


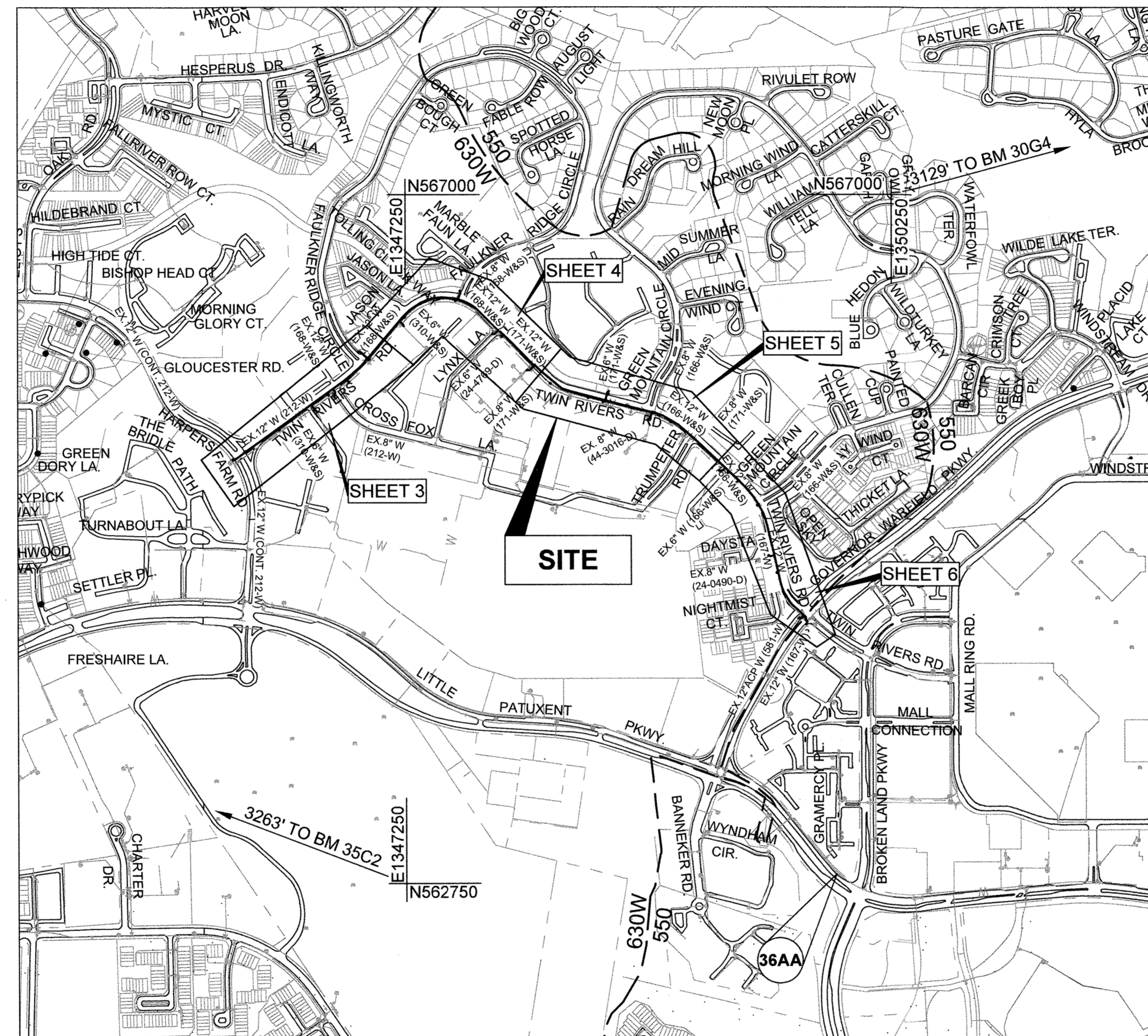
TWIN RIVERS ROAD WATER MAIN REPLACEMENT CAPITAL PROJECT NO. W8331 CONTRACT NO. 44-5072 HOWARD COUNTY, MARYLAND

PURPOSE STATEMENT:

THE PURPOSE OF THIS PROJECT IS TO REPLACE THE AGING CAST IRON WATER MAIN ALONG TWIN RIVERS ROAD BETWEEN HARPERS FARM ROAD AND GOVERNOR WARFIELD PARKWAY. THE REPLACEMENT OF THE MAIN IS REQUIRED TO ENSURE LONG TERM FIRE PROTECTION AND DOMESTIC WATER SUPPLY FOR RESIDENTS AND BUSINESSES ALONG THE TWIN RIVERS ROAD CORRIDOR.

GENERAL NOTES

- APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES 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 05/14/2018 BY KCI TECHNOLOGIES, INC.
- HORIZONTAL AND VERTICAL SURVEY CONTROLS:
THE COORDINATES SHOWN ON THE DRAWINGS ARE BASED ON MARYLAND STATE REFERENCE SYSTEM NAD 83/91 AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL POINTS 30G4, 35C2 AND 36AA. ALL VERTICAL CONTROLS ARE BASED ON NAVD 88. VERTICAL CONTROLS PROVIDED ON THE DRAWINGS ARE 30G4 AND 35C2.
- ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- CLEAR ALL UTILITIES BY A MINIMUM OF 12". 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 REQUIRED. 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.
- ALL EXISTING UTILITIES SHALL BE TEST PITTED / LOCATED AS NECESSARY AND IN ADVANCE OF THE PROPOSED CONSTRUCTION. IN ORDER TO PROPERLY MAKE ALL REQUIRED UTILITY CROSSINGS AND / OR CONNECTIONS, ANY DISCREPANCIES OR UTILITY CONFLICTS SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER. WHERE TEST PITS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL  AT THE LOCATION OF THE TEST PIT. A NOTE OR NOTES CONTAINING THE RESULTS OF THE TEST PIT OR PITS IS INCLUDED ON THE DRAWINGS OR IN THE SPECIFICATIONS. LOCATIONS OF OTHER EXISTING UTILITIES IN THE VICINITY OF THE PROPOSED WORK FOR WHICH TEST PITS HAVE NOT BEEN NOTED 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.
- THE CONTRACTOR SHALL NOTIFY THE BUREAU OF HIGHWAYS, HOWARD COUNTY, AT (410)313-7450 AT LEAST FIVE WORKING DAYS BEFORE ANY OPEN CUT OF ANY COUNTY ROAD OR BORING/JACKING OPERATION IN COUNTY ROADS 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 SHALL PROVIDE ALL NECESSARY LINES, GRADES AND ELEVATIONS, AND CUT SHEETS SHALL BE PREPARED BASED ON THE LINES AND GRADES SHOWN ON THE CONTRACT DRAWINGS.
- SPOIL FROM TRENCHING OPERATIONS SHALL BE PLACED ON THE UPHILL SIDE OF THE TRENCH.



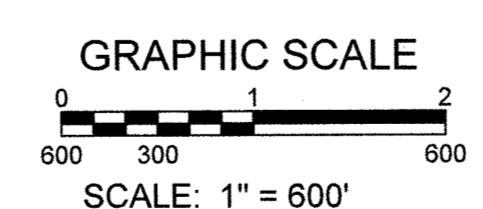
VICINITY MAP

SCALE: 1" = 600'

DRAINAGE AREA: MIDDLE PATUXENT PRESSURE ZONE: 630-W
WATER TEST GRADIENT: 764

CONTROL NOTE
THE HORIZONTAL AND VERTICAL DATUM SHOWN HEREON ARE BASED ON THE FOLLOWING HOWARD COUNTY GEODETIC CONTROL STATIONS.

NAD83/1991 (HORIZONTAL)		
NAVD 88 (VERTICAL)		
30G4	N 567815.203	35C2 N 563920.824
	E 1353271.299	E 1344204.185
	ELEV. 360.268	ELEV. 463.405
		ELEV. 359.163



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. 31383, Expiration Date 01/18/2020.

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND, ABBREVIATIONS, WATER MAIN NOTES, SEQUENCE OF CONSTRUCTION AND TEMPORARY PAVING
3	12" WATER PLAN AND PROFILE STA.0+00 TO STA. 12+00
4	12" WATER PLAN AND PROFILE STA.12+00 TO STA. 24+50
5	12" WATER PLAN AND PROFILE STA.24+50 TO STA. 37+00
6	12" WATER PLAN AND PROFILE STA.37+00 TO STA. 48+70
7	PROFILES - WATER MAIN LATERAL CONNECTIONS
8	EROSION & SEDIMENT CONTROL PLAN
9	EROSION & SEDIMENT CONTROL PLAN
10	EROSION & SEDIMENT CONTROL NOTES AND DETAILS
11	EROSION & SEDIMENT CONTROL NOTES
12	TRAFFIC CONTROL NOTES AND DETAILS
13	HIGH FRICTION SURFACE TREATMENT PLAN

BILL OF MATERIALS

ITEM	UNIT	ESTIMATE	AS-BUILT	MANUFACTURER
12" PVC C-900 DR14 WATER	L.F.	4900	4935	JM EAGLE
8" PVC C-900 DR 14 WATER	L.F.	320	320	JM EAGLE
6" PVC C-900 DR 14 WATER	L.F.	210	210	JM EAGLE
3" PVC SDR 13.5	L.F.	25	0	N/A
12" x 12" TAPPING SLEEVE AND VALVE	EA.	2	2	SMITH BLAIR/MUELLER
12" VALVE	EA.	8	8	MUELLER CO.
8" VALVE	EA.	6	6	MUELLER CO.
6" VALVE	EA.	4	6	MUELLER CO.
2 1/2" BLOW-OFF ASSEMBLY	EA.	1	1	JOHN C. KUPPERLE FOUNDARY
FIRE HYDRANT & 6" VALVE	EA.	2	2	MUELLER CO.
NAME OF UTILITY CONTRACTOR: <u>ECM CORPORATION</u>				
CHECKBOX				
AS-BUILT DATE				
SURVEY AND DRAFTING DIVISION				

PURPOSE STATEMENT
THE PURPOSE OF CONTRACT 44-5072 IS TO INSTALL NEW PVC WATER MAIN TO REPLACE THE EXISTING WATER MAIN INSTALLED UNDER CONTRACT NO. 212-W ALONG TWIN RIVERS ROAD FROM THE INTERSECTION WITH HARPERS FARM ROAD TO THE INTERSECTION WITH GOVERNOR WARFIELD PARKWAY.

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."

Paul S. Di Marco Aug. 16, 2019
OWNERS / DEVELOPERS SIGNATURE DATE

Paul S. Di Marco
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."

Guohua Wang 08/09/2019
DESIGNERS SIGNATURE DATE

GUIHUA WANG
PRINTED NAME MD REGISTRATION NO. 31363
P.E. R.L.S. OR R.L.A. (CIRCLE ONE)

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

Guohua Wang 08/09/2019
DESIGNERS SIGNATURE DATE

Guohua Wang 08/09/2019
DESIGNERS SIGNATURE DATE

AS-BUILT
DATE 02/05/2021

KCI TECHNOLOGIES PROJECT No.: 13122677.67

Aug. 09, 2019, 12:30pm User: kci\jackson M:\2019\13122677_67\Drawings\001_The Sheet.dwg

**DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND**

<i>Thomas E. Suttler</i> 8-19-19 DIRECTOR OF PUBLIC WORKS DATE	<i>Thomas E. Suttler</i> 8-19-19 CHIEF, BUREAU OF ENGINEERING DATE
<i>Chris Stry</i> 8-20-19 CHIEF, BUREAU OF UTILITIES DATE	<i>Chris Stry</i> 8/16/19 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
Guohua Wang
PROFESSIONAL ENGINEER
NO. 31383
08/09/2019

DES: KJ					
DRN: KJ					
CHK: JB/GW					
DATE: AUG. 2019					
BY: KJ	NO. 25	REVISION AS-BUILT, RECORD DRAWING	DATE: 2/5/21		

TITLE SHEET

600' SCALE MAP NO. 29, 30, 36 BLOCK NO. 24, 19, 1

**TWIN RIVERS ROAD
WATER MAIN REPLACEMENT**

CAPITAL PROJECT No. W8331
CONTRACT No. 44-5072

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 1 of 13

WATER MAIN NOTES

SUGGESTED SEQUENCE OF CONSTRUCTION

LEGEND

EXISTING	
	DECIDUOUS TREE
	CONIFEROUS TREE
	BUSH
	HEDGE
	UTILITY POLE
	GUY
	LIGHT POST
	MAIL BOX
	TELECOM PEDISTAL
	WATER WELL
	WATER METER / CURB STOP
	SEWER CLEAN-OUT
	SIGN
	TRAVERSE POINT
	FIRE HYDRANT
	WATER VALVE
	SEWER MANHOLE
	STORM DRAIN MANHOLE
	WATER MAIN
	SEWER MAIN
	STORM DRAIN
	OVERHEAD WIRE
	CABLE TV
	FENCE
	PROPERTY BOUNDARY
	MAJOR CONTOUR
	MINOR CONTOUR

PROPOSED

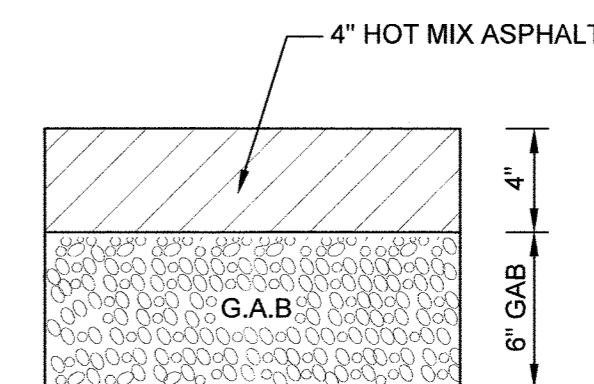
	WATER METER		WATER MAIN
	TEST HOLE		SILT FENCE
	SOIL BORING		LIMIT OF DISTURBANCE
	CONTINUITY TEST STATION		ABANDON EX. WATER
	CORROSION TEST STATION		REMOVE EX. WATER
	FIRE HYDRANT		
	WATER VALVE		

ABBREVIATIONS

SYMBOL	DESCRIPTION
CIP	CAST IRON PIPE
CMP	CORRUGATED METAL PIPE
CNF	CANNOT FIND
CO	CLEAN-OUT
CTS	CONTINUITY TEST STATION
CRTS	CORROSION TEST STATION
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
FHT	FIRE HYDRANT TEE
GAB	GRADED AGGREGATE BASE
(H)	HORIZONTAL
HB	HORIZONTAL BEND
HDC	HIGH DEFLECTION COUPLING
HO. CO.	HOWARD COUNTY
INV	INVERT
MH	MANHOLE
PVC	POLYVINYL CHLORIDE
RAW	RIGHT OF WAY
STD	STANDARD
TRAV	TRAVERSE
TS&V	TAPPING SLEEVE AND VALVE
(V)	VERTICAL
VB	VERTICAL BEND
WHC	WATER HOUSE CONNECTION

- ALL WATER MAINS SHALL BE PVC DR14 UNLESS OTHERWISE NOTED.
- TOPS OF ALL WATER MAINS SHALL HAVE A MINIMUM OF 3'-6" 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 HYDRANTS 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, HARNESSES AND COUPLINGS. 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 STANDARD BENDS, 5-DEGREE SWEEPS, HIGH DEFLECTION (HD) COUPLINGS OR RESTRAINED COUPLINGS. NO BENDING OF THE PIPE OR DEFLECTING OF PVC PIPE JOINTS IS PERMITTED. WHERE HIGH DEFLECTION COUPLING, RESTRAINED COUPLING OR 5-DEGREE SWEEPS ARE PERMITTED, THE CONTRACTOR SHALL PROVIDE ONE FULL PIPE LENGTH (20-FOOT LONG) ON EITHER SIDE OF THE HIGH DEFLECTION COUPLING, RESTRAINED COUPLING OR 5-DEGREE SWEEP. THE CONTRACTOR SHALL USE A VIBRATORY PLATE COMPACTOR OR OTHER APPROVED MEANS TO THOROUGHLY COMPACT THE #57 STONE ON BOTH SIDES OF THE HIGH DEFLECTION COUPLING, RESTRAINED COUPLING OR 5-DEGREE SWEEP, TAKING CARE NOT TO USE COMPACTION EQUIPMENT DIRECTLY OVER THE FITTING.
- PVC HIGH DEFLECTION COUPLINGS SHALL BE LIMITED TO A TOTAL DEFLECTION OF 3-DEGREES (1½-DEGREE ON EITHER END OF THE COUPLING), SHALL BE RATED FOR A MINIMUM 200 PSI MEETING THE REQUIREMENTS OF AWWA C900. SHALL HAVE A MINIMUM LAY LENGTH OF 9-INCHES AND SHALL HAVE CENTER STOPS. PVC HIGH DEFLECTION COUPLINGS SHALL BE CERTAINTEEED PVC HIGH DEFLECTION (HD) STOP COUPLINGS OR EQUAL. WITHIN THE LIMITS OF RESTRAINED JOINTS, RESTRAINED COUPLINGS SHALL BE USED IN LIEU OF HIGH DEFLECTION COUPLINGS. RESTRAINED COUPLINGS SHALL BE LIMITED TO A TOTAL DEFLECTION OF 3 DEGREES (1½-DEGREE ON EITHER END OF THE COUPLING), THE PIPE SHALL BE INSERTED AN EQUAL DEPTH ON BOTH SIDES OF THE COUPLING. THE CONTRACTOR SHALL PROVIDE CORROSION PROTECTION AS PER STANDARD DETAILS AND AS SHOWN IN THESE DRAWINGS. RESTRAINED COUPLINGS SHALL BE RATED FOR A MINIMUM 305 PSI, DR-14, MEETING THE REQUIREMENTS OF ANSI / AWWA C900 AND SHALL BE SERIES 3800 MEGA-COUPLING, AS MANUFACTURED BY EBBA IRON, OR APPROVED EQUAL.
- FIVE DEGREE SWEEPS SHALL BE BELL BY SPIGOT, RATED FOR A MINIMUM 225 PSI, DR14 MEETING THE REQUIREMENTS OF AWWA C900 AND SHALL BE MULTI FITTINGS (IPEX) BLUE BRUTE DR14 OR EQUAL.
- WHEN PVC HIGH DEFLECTION COUPLINGS OR PVC 5-DEGREE SWEEPS ARE USED TO FACILITATE CHANGES IN HORIZONTAL OR VERTICAL ALIGNMENTS OF AWWA C-900 PVC PIPELINES, THE CONTRACTOR SHALL INSTALL DEVICES FOR THE PREVENTION OF OVER-INSERTION OF THE PVC PIPE SPIGOTS OR PLAIN ENDS INTO THE PUSH ON BELL JOINT ON BOTH SIDES OF THE HIGH DEFLECTION COUPLINGS AND 5 DEGREE SWEEPS. BELL STOPS SHALL BE PLACED AT THE PROPER INSERTION LINE FOR THE FITTING. THE BELL STOP SHALL BE MANUFACTURED OF DUCTILE IRON AND INCORPORATE AN EXPANSION RETENTION SPRING TO ALLOW FOR PIPE EXPANSION AND CONTRACTION. THE BELL STOPS SHALL BE SERIES 5000 MEGA-STOP, AS MANUFACTURED BY EBAA IRON, INC. OR APPROVED EQUAL.

- THE FOLLOWING SEQUENCE OF CONSTRUCTION IS NOT A COMPLETE LIST OF TASKS OR WORK REQUIRED TO COMPLETE THE CONTRACT REQUIREMENTS. THE SEQUENCE OF CONSTRUCTION MAY BE MODIFIED OR REVISED AT THE REQUEST OF THE CONTRACTOR WITH THE APPROVAL OF THE COUNTY PRIOR TO THE START OF CONSTRUCTION.
- INSTALL TAPPING SLEEVES AND VALVES AT STATIONS 0+00 AND 48+70. VALVES SHALL REMAIN CLOSED.
 - INSTALL REMAINING WATER MAIN ALONG TWIN RIVERS RD. FROM STATION 0+00 TO STATION 48+70 INCLUDING ALL LATERAL MAIN CONNECTIONS. DO NOT MAKE CONNECTIONS TO EXISTING PIPES AT THIS TIME. ALL VALVES ON LATERAL MAINS SHALL REMAIN CLOSED.
 - PERFORM PRESSURE TESTING AND DISINFECT THE WATER MAIN. PERFORM BACTERIOLOGICAL TESTING.
 - OPEN THE VALVES ON THE MAIN AT STATIONS 0+00 AND 48+70.
 - CLOSE THE EXISTING VALVES NECESSARY TO MAKE CONNECTIONS TO EXISTING LATERAL WATER MAINS AND COMPLETE THE CONNECTIONS ONE LATERAL MAIN AT A TIME. ONCE THE LATERAL MAIN IS CONNECTED, OPEN THE EXISTING VALVES AND THE NEW VALVE. REPEAT THIS PROCEDURE UNTIL ALL LATERAL MAINS ARE CONNECTED.
 - UPON COMPLETION OF THE WATER MAIN CONSTRUCTION, ABANDON THE EXISTING MAIN AND REMAINING PORTIONS OF THE EXISTING LATERAL MAINS AS SHOWN ON THE PLANS AND SPECIFIED IN THE HOWARD COUNTY DESIGN MANUALS.
 - COMPLETE PAVING RESTORATION AND IMPROVEMENTS PER DETAIL AND NOTES ON THIS SHEET AND ROADWAY PLAN ON SHEET 13 OF 13.



