LANCER, LEPRECHAUN, MASTERPIECE, MICRO DD, MILLENNIUM, OLYMPIC GOLD, ONCUE, PIXIE, PIXIE E+, PLANTATION, PYRAMID, REBEL 2000, REBEL 3D, REBEL III, REBEL JR, REBEL SENTRY, RED COAT, REGIMENT, REMBRANDT, RENEGADE, RESERVE, SCORPIO, SHENANDOAH, SHENANDOAH II, SOUTHERN CHOICE, SR 8200, SR 8300, STETSON, TARHEEL, TF8, TITAN 2, TOMAHAWK, TRAILBLAZER II, TWILIGHT II, VIRTUE, WATCHDOG, WOLFPACK, WPEZE, WYATT

B-4-4 STANDARDS AND SPECIFICATIONS
FOR
TEMPORARY STABILIZATION

Definition

To stabilize disturbed soils with vegetation for up to 6 months.

Purpose

To use fast growing vegetation that provides cover on disturbed soils.

Conditions Where Practice Applies

Exposed soils where ground cover is needed for a period of 6 months or less. For longer duration of time, permanent stabilization practices are required.

Criteria

1. Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.
2. For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
3. When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4-3.A.1.b and maintain until the next seeding season.

TEMPORARY SEEDING SUMMARY

HARDINESS ZONE: 6B		SEEDING DATES	SEEDING DEPTHS	FERTILIZER RATE (10–20–20)	LIME RATE
SPECIES	APPLICATION RATE (LB/AC.)				
ANNUAL RYEGRASS	40	3/1 – 5/15; 8/1 – 10/15	1/2"	436 LB/AC (10 LB/1000 SF)	2 TONS/AC (90 LB/1000 SF)
FOXTAIL MILLET	30	5/16 – 7/31	1/2"		

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

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 of Engineer: _____ Registration Number: 50399 Date: 01/16/18

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/19/18
CHIEF – BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1/17/18
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. 50399, EXPIRATION DATE 12/28/2018 01/16/18

STATE OF MARYLAND — LOUIS RAGOZZINO — No. 50399 — PROFESSIONAL ENGINEER

DSN. BY:	CTP
DRN. BY:	IH
CHK. BY:	RJD
DATE:	01/18

BY	NO.	REVISION	DATE
CTP	1	RECORD DRAWINGS	10/16/19

SOIL EROSION AND SEDIMENT CONTROL PLAN NOTES AND DETAILS – 2

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 22 OF 41

FILE NO. 51204-022

B-4-1 STANDARDS AND SPECIFICATIONS FOR INCREMENTAL STABILIZATION

Definition

Establishment of vegetative cover on cut and fill slopes.

Purpose

To provide timely vegetative cover on cut and fill slopes as work progresses.

Conditions Where Practice Applies

Any cut or fill slope greater than 15 feet in height. This practice also applies to stockpiles.

Criteria

A. Incremental Stabilization - Cut Slopes

1. Excavate and stabilize cut slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all cut slopes as the work progresses.
2. Construction sequence example (Refer to Figure B.1):
   a. Construct and stabilize all temporary swales or dikes that will be used to convey runoff around the excavation.
   b. Perform Phase 1 excavation, prepare seedbed, and stabilize.
   c. Perform Phase 2 excavation, prepare seedbed, and stabilize. Overseed Phase 1 areas as necessary.
   d. Perform final phase excavation, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

Note: Once excavation has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

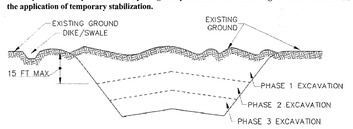


Figure B.1: Incremental Stabilization – Cut

B. Incremental Stabilization - Fill Slopes

1. Construct and stabilize fill slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all slopes as the work progresses.
2. Stabilize slopes immediately when the vertical height of a lift reaches 15 feet, or when the grading operation ceases as prescribed in the plans.
3. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
4. Construction sequence example (Refer to Figure B.2):
   a. Construct and stabilize all temporary swales or dikes that will be used to divert runoff around the fill. Construct silt fence on low side of fill unless other methods shown on the plans address this area.
   b. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
   c. Place Phase 1 fill, prepare seedbed, and stabilize.
   d. Place Phase 2 fill, prepare seedbed, and stabilize.
   e. Place final phase fill, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

Note: Once the placement of fill has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

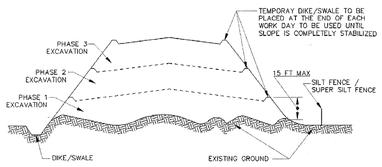


Figure B.2: Incremental Stabilization – Fill

B-4-6 STANDARDS AND SPECIFICATIONS FOR SOIL STABILIZATION MATTING

Definition

Material used to temporarily or permanently stabilize channels or steep slopes until groundcover is established.

Purpose

To protect the soils until vegetation is established.

Conditions Where Practice Applies

On newly seeded surfaces to prevent the applied seed from washing out; in channels and on steep slopes where the flow has erosive velocities or conveys clear water; on temporary swales, earth dikes, and perimeter dike swales as required by the respective design standard; and, on stream banks where moving water is likely to wash out new vegetative plantings.

Design Criteria

1. The soil stabilization matting that is used must withstand the flow velocities and shear stresses determined for the area, based on the 2-year, 24-hour frequency storm for temporary applications and the 10-year, 24-hour frequency storm for permanent applications. Designate on the plan the type of soil stabilization matting using the standard symbol and include the calculated shear stress for the respective treatment area.
2. Matting is required on permanent channels where the runoff velocity exceeds two and half feet per second (2.5 fps) or the shear stress exceeds two pounds per square foot (2 lbs/ft^2). On temporary channels discharging to a sediment trapping practice, provide matting where the runoff velocity exceeds four feet per second (4 fps).
3. Temporary soil stabilization matting is made with degradable (lasts 6 months minimum), natural, or manmade fibers of uniform thickness and distribution of fibers throughout and is smolder resistant. The maximum permissible velocity for temporary matting is 6 feet per second.
4. Permanent soil stabilization matting is an open weave, synthetic material consisting of non-degradable fibers or elements of uniform thickness and distribution of weave throughout. The maximum permissible velocity for permanent matting is 8.5 feet per second.
5. Calculate channel velocity and shear stress using the following procedure:

   Shear Stress (τ) is a measure of the force of moving water against the substrate and is calculated as:

   $\tau = \gamma \cdot R \cdot S_w$ where:

   τ = shear stress (lb/ft^2)
   γ = weight density of water (62.4 lb/ft^3)
   R = average water depth (hydraulic radius) (ft)
   S_w = water surface slope (ft/ft)

   Velocity (v) measures the rate of flow through a defined area and is calculated as:

   $$v = \frac{1.486 R^{2/3} s^{1/2}}{n}$$

   where:
   v = velocity (ft/sec)
   n = Manning's roughness coefficient
   R = hydraulic radius (ft)
   s = channel slope (ft/ft)

6. Use Table B.7 to assist in selecting the appropriate soil stabilization matting for slope applications based on the slope, the slope length, and the soil-erodibility K factor.

Table B.7: Soil Stabilization on Slopes

Slope	20:1 or Flatter (≤5%)			<20:1 to 4:1 (>5 - 25%)			<4:1 to 3:1 (>25 - 33%)			<3:1 to 2.5:1 (>33 - 40%)			<2.5:1 to 2:1** (>40 - 50%)		
Slope Length (feet)*	0-30	30-60	60-120	0-30	30-60	60-120	0-30	30-60	60-120	0-30	30-60	60-120	0-30	30-60	60-120
Straw Mulch/Wood Cellulose Fiber				for K ≤ 0.35***											
Temporary Matting with Design Shear Stress ≥ 1.5 lb/sf															
Temporary Matting with Design Shear Stress ≥ 1.75 lb/sf															
Temporary Matting with Design Shear Stress ≥ 2.0 lb/sf															
Temporary Matting with Design Shear Stress ≥ 2.25 lb/sf															

Effective range for all K values unless otherwise specified

* Slope length includes contributing flow length.
** Slopes steeper than 2:1 must be engineered.
*** Soil having a K value less than or equal to 0.35 can be stabilized effectively with straw mulch or wood cellulose fiber when located on slopes steeper than 5%. Soil stabilization matting is required on all slopes steeper than 5% that have soil with a K factor greater than 0.35. K factor ratings are published in the NRCS Soil Survey http:// websoilsurvey.nrcs.usda.gov/app. During construction or reclamation, the soil-erodibility K value should represent the upper 6 inches of the final fill material re-spread as the last lift. Only the effects of rock fragments within the soil profile are considered in the estimation of the K value. Do not adjust K values to account for rocks on the soil surface or increases in soil organic matter related to management activities.

Maintenance

Vegetation must be established and maintained so that the requirements for Adequate Vegetative Establishment are continuously met in accordance with Section B-4 Vegetative Stabilization.

B-4-7 STANDARDS AND SPECIFICATIONS FOR HEAVY USE AREA PROTECTION

Definition

The stabilization of areas frequently and intensively used by surfacing with suitable materials (e.g., mulch and aggregate).

Purpose

To provide a stable, non-eroding surface for areas frequently used and to improve the water quality from the runoff of these areas.

Conditions Where Practice Applies

This practice applies to intensively used areas (e.g., equipment and material storage, staging areas, heavily used travel lanes).

Criteria

1. A minimum 4-inch base course of crushed stone or other suitable materials including wood chips over nonwoven geotextile should be provided as specified in Section H-1 Materials.
2. Select the stabilizing material based on the intended use, desired maintenance frequency, and runoff control.
3. The transport of sediments, nutrients, oils, chemicals, particulate matter associated with vehicular traffic and equipment, and material storage needs to be considered in the selection of material. Additional control measures may be necessary to control some of these potential pollutants.
4. Surface erosion can be a problem on large heavy use areas. In these situations, measures to reduce the flow length of runoff or erosive velocities need to be considered.

Maintenance

The heavy use areas must be maintained in a condition that minimizes erosion. This may require adding suitable material, as specified on the approved plans, to maintain a clean surface.

B-4-8 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA

Definition

A mound or pile of soil protected by appropriately designed erosion and sediment control measures.

Purpose

To provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and changes to drainage patterns.

Conditions Where Practice Applies

Stockpile areas are utilized when it is necessary to salvage and store soil for later use.

Criteria

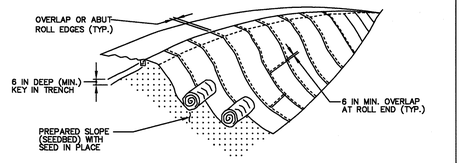
1. The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
2. The footprint of the stockpile must be sized to accommodate the anticipated volume of material and based on a side slope ratio no steeper than 2:1. Benching must be provided in accordance with Section B-3 Land Grading.
3. Runoff from the stockpile area must drain to a suitable sediment control practice.
4. Access the stockpile area from the upgrade side.
5. Clear water runoff into the stockpile area must be minimized by use of a diversion device such as an earth dike, temporary swale or diversion fence. Provisions must be made for discharging concentrated flow in a non-erosive manner.
6. Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment control practice must be used to intercept the discharge.
7. Stockpiles must be stabilized in accordance with the 3/7 day stabilization requirement as well as Standard B-4-1 Incremental Stabilization and Standard B-4-4 Temporary Stabilization.
8. If the stockpile is located on an impervious surface, a liner should be provided below the stockpile to facilitate cleanup. Stockpiles containing contaminated material must be covered with impermeable sheeting.

Maintenance

The stockpile area must continuously meet the requirements for Adequate Vegetative Establishment in accordance with Section B-4 Vegetative Stabilization. Side slopes must be maintained at no steeper than a 2:1 ratio. The stockpile area must be kept free of erosion. If the vertical height of a stockpile exceeds 20 feet for 2:1 slopes, 30 feet for 3:1 slopes, or 40 feet for 4:1 slopes, benching must be provided in accordance with Section B-3 Land Grading.

DETAIL B-4-6-B TEMPORARY SOIL STABILIZATION MATTING SLOPE APPLICATION

STANDARD SYMBOL
TSSMS – * lb/ft^2
(* INCLUDE SHEAR STRESS)



ISOMETRIC VIEW

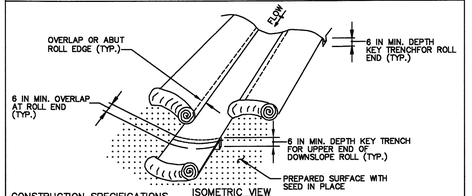
CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION & SEDIMENT CONTROL PLAN.
5. UNROLL MATTING DOWNSLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
7. KEY IN THE UPSLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

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

DETAIL B-4-6-A TEMPORARY SOIL STABILIZATION MATTING CHANNEL APPLICATION

STANDARD SYMBOL
TSSMC – * lb/ft^2
(* INCLUDE SHEAR STRESS)



ISOMETRIC VIEW

CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTERLINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MAT SMOOTHLY AND FIRMLY ON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. KEY-IN UPSTREAM END OF EACH MAT ROLL BY DIGGING A 6 INCH (MINIMUM) TRENCH AT THE UPSTREAM END OF THE MATTING, PLACING THE ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END.
7. OVERLAP OR ABUT THE ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

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

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.
O'BRIEN & GERE ENGINEERS, INC.
By: _____

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.

L-Ragozzino 50399 01/16/18
Signature of Engineer | Registration Number | Date

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/9/18
CHIEF – BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-12-18
CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/18

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. 50399, EXPIRATION DATE 12/26/2018 01/16/18
STATE OF MARYLAND · LOUIS RAGOZZINO · No. 50399 · REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	CTP
DRN. BY:	IH
CHK. BY:	RJD
DATE:	01/18

BY	NO.		DATE
CTP	1	RECORD DRAWINGS	10/16/19

SOIL EROSION AND SEDIMENT CONTROL PLAN NOTES AND DETAILS – 3

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

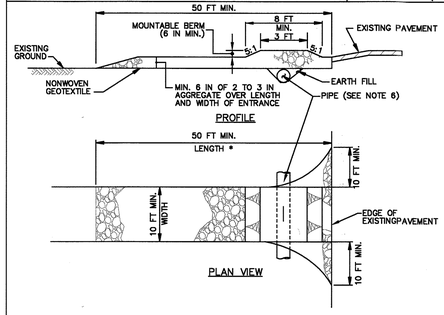
SCALE AS SHOWN

SHEET 23 OF 41

FILE NO. 51204-023

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

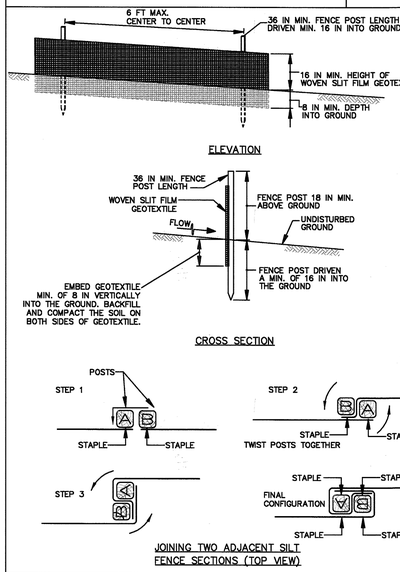
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF



1 OF 2

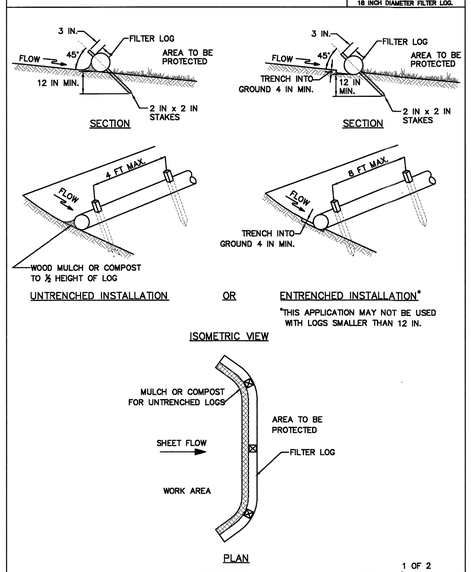
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-6 FILTER LOG

STANDARD SYMBOL: FL-18

DESIGNATION FL-18 REFERS TO 18 INCH DIAMETER FILTER LOG.



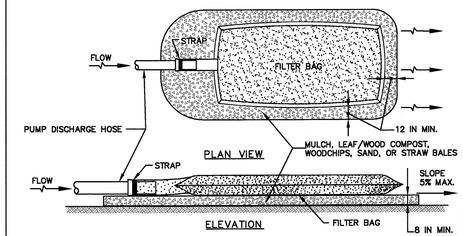
1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL F-4 FILTER BAG

STANDARD SYMBOL: FB



CONSTRUCTION SPECIFICATIONS

1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
2. PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
3. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
4. REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
5. USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT²	ASTM D-4491
PERMITTIVITY (SEC^{-1})	1.2 SEC^{-1}	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632

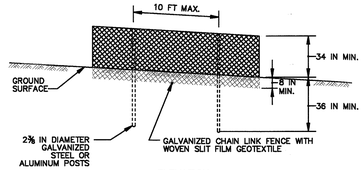
6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: SSF



CONSTRUCTION SPECIFICATIONS

1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± 1/16 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-6 FILTER LOG

STANDARD SYMBOL: FL-18

DESIGNATION FL-18 REFERS TO 18 INCH DIAMETER FILTER LOG.

CONSTRUCTION SPECIFICATIONS

1. PRIOR TO INSTALLATION, CLEAR ALL OBSTRUCTIONS INCLUDING ROCKS, CLODS, AND DEBRIS GREATER THAN ONE INCH THAT MAY INTERFERE WITH PROPER FUNCTION OF FILTER LOG.
2. FILL LOG NETTING UNIFORMLY WITH COMPOST (IN ACCORDANCE WITH SECTION H-1 MATERIALS), OR OTHER APPROVED BIODEGRADABLE MATERIAL TO DESIRED LENGTH SUCH THAT LOGS DO NOT DEFORM.
3. INSTALL FILTER LOGS PERPENDICULAR TO THE FLOW DIRECTION AND PARALLEL TO THE SLOPE WITH THE BEGINNING AND END OF THE INSTALLATION POINTING SLIGHTLY UP THE SLOPE CREATING A "J" SHAPE AT EACH END TO PREVENT BYPASS.
4. FOR UNTRENCHED INSTALLATION BLOW OR HAND PLACE MULCH OR COMPOST ON UPHILL SIDE OF THE SLOPE ALONG LOG.
5. STAKE FILTER LOG EVERY 4 FEET OR CLOSER ALONG ENTIRE LENGTH OF LOG OR TRENCH LOG INTO GROUND A MINIMUM OF 4 INCHES AND STAKE LOG EVERY 8 FEET OR CLOSER.
6. USE STAKES WITH A MINIMUM NOMINAL CROSS SECTION OF 2X2 INCH AND OF SUFFICIENT LENGTH TO ATTAIN A MINIMUM OF 12 INCHES INTO THE GROUND AND 3 INCHES PROTRUDING ABOVE LOG.
7. WHEN MORE THAN ONE LOG IS NEEDED, OVERLAP ENDS 12 INCHES MINIMUM AND STAKE.
8. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO A DEPTH OF ½ THE EXPOSED HEIGHT OF LOG AND REPLACE MULCH. REPLACE FILTER LOG IF TORN. REINSTALL FILTER LOG IF UNDERMINING OR DISLODGING OCCURS. REPLACE CLOGGED FILTER LOGS. FOR PERMANENT APPLICATIONS, ESTABLISH AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

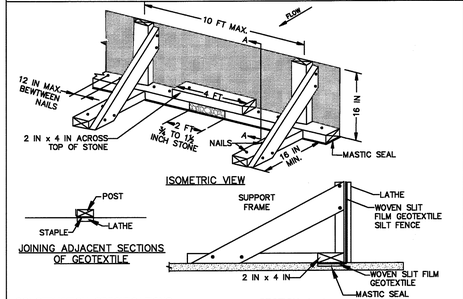
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-2 SILT FENCE ON PAVEMENT

STANDARD SYMBOL: SFOP



CONSTRUCTION SPECIFICATIONS

1. USE NOMINAL 2 INCH X 4 INCH LUMBER.
2. USE WOVEN SLIT FILM GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
3. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
4. SPACE UPRIGHT SUPPORTS NO MORE THAN 10 FEET APART.
5. PROVIDE A TWO FOOT OPENING BETWEEN EVERY SET OF SUPPORTS AND PLACE STONE IN THE OPENING OVER GEOTEXTILE.
6. KEEP SILT FENCE TAUT AND SECURELY STAPLE TO THE UPSLOPE SIDE OF UPRIGHT SUPPORTS. EXTEND GEOTEXTILE UNDER 2x4.
7. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, FOLD, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL. ATTACH LATHE.
8. PROVIDE A MASTIC SEAL BETWEEN PAVEMENT, GEOTEXTILE, AND 2x4 TO PREVENT SEDIMENT-LADEN WATER FROM ESCAPING BENEATH SILT FENCE INSTALLATION.
9. SECURE BOARDS TO PAVEMENT WITH 40D 5 INCH MINIMUM LENGTH NAILS.
10. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. MAINTAIN WATER TIGHT SEAL ALONG BOTTOM. REPLACE STONE IF DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

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.

