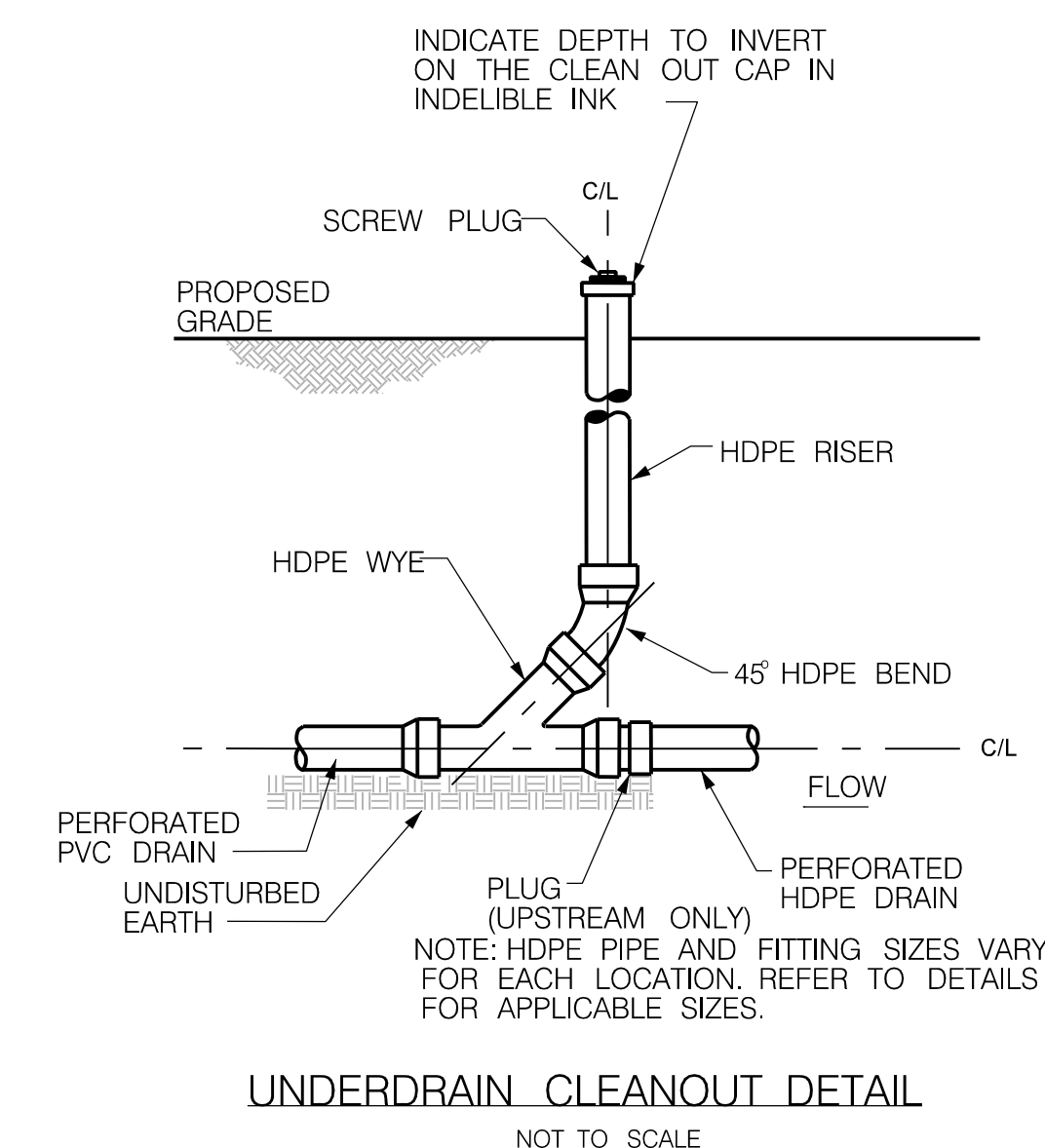


- ESD-8-1 NOTES:**
- BIOSWALE WITH TEMPORARY SOIL STABILIZATION MATTING (TYPE D)
  - SLOPE = 0.5%
  - Q10= 4.98 CFS
  - V10= 0.56 F/S
  - WATER DEPTH= 11.8 IN.
  - STARTS FROM STATION 90+88, 8.50' RT TO STA 96+90, 9.80' RT

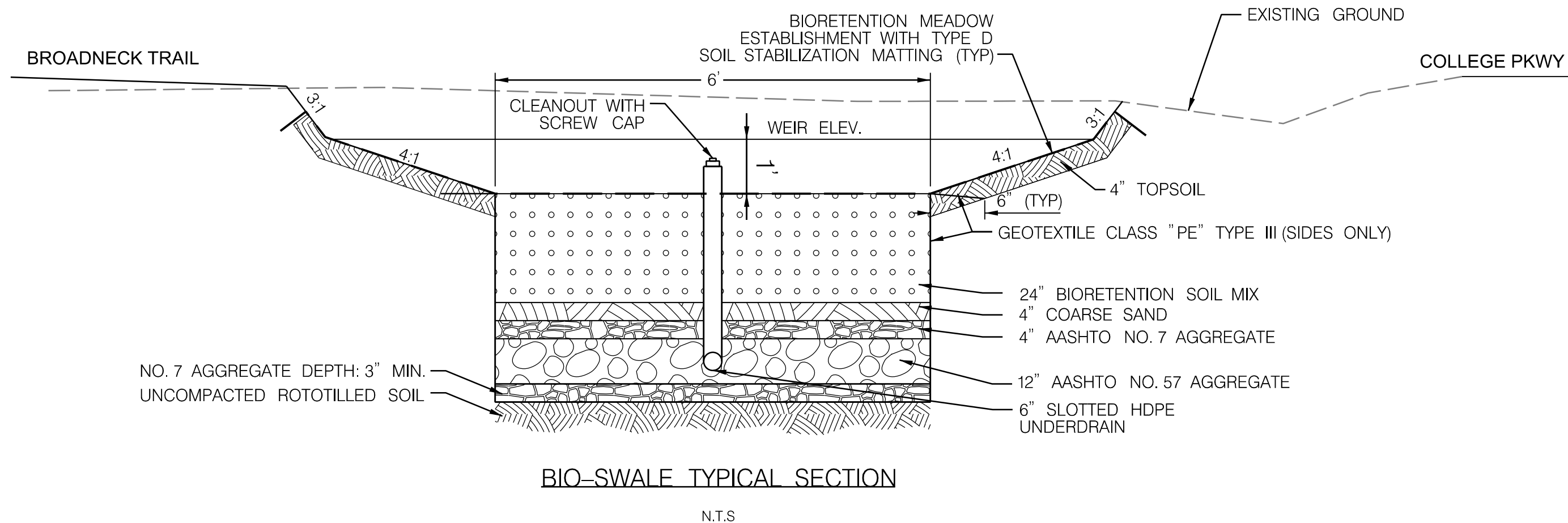
NOTE: ANNE ARUNDEL COUNTY TO OWN, OPERATE AND MAINTAIN ESD 8-1

**BIOSWALE ESD 8-1 PROFILE**

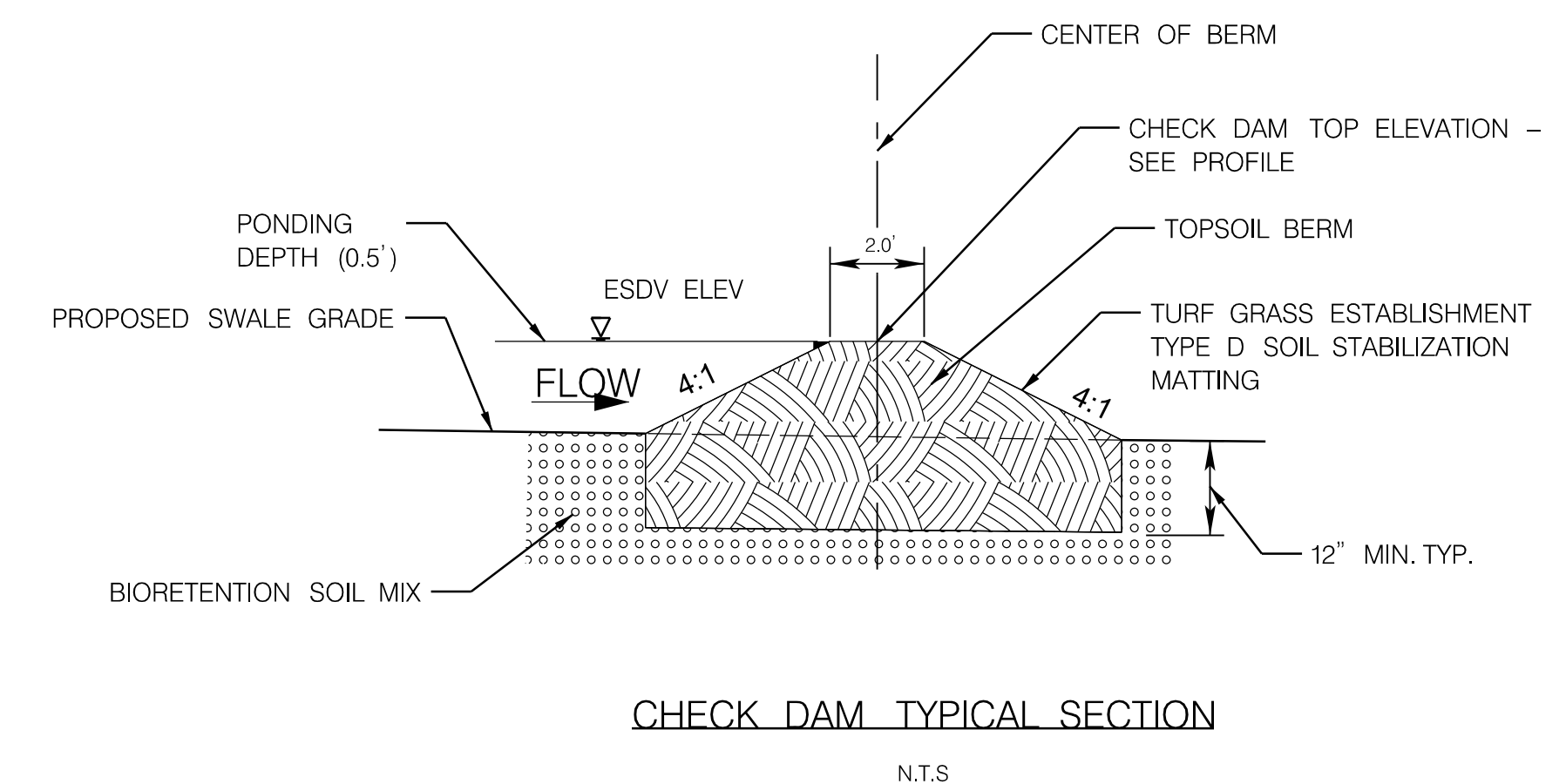
HORIZ. SCALE 1" = 30'  
VERT. SCALE 1" = 3'



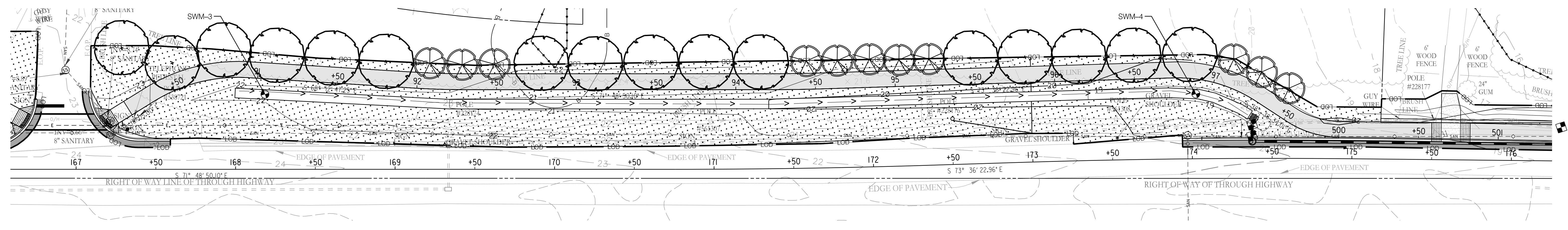
**UNDERDRAIN CLEANOUT DETAIL**  
NOT TO SCALE



**BIO-SWALE TYPICAL SECTION**  
N.T.S.



**CHECK DAM TYPICAL SECTION**  
N.T.S.



**BIOSWALE ESD 8-1 - LANDSCAPE PLAN**  
SCALE 1" = 30'

BORING LOCATIONS			
NO.	NORTHING	EASTING	ELEVATION
SWM-3	494,480.83	1,475,749.93	22.45
SWM-4	494,298.87	1,476,304.48	20.15

NOTE: SEE SWD-02 FOR BORING LOGS



AECOM  
4 NORTH PARK DRIVE  
SUITE 300  
HUNT VALLEY, MARYLAND 21030  
PHONE: 410-785-7220  
FAX: 410-785-6818

PROFESSIONAL CERTIFICATION  
"I 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."  
MD LICENSE NUMBER: S3587  
EXPIRATION DATE: 12-09-2024



06/08/2023

REVISIONS			
NO.	DESCRIPTION	BY	DATE

ANNE ARUNDEL COUNTY			
DEPARTMENT OF PUBLIC WORKS			
APPROVED	DATE	APPROVED	DATE
<i>[Signature]</i>	11/20/2023   08:59 EST	<i>[Signature]</i>	11/17/2023   08:00 EST
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
<i>[Signature]</i>	11/17/2023   11:56 EST	<i>[Signature]</i>	11/17/2023   18:30 EST
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY	
SCALE: AS NOTED		DRAWN BY: DMT	
CHECKED BY: DMT		SHEET NO. 59 OF 116	
PROJECT NO. P504100		CONTRACT NO. P504105	
<b>STORMWATER MANAGEMENT PLAN</b>			

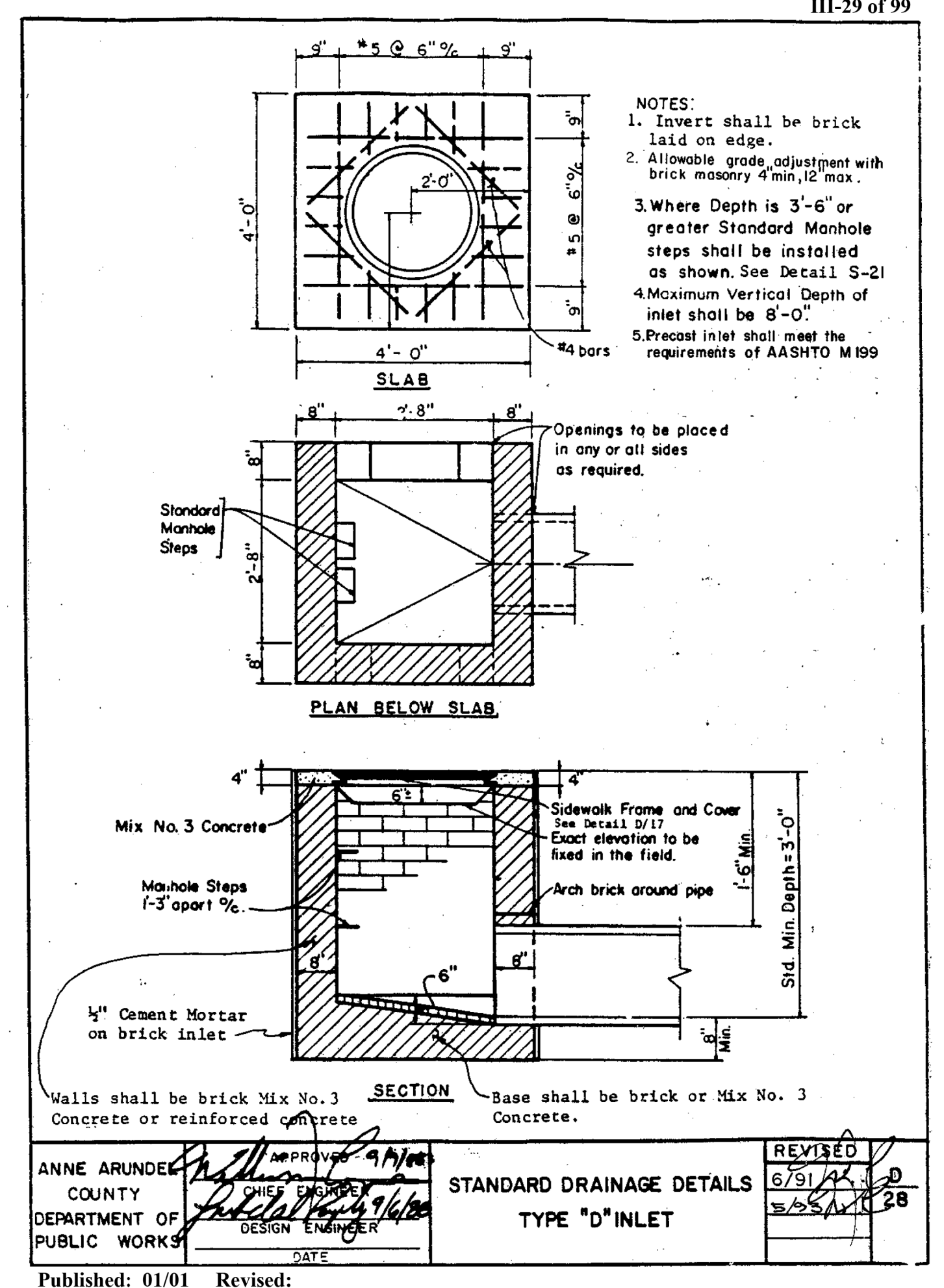
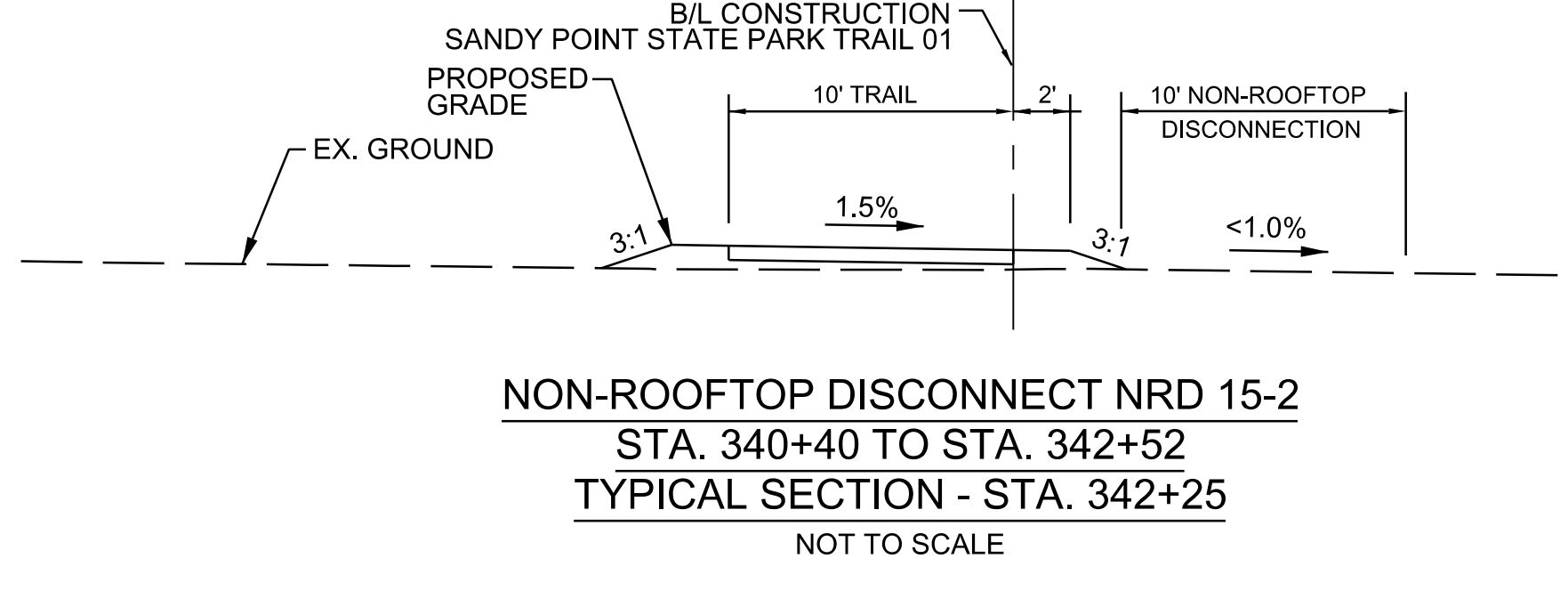
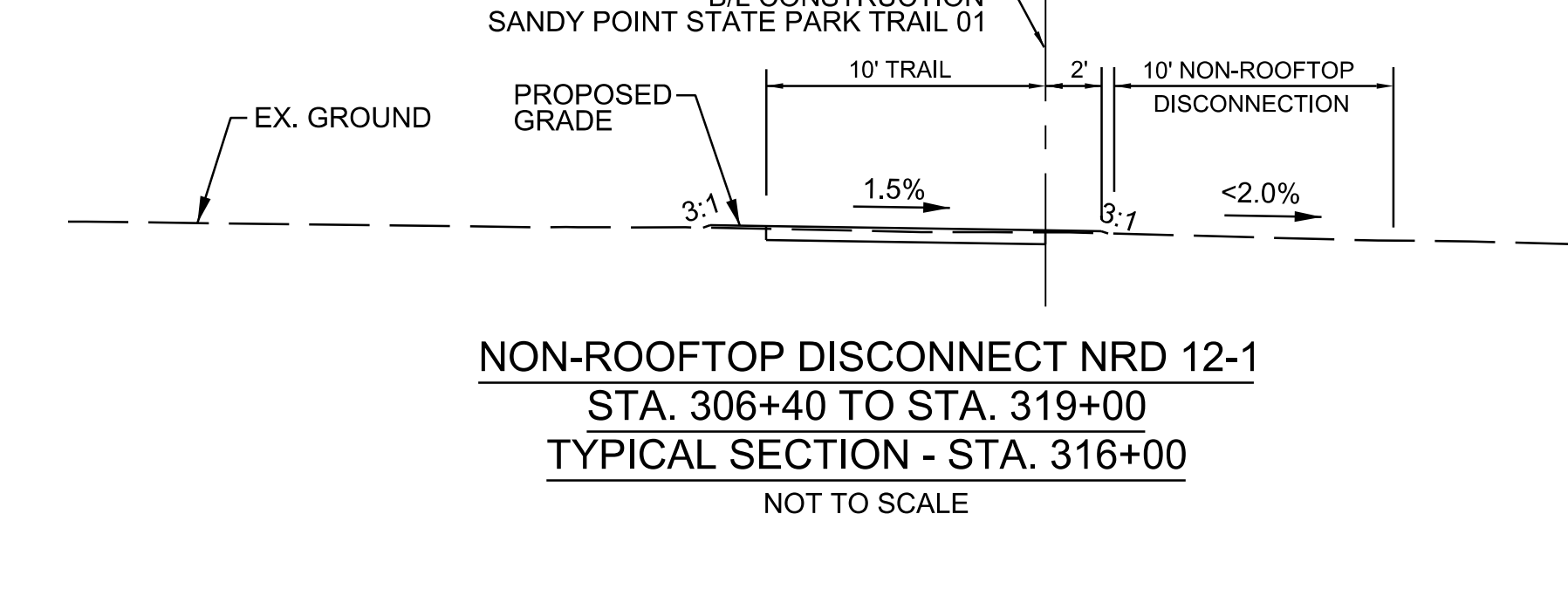
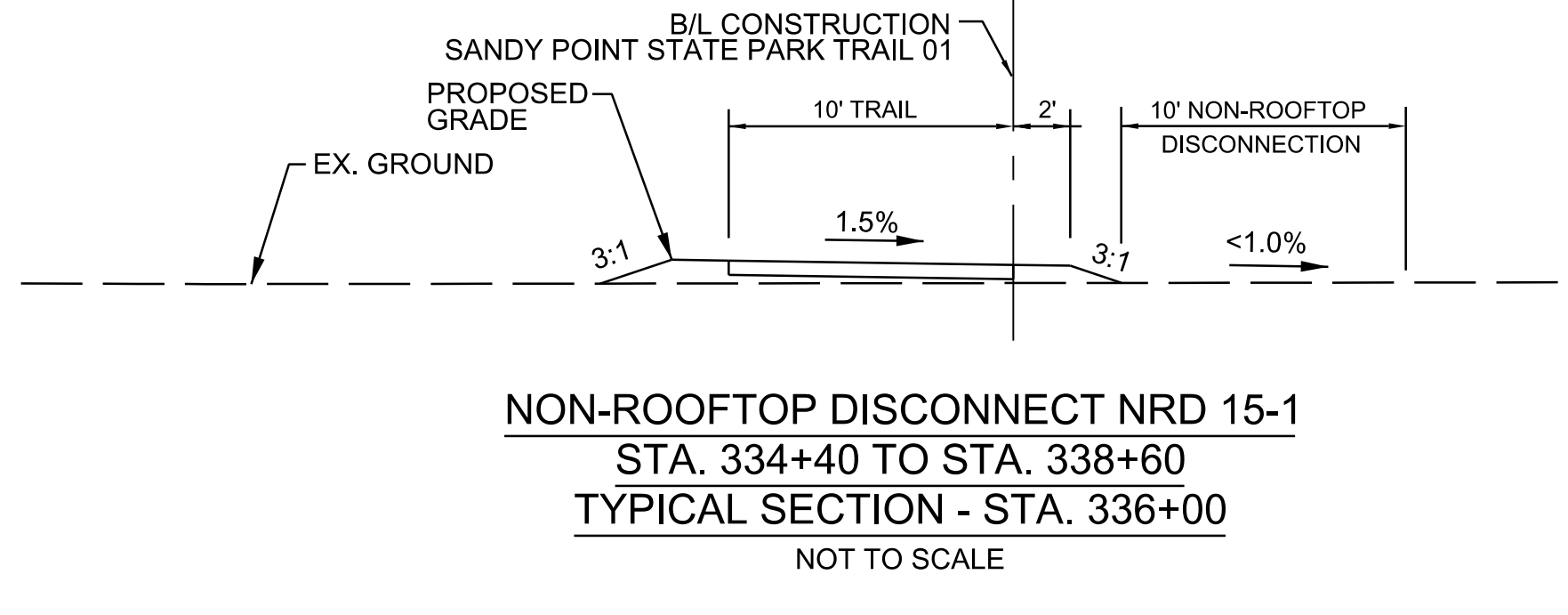
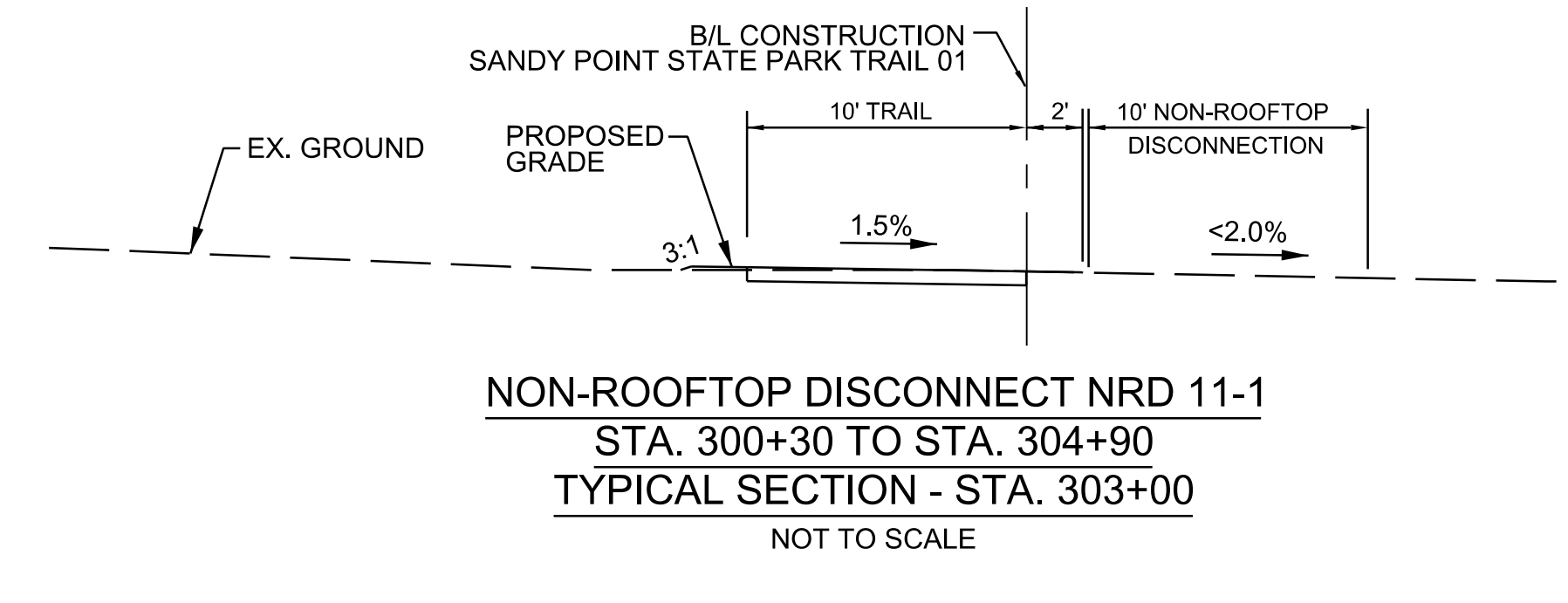
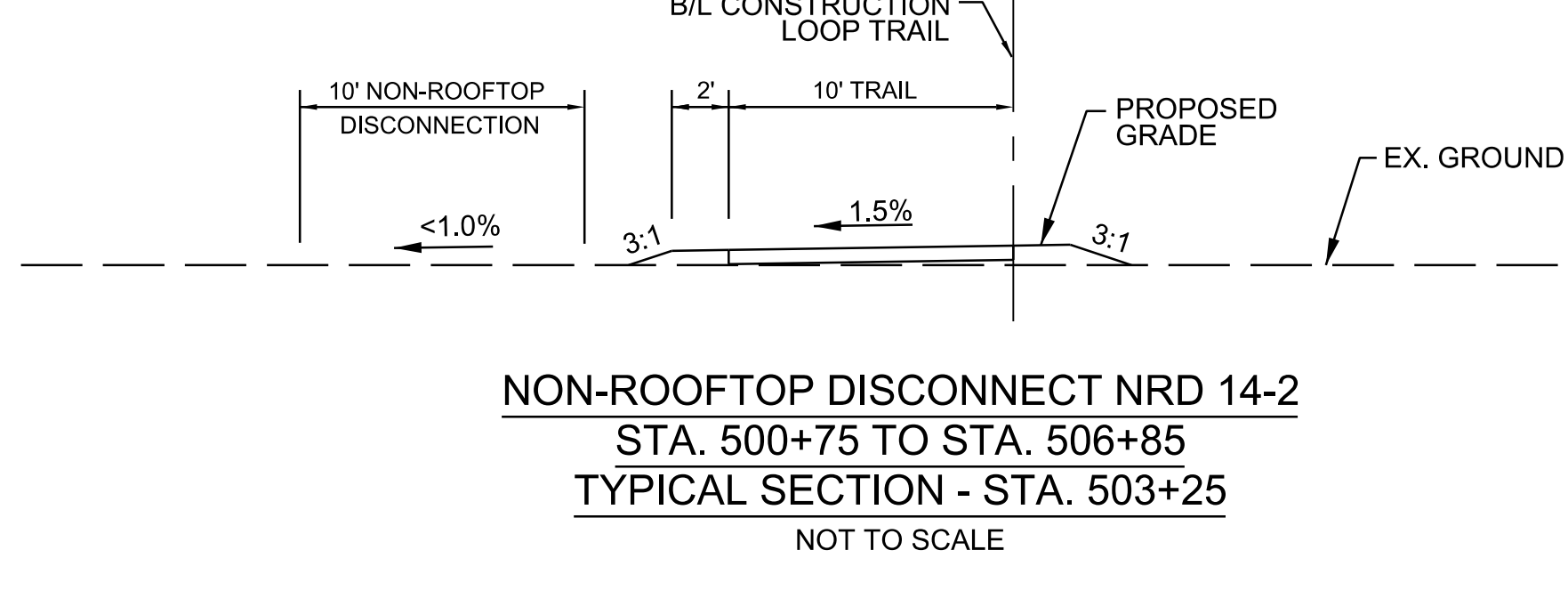
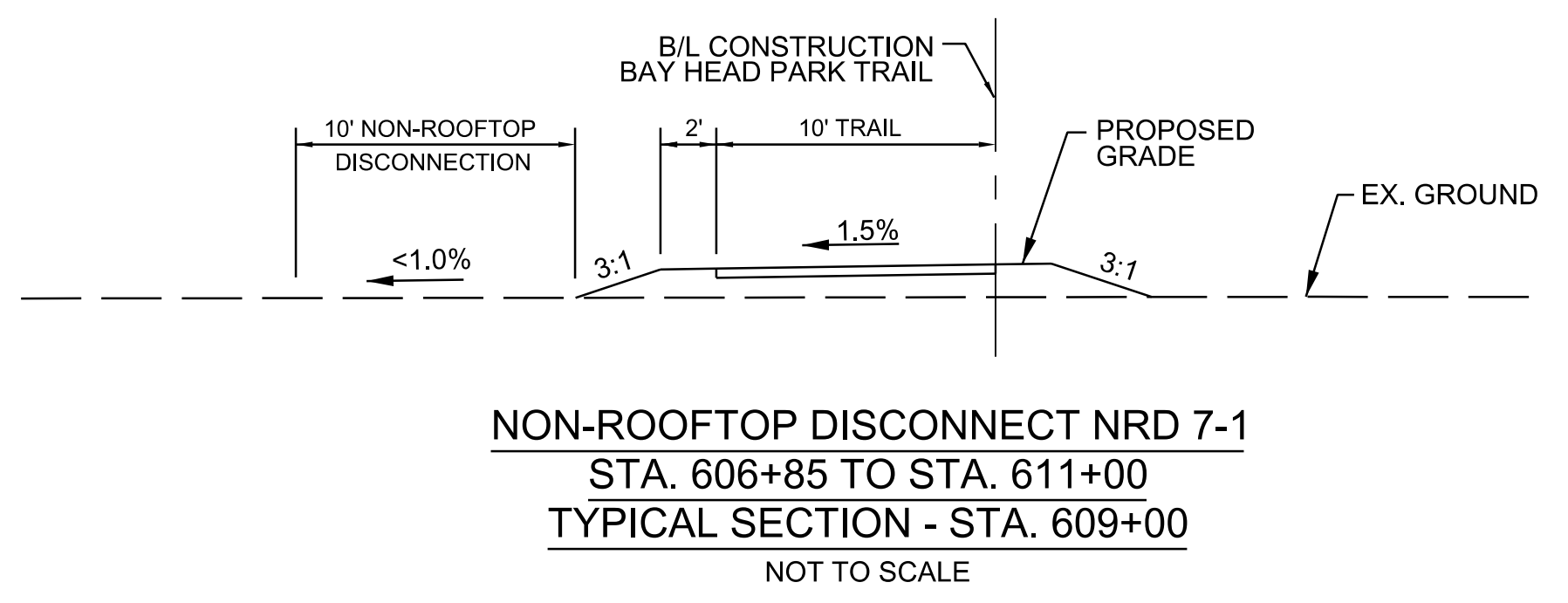
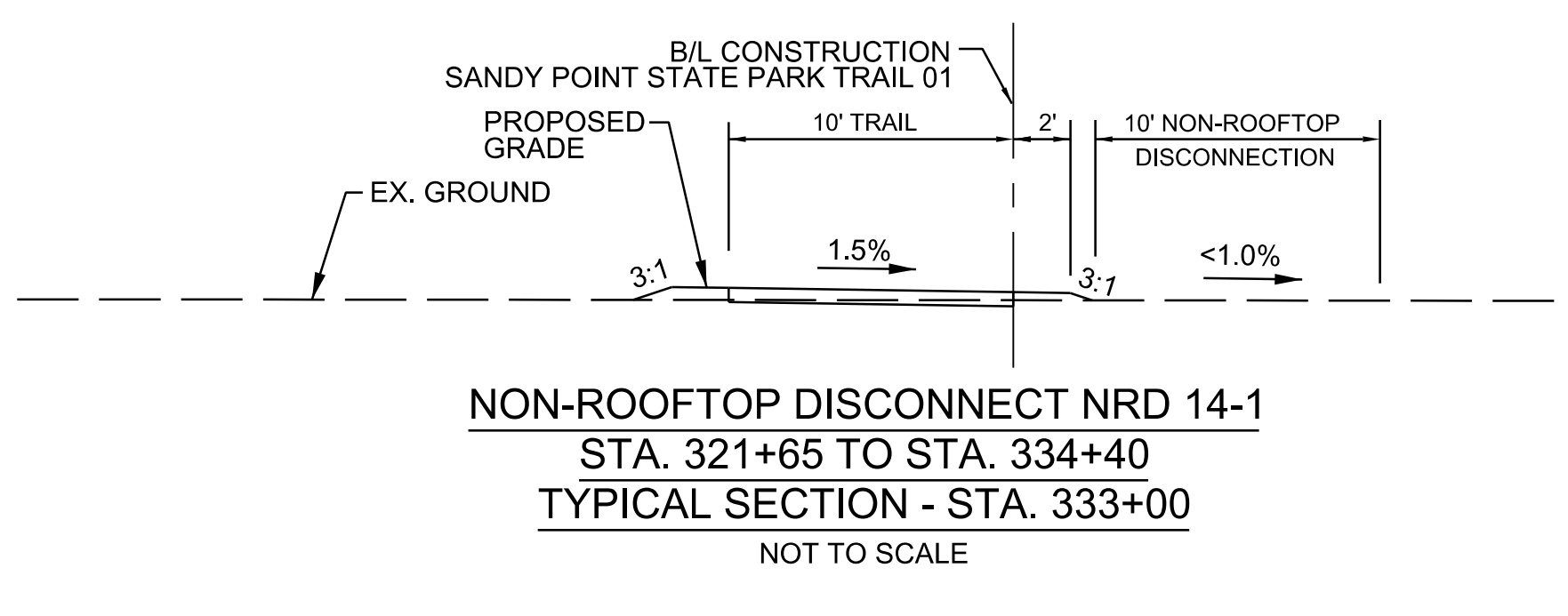
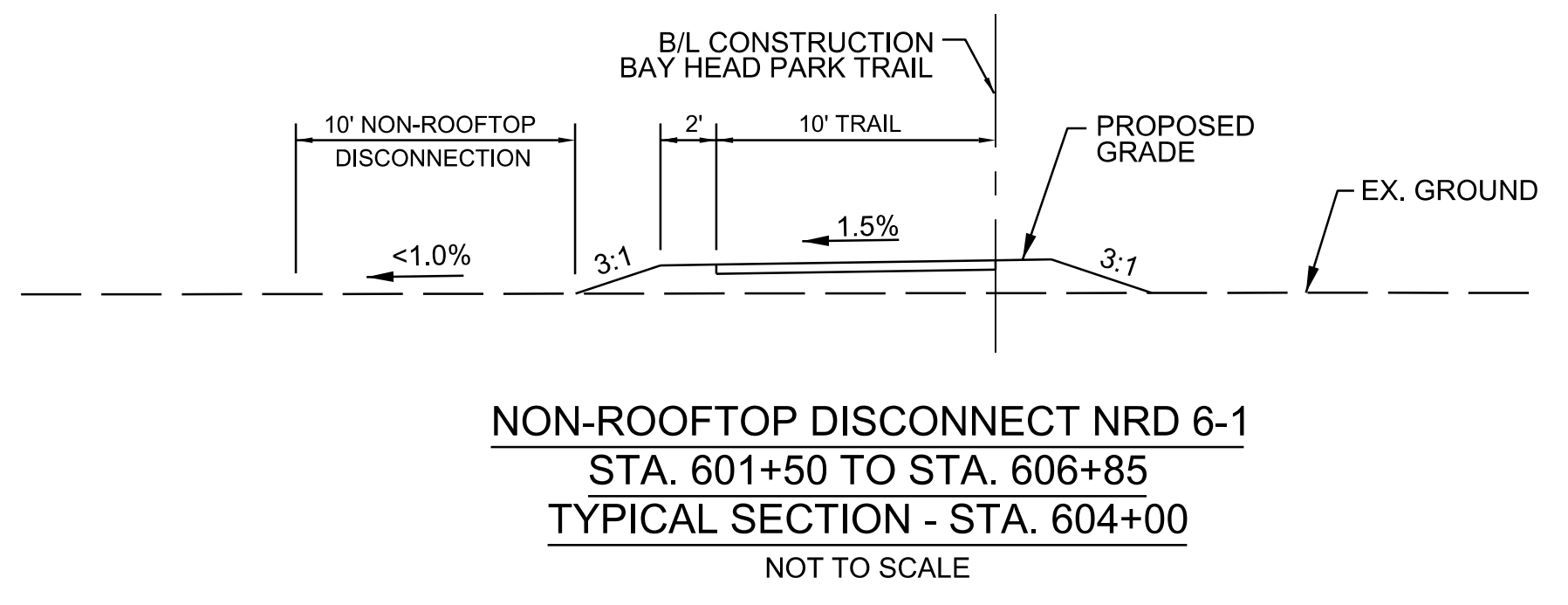


GP# G02018957

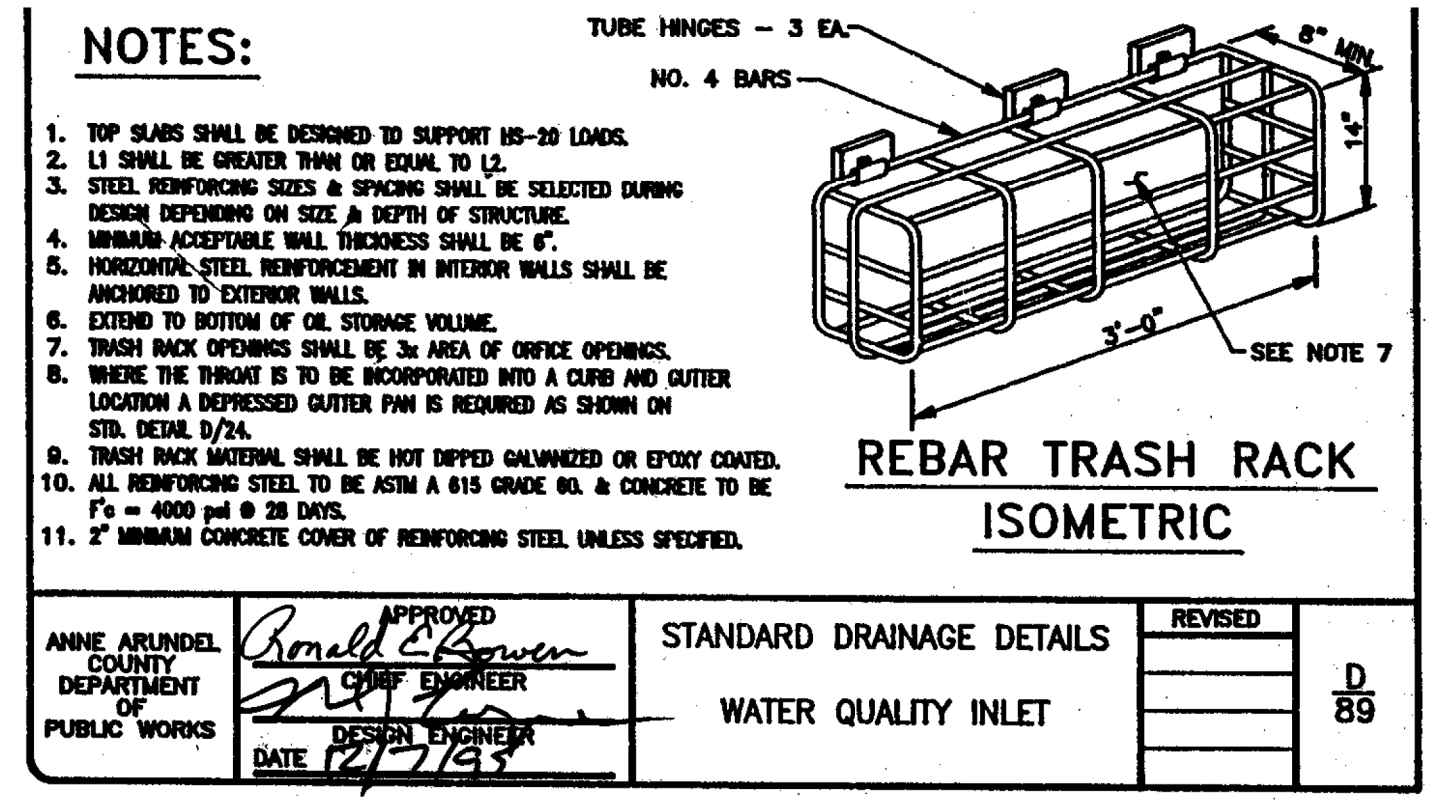
DWG. NO.: SW-07

BROADNECK PENINSULA TRAIL PHASE IB & V



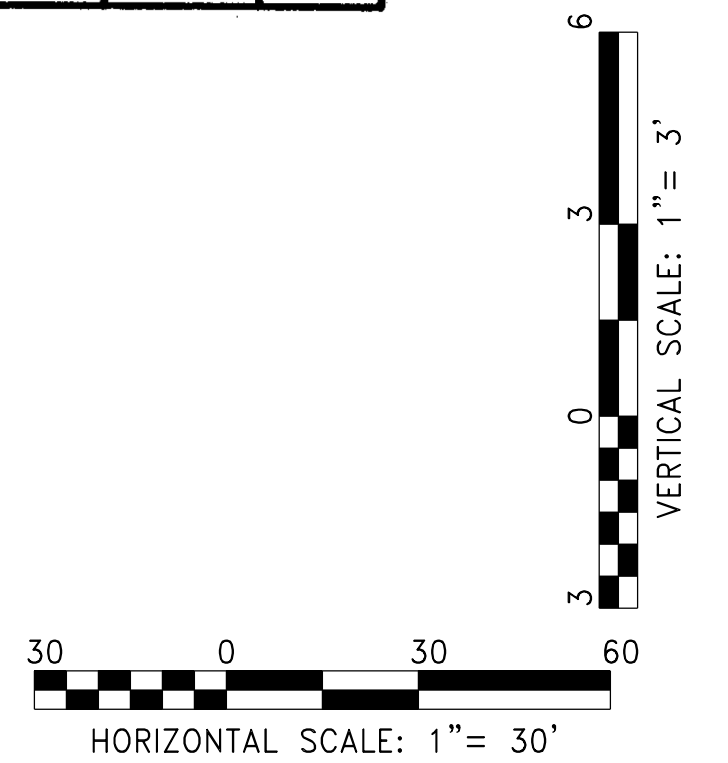


NOTE: TRASH RACK FROM AA COUNTY WATER QUALITY INLET (AAO STD. D89) TO BE ADAPTED ON OPENING OF TYPE D INLET. SHOP DRAWING OF TRASH RACK AND INLET SHALL BE SUBMITTED FOR APPROVAL BY ENGINEER.



