

# U.S. 29 INTERCHANGE AT JOHNS HOPKINS / GORMAN ROADS AND OLD COLUMBIA ROAD 8-INCH, 12-INCH AND 16-INCH WATER MAIN RELOCATIONS

**CAPITAL PROJECT W-8212  
CONTRACT NO. 44-3868**

**GENERAL NOTES**

**PART I**

1. APPROXIMATE LOCATIONS OF EXISTING MAINS ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING MAINS AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
2. ALL HORIZONTAL CONTROLS ARE BASED ON MARYLAND STATE COORDINATES, NAD 83/91.
3. ALL VERTICAL CONTROLS ARE BASED ON NAVD 88.
4. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
5. CLEAR ALL UTILITIES BY A MINIMUM OF 1 FOOT. CLEAR ALL POLES BY 5'-0" MINIMUM OR TUNNEL AS REQUIRED UNLESS OTHERWISE NOTED. THE OWNER HAS CONTACTED THE UTILITY COMPANIES AND HAS MADE ARRANGEMENTS FOR BRACING OF POLES AS SHOWN ON THE DRAWINGS. IN THE EVENT THE CONTRACTOR'S WORK REQUIRES THE BRACING OF ADDITIONAL POLES, ANY COST INCURRED BY THE OWNER FOR THE BRACING OF ADDITIONAL POLES OR DAMAGES SHALL BE DEDUCTED FROM MONIES OWED THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO SCHEDULE THE BRACING OF THE POLES.
6. SEE THE SPECIAL PROVISIONS FOR DETAILS NOT SHOWN ON THE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS. THE CONTRACTOR SHALL HAVE A COPY OF THE SPECIAL PROVISIONS ON THE JOB.
7. WHERE TEST PITS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL ● AT THE LOCATIONS OF THE TEST PITS. A NOTE OR NOTES CONTAINING THE RESULTS OF THE TEST PIT OR PITS IS INCLUDED ON THE DRAWINGS. EXISTING UTILITIES IN THE VICINITY OF THE PROPOSED WORK FOR WHICH TEST PITS HAVE NOT BEEN DUG SHALL BE LOCATED BY THE CONTRACTOR TWO WEEKS IN ADVANCE OF CONSTRUCTION OPERATIONS AT HIS OWN EXPENSE.
8. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS.
  - AT&T CABLE HAZARD CENTER.....1-800-252-1133
  - AT&T MONROVIA, MARYLAND.....1-301-865-3801
  - BGE (CONTRACTOR SERVICES).....410-850-4620
  - BGE (UNDERGROUND DAMAGE CONTROL).....410-787-9068
  - BUREAU OF UTILITIES.....410-313-4900
  - BELL ATLANTIC MARYLAND, INC.....1-800-621-9900
  - COLONIAL PIPELINE CO.....410-795-1390
  - MISS UTILITY.....1-800-257-7777
  - STATE HIGHWAY ADMINISTRATION.....410-531-5533
9. TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS LOCATED WITHIN THE CONSTRUCTION STRIP ARE NOT TO BE REMOVED OR DAMAGED BY THE CONTRACTOR.
10. CONTRACTOR SHALL REMOVE TREES, STUMPS AND ROOTS ALONG THE LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT BID PRICE FOR CONSTRUCTION OF THE MAIN.
11. THE CONTRACTOR SHALL NOTIFY THE BUREAU OF HIGHWAYS, HOWARD COUNTY, AT (410) 313-7450 AT LEAST FIVE WORKING DAYS BEFORE OPEN CUTTING OR BORING/JACKING OF ANY COUNTY ROAD FOR LAYING WATER/SEWER MAINS OR HOUSE CONNECTIONS. THE APPROVAL OF THESE DRAWINGS WILL CONSTITUTE COMPLIANCE WITH DPW REQUIREMENTS PER SECTION 18.11(4)(d) OF THE HOWARD COUNTY CODE.
12. THE ROADWAY CONTRACTOR WILL BE THE PRIME CONTRACTOR AND WILL BE RESPONSIBLE FOR FURNISHING AND ERECTING ALL TEMPORARY SIGNING AND PRIMARY TEMPORARY CHANNELIZATION. THE UTILITY CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING FLAGGER CONTROL AND LOCALIZED TEMPORARY CHANNELIZATION TO MAINTAIN TWO-WAY TRAFFIC DURING CONSTRUCTION OF THE WATER MAINS IN THE INTERSECTING STREETS AND IN LOCALIZED AREAS WHEN CONSTRUCTING TIE-INS. ALL STANDARD REGULATORY AND WARNING SIGNS USED FOR MAINTENANCE OF TRAFFIC SHALL BE IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD LATEST EDITION) AND MARYLAND EDITION OF THE BOOKLET STANDARD HIGHWAY SIGNS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROCURE THE LATEST EDITION AND SUPPLEMENTS OF EACH OF THESE PUBLICATIONS FOR HIS/HER USE.

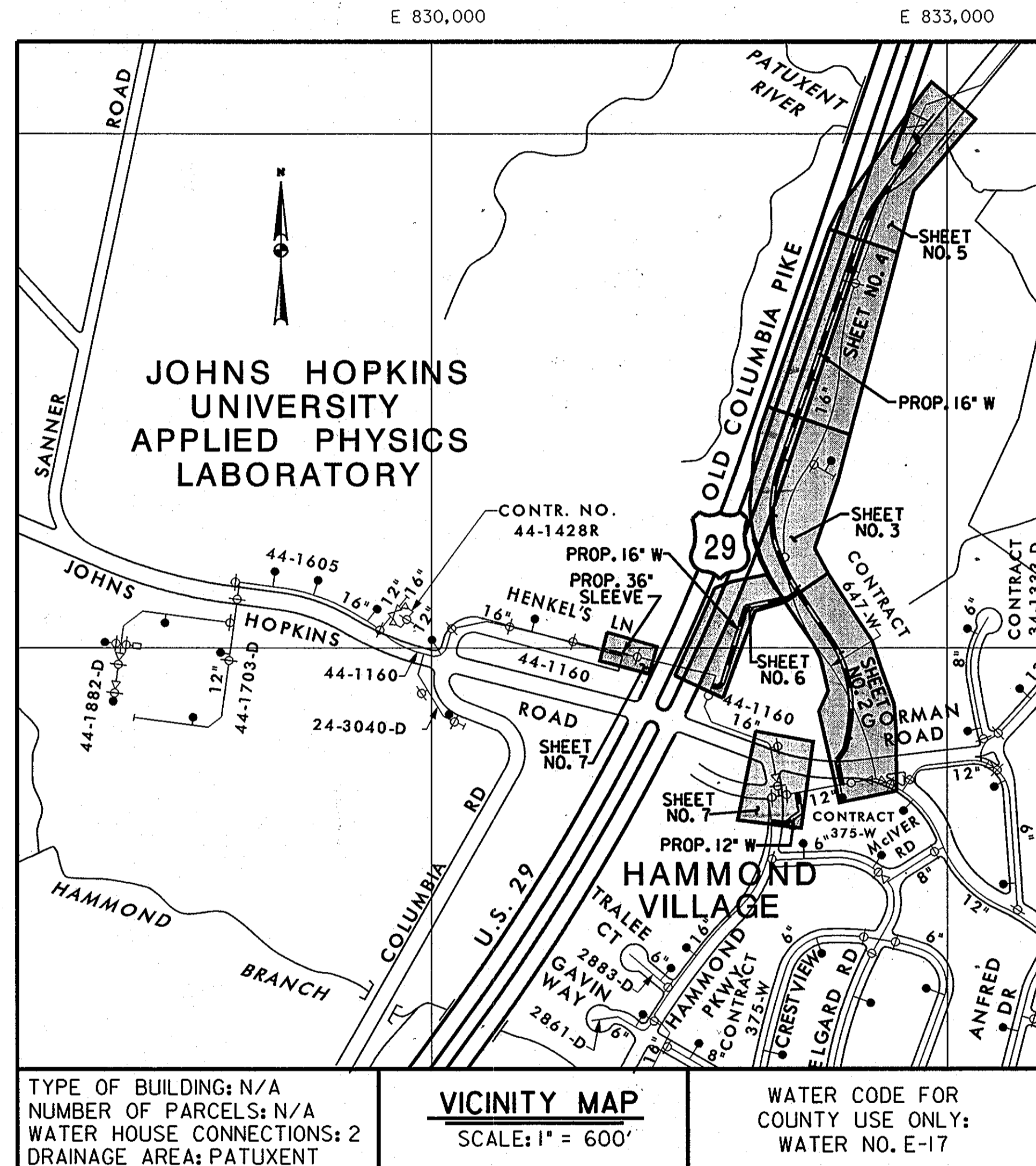
**PART II WATER**

1. ALL WATER MAINS SHALL BE D.I.P. CLASS 52.
2. TOPS OF ALL WATER MAINS SHALL HAVE A MINIMUM OF 3'-6" OF COVER UNLESS OTHERWISE NOTED.
3. VALVES ADJACENT TO TEES SHALL BE STRAPPED TO TEES.
4. ALL FITTINGS SHALL BE RESTRAINED JOINTS AND BUTTRESSED OR ANCHORED WITH CONCRETE IN ACCORDANCE WITH THE STANDARD DETAILS UNLESS OTHERWISE PROVIDED FOR ON THE DRAWINGS.
5. THE CONTRACTOR SHALL NOT OPERATE ANY WATER MAIN VALVES ON THE EXISTING WATER SYSTEM.
6. FIRE HYDRANTS SHALL BE SET TO THE BURY LINE ELEVATIONS SHOWN ON THE DRAWINGS. ALL FIRE HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD DETAILS. THE SOIL AROUND THE FIRE HYDRANT SHALL BE COMPACTED TO THE FOLLOWING PERCENTAGES OF MAXIMUM LABORATORY DENSITY AT OPTIMUM MOISTURE DETERMINED BY AASHTO METHOD T-180A:
  - A. 95% IN THE TOP TWO FEET OF THE TRENCH BELOW FINAL SUBGRADE.
  - B. 90% FROM TWO FEET BELOW FINAL SUBGRADE TO THE TOP OF THE PIPE BEDDING.

**As-Built**

ITEM	QUANTITIES		TYPE MATERIAL	SUPPLIER
	ESTIMATED	AS BUILT		
3/4" INCH WATER HOUSE SERVICE	150 L.F.		COPPER TUBING	
6 INCH WATER	282 L.F.		D.I.P. CLASS 52	
8 INCH WATER	124 L.F.		D.I.P. CLASS 52	
12 INCH WATER	116 L.F.		D.I.P. CLASS 52	
16 INCH WATER	4950 L.F.		D.I.P. CLASS 52	
36 INCH O.D. CASING	94 L.F.		3/8" THICK STEEL	
FIRE HYDRANTS	11 EA.			
2' COMBINATION AIR VALVE AND MANHOLE	1 EA.			
6 INCH RESILIENT SEATED GATE VALVES	11 EA.		AWWA C509	
8 INCH RESILIENT SEATED GATE VALVES	1 EA.		AWWA C509	
16 INCH RESILIENT SEATED GATE VALVES	4 EA.		AWWA C509	
12" X 12" TAPPING SLEEVE & VALVES (R.S.G.V.)	2 EA.		AWWA C509	
16" X 12" TAPPING SLEEVE & VALVES (R.S.G.V.)	1 EA.		AWWA C509	
16" X 16" TAPPING SLEEVE & VALVES (R.S.G.V.)	2 EA.		AWWA C509	
12 INCH LINE STOP	1 EA.		RATED TO 150 PSI	
16 INCH LINE STOP	4 EA.		RATED TO 150 PSI	

INDEX OF SHEETS	
DRAWING NO.	DESCRIPTION
U-1	TITLE SHEET
U-2	PLAN AND PROFILE - OLD COLUMBIA RD. STA. 1001+00 TO STA. 1009+50
U-3	PLAN AND PROFILE - OLD COLUMBIA RD. STA. 1009+50 TO STA. 1020+50
U-4	PLAN AND PROFILE - OLD COLUMBIA RD. STA. 1020+50 TO STA. 1031+50
U-5	PLAN AND PROFILE - OLD COLUMBIA RD. STA. 1031+50 TO STA. 1040+30
U-6	PLAN AND PROFILE - EXISTING S.H.A. SALT DOME ENTRANCE
U-7	PLAN AND PROFILE - HAMMOND PARKWAY/RAMP I AND SPUR I (BY OTHERS)
U-8	FIRE HYDRANT PROFILES, CONNECTION DETAILS, STEEL SLEEVE DETAILS
U-9	SPLIT STEEL SLEEVE DETAILS, TRENCH DETAIL, SEQUENCE OF CONSTRUCTION, COMBINATION AIR VALVE MANHOLE DETAILS
U-10	CATHODIC PROTECTION DETAILS
U-11	CATHODIC PROTECTION DETAILS
U-12	CATHODIC PROTECTION DETAILS
U-13	CATHODIC PROTECTION DETAILS
U-14	CATHODIC PROTECTION DETAILS



S.H.A. CONTRACT NO. H07415170

**DEPARTMENT OF PUBLIC WORKS**  
HOWARD COUNTY, MARYLAND  
2/28/03

THE WILSON T. BALLARD CO.  
CONSULTING ENGINEERS  
OWINGS MILLS, MARYLAND

DES: JSZ			
DWN: GFP			
CHK: KLE			
DATE: 6/28/00	BY NO.	REVISION	DATE

**TITLE SHEET**

600' SCALE MAP NO. W41 BLOCK NO.

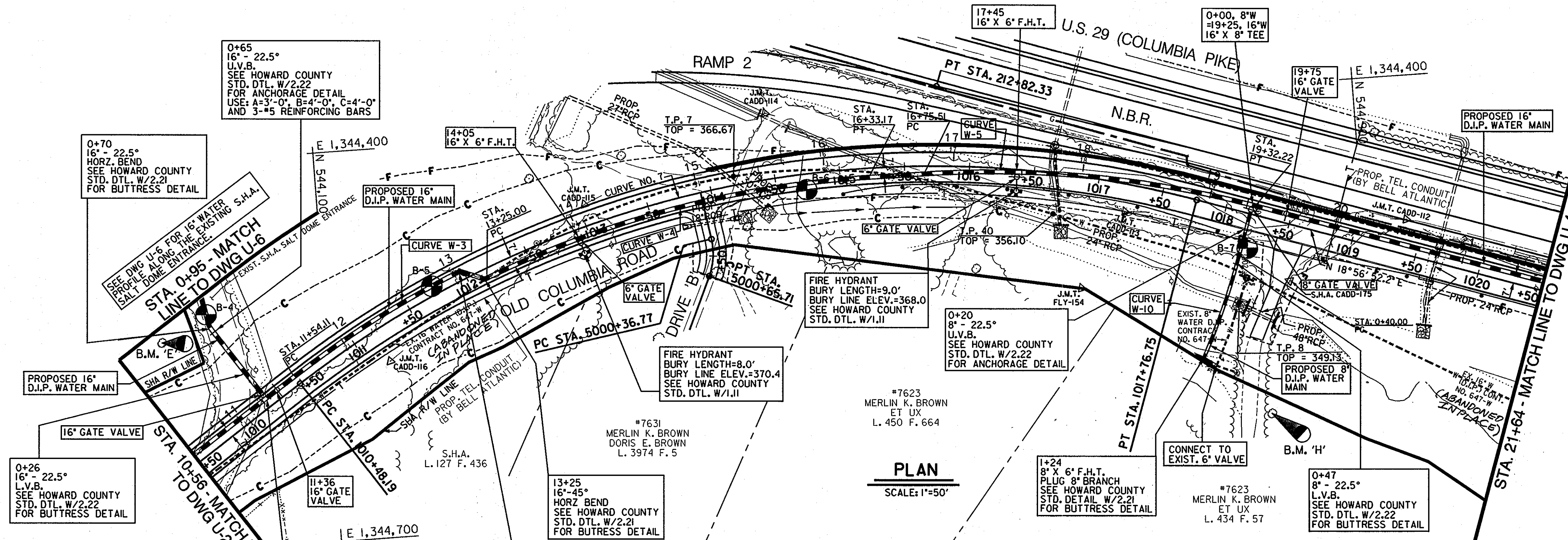
**U.S. 29 INTERCHANGE AT JOHNS HOPKINS / GORMAN ROADS AND OLD COLUMBIA ROAD**  
CAPITAL PROJECT W-8212  
CONTRACT NO. 44-3868  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
DWG U-1  
SHEET 1 OF 9



CURVE NO. 1	CURVE W-3	CURVE W-4	CURVE W-5	CURVE W-10
P.I. STA. = 1014+40.67	Δ = 12°23'45.7" RT.	Δ = 22°32'34.3" RT.	Δ = 18°23'07" RT.	Δ = 8°22'12.6" RT.
Δ = 52°49'14.2" RT.	Dc = 77.111'	Dc = 71.8'54.7"	Dc = 77.09'43.1"	Dc = 9°57'52"
Dc = 74.15'00"	R = 797.29'	R = 783.24'	R = 800.00'	R = 575.00'
T = 740.29'	T = 86.59'	T = 156.10'	T = 129.47'	T = 42.07'
L = 392.48'	L = 172.49'	L = 308.17'	L = 256.71'	L = 84.00'
E = 728.56'	E = 4.69'	E = 15.40'	E = 10.41'	E = 1.54'

WATER STAKEOUT DATA				
WATER STA.	DESCRIPTION	ROADWAY STATION & OFFSET	NORTHING	EASTING
11+36, 16' W	16" GATE VALVE	OLD COLUMBIA RD. STA. 1010+30.08, 7.00' LT.	544058.3412	1344580.8914
11+54.11, 16' W	PC	OLD COLUMBIA RD. STA. 1010+48.19, 7.00' LT.	544073.3761	1344570.7988
13+05.00, 16' W	16"-45° HZ. BEND, P.T.	OLD COLUMBIA RD. STA. 1011+97.76, 6.88' LT.	544205.8918	1344499.1252
13+25.00, 16' W	16"-45° HZ. BEND, P.C.	OLD COLUMBIA RD. STA. 1012+12.12, 7.04' LT.	544224.4842	1344506.4956
14+05, 16' W	F.H.	OLD COLUMBIA RD. STA. 1012+91.94, 7.00' RT.	544298.9665	1344480.6985
16+33.17, 16' W	PT	OLD COLUMBIA RD. STA. 1015+23.06, 7.04' RT.	544525.3259	1344449.5617
16+75.51, 16' W	PC	OLD COLUMBIA RD. STA. 1015+65.74, 5.90' RT.	544567.6663	1344449.9719
17+45, 16' W	F.H.	OLD COLUMBIA RD. STA. 1016+36.51, 2.04' RT.	544638.0656	1344453.7605
19+32.22, 16' W	PT	OLD COLUMBIA RD. STA. 1018+22.11, 7.00' LT.	54489.5841	1344493.2488
19+60, 16' W	16" GATE VALVE	OLD COLUMBIA RD. STA. 1018+45.98, 7.00' LT.	544842.1088	1344501.6663
0+00, 16' W	16" X 16" TEE	OLD COLUMBIA RD. STA. 1010+20.26, 7.00' LT.	544050.1882	1344586.3643
0+26, 16' W	16" - 22.5° L.V.B.	OLD COLUMBIA RD. STA. 1010+20.26, 33.00' LT.	544035.6972	1344564.7770
0+65, 16' W	16" - 22.5° U.V.B.	OLD COLUMBIA RD. STA. 1010+20.26, 72.00' LT.	544013.9606	1344532.3961
0+70, 16' W	16"-22.5° HORIZ. BEND	OLD COLUMBIA RD. STA. 1010+20.26, 77.00' LT.	544011.739	1344528.2448
0+00, 8" W	16" X 8" TEE	OLD COLUMBIA RD. STA. 1018+18.98, 7.00' LT.	544816.5718	1344492.3992
0+20, 8" W	8" - 22.5° U.V.B.	OLD COLUMBIA RD. STA. 1018+18.98, 13.00' RT.	544810.0776	1344511.3155
0+40, 8" W	PC	OLD COLUMBIA RD. STA. 1018+18.98, 33.00' RT.	544803.5835	1344530.2318
0+47, 8" W	8" - 22.5° L.V.B.	OLD COLUMBIA RD. STA. 1018+18.94, 40.00' RT.	544801.2703	1344536.8385
1+24, 8" W	PT - 8" X 6" F.H.T.	OLD COLUMBIA RD. STA. 1018+12.86, 116.70' RT.	544770.6121	1344607.4091



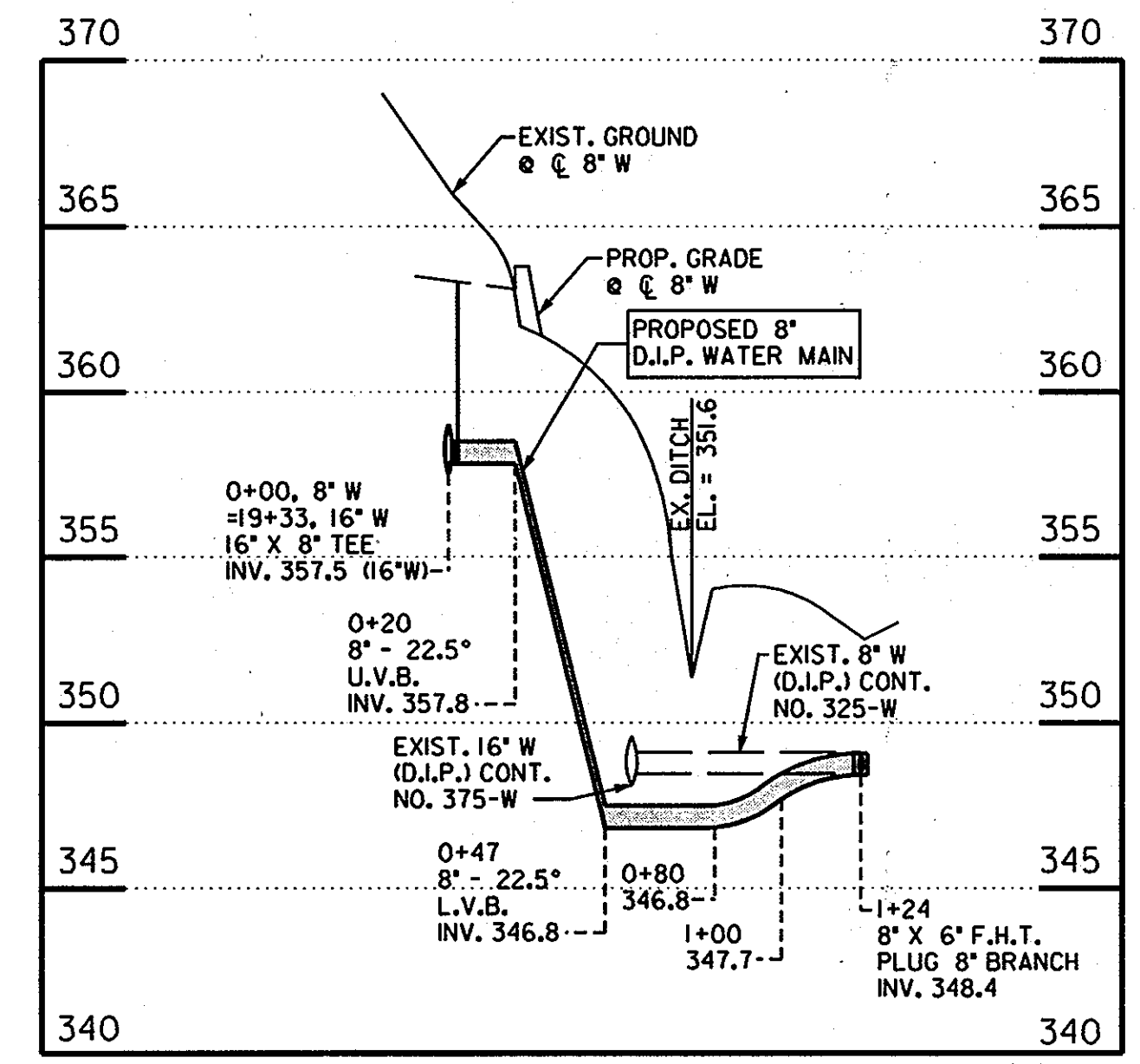
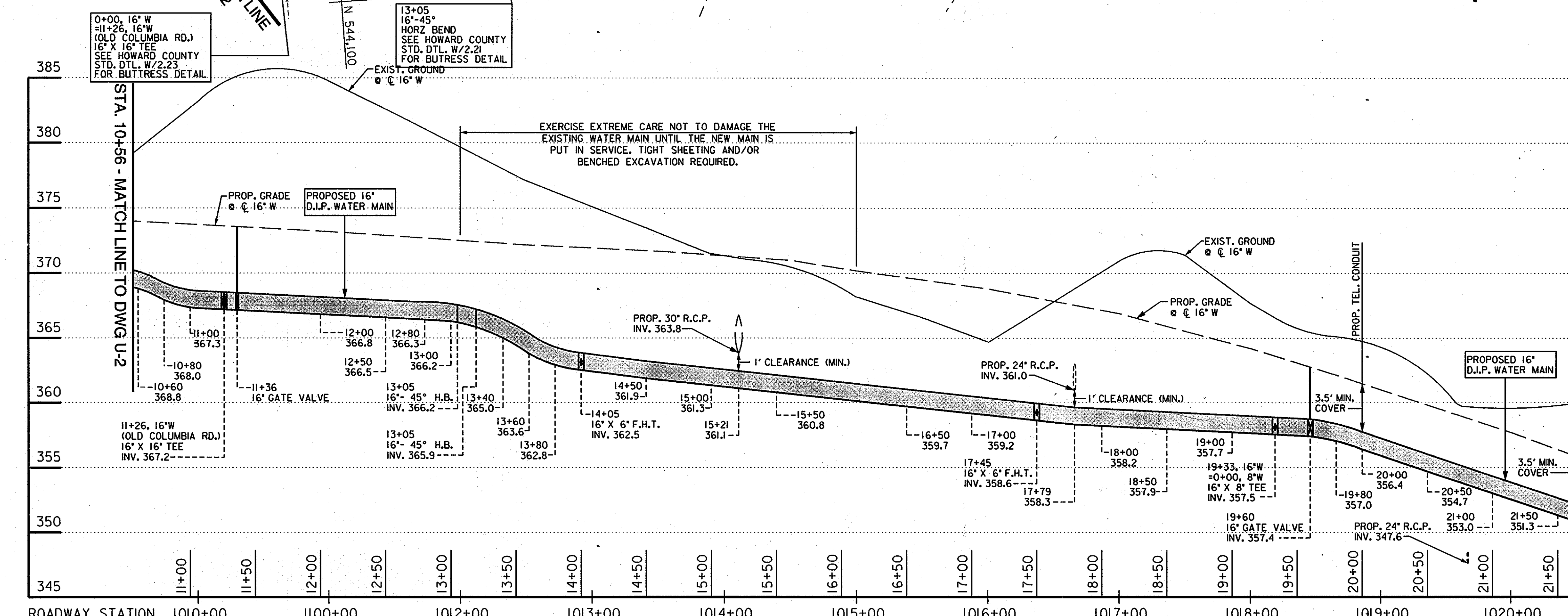
TRAVERSE POINTS			
POINT	NORTHING	EASTING	ELEVATION
S.H.A. CADD-175	544840.9060	1344552.5480	360.05
J.M.T. CADD-112	544933.6219	1344511.9878	363.49
J.M.T. CADD-113	544718.6738	1344490.6837	361.49
J.M.T. CADD-114	545979.1553	1345006.9337	315.42
J.M.T. CADD-115	544304.8259	1344454.8197	-
J.M.T. CADD-116	544147.4930	1344563.4778	-

NOTE: ALL FINAL RESTORATION ON THIS SHEET WILL BE COMPLETED BY THE ROADWAY CONTRACTOR.

**BENCH MARKS**

**B.M. 'E'**  
SPIKE NAIL SET IN 15" PINE TREE  
OLD COLUMBIA RD. STA. 1009+84.3, 89.8' LT.  
N 543974.2202 E 1344537.6518  
ELEV. = 389.79

**B.M. 'H'**  
P.K. NAIL SET IN 18" OAK TREE  
OLD COLUMBIA RD. STA. 1018+74.8, 144.1' RT.  
N 544820.2899 E 1344653.4226  
ELEV. = 354.06



**8" WATER PROFILE**  
OLD COLUMBIA RD. STA. 1018+23

SCALE: 1"=50' HORIZONTAL  
1"=5" VERTICAL

**AS-Built**

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

3/10/03  
DATE

3-3-03  
DATE

THE WILSON T. BALLARD CO.  
CONSULTING ENGINEERS  
OWINGS MILLS, MARYLAND

Professional Engineer Seal

DES:	JSZ
DWN:	GFP
CHK:	KLE
DATE:	6/28/00
BY:	NO.
REVISION:	
DATE:	

PLAN AND PROFILE SHEET

600' SCALE MAP NO. W41 BLOCK NO.