L. P. [illegible] 50399 01/16/18

Signature of Engineer Registration Number Date

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/18/18
CHIEF - BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-17-18
CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/18

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. 50399, EXPIRATION DATE 12/28/2018 01/16/18

STATE OF MARYLAND — LOUIS RAGO JR. — No. 50399 — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	CTP
DRN. BY:	IH
CHK. BY:	RJD
DATE:	01/18

BY	NO.	REVISION	DATE
CTP	1	RECORD DRAWINGS	10/16/19

SOIL EROSION AND SEDIMENT CONTROL PLAN NOTES AND DETAILS – 4

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

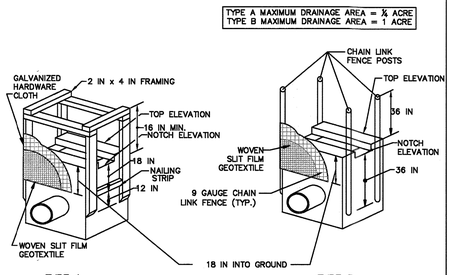
SHEET 24 OF 41

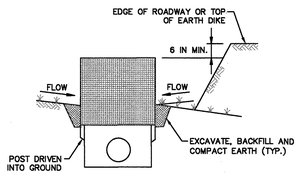
FILE NO. 51204-024

I:\HOWARD-CO,2343\51204,BROKEN-LAND-PKWY\DOCS\DWG\SHEETS\ESSC\51240-025.DWG

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL: SIP





SECTION FOR TYPE A AND B

1 OF 2

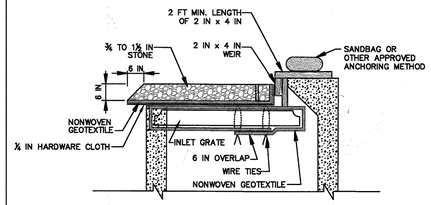
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

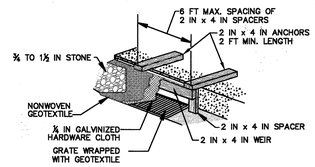
DETAIL E-9-6 COMBINATION INLET PROTECTION

STANDARD SYMBOL: COIP

MAXIMUM DRAINAGE AREA = ¼ ACRE



SECTION



ISOMETRIC VIEW

1 OF 2

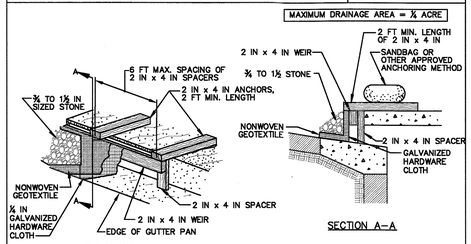
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-3 CURB INLET PROTECTION

STANDARD SYMBOL: CIP

MAXIMUM DRAINAGE AREA = ¼ ACRE



ISOMETRIC

SECTION A–A

CONSTRUCTION SPECIFICATIONS

1. USE NOMINAL 2 INCH x 4 INCH LUMBER
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
3. NAIL THE 2x4 WEIR TO 9 INCH LONG VERTICAL SPACERS (MAXIMUM 6 FEET APART).
4. ATTACH A CONTINUOUS PIECE OF ¼ INCH GALVANIZED HARDWARE CLOTH, WITH A MINIMUM WIDTH OF 30 INCHES AND A MINIMUM LENGTH OF 4 FEET LONGER THAN THE THROAT OPENING, TO THE 2x4 WEIR, EXTENDING IT 2 FEET BEYOND THROAT ON EACH SIDE.
5. PLACE A CONTINUOUS PIECE OF NONWOVEN GEOTEXTILE OF THE SAME DIMENSIONS AS THE HARDWARE CLOTH OVER THE HARDWARE CLOTH AND SECURELY ATTACH TO THE 2x4 WEIR.
6. PLACE THE ASSEMBLY AGAINST THE INLET THROAT AND NAIL TO 2x4 ANCHORS (MINIMUM 2 FEET LENGTH), EXTEND THE ANCHORS ACROSS THE INLET TOP AND HOLD IN PLACE BY SANDBAGS OR OTHER APPROVED ANCHORING METHOD.
7. INSTALL END SPACERS A MINIMUM OF 1 FOOT BEYOND THE ENDS OF THE THROAT OPENING.
8. FORM THE HARDWARE CLOTH AND THE GEOTEXTILE TO THE CONCRETE GUTTER AND FACE OF CURB TO SPAN THE INLET OPENING. COVER THE HARDWARE CLOTH AND GEOTEXTILE WITH CLEAN ⅜ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE.
9. AT NON–SUMP LOCATIONS, INSTALL A TEMPORARY SANDBAG OR ASPHALT BERM TO PREVENT INLET BYPASS.
10. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

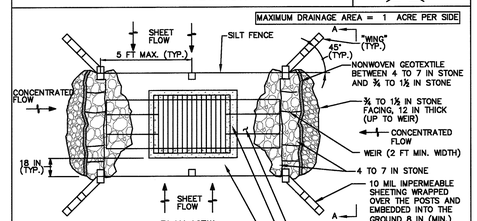
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

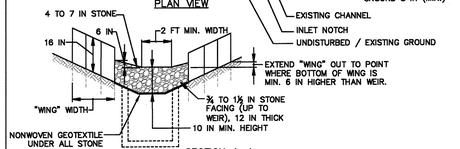
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-5 MEDIAN SUMP INLET PROTECTION

STANDARD SYMBOL: MSIP

MAXIMUM DRAINAGE AREA = 1 ACRE PER SIDE





SECTION A–A

CONSTRUCTION SPECIFICATIONS

1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
2. INSTALL SILT FENCE ON ALL SIDES OF INLET RECEIVING SHEET FLOW. FENCE IS TO BE INSTALLED IN ACCORDANCE WITH SILT FENCE DETAIL E–1, EXCEPT POSTS ARE TO BE SPACED A MAXIMUM OF 5 FEET APART.
3. INSTALL EACH STONE STONE STRUCTURE WITH THE WEIR 10 INCHES ABOVE THE INVERT OF THE CHANNEL AND THE WEIR OPENING THE SAME WIDTH AS THE CHANNEL BOTTOM OR 2 FEET MINIMUM. USE CLEAN 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE. PLACE NONWOVEN GEOTEXTILE ON THE UPSTREAM FACE AND COVER WITH A 12 INCH THICK LAYER OF CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE.
4. CONSTRUCT "WINGS" IN ACCORDANCE WITH DIVERSION FENCE DETAIL C–9.
5. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL: SIP

CONSTRUCTION SPECIFICATIONS

1. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
2. EXCAVATE COMPLETELY AROUND THE INLET TO A DEPTH OF 18 INCHES BELOW THE NOTCH ELEVATION.
3. FOR TYPE A, USE NOMINAL 2 INCH X 4 INCH CONSTRUCTION GRADE LUMBER POSTS, DRIVEN 1 FOOT INTO THE GROUND AT EACH CORNER OF THE INLET. PLACE NAIL STRIPS BETWEEN THE POSTS ON THE ENDS OF THE INLET. ASSEMBLE THE TOP PORTION OF THE 2X4 FRAME AS SHOWN. STRETCH ½ INCH GALVANIZED HARDWARE CLOTH TIGHTLY AROUND THE FRAME AND FASTEN SECURELY. FASTEN GEOTEXTILE SECURELY TO THE HARDWARE CLOTH WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND HARDWARE CLOTH A MINIMUM OF 18 INCHES BELOW THE WEIR CREST. THE ENDS OF THE GEOTEXTILE MUST MEET AT A POST, BE OVERLAPPED AND FOLDED, THEN FASTENED TO THE POST.

   FOR TYPE B, USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND 6 FOOT LENGTH, DRIVEN A MINIMUM OF 36 INCHES BELOW THE WEIR CREST AT EACH CORNER OF THE STRUCTURE. FASTEN 9 GAUGE OR HEAVIER CHAIN LINK FENCE, 42 INCHES IN HEIGHT, SECURELY TO THE FENCE POSTS WITH WIRE TIES. FASTEN GEOTEXTILE SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 18 INCHES BELOW THE WEIR CREST.
4. BACKFILL AROUND THE INLET IN LOOSE 4 INCH LIFTS AND COMPACT UNTIL SOIL IS LEVEL WITH THE NOTCH ELEVATION ON THE ENDS AND TOP ELEVATION ON THE SIDES.
5. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-6 COMBINATION INLET PROTECTION

STANDARD SYMBOL: COIP

CONSTRUCTION SPECIFICATIONS

1. USE NOMINAL 2 INCH x 4 INCH LUMBER.
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
3. LIFT GRATE, AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS, THEN SET GRATE BACK IN PLACE.
4. ATTACH A CONTINUOUS PIECE OF ½ INCH GALVANIZED HARDWARE CLOTH WITH A MINIMUM WIDTH OF 30 INCHES AND A MINIMUM LENGTH OF 4 FEET LONGER THAN THE THROAT OPENING, TO THE 2X4 WEIR, EXTENDING 2 FEET BEYOND THROAT ON EACH SIDE.
5. PLACE A CONTINUOUS PIECE OF NONWOVEN GEOTEXTILE THE SAME DIMENSIONS AS THE HARDWARE CLOTH OVER THE HARDWARE CLOTH AND SECURELY ATTACH IT TO THE WEIR.
6. NAIL THE 2X4 WEIR TO THE TOP OF A 9 INCH LONG VERTICAL SPACER TO BE LOCATED BETWEEN THE WEIR AND THE INLET FACE (MAXIMUM 4 FEET APART).
7. PLACE THE ASSEMBLY AGAINST THE INLET THROAT AND NAIL TO 2X4 ANCHORS (MINIMUM 2 FOOT LENGTHS OF 2x4 INCH TO THE TOP OF THE WEIR AT SPACER LOCATIONS). EXTEND 2X4 ANCHORS ACROSS THE INLET TOP AND HOLD IN PLACE BY SANDBAGS OR OTHER APPROVED ANCHORING METHOD.
8. INSTALL END SPACERS A MINIMUM OF 1 FOOT BEYOND BOTH ENDS OF THE THROAT OPENING.
9. FORM THE ¼ INCH HARDWARE CLOTH AND THE GEOTEXTILE TO THE CONCRETE GUTTER AND AGAINST THE FACE OF THE CURB ON BOTH SIDES OF THE INLET. PLACE CLEAN ⅜ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE OVER THE HARDWARE CLOTH AND GEOTEXTILE IN SUCH A MANNER TO PREVENT WATER FROM ENTERING THE INLET UNDER OR AROUND THE GEOTEXTILE.
10. AT NON–SUMP LOCATIONS, INSTALL A TEMPORARY SANDBAG OR ASPHALT BERM TO PREVENT INLET BYPASS.
11. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

2 OF 2

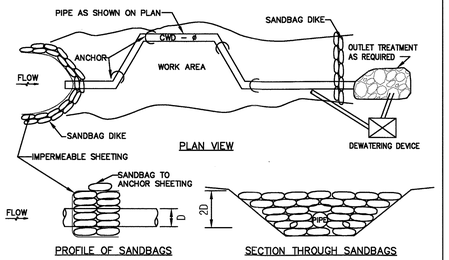
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL C-6 CLEAR WATER DIVERSION PIPE

STANDARD SYMBOL: CWD – 12

DESIGNATION CWD–12 REFERS TO 12 INCH CLEAR WATER DIVERSION.



CONSTRUCTION SPECIFICATIONS

1. FLEXIBLE PIPE IS PREFERRED. HOWEVER, CORRUGATED METAL PIPE OR EQUIVALENT PVC PIPE CAN BE USED. MAKE ALL JOINTS WATERTIGHT.
2. FOR SANDBAGS USE MATERIALS THAT ARE RESISTANT TO ULTRA–VIOLENT RADIATION, TEARING, AND PUNCTURE AND WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF FILL MATERIAL.
3. USE 10 MIL OR THICKER, UV RESISTANT, IMPERMEABLE SHEETING OR OTHER APPROVED MATERIAL THAT IS IMPERMEABLE AND RESISTANT TO PUNTURING AND TEARING.
4. PLACE IMPERMEABLE SHEETING SUCH THAT UPGRADE PORTION OVERLAPS DOWNGRADE PORTION BY A MINIMUM OF 18 INCHES.
5. SET HEIGHT OF SANDBAG DIKE AT TWICE THE PIPE DIAMETER. MAINTAIN HEIGHT ALONG LENGTH OF SANDBAG DIKE. PLACE DOUBLE ROW OF SANDBAGS.
6. AT A MINIMUM, SECURELY ANCHOR DIVERSION PIPE AT EACH DOWNGRADE JOINT.
7. SET OUTLET END OF DIVERSION PIPE LOWER THAN INLET END.
8. PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.
9. DEWATER WORK AREA USING AN APPROVED EROSION AND SEDIMENT CONTROL PRACTICE AS SPECIFIED ON APPROVED PLAN.
10. KEEP POINT OF DISCHARGE FREE OF EROSION. MAINTAIN WATER TIGHT CONNECTIONS AND POSITIVE DRAINAGE. REPLACE SANDBAGS AND IMPERMEABLE SHEETING IF TORN.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

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.

Louis Ragozzino 50399 — 01/16/18

Signature of Engineer — Registration Number — Date

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/16/18
CHIEF – BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-12-18
CHIEF, UTILITY DESIGN DIVISION — PED — DATE 1/17/18

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. 50399, EXPIRATION DATE 12/28/2018 — 01/16/18

STATE OF MARYLAND — LOUIS RAGOZZINO — 50399 — REGISTERED PROFESSIONAL ENGINEER

DSN. BY: CTP
DRN. BY: IH
CHK. BY: RJD
DATE: 01/18

BY	NO.	REVISION	DATE
CTP	1	RECORD DRAWINGS	10/16/19

SOIL EROSION AND SEDIMENT CONTROL PLAN NOTES AND DETAILS – 5

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30–INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W–8307
CONTRACT NO.: 44–4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 25 OF 41

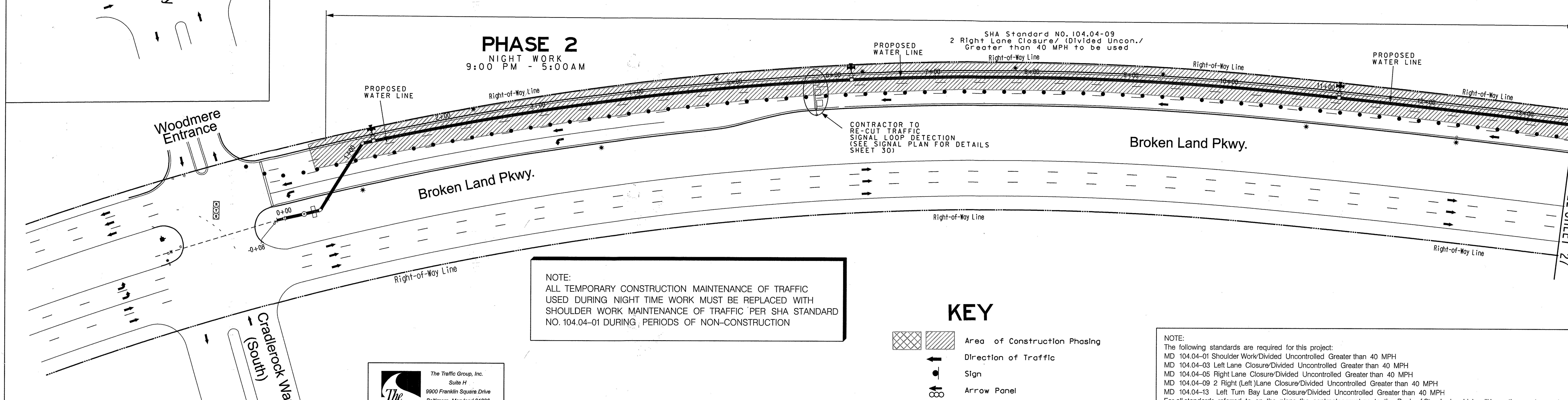
FILE NO. 51204–025

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: ____________



NOTE:
ALL TEMPORARY CONSTRUCTION MAINTENANCE OF TRAFFIC USED DURING NIGHT TIME WORK MUST BE REPLACED WITH SHOULDER WORK MAINTENANCE OF TRAFFIC PER SHA STANDARD NO. 104.04-01 DURING PERIODS OF NON-CONSTRUCTION

KEY

- Area of Construction Phasing
- Direction of Traffic
- Sign
- Arrow Panel
- Channelizing Device (Drum)
- Channelizing Device (Cones)

NOTE:
The following standards are required for this project:
MD 104.04–01 Shoulder Work/Divided Uncontrolled Greater than 40 MPH
MD 104.04–03 Left Lane Closure/Divided Uncontrolled Greater than 40 MPH
MD 104.04–05 Right Lane Closure/Divided Uncontrolled Greater than 40 MPH
MD 104.04–09 2 Right (Left)Lane Closure/Divided Uncontrolled Greater than 40 MPH
MD 104.04–13 Left Turn Bay Lane Closure/Divided Uncontrolled Greater than 40 MPH
For all standards referred to on the plans the contractor must go to the Book of Standards which will have the most current version. The Book of Standards can be accessed at:
http://apps.roads.maryland.gov/businesswithsha/bizstdsspecs/desmanualstdpub/publicationsonline/ohd/bookstd/index.asp
All items are to be constructed in accordance with the current version of the referenced standard at the time of construction.

The Traffic Group, Inc.
Suite H
9900 Franklin Square Drive
Baltimore, Maryland 21236
410-931-6600
1-800-583-8411
Fax 410-931-6601
"Merging Innovation and Excellence"®

50' 0 50' 100'
SCALE: 1" = 50'

PLOTTED: Monday, January 15, 2018 AT 02:20 PM

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/19/18
CHIEF - BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-17-18
CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/18

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. 31757 EXPIRATION DATE 6/28/2019

STATE OF MARYLAND — FU-HSIUNG HUANG — 31757 — PROFESSIONAL ENGINEER

DSN. BY:	FJH				
DRN. BY:	FJH				
CHK. BY:	JJD				
DATE:	1/16/2018	CJP	1	RECORD DRAWINGS	10/16/19
		BY	NO.	REVISION	DATE

MAINTENANCE OF TRAFFIC PLAN

600' SCALE MAP NO. 36 BLOCK NO. 14,20,21

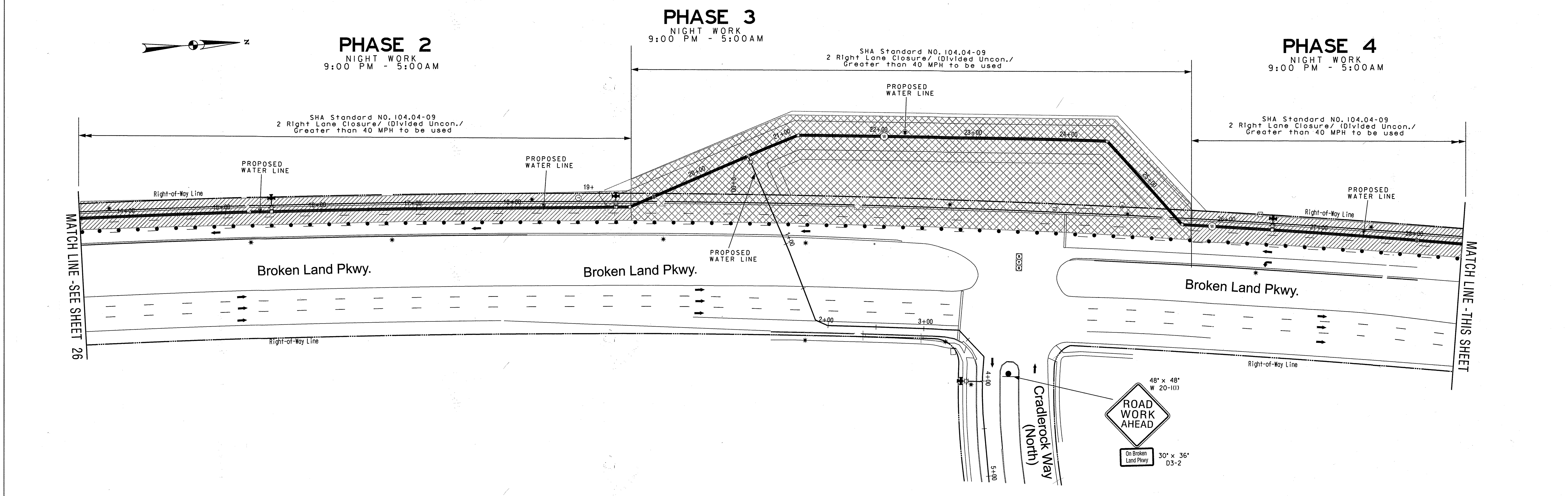
BROKEN LAND PARKWAY
30" WATER TRANSMISSION MAIN EXTENSION

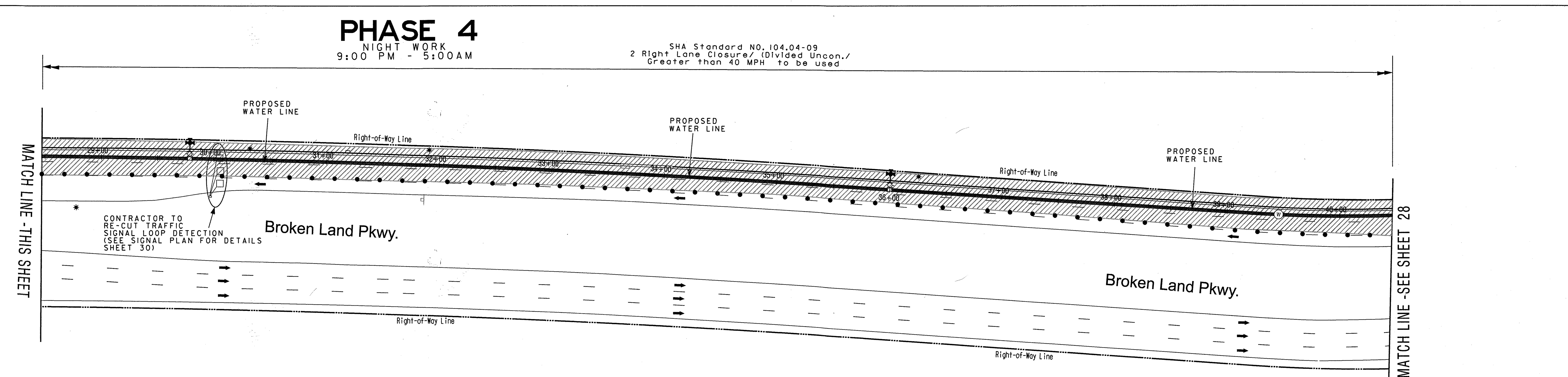
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 26 OF 41

FILE NO 51204-026





RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.
O'BRIEN & GERE ENGINEERS, INC.

