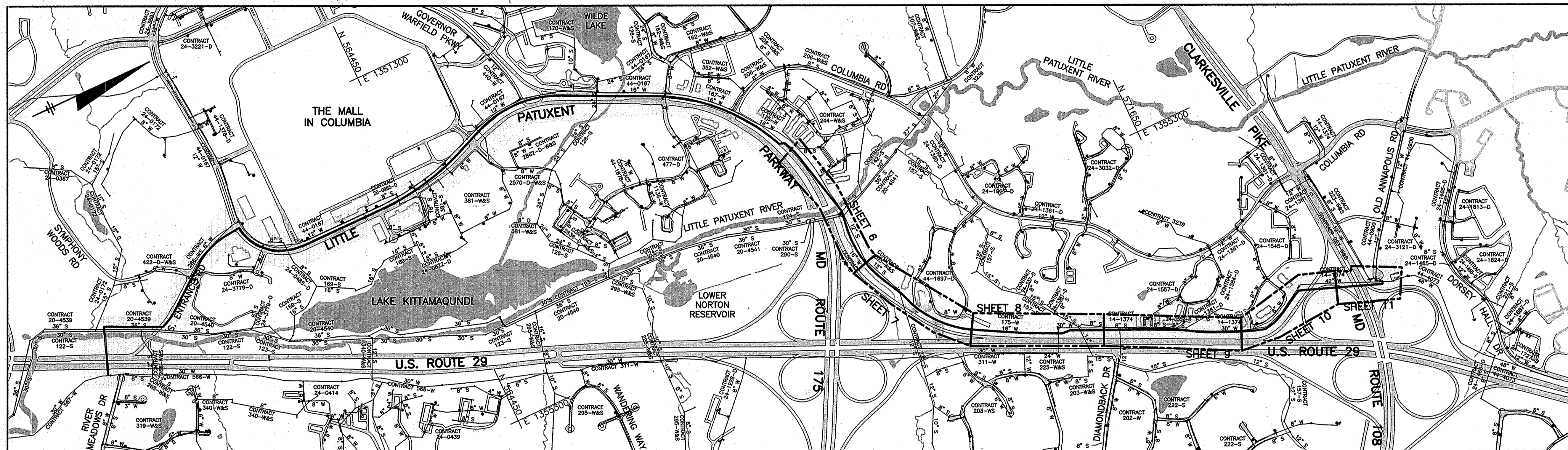


U.S. ROUTE 29 WATER TRANSMISSION MAIN: LITTLE PATUXENT PARKWAY TO MD ROUTE 108

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

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.			



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

VICINITY MAP
SCALE: 1" = 600'

SEDIMENT CONTROL MEASURES FOR THIS CONTRACT WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 219 OF THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS. 2/28

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

[Signature] 2/28/16
Howard Soil Conservation District 2/28/16 Date

ENGINEERS DESIGN CERTIFICATION:
I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

[Signature] 18523 2/27/16
Signature of Engineer - Registration Number Date

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

[Signature] 2/22/16
Signature of Developer Date

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 2/28/16
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 2/28/16
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 2/23/16
CHIEF - BUREAU OF ENGINEERING DATE

[Signature] 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

[Signature]
Professional Engineer

DSN. BY:	GLF				
DRN. BY:	RPW				
CHK. BY:	RJD				
DATE:	02/16				
BY	RJD	0	AS BID	02/16	
NO.			REVISION	DATE	

COVER SHEET

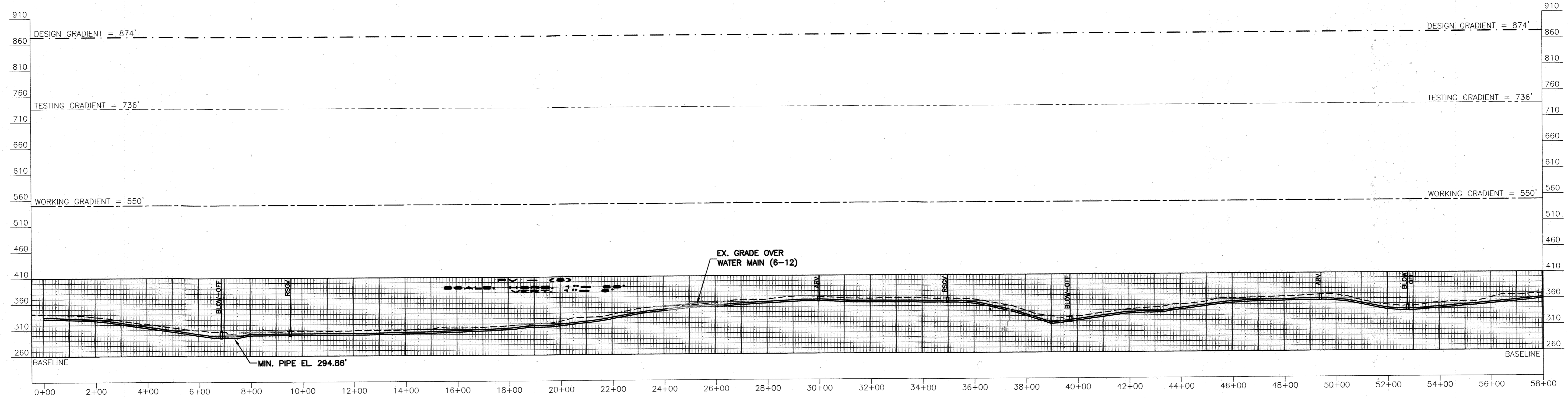
600' SCALE MAP NO. 30 BLOCK NO. 36

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

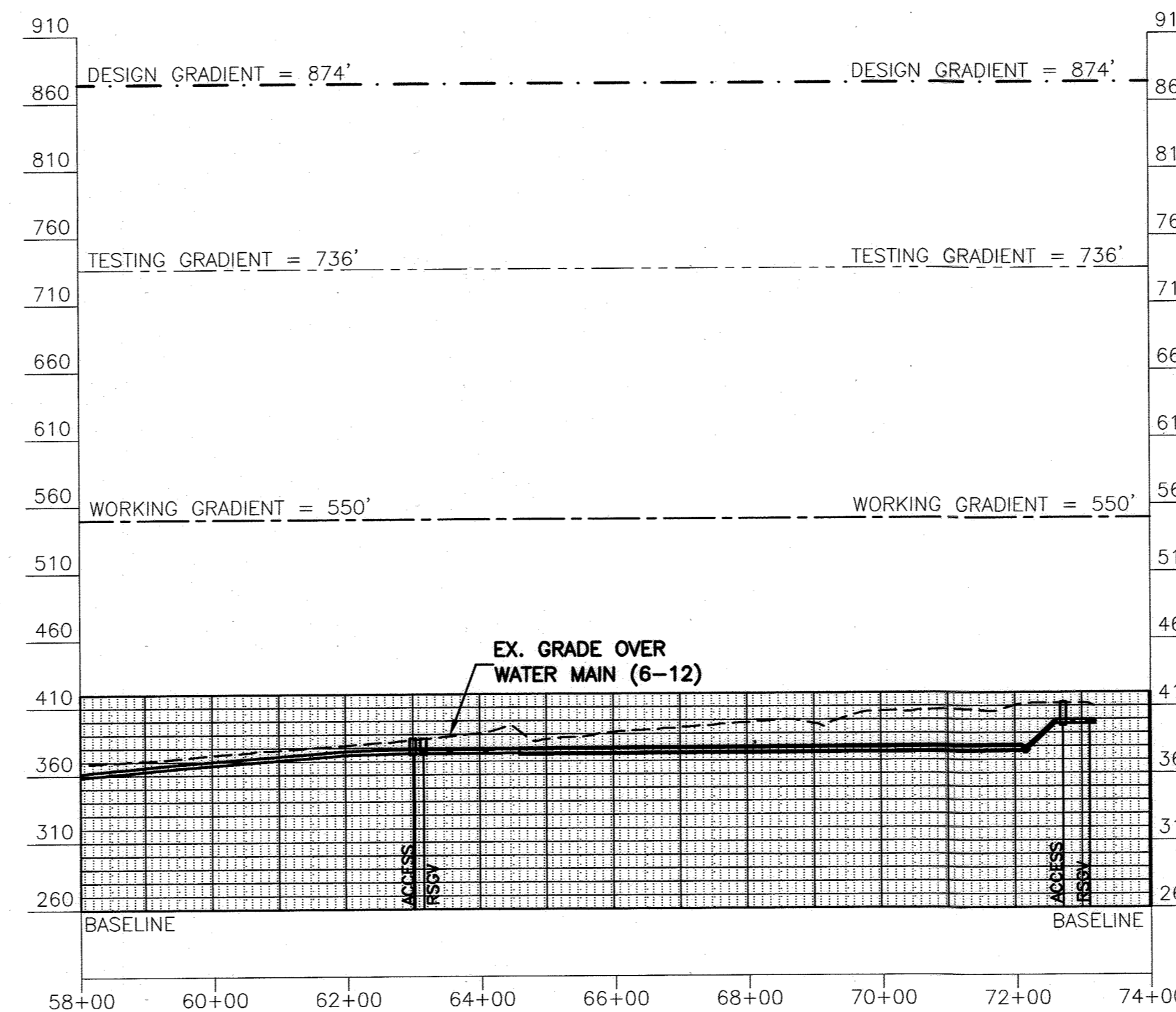
SCALE AS SHOWN

SHEET 1 OF 38



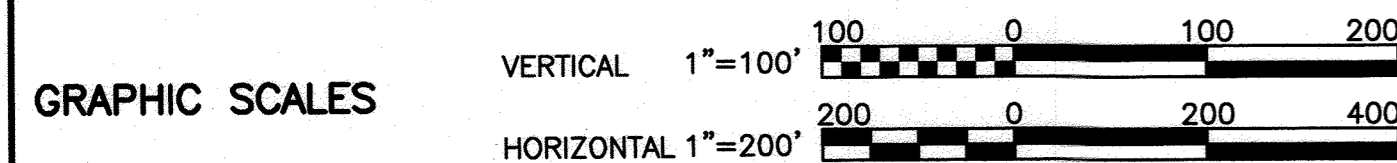
HYDRAULIC PROFILE

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



HYDRAULIC PROFILE

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



RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 2/26/16
Chief, Bureau of Engineering: *[Signature]* 2/26/16
Chief, Bureau of Utilities: *[Signature]* 2/26/16

O BRIEN & GERE
4201 MITCHELLVILLE ROAD
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[Professional Engineer Seal]

DSN. BY:	GLF			
DRN. BY:	RPW	JPC 2	RECORD DRAWINGS	11/20
CHK. BY:	RJD	LR 1	RECORD DRAWINGS	05/19
DATE:	02/16	RJD 0	AS BID	02/16
		BY NO.	REVISION	DATE

HYDRAULIC PROFILE

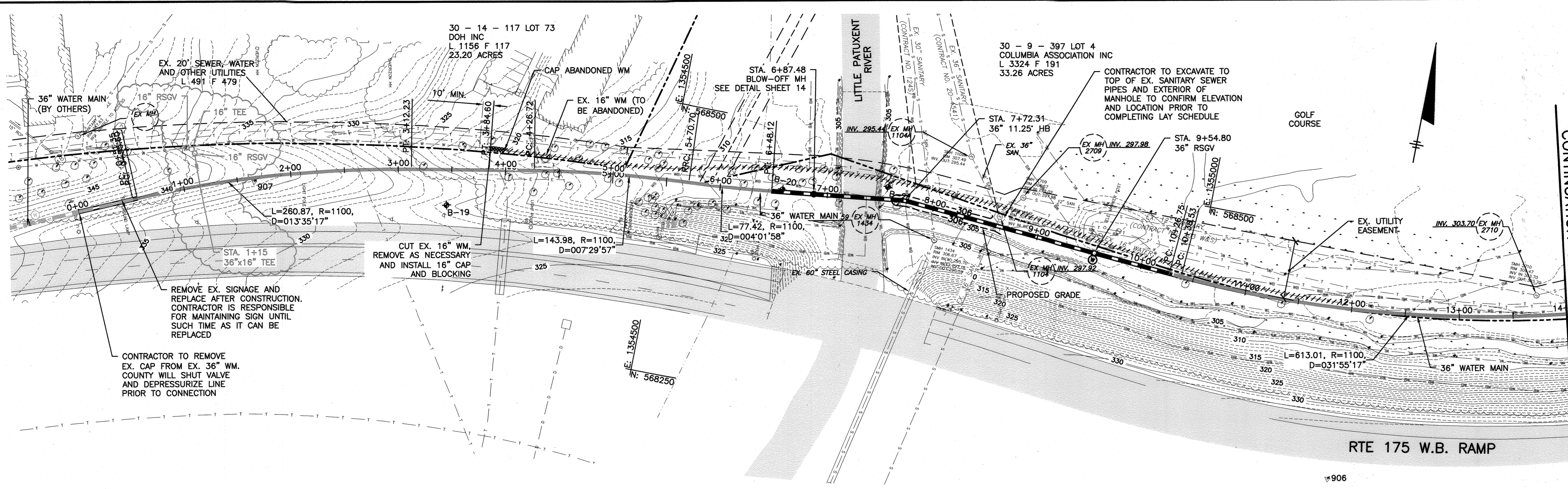
600' SCALE MAP NO. 30 BLOCK NO. 36

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

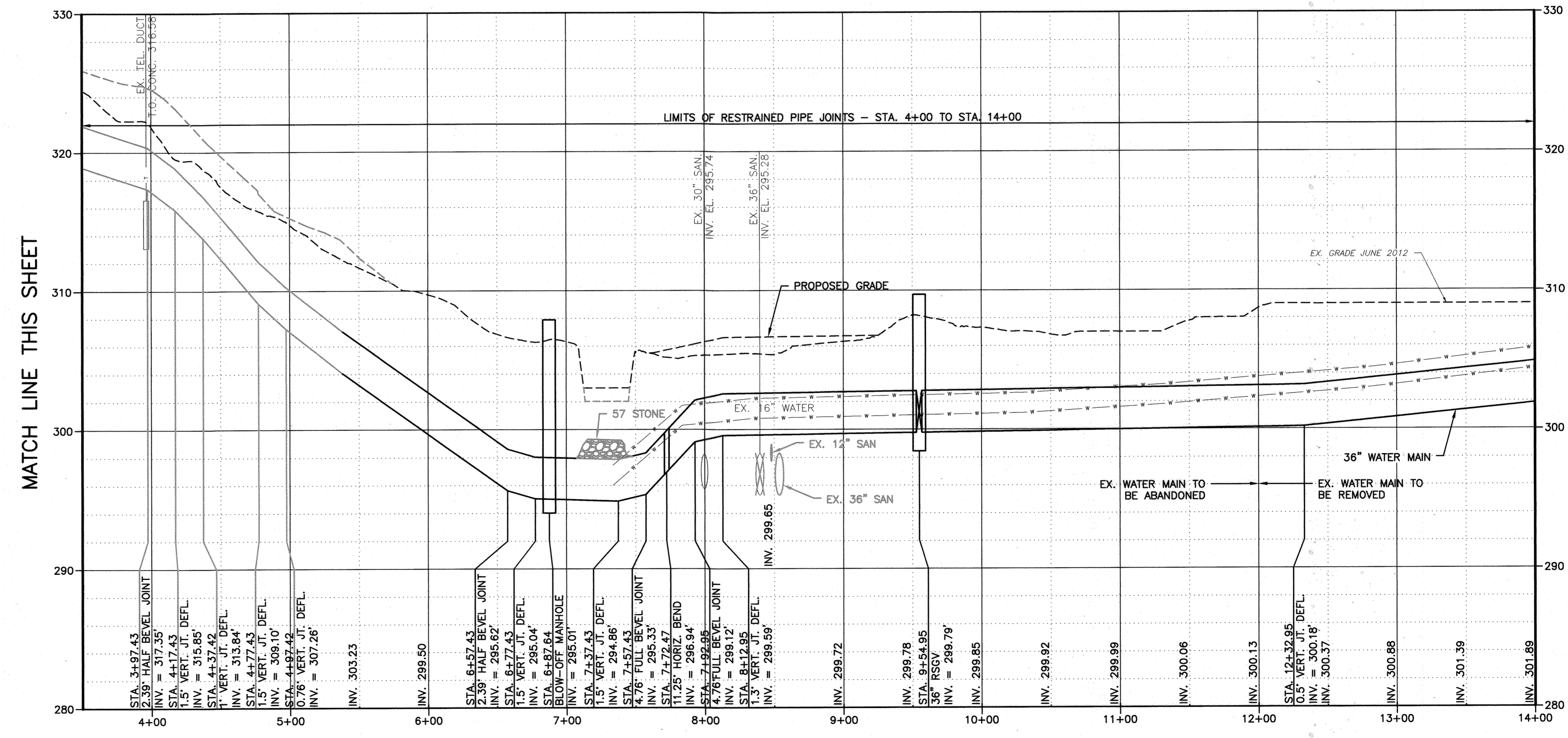
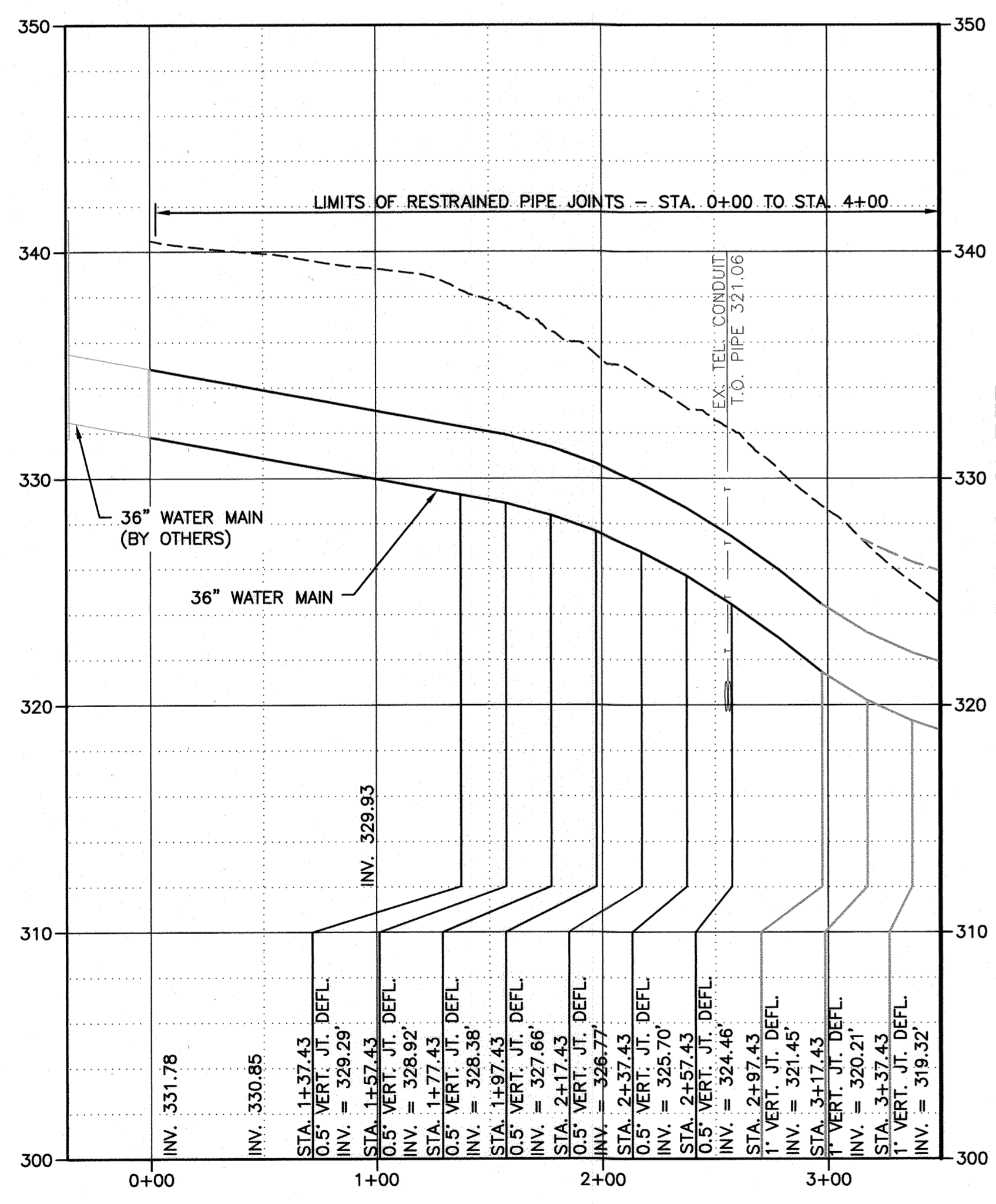
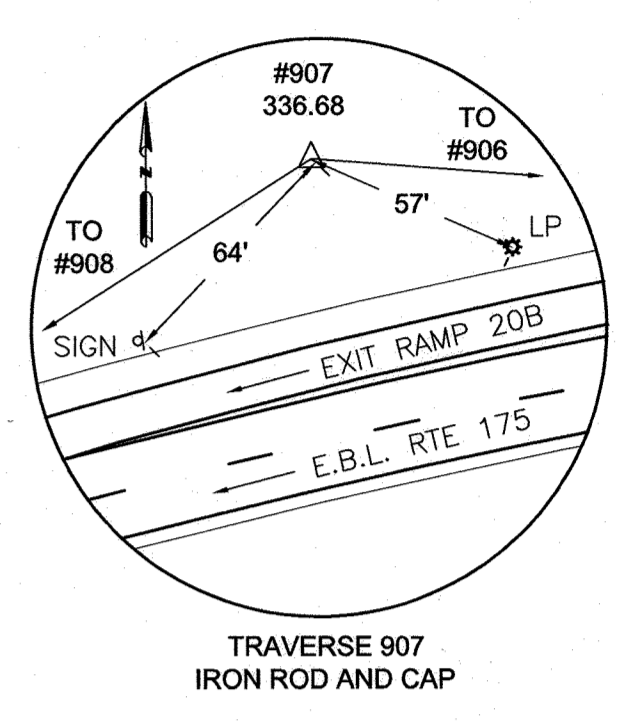
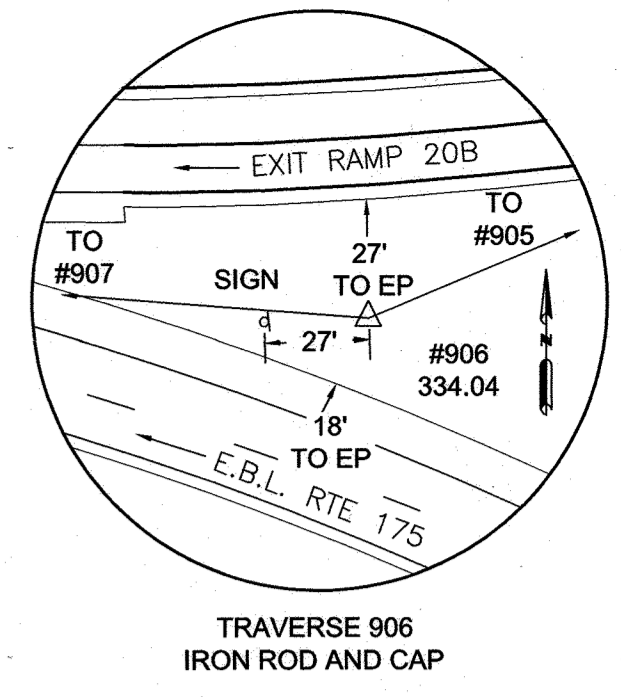
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 4 OF 38

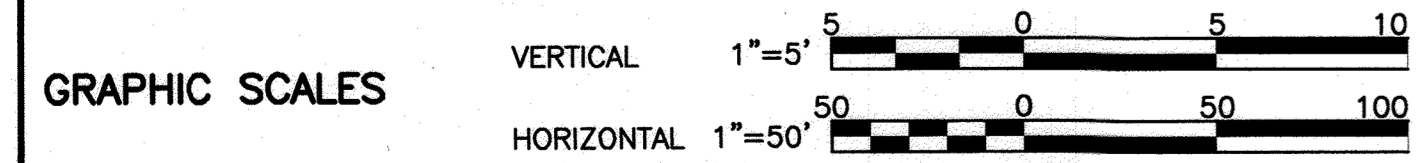
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MATCH LINE STA. 14+00 FOR CONTINUATION SEE SHEET 7



MATCH LINE STA. 14+00 FOR CONTINUATION SEE SHEET 7



DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 2/25/16
 Chief - Bureau of Engineering: *[Signature]* 2/25/16
 Chief, Bureau of Utilities: *[Signature]* 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 PROFESSIONAL ENGINEER

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

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

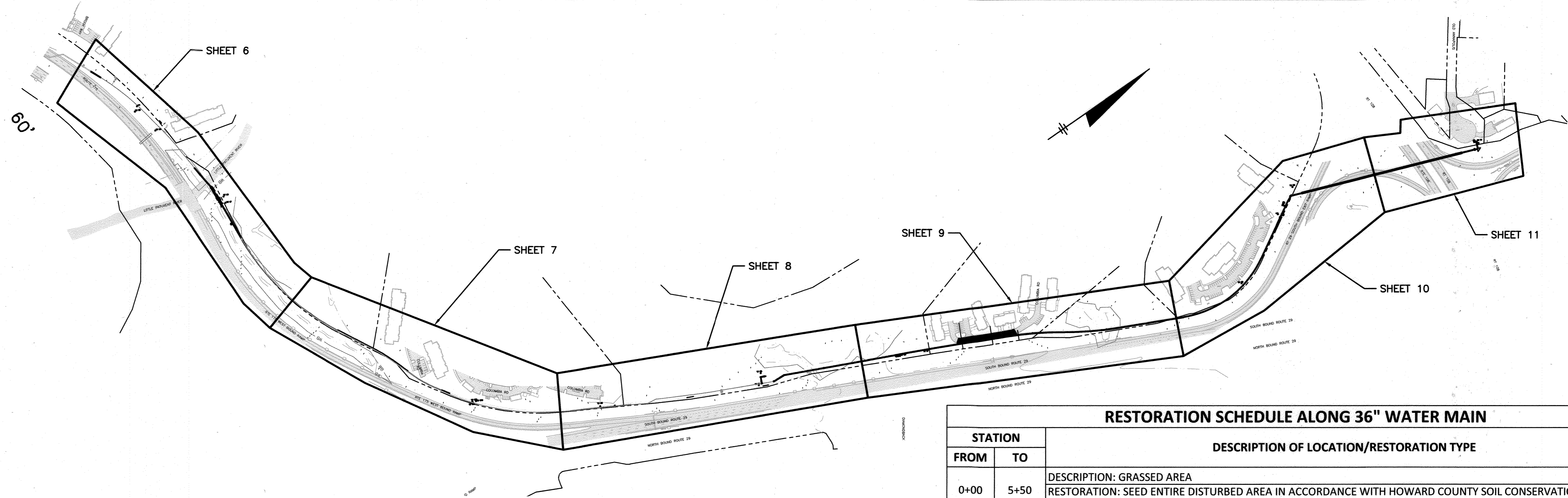
600' SCALE MAP NO. 30 BLOCK NO. 36

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

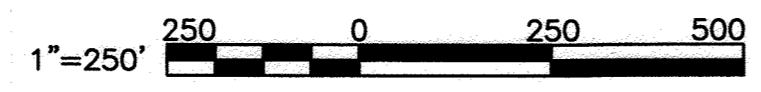
CAPITAL PROJECT: W-R296
 CONTRACT NO.: 44-4930
 ELECTION DISTRICT: 5
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
 SHEET 6 OF 38
 FILE NO. 33498-XXXF

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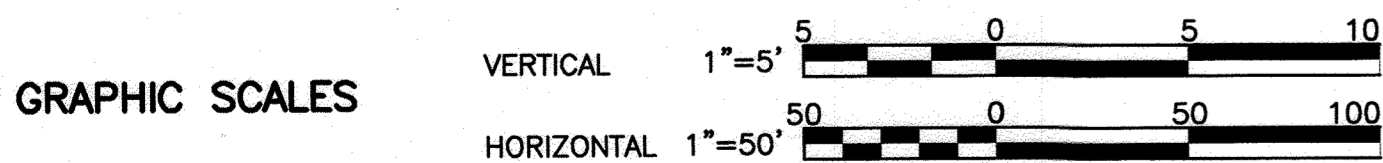
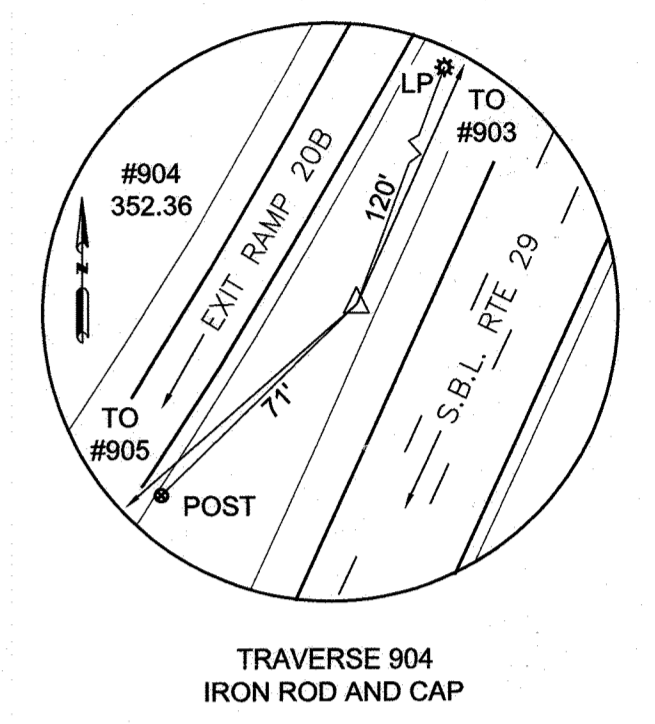
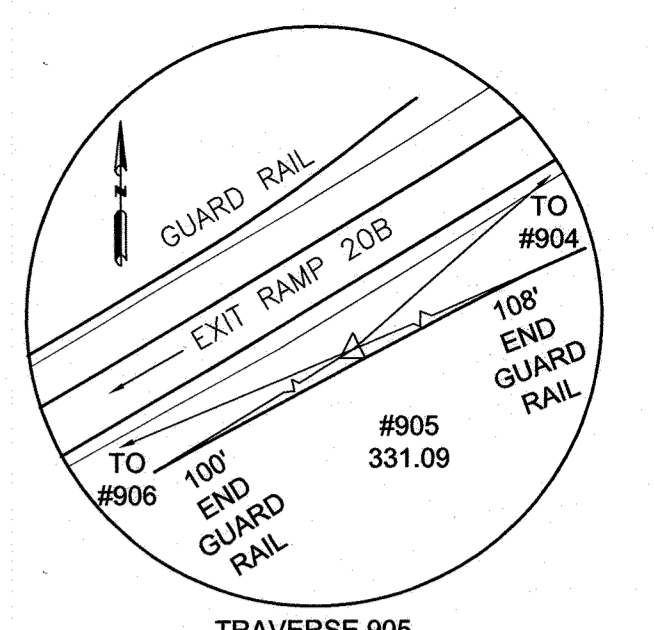
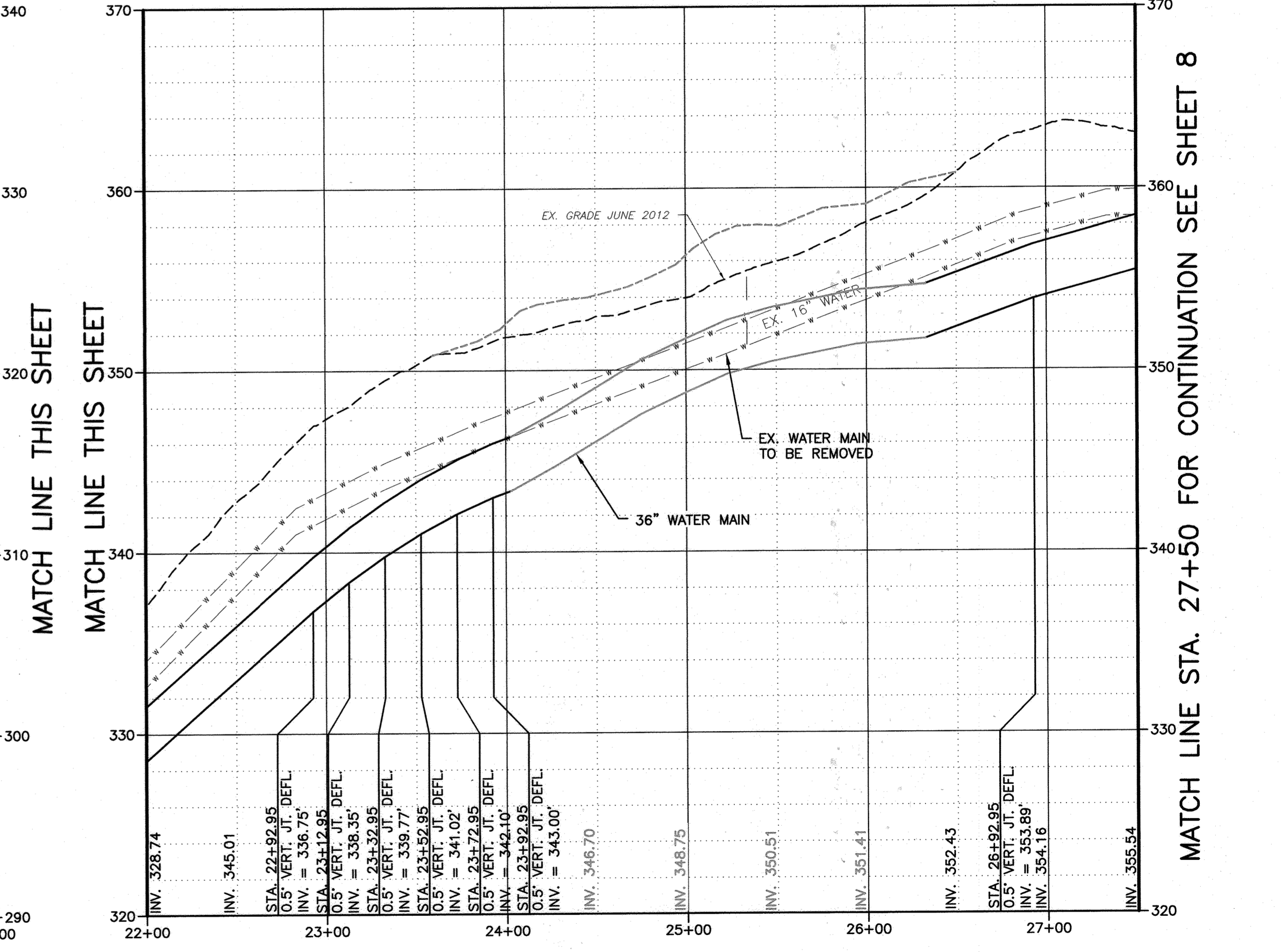
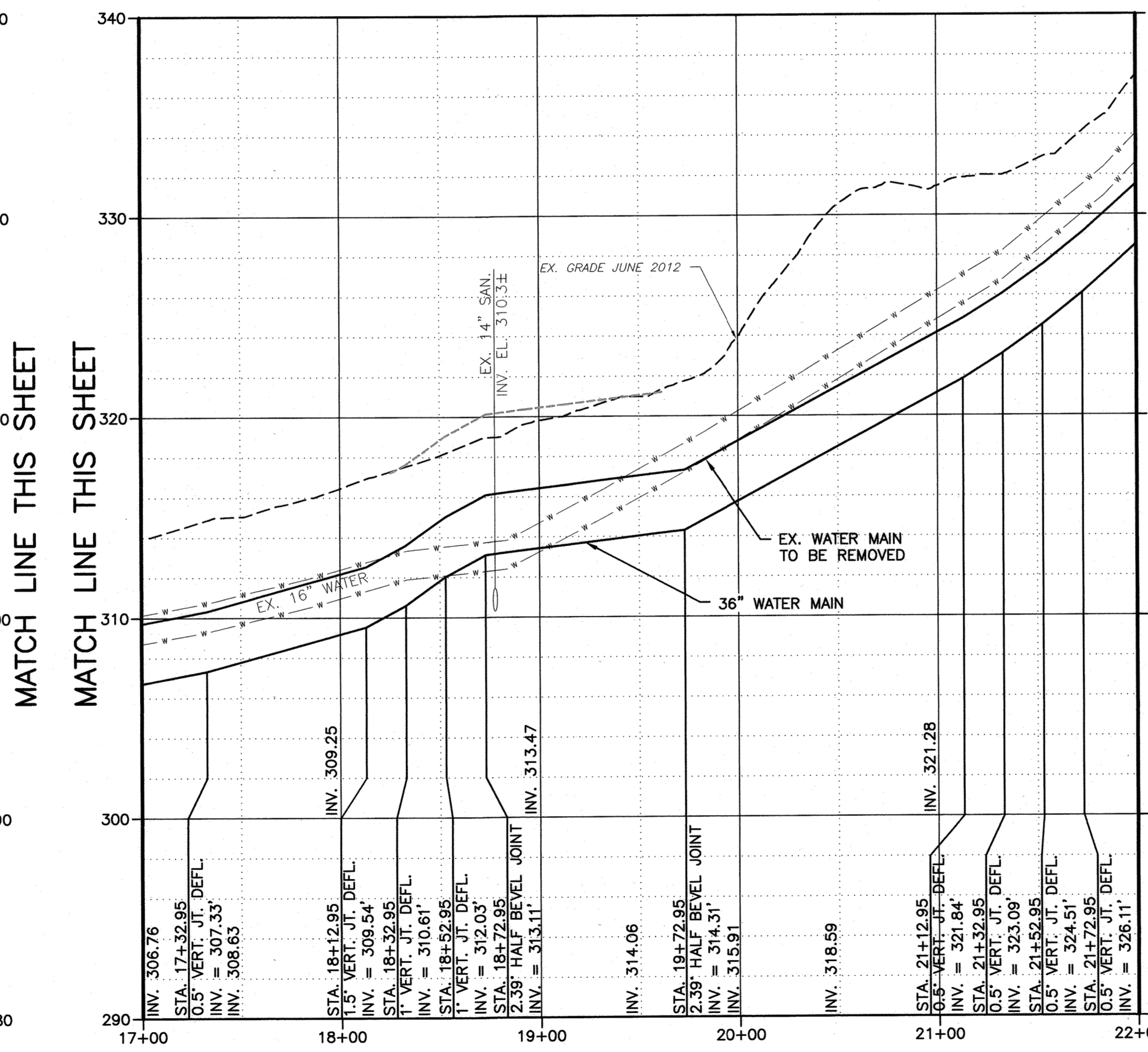
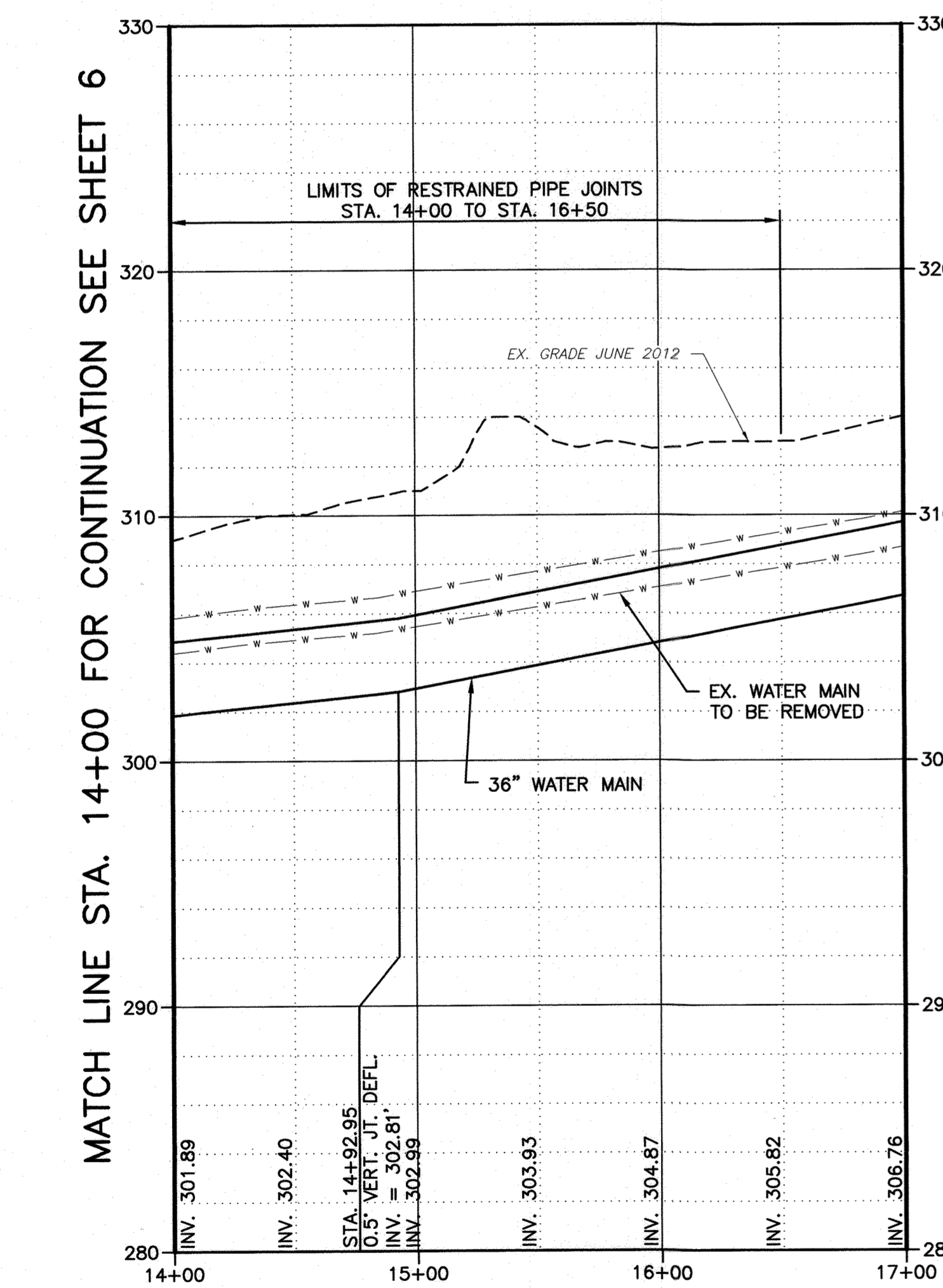
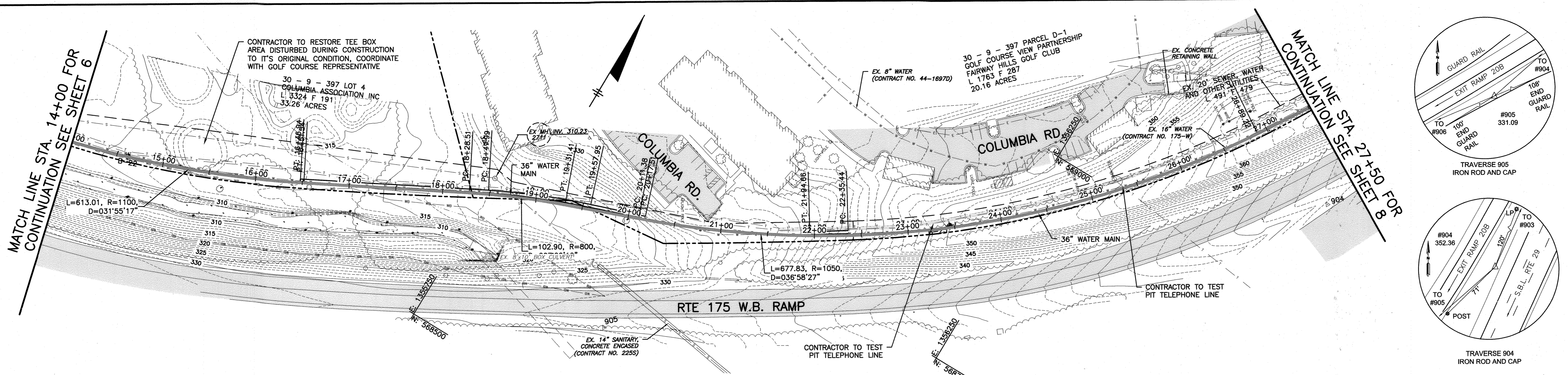
RESTORATION SCHEDULE ALONG 36" WATER MAIN		
STATION		DESCRIPTION OF LOCATION/RESTORATION TYPE
FROM	TO	
0+00	5+50	DESCRIPTION: GRASSED AREA RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH HOWARD COUNTY SOIL CONSERVATION DISTRICT REQUIREMENTS AND SEED SUMMARIES PER NOTES ON SHEET 21
5+50	7+10	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



RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Director of Public Works: [Signature] DATE: 2/25/16 Chief, Bureau of Engineering: [Signature] DATE: 2/25/16 Chief, Bureau of Utilities: [Signature] DATE: 2/25/16 Chief, Utility Design Division: [Signature] 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. [Professional Engineer Seal]	DSN. BY: GLF DRN. BY: RPW CHK. BY: RJD DATE: 02/16	<table border="1"> <tr> <td>JPC</td> <td>2</td> <td>RECORD DRAWINGS</td> <td>11/20</td> </tr> <tr> <td>LR</td> <td>1</td> <td>RECORD DRAWINGS</td> <td>05/19</td> </tr> <tr> <td>RJD</td> <td>0</td> <td>AS BID</td> <td>02/16</td> </tr> <tr> <td>BY</td> <td>NO.</td> <td>REVISION</td> <td>DATE</td> </tr> </table>	JPC	2	RECORD DRAWINGS	11/20	LR	1	RECORD DRAWINGS	05/19	RJD	0	AS BID	02/16	BY	NO.	REVISION	DATE	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-8298 CONTRACT NO.: 44-4930 ELECTION DISTRICT: 5 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 5 OF 38
JPC	2	RECORD DRAWINGS	11/20																					
LR	1	RECORD DRAWINGS	05/19																					
RJD	0	AS BID	02/16																					
BY	NO.	REVISION	DATE																					

FILE NO. 33498-XXX



DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Director of Public Works: [Signature]
 Chief, Bureau of Engineering: [Signature]
 Chief, Bureau of Utilities: [Signature]
 Chief, Utility Design Division: [Signature]

G O BRIEN & G E R E
 4201 MITCHELLVILLE ROAD
 SUITE 500
 BOWIE, MD 20716
 PHONE: 301-731-5622

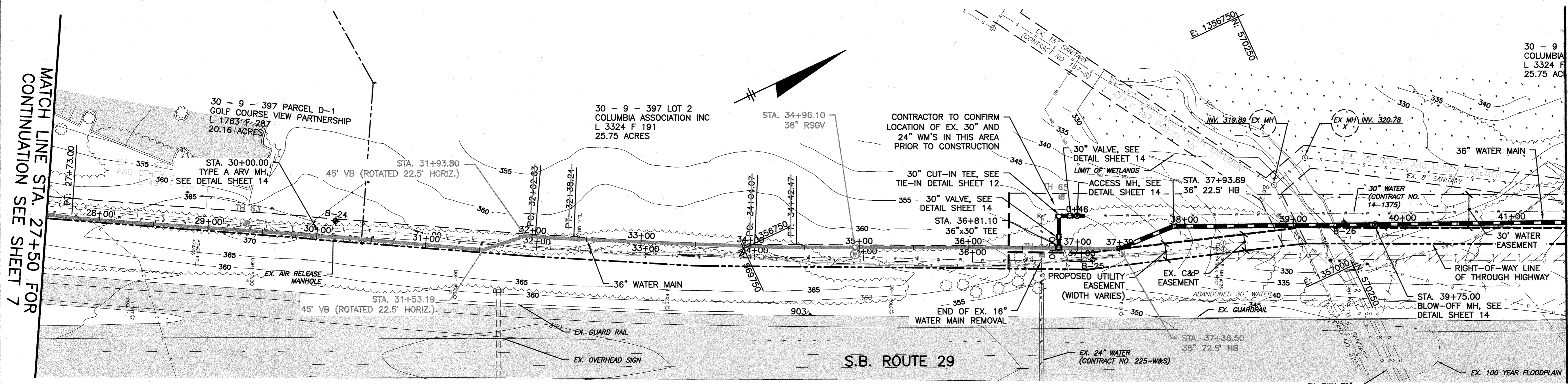
PROFESSIONAL CERTIFICATION:
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DSN. BY:	GLF	JPC	3	11/20
DRN. BY:	RPW	LR	2	05/19
CHK. BY:	RJD	RJD	1	08/17
DATE:	02/16	RJD	0	02/16
		BY	NO.	REVISION