U.S. 29 INTERCHANGE AT JOHNS HOPKINS/  
GORMAN ROADS AND OLD COLUMBIA ROAD  
CAPITAL PROJECT W-8212  
CONTRACT NO. 44-3868  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
DWG U-3  
SHEET 3 OF 9

WATER STAKEOUT DATA				
WATER STA.	DESCRIPTION	ROADWAY STATION & OFFSET	NORTHING	EASTING
22+00, 16' W	POL	OLD COLUMBIA RD. STA. 1020+85.98, 7.00' LT.	545069.1042	1344579.0961
22+70, 16' W	F.H.	OLD COLUMBIA RD. STA. 1021+55.98, 14.00' RT.	545128.4924	1344621.6877
26+00, 16' W	POL	OLD COLUMBIA RD. STA. 1024+85.98, 7.00' LT.	545447.4300	1344708.9790
29+37, 16' W	F.H.	OLD COLUMBIA RD. STA. 1028+22.98, 14.00' RT.	545759.3507	1344838.2675
30+00, 16' W	POL	OLD COLUMBIA RD. STA. 1028+85.98, 7.00' LT.	545825.7558	1344838.8620
30+40, 16' W	16" GATE VALVE	OLD COLUMBIA RD. STA. 1029+25.98, 7.00' LT.	545863.5884	1344851.8503

TRAVERSE POINTS			
POINT	NORTHING	EASTING	ELEVATION
S.H.A. CADD-176	545210.7590	1344786.9530	343.58
S.H.A. CADD-178	545772.2480	1344854.2520	312.84
S.H.A. CADD-179	545946.4240	1344894.3970	302.13

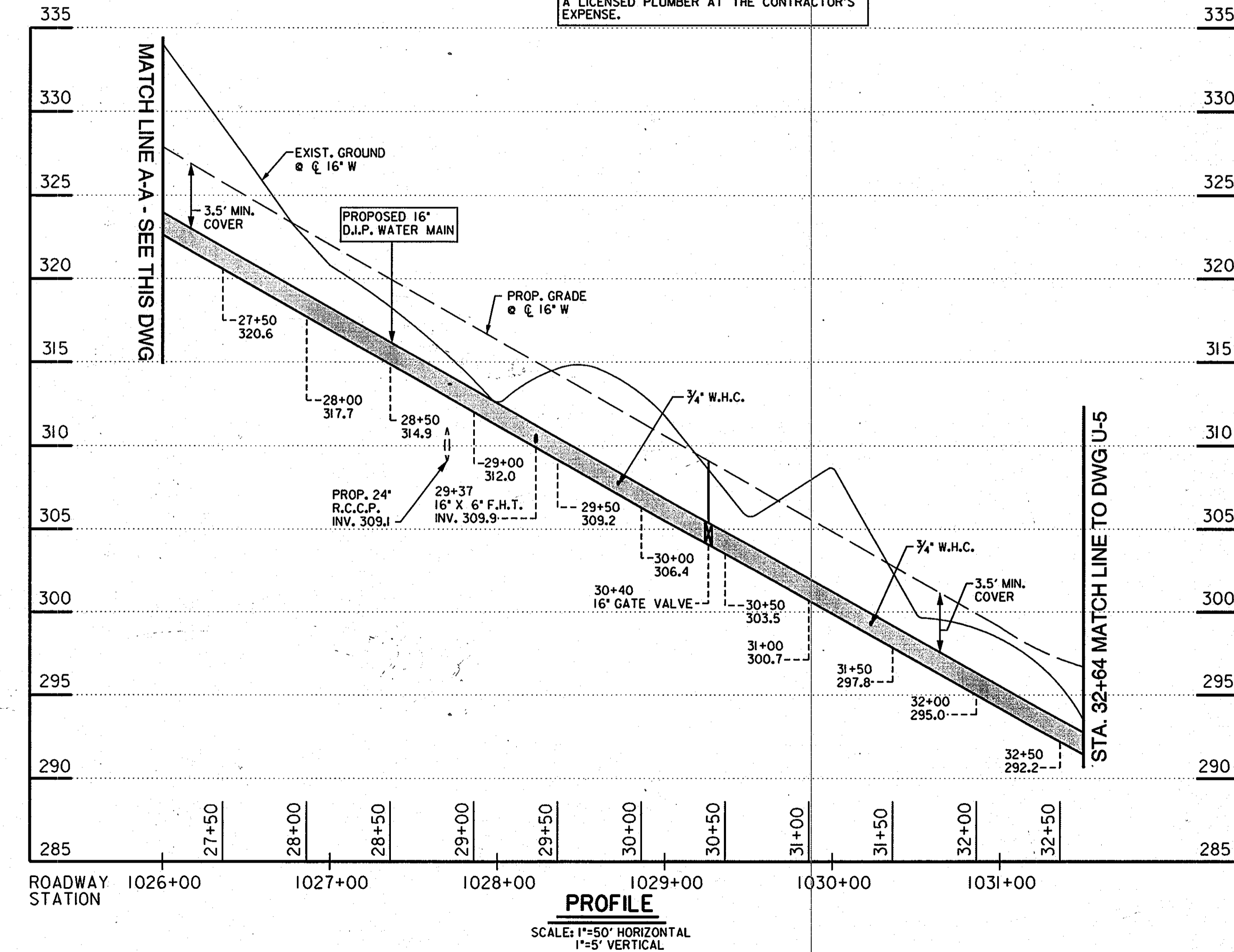
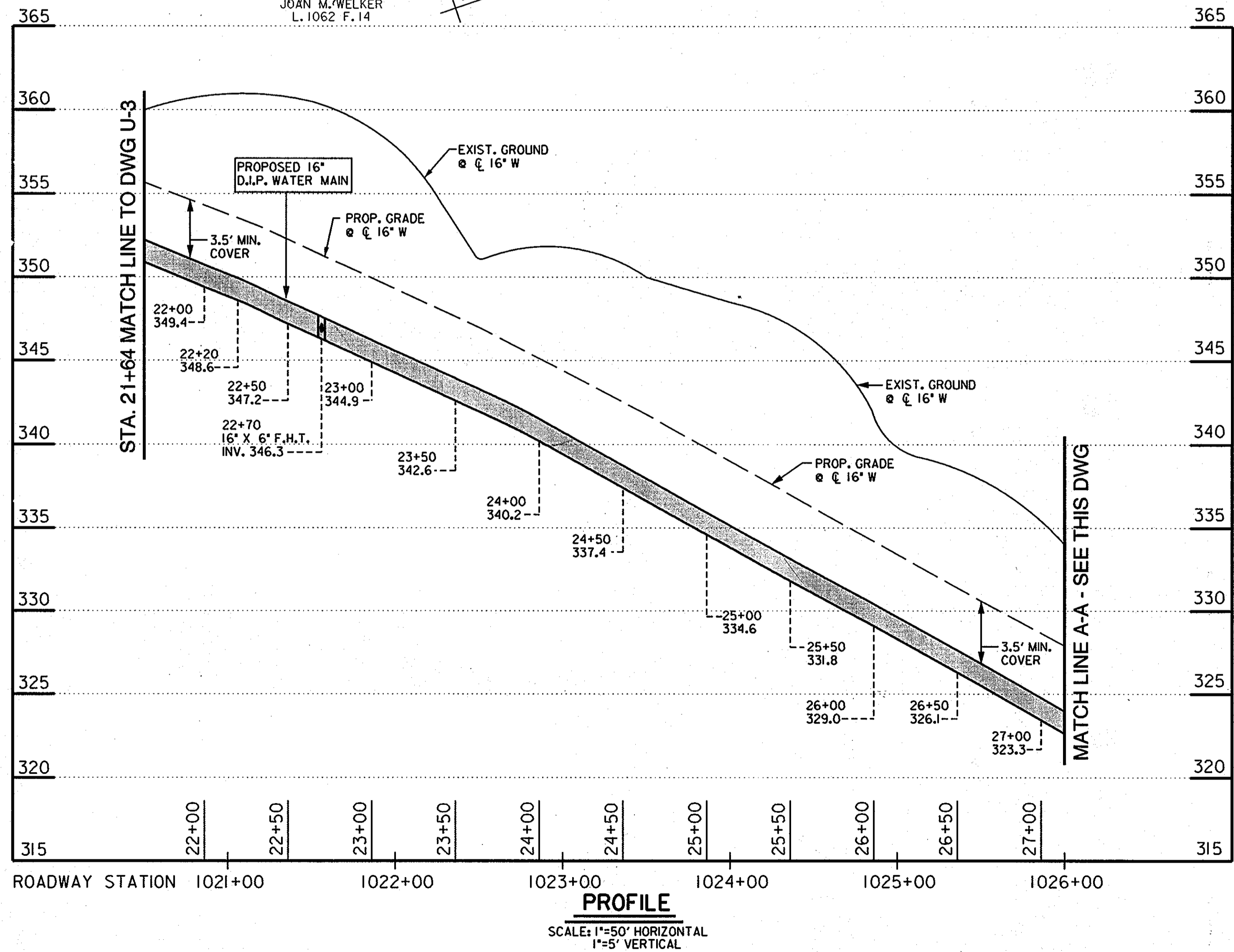
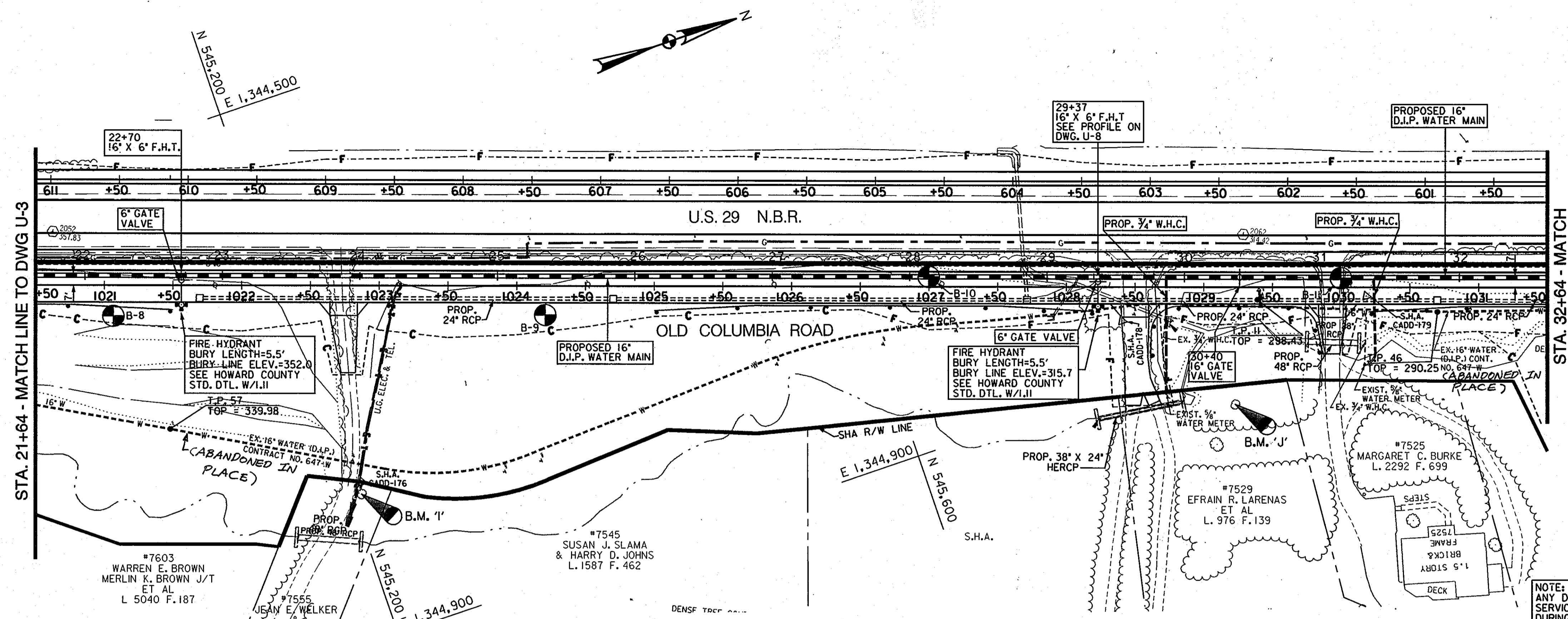
NOTE:  
ALL FINAL RESTORATION ON THIS SHEET WILL BE COMPLETED BY THE ROADWAY CONTRACTOR.

**BENCH MARKS**

**B.M. 'I'**  
P.K. NAIL SET IN 8' TREE  
OLD COLUMBIA RD. STA. 1022+87.6, 151.4' RT.  
N 545208.3777 E 1344794.3334  
ELEV.= 344.60

**B.M. 'J'**  
SPIKE NAIL SET IN 15' POPLAR TREE  
OLD COLUMBIA RD. STA. 1029+23.1, 86.1' RT.  
N 545830.6777 E 1344938.9586  
ELEV.= 310.00

NOTE:  
ANY DAMAGE DONE TO EXISTING WATER HOUSE SERVICES OUTSIDE THE ROAD RIGHT OF WAY DURING CONSTRUCTION MUST BE REPAIRED BY A LICENSED PLUMBER AT THE CONTRACTOR'S EXPENSE.



**DEPARTMENT OF PUBLIC WORKS**

HOWARD COUNTY, MARYLAND  
 Director of Public Works: *Jan J. ...* DATE: 3/10/03  
 Chief, Bureau of Engineering: *...* DATE: 2/28/03  
 Chief, Bureau of Utilities: *...* DATE: 3-3-03  
 Chief, Utility Design Division: *...* DATE: 2-28-03

THE WILSON T. BALLARD CO.  
 CONSULTING ENGINEERS  
 OWINGS MILLS, MARYLAND



DES: JSZ	BY NO.	REVISION	DATE
DWN: GFP			
CHK: KLE			
DATE: 6/28/00			

**PLAN AND PROFILE SHEET**

600' SCALE MAP NO. W41 BLOCK NO.

U.S. 29 INTERCHANGE AT JOHNS HOPKINS/  
 GORMAN ROADS AND OLD COLUMBIA ROAD  
 CAPITAL PROJECT W-8212  
 CONTRACT NO. 44-3868  
 ELECTION DISTRICT NO. 6  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 SHEET 4 OF 9



WATER STAKEOUT DATA				
WATER STA.	DESCRIPTION	ROADWAY STATION & OFFSET	NORTHING	EASTING
33+23.79, 16" W	PC	OLD COLUMBIA RD. STA. 1032+09.77, 7.00' LT.	546132.0007	1344943.9989
33+50, 16" W	F.H.	OLD COLUMBIA RD. STA. 1032+35.73, 15.50' RT.	546148.5587	1344973.9592
35+34.78, 16" W	PT	OLD COLUMBIA RD. STA. 1034+18.72, 7.00' LT.	546318.8169	1345040.4485
37+50, 16" W	F.H.	OLD COLUMBIA RD. STA. 1036+33.94, 15.00' RT.	546480.8452	1345183.8003
38+00, 16" W	POL	OLD COLUMBIA RD. STA. 1036+83.94, 7.00' LT.	546534.2945	1345195.0776
40+40, 16" W	F.H.	OLD COLUMBIA RD. STA. 1039+23.94, 18.00' RT.	546714.7077	1345355.3151
40+85, 16" W	16'-45° HORZ. BEND	OLD COLUMBIA RD. STA. 1039+69.20, 7.00' LT.	546766.0532	1345361.3902
41+28, 16" W	16'-45° HORZ. BEND	OLD COLUMBIA RD. STA. 1039+97.60, 38.59' LT.	546807.5498	1345352.2899
41+38, 16" W	16" X 16" T.S.&V.	OLD COLUMBIA RD. STA. 1039+97.08, 48.57' LT.	546812.9420	1345343.8682

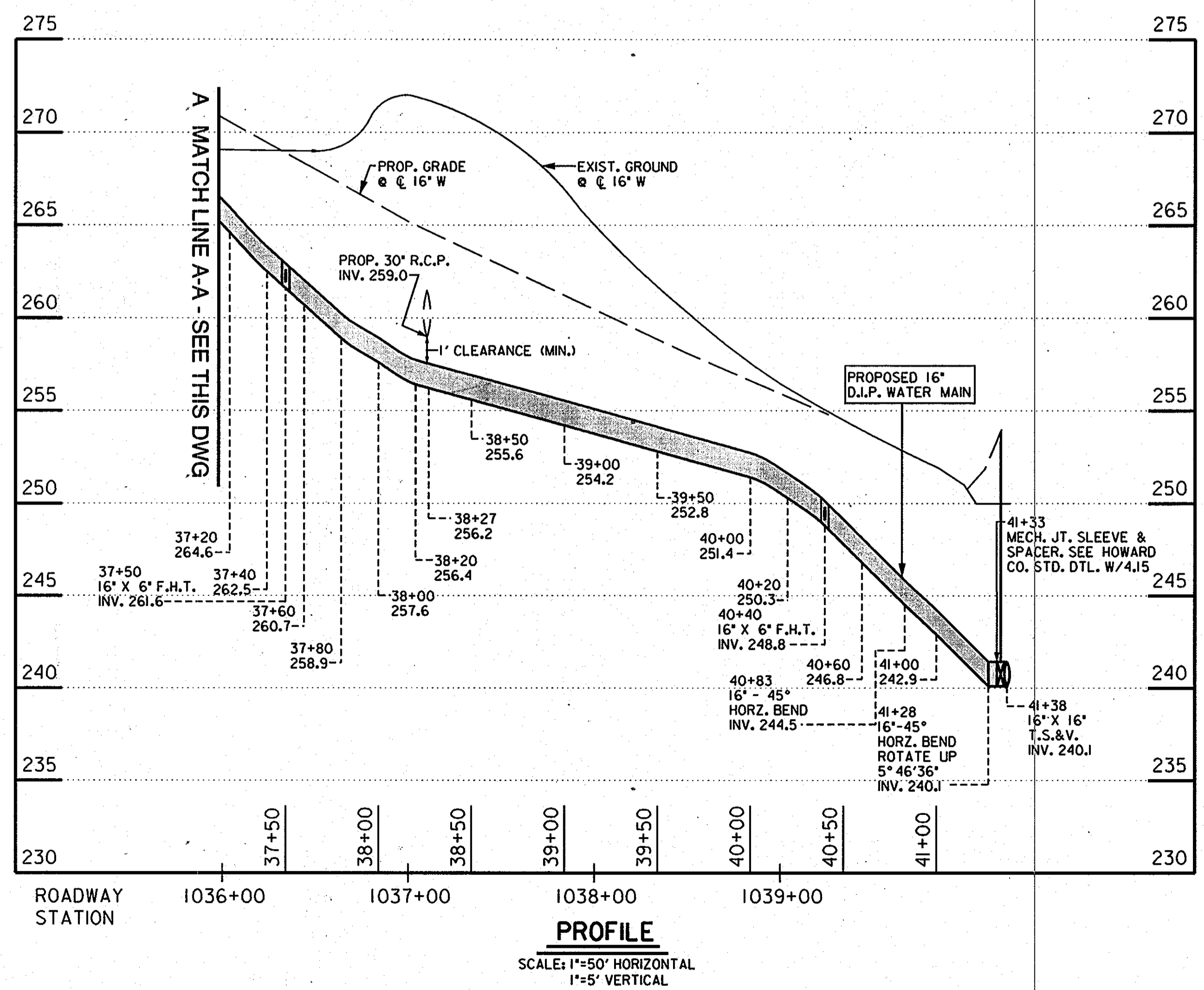
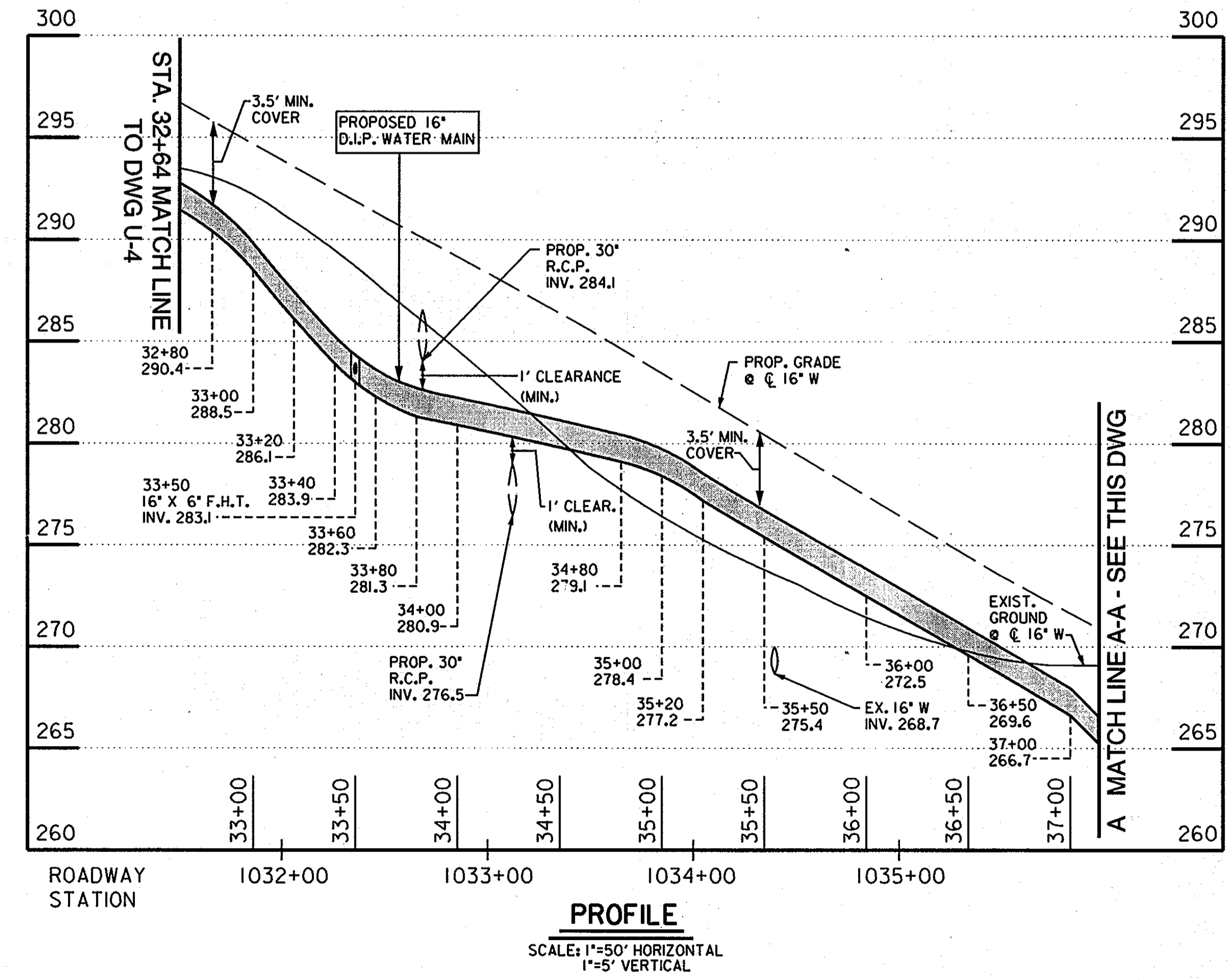
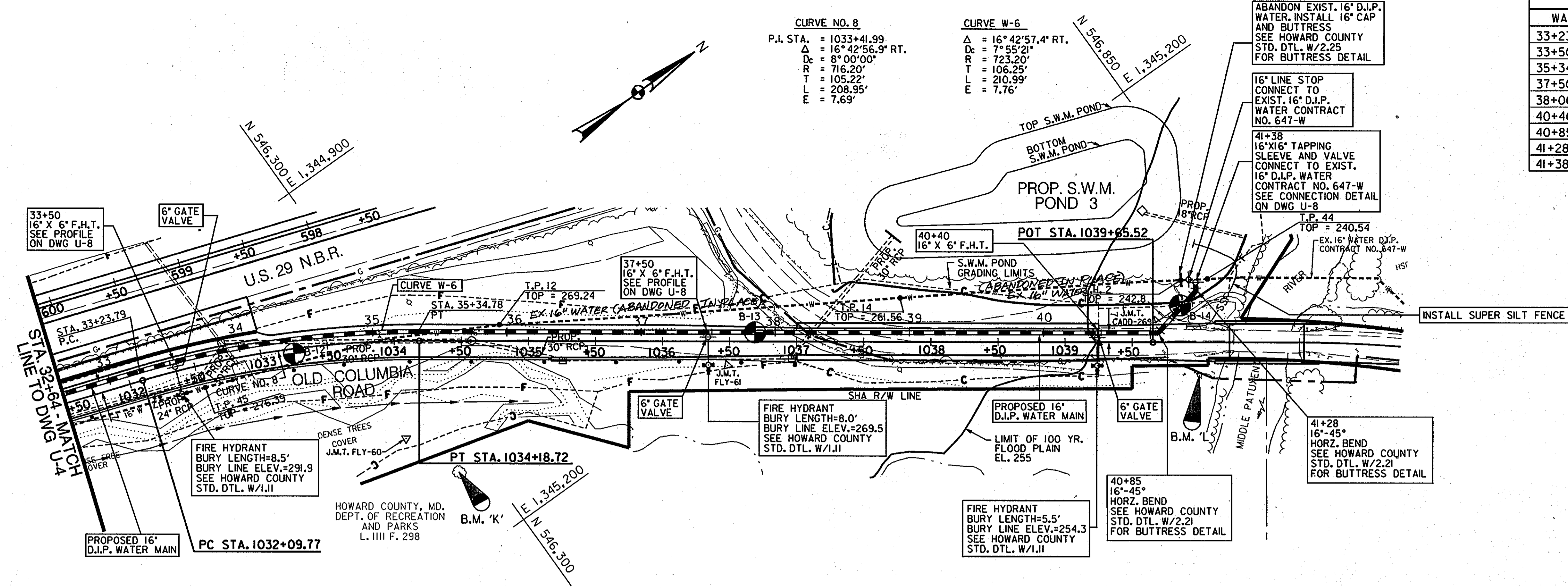
NOTE:  
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**BENCH MARKS**

B.M. 'K'  
P.K. NAIL SET IN 15' OAK TREE  
OLD COLUMBIA RD. STA. 1034+46.2, 98.5' RT.  
N 546279.6552 E 1345142.1648  
ELEV.= 281.57

B.M. 'L'  
SPIKE NAIL SET IN B.G.&E POLE# 385417  
OLD COLUMBIA RD. STA. 1039+99.7, 23.7' RT.  
N 546772.9539 E 1345404.1620  
ELEV.= 252.95

TRAVERSE POINTS			
POINT	NORTHING	EASTING	ELEVATION
J.M.T. FLY-60	546264.0431	1345100.0909	282.44
J.M.T. FLY-61	546490.8752	1345194.6178	266.27
J.M.T. CADD-269	546788.2747	1345354.3346	252.18



DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
3/10/03  
2/28/03  
3-3-03  
2-28-03

THE WILSON T. BALLARD CO.  
CONSULTING ENGINEERS  
OWINGS MILLS, MARYLAND



DES: JSZ			
DWN: GFP			
CHK: KLE			
DATE: 6/28/00	BY NO.	REVISION	DATE

**PLAN AND PROFILE SHEET**

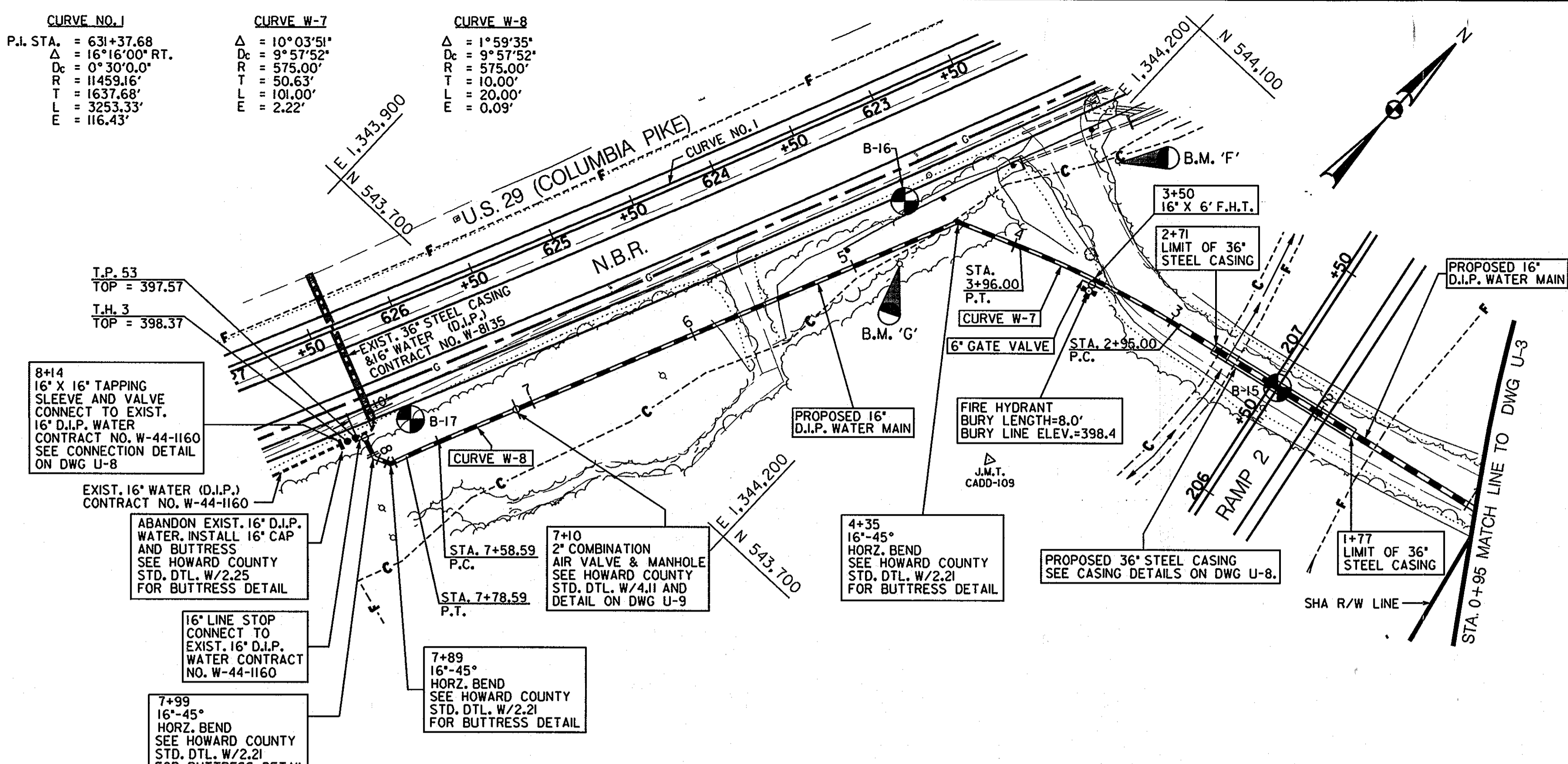
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ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
DWG U-5  
SHEET 5 OF 9

**CURVE NO. J**  
 P.I. STA. = 631+37.68  
 $\Delta = 16^{\circ}16'00''$  RT.  
 $D_c = 0^{\circ}30'00''$   
 $R = 11459.16'$   
 $T = 1637.68'$   
 $L = 3253.33'$   
 $E = 116.43'$

**CURVE W-7**  
 $\Delta = 10^{\circ}03'51''$   
 $D_c = 9^{\circ}57'52''$   
 $R = 575.00'$   
 $T = 50.63'$   
 $L = 101.00'$   
 $E = 2.22'$

**CURVE W-8**  
 $\Delta = 1^{\circ}59'35''$   
 $D_c = 9^{\circ}57'52''$   
 $R = 575.00'$   
 $T = 10.00'$   
 $L = 20.00'$   
 $E = 0.09'$