By:

KEY

- Area of Construction Phasing
- Direction of Traffic
- Sign
- Arrow Panel
- Channelizing Device (Drum)
- Channelizing Device (Cones)

The Traffic Group, Inc.
Suite H
9900 Franklin Square Drive
Baltimore, Maryland 21236
410-931-6600
1-800-583-8411
Fax 410-931-6601
"Merging Innovation and Excellence"®

SCALE: 1" = 50'

NOTE:
ALL TEMPORARY CONSTRUCTION MAINTENANCE OF TRAFFIC USED DURING NIGHT TIME WORK MUST BE REPLACED WITH SHOULDER WORK MAINTENANCE OF TRAFFIC PER SHA STANDARD NO. 104.04-01 DURING PERIODS OF NON-CONSTRUCTION

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR, PUBLIC WORKS — DATE 1/19/18	CHIEF - BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-17-18	CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/18

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. 31757, EXPIRATION DATE 6/26/2019

STATE OF MARYLAND — FU-HSIUNG HUANG — 31757 — PROFESSIONAL ENGINEER

DSN. BY:	FJH			
DRN. BY:	FJH			
CHK. BY:	JJD			
DATE:	1/16/2018	CTP 1	RECORD DRAWINGS	10/16/19
		BY / NO.	REVISION	DATE

MAINTENANCE OF TRAFFIC PLAN

600' SCALE MAP NO. 36 BLOCK NO. 14,20,21

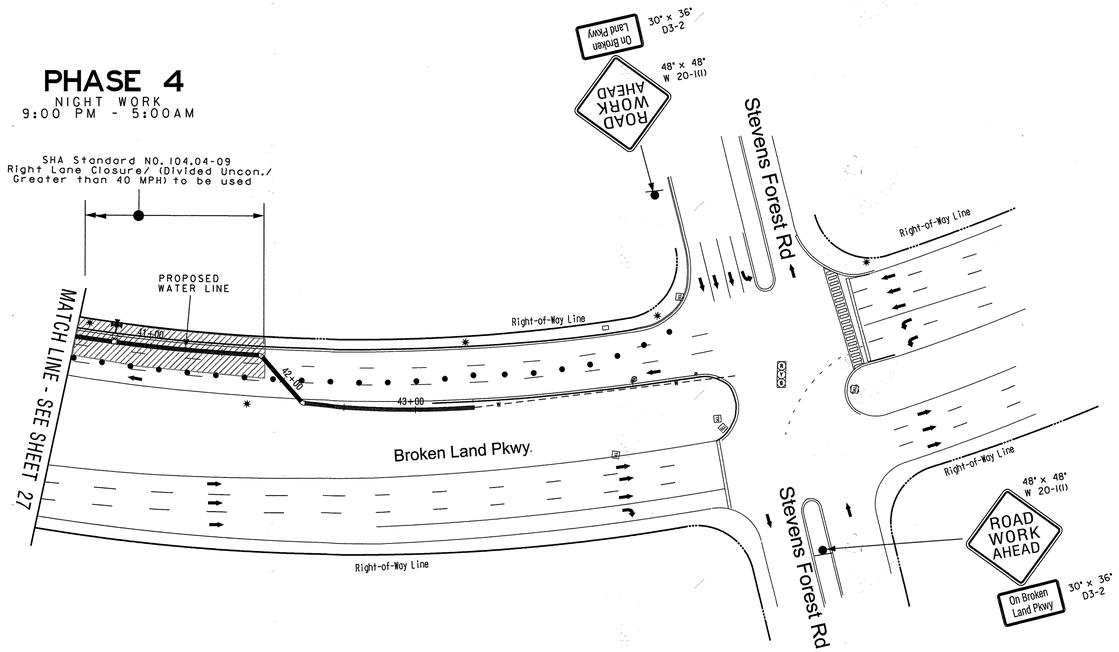
BROKEN LAND PARKWAY
30" WATER TRANSMISSION MAIN EXTENSION

CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

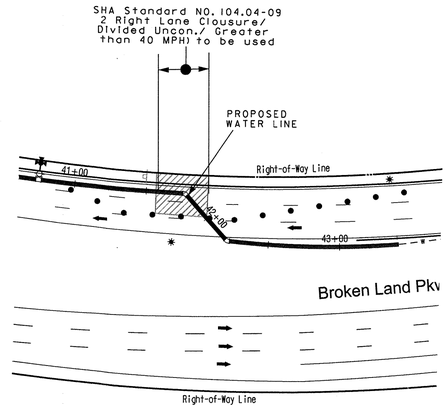
SCALE AS SHOWN

FILE NO 93084-027

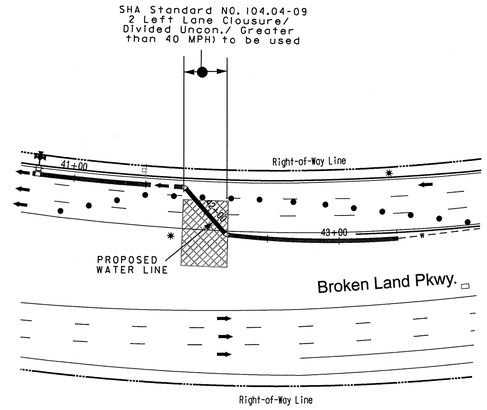
PHASE 4
NIGHT WORK
9:00 PM - 5:00AM



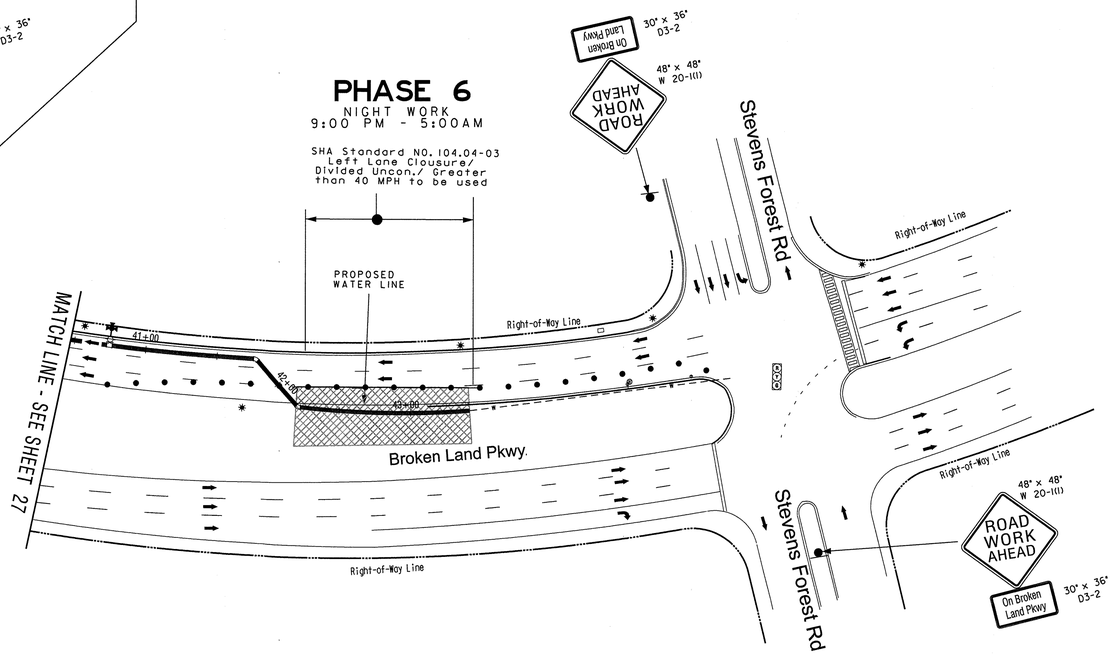
PHASE 5a
NIGHT WORK
9:00 PM - 5:00AM



PHASE 5b
NIGHT WORK
9:00 PM - 5:00AM



PHASE 6
NIGHT WORK
9:00 PM - 5:00AM



RECORD DRAWINGS
This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been transferred into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.
O'BRIEN & GERE ENGINEERING, INC.
By:

NOTE:
ALL TEMPORARY CONSTRUCTION MAINTENANCE OF TRAFFIC USED DURING NIGHT TIME WORK MUST BE REPLACED WITH SHOULDER WORK MAINTENANCE OF TRAFFIC PER SHA STANDARD NO. 104.04-01 DURING PERIODS OF NON-CONSTRUCTION

KEY

- Area of Construction Phasing
- Direction of Traffic
- Sign
- Arrow Panel
- Channelizing Device (Drum)
- Channelizing Device (Cones)

The Traffic Group, Inc.
Suite H
9900 Franklin Square Drive
Baltimore, Maryland 21236
410-931-6600
1-800-583-8411
Fax 410-931-6601
"Merging Innovation and Excellence"®

50' 0 50' 100'
SCALE: 1" = 50'

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/19/18
CHIEF - BUREAU OF ENGINEERING — DATE 1/19/18
CHIEF, BUREAU OF UTILITIES — DATE 1-19-18
CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/18

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. 31757 EXPIRATION DATE 8/28/2019.

STATE OF MARYLAND — FU-HSIUNG HUANG — 31757 — PROFESSIONAL ENGINEER

DSN. BY:	FJH				
DRN. BY:	FJH				
CHK. BY:	JJD				
DATE:	1/16/2018	GTP	1	RECORD DRAWINGS	10/16/19
		BY	NO.	REVISION	DATE

MAINTENANCE OF TRAFFIC PLAN

600' SCALE MAP NO. 36 BLOCK NO. 14,20,21

BROKEN LAND PARKWAY
30" WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

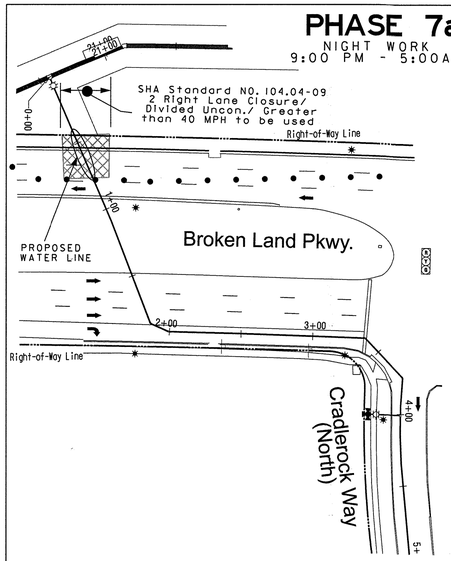
SHEET 28 OF 41

PLOTTED: Monday, January 15, 2018 AT 02:20 PM

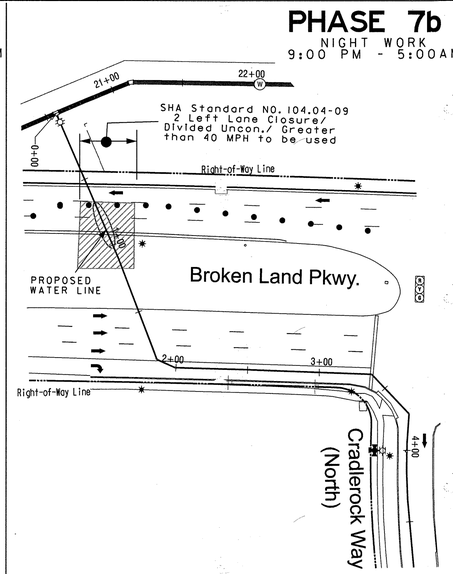
FILE: F:\2016\2016-2017_Brokenland Parkway Water Main Replacement\DESIGN\TEXT\MOT- Brokenland Pkwy.dgn

FILE NO 31304-028

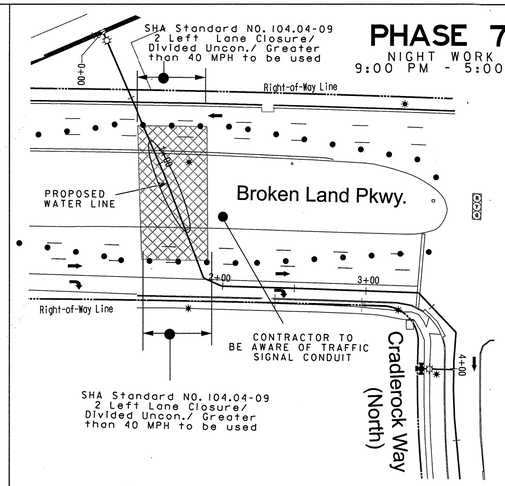
PHASE 7a
NIGHT WORK
9:00 PM - 5:00AM



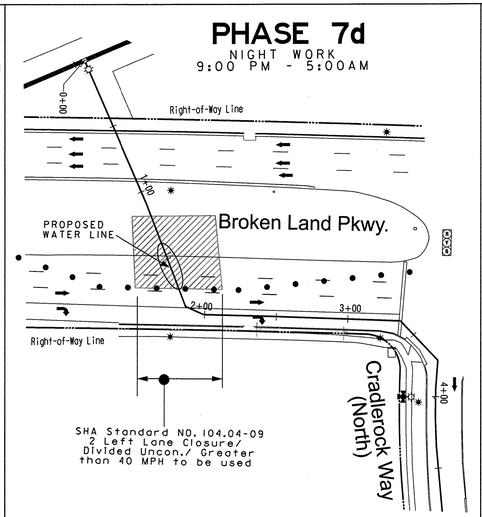
PHASE 7b
NIGHT WORK
9:00 PM - 5:00AM



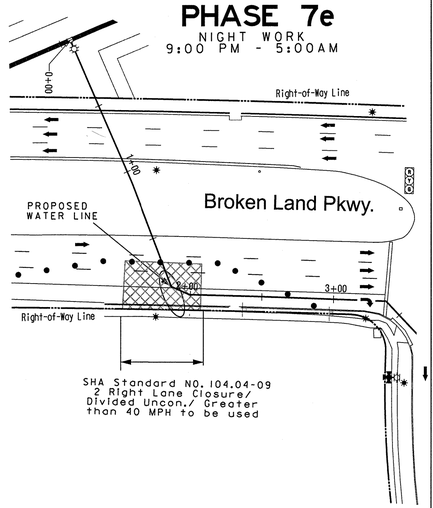
PHASE 7c
NIGHT WORK
9:00 PM - 5:00AM



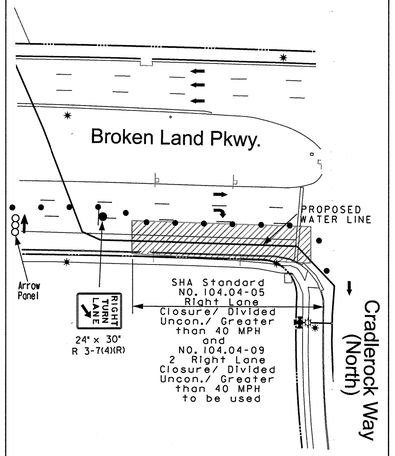
PHASE 7d
NIGHT WORK
9:00 PM - 5:00AM



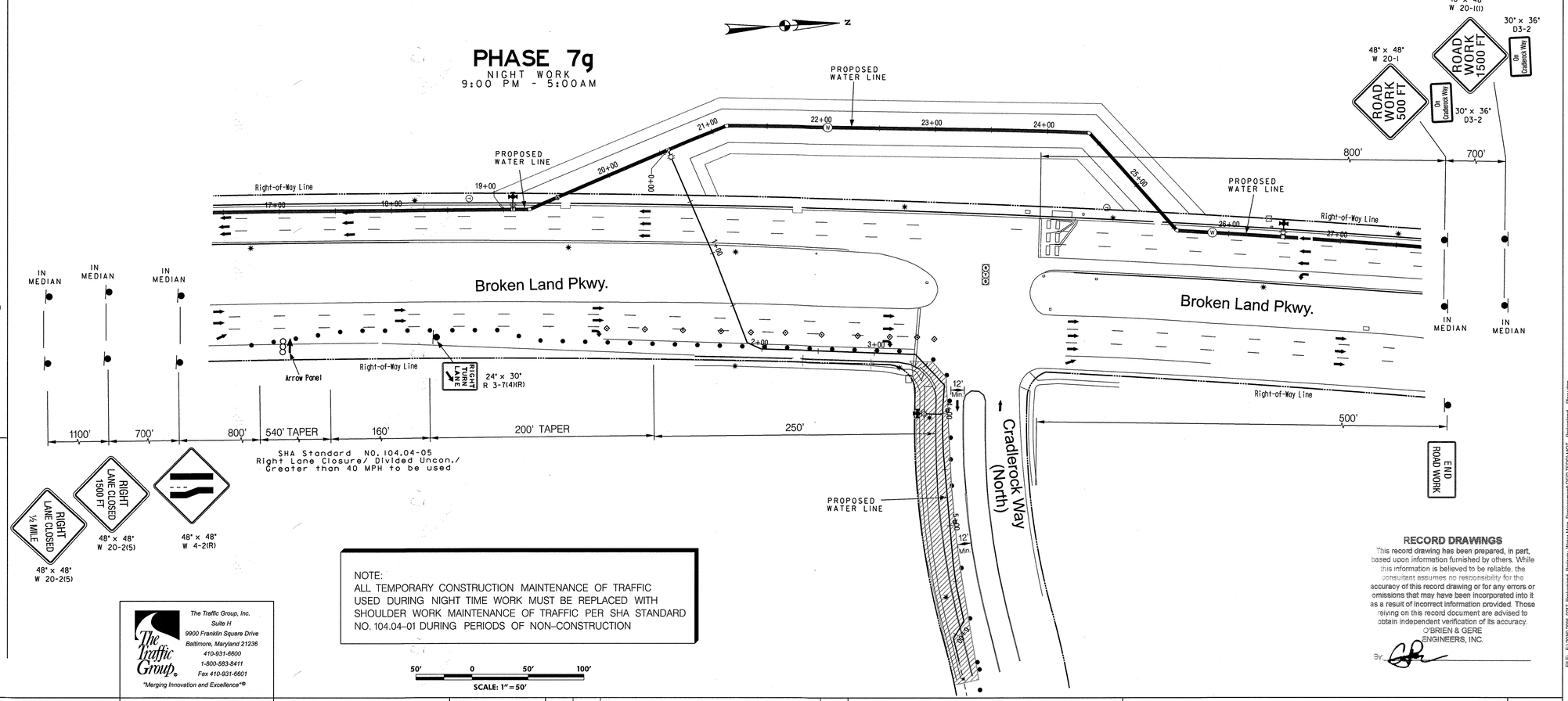
PHASE 7e
NIGHT WORK
9:00 PM - 5:00AM



PHASE 7f
NIGHT WORK
9:00 PM - 5:00AM



PHASE 7g
NIGHT WORK
9:00 PM - 5:00AM



KEY

- Area of Construction Phasing
- Direction of Traffic
- Sign
- Arrow Panel
- Channelizing Device (Drum)
- Channelizing Device (Cones)

NOTE:
ALL TEMPORARY CONSTRUCTION MAINTENANCE OF TRAFFIC USED DURING NIGHT TIME WORK MUST BE REPLACED WITH SHOULDER WORK MAINTENANCE OF TRAFFIC PER SHA STANDARD NO. 104.04-01 DURING PERIODS OF NON-CONSTRUCTION

50' 0 50' 100'
SCALE: 1" = 50'

The Traffic Group, Inc.
Suite H
9900 Franklin Square Drive
Baltimore, Maryland 21236
410-931-6600
1-800-583-8411
Fax 410-931-6601
"Merging Innovation and Excellence"®

RECORD DRAWINGS
This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.
O'BRIEN & GERE ENGINEERS, INC.
By: _____

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	1/19/18	CHIEF - BUREAU OF ENGINEERING	1/17/18
CHIEF, BUREAU OF UTILITIES	1-12-18	CHIEF, UTILITY DESIGN DIVISION	1/17/18

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. 31757 EXPIRATION DATE 6/28/2019

STATE OF MARYLAND — FUNSING HUNG — 31757 — PROFESSIONAL ENGINEER

DSN. BY:	FJH				
DRN. BY:	FJH				
CHK. BY:	JJD				
DATE:	1/16/2018	CTP BY	1 NO.	RECORD DRAWINGS REVISION	10/16/19 DATE

MAINTENANCE OF TRAFFIC PLAN

600' SCALE MAP NO. 36 BLOCK NO. 14,20,21

BROKEN LAND PARKWAY
30" WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

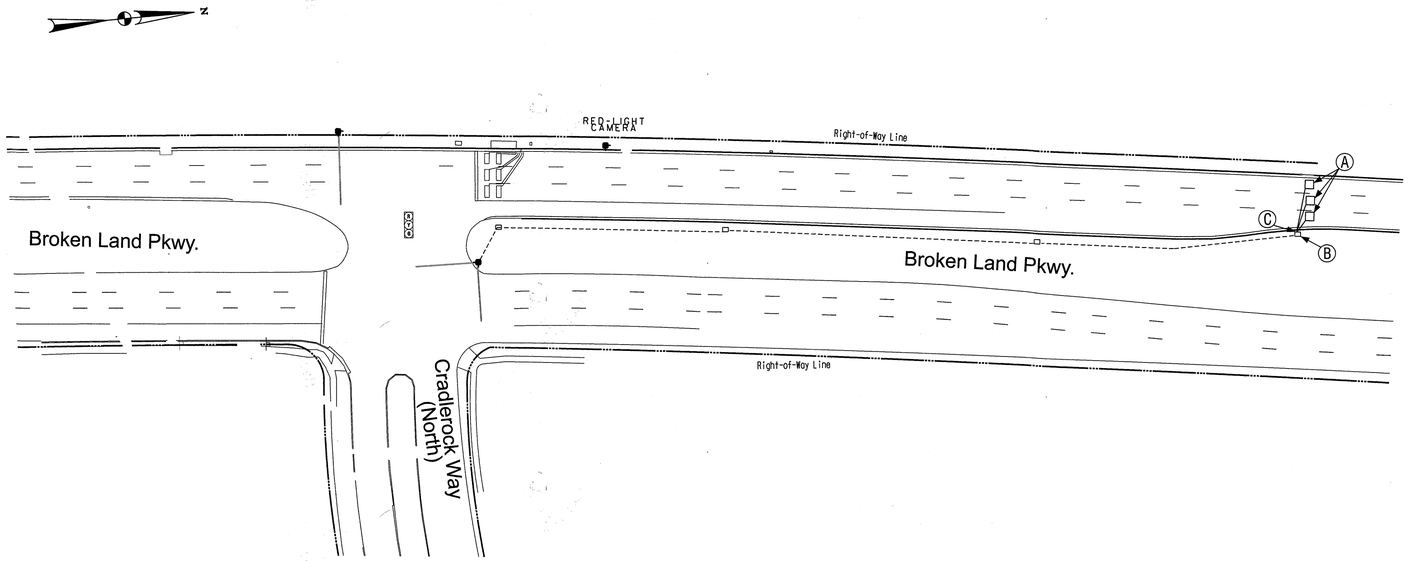
SHEET 29 OF 41

FILE NO. 33004-029

PLOTTED: Monday, January 15, 2018 AT 02:29 PM

FILE: F:\2016\2016-027_Brokenland Parkway Water Main Replacement\DESIGN\TECH\MOT- Brokenland Pkwy.dgn

