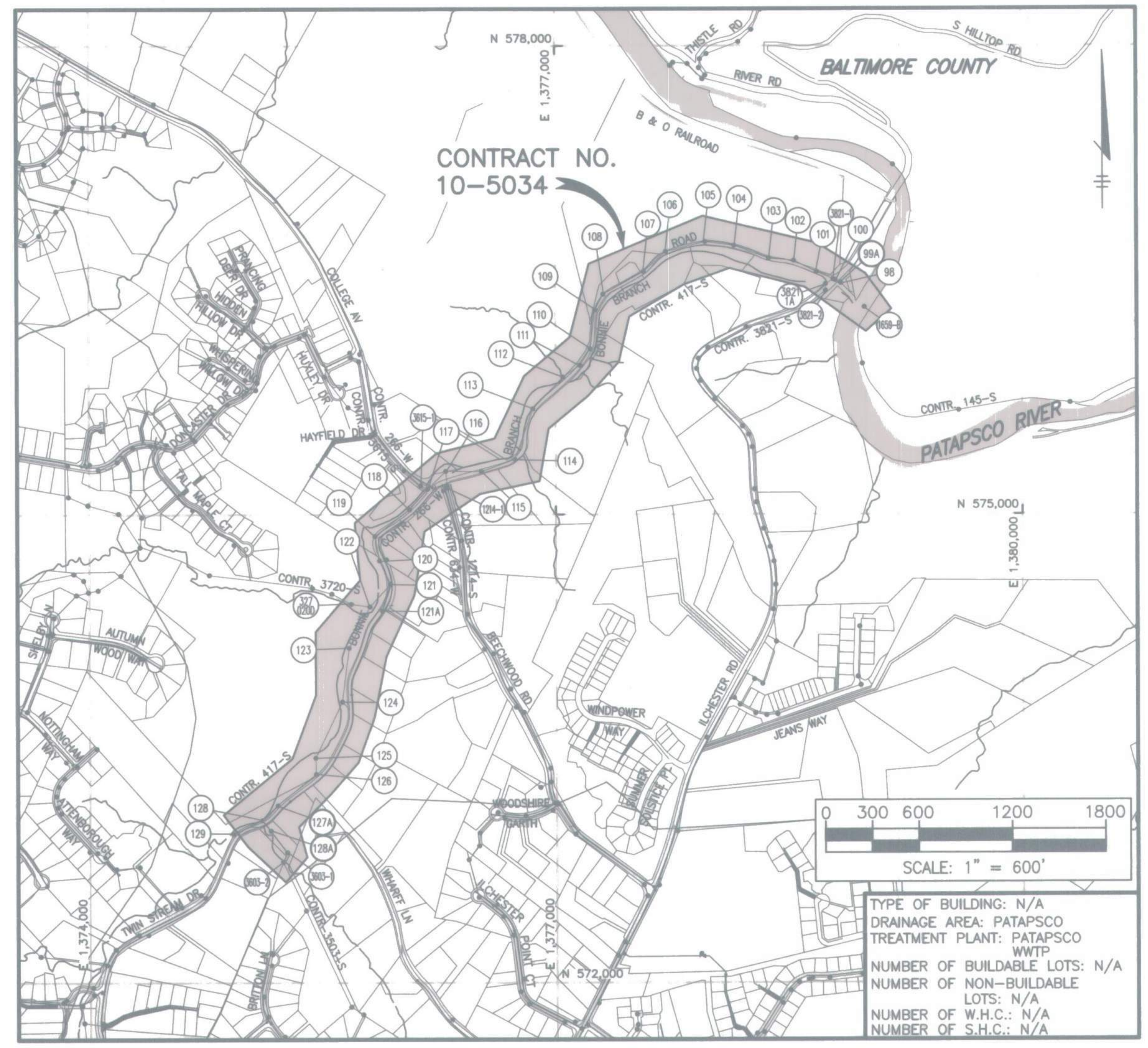
INDEX OF SHEETS



TYPE OF BUILDING: N/A
DRAINAGE AREA: PATAPSCO
TREATMENT PLANT: PATAPSCO WWTP
NUMBER OF BUILDABLE LOTS: N/A
NUMBER OF NON-BUILDABLE LOTS: N/A
NUMBER OF W.H.C.: N/A
NUMBER OF S.H.C.: N/A

VICINITY MAP

GENERAL NOTES

1. Approximate locations of existing mains are shown. The contractor shall take all necessary precautions to protect existing mains and services and maintain uninterrupted service. Any damage incurred shall be repaired immediately to the satisfaction of the Engineer at the Contractor's expense.
2. Topographic field surveys were performed during May and June, 2017, by C.C. Johnson & Malhotra, P.C. for the areas from existing MH 101 to existing MH 098 and for the area from existing MH 127 to existing MH 3503–1. Howard County GIS topography is used in all other areas.
3. Horizontal and Vertical Survey Controls:

   The coordinates shown on the drawings are based on Maryland State Reference System NAD '83 / '91 and the vertical controls shown on the drawings are based on NAVD '88 as projected by the following Howard County Geodetic Control Stations:

   31BA – N 575987.759, E 1375729.958, Elev. 376.098
   31DA – N 571982.665, E 1372145.130, Elev. 481.603
   31EA – N 569641.138, E 1374816.086, Elev. 468.877
   31EB – N 568730.995, E 1376273.635, Elev. 452.657
   0081 – N 572335.338, E 1377504.092, Elev. 477.919
4. All pipe elevations shown are invert elevations unless otherwise noted on the plans.
5. Maintain a minimum of ten (10) feet horizontal and eighteen (18) inches vertical separation (outside diameter to outside diameter) from all water mains. Clear all other utilities by a minimum of 12 inches. Clear all poles by 5'–0" minimum or tunnel as required unless otherwise noted. The owner has contacted the utility companies and has made arrangements for bracing of poles as shown on the drawings. In the event the contractor's work requires the bracing of additional poles, any cost incurred by the owner for the bracing of additional poles or damages shall be deducted from monies owed the contractor. The contractor shall coordinate with the utility companies to schedule the bracing of the poles.
6. 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.
7. Where test pits have been made on existing utilities, they are noted by the symbol (▣) at the locations of the test pits. A note or notes containing the results of the test pit or pits is included on the drawings. Existing utilities in the vicinity of the proposed work for which test pits have not been dug shall be located by the contractor two weeks in advance of construction operations at his own expense.
8. The contractor shall notify the following utility companies or agencies at least five working days before starting work shown on these plans:

AT&T	1–800–252–1133
BGE (Construction Services)	410–850–4620
BGE (Emergency)	410–685–1400
Bureau of Utilities	410–313–4900
Colonial Pipeline Co.	410–795–1390
COMCAST	1–888–987–8600
Miss Utility	1–800–257–7777
State Highway Administration	410–531–5533
Verizon	1–800–743–0033 / 410–224–9210

9. Trees within the temporary construction strips and temporary construction easements shall not be removed or damaged by the contractor. Shrubs within the temporary construction strips and temporary construction easements shall be protected from damage to the maximum extent possible.
10. The contractor shall remove trees, stumps and roots along the line of excavation. Payment for such removal shall be included in the bid item prices for contingent Tree Removal and Clearing and Grubbing.
11. The contractor shall notify the Bureau of Highways, Howard County, at 410–313–7450 at least five working days before open cutting or boring/jacking of any County road for laying water/sewer mains or house connections. The approval of these drawings will constitute compliance with DPW requirements per Section 18.114(a) of the Howard County Code.

PROJECT PURPOSE

The purpose of this Capital Project is to rehabilitate 30 existing Manholes of Contract 417–S, make various point repairs to existing Sanitary Sewer Pipe, provide a smoother transition of flow from Contract No. 3503–S to Contract No. 417–S at existing Manhole 128, and replace the existing Billing Flow Meter and Vault with a new Billing Flow Meter and Vault at Ilchester Road.

BONNIE BRANCH

INTERCEPTOR SEWER IMPROVEMENTS

CAPITAL PROJECT S6282

CONTRACT NO. 10-5034

HOWARD COUNTY, MARYLAND

BILL OF MATERIALS

ITEMS	QUANTITIES ESTIMATED	AS-BUILT QUANTITIES	AS-BUILT UNITS	AS-BUILT PRODUCT MANUFACTURER.
INSTALL MANHOLE INSERT	~~32 EA~~			PARSON ENVIRONMENTAL
MH WALL GROUT INJECTION	14 EA	14		PARSON ENVIRONMENTAL
EPOXY/POLYURETHANE MH INTERIOR RESURFACING	33 EA	33		PARSON ENVIRONMENTAL
OPEN CUT 12" SEWER POINT REPAIR – 13 LINEAR FEET	6 EA			
OPEN CUT 12" SEWER POINT REPAIR – ADDITIONAL REPAIR LENGTH	39 EA			
GROUT MAINLINE SEWER PIPE JOINT	8 EA	11		AVANTI
LATERAL SEWER POINT REPAIR	1 EA	1		
GROUT LATERAL SEWER PIPE JOINT	3 EA	3		AVANTI
12" PVC SEWER PIPE / 12-IN C-900	47 LF	4/167		NATIONAL PIPE / NORTH AMERICAN PIPE
16" PVC SEWER PIPE / 12-IN C-900	25 LF	26		NATIONAL PIPE / NORTH AMERICAN PIPE
NEW 5' DIAMETER PRECAST MANHOLE INSTALLATION	2 EA	2		ATLANTIC CONCRETE
NEW 5' DIAMETER PRECAST DOGHOUSE MANHOLE INSTALLATION	1 EA	1		ATLANTIC CONCRETE
NEW 5' DIAMETER PRECAST MANHOLE INSTALLATION – ADDITIONAL DEPTH	~~6 VLF~~			ATLANTIC CONCRETE
FLOW METER	1 EA			NOT APPLICABLE
REPLACE MANHOLE COVER W/T F/C	1 EA	3		
REPLACE MH STEPS	285 EA	178		M.A. INDUSTRIES

NAME OF UTILITY CONTRACTOR :

Sediment control measures for this contract will be implemented in accordance with Section 308 of the Specifications and as shown on these plans.

CHECKBOX
AS-BUILT DATE
SURVEY AND DRAFTING DIVISION

This plan is approved for soil erosion and sediment control by the Howard Soil Conservation District EP–19–30.

HOWARD SOIL CONSERVATION DISTRICT — 1/19/20 DATE

BY THE OWNER / DEVELOPER:

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 Choi — 01/06/2021
DEVELOPER/OWNER — DATE

BY THE ENGINEER :

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 COUNTY SOIL CONSERVATION DISTRICT.

ENGINEER — 01/04/2021 DATE

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. 30875, EXPIRATION DATE NOVEMBER 29, 2022.

W. MARK GARDOCKY, P.E.

AS-BUILT
DATE 12-22-2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	1/12/2021	CHIEF, BUREAU OF ENGINEERING (Acting for Tom E. Butler)	1/8/2021
CHIEF, BUREAU OF UTILITIES	1-11-21	CHIEF, UTILITY DESIGN DIVISION	1/7/2021

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ARCHITECTS & ENGINEERS
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www.gmbnet.com

DES: WMG				
DRN: JWB				
CHK: AWW				
DATE: 12/2020	AMP	1	AS-BUILT	
	BY	NO.	REVISION	DATE

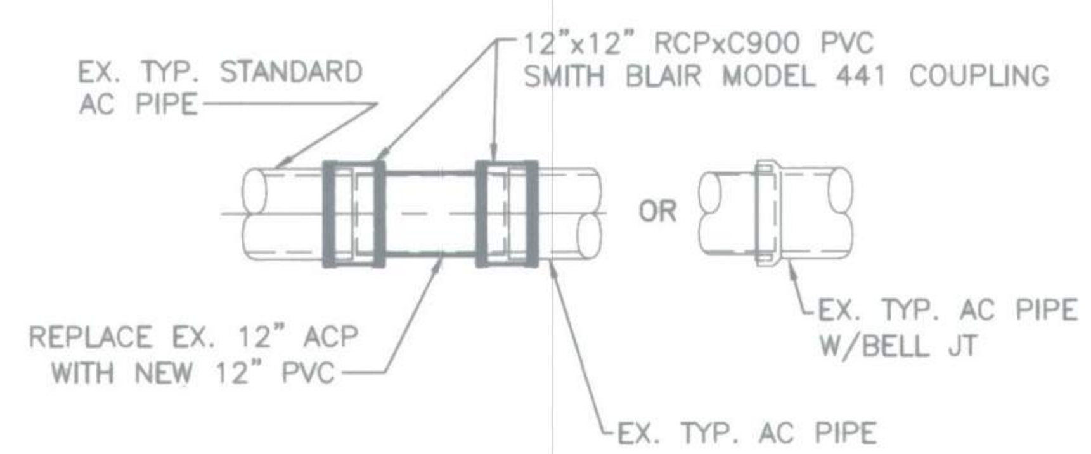
TITLE SHEET

600 SCALE MAP NO. 31 — BLOCK NO. 4

BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10–5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 01 OF 16



TYPICAL OPEN CUT POINT REPAIR DETAILS

NOT TO SCALE

ABBREVIATIONS

AB'D,ABAND	ABANDONED	P/L,℄	PROPERTY LINE
C/L,℄	CENTERLINE	PVM'T	PAVEMENT
CO	CLEANOUT	RED,RDCR	REDUCER
CPLG	COUPLING	R/W,ROW	RIGHT-OF-WAY
DIA,ø	DIAMETER	UG	UNDERGROUND
E,EL,ELEC	ELECTRIC	UP	UTILITY POLE
EOP	EDGE OF PAVEMENT	SAN	SANITARY
ESM'T	EASEMENT	SD	(STORM)DRAIN
EX	EXISTING	SF	SILT FENCE
FH	FIRE HYDRANT	SSF	SUPER SILT FENCE
FHT	FIRE HYDRANT TEE	T	TEE
FP	FLOOD PLAIN	TEL,PHN	TELEPHONE
G	GAS	TP	TREE PROTECTION
HORZ,HZ	HORIZONTAL	TRAV	TRAVERSE
LOD	LIMIT-OF-DISTURBANCE	V	VALVE
LP	LIGHT POLE	VT,VERT	VERTICAL
MH	MANHOLE	VB	VEGETATION BUFFER
OH	OVERHEAD	W	WATER, WETLANDS
PED	PEDESTAL		

LEGEND

UTILITY - EXISTING

- SANITARY SEWER; =>12", MH, <12"
- STORM DRAIN; =>12", MH, <12"
- WATER MAIN; =>12", MH, <12"
- REDUCER, TEE, FIRE HYDRANT, VALVE
- WATER MAIN VALVE VAULT
- UNDERGROUND ELECTRIC, MH
- OVERHEAD UTILITY (ELEC., TEL., CTV)
- GAS MAIN, MH
- UTILITY POLE (ELEC., TEL., CTV)
- ABANDONED UTILITY

UTILITY - EXISTING REHABILITATION

- SANITARY SEWER; =>12", MH, <12"

UTILITY - PROPOSED

- SANITARY SEWER; =>12", MH, <12"

PLAT

- EX. FENCE
- EX. STRUCTURES
- EX. FOOT PATH
- EX. GUARDRAIL
- EX. PAVEMENT MARKINGS
- EX. EDGE OF PAVEMENT
- EX. CURB & GUTTER
- EX. EDGE DIRT, GRAVEL, MACADAM
- RIGHT-OF-WAY
- PROPERTY BOUNDARY
- ADJACENT PROPERTIES - SAME OWNER
- EX. TREELINE
- FLOW
- EX. SIGN
- EX. TRAFFIC POLE
- EX. UTILITY PEDESTAL
- EX. RIPRAP
- PROPOSED UTILITY EASEMENT
- PROPOSED CONSTRUCTION EASEMENT

ESC

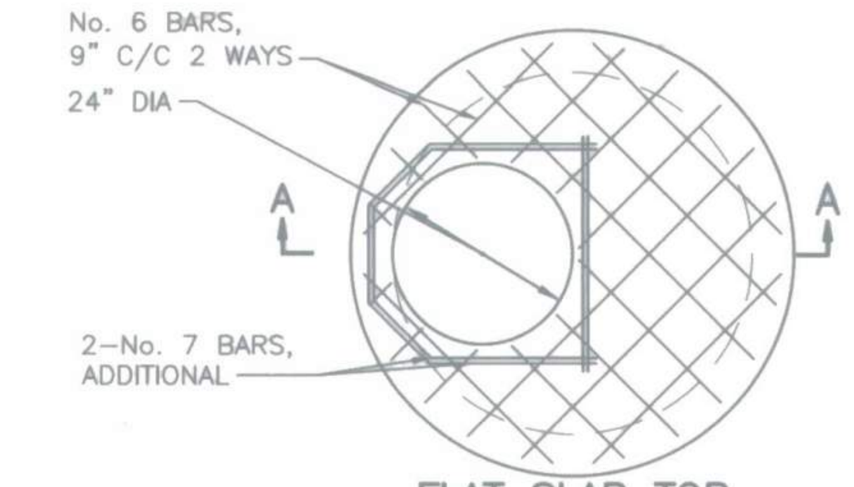
- EX. SPECIMEN TREE
- FP — FP: 100-YEAR FLOODPLAIN
- WB — WB: EX. WETLAND BUFFER
- VB — VB: EX. VEGETATION BUFFER
- LOD — LOD: LIMIT OF DISTURBANCE
- SF — SF: SILT FENCE
- SSF — SSF: SUPER SILT FENCE
- TP — TP: TREE PROTECTION FENCE
- WETLANDS

SURVEYOR

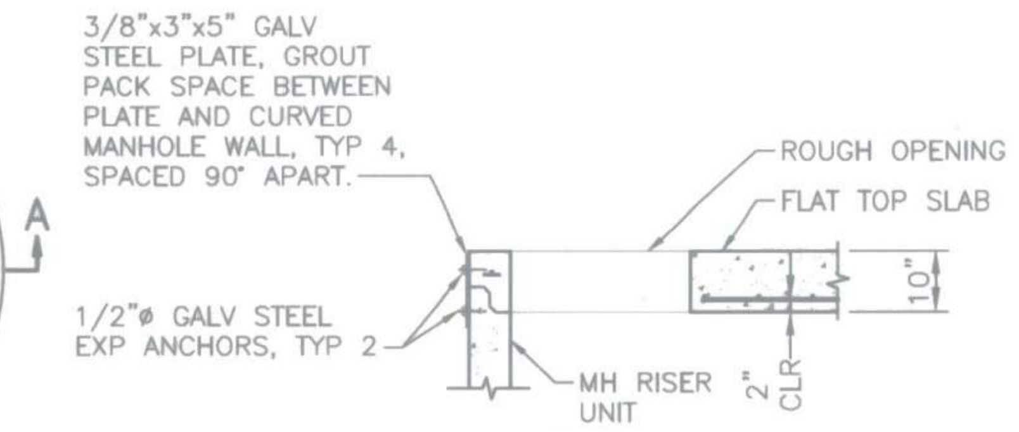
- TRAVERSE

EXISTING TERRAIN

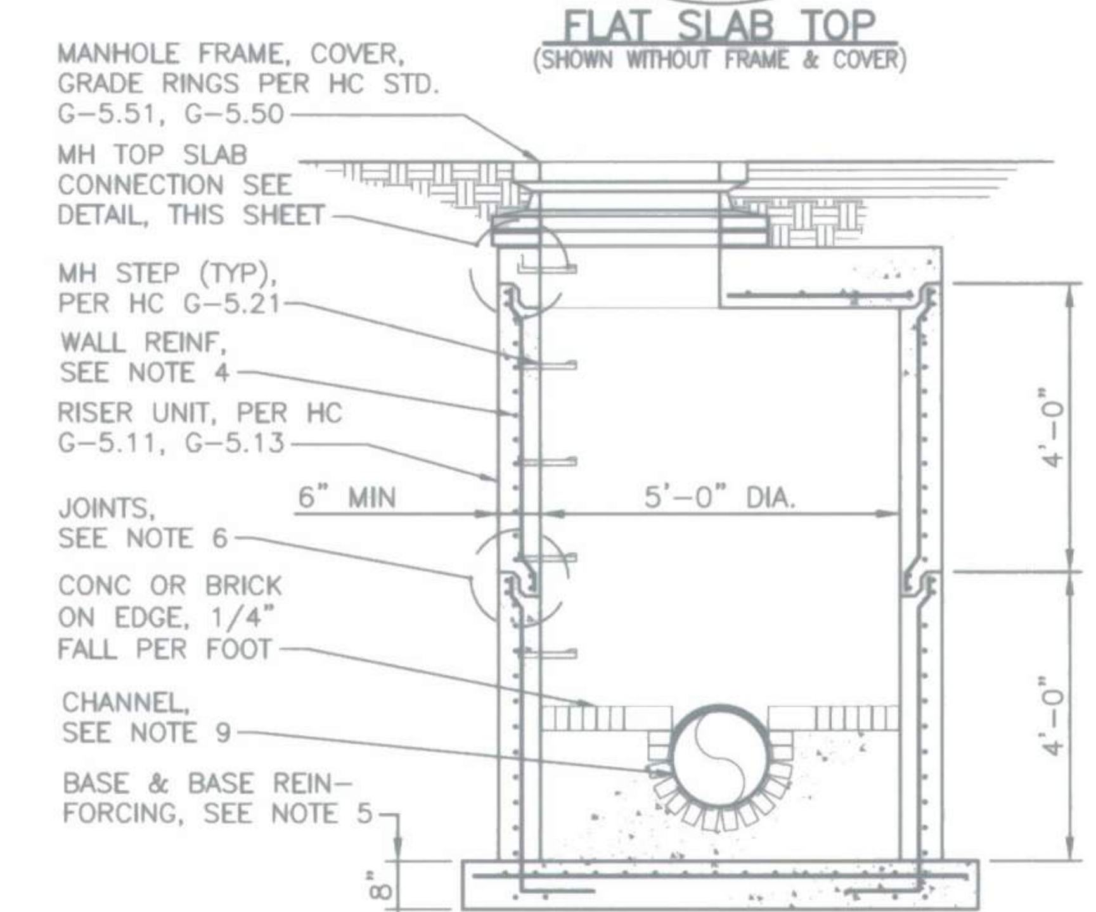
- EX. MARSH
- HYDROGRAPHY, SURFACE FLOW
- 10 FOOT CONTOURS
- 2 FOOT CONTOURS



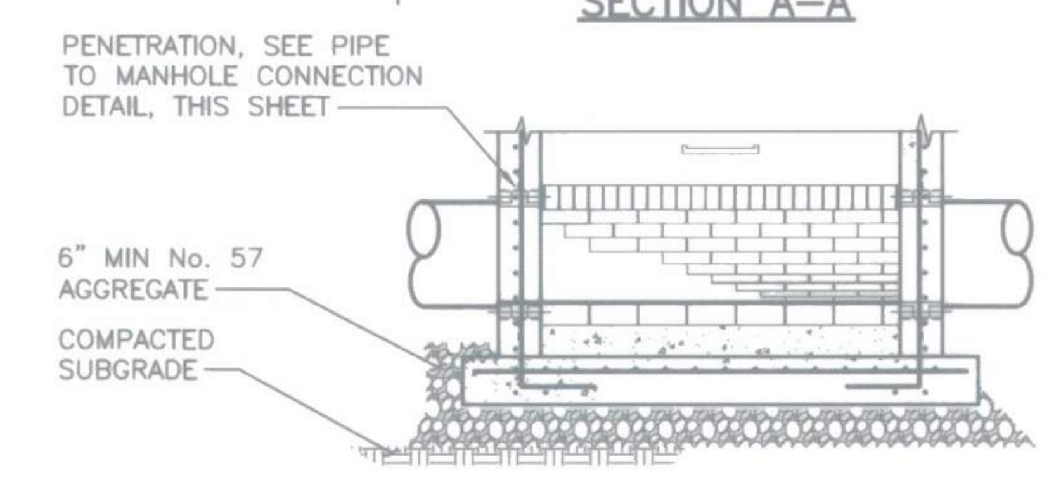
FLAT SLAB TOP
(SHOWN WITHOUT FRAME & COVER)



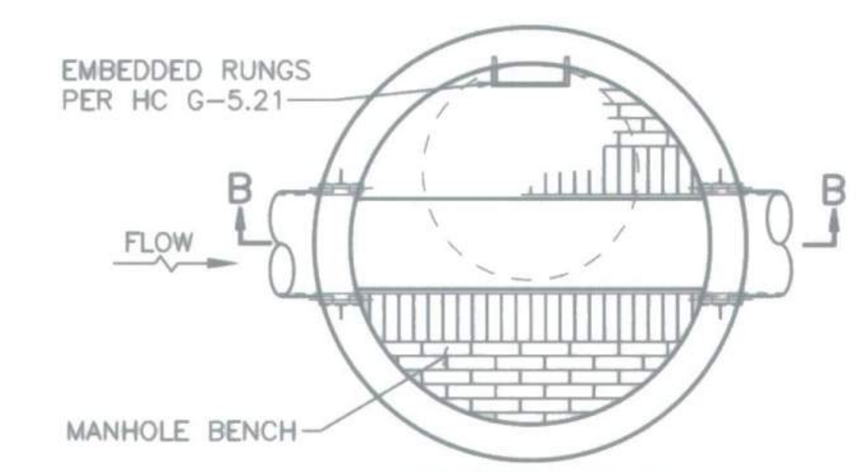
MANHOLE SLAB TOP CONNECTION
NO SCALE



SECTION A–A



SECTION B–B



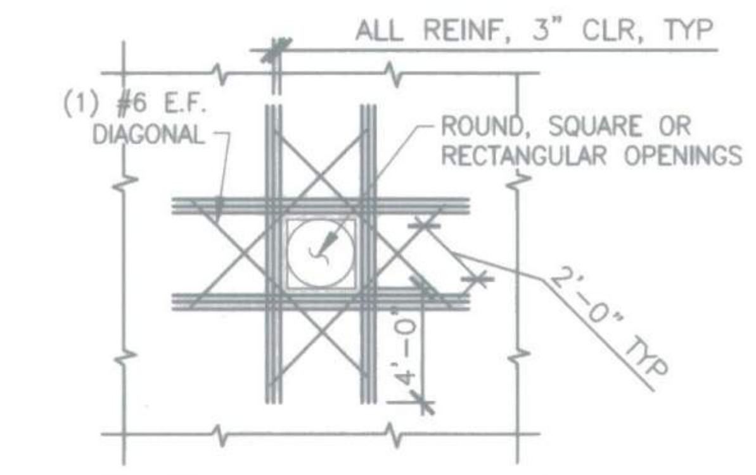
BOTTOM SLAB
(SHOWN AT BENCH)

NOTES:

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C-478 AND THE GENERAL NOTES APPLICABLE TO ALL PRECAST MANHOLES ON STANDARD DETAIL G-5.11.
2. MH 127A WILL BE A DOGHOUSE MANHOLE WITH THE BASE CONSTRUCTED ACCORDING TO STANDARD DETAIL G-5.14 AND OTHERWISE IN ACCORDANCE WITH THE DETAILS AS SEEN ON THIS SHEET.
3. CONCRETE SHALL BE MIX NO.6 (4500 PSI) AND AIR ENTRAINED(5% ±1%). CONCRETE SHALL HAVE A SLUMP OF 4" (±1").
4. WALL REINFORCEMENT FOR BASE UNITS AND RISER UNITS SHALL BE REINFORCEMENT BARS OR WELDED WIRE FABRIC WITH A MINIMUM AREA OF 0.23 IN^2/FT FOR THE 60" DIAMETER MANHOLES. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-1064. REINFORCEMENT BARS SHALL MEET ASTM A-615, GRADE 60.
5. BASE REINFORCEMENT TO BE REINFORCEMENT BARS OR WELDED WIRE FABRIC WITH A MINIMUM AREA OF 0.23 IN /FT. THE BASE SHALL BE CAST MONOLITHIC WITH THE BASE UNIT OR JOINTED PER MANUFACTURER'S DESIGN.
6. THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATERTIGHT USING RUBBER O-RING GASKETS MEETING ASTM C-443.
7. MINIMUM DISTANCE BETWEEN PIPE OPENINGS IN MANHOLE WALL SHALL BE 12 INCHES.
8. LIFT HOLES OR LIFT EYES SHALL BE PROVIDED IN EACH SECTION FOR HANDLING.
9. MIX NO. 6 PRECAST CONCRETE OR BRICK CHANNEL SHALL BE PROVIDED AND SHALL SLOPE TOWARD OUTLET AS DIRECTED BY THE ENGINEER.
10. NO MORE THAN ONE 1' RISER SECTION MAY BE USED PER MANHOLE.
11. MANHOLE INTERIOR LINER IS REQUIRED. REFER TO "SANITARY SEWER MANHOLES" SECTION OF THE SPECIAL PROVISIONS.

* DIMENSIONS TO BE CONFIRMED BY THE MANUFACTURER.

NOTICE: "STANDARD DETAIL" REFERS TO DETAILS IN HOWARD COUNTY DESIGN MANUAL VOLUME IV – STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION, LATEST EDITION.



NOTES –– REBAR OPENING DETAIL:

1. PROVIDE ADDITIONAL REINFORCING, (MINIMUM OF ONE-HALF THE NUMBER OF PRINCIPAL REINFORCING, BARS BEING INTERRUPTED BY THE OPENING AT EACH FACE ON EACH SIDE.
2. FOR OPENINGS LESS THAN 12" DIAMETER, NO ADDITIONAL REINFORCING IS REQUIRED PROVIDED NO REINFORCING IS INTERRUPTED BY THE OPENING.

5'-0" DIAMETER PRECAST MANHOLE

NO SCALE

PROJECT NOTES

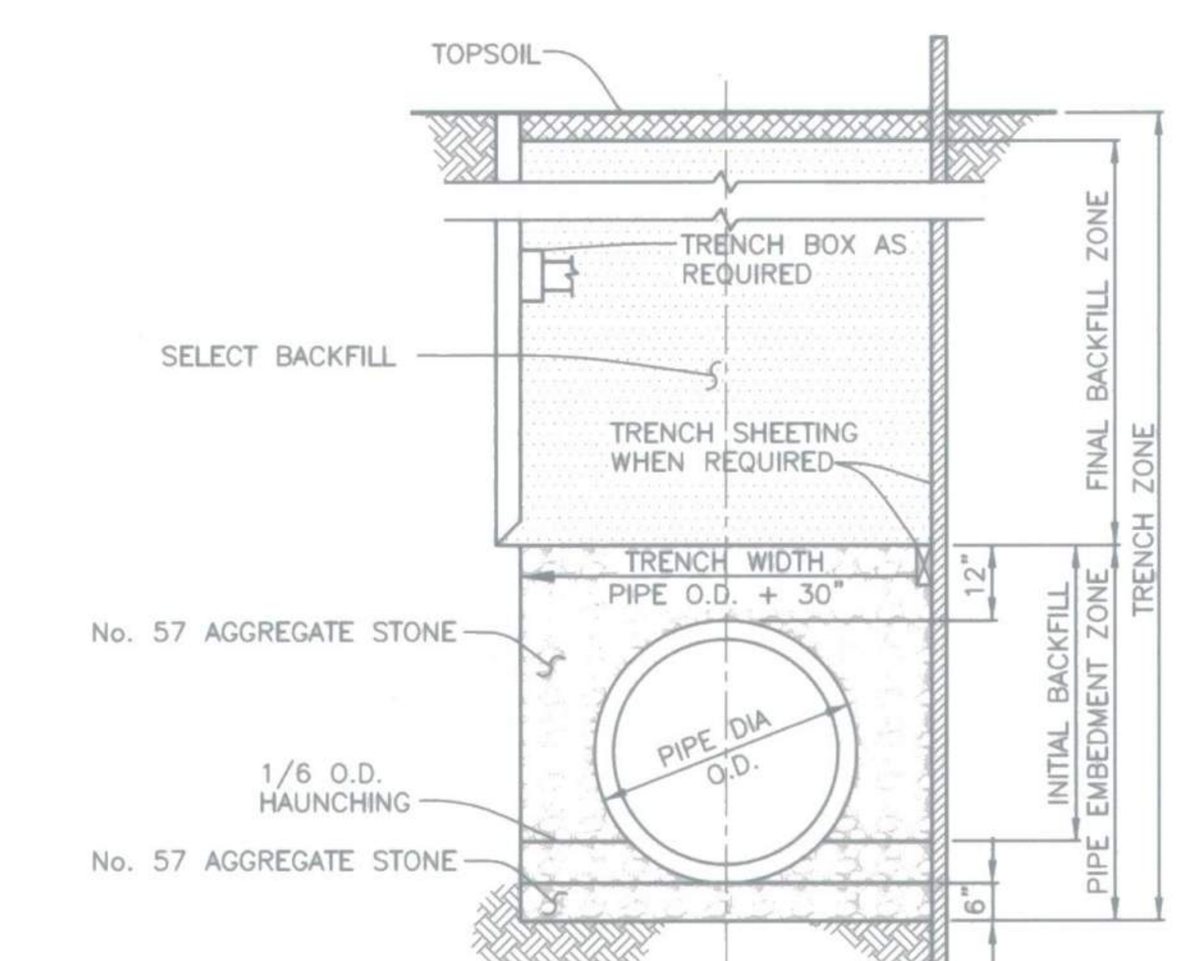
1. Spoil from trenching operations is to be placed on the uphill side of the trench.
2. The contractor shall be responsible for acquiring any additional staging and/or stockpile areas that the contractor deems necessary.
3. The contractor shall be responsible for repairing and replacing any existing fences, signs, concrete curb, driveways, paving, curb and gutter pan, walkways, etc., damaged or removed during construction. All disturbed areas shall be returned to their original or better condition.
4. This project is exempt from Forest Conservation requirements under section 16.1202.b.1.x of the Howard County Forest Conservation Code.
5. The site is not located within a Tier II watershed.
6. The site is located within an impaired waterway with respect to total suspended solids, sulfates and chlorides.
7. Work shall be limited to that which can be stabilized in the same day. Soil stabilization matting shall be used as appropriate per Table B.7 Soil Stabilization on Slopes on Sheet 13.

SEWER NOTES

1. All sewer mains shall be AWWA C-900 / DR-25 PVC unless otherwise noted.
2. All manholes shall be 4'-0" or 5'-0" inside diameter as noted in the Existing Manhole Schedule and Proposed Manhole Schedule.
3. Manholes designated W.T. in profile shall have watertight frames and covers. Where watertight manhole frames and covers are used, set top of manhole with embedded frame 1'-6" above finished grade unless otherwise noted on the drawings.
4. The existing sewer shall remain in service at all times and be protected during construction.
5. Contractor shall CCTV the pipe prior to any excavation to verify repair location.

HANDLING ASBESTOS CONTAINING MATERIAL

1. The existing water main is asbestos cement pipe (ACP). It must be removed in accordance with applicable federal, state, and local regulations, including but not limited to, 29CFR1926.1101, 40CFR61, 262, and 263 and COMAR 26.11.21. 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.
2. The work may require entry into permit-required confined spaces. The contractor is responsible for complying with applicable regulations including 29CFR1910.146.



NOTES:

1. CONTRACTOR TO STRICTLY ADHERE TO SECTION 1000.03.05, "EXCAVATION AND SUBGRADE PREPARATION", OF THE STANDARD SPECIFICATIONS AND DETAILS OF CONSTRUCTION, VOLUME IV.
2. TRENCH BACKFILL IN THE FINAL BACKFILL ZONE, FROM 12 INCHES ABOVE THE CROWN OF PIPE TO 6 INCHES BELOW THE FINAL GRADE, SHALL CONSIST OF SELECT BACKFILL.
3. ALL TRENCHING IN ASPHALT ROADS SHALL BE RESTORED ACCORDING TO STANDARD DETAIL G-4.01 FOR ROADS WITH FLEXIBLE PAVEMENT.

AS-BUILT
DATE 12-22-2021

TRENCH DETAIL

NO SCALE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — 1/12/2021 — DATE
CHIEF, BUREAU OF ENGINEERING (Acting) — 1/8/2021 — DATE
CHIEF, BUREAU OF UTILITIES — 1-11-21 — DATE
CHIEF, UTILITY DESIGN DIVISION — 1/7/2021 — DATE

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GEORGE, MILES & BUHR, LLC
ARCHITECTS & ENGINEERS
SALISBURY · BALTIMORE · SEAFORD
www.gmbnet.com

STATE OF MARYLAND · W. MARK GARDOCKY · No. 30678 · REGISTERED PROFESSIONAL ENGINEER

DES: WMG	BY	NO.	REVISION	DATE
DRN: BRW				
CHK: AWW				
DATE: 12/2020				

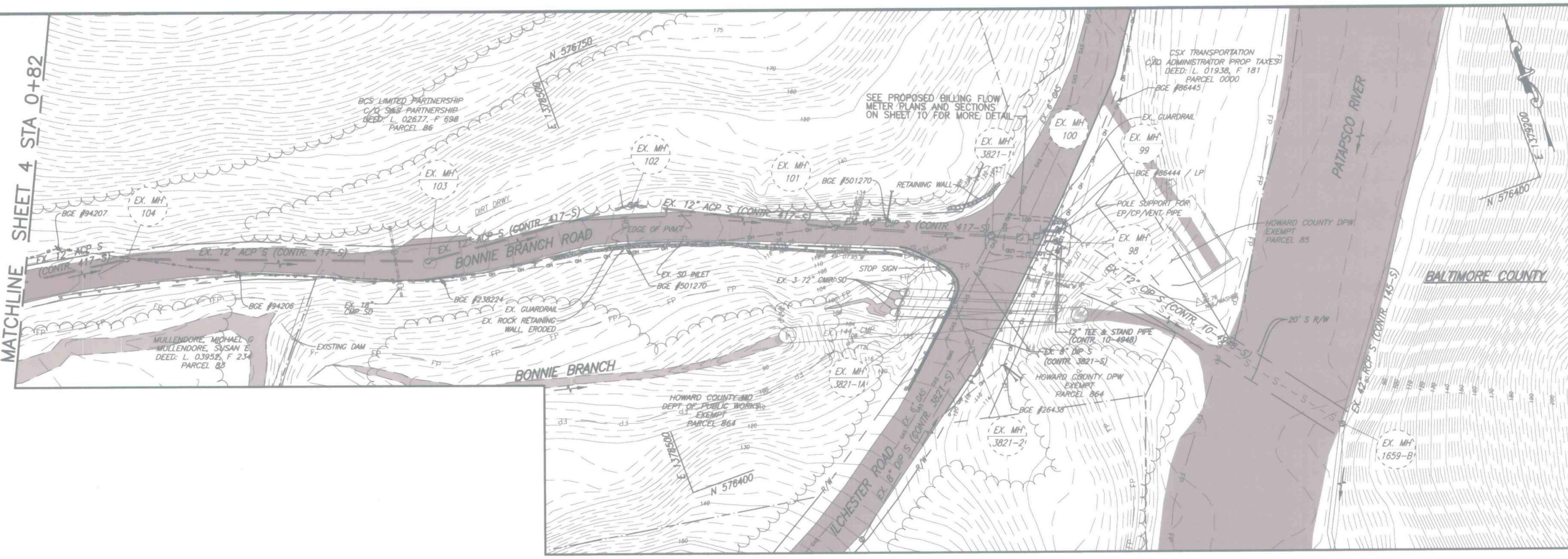
LEGEND, NOTES, AND DETAILS

600 SCALE MAP NO. 31 BLOCK NO. 4

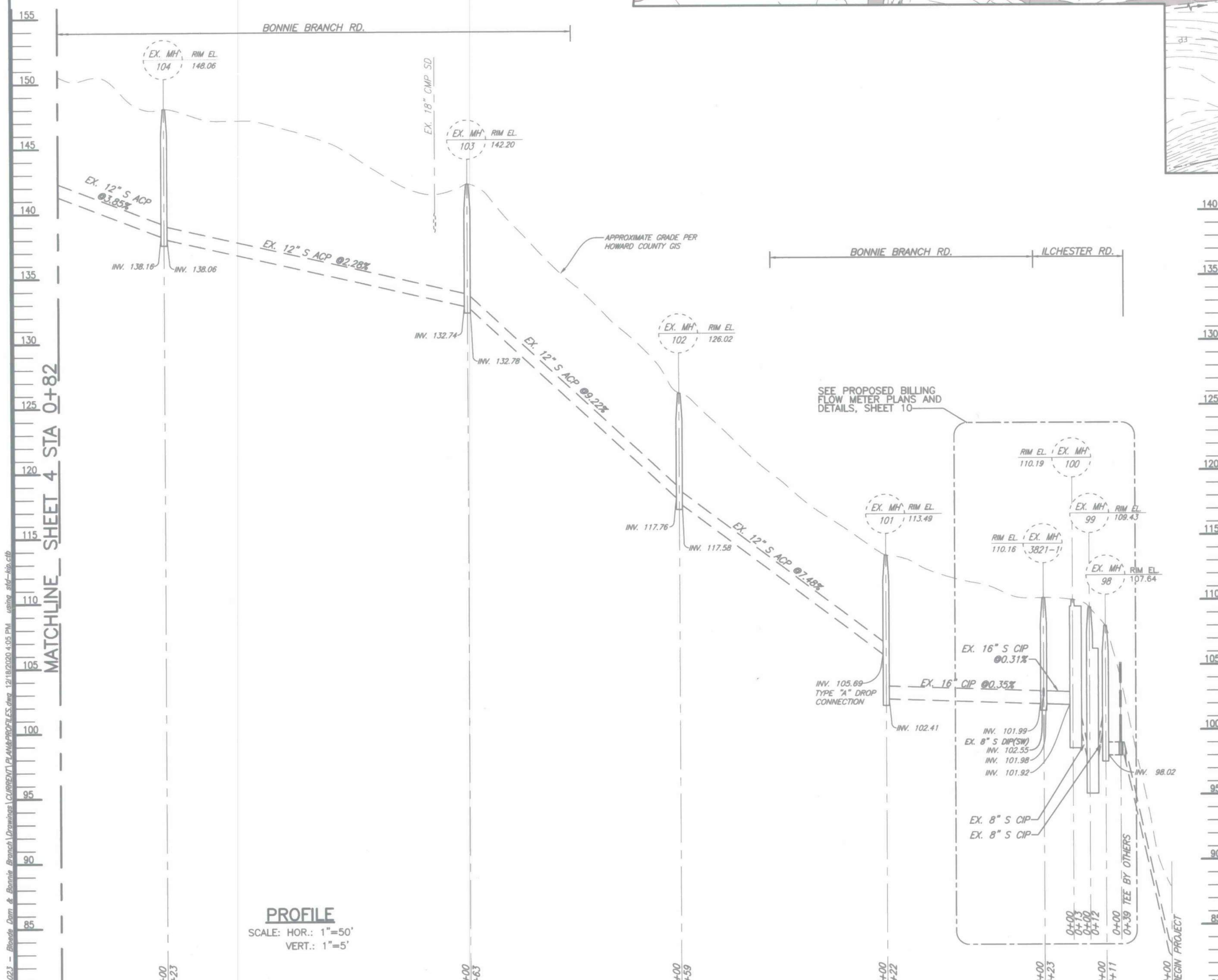
BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 02 OF 16



PLAN
SCALE: 1"=50'



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

NOTES:

1. EXISTING MANHOLES TO BE REHABILITATED: 98, 3821-1, 101 THRU 104
2. REFER TO STRUCTURE SCHEDULE SHEET 09 FOR INFORMATION ON ALL EXISTING AND PROPOSED STRUCTURES INCLUDING REHABILITATION OF EXISTING MANHOLES.
3. INVERT ELEVATIONS AND PIPE INFORMATION BETWEEN MH 98 AND MH 3821-1 SHOWN ON SHEET 10.
4. SEE SHEET 09 FOR TRAVERSE DETAILS.

