

PURPOSE STATEMENT & DESIGN NARRATIVE

THE PURPOSE OF THIS PROJECT IS TO REPLACE APPROXIMATELY 700 LINEAR FEET OF EXISTING SEWER MAIN. THE STREAM WILL BE RESTORED UNDER A SEPARATE CONTRACT POST REPLACEMENT OF SEWER MAIN. DURING THE CONSTRUCTION OF THE SEWER MAIN, SPECIMEN TREE CRITICAL ROOT ZONES WILL BE PROTECTED VIA LOAD MATS. A STREAM DIVERSION PIPE WILL BE INSTALLED TO DIVERT STREAM BASEFLOW AROUND THE SEWER REPLACEMENT. RUNOFF WILL BE CONTAINED WITHIN THE LIMITS OF DISTURBANCE BY A DIVERSION FENCE. THE MOVEMENT OF SEDIMENT TO OUTSIDE OF THE LIMITS OF DISTURBANCE WILL BE REDUCED VIA A SILT FENCE AND MULCH ACCESS PATH. PORTABLE PUMPS, FLEXIBLE TUBING, AND FILTER BAGS WILL BE UTILIZED TO DEWATER THE PROJECT AREA AS NEEDED ACCORDING TO MDE EROSION AND SEDIMENT CONTROL REQUIREMENTS.

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 IN OCTOBER 2015 BY AB CONSULTANT INC. AND FURTHER ADJUSTED ON 3 JULY 2017 BY KCI TECHNOLOGIES, INC. BUILDINGS SHOWN ON PLAN ARE FROM HOWARD COUNTY GIS FOR REFERENCE ONLY.
- 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 24F4 AND 24GC. ALL VERTICAL CONTROLS ARE BASED ON NAVD 88. VERTICAL CONTROLS PROVIDED ON THE DRAWINGS ARE 24F4 AND 24GC.
- 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.
- 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
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 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, 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.
- THE CONTRACTOR SHALL PROVIDE THE STAGING / STORAGE AREA. THE WORK SHALL BE CONDUCTED UNDER STRICT ADHERENCE TO SECTION 308 - EROSION AND SEDIMENT CONTROL OF THE HOWARD COUNTY DESIGN MANUAL, VOLUME IV. PRECONSTRUCTION CONTOURS SHALL BE RESTORED ONCE THE UTILITY HAS BEEN INSTALLED.
- ALL EXCESS MATERIAL GENERATED DURING CONSTRUCTION SHALL BE REMOVED FROM THE 100 YEAR FLOODPLAIN. THE SITE SHALL BE RESTORED TO PRECONSTRUCTION CONTOURS IN THE VICINITY OF THE SEWER MAIN ONCE THE UTILITY HAS BEEN INSTALLED. FINAL GRADES WITHIN THE STREAM RESTORATION REACH MUST MATCH THE DESIGN PLANS. SPOIL TO BE REMOVED FROM THE SITE SHALL BE TAKEN TO A LOCATION WITH AN ACTIVE GRADING PERMIT.
- MOUNDING OR WASTING OF MATERIALS CAN ONLY BE STORED WITHIN THE DESIGNATED AREA.
- KCI REVIEWED MARYLAND'S HIGH QUALITY WATERS (TIER II) LIST TO IDENTIFY ANY TIER II WATERS WITHIN THE STUDY AREA. NO TIER II WATERS WERE IDENTIFIED IN THE STUDY AREA (MDE, 2010).
- THE RECEIVING WATERS (LITTLE PATUXENT RIVER) IS CLASSIFIED AS 303(d) CATEGORY 3 WATERS FOR E. COLI, CATEGORY 4A WATERS FOR PHOSPHORUS, SEDIMENTATION/SILTATION, AND TOTAL SUSPENDED SOLIDS AND CATEGORY 5 WATERS FOR CHLORIDES ACCORDING TO THE DRAFT 2018 INTEGRATED REPORT OF SURFACE WATER QUALITY (MDE, 2018).
- THE MDE PERMIT/TRACKING NUMBER IS 17-NT-3267/201761581.
- THE STREAM RESTORATION IS TO OCCUR UNDER THE WILLOW BEND STREAM RESTORATION PROJECT (D-1158).

HANDLING ASBESTOS CONTAINING MATERIAL

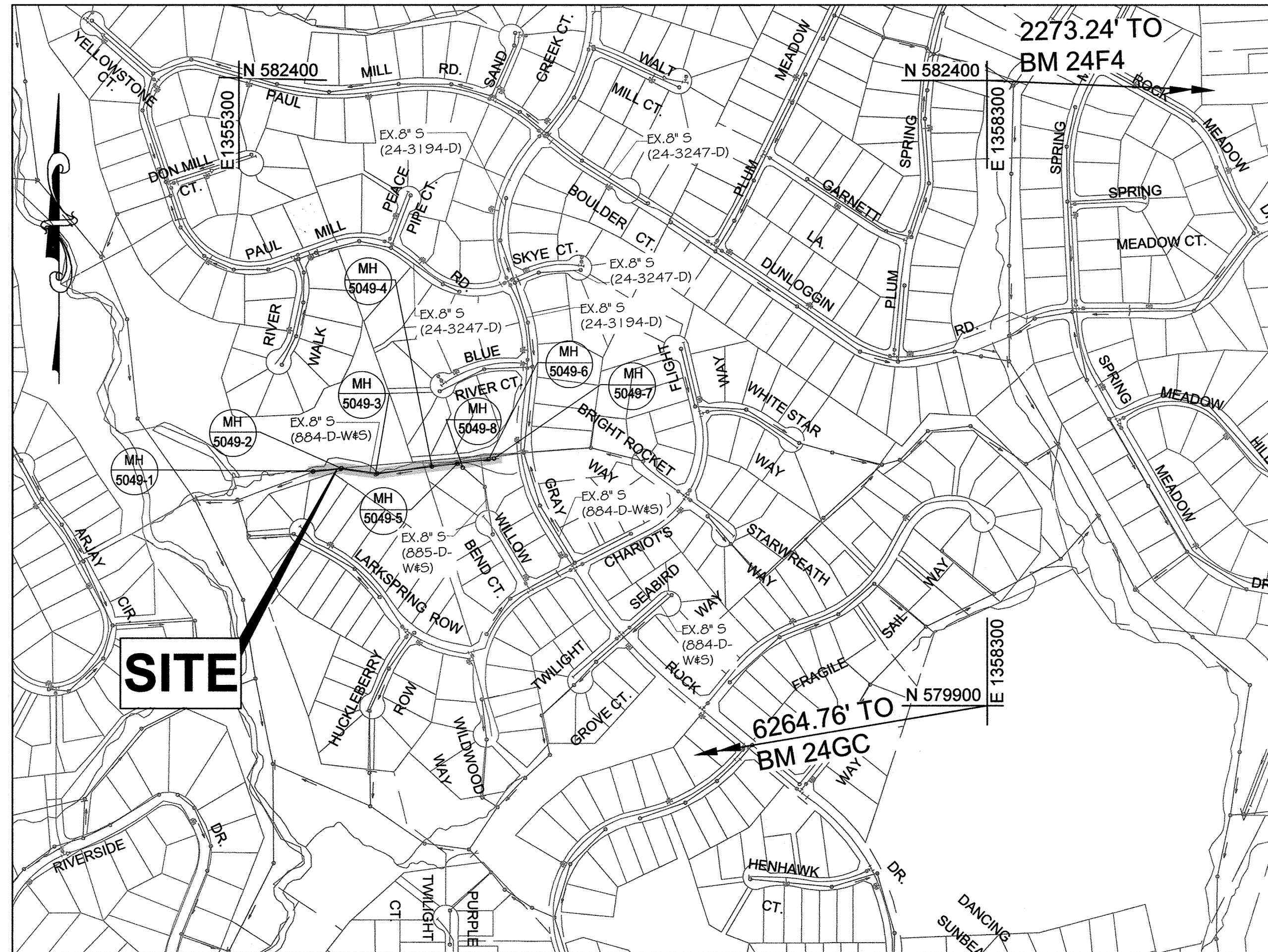
- THE EXISTING SEWER MAIN IS ASBESTOS CEMENT PIPE (ACP). IT MUST BE REMOVED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS, INCLUDING BUT NOT LIMITED TO: 29 CFR 1926.1101, 40CFR61, 262 AND 263 AND COMAR 21.11.21. THIS WORK REQUIRES SUBMISSION AND ACCEPTANCE OF AN ASBESTOS ABATEMENT WORK PLAN THAT DESCRIBES IN DETAIL THE METHODS THE CONTRACTOR WILL USE TO COMPLY WITH APPLICABLE REGULATIONS, INCLUDING TRAINING, RESPIRATORY PROTECTION AND WASTE DISPOSAL. THIS ITEM ALSO INCLUDES DESIGN AND IMPLEMENTATION OF ENGINEERING CONTROLS AND DUST CONTROL MEASURES TO REDUCE VISIBLE EMISSIONS WHILE PERFORMING ASBESTOS ABATEMENT. THE CONTRACTOR SHALL DISPOSE OF ALL ACP IN A PERMITTED FACILITY.
- THE WORK MAY REQUIRE ENTRY INTO PERMIT-REQUIRED CONFINED SPACES. THE CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH APPLICABLE REGULATIONS INCLUDING 29 CFR 1910.146.

WILLOW BEND SEWER REHABILITATION

CAPITAL PROJECT NO. S6268

CONTRACT NO. 20-5049

HOWARD COUNTY, MARYLAND



VICINITY MAP

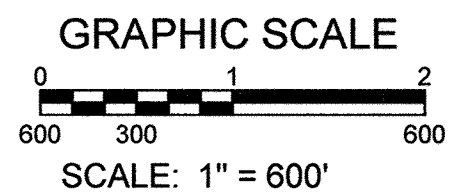
SCALE: 1" = 600'

TYPE OF BUILDING: RESIDENTIAL
 NUMBER OF PARCELS: NA
 NUMBER OF SEWER HOUSE CONNECTIONS: NA
 NUMBER OF WATER HOUSE CONNECTIONS: NA
 DRAINAGE AREA: LITTLE PATUXENT

CONTROL NOTE
 THE HORIZONTAL AND VERTICAL DATUM SHOWN HEREON ARE BASED ON GPS OBSERVATIONS FROM HOWARD COUNTY GEODETIC SURVEY CONTROL POINTS.
 NAD 1983 / 91 (HORIZONTAL)
 NAVD 1988 (VERTICAL)

24F4 N 582298.64 24GC N 578868.87
 E 1360571.01 E 1352120.76
 ELEV. 386.11 ELEV. 438.77

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 1/16/2020.



RESTORATION SCHEDULE		
LOCATION	DISTANCE	TYPE
L.O.D. IN SEWER EASEMENT	720'	SEED & MULCH

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."

Silver Chai 07/20/2018
 OWNERS / DEVELOPERS SIGNATURE DATE
Silver Chai 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."

James Tomlinson 07/19/2018
 DESIGNERS SIGNATURE DATE
 JAMES TOMLINSON
 PRINTED NAME MD REGISTRATION NO. 31201
 (P.E.) (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.

James Tomlinson 7/20/18
 HOWARD SOIL CONSERVATION DISTRICT DATE
 8/18/16

AS-BUILT
 DATE 3/1/2019

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	SANITARY SEWER NOTES AND DETAILS
3	SEWER PLAN & PROFILE MH 5049-1 TO MH 5049-7
4	SANITARY SEWER BYPASS PUMPING PLAN
5	ENVIRONMENTAL RESOURCES MAP
6	EROSION & SEDIMENT CONTROL PLAN
7	EROSION & SEDIMENT CONTROL PLAN
8	EROSION & SEDIMENT CONTROL NOTES
9	EROSION & SEDIMENT CONTROL NOTES
10	EROSION & SEDIMENT CONTROL DETAILS
11	EROSION & SEDIMENT CONTROL DETAILS

BILL OF MATERIALS

ITEM	UNIT	ESTIMATE	AS-BUILT	MANUFACTURER
8" DIP SEWER	L.F.	710		
48" (4' DIA.) PRECAST MANHOLE	EA.	6		
4' DIA. MANHOLE RISER > 6'	V.F.	32		
4' DIA. PRECAST DOGHOUSE MANHOLE	EA.	2		
TEMPORARY 8" BYPASS PIPE	L.F.	1144		
24" CORRUGATED HDPE STREAM BYPASS PIPE	L.F.	653		

NAME OF UTILITY CONTRACTOR: _____
 CHECKBOX _____
 AS-BUILT DATE _____
 SURVEY AND DRAFTING DIVISION _____

LEGEND

EXISTING	PROPOSED
	DECIDUOUS TREE
	CONIFEROUS TREE
	EXISTING UTILITY POLE
	EXISTING FIRE HYDRANT
	EXISTING VALVE
	TRAVERSE POINT
	EXISTING WATER MAIN
	EXISTING SEWER MAIN
	EXISTING GAS
	COLONIAL PETROLEUM PIPELINE
	WATER OF UNITED STATES
	STREAM BUFFER
	100 YR. FLOODPLAIN
	EXISTING SEWER & DRAINAGE EASEMENT
	PROPERTY BOUNDARY
	MAJOR CONTOUR
	MINOR CONTOUR
	SEWER MAIN
	SEWER MANHOLE
	SILT FENCE
	SUPER SILT FENCE
	LIMIT OF DISTURBANCE
	LIMIT OF DISTURBANCE AND SILT FENCE
	SEWER FLOW DIRECTION
	TEST HOLE (COMPLETED)
	SOIL BORING (SEE GEOTECHNICAL REPORT)

KCI TECHNOLOGIES PROJECT NO.: 13122677.59

Jul 19, 2018 - 1:56pm User: hndh_jackpot File: 2018\13122677.59\Drawings\0-001 Title.dwg

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

James Tomlinson 7/20/18
 DIRECTOR OF PUBLIC WORKS DATE

Thomas B. Butler 7/20/18
 CHIEF, BUREAU OF ENGINEERING DATE

James Tomlinson 7-21-18
 CHIEF, BUREAU OF UTILITIES DATE

James Tomlinson 7/21/18
 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
 07/19/2018

DES: JB					
DRN: CK					
CHK: GW					
DATE: JULY 2018	BY	NO.	REVISION	DATE	

TITLE SHEET

600' SCALE MAP NO. 24 BLOCK NO. 15

WILLOW BEND SEWER REHABILITATION

CAPITAL PROJECT No. S6268
 CONTRACT No. 20-5049

ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN SHEET 1 of 11

KCI TECHNOLOGIES PROJECT No. : 13122677.59

SANITARY SEWER MAIN NOTES

- ALL SEWER MAINS SHALL BE PVC, UNLESS OTHERWISE NOTED.
- ALL MANHOLES SHALL BE 4'-0" INSIDE DIAMETER UNLESS OTHERWISE NOTED.
- FORCE MAINS SHALL BE D.I.P. ONLY.
- MANHOLES SHOWN WITH 12" AND 16" WALLS ARE FOR BRICK MANHOLES ONLY.
- MANHOLES DESIGNATED W.T. IN PLAN AND PROFILE SHALL HAVE WATERTIGHT FRAME AND COVER, STANDARD DETAIL G5.52. WHERE WATERTIGHT MANHOLE FRAMES AND COVERS ARE USED, SET TOP FRAME 1'-6" ABOVE FINISHED GRADE UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- HOUSE(S) WITH THE SYMBOL "C.N.S." INDICATES THAT THE CELLAR CANNOT BE SERVED.
- DISTANCES SHOWN FOR THE SANITARY SEWER MANHOLES IN PROFILE ARE ALONG THE CENTERLINE OF THE PIPE FROM CENTER OF MANHOLE TO THE CENTER OF MANHOLE. ESTIMATED QUANTITIES SHOWN ON THE BILL OF MATERIALS EXCLUDE DISTANCES WITHIN MANHOLE INTERIORS.