DETAIL - TEMPORARY PAVING TRENCH PATCH

NOT TO SCALE

NOTES:

- FOR TRENCH DETAIL REFER TO HOWARD COUNTY STANDARD DETAIL G-2.12
- PERMANENT PAVEMENT SHALL FOLLOW HOWARD COUNTY STANDARD DETAIL G-4.01, UTILITY TRENCH ROADWAY REPAVING.
- THE PAVING SECTION TO BE USED FOR PERMANENT PAVING SHALL FOLLOW HOWARD COUNTY STANDARD DETAIL G-4.01 AND HOWARD COUNTY STANDARD DETAIL R-2.02 FOR A P-6 SECTION WITH A CBR 3 TO <5 WITH MODIFICATIONS THAT ALL SUPERPAVE ASPHALT MIXES ARE TO BE PG 64-22 LEVEL 3 (HIGH SEAL). THE CONTRACTOR SHALL REFER TO SHEET 13 OF 13 FOR PAVEMENT REQUIREMENT FROM STA. 102+75 TO STA. 110+00
- FOR ROADWAY IMPROVEMENTS BETWEEN WATERMAIN STATION 13+40 AND 20+40, SEE ROADWAY PLAN ON SHEET 13 OF 13. ALL REMAINING PAVEMENT ALONG THE WATERMAIN ALIGNMENT SHALL BE PER NOTES 2 & 3.

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
 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
 08/09/2019

DES: KJ					
DRN: KJ					
CHK: JB/GW					
DATE: AUG. 2019					
BY	NO.	REVISION	DATE	600' SCALE MAP NO.	BLOCK NO.

LEGEND, ABBREVIATIONS, WATER MAIN NOTES, SEQUENCE OF CONSTRUCTION AND TEMPORARY PAVING

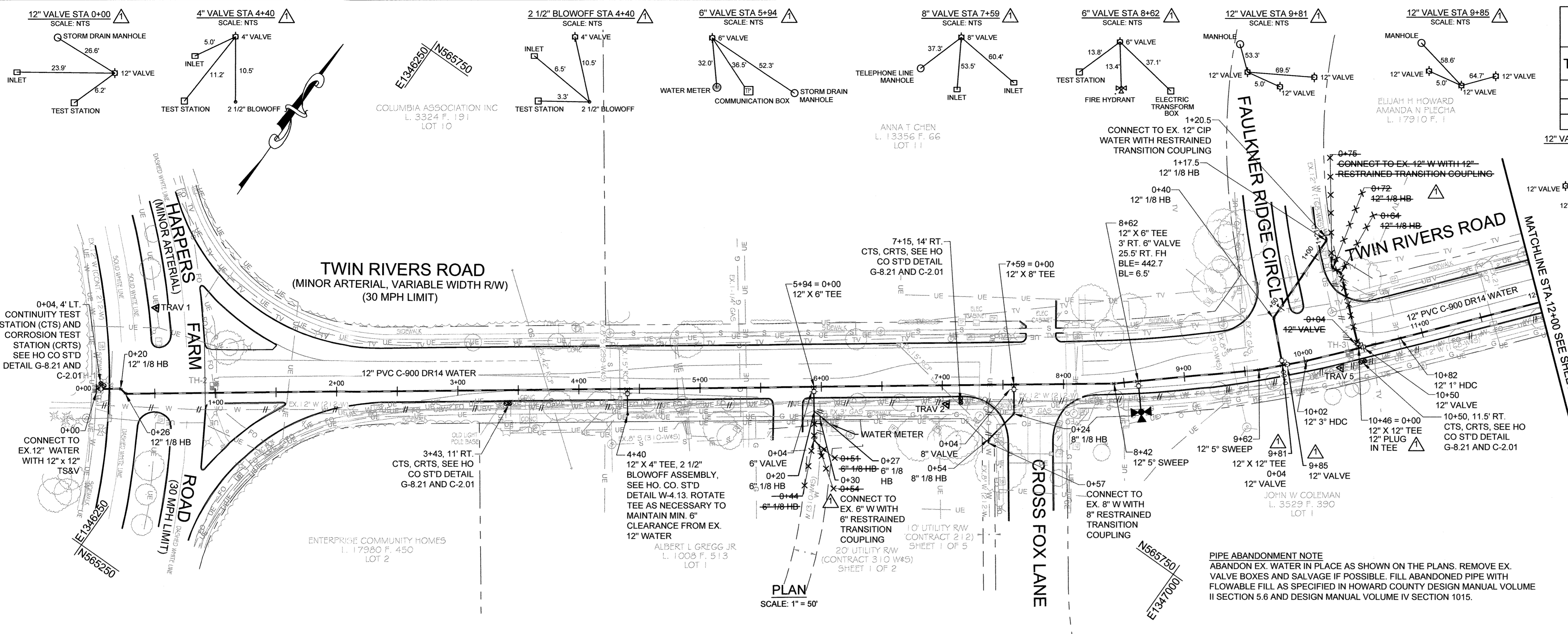
AS-BUILT
 DATE 02/05/2021

TWIN RIVERS ROAD WATER MAIN REPLACEMENT
 CAPITAL PROJECT No. W8331
 CONTRACT No. 44-5072

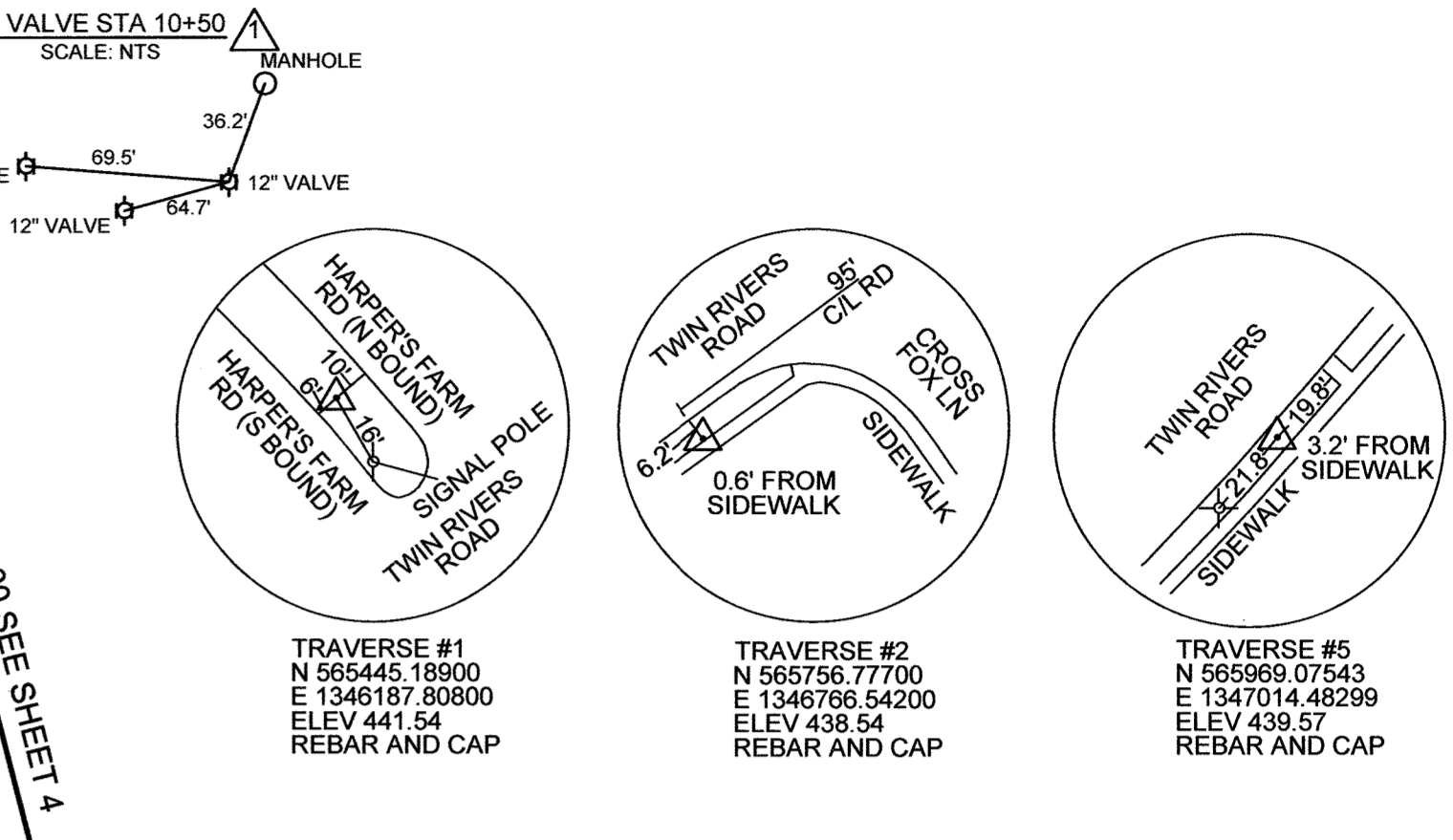
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN SHEET 2 of 13

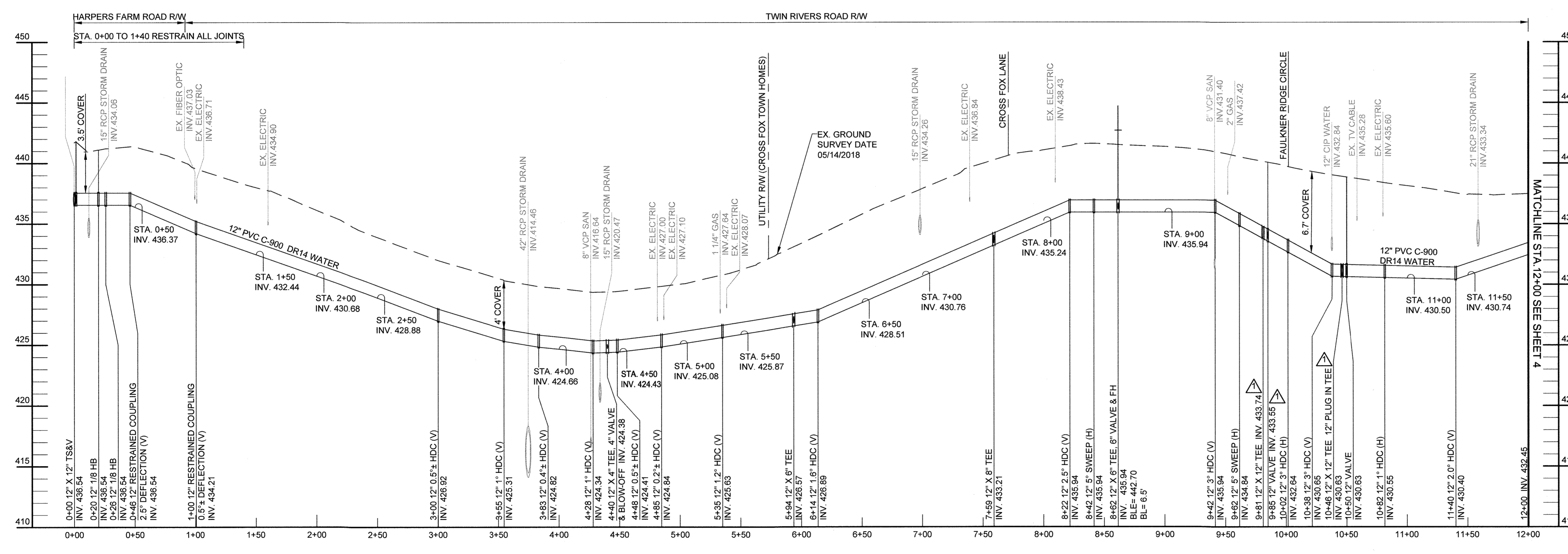
KCI TECHNOLOGIES PROJECT No. 1312267.67



TEST HOLE SCHEDULE				
TEST HOLE NO.	UTILITY	MATERIAL	DEPTH	PAVEMENT
TH-1	12" WATER	CIP	4.08'	N/A
TH-2	FIBER OPTIC	PLASTIC	2.36'	4" ASPHALT
TH-3	12" WATER	CIP	5.16'	4" ASPHALT

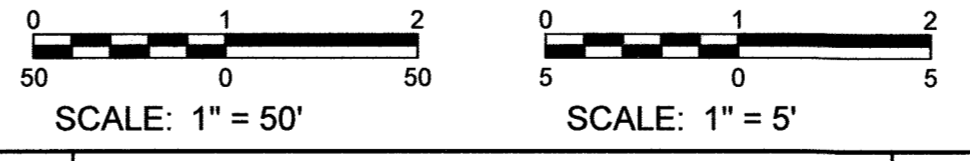


NOTE:
EXISTING UTILITIES SHOWN ARE BASED ON BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL CONTACT MISS UTILITY FOR MARK OUT OF EXISTING UTILITIES. THE CONTRACTOR SHALL FIELD VERIFY THE EXACT LOCATION, SIZE, TYPE, AND ELEVATION OF ALL UTILITIES PRIOR TO CROSSING. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. THE CONTRACTOR SHALL HOLD THE COUNTY HARMLESS FOR ANY DAMAGES OR CONFLICTS RELATED TO MISMARKED OR UNMARKED UTILITIES IN THE FIELD AND/OR UTILITIES NOT SHOWN ON THE DRAWINGS.



WATER MAIN STAKE-OUT SCHEDULE			
STATION	DESCRIPTION	NORTHING	EASTING
TWIN RIVERS ROAD			
0+00	12" X 12" TS&V	565362.20	1346186.16
0+20	12" 1/8 HB	565373.78	1346202.19
0+26	12" 1/8 HB	565372.81	1346208.19
5+94	12" X 6" TEE	565705.12	1346668.42
7+59	12" X 8" TEE	565801.85	1346802.40
8+42	12" 5" SWEEP	565850.23	1346869.40
8+62	12" X 6" FHT	565863.31	1346884.53
9+62	12" 5" SWEEP	565928.69	1346960.20
10+02	12" 3" HDC	565957.39	1346988.06
10+46	12" X 12" TEE	565990.92	1347017.38
10+82	12" 1" HDC	566017.62	1347040.72
6" CONNECTION AT STA. 5+94			
0+44	6" 1/8 HB	565669.37	1346694.07
0+51	6" 1/8 HB	565668.19	1346700.57
0+54	CONNECT TO EX. 6" W	565665.81	1346702.23
8" CONNECTION AT STA. 7+59			
0+24	8" 1/8 HB	565782.39	1346816.45
0+54	8" 1/8 HB	565752.84	1346811.67
0+57	CONNECT TO EX. 8" W	565750.48	1346813.37
12" CONNECTION AT STA. 10+46			
0+64	12" 1/8 HB	566033.05	1346969.20
0+72	12" 1/8 HB	566032.50	1346961.00
0+75	CONNECT TO EX. 12" W	566034.39	1346958.79

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.



AS-BUILT REPLACEMENT SHEET

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 8/19/19
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 8-20-19
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 8-19-19
CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 8/19/19
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
08/09/2019

DES: KJ	
DRN: KJ	
CHK: JB/GW	
DATE: AUG. 2019	
BY: [Signature]	
NO. []	
REVISION []	
DATE: 3/15/21	

12" WATER PLAN & PROFILE
STA. 0+00 TO STA. 12+00

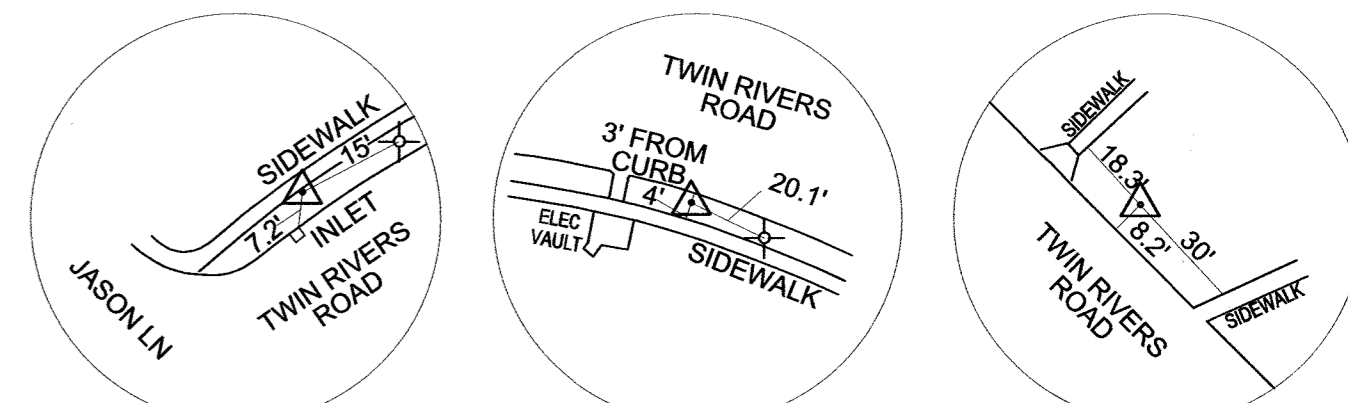
600' SCALE MAP NO. 29_30_36 BLOCK NO. 24_19_1

TWIN RIVERS ROAD
WATER MAIN REPLACEMENT
CAPITAL PROJECT No. W8331
CONTRACT No. 44-5072

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN SHEET 3 OF 13

TEST HOLE SCHEDULE				
TEST HOLE NO.	UTILITY	MATERIAL	DEPTH	PAVEMENT
TH-4	8" WATER	CIP	4.02'	6" ASPHALT & 8" CONCRETE

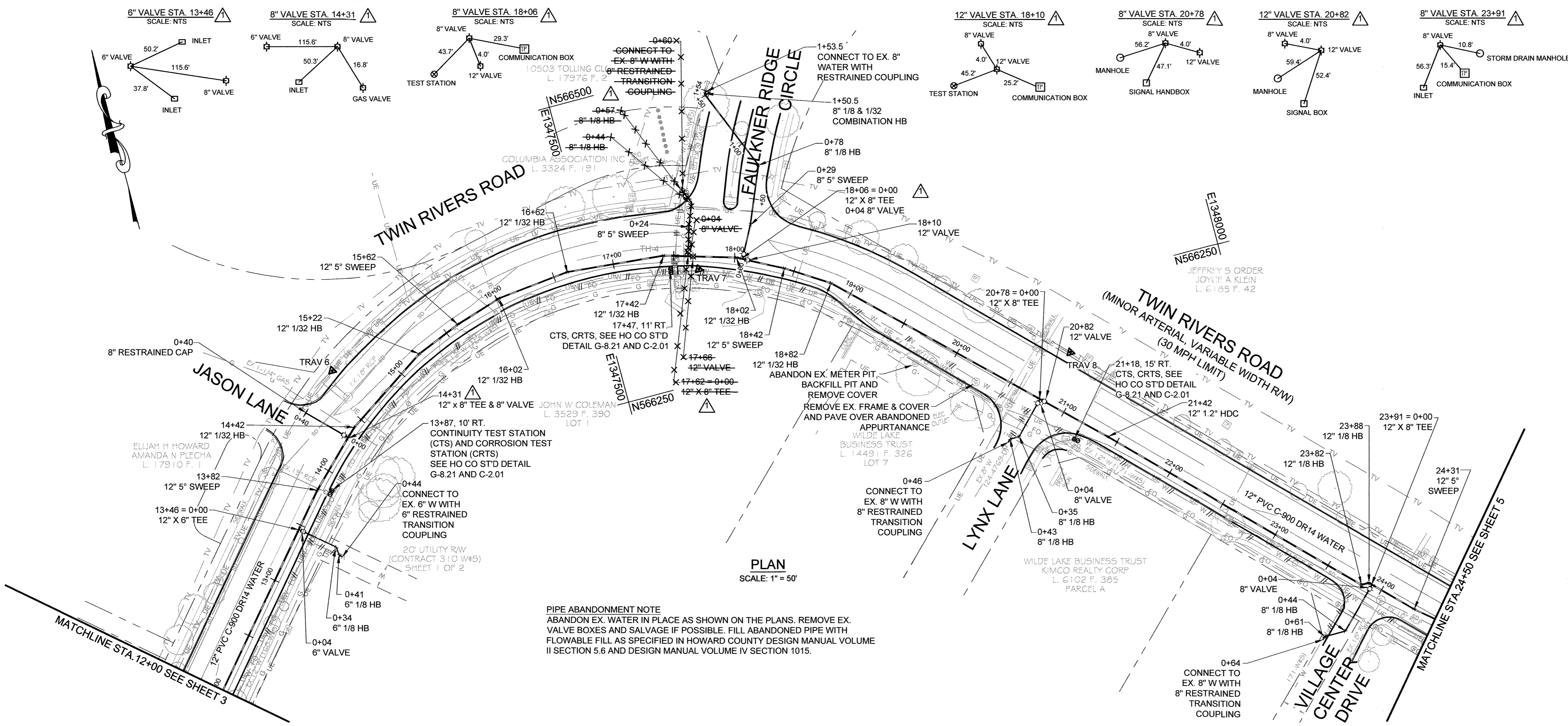


TRAVERSE #6
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E 1347271.83506
ELEV 438.15
REBAR AND CAP

TRAVERSE #7
N 566340.21863
E 1347583.74517
ELEV 452.97
REBAR AND CAP

TRAVERSE #8
N 566196.21866
E 1347860.14778
ELEV 452.97
REBAR AND CAP

NOTE:
EXISTING UTILITIES SHOWN ARE BASED ON BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL CONTACT MISS UTILITY FOR MARK OUT OF EXISTING UTILITIES. THE CONTRACTOR SHALL FIELD VERIFY THE EXACT LOCATION, SIZE, TYPE, AND ELEVATION OF ALL UTILITIES PRIOR TO CROSSING. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. THE CONTRACTOR SHALL HOLD THE COUNTY HARMLESS FOR ANY DAMAGES OR CONFLICTS RELATED TO MISMARKED OR UNMARKED UTILITIES IN THE FIELD AND/OR UTILITIES NOT SHOWN ON THE DRAWINGS.