**NON-ROOFTOP DISCONNECT NOTES:**

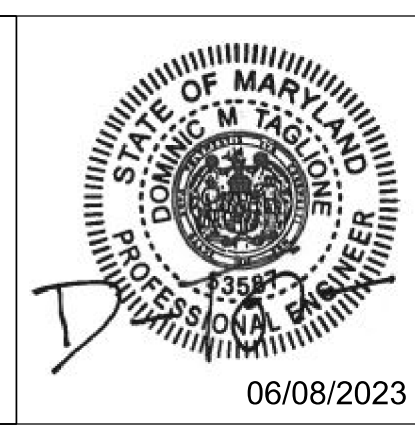
- ALL NON-ROOFTOP DISCONNECTIONS ARE FOR AREAS OF THE PROPOSED TRAIL THROUGH HIGHLY WOODED AND VEGETATIVE AREAS.
- IN ORDER TO KEEP THE INTENT OF STORMWATER MANAGEMENT, NO ADDITIONAL TREE CLEARING WILL BE PERFORMED FOR IMPLEMENTATION OF MICRO-SCALE OR STRUCTURAL PRACTICES IN THE STATION LIMITS OF NON-ROOFTOP DISCONNECTIONS.
- THE AREAS RECEIVING NON-ROOFTOP DISCONNECT AS SHOWN IN THE TYPICAL SECTIONS ABOVE SHALL REMAIN UNDISTURBED. NO SLOPES >5% ARE ANTICIPATED WITHIN THE DISCONNECTION ZONES OFF OF THE PROPOSED TRAIL.
- AREAS RECEIVING DISCONNECTED RUNOFF SHALL MINIMIZE DISTURBANCE AND COMPACTION. CONSTRUCTION VEHICLES AND EQUIPMENT SHALL AVOID THESE AREAS.
- SHOULD AREAS RECEIVING DISCONNECTED RUNOFF BECOME COMPACTED, SCARIFYING THE SURFACE OR ROTOTILING THE SOIL TO A DEPTH OF FOUR INCHES SHALL BE PERFORMED TO ENSURE PERMEABILITY AND DONE AT THE CONTRACTOR'S EXPENSE.
- FINAL INSPECTION SHALL BE CONDUCTED AT THE END OF CONSTRUCTION TO ENSURE THAT ADEQUATE TREATMENT AREAS AND PERMANENT STABILIZATION HAS BEEN ESTABLISHED.
- AREAS RECEIVING DISCONNECTED RUNOFF SHALL BE PROTECTED FROM FUTURE COMPACTION.



GP# G02018957 DWG. NO.: SW-08

**AECOM**  
 AECOM  
 4 NORTH PARK DRIVE  
 SUITE 300  
 HUNT VALLEY, MARYLAND 21030  
 PHONE: 410-785-7220  
 FAX: 410-785-6818

PROFESSIONAL CERTIFICATION  
 I 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.  
 MD LICENSE NUMBER: 53587  
 EXPIRATION DATE: 12-09-2024



REVISIONS			
NO.	DESCRIPTION	BY	DATE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS			
APPROVED	DATE	APPROVED	DATE
<i>Donald G. Brown</i>	11/20/2023   08:59 EST	<i>John C. Davis</i>	11/17/2023   08:00 EST
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
<i>Donald G. Brown</i>	11/17/2023   11:56 EST	<i>John C. Davis</i>	11/17/2023   18:30 EST
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY	
SCALE: AS NOTED		DRAWN BY: DMT	
CHECKED BY: DMT		SHEET NO. 80 OF 116	
PROJECT NO. P504100		CONTRACT NO. P504105	
<b>STORMWATER MANAGEMENT PLAN</b>			



### GRASS SWALE ESD-1-1

SWM FACILITY AS-BUILT CERTIFICATION DATA TABLE FOR M-8 GRASS SWALES

MAY ONLY BE CERTIFIED BY THE AS-BUILT ENGINEER (ABE) PER COMAR 26.17.02.10.

Table with 3 columns: SWM FACILITY NUMBER (TBA), MDE/PRD NUMBER (N/A), SHA CONTRACT NUMBER TRACKING NO. 20APAA014XX. Includes activity log for excavation, installation, and final grading.

Table with 4 columns: FEATURE, DESIGN, AS-BUILT, DIFFERENCE. Lists features like bottom width, total length, channel slope, and dam heights.

ONLY COMPLETE THE PORTION BELOW WHEN TOLERANCES ARE NOT MET. ALSO PROVIDE COMPUTATIONS AND SWM REPORT REVISIONS.

Table with 4 columns: FEATURE, DESIGN, AS-BUILT, DIFFERENCE. Lists design parameters like water surface elevation, flow depth, and velocity.

SWM FACILITY AS-BUILT CERTIFICATION ACCEPTANCE APPROVING AUTHORITY: [ ] MDE [ ] PRD. ACCEPTED BY: [NAME] DATE: [ ]

REVISED 04-10-2018

### GRASS SWALE ESD-1-2

SWM FACILITY AS-BUILT CERTIFICATION DATA TABLE FOR M-8 GRASS SWALES

MAY ONLY BE CERTIFIED BY THE AS-BUILT ENGINEER (ABE) PER COMAR 26.17.02.10.

Table with 3 columns: SWM FACILITY NUMBER (TBA), MDE/PRD NUMBER (N/A), SHA CONTRACT NUMBER TRACKING NO. 20APAA014XX. Includes activity log for excavation, installation, and final grading.

Table with 4 columns: FEATURE, DESIGN, AS-BUILT, DIFFERENCE. Lists features like bottom width, total length, channel slope, and dam heights.

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Table with 4 columns: FEATURE, DESIGN, AS-BUILT, DIFFERENCE. Lists design parameters like water surface elevation, flow depth, and velocity.

SWM FACILITY AS-BUILT CERTIFICATION ACCEPTANCE APPROVING AUTHORITY: [ ] MDE [ ] PRD. ACCEPTED BY: [NAME] DATE: [ ]

REVISED 04-10-2018

### SUBMERGED GRAVEL WETLAND ESD-1-3

SWM FACILITY AS-BUILT CERTIFICATION DATA TABLE FOR M-2 SUBMERGED GRAVEL WETLAND

MAY ONLY BE CERTIFIED BY THE AS-BUILT ENGINEER (ABE) PER COMAR 26.17.02.10.

Table with 3 columns: SWM FACILITY NUMBER (TBA), MDE/PRD NUMBER (N/A), SHA CONTRACT NUMBER TRACKING NO. 20APAA014XX. Includes activity log for excavation, installation, and final grading.

Table with 4 columns: FEATURE, DESIGN, AS-BUILT, DIFFERENCE. Lists features like bottom width, total length, channel slope, and dam heights.

ONLY COMPLETE THE PORTION BELOW WHEN TOLERANCES ARE NOT MET. ALSO PROVIDE COMPUTATIONS AND SWM REPORT REVISIONS.

Table with 4 columns: FEATURE, DESIGN, AS-BUILT, DIFFERENCE. Lists design parameters like water surface elevation, ponding depth, and velocity.

SWM FACILITY AS-BUILT CERTIFICATION ACCEPTANCE APPROVING AUTHORITY: [ ] MDE [ ] PRD. ACCEPTED BY: [NAME] DATE: [ ]

REVISED 04-10-2018

### GRASS SWALE ESD-2-1

SWM FACILITY AS-BUILT CERTIFICATION DATA TABLE FOR M-8 GRASS SWALES

MAY ONLY BE CERTIFIED BY THE AS-BUILT ENGINEER (ABE) PER COMAR 26.17.02.10.

Table with 3 columns: SWM FACILITY NUMBER (TBA), MDE/PRD NUMBER (N/A), SHA CONTRACT NUMBER TRACKING NO. 20APAA014XX. Includes activity log for excavation, installation, and final grading.

Table with 4 columns: FEATURE, DESIGN, AS-BUILT, DIFFERENCE. Lists features like bottom width, total length, channel slope, and dam heights.

ONLY COMPLETE THE PORTION BELOW WHEN TOLERANCES ARE NOT MET. ALSO PROVIDE COMPUTATIONS AND SWM REPORT REVISIONS.

Table with 4 columns: FEATURE, DESIGN, AS-BUILT, DIFFERENCE. Lists design parameters like water surface elevation, flow depth, and velocity.

SWM FACILITY AS-BUILT CERTIFICATION ACCEPTANCE APPROVING AUTHORITY: [ ] MDE [ ] PRD. ACCEPTED BY: [NAME] DATE: [ ]

REVISED 04-10-2018

#### STORMWATER MANAGEMENT AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE STORMWATER MANAGEMENT FACILITY (FACILITIES) SHOWN ON THE PLANS AND INDIVIDUALLY IDENTIFIED BELOW HAS (HAVE) BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS INCLUDED UNDER THE MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVAL, NUMBER [ ] EXCEPT AS NOTED IN GREEN ON THE "AS-BUILT" DRAWINGS. FURTHERMORE, THE GREEN-NOTED EXCEPTIONS DO NOT ADVERSELY AFFECT THE DESIGN AND/OR THE INTENDED PERFORMANCE OF THE FACILITY (FACILITIES).

ESD-1-1 (GRASS SWALE) ESD-1-3 (SUBMERGED GRAVEL WETLAND) ESD-1-2 (GRASS SWALE) ESD-2-1 (GRASS SWALE)

EACH SWM FACILITY IS IDENTIFIED INDIVIDUALLY BY A UNIQUE SWM FACILITY NUMBER

Name (Printed) Signature Maryland Registration Number 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. [ ], EXPIRATION DATE [ ]"

"CERTIFY" MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED ON SUFFICIENT AND APPROPRIATE ONSITE INSPECTIONS AND MATERIAL TESTS CONDUCTED DURING CONSTRUCTION. NOTE: AS-BUILT CHECKLISTS CONTAINED IN THE CONTRACT DRAWINGS SHALL BE COMPLETED BY THE AS-BUILT INSPECTOR AND SUBMITTED TO THE SHA ALONG WITH THIS CERTIFICATION.

NOTE: ANNE ARUNDEL COUNTY TO OWN, OPERATE AND MAINTAIN ESD 1-1, ESD 1-2, ESD 1-3, AND ESD 2-1

AECOM logo and address: 4 NORTH PARK DRIVE, SUITE 300, HUNT VALLEY, MARYLAND 21030. Includes professional certification details and expiration date 06/08/2023.

REVISIONS table with columns: NO., DESCRIPTION, BY, DATE. Includes entries for approved and approved dates.

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS. SCALE: AS NOTED. SHEET NO. 61 OF 116. PROJECT NO. P504100. CONTRACT NO. P504105. BROADNECK PENINSULA TRAIL PHASE IB & V. STORMWATER MANAGEMENT AS-BUILT.

GP# G02018957 DWG. NO.: SW-09



### GRASS SWALE ESD-3-1

SWM FACILITY AS-BUILT CERTIFICATION DATA TABLE FOR M-8 GRASS SWALES

MAY ONLY BE CERTIFIED BY THE AS-BUILT ENGINEER (ABE) PER COMAR 26.17.02.10.

Table with columns: SWM FACILITY NUMBER, MDE/PRD NUMBER, SHA CONTRACT NUMBER, ACTIVITY, SUPPORTING DOCUMENTATION AND INFORMATION, DATE(S) OF INSPECTION.

Table with columns: FEATURE, DESIGN, AS-BUILT, DIFFERENCE. Rows include BOTTOM WIDTH (FT), TOTAL LENGTH (FT), MAXIMUM CHANNEL SLOPE, etc.

ONLY COMPLETE THE PORTION BELOW WHEN TOLERANCES ARE NOT MET. ALSO PROVIDE COMPUTATIONS AND SWM REPORT REVISIONS.

Table with columns: FEATURE, DESIGN, AS-BUILT, DIFFERENCE. Rows include ESDv WATER SURFACE ELEVATION, ESDv FLOW DEPTH, etc.

SWM FACILITY AS-BUILT CERTIFICATION ACCEPTANCE APPROVING AUTHORITY: [ ] MDE [ ] PRD ACCEPTED BY: (NAME) DATE:

REVISED 04-10-2018

### GRASS SWALE ESD-3-2

SWM FACILITY AS-BUILT CERTIFICATION DATA TABLE FOR M-8 GRASS SWALES

MAY ONLY BE CERTIFIED BY THE AS-BUILT ENGINEER (ABE) PER COMAR 26.17.02.10.

Table with columns: SWM FACILITY NUMBER, MDE/PRD NUMBER, SHA CONTRACT NUMBER, ACTIVITY, SUPPORTING DOCUMENTATION AND INFORMATION, DATE(S) OF INSPECTION.

Table with columns: FEATURE, DESIGN, AS-BUILT, DIFFERENCE. Rows include BOTTOM WIDTH (FT), TOTAL LENGTH (FT), MAXIMUM CHANNEL SLOPE, etc.

ONLY COMPLETE THE PORTION BELOW WHEN TOLERANCES ARE NOT MET. ALSO PROVIDE COMPUTATIONS AND SWM REPORT REVISIONS.

Table with columns: FEATURE, DESIGN, AS-BUILT, DIFFERENCE. Rows include ESDv WATER SURFACE ELEVATION, ESDv FLOW DEPTH, etc.

SWM FACILITY AS-BUILT CERTIFICATION ACCEPTANCE APPROVING AUTHORITY: [ ] MDE [ ] PRD ACCEPTED BY: (NAME) DATE:

REVISED 04-10-2018

### GRASS SWALE ESD-4-1

SWM FACILITY AS-BUILT CERTIFICATION DATA TABLE FOR M-8 GRASS SWALES

MAY ONLY BE CERTIFIED BY THE AS-BUILT ENGINEER (ABE) PER COMAR 26.17.02.10.

Table with columns: SWM FACILITY NUMBER, MDE/PRD NUMBER, SHA CONTRACT NUMBER, ACTIVITY, SUPPORTING DOCUMENTATION AND INFORMATION, DATE(S) OF INSPECTION.

Table with columns: FEATURE, DESIGN, AS-BUILT, DIFFERENCE. Rows include BOTTOM WIDTH (FT), TOTAL LENGTH (FT), MAXIMUM CHANNEL SLOPE, etc.

ONLY COMPLETE THE PORTION BELOW WHEN TOLERANCES ARE NOT MET. ALSO PROVIDE COMPUTATIONS AND SWM REPORT REVISIONS.

Table with columns: FEATURE, DESIGN, AS-BUILT, DIFFERENCE. Rows include ESDv WATER SURFACE ELEVATION, ESDv FLOW DEPTH, etc.

SWM FACILITY AS-BUILT CERTIFICATION ACCEPTANCE APPROVING AUTHORITY: [ ] MDE [ ] PRD ACCEPTED BY: (NAME) DATE:

REVISED 04-10-2018

### GRASS SWALE ESD-5-1

SWM FACILITY AS-BUILT CERTIFICATION DATA TABLE FOR M-8 GRASS SWALES

MAY ONLY BE CERTIFIED BY THE AS-BUILT ENGINEER (ABE) PER COMAR 26.17.02.10.

Table with columns: SWM FACILITY NUMBER, MDE/PRD NUMBER, SHA CONTRACT NUMBER, ACTIVITY, SUPPORTING DOCUMENTATION AND INFORMATION, DATE(S) OF INSPECTION.

Table with columns: FEATURE, DESIGN, AS-BUILT, DIFFERENCE. Rows include BOTTOM WIDTH (FT), TOTAL LENGTH (FT), MAXIMUM CHANNEL SLOPE, etc.

ONLY COMPLETE THE PORTION BELOW WHEN TOLERANCES ARE NOT MET. ALSO PROVIDE COMPUTATIONS AND SWM REPORT REVISIONS.

Table with columns: FEATURE, DESIGN, AS-BUILT, DIFFERENCE. Rows include ESDv WATER SURFACE ELEVATION, ESDv FLOW DEPTH, etc.

SWM FACILITY AS-BUILT CERTIFICATION ACCEPTANCE APPROVING AUTHORITY: [ ] MDE [ ] PRD ACCEPTED BY: (NAME) DATE:

REVISED 04-10-2018

#### STORMWATER MANAGEMENT AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE STORMWATER MANAGEMENT FACILITY (FACILITIES) SHOWN ON THE PLANS AND INDIVIDUALLY IDENTIFIED BELOW HAS (HAVE) BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS INCLUDED UNDER THE MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVAL, NUMBER EXCEPT AS NOTED IN GREEN ON THE "AS-BUILT" DRAWINGS. FURTHERMORE, THE GREEN-NOTED EXCEPTIONS DO NOT ADVERSELY AFFECT THE DESIGN AND/OR THE INTENDED PERFORMANCE OF THE FACILITY (FACILITIES).

ESD-3-1 (GRASS SWALE) ESD-4-1 (BIORETENTION) ESD-3-2 (GRASS SWALE) ESD-5-1 (GRASS SWALE)

EACH SWM FACILITY IS IDENTIFIED INDIVIDUALLY BY A UNIQUE SWM FACILITY NUMBER

Name (Printed) Signature Maryland Registration Number 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. , EXPIRATION DATE ."

"CERTIFY" MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED ON SUFFICIENT AND APPROPRIATE ONSITE INSPECTIONS AND MATERIAL TESTS CONDUCTED DURING CONSTRUCTION. NOTE: AS-BUILT CHECKLISTS CONTAINED IN THE CONTRACT DRAWINGS SHALL BE COMPLETED BY THE AS-BUILT INSPECTOR AND SUBMITTED TO THE SHA ALONG WITH THIS CERTIFICATION.

NOTE: ANNE ARUNDEL COUNTY TO OWN, OPERATE AND MAINTAIN ESD 3-1, ESD 4-1, ESD 3-2, AND ESD 5-1

AECOM logo and address: 4 NORTH PARK DRIVE, SUITE 300, HUNT VALLEY, MARYLAND 21030. Includes professional seal and expiration date: 06/08/2023.

Table with columns: NO., DESCRIPTION, BY, DATE. Contains revision entries.

APPROVED signatures and dates for ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS. Includes project manager and chief engineer signatures.

GP# G02018957 DWG. NO.: SW-10

STORMWATER MANAGEMENT AS-BUILT



### GRASS SWALE ESD-6-1 SWM FACILITY AS-BUILT CERTIFICATION DATA TABLE FOR M-8 GRASS SWALES

MAY ONLY BE CERTIFIED BY THE AS-BUILT ENGINEER (ABE) PER COMAR 26.17.02.10.

SWM FACILITY NUMBER TBA	MDE/PRD NUMBER N/A	SHA CONTRACT NUMBER TRACKING NO. 20APAA014XX
<b>ACTIVITY</b>	<b>SUPPORTING DOCUMENTATION AND INFORMATION</b> (SUBMIT WITH SWM FACILITY AS-BUILT CERTIFICATION PACKAGE)	
PRIOR TO SWM FACILITY EXCAVATION, OBSERVED ESC MEASURES ARE INSTALLED AROUND THE FACILITY OR CONFIRMED SURROUNDING AREA IS STABILIZED	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
OBSERVED EXCAVATION OF SWM FACILITY	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
OBSERVED INSTALLATION OF CHECK DAMS	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
OBSERVED INSTALLATION OF RELEASE STRUCTURE	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS RELEASE STRUCTURE: <input type="checkbox"/> INLET <input type="checkbox"/> WEIR <input type="checkbox"/> CHECK DAM <input type="checkbox"/> OUTFALL <input type="checkbox"/> NOT APPLICABLE <input type="checkbox"/> OTHER (WRITE IN):	
OBSERVED FINAL GRADING OF SWM FACILITY	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
VERIFIED ESTABLISHMENT OF TURFGRASS SOD OR SOIL STABILIZATION MATTING AND TURFGRASS SEED	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS <input type="checkbox"/> LANDSCAPE ACCEPTANCE LETTER	

FEATURE	DESIGN	AS-BUILT	DIFFERENCE
BOTTOM WIDTH (FT) – MAY NOT BE LESS THAN 2 FT OR EXCEED 8 FT	6'		
TOTAL LENGTH (FT)	440'		
MAXIMUM CHANNEL SLOPE (FT/FT) – MAY NOT EXCEED 4%	0.3%		
LEFT SIDE SLOPE (H:V) – MAY NOT BE STEEPER THAN 3:1	3:1		
RIGHT SIDE SLOPE (H:V) – MAY NOT BE STEEPER THAN 3:1	3:1		
NUMBER OF CHECK DAMS	N/A		
DISTANCE BETWEEN CHECK DAMS (FT)	SEE PROFILE		
CHECK DAM HEIGHT (FT)	SEE PROFILE		
TOP OF DITCH ELEVATION (FT)	SEE PROFILE		

**ONLY COMPLETE THE PORTION BELOW WHEN TOLERANCES ARE NOT MET. ALSO PROVIDE COMPUTATIONS AND SWM REPORT REVISIONS.**

FEATURE	DESIGN	AS-BUILT	DIFFERENCE
ESDv WATER SURFACE ELEVATION (FT)	21.57 (MAX.)		
ESDv FLOW DEPTH (IN.)	3.2 IN.		
1-YR FLOW VELOCITY (FT/S) – MUST BE NON-EROSIVE	0.21 FPS		
10-YR WATER SURFACE ELEVATION (FT)	21.93 (MAX)		
10-YR FLOW DEPTH (IN.)	7.5 IN.		
10-YR FLOW VELOCITY (FT/S) – MUST BE NON-EROSIVE	0.34 FPS		
10-YR FREEBOARD (IN.) – MAY NOT BE LESS THAN 9 IN. – MEASURED VERTICALLY FROM 10-YR WATER SURFACE ELEVATION TO PAVEMENT EDGE/SHOULDER	9 IN.		

SWM FACILITY AS-BUILT CERTIFICATION ACCEPTANCE APPROVING AUTHORITY:  MDE  PRD  
 ACCEPTED BY: \_\_\_\_\_ (NAME) DATE: \_\_\_\_\_

REVISED 04-10-2018

NOTE: ANNE ARUNDEL COUNTY TO OWN, OPERATE AND MAINTAIN ESD 6-1, ESD 6-2, AND ESD 8-1

### GRASS SWALE ESD-6-2 SWM FACILITY AS-BUILT CERTIFICATION DATA TABLE FOR M-8 GRASS SWALES

MAY ONLY BE CERTIFIED BY THE AS-BUILT ENGINEER (ABE) PER COMAR 26.17.02.10.

SWM FACILITY NUMBER TBA	MDE/PRD NUMBER N/A	SHA CONTRACT NUMBER TRACKING NO. 20APAA014XX
<b>ACTIVITY</b>	<b>SUPPORTING DOCUMENTATION AND INFORMATION</b> (SUBMIT WITH SWM FACILITY AS-BUILT CERTIFICATION PACKAGE)	
PRIOR TO SWM FACILITY EXCAVATION, OBSERVED ESC MEASURES ARE INSTALLED AROUND THE FACILITY OR CONFIRMED SURROUNDING AREA IS STABILIZED	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
OBSERVED EXCAVATION OF SWM FACILITY	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
OBSERVED INSTALLATION OF CHECK DAMS	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
OBSERVED INSTALLATION OF RELEASE STRUCTURE	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS RELEASE STRUCTURE: <input type="checkbox"/> INLET <input type="checkbox"/> WEIR <input type="checkbox"/> CHECK DAM <input type="checkbox"/> OUTFALL <input type="checkbox"/> NOT APPLICABLE <input type="checkbox"/> OTHER (WRITE IN):	
OBSERVED FINAL GRADING OF SWM FACILITY	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
VERIFIED ESTABLISHMENT OF TURFGRASS SOD OR SOIL STABILIZATION MATTING AND TURFGRASS SEED	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS <input type="checkbox"/> LANDSCAPE ACCEPTANCE LETTER	

FEATURE	DESIGN	AS-BUILT	DIFFERENCE
BOTTOM WIDTH (FT) – MAY NOT BE LESS THAN 2 FT OR EXCEED 8 FT	8'		
TOTAL LENGTH (FT)	640'		
MAXIMUM CHANNEL SLOPE (FT/FT) – MAY NOT EXCEED 4%	0.3%		
LEFT SIDE SLOPE (H:V) – MAY NOT BE STEEPER THAN 3:1	3:1		
RIGHT SIDE SLOPE (H:V) – MAY NOT BE STEEPER THAN 3:1	3:1		
NUMBER OF CHECK DAMS	N/A		
DISTANCE BETWEEN CHECK DAMS (FT)	SEE PROFILE		
CHECK DAM HEIGHT (FT)	SEE PROFILE		
TOP OF DITCH ELEVATION (FT)	SEE PROFILE		

**ONLY COMPLETE THE PORTION BELOW WHEN TOLERANCES ARE NOT MET. ALSO PROVIDE COMPUTATIONS AND SWM REPORT REVISIONS.**

FEATURE	DESIGN	AS-BUILT	DIFFERENCE
ESDv WATER SURFACE ELEVATION (FT)	22.61 (MAX.)		
ESDv FLOW DEPTH (IN.)	3.7 IN.		
1-YR FLOW VELOCITY (FT/S) – MUST BE NON-EROSIVE	0.23 FPS		
10-YR WATER SURFACE ELEVATION (FT)	23.06 (MAX)		
10-YR FLOW DEPTH (IN.)	9.1 IN.		
10-YR FLOW VELOCITY (FT/S) – MUST BE NON-EROSIVE	0.39 FPS		
10-YR FREEBOARD (IN.) – MAY NOT BE LESS THAN 9 IN. – MEASURED VERTICALLY FROM 10-YR WATER SURFACE ELEVATION TO PAVEMENT EDGE/SHOULDER	9 IN.		

SWM FACILITY AS-BUILT CERTIFICATION ACCEPTANCE APPROVING AUTHORITY:  MDE  PRD  
 ACCEPTED BY: \_\_\_\_\_ (NAME) DATE: \_\_\_\_\_

REVISED 04-10-2018

### BIOSWALE ESD-8-1 SWM FACILITY AS-BUILT CERTIFICATION DATA TABLE FOR M-8 BIO-SWALES

MAY ONLY BE CERTIFIED BY THE AS-BUILT ENGINEER (ABE) PER COMAR 26.17.02.10.

SWM FACILITY NUMBER TBA	MDE/PRD NUMBER N/A	SHA CONTRACT NUMBER TRACKING NO. 20APAA014XX
<b>ACTIVITY</b>	<b>SUPPORTING DOCUMENTATION AND INFORMATION</b> (SUBMIT WITH SWM FACILITY AS-BUILT CERTIFICATION PACKAGE)	
PRIOR TO SWM FACILITY EXCAVATION, OBSERVED ESC MEASURES ARE INSTALLED AROUND THE FACILITY OR CONFIRMED SURROUNDING AREA IS STABILIZED	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
OBSERVED EXCAVATION OF SWM FACILITY	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
OBSERVED INSTALLATION OF GEOTEXTILE AND VERIFIED INSTALLATION PERFORMED AS SPECIFIED	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
OBSERVED INSTALLATION OF NO. 57 AGGREGATE BEDDING FOR SUB-DRAIN	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS <input type="checkbox"/> NOT APPLICABLE	
OBSERVED INSTALLATION OF SUB-DRAIN, VERIFIED TYPE IS PPWP OR CPP-S, AND HAS SLOTTED PERFORATIONS	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS <input type="checkbox"/> NOT APPLICABLE PIPE TYPE: <input type="checkbox"/> PPWP <input type="checkbox"/> CPP-S	
OBSERVED INSTALLATION OF NO. 57 AGGREGATE AROUND AND ABOVE SUB-DRAIN	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS <input type="checkbox"/> NOT APPLICABLE	
OBSERVED INSTALLATION OF NO. 7 AGGREGATE	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS <input type="checkbox"/> NOT APPLICABLE	
OBSERVED INSTALLATION OF COARSE SAND	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS <input type="checkbox"/> NOT APPLICABLE	
OBSERVED INSTALLATION OF APPROVED BIORETENTION SOIL MIX (BSM)	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS <input type="checkbox"/> MATERIAL APPROVAL FORM	
OBSERVED INSTALLATION OF CHECK DAMS	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
OBSERVED INSTALLATION OF RELEASE STRUCTURE	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS RELEASE STRUCTURE: <input type="checkbox"/> INLET <input type="checkbox"/> WEIR <input type="checkbox"/> CHECK DAM <input type="checkbox"/> OUTFALL <input type="checkbox"/> NOT APPLICABLE <input type="checkbox"/> OTHER (WRITE IN):	
OBSERVED FINAL GRADING OF SWM FACILITY	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
VERIFIED ESTABLISHMENT OF TURFGRASS AND OTHER VEGETATIVE SEED WITH SOIL STABILIZATION MATTING, INCLUDING PLUGS	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS <input type="checkbox"/> LANDSCAPE ACCEPTANCE LETTER	

FEATURE	DESIGN	AS-BUILT	DIFFERENCE
BOTTOM WIDTH (FT) – MAY NOT BE LESS THAN 2 FT OR EXCEED 8 FT	6'		
TOTAL LENGTH (FT)	530'		
MAXIMUM CHANNEL SLOPE (FT/FT) – MAY NOT EXCEED 4%	0.3%		
LEFT SIDE SLOPE (H:V) – MAY NOT BE STEEPER THAN 3:1	3:1		
RIGHT SIDE SLOPE (H:V) – MAY NOT BE STEEPER THAN 3:1	3:1		
TOTAL THICKNESS OF NO. 57 AGGREGATE (IN.) – MAY NOT BE LESS THAN 18 IN.	18 IN.		
THICKNESS OF NO. 7 AGGREGATE (IN.) – MAY NOT BE LESS THAN 4 IN.	4 IN.		
THICKNESS OF COARSE SAND (IN.) – MAY NOT BE LESS THAN 4 IN.	4 IN.		
THICKNESS OF BSM (IN.) – MAY NOT BE LESS THAN 24 IN.	24 IN.		
SUB-DRAIN PIPE DIAMETER (IN.) – MAY NOT DIFFER FROM VALUE SPECIFIED	6 IN.		
SUB-DRAIN OUTLET INVERT ELEVATION (FT)	15.21		
NUMBER OF CHECK DAMS	8		
DISTANCE BETWEEN CHECK DAMS (FT)	SEE PROFILE		
CHECK DAM HEIGHT (FT)	SEE PROFILE		
TOP OF DITCH ELEVATION (FT)	SEE PROFILE		

**ONLY COMPLETE THE PORTION BELOW WHEN TOLERANCES ARE NOT MET. ALSO PROVIDE COMPUTATIONS AND SWM REPORT REVISIONS.**

FEATURE	DESIGN	AS-BUILT	DIFFERENCE
ESDv WATER SURFACE ELEVATION (FT)	21.97 (MAX.)		
ESDv FLOW DEPTH (IN.)	5.6 IN.		
1-YR FLOW VELOCITY (FT/S) – MUST BE NON-EROSIVE	0.37 FPS		
10-YR WATER SURFACE ELEVATION (FT)	22.48 (MAX)		
10-YR FLOW DEPTH (IN.)	11.8 IN.		
10-YR FLOW VELOCITY (FT/S) – MUST BE NON-EROSIVE	0.55 FPS		
10-YR FREEBOARD (IN.) – MAY NOT BE LESS THAN 9 IN. – MEASURED VERTICALLY FROM 10-YR WATER SURFACE ELEVATION TO PAVEMENT EDGE/SHOULDER	9 IN.		

SWM FACILITY AS-BUILT CERTIFICATION ACCEPTANCE APPROVING AUTHORITY:  MDE  PRD  
 ACCEPTED BY: \_\_\_\_\_ (NAME) DATE: \_\_\_\_\_

REVISED 04-10-2018

### STORMWATER MANAGEMENT AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE STORMWATER MANAGEMENT FACILITY (FACILITIES) SHOWN ON THE PLANS AND INDIVIDUALLY IDENTIFIED BELOW HAS (HAVE) BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS INCLUDED UNDER THE MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVAL, NUMBER \_\_\_\_\_ EXCEPT AS NOTED IN GREEN ON THE "AS-BUILT" DRAWINGS. FURTHERMORE, THE GREEN-NOTED EXCEPTIONS DO NOT ADVERSELY AFFECT THE DESIGN AND/OR THE INTENDED PERFORMANCE OF THE FACILITY (FACILITIES).

ESD-6-1 (GRASS SWALE) \_\_\_\_\_ ESD-8-1 (BIOSWALE) \_\_\_\_\_  
 ESD-6-2 (GRASS SWALE) \_\_\_\_\_

EACH SWM FACILITY IS IDENTIFIED INDIVIDUALLY BY A UNIQUE SWM FACILITY NUMBER

Name (Printed) \_\_\_\_\_ Signature \_\_\_\_\_  
 Maryland Registration Number \_\_\_\_\_ 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. \_\_\_\_\_, EXPIRATION DATE \_\_\_\_\_."

"CERTIFY" MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED ON SUFFICIENT AND APPROPRIATE ONSITE INSPECTIONS AND MATERIAL TESTS CONDUCTED DURING CONSTRUCTION. NOTE: AS-BUILT CHECKLISTS CONTAINED IN THE CONTRACT DRAWINGS SHALL BE COMPLETED BY THE AS-BUILT INSPECTOR AND SUBMITTED TO THE SHA ALONG WITH THIS CERTIFICATION.

### STORMWATER MANAGEMENT AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE STORMWATER MANAGEMENT FACILITY (FACILITIES) SHOWN ON THE PLANS AND INDIVIDUALLY IDENTIFIED BELOW HAS (HAVE) BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS INCLUDED UNDER THE MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVAL, NUMBER \_\_\_\_\_ EXCEPT AS NOTED IN GREEN ON THE "AS-BUILT" DRAWINGS. FURTHERMORE, THE GREEN-NOTED EXCEPTIONS DO NOT ADVERSELY AFFECT THE DESIGN AND/OR THE INTENDED PERFORMANCE OF THE FACILITY (FACILITIES).

NRD-6-1 (NON-ROOFTOP DISCONNECT) NRD-14-1 (NON-ROOFTOP DISCONNECT)  
 NRD-7-1 (NON-ROOFTOP DISCONNECT) NRD-14-2 (NON-ROOFTOP DISCONNECT)  
 NRD-11-1 (NON-ROOFTOP DISCONNECT) NRD-15-1 (NON-ROOFTOP DISCONNECT)  
 NRD-12-1 (NON-ROOFTOP DISCONNECT) NRD-15-2 (NON-ROOFTOP DISCONNECT)  
 EACH SWM FACILITY IS IDENTIFIED INDIVIDUALLY BY A UNIQUE SWM FACILITY NUMBER

Name (Printed) \_\_\_\_\_ Signature \_\_\_\_\_  
 Maryland Registration Number \_\_\_\_\_ 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. \_\_\_\_\_, EXPIRATION DATE \_\_\_\_\_."

"CERTIFY" MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED ON SUFFICIENT AND APPROPRIATE ONSITE INSPECTIONS AND MATERIAL TESTS CONDUCTED DURING CONSTRUCTION. NOTE: AS-BUILT CHECKLISTS CONTAINED IN THE CONTRACT DRAWINGS SHALL BE COMPLETED BY THE AS-BUILT INSPECTOR AND SUBMITTED TO THE SHA ALONG WITH THIS CERTIFICATION.

### STORMWATER MANAGEMENT NOTES:

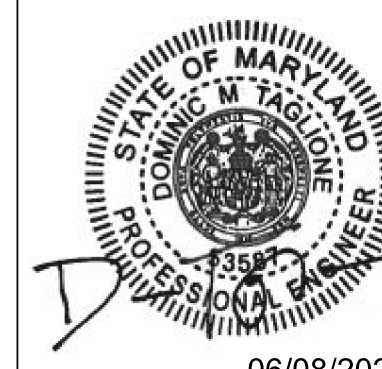
- CONSTRUCTION OF THE PROPOSED SHA BIORETENTION FACILITY WILL CONFORM TO THE LATEST SHA STANDARD SPECIFICATION 316 FOR 'STORMWATER MANAGEMENT (SWM) FILTRATION FACILITIES'.
- ASBUILT CERTIFICATION WILL CONFORM TO THE LATEST SHA STANDARD SPECIFICATION 317 STORMWATER MANAGEMENT (SWM) FACILITY AS-BUILT CERTIFICATION.
- UPON COMPLETION OF THE PROJECT, THE AS-BUILT CERTIFICATION MUST BE SIGNED; AND THE AS-BUILT PLANS (ALONG WITH THE FINAL STORMWATER MANAGEMENT REPORT) MUST BE ELECTRONICALLY FORWARDED TO MS. KIONA LEAH (KLEAH@MDOT.MARYLAND.GOV). THIS WILL BE A CONDITION OF THE FINAL BOND.

GP# G02018957 DWG. NO.: SW-11



AECOM  
4 NORTH PARK DRIVE  
SUITE 300  
HUNT VALLEY, MARYLAND 21030  
PHONE: 410-785-7220  
FAX: 410-785-6818

PROFESSIONAL CERTIFICATION  
 "I 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."  
 MD LICENSE NUMBER: 53587  
 EXPIRATION DATE: 12-09-2024



06/08/2023

REVISIONS			
NO.	DESCRIPTION	BY	DATE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS			
APPROVED DATE	APPROVED DATE	SCALE: AS NOTED	BROADNECK PENINSULA TRAIL PHASE IB & V
11/20/2023   08:59 EST CHIEF ENGINEER	11/17/2023   08:00 EST PROJECT MANAGER	DRAWN BY: DMT	
APPROVED DATE	APPROVED DATE	CHECKED BY: DMT	STORMWATER MANAGEMENT AS-BUILT
11/17/2023   11:56 EST ASSISTANT CHIEF ENGINEER	11/17/2023   18:30 EST CHIEF, RIGHT OF WAY	SHEET NO. 63 OF 116 PROJECT NO. P504100 CONTRACT NO. P504105	



## OUTFALL STATEMENTS:

A FIELD INVESTIGATION OF THE MULTIPLE OUTFALLS WITHIN THE PROJECT AREA WAS PERFORMED IN FEBRUARY BY AECOM. BASED ON A HYDROLOGIC ANALYSIS WHICH INDICATED POST DEVELOPMENT PEAK DISCHARGE CHANGES 10% OR LESS FOR ALL OUTFALLS WITHIN THE PROJECT, THE OUTFALLS ARE DEEMED TO BE ADEQUATE PER ANNE ARUNDEL COUNTY STORMWATER MANAGEMENT MANUAL. THE PROJECT WILL NOT CONTRIBUTE TO THE ADVERSE IMPACTS AT THE OUTFALLS.

POINT OF INVESTIGATION # 1 (POI-1) IS LOCATED DOWNSTREAM OF AN EXISTING 22"x36" CMP CULVERT CROSSING COLLEGE PARKWAY AT STATION 7+80 THAT CONVEYS DRAINAGE FROM THE FOUR SEASONS AT SAINT MARGARETS DEVELOPMENT. THIS OFFSITE FROM AN ADJACENT DEVELOPMENT WILL HAVE NO ADVERSE IMPACT ON THE PROJECT AS THE DRAINAGE AREA WILL NOT CHANGE FROM THE EXISTING TO PROPOSED CONDITIONS. AN EXISTING 18" CMP ALSO DISCHARGES RUNOFF FROM EAST COLLEGE PARKWAY AT THIS LOCATION. THE OUTFALL IS STABLE AND CONSISTS OF A LARGE ROUGHLY TRAPEZOIDAL RIPRAP CHANNEL THAT DISCHARGES TO TWIN 30" RCP PIPES APPROXIMATELY 150' DOWNSTREAM, WITH THE PROPOSED IMPROVEMENTS, GRASS SWALE ESD 1-2 WILL UTILIZE THE EXISTING 18" CMP TO OUTFALL. A NEW 18" RCP WILL DISCHARGE GRASS SWALE ESD 1-1 ADJACENT TO THE EXISTING HEADWALL AT NON-EROSIVE VELOCITIES. THEREFORE, NO ADVERSE EFFECTS ARE ANTICIPATED AT THE EXISTING RIPRAP OUTFALL.