CONSTRUCTION NOTES

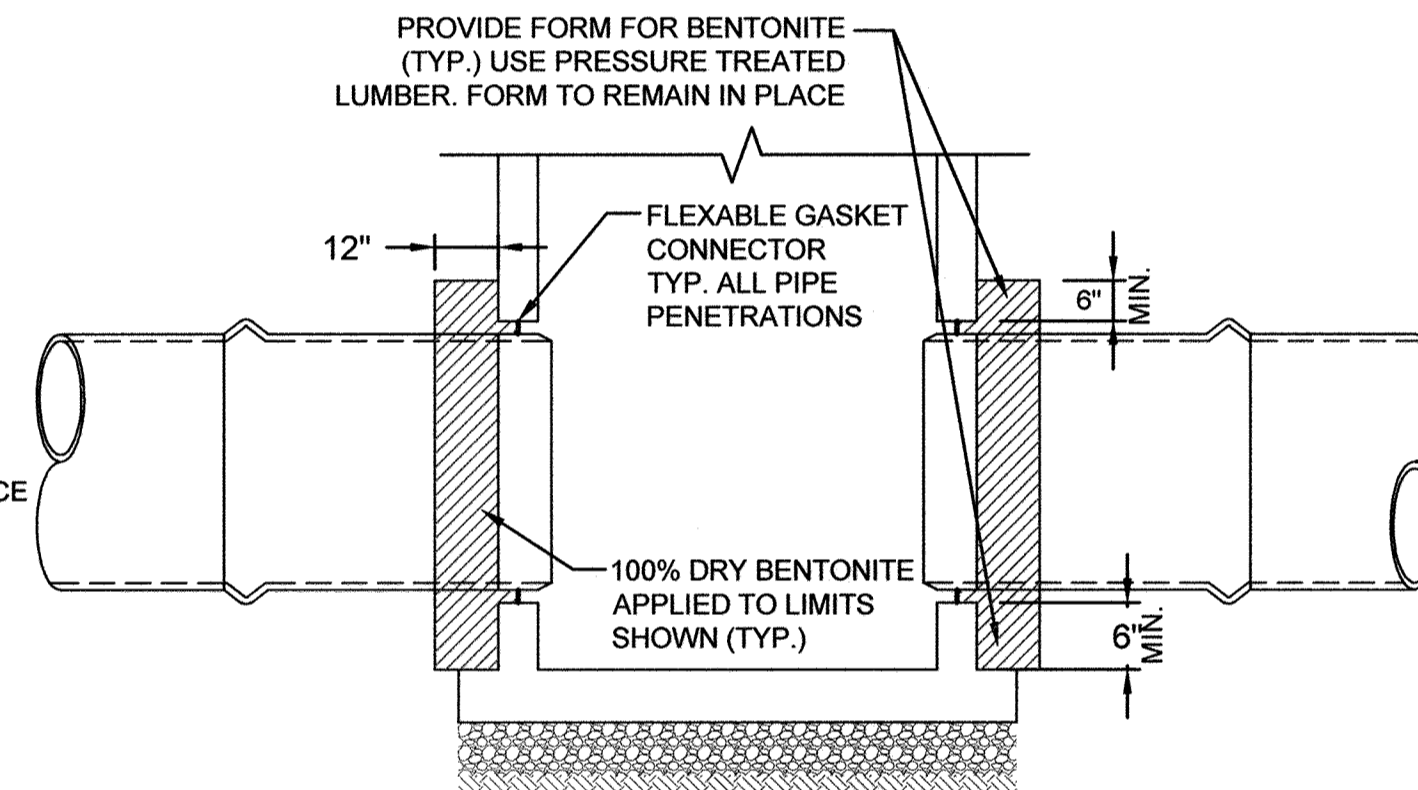
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY CONTAINED HEREIN PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS, BUREAU OF ENGINEERING/ CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 48 HOURS IN ADVANCE OF ANY WORK BEING DONE.
- EXISTING UTILITIES ARE BASED ON FIELD SURVEYS AND AVAILABLE RECORD DRAWINGS.
- THE WETLANDS DELINEATION FOR THIS PROJECT WAS PERFORMED BY KCI TECHNOLOGIES INC. DURING NOVEMBER, 2016.
- ALL WORK SHALL CONFORM TO THE MDE BEST MANAGEMENT PRACTICES FOR WETLANDS AND WATERWAYS AS LISTED IN THE REQUIREMENTS OF THE NONTIDAL WETLANDS AND WATERWAYS PERMIT APPROVED ON 10/3/2017 (MDE PERMIT NO. 17-NT-3267/2017 61581).
- 100-YEAR FLOODPLAIN ELEVATION IS SHOWN ON THE PLANS.
- NO STOCKPILE OF ANY MATERIAL IS ALLOWED IN THE 100-YEAR FLOODPLAIN.
- IN-STREAM WORK IS PROHIBITED FROM MARCH 1 TO MAY 31, INCLUSIVE. STREAM CLASSIFICATIONS: USE IV-P.
- CONTRACTOR SHALL CONTINUALLY MONITOR WEATHER FORECASTS DURING WORK ACTIVITIES AND SCHEDULE WORK DURING FAVORABLE CONDITIONS.
- THE CONTRACTOR SHALL EXERCISE CARE IN ACTIVITIES INVOLVING EITHER CUT AND FILL OR GRADING IN THE VICINITY OF TREES THAT ARE TO REMAIN AT THE CONSTRUCTION SITE. ALL EARTH CUTS AND ACTIVITIES IN THE VICINITY OF TREES TO REMAIN SHALL BE MADE IN A MANNER THAT DOES NOT DISTURB THE CRITICAL ROOT ZONE WITHIN THE DRILLPIE OF THE TREE. PROTECTIVE ORANGE FENCING SHALL BE INSTALLED AROUND THE PERIMETER OF THE CRITICAL ROOT ZONE PRIOR TO CONSTRUCTION. THE LOCATION OF THE PROTECTIVE ORANGE FENCING SHALL BE APPROVED BY HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS PRIOR TO CONSTRUCTION.
- CONTRACTOR SHALL NOT STORE EQUIPMENT, MATERIALS AND/OR SUPPLIES BEYOND THE LIMIT OF DISTURBANCE SHOWN ON THE PLANS.
- UPON COMPLETION OF THE WORK, BUT PRIOR TO DE-MOBILIZATION, THE CONTRACTOR SHALL REMOVE ALL REMNANTS OF CONSTRUCTION MATERIALS FROM THE SITE. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO A CONDITION EQUAL TO OR BETTER THAN THE PRE-CONSTRUCTION CONDITIONS.
- ALL MATERIAL SHALL BE REMOVED AND DISPOSED OF OFFSITE.
- WORKING HOURS ARE 7:30AM TO 5PM MONDAY THROUGH FRIDAY.
- THE CONTRACTOR SHALL AVOID TRACKING HEAVY EQUIPMENT OVER THE CRITICAL ROOT ZONE OF SPECIMEN TREES. IF UNAVOIDABLE, LOAD MATTS SHOULD BE USED WHEN TRACKING OVER THE CRITICAL ROOT ZONES.

SUGGESTED SEQUENCE OF CONSTRUCTION FOR SEWER MAIN

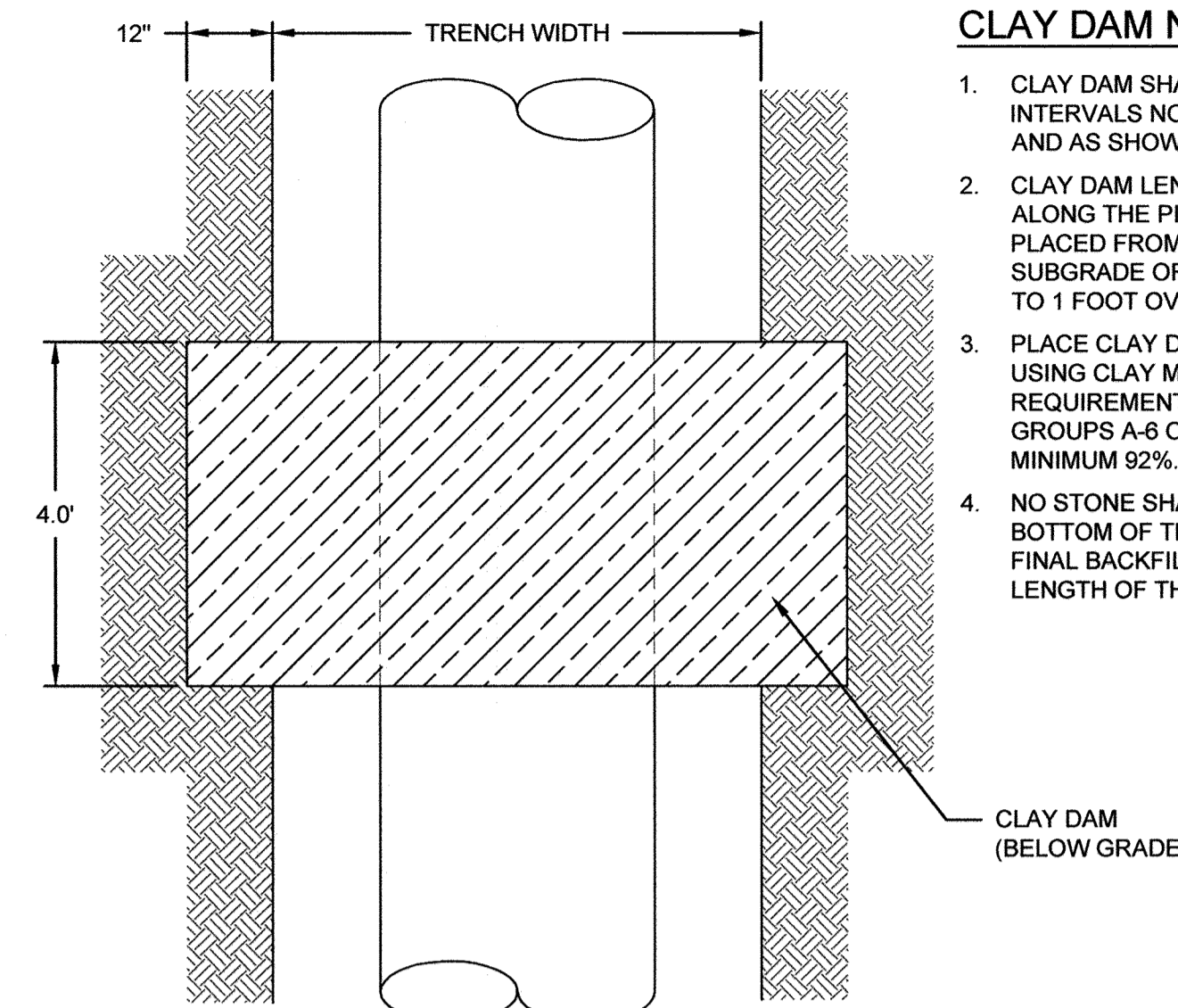
THE FOLLOWING SEQUENCE OF CONSTRUCTION IS NOT A COMPLETE LIST OF TASKS OR WORK REQUIRED TO COMPLETE THE CONTRACT REQUIREMENTS. THE SEQUENCE OF CONSTRUCTION MAY BE MODIFIED OR REVISED AT THE REQUEST OF THE CONTRACTOR WITH THE APPROVAL OF THE COUNTY PRIOR TO THE START OF CONSTRUCTION.

- INSTALL DOGHOUSE MANHOLES 5049-7 & 5049-8.
- SET UP BYPASS PUMPING IN ACCORDANCE WITH THE CONTRACT DRAWINGS. THE BYPASS PUMPING SYSTEM #1 SHALL ACCOMMODATE THE PEAK FLOW RATE OF 1 MGD. THE BYPASS PUMPING SYSTEM #2 SHALL ACCOMMODATE THE PEAK FLOW RATE OF 1 MGD. ALL BYPASS PUMPING SYSTEMS SHALL ALSO ACCOMMODATE THE AVERAGE DAILY AND LOW FLOWS IN THE SEWER SYSTEM.
- CONSTRUCT NEW 8" SANITARY SEWER & MANHOLES AS SHOWN ON THE DRAWINGS. THE EX. PIPE AND MANHOLES SHALL BE REMOVED AND DISPOSED. ALL ACP SHALL BE DISPOSED IN A PERMITTED FACILITY.
- REMOVE BYPASS PUMPING.

CONTRACTOR SHALL REFER TO SEDIMENT AND EROSION CONTROL SEQUENCE OF CONSTRUCTION ON SHEET 8.



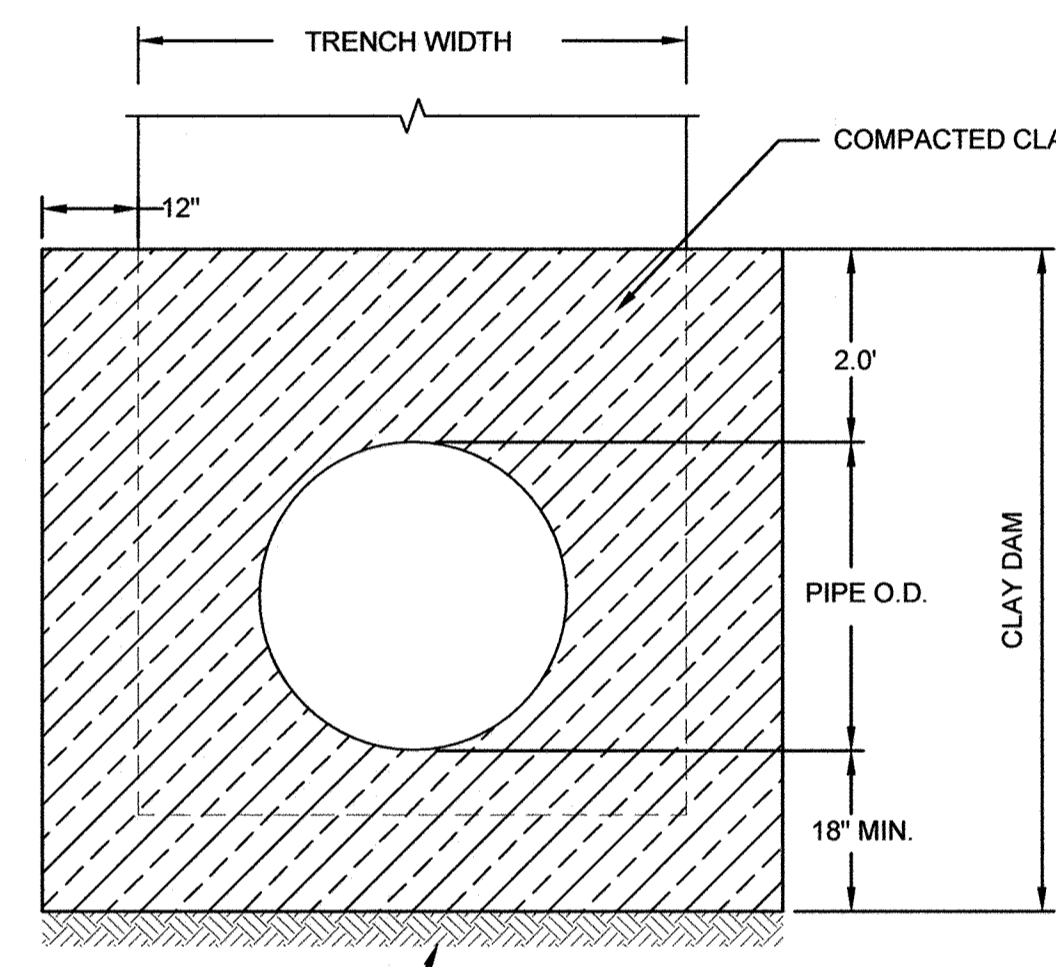
DETAIL - PIPE TO MANHOLE CONNECTION
SCALE: NOT TO SCALE



PLAN

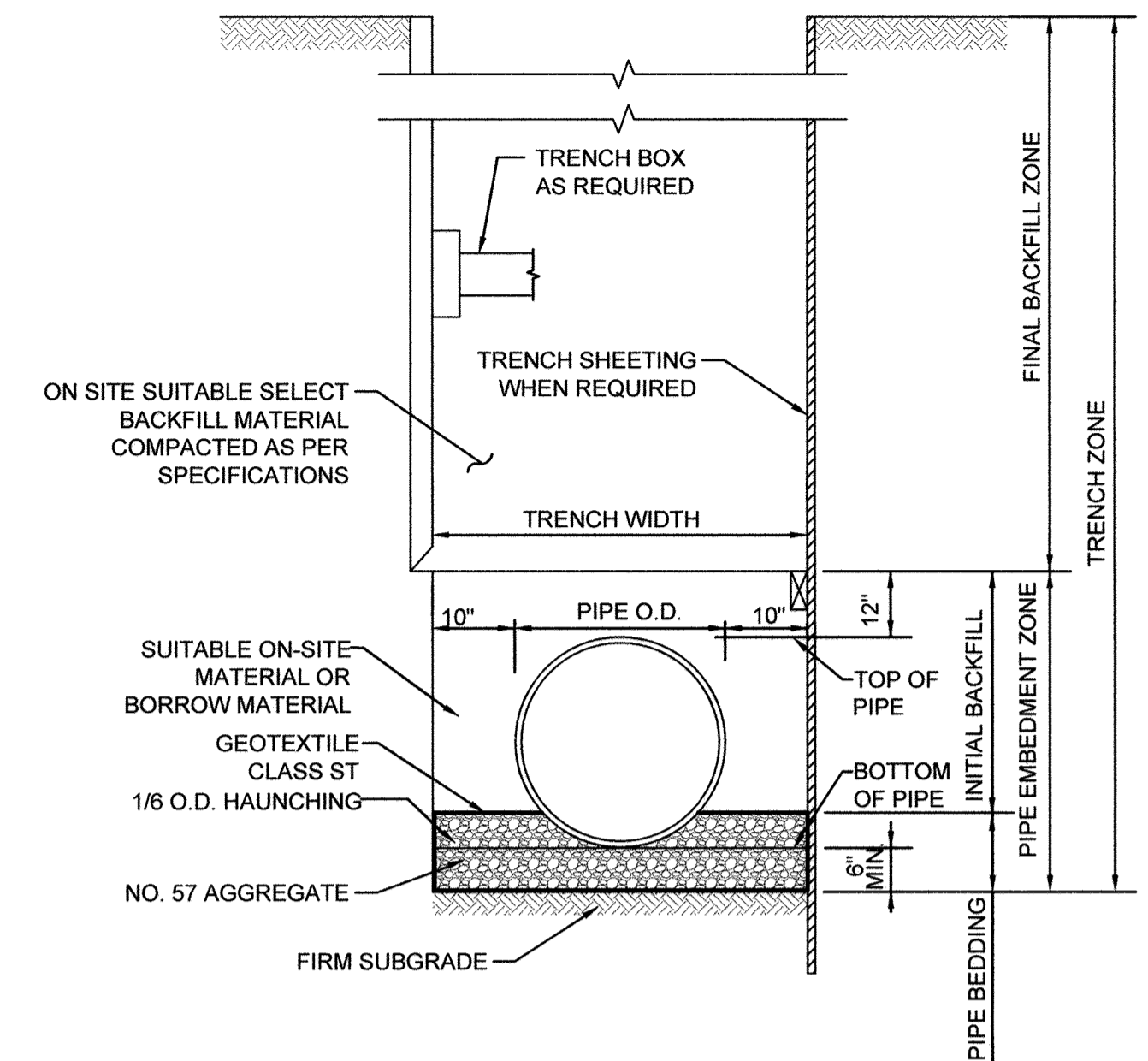
CLAY DAM NOTES

- CLAY DAM SHALL BE INSTALLED AT INTERVALS NOT TO EXCEED 500 FEET AND AS SHOWN ON PLANS.
- CLAY DAM LENGTH SHALL BE 4 FEET ALONG THE PIPE AXIS AND SHALL BE PLACED FROM THE UNDERCUT SUBGRADE OR TRENCH SUBGRADE UP TO 1 FOOT OVER THE INITIAL BACKFILL.
- PLACE CLAY DAM IN 6 INCH LIFTS, USING CLAY MEETING THE REQUIREMENTS OF AASHTO M145 SOIL GROUPS A-6 OR A-7 AND COMPACT TO MINIMUM 92%.
- NO STONE SHALL BE USED IN THE BOTTOM OF THE TRENCH OR IN THE FINAL BACKFILL ZONE ALONG THE LENGTH OF THE DAM.