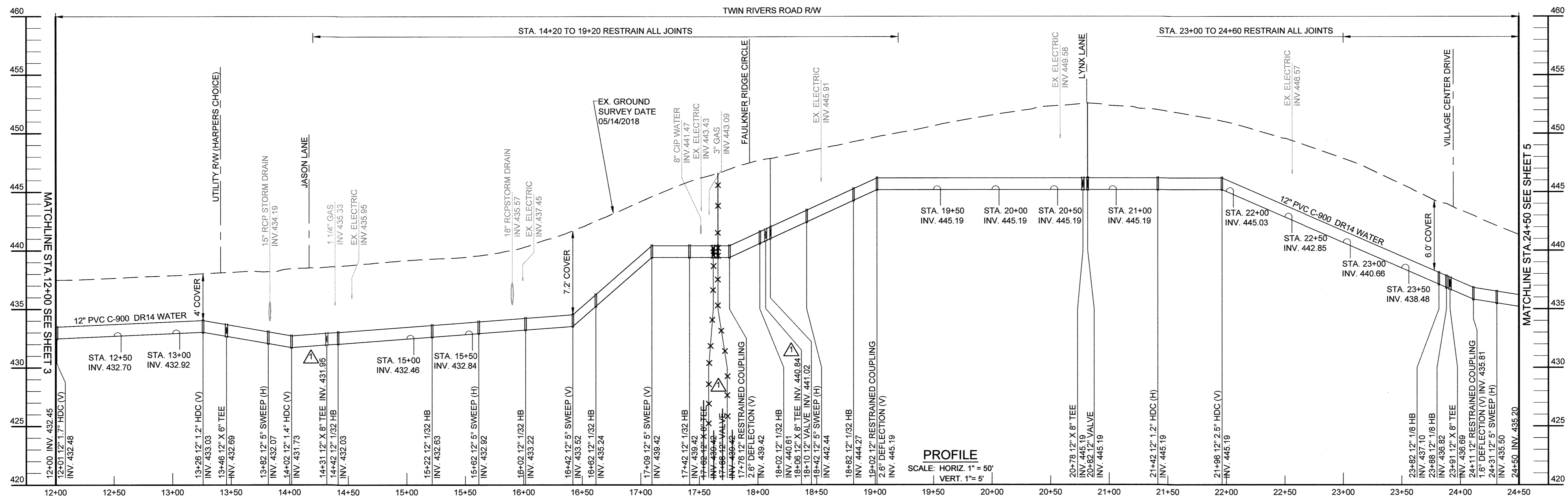


PLAN
SCALE: 1" = 50'

PIPE ABANDONMENT NOTE
ABANDON EX. WATER IN PLACE AS SHOWN ON THE PLANS. REMOVE EX. VALVE BOXES AND SALVAGE IF POSSIBLE. FILL ABANDONED PIPE WITH FLOWABLE FILL AS SPECIFIED IN HOWARD COUNTY DESIGN MANUAL VOLUME II SECTION 5.6 AND DESIGN MANUAL VOLUME IV SECTION 1015.

WATER MAIN STAKE-OUT SCHEDULE

STATION	DESCRIPTION	NORTHING	EASTING
TWIN RIVERS ROAD			
13+46	12" X 6" TEE	566219.25	1347211.72
13+82	12" 5" SWEEP	566246.41	1347234.76
14+42	12" 1/32 HB	566288.62	1347277.41
15+22	12" 1/32 HB	566332.72	1347344.16
15+62	12" 5" SWEEP	566347.83	1347381.19
16+02	12" 1/32	566359.66	1347419.40
16+62	12" 1/32 HB	566365.88	1347479.08
17+42	12" 1/32 HB	566358.50	1347558.74
17+62	12" X 8" TEE	566352.74	1347578.13
18+02	12" 1/32 HB	566341.41	1347616.25
18+42	12" 5" SWEEP	566322.76	1347651.64
18+82	12" 1/32 HB	566301.09	1347686.26
20+78	12" X 8" TEE	566164.78	1347826.18
21+42	12" 1.2" HDC	566120.33	1347872.14
23+82	12" 1/8 HB	565949.84	1348041.07
23+88	12" 1/8 HB	565949.81	1348047.56
23+91	12" X 8" TEE	565947.68	1348049.67
24+31	12" 5" SWEEP	565919.27	1348077.83
6" CONNECTION AT STA. 13+46			
0+34	6" 1/8 HB	566197.25	1347237.65
0+41	6" 1/8 HB	566190.30	1347238.22
0+44	CONNECT TO EX. 6" W	566198.42	1347240.43
8" CONNECTION AT STA. 17+62			
0+24	8" 5" SWEEP	566375.75	1347584.94
0+44	8" 1/8 HB	566394.36	1347592.27
0+57	8" 1/8 HB	566406.37	1347587.17
0+60	CONNECT TO EX. 8" W	566408.97	1347588.33
8" CONNECTION AT STA. 20+78			
0+35	8" 1/8 HB	566139.54	1347801.78
0+43	8" 1/8 HB	566139.41	1347793.95
0+46	CONNECT TO EX. 8" W	566137.30	1347791.82
8" CONNECTION AT STA. 23+91			
0+44	8" 1/8 HB	565916.71	1348018.42
0+61	8" 1/8 HB	565916.79	1348000.98
0+64	CONNECT TO EX. 8" W	565914.68	1347998.85



PROFILE
SCALE: HORIZ. 1" = 50'
VERT. 1" = 5'

AS-BUILT REPLACEMENT SHEET

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 01/18/2020.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature]
DIRECTOR OF PUBLIC WORKS
DATE: 8-20-19

[Signature]
CHIEF, UTILITY DESIGN DIVISION
DATE: 8-20-19

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

KCI TECHNOLOGIES
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Sparks, MD 21152
Phone: (410) 316-7800
Fax: (410) 316-7817
www.kci.com

STATE OF MARYLAND
PROFESSIONAL ENGINEER
NO. 31363
08/08/2019

DES: KJ			
DRN: KJ			
CHK: JB/GW			
DATE: AUG. 2019			
BY: [Signature]	AS-BUILT, RECORD DRAWING	3/15/21	
	REVISION	DATE	

12" WATER PLAN & PROFILE
STA. 12+00 TO STA. 24+50

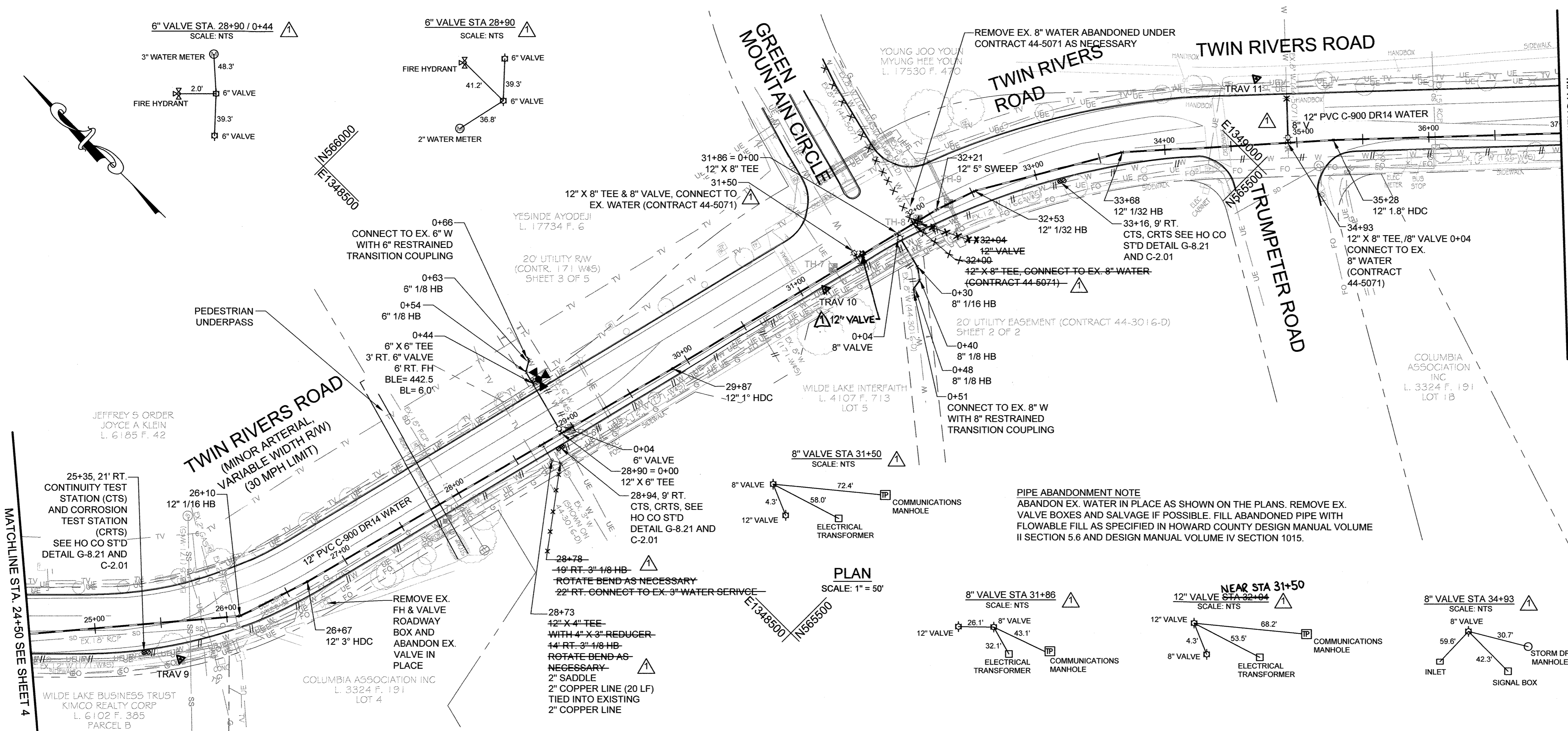
600' SCALE MAP NO. 29_30_36
BLOCK NO. 24_19_1

TWIN RIVERS ROAD
WATER MAIN REPLACEMENT
CAPITAL PROJECT No. W8331
CONTRACT No. 44-5072

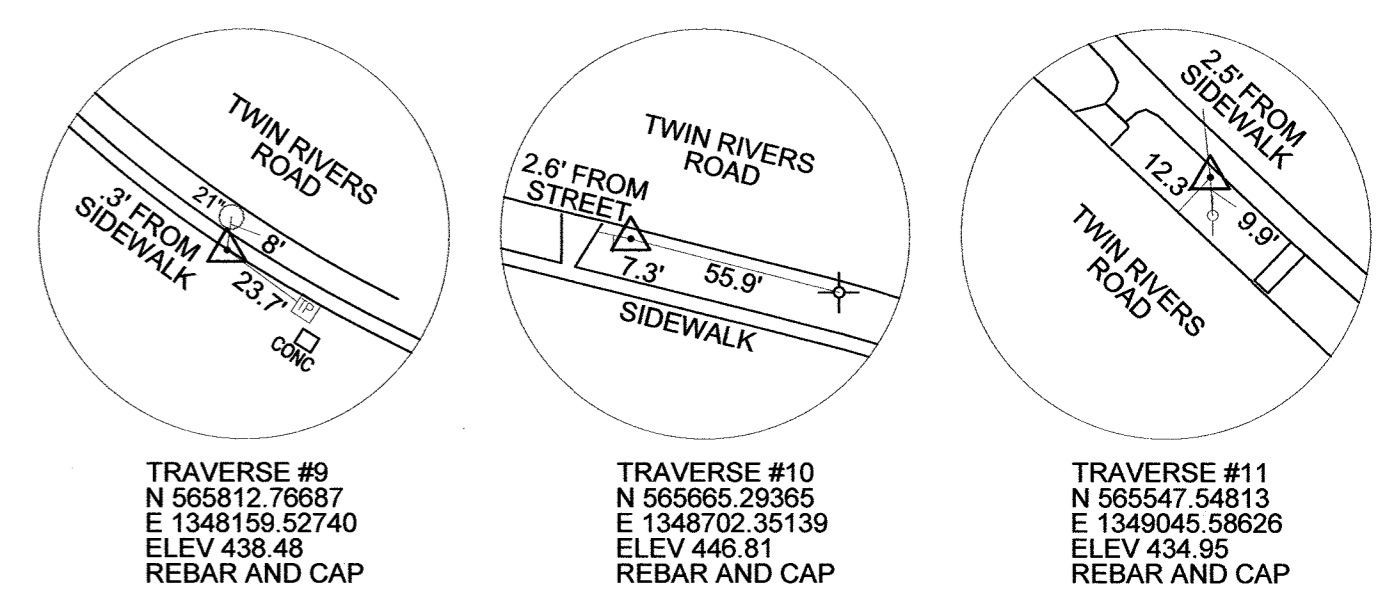
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN
SHEET: 4 OF 13

KCI TECHNOLOGIES PROJECT No. 13122671.67

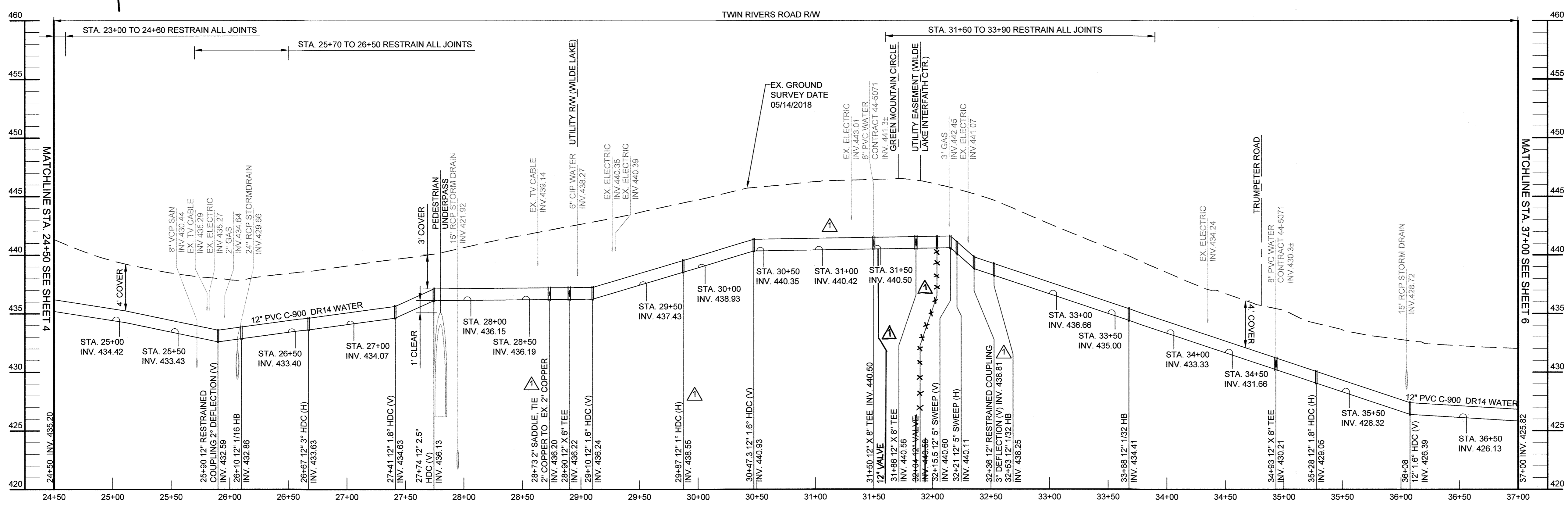


TEST HOLE SCHEDULE				
TEST HOLE NO.	UTILITY	MATERIAL	DEPTH	PAVEMENT
TH-5	12" WATER OVER UNDERPASS	CIP	3.52'	5" CONCRETE
TH-6	6" WATER	CIP	3.82'	6" ASPHALT
TH-7	ELECTRIC	4" PLASTIC	3.04'	6" ASPHALT
TH-8	8" WATER	CIP	3.82'	6" ASPHALT
TH-9	ELECTRIC	6" STEEL SLEEVE	3.78'	6" ASPHALT

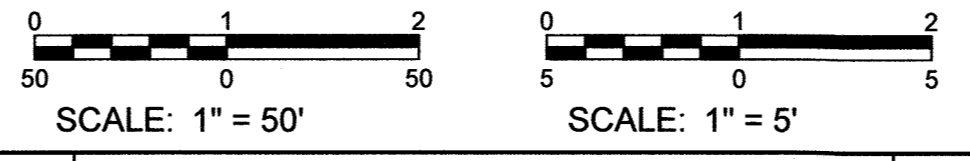


NOTE:
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WATER MAIN STAKE-OUT SCHEDULE			
STATION	DESCRIPTION	NORTHING	EASTING
TWIN RIVERS ROAD			
26+10	12" 1/16 HB	565803.84	1348214.53
26+67	12" 3" HDC	565786.37	1348269.07
28+90	12" X 8" TEE	565729.58	1348484.56
29+87	12" 1" HDC	565704.83	1348578.50
31+86	12" X 8" TEE	565656.61	1348770.84
32+00	12" X 8" TEE	565653.22	1348784.39
32+21	12" 5" SWEEP	565648.11	1348804.76
32+53	12" 1/32 HB	565637.66	1348835.11
33+68	12" 1/32 HB	565579.57	1348934.43
34+93	12" X 8" TEE	565496.32	1349028.38
35+28	12" 1.8" HDC	565473.40	1349054.13
6" CONNECTION AT STA. 28+90			
0+44	6" X 6" FHT	565772.13	1348495.77
0+54	6" 1/8 HB	565781.46	1348498.23
0+63	6" 1/8 HB	565786.13	1348506.23
0+66	CONNECT TO EX. 6" W	565788.87	1348506.96
8" CONNECTION AT STA. 31+86			
0+30	8" 1/16 HB	565627.51	1348763.55
0+40	8" 1/8 HB	565619.48	1348757.59
0+48	8" 1/8 HB	565618.36	1348750.02
0+51	CONNECT TO EX. 8" W	565616.03	1348748.29



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.