WATER STA.	DESCRIPTION	ROADWAY STATION & OFFSET	NORTHING	EASTING
1+77, 16" W	LIMIT OF 36" STEEL CASING	RAMP 2 STA. 206+73.19, 50.97' RT.	543990.0748	134423.3456
2+71, 16" W	LIMIT OF 36" STEEL CASING	RAMP 2 STA. 206+71.13, 43.01' LT.	543971.5392	134431.1912
2+95, 16" W	PC	RAMP 2 STA. 206+70.61, 67.01' LT.	543966.8067	1344307.6625
3+50, 16" W	F.H.	U.S. 29 STA. 622+26.79, 148.46' LT.	543953.4011	1344254.3428
3+96, 16" W	PT	U.S. 29 STA. 622+57.09, 114.18' LT.	543938.3190	1344210.8986
4+35, 16" W	16"-45" HORZ. BEND	U.S. 29 STA. 622+84.03, 86.27' LT.	543924.0828	1344174.6404
7+10, 16" W	AIR RELEASE MH	U.S. 29 STA. 625+57.04, 84.90' LT.	543672.4964	1344063.4865
7+58.59, 16" W	P.C.	U.S. 29 STA. 626+05.28, 85.34' LT.	543628.0481	1344043.8487
7+78.59, 16" W	P.T.	U.S. 29 STA. 626+25.12, 85.92' LT.	543609.6172	1344036.0859
7+89, 16" W	16"-45" HORZ. BEND	U.S. 29 STA. 626+35.03, 86.40' LT.	543600.3351	1344032.3652
7+99, 16" W	16"-45" HORZ. BEND	U.S. 29 STA. 626+42.39, 79.69' LT.	543596.4027	1344023.1708
8+14, 16" W	16" X 16" T.S.&V.	U.S. 29 STA. 626+43.12, 64.71' LT.	543601.9838	1344009.2478

NOTE:  
 ALL FINAL RESTORATION ON THIS SHEET WILL BE COMPLETED BY THE ROADWAY CONTRACTOR

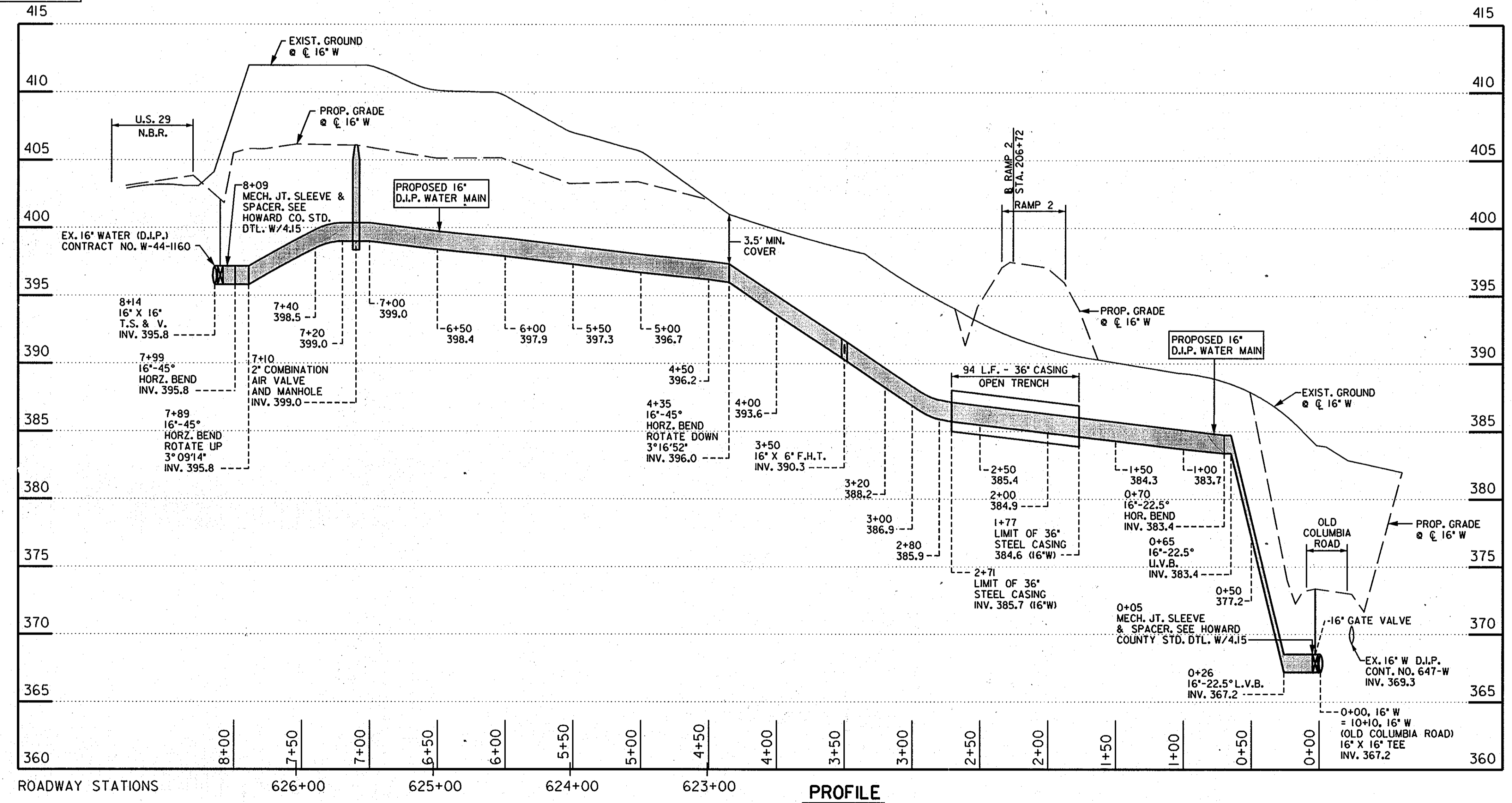
**BENCH MARKS**

**B.M. 'F'**  
 SPIKE NAIL SET IN B.G.&E. POLE # 281954  
 U.S. 29 STA. 621+86.0, 91.8' LT.  
 N 544013.1647 E 1344217.7323  
 ELEV. = 399.63

**B.M. 'G'**  
 SPIKE NAIL SET IN B.G.&E. POLE # 281955  
 U.S. 29 STA. 623+24.2, 93.9' LT.  
 N 543883.8171 E 1344165.8130  
 ELEV. = 404.94

**TRAVERSE POINTS**

POINT	NORTHING	EASTING	ELEVATION
J.M.T. CADD-109	543724.2082	1344231.6732	407.62



**PROFILE**  
 SCALE: 1"=50' HORIZONTAL  
 1"=5' VERTICAL

**DEPARTMENT OF PUBLIC WORKS**

HOWARD COUNTY, MARYLAND  
 Director of Public Works: *James J. Ehrlich* 3/1/03  
 Chief, Bureau of Engineering: *Charles O. Soper* 2/28/03  
 Chief, Bureau of Utilities: *Ralph B. ...* 3-3-03  
 Chief, Utility Design Division: *...* 2-28-03

THE WILSON T. BALLARD CO.  
 CONSULTING ENGINEERS  
 OWINGS MILLS, MARYLAND



DES: JSZ	BY NO.	REVISION	DATE
DWN: GFP			
CHK: KLE			
DATE:			

**PLAN AND PROFILE SHEET**

U.S. 29 INTERCHANGE AT JOHNS HOPKINS/  
 GORMAN ROADS AND OLD COLUMBIA ROAD  
 CAPITAL PROJECT W-8212  
 CONTRACT NO. 44-3868  
 ELECTION DISTRICT NO. 6  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 DWG U-6  
 SHEET 6 OF 9

**BENCH MARKS**

**B.M. 'A'**  
 R.R. SPIKE FOUND IN C&P POLE # 12  
 HAMMOND PARKWAY STA. 3005+13.5, 63.4' LT.  
 N 542999.7949 E 1344481.9049  
 ELEV. = 406.21

**B.M. 'B'**  
 R.R. SPIKE FOUND IN C&P POLE # 2  
 HAMMOND PARKWAY STA. 3006+08.9, 25.3' LT.  
 N 542938.0471 E 1344426.2282  
 ELEV. = 405.08

**CURVE NO. 15**

P.I. STA. = 3005+72.25  
 $\Delta = 30^\circ 03' 44.3''$  RT.  
 $D_c = 38^\circ 11' 49.9''$   
 $R = 150.00'$   
 $T = 40.28'$   
 $L = 78.70'$   
 $E = 5.31'$

**CURVE NO. 16**

P.I. STA. = 3007+02.23  
 $\Delta = 14^\circ 14' 21.6''$  RT.  
 $D_c = 7^\circ 48' 59.8''$   
 $R = 733.00'$   
 $T = 91.56'$   
 $L = 182.17'$   
 $E = 5.70'$

**CURVE W-9**

$\Delta = 11^\circ 20' 17.7''$  RT.  
 $D_c = 19^\circ 45' 25.8''$   
 $R = 290.00'$   
 $T = 28.79'$   
 $L = 57.91'$   
 $E = 1.43'$

WATER STAKEOUT DATA				
WATER STA.	DESCRIPTION	ROADWAY STATION & OFFSET	NORTHING	EASTING
0+00, 12" W	12" X 12" T.S.&V.	HAMMOND PARKWAY STA. 3005+62.14, 2.34' RT.	542984.4225	1344403.8877
0+20.00, 12" W	PC	HAMMOND PARKWAY STA. 3005+81.16, 4.26' LT.	542964.5960	1344406.5158
0+77.39, 12" W	PT	HAMMOND PARKWAY STA. 3006+38.95, 7.49' LT.	542907.3324	1344408.3970
0+87, 12" W	12"-45° HORZ. BEND	HAMMOND PARKWAY STA. 3006+48.49, 7.10' LT.	542897.7084	1344407.7599
0+97, 12" W	12"-45° HORZ. BEND	HAMMOND PARKWAY STA. 3006+55.50, 8' RT.	542890.9357	1344400.4025
+1+3, 12" W	16" X 12" T.S.&V.	HAMMOND PARKWAY STA. 3006+55.50, 16.00' RT.	542897.5972	1344384.4162

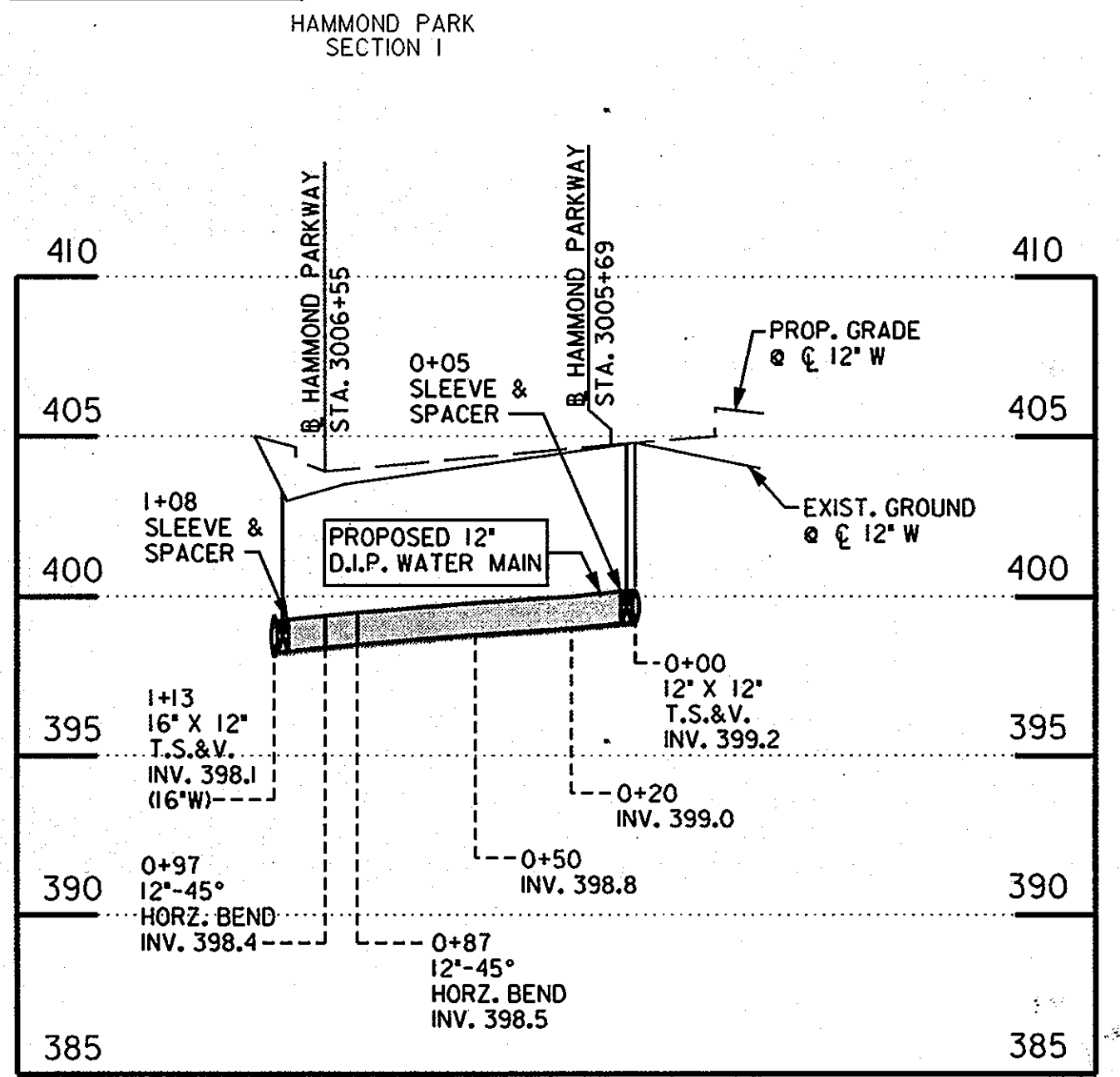
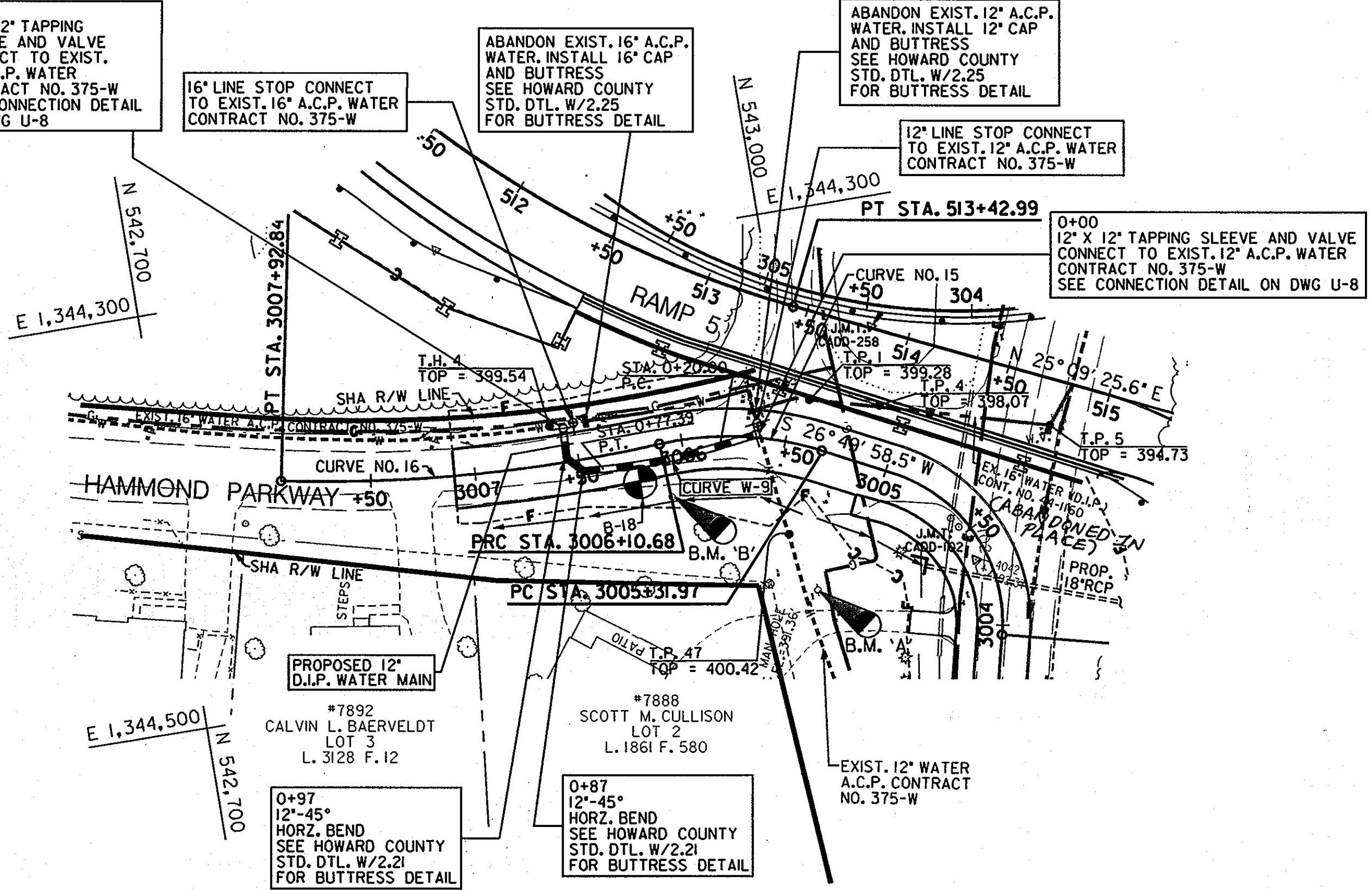
TRAVERSE POINTS			
POINT	NORTHING	EASTING	ELEVATION
J.M.T. CADD-102	543075.9727	1344480.4367	402.41
J.M.T. CADD-258	543044.9159	1344362.1001	406.19

NOTE:  
 ALL FINAL RESTORATION ON THIS SHEET WILL  
 BE COMPLETED BY THE ROADWAY CONTRACTOR

SLEEVE STAKEOUT DATA				
SLEEVE STA.	DESCRIPTION	ROADWAY STATION & OFFSET	NORTHING	EASTING
0+00, 36" S.S.	LIMIT OF 36" SPLIT SLEEVE	RAMP 2 STA. 114+56.06, 70.30' LT.	543719.9956	1343606.6602
+1+85, 36" S.S.	LIMIT OF 36" SPLIT SLEEVE	RAMP 2 STA. 115+92.24, 53.93' RT.	543753.4987	1343424.8395

**CURVE NO. 26**  
 P.I. STA. = 116+08.43  
 $\Delta = 53^\circ 59' 43.3''$  RT.  
 $D_c = 11^\circ 45' 0.00''$   
 $R = 487.62'$   
 $T = 248.85'$   
 $L = 459.54'$   
 $E = 59.64'$

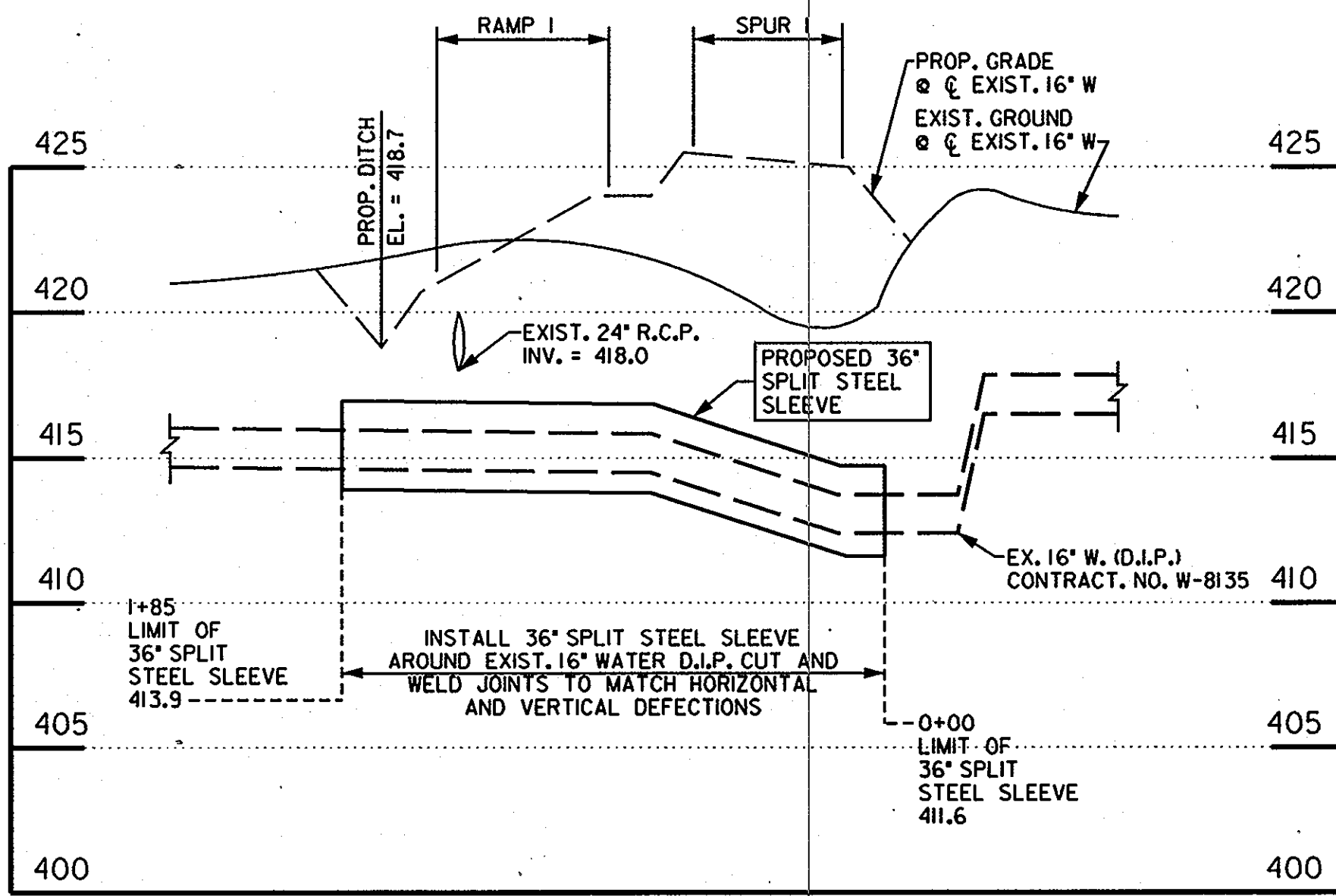
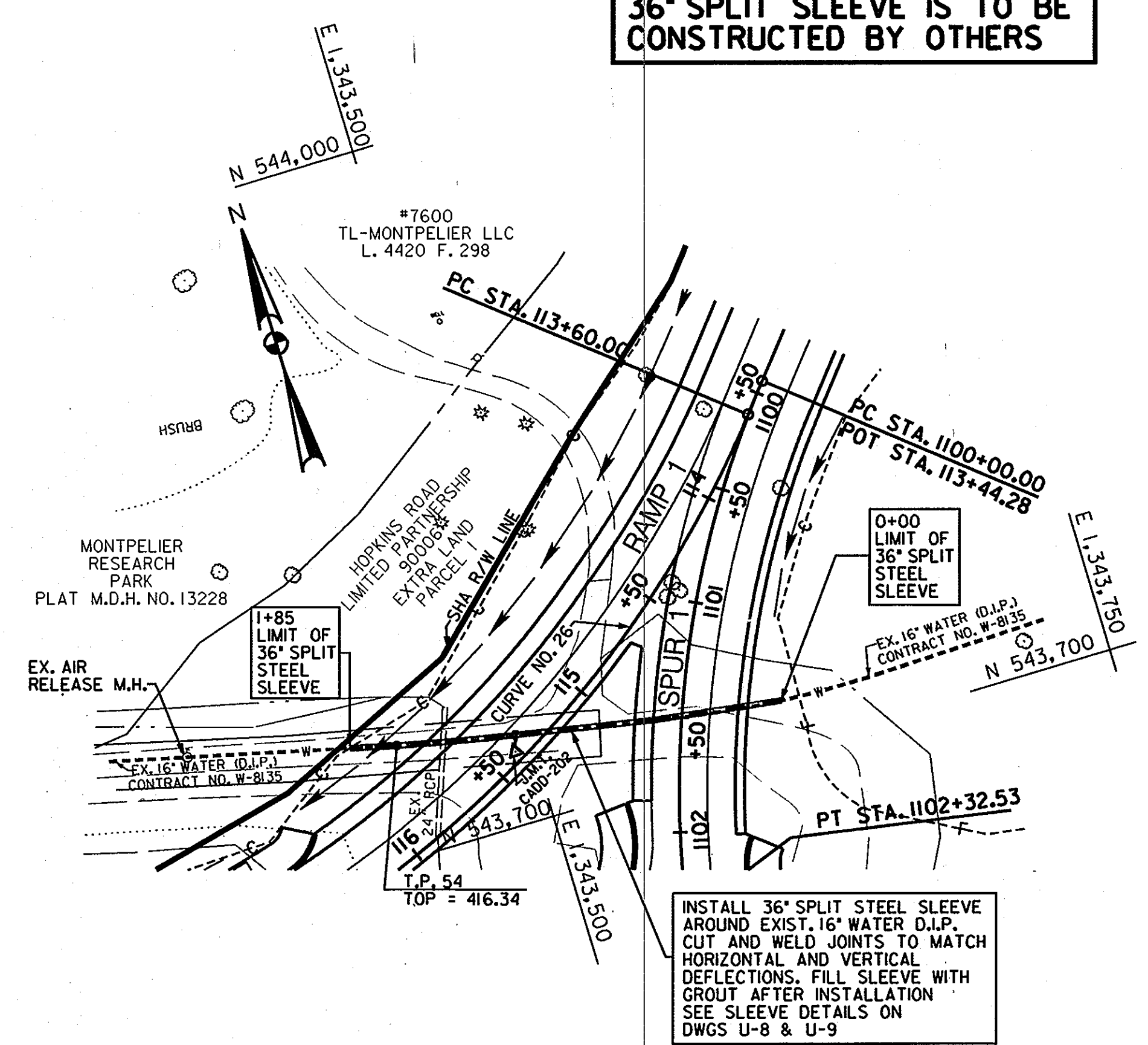
+1+3  
 16" X 12" TAPPING  
 SLEEVE AND VALVE  
 CONNECT TO EXIST.  
 16" A.C.P. WATER  
 CONTRACT NO. 375-W  
 SEE CONNECTION DETAIL  
 ON DWG U-8



**PROFILE**  
 SCALE: 1"=50' HORIZONTAL  
 1"=5' VERTICAL

NOTE:  
 SEE HOWARD COUNTY STD. DTL. W/415  
 FOR MECH. UT. SLEEVE & SPACER DETAILS.