ELEVATION

DETAIL - CLAY DAM
SCALE: NOT TO SCALE



DETAIL - TRENCH FOR DIP PIPE
SCALE: NOT TO SCALE

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 1/16/2020.

AS-BUILT
DATE 3/11/2019

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<p>DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND</p>		<p>7/27/18 DATE</p>	
<p>7/27/18 DATE</p>		<p>7/27/18 DATE</p>	
<p>7-24-18 DATE</p>		<p>7/27/18 DATE</p>	

KCI TECHNOLOGIES
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STATE OF MARYLAND
PROFESSIONAL ENGINEER
NO. 31363
07/19/2018

DES: JB					
DRN: CK					
CHK: GW					
DATE: JULY 2018	BY	NO.	REVISION	DATE	

SANITARY SEWER NOTES AND DETAILS

600' SCALE MAP NO. 24 BLOCK NO. 15

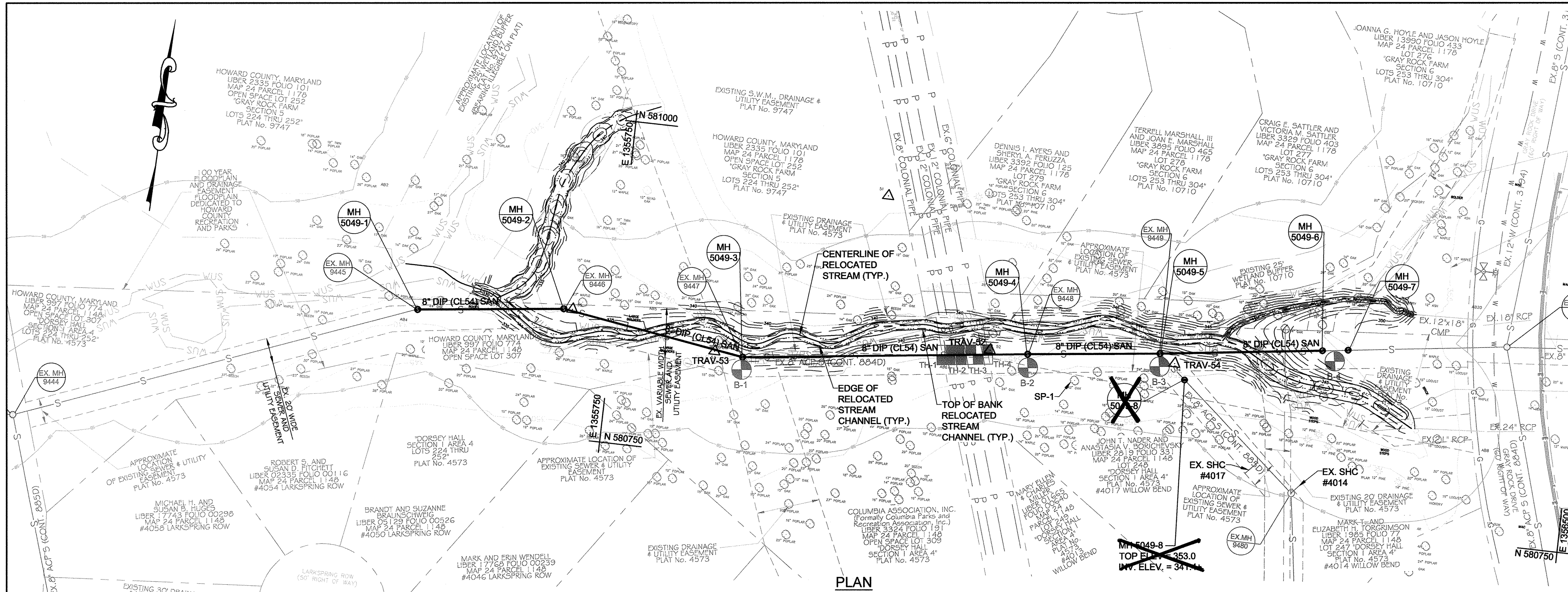
WILLOW BEND SEWER REHABILITATION

CAPITAL PROJECT No. S6268
CONTRACT No. 20-5049

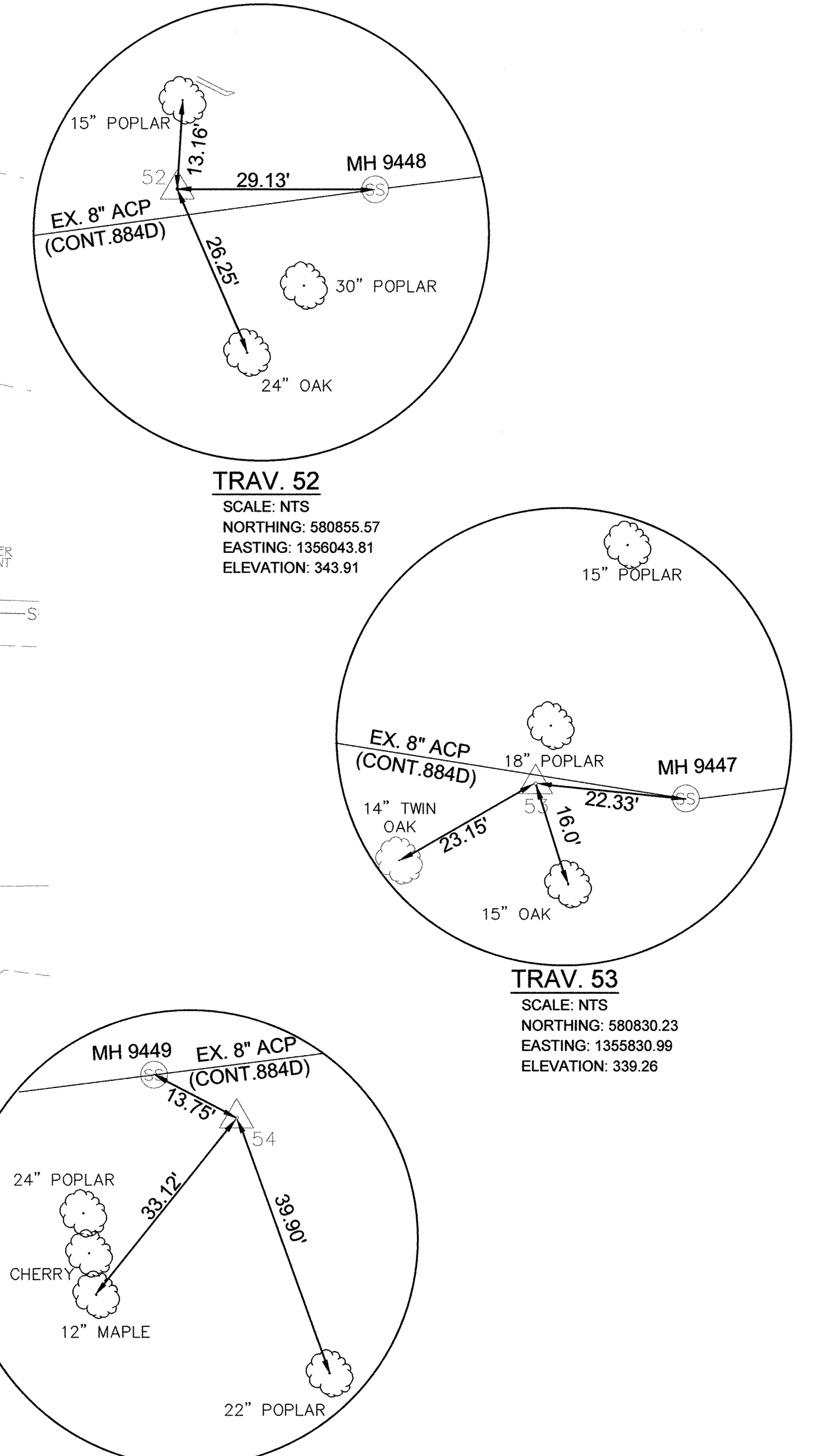
ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET
2 OF 11

KCI TECHNOLOGIES PROJECT NO.: 13122677.59



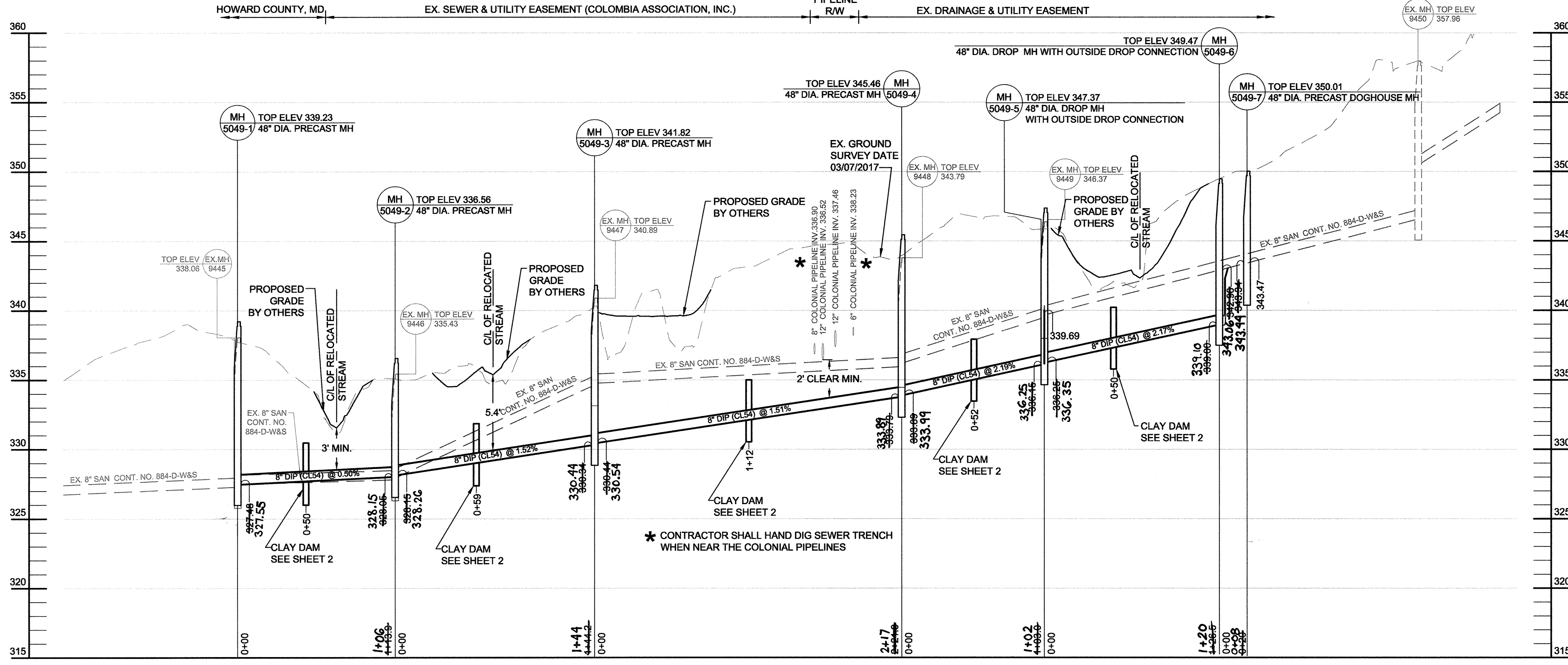
PLAN
SCALE: 1" = 50'



TRAV. 52
SCALE: NTS
NORTHING: 580855.57
EASTING: 1356043.81
ELEVATION: 343.91

TRAV. 53
SCALE: NTS
NORTHING: 580830.23
EASTING: 1356830.99
ELEVATION: 339.26

TRAV. 54
SCALE: NTS
NORTHING: 580861.51
EASTING: 1356187.82
ELEVATION: 347.93



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

MANHOLE STAKEOUT TABLE					
DESCRIPTION	LOCATION	FRAME & COVER	STANDARD DETAIL	NORTHING	EASTING
MH 5049-1		WATER TIGHT	G-5.12 & G-5.52	580836.18	1355597.46
MH 5049-2		WATER TIGHT	G-5.12 & G-5.52	580849.53	1355710.53
MH 5049-3		WATER TIGHT	G-5.12 & G-5.52	580828.01	1355853.16
MH 5049-4		WATER TIGHT	G-5.12 & G-5.52	580855.54	1356073.35
MH 5049-5		WATER TIGHT	G-5.12, G-5.52 & S-1.32(TYPE A)	580867.78	1356175.65
MH 5049-6	EX. 8" ACP S (884D)	WATER TIGHT	G-5.12, G-5.52 & S-1.32(TYPE B)	580884.42	1356301.01
MH 5049-7	EX. 8" ACP S (884D)	WATER TIGHT	G-5.14 & G-5.52	580887.13	1356320.82
MH 5049-8	EX. 8" ACP S (885D)	WATER TIGHT	G-5.14 & G-5.52	580849.74	1356196.87

TEST HOLE SCHEDULE		
NUMBER	UTILITY	INVERT
TH-1	8" COLONIAL PIPELINE	336.90
TH-2	12" COLONIAL PIPELINE	336.52
TH-3	12" COLONIAL PIPELINE	337.46
TH-4	6" COLONIAL PIPELINE	338.23

AS-BUILT
DATE 3/1/2019

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 1/16/2020.