AS-BUILT REPLACEMENT SHEET

KCI TECHNOLOGIES PROJECT No. 1312267.67

Apr 08, 2021, 8:38am User: jordanwang
File Path: I:\2021\1312267.67\1312267.67.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 8-20-19
 Chief, Bureau of Utilities: *[Signature]* 8-20-19

Chief Engineer: *[Signature]* 8-19-19
 Chief, Utility Design Division: *[Signature]* 8-20-19

KCI TECHNOLOGIES
ENGINEERS, PLANNERS, SCIENTISTS, CONSTRUCTION MANAGERS
936 Route 660, Suite 200, Sparks, MD 21152
Phone: (410) 316-7800
Fax: (410) 316-7817
www.kci.com

STATE OF MARYLAND
PROFESSIONAL ENGINEER
No. 31363
08/09/2019

DES: KJ		
DRN: KJ		
CHK: JB/GW		
DATE: AUG. 2019		
BY: [Signature]	NO.	REVISION
		AS-BUILT, RECORD DRAWING
		3/15/21

12" WATER PLAN & PROFILE
STA. 24+50 TO STA. 37+00

600' SCALE MAP NO. 29_30_36
BLOCK NO. 24_19_1

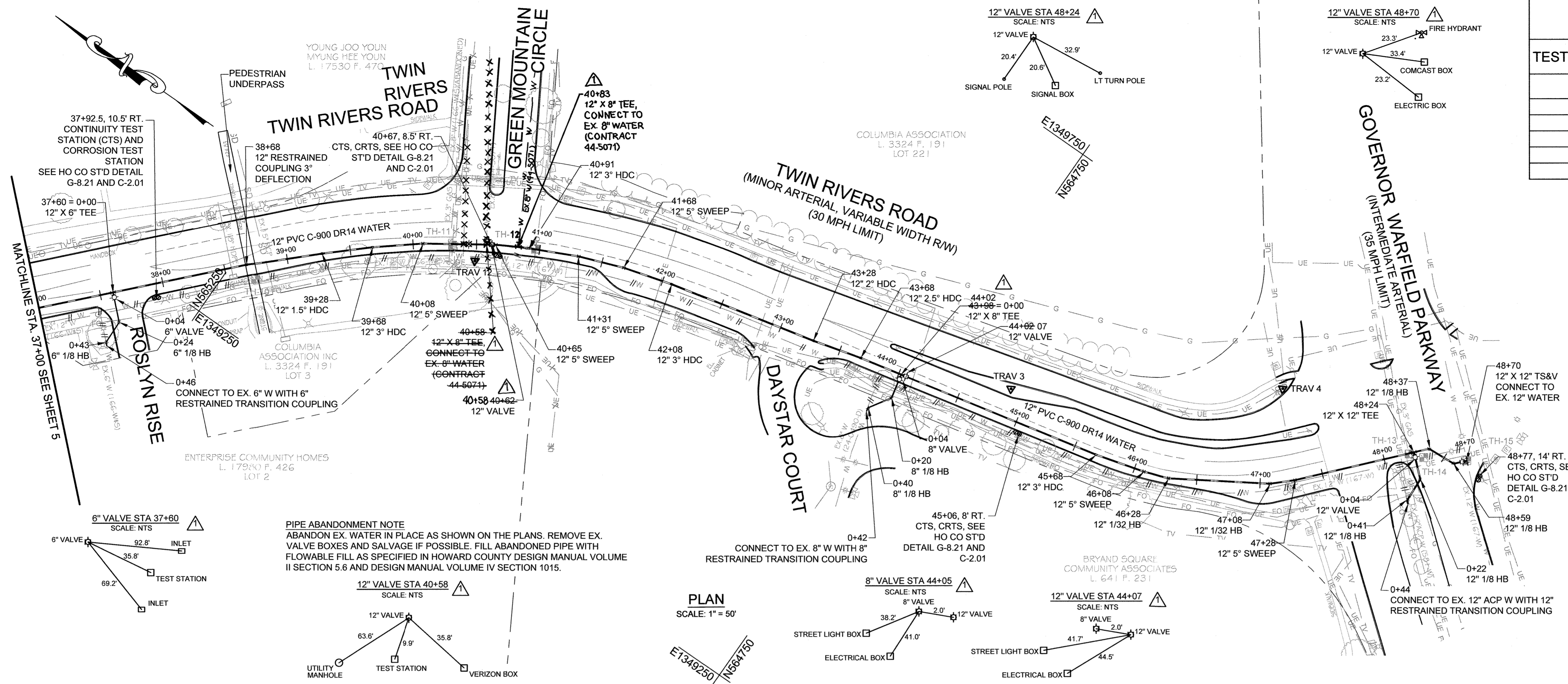
TWIN RIVERS ROAD
WATER MAIN REPLACEMENT
CAPITAL PROJECT No. W8331
CONTRACT No. 44-5072

ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

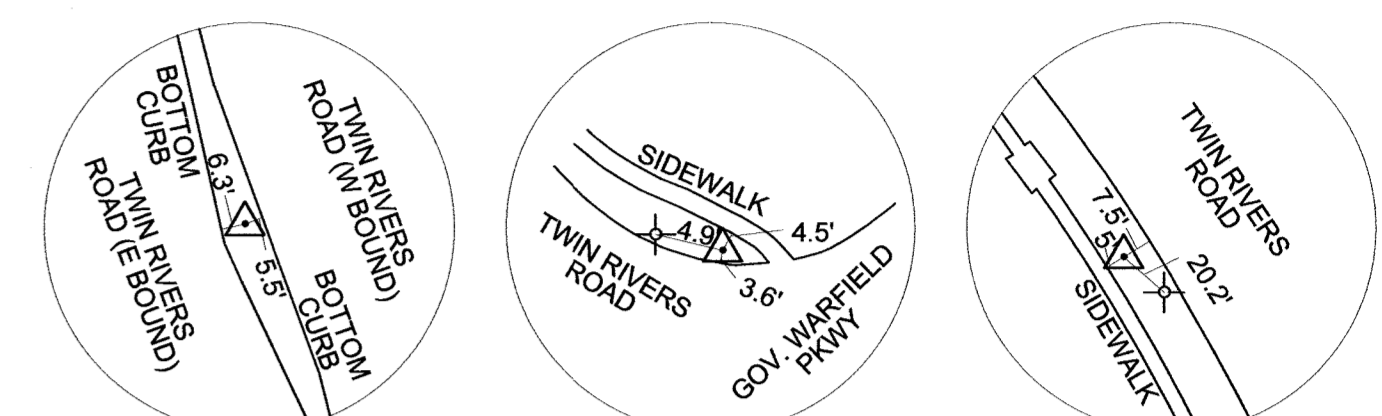
SCALE AS SHOWN
SHEET 5 OF 13

KCI TECHNOLOGIES PROJECT No. 13122677.67

May 15, 2021, 9:17 AM User: keni.jackson
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TEST HOLE SCHEDULE				
TEST HOLE NO.	UTILITY	MATERIAL	DEPTH	PAVEMENT
TH-10	12" WATER OVER UNDERPASS	CIP	3.72'	N/A
TH-11	8" WATER	CIP	3.86'	12" ASPHALT
TH-12	FIBER OPTIC	PLASTIC	3.82'	12" ASPHALT
TH-13	3" GAS	STEEL	3.32'	12" ASPHALT
TH-14	12" WATER	CIP	5.18'	12" ASPHALT
TH-15	12" WATER	CIP	5.06'	8 ASPHALT



TRAVERSE #3
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 E 134968.38600
 ELEV 435.25
 REBAR AND CAP

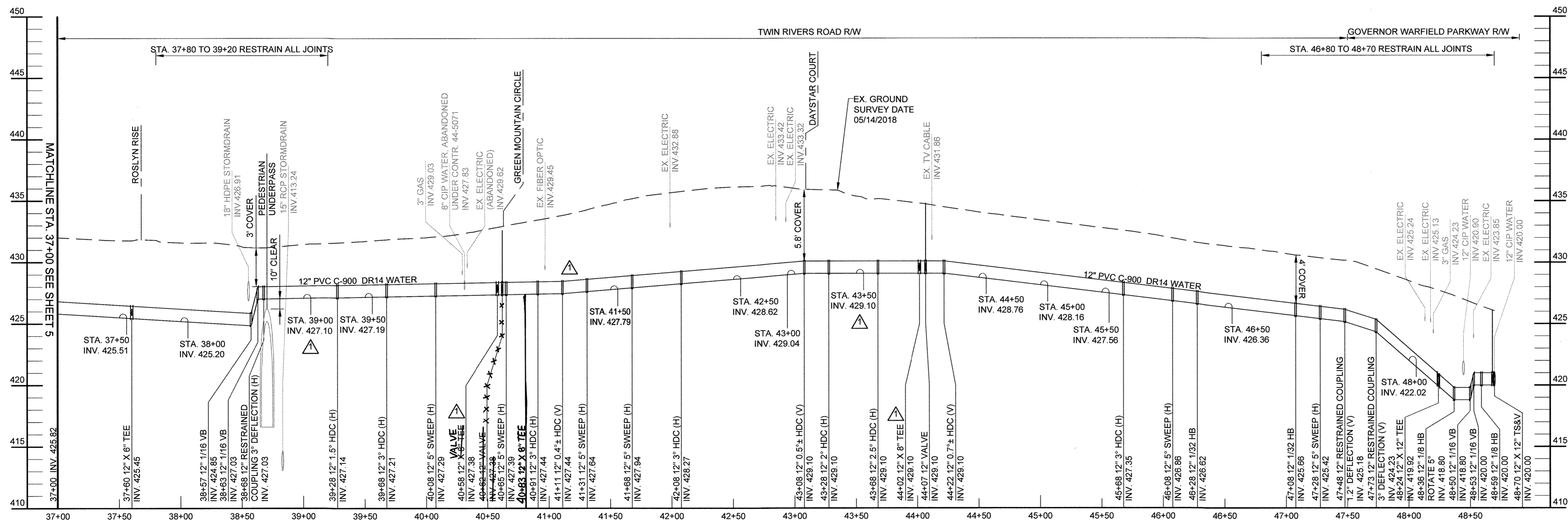
TRAVERSE #4
 N 56495.70300
 E 134969.26400
 ELEV 433.86
 REBAR AND CAP

TRAVERSE #12
 N 56504.54684
 E 134947.02504
 ELEV 433.28
 REBAR AND CAP

NOTE:
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PIPE ABANDONMENT NOTE
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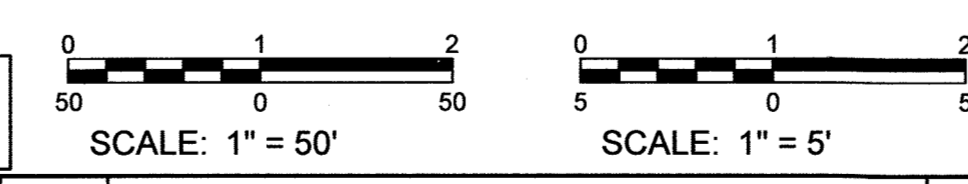
PLAN
 SCALE: 1" = 50'



WATER MAIN STAKE-OUT SCHEDULE

STATION	DESCRIPTION	NORTHING	EASTING
TWIN RIVERS ROAD			
37+60	12" X 6" TEE	565313.86	1349223.25
38+68	12" 3" HDC	565240.09	1349301.44
39+28	12" 1.5" HDC	565196.69	1349342.87
39+68	12" 3" HDC	565167.00	1349369.68
40+08	12" 5" SWEEP	565135.95	1349394.90
40+40	12" X 8" TEE	565109.31	1349412.93
40+65	12" 5" SWEEP	565088.35	1349427.11
40+91	12" 3" HDC	565065.53	1349439.65
41+31	12" 5" SWEEP	565029.74	1349456.97
41+68	12" 5" SWEEP	564995.32	1349469.96
42+08	12" 3" HDC	564956.89	1349481.04
43+28	12" 2" HDC	564840.01	1349508.21
43+68	12" 2.5" HDC	564801.37	1349518.58
43+98	12" X 8" TEE	564772.10	1349525.12
45+68	12" 3" HDC	564606.20	1349562.23
46+08	12" 5" SWEEP	564567.67	1349573.00
46+28	12" 1/32 HB	564548.95	1349580.04
47+08	12" 1/32 HB	564481.00	1349622.26
47+28	12" 5" SWEEP	564466.40	1349635.93
48+24	12" X 12" TEE	564402.15	1349707.58
48+37	12" 1/8 HB	564393.96	1349716.72
48+59	12" 1/8 HB	564371.34	1349718.15
48+70	12" X 12" TS&V	564364.12	1349726.07
6" CONNECTION AT STA. 37+60			
0+24	6" 1/8 HB	565296.36	1349206.75
0+43	6" 1/8 HB	565295.82	1349187.97
0+46	CONNECT TO EX. 6" W	565293.70	1349185.97
8" CONNECTION AT STA. 43+98			
0+24	8" 1/8 HB	564766.84	1349501.65
0+38	8" 1/8 HB	564774.39	1349489.51
0+41	CONNECT TO EX. 8" W	564773.80	1349486.86
12" CONNECTION AT STA. 48+24			
0+22	12" 1/8 HB	564385.71	1349692.83
0+41	12" 1/8 HB	564384.82	1349673.60
0+44	CONNECT TO EX. 12" W	564382.68	1349671.65

PROFILE
 SCALE: HORIZ. 1" = 50'
 VERT. 1" = 5'



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: [Signature] 8-20-19
 Chief, Bureau of Utilities: [Signature] 8/20/19

Chief, Bureau of Engineering: [Signature] 8-19-19
 Chief, Utility Design Division: [Signature] 8/16/19

KCI TECHNOLOGIES
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 Sparks, MD 21152
 Phone: (410) 316-7800
 Fax: (410) 316-7817
 www.kci.com

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

DES: KJ	DRN: KJ	CHK: JB/GW	DATE: AUG. 2019
SD	AS-BUILT, RECORD DRAWING	3/15/21	
BY	NO.	REVISION	DATE

12" WATER PLAN & PROFILE
 STA. 37+00 TO STA. 48+70

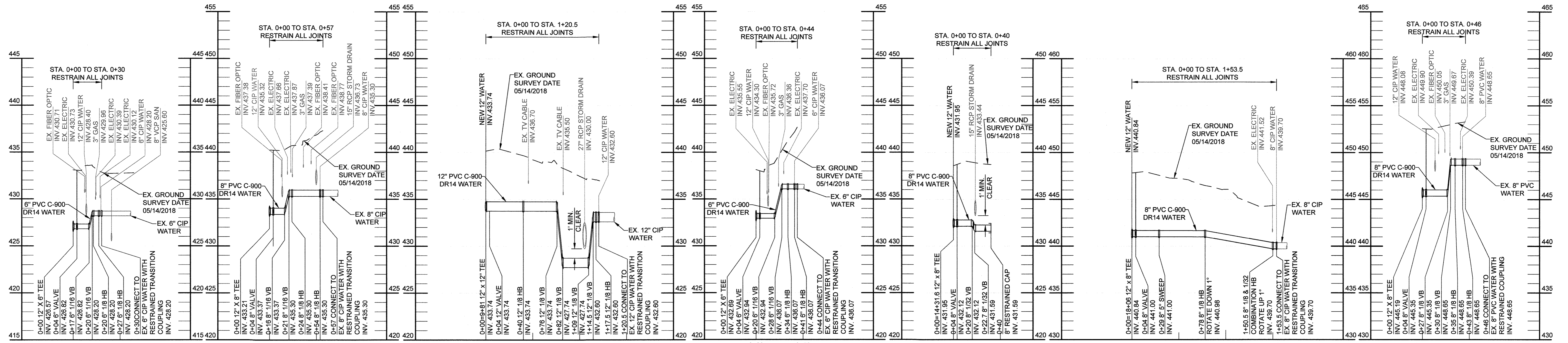
600' SCALE MAP NO. 29_30_36
 BLOCK NO. 24_19_1

AS-BUILT REPLACEMENT SHEET

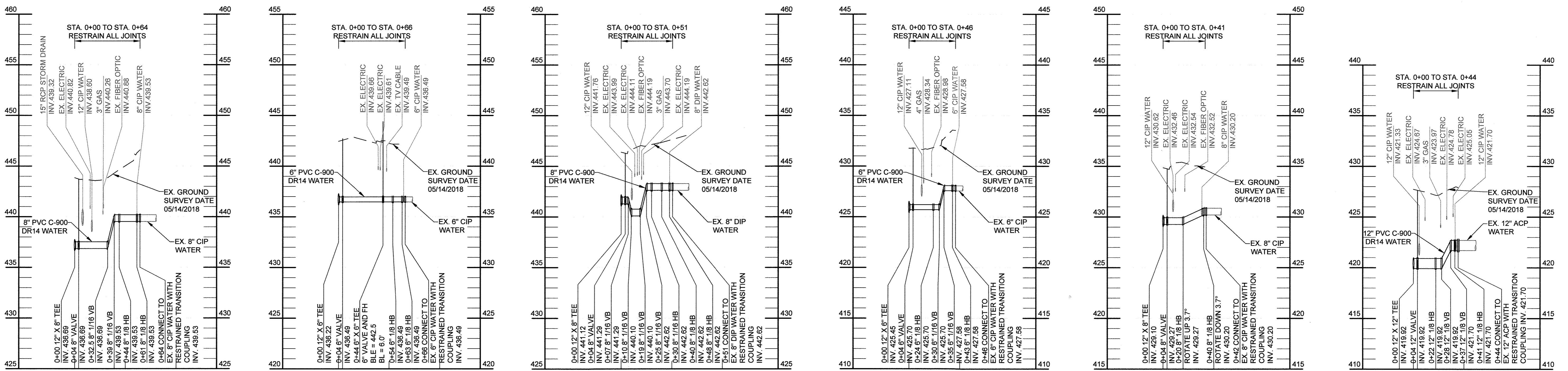
TWIN RIVERS ROAD
 WATER MAIN REPLACEMENT
 CAPITAL PROJECT No. W8331
 CONTRACT No. 44-5072

ELECTION DISTRICT NO. 5
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
 SHEET 6 OF 13

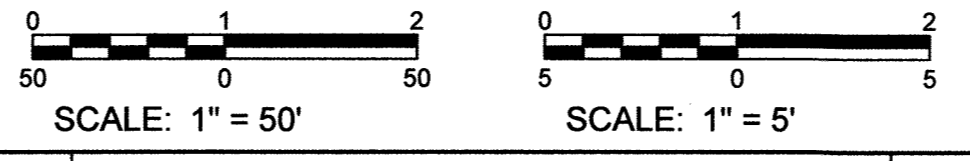


PROFILE - 6\"/>



PROFILE - 8\"/>

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JUN 20, 2021, 7:55am User: jordanwing
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
 Director of Public Works: [Signature] DATE: 8-19-19
 Chief, Bureau of Engineering: [Signature] DATE: 8-19-19
 Chief, Bureau of Utilities: [Signature] DATE: 8-20-19
 Chief, Utility Design Division: [Signature] DATE: 8/20/19

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

STATE OF MARYLAND
 JOSHUA WANG
 PROFESSIONAL ENGINEER
 License No. 31363
 08/09/2019

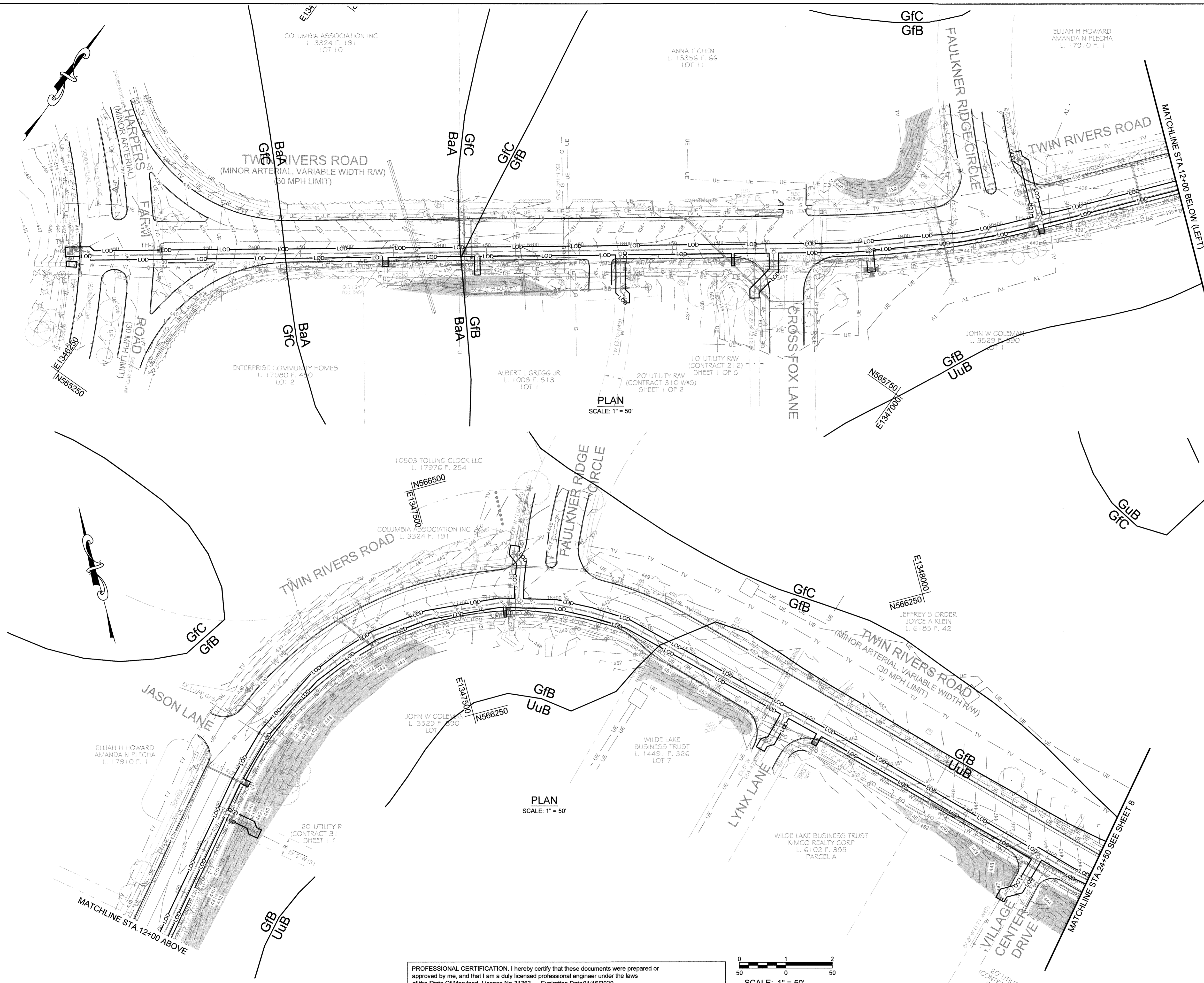
DES: KJ			
DRN: KJ			
CHK: JB/GW			
DATE: AUG. 2019			
BY: KJ	AS-BUILT, RECORD DRAWING	3/15/21	
NO.	REVISION	DATE	