1 inch = 50 ft.
1 inch = 5 ft.

AS-BUILT
DATE 12-22-2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	1/12/2021	CHIEF, BUREAU OF ENGINEERING	1-8-2021
CHIEF, BUREAU OF UTILITIES	1-11-21	CHIEF, UTILITY DESIGN DIVISION	1/7/2021

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DES: WMG
DRN: BRW
CHK: AWW
DATE: 12/2020

BY	NO.	REVISION	DATE

EXISTING
PLAN AND PROFILE

600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 03 OF 16

NOTES:

1. EXISTING MANHOLES TO BE REHABILITATED: 105 THRU 109
2. REFER TO STRUCTURE TABLE SHEET 09 FOR INFORMATION ON ALL EXISTING AND PROPOSED STRUCTURES INCLUDING REHABILITATION OF EXISTING MANHOLES.

1 inch = 50 ft.

1 inch = 5 ft.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/12/2021
CHIEF, BUREAU OF ENGINEERING — DATE 1/8/2021
CHIEF, BUREAU OF UTILITIES — DATE 1-11-21
CHIEF, UTILITY DESIGN DIVISION — DATE 1/7/2021

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DES: WMG
DRN: BRW
CHK: AWW
DATE: 12/2020

BY	NO.	REVISION	DATE
AMP	1	AS-BUILT	

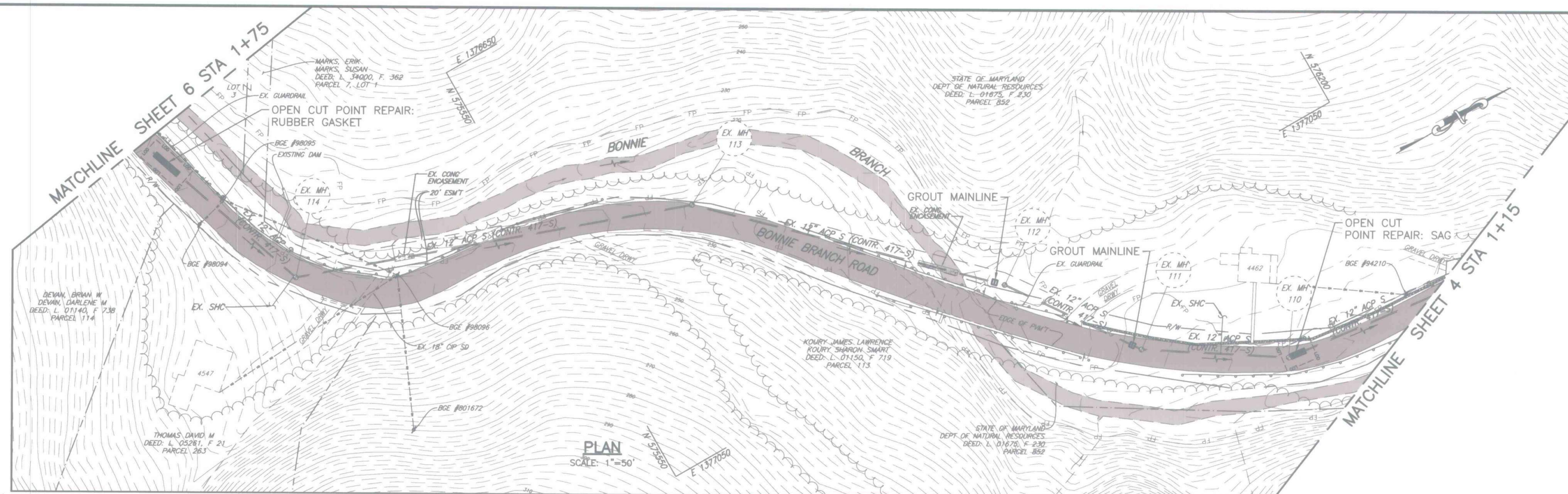
EXISTING
PLAN AND PROFILE

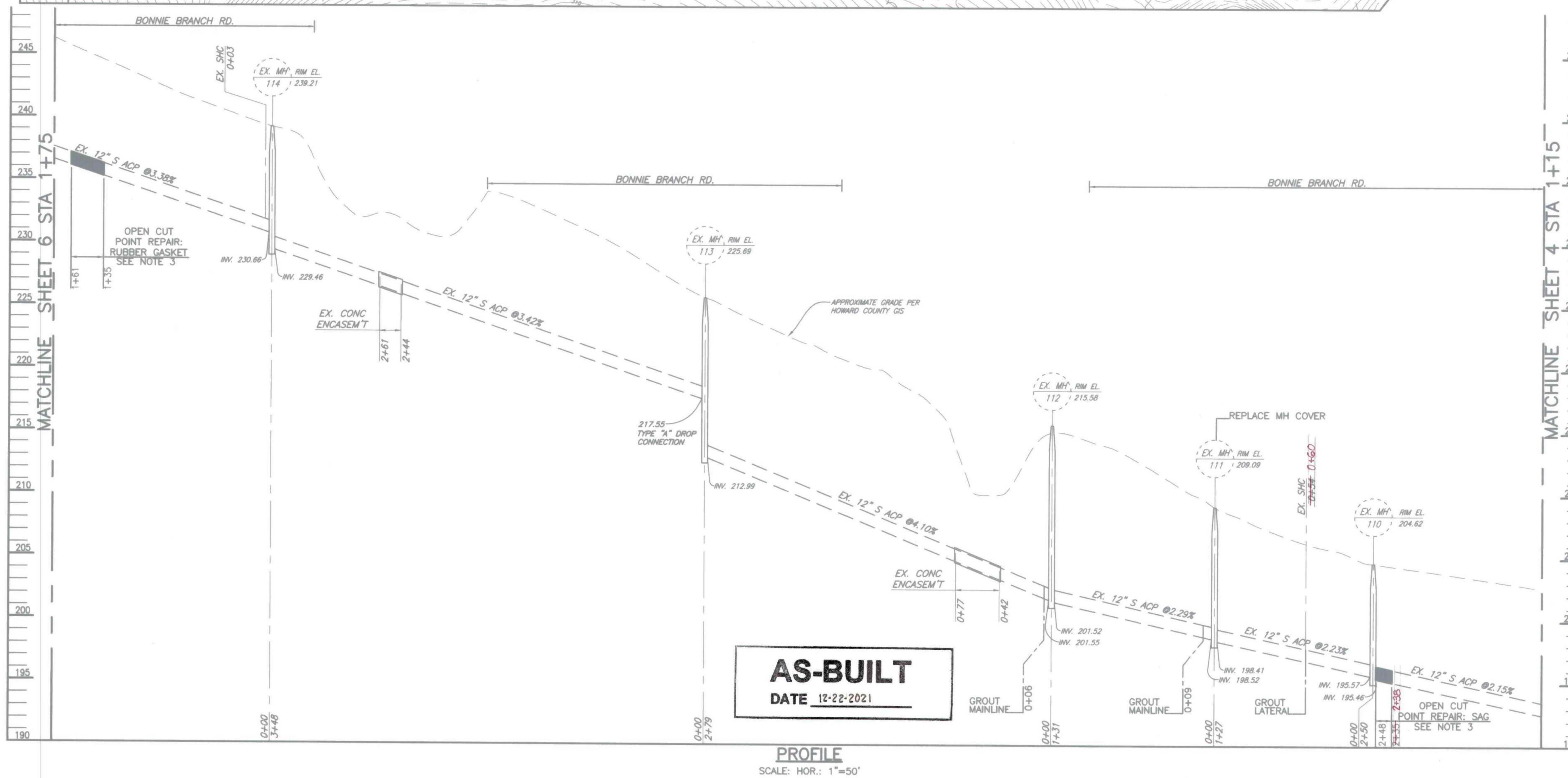
600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 04 OF 16





AS-BUILT
DATE 12-22-2021

NOTES:

1. EXISTING MANHOLES TO BE REHABILITATED: 110 THRU 114
2. REFER TO STRUCTURE TABLE SHEET 09 FOR INFORMATION ON ALL EXISTING AND PROPOSED STRUCTURES INCLUDING REHABILITATION OF EXISTING MANHOLES.
3. CONTRACTOR SHALL CHECK AND COMPACT THE SUB-GRADE TO 6" MINIMUM AND FILL TRENCH TO 1'-0" ABOVE TOP OF PIPE WITH #57 STONE AND FILL THE REST OF THE WAY WITH SELECT BACKFILL

1 inch = 50 ft.
1 inch = 5 ft.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	1/12/2021	CHIEF, BUREAU OF ENGINEERING	1-8-2021
CHIEF, BUREAU OF UTILITIES	1-11-21	CHIEF, UTILITY DESIGN DIVISION	1/7/2021

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ARCHITECTS & ENGINEERS
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DES: WMG
DRN: BRW
CHK: AWW
DATE: 12/2020

BY	NO.	REVISION	DATE
AMP	1	AS-BUILT	

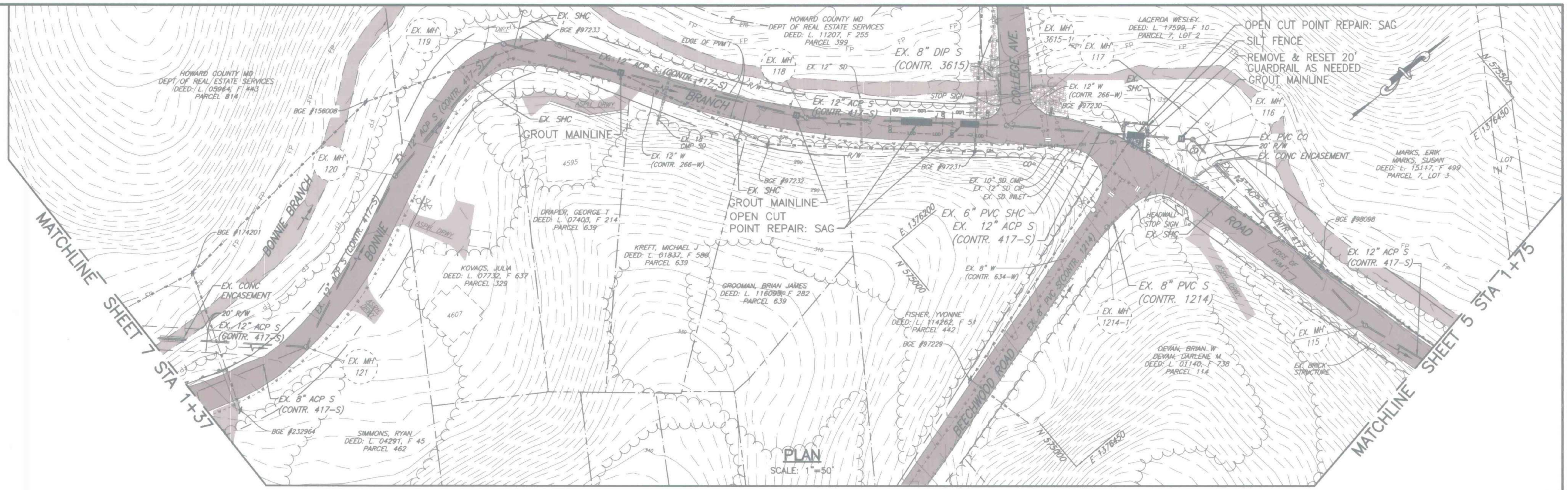
EXISTING PLAN AND PROFILE

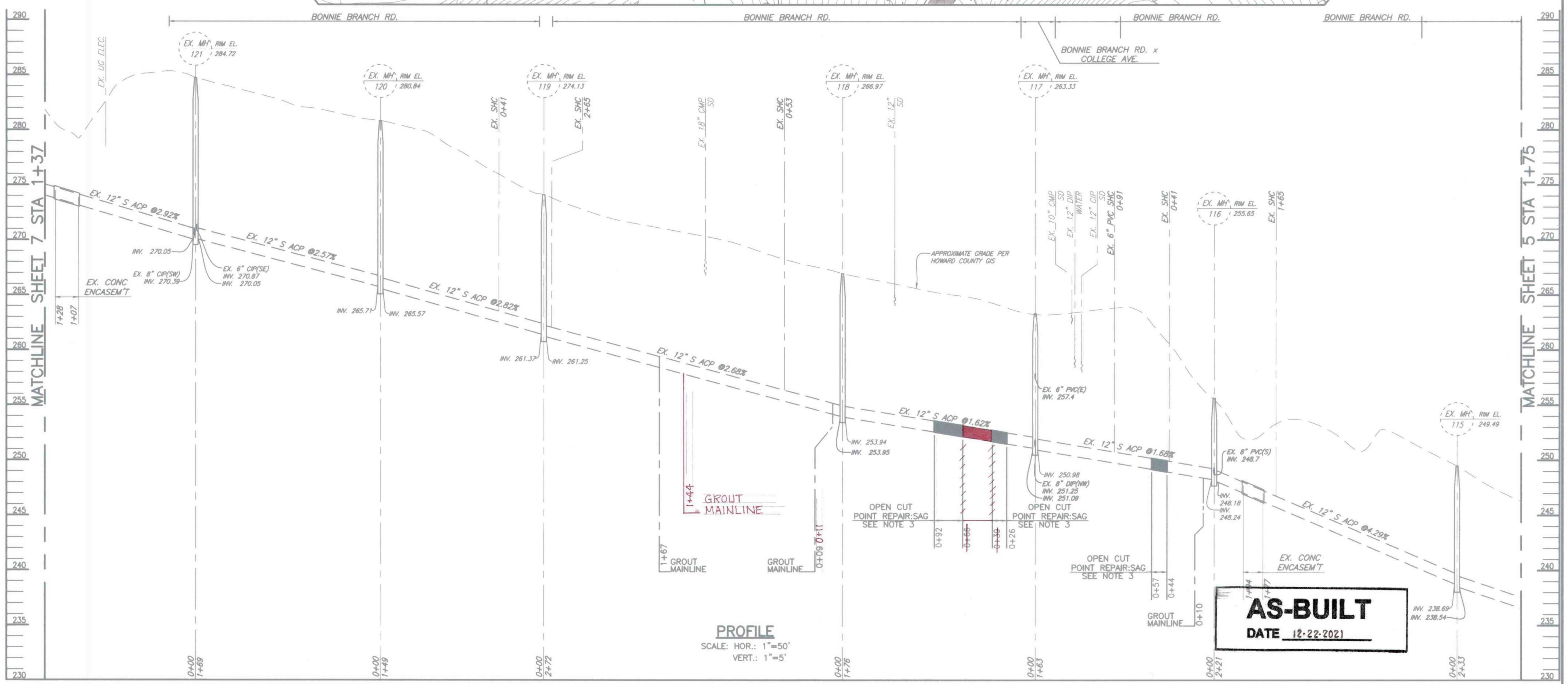
800 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 05 OF 16





NOTES:

1. EXISTING MANHOLES TO BE REHABILITATED: 115 THRU 121
2. REFER TO STRUCTURE TABLE SHEET 09 FOR INFORMATION ON ALL EXISTING AND PROPOSED STRUCTURES INCLUDING REHABILITATION OF EXISTING MANHOLES.
3. CONTRACTOR SHALL CHECK AND COMPACT THE SUB-GRADE TO 6" MINIMUM AND FILL TRENCH TO 1'-0" ABOVE TOP OF PIPE WITH #57 STONE AND FILL THE REST OF THE WAY WITH SELECT BACKFILL

1 inch = 50 ft.

1 inch = 5 ft.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — 1/12/2021 — DATE	CHIEF, BUREAU OF ENGINEERING — 1/8/2021 — DATE
CHIEF, BUREAU OF UTILITIES — 1-11-21 — DATE	CHIEF, UTILITY DESIGN DIVISION — 1/7/2021 — DATE

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ARCHITECTS & ENGINEERS
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DES: WMG					
DRN: BRW					
CHK: AWW	AMP	1	AS-BUILT		
DATE: 12/2020	BY	NO.	REVISION	DATE	

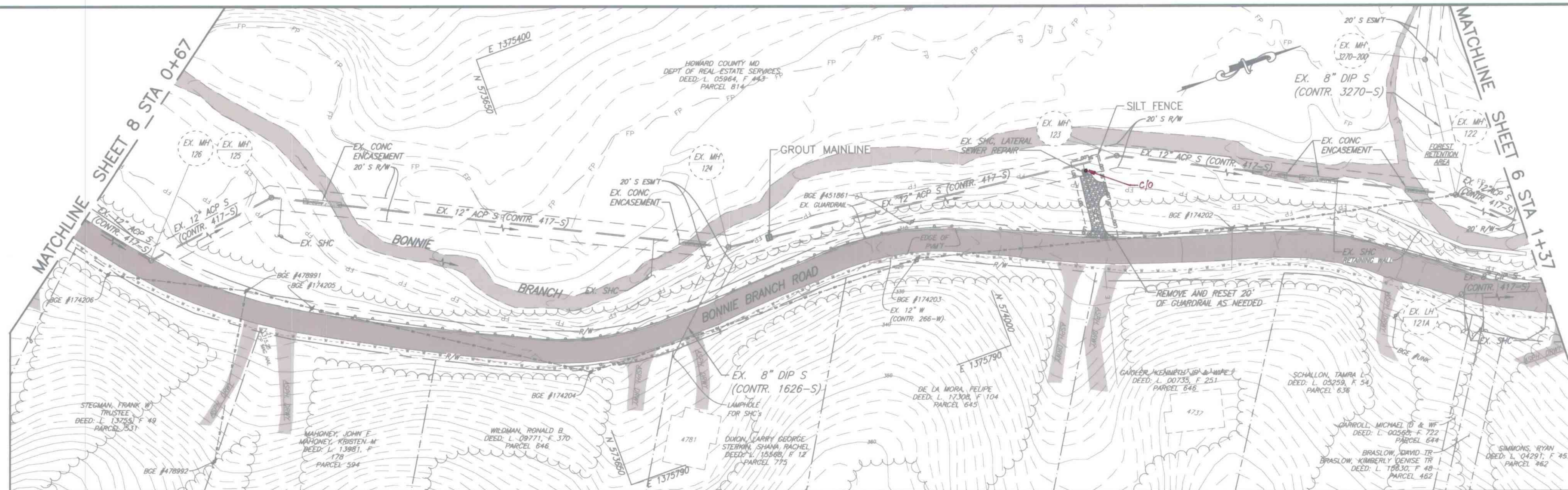
EXISTING
PLAN AND PROFILE

600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

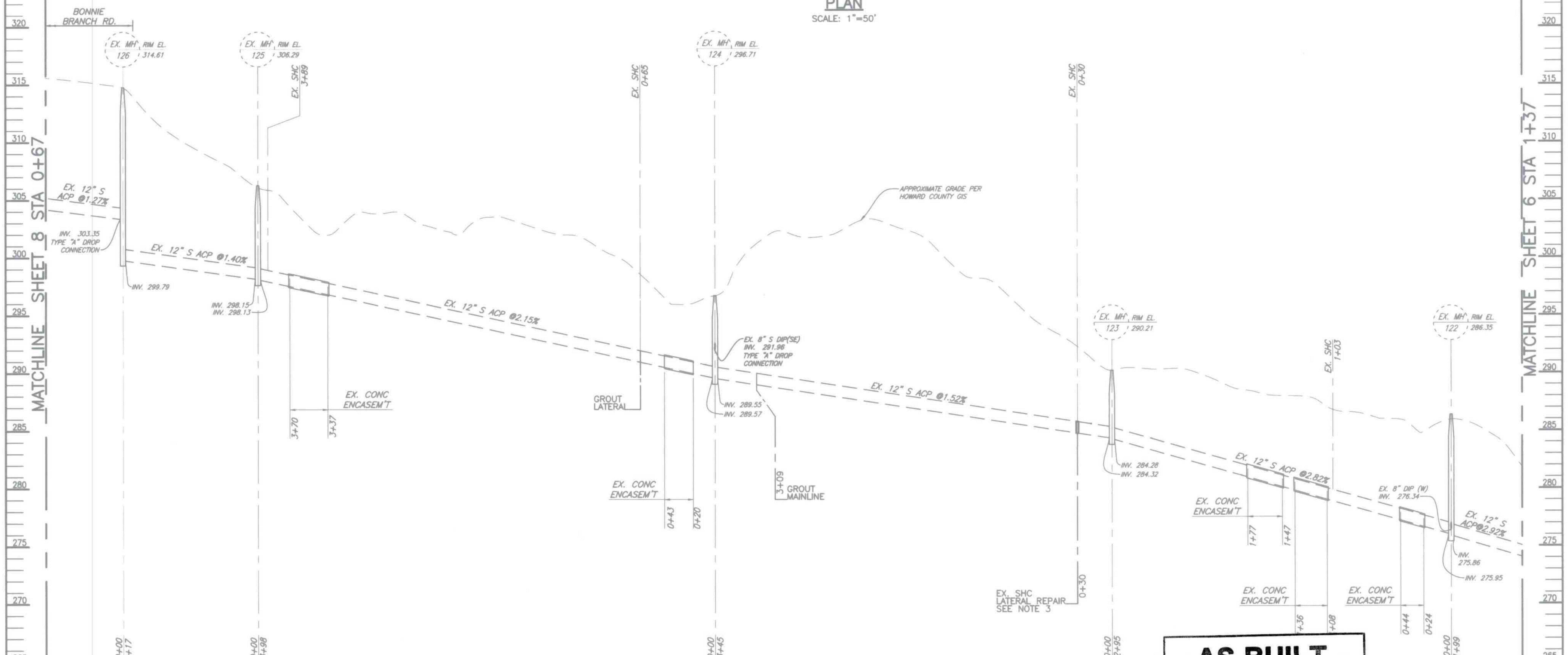
SCALE AS SHOWN

SHEET 06 OF 16



PLAN

SCALE: 1"=50'



PROFILE

SCALE: HOR.: 1"=50'
VERT.: 1"=5'

AS-BUILT
DATE 12-22-2021

NOTES:

1. EXISTING MANHOLES TO BE REHABILITATED: 122 THRU 126
2. REFER TO STRUCTURE TABLE SHEET 09 FOR INFORMATION ON ALL EXISTING AND PROPOSED STRUCTURES INCLUDING REHABILITATION OF EXISTING MANHOLES.
3. CONTRACTOR SHALL CHECK AND COMPACT THE SUB-GRADE TO 6" MINIMUM AND FILL TRENCH TO 1'-0" ABOVE TOP OF PIPE WITH #57 STONE AND FILL THE REST OF THE WAY WITH SELECT BACKFILL.
4. STABILIZED CONSTRUCTION ENTRANCE PER MDE WMA DETAIL B-1.

1 inch = 50 ft.
1 inch = 5 ft.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR, PUBLIC WORKS	1/12/2021	Acting CHIEF, BUREAU OF ENGINEERING	1-8-2021
CHIEF, BUREAU OF UTILITIES	1-11-21	CHIEF, UTILITY DESIGN DIVISION	1/7/2021

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DES: WMG
DRN: BRW
CHK: AWW
DATE: 12/2020

BY	NO.	REVISION	DATE
AMP	1	AS-BUILT	

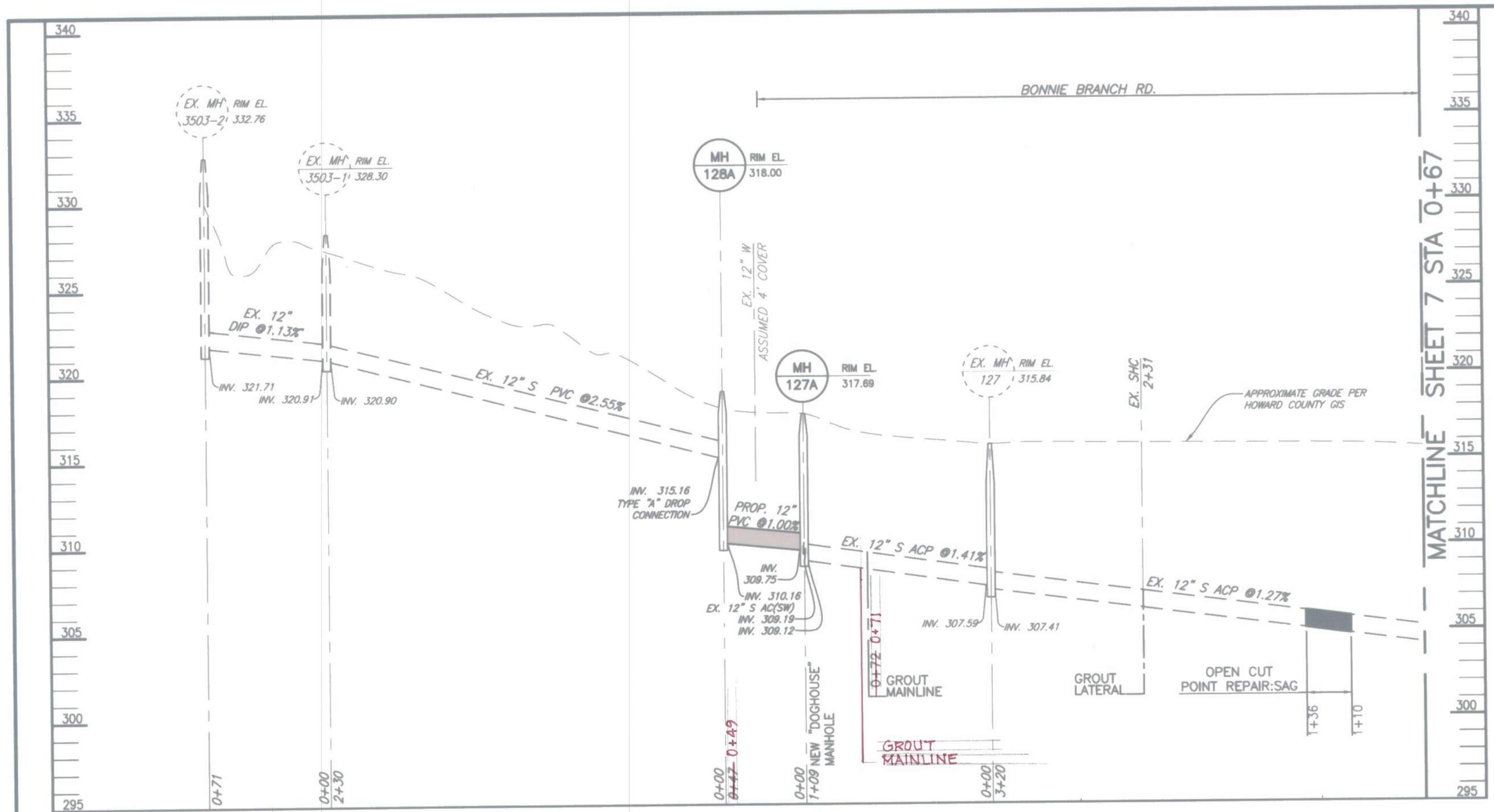
EXISTING
PLAN AND PROFILE

600 SCALE MAP NO. 31 BLOCK NO. 4

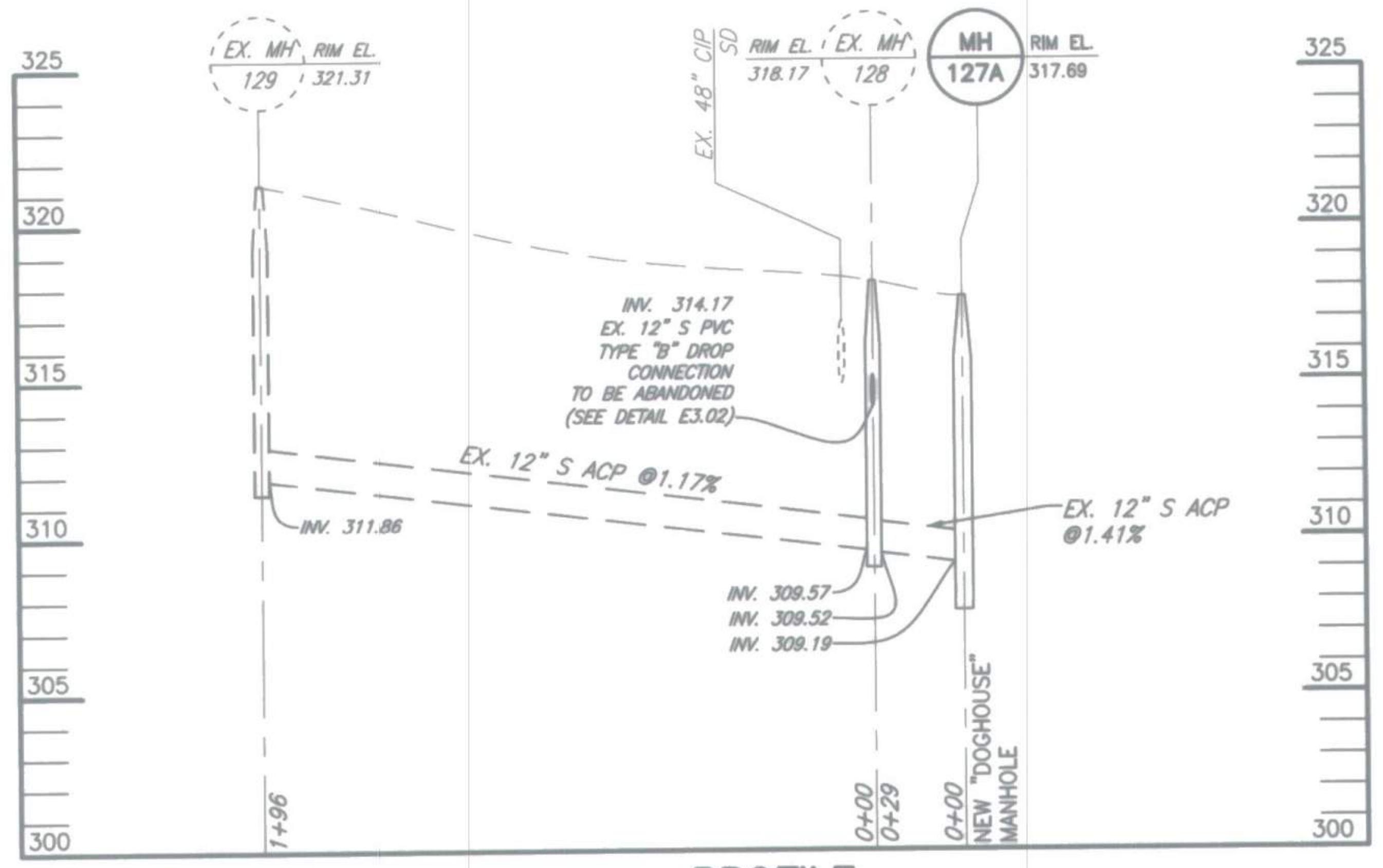
BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 07 OF 16



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



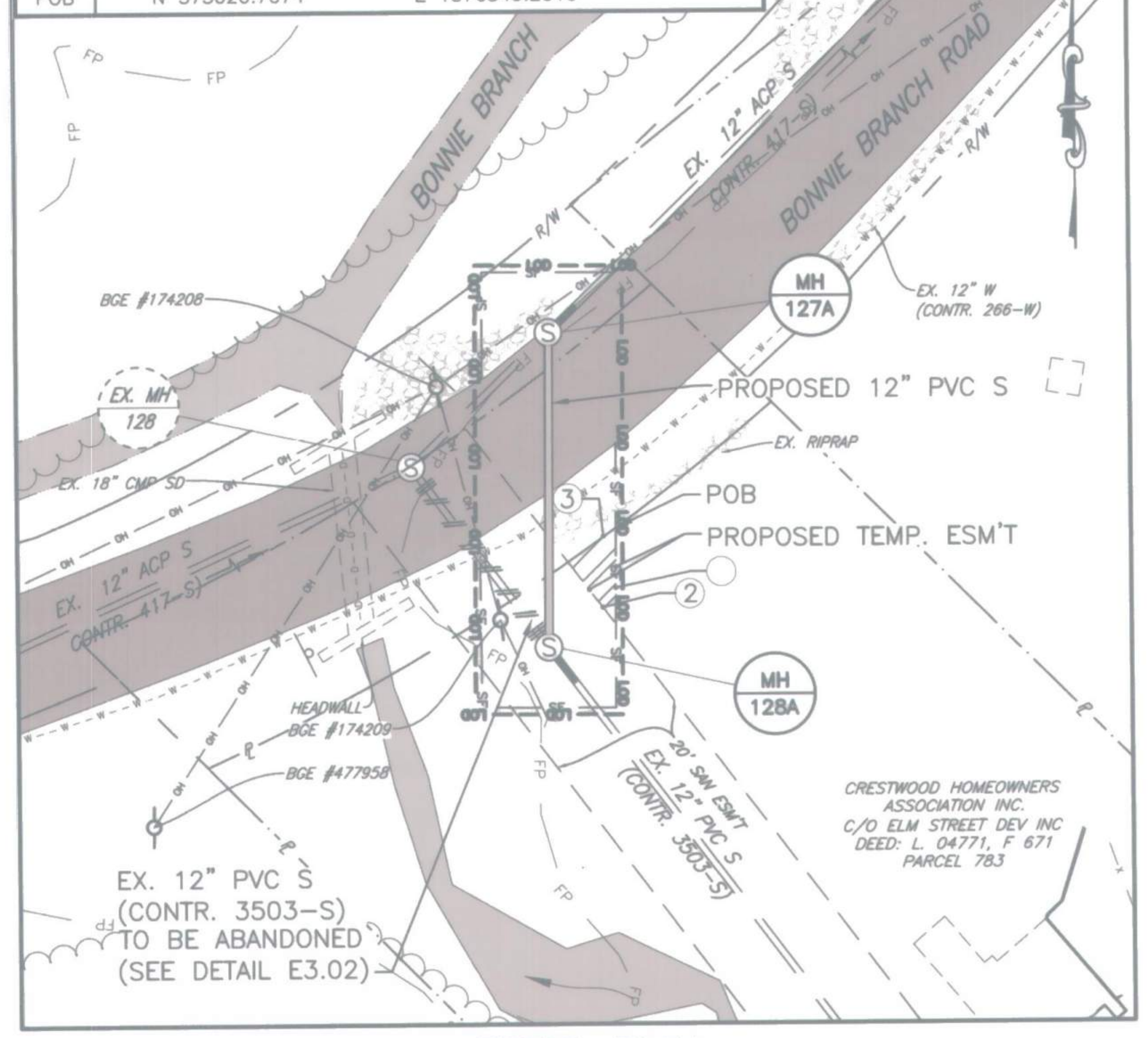
PROFILE
SCALE: HOR.: 1"=50'
VERT.: 1"=5'

NOTES:

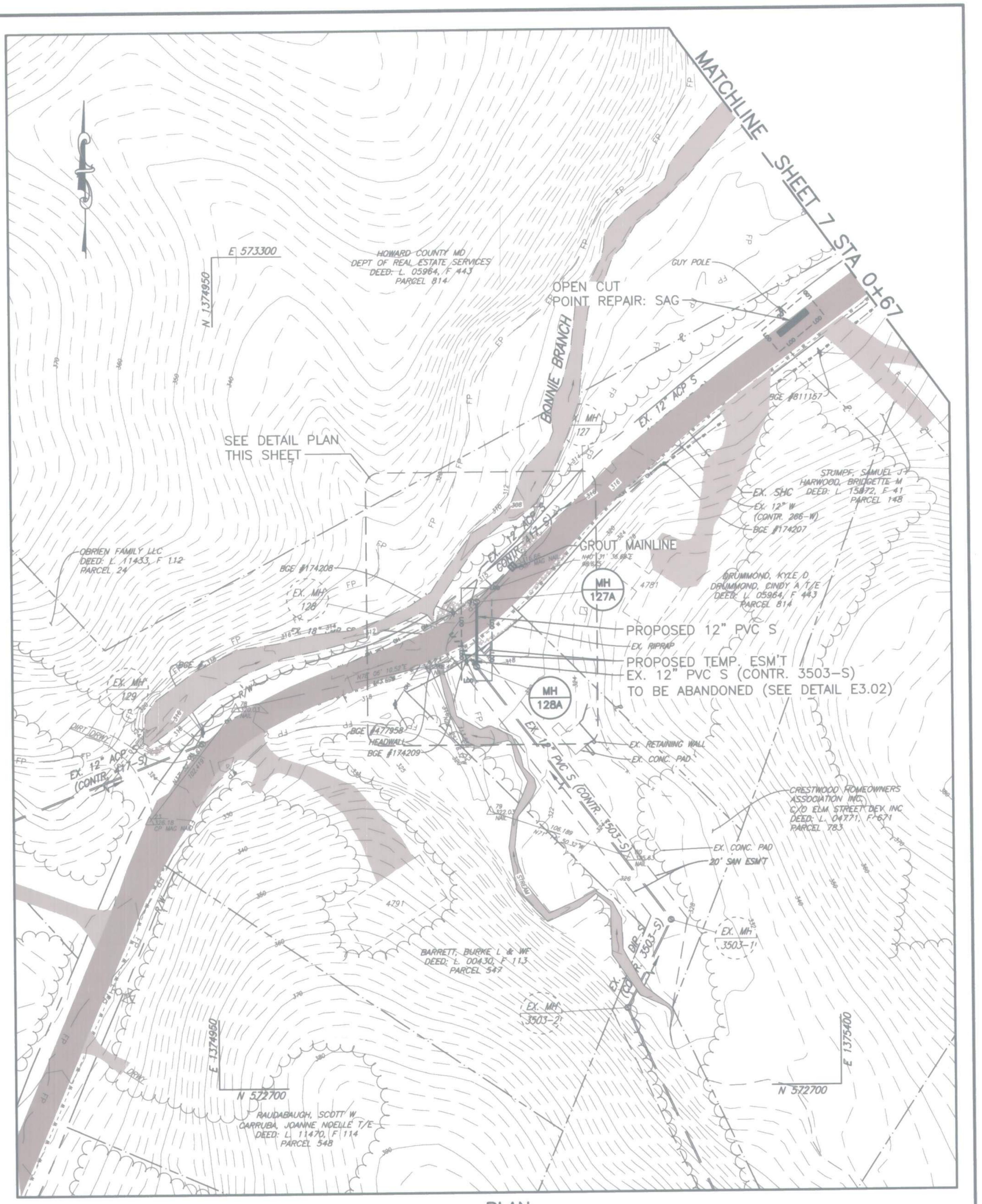
1. EXISTING MANHOLES TO BE REHABILITATED: 127, 128
2. REFER TO STRUCTURE TABLE SHEET 09 FOR INFORMATION ON ALL EXISTING AND PROPOSED STRUCTURES INCLUDING REHABILITATION OF EXISTING MANHOLES.
3. CONTRACTOR SHALL CHECK AND COMPACT THE SUB-GRADE TO 6" MINIMUM AND FILL TRENCH TO 1'-0" ABOVE TOP OF PIPE WITH #57 STONE AND FILL THE REST OF THE WAY WITH SELECT BACKFILL.
4. SEE SHEET 09 FOR TRAVERSE DETAILS.
5. PIPE ABANDONMENT AT THE MANHOLE SHALL BE IN CONFORMANCE WITH STANDARD DETAIL E-3.02.
6. PROPOSED MANHOLE 127A SHALL BE A PRECAST DOGHOUSE MANHOLE WITH THE BASE OF THE MANHOLE CONSTRUCTED ACCORDING TO STANDARD DETAIL G-5.14 AND THE REST CONSTRUCTED ACCORDING TO THE 5'-0" DIAMETER PRECAST MANHOLE DETAIL ON SHEET 02.
7. PROPOSED MANHOLE 128A SHALL BE CONSTRUCTED ACCORDING TO THE 5'-0" DIAMETER PRECAST MANHOLE DETAIL ON SHEET 02.