Jul 19, 2018 - 1:56pm User: lewis.jacobson M:\2018\13122677.59\Drawings\C-1 Plan & Profile.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Jay A. ... 7/27/18
DIRECTOR OF PUBLIC WORKS DATE

Thomas P. ... 7/20/19
CHIEF, BUREAU OF ENGINEERING DATE

... 7-24-18
CHIEF, BUREAU OF UTILITIES DATE

... 7/21/18
CHIEF, UTILITY DESIGN DIVISION DATE

KCI
TECHNOLOGIES

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

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STATE OF MARYLAND
Professional Engineer
No. 31363
07/19/2018

DES: JB
DRN: CK
CHK: GW
DATE: JULY 2018

BY: NO. AS-BUILT
REVISION: 3/1/19

SEWER PLAN & PROFILE
MH 5049-1 TO MH 5049-7

600' SCALE MAP NO. 24 BLOCK NO. 15

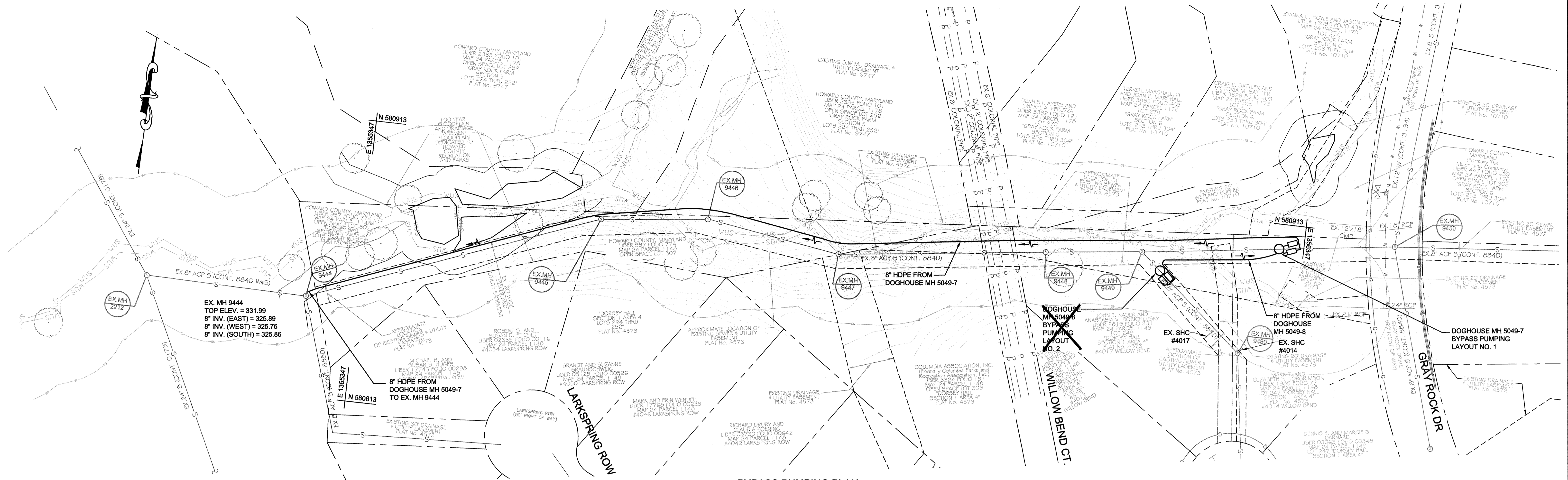
WILLOW BEND
SEWER REHABILITATION

CAPITAL PROJECT NO. S6268
CONTRACT NO. 20-5049

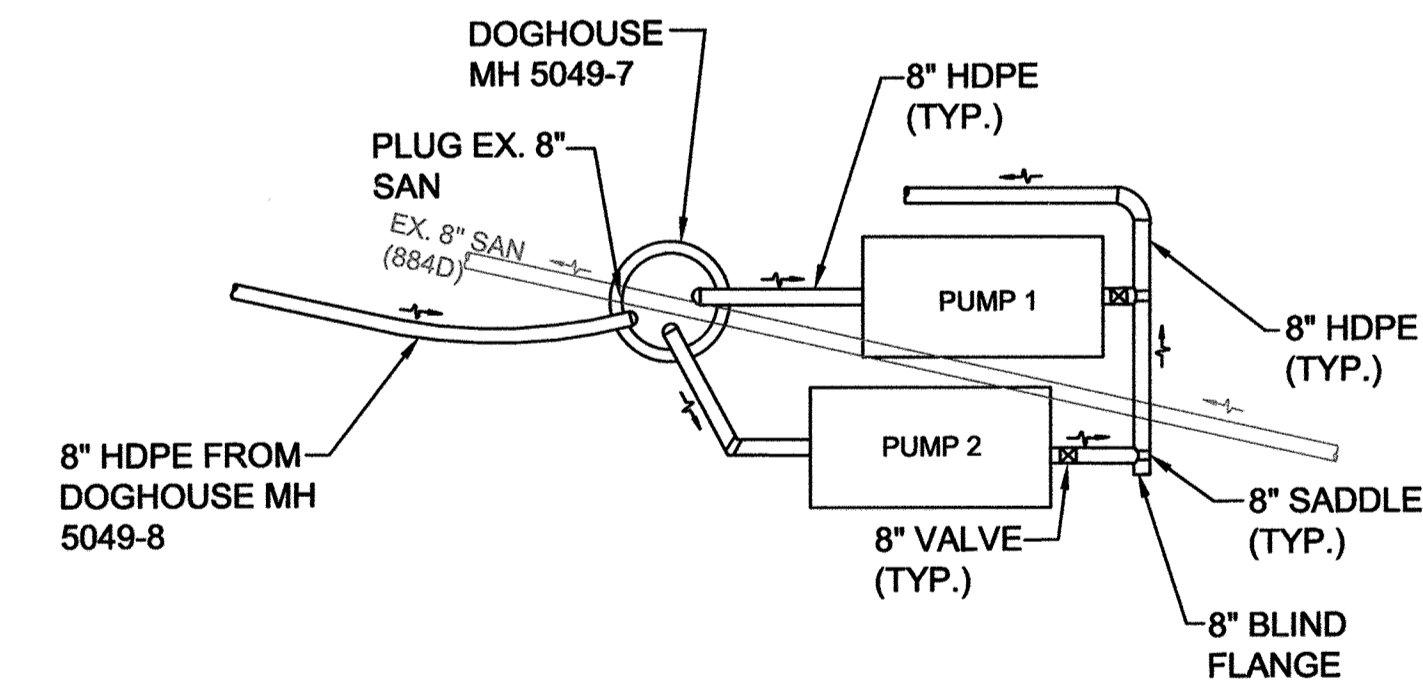
ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

SCALE
AS SHOWN

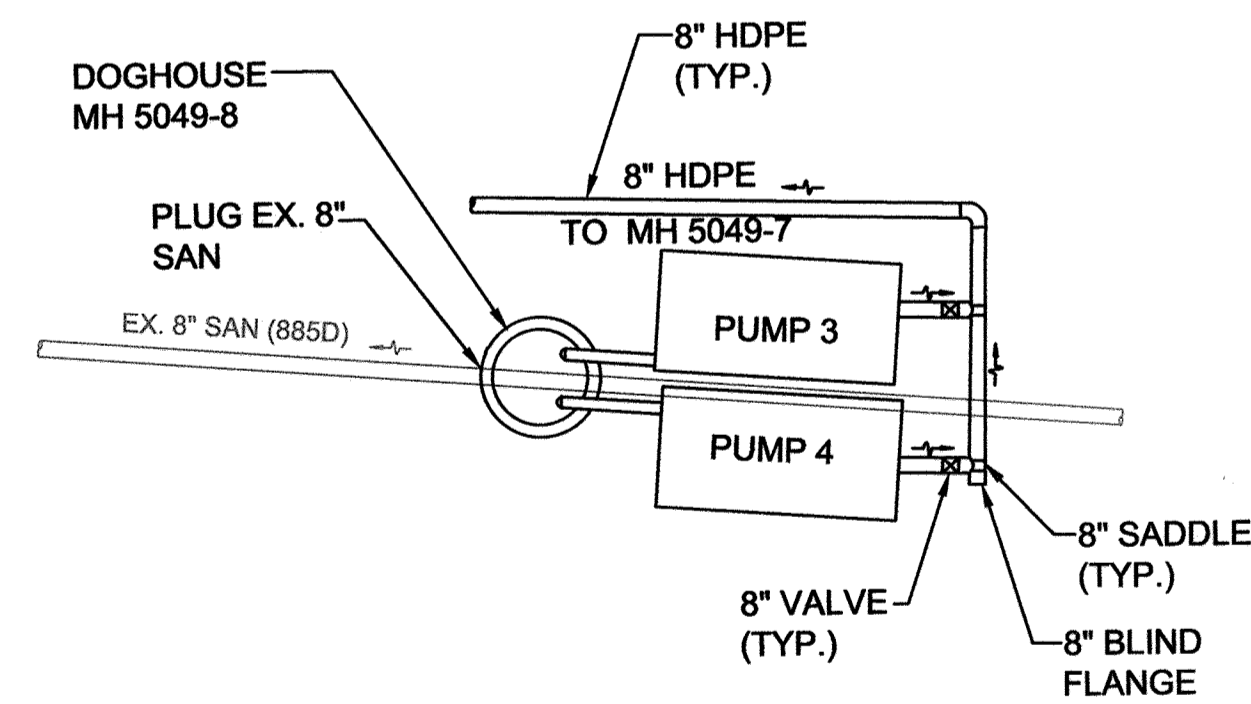
SHEET
3 OF 11



BYPASS PUMPING PLAN
SCALE: 1" = 50'



BYPASS PUMPING LAYOUT NO. 1
SCALE: NOT TO SCALE



BYPASS PUMPING LAYOUT NO. 2
SCALE: NOT TO SCALE

NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGNING, FURNISHING, INSTALLING, OPERATING AND MAINTAINING THE BYPASS SYSTEM, AS PER THE SPECIFICATIONS.
2. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING MANHOLES/VAULTS OF SUFFICIENT SIZE TO ACCOMMODATE ALL SUCTION/DISCHARGE PIPING, AND PROVIDING PUMP PADS FOR PLACING EQUIPMENT.
3. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND CALCULATIONS TO VERIFY DESIGN AND SIZING OF THE BYPASS SYSTEM.
4. THE CONTRACTOR SHALL BE RESPONSIBLE, INCLUDING PAYMENT OF PENALTIES, FOR ANY VIOLATIONS AND SPILLAGE OF SEWAGE.
5. NO STORMWATER SHALL BE ALLOWED TO ENTER POINT OF SUCTION MANHOLES.
6. ALL PUMPS SHALL BE DIESEL POWERED, WITH SOUND ATTENUATION AND SPILL PROTECTION.
7. EACH PUMP SHALL BE FITTED WITH AN INDIVIDUAL SUCTION PIPE. MANIFOLD SUCTION WILL NOT BE ALLOWED.
8. COUPLED, FLANGED OR WELDED HDPE PIPING SHALL BE USED FOR LEAK FREE CONNECTIONS.
9. PUMPING EQUIPMENT SHALL BE MANNED AT ALL TIMES WHEN IN OPERATION.
10. BYPASS PIPE SHALL BE LAID ABOVE GROUND EXCEPT WHERE NOTED.
11. BYPASS PUMP FLOW REQUIREMENT = 1 MGD

AS-BUILT

DATE 3/11/2019

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 1/16/2020.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 7/27/18
DIRECTOR OF PUBLIC WORKS DATE
[Signature] 7-27-18
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 7/20/18
CHIEF, BUREAU OF ENGINEERING DATE
[Signature] 7/20/18
CHIEF, UTILITY DESIGN DIVISION DATE

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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
Professional Engineer
No. 31363
07/19/2018

DES:	JB				
DRN:	CK				
CHK:	GW				
DATE:	JULY 2018	JER	AS-BUILT	3/1/19	
BY:		NO.		REVISION	

**SANITARY SEWER
BYPASS PUMPING PLAN**

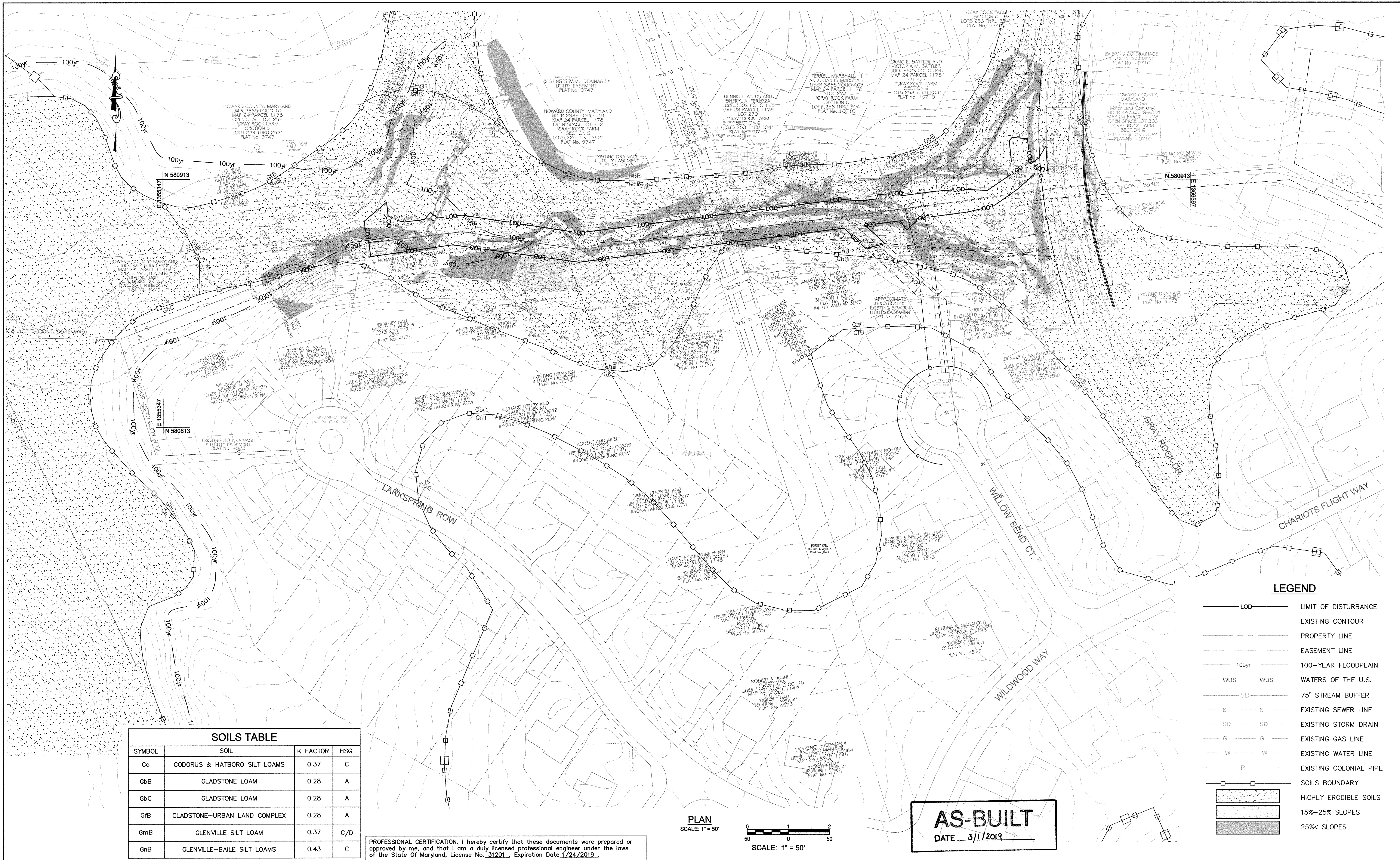
**WILLOW BEND
SEWER REHABILITATION**

CAPITAL PROJECT No. S6268
CONTRACT No. 20-5049

ELECTION DISTRICT NO. 2

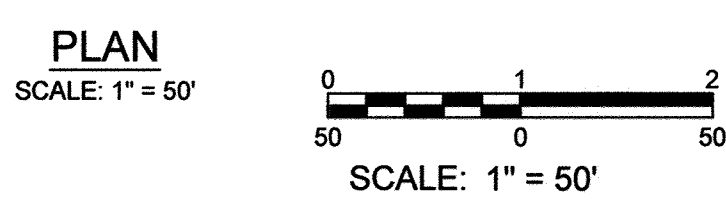
HOWARD COUNTY, MARYLAND

SCALE
AS SHOWN
SHEET
4 OF 11



SOILS TABLE			
SYMBOL	SOIL	K FACTOR	HSG
Co	CODORUS & HATBORO SILT LOAMS	0.37	C
GbB	GLADSTONE LOAM	0.28	A
GbC	GLADSTONE LOAM	0.28	A
GfB	GLADSTONE-URBAN LAND COMPLEX	0.28	A
GmB	GLENVILLE SILT LOAM	0.37	C/D
GnB	GLENVILLE-BAILE SILT LOAMS	0.43	C

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. 31201, Expiration Date 1/24/2019.