PROFILES - WATER MAIN LATERAL CONNECTIONS
 600' SCALE MAP NO. 29_30_36
 BLOCK NO. 24_19_1

AS-BUILT REPLACEMENT SHEET
 TWIN RIVERS ROAD
 WATER MAIN REPLACEMENT
 CAPITAL PROJECT No. W8331
 CONTRACT No. 44-5072
 ELECTION DISTRICT NO. 5
 HOWARD COUNTY, MARYLAND
 SCALE AS SHOWN
 SHEET 7 OF 13

KCI TECHNOLOGIES PROJECT No. 13122677.67

Aug 05, 2019 - 12:40pm User: kci\jacobson
M:\2019\13122677_67\Drawings\65-301 PLAN.dwg



LEGEND

	DECIDUOUS TREE		EXISTING GAS MAIN
	CONIFEROUS TREE		EXISTING UNDERGROUND ELECTRIC
	EXISTING FIRE HYDRANT		EXISTING OVERHEAD WIRE
	EXISTING VALVE		EXISTING FIBER OPTIC
	TRAVERSE POINT		EXISTING UNDERGROUND TELECOMMUNICATIONS
	MAJOR CONTOUR		EXISTING SEWER EASEMENT
	MINOR CONTOUR		PROPERTY BOUNDARY/RIGHT OF WAY
	EXISTING WATER MAIN		GUARDRAIL
	EXISTING SEWER MAIN		TREELINE
			STEEP SLOPES / HIGHLY ERODIBLE SOILS

PROPOSED

	WATER MAIN		LIMIT OF DISTURBANCE
	FIRE HYDRANT		SILT FENCE
	VALVE		LIMIT OF DISTURBANCE AND SILT FENCE
	CONTINUITY TEST STATION		GfB SOILS DESIGNATION
	TEST PIT (COMPLETED)		BaA SOILS DESIGNATION
	SOIL BORING (SEE GEOTECHNICAL REPORT)		

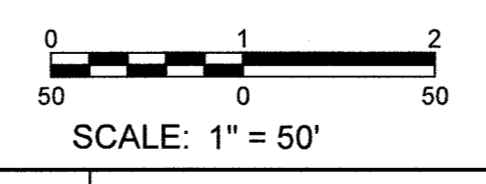
SOIL MAPPING UNIT

BaA	BAIL SILT LOAM, 0 TO 3 PERCENT SLOPES, Kw=0.32
GdB	GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES, Kw=0.20
GfB	GLADSTONE-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES, Kw=0.20
GfC	GLADSTONE-URBAN LAND COMPLEX, 8 TO 15 PERCENT SLOPES, Kw=0.28
GuB	GLENVILLE-URBAN LAND-UDORTHENT COMPLEX, 0 TO 8 PERCENT SLOPES, Kw=0.43
UuB	URBAN LAND-UDORTHENT COMPLEX, 0 TO 8 PERCENT SLOPES, Kw=0.28

- ### NOTES
- SILT FENCE SHALL BE PLACED ON THE DOWNHILL SIDE OF ALL TRENCHES WITHIN VEGETATED AREAS. SILT FENCE NOT SHOWN FOR CLARITY.
 - THE CONTRACTOR SHALL LOCATE AND PROVIDE A STABILIZED CONSTRUCTION ENTRANCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR. SEE DETAIL ON SHEET NO. 10 OF 12. FOR AREAS WHERE A STABILIZED CONSTRUCTION ENTRANCE IS NOT APPLICABLE SEE EQUIPMENT CLEANING AREA DETAIL ON SHEET NO. 10 OF 13.
 - 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. THE OFF-SITE WASTE/ BORROW AREA SHALL BE A SITE WITH AN ACTIVE GRADING PERMIT, APPROVED BY THE SEDIMENT CONTROL INSPECTOR. ON-SITE STORAGE IS NOT PERMITTED.
 - THE CONTRACTOR SHALL USE SOIL STABILIZATION MATTING FOR ALL SAME-DAY STABILIZATION AREAS. SEE DETAILS ON SHEET 10 OF 13.

PLAN SCALE: 1" = 50'

PLAN SCALE: 1" = 50'



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.

AS-BUILT
DATE 02/05/2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Ray 8/21/19
DIRECTOR OF PUBLIC WORKS DATE

Thomas P. Butler 8-19-19
CHIEF, BUREAU OF ENGINEERING DATE

Butler 8-20-19
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 8/16/19
CHIEF, UTILITY DESIGN DIVISION DATE

KCI TECHNOLOGIES

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

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

STATE OF MARYLAND
GUYA WANG
PROFESSIONAL ENGINEER
No. 31363
08/09/2019

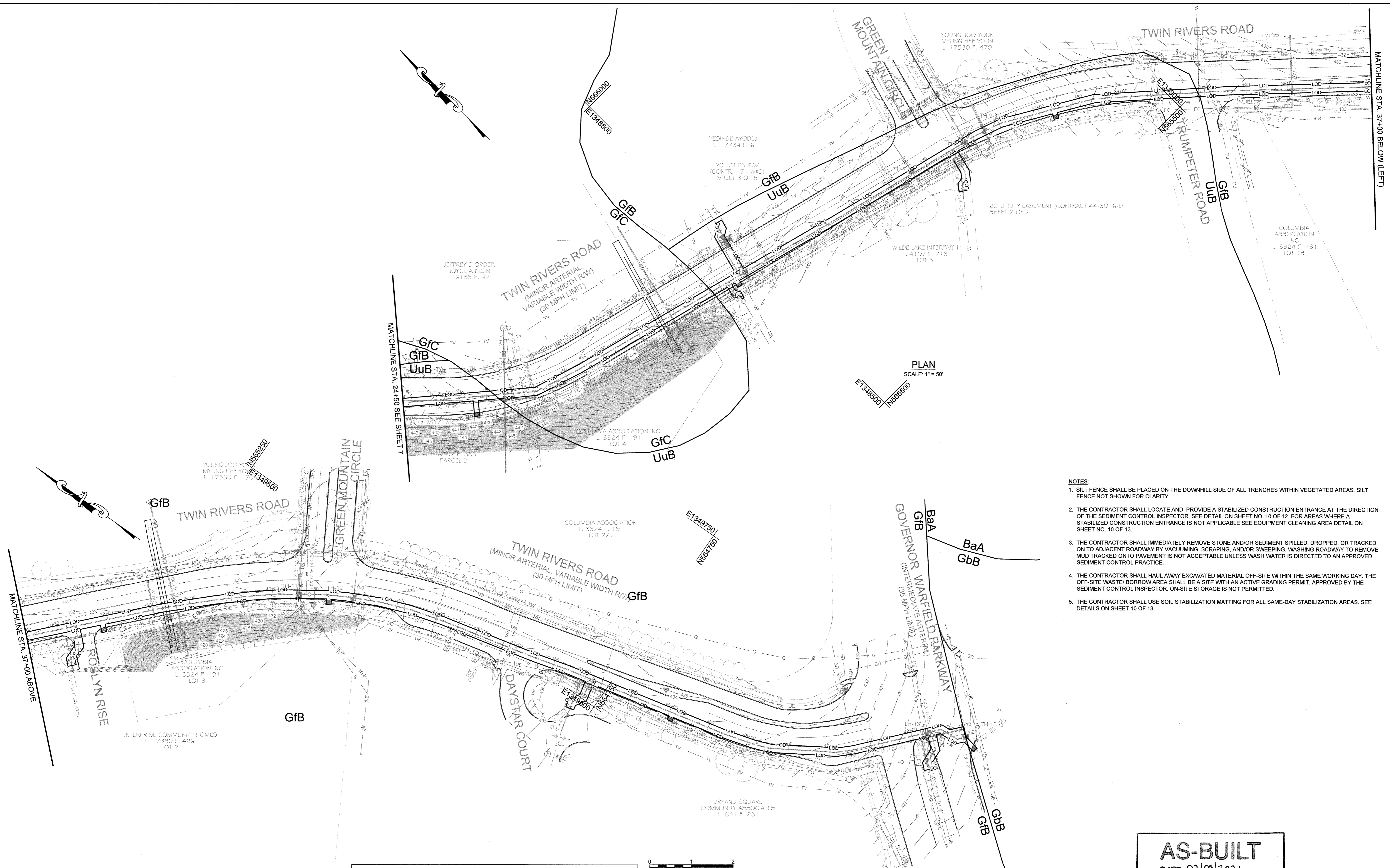
DES: KJ					
DRN: KJ					
CHK: JB/GW					
DATE: AUG. 2019					
BY	NO.	REVISION	DATE	600' SCALE MAP NO.	29, 30, 36
				BLOCK NO.	24, 19, 1

EROSION & SEDIMENT CONTROL PLAN

TWIN RIVERS ROAD
WATER MAIN REPLACEMENT
CAPITAL PROJECT No. W8331
CONTRACT No. 44-5072

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

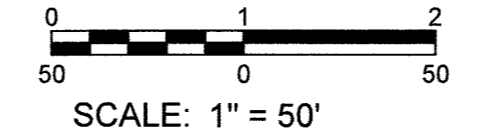
SCALE AS SHOWN
SHEET 8 of 13



- NOTES:**
1. SILT FENCE SHALL BE PLACED ON THE DOWNHILL SIDE OF ALL TRENCHES WITHIN VEGETATED AREAS. SILT FENCE NOT SHOWN FOR CLARITY.
 2. THE CONTRACTOR SHALL LOCATE AND PROVIDE A STABILIZED CONSTRUCTION ENTRANCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR. SEE DETAIL ON SHEET NO. 10 OF 12. FOR AREAS WHERE A STABILIZED CONSTRUCTION ENTRANCE IS NOT APPLICABLE SEE EQUIPMENT CLEANING AREA DETAIL ON SHEET NO. 10 OF 13.
 3. 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.
 4. THE CONTRACTOR SHALL HAUL AWAY EXCAVATED MATERIAL OFF-SITE WITHIN THE SAME WORKING DAY. THE OFF-SITE WASTE/ BORROW AREA SHALL BE A SITE WITH AN ACTIVE GRADING PERMIT, APPROVED BY THE SEDIMENT CONTROL INSPECTOR. ON-SITE STORAGE IS NOT PERMITTED.
 5. THE CONTRACTOR SHALL USE SOIL STABILIZATION MATTING FOR ALL SAME-DAY STABILIZATION AREAS. SEE DETAILS ON SHEET 10 OF 13.

AS-BUILT
DATE 02/05/2021

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

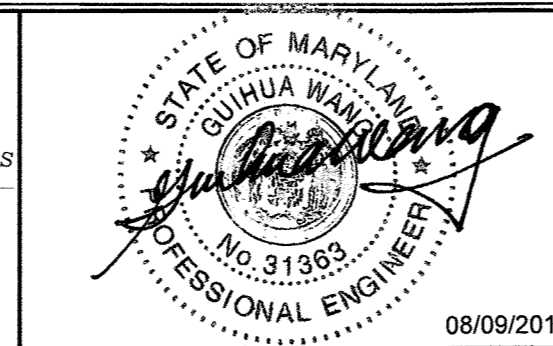
Director of Public Works: *Ray W. ...* 06/19
 Chief, Bureau of Utilities: *Tom ...* 8-20-19

Chief, Bureau of Engineering: *Thomas P. Butler* 8-19-19
 Chief, Utility Design Division: *...* 8/16/19

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BY:	NO.	REVISION	DATE

EROSION & SEDIMENT CONTROL PLAN

600' SCALE MAP NO. 29, 30, 36
BLOCK NO. 24, 19, 1

TWIN RIVERS ROAD WATER MAIN REPLACEMENT
CAPITAL PROJECT No. W8331
CONTRACT No. 44-5072

ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

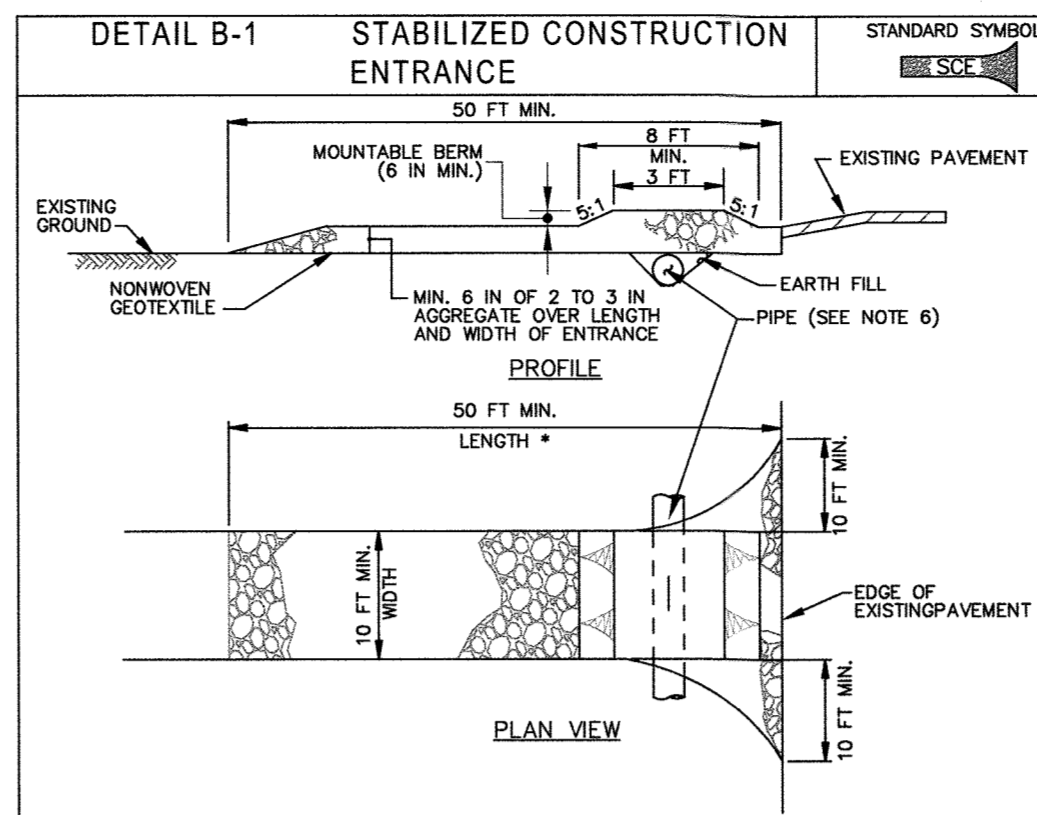
SCALE AS SHOWN
SHEET 9 of 13

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

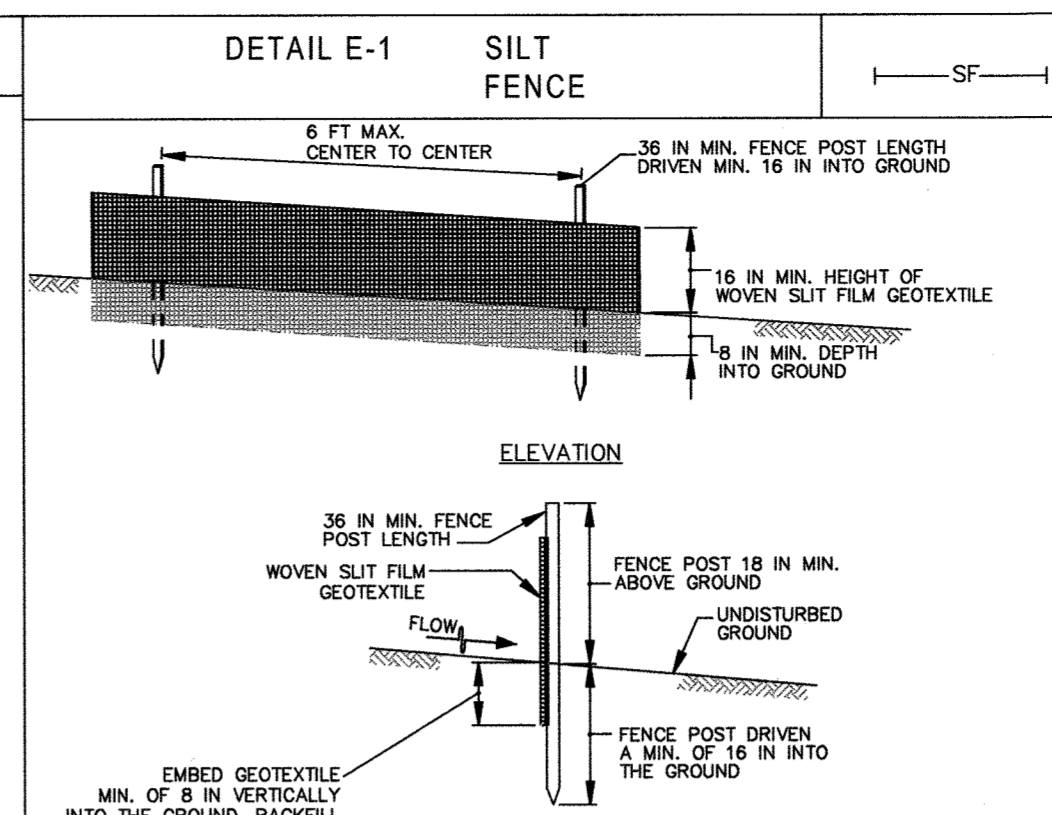
- A pre-construction meeting must occur with the Howard County Department of Public Works, Construction Inspection Division (CID), 410-313-1855 after the future LOD and protected areas are marked clearly in the field. A minimum of 48 hour notice to CID must be given at the following stages:
 - Prior 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:	1,295	Acres
Area Disturbed:	0,656	Acres
Area to be roofed or paved:	0,611	Acres
Area to be vegetatively stabilized:	0,045	Acres
Total Cut:	4,737	Cu. Yds.
Total Fill:	4,737	Cu. Yds.
Offsite waste/borrow area location:	CONTRACTOR COORDINATE (SEE NOTE A, SHEETS B+9)	
- 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, 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 IIP 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.



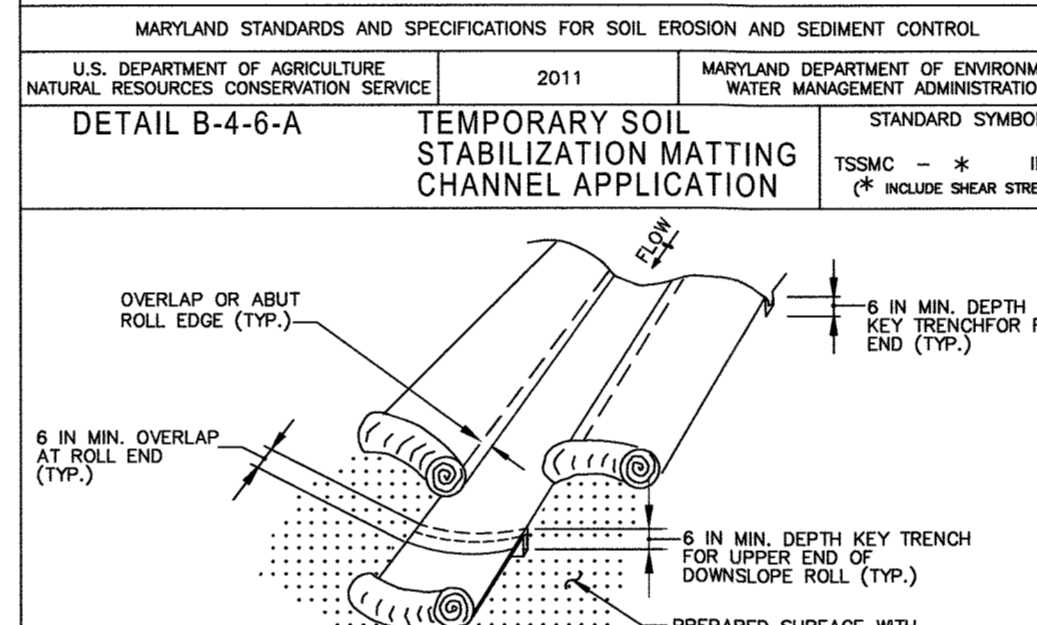
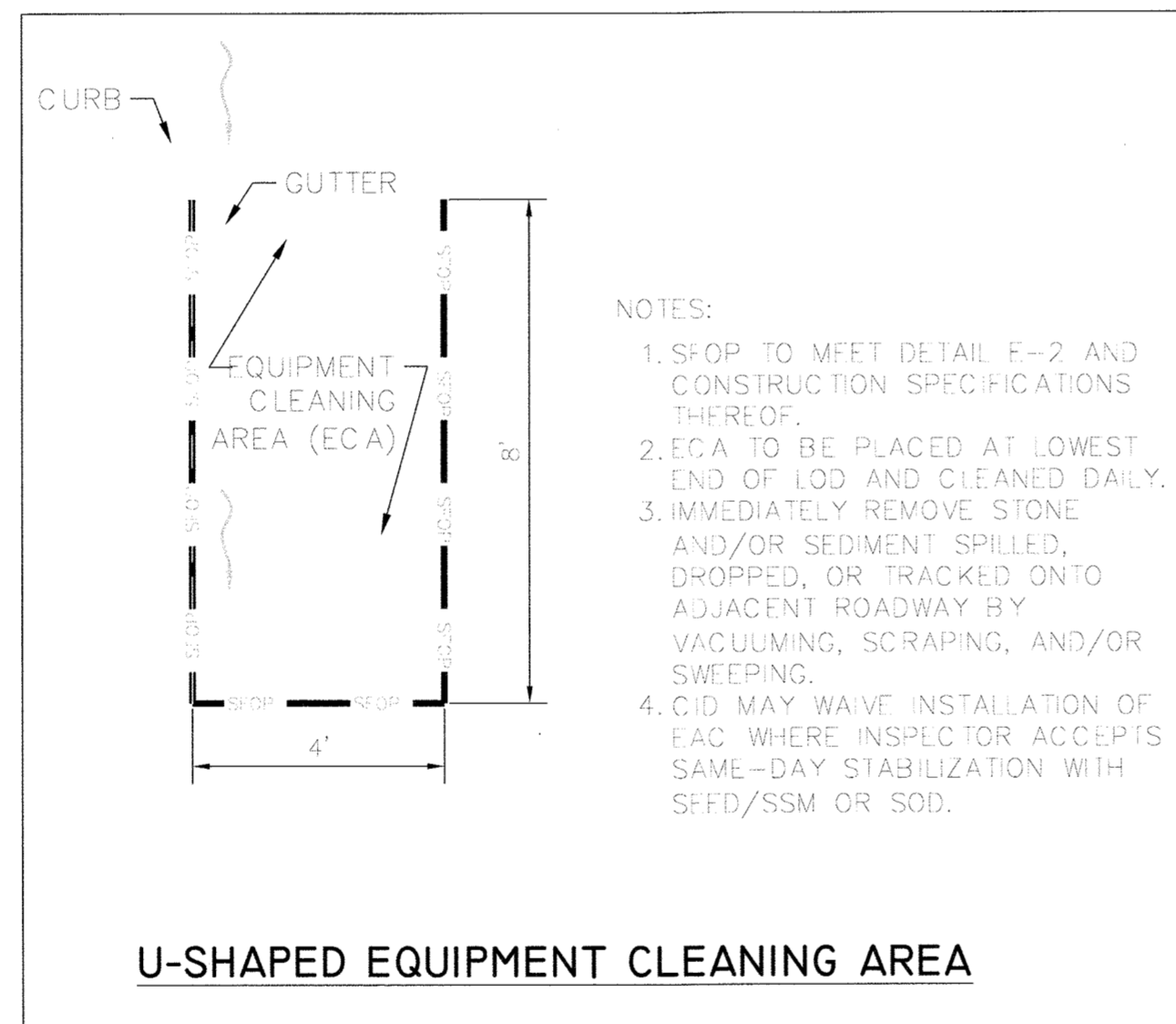
- CONSTRUCTION SPECIFICATIONS**
- PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (40 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
 - PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BEAM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BEAM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
 - PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
 - PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 8 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 CLEAR SURFACE. MOUNTABLE BEAM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.