TRAFFIC SIGNAL DETAILS

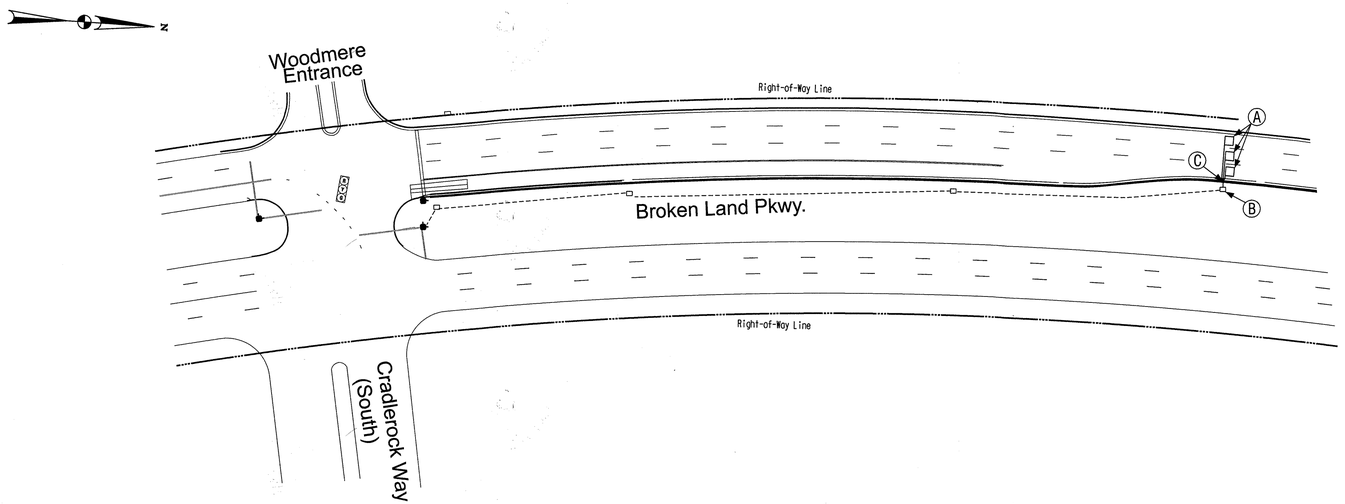


CONSTRUCTION DETAILS

A. INSTALL 6 FT. X 6 FT. LOOP DETECTOR (4 TURNS).
B. USE EXISTING HANDHOLE. SPLICE NEW LOOP DETECTOR CABLE TO EXISTING 2-CONDUCTOR ALUMINUM SHIELDED CABLE.
C. INSTALL 1 IN. LIQUID TIGHT FLEXIBLE CONDUIT FOR DETECTOR SLEEVE.

EQUIPMENT LIST

QUANTITY	UNITS	DESCRIPTION
175	LF	SAWCUT FOR SIGNAL LOOP DETECTOR
390	LF	LOOP DETECTOR WIRE ENCASED IN FLEXIBLE TUBING
2	LF	1 IN. LIQUID TIGHT FLEXIBLE CONDUIT FOR DETECTOR SLEEVE



CONSTRUCTION DETAILS

A. INSTALL 6 FT. X 6 FT. LOOP DETECTOR (4 TURNS).
B. USE EXISTING HANDHOLE. SPLICE NEW LOOP DETECTOR CABLE TO EXISTING 2-CONDUCTOR ALUMINUM SHIELDED CABLE.
C. INSTALL 1 IN. LIQUID TIGHT FLEXIBLE CONDUIT FOR DETECTOR SLEEVE.

EQUIPMENT LIST

QUANTITY	UNITS	DESCRIPTION
175	LF	SAWCUT FOR SIGNAL LOOP DETECTOR
390	LF	LOOP DETECTOR WIRE ENCASED IN FLEXIBLE TUBING
2	LF	1 IN. LIQUID TIGHT FLEXIBLE CONDUIT FOR DETECTOR SLEEVE

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

The Traffic Group, Inc.
Suite H
9900 Franklin Square Drive
Baltimore, Maryland 21236
410-931-6600
1-800-583-8411
Fax 410-931-6601
"Merging Innovation and Excellence"®

50′ 0 50′ 100′
SCALE: 1″ = 50′

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/19/18
CHIEF - BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-22-18
CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/18

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. 31757 EXPIRATION DATE 6/28/2019

STATE OF MARYLAND — 31757 — PROFESSIONAL ENGINEER

DSN. BY:	FJH
DRN. BY:	FJH
CHK. BY:	JJD
DATE:	1/16/2018

BY	NO.	REVISION	DATE
CTP	1	RECORD DRAWINGS	01/16/19

MAINTENANCE OF TRAFFIC PLAN

600' SCALE MAP NO. 36 BLOCK NO. 14,20,21

BROKEN LAND PARKWAY
30" WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 30 OF 41

FILE NO 3304-030

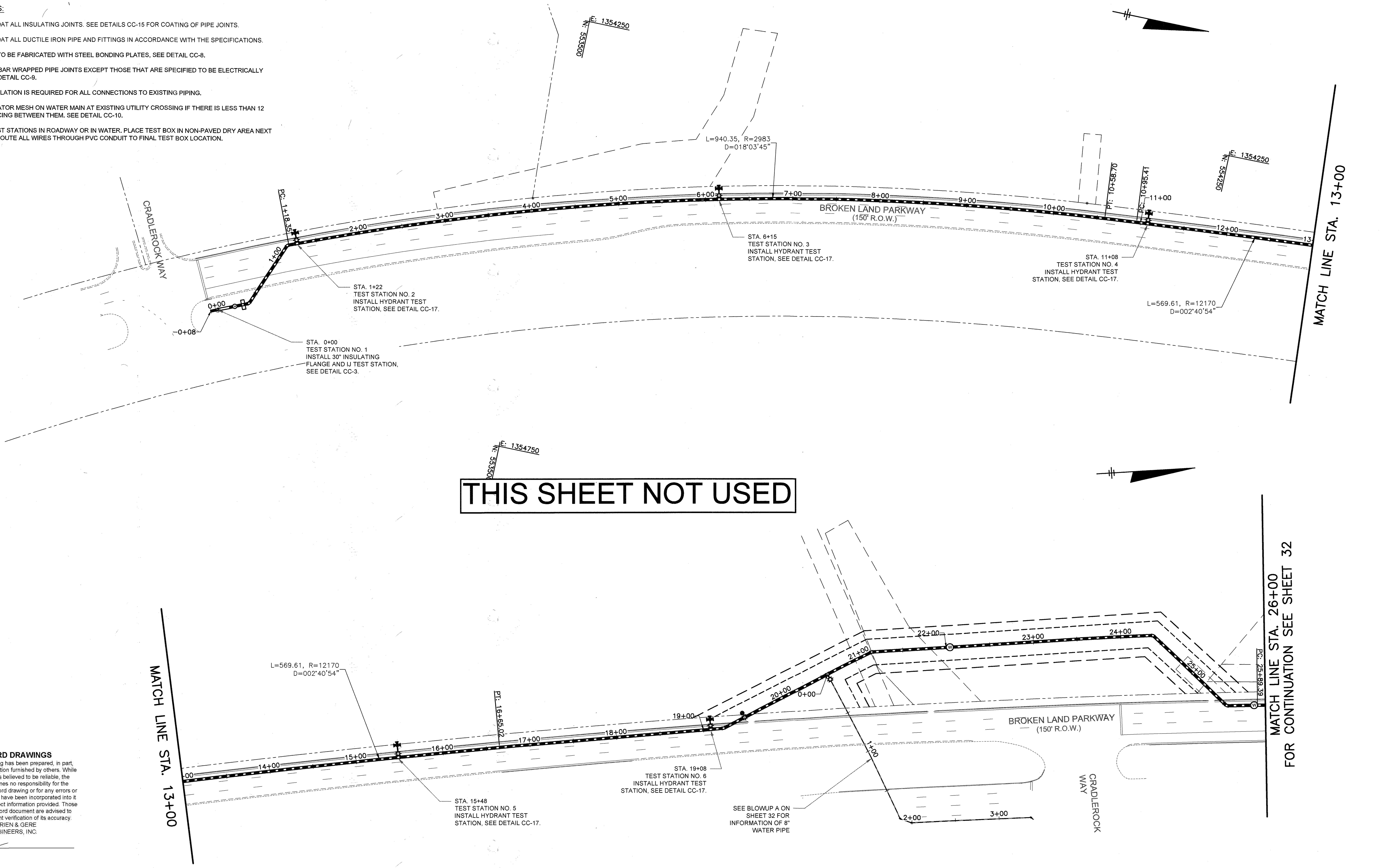
PLOTTED: Monday, January 15, 2018 AT 02:20 PM

FILE: F:\2016\2016-0017_Brokenland Parkway Water Main Replacement\DESIGN\TEDD\MOT- Brokenland Pkwy.dgn

I:\CC\PROJECT\O'BRIEN & GERE\HOWARD CO\BROKEN LAND PKWY 2016\RCC# 169528.00 (HOCO BROKENLAND PARKWAY) CP DESIGN\DRAWING SET\RCC# 169528.00 (HOCO BROKENLAND PARKWAY) CP DESIGN.DWG

CORROSION NOTES:

1. EXTERNALLY COAT ALL INSULATING JOINTS. SEE DETAILS CC-15 FOR COATING OF PIPE JOINTS.
2. EXTERNALLY COAT ALL DUCTILE IRON PIPE AND FITTINGS IN ACCORDANCE WITH THE SPECIFICATIONS.
3. BAR WRAPPED TO BE FABRICATED WITH STEEL BONDING PLATES, SEE DETAIL CC-8.
4. BOND ALL NEW BAR WRAPPED PIPE JOINTS EXCEPT THOSE THAT ARE SPECIFIED TO BE ELECTRICALLY ISOLATED, SEE DETAIL CC-9.
5. ELECTRICAL ISOLATION IS REQUIRED FOR ALL CONNECTIONS TO EXISTING PIPING.
6. INSTALL SEPARATOR MESH ON WATER MAIN AT EXISTING UTILITY CROSSING IF THERE IS LESS THAN 12 INCHES OF SPACING BETWEEN THEM. SEE DETAIL CC-10.
7. DO NOT SET TEST STATIONS IN ROADWAY OR IN WATER. PLACE TEST BOX IN NON-PAVED DRY AREA NEXT TO ROADWAY. ROUTE ALL WIRES THROUGH PVC CONDUIT TO FINAL TEST BOX LOCATION.



RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.
O'BRIEN & GERE ENGINEERS, INC.

By: [signature]

GRAPHIC SCALE — HORIZONTAL 1"=50' (50, 0, 50, 100)

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[signature] 1/19/18		[signature] 1/17/18	
DIRECTOR OF PUBLIC WORKS	DATE	CHIEF – BUREAU OF ENGINEERING	DATE
[signature] 1-17-18		[signature] 1/17/18	
CHIEF, BUREAU OF UTILITIES	DATE	CHIEF, UTILITY DESIGN DIVISION	DATE

RUSSELL CORROSION CONSULTANTS, LLC
www.RussellCorrosion.com

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. 44991, EXPIRATION DATE 01/09/2020

01/16/2018

DSN. BY:	YZ
DRN. BY:	AMT
CHK. BY:	WD
DATE:	1/16/2018

BY	NO.	REVISION	DATE
CTP	1	RECORD DRAWINGS	10/16/19

BAR WRAPPED PIPE OPTION
CATHODIC PROTECTION PLANS
30-INCH WATER MAIN STA. -0+08 TO STA. 26+00

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 31 OF 41

FILE NO. 51204-031

I:\CC\PROJECTS\O'BRIEN & GERE\HOWARD CO\BROKEN LAND PKWY 2016\RCC# 169528.00 (HOCO BROKENLAND PARKWAY) CP DESIGN\DRAWING SET\RCC# 169528.00 (HOCO BROKENLAND PARKWAY) CP DESIGN.DWG

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By:

GRAPHIC SCALE HORIZONTAL 1"=50' 50 0 50 100

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

1/18/18	1/17/18		
DIRECTOR OF PUBLIC WORKS	DATE	CHIEF - BUREAU OF ENGINEERING	DATE
1-17-18	1/17/18		
CHIEF, BUREAU OF UTILITIES	DATE	CHIEF, UTILITY DESIGN DIVISION	DATE

RUSSELL CORROSION CONSULTANTS, LLC
www.RussellCorrosion.com

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. 44991, EXPIRATION DATE 01/08/2020

01/16/2018

DSN. BY:	YZ
DRN. BY:	AMT
CHK. BY:	WD
DATE:	1/16/2018

CTP	1	RECORD DRAWINGS	10/16/19
BY	NO.	REVISION	DATE

BAR WRAPPED PIPE OPTION
CATHODIC PROTECTION PLANS
30-INCH WATER MAIN STA. 26+00 TO STA. 43+41.38
8-INCH WATER MAIN STA. 0+00 TO STA. 6+24.07

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION

CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

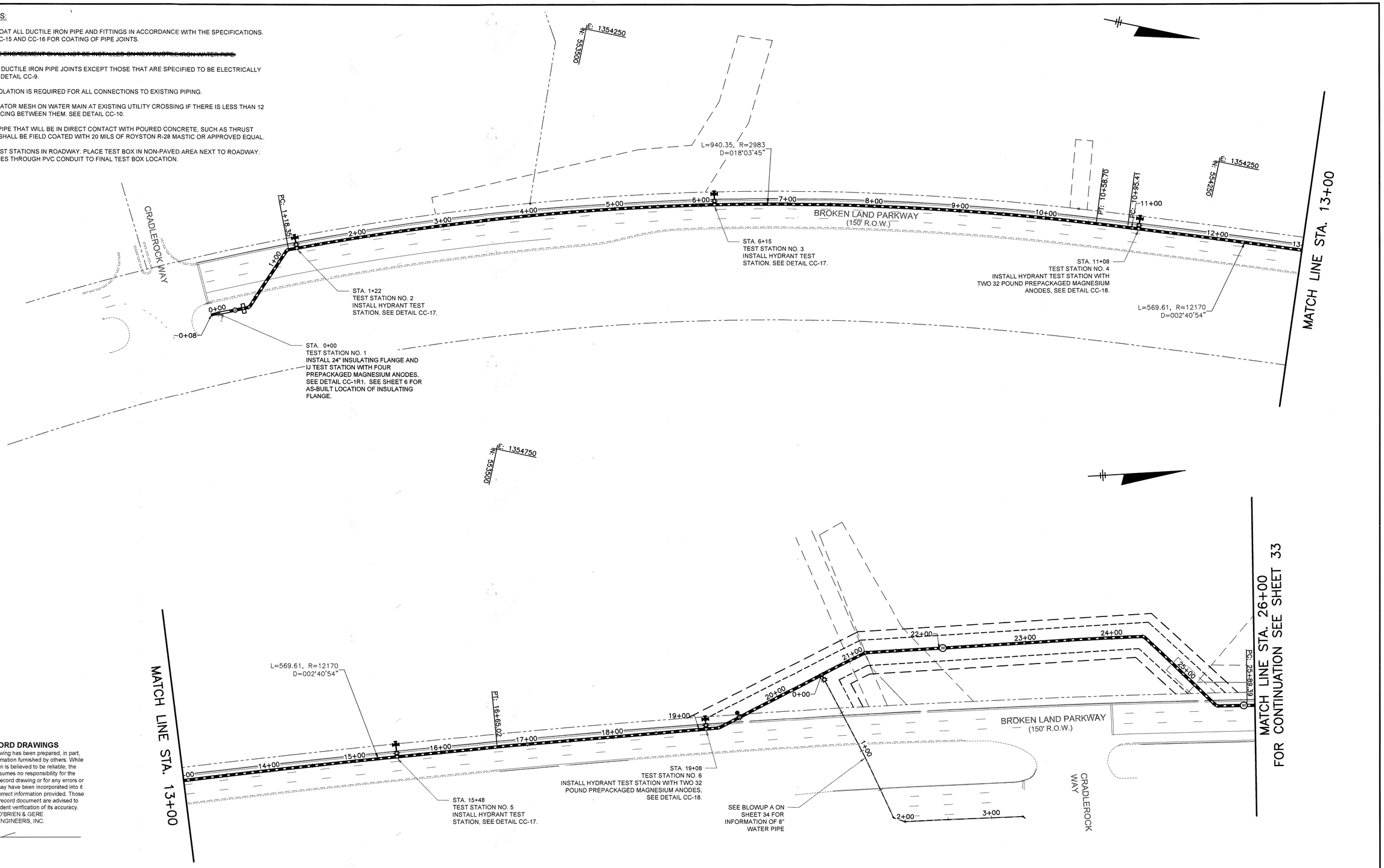
SHEET 32 OF 41

FILE NO. 51204-032

I:\CC\PROJECT\O'BRIEN & GERE\HOWARD CO\BROKEN LAND PKWY 2016\RCC# 169528.00 (HOCO BROKENLAND PARKWAY) CP DESIGN\DRAWING SET\RCC# 169528.00 (HOCO BROKENLAND PARKWAY) CP DESIGN.DWG

CORROSION NOTES:

1. EXTERNALLY COAT ALL DUCTILE IRON PIPE AND FITTINGS IN ACCORDANCE WITH THE SPECIFICATIONS. SEE DETAILS CC-15 AND CC-16 FOR COATING OF PIPE JOINTS.
2. ~~POLYETHYLENE ENCASEMENT SHALL NOT BE INSTALLED ON NEW DUCTILE IRON WATER PIPE.~~
3. BOND ALL NEW DUCTILE IRON PIPE JOINTS EXCEPT THOSE THAT ARE SPECIFIED TO BE ELECTRICALLY ISOLATED, SEE DETAIL CC-9.
4. ELECTRICAL ISOLATION IS REQUIRED FOR ALL CONNECTIONS TO EXISTING PIPING.
5. INSTALL SEPARATOR MESH ON WATER MAIN AT EXISTING UTILITY CROSSING IF THERE IS LESS THAN 12 INCHES OF SPACING BETWEEN THEM. SEE DETAIL CC-10.
6. DUCTILE IRON PIPE THAT WILL BE IN DIRECT CONTACT WITH POURED CONCRETE, SUCH AS THRUST BLOCKS, ETC., SHALL BE FIELD COATED WITH 20 MILS OF ROYSTON R-28 MASTIC OR APPROVED EQUAL.
7. DO NOT SET TEST STATIONS IN ROADWAY. PLACE TEST BOX IN NON-PAVED AREA NEXT TO ROADWAY. ROUTE ALL WIRES THROUGH PVC CONDUIT TO FINAL TEST BOX LOCATION.



RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By _____

GRAPHIC SCALE HORIZONTAL 1"=50' 50 0 50 100

NOTE: SEE SHEETS 6-10 FOR AS-BUILT WATER MAIN ALIGNMENT AND STATIONING.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	11/9/18 DATE	CHIEF – BUREAU OF ENGINEERING	11/7/18 DATE
CHIEF, BUREAU OF UTILITIES	1-12-19 DATE	CHIEF, UTILITY DESIGN DIVISION PDP	11/7/18 DATE

RUSSELL CORROSION CONSULTANTS, LLC.
www.RussellCorrosion.com

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. 44991, EXPIRATION DATE 01/09/2020

STATE OF MARYLAND — YAOQU ZHU — No. 44991 — PROFESSIONAL ENGINEER

01/16/2018

DSN. BY:	YZ
DRN. BY:	AMT
CHK. BY:	WD
DATE:	1/16/2018

NO.		REVISION	DATE
CTP	3	RECORD DRAWINGS	10/16/19
YZ	2	DESIGN REVISION NO. 4	2/26/19
LR	1	ADDENDUM NO. 4	2/24/18
BY			

DUCTILE IRON OPTION CATHODIC PROTECTION PLANS

30-INCH WATER MAIN STA. -0+08 TO STA. 26+00

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

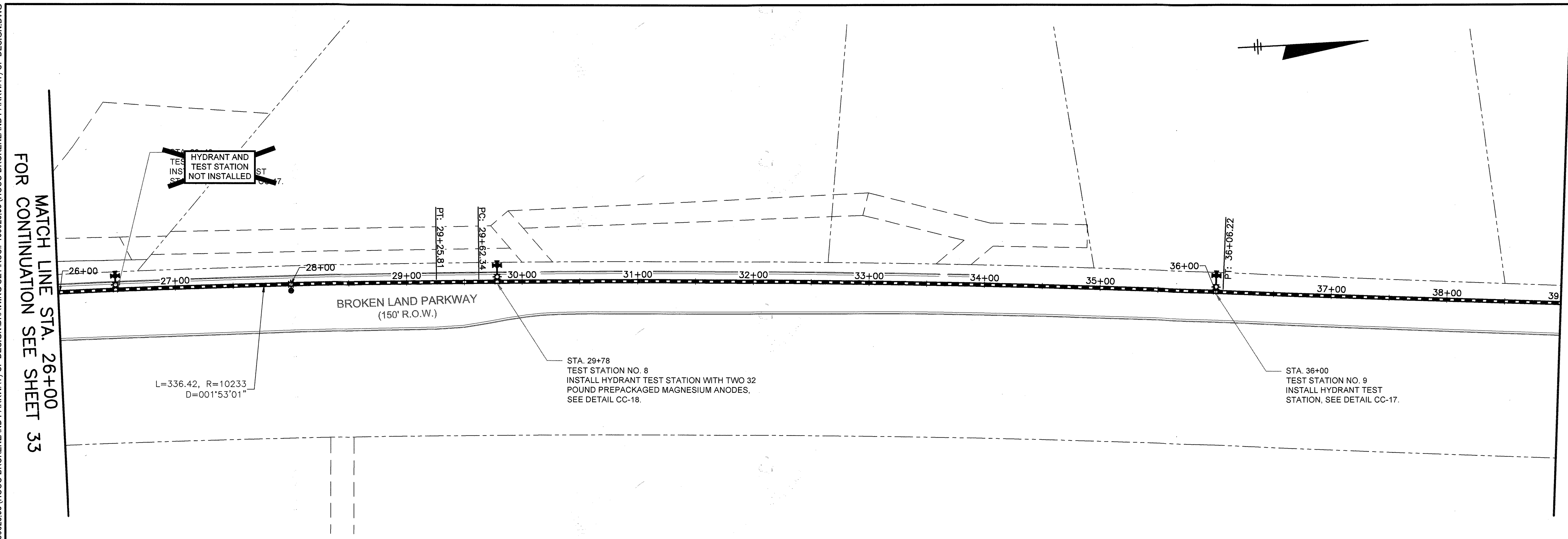
BROKEN LAND PARKWAY 30-INCH WATER TRANSMISSION MAIN EXTENSION

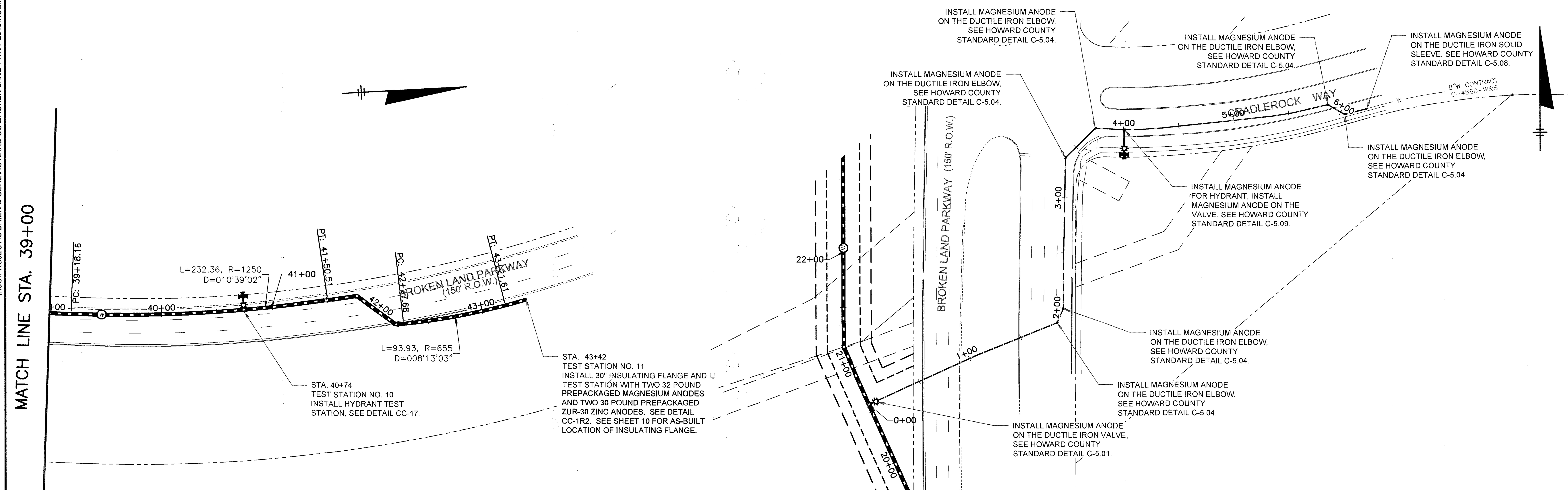
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 33 OF 41

FILE NO. 51204-033





RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By

NOTE: SEE SHEETS 6-10 FOR AS-BUILT WATER MAIN ALIGNMENT AND STATIONING.

GRAPHIC SCALE HORIZONTAL 1"=50' 50 0 50 100

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	1/18/18 DATE	CHIEF – BUREAU OF ENGINEERING	1/17/18 DATE
CHIEF, BUREAU OF UTILITIES	1-17-18 DATE	CHIEF, UTILITY DESIGN DIVISION	1/17/18 DATE

RUSSELL CORROSION CONSULTANTS, LLC
www.RussellCorrosion.com

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. 44991, EXPIRATION DATE 01/09/2020

01/16/2018

DSN. BY: YZ				
DRN. BY: AMT				
CHK. BY: WD	CTP	2	RECORD DRAWINGS	10/16/19
	YZ	1	DESIGN REVISION NO. 4	2/26/19
DATE: 1/16/2018	BY	NO.	REVISION	DATE

DUCTILE IRON OPTION
CATHODIC PROTECTION PLANS
30–INCH WATER MAIN STA. 26+00 TO STA. 43+41.38
8–INCH WATER MAIN STA. 0+00 TO STA. 6+24.07

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30–INCH WATER TRANSMISSION MAIN EXTENSION

CAPITAL PROJECT: W–8307
CONTRACT NO.: 44–4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 34 OF 41

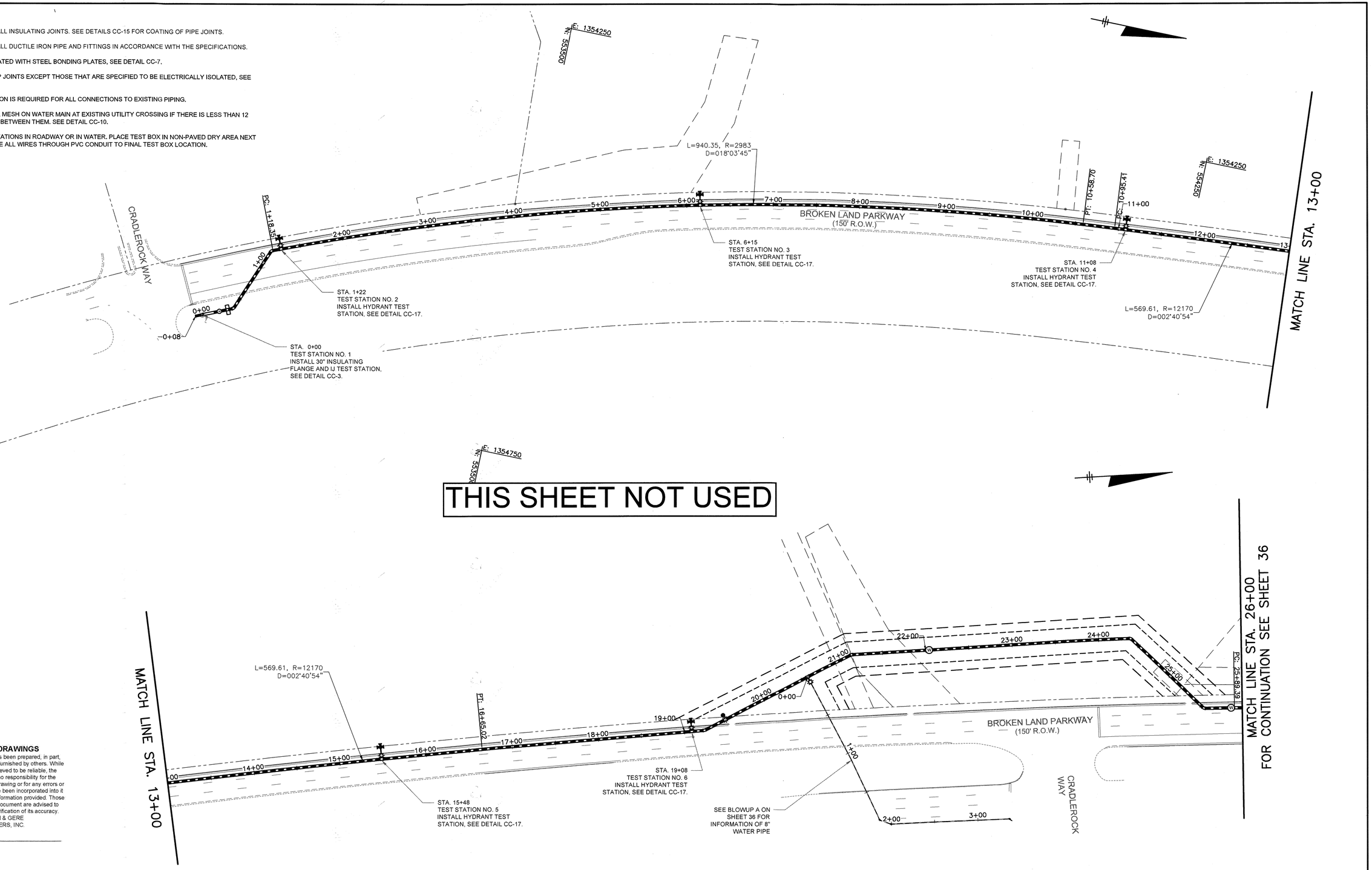
FILE NO. 51204-034

I:\CC\PROJECT\O'BRIEN & GERE\HOWARD CO\BROKEN LAND PKWY 2016\RCC# 169528.00 (HOCO BROKENLAND PARKWAY) CP DESIGN\DRAWING SET\RCC# 169528.00 (HOCO BROKENLAND PARKWAY) CP DESIGN.DWG

I:\CC\PROJECT\O'BRIEN & GERE\HOWARD CO\BROKEN LAND PKWY 2016\RCC# 169528.00 (HOCO BROKENLAND PARKWAY) CP DESIGN\DRAWING SET\RCC# 169528.00 (HOCO BROKEN_LAND PARKWAY) CP DESIGN.DWG

CORROSION NOTES:

1. EXTERNALLY COAT ALL INSULATING JOINTS. SEE DETAILS CC-15 FOR COATING OF PIPE JOINTS.
2. EXTERNALLY COAT ALL DUCTILE IRON PIPE AND FITTINGS IN ACCORDANCE WITH THE SPECIFICATIONS.
3. PCCP TO BE FABRICATED WITH STEEL BONDING PLATES, SEE DETAIL CC-7.
4. BOND ALL NEW PCCP JOINTS EXCEPT THOSE THAT ARE SPECIFIED TO BE ELECTRICALLY ISOLATED, SEE DETAIL CC-9.
5. ELECTRICAL ISOLATION IS REQUIRED FOR ALL CONNECTIONS TO EXISTING PIPING.
6. INSTALL SEPARATOR MESH ON WATER MAIN AT EXISTING UTILITY CROSSING IF THERE IS LESS THAN 12 INCHES OF SPACING BETWEEN THEM. SEE DETAIL CC-10.
7. DO NOT SET TEST STATIONS IN ROADWAY OR IN WATER. PLACE TEST BOX IN NON-PAVED DRY AREA NEXT TO ROADWAY. ROUTE ALL WIRES THROUGH PVC CONDUIT TO FINAL TEST BOX LOCATION.



RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.
O'BRIEN & GERE ENGINEERS, INC.
By: _____

GRAPHIC SCALE HORIZONTAL 1"=50' 50 0 50 100

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	1/16/19 DATE	CHIEF – BUREAU OF ENGINEERING	1/17/18 DATE
CHIEF, BUREAU OF UTILITIES	1-17-18 DATE	CHIEF, UTILITY DESIGN DIVISION PSD	1/17/18 DATE

RUSSELL CORROSION CONSULTANTS, LLC.
www.RussellCorrosion.com

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. 44991, EXPIRATION DATE 01/08/2020

STATE OF MARYLAND — STEVEN ZHANG — No. 44991 — PROFESSIONAL ENGINEER

01/16/2018

DSN. BY:	YZ
DRN. BY:	AMT
CHK. BY:	WD
DATE:	1/16/2018

BY	NO.	REVISION	DATE
CTP	1	RECORD DRAWINGS	10/16/19

PCCP OPTION
CATHODIC PROTECTION PLANS
30-INCH WATER MAIN STA. -0+08 TO STA. 26+00

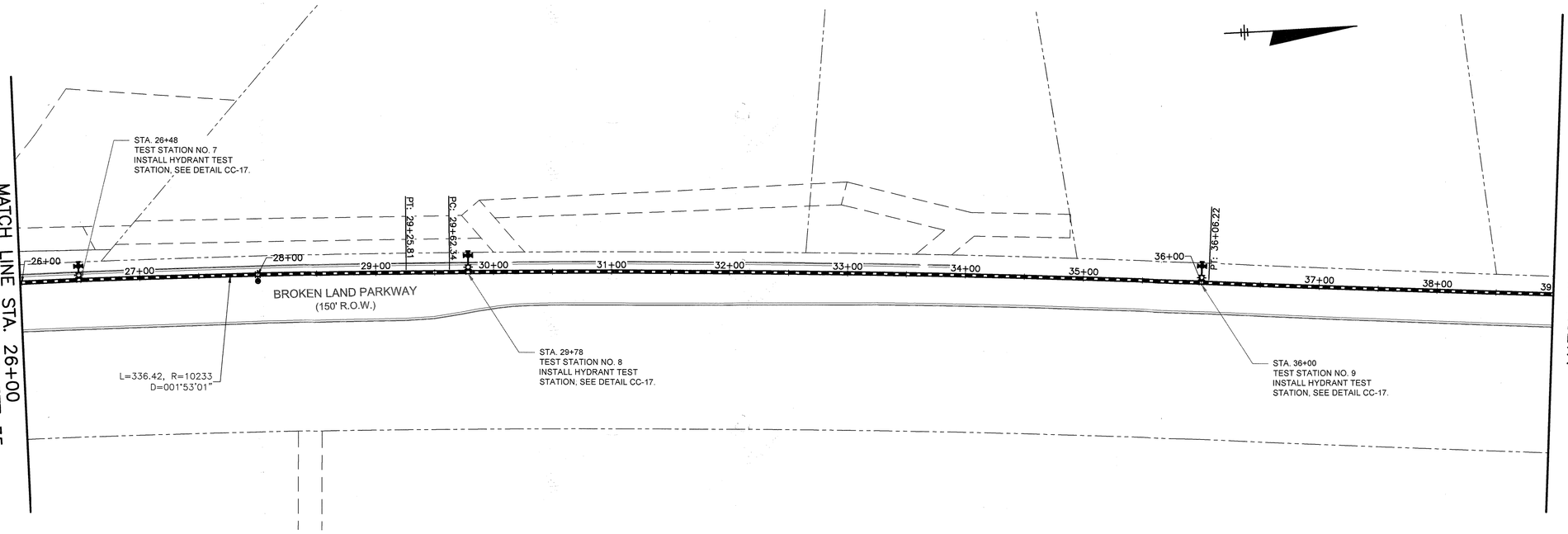
600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

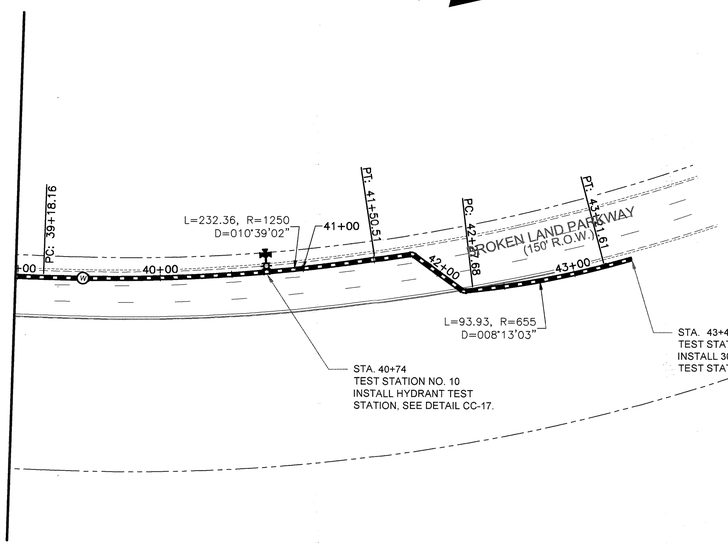
BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

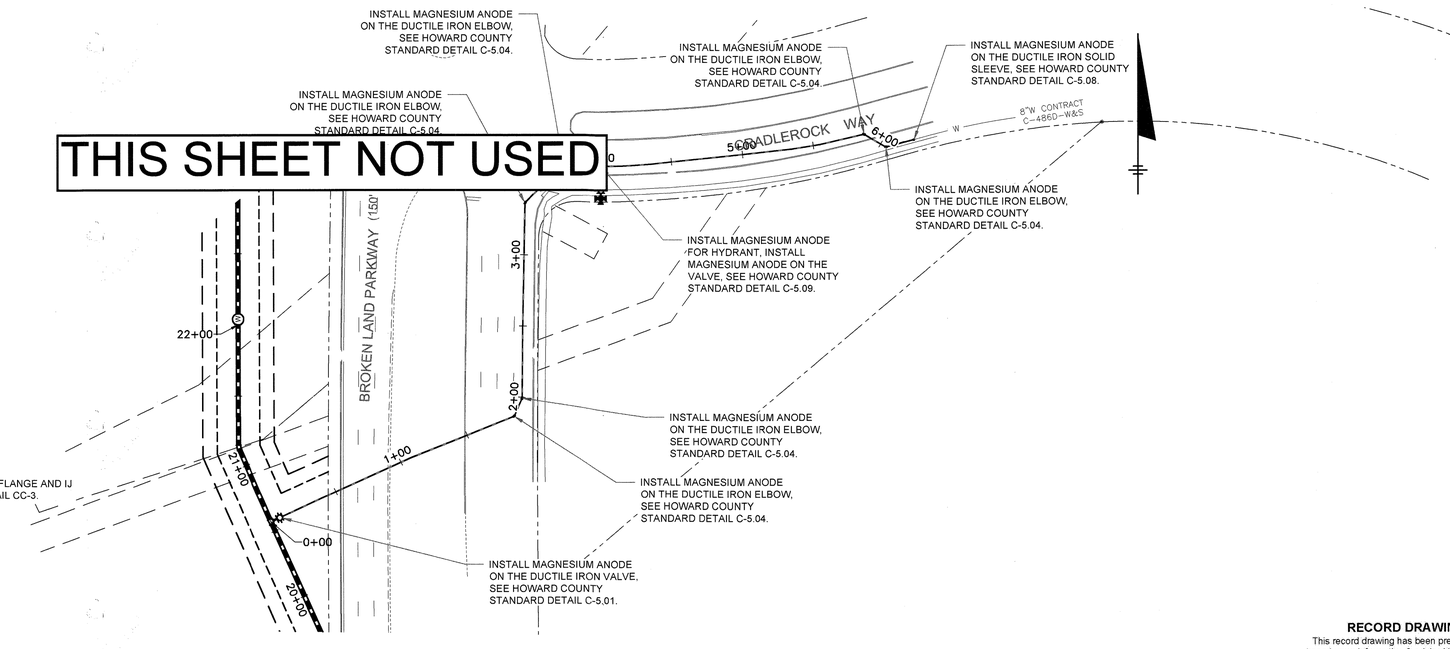
SCALE AS SHOWN

SHEET 35 OF 41

FILE NO. 51204-035







RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

GRAPHIC SCALE HORIZONTAL 1"=50' 50 0 50 100

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	1/19/18 DATE	CHIEF – BUREAU OF ENGINEERING	1/17/18 DATE
CHIEF, BUREAU OF UTILITIES	1-17-18 DATE	CHIEF, UTILITY DESIGN DIVISION	1/17/18 DATE

RUSSELL CORROSION CONSULTANTS, LLC.
www.RussellCorrosion.com

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. 44991, EXPIRATION DATE 01/09/2020

STATE OF MARYLAND — XIAOFU ZHANG — No. 44991 — PROFESSIONAL ENGINEER

01/16/2018

DSN. BY:	YZ
DRN. BY:	AMT
CHK. BY:	WD
DATE:	1/16/2018

BY	NO.		DATE
CTP	1	RECORD DRAWINGS	10/16/19

PCCP OPTION
CATHODIC PROTECTION PLANS
30-INCH WATER MAIN STA. 26+00 TO STA. 43+41.38
8-INCH WATER MAIN STA. 0+00 TO STA. 6+24.07

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

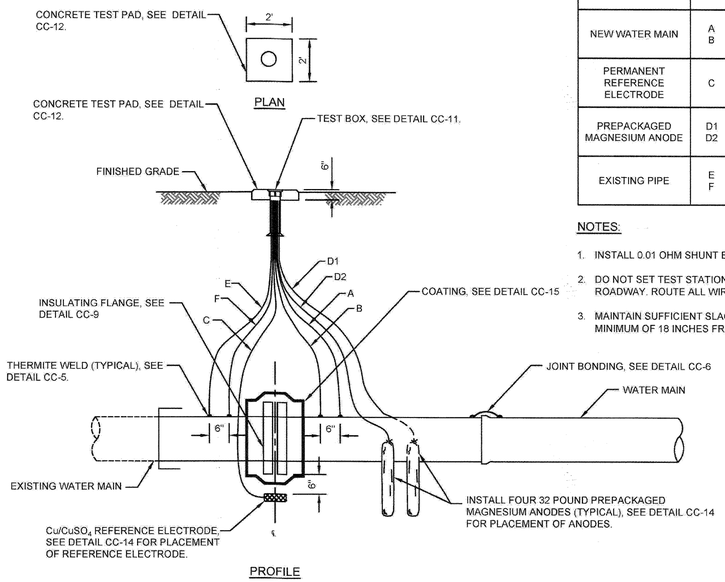
BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION

CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 36 OF 41

FILE NO. 51204-036



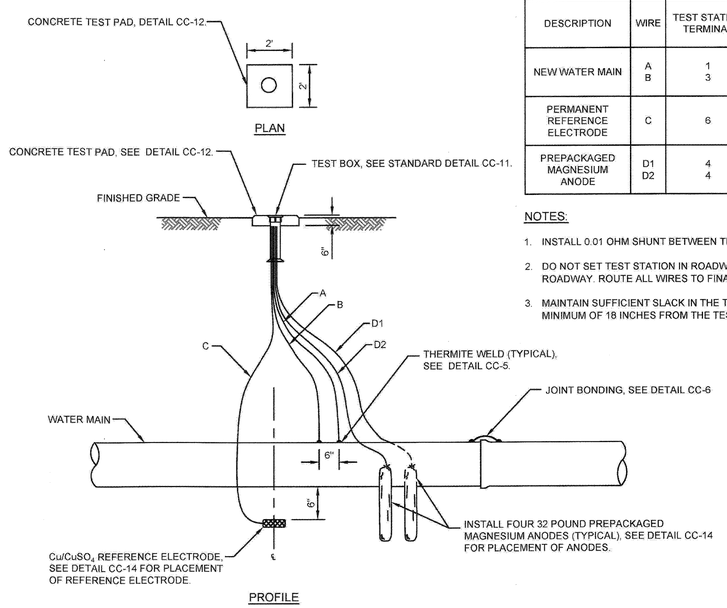
WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE OF INSULATION	COLOR OF INSULATION
NEW WATER MAIN	A B	1 3	#10 #8	THWN THWN	WHITE WHITE
PERMANENT REFERENCE ELECTRODE	C	6	#12	THWN	BLUE
PREPACKAGED MAGNESIUM ANODE	D1 D2	4 4	#12 #12	HMWPE	BLACK BLACK
EXISTING PIPE	E F	2 5	#10 #8	THWN THWN	BLACK BLACK

NOTES:

1. INSTALL 0.01 OHM SHUNT BETWEEN TERMINALS #1 AND #4.
2. DO NOT SET TEST STATION IN ROADWAY. PLACE TEST BOX IN NON-PAVED AREA NEXT TO ROADWAY. ROUTE ALL WIRES TO FINAL TEST BOX LOCATION.
3. MAINTAIN SUFFICIENT SLACK IN THE TEST WIRES SO THAT THE WIRES CAN EXTEND A MINIMUM OF 18 INCHES FROM THE TEST BOX.

