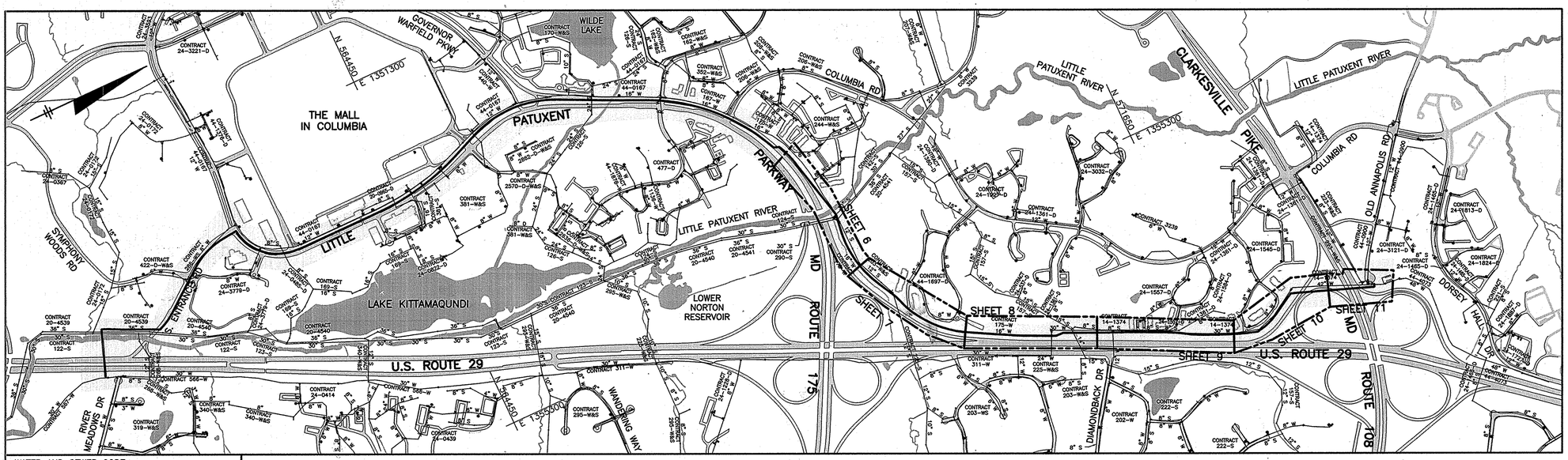
I:\HOWARD-CO.2343\45854.RT-29-RT-108-WA\DOCS\DWG\SPLIT-SETS\SHEETS\45854-201.DWG

U.S. ROUTE 29 WATER TRANSMISSION MAIN: LITTLE PATUXENT PARKWAY TO MD ROUTE 108

QUANTITIES					
ITEM	BID AMOUNT	UNIT	AS-BUILT AMOUNT	MATERIAL	SUPPLIER
36" WATER RJ (BY OPEN CUT METHODS)	3,468	L.F.			
36" WATER (BY OPEN CUT METHODS)	3,100	L.F.			
36" WATER RJ (BY TUNNELING METHOD)	752	L.F.			
60" ID CASING PIPE	752	L.F.			
ACCESS/BLOW-OFF MANHOLE ASSEMBLY	7	EA.			
42" RSGV	1	EA.			
36" RSGV	4	EA.			
30" RSGV	3	EA.			
12" RSGV	1	EA.			
AIR RELEASE MANHOLE	2	EA.			

CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS



VICINITY MAP
SCALE: 1" = 600'

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

SEDIMENT CONTROL MEASURES FOR THIS CONTRACT WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION ~~219~~ 308 OF THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS.

HOWARD SOIL CONSERVATION DISTRICT CERTIFICATION:

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

Howard Soil Conservation District EP:16-20 — 1 Date 6/28/16

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 18523 — Date 2/17/16

OWNERS/DEVELOPER CERTIFICATION:

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

Signature of Developer — Date 2/22/16

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
CHIEF - BUREAU OF ENGINEERING — DATE 2/23/16
CHIEF, BUREAU OF UTILITIES — DATE 2/24/16
CHIEF, UTILITY DESIGN DIVISION — DATE 2/25/16

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

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 18523, EXPIRATION DATE 12/08/2017

STATE OF MARYLAND — ROBERT JOHN PUSEY — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	GLF
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	02/16

BY	NO.	REVISION	DATE
RJD	0	AS BID	02/16

COVER SHEET

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 1 OF 38

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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 PROJECT 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 ON JUNE, 2012 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. 30G4 AND NO. 36AA. 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.

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 IN ADVANCE OF DEVELOPING THE LAY SCHEDULE 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 STRIP ARE NOT TO BE REMOVED OR DAMAGED BY THE CONTRACTOR.

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. 36-INCH WATER MAIN DESIGN CRITERIA:
   A. THIS PROJECT MAY BE BID USING ONE OF THE FOLLOWING PIPE MATERIALS FOR THE PROPOSED 36-INCH WATER MAIN (PCCP, BWCCP, OR TAPE COATED DIP).
   B. RESTRAINED JOINTS ARE TO BE USED ON THE 36" MAIN PER THE LIMITS SHOWN ON THE DESIGN PLANS.
   C. ALL FITTINGS ON THE 36" MAIN SHALL BE RESTRAINED JOINT UNLESS OTHERWISE NOTED. ALL FITTINGS ON SMALLER MAINS SHALL BE RESTRAINED 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 IS BASED ON PCCP, IF DIFFERENT PIPE MATERIAL IS SELECTED, THE LAY SCHEDULE SHALL BE CAD BASED ABLE TO TIE INTO CONTRACT DRAWINGS TO ENABLE ENGINEER TO REVIEW THE IMPACT OF ALIGNMENT CHANGES. CAD DRAWINGS TO 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. 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.

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

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

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

22. WHERE THE PROPOSED MAIN PARALLELS EXISTING MAINS, THE APPROXIMATE ELEVATION OF THE EXISTING MAIN IS SHOWN IN THE PROFILES. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING MAIN AS WELL AS ANY EXISTING THRUST RESTRAINT.

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

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

25. 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. ALL D.I.P. SHALL HAVE A MINIMUM OF 150 PSI WORKING PRESSURE AND SPECIAL THICKNESS CLASS SHALL BE 54.

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

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

28. IN ACCORDANCE WITH THE 10 STATE STANDARD REQUIREMENTS - ALL CROSSINGS OF THE NEW WATER MAIN WITH EXISTING SANITARY OR STORM SEWER PIPING (RESULTING IN LESS THAN 18" OF SEPARATION) SHALL BE ACCOMPLISHED BY CENTERING A FULL LENGTH OF NEW WATER MAIN PIPING AT THE CROSSING TO MAXIMIZE THE DISTANCE OF ANY WATER MAIN JOINT FROM THE CROSSING.

29. 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.

30. 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.

INDEX OF DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
CHIEF - BUREAU OF ENGINEERING — DATE 2/23/16
CHIEF, BUREAU OF UTILITIES — DATE 2/24/16
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STATE OF MARYLAND — ROBERT JOHN DUNN — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	GLF
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	02/16

BY	NO.	REVISION	DATE
RJD	0	AS BID	02/16

GENERAL NOTES AND INDEX OF DRAWINGS

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
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SCALE AS SHOWN

SHEET 2 OF 38

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SOIL BORINGS

BORING NUMBER	EASTING	NORTHING	DESCRIPTION
B-19	1354302.70	568366.46	MINIMUM DISTANCE BETWEEN BORINGS
B-20	1354606.23	568440.09	RIVER CROSSING
B-21	1354702.48	568460.88	RIVER CROSSING
B-22	1355402.61	568484.07	MINIMUM DISTANCE BETWEEN BORINGS
B-23	1356189.17	568877.20	MINIMUM DISTANCE BETWEEN BORINGS
B-24	1356569.29	569421.53	MINIMUM DISTANCE BETWEEN BORINGS
B-25	1356894.15	570035.94	22.5° BEND
B-26	1356961.46	570258.62	MINIMUM DISTANCE BETWEEN BORINGS
B-27	1357114.17	570594.04	36"x16" TEE
B-28	1357374.01	571149.20	MINIMUM DISTANCE BETWEEN BORINGS
B-29	1357559.86	571488.08	MINIMUM DISTANCE BETWEEN BORINGS
B-30	1357751.73	571963.22	MINIMUM DISTANCE BETWEEN BORINGS
B-31	1357534.55	572472.37	36" TEE
B-32	1357555.22	572520.42	END CASING TUNNEL
B-33	1357664.64	572785.39	CASING TUNNEL IN ROADWAY SHOULDER
B-34	1357769.72	573066.02	CASING TUNNEL IN MEDIAN
B-35	1357826.69	573231.96	BEGIN CASING TUNNEL
B-36	1357836.66	573307.51	36" GATE VALVE AT TIE-IN

SURVEY CONTROL DATA

#	NORTHING	EASTING	ELEVATION	DESCRIPTION
900	572257.2154	1358006.9106	369.09	IRON ROD AND CAP
901	571346.9665	1357567.8741	343.20	IRON ROD AND CAP
902	570593.7852	1357213.5062	337.79	IRON ROD AND CAP
903	569778.4255	1356829.3967	357.45	IRON ROD AND CAP
904	569105.7221	1356521.9235	352.36	IRON ROD AND CAP
905	568593.1857	1355930.7812	331.09	IRON ROD AND CAP
906	568273.8373	1355154.5914	334.04	IRON ROD AND CAP
907	568353.1856	1354123.0573	336.68	IRON ROD AND CAP

36" DIA. WATER MAIN COORDINATE TABLE

STATION	ITEM	NORTHING	EASTING
0+55.60	PC	568317.41	1354019.36
3+84.60	PT	568404.76	1354335.30
6+87.48	BLOW-OFF MANHOLE	568441.29	1354635.97
7+72.31	36" 11.25-DEGREE HB	568451.47	1354720.19
9+54.80	36" RSGV	568437.78	1354902.17
10+26.75	PC	568432.35	1354973.91
16+46.94	PT	568557.82	1355572.92
18+47.99	PC	568652.15	1355750.47
19+57.95	PT	568695.92	1355851.22
20+17.51	PC	568715.30	1355907.54
21+94.66	PT	568792.71	1356066.39
22+35.44	PC	568814.91	1356100.59
27+73.00	PT	569204.04	1356463.69
30+00.00	AIR RELEASE MANHOLE	569402.57	1356573.76
34+98.51	36" RSGV	569842.62	1356802.50
36+81.10	36"x30" TEE	570007.81	1356881.16
36+81.10	30" RSGV	570012.14	1356871.95
36+81.10	30"x30" TEE	570024.57	1356845.33
36+90.32	30" RSGV	570033.68	1356849.59
36+96.80	BLOW-OFF MANHOLE	570039.83	1356852.27
37+09.89	36" 22.5-DEGREE HB	570035.74	1356894.14
37+93.89	36" 22.5-DEGREE HB	570116.46	1356898.22
39+75.00	BLOW-OFF MANHOLE	570284.04	1356974.85
43+07.32	36"x12" TEE	570586.62	1357112.24
43+07.64	12" 90-DEGREE HB	570583.99	1357118.81
43+22.09	12" RSGV	570597.02	1357125.09
43+27.30	12"x12" TEE	570601.76	1357127.23
48+23.61	PC	571054.55	1357330.38
49+40.00	AIR RELEASE MANHOLE	571157.77	1357384.07
50+78.17	PRC	571275.85	1357459.39
52+78.20	BLOW-OFF MANHOLE	571445.17	1357561.98
53+31.42	PT	571492.84	1357585.65
56+34.37	PC	571766.47	1357715.65
60+96.84	PT	572210.48	1357696.42
63+00.00	ACCESS MANHOLE	572385.76	1357593.70
63+15.93	36" RSGV	572399.50	1357585.65
63+55.48	36"x30" TEE	572433.62	1357565.65
63+55.48	30" RSGV	572429.99	1357559.50
63+55.48	30"x30" TEE	572426.38	1357553.31
64+08.94	36" 45-DEGREE HB	572480.92	1357540.80
64+59.77	START 60" CASING PIPE	572528.59	1357558.22
72+11.58	END 60" CASING PIPE	573231.75	1357822.01
72+71.60	ACCESS MANHOLE	573288.68	1357843.51
72+86.11	36" 90-DEGREE HB	573302.28	1357848.25
73+09.00	36" RSGV	573311.21	1357827.27
73+18.43	42"x36" TEE	573314.74	1357818.43

LEGEND
(PLAN AND PROFILE SHEETS)

- SIDEWALK
- PAVEMENT (EDGE)
- GRAVEL (EDGE)
- CONCRETE (EDGE)
- BUILDING
- CENTERLINE
- SHA THRU HIGHWAY RIGHT-OF-WAY
- PROPERTY LINE/RIGHT-OF-WAY
- GUARDRAIL
- FENCE (WOOD)
- FENCE IRON, RAIL
- FENCE(CHAINLINK)
- UNDG ELECTRIC LINE
- UNDG TELEPHONE LINE
- UNDG CABLE LINE
- UNDG FIBER OPTIC LINE
- OVERHEAD UTILITIES
- SANITARY SEWER
- STORM DRAIN
- WATER MAIN
- PROPOSED WATER
- GAS
- DITCH
- STREAM
- WOODLINE
- BUSH
- RIP-RAP DITCH
- MILL AND OVERLAY
- SB# BORING LOCATION
- TH-# TEST PIT LOCATION
- BM # BM #
- REBAR REBAR
- FLY FLY STATION
- ABANDON IN PLACE EX. WM
- WET LIMITS OF WETLANDS
- WB WETLANDS BUFFER LINE
- UTILITY EASEMENT

- MAIL BOX
- VENT
- STORM DRAIN MH
- HEADWALL/ENDWALL
- DROP INLET GRATE
- DROP INLET
- ROAD SIGN
- TELE. JUNC. BOX
- UTILITY POLE
- LIGHT POLE
- GUY WIRE
- GROUND LIGHT
- ELEC. TRANSFORMER
- ELEC. MH
- ELEC. JUNC. BOX
- 325.5 SPOT ELEVATION
- CATV CABLE BOX
- SAN. SEW. MH
- CLEAN OUT
- WATER VALVE
- RSG VALVE
- WATER METER
- WATER MAIN VALVE VAULT
- IRRIGATION VALVE
- FIRE HYDRANT
- GAS VENT PIPE
- GAS VALVE
- GP GAS PUMP
- GAS LINE MARKER
- IPF IRON PIPE FOUND
- RBC REBAR AND CAP
- TRAVERSE STATION
- P POINT OF CONNECTION
- CP/CT CORROSION PROTECTION AND CONTINUITY TESTING STATION

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
DEFL.	DEFLECTION
DEG.	DEGREE
DET OR DTL.	DETAIL
DIP	DUCTILE IRON PIPE
DR	DRIVE
E OR ELEC	ELECTRIC
EA	EACH
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
HC	HOWARD COUNTY
HCR	HORIZONTAL CURVE RADIUS
HDP	HORIZONTAL DEFLECTION POINT
HDPE	HIGH DENSITY POLYETHYLENE
HORIZ OR HOR	HORIZONTAL
INV	INVERT
JT	JOINT
LF	LINEAR FOOT
LOD	LIMIT OF DISTURBANCE
MAC	MACADAM
MBR	MINIMUM BENDING RADIUS
MD	MARYLAND
MH	MANHOLE
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO	NUMBER
PC	POINT OF CURVE
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
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 OR VT	VERTICAL
W	WATER
W/	WITH
WHC	WATER HOUSE CONNECTION
WM	WATER MAIN

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
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BOWIE, MD 20716
PHONE: 301-731-5622

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 18523, EXPIRATION DATE 12/08/2017

STATE OF MARYLAND — ROBERT JOHN DUNN — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	GLF
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	02/16

BY	NO.	REVISION	DATE
RJD	0	AS BID	02/16

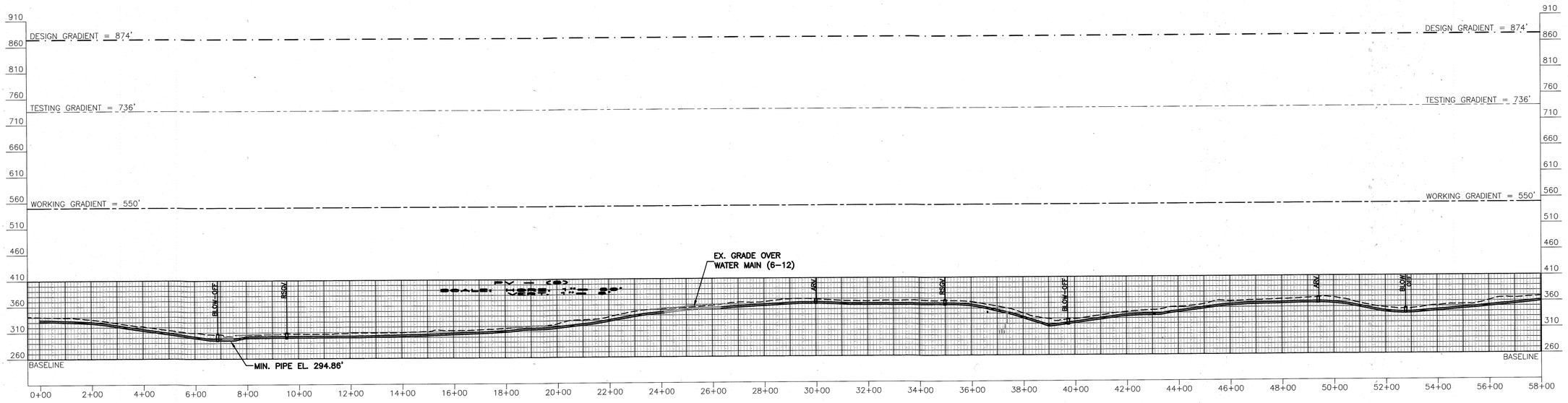
SCHEDULES, TABLES, LEGEND AND ABBREVIATIONS

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

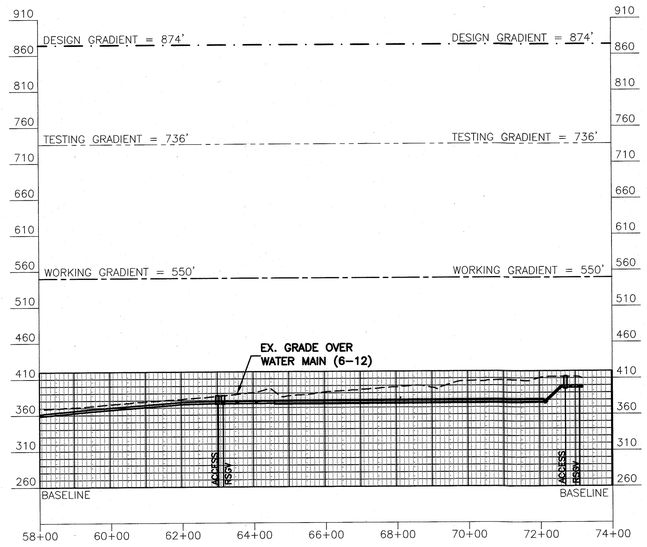
SCALE AS SHOWN

SHEET 3 OF 38



HYDRAULIC PROFILE

HORIZ. SCALE: 1"=200'
VERT. SCALE: 1"=100'



HYDRAULIC PROFILE

HORIZ. SCALE: 1"=200'
VERT. SCALE: 1"=100'

GRAPHIC SCALES

VERTICAL 1"=100' 100 0 100 200

HORIZONTAL 1"=200' 200 0 200 400

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
CHIEF - BUREAU OF ENGINEERING — DATE 2/23/16
CHIEF, BUREAU OF UTILITIES — DATE 2/24/16
CHIEF, UTILITY DESIGN DIVISION — DATE 2/23/16

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

PROFESSIONAL CERTIFICATION:
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STATE OF MARYLAND — ROBERT JOHN DAVIS — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	GLF
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	02/16

BY	NO.	REVISION	DATE
JPC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

HYDRAULIC PROFILE

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 4 OF 38

FILE NO. 33498-XXXF

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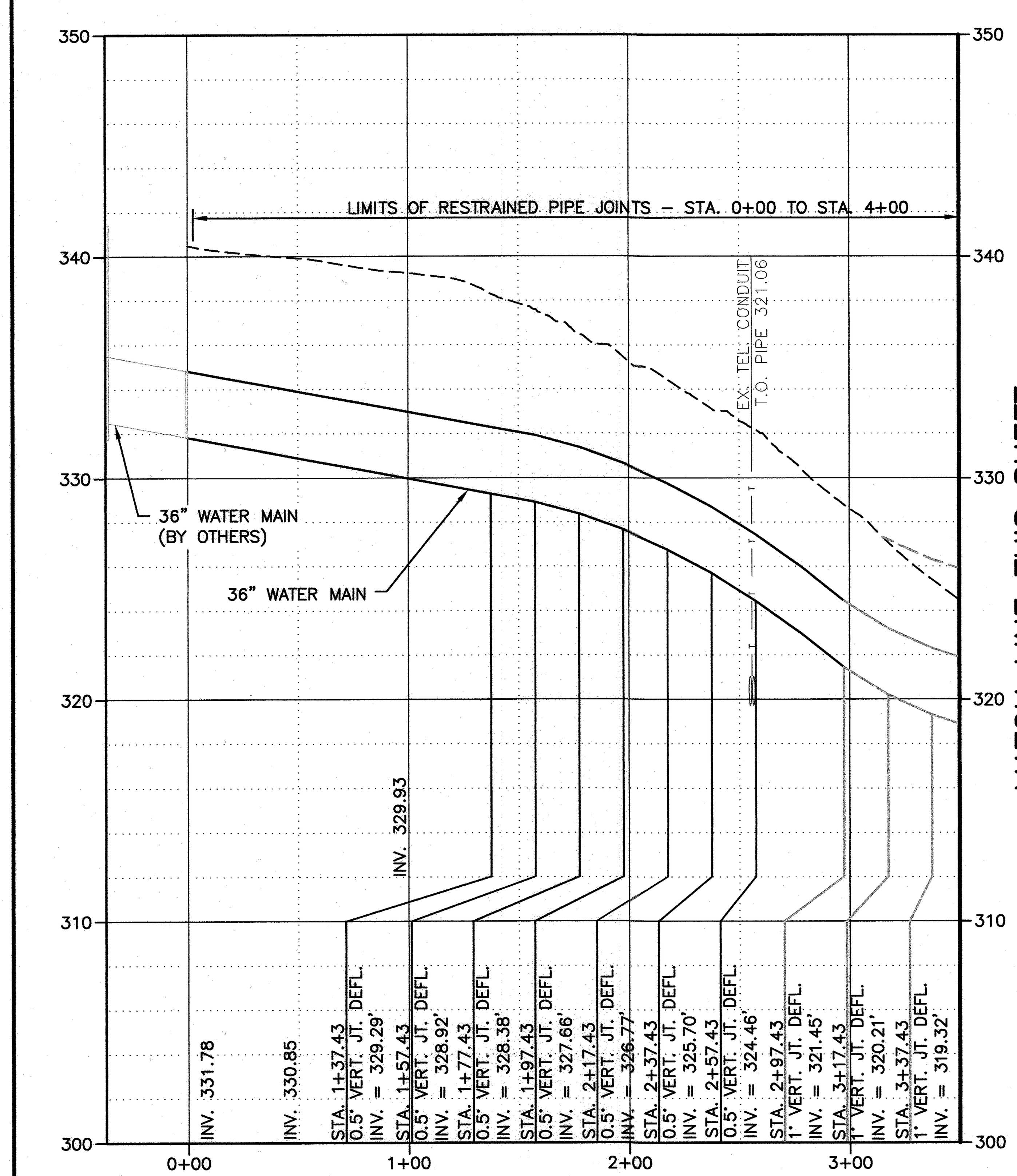

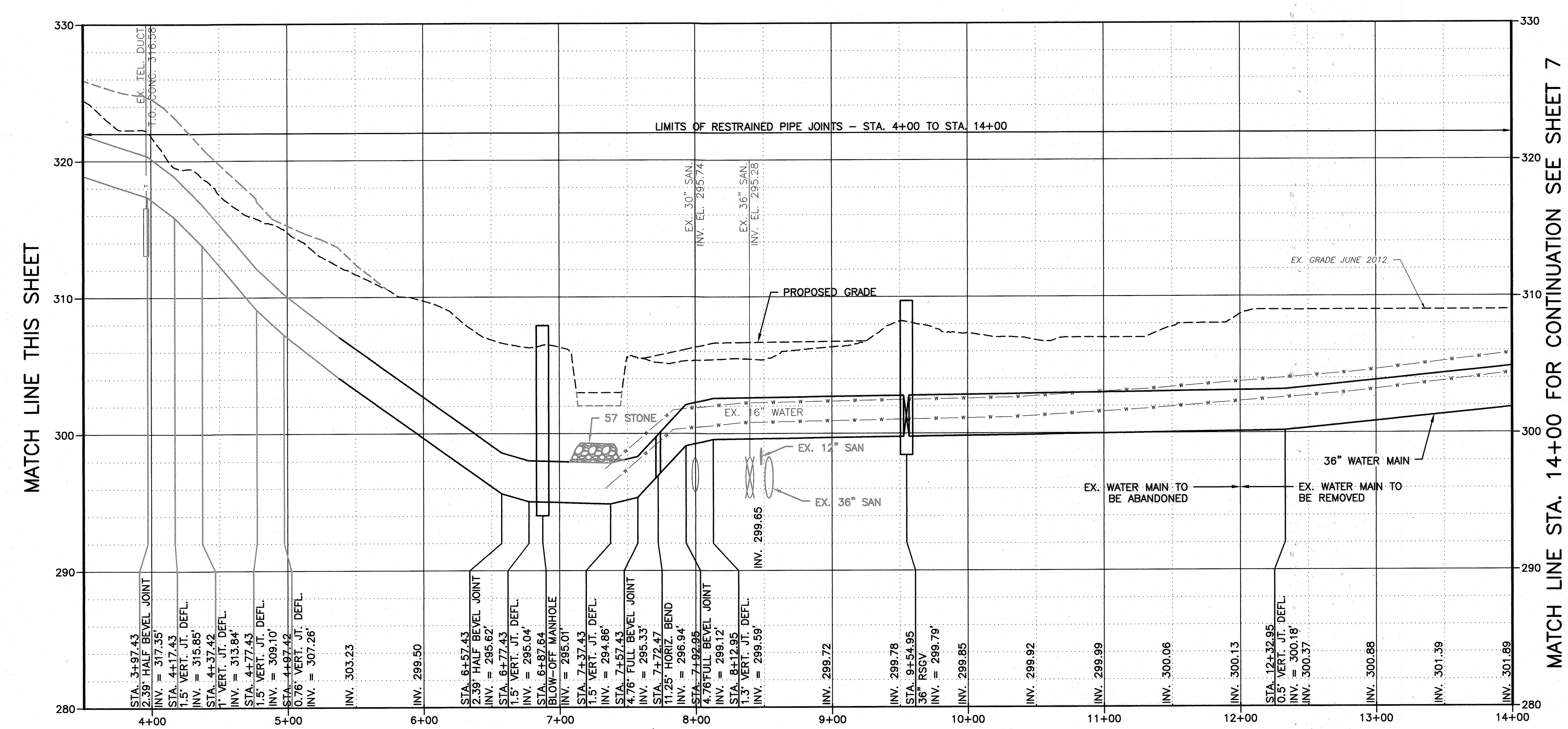

GRAPHIC SCALES
VERTICAL 1"=5'
HORIZONTAL 1"=50'

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
CHIEF – BUREAU OF ENGINEERING — DATE 2/23/16
CHIEF, BUREAU OF UTILITIES — DATE 2/24/16
CHIEF, UTILITY DESIGN DIVISION — DATE

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

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DSN. BY:	GLF
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	02/16

BY	NO.	REVISION	DATE
JPC	4	RECORD DRAWINGS	11/20
LR	3	RECORD DRAWINGS	05/19
RJD	2	DESIGN REVISION #2	01/18
RJD	1	DESIGN REVISION #1	08/17
RJD	0	AS BID	02/16

PLAN AND PROFILE
STA. 0+00 TO STA. 14+00

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108

CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 6 OF 38

FILE NO. 33498-XXXF

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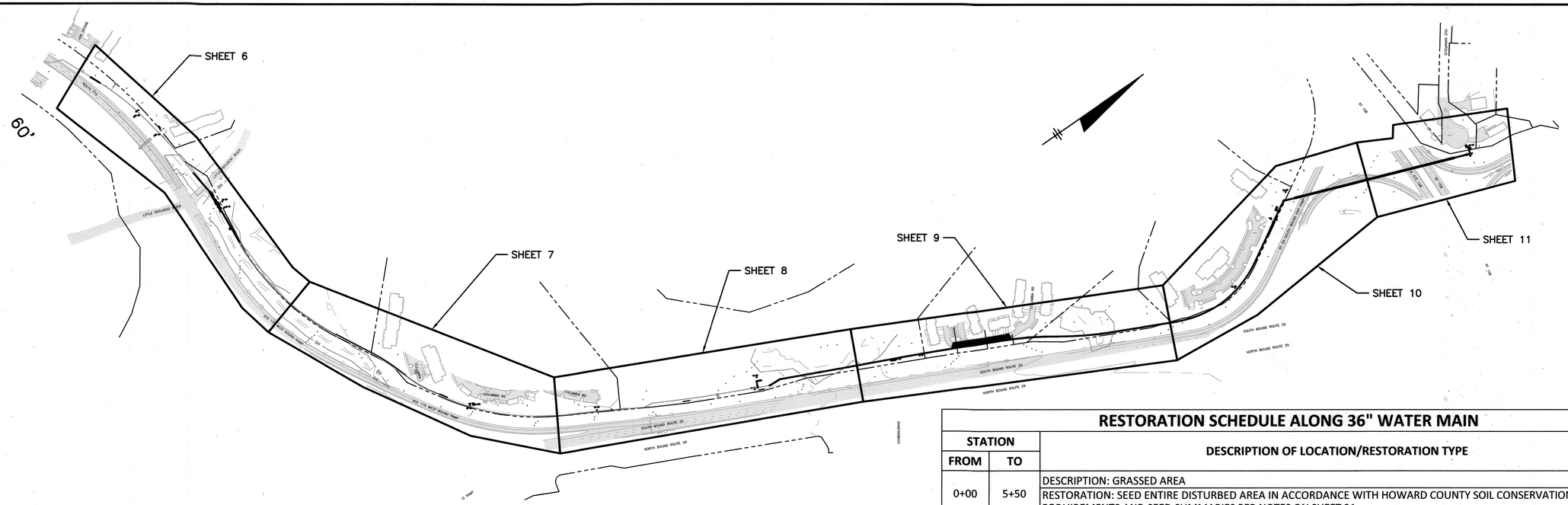

RESTORATION SCHEDULE ALONG 36" WATER MAIN

STATION FROM	STATION TO	DESCRIPTION OF LOCATION/RESTORATION TYPE
0+00	5+50	DESCRIPTION: GRASSED AREA RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH HOWARD COUNTY SOIL CONSERVATION DISTRICT REQUIREMENTS AND SEED SUMMARIES PER NOTES ON SHEET 21
5+50	7+10	DESCRIPTION: WETLAND AREA RESTORATION: RESTORE WITH WETLAND IN ACCORDANCE WITH WETLAND PLANTING MIX AS INCLUDING WITHIN THE USACE 2013-60399-M37 WETLAND PERMIT.
7+10	7+50	DESCRIPTION: STREAM CROSSING RESTORATION: RESTORE STREAMBANKS WITH IMBRICATED RIPRAP PER DETAIL 2.2 ON SHEET 20. RESTORE THE STREAM BOTTOM PER DETAIL 4.2 (B) ON SHEET 20.
7+50	15+00	DESCRIPTION: GRASSED AREA RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH HOWARD COUNTY SOIL CONSERVATION DISTRICT REQUIREMENTS AND SEED SUMMARIES PER NOTES ON SHEET 21
15+00	15+75	DESCRIPTION: GOLF TEE RESTORATION: RESTORE GOLF TEE TO ORIGINAL CONDITIONS PER GOLF COURSE ON SOIL AND SEED MIX REQUIREMENTS
15+75	39+00	DESCRIPTION: GRASSED AREA RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH HOWARD COUNTY SOIL CONSERVATION DISTRICT REQUIREMENTS AND SEED SUMMARIES PER NOTES ON SHEET 21
39+00	41+00	DESCRIPTION: WETLAND AREA RESTORATION: RESTORE WITH WETLAND IN ACCORDANCE WITH WETLAND PLANTING MIX AS INCLUDING WITHIN THE USACE 2013-60399-M37 WETLAND PERMIT.
41+00	46+00	DESCRIPTION: GRASSED AREA RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH HOWARD COUNTY SOIL CONSERVATION DISTRICT REQUIREMENTS AND SEED SUMMARIES PER NOTES ON SHEET 21
45+00	49+50	DESCRIPTION: GRASSED AREA RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH MDE REQUIREMENTS. REMOVE SEVEN TREES AND PLANT SEVEN 4-INCH CALIPER TREES AND FOURTEEN SHRUBS OS SIMILAR TYPE AS ADJACENT PLANTINGS, REPLACE CONCRETE CURB.
46+00	48+75	DESCRIPTION: PAVED AREA RESTORATION: RESTORE PAVEMENT, CONCRETE CURB, AND STRIPING PER HOWARD COUNTY STANDARD PAVING SECTION P-2 AND OTHER STANDARD DETAILS. MILL AND OVERLAY FULL WIDTH OF ROAD WITH HMA SUPERPAVE FINAL SURFACE COURSE.
49+50	52+10	DESCRIPTION: GRASSED AREA RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH MDE REQUIREMENTS
52+10	53+50	DESCRIPTION: WETLAND AREA RESTORATION: RESTORE WITH WETLAND IN ACCORDANCE WITH WETLAND PLANTING MIX AS INCLUDING WITHIN THE USACE 2013-60399-M37 WETLAND PERMIT.
53+50	64+60	DESCRIPTION: GRASSED AREA RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH HOWARD COUNTY SOIL CONSERVATION DISTRICT REQUIREMENTS AND SEED SUMMARIES PER NOTES ON SHEET 21
72+00	73+20	DESCRIPTION: GRASSED AREA RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH HOWARD COUNTY SOIL CONSERVATION DISTRICT REQUIREMENTS AND SEED SUMMARIES PER NOTES ON SHEET 21

1"=250' 250 0 250 500

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

2/25/16
DIRECTOR OF PUBLIC WORKS — DATE

Mark E. Butler 2/23/16
CHIEF – BUREAU OF ENGINEERING — DATE

2/24/16
CHIEF, BUREAU OF UTILITIES — DATE

2/23/16
CHIEF, UTILITY DESIGN DIVISION — DATE

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

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 18523, EXPIRATION DATE 12/08/2017

ROBERT JOHN DUDLEY No. 18523

DSN. BY: GLF
DRN. BY: RPW
CHK. BY: RJD
DATE: 02/16

BY	NO.	REVISION	DATE
JPC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

KEY SHEET AND RESTORATION SCHEDULE

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 5 OF 38

FILE NO. 33498-XXXF

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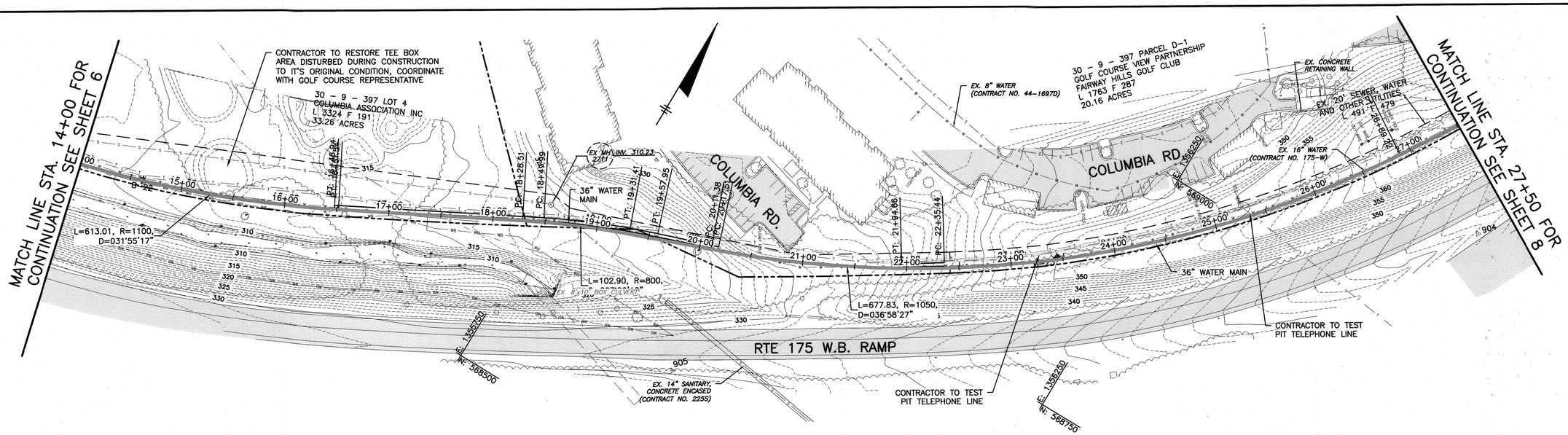
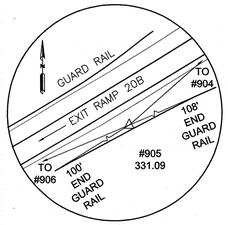
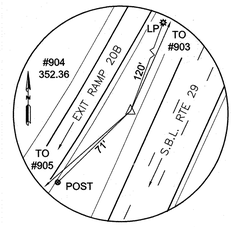