**36" SPLIT SLEEVE IS TO BE  
 CONSTRUCTED BY OTHERS**



**PROFILE**  
 SCALE: 1"=50' HORIZONTAL  
 1"=5' VERTICAL

**As-Built**

**DEPARTMENT OF PUBLIC WORKS**

HOWARD COUNTY, MARYLAND  
 DATE: 2/28/03  
 DATE: 3-3-03

THE WILSON T. BALLARD CO.  
 CONSULTING ENGINEERS  
 OWINGS MILLS, MARYLAND

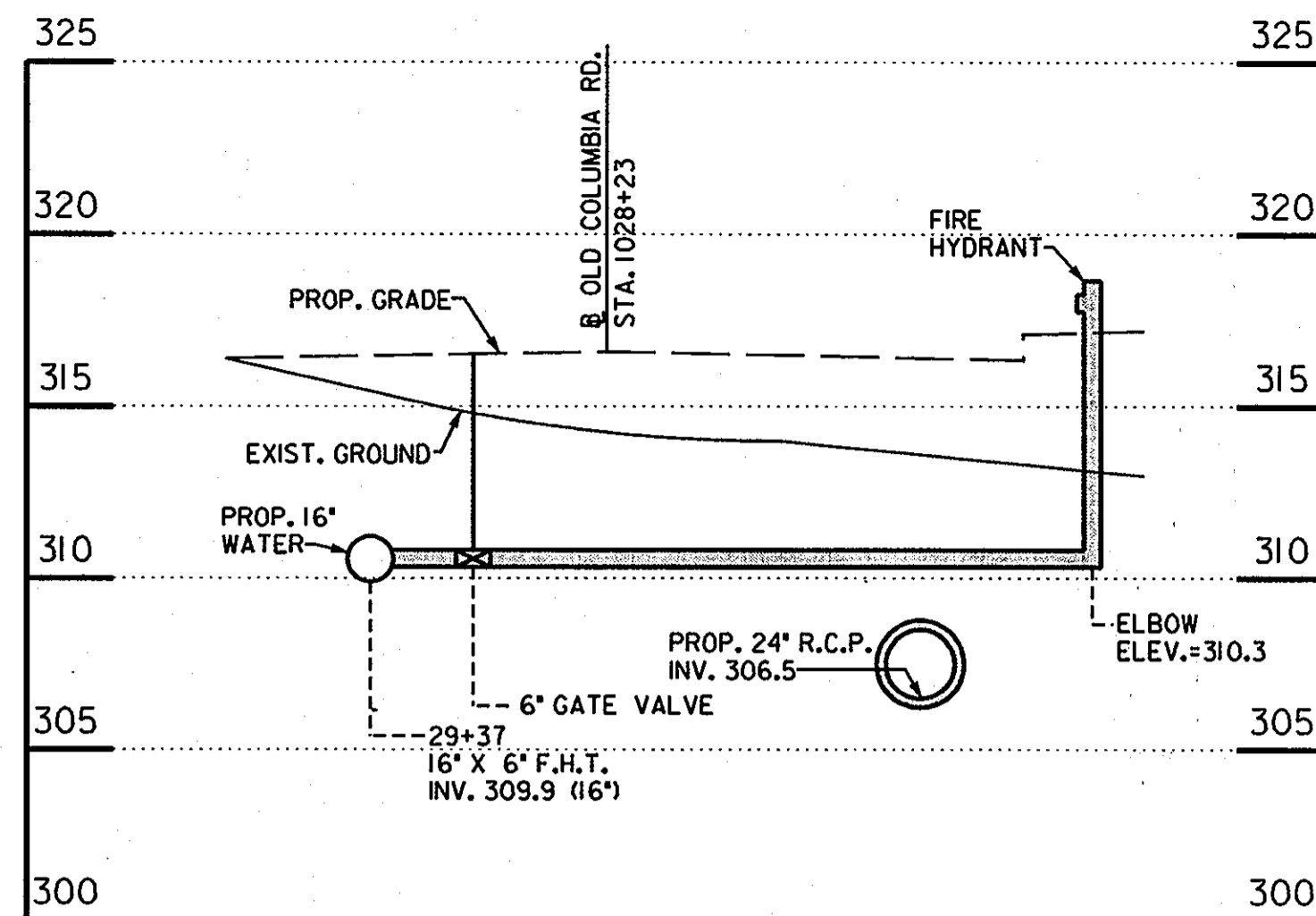


DES: JSZ			
DWN: GFP			
CHK: KLE			
DATE: 6/28/00	BY NO.	REVISION	DATE

**PLAN AND PROFILE SHEET**

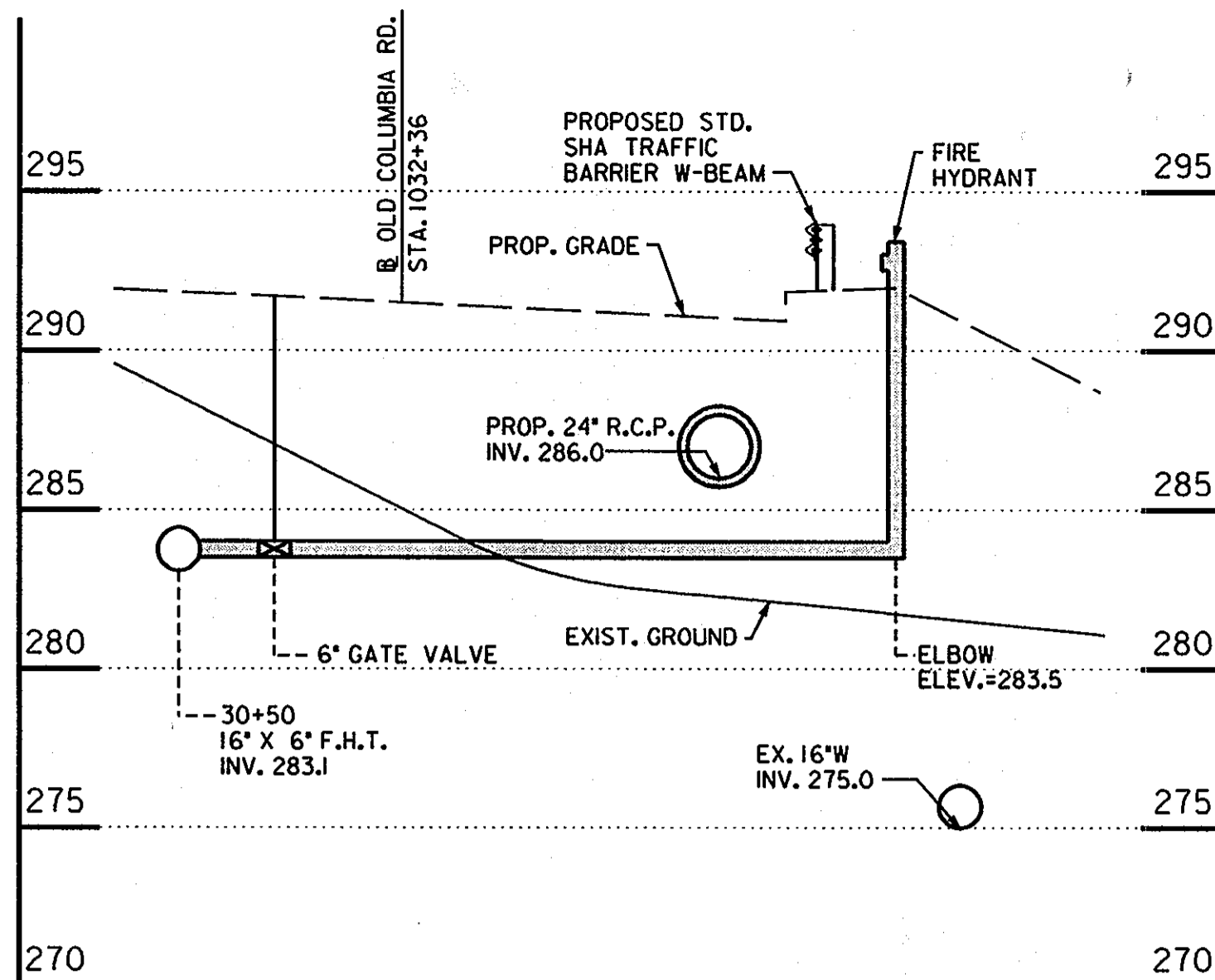
U.S. 29 INTERCHANGE AT JOHNS HOPKINS/  
 GORMAN ROADS AND OLD COLUMBIA ROAD  
 CAPITAL PROJECT W-8212  
 CONTRACT NO. 44-3868  
 ELECTION DISTRICT NO. 6  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 DWG U-7  
 SHEET 7 OF 9



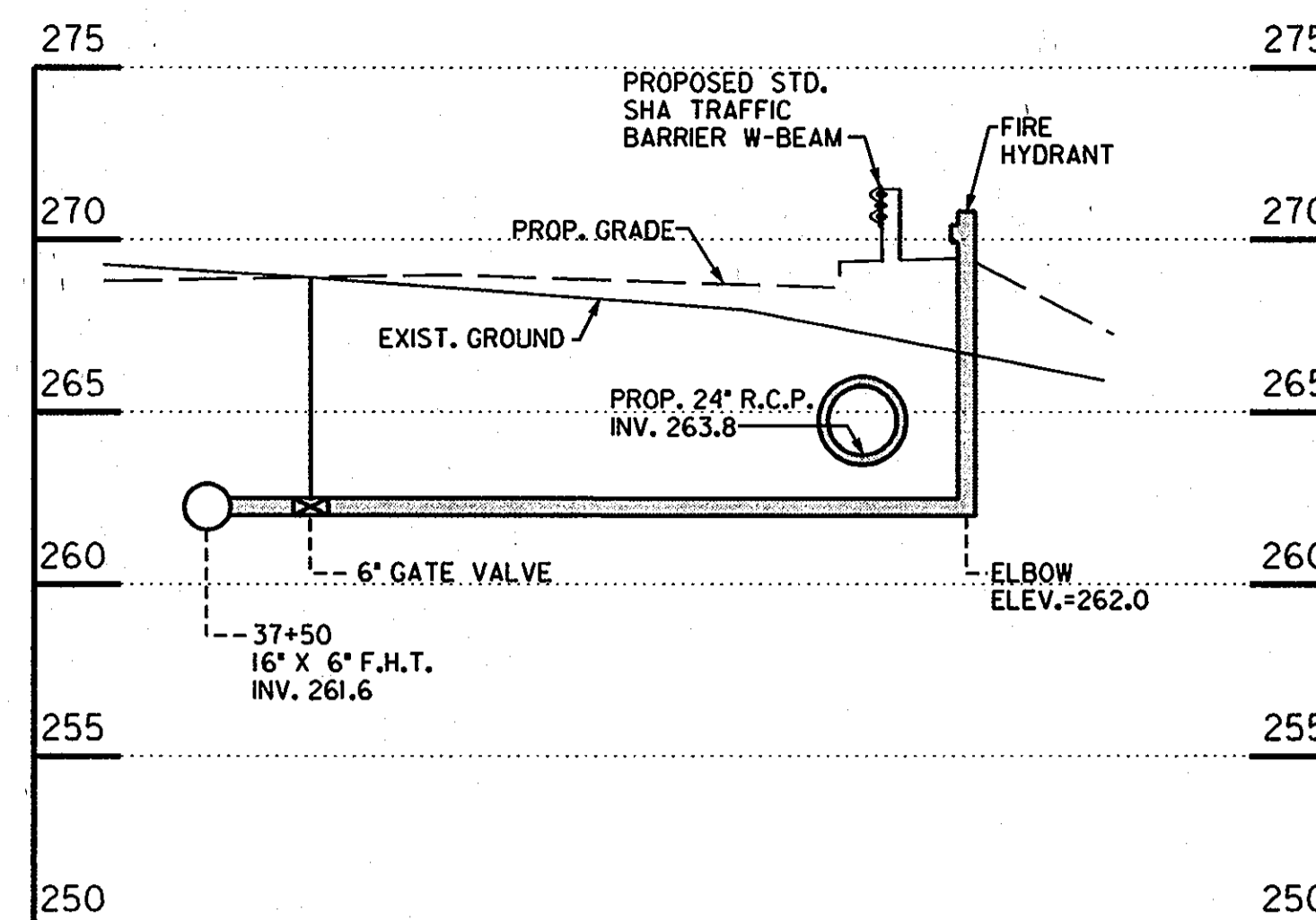
**PROFILE - FIRE HYDRANT  
RT. OLD COLUMBIA RD. STA. 1028+23**

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



**PROFILE - FIRE HYDRANT  
RT. OLD COLUMBIA RD. STA. 1032+36**

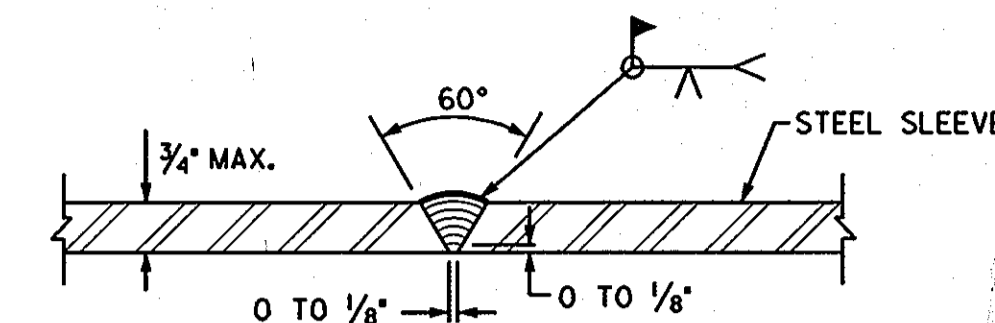
SCALE: 1"=5' HORIZONTAL  
1"=5' VERTICAL



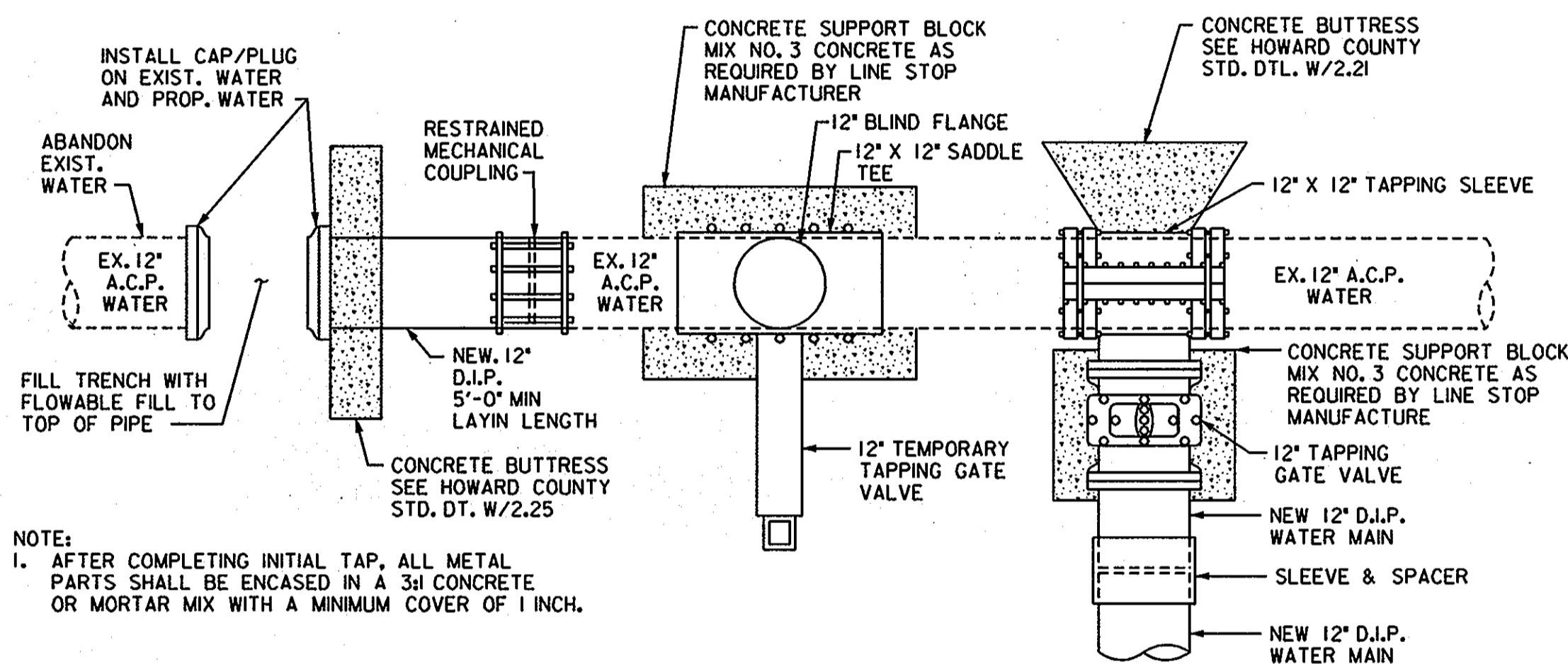
**PROFILE - FIRE HYDRANT  
RT. OLD COLUMBIA RD. STA. 1036+34**

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

- NOTES:**
1. PROVIDE 8" THICK BRICK BULKHEAD AT EACH END OF CASING AS SHOWN ON HOWARD COUNTY STANDARDS DETAIL G/9.01.
  2. 36" DIA. STEEL SLEEVE TO BE 3/8" THICK. JOINTS TO BE WELDED FULL CIRCUMFERENCE.
  3. FILL ANNULAR SPACE WITH FLO-ASH. PROVIDE TWO-2" DRAINS THROUGH BRICK BULKHEAD WHILE FILLING WITH FLO-ASH TO PREVENT POCKETS OF WATER IN CASING.

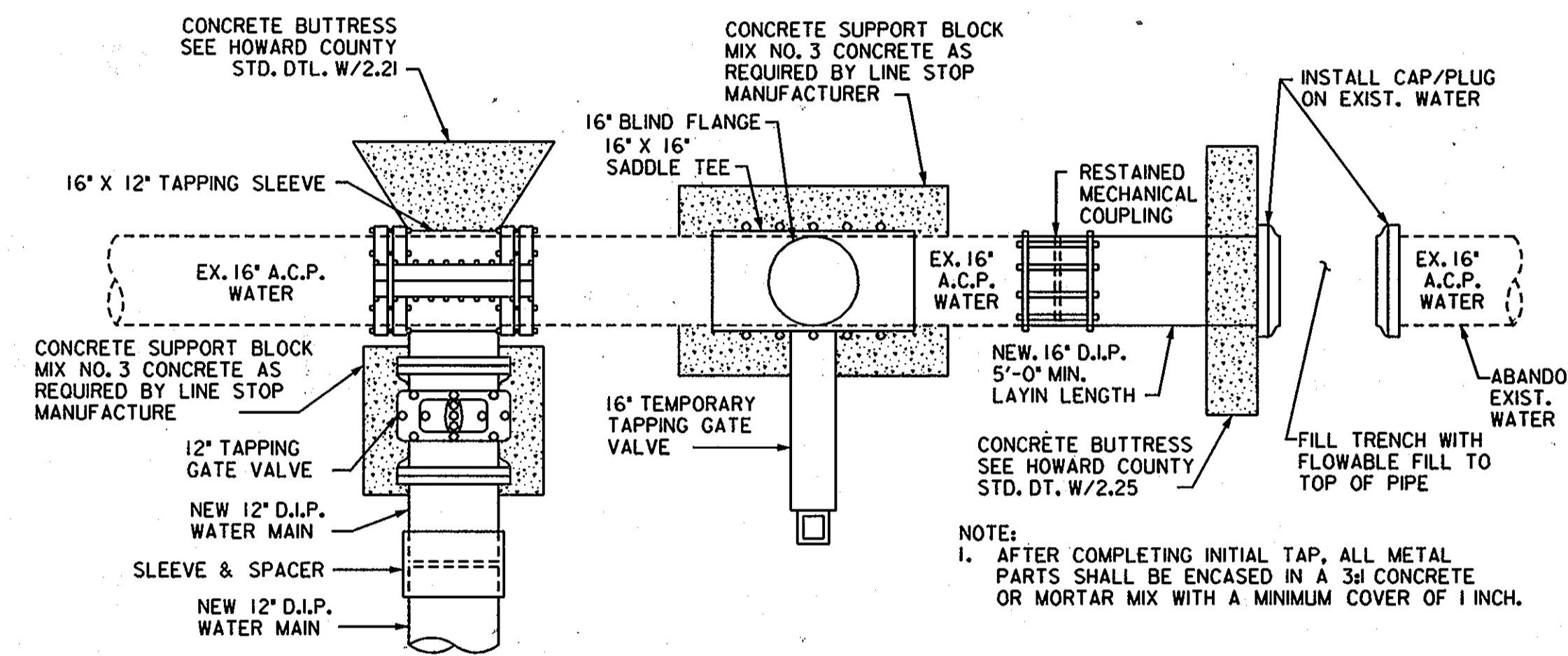


**STEEL CASING WELD DETAIL (TYP.)**



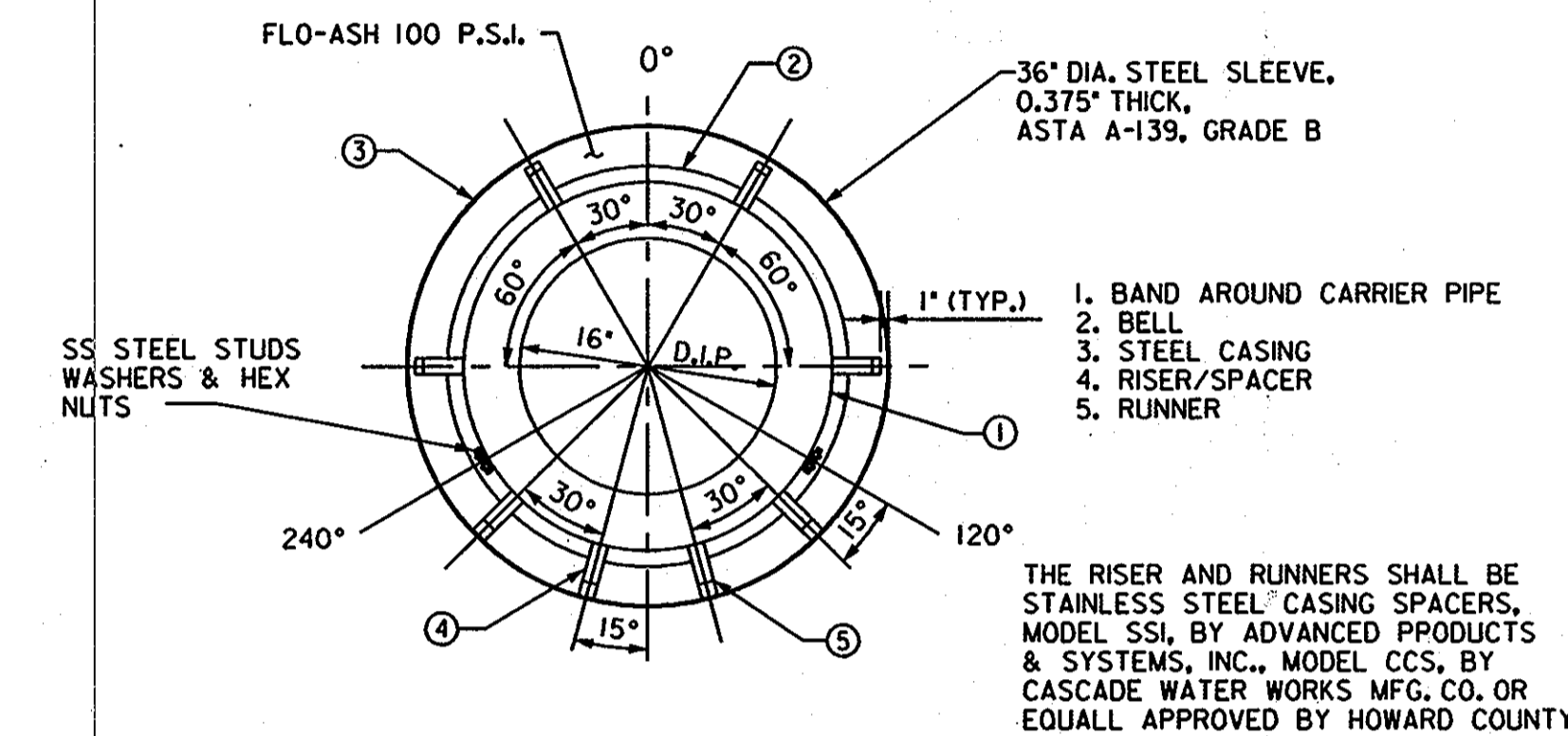
**CONNECTION DETAIL  
ALONG HAMMOND PARKWAY - 12\"/>**

NOT TO SCALE



**CONNECTION DETAIL  
ALONG HAMMOND PARKWAY - 12\"/>**

NOT TO SCALE



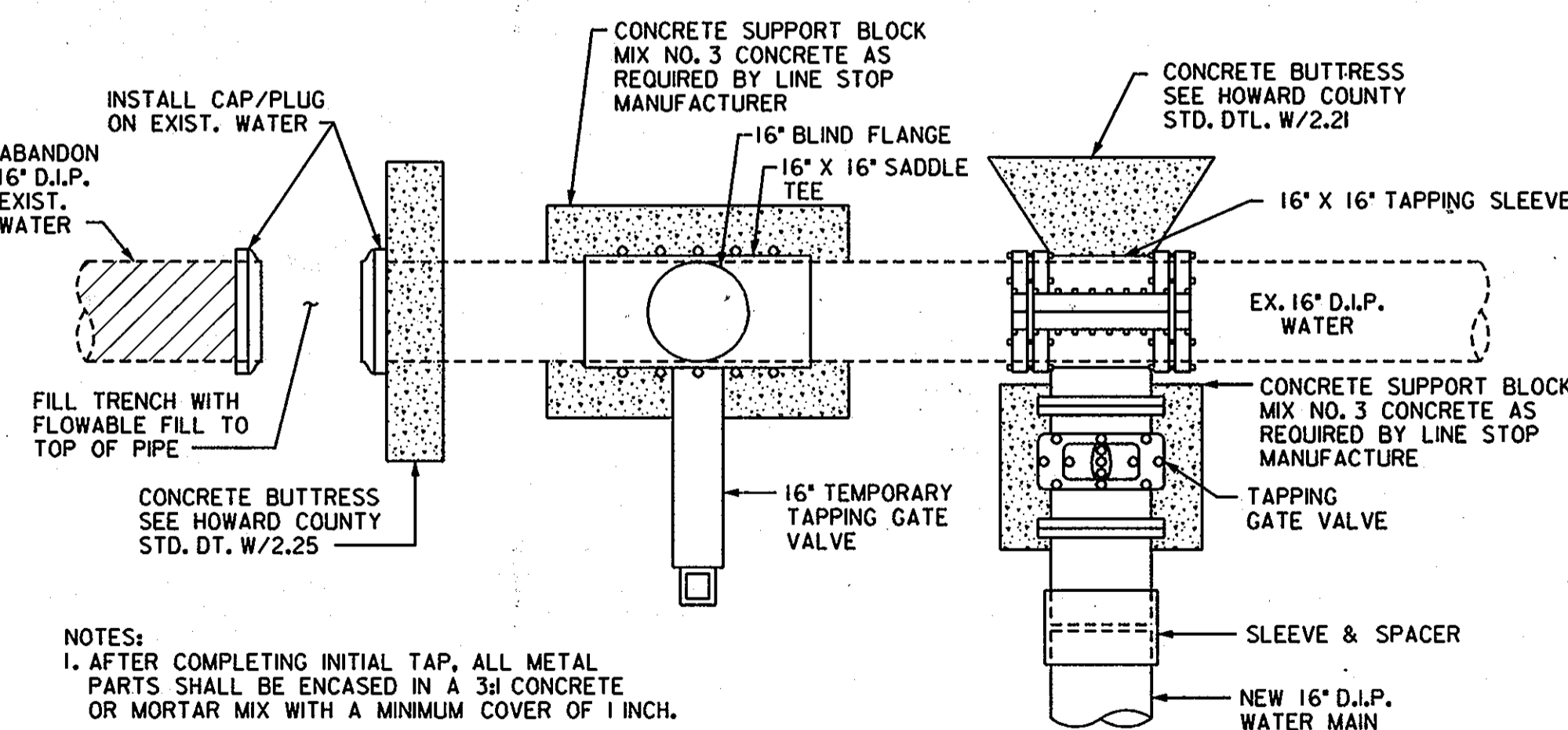
**RISER LOCATION FOR 16\"/>**

THE RISER AND RUNNERS SHALL BE STAINLESS STEEL CASING SPACERS, MODEL SSI, BY ADVANCED PRODUCTS & SYSTEMS, INC., MODEL CCS, BY CASCADE WATER WORKS MFG. CO. OR EQUALLY APPROVED BY HOWARD COUNTY.

**SEQUENCE OF CONSTRUCTION FOR HAMMOND PARKWAY CONNECTIONS**

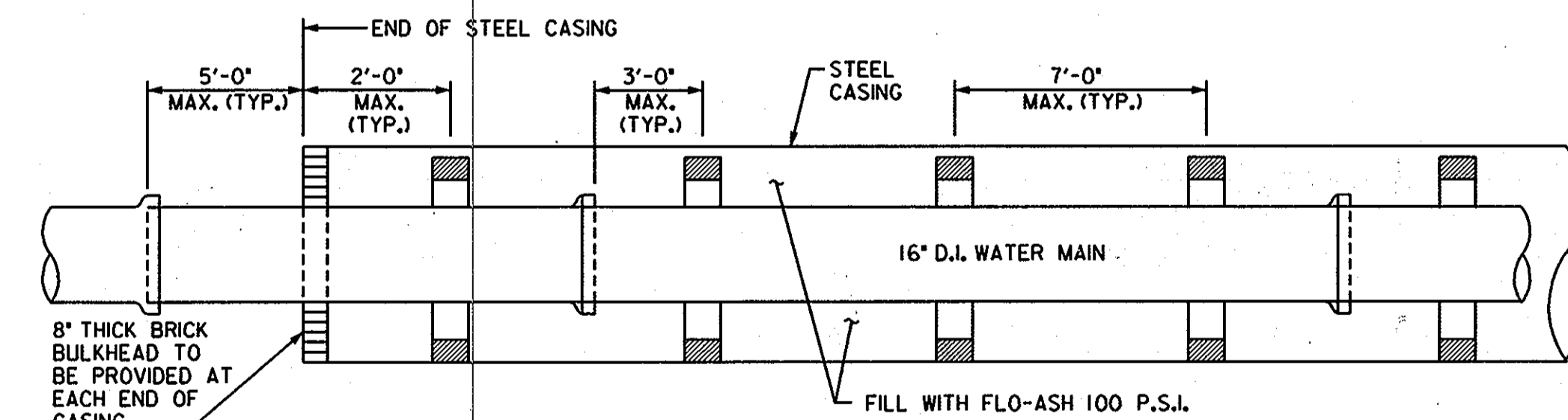
- TAPPING SLEEVE & VALVE OPERATIONS**
1. INSTALL 16" X 12" TAPPING SLEEVE & GATE VALVE ON THE EXISTING 16" A.C.P. WATER (CONTRACT NO. 375-W) AT 12" W STA. 1+13. CLOSE 12" VALVE.
  2. POUR CONCRETE BUTTRESS AT 16" X 12" TAPPING SLEEVE & GATE VALVE.
  3. ATTACH TAPPING MACHINE TO 12" VALVE. OPEN VALVE AND CUT 12" HOLE IN EXISTING PIPE. RETRACT CUTTER WITH PIPE COUPON. CLOSE 12" VALVE AND REMOVE TAPPING MACHINE.
  4. REPEAT STEPS 1, 2 AND 3 FOR WET TAP CONNECTION ON THE EXISTING 12" A.C.P. WATER (CONTRACT NO. 375-W AT 12" W STA. 0+00).
  5. INSTALL AND TEST RELOCATED 12-INCH WATER MAIN.
  6. INSTALL A SHORT PIECE ON 12" VALVES AT BOTH CONNECTION AND CONNECT ENDS OF MAIN WITH SLEEVES AND SPACERS.
  7. OPEN BOTH 12" VALVES AND PUT NEW MAIN IN SERVICE.
- LINE STOP OPERATIONS**
8. INSTALL SADDLE TEES WITH ATTACHED TEMPORARY GATE VALVES AT 12" W STA. 0+00 AND STA. 1+13. CLOSE TEMPORARY GATE VALVES.
  9. ATTACH TAPPING MACHINE TO TEMPORARY VALVES AT 12" W STA. 0+00 AND STA. 1+13. OPEN VALVE AND CUT HOLES IN EXISTING PIPE. RETRACT CUTTER WITH PIPE COUPON. CLOSE VALVES AND REMOVE TAPPING MACHINE.
  10. INSTALL LINESSTOPPING MACHINES ON EACH TEMPORARY GATE VALVE.
  11. OPEN TEMPORARY GATE VALVES AND SIMULTANEOUSLY INSERT LINE STOPPING PLUG HEADS AT EACH LOCATION TO STOP FLOW THROUGH EXISTING MAIN. ALL FLOW WILL CONTINUE THROUGH THE RELOCATED MAIN.
  12. CUT EXISTING PIPE AT EACH LOCATION. INSTALL MECHANICAL COUPLINGS, CAPS/PLUGS, BUTTRESSES, FLOWABLE FILL, ETC...
  13. REMOVE LINESSTOPPING MACHINES. ATTACH COMPLETION MACHINES AND INSTALL COMPLETION PLUGS IN EACH TEE OUTLET.
  14. REMOVE COMPLETION MACHINE AND TEMPORARY VALVES. INSTALL 12"/16" BLIND FLANGES ON EACH TEE OUTLET.

NOTE:  
RESTRAIN ALL PERMANENT FITTINGS WITH "MEGALUG" SERIES 1100 OR APPROVED EQUAL.



**CONNECTION DETAIL  
ALONG OLD COLUMBIA RD. - 16\"/>**

NOT TO SCALE



**TYPICAL D.I. PIPE AND SPACER LAYOUT INSIDE STAINLESS STEEL CASING**

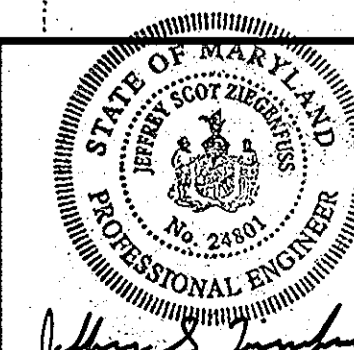
**36\"/>**

NOT TO SCALE

**DEPARTMENT OF PUBLIC WORKS**

HOWARD COUNTY, MARYLAND  
 Director of Public Works: *Jan P. Chu* 3/10/03  
 Chief, Bureau of Engineering: *William J. Ryan* 2/20/03  
 Chief, Bureau of Utilities: *John J. ...* 3-3-03  
 Chief, Utility Design Division: *...* 2-26-03

THE WILSON T. BALLARD CO.  
 CONSULTING ENGINEERS  
 OWINGS MILLS, MARYLAND



DES: JSZ					
DWN: GFP					
CHK: KLE					
DATE: 6/28/00	BY NO.	REVISION	DATE	600' SCALE MAP NO. W41	BLOCK NO.