CC-1: INSULATING FLANGE TEST STATION WITH MAGNESIUM ANODES (IJ)

Scale: None



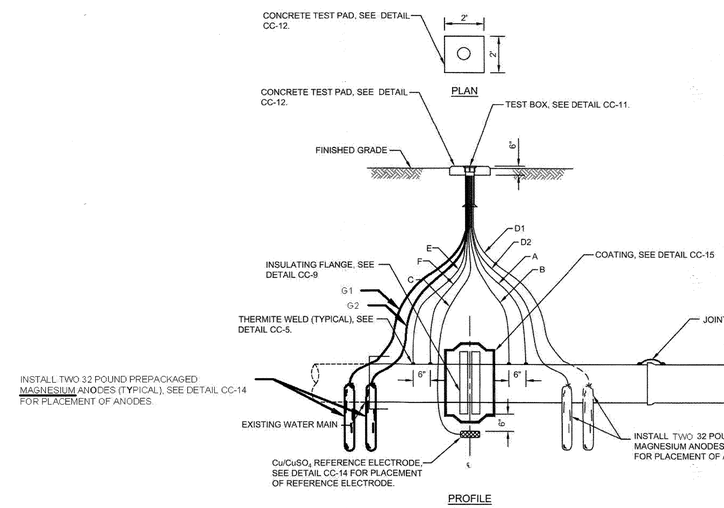
WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE OF INSULATION	COLOR OF INSULATION
NEW WATER MAIN	A B	1 3	#10 #8	THWN THWN	WHITE WHITE
PERMANENT REFERENCE ELECTRODE	C	6	#12	THWN	BLUE
PREPACKAGED MAGNESIUM ANODE	D1 D2	4 4	#12 #12	HMWPE	BLACK BLACK

NOTES:

1. INSTALL 0.01 OHM SHUNT BETWEEN TERMINALS #1 AND #4.
2. DO NOT SET TEST STATION IN ROADWAY. PLACE TEST BOX IN NON-PAVED AREA NEXT TO ROADWAY. ROUTE ALL WIRES TO FINAL TEST BOX LOCATION.
3. MAINTAIN SUFFICIENT SLACK IN THE TEST WIRES SO THAT THE WIRES CAN EXTEND A MINIMUM OF 18 INCHES FROM THE TEST BOX.

CC-2: ANODE TEST STATION

Scale: None

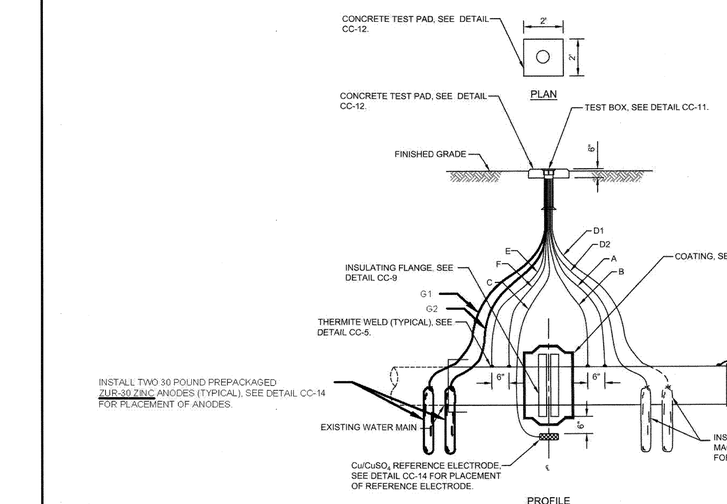


WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE OF INSULATION	COLOR OF INSULATION
NEW WATER MAIN	A B	1 3	#10 #8	THWN THWN	WHITE WHITE
PERMANENT REFERENCE ELECTRODE	C	6	#12	THWN	BLUE
PREPACKAGED MAGNESIUM ANODE	D1 D2	4 4	#12 #12	HMWPE	BLACK BLACK
EXISTING PIPE	E F	2 5	#10 #8	THWN THWN	BLACK BLACK
PREPACKAGED MAGNESIUM ANODE	G1 G2	7 7	#12 #12	HMWPE HMWPE	BLACK BLACK

NOTES:

1. INSTALL 0.01 OHM SHUNT BETWEEN TERMINALS #1 AND #4.
   INSTALL 0.01 OHM SHUNT BETWEEN TERMINALS #2 AND #7.
2. DO NOT SET TEST STATION IN ROADWAY. PLACE TEST BOX IN NON-PAVED AREA NEXT TO ROADWAY. ROUTE ALL WIRES TO FINAL TEST BOX LOCATION.
3. MAINTAIN SUFFICIENT SLACK IN THE TEST WIRES SO THAT THE WIRES CAN EXTEND A MINIMUM OF 18 INCHES FROM THE TEST BOX.

DETAIL CC-1R1, REVISED FOR FOUR MAGNESIUM ANODES



WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE OF INSULATION	COLOR OF INSULATION
NEW WATER MAIN	A B	1 3	#10 #8	THWN THWN	WHITE WHITE
PERMANENT REFERENCE ELECTRODE	C	6	#12	THWN	BLUE
PREPACKAGED MAGNESIUM ANODE	D1 D2	4 4	#12 #12	HMWPE	BLACK BLACK
EXISTING PIPE	E F	2 5	#10 #8	THWN THWN	BLACK BLACK
PREPACKAGED ZINC ANODE	G1 G2	7 7	#12 #12	HMWPE HMWPE	BLACK BLACK

NOTES:

1. INSTALL 0.01 OHM SHUNT BETWEEN TERMINALS #1 AND #4.
   INSTALL 0.01 OHM SHUNT BETWEEN TERMINALS #2 AND #7.
2. DO NOT SET TEST STATION IN ROADWAY. PLACE TEST BOX IN NON-PAVED AREA NEXT TO ROADWAY. ROUTE ALL WIRES TO FINAL TEST BOX LOCATION.
3. MAINTAIN SUFFICIENT SLACK IN THE TEST WIRES SO THAT THE WIRES CAN EXTEND A MINIMUM OF 18 INCHES FROM THE TEST BOX.

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

DETAIL CC-1R2, REVISED FOR TWO MAGNESIUM ANODES & TWO ZINC ANODES

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/19/18
CHIEF – BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-17-18
CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/18

RUSSELL CORROSION CONSULTANTS, LLC.
www.RussellCorrosion.com

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. 44991, EXPIRATION DATE 01/09/2020

STATE OF MARYLAND — YISHU ZHANG — 44991 — PROFESSIONAL ENGINEER
01/16/2018

DSN. BY:	YZ
DRN. BY:	AMT
CHK. BY:	WD
DATE:	1/16/2018

CTP	2	RECORD DRAWINGS	10/16/19
YZ	1	DESIGN REVISION NO. 4	2/26/19
BY	NO.	REVISION	DATE

CATHODIC PROTECTION DETAILS
SHEET ONE

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

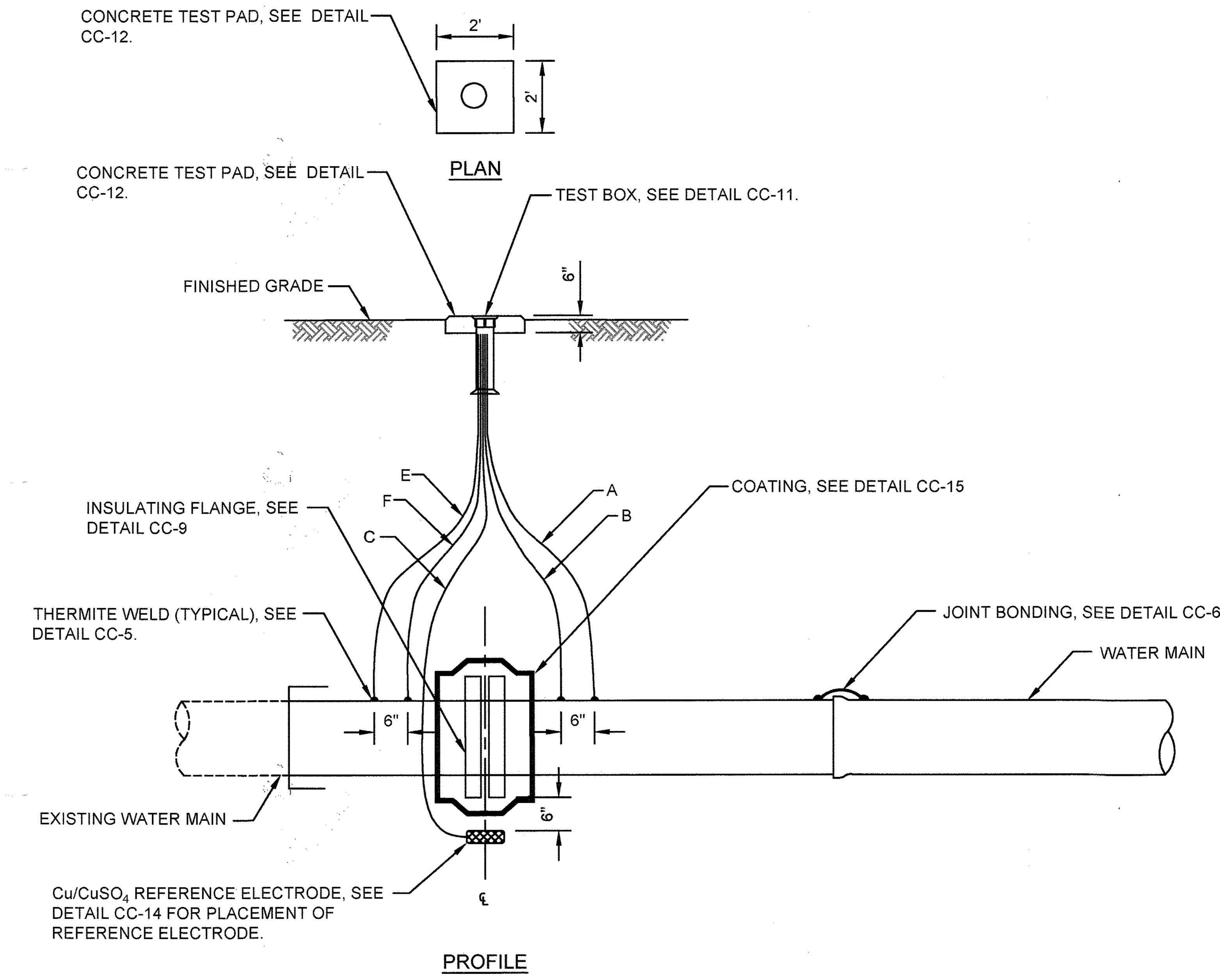
BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 37 OF 41

FILE NO. 51204-037

I:\CO\PROJECT\O'BRIEN & GERE\HOWARD CO\BROKEN LAND PKWY 2016\RCC# 169528.00 (HOCO BROKENLAND PARKWAY) CP DESIGN\DRAWING SET\RCC# 169528.00 (HOCO BROKEN LAND PARKWAY) CP DESIGN.DWG



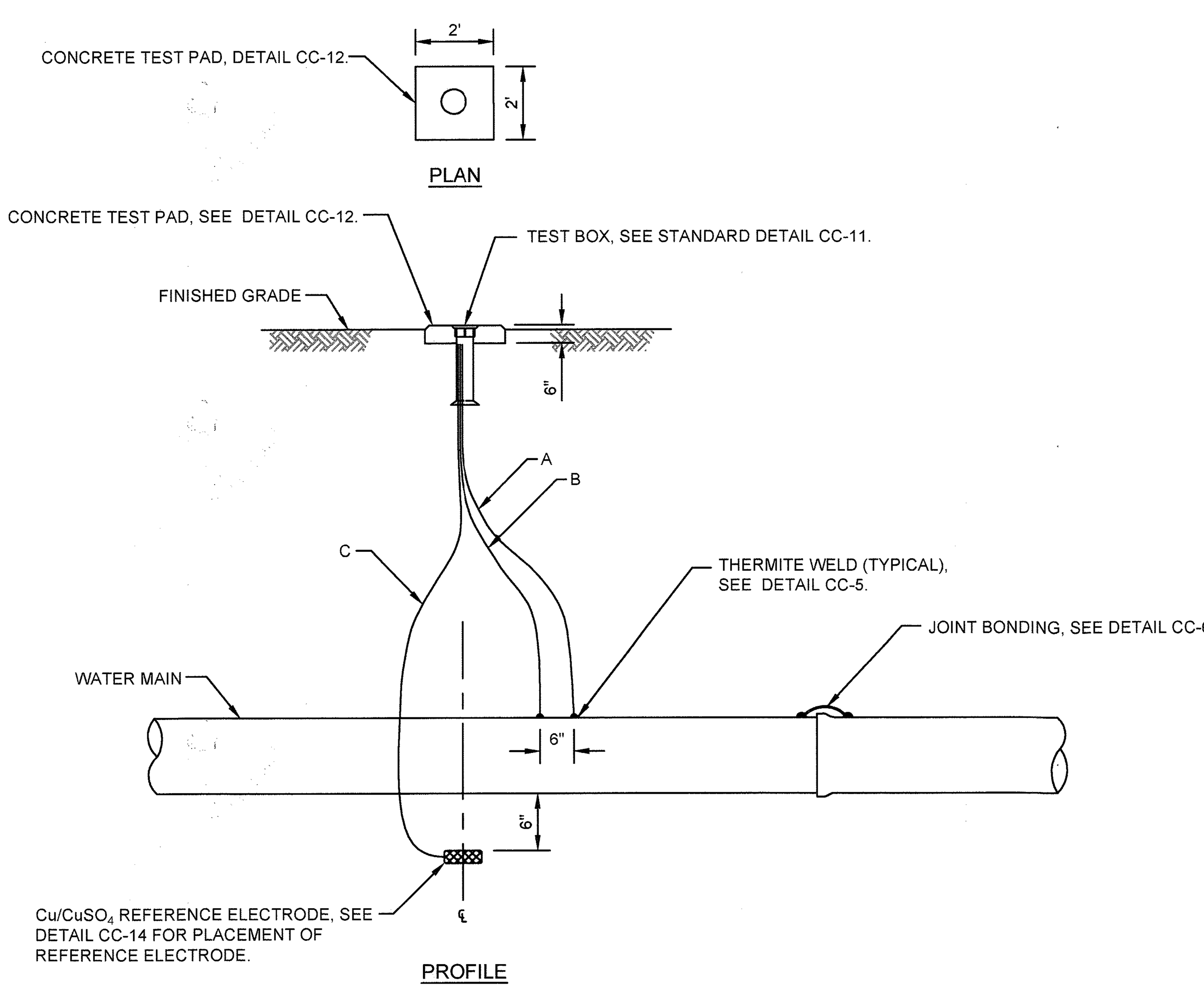
CC–3: INSULATING FLANGE TEST STATION

Scale: None

WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE OF INSULATION	COLOR OF INSULATION
NEW WATER MAIN	A B	1 3	#10 #8	THWN THWN	WHITE WHITE
PERMANENT REFERENCE ELECTRODE	C	6	#12	THWN	BLUE
EXISTING PIPE	E F	2 5	#10 #8	THWN THWN	BLACK BLACK

NOTES:

1. DO NOT SET TEST STATION IN ROADWAY. PLACE TEST BOX IN NON-PAVED AREA NEXT TO ROADWAY. ROUTE ALL WIRES TO FINAL TEST BOX LOCATION.
2. MAINTAIN SUFFICIENT SLACK IN THE TEST WIRES SO THAT THE WIRES CAN EXTEND A MINIMUM OF 18 INCHES FROM THE TEST BOX.



CC–4: STANDARD TEST STATION

Scale: None

WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE OF INSULATION	COLOR OF INSULATION
NEW WATER MAIN	A B	1 3	#10 #8	THWN THWN	WHITE WHITE
PERMANENT REFERENCE ELECTRODE	C	6	#12	THWN	BLUE

NOTES:

1. DO NOT SET TEST STATION IN ROADWAY. PLACE TEST BOX IN NON-PAVED AREA NEXT TO ROADWAY. ROUTE ALL WIRES TO FINAL TEST BOX LOCATION.
2. MAINTAIN SUFFICIENT SLACK IN THE TEST WIRES SO THAT THE WIRES CAN EXTEND A MINIMUM OF 18 INCHES FROM THE TEST BOX.

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By:

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	1/19/19 DATE	CHIEF – BUREAU OF ENGINEERING	1/17/18 DATE
CHIEF, BUREAU OF UTILITIES	1-17-18 DATE	CHIEF, UTILITY DESIGN DIVISION PSD	1/17/18 DATE

RUSSELL CORROSION CONSULTANTS, LLC
www.RussellCorrosion.com

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. 44991, EXPIRATION DATE 01/09/2020

01/16/2018

DSN. BY: YZ				
DRN. BY: AMT				
CHK. BY: WD				
DATE: 1/16/2018	CTP	1	RECORD DRAWINGS	10/16/19
	BY	NO.	REVISION	DATE

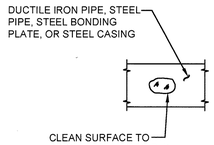
CATHODIC PROTECTION DETAILS
SHEET TWO

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

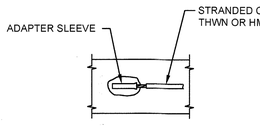
BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W–8307
CONTRACT NO.: 44–4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

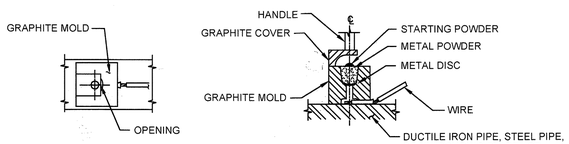
FILE NO. 51204-038



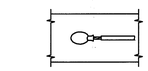
STEP 1



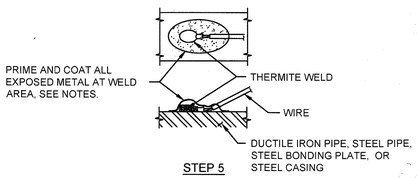
STEP 2



STEP 3



STEP 4



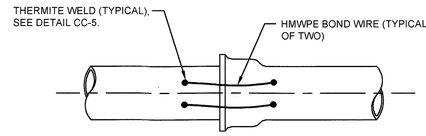
STEP 5

NOTES:

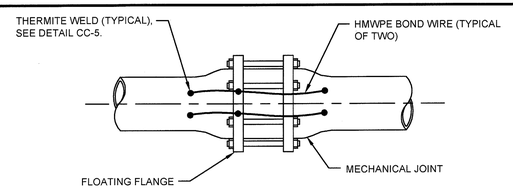
1. THERMITE WELDS MADE TO DUCTILE IRON PIPE, STEEL PIPE OR CASING SHALL BE COATED WITH A PREFABRICATED ONE PIECE PLASTIC CAP FILLED WITH ELASTOMERIC MATERIAL, ROYSTON HANDY-CAP OR APPROVED EQUAL. REPAIR PIPE COATING IN ACCORDANCE WITH COATING MANUFACTURER'S RECOMMENDATIONS.
2. THERMITE WELDS MADE TO THE STEEL BONDING PLATES OF PCCP OR BAR WRAPPED CONCRETE CYLINDER PIPING SHALL BE COATED WITH BRUSH APPLIED R28 MASTIC (10 MILS MINIMUM THICKNESS) OR APPROVED EQUAL. MASTIC SHALL BE DRY BEFORE THERMITE WELDS ARE COVERED OVER WITH GROUT.