TRAVERSE 905
IRON ROD AND CAP



TRAVERSE 904
IRON ROD AND CAP

GRAPHIC SCALES

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

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

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
CHIEF - BUREAU OF ENGINEERING — DATE 2/23/16
CHIEF, BUREAU OF UTILITIES — DATE 2/24/16
CHIEF, UTILITY DESIGN DIVISION — DATE 2/24/16

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

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STATE OF MARYLAND — ROBERT JOHN LEE — REGISTERED PROFESSIONAL ENGINEER

DSN. BY: GLF
DRN. BY: RPW
CHK. BY: RJD
DATE: 02/16

BY	NO.	REVISION	DATE
JPC	3	RECORD DRAWINGS	11/20
LR	2	RECORD DRAWINGS	05/19
RJD	1	DESIGN REVISION #1	08/17
RJD	0	AS BID	02/16

PLAN AND PROFILE
STA. 14+00 TO STA. 27+50

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8298
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 7 OF 38

FILE NO. 33498-XXXF

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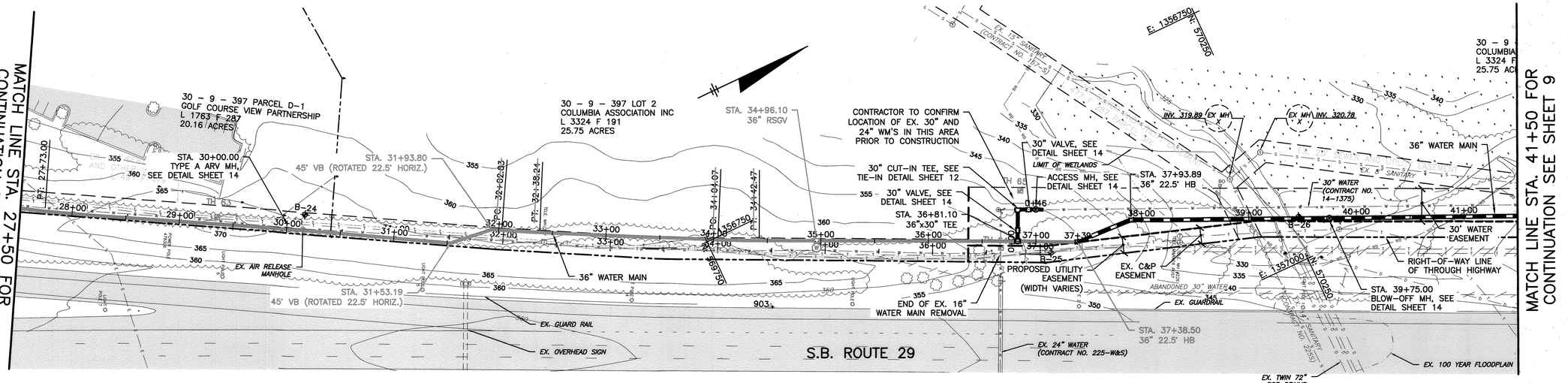

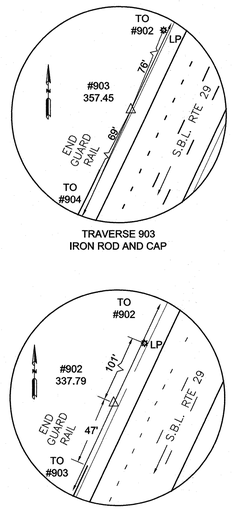

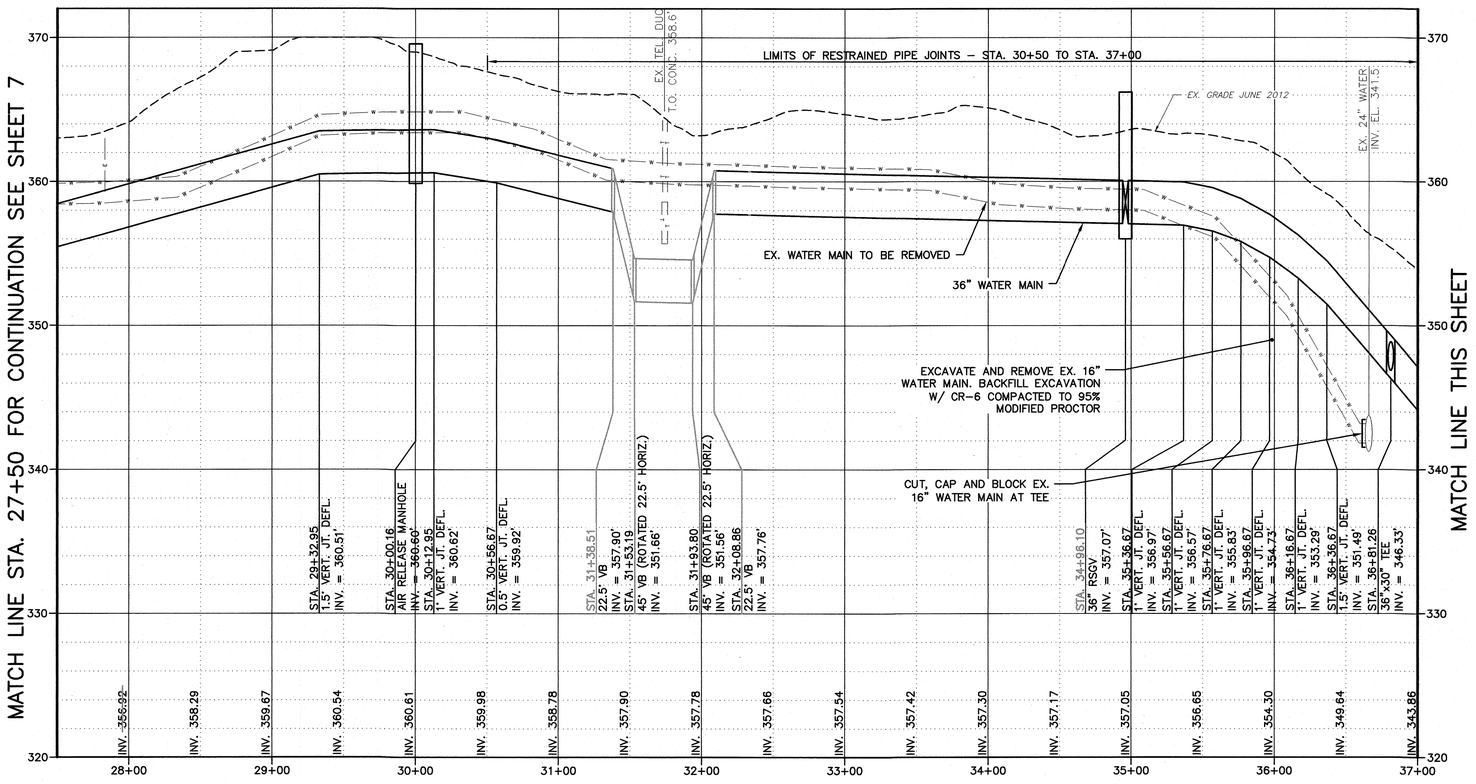

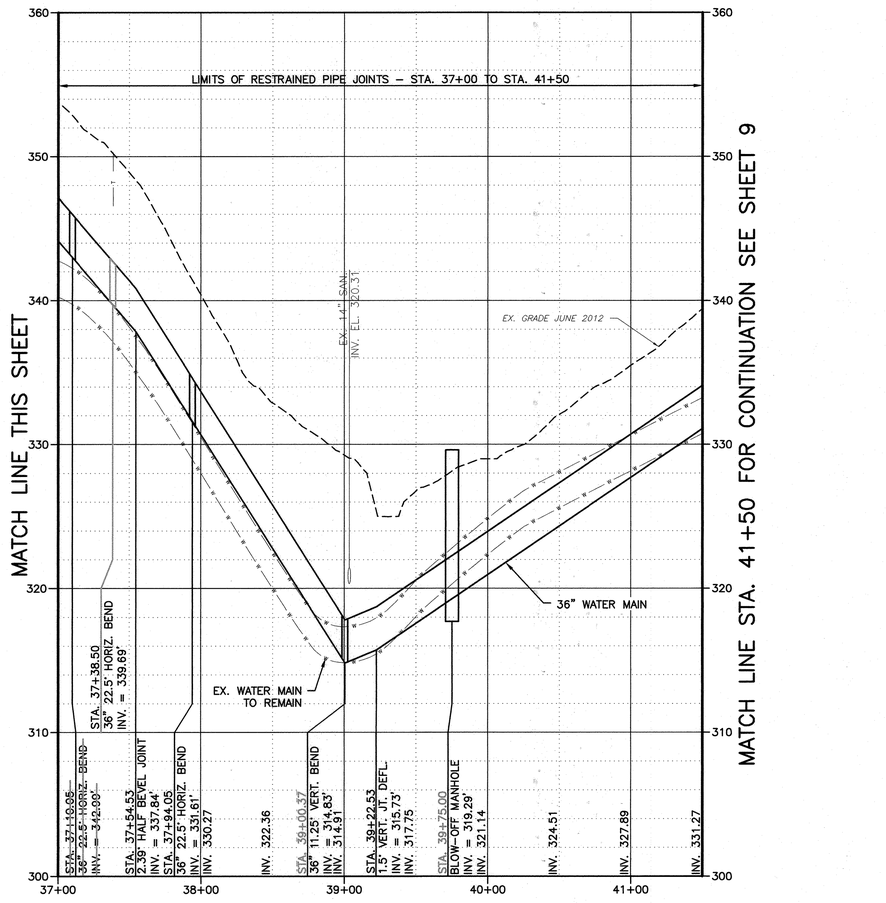

GRAPHIC SCALES

VERTICAL 1"=5' 5 0 5 10

HORIZONTAL 1"=50' 50 0 50 100

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16

CHIEF - BUREAU OF ENGINEERING — DATE 2/23/16

CHIEF, BUREAU OF UTILITIES — DATE 2/24/16

CHIEF, UTILITY DESIGN DIVISION — DATE 2/24/16

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

PROFESSIONAL CERTIFICATION:
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STATE OF MARYLAND — ROBERT JOHN FISCHER — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	GLF
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	02/16

BY	NO.	REVISION	DATE
JPC	3	RECORD DRAWINGS	11/20
LR	2	RECORD DRAWINGS	05/19
RJD	1	DESIGN REVISION #1	08/17
RJD	0	AS BID	02/16

PLAN AND PROFILE
STA. 27+50 TO STA. 41+50

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 8 OF 38

FILE NO. 33498-XXXF

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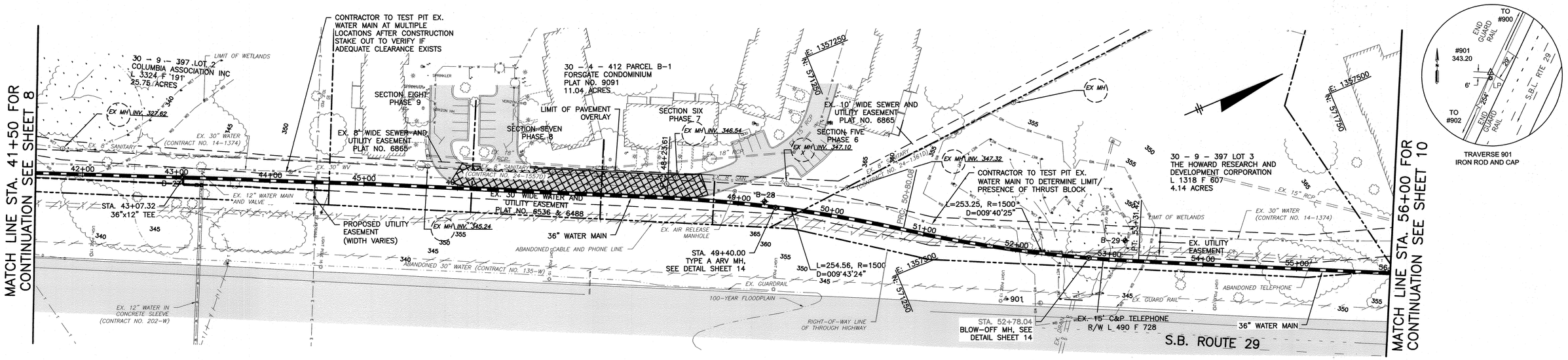

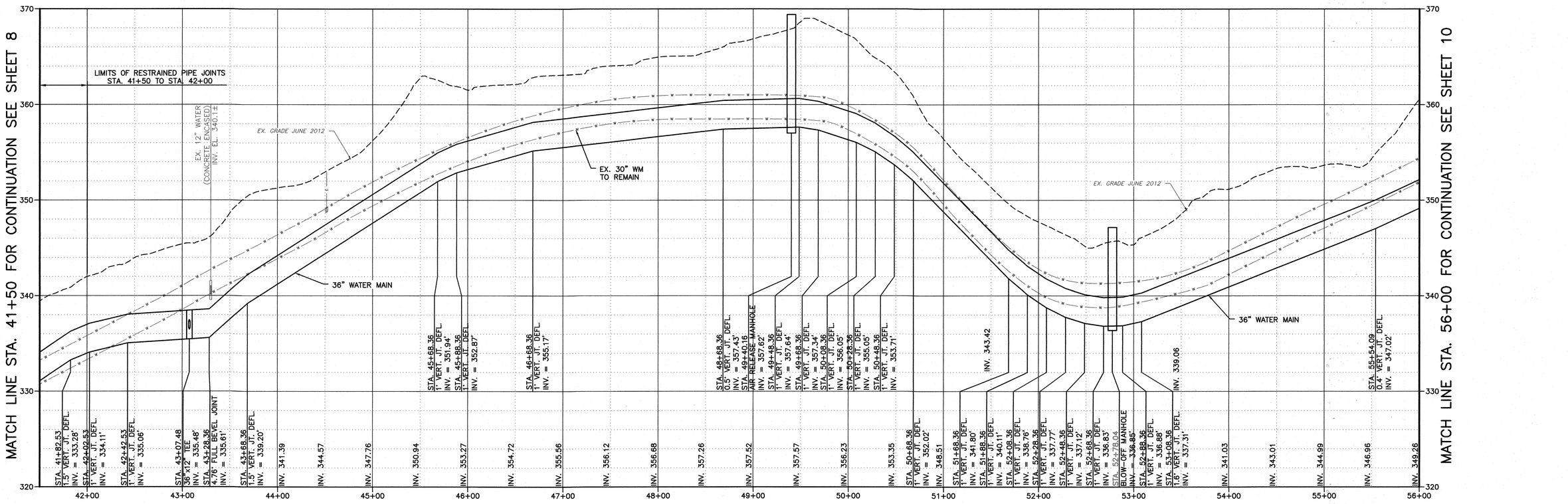

GRAPHIC SCALES

VERTICAL 1"=5' 5 0 5 10

HORIZONTAL 1"=50' 50 0 50 100

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
CHIEF, BUREAU OF ENGINEERING — DATE 2/23/16
CHIEF, BUREAU OF UTILITIES — DATE 2/24/16
CHIEF, UTILITY DESIGN DIVISION — DATE 2/25/16

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

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STATE OF MARYLAND — ROBERT JOHN DAVIS — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	GLF
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	02/16

BY	NO.	REVISION	DATE
JPC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

PLAN AND PROFILE
STA. 41+50 TO STA. 56+00

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 9 OF 38

FILE NO. 33498-XXXF

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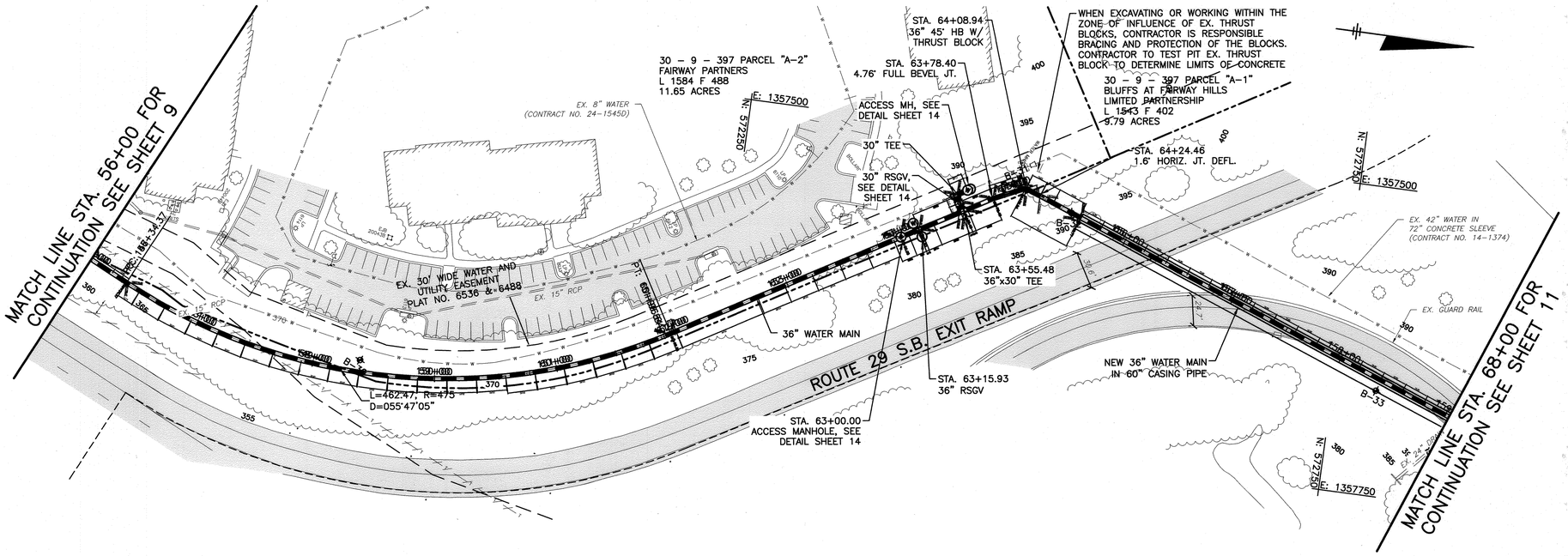
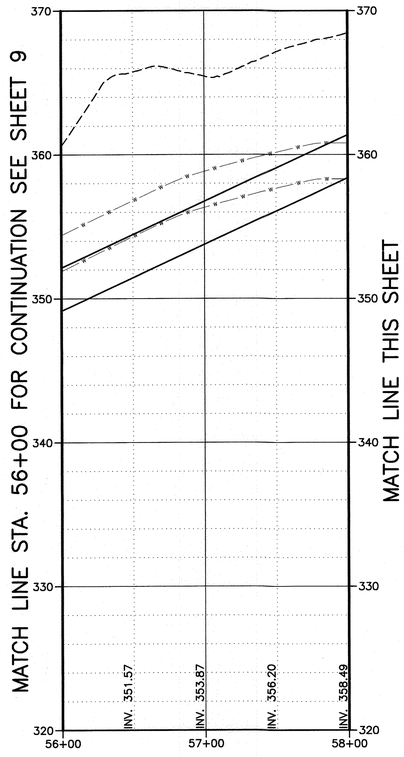
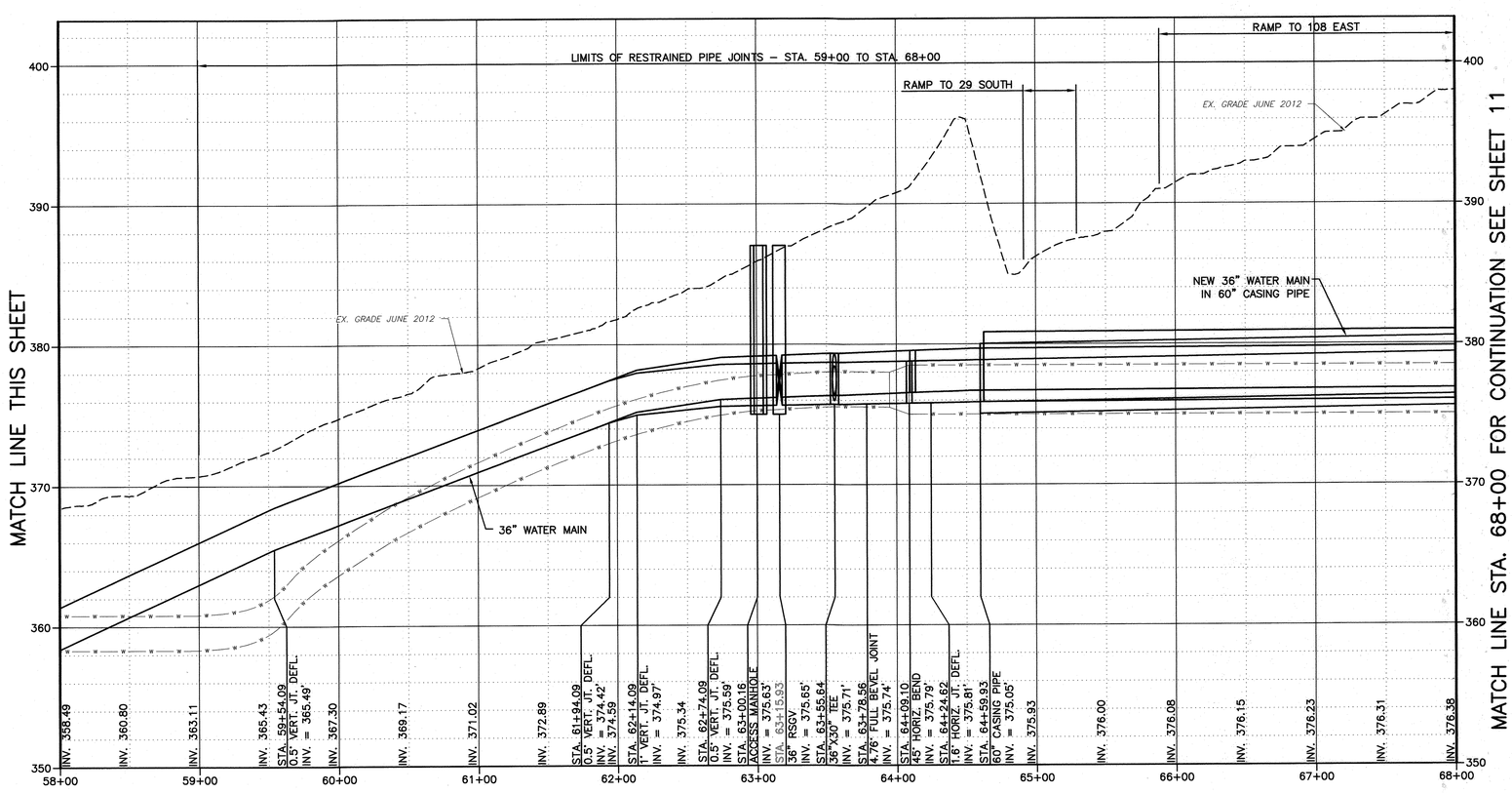






GRAPHIC SCALES

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

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

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
CHIEF - BUREAU OF ENGINEERING — DATE 2/23/16
CHIEF, BUREAU OF UTILITIES — DATE 2/24/16
CHIEF, UTILITY DESIGN DIVISION — PSD — DATE 2/23/16

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

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 18523, EXPIRATION DATE 12/08/2017

STATE OF MARYLAND — ROBERT JOHN DUFFY — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	GLF
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	02/16

BY	NO.	REVISION	DATE
JPC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

PLAN AND PROFILE
STA. 56+00 TO STA. 68+00

600' SCALE MAP NO. 30 BLOCK NO. 36

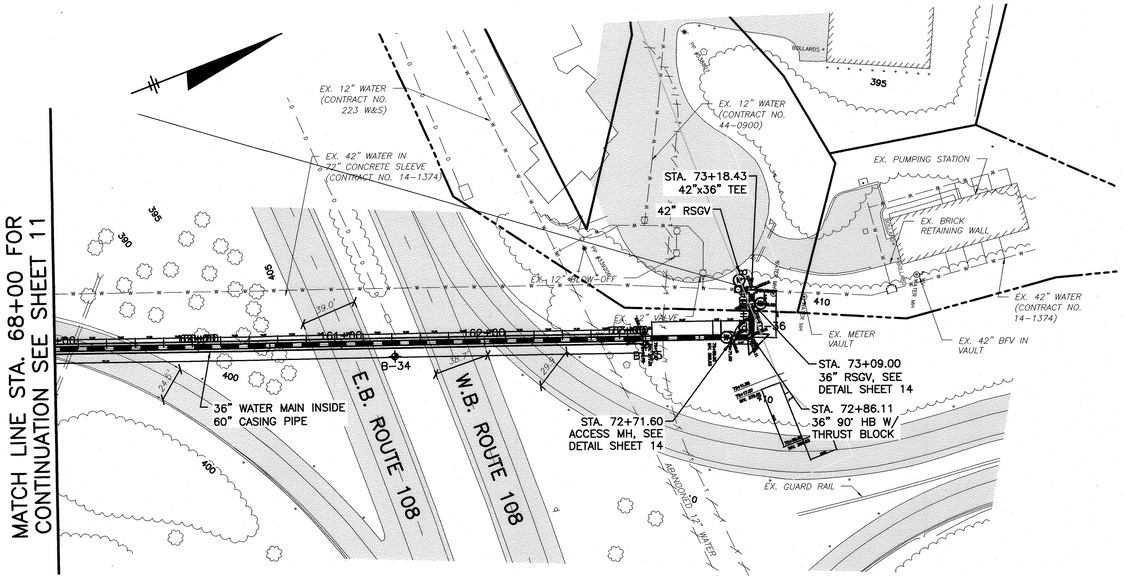
U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8298
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

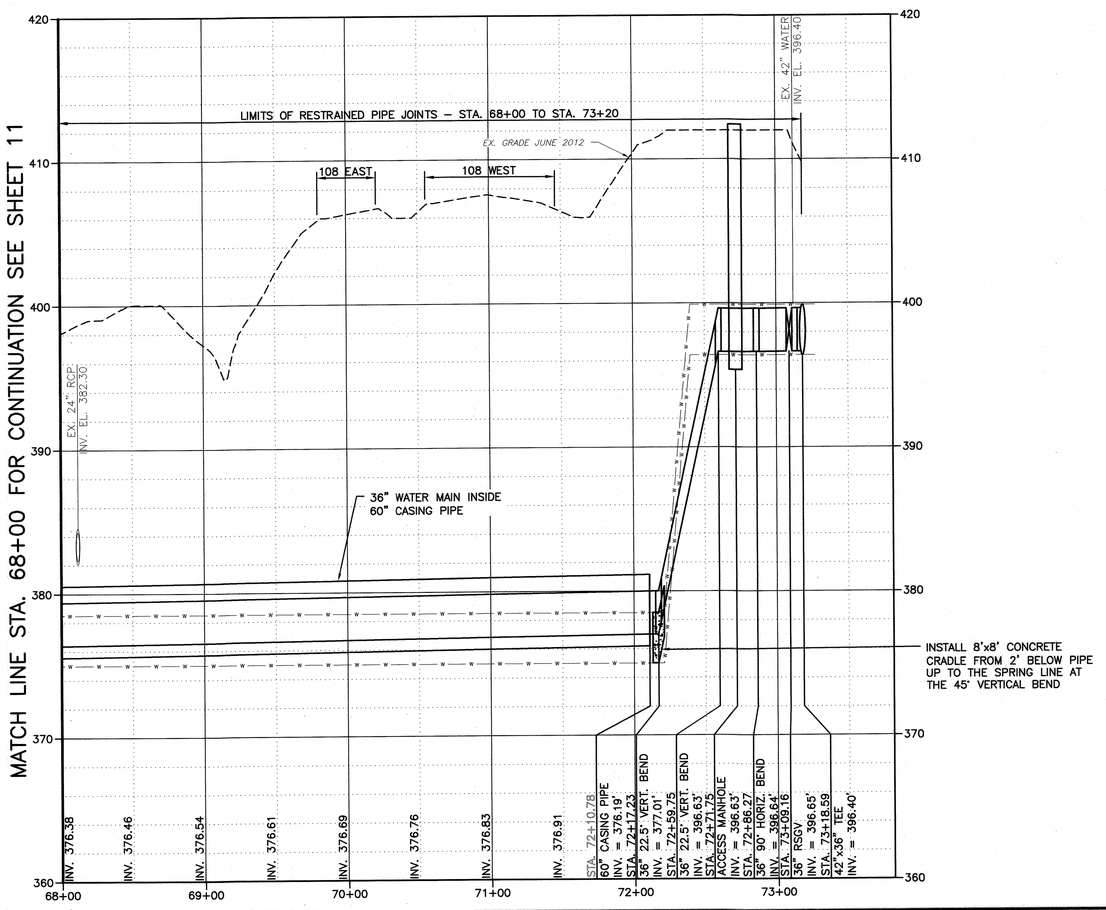
SCALE AS SHOWN

SHEET 10 OF 38

FILE NO. 33498-XXXF

I:_HOWARD-CO.2343\45854.RT-29-RT-108-WA\DOCS\DWG\SPLIT-SETS\SHEETS\45854-019.DWG





GRAPHIC SCALES

VERTICAL 1"=5' 5 0 5 10

HORIZONTAL 1"=50' 50 0 50 100

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
CHIEF – BUREAU OF ENGINEERING — DATE 2/23/16
CHIEF, BUREAU OF UTILITIES — DATE 2/24/16
CHIEF, UTILITY DESIGN DIVISION — DATE 2/23/16

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

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ROBERT JOHN DAVIS — STATE OF MARYLAND — PROFESSIONAL ENGINEER

DSN. BY:	GLF
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	02/16

BY	NO.	REVISION	DATE
JPC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

PLAN AND PROFILE
STA. 68+00 TO STA. 73+20

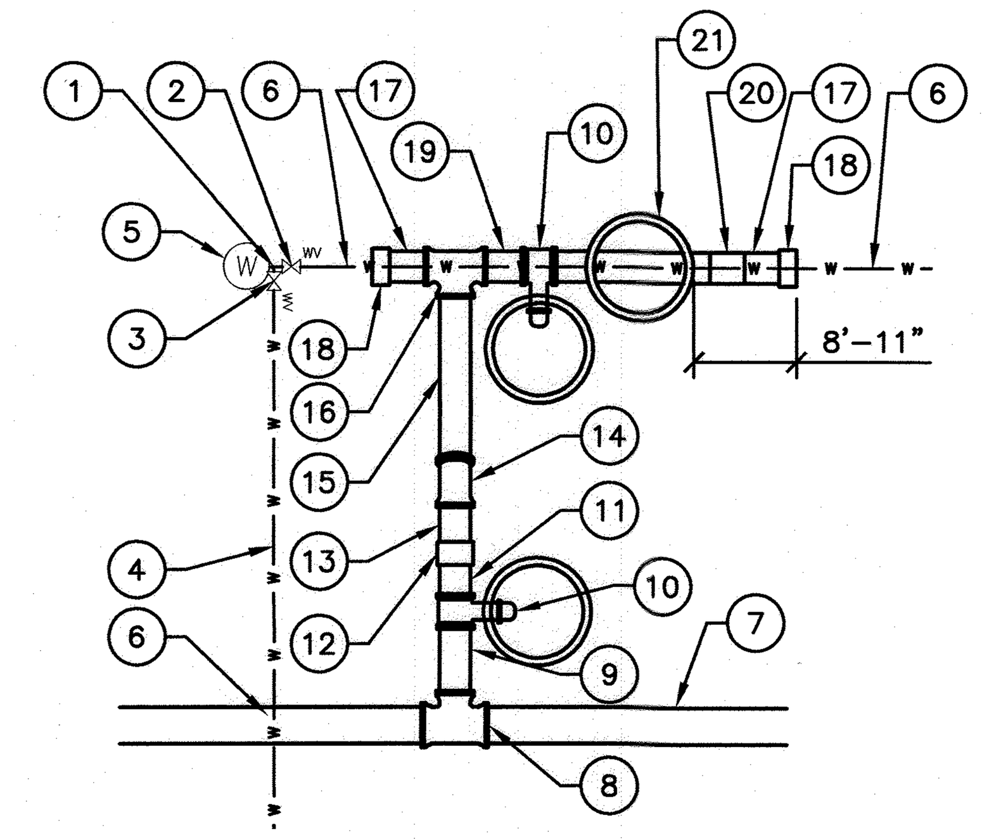
600' SCALE MAP NO. 30 BLOCK NO. 38

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

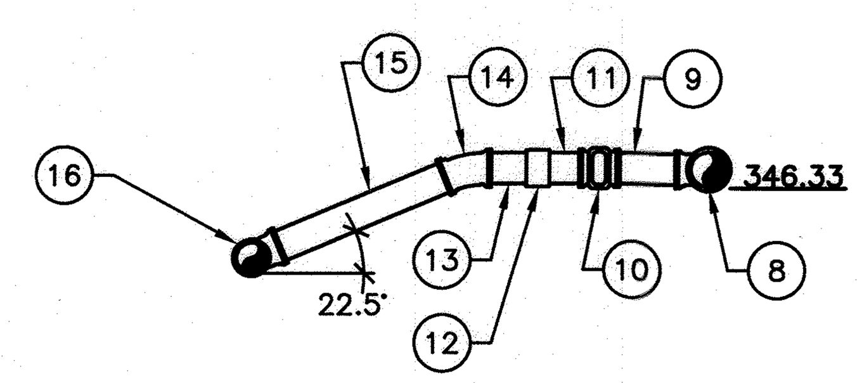
SCALE AS SHOWN

SHEET 11 OF 38

FILE NO. 33498-XXXF



PLAN



ELEVATION

CONNECTION DETAIL STA. 36+81

EXISTING:

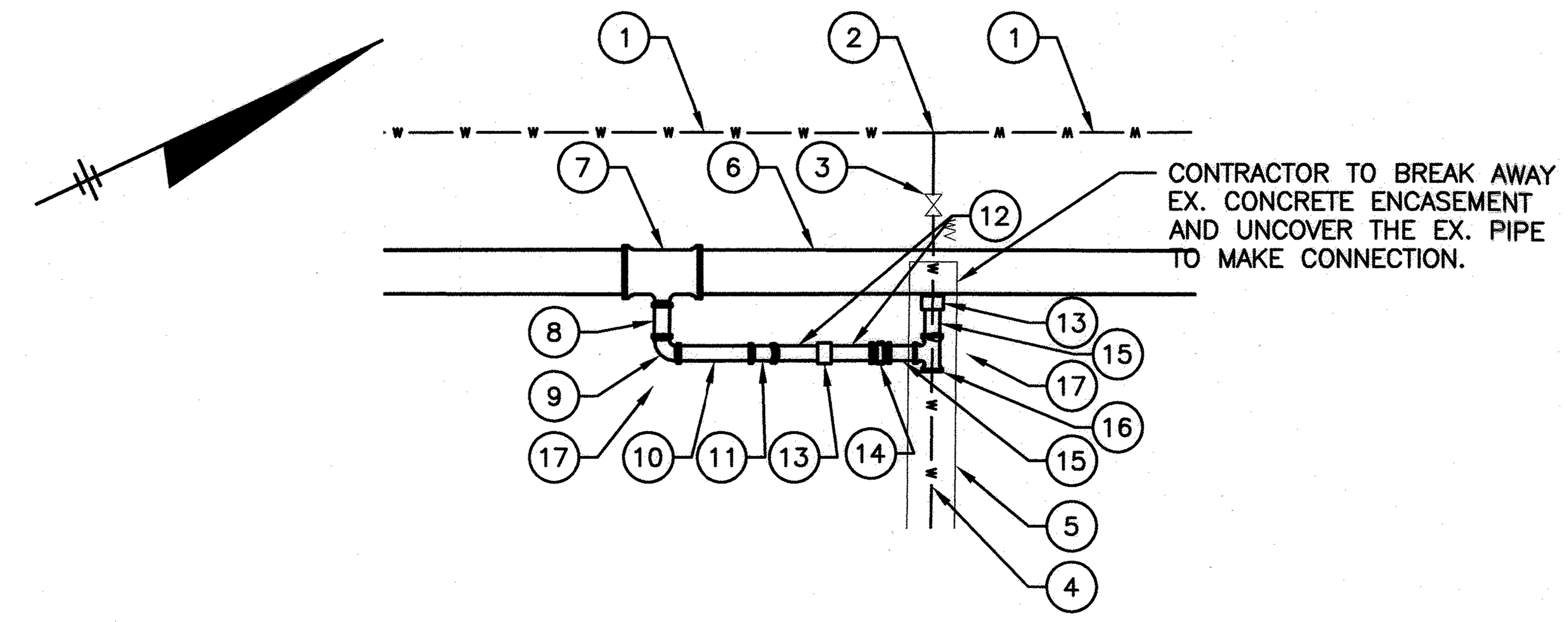
1. 30"x24" PCCP TEE
2. 30" VALVE
3. 24" VALVE
4. 24" WM PIPE
5. PURE TECHNOLOGIES MANHOLE
6. 30" PCCP WM PIPE

PROPOSED:

7. 36" WM PIPE
8. 36"x30" TEE W/ INSULATING FLANGE
9. 30" DI PExFL SPOOL PIECE 3.0' LONG, CLASS 54
10. 30" DI MJ RSGV RESTRAINED
11. 30" DI PExPE SPOOL PIECE 3.0' LONG, CLASS 54
12. 30" DI MJ SOLID SLEEVE RESTRAINED
13. 30" DI PExPE SPOOL PIECE 20' LONG, CLASS 54
14. 30" DI MJ 22.5° VERTICAL BEND, RESTRAINED
15. 30" DI FLxPE SPOOL PIECE 20' LONG, CLASS 54
16. 30" PCCP SRBxSRBxFL TEE
17. 30" PCCP SRSxSE SHORT
18. 30" PCCP WELDED BE OR SExFL ADAPTER PROVIDED BY PCCP MANUFACTURER, FIELD WELD ADAPTER TO EX. PIPE JOINT
19. 30" PCCP SRSxFL SHORT
20. 30" PCCP FOLLOWER RING CLOSURE ASSEMBLY, FIELD WELD IN PLACE
21. ACCESS MANHOLE

NOTE:

ALL PROPOSED PIPING IN THIS DETAIL SHALL BE RESTRAINED JOINT.