**PROFILE & DETAIL SHEET**

U.S. 29 INTERCHANGE AT JOHNS HOPKINS/  
 GORMAN ROADS AND OLD COLUMBIA ROAD  
 CAPITAL PROJECT W-8212  
 CONTRACT NO. 44-3868  
 ELECTION DISTRICT NO. 6  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 DWG U-8  
 SHEET 8 OF 9





**SEQUENCE OF CONSTRUCTION**

I. THE FOLLOWING WATER MAIN WORK IS TO BE COMPLETED AFTER THE ROADWAY CONTRACTOR HAS REACHED SUBGRADE AT JOHNS HOPKINS ROAD STA. 44+20± DURING PHASE 1A:

A. 16" MAIN IN JOHNS HOPKINS ROAD FROM 16" W STA. 0+38 TO STA. 2+38 AS SHOWN ON DWG U-2.

THE FOLLOWING WATER MAIN WORK SHALL BE COORDINATED WITH AND PERFORMED DURING THE GRADING OPERATIONS FOR TRAFFIC CONTROL PLAN PHASE 1B:

A. 16-INCH MAIN FROM EAST SIDE OF U.S. 29 N.B.R. (16" W STA. 8+14) TO OLD COLUMBIA ROAD (16" W STA. 0+00) AS SHOWN ON DRAWINGS U-3 AND U-6.

B. 16-INCH MAIN AND 8-INCH MAIN IN OLD COLUMBIA ROAD, 16" W STA. 11+26 TO STA. 41+38 AS SHOWN ON DWGS U-3, U-4 AND U-5.

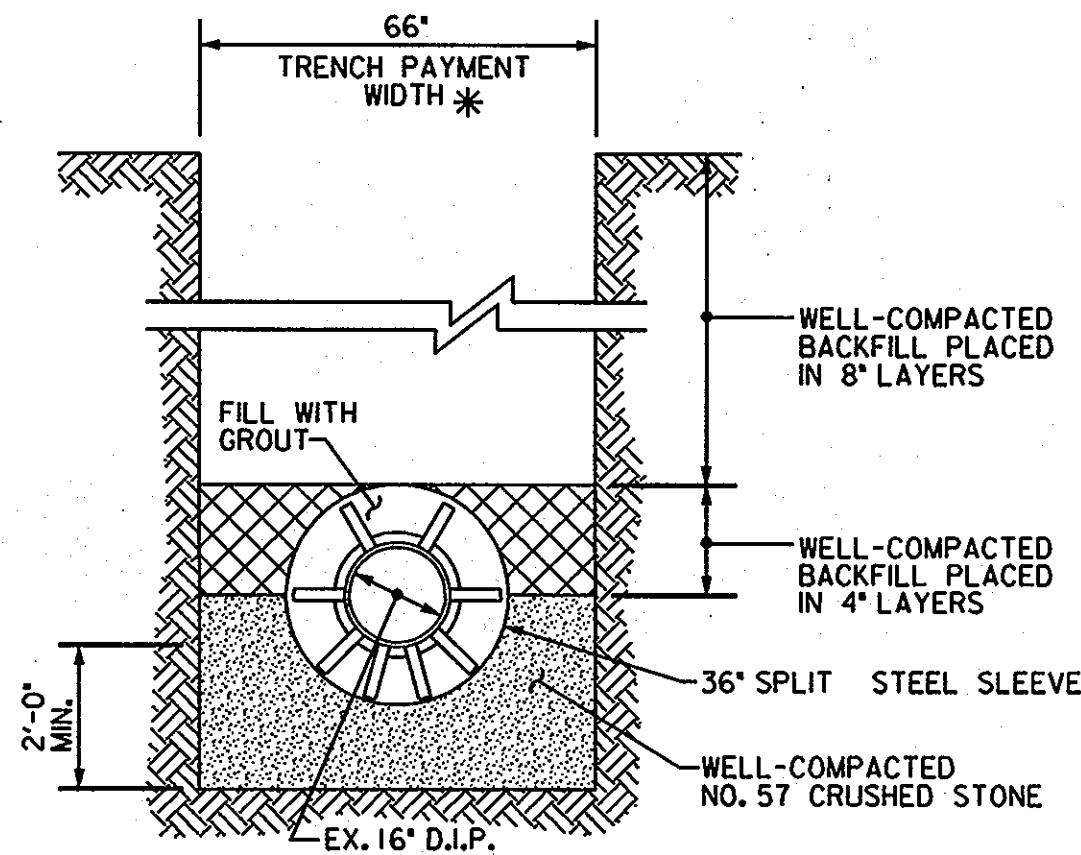
C. INSTALL LINE STOP FOR THE TIE-IN CONNECTION AT STA. 41+38.

D. ABANDON THE EXIST. 16-INCH WATER MAIN (CONTRACT NO. 647-W) IN OLD COLUMBIA ROAD, THE EXISTING 12-INCH WATER MAIN (CONTRACT NO. 375-W) AND THE EXISTING 16-INCH WATER MAIN (CONTRACT NO. 44-1160) IN JOHNS HOPKINS ROAD MUST REMAIN IN SERVICE.

II. THE FOLLOWING WATER MAIN WORK MUST BE COMPLETED AND PUT IN SERVICE PRIOR TO ABANDONING THE EXISTING MAINS IN JOHNS HOPKINS ROAD:

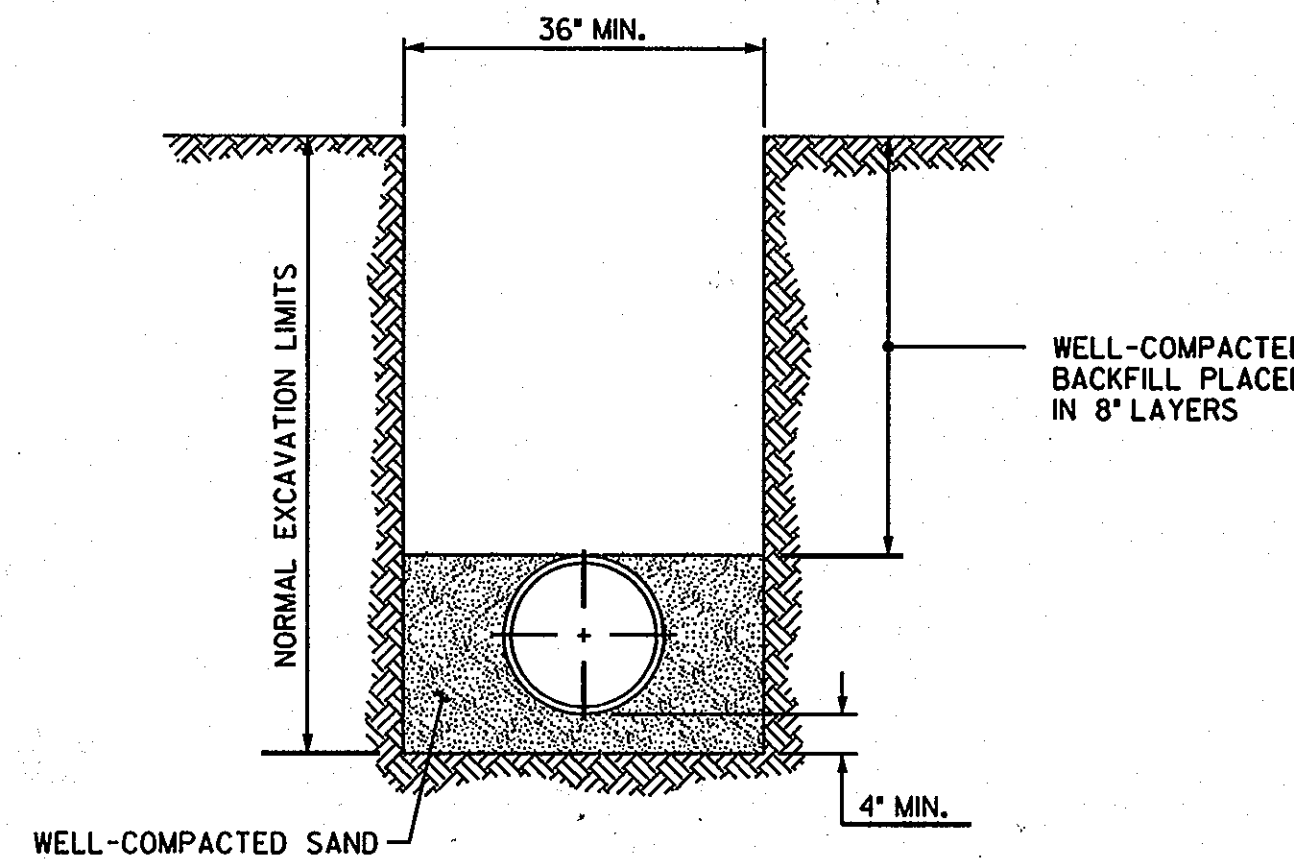
A. 16-INCH MAIN IN OLD COLUMBIA ROAD, 16" W STA. 2+38 TO STA. 11+26 AND 16" W STA. 0+00 TO STA. 0+38 AS SHOWN ON DRAWINGS U-2 AND U-3.

B. 12-INCH MAIN IN HAMMOND PARKWAY, 12" W STA. 0+00 TO STA. 1+13 AS SHOWN ON DRAWING U-7.



**SECTION**  
SCALE: 3/8" = 1'-0"

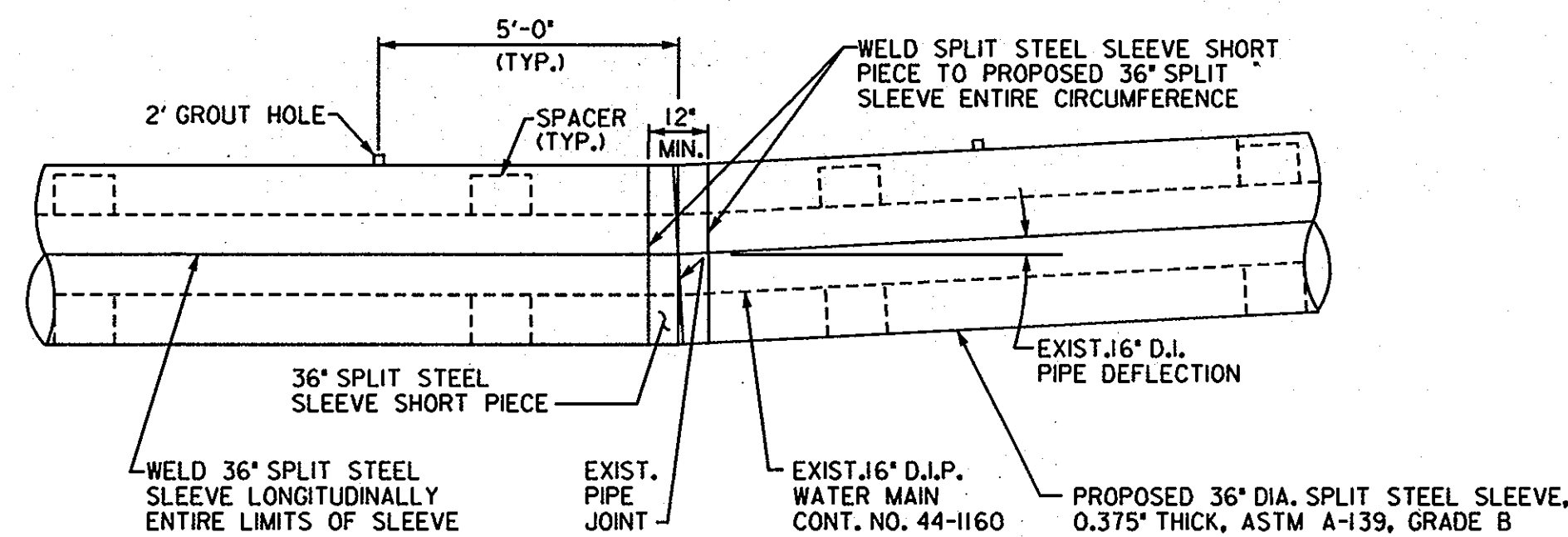
\* TRENCH PAYMENT WIDTH FOR EXCAVATION AND REFILL OF UNSUITABLE MATERIAL ENCOUNTERED BELOW SUBGRADE OF TRENCH.



**WATER MAIN TRENCH DETAIL**  
NOT TO SCALE

**NOTES:**

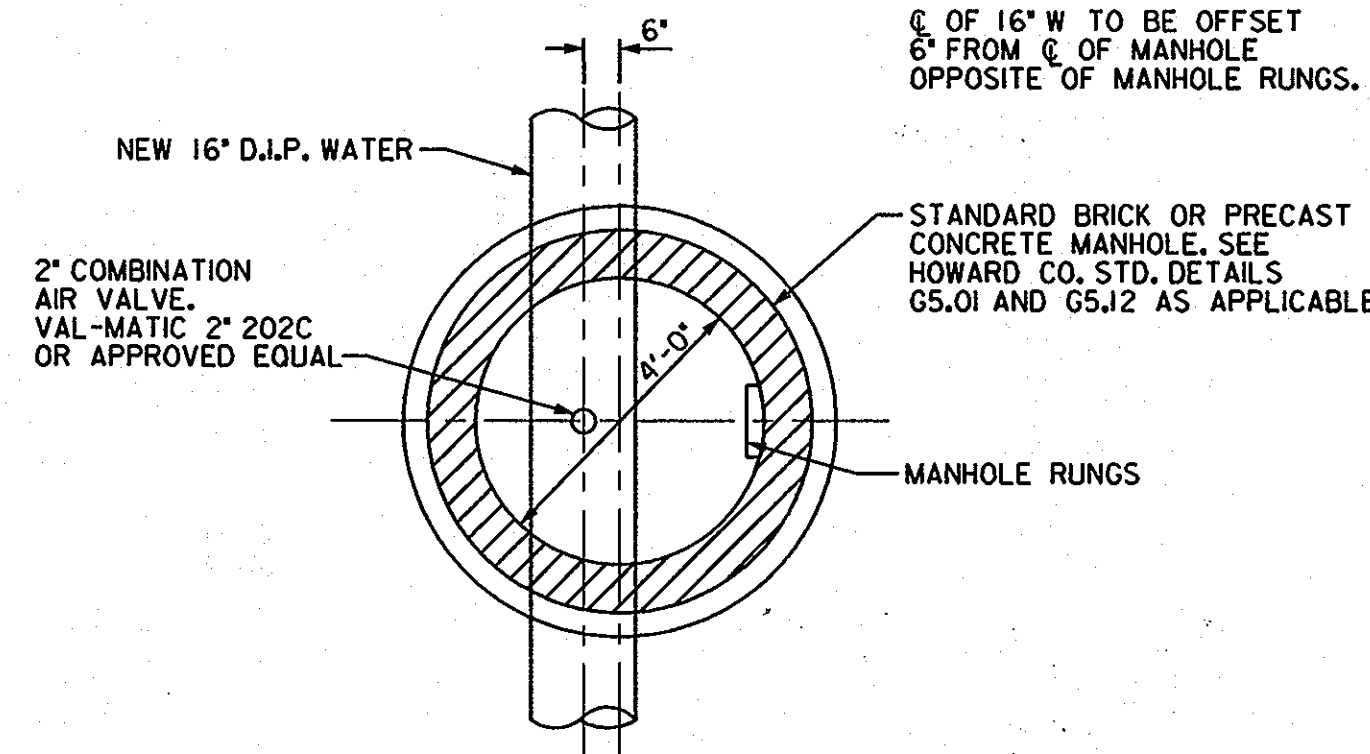
- SEE DWG U-8 FOR SPACER DETAILS AND SPACER LAYOUT INSIDE STEEL SLEEVE.
- PROVIDE 2" DIA. GROUT HOLES 5 FEET FROM EACH END OF EXIST. PIPE JOINT.
- EACH END OF SPLIT STEEL SLEEVE TO BE WITHIN 2 FEET OF AN EXISTING 16" PIPE JOINT.
- AFTER SPLIT STEEL SLEEVE INSTALLATION IS COMPLETE, FILL SLEEVE WITH GROUT.
- PROVIDE 8" BRICK BULKHEAD AT EACH END OF SLEEVE WITH 2" DIAMETER PIPE THROUGH EACH BULKHEAD FOR DRAINAGE PRIOR TO FILLING WITH GROUT.



**ELEVATION**  
SCALE: 3/8" = 1'-0"

FOR REMAINING DETAILS REFER TO HOWARD COUNTY STD. DTL. W4.11

∅ OF 16" W TO BE OFFSET 6" FROM ∅ OF MANHOLE OPPOSITE OF MANHOLE RUNGS.



**COMBINATION AIR VALVE MANHOLE DETAIL**  
SCALE: 3/8" = 1'-0"

FIRE HYDRANT RELOCATIONS						
ROADWAY STATION	EXIST. OFFSET	NEW OFFSET	EX. BURY LINE ELEV.	NEW BURY LINE ELEV.	EXIST. ELBOW ELEVATION	F.H. EXT. KIT
JOHNS HOPKINS ROAD STA. 73+54	35' RT.	49' RT.	421.9	423.1	412.7	1'-6"
JOHNS HOPKINS ROAD STA. 77+25	29' RT.	37' RT.	411.8	414.9	408.3	3'-6"
JOHNS HOPKINS ROAD STA. 80+70	25' RT.	37' RT.	414.9	417.6	410.9	3'-0"

NOTE: REMOVE EXISTING HYDRANT. EXTEND FIRE HYDRANT LEAD. REINSTALL EXISTING HYDRANT WITH REQUIRED EXTENSION KIT AT NEW LOCATION.

NOTE: ELBOW ELEVATIONS BASED ON RECORD PLANS (NGVD 29) AND ADJUSTED TO NAVD 88.

ROADWAY SURFACE ADJUSTMENTS			
ITEM	ROADWAY STATION AND OFFSET	EXIST. ELEV.	PROP. ELEV.
SANITARY MH FRAME & COVER	JOHNS HOPKINS STA. 40+35, 24' LT.	401.8	405.2
WATER VALVE BOX	JOHNS HOPKINS STA. 42+52, 40' LT.	406.0	407.5
WATER VALVE BOX	HAMMOND PARKWAY STA. 3001+44, 31' LT.	406.4	406.1
WATER VALVE BOX	JOHNS HOPKINS ROAD STA. 69+21, 70' RT.	428.3	429.5
FIRE HYDRANT (BURY LINE)	JOHNS HOPKINS ROAD STA. 69+24, 73' RT.	428.4	428.9
MANHOLE FRAME & COVER	JOHNS HOPKINS ROAD STA. 69+32, 59' RT.	428.5	429.8
WATER VALVE FRAME & COVER	JOHNS HOPKINS ROAD STA. 73+19, 37' RT.	422.9	422.8
WATER VALVE FRAME & COVER	JOHNS HOPKINS ROAD STA. 73+24, 37' RT.	422.8	422.7
WATER VALVE FRAME & COVER	JOHNS HOPKINS ROAD STA. 73+44, 27' RT.	421.8	422.2
WATER VALVE FRAME & COVER	JOHNS HOPKINS ROAD STA. 73+55, 30' RT.	421.7	422.0
WATER VALVE BOX	JOHNS HOPKINS ROAD STA. 77+25, 25' RT.	412.5	414.1
WATER VALVE BOX	JOHNS HOPKINS ROAD STA. 80+70, 22' RT.	415.0	416.8
WATER VALVE BOX	JOHNS HOPKINS ROAD STA. 81+55, 20' RT.	418.0	418.9
WATER VALVE BOX	JOHNS HOPKINS ROAD STA. 81+58, 24' RT.	417.8	419.1

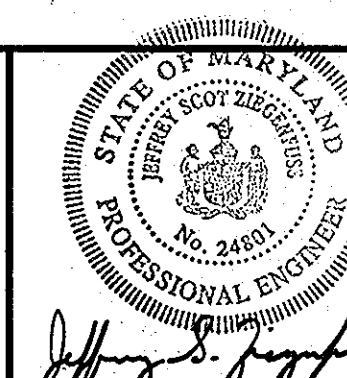
- REMOVE EXISTING MANHOLE FRAME & COVER, AND CONE. INSTALL NEW RISER SECTION. REINSTALL EXISTING CONE SECTION AND MANHOLE FRAME & COVER TO MEET PROPOSED GRADE.
- INSTALL EXTENSION KIT ON EXISTING HYDRANT.

**36" SPLIT STEEL SLEEVE DETAIL UNDER RAMP/SPUR 1**  
BY OTHERS

**DEPARTMENT OF PUBLIC WORKS**

HOWARD COUNTY, MARYLAND  
 Director of Public Works: *James M. Lewis* 2/10/03  
 Chief, Bureau of Engineering: *Jeffrey S. Ferguson* 2/28/03  
 Chief, Bureau of Utilities: *Ruth Ann* 2-3-03  
 Chief, Utility Design Division: *Clayton* 2-28-03

THE WILSON T. BALLARD CO.  
 CONSULTING ENGINEERS  
 OWINGS MILLS, MARYLAND



DES: JSZ					
DWN: GFP					
CHK: KLE					
DATE: 6/28/00	BY NO.	REVISION	DATE	600' SCALE MAP NO. W41	BLOCK NO.

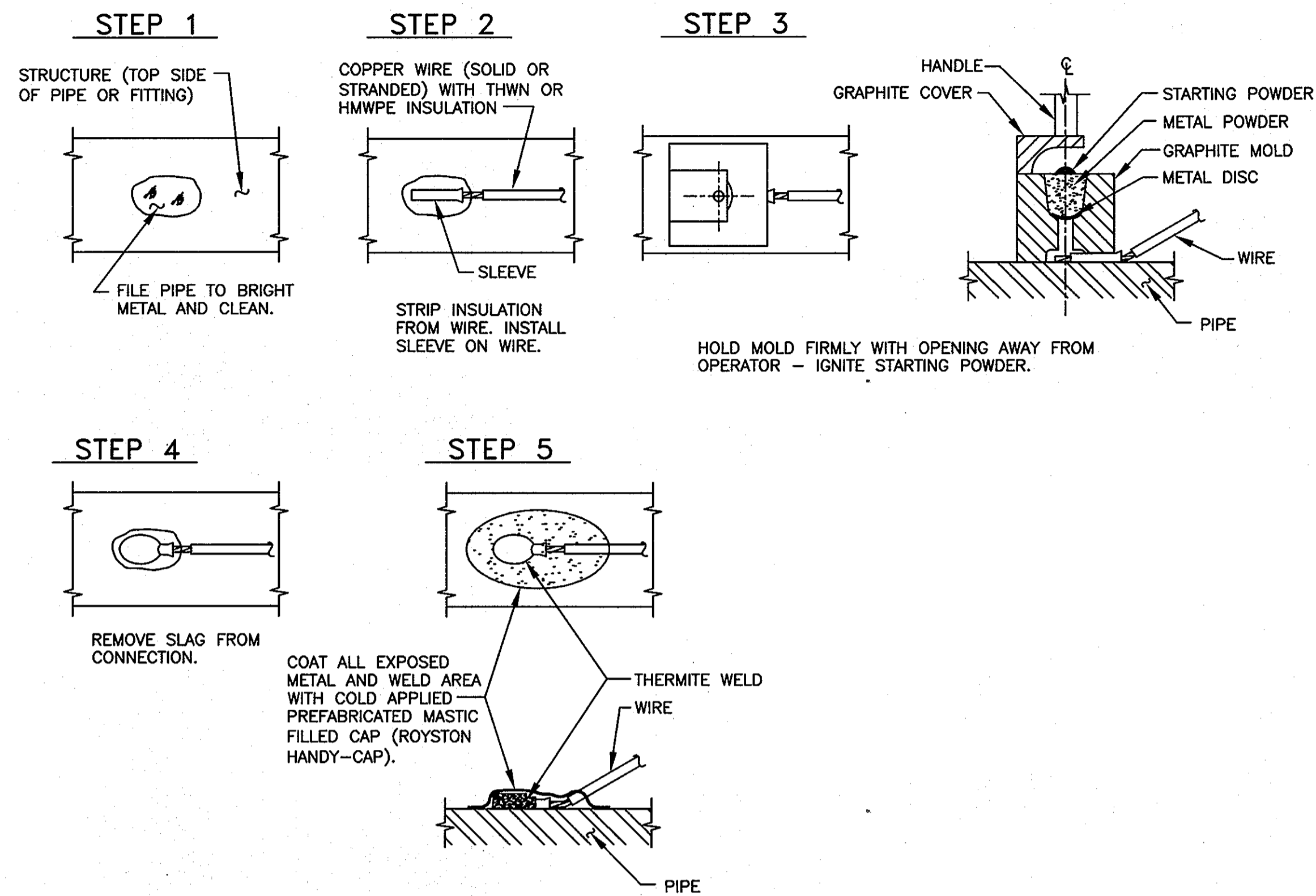
**PROFILE & DETAIL SHEET**

U.S. 29 INTERCHANGE AT JOHNS HOPKINS/  
 GORMAN ROADS AND OLD COLUMBIA ROAD  
 CAPITAL PROJECT W-8212  
 CONTRACT NO. 44-3868  
 ELECTION DISTRICT NO. 6  
 HOWARD COUNTY, MARYLAND

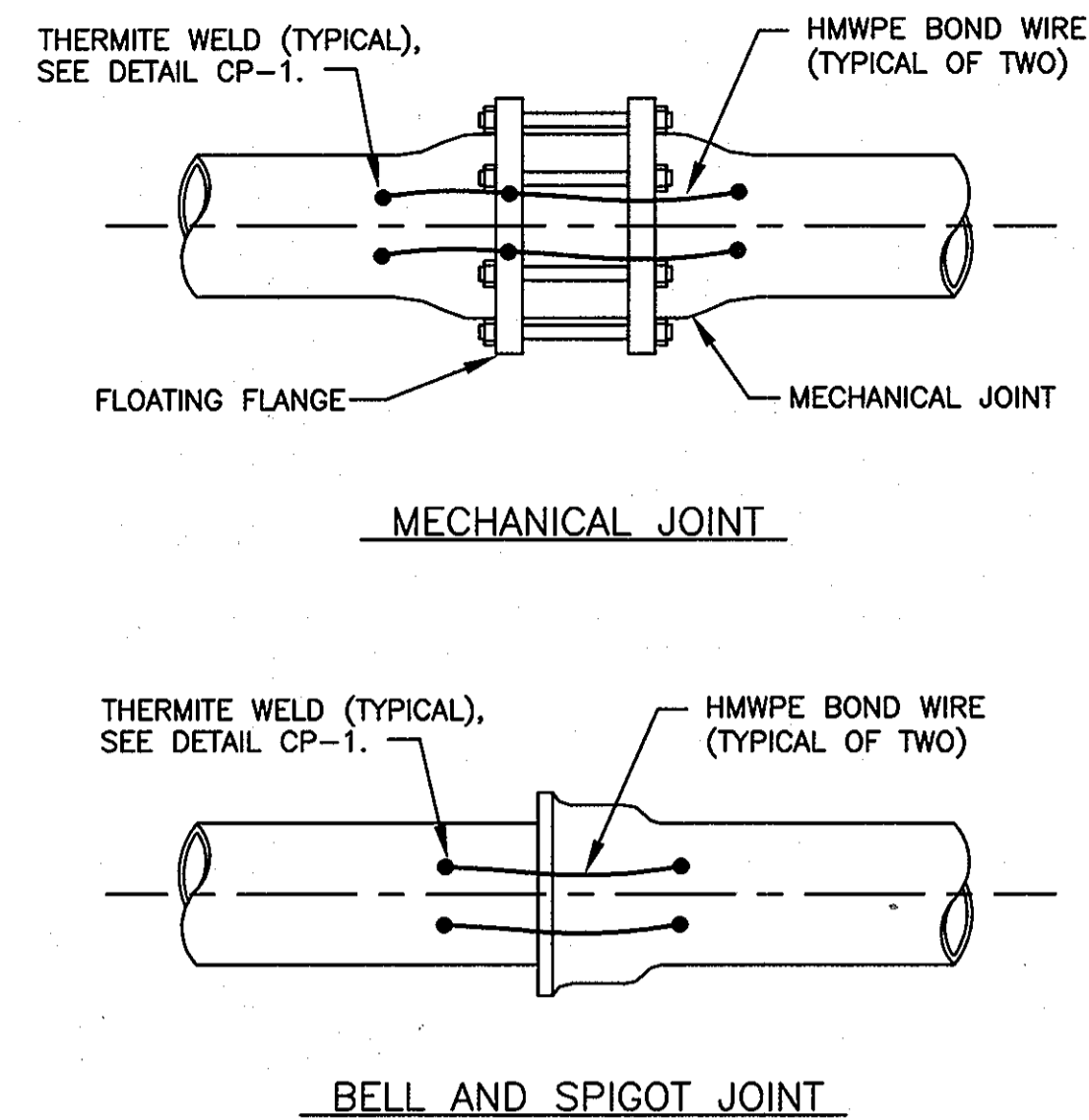
SCALE AS SHOWN  
 DWG U-9  
 SHEET 9 OF 9