STAKEOUT

No.	DISTANCE	BEARING			
1	14.3747	S00°22'50"W			
2	11.7005	N37°08'02"W			
	L-CURVE	RADIUS	TANGENT	CHORD Brg.	CHORD Lng.
3	8.7595	340.0000	4.3800	N54°46'26"E	8.7593
AREA	51.0507 sf				
POB	N 573020.7074		E 1376349.2016		



DETAIL PLAN
SCALE: 1"=20'



PLAN
SCALE: 1"=50'

AS-BUILT
DATE 12-22-2021

1 inch = 50 ft.
1 inch = 5 ft.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/12/2021
CHIEF, BUREAU OF ENGINEERING — DATE 1.8.2021
CHIEF, BUREAU OF UTILITIES — DATE 1-11-21
CHIEF, UTILITY DESIGN DIVISION — DATE 1/7/2021

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DATE: 12/2020

BY	NO.	REVISION	DATE
AMP	1	AS-BUILT	

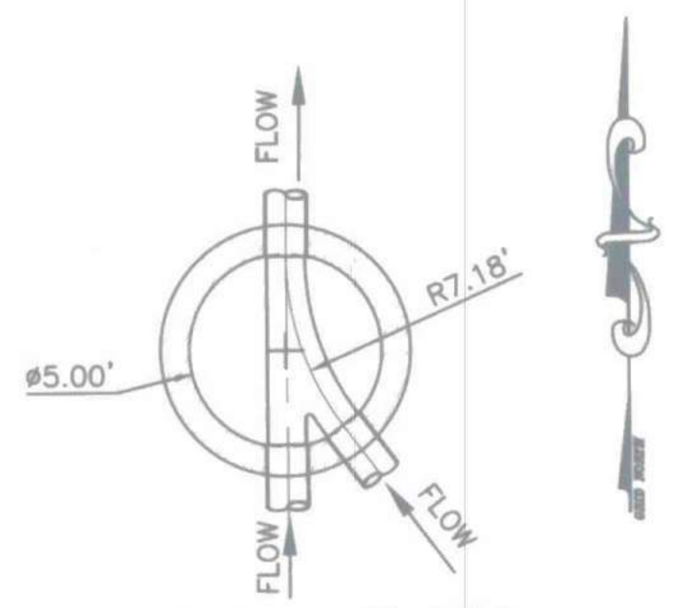
EXISTING AND PROPOSED
PLAN AND PROFILE
AT MANHOLE 128

600 SCALE MAP NO. 31 BLOCK NO. 4

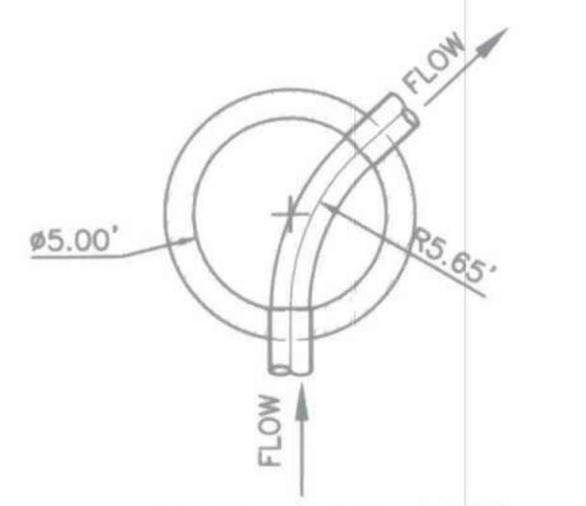
BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

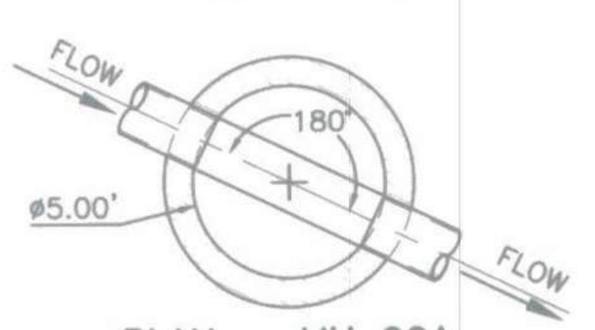
SHEET 08 OF 16



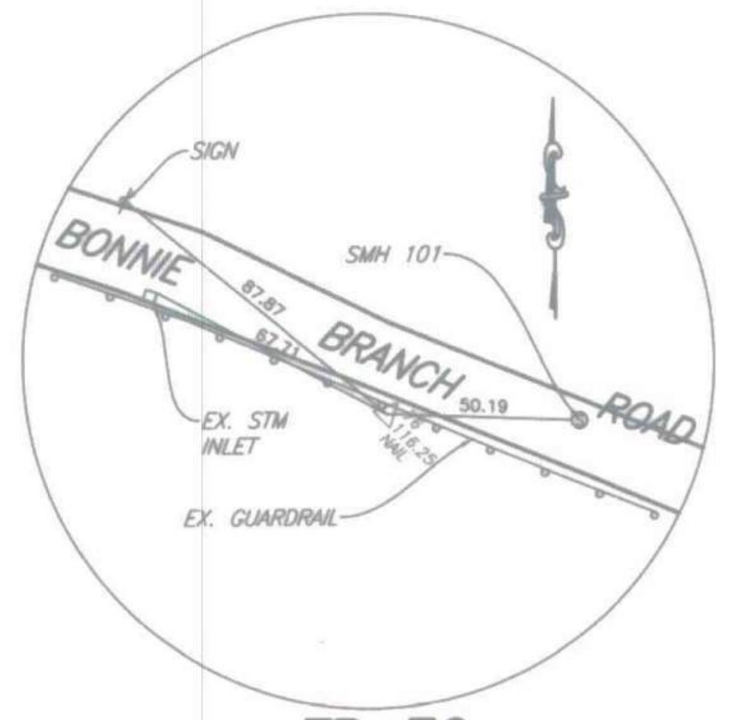
PLAN – MH 127A



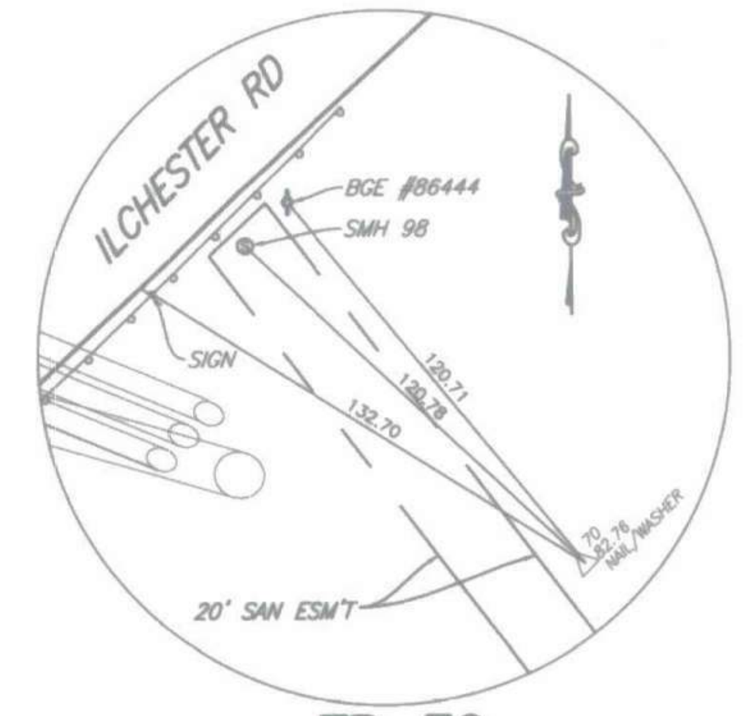
PLAN – MH 128A



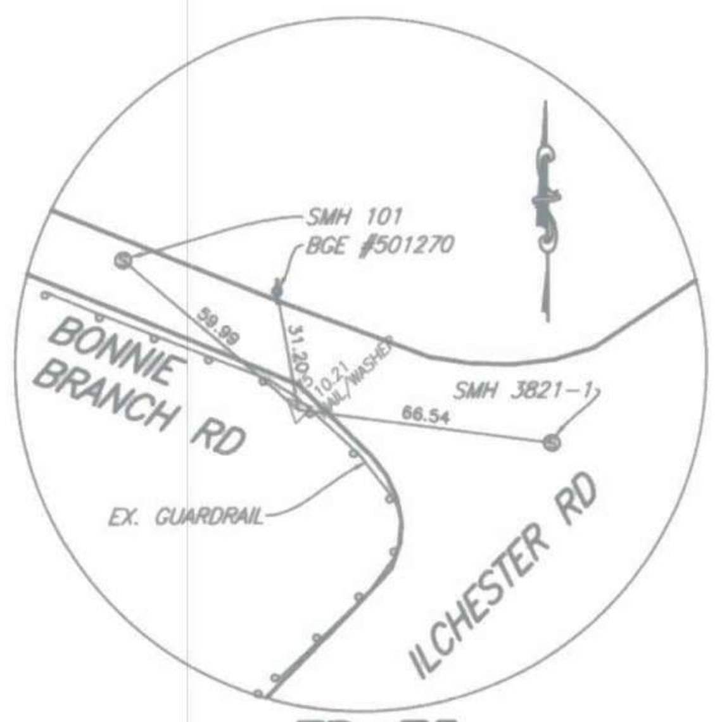
PLAN – MH 99A



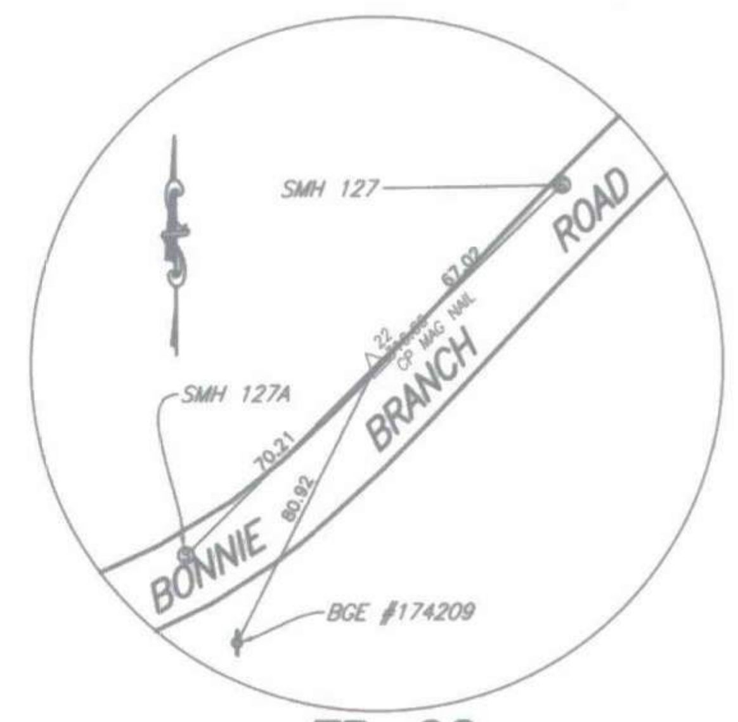
TP–76
SCALE: 1"=50'



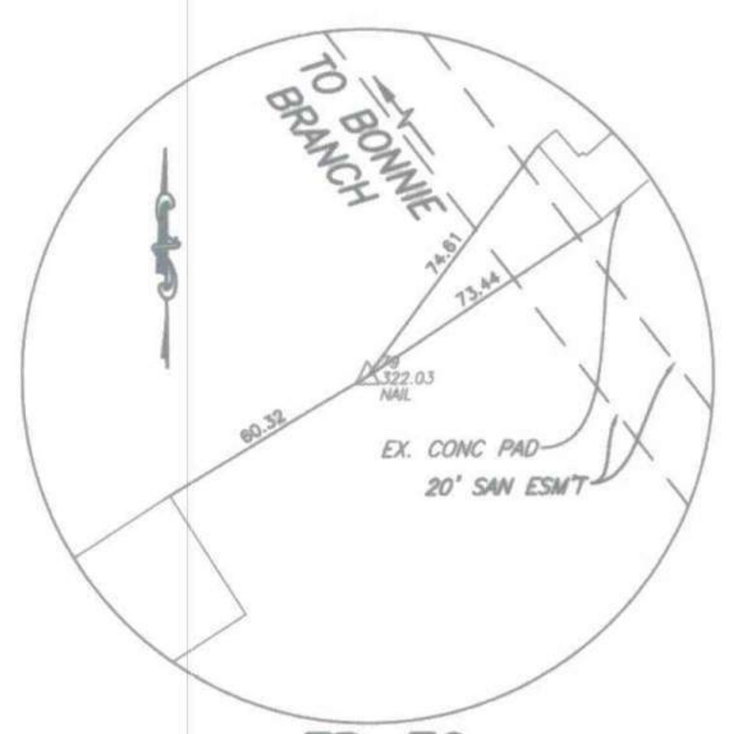
TP–70
SCALE: 1"=50'



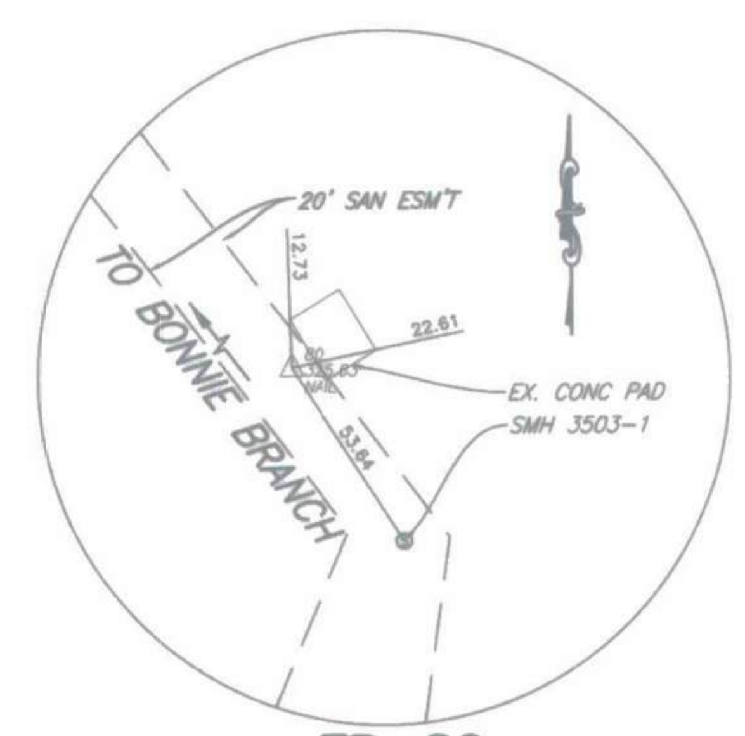
TP–75
SCALE: 1"=50'



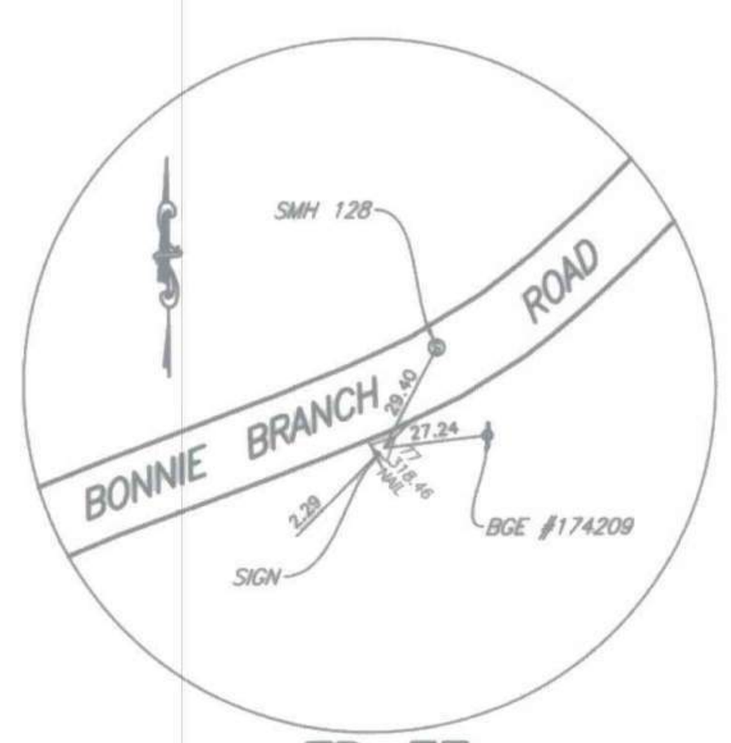
TP–22
SCALE: 1"=50'



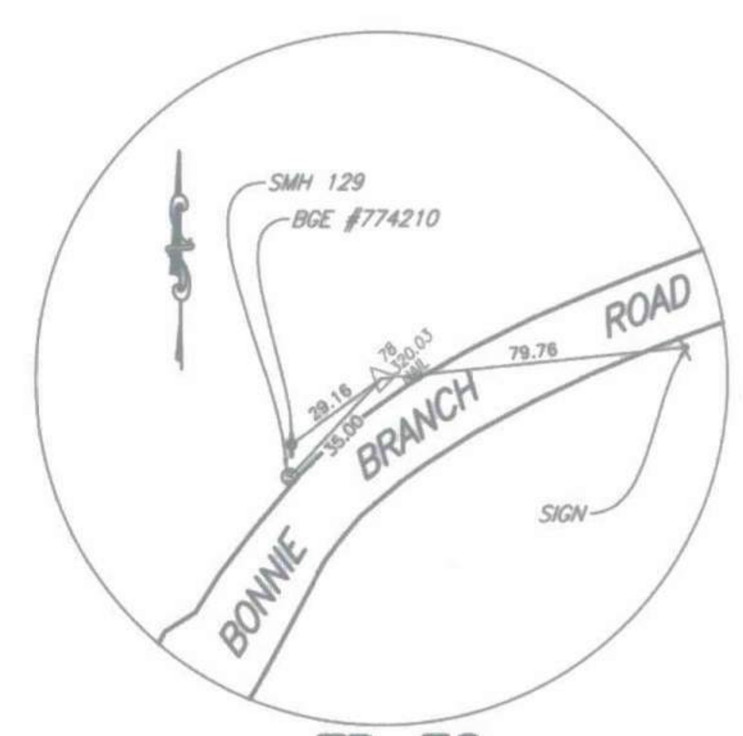
TP–79
SCALE: 1"=50'



TP–80
SCALE: 1"=50'



TP–77
SCALE: 1"=50'



TP–78
SCALE: 1"=50'

NOTES:

1. THE CENTERLINE OF ALL PIPES ENTERING A MANHOLE SHALL INTERSECT WITHIN 1"± OF THE LONGITUDINAL AXIS OF THE MANHOLE BARREL (CENTER).

2. MANHOLE CHANNEL AND BENCH SHALL BE PRECAST OR FORMED USING SEWER BRICK (ASTM DESIGNATION C32–73, GRADE SM, SIZE NO. 1).

3. CHANNEL SHALL PROVIDE SMOOTH HYDRAULIC TRANSITION BETWEEN PIPES.

4. MINIMUM CENTERLINE CHANNEL RADIUS SHALL BE 2.5 x OUTLET PIPE DIAMETER.

MANHOLE CHANNEL CONFIGURATION DETAILS

SCALE: 1"=5'

TRAVERSE TABLE

TP No.	NORTHING	EASTING
BONNIE BRANCH ROAD + ILCHESTER ROAD, SHEET 03		
70	576401.10	1378918.57
75	576514.57	1378719.56
76	576555.60	1378623.76
SOUTH TRIBUTARY TO BONNIE BRANCH TO MH128, SHEET 08		
80	572394.59	1374319.93
79	572393.98	1374124.22
77	572156.64	1374127.97
ALONG BONNIE BRANCH ROAD AT MH128, SHEET 08		
78	572172.82	1374345.39
22	572611.04	1374344.02

EXISTING MANHOLE SCHEDULE

Sheet Number (-)	Contract (-)	Manhole (-)	Northing Coordinate (-)	Easting Coordinate (-)	Manhole Rim Elevation (ft)	Outgoing Invert Elevation (ft)	Incoming Invert Elevation (ft)	Secondary Incoming Inv. Elev. (ft)	Description of Secondary Incoming Line (-)	Manhole Depth (ft)	Manhole Wall Dimension (ft)	Manhole Cover (-)	Site (-)	Manhole Grouting (-)	Coat Base to 6 V.F. Epoxy-Polyurethane (-)	Additional Coating Added (Vertical ft)	Replace Manhole Rungs (-)	Install Manhole Insert (-)
3	417	98	576,484.83	1,378,831.09	107.64	98.02	~~98.37~~ 101.21	–	–	9.62	4.00	Standard	Off-Road	-	Yes	3.62	8	1
3	417	99	576,492.94	1,378,818.60	109.43	97.13	97.13	–	–	12.30	7.00 X 7.00	30-Inch Water-Tight	Pavement	-	N/A	N/A	N/A	N/A
3	417	100	576,496.39	1,378,806.58	110.19	99.04	101.92	–	Outgoing Elevation from As-Built	11.15	5.00 X 7.00	Standard	Pavement	-	N/A	N/A	N/A	N/A
3	3821	1	576,505.60	1,378,785.69	110.16	101.99	101.98	102.55	8-Inch Branch	8.17	4.00	Standard	Pavement	-	Yes	2.17	7	1
3	417	101	576,553.59	1,378,673.84	113.49	102.41	105.69	–	–	11.08	4.00	Standard with Insert	Pavement	-	Yes	5.08	10	1
3	417	102	576,625.07	1,378,531.81	126.02	117.58	117.76	–	–	8.44	4.00	Standard with Insert	Grass	Yes	Yes	2.44	7	1
3	417	103	576,638.69	1,378,369.45	142.20	132.78	132.74	–	–	9.42	4.00	Standard with Insert	Pavement	-	Yes	3.42	8	1
3	417	104	576,721.11	1,378,150.74	148.06	138.06	138.16	–	–	10.00	4.00	Standard with Insert	Pavement	-	Yes	4.00	9	1
4	417	105	576,745.74	1,377,963.03	155.92	145.44	145.49	–	–	10.48	4.00	Standard with Insert	Pavement	-	Yes	4.48	9	1
4	417	106	576,682.75	1,377,709.31	167.14	154.57	154.62	–	–	12.57	4.00	Standard with Insert	Pavement / Grass	Yes	Yes	6.57	12	1
4	417	107	576,553.02	1,377,567.72	171.67	161.35	163.77	–	–	10.32	4.00	Standard with Insert	Pavement	-	Yes	4.32	9	1
4	417	108	576,411.82	1,377,308.25	192.90	182.57	182.91	–	–	10.33	4.00	Standard	Off-Road Gutter	Yes	Yes	4.33	9	1
4	417	109	576,309.15	1,377,252.28	200.28	190.05	190.09	–	–	10.23	4.00	Standard	Pavement (Edge)	-	Yes	4.23	9	1
5	417	110	576,060.68	1,377,223.53	204.62	195.46	195.57	–	–	9.16	4.00	Standard with Insert	Pavement	Yes	Yes	3.16	8	1
5	417	111	575,953.67	1,377,154.53	209.09	198.41	198.52	–	–	10.68	4.00	Standard	Pavement	Yes	Yes	4.68	10	1
5	417	112	575,878.49	1,377,047.42	215.58	201.52	201.55	–	–	14.06	4.00	Standard with Insert	Off-Road	-	Yes	8.06	13	1
5	417	113	575,677.96	1,376,853.75	225.69	212.99	217.55	212.95	Bottom of Mainline Drop Connection	12.70	4.00	Standard	Pavement	-	Yes	6.70	12	1
5	417	114	575,349.67	1,376,738.78	239.21	229.46	230.66	–	–	9.75	4.00	Standard	Pavement	Yes	Yes	3.75	9	1
6	417	115	575,272.88	1,376,518.45	249.49	238.54	238.69	–	–	10.95	4.00	Standard	Pavement	-	Yes	4.95	10	1
6	417	116	575,261.46	1,376,297.35	255.65	248.18	248.24	248.70	8-Inch Branch	7.47	4.00	Standard, Bolted	Off-Road	Yes	Yes	1.47	6	1
6	417	117	575,144.64	1,376,183.24	263.33	250.98	251.09	251.25 / 257.40	8-Inch Branch / 6-Inch Branch	12.35	4.00	Standard	Pavement	Yes	Yes	6.35	11	1
6	417	118	575,014.56	1,376,065.14	266.97	253.94	253.95	–	–	13.03	4.00	Standard	Pavement	-	Yes	7.03	12	1
6	417	119	574,852.91	1,375,846.12	274.13	261.25	261.37	–	–	12.88	4.00	Standard	Pavement	Yes	Yes	6.88	12	1
6	417	120	574,706.53	1,375,873.30	280.84	265.57	265.71	–	–	15.27	4.00	Standard	Pavement (Edge)	Yes	Yes	9.27	14	1
6	417	121	574,550.63	1,375,937.48	284.72	270.05	270.05	270.39 / 270.87	8-Inch / 6-Inch Branch	14.67	4.00	Standard	Pavement	Yes	Yes	8.67	14	1
7	417	122	574,405.89	1,375,800.72	286.35	275.86	275.95	276.34	6-Inch Branch	10.49	4.00	Standard, Bolted	Off-Road	Yes	Yes	4.49	9	1
7	417	123	574,141.96	1,375,667.93	290.21	284.28	284.32	–	–	5.93	4.00	Standard with Insert	Off-Road	-	Yes	0	5	1
7	417	124	573,799.31	1,375,626.33	296.71	289.55	289.57	291.96	8-Inch Branch	7.16	4.00	Water-Tight	Off-Road	Yes	Yes	1.16	6	0
7	417	125	573,442.40	1,375,450.82	306.29	298.13	298.15	–	–	8.16	4.00	Standard	Off-Road	Yes	Yes	2.16	7	1
7	417	126	573,326.01	1,375,465.97	314.61	299.79	303.35	299.84	Bottom of Mainline Drop Connection	14.82	4.00	Standard	Pavement / Grass	-	Yes	8.82	14	1
8	417	127	573,125.42	1,375,217.25	315.84	307.41	307.59	–	–	8.43	4.00	Standard	Pavement	-	Yes	2.43	8	1
8	417	128	573,030.18	1,375,118.78	318.17	309.52	309.57	314.17 / 309.57	Bottom of Mainline Drop Connection / 10-Inch Branch	8.65	4.00	Standard	Pavement	-	Yes	2.65	8	1
															Totals:	137.34	285	29

PROPOSED MANHOLE SCHEDULE

Sheet Number (-)	Contract (-)	Manhole (-)	Northing Coordinate (-)	Easting Coordinate (-)	Manhole Rim Elevation (ft)	Outgoing Invert Elevation (ft)	Incoming Invert Elevation (ft)	Secondary Incoming Inv. Elev. (ft)	Description of Secondary Incoming Line (-)	Manhole Depth (ft)	Manhole Wall Dimension (ft)	Manhole Cover (-)	Site (-)	Manhole Grouting (-)	Coat Base to 6 V.F. Epoxy-Polyurethane (-)	Additional Coating Added (Vertical ft)	Replace Manhole Rungs (-)	Install Manhole Insert (-)
10	5034	99A	576,490.92	1,378,817.68	109.46	~~101.87~~ 101.43	~~101.87~~ 101.43	–	–	7.59	5.00	Standard	Pavement	-	Yes	1.59	N/A	1
8	5034	127A	573,053.78	1,375,143.42	316.36	309.04	309.64	309.04	12-Inch from MH 128	7.32	5.00	Standard	Pavement	-	Yes	1.32	N/A	1
8	5034	128A	572,997.77	1,375,143.04	318.21	310.16	315.21	310.17	Bottom of Mainline Drop Connection	8.05	5.00	Standard	Off-Road	-	Yes	2.05	N/A	1
															Totals:	4.96	0	3

AS-BUILT
DATE 12-22-2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS 1/12/2021 DATE	Acting CHIEF, BUREAU OF ENGINEERING 1-8-2021 DATE
CHIEF, BUREAU OF UTILITIES 1-11-21 DATE	CHIEF, UTILITY DESIGN DIVISION 1/7/2021 S.G. DATE

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ARCHITECTS & ENGINEERS
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STATE OF MARYLAND · W. MARK GARDOCKY · No. 30876 · REGISTERED PROFESSIONAL ENGINEER

DES: WMG
DRN: BRW
CHK: AWW
DATE: 12/2020

BY	NO.	REVISION	DATE
AMP	1	AS-BUILT	

STRUCTURE SCHEDULE

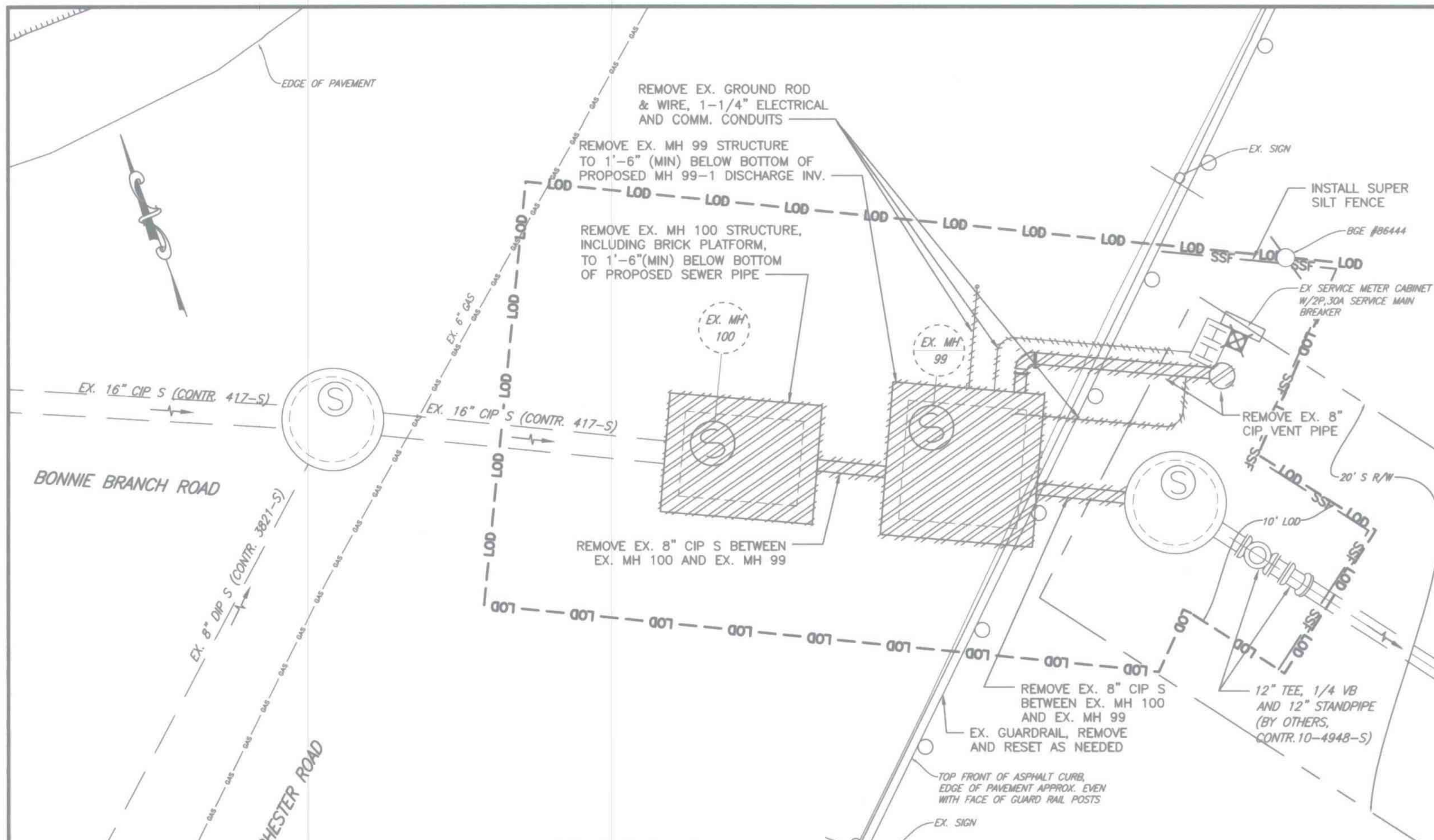
600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10–5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

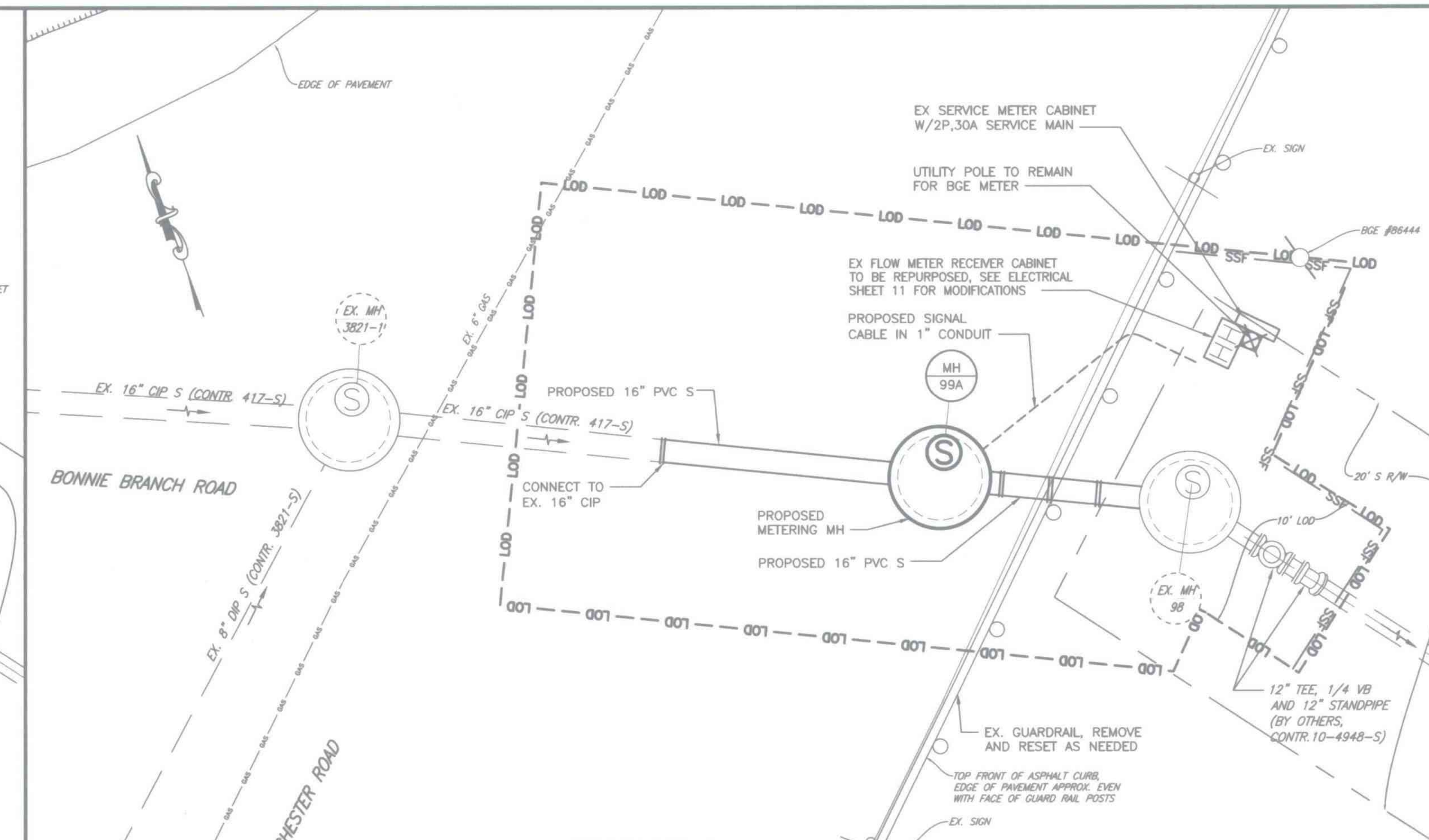
SCALE AS SHOWN

SHEET 09 OF 16

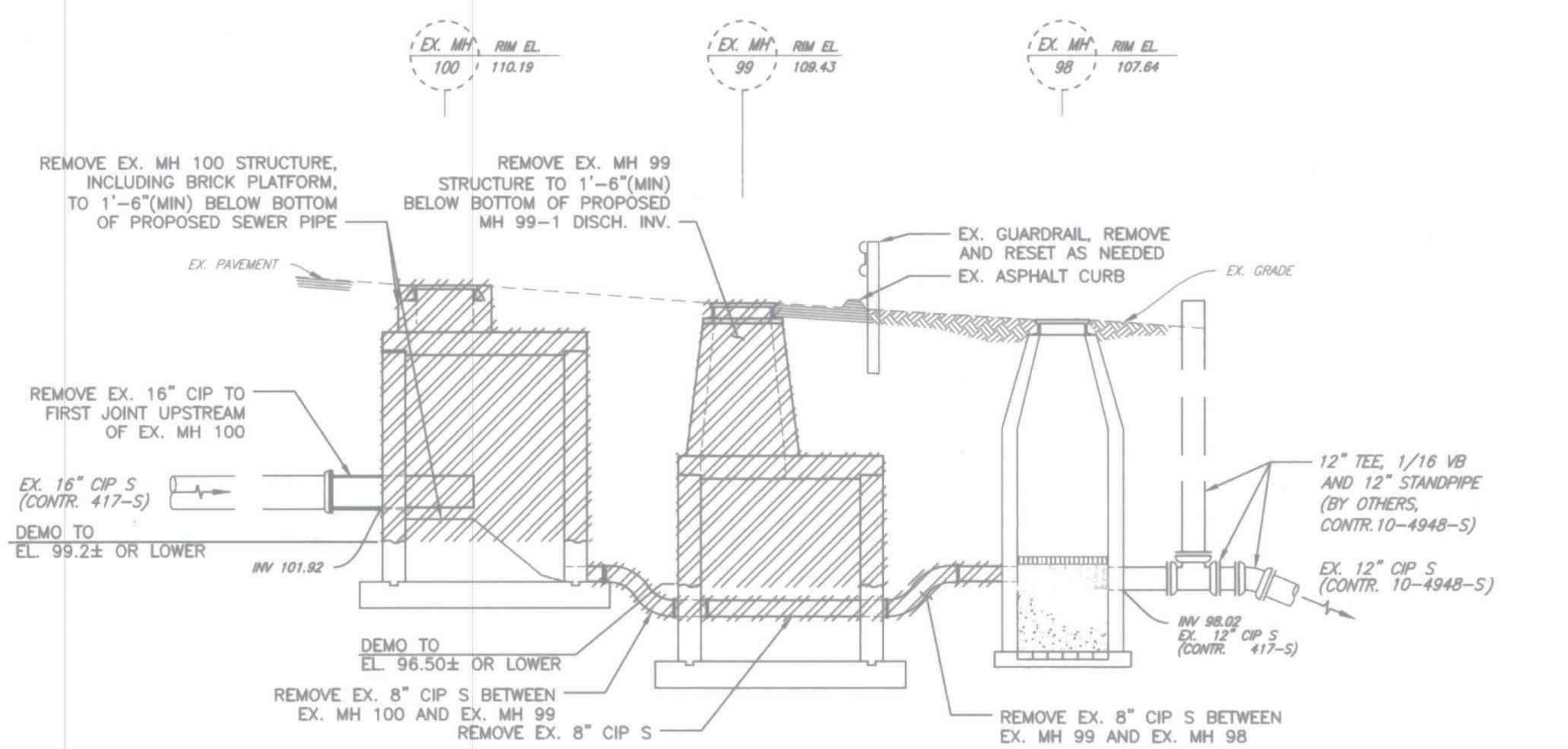
PATH: I:\Projects\2012\120198-023 – Bloede Dam & Bonnie Branch\Drawings\CURRENT\MH TABLES.dwg 12/17/2020 11:07 AM using std-kip.ctb



DEMOLTION PLAN
SCALE: 1"=5'



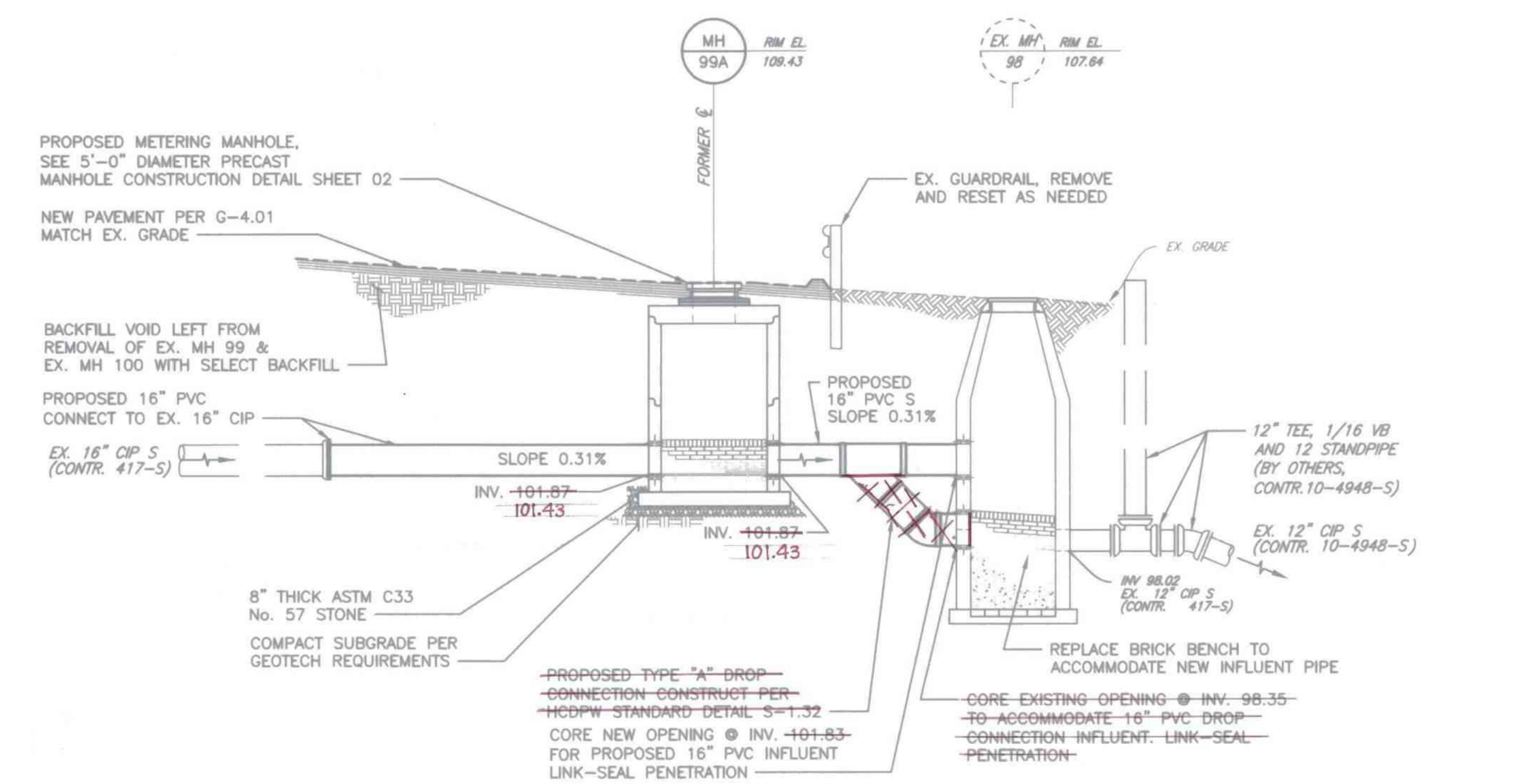
PROPOSED PLAN
SCALE: 1"=5'



NOTE:

EXISTING FLOW METER VAULT (MH-99) TO BE TAKEN OUT OF SERVICE, DISMANTLED AS SHOWN & ABANDONED IN PLACE. DISCONNECT ALL EXISTING POWER, INSTRUMENTATION & COMMUNICATION CIRCUITRY TO THE VAULT. REMOVE ALL EXISTING WIRING COMING FROM THE EXISTING SERVICE / METER PANEL TO THE VAULT. ABANDON EXISTING CONDUITS IN PLACE.