POINT OF INVESTIGATION # 2 (POI-2) IS LOCATED ADJACENT TO THE SULLIVAN PROPERTY AND CONVEYS A LARGE AMOUNT OF RUNOFF FROM THE NEARBY BUSINESSES, INCLUDING BAY HEAD INSURANCE AND DODGE & SONS PROPERTY. THE EXISTING OUTFALL IS STABLE AND CONSISTS OF A MARSH AREA WITH HEAVY VEGETATION. IN THE EXISTING CONDITIONS, FLOODING HAS BEEN REPORTED ALONG THE WEST EDGE OF SULLIVAN PROPERTY. THE PROPOSED CONDITIONS WILL IMPROVE THE OUTFALL ALONG THE SULLIVAN PROPERTY BY PLACING A STONE MATTING OUTFALL THAT WILL IMPROVE CAPACITY AND CREATE A MORE DEFINED CHANNEL DECREASING FLOOD EVENTS IN THIS AREA. IN ADDITION, A BIORETENTION FACILITY WILL BE PLACED UPSTREAM OF THE SULLIVAN PROPERTY WHICH WILL CAPTURE AND SLOW RUNOFF LEAVING THE SITE. THE PROPOSED PROJECT IMPROVEMENTS WILL HAVE NO ANTICIPATED ADVERSE IMPACTS AT POI-2.

LINE OF INVESTIGATION #3 (LOI-3) IS LOCATED FROM STATION 20+00, LT TO 22+20, LT. WHERE THE RUNOFF FROM THE PROJECT SHEET FLOWS IN A NORTHERLY DIRECTION TOWARDS A WOODED AREA ADJACENT TO THE REVELL DOWNS DEVELOPMENT. THE LINE OF INVESTIGATION IS WITHIN A STABLE WOODED AREA AND EVIDENCE OF EROSION, SEDIMENTATION OR FLOODING WAS NOT OBSERVED.

POINT OF INVESTIGATION #4 (POI-4) IS LOCATED JUST UPSTREAM OF THE EXISTING 24" CMP CULVERT CROSSING COLLEGE PARKWAY AT STATION 128+80. THE CULVERT CONVEYS DRAINAGE FROM EAST COLLEGE PARKWAY AND REVELL DOWNS DEVELOPMENT ULTIMATELY TO THE CLOSED DRAINAGE NETWORK ALONG US-50. THE OUTFALL IS STABLE AND NO EVIDENCE OF FLOODING, EROSION OR SEDIMENTATION IS VISIBLE. THE PROPOSED CONDITIONS WILL CREATE A NEW OUTFALL AT EW-2/3 AND CONVEYS FLOWS FROM THE GRASS SWALE ESD 3-1 JUST UPSTREAM OF POI-4. RIPRAP WILL BE PLACED AT THE PROPOSED OUTFALL TO ENSURE NO ADVERSE IMPACTS DOWNSTREAM OF THE OUTFALL.

POINT OF INVESTIGATION #5 (POI-5) IS LOCATED JUST UPSTREAM OF THE EXISTING 24" CMP CULVERT CROSSING COLLEGE PARKWAY AT STATION 143+40. THE CROSSING CONVEYS DRAINAGE FROM EAST COLLEGE PARKWAY AND BAY HEAD ROAD ULTIMATELY TO THE CLOSED DRAINAGE NETWORK ALONG US-50. THE OUTFALL IS STABLE AND NO EVIDENCE OF FLOODING, EROSION OR SEDIMENTATION IS VISIBLE AT THE OUTFALL. THE EXISTING 18" RCP PIPE CROSSING AT BAY HEAD ROAD IS CLOGGED AND FULL OF SEDIMENT. THE PROPOSED CONDITIONS WILL REPLACE THE CLOGGED SYSTEM TO ENSURE POSITIVE DRAINAGE WITH THE GRADING IMPROVEMENTS. TWO (2) PIPE CROSSINGS UNDER THE TRAIL WILL MAINTAIN POSITIVE DRAINAGE TO THE OUTFALL AND DISCHARGE JUST UPSTREAM OF POI-5. RIPRAP WILL LINE THE CHANNEL NEAR THE OUTFALL TO ENSURE NO ADVERSE IMPACTS DOWNSTREAM OF THE OUTFALL.

POINT OF INVESTIGATION #6 (POI-6) IS LOCATED NEAR BAY HEAD PARK. DRAINAGE BETWEEN EAST COLLEGE PARKWAY AND BAY HEAD PARK IS MINIMAL AS IT IS FLAT AND HIGHLY WOODED. A PORTION OF BAY HEAD PARK AND SECTION OF THE WOODED AREA DRAINS TO A WETLAND AREA LOCATED SOUTH BAY HEAD PARK NEAR TRAIL STATION 608+75. THE OUTFALL IS STABLE AND NO EVIDENCE OF EROSION OR SEDIMENTATION IS VISIBLE. THE PROPOSED TRAIL WILL MEET CRITERIA FOR NON-ROOFTOP DISCONNECT IN THE PARK AND MEET THE INTENT OF STORMWATER MANAGEMENT. NO ADVERSE IMPACTS ARE ANTICIPATED DOWNSTREAM DUE TO THE PROPOSED IMPROVEMENTS.

POINT OF INVESTIGATION #7 (POI-7) IS LOCATED JUST UPSTREAM OF THE EXISTING 24" RCP CULVERT CROSSING COLLEGE PARKWAY AT STATION 157+75. THE CROSSING CONVEYS DRAINAGE FROM EAST COLLEGE PARKWAY AND A FLAT WOODED AREA JUST SOUTH OF BAY HEAD PARK ULTIMATELY TO THE CLOSED DRAINAGE NETWORK ALONG US-50. THE OUTFALL IS STABLE AND NO EVIDENCE OF EROSION OR SEDIMENTATION IS VISIBLE. THE GRADES ARE VERY FLAT WITH SLOPES OF LESS THAN 0.3% IN SOME AREAS. SHALLOW POONDING OCCURS IN THE WOODED AREAS ADJACENT TO EAST COLLEGE PARKWAY, BUT NO EVIDENCE OF ROADWAY FLOODING. THE PROPOSED IMPROVEMENTS WILL ADEQUATELY RAISE THE TRAIL IN THIS AREA TO ENSURE DRAINAGE ADJACENT AND UNDER THE TRAIL NEAR POI-7. THE PROPOSED GRASS SWALES AND DRAINAGE DITCHES WILL IMPROVE CONVEYANCE.

POINT OF INVESTIGATION #8 (POI-8) IS LOCATED JUST DOWNSTREAM OF THE EXISTING 24" RCP CULVERT CROSSING COLLEGE PARKWAY AT STATION 177+50. THE CROSSING CONVEYS DRAINAGE SOUTH OF EAST COLLEGE PARKWAY FROM SKIPMORE DRIVE UNDER US-50. THE OUTFALL IS STABLE AND NO EVIDENCE OF EROSION OR SEDIMENTATION IS VISIBLE. THE RUNOFF IS CONVEYED IN A ROUGHLY TRAPEZOIDAL NATURAL CHANNEL IN A NORTHERLY DIRECTION TO AN UNAMED TRIBUTARY OF MEREDITH CREEK. DUE TO THE LIMITED SPACE WITHIN THE RIGHT-OF-WAY AND PRESENCE OF STEEP SLOES THE PROPOSED TRAIL WILL BE CONSTRUCTED ALONG CURB AND GUTTER. THE PROPOSED CLOSED DRAINAGE SYSTEM WILL CONVEY RUNOFF FROM THE PROPOSED TRAIL AND EAST COLLEGE PARKWAYS AND DISCHARGE IT AT THE EXISTING OUTFALL PIPE AT POI-8.

POINT OF INVESTIGATION #9 (POI-9) IS LOCATED JUST UPSTREAM OF THE EXISTING TWIN 24"x36" RCP CULVERT CROSSING COLLEGE PARKWAY AT TRAIL STATION 177+50. THE CROSSING CONVEYS MEREDITH CREEK UNDER US-50. THE OUTFALL IS A STABLE STREAM AND NO EVIDENCE OF EROSION OR SEDIMENTATION IS VISIBLE. THE PERENNIAL STREAM CONVEYS MOSTLY A LARGE DRAINAGE AREA OF UNDISTURBED WOODS AND SOME DEVELOPMENT OFF YORKTOWN ROAD. THE PROPOSED TRAIL WILL BE CONSTRUCTED ALONG CURB AND GUTTER DUE TO THE LIMITED SPACE WITHIN THE RIGHT-OF-WAY AND PRESENCE OF STEEP SLOPES. THE PROPOSED CLOSED DRAINAGE SYSTEM WILL CONVEY RUNOFF FROM THE PROPOSED TRAIL AND EAST COLLEGE PARKWAYS AND DISCHARGE IT JUST UPSTREAM OF THE EXISTING OUTFALL PIPE AT POI-9. THE OUTFALL IS DISCHARGING INTO A 100 YEAR FLOODPLAIN WHICH IS CONTAINED WITHIN ANNE ARUNDEL COUNTY RIGHT-OF-WAY.

POINT OF INVESTIGATION #10 (POI-10) IS LOCATED AT THE EXISTING INLET AT THE INTERSECTION OF EAST COLLEGE PARKWAY AND LOG INN ROAD. THE OUTFALL IS STABLE AND NO EVIDENCE OF FLOODING, EROSION OR SEDIMENTATION IS VISIBLE. THE PROPOSED TRAIL WILL BE CONSTRUCTED ALONG CURB AND GUTTER DUE TO THE LIMITED SPACE WITHIN THE RIGHT-OF-WAY AND DISCHARGE TO THE EXISTING INLET MAINTAINING THE EXISTING DRAINAGE PATTERN. NO ADVERSE IMPACTS ARE ANTICIPATED DOWNSTREAM OF THE OUTFALL.

POINT OF INVESTIGATION #11 (POI-11) IS LOCATED JUST UPSTREAM OF THE EXISTING 60" RCP CULVERT CROSSING COLLEGE PARKWAY AT STATION 201+20. THE OUTFALL IS STABLE AND NO EVIDENCE OF FLOODING, EROSION OR SEDIMENTATION IS VISIBLE. THE STREAM CONVEYS A LARGE DRAINAGE AREA OF UNDISTURBED WOODS AND A SMALL AMOUNT OF DEVELOPMENT OFF LOG INN ROAD ULTIMATELY TO THE CLOSED DRAINAGE NETWORK ALONG US-50. MOST OF THE PROPOSED TRAIL WITHIN THE STANDY POINT STATE PARK WILL ULTIMATELY OUTFALL AT THIS LOCATION. THE PROPOSED TRAIL WILL MEET CRITERIA FOR NON-ROOFTOP DISCONNECT THROUGHOUT THE PARK AND WILL MEET THE INTENT OF STORMWATER MANAGEMENT. NO ADVERSE IMPACTS ARE ANTICIPATED DOWNSTREAM OF THE OUTFALL.

LINE OF INVESTIGATION #12 (LOI-12) IS LOCATED NEAR SANDY POINT STATE PARK MAINTANANCE. IN THIS SECTION OF THE PARK, THERE ARE NO CLEAR DRAINAGE PATHS WITHIN THE FLAT SECTION OF WOODS. LOI-12 IS SHEET FLOW FROM THE PARK THAT LEAVES THE SITE FROM TRAIL STATION 339+00 TO STATION 345+80 IN A NORTHERLY DIRECTION. THE OUTFALL IS STABLE AND NO EVIDENCE OF FLOODING, EROSION OR SEDIMENTATION IS VISIBLE. THE PROPOSED TRAIL WILL MEET CRITERIA FOR NON-ROOFTOP DISCONNECT IN THE PARK AND MEET THE INTENT OF STORMWATER MANAGEMENT. NO ADVERSE IMPACTS ARE ANTICIPATED DOWNSTREAM DUE TO THE PROPOSED IMPROVEMENTS.

POINT OF INVESTIGATION #13 (POI-13) IS LOCATED JUST DOWNSTREAM OF A NATURAL DITCH IN SANDY POINT STATE PARK THAT FLOWS IN A NORTHERLY DIRECTION TO A HIGHLY WOODED AREA. THE DRAINAGE BETWEEN OCEANIC DRIVE AND SOUTH BEACH ROAD FOR THIS PORTION AREA OF THE PROJECT ULTIMATELY OUTFALLS TO THIS LOCATION. THE OUTFALL IS STABLE AND NO EVIDENCE OF FLOODING, EROSION OR SEDIMENTATION IS VISIBLE. THE PROPOSED TRAIL WILL MEET CRITERIA FOR NON-ROOFTOP DISCONNECT IN THE PARK AND MEET THE INTENT OF STORMWATER MANAGEMENT. NO ADVERSE IMPACTS ARE ANTICIPATED DOWNSTREAM DUE TO THE PROPOSED IMPROVEMENTS.

POINT OF INVESTIGATION #14 (POI-14) IS LOCATED NEAR SANDY POINT STATE PARK KIOSK. THERE IS A SMALL PORTION OF PROPOSED WORK THAT DISCHARGES THE OPPOSITE DIRECTION OF THE OTHER POI. S AND LOI. S AFTER THE HIGH POINT NEAR TRAIL STATION 407+00. OUTFALL IS STABLE AND NO EVIDENCE OF FLOODING, EROSION OR SEDIMENTATION IS VISIBLE. THE PROPOSED TRAIL WILL MEET CRITERIA FOR NON-ROOFTOP DISCONNECT IN THE PARK AND MEET THE INTENT OF STORMWATER MANAGEMENT. NO ADVERSE IMPACTS ARE ANTICIPATED DOWNSTREAM DUE TO THE PROPOSED IMPROVEMENTS.

BASED ON THE SITE INVESTIGATION, EXISTING CONDITIONS, THE PROPOSED IMPROVEMENTS, AND THE PROPOSED STORMWATER MANAGEMENT PRACTICES, IT HAS BEEN CONCLUDED THAT THE PROJECT WILL HAVE NO ADVERSE IMPACT ON THE ULTIMATE DOWNSTREAM RECEIVING WATERWAY.

## STORMWATER MANAGEMENT NOTES:

- STORMWATER MANAGEMENT FOR THIS PROJECT SHALL BE APPROVED IN ACCORDANCE WITH ARTICLE 16 AND 17 OF THE ANNE ARUNDEL COUNTY ORDINANCE; AND ENVIRONMENT ARTICLE, TITLE 4, SUBTITLE 2, OF THE ANNOTATED CODE OF MARYLAND, AND THE APPROVED STORMWATER MANAGEMENT PLANS ARE ON FILE WITH THE OFFICE OF PLANNING AND ZONING.
- METHODS FOR STORMWATER MANAGEMENT INCLUDE THE USE OF NON-ROOFTOP DISCONNECT, GRASS SWALES, BIOSWALES AND BIORETENTION.
- THIS PROJECT WILL ADD (NET) ABOUT 3.5 ACRES OF IMPERVIOUS AREA SPREAD OUT OVER NUMEROUS POINTS OF INVESTIGATION (POI) AND LINE OF INVESTIGATION (LOI) DISTRIBUTED OVER THE LENGTH OF THIS LINEAR PROJECT. SEE STORMWATER MANAGEMENT REPORT FOR DETAILED INFORMATION.

Table B.3.2 Materials Specifications for Bioretention

Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
planting soil [2.5' to 4' deep]	sand 35 - 60% silt 30 - 55% clay 10 - 25%	n/a	USDA soil types loamy sand, sandy loam or loam
mulch	shredded hardwood		aged 6 months, minimum
pea gravel diaphragm and curtain drain	pea gravel: ASTM-D-448  ornamental stone: washed cobbles	pea gravel: No. 6 stone: 2" to 5"	
geotextile	Class "C" - apparent opening size (ASTM-D-4751), grab tensile strength (ASTM-D-4632), puncture resistance (ASTM-D-4833)	n/a	for use as necessary beneath underdrains only
underdrain gravel	AASHTO M-43	0.375" to 0.75"	
underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes
poured in place concrete (if required)	MSHA Mix No. 3; f'c = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) <i>not using previously approved State or local standards</i> requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350.R/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressures); and analysis of potential cracking
sand [1' deep]	AASHTO M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

## B.3.B SPECIFICATIONS FOR BIORETENTION

### 1. MATERIAL SPECIFICATIONS

THE ALLOWABLE MATERIALS TO BE USED IN BIORETENTION AREA ARE DETAILED IN TABLE B.3.2.

### 2. PLANTING SOIL

THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE BIORETENTION AREA THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHERNOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05.

THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:

- PH RANGE 5.2 - 7.0
- ORGANIC MATTER 1.5 - 4% (BY WEIGHT)
- MAGNESIUM 35 LB./AC
- PHOSPHORUS (PHOSPHATE - P2O5) 75 LB./AC
- POTASSIUM (POTASH - K2O) 85 LB./AC
- SOLUBLE SALTS NOT TO EXCEED 500 PPM

ALL BIORETENTION AREAS SHALL HAVE A MINIMUM OF ONE TEST. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, PHOSPHORUS, AND POTASSIUM AND ADDITIONAL TESTS OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOP SOIL WAS EXCAVATED.

SINCE DIFFERENT LABS CALIBRATE THEIR TESTING EQUIPMENT DIFFERENTLY, ALL TESTING RESULTS SHALL COME FROM THE SAME TESTING FACILITY.

SHOULD THE PH FALL OUT OF THE ACCEPTABLE RANGE, IT MAY BE MODIFIED (HIGHER) WITH LIME OR (LOWER) WITH IRON SULFATE PLUS SULFUR.

### 3. COMPACTION

IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF THE BIORETENTION AREA AND THE REQUIRED BACKFILL, WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF BIORETENTION AREAS ARE EXCAVATED USING A LOADER, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TYPE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE.

COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS A CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACTURE THE SOIL PROFILE THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.

ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE OPTIONAL SAND LAYER. PUMP ANY PONDED WATER BEFORE PREPARING (ROTOTILLING) BASE.

WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL TO FINAL GRADE.

WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS 12" TO 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.

### 4. PLANT MATERIAL

THE PLANT MATERIALS TO BE USED ON THE PROJECT ARE SHOWN ON THE LANDSCAPE PLANS ACCORDING TO THE LIST OF RECOMMENDED PLANT MATERIAL FOR BIORETENTION AREAS (APPENDIX A, SECTION A.2.3).

### 5. PLANT INSTALLATION

MULCH SHOULD BE PLACED TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.

ROOT STOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8TH OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION. TREES SHALL BE BRACED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL.

GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.

THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFEATS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.

### 6. UNDERDRAINS





UNDERDRAINS ARE TO BE PLACED ON A 3'-0" WIDE SECTION OF FILTER CLOTH. PIPE IS PLACED NEXT, FOLLOWED BY THE GRAVEL BEDDING. THE ENDS OF UNDERDRAIN PIPES NOT TERMINATING IN AN OBSERVATION WELL SHALL BE CAPPED. THE MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).

### 7. MISCELLANEOUS

THE BIORETENTION FACILITY MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.

GP# G02018957

DWG. NO.:  
SWD-01

AECOM		PROFESSIONAL CERTIFICATION	REVISIONS				ANNE ARUNDEL COUNTY						
AECOM 4 NORTH PARK DRIVE SUITE 300 HUNT VALLEY, MARYLAND 21030 PHONE: 410-785-7220 FAX: 410-785-6818		* I 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.  MD LICENSE NUMBER: 53587  EXPIRATION DATE: 12-09-2024	NO.	DESCRIPTION	BY	DATE	DEPARTMENT OF PUBLIC WORKS						
							APPROVED	DATE	APPROVED	DATE	SCALE: AS NOTED	BROADNECK PENINSULA TRAIL PHASE IB & V	
							<i>David C. Blanton</i>	11/20/2023	08:59 EST	<i>John Smith</i>	11/17/2023		08:10
							CHIEF ENGINEER		PROJECT MANAGER		CHECKED BY: DMT	STORMWATER MANAGEMENT NOTES AND DETAILS	
							APPROVED	DATE	APPROVED	DATE	SHEET NO. <u>84</u> OF 116		
							<i>David C. Blanton</i>	11/17/2023	11:56 EST	<i>John Smith</i>	11/17/2023	18:30	PROJECT NO. P504100
							ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY		CONTRACT NO. P504105		



### B.4.C SPECIFICATIONS FOR BIOSWALES

#### 1. MATERIAL SPECIFICATIONS

THE ALLOWABLE MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.

#### 2. FILTERING MEDIA OR PLANTING SOIL

THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE MICROBIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUUDA GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05.

THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:

- SOIL COMPONENT - LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION)
- ORGANIC CONTENT - MINIMUM 10% BY DRY WEIGHT (ASTM D 2974) .IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%-65%) AND COMPOST (35% TO 40%) OR SANDY LOAM (30%) , COARSE SAND (30%) ,AND COMPOST (40%)
- CLAY CONTENT - MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
- PH RANGE SHOULD BE BETWEEN 5.5 - 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED INTO THE SOIL TO INCREASE OR DECREASE PH.

THESE SHALL BE AT LEAST ONE SOIL TEST PER PROJECT. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, AND ADDITIONAL TESTS OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.

#### 3. COMPACTION

IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING A LOADER, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TYPE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH-PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE.

COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS A CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACTURE THE SOIL PROFILE THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.

ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE OPTIONAL SAND LAYER. PUMP ANY PONDED WATER BEFORE PREPARING ( ROTOTILLING) BASE.

WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL TO FINAL GRADE.

WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS 12" TO 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.

#### 4. PLANT MATERIAL

RECOMMENDED PLANT MATERIAL FOR BIOSWALE PRACTICES ARE SHOWN ON THE LANDSCAPE PLANS.

#### 5. PLANT INSTALLATION

COMPOST IS A BETTER ORGANIC MATERIAL SOURCE, IS LESS LIKELY TO FLOAT, AND SHOULD BE PLACED IN THE INVERT AND OTHER LOW AREAS. MULCH SHOULD BE PLACED IN SURROUNDING TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.

ROOTSTOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8TH OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION.

TREES SHALL BE BRACED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL.

GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.

THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFEATS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.

#### 6. UNDERDRAINS

UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:

- PIPE- SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTM F 758, TYPE PS 28, OR AASHTO-M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G. PVC OR HDPE)
- PERFORATIONS - IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 3/8" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE WRAPPED WITH A 1/4" (NO. 4 OR 4X4) GALVANIZED HARDWARE CLOTH.
- GRAVEL- THE GRAVEL LAYER (NO. 57 STONE PREFERRED) SHALL BE AT LEAST 3" THICK ABOVE AND BELOW THE UNDERDRAIN.
- THE MAIN COLLECTOR PIPE SHALL BE AT A MINIMUM 0.3% SLOPE.
- A RIGID, NON-PERFORATED OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1,000 SQUARE FEET) TO PROVIDE A CLEAN-OUT PORT AND MONITOR PERFORMANCE OF THE FILTER.
- A 4" LAYER OF PEA GRAVEL (1/4" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES INTO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".

THE MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.3%. OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA) .

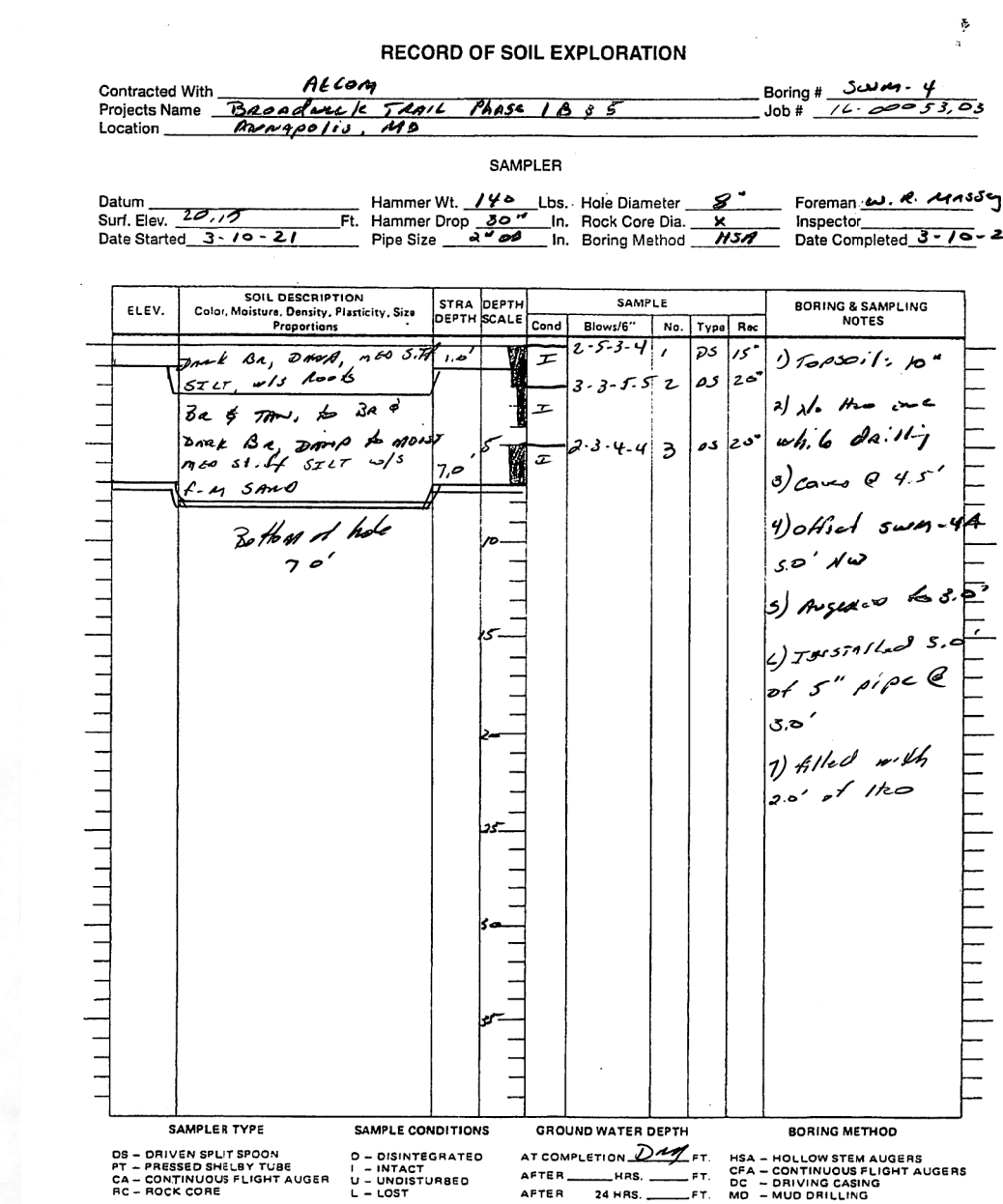
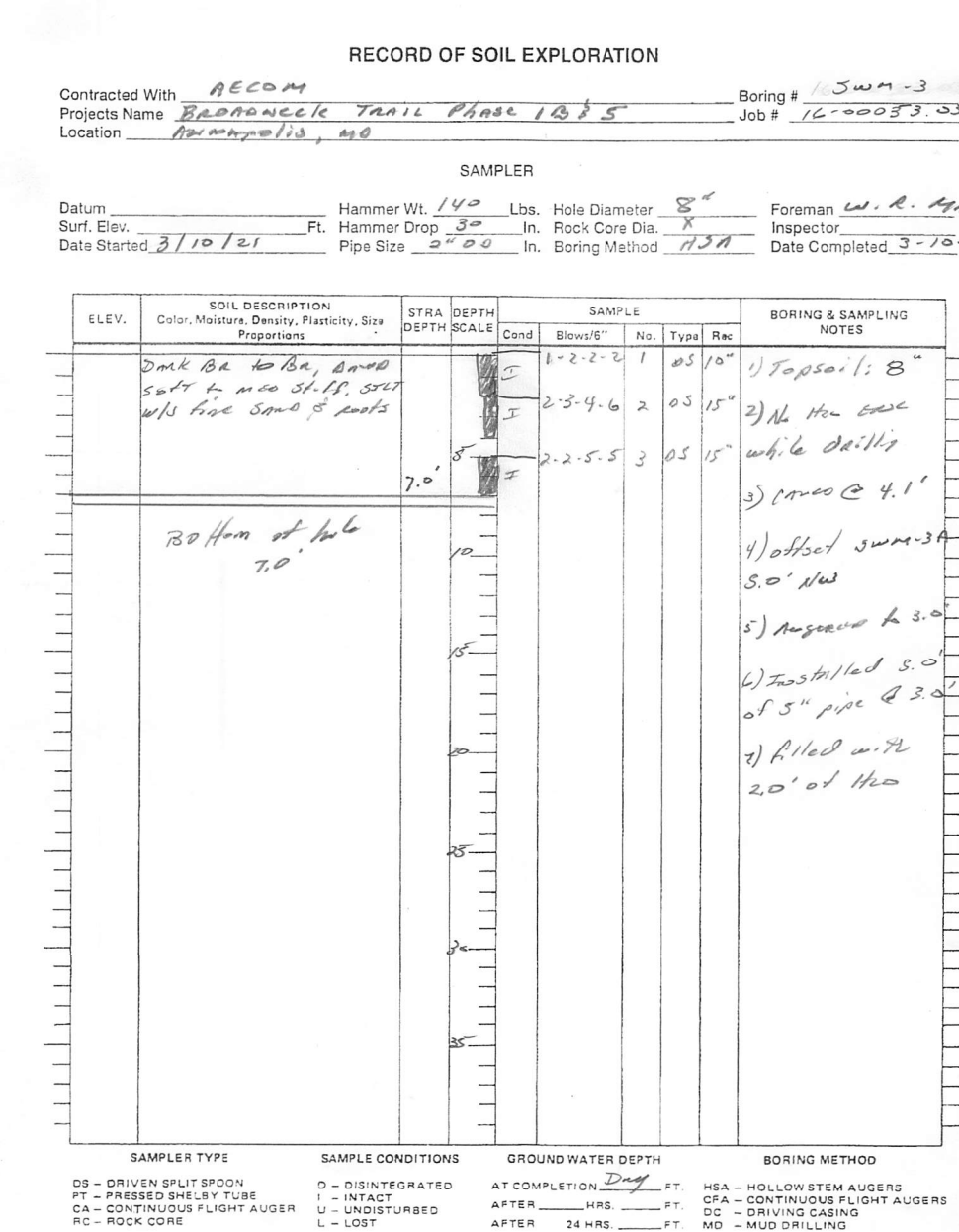
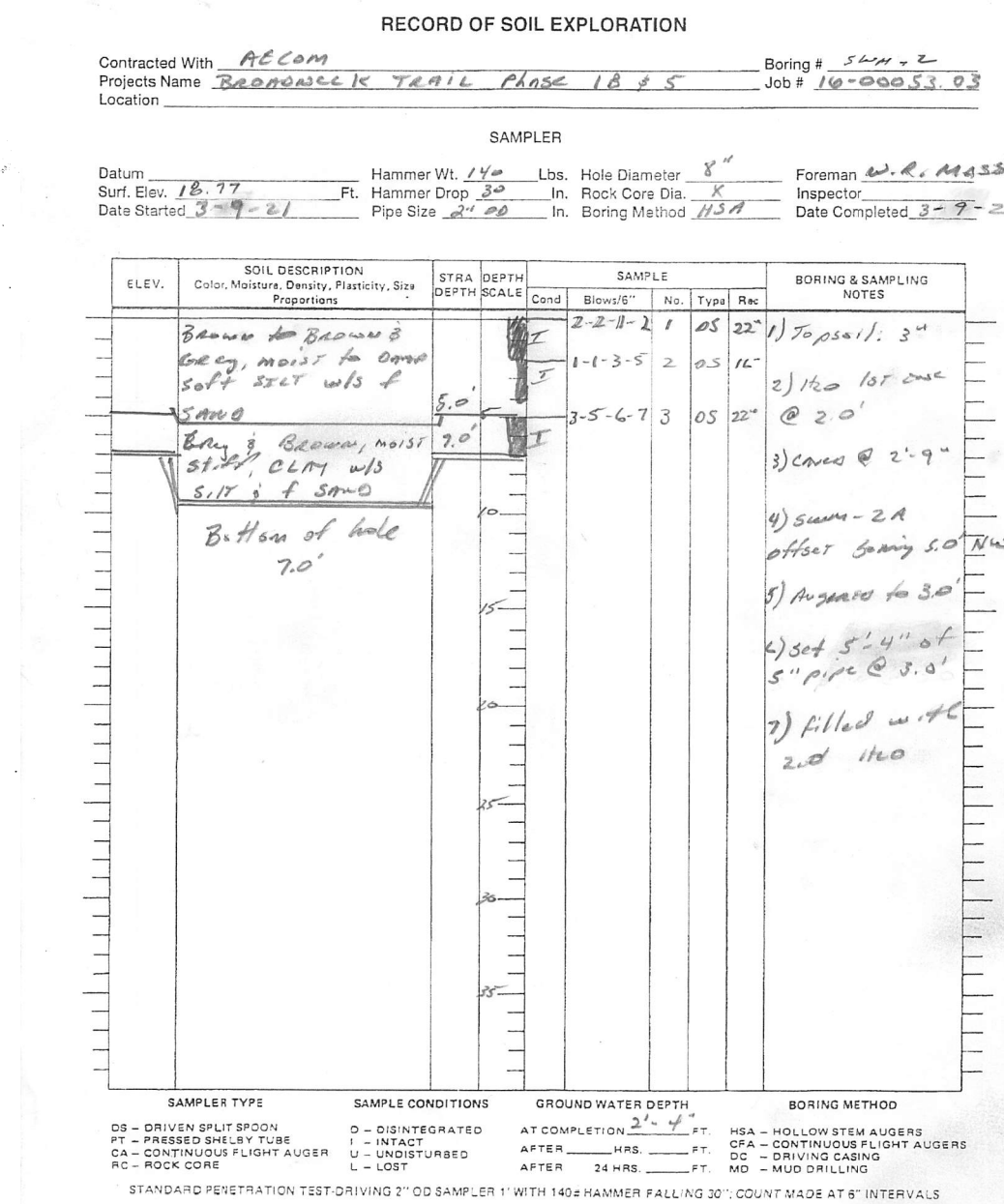
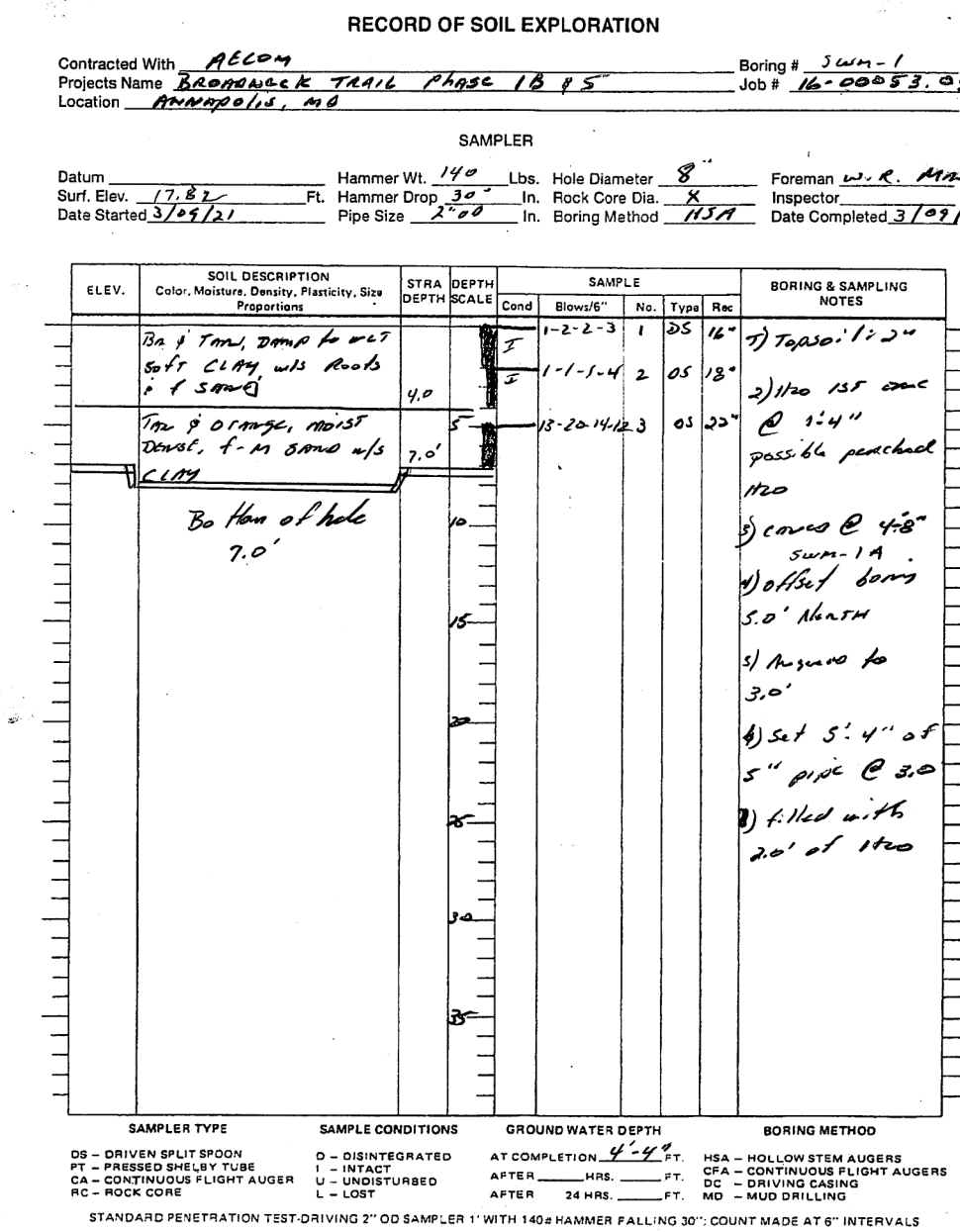
#### 7. MISCELLANEOUS

THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED

Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil [2' to 4' deep]	loamy sand (60 - 65%) & compost (35 - 40%) or sandy loam (30%), coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)		
Mulch	shredded hardwood		aged 6 months, minimum; no pine or wood chips
Pea gravel diaphragm	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curtain drain	ornamental stone: washed cobbles	stone: 2" to 5"	
Geotextile		n/a	PE Type 1 nonwoven
Gravel (underdrains and infiltration berms)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (3/8" to 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes. Perforated pipe shall be wrapped with 1/4-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; $f_c = 3500$ psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) <i>not using previously approved State or local standards</i> requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350.R/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressures); and analysis of potential cracking
Sand	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone (AASHTO) #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

### STORMWATER MANAGEMENT GENERAL NOTES:

- COORDINATES ARE BASED ON THE MARYLAND STATE COORDINATE SYSTEM NAD 83 DATUM PROJECTED BY THE DEPARTMENT OF PUBLIC WORKS OF ANNE ARUNDEL COUNTY, MARYLAND.
- ELEVATIONS ARE BASED ON THE U.S.C. AND G.S. 1929 DATUM PROJECTED BY THE ANNE ARUNDEL COUNTY OFFICE OF PLANNING AND ZONING.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE MOST CURRENT VERSION OF THE ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS STANDARD DETAILS FOR CONSTRUCTION OF STORM DRAINS, ROADS AND STORMWATER MANAGEMENT.
- NECESSARY PRECAUTIONS SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT EXISTING SERVICES AND MAINS. ANYDAMAGE TO EXISTING SERVICES AND MAINS DUE TO THEIR NEGLIGENCE SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
- THE EXISTING UTILITIES AND OBSTRUCTIONS SHOWN ARE FROM THE BEST AVAILABLE RECORDS AND SHALL BE VERIFIED BY THE CONTRACTOR TO HIS OWN SATISFACTION BEFORE STARTING CONSTRUCTION. NEITHER THE OWNER NOR ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS WARRANT OR GUARANTEE THE COMPLETENESS OR THE CORRECTNESS OF THE INFORMATION GIVEN.
- IT SHALL BE DISTINCTLY UNDERSTOOD THAT FAILURE TO SPECIFICALLY MENTION ANY WORK WHICH WOULD NORMALLY BE REQUIRED TO COMPLETE THE PROJECT SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO PERFORM SUCH WORK.
- THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES AT LEAST 5 DAYS PRIOR TO STARTING CONSTRUCTION OF THIS PROJECT.
- THE CONTRACTOR SHALL NOTIFY THE ANNE ARUNDEL COUNTY DEPARTMENT OF INSPECTION AND PERMITS FIVE (5) WORKING DAYS BEFORE STARTING WORK SHOWN ON THE DRAWINGS.
- THE CONTRACTOR SHALL NOTIFY MISS UTILITY@ 1-800-257-7777 FIVE (5) WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE DRAWINGS.
- ALL UTILITY POLES SHALL BE BRACED AS NECESSARY AT CONTRACTOR'S EXPENSE. UTILITY POLES SHALL BE RELOCATED AT THE OWNER'S EXPENSE IN CASES WHERE THEY WILL INTERFERE WITH CONSTRUCTION.
- PIPE ELEVATIONS REFER TO INVERTS UNLESS OTHERWISE NOTED.