AS-BUILT
DATE 3/1/2019

LEGEND	
LOD	LIMIT OF DISTURBANCE
(Dashed line)	EXISTING CONTOUR
(Solid line)	PROPERTY LINE
(Dashed line)	EASEMENT LINE
100yr	100-YEAR FLOODPLAIN
WUS	WATERS OF THE U.S.
SB	75' STREAM BUFFER
S	EXISTING SEWER LINE
SD	EXISTING STORM DRAIN
G	EXISTING GAS LINE
W	EXISTING WATER LINE
P	EXISTING COLONIAL PIPE
(Square symbol)	SOILS BOUNDARY
(Stippled area)	HIGHLY ERODIBLE SOILS
(Light gray area)	15%-25% SLOPES
(Dark gray area)	25%< SLOPES

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Levin Jackson 7/20/18
DIRECTOR OF PUBLIC WORKS DATE

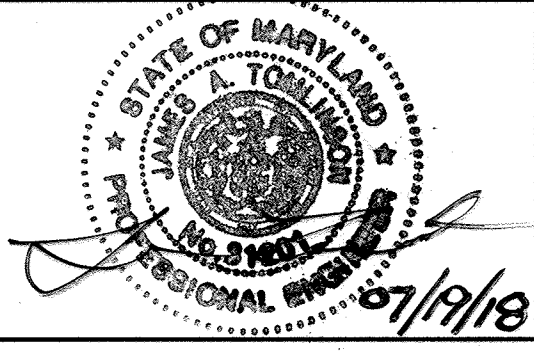
Thomas S. ... 7/24/18
CHIEF, BUREAU OF UTILITIES DATE

James & ... 7/20/18
CHIEF, BUREAU OF ENGINEERING DATE

... 7/24/18
CHIEF, UTILITY DESIGN DIVISION DATE

KCI TECHNOLOGIES
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936 Ridgebrook Road
Sparks, MD 21152
Phone: (410) 316-7800
Fax: (410) 316-7811
www.kci.com



DES: BE	
DRN: KP	
CHK: JT	
DATE: JULY 2018	
BY NO.	
REVISION	
DATE	

ENVIRONMENTAL RESOURCES MAP

600' SCALE MAP NO. 24 BLOCK NO. 15

WILLOW BEND SEWER REHABILITATION

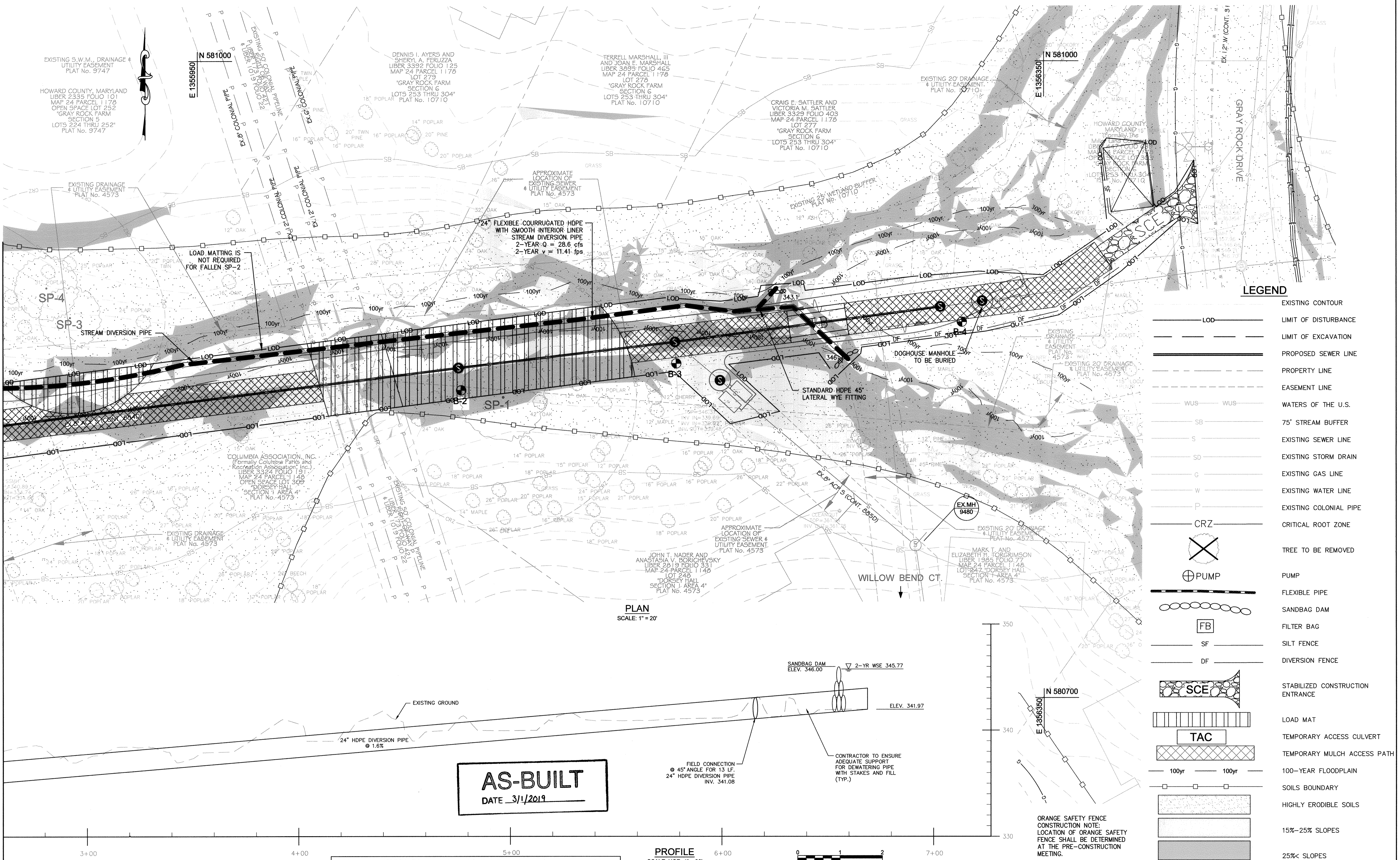
CAPITAL PROJECT No. S6268
CONTRACT No. 20-5049

ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 5 OF 11

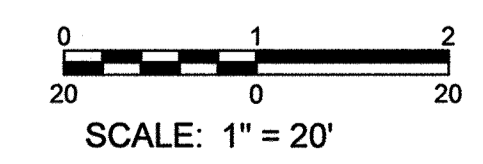
KCI TECHNOLOGIES PROJECT No.: 13122677.59

MATCHLINE - SEE SHEET 7



PLAN SCALE: 1" = 20'

PROFILE SCALE: HOR: 1" = 20' VERT: 1" = 4'



AS-BUILT
DATE 3/1/2019

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. 31201, Expiration Date 1/24/2019.

LEGEND

- LOD ——— EXISTING CONTOUR
- — — — — LIMIT OF DISTURBANCE
- — — — — LIMIT OF EXCAVATION
- — — — — PROPOSED SEWER LINE
- — — — — PROPERTY LINE
- — — — — EASEMENT LINE
- WUS — WUS — WATERS OF THE U.S.
- SB — — — 75' STREAM BUFFER
- S — — — — EXISTING SEWER LINE
- SD — — — — EXISTING STORM DRAIN
- G — — — — EXISTING GAS LINE
- W — — — — EXISTING WATER LINE
- P — — — — EXISTING COLONIAL PIPE
- CRZ — — — CRITICAL ROOT ZONE
- ⊗ TREE TO BE REMOVED
- ⊕ PUMP
- ○ ○ ○ ○ FLEXIBLE PIPE
- ○ ○ ○ ○ SANDBAG DAM
- [FB] FILTER BAG
- SF — — — SILT FENCE
- DF — — — DIVERSION FENCE
- [SCE] STABILIZED CONSTRUCTION ENTRANCE
- [TAC] LOAD MAT
- [TAC] TEMPORARY ACCESS CULVERT
- [TAC] TEMPORARY MULCH ACCESS PATH
- 100yr — 100yr — 100-YEAR FLOODPLAIN
- □ □ □ □ SOILS BOUNDARY
- ▨ HIGHLY ERODIBLE SOILS
- ▨ 15%—25% SLOPES
- ▨ 25%< SLOPES

Jul 19, 2018 - 2:01pm User: kevin.jackson File: 2012\13122677.59\Drawings\AS-Built-WillowBend.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Kevin Jackson 7/20/18
DIRECTOR OF PUBLIC WORKS DATE

Thomas Butler 7/20/18
CHIEF, BUREAU OF ENGINEERING DATE

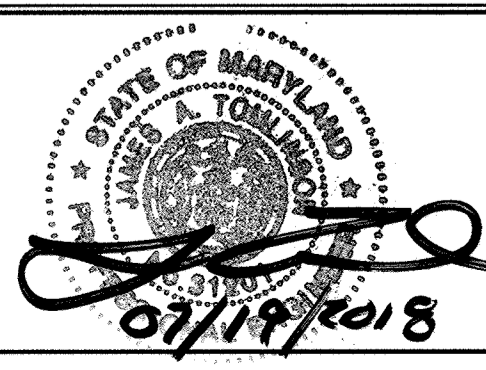
Kevin Jackson 7-21-18
CHIEF, BUREAU OF UTILITIES DATE

Kevin Jackson 7/20/18
CHIEF, UTILITY DESIGN DIVISION DATE

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Fax: (410) 316-7817
www.kci.com



DES: BE					
DRN: KP					
CHK: JT					
DATE: JULY 2018	BY	NO.	REVISION	DATE	

EROSION & SEDIMENT CONTROL PLAN

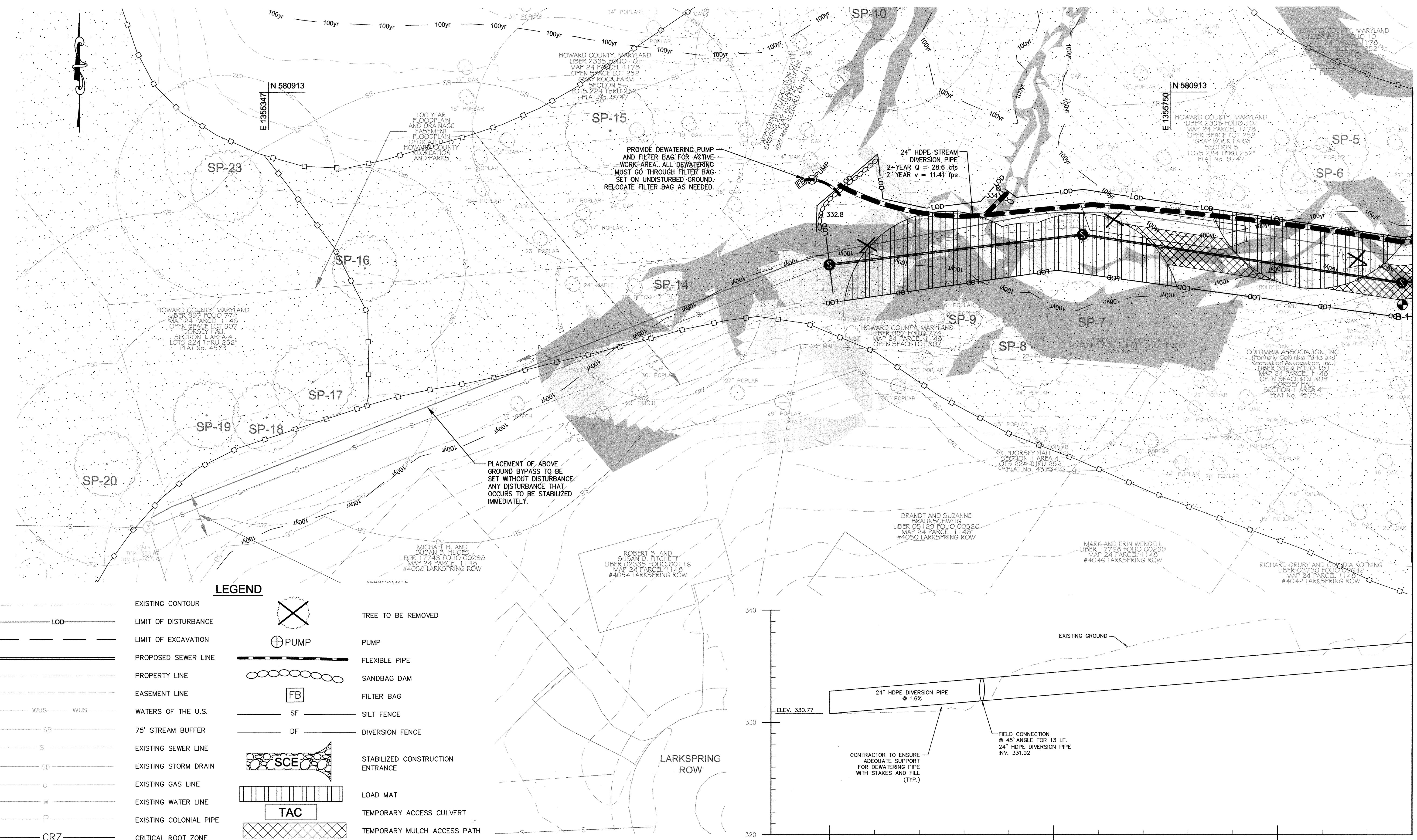
600' SCALE MAP NO. 24 BLOCK NO. 15

WILLOW BEND SEWER REHABILITATION

CAPITAL PROJECT No. S6268
CONTRACT No. 20-5049

ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

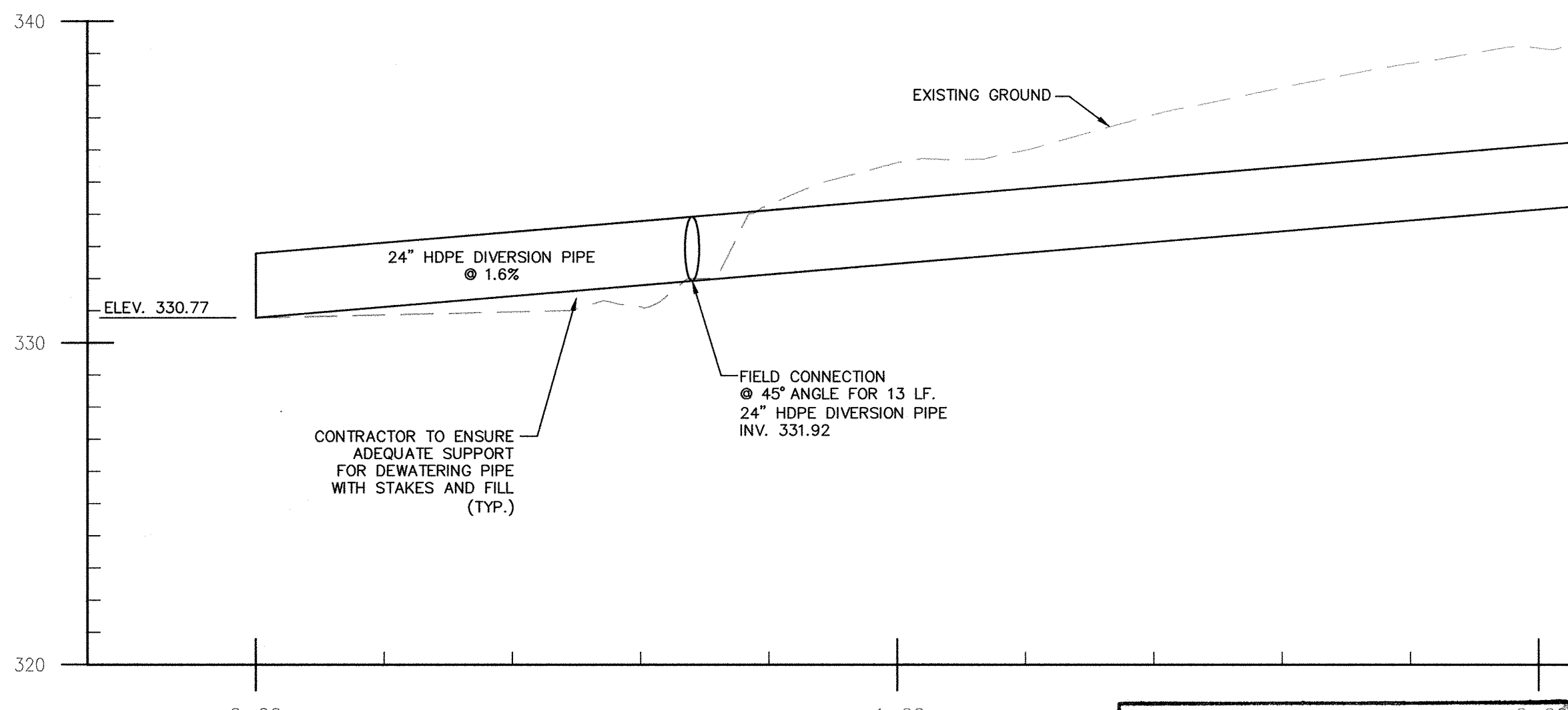
SCALE AS SHOWN SHEET 6 OF 11



LEGEND

— LOD —	EXISTING CONTOUR		TREE TO BE REMOVED
- - - - -	LIMIT OF DISTURBANCE		PUMP
— — — — —	LIMIT OF EXCAVATION	— — — — —	FLEXIBLE PIPE
— — — — —	PROPOSED SEWER LINE		SANDBAG DAM
— — — — —	PROPERTY LINE		FILTER BAG
— — — — —	EASEMENT LINE	— SF —	SILT FENCE
— WUS —	WATERS OF THE U.S.	— DF —	DIVERSION FENCE
— SB —	75' STREAM BUFFER		STABILIZED CONSTRUCTION ENTRANCE
— S —	EXISTING SEWER LINE		LOAD MAT
— SD —	EXISTING STORM DRAIN		TEMPORARY ACCESS CULVERT
— G —	EXISTING GAS LINE		TEMPORARY MULCH ACCESS PATH
— W —	EXISTING WATER LINE		100-YEAR FLOODPLAIN
— P —	EXISTING COLONIAL PIPE		SOILS BOUNDARY
— CRZ —	CRITICAL ROOT ZONE		HIGHLY ERODIBLE SOILS
	15%-25% SLOPES		
	25%+ SLOPES		

PLAN SCALE: 1" = 20'



PROFILE SCALE: HOR: 1" = 20' VERT: 1" = 4'

AS-BUILT
DATE 3/11/2019

ORANGE SAFETY FENCE CONSTRUCTION NOTE:
LOCATION OF ORANGE SAFETY FENCE SHALL BE DETERMINED AT THE PRE-CONSTRUCTION MEETING.