DEMOLITION SECTION
SCALE: 1"=5'



PROPOSED SECTION
SCALE: 1"=5'

AS-BUILT
DATE 12-22-2021

5 0 2.5 5 10
1 inch = 5 ft.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND		
DIRECTOR OF PUBLIC WORKS	DATE 1/12/2021	
CHIEF, BUREAU OF ENGINEERING (Acting)	DATE 1-8-2021	
CHIEF, BUREAU OF UTILITIES	DATE 1-11-21	
CHIEF, UTILITY DESIGN DIVISION	DATE 1/7/2021	

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STATE OF MARYLAND — PROFESSIONAL ENGINEER

DES: WMG	BY	NO.	REVISION	DATE
DRN: BRW				
CHK: AWW				
DATE: 12/2020	AMP	1	AS-BUILT	

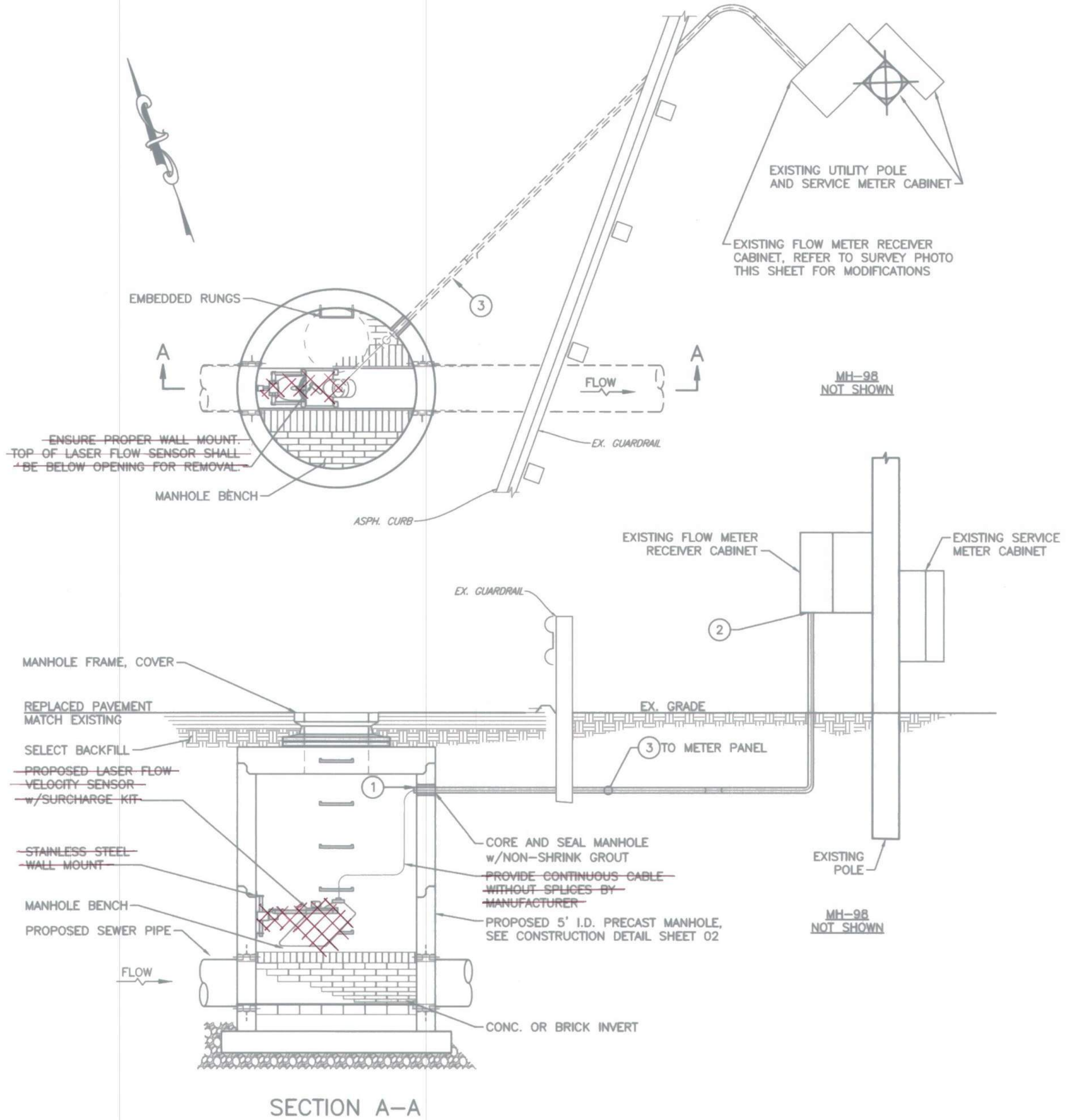
PROPOSED
BILLING FLOW METER
PLANS AND SECTIONS

600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

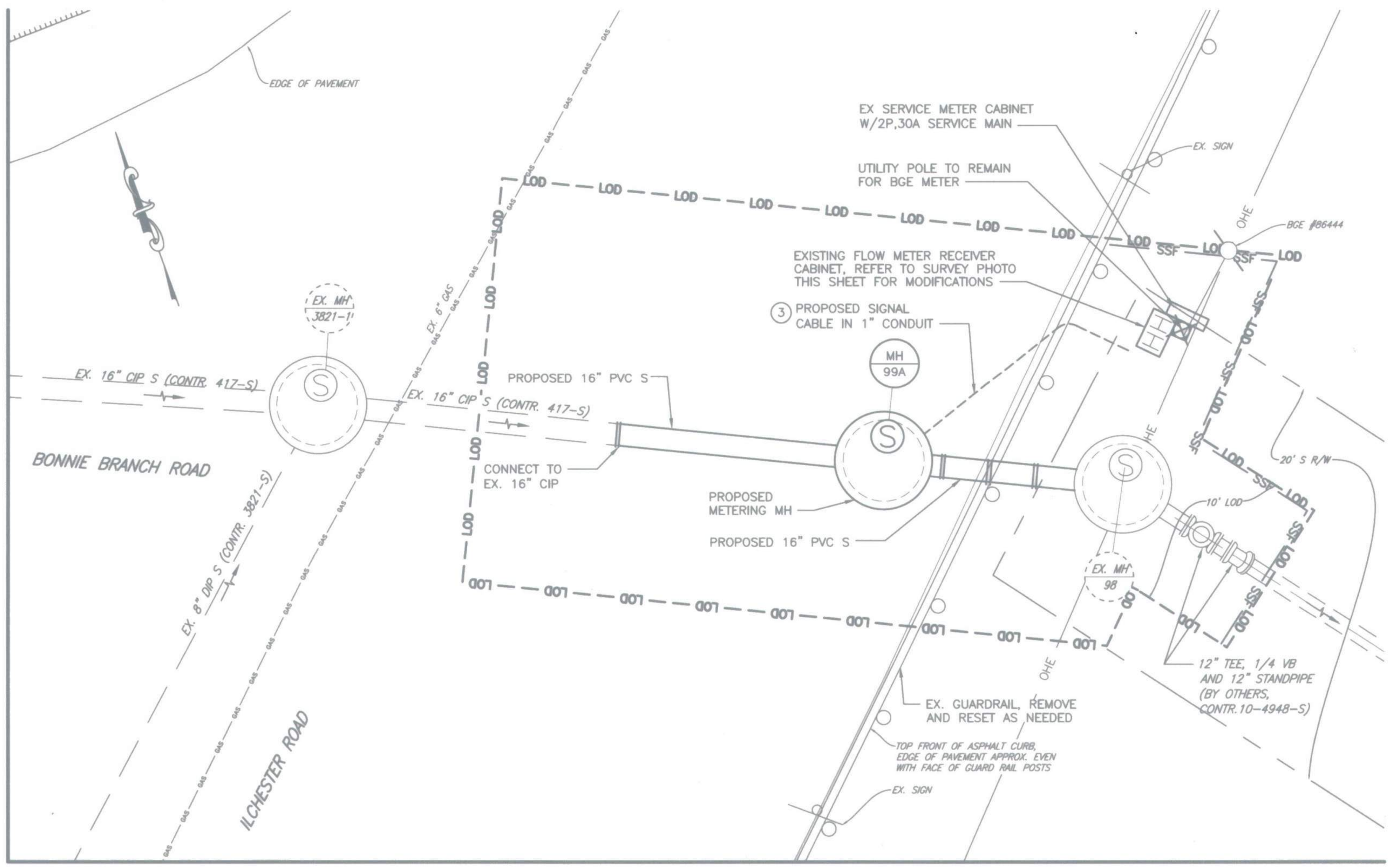
SCALE AS SHOWN

SHEET 10 OF 16



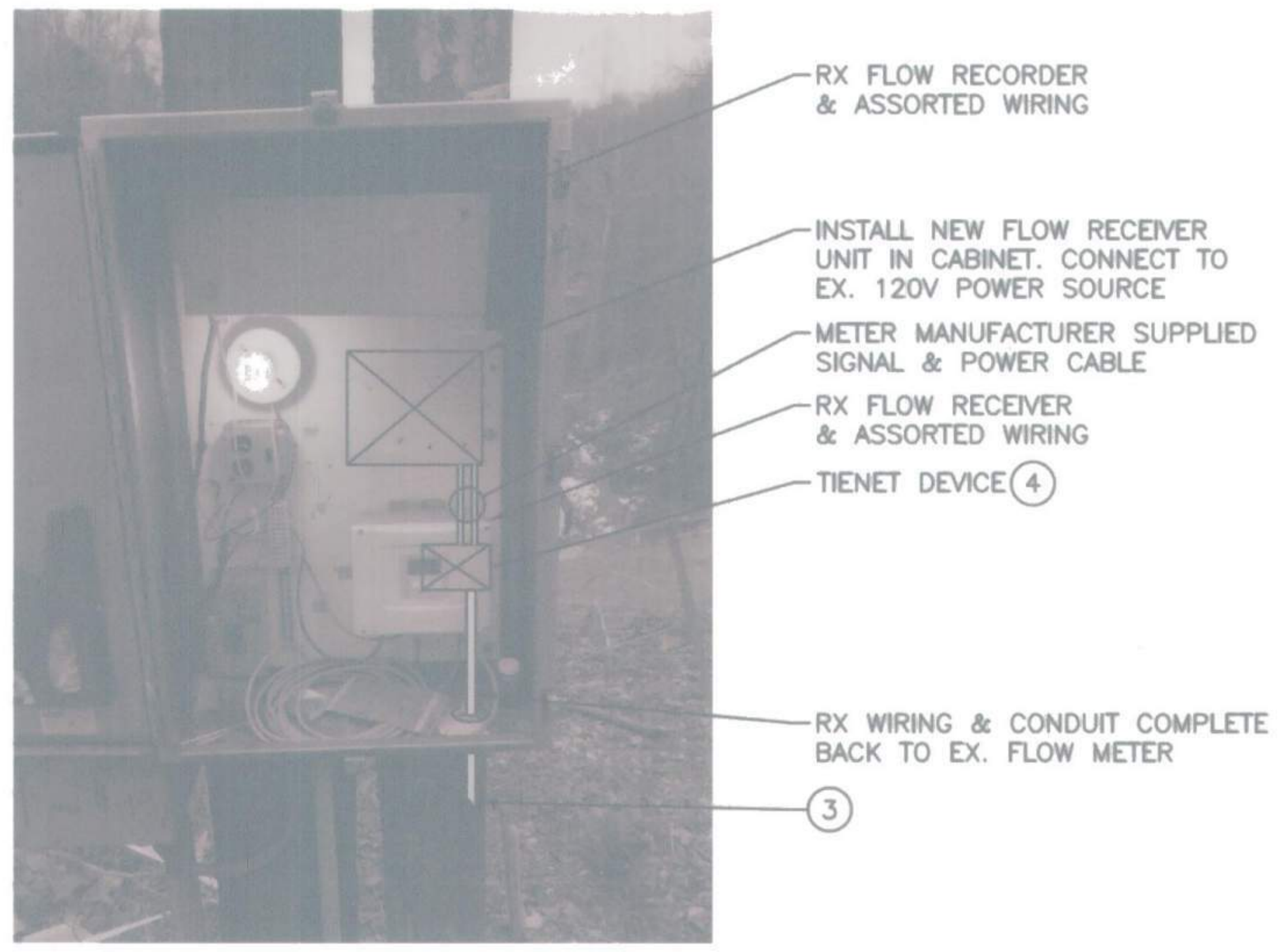
PROPOSED FLOW METER AT 99A DETAIL

SCALE: NTS



PROPOSED PLAN

SCALE: 1"=5'



EXISTING FLOW METER RECEIVER CABINET

(SURVEY PHOTO 2017-12-12)

SHEET NOTES:

1. TERMINATE CONDUIT 3" BEYOND INTERIOR FACE OF MANHOLE. PROVIDE INSULATED BUSHING & STAINLESS STEEL CABLE STRAIN RELIEF DEVICE.
2. PROVIDE SEALING FITTING PRIOR TO CONDUIT ENTRY INTO JUNCTION BOX. SEALING FITTING SHALL BE COMPOUND FILLED.
3. INSTALL SIGNAL CABLE SUPPLIED BY METER MANUFACTURER IN 1"C. FROM MANHOLE TO TIENET DEVICE in EXISTING FLOW METER RECEIVER CABINET.
4. INSTALL TIENET DEVICE IN EXISTING FLOW METER RECEIVER CABINET. UTILIZE CORD-GRIP FITTINGS SUPPLIED BY FLOW METER MANUFACTURER FOR ALL CABLE CONNECTIONS TO TIENET DEVICE.

ELECTRICAL LEGEND:

A.	AMPERES
C.	CONDUIT
EX	EXISTING
JB	JUNCTION BOX
MFR	MANUFACTURER
RX	REMOVE EXISTING
V	VOLTS
⊠	SPECIAL DEVICE AS NOTED
(#)	DENOTES REFERENCE TO SHEET NOTE NUMBER.
⌒	CONDUIT – UNDERGROUND IN PLAN

5 0 2.5 5 10
1 inch = 5 ft.

AS-BUILT
DATE 12-22-2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR, PUBLIC WORKS — 1/12/2021 DATE
CHIEF, BUREAU OF UTILITIES — 1-6-21 DATE
Acting CHIEF, BUREAU OF ENGINEERING — 1-8-2021 DATE
CHIEF, UTILITY DESIGN DIVISION — 1/7/2021 DATE

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STATE OF MARYLAND — PROFESSIONAL ENGINEER

DES: WMG
DRN: BRW
CHK: AWW
DATE: 12/2020

BY	NO.	REVISION	DATE
AMP	1	AS-BUILT	

ELECTRICAL
PLAN, DETAILS AND NOTES

600 SCALE MAP NO. 31 BLOCK NO. 4

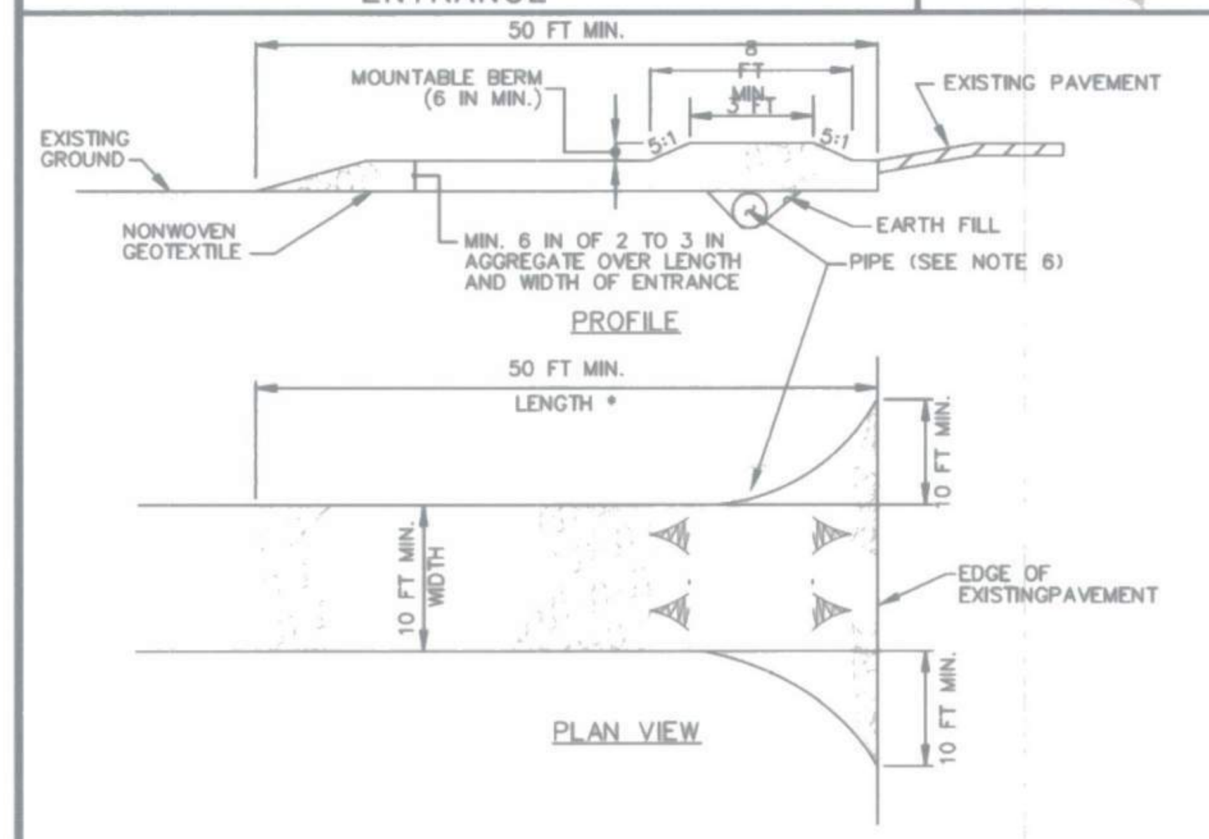
BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10–5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 11 OF 16

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL



CONSTRUCTION SPECIFICATIONS

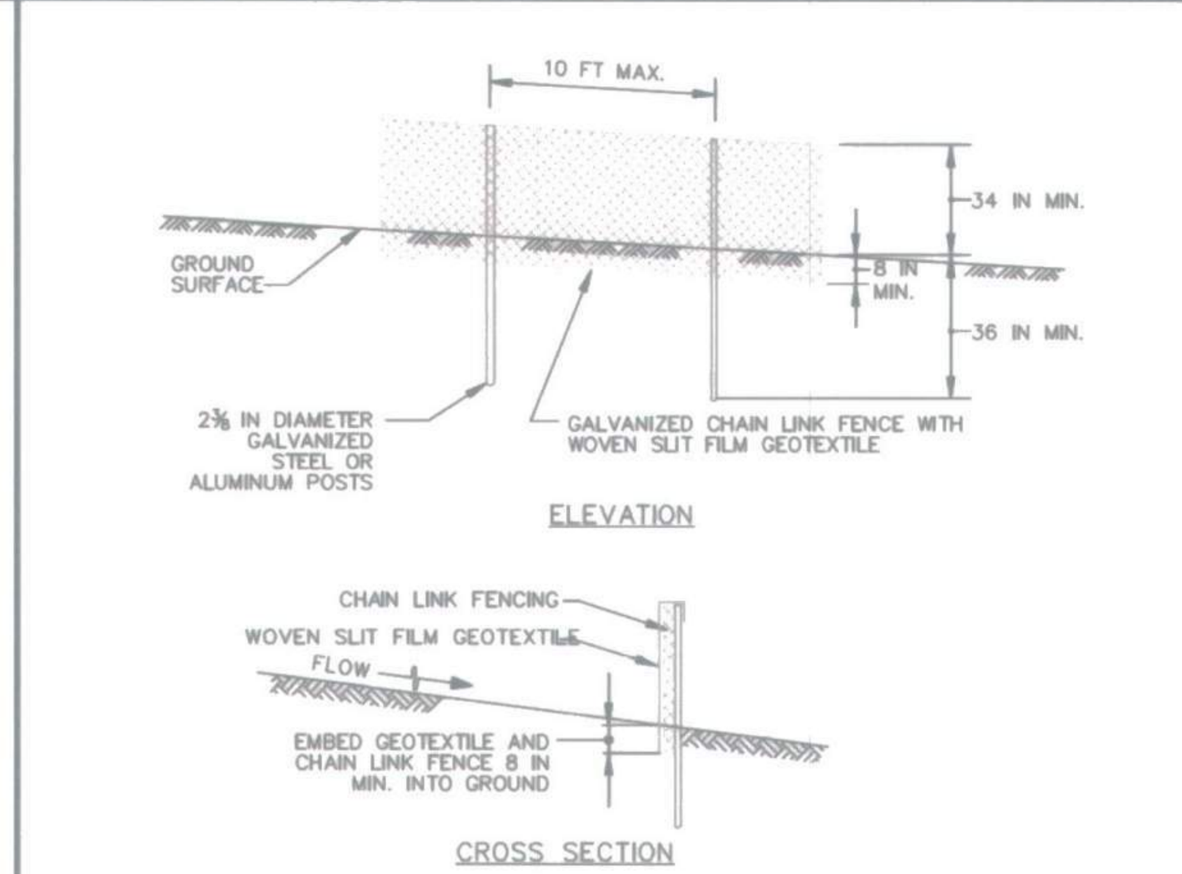
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. 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 BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL —SSF—



CONSTRUCTION SPECIFICATIONS

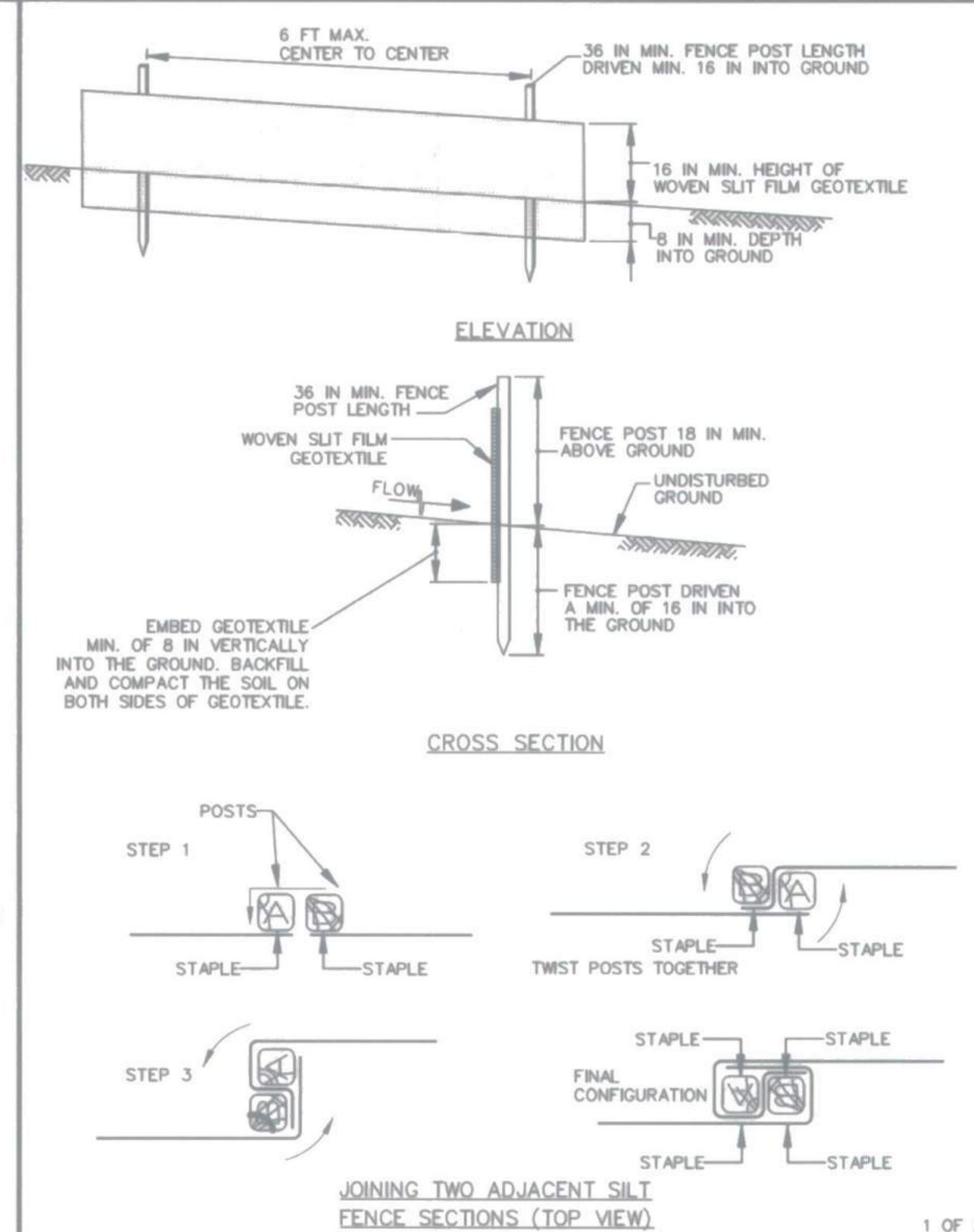
1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

STANDARD SYMBOL —SF—



1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

STANDARD SYMBOL —SF—

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± 1/16 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.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. 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.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. 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.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

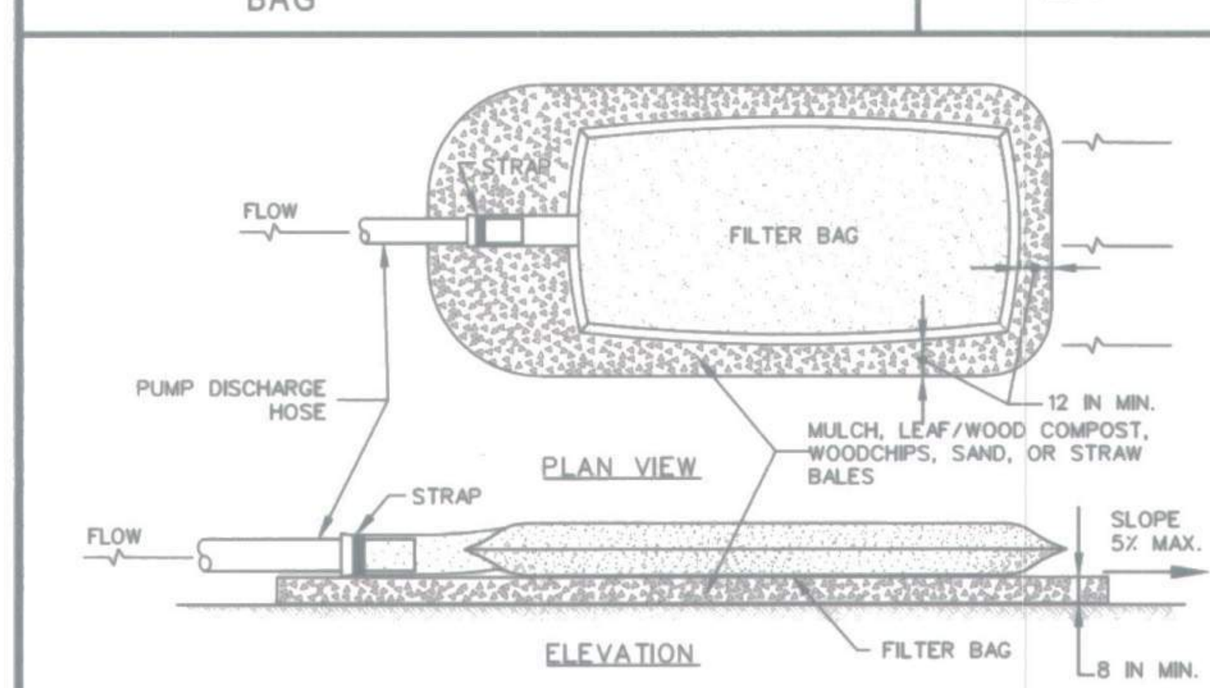
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL F-4 FILTER BAG

STANDARD SYMBOL ☒FB



CONSTRUCTION SPECIFICATIONS

1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
2. 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.
3. 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.
4. 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.
5. 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-4833
FLOW RATE	70 GAL/MIN/FT²	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

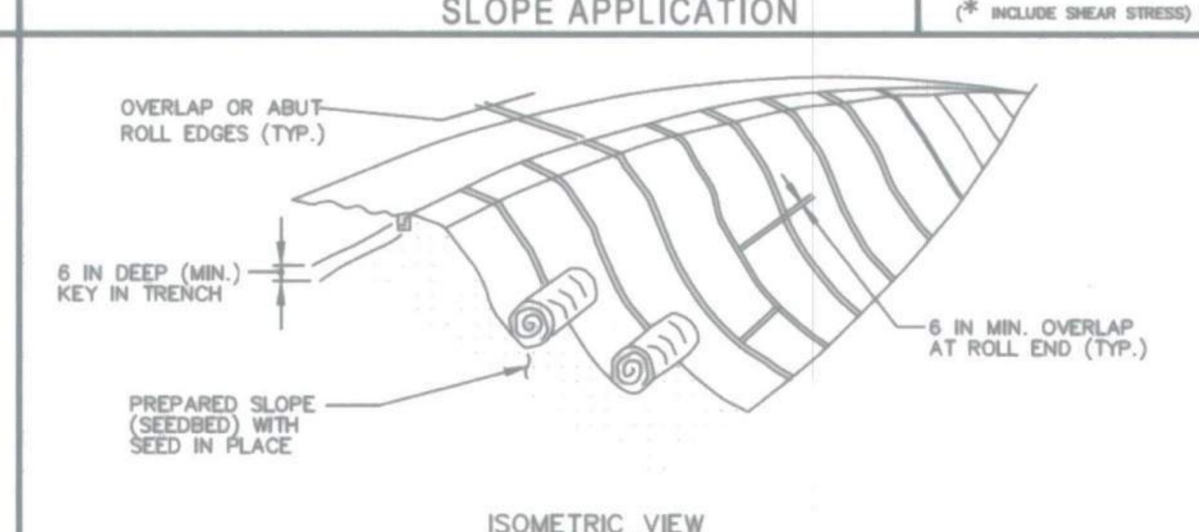
6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-4-6-B TEMPORARY SOIL STABILIZATION MATTING SLOPE APPLICATION

STANDARD SYMBOL TSSMS – 2.25 lb/ft² (* INCLUDE SHEAR STRESS)



CONSTRUCTION SPECIFICATIONS

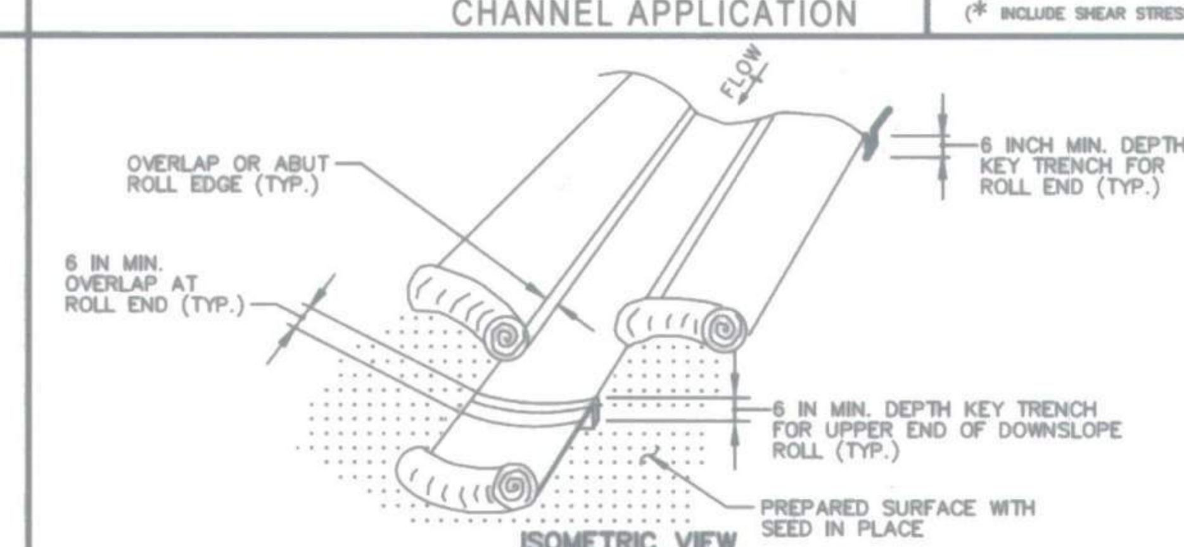
1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS 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.
3. 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 1½ 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, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. 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.
5. UNROLL MATTING DOWNSLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. 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.
7. 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.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-4-6-A TEMPORARY SOIL STABILIZATION MATTING CHANNEL APPLICATION

STANDARD SYMBOL TSSMS – 2.25 lb/ft² (* INCLUDE SHEAR STRESS)



CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS 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.
3. 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 1½ 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, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. 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.
5. UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTERLINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MAT SMOOTHLY AND FIRMLY ON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. KEY-IN UPSTREAM END OF EACH MAT ROLL BY DIGGING A 6 INCH (MINIMUM) TRENCH AT THE UPSTREAM END OF THE MATTING, PLACING THE ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END.
7. OVERLAP OR ABUT THE ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. 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

BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLANS

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 which 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, unsightly debris, 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 flood plain in excess of that lost under the originally authorized structure or fill.
6. Rectify any nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year flood plain 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 (uniola sp.), and/or rye (secale cereale). these species will allow for 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 classification of the stream:

   Use I waters: in-stream work shall not be conducted during the period of 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 the aquatic species, unless the purpose of the activity is to impound water.

SEQUENCE OF CONSTRUCTION

EROSION AND SEDIMENT CONTROL SETUP – 5 DAYS

1. (DAY 1) THE CONTRACTOR SHALL STAKE OUT THE LIMITS OF DISTURBANCE AS SHOWN ON THE PLANS AND OBTAIN GRADING PERMIT.
2. (DAY 1) NOTIFY MISS UTILITY (1-800-257-7777) AT LEAST 48 HOURS PRIOR TO BEGINNING WORK.
3. (DAY 2) THE CONTRACTOR SHALL CONDUCT A PRE-CONSTRUCTION MEETING ONSITE WITH THE SEDIMENT CONTROL INSPECTOR AND ENGINEER TO REVIEW THE LIMITS OF DISTURBANCE, STRUCTURE STAKEOUT, EROSION AND SEDIMENT CONTROL REQUIREMENTS, AND THE SEQUENCE OF CONSTRUCTION. THE PARTICIPANTS WILL ALSO VERIFY THE LOCATION OF ANY NECESSARY STAGING AREA AND FLAG ANY TREES WITHIN THE LIMITS OF DISTURBANCE WHICH WILL BE REMOVED FOR CONSTRUCTION ACCESS AND GRADING.
4. (DAY 3) THE CONTRACTOR SHALL INSTALL PERIMETER EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN ON THE PLAN INCLUDING THE SILT FENCE .
5. (DAY 5) THE HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION SHALL BE NOTIFIED UPON COMPLETION OF CONTROLS. UPON COMPLETION OF CONTROL INSTALLATION, AND WITH APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, THE CONTRACTOR MAY BEGIN OPERATIONS. CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH THE SEQUENCE OF CONSTRUCTION, AND GRADING PLANS, AND EROSION AND SEDIMENT CONTROL STANDARD DETAILS AND NOTES. WORK SHALL BE LIMITED TO THAT WHICH CAN BE BACKFILLED AND STABILIZED IN ONE DAY. SOIL STABILIZATION MATTING SHALL BE USED AS APPROPRIATE PER TABLE B.7:SOIL STABILIZATION ON SLOPES ON SHEET 13.
6. (DAY 85) FOLLOWING COMPLETION OF THE CONSTRUCTION, THE CONTRACTOR MAY REMOVE EROSION AND SEDIMENT CONTROL MEASURES UPON RECEIVING APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR.

CONSTRUCTION – 90 DAYS

AS-BUILT
DATE 12-22-2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	1/12/2021	CHIEF, BUREAU OF ENGINEERING	1-8-2021
CHIEF, BUREAU OF UTILITIES	1-11-21	CHIEF, UTILITY DESIGN DIVISION	1/7/2021

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EROSION AND SEDIMENT CONTROL DETAILS AND NOTES

600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

B-4 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

Definition
Using vegetation as cover to protect exposed soil from erosion.

Purpose
To promote the establishment of vegetation on exposed soil.

Conditions Where Practice Applies
On all disturbed areas not stabilized by other methods. This specification is divided into sections on incremental stabilization; soil preparation, soil amendments and topsoiling; seeding and mulching; temporary stabilization; and permanent stabilization.

Effects on Water Quality and Quantity
Stabilization practices are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas.

Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Over time, vegetation will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth.

Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present within the root zone.

Sediment control practices Must remain in place during grading, seedbed preparation, seeding, mulching, and vegetative establishment.

Adequate Vegetative Establishment
Inspect seeded areas for vegetative establishment and make necessary repairs, replacements, and reseedings within the planting season.

1. Adequate vegetative stabilization requires 95 percent groundcover.
2. If an area has less than 40 percent groundcover, restabilize following the original recommendations for lime, fertilizer, seedbed preparation, and seeding.
3. If an area has between 40 and 94 percent groundcover, over-seed and fertilize using half of the rates originally specified.
4. Maintenance fertilizer rates for permanent seeding are shown in Table B.6.

B-4-1 STANDARDS AND SPECIFICATIONS FOR INCREMENTAL STABILIZATION

Definition
Establishment of vegetative cover on cut and fill slopes.

Purpose
To provide timely vegetative cover on cut and fill slopes as work progresses.

Conditions Where Practice Applies
Any cut or fill slope greater than 15 feet in height. This practice also applies to stockpiles.

Criteria:
A. Incremental Stabilization – Cut Slopes

1. Excavate and stabilize cut slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all cut slopes as the work progresses.
2. Construction sequence example (refer to figure b.1):
   a. Construct and stabilize all temporary swales or dikes that will be used to convey runoff around the excavation.
   b. Perform phase 1 excavation, prepare seedbed, and stabilize.
   c. Perform phase 2 excavation, prepare seedbed, and stabilize. overseed phase 1 areas as necessary.
   d. Perform final phase excavation, prepare seedbed, and stabilize. overseed previously seeded areas as necessary.

Note: Once excavation has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

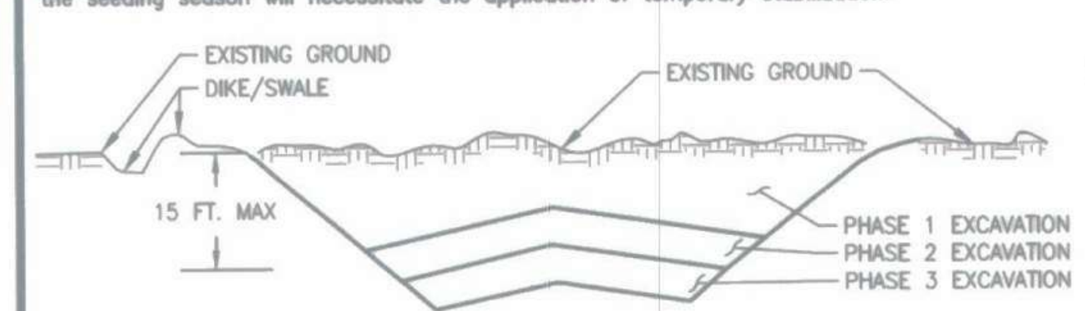

FIGURE B.1 INCREMENTAL STABILIZATION – CUT

B. Incremental Stabilization – Fill Slopes

1. Construct and stabilize fill slopes in increments not to exceed 15 feet in height. prepare seedbed and apply seed and mulch on all slopes as the work progresses.
2. Stabilize slopes immediately when the vertical height of a lift reaches 15 feet, or when the grading operation ceases as prescribed in the plans.
3. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
4. Construction sequence example (Refer to figure B.2):
   a. Construct and stabilize all temporary swales or dikes that will be used to divert runoff around the fill. Construct silt fence on low side of fill unless other methods shown on the plans address this area.
   b. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
   c. Place phase 1 fill, prepare seedbed, and stabilize.
   d. Place phase 2 fill, prepare seedbed, and stabilize.
   e. Place final phase fill, prepare seedbed, and stabilize. overseed previously seeded areas as necessary.

NOTE: Once the placement of fill has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

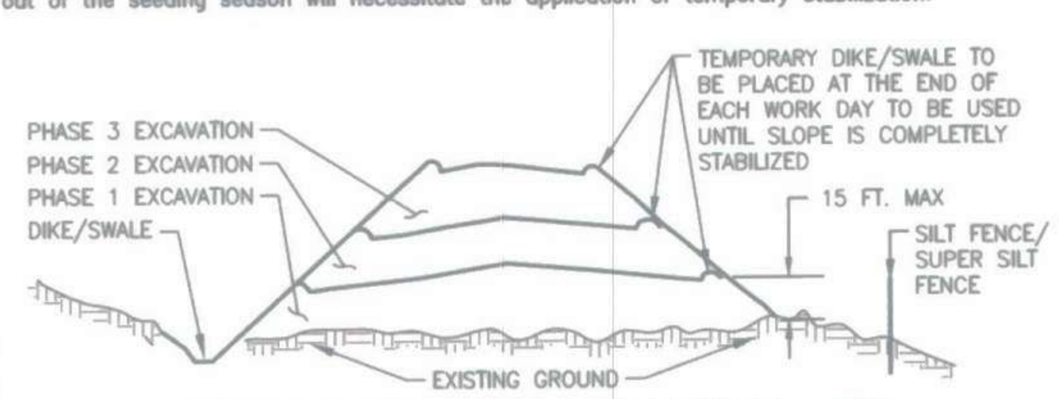

FIGURE B.2 INCREMENTAL STABILIZATION – FILL

B-4-2 STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL

Definition: The process of preparing the soils to sustain adequate vegetative stabilization.
Purpose: To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies:
Where vegetative stabilization is to be established.

Criteria:
A. Soil Preparation

1. Temporary stabilization
   a. Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
   b. Apply fertilizer and lime as prescribed on the plans.
   c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.

B-4-2 continued...