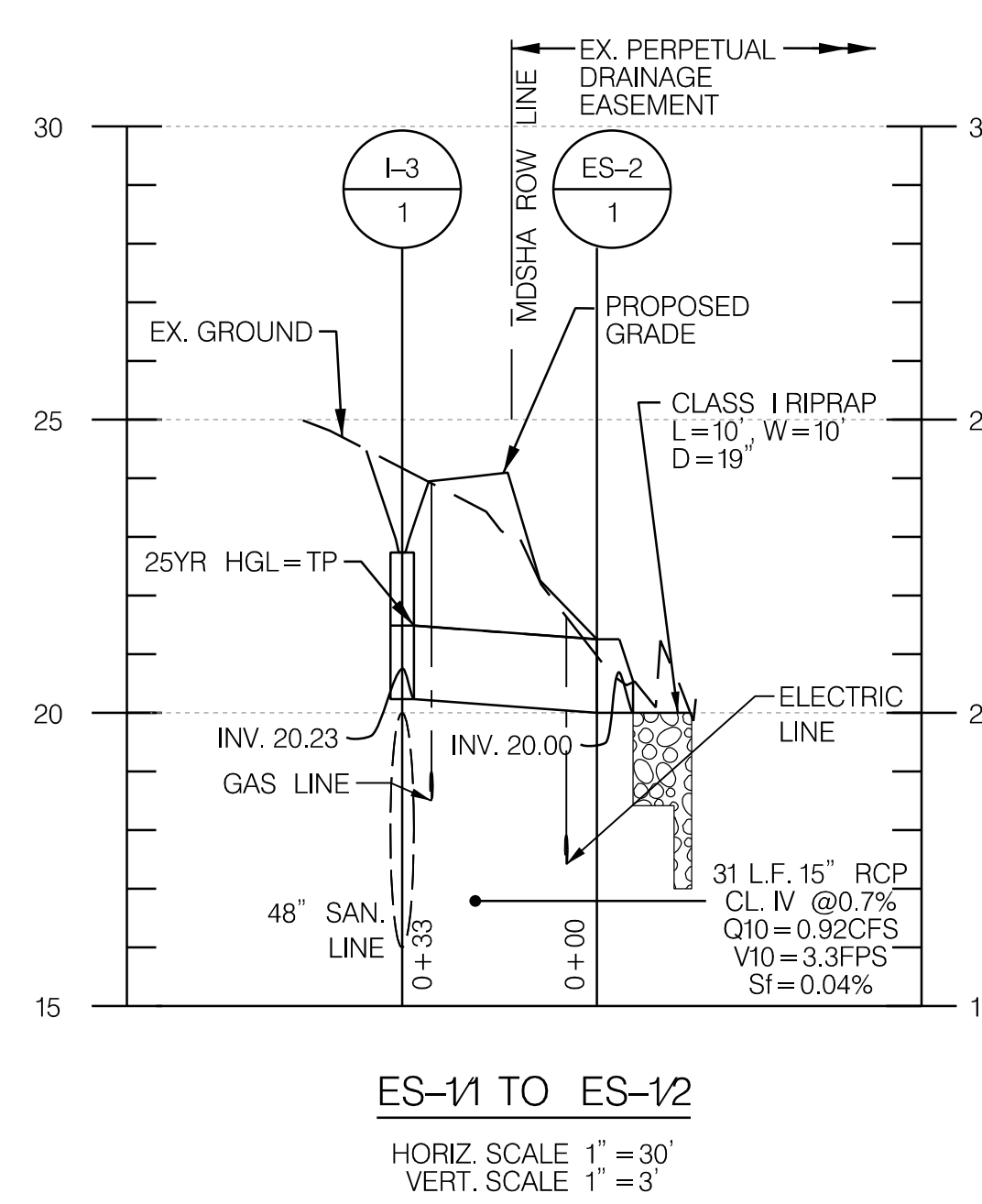


NOTE: SEE SW-02 AND SW-07 FOR SWM BORING LOCATIONS

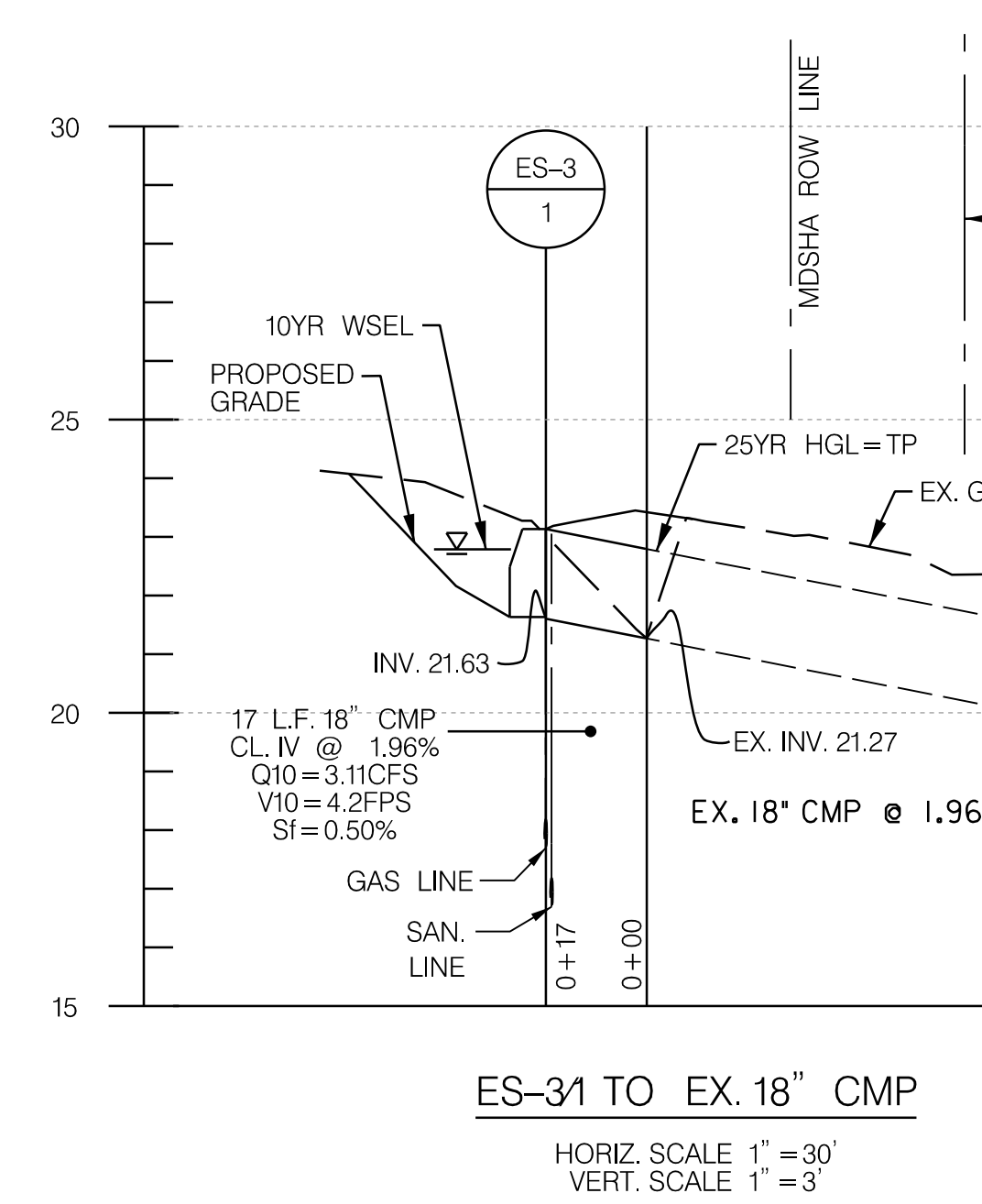
GP# G02018957 DWG. NO.: SWD-02

<p>AECOM 4 NORTH PARK DRIVE SUITE 300 HUNT VALLEY, MARYLAND 21030 PHONE: 410-785-7220 FAX: 410-785-6818</p>	<p>PROFESSIONAL CERTIFICATION</p> <p>"I 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."</p> <p>MD LICENSE NUMBER: 53587</p> <p>EXPIRATION DATE: 12-09-2024</p>		<p>REVISIONS</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>BY</th> <th>DATE</th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>				NO.	DESCRIPTION	BY	DATE									<p>ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS</p> <table border="1"> <thead> <tr> <th>APPROVED</th> <th>DATE</th> <th>APPROVED</th> <th>DATE</th> <th>SCALE: AS NOTED</th> <th rowspan="2">DRAWN BY: DMT</th> <th rowspan="2">CHECKED BY: DMT</th> <th rowspan="2">SHEET NO. 65 OF 116</th> <th rowspan="2">PROJECT NO. P504100</th> <th rowspan="2">CONTRACT NO. P504105</th> </tr> </thead> <tbody> <tr> <td></td> <td>11/20/2023</td> <td></td> <td>11/17/2023</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CHIEF ENGINEER</td> <td></td> <td>PROJECT MANAGER</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>APPROVED</td> <td>DATE</td> <td>APPROVED</td> <td>DATE</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>11/17/2023</td> <td></td> <td>11/17/2023</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>ASSISTANT CHIEF ENGINEER</td> <td></td> <td>CHIEF, RIGHT OF WAY</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				APPROVED	DATE	APPROVED	DATE	SCALE: AS NOTED	DRAWN BY: DMT	CHECKED BY: DMT	SHEET NO. 65 OF 116	PROJECT NO. P504100	CONTRACT NO. P504105		11/20/2023		11/17/2023							CHIEF ENGINEER		PROJECT MANAGER								APPROVED	DATE	APPROVED	DATE								11/17/2023		11/17/2023							ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY							
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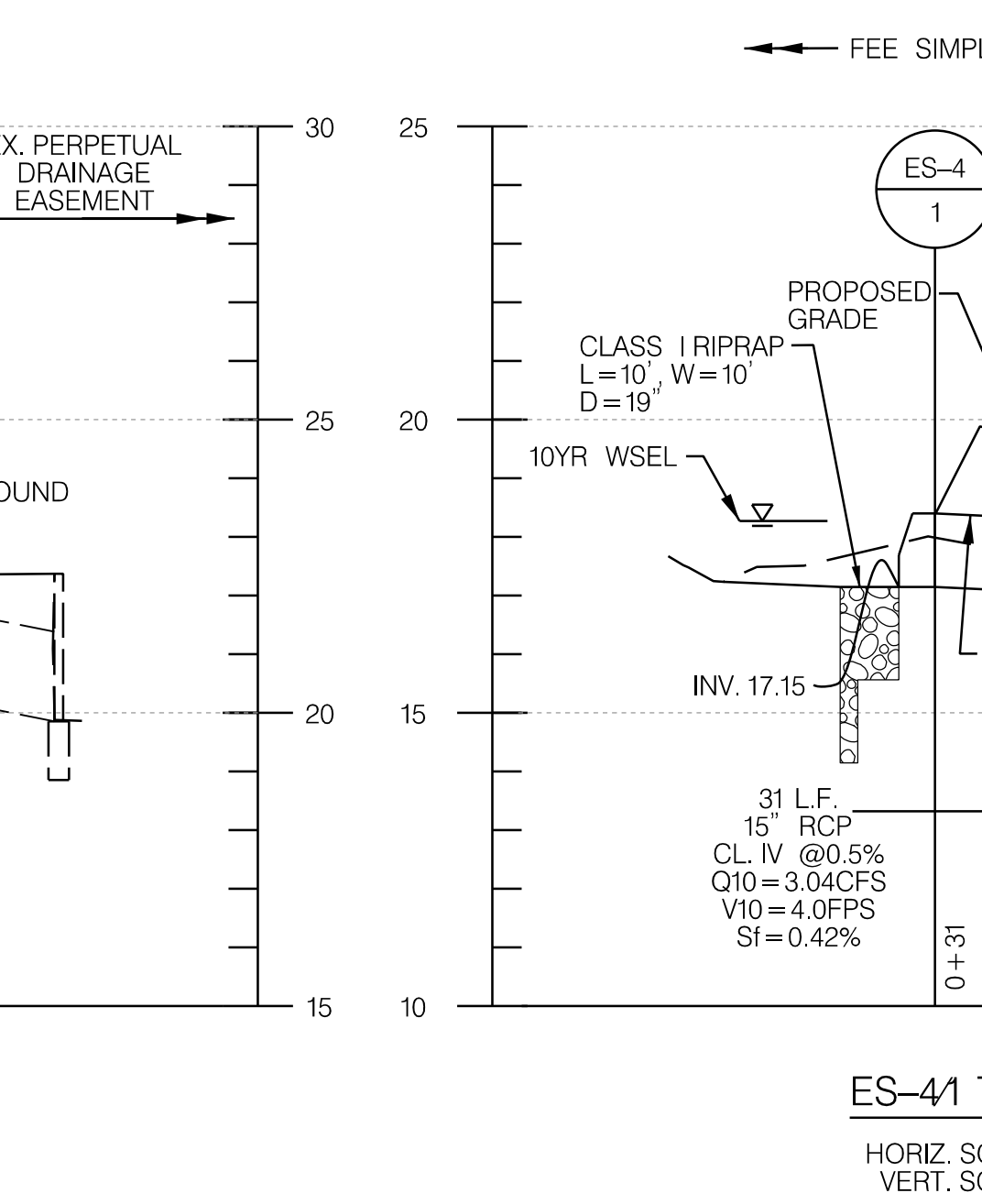




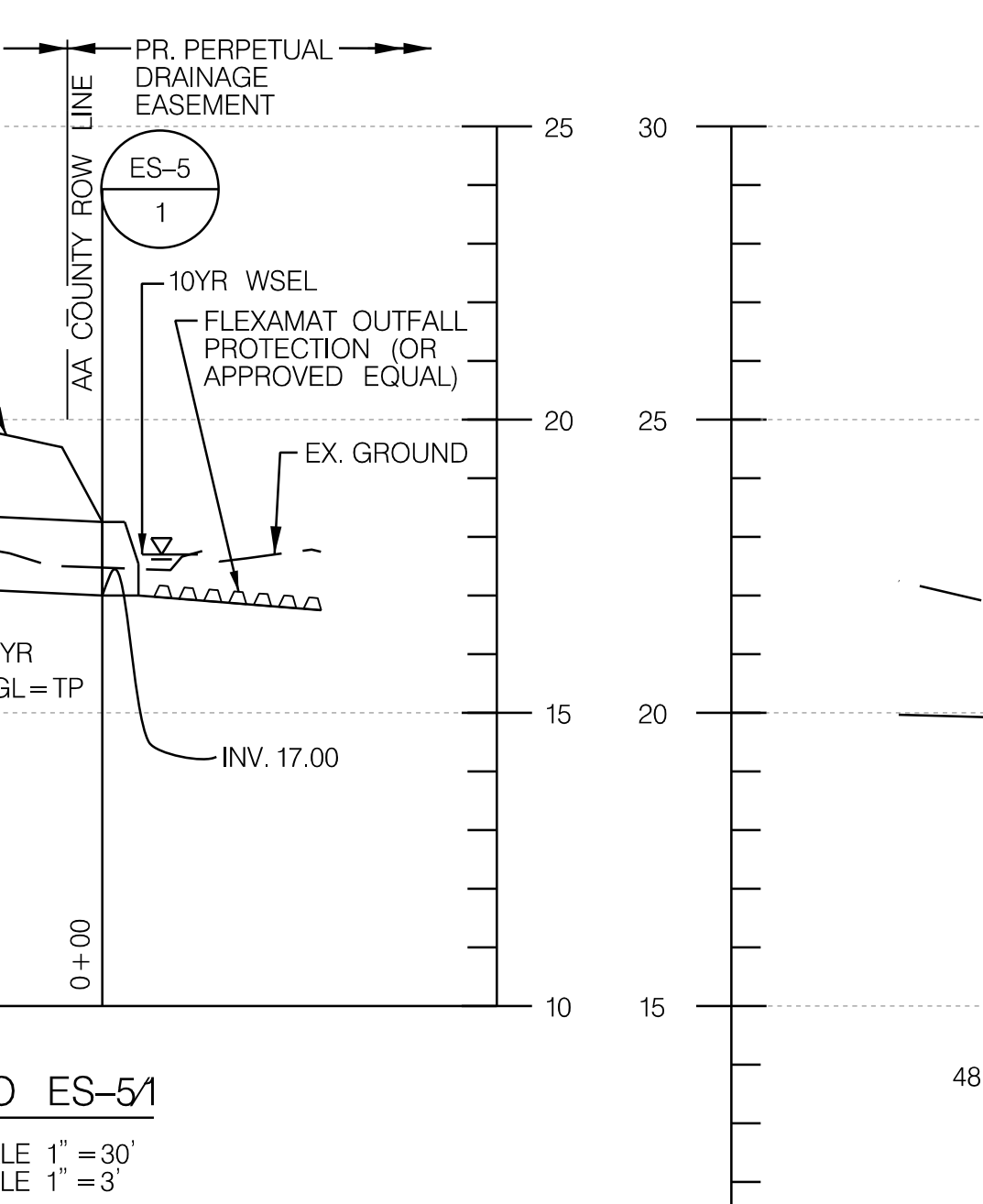
**ES-11 TO ES-12**  
HORIZ. SCALE 1" = 30'  
VERT. SCALE 1" = 3'



**ES-31 TO EX. 18" CMP**  
HORIZ. SCALE 1" = 30'  
VERT. SCALE 1" = 3'

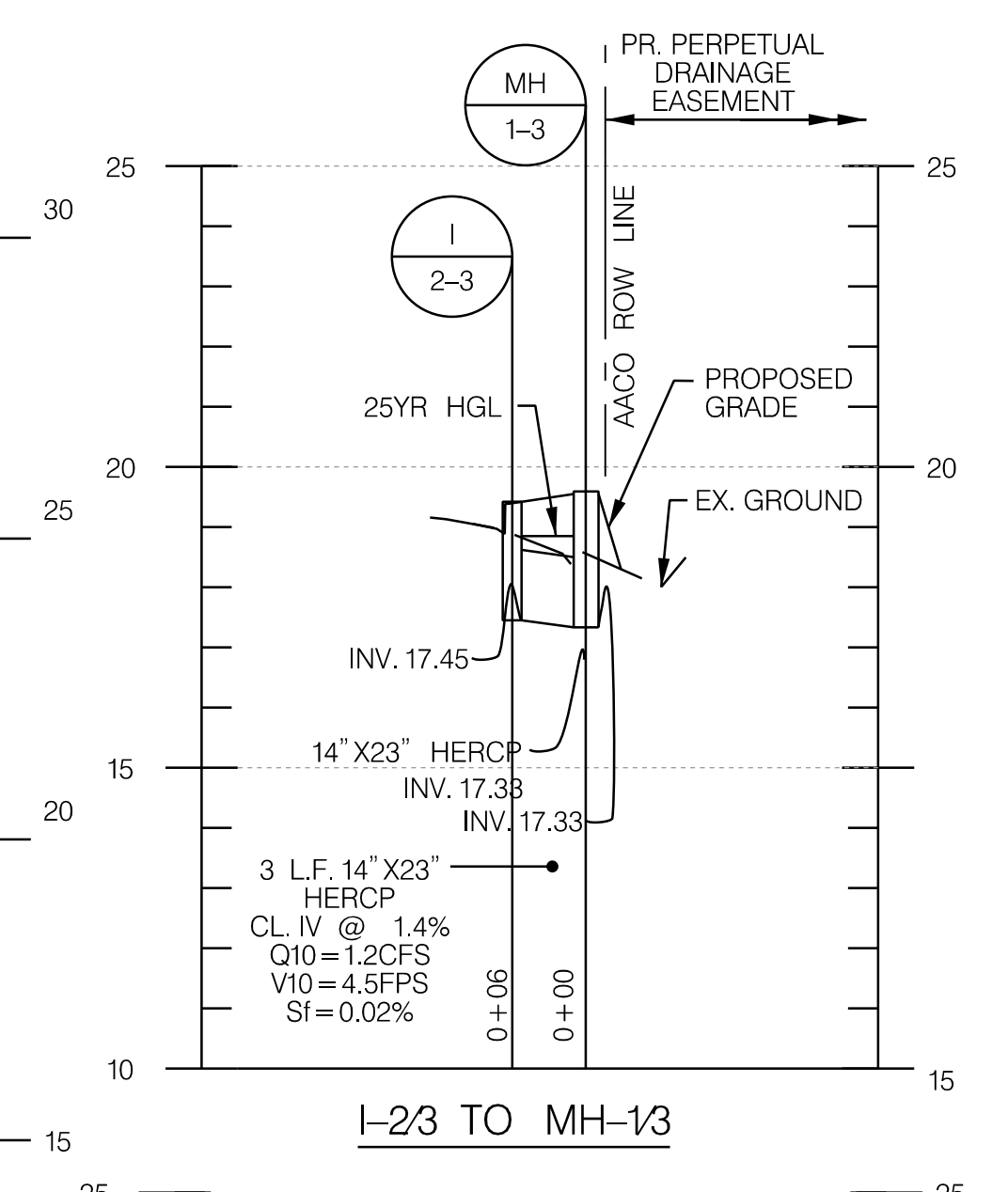


**ES-41 TO ES-51**  
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VERT. SCALE 1" = 3'

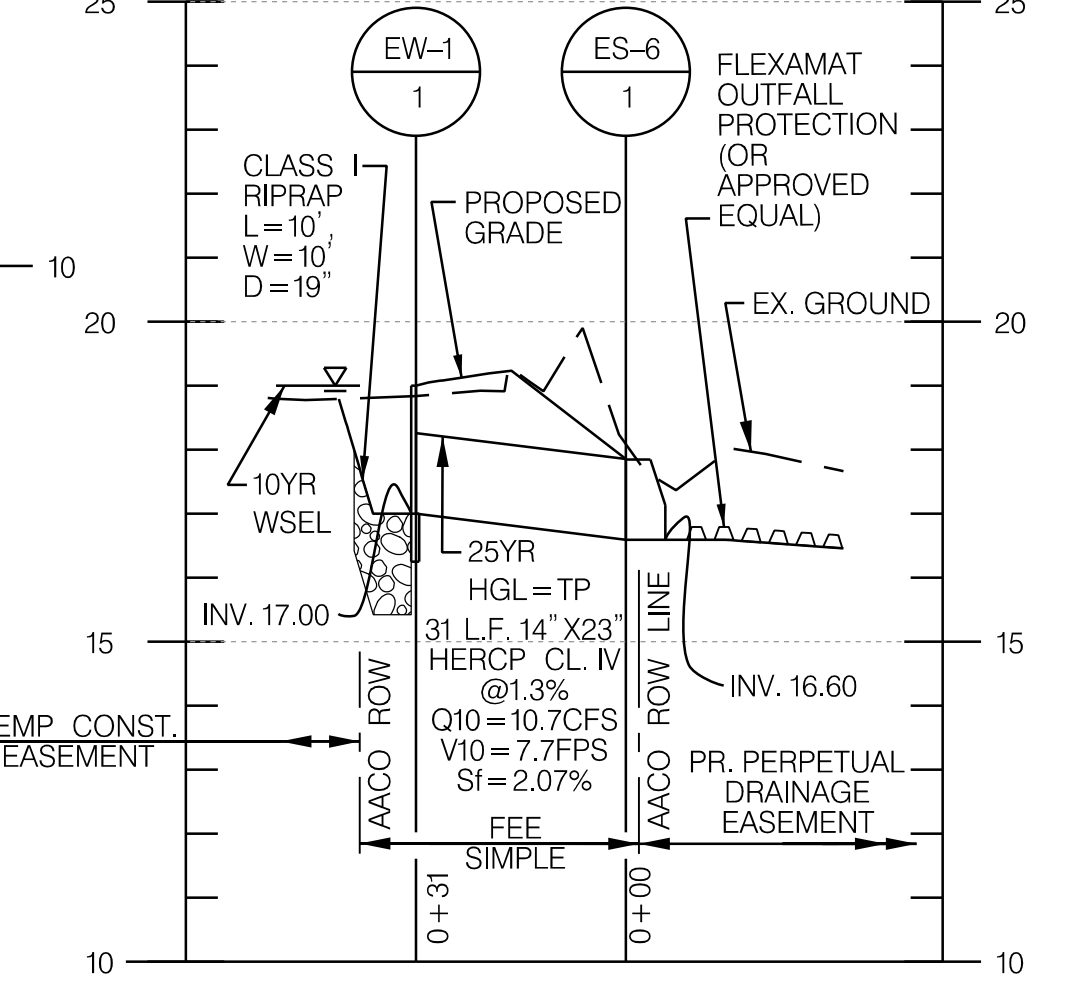


**I-1 TO EW-3-3**  
HORIZ. SCALE 1" = 30'  
VERT. SCALE 1" = 3'

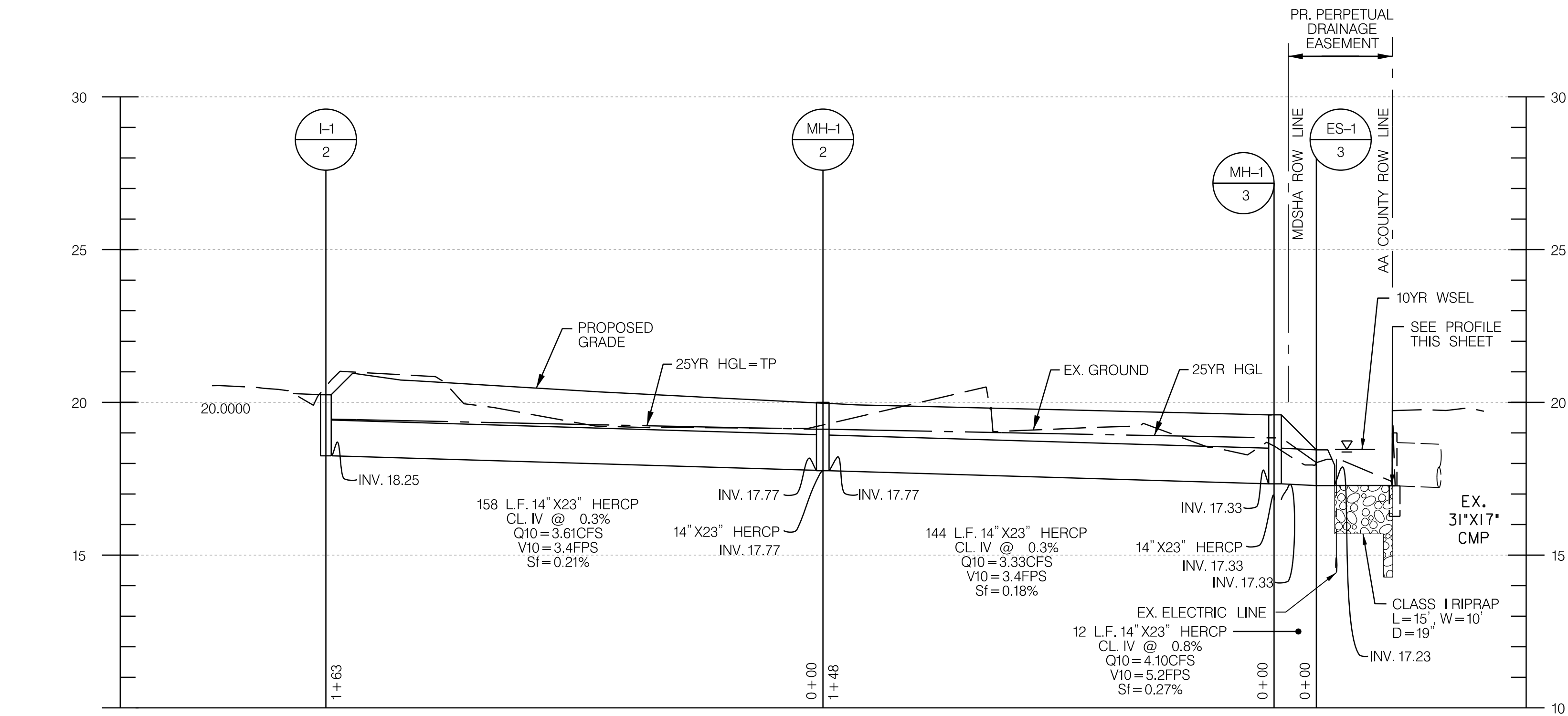
NOTE: UTILITY LOCATION ARE APPROXIMATE. TEST PIT ALL UTILITY CROSSINGS PRIOR TO STORM DRAIN PURCHASING AND INSTALLATION.



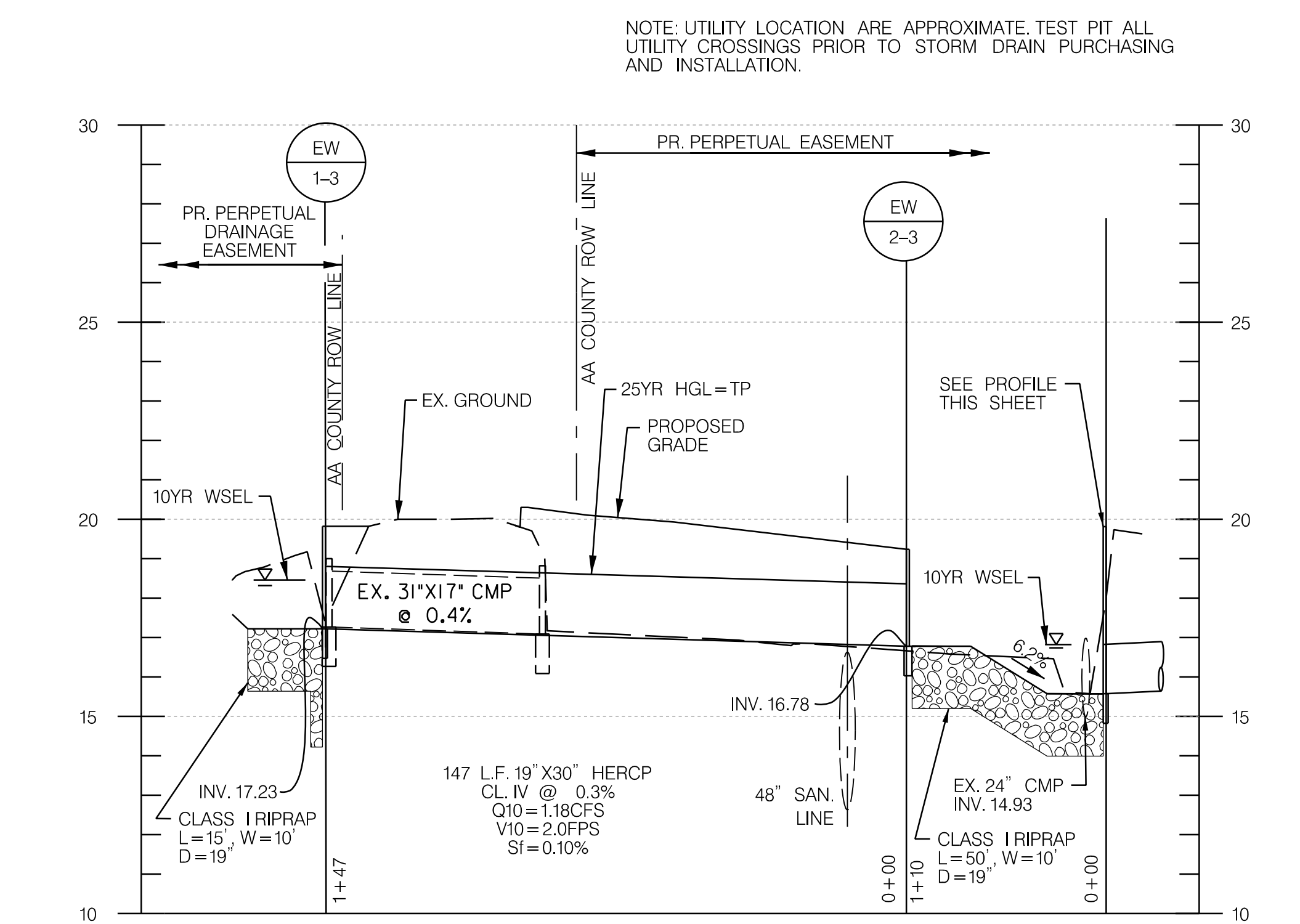
**I-23 TO MH-1/3**



**EW-1 TO ES-61**  
HORIZ. SCALE 1" = 30'  
VERT. SCALE 1" = 3'

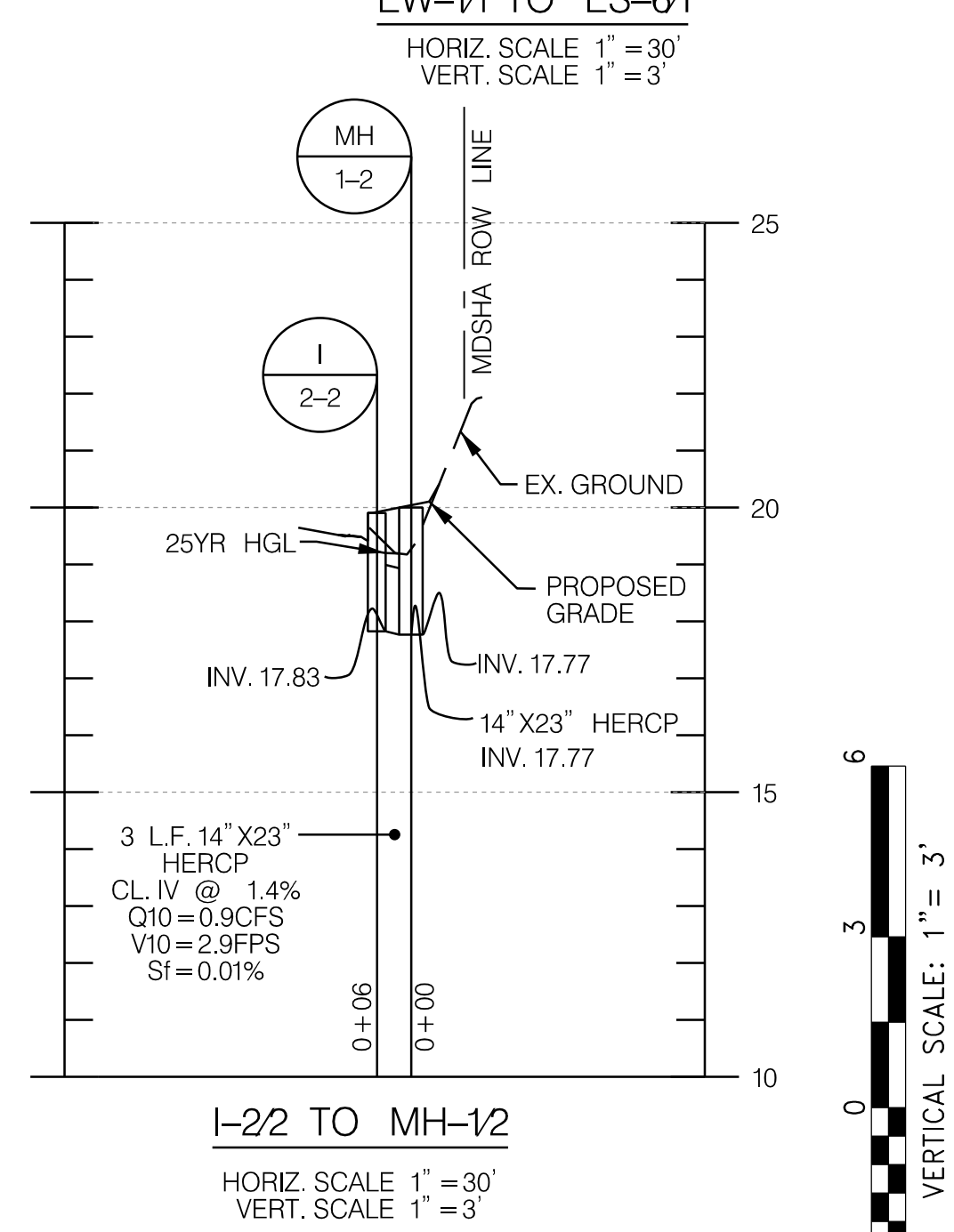


**I-12 TO ES-13**  
HORIZ. SCALE 1" = 30'  
VERT. SCALE 1" = 3'



**EW-13 TO EW-23**  
HORIZ. SCALE 1" = 30'  
VERT. SCALE 1" = 3'

NOTE: UTILITY LOCATION ARE APPROXIMATE. TEST PIT ALL UTILITY CROSSINGS PRIOR TO STORM DRAIN PURCHASING AND INSTALLATION.

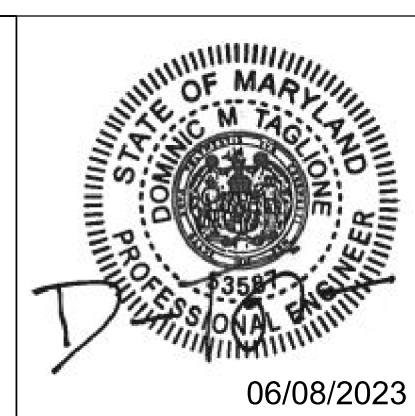


**I-22 TO MH-12**  
HORIZ. SCALE 1" = 30'  
VERT. SCALE 1" = 3'



**AECOM**  
4 NORTH PARK DRIVE  
SUITE 300  
HUNT VALLEY, MARYLAND 21030  
PHONE: 410-785-7220  
FAX: 410-785-6818

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EXPIRATION DATE: 12-09-2024



REVISIONS			
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APPROVED	DATE	APPROVED	DATE
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ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY	

GP# G02018957      DWG. NO.: SDP-01

SCALE: AS NOTED

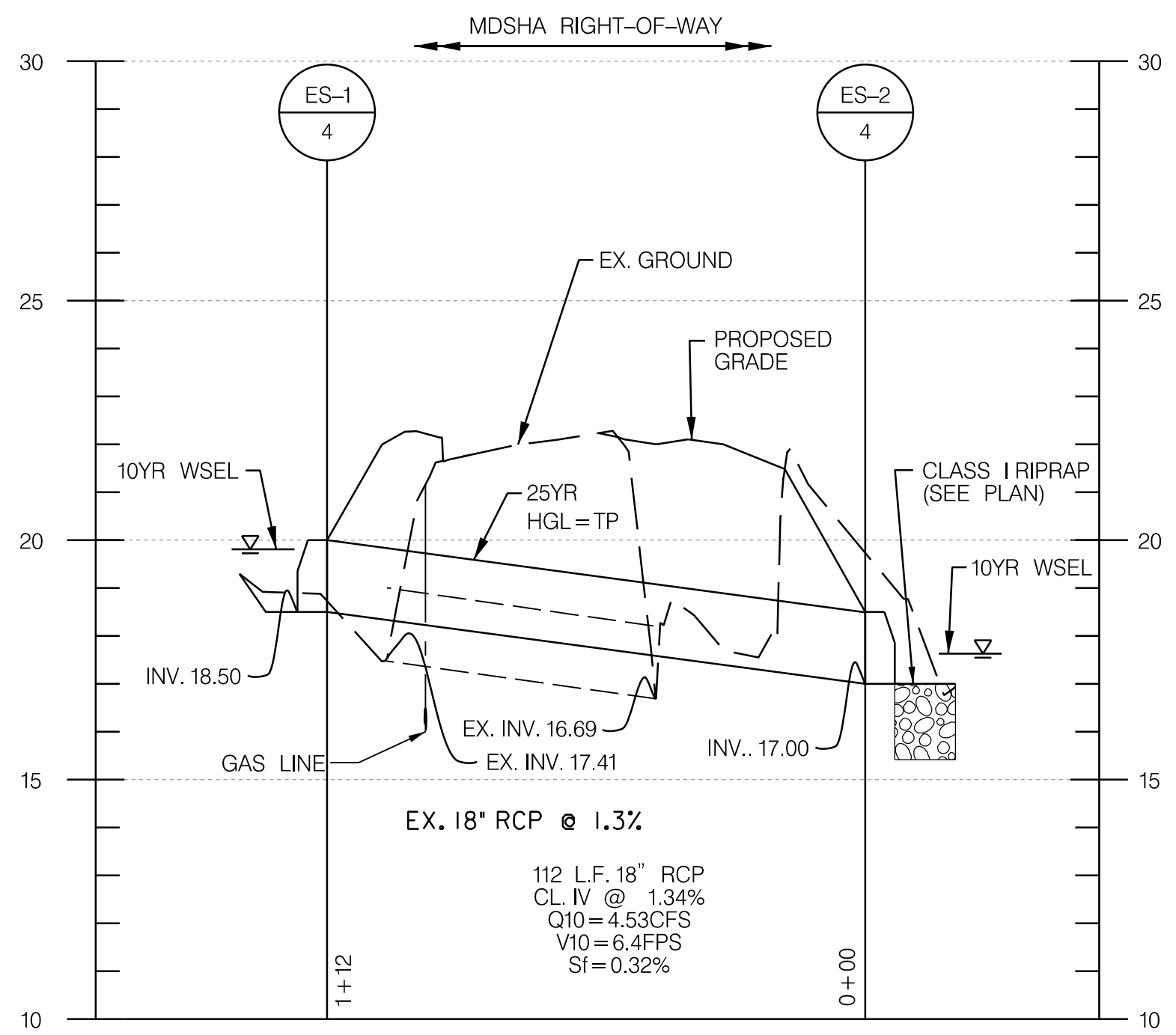
BROADNECK PENINSULA TRAIL PHASE IB & V

SHEET NO. 66 OF 116

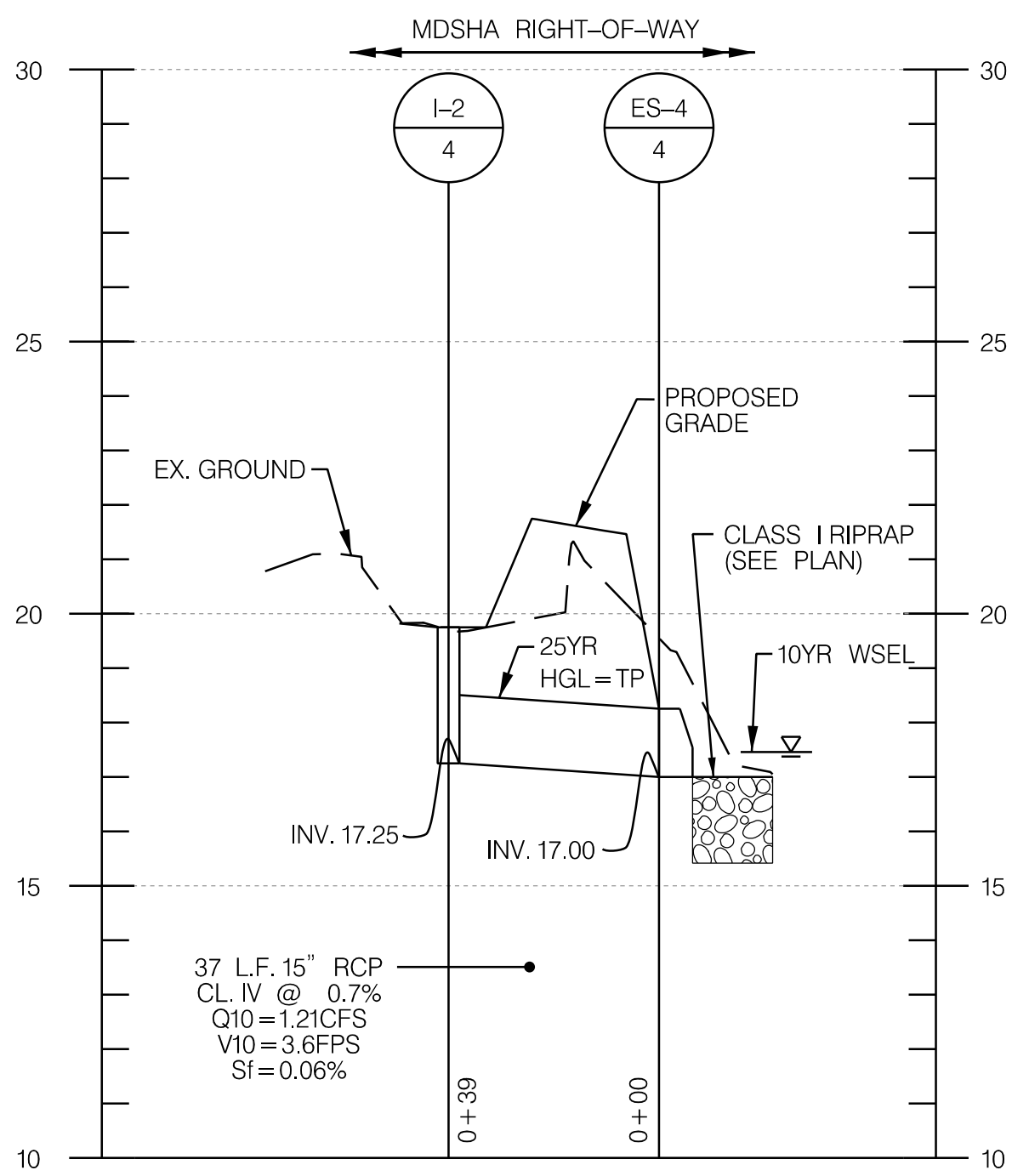
**STORMDRAIN PROFILES**

PROJECT NO. P504100  
CONTRACT NO. P504105

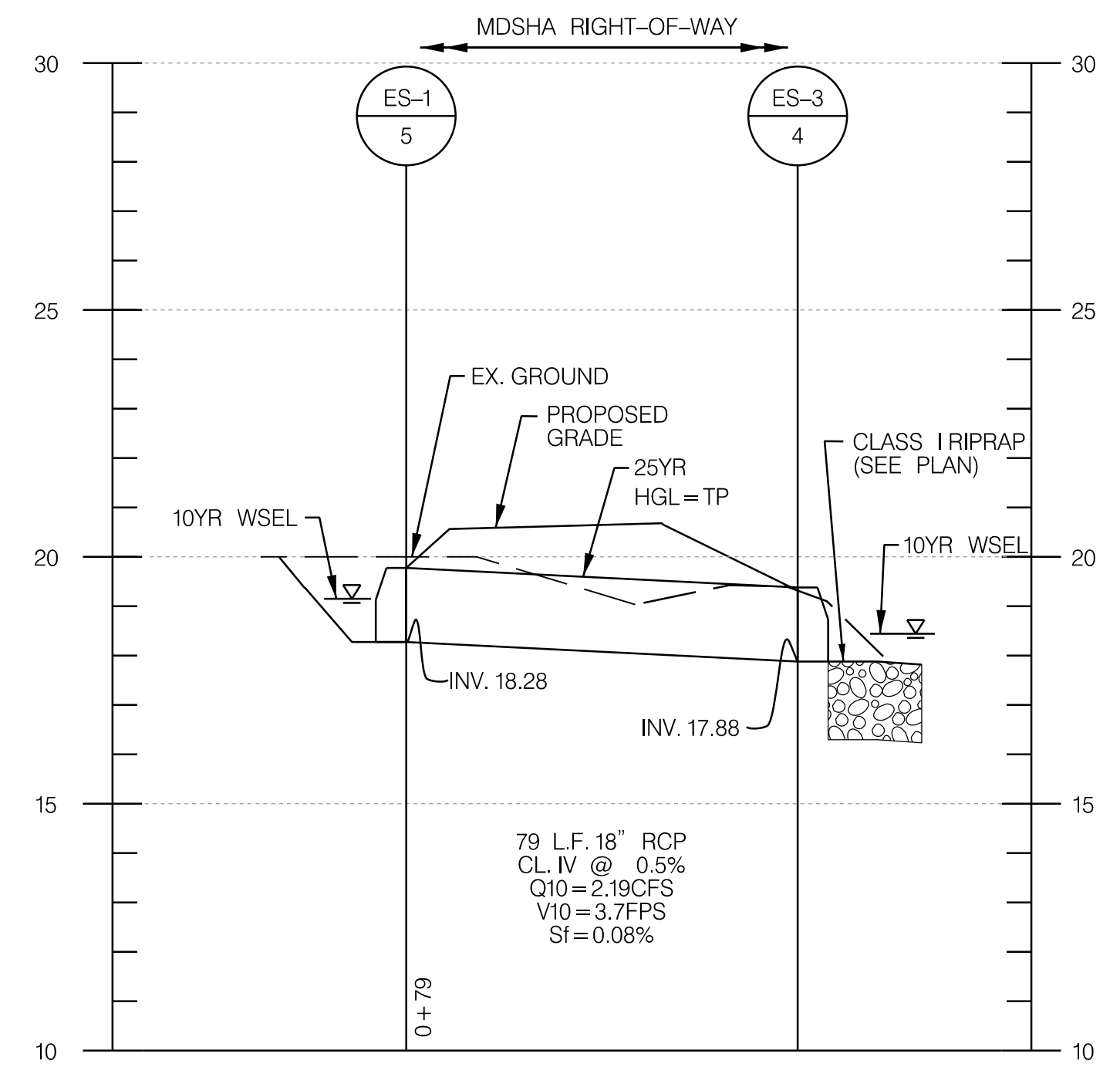




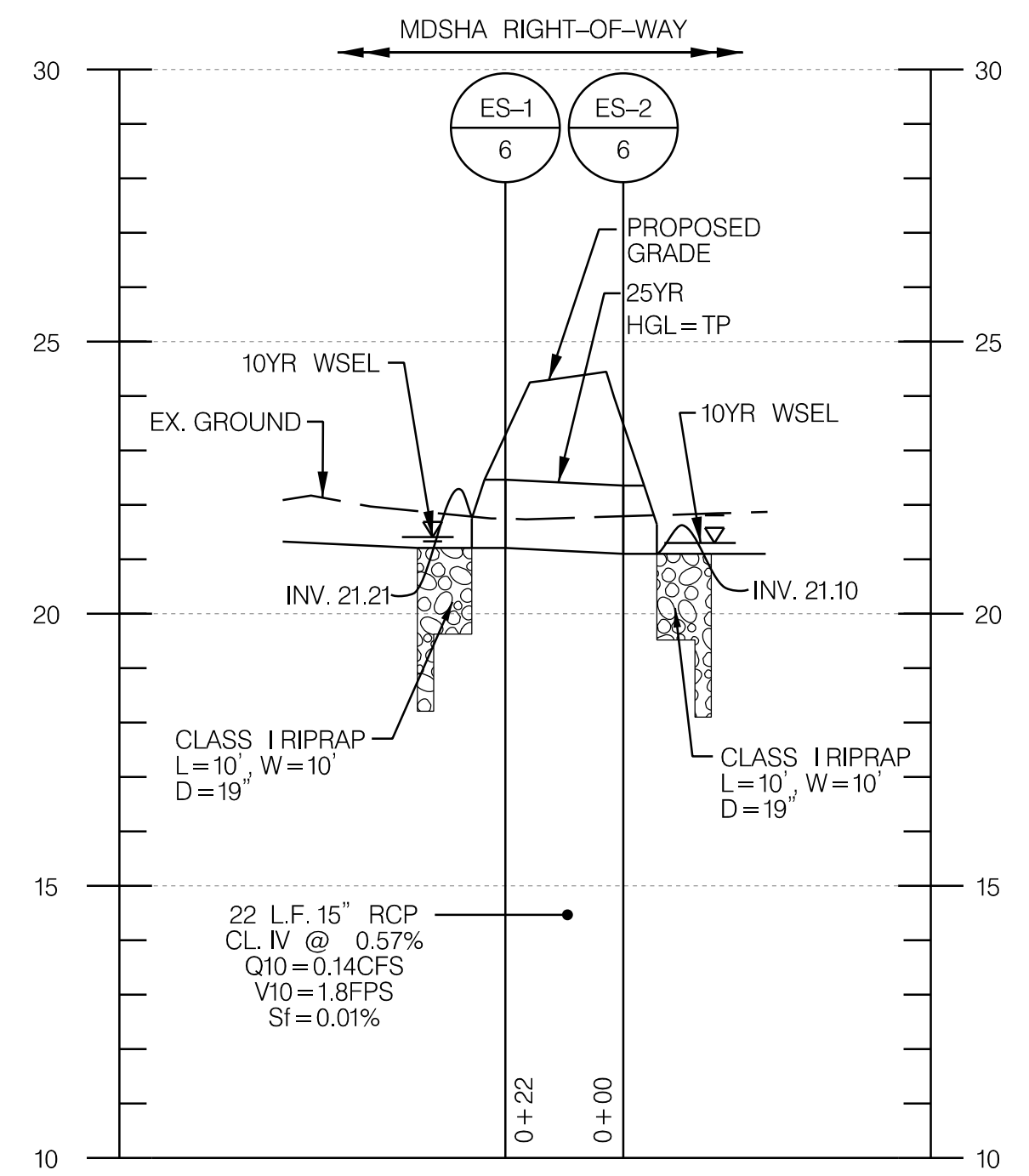
**ES-14 TO ES-24**  
 HORIZ SCALE 1" = 30'  
 VERT. SCALE 1" = 3'



**I-2/4 TO ES-4/4**  
 HORIZ SCALE 1" = 30'  
 VERT. SCALE 1" = 3'

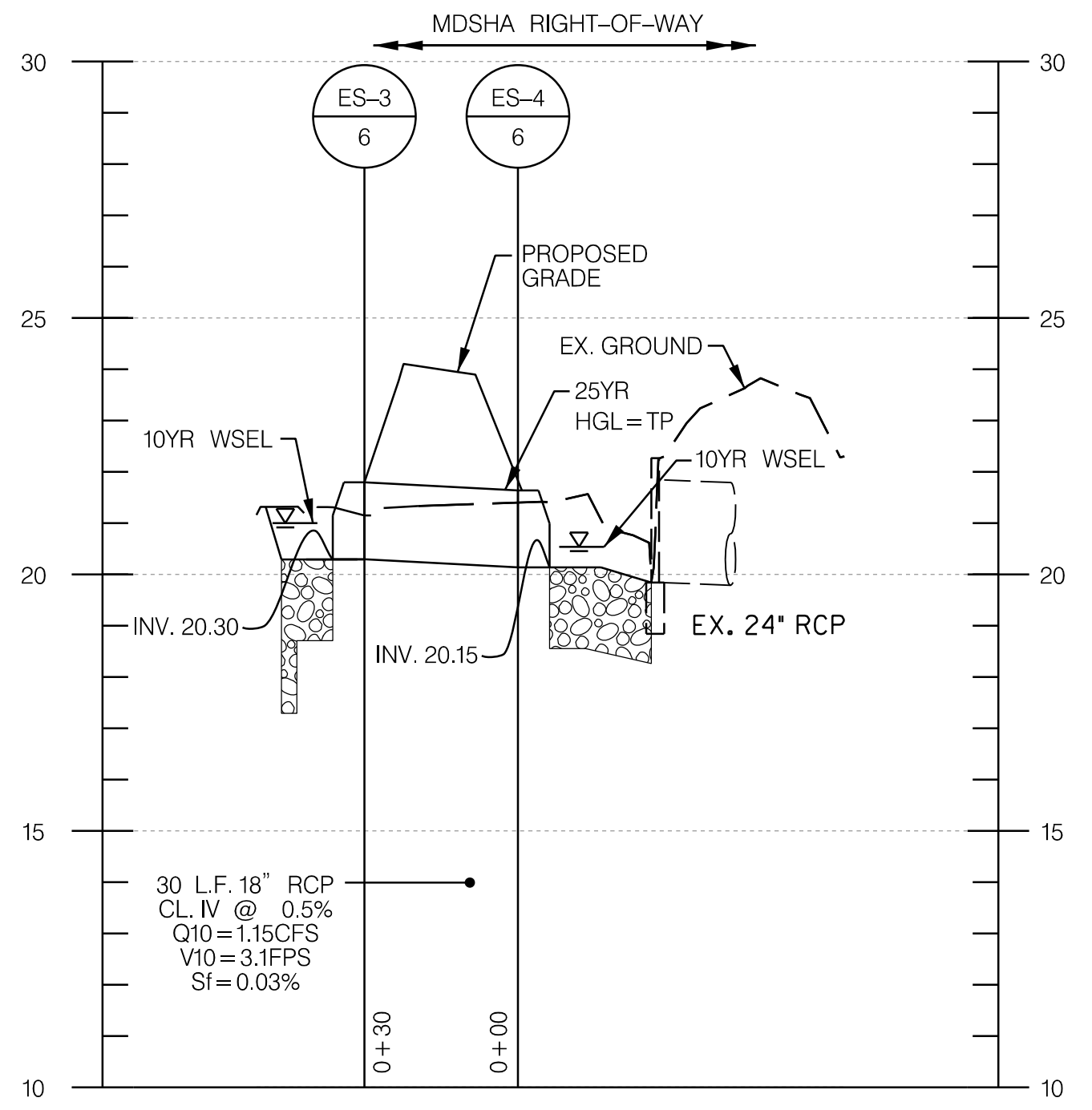


**I-15 TO ES-3/4**  
 HORIZ SCALE 1" = 30'  
 VERT. SCALE 1" = 3'

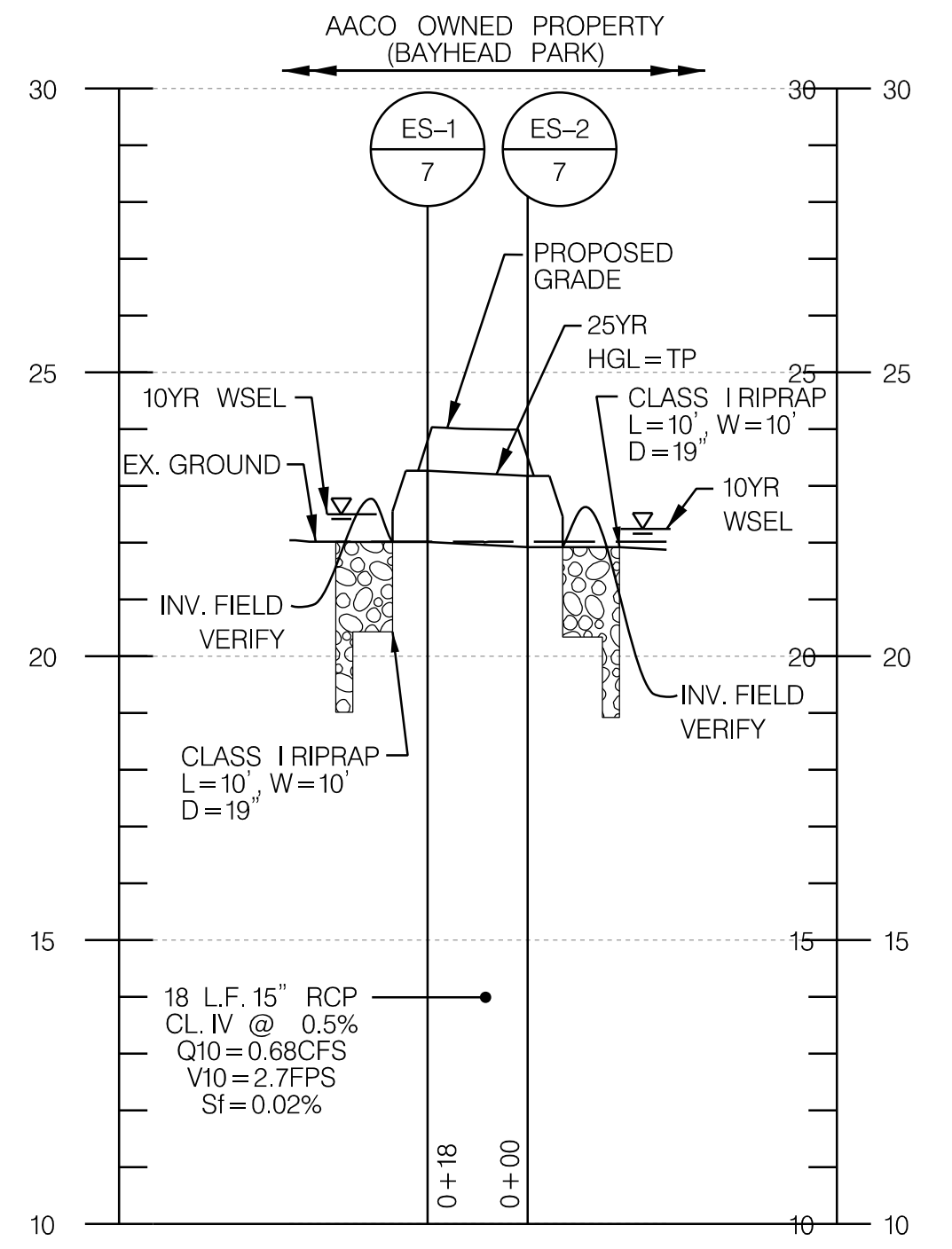


**ES-36 TO ES-4/6**  
 HORIZ SCALE 1" = 30'  
 VERT. SCALE 1" = 3'

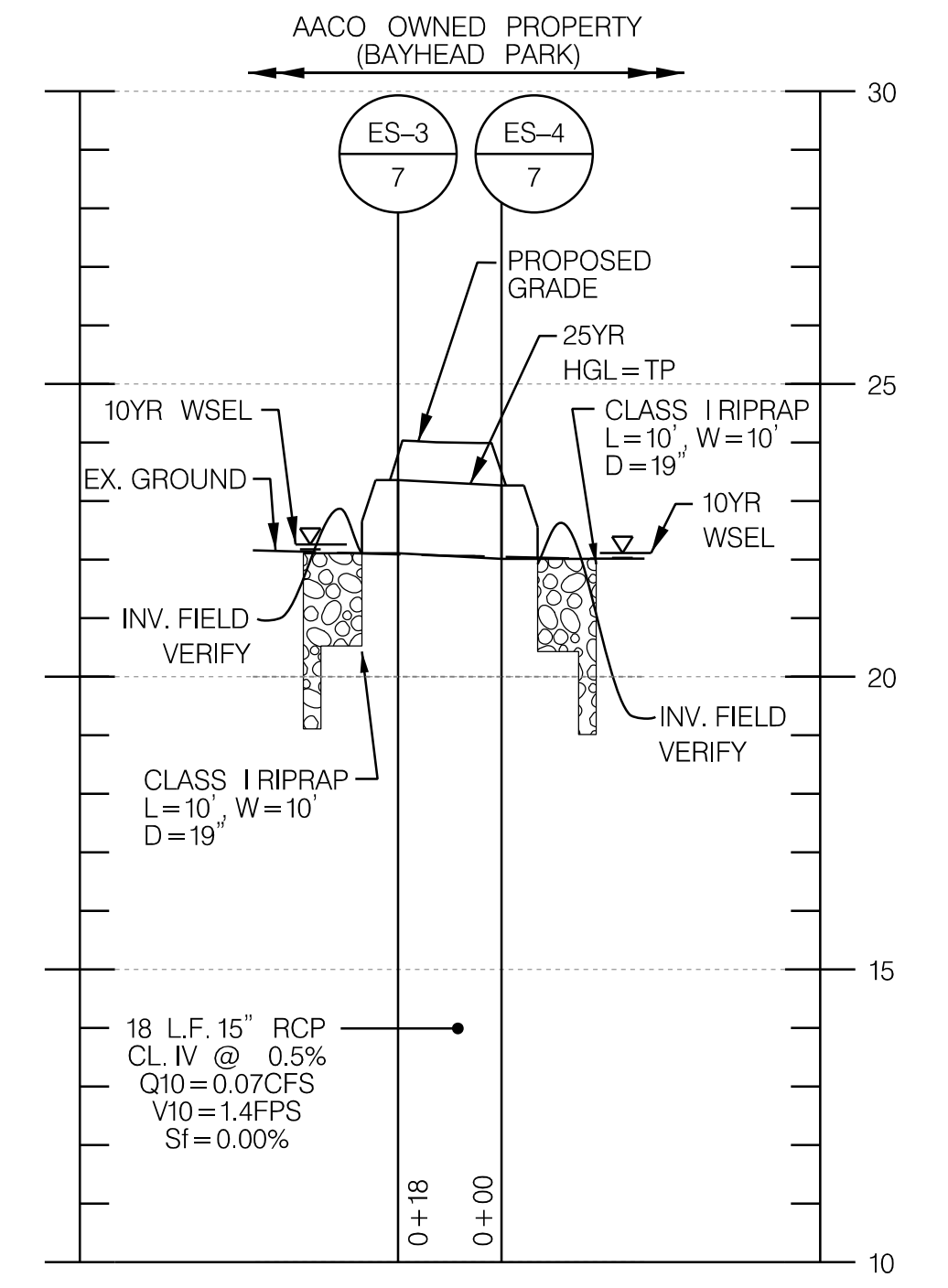
NOTE: UTILITY LOCATION ARE APPROXIMATE. TEST PIT ALL UTILITY CROSSINGS PRIOR TO STORM DRAIN PURCHASING AND INSTALLATION.



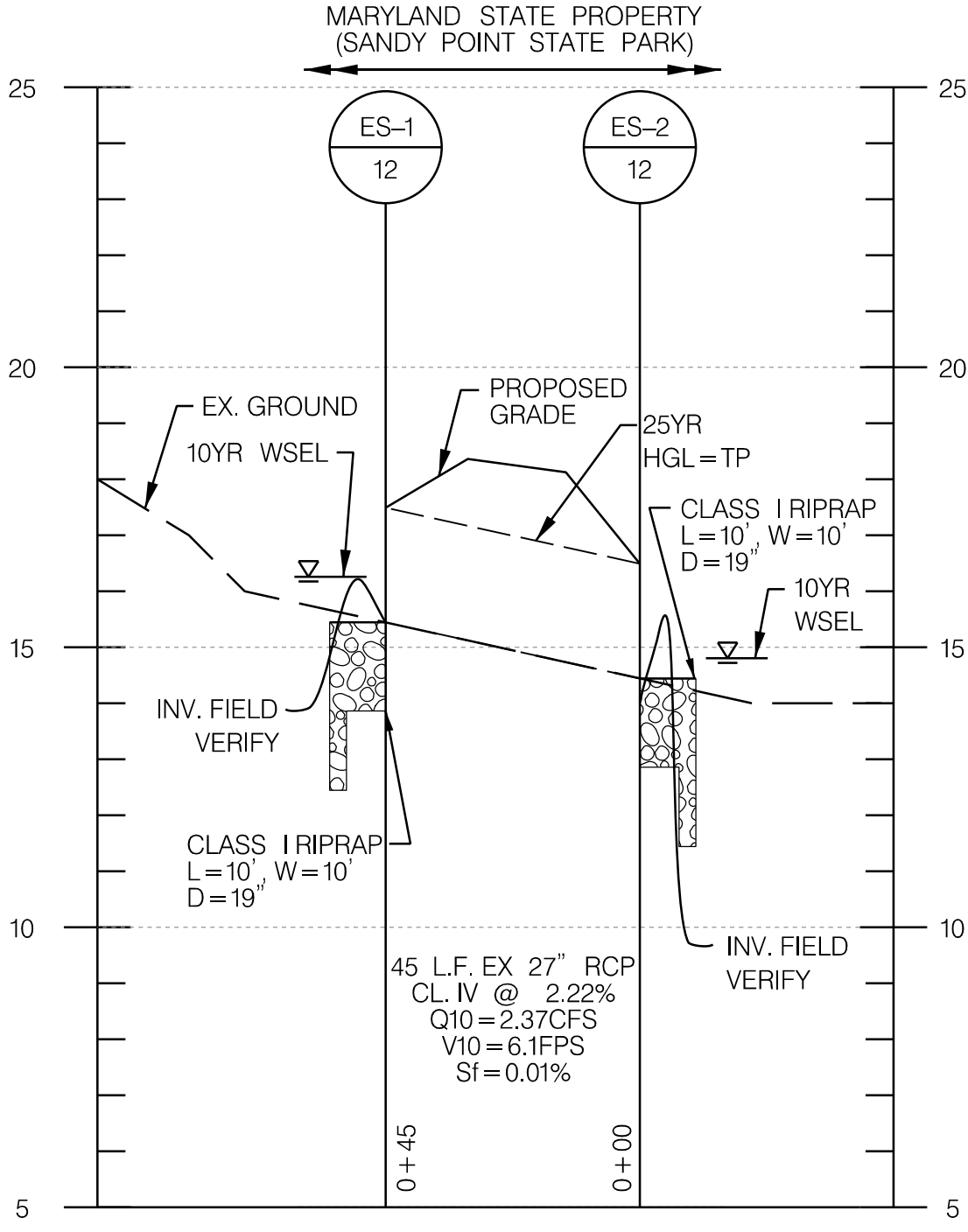
**ES-36 TO ES-4/6**  
 HORIZ SCALE 1" = 30'  
 VERT. SCALE 1" = 3'



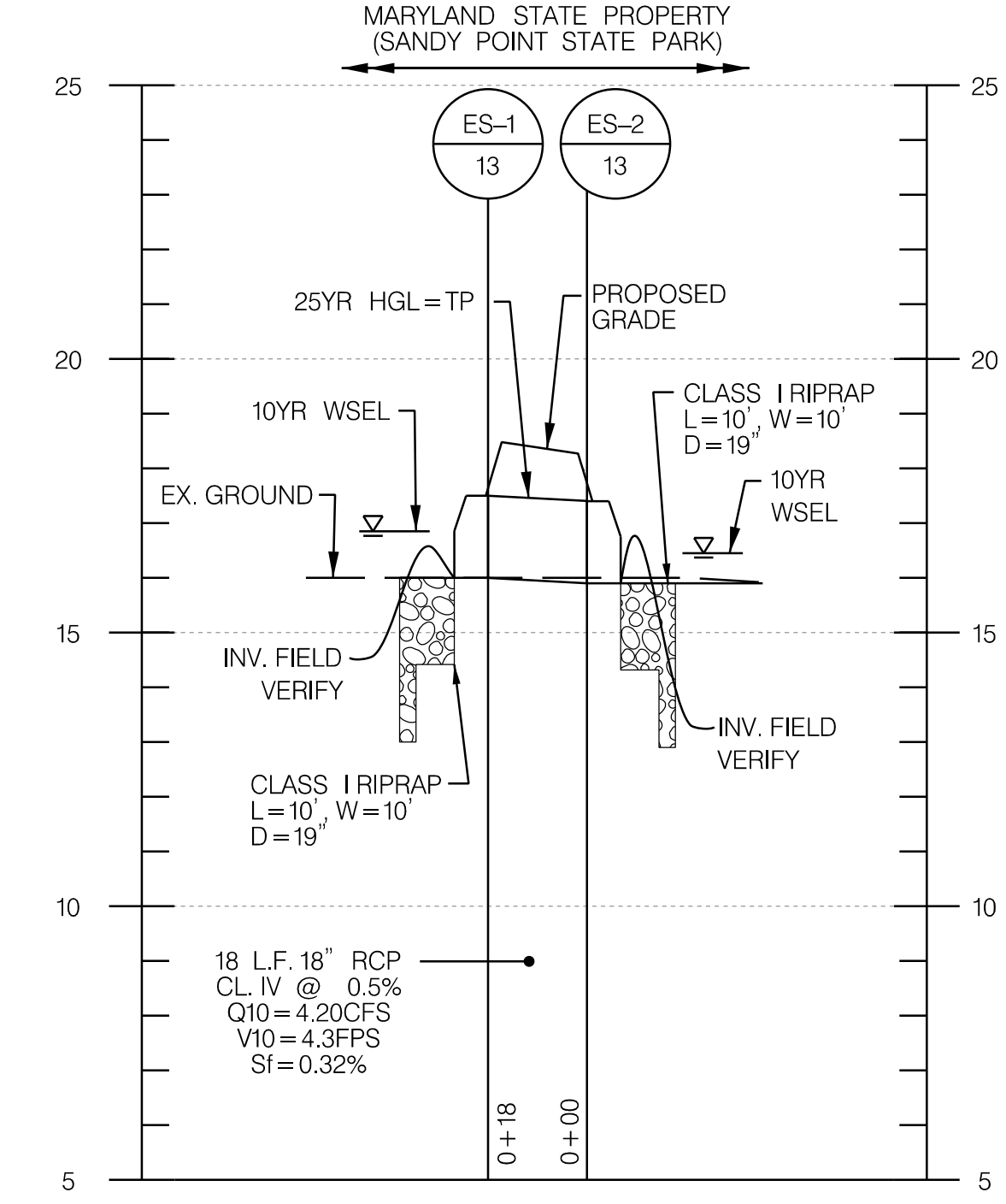
**ES-17 TO ES-2/7**  
 HORIZ SCALE 1" = 30'  
 VERT. SCALE 1" = 3'



**ES-37 TO ES-4/7**  
 HORIZ SCALE 1" = 30'  
 VERT. SCALE 1" = 3'



**ES-1/2 TO ES-2/2**  
 HORIZ SCALE 1" = 30'  
 VERT. SCALE 1" = 3'

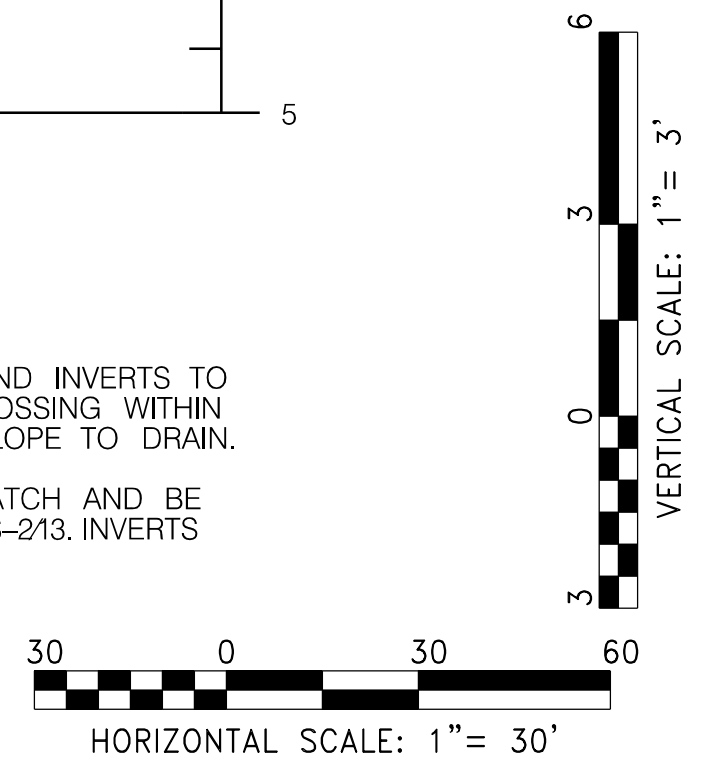


**ES-1/3 TO ES-2/3**  
 HORIZ SCALE 1" = 30'  
 VERT. SCALE 1" = 3'

NOTE: LOCATION OF PROPOSED STRUCTURES AND INVERTS TO BE FIELD VERIFIED WITH EXISTING DITCH ALONG LOG INN ROAD. ENSURE 0.5% MIN. SLOPE TO DRAIN.

NOTE: LOCATION OF PROPOSED STRUCTURES AND INVERTS TO BE FIELD VERIFIED WITH EXISTING STREAM CROSSING WITHIN SANDY POINT STATE PARK. ENSURE 0.5% MIN. SLOPE TO DRAIN.

PIPE PROFILE FOR ES-313 TO ES-314 SHALL MATCH AND BE INSTALLED 5 FEET UPSTREAM OF ES-1/3 TO ES-2/3. INVERTS AND LOCATION TO BE FIELD VERIFY.



**AECOM**  
 4 NORTH PARK DRIVE  
 SUITE 300  
 HUNT VALLEY, MARYLAND 21030  
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 FAX: 410-785-6818

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 MD LICENSE NUMBER: 53587  
 EXPIRATION DATE: 12-09-2024



REVISIONS			
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**ANNE ARUNDEL COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**

APPROVED	DATE	APPROVED	DATE
<i>[Signature]</i>	11/20/2023   08:59 EST	<i>[Signature]</i>	11/17/2023   08:00 EST
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
<i>[Signature]</i>	11/17/2023   11:56 EST	<i>[Signature]</i>	11/17/2023   18:30 EST
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY	

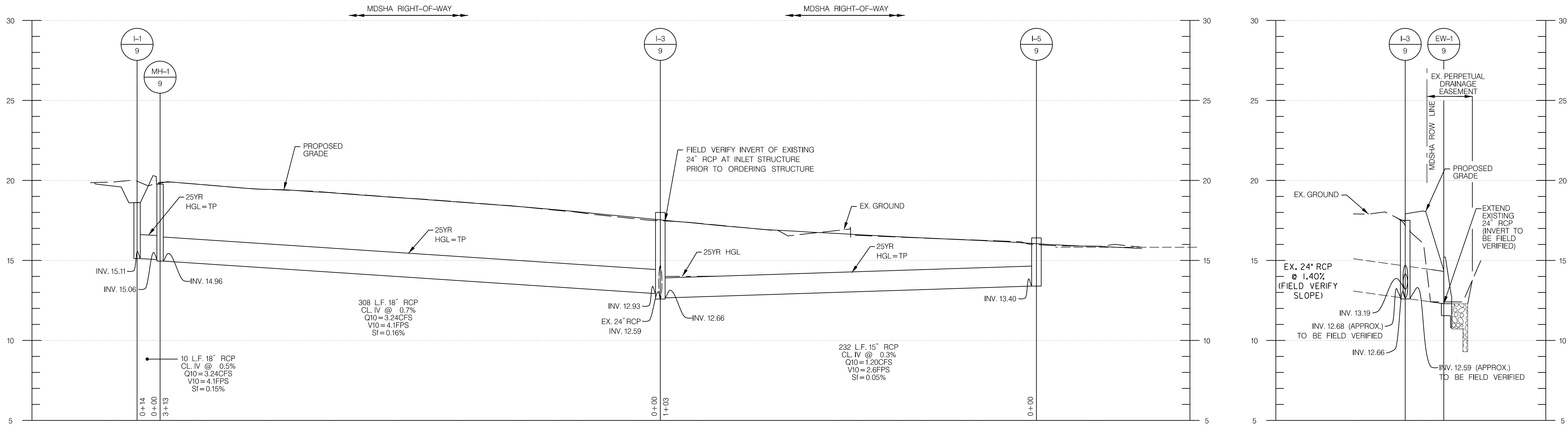
SCALE: AS NOTED  
 DRAWN BY: DMT  
 CHECKED BY: DMT  
 SHEET NO. 67 OF 116  
 PROJECT NO. P504100  
 CONTRACT NO. P504105

**BROADNECK PENINSULA TRAIL PHASE IB & V**  
**STORMDRAIN PROFILES**

GP# G02018957

DWG. NO.: SDP-02



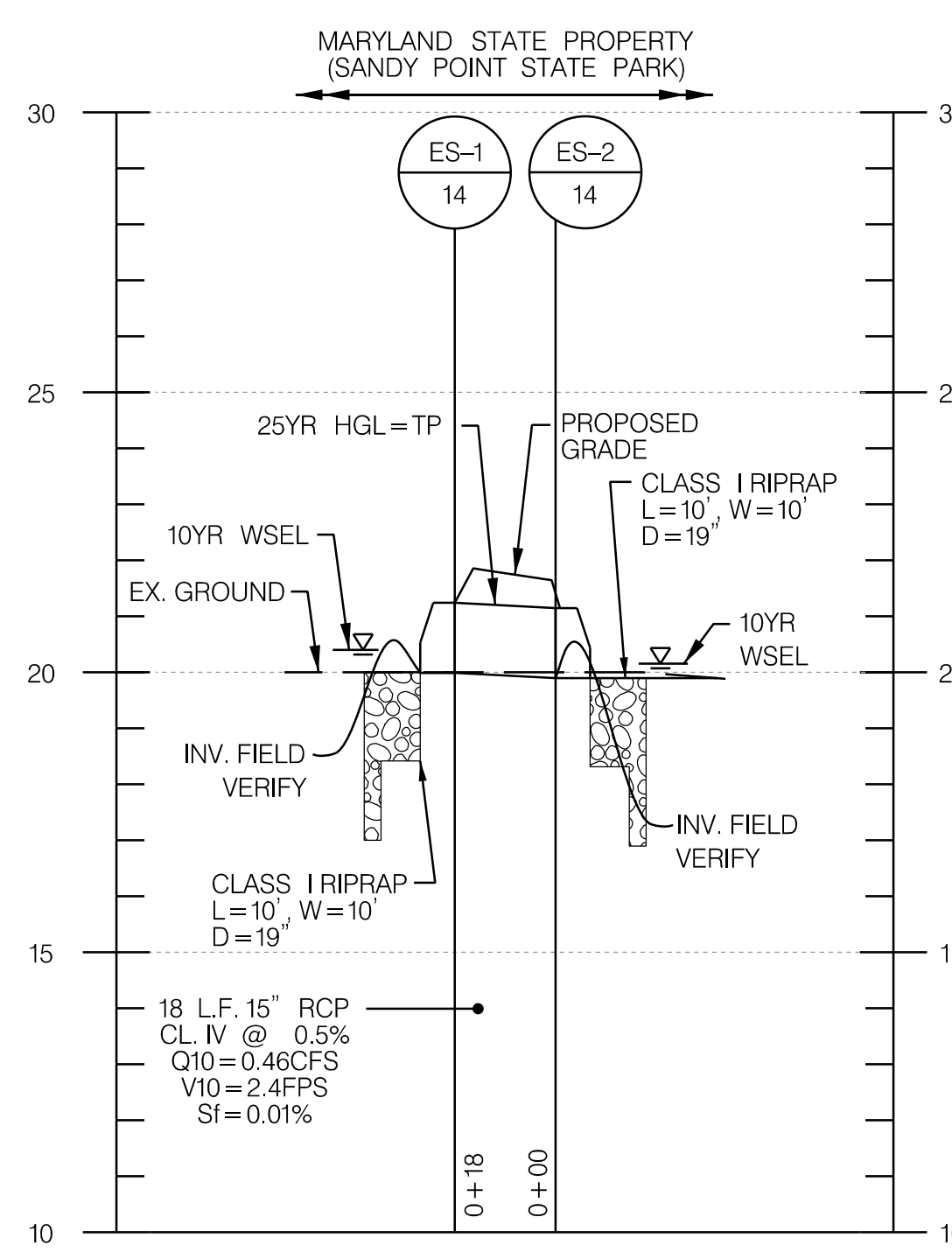


I-19 TO I-59

HORIZ. SCALE 1" = 30'  
VERT. SCALE 1" = 3'

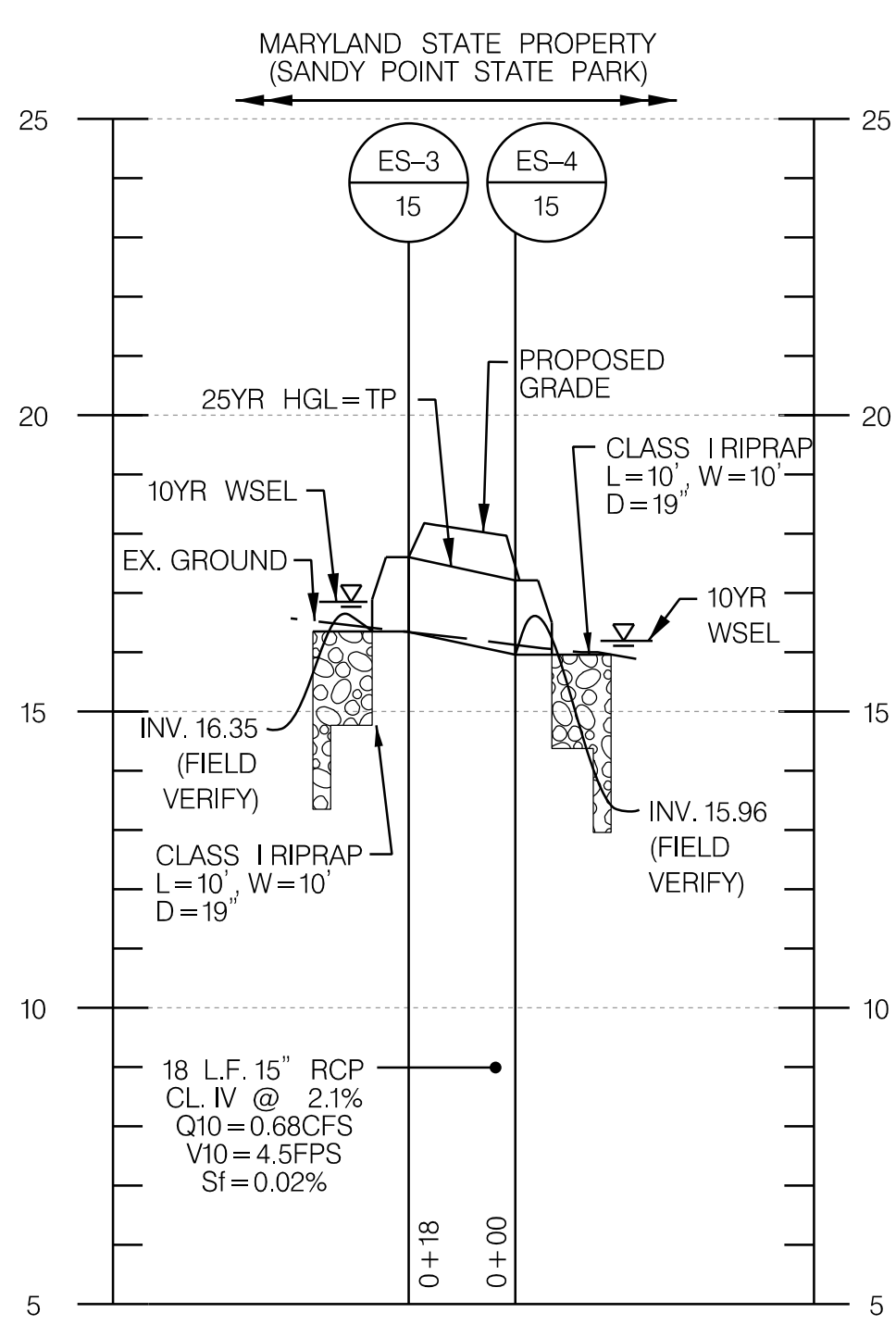
I-39 TO EX. OUTFALL

HORIZ. SCALE 1" = 30'  
VERT. SCALE 1" = 3'



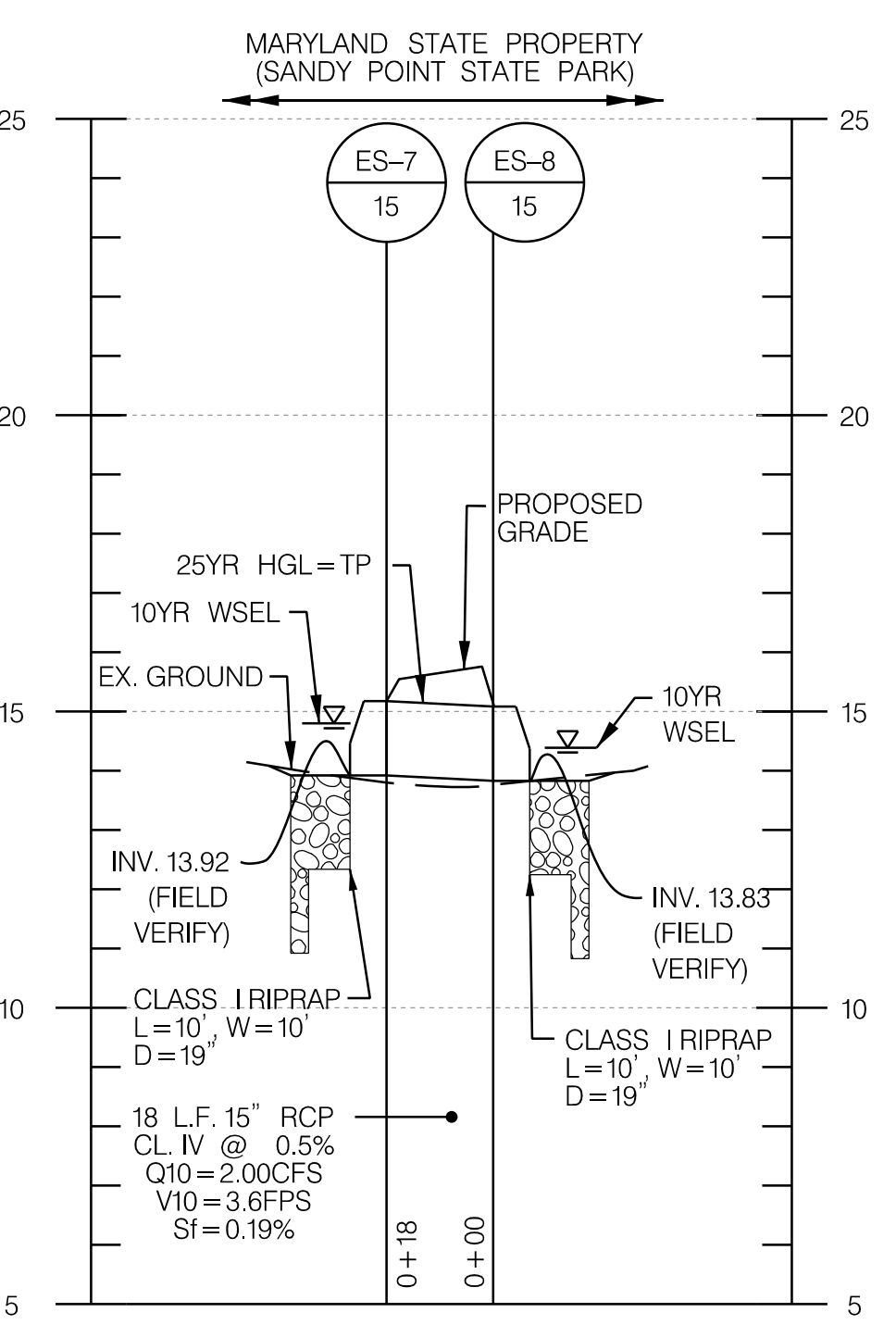
ES-144 TO ES-214

HORIZ. SCALE 1" = 30'  
VERT. SCALE 1" = 3'



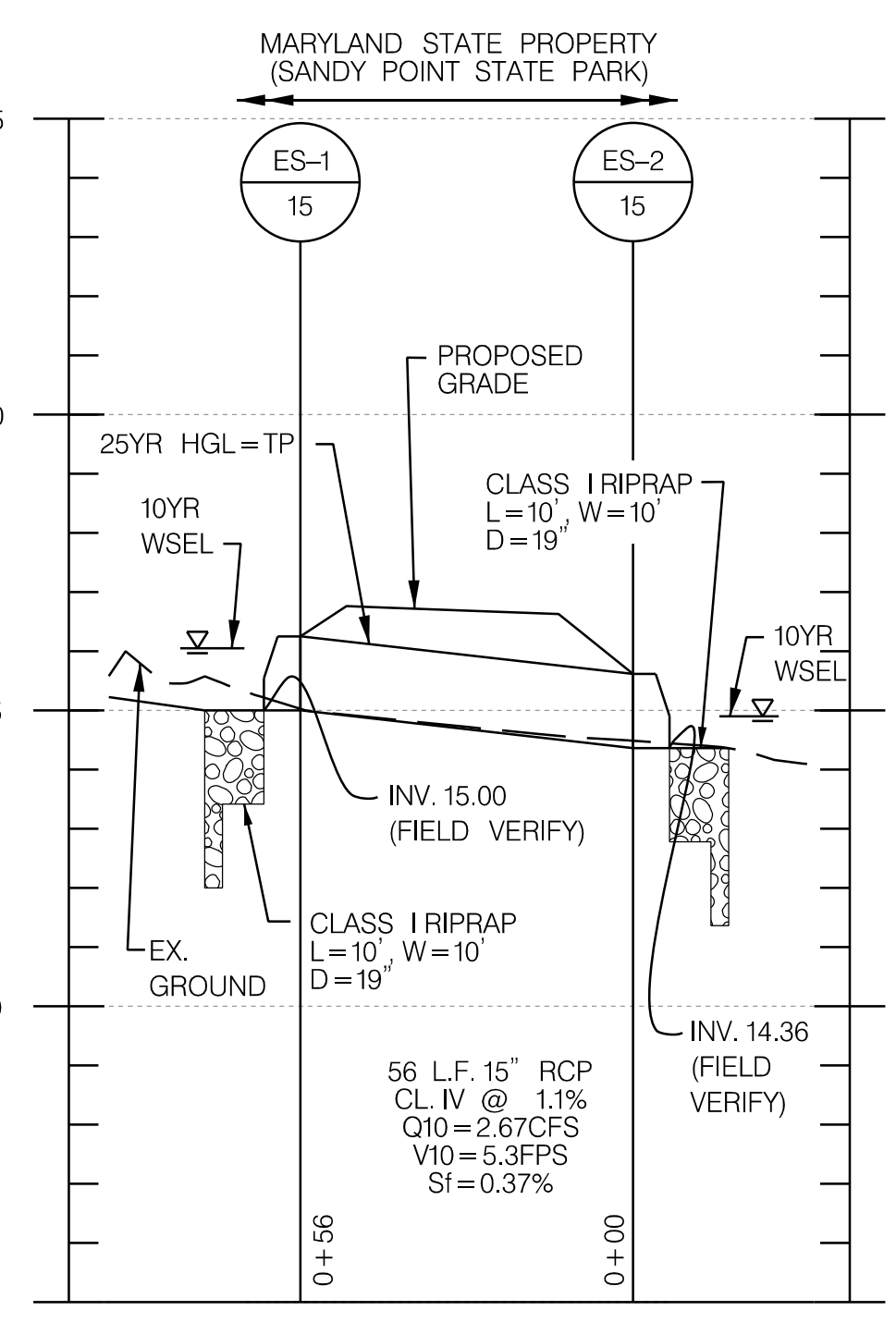
ES-315 TO ES-415

HORIZ. SCALE 1" = 30'  
VERT. SCALE 1" = 3'



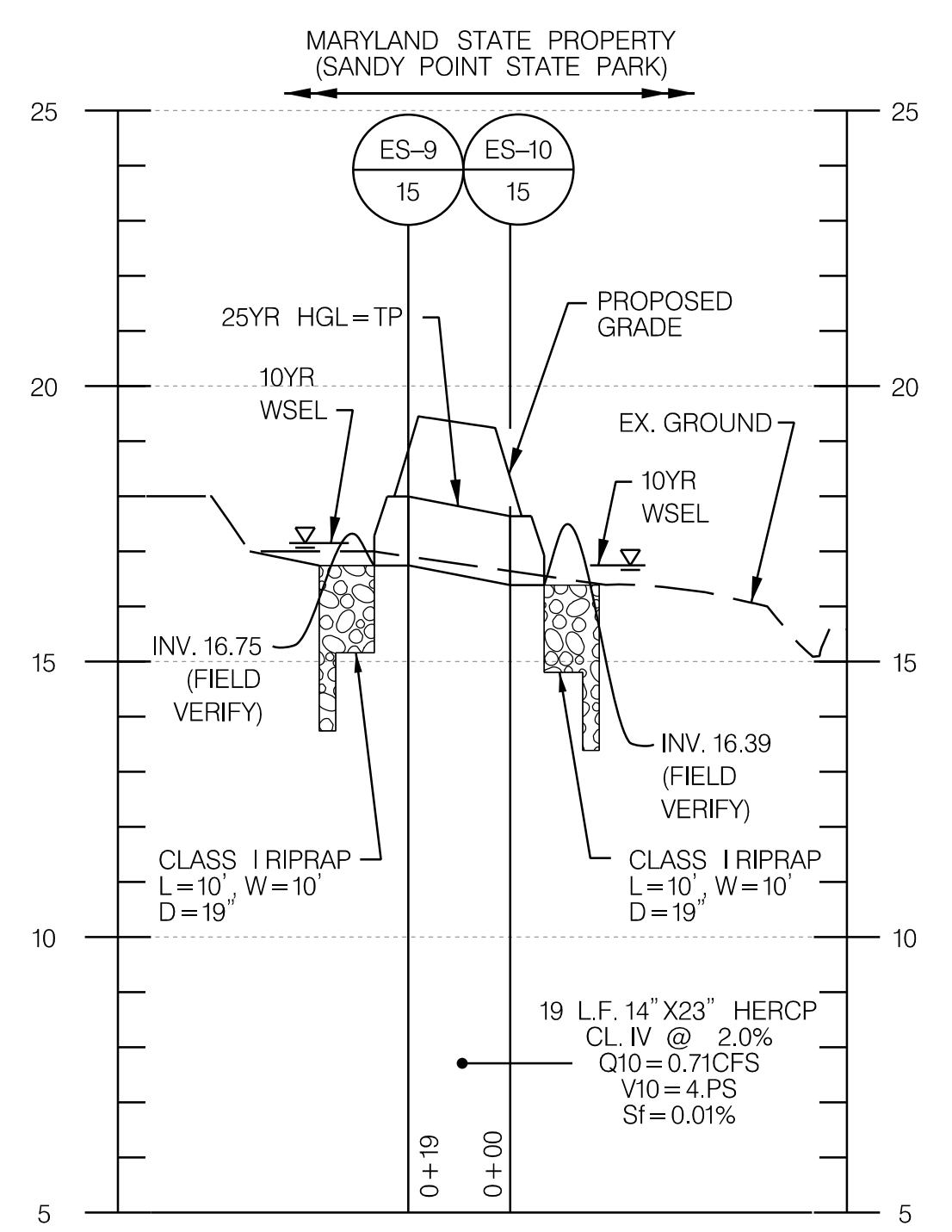
ES-715 TO ES-815

HORIZ. SCALE 1" = 30'  
VERT. SCALE 1" = 3'



ES-115 TO ES-215

HORIZ. SCALE 1" = 30'  
VERT. SCALE 1" = 3'



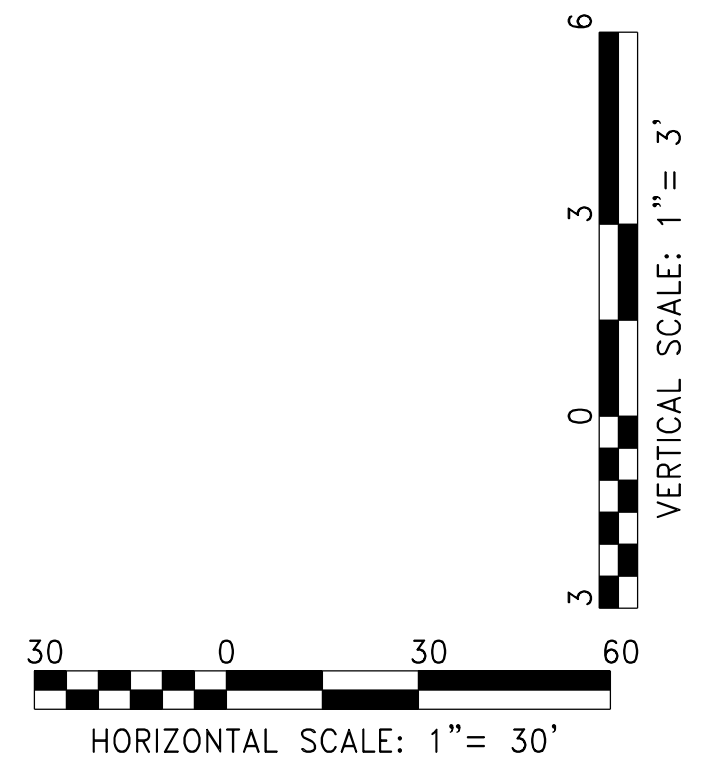
ES-915 TO ES-1015

HORIZ. SCALE 1" = 30'  
VERT. SCALE 1" = 3'

NOTE: LOCATION OF PROPOSED STRUCTURES AND INVERTS TO BE FIELD VERIFIED WITH EXISTING STREAM CROSSING WITHIN SANDY POINT STATE PARK. REMOVE AND REPLACE EXISTING METAL PIPE. ENSURE 0.5% MIN. SLOPE TO DRAIN.

NOTE: LOCATION OF PROPOSED STRUCTURES AND INVERTS TO BE FIELD VERIFIED WITH EXISTING DITCH NEAR SANDY POINT STATE PARK MAINTENANCE YARD. ENSURE 0.5% MIN. SLOPE TO DRAIN.

NOTE: LOCATION OF PROPOSED STRUCTURES AND INVERTS TO BE FIELD VERIFIED WITH EXISTING DITCH WITHIN SANDY POINT STATE NEAR PARK ENTRANCE. ENSURE 0.5% MIN. SLOPE TO DRAIN.



**AECOM**  
4 NORTH PARK DRIVE  
SUITE 300  
HUNT VALLEY, MARYLAND 21030  
PHONE: 410-785-7220  
FAX: 410-785-6818

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MD LICENSE NUMBER: S3587  
EXPIRATION DATE: 12-09-2024



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ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY	

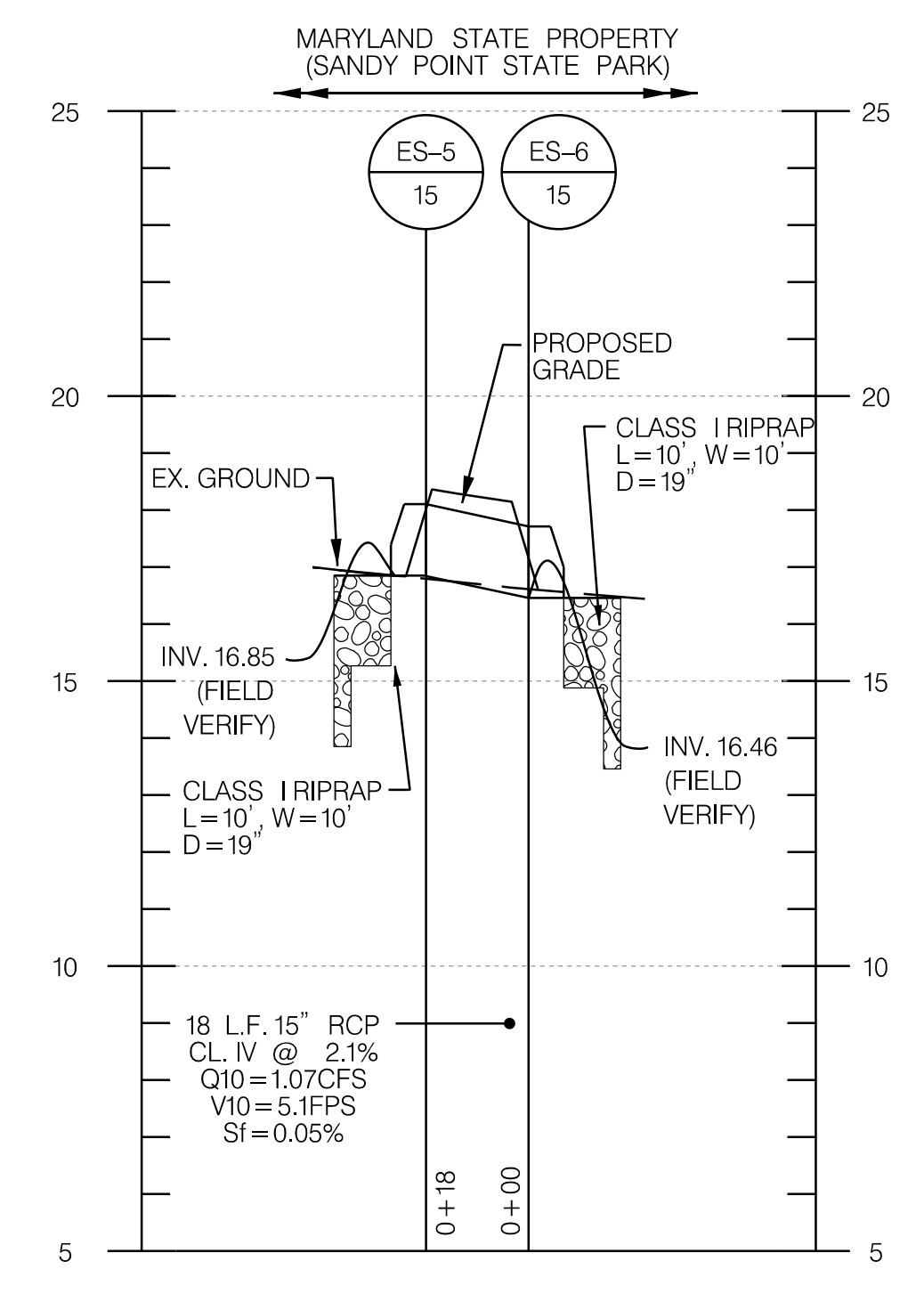
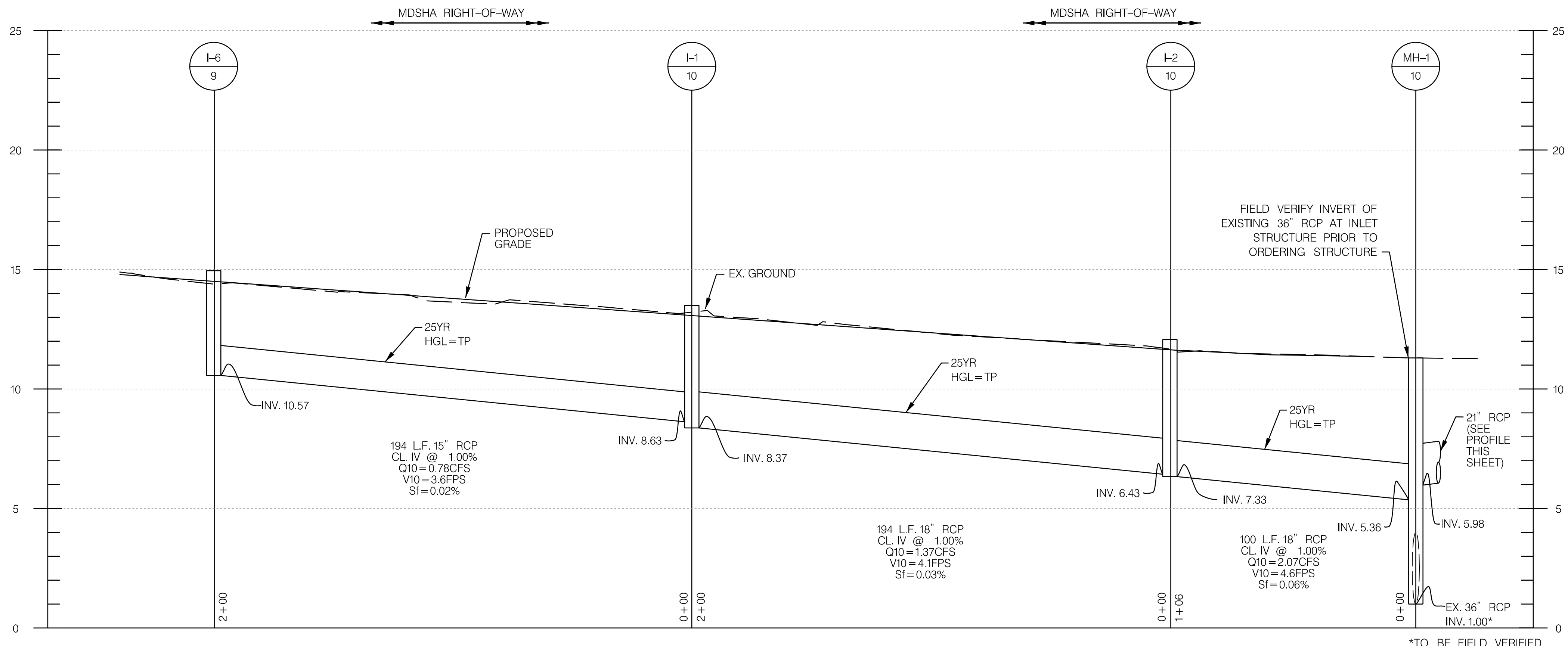
GP# G02018957 DWG. NO.: SDP-03

BROADNECK PENINSULA TRAIL PHASE IB & V

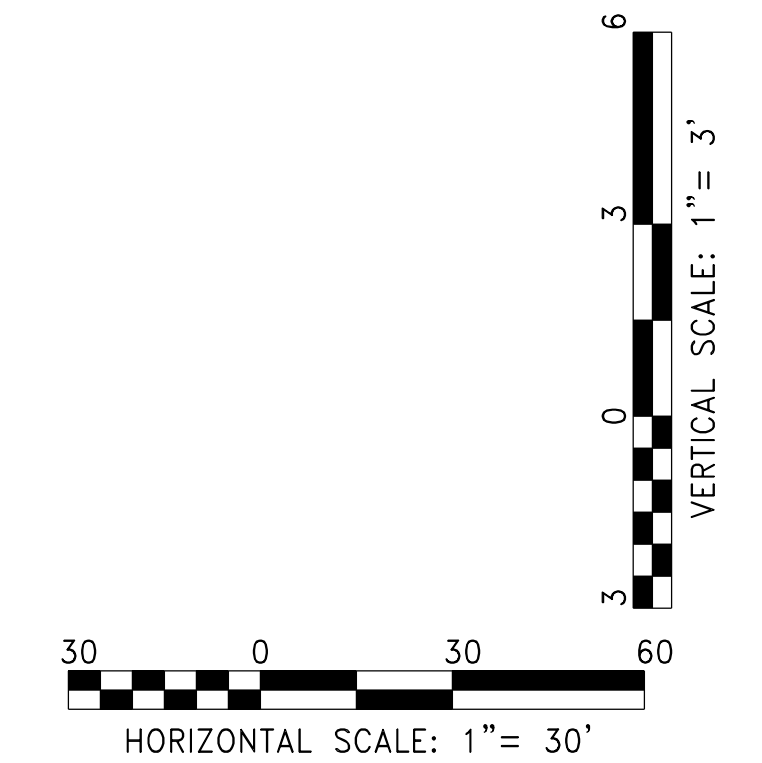
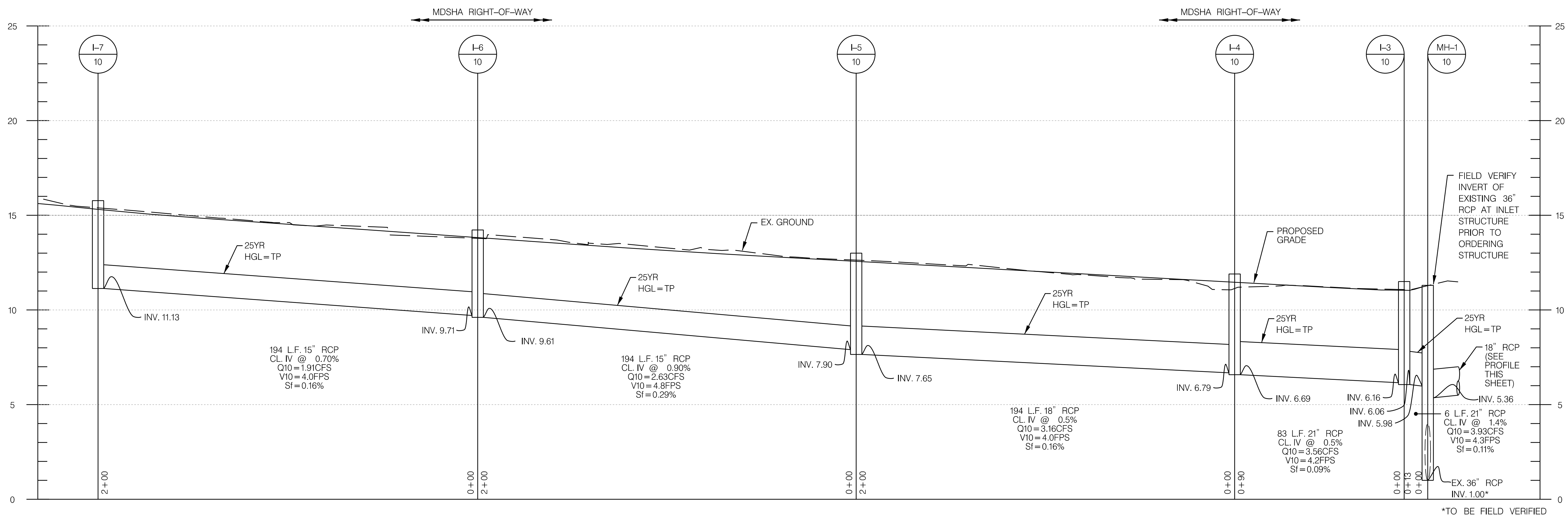
**STORMDRAIN PROFILES**

SCALE: AS NOTED  
DRAWN BY: DMT  
CHECKED BY: DMT  
SHEET NO. 88 OF 116  
PROJECT NO. P504100  
CONTRACT NO. P504105





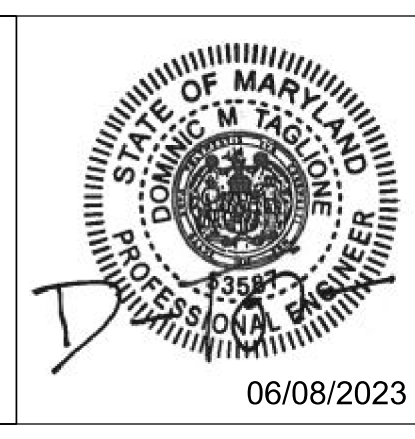
NOTE: UTILITY LOCATION ARE APPROXIMATE. TEST PIT ALL UTILITY CROSSINGS PRIOR TO STORM DRAIN PURCHASING AND INSTALLATION.



GP# G02018957 DWG. NO.: SDP-04

**AECOM**  
 4 NORTH PARK DRIVE  
 SUITE 300  
 HUNT VALLEY, MARYLAND 21030  
 PHONE: 410-785-7220  
 FAX: 410-785-6818

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 EXPIRATION DATE: 12-09-2024



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ANNE ARUNDEL COUNTY  
 DEPARTMENT OF PUBLIC WORKS

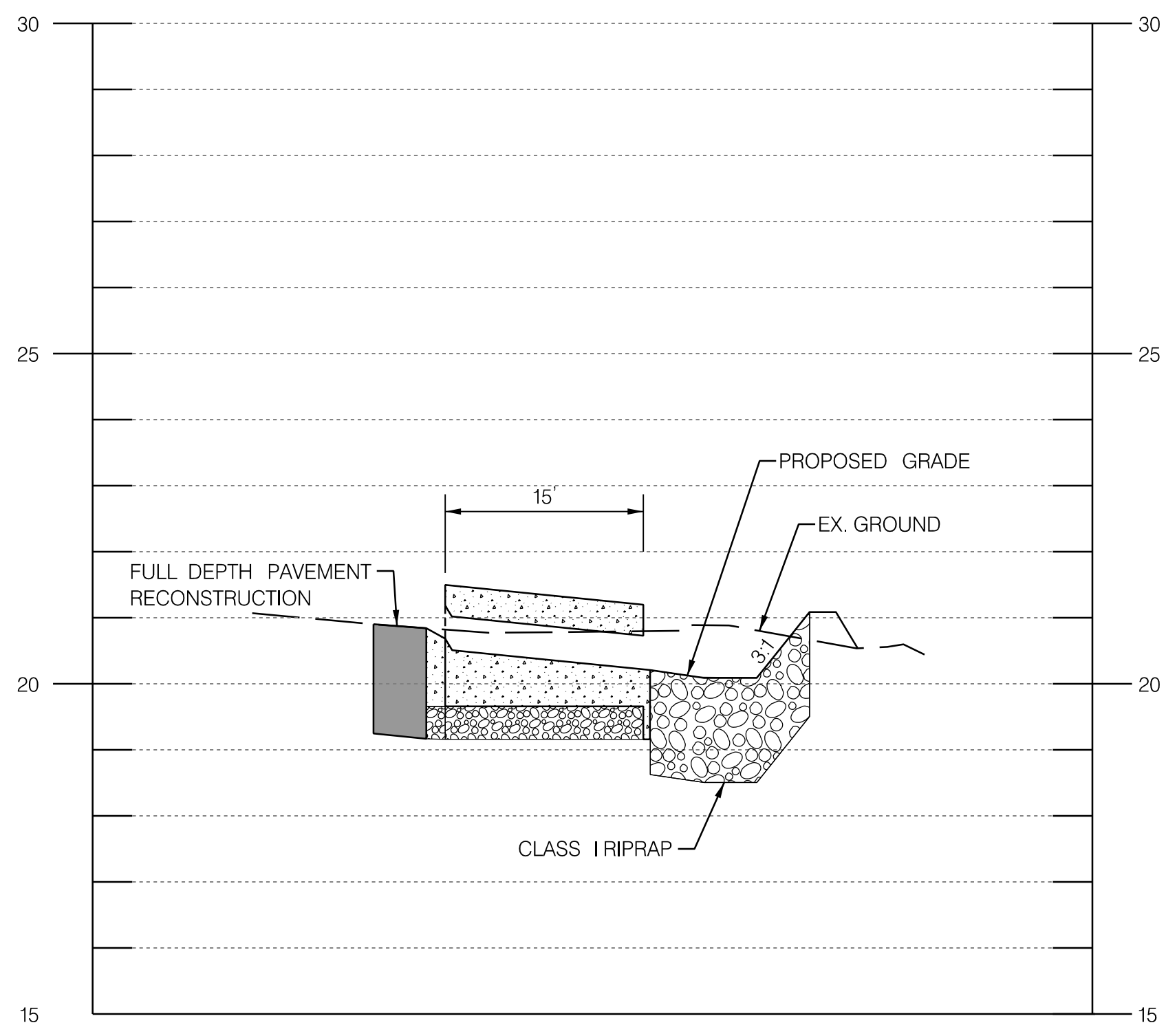
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ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY	

SCALE: AS NOTED  
 DRAWN BY: DMT  
 CHECKED BY: DMT  
 SHEET NO. 69 OF 116  
 PROJECT NO. P504100  
 CONTRACT NO. P504105

**BROADNECK PENINSULA TRAIL PHASE IB & V**

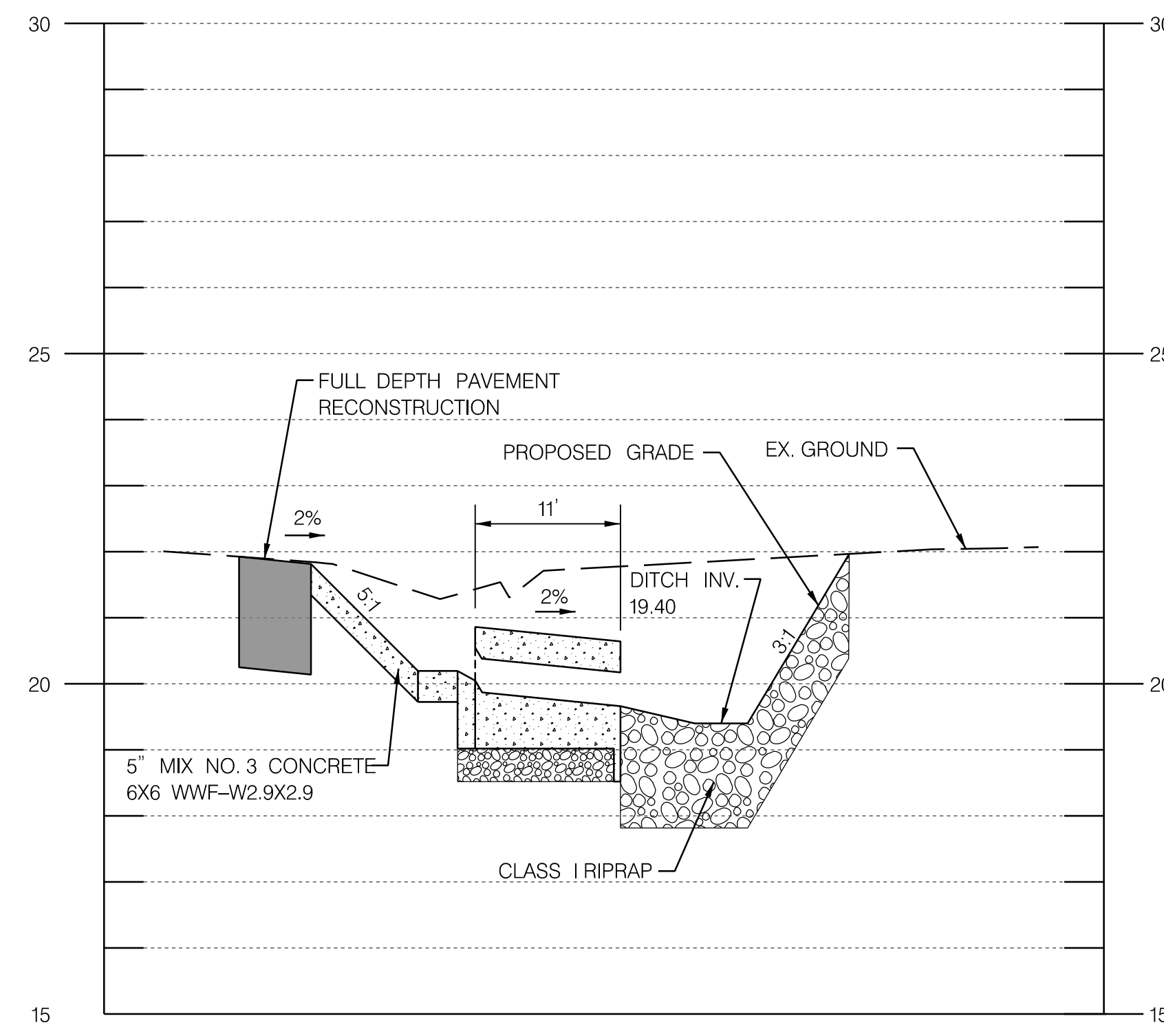
**STORMDRAIN PROFILES**





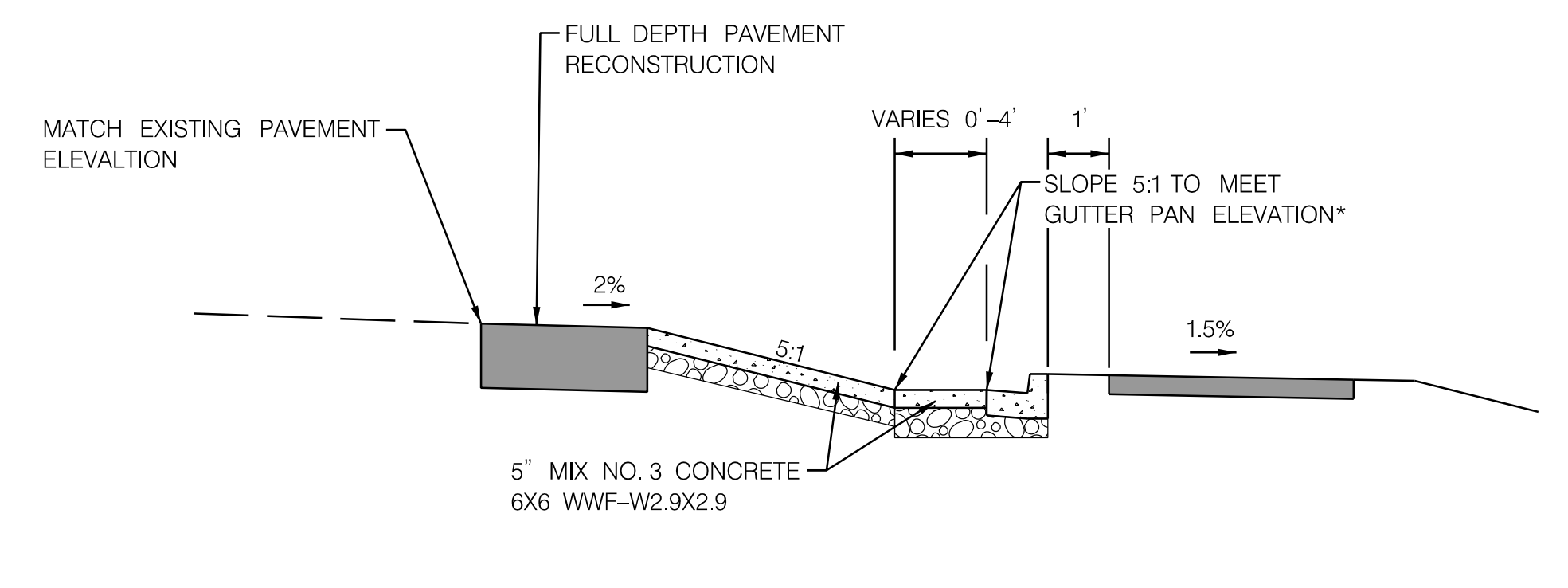
I-21: OPEN BACK INLET SECTION B-B

HORIZ. SCALE 1" = 10'  
VERT. SCALE 1" = 2'



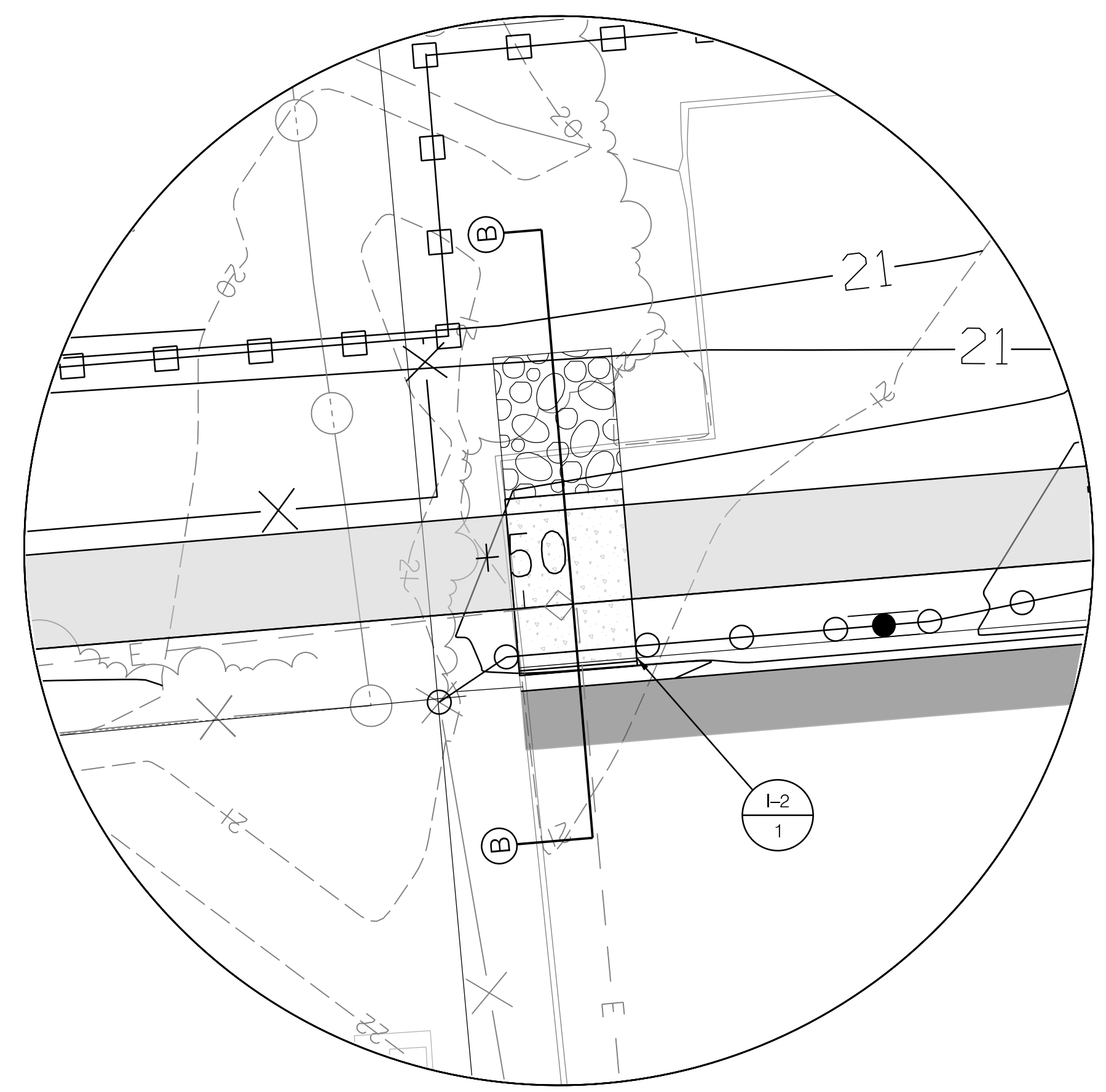
I-14: OPEN BACK INLET SECTION C-C

HORIZ. SCALE 1" = 10'  
VERT. SCALE 1" = 2'



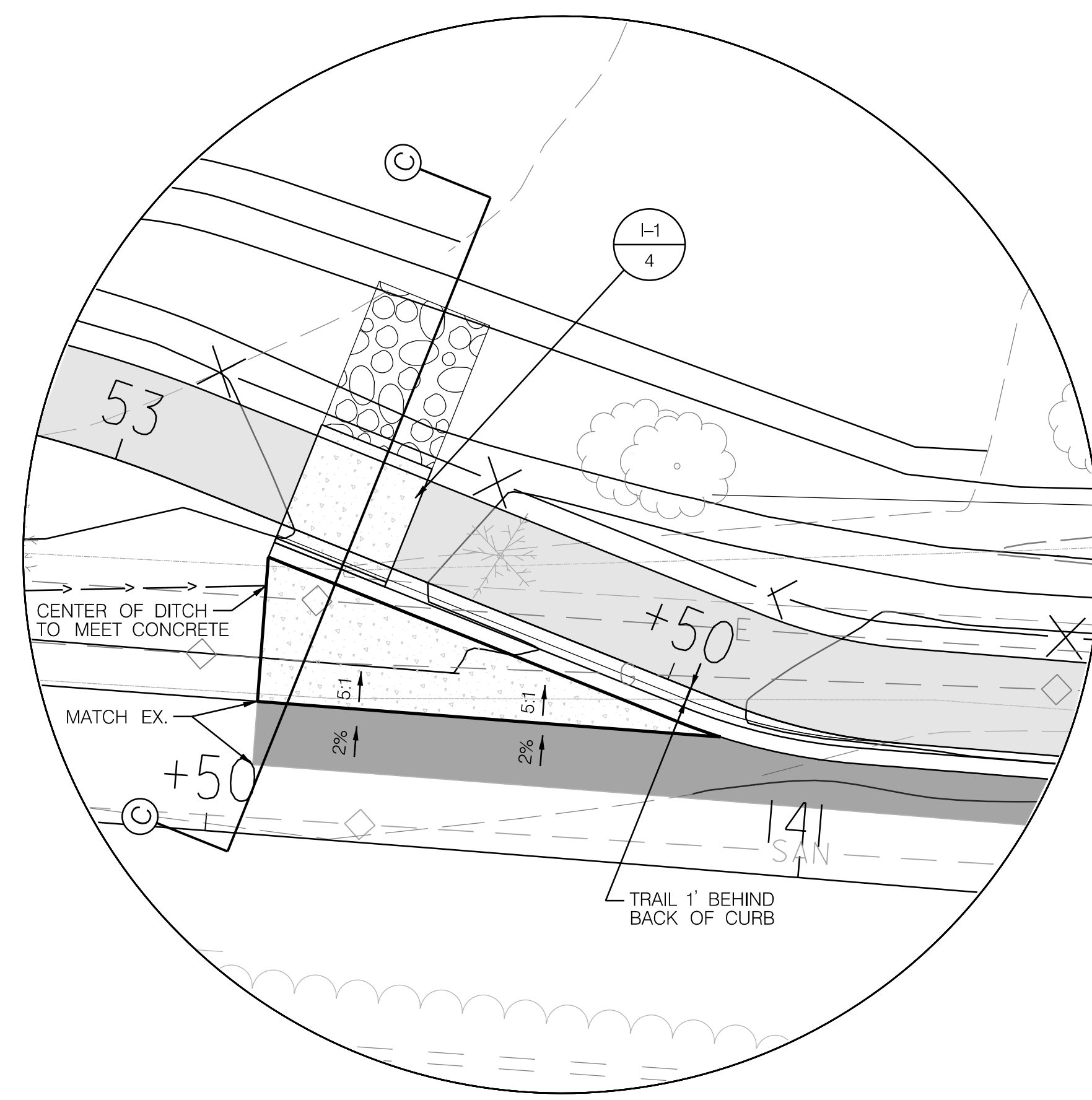
CONCRETE SLOPE - STATION 53+15 TO 53+55

NOT TO SCALE



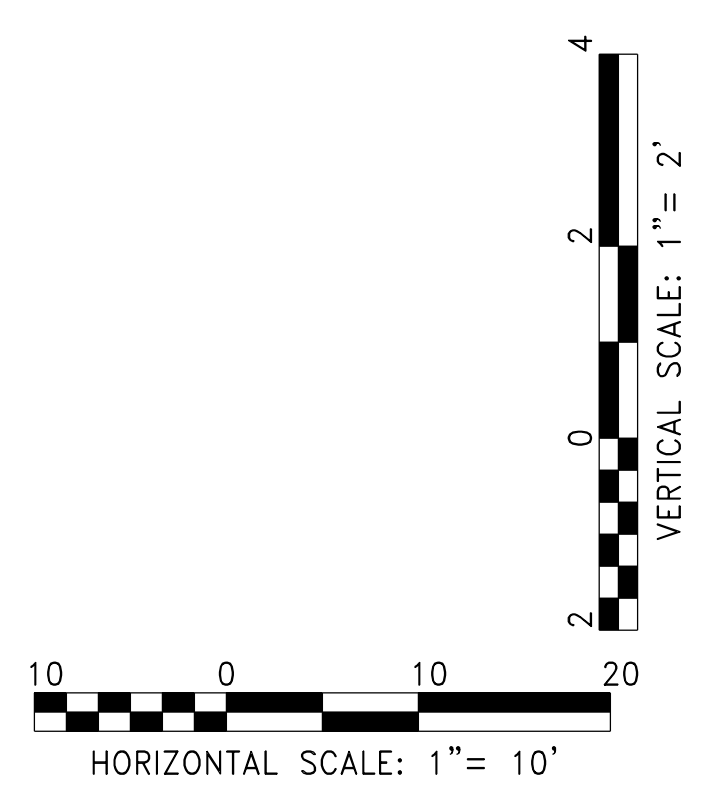
I-21: OPEN BACK INLET PLAN

HORIZ. SCALE 1" = 10'



I-14: OPEN BACK INLET PLAN

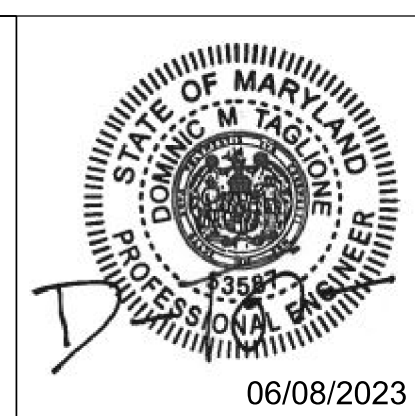
HORIZ. SCALE 1" = 10'



GP# G02018957 DWG. NO.: SDP-05

**AECOM**  
AECOM  
4 NORTH PARK DRIVE  
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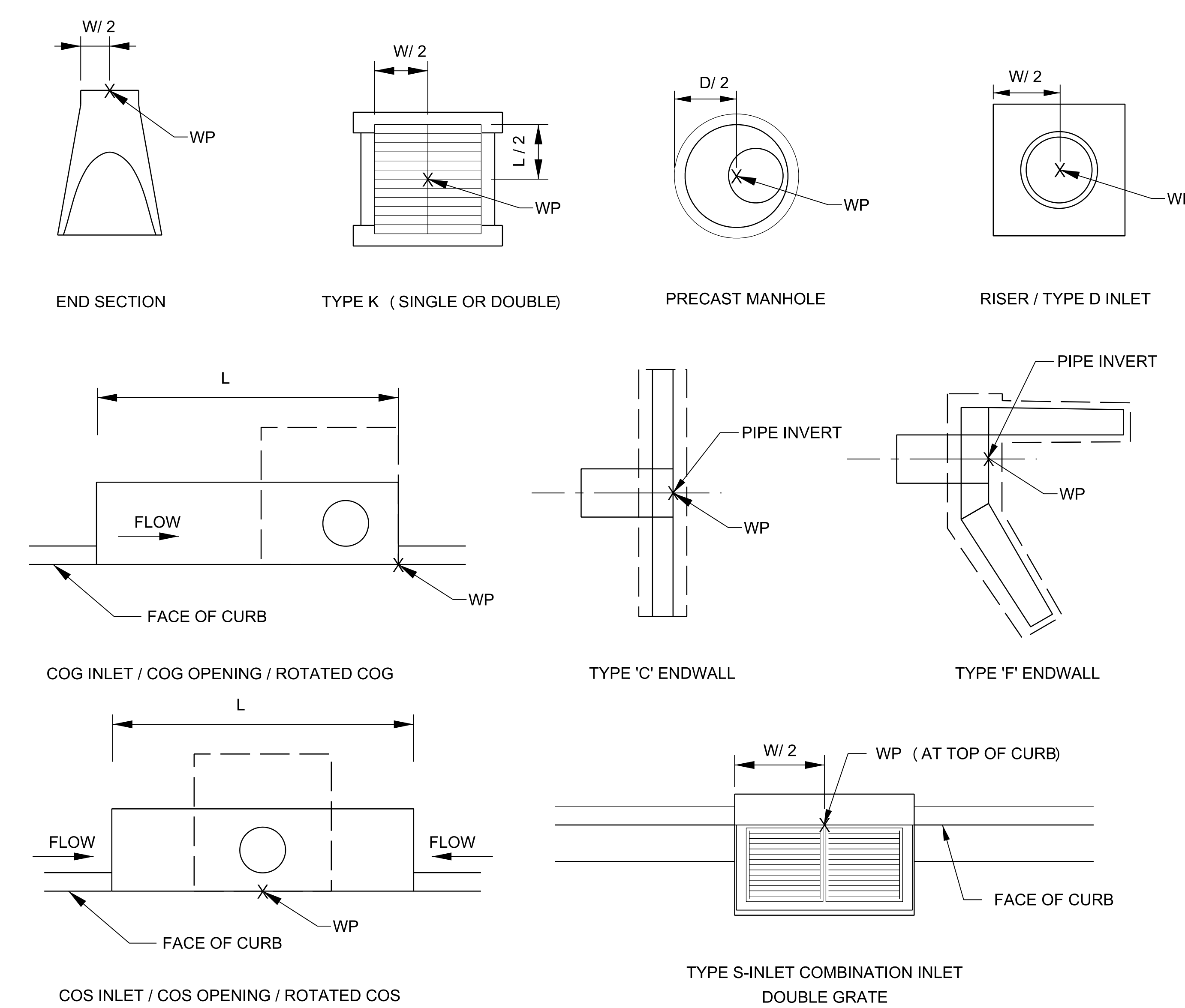


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CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
<i>[Signature]</i>	11/17/2023   11:56 EST	<i>[Signature]</i>	11/17/2023   18:30 EST
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY	
SCALE: AS NOTED		DRAWN BY: DMT	
CHECKED BY: DMT		SHEET NO. 70 OF 116	
PROJECT NO. P504100		CONTRACT NO. P504105	
BROADNECK PENINSULA TRAIL PHASE IB & V			
<b>STORMDRAIN PROFILES</b>			

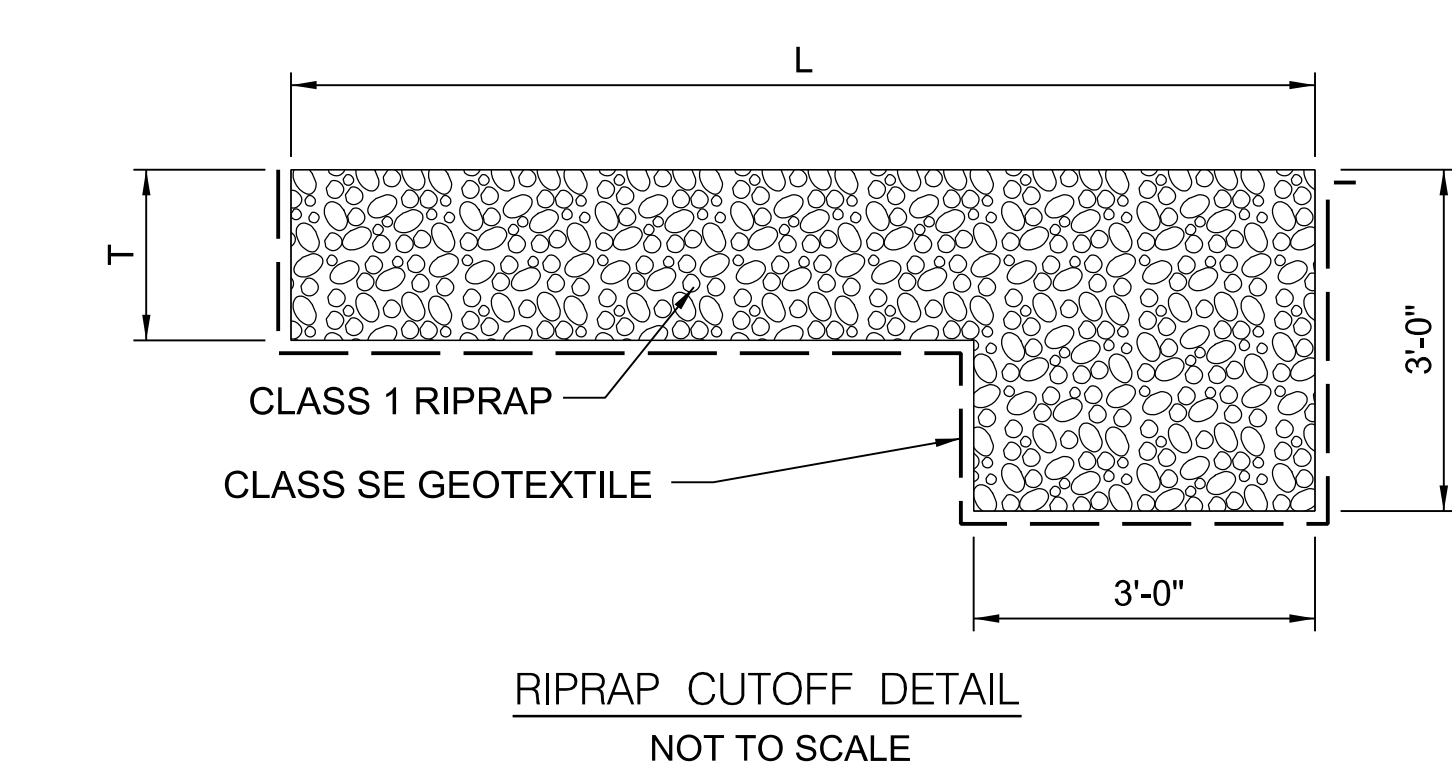


STRUCTURE NO.	STRUCTURE TYPE	BASELINE	* WORK POINT (WP)		T.G./ T.S./ T.C.	INVERT IN	INVERT OUT	STANDARD NUMBER	OWNERSHIP	REMARKS
			STATION	OFFSET						
I-3/1	STANDARD SINGLE TYPE K INLET	TRAIL-01	7+59.48	6.11 RT	22.75	-	20.23	MD 378.03	AA County	SHALLOW BOX
ES-2/1	STANDARD CONCRETE END SECTION	TRAIL-01	7+73.69	23.57 LT	-	-	20.00	MD 368.01	AA County	
ES-3/1	STANDARD METAL END SECTION	TRAIL-01	8+71.50	2.38 RT	-	-	21.63	MD 370.01	AA County	
EW-1/1	STANDARD TYPE C ENDWALL	TRAIL-01	14+17.68	3.88 RT	-	-	17.00	MD 368.01	AA County	
ES-6/1	STANDARD CONCRETE END SECTION	TRAIL-01	14+28.09	25.90 LT	-	-	16.60	MD 369.00	AA County	
ES-5/1	STANDARD CONCRETE END SECTION	TRAIL-01	14+51.15	15.37 LT	-	-	17.00	MD 368.01	AA County	
ES-7/1	HORIZONTAL ELLIPTICAL PIPE	TRAIL-01	14+59.19	26.04 LT	-	-	16.40	MD 369.00	AA County	
ES-4/1	STANDARD CONCRETE END SECTION	TRAIL-01	14+72.87	7.06 RT	-	-	17.15	MD 368.01	AA County	
R-1/1	TYPE D INLET	TRAIL-01	14+93.62	20.97 RT	19.83	14.17 (Subdrain)	16.67	AA Co D/28	AA County	WEIR ELEVATION SET TO 19.00 WITH TRASH RACK (SEE SW-08)
I-2/1	MODIFIED OPEN BACK COG	TRAIL-01	17+54.09	5.67 RT	21.50	-	-	SEE DE-04	AA County	
I-1/2	STANDARD SINGLE TYPE K INLET	TRAIL-01	27+30.07	4.3 RT	20.25	-	18.25	MD 378.03	AA County	SHALLOW BOX
I-2/2	SHALLOW 10' COG INLET	TRAIL-01	28+94.75	0.67 RT	20.00	-	17.83	MD 374.66	AA County	
MH-1/2	STANDARD PRECAST MANHOLE	TRAIL-01	28+92.90	6.73 LT	20.09	17.77 / 17.77	17.77	MD 384.01	AA County	
I-2/3	SHALLOW 10' COS INLET	TRAIL-01	30+40.36	0.67 RT	19.55	-	17.45	MD 374.67	AA County	
MH-1/9	STANDARD PRECAST MANHOLE	TRAIL-01	30+40.56	12.97 LT	19.70	17.33 / 17.33	17.33	MD 384.01	AA County	
ES-1/3	STANDARD CONCRETE END SECTION	TRAIL-01	30+57.88	21.82 LT	-	-	17.23	MD 369.00	AA County	
EW-1/3	STANDARD TYPE E ENDWALL	TRAIL-01	30+99.30	11.9 LT	-	-	17.23	MD 356.01 MOD	AA County	TYPE C ENDWALL FOR 30INCH PIPE MODIFIED FOR 19X30 HERCP
EW-2/3	STANDARD TYPE C ENDWALL	TRAIL-02	40+94.42	18.29 RT	-	-	16.78	MD 355.02	AA County	HORIZONTAL ELLIPTICAL CONCRETE PIPE
EW-3/3	STANDARD TYPE C ENDWALL	TRAIL-02	41+48.56	12.18 RT	-	-	15.58	MD 354.01	AA County	
I-1/3	STANDARD SINGLE TYPE K INLET	TRAIL-02	41+97.80	13.68 LT	19.50	-	15.83	MD 378.03	AA County	
I-1/4	MODIFIED OPEN BACK COG	TRAIL-02	53+15.00	1.67 RT	21.86	-	-	SEE DE-04	AA County	
ES-1/4	STANDARD CONCRETE END SECTION	TRAIL-02	54+76.74	19.80 LT	-	-	18.50	MD 368.01	AA County	
I-2/4	STANDARD SINGLE TYPE K INLET	TRAIL-03	60+25.14	24.74 LT	19.75	-	17.25	MD 378.03	AA County	SHALLOW BOX
ES-2/4	STANDARD CONCRETE END SECTION	TRAIL-03	60+47.27	12.47 RT	-	-	17.00	MD 368.01	AA County	
ES-4/4	STANDARD CONCRETE END SECTION	TRAIL-03	60+51.16	4.35 RT	-	-	17.00	MD 368.01	AA County	
ES-3/4	STANDARD CONCRETE END SECTION	TRAIL-03	61+20.22	10.97 RT	-	-	17.88	MD 368.01	AA County	
ES-1/5	STANDARD CONCRETE END SECTION	TRAIL-03	61+95.10	14.70 LT	-	-	18.28	MD 368.01	AA County	
ES-1/6	STANDARD CONCRETE END SECTION	TRAIL-03	73+51.37	26.15 LT	-	-	21.80	MD 368.01	AA County	
ES-2/6	STANDARD CONCRETE END SECTION	TRAIL-03	73+68.01	30.23 LT	-	-	21.69	MD 368.01	AA County	
ES-3/6	STANDARD CONCRETE END SECTION	TRAIL-03	75+42.39	19.36 LT	-	-	20.30	MD 368.01	AA County	
ES-4/6	STANDARD CONCRETE END SECTION	TRAIL-03	75+42.23	10.29 RT	-	-	20.15	MD 368.01	AA County	
ES-1/7	STANDARD CONCRETE END SECTION	BHP	610+96.71	2.99 RT	-	-	FIELD VERIFY*	MD 368.01	AA County	
ES-2/7	STANDARD CONCRETE END SECTION	BHP	610+92.43	14.08 LT	-	-	FIELD VERIFY*	MD 368.01	AA County	
ES-3/7	STANDARD CONCRETE END SECTION	BHP	608+58.30	3.80 RT	-	-	FIELD VERIFY*	MD 368.01	AA County	
ES-4/7	STANDARD CONCRETE END SECTION	BHP	608+58.30	13.80 RT	-	-	FIELD VERIFY*	MD 368.01	AA County	
I-1/9	STANDARD SINGLE TYPE K INLET	TRAIL-04	97+33.74	9.57 RT	18.61	-	15.11	MD 378.03	AA County	
MH-1/9	STANDARD PRECAST MANHOLE	TRAIL-04	97+40.99	22.37 RT	19.82	15.06	14.96	MD 384.01	AA County	
I-3/9	STANDARD TYPE S COMBINATION INLET DOUBLE GRATE	TRAIL-04	502+57.85	0.67 RT	17.92	12.93 / 12.66	12.41	MD 379.04	AA County	
EW-1/9	STANDARD TYPE G ENDWALL	TRAIL-04	502+53.11	23.08 LT	-	-	FIELD VERIFY*	MD 360.01	MDOT SHA	MDOT SHA OWNS AND WILL MAINTAIN EX 24" RCP CROSSING
I-5/9	STANDARD TYPE S COMBINATION INLET DOUBLE GRATE	TRAIL-04	504+97.00	0.67 RT	16.41	-	13.40	MD 379.04	AA County	SHALLOW BOX
I-6/9	STANDARD TYPE S COMBINATION INLET DOUBLE GRATE	TRAIL-04	506+96.36	0.67 RT	14.95	-	10.57	MD 379.04	AA County	
I-1/10	STANDARD TYPE S COMBINATION INLET DOUBLE GRATE	TRAIL-04	508+96.36	0.67 RT	13.51	8.63	8.37	MD 379.04	AA County	
I-2/10	STANDARD TYPE S COMBINATION INLET DOUBLE GRATE	TRAIL-04	510+96.36	0.67 RT	12.07	6.43	6.33	MD 379.04	AA County	
MH-1/10	PRECAST MANHOLE WITH DOGHOUSE	TRAIL-04	512+02.06	7.21 RT	11.29	5.98 / 5.38 / 1.00	0.92	SEE DE-06	AA County	MD 384.05 MANHOLE TOP WITH DOGHOUSE BASE
I-3/10	STANDARD TYPE S COMBINATION INLET DOUBLE GRATE	TRAIL-04	512+12.71	0.67 RT	11.50	6.16	6.06	MD 379.04	AA County	
I-4/10	STANDARD TYPE S COMBINATION INLET DOUBLE GRATE	TRAIL-04	513+02.36	0.67 RT	11.90	6.79	6.69	MD 379.04	AA County	
I-5/10	STANDARD TYPE S COMBINATION INLET DOUBLE GRATE	TRAIL-04	515+02.36	0.67 RT	13.00	7.90	7.65	d	AA County	
I-6/10	STANDARD TYPE S COMBINATION INLET DOUBLE GRATE	TRAIL-04	517+02.36	0.67 RT	14.25	9.71	9.61	MD 379.04	AA County	
I-7/10	STANDARD TYPE S COMBINATION INLET DOUBLE GRATE	TRAIL-04	519+03.00	0.67 RT	15.75	-	11.13	MD 379.04	AA County	
ES-2/12	STANDARD CONCRETE END SECTION	SPSP-01	305+46.46	12.21 RT	-	-	FIELD VERIFY*	MD 368.01	AA County	
ES-1/12	STANDARD CONCRETE END SECTION	SPSP-01	305+73.46	23.63 LT	-	-	FIELD VERIFY*	MD 368.01	AA County	
ES-1/13	STANDARD CONCRETE END SECTION	SPSP-01	320+83.15	13.64 LT	-	-	FIELD VERIFY*	MD 368.01	AA County	CENTER END SECTION IN STREAM
ES-2/13	STANDARD CONCRETE END SECTION	SPSP-01	320+84.66	4.40 RT	-	-	FIELD VERIFY*	MD 368.01	AA County	CENTER END SECTION IN STREAM
ES-3/13	STANDARD CONCRETE END SECTION	SPSP-01	320+77.41	13.13 LT	-	-	FIELD VERIFY*	MD 368.01	AA County	
ES-4/13	STANDARD CONCRETE END SECTION	SPSP-01	320+79.89	4.80 RT	-	-	FIELD VERIFY*	MD 368.01	AA County	
ES-1/14	STANDARD CONCRETE END SECTION	SPSP-01	350+26.15	14.00 RT	-	-	FIELD VERIFY*	MD 368.01	AA County	
ES-2/14	STANDARD CONCRETE END SECTION	SPSP-01	350+26.57	4.00 LT	-	-	FIELD VERIFY*	MD 368.01	AA County	
ES-5/15	STANDARD METAL END SECTION	SPSP-01	331+92.76	13.63 LT	-	-	FIELD VERIFY*	MD 370.01	AA County	
ES-6/15	STANDARD METAL END SECTION	SPSP-01	331+94.28	7.04 RT	-	-	FIELD VERIFY*	MD 370.01	AA County	
ES-3/15	STANDARD CONCRETE END SECTION	SPSP-01	333+38.64	14.25 LT	-	-	FIELD VERIFY*	MD 368.01	AA County	
ES-4/15	STANDARD CONCRETE END SECTION	SPSP-01	333+38.13	3.75 RT	-	-	FIELD VERIFY*	MD 368.01	AA County	
ES-7/15	STANDARD CONCRETE END SECTION	SPSP-01	338+66.99	3.80 RT	-	-	FIELD VERIFY*	MD 368.01	AA County	
ES-8/15	STANDARD CONCRETE END SECTION	SPSP-01	338+66.99	14.25 LT	-	-	FIELD VERIFY*	MD 368.01	AA County	
ES-2/15	STANDARD CONCRETE END SECTION	SPSP-01	339+60.31	16.92 LT	-	-	FIELD VERIFY*	MD 368.01	AA County	
ES-1/15	STANDARD CONCRETE END SECTION	SPSP-01	340+12.03	5.03 RT	-	-	FIELD VERIFY*	MD 368.01	AA County	
ES-9/15	STANDARD CONCRETE END SECTION	SPSP-01	341+30.30	15.51 LT	-	-	FIELD VERIFY*	MD 368.01	AA County	
ES-10/15	STANDARD CONCRETE END SECTION	SPSP-01	341+30.30	7.30 RT	-	-	FIELD VERIFY*	MD 368.01	AA County	



**WORKPOINT LOCATIONS**  
NOT TO SCALE

NOTE: WORK POINT LOCATIONS FOR STRUCTURES ARE SHOWN IN THE DIAGRAMS ABOVE. THE TOP ELEVATIONS OF THE STRUCTURES ARE GIVEN AT THE WORK POINTS. FOR CURB INLETS AND COMBINATION INLETS (TYPE S-INLET), THE TOP ELEVATIONS ARE GIVEN AT THE TOP OF CURB.

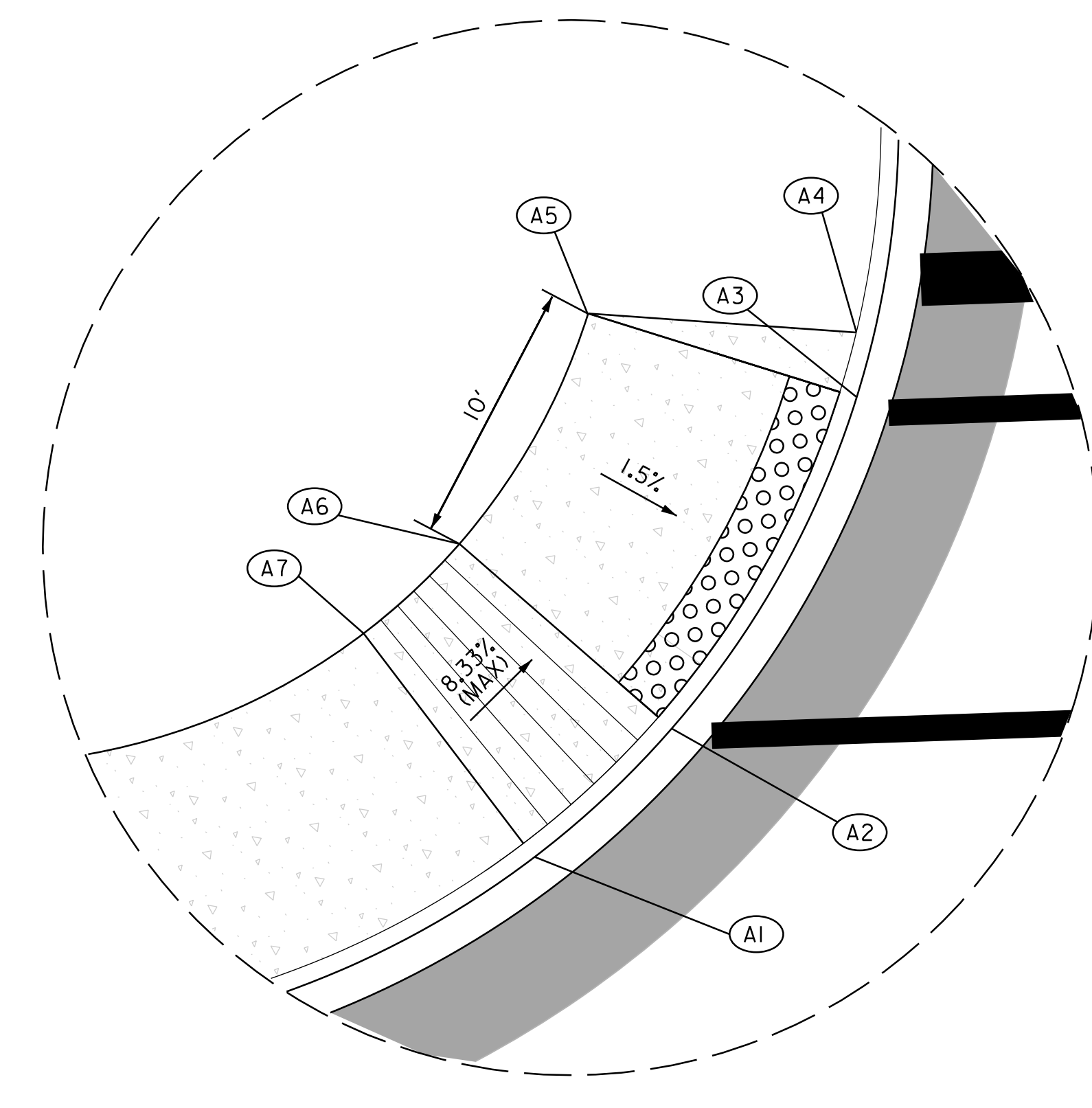
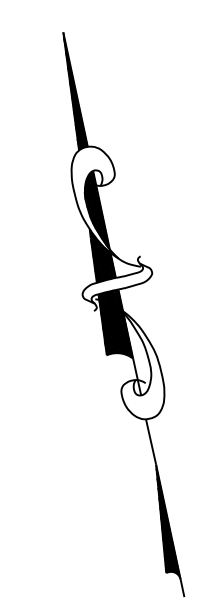
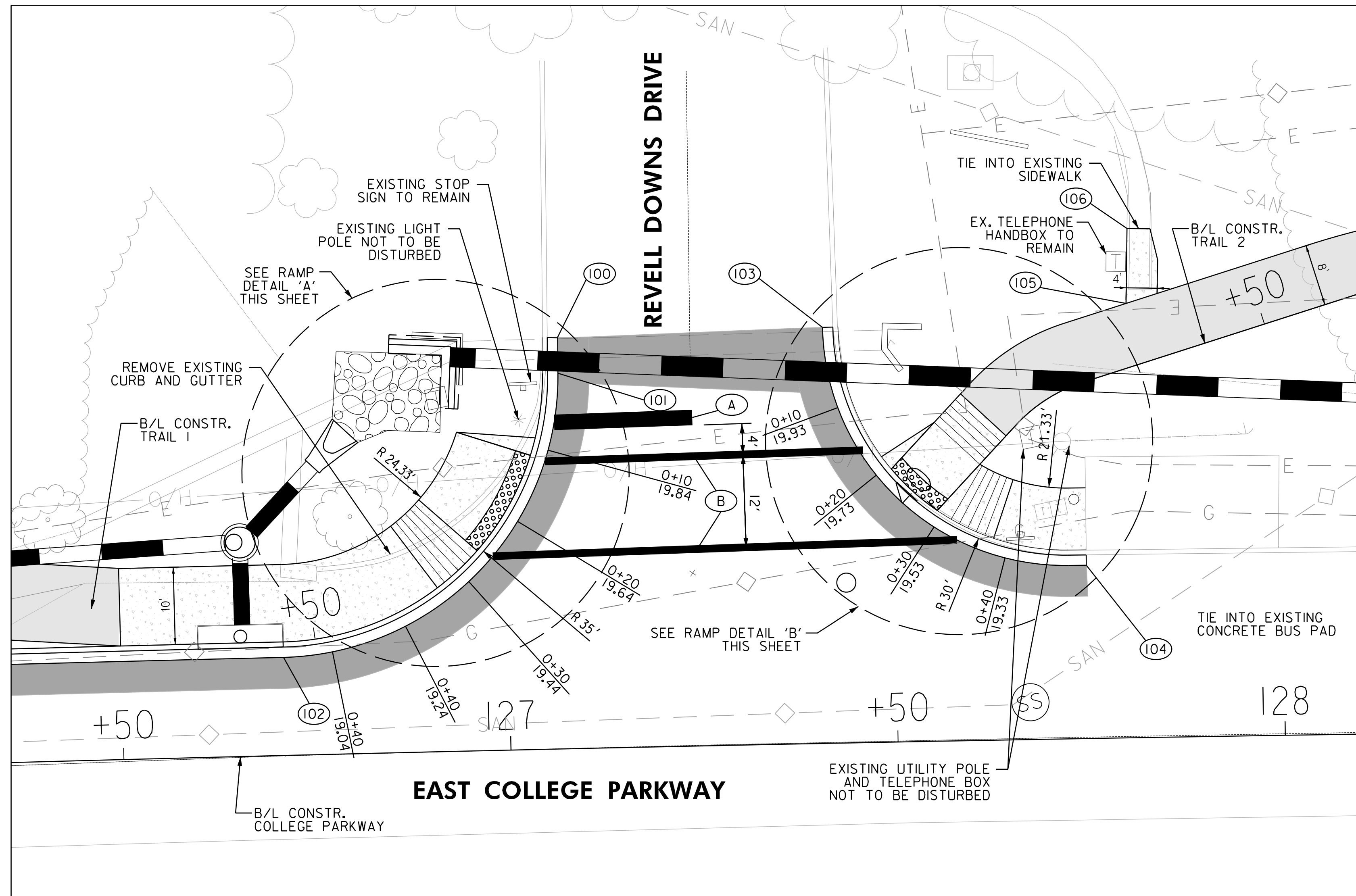


**RIPRAP CUTOFF DETAIL**  
NOT TO SCALE

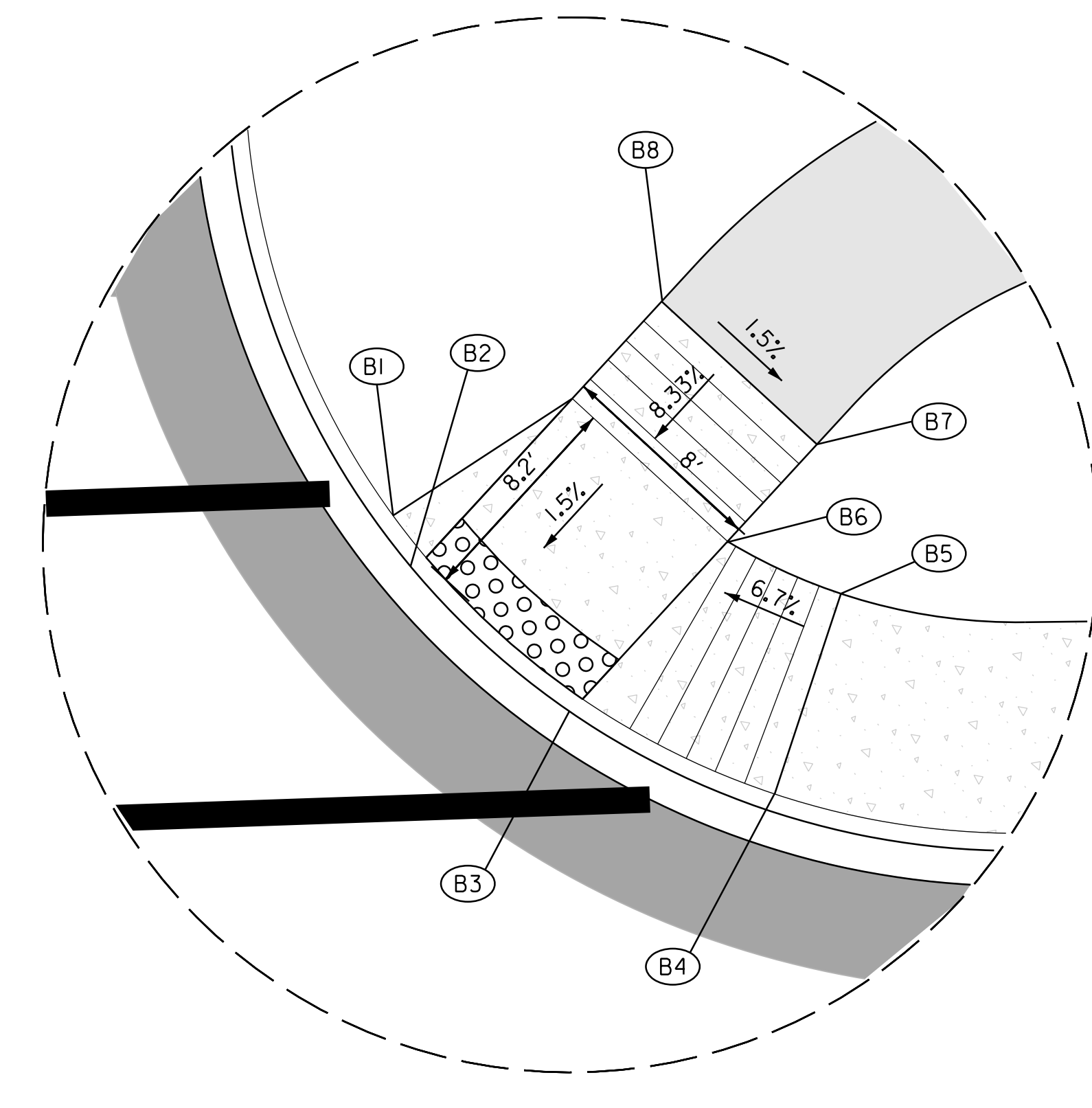
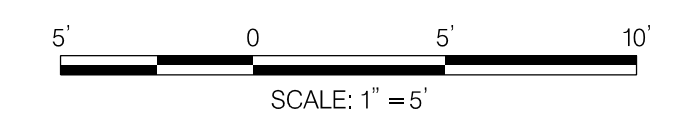
GP# G02018957 DWG. NO.: DS-01

<p>AECOM 4 NORTH PARK DRIVE SUITE 300 HUNT VALLEY, MARYLAND 21030 PHONE: 410-785-7220 FAX: 410-785-6818</p>	<p>PROFESSIONAL CERTIFICATION</p> <p>* I 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.</p> <p>MD LICENSE NUMBER: S3587</p> <p>EXPIRATION DATE: 12-09-2024</p> <p>06/08/2023</p>	<p>REVISIONS</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>BY</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>				NO.	DESCRIPTION	BY	DATE																	<p>ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS</p> <table border="1"> <thead> <tr> <th>APPROVED</th> <th>DATE</th> <th>APPROVED</th> <th>DATE</th> <th>SCALE: AS NOTED</th> </tr> </thead> <tbody> <tr> <td></td> <td>11/20/2023</td> <td></td> <td>11/17/2023</td> <td>08:59 EST</td> </tr> <tr> <td>CHIEF ENGINEER</td> <td></td> <td>PROJECT MANAGER</td> <td></td> <td>DRAWN BY: DMT</td> </tr> <tr> <td>APPROVED</td> <td>DATE</td> <td>APPROVED</td> <td>DATE</td> <td>CHECKED BY: DMT</td> </tr> <tr> <td></td> <td>11/17/2023</td> <td></td> <td>11/17/2023</td> <td>SHEET NO. 71 OF 116</td> </tr> <tr> <td>ASSISTANT CHIEF ENGINEER</td> <td></td> <td>CHIEF, RIGHT OF WAY</td> <td></td> <td>PROJECT NO. P504100</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>CONTRACT NO. P504105</td> </tr> </tbody> </table>				APPROVED	DATE	APPROVED	DATE	SCALE: AS NOTED		11/20/2023		11/17/2023	08:59 EST	CHIEF ENGINEER		PROJECT MANAGER		DRAWN BY: DMT	APPROVED	DATE	APPROVED	DATE	CHECKED BY: DMT		11/17/2023		11/17/2023	SHEET NO. 71 OF 116	ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY		PROJECT NO. P504100					CONTRACT NO. P504105
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<p><b>DRAINAGE SCHEDULES AND DETAILS</b></p>																																																																





DETAIL 'A'  
SCALE 1"=5'

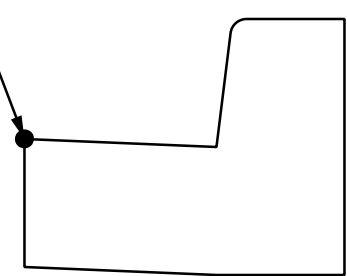


DETAIL 'B'  
SCALE 1"=5'

INTERSECTION CONSTRUCTION NOTES

- (A) 24 INCH WHITE HEAT APPLIED PERFORMED THERMOPLASTIC PAVEMENT MARKING FOR STOP LINE
- (B) 12 INCH WHITE HEAT APPLIED PERFORMED THERMOPLASTIC PAVEMENT MARKING FOR CROSSWALK

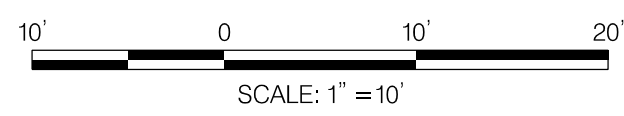
EDGE OF GUTTER PAN  
POINT OF APPLICATION



NOTES:

1. CURB, RAMP, AND SIDEWALK ELEVATIONS PROVIDED ARE FOR CONTRACTOR REFERENCE ONLY. ACTUAL FIELD CONDITIONS MAY VARY. PRIOR TO CONSTRUCTION, THESE ELEVATIONS SHALL BE CONFIRMED BY THE CONTRACTOR TO MEET THE REQUIREMENTS SET FORTH BY THE LATEST EDITION OF THE AMERICANS WITH DISABILITIES ACT AND THE MARYLAND STATE HIGHWAY ADMINISTRATION'S (MDSA) "ACCESSIBILITY POLICY AND GUIDELINES FOR PEDESTRIAN FACILITIES ALONG STATE HIGHWAY (2010)." ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER.
2. PROPOSED CURB/GUTTER AND SIDEWALK TIE-INS SHALL BE MADE TO THE NEAREST EXISTING CONCRETE JOINT WHEN POSSIBLE.
3. ALL SIDEWALK RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH MARYLAND STATE HIGHWAY ADMINISTRATION (MDSA) STANDARD DETAILS, INCLUDING MD 655.11 AND MD 655.12. SEE DWG. NO. DE-01.