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. 31201, Expiration Date 1/24/2019.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John J. ... 7/27/18
DIRECTOR OF PUBLIC WORKS DATE

Thomas B. ... 7/20/18
CHIEF, BUREAU OF ENGINEERING DATE

... 7/20/18
CHIEF, UTILITY DESIGN DIVISION DATE

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STATE OF MARYLAND
Professional Engineer Seal

... 07/19/2018

DES: BE			
DRN: KP			
CHK: JT			
DATE: JULY 2018	BY: NO.	REVISION	DATE

EROSION & SEDIMENT CONTROL PLAN

600' SCALE MAP NO. 24 BLOCK NO. 15

WILLOW BEND SEWER REHABILITATION

CAPITAL PROJECT No. S6268
CONTRACT No. 20-5049

ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN SHEET 7 OF 11

MATCHLINE - SEE SHEET 6

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:	0.67	Acres
Area Disturbed:	0.67	Acres
Area to be roofed or paved:	0.00	Acres
Area to be vegetatively stabilized:	0.67	Acres
Total Cut:	680.00	Cu. Yds.
Total Fill:	680.00	Cu. Yds.
Offsite waste/borrow area location:	SITE WITH AN ACTIVE GRADING PERMIT (TBD AT CONSTRUCTION MEETING)	
- 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 CID. Unless otherwise specified and approved by the CID, 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 IIIIP 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. 8/2015

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

- Soil Preparation
 - Temporary Stabilization
 - 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.
 - Apply fertilizer and lime as prescribed on the plans.
 - Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
 - Permanent Stabilization
 - A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
 - Soil pH between 6.0 and 7.0.
 - Soluble salts less than 500 parts per million (ppm).
 - 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.
 - Soil contains 1.5 percent minimum organic matter by weight.
 - Soil contains sufficient pore space to permit adequate root penetration.
 - Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
 - 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.

B.12

B.14

- Soil Amendments as specified on the approved plan or as indicated by the results of a soil test.
- Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.

B. Topsoiling

- 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.
- 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.
- Topsoiling is limited to areas having 2:1 or flatter slopes where:
 - The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
 - 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.
 - The original soil to be vegetated contains material toxic to plant growth.
 - The soil is so acidic that treatment with limestone is not feasible.
- Areas having slopes steeper than 2:1 require special consideration and design.
- Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
 - 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.
 - 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.
 - 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.
- Topsoil Application
 - Erosion and sediment control practices must be maintained when applying topsoil.
 - 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.
 - 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

B.13

and seedbed preparation.
C. Soil Amendments (Fertilizer and Lime Specifications)

- 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.
- 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.
- 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.
- 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.
- 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.

SEQUENCE OF CONSTRUCTION



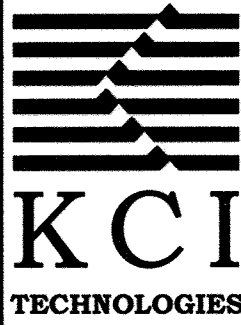

- THE MARYLAND SURFACE WATER USE DESIGNATION FOR THE LITTLE PATUXENT RIVER AND ALL ITS TRIBUTARIES IN THIS AREA IS "USE IV-P", PURSUANT TO WHICH THEY ARE PROTECTED AS "RECREATIONAL TROUT WATERS AND PUBLIC WATER SUPPLY" (COMAR 26.08.02.08). DUE TO THIS DESIGNATION, IN-STREAM WORK MAY NOT BE CONDUCTED DURING THE PERIOD OF MARCH 1 THROUGH MAY 31, INCLUSIVE, DURING ANY YEAR (COMAR 26.08.02.11).
- THE MDE PERMIT/TRACKING NUMBER IS 17-NT-3267/201761581.
- THE CONTRACTOR SHALL CALL MISS UTILITY (800-257-7777) AT LEAST FIVE (5) WORKING DAYS PRIOR TO COMMENCING ANY WORK. 5 DAYS
- STAKEOUT LIMITS OF DISTURBANCE AND MARK TREES TO BE REMOVED. 5 DAYS
- CONDUCT A PRE-CONSTRUCTION MEETING AND DETERMINE THE LOCATION OF THE ORANGE SAFETY FENCE. NOTIFY THE DEPARTMENT OF INSPECTIONS AND PERMITS AT LEAST 5 DAYS BEFORE COMMENCING WORK AT (410)-222-7780. WORK MAY NOT COMMENCE UNTIL THE PERMITTEE OR THE RESPONSIBLE PERSONNEL HAVE MET ON SITE WITH THE SEDIMENT AND EROSION CONTROL INSPECTOR TO REVIEW THE APPROVED PLANS. 3 DAYS
- EXISTING TOPOGRAPHY MUST BE FIELD VERIFIED FOR THE SEDIMENT CONTROL INSPECTOR PRIOR TO COMMENCING WORK. 2 DAYS
- INSTALL STABILIZED CONSTRUCTION ENTRANCE, TEMPORARY STAGING/STOCKPILE AREA, AND SILT FENCE AS SHOWN ON THE PLAN. 1 DAY
- INSTALL STREAM DIVERSION PIPE WITH TEMPORARY ACCESS CULVERT FROM DOWNSTREAM TO UPSTREAM AS SHOWN ON PLANS. TRENCH, PARTIAL TRENCH, OR SIDE STAKE THE PIPE TO SECURE PIPE IN PLACE. 5 DAYS
- ACTIVATE STREAM DIVERSION BY INSTALLING UPSTREAM AND DOWNSTREAM SANDBAG DIVERSIONS. 2 DAYS
- INSTALL EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN ON THE PLAN INCLUDING PUMP-AROUND PRACTICE, FILTER BAG, AND LOAD MATTING. 2 DAYS
- ONCE SEDIMENT CONTROLS HAVE BEEN INSTALLED, CONTACT THE INSPECTOR FOR APPROVAL OF SEDIMENT CONTROL INSTALLATION PRIOR TO COMMENCING WORK. 1 DAY
- CONSTRUCT SEWER PER APPROVED PLAN FOLLOWING SEQUENCE OF CONSTRUCTION ON SHEET 2. ONLY DISTURB THAT AREA WHICH CAN BE BACKFILLED AND STABILIZED IN ONE WORKING DAY. DEWATER TRENCH AREA USING A FILTER BAG AS NEEDED TO ADDRESS SEEPAGE. ALL DISTURBED AREAS SHALL BE BACKFILLED AND STABILIZED OR COVERED BY A STEEL PLATE AT THE END OF EACH WORK DAY. 15 DAYS
- PERMANENTLY STABILIZE VEGETATED AREAS. ENTIRE LOD, OUTSIDE OF WATERS OF THE US, SHALL BE STABILIZED WITH SEED AND SOIL STABILIZATION MATTING. 5 DAYS
- AFTER THE SITE IS STABILIZED, REMOVE THE SEDIMENT CONTROLS WITH THE INSPECTOR'S APPROVAL. 1 DAY
- AFTER THE SITE IS STABILIZED AND APPROVED, REMOVE SEWER BYPASS. 2 DAYS
- DEMOBILIZE FROM SITE. STABILIZE ALL AREAS DISTURBED BY THIS PROCESS. LEAVE STREAM DIVERSION PIPE IN PLACE. 1 DAY

KCI TECHNOLOGIES PROJECT NO.: 13122677.59

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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. 31201, Expiration Date 1/24/2019.

AS-BUILT
DATE 3/1/2019

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  7/20/18 DIRECTOR OF PUBLIC WORKS DATE  7-24-18 CHIEF, BUREAU OF UTILITIES DATE		 ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS 936 Ridgeway Road Sparks, MD 21152 PHONE: (410) 316-7800 FAX: (410) 316-7817 www.kci.com		 DES: BE DRN: KP CHK: JT DATE: JULY 2018		EROSION & SEDIMENT CONTROL NOTES 600' SCALE MAP NO. 24 BLOCK NO. 15		WILLOW BEND SEWER REHABILITATION CAPITAL PROJECT NO. S6268 CONTRACT No. 20-5049 ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND		SCALE AS SHOWN SHEET 8 OF 11
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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. Cultipacker 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.

B.15

- 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, Petrosel, 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 should 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 mixtures listed in Table B.1 for the appropriate Plant Hardness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. 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.

Table B.1: Temporary Seeding for Site Stabilization

Plant Species	Seeding Rate ^{1/}		Seeding Depth ^{2/} (inches)	Recommended Seeding Dates by Plant Hardness Zone ^{3/}		
	lb/acre	lb/1000 ft ²		5b and 6a	6b	7a and 7b
Cool-Season Grasses						
Annual Ryegrass (<i>Lolium perenne ssp. multiflorum</i>)	40	1.0	0.5	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Barley (<i>Hordeum vulgare</i>)	96	2.2	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Oats (<i>Avena sativa</i>)	72	1.7	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Wheat (<i>Triticum aestivum</i>)	120	2.8	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Cereal Rye (<i>Secale cereale</i>)	112	2.8	1.0	Mar 15 to May 31; Aug 1 to Oct 31	Mar 1 to May 15; Aug 1 to Nov 15	Feb 15 to Apr 30; Aug 15 to Dec 15
Warm-Season Grasses						
Foxtail Millet (<i>Setaria italica</i>)	30	0.7	0.5	Jun 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14
Pearl Millet (<i>Pennisetum glaucum</i>)	20	0.5	0.5	Jun 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14

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.
 2/ Also are the recommended nurse crop for warm-season grasses.
 3/ For sandy soils, plant seeds at twice the depth listed above.
 4/ The planting dates listed are averages for each Zone and may require adjustment to reflect local conditions, especially near the boundaries of the zone.

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B-4-5 STANDARDS AND SPECIFICATIONS

FOR
PERMANENT STABILIZATION
Definition
To stabilize disturbed soils with permanent vegetation.
Purpose
To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.
Conditions Where Practice Applies
Exposed soils where ground cover is needed for 6 months or more.
Criteria

- A. Seed Mixtures
 - 1. General Use
 - a. Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
 - b. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting.
 - c. For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency.
 - d. For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 ½ pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.
 - 2. Turfgrass Mixtures
 - a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
 - b. Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
 - i. Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
 - ii. Kentucky Bluegrass/Perennial Ryegrass: Full Sun Mixture: For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
 - iii. Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes: Certified Tall Fescue Cultivars 95 to 100 percent, Certified Kentucky Bluegrass Cultivars 0 to 5 percent. Seeding Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.
 - iv. Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes: Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seeding Rate: 1½ to 3 pounds per 1000 square feet.

B.21

Notes:
 Select turfgrass varieties from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland"
 Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line.

- c. Ideal Times of Seeding for Turf Grass Mixtures
 - Western MD: March 15 to June 1, August 1 to October 1 (Hardiness Zones: 5b, 6a)
 - Central MD: March 1 to May 15, August 15 to October 15 (Hardiness Zone: 6b)
 - Southern MD, Eastern Shore: March 1 to May 15, August 15 to October 15 (Hardiness Zones: 7a, 7b)

- d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the areas to prepare a proper seedbed. Remove stones and debris over 1½ inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.
- e. If soil moisture is deficient, supply new seedings with adequate water for plant growth (½ to 1 inch every 3 to 4 days depending on soil texture) until they are firmly established. This is especially true when seedings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

Permanent Seeding Summary

No.	Species	Application Rate (lb/acre)	Seeding Dates	Seeding Depths	Fertilizer Rate (10-20-20)			Lime Rate
					N	P ₂ O ₅	K ₂ O	
Hardness Zone (from Figure B.3): 7a Seed Mixture (from Table B.3): 1								
1	Switch Grass	10	Feb. 15 to Apr. 30	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)
	Creeping Red Fescue	15	May 1 to May 31	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)
	Partridge Pea	4	May 31 to May 31	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)
5	Creeping Red Fescue	20	Feb. 15 to Apr. 30	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)
	Redtop	1	Aug. 15 to Oct. 31	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)
	Flatpea	15	Nov. 1 to Nov. 30	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)

EROSION & SEDIMENT CONTROL NOTES

B-4-8 STANDARDS AND SPECIFICATIONS

FOR
STOCKPILE AREA
Definition
A mound or pile of soil protected by appropriately designed erosion and sediment control measures.
Purpose
To provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and changes to drainage patterns.
Conditions Where Practice Applies
Stockpile areas are utilized when it is necessary to salvage and store soil for later use.
Criteria

1. The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
2. The footprint of the stockpile must be sized to accommodate the anticipated volume of material and based on a side slope ratio no steeper than 2:1. Benching must be provided in accordance with Section B-3 Land Grading.
3. Runoff from the stockpile area must drain to a suitable sediment control practice.
4. Access the stockpile area from the upgrade side.
5. Clear water runoff into the stockpile area must be minimized by use of a diversion device such as an earth dike, temporary swale or diversion fence. Provisions must be made for discharging concentrated flow in a non-erosive manner.
6. Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment control practice must be used to intercept the discharge.
7. Stockpiles must be stabilized in accordance with the 3/7 day stabilization requirement as well as Standard B-4-1 Incremental Stabilization and Standard B-4-4 Temporary Stabilization.
8. If the stockpile is located on an impervious surface, a liner should be provided below the stockpile to facilitate cleanup. Stockpiles containing contaminated material must be covered with impermeable sheeting.

Maintenance

The stockpile area must continuously meet the requirements for Adequate Vegetative Establishment in accordance with Section B-4 Vegetative Stabilization. Side slopes must be maintained at no steeper than a 2:1 ratio. The stockpile area must be kept free of erosion. If the vertical height of a stockpile exceeds 20 feet for 2:1 slopes, 30 feet for 3:1 slopes, or 40 feet for 4:1 slopes, benching must be provided in accordance with Section B-3 Land Grading.