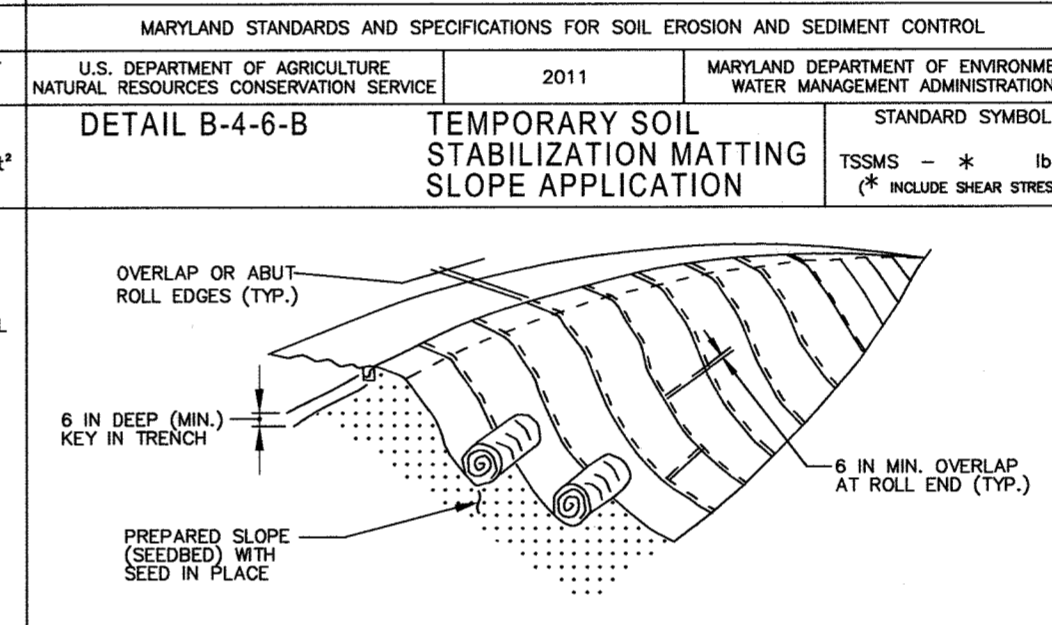
- CONSTRUCTION SPECIFICATIONS**
- USE WOOD POSTS 1 1/2 x 1 1/2 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD, AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
 - USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND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

SEQUENCE OF CONSTRUCTION

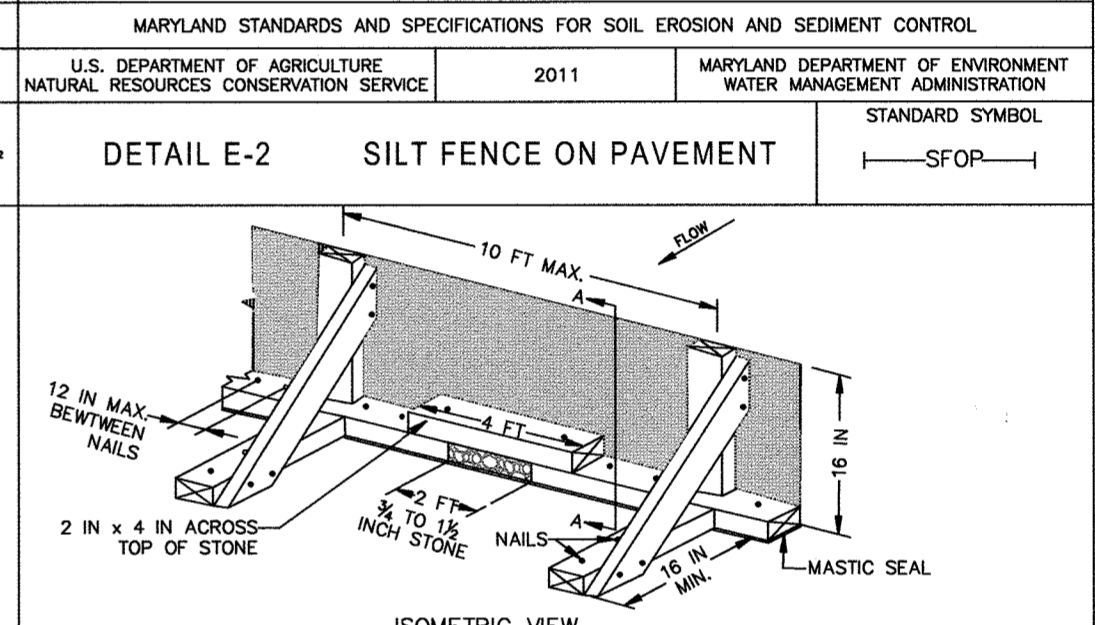
- OBTAIN GRADING PERMIT.
- LAYOUT ALIGNMENT AT SITE. (2 DAYS)
- REQUEST PRE-CONSTRUCTION MEETING ON-SITE WITH REPRESENTATIVE OF HOWARD COUNTY DPW CONSTRUCTION INSPECTION DIVISION. (1 DAY)
- THE CONTRACTOR SHALL INSTALL SEDIMENT CONTROL DEVICES AT THE DIRECTION OF THE HOWARD DPW CID INSPECTOR. (1 DAY)
- EXCAVATE TRENCH TO THE GRADE SPECIFIED ON THE PROFILE, INSTALL WATER MAIN, BACKFILL, STABILIZE TRENCH AND RESURFACE WITH BITUMINOUS PAVING AS APPROPRIATE (120 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 SHEET NO. 11 OF 12 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 TEMPORARY PAVING DETAIL ON DRAWING NO. SHEET 2 OF 12.
- 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 SHEET NO. 11 OF 12 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)



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



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



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

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.: 13122677.67

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John J. Kelly 02/19
DIRECTOR OF PUBLIC WORKS DATE

Thomas P. Keller 01/19
CHIEF, BUREAU OF ENGINEERING DATE

Chris 02/19
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 01/19
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EROSION & SEDIMENT CONTROL NOTES AND DETAILS

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WATER MAIN REPLACEMENT
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ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

SCALE
AS SHOWN
SHEET
10 of 13

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...

- 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...

- 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.

- C. Soil Amendments (Fertilizer and Lime Specifications)
1. Soil tests must be performed to determine the exact rates and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more...

- 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.

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...

- 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...

- 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...

- 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...

- 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...

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...

Temporary Seeding Summary

Table with columns: No., Species, Application Rate (lb/ac), Seeding Dates, Seeding Depths, Fertilizer Rate (10-20-20), Lime Rate. Includes rows for Annual Ryegrass, Barley, Oats, Foxtail Millet.

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.
2/ For sandy soils, plant seeds at twice the depth listed above.

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...

- 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.

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

- 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)

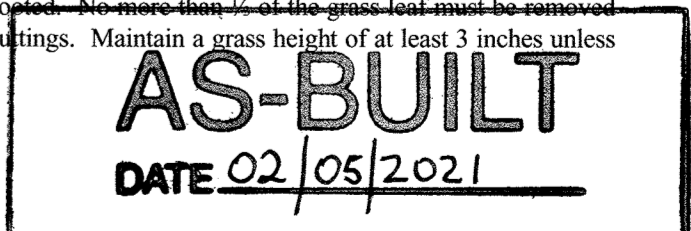
- d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the areas to prepare a proper seedbed. Remove stones and debris over 1 1/2 inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.

Permanent Seeding Summary table with columns: No., Species, Application Rate (lb/ac), Seeding Dates, Seeding Depths, Fertilizer Rate (10-20-20), Lime Rate. Includes rows for Tall Fescue, Perennial Ryegrass, White Clover.

- 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.

- 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.

- 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.



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. 13122677.67

Aug 05, 2016 - 12:45pm User: kci\jacob... M:\2016\13122677_67\Drawings\65-504 NOTES.dwg

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND. Includes signatures of Director of Public Works, Chief of Utilities, and Chief of Utility Design Division.

KCI TECHNOLOGIES logo and contact information: 936 Ridgebrook Road, Sparks, MD 21152.

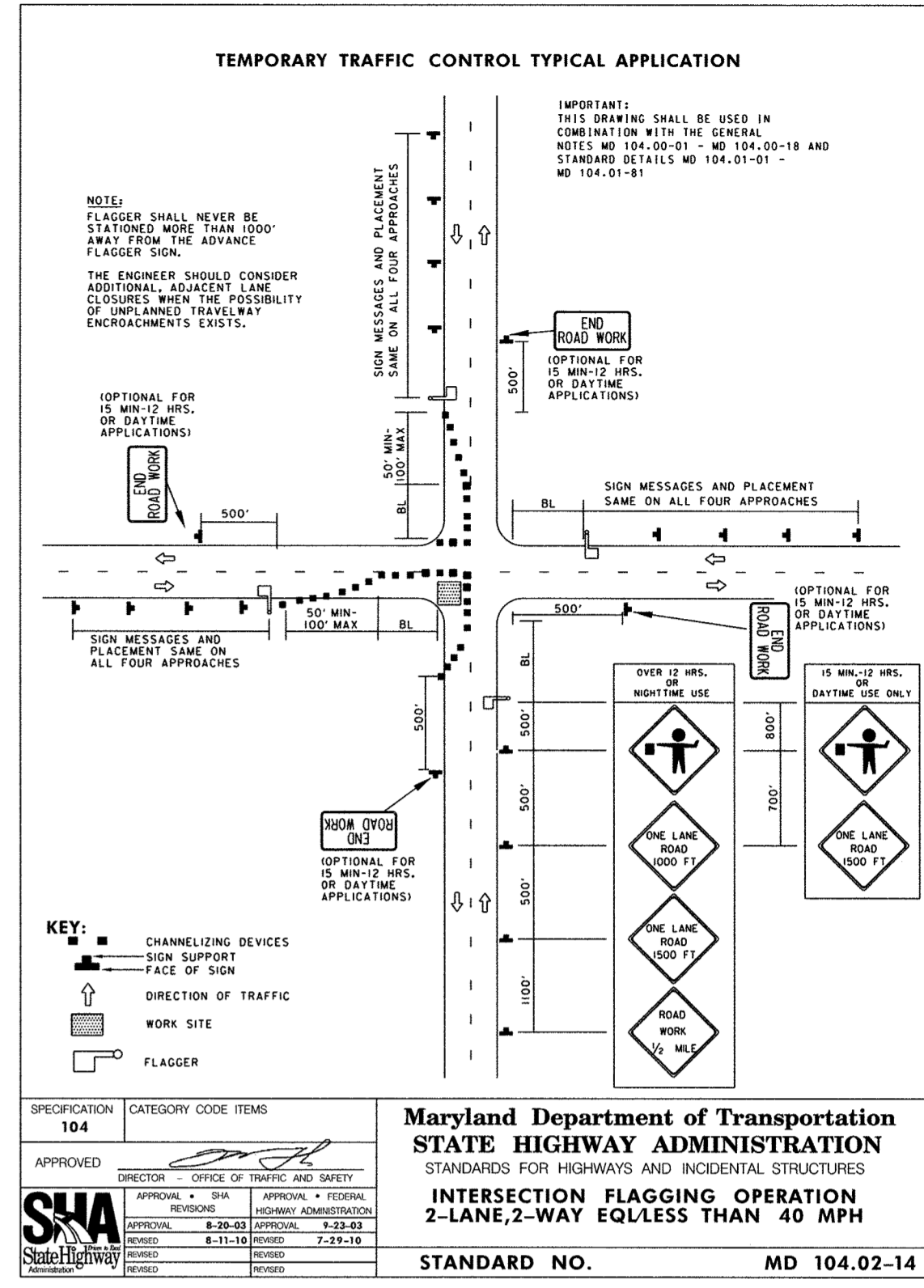
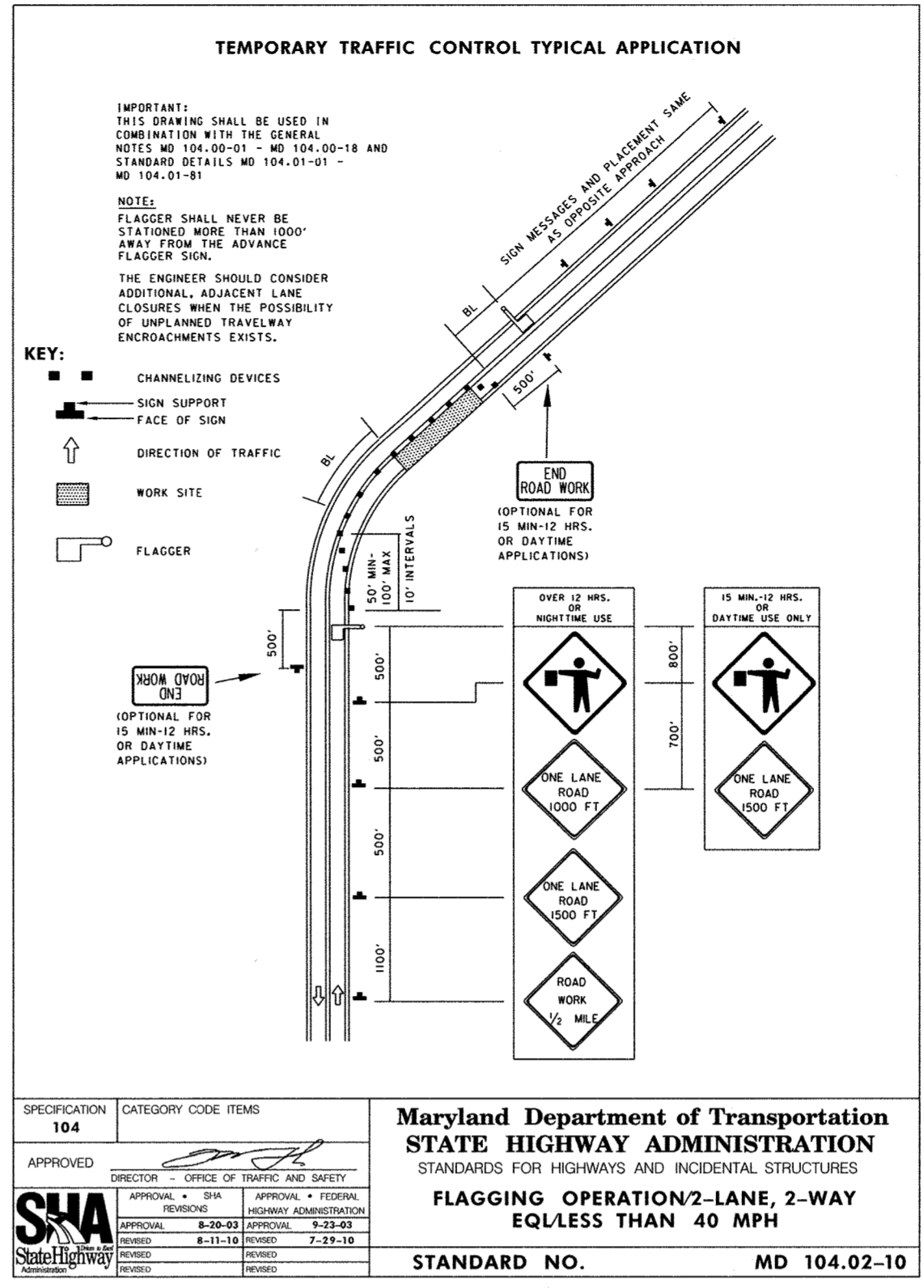
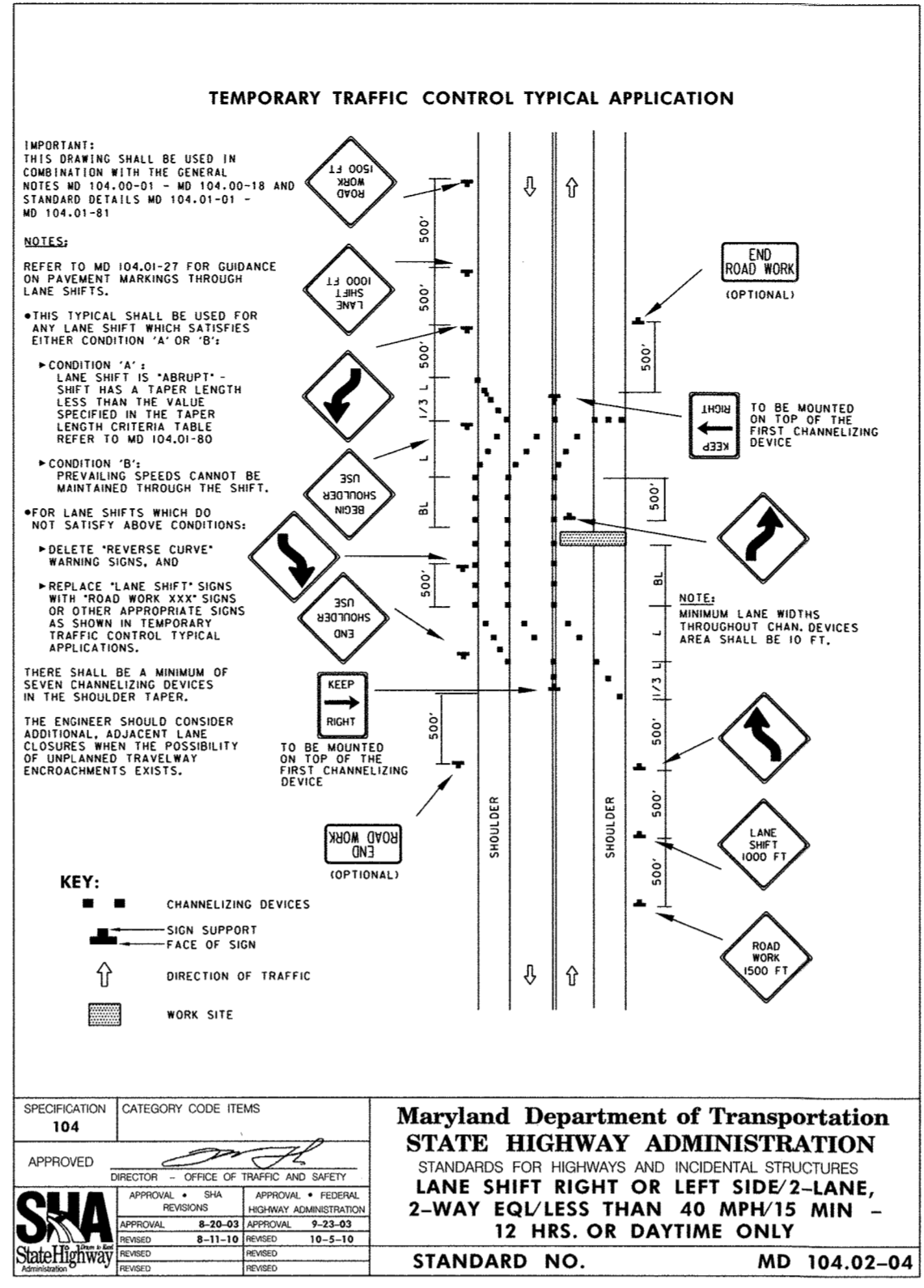
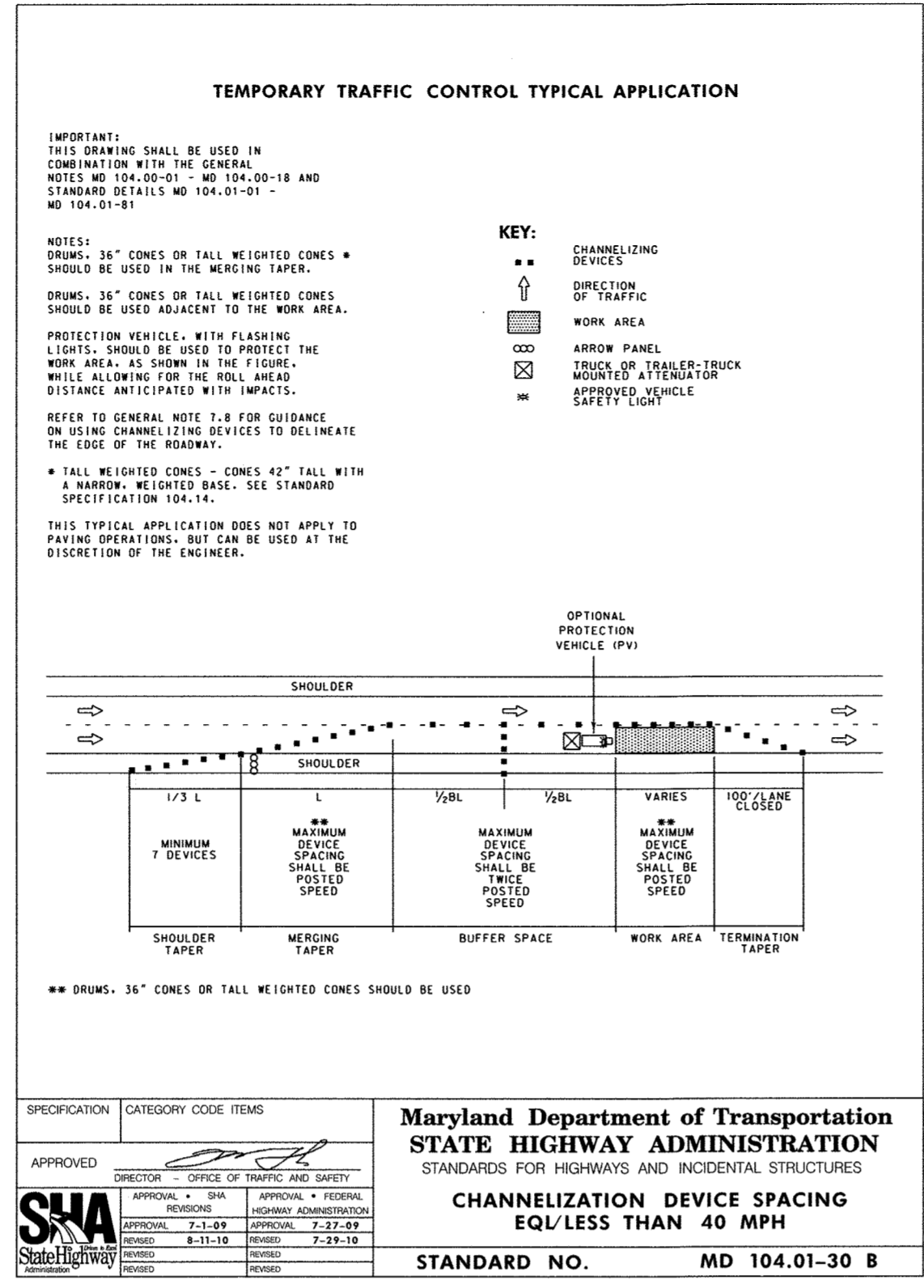
Professional Engineer seal for the State of Maryland, License No. 31363, dated 08/09/2019.