2. Permanent stabilization
   a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
   i. Soil ph between 6.0 and 7.0.
   ii. Soluble salts less than 500 parts per million (PPM). 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.
   iii. Soil contains 1.5 percent minimum organic matter by weight.
   vi. Soil contains sufficient pore space to permit adequate root penetration.
   b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
   c. Graded areas must be maintained in a true and even grade, as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.
   d. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
   e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. RAke 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

1. Topsoiling is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low PH, materials toxic to plants, and/or unacceptable soil gradation.
2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the soil survey published by USDA-NRCS.
3. Topsoiling is limited to areas having 2:1 or flatter slopes where:
   a. the texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
   b. the soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
   c. the original soil to be vegetated contains material toxic to plant growth.
   d. the soil is so acidic that treatment with limestone is not feasible.
4. Areas having slopes steeper than 2:1 require special consideration and design.
5. Topsoil specifications: soil to be used as topsoil must meet the following criteria:
   a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1½ inches in diameter.
   b. Topsoil must be free of noxious plants or plant parts such as bermuda grass, quack grass, johnson grass, nut sedge, poison ivy, thistle, or others as specified.
   c. Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
6. Topsoil application
   a. Erosion and sediment control practices must be maintained when applying topsoil.
   b. Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. spreading is to be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.
   c. Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation

C. Soil amendments (Fertilizer and lime specifications)
1. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. soil analysis may be performed by a recognized private or commercial laboratory. soil samples taken for engineering purposes may also be used for chemical analyses.
2. Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.
3. Lime materials must be ground limestone (Hydrated or burnt lime may be substituted except when hydroseeding) which contains at least 50 percent total oxides (Calcium Oxide plus Magnesium Oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
4. Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
5. Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

B-4-3 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

Definition: The application of seed and mulch to establish vegetative cover.
Purpose: To protect disturbed soils from erosion during and at the end of construction.
Conditions Where Practice Applies: To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.

Criteria:
A. Seeding
1. Specifications
   a. All seed must meet the requirements of the maryland state seed law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to table B.4 regarding the quality of seed. seed tags must be available upon request to the inspector to verify type of seed and seeding rate.
   b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. the appropriate seeding mixture must be applied when the ground thaws.
   c. Inoculants: the inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. temperatures above 75 to 80 degrees fahrenheit can weaken bacteria and make the inoculant less effective.
   d. Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.
2. Application
   a. Dry seeding: This includes use of conventional drop or broadcast spreaders
   i. Incorporate seed into the subsoil at the rates prescribed on temporary seeding table B.1, permanent seeding table B.3, or site-specific seeding summaries.
   ii. Apply seed in two directions, perpendicular to each other. apply half the seeding rate in each direction. roll the seeded area with a weighted roller to provide good seed to soil contact.
   b. Drill or cultipacker seeding: mechanized seeders that apply and cover seed with soil.
   i. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. seedbed must be firm after planting.
   ii. Apply seed in two directions, perpendicular to each other. apply half the seeding rate in each direction
   c. Hydroseeding: apply seed uniformly with hydroseeder (slurry includes seed and fertilizer).
   i. If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; p2o5 (phosphorous), 200 pounds per acre; k2o (potassium), 200 pounds per acre.

B-4-3 continued...

   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.

A. Mulching
1. Mulch materials (In order of preference)
   a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the maryland seed law and not musty, moldy, caked, decayed, or excessively dusty. **Note: use only sterile straw mulch in areas where one species of grass is desired.**
   b. Wood cellulose fiber mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
   i. WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
   ii. WCFM, including dye, must contain no germination or growth inhibiting factors.
   iii. WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a blotter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
   iv. WCFM material must not contain elements or compounds at concentration levels that will be phyto-toxic.
   v. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, PH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.
2. Application
   a. Apply mulch to all seeded areas immediately after seeding.
   b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. when using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.
   c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. mix the wood cellulose fiber with water to attain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
3. Anchoring:
   a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
   i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.
   ii. Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
   iii. Synthetic binders such as acrylic dlr (AGRO-TACK), DCA-70, PETROSET, TERRA TAX II, TERRA TACK AR or other approved equal may be used. Follow application rates as specified by the manufacturer. application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. **Use of asphalt binders is strictly prohibited.**
   iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000 feet long.

B-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABILIZATION

Definition: To stabilize disturbed soils with vegetation for up to 6 months.
Purpose: To use fast growing vegetation that provides cover on disturbed soils.
Conditions Where Practice Applies: Exposed soils where ground cover is needed for a period of 6 months or less. for longer duration of time, permanent stabilization practices are required.

Criteria:
1. Select one or more of the species or seed mixtures listed in table b.1 for the appropriate plant hardiness zone (from figure B.3), and enter them in the temporary seeding summary below along with application rates, seeding dates and seeding depths. if this summary is not put on the plan and completed, then table B.1 plus fertilizer and lime rates must be put on the plan.
2. For sites having soil tests performed, use and show the recommended rates by the testing agency. soil tests are not required for temporary seeding.
3. When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in section B-4-3.A.1.B and maintain until the next seeding season.

TEMPORARY SEEDING SUMMARY

SEED MIXTURE (HARDINESS ZONE 7A) FROM TABLE 26					FERTILIZER RATE (10-10-10)	LIME RATE
No.	Species	Application rate(lb/ac)	Seeding Dates	Seeding Depths		
1	Annual Ryegrass	40	2/15-4/30 8/15-11/30	surface	436 lb/ac (10lb/1000sf)	2 tons/ac. (90lb/1000sf)
2	Barley	96	2/15-4/30 8/15-11/30	surface		
3	Foxtail Millet	30	5/1-8/14	surface		

B-4-5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION

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

Criteria:
A. Seed mixtures
1. General use
   a. Select one or more of the species or mixtures listed in table B.3 for the appropriate plant hardiness zone (from figure B.3) and based on the site condition or purpose found on table b.2. enter selected mixture(s), application rates, and seeding dates in the permanent seeding summary. the summary is to be placed on the plan.
   b. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in usda-nrcs technical field office guide, section 342 – critical area planting.
   c. For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency.
   d. For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 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.

B-4-5 CONTINUED...

2. Turfgrass mixtures
   a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
   b. Select one or more of the species or mixtures listed below based on the site conditions or purpose. enter selected mixture(s), application rates, and seeding dates in the permanent seeding summary. The summary is to be placed on the plan.

   i. Kentucky Bluegrass: full sun mixture: for use in areas that receive intensive management. irrigation required in the areas of Central Maryland and Eastern Shore. recommended certified Kentucky Bluegrass cultivars seeding rate: 1.5 to 2.0 pounds per 1000 square feet. choose a minimum of three Kentucky Bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
   ii. Kentucky Bluegrass/Perennial Rye: full sun mixture: for use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. certified Perennial Ryegrass cultivars/certified Kentucky Bluegrass seeding rate: 2 pounds mixture per 1000 square feet. choose a minimum of three Kentucky Bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
   iii. Tall Fescue/Kentucky Bluegrass: full sun mixture: for use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. recommended mixture includes; certified Tall Fescue cultivars 95 to 100 percent, certified Kentucky Bluegrass cultivars 0 to 5 percent. seeding rate: 5 to 8 pounds per 1000 square feet. one or more cultivars may be blended.
   iv. Kentucky Bluegrass/Fine Fescue: shade mixture: for use in areas with shade in Bluegrass lawns. for establishment in high quality, intensively managed turf area. mixture includes; certified Kentucky Bluegrass cultivars 30 to 40 percent and certified Fine Fescue and 60 to 70 percent. seeding rate: 1½ to 3 pounds per 1000 square feet.

NOTES: Select turfgrass varieties from those listed in the most current University of maryland Publication, Agronomy Memo #77, "Turfgrass Tultivar 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 Teed 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 zone: 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.

B. Sod: to provide quick cover on disturbed areas (2:1 grade or flatter).
1. General specifications
   a. Class of Turfgrass sod must be Maryland state certified. Sod labels must be made available to the job foreman and inspector.
   b. Sod must be machine cut at a uniform soil thickness of 3/4 inch, plus or minus ¼ inch, at the time of cutting. Measurement for thickness must exclude top growth and thatch. broken pads and torn or uneven ends will not be acceptable.
   c. Standard size sections of sod must be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section.
   d. sod must not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
   e. Sod must be harvested, delivered, and installed within a period of 36 hours. sod not transplanted within this period must be approved by an agronomist or soil scientist prior to its installation.
2. Sod installation
   a. During periods of excessively high temperature or in areas having dry subsoil, lightly irrigate the subsoil immediately prior to laying the sod.
   b. Lay the first row of sod in a straight line with subsequent rows placed parallel to it and tightly wedged against each other. STagger lateral joints to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots.
   c. Wherever possible, lay sod with the long edges parallel to the contour and with staggering joints. roll and tamp, peg or otherwise secure the sod to prevent slippage on slopes. Ensure solid contact exists between sod roots and the underlying soil surface.
   d. Water the sod immediately following rolling and tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. Complete the operations of laying, tamping and irrigating for any piece of sod within eight hours.
3. Sod maintenance
   a. In the absence of adequate rainfall, water daily during the first week or as often and sufficiently as necessary to maintain moist soil to a depth of 4 inches. Water sod during the heat of the day to prevent wilting.
   b. After the first week, sod watering is required as necessary to maintain adequate moisture content.
   c. Do not mow until the sod is firmly rooted. no more than 1/3 of the grass leaf must be removed by the initial cutting or subsequent cuttings. maintain a grass height of at least 3 inches unless otherwise specified.

PERMANENT SEEDING SUMMARY

SEED MIXTURE (HARDINESS ZONE 7A) FROM TABLE 25					FERTILIZER RATE (10-20-20)			LIME RATE
No.	Species	Application Rates(lb/ac)	Seeding Dates	Seeding Depths	N	P205	K20	
1	SWITCH GRASS CREEPING RED FESCUE PARTRIDGE PEA	10 15 4	2/15-4/30 5/1-5/31	1/12" TO 1/4"	45 lb/ac (1.0 lb/ 1000sf.)	90 lb/ac (2.0 lb/ 1000sf.)	90 lb/ac (2.0 lb/ 1000sf.)	2 tons/ac (90.0 lb/ 1000sf.)
2	BIG BLUESTEM INDIAN GRASS LITTLE BLUESTEM CREEPING RED FESCUE PARTRIDGE PEA	6 6 4 15 4	2/15-4/30 5/1-5/31	1/12" TO 1/4"				
5	HARD FESCUE PERENNIAL RYEGRASS FLATPEA	20 10 15	2/15-4/30 8/15-10/31 11/11-11/31	1/12" TO 1/4"				

B-4-6 STANDARDS AND SPECIFICATIONS FOR SOIL STABILIZATION MATTING

Definition: Material used to temporarily or permanently stabilize channels or steep slopes until groundcover is established.
Purpose: To protect the soils until vegetation is established.
Conditions Where Practice Applies: On newly seeded surfaces to prevent the applied seed from washing out; in channels and on steep slopes where the flow has erosive velocities or conveys clear water; on temporary swales, earth dikes, and perimeter dike swales as required by the respective design standard; and, on stream banks where moving water is likely to wash out new vegetative plantings.

Criteria:
1. The soil stabilization matting that is used must withstand the flow velocities and shear stresses determined for the area, based on the 2-year, 24-hour frequency storm for temporary applications and the 10-year, 24-hour frequency storm for permanent applications. Designate on the plan the type of soil stabilization matting using the standard symbol and include the calculated shear stress for the respective treatment area.
2. Matting is required on permanent channels where the runoff velocity exceeds two and half feet per second (2.5 fps) or the shear stress exceeds two pounds per square foot (2 lbs/ft2). On temporary channels discharging to a sediment trapping practice, provide matting where the runoff velocity exceeds four feet per second (4 fps).
3. Temporary soil stabilization matting is made with degradable (lasts 6 months minimum), natural, or manmade fibers of uniform thickness and distribution of fibers throughout and is smolder resistant. The maximum permissible velocity for temporary matting is 6 feet per second.
4. Permanent soil stabilization matting is an open weave, synthetic material consisting of non-degradable fibers or elements of uniform thickness and distribution of weave throughout. The maximum permissible velocity for permanent matting is 8.5 feet per second.
5. Calculate channel velocity and shear stress using the following procedure:

   Shear Stress (t) is a measure of the force of moving water against the substrate and is calculated as:

   $t = y \cdot R \cdot S_w$ where: t = shear stress (lb/ft²)
   y = weight density of water (62.4 lb/ft³)
   R = average water depth (hydraulic radius)(ft)
   S_w = average surface slope (ft/ft)

   Velocity (v) measures the rate of flow through a defined area and is calculated as:

   $v = (1.486 \cdot R^{2/3} \cdot s^{1/2}) / n$

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

6. Use Table B.7 to assist in selecting the appropriate soil stabilization matting for slope applications based on the slope, the slope length, and the soil-erodibility K factor.

Maintenance:
1. Vegetation must be established and maintained so that the requirements for Adequate Vegetative Establishment are continuously met in accordance with Section B-4 Vegetative Stabilization.

HOWARD SOIL CONSERVATION DISTRICT (HSCD) STANDARD SEDIMENT CONTROL NOTES

1. A pre-construction meeting must occur with the Howard County Department of Public Works, Construction Inspection Division (CID), 410-313-1855 after the future LOD and protected areas are marked clearly in the field. A minimum of 48 hour notice to CID must be given at the following stages:

   a. Prior to the start of earth disturbance,
   b. Upon completion of the installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading,
   c. Prior to the start of another phase of construction or opening of another grading unit, d. Prior to the removal or modification of sediment control practices.

   Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made. Other related state and federal permits shall be referenced, to ensure coordination and to avoid conflicts with this plan.

2. All vegetative and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and revisions thereto.
3. Following initial soil disturbance or re-disturbance, permanent or temporary stabilization is required within three (3) calendar days as to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes steeper than 3 horizontal to 1 vertical (3:1); and seven (7) calendar days as to all other disturbed areas on the project site except for those areas under active grading.
4. All disturbed areas must be stabilized within the time period specified above in accordance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for topsoil (Sec. B-4-2), permanent seeding (Sec. B-4-5), temporary seeding (Sec. B-4-4) and mulching (Sec. B-4-3). Temporary stabilization with mulch alone can only be applied between the fall and spring seeding dates if the ground is frozen. Incremental stabilization (Sec. B-4-1) specifications shall be enforced in areas with >15' of cut and/or fill. Stockpiles (Sec. B-4-8) in excess of 20 ft. must be benched with stable outlet. All concentrated flow, steep slope, and highly erodible areas shall receive soil stabilization matting (Sec. B-4-6).
5. All sediment control structures are to remain in place, and are to be maintained in operative condition until permission for their removal has been obtained from the CID.
6. Site Analysis:
   Total Area of Site: 3.88 Acres(gross)
   Area Disturbed: 0.20 Acres
   Area to be roofed or paved: 0.03 Acres
   Area to be vegetatively stabilized: 0.09 Acres
   Total Cut: 1028 Cu. Yds.
   Total Fill: 1028 Cu. Yds.
   Offsite waste/borrow area location: N/A
7. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
8. Additional sediment control must be provided, if deemed necessary by the CID. The site and all controls shall be inspected by the contractor weekly; and the next day after each rain event. A written report by the contractor, made available upon request, is part of every inspection and should include:

   - Inspection date
   - Inspection type (routine, pre-storm event, 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).

9. 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.
10. Any major changes or revisions to the plan or sequence of construction must be reviewed and approved by the HSCD prior to proceeding with construction. Minor revisions may allowed by the CID per the list of HSCD-approved field changes.
11. 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 HSCD, no more than 30 acres cumulatively may be disturbed at a given time.
12. Wash water from any equipment, vehicles, wheels, pavement, and other sources must be treated in a sediment basin or other approved washout structure.
13. Topsoil shall be stockpiled and preserved on-site for redistribution onto final grade.
14. All Silt Fence and Super Silt Fence shall be placed on-the-contour, and be imbricated at 25' minimum intervals, with lower ends curled uphill by 2' in elevation.
15. Stream channels must not be disturbed during the following restricted time periods (inclusive): · Use I and IP March 1 – June 15 · Use III and IIIP October 1 – April 30 · Use IV March 1 – May 31
16. A copy of this plan, the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and associated permits shall be on-site and available when the site is active.

TABLE B.7: SOIL STABILIZATION ON SLOPES

SLOPE	20:1 OR FLATTER (<=5%)			<20:1 TO 4:1 (>5-25%)			<4:1 TO 3:1 (>25-33%)			<3:1 TO 2.5:1 (>33 - 40%)			<2.5:1 TO 2:1** (>40-50%)		
SLOPE LENGTH (FEET)*	0-30	30-60	60-120	0-30	30-60	60-120	0-30	30-60	60-120	0-30	30-60	60-120	0-30	30-60	60-120
STRAW MULCH/WOOD CELLULOSE FIBER				FOR K<= 0.35***											
TEMPORARY MATTING WITH DESIGN STRESS >= 1.5 PSF															
TEMPORARY MATTING WITH DESIGN SHEAR STRESS >= 1.75 PSF															
TEMPORARY MATTING WITH DESIGN SHEAR STRESS >= 2.0 PSF															
TEMPORARY MATTING WITH DESIGN SHEAR STRESS >= 2.25 PSF													X		

* SLOPE LENGTH INCLUDES CONTRIBUTING FLOW LENGTH

** SLOPES STEEPER THAN 2:1 MUST BE ENGINEERED.

*** SOIL HAVING A K FACTOR LESS THAN OR EQUAL TO 0.35 CAN BE STABILIZED EFFECTIVELY WITH STRAW MULCH OR WOOD CELLULOSE FIBER WHEN LOCATED ON SLOPES STEEPER THAN 5%. SOIL STBAILIZATION MATTING IS REQUIRED ON ALL SLOPES STEEPER THAN 5% THAT HAVE SOIL WITH A K FACTOR GREATER THAN 0.35.

AS-BUILT
DATE 12-22-2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	1/12/2021 DATE	CHIEF, BUREAU OF ENGINEERING	1-8-2021 DATE
CHIEF, BUREAU OF UTILITIES	1-11-21 DATE	CHIEF, UTILITY DESIGN DIVISION	1/7/2021 DATE

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SALISBURY · BALTIMORE · SEAFORD
www.gmbnet.com

STATE OF MARYLAND · MARK GARDOCKY · PROFESSIONAL ENGINEER

DES: WMG
DRN: BRW
CHK: AWW
DATE: 12/2020

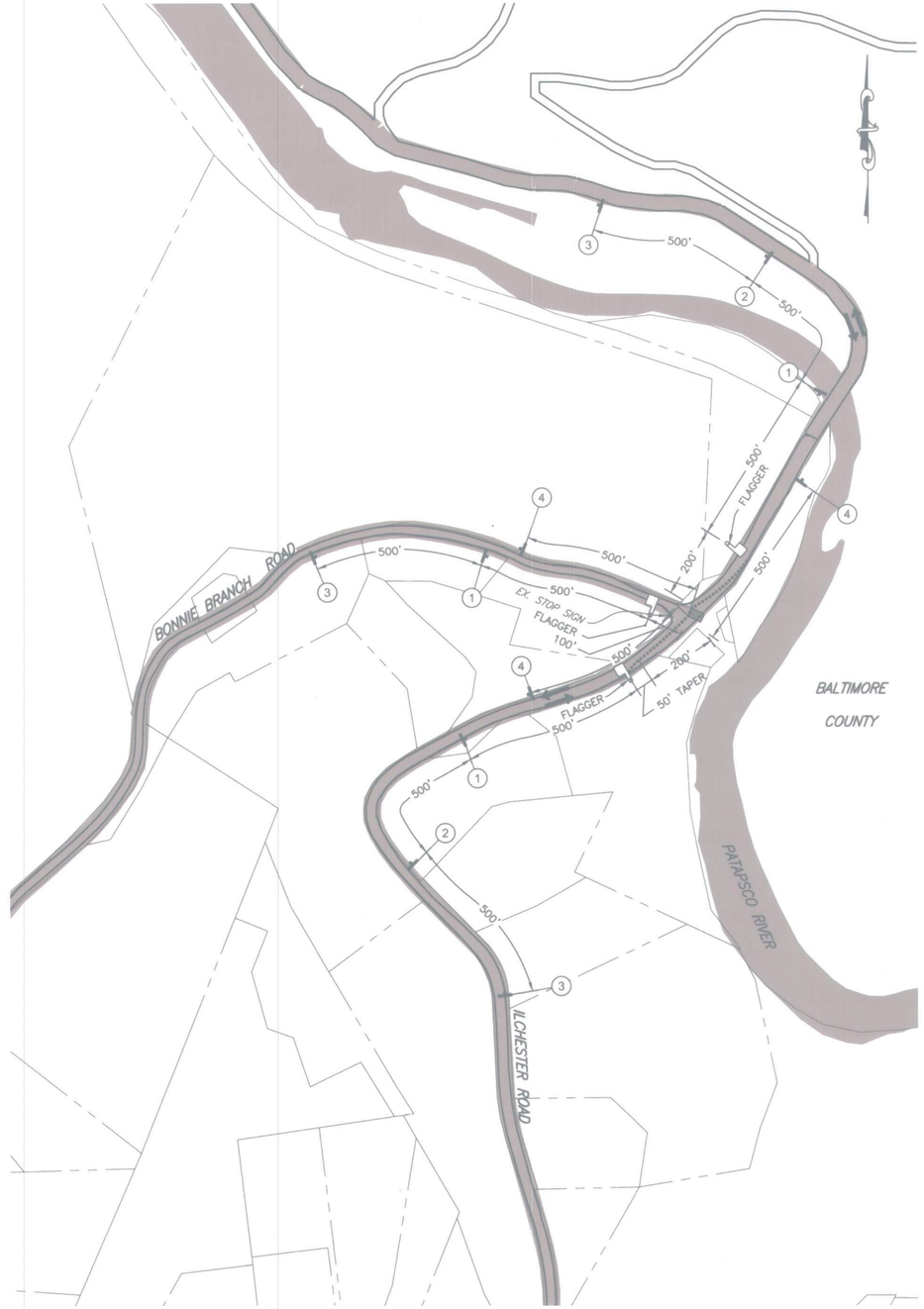
BY	NO.	REVISION	DATE

EROSION AND SEDIMENT CONTROL NOTES

600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN



CLOSURE OF ILCHESTER ROAD NORTHBOUND LANE AT INTERSECTION WITH BONNIE BRANCH ROAD

SCALE: 1"=200'

200 0 100 200 400

1 inch = 200 ft.

LEGEND

SIGN SUPPORT — FACE OF SIGN — SIGN/BARRIER — SIGN

TRAFFIC CONES

WORK AREA

DIRECTION OF TRAFFIC

FLAGGER

SEQUENCE OF CONSTRUCTION:

THE CONTRACTOR SHALL UTILIZE A FLAGGING OPERATION ON ILLCHESTER ROAD PER MD STD. 104.02-10 AND THESE PLANS.

GENERAL NOTES:

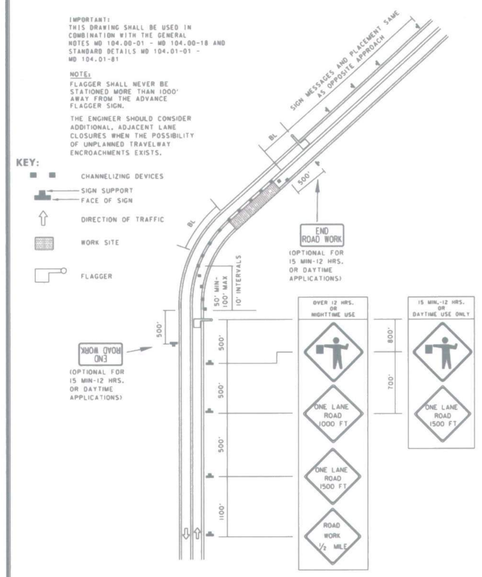
1. THE CONTRACTOR SHALL ADHERE TO THE 2011 MDOT SHA MUTCD OR LATEST ADDITION.
2. THE CONTRACTOR SHALL ADHERE TO THE LATEST EDITION OF THE MDOT SHA BOOK OF STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES.
3. PARKING IS TO BE RESTRICTED FOR 72 HOURS.
4. CONTRACTOR SHALL ASSIST ANY AND ALL PEDESTRIANS THROUGH THE WORK ZONE.
5. TRAVEL LANES MUST REMAIN AT A MINIMUM 11'-0" WIDTH.
6. LANE CLOSURE HOURS SHALL BE LIMITED TO 9:00AM – 3:00PM.
7. SIGNS NO LONGER REQUIRED OR APPLICABLE SHALL BE REMOVED, COVERED OR TURNED AWAY.
8. SIGNS SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ALL WORK AND REMOVED IMMEDIATELY AFTER COMPLETION OF ACTIVITIES.
9. ACCESS TO ALL ROADWAYS & DRIVEWAYS MUST BE MAINTAINED AT ALL TIMES.
10. THE CONTRACTOR SHALL PROVIDE AN ADEQUATE WORK ZONE BUFFER PER MD STD. 104.01-81 AND THESE PLANS.
11. THE CONTRACTOR SHALL INSTALL AND REMOVE TRAFFIC CONTROL DEVICES PER MD STD. 104.06-01 THROUGH 104.06-04.
12. THE CONTRACTOR SHALL INSTALL CHANNELIZING DEVICES PER MD STD. 104.01-30B AND 104.01-30D WHILE REFERENCING MD STD. 104.00-09 AND 104.00-10.

SIGNAGE

ICON No.	DETAIL	REFERENCE
1	FLAGGER	W20-7a 48"X48"
2	ONE LANE ROAD AHEAD	W20-4(1) 48"X48"
3	ROAD WORK AHEAD	W20-1(1) 48"X48"
4	END ROAD WORK	G20-2(1) 48"x24"

AS-BUILT
DATE 12-22-2021

TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION



SPECIFICATION 104	CATEGORY CODE ITEMS
APPROVED	DIRECTOR OFFICE OF TRAFFIC AND SAFETY

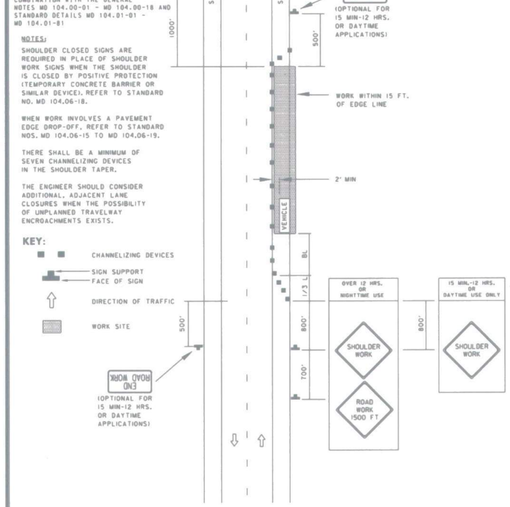
Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

FLAGGING OPERATION/2-LANE, 2-WAY EQL/LESS THAN 40 MPH

STANDARD NO. MD 104.02-10

	APPROVAL + SHA REVISIONS	APPROVAL + FEDERAL HIGHWAY ADMINISTRATION
APPROVAL	8-20-03	9-23-03
REVISED	8-11-10	7-23-10
REVISED		
REVISED		

TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION



SPECIFICATION 104	CATEGORY CODE ITEMS
APPROVED	DIRECTOR OFFICE OF TRAFFIC AND SAFETY

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

SHOULDER WORK/2-LANE, 2-WAY EQL/LESS THAN 40 MPH

STANDARD NO. MD 104.02-02

	APPROVAL + SHA REVISIONS	APPROVAL + FEDERAL HIGHWAY ADMINISTRATION
APPROVAL	8-20-03	9-23-03
REVISED	8-11-10	10-5-10
REVISED		
REVISED		

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 11/12/2021
CHIEF, BUREAU OF ENGINEERING — DATE 1.8.2021
CHIEF, BUREAU OF UTILITIES — DATE 1-11-21
CHIEF, UTILITY DESIGN DIVISION — DATE 1/7/2021

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STATE OF MARYLAND — MARK WILLIAM GARDOCKI — No. 39906 — REGISTERED PROFESSIONAL ENGINEER

DES: WMG
DRN: BRW
CHK: AWW
DATE: 12/2020

BY	NO.	REVISION	DATE

MAINTENANCE OF TRAFFIC

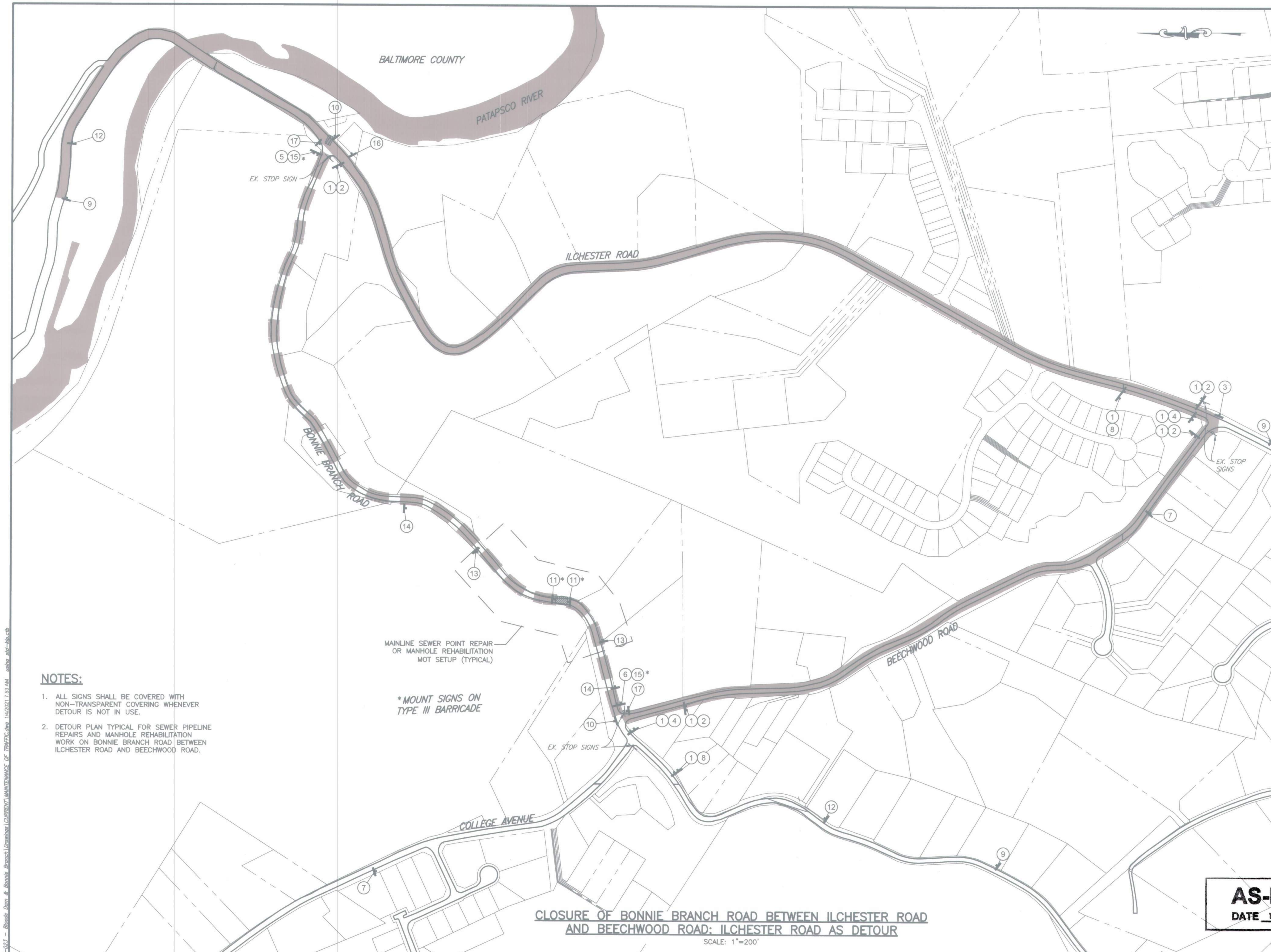
600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 14 OF 16

PATH: J:\Projects\2021\21018-032 - Bonnie Branch\Drawings\CURRENT\MAINTENANCE OF TRAFFIC.dwg 12/21/2020 3:21 PM jwhite dfc-hls.ctb



NOTES:

1. ALL SIGNS SHALL BE COVERED WITH NON-TRANSPARENT COVERING WHENEVER DETOUR IS NOT IN USE.
2. DETOUR PLAN TYPICAL FOR SEWER PIPELINE REPAIRS AND MANHOLE REHABILITATION WORK ON BONNIE BRANCH ROAD BETWEEN ILCHESTER ROAD AND BEECHWOOD ROAD.

LEGEND

SIGN SUPPORT — SIGN/BARRIER

FACE OF SIGN — SIGN

WORK AREA

CLOSED ROAD

DETOUR ROUTE

SIGNAGE

ICON No.	DETAIL	REFERENCE
1	BONNIE BRANCH ROAD	M4-9(1) 30"x12"
2	DETOUR (up arrow)	M4-9(MOD) 30"x24"
3	DETOUR (left arrow)	M4-9L 30"X24"
4	DETOUR (right arrow)	M4-9R 30"X24"
5	DETOUR	M4-10L 48"x18'
6	DETOUR	M4-10R 48"x18'
7	DETOUR	M5-1L(MOD) 30"x24"
8	DETOUR	M5-1R(MOD) 30"x24"
9	NOTICE BONNIE BRANCH ROAD CLOSED AT BEECHWOOD ROAD FOLLOW DETOUR (BLACK ON YELLOW / BLACK ON WHITE / BLACK ON ORANGE)	R11-2(alt) 60"x48"
10	END DETOUR	M4-8a(1) 34"x24"
11	ROAD CLOSED	R11-2 48"x30"
12	DETOUR 800 FT	W20-2(1) 48"x48'
13	ROAD CLOSED AHEAD	W20-3 48"X48"
14	ROAD CLOSED 800 FT	W20-3 48"X48"
15	ROAD CLOSED AHEAD LOCAL TRAFFIC ONLY	R11-3a 60"x30"
16		R3-2L 24"x24"
17		R3-1R 24"x24"

AS-BUILT
DATE 12-22-2021

CLOSURE OF BONNIE BRANCH ROAD BETWEEN ILCHESTER ROAD AND BEECHWOOD ROAD: ILCHESTER ROAD AS DETOUR

SCALE: 1"=200'

200 0 100 200 400
1 inch = 200 ft.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — 1/12/2021 — DATE

Acting CHIEF, BUREAU OF ENGINEERING — 1.8.2021 — DATE

CHIEF, BUREAU OF UTILITIES — 1-11-21 — DATE

CHIEF, UTILITY DESIGN DIVISION S.L. — 1/7/2021 — DATE

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STATE OF MARYLAND · W. MARK GARDOCKY · NO. 30875 · REGISTERED · PROFESSIONAL ENGINEER

DES: WMG
DRN: BRW
CHK: AWW
DATE: 12/2020

BY	NO.	REVISION	DATE
		WMG	

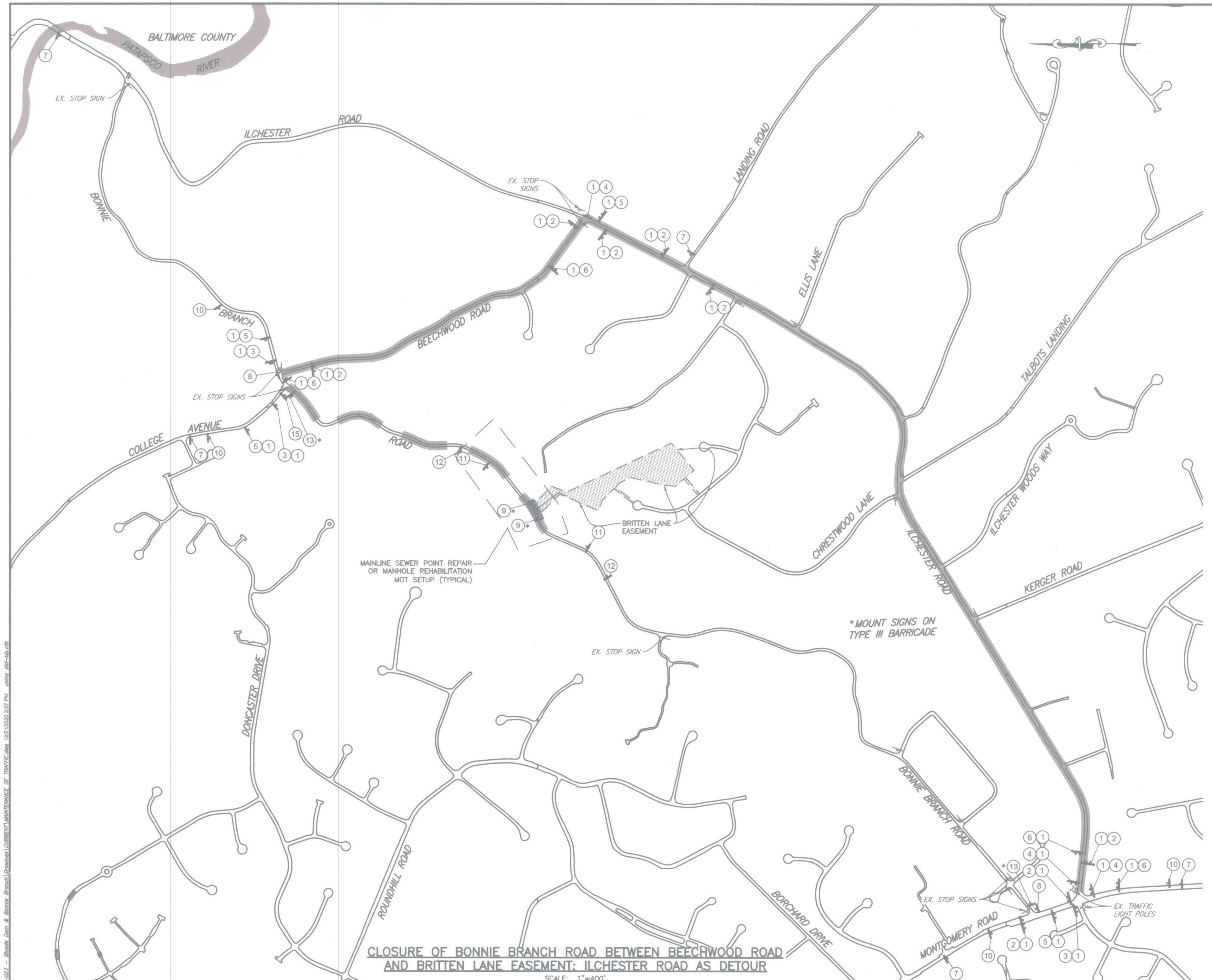
MAINTENANCE OF TRAFFIC

600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10–5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 15 OF 16



CLOSURE OF BONNIE BRANCH ROAD BETWEEN BEECHWOOD ROAD AND BRITTEN LANE EASEMENT: ILCHESTER ROAD AS DETOUR

SCALE: 1"=400'

LEGEND

- SIGN SUPPORT / FACE OF SIGN — SIGN/BARRIER, SIGN
- WORK AREA
- CLOSED ROAD
- DETOUR ROUTE

NOTES:

1. ALL SIGNS SHALL BE COVERED WITH NON-TRANSPARENT COVERING WHENEVER DETOUR IS NOT IN USE.
2. DETOUR PLAN TYPICAL FOR SEWER PIPELINE AND MANHOLE REHABILITATION WORK ON BONNIE BRANCH ROAD BETWEEN COLLEGE AVENUE AND BRITTEN LANE EASEMENT
3. BRITTEN LANE EASEMENT CONSISTS OF COMBINED WATER & SEWER EASEMENTS OF BRITTEN LANE AND FOREST CONSERVATION EASEMENT OPEN SPACE LOT 22 DEED: L. 04771, F 671

SIGNAGE

ICON No.	DETAIL	REFERENCE
1	BONNIE BRANCH ROAD	M4-9(1) 30"x12"
2	DETOUR (arrow up)	M4-9(MOD) 30"x24"
3	DETOUR (arrow left)	M4-9L 30"X24"
4	DETOUR (arrow right)	M4-9R 30"X24"
5	DETOUR (turn left)	M5-1L 30"x24"
6	DETOUR (turn right)	M5-1R 30"x24"
7	NOTICE / BONNIE BRANCH ROAD CLOSED AT COLLEGE AVENUE / FOLLOW DETOUR (BLACK ON YELLOW / BLACK ON WHITE / BLACK ON ORANGE)	R11-2(alt) 60"x48"
8	END DETOUR	M4-8a(1) 34"x24"
9	ROAD CLOSED	R11-2 48"x30"
10	DETOUR 800 FT	W20-2(1) 48"x48'
11	ROAD CLOSED AHEAD	W20-3 48"X48"
12	ROAD CLOSED 800 FT	W20-3 48"X48"
13	ROAD CLOSED AHEAD LOCAL TRAFFIC ONLY	R11-3a 60"x30"
14	(no left turn)	R3-2L 24"x24"
15	(no right turn)	R3-1R 24"x24"

AS-BUILT
DATE 12-22-2021

400 0 200 400 800
1 inch = 400 ft.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	1/12/2021 DATE	CHIEF, BUREAU OF ENGINEERING	1-8-2021 DATE
CHIEF, BUREAU OF UTILITIES	1-11-21 DATE	CHIEF, UTILITY DESIGN DIVISION S.G.	1/7/2021 DATE

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DES: WMG
DRN: BRW
CHK: AWW
DATE: 12/2020

BY	NO.	REVISION	DATE

MAINTENANCE OF TRAFFIC

600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 16 OF 16

BONNIE BRANCH
EMERGENCY SEWER PROTECTION & STREAM BANK STABILIZATION
CAPITAL PROJECT S6282
CONTRACT NO. 10-5034
HOWARD COUNTY, MARYLAND

AS-BUILT
DATE 12/22/2021

SHEET INDEX

DESIGN NARRATIVE

BONNIE BRANCH BANK STABILIZATION IS AN EMERGENCY REPAIR PROJECT TO MITIGATE RISKS CAUSED BY THE EXPOSURE OF SANITARY SEWER MANHOLE 124. THE PRIMARY GOAL OF THE PROJECT IS TO REDUCE EROSION SURROUNDING THE EXPOSED MANHOLE BY SHIFTING THE THALWEG AWAY FROM THE RIGHT BANK AND ARMORING THE BANK. THE PROJECT SITE IS APPROXIMATELY 530 LF. THE SPECIFIC STABILIZATION ACTIONS TO BE TAKEN INCLUDE:

- CONSTRUCTING A BOULDER CLUSTER NESTLED IN THE RIGHT BANK IN THE UPSTREAM LIMITS TO DISSIPATE ENERGY DIRECTED TOWARDS THE RIGHT BANK.
- CONSTRUCTING BOULDER SLOPE STABILIZATION TO ARMOR THE RIGHT BANK.
- CONSTRUCTING BARB DEFLECTORS TO REDIRECT ENERGY AWAY FROM THE EXPOSED MANHOLE LOCATION.
- GRADING THE OPPOSING BANK TO PROVIDE SUFFICIENT CHANNEL CAPACITY.