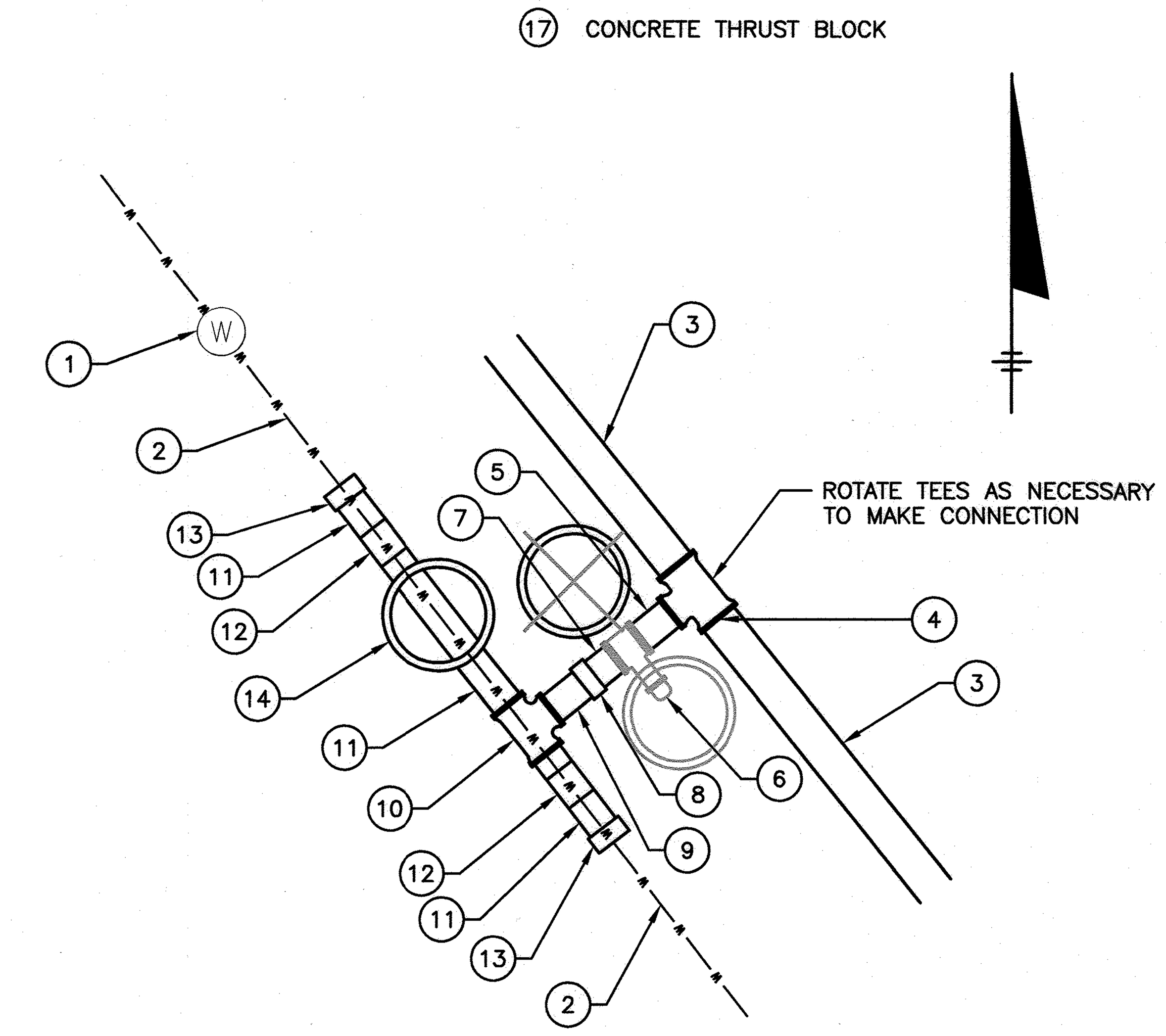
CONNECTION DETAIL STA. 43+07

EXISTING:

1. 30" PCCP WM PIPE
2. 12" STEEL OUTLET
3. 12" VALVE
4. 12" DI WM PIPE
5. CONCRETE ENCASEMENT (TO BE REMOVED AS NECESSARY TO FACILITATE CONNECTION)

PROPOSED:

6. 36" WM PIPE
7. 12" STEEL FL BOSS OUTLET W/ INSULATING FLANGE
8. 12" DI FLxPE SPOOL PIECE, 1.5' LONG, CLASS 54
9. 12" DI MJ 90° BEND, RESTRAINED
10. 12" DI PExPE SPOOL PIECE 7.0'± LONG, CLASS 54
11. 12" DI MJ 22.5° BEND, RESTRAINED
12. 12" DI PExPE SPOOL PIECE 3.0'± LONG, CLASS 54
13. 12" DI MJ SOLID SLEEVE, RESTRAINED
14. 12" DI MJ RSGV, RESTRAINED
15. 12" DI PExPE SPOOL PIECE 2.0' LONG, CLASS 54
16. 12"x12" DI MJxMJ TEE, RESTRAINED
17. CONCRETE THRUST BLOCK



CONNECTION DETAIL STA. 63+55

EXISTING:

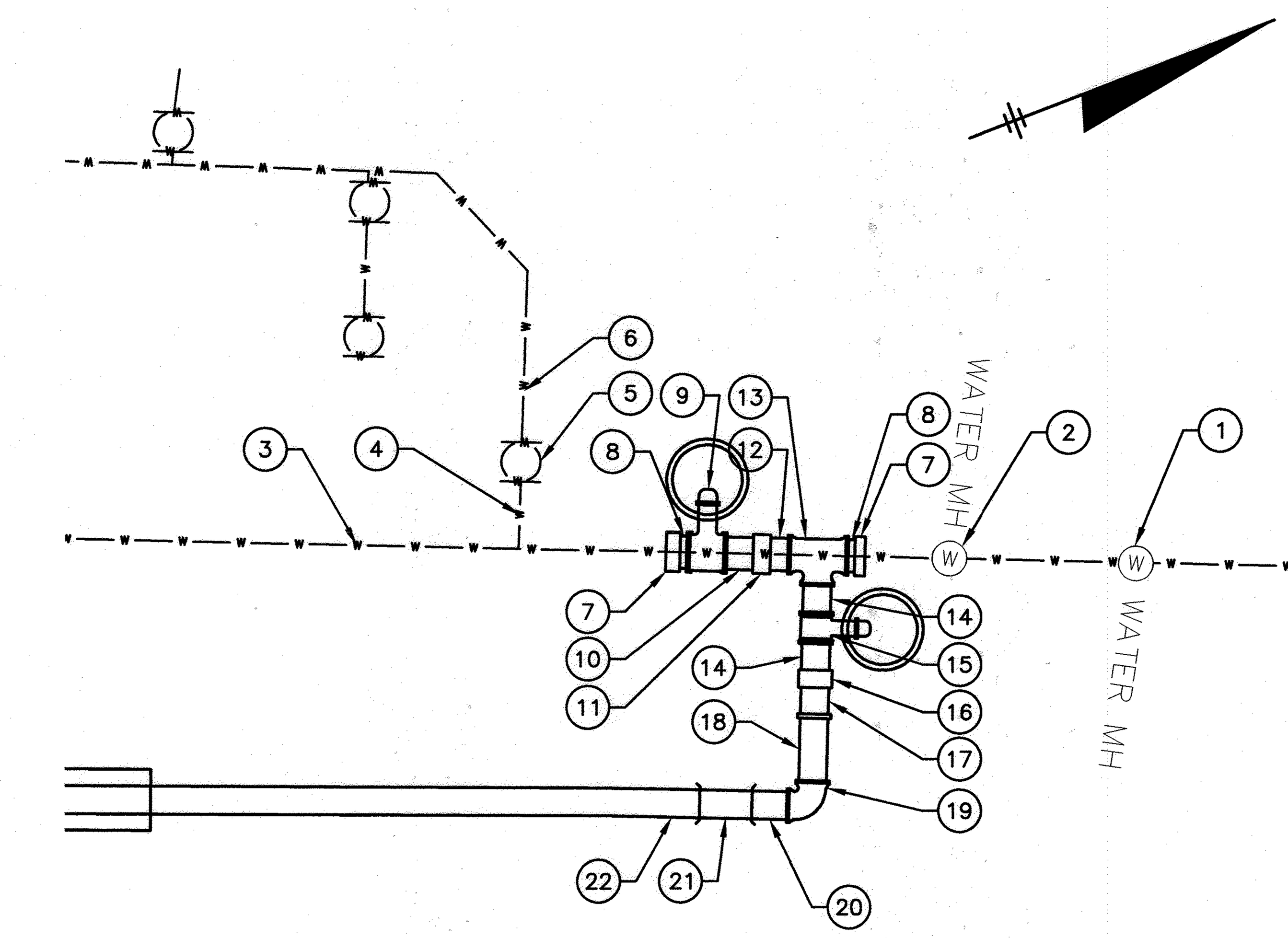
1. 30" VALVE AND VAULT
2. 30" PCCP WM

PROPOSED:

3. 36" WM PIPE
4. 36"x30" TEE W/ INSULATING FLANGE
5. 30" DI PExFL SPOOL PIECE 3.0' LONG, CLASS 54
6. 30" DI MJ RSGV RESTRAINED
7. 30" DI PExPE SPOOL PIECE 3.0' LONG, CLASS 54
8. 30" DI MJ SOLID SLEEVE RESTRAINED
9. 30" DI PExFL SPOOL PIECE X' LONG, CLASS 54
10. 30"x30" PCCP SRBxSRBxFL TEE
11. 30" PCCP SRSxSE SHORT
12. 30" PCCP FOLLOWER RING CLOSURE ASSEMBLY, FIELD WELD IN PLACE
13. 30" PCCP WELDED BE OR SExFL ADAPTER PROVIDED BY PCCP MANUFACTURER, FIELD WELD ADAPTER TO EX. PIPE JOINT
14. ACCESS MANHOLE

GENERAL NOTES:

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. ACTUAL PIPE AND JOINT LOCATIONS AND 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. THE PCCP OR BWCCP BELL AND SPIGOT ADAPTERS (PROVIDED BY PCCP OR BWCCP MANUFACTURER, PAID FOR AND INSTALLED BY THE CONTRACTOR) SHALL BE WELDED TO THE EXISTING PCCP BELL AND SPIGOT ENDS FOR RESTRAINT. WELDS SHALL BE IN ACCORDANCE WITH PCCP OR BWCCP MANUFACTURER'S RECOMMENDATIONS. COAT ADAPTERS WITH TWO COATS OF KOPPERS 300M OR EQUAL.
3. INSULATED JOINTS SHALL BE PROVIDED AT ALL FLANGED CONNECTIONS TO EXISTING WATER MAINS PER SHEET 32.
4. 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.
5. IN ADDITION TO THE CLOSURE PIECES REQUIRED FOR EACH CONNECTION, THE CONTRACTOR SHALL INCLUDE TWO ADDITIONAL CLOSURE PIECES FOR UNFORESEEN CIRCUMSTANCES, TO BE USED AT THE COUNTY'S DISCRETION.



CONNECTION DETAIL STA. 73+18

EXISTING:

1. METER VAULT
2. 42" VALVE RESTRAINED
3. 42" PCCP WM PIPE RESTRAINED
4. 12" STEEL BOSS OUTLET
5. 12" GATE VALVE RESTRAINED
6. 12" DI WM PIPE RESTRAINED

PROPOSED:

7. 42" WELDED BE OR SExFL ADAPTER, FIELD WELD BE OR SE END OF ADAPTER TO EX. PCCP PIPE JOINT
8. 42" DI FLxPE CLOSURE PIECE, 0.75' LONG, CLASS 54
9. 42" MJ RSGV RESTRAINED
10. 42" DI PExPE WM PIPE, DETERMINE LENGTH IN FIELD, CLASS 54
11. 42" DI MJ SOLID SLEEVE RESTRAINED
12. 36" DI PExPE SPOOL PIECE, 2.0' LONG, CLASS 54
13. 42"x36" DI MJxMJ TEE RESTRAINED (C153)
14. 36" DI PExPE SPOOL PIECE, 3.0' LONG, CLASS 54
15. 36" DI MJ RSGV RESTRAINED
16. 36" DI MJ SOLID SLEEVE RESTRAINED
17. 36" DI PExFL SPOOL PIECE 3.0' LONG, CLASS 54
18. 36" WM PIPE W/ INSULATING FLANGE, DETERMINE LENGTH IN FIELD
19. 36" SRB 90° BEND RESTRAINED
20. 36" SExSRS SHORT, 4.0' LONG
21. 36" RING CLOSURE ASSEMBLY, FIELD WELD FOLLOWER RING IN PLACE (UP TO 6' LONG)
22. 36" WM PIPE

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
CHIEF – BUREAU OF ENGINEERING — DATE 2/23/16
CHIEF, BUREAU OF UTILITIES — DATE 2/24/16
CHIEF, UTILITY DESIGN DIVISION — PSD — DATE 2/8/16

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

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 18523, EXPIRATION DATE 12/08/2017

DSN. BY:	GLF
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	02/16

BY	NO.	REVISION	DATE
JPC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

CONNECTION DETAILS
STA. 44+85, STA. 63+58
AND STA. 73+18

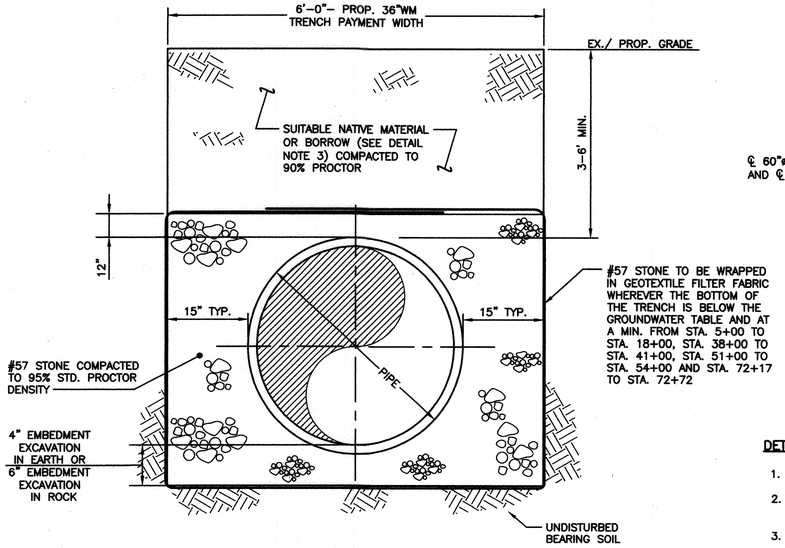
600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 12 OF 38

FILE NO. 33498-XXXF

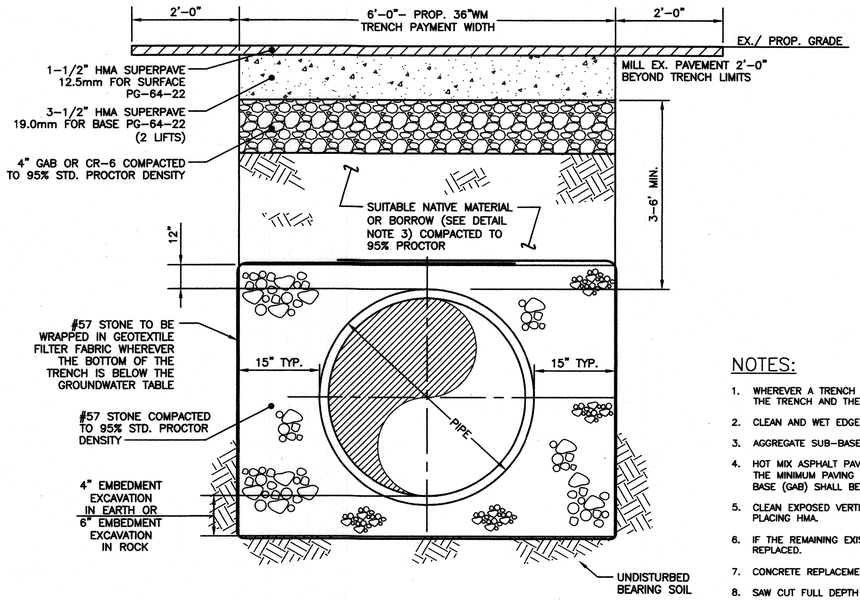


TYPICAL PIPE TRENCH DETAIL (UNPAVED AREA)

N.T.S.

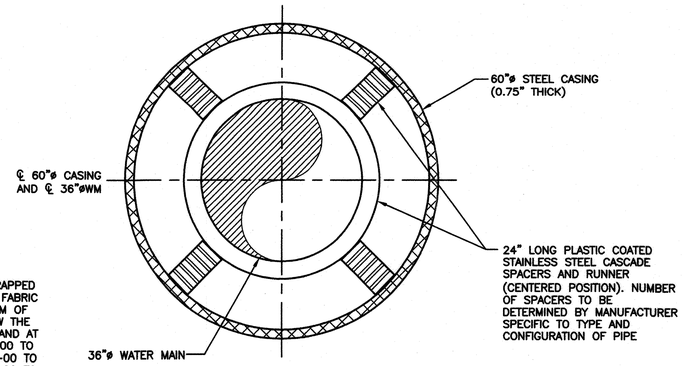
DETAIL NOTES:

1. WITHIN ROAD RIGHT-OF-WAY, TRENCH SHALL BE COMPACTED TO 95% STD. PROCTOR DENSITY, 8" LAYERS MAXIMUM.
2. OUTSIDE OF ROAD RIGHT-OF-WAY, MATERIAL ABOVE TOP OF PIPE SHALL BE COMPACTED TO 90% IN 12" LAYERS.
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.



TYPICAL PIPE TRENCH DETAIL (PAVED AREA)

N.T.S.

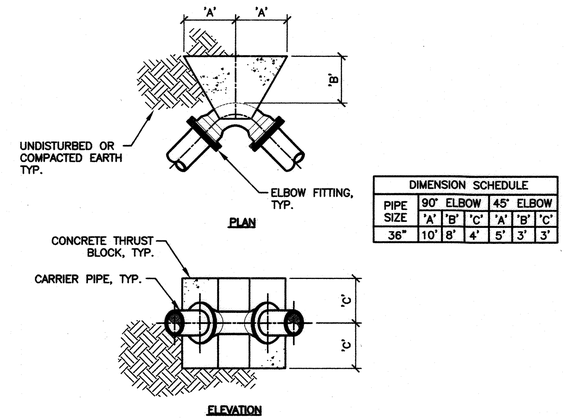


60" CASING UNDER ROADWAY

N.T.S.

DETAIL NOTES:

1. CASING TO BE SEALED ON BOTH ENDS WITH DUAL BRICK AND MORTAR COURSE.
2. PROVIDE FLEXIBLE RESTRAINED PIPE JOINT 3-FEET BEYOND EACH END OF CASING PIPE.
3. SPACERS SHALL BE CASCADE MODEL CCS-ER WITH A MIN. 14GA T-304 SS SHELL AND ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE PLASTIC COATED RUNNERS OR APPROVED EQUAL.
4. CASING SPACERS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.



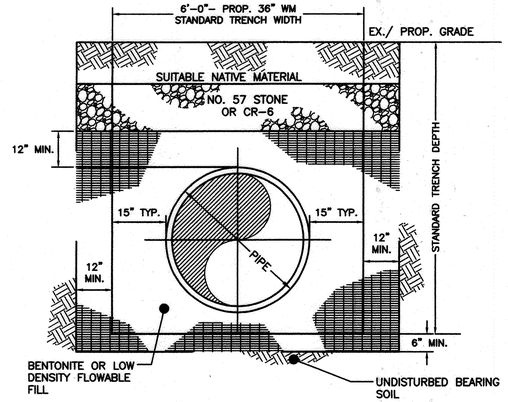
DIMENSION SCHEDULE						
PIPE SIZE	90° ELBOW			45° ELBOW		
	'A'	'B'	'C'	'A'	'B'	'C'
36"	10'	8'	4'	5'	3'	3'

THRUST BLOCK FOR BENDS

NOT TO SCALE

NOTES:

1. WHEREVER A TRENCH CROSSES A CONCRETE ROADWAY THAT HAS JOINT INSTALLATIONS THE ENTIRE SLAB BETWEEN THE EDGE OF THE TRENCH AND THE NEAREST JOINT SHALL BE REMOVED IF THE DISTANCE IS LESS THAN 10 FEET.
2. CLEAN AND WET EDGES OF CUT AND SUBGRADE BEFORE PLACING CONCRETE.
3. AGGREGATE SUB-BASE WIDTH SHALL BE 6 FT MINIMUM OR ACTUAL TRENCH WIDTH, WHICH EVER IS GREATER.
4. HOT MIX ASPHALT PAVEMENT PATCH THICKNESS SHALL BE EQUAL TO THE EXISTING PAVING SECTION OR AS APPROVED BY DPW. THE MINIMUM PAVING PATCH SHALL CONSIST OF 2" HMA SURFACE COURSE OVER 10"HMA BASE COURSE. GRADED AGGREGATE BASE (GAB) SHALL BE PLACED AND COMPACTED IN 6" MAXIMUM COMPACTED THICKNESS LAYERS.
5. CLEAN EXPOSED VERTICAL SURFACE OF ADJACENT PAVEMENT AND PLACE TACK COAT ON ALL VERTICAL SURFACES PRIOR TO PLACING HMA.
6. IF THE REMAINING EXISTING PAVEMENT IS LESS THAN 4' WIDE , THE RESIDUAL PAVEMENT SHALL BE REMOVED IN ITS ENTIRITY AND REPLACED.
7. CONCRETE REPLACEMENT SHALL BE 10" MINIMUM MIX NO. 6.
8. SAW CUT FULL DEPTH ALL JOINTS OF EXISTING CONCRETE, BITUMINOUS, AND BASE PAVEMENTS.
9. REINFORCEMENT OF CONCRETE PAVING SHALL BE ACCOMPLISHED BY DOWELING. DOWELS SHALL BE CENTERED IN PAVEMENT THICKNESS. NEW REINFORCING SHALL BE TIED TO DOWELS.
10. TOTAL REPAIR WIDTH SHALL BE EQUAL TO THE LANE WIDTH IN ACCORDANCE WITH THE SPECIFICATIONS.

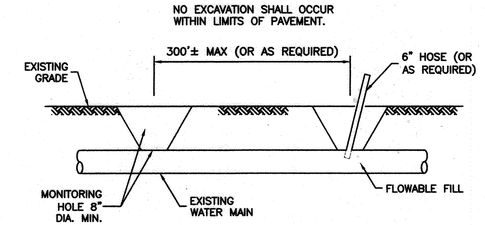


TRENCH CUT-OFF DETAIL

N.T.S.

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 THIS SHEET FOR THE REMAINING BACKFILL REQUIREMENTS. EXTEND 3' LONGITUDINALLY ALONG THE PIPE TRENCH.
3. CUT-OFFS TO BE LOCATED AT STA. 8+50, STA. 11+00, AND AT STA. 13+50.



DETAIL NOTES:

1. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, EQUIPMENT AND SUPPLIES TO ABANDON THE EXISTING WATER MAIN INCLUDING EXCAVATION AND BACKFILL, DEMOLITION AND SITE RESTORATION, ALL AS INDICATED, SPECIFIED AND/OR NECESSARY TO COMPLETE THE WORK.
2. READY MIX FLOWABLE FILL (CDF) – SHALL CONSIST OF A MIXTURE OF PORTLAND CEMENT, FLY ASH AND SAND. MIXTURE SHALL CONSIST OF THE FOLLOWING APPROXIMATE QUANTITIES OF MATERIAL PER CUBIC YARD AND SHALL BE CAPABLE OF ACHIEVING A COMPRESSIVE STRENGTH OF 100 PSI.

   CEMENT – 100 LBS.
   FLY ASH – 300 LBS.
   SAND (SSD) – 2,576 LBS.
   WATER – 541 LBS. (65 GALLONS)
3. EXISTING MAIN TO BE ABANDONED SHALL BE CUT AND CAPPED TO PREVENT EXIT OF FLOWABLE FILL OUTSIDE LIMITS OF PROPOSED TRENCH.
4. PRIOR TO BEGINNING ABANDONMENT, ALL WATER REMAINING IN THE PIPELINE AND STRUCTURES, SHALL BE REMOVED AND DECHLORINATED PRIOR TO DISCHARGE.
5. ABANDONMENT SHALL BE PAID FOR AS A SEPARATE BID ITEM.
6. ALL VALVE BOXES, FIRE HYDRANTS, AIR RELEASE VALVES, BLOW-OFFS, AND ANY OTHER APPURTENANCES WHICH EXTEND TO, OR ABOVE, GRADE SHALL BE REMOVED DOWN TO THE ELEVATION OF THE PIPE. ITEMS TO BE SALVAGED ARE DEPICTED ON PLAN SHEETS.
7. THE CONTRACTOR SHALL NOT OPEN CUT THE PAVEMENT FOR THE WATER MAIN ABANDONMENT. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR COMPLETING OPERATIONS IN ACCORDANCE WITH PERMIT REQUIREMENTS.
8. HOSE SHALL EXTEND INTO EX. WATER MAIN PIPE DURING ABANDONMENT OF WATER MAIN PIPE.

WATER MAIN ABANDONMENT DETAIL

N.T.S.

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
CHIEF – BUREAU OF ENGINEERING — DATE 2/23/16
CHIEF, BUREAU OF UTILITIES — DATE 2/24/16
CHIEF, UTILITY DESIGN DIVISION — DATE 2/23/16

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

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STATE OF MARYLAND — ROBERT JOHN DUNN — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	GLF
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	02/16

BY	NO.	REVISION	DATE
JPC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

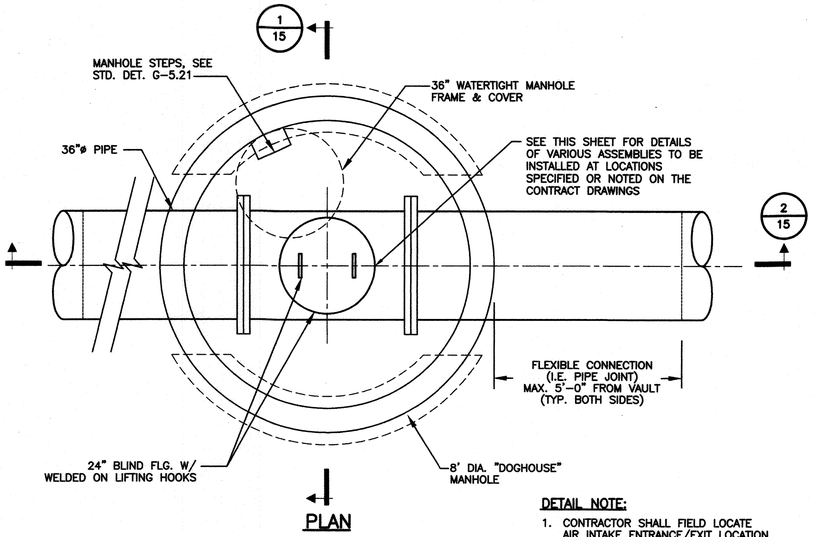
MISCELLANEOUS DETAILS

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 13 OF 38

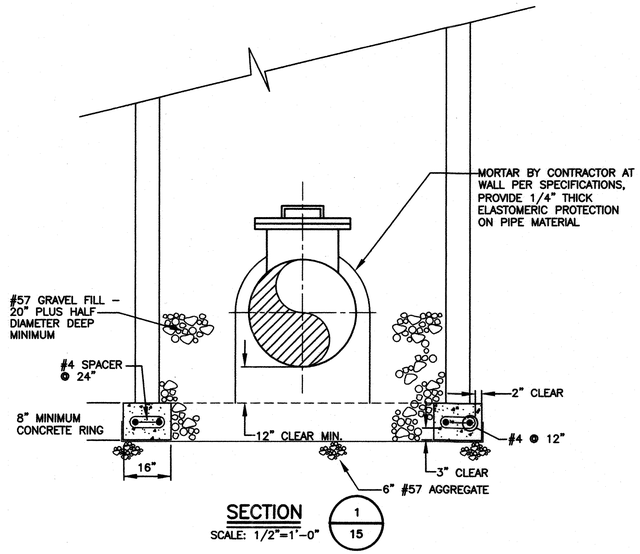


DETAIL NOTE:

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

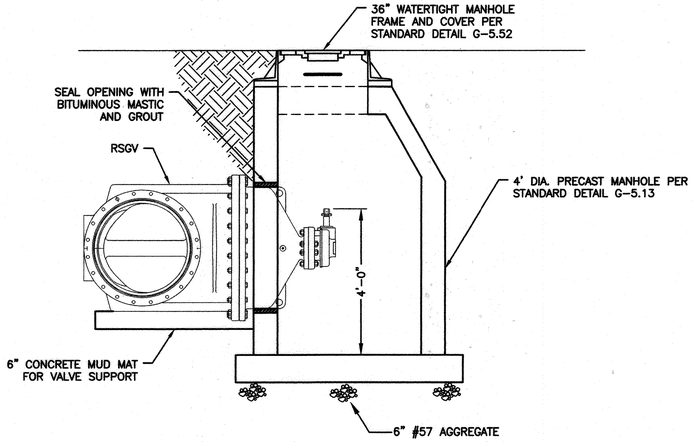
TYPICAL ACCESS MANHOLE – DETAIL

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



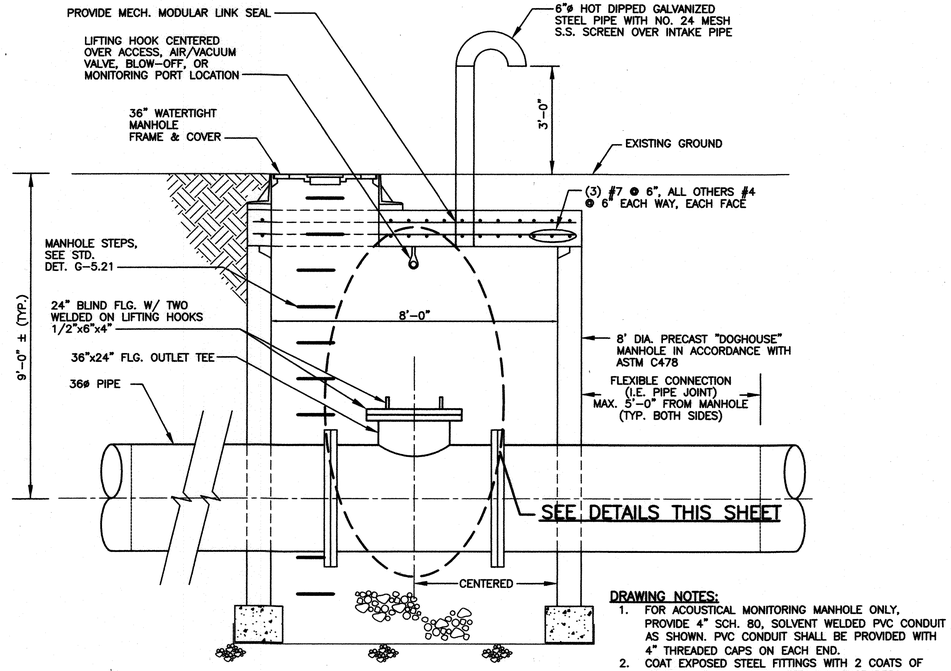
SECTION

SCALE: 1/2"=1'-0" (1/15)



36" RSGV WITH ACTUATOR ACCESS MANHOLE

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

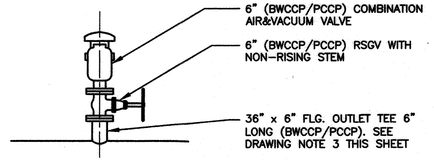


DRAWING NOTES:

1. FOR ACOUSTICAL MONITORING MANHOLE ONLY, PROVIDE 4" SCH. 80, SOLVENT WELDED PVC CONDUIT AS SHOWN. PVC CONDUIT SHALL BE PROVIDED WITH 4" THREADED CAPS ON EACH END.
2. COAT EXPOSED STEEL FITTINGS WITH 2 COATS OF ROYSTON R-28 MASTIC, PER MANUFACTURERS RECOMMENDATIONS.