B.43

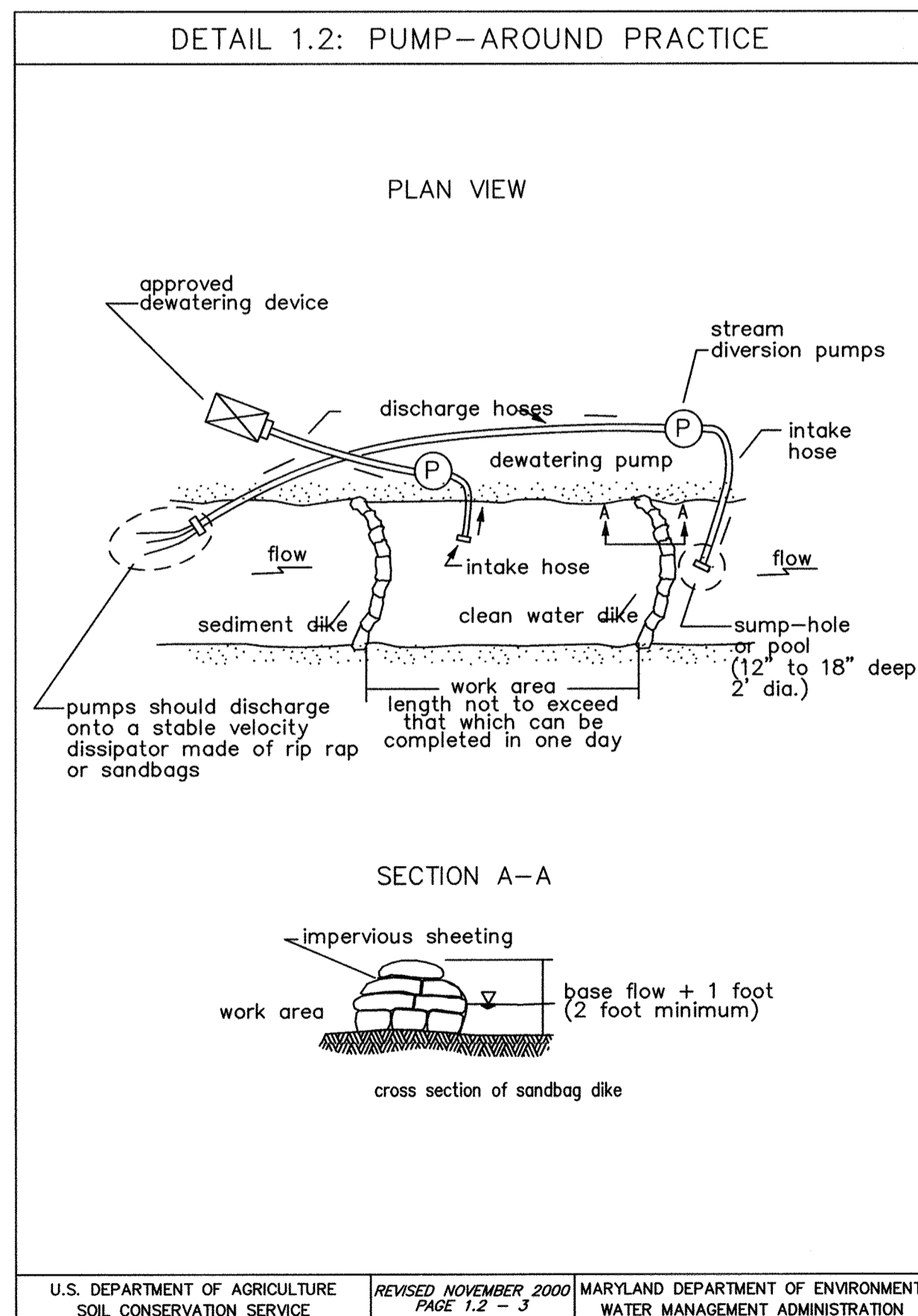
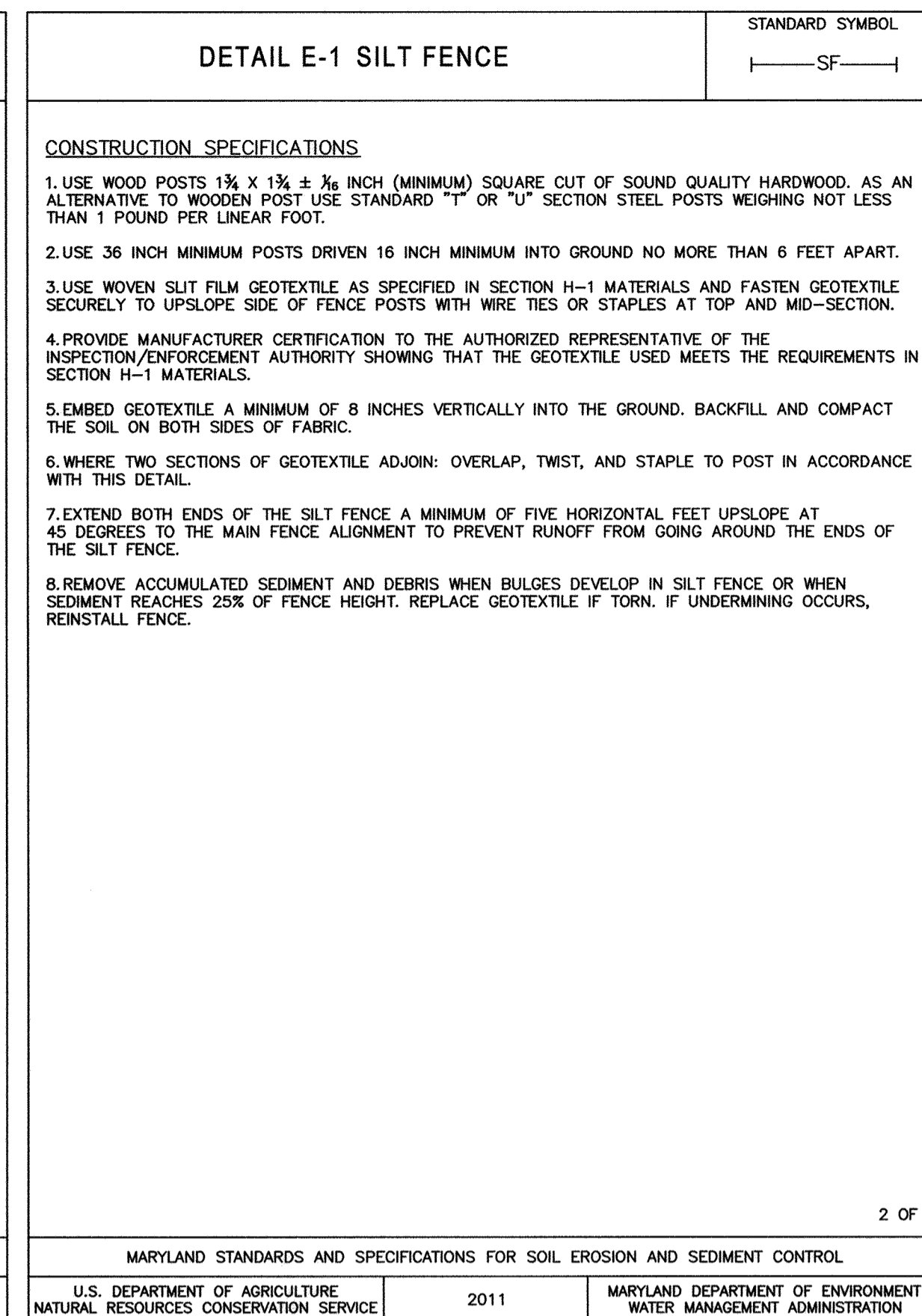
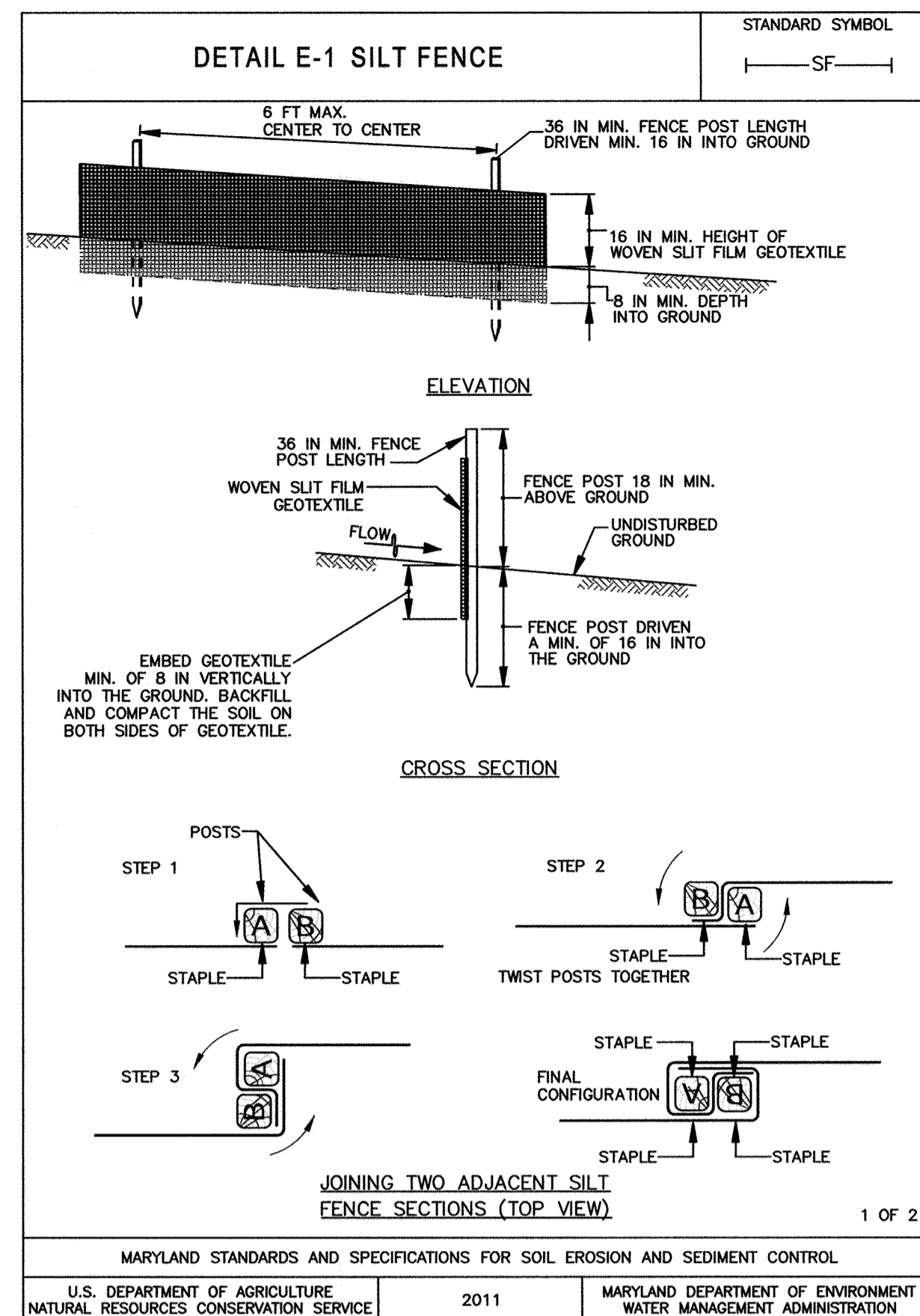
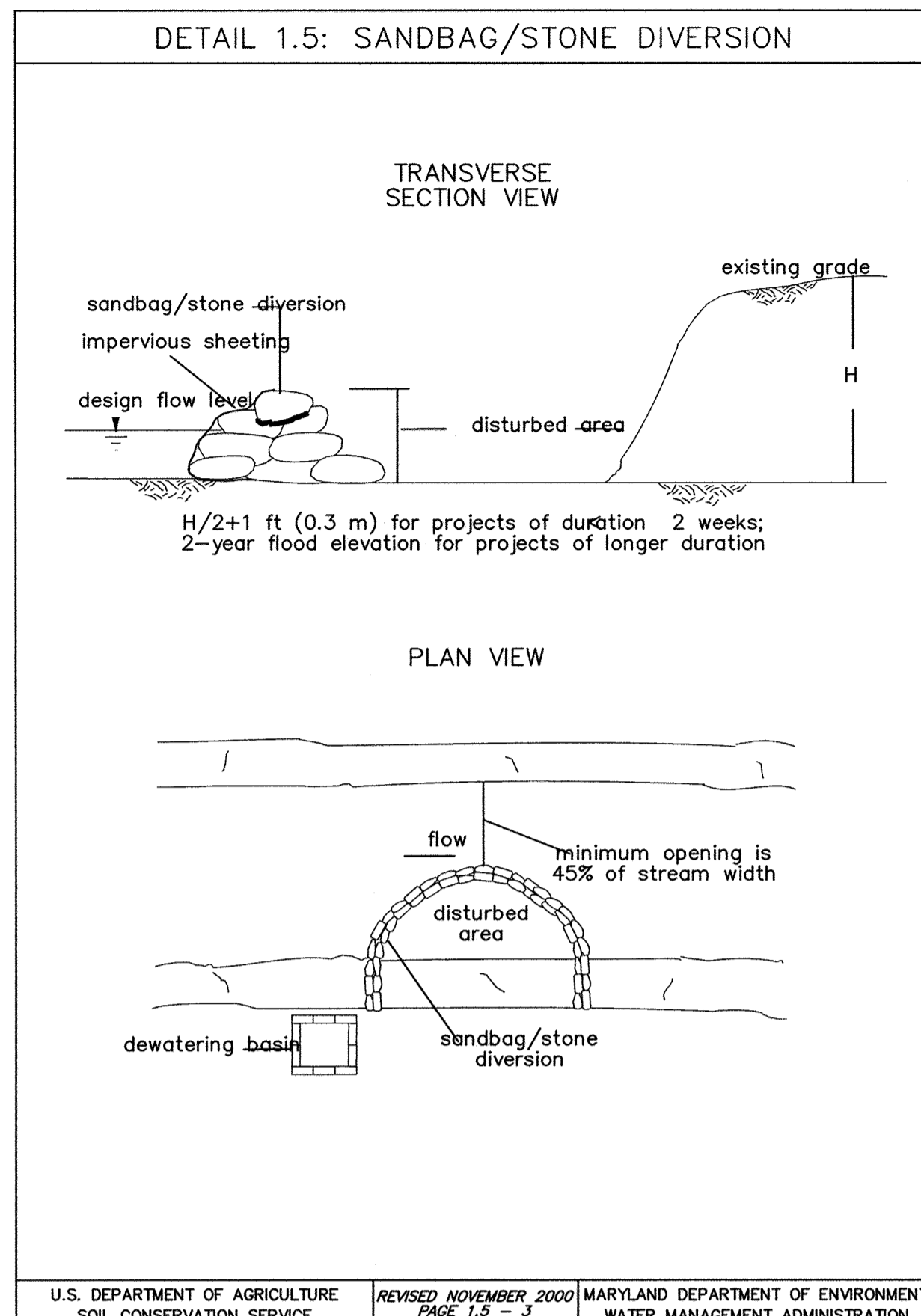
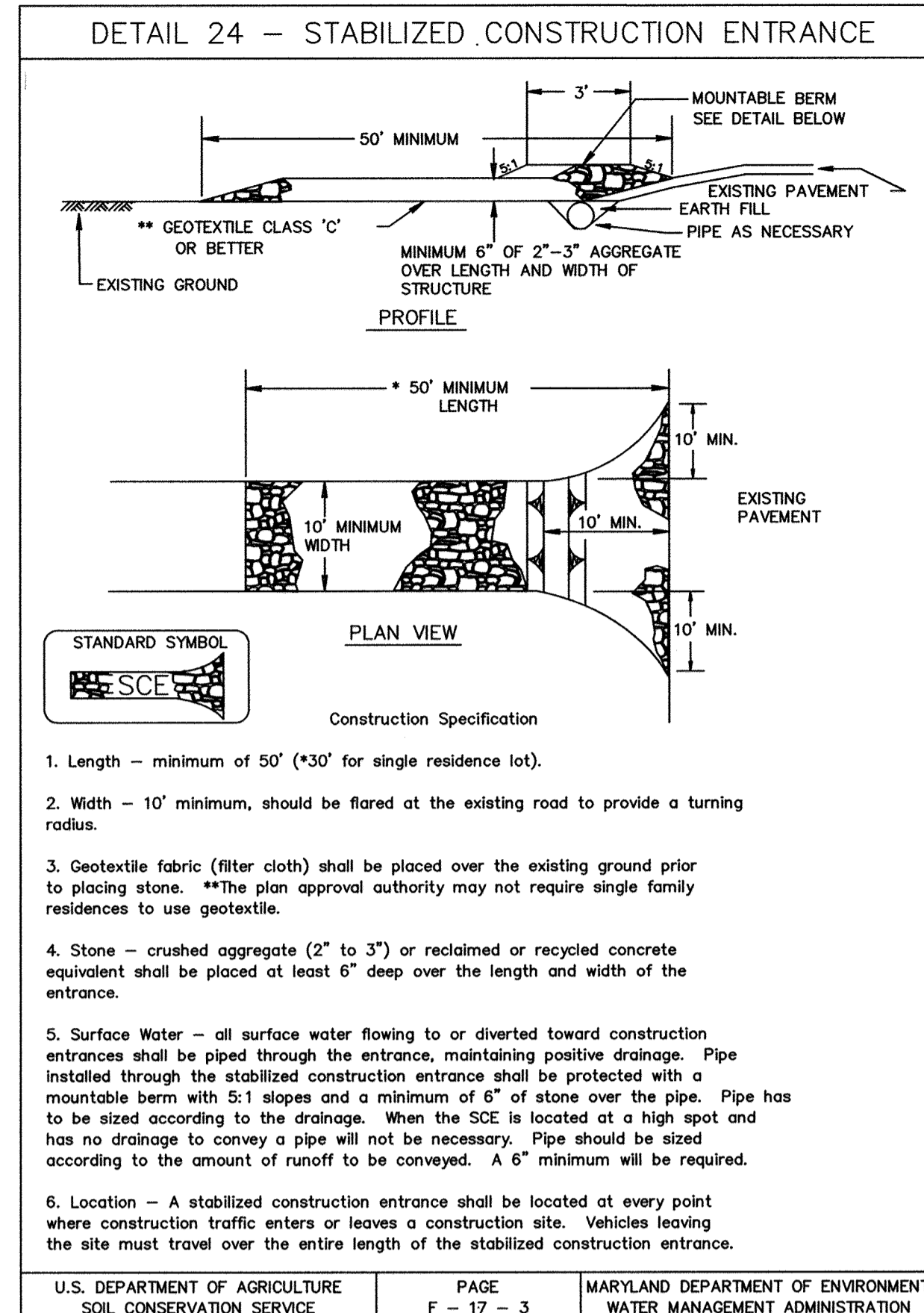
**Marland Department of the Environment
Best Management Practices for Working in Nontidal Wetlands, the Nontidal Wetland Buffer, Waters of the State and the 100-Year Floodplain**

1. No excess fill, construction material, or debris shall be stockpiled or stored in nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
2. Place materials in a location and manner that does not adversely impact surface or subsurface water flow into or out of nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
3. Do not use the excavated material as backfill if it contains waste metal products, unsightly debris, toxic material, or any other deleterious substance. If additional backfill is required, use clean material free of waste metal products, toxic material, or any other deleterious substance.
4. Place heavy equipment on mats or suitably operate the equipment to prevent damage to nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
5. Repair and maintain any serviceable structure or fill so there is no permanent loss of nontidal wetlands, nontidal wetland buffers, or waterways, or permanent modification of the 100-year floodplain in excess of that lost under the originally authorized structure or fill.
6. Rectify any nontidal wetlands, wetland buffers, waterways, or 100-year floodplain temporarily impacted by any construction.
7. All stabilization in the nontidal wetland and nontidal wetland buffer shall consist of the following species: Annual Ryegrass (*Lolium multiflorum*), Millet (*Setaria italica*), Barley (*Hordeum sp.*), Oats (*Avena sp.*), and/or Rye (*Secale cereale*). These species will allow for the stabilization of the site while also allowing for the voluntary revegetation of natural wetland species. Other non-persistent vegetation may be acceptable, but must be approved by the Nontidal Wetlands and Waterways Division. **Kentucky 31 fescue shall not be utilized in wetland or buffer areas.** The area should be seeded and mulched to reduce erosion after construction activities have been completed.
8. After installation has been completed, make post-construction grades and elevations the same as the original grades and elevations in temporarily impacted areas.
9. To protect aquatic species, in-stream work is prohibited as determined by the classification of the stream.
 - Use 1 waters: In-stream work shall not be conducted during the period March 1 through June 15, inclusive, during any year.
10. Stormwater runoff from impervious surfaces shall be controlled to prevent the washing of debris into the waterway.
11. Culverts shall be constructed and any riprap placed so as not to obstruct the movement of aquatic species, unless the purpose of the activity is to impound water.