CC-5: THERMITE WELD

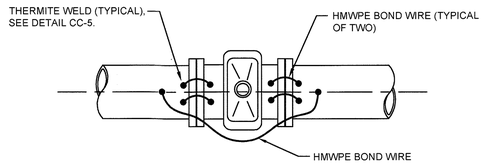
Scale: None



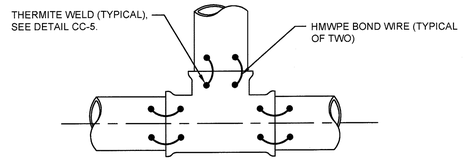
TYPICAL PIPE JOINT BOND



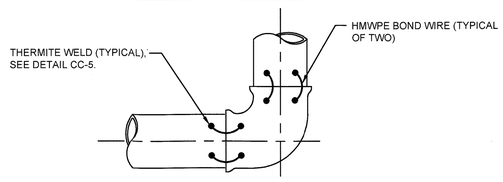
TYPICAL MECHANICAL COUPLING BOND



TYPICAL BONDING OF VALVE



TYPICAL BONDING OF TEE



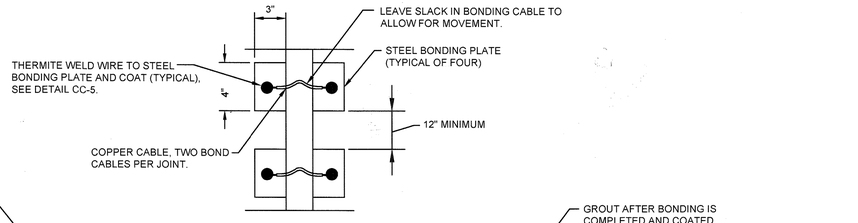
TYPICAL BONDING OF BEND, REDUCER OR SOLID SLEEVE

NOTES:

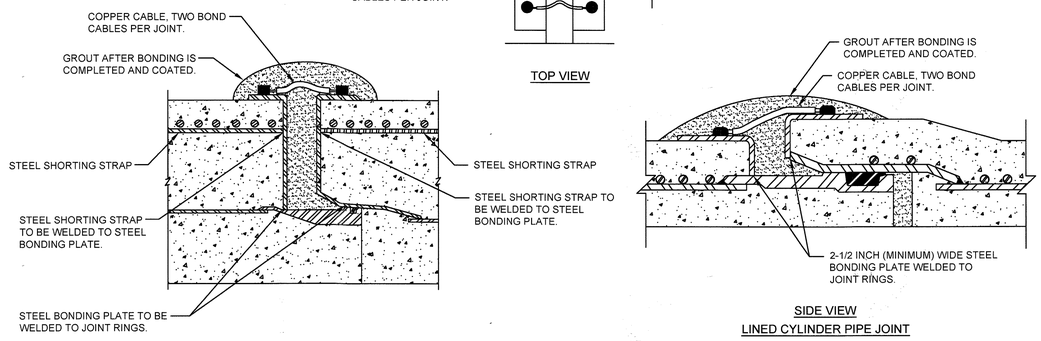
1. BOND ALL JOINTS ON UNDERGROUND PIPING ASSOCIATED WITH THE WATER MAIN EXCEPT INSULATED JOINTS.
2. THERMITE WELD BONDING WIRES TO TOP OF PIPE OR FITTINGS, SEE DETAIL CC-5.
3. WIRE SIZE FOR BONDING JOINTS SHALL BE AS FOLLOWS:
   12" & SMALLER - AWG NO. 6
   16" TO 36" - AWG NO. 4
   LARGER THAN 36" - AWG NO. 2
4. ALL THERMITE WELDS TO PCCP OR BAR WRAPPED CONCRETE CYLINDER PIPE TO BE PERFORMED AT THE STEEL BONDING PLATES, SEE DETAIL CC-7.

CC-6: JOINT BONDING

Scale: None



TOP VIEW



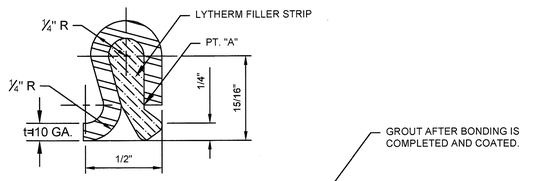
SIDE VIEW
LINED CYLINDER PIPE JOINT

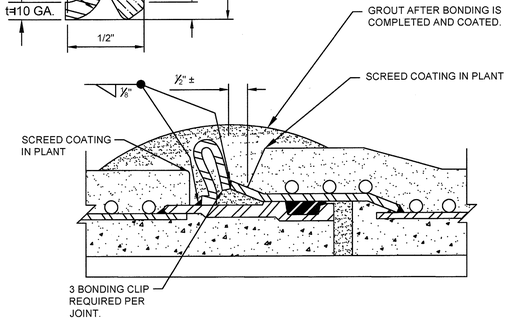
NOTES:

1. TWO STEEL SHORTING STRAPS REQUIRED PER PIPE SECTION FOR EMBEDDED CYLINDER PIPE. NO SHORTING STRAPS REQUIRED FOR LINED CYLINDER PIPE.
2. STEEL BONDING PLATES AND STEEL SHORTING STRAPS (IF REQUIRED) TO BE INSTALLED BY PIPE MANUFACTURER DURING PIPE FABRICATION.
3. BOND ALL PIPE JOINTS, INCLUDING THOSE ON PIPE, FITTINGS, VALVES, ETC., EXCEPT THOSE SPECIFIED TO BE INSULATED.
4. WIRE SIZE FOR BONDING JOINTS SHALL BE AS FOLLOWS:
   12" & SMALLER - AWG NO. 6
   16" TO 36" - AWG NO. 4
   LARGER THAN 36" - AWG NO. 2

CC-7: PCCP JOINT BONDING

Scale: None





SIDE VIEW

NOTES:

1. STEEL BONDING CLIP:
   MATERIAL SPEC. .....ASTM 4366 OR EQUAL
   CUT LENGTH.....2-1/2" ± 1/16"
   WIDTH.....1-1/4" ± 1/16"
2. LYTHERM FILLER STRIP TO BE 1" X 1-1/2" WIDE TO OVERLAP SIDES OF CLIP.
3. BONDING CLIP CRIMPED OVER FILLER AT "A" TO COMPRESS FILLER.

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

CC-8: BWP JOINT BONDING

Scale: None

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/19/18
CHIEF - BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-12-18
CHIEF, UTILITY DESIGN DIVISION — DATE 1/17/18

RUSSELL CORROSION CONSULTANTS, LLC
www.RussellCorrosion.com

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. 44991, EXPIRATION DATE 01/09/2020

STATE OF MARYLAND — YAOHUI ZHANG — No. 44991 — PROFESSIONAL ENGINEER
01/16/2018

DSN. BY:	YZ
DRN. BY:	AMT
CHK. BY:	WD
DATE:	1/16/2018

BY	NO.		DATE
CTP	1	RECORD DRAWINGS	10/16/19

CATHODIC PROTECTION DETAILS
SHEET THREE

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

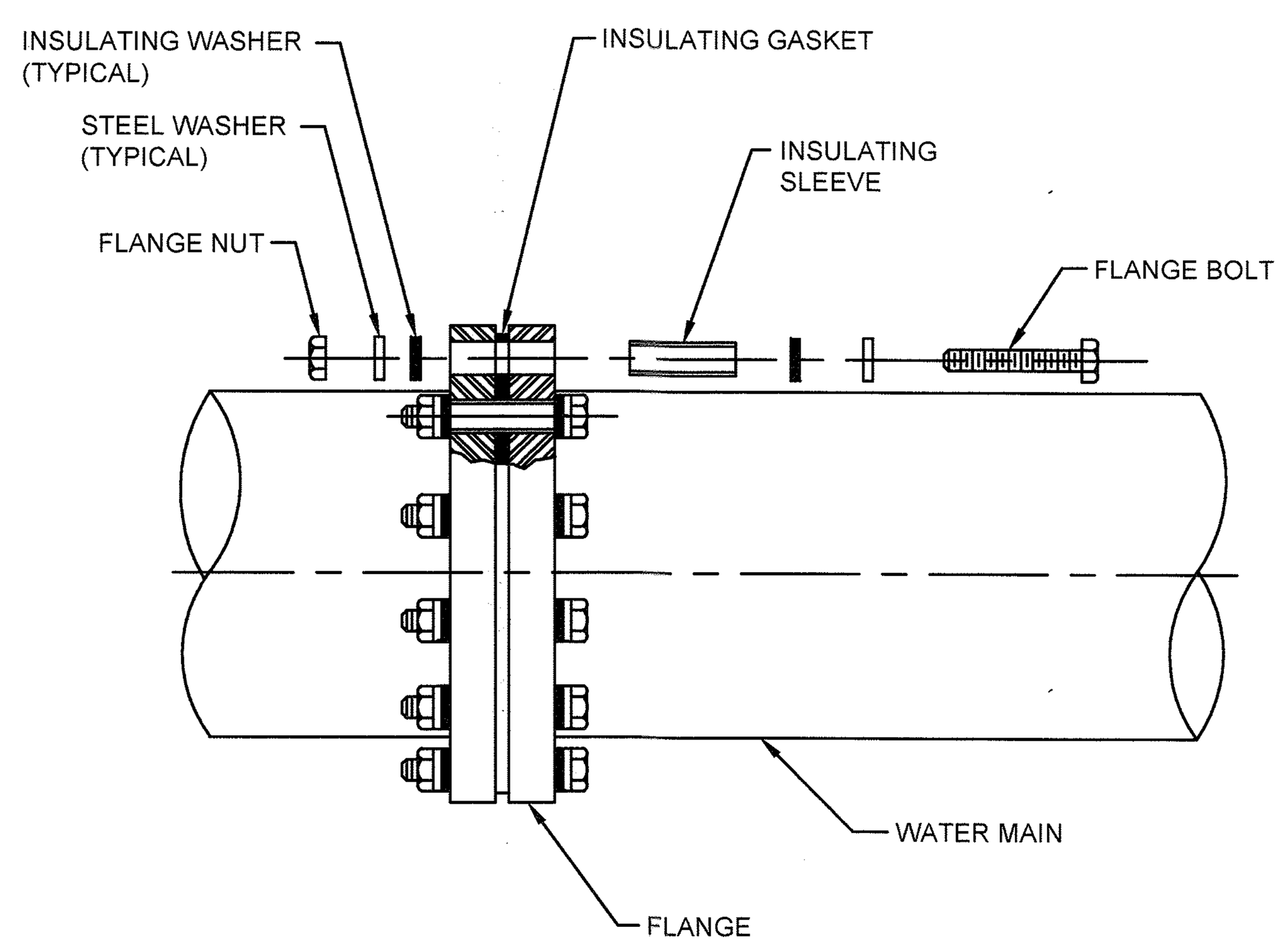
SCALE AS SHOWN

SHEET 39 OF 41

FILE NO. 51204-039

I:\CC\PROJECT\OBRIEN & GERE\HOWARD CO\BROKEN LAND PKWY 2016\RCC# 169528.00 (HOCO BROKENLAND PARKWAY) CP DESIGN\DRAWING SET\RCC# 169528.00 (HOCO BROKEN LAND PARKWAY) CP DESIGN.DWG

I:\CC\PROJECT\O'BRIEN & GERE\HOWARD CO\BROKEN LAND PKWY 2016\RCC# 169528.00 (HOCO BROKENLAND PARKWAY) CP DESIGN\DRAWING SET\RCC# 169528.00 (HOCO BROKENLAND PARKWAY) CP DESIGN.DWG

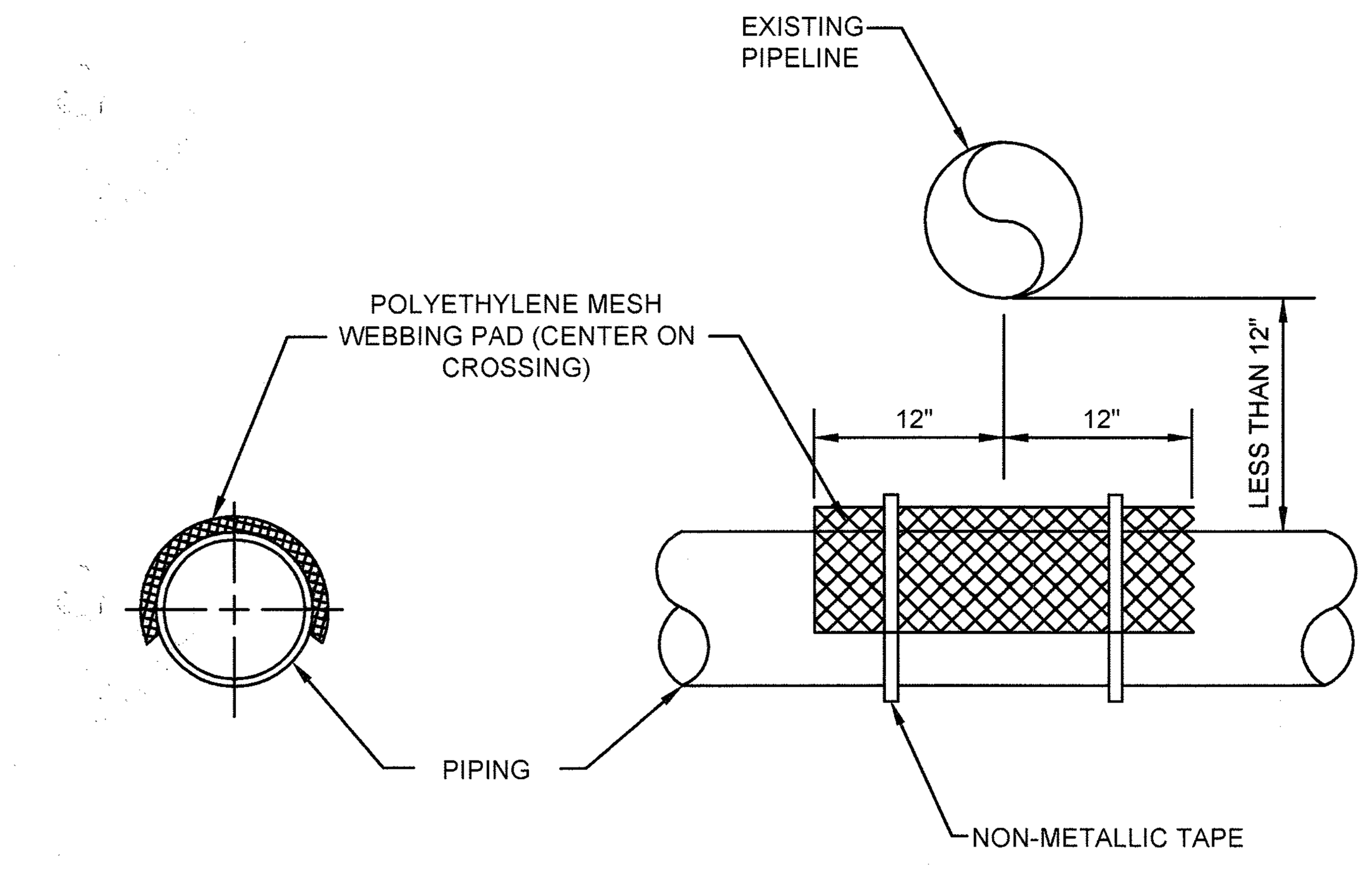


NOTE:

SEE SPECIFICATIONS FOR EXTERNAL COATING OF INSULATING FLANGE.

CC-9: INSULATING FLANGE

Scale: None

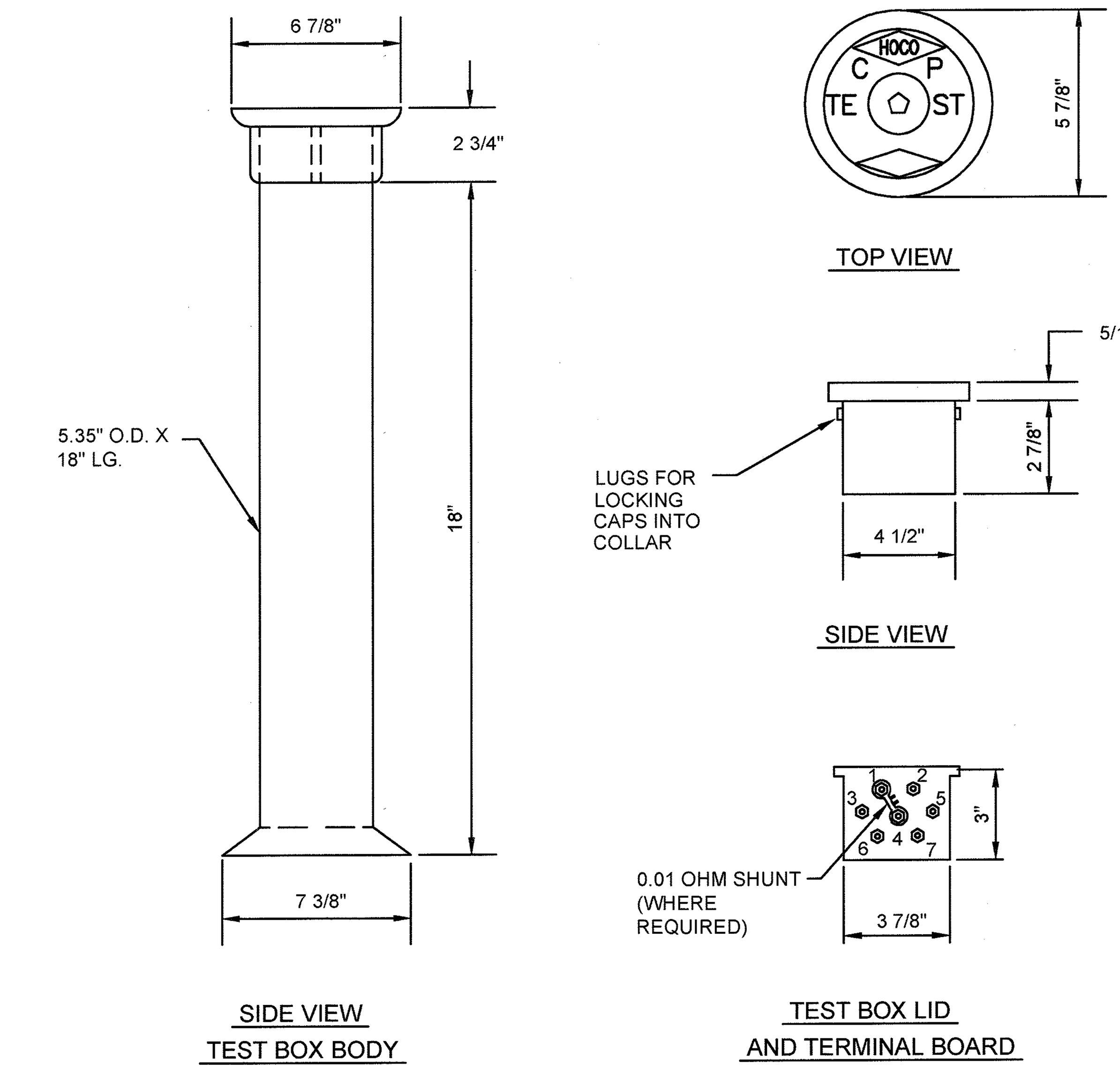


NOTE:

USE ONLY WHEN PIPES ARE LESS THAN 12" APART.