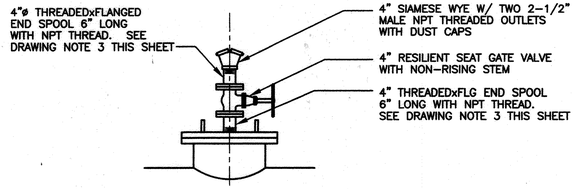
SECTION

SCALE: 1/2"=1'-0" (2/15)



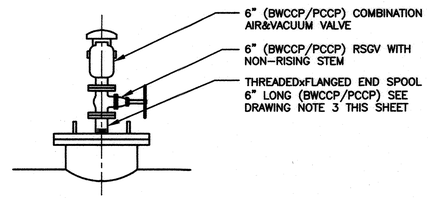
TYPICAL AIR&VACUUM VALVE MANHOLE ASSEMBLY – DETAIL

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



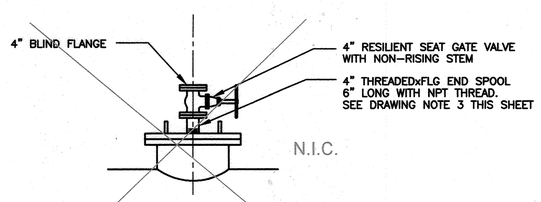
TYPICAL BLOW-OFF/ACCESS MANHOLE ASSEMBLY – DETAIL

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



TYPICAL AIR&VACUUM VALVE/ACCESS MANHOLE ASSEMBLY – DETAIL

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



TYPICAL ACOUSTICAL MONITORING MANHOLE ASSEMBLY – DETAIL

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

SCALES: 1/2"=1'-0" (1 0 1 2 3 4 5)

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
CHIEF – BUREAU OF ENGINEERING — DATE 2/23/16
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BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

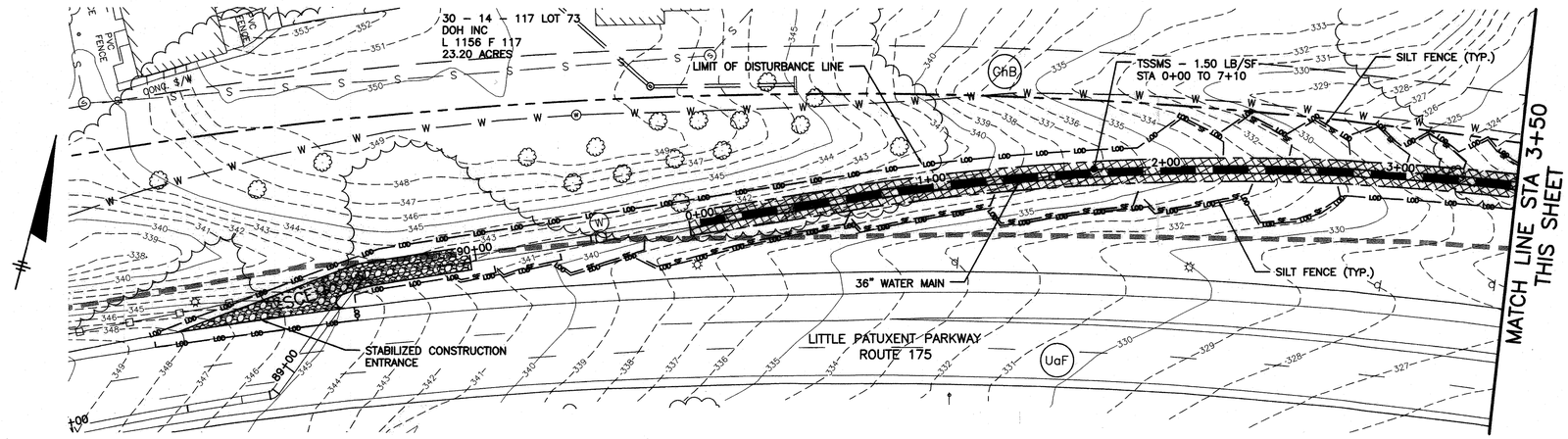
TYPICAL ACCESS, AIR VALVE, BLOW-OFF AND MONITORING MANHOLE DETAILS

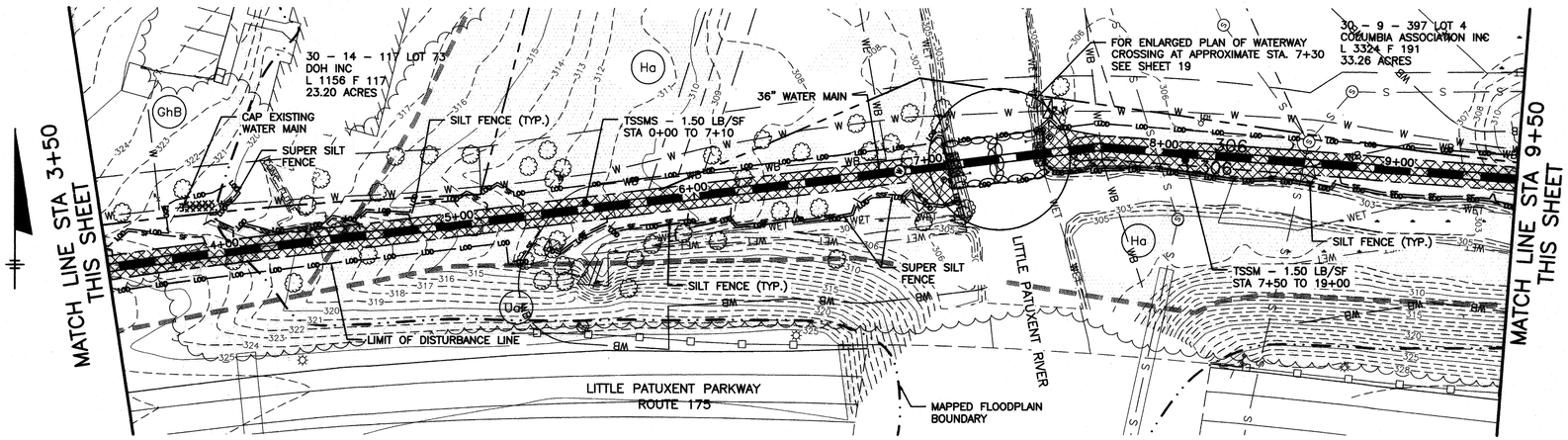
600' SCALE MAP NO. 30 BLOCK NO. 36

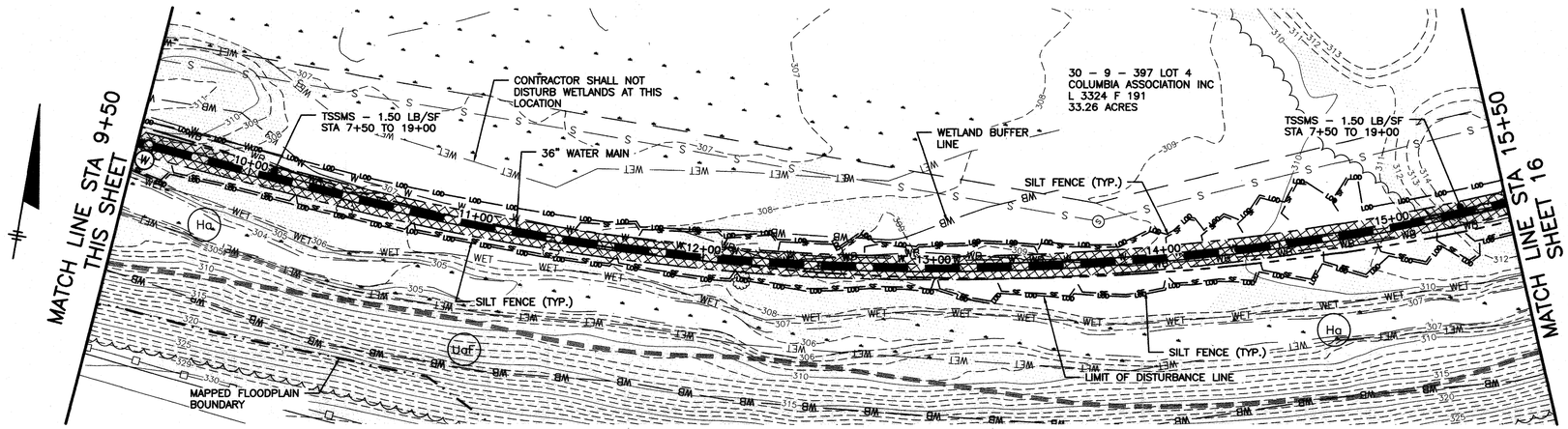
U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 14 OF 38







RECORD DRAWINGS

SEDIMENT CONTROL PLAN LEGEND

- PROPERTY LINE
- EASEMENT LINE
- LOD — LIMIT OF DISTURBANCE LINE
- FL-18 — FILTER LOG - 18" HEIGHT
- SF — SILT FENCE
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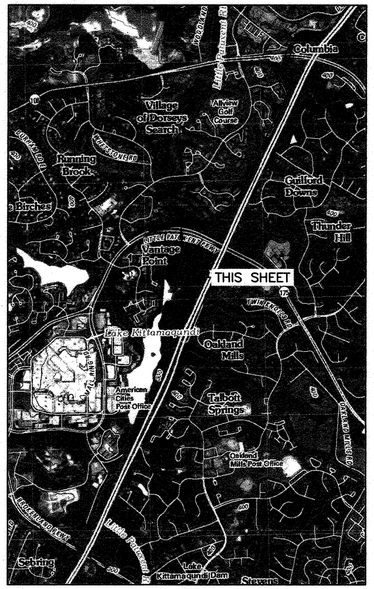

LOCATION AND INDEX MAP

SCALE: 1" = 2000'

ADAPTED FROM SAVAGE, MD USGS 7.5 MIN. QUADRANGLE (2011)

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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 — 18523 Registration Number — 6/22/16 Date

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HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 6/28/16
CHIEF, BUREAU OF ENGINEERING — DATE 6/24/16
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O'BRIEN & GERE
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SUITE 500
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PHONE: 301-731-5622

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STATE OF MARYLAND — ROBERT JOHN GERE — REG. NO. 18523 — PROFESSIONAL ENGINEER

DSN. BY:	SMS
DRN. BY:	SMS
CHK. BY:	RJD
DATE:	2/16

JC	2	RECORD DRAWINGS	11/20
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RJD		REVISED PER HSCD REVIEW	5/16
RJD		REVISED PER HSCD REVIEW	4/16
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BY	NO.	REVISION	DATE

SOIL EROSION AND SEDIMENT CONTROL PLAN
STA. 0+00 TO STA. 15+50

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 15 OF 38

FILE NO. 3349R-XXXF

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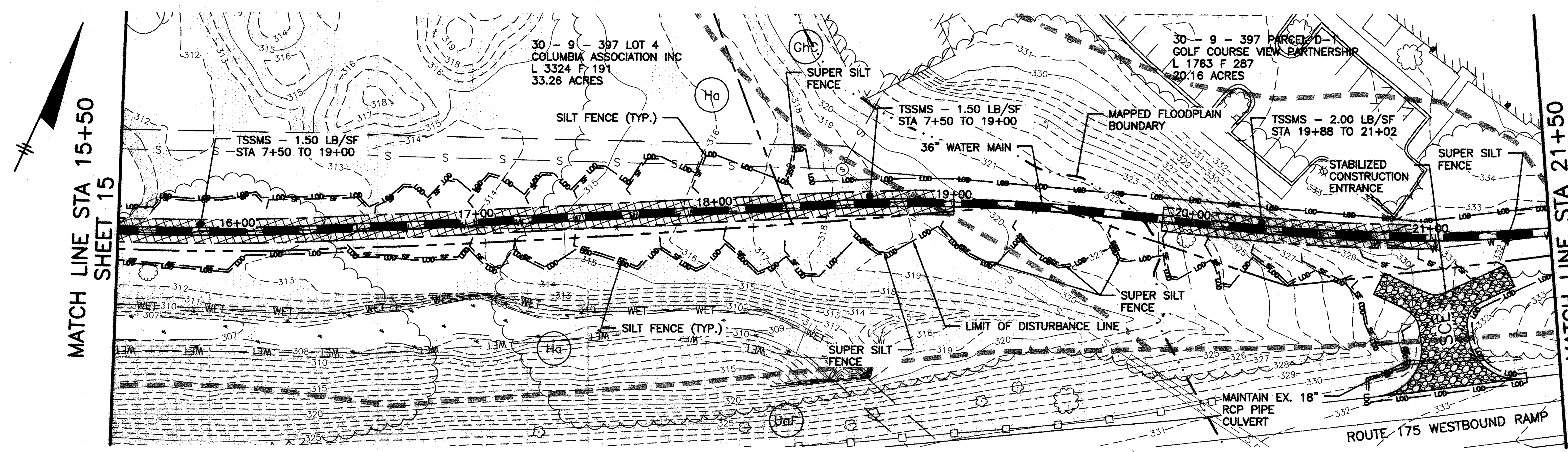

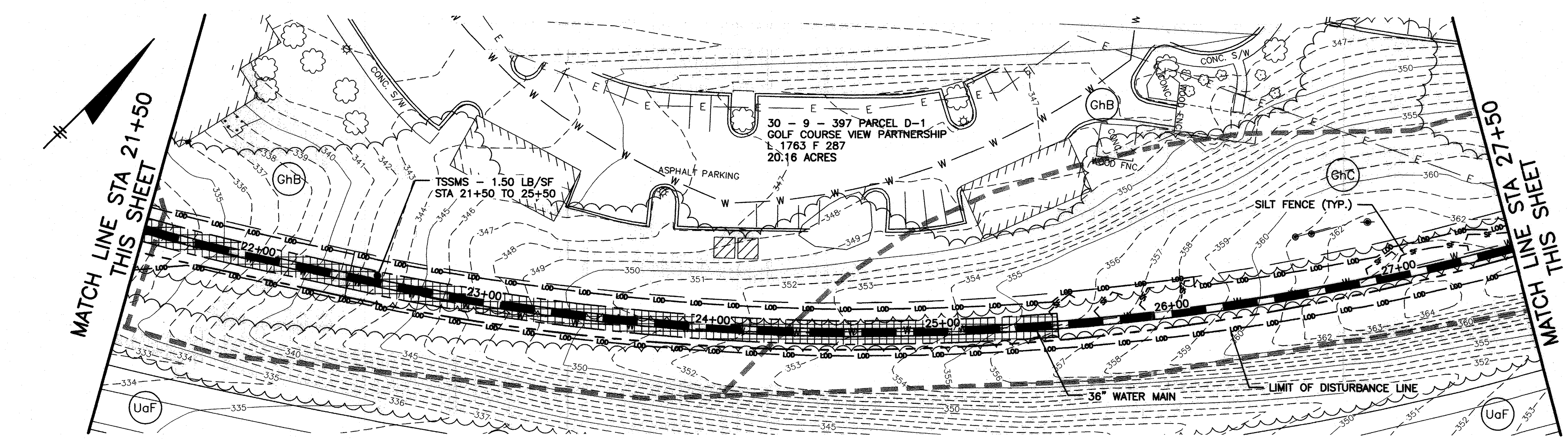

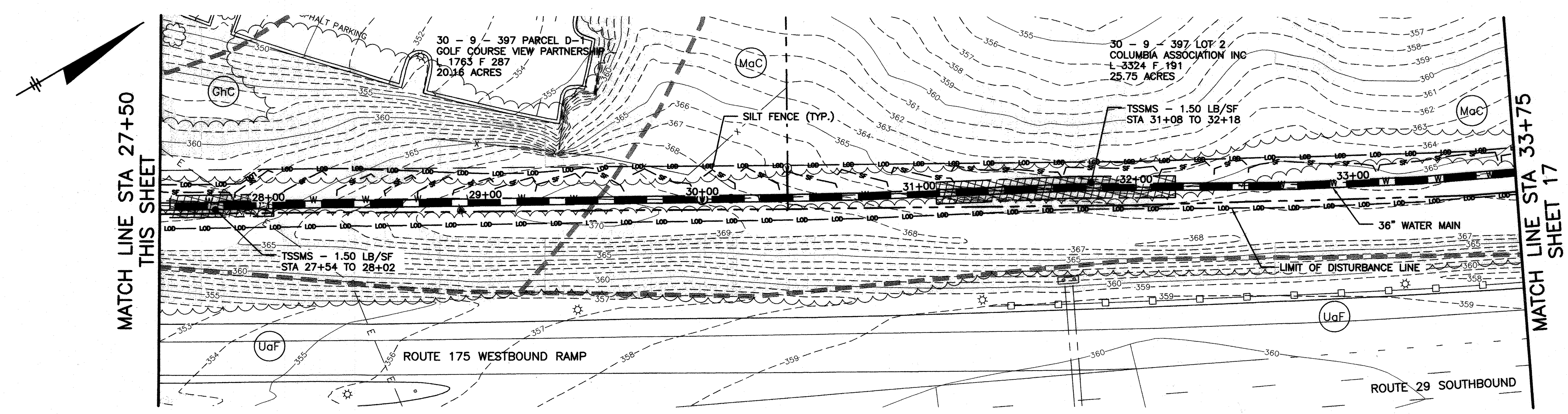

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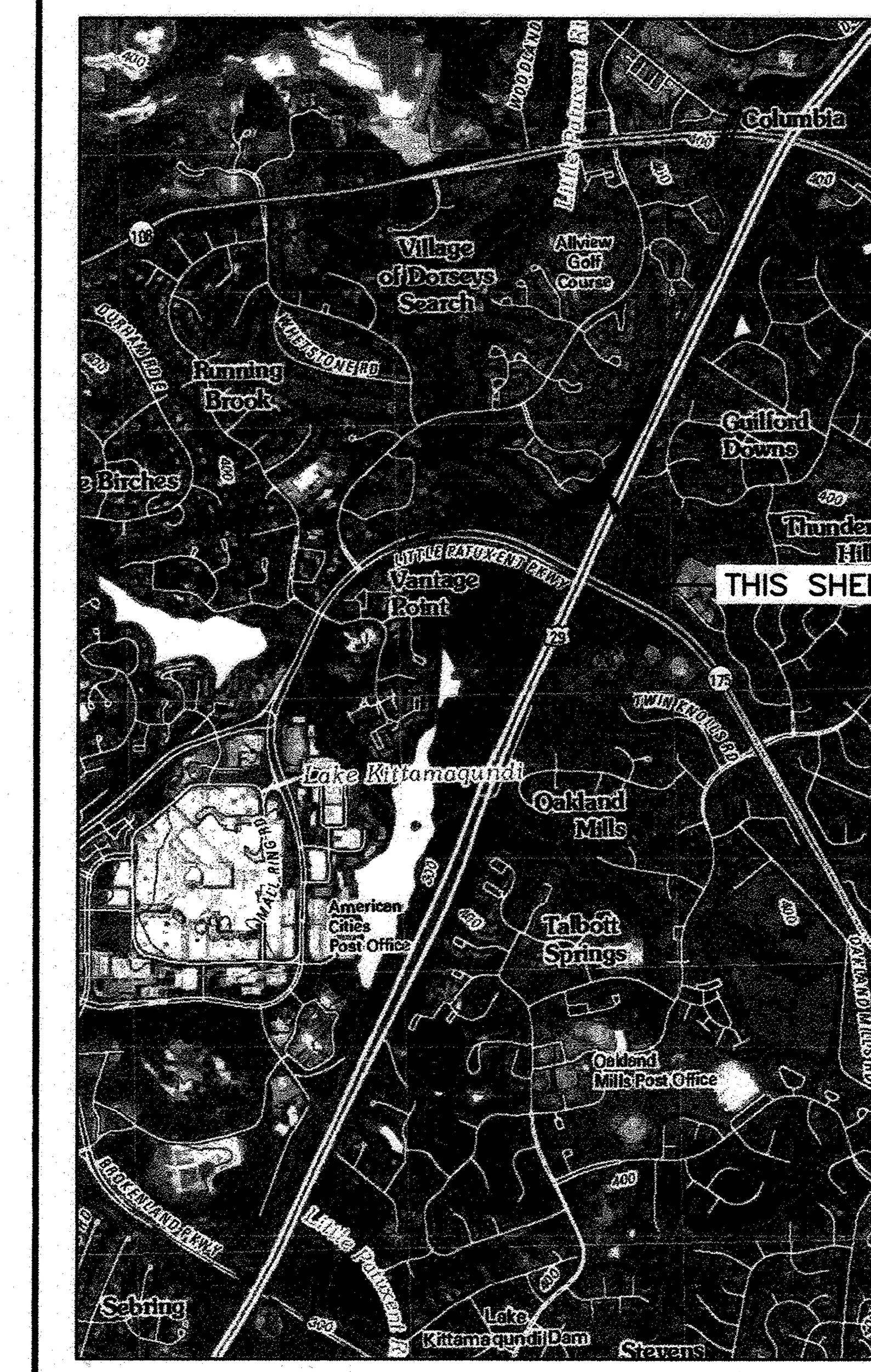

LOCATION AND INDEX MAP

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18523 6/22/16

Signature of Engineer / Registration Number / Date

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS 6/25/16 DATE — CHIEF, BUREAU OF ENGINEERING 6/24/16 DATE
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SOIL EROSION AND SEDIMENT CONTROL PLAN
STA. 15+50 TO STA. 37+75

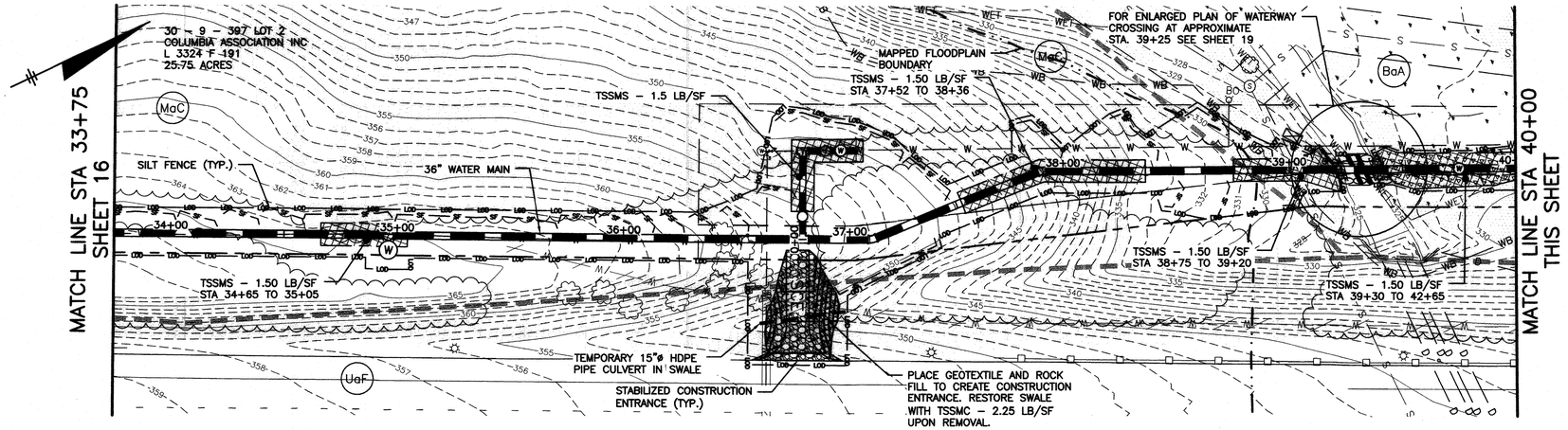
600' SCALE MAP NO. 30 BLOCK NO. 36

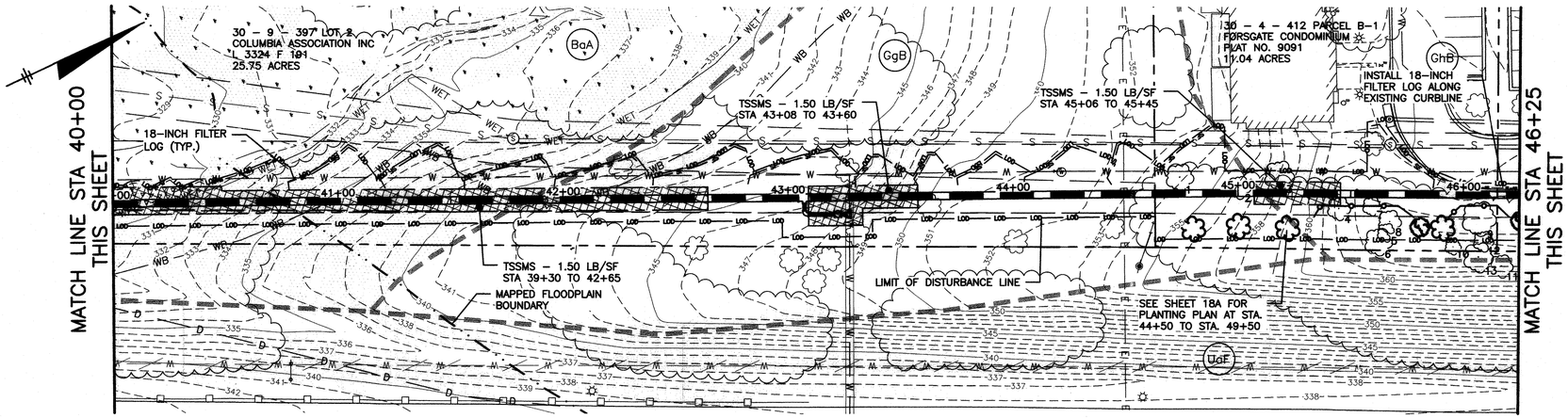
U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

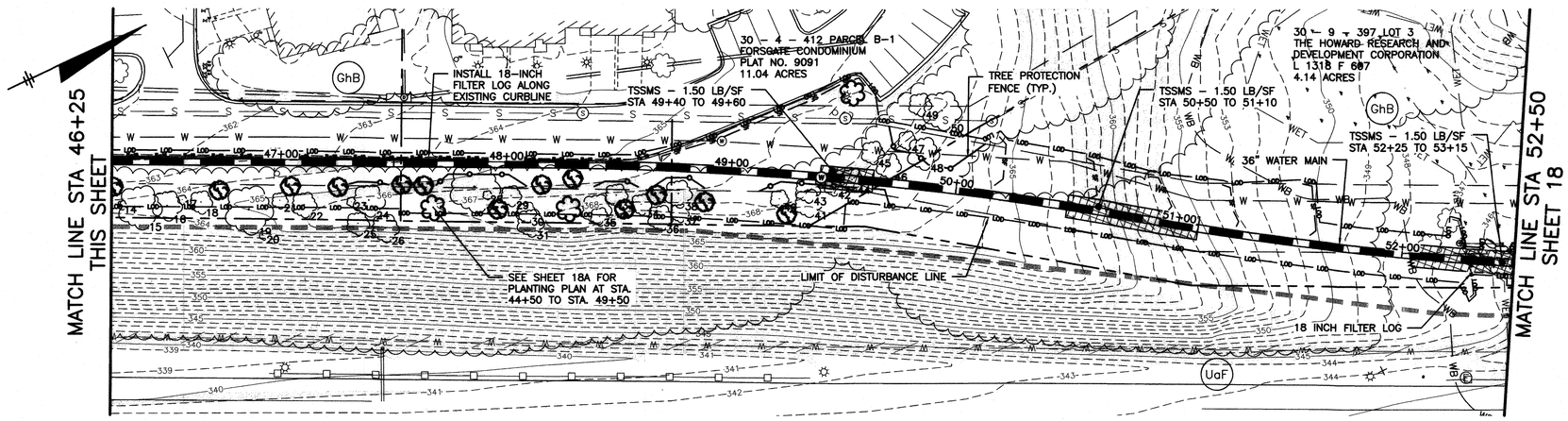
SCALE AS SHOWN

SHEET 16 OF 38

FILE NO. 3349R-XXXF







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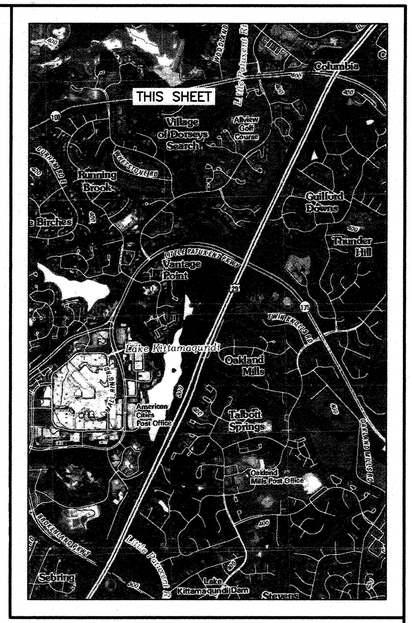

LOCATION AND INDEX MAP

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HOWARD COUNTY, MARYLAND

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SOIL EROSION AND SEDIMENT CONTROL PLAN STA. 37+75 TO STA. 52+50

600' SCALE MAP NO. 30 BLOCK NO. 36

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CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
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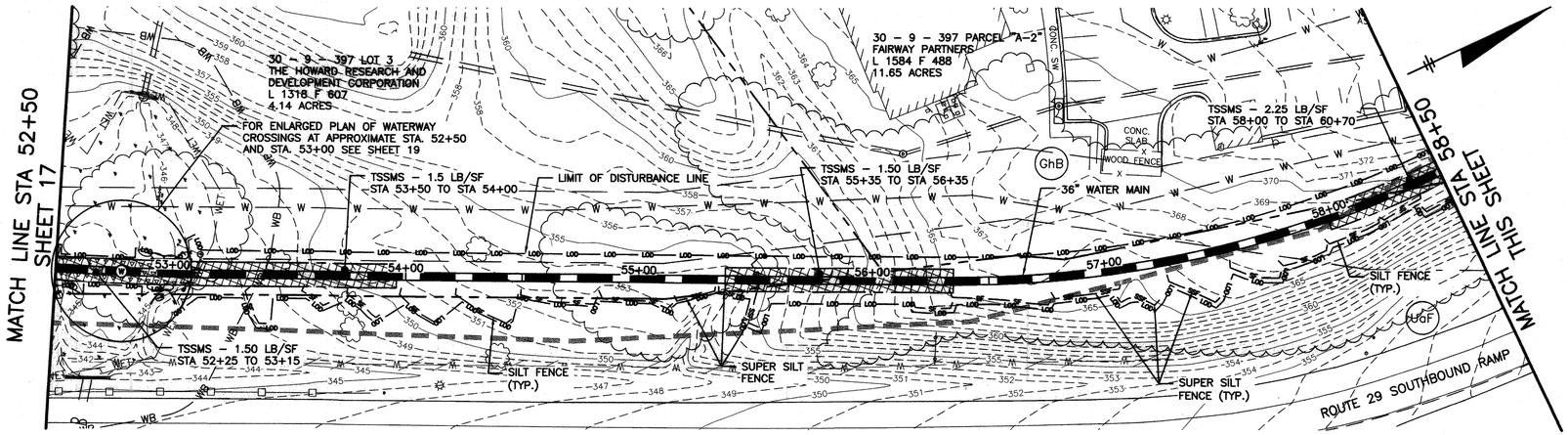
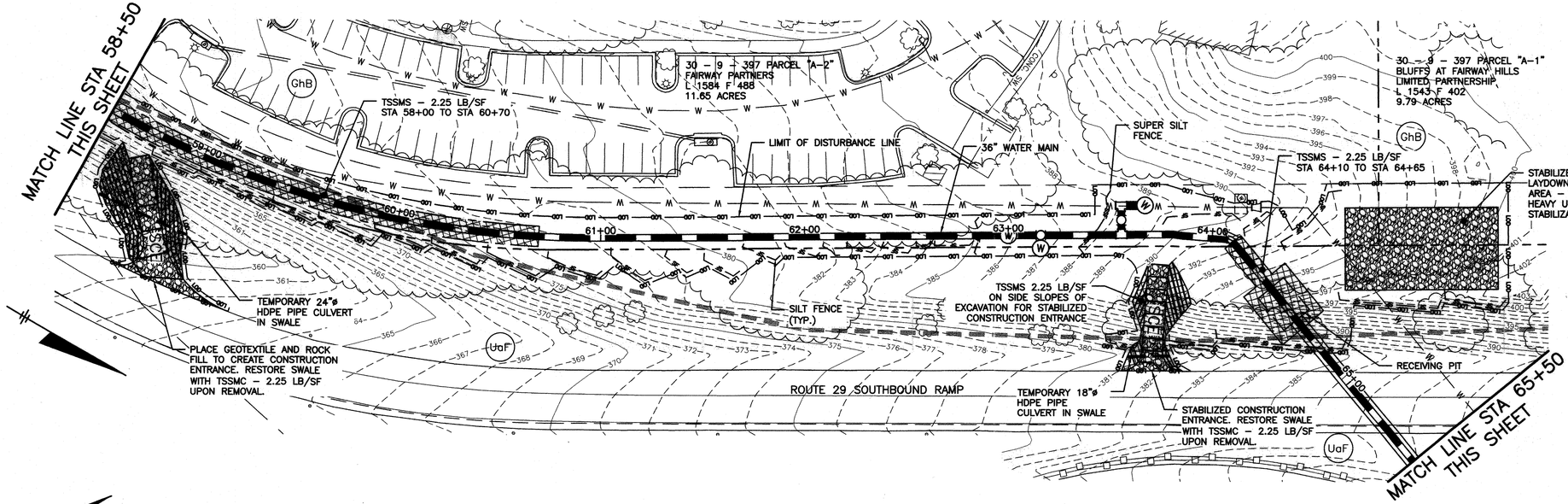
SCALE AS SHOWN

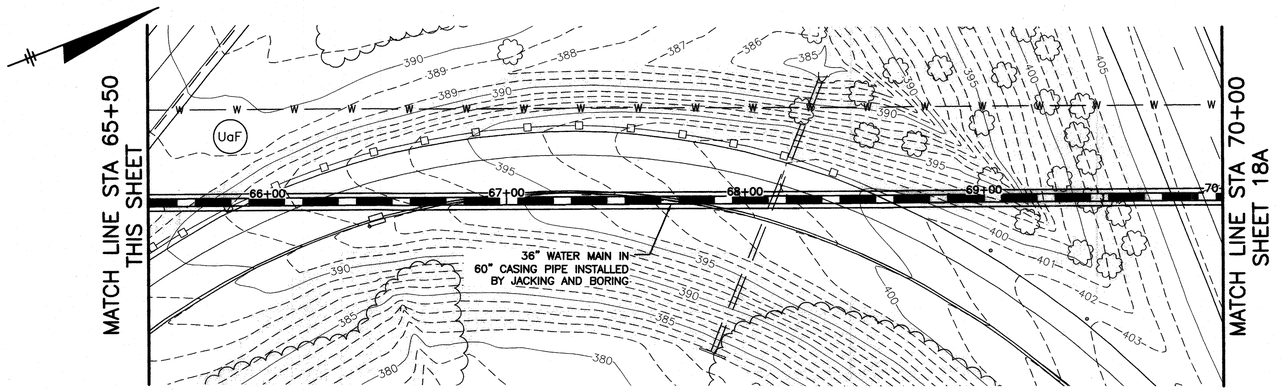
SHEET 17 OF 38

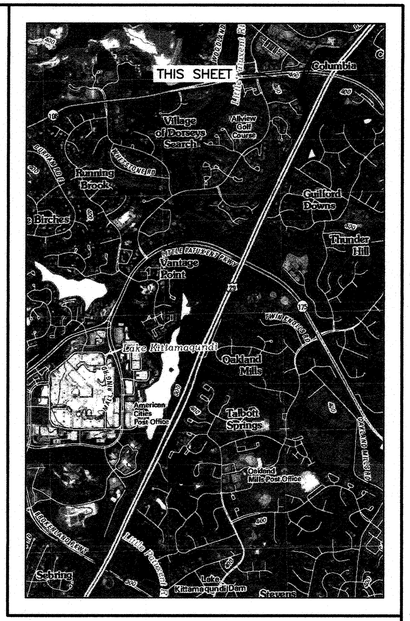
FILE NO. 3348R-XXXF

I:\HOWARD-CO.2343\45854.RT-29-RT-108-WA\DOCS\DWG\SPLIT-SETS\SHEETS\45854-217.DWG









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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 — 18523 Registration Number — 6/22/16 Date

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 6/28/16
CHIEF - BUREAU OF ENGINEERING — DATE 6/24/16
CHIEF, BUREAU OF UTILITIES — DATE 6/27/16
CHIEF, UTILITY DESIGN DIVISION PSD — DATE 6/29/16

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

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STATE OF MARYLAND — ROBERT JOHN DEAN — PROFESSIONAL ENGINEER

DSN. BY:	SMS
DRN. BY:	SMS
CHK. BY:	RJD
DATE:	2/16

BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	5/19
RJD		REVISED PER HSCD REVIEW	5/16
RJD		REVISED PER HSCD REVIEW	4/16
RJD	0	AS BID	2/16

SOIL EROSION AND SEDIMENT CONTROL PLAN STA. 52+50 TO STA. 70+00

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN LITTLE PATUXENT PARKWAY TO MD ROUTE 108

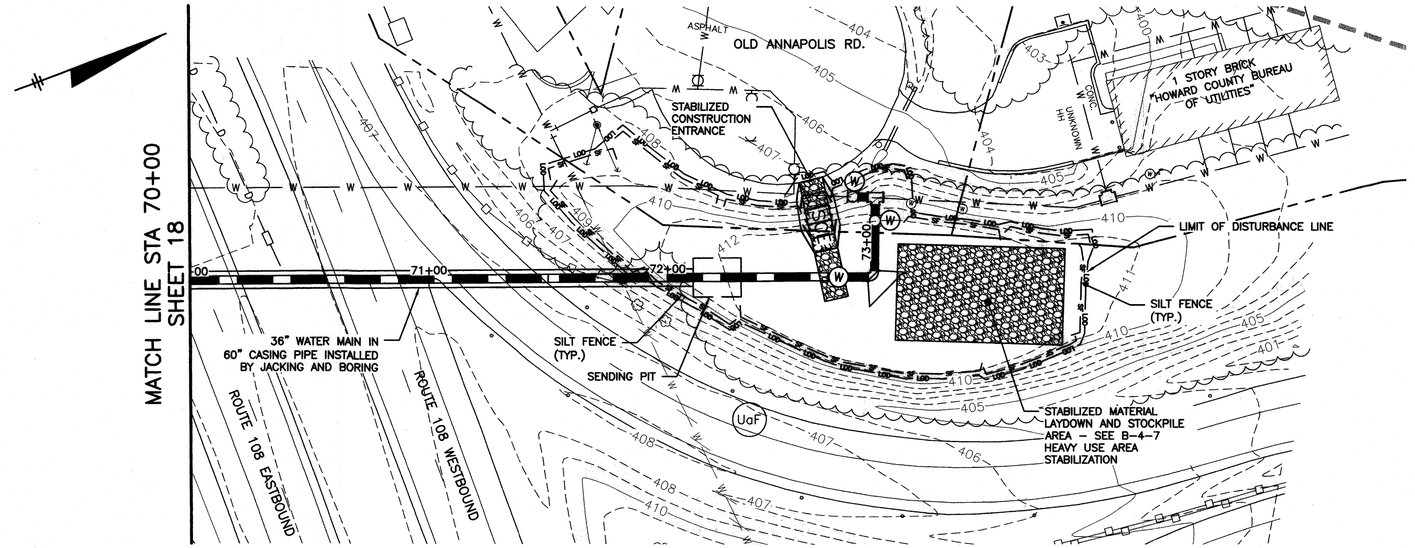
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

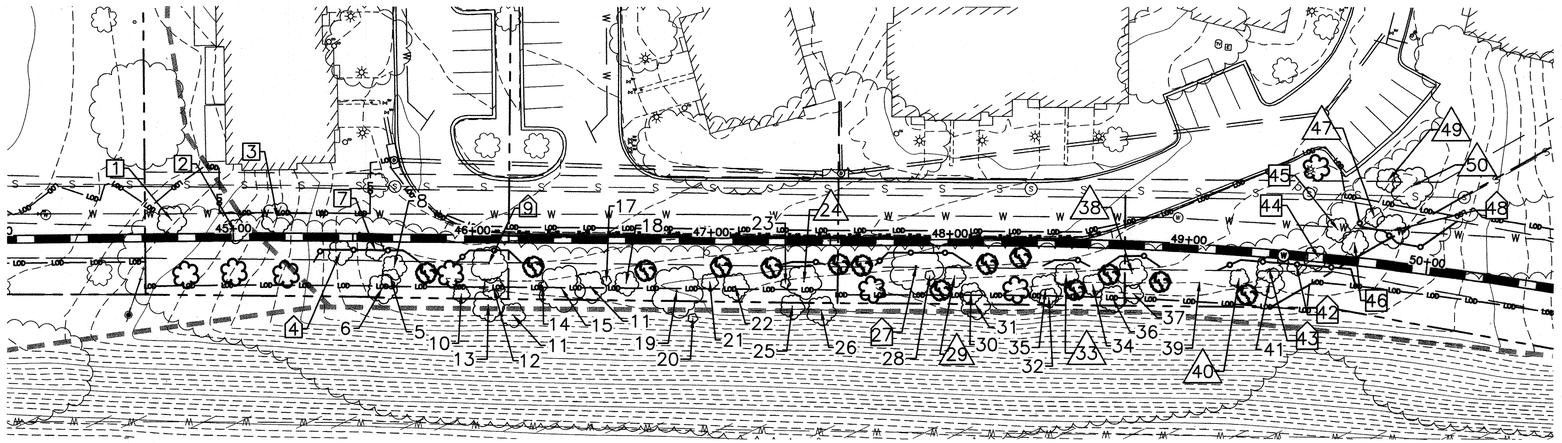
SCALE AS SHOWN

SHEET 18 OF 38

FILE NO. 3.1408-XXXF

I:\HOWARD-CO.2343\45854.RT-29-RT-108-WA\DOCS\DWG\SPLIT-SETS\SHEETS\45854-218A.DWG





PLANTING PLAN AT STA. 44+50 TO STA. 50+00

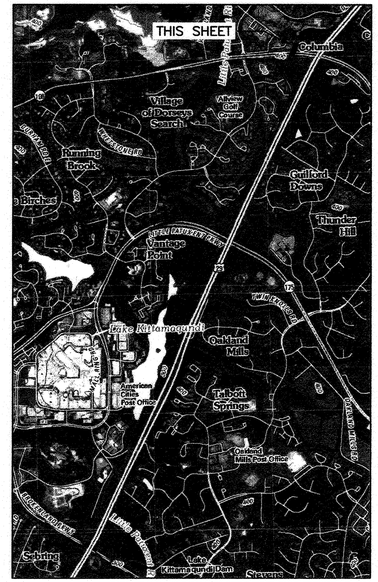
SCALE: 1"=30'

EXISTING TREES TO BE REMOVED		
TREE NUMBER	SPECIES	SIZE (DIAMETER IN INCHES)
1	WHITE PINE	14
2	RED MAPLE	12
3	NORWAY MAPLE	15
7	NORWAY MAPLE	10
44	WHITE PINE	12
45	RED MAPLE	12
46	WHITE PINE	13

REPLACEMENT SPECIES				
GROWTH HABIT	COMMON NAME	SCIENTIFIC NAME	POT SIZE	ESTIMATED NUMBER OF PLANTINGS
TREES	RED MAPLE	Acer rubrum	#3	4
	WHITE PINE	Pinus strobus	#3	3
SHRUBS	WINTERBERRY	Ilex verticillata	#2	4
	RHODODENDRON	Rhododendron minus	#2	4
	DWARF AZALEA	Rhododendron atlanticum	#2	3
	MAPLE-LEAF VIBURNUM	Viburnum acerifolium	#2	3

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
- 13M 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



LOCATION AND INDEX MAP

SCALE: 1" = 2000'

ADAPTED FROM SAVAGE, MD USGS 7.5 MIN. QUADRANGLE (2011)

NOTES

1. THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) CONSTRUCTION PERMIT NUMBER FOR THIS PROJECT IS 13-12-1008.
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.