NATURAL RESOURCE PROTECTION AND ENHANCEMENT

THE SPECIFIC SITE IS LOCATED ON PROPERTY OWNED BY HOWARD COUNTY, MARYLAND. THE SITE IS ACCESSIBLE DIRECTLY FROM BONNIE BRANCH ROAD. THE SITE IS BORDERED ON ALL SIDES BY DECIDUOUS FOREST SURROUNDED BY EXISTING SINGLE FAMILY RESIDENTIAL DEVELOPMENTS. THE EAST SIDE OF THE PROJECT SITE IS BORDERED BY BONNIE BRANCH ROAD. A NATURAL RESOURCES SURVEY WAS COMPLETED ON THE SITE. TREES GREATER THAN 12 INCHES WERE IDENTIFIED AND ASSESSED. 16 SPECIMEN TREES WERE IDENTIFIED DURING THE ASSESSMENT.

THIS PROJECT SEEKS TO PRESERVE NATURAL RESOURCES LOCATED ON AND ADJACENT TO THE PROJECT SITE. THEREFORE, THE PROJECT SCOPE HAS BEEN LIMITED TO WORK ALONG DEGRADED PORTIONS OF THE PROJECT REACH. SEVEN (7) TREES GREATER THAN 12" DBH ARE PROPOSED TO BE REMOVED. ONE (1) SPECIMEN TREE IS PROPOSED FOR REMOVAL. DISTURBANCE TO ON-SITE WETLANDS WILL BE AVOIDED. NATURAL RESOURCES WILL BE PROTECTED ALONG THE SITE'S PERIMETER WITH BLAZE ORANGE CONSTRUCTION SAFETY FENCING AS WELL AS SEDIMENT CONTROL FENCING (E.G. SUPER SILT FENCE) WHERE REQUIRED.

MAINTENANCE OF NATURAL FLOW PATTERNS

THIS PROJECT DOES NOT ALTER THE EXISTING CONDITION FLOW PATTERNS ALONG THE MAJORITY OF THE PROJECT REACH. MINOR CHANNEL PLANFORM ADJUSTMENTS ARE PROPOSED TO REDUCE STRESS ON THE OUTER BANK AND CREATE A STABLE CHANNEL ALIGNMENT.

REDUCTION OF IMPERVIOUS AREAS THROUGH BETTER SITE DESIGN

THIS PROJECT WILL NOT INCREASE IMPERVIOUS AREAS ON THE SITE.

INTEGRATION OF EROSION AND SEDIMENT CONTROLS INTO SWM STRATEGY

THE CONSTRUCTION APPROACH FOR THE PROJECT WAS DESIGNED TO BYPASS OF CLEAN WATER AROUND THE CONSTRUCTION AREA. SANDBAG DIVERSIONS AND PUMP AROUND PRACTICES WILL BE UTILIZED IN PHASES TO ALLOW FOR THE MAINTENANCE OF STREAM BASEFLOW. ALL DIRTY WATER WITHIN THE WORK AREA WILL BE PUMPED TO A FILTER BAG BEFORE DISCHARGING DOWNSTREAM OF THE WORK AREA. ALL DISTURBED AREAS NOT DRAINING TO AN APPROVED SEDIMENT CONTROL DEVICE MUST BE STABILIZED AT THE END OF EACH DAY. CONTRACTOR SHALL LIMIT WORK ACTIVITIES IN SUCH A MANNER THAT ALL DISTURBED AREAS CAN BE STABILIZED TO THE FINAL GRADE AT THE END OF EACH WORKING DAY. NO DISTURBED AREAS SHALL BE LEFT UN-STABILIZED OVERNIGHT UNLESS RUNOFF IS DIRECTED TO AN MDE APPROVED SEDIMENT CONTROL DEVICE. SUPER SILT FENCE IS PROPOSED AROUND ALL STOCKPILE AREAS AND ACCESS ROUTES. PERMANENT STABILIZATION MATTING AND SEED IS PROPOSED FOR ALL DISTURBED SLOPES FOR RAPID STABILIZATION.

IMPLEMENTATION OF ESD PLANNING TECHNIQUES AND PRACTICES

THE PROJECT OBJECTIVE IS STREAM BANK STABILIZATION AND UTILITY INFRASTRUCTURE PROTECTION. THEREFORE, ESD PLANNING TECHNIQUES AND PRACTICES ARE NOT RELEVANT TO THIS PROJECT.

REQUEST FOR DESIGN MANUAL AND WAIVER PETITION FOR ENVIRONMENTAL AND STORMWATER DESIGN

NO WAIVERS ARE REQUESTED.

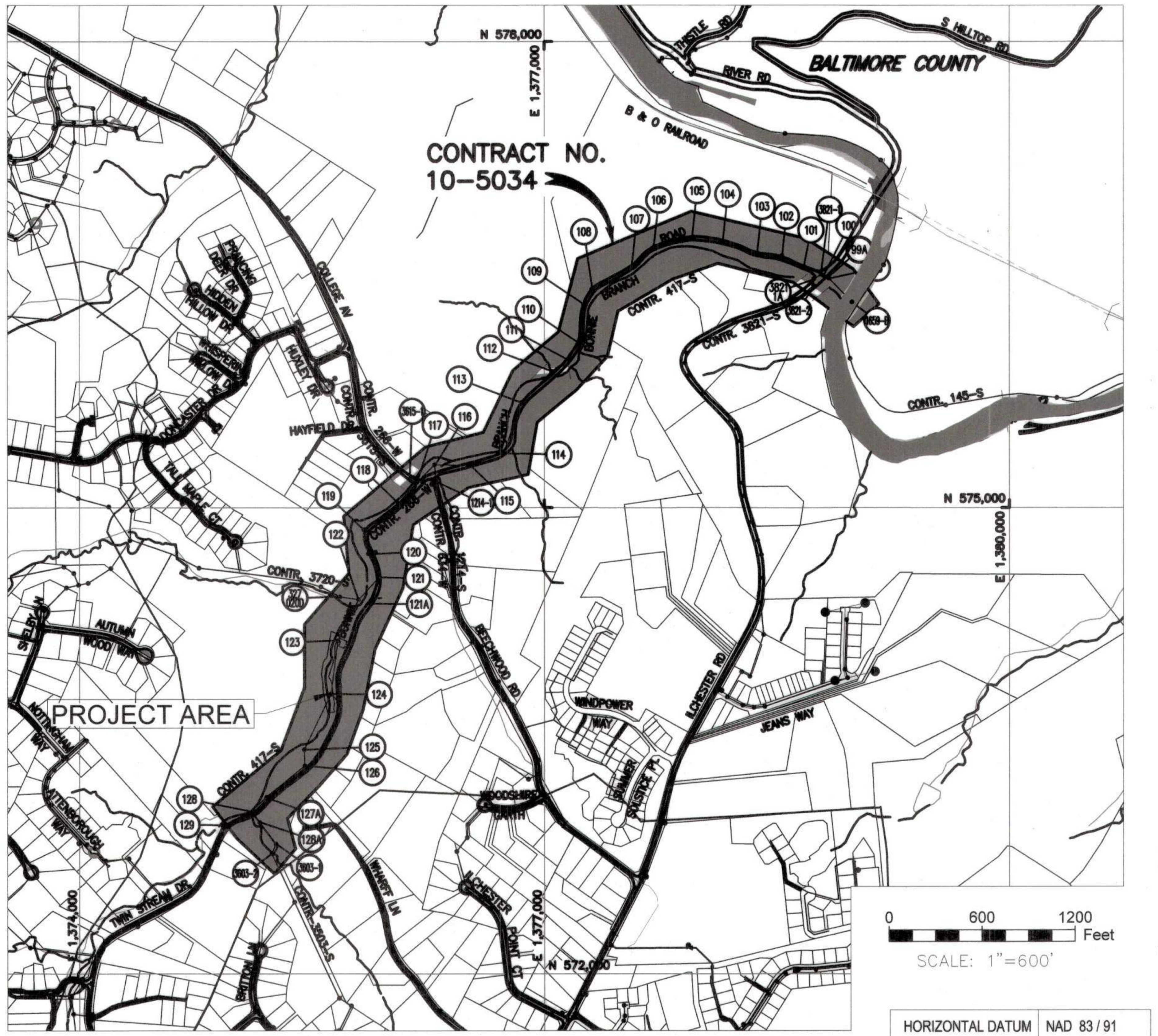
SUMMARY OF ENVIRONMENTAL IMPACTS

TREE REMOVAL (EA)	STREAM DISTURBANCE (LF)	WETLAND DISTURBANCE (SF)	WETLAND BUFFER DISTURBANCE (SF)	LIMIT OF DISTURBANCE (SF)	CUT (CY)	FILL (CY)	NET (CY)
7	530	0	1,786.8	29,496.5	143.3	117.9	25.4

Approvals/Permits*

Agency	Permit #	Date Applied	Date Approved
MDE/USACE Wetlands/Waterway Authorization	To be obtained	MARCH 16, 2021	
Howard Soil Conservation District	To be obtained		
Howard County DPZ Alternative Compliance	To be obtained		
MDE General Discharge Permit	To be obtained	MARCH 16, 2021	

*AS THIS IS AN EMERGENCY REPAIR PROJECT, AFTER - THE - FACT PERMITTING WILL BE ISSUED ON THE COMPLETION OF WORK. EMERGENCY AUTHORIZATION HAS BEEN OBTAINED FROM REGULATOR AGENCIES. AFTER - THE - FACT PERMITTING WILL BE APPLIED FOR UPON THE COMPLETION OF THE EMERGENCY WORK.



0 600 1200 Feet
SCALE: 1"=600'

HORIZONTAL DATUM	NAD 83 / 91
VERTICAL DATUM	NAVD 88

ADC MAP COORDINATES
HOWARD COUNTY MAP 11
COLUMN K, ROW 3

PROJECT NOTES

1. EMERGENCY REPAIR AUTHORIZATION WAS APPROVED BY THE MARYLAND DEPARTMENT OF ENVIRONMENT (MDE) ON MARCH 16, 2021 AND THE US ARMY CORP OF ENGINEERS (USACE) ON MARCH 17TH. AFTER-THE-FACT PERMITTING WILL BE APPLIED FOR UPON COMPLETION OF WORK.
2. PROJECT IMPACTS INCLUDE WORK IN A USE I STREAM. WORK MAY NOT BE CONDUCTED DURING THE PERIOD FROM MARCH 1 AND JUNE 15, INCLUSIVE OF ANY YEAR, WITHOUT SPECIAL APPROVAL THROUGH THE MARYLAND DEPARTMENT OF NATURAL RESOURCES.
3. THE SITE IS LOCATED IN THE PATAPSCO RIVER LOWER NORTH BRANCH WATERSHED. THIS PORTION OF THE WATERSHED IS IMPAIRED BY BACTERIA (*E. COLI*), SULFATE, CHLORIDE, CADMIUM, ARSENIC, LEAD, COPPER, CHROMIUM, NICKEL, MERCURY, ZINC, CHLORDANE, CHANNELIZATION, PHOSPHORUS, NITROGEN, AND TOTAL SUSPENDED SOILS (TSS). THE RECEIVING WATERS ARE NOT CLASSIFIED UNDER TIER II HIGH QUALITY WATERS.
4. THE PROJECT SITE IS LOCATED WITHIN A FEMA REGULATED FLOODPLAIN: FEMA FIRM PANEL NO 24027C0160D.
5. SURVEY OF THIS SITE WAS PERFORMED BY C.C. JOHNSON & MALHOTRA, P.C. (CCJM) IN MARCH 2021.
6. WETLANDS AND WATERS OF THE US WERE DELINEATED BY STANTEC IN MARCH 2021.
7. A WAIVER PETITION FOR ALTERNATIVE COMPLIANCE SHALL BE SUBMITTED TO THE HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING FOR THIS PROJECT AFTER THE FACT.
8. FOR STREAM CHANNEL WORK THE CONTRACTOR SHALL ONLY DISTURB THE LENGTH OF CHANNEL THAT CAN AND SHALL BE STABILIZED AT THE END OF EACH WORK DAY.
9. THE DEPARTMENT OF PUBLIC WORKS HAS DETERMINED THAT THE DISTURBANCE OF WETLANDS, STREAMS, BUFFERS, AND STEEP SLOPES FOR THIS PROJECT ARE CONSIDERED ESSENTIAL OR NECESSARY IN ACCORDANCE WITH SECTION 16.115(c) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS.
10. THIS PLAN IS PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
11. OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND DO NOT WARRANT OR GUARANTEE THE CORRECTNESS OR COMPLETENESS OF THE INFORMATION GIVEN. THE CONTRACTOR MUST VERIFY SUCH INFORMATION ON ITS OWN.
12. SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS, THE COUNTY SHOULD BE NOTIFIED IMMEDIATELY TO RESOLVE THE SITUATION. SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT NOTIFYING THE COUNTY, THEN THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THOSE CHANGES.
13. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS.
14. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS.
15. CONTRACTOR SHALL CONTINUOUSLY MONITOR WEATHER FORECASTS DURING WORK ACTIVITIES AND SCHEDULE WORK DURING FAVORABLE CONDITIONS.
16. THE CONTRACTOR SHALL EXERCISE CARE IN ACTIVITIES INVOLVING EITHER CUT AND FILL OR GRADING IN THE VICINITY OF TREES THAT ARE TO REMAIN. ACTIVITIES NEAR TREES THAT ARE TO REMAIN SHALL BE DONE IN A MANNER THAT DOES NOT DISTURB THE CRITICAL ROOT ZONE OR WITHIN THE DRIPLINE OF THE TREES. ORANGE FENCING SHALL BE INSTALLED AROUND THE PERIMETER OF THE CRITICAL ROOT ZONE PRIOR TO CONSTRUCTION. THE LOCATION OF THE PROTECTIVE ORANGE FENCE SHALL BE APPROVED BY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS PRIOR TO CONSTRUCTION.
17. CONTRACTOR SHALL NOT STORE EQUIPMENT, MATERIALS, AND/OR SUPPLIES BEYOND THE ORANGE FENCING SHOWN ON THE PLANS OR IN THE 100-YR FLOODPLAIN.
18. UPON COMPLETION OF WORK BUT PRIOR TO DE-MOBILIZATION, THE CONTRACTOR SHALL REMOVE REMNANTS OF CONSTRUCTION MATERIAL FROM THE SITE. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO A CONDITION EQUAL TO OR BETTER THAN THE PRE-CONSTRUCTION CONDITIONS.
19. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES, PHOTOGRAPHS OF THE PROPOSED WORK AREA AND ACCESS SHALL BE TAKEN.
20. ALL TREES TO BE REMOVED SHALL BE CUT AT THE BASE WITH A SAW AND NOT PUSHED OVER. TREE STUMPS OUTSIDE THE EMBANKMENT MAY BE LEFT IN PLACE, UNLESS OTHERWISE DIRECTED ON THE PLANS OR BY THE ENGINEER.
21. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN EXITING THE PROJECT SITE AND PAY CLOSE ATTENTION TO TRAFFIC NEAR THE SITE.
22. WORKING HOURS ARE 7 A.M. TO 5 P.M. MONDAY THROUGH FRIDAY. WITH ADVANCED PERMISSION FROM THE COUNTY, CONTRACTORS MAY WORK ON SATURDAY 9 A.M. TO 3 P.M. NO WORK IS ALLOWED ON SUNDAY.
23. THE CONTRACTOR SHALL AVOID TRACKING HEAVY EQUIPMENT OVER CRITICAL ROOT ZONE OF SPECIMEN TREES. IF UNAVOIDABLE, LOAD MATS SHOULD BE USED WHEN TRACKING OVER CRITICAL ROOT ZONES AND WHILE TRACKING OVERTOP OF SANITARY SEWER LINES.
24. NO STRUCTURE OR SUBDIVISIONS ARE PROPOSED; THEREFORE THIS PROJECT IS NOT REQUIRED TO MEET THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL.

REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT
AND MEETS TECHNICAL REQUIREMENTS

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

Alexander Bratchie FOR GEOFFREY SCHOMING 04/28/22
HOWARD SOIL CONSERVATION DISTRICT EP-19-030

DESIGN CERTIFICATE

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH THE 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.

Brett M Schrey
DESIGNERS SIGNATURE — 5/24/2021 DATE

BRETT M. SCHREY
PRINTED NAME — MD REGISTRATION NO. 44931
P.E., R.L.S, OR R.L.A

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. 44931, EXPIRATION DATE: 12/22/2021

OWNERS/DEVELOPER'S CERTIFICATE

"I/WE HEREBY CERTIFY THAT ANY 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 THAT 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 BEGINNING 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 — 2021-12-30
SILVER CHAI, PE — DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	4/27/2022	CHIEF, BUREAU OF ENGINEERING	4-18-22
CHIEF, BUREAU OF UTILITIES	4/21/22	CHIEF, UTILITY DESIGN DIVISION	4/14/2022

Stantec

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FAX. 410.583.6704
www.stantec.com

STATE OF MARYLAND — BRETT M SCHREY — NO. 44931 — REGISTERED PROFESSIONAL ENGINEER

DES: AB	BY	NO.	REVISION	DATE
DRN: DD				
CHK: RP				
DATE: 01/2022				

Bonnie Branch Emergency Sewer Protection & Stream Bank Stabilization at MH 124
TITLE SHEET
TI-01
600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10–5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

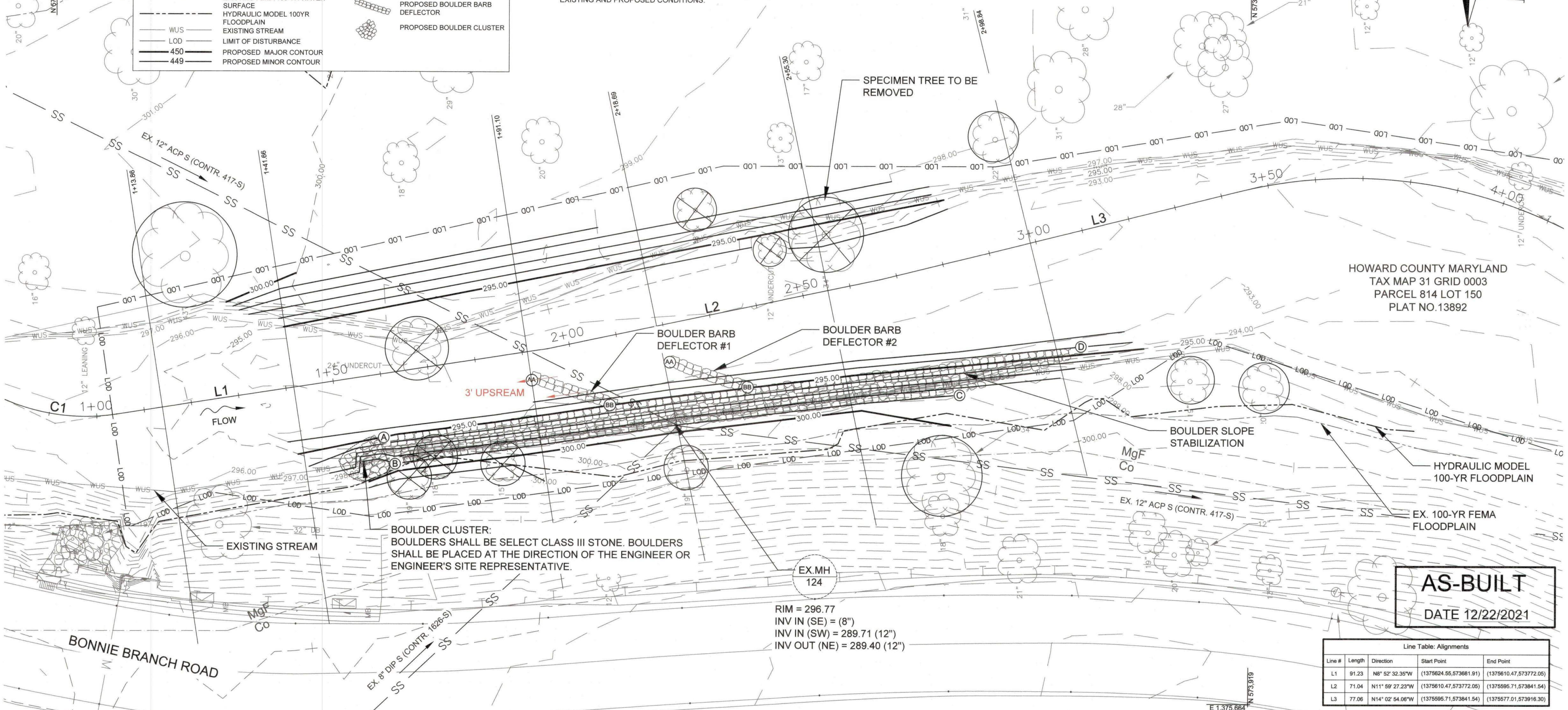
SCALE AS SHOWN

LEGEND

Symbol	Description
△	EXISTING TRAVERSE POINT
450	EXISTING MAJOR CONTOUR
449	EXISTING MINOR CONTOUR
SS	EXISTING SEWER PIPE
Ⓢ	EXISTING SEWER MANHOLE
LoB / WcB	SOIL BOUNDARY
	EXISTING FEMA 100-YR WATER SURFACE
	HYDRAULIC MODEL 100YR FLOODPLAIN
WUS	EXISTING STREAM
LOD	LIMIT OF DISTURBANCE
450	PROPOSED MAJOR CONTOUR
449	PROPOSED MINOR CONTOUR
	TREE PROTECTION PLANKING
	TREE REMOVAL
	PROPOSED BOULDER SLOPE STABILIZATION
	PROPOSED BOULDER BARB DEFLECTOR
	PROPOSED BOULDER CLUSTER

NOTES:

1. IT SHALL BE DISTINCTLY UNDERSTOOD THAT FAILURE TO MENTION SPECIFICALLY ANY WORK WHICH WOULD NATURALLY BE REQUIRED TO COMPLETE THE PROJECT SHALL NOT RELIEVE THE CONTRACTOR OF THEIR RESPONSIBILITY TO COMPLETE SUCH WORK.
2. DUE TO INTERIM STREAM BED AND BANK EROSION, PROPOSED STREAM STABILIZATION STRUCTURES SHALL BE CONSTRUCTED AT THE DIRECTION OF THE ENGINEER OR ENGINEER'S SITE REPRESENTATIVE.
6. THE ENTIRETY OF THE PROJECT AREA LAYS WITHIN THE 75 FT STREAM BUFFER.
7. CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN WORKING AROUND ELECTRICAL LINES, SEWER MANHOLES, BURIED SEWER LINES, AND ANY OTHER EXISTING UTILITIES.
8. THE HYDRAULIC MODELED 100-YR DISCHARGE EXCEEDS THE FEMA 100-YR DISCHAGE. THE "HYDRAULIC MODEL 100YR FLOODPLAIN" REPRESENTS BOTH EXISTING AND PROPOSED CONDITIONS.



AS-BUILT

DATE 12/22/2021

Line Table: Alignments

Line #	Length	Direction	Start Point	End Point
L1	91.23	N8° 52' 32.35"W	(1375624.55,573681.91)	(1375610.47,573772.05)
L2	71.04	N11° 59' 27.23"W	(1375610.47,573772.05)	(1375595.71,573841.54)
L3	77.06	N14° 02' 54.06"W	(1375595.71,573841.54)	(1375577.01,573916.30)

Curve Table: Alignments

Curve #	Radius	Length	Chord Direction	Start Point	End Point
C1	42.58	25.21	N8° 05' 14.52"E	(1375621.05,573657.31)	(1375624.55,573681.91)

BOULDER SLOPE STABILIZATION

	STA	OFFSET RIGHT BANK LOOKING DOWNSTREAM	NORTHING	EASTING	ELE.
A	1+58.71	13.13	1375629.0973	573737.8537	294.5
B	1+60.25	19.19	1375634.8531	573740.3145	299.5
C	2+81.31	25.11	1375618.9554	573858.9502	299
D	3+06.23	23.02	1375609.6322	573882.6829	293.5

BOULDER BARB DEFLECTORS

BARB #	CONTROL POINT AA					CONTROL POINT BB					GENERAL	
	STA	OFFSET RIGHT BANK LOOKING DOWNSTREAM	NORTHING	EASTING	ELE.	STA	OFFSET RIGHT BANK LOOKING DOWNSTREAM	NORTHING	EASTING	ELE.	BOULDER SLOPE	LENGTH
1	1+88.30 ~~1+91.30~~	6.00	1375617.4027 ~~1375616.9287~~	573765.9840 ~~573768.8671~~	293.5	2+02.35 ~~2+05.35~~	14.02	1375622.7329 ~~1375622.0382~~	573781.7845 ~~573785.2597~~	294.14	4%	16
2	2+19.87	8.25	1375613.5146	573797.8368	293.5	2+33.99	16.51	1375618.5619	573813.4768	294.14	4%	16

1"=10' 0 5' 10' 20'

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 4/27/2022
CHIEF, BUREAU OF ENGINEERING — DATE 4-18-22
CHIEF, BUREAU OF UTILITIES — DATE 4/21/22
CHIEF, UTILITY DESIGN DIVISION — DATE 4/14/2022

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STATE OF MARYLAND — BRETT M. SCHREY — NO. 44920 — REGISTERED PROFESSIONAL ENGINEER

DES: AB				
DRN: DD				
CHK: RP				
DATE: 01/2022	DD	1	AS-BUILT	1/26/22
	BY	NO.	REVISION	DATE

Bonnie Branch Emergency Sewer Protection & Stream Bank Stabilization at MH 124

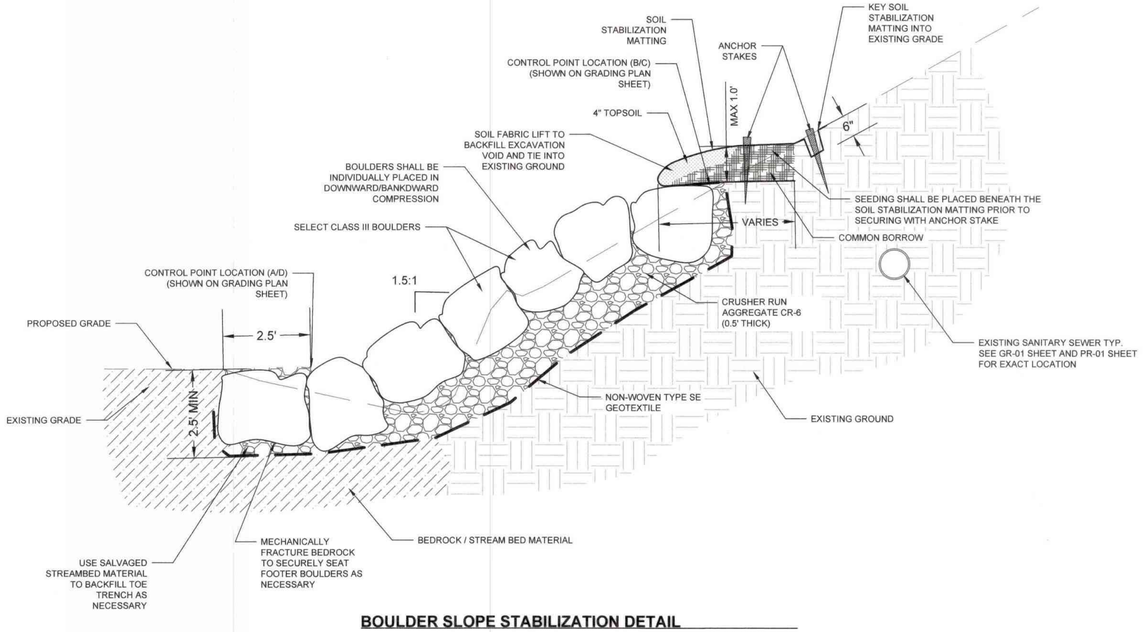
GRADING PLAN

GR-01

600 SCALE MAP NO. 31 BLOCK NO. 4

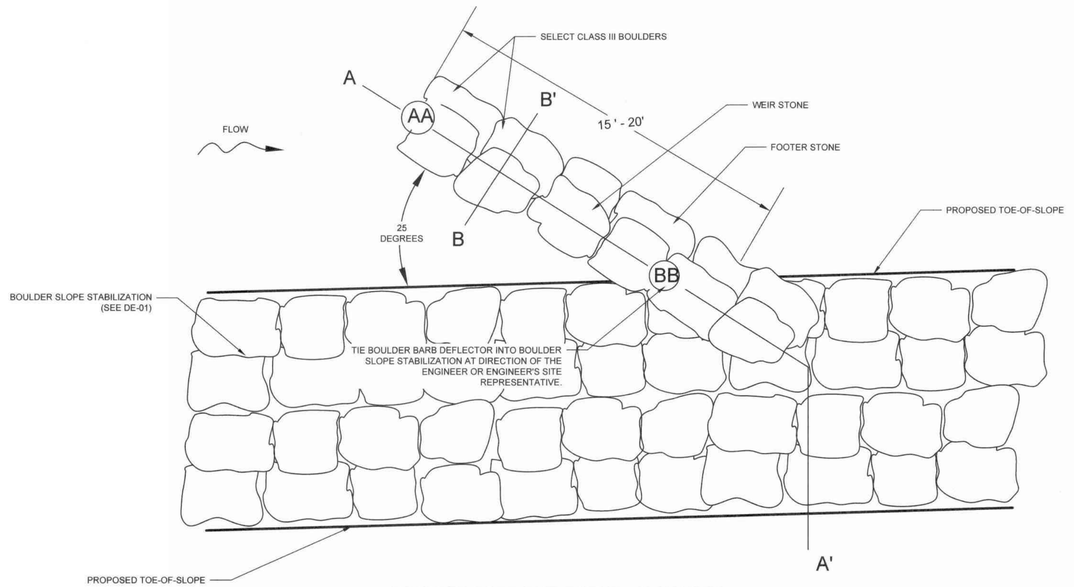
BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN



BOULDER SLOPE STABILIZATION DETAIL

NOT TO SCALE

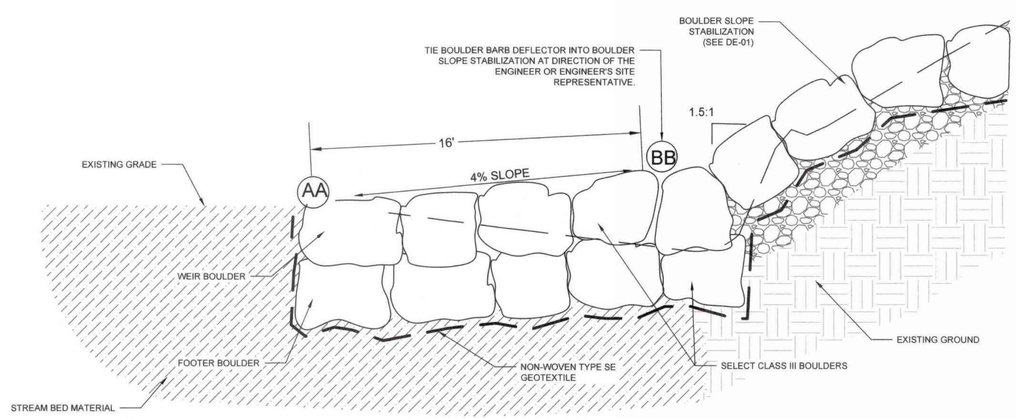


BOULDER BARB DEFLECTOR - PLAN VIEW

NOT TO SCALE

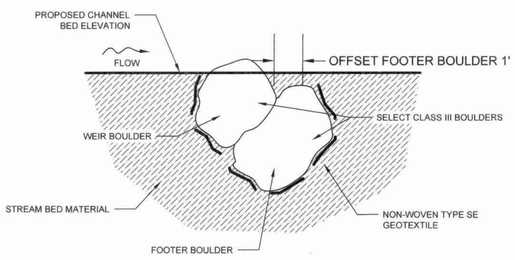
BOULDER SLOPE STABILIZATION NOTES:

1. EXTENTS OF THE BOULDER SLOPE STABILIZATION ARE SHOWN USING CONTROL POINTS DISPLAYED ON GR-01. THE STRUCTURE TABLE IS LOCATED ON GR-01.
2. BEDROCK SHALL BE MECHANICALLY FRACTURED TO PROVIDE ADEQUATE ROOM TO SECURELY SEAT THE FOOTER BOULDERS A MINIMUM OF 2.5 FEET BELOW THE CHANNEL INVERT AS ILLUSTRATED.
3. SELECT CLASS III BOULDERS SHALL BE MECHANICALLY PLACED WITH STAGGERED JOINTS SUCH THAT EACH BOULDER RESTS FIRMLY ON TWO BOULDERS IN THE TIER BELOW WITH MINIMUM TO NO VOID SPACES. STONE SHALL NOT BE PLACED BY DUMPING OR SIMILAR METHODS.
4. THE TOE BOULDER MUST BE PROPERLY SEATED WITH SUBSEQUENT BOULDERS PLACED IN A DOWNWARD AND BANKWARD COMPRESSION WITH MINIMAL OPPORTUNITY FOR MOVEMENT.
5. SELECT CLASS III BOULDERS SHALL BE TIED INTO THE EXISTING CHANNEL SUBSTRATE/BEDROCK AT THE DIRECTION OF THE ENGINEER OR ENGINEER'S SITE REPRESENTATIVE TO ESTABLISH A STABLE CROSS SECTION. THE EXISTING CROSS-SECTIONAL AREA OF THE CHANNEL SHALL BE MAINTAINED TO THE GREATEST EXTENT POSSIBLE.
6. THE UPSTREAM AND DOWNSTREAM EXTENTS OF THE BOULDER SLOPE STABILIZATION SHALL BE KEYED INTO THE EXISTING BANK OR REVETMENT TO ESTABLISH A SMOOTH CROSS SECTION IN TRANSITION AREAS.



BOULDER BARB DEFLECTOR A - A'

NOT TO SCALE



BOULDER BARB DEFLECTOR B - B'

NOT TO SCALE

BOULDER BARB DEFLECTOR NOTES:

1. EXTENTS OF THE BOULDER BARB DEFLECTOR STRUCTURES ARE SHOWN USING CONTROL POINTS DISPLAYED ON GR-01. THE STRUCTURE TABLE IS LOCATED ON GR-01.
2. BEDROCK SHALL BE MECHANICALLY FRACTURED TO PROVIDE ADEQUATE ROOM TO SECURELY SEAT THE FOOTER BOULDERS AS SHOWN.
3. SELECT CLASS III BOULDERS SHALL BE MECHANICALLY PLACED WITH STAGGERED JOINTS SUCH THAT EACH BOULDER RESTS FIRMLY ON THE BOULDERS IN THE TIER BELOW WITH MINIMUM TO NO VOID SPACES. STONE SHALL NOT BE PLACED BY DUMPING OR SIMILAR METHODS.
4. FOOTER BOULDER SHALL BE SEATED WITH SUBSEQUENT WEIR BOULDERS PLACED IN A DOWNWARD AND BANKWARD COMPRESSION WITH MINIMAL OPPORTUNITY FOR MOVEMENT.
5. SELECT CLASS III BOULDERS SHALL BE TIED INTO THE EXISTING CHANNEL SUBSTRATE/BEDROCK AT THE DIRECTION OF THE ENGINEER OR ENGINEER'S SITE REPRESENTATIVE TO ESTABLISH A STABLE CROSS SECTION.
6. THE BOULDER BARB DEFLECTOR SHALL BE SEAMLESSLY TIED INTO THE BOULDER SLOPE STABILIZATION AS SHOWN TO ESTABLISH A SMOOTH CROSS SECTION IN TRANSITION AREAS.

AS-BUILT

DATE 12/22/2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 4/27/2022
CHIEF, BUREAU OF ENGINEERING — DATE 4-18-22
CHIEF, BUREAU OF UTILITIES — DATE 4/21/22
CHIEF, UTILITY DESIGN DIVISION — DATE 4/14/2022

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STATE OF MARYLAND — BRETT M. SCHEY — NO. 44301 — REGISTERED PROFESSIONAL ENGINEER

DES: AB
DRN: DD
CHK: RP
DATE: 01/2022

BY	NO.	REVISION	DATE

Bonnie Branch Emergency Sewer Protection & Stream Bank Stabilization at MH 124

DETAILS

DE-01

600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 19 OF 26

PATH: \\US0525-PPFSS01\workgroup\2028\active\2028113261\01_data\civil\sheet_files\03-Details_BonnieBranch.dwg 1/26/2022 11:38 AM oakley.stantec_mono.ctb

NON-WOVEN TYPE SE GEOTEXTILE

NON-WOVEN TYPE SE GEOTEXTILE SHALL BE PER MDOT MSHA 919 GEOTEXTILES.

NONWOVEN TYPE SE GEOTEXTILE: PROPERTIES				
GRAB STRENGTH (LB)	PUNCTURE STRENGTH (LB)	PERMITTIVITY (SEC^{-1})	APPARENT OPENING SIZE, MAX (MM)	TRAPEZOID TEAR STRENGTH (LB)
160	310	0.20	0.30	80

SOIL STABILIZATION MATTING TYPE D

MATTING FOR THE BANK TREATMENT AREAS SHALL CONSIST OF A MACHINE PRODUCED MAT OF DEGRADABLE NATURAL FIBERS AND SHALL MEET THE FOLLOWING MINIMUM SPECIFICATIONS:

- MATERIAL: WOVEN COIR FIBER YARN OR TWINE
- THICKNESS: 0.25 IN.
- ELONGATION (DRY/WET): 29% / 35%
- WEIGHT: 20 OZ/SY
- OPEN AREA: 50%
- SIZE 6 FT WIDE x 150 FT LENGTH (100 SY PER ROLL)
- FLOW VELOCITY: 8 FT/SEC
- LIFE EXPECTANCY: 3 YEARS

TOP SOIL

TOPSOIL SHALL BE PER MDOT MSHA 920.01.02 FURNISHED TOPSOIL.

COMMON BORROW

COMMON BORROW SHALL BE PER MDOT MSHA 916.01 COMMON BORROW. COMMON BORROW SHALL BE FREE FROM STONES OR OTHER FOREIGN MATERIALS 3 IN. OR GREATER. SALVAGED STREAMBED MATERIAL, IF PRESENT, SHALL BE SALVAGED PRIOR TO PLACEMENT OF THE COMMON BORROW. COMMON BORROW SHALL BE PLACED, SPREAD, AND COMPACTED IN MAXIMUM LAYERS OF 8 IN. TO ACHIEVE REQUIRED DEGREE OF COMPACTION. "REQUIRED DEGREE OF COMPACTION" SHALL BE UNDERSTOOD TO MEAN THAT, IF COMMON BORROW IS FORMED INTO A BALL IT SHALL NOT CRUMBLE AND SHALL NOT BE WET THAT WATER MAY BE SQUEEZED FROM THE MATERIAL.

- MAXIMUM DRY DENSITY MINIMUM P.C.F. T180 = 100

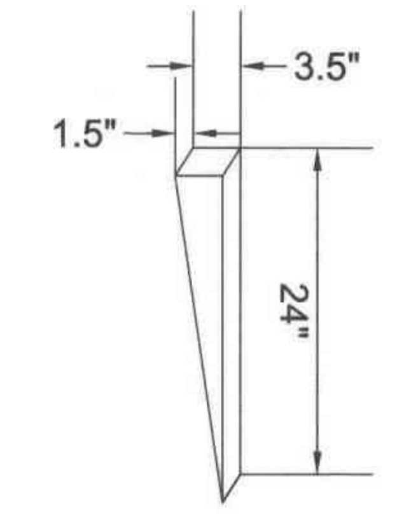
BOULDERS

STONE USED SHALL BE BROWN OR GRAY IN COLOR. NO WHITE STONE WILL BE ALLOWED. THE STONE SHALL NOT DISINTEGRATE FROM THE ACTION OF AIR, WATER, OR HANDLING AND PLACING. GRANULAR SEDIMENTARY STONE WILL GENERALLY BE UNACCEPTABLE. CONCRETE WILL NOT BE CONSIDERED AS AN ALTERNATIVE FOR STONE. STONE MUST THE FOLLOWING GRADATION AND REQUIREMENTS OF MD SHA 901.02.:

SELECT CLASS III BOULDERS		
WEIGHT (LBS)	MIN. % FINER	DIAMETER (IN)
2,200	100	36
1,600	50	32
1,200	0	29

CRUSHER RUN AGGREGATE CR-6

STANDARD CRUSHER RUN AGGREGATE CR-6 SHALL BE USED ACCORDING TO MDOT MSHA 901.01 AGGREGATE.



NOTE:
ANCHOR STAKES SHALL BE TAPERED TWO FOOT LONG WOODEN STAKES CONSISTING OF STANDARD 2" X 4" WOODEN BOARDS CUT DIAGONALLY.