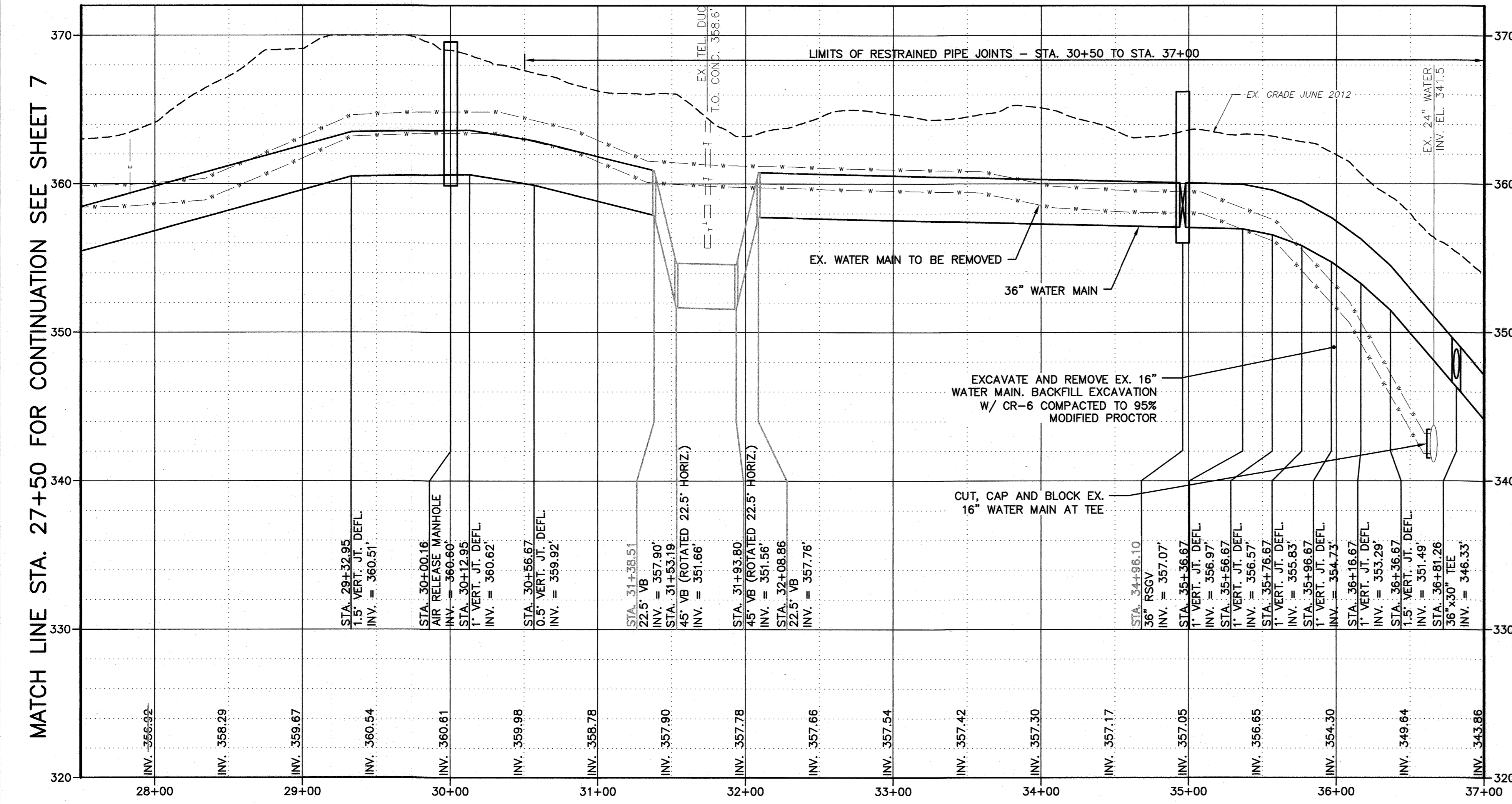
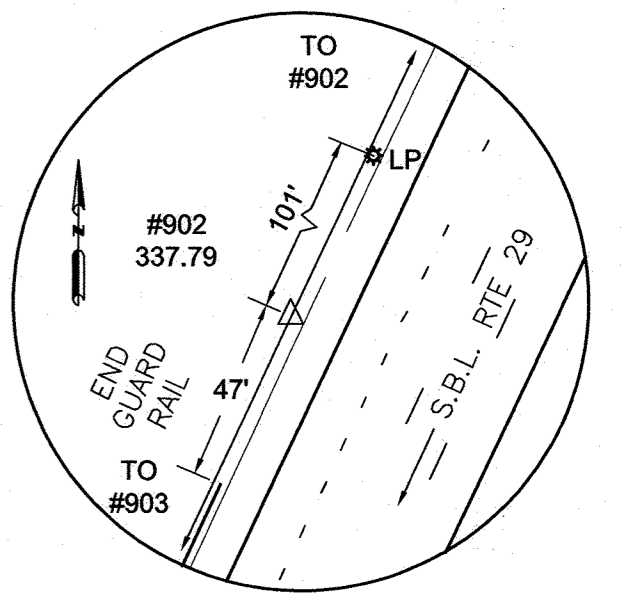
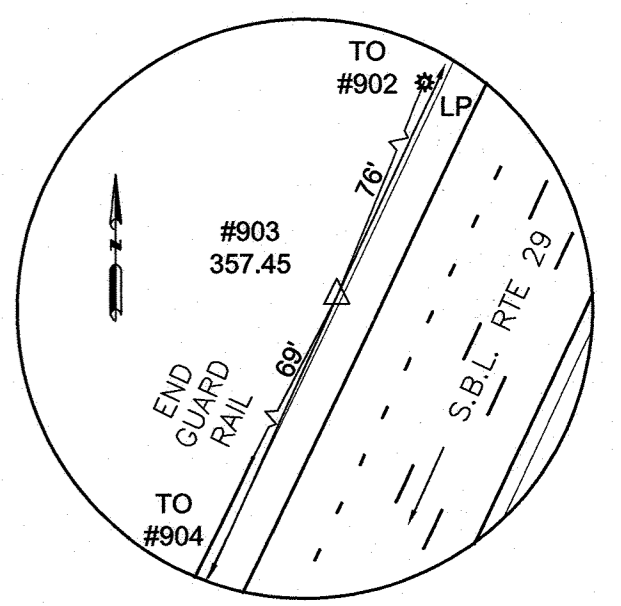
PLAN AND PROFILE
 STA. 14+00 TO STA. 27+50
 600' SCALE MAP NO. 30 BLOCK NO. 36

U.S. ROUTE 29 WATER TRANSMISSION MAIN
 LITTLE PATUXENT PARKWAY TO MD ROUTE 108
 CAPITAL PROJECT: W-8286
 CONTRACT NO.: 44-4930
 ELECTION DISTRICT: 5
 HOWARD COUNTY, MARYLAND
 SCALE AS SHOWN
 SHEET 7 OF 38

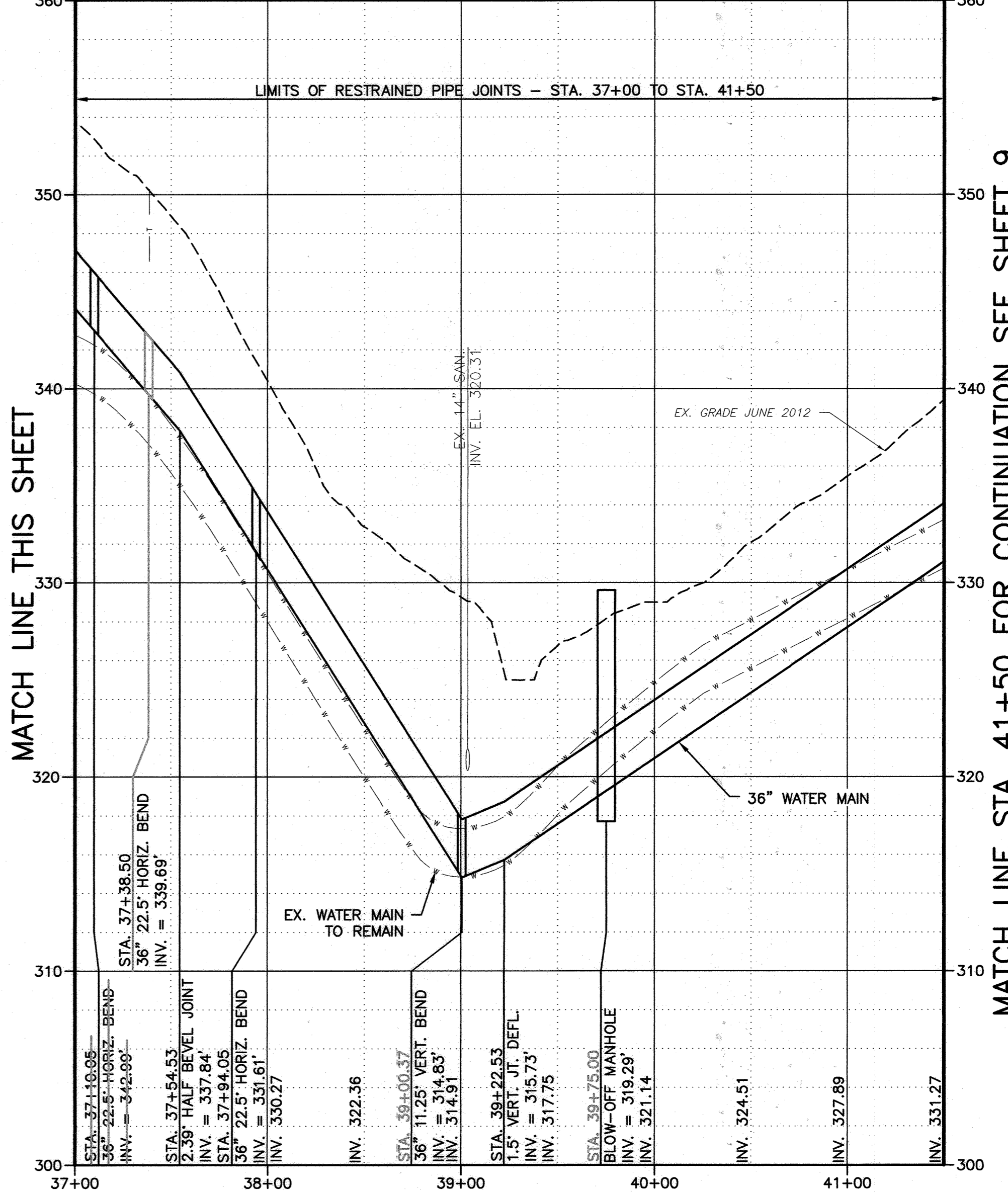
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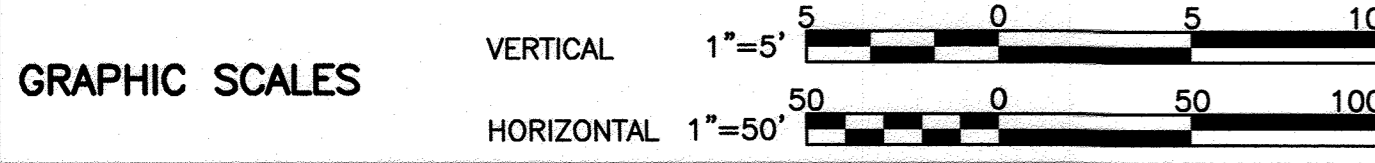
MATCH LINE STA. 41+50 FOR CONTINUATION SEE SHEET 9



MATCH LINE THIS SHEET



MATCH LINE STA. 41+50 FOR CONTINUATION SEE SHEET 9



DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Director of Public Works: [Signature] DATE: 2/25/16
 Chief, Bureau of Engineering: [Signature] DATE: 2/25/16
 Chief, Bureau of Utilities: [Signature] DATE: 2/25/16
 Chief, Utility Design Division: [Signature] DATE: 2/25/16

G 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.



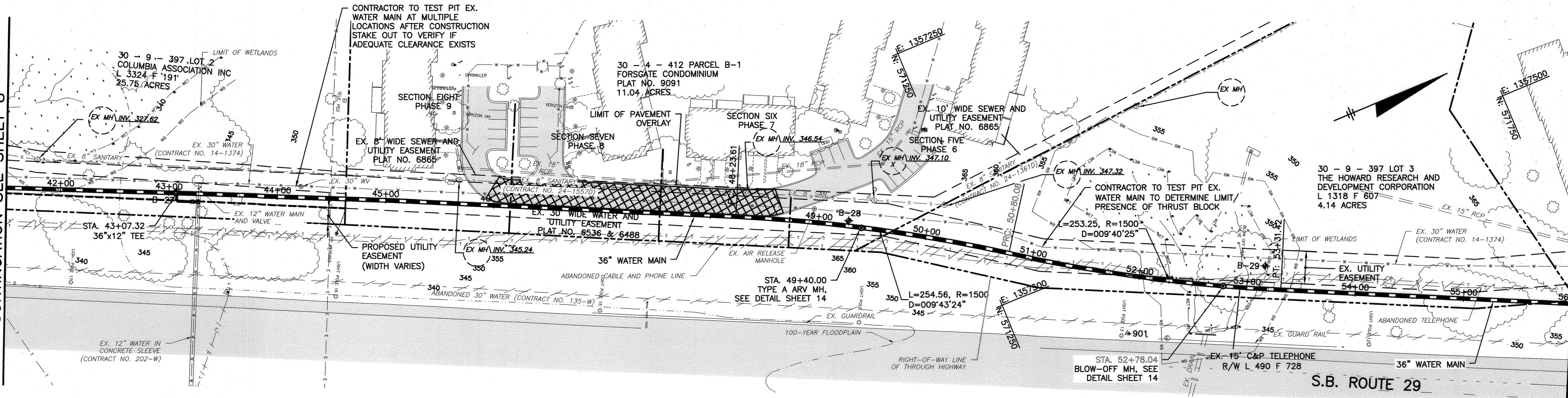
DSN. BY:	GLF				
DRN. BY:	RPW	JPC	2	RECORD DRAWINGS	11/20
CHK. BY:	RJD	RJD	1	RECORD DRAWINGS	05/19
DATE:	02/16	RJD	0	DESIGN REVISION #1	08/17
		BY	NO.	AS BID	02/16
				REVISION	DATE

PLAN AND PROFILE
 STA. 27+50 TO STA. 41+50
 600' SCALE MAP NO. 30 BLOCK NO. 36

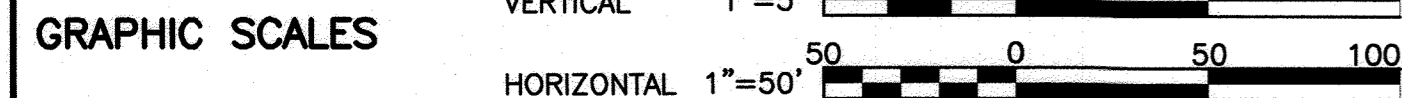
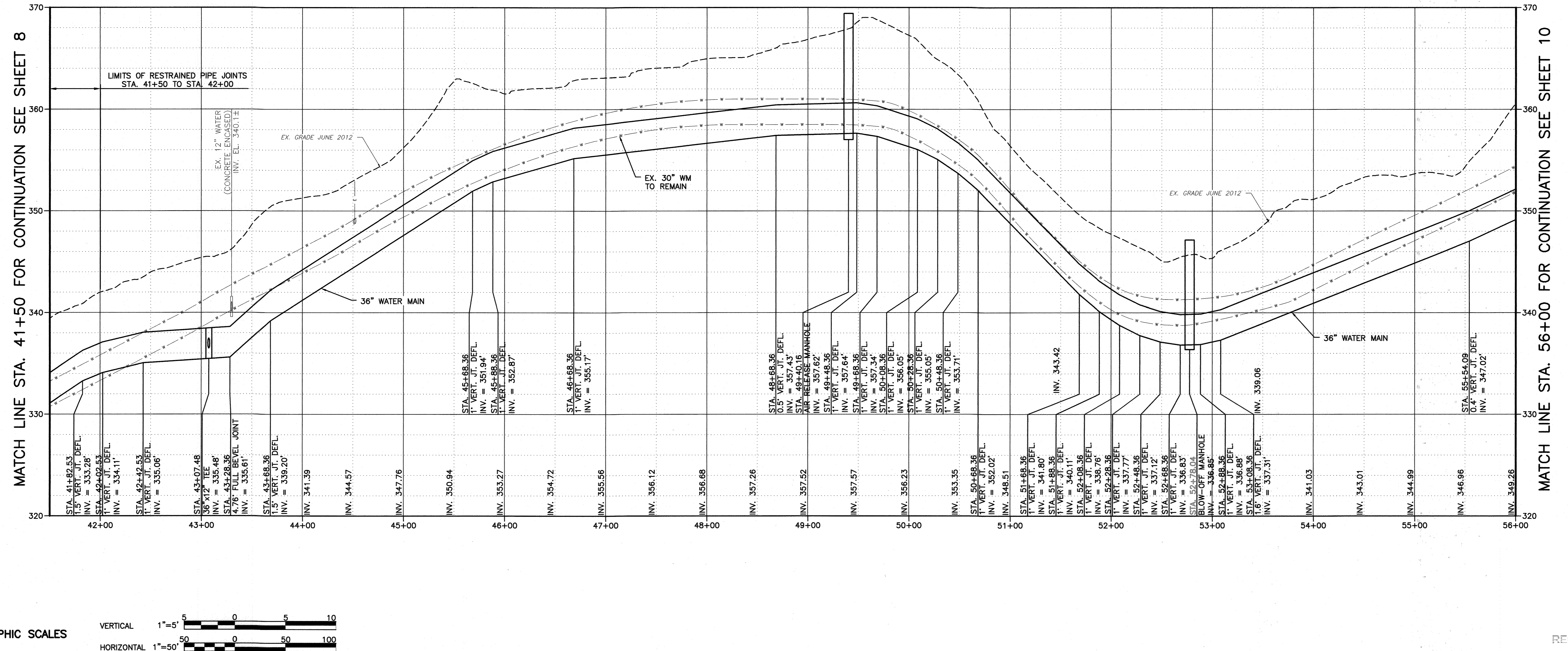
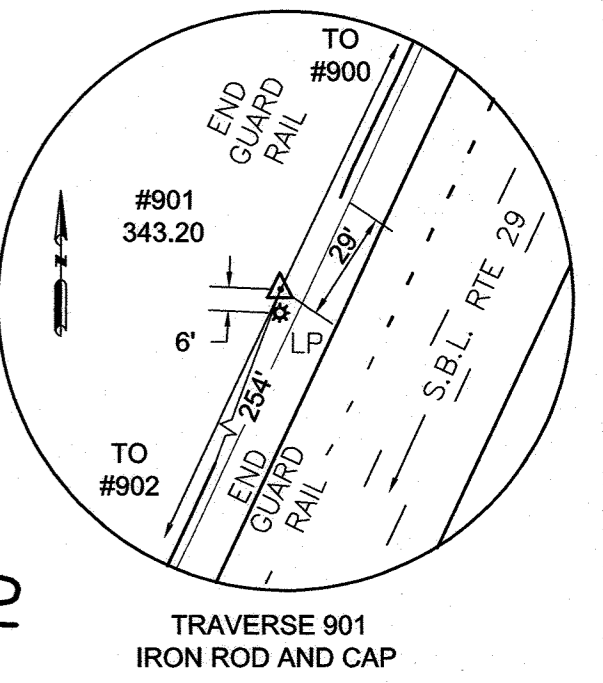
U.S. ROUTE 29 WATER TRANSMISSION MAIN
 LITTLE PATUXENT PARKWAY TO MD ROUTE 108
 CAPITAL PROJECT: W-8298
 CONTRACT NO.: 44-4930
 ELECTION DISTRICT: 5
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
 SHEET 8 OF 38
 FILE NO. 33498-XXX

MATCH LINE STA. 41+50 FOR CONTINUATION SEE SHEET 8



MATCH LINE STA. 56+00 FOR CONTINUATION SEE SHEET 10



RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
Director of Public Works: [Signature]
Chief, Bureau of Engineering: [Signature]
Chief, Bureau of Utilities: [Signature]
Chief, Utility Design Division: [Signature]

G O BRIEN & GERE
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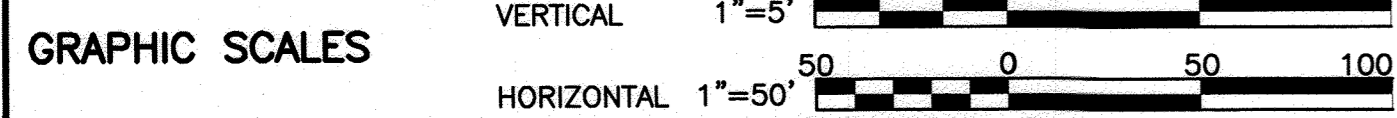
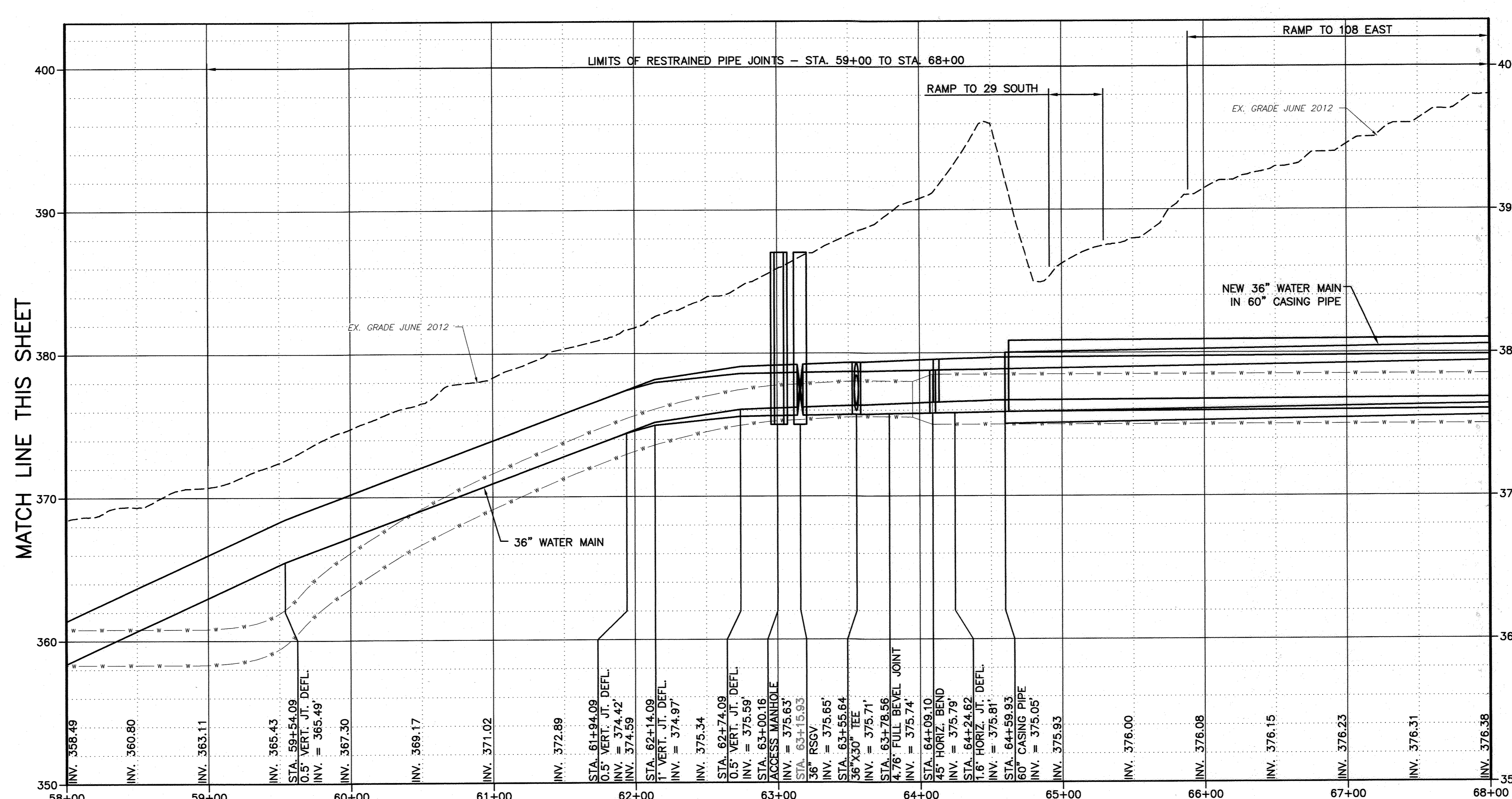
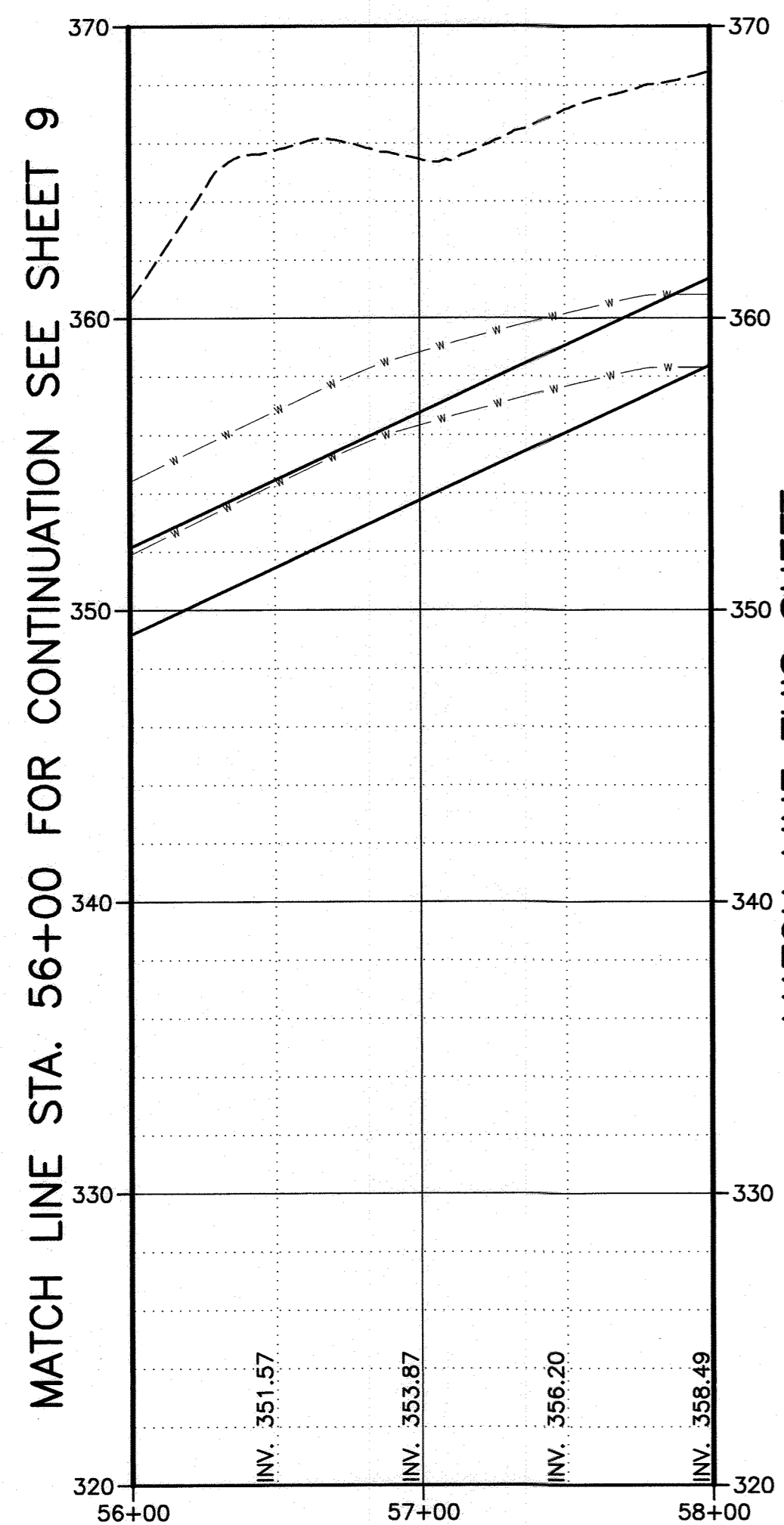
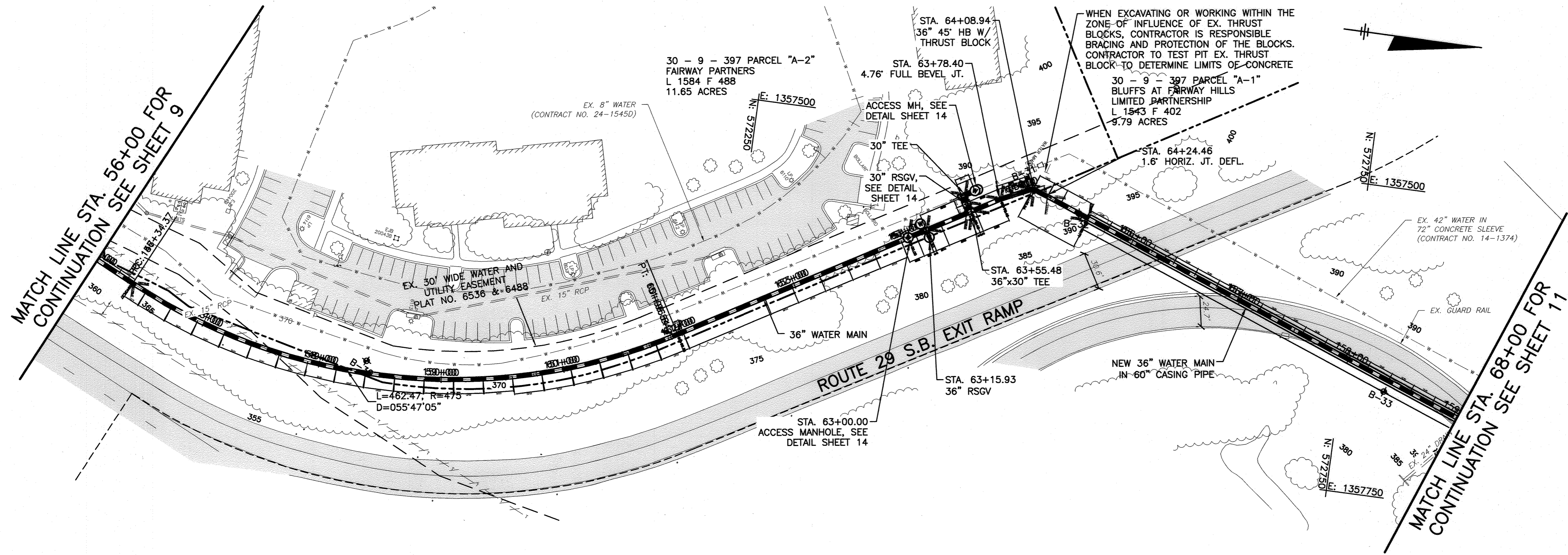
DSN. BY: GLF
DRN. BY: RPW
CHK. BY: RJD
DATE: 02/16

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

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-XXX



DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 2/20/16
 Chief, Bureau of Engineering: *[Signature]* 2/23/16
 Chief, Bureau of Utilities: *[Signature]* 2/23/16
 Chief, Utility Design Division: *[Signature]* 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. 18923, EXPIRATION DATE 12/08/2017.

[Professional Engineer Seal]

DSN. BY:	GLF		
DRN. BY:	RPW	JPC 2	RECORD DRAWINGS 11/20
CHK. BY:	RJD	LR 1	RECORD DRAWINGS 05/19
DATE:	02/16	RJD 0	AS BID 02/16
		BY NO.	REVISION DATE

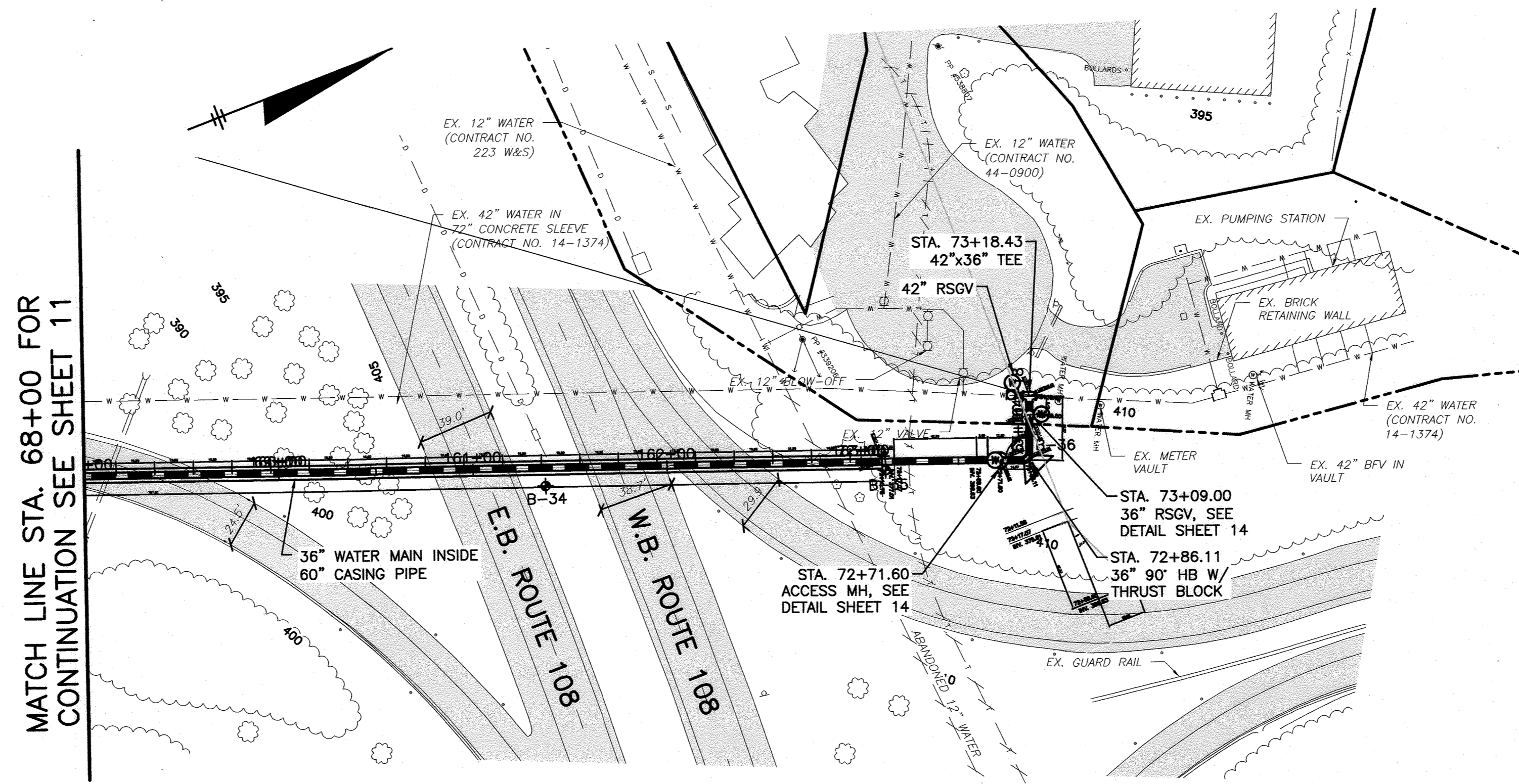
PLAN AND PROFILE
 STA. 56+00 TO STA. 68+00

600' SCALE MAP NO. 30 BLOCK NO. 36

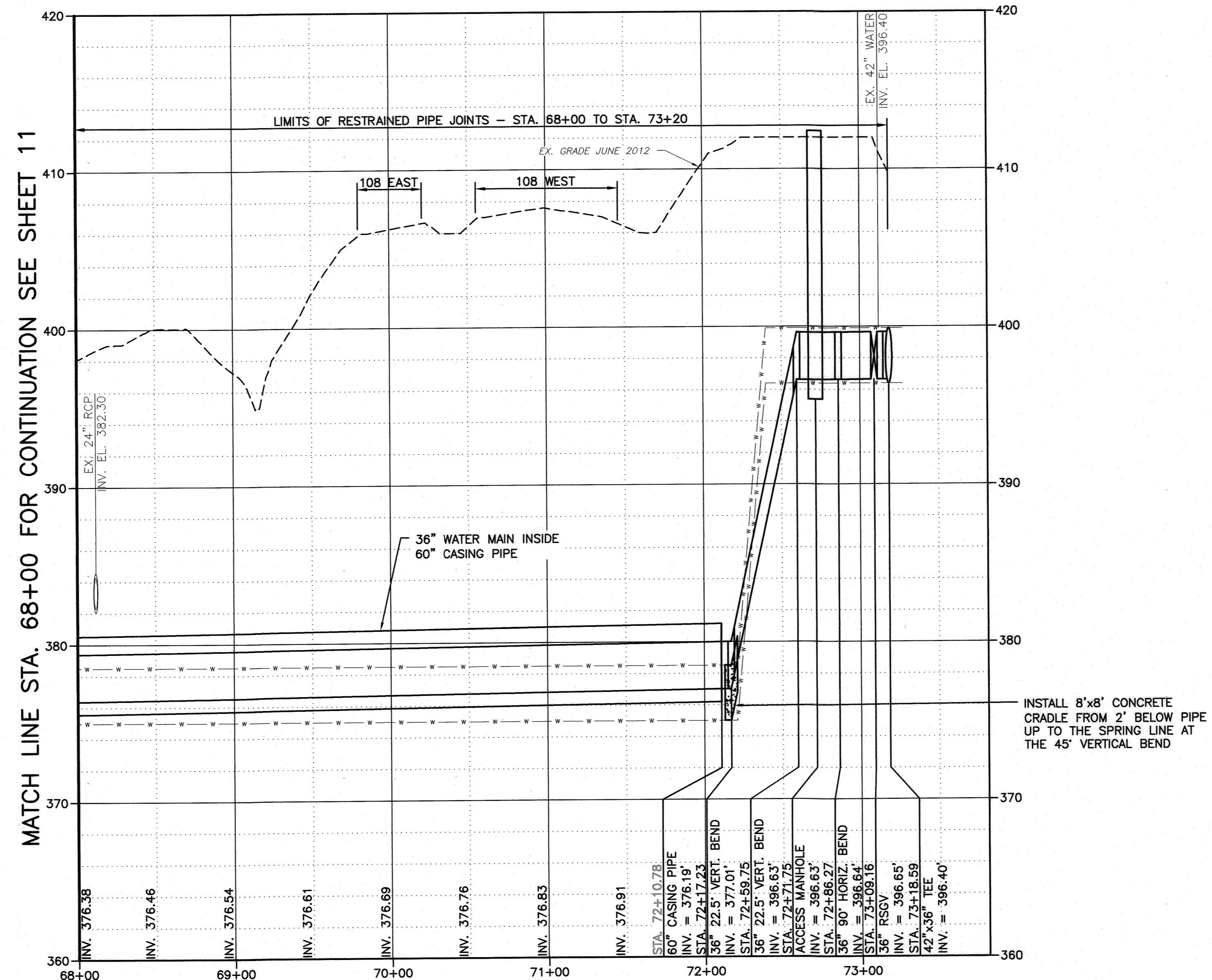
U.S. ROUTE 29 WATER TRANSMISSION MAIN
 LITTLE PATUXENT PARKWAY TO MD ROUTE 108

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

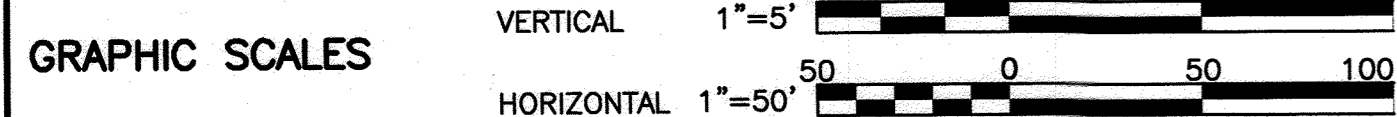
SCALE AS SHOWN
 SHEET 10 OF 38



MATCH LINE STA. 68+00 FOR CONTINUATION SEE SHEET 11



MATCH LINE STA. 68+00 FOR CONTINUATION SEE SHEET 11



RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Director of Public Works: *[Signature]* 2/20/16
 Chief, Bureau of Engineering: *[Signature]* 2/23/16
 Chief, Bureau of Utilities: *[Signature]* 2/23/16
 Chief, Utility Design Division: *[Signature]* 2/23/16

O'Brien & Gere
 4201 MITCHELLVILLE ROAD
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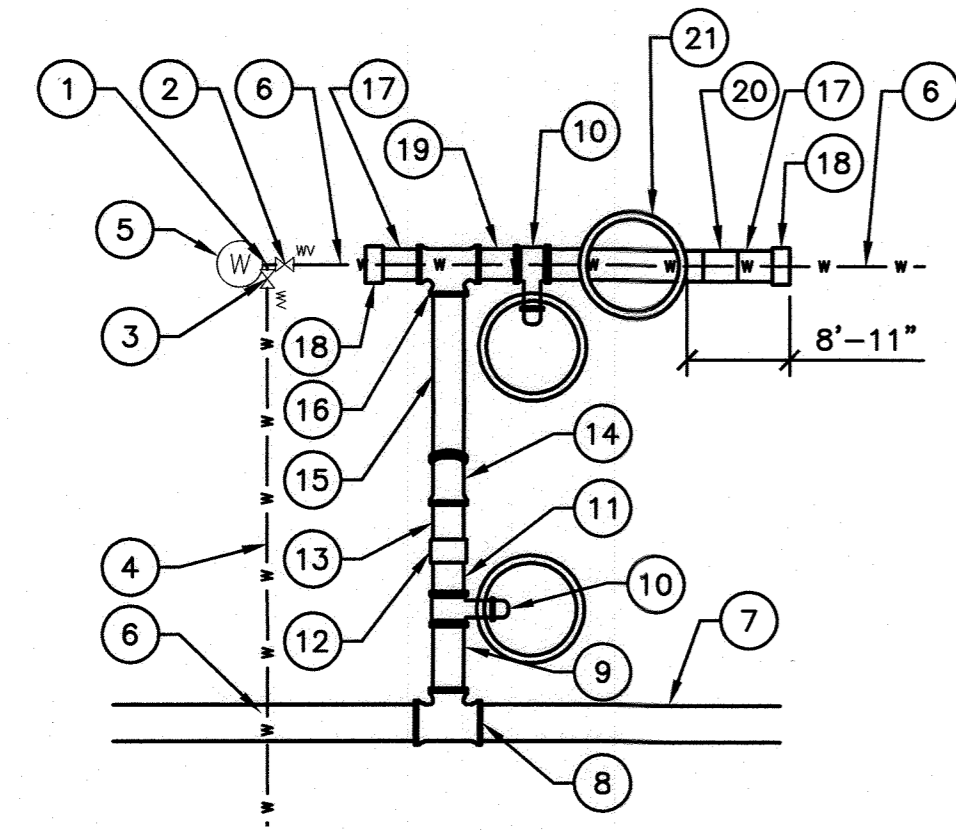
DSN. BY:	GLF			
DRN. BY:	RPW	JPC 2	RECORD DRAWINGS	11/20
CHK. BY:	RJD	LR 1	RECORD DRAWINGS	05/19
DATE:	02/16	RJD 0	AS BID	02/16
		BY NO.	REVISION	DATE

PLAN AND PROFILE
 STA. 68+00 TO STA. 73+20
 600' SCALE MAP NO. 30 BLOCK NO. 36

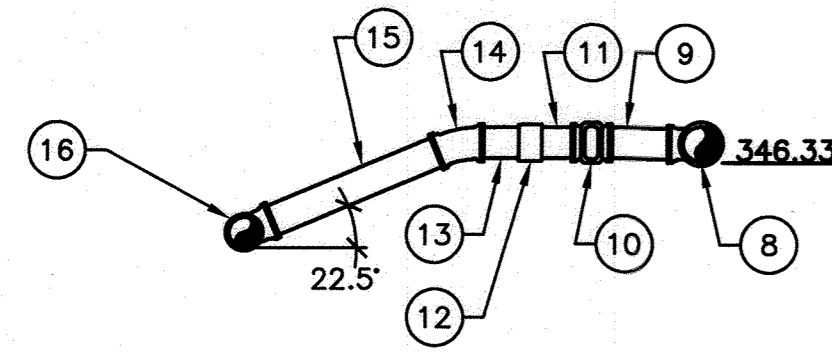
U.S. ROUTE 29 WATER TRANSMISSION MAIN
 LITTLE PATUXENT PARKWAY TO MD ROUTE 108
 CAPITAL PROJECT: W-8296
 CONTRACT NO.: 44-4930
 ELECTION DISTRICT: 5
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
 SHEET 11 OF 38
 FILE NO. 33498-XXXX

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PLAN



ELEVATION

CONNECTION DETAIL STA. 36+81

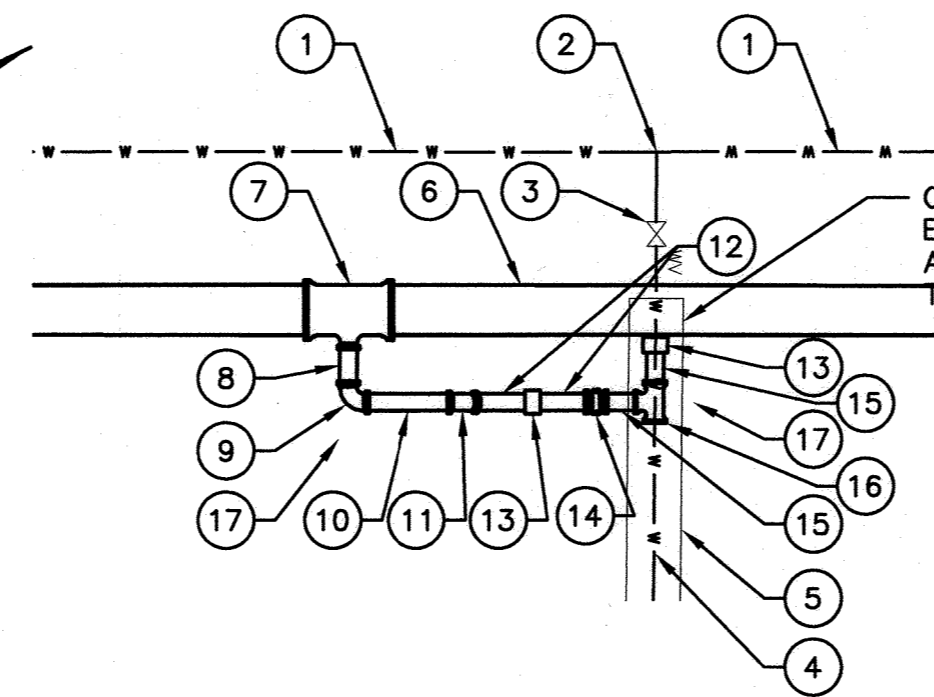
EXISTING:

- 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

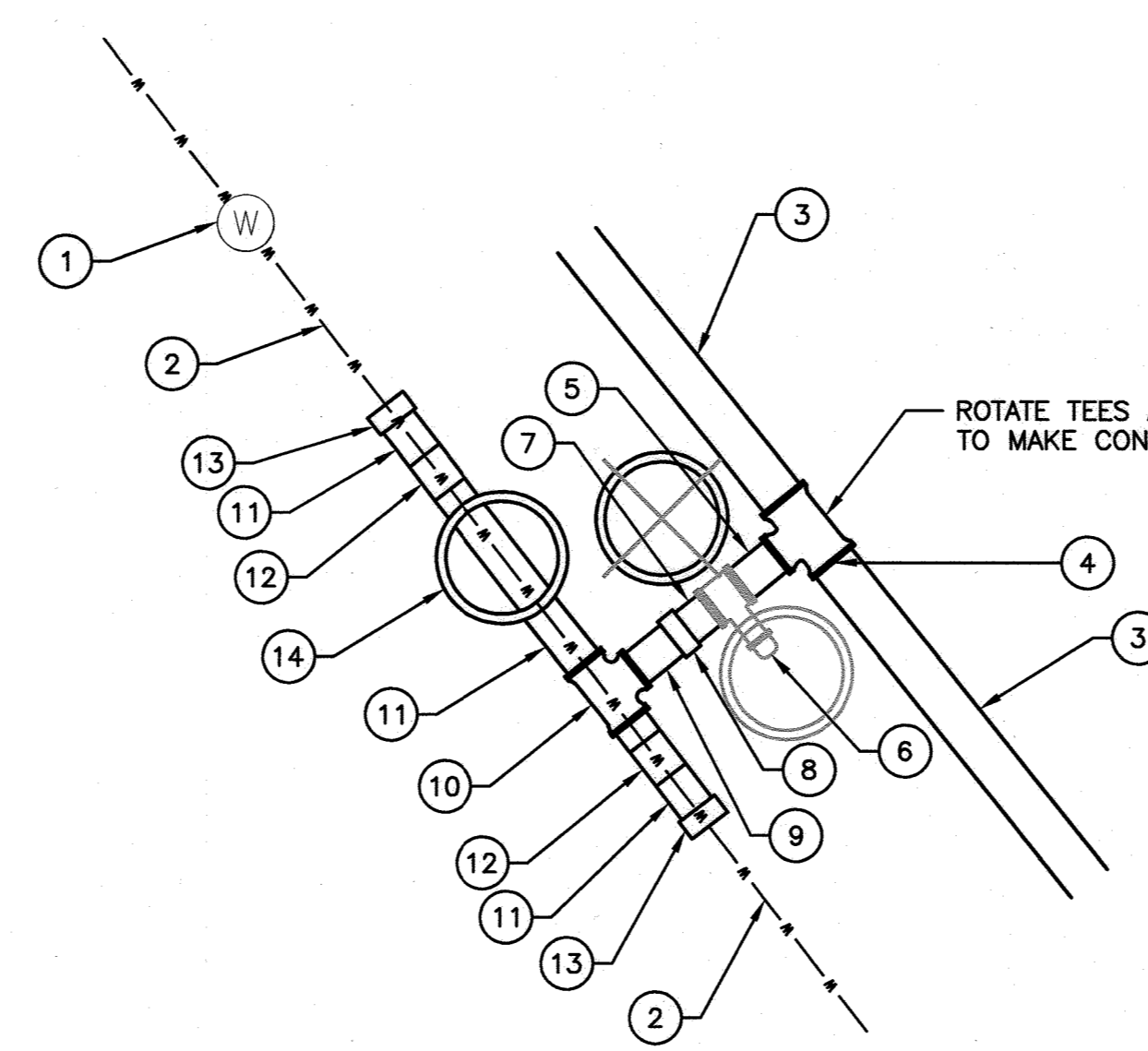
EXISTING:

- ① 30" PCCP WM PIPE
- ② 12" STEEL OUTLET
- ③ 12" VALVE
- ④ 12" DI WM PIPE
- ⑤ CONCRETE ENCASMENT (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

CONTRACTOR TO BREAK AWAY EX. CONCRETE ENCASMENT AND UNCOVER THE EX. PIPE TO MAKE CONNECTION.