PLANTING PLAN LEGEND

- EXISTING TREE
- TREE TO BE REMOVED
- TREE PROTECTION FENCING
- # — TREE ID NUMBER – NO IMPACT
- # — TREE ID NUMBER – ROOT IMPACT, PROTECT
- # — TREE ID NUMBER – REMOVE
- # — TREE ID NUMBER – PROTECT ROOT ZONE
- SHRUB TO BE PLANTED
- TREE TO BE PLANTED

GRAPHIC SCALE 1"=30' 30 0 30 60

ENGINEERS DESIGN CERTIFICATION:

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SOIL EROSION AND SEDIMENT CONTROL PLAN
STA. 70+00 TO STA. 73+20
AND PLANTING PLAN

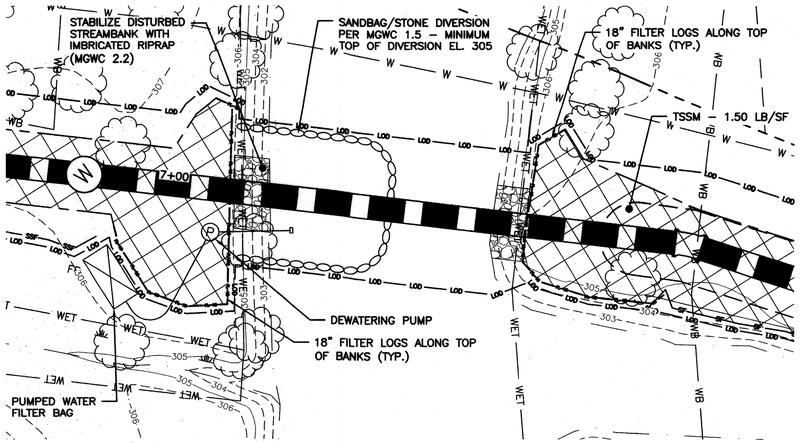
600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

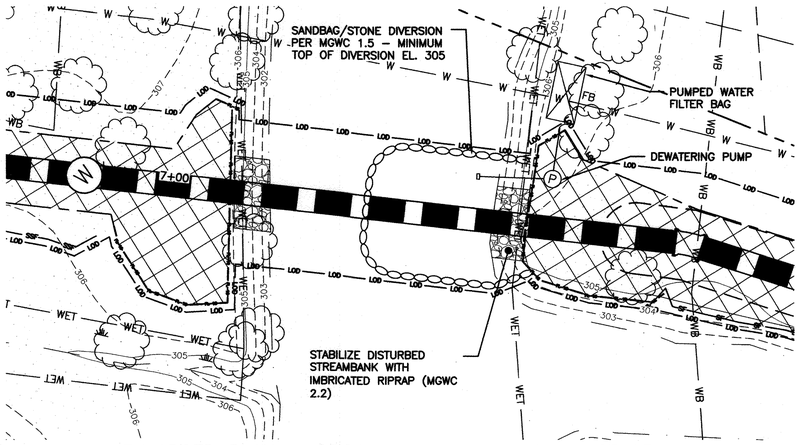
SHEET 18A OF 38

FILE NO. 3340R-XXXF



ENLARGED PLAN – CROSSING AT STA. 7+30 – STAGE 1

SCALE: 1"=10'

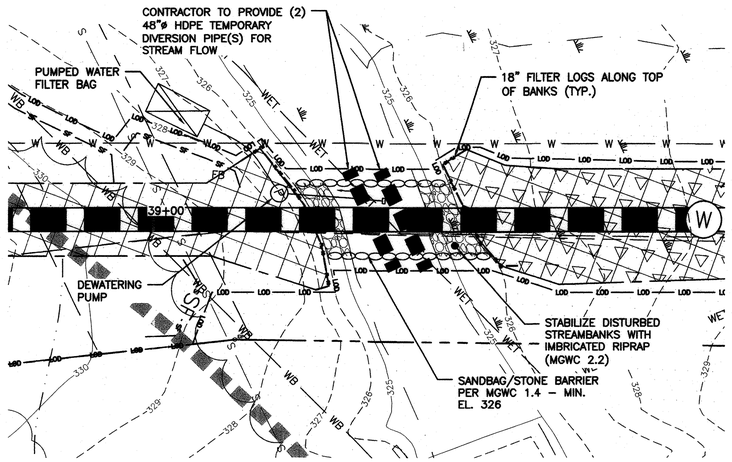


ENLARGED PLAN – CROSSING AT STA. 7+30 – STAGE 2

SCALE: 1"=10'

NOTES

1. CROSSING AT STATION 7+30 TO BE ACCOMPLISHED UTILIZING SANDBAG/STONE DIVERSION PER THE 2011 MARYLAND WATERWAY CONSTRUCTION GUIDELINES (MGWC 1.5). FOR DETAILS, NOTES AND SPECIFICATIONS FOR MGWC 1.5, SEE SHEET 20.
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. 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 20.

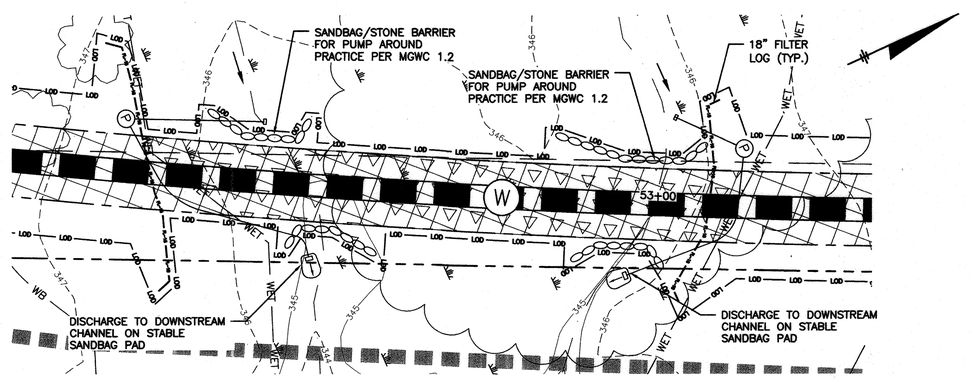


ENLARGED PLAN – CROSSING AT STA. 39+25

SCALE: 1"=10'

NOTES

1. CROSSING AT STATION 39+25 TO BE ACCOMPLISHED UTILIZING DIVERSION PIPE PER THE 2011 MARYLAND WATERWAY CONSTRUCTION GUIDELINES (MGWC 1.4). FOR DETAILS, NOTES AND SPECIFICATIONS FOR MGWC 1.4, SEE SHEET 20.
2. CONTRACTOR MAY UTILIZE ALTERNATE METHODS OF STREAM BARRIER, 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. CROSSING SHALL ONLY BE PERFORMED UPON A 3-DAY CLEAR WEATHER FORECAST FROM THE NATIONAL WEATHER SERVICE AND WITH THE APPROVAL OF THE CID INSPECTOR.
4. THE CONTRACTOR SHALL VERIFY THAT THE HEIGHT OF THE BARRIER INDICATED ON THE PLANS MEETS THE REQUIRED HEIGHT OF ONE HALF THE STREAMBANK HEIGHT, MEASURED FROM THE CHANNEL BED, PLUS 1 FOOT.
5. CONTRACTOR SHALL UTILIZE TRENCH BOXES OR OTHER SHORING TO MINIMIZE THE WIDTH OF TRENCHING AND DISTURBANCE TO THE STREAMBANKS AND CHANNEL BED.
6. CONTRACTOR SHALL PROVIDE TWO 48"ø HDPE TEMPORARY DIVERSION PIPES. PIPE SIZE HAS BEEN SELECTED TO BYPASS THE ANTICIPATED PEAK FLOW FROM THE 1.25-YEAR RETURN PERIOD STORM. THE DURATION OF INSTREAM WORK, INCLUDING DIVERSION SHALL NOT EXCEED THREE DAYS.
7. CONTRACTOR SHALL PROVIDE PROPER SUPPORT FOR DIVERSION PIPE(S) PASSING ABOVE THE UTILITY TRENCH AS SHOWN ON THE PLAN. CONTRACTOR SHALL NOT EXCAVATE INTO THE STREAMBANK TO INSTALL DIVERSION PIPE AS INDICATED ON MGWC 1.4.
8. FOR DETAILS AND SPECIFICATIONS OF IMBRICATED RIPRAP (MGWC 2.2) SEE SHEET 20.

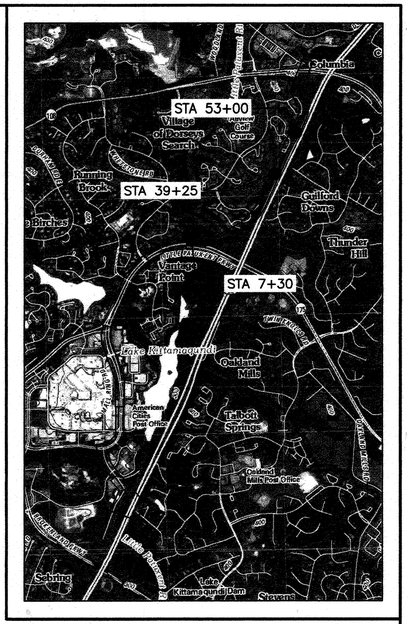


ENLARGED PLAN – CROSSINGS AT STA. 52+50 AND STA. 53+00

SCALE: 1"=10'

NOTES

1. CROSSINGS AT STATION 52+50 AND 53+00 TO BE ACCOMPLISHED PUMP AROUND PRACTICE PER THE 2011 MARYLAND WATERWAY CONSTRUCTION GUIDELINES (MGWC 1.2). FOR DETAILS, NOTES AND SPECIFICATIONS FOR MGWC 1.2, SEE SHEET 20.
2. WORK SHALL BE PERFORMED DURING LOW-FLOW PERIODS. IF NO FLOW IS PRESENT, CONTRACTOR MAY PERFORM WORK WITHOUT INSTALLING PUMP AROUND PRACTICE.
3. CROSSING OF EACH CHANNEL, INCLUDING BACKFILL AND RESTORATION SHALL BE PERFORMED IN ONE WORKING DAY.
4. DEWATERING OF EXCAVATIONS SHALL BE THROUGH A PUMPED WATER FILTER BAG OR OTHER SEDIMENT FILTERING DEVICE AS APPROVED BY THE CID.



LOCATION AND INDEX MAP

SCALE: 1" = 2000'

ADAPTED FROM SAVAGE, MD USGS 7.5 MIN. QUADRANGLE (2011)

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
Ⓟ	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
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	WETLANDS RESTORATION AREA

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SOIL EROSION AND SEDIMENT CONTROL PLAN WATERWAY CROSSINGS

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 19 OF 38

FILE NO. 33498-XXXF

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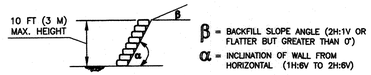
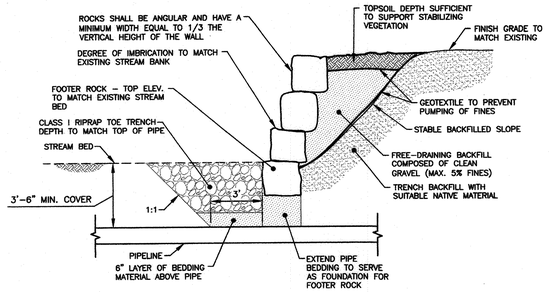
DETAIL: IMBRICATED RIPRAP
(ADAPTED FROM MGWC 2.2)

DEFINITION SKETCH

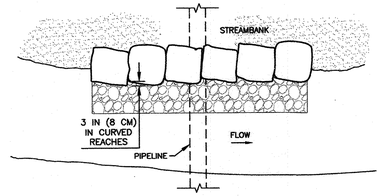


SECTION VIEW



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. 7+30: TOE RIPRAP SHALL BE CLASS I
IMBRICATED STONES TO BE APPROX. 36"L x 24"W x 24"H

FOR CROSSING AT STA. 39+25: 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).

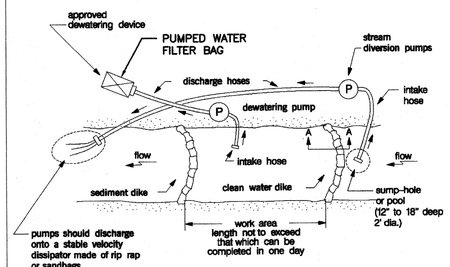
INSTALLATION GUIDELINES:

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):

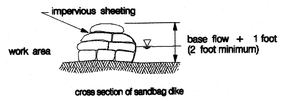
1. THE STREAM SHOULD BE DIVERTED ACCORDING TO A WMA RECOMMENDED PROCEDURE (SEE SECTION 1, TEMPORARY INSTREAM CONSTRUCTION MEASURES, MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION), AND THE CONSTRUCTION AREA SHOULD BE DEWATERED.
2. ALL EXCAVATION SHOULD BE MADE IN REASONABLY CLOSE CONFORMITY WITH THE 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 1.2: PUMP-AROUND PRACTICE

PLAN VIEW



SECTION A-A



TEMPORARY INSTREAM CONSTRUCTION MEASURES | REVISED NOVEMBER 2000 PAGE 1.2 - 3 | MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

MGWC 1.2: PUMP AROUND PRACTICE

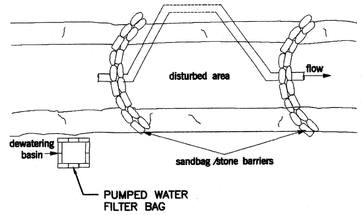
IMPLEMENTATION SEQUENCE:

SEDIMENT CONTROL MEASURES, PUMP-AROUND PRACTICES, AND ASSOCIATED CHANNEL AND BANK CONSTRUCTION SHOULD BE COMPLETED IN THE FOLLOWING SEQUENCE (REFER TO DETAIL 1.2):

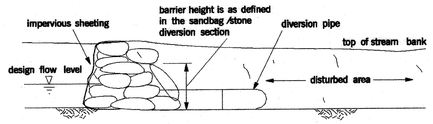
1. CONSTRUCTION ACTIVITIES INCLUDING THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES SHOULD NOT BEGIN UNTIL ALL NECESSARY EASEMENTS AND/OR RIGHT-OF-WAYS HAVE BEEN ACQUIRED. ALL EXISTING UTILITIES SHOULD BE MARKED IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES THAT MAY RESULT FROM CONSTRUCTION AND SHOULD REPAIR THE DAMAGE AT HIS/HER OWN EXPENSE TO THE COUNTY'S OR UTILITY COMPANY'S SATISFACTION.
2. THE CONTRACTOR SHOULD NOTIFY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT OR WMA SEDIMENT CONTROL INSPECTOR AT LEAST 5 DAYS BEFORE BEGINNING CONSTRUCTION. ADDITIONALLY THE CONTRACTOR SHOULD NOTIFY THE HOWARD SOIL CONSERVATION DISTRICT AND THE PROVIDER OF LOCAL UTILITIES A MINIMUM OF 48 HOURS BEFORE BEGINNING CONSTRUCTION.
3. THE CONTRACTOR SHOULD CONDUCT A PRE-CONSTRUCTION MEETING ON SITE WITH THE WMA SEDIMENT CONTROL INSPECTOR, THE COUNTY PROJECT MANAGER, AND THE ENGINEER TO REVIEW LIMITS OF DISTURBANCE, EROSION AND SEDIMENT CONTROL REQUIREMENTS, AND THE SEQUENCE OF CONSTRUCTION. THE CONTRACTOR SHOULD STAKE OUT ALL LIMITS OF DISTURBANCE PRIOR TO THE PRE-CONSTRUCTION MEETING SO THEY MAY BE REVIEWED. THE PARTICIPANTS WILL ALSO DESIGNATE THE CONTRACTOR'S STAGING AREAS AND FLAG ALL TREES WITHIN THE LIMIT OF DISTURBANCE WHICH WILL BE REMOVED FOR CONSTRUCTION ACCESS. TREES SHOULD NOT BE REMOVED WITHIN THE LIMIT OF DISTURBANCE WITHOUT APPROVAL FROM THE WMA OR LOCAL AUTHORITY.
4. CONSTRUCTION SHOULD NOT BEGIN UNTIL ALL SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED AND APPROVED BY THE ENGINEER AND THE SEDIMENT CONTROL INSPECTOR. THE CONTRACTOR SHOULD STAY WITHIN THE LIMITS OF THE DISTURBANCE AS SHOWN ON THE PLANS AND MINIMIZE DISTURBANCE WITHIN THE WORK AREA WHENEVER POSSIBLE.
5. UPON INSTALLATION OF ALL SEDIMENT CONTROL MEASURES AND APPROVAL BY THE SEDIMENT CONTROL INSPECTOR AND THE LOCAL ENVIRONMENTAL PROTECTION AND RESOURCE MANAGEMENT INSPECTION AND ENFORCEMENT DIVISION, THE CONTRACTOR SHOULD BEGIN WORK AT THE UPSTREAM SECTION AND PROCEED DOWNSTREAM BEGINNING WITH THE ESTABLISHMENT OF STABILIZED CONSTRUCTION ENTRANCES. IN SOME CASES, WORK MAY BEGIN DOWNSTREAM IF APPROPRIATE. THE SEQUENCE OF CONSTRUCTION MUST BE FOLLOWED UNLESS THE CONTRACTOR GETS WRITTEN APPROVAL FOR DEVIATIONS FROM THE WMA OR LOCAL AUTHORITY. THE CONTRACTOR SHOULD ONLY BEGIN WORK IN AN AREA WHICH CAN BE COMPLETED BY THE END OF THE DAY INCLUDING GRADING ADJACENT TO THE CHANNEL. AT THE END OF EACH WORK DAY, THE WORK AREA MUST BE STABILIZED AND THE PUMP AROUND REMOVED FROM THE CHANNEL. WORK SHOULD NOT BE CONDUCTED IN THE CHANNEL DURING RAIN EVENTS.
6. SANDBAG DIKES SHOULD BE SITUATED AT THE UPSTREAM AND DOWNSTREAM ENDS OF THE WORK AREA AS SHOWN ON THE PLANS, AND STREAM FLOW SHOULD BE PUMPED AROUND THE WORK AREA. THE PUMP SHOULD DISCHARGE ONTO A STABLE VELOCITY DISSIPATER MADE OF RIPRAP OR SANDBAGS.
7. WATER FROM THE WORK AREA SHOULD BE PUMPED TO A SEDIMENT FILTERING MEASURE SUCH AS A DEWATERING BASIN, SEDIMENT BAG, OR OTHER APPROVED SOURCE. THE MEASURE SHOULD BE LOCATED SUCH THAT THE WATER DRAINS BACK INTO THE CHANNEL BELOW THE DOWNSTREAM SANDBAG DIKE.
8. TRAVERSING A CHANNEL REACH WITH EQUIPMENT WITHIN THE WORK AREA WHERE NO WORK IS PROPOSED SHOULD BE AVOIDED. IF EQUIPMENT HAS TO TRAVERSE SUCH A REACH FOR ACCESS TO ANOTHER AREA, THEN TIMBER MATS OR SIMILAR MEASURES SHOULD BE USED TO MINIMIZE DISTURBANCE TO THE CHANNEL. TEMPORARY STREAM CROSSINGS SHOULD BE USED ONLY WHEN NECESSARY AND ONLY WHERE NOTED ON THE PLANS OR SPECIFIED. (SEE SECTION 4, STREAM CROSSINGS, MARYLAND GUIDELINES TO WATERWAY CONSTRUCTION).
9. ALL STREAM RESTORATION MEASURES SHOULD BE INSTALLED AS INDICATED BY THE PLANS AND ALL BANKS GRADED IN ACCORDANCE WITH THE GRADING PLANS AND TYPICAL CROSS-- SECTIONS. ALL GRADING MUST BE STABILIZED AT THE END OF EACH DAY WITH SEED AND MULCH OR SEED AND MATTING AS SPECIFIED ON THE PLANS.
10. AFTER AN AREA IS COMPLETED AND STABILIZED, THE CLEAN WATER DIKE SHOULD BE REMOVED. AFTER THE FIRST SEDIMENT FLUSH, A NEW CLEAN WATER DIKE SHOULD BE ESTABLISHED UPSTREAM FROM THE OLD SEDIMENT DIKE. FINALLY, UPON ESTABLISHMENT OF A NEW SEDIMENT DIKE BELOW THE OLD ONE, THE OLD SEDIMENT DIKE SHOULD BE REMOVED.
11. A PUMP AROUND MUST BE INSTALLED ON ANY TRIBUTARY OR STORM DRAIN OUTFALL WHICH CONTRIBUTES BASEFLOW TO THE WORK AREA. THIS SHOULD BE ACCOMPLISHED BY LOCATING A SANDBAG DIKE AT THE DOWNSTREAM END OF THE TRIBUTARY OR STORM DRAIN OUTFALL AND PUMPING THE STREAM FLOW AROUND THE WORK AREA. THIS WATER SHOULD DISCHARGE ONTO THE SAME VELOCITY DISSIPATER USED FOR THE MAIN STEM PUMP AROUND.
12. IF A TRIBUTARY IS TO BE RESTORED, CONSTRUCTION SHOULD TAKE PLACE ON THE TRIBUTARY BEFORE WORK ON THE MAIN STEM REACHES THE TRIBUTARY CONFLUENCE. CONSTRUCTION IN THE TRIBUTARY, INCLUDING PUMP AROUND PRACTICES, SHOULD FOLLOW THE SAME SEQUENCE AS FOR THE MAIN STEM OF THE RIVER OR STREAM. WHEN CONSTRUCTION ON THE TRIBUTARY IS COMPLETED, WORK ON THE MAIN STEM SHOULD RESUME. WATER FROM THE TRIBUTARY SHOULD CONTINUE TO BE PUMPED AROUND THE WORK AREA IN THE MAIN STEM.
13. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ACCESS TO AND MAINTAINING ALL EROSION AND SEDIMENT CONTROL DEVICES UNTIL THE SEDIMENT CONTROL INSPECTOR APPROVES THEIR REMOVAL.
14. AFTER CONSTRUCTION, ALL DISTURBED AREAS SHOULD BE REGRADED AND REVEGETATED AS PER THE PLANTING PLAN.

Maryland's Guidelines To Waterway Construction
DETAIL 1.4: DIVERSION PIPE

PLAN VIEW



LONGITUDINAL SECTION VIEW



TEMPORARY INSTREAM CONSTRUCTION MEASURES | REVISED NOVEMBER 2000 PAGE 1.4 - 3 | MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

MGWC 1.4: DIVERSION PIPE

MATERIAL SPECIFICATIONS:

MATERIALS FOR 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:

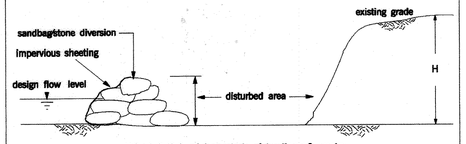
ALL EROSION AND SEDIMENT CONTROL DEVICES, INCLUDING MANDATORY DEWATERING BASINS SHOULD BE INSTALLED AS THE FIRST ORDER OF BUSINESS ACCORDING TO A PLAN APPROVED BY THE WMA OR LOCAL AUTHORITY. INSTALLATION SHOULD PROCEED FROM UPSTREAM TO DOWNSTREAM DURING LOW FLOW CONDITIONS. IF NECESSARY, SILT FENCE OR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

DIVERSION PIPES WITH SANDBAG OR STONE BARRIERS SHOULD BE COMPLETED AS FOLLOWS (REFER TO DETAIL 1.4):

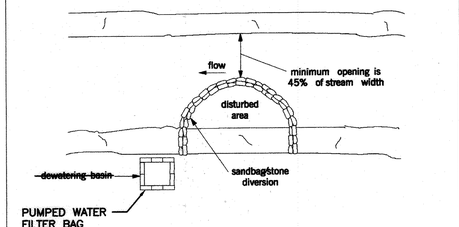
1. SANDBAG/STONE BARRIERS SHOULD BE SIZED AND INSTALLED AS DETAILED IN MGWC 1.5: SANDBAG/STONE DIVERSION. THE MATERIALS SHOULD BE SIZED TO WITHSTAND BASEFLOW VELOCITIES.
2. ALL EXCAVATED MATERIAL SHOULD BE DEPOSITED AND STABILIZED IN AN APPROVED AREA OUTSIDE THE 100-YEAR FLOODPLAIN UNLESS OTHERWISE AUTHORIZED BY THE WMA.
3. SEDIMENT-LADEN WATER FROM THE CONSTRUCTION AREA SHOULD BE PUMPED TO A DEWATERING BASIN OR A PUMPED WATER FILTER BAG.
4. THE DIVERSION PIPE SHOULD HAVE A MINIMUM CAPACITY SUFFICIENT TO CONVEY THE 2-YEAR FLOW FOR PROJECTS WITH A DURATION OF TWO WEEKS OR GREATER. FOR PROJECTS OF SHORTER DURATION, THE CAPACITY OF THE PIPE CAN BE REDUCED ACCORDINGLY.
5. IF NECESSARY, SILT FENCE OR STRAW BALES SHOULD BE INSTALLED AROUND THE PERIMETER OF THE WORK AREA.
6. SEDIMENT CONTROL DEVICES ARE TO REMAIN IN PLACE UNTIL ALL DISTURBED AREAS ARE STABILIZED AND THE INSPECTING AUTHORITY APPROVES THEIR REMOVAL.

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

TRANSVERSE SECTION VIEW



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.

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.

18523 — Signature of Engineer – Registration Number
6/22/16 — Date

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 6/28/16
CHIEF - BUREAU OF ENGINEERING — DATE 6/28/16
CHIEF, BUREAU OF UTILITIES — DATE 6/23/16
CHIEF, UTILITY DESIGN DIVISION — DATE 6/28/16

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

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 18523, EXPIRATION DATE 12/08/2017

STATE OF MARYLAND — ROBERT JOHN DUDLA — PROFESSIONAL ENGINEER

DSN. BY: SMS
DRN. BY: SMS
CHK. BY: RJD
DATE: 2/16

BY	NO.		DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	5/19
RJD		REVISED PER HSCD REVIEW	5/16
RJD		REVISED PER HSCD REVIEW	4/16
RJD	0	AS BID	2/16

SOIL EROSION AND SEDIMENT CONTROL PLAN
WATERWAY CROSSING DETAILS

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 20 OF 38

FILE NO. 3340R-XXYF

I:\HOWARD-CO.2343\45854.RT-29-RT-108-WA\DOCS\DWG\SPLIT-SETS\SHEETS\45854-215.DWG

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 21 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

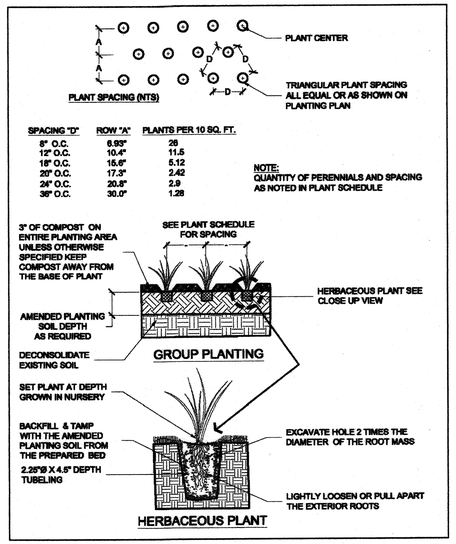
16. JOB CONDITIONS:
   - A. EXAMINE AND EVALUATE GRADES, SOILS AND WATER LEVELS. OBSERVE THE CONDITIONS UNDER WHICH WORK IS TO BE PERFORMED AND NOTIFY THE ENGINEER OF UNSATISFACTORY CONDITIONS. DO NOT PROCEED WITH THE WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED IN AN ACCEPTABLE MANNER.
   - 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.
▽▽▽▽▽▽	6,000	WETLAND PLANTING MIX	TUBELINGS/PLUGS @ 12" O.C.

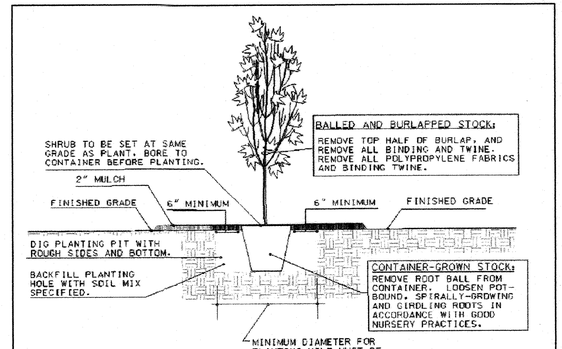
WETLAND PLANTING MIX: PLANT EACH SPECIES IN RANDOM GROUPS OF 4 TO 7 PLANTS.

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.



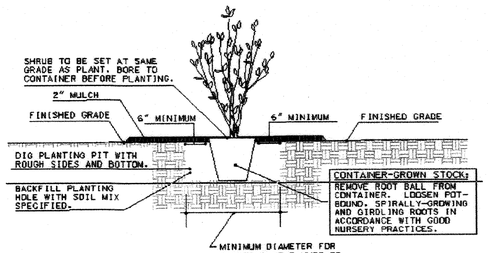
HERBACEOUS TUBELING/PLUG PLANTING DETAIL

NOT TO SCALE



PLANTING DETAIL -- SMALL DECIDUOUS AND EVERGREEN TREES

NOT TO SCALE

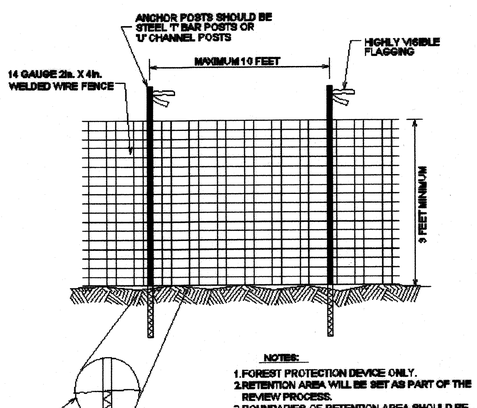


PLANTING DETAIL -- DECIDUOUS AND EVERGREEN SHRUBS

NOT TO SCALE

TREE PROTECTION FENCING

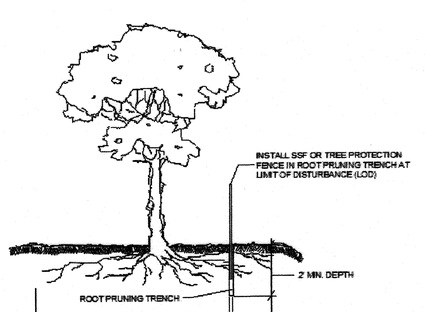
WIRE MESH



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 INSTALLED 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 ARE NATIVE AND WERE 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. PLANTING LOCATIONS SPECIFIED IN THE PLANTING PLAN ARE FOR ESTIMATING PURPOSES ONLY. ACTUAL PLANTING REQUIREMENTS AND LOCATIONS SHALL BE DETERMINED IN THE FIELD BASED ON THE NUMBER OF TREES REMOVED DURING CONSTRUCTION ACTIVITIES.
6. SPECIES AND SIZES OF REPLANTINGS ARE PROVIDED IN THE ATTACHED MAPPING.
7. TREES AND SHRUBS SHALL BE PLACED A MINIMUM OF 15 FEET AND 10 FEET, RESPECTIVELY, FROM THE WATER MAIN.
8. 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. IT 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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 6/24/16
CHIEF - BUREAU OF ENGINEERING — DATE 6/24/16
CHIEF, BUREAU OF UTILITIES — DATE 6/23/16
CHIEF, UTILITY DESIGN DIVISION — DATE 6/23/16

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

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 18523, EXPIRATION DATE 12/08/2017

STATE OF MARYLAND — ROBERT JOHN DAVIS — PROFESSIONAL ENGINEER

DSN. BY: SMS
DRN. BY:
CHK. BY: RJD
DATE: 2/16

BY	NO.		DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	5/19
RJD		REVISED PER HSCD REVIEW	5/16
RJD		REVISED PER HSCD REVIEW	4/16
RJD	0	AS BID	02/16

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

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 20A OF 38

FILE NO. 3340R-XXYF

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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.
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION 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.
4. 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).
5. 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.
6. SITE ANALYSIS:

TOTAL AREA OF SITE:	4.94 ACRES
AREA DISTURBED:	4.94 ACRES
AREA TO BE ROOFED OR PAVED:	0.25 ACRES (RESTORE EXISTING PAVEMENT)
AREA TO BE VEGETATIVELY STABILIZED:	4.69 ACRES
TOTAL CUT:	12,000 CU. YDS.
TOTAL FILL:	10,800 CU. YDS.
OFFSITE WASTE/BORROW AREA LOCATION:	TO BE DETERMINED - SITE SHALL HAVE AN ACTIVE GRADING PERMIT AND BE APPROVED BY THE CID INSPECTOR.

7. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
8. 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)
9. 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.
10. 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.
11. 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.
12. WASH WATER FROM ANY EQUIPMENT, VEHICLES, WHEELS, PAVEMENT, AND OTHER SOURCES MUST BE TREATED IN A SEDIMENT BASIN OR OTHER APPROVED WASHOUT STRUCTURE.
13. TOPSOIL SHALL BE STOCKPILED AND PRESERVED ON-SITE FOR REDISTRIBUTION ONTO FINAL GRADE.
14. 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.
15. 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
16. 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 13-12-1008.
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 SOIL CONSERVATION DISTRICT (HSCD) INSPECTOR, 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.
3. INSTALL STABILIZED CONSTRUCTION ENTRANCES AND STABILIZED CONSTRUCTION STAGING AREAS. **(ESTIMATED DURATION: 10 DAYS)**
4. INSTALL SILT FENCE AND FILTER LOGS AS INDICATED ALONG WATERLINE ALIGNMENT IN VEGETATED AREAS. THE CID INSPECTOR SHALL APPROVE THE LOCATION AND INSTALLATION OF ALL SILT FENCE AND FILTER LOGS PRIOR TO PROCEEDING WITH FURTHER ACTIVITIES. **(ESTIMATED DURATION: 15 DAYS)**
5. BEGIN EXCAVATION AND CONNECTION TO EXISTING WATER MAIN AT STATION 0+00 AND CONTINUE TO APPROXIMATE STATION 7+30. **(ESTIMATED DURATION: 30 DAYS)**
6. INSTALL PIPELINE BENEATH LITTLE PATUXENT RIVER AT APPROXIMATE STATION 7+30 USING SANDBAG/ STONE CHANNEL DIVERSIONS AS INDICATED PER MGWC 1.5 (REFER TO SHEETS 19 AND 20). IN-STREAM WORK SHALL BE COMPLETED IN LESS THAN TWO WEEKS. STABILIZE BANKS WITH IMBRICATED RIPRAP PER MGWC 2.2 (REFER TO SHEET 20). 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: 14 DAYS)**
7. CONTINUE EXCAVATION AND INSTALLATION OF NEW WATER MAIN FROM STATION 7+30 TO APPROXIMATE STATION 39+25. **(ESTIMATED DURATION: 140 DAYS)**
8. INSTALL PIPELINE BENEATH STREAM AT APPROXIMATE STATION 39+25 USING DIVERSION PIPE AS INDICATED PER MGWC 1.4 (REFER TO SHEETS 19 AND 20). STABILIZE STREAMBANKS WITH IMBRICATED RIPRAP PER MGWC 2.2 (REFER TO SHEET 20). 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: 3 DAYS)**
9. CONTINUE EXCAVATION AND INSTALLATION OF NEW WATER MAIN FROM STATION 39+25 TO APPROXIMATE STATION 64+50. PERFORM CROSSING OF WETLAND AND STREAM CHANNELS AT APPROXIMATE STATIONS 52+50 AND 53+00 USING PUMP AROUND PRACTICE MGWC 1.2. IN-STREAM WORK SHALL BE COMPLETED IN ONE WORKING DAY (REFER TO SHEETS 19 AND 20). 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: 115 DAYS)**
10. INSTALL PIPELINE FROM APPROXIMATE STATION 64+50 TO APPROXIMATE STATION 72+00 BY BORING. CONTRACTOR SHALL INSTALL SILT FENCING DOWNSLOPE OF SENDING AND RECEIVING PITS FOR BORING CONSTRUCTION. **(ESTIMATED DURATION: 150 DAYS)**
11. COMPLETE EXCAVATION AND INSTALLATION OF NEW WATER MAIN AND COMPLETE CONNECTION TO EXISTING WATER MAIN. **(ESTIMATED DURATION: 13 DAYS)**
12. 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. RESTORE ROADSIDE SWALES AT STABILIZED CONSTRUCTION ENTRANCE WITH TEMPORARY SLOPE STABILIZATION MATTING AS INDICATED. **(ESTIMATED DURATION: 20 DAYS)**

TOTAL ESTIMATED DURATION: 550 DAYS

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
GbB	GLADSTONE LOAM	3-8%	0.28	NO	B	CUTBANKS CAVE
GbC	GLADSTONE LOAM	8-15%	0.28	NO	B	CUTBANKS CAVE
GgB	GLENELG LOAM	3-8%	0.28	NO	B	CUTBANKS CAVE
GhB	GLENELG-URBAN LAND COMPLEX	0-8%	0.28	NO	B	CUTBANKS CAVE
GhC	GLENELG-URBAN LAND COMPLEX	8-15%	0.28	NO	B	CUTBANKS CAVE
GmB	GLENVILLE SILT LOAM	3-8%	0.43	NO	C	CUTBANKS CAVE; SEASONAL HIGH WATER TABLE; SLOW PERCOLATION
GnB	GLENVILLE-BAILE SILT LOAMS	0-8%	0.43	YES	C	CUTBANKS CAVE; SEASONAL HIGH WATER TABLE; SLOW PERCOLATION
GoB	GLENVILLE-CODORUS SILT LOAMS	0-8%	0.43	NO	C	CUTBANKS CAVE; SEASONAL HIGH WATER TABLE; SLOW PERCOLATION
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
MaD	MANOR LOAM	15-25%	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; SLOW PERCOLATION
UuB	URBAN LAND-UDORTHENTS COMPLEX	0-8%	0.28	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

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 18523 — Date 6/22/16

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 6/28/16
CHIEF - BUREAU OF ENGINEERING — DATE 6/24/16
CHIEF, BUREAU OF UTILITIES — DATE 6/27/16
CHIEF, UTILITY DESIGN DIVISION — DATE 6/28/16

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

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 18523, EXPIRATION DATE 12/08/2017

STATE OF MARYLAND — ROBERT JOHN DAVIS — REGISTERED PROFESSIONAL ENGINEER

DSN. BY: SMS
DRN. BY: SMS
CHK. BY: RJD
DATE: 2/16

BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	5/19
RJD		REVISED PER HSCD REVIEW	5/16
RJD		REVISED PER HSCD REVIEW	4/16
RJD	0	AS BID	2/16

SOIL EROSION AND SEDIMENT CONTROL PLAN NOTES AND DETAILS - 1

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 21 OF 38

FILE NO. 33498-XXXF

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

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

BARIRUS	HAGA	MONOPOLY
CALIBER	LIVINGTON	WASHINGTON
EAGLETON	MERIT	
FREEDOM	MIDNIGHT	

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

ALAMO E	BULLDAWG	DEBUTANTE	GOOD-EN	MICRO DD	REBEL 3D	SCORPIO	TITAN 2
APACHE II	CHAPEL HILL	DOMINION	GRANDE	MILLENNIUM	REBEL III	SHENANDOAH	TOMAHAWK
AVANTI	CHIEFTAIN II	DUKE	GUARDIAN	OLYMPIC GOLD	REBEL JR.	SHENANDOAH II	TRAILBLAZER II
AXIOM	CHINOOK	DUSTER	HERITAGE	ONCUE	REBEL SENTRY	SOUTHERN CHOICE	TWILIGHT II
BANDANA	COCHISE II	ELDORADO	HOUNDOG 5	PIXIE	RED COAT	SR 8200	VIRTUE
BARLEXUS	COMSTOCK	EMPRESS	JAGUAR III	PIXIE E+	REGIMENT	SR 8300	WATCHDOG
BARRINGTON	COYOTE	FALCON II	LANCER	PLANTATION	REMBRANDT	STETSON	WOLFPACK
BONANZA	CROSSFIRE	FINELAWN PETITE	LEPRECHAUN	PYRAMID	RENEGADE	TARHEEL	WPEZE
BONANZA II	CROSSFIRE II	GENESIS	MASTERPIECE	REBEL 2000	RESERVE	TF6	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"		

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.

18523 6/22/16
Signature of Engineer - Registration Number Date

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 6/28/16
CHIEF - BUREAU OF ENGINEERING — DATE 6/24/16
CHIEF, BUREAU OF UTILITIES — DATE 6/27/16
CHIEF, UTILITY DESIGN DIVISION — DATE 6/23/16

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

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 18523, EXPIRATION DATE 12/08/2017

STATE OF MARYLAND — ROBERT JOHN D... — REGISTERED PROFESSIONAL ENGINEER

DSN. BY: SMS
DRN. BY: SMS
CHK. BY: RJD
DATE: 2/16

BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	5/19
RJD		REVISED PER HSCD REVIEW	5/16
RJD		REVISED PER HSCD REVIEW	4/16
RJD	0	AS BID	02/16

SOIL EROSION AND SEDIMENT CONTROL PLAN NOTES AND DETAILS - 2

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 22 OF 38

FILE NO. 3349R-XXXF

I:\HOWARD-CO.2343\45854.RT-29-RT-108-WA\DOCS\DWG\SPLIT-SETS\SHEETS\45854-215.DWG

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.

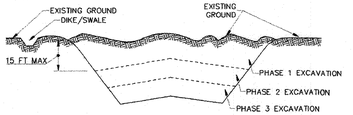


Figure B.1: Incremental Stabilization – Cut

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.

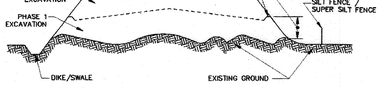


Figure B.2: Incremental Stabilization – Fill

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

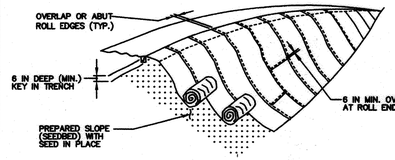
1. The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
2. The footprint of the stockpile must be sized to accommodate the anticipated volume of material and based on a side slope ratio no steeper than 2:1. Benching must 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

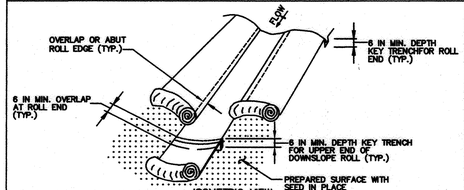
1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION 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

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.

18523 — Signature of Engineer – Registration Number
6/22/16 — Date

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 6/24/16
CHIEF – BUREAU OF ENGINEERING — DATE 6/24/16
CHIEF, BUREAU OF UTILITIES — DATE 6/27/16
CHIEF, UTILITY DESIGN DIVISION — DATE 6/23/16

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

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 18523, EXPIRATION DATE 12/08/2017

STATE OF MARYLAND — ROBERT JOHN DAY — PROFESSIONAL ENGINEER

DSN. BY: SMS
DRN. BY: SMS
CHK. BY: RJD
DATE: 2/16

JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	5/19
RJD		REVISED PER HSCD REVIEW	5/16
RJD		REVISED PER HSCD REVIEW	4/16
RJD	0	AS BID	02/16
BY	NO.	REVISION	DATE

SOIL EROSION AND SEDIMENT CONTROL PLAN NOTES AND DETAILS – 3

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

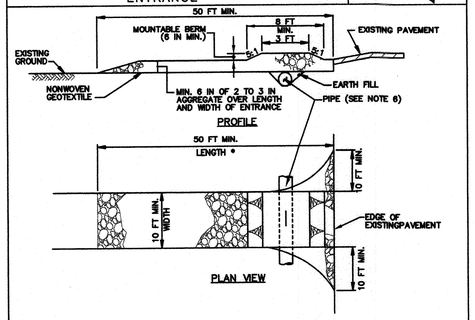
SHEET 23 OF 38

FILE NO. 3AAA-0022

I:\HOWARD-CO,23A3\45854-RT-29-RT-108-WA\DOCS\DWG\SPLIT-SETS\SHEETS\45854-223A.DWG

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

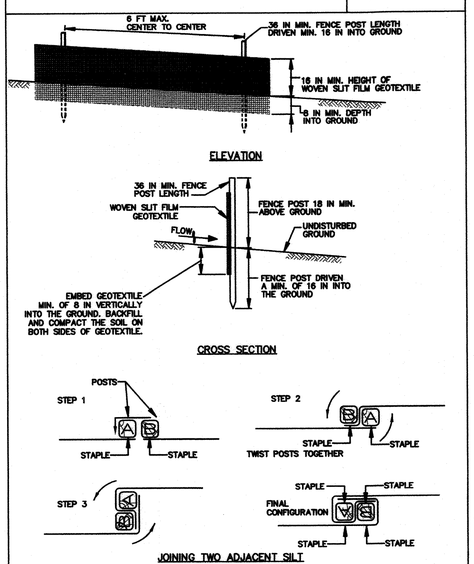
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING 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



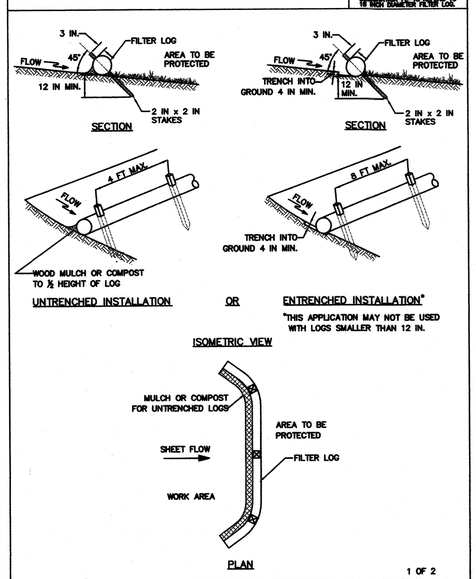
1 OF 2

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.)



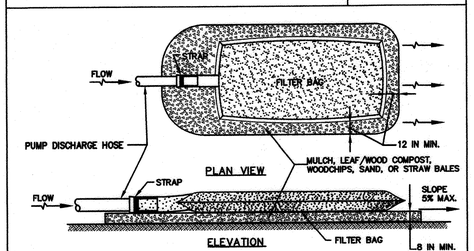
1 OF 2

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.

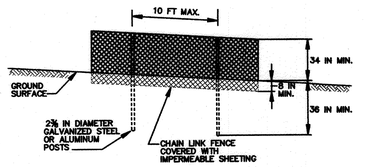
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL C-9 DIVERSION FENCE

STANDARD SYMBOL: DF

MAXIMUM DRAINAGE AREA = 2 ACRES



CONSTRUCTION SPECIFICATIONS

1. USE 42 INCH HIGH, 9 GAUGE OR THICKER CHAIN LINK FENCING (2⅜ INCH MAXIMUM OPENING).
2. USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. THE POSTS DO NOT NEED TO BE SET IN CONCRETE.
3. FASTEN CHAIN LINK FENCE SECURELY TO THE FENCE POSTS WITH WIRE TIES.
4. SECURE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING TO CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT TOP, MID SECTION, AND BELOW GROUND SURFACE.
5. EXTEND SHEETING A MINIMUM OF 4 FEET ALONG FLOW SURFACE AND EMBED END A MINIMUM OF 8 INCHES INTO GROUND. SOIL STABILIZATION MATTING MAY BE USED IN LIEU OF IMPERMEABLE SHEETING ALONG FLOW SURFACE.
6. WHEN TWO SECTIONS OF SHEETING ADJOIN EACH OTHER, OVERLAP BY 6 INCHES AND FOLD WITH SEAM FACING DOWNGRADE.
7. KEEP FLOW SURFACE ALONG DIVERSION FENCE AND POINT OF DISCHARGE FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE. REPLACE IMPERMEABLE SHEETING IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

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 ± 1/8 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.

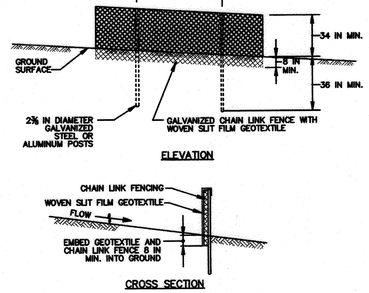
2 OF 2

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-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 HOG 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

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.

18523 — Signature of Engineer – Registration Number
6/22/16 — Date

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 6/28/16
CHIEF – BUREAU OF ENGINEERING — DATE 6/24/16
CHIEF, BUREAU OF UTILITIES — DATE 6/27/16
CHIEF, UTILITY DESIGN DIVISION — DATE 6/28/16

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

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 18523, EXPIRATION DATE 12/08/2017

STATE OF MARYLAND — ROBERT JOHN DIXON — PROFESSIONAL ENGINEER

DSN. BY: SMS
DRN. BY: SMS
CHK. BY: RJD
DATE: 2/16

BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	5/19
RJD		REVISED PER HSCD REVIEW	5/16
RJD		REVISED PER HSCD REVIEW	4/16
RJD	0	AS BID	2/16

SOIL EROSION AND SEDIMENT CONTROL PLAN NOTES AND DETAILS – 4

600' SCALE MAP NO. 30 BLOCK NO. 36

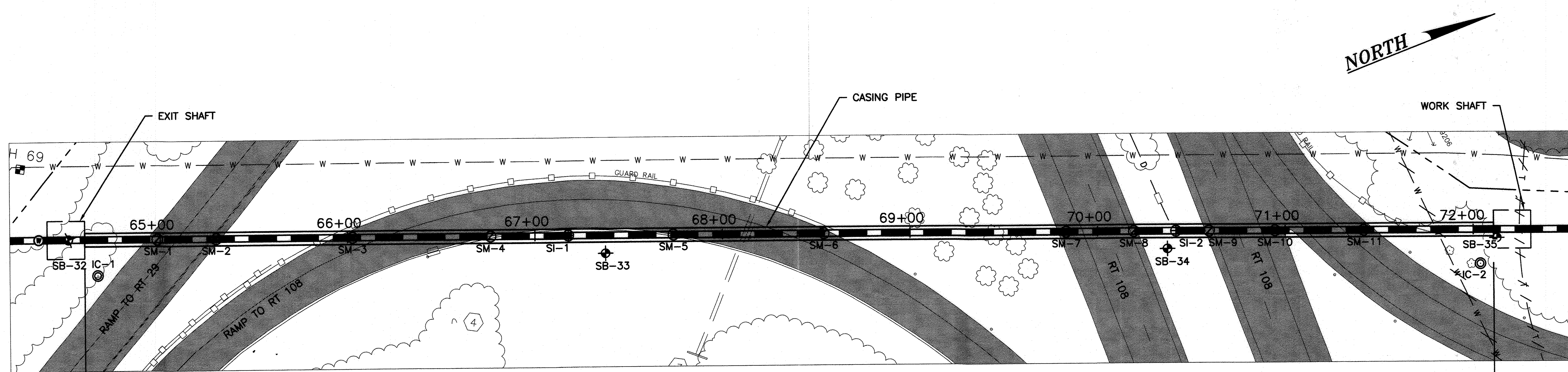
U.S. ROUTE 29 WATER TRANSMISSION MAIN LITTLE PATUXENT PARKWAY TO MD ROUTE 108

CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 23A OF 38

S:\JENNY ENGINEERING\PROJ\CAD\DWG\ACTIVE PROJECTS\2012016-HOWARD COUNTY - RT 29 CROSSSING\10-23-2015_GIP\S-24 22.DWG



STA. 64+59.77
INV. EL. 375.88
END 60" CASING PIPE

PLAN

SCALE: 1"=30'

STA 64+59.77 TO 72+11.58

STA. 72+11.58
INV. EL. 376.19
START 60" CASING PIPE

RECORD DRAWINGS

LEGEND

- BORING
- (IC) – INCLINOMETER
- (SI) – SUBSURFACE SHALLOW SETTLEMENT INDICATOR
- (SM) – SURFACE SETTLEMENT MARKER

NOTE

FOR LOCATION OF INSTRUMENTATION REFER TO SHEET 25 OF 38.

1"=30' 30' 15' 0 30'
HORIZONTAL SCALE IN FEET

JENNY ENGINEERING CORPORATION
CONSULTING ENGINEERS
2 Edison Place Springfield, New Jersey 07081
Phone: (973) 379-6699 Fax: (973) 379-6774
Website: www.jennyeng.com

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	DATE 2/25/16	CHIEF – BUREAU OF ENGINEERING	DATE 2/23/16
CHIEF, BUREAU OF UTILITIES	DATE 2/24/16	CHIEF, UTILITY DESIGN DIVISION	DATE 2/23/16

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. 21100, EXPIRATION DATE 01/17/2018

STATE OF MARYLAND — 21100 — REGISTERED PROFESSIONAL ENGINEER

DSN. BY: LJG
DRN. BY: JSA/RS
CHK. BY: LG
DATE: FEB 2016

BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

GEOTECHNICAL
INSTRUMENTATIONAL PLAN

600' SCALE MAP NO. 30 BLOCK NO. 36

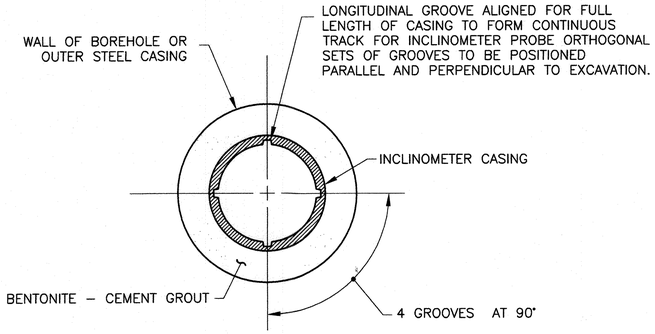
U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108

CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

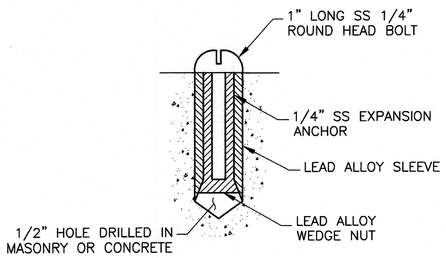
SCALE AS SHOWN

SHEET 24 OF 38

FILE NO. 33498-XXXF

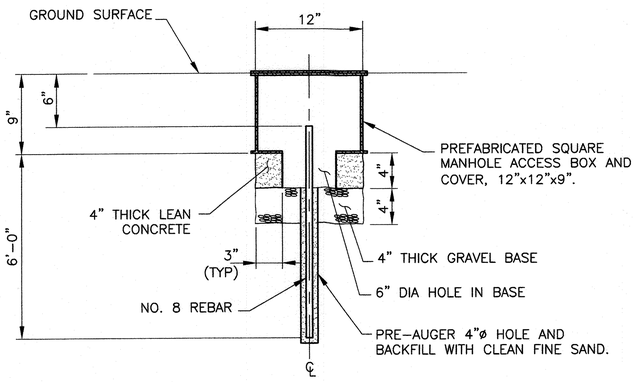


CROSS SECTION THROUGH INCLINOMETER CASING



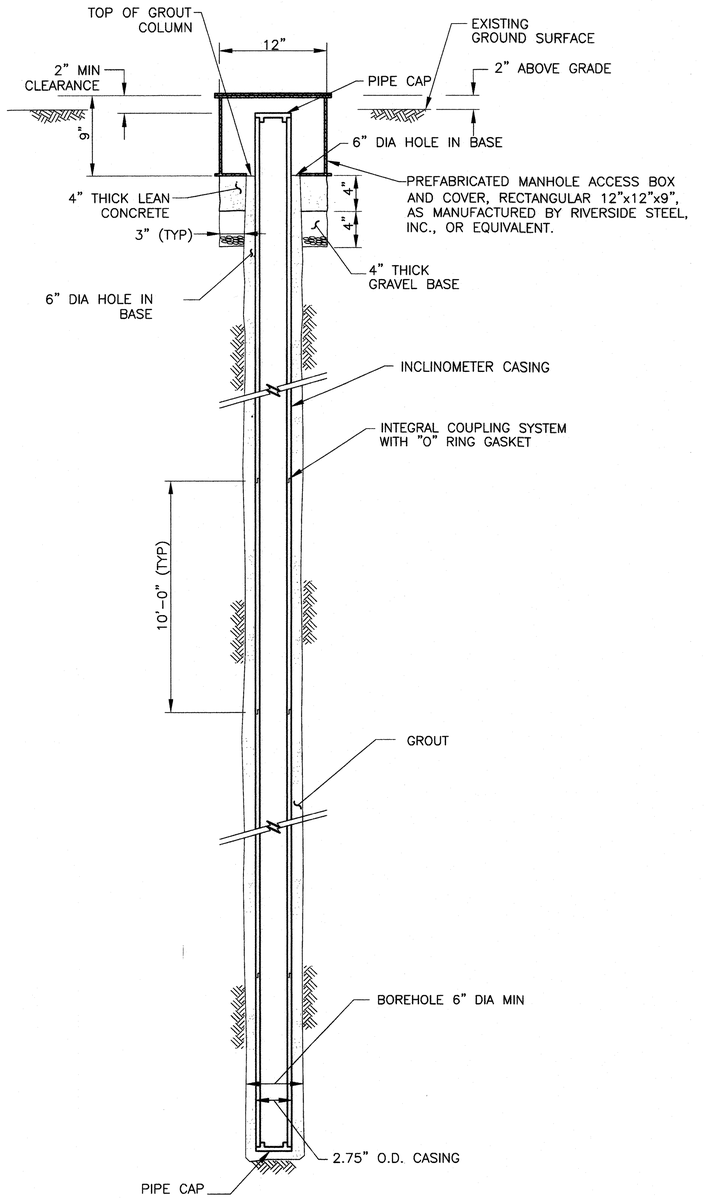
SURFACE SETTLEMENT MARKER HORIZONTAL MASONRY, CONCRETE SURFACE OR PAVEMENT

(SM)



SUBSURFACE SHALLOW SETTLEMENT INDICATOR

(SI)



INCLINOMETER CASING

(IC)

SURFACE SETTLEMENT MARKERS SCHEDULE (SM)

MARKER NUMBER	LOCATION		
	STA ℄	OFFSET (FT)	COMMENTS
SM–1	64+99	0	–
SM–2	65+30	0	–
SM–3	66+03	0	–
SM–4	66+76	0	–
SM–5	67+74	0	–
SM–6	68+54	0	–
SM–7	69+83	0	–
SM–8	70+19	0	–
SM–9	70+60	0	–
SM–10	70+95	0	–
SM–11	71+42	0	–

SUBSURFACE SHALLOW SETTLEMENT INDICATORS SCHEDULE (SI)

INDICATOR NUMBER	LOCATION	
	STA ℄	OFFSET (FT)
SI–1	67+23	0
SI–2	70+47	0

INCLINOMETERS SCHEDULE (IC)

INCLINOMETER NUMBER	LOCATION		APPROXIMATE GROUND ELEVATION (FT)	MINIMUM BOTTOM ELEVATION (FT)
	STA ℄	OFFSET (FT)		
IC–1	64+72	19 R	392	371
IC–2	72+09	18 R	410	371

LEGEND

- ◎ (IC) – INCLINOMETER
- ⊕ (SI) – SUBSURFACE SHALLOW SETTLEMENT INDICATOR
- ⊘ (SM) – SURFACE SETTLEMENT MARKER

RECORD DRAWINGS

NOTE:

1. R AND L UNDER OFFSET HEADING INDICATE RIGHT AND LEFT OF THE TUNNEL CENTERLINE LOOKING UPSTATION.
2. CONTRACTOR TO SUBMIT PROPOSED LOCATIONS OF SM IN THE FIELD. THEY ARE TO BE LOCATED ON THE ROADWAY SURFACE.

JENNY ENGINEERING CORPORATION
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Website: www.jennyeng.com

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/23/16
CHIEF, BUREAU OF UTILITIES — DATE 2/22/16
CHIEF – BUREAU OF ENGINEERING — DATE 2/23/16
CHIEF, UTILITY DESIGN DIVISION — DATE 2/23/16

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. 21100, EXPIRATION DATE 01/19/2018
STATE OF MARYLAND — LEONARD M. COADY — 21100 — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	LJG
DRN. BY:	JSA/RS
CHK. BY:	LG
DATE:	FEB 2016

BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

GEOTECHNICAL INSTRUMENTATION MONTORING DETAILS

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W–8296
CONTRACT NO.: 44–4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

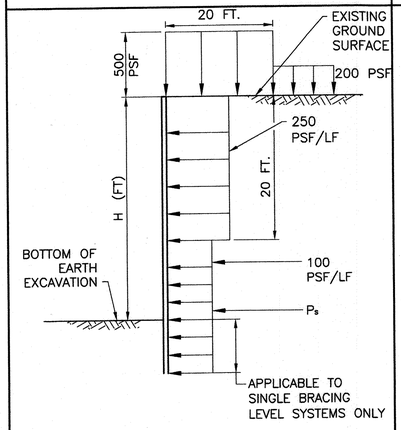
SCALE AS SHOWN

SHEET 25 OF 38

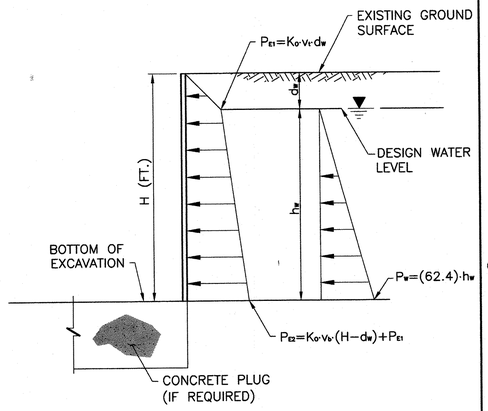
FILE NO. 33498– XXXF

MINIMUM DESIGN CRITERIA FOR TEMPORARY EXCAVATION SUPPORT SYSTEM

TRAFFIC AND CONSTRUCTION EQUIPMENT LOAD

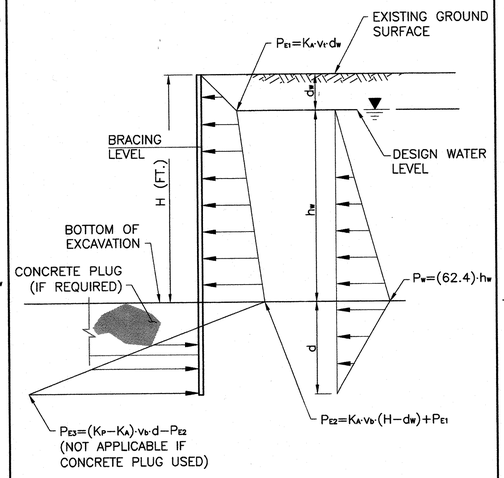


CIRCULAR SHAFT

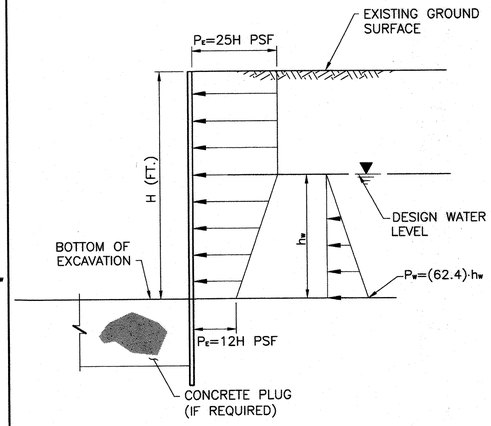


BRACED PORTALS OR RECTANGULAR SHAFTS

SINGLE BRACING LEVEL SYSTEMS



MULTIPLE BRACING SYSTEMS



LIST OF SYMBOLS

C_U	–	UNDRAINED SHEAR STRENGTH OF COHESIVE SOIL (PSF).
H	–	HEIGHT OF CUT FROM GROUND SURFACE TO THE BOTTOM OF THE EXCAVATION (FT.)
K_A	–	LATERAL EARTH PRESSURE COEFFICIENT FOR RANKINE ACTIVE CONDITION
K_o	–	LATERAL EARTH PRESSURE COEFFICIENT FOR RANKINE AT REST CONDITION
K_P	–	LATERAL EARTH PRESSURE COEFFICIENT FOR RANKINE PASSIVE CONDITION
P_E	–	LATERAL EARTH PRESSURE
P_S	–	LATERAL SURCHARGE PRESSURE
P_W	–	LATERAL HYDROSTATIC PRESSURE
d	–	EMBEDMENT DEPTH BELOW BOTTOM OF EXCAVATION
d_w	–	DEPTH FROM GROUND SURFACE TO DESIGN WATER LEVEL
h	–	DEPTH BELOW GROUND SUFRACE (FT)
h_w	–	DEPTH FROM DESIGN GROUNDWATER LEVEL TO BOTTOM OF EXCAVATION (FT)
v_b	–	BUOYANT UNIT WEIGHT OF SOIL (PSF)
v_t	–	TOTAL UNIT WEIGHT OF SOIL (PCF)

NOTES:

1. THE MINIMUM DESIGN CRITERIA DESCRIBED HEREIN APPLIES TO BOTH THE JACKING AND RECEIVING PITS TO BE DESIGNED BY THE CONTRACTOR.

2. LATERAL PRESSURE
   2.1. MINIMUM DESIGN LOADING CONDITIONS ARE TO BE DETERMINED BY ADDING TOGETHER THE APPROPRIATE LOADING DIAGRAMS FOR EARTH (E), WATER (W) WHERE APPLICABLE, AND THE APPROPRIATE COMBINATION OF SURCHARGES (S).
   2.2. CALCULATIONS ARE TO BE BASED ON A DESIGN WATER LEVEL EQUAL TO MAXIMUM WATER LEVEL OBSERVED.
   2.3. BRACING LEVELS ARE NOT SHOWN. DIAGRAMS AS NOTED ARE APPLICABLE TO SINGLE–LEVEL BRACED OR MULTIPLE–BRACED SYSTEMS IN THE ULTIMATE CONFIGURATION.
   2.4. LATERAL PRESSURE, DUE TO TRAFFIC AND CONSTRUCTION EQUIPMENT, IS BASED ON AN ASSUMED MINIMUM SURFACE SURCHARGE OF 500 PSF ACTING OVER A 20–FT. WIDE INFLUENCE AREA IMMEDIATELY ADJACENT TO THE EXCAVATION, BEYOND WHICH A 200 PSF SURCHARGE IS ASSUMED. FOR MORE SEVERE CONSTRUCTION EQUIPMENT LOADING, SPECIAL ANALYSES SHALL BE MADE. THE CONTRACTOR SHALL ACCOUNT FOR MORE CRITICAL SURCHARGE LOADINGS OR OTHER LOADINGS CONDITIONS NOT DESCRIBED HEREIN.
   2.5. THE TEMPORARY EXCAVATION SUPPORT SYSTEM SHALL BE CONSIDERED TO BE SUBJECTED TO LATERAL SURCHARGE PRESSURES FROM LOADS ASSOCIATED WITH ADJACENT STRUCTURES IF THE ADJACENT STRUCTURE IS LOCATED WITHIN A ZONE DEFINED BY A 1 HORIZONTAL TO 1 VERTICAL LINE DRAWN UPWARD AND OUTWARD TOWARD THE ADJACENT STRUCTURE FROM THE BOTTOM OF THE FINAL EXCAVATION LEVEL AT THE OUTSIDE FACE OF THE TEMPORARY EXCAVATION SUPPORT SYSTEM.

3. TOE AND BOTTOM STABILITY DESIGN.
   3.1. TO DETERMINE THE EMBEDMENT LENGTH OF TOE PENETRATION REQUIRED TO PROVIDE TOE STABILITY, SOLVE FOR THE REQUIRED TOE EMBEDMENT BY MOMENT EQUILIBRIUM (M=0) ABOUT THE LOWEST BRACING LEVEL FOR MULTIPLE BRACED SYSTEMS, CONSIDER ONLY THE LATERAL PRESSURES ACTING ON THE WALL BELOW THE LOWEST BRACING LEVEL. LATERAL SURCHARGE PRESSURES SHALL BE INCLUDED IF THE SURCHARGE PRESSURES ACT ON THE WALL BELOW THE LOWEST BRACING LEVEL. ASSUME A HINGE IN THE WALL AT THE LOWEST BRACING LEVEL FOR MULTIPLE BRACED SYSTEMS.
   3.2. FOR CALCULATIONS OF REQUIREMENTS FOR TOE PENETRATION OF MULTIPLE LEVEL BRACED EXCAVATIONS, THE ACTIVE AND PASSIVE EARTH PRESSURES BELOW THE BOTTOM OF THE EXCAVATION SHALL BE CALCULATED USING RANKINE ACTIVE AND PASSIVE EARTH PRESSURES TOGETHER WITH THE SOIL PARAMETERS INDICATED IN THE TABLE IN NOTE 4.1.

4. SOIL PARAMETERS
   4.1. THE FOLLOWING SOIL PARAMETERS ARE TO BE USED FOR DESIGN. A FACTOR OF SAFETY OF 1.5 SHALL BE APPLIED TO THE COEFFICIENT OF PASSIVE EARTH PRESSURE K_P, LENGTH OF TOE PENETRATION.

SOIL STRATUM	MOIST UNIT WEIGHT (PCF)	TOTAL UNIT WEIGHT (PCF)	FRICTION ANGLE (DEGREES)	UNDRAINED COMPRESSIVE STRENGTH C_U(PSF)	K_A	K_P	K_O
FILL	115	120	26	–	0.39	2.56	0.56
SILTY/CLAYEY SAND	120	125	28	–	0.36	2.77	0.53
DECOMPOSED ROCK	125	130	32	–	0.30	3.25	0.47
WEATHERED ROCK	140	145	45	–	0.17	5.83	0.29

RECORD DRAWINGS

JENNY ENGINEERING CORPORATION
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Website: www.jennyeng.com

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
CHIEF – BUREAU OF ENGINEERING — DATE 2/23/16
CHIEF, BUREAU OF UTILITIES — DATE 2/24/16
CHIEF, UTILITY DESIGN DIVISION — DATE 2/23/16

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. 21100, EXPIRATION DATE 01/19/2018
STATE OF MARYLAND — EDWARD M. BORDEN — 21100 — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	LJG
DRN. BY:	JSA/RS
CHK. BY:	LG
DATE:	FEB 2016

BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

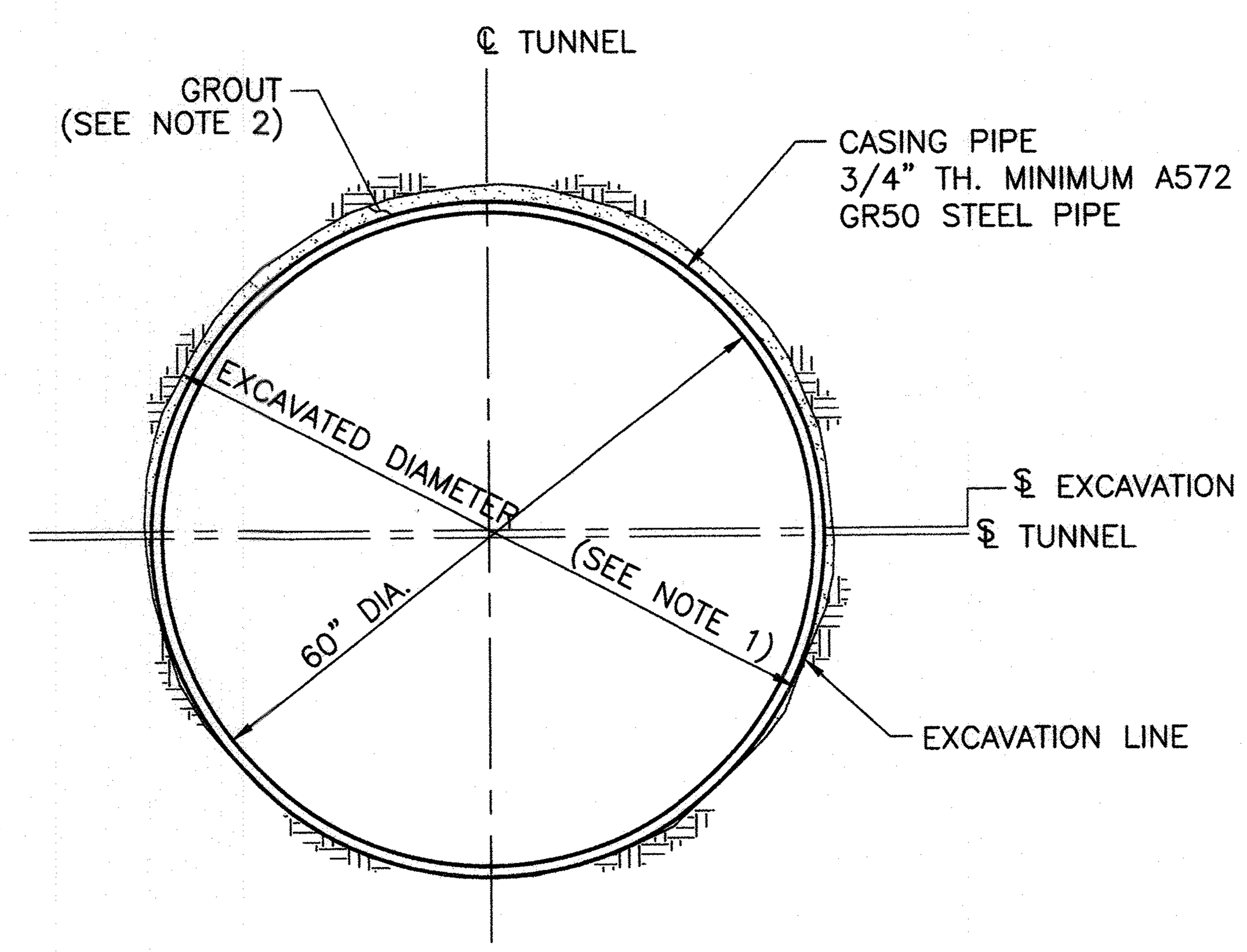
CONSTRUCTION SHAFTS DESIGN CRITERIA

600' SCALE MAP NO. 30 BLOCK NO. 36

US ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W–8296
CONTRACT NO.: 44–4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 26 OF 38
FILE NO. 33498–XXXF

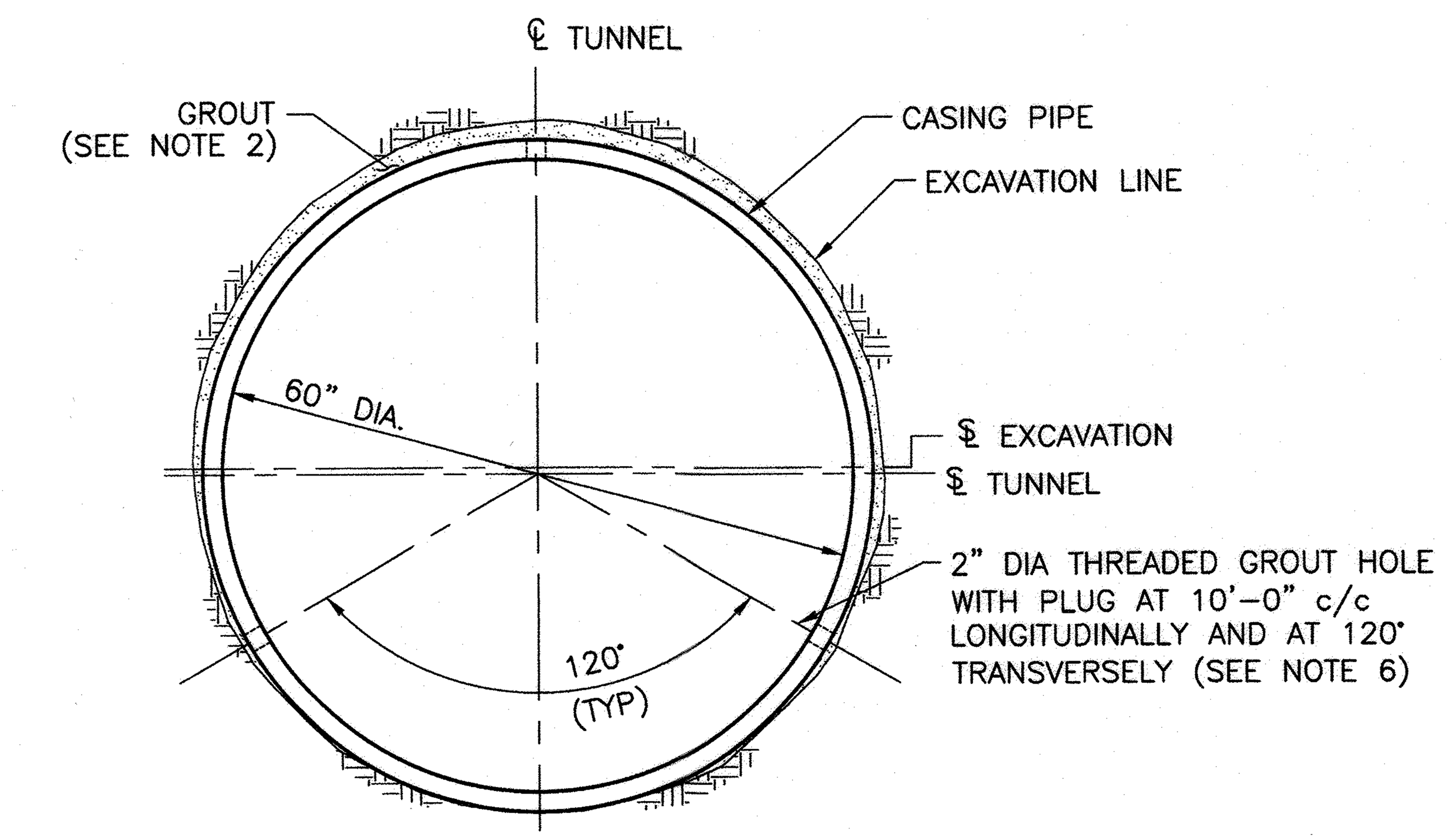
S:\JENNY ENGINEERING\PROJ\CAD\DWG\ACTIVE PROJECTS\2012016–HOWARD COUNTY – RT 29 CROSSING\10–23–2015_GIP\S–26 CONSTRUCTION SHAFTS.DWG



TYPICAL TUNNEL SECTION – STEEL CASING PIPE

SCALE: 3/4"=1'-0"

STA 64+59.77 TO 72+11.58



TYPICAL GROUTING DETAIL

N.T.S.

NOTES:

1. THE EXCAVATION DIAMETER SHALL BE SELECTED BY THE CONTRACTOR TO FACILITATE THE CONTRACTOR'S MEANS AND METHODS OF EXCAVATION AND CASING INSTALLATION.

2. GROUTING, AS SPECIFIED, SHALL BE UTILIZED TO FILL THE ANNULAR VOID OR IF OTHER VOIDS DEVELOP DURING MICROTUNNELING, GROUTING SHALL BE EMPLOYED TO FILL THOSE VOIDS.

3. THE CONTRACTOR SHALL SUBMIT DETAILS OF PIPE AND PIPE JOINT TO THE ENGINEER PRIOR TO COMMENCEMENT OF MICROTUNNELING.

4. THE CONTRACTOR SHALL VERIFY THAT THE PIPE AND PIPE JOINT HAVE THE CAPACITY TO CARRY JACKING FORCES ANTICIPATED BY THE CONTRACTOR AND SHALL PROVIDE SUPPORTING CALCULATIONS.

5. LUBRICATION OF PIPE EXTERIOR IS MANDATORY DURING MICROTUNNELING AND SHALL BE CONDUCTED CONTINUOUSLY UTILIZING BENTONITE SLURRY OR OTHER APPROVED MATERIAL.

6. DETAILS OF THE 2" DIA. GROUT HOLES SHALL BE PROVIDED BY THE CONTRACTOR FOR THE REVIEW AND APPROVAL BY THE ENGINEER.

RECORD DRAWINGS

SCALES: ¾"=1'-0" 0 1 2 3 SCALE IN FEET

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS 2/25/16 DATE
CHIEF – BUREAU OF ENGINEERING 2/23/16 DATE
CHIEF, BUREAU OF UTILITIES 2/24/16 DATE
CHIEF, UTILITY DESIGN DIVISION PSP 2/23/16 DATE

JENNY ENGINEERING CORPORATION
CONSULTING ENGINEERS

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

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DRN. BY: JSA/RS
CHK. BY: LG
DATE: FEB 2016

BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

TUNNEL SECTIONS AND DETAILS

600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108

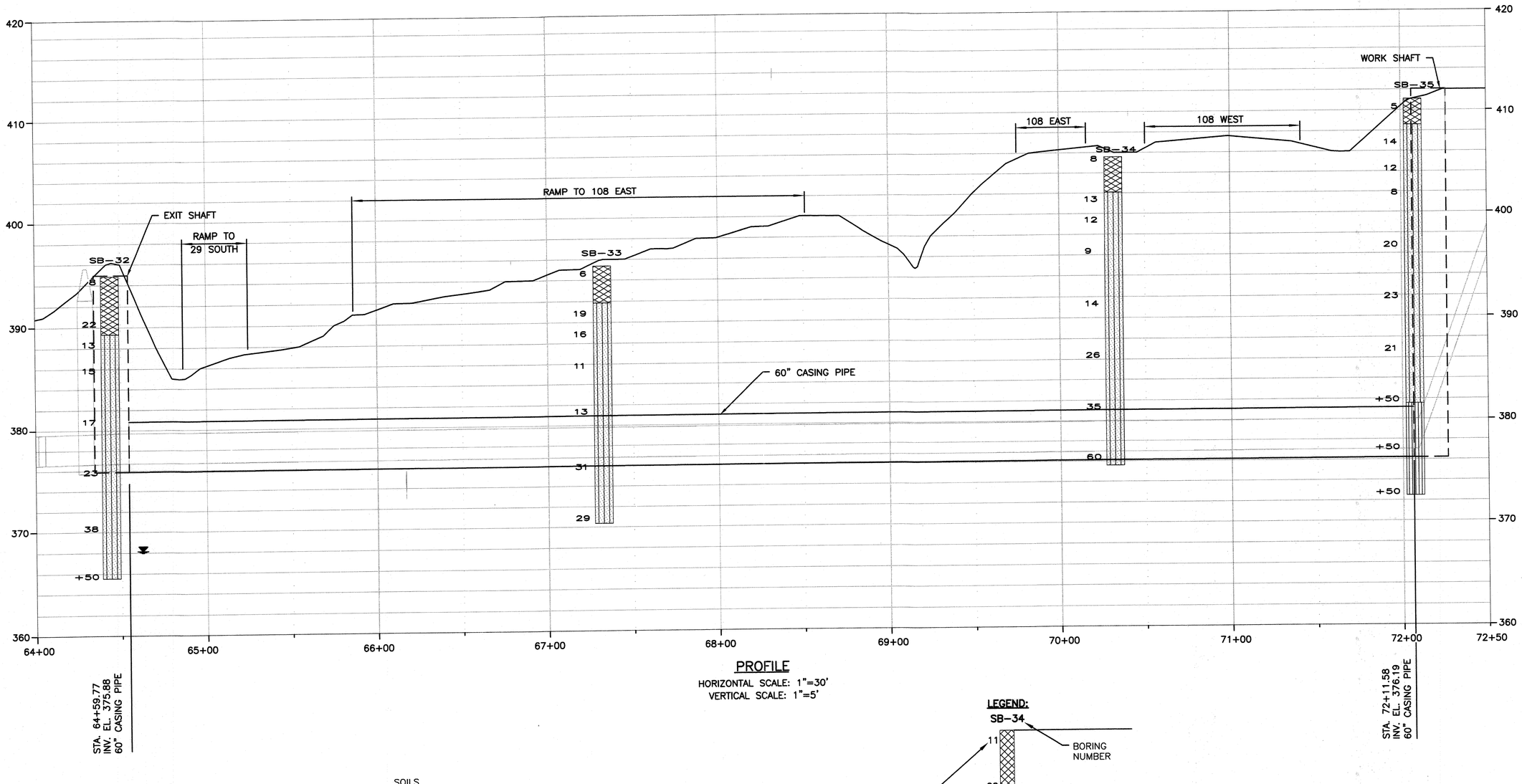
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 27 OF 38

FILE NO. 33498-XXXF

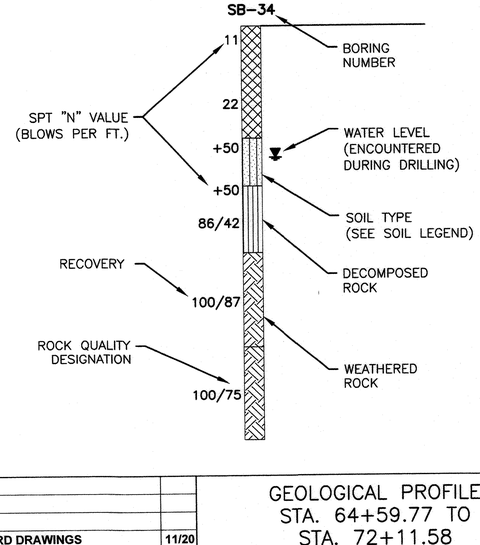
S:\JENNY ENGINEERING\PROJ\CAD\DWG\ACTIVE PROJECTS\2012016-HOWARD COUNTY - RT 29 CROSSSING\10-23-2015_GIP\S-27 TUNNEL SECTIONS.DWG



PROFILE
HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=5'

SOILS

- FILL
- SILTY SAND (SM)
- DECOMPOSED ROCK
- WEATHERED ROCK



1"=5' 5' 0 5'
VERTICAL SCALE IN FEET

1"=30' 30' 15' 0 30'
HORIZONTAL SCALE IN FEET

RECORD DRAWINGS

JENNY ENGINEERING CORPORATION
CONSULTING ENGINEERS
2 Edison Place Springfield, New Jersey 07081
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
CHIEF - BUREAU OF ENGINEERING — DATE 2/23/16
CHIEF, BUREAU OF UTILITIES — DATE 2/24/16
CHIEF, UTILITY DESIGN DIVISION — DATE 2/23/16 FSD

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

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STATE OF MARYLAND — JAMES R. BUTLER — 21100 — REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	LJG
DRN. BY:	JSA/RS
CHK. BY:	LG
DATE:	FEB 2016

BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

GEOLOGICAL PROFILE
STA. 64+59.77 TO
STA. 72+11.58

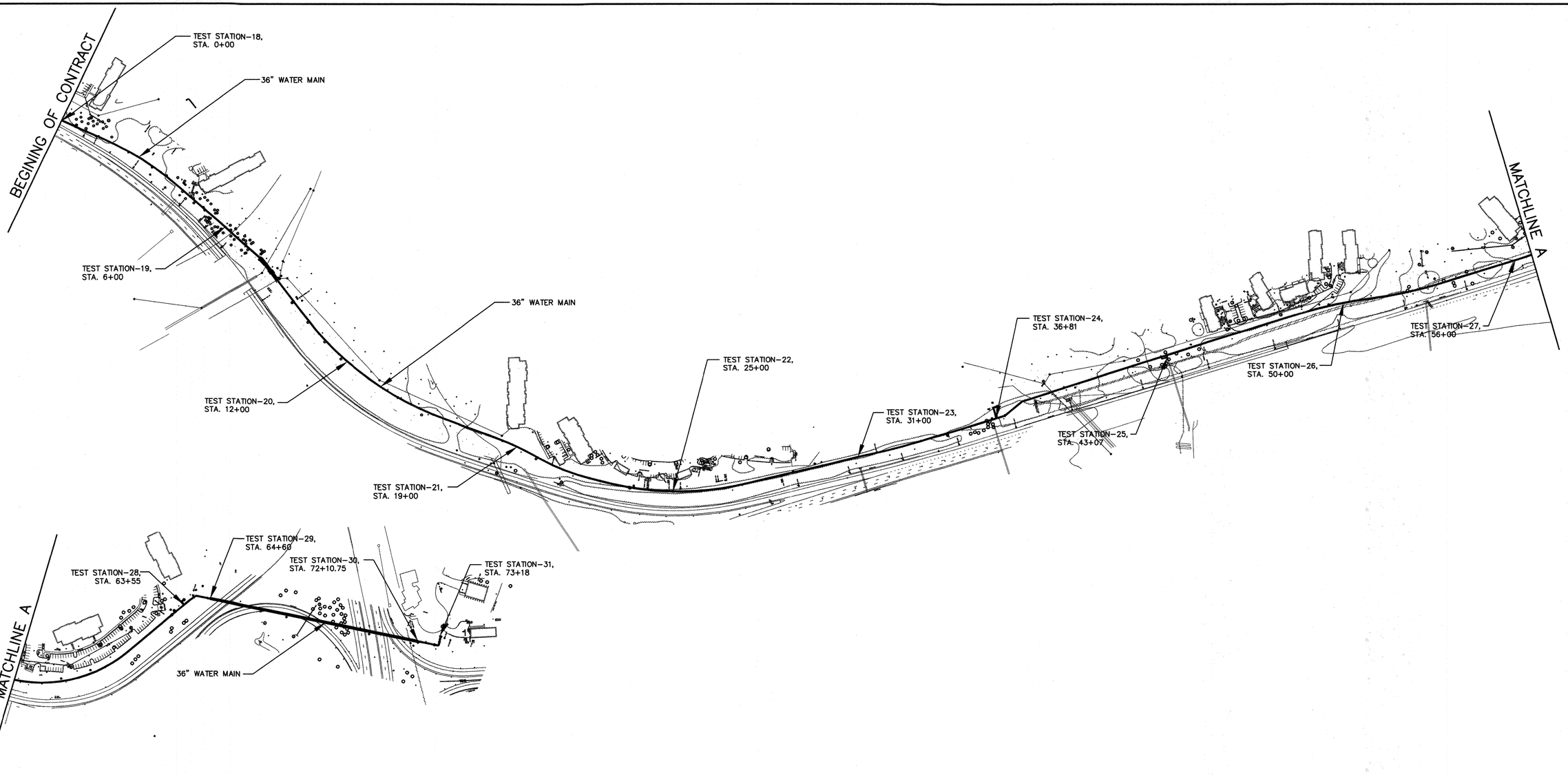
600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 28 OF 38

FILE NO. 33498- XXXF



NOTES:

1. PCCP OR BAR WRAPPED CONCRETE CYLINDER PIPE TO BE FABRICATED WITH STEEL BONDING PLATES, SEE DETAIL CC–7.
2. BOND ALL NEW PIPE JOINTS. EXCEPT THOSE SPECIFIED TO BE ELECTRICALLY ISOLATED. SEE DETAILS CC–6 AND CC–7.
3. ELECTRICAL ISOLATION IS REQUIRED FOR ALL CONNECTIONS TO NEW WATER MAIN. SEE DETAIL CC–1.
4. INSTALL SEPERATOR MESH ON WATER MAIN AT EXISTING UTILITY CROSSING IF THERE IS LESS THAN 12 INCHES OF SPACING BETWEEN THEM, SEE DETAIL CC–9.
5. SEE DETAIL CC–13 FOR TEST STATION SCHEDULE.

CATHODIC PROTECTION LAYOUT 1

Scale: N.T.S

RECORD DRAWINGS

RUSSELL CORROSION CONSULTANTS, INC.
Columbia, Maryland

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
CHIEF – BUREAU OF ENGINEERING — DATE 2/25/16
CHIEF, BUREAU OF UTILITIES — DATE 2/24/16
CHIEF, UTILITY DESIGN DIVISION — DATE 2/23/16

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BOWIE, MD 20716
PHONE: 301–731–5622

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02.11.2016

DSN. BY: YZ
DRN. BY: JWW
CHK. BY: YZ
DATE: FEB. 2016

BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	2/16

CATHODIC PROTECTION LAYOUT 1

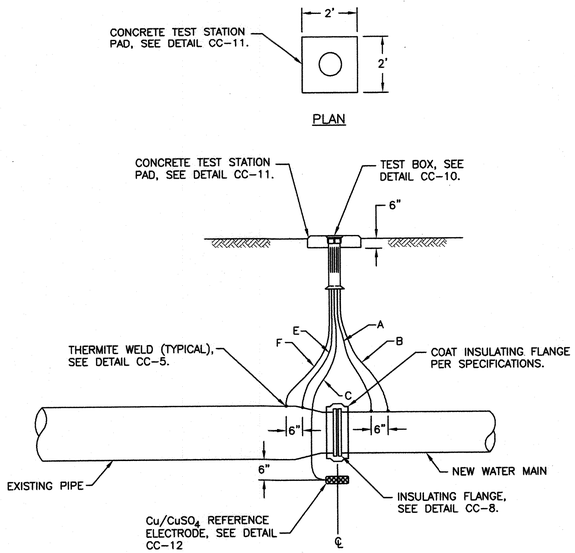
600' SCALE MAP NO. _____ BLOCK NO. _____

US ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W–8296
CONTRACT NO.: 44–4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 29 OF 38

FILE NO. 33498–



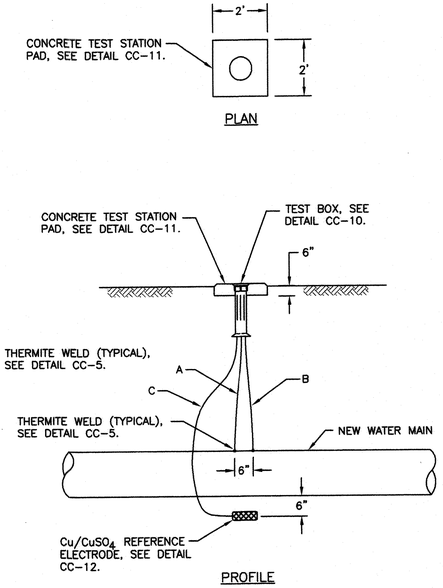
WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE OF INSULATION	COLOR OF INSULATION
NEW WATER MAIN	A B	1 3	#8 #10	THWN THWN	BLUE BLUE
PERMANENT REFERENCE ELECTRODE	C	6	#14	HMWPE	BLACK
EXISTING PIPE	E F	2 5	#8 #10	THWN THWN	WHITE WHITE

NOTES:

1. DO NOT SET TEST STATION IN ROADWAY. PLACE TEST BOX IN NON-PAVED AREA (GRASS MEDIAN) NEXT TO ROADWAY. ROUTE ALL WIRES TO FINAL TEST BOX LOCATION.
2. ALL THERMITE WELDS TO PCCP OR BAR WRAPPED CONCRETE CYLINDER PIPE TO BE PERFORMED AT STEEL BONDING PLATES, SEE DETAIL CC-7.

CC-1: INSULATING FLANGE TEST STATION

Scale: None



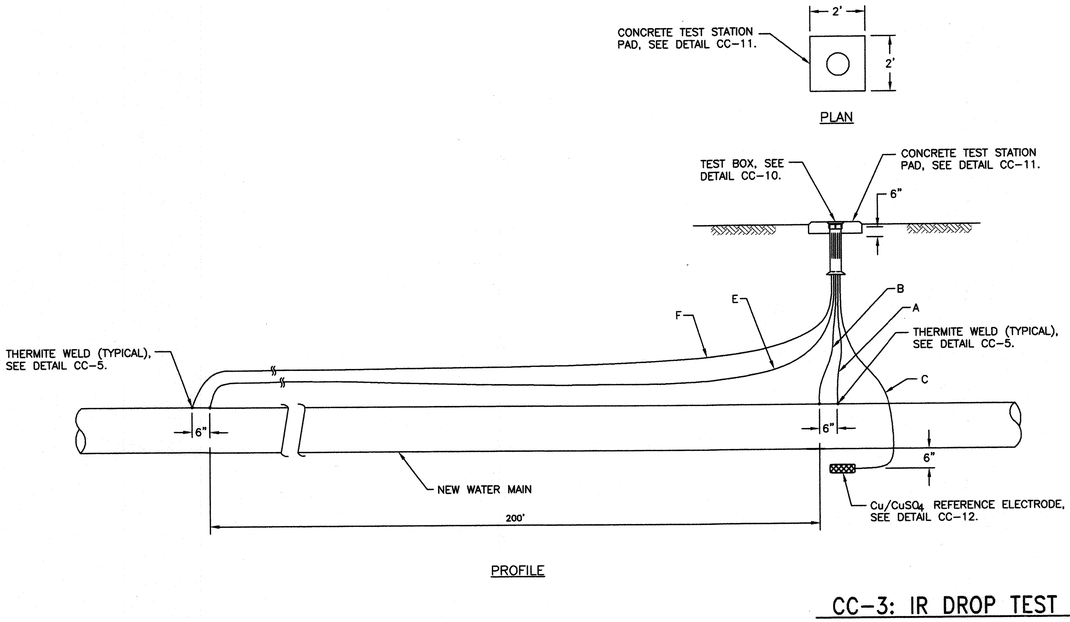
WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE OF INSULATION	COLOR OF INSULATION
NEW WATER MAIN	A B	1 3	#8 #10	THWN THWN	BLUE BLUE
PERMANENT REFERENCE ELECTRODE	C	6	#14	HMWPE	BLACK

NOTES:

1. DO NOT SET TEST STATION IN ROADWAY. PLACE TEST BOX IN NON-PAVED AREA (GRASS MEDIAN) NEXT TO ROADWAY. ROUTE ALL WIRES TO FINAL TEST BOX LOCATION.
2. ALL THERMITE WELDS TO PCCP OR BAR WRAPPED CONCRETE CYLINDER PIPE TO BE PERFORMED AT STEEL BONDING PLATES, SEE DETAIL CC-7.

CC-2: 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	#8 #10	THWN THWN	BLUE BLUE
PERMANENT REFERENCE ELECTRODE	C	6	#14	HMWPE	BLACK
NEW WATER MAIN 200 FT. AWAY FROM TEST STATION	E F	2 5	#8 #10	THWN THWN	WHITE WHITE

NOTES:

1. DO NOT SET TEST STATION IN ROADWAY. PLACE TEST BOX IN NON-PAVED AREA (GRASS MEDIAN) NEXT TO ROADWAY. ROUTE ALL WIRES TO FINAL TEST BOX LOCATION.
2. ALL THERMITE WELDS TO PCCP OR BAR WRAPPED CONCRETE CYLINDER PIPE TO BE PERFORMED AT STEEL BONDING PLATES, SEE DETAIL CC-7.

CC-3: IR DROP TEST STATION

Scale: None

RECORD DRAWINGS

RUSSELL CORROSION CONSULTANTS, INC.
Columbia, Maryland

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
CHIEF - BUREAU OF ENGINEERING — DATE 2/23/16
CHIEF, BUREAU OF UTILITIES — DATE 2/24/16
CHIEF, UTILITY DESIGN DIVISION — DATE 2/28/16

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. 44991, EXPIRATION DATE 01/09/2018.

DSN. BY: YZ
DRN. BY: JWW
CHK. BY: YZ
DATE: FEB. 2016

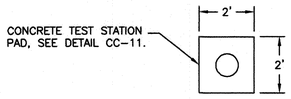
BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	2/16

CATHODIC PROTECTION DETAILS 1

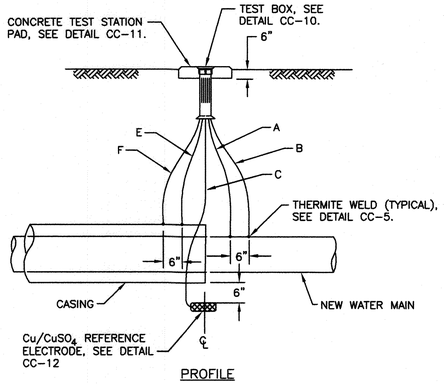
600' SCALE MAP NO. _____ BLOCK NO. _____

US ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 30 OF 38
FILE NO. 33498-



PLAN



PROFILE

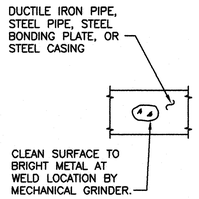
WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE OF INSULATION	COLOR OF INSULATION
NEW WATER MAIN	A B	1 3	#8 #10	THWN THWN	BLUE BLUE
PERMANENT REFERENCE ELECTRODE	C	6	#14	HMWPE	BLACK
CASING PIPE	E F	2 5	#8 #10	THWN THWN	WHITE WHITE

NOTES:

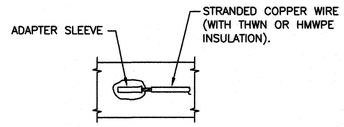
1. DO NOT SET TEST STATION IN ROADWAY. PLACE TEST BOX IN NON-PAVED AREA (GRASS MEDIAN) NEXT TO ROADWAY. ROUTE ALL WIRES TO FINAL TEST BOX LOCATION.
2. ALL THERMITE WELDS TO PCCP OR BAR WRAPPED CONCRETE CYLINDER PIPE TO BE PERFORMED AT STEEL BONDING PLATES, SEE DETAIL CC-7.

CC-4: CASING TEST STATION

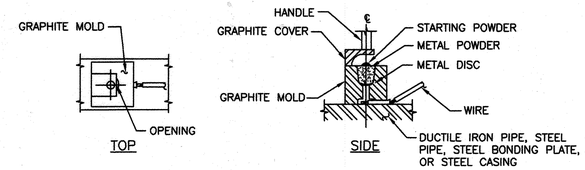
Scale: None



STEP 1

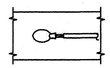


STEP 2

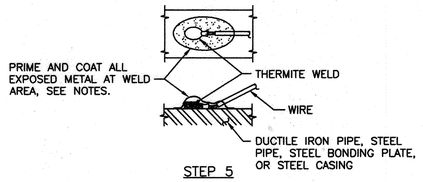


HOLD GRAPHITE MOLD FIRMLY OVER ADAPTER SLEEVE WITH OPENING AWAY FROM OPERATOR – IGNITE STARTING POWDER.

STEP 3



STEP 4



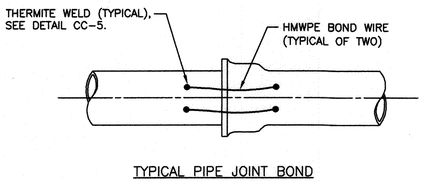
STEP 5

NOTES:

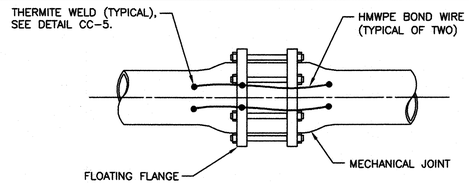
1. THERMITE WELDS MADE TO DUCTILE IRON PIPE, STEEL PIPE OR CASING SHALL BE COATED WITH A PREFABRICATED ONE PIECE PLASTIC CAP FILLED WITH ELASTOMERIC MATERIAL, ROYSTON HANDY-CAP OR APPROVED EQUAL. REPAIR PIPE COATING IN ACCORDANCE WITH COATING MANUFACTURER'S RECOMMENDATIONS.
2. THERMITE WELDS MADE TO 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

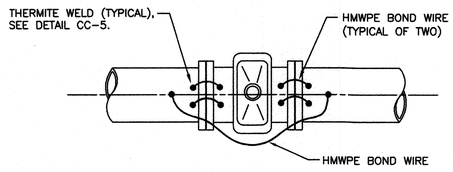
Scale: None



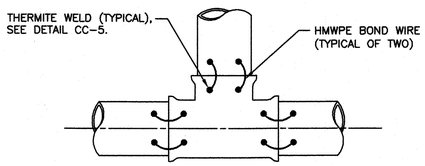
TYPICAL PIPE JOINT BOND



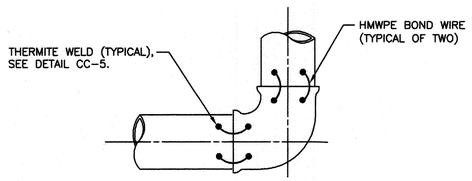
TYPICAL MECHANICAL COUPLING BOND



TYPICAL BONDING OF VALVE



TYPICAL BONDING OF TEE



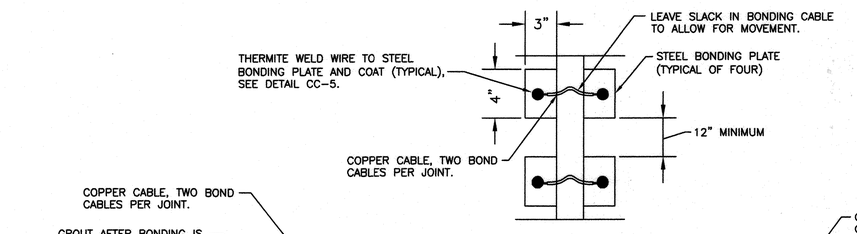
TYPICAL BONDING OF BEND, REDUCER OR SOLID SLEEVE

NOTES:

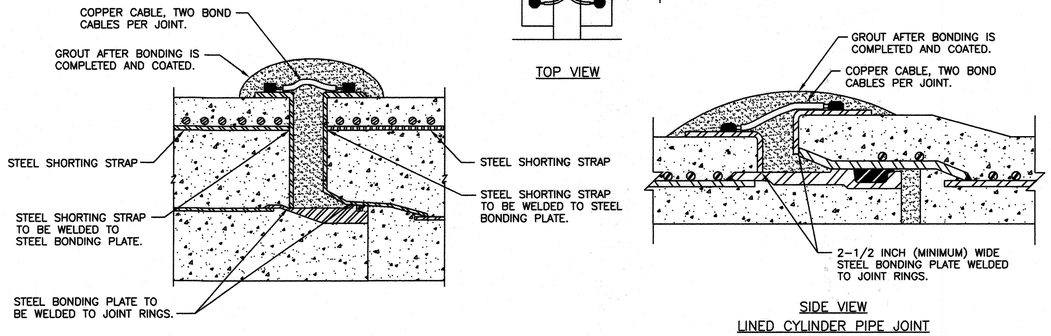
1. BOND ALL JOINTS ON UNDERGROUND PIPING ASSOCIATED WITH THE WATER MAIN EXCEPT INSULATED JOINTS.
2. THERMITE WELD BONDING WIRES TO TOP OF PIPE OR FITTINGS, SEE DETAIL CC-5.
3. WIRE SIZE FOR BONDING JOINTS SHALL BE AS FOLLOWS:
   12" & SMALLER – AWG NO. 6
   16" TO 36" – AWG NO. 4
   LARGER THAN 36" –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

RECORD DRAWINGS

CC-7: CONCRETE JOINT BONDING

Scale: None

RUSSELL CORROSION CONSULTANTS, INC.
Columbia, Maryland

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/23/16
CHIEF – BUREAU OF ENGINEERING — DATE 2/23/16
CHIEF, BUREAU OF UTILITIES — DATE 2/24/16
CHIEF, UTILITY DESIGN DIVISION — DATE 2/23/16

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. 44991, EXPIRATION DATE 01/09/2018.