ANCHOR STAKE DETAIL

NOT TO SCALE

GENERAL NOTES

1. EXCAVATE THE BED AND BANKS ACCORDING TO THE PLANS TO OBTAIN THE NECESSARY SUBGRADE. PLACE CRUSHER RUN AGGREGATE CR-6 AND GEOTEXTILE TYPE SE AS ILLUSTRATED ON THE CONTRACT DOCUMENTS. GEOTEXTILE TORN OR DAMAGED SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. GEOTEXTILE SHALL BE KEYED-IN A MINIMUM OF 6" AND TRIMMED TO AVOID EXPOSED EDGES UPON COMPLETION OF CONSTRUCTION.
2. RIPRAP SHALL BE PLACED SO THAT SMALL AND LARGE STONES ARE MIXED TO MINIMIZE VOID SPACE AND PROMOTE INTERLOCKING. DUMPING OF STONE WILL NOT BE PERMITTED. STONES SHALL BE SEATED FIRMLY AND SHALL NOT ROCK OR ROTATE IN PLACE.
3. PERMANENT SEEDING MUST BE APPLIED ONTO TOPSOIL PRIOR TO PLACING AND STAKING THE MATTING.
4. SURFACE ELEVATIONS, WIDTHS, AND SLOPES SHALL CONFORM TO THE PROPOSED DESIGN STREAM PROFILE SPECIFIED ON THE CONTRACT DRAWINGS. TOLERANCES OF THE FINISHED STRUCTURE ARE AS FOLLOWS:
   - SURFACE ELEVATION: +/- 0.2 FEET
   - SLOPE +/- 01 PERCENT
5. PLACED MATERIAL NOT CONFORMING TO THE SPECIFIED LIMIT OR MATERIAL REQUIREMENTS SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE ENGINEER OR ENGINEER'S SITE REPRESENTATIVE AT NO ADDITIONAL COST.
6. IF FOOTER DEPTH CANNOT BE ACHIEVED DUE TO BEDROCK, CLASS III RIPRAP BOULDERS ARE TO BE PLACED DIRECTLY ON BEDROCK TO MEET PROPOSED GRADE AT THE DIRECTION OF THE ENGINEER OR ENGINEER'S SITE REPRESENTATIVE. BEDROCK MUST BE FREE OF DIRT AND GRAVEL PRIOR TO BOULDER PLACEMENT. BOULDERS MUST BE PROPERLY SEATED WITH LIMITED OPPORTUNITY FOR MOVEMENT.

AS-BUILT

DATE 12/22/2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 4/27/2022	CHIEF, BUREAU OF ENGINEERING — DATE 4-18-22
CHIEF, BUREAU OF UTILITIES — DATE 4/21/22	CHIEF, UTILITY DESIGN DIVISION — DATE 4/14/2022

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www.stantec.com

DES: AB				
DRN: DD				
CHK: RP				
DATE: 01/2022	BY	NO.	REVISION	DATE

Bonnie Branch Emergency Sewer Protection & Stream Bank Stabilization at MH 124

MATERIAL SPECS

DE-02

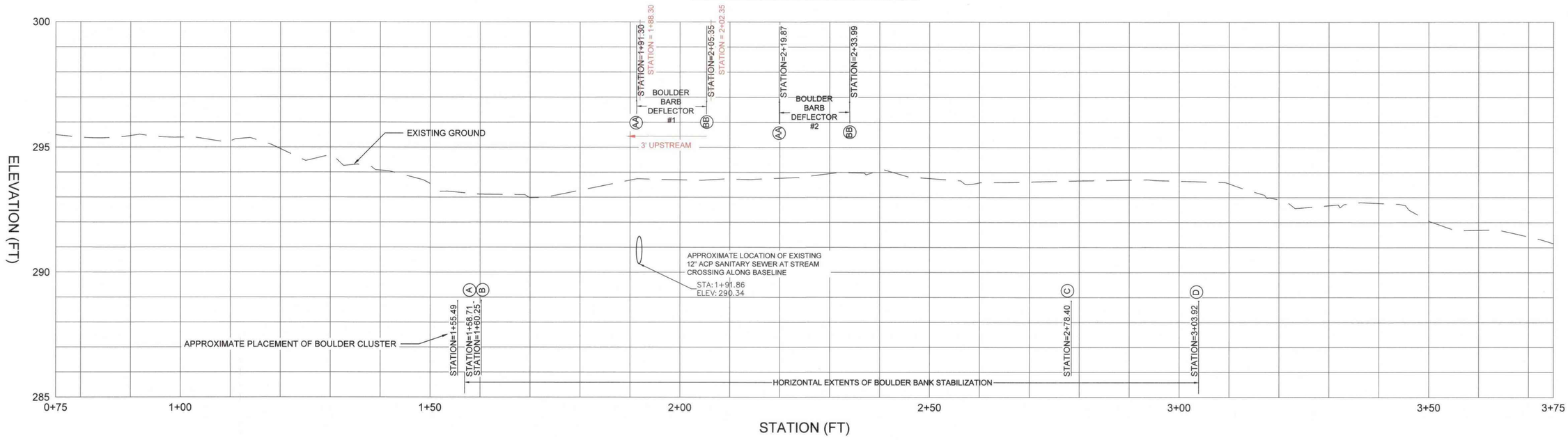
600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 20 OF 26

BONNIE BRANCH PROFILE



LEGEND

- EXISTING GRADE
- APPROXIMATE LOCATION OF SANITARY SEWER
- STRUCTURE CONTROL POINT

AS-BUILT

DATE 12/22/2021

HORZ. 1"=10' (0, 5', 10', 20')

VERT. 1"=2' (0, 1', 2', 4')

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 4/22/2022

CHIEF, BUREAU OF ENGINEERING — DATE 4-18-22

CHIEF, BUREAU OF UTILITIES — DATE 4/21/22

CHIEF, UTILITY DESIGN DIVISION — DATE 4/4/2022 S.C.

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www.stantec.com

STATE OF MARYLAND — BRETT M. BORDEN — NO. 44921 — REGISTERED PROFESSIONAL ENGINEER

DES: AB
DRN: DD
CHK: RP
DATE: 01/2022

BY	NO.	REVISION	DATE
DD	1	AS-BUILT	1/26/22

Bonnie Branch Emergency Sewer Protection & Stream Bank Stabilization at MH 124

PROFILE

PR-01

600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

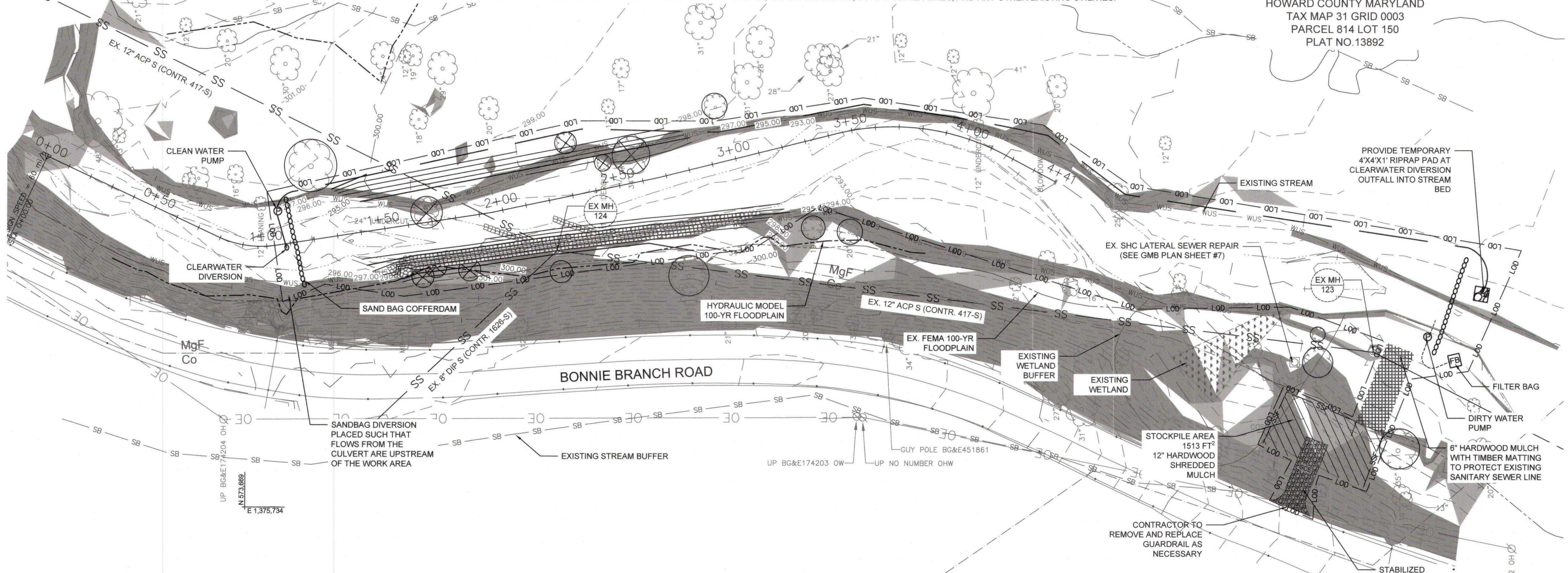
SCALE AS SHOWN

SHEET 21 OF 26

PATH: \\us2528-ppfss01\workgroup\20281\active\202813303\01_data\cad\sheet_files\04-Profile_BonnieBranch.dwg 1/26/2022 11:36 AM using stantec_mono.ctb

NOTES:
1. AT THE END OF EACH WORK DAY THE CONTRACTOR SHALL STABILIZE ANY DISTURBED AREA WITHIN THE LOD NOT DIRECTED TO AN EROSION AND CONTROL DEVICE AND REMOVE SANDBAG DIVERSION AND PUMP AROUND PRACTICE. THE WORK AREA SHALL BE DEWATERED UTILIZING DEWATERING PUMPS AND A PORTABLE SEDIMENT TANK/FILTER BAG OR MDE APPROVED SUBSTITUTE.
2. ALL DISTURBED, HIGHLY ERODIBLE SOILS/ STEEP SLOPES MUST BE PERMANENTLY STABILIZED USING PROCEDURES DESCRIBED ON DE-02, EN-01 AND EN-02.
3. ANY STOCKPILE OF MATERIALS MUST REMAIN OUTSIDE THE 100 YEAR FLOODPLAIN.
4. ADDITIONAL SEDIMENT CONTROLS SHALL BE PROVIDED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.
5. DIVERSION HOSES MAY BE MOVED DURING THE DAY TO FACILITATE THE GRADING.
6. STANDARD HOWARD COUNTY SCD SEED MIXES (AS SEEN ON SHEET EN-02) SHALL BE USED FOR TEMPORARY STABILIZATION ON STEEP SLOPES AND RIPARIAN ZONES WITHIN THE LOD. THE SITE SHALL BE PERMANENTLY STABILIZED WITH THE PERMANENT SLOPE REVEGETATION SEED MIX AS SEEN ON EN-02.
7. THE ENTIRETY OF THE PROJECT AREA LAYS WITHIN THE 75 FT STREAM BUFFER.
8. CONTRACTOR TO PROVIDE MOT AS NEEDED OR AS REQUIRED BY THE COUNTY DURING MATERIAL AND EQUIPMENT DELIVERY.
9. CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN WORKING AROUND ELECTRICAL LINES, SEWER MANHOLES, BURIED SEWER LINES, AND ANY OTHER EXISTING UTILITIES.

HOWARD COUNTY MARYLAND
TAX MAP 31 GRID 0003
PARCEL 814 LOT 150
PLAT NO.13892



LEGEND

△	EXISTING TRAVERSE POINT
— — 450 — —	EXISTING MAJOR CONTOUR
— — 449 — —	EXISTING MINOR CONTOUR
—— SS ——	EXISTING SEWER PIPE
Ⓢ	EXISTING SEWER MANHOLE
LoB / WcB	SOIL BOUNDARY
	EXISTING FEMA 100-YR WATER SURFACE
—— WB ——	EXISTING WETLAND BUFFER
	EXISTING WETLAND
—— WUS ——	EXISTING STREAM
—— SB ——	EXISTING STREAM BUFFER
—— LOD ——	LIMIT OF DISTURBANCE
—— 450 ——	PROPOSED MAJOR CONTOUR
—— 449 ——	PROPOSED MINOR CONTOUR
	HYDRAULIC MODEL 100-YR WATER SURFACE
	TREE PROTECTION PLANKING
⊗	TREE REMOVAL
	BOULDER SLOPE STABILIZATION
	BOULDER BARB DEFLECTOR
	BOULDER CLUSTER
—— SSF ——	SUPER SILT FENCE
	CLEARWATER DIVERSION HOSE
	DIRTY WATER DIVERSION HOSE
	STAGING AND STOCKPILING AREA
	TIMBER MAT ACCESS ROAD
	STABILIZED CONSTRUCTION ENTRANCE
FB	FILTER BAG
Ⓟ	PUMP AROUND LOCATION
	SAND BAG COFFERDAM
	TEMPORARY RIPRAP PAD
	HIGHLY ERODIBLE (>15%) SOILS
	STEEP (>20%) SLOPES

TIME RESTRICTION NOTES:
1. PUMPING IS NOT PERMITTED BETWEEN THE HOURS OF 5:00PM AND 7:00AM, MONDAY THROUGH FRIDAY.
2. CONSTRUCTION EQUIPMENT SHALL NOT BE STARTED NOR RUN BETWEEN THE HOURS OF 5:00PM AND 7:00AM, MONDAY THROUGH FRIDAY
3. FOR SATURDAY WORK, THE ABOVE HOURS SHALL BE 3:00PM AND 9:00AM, RESPECTIVELY.
4. NO WORK SHALL BE DONE ON SUNDAY.

AS-BUILT
DATE 12/22/2021

0 10' 20' 40'
1"=20'

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	DATE 4/27/2022	CHIEF, BUREAU OF ENGINEERING	DATE 4-18-22
CHIEF, BUREAU OF UTILITIES	DATE 4/21/22	CHIEF, UTILITY DESIGN DIVISION	DATE 4/14/2022

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STATE OF MARYLAND · BRETT M SCHREY · NO. 44931 · REGISTERED PROFESSIONAL ENGINEER

DES: AB
DRN: DD
CHK: RP
DATE: 01/2022

BY	NO.	REVISION	DATE

Bonnie Branch Emergency Sewer Protection & Stream Bank Stabilization at MH 124

EROSION CONTROL PLAN

ES-01

600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 22 OF 26

HOWARD SOIL CONSERVATION DISTRICT (HSCD) STANDARD SEDIMENT CONTROL NOTES

1. A PRE-CONSTRUCTION MEETING MUST OCCUR WITH THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION INSPECTION DIVISION (CID), 410-313-1855 AFTER THE FUTURE LOD AND PROTECTED AREAS ARE MARKED CLEARLY IN THE FIELD. A MINIMUM OF 48 HOUR NOTICE TO CID MUST BE GIVEN AT THE FOLLOWING STAGES:
   - 1.A. PRIOR TO THE START OF EARTH DISTURBANCE,
   - 1.B. UPON COMPLETION OF THE INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING,
   - 1.C. PRIOR TO THE START OF ANOTHER PHASE OF CONSTRUCTION OR OPENING OF ANOTHER GRADING UNIT,
   - 1.D. PRIOR TO THE REMOVAL OR MODIFICATION OF SEDIMENT CONTROL PRACTICES.

OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE. OTHER RELATED STATE AND FEDERAL PERMITS SHALL BE REFERENCED, TO ENSURE COORDINATION AND TO AVOID CONFLICTS WITH THIS PLAN.

2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, AND REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION IS REQUIRED WITHIN THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED AREAS ON THE PROJECT SITE EXCEPT FOR THOSE AREAS UNDER ACTIVE GRADING.
4. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR TOPSOIL (SEC. B-4-2), PERMANENT SEEDING (SEC. B-4-5), TEMPORARY SEEDING (SEC. B-4-4) AND MULCHING (SEC. B-4-3). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES IF THE GROUND IS FROZEN. INCREMENTAL STABILIZATION (SEC. B-4-1) SPECIFICATIONS SHALL BE ENFORCED IN AREAS WITH >15 FT OF CUT AND/OR FILL. STOCKPILES (SEC. B-4-8) IN EXCESS OF 20 FT. MUST BE BENCHED WITH STABLE OUTLET. ALL CONCENTRATED FLOW, STEEP SLOPE, AND HIGHLY ERODIBLE AREAS SHALL RECEIVE SOIL STABILIZATION MATTING (SEC. B-4-6).
5. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE, AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE CID.
6. SITE ANALYSIS:

TOTAL AREA OF SITE:	ACRES	0.68
AREA DISTURBED:	ACRES	0.68
AREA TO BE ROOFED OR PAVED:	ACRES	0.00
AREA TO BE VEGETATIVELY STABILIZED:	ACRES	0.15
TOTAL CUT:	CU.YDS.	143.3
TOTAL FILL:	CU.YDS.	117.9
OFFSITE WASTE&BORROW AREA LOCATION:	N/A	

7. CUT/FILL QUANTITIES DERIVED FROM DIFFERENCE BETWEEN EXISTING AND PROPOSED SURFACES. DOES NOT ACCOUNT FOR OVER EXCAVATION FOR STRUCTURE PLACEMENT.
8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
9. 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 PROJECTS STATUS (E.G., PERCENT COMPLETE) AND/OR CURRENT ACTIVITIES
   - EVIDENCE OF SEDIMENT DISCHARGES
   - IDENTIFICATION OF PLAN DEFICIENCIES
   - IDENTIFICATION OF SEDIMENT CONTROLS THAT REQUIRE MAINTENANCE
   - IDENTIFICATION OF MISSING OR IMPROPERLY INSTALLED SEDIMENT CONTROLS
   - COMPLIANCE STATUS REGARDING THE SEQUENCE OF CONSTRUCTION AND STABILIZATION REQUIREMENTS
   - PHOTOGRAPHS
   - MONITORING/SAMPLING
   - MAINTENANCE AND/OR CORRECTIVE ACTION PERFORMED
   - OTHER INSPECTION ITEMS AS REQUIRED BY THE GENERAL PERMIT FOR STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITIES (NPDES, MDE).
9. 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 ALLOWED BY THE CID PER THE LIST OF HSCD-APPROVED FIELD CHANGES.
10. 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 HSCD, NO MORE THAN 30 ACRES CUMULATIVELY MAY BE DISTURBED AT A GIVEN TIME.
11. WASH WATER FROM ANY EQUIPMENT, VEHICLES, WHEELS, PAVEMENT, AND OTHER SOURCES MUST BE TREATED IN A SEDIMENT BASIN OR OTHER APPROVED WASHOUT STRUCTURE.
12. TOPSOIL SHALL BE STOCKPILED AND PRESERVED ON-SITE FOR REDISTRIBUTION ONTO FINAL GRADE.
13. 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.
14. STREAM CHANNELS MUST NOT BE DISTURBED DURING THE FOLLOWING RESTRICTED TIME PERIODS (INCLUSIVE):
   - USE I AND IP MARCH 1 - JUNE 15 *BONNIE BRANCH'S USE CLASSIFICATION
   - USE III AND IIIP OCTOBER 1 - APRIL 30
   - USE IV MARCH 1 - MAY 31
16. A COPY OF THIS PLAN, THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, AND ASSOCIATED PERMITS SHALL BE ON-SITE AND AVAILABLE WHEN THE SITE IS ACTIVE.
17. OFFSITE WASTE & BORROW SITE SHALL HAVE AN APPROVED SEDIMENT CONTROL PLAN AND PERMIT.

SEQUENCE OF CONSTRUCTION (SOC) (REFER TO SOC PHASE NOTES BELOW FOR DURATION)

1. INITIAL PHASE - SITE PREPARATION (PROP. STREAM CENTERLINE, STA 1+19.34 TO D.S OF STREAM WORK)
   - 1.A. MARK LIMITS OF DISTURBANCE PRIOR TO CLEARING OF TREES, INSTALLATION OF SEDIMENT CONTROL MEASURES, CONSTRUCTION OR OTHER LAND DISTURBING ACTIVITIES. 1 DAY.
   - 1.B. PLACE ORANGE CONSTRUCTION FENCE (MD SHA 104.20 TEMPORARY ORANGE CONSTRUCTION FENCE) ALONG THE ENTIRE LOD FOR THE ACTIVE WORKING SEGMENT, EXCEPT AT STREAM CROSSINGS, CONSTRUCTION ENTRANCES, AND ALONG OTHER FENCES (E.G., SUPER SILT FENCE, SILT FENCE, ETC.). 1 DAY
   - 1.C. INSTALL TREE PROTECTION PLANKING AS SHOWN ON EN-03. 1 DAY
   - 1.D. INSTALL TRAFFIC CONTROL MEASURES AS NECESSARY, INCLUDING REMOVING SECTION OF GUARDRAIL AS NEEDED. 1DAY
   - 1.E. CLEAR FOR AND CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE (SCE). UTILIZE CURB AND PAVING PROTECTION MEASURES WHERE NECESSARY. CLEAR FOR AND INSTALL SUPER SILT FENCE AS SHOWN ON THE PLANS. 1 DAY
   - 1.F. PLACE HARDWOOD SHREDDED MULCH AS SHOWN ON PLAN ES-01 AND CONSTRUCT TIMBER MAT CONSTRUCTION ACCESS PATH OVER EXISTING SEWER LINE AS SHOWN ON PLAN ES-01. 1 DAY
   - 1.G. CLEAR AND GRADE FOR INSTALLATION OF SEDIMENT CONTROL DEVICES, ONLY DISTURBING THE AREA NEEDED FOR INSTALLATION OF THE SEDIMENT CONTROL DEVICES. 2 DAYS
   - 1.H. INSTALL SEDIMENT CONTROL DEVICES INCLUDING TREE PROTECTION PLANKING. TREES TO RECEIVE PLANKING ARE SHOWN ON THE EROSION AND SEDIMENT CONTROL PLANS. IMMEDIATELY STABILIZE ANY DISTURBED AREAS DUE TO SEDIMENT CONTROL INSTALLATION. 1 DAY
   - 1.I. OBTAIN WRITTEN APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR BEFORE PROCEEDING WITH ANY ADDITIONAL CLEARING, GRUBBING, OR GRADING.

2. PHASE 1 - STREAM WORK (PROP. STREAM CENTERLINE, STA 1+19.34 TO STA 3+23.27)
   - 2.A. INSTALL SANDBAG DIKE AND CLEARWATER PUMP. CLEARWATER DIVERSION SHALL OUTFALL INTO THE STREAM BED DOWNSTREAM OF THE PHASE 1 STREAM WORK. PROVIDE A 4'X4' RIPRAP PAD OR OTHER APPROVED ENERGY DISSIPATION DEVICE AT THE DOWNSTREAM END OF THE CLEARWATER DIVERSION. 2 DAYS
   - 2.B. INSTALL SANDBAG DIKE AND DIRTY WATER PUMP AT THE DOWNSTREAM END OF PHASE 1 STREAM WORK. PUMP SHALL DISCHARGE INTO A FILTER BAG LOCATED IN A STABLE, LEVEL AREA DOWNSTREAM OF THE DIKE AND ADJACENT TO THE EXISTING STREAM AT A LOCATION TO BE ESTABLISHED AND AGREED UPON BY THE CONTRACTOR AND THE SEDIMENT CONTROL INSPECTOR. 1 DAY
   - 2.C. PERFORM STREAM CONSTRUCTION WORK IN THE WORK AREA, DEWATERING TO THE FILTER BAG AS NECESSARY. BASE FLOW MAY BE ALLOWED THROUGH THE WORK AREA AT THE END OF EACH WORK DAY PROVIDED THE STABILIZATION REQUIREMENTS NOTED IN THE ADDITIONAL SEDIMENT CONTROL NOTES HAVE BEEN MET. 6 DAYS
   - 2.D. PERMANENTLY STABILIZE ALL DISTURBED AREAS. INSTALL 10 INDIVIDUAL TREES AT THE DIRECTION OF THE COUNTY. 1 DAY

3. FINAL PHASE COMPLETION
   - 3.A. CONDUCT A PUNCH LIST WALK-THROUGH FOR STREAM WORK AREAS AND REPAIR ANY OUTSTANDING ITEMS. 5 DAYS
   - 3.B. REMOVE ANY REMAINING SEDIMENT CONTROL DEVICES ALONG THE STREAM WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, INCLUDING ALL TREE PROTECTION MEASURES FOR ENTIRE SITE. 1 DAY
   - 3.C. REMOVE TIMBER MAT ACCESS, AND COMPLETE ANY REMAINING PLANTING DURING THE APPROPRIATE PLANTING SEASON. REMOVE ALL REMAINING SEDIMENT CONTROL DEVICES WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR. 3 DAYS
   - 3.D. REPLACE REMOVED SECTION OF GUARDRAIL. 1 DAY

ADDITIONAL SEDIMENT CONTROL NOTES

1. ALL STREAM STABILIZATION MEASURES SHALL BE INSTALLED AS INDICATED ON THE PLANS, AND ALL BANKS AND AREAS ADJACENT TO THE BANKS SHALL BE GRADED IN ACCORDANCE WITH THE GRADING PLANS AND TYPICAL SECTIONS.
2. CONTRACTOR SHALL ONLY BEGIN STREAM WORK FOR AN AREA THAT CAN BE COMPLETED BY THE END OF THE WORK DAY, INCLUDING GRADING WITHIN AND ADJACENT TO THE CHANNEL.
3. DISTURBED AREAS OUTSIDE OF THE CHANNEL BOTTOM SHALL HAVE EITHER PERMANENT OR TEMPORARY STABILIZATION AT THE END OF EACH WORK DAY. CHANNEL BED MATERIAL SHALL BE COMPACTED IN PLACE PRIOR TO ALLOWING BASE FLOW BACK INTO WORK AREA DURING OFF-WORK HOURS. THE PUMP AROUND SHALL BE REMOVED AT THE END OF EACH WORK DAY.
4. WORK SHALL NOT BE CONDUCTED IN THE CHANNEL DURING RAINFALL RUNOFF EVENTS.
5. CONTRACTOR MAY COMPLETE WORK IN MULTIPLE SECTIONS CONCURRENTLY WITH PRIOR APPROVAL OF THE INSPECTOR AND ENGINEER AS LONG AS THE LOD IS STAKED OUT AND ALL SEDIMENT CONTROL DEVICES ARE IN PLACE.
6. CONTRACTOR MAY ADJUST THE PHASE LIMITS AND LOCATIONS OF DIKES AND PUMP AROUNDS WITH THE APPROVAL OF THE ENGINEER AND THE SEDIMENT CONTROL INSPECTOR.
7. STREAM WORK FOR EACH WORK AREA IS TO BE PERFORMED FROM UPSTREAM TO DOWNSTREAM.
8. AT THE START OF EACH WORK DAY, RE-ESTABLISH THE SANDBAG DIKES AND PUMP AROUNDS.
9. THE CONTRACTOR MUST OBTAIN WRITTEN APPROVAL FROM THE HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION (HCCID) INSPECTOR PRIOR TO THE REMOVAL OF ANY SEDIMENT CONTROL DEVICE. ANY AREAS DISTURBED DURING THE REMOVAL OF E&SC DEVICES SHALL BE IMMEDIATELY STABILIZED.

AS-BUILT
DATE 12/22/2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	DATE 4/21/2022	CHIEF, BUREAU OF ENGINEERING	DATE 4-18-22
CHIEF, BUREAU OF UTILITIES	DATE 4/21/22	CHIEF, UTILITY DESIGN DIVISION	DATE 4/14/2022

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DES: AB
DRN: DD
CHK: RP
DATE: 01/2022

BY	NO.	REVISION	DATE

Bonnie Branch Emergency Sewer Protection & Stream Bank Stabilization at MH 124
EROSION CONTROL NOTES
EN-01

600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

B- 4- 2 SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

A. SOIL PREPARATION

A.1. TEMPORARY STABILIZATION

A.1.1. 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.

A.1.2. APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS.

A.1.3. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.

A.2. PERMANENT STABILIZATION

A.2.1. A SOIL TEST IS REQUIRED FOR ANY EARTH DISTURBANCE OF 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE:

A.2.1.1. SOIL PH BETWEEN 6.0 AND 7.0.

A.2.1.2. SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (PPM).

A.2.1.3. 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.

A.2.1.4. SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT.

A.2.1.5. SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.

A.2.2. APPLICATION OF AMENDMENTS OR TOPSOIL IS REQUIRED IF ON-SITE SOILS DO NOT MEET THE ABOVE CONDITIONS.

A.2.3. 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.

A.2.4. APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE RESULTS OF A SOIL TEST.

A.2.5. 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

B.1. TOPSOIL IS PLACED OVER PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION. THE PURPOSE IS TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH, SOILS OF CONCERN HAVE LOW MOISTURE CONTENT, LOW NUTRIENT LEVELS, LOW PH, MATERIALS TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION.

B.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.

B.3. TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:

B.3.1. THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.

B.3.2. 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.

B.3.3. THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.

B.3.4. THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.

B.3.5. AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN.

B.4. TOPSOIL SPECIFICATIONS: SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING CRITERIA:

B.4.1. 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 INCH IN DIAMETER.

B.4.2. 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.

B.4.3. 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.

B.5. TOPSOIL APPLICATION

B.5.1. EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL.

B.5.2. 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.

B.5.3. TOPSOIL MUST NOT BE PLACED IF THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.

C. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)

C.1. SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OF 5 ACRES OR MORE. SOIL ANALYSIS MAY BE PERFORMED BY A RECOGNIZED PRIVATE OR COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSES.

C.2. FERTILIZERS MUST BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR ACCURATE APPLICATION BY APPROPRIATE EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS MUST ALL BE DELIVERED TO THE SITE FULLY LABELED ACCORDING TO THE APPLICABLE LAWS AND MUST BEAR THE NAME, TRADE NAME OR TRADEMARK AND WARRANTY OF THE PRODUCER.

C.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.

C.4. LIME AND FERTILIZER ARE TO BE EVENLY DISTRIBUTED AND INCORPORATED INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.

C.5. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, SPREAD GROUND LIMESTONE AT THE RATE OF 4 TO 8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL.

B-4-3 SEEDING AND MULCHING

A. SEEDING

A.1. SPECIFICATIONS

A.1.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.

A.1.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.

A.1.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.

A.1.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.

B. APPLICATION

B.1. DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.

B.1.A. 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.

B.1.B. 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.2. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.

B.2.A. CULTIPACKING SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST 1/4 INCH OF SOIL COVERING. SEEDBED MUST BE FIRM AFTER PLANTING.

B.2.B. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.

B.3. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER).

B.3.A. 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 (PHOSPHOROUS), 200 POUNDS PER ACRE; K2O (POTASSIUM), 200 POUNDS PER ACRE.

B.3.B. 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.

B.3.C. MIX SEED AND FERTILIZER ON SITE AND SEED IMMEDIATELY AND WITHOUT INTERRUPTION.

B.3.D. WHEN HYDROSEEDING DO NOT INCORPORATE SEED INTO THE SOIL.

C. MULCHING

C.1. MULCH MATERIALS (IN ORDER OF PREFERENCE)

C.1.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.

C.1.B. WOOD CELLULOSE FIBER MULCH (WCFM) CONSISTING OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.

C.1.B.1.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.

C.1.B.2.WCFM, INCLUDING DYE, MUST CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.

C.1.B.3.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.

C.1.B.4.WCFM MATERIAL MUST NOT CONTAIN ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.

C.1.B.5.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.

C.2. APPLICATION

C.2.A. APPLY MULCH TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.

C.2.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.2.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.

C.3. ANCHORING

C.3.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:

C.3.A.1.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.

C.3.A.2. 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.

C.3.A.3.SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRO-TACK), DCA-70, PETROSET, TERRA TAX II, TERRA TACK AR OR OTHER APPROVED EQUAL MAY BE USED. FOLLOW APPLICATION RATES AS SPECIFIED BY THE MANUFACTURER. APPLICATION OF LIQUID BINDERS NEEDS TO BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. USE OF ASPHALT BINDERS IS STRICTLY PROHIBITED.

C.3.A.4.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-4-8 STOCKPILE AREA

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 3/7DAY 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. TREES WILL HAVE 100% SURVIVAL WARRANTY. TREES THAT DO NOT MEET WARRANTY REQUIREMENTS OF SURVIVAL AND BEING FREE FROM DISEASE SHALL BE REPLACED.

B-4-4 TEMPORARY STABILIZATION

HARDINESS ZONE (FROM FIGURE B.3): 6B SEED MIXTURE (FROM TABLE B.1): SEED MIXTURE (FROM TABLE B.1)					FERTILIZER RATE (10-20-20)	LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS		
	ANNUAL RYEGRASS	40	MAR 1 TO MAY 15; AUG 1 TO OCT 15	0.5	436 LB/AC (10 LB/1000 SF)	2 TON/AC (90 LB/1000 SF)
	FOXTAIL MILLET	30	MAY 16 TO JULY 31	0.5		

B-4-5 PERMANENT STABILIZATION

HARDINESS ZONE (FROM GIGURE B.3): 6B SEED MIXTURE (FROM TABLE B.1): 1 AND 3					FERTILIZER RATE (10-20-20)			LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	N	P_2O_5	K_2O	
1	SWITCH GRASS	10	MAR 1 TO MAY 15; MAY 16 TO JUNE 15	$\frac{1}{4}$ - $\frac{1}{2}$ IN.	45 LB/AC (1 LB/1000 SF)	90 LB/AC (2 LB/1000 SF)	90 LB/AC (2 LB/1000 SF)	2 TON/AC (90 LB/1000 SF)
	CREEPING RED FESCUE	15	MAR 1 TO MAY 15; MAY 16 TO JUNE 15	$\frac{1}{4}$ - $\frac{1}{2}$ IN.				
	PARTRIDGE PEA	4	MAR 1 TO MAY 15; MAY 16 TO JUNE 15	$\frac{1}{4}$ - $\frac{1}{2}$ IN.				
3	CANADA WILD RYE	3	MAR 1 TO MAY 15; MAY 16 TO JUNE 15	$\frac{1}{4}$ - $\frac{1}{2}$ IN.	45 LB/AC (1 LB/1000 SF)	90 LB/AC (2 LB/1000 SF)	90 LB/AC (2 LB/1000 SF)	2 TON/AC (90 LB/1000 SF)
	REDTOP	1	MAR 1 TO MAY 15; MAY 16 TO JUNE 15	$\frac{1}{4}$ - $\frac{1}{2}$ IN.				
	COMMON LESPEDEZA	10	MAR 1 TO MAY 15; MAY 16 TO JUNE 15	$\frac{1}{4}$ - $\frac{1}{2}$ IN.				

NOTES:

1. MAY 16 TO JUNE 15 ARE ADDITIONAL PLANTING DATES DURING WHICH SUPPLEMENTAL WATERING MAY BE NEEDED TO ENSURE PLANT ESTABLISHMENT

PERMANENT SLOPE REVEGETATION SEED MIX

NATIVE STEEP SLOPE MIX						
		SEEDING RATE (LBS)/ACRE:	60			
		TOTAL ZONE SIZE (SF/43,560):	6,719	43,560	0.1542	ACRES
			AMOUNT OF SEED NEEDED (LBS)	9.25482094		
TOTAL QTY. (lbs)	FREQUENCY %	BOTANICAL NAME	COMMON NAME	REGIONAL INDICATOR STATUS	ROOT TYPE	COMMENTS
2.88	31.1%	*Sorghastrum nutans*	Indiangrass	FACU	seed	Pure Live Seed
1.85	20.0%	*Lolium multiflorum*	Annual Ryegrass	FACU	seed	Pure Live Seed
1.30	14.0%	*Andropogon gerardii*	Big Bluestem	FAC	seed	Pure Live Seed
0.93	10.0%	*Elymus virginicus*	Virginia Wildrye	FACW	seed	Pure Live Seed
0.65	7.0%	*Elymus canadensis*	Canada Wildrye	FACU	seed	Pure Live Seed
0.37	4.0%	*Agrostis perennans*	Autumn Bentgrass	FACU	seed	Pure Live Seed
0.37	4.0%	*Panicum virgatum*	Switchgrass	FAC	seed	Pure Live Seed
0.28	3.0%	*Panicum clandestinum*	Deertongue	FAC	seed	Pure Live Seed
0.14	1.5%	*Echinacea purpurea*	Purple Coneflower	UPL	seed	Pure Live Seed
0.12	1.3%	*Chamaecrista fasciculata*	Partridge Pea	FACU	seed	Pure Live Seed
0.11	1.2%	*Heliopsis helianthoides*	Oxeye Sunflower	FACU	seed	Pure Live Seed
0.09	1.0%	*Coreopsis lanceolata*	Lanceleaf Coreopsis	FACU	seed	Pure Live Seed
0.09	1.0%	*Rudbeckia hirta*	Blackeyes Susan	FACU	seed	Pure Live Seed
0.03	0.3%	*Monarda fistulosa*	Wild Bergamot	UPL	seed	Pure Live Seed
0.02	0.2%	*Asclepias syriaca*	Common Milkweed	FACU	seed	Pure Live Seed
0.02	0.2%	*Solidago rugosa*	Wrinkleleaf Goldenrod	FAC	seed	Pure Live Seed
0.01	0.1%	*Aster lateriflorus*	Calico Aster	FACW	seed	Pure Live Seed
0.01	0.1%	*Aster pilosus*	Heath Aster	FACU	seed	Pure Live Seed
9.25	**100.0%**	**= Total**				

NOTES:

1. ERNMX 181 OR SIMILAR MAY BE USED. SUBSTITUTIONS SHALL BE APPROVED BY THE OWNER OR THEIR REPRESENTATIVE

TREE PLANTING

# OF TREES	SPECIES	SPECIES (SCIENTIFIC)	SIZE
5	TULIP POPLAR	LIRIODENDRON TULIPIFERA	0.75 TO 1 IN. CAL.
5	RED MAPLE	ACER RUBRUM	0.75 TO 1 IN. CAL.

NOTES:

1. REPLACEMENT TREE PLANTING LOCATIONS TO BE IDENTIFIED DURING CONSTRUCTION BY THE ENGINEER OR ENGINEER'S REPRESENTATIVE.
2. CONTRACTOR SHALL INSTALL AND MAINTAIN TREES/SHRUBS IN ACCORDANCE WITH SECTION 10 OF THE MDOT SHA STANDARD SPECIFICATIONS (JANUARY 2020).

AS-BUILT

DATE 12/22/2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

4/27/2022
DIRECTOR OF PUBLIC WORKS — DATE

4/21/22
CHIEF, BUREAU OF UTILITIES — DATE

4-18-22
CHIEF, BUREAU OF ENGINEERING — DATE

4/14/2022
CHIEF, UTILITY DESIGN DIVISION 4.C. DATE

Stantec

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DES: AB
DRN: DD
CHK: RP
DATE: 01/2022

BY	NO.	REVISION	DATE

Bonnie Branch Emergency Sewer Protection & Stream Bank Stabilization at MH 124

EROSION CONTROL NOTES

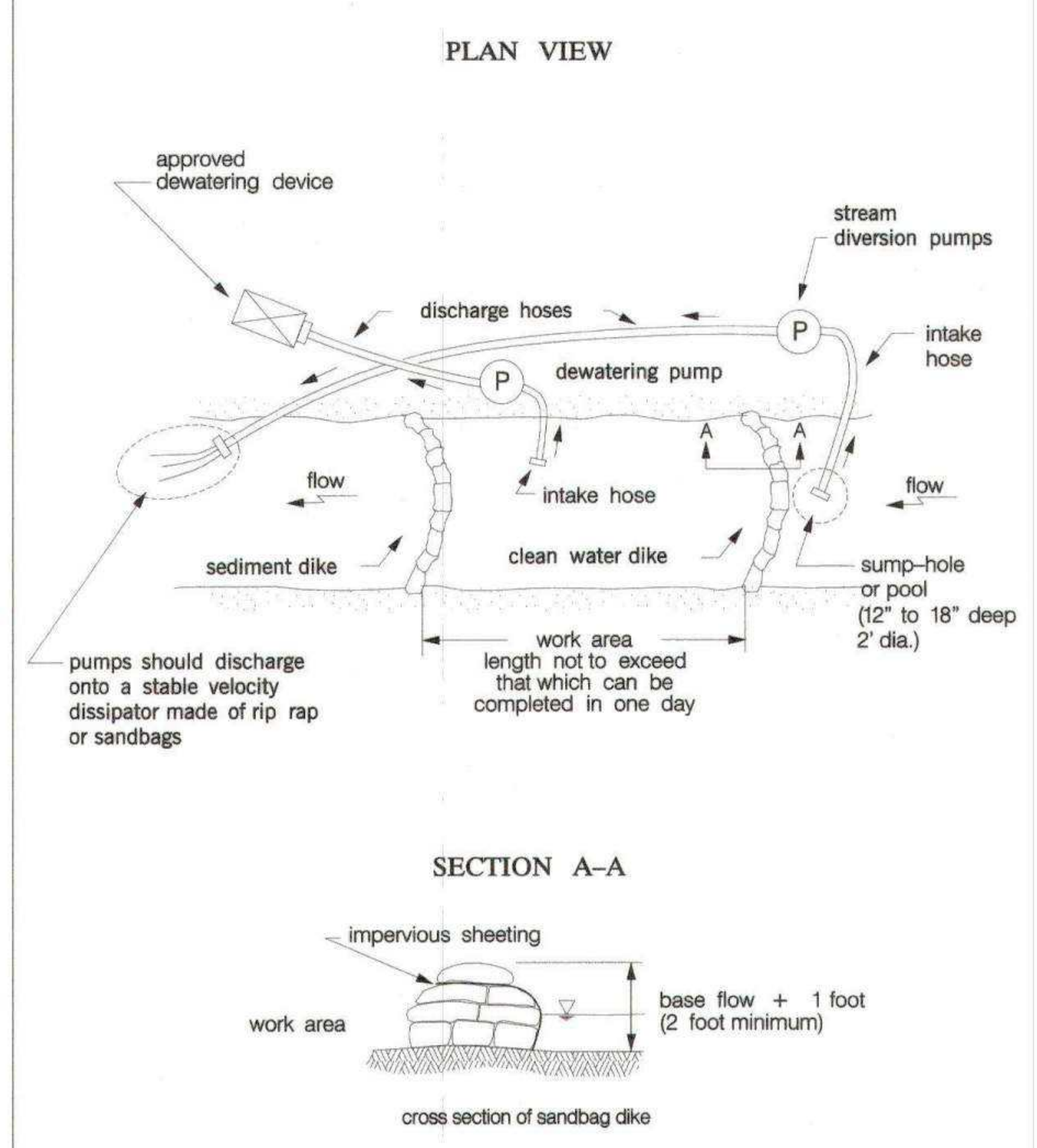
EN-02

600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH
INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

Maryland's Guidelines To Waterway Construction
DETAIL 1.2: PUMP-AROUND PRACTICE



TEMPORARY INSTREAM CONSTRUCTION MEASURES	REVISED NOVEMBER 2000 PAGE 1.2 - 3	MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

MGWC 1.2: PUMP-AROUND PRACTICE

Temporary measure for dewatering in-channel construction sites

DESCRIPTION

The work should consist of installing a temporary pump around and supporting measures to divert flow around in-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):

1. 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.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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 dissipater made of riprap or sandbags.