CONNECTION DETAIL STA. 63+55

EXISTING:

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

PROPOSED:

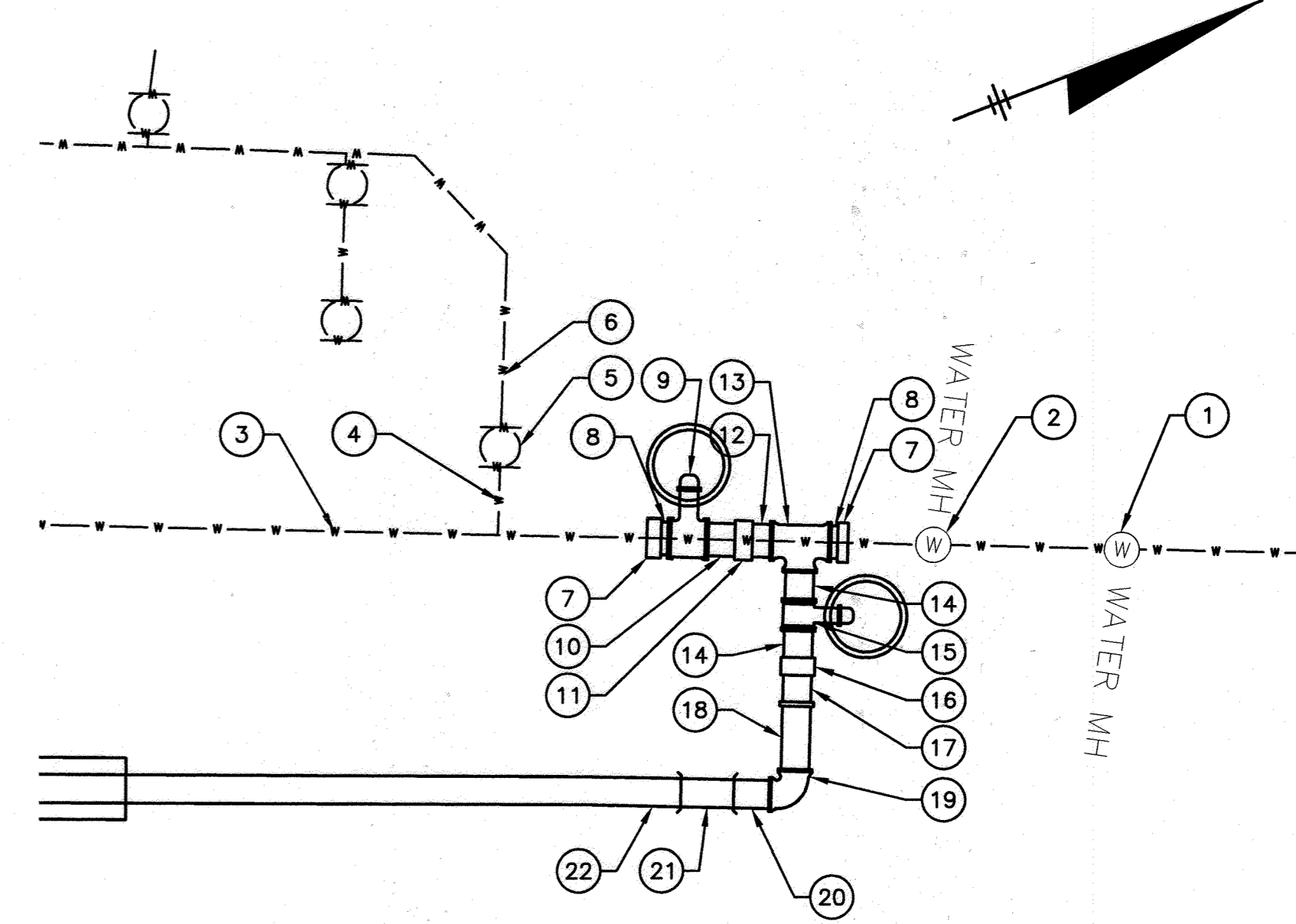
- ③ 36" WM PIPE
- ④ 36"x30" TEE W/ INSULATING FLANGE
- ⑤ 30" DI PEXFL SPOOL PIECE 3.0' LONG, CLASS 54
- ⑥ 30" DI MJ RSGV RESTRAINED
- ⑦ 30" DI PEXPE SPOOL PIECE 3.0' LONG, CLASS 54
- ⑧ 30" DI MJ SOLID SLEEVE RESTRAINED
- ⑨ 30" DI PEXFL SPOOL PIECE X' LONG, CLASS 54
- ⑩ 30"x30" PCCP SRBxSRBxFL TEE
- ⑪ 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

ROTATE TEES AS NECESSARY TO MAKE CONNECTION

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:

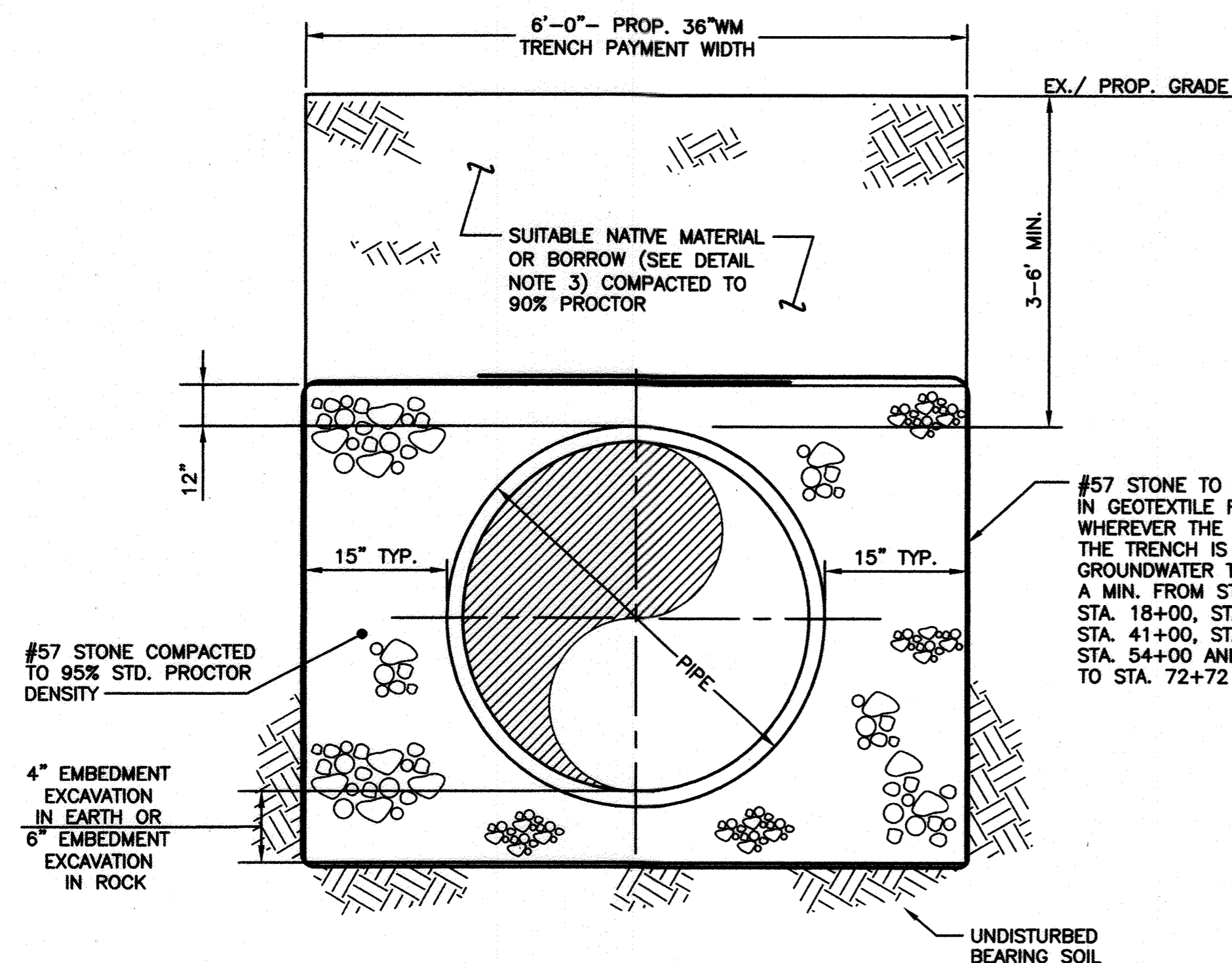
- ⑦ 42" WELDED BE OR SEXFL ADAPTER, FIELD WELD BE OR SE END OF ADAPTER TO EX. PCCP PIPE JOINT
- ⑧ 42" DI FLXPE CLOSURE PIECE, 0.75' LONG, CLASS 54
- ⑨ 42" MJ RSGV RESTRAINED
- ⑩ 42" DI PEXPE WM PIPE, DETERMINE LENGTH IN FIELD, CLASS 54
- ⑪ 42" DI MJ SOLID SLEEVE RESTRAINED
- ⑫ 36" DI PEXPE SPOOL PIECE, 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 CHIEF, BUREAU OF UTILITIES 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.	DSN. BY: GLF DRN. BY: RPW CHK. BY: RJD DATE: 02/16	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>BY</td> <td>NO.</td> <td>REVISION</td> <td>DATE</td> </tr> <tr> <td>JPC</td> <td>2</td> <td>RECORD DRAWINGS</td> <td>11/20</td> </tr> <tr> <td>LR</td> <td>1</td> <td>RECORD DRAWINGS</td> <td>05/19</td> </tr> <tr> <td>RJD</td> <td>0</td> <td>AS BID</td> <td>02/16</td> </tr> </table>	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
BY	NO.	REVISION	DATE																				
JPC	2	RECORD DRAWINGS	11/20																				
LR	1	RECORD DRAWINGS	05/19																				
RJD	0	AS BID	02/16																				

FILE NO. 33498-XXX

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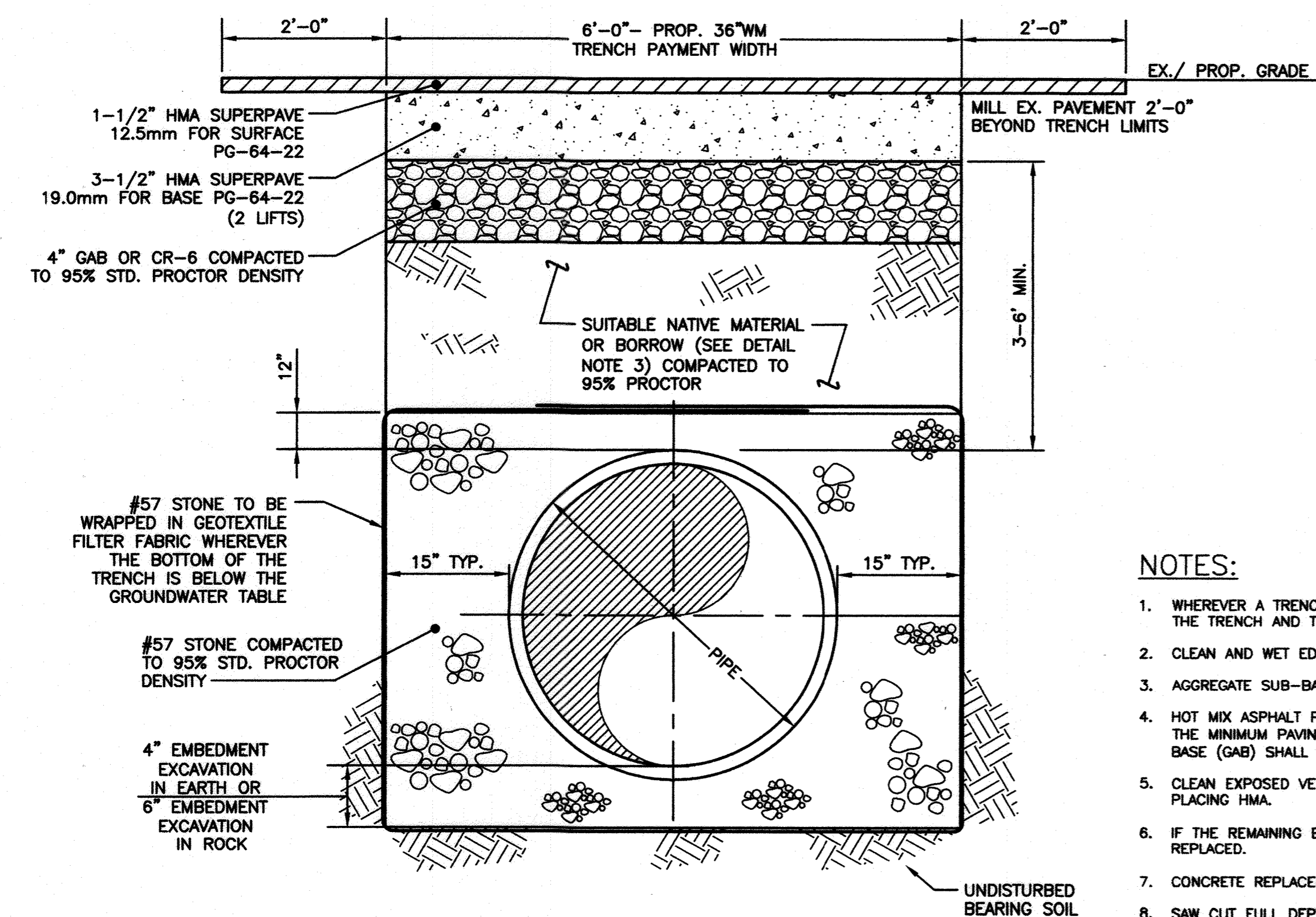


TYPICAL PIPE TRENCH DETAIL (UNPAVED AREA)

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)

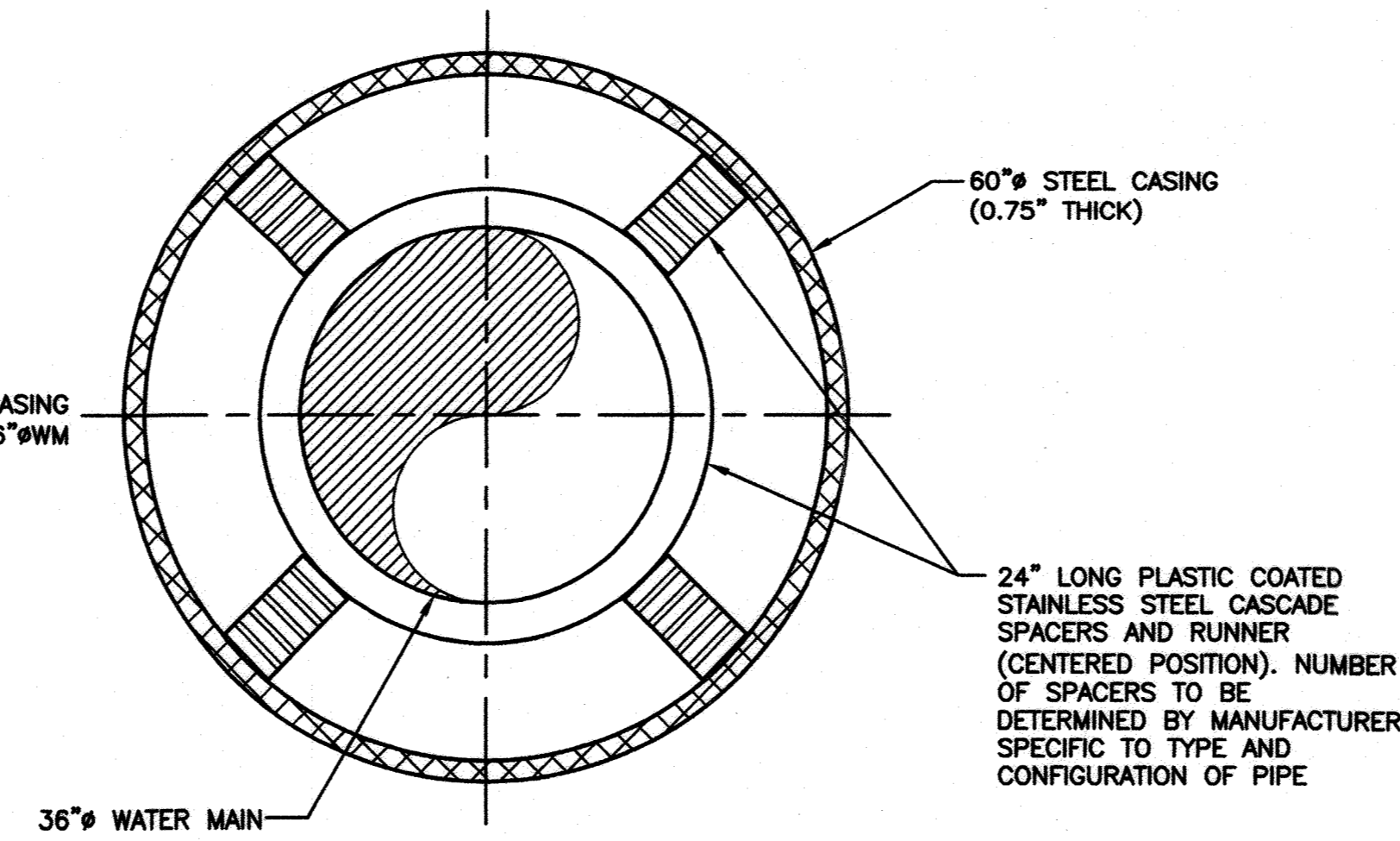
N.T.S.

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.

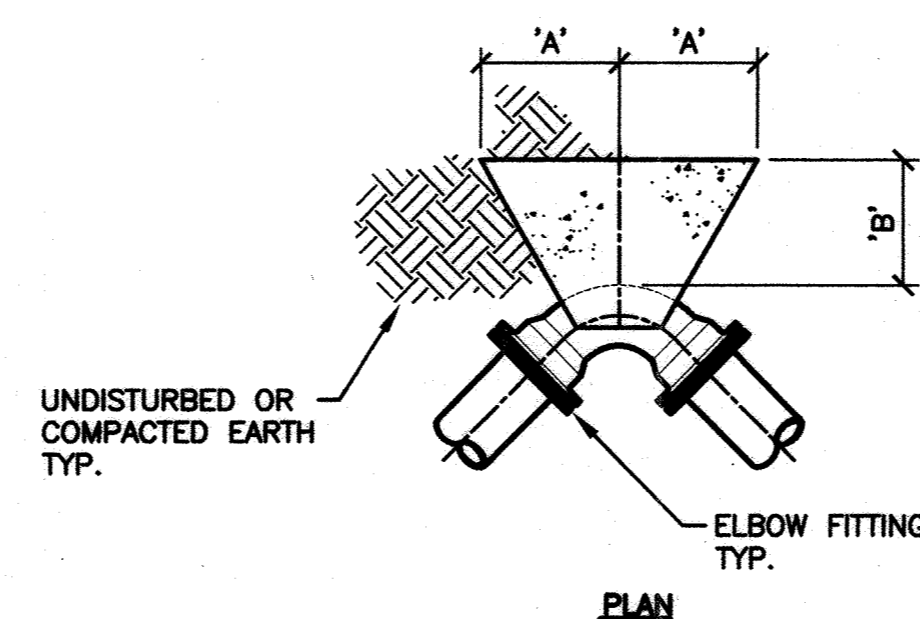
60" CASING UNDER ROADWAY

N.T.S.



60" CASING UNDER ROADWAY

N.T.S.



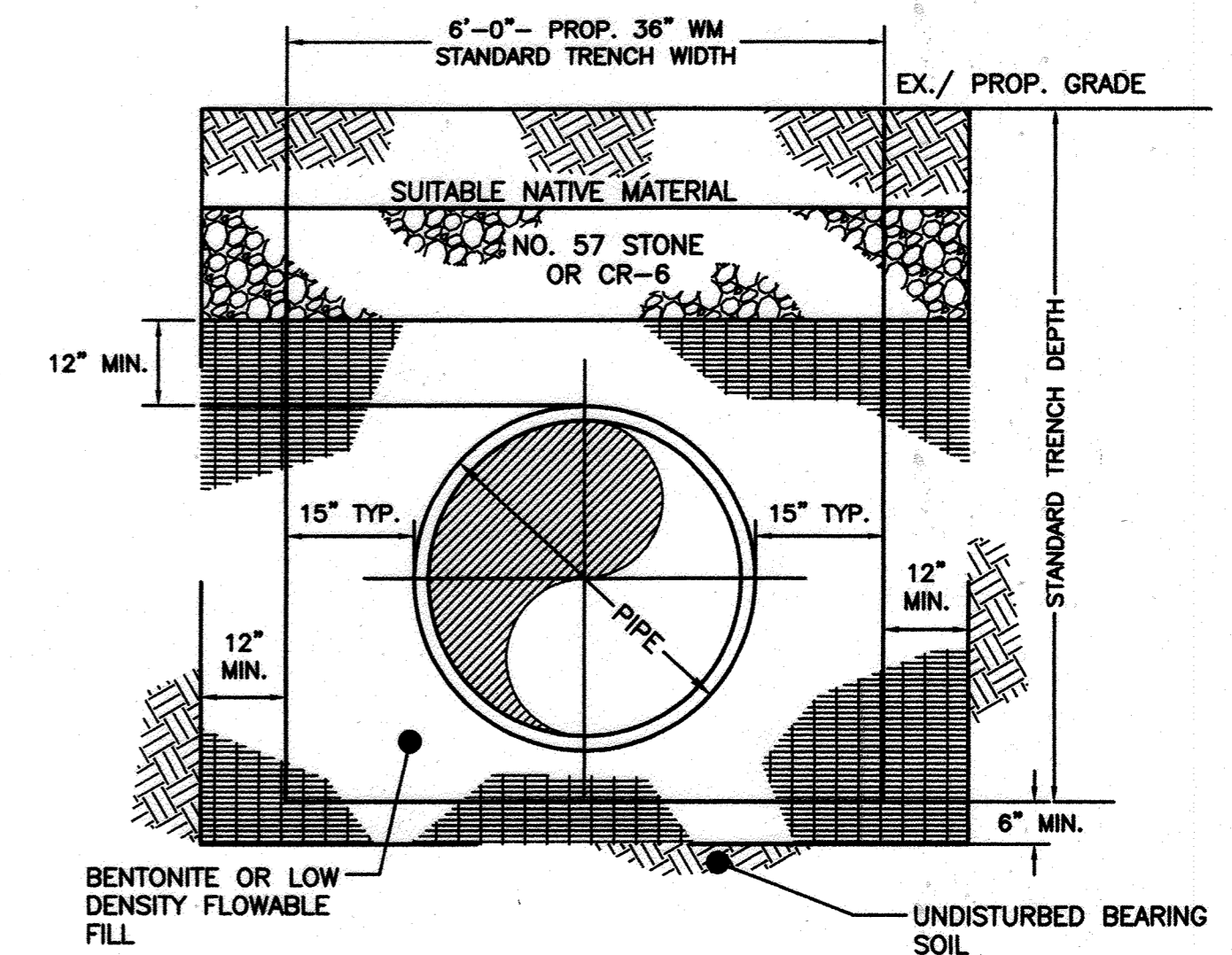
ELEVATION

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 ENTIRETY 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.



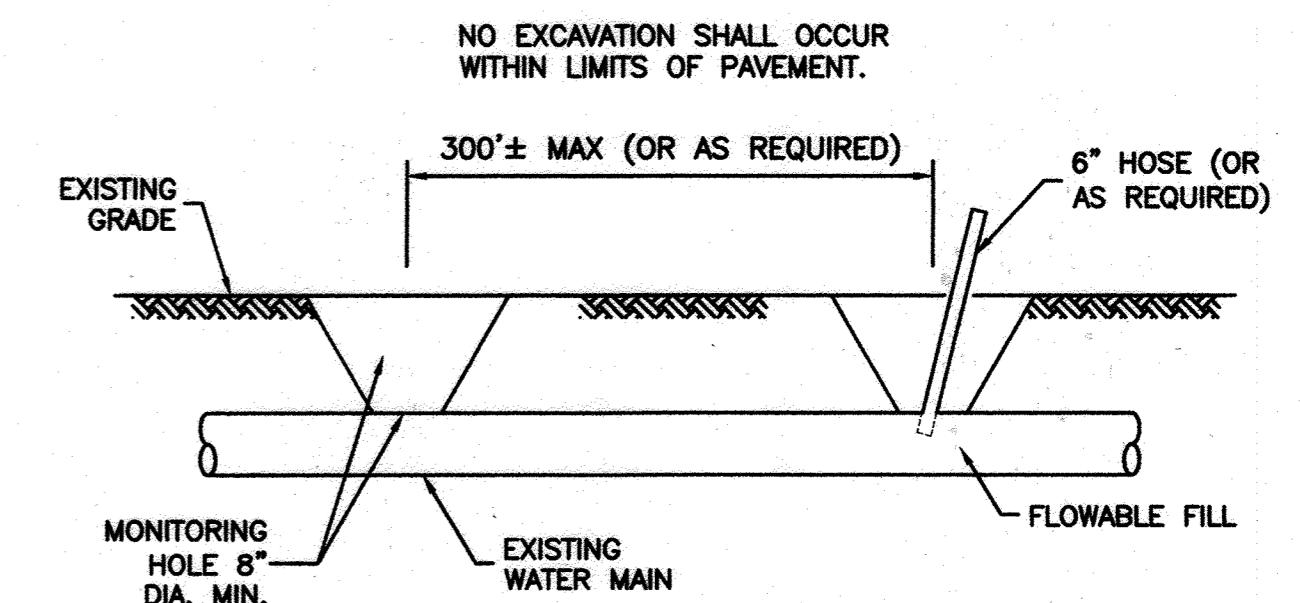
TRENCH CUT-OFF DETAIL

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.

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



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: *[Signature]* 2/25/16
Date: 2/25/16

Chief - Bureau of Engineering: *[Signature]* 2/23/16
Date: 2/23/16

Chief, Bureau of Utilities: *[Signature]* 2/25/16
Date: 2/25/16

Chief, Utility Design Division: *[Signature]* 2/23/16
Date: 2/23/16

O'BRIEN & GERE

4201 MITCHELLVILLE ROAD
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[Signature]
Professional Engineer

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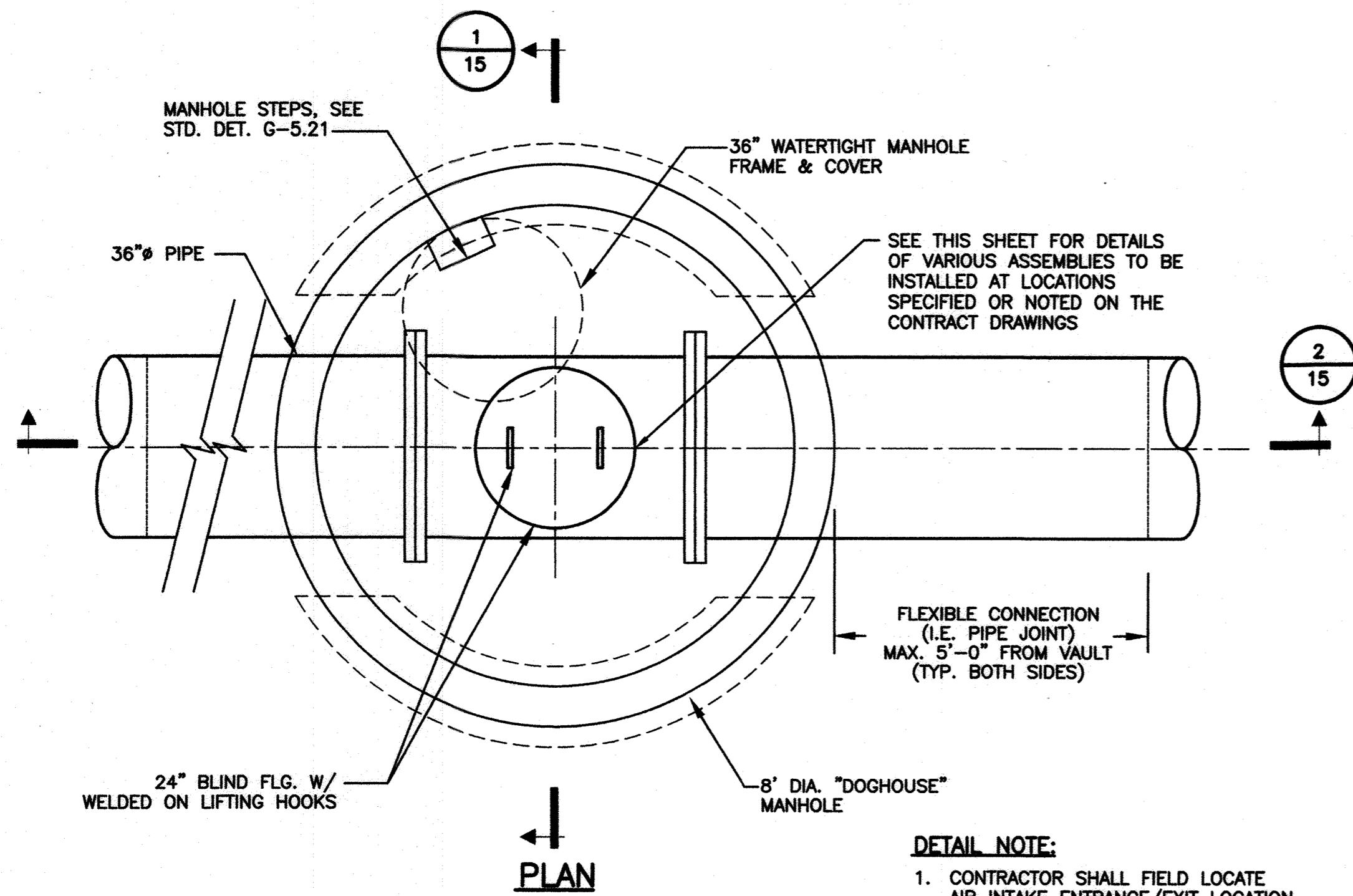
MISCELLANEOUS DETAILS

60' SCALE MAP NO.	30	BLOCK NO.	36
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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

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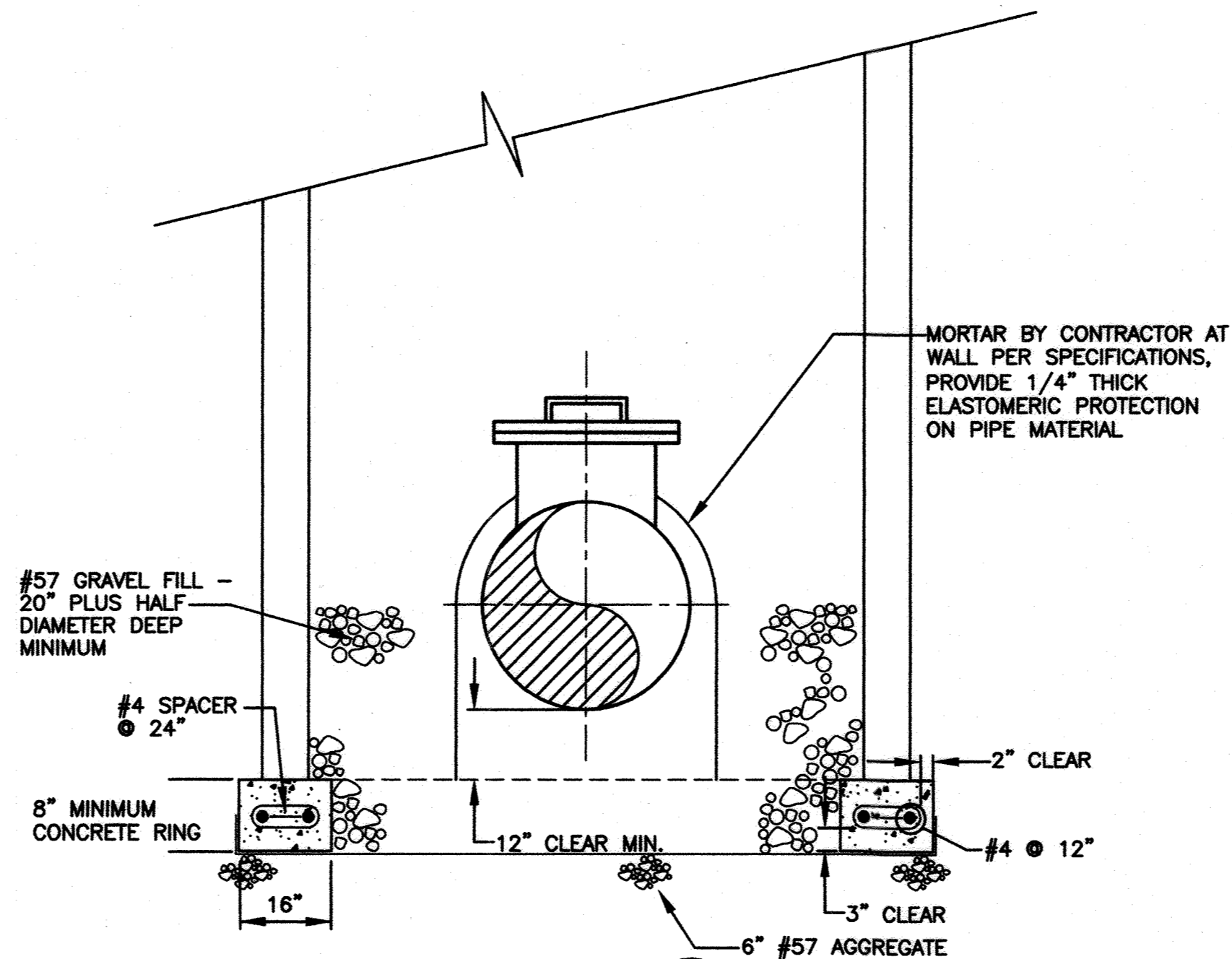


TYPICAL ACCESS MANHOLE - DETAIL

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

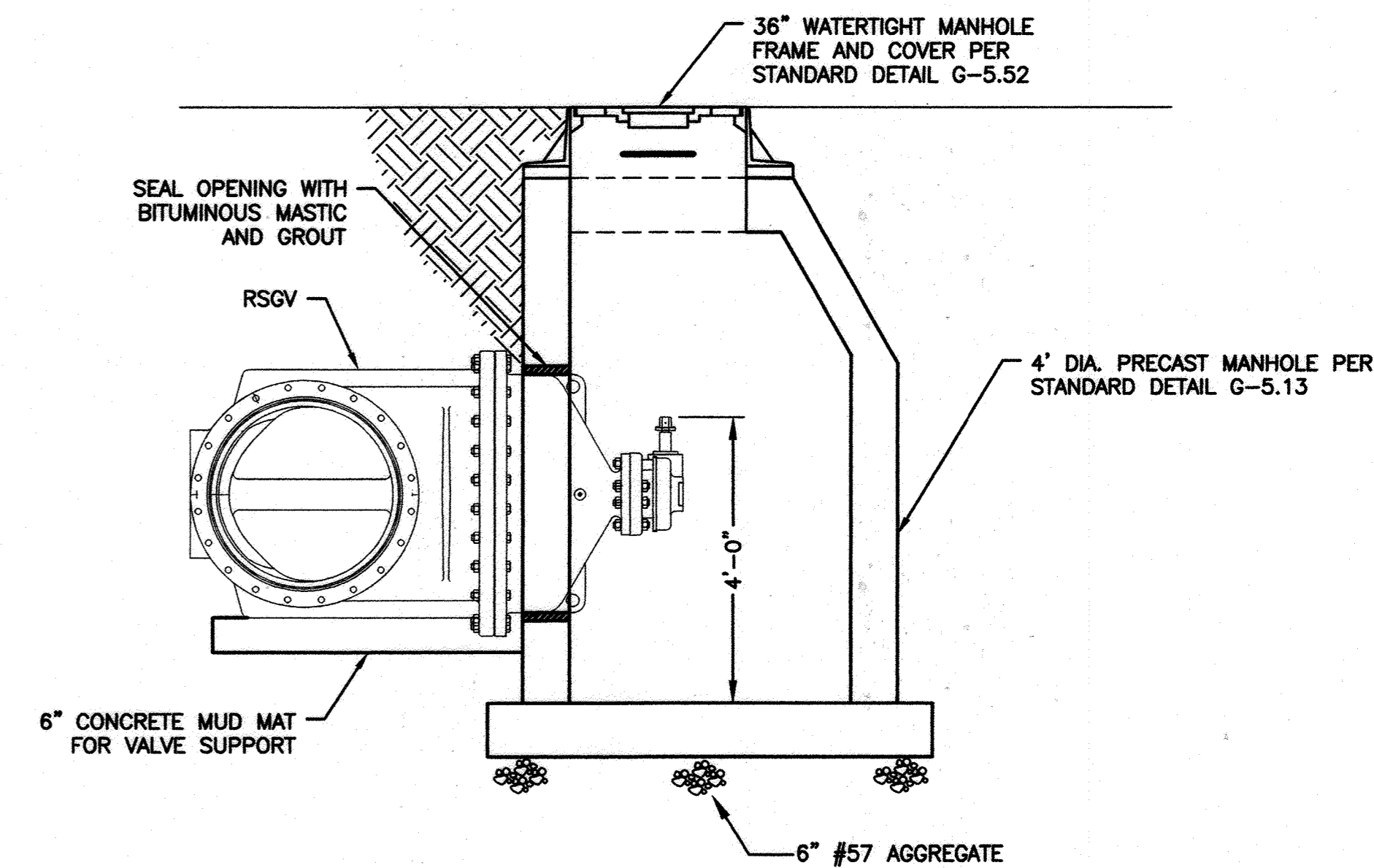
DETAIL NOTE:

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



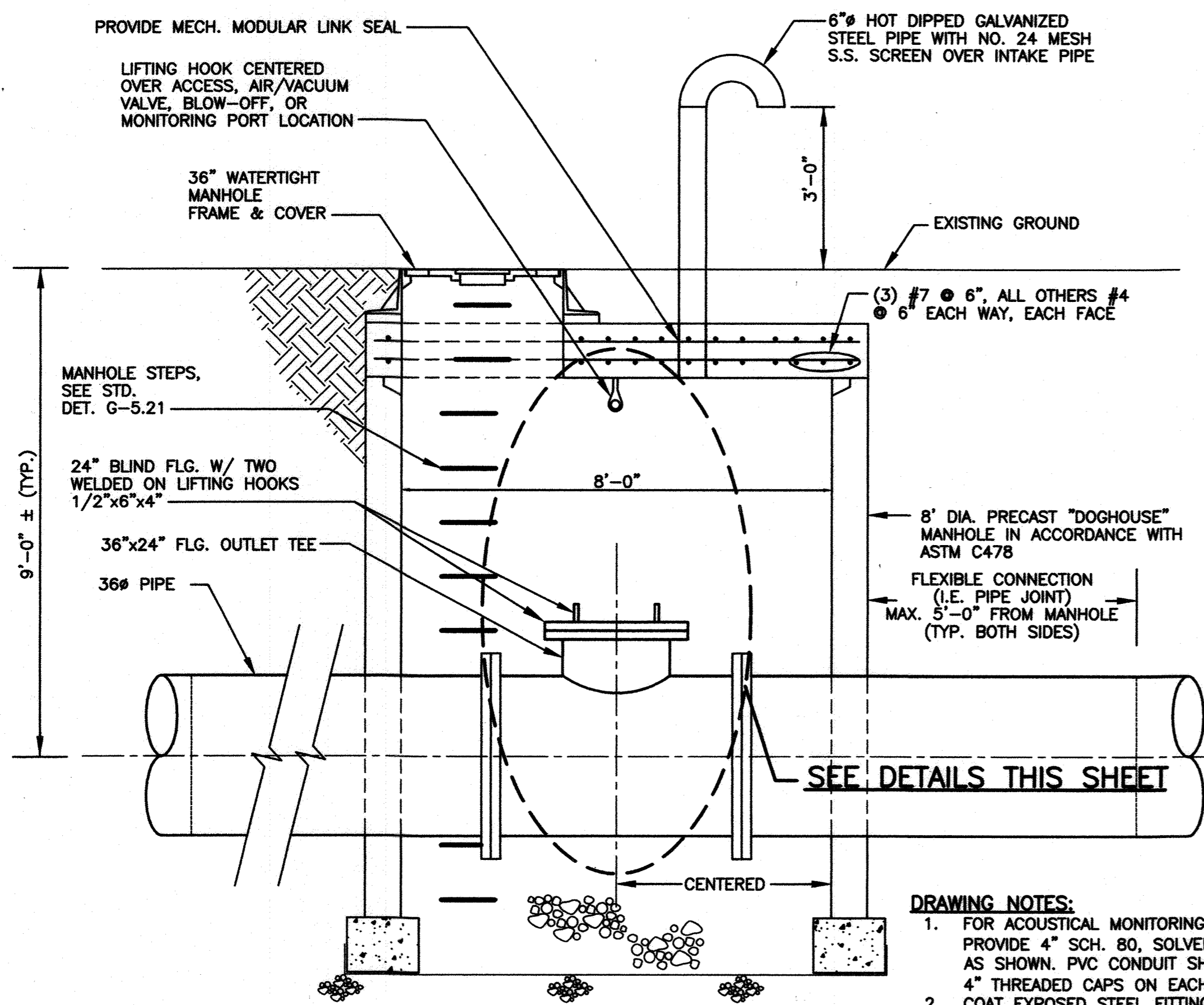
SECTION

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



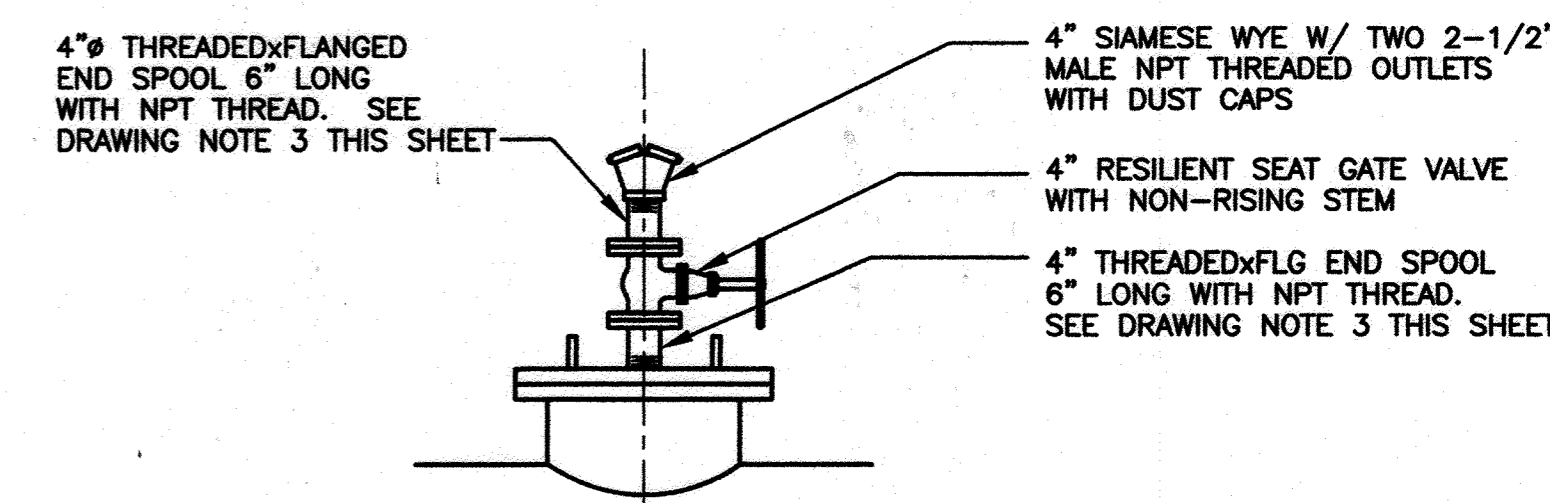
36" RSGV WITH ACTUATOR ACCESS MANHOLE

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



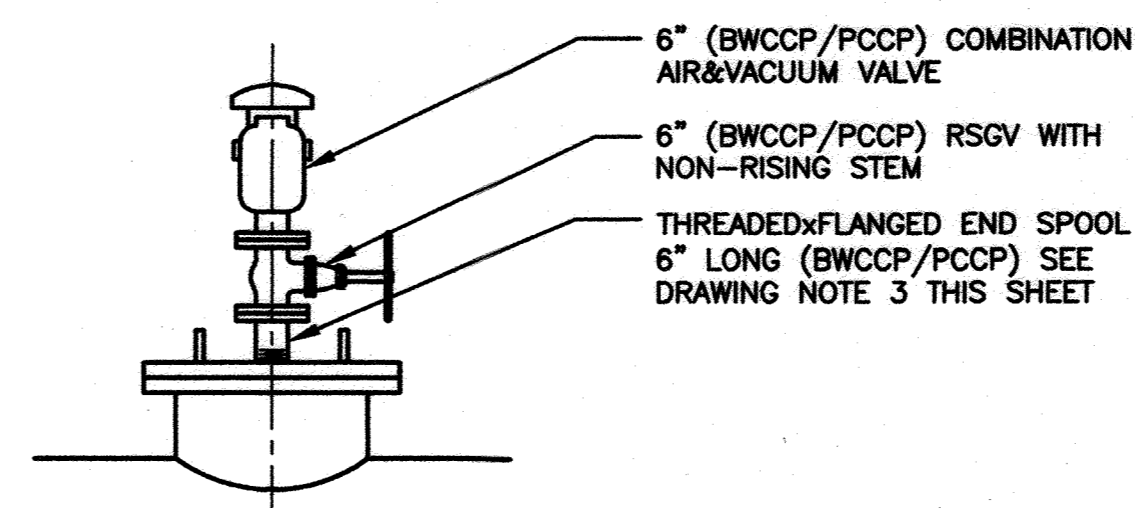
TYPICAL AIR&VACUUM VALVE MANHOLE ASSEMBLY - DETAIL

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



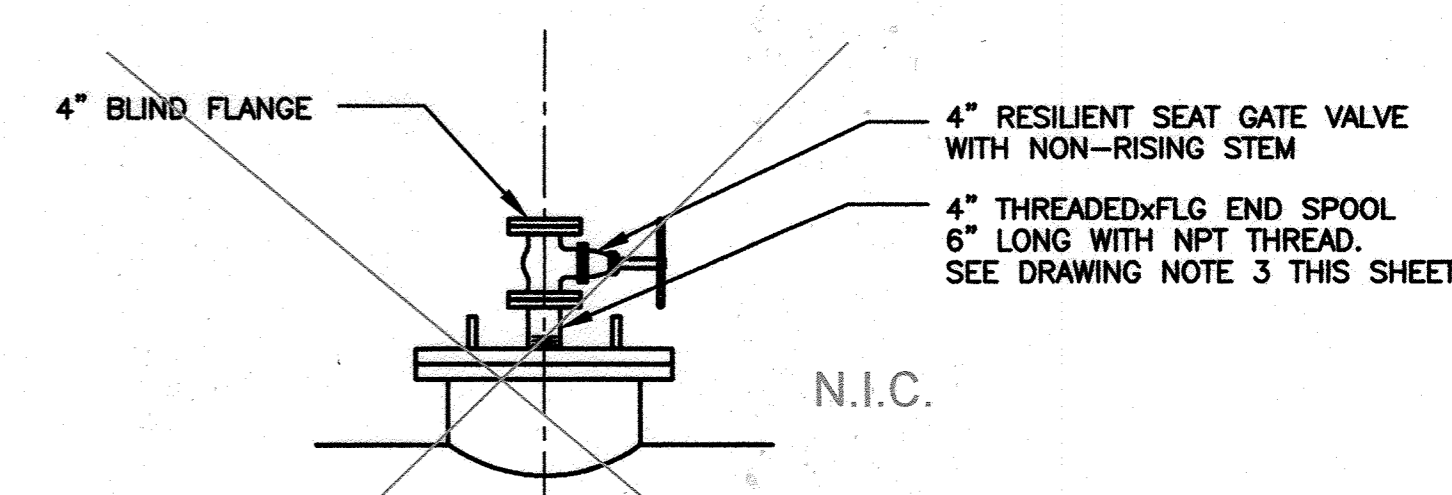
TYPICAL BLOW-OFF/ACCESS MANHOLE ASSEMBLY - DETAIL

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



TYPICAL AIR&VACUUM VALVE/ACCESS MANHOLE ASSEMBLY - DETAIL

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



TYPICAL ACOUSTICAL MONITORING MANHOLE ASSEMBLY - DETAIL

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

DRAWING NOTES:

- 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.
- COAT EXPOSED STEEL FITTINGS WITH 2 COATS OF ROYSTON R-28 MASTIC, PER MANUFACTURERS RECOMMENDATIONS.

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: Jay P. ...
Chief, Bureau of Engineering: Thomas B. ...
Chief, Bureau of Utilities: Steve C. ...
Chief, Utility Design Division: ...