Table with columns: DES: KJ, DRN: KJ, CHK: JB/GW, DATE: AUG 2019, BY, NO., REVISION, DATE.

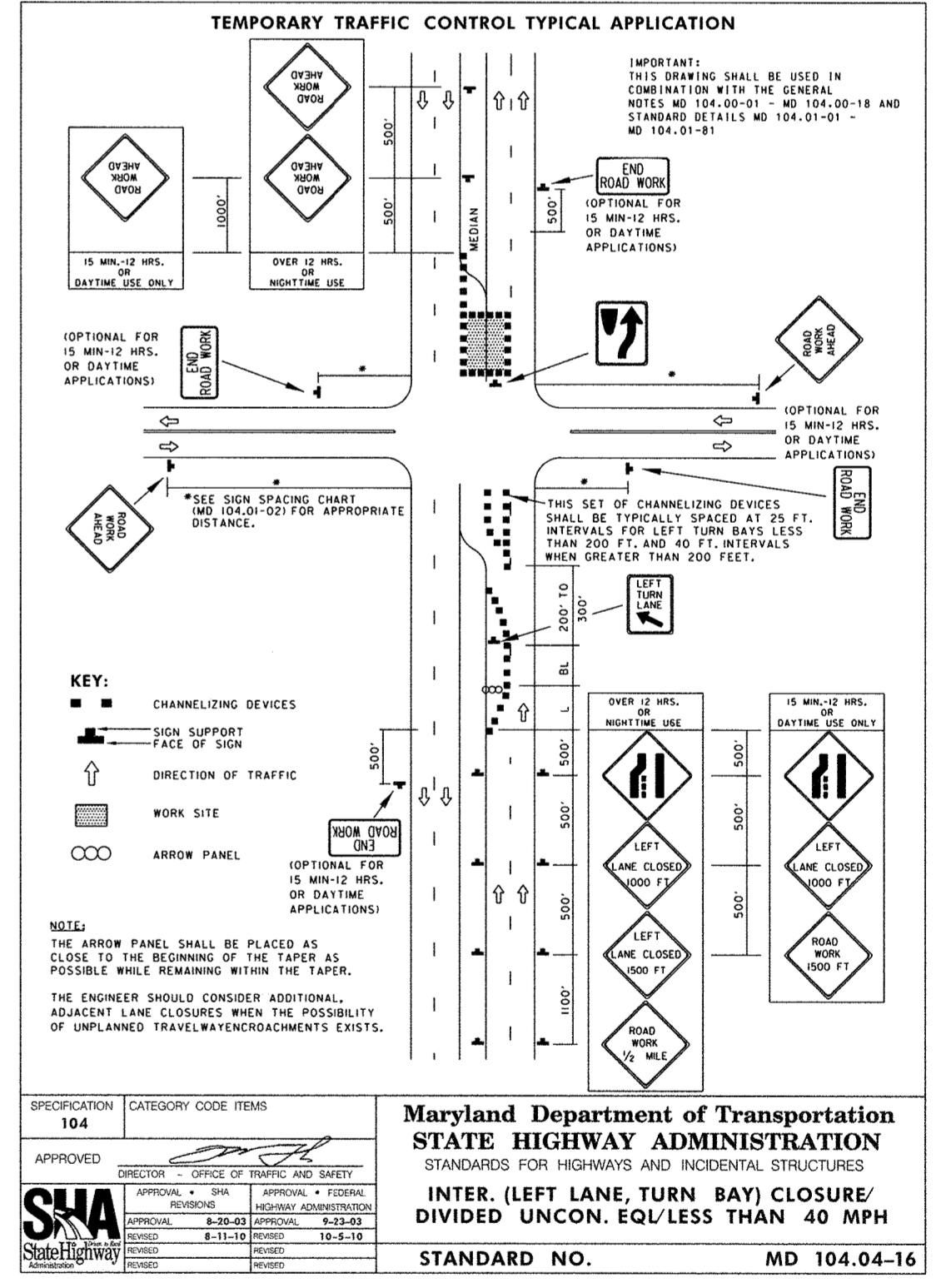
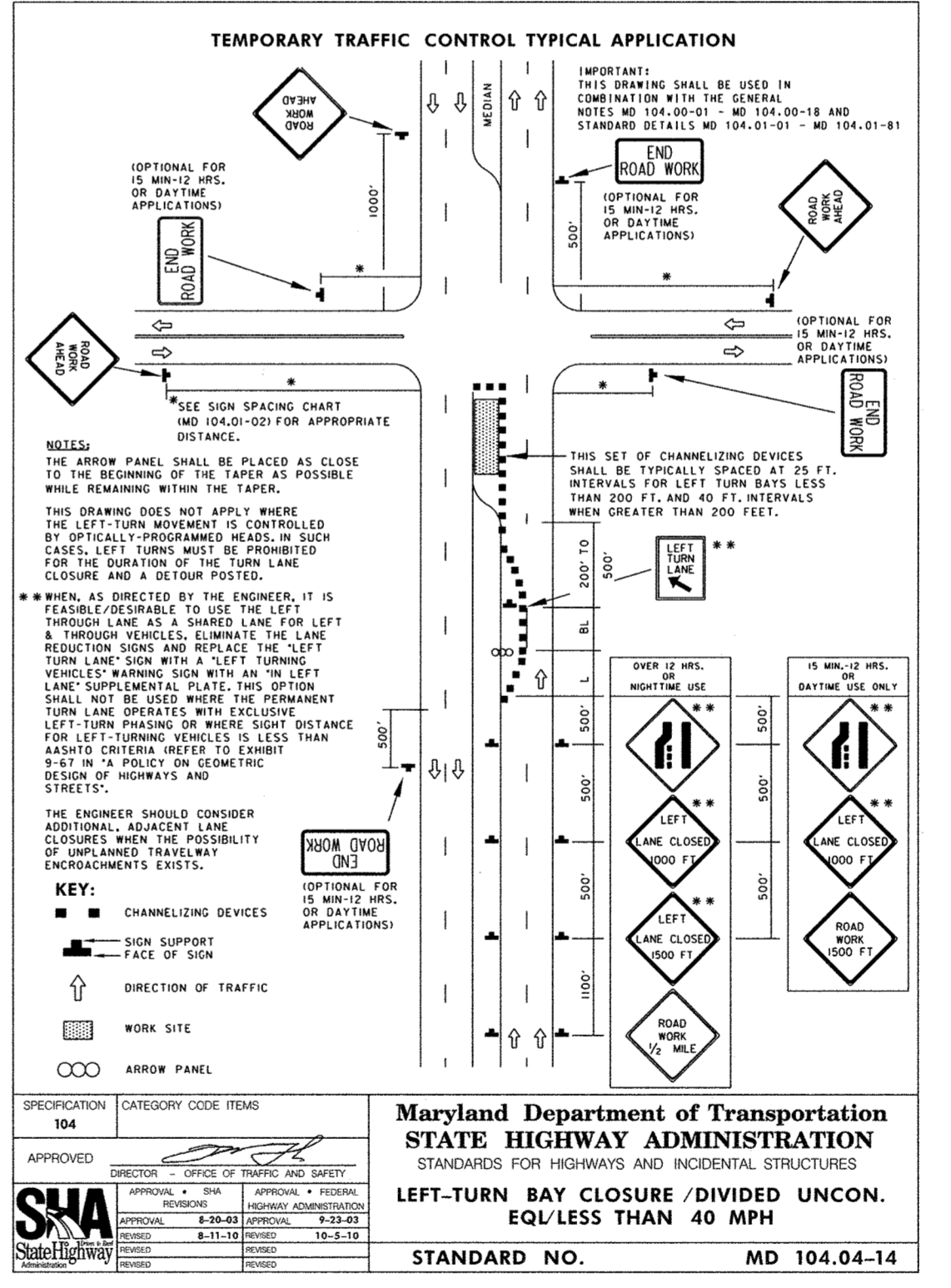
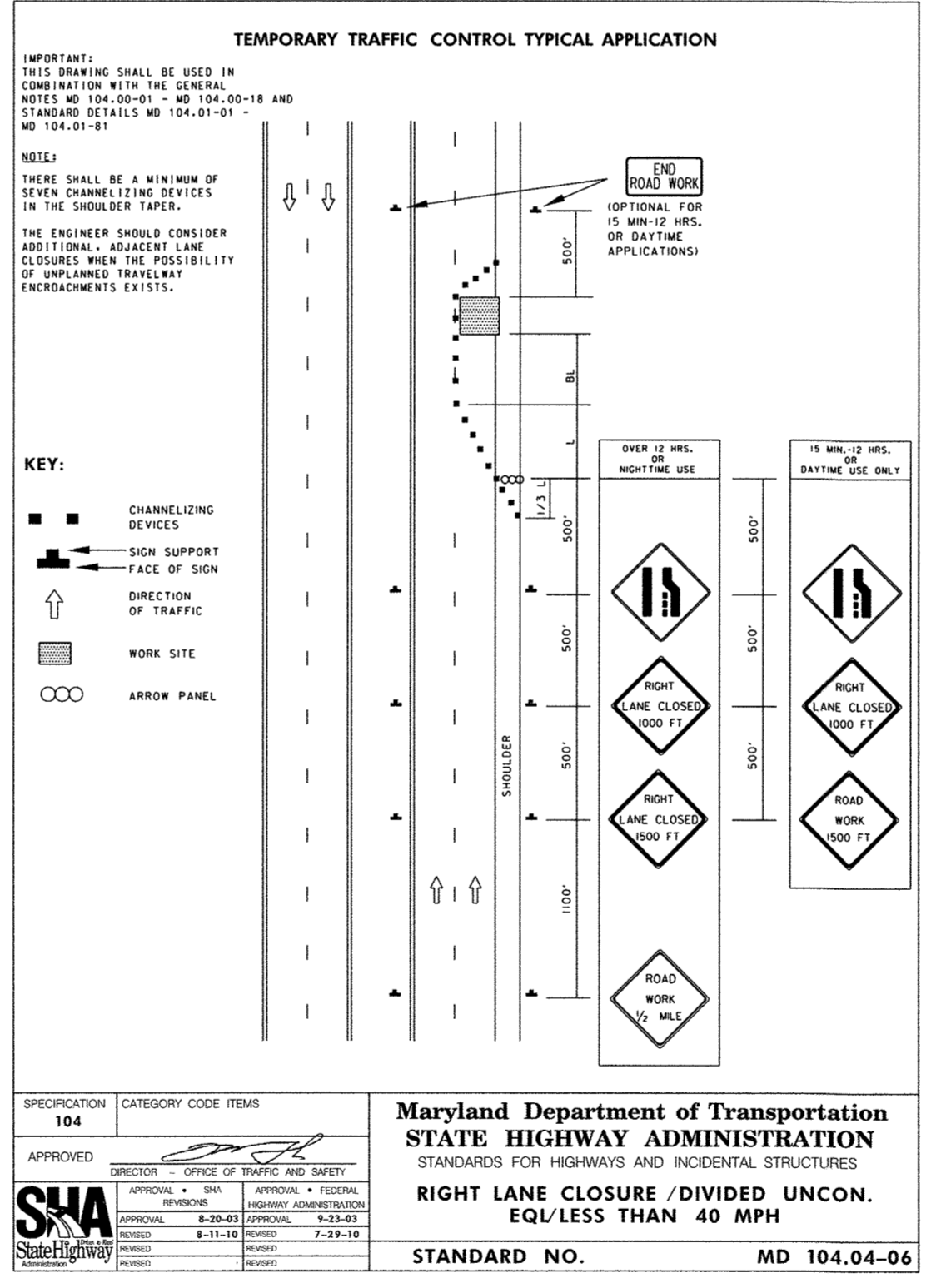
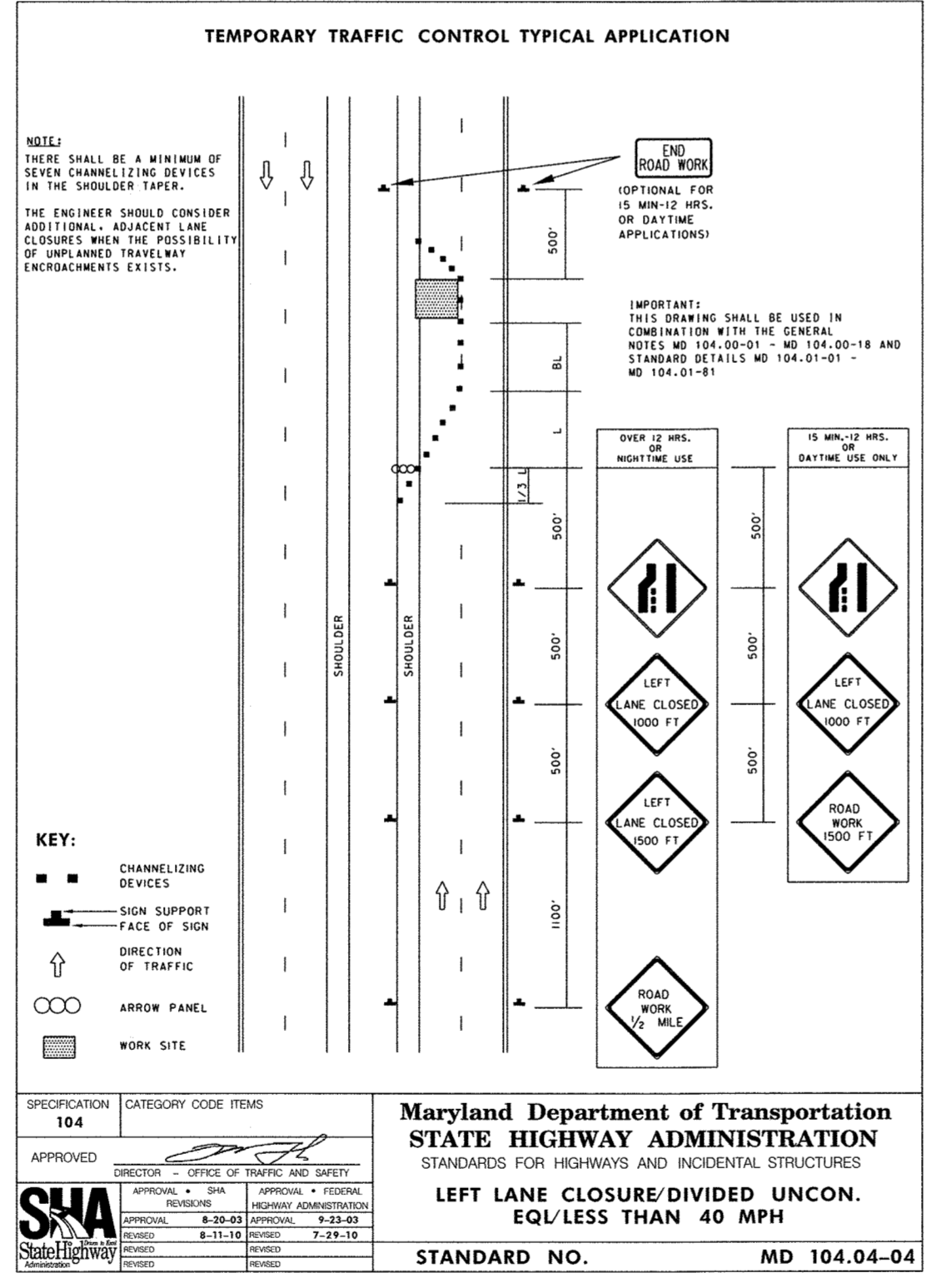
EROSION & SEDIMENT CONTROL NOTES. Includes fields for 600' SCALE MAP NO. 29, 30, 36 and BLOCK NO. 24, 19, 1.

TWIN RIVERS ROAD WATER MAIN REPLACEMENT. CAPITAL PROJECT No. W8331, CONTRACT No. 44-5072. ELECTION DISTRICT NO. 5, HOWARD COUNTY, MARYLAND. SCALE AS SHOWN, SHEET 11 of 13.

- 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, MSHA 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. THE ROADWAY SHALL BE OPENED TO TWO FULL LANES 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.
- 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.
- 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.
- CONTACT HOWARD COUNTY TRAFFIC DIVISION AT 410-313-2430 TO SCHEDULE PLACING THE SIGNAL, AT TWIN RIVERS ROAD AND GOVERNOR WARFIELD PARKWAY, ON FLASH OR AUTOMATIC RECALL DURING CONSTRUCTION IN THE INTERSECTION AT LEAST 3 DAYS BEFORE WORK IN THE INTERSECTION.
- 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 8:30 AM TO 4 PM MONDAY-FRIDAY. WHEN WORKING AT THE INTERSECTION OF TWIN RIVERS ROAD AND GOVERNOR WARFIELD PARKWAY WORK HOURS ARE 9 AM TO 3 PM. COUNTY MAY ALTER WORK HOURS BASED ON TRAFFIC CONDITIONS. FOR ADDITIONAL INFORMATION, REFER TO SPECIFICATIONS.
- NOTIFY HOWARD COUNTY POLICE 5 DAYS PRIOR TO STARTING WORK.