AS-BUILT
DATE 3/1/2019

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 				WILLOW BEND SEWER REHABILITATION CAPITAL PROJECT No. S6268 CONTRACT No. 20-5049 ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND				SCALE AS SHOWN SHEET
DATE: JULY 2018 BY: NO. _____ REVISION _____ DATE: _____				600' SCALE MAP NO. <u>24</u> BLOCK NO. <u>15</u>				9 of 11

KCI TECHNOLOGIES PROJECT NO.: 13122677.59



MWGC 1.2: PUMP-AROUND PRACTICE

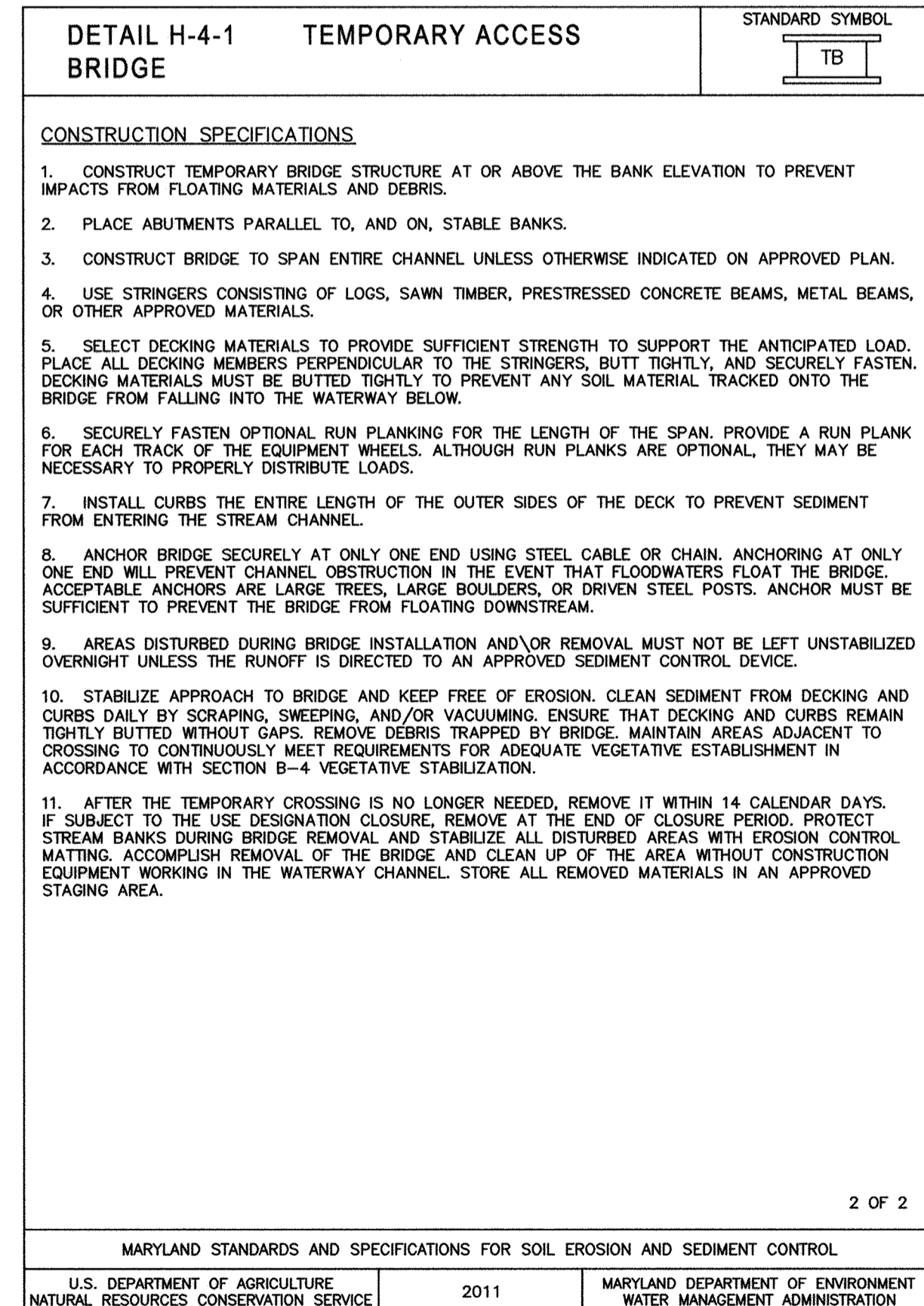
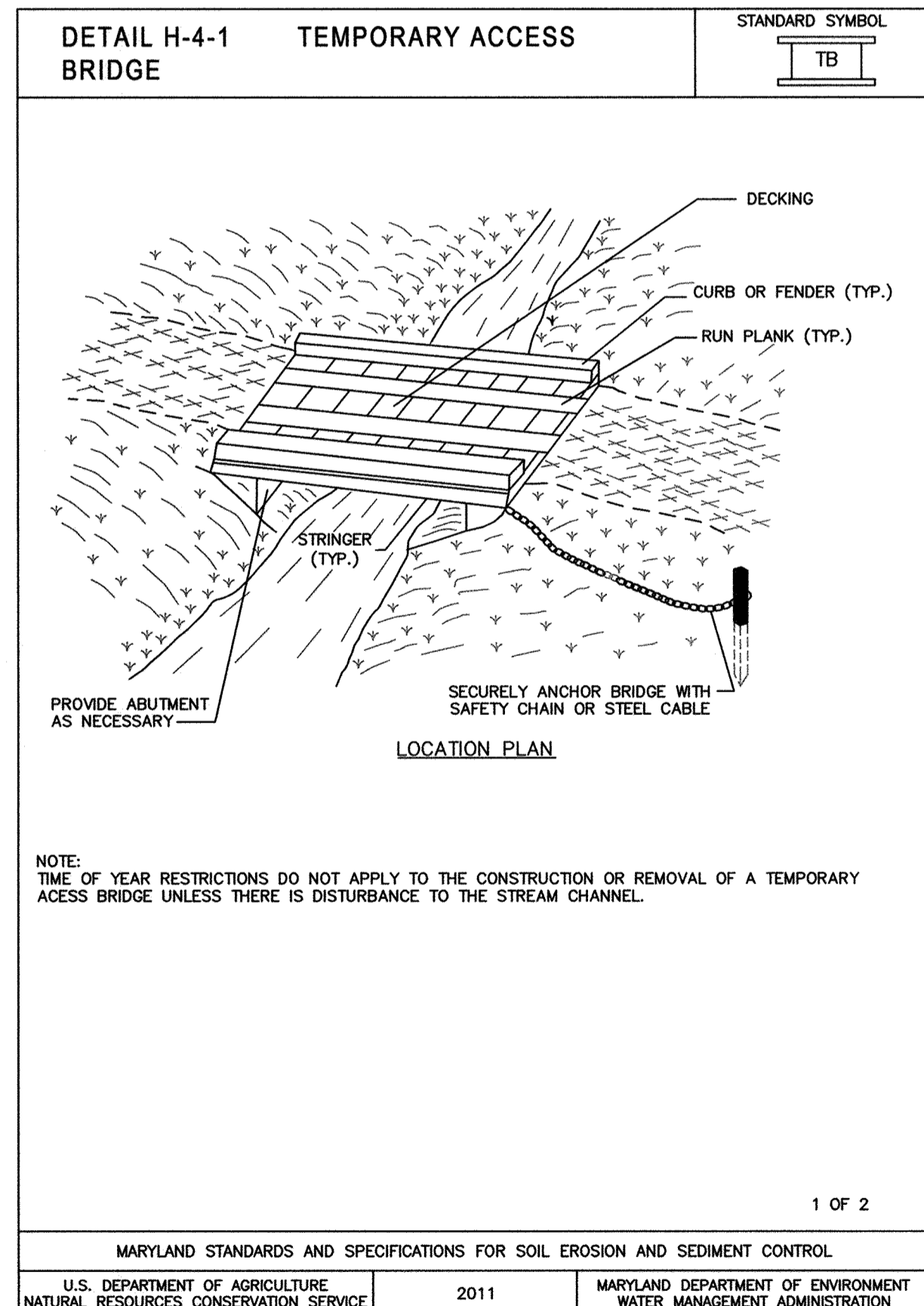
DESCRIPTION

The work should consist of installing a temporary pump around and supporting measures to divert flow around stream construction sites.

IMPLEMENTATION SEQUENCE

Sediment control measures, pump-around practices, and associated channel and bank construction should be completed in the following sequence (refer to Detail 1.2):

- Construction activities including the installation of erosion and sediment control measures should not begin until all necessary easements and/or right-of-ways have been acquired. All existing utilities should be marked in the field prior to construction. The contractor is responsible for any damage to existing utilities that may result from construction and should repair the damage at his/her own expense to the county's or utility company's satisfaction.
- The contractor should notify the Maryland Department of the Environment or WMA sediment control inspector at least 5 days before beginning construction. Additionally, the contractor should inform the local environmental protection and resource management inspection and enforcement division and the provider of local utilities a minimum of 48 hours before starting construction.
- The contractor should conduct a pre-construction meeting on site with the WMA sediment control inspector, the county project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor should stake out all limits of disturbance prior to the pre-construction meeting so they may be reviewed. The participants will also designate the contractor's staging areas and flag all trees within the limit of disturbance which will be removed for construction access. Trees should not be removed within the limit of disturbance without approval from the WMA or local authority.
- Construction should not begin until all sediment and erosion control measures have been installed and approved by the engineer and the sediment control inspector. The contractor should stay within the limits of the disturbance as shown on the plans and minimize disturbance within the work area whenever possible.
- Upon installation of all sediment control measures and approval by the sediment control inspector and the local environmental protection and resource management inspection and enforcement division, the contractor should begin work at the upstream section and proceed downstream beginning with the establishment of stabilized construction entrances. In some cases, work may begin downstream if appropriate. The sequence of construction must be followed unless the contractor gets written approval for deviations from the WMA or local authority. The contractor should only begin work in an area which can be completed by the end of the day including grading adjacent to the channel. At the end of each work day, the work area must be stabilized and the pump around removed from the channel. Work should not be conducted in the channel during rain events.
- Sandbag dikes should be situated at the upstream and downstream ends of the work area as shown on the plans, and stream flow should be pumped around the work area. The pump should discharge onto a stable velocity dissipator made of riprap or sandbags.



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. 31201, Expiration Date 1/24/2019.

AS-BUILT
DATE 3/11/2019

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 7/20/18
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 7-21-18
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 7/20/18
CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 7/20/18
CHIEF, UTILITY DESIGN DIVISION S.C. DATE

KCI TECHNOLOGIES

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STATE OF MARYLAND
Professional Engineer Seal
07/19/2018

DES:	BE				
DRN:	KP				
CHK:	JT				
DATE:	JULY 2018	BY:	NO.	REVISION	DATE

EROSION & SEDIMENT CONTROL DETAILS

600' SCALE MAP NO. 24 BLOCK NO. 15

WILLOW BEND SEWER REHABILITATION

CAPITAL PROJECT No. S6268
CONTRACT No. 20-5049

ELECTION DISTRICT NO. 2

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN SHEET 10 of 11

DETAIL B-4-6-D PERMANENT SOIL STABILIZATION MATTING SLOPE APPLICATION

STANDARD SYMBOL
PSSMS - 1.13 lb/ft²

ISOMETRIC VIEW

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 PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON-DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2/32 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 OR WOOD STAKES. 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 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 SHAPE 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 DOWN SLOPE. LAY MATTING SMOOTHLY AND FIRMLY UPON THE SEEDING SURFACE. AVOID STRETCHING THE MATTING.
- OVERLAP OR ABUT EDGES OF MATTING ROLLS PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
- KEY IN THE TOP OF SLOPE 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.
- IF SPECIFIED BY THE DESIGNER OR MANUFACTURER AND DEPENDING ON THE TYPE OF MAT BEING INSTALLED, ONCE THE MATTING IS KEPT AND STAPLED IN PLACE, FILL THE MAT VOIDS WITH TOP SOIL OR GRANULAR MATERIAL AND LIGHTLY COMPACT OR ROLL TO MAXIMIZE SOIL/MAT CONTACT WITHOUT CRUSHING MAT.
- ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION
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DETAIL C-6 CLEAR WATER DIVERSION PIPE

STANDARD SYMBOL
CWD - 12
DESIGNATION CWD-12 REFERS TO 12 INCH CLEAR WATER DIVERSION.

PLAN VIEW

PROFILE OF SANDBAGS

CONSTRUCTION SPECIFICATIONS

- FLEXIBLE PIPE IS PREFERRED. HOWEVER, CORRUGATED METAL PIPE OR EQUIVALENT PVC PIPE CAN BE USED. MAKE ALL JOINTS WATER TIGHT.
- FOR SANDBAGS USE MATERIALS THAT ARE RESISTANT TO ULTRA-VIOLET RADIATION, TEARING, AND PUNCTURE AND WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF FILL MATERIAL.
- USE 10 MIL OR THICKER, UV RESISTANT, IMPERMEABLE SHEETING OR OTHER APPROVED MATERIAL THAT IS IMPERMEABLE AND RESISTANT TO PUNCTURING AND TEARING.
- PLACE IMPERMEABLE SHEETING SUCH THAT UPGRADE PORTION OVERLAPS DOWNGRADE PORTION BY A MINIMUM OF 18 INCHES.
- SET HEIGHT OF SANDBAG DIKE AT TWICE THE PIPE DIAMETER. MAINTAIN HEIGHT ALONG LENGTH OF SANDBAG DIKE. PLACE DOUBLE ROW OF SANDBAGS.
- AT A MINIMUM, SECURELY ANCHOR DIVERSION PIPE AT EACH DOWNGRADE JOINT.
- SET OUTLET END OF DIVERSION PIPE LOWER THAN INLET END.
- PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.
- DEWATER WORK AREA USING AN APPROVED EROSION AND SEDIMENT CONTROL PRACTICE AS SPECIFIED ON APPROVED PLAN.
- KEEP POINT OF DISCHARGE FREE OF EROSION. MAINTAIN WATER TIGHT CONNECTIONS AND POSITIVE DRAINAGE. REPLACE SANDBAGS AND IMPERMEABLE SHEETING IF TORN.

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DETAIL C-9 DIVERSION FENCE

STANDARD SYMBOL
DF

MAXIMUM DRAINAGE AREA = 2 ACRES

ELEVATION

SECTION

CONSTRUCTION SPECIFICATIONS

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

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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DETAIL F-4 FILTER BAG

STANDARD SYMBOL
FB

PLAN VIEW

ELEVATION

CONSTRUCTION SPECIFICATIONS

- TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
- PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
- CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
- REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
- USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4853
FLOW RATE	70 GAL./MIN./FT ²	ASTM D-4491
PERMITTIVITY (SEC ⁻¹)	1.2 SEC ⁻¹	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632

- REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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ACCESS ROAD LOAD MAT SECTION

NOT TO SCALE

SECTION B-B

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

- MATS SHALL BE PLACED END-TO-END TO FORM A CONTINUOUS SPAN FOR THE ENTIRE LENGTH OF THE AREA TO BE PROTECTED.
- MATS CAN BE USED AS A SUBSTITUTE FOR OR IN CONJUNCTION WITH STONE, GRAVEL, WOOD CHIPS, CULVERTS, OR OTHER STABILIZING MATERIAL AT THE ENTRANCE TO THE SITE.
- MATS SHALL BE INSPECTED FREQUENTLY AND MAINTAINED OR REPLACED AS NECESSARY TO ENSURE THEIR PROPER FUNCTION.

ACCESS ROAD DETAIL

NOT TO SCALE

PROFILE

PLAN VIEW

NOTE: MULCH, GEOTEXTILE, AND ALL OTHER COMPONENTS OF THE CONSTRUCTION ACCESS ROAD SHALL BE REMOVED PRIOR TO DEMOBILIZATION, AND THE AREA PERMANENTLY STABILIZED.

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. 31201, Expiration Date 1/24/2019.

AS-BUILT
DATE 3/1/2019

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James L. ... 7/27/18
DIRECTOR OF PUBLIC WORKS DATE

Thomas E. ... 7/27/18
CHIEF, BUREAU OF ENGINEERING DATE

... 7-27-18
CHIEF, UTILITY DESIGN DIVISION DATE

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