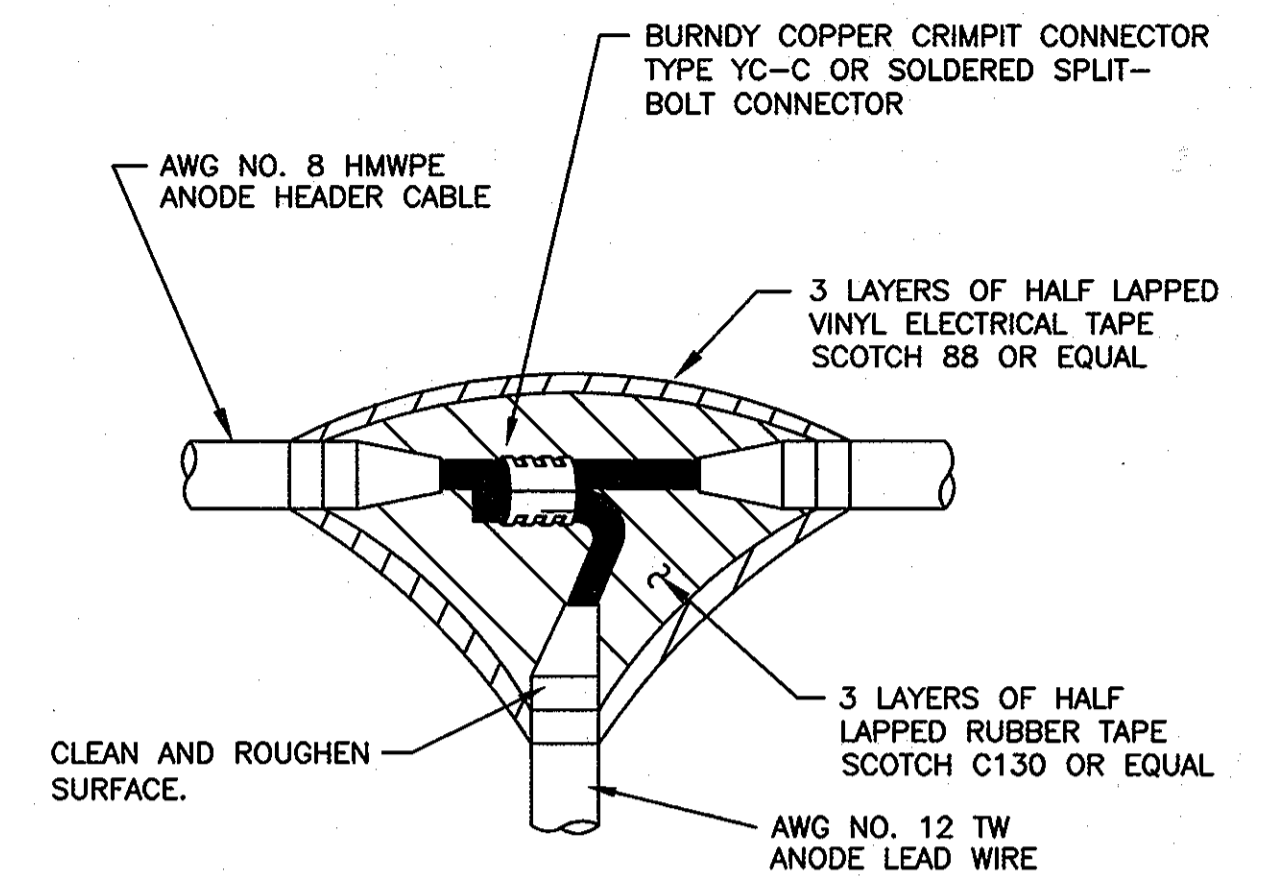
CP-1: TYPICAL THERMITE WELD



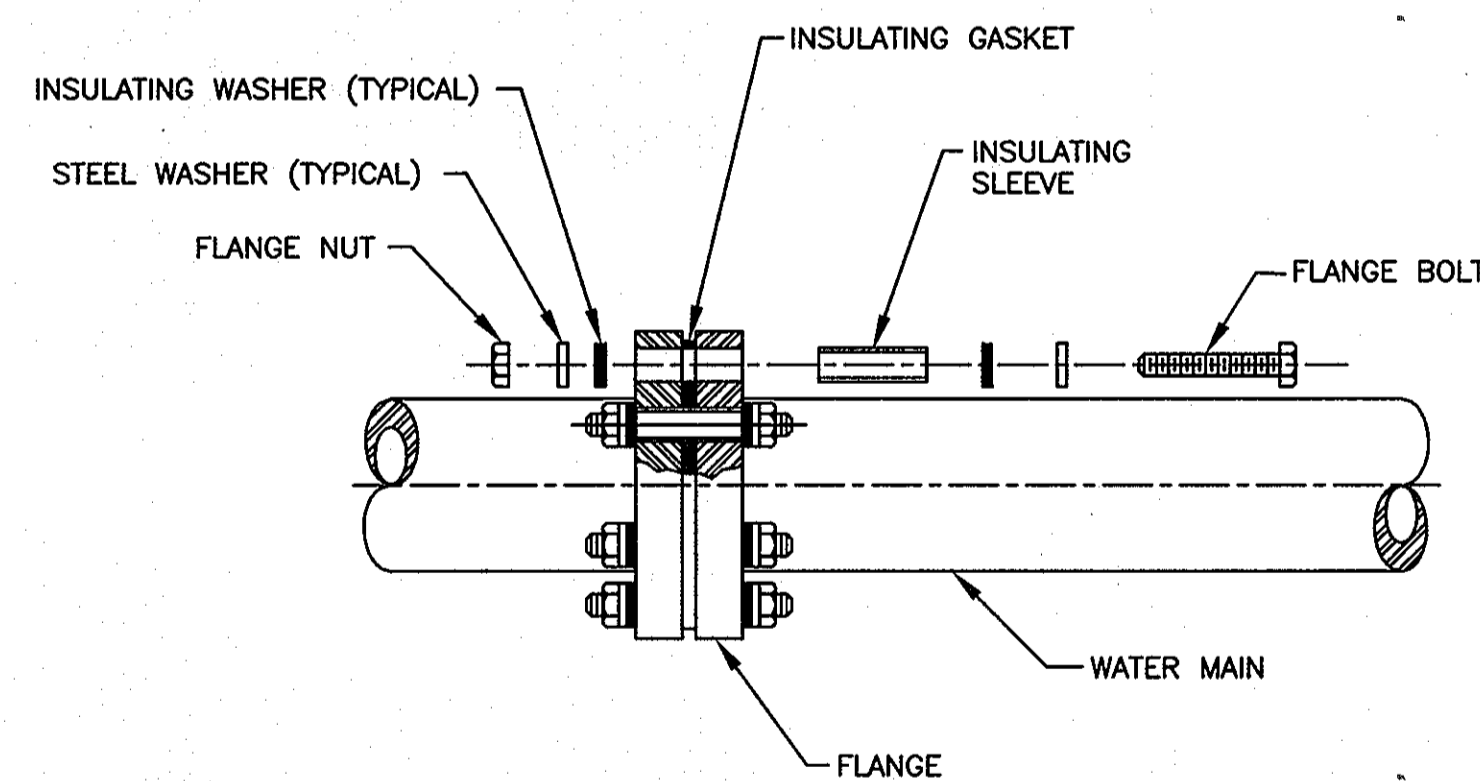
NOTE:  
ALL JOINTS ARE TO BE BONDED WITH TWO INSULATED COPPER CABLES AS FOLLOWS BASED ON PIPE SIZE:

PIPE SIZE	WIRE SIZE
LARGER THAN 32"	AWG NO. 2
16" TO 32"	AWG NO. 4
12" AND SMALLER	AWG NO. 6

CP-2: TYPICAL PIPE JOINT BOND

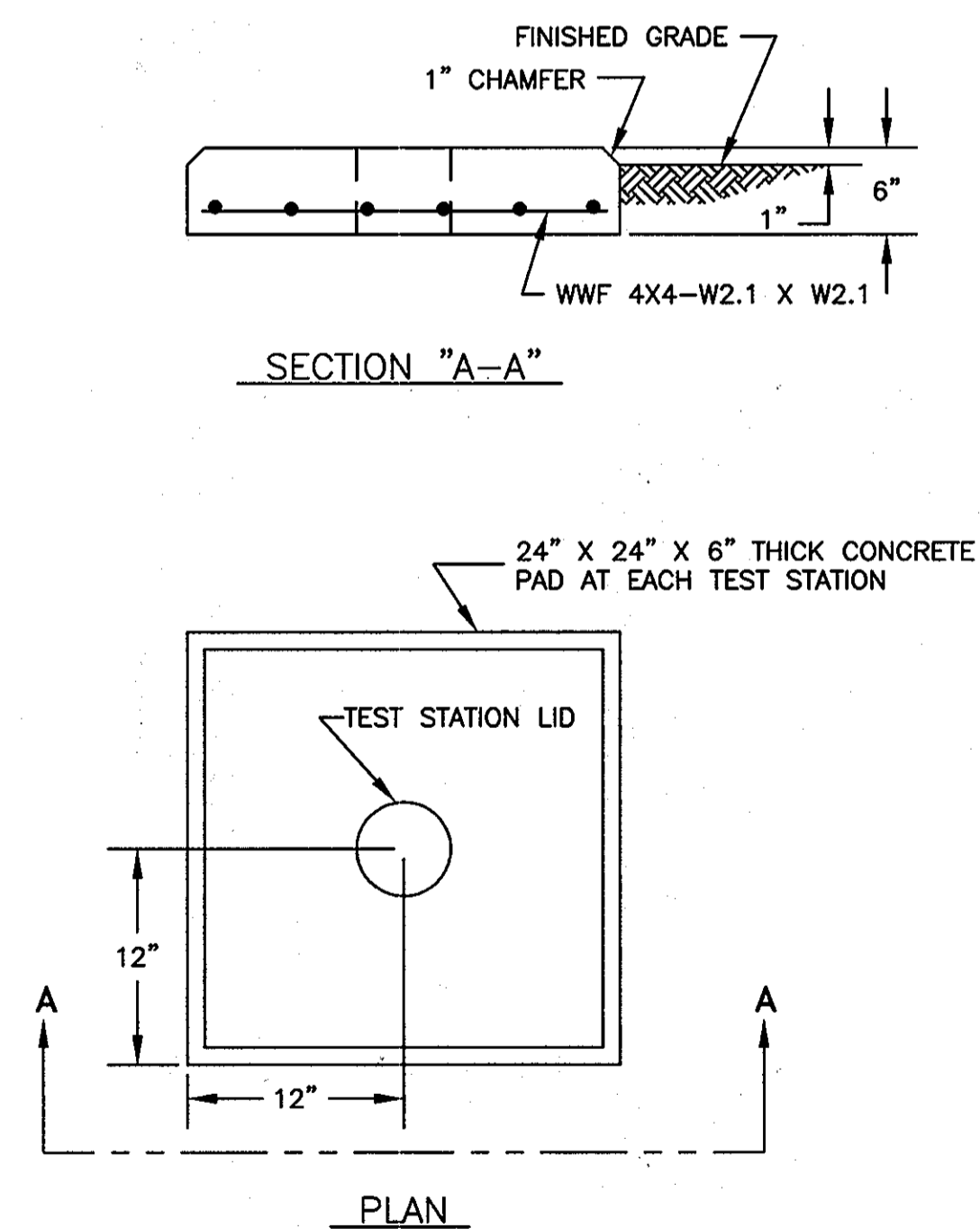


CP-3: ANODE SPLICE

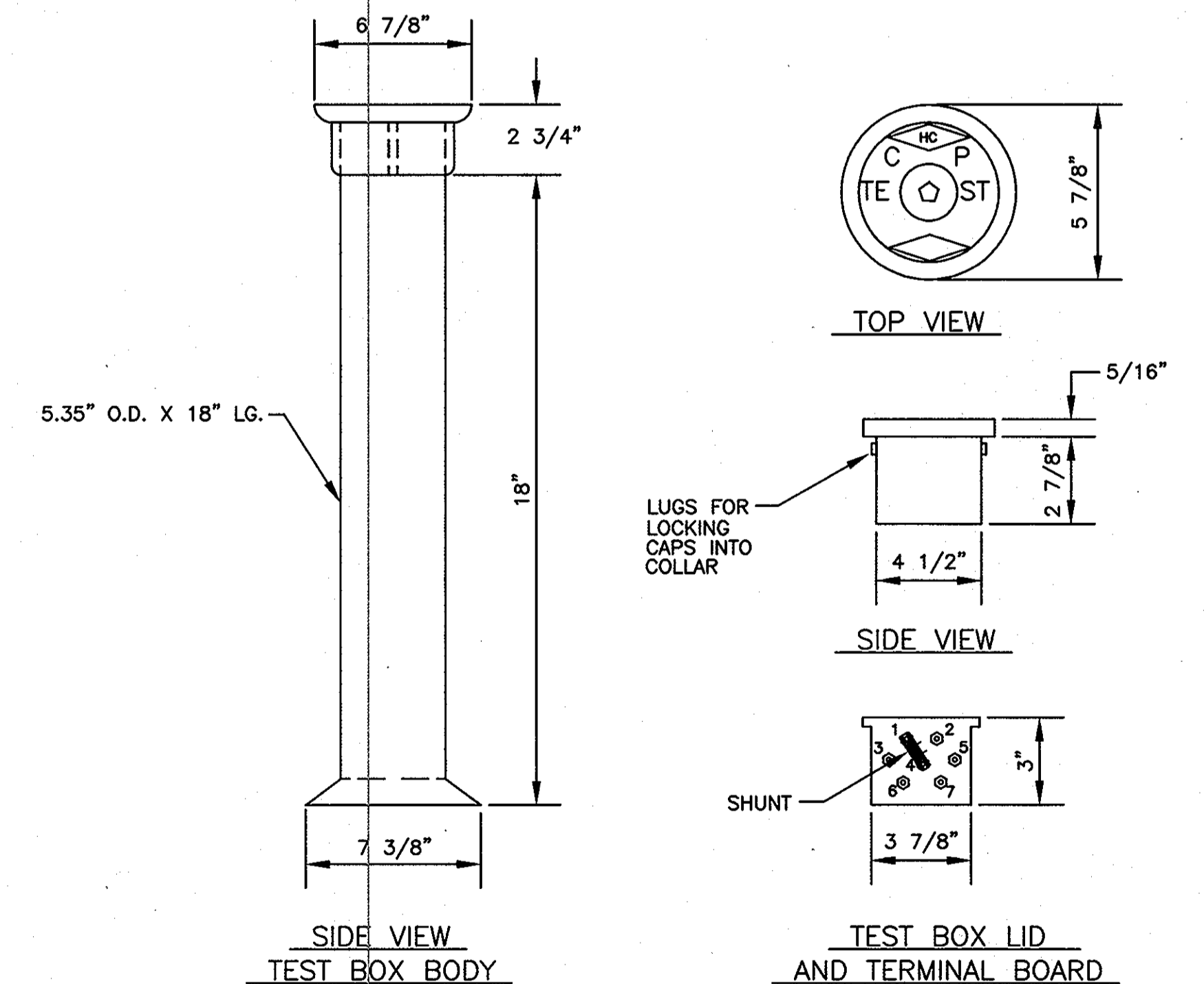


NOTE:  
SEE SPECIFICATIONS FOR EXTERNAL COATING OF INSULATING FLANGE.

CP-4: INSULATING FLANGE



CP-5: TEST STATION PAD



CP-6: TEST BOX

As-Built

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
Director of Public Works  
5/10/04  
Chief, Bureau of Engineering  
5/4/04  
Chief, Utility Design Division  
5-4-04

RUSSELL CORROSION CONSULTANTS, INC.  
5405 TWIN KNOLLS RD., SUITE 3  
COLUMBIA, MD 21045



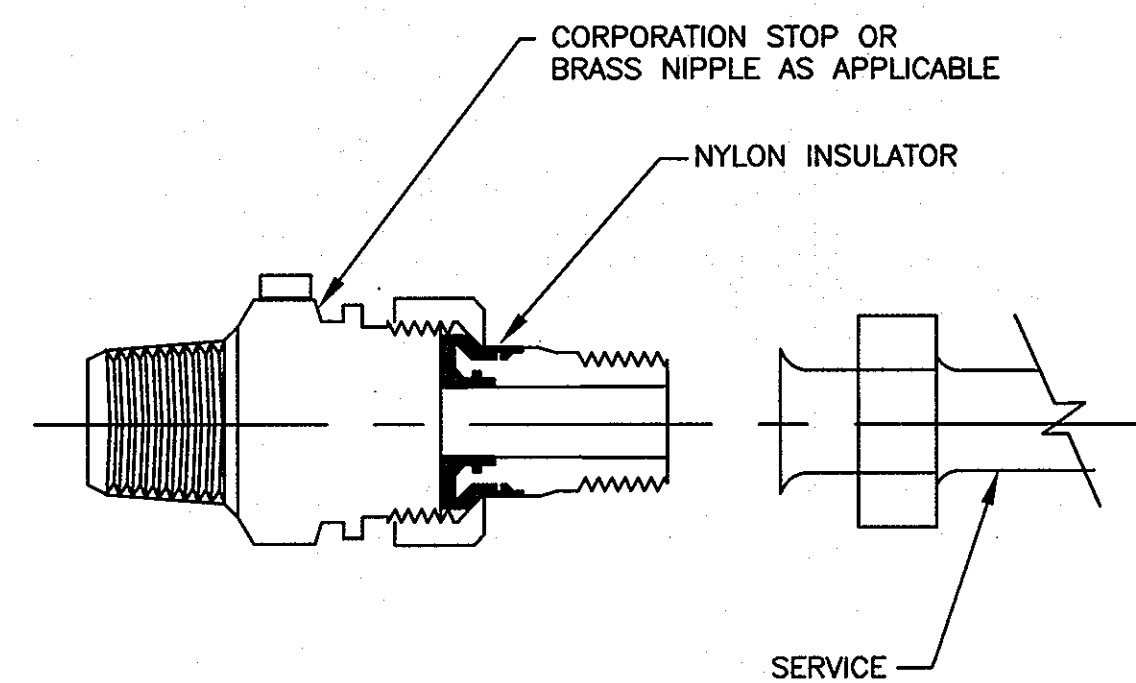
DES: MJS	DJD	AS-BUILT	3/04
DRN: DJD			
CHK: MJS			
DATE: 6/28/00	BY NO.	REVISION	NO.

CATHODIC PROTECTION  
DETAILS - 1

U.S. 29 INTERCHANGE AT JOHNS HOPKINS/  
GORMAN ROADS AND OLD COLUMBIA ROAD  
CAPITAL PROJECT W-8212  
CONTRACT NO. 44-3868  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

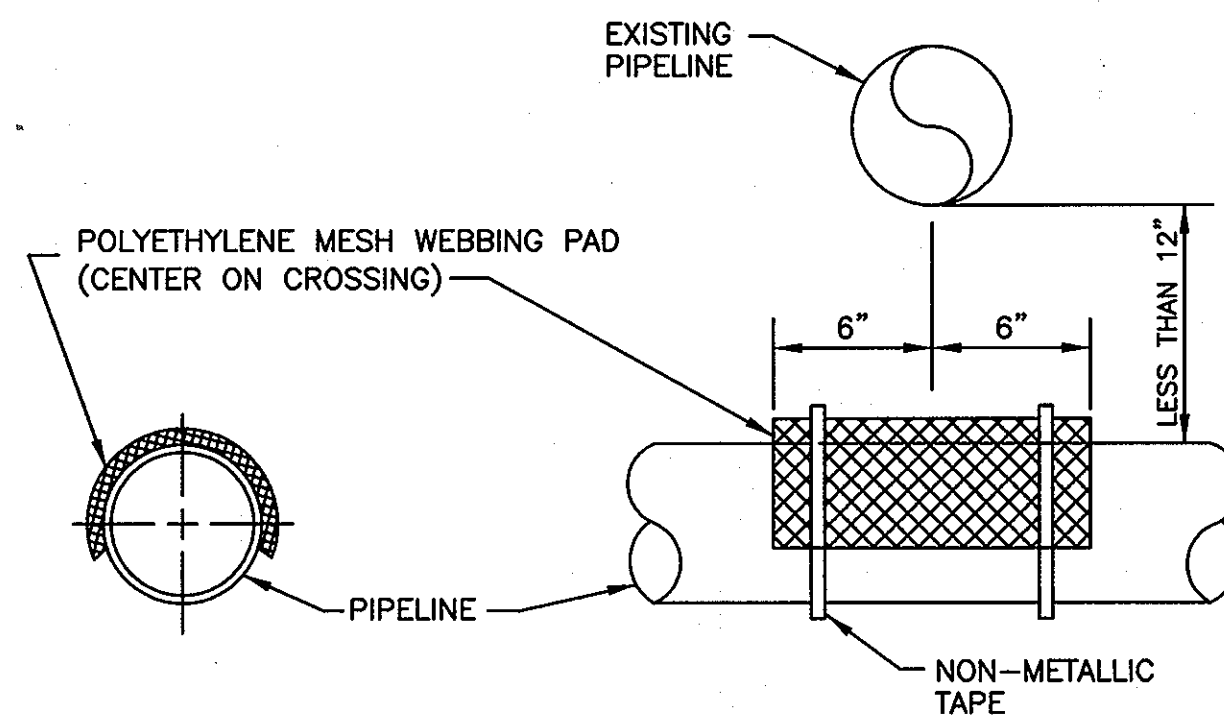
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DWG U-10  
SHEET  
10 of 13

4/16/2004 12:47:20 PM, REC



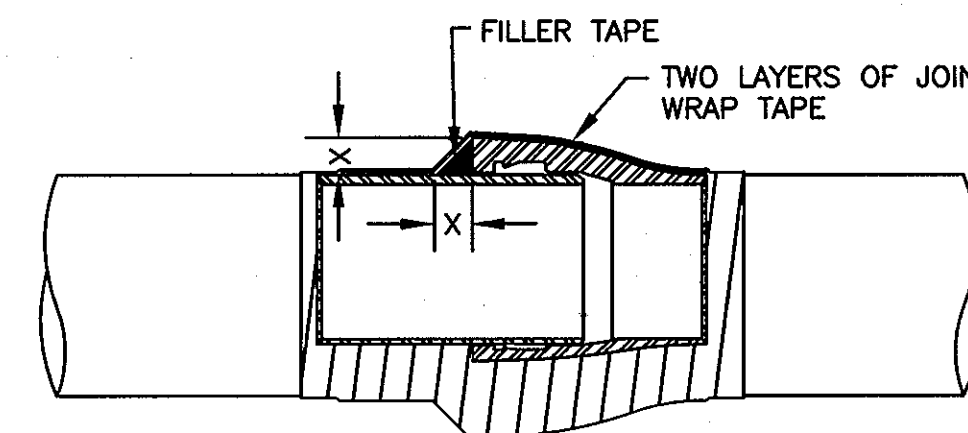
- NOTES:**
1. INSTALL ELECTRICAL ISOLATION ON ALL WATER SERVICE CONNECTIONS TO DUCTILE IRON MAIN.
  2. COAT EXTERIOR OF SERVICE PIPING WITH TWO COATS OF COAL TAR MASTIC (20 MILS TOTAL) FOR A DISTANCE OF 12 INCHES ON EITHER SIDE OF INSULATOR.

**CP-7: INSULATING UNION FOR SERVICE**



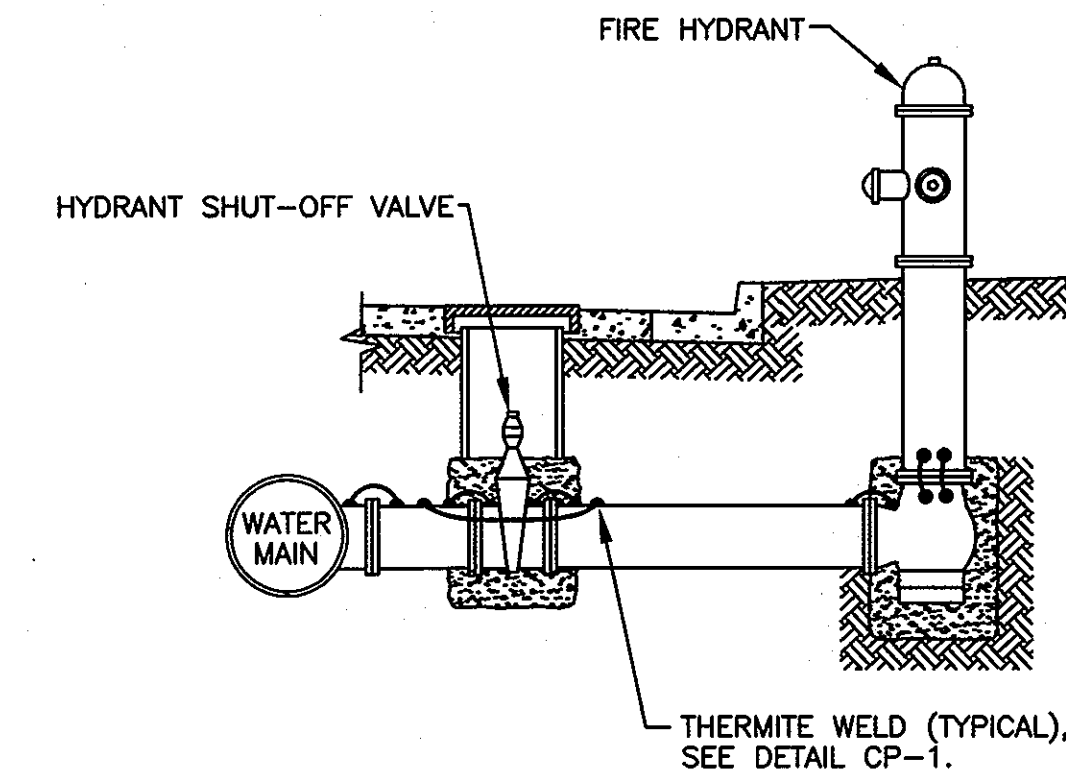
- NOTE:**
1. USE ONLY WHEN PIPES ARE LESS THAN 12" APART.

**CP-8: SEPARATOR TO AVOID ELECTRICAL CONTACT**



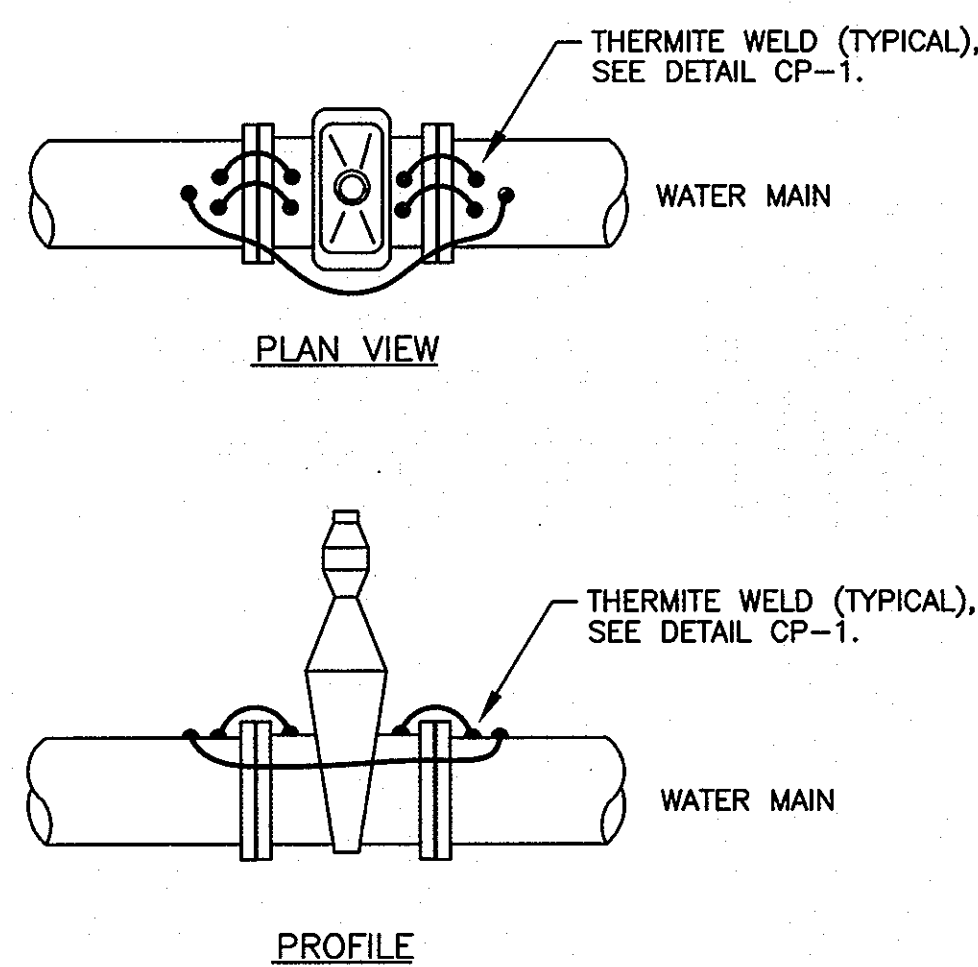
- NOTES:**
1. CLEAN JOINT OF ALL FOREIGN MATERIAL BY WIRE BRUSHING.
  2. APPLY COATING PRIMER TO JOINT.
  3. INSTALL FILLER TAPE AS SHOWN.
  4. APPLY TWO LAYERS OF JOINT WRAP TAPE.
  5. COAT PIPE FITTINGS IN A SIMILAR MANNER.

**CP-9: JOINT COATING**

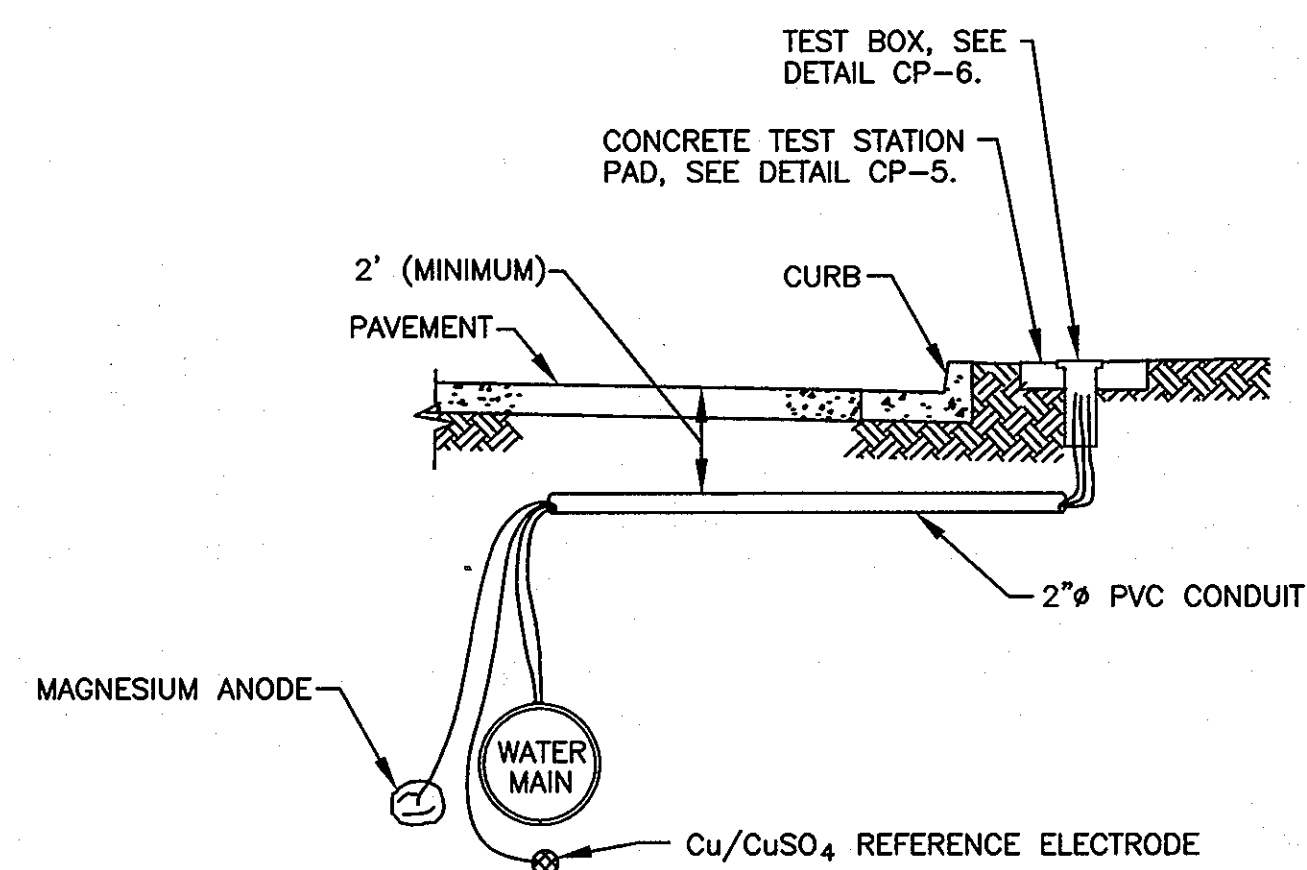


- NOTES:**
1. BOND ALL DUCTILE IRON COMPONENTS TOGETHER WITH AWG NO. 6 HMWPE WIRES.
  2. INSTALL BOND WIRES ON TOP OF PIPE OR FITTING WHERE POSSIBLE.
  3. INSTALL A MINIMUM OF TWO BOND CABLES ACROSS EACH PIPE JOINT.
  4. SEE DETAIL CP-11 FOR BONDING OF VALVE.