STATE OF MARYLAND — JASON WOOD — 44991 — PROFESSIONAL ENGINEER — 02-11-2016

DSN. BY: YZ
DRN. BY: JWW
CHK. BY: YZ
DATE: FEB. 2016

BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	2/16

CATHODIC PROTECTION DETAILS 2

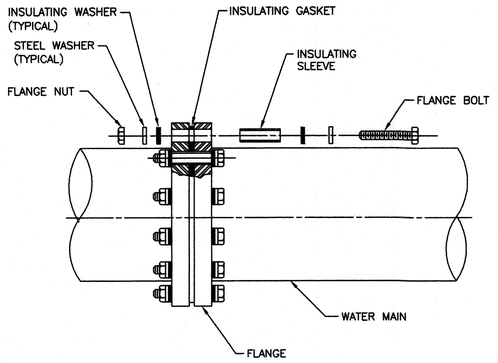
600' SCALE MAP NO. _____ BLOCK NO. _____

US ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 31 OF 38

FILE NO. 33498-

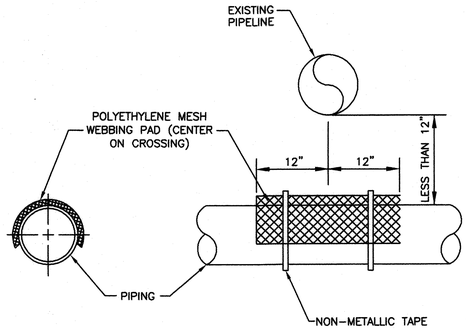


NOTE:

SEE SPECIFICATIONS FOR EXTERNAL COATING OF INSULATING FLANGE.

CC-8: INSULATING FLANGE

Scale: None

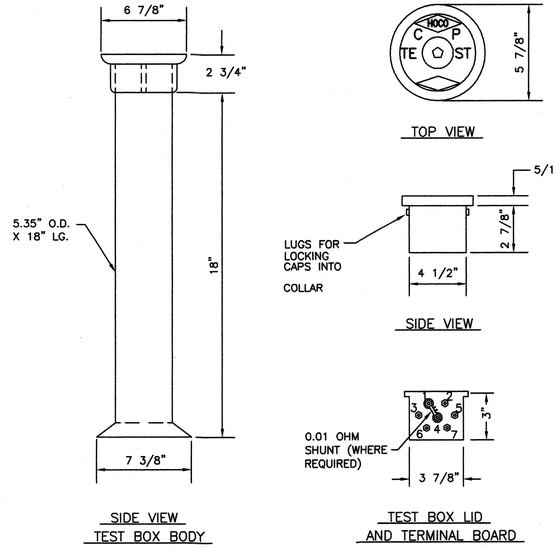


NOTE:

USE ONLY WHEN PIPES ARE LESS THAN 12" APART.

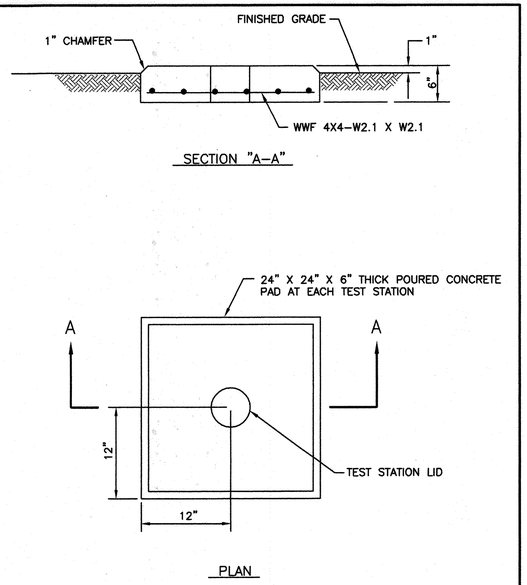
CC-9: SEPARATOR TO AVOID ELECTRICAL CONTACT

Scale: None



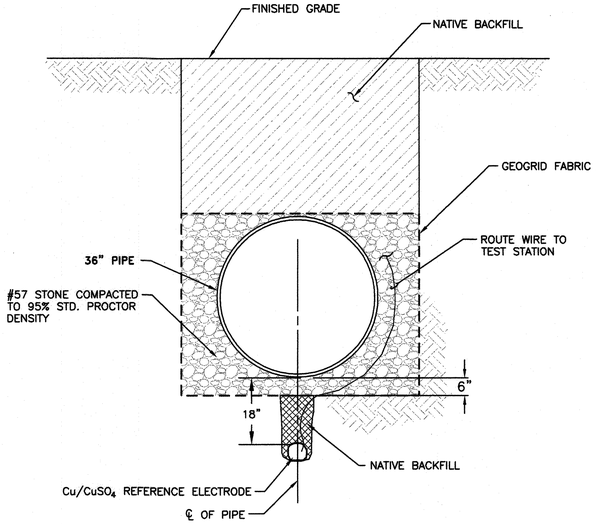
CC-10: TEST BOX

Scale: None



CC-11: CONCRETE TEST STATION PAD

Scale: None



NOTE:

INSTALL REFERENCE ELECTRODE IN SOIL BACKFILL. DO NOT BACKFILL REFERENCE ELECTRODE WITH SAND OR STONE.

CC-12: REFERENCE ELECTRODE PLACEMENT

Scale: None

36" WATER TRANSMISSION MAIN

TEST STATION NUMBER	STATION NUMBER	TEST STATION TYPE	NUMBER OF MANESIUM ANODES	DETAIL NUMBER	REFERENCE ELECTRODE
TEST STATION - 18	0+00	STANDARD	0	CC-2	YES
TEST STATION - 19	6+00	STANDARD	0	CC-2	YES
TEST STATION - 20	12+00	STANDARD	0	CC-2	YES
TEST STATION - 21	19+00	STANDARD	0	CC-2	YES
TEST STATION - 22	25+00	STANDARD	0	CC-2	YES
TEST STATION - 23	31+00	STANDARD	0	CC-2	YES
TEST STATION - 24	36+81	INSULATING FLANGE	0	CC-1	YES
TEST STATION - 25	43+07	INSULATING FLANGE	0	CC-1	YES
TEST STATION - 26	50+00	STANDARD	0	CC-2	YES
TEST STATION - 27	56+00	STANDARD	0	CC-2	YES
TEST STATION - 28	63+55	INSULATING FLANGE	0	CC-1	YES
TEST STATION - 29	64+60	CASING	0	CC-4	YES
TEST STATION - 30	72+10.75	CASING	0	CC-4	YES
TEST STATION - 31	73+18	INSULATING FLANGE	0	CC-1	YES

CC-13: TEST STATION SCHEDULE

Scale: None

RECORD DRAWINGS

RUSSELL CORROSION CONSULTANTS, INC.
Columbia, Maryland

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 2/25/16
CHIEF - BUREAU OF ENGINEERING — DATE 2/23/16
CHIEF, BUREAU OF UTILITIES — DATE 2/24/16
CHIEF, UTILITY DESIGN DIVISION — DATE 2/23/16

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. 44991, EXPIRATION DATE 01/09/2018.

STATE OF MARYLAND — JOHN ZYMO — No. 44991 — PROFESSIONAL ENGINEER — 2/16

DSN. BY: YZ
DRN. BY: JWW
CHK. BY: YZ
DATE: FEB. 2016

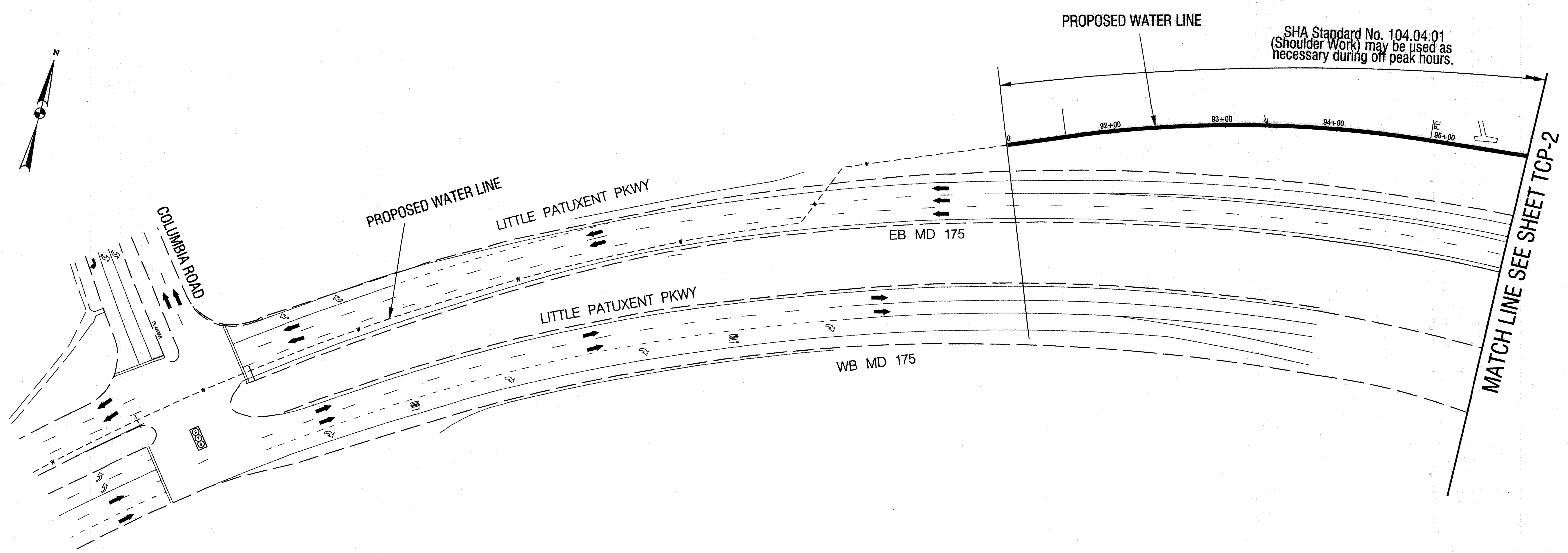
BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	5/19
RJD	0	AS BID	2/16

CATHODIC PROTECTION DETAILS 3

600' SCALE MAP NO. _____ BLOCK NO. _____

US ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 32 OF 38
FILE NO. 33498-



KEY

- - - Existing Geometrics
← Direction of Traffic

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

RECORD DRAWINGS

TCP-1

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"

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 6/20/16
CHIEF - BUREAU OF ENGINEERING — DATE 6/24/16
CHIEF, BUREAU OF UTILITIES — DATE 6/22/16
CHIEF, UTILITY DESIGN DIVISION — DATE 6/28/16 PSD

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 6/28/17

STATE OF MARYLAND — PROFESSIONAL ENGINEER — No. 31757

DSN. BY: F. HOECKEL
DRN. BY: F. HOECKEL
CHK. BY: J. DIRNDORFER
DATE: APRIL 2016

BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

MAINTENANCE OF TRAFFIC PLAN

600' SCALE MAP NO. 30 BLOCK NO. 36

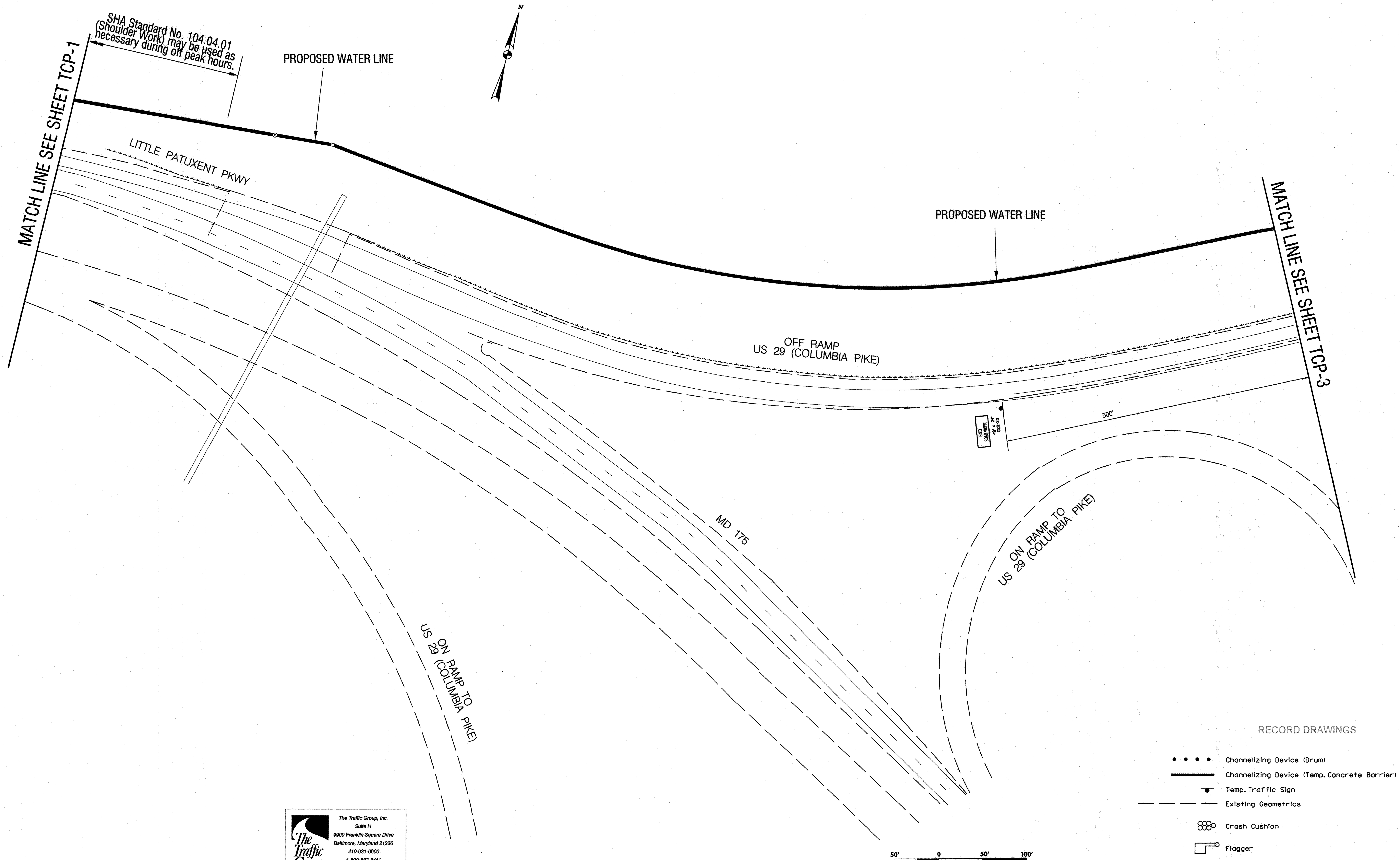
US ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108

CAPITAL PROJECT: W-8296
CONTRACT NO.:44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 33 OF 38

PLOTTED: Tuesday, June 21, 2016 AT 09:25 AM
FILE: ...000-1211\Task 016 – MD 108 to Broken Land Pkwy\pTC-P001A_MOT-US29.dgn



TCP-2

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"®

DEPARTMENT OF PUBLIC WORKS

HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — 6/28/16

CHIEF - BUREAU OF ENGINEERING — DATE 6/24/16

CHIEF, BUREAU OF UTILITIES — DATE 6/27/16

CHIEF, UTILITY DESIGN DIVISION — DATE 6/23/16 PSD

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

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STATE OF MARYLAND — HSIUNG HUANG — No. 31757 — PROFESSIONAL ENGINEER

DSN. BY: F. BROWNLEY
DRN. BY: F. BROWNLEY/fh
CHK. BY: J. DIRNDORFER
DATE: APRIL 2016

BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

MAINTENANCE OF TRAFFIC PLAN

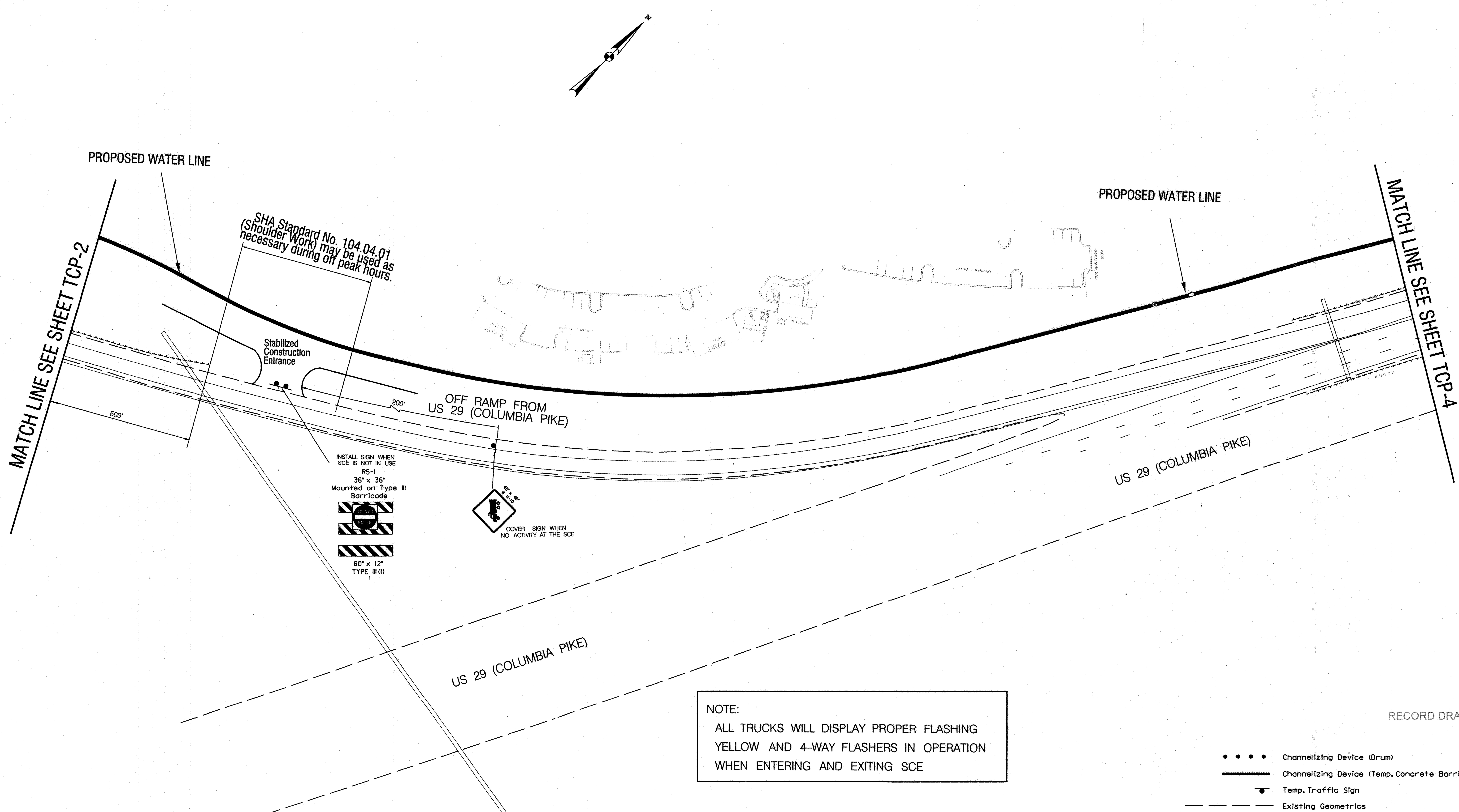
600' SCALE MAP NO. 30 BLOCK NO. 36

US ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108

CAPITAL PROJECT: W-8296
CONTRACT NO.:44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 34 OF 38



NOTE:
ALL TRUCKS WILL DISPLAY PROPER FLASHING YELLOW AND 4-WAY FLASHERS IN OPERATION WHEN ENTERING AND EXITING SCE

RECORD DRAWINGS

- Channelizing Device (Drum)
- Channelizing Device (Temp. Concrete Barrier)
- Temp. Traffic Sign
- Existing Geometrics
- Crash Cushion
- Flagger

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

TCP-3

PLOTTED: Tuesday, June 21, 2016 AT 09:28 AM
FILE: F:\2000\2000-1211\Task 016 – MD 108 to Broken Land Pkwy\

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"®

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE
CHIEF - BUREAU OF ENGINEERING 6/24/16 — DATE
CHIEF, BUREAU OF UTILITIES 6/22/16 — DATE
CHIEF, UTILITY DESIGN DIVISION 6/23/16 PSD — DATE

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

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STATE OF MARYLAND — FU-HSIUNG HUANG — No. 31757 — PROFESSIONAL ENGINEER

DSN. BY: F. BROWNLEY
DRN. BY: F. BROWNLEY/fh
CHK. BY: J. DIRNDORFER
DATE: APRIL 2016

BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

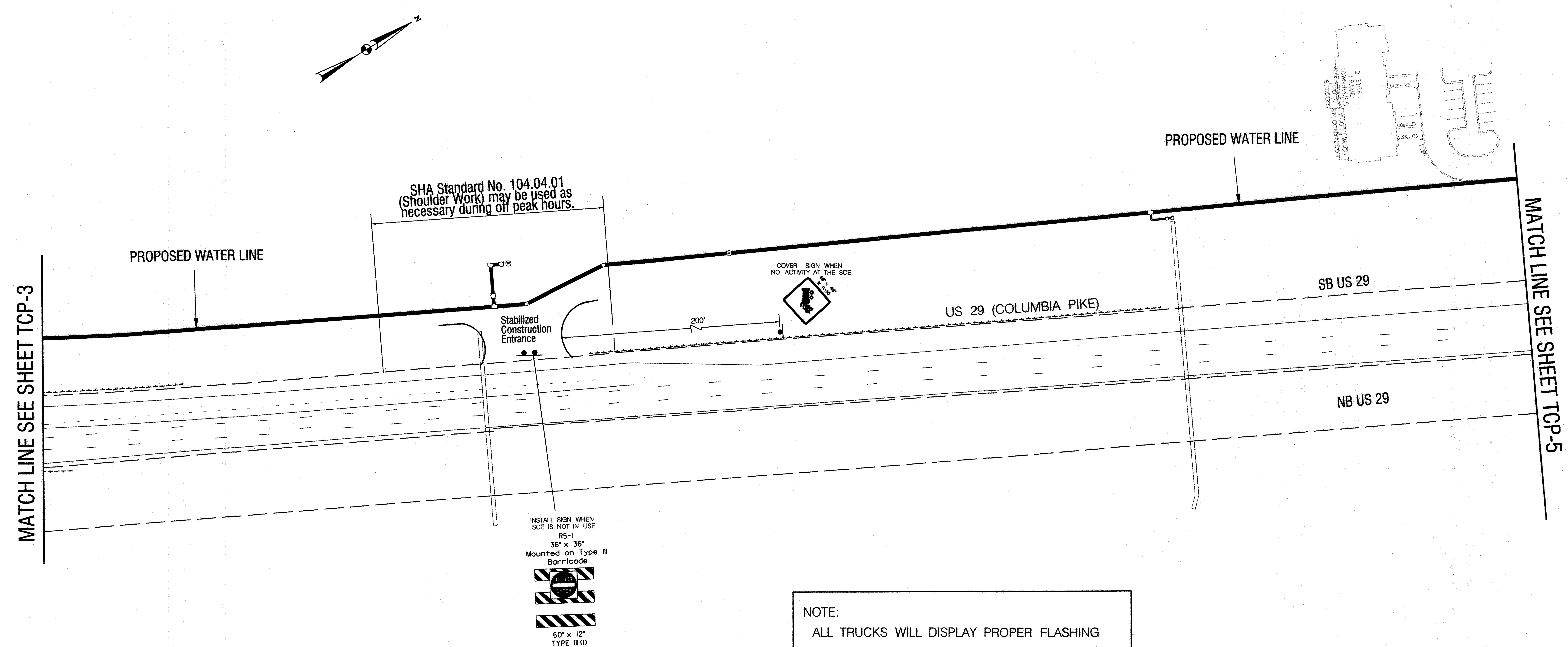
MAINTENANCE OF TRAFFIC PLAN

600' SCALE MAP NO. 30 BLOCK NO. 36

US ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.:44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 35 OF 38



NOTE:
ALL TRUCKS WILL DISPLAY PROPER FLASHING YELLOW AND 4-WAY FLASHERS IN OPERATION WHEN ENTERING AND EXITING SCE

RECORD DRAWINGS

- Channelizing Device (Drum)
- Channelizing Device (Temp. Concrete Barrier)
- Temp. Traffic Sign
- Existing Geometrics
- Crash Cushion
- Flagger

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

TCP-4

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FILE: F:\2000\2000-1211\Task 016 - MD 108 to Broken Land

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"®

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS 6/22/16
CHIEF - BUREAU OF ENGINEERING 6/24/16 DATE
CHIEF, BUREAU OF UTILITIES 6/22/16 DATE
CHIEF, UTILITY DESIGN DIVISION PSD 6/23/16 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. 31757
EXPIRATION DATE 6/28/2017

STATE OF MARYLAND — FU-HSIUNG HUANG — No. 31757 — PROFESSIONAL ENGINEER

DSN. BY: F. BROWNLEY
DRN. BY: F. BROWNLEY/fh
CHK. BY: J. DIRNDORFER
DATE: APRIL 2016

BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

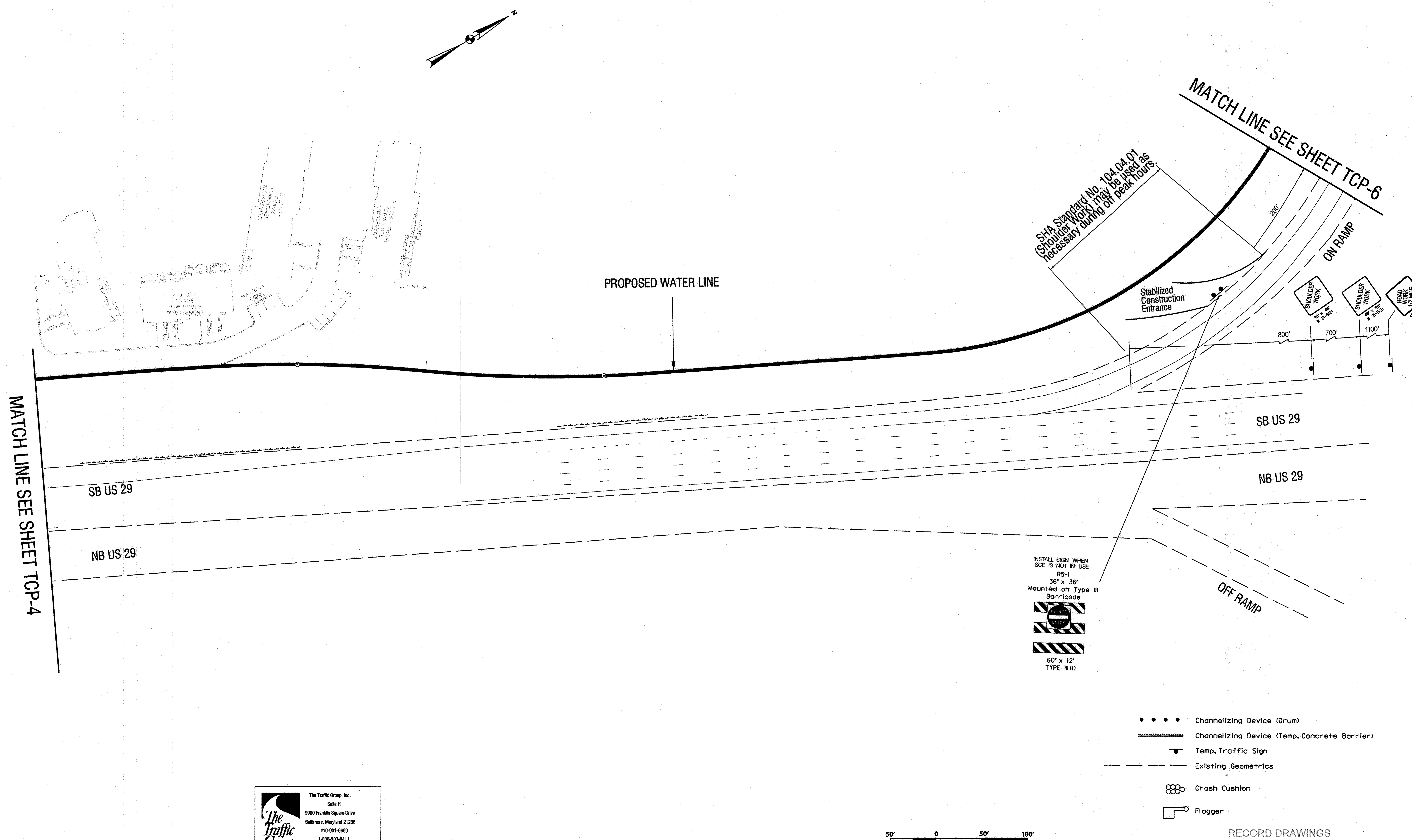
MAINTENANCE OF TRAFFIC PLAN

600' SCALE MAP NO. 30 BLOCK NO. 36

US ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.:44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 36 OF 38



RECORD DRAWINGS

TCP-5

The Traffic Group, Inc.
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Baltimore, Maryland 21236
410-931-6600
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

6/28/16 — DIRECTOR OF PUBLIC WORKS
Thomas E. Butler 6/24/16 — CHIEF - BUREAU OF ENGINEERING — DATE
6/27/16 — CHIEF, BUREAU OF UTILITIES — DATE
6/28/16 PSD — 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. 31757 EXPIRATION DATE 6/28/2017

STATE OF MARYLAND — HSIUNG HUANG — No. 31757 — PROFESSIONAL ENGINEER

DSN. BY: F. BROWNLEY
DRN. BY: F. BROWNLEY/fh
CHK. BY: J. DIRNDORFER
DATE: FEB 2016

BY	NO.	REVISION	DATE
JC	2	RECORD DRAWINGS	11/20
LR	1	RECORD DRAWINGS	05/19
RJD	0	AS BID	02/16

MAINTENANCE OF TRAFFIC PLAN

600' SCALE MAP NO. 30 BLOCK NO. 36

US ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.:44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 37 OF 38

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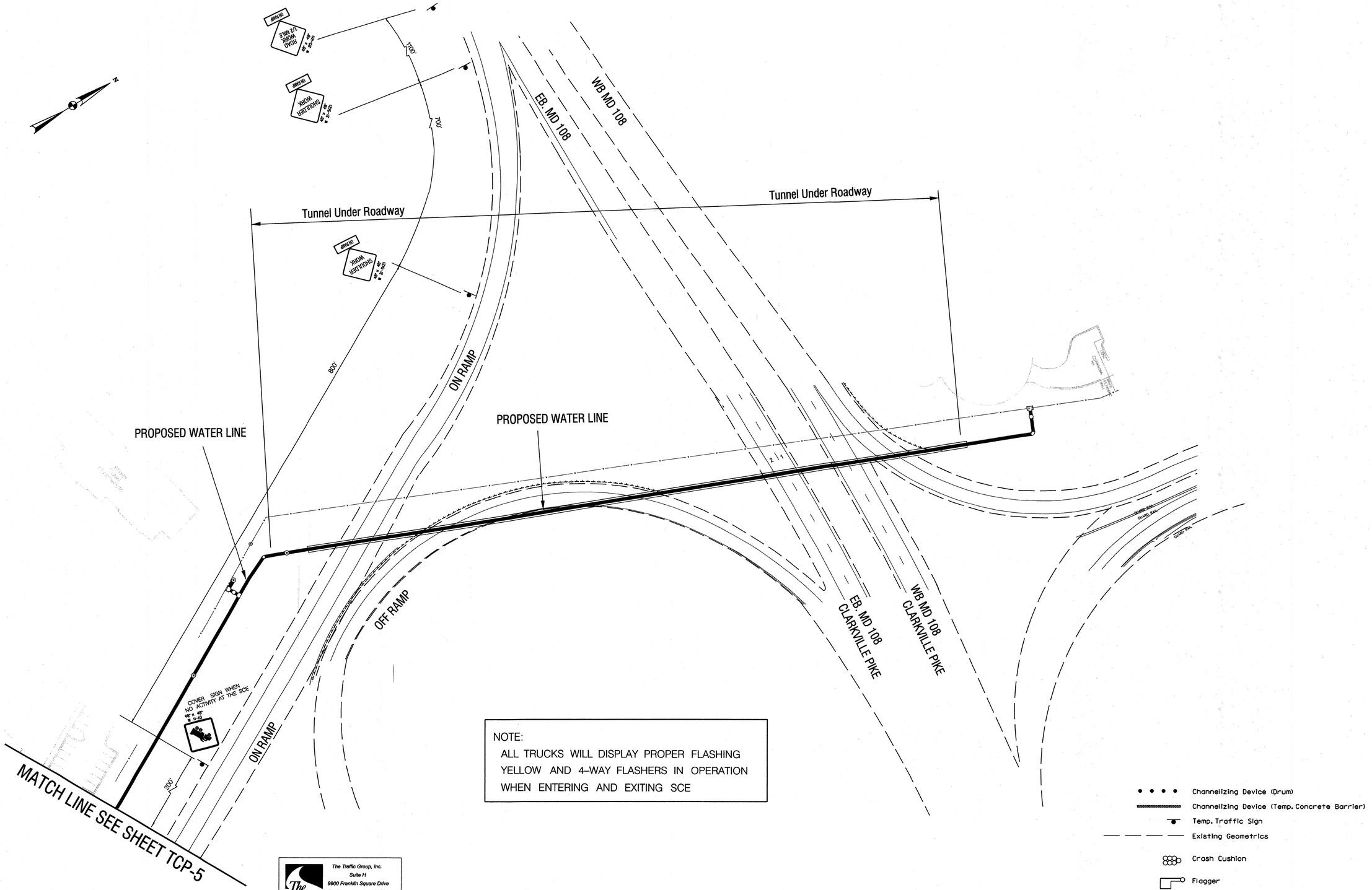

NOTE:
ALL TRUCKS WILL DISPLAY PROPER FLASHING YELLOW AND 4-WAY FLASHERS IN OPERATION WHEN ENTERING AND EXITING SCE

RECORD DRAWINGS

TCP-6

The Traffic Group, Inc.
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 6/28/16
CHIEF, BUREAU OF UTILITIES — DATE 6/23/16
CHIEF, BUREAU OF ENGINEERING — DATE 6/24/16
CHIEF, UTILITY DESIGN DIVISION — DATE 6/23/16 PSD

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 6/9/2017

STATE OF MARYLAND — No. 31757 — PROFESSIONAL ENGINEER

DSN. BY: F. BROWNLEY				
DRN. BY: F. BROWNLEY				
CHK. BY: J. DIRNDORFER	JC	2	RECORD DRAWINGS	11/20
	LR	1	RECORD DRAWINGS	05/19
DATE: APRIL 2016	RJD	0	AS BID	02/16
	BY	NO.	REVISION	DATE

MAINTENANCE OF TRAFFIC PLAN

600' SCALE MAP NO. 30 BLOCK NO. 36

US ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.:44-4930
ELECTION DISTRICT:5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 38 OF 38

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