- SEQUENCE OF CONSTRUCTION**
- SET UP TRAFFIC CONTROL FOR THE WORK AREA DURING WORKING HOURS.
 - 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 WATER MAIN CONSTRUCTION IS COMPLETE, MILL AND OVERLAY ROADWAY TO THE LIMITS SHOWN ON HOWARD COUNTY STANDARD DETAIL G-4.01.

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. 31363, Expiration Date 01/16/2020.

AS-BUILT
DATE 02/05/2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* Date: 8-20-19
Chief, Bureau of Utilities: *[Signature]* Date: 8-20-19

Chief of Engineering: *[Signature]* Date: 8-20-19
Chief, Utility Design Division: *[Signature]* Date: 8-20-19

KCI TECHNOLOGIES
936 Reisterstown Road
Suite, MD 21152
Phone: (410) 316-7800
Fax: (410) 316-7817
www.kci.com

Professional Engineer: *[Signature]*
Professional Engineer No. 31363
Expiration Date 01/16/2020

DES: KJ
DRN: KJ
CHK: JB/GW
DATE: AUG. 2019

BY	NO.	REVISION	DATE

600' SCALE MAP NO. 29_30_36 BLOCK NO. 24_19_1

TRAFFIC CONTROL NOTES AND DETAILS

TWIN RIVERS ROAD
WATER MAIN REPLACEMENT
CAPITAL PROJECT No. W8331
CONTRACT No. 44-5072

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN
SHEET: 12 of 13

SIGN LEGEND

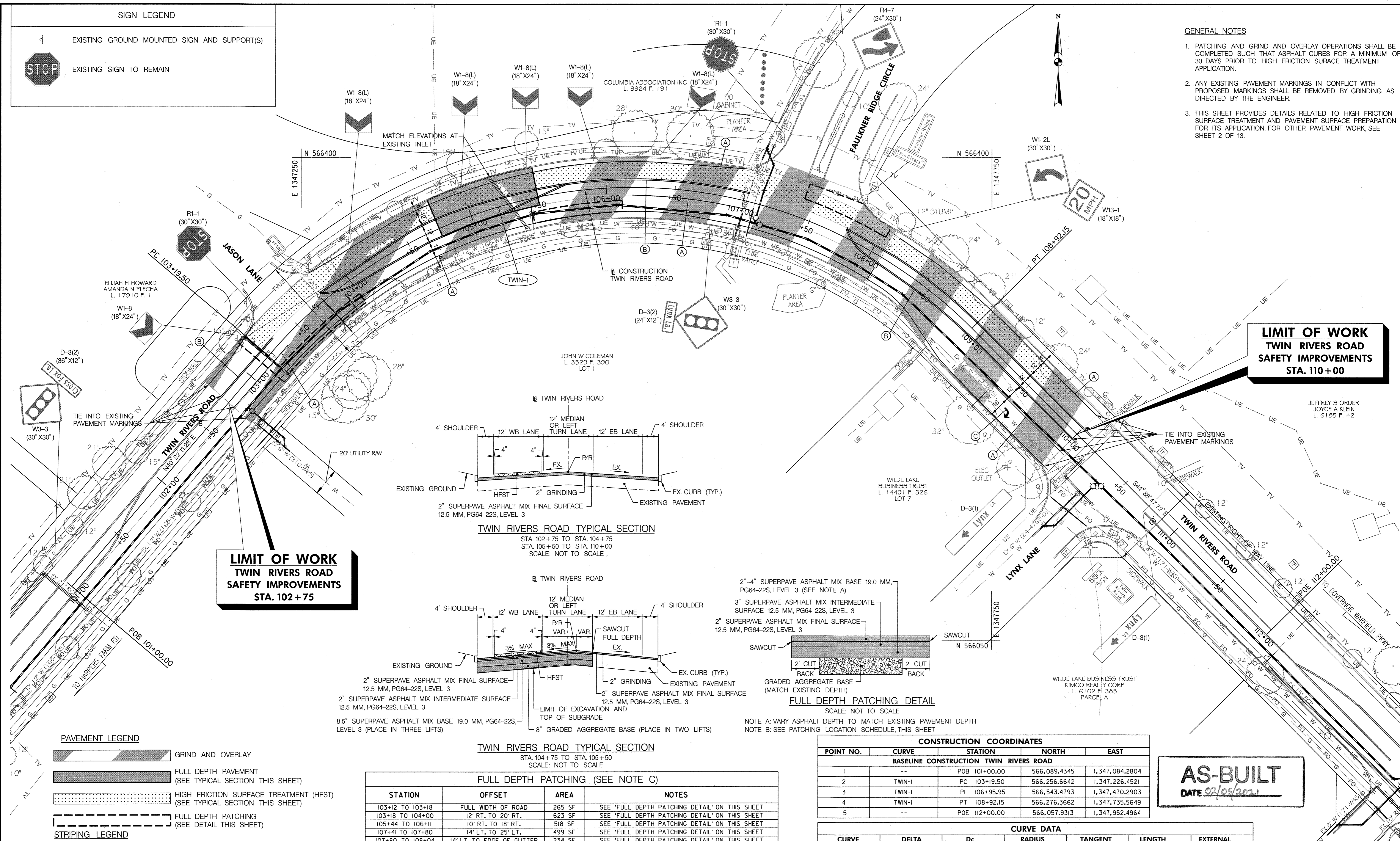
- EXISTING GROUND MOUNTED SIGN AND SUPPORT(S)
- EXISTING SIGN TO REMAIN

GENERAL NOTES

1. PATCHING AND GRIND AND OVERLAY OPERATIONS SHALL BE COMPLETED SUCH THAT ASPHALT CURES FOR A MINIMUM OF 30 DAYS PRIOR TO HIGH FRICTION SURFACE TREATMENT APPLICATION.
2. ANY EXISTING PAVEMENT MARKINGS IN CONFLICT WITH PROPOSED MARKINGS SHALL BE REMOVED BY GRINDING AS DIRECTED BY THE ENGINEER.
3. THIS SHEET PROVIDES DETAILS RELATED TO HIGH FRICTION SURFACE TREATMENT AND PAVEMENT SURFACE PREPARATION FOR ITS APPLICATION. FOR OTHER PAVEMENT WORK, SEE SHEET 2 OF 13.

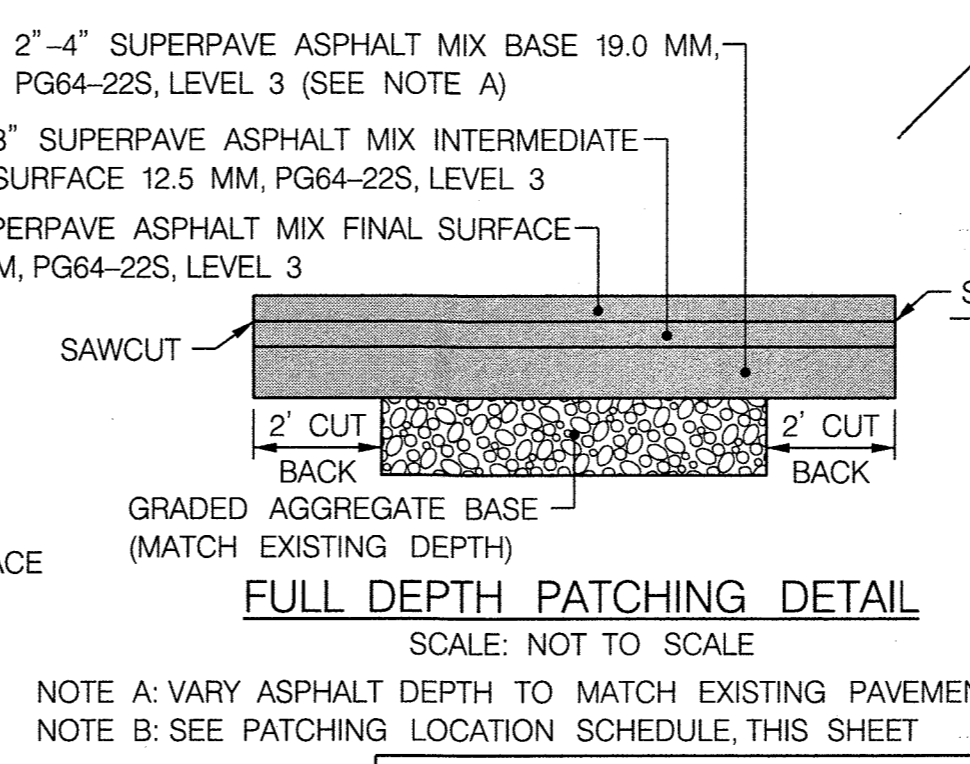
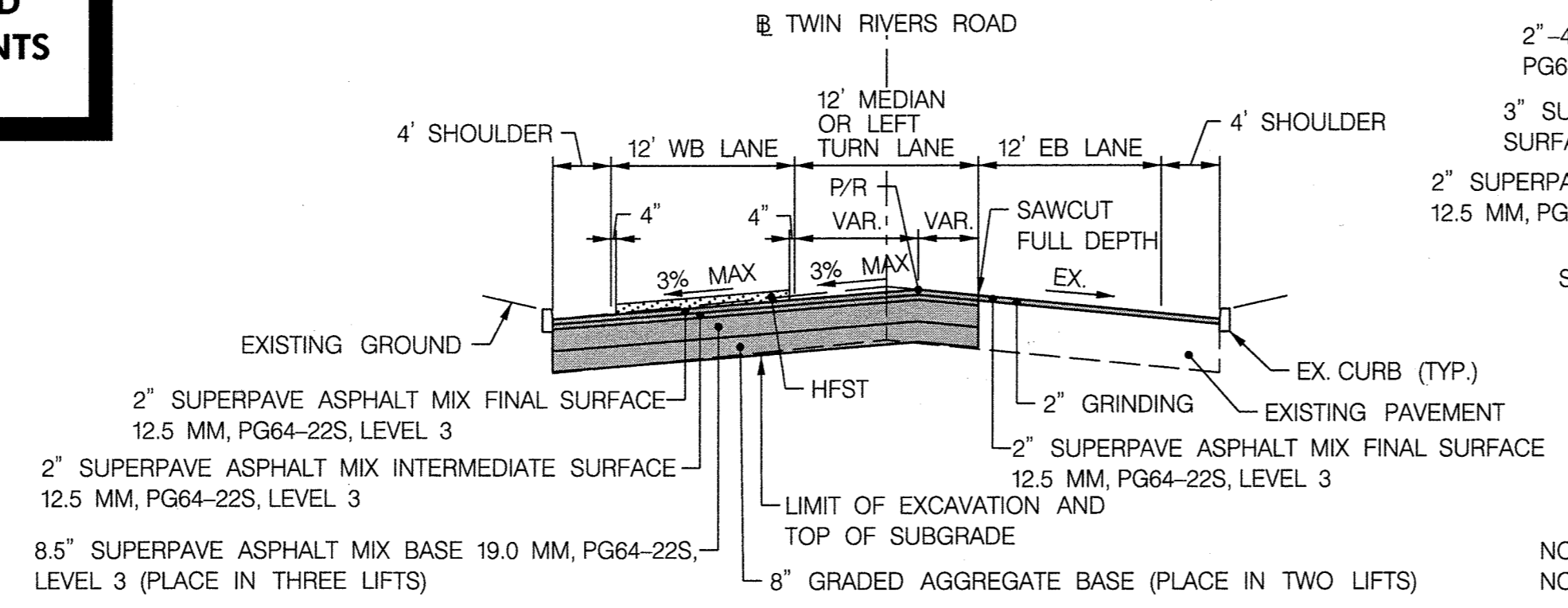
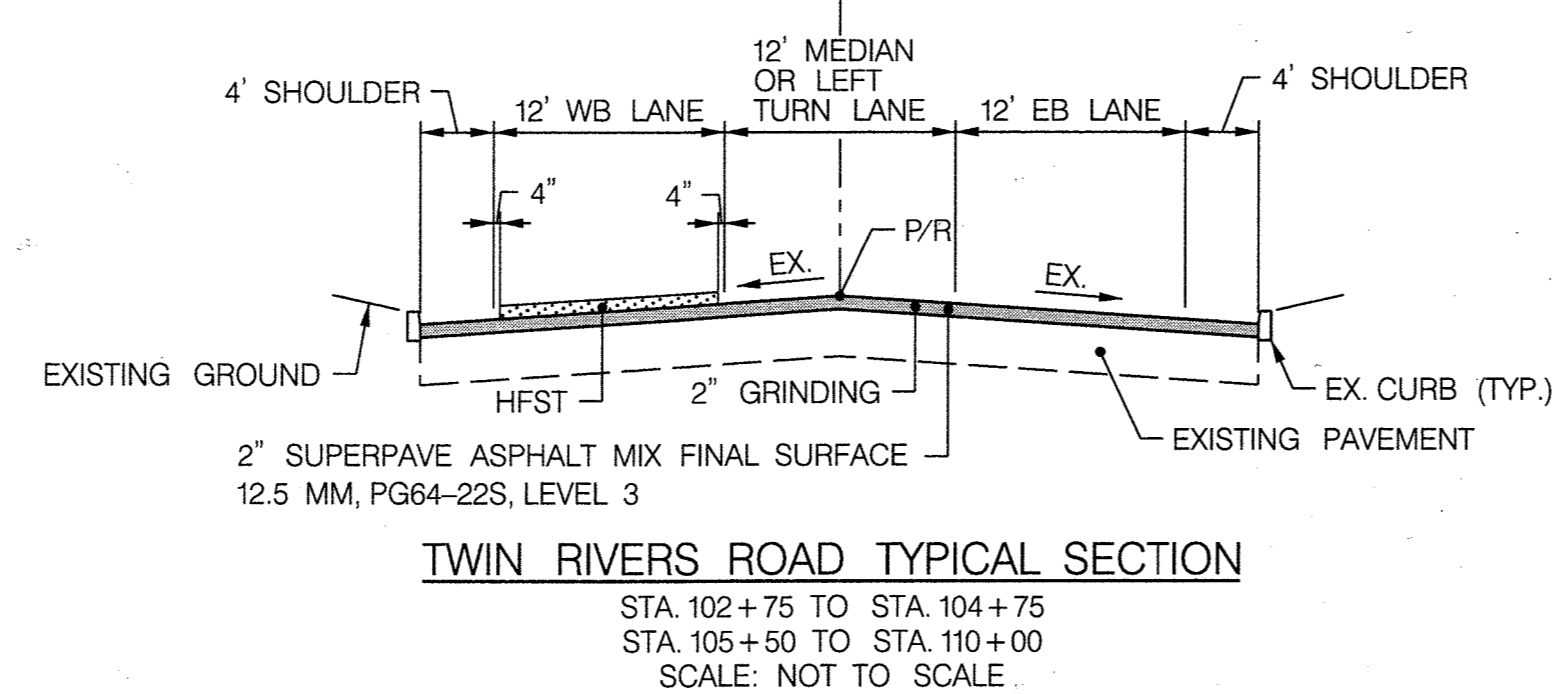
KCI TECHNOLOGIES PROJECT No.: 13122677.67

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**LIMIT OF WORK
TWIN RIVERS ROAD
SAFETY IMPROVEMENTS
STA. 102+75**

**LIMIT OF WORK
TWIN RIVERS ROAD
SAFETY IMPROVEMENTS
STA. 110+00**



FULL DEPTH PATCHING (SEE NOTE C)

STATION	OFFSET	AREA	NOTES
103+12 TO 103+18	FULL WIDTH OF ROAD	265 SF	SEE "FULL DEPTH PATCHING DETAIL" ON THIS SHEET
103+18 TO 104+00	12' RT. TO 20' RT.	623 SF	SEE "FULL DEPTH PATCHING DETAIL" ON THIS SHEET
105+44 TO 106+11	10' RT. TO 18' RT.	518 SF	SEE "FULL DEPTH PATCHING DETAIL" ON THIS SHEET
107+41 TO 107+80	14' LT. TO 25' LT.	499 SF	SEE "FULL DEPTH PATCHING DETAIL" ON THIS SHEET
107+80 TO 108+04	14' LT. TO EDGE OF GUTTER	234 SF	SEE "FULL DEPTH PATCHING DETAIL" ON THIS SHEET

NOTE C: COORDINATE ROADWAY PATCHING WITH TRENCH PATCHING FOR WATER LINE WORK. DO NOT PATCH AREAS TWICE.

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. 30737, Expiration Date 06/29/2020.

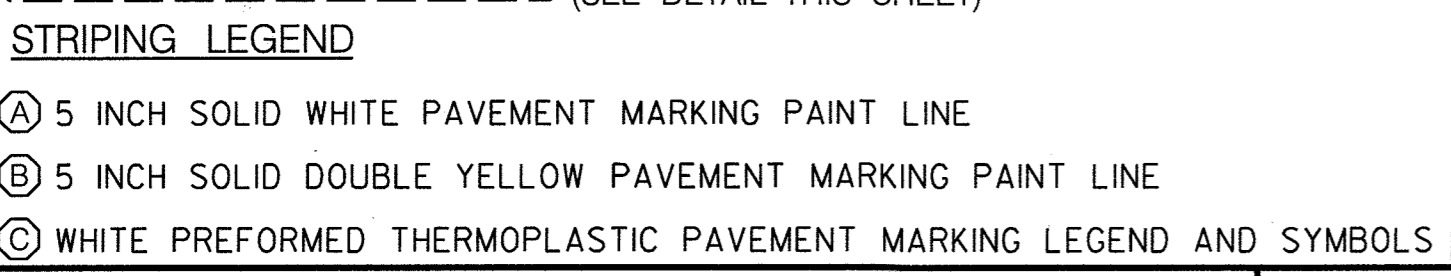
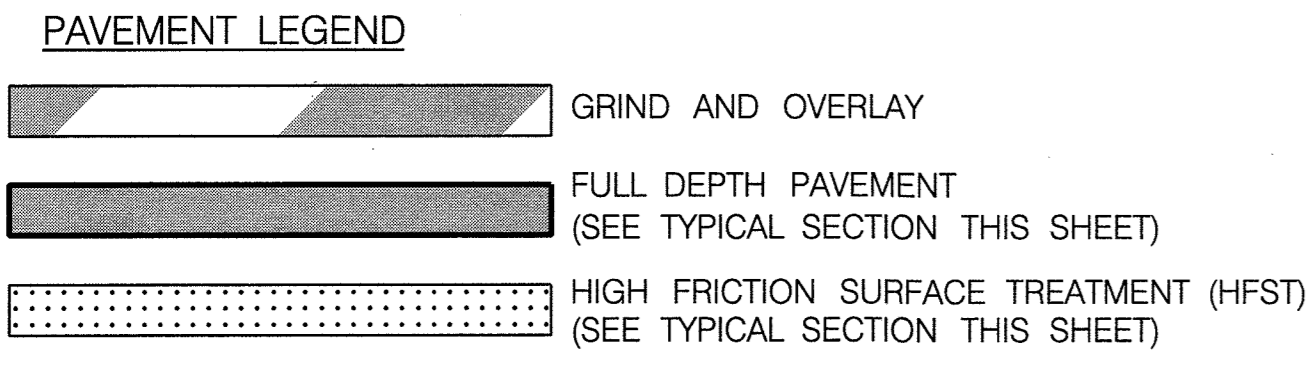
CONSTRUCTION COORDINATES

POINT NO.	CURVE	STATION	NORTH	EAST
BASELINE CONSTRUCTION TWIN RIVERS ROAD				
1	--	POB 101+00.00	566,089.4345	1,347,084.2804
2	TWIN-1	PC 103+19.50	566,256.6642	1,347,226.4521
3	TWIN-1	PI 106+95.95	566,543.4793	1,347,470.2903
4	TWIN-1	PT 108+92.15	566,276.3662	1,347,735.5649
5	--	POE 112+00.00	566,057.9313	1,347,952.4964

CURVE DATA

CURVE	DELTA	Dc	RADIUS	TANGENT	LENGTH	EXTERNAL
TWIN-1	94°49' 41.00" RT	16°33' 34.10"	346.00	376.46	572.65	165.31

AS-BUILT
DATE 02/05/2021



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 8/8/2019
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 8/19/19
CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 8/16/2019
CHIEF, TRANSPORTATION & SPECIAL PROJECTS DATE

PREPARED BY:

WRA
Whitman, Reardon & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231

DES: BMM
DRN: BMM
CHK: BRT
DATE: JUNE 2019

BY	NO.	REVISION	DATE

HIGH FRICTION SURFACE TREATMENT PLAN

600' SCALE MAP NO. 29, 30, 36 BLOCK NO. 24, 19, 1

TWIN RIVERS ROAD WATER MAIN REPLACEMENT
CAPITAL PROJECT No. W-8331
CONTRACT No. 44-5072

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN SHEET 13 OF 13