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

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



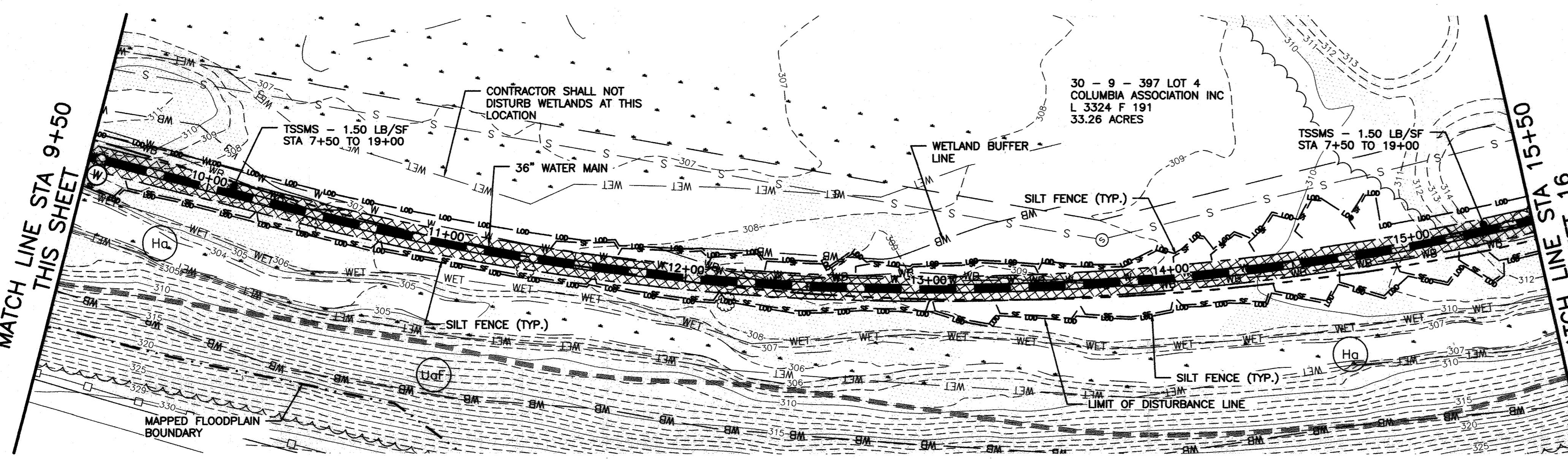
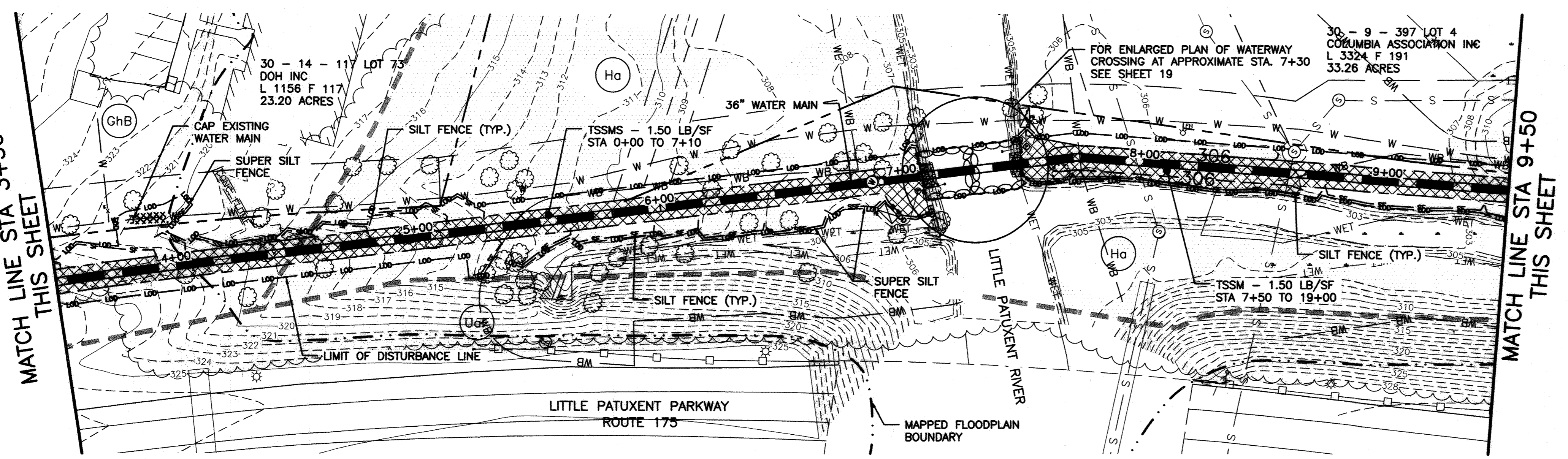
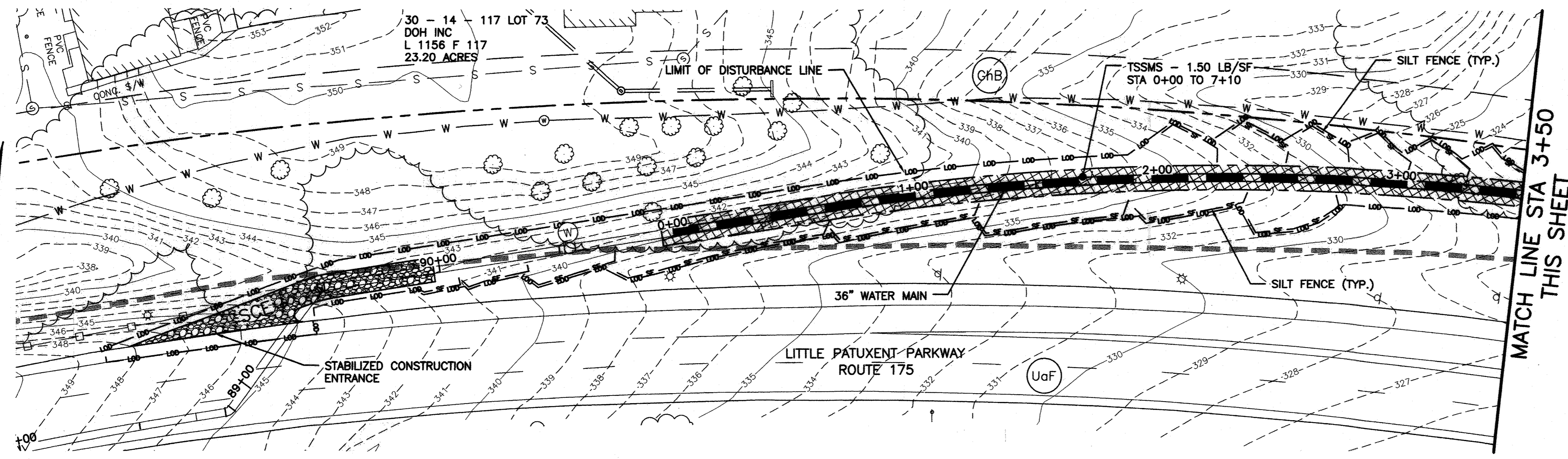
DSN. BY:	GLF				
DRN. BY:	RPW				
CHK. BY:	RJD	JC	2	RECORD DRAWINGS	11/20
DATE:	02/16	LR	1	RECORD DRAWINGS	05/19
		RJD	0	AS BID	02/16
		BY	NO.	REVISION	DATE

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

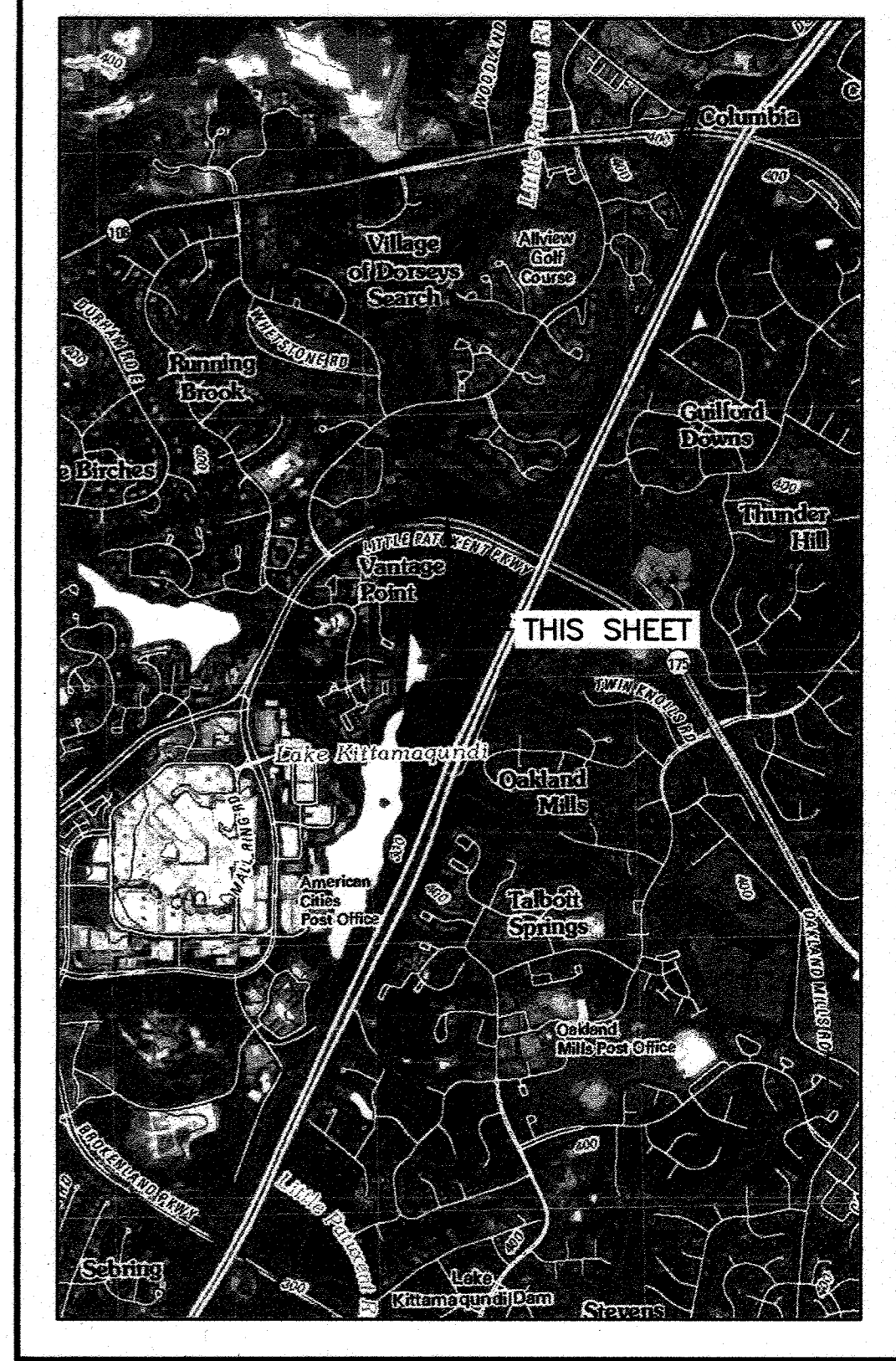
U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

RECORD DRAWINGS

SCALE AS SHOWN
SHEET 14 OF 38



- 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
 - TEMPORARY SOIL STABILIZATION MATTING (SLOPE) - MINIMUM DESIGN SHEAR STRESS
 - TEMPORARY SOIL STABILIZATION MATTING (CHANNEL) - MINIMUM DESIGN SHEAR STRESS
 - PROPOSED WATER MAIN
 - SOIL BOUNDARY LINE
 - ⊙ GhC SOIL LABEL
 - FLOODPLAIN BOUNDARY
 - WET WETLANDS AREA
 - WB WETLANDS BUFFER LINE
 - AREA OF STEEP (15% OR STEEPER) SLOPES
 - AREA OF ERODIBLE SOILS (K VALUE >0.35) WITH 5% OR STEEPER SLOPES
 - WETLANDS RESTORATION AREA



LOCATION AND INDEX MAP

SCALE: 1" = 2000'
ADAPTED FROM SAVAGE, MD USGS 7.5 MIN. QUADRANGLE (2011)

- NOTES**
- THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) CONSTRUCTION PERMIT NUMBER FOR THIS PROJECT IS 13-12-1008.
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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] 18523 6/22/16
Engineer - Registration Number Date

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 6/22/16
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 6/22/16
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 6/22/16
CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 6/22/16
CHIEF, UTILITY DESIGN DIVISION DATE

G O BRIEN & G E R E
4201 MITCHELLVILLE ROAD
SUITE 500
BOWIE, MD 20716
PHONE: 301-731-5622

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[Signature]
ROBERT JOHN RYAN
REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	SMS	JC	2	RECORD DRAWINGS	11/20
DRN. BY:	SMS	LR	1	RECORD DRAWINGS	01/19
CHK. BY:	RJD	RJD		REVISED PER HSCD REVIEW	5/16
		RJD		REVISED PER HSCD REVIEW	4/16
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DATE:	2/16	BY	NO.	REVISION	DATE

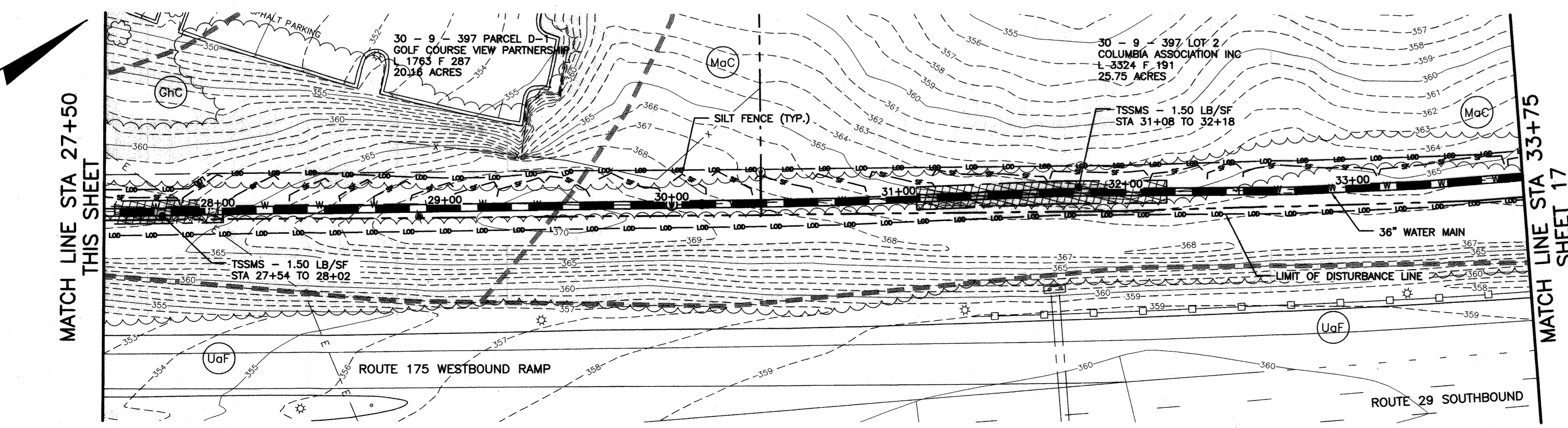
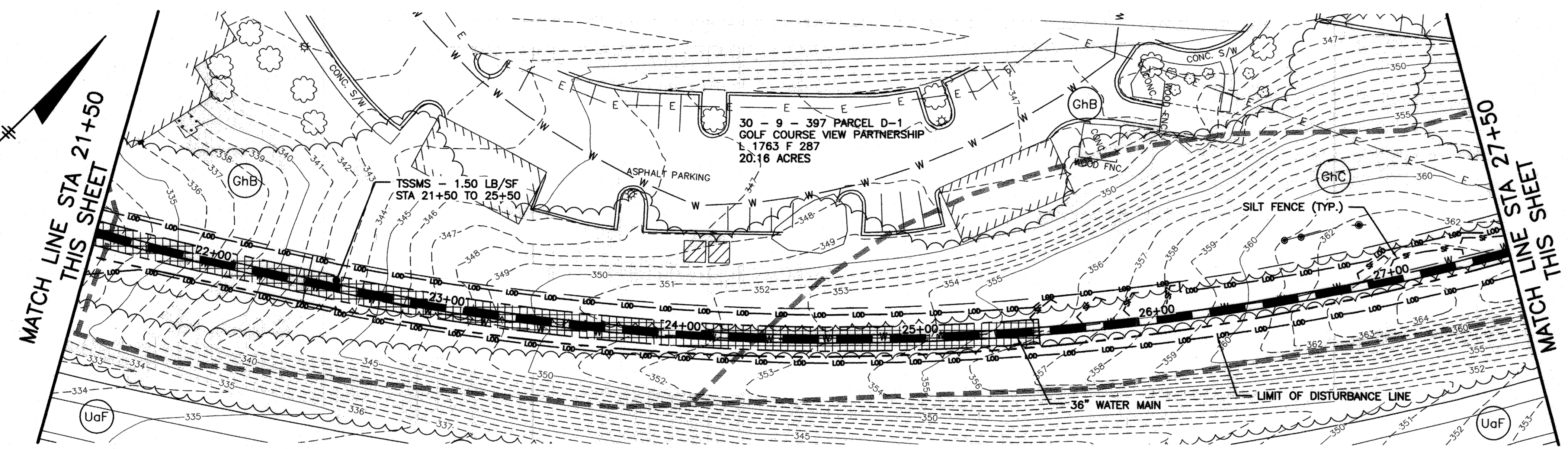
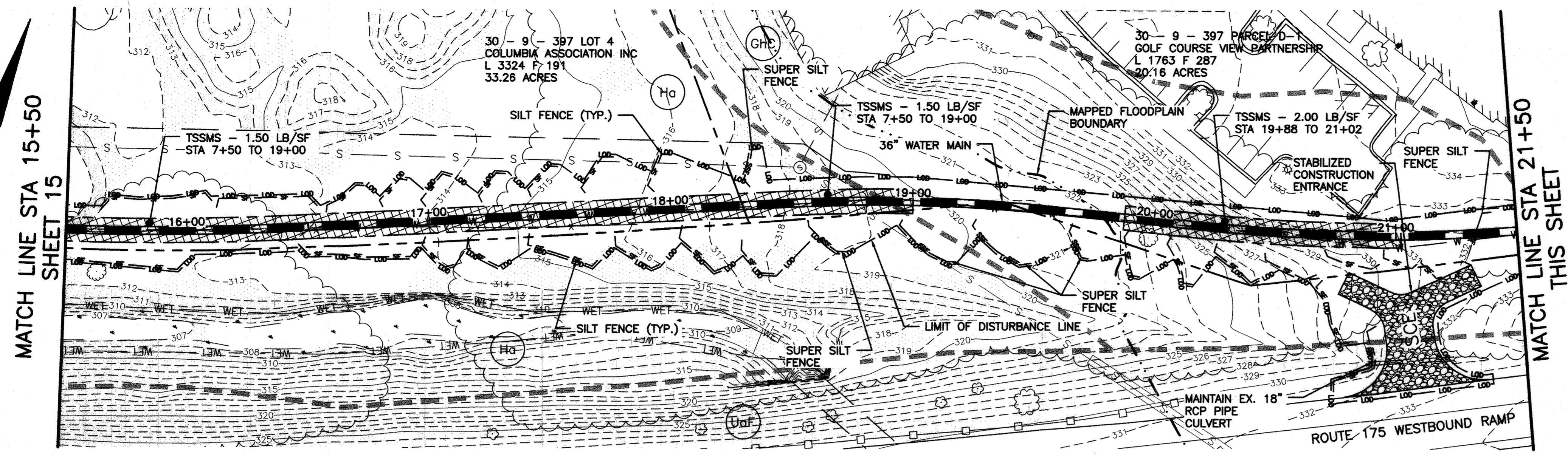
SOIL EROSION AND SEDIMENT CONTROL PLAN
STA. 0+00 TO STA. 15+50

600' SCALE MAP NO. 30 BLOCK NO. 36

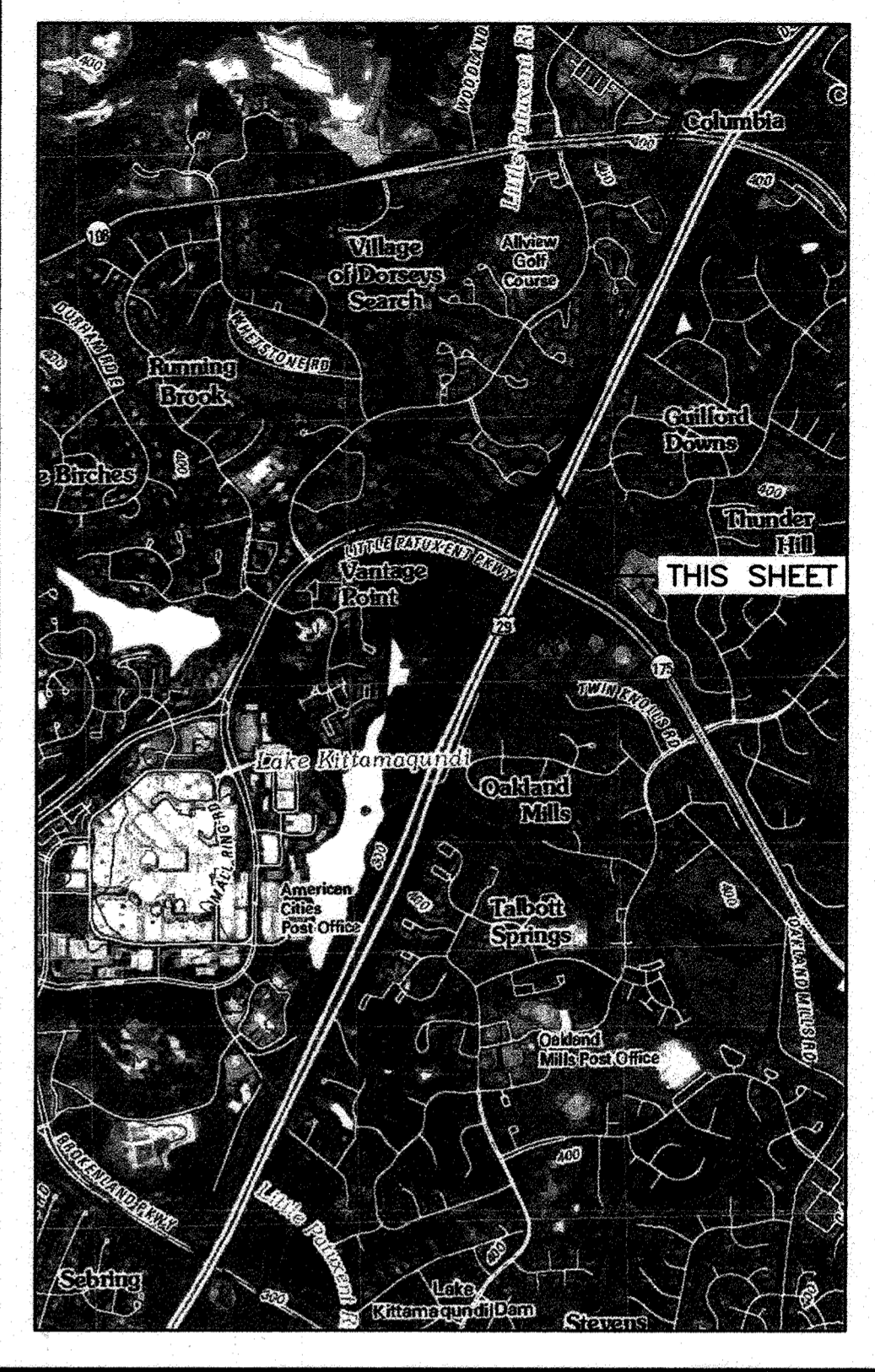
U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108

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

SCALE AS SHOWN
SHEET 15 OF 38

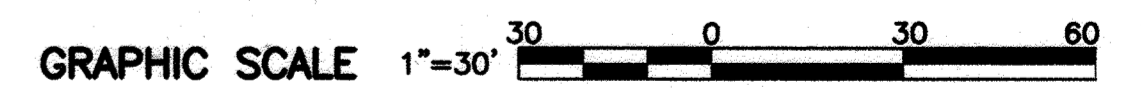


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LOCATION AND INDEX MAP
SCALE: 1" = 2000'
ADAPTED FROM SAVAGE, MD USGS 7.5 MIN. QUADRANGLE (2011)

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Signature: [Signature] 18523 6/22/16
Registration Number Date

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
Director of Public Works: [Signature] DATE: [Date]
Chief, Bureau of Engineering: [Signature] DATE: [Date]
Chief, Bureau of Utilities: [Signature] DATE: [Date]
Chief, Utility Design Division: [Signature] DATE: [Date]

G O BRIEN & G E R E
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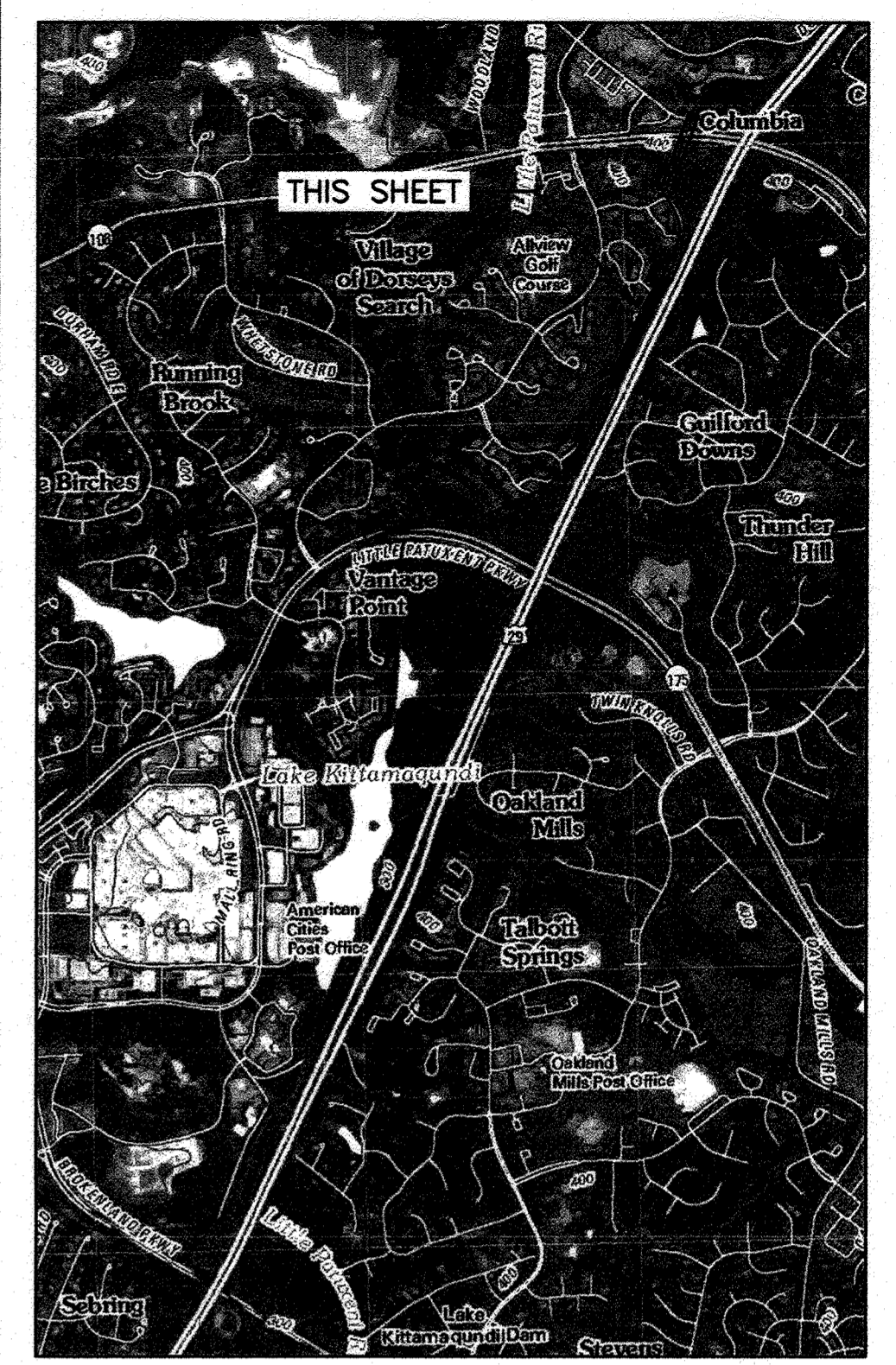
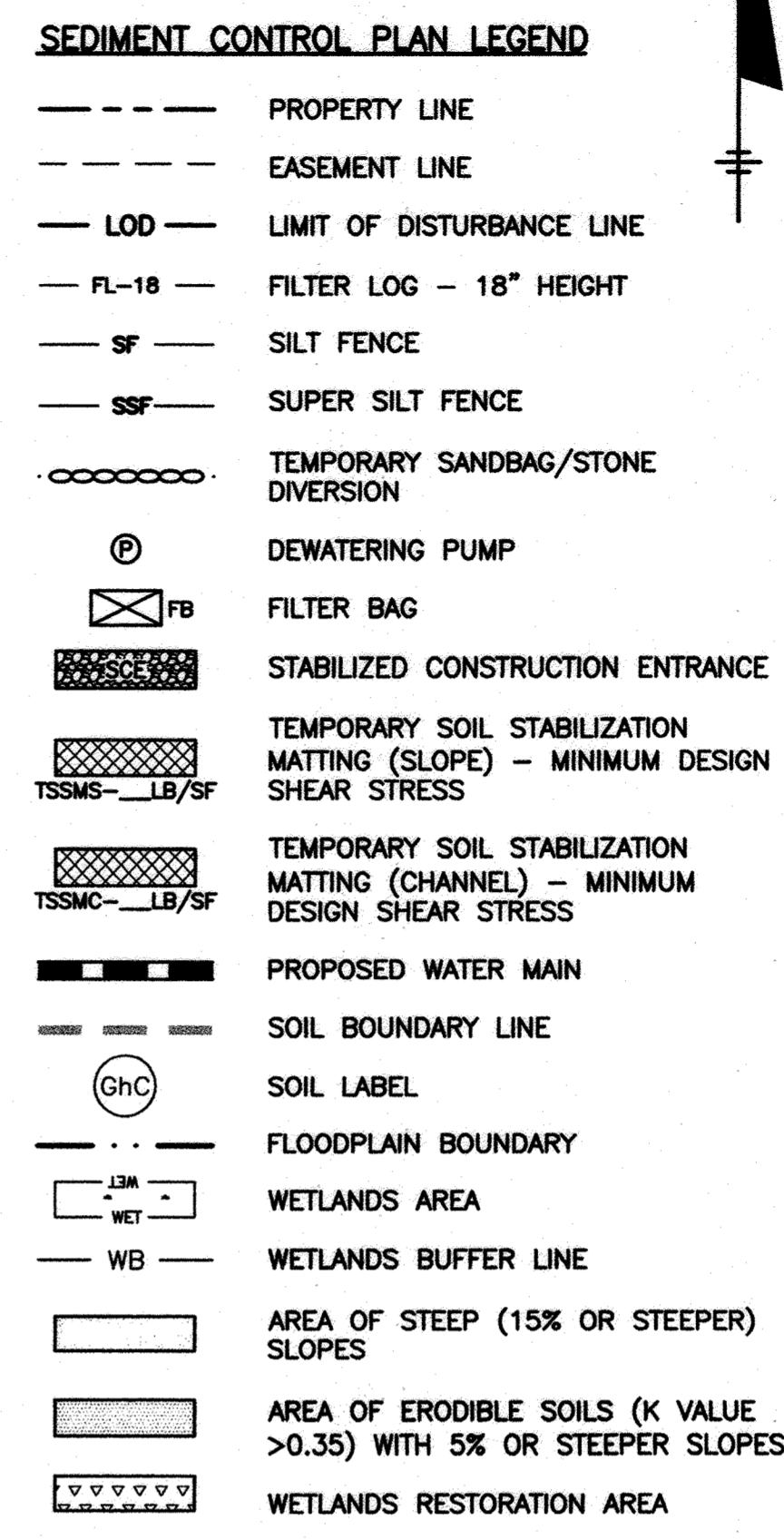
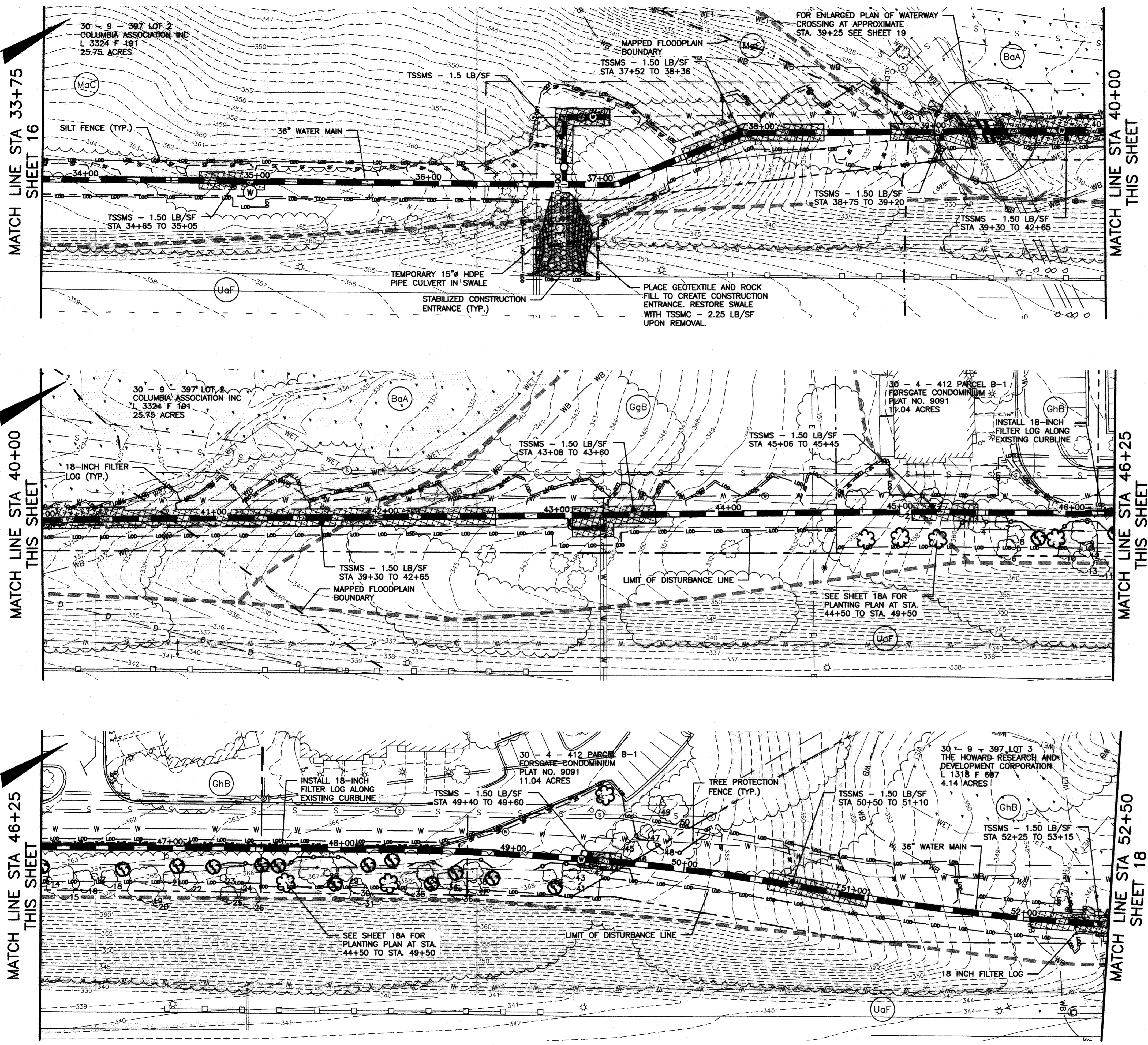
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DSN. BY: SMS	JC	2	RECORD DRAWINGS	11/20
DRN. BY: SMS	LR	1	RECORD DRAWINGS	5/19
CHK. BY: RJD	RJD		REVISED PER HSCD REVIEW	5/16
	RJD		REVISED PER HSCD REVIEW	4/16
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DATE: 2/16	BY NO.		REVISION	DATE

SOIL EROSION AND SEDIMENT CONTROL PLAN
STA. 15+50 TO STA. 37+75
600' SCALE MAP NO. 30 BLOCK NO. 36

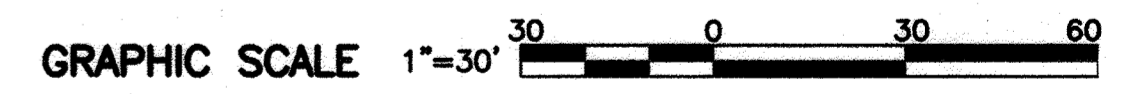
U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 16 OF 38



LOCATION AND INDEX MAP
SCALE: 1" = 2000'
ADAPTED FROM SAVAGE, MD USGS 7.5 MIN. QUADRANGLE (2011)

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[Signature] 18523 4/22/16
Signature of Engineer - Registration Number Date

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
Director of Public Works: *[Signature]* Date: *[Date]*
Chief, Bureau of Engineering: *[Signature]* Date: *[Date]*
Chief, Bureau of Utilities: *[Signature]* Date: *[Date]*
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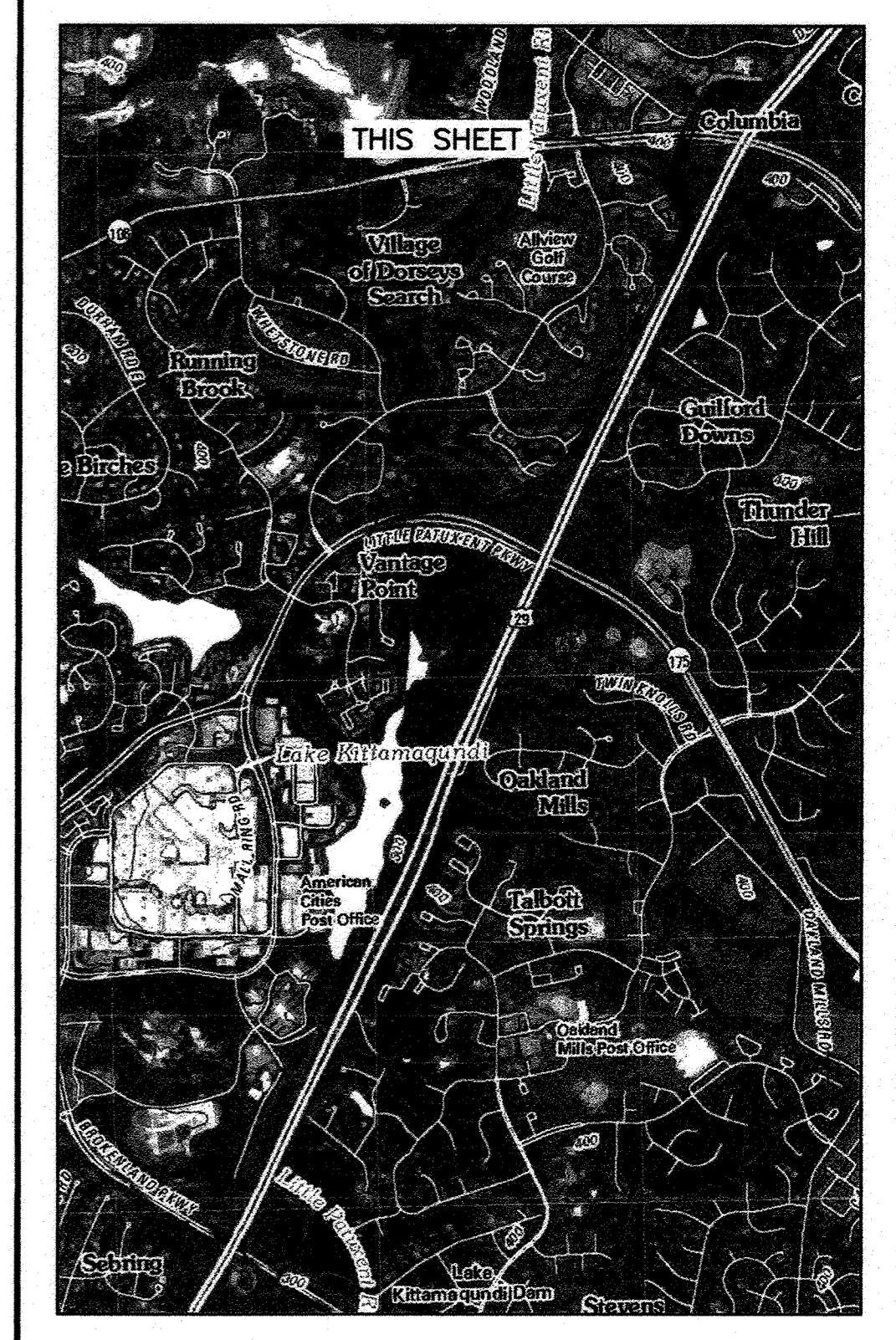
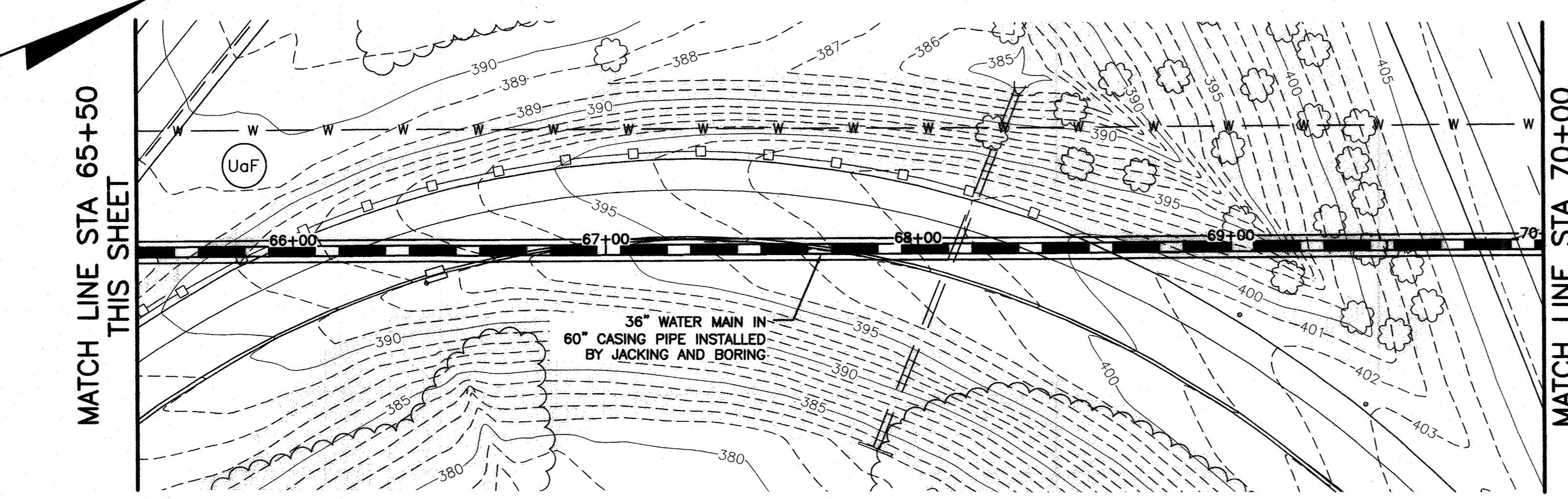
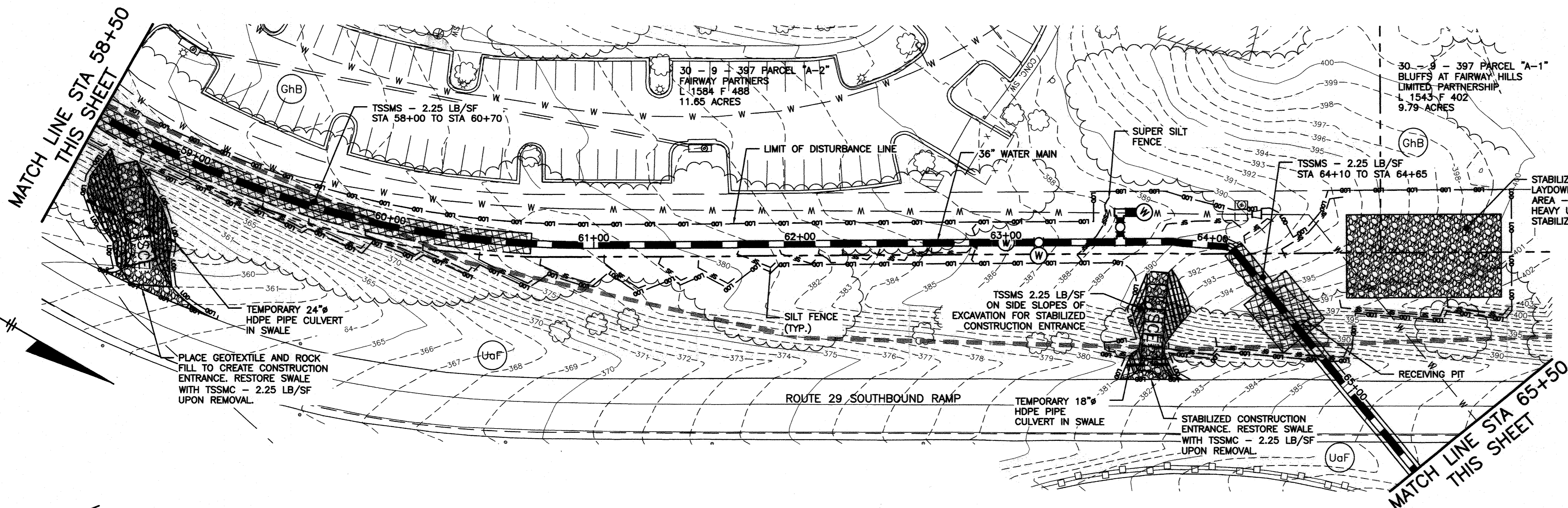
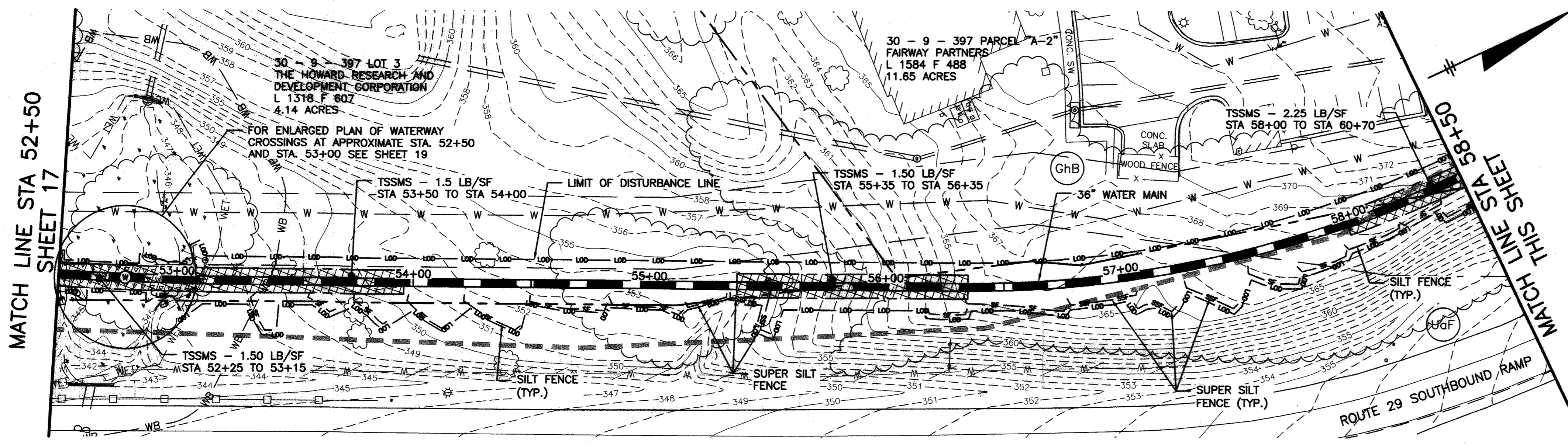
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SOIL EROSION AND SEDIMENT CONTROL PLAN
STA. 37+75 TO STA. 52+50
600' SCALE MAP NO. 30 BLOCK NO. 36

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 17 OF 38



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
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[Pattern]	WETLANDS RESTORATION AREA

GRAPHIC SCALE 1"=30' 0 30 60

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[Signature] 18523 4/22/16
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HOWARD COUNTY, MARYLAND

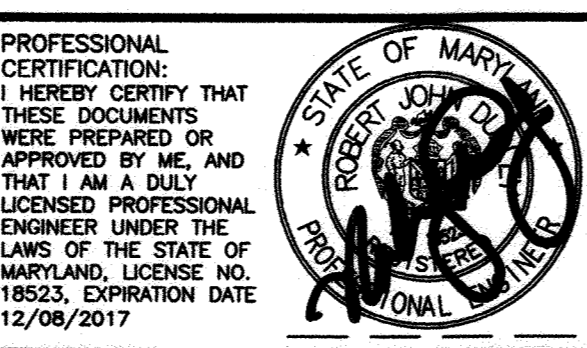
[Signature] 6/26/16
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 6/22/16
CHIEF, BUREAU OF UTILITIES DATE

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

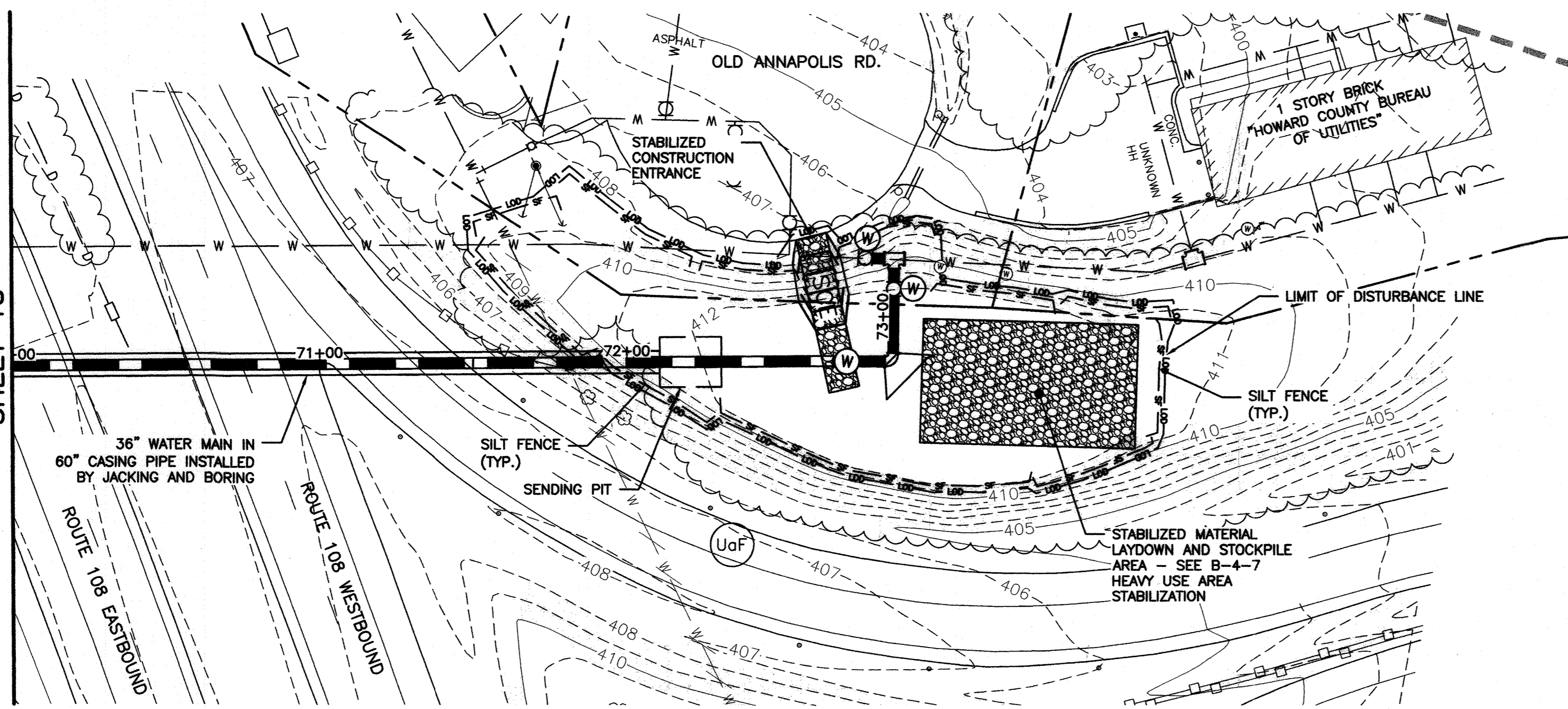
600' SCALE MAP NO. 30 BLOCK NO. 36

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

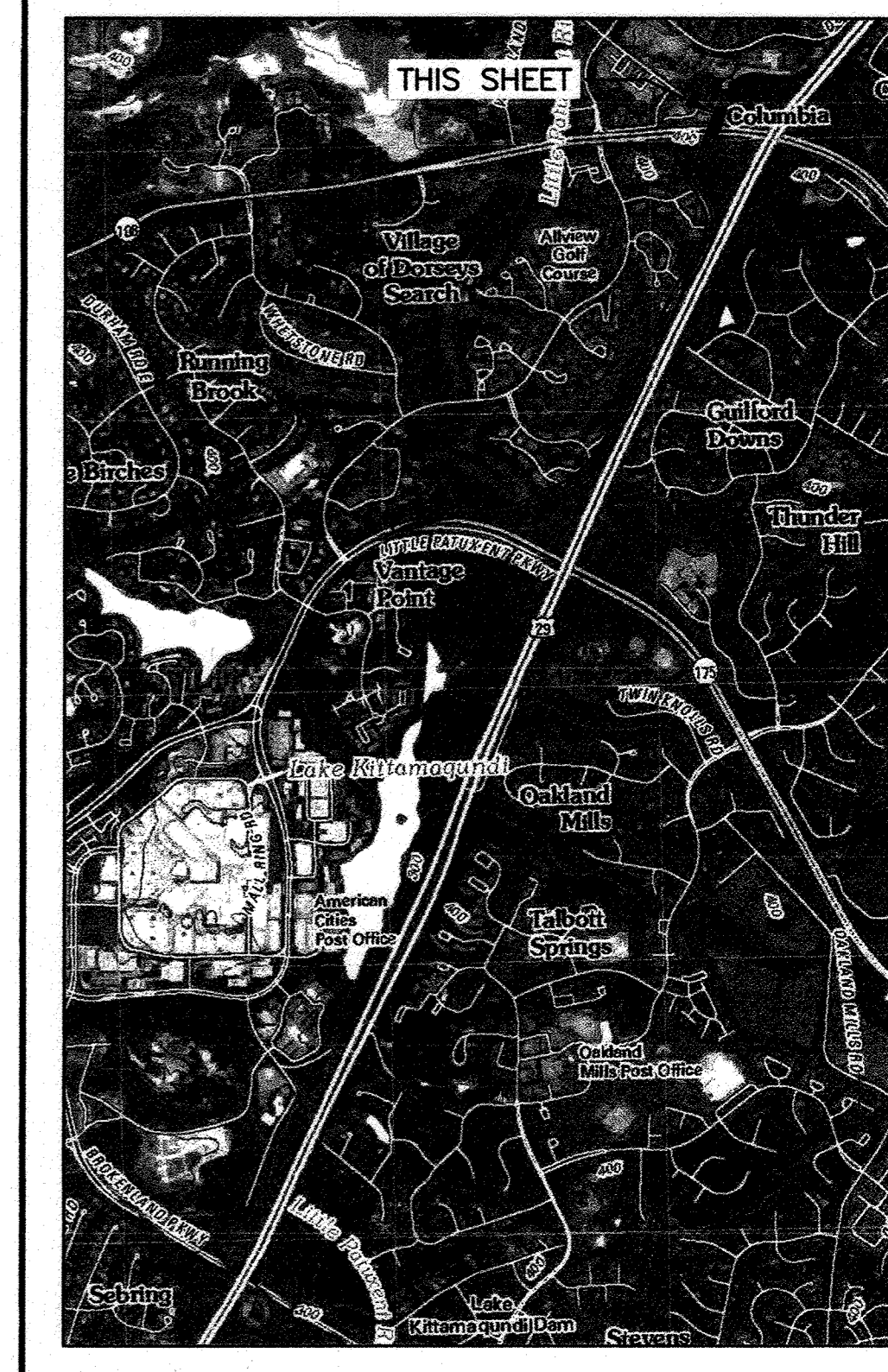
SCALE AS SHOWN
SHEET 18 OF 38

MATCH LINE STA 70+00
SHEET 18



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
- TEMPORARY SOIL STABILIZATION MATTING (SLOPE) - MINIMUM DESIGN SHEAR STRESS
- TEMPORARY SOIL STABILIZATION MATTING (CHANNEL) - MINIMUM DESIGN SHEAR STRESS
- PROPOSED WATER MAIN
- SOIL BOUNDARY LINE
- ⊙ SOIL LABEL
- FLOODPLAIN BOUNDARY
- WETLANDS AREA
- 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)

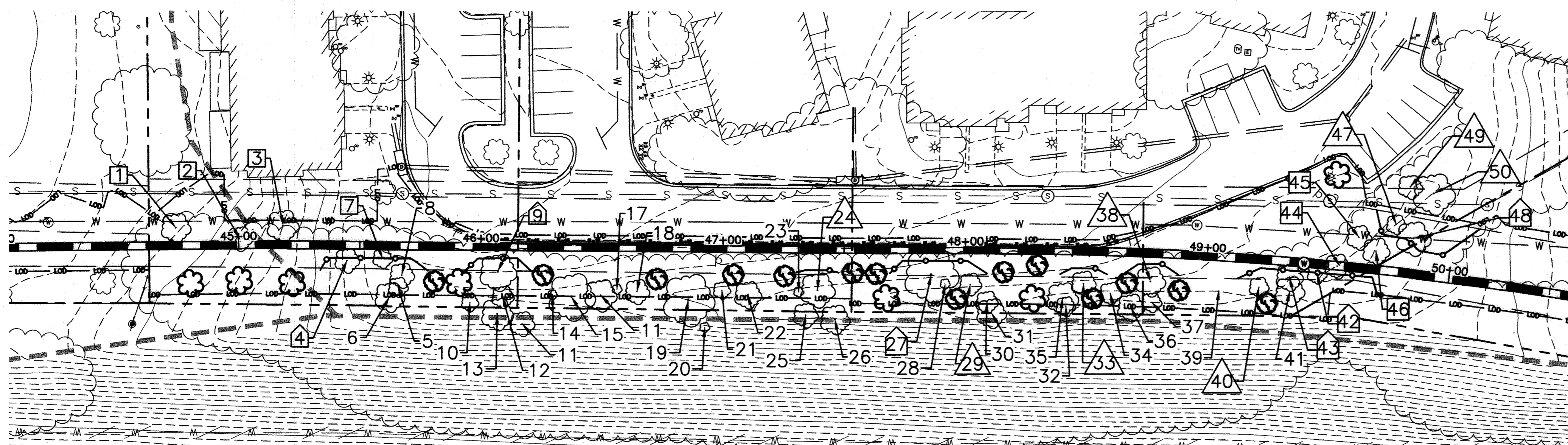
NOTES

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' 0 30 60



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
	WINTERBERRY	Ilex verticillata	#2	4
SHRUBS	RHODODENDRON	Rhododendron minus	#2	4
	DWARF AZALEA	Rhododendron atlanticum	#2	3
	MAPLE-LEAF VIBURNUM	Viburnum acerifolium	#2	3

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] 13523 6/22/16
Signature of Engineer - Registration Number Date

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] DIRECTOR OF PUBLIC WORKS
[Signature] CHIEF, BUREAU OF UTILITIES

[Signature] CHIEF, BUREAU OF ENGINEERING
[Signature] CHIEF, UTILITY DESIGN DIVISION

G O BRIEN & G E R E
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

[Signature]
STATE OF MARYLAND
PROFESSIONAL ENGINEER

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

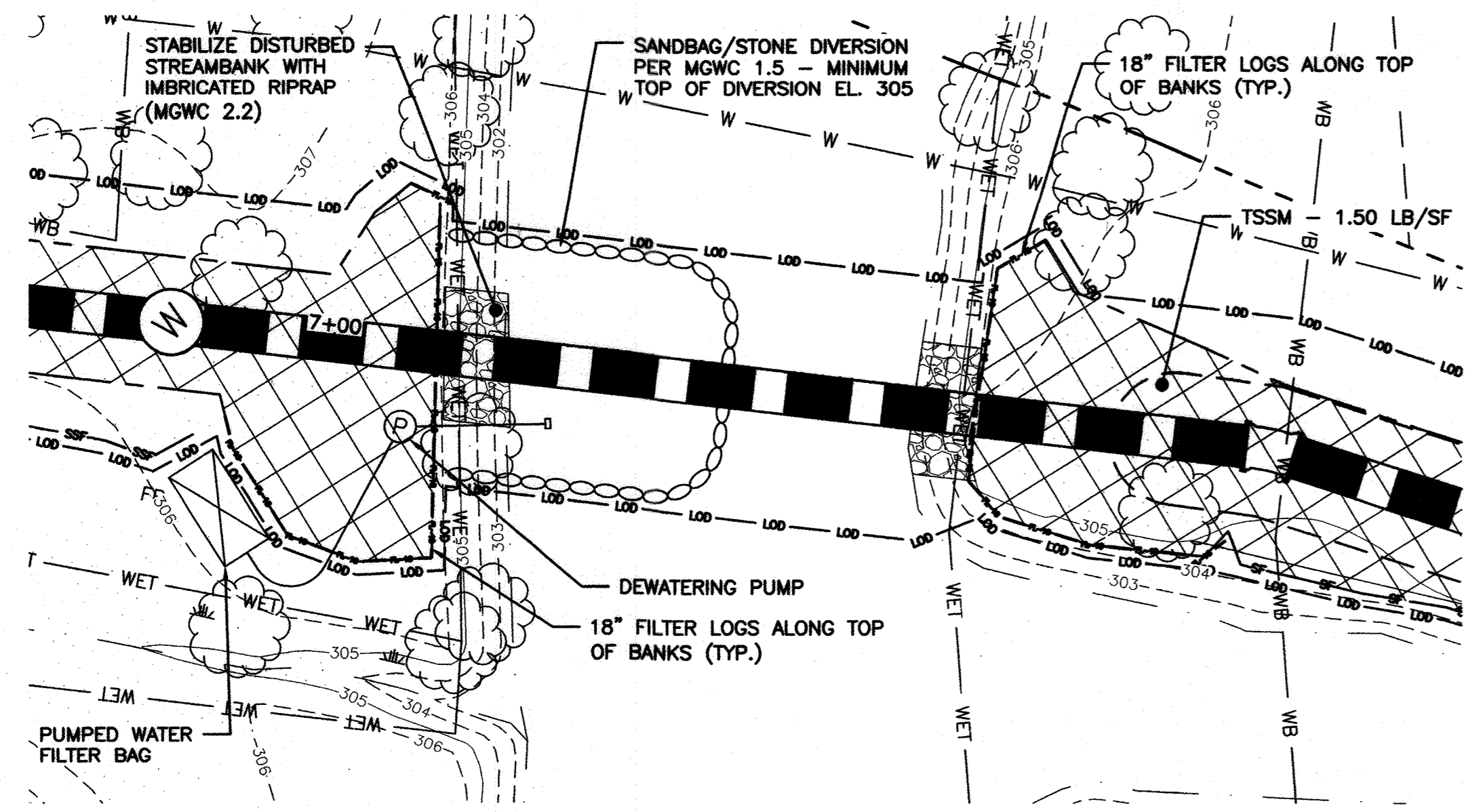
SOIL EROSION AND SEDIMENT CONTROL PLAN
STA. 70+00 TO STA. 73+20 AND PLANTING PLAN

600' SCALE MAP NO. 30 BLOCK NO. 36

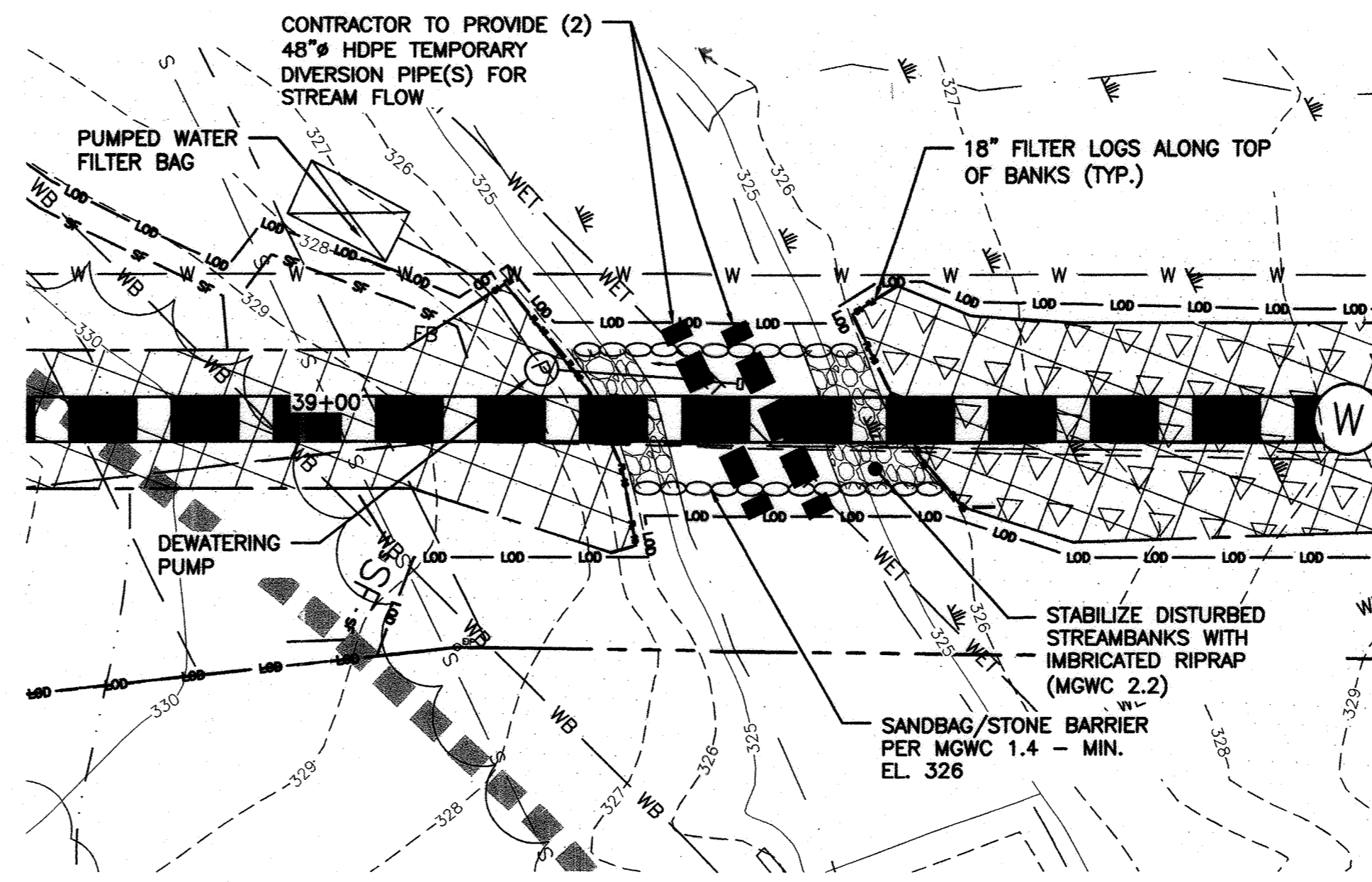
U.S. ROUTE 29 WATER TRANSMISSION MAIN
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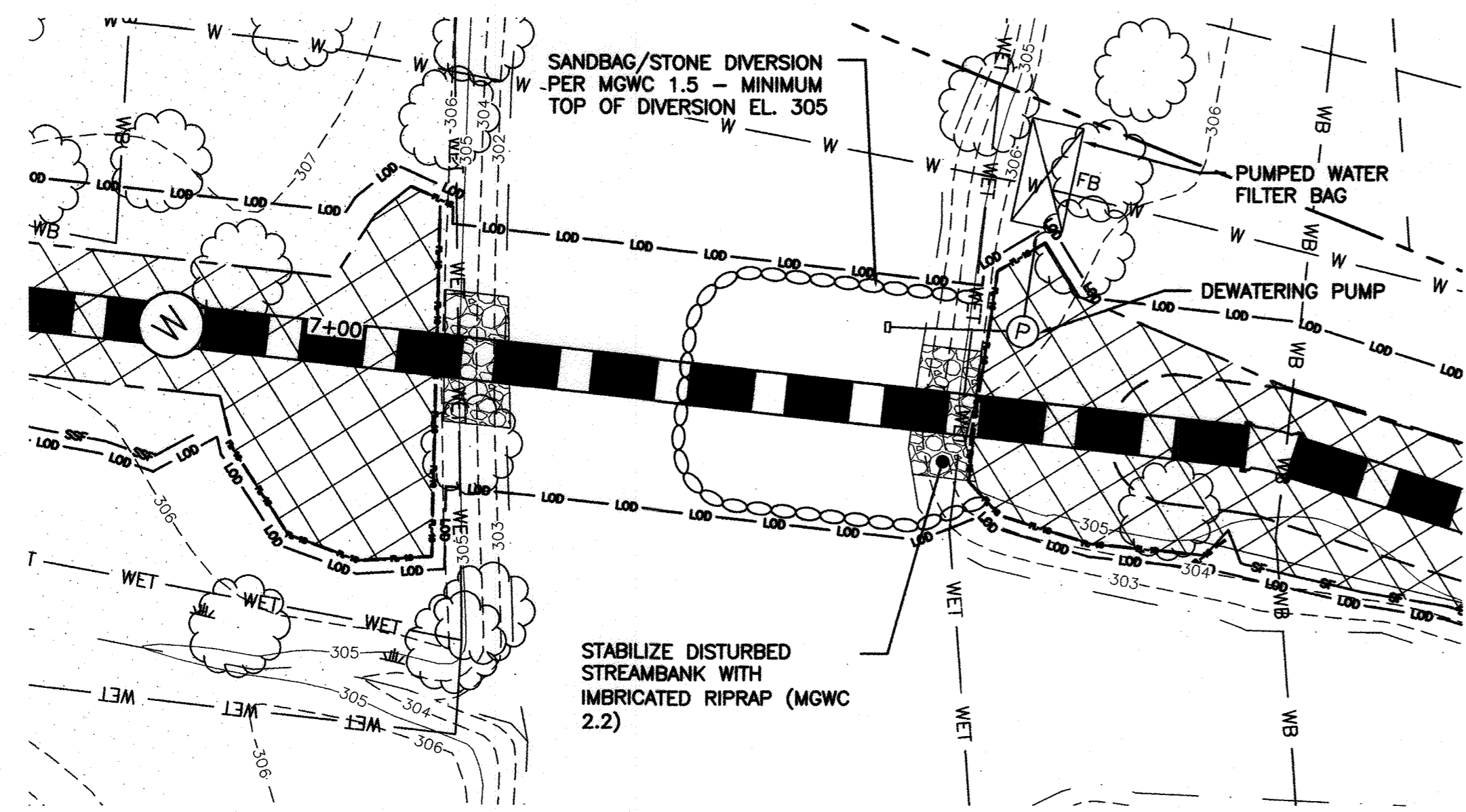
SCALE AS SHOWN
SHEET 18A OF 38



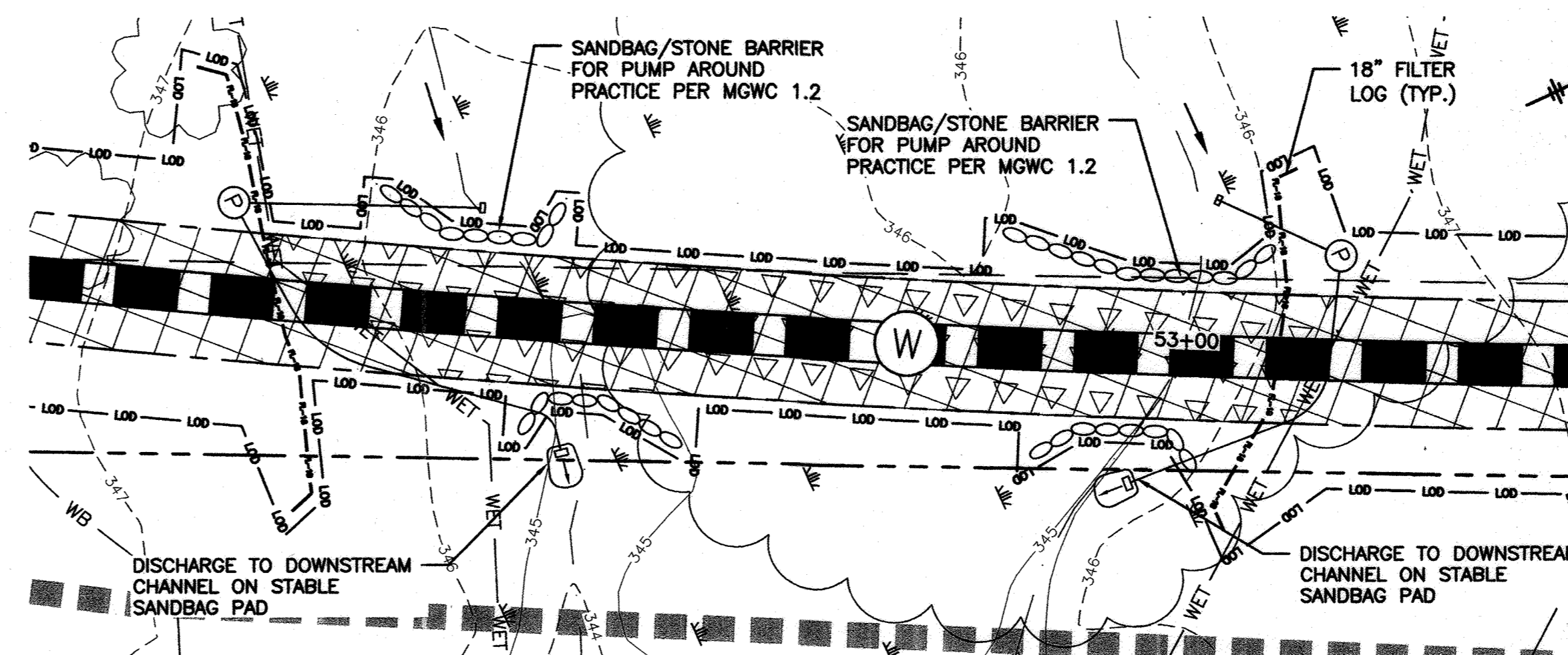
ENLARGED PLAN - CROSSING AT STA. 7+30 - STAGE 1
SCALE: 1"=10'



ENLARGED PLAN - CROSSING AT STA. 39+25
SCALE: 1"=10'



ENLARGED PLAN - CROSSING AT STA. 7+30 - STAGE 2
SCALE: 1"=10'

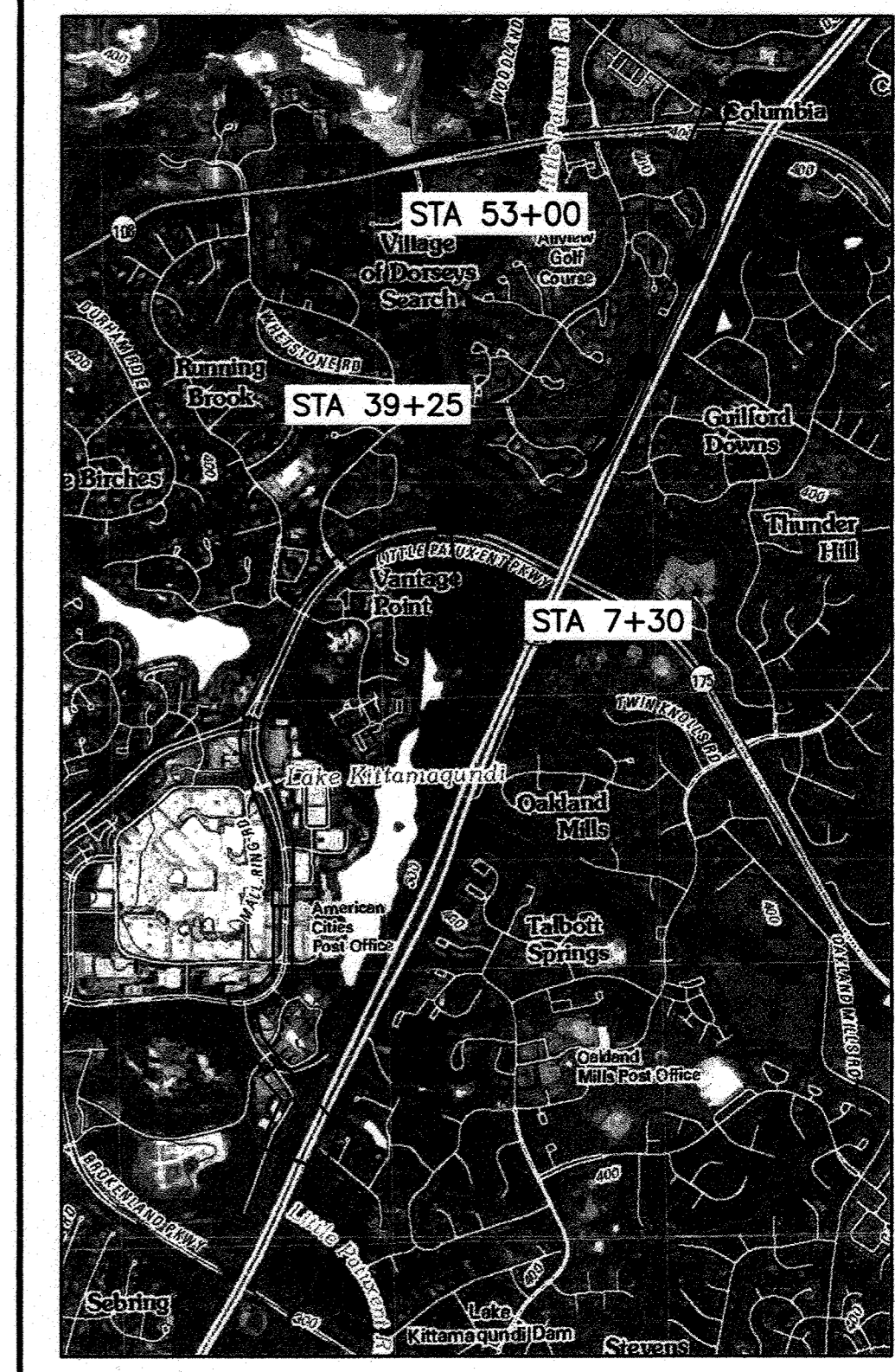


ENLARGED PLAN - CROSSINGS AT STA. 52+50 AND STA. 53+00
SCALE: 1"=10'

- NOTES**
- 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.
 - 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.
 - 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.
 - CONTRACTOR SHALL UTILIZE TRENCH BOXES OR OTHER SHORING TO MINIMIZE THE WIDTH OF TRENCHING AND DISTURBANCE TO THE STREAMBANKS AND CHANNEL BED.
 - FOR DETAILS AND SPECIFICATIONS OF IMBRICATED RIPRAP (MGWC 2.2) SEE SHEET 20.

- NOTES**
- 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.
 - 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.
 - 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.
 - 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.
 - CONTRACTOR SHALL UTILIZE TRENCH BOXES OR OTHER SHORING TO MINIMIZE THE WIDTH OF TRENCHING AND DISTURBANCE TO THE STREAMBANKS AND CHANNEL BED.
 - CONTRACTOR SHALL PROVIDE TWO 48" 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.
 - 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.
 - FOR DETAILS AND SPECIFICATIONS OF IMBRICATED RIPRAP (MGWC 2.2) SEE SHEET 20.

- NOTES**
- 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.
 - WORK SHALL BE PERFORMED DURING LOW-FLOW PERIODS. IF NO FLOW IS PRESENT, CONTRACTOR MAY PERFORM WORK WITHOUT INSTALLING PUMP AROUND PRACTICE.
 - CROSSING OF EACH CHANNEL, INCLUDING BACKFILL AND RESTORATION SHALL BE PERFORMED IN ONE WORKING DAY.
 - 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
---	LIMIT OF DISTURBANCE LINE
FL-18	FILTER LOG - 18" HEIGHT
SF	SILT FENCE
SSP	SUPER SILT FENCE
○	TEMPORARY SANDBAG/STONE DIVERSION
⊕	DEWATERING PUMP
⊗	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
⊙	SOIL LABEL
---	FLOODPLAIN BOUNDARY
WET	WETLANDS AREA
WB	WETLANDS BUFFER LINE
▭	AREA OF STEEP (15% OR STEEPER) SLOPES
▭	AREA OF ERODIBLE SOILS (K VALUE >0.35) WITH 5% OR STEEPER SLOPES
▭	WETLANDS RESTORATION AREA

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[Signature] 18523 6/22/16
Registration Number / Date

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] Director of Public Works
[Signature] Chief, Bureau of Utilities

[Signature] Chief - Bureau of Engineering
[Signature] Chief, Utility Design Division

G O BRIEN & GERE
4201 MITCHELLVILLE ROAD
SUITE 500
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[Signature] ROBERT JOHNSON
Professional Engineer

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

SOIL EROSION AND SEDIMENT CONTROL PLAN WATERWAY CROSSINGS

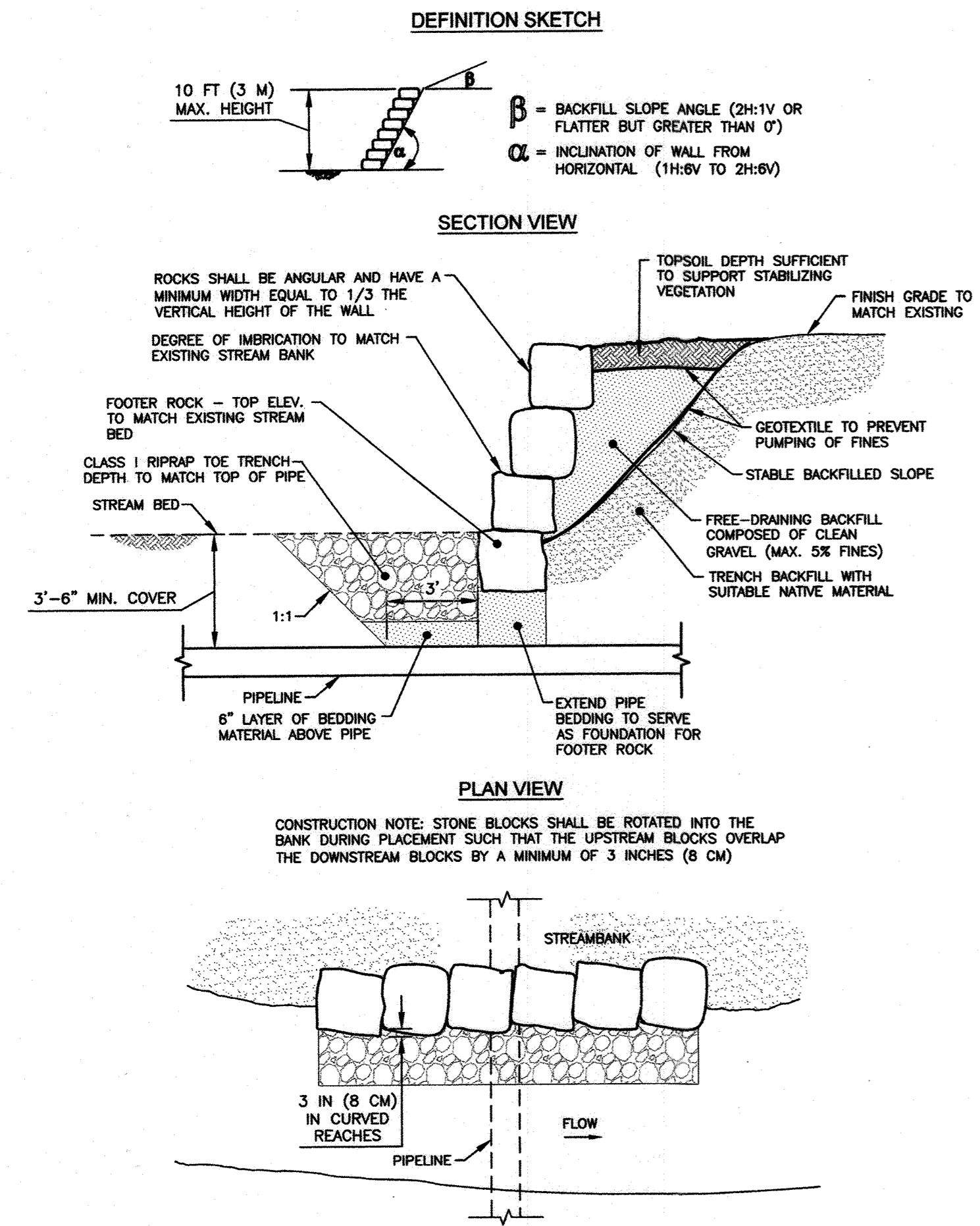
600' SCALE MAP NO. 30 BLOCK NO. 36

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

DETAIL: IMBRICATED RIPRAP
(ADAPTED FROM MGWC 2.2)



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

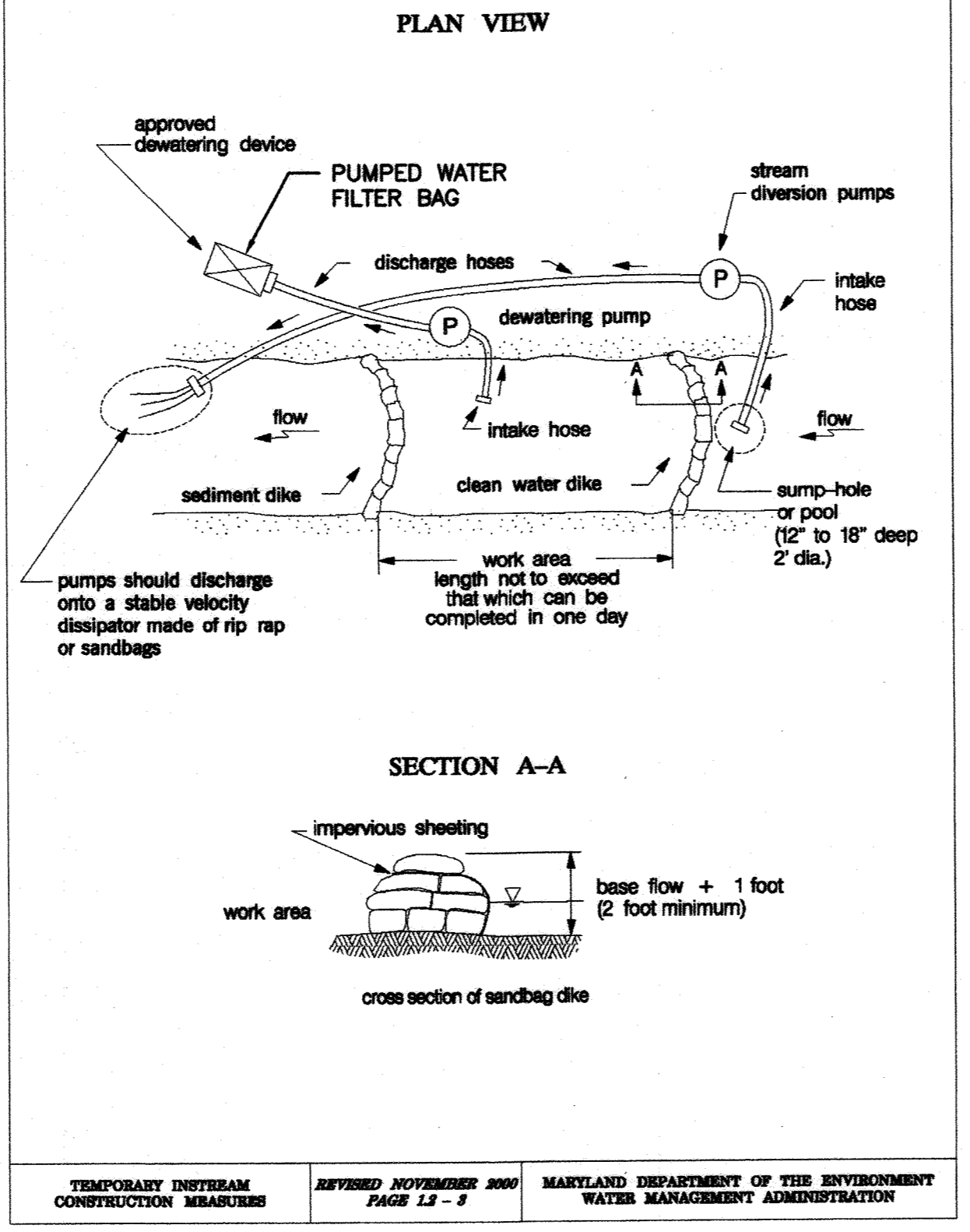
- TOE RIPRAP: THE MAXIMUM DIAMETER OR WEIGHT OF STONE FOR TOE RIPRAP SHOULD BE BASED UPON THE BANKFULL STREAM CHANNEL VELOCITY AS DETAILED IN THE MGWC 2.1: RIPRAP AND FIGURE 2.1.
- IMBRICATED STONES: IMBRICATED RIPRAP SHOULD BE ANGULAR AND BLOCKY IN SHAPE SUCH THAT THEY ARE STACKABLE AND SHOULD BE SUFFICIENTLY 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):

- 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.
- 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.
- A GRADED GRANULAR FILTER OR FILTER FABRIC SHOULD BE PLACED ON THE FACE OF THE CUT SLOPE TO PREVENT THE MIGRATION OF FINE MATERIALS THROUGH THE REVETMENT. IF FILTER FABRIC IS USED, IT SHOULD BE CAREFULLY AND LOOSELY PLACED ON THE PREPARED SLOPE AND SECURED. ADJACENT STRIPS SHOULD OVERLAP A MINIMUM OF 8 INCHES (0.20 METERS). IF THE FILTER FABRIC IS TORN OR DAMAGED, IT SHOULD BE REPAIRED OR REPLACED.
- THE ROCK LAYERS SHOULD BE NEATLY STACKED WITH STAGGERED JOINTS SO THAT EACH STONE RESTS FIRMLY ON TWO STONES IN THE TIER BELOW. ADDITIONALLY, SMALLER STONES SHOULD BE USED TO FILL VOIDS SO THAT EACH ROCK RESTS SOLIDLY ON THE PREVIOUS ROCK LAYER WITH MINIMAL OPPORTUNITY FOR MOVEMENT. UPON COMPLETION OF THE FIRST LAYER OF STONES, THE TOE TRENCH SHOULD BE FILLED WITH CLASS II RIPRAP SIZED ACCORDING TO MGWC 2.1: RIPRAP OR ADDITIONAL IMBRICATED STONE. TWO FOOTER STONES SHOULD BE USED WHERE HIGH POTENTIAL FOR CHANNEL INCISION EXISTS. THE HEIGHT OF THE IMBRICATED REVETMENT IS DICTATED BY THE SIZE OF THE STONE USED, AND THE HEIGHT SHOULD NOT EXCEED 3 TIMES THE LENGTH OF THE LONGEST AXIS AND SHOULD NOT BE GREATER THAN 10 FEET (3 METERS).
- PLACEMENT OF THE GRANULAR BACKFILL SHOULD OCCUR CONCURRENTLY WITH THE STONE PLACEMENT. THE BACKFILL SLOPE ANGLE SHOULD BE 2H:1V OR FLATTER BUT 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.
- 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



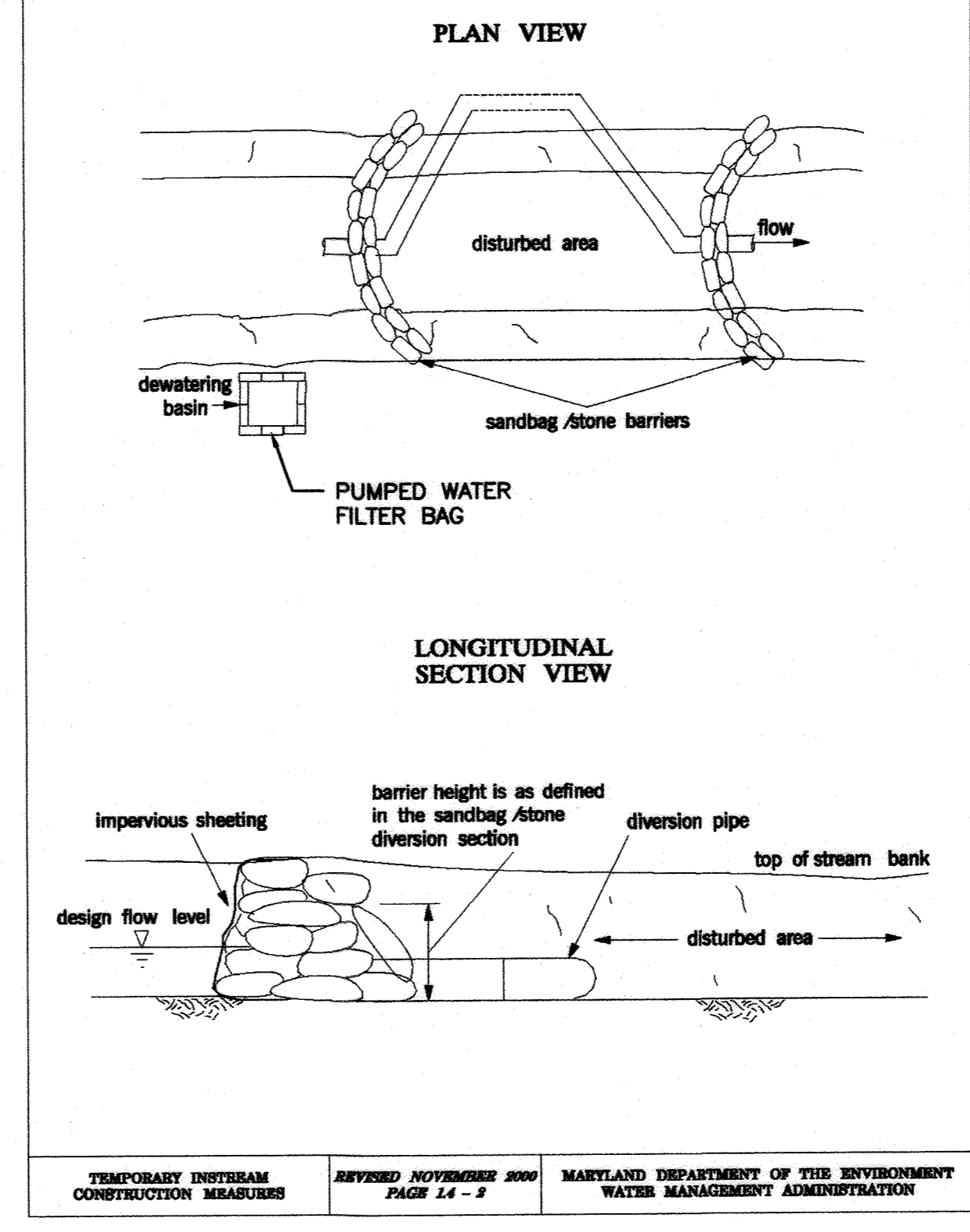
MGWC 1.2: PUMP-AROUND PRACTICE

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):

- 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.
- 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.
- 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.
- 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.
- 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 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.
- SANDBAG DIKES SHOULD BE SITUATED AT THE UPSTREAM AND DOWNSTREAM ENDS OF THE WORK AREA AS SHOWN ON THE PLANS. STREAM FLOW SHOULD BE PUMPED AROUND THE WORK AREA. THE PUMP SHOULD DISCHARGE ONTO A STABLE VELOCITY DISSIPATER MADE OF RIPRAP OR SANDBAGS.
- 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.
- 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).
- 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.
- 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.
- 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.
- 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.
- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ACCESS TO AND MAINTAINING ALL EROSION AND SEDIMENT CONTROL DEVICES UNTIL THE SEDIMENT CONTROL INSPECTOR APPROVES THEIR REMOVAL.
- 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



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.

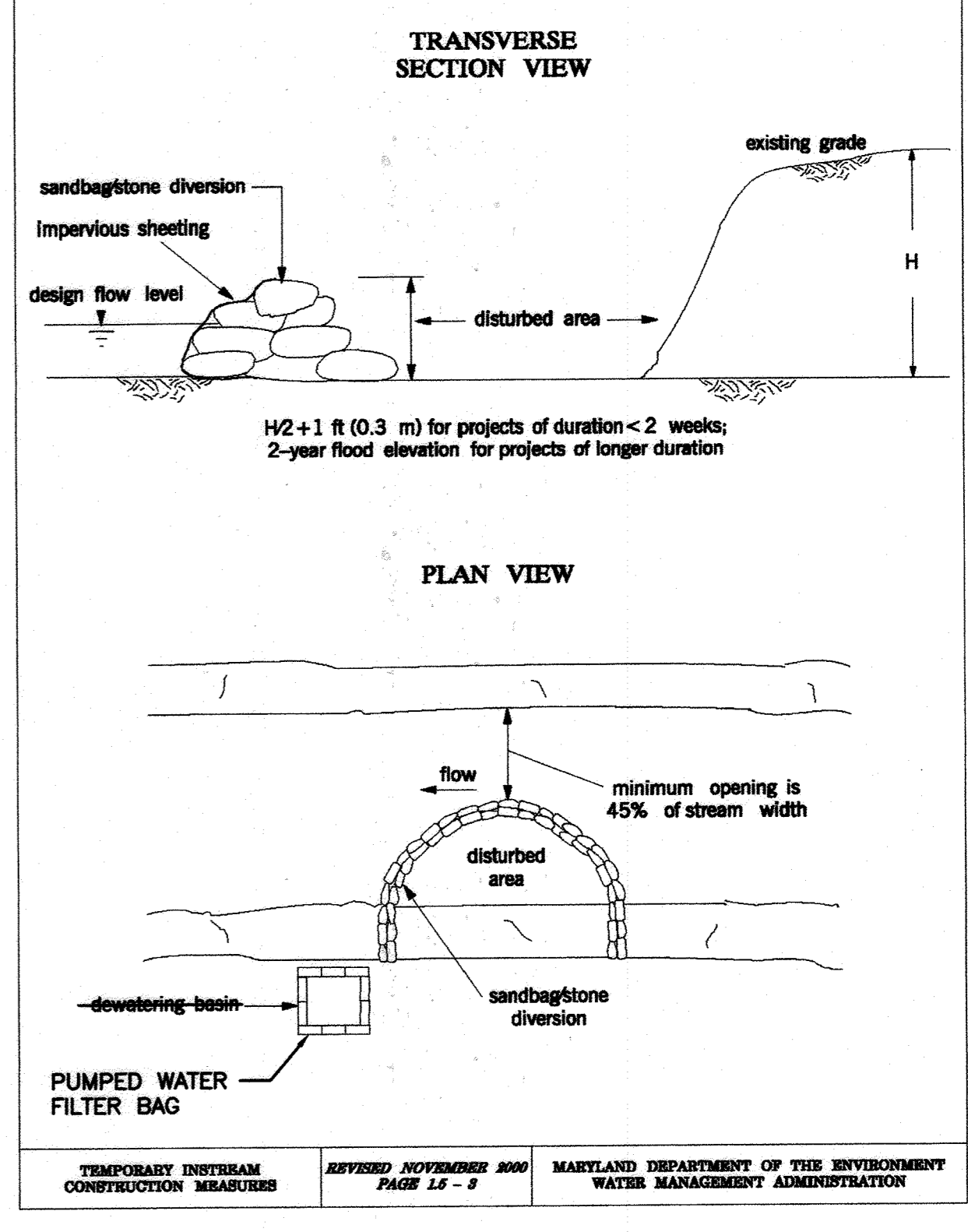
INSTALLATION GUIDELINES:

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):

- 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.
- ALL EXCAVATED MATERIAL SHOULD BE DEPOSITED AND STABILIZED IN AN APPROVED AREA OUTSIDE THE 100-YEAR FLOODPLAIN UNLESS OTHERWISE AUTHORIZED BY THE WMA.
- SEDIMENT-LADEN WATER FROM THE CONSTRUCTION AREA SHOULD BE PUMPED TO A DEWATERING BASIN OR A PUMPED WATER FILTER BAG.
- 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.
- IF NECESSARY, SILT FENCE OR STRAW BALES SHOULD BE INSTALLED AROUND THE PERIMETER OF THE WORK AREA.
- 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



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):

- THE DIVERSION STRUCTURE SHOULD BE INSTALLED FROM UPSTREAM TO DOWNSTREAM.
- 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.
- ALL EXCAVATED MATERIAL SHOULD BE DEPOSITED AND STABILIZED IN AN APPROVED AREA OUTSIDE THE 100-YEAR FLOODPLAIN UNLESS OTHERWISE AUTHORIZED BY THE WMA.
- SEDIMENT-LADEN WATER FROM THE CONSTRUCTION AREA SHOULD BE PUMPED TO A DEWATERING BASIN.
- 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.
- SANDBAG OR STONE DIVERSIONS SHOULD NOT OBSTRUCT MORE THAN 45% OF THE STREAM WIDTH. ADDITIONALLY, BANK STABILIZATION MEASURES SHOULD BE PLACED IN THE CONSTRUCTED 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.
- 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.
- 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.

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 6/22/16
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 6/22/16
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 6/22/16
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

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

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

I:\HOWARD-CO.2343\45854-RT-29-108-WA.DWG\SPUT-SETS\SHEETS\45854-221.DWG

HOWARD SOIL CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

- 1. A PRE-CONSTRUCTION MEETING MUST OCCUR WITH THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION INSPECTION DIVISION (CID), 410-313-1855 AFTER THE FUTURE LOD AND PROTECTED AREAS ARE MARKED CLEARLY IN THE FIELD. A MINIMUM OF 48 HOUR NOTICE TO CID MUST BE GIVEN AT THE FOLLOWING STAGES:
A. PRIOR TO THE START OF EARTH DISTURBANCES.
B. UPON COMPLETION OF THE INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING.
C. PRIOR TO THE START OF ANOTHER PHASE OF CONSTRUCTION OR OPENING OF ANOTHER GRADING UNIT.
D. PRIOR TO THE REMOVAL OR MODIFICATION OF SEDIMENT CONTROL PRACTICES.
OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE. OTHER RELATED STATE AND FEDERAL PERMITS SHALL BE REFERENCED, TO ENSURE COORDINATION AND TO AVOID CONFLICTS WITH THIS PLAN.
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 THEREOF.
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 IIP 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 TAKEOUT 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 with columns: SYMBOL, DESCRIPTION, SLOPES, SOIL ERODIBILITY FACTOR (K), HYDRIC COMPONENTS?, HYDROLOGIC SOIL GROUP, LIMITATIONS. Rows include BaA, Co, GbB, GbC, GgB, GbH, GhC, GmB, GnB, GoB, GuB, Ha, MaC, MaD, McD, UoF, UuB.

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 (ULIOLA SP.); AND/OR RYE (SECALE CEREALE). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY RESTORATION 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.

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: [Signature], Registration Number: 18523, Date: 6/22/16

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND. Director of Public Works: [Signature], Chief, Bureau of Utilities: [Signature]

G O BRIEN & GERE 4201 MITCHELLVILLE ROAD SUITE 500 20716 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 NUMBER: 18523, EXPIRATION DATE: 12/08/2017

Table with columns: DSN. BY, DRN. BY, CHK. BY, DATE, JC, LR, RJD, BY, NO., REVISION. Includes entries for SMS, RJD, and revision numbers.

SOIL EROSION AND SEDIMENT CONTROL PLAN NOTES AND DETAILS - 1. 800' SCALE MAP NO. 30, BLOCK NO. 36

RECORD DRAWINGS 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

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. Scooped preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment... b. Apply fertilizer and lime as prescribed on the plans... c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil...

B. Topsoiling

- 1. Topsoil is placed over prepared subsoil prior to establishment of permanent vegetation... 2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications...

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... 2. Fertilizers must be uniform in composition, free flowing and suitable for accurate application... 3. Lime materials must be ground limestone (hydrated or burnt lime) may be substituted except when hydroseeding...

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... b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen... 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...

B. Mulching

- 1. Mulch Materials (in order of preference) a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley... b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state... 2. Application a. Apply mulch to all seeded areas immediately after seeding...

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 Hardness Zone... b. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes... c. For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency...

- ii. Kentucky Bluegrass/Perennial Ryegrass: Full Sun Mixture: For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management... iii. Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or for areas receiving low to medium management...

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

1. Ideal Times of Seeding for Turf Grass Mixtures Western MD: March 15 to June 1, August 1 to October 1 (Hardness Zones: 5b, 6a) Central MD: March 1 to May 15, August 15 to October 15 (Hardness Zones: 6b) Southern MD, Eastern Shore: March 1 to May 15, August 15 to October 15 (Hardness 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... e. If soil moisture is deficient, supply new seedlings with adequate water for plant growth... 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 3/4 inch, plus or minus 1/8 inch...

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... c. Wherever possible, lay sod with the long edges parallel to the contour...

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... 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... otherwise specified.

Table with columns: HARDNESS ZONE: 6B, MIX, SPECIES, APPLICATION RATE (LB./AC.), SEEDING DATES, SEEDING DEPTHS, FERTILIZER RATE (10-20-20) (N, P, K), LIME RATE.

NOTES:

- 1. SEEDING RATES: SEEDING RATES FOR THE WARM SEASON GRASSES ARE IN POUNDS OF PURE LIVE SEED (PLS)... 2. TURF-TYPE CULTIVARS OF TALL FESCUE AND KENTUCKY BLUEGRASS MUST BE SELECTED BASED ON RECOMMENDATIONS OF THE UNIVERSITY OF MARYLAND...

Tables listing Kentucky Bluegrass Cultivars and Tall Fescue cultivars suitable for general use and shade tolerance.

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 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 Hardness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths... 2. For sites having soil tests performed, use and show the recommended rates by the testing agency... 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.

Table for Temporary Seeding Summary with columns: HARDNESS ZONE: 6B, SPECIES, APPLICATION RATE (LB./AC.), SEEDING DATES, SEEDING DEPTHS, FERTILIZER RATE (10-20-20), LIME RATE.

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, Registration Number 13523, Date 6/22/16

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS

HOWARD COUNTY, MARYLAND

Director of Public Works signature and name

Chief - Bureau of Engineering signature and name

G OBRIEN & GERE

4201 MITCHELLVILLE ROAD, SUITE 500, BOWIE, MD 20716

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 12/06/2017.

Table with columns: DSN. BY, DRN. BY, CHK. BY, DATE, JC, LR, RJD, BY, NO., RECORD DRAWINGS, REVISED PER HSCD REVIEW, AS BID, REVISION.

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

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**
- Incremental Stabilization - Cut Slopes
 - 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.
 - Construction sequence example (Refer to Figure B.1):
 - Construct and stabilize all temporary swales or dikes that will be used to convey runoff around the excavation.
 - Perform Phase 1 excavation, prepare seedbed, and stabilize.
 - Perform Phase 2 excavation, prepare seedbed, and stabilize. Overseed Phase 1 areas as necessary.
 - 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.

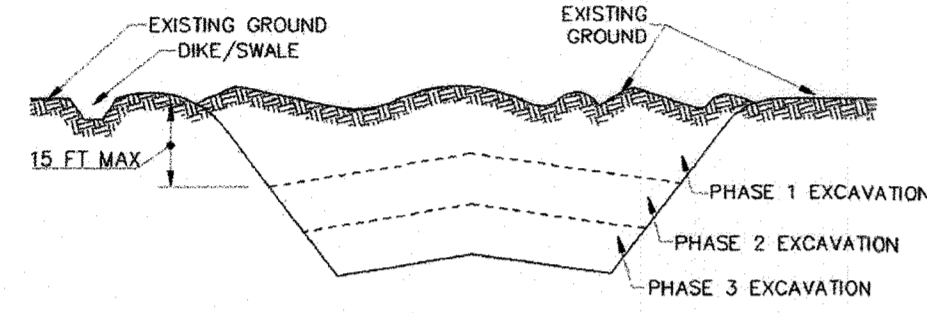


Figure B.1: Incremental Stabilization - Cut

B. Incremental Stabilization - Fill Slopes

- 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.
- Stabilize slopes immediately when the vertical height of a lift reaches 15 feet, or when the grading operation ceases as prescribed in the plans.
- 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.
- Construction sequence example (Refer to Figure B.2):
 - 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.
 - 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.
 - Place Phase 1 fill, prepare seedbed, and stabilize.
 - Place Phase 2 fill, prepare seedbed, and stabilize.
 - 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.

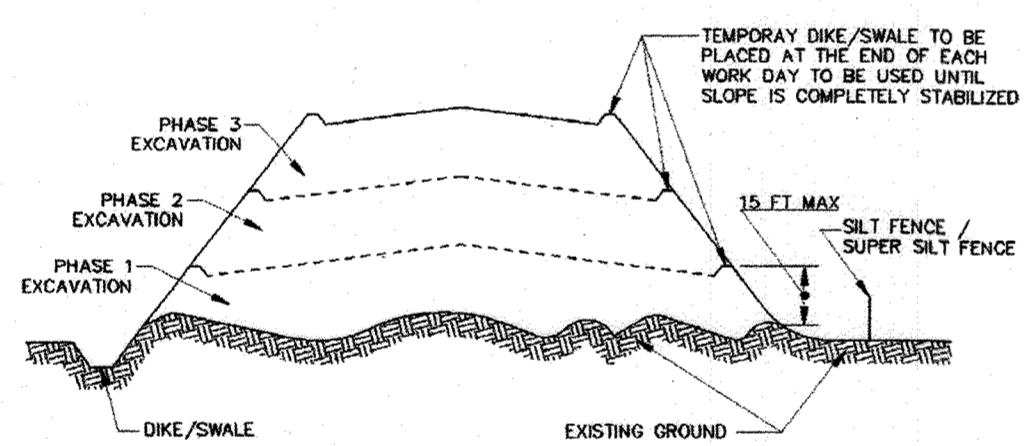


Figure B.2: Incremental Stabilization - Fill

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; 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**
- 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 plans the type of soil stabilization matting using the standard symbol and include the calculated shear stress for the respective treatment area.
 - 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/ft²). On temporary channels discharging to a sediment trapping practice, provide matting where the runoff velocity exceeds four feet per second (4 fps).
 - 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.
 - 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.
 - 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/ft²)
- γ = weight density of water (62.4 lb/ft³)
- 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:

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

where:

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

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
Straw Mulch/Wood Cellulose Fiber			for K ≤ 0.35***		
Temporary Matting with Design Shear Stress ≥ 1.5 lb/ft ²					
Temporary Matting with Design Shear Stress ≥ 1.75 lb/ft ²					
Temporary Matting with Design Shear Stress ≥ 2.0 lb/ft ²					
Temporary Matting with Design Shear Stress ≥ 2.25 lb/ft ²					

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.sc.egov.usda.gov>. 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-erosive 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**
- 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.
 - Select the stabilizing material based on the intended use, desired maintenance frequency, and runoff control.
 - 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.
 - 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**
- The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
 - 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.
 - Runoff from the stockpile areas must drain to a suitable sediment control practice.
 - Access the stockpile area from the upgrade side.
 - 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.
 - Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment control practice must be used to intercept the discharge.
 - Stockpiles must be stabilized in accordance with the 37 day stabilization requirement as well as Standard B-4.1 Incremental Stabilization and Standard B-4.4 Temporary Stabilization.
 - 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 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/ft² (* INCLUDE SHEAR STRESS)

CONSTRUCTION SPECIFICATIONS

- USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
- 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-HAZARIOUS TO THE SOIL. 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.
- 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 1 1/2 INCHES WIDE AND BE A MINIMUM OF 8 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.
- 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.
- UNROLL MATTING DOWNSLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
- 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.
- 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.
- STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
- 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/ft² (* INCLUDE SHEAR STRESS)

CONSTRUCTION SPECIFICATIONS

- USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
- 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-HAZARIOUS TO THE SOIL. 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.
- 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 1 1/2 INCHES WIDE AND BE A MINIMUM OF 8 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.
- 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.
- 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.
- 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.
- OVERLAP OR ABUT THE ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE NEXT DOWNSLOPE MAT.
- STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
- 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.

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

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 6/21/16
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 6/21/16
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 6/21/16
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

[Signature]
ROBERT J. DUNN
REGISTERED PROFESSIONAL ENGINEER

DSN. BY:	SMS	JC	2	RECORD DRAWINGS	11/20
DRN. BY:	SMS	LR	1	RECORD DRAWINGS	5/19
CHK. BY:	RJD	RJD		REVISED PER HSCD REVIEW	5/16
		RJD		REVISED PER HSCD REVIEW	4/16
		RJD	0	AS BID	02/16
DATE:	2/16	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

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SF-18

CONSTRUCTION SPECIFICATIONS

- 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.
- PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE. MAINTAIN POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BEAM 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 BEAM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
- PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
- 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.
- MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE. MOUNTABLE BEAM, 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

CONSTRUCTION SPECIFICATIONS

- USE WOOD POSTS 1 1/2 X 1 1/2 X 1/4 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.
- USE 3/8 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
- USE WOVEN SILT 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.
- 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.
- EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
- WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
- 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.
- 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.

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

CONSTRUCTION SPECIFICATIONS

- PRIOR TO INSTALLATION, CLEAR ALL OBSTRUCTIONS INCLUDING ROCKS, CLODS, AND DEBRIS GREATER THAN ONE INCH THAT MAY INTERFERE WITH PROPER FUNCTION OF FILTER LOG.
- 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.
- 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.
- FOR UNTRENCHED INSTALLATION BLOW OR HAND PLACE MULCH OR COMPOST ON UPSLOPE SIDE OF THE SLOPE ALONG LOG.
- 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.
- 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.
- WHEN MORE THAN ONE LOG IS NEEDED, OVERLAP ENDS 12 INCHES MINIMUM AND STAKE.
- REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO A DEPTH OF 1/2 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.

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

- TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
- 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.
- 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.
- 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.
- 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 PUNCTURE	250 LB	ASTM D-4832
FLOW RATE	150 LB	ASTM D-4833
PERMITIVITY (SEC ⁻¹)	70 GAL/MIN/FT ²	ASTM D-4491
UV RESISTANCE	1.2 SEC ⁻¹	ASTM D-4491
APPARENT OPENING SIZE (AOS)	70% STRENGTH @ 500 HOURS	ASTM D-4355
SEAM STRENGTH	0.15-0.18 MM	ASTM D-4751
	90%	ASTM D-4632
- 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

CONSTRUCTION SPECIFICATIONS

- USE 42 INCH HIGH, 9 GAUGE OR THICKER CHAIN LINK FENCING (2 1/2 INCH MAXIMUM OPENING).
- USE 2 1/2 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.
- FASTEN CHAIN LINK FENCE SECURELY TO THE FENCE POSTS WITH WIRE TIES.
- 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.
- 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.
- WHEN TWO SECTIONS OF SHEETING ADJOIN EACH OTHER, OVERLAP BY 6 INCHES AND FOLD WITH SEAM FACING DOWNGRADE.
- 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

- USE WOOD POSTS 1 1/2 X 1 1/2 X 1/4 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.
- USE 3/8 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
- USE WOVEN SILT 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.
- 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.
- EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
- WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
- 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.
- 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.

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

CONSTRUCTION SPECIFICATIONS

- PRIOR TO INSTALLATION, CLEAR ALL OBSTRUCTIONS INCLUDING ROCKS, CLODS, AND DEBRIS GREATER THAN ONE INCH THAT MAY INTERFERE WITH PROPER FUNCTION OF FILTER LOG.
- 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.
- 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.
- FOR UNTRENCHED INSTALLATION BLOW OR HAND PLACE MULCH OR COMPOST ON UPSLOPE SIDE OF THE SLOPE ALONG LOG.
- 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.
- 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.
- WHEN MORE THAN ONE LOG IS NEEDED, OVERLAP ENDS 12 INCHES MINIMUM AND STAKE.
- REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO A DEPTH OF 1/2 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.

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

- INSTALL 2 1/2 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.
- FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2 1/2 INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
- FASTEN WOVEN SILT 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.
- WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
- 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.
- PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
- 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.

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

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *Signature* DATE
Chief, Bureau of Utilities: *Signature* DATE

Chief, Bureau of Engineering: *Signature* DATE
Chief, Utility Design Division: *Signature* DATE

G O BRIEN & BORE
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:	SMS	JC 2	RECORD DRAWINGS	11/20
DRN. BY:	SMS	LR 1	RECORD DRAWINGS	5/19
CHK. BY:	RJD	RJD	REVISED PER HSCD REVIEW	5/16
		RJD	REVISED PER HSCD REVIEW	4/16
		RJD 0	AS BID	2/16
DATE:	2/16	BY NO.	REVISION	DATE

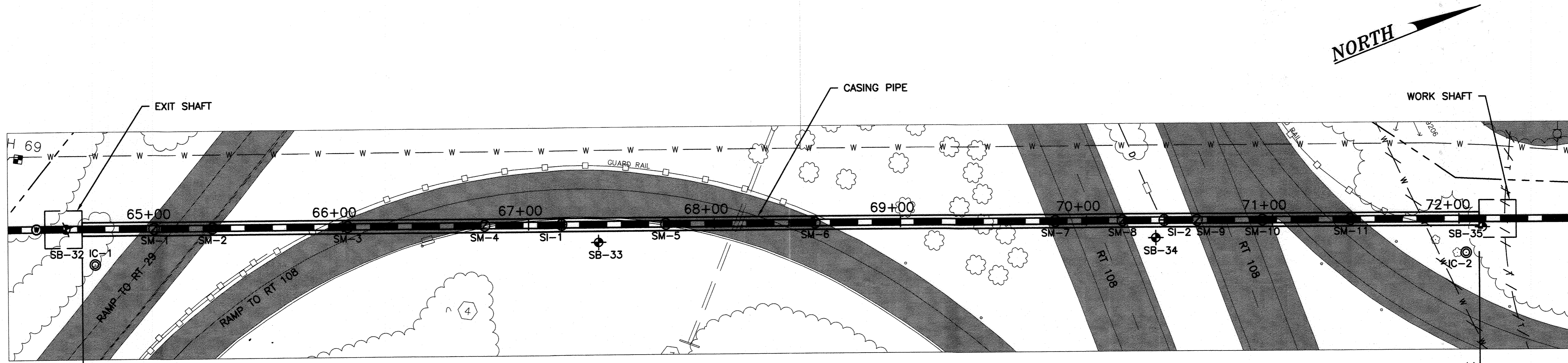
SOIL EROSION AND SEDIMENT CONTROL PLAN
NOTES AND DETAILS - 4

60' 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



PLAN
SCALE: 1"=30'
STA 64+59.77 TO 72+11.58

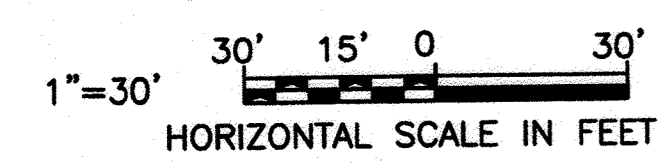
STA. 64+59.77
INV. EL. 375.88
END 60" CASING PIPE

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.



JEC JENNY ENGINEERING CORPORATION
CONSULTING ENGINEERS
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O BRIEN & GERE
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PHONE: 301-731-5622

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DSN. BY:	LJG			
DRN. BY:	JSA/RS			
CHK. BY:	LG	JC	2	11/20
DATE:	FEB 2016	LR	1	05/19
		RJD	0	02/16
		BY	NO.	REVISION

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

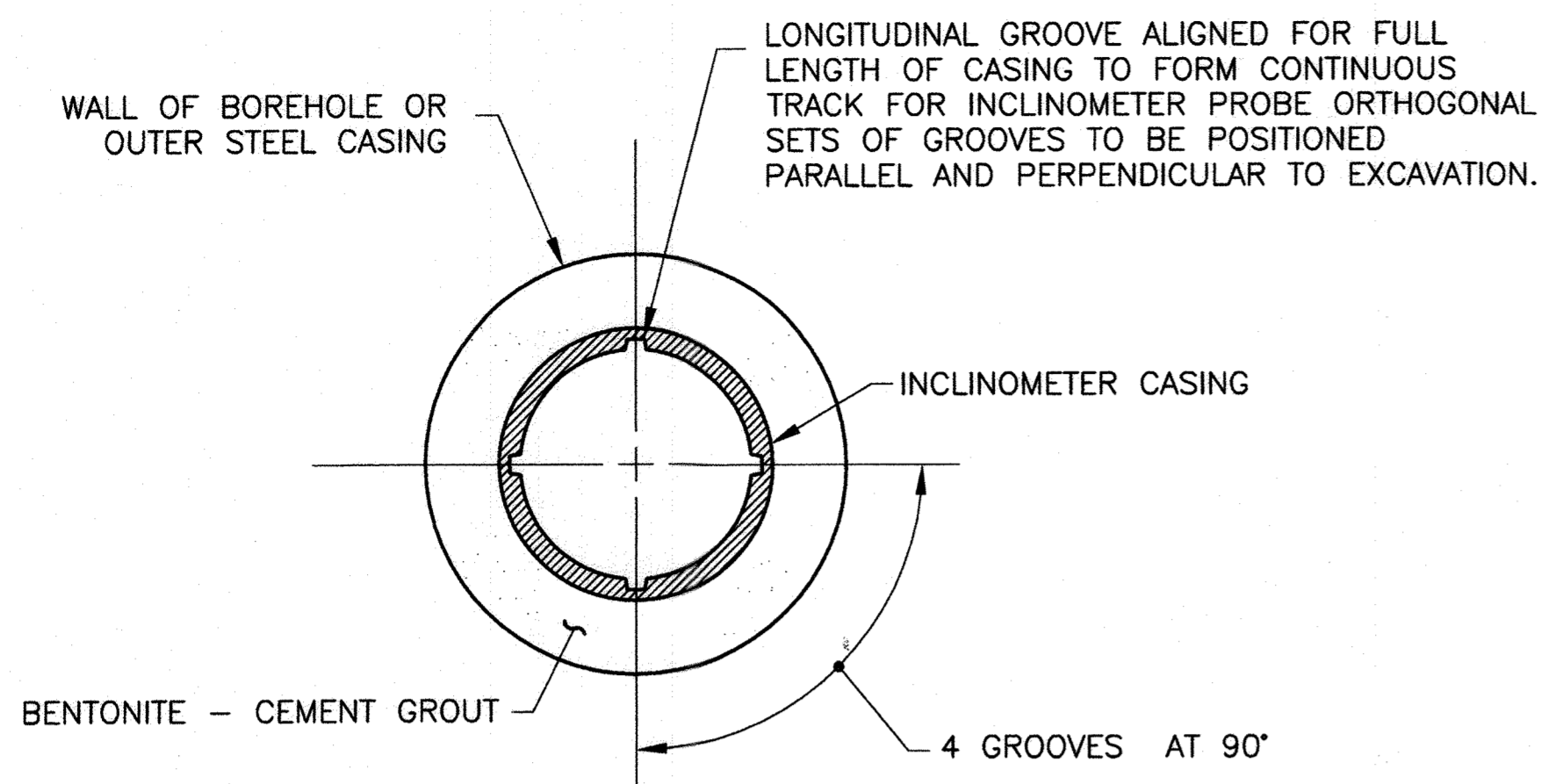
Ray A. ... 2/25/16
DIRECTOR OF PUBLIC WORKS DATE

Thomas B. Butler 2/23/16
CHIEF - BUREAU OF ENGINEERING DATE

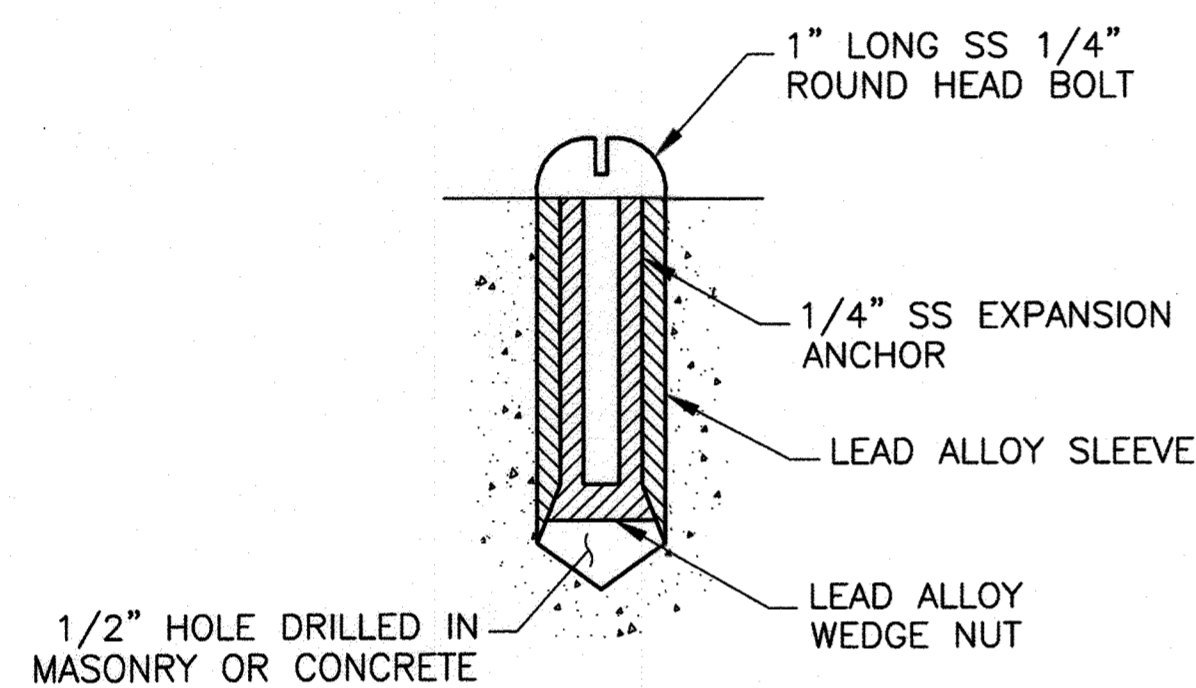
... 2/23/16
CHIEF, UTILITY DESIGN DIVISION DATE

... 2/23/16
CHIEF, BUREAU OF UTILITIES DATE

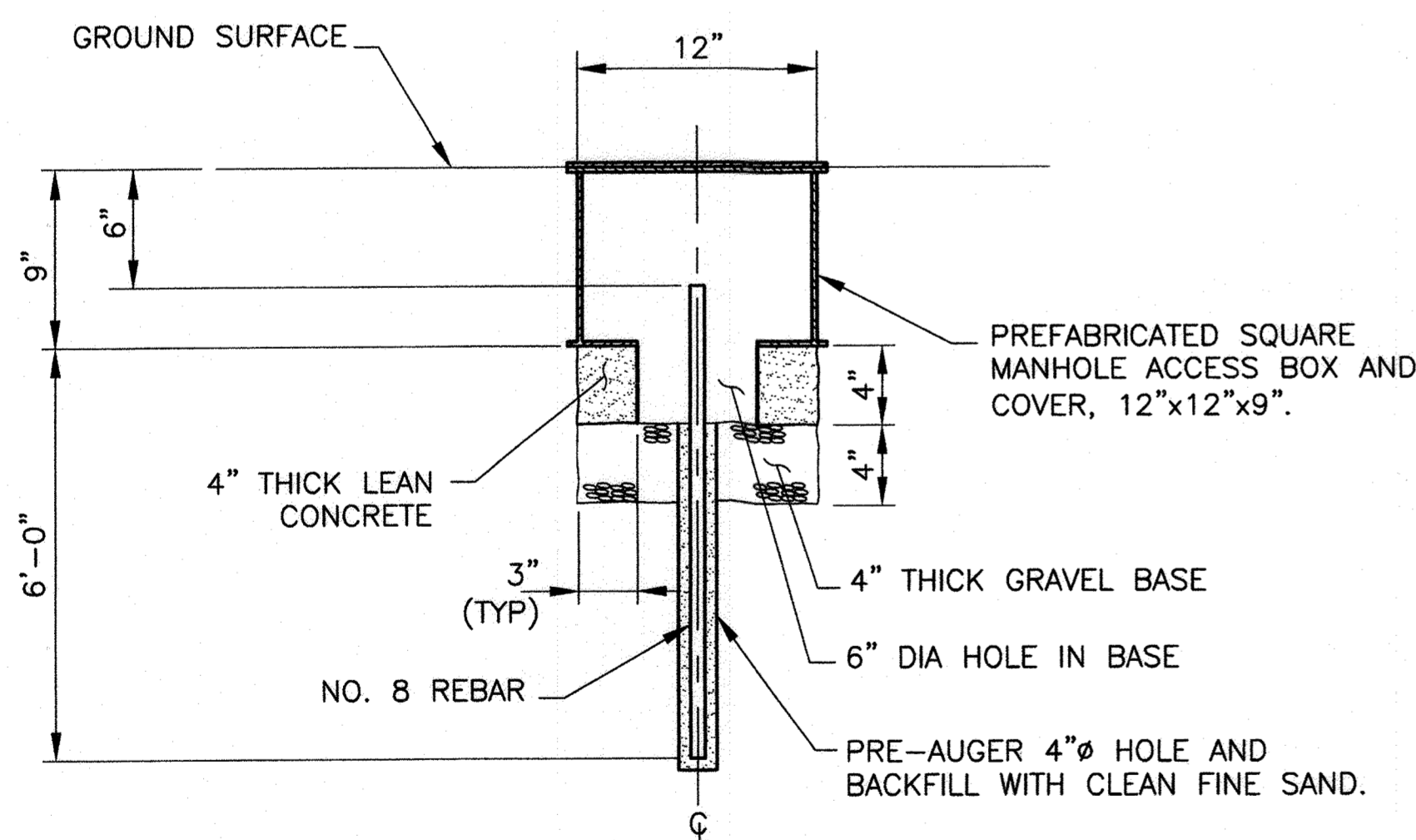
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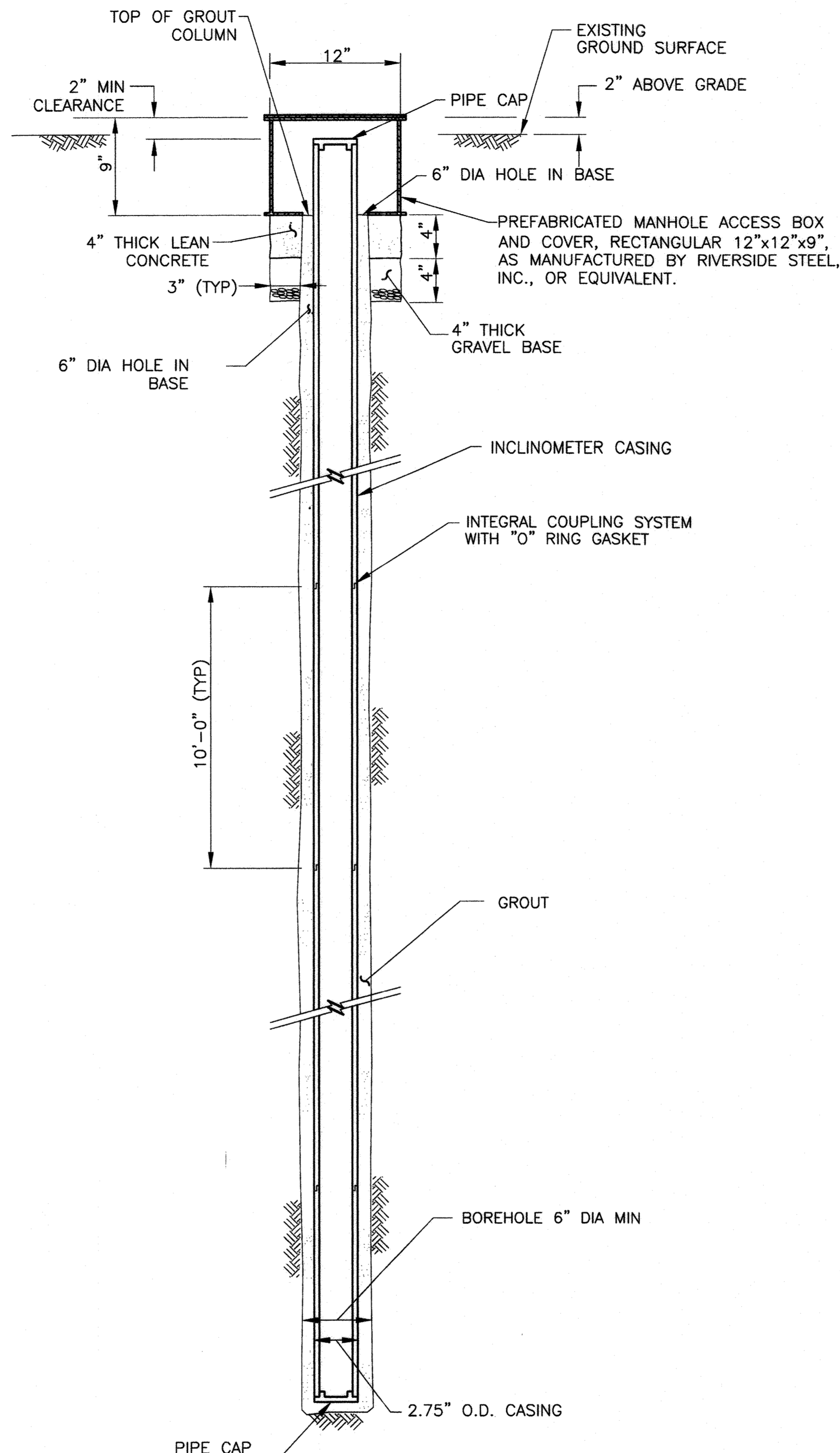
CROSS SECTION THROUGH INCLINOMETER CASING



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 \mathcal{C}	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)

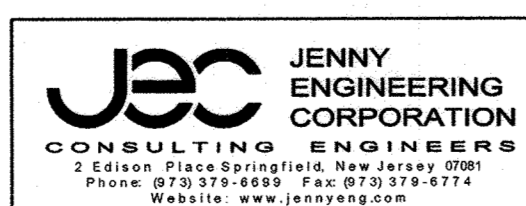
INDICATOR NUMBER	LOCATION	
	STA \mathcal{C}	OFFSET (FT)
SI-1	67+23	0
SI-2	70+47	0

INCLINOMETERS SCHEDULE (IC)

INCLINOMETER NUMBER	LOCATION		APPROXIMATE GROUND ELEVATION (FT)	MINIMUM BOTTOM ELEVATION (FT)
	STA \mathcal{C}	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



O'BRIEN & GERE

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

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DRN. BY:	JSA/RS			
CHK. BY:	LG	JC 2	RECORD DRAWINGS	11/20
		LR 1	RECORD DRAWINGS	05/19
		RJD 0	AS BID	02/16
DATE:	FEB 2016	BY NO.	REVISION	DATE

GEOTECHNICAL INSTRUMENTATION MONITORING DETAILS

600' SCALE MAP NO. 30 BLOCK NO. 36

NOTE:

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

RECORD DRAWINGS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* Date: *[Date]*
 Chief - Bureau of Engineering: *[Signature]* Date: *[Date]*
 Chief, Bureau of Utilities: *[Signature]* Date: *[Date]*
 Chief, Utility Design Division: *[Signature]* Date: *[Date]*

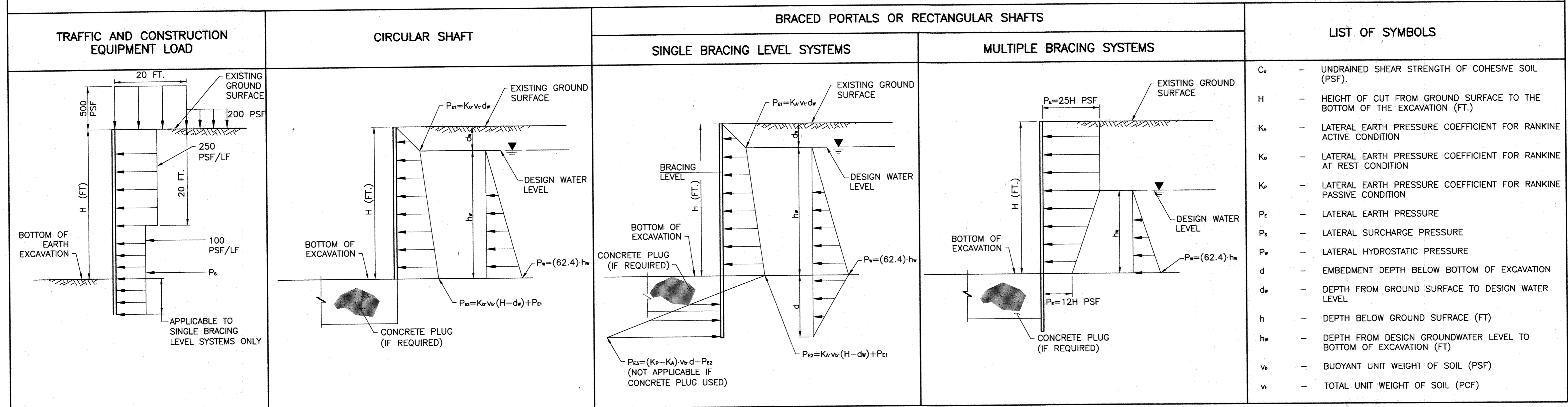
U.S. ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108

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



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_0	K_p
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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

J. J. ... 2/25/16
DIRECTOR OF PUBLIC WORKS DATE

... 2/25/16
CHIEF, BUREAU OF UTILITIES DATE

... 2/25/16
CHIEF - BUREAU OF ENGINEERING DATE

... 2/25/16
CHIEF, UTILITY DESIGN DIVISION DATE

JEC
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CONSULTING ENGINEERS

2 Edison Plaza Springfield, New Jersey 07081
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Robert M. ...
PROFESSIONAL ENGINEER

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

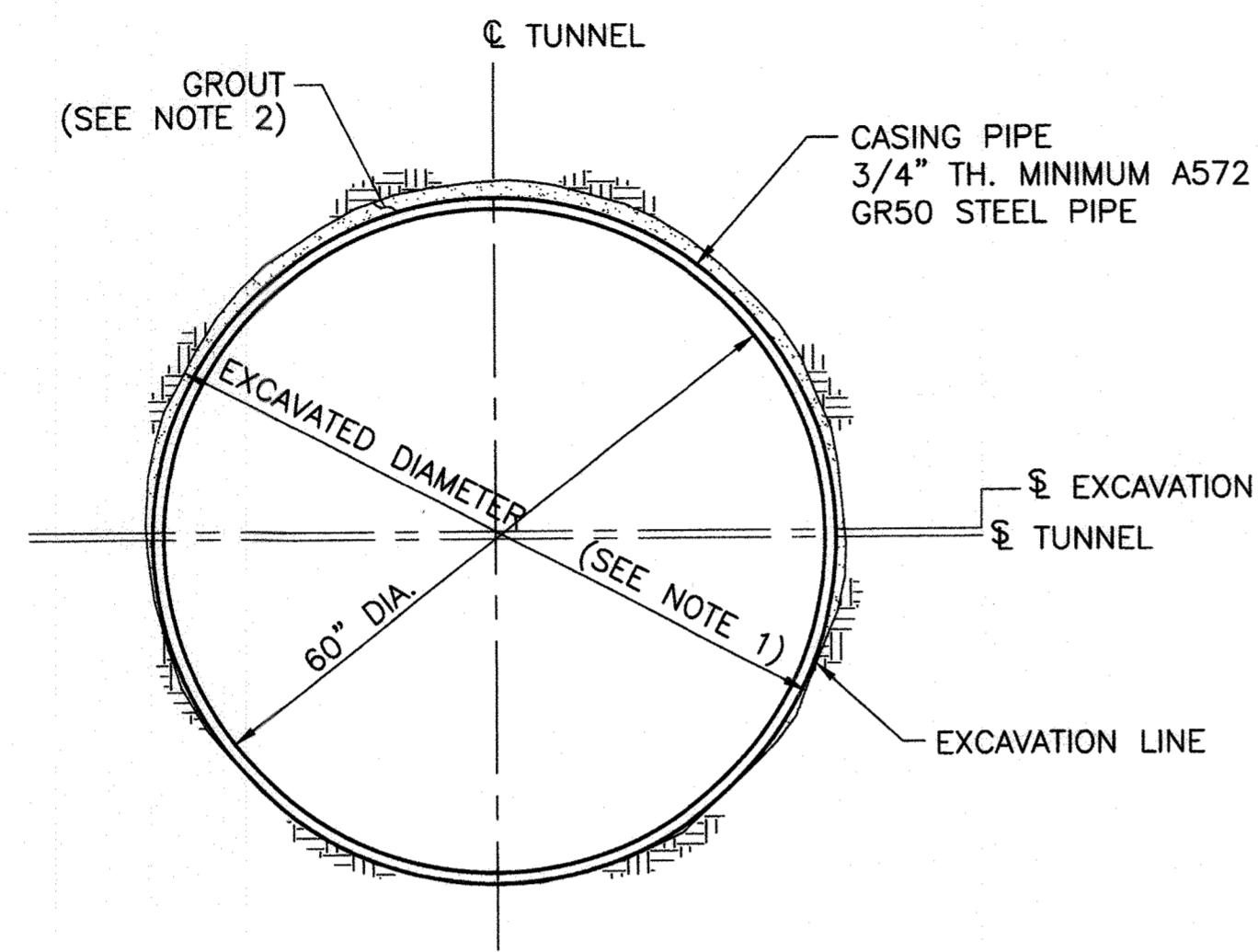
NO.	DESCRIPTION	DATE
JC 2	RECORD DRAWINGS	11/20
LR 1	RECORD DRAWINGS	05/19
RJD 0	AS BID	02/16
BY NO.	REVISION	DATE

CONSTRUCTION SHAFTS DESIGN CRITERIA

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

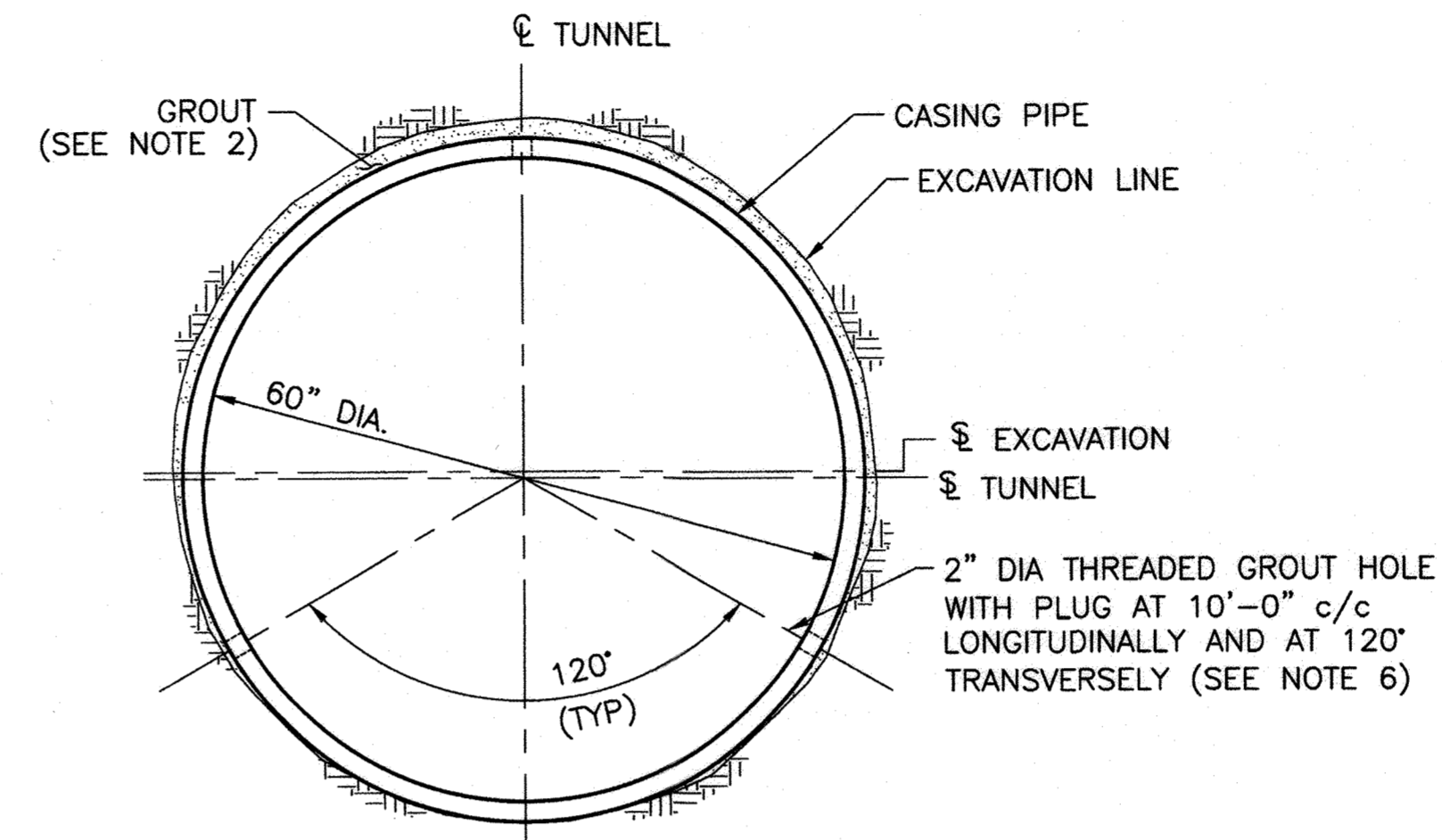
CAPITAL PROJECT: W-8296
CONTRACT NO.: 44-4930
ELECTION DISTRICT: 5
HOWARD COUNTY, MARYLAND

600' SCALE MAP NO. 30 BLOCK NO. 36



TYPICAL TUNNEL SECTION - STEEL CASING PIPE
SCALE: 3/4"=1'-0"

STA 64+59.77 TO 72+11.58

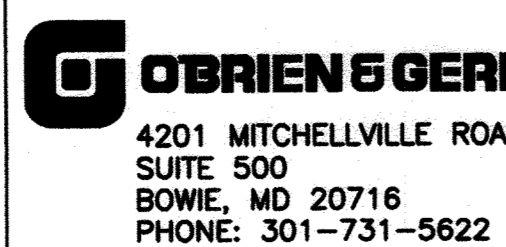


TYPICAL GROUTING DETAIL
N.T.S.

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.

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



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DSN. BY:	LJG				
DRN. BY:	JSA/RS				
CHK. BY:	LG	JC	2	RECORD DRAWINGS	11/20
		LR	1	RECORD DRAWINGS	05/19
		RJD	0	AS BID	02/16
DATE:	FEB 2016	BY	NO.	REVISION	DATE

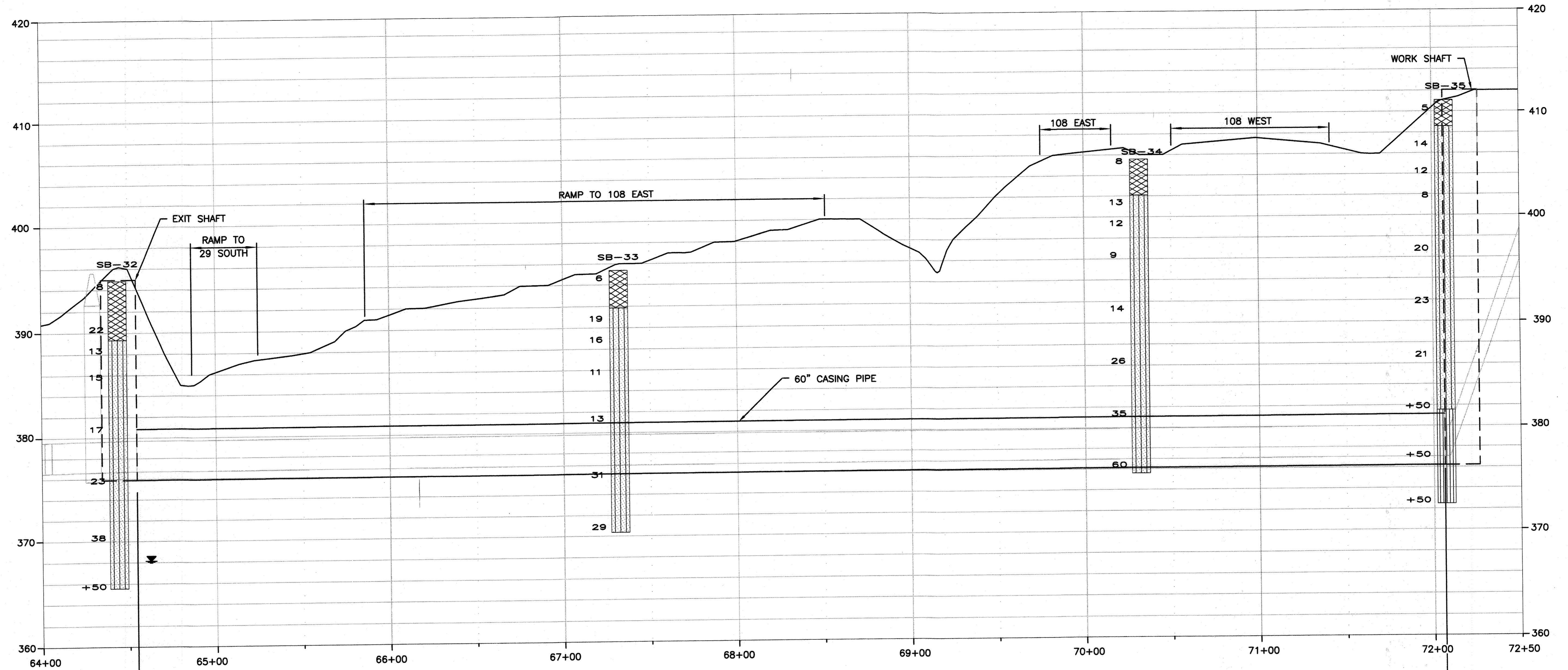
TUNNEL SECTIONS AND DETAILS

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

RECORD DRAWINGS

SCALE AS SHOWN
SHEET 27 OF 38

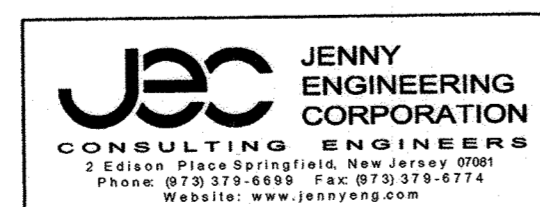
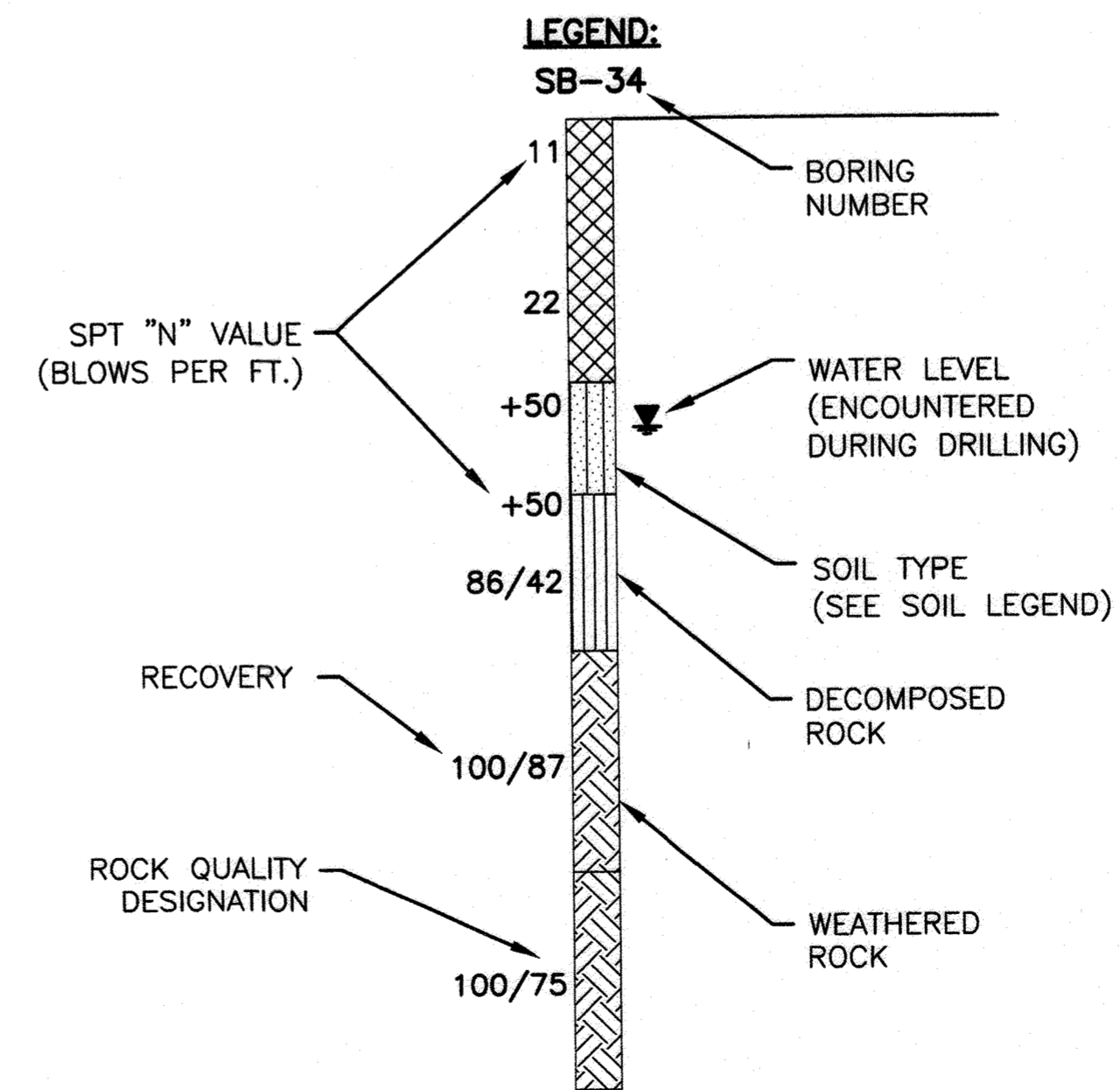
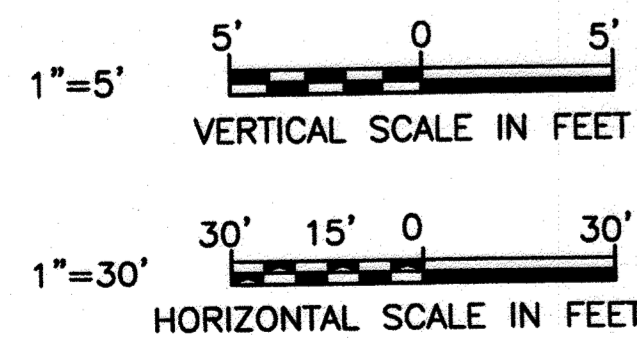


PROFILE
 HORIZONTAL SCALE: 1"=30'
 VERTICAL SCALE: 1"=5'

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

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

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



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 BOWIE, MD 20716
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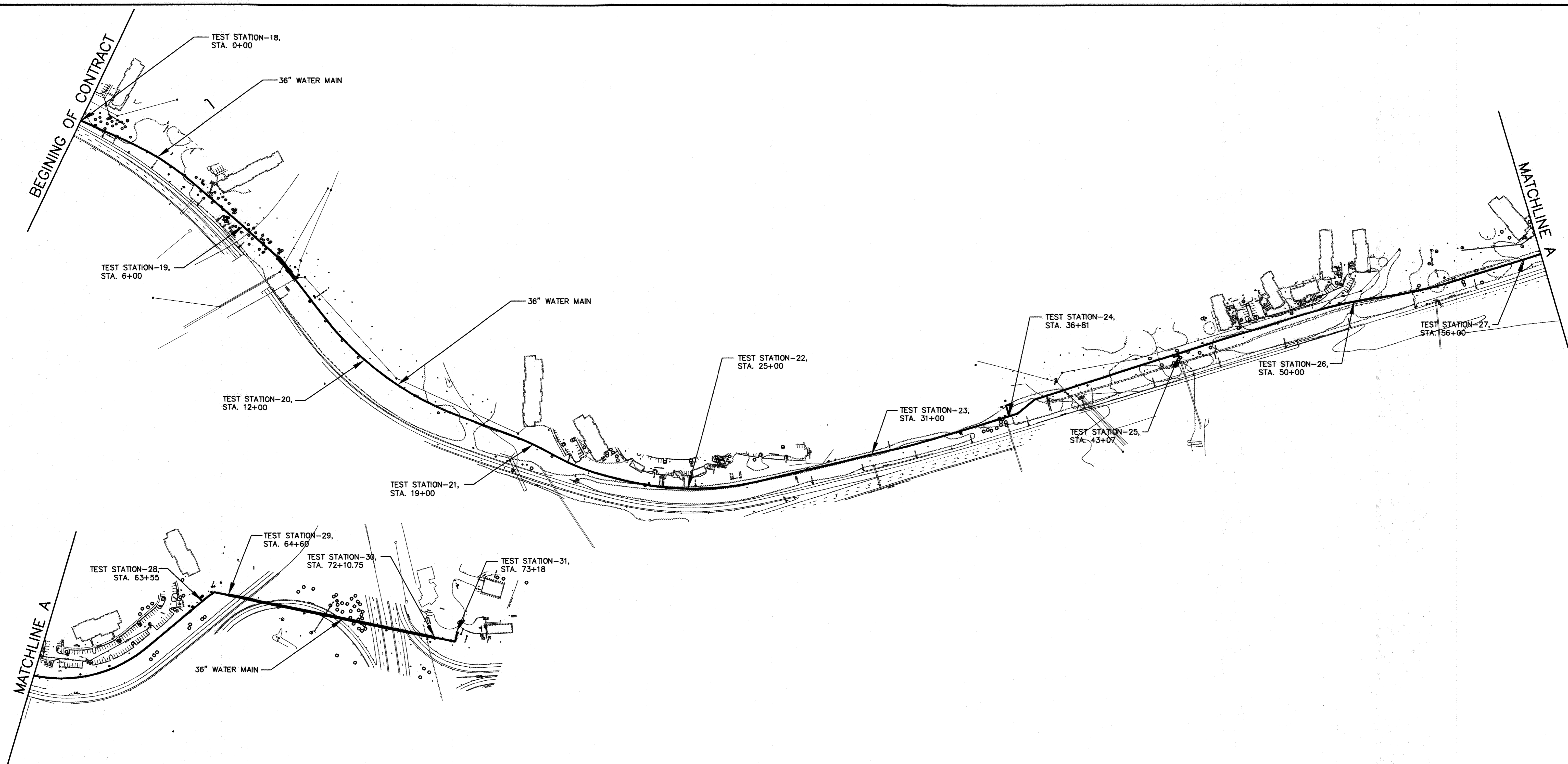
DSN. BY:	LJG			
DRN. BY:	JSA/RS			
CHK. BY:	LG	JC	2	11/20
		LR	1	05/19
		RJD	0	02/16
DATE:	FEB 2016	BY	NO.	

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

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

RECORD DRAWINGS

SCALE AS SHOWN
 SHEET 28 OF 38

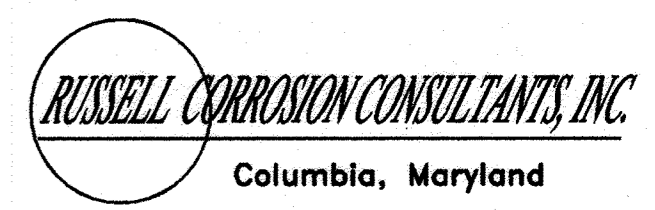


- NOTES:**
1. PCCP OR BAR WRAPPED CONCRETE CYLINDER PIPE TO BE FABRICATED WITH STEEL BONDING PLATES, SEE DETAIL CC-7.
 2. BOND ALL NEW PIPE JOINTS. EXCEPT THOSE SPECIFIED TO BE ELECTRICALLY ISOLATED. SEE DETAILS CC-6 AND CC-7.
 3. ELECTRICAL ISOLATION IS REQUIRED FOR ALL CONNECTIONS TO NEW WATER MAIN. 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.

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CATHODIC PROTECTION LAYOUT 1
Scale: N.T.S

RECORD DRAWINGS



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

J. P. [Signature] 2/25/16
DIRECTOR OF PUBLIC WORKS DATE

Thomas B. Butler 2/23/16
CHIEF - BUREAU OF ENGINEERING DATE

Steve [Signature] 2/23/16
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 2/23/16
CHIEF, UTILITY DESIGN DIVISION PSD DATE

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

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[Signature]
02.11.2016

DSN. BY: YZ					
DRN. BY: JWW					
CHK. BY: YZ	JC	2	RECORD DRAWINGS	11/20	
DATE: FEB. 2016	LR	1	RECORD DRAWINGS	05/19	
	RJD	0	AS BID	2/16	
	BY	NO.	REVISION	DATE	

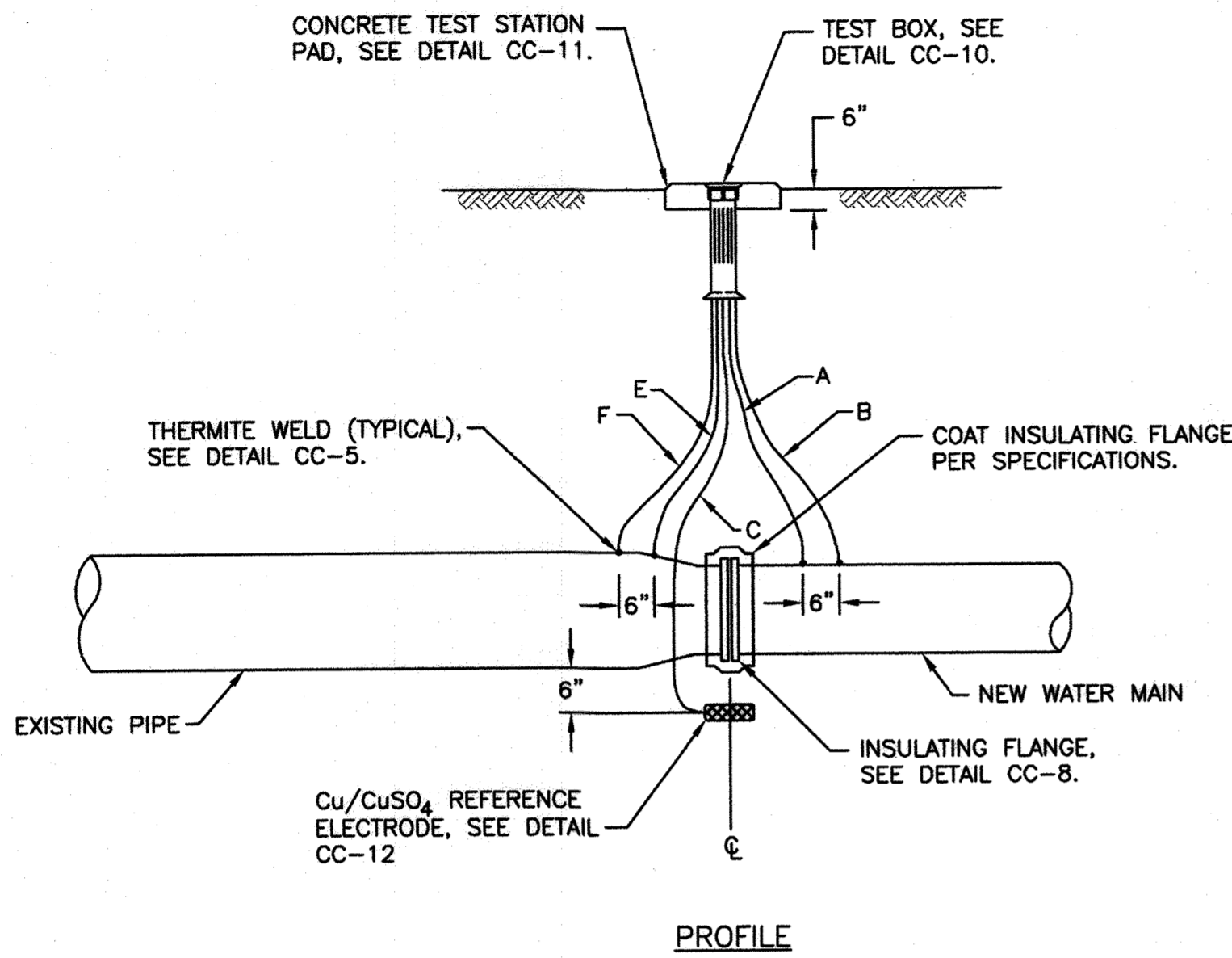
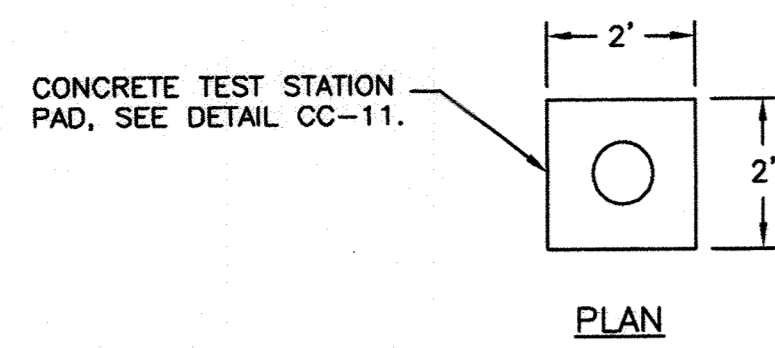
CATHODIC PROTECTION LAYOUT 1

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-



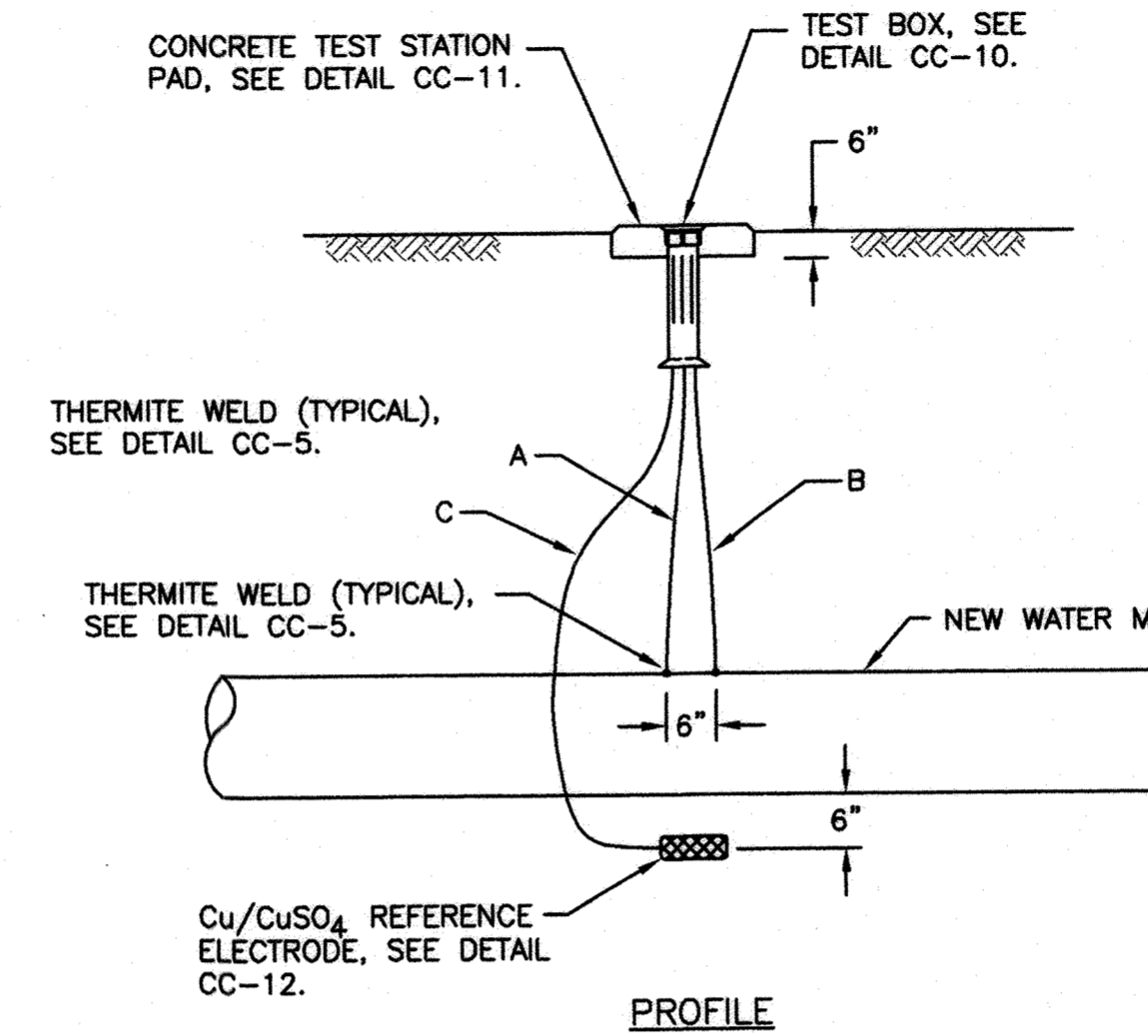
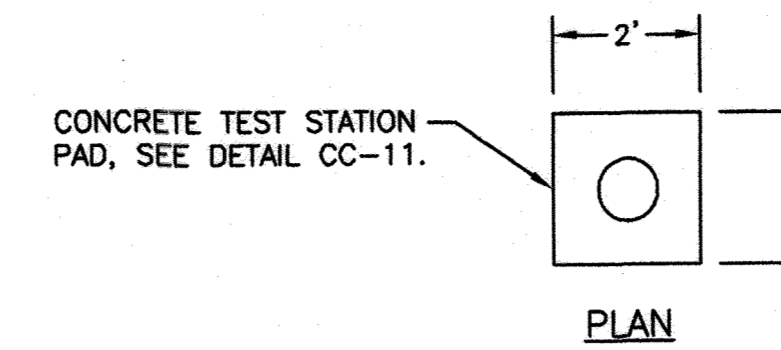
CC-1: INSULATING FLANGE TEST STATION

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
EXISTING PIPE	E F	2 5	#8 #10	THWN THWN	WHITE WHITE

NOTES:

- 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.
- ALL THERMITE WELDS TO PCCP OR BAR WRAPPED CONCRETE CYLINDER PIPE TO BE PERFORMED AT STEEL BONDING PLATES, SEE DETAIL CC-7.



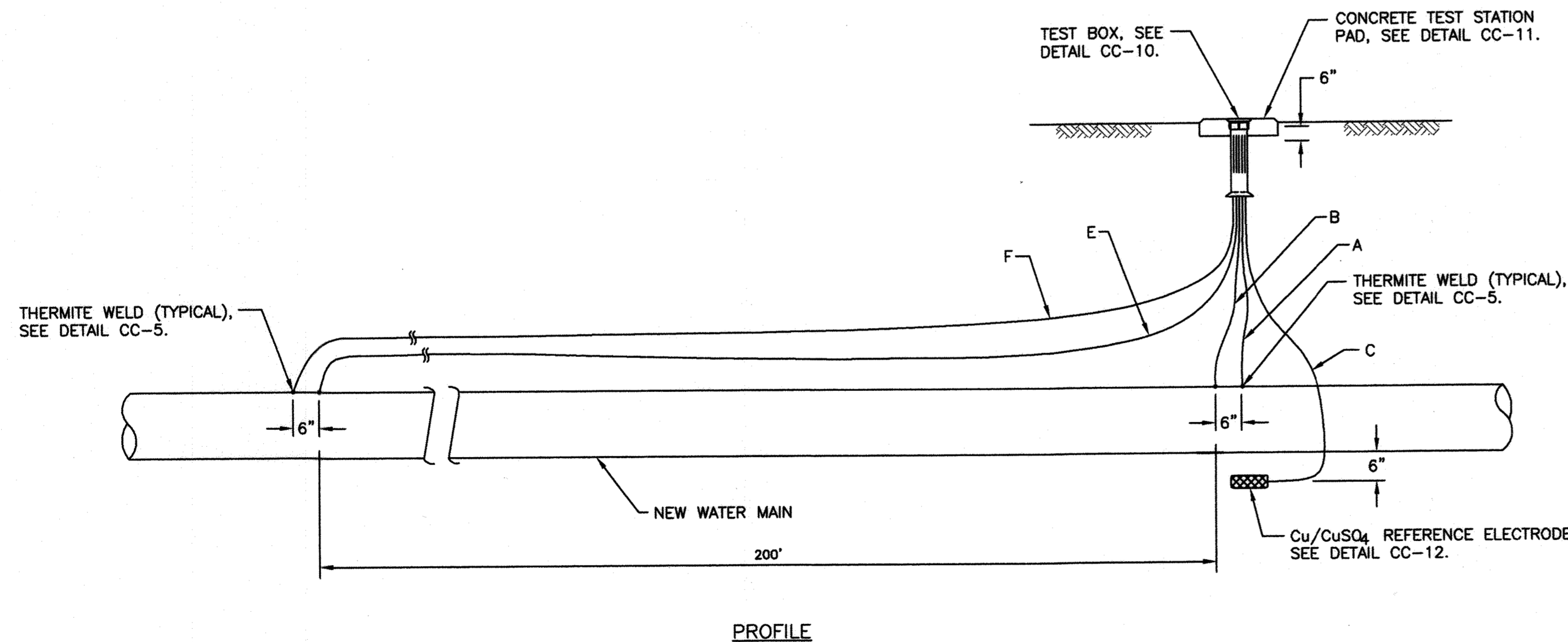
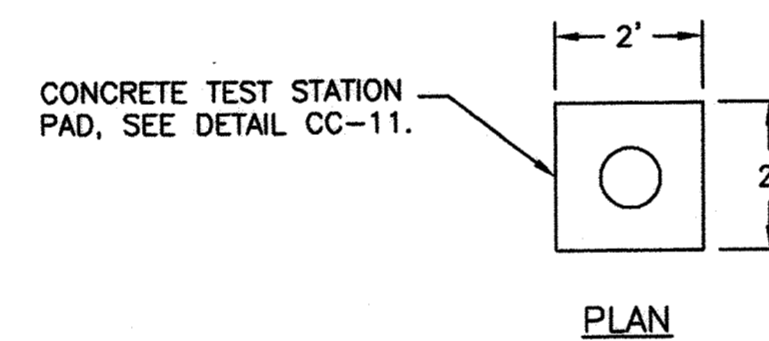
CC-2: STANDARD TEST STATION

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

NOTES:

- 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.
- 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

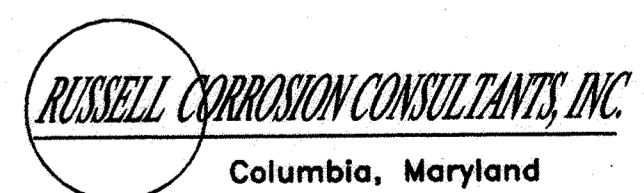
Scale: None

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:

- 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.
- ALL THERMITE WELDS TO PCCP OR BAR WRAPPED CONCRETE CYLINDER PIPE TO BE PERFORMED AT STEEL BONDING PLATES, SEE DETAIL CC-7.

RECORD DRAWINGS



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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* DATE: 2/24/16
 Chief, Bureau of Engineering: *[Signature]* DATE: *[Signature]*
 Chief, Utility Design Division: *[Signature]* DATE: *[Signature]*

G OBIEN & 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	JC	2	RECORD DRAWINGS	11/20
DRN. BY: JWW	LR	1	RECORD DRAWINGS	05/19
CHK. BY: YZ	RJD	0	AS BID	2/16
DATE: FEB. 2016	BY	NO.	REVISION	DATE

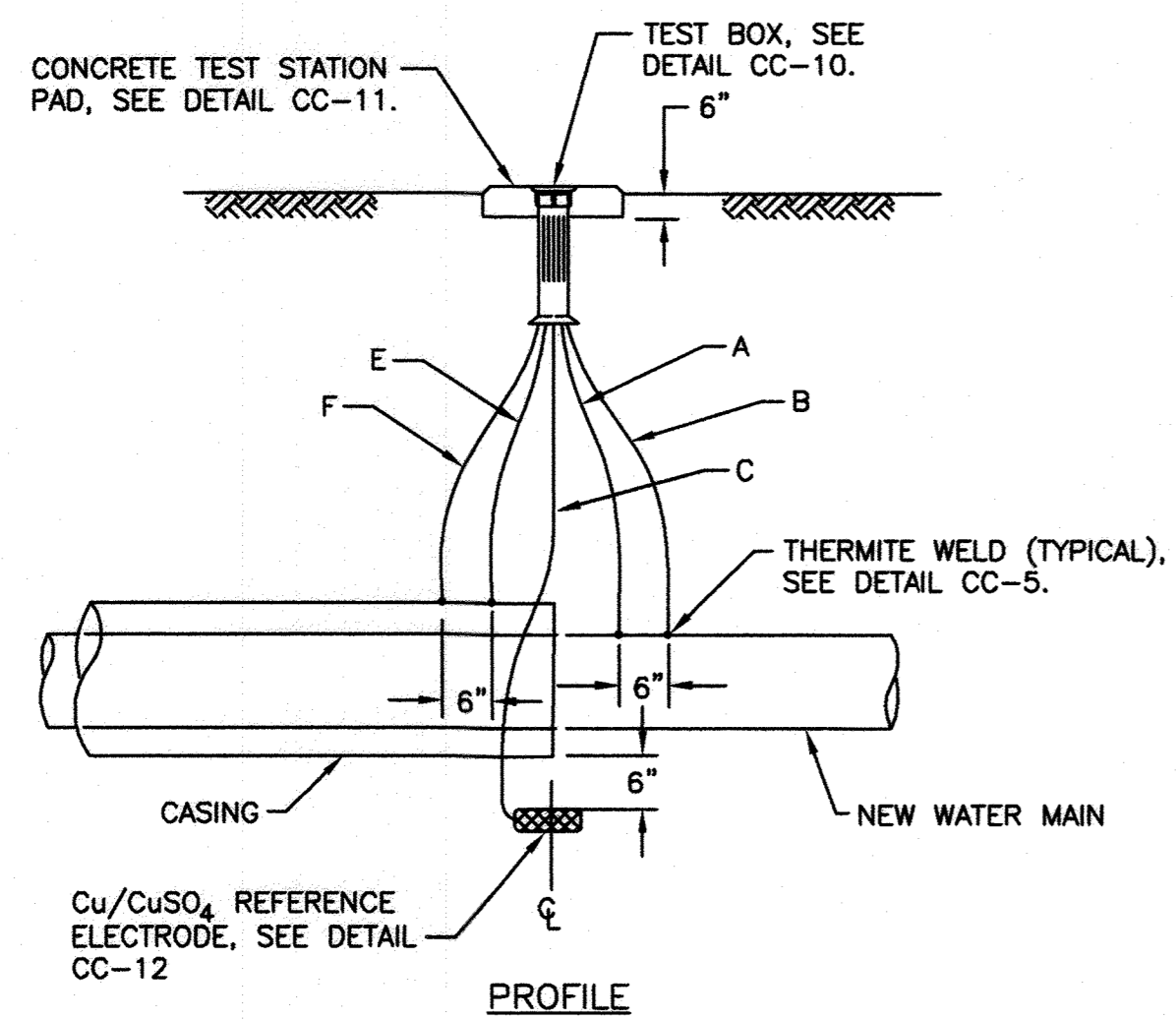
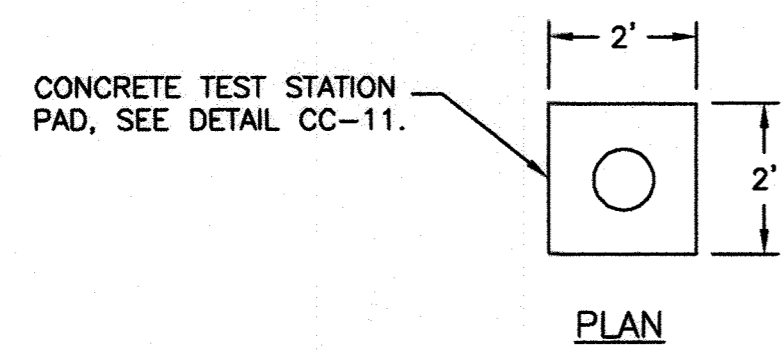
CATHODIC PROTECTION DETAILS 1

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

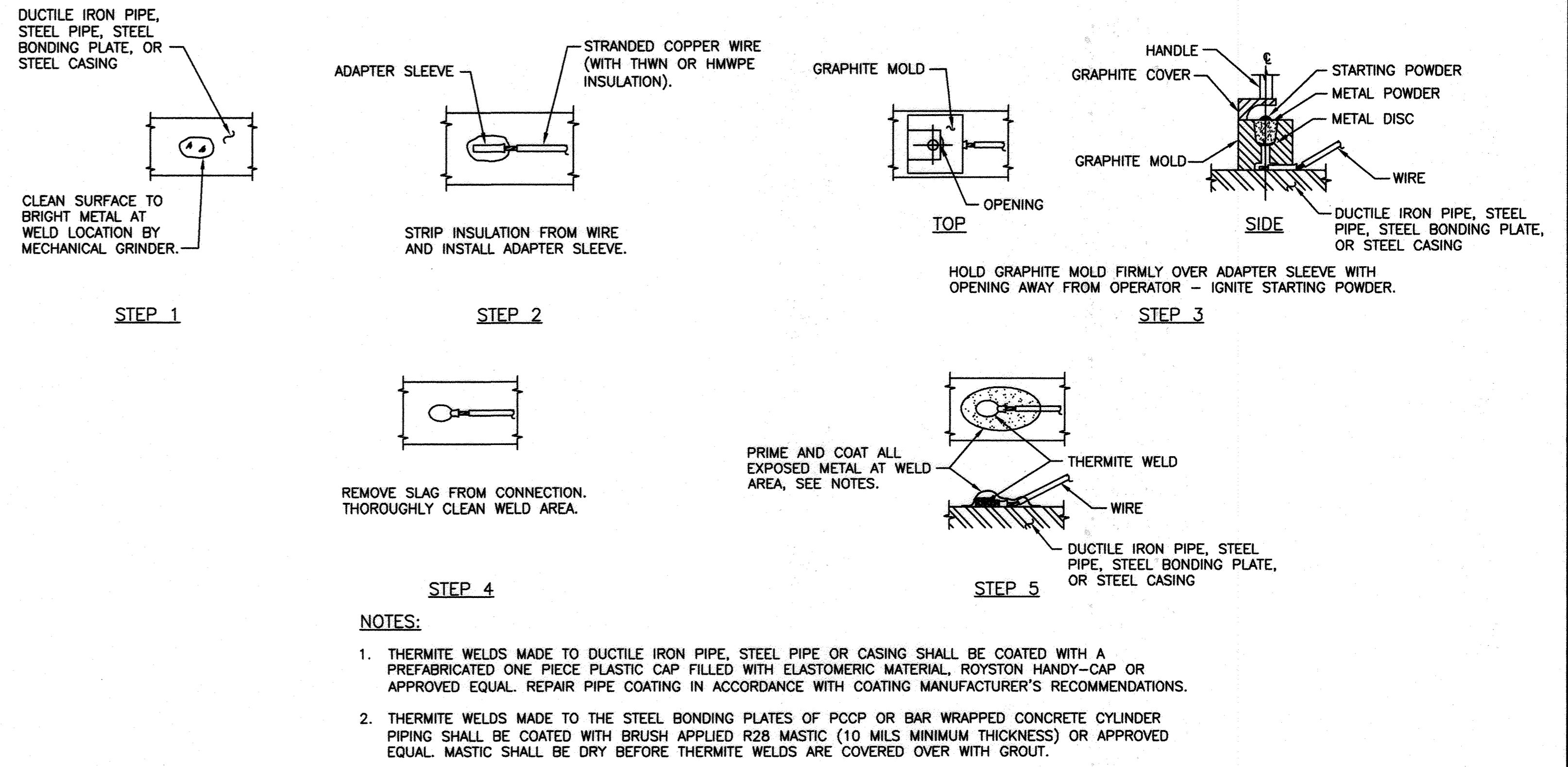
SCALE AS SHOWN
 SHEET 30 OF 38
 FILE NO. 33498



CC-4: CASING TEST STATION
Scale: None

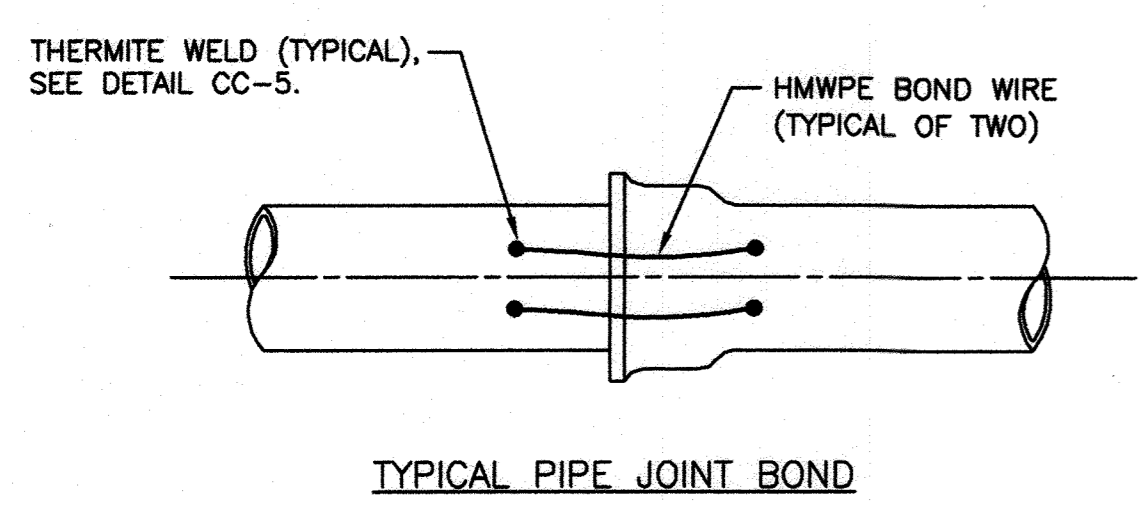
WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE OF INSULATION	COLOR OF INSULATION
NEW WATER MAIN	A	1	#8	THWN	BLUE
	B	3	#10	THWN	BLUE
PERMANENT REFERENCE ELECTRODE	C	6	#14	HMWPE	BLACK
CASING PIPE	E	2	#8	THWN	WHITE
	F	5	#10	THWN	WHITE

- NOTES:**
- 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.
 - ALL THERMITE WELDS TO PCCP OR BAR WRAPPED CONCRETE CYLINDER PIPE TO BE PERFORMED AT STEEL BONDING PLATES, SEE DETAIL CC-7.

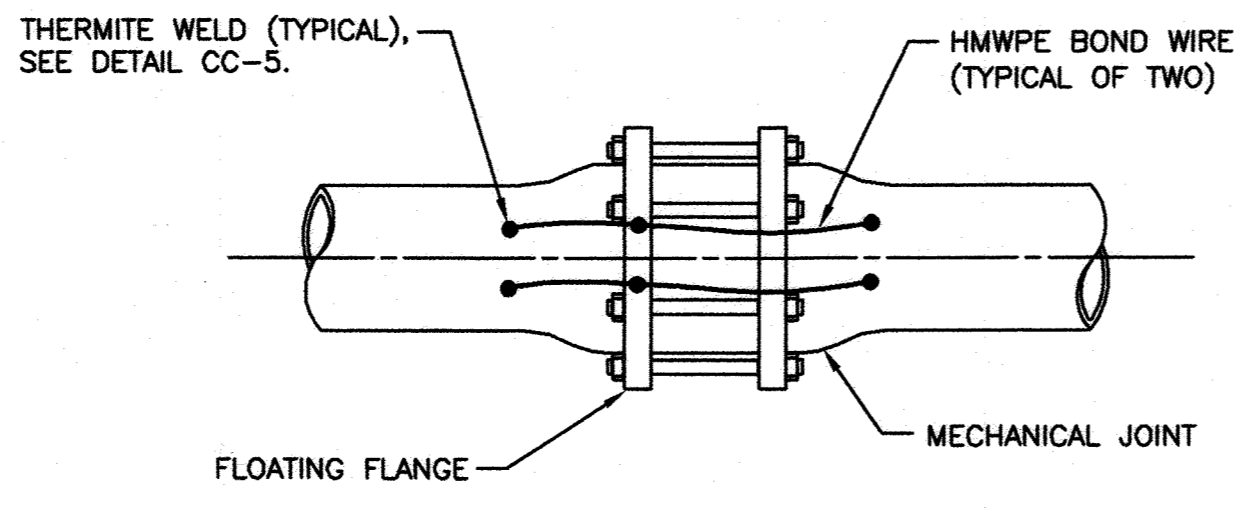


CC-5: THERMITE WELD
Scale: None

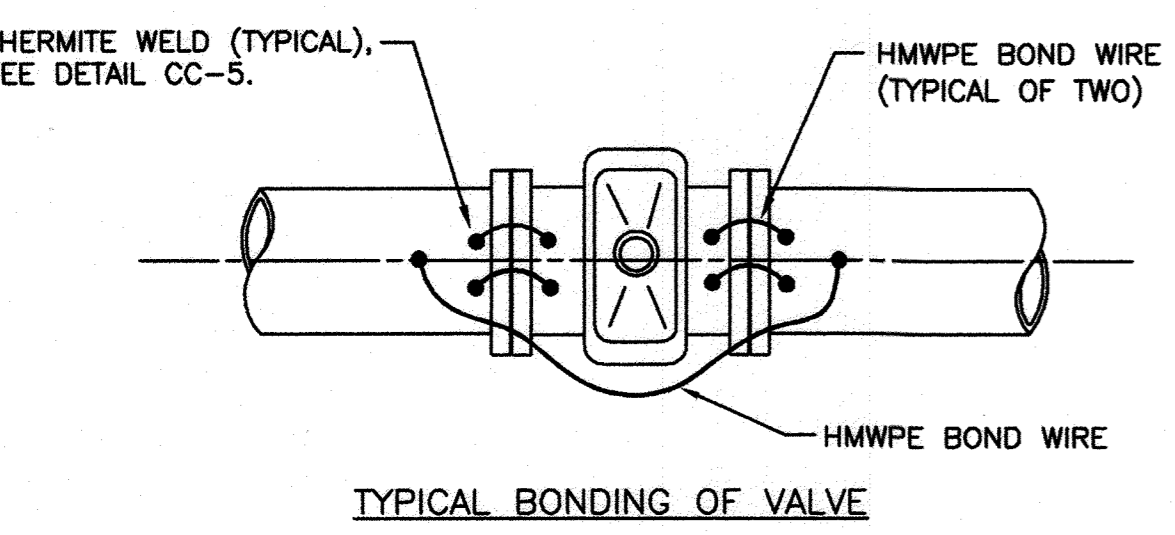
- NOTES:**
- THERMITE WELDS MADE TO DUCTILE IRON PIPE, STEEL PIPE OR CASING SHALL BE COATED WITH A PREFABRICATED ONE PIECE PLASTIC CAP FILLED WITH ELASTOMERIC MATERIAL, ROYSTON HANDY-CAP OR APPROVED EQUAL. REPAIR PIPE COATING IN ACCORDANCE WITH COATING MANUFACTURER'S RECOMMENDATIONS.
 - THERMITE WELDS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



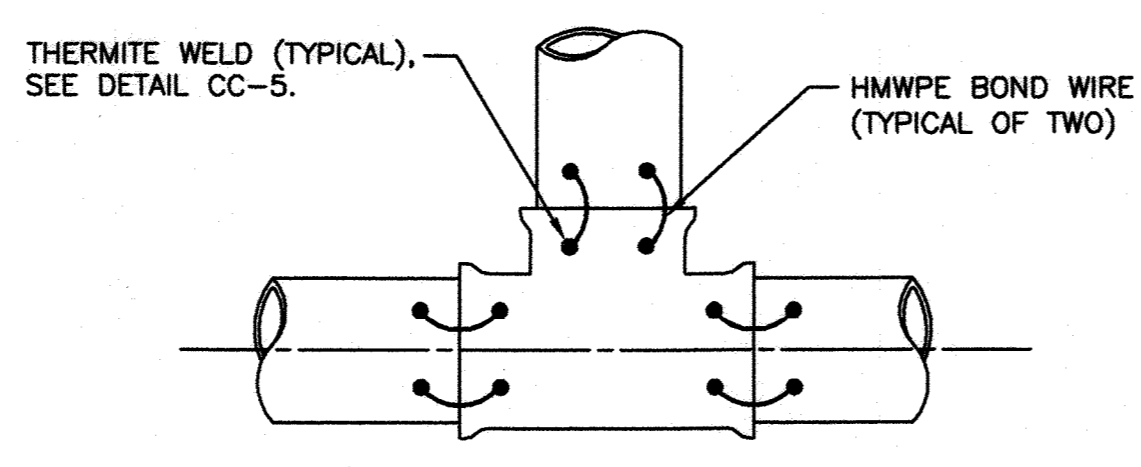
TYPICAL PIPE JOINT BOND



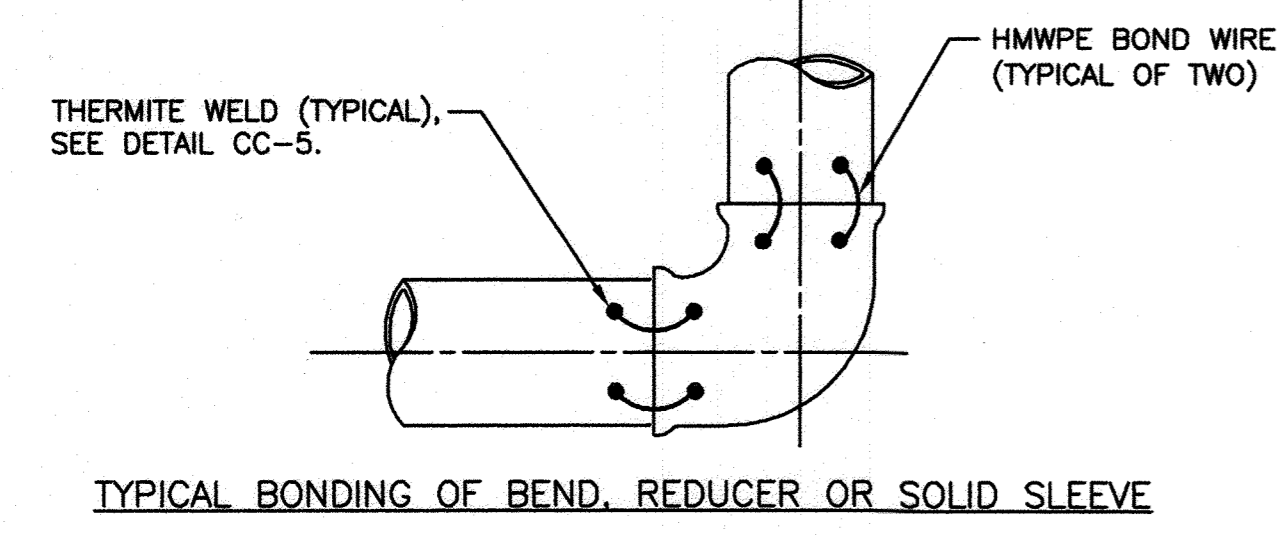
TYPICAL MECHANICAL COUPLING BOND



TYPICAL BONDING OF VALVE



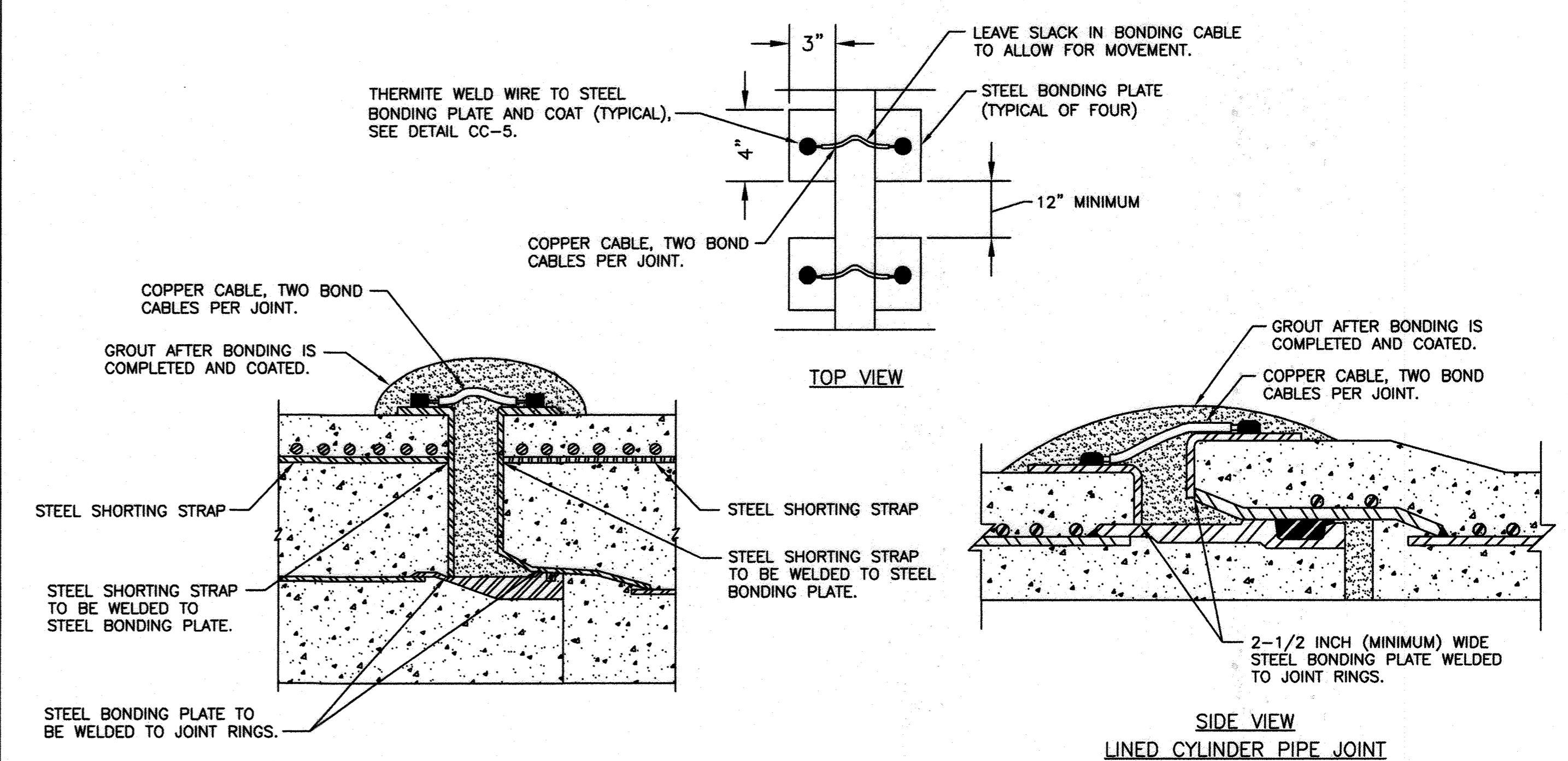
TYPICAL BONDING OF TEE



TYPICAL BONDING OF BEND, REDUCER OR SOLID SLEEVE

- NOTES:**
- BOND ALL JOINTS ON UNDERGROUND PIPING ASSOCIATED WITH THE WATER MAIN EXCEPT INSULATED JOINTS.
 - THERMITE WELD BONDING WIRES TO TOP OF PIPE OR FITTINGS, SEE DETAIL CC-5.
 - 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
 - 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



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

CC-7: CONCRETE JOINT BONDING
Scale: None

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: [Signature] DATE: 2/23/16
Chief - Bureau of Engineering: Thomas B. Kuttler DATE: 2/23/16
Chief, Bureau of Utilities: [Signature] DATE: 2/23/16
Chief, Utility Design Division: [Signature] 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.

DSN. BY: YZ			
DRN. BY: JWW			
CHK. BY: YZ			
DATE: FEB. 2016			
JC 2	RECORD DRAWINGS	11/20	
LR 1	RECORD DRAWINGS	05/19	
RJD 0	AS BID	2/16	
BY NO.	REVISION	DATE	

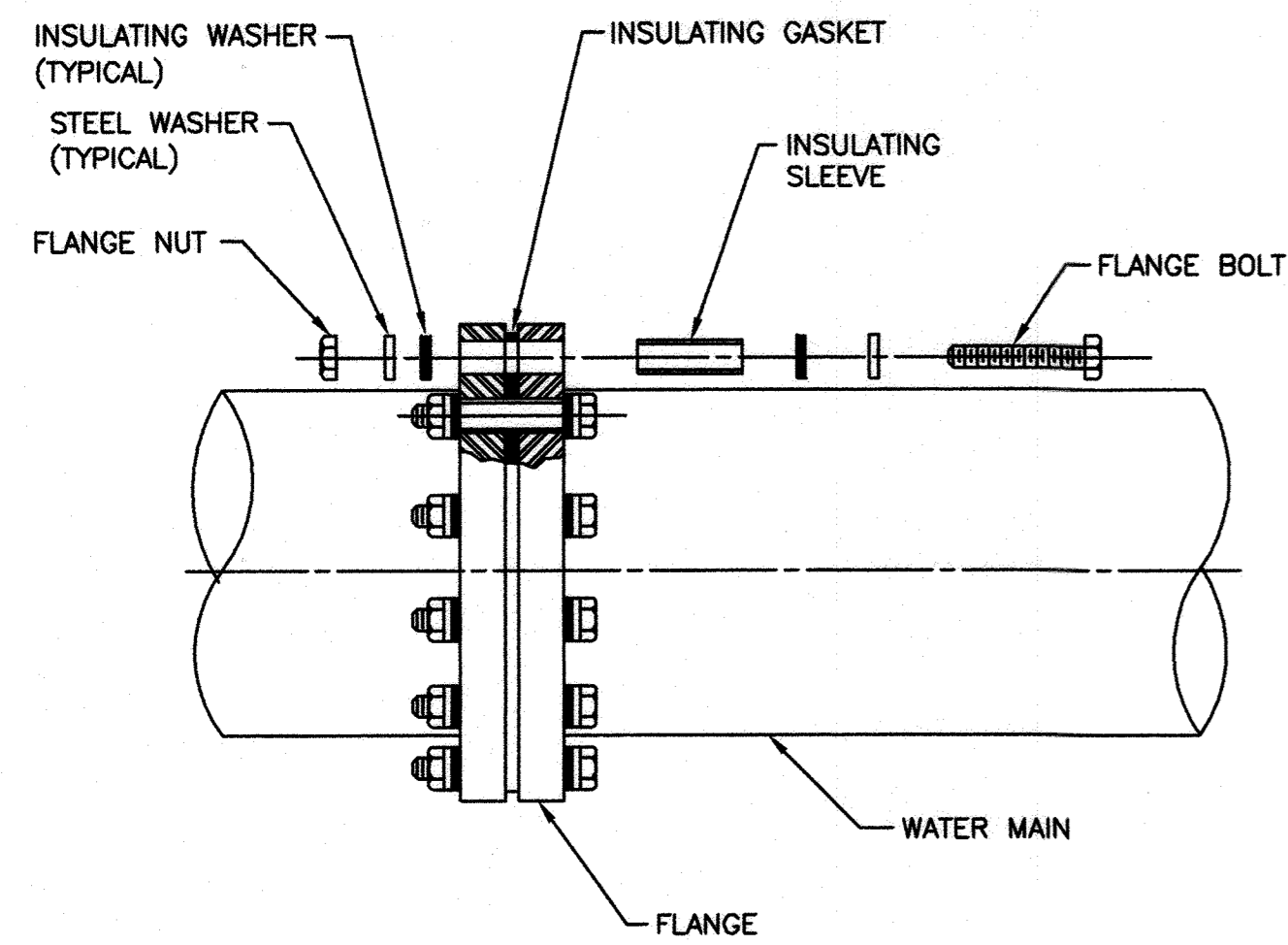
CATHODIC PROTECTION
DETAILS 2

600' SCALE MAP NO. _____ BLOCK NO. _____

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

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

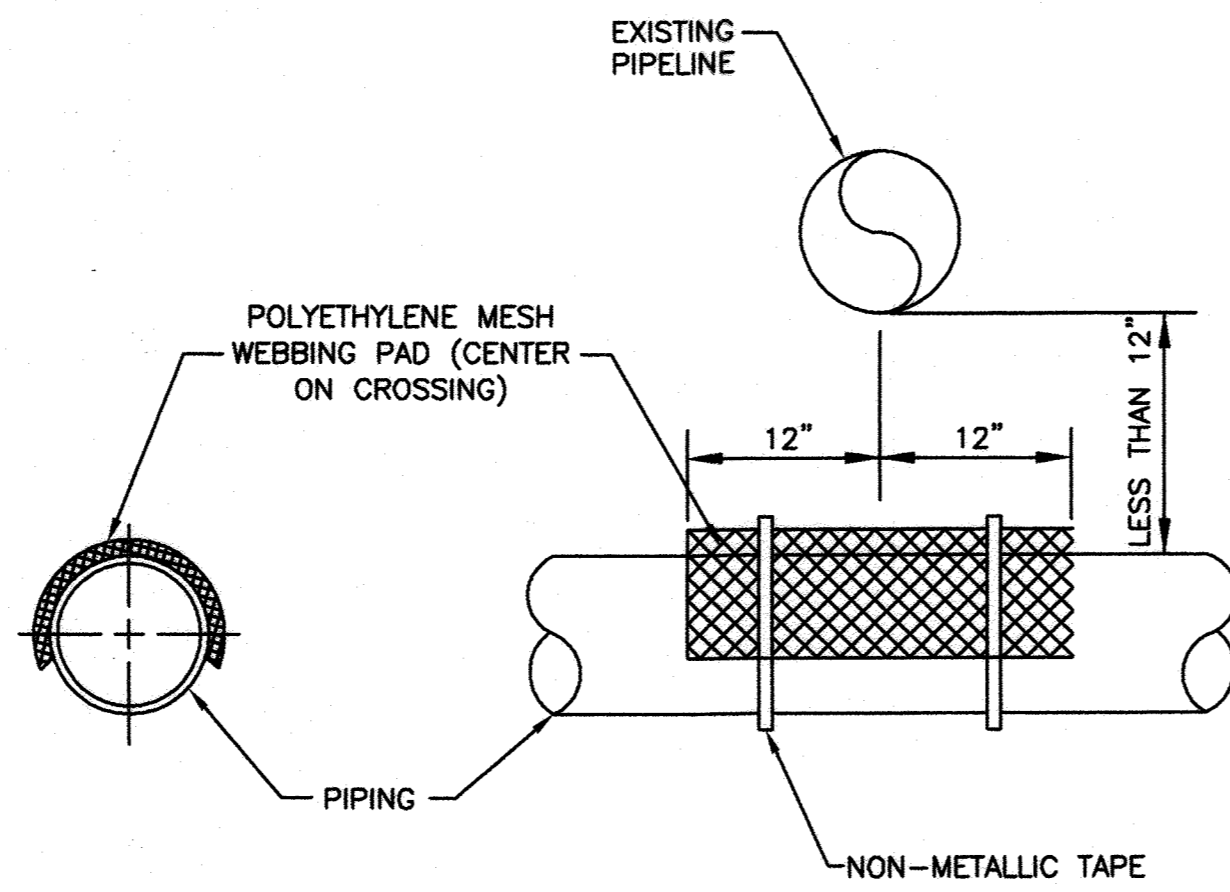
RUSSELL CORROSION CONSULTANTS, INC.
Columbia, Maryland



NOTE:
SEE SPECIFICATIONS FOR EXTERNAL COATING OF INSULATING FLANGE.