TEMPORARY INSTREAM CONSTRUCTION MEASURES — *MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES REVISED NOVEMBER 2000*

PAGE 1.2 - 1

MGWC 1.2: PUMP-AROUND PRACTICE

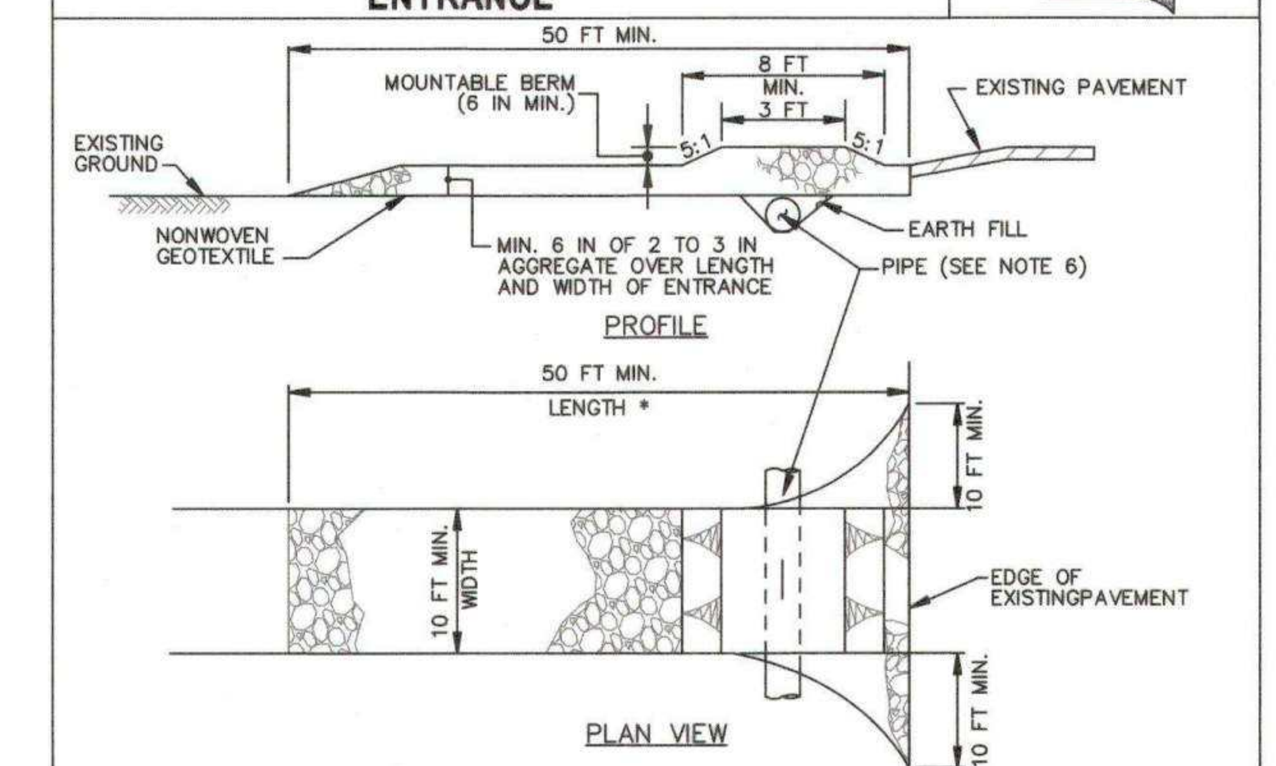
7. Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into the channel below the downstream sandbag dike.
8. Traversing a channel reach with equipment within the work area where no work is proposed should be avoided. If equipment has to traverse such a reach for access to another area, then timber mats or similar measures should be used to minimize disturbance to the channel. Temporary stream crossings should be used only when necessary and only where noted on the plans or specified. (*See Section 4, Stream Crossings, Maryland Guidelines to Waterway Construction*).
9. All stream restoration measures should be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross- sections. All grading must be stabilized at the end of each day with seed and mulch or seed and matting as specified on the plans.
10. After an area is completed and stabilized, the clean water dike should be removed. After the first sediment flush, a new clean water dike should be established upstream from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike should be removed.
11. A pump around must be installed on any tributary or storm drain outfall which contributes baseflow to the work area. This should be accomplished by locating a sandbag dike at the downstream end of the tributary or storm drain outfall and pumping the stream flow around the work area. This water should discharge onto the same velocity dissipater used for the main stem pump around.
12. If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, should follow the same sequence as for the main stem of the river or stream. When construction on the tributary is completed, work on the main stem should resume. Water from the tributary should continue to be pumped around the work area in the main stem.
13. The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.
14. After construction, all disturbed areas should be regraded and revegetated as per the planting plan.

TEMPORARY INSTREAM CONSTRUCTION MEASURES — *MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES REVISED NOVEMBER 2000*

PAGE 1.2 - 2

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

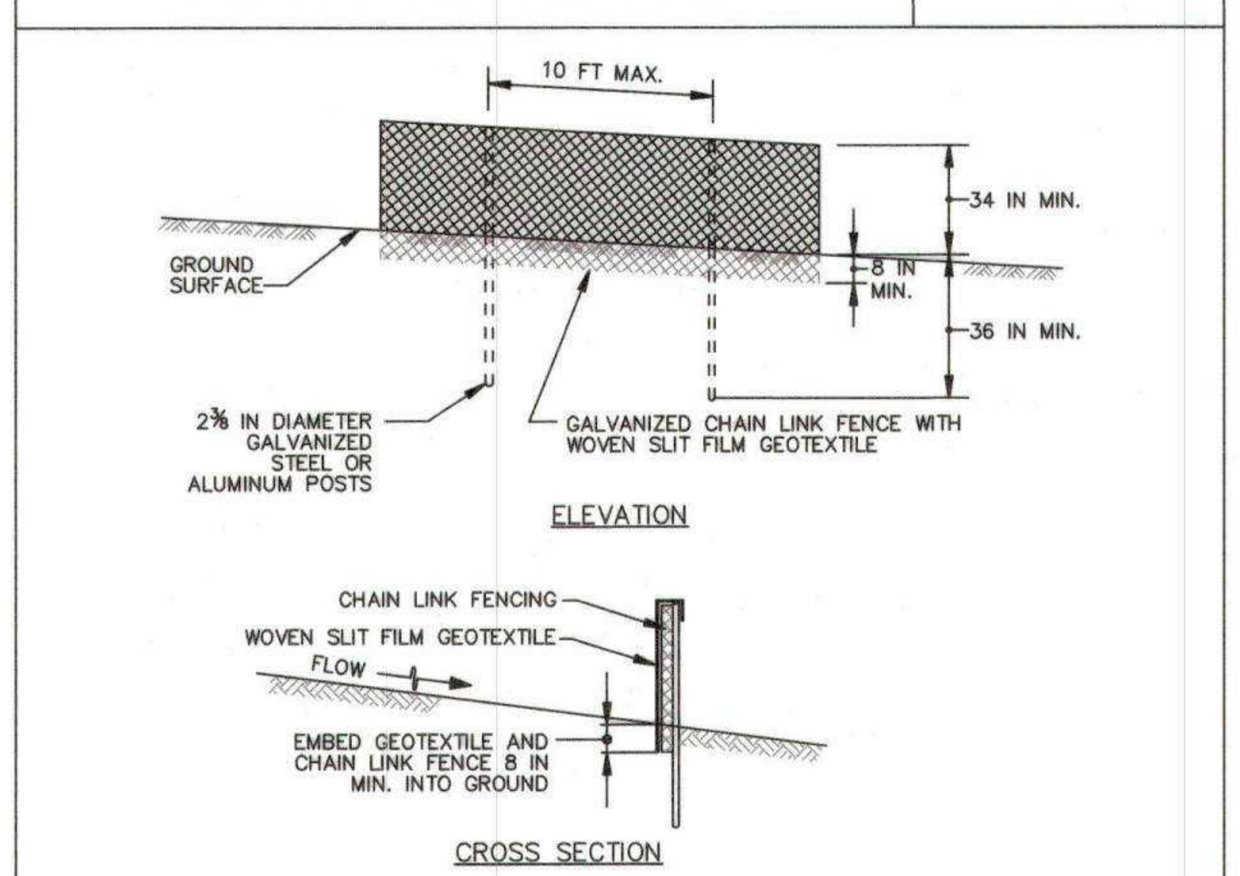
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. 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 BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

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

B.2

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: SSF



CONSTRUCTION SPECIFICATIONS

1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

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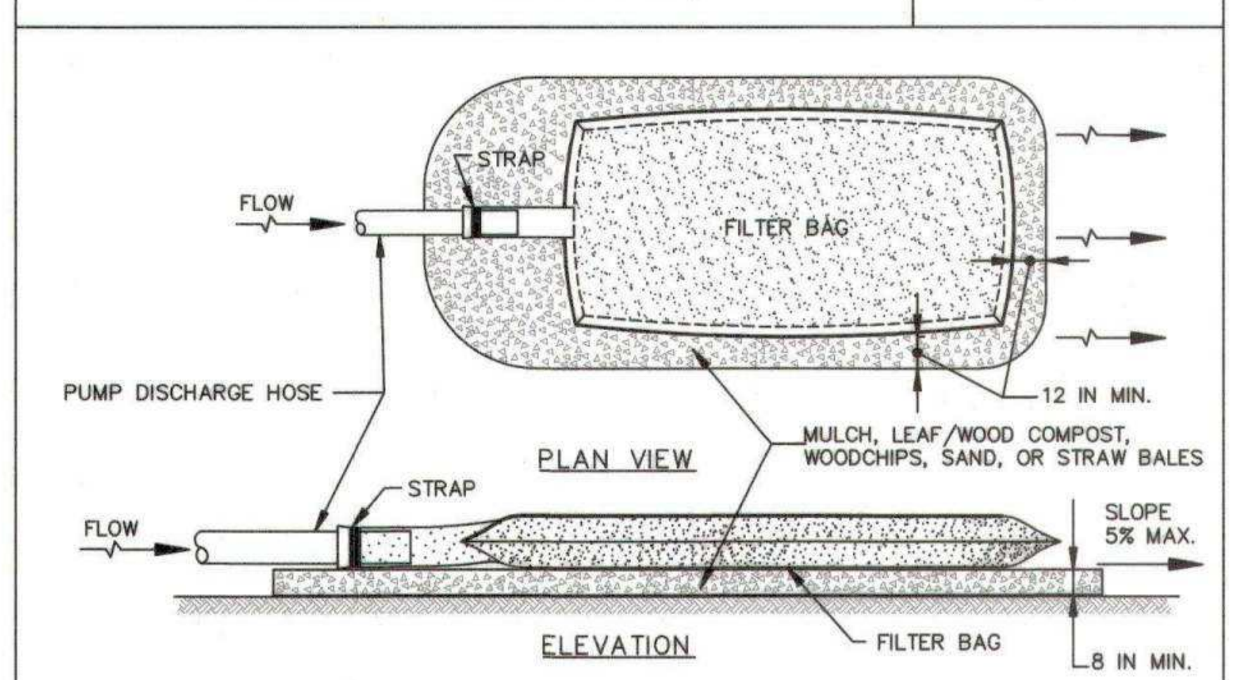
E.7

DETAIL F-4 FILTER BAG

STANDARD SYMBOL: FB



CONSTRUCTION SPECIFICATIONS

1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
2. 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.
3. 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.
4. 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.
5. 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-4833
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

6. 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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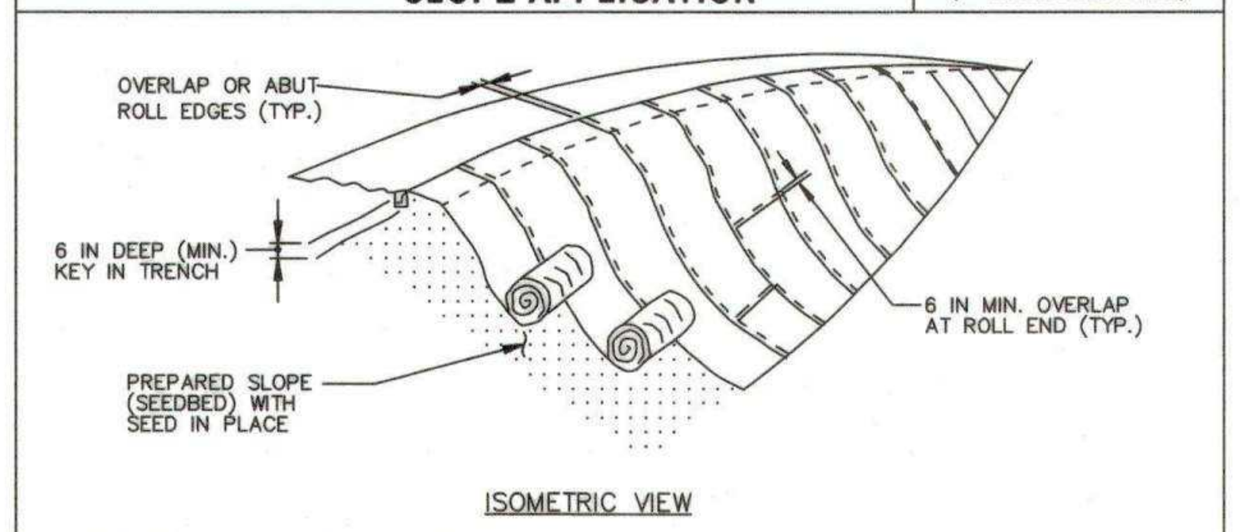
F.9

DETAIL B-4-6-B TEMPORARY SOIL STABILIZATION MATTING SLOPE APPLICATION

STANDARD SYMBOL: TSSMS - * lb/ft^2 (* INCLUDE SHEAR STRESS)



CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS 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.
3. 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 1½ 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, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. 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.
5. UNROLL MATTING DOWNSLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. 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.
7. 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.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. 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		
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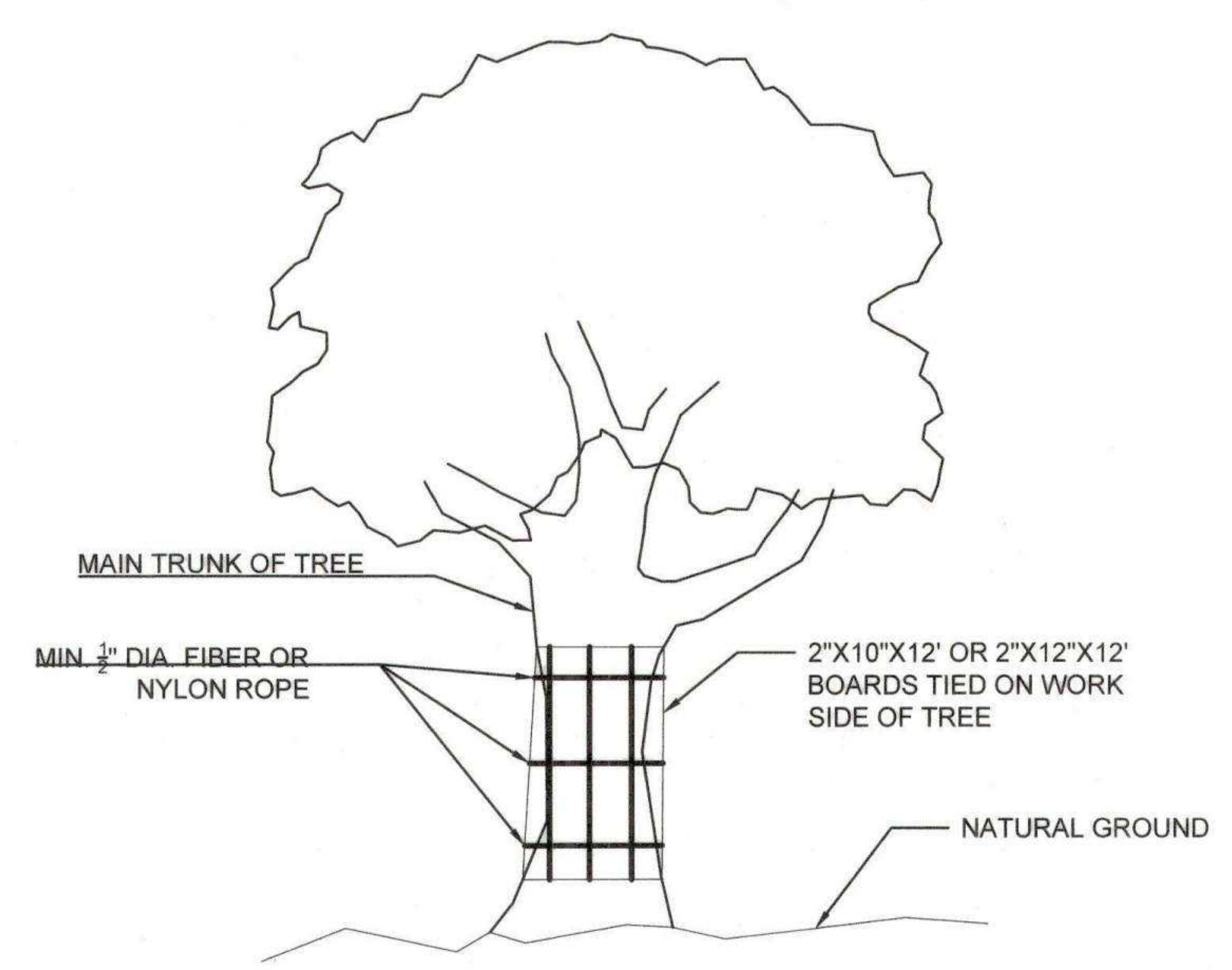
B.39



NOTES:

1. TIE WITH ½" DIAMETER ROPE (FIBER OR NYLON), SUFFICIENT 2"X10"X12' OR 2"X12"X12' BOARDS AROUND MAIN TRUNK OF TREE TO PROTECT ALL AREAS EXPOSED TO CONSTRUCTION.

TREE PROTECTION PLANKING

N.T.S

AS-BUILT

DATE 12/22/2021

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — 4/27/2022 — DATE
CHIEF, BUREAU OF ENGINEERING — 4-18-22 — DATE
CHIEF, BUREAU OF UTILITIES — 4/21/22 — DATE
CHIEF, UTILITY DESIGN DIVISION — 4/14/2022 S.c. — DATE

Stantec

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FAX. 410.583.6704
www.stantec.com

STATE OF MARYLAND — BRETT M SCHREY — NO. 44931 — REGISTERED PROFESSIONAL ENGINEER

DES: AB
DRN: DD
CHK: RP
DATE: 01/2022

BY	NO.	REVISION	DATE

Bonnie Branch Emergency Sewer Protection & Stream Bank Stabilization at MH 124

EROSION CONTROL DETAILS

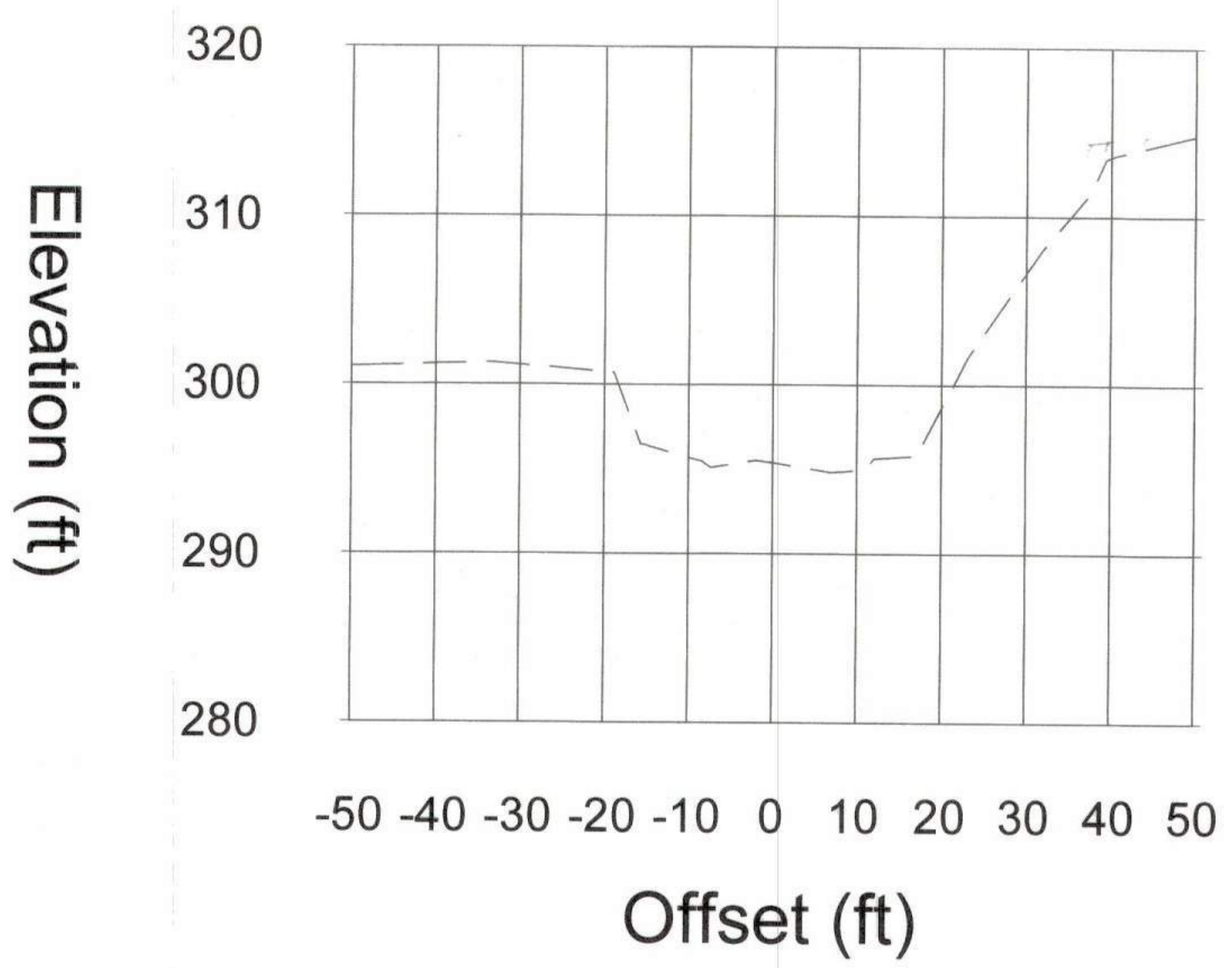
EN-03

600 SCALE MAP NO. 31 — BLOCK NO. 4

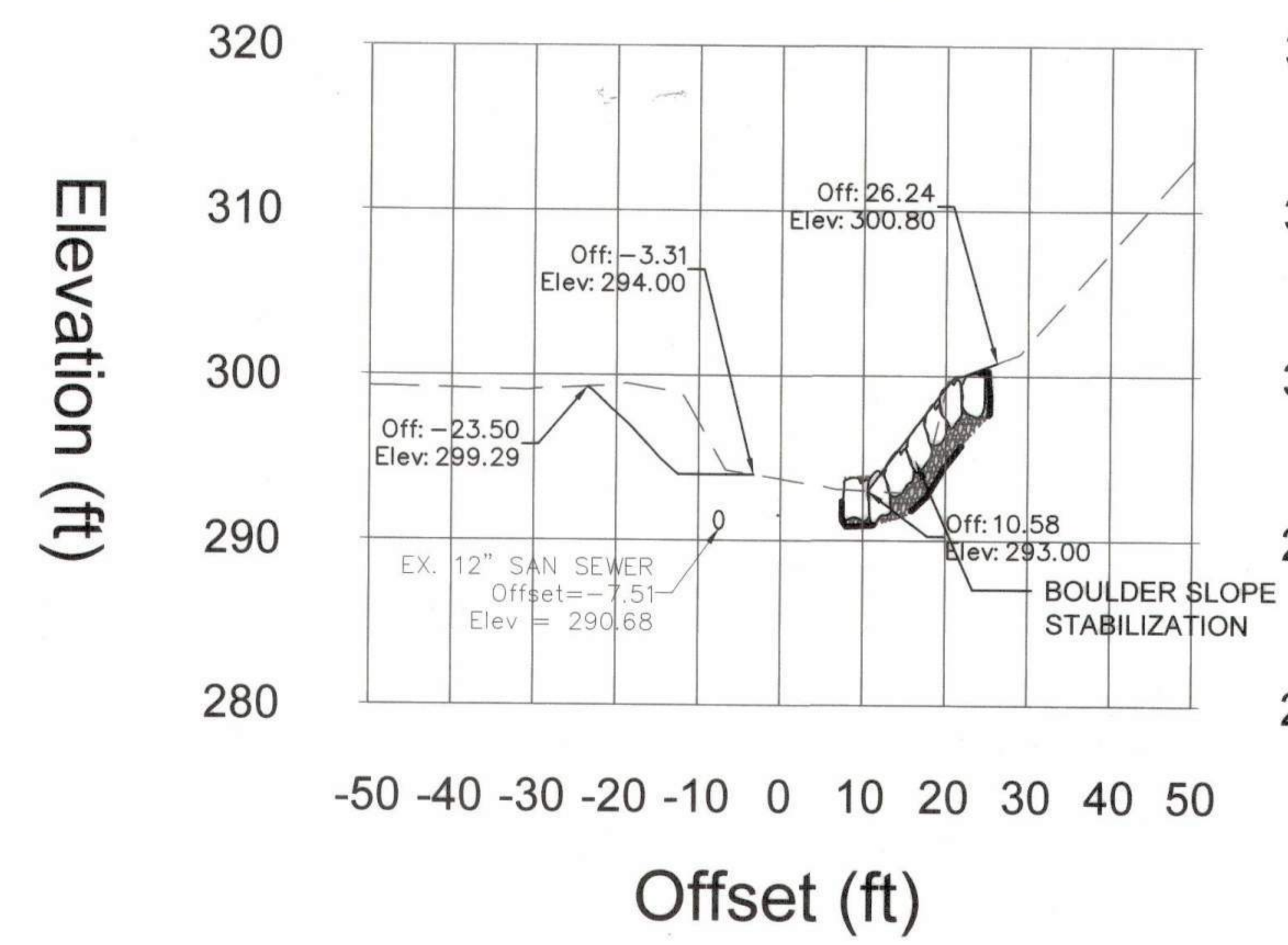
BONNIE BRANCH INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

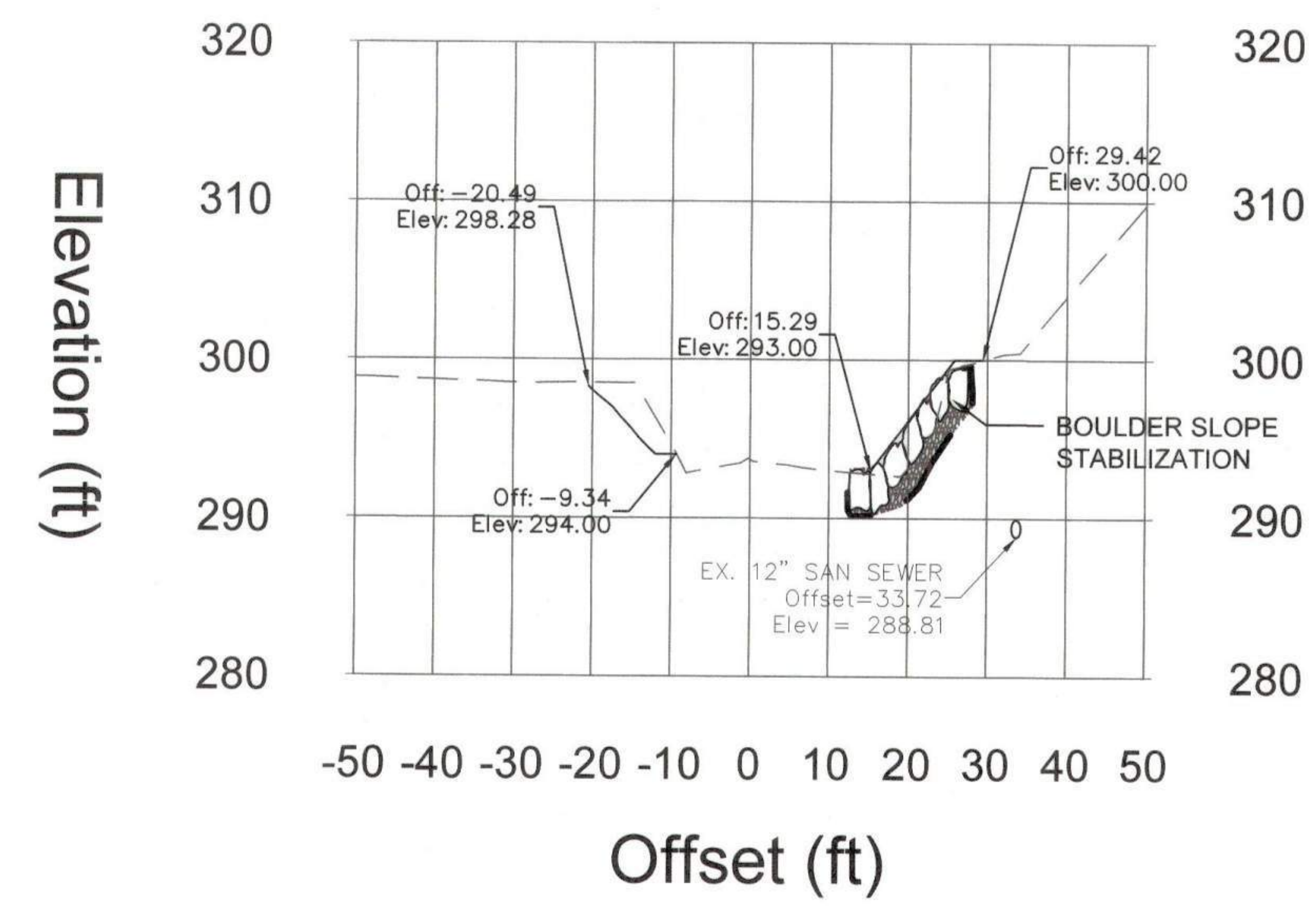
1+13.86



1+91.10



2+55.30



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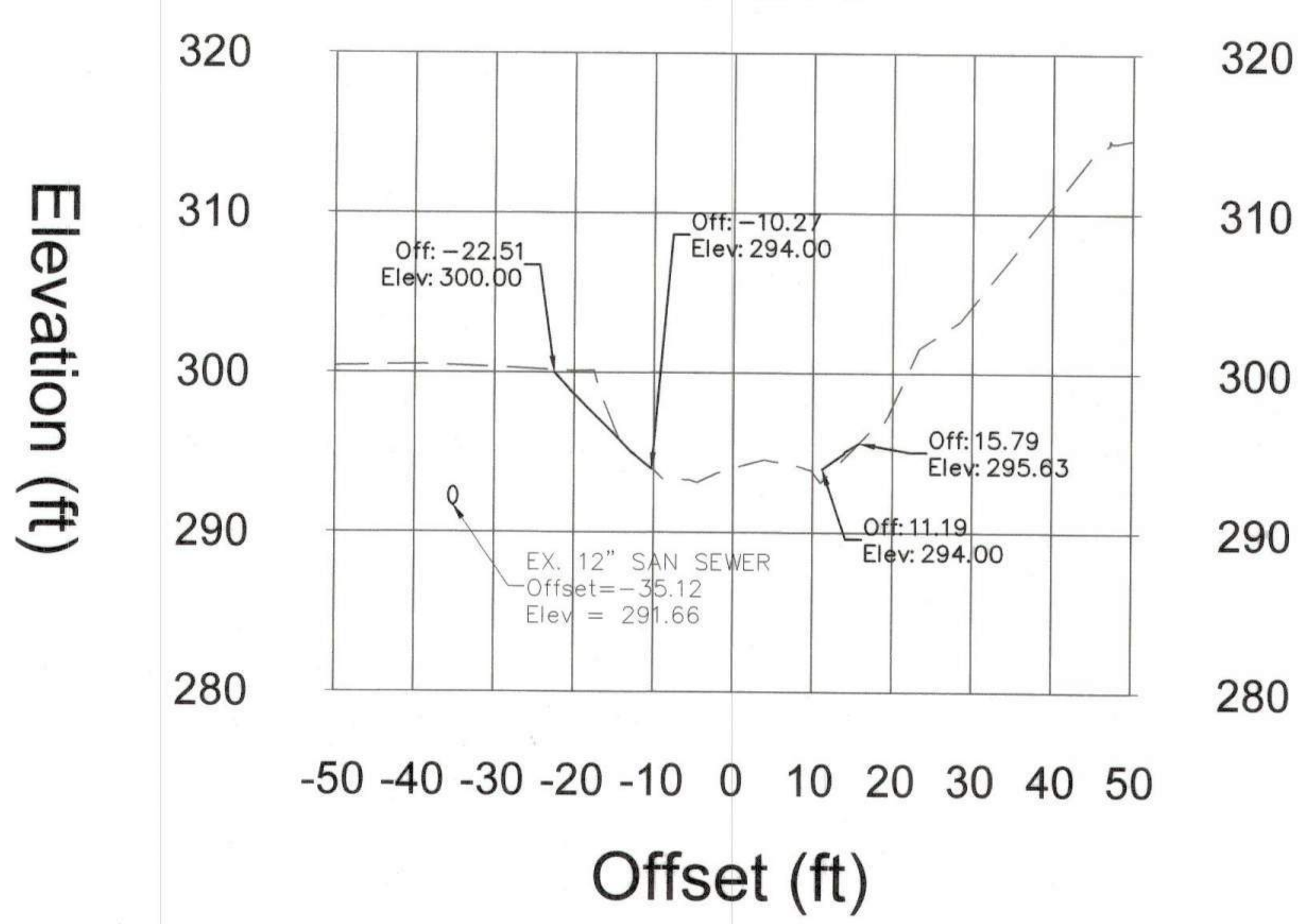

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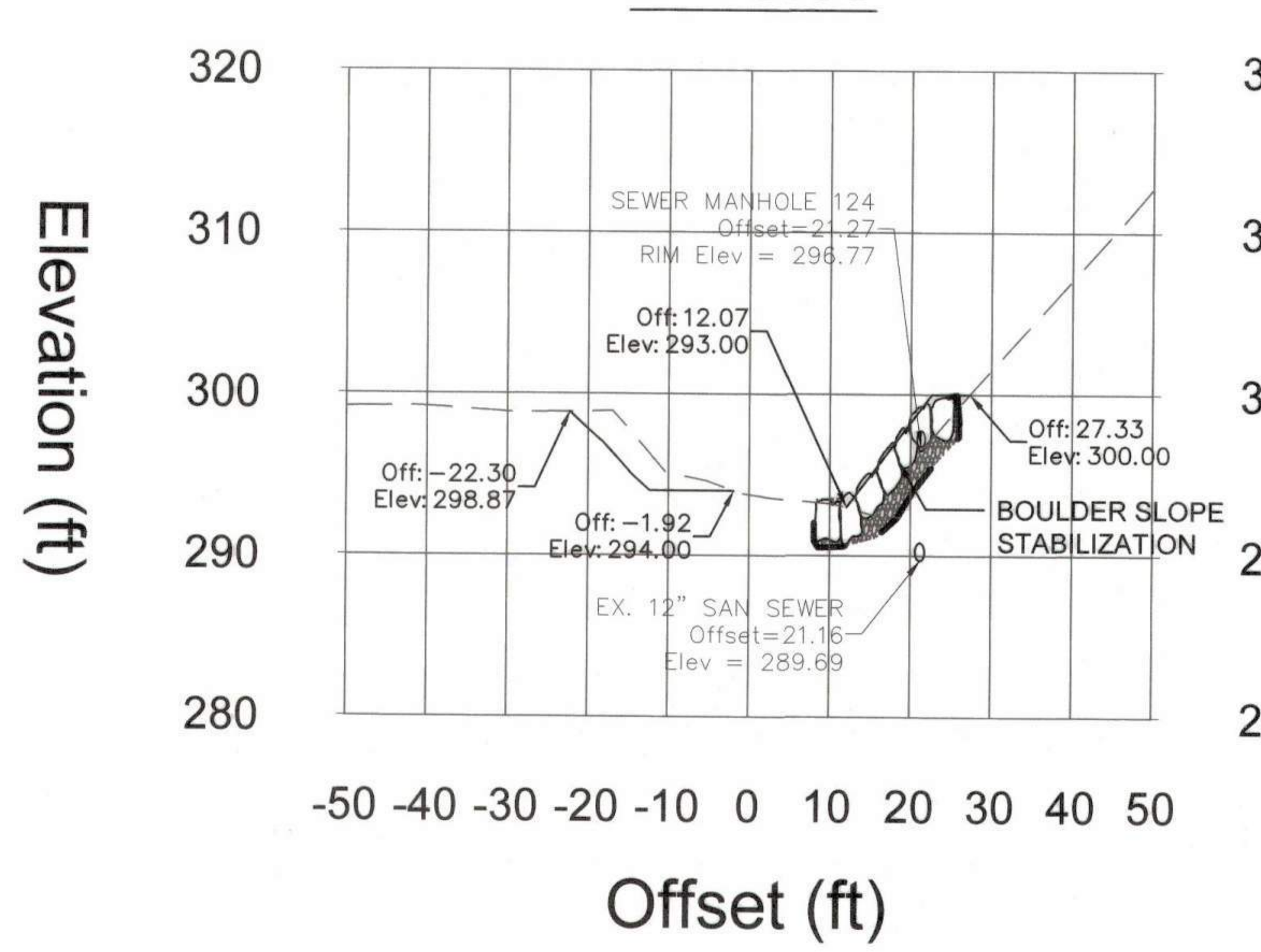
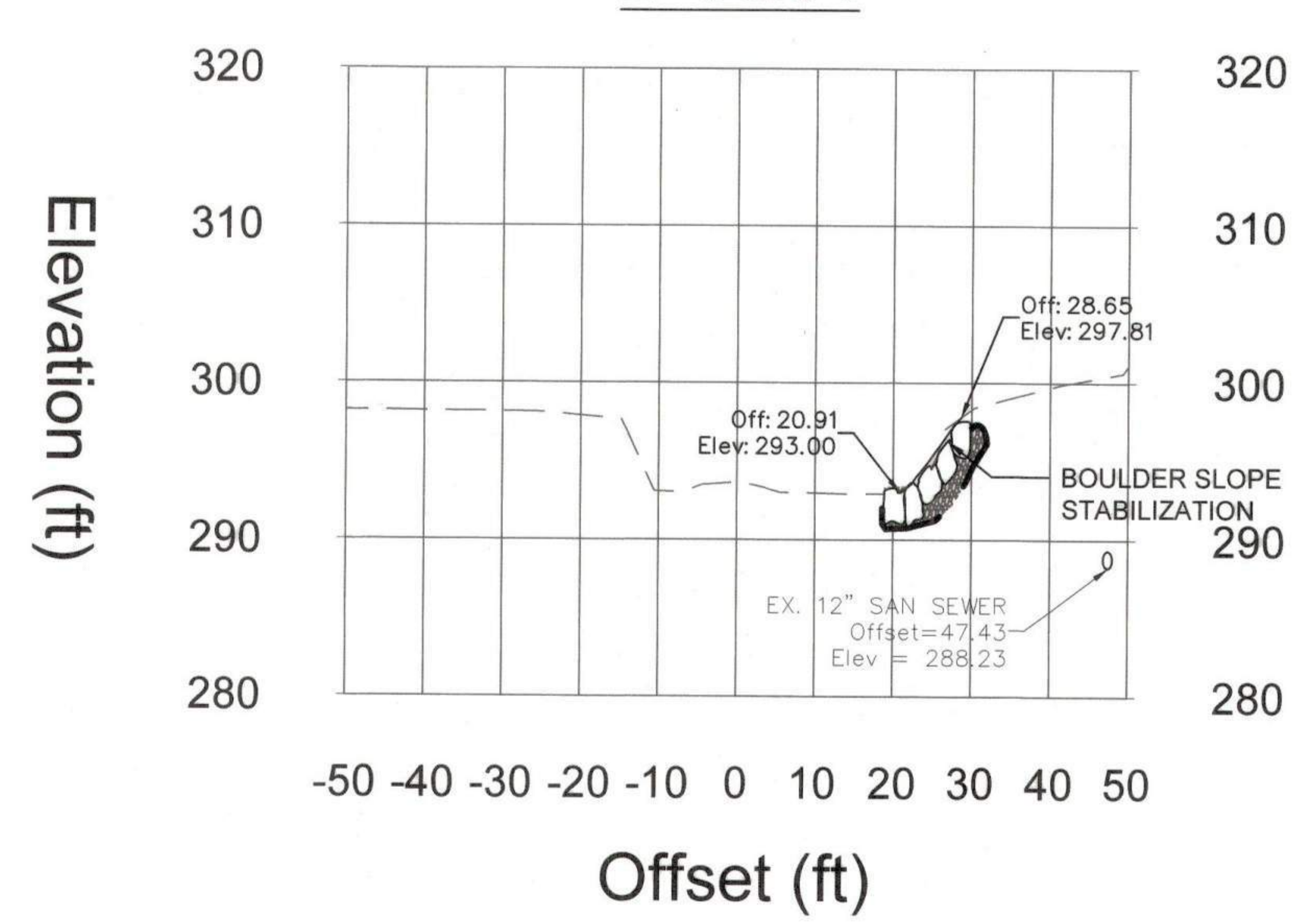


2+98.84



LEGEND

- △ EXISTING TRAVERSE POINT
- — — — EXISTING GRADE
- ——— PROPOSED GRADE
- 0 APPROXIMATE LOCATION OF SANITARY SEWER
- APPROXIMATE PLACEMENT OF BOULDER SLOPE STABILIZATION

NOTE:
STONE GRAPHICALLY DEPICTED IS FOR INFORMATIONAL PURPOSES ONLY. SEE PLAN VIEW, DETAILS AND SPECIFICATIONS FOR MORE DETAIL.

AS-BUILT
DATE 12/22/2021

HORIZONTAL SCALE 1"=20' (0 10' 20' 40')
VERTICAL SCALE 1"=10' (0 5' 10' 20')

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS	4/27/2022 DATE	CHIEF, BUREAU OF ENGINEERING	4-18-22 DATE
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DATE: 01/2022

BY	NO.	REVISION	DATE

Bonnie Branch Emergency Sewer Protection & Stream Bank Stabilization at MH 124
CROSS SECTIONS
XS-01

600 SCALE MAP NO. 31 BLOCK NO. 4

BONNIE BRANCH INTERCEPTOR SEWER IMPROVEMENTS
CONTRACT NO. 10-5034
2ND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN