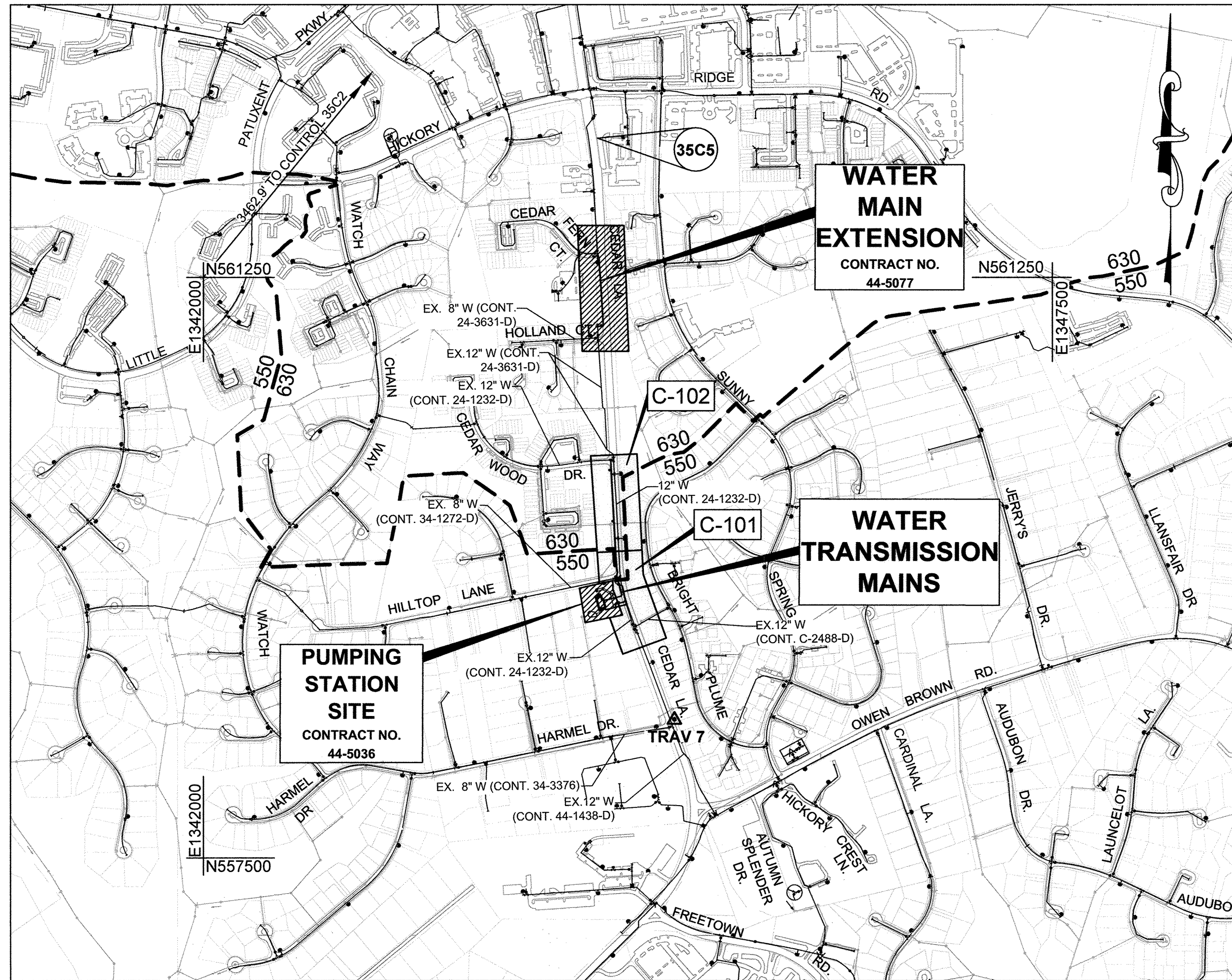


CEDAR LANE WATER TRANSMISSION MAINS CAPITAL PROJECT NO. W-8328 CONTRACT NO. 44-5046 HOWARD COUNTY, MARYLAND

INDEX OF SHEETS		
SHEET NO.	DRAWING NO.	DESCRIPTION
1	G-001	TITLE SHEET
2	G-002	GENERAL NOTES, LEGEND, TRENCH DETAILS AND SEQUENCE OF CONSTRUCTION
3	C-001	PRESSURE ZONE BOUNDARY AND VALVE LOCATION & POSITION PLAN
4	C-101	12" SUCTION WATER MAINS AND 16 DISCHARGE WATER MAIN STA. 0+00 TO STA. 4+50
5	C-102	16" DISCHARGE WATER MAIN STA. 4+50 TO STA. 10+06
6	ES-101	EROSION AND SEDIMENT CONTROL PLAN
7	ES-102	EROSION AND SEDIMENT CONTROL NOTES AND DETAILS
8	ES-103	EROSION AND SEDIMENT CONTROL NOTES
9	T-101	TRAFFIC CONTROL NOTES AND DETAILS
10	CP-1	CATHODIC PROTECTION PLAN



VICINITY MAP
SCALE: 1" = 600'

QUANTITIES

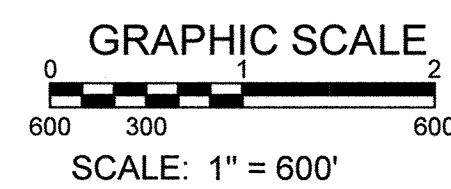
ITEM	UNIT	ESTIMATE	AS-BUILT	MANUFACTURER
16" CLASS C-900 DR14 PVC	L.F.	927		
12" CLASS C-900 DR14 PVC	L.F.	105		
6" CLASS C-900 DR14 PVC	L.F.	50		
16" VALVE	EA.	2		
12" VALVE	EA.	3		
16" X 6" FHT AND 6" VALVE	EA.	2		
NAME OF UTILITY CONTRACTOR:				
			CHECKBOX	
			AS-BUILT DATE	
SURVEY AND DRAFTING DIVISION				

NOTE:
FOR GENERAL NOTES, WATER MAIN NOTES AND LEGEND, SEE DRAWING NO. G-002.

TYPE OF BUILDING:	N/A
NUMBER OF PARCELS:	N/A
NUMBER OF WATER HOUSE CONNECTIONS:	N/A
PRESSURE ZONE:	550 & 630
TEST GRADIENT:	780 (550 ZONE) 860 (630 ZONE)
TEST PRESSURE:	166 psi (550 ZONE) 201 psi (630 ZONE)
DRAINAGE AREA:	MIDDLE PATUXENT

CONTROL NOTE
THE HORIZONTAL AND VERTICAL DATUM SHOWN HEREON ARE BASED ON GPS OBSERVATIONS FROM HOWARD COUNTY GEODETIC SURVEY CONTROL POINTS.
NAD 1983 / 2011 (HORIZONTAL)
NAVD 1988 (VERTICAL)

35C2 N 563920.82	35C5 N 562148.44
E 1344204.19	E 1344554.49
ELEV. 463.41	ELEV. 451.54



OWNER'S/DEVELOPER'S CERTIFICATION

"I/WE CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT PRIOR TO THE BEGINNING OF THE PROJECT. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR MDE."

Kerri Dinsmore 2/13/2019
OWNERS / DEVELOPERS SIGNATURE DATE
Kerri Dinsmore Project Manager
PRINTED NAME & TITLE

DESIGN CERTIFICATION

"I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

Guihua Wang 02/11/2019
DESIGNERS SIGNATURE DATE
GUIHUA WANG
PRINTED NAME
MD REGISTRATION NO. 31363
(P.E./R.L.S. OR R.L.A. (CIRCLE ONE))

PURPOSE STATEMENT:

CONTRACT NO. 44-5046 IS IN CONJUNCTION WITH CONTRACT NO. 44-5036 TO PROVIDE REDUNDANCE TO THE 630 WEST WATER PRESSURE ZONE. THE TRANSMISSION MAINS WITHIN THE PUBLIC RIGHT-OF-WAY ARE INCLUDED IN THIS CONTRACT (44-5046), WHILE 44-5036 INCLUDES THE CEDAR LANE WATER PUMPING STATION AND ASSOCIATED SYSTEM UPGRADES.

NOTE:
THE WORK SITE SHALL BE CONTROLLED IN ACCORDANCE WITH THE HOWARD SOIL CONSERVATION DISTRICT "STANDARD EROSION AND SEDIMENT CONTROL PLAN FOR MINOR EARTH DISTURBANCE", AND ADHERE TO THE LIMITATIONS, CONDITIONS AND REQUIREMENTS THEREIN. A COPY OF THE STANDARD PLAN SHALL BE ON-SITE FOR REFERENCE DURING WORKING HOURS.

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. 31363, Expiration Date 01/16/2020

KCI TECHNOLOGIES PROJECT NO.: 131601306.01

Feb 11, 2019 - 9:20am User: kevin.jackson M:\2016\131601306.01\Drawings\G-001 Cover Sheet_ML.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John P. ... 2/14/19
DIRECTOR OF PUBLIC WORKS DATE

Thomas E. ... 2-13-19
CHIEF, BUREAU OF ENGINEERING DATE

... 2-13-19
CHIEF, UTILITY DESIGN DIVISION DATE

KCI TECHNOLOGIES

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

936 Ridgebrook Road
Sparks, MD 21152
PHONE: (410) 316-7800
FAX: (410) 316-7817
www.kci.com

STATE OF MARYLAND
PROFESSIONAL ENGINEER
No. 31363
02/11/2019

DES: KFJ			
DRN: KFJ			
CHK: GW			
DATE: FEB. 2019	BY	NO.	REVISION

TITLE SHEET

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

**CEDAR LANE
WATER TRANSMISSION MAINS**

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5046

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. G-001
SCALE AS SHOWN
SHEET 1 of 10

GENERAL NOTES

WATER MAIN NOTES

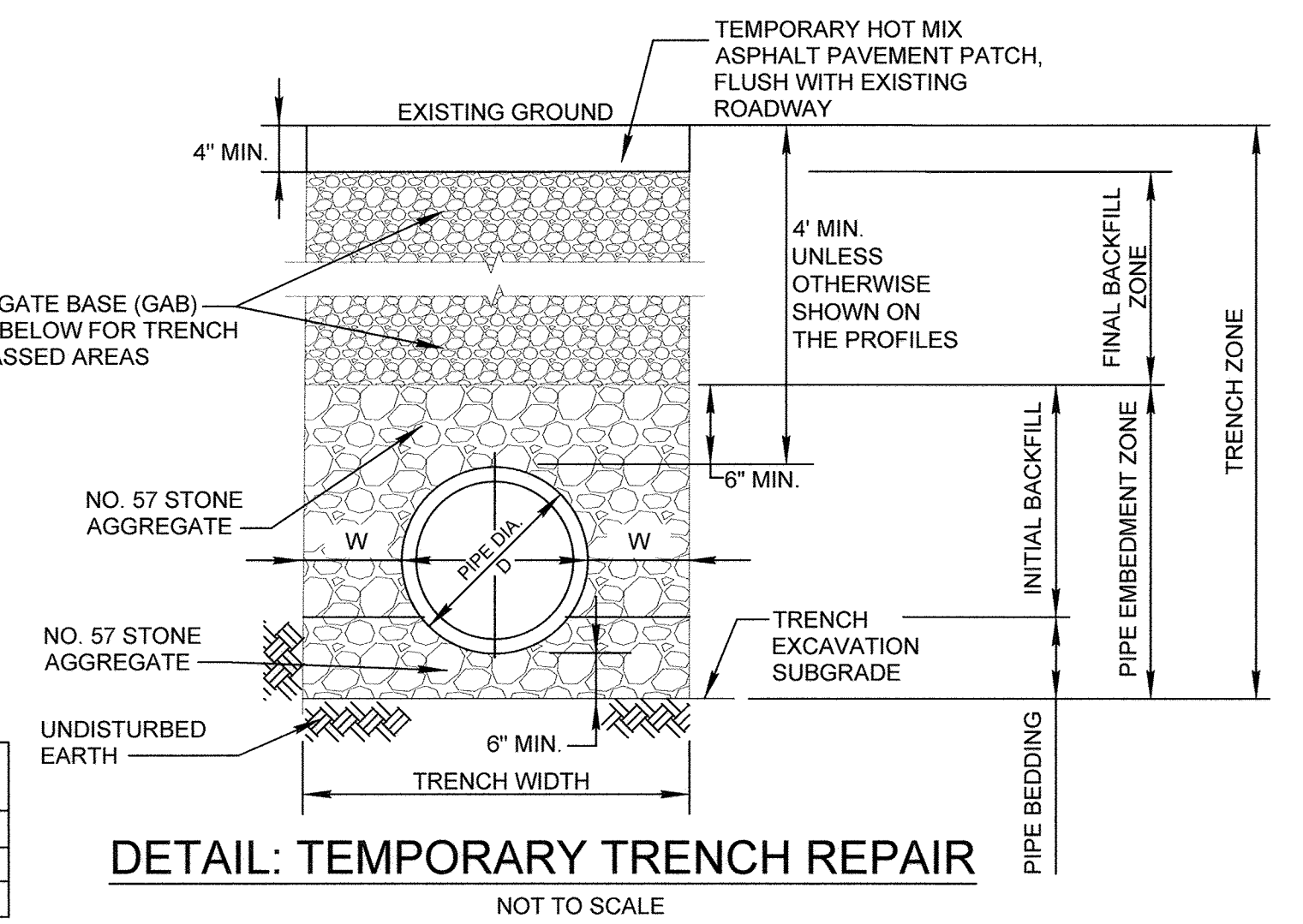
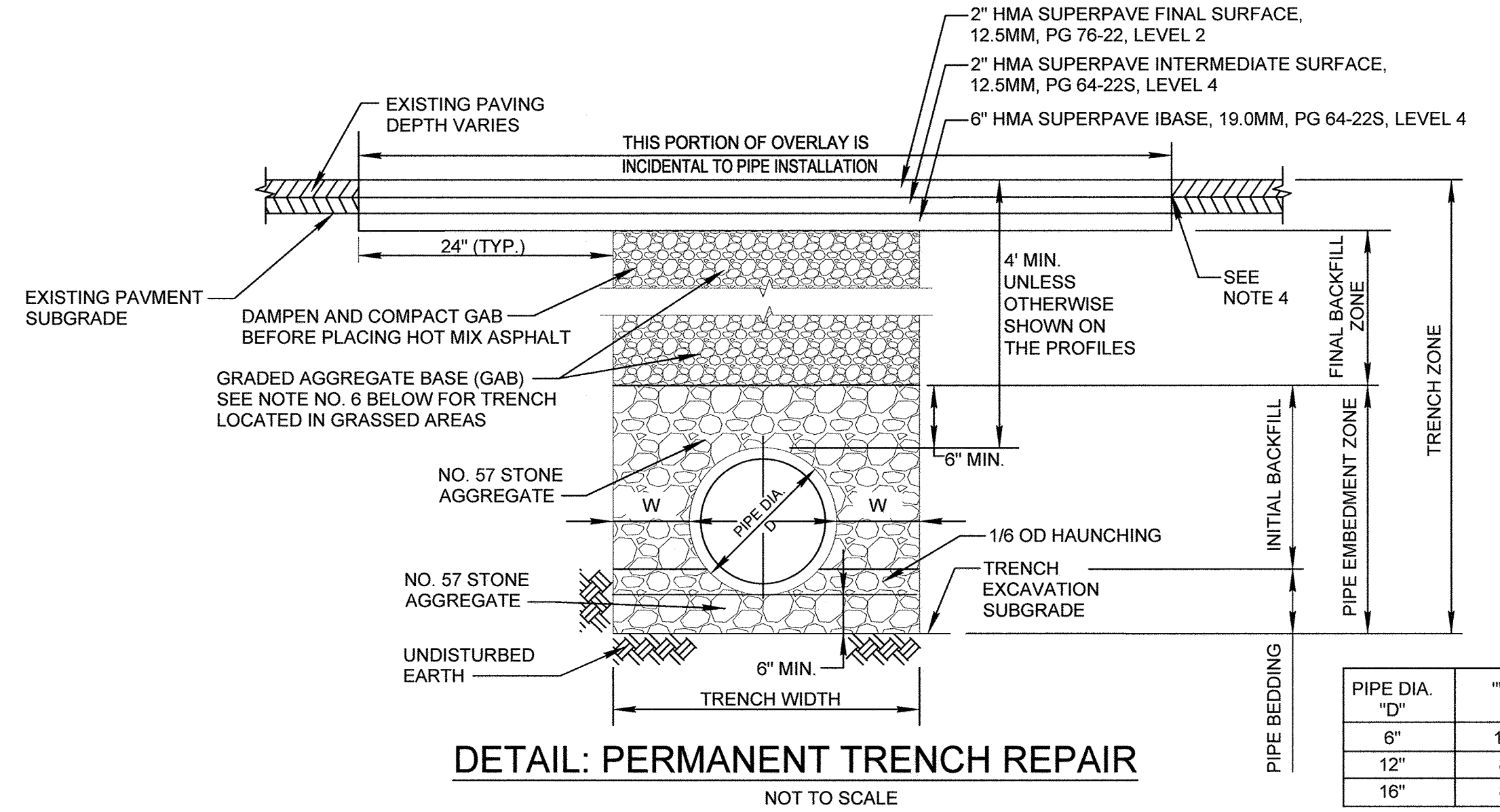
- APPROXIMATE LOCATION OF EXISTING MAINS ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING MAINS AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR EXPENSE.
- TOPOGRAPHIC FIELD SURVEYS WERE PERFORMED ON 6/02/2017 BY KCI TECHNOLOGIES, INC.
- HORIZONTAL AND VERTICAL SURVEY CONTROLS:
THE COORDINATES SHOWN ON THE DRAWINGS ARE BASED ON MARYLAND STATE REFERENCE SYSTEM NAD 1983/2011 AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. 35C2, 35C5. ALL VERTICAL CONTROLS ARE BASED ON NAVD 88. VERTICAL CONTROLS PROVIDED ON THE DRAWINGS ARE REBAR & CAP AND NAILS.
- ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- CLEAR ALL UTILITIES BY A MINIMUM OF 12 INCHES. 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.
- FOR DETAILS NOT SHOWN ON THE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS, USE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION), THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB.
- 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.
- CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:
AT&T.....1-800-252-1133
BG&E (CONSTRUCTION SERVICES).....410-637-8713
BG&E (EMERGENCY).....410-685-0123
BUREAU OF UTILITIES (DPW).....410-313-4900
COLONIAL PIPELINE CO.....410-795-1390
MISS UTILITY.....1-800-257-7777
STATE HIGHWAY ADMINISTRATION.....410-531-5533
VERIZON.....1-800-743-0033 / 410-224-9210
- 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.
- CONTRACTOR SHALL REMOVE TREES, STUMPS AND ROOTS ALONG LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF THE MAIN.
- THE CONTRACTOR SHALL NOTIFY THE BUREAU OF HIGHWAYS, HOWARD COUNTY, AT (410) 313-7450 AT LEAST FIVE WORKING DAYS BEFORE OPEN CUTTING OR BORING / JACKING OF ANY COUNTY ROAD FOR LAYING WATER / SEWER MAINS OR HOUSE CONNECTIONS. THE APPROVAL OF THESE DRAWINGS WILL CONSTITUTE COMPLIANCE WITH DPW REQUIREMENTS PER SECTION 18.114(a) OF THE HOWARD COUNTY CODE.
- THE CONTRACTOR SHALL PROVIDE SURVEY CONSTRUCTION STAKEOUT FOR ALL NECESSARY LINES.
- THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE VARIOUS BUSINESSES AND RESIDENCES AND COORDINATE THE WORK ACTIVITIES SO AS NOT TO NEGATIVELY IMPACT THE CONNECTED CUSTOMERS. THE INSTALLATION OF WATER MAIN SHALL CAUSE MINIMUM DISTURBANCE TO THE EXISTING BUSINESSES AND RESIDENCES AND NOTIFICATION OF ANY INTERRUPTIONS OF SERVICE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE COUNTY REQUIRES THAT THE CONTRACTOR NOTIFY EACH AFFECTED BUSINESS AND RESIDENCE OF THE IMPENDING INTERRUPTION BY LETTER OR WITH DOOR TAGS AT LEAST 72 HOURS IN ADVANCE OF THE PLANNED INTERRUPTION. IN THE EVENT OF UNPLANNED INTERRUPTION, THE CONTRACTOR WILL BE RESPONSIBLE FOR NOTIFYING THE BUSINESSES AND RESIDENCES BY DOOR-TO-DOOR CANVASSING.
- A GEOTECHNICAL REPORT HAS BEEN PREPARED FOR THIS PROJECT BY KCI TECHNOLOGIES, INC. THIS REPORT IS FOR INFORMATIONAL PURPOSES ONLY AND SHALL NOT BE CONSIDERED AS PART OF THE CONTRACT DOCUMENTS. THE OPINIONS AND CONCLUSIONS OF KCI REPRESENT OUR INTERPRETATION OF THE SUBSURFACE CONDITIONS AND THE PLANNED CONSTRUCTION AT THE TIME OF THE REPORT PREPARATION. THE DATA IN THIS REPORT MAY NOT BE ADEQUATE FOR CONTRACTORS' ESTIMATING PURPOSES.
- FOR PUMPING STATION WORK SEE CONTRACT NO. 44-5036.

- ALL WATER MAINS SHALL BE D.I.P. CLASS 54 UNLESS OTHERWISE NOTED.
- TOPS OF ALL WATER MAINS SHALL HAVE A MINIMUM OF 4'-0" OF COVER UNLESS OTHERWISE NOTED.
- VALVES ADJACENT TO TEES SHALL BE STRAPPED TO TEES.
- ALL FITTINGS SHALL BE BUTTRESSED OR ANCHORED WITH CONCRETE IN ACCORDANCE WITH STANDARD DETAILS UNLESS OTHERWISE PROVIDED FOR ON THE DRAWINGS.
- FIRE HYDRANTS SHALL BE SET TO THE BURY LINE ELEVATIONS SHOWN ON THE DRAWINGS. ALL FIRE HYDRANT SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD DETAILS. THE SOIL AROUND THE FIRE HYDRANT SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 1000 AND SECTION 1005 OF THE STANDARD SPECIFICATIONS.
- THE CONTRACTOR SHALL NOT OPERATE ANY WATER MAIN VALVES ON THE EXISTING WATER SYSTEM.
- TRACER WIRES AND CONTINUITY TEST STATIONS SHALL BE INSTALLED ON ALL DIP AND PVC WATER MAINS IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL.
- FOR PVC WATER MAINS, ALL RECORDS FOR THE QUALITY CONTROL AND QUALIFICATION TEST REQUIREMENTS NOTED IN SECTION 5.1 OF THE AWWA STANDARD C900 FOR PVC PRESSURE PIPE SHALL BE SUBMITTED WITH THE PIPE MATERIAL CERTIFICATIONS OR SHOP DRAWINGS PRIOR TO APPROVAL OF THE MATERIAL FOR USE. THE TEST RECORDS SHALL BE FOR THE PIPE TO BE INSTALLED UNDER THIS CONTRACT. ALL PVC PIPE SHALL CONTAIN MARKINGS TO ALLOW CROSS REFERENCING OF THE PIPE SUPPLIED TO THE TEST RECORDS RECEIVED.
- UNLESS OTHERWISE NOTED ON THE PLANS OR IN THE SPECIFICATIONS SACRIFICIAL ANODES SHALL BE INSTALLED ON ALL VALVES AND METALLIC FITTINGS USED WITH PVC WATER MAINS IN ACCORDANCE WITH VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION SEVENTEEN (17) POUND MAGNESIUM ANODES SHALL BE INSTALLED ON ALL VALVES AND DUCTILE IRON FITTINGS INCLUDING RESTRAINTS AND HARNESSSES. TWELVE (12) POUND ZINC ANODES SHALL BE INSTALLED ON ALL STAINLESS STEEL FITTINGS AND SADDLES USED WITH PVC MAINS. ALL "TEES" USED WITH PVC MAINS SHALL BE DUCTILE IRON.
- PROPER ASSEMBLY OF GASKETED PVC PIPE JOINTS: THE MANUFACTURER'S INSERTION LINE OF GASKETED PVC PIPE JOINTS INDICATES THE MAXIMUM DEPTH OF INSERTION OF THE SPIGOT INTO THE BELL. AFTER ASSEMBLY OF THE JOINT, THE INSERTION LINE SHALL REMAIN VISIBLE. DUAL INSERTION LINES ON GASKETED PVC PIPE INDICATE THE MAXIMUM AND MINIMUM DEPTH OF INSERTION OF THE SPIGOT INTO THE BELL. THE CONTRACTOR SHALL NOT OVER INSERT OR OVER HOME THE SPIGOT INTO THE BELL OF PVC PIPE.
- ALL CHANGES IN HORIZONTAL OR VERTICAL DIRECTION OF PVC WATER PIPE SHALL BE MADE WITH MECHANICAL JOINT DUCTILE IRON(AWWA C153) STANDARD (1/4, 1/8, 1/16, 1/32, 1/64) BENDS OR MECHANICAL JOINT, FULL BODY, SOLID SLEEVES MEETING AWWA C110. NO BENDING OF THE PIPE OR DEFLECTING OF PVC PIPE JOINTS IS PERMITTED. WHERE SOLID SLEEVES ARE PERMITTED, THE CONTRACTOR SHALL PROVIDE ONE FULL PIPE LENGTH (20-FOOT LONG) ON EITHER SIDE OF THE SOLID SLEEVE. THE CONTRACTOR SHALL USE A VIBRATORY PLATE COMPACTOR OR OTHER APPROVED MEANS TO THOROUGHLY COMPACT THE #57 STONE ON BOTH SIDES OF THE SOLID SLEEVE.
- RESTRAINING JOINTS AT MECHANICAL JOINT SOLID SLEEVES SHALL BE ACHIEVED BY USING EBBA IRON SERIES 2000PV OR APPROVED EQUAL.
- WHERE CONNECTING TO EX. CAST IRON OR DUCTILE IRON PIPE, THE CONTRACTOR SHALL USE PE X PE SPOOL PIECE AND A RESTRAINED COUPLING MANUFACTURED BY EBBA IRON, SERIES 3800 OR APPROVED EQUAL.
- THE CONTRACTOR SHALL NOTIFY THE BUREAU OF UTILITIES HOWARD COUNTY, 1 WEEK PRIOR TO WATER MAIN SHUT DOWN. ALL SHUT DOWNS SHALL BE DISCUSSED AND OUTAGES CONFIRMED WITH HOWARD COUNTY. THE CONTRACTOR IS RESPONSIBLE FOR ALL NOTIFICATIONS.
- WHEN THE WATER MAIN IS UNDER A UTILITY, THE WATER MAIN PIPE SEGMENT SHALL BE CENTERED AT THE CROSSING.
- IN COMPLIANCE WITH COMAR 09.20.01.03 AND THE SAFE DRINKING WATER ACT (SECTION 1417(a)(4)(8)), MATERIALS THAT COME IN CONTACT WITH WATER INTENDED FOR USE IN PUBLIC WATER SUPPLY SHALL COMPLY WITH THE REDUCTION OF LEAD IN DRINKING WATER ACT, WHICH WENT INTO EFFECT IN MARYLAND IN JANUARY 2012.
- IN ACCORDANCE WITH CODE OF MARYLAND REGULATIONS (COMAR) 26.04.01.33, DIRECT AND INDIRECT ADDITIVES, SUPPLIERS OF WATER SHALL ONLY USE PRODUCTS (ANY MATERIALS THAT COME IN CONTACT WITH WATER INTENDED FOR USE IN PUBLIC WATER SUPPLY) THAT MEET THE APPLICABLE AMERICAN NATIONAL STANDARDS INSTITUTE / NSF INTERNATIONAL (ANSI / NSF) STANDARDS FOR DIRECT OR INDIRECT DRINKING WATER ADDITIVES. THE PRODUCTS CAN ALSO BE CERTIFIED BY AN ORGANIZATION ACCREDITED BY THE ANSI FOR SUCH TESTING (I.E. INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS RESEARCH AND TESTING, ONTARIO CA, UNDERWRITERS LABORATORY, NORTHBROOK IL, AND WATER QUALITY ASSOCIATION, LISLE IL)
- AFTER DISINFECTION, SAMPLES MUST BE COLLECTED BY A STATE-CERTIFIED SAMPLER AND ANALYZED AT A STATE-CERTIFIED LABORATORY. THE SAMPLE RESULTS MUST BE SUBMITTED TO MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER SUPPLY PROGRAM FOR REVIEW.
- THE PUMPING STATION SUCTION WATER MAIN SHOWN ON DRAWING NO. C-101 SHALL BE TESTED AT THE TEST PRESSURE FOR THE 550 ZONE AS SHOWN ON DRAWING NO. G-001. THE PUMPING STATION DISCHARGE WATER MAIN SHOWN ON DRAWINGS C-101 AND C-102 SHALL BE TESTED AT THE TEST PRESSURE FOR THE 630 ZONE AS SHOWN ON DRAWING NO. G-001.

KCI TECHNOLOGIES PROJECT NO.: 131601306.01

LEGEND

EXISTING	PROPOSED



PIPE DIA. "D"	"W"	TRENCH WIDTH
6"	11"	28"
12"	8"	28"
16"	8"	32"

- NOTES:**
- THE "W" DIMENSION SHALL BE USED TO CALCULATE MAXIMUM TRENCH PAY WIDTH
 - GRADED AGGREGATE BASE (GAB) SHALL BE PLACED AND COMPACTED IN 6" MAXIMUM COMPACTED THICKNESS LAYERS.
 - SAW CUT FULL DEPTH JOINTS OF EXISTING PAVEMENT.
 - CLEAN EXPOSED VERTICAL SURFACE OF ADJACENT PAVEMENT AND PLACE TACK COAT ON ALL VERTICAL SURFACES PRIOR TO PLACING HMA.
 - IF THE REMAINING EXISTING PAVEMENT WITHIN THE LANE IS LESS THAN 4 FEET WIDE ON THE CURB SIDE OF THE TRENCH, THE RESIDUAL PAVEMENT SHALL BE REMOVED AND REPLACED.
 - THE DETAILS SHOWN ABOVE ARE FOR USE IN PAVED AREAS. IN GRASSED AREAS, SUITABLE ON SITE SOIL MAY BE USED AS BACKFILL IN PLACE OF THE GRADED AGGREGATE BASE.
 - THE CONTRACTOR SHALL PROVIDE 2" MILL AND OVERLAY ASPHALT FOR THE FULL LANE WIDTH FOR ANY LANE ENCLOSED BY THE UTILITY TRENCH MORE THAN ONE FOOT. PRIOR TO EXCAVATION THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF THE UTILITY TRENCH WILL ENCLOSE MORE THAN ONE LANE.

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. 31363, Expiration Date 01/16/2020

Date: 11/2019, 5:20am, User: kwin, Location: M:\2019\131601306\131601306.dwg, Title: Trenches and Legend.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director: *[Signature]* 2/14/19
Chief, Bureau of Engineering: *[Signature]* 2-13-19

Chief, Bureau of Utilities: *[Signature]* 2-13-19
Chief, Utility Design Division: *[Signature]* 2/15/19

KCI TECHNOLOGIES

936 Ridgebrook Road
Sparks, MD 21152
Phone: (410) 316-7800
Fax: (410) 316-7817
www.kci.com

STATE OF MARYLAND
Professional Engineer
No. 31363
Expiration Date 01/16/2020

DES: Kfj					
DRN: Kfj					
CHK: GW					
DATE: FEB. 2019	BY	NO.	REVISION	DATE	

GENERAL NOTES, LEGEND, TRENCH DETAILS AND SEQUENCE OF CONSTRUCTION

60' SCALE MAP NO. 35 BLOCK NO. 17, 11

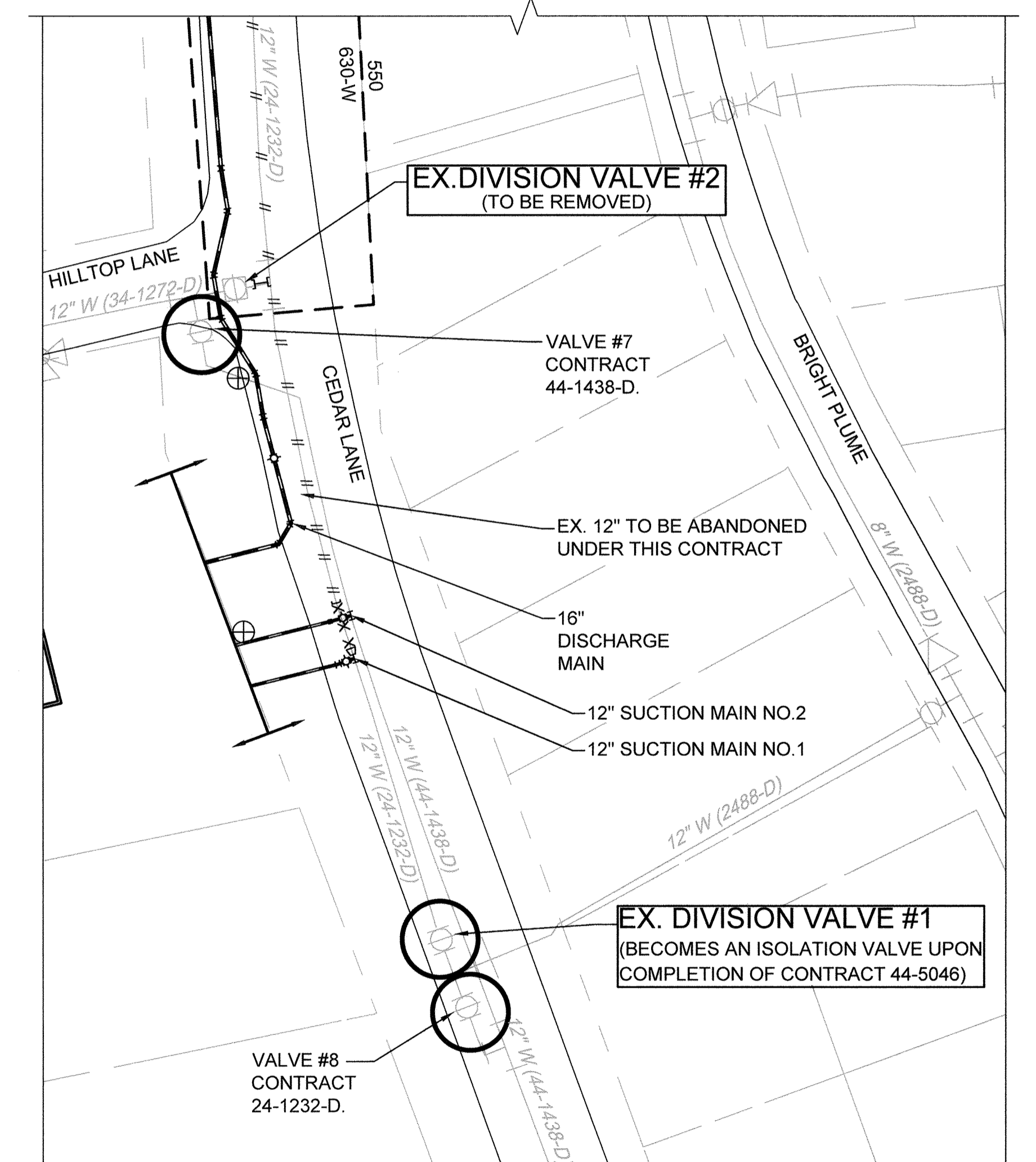
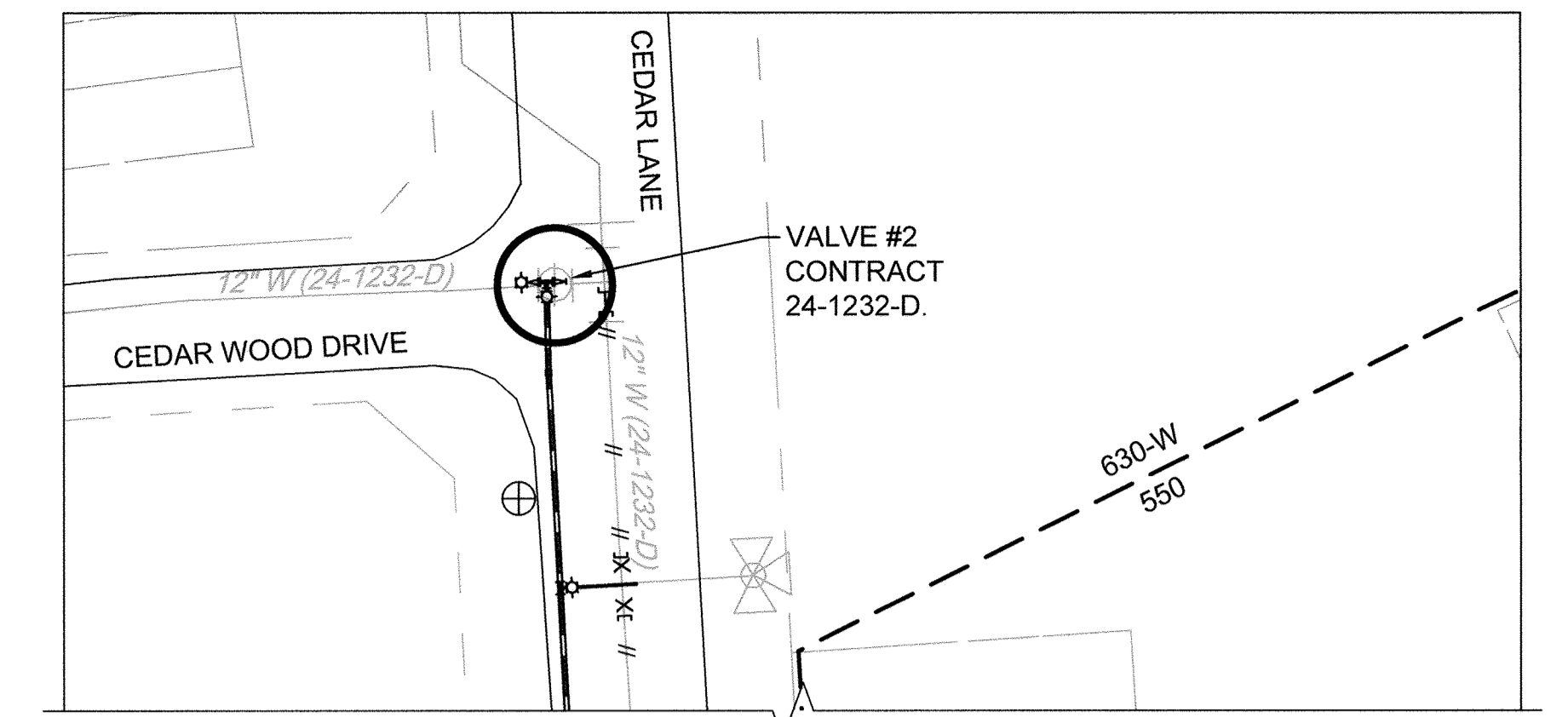
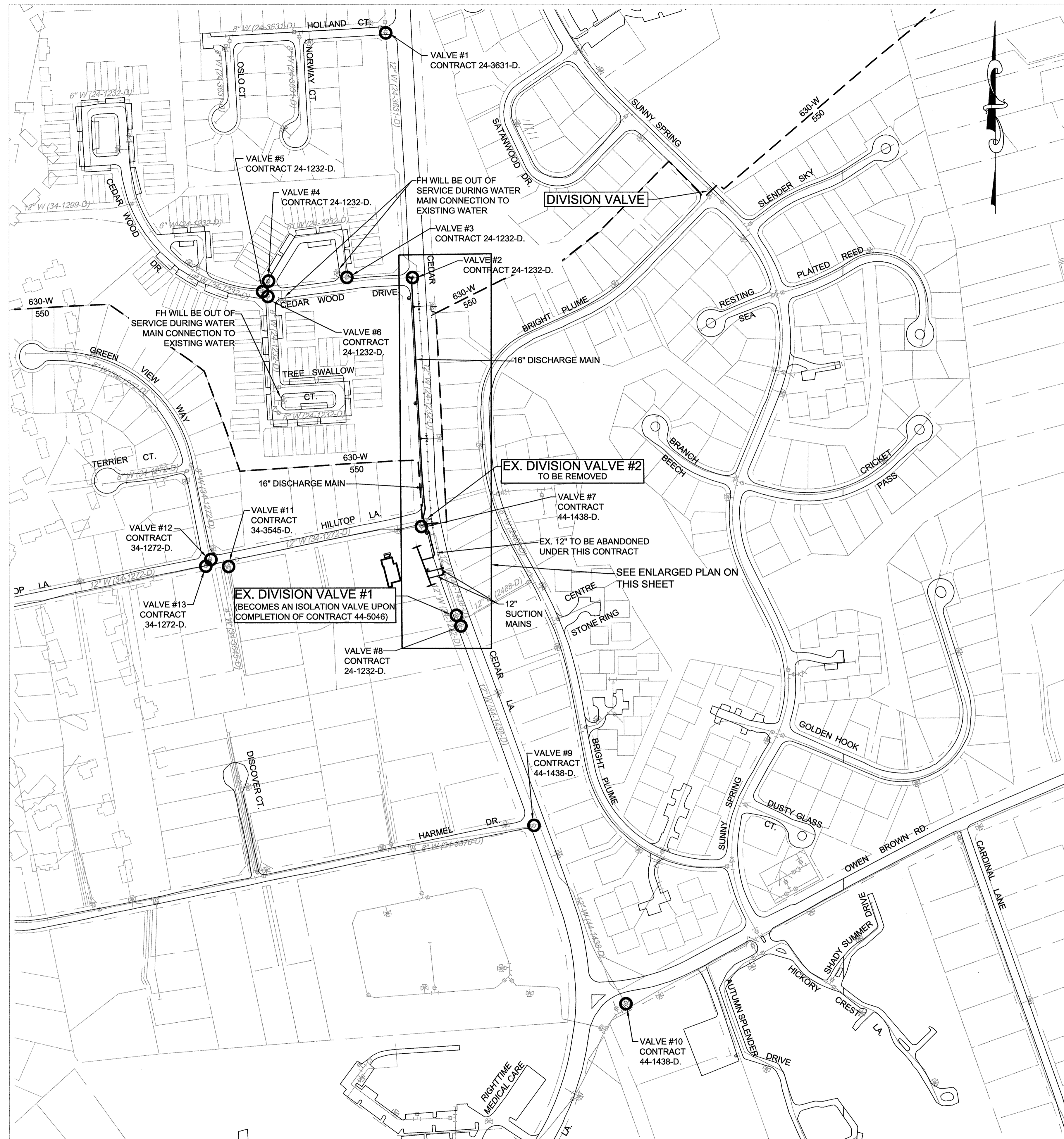
CEDAR LANE WATER TRANSMISSION MAINS

CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5046

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. G-002
SCALE AS SHOWN
SHEET 2 of 10

KCI TECHNOLOGIES PROJECT No.: 131601306.01



ENLARGED PLAN AT PUMP STATION CONNECTION
SCALE: NOT TO SCALE

NOTE:
TEMPORARY WATER HAS NOT BEEN ACCOUNTED FOR IN THIS CONTRACT. IF THE SHUT-DOWN IS EXPECTED TO LAST LONGER THAN 8 HOURS, THE CONTRACTOR SHALL CONTACT THE COUNTY PROJECT MANAGER TO DETERMINE IF ACCOMMODATIONS MUST BE MADE FOR TEMPORARY WATER.

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. 31363, Expiration Date 01/16/2020

PLAN
SCALE: NOT TO SCALE

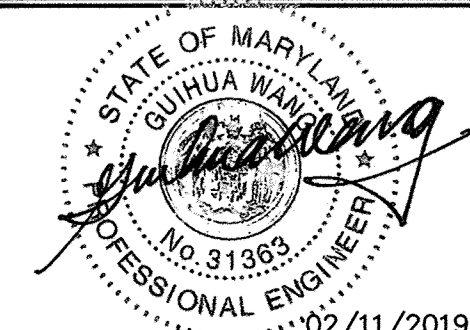
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Kevin Jickson 2/14/19
DIRECTOR OF PUBLIC WORKS DATE
Kevin Jickson 2-13-19
CHIEF, BUREAU OF UTILITIES DATE

Ronald E. Butler 2-13-19
CHIEF, BUREAU OF ENGINEERING DATE
Ronald E. Butler 2/13/19
CHIEF, UTILITY DESIGN DIVISION DATE

KCI TECHNOLOGIES
ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS
936 Ridgeway Road
Sparks, MD 21152
PHONE: (410) 316-7800
FAX: (410) 316-7817
www.kci.com



DES: KFJ
DRN: KFJ
CHK: GW
DATE: FEB. 2019

BY	NO.	REVISION	DATE

PRESSURE ZONE BOUNDARY
AND
VALVE LOCATION & POSITION
PLAN
600' SCALE MAP NO. 35 BLOCK NO. 17, 11

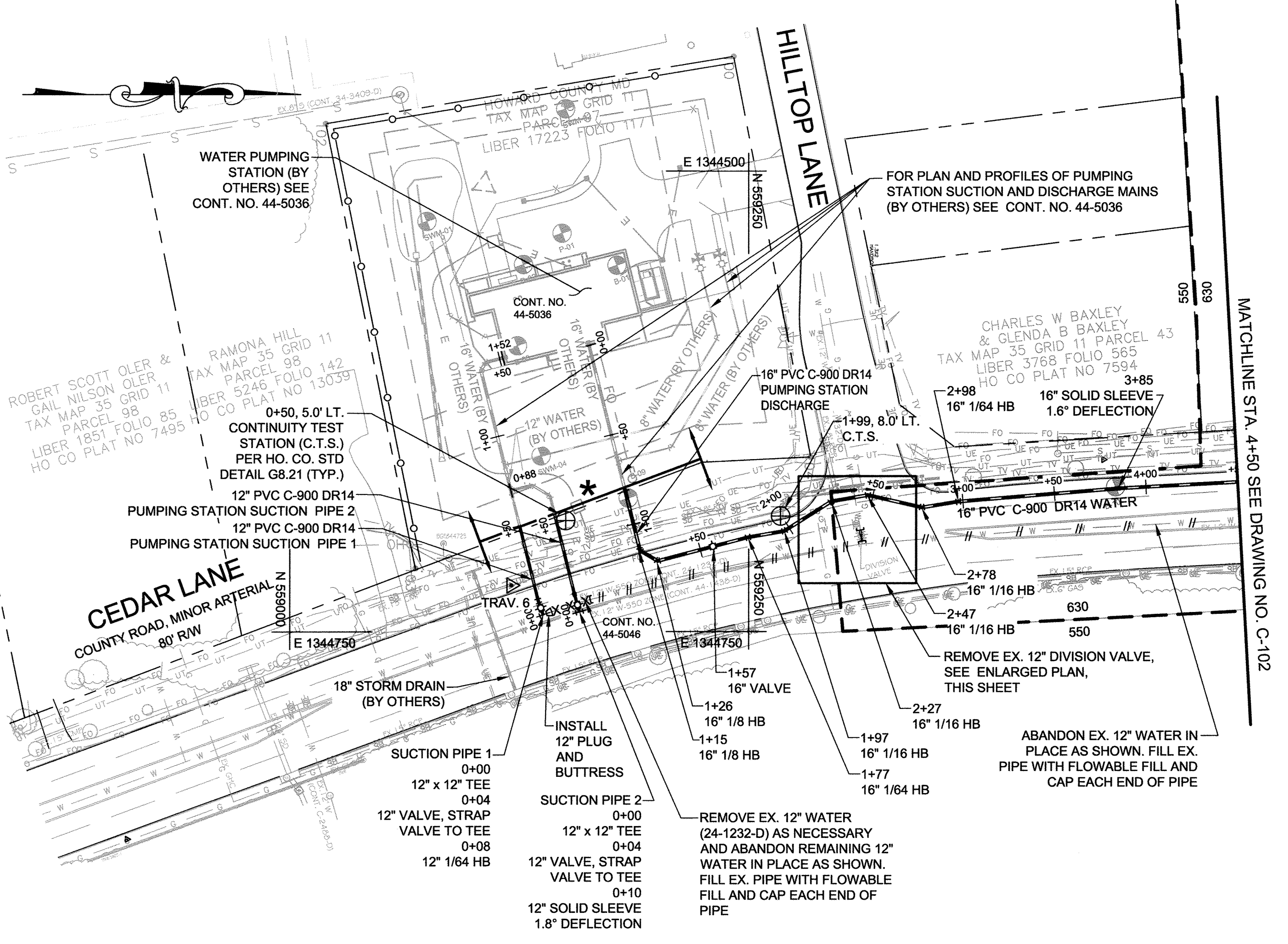
**CEDAR LANE
WATER TRANSMISSION MAINS**

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5046
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO.
C-001
SCALE
AS SHOWN
SHEET
3 of 10

KCI TECHNOLOGIES PROJECT No.: 131601306.01

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PLAN
SCALE: 1" = 50'

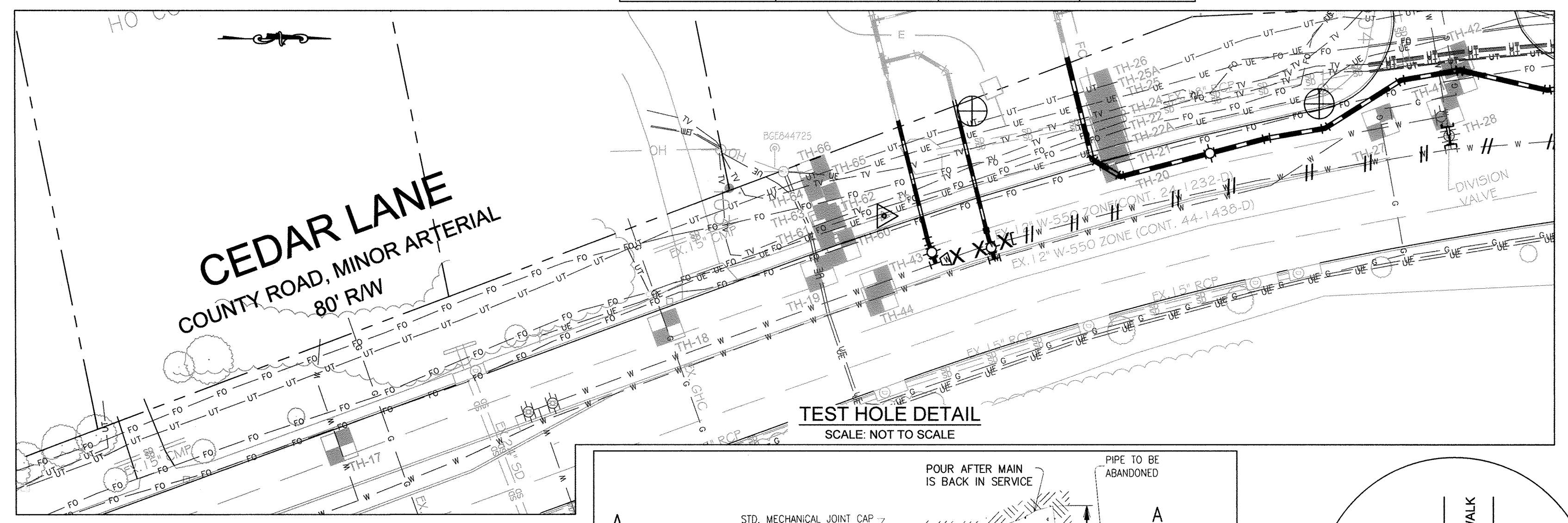
MATCHLINE STA. 4+50 SEE DRAWING NO. C-102

WATER MAIN STAKE-OUT SCHEDULE

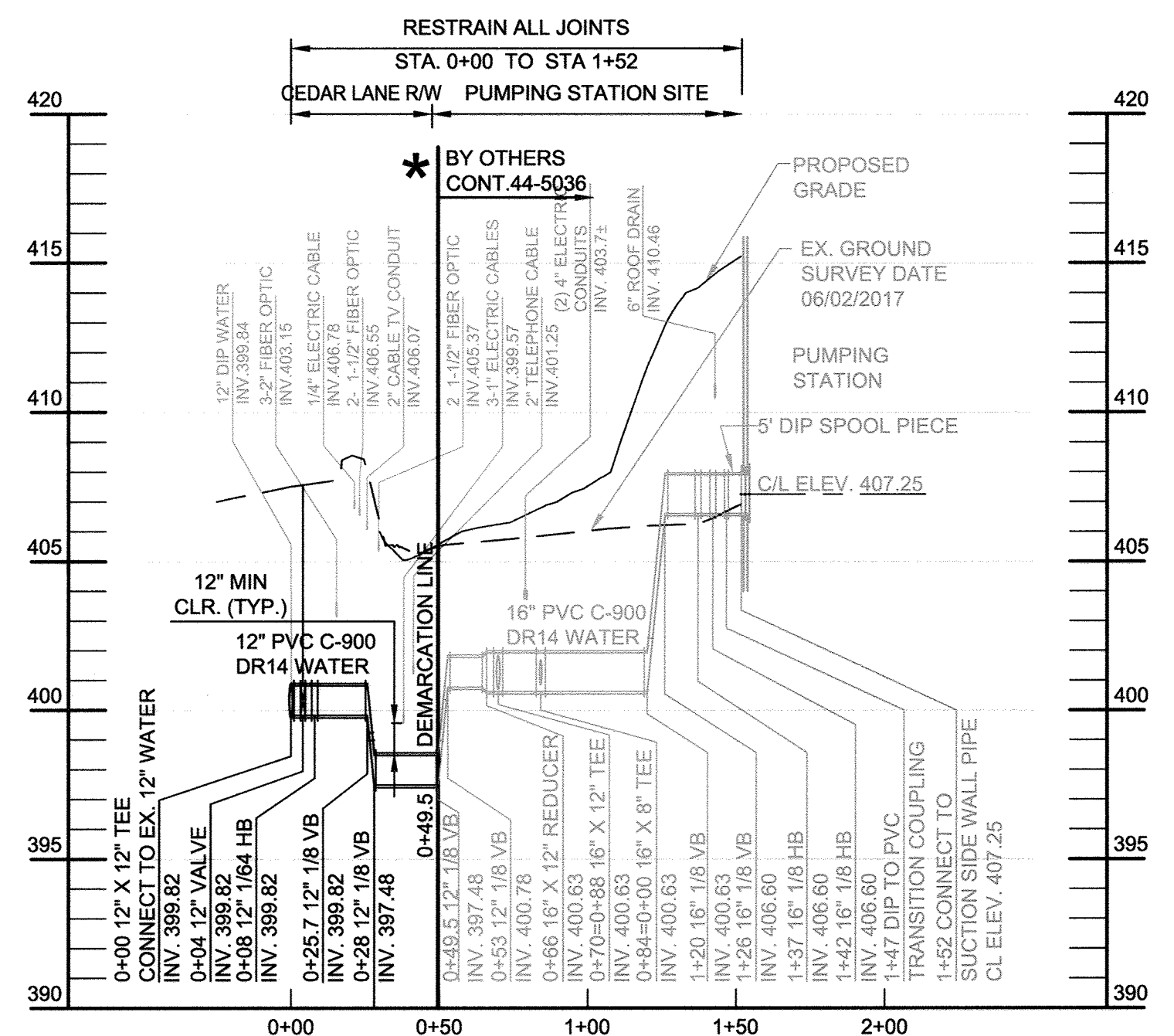
STATION	DESCRIPTION	EASTING	NORTHING
PUMPING STATION SUCTION PIPE 1			
0+00	12" X 12" TEE	1344740.83	559138.06
0+04	12" VALVE	1344737.08	559136.73
0+08	12" 1/64 HB	1344733.31	559135.40
0+49.5	DEMARICATION LINE	1344692.96	559125.33
PUMPING STATION SUCTION PIPE 2			
0+00	12" X 12" TEE	1344739.31	559157.83
0+04	12" VALVE	1344735.46	559156.74
0+00	12" SOLID SLEEVE 1.8" DEFLECTION	1344729.69	559155.11
0+55	DEMARICATION LINE	1344685.88	559144.18
PUMPING STATION DISCHARGE PIPE			
0+79.5	DEMARICATION LINE	1344671.69	559182.25
1+15	16" 1/8 HB	1344705.91	559190.78
1+26	16" 1/8 HB	1344711.66	559200.46
1+57	16" VALVE	1344703.82	559230.47
1+77	16" 1/64 HB	1344698.81	559249.63
1+97	16" 1/16 HB	1344695.45	559269.34
2+27	16" 1/16 HB	1344679.32	559294.95
2+47	16" 1/16 HB	1344675.92	559314.87
2+78	16" 1/16 HB	1344682.62	559344.38
2+98	16" 1/64 HB	1344679.44	559364.13
3+85	16" SOLID SLEEVE-1.6" DEFLECTION	1344672.25	559451.60

TEST HOLE SCHEDULE

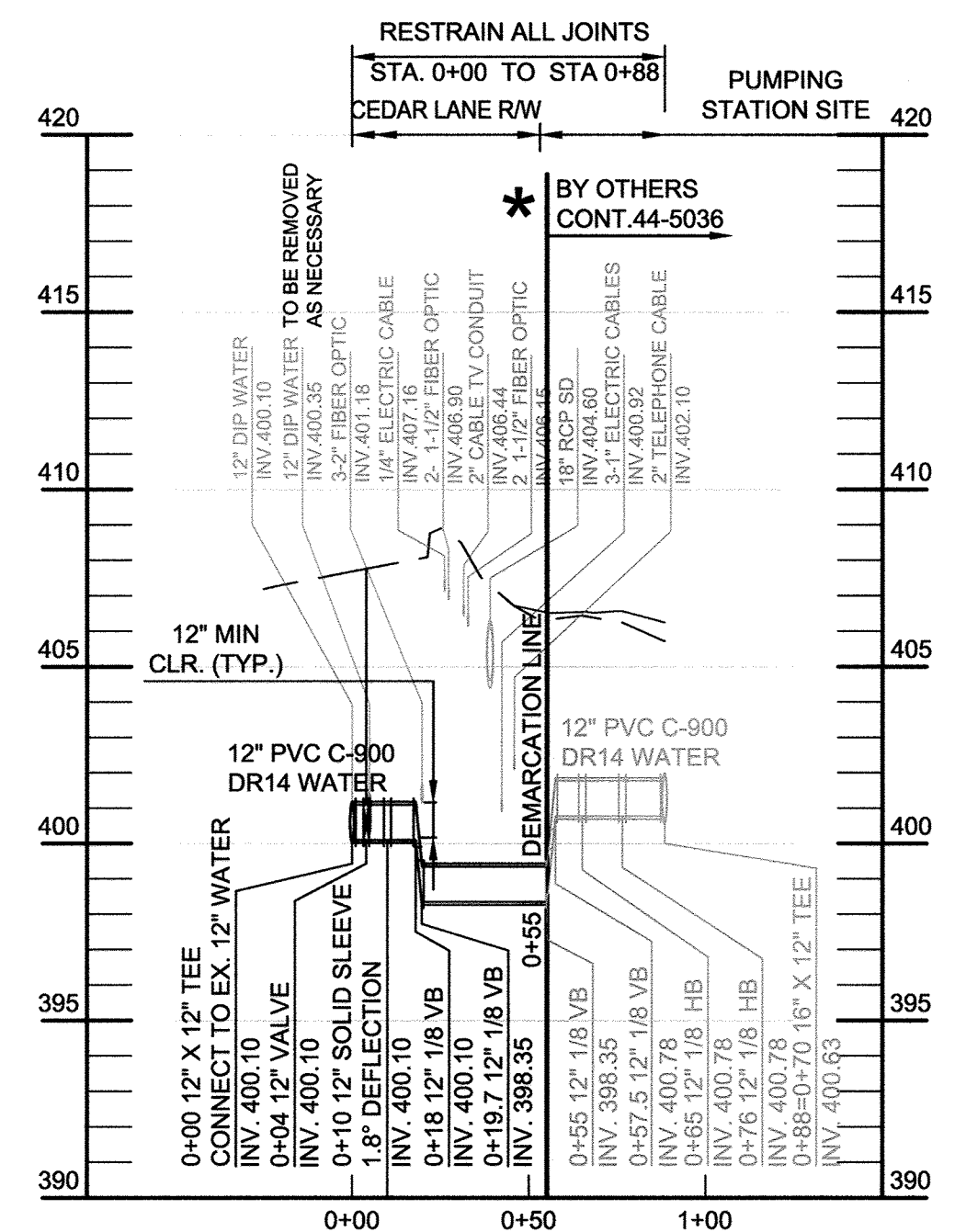
TEST HOLE NO.	UTILITY	MATERIAL	DEPTH
TH-17	1" WATER	COPPER	4.10'
TH-18	1/2" GAS H.C.	PLASTIC	2.08'
TH-19	(2) 2" ELECTRIC	PLASTIC	1.84'
TH-20	(3) 2" FIBER OPTIC	PLASTIC	6.34'
TH-21	1/2" ELECTRIC	PLASTIC	1.42'
TH-22	(2) 2" FIBER OPTIC	PLASTIC	2.40'
TH-22A	(2) 1-1/2" FIBER OPTIC	PLASTIC	1.60'
TH-24	2" CATV	PLASTIC	1.72'
TH-25	CATV	PLASTIC	NOT FOUND
TH-25A	(3) 1" ELECTRIC	PLASTIC	5.80'
TH-26	2" TELECOMM	PLASTIC	4.12'
TH-27	2" GAS	PLASTIC	2.86'
TH-28	12" WATER	DIP	4.50'
TH-41	(3) 2" FIBER OPTIC	PLASTIC	8.32'
TH-42	(6) 2" TELECOMM	PLASTIC	8.52'
TH-43	12" WATER	DIP	8.36'
TH-44	12" WATER	DIP	7.54'
TH-60	FIBER OPTIC	PLASTIC	3.5' CONC. SLAB
TH-61	(3) 3/4" ELECTRIC	PLASTIC	0.76'
TH-62	(2) 2" TELECOMM	PLASTIC	1.44'
TH-63	2" CATV	PLASTIC	1.84'
TH-64	(2) 2" FIBER OPTIC	PLASTIC	5.66'
TH-65	(2) 2" CATV	PLASTIC	3.46'
TH-66	2" ELECTRIC	PLASTIC	2.16'



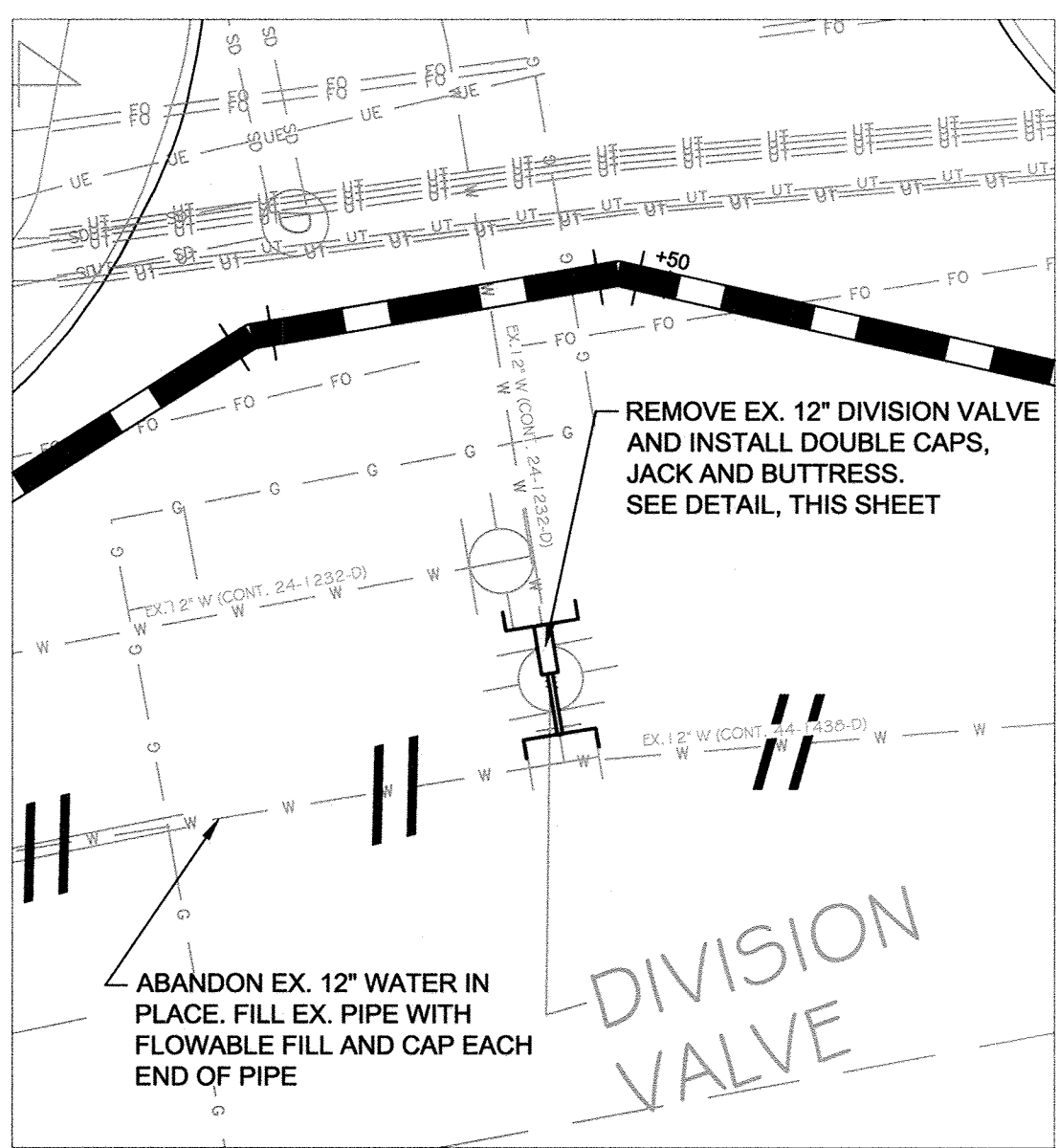
ENLARGED PLAN
SCALE: 1" = 10'



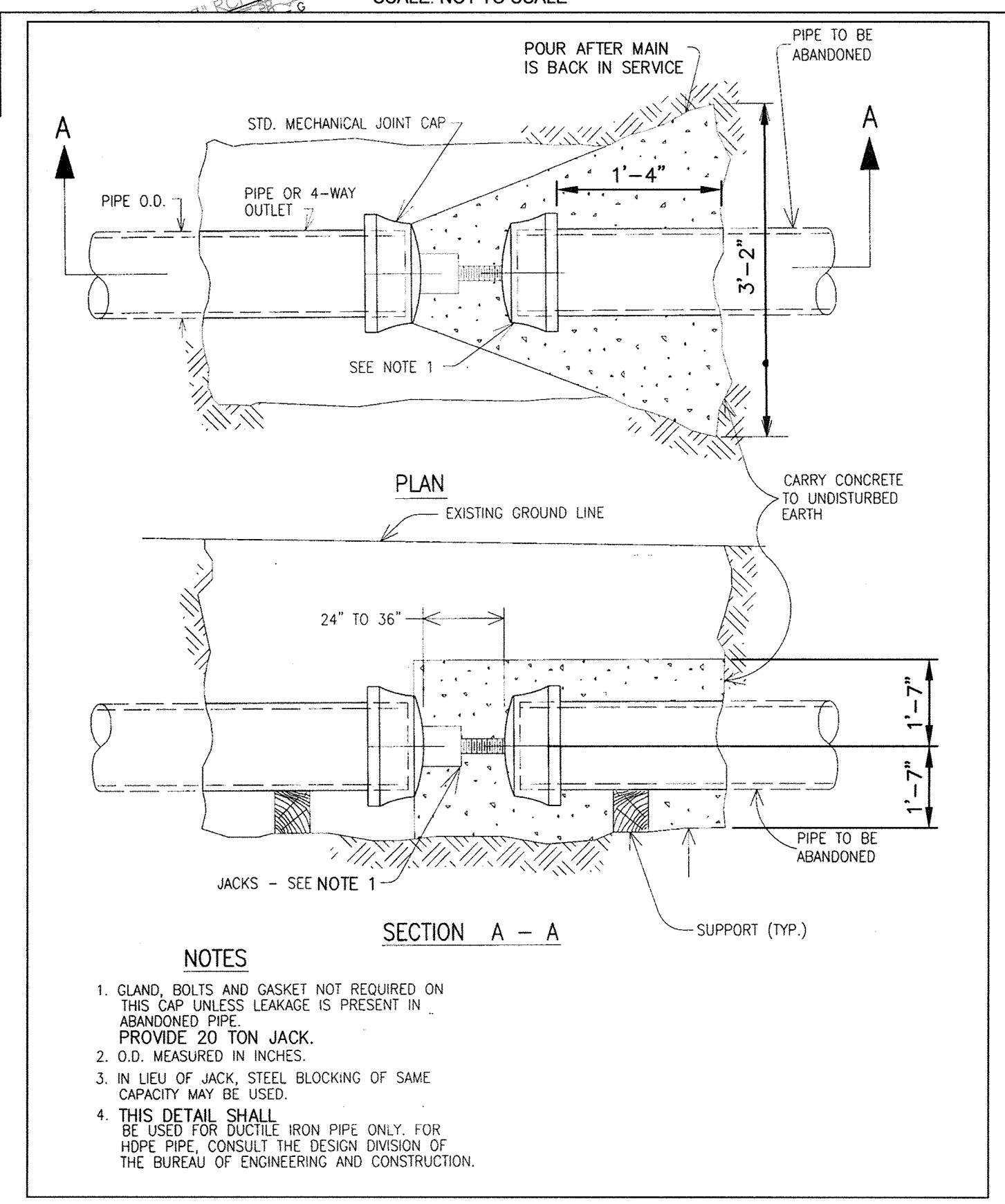
PROFILE - PUMPING STATION SUCTION PIPE 1
SCALE: HORIZ 1" = 50'
VERT. 1" = 5'



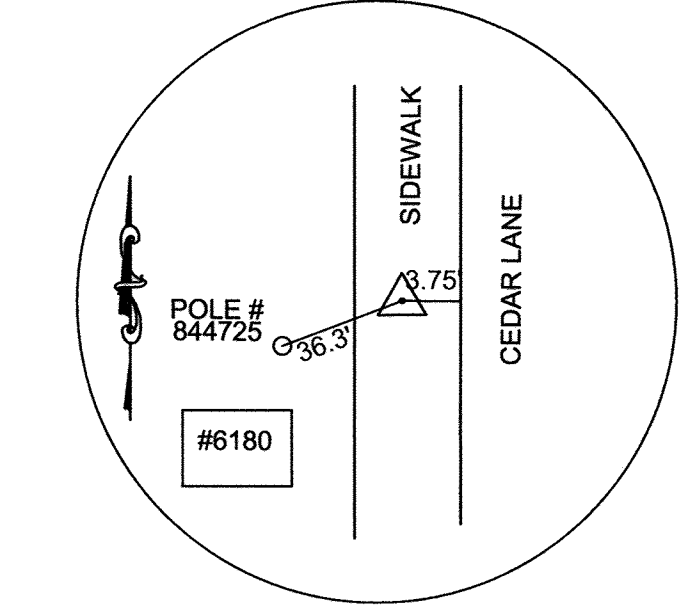
PROFILE - PUMPING STATION SUCTION PIPE 2
SCALE: HORIZ 1" = 50'
VERT. 1" = 5'



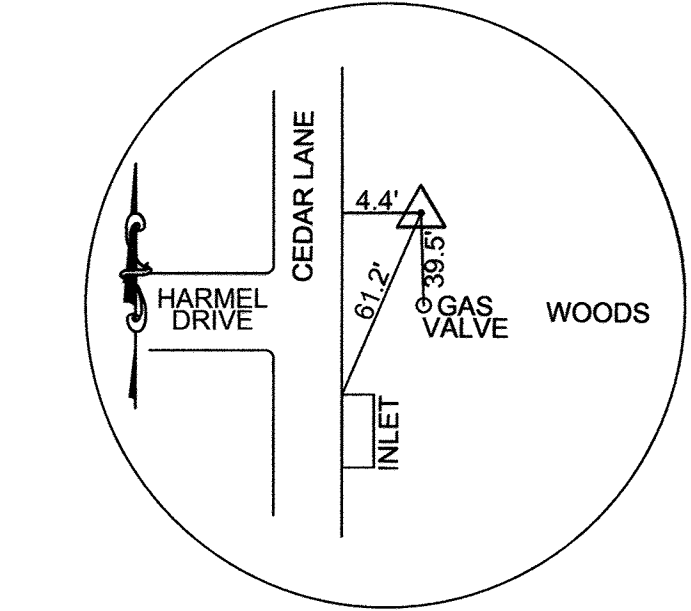
ENLARGED PLAN
SCALE: 1" = 10'



DETAIL - DOUBLE CAPS, JACK AND BUTRESS



TRAVERSE # 6
N 559120.66
E 1344724.906
EL 408.306
X-CUT



TRAVERSE # 7
N 559306.73
E 1345051.64
EL 397.18
REBAR & CAP

* THE CONTRACTOR SHALL INSTALL A TEMPORARY CAP AND BUTRESS AT THE DEMARICATION LINE, ON BOTH 12" SUCTION PIPES AND 16" DISCHARGE PIPE FOR FUTURE CONNECTION UNDER CONTRACT NO. 44-5036.

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. 31363, Expiration Date 01/16/2020

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *John G. R...* 2/14/19
Date: 2-13-19

Chief, Bureau of Engineering: *Thomas P. Butler* 2-13-19
Date: 2-13-19

Chief, Bureau of Utilities: *...* 2-13-19
Date: 2-13-19

Chief, Utility Design Division: *...* 2-13-19
Date: 2-13-19

KCI TECHNOLOGIES

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STATE OF MARYLAND
Professional Engineer
No. 31363
02/11/2019

DES: Kfj	BY: NO.	NO.	REVISION
DRN: Kfj	DATE: FEB. 2019		
CHK: GW			

12" SUCTION WATER MAINS
AND
16" DISCHARGE WATER MAIN
STATION 0+00 TO 4+50

600' SCALE MAP NO. 35
BLOCK NO. 17.11

CEDAR LANE
WATER TRANSMISSION MAINS

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5046

ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

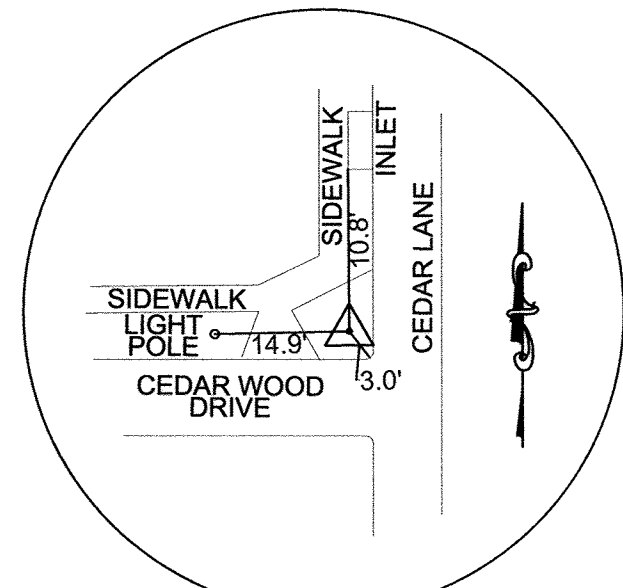
DRAWING NO.	C-101
SCALE	AS SHOWN
SHEET	4 of 10

KCI TECHNOLOGIES PROJECT NO.: 131601306.01

Feb 11, 2019 - 9:21am User: kevin.jackson
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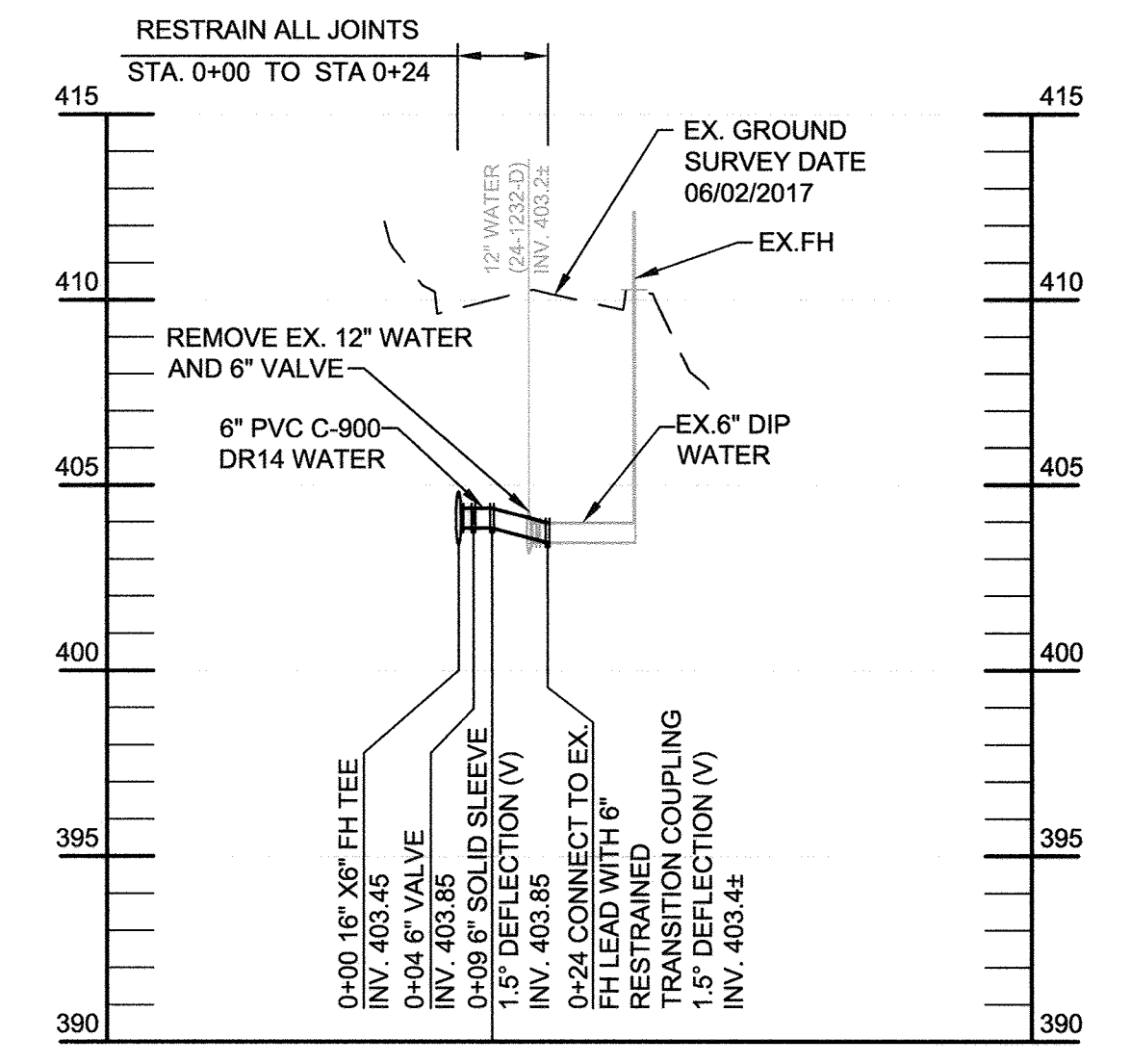
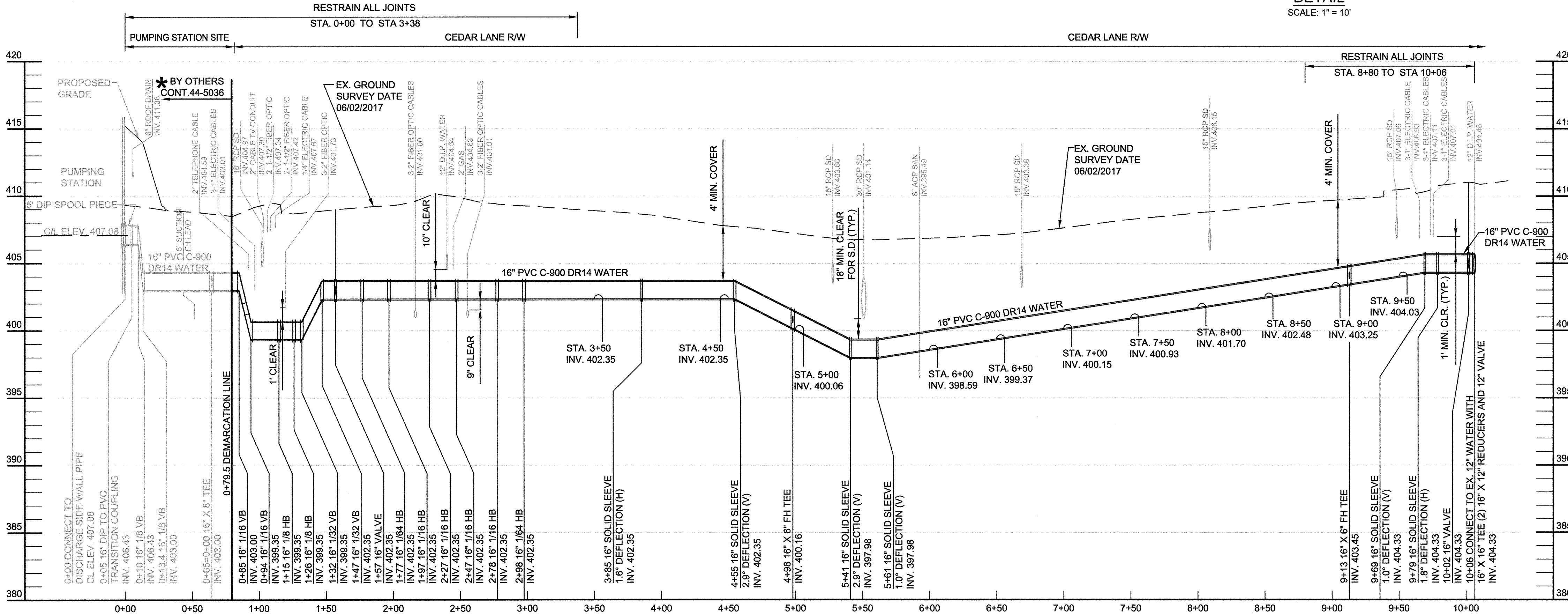
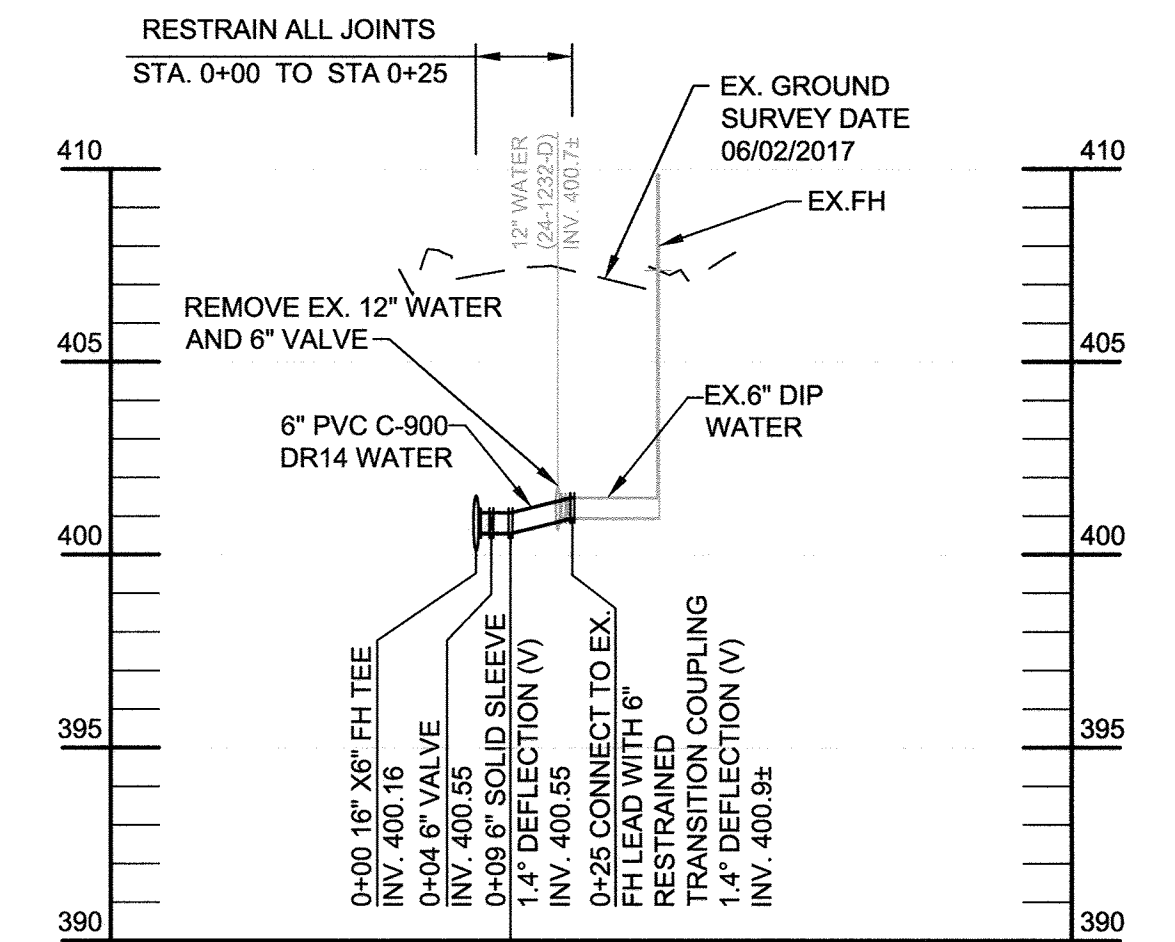
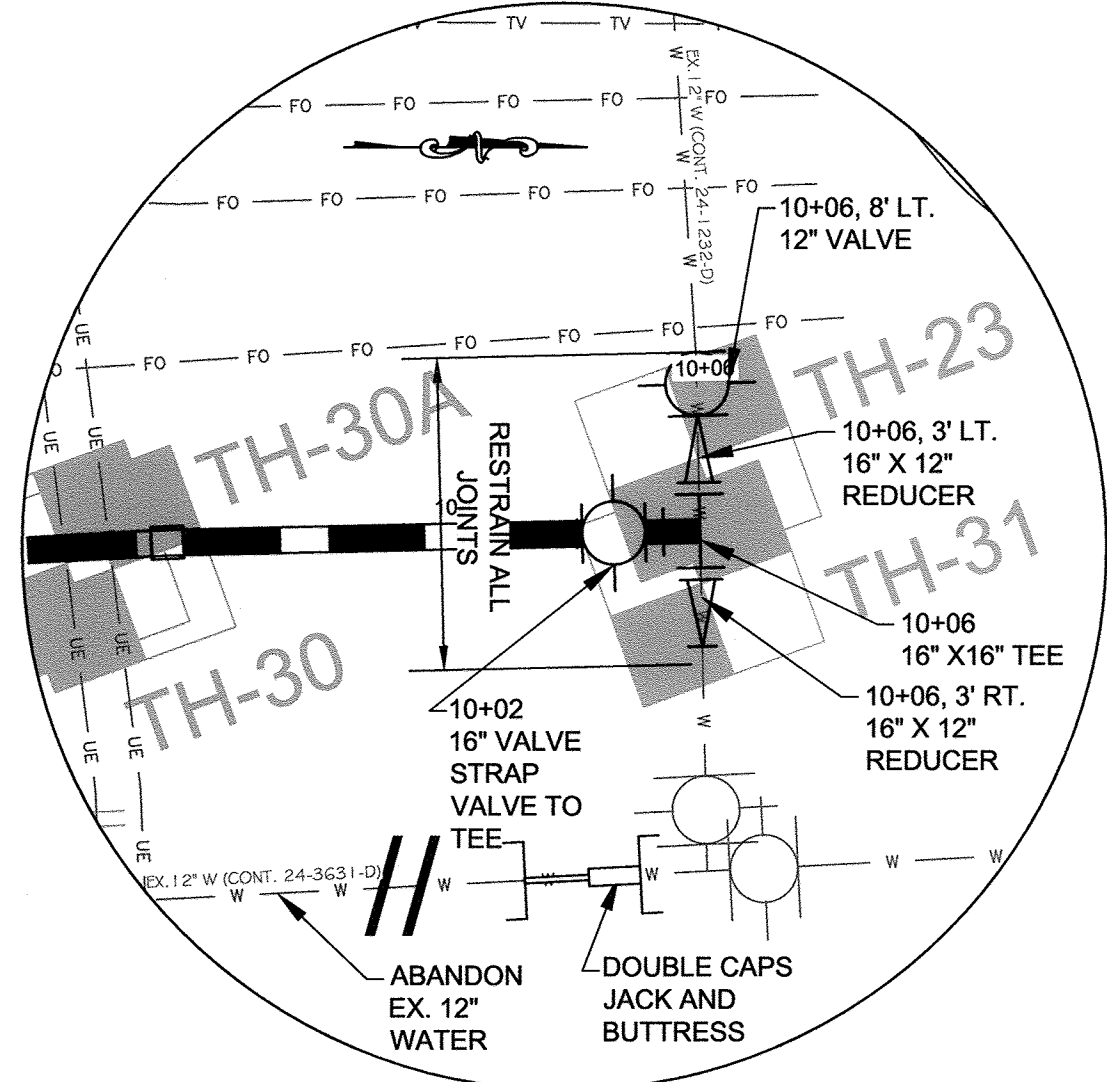
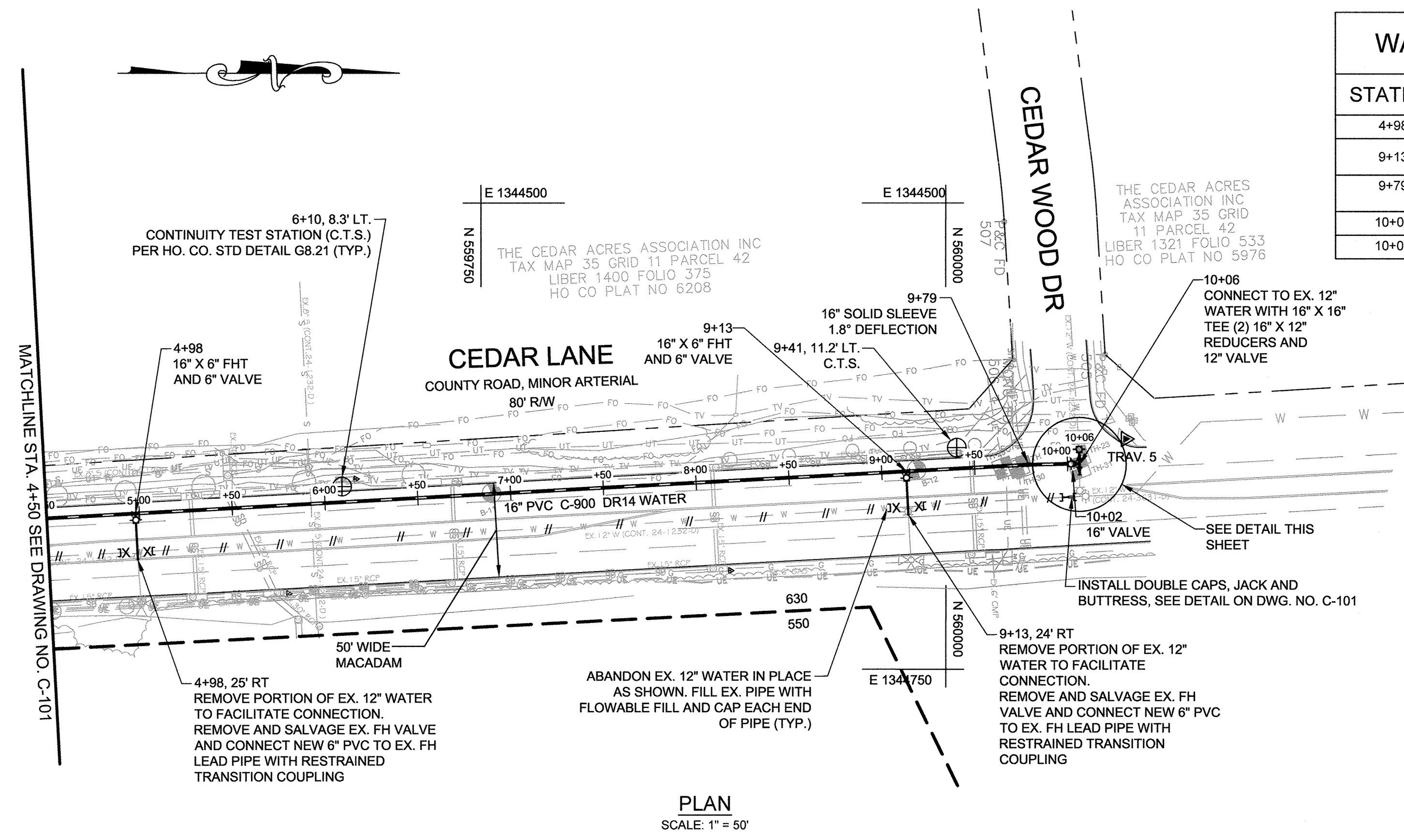
WATER MAIN STAKE-OUT SCHEDULE

STATION	DESCRIPTION	NORTHING	EASTING
4+98	16" X 6" FHT	559564.01	1344686.20
9+13	16" X 6" FHT	559978.62	1344643.89
9+79	16" SOLID SLEEVE 1.8" DEFLECTION	560044.14	1344640.36
10+02	16" VALVE	560067.34	1344639.85
10+06	16" X 16" TEE	560071.83	1344639.76



TEST HOLE SCHEDULE

TEST HOLE NO.	UTILITY	MATERIAL	DEPTH
TH-23	12" WATER	DIP	5.4'
TH-29	(3) 1" ELECTRIC	PLASTIC	3.08'
TH-30	(3) 1" ELECTRIC	PLASTIC	3.06'
TH-30A	(3) 1" ELECTRIC	PLASTIC	3.26'
TH-31	12" WATER	DIP	5.48'



* THE CONTRACTOR SHALL INSTALL A TEMPORARY CAP AND BUTTRESS, AT THE DEMARCATION LINE, ON BOTH 12" SUCTION PIPES AND 16" DISCHARGE PIPE FOR FUTURE CONNECTION UNDER CONTRACT NO. 44-5036.

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. 31363, Expiration Date 01/16/2020

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Director of Public Works: *Kevin Jackson* 2/14/19
 Chief, Bureau of Engineering: *Thomas E. Butler* 2-13-19
 Chief, Bureau of Utilities: *Kevin Jackson* 2-13-19
 Chief, Utility Design Division: *Kevin Jackson* 2-13-19

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STATE OF MARYLAND
 PROFESSIONAL ENGINEER
 License No. 31363
 Expiration Date 01/16/2020

DES: KFJ	BY: NO.	REVISION	DATE
DRN: KFJ			
CHK: GW			
DATE: FEB. 2019			

16" DISCHARGE WATER MAIN
 STA. 4+50 TO STA. 10+06

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

CEDAR LANE
WATER TRANSMISSION MAINS
 CAPITAL PROJECT No. W-8328
 CONTRACT No. 44-5046
 ELECTION DISTRICT NO. 5
 HOWARD COUNTY, MARYLAND

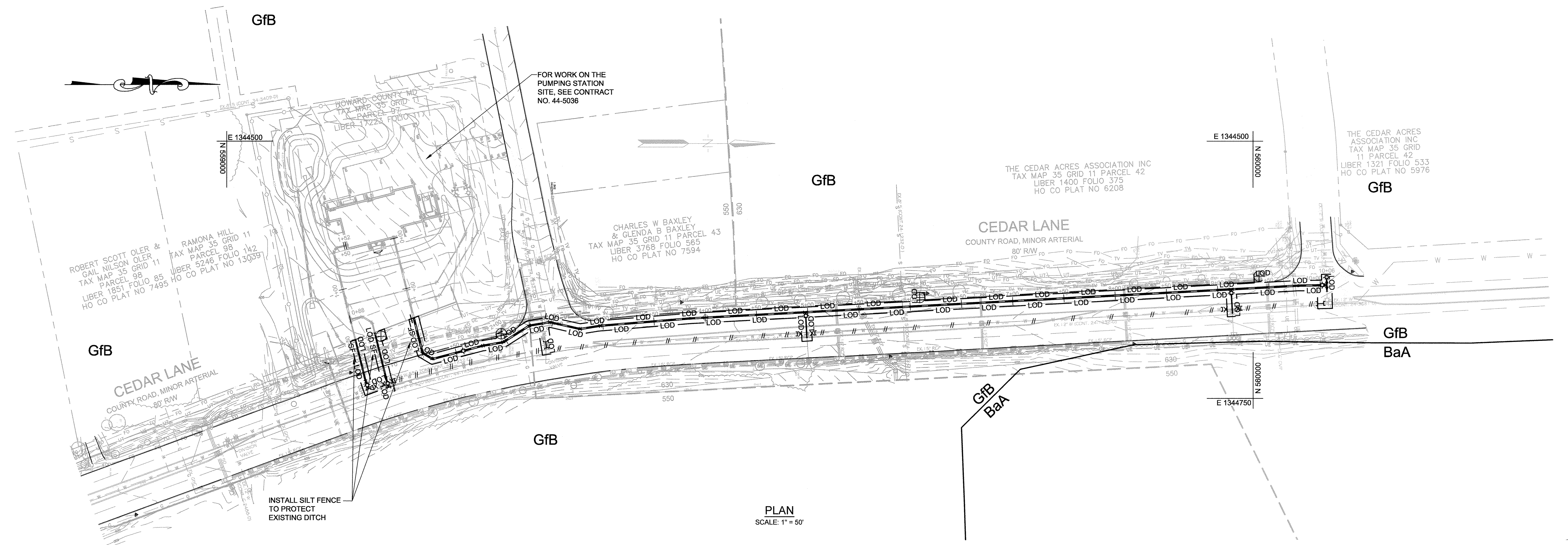
DRAWING NO. C-102
 SCALE AS SHOWN
 SHEET 5 OF 10

SOIL MAPPING UNIT

BaA BAIL SILT LOAM, 0 TO 3 PERCENT SLOPES, Kw=0.32
 GfB GLADSTONE-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES, Kw=0.20

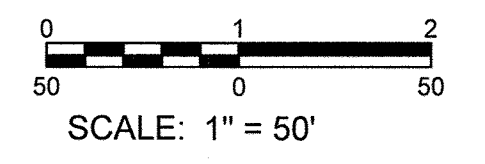
LEGEND

- EXISTING**
- DECIDUOUS TREE
 - ⊗ CONIFEROUS TREE
 - ⊕ EXISTING FIRE HYDRANT
 - ⊕ EXISTING VALVE
 - ⊕ TRAVERSE POINT
 - 395 — MAJOR CONTOUR
 - — MINOR CONTOUR
 - W — EXISTING WATER MAIN
 - S — EXISTING SEWER MAIN
 - SD — EXISTING STORM DRAIN
 - G — EXISTING GAS MAIN
 - UE — EXISTING UNDERGROUND ELECTRIC
 - OE — EXISTING OVERHEAD ELECTRIC
 - OH — EXISTING OVERHEAD WIRE
 - FO — EXISTING FIBER OPTIC
 - UT — EXISTING UNDERGROUND TELECOMMUNICATIONS
 - - - EXISTING SEWER EASEMENT
 - - - PROPERTY BOUNDARY/RIGHT OF WAY GUARDRAIL
 - TREELINE
- PROPOSED**
- STORM DRAIN (BY OTHERS)
 - WATER MAIN
 - LOD — LIMIT OF DISTURBANCE
 - SF — SILT FENCE
 - LOD / SF — LIMIT OF DISTURBANCE AND SILT FENCE
 - GfB — SOILS DESIGNATION
 - BaA — SOILS DESIGNATION



- NOTES:**
- IF REQUIRED BY THE SEDIMENT CONTROL INSPECTOR, THE CONTRACTOR SHALL PROVIDE A STABILIZED CONSTRUCTION ENTRANCE. SEE DETAIL ON DRAWING NO. ES-102.
 - THE CONTRACTOR SHALL IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ON TO 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.
 - THE CONTRACTOR SHALL HAUL AWAY EXCAVATED MATERIAL OFF-SITE WITHIN THE SAME WORKING DAY.

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. 31363, Expiration Date 01/16/2020



KCI TECHNOLOGIES PROJECT No.: 131601306.01

Date: 11/20/19 11:25am User: kci\jason.m... M: 2019\131601306.01\Working\ES-101.dwg Plotting

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Jason M. ... 2/14/19
 DIRECTOR OF PUBLIC WORKS DATE

Thomas D. ... 2-13-19
 CHIEF, BUREAU OF ENGINEERING DATE

... 2/13/19
 CHIEF, UTILITY DESIGN DIVISION DATE

KCI TECHNOLOGIES

ENGINEERS
 PLANNERS
 SCIENTISTS
 CONSTRUCTION MANAGERS

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 www.kci.com

STATE OF MARYLAND
 GUINHA WANG
 PROFESSIONAL ENGINEER
 NO. 31363
 02/11/2019

DES:	KFJ
DRN:	KFJ
CHK:	GW
DATE:	FEB. 2019
BY:	NO.
REVISION:	

EROSION AND SEDIMENT CONTROL PLAN

DATE: FEB. 2019 BY: NO. REVISION: DATE: 600' SCALE MAP NO. 35 BLOCK NO. 17, 11

CEDAR LANE WATER TRANSMISSION MAINS

CAPITAL PROJECT No. W-8328
 CONTRACT No. 44-5046

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. ES-101
 SCALE AS SHOWN
 SHEET 6 OF 10

KCI TECHNOLOGIES PROJECT No.: 131601306 01

**HOWARD SOIL CONSERVATION DISTRICT (HSCD)
STANDARD SEDIMENT CONTROL NOTES**

- 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:
 - Prior to the start of earth disturbance.
 - Upon completion of the installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading.
 - Prior to the start of another phase of construction or opening of another grading unit.
 - Prior to the removal or modification of sediment control practices.
- Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made. Other related state and federal permits shall be referenced, to ensure coordination and to avoid conflicts with this plan.
- All vegetative and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and revisions thereto.
- 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.
- 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).
- 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.
- Site Analysis:

Total Area of Site:	0.28	Acres
Area Disturbed:	0.09	Acres
Area to be roofed or paved:	0.085	Acres
Area to be vegetatively stabilized:	0.005	Acres
Total Cut:	735	Cu. Yds.
Total Fill:	735	Cu. Yds.
Offsite waste/borrow area location:	CONTRACTOR COORDINATE	
- Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
- 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, during rain 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).
- Trenches for the construction of utilities is limited to three pipe lengths or that which can and shall be back-filled and stabilized by the end of each workday, whichever is shorter.
 - 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.
 - Disturbance shall not occur outside the L.O.D. 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 HSCD. Unless otherwise specified and approved by the HSCD, no more than 30 acres cumulatively may be disturbed at a given time.
 - Wash water from any equipment, vehicles, wheels, pavement, and other sources must be treated in a sediment basin or other approved washout structure.
 - Topsoil shall be stockpiled and preserved on-site for redistribution onto final grade.
 - 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.
 - Stream channels must not be disturbed during the following restricted time periods (inclusive):
 - Use I and IP March 1 - June 15
 - Use III and IIIP October 1 - April 30
 - Use IV March 1 - May 31
 - 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.

Rev. 7/2016

<p>DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE</p> <p>CONSTRUCTION SPECIFICATIONS</p> <ol style="list-style-type: none"> 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 (45 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 BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT. 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 BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE. 	<p>DETAIL E-1 SILT FENCE</p> <p>CROSS SECTION</p> <p>STEP 1: STAPLE</p> <p>STEP 2: TWIST POSTS TOGETHER</p> <p>STEP 3: JOINING TWO ADJACENT SILT FENCE SECTIONS (TOP VIEW)</p>	<p>CONSTRUCTION SPECIFICATIONS</p> <ol style="list-style-type: none"> USE WOOD POSTS 1 1/2 x 1 1/2 x 3/4 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 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION. 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 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011	MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011

SEQUENCE OF CONSTRUCTION

- OBTAIN GRADING PERMIT.
- LAYOUT ALIGNMENT AT SITE. (2 DAYS)
- REQUEST PRE-CONSTRUCTION MEETING ON-SITE WITH REPRESENTATIVE OF HOWARD COUNTY DPW CONSTRUCTION INSPECTION DIVISION. (1 DAY)
- THE CONTRACTOR SHALL INSTALL SEDIMENT CONTROL DEVICES AT THE DIRECTION OF THE HOWARD DPW CID INSPECTOR. (1 DAY)
- EXCAVATE TRENCH TO THE GRADE SPECIFIED ON THE PROFILE. INSTALL WATER MAIN, BACKFILL, STABILIZE TRENCH AND RESURFACE WITH BITUMINOUS PAVING AS APPROPRIATE (60 DAYS). TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO 3 LENGTHS OF PIPE OR THAT WHICH CAN BE BACK FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER. AT THE END OF EACH WORK DAY, ALL VEGETATED AREAS DISTURBED DURING THE COURSE OF CONSTRUCTION SHALL BE TEMPORARILY STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SUMMARY SHOWN ON DRAWING NO. ES-104 AND THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, SECTION B-4-4. AT THE END OF EACH WORKING DAY ALL DISTURBED PAVING AREAS WITHIN THE EXISTING ROAD SHALL BE REPLACED WITH PERMANENT SUBGRADE AND BASE ASPHALT, THEN TEMPORARILY PATCHED, SEE TEMPORARILY PAVING DETAIL ON DRAWING NO. C-001.
- UPON COMPLETION OF PIPE INSTALLATION AND INSPECTOR'S APPROVAL, PERMANENTLY STABILIZE ALL DISTURBED VEGETATED AREAS IN ACCORDANCE WITH STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION SHOWN ON DRAWING NO. ES-104 AND THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, SECTION B-4-5. (1 DAY)
- CLEAN UP CONSTRUCTION SITE. (1 DAY)
- REMOVE SEDIMENT CONTROL DEVICES AFTER PERMISSION IS GRANTED BY THE HOWARD CID INSPECTOR. (1 DAY)

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. 31363, Expiration Date 01/16/2020

Feb 11, 2019 - 9:21am User: kevin.jackson File: 131601306 01 Drawings\445-102 E08 DETAILS_NOTES.dwg

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	
Director of Public Works <i>[Signature]</i> 2/14/19 DATE	Chief, Bureau of Engineering <i>[Signature]</i> 2-13-19 DATE
Chief, Bureau of Utilities <i>[Signature]</i> 2-13-19 DATE	Chief, Utility Design Division <i>[Signature]</i> 2/13/19 DATE

ENGINEERS
 PLANNERS
 SCIENTISTS
 CONSTRUCTION MANAGERS

KCI

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STATE OF MARYLAND
 PROFESSIONAL ENGINEER
 No. 31363
 02/11/2019

DES: Kfj					
DRN: Kfj					
CHK: GW					
DATE: FEB. 2019	BY	NO.	REVISION	DATE	

EROSION & SEDIMENT
 CONTROL NOTES AND
 DETAILS

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

CEDAR LANE
 WATER TRANSMISSION MAINS

CAPITAL PROJECT No. W-8328
 CONTRACT No. 44-5046
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO.
 ES-102
 SCALE
 AS SHOWN
 SHEET
 7 of 10

KCI TECHNOLOGIES PROJECT NO.: 131601306.01

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B-4-2 STANDARDS AND SPECIFICATIONS

FOR

SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

Definition

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

Purpose

To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies

Where vegetative stabilization is to be established.

Criteria

- A. Soil Preparation
 - 1. Temporary Stabilization
 - a. Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
 - b. Apply fertilizer and lime as prescribed on the plans.
 - c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
 - 2. Permanent Stabilization
 - a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
 - i. Soil pH between 6.0 and 7.0.
 - ii. Soluble salts less than 500 parts per million (ppm).
 - iii. Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if lovegrass will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
 - iv. Soil contains 1.5 percent minimum organic matter by weight.
 - v. Soil contains sufficient pore space to permit adequate root penetration.
 - b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
 - c. Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.
- d. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
- e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake loam areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.
- B. Topsoiling
 - 1. Topsoil is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
 - 2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-NRCS.
 - 3. Topsoiling is limited to areas having 2:1 or flatter slopes where:
 - a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
 - b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
 - c. The original soil to be vegetated contains material toxic to plant growth.
 - d. The soil is so acidic that treatment with limestone is not feasible.
 - 4. Areas having slopes steeper than 2:1 require special consideration and design.
 - 5. Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
 - a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 1/2 inches in diameter.
 - b. Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
 - c. Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
 - 6. Topsoil Application
 - a. Erosion and sediment control practices must be maintained when applying topsoil.
 - b. Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. Spreading is to be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.
 - c. Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.
- C. Soil Amendments (Fertilizer and Lime Specifications)
 - 1. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
 - 2. Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.

- 3. Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydroseeding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
- 4. Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
- 5. Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

B-4-3 STANDARDS AND SPECIFICATIONS

FOR

SEEDING AND MULCHING

Definition

The application of seed and mulch to establish vegetative cover.

Purpose

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

Conditions Where Practice Applies

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

Criteria

- A. Seeding
 - 1. Specifications
 - a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed and seeding rate.
 - b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
 - c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
 - d. Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.
 - 2. Application
 - a. Dry Seeding: This includes use of conventional drop or broadcast spreaders.
 - i. Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent Seeding Table B.3, or site-specific seeding summaries.
 - ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.
 - b. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
 - i. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
 - ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.
 - c. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer).
 - i. If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P₂O₅ (phosphorus), 200 pounds per acre; K₂O (potassium), 200 pounds per acre.
 - ii. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
 - iii. Mix seed and fertilizer on site and seed immediately and without interruption.
 - iv. When hydroseeding do not incorporate seed into the soil.
- B. Mulching
 - 1. Mulch Materials (in order of preference)
 - a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland Seed Law and not musty, moldy, caked, decayed, or excessively dusty. **Note: Use only sterile straw mulch in areas where one species of grass is desired.**
 - b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
 - i. WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
 - ii. WCFM, including dye, must contain no germination or growth inhibiting factors.
 - iii. WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a blotter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
 - iv. WCFM material must not contain elements or compounds at concentration levels that will be phyto-toxic.
 - v. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.
 - 2. Application
 - a. Apply mulch to all seeded areas immediately after seeding.
 - b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.

- c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to attain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
- 3. Anchoring
 - a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
 - i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.
 - ii. Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
 - iii. Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petrosol, Terra Tax II, Terra Tack AR or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. **Use of asphalt binders is strictly prohibited.**
 - iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000 feet long.

B-4-4 STANDARDS AND SPECIFICATIONS

FOR

TEMPORARY STABILIZATION

Definition

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

Purpose

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

Conditions Where Practice Applies

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

Criteria

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

Hardiness Zone (from Figure B.3): <u>6b</u>					Fertilizer Rate (10-20-20)	Lime Rate
Seed Mixture (from Table B.1):						
No.	Species	Application Rate (lb/acre)	Seeding Dates	Seeding Depths		
	ANNUAL RYEGRASS	40	3/15 - 5/15 8/1 - 10/15	0.5"	436 lb/acre (10 lb/1000 sf)	2 tons/acre (90 lb/1000 sf)
	BARLEY	96	3/15 - 5/15 8/1 - 10/15	1.0"		
	OATS	72	3/15 - 5/31 8/1 - 9/30	1.0"		
	FOXTAIL MILLET	30	5/16 - 7/31	0.5"		

NOTES:
 1/ Seeding rates for the warm-season grasses are in pounds of Pure Live Seed (PLS). Actual planting rates shall be adjusted to reflect percent seed germination and purity, as tested. Adjustments are usually not needed for the cool-season grasses.
 Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mixes, use 1/3 of the seeding rate listed above for barley, oats, and wheat. For smaller-seeded grasses (annual ryegrass, pearl millet, foxtail millet), do not exceed more than 5% (by weight) of the overall permanent seeding mix. Cereal rye generally should not be used as a nurse crop, unless planting will occur in very late fall beyond the seeding dates for other temporary seedings. Cereal rye has allelopathic properties that inhibit the germination and growth of other plants. If it must be used as a nurse crop, seed at 1/3 of the rate listed above.
 Oats are the recommended nurse crop for warm-season grasses.
 2/ For sandy soils, plant seeds at twice the depth listed above.
 3/ The planting dates listed are averages for each Zone and may require adjustment to reflect local conditions, especially near the boundaries of the zone.

B-4-5 STANDARDS AND SPECIFICATIONS

FOR

PERMANENT STABILIZATION

Definition

To stabilize disturbed soils with permanent vegetation.

Purpose

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

Conditions Where Practice Applies

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

Criteria

- A. Seed Mixtures
 - 1. General Use
 - a. Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
 - b. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting.

- c. For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency.
 - d. For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 1/2 pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.
 - 2. Turfgrass Mixtures
 - a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
 - b. Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
 - i. Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
 - ii. Kentucky Bluegrass/Perennial Rye: Full Sun Mixture: For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
 - iii. Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes: Certified Tall Fescue Cultivars 95 to 100 percent, Certified Kentucky Bluegrass Cultivars 0 to 5 percent. Seeding Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.
 - iv. Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes: Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seeding Rate: 1 1/2 to 3 pounds per 1000 square feet.
- Notes:**
 Select turfgrass varieties from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland"
 Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line.
- c. Ideal Times of Seeding for Turf Grass Mixtures
 - Western MD: March 15 to June 1, August 1 to October 1 (Hardiness Zones: 5b, 6a)
 - Central MD: March 1 to May 15, August 15 to October 15 (Hardiness Zone: 6b)
 - Southern MD, Eastern Shore: March 1 to May 15, August 15 to October 15 (Hardiness Zones: 7a, 7b)
 - d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the areas to prepare a proper seedbed. Remove stones and debris over 1 1/2 inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.
 - e. If soil moisture is deficient, supply new seedlings with adequate water for plant growth (1/2 to 1 inch every 3 to 4 days depending on soil texture) until they are firmly established. This is especially true when seedlings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

Hardiness Zone (from Figure B.3): <u>6b</u>					Fertilizer Rate (10-20-20)			Lime Rate
Seed Mixture (from Table B.3):					N	P ₂ O ₅	K ₂ O	
No.	Species	Application Rate (lb/acre)	Seeding Dates	Seeding Depths				
	TALL FESCUE	40	5/1 - 5/15 8/1 - 10/15	1/4 - 1/2 in	45 pounds per acre (1.0 lb/1000 sf)	90 lb/acre (2 lb/1000 sf)	90 lb/acre (2 lb/1000 sf)	2 tons/acre (90 lb/1000 sf)
	PERENNIAL RYEGRASS	25	5/1 - 5/15 8/1 - 10/15	1/4 - 1/2 in				
	WHITE CLOVER	5	5/1 - 5/15 8/1 - 10/15	1/4 - 1/2 in				

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

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. 31363, Expiration Date 01/16/2020

DES: KFJ
 DRN: KFJ
 CHK: GW
 DATE: FEB. 2019

BY NO. REVISION DATE

600' SCALE MAP NO. 35 BLOCK NO. 17_11

6/11/2019

ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS
 936 Ridgeway Road Sparks, MD 21152
 PHONE: (410) 316-7800 FAX: (410) 316-7817 www.kci.com

STATE OF MARYLAND
 DIVISION OF PROFESSIONAL ENGINEERS
 License No. 31363
 02/11/2019

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Director of Public Works DATE 2-13-19
 Chief, Bureau of Utilities DATE 2-13-19

Chief, Bureau of Engineering DATE 2-13-19
 Chief, Utility Design Division DATE 2-13-19

KCI TECHNOLOGIES

EROSION & SEDIMENT CONTROL NOTES

CEDAR LANE WATER TRANSMISSION MAINS

CAPITAL PROJECT No. W-8328
 CONTRACT No. 44-5046

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. ES-103

SCALE AS SHOWN

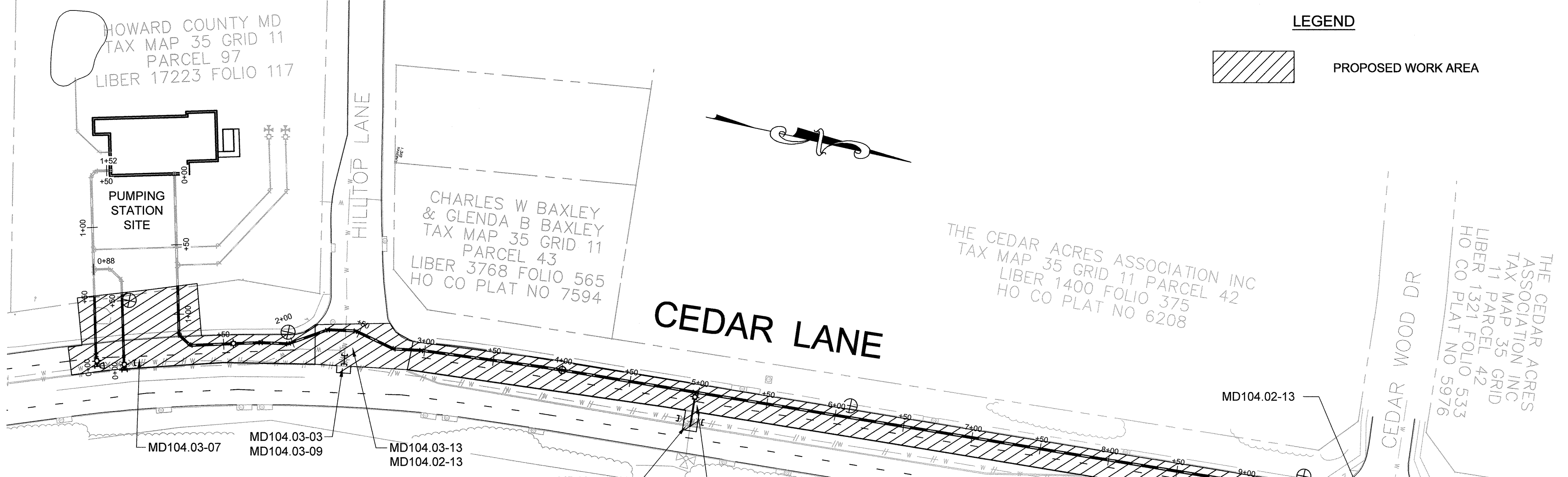
SHEET 8 of 10

TRAFFIC CONTROL NOTES:

- ALL STANDARD REGULATORY AND WARNING SIGNS AND OTHER TRAFFIC CONTROL DEVICES USED FOR MAINTENANCE OF TRAFFIC SHALL BE IN ACCORDANCE WITH THE MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (LATEST EDITION).
- ALL TEMPORARY TRAFFIC SIGNS SHALL BE INSTALLED IN ACCORDANCE TO MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, MDSA BOOK OF STANDARDS, AND NCHRP 350.
- ALL TEMPORARY SIGNS SHOWN ON THIS PLAN SHALL BE PLACED SO THAT THEY DO NOT OBSTRUCT EXISTING TRAFFIC CONTROL DEVICES (MINIMUM 200' SPACING).
- ANY CORRECTIONS, MODIFICATIONS, OR ADDITIONS TO THIS PLAN MUST BE APPROVED BY THE HOWARD COUNTY DEPT. OF PUBLIC WORKS TRAFFIC DIVISION.
- MISS UTILITY MUST BE NOTIFIED PRIOR TO PLACEMENT OF SIGNING, IF MOUNTING ON POSTS.
- SIGN INSTALLATION SHALL NOT LAST ANY LONGER THAN 15 MINUTES PER LOCATION. IF LONGER THAN 15 MINUTES APPROPRIATE TRAFFIC CONTROL AND PERMITS MUST BE USED.
- THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL TRAFFIC CONTROL DEVICES. AT ANYTIME THE CONTRACTOR DOES NOT MAKE NECESSARY REPAIRS WITHIN 24 HOURS OF NOTIFICATION, APPROPRIATE WORK TIME REDUCTION AND/OR FINES MAY BE APPLIED.
- ALL DRIVEWAY ENTRANCES MUST BE MAINTAINED AT ALL TIMES.
- THE DAILY TRENCHING OPERATION SHALL NOT EXTEND MORE THAN 30 FEET IN ADVANCE OF THE PIPE LAYING OPERATION. ALL ROADWAYS SHALL BE FULLY REOPENED AT THE END OF EACH WORK DAY.
- LANE CLOSURE NOTIFICATION:
THE CONTRACTOR SHALL NOTIFY THE FOLLOWING AGENCIES AT LEAST 4 WEEKS IN ADVANCE:
HOWARD COUNTY DPW - TRAFFIC DIVISION-410-313-2430
HOWARD COUNTY PUBLIC SCHOOLS/TRANSPORTATION DIVISION-410-313-6728 (IF DURING SCHOOL TIMES)
HOWARD COUNTY TRANSIT SERVICES-240-581-5800
HOWARD COUNTY BUREAU OF ENVIRONMENTAL SERVICES-410-313-6470
HOWARD COUNTY EMERGENCY COMMUNICATIONS/911 CENTER-410-313-2300.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THE SAFETY OF THE PUBLIC AND THE WORK CREW IS MAINTAINED AT ALL TIMES THROUGHOUT THE TERM OF THE CONTRACT. MOTORISTS SHALL BE GUIDED IN A CLEAR AND POSITIVE MANNER WHILE TRAVELING THROUGH THE WORK ZONE.
- THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT AND MATERIALS FROM THE TRAVELED PORTION OF THE ROADWAY. NO EQUIPMENT OR MATERIALS SHOULD BE STORED IN A WAY THAT OBSTRUCTS SIGHT DISTANCE AT INTERSECTING ROADWAYS AND SHALL NOT BE STORED WITHIN THE 30-FOOT CLEAR ZONE WITHOUT POSITIVE PROTECTION. THE CONTRACTOR AND INSPECTORS SHALL NOT PARK VEHICLES BEHIND DRUMS WITHIN THE TAPER AND BUFFER AREAS.

TRAFFIC CONTROL NOTES (CONTINUED)

- ANY DAMAGE TO EXISTING STRUCTURES, SIGNS, POSTS AND HARDWARE AS A RESULT OF OPERATIONS DURING CONSTRUCTION SHALL BE REPLACED AT NO ADDITIONAL COST TO THE COUNTY.
- IN THE EVENT THAT ADJACENT CONSTRUCTION PROJECTS OCCUR SIMULTANEOUSLY WITH THIS PROJECT, COORDINATION OF THE TRAFFIC CONTROL PLANS FOR EACH PROJECT WILL BE REQUIRED. SPECIFICALLY THE LOCATION OF OVERLAPPING ADVANCED WARNING SIGNS SHALL BE ADJUSTED AS REQUIRED.
- ALL TEMPORARY SIGNS INSTALLED FOR THIS PROJECT SHALL BE ADJUSTED TO AVOID CONFLICTS WITH EXISTING SIGNS. ANY EXISTING OR TEMPORARY SIGN THAT IS NO LONGER APPLICABLE SHALL BE COVERED OR REMOVED AND RESTORED WHEN THE PROJECT IS COMPLETE. TEMPORARY SIGNS SHALL MAINTAIN A MINIMUM SPACING OF 200 FEET BETWEEN SIGNS.
- SEE CONTRACT DOCUMENTS FOR WORK RESTRICTIONS, LANE CLOSURE TIMES AND HOLIDAYS.
- EXCAVATION THAT RESULTS IN A PAVEMENT EDGE DROP-OFF SHALL BE SIGNED IN ACCORDANCE WITH MD. STD. NO. 104.06-15 TO MD 104.06-19.
- NOTIFY THE HOWARD COUNTY HIGHWAY DEPARTMENT AT 410-313-7450 3 DAYS PRIOR TO WORKING IN THE ROADWAY.
- THE CONTRACTOR SHALL BACKFILL THE TRENCH IMMEDIATELY AFTER THE INSTALLATION OF A SECTION OF PIPE. IF STEEL PLATES ARE TO BE USED, APPROPRIATE SIGNING WILL BE REQUIRED. STEEL PLATES MUST BE RECESSED AND PINNED PER HOWARD COUNTY STANDARD DETAIL G-4.02. THE CONTRACTOR SHALL NOT LEAVE AN OPEN TRENCH UNATTENDED. ALL ROADWAYS SHALL BE FULLY REOPENED AT THE END OF EACH WORK SHIFT.
- FLAGGERS SHALL BE CERTIFIED AND HAVE THEIR CERTIFIED FLAGGER CARD WITH THEM AT ALL TIMES DURING FLAGGING OPERATIONS.
- LANE CLOSURES ARE RESTRICTED TO 9 AM TO 3 PM MONDAY-FRIDAY. COUNTY MAY ALTER WORK HOURS BASED ON TRAFFIC CONDITIONS.
- NOTIFY HOWARD COUNTY POLICE 5 DAYS PRIOR TO STARTING WORK.
- SEE MD STDS 104.00-01 THROUGH 104.00-18 FOR TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATIONS AND STANDARDS.
- CONTRACTOR SHALL DOCUMENT ALL EXISTING PAVEMENT MARKINGS AND RE-INSTALL IN KIND.

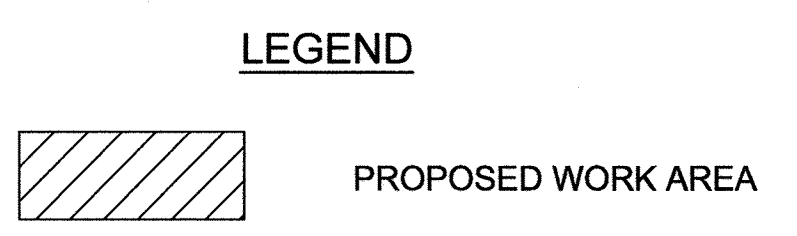


SEQUENCE OF CONSTRUCTION

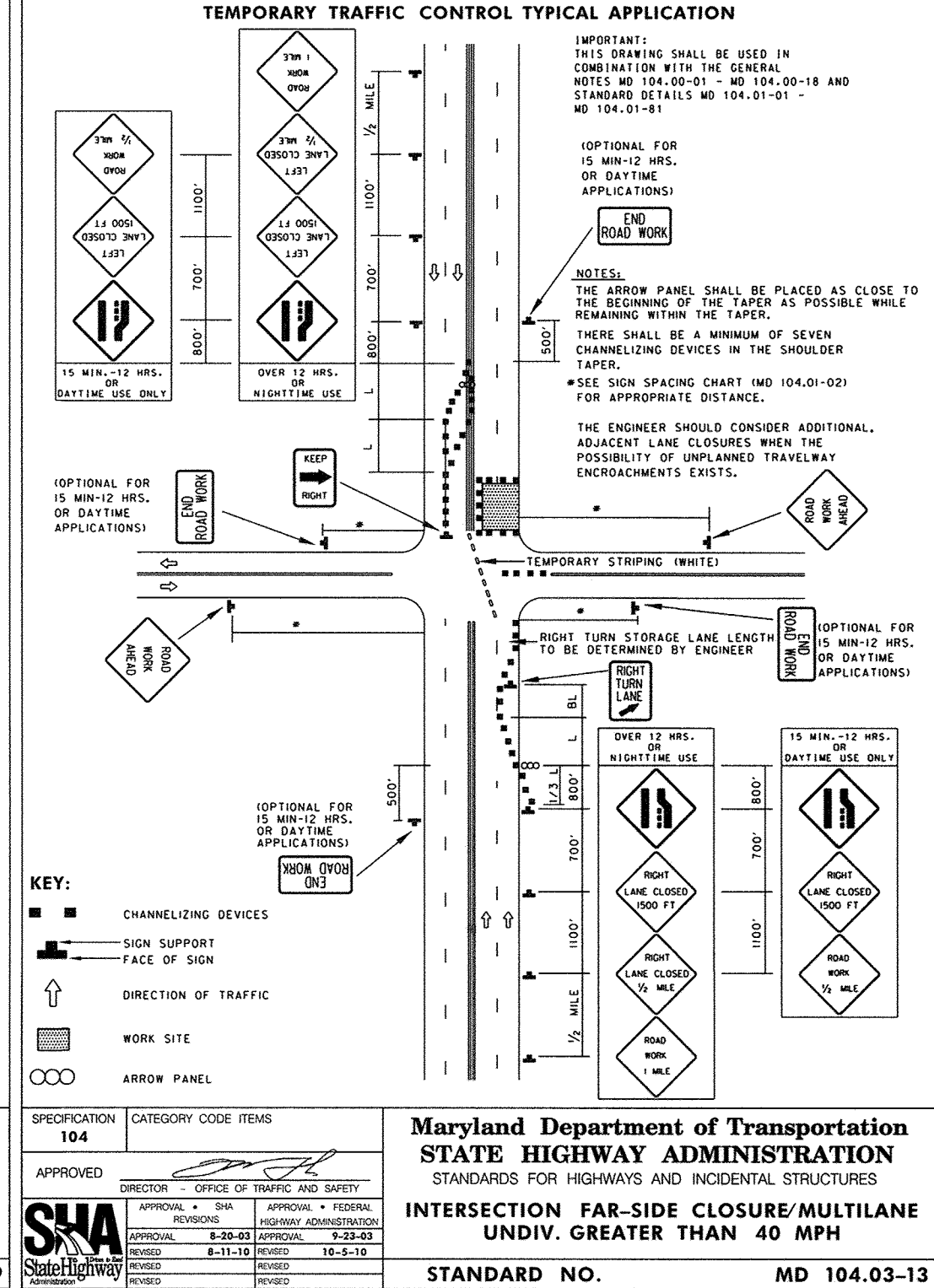
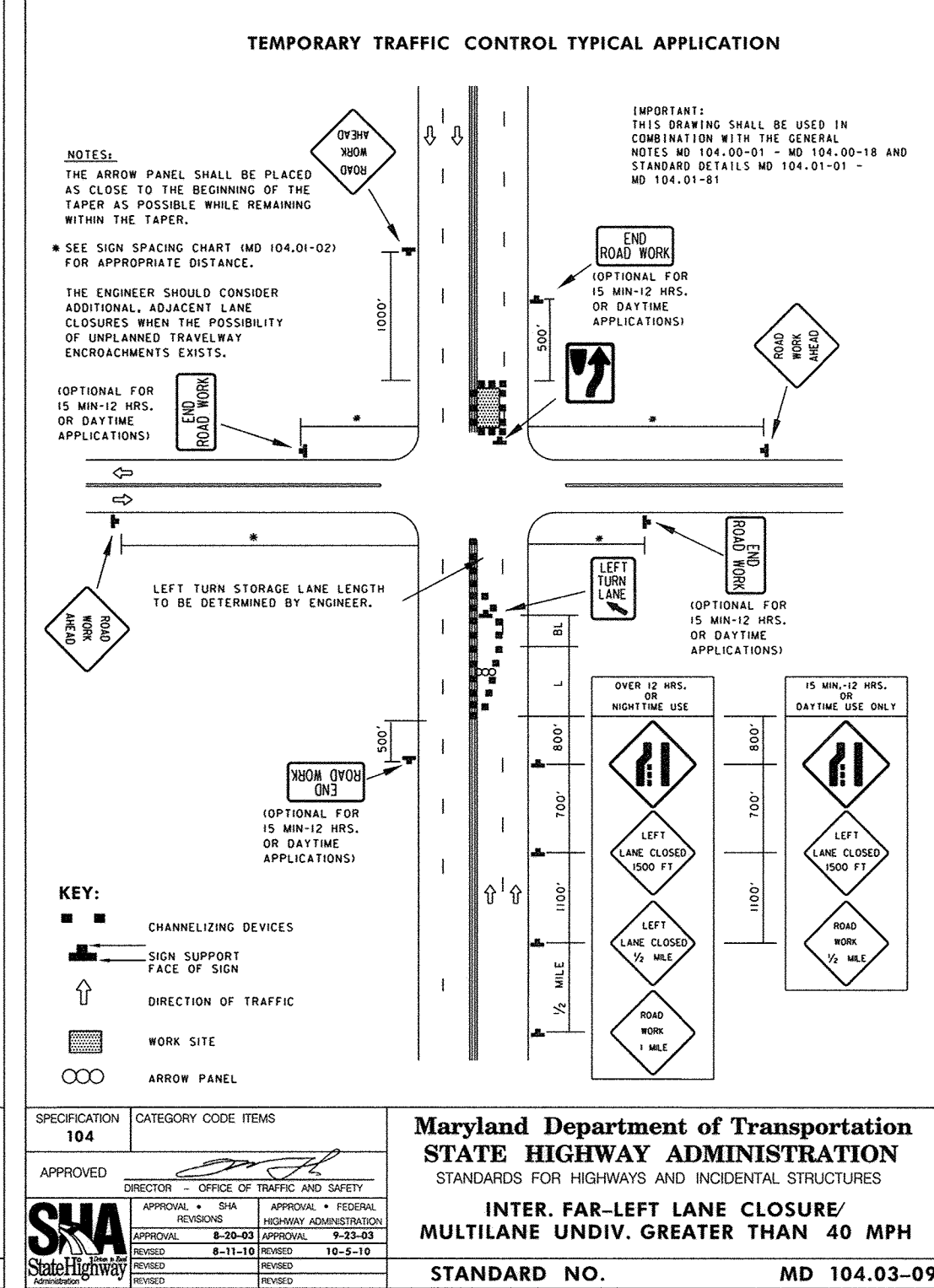
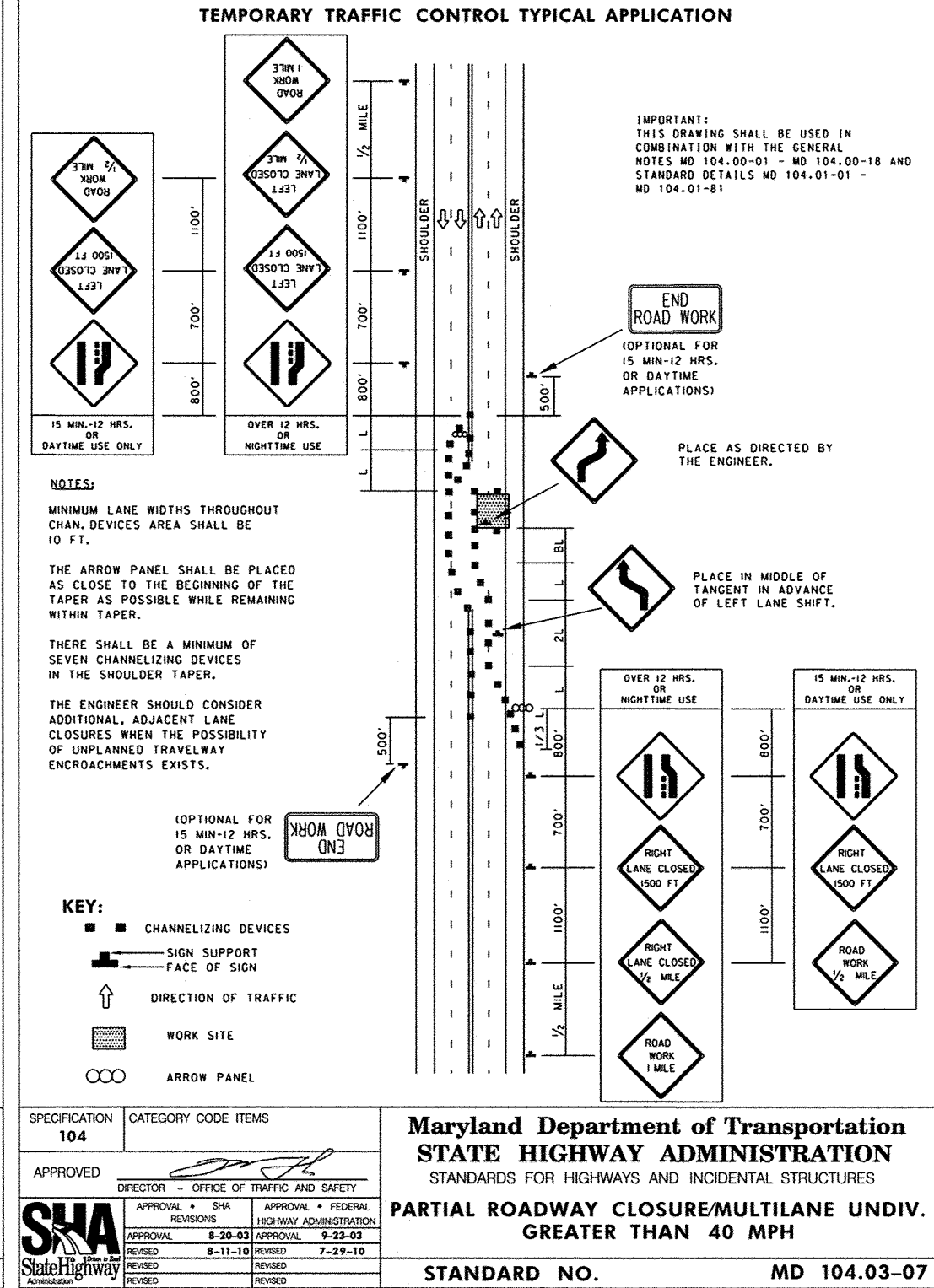
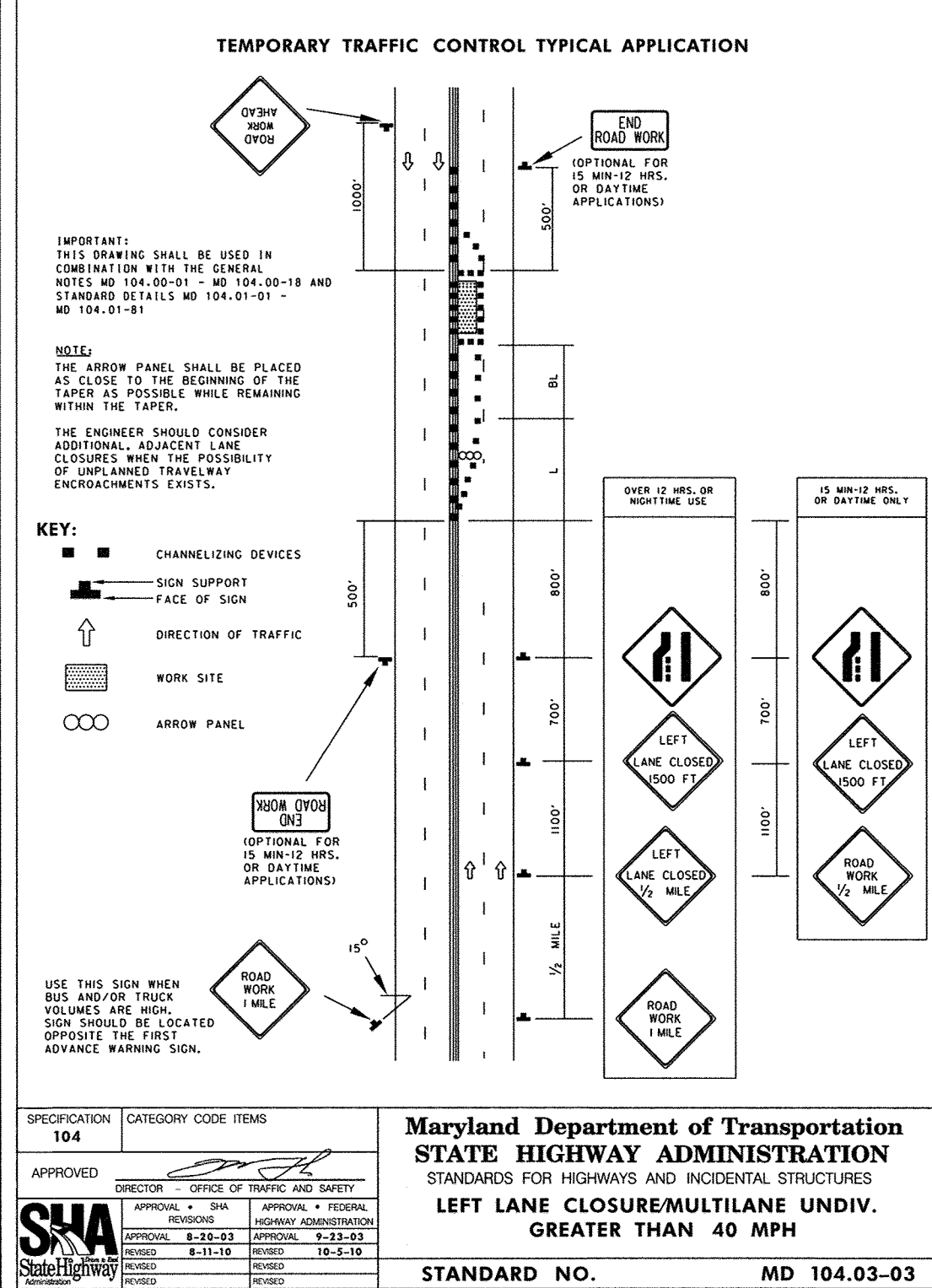
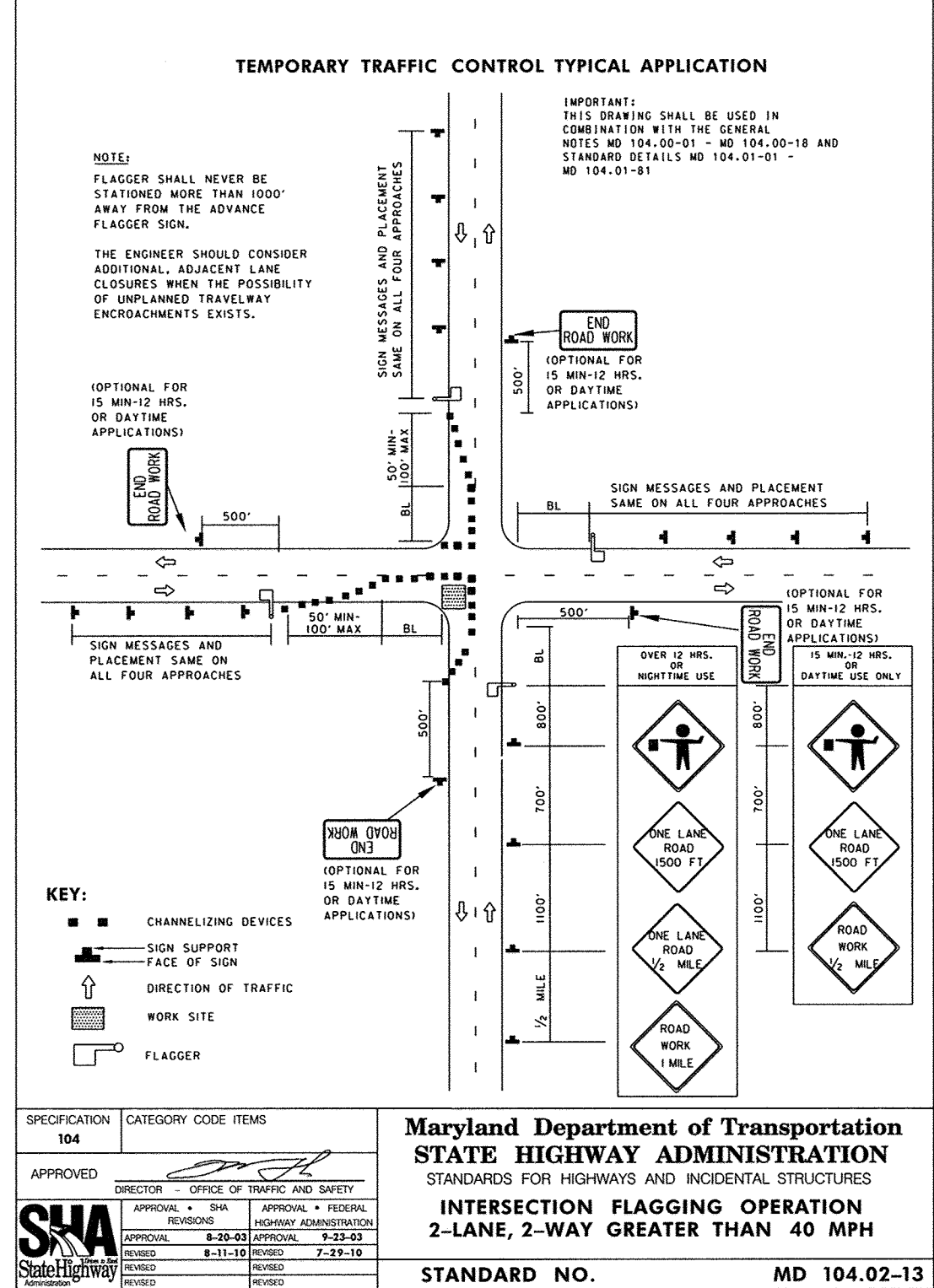
- SET UP TRAFFIC CONTROL PER TRAFFIC CONTROL PLANS FOR THE WORK AREA DURING WORKING HOURS.
 - SET UP MD104.03-07 AND MD 104.03 -13 TO CONSTRUCT WATER MAIN ON CEDAR LANE FROM PUMPING STATION SITE TO CEDAR WOOD DRIVE. (CLOSE CENTER LEFT TURN LANE ON CEDAR LANE) FLAG TRAFFIC ENTERING AND EXITING HILLTOP LANE.
 - SET UP MD 104.03 -13 TO CONSTRUCT WATER MAIN AT CEDAR WOOD DRIVE ENTRANCE. FLAG TRAFFIC ENTERING AND EXITING CEDAR WOOD DRIVE.
 - SET UP MD 104.03-03 AND/OR MD 104.03-09 TO CONSTRUCT FIRE HYDRANT LEAD PIPES AND DOUBLE CAP, JACK AND BUTTRESS.
- CONSTRUCT WATER MAIN IN WORK AREA.
- BACK FILL AND PAVE, OR INSTALL TEMPORARY STEEL PLATES OVER THE NEW WATER MAIN AT THE END OF WORK HOURS.
- REMOVE TEMPORARY TRAFFIC CONTROL AND OPEN ALL LANES.
- WHEN WATERMAIN CONSTRUCTION IS COMPLETE, MILL AND OVERLAY ROADWAY.

POSTED SPEED LIMIT	35 MPH
DESIGN SPEED	50 MPH
LANE CLOSURE TAPER (L) (ASSUME A 10' LANE)	500'
BUFFER LENGTH	425'
DRUM SPACING	35' (MAX.)

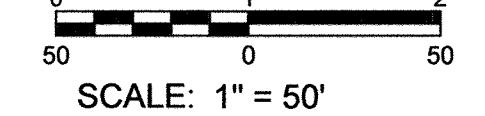
PLAN
SCALE: 1" = 50'



KCI TECHNOLOGIES PROJECT No.: 131601306.01



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. 16303, Expiration Date 12/21/2020.



User: kci_tm, jobno: 131601306.01, sheet: 17 of 17, date: 2/14/19

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John J. ... 2/14/19
DIRECTOR OF PUBLIC WORKS DATE

Thomas P. Butler 2-13-19
CHIEF, BUREAU OF ENGINEERING DATE

... 2-13-19
CHIEF, BUREAU OF UTILITIES DATE

... 2-13-19
CHIEF, UTILITY DESIGN DIVISION DATE

KCI TECHNOLOGIES

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

936 Ridgebrook Road
Sparks, MD 21152
Phone: (410) 316-7800
Fax: (410) 316-7817
www.kci.com

STATE OF MARYLAND

PROFESSIONAL ENGINEER

... 02-12-2019

DES:	AMH
DRN:	CK
CHK:	JFL
DATE:	FEB. 2019
BY:	NO.
REVISION:	

DATE:	600' SCALE MAP NO. 35
BLOCK NO.:	17.11

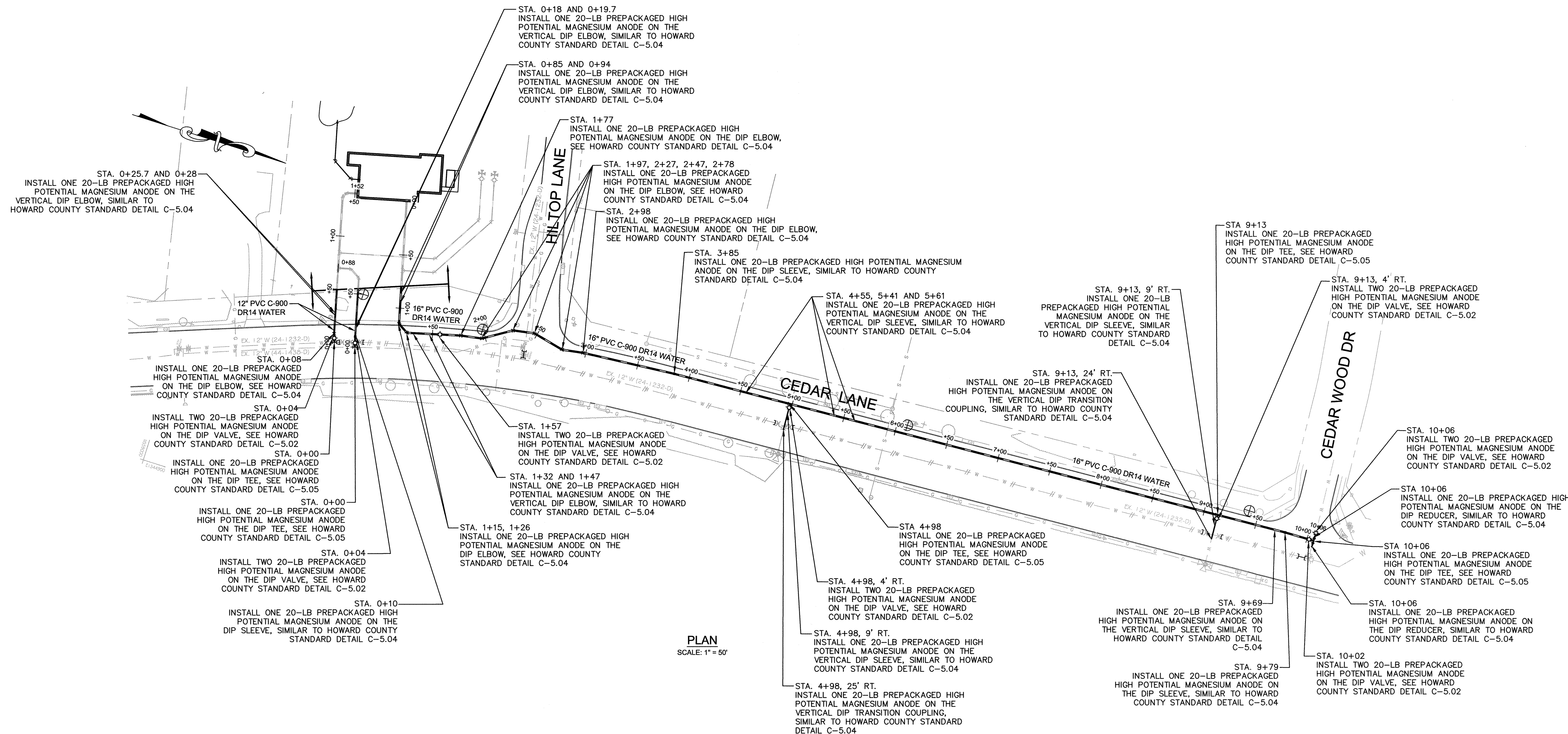
TRAFFIC CONTROL PLAN

CEDAR LANE
WATER TRANSMISSION MAINS

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5046

ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

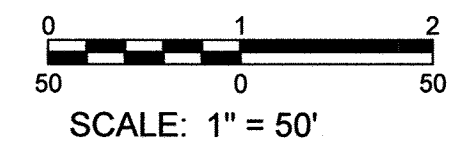
DRAWING NO. T-102
SCALE AS SHOWN
SHEET 9 OF 10



PLAN
 SCALE: 1" = 50'

NOTES:

1. ALL NEW DUCTILE IRON AND STEEL FITTINGS, VALVES, COUPLINGS, TAPPING SLEEVES, REDUCERS, AND FIRE HYDRANT PIPE ALONG THE PVC WATER MAIN ARE TO BE PROVIDED WITH CORROSION PROTECTION, SEE HOWARD COUNTY STANDARD DETAIL C-5.01 THROUGH C-5.15.
2. FOR THERMITE WELD TO CONNECTOR PLATE, SEE HOWARD COUNTY STANDARD DETAIL C-5.13.
3. FOR HORIZONTAL THERMITE WELDS TO DUCTILE IRON PIPE, SEE HOWARD COUNTY STANDARD DETAIL C-3.04. FOR VERTICAL THERMITE WELDS TO DUCTILE IRON PIPE, SEE HOWARD COUNTY STANDARD DETAIL C-3.05.
4. FOR PLACEMENT OF ANODES, SEE HOWARD COUNTY STANDARD DETAIL C-5.14 AND C-5.15.
5. DO NOT MAKE THERMITE WELDS TO PVC PIPE.
6. POLYETHYLENE ENCASUREMENT SHALL NOT BE INSTALLED ON NEW DUCTILE IRON WATER PIPING.
7. INSTALL SEPARATOR MESH ON WATER MAIN AT EXISTING UTILITY CROSSINGS IF THERE IS LESS THAN 12 INCHES OF SPACING BETWEEN THEM, SEE HOWARD COUNTY STANDARD DETAILS C-4.06.
8. INSTALL ONE 12-LB PREPACKAGED ZINC ANODE ON ALL RESTRAINING HARNESSSES, SEE HOWARD COUNTY STANDARD DETAIL C-5.10.



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. **44911**, Expiration Date **Jan 4, 2020**

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

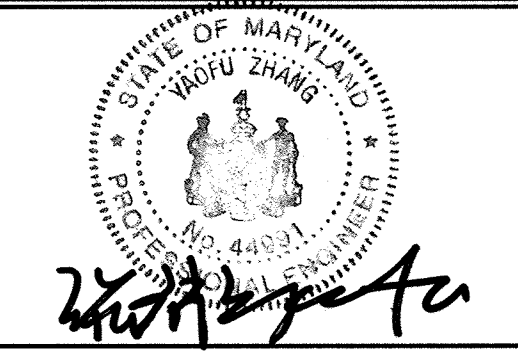
Kevin Jackson 2-13-19
 DIRECTOR OF PUBLIC WORKS DATE

Donna S. Butler 2-13-19
 CHIEF, BUREAU OF ENGINEERING DATE

Kevin Jackson 2-13-19
 CHIEF, BUREAU OF UTILITIES DATE

Kevin Jackson 2-13-19
 CHIEF, UTILITY DESIGN DIVISION DATE

RUSSELL CORROSION CONSULTANTS, LLC
 7130 Minstral Way - Suite 230
 Columbia, MD - 410-997-4481
 www.RussellCorrosion.com



DES: YZ					
DRN: AMT					
CHK: DD					
DATE: FEB. 2019	BY	NO.	REVISION	DATE	

CATHODIC PROTECTION
 PLAN

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

CEDAR LANE
 WATER TRANSMISSION MAINS

CAPITAL PROJECT No. W-8328
 CONTRACT No. 44-5046

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO.
 CP-1

SCALE
 AS SHOWN

SHEET
 10 of 10