CC-8: INSULATING FLANGE

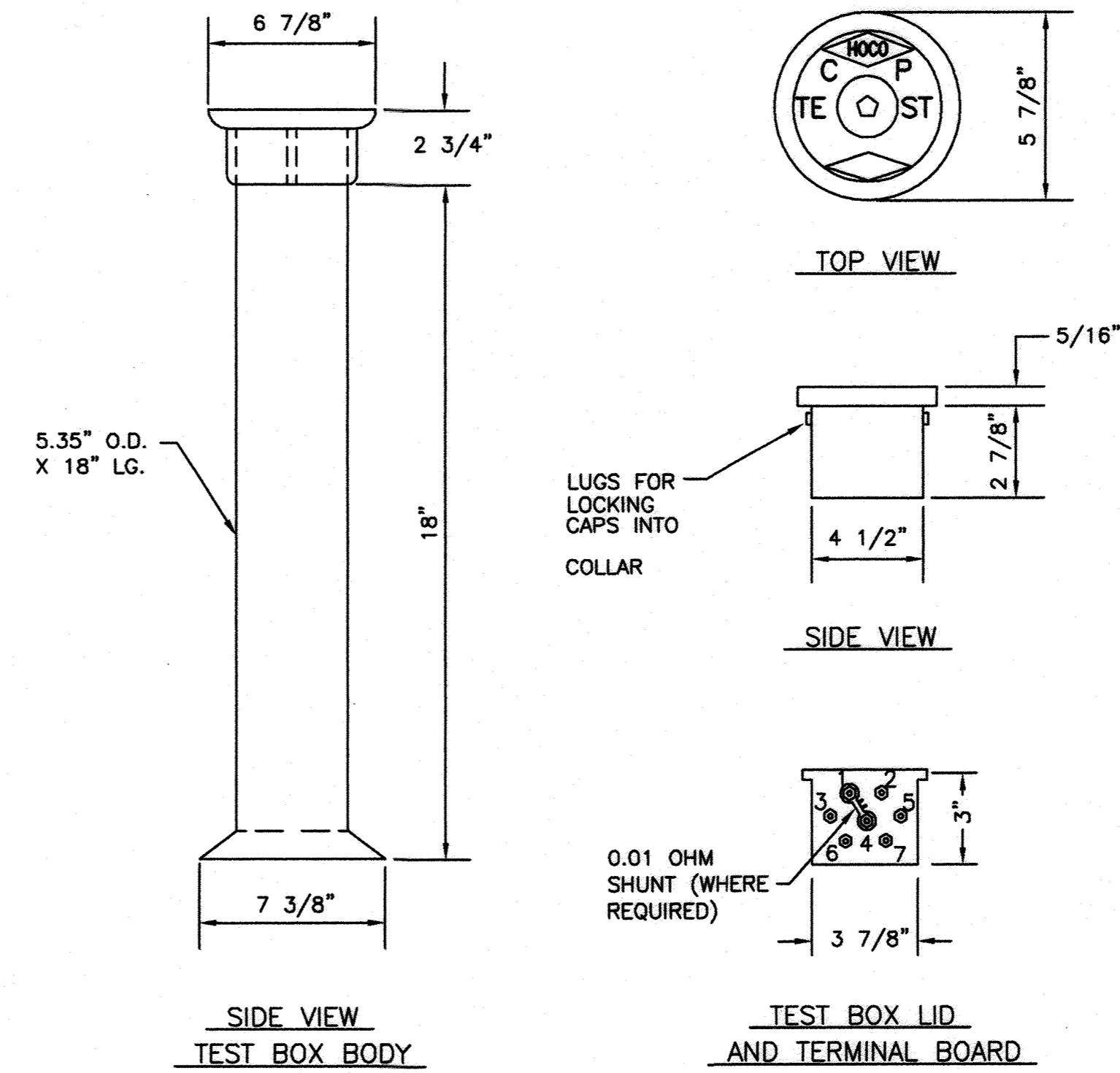
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NOTE:
USE ONLY WHEN PIPES ARE LESS THAN 12" APART.

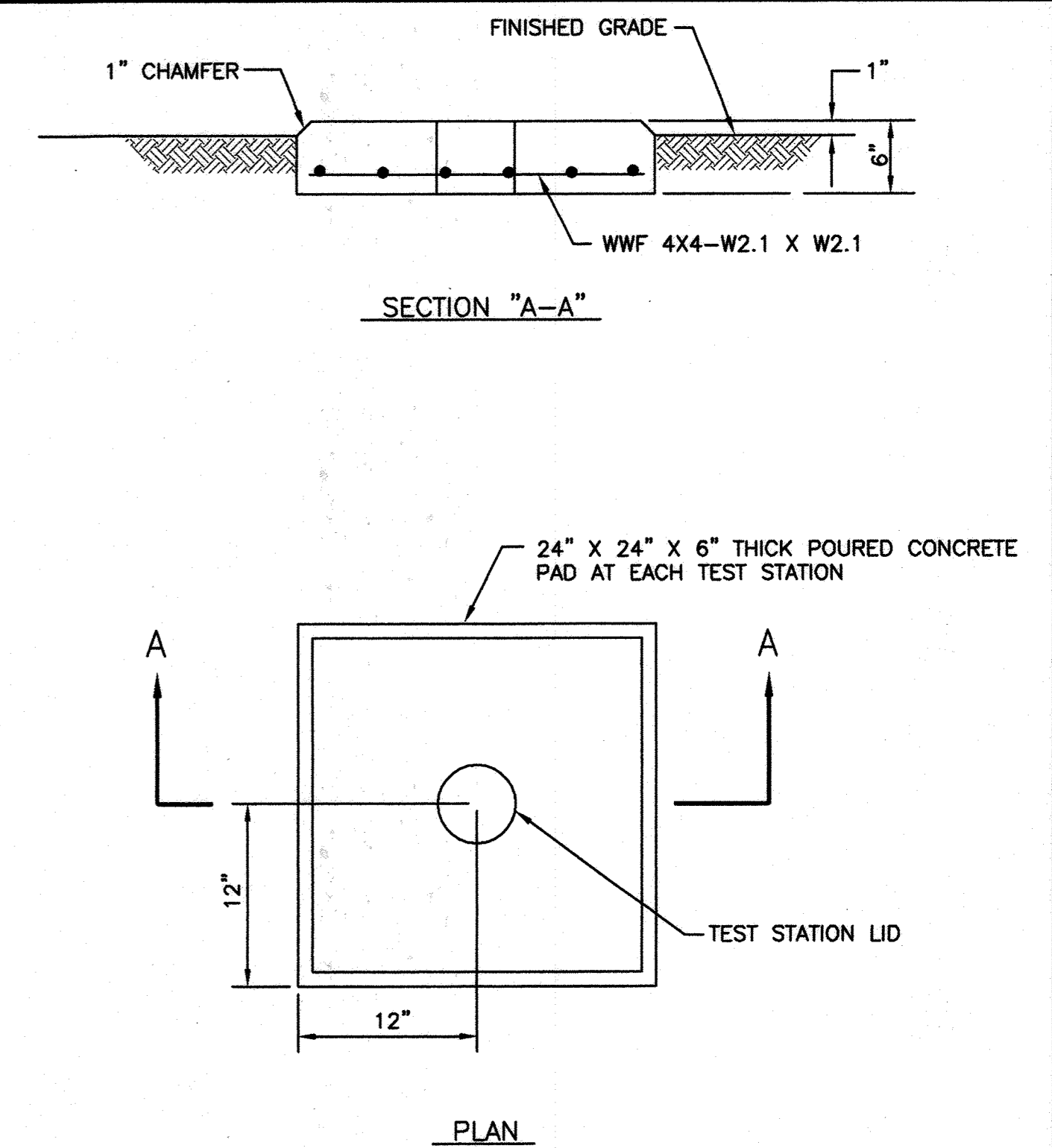
CC-9: SEPARATOR TO AVOID ELECTRICAL CONTACT

Scale: None



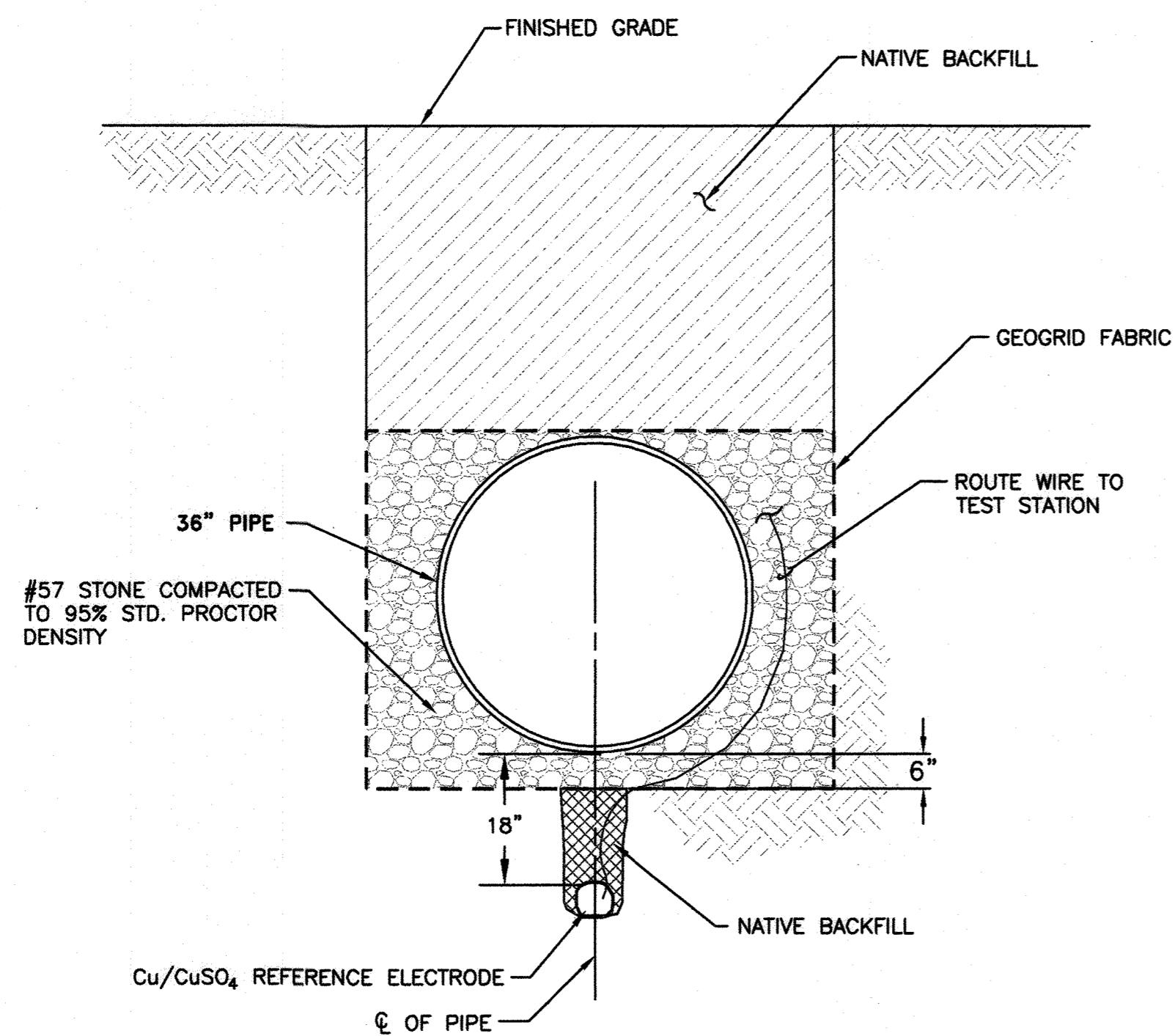
CC-10: TEST BOX

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

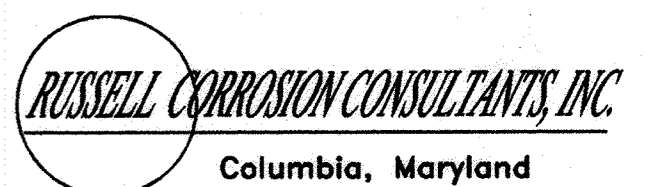
36" WATER TRANSMISSION MAIN					
TEST STATION NUMBER	STATION NUMBER	TEST STATION TYPE	NUMBER OF MANESIUM ANODES	DETAIL NUMBER	REFERENCE ELECTRODE
TEST STATION - 18	0+00	STANDARD	0	CC-2	YES
TEST STATION - 19	6+00	STANDARD	0	CC-2	YES
TEST STATION - 20	12+00	STANDARD	0	CC-2	YES
TEST STATION - 21	19+00	STANDARD	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

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RECORD DRAWINGS



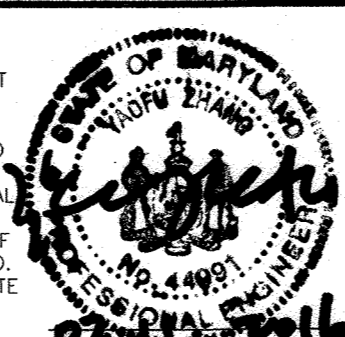
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works
2/24/16

Chief - Bureau of Engineering
2/24/16

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

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DSN. BY: YZ				
DRN. BY: JWW				
CHK. BY: YZ	JC	2	RECORD DRAWINGS	11/20
	LR	1	RECORD DRAWINGS	5/19
	RJD	0	AS BID	2/16
DATE: FEB. 2016	BY NO.		REVISION	DATE

CATHODIC PROTECTION
DETAILS 3

600' SCALE MAP NO. _____ BLOCK NO. _____

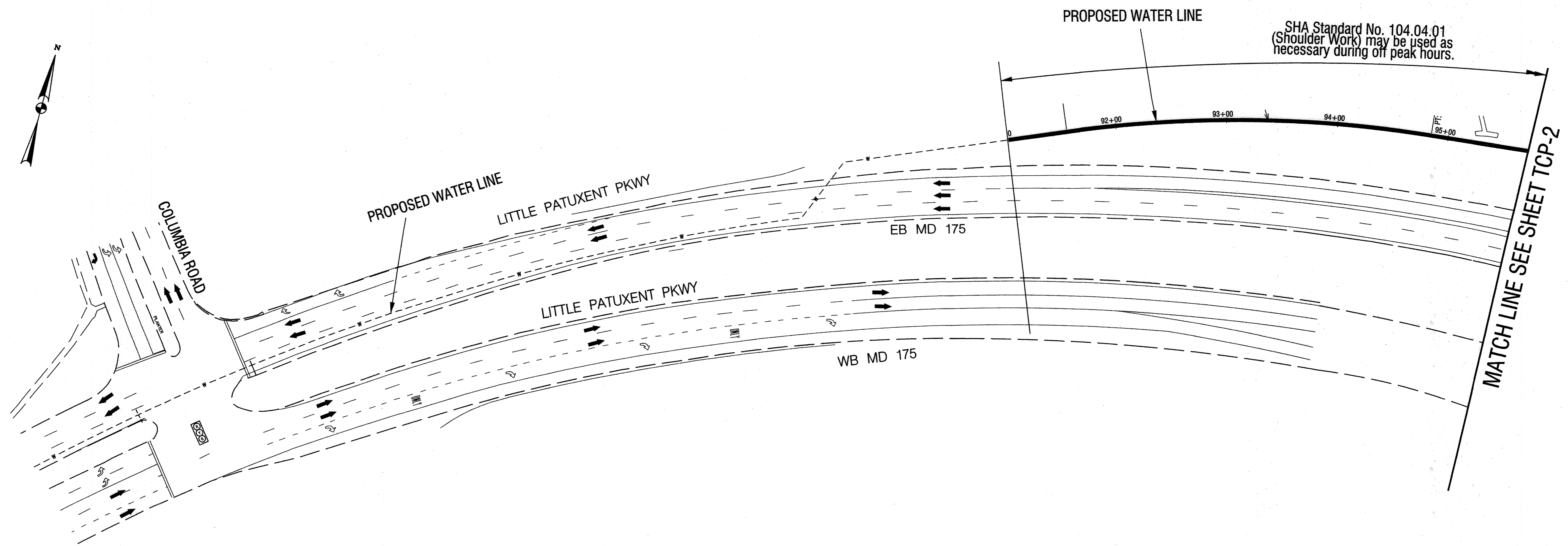
US ROUTE 29 WATER TRANSMISSION MAIN
LITTLE PATUXENT PARKWAY TO MD ROUTE 108

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

SCALE AS SHOWN

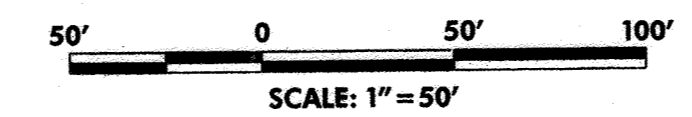
SHEET 32 OF 38

FILE NO. 33498-



KEY

- Existing Geometrics
- ← Direction of Traffic



RECORD DRAWINGS

TCP-1

PLOTTED: Tuesday, June 29, 2016 11:05:38 AM
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

The Traffic Group, Inc.
Suite 14
8800 Franklin Square Drive
Baltimore, Maryland 21236
410-831-6800
1-800-593-8411
Fax 410-831-6801
Merging Innovation and Excellence

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

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[Signature]
PROFESSIONAL ENGINEER

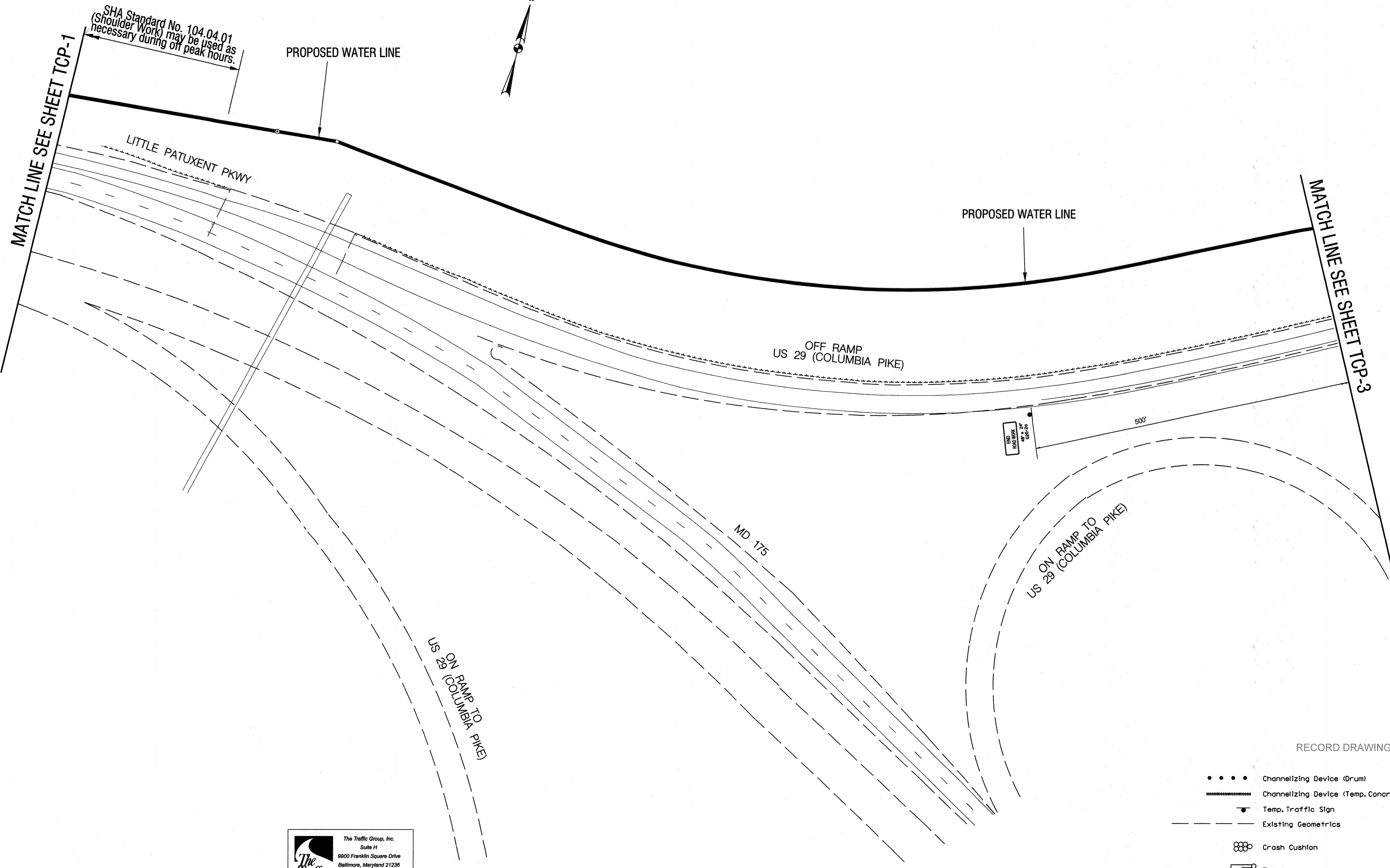
DSN. BY: F. HOECKEL				
DRN. BY: F. HOECKEL	JC	2	RECORD DRAWINGS	11/20
CHK. BY: J. DIRNDORFER	LR	1	RECORD DRAWINGS	05/19
DATE: APRIL 2016	RJD	0	AS BID	02/16
	BY	NO.	REVISION	DATE

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 33 OF 38



SHA Standard No. 104.04.01 (Shoulder Work) may be used as necessary during off peak hours.

MATCH LINE SEE SHEET TCP-1

MATCH LINE SEE SHEET TCP-3

END OF ROAD STOP SIGN 180'-00"

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-2

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STATE OF MARYLAND
THE ENGINEERING PROFESSION
FREDERICK H. KING, JR., PRESIDENT
PROFESSIONAL ENGINEER

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

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

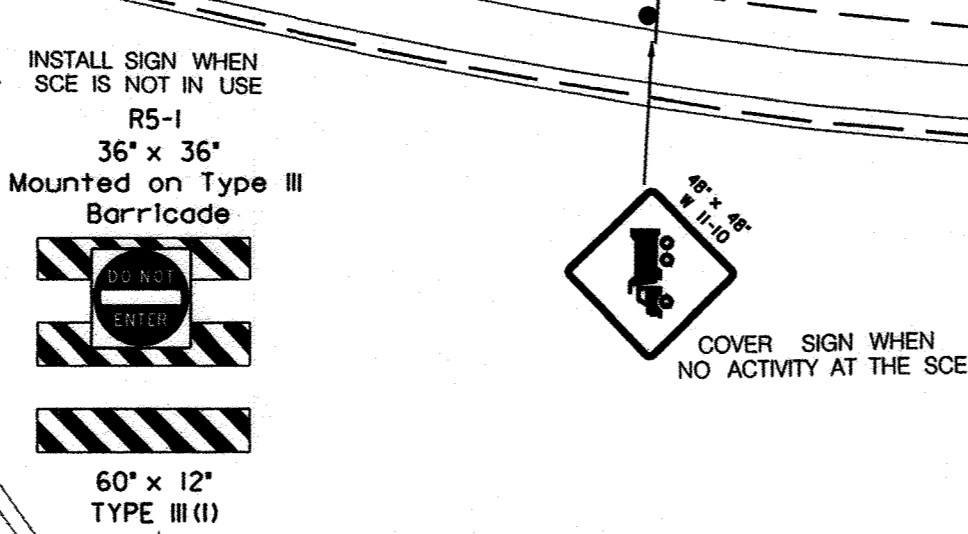
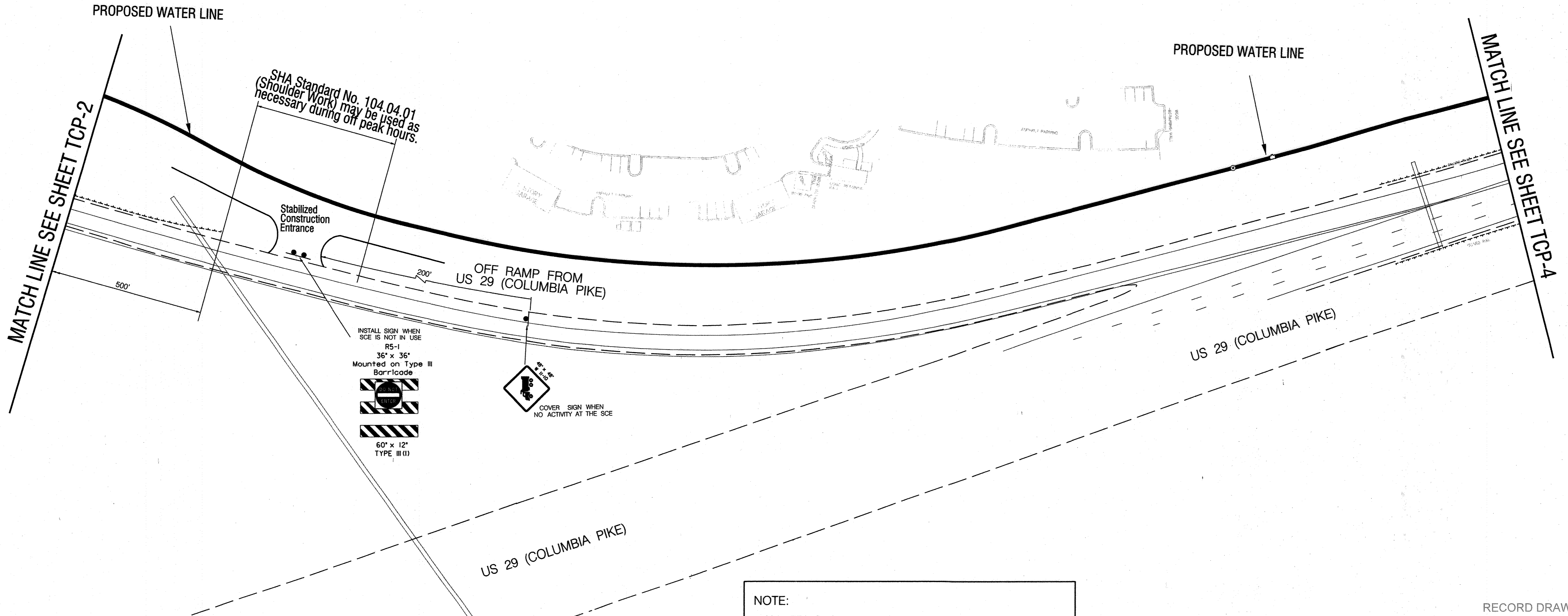
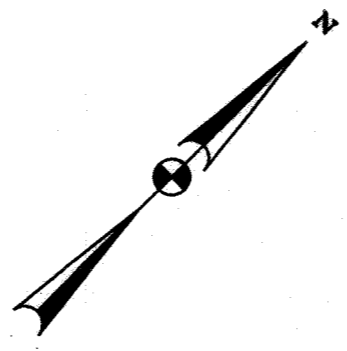
SCALE AS SHOWN
SHEET 34 OF 38

REVISIONS: 1. DATE: 01/20/16 BY: [Signature] DESCRIPTION: [Signature]
 2. DATE: 02/16/16 BY: [Signature] DESCRIPTION: [Signature]

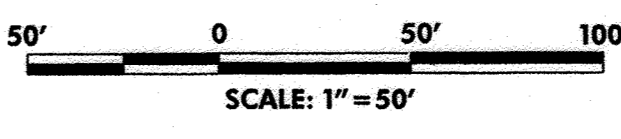
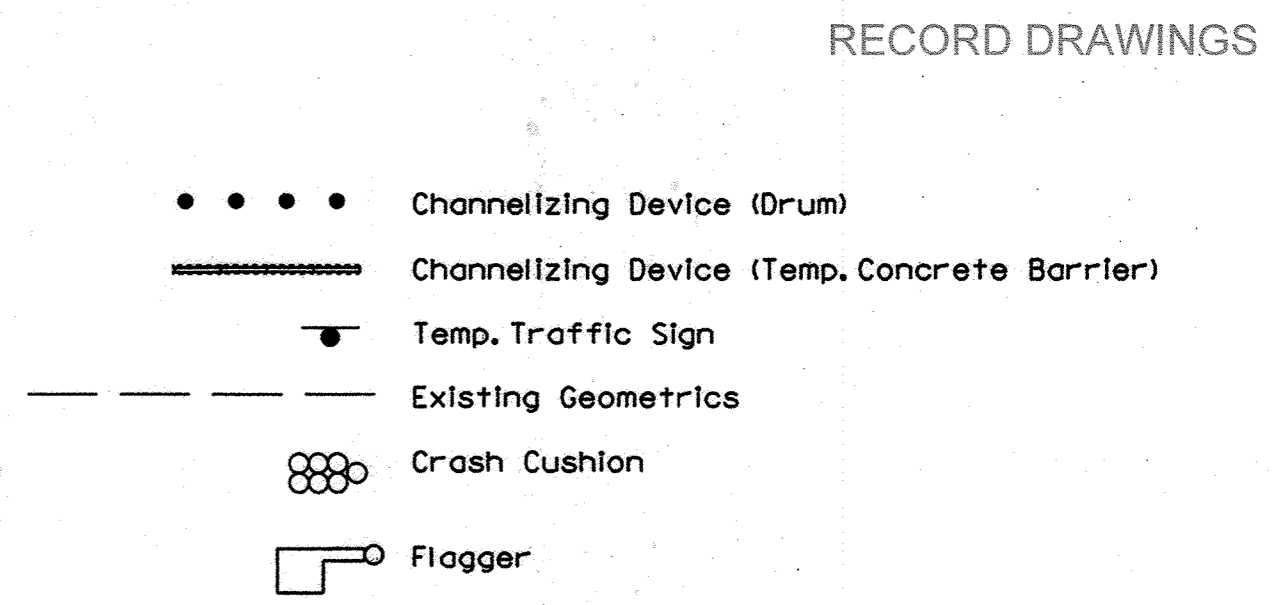
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works [Signature] DATE [Date]
 Chief, Bureau of Engineering [Signature] DATE [Date]
 Chief, Utility Design Division [Signature] DATE [Date]

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

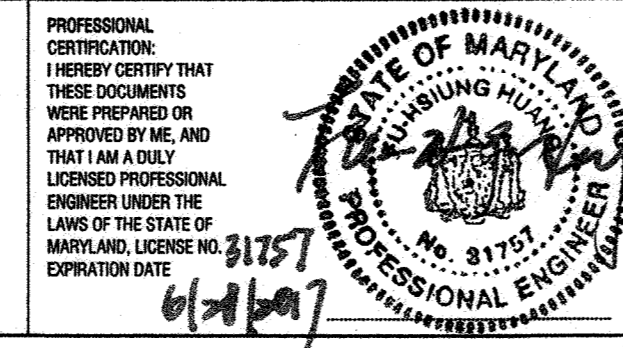


NOTE:
 ALL TRUCKS WILL DISPLAY PROPER FLASHING
 YELLOW AND 4-WAY FLASHERS IN OPERATION
 WHEN ENTERING AND EXITING SCE



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

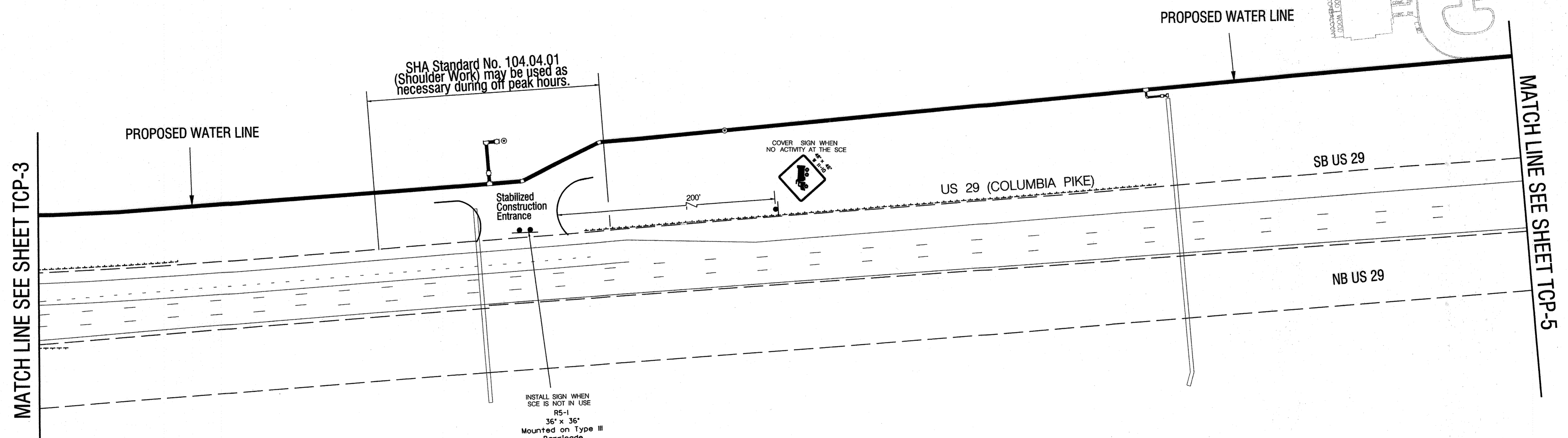
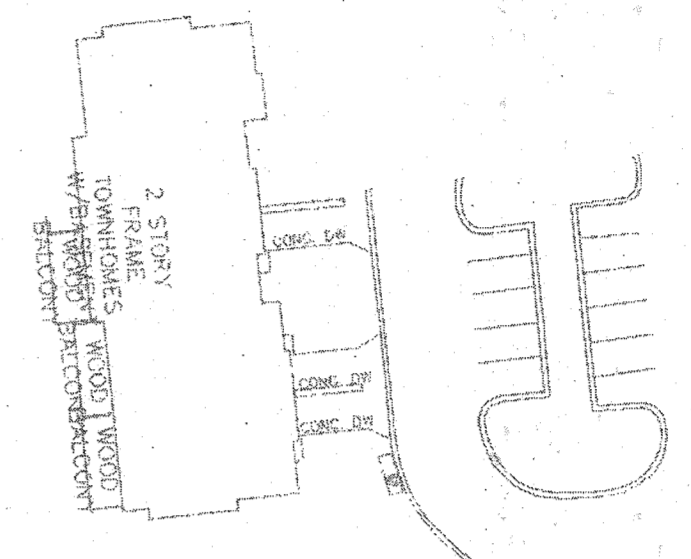
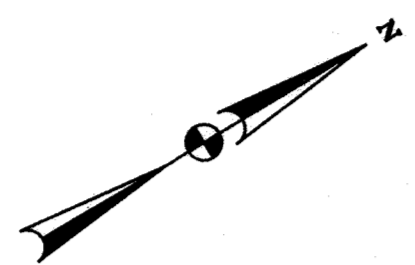
MAINTENANCE OF TRAFFIC PLAN
 600' SCALE MAP NO. 30 BLOCK NO. 36

**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

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Director of Public Works: [Signature]
 Chief - Bureau of Engineering: [Signature] 6/23/16
 Chief, Bureau of Utilities: [Signature] 6/23/16

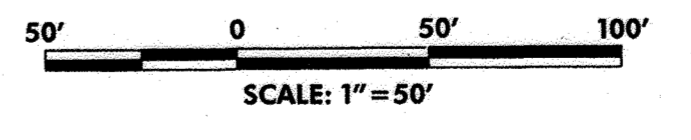
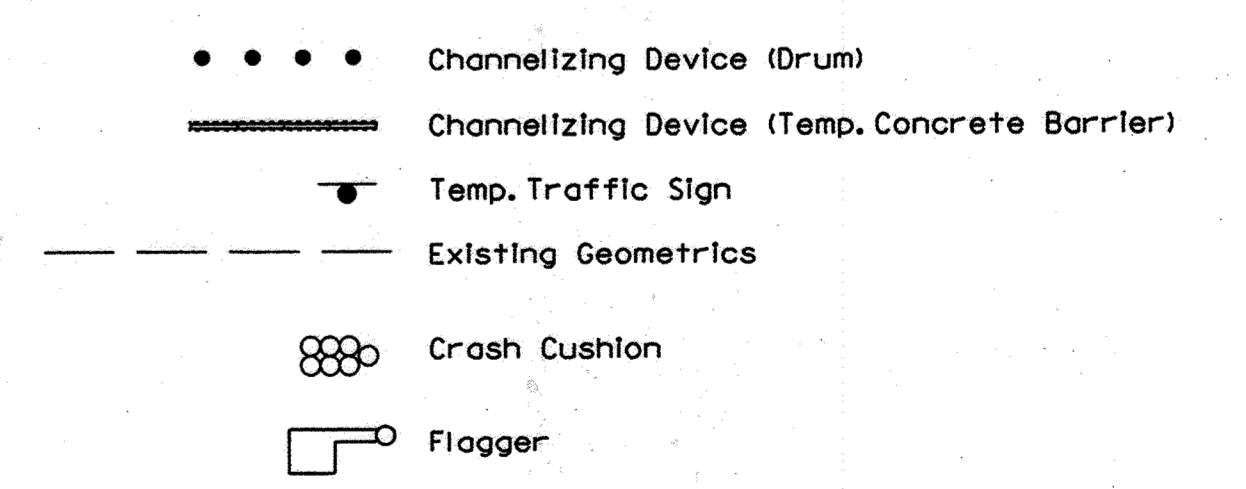
TCP-3
 SCALE AS SHOWN
 SHEET 35 OF 38

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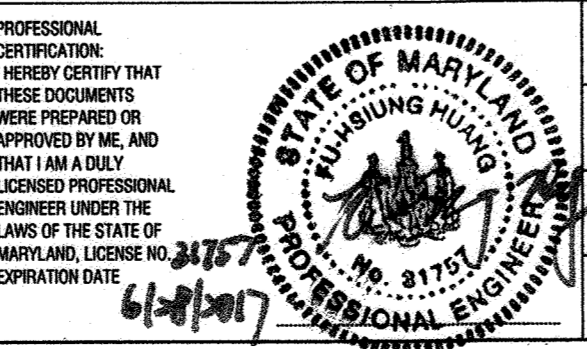
NOTE:
 ALL TRUCKS WILL DISPLAY PROPER FLASHING YELLOW AND 4-WAY FLASHERS IN OPERATION WHEN ENTERING AND EXITING SCE

RECORD DRAWINGS



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



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

MAINTENANCE OF TRAFFIC PLAN	
60' 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

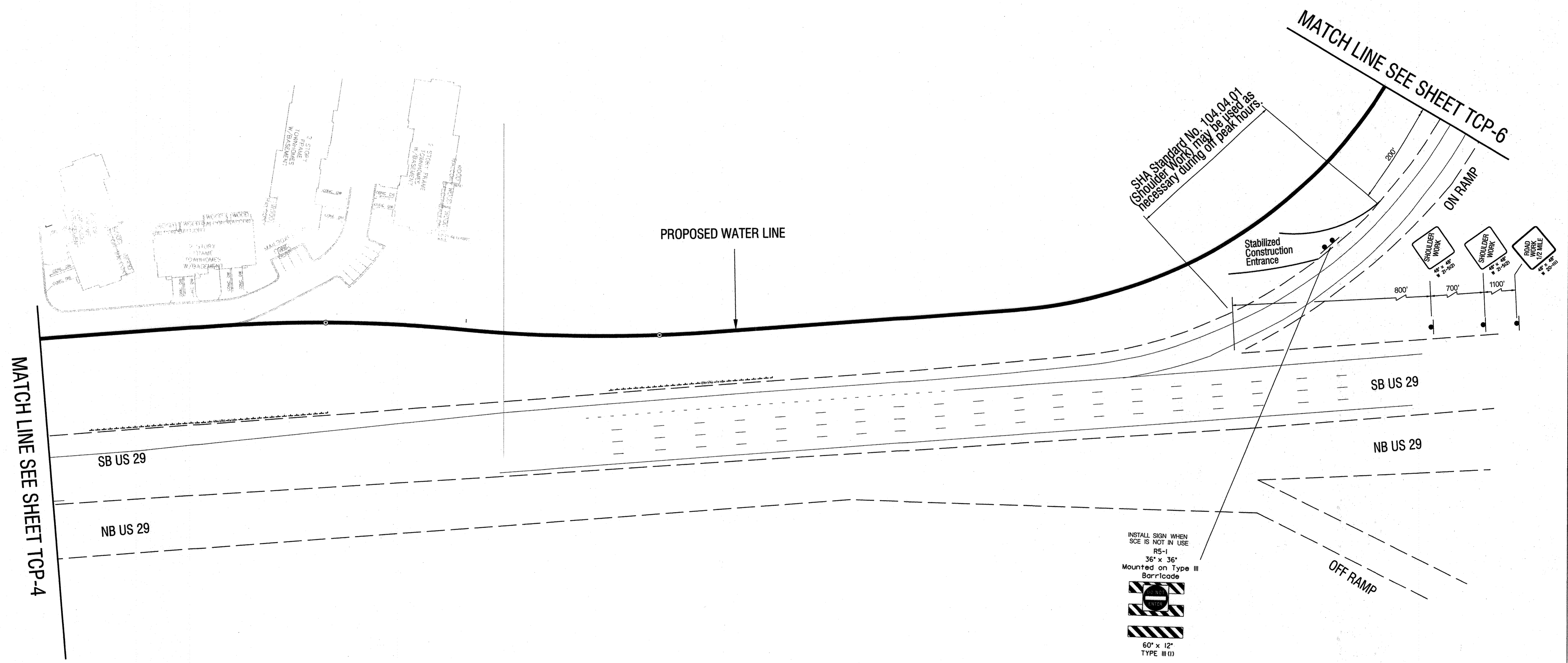
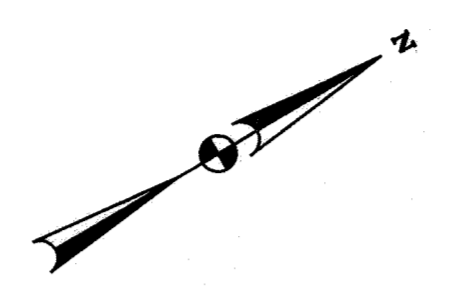
TCP-4
 SCALE AS SHOWN
 SHEET 36 OF 38

PLOTTED: TUESDAY, JANUARY 26, 2016 11:02:29 AM
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DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

J. DIRNDORFER
 CHIEF, BUREAU OF UTILITIES
 DATE: 02/16

F. BROWNLEY
 CHIEF, UTILITY DESIGN DIVISION
 DATE: 02/16



INSTALL SIGN WHEN
SCE IS NOT IN USE
R5-1
36" x 36"
Mounted on Type III
Barricade

60" x 12"
TYPE III (I)

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

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

RECORD DRAWINGS

TCP-5

PLOTTER: Tundra Jan 25 2016 11:25:44 AM
 FILE: P:\2016\2016-0000-INT\1604-001 - MD 786 to Bowen Land P

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS
 DATE: 02/16

CHIEF - BUREAU OF ENGINEERING
 DATE: 02/16

CHIEF, BUREAU OF UTILITIES
 DATE: 02/16

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"

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

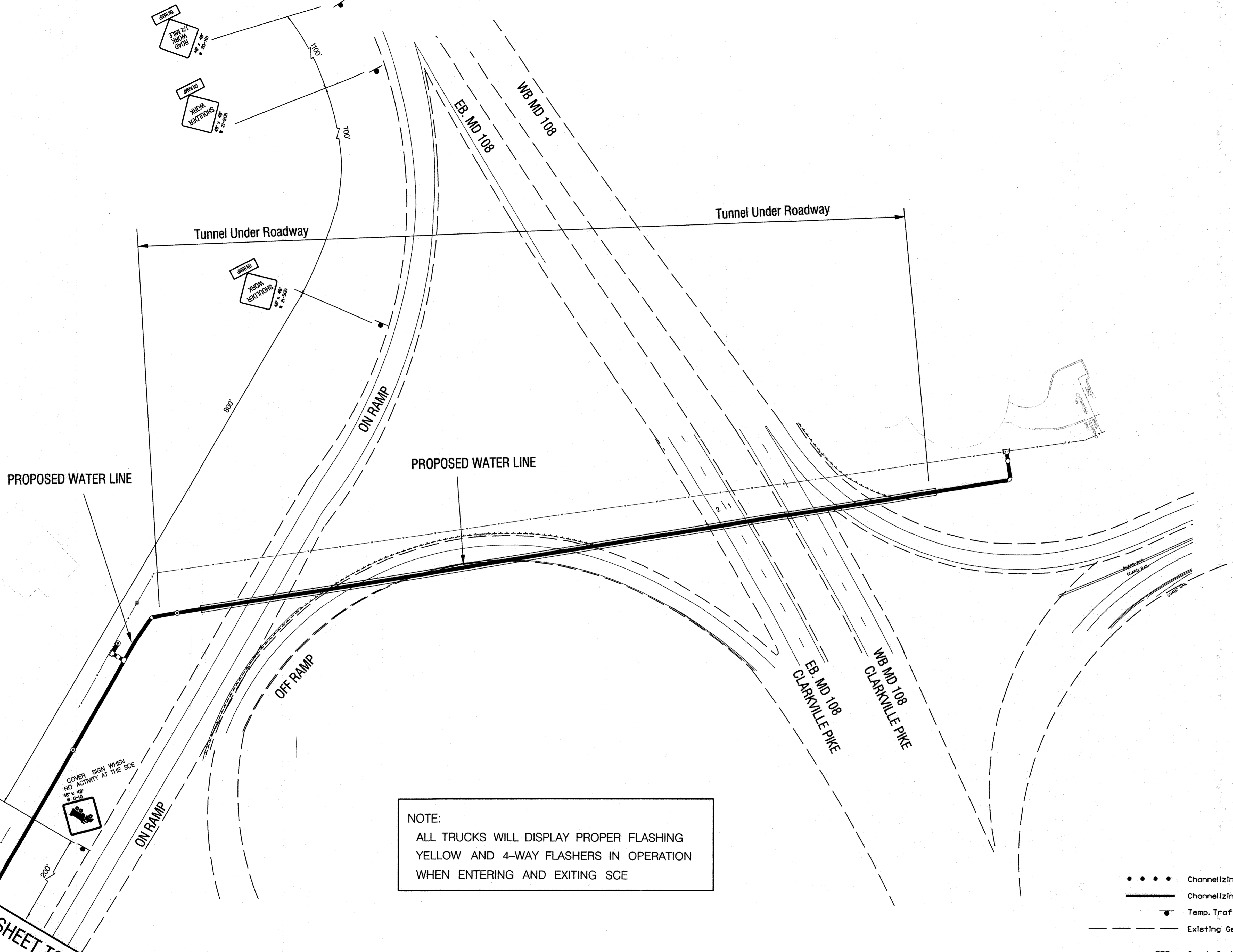
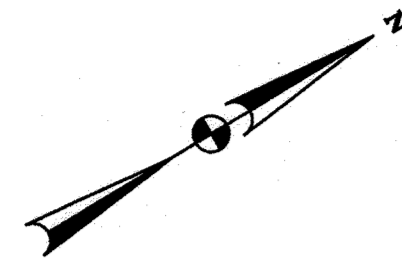
PROFESSIONAL
 CERTIFICATION:
 I HEREBY CERTIFY THAT
 THESE DOCUMENTS
 WERE PREPARED OR
 APPROVED BY ME, AND
 THAT I AM A DULY
 LICENSED PROFESSIONAL
 ENGINEER UNDER THE
 LAWS OF THE STATE OF
 MARYLAND. LICENSE NO. 21751
 EXPIRATION DATE 6/21/17

DSN. BY:	F. BROWNLEY			
DRN. BY:	F. BROWNLEY/m			
CHK. BY:	J. DIRNDORFER	JC	2	RECORD DRAWINGS
		LR	1	RECORD DRAWINGS
		RJD	0	AS BID
DATE:	FEB 2016	BY	NO.	REVISION
				DATE

MAINTENANCE OF TRAFFIC PLAN
 600' SCALE MAP NO. 30 BLOCK NO. 36

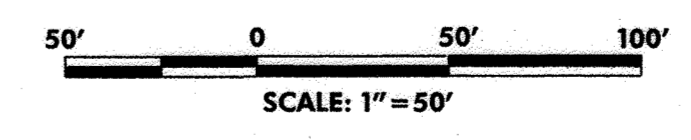
US ROUTE 29 WATER TRANSMISSION MAIN
 LITTLE PATUXENT PARKWAY TO MD ROUTE 108
 CAPITAL PROJECT: W-8286
 CONTRACT NO. 44-4930
 ELECTION DISTRICT: 5
 HOWARD COUNTY, MARYLAND

SCALE
 AS
 SHOWN
 SHEET
 37 OF 38



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

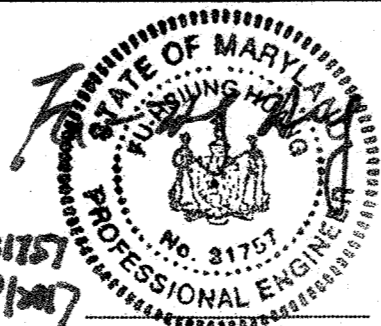
- Channelizing Device (Drum)
- Channelizing Device (Temp. Concrete Barrier)
- Temp. Traffic Sign
- Existing Geometrics
- ⊗ Crash Cushion
- ⌚ Flagger



RECORD DRAWINGS **TCP-6**

The Traffic Group, Inc.
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 4201 MITCHELLVILLE ROAD
 SUITE 500
 BOWIE, MD 20716
 PHONE: 301-731-5622



DSN BY:	F. BROWNLEY			
DRN BY:	F. BROWNLEY	JC	2	RECORD DRAWINGS
CHK BY:	J. DIRNDORFER	LR	1	RECORD DRAWINGS
DATE:	APRIL 2016	RJD	0	AS BID
BY:	NO.			REVISION
DATE:				

MAINTENANCE OF TRAFFIC PLAN 600' SCALE MAP NO. 30 BLOCK NO. 36	
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**US ROUTE 29 WATER TRANSMISSION MAIN
 LITTLE PATUXENT PARKWAY TO MD ROUTE 108**
 CAPITAL PROJECT: W-8296
 CONTRACT NO.: 44-4830
 ELECTION DISTRICT: 5
 HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]*
 Chief, Bureau of Utilities: *[Signature]*

Chief, Bureau of Engineering: *[Signature]*
 Chief, Utility Design Division: *[Signature]*

PLOTTED: Tuesday, June 21, 2016 AT 09:50 AM
 FILE: F:\2000\2000\2511\Draws\016 - MD 108 to Bowtie Lane

SCALE AS SHOWN
 SHEET 38 OF 38