**CP-10: ELECTRICAL BONDING OF HYDRANT PIPING**

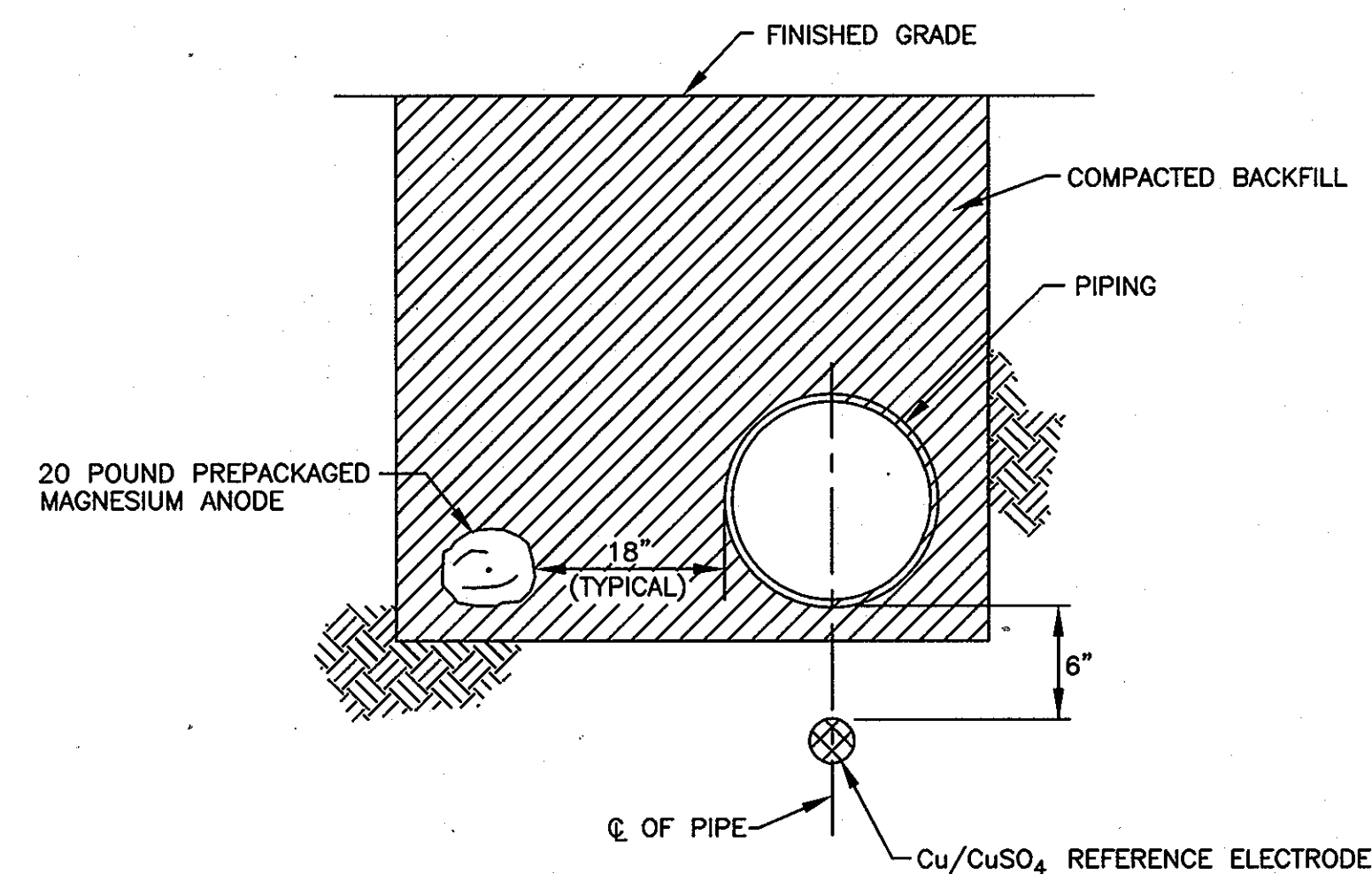


**CP-11: BONDING OF VALVES**



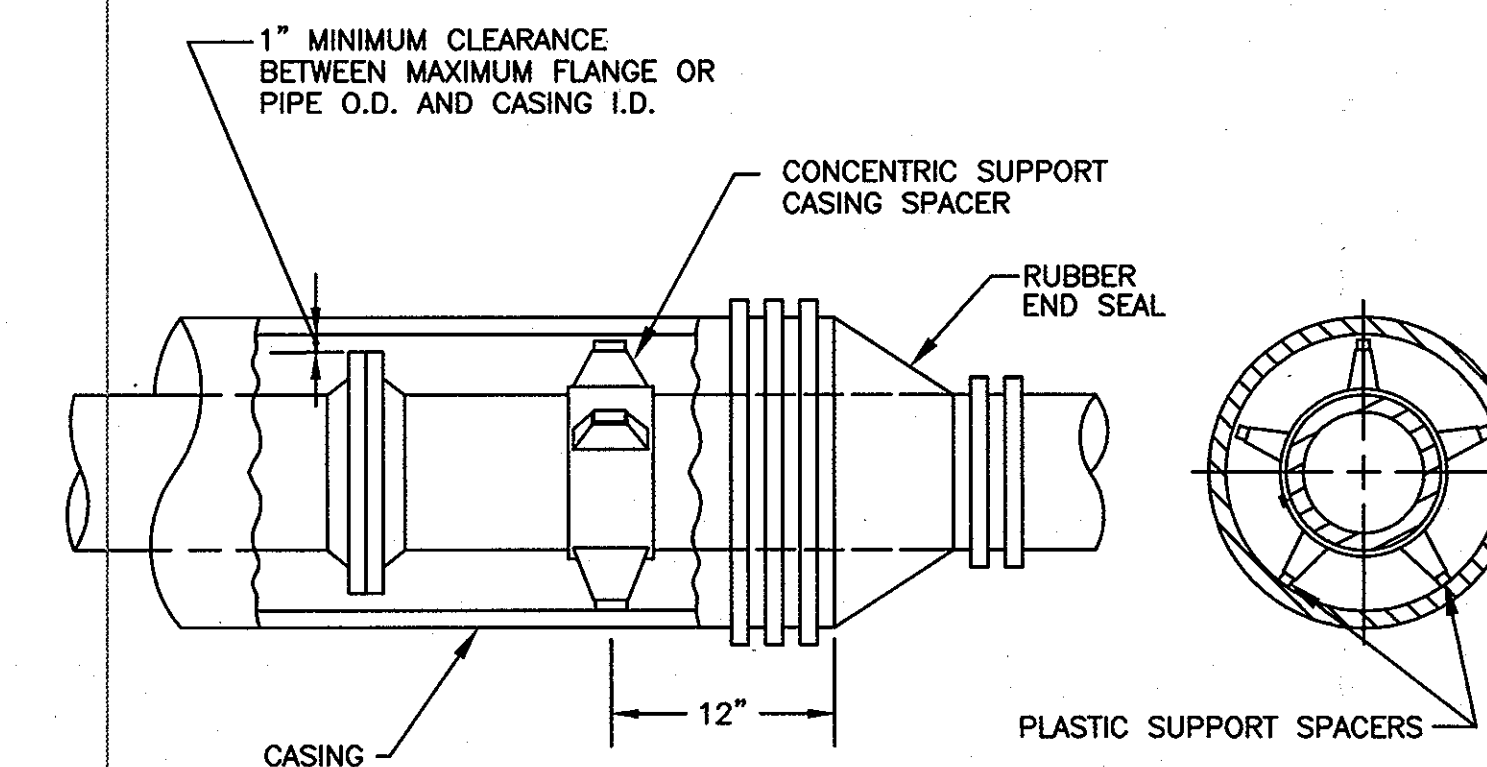
- NOTES:**
1. INSTALL TEST BOX DIRECTLY ABOVE PIPING IN NON-PAVED AREAS.
  2. IN PAVED AREAS, INSTALL TEST BOX OUTSIDE OF PAVEMENT.
  3. ROUTE TEST LEADS THROUGH CONDUIT TO TEST BOX WHEN TEST BOX IS NOT IMMEDIATELY ABOVE PIPING.

**CP-12: TEST STATION PLACEMENT**



- NOTE:**
1. INSTALL ANODES AND REFERENCE ELECTRODES IN NATIVE SOIL. DO NOT BACKFILL ANODES OR REFERENCE ELECTRODES WITH SAND OR STONE.

**CP-13: ANODE AND REFERENCE ELECTRODE PLACEMENT**



- NOTE:**
1. INSTALL CASING SPACERS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

**CP-14: CASING ISOLATION**

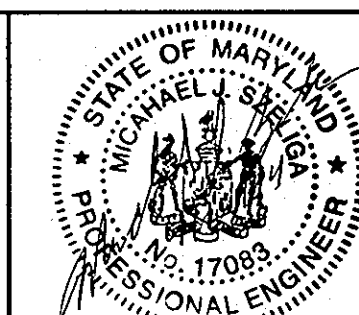
**AS-Built**

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 5/17/04  
Chief, Bureau of Engineering: *[Signature]* 5/14/04

Chief, Bureau of Utilities: *[Signature]* 5-5-04  
Chief, Utility Design Division: *[Signature]* 5-4-04

RUSSELL CORROSION CONSULTANTS, INC.  
5405 TWIN KNOLLS RD., SUITE 3  
COLUMBIA, MD 21045



DES: MJS	DJD	AS-BUILT	3/04
DRN: DJD			
CHK: MJS			
DATE: 6/28/00	BY NO.	REVISION	NO.

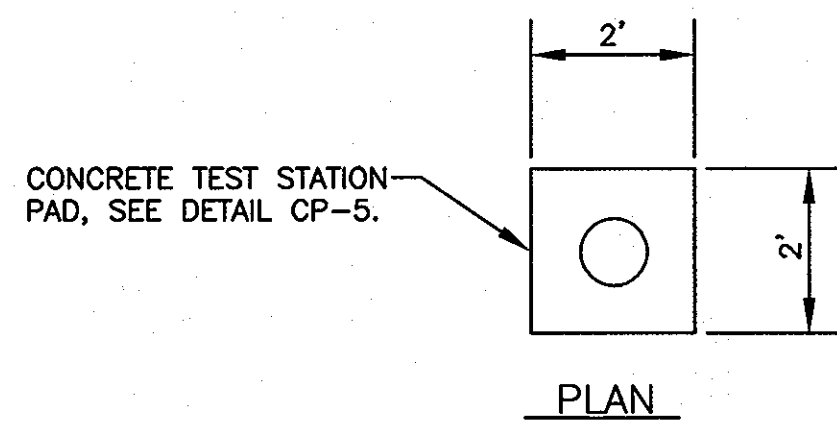
CATHODIC PROTECTION  
DETAILS - 2

600' SCALE MAP NO. W41 BLOCK NO.

U.S. 29 INTERCHANGE AT JOHNS HOPKINS/  
GORMAN ROADS AND OLD COLUMBIA ROAD  
CAPITAL PROJECT W-8212  
CONTRACT NO. 44-3868  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

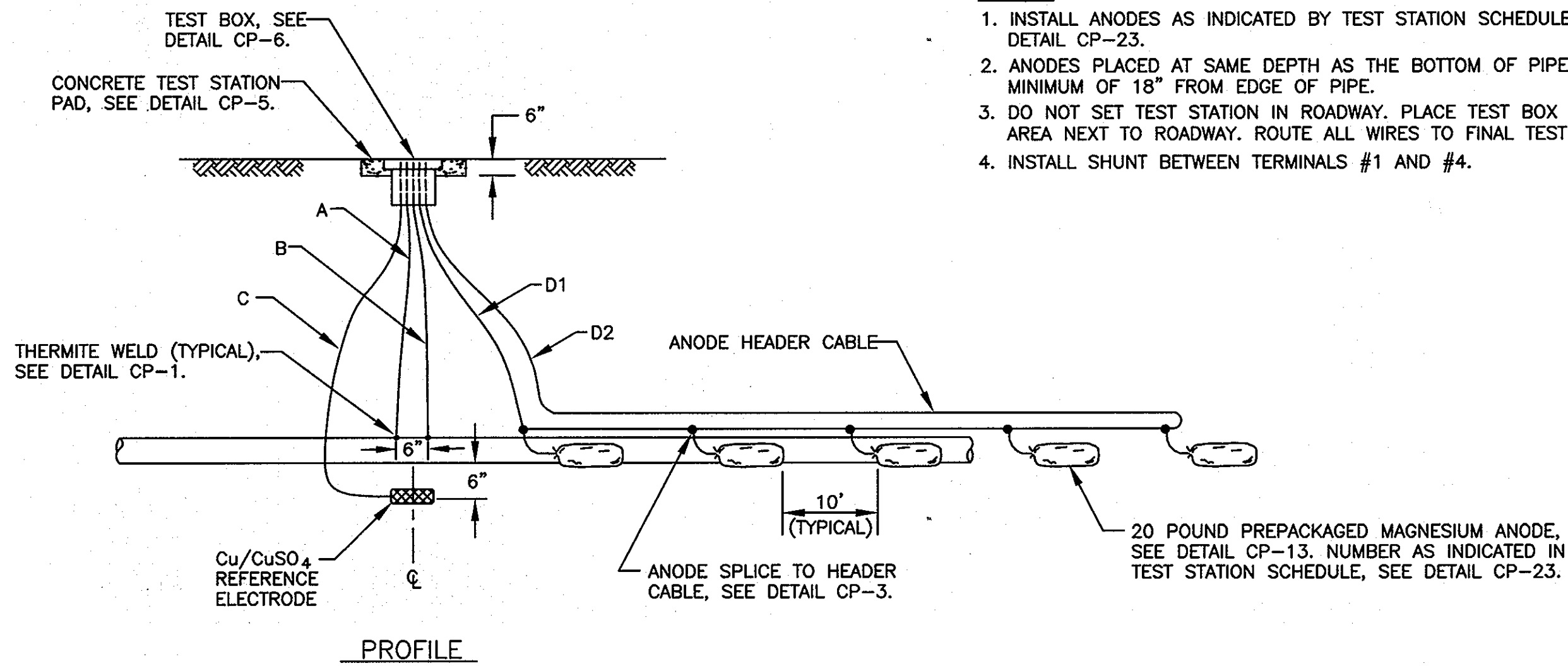
SCALE:  
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DWG U-11

SHEET  
11 OF 13

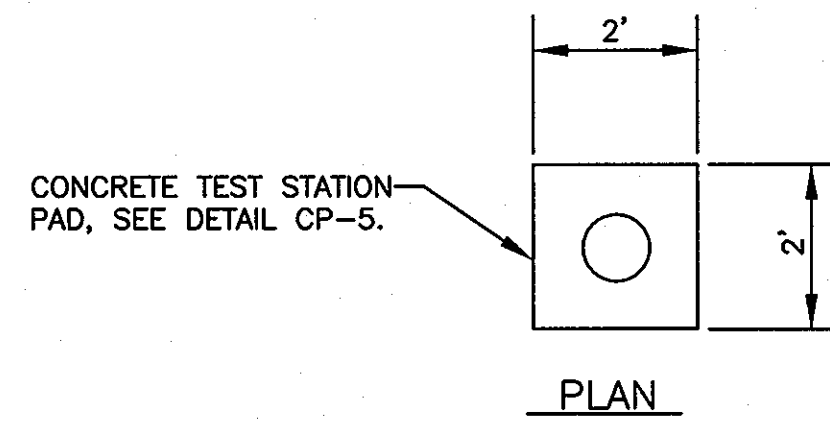


WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE INSULATION	COLOR INSULATION
NEW PIPE	A B	1 3	#10 #10	THWN THWN	BLUE BLUE
PERMANENT REFERENCE ELECTRODE	C	6	#14	HMWPE	YELLOW
MAGNESIUM ANODE HEADER CABLE	D1 D2	4 7	#8 #8	HMWPE HMWPE	BLACK BLACK

- NOTES:
1. INSTALL ANODES AS INDICATED BY TEST STATION SCHEDULE. SEE DETAIL CP-23.
  2. ANODES PLACED AT SAME DEPTH AS THE BOTTOM OF PIPE AND AT A MINIMUM OF 18" FROM EDGE OF PIPE.
  3. DO NOT SET TEST STATION IN ROADWAY. PLACE TEST BOX IN NON-PAVED AREA NEXT TO ROADWAY. ROUTE ALL WIRES TO FINAL TEST BOX LOCATION.
  4. INSTALL SHUNT BETWEEN TERMINALS #1 AND #4.

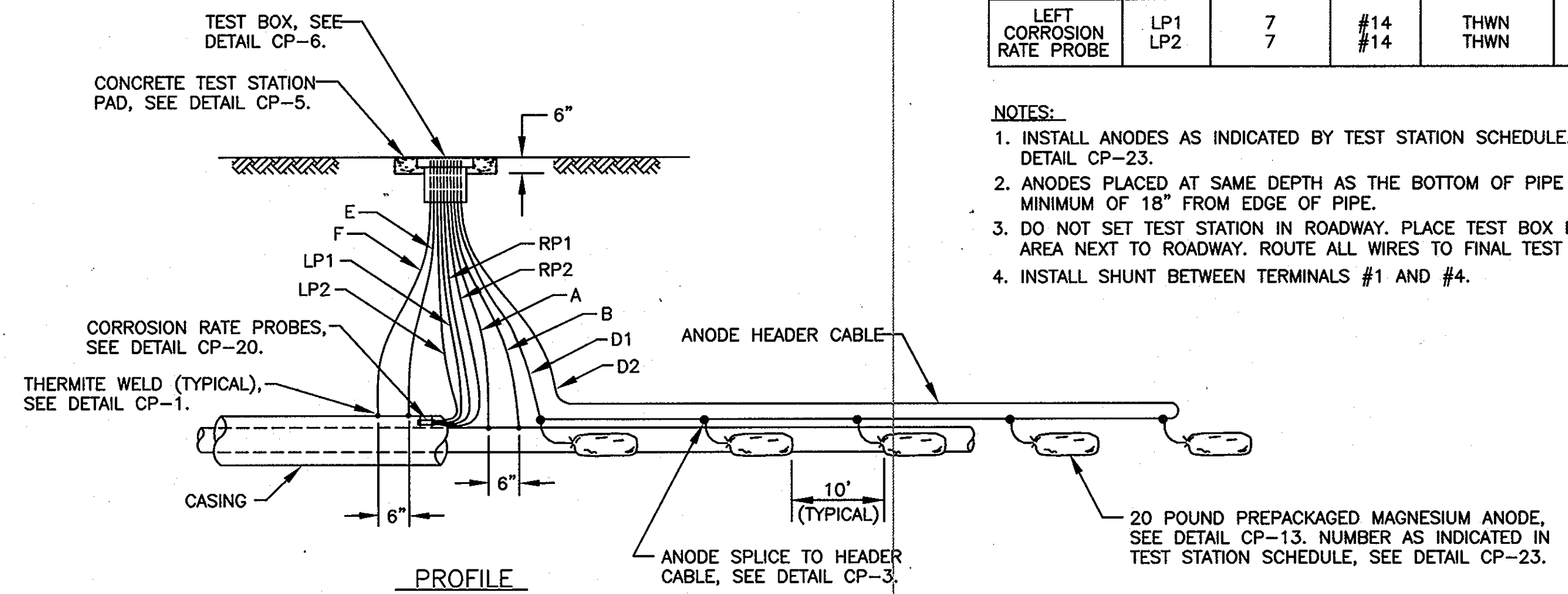


CP-15: ANODE TEST STATION

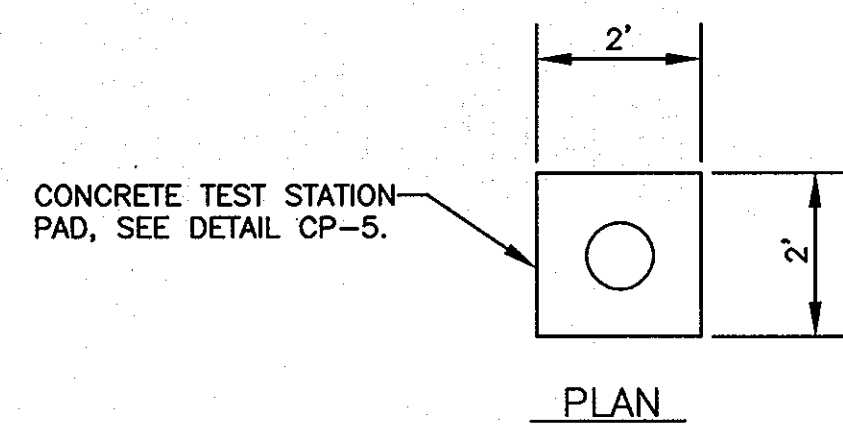


WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE INSULATION	COLOR INSULATION
NEW PIPE	A B	1 3	#10 #10	THWN THWN	BLUE BLUE
CASING	E F	2 5	#10 #10	THWN THWN	WHITE WHITE
MAGNESIUM ANODE HEADER CABLE	D1 D2	4 4	#8 #8	HMWPE HMWPE	BLACK BLACK
RIGHT CORROSION RATE PROBE	RP1 RP2	6 6	#14 #14	THWN THWN	BLACK BLACK
LEFT CORROSION RATE PROBE	LP1 LP2	7 7	#14 #14	THWN THWN	BLACK BLACK

- NOTES:
1. INSTALL ANODES AS INDICATED BY TEST STATION SCHEDULE. SEE DETAIL CP-23.
  2. ANODES PLACED AT SAME DEPTH AS THE BOTTOM OF PIPE AND AT A MINIMUM OF 18" FROM EDGE OF PIPE.
  3. DO NOT SET TEST STATION IN ROADWAY. PLACE TEST BOX IN NON-PAVED AREA NEXT TO ROADWAY. ROUTE ALL WIRES TO FINAL TEST BOX LOCATION.
  4. INSTALL SHUNT BETWEEN TERMINALS #1 AND #4.

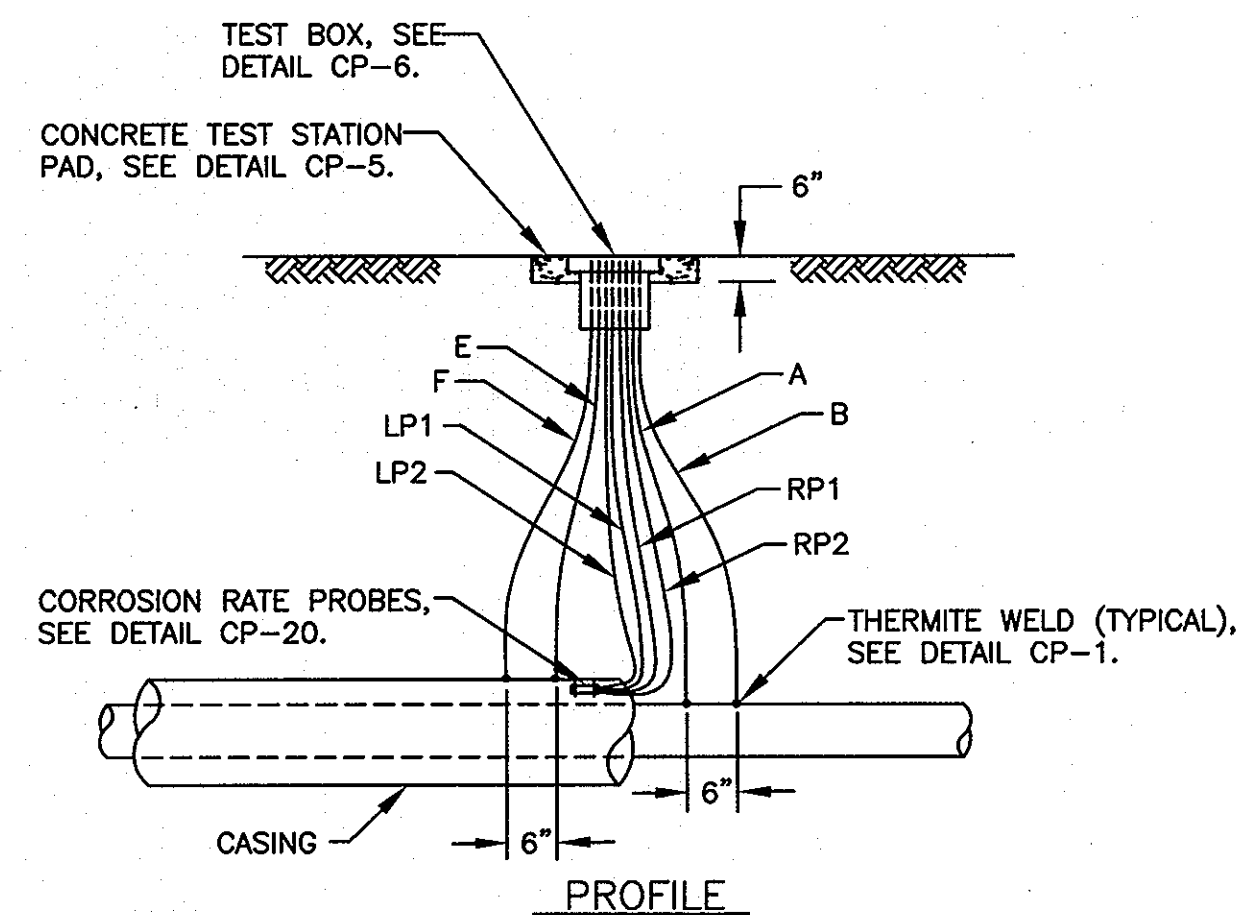


CP-16: CASING TEST STATION (WITH ANODES)

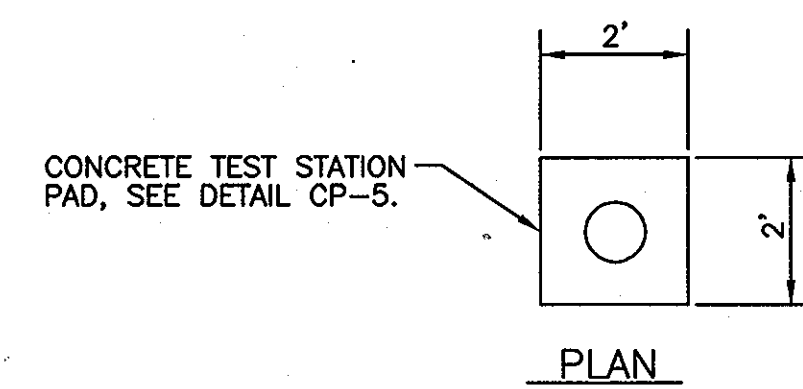


WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE INSULATION	COLOR INSULATION
NEW PIPE	A B	1 3	#10 #10	THWN THWN	BLUE BLUE
CASING	E F	2 5	#10 #10	THWN THWN	WHITE WHITE
RIGHT CORROSION RATE PROBE	RP1 RP2	6 6	#14 #14	THWN THWN	BLACK BLACK
LEFT CORROSION RATE PROBE	LP1 LP2	7 7	#14 #14	THWN THWN	BLACK BLACK

- NOTE:
1. DO NOT SET TEST STATION IN ROADWAY. PLACE TEST BOX IN NON-PAVED AREA NEXT TO ROADWAY. ROUTE ALL WIRES TO FINAL TEST BOX LOCATION.

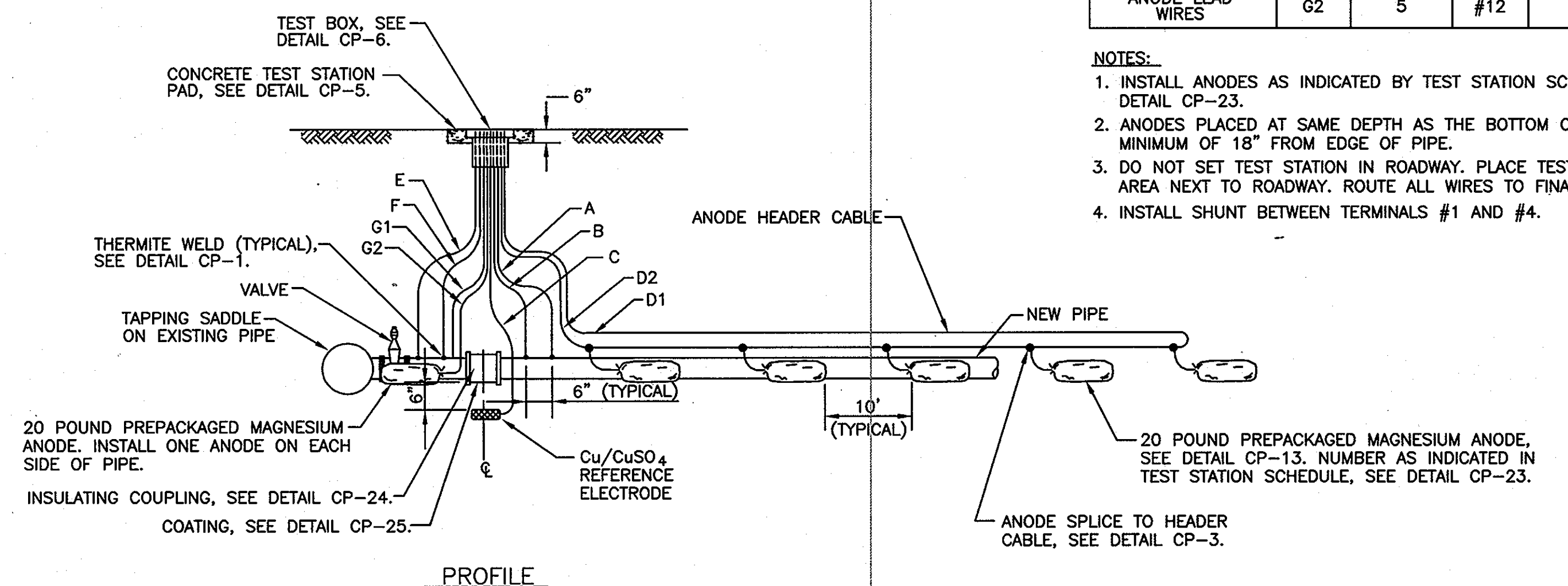


CP-17: CASING TEST STATION (WITHOUT ANODES)



WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE INSULATION	COLOR INSULATION
NEW PIPE	A B	1 3	#10 #10	THWN THWN	BLUE BLUE
PERMANENT REFERENCE ELECTRODE	C	6	#14	HMWPE	YELLOW
MAGNESIUM ANODE HEADER CABLE	D1 D2	4 7	#8 #8	HMWPE HMWPE	BLACK BLACK
EXISTING PIPE SIDE OF INSULATOR	E F	2 5	#10 #10	THWN THWN	WHITE WHITE
MAGNESIUM ANODE LEAD WIRES	G1 G2	2 5	#12 #12	TW TW	BLACK BLACK

- NOTES:
1. INSTALL ANODES AS INDICATED BY TEST STATION SCHEDULE. SEE DETAIL CP-23.
  2. ANODES PLACED AT SAME DEPTH AS THE BOTTOM OF PIPE AND AT A MINIMUM OF 18" FROM EDGE OF PIPE.
  3. DO NOT SET TEST STATION IN ROADWAY. PLACE TEST BOX IN NON-PAVED AREA NEXT TO ROADWAY. ROUTE ALL WIRES TO FINAL TEST BOX LOCATION.
  4. INSTALL SHUNT BETWEEN TERMINALS #1 AND #4.



CP-18: INSULATING JOINT TEST STATION (WITH ANODES)

AS-Built

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

Director of Public Works: *Langdon* 5/17/04  
Chief, Bureau of Utilities: *Ruth* 5-5-04

Chief, Bureau of Engineering: *William* 5/4/04  
Chief, Utility Design Division: *Qu* 5-4-04

RUSSELL CORROSION CONSULTANTS, INC.  
5405 TWIN KNOLLS RD., SUITE 3  
COLUMBIA, MD 21045

STATE OF MARYLAND  
MICHAEL S. SWEET, P.E.  
PROFESSIONAL ENGINEER

DES: MJS	DJD	AS-BUILT	3/04
DRN: DJD			
CHK: MJS			
DATE: 6/28/00	BY NO.	REVISION	NO.

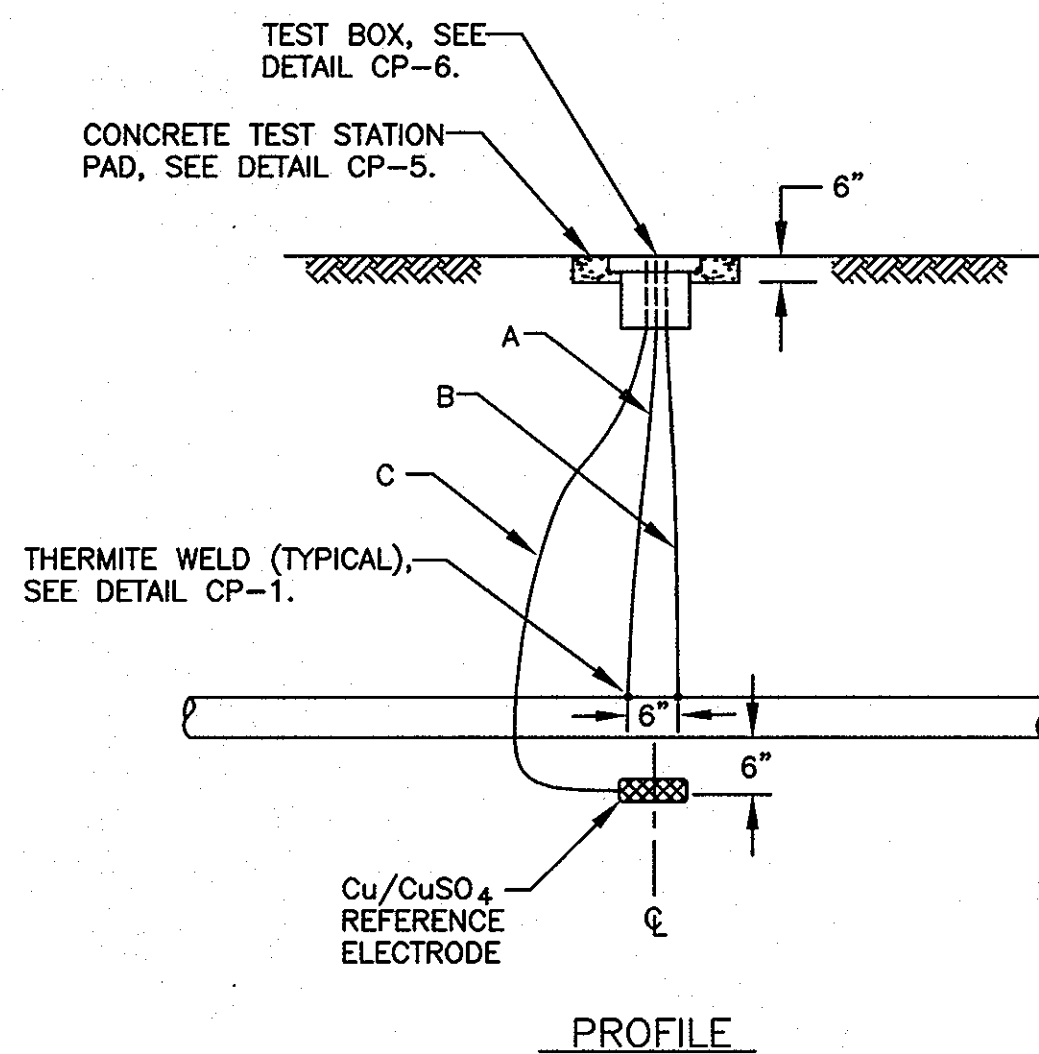
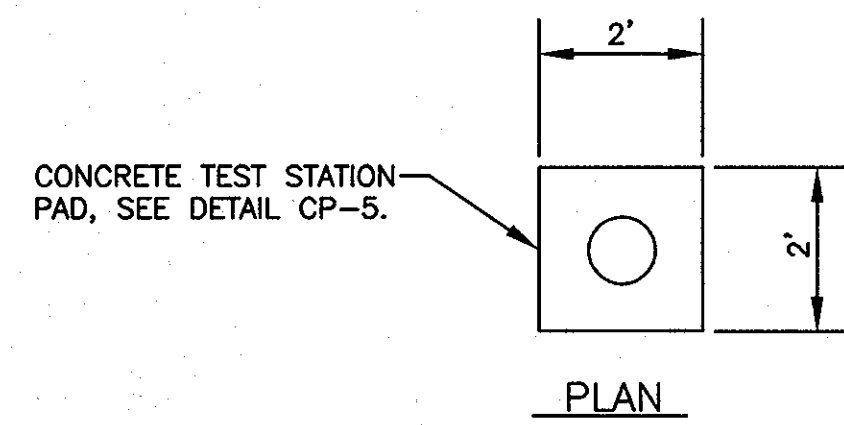
CATHODIC PROTECTION  
DETAILS - 3

600' SCALE MAP NO. W41 BLOCK NO.

U.S. 29 INTERCHANGE AT JOHNS HOPKINS/  
GORMAN ROADS AND OLD COLUMBIA ROAD  
CAPITAL PROJECT W-8212  
CONTRACT NO. 44-3868  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE:  
NONE  
DWG U-12

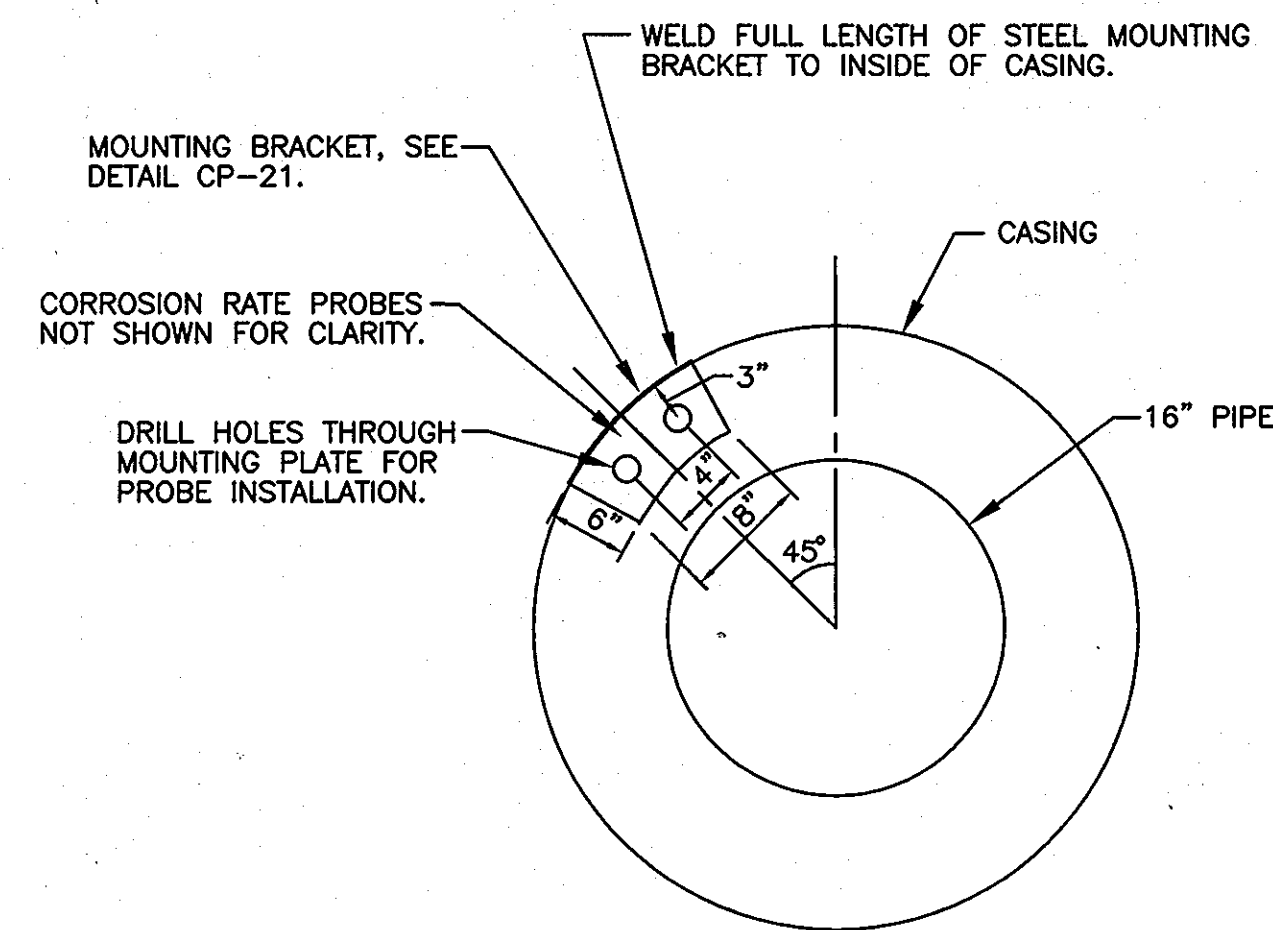
SHEET  
12 OF 13



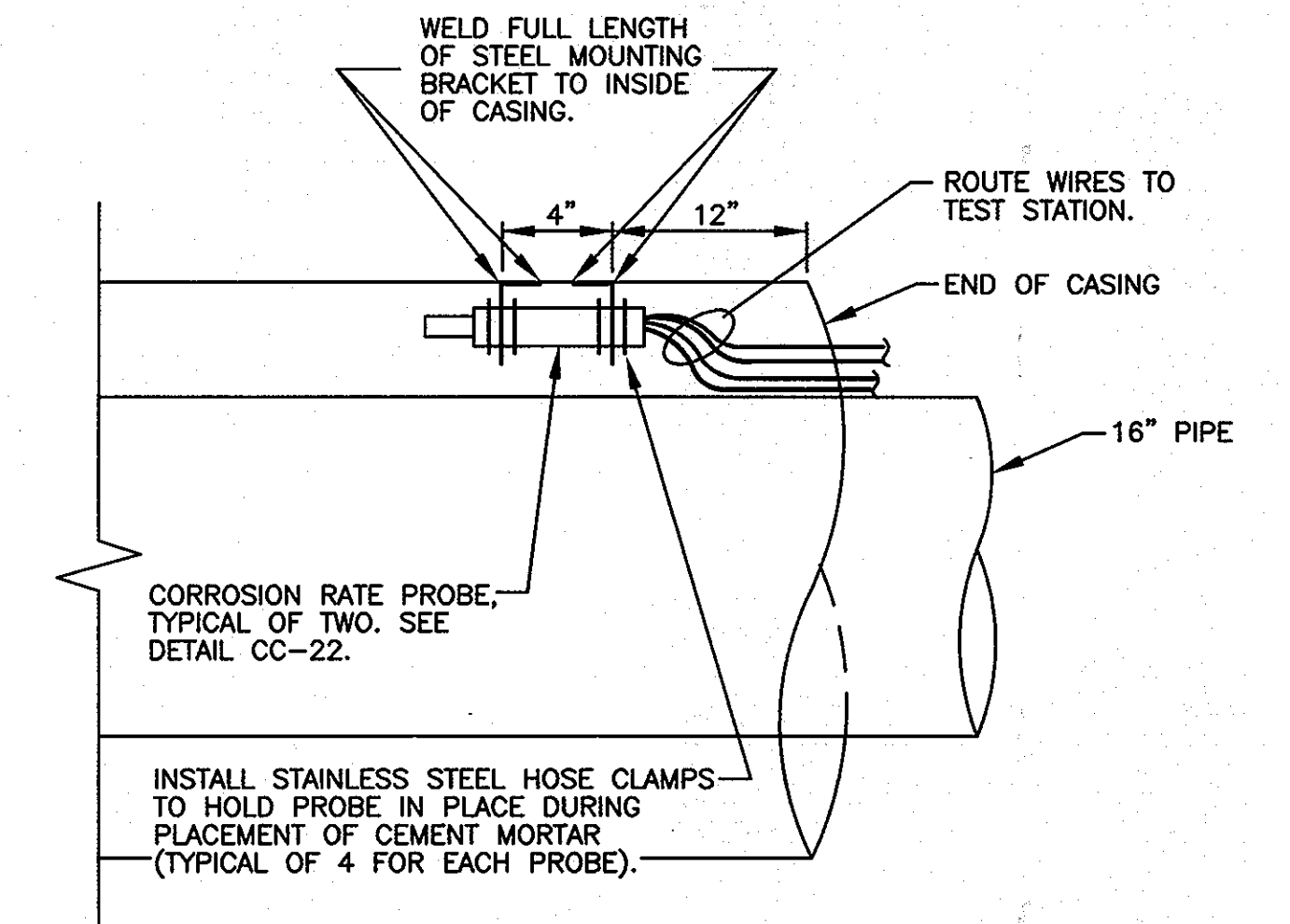
CP-19: STANDARD TEST STATION

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

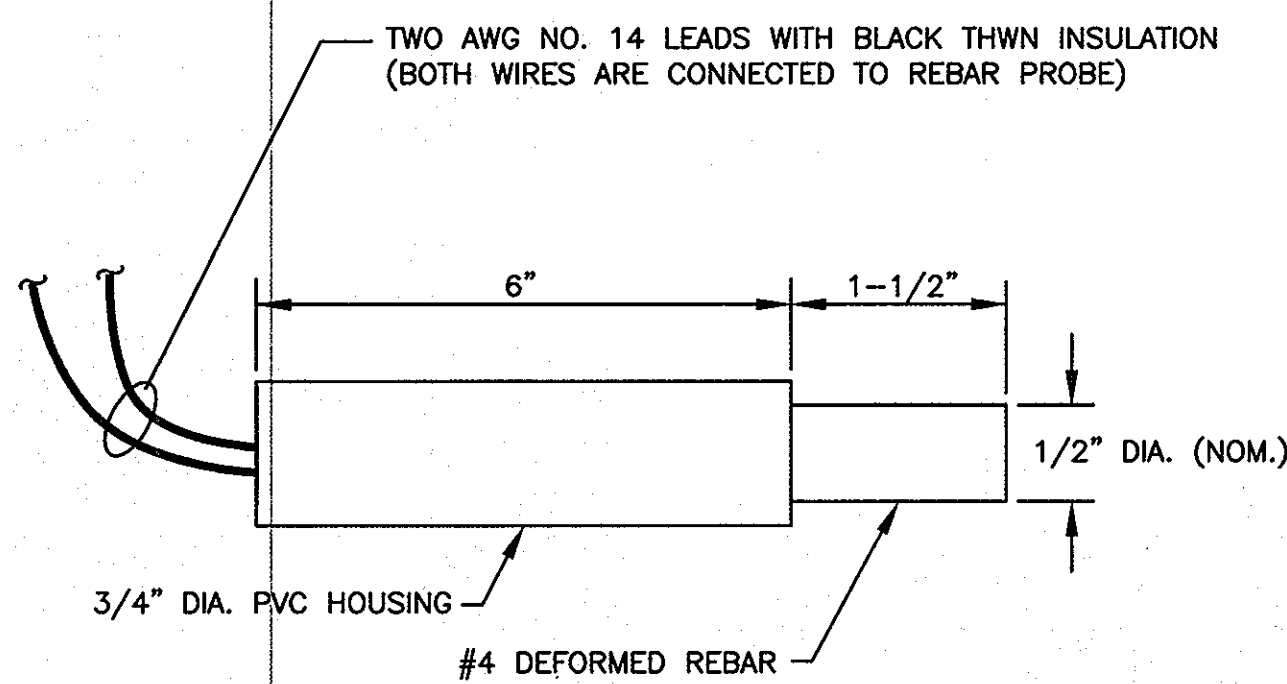
NOTE:  
1. DO NOT SET TEST STATION IN ROADWAY. PLACE TEST BOX IN NON-PAVED AREA NEXT TO ROADWAY. ROUTE ALL WIRES TO FINAL TEST BOX LOCATION.



CP-20: CORROSION RATE PROBES PLACEMENT



CP-21: CORROSION RATE PROBES MOUNTING BRACKET

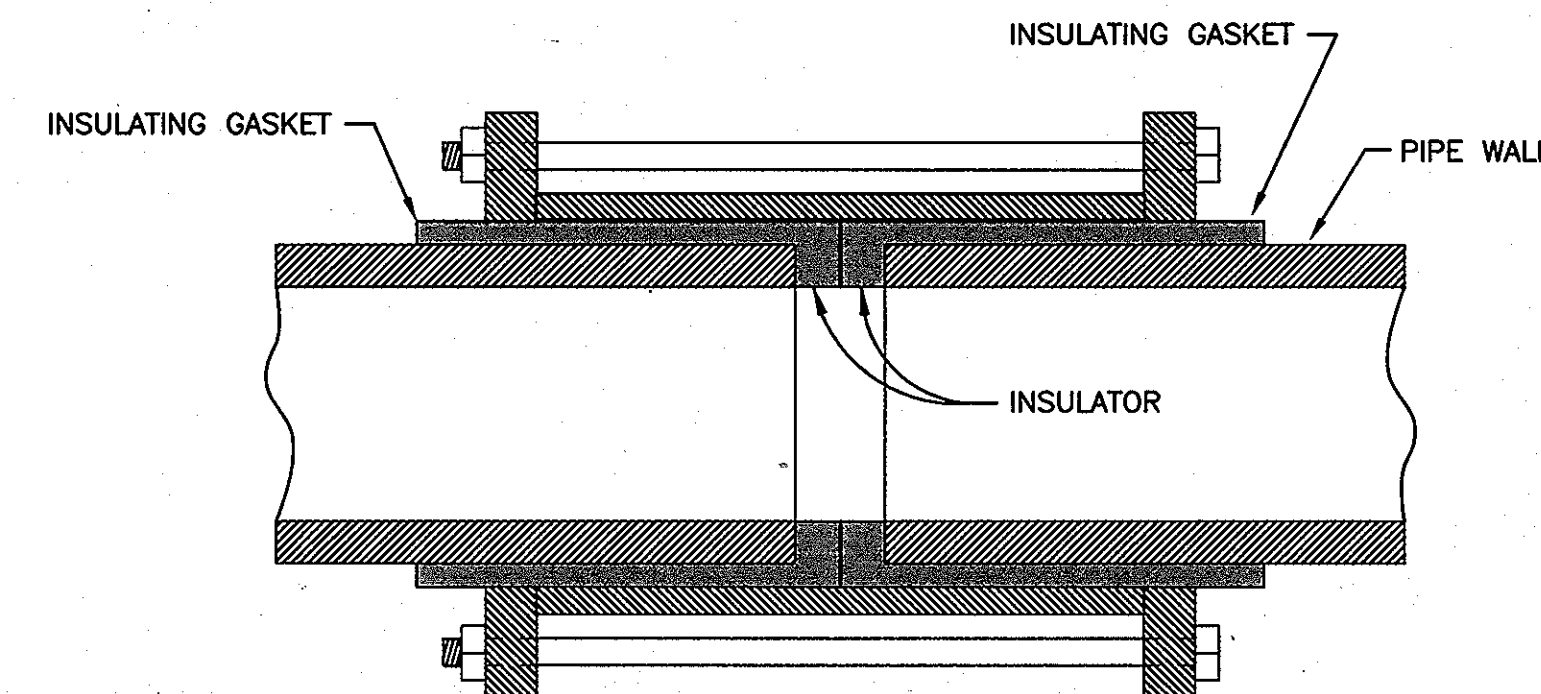


REBAR PROBE MODEL #CP-REB-CW040(6") AS MANUFACTURED BY ELECTROCHEMICAL DEVICES, INC.

CP-22: CORROSION RATE PROBE

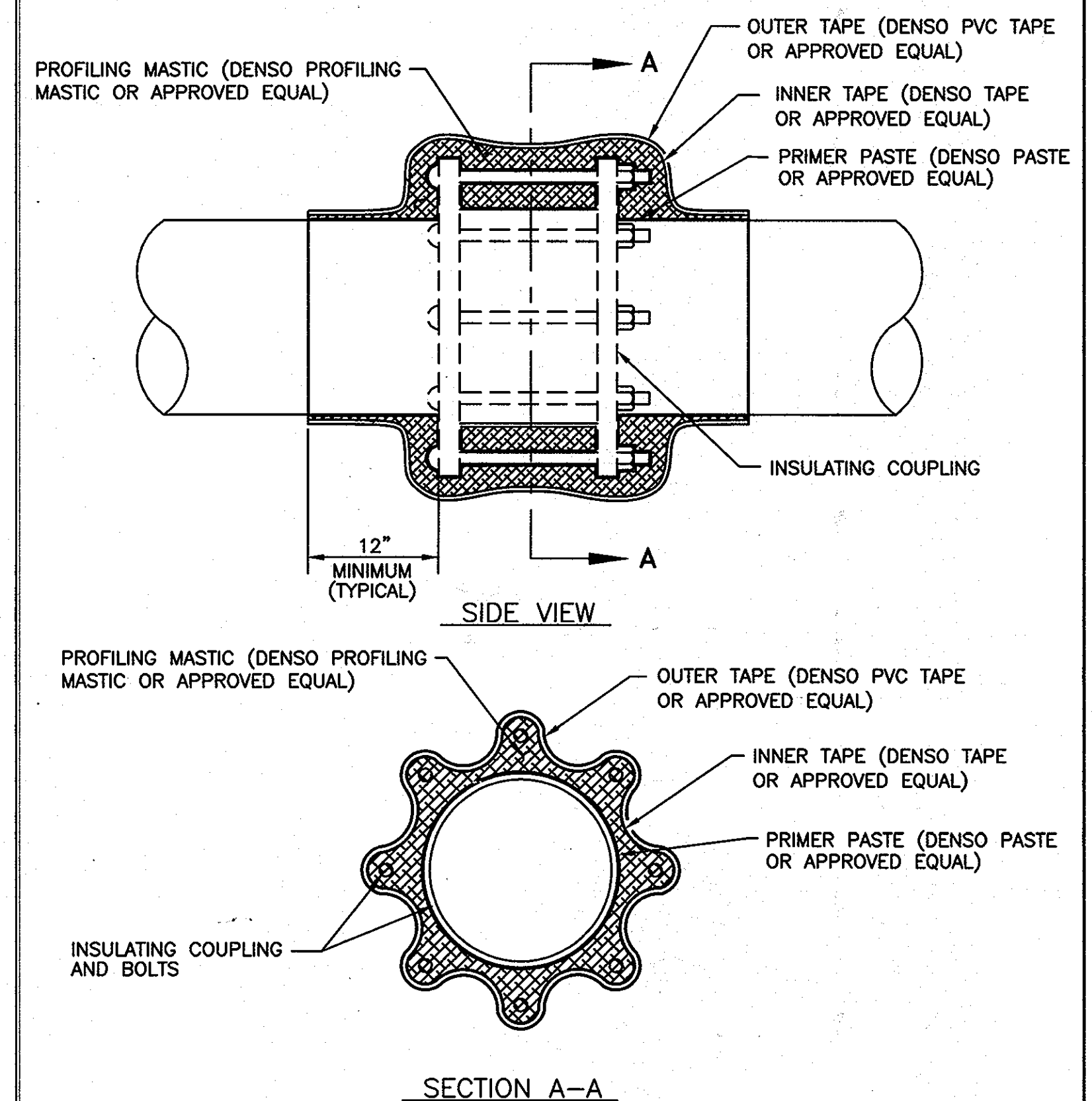
CATHODIC PROTECTION TEST STATION SCHEDULE U.S. ROUTE 29 & JOHNS HOPKINS ROAD				
STATION NUMBER	TEST STATION NUMBER	TEST STATION TYPE	NUMBER OF ANODES	DETAIL NUMBER
0+00	TS-1	INSULATING JOINT WITH ANODES	5 PLUS 2	CP-18
11+26	TS-2	ANODE	5	CP-15
19+33	TS-3a	ANODE	5	CP-15
1+24 (8")	TS-3b	STANDARD	NONE	CP-19
29+90	NONE	INSULATING UNION	NONE	CP-7
30+00	TS-4	ANODE	5	CP-15
31+25	NONE	INSULATING UNION	NONE	CP-7
41+38	.TS-5	INSULATING JOINT WITH ANODES	5 PLUS 2	CP-18
1+77 (N)	TS-6	CASING WITH ANODES	5	CP-16
2+71 (N)	TS-7	CASING	NONE	CP-17
8+24 (N)	TS-8	INSULATING JOINT WITH ANODES	5 PLUS 2	CP-18
0+00 (12")	TS-9	ANODE	2	CP-15
1+13 (12")	TS-10	ANODE	2	CP-15

CP-23: TEST STATION SCHEDULE



NOTES:  
1. MATERIALS: THE INSULATING MATERIALS SHALL INCLUDE AN INSULATING GASKET AND A "FULL BOOT" PLASTIC TUBULAR INSULATOR INSIDE THE MIDDLE RING TO PREVENT CONTACT BETWEEN PIPE ENDS THAT ARE ISOLATED FROM ONE ANOTHER. INSULATION SHALL BE PROVIDED TO BOTH ENDS OF COUPLING. INSULATING COUPLINGS SHALL BE AS MANUFACTURED BY DRESSER INDUSTRIES, INC. STYLE 39 INSULATING COUPLING, OR APPROVED EQUAL.  
2. EXECUTION:  
A. THE CONTRACTOR SHALL CAREFULLY ALIGN AND INSTALL THE INSULATING COMPONENTS ACCORDING TO THE INSULATOR MANUFACTURER'S INSTRUCTIONS.  
B. BEFORE BACKFILLING, EACH INSULATOR SHALL BE TESTED FOR ELECTRICAL INSULATION. IF THE COUPLING IS NOT PROPERLY INSULATED, THE CONTRACTOR SHALL, AT HIS EXPENSE, REPAIR OR REPLACE ALL DEFECTIVE COMPONENTS. THE REPAIRED INSULATOR SHALL BE TESTED. THIS PROCESS WILL CONTINUE UNTIL THE COUPLING IS TESTED TO BE PROPERLY ISOLATED.  
C. AFTER THE COUPLING IS TESTED TO BE PROPERLY ISOLATED, THE INSULATOR SHALL BE COATED WITH A TAPE COATING AS SHOWN IN DETAIL CP-25. TEST WIRES AND MAGNESIUM ANODES SHALL BE INSTALLED AT EACH INSULATING COUPLING AS SHOWN IN DETAIL CP-18.

CP-24: INSULATING COUPLING (ADDED)



CP-25: COATING OF INSULATING COUPLING (ADDED)

As-Built

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 5/17/04  
Chief, Bureau of Engineering: *[Signature]* 5/14/04

Chief, Bureau of Utilities: *[Signature]* 5-5-04  
Chief, Utility Design Division: *[Signature]* 5-4-04

RUSSELL CORROSION CONSULTANTS, INC.  
5405 TWIN KNOLLS RD., SUITE 3  
COLUMBIA, MD 21045

STATE OF MARYLAND  
PROFESSIONAL ENGINEER  
MICHAEL J. SULLIVAN  
No. 17089

DES: MJS	DJD	AS-BUILT	3/04
DRN: DJD			
CHK: MJS			
DATE: 6/28/00	BY NO.	REVISION	NO.

CATHODIC PROTECTION DETAILS - 4  
600' SCALE MAP NO. W41 BLOCK NO.

U.S. 29 INTERCHANGE AT JOHNS HOPKINS/  
GORMAN ROADS AND OLD COLUMBIA ROAD  
CAPITAL PROJECT W-8212  
CONTRACT NO. 44-3868  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE: NONE  
DWG U-13  
SHEET 13 OF 13