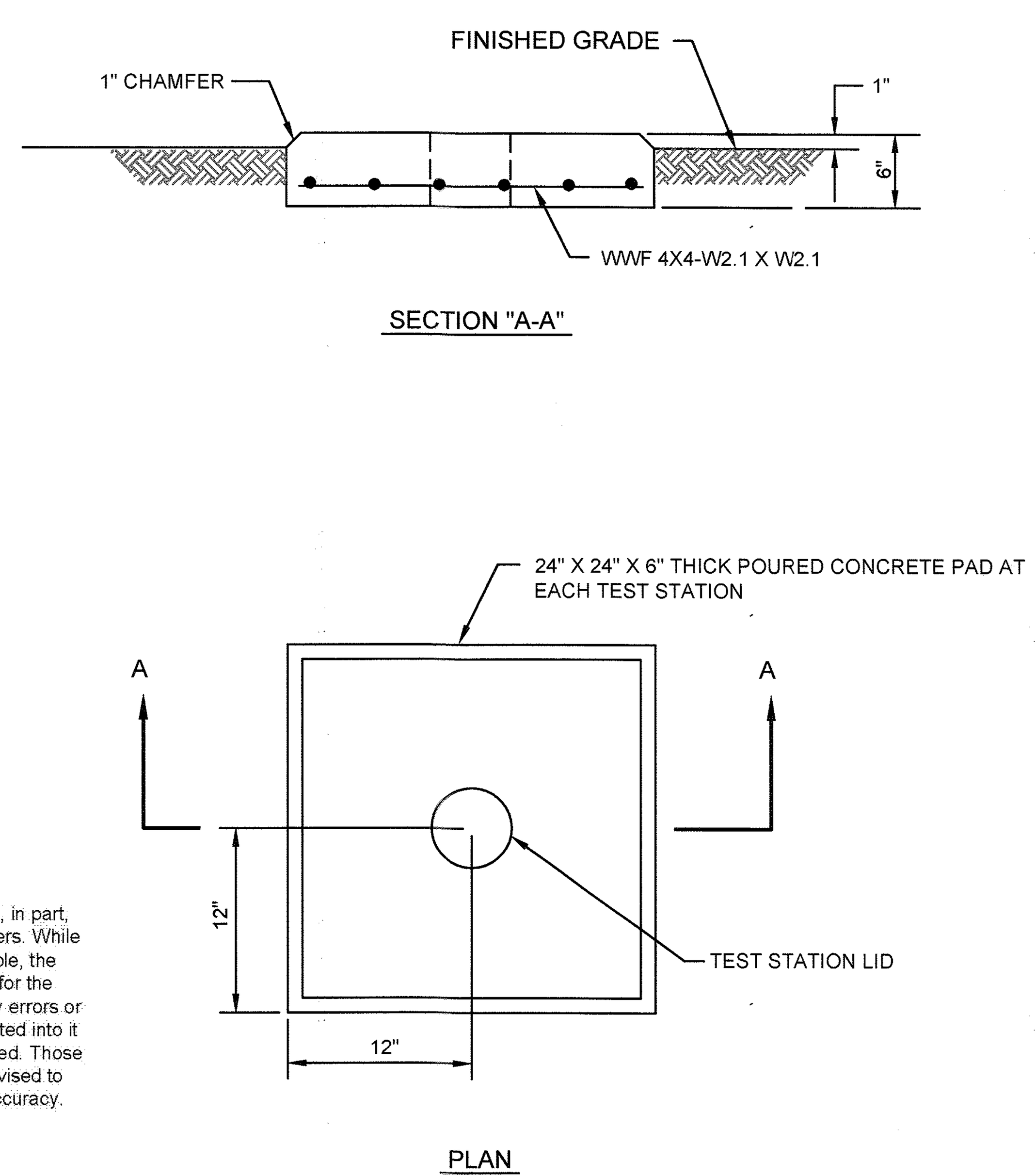
CC-10: SEPARATOR TO AVOID ELECTRICAL CONTACT

Scale: None



CC-11: TEST BOX

Scale: None



RECORD DRAWINGS

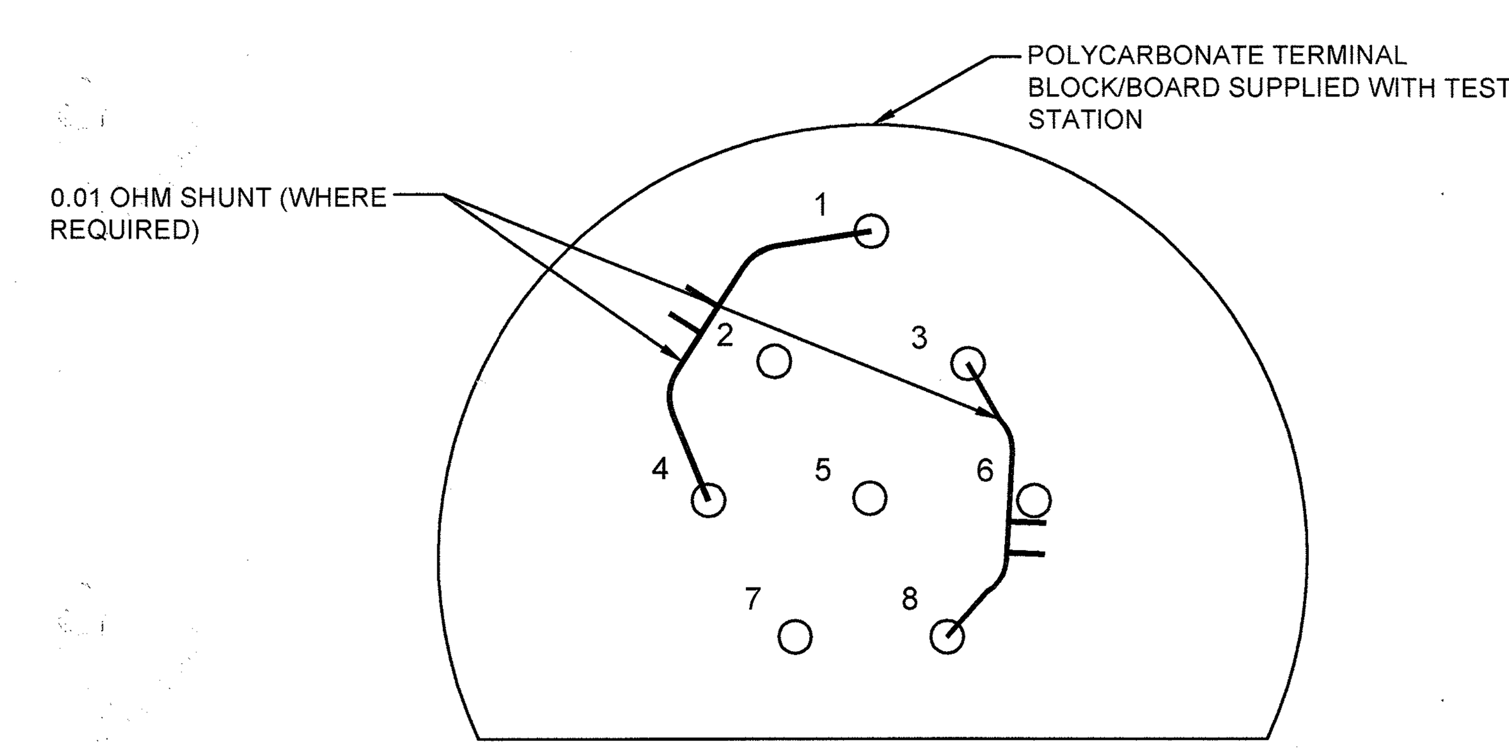
This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: [signature]

CC-12: CONCRETE TEST STATION PAD

Scale: None



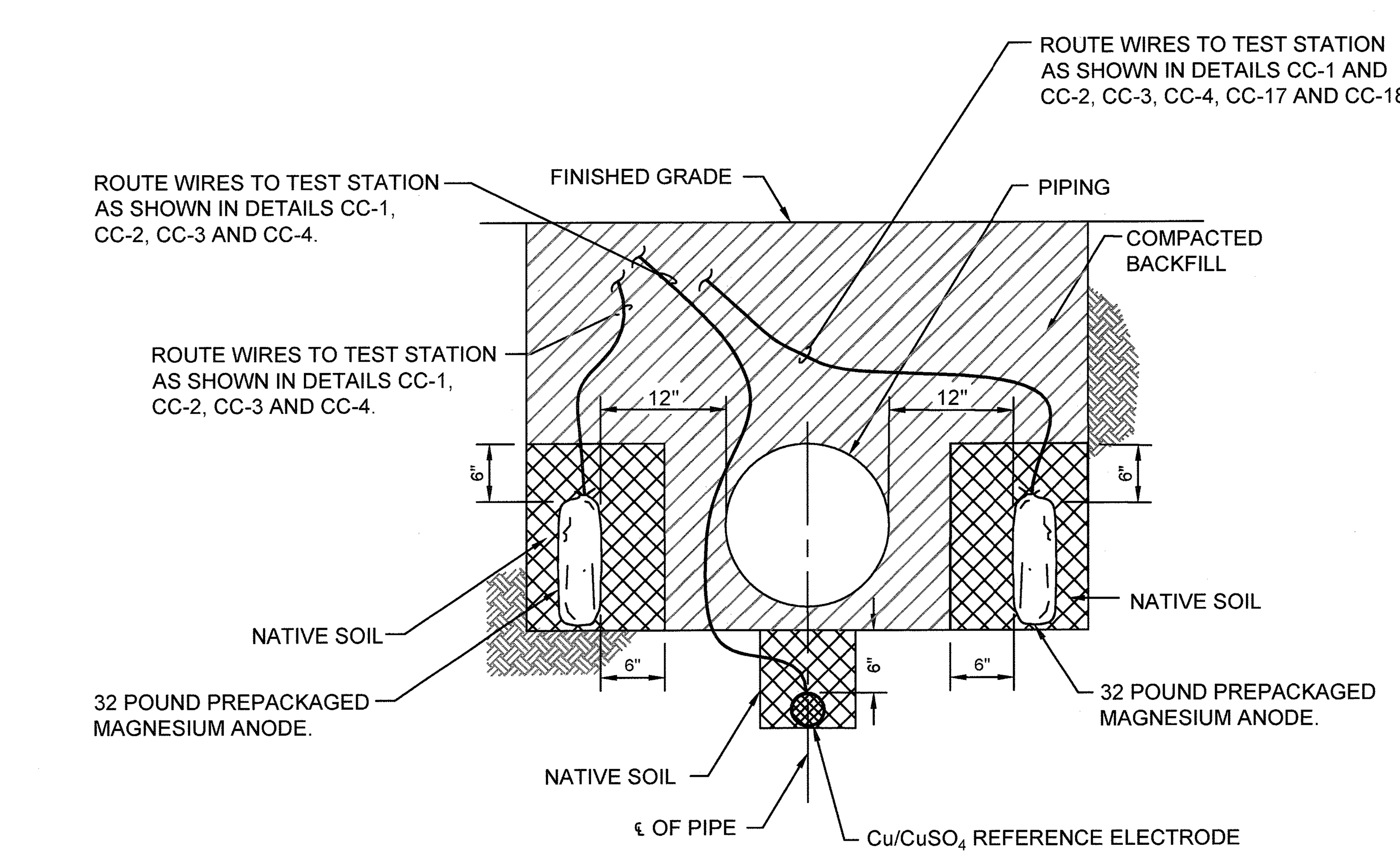
TERMINAL #1	-	NEW WATER MAIN
TERMINAL #2	-	EXISTING PIPE
TERMINAL #3	-	NEW WATER MAIN
TERMINAL #4	-	PREPACKAGED MAGNESIUM ANODE LEAD WIRES
TERMINAL #5	-	EXISTING PIPE
TERMINAL #6	-	PERMANENT REFERENCE ELECTRODE
TERMINAL #7	-	EMPTY
TERMINAL #8	-	PREPACKAGED MAGNESIUM ANODE LED WIRES

CC-13: FLUSH MOUNTED TEST STATION TERMINAL BLOCK

Scale: None

NOTES:

1. INSTALL ANODE AND REFERENCE ELECTRODE IN SOIL BACKFILL. DO NOT BACKFILL ANODE OR REFERENCE ELECTRODE WITH SAND OR STONE.
2. THE TOP OF THE ANODE SHOULD BE NO HIGHER THAN THE CROWN OF THE WATER MAIN, AND NO LOWER THAN THE SPRINGLINE OF THE WATER MAIN.



CC-14: ANODE AND REFERENCE ELECTRODE PLACEMENT

Scale: None

DEPARTMENT OF PUBLIC WORKS			
HOWARD COUNTY, MARYLAND			
DIRECTOR OF PUBLIC WORKS	DATE 1/19/18	CHIEF - BUREAU OF ENGINEERING	DATE 1/17/18
CHIEF, BUREAU OF UTILITIES	DATE 1-17-18	CHIEF, UTILITY DESIGN DIVISION PSD	DATE 1/17/18

RUSSELL CORROSION CONSULTANTS, LLC
www.RussellCorrosion.com

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. 44991, EXPIRATION DATE 01/09/2020

01/16/2018

DSN. BY: YZ					
DRN. BY: AMT					
CHK. BY: WD					
DATE: 1/16/2018	CTP	1	RECORD DRAWINGS	10/16/19	
	BY	NO.	REVISION	DATE	

CATHODIC PROTECTION DETAILS
SHEET FOUR

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

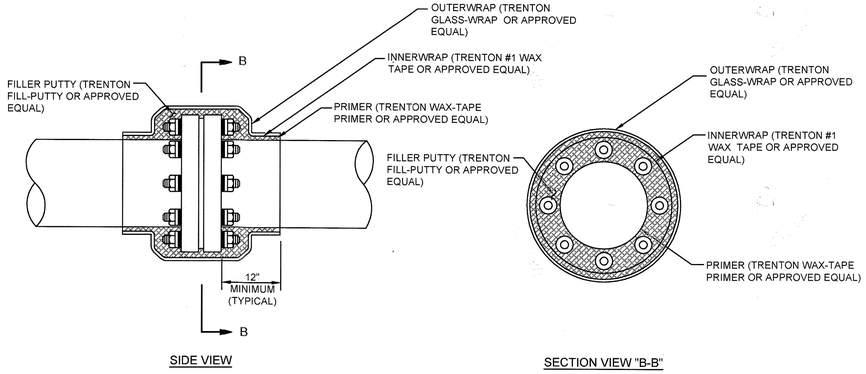
BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION

CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 40 OF 41

FILE NO. 51204-040

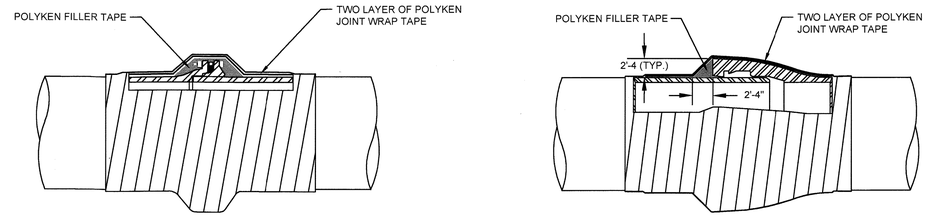


SIDE VIEW

SECTION VIEW "B-B"

CC-15: COATING OF INSULATING FLANGE DETAIL

Scale: None



MEGALUG JOINT

BELL AND SPIGOT JOINT

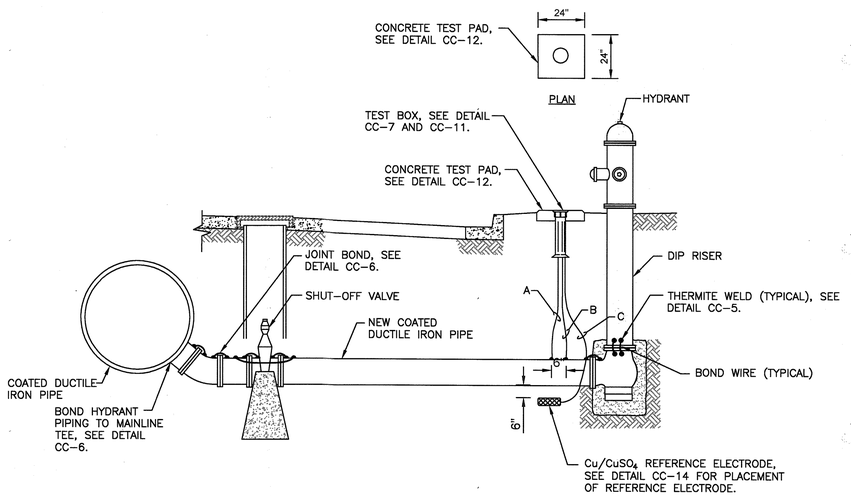
CC-16: JOINT COATING DETAIL

Scale: None

NOTES:

1. MAINTAIN SUFFICIENT SLACK IN THE TEST WIRES SO THAT THE WIRES CAN EXTEND A MINIMUM OF 18 INCHES FROM THE TEST BOX.
2. BOND ALL DUCTILE IRON COMPONENTS TOGETHER WITH AWG NO. 4 HMWPE WIRES.
3. INSTALL BOND WIRES ON TOP OF PIPE OR FITTING WHERE POSSIBLE.
4. INSTALL A MINIMUM OF TWO BOND CABLES ACROSS EACH PIPE JOINT.
5. SEE DETAIL CC-6 FOR BONDING OF VALVE.
6. INSTALL BOND CABLES ON HYDRANT RISER PIPE AND RISER ELBOW BEFORE INSTALLING RISER PIPE IN EXCAVATION.

WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE OF INSULATION	COLOR OF INSULATION
NEW WATER MAIN	A B	1 3	#10 #8	THWN THWN	WHITE WHITE
PERMANENT REFERENCE ELECTRODE	C	6	#12	THWN	RED



CC-17: HYDRANT TEST STATION

Scale: None

Bar Wrapped Pipe Option						
Test Station Number	Pipe Size (inch)	Test Station Type	Anode Number	Size (lb)	Material	Station Number
1	30	IJ	-	-	-	0+00
2	30	Hydrant	-	-	-	1+22
3	30	Hydrant	-	-	-	6+15
4	30	Hydrant	-	-	-	11+08
5	30	Hydrant	-	-	-	15+48
6	30	Hydrant	-	-	-	19+08
7	30	Hydrant	-	-	-	26+48
8	30	Hydrant	-	-	-	29+78
9	30	Hydrant	-	-	-	36+00
10	30	Hydrant	-	-	-	40+74
11	30	IJ	-	-	-	43+42

NOT USED

Ductile Iron Pipe Option						
Test Station Number	Pipe Size (inch)	Test Station Type	Anode Number	Size (lb)	Material	Station Number
1	24 ~~30~~	IJ w/Anodes	4 ~~8~~	32	Magnesium	0+00
2	30	Hydrant	-	-	-	1+22
3	30	Hydrant	-	-	-	6+15
4	30	Hydrant w/Anodes	2	32	Magnesium	11+08
5	30	Hydrant	-	-	-	15+48
6	30	Hydrant w/Anodes	2	32	Magnesium	19+08
7	30	Hydrant	-	-	-	26+48
8	30	Hydrant	-	-	-	29+78
9	30	Hydrant	-	-	-	36+00
10	30	Hydrant w/Anodes	2	32	Magnesium	40+74
11	30	IJ w/Anodes	4 ~~8~~	~~32~~	~~Magnesium~~	43+42

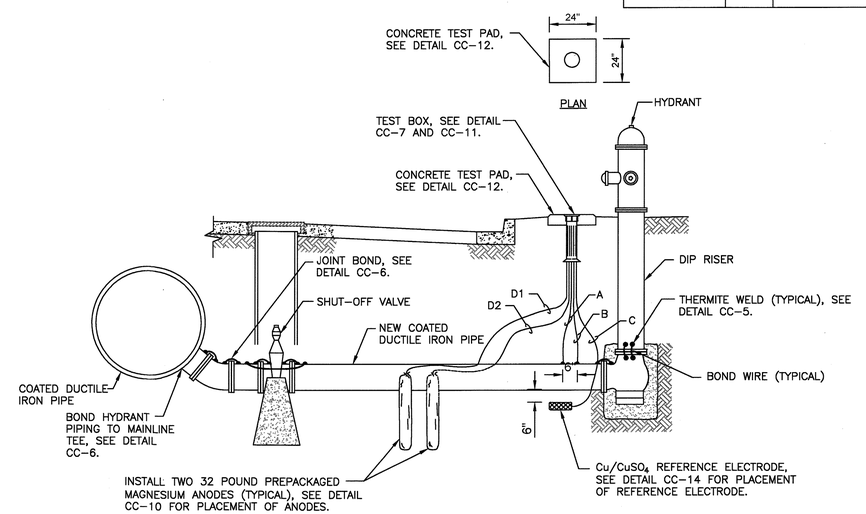
32# Mg/30# Zn 2 Magnesium/2 Zinc

NOTE: SEE SHEETS 6-10 FOR AS-BUILT WATER MAIN ALIGNMENT AND STATIONING.

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 INCHES FROM THE TEST BOX.
3. BOND ALL DUCTILE IRON COMPONENTS TOGETHER WITH AWG NO. 4 HMWPE WIRES.
4. INSTALL BOND WIRES ON TOP OF PIPE OR FITTING WHERE POSSIBLE.
5. INSTALL A MINIMUM OF TWO BOND CABLES ACROSS EACH PIPE JOINT.
6. SEE DETAIL CC-6 FOR BONDING OF VALVE.
7. INSTALL BOND CABLES ON HYDRANT RISER PIPE AND RISER ELBOW BEFORE INSTALLING RISER PIPE IN EXCAVATION.

WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE OF INSULATION	COLOR OF INSULATION
NEW WATER MAIN	A B	1 3	#10 #8	THWN THWN	WHITE WHITE
PERMANENT REFERENCE ELECTRODE	C	6	#12	THWN	RED
PREPACKAGED MAGNESIUM ANODE	D1 D2	4 4	#12 #12	THW, THWN OR THHN	BLACK BLACK



CC-18: HYDRANT TEST STATION WITH ANODES

Scale: None

PCCP Option						
Test Station Number	Pipe Size (inch)	Test Station Type	Anode Number	Size (lb)	Material	Station Number
1	30	IJ	-	-	-	0+00
2	30	Hydrant	-	-	-	1+22
3	30	Hydrant	-	-	-	6+15
4	30	Hydrant	-	-	-	11+08
5	30	Hydrant	-	-	-	15+48
6	30	Hydrant	-	-	-	19+08
7	30	Hydrant	-	-	-	26+48
8	30	Hydrant	-	-	-	29+78
9	30	Hydrant	-	-	-	36+00
10	30	Hydrant	-	-	-	40+74
11	30	IJ	-	-	-	43+42

NOT USED

RECORD DRAWINGS

This record drawing has been prepared, in part, based upon information furnished by others. While this information is believed to be reliable, the consultant assumes no responsibility for the accuracy of this record drawing or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided. Those relying on this record document are advised to obtain independent verification of its accuracy.

O'BRIEN & GERE ENGINEERS, INC.

By: _____

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/19/18
CHIEF — BUREAU OF ENGINEERING — DATE 1/17/18
CHIEF, BUREAU OF UTILITIES — DATE 1-17-18
CHIEF, UTILITY DESIGN DIVISION PSD — DATE 1/17/18

RUSSELL CORROSION CONSULTANTS LLC
www.RussellCorrosion.com

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. 44991, EXPIRATION DATE 01/09/2020

STATE OF MARYLAND — WILLIAM DAVID — No. 44991 — PROFESSIONAL ENGINEER

01/16/2018

DSN. BY:	YZ
DRN. BY:	AMT
CHK. BY:	WD
DATE:	1/16/2018

BY	NO.		DATE
CTP	2	RECORD DRAWINGS	10/16/19
YZ	1	DESIGN REVISION NO. 4	2/26/19

CATHODIC PROTECTION DETAILS
SHEET FIVE

600' SCALE MAP NO. 36 BLOCK NO. 14, 20, 21

BROKEN LAND PARKWAY
30-INCH WATER TRANSMISSION MAIN EXTENSION
CAPITAL PROJECT: W-8307
CONTRACT NO.: 44-4958
ELECTION DISTRICT: 6
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 41 OF 41

FILE NO. 51204-041

N:\CC\PROJECT\O'BRIEN & GERE\HOWARD CO\BROKEN LAND PKWY 2016\RCC# 169528.00 (HOCO BROKEN LAND PARKWAY) CP DESIGN\DRAWING SET\RCC# 169528.00 (HOCO BROKEN LAND PARKWAY) CP DESIGN.DWG