POINT TABLE						
POINT	BASELINE	STATION	OFFSET	NORTHING	EASTING	ELEVATION
100	TRAIL 01	30+78.62	32.97 LT	495,666.81	1,471,810.21	MATCH EX.
101	TRAIL 01	30+78.50	28.33 LT	495,662.26	1,471,809.28	20.04
102	TRAIL 01	30+41.81	7.12 RT	495,633.81	1,471,766.93	18.90
103	TRAIL 02	40+07.38	26.92 LT	495,660.88	1,471,843.93	MATCH EX.
104	TRAIL 02	40+07.84	18.95 RT	495,623.69	1,471,870.80	MATCH EX.
105	TRAIL 02	40+33.79	8.00 LT	495,655.68	1,471,882.89	20.80
106	TRAIL 02	40+36.89	17.18 LT	495,665.12	1,471,885.07	MATCH EX.
A1	TRAIL 01	30+63.99	2.69 LT	495,639.57	1,471,790.49	19.90
A2	TRAIL 01	30+69.44	7.26 LT	495,643.11	1,471,796.66	19.60
A3	TRAIL 01	30+75.21	17.64 LT	495,652.31	1,471,804.16	19.80
A4	TRAIL 01	30+75.28	20.09 LT	495,654.71	1,471,804.66	20.35
A5	TRAIL 01	30+65.14	21.16 LT	495,657.55	1,471,794.87	20.02
A6	TRAIL 01	30+61.13	13.95 LT	495,651.15	1,471,789.65	19.72
A7	TRAIL 01	30+57.64	10.42 LT	495,648.29	1,471,785.59	20.15
B1	TRAIL 02	40+00.25	10.00 LT	495,642.95	1,471,847.88	20.10
B2	E COLLEGE PKWY	127+49.32	34.78 LT	495,640.74	1,471,848.22	19.70
B3	E COLLEGE PKWY	127+55.14	29.31 LT	495,634.25	1,471,852.90	19.55
B4	TRAIL 02	40+02.28	7.79 RT	495,629.59	1,471,859.81	19.90
B5	TRAIL 02	40+09.57	4.50 RT	495,636.49	1,471,863.87	20.02
B6	TRAIL 02	40+08.12	0.00 RT	495,639.32	1,471,860.08	19.70
B7	TRAIL 02	40+13.12	0.00 RT	495,642.21	1,471,864.16	20.30
B8	TRAIL 02	40+13.12	8.00 LT	495,648.74	1,471,859.54	20.42



PROFESSIONAL CERTIFICATION  
 "I 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."  
 MD LICENSE NUMBER: 53587  
 EXPIRATION DATE: 12-09-2024



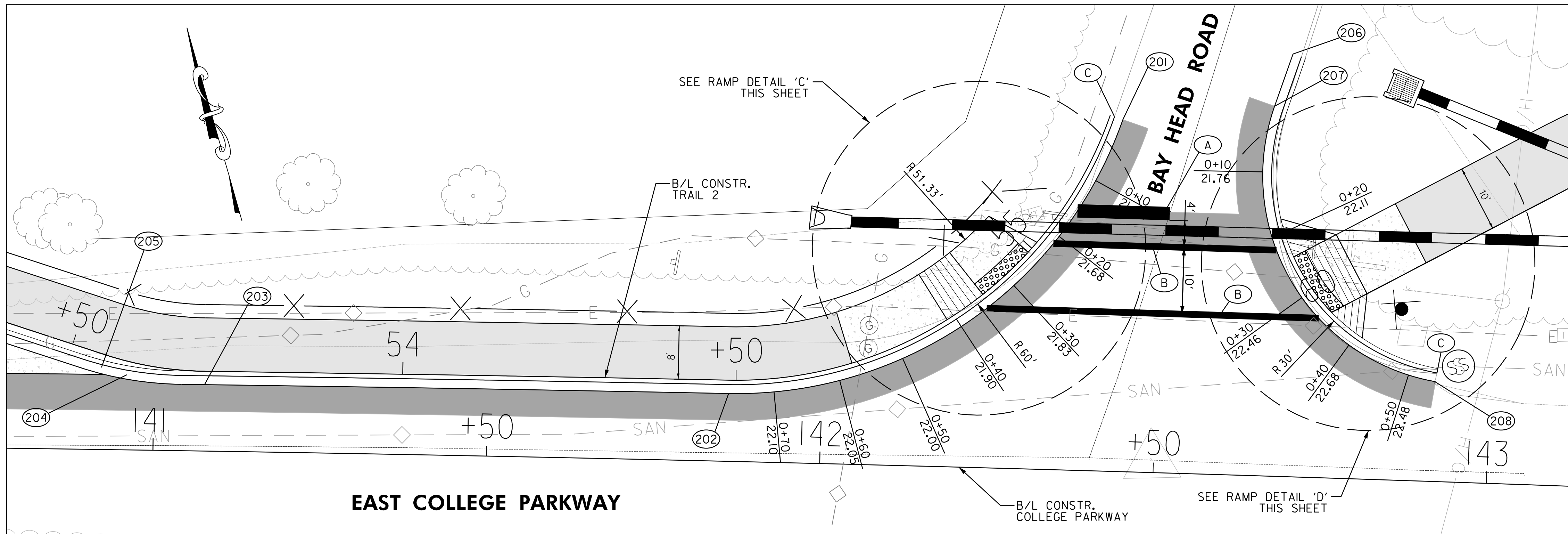
REVISIONS			
NO.	DESCRIPTION	BY	DATE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS			
APPROVED	DATE	APPROVED	DATE
<i>[Signature]</i>	11/20/2023   08:59 EST	<i>[Signature]</i>	11/17/2023   08:00 EST
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ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY	

GP# G02018957 DWG. NO.: ID-01

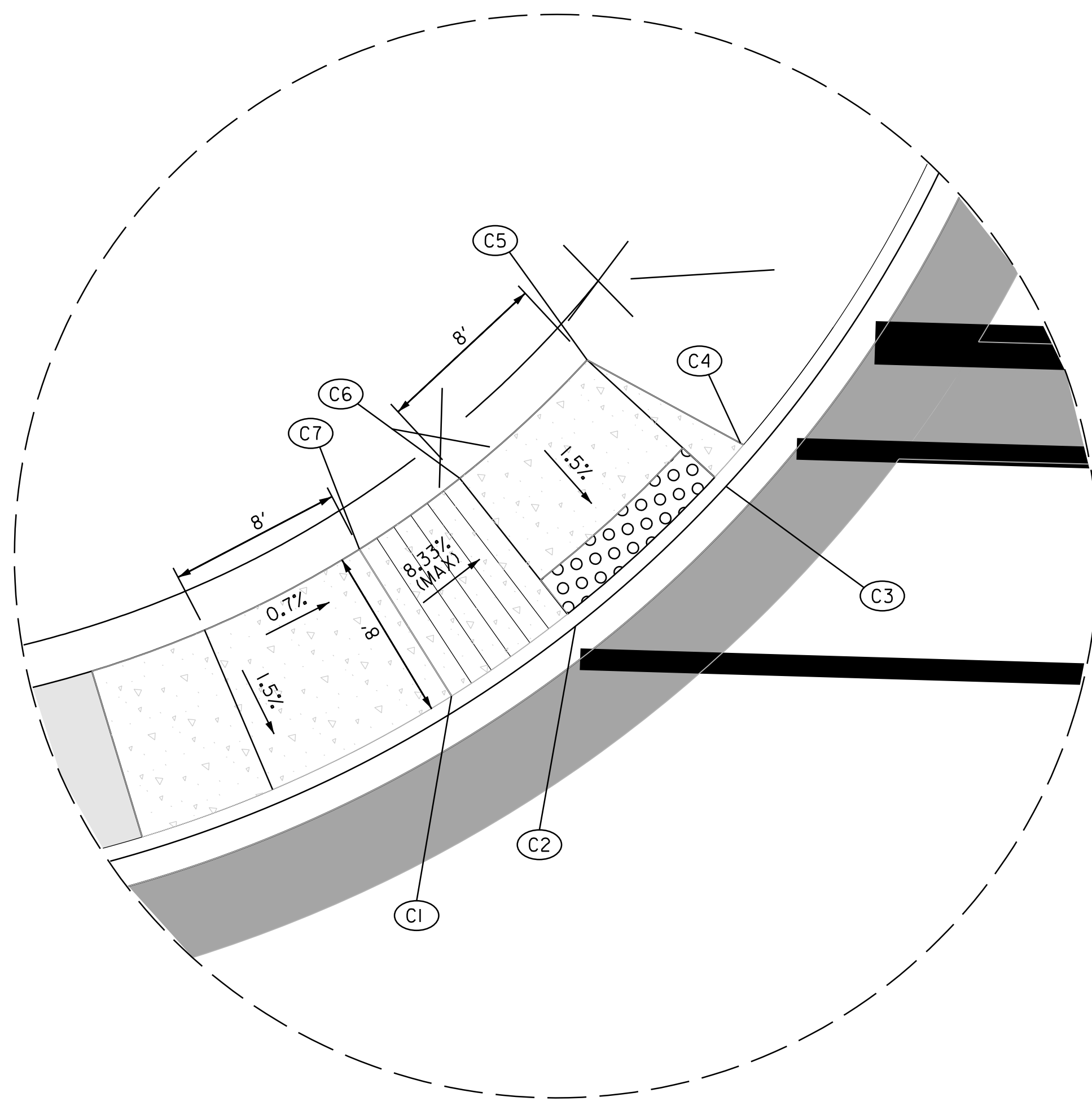
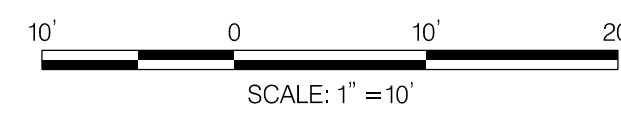
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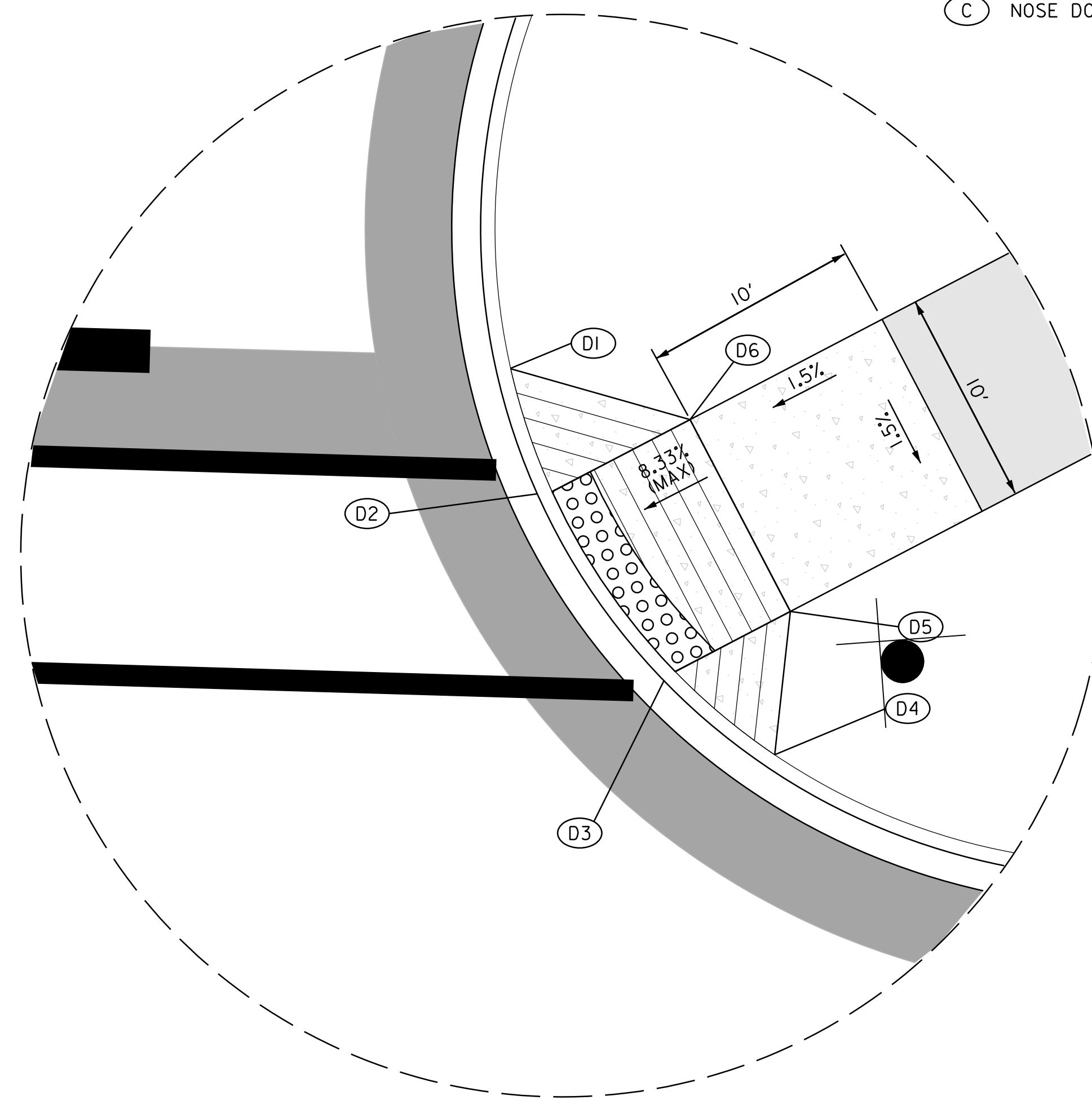


POINT TABLE						
POINT	BASELINE	STATION	OFFSET	NORTHING	EASTING	ELEVATION
201	TRAIL 02	55+23.30	2.00 RT	495,293.44	1,473,306.48	MATCH EX
202	TRAIL 02	54+48.91	2.00 RT	495,270.21	1,473,238.38	22.08
203	TRAIL 02	53+70.30	2.00 RT	495,293.04	1,473,163.17	21.85
204	TRAIL 02	53+58.98	2.00 RT	495,297.66	1,473,152.37	21.82
205	TRAIL 02	53+55.18	2.00 RT	495,299.75	1,473,149.01	21.80
206	TRAIL 03	60+12.79	36.98 LT	495,295.91	1,473,333.70	MATCH EX
207	TRAIL 03	60+06.73	31.33 LT	495,289.15	1,473,328.91	21.26
208	TRAIL 03	60+09.00	16.42 RT	495,242.84	1,473,340.79	MATCH EX
C1	TRAIL 02	54+83.35	0.00	495,271.86	1,473,272.93	22.41
C2	TRAIL 02	54+89.91	0.67 RT	495,273.41	1,473,279.36	21.87
C3	TRAIL 02	54+99.19	0.67 RT	495,277.67	1,473,287.72	21.75
C4	TRAIL 02	55+01.19	0.00 RT	495,279.31	1,473,289.06	22.22
C5	TRAIL 02	54+99.19	8.00 LT	495,285.06	1,473,283.19	21.87
C6	TRAIL 02	54+89.91	8.00 LT	495,281.42	1,473,276.04	22.00
C7	TRAIL 02	54+83.35	8.00 LT	495,279.54	1,473,270.70	22.53
D1	E COLLEGE PKWY	142+67.97	38.57 LT	495,272.64	1,473,325.18	22.52
D2	E COLLEGE PKWY	142.69.47	32.63 LT	495,266.52	1,473,324.81	22.25
D3	E COLLEGE PKWY	142+75.38	24.48 RT	495,256.96	1,473,327.97	22.60
D4	TRAIL 03	60+02.30	5.53 RT	495,252.15	1,473,332.02	23.16
D5	TRAIL 03	60+06.00	0.00	495,258.32	1,473,334.53	22.72
D6	TRAIL 03	60+06.00	10.00 LT	495,268.11	1,473,332.51	22.84

- INTERSECTION CONSTRUCTION NOTES
- (A) 24 INCH WHITE HEAT APPLIED PERFORMED THERMOPLASTIC PAVEMENT MARKING FOR STOP LINE
  - (B) 12 INCH WHITE HEAT APPLIED PERFORMED THERMOPLASTIC PAVEMENT MARKING FOR CROSSWALK
  - (C) NOSE DOWN CURB (MAX. 3:1 SLOPE)



DETAIL 'C'  
SCALE 1"=5'



DETAIL 'D'  
SCALE 1"=5'

GP# G02018957      DWG. NO.: ID-02

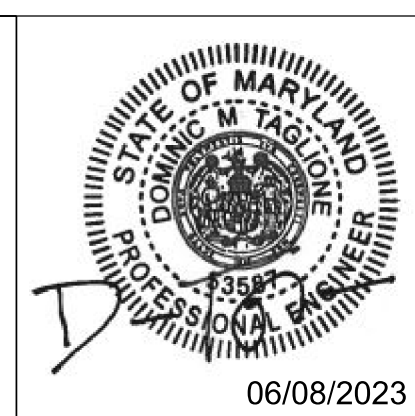
**AECOM**

AECOM  
4 NORTH PARK DRIVE  
SUITE 300  
HUNT VALLEY, MARYLAND 21030  
PHONE: 410-785-7220  
FAX: 410-785-6818

PROFESSIONAL CERTIFICATION

"I 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."

MD LICENSE NUMBER: 53587  
EXPIRATION DATE: 12-09-2024

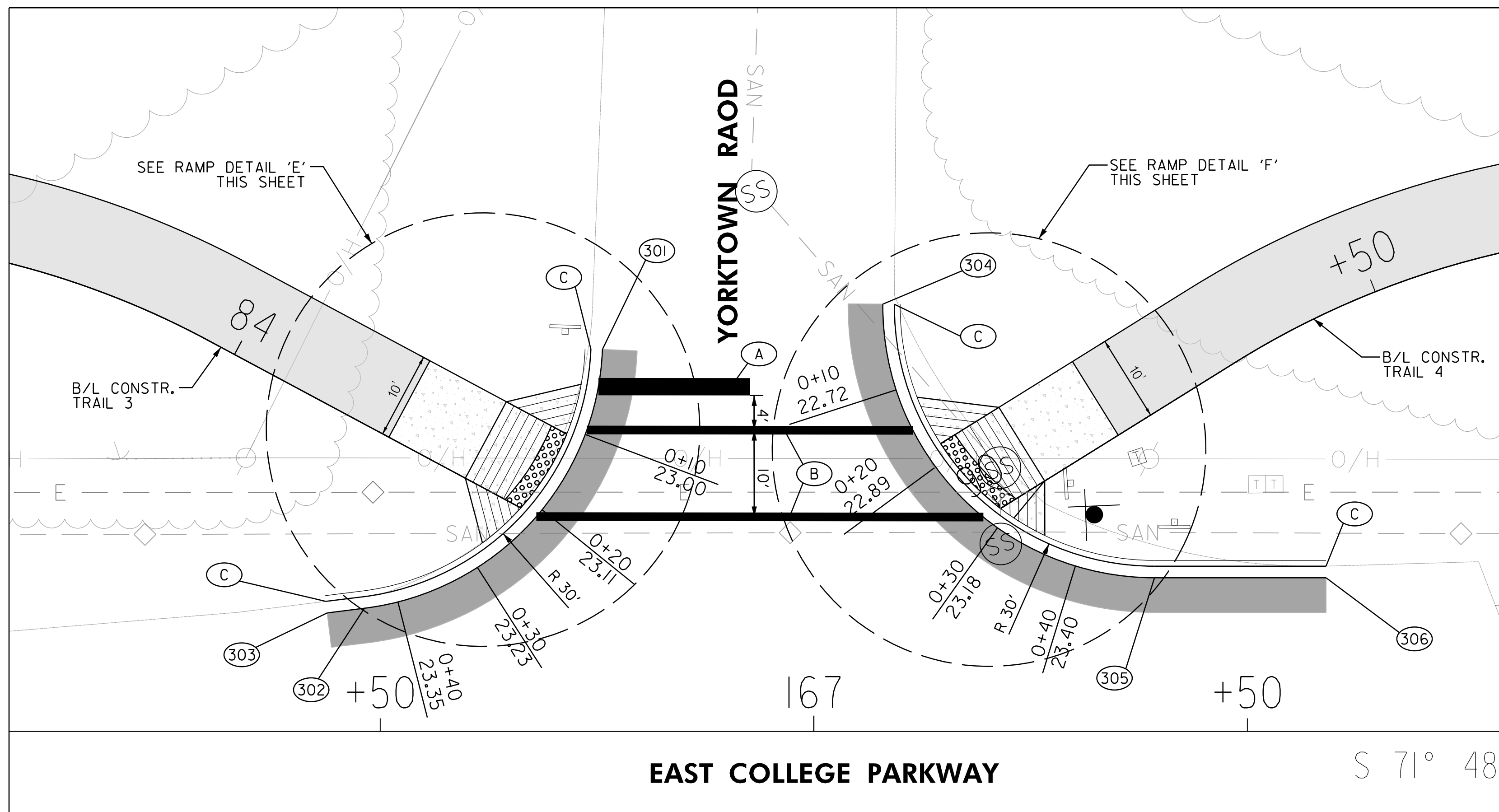


REVISIONS			
NO.	DESCRIPTION	BY	DATE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS			
APPROVED	DATE	APPROVED	DATE
<i>[Signature]</i>	11/20/2023   08:59 EST	<i>[Signature]</i>	11/17/2023   08:00 EST
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
<i>[Signature]</i>	11/17/2023   11:56 EST	<i>[Signature]</i>	11/17/2023   18:30 EST
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY	
SCALE: AS NOTED		DRAWN BY: DMT	
CHECKED BY: DMT		SHEET NO. 73 OF 116	
PROJECT NO. P504100		CONTRACT NO. P504105	

**INTERSECTION DETAIL**

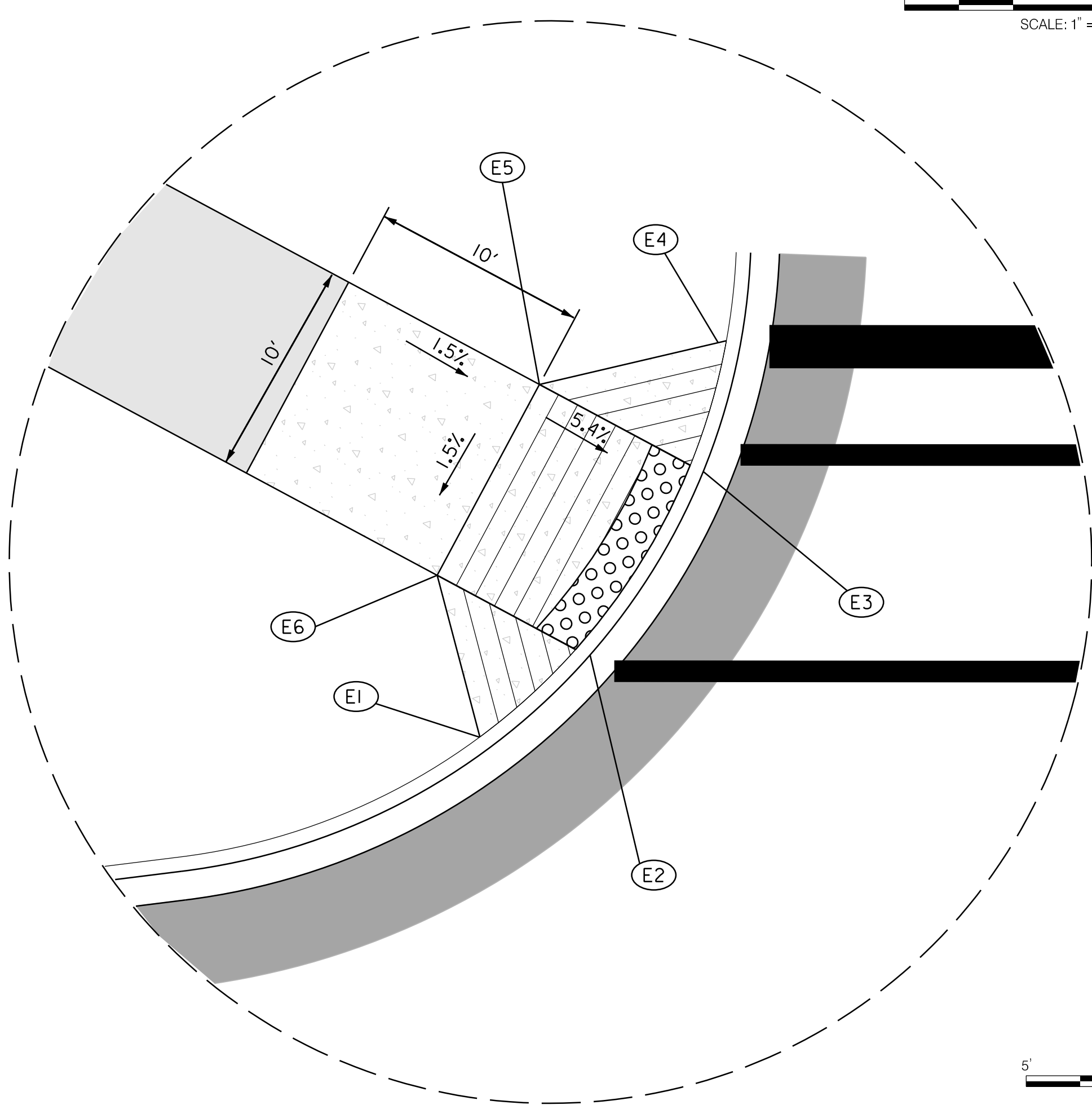
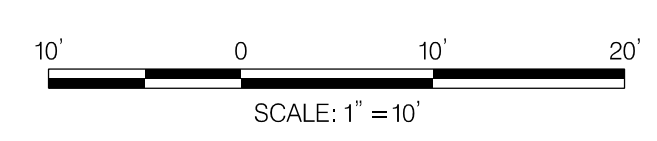




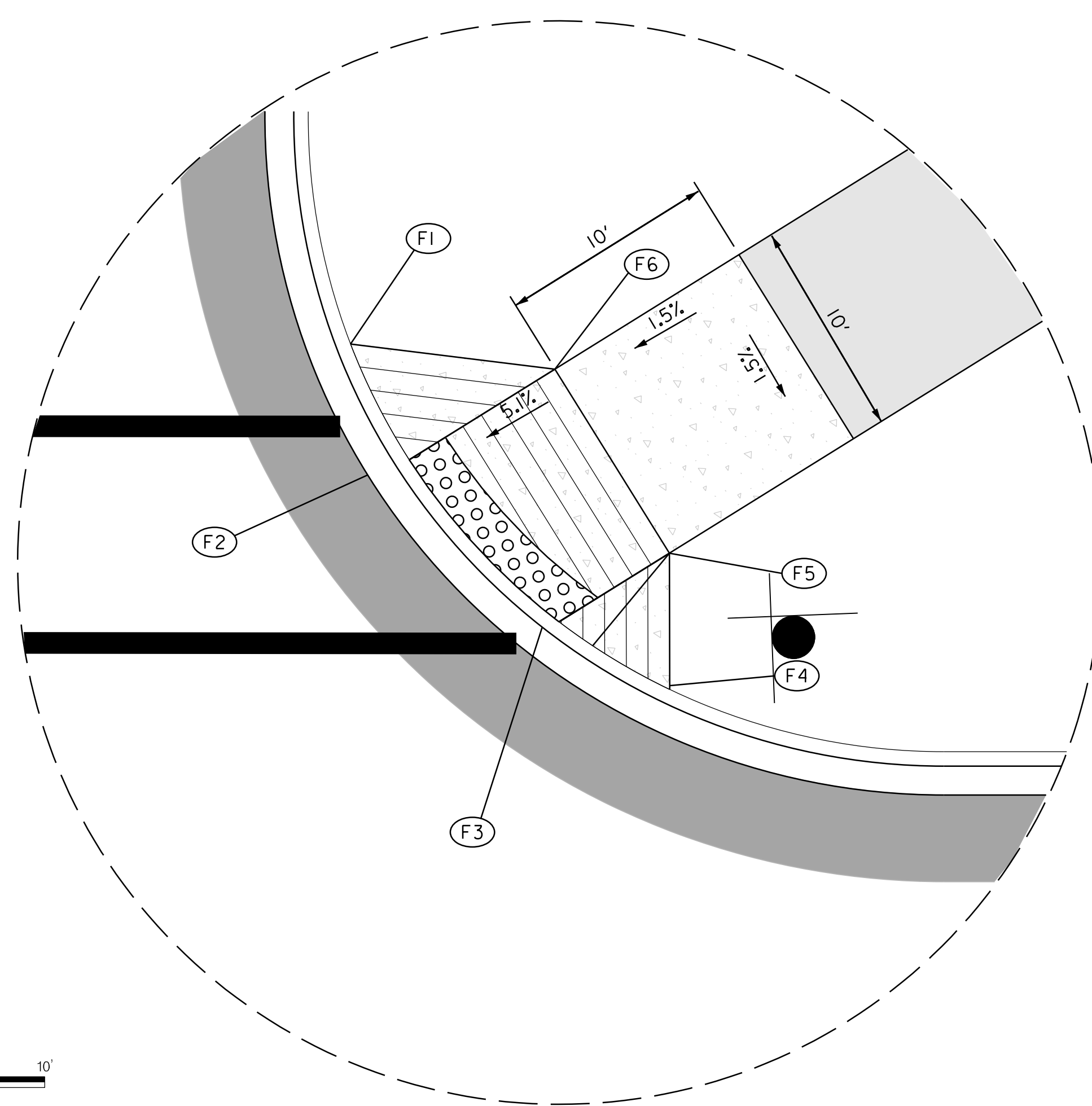
POINT TABLE						
POINT	BASELINE	STATION	OFFSET	NORTHING	EASTING	ELEVATION
301	TRAIL 03	84+37.13	20.55 LT	494,522.48	1,475,613.31	MATCH EX
302	TRAIL 03	84+27.02	18.72 RT	494,502.70	1,475,577.92	23.40
303	TRAIL 03	84+23.49	21.21 RT	494,503.53	1,475,573.68	MATCH EX
304	TRAIL 04	90+00.93	27.17 LT	494,517.36	1,475,645.66	MATCH EX
305	TRAIL 04	90+10.86	16.17 RT	494,477.60	1,475,665.58	23.35
306	TRAIL 04	90+27.65	26.61 RT	494,471.43	1,475,684.37	MATCH EX
E1	E COLLEGE PKWY	166+61.80	21.72 LT	494,505.60	1,475,593.20	23.70
E2	E COLLEGE PKWY	166+66.82	25.43 LT	494,507.57	1,475,599.14	23.12
E3	E COLLEGE PKWY	166+72.10	33.95 LT	494,514.01	1,475,606.81	23.00
E4	TRAIL 03	84+36.86	15.86 LT	494,519.44	1,475,609.73	23.43
E5	TRAIL 03	84+30.20	10.00 LT	494,520.22	1,475,600.90	23.43
E6	TRAIL 03	84+30.20	0.00	494,513.31	1,475,593.66	23.28
F1	E COLLEGE PKWY	167+11.92	38.52 LT	494,505.92	1,475,646.06	23.25
F2	E COLLEGE PKWY	167+14.06	32.82 LT	494,499.84	1,475,646.32	22.85
F3	E COLLEGE PKWY	167+20.93	25.32 LT	494,490.57	1,475,650.51	23.13
F4	TRAIL 04	90+02.69	5.35 RT	494,486.18	1,475,655.08	23.79
F5	TRAIL 04	90+06.00	0.00	494,492.16	1,475,657.03	23.25
F6	TRAIL 04	90+06.00	10.00 LT	494,501.88	1,475,654.66	23.40

INTERSECTION CONSTRUCTION NOTES

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- (B) 12 INCH WHITE HEAT APPLIED PERFORMED THERMOPLASTIC PAVEMENT MARKING FOR CROSSWALK
- (C) NOSE DOWN CURB (MAX. 3:1 SLOPE)



DETAIL 'E'  
SCALE 1"=5'

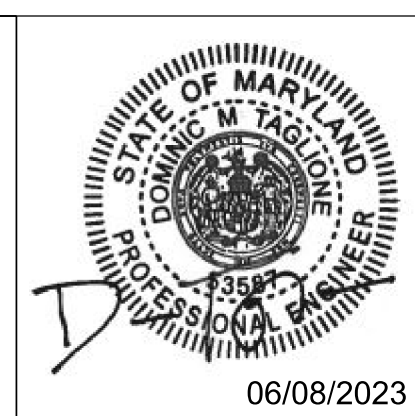


DETAIL 'F'  
SCALE 1"=5'

GP# G02018957      DWG. NO.: ID-03

**AECOM**  
 AECOM  
 4 NORTH PARK DRIVE  
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 FAX: 410-785-6818

PROFESSIONAL CERTIFICATION  
 "I 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."  
 MD LICENSE NUMBER: S3587  
 EXPIRATION DATE: 12-09-2024



REVISIONS			
NO.	DESCRIPTION	BY	DATE

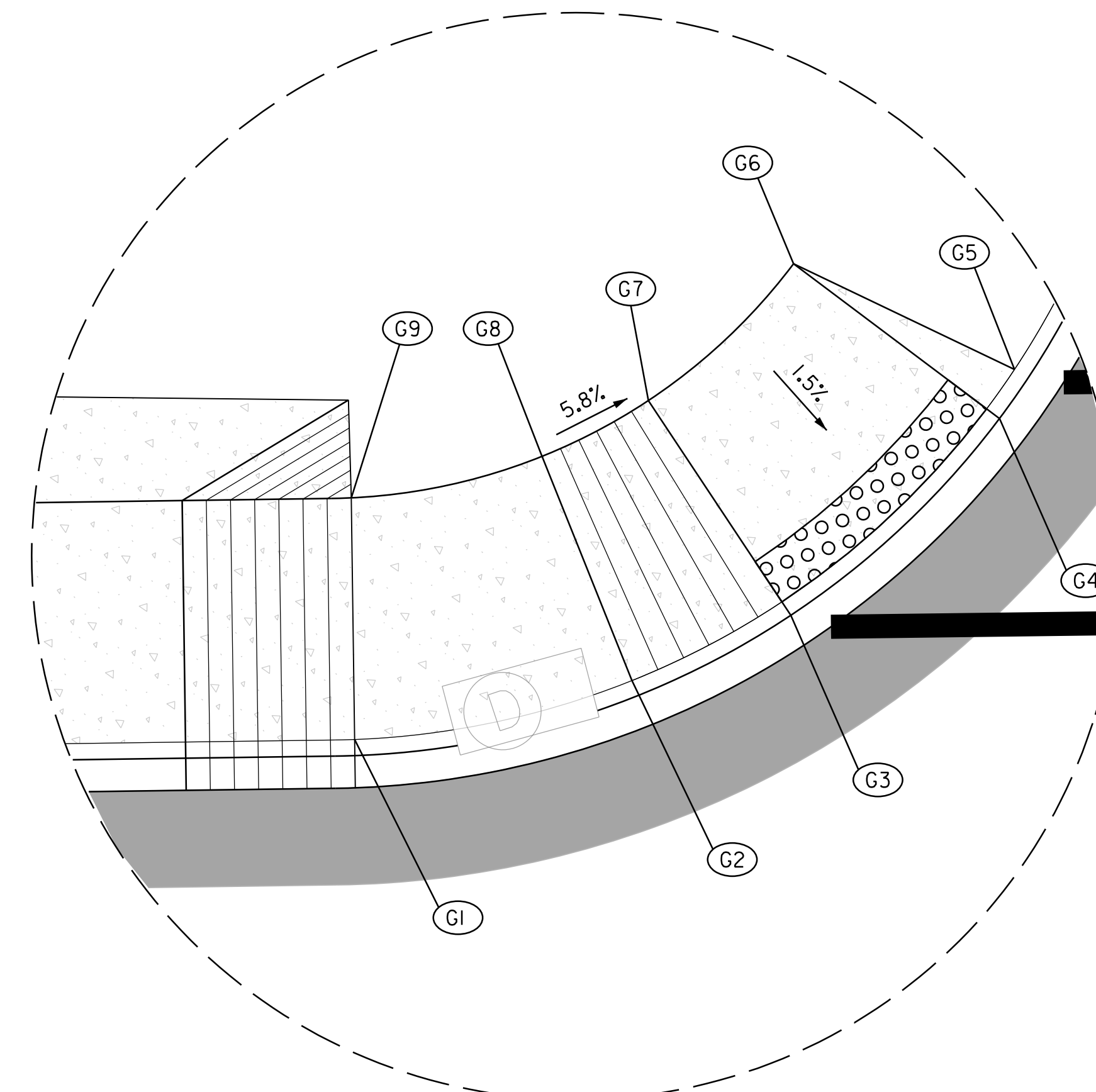
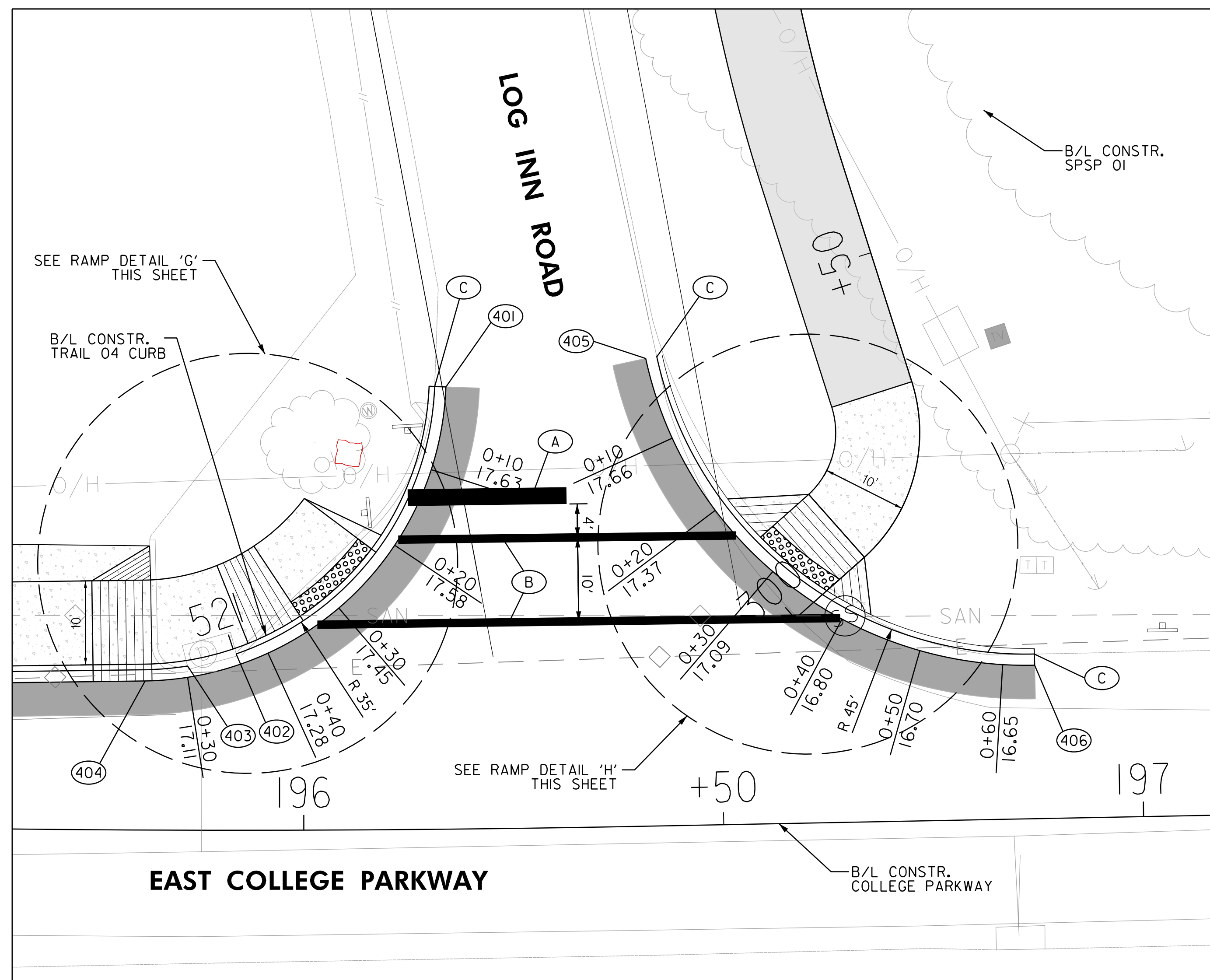
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS			
APPROVED	DATE	APPROVED	DATE
<i>[Signature]</i>	11/20/2023   08:59 EST	<i>[Signature]</i>	11/17/2023   08:00 EST
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
<i>[Signature]</i>	11/17/2023   11:56 EST	<i>[Signature]</i>	11/17/2023   18:30 EST
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY	

SCALE: AS NOTED  
 DRAWN BY: DMT  
 CHECKED BY: DMT  
 SHEET NO. 74 OF 116  
 PROJECT NO. P504100  
 CONTRACT NO. P504105

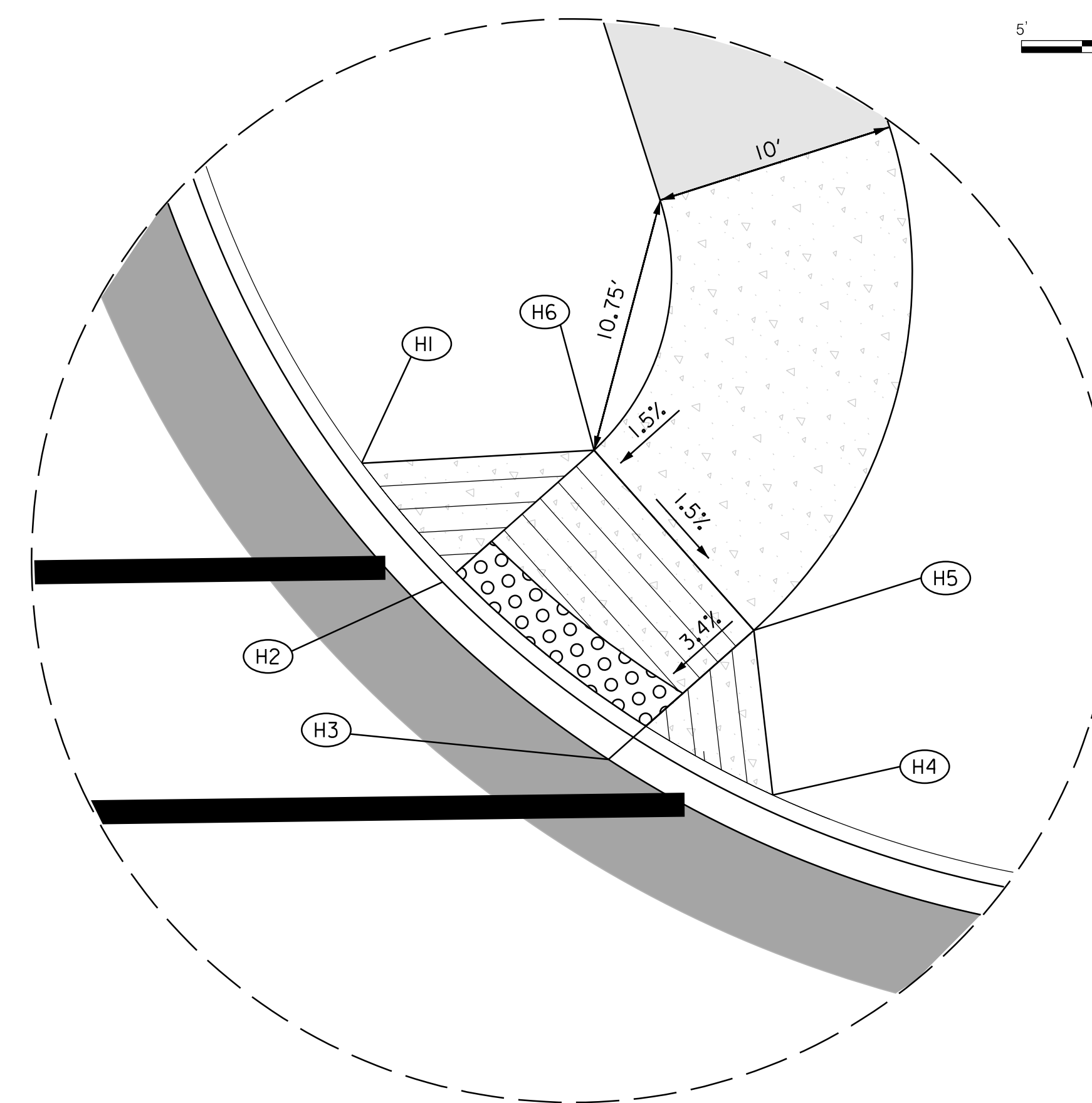
**BROADNECK PENINSULA TRAIL  
 PHASE IB & V**

**INTERSECTION DETAIL**

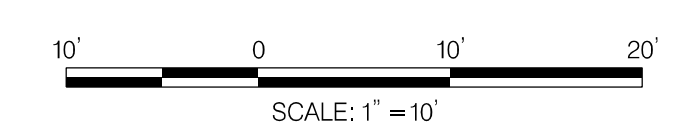
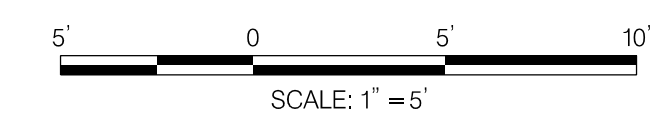




DETAIL 'G'  
SCALE 1"=5'



DETAIL 'H'  
SCALE 1"=5'



INTERSECTION CONSTRUCTION NOTES

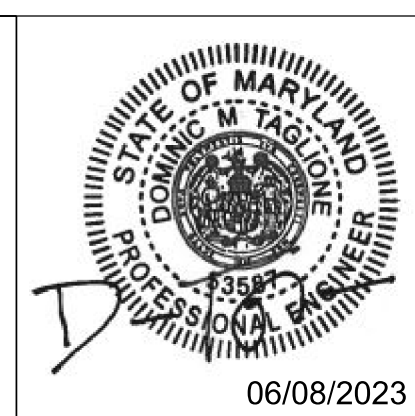
- (A) 24 INCH WHITE HEAT APPLIED PERFORMED THERMOPLASTIC PAVEMENT MARKING FOR STOP LINE
- (B) 12 INCH WHITE HEAT APPLIED PERFORMED THERMOPLASTIC PAVEMENT MARKING FOR CROSSWALK
- (C) NOSE DOWN CURB (MAX. 3:1 SLOPE)

POINT TABLE						
POINT	BASELINE	STATION	OFFSET	NORTHING	EASTING	ELEVATION
401	TRAIL 04 CURB	521+41.50	2.00 RT	493,607.74	1,478,408.54	MATCH EX
402	TRAIL 04 CURB	521+00.16	0.67 RT	493,585.34	1,478,374.90	MATCH EX
403	TRAIL 04 CURB	520+94.30	0.67 RT	493,585.77	1,478,368.96	MATCH EX
404	TRAIL 04 CURB	520+89.30	2.00 RT	493,585.66	1,478,363.60	17.02
405	E COLLEGE PKWY	196+41.78	55.68 LT	493,603.52	1,478,432.21	MATCH EX
406	SPSP 01	521+32.00	77.51 RT	493,554.38	1,478,464.79	MATCH EX
G1	TRAIL 04 CURB	520+90.12	0.00 RT	493,587.34	1,478,364.98	17.54
G2	TRAIL 04 CURB	521+01.91	0.00 RT	493,586.07	1,478,376.65	17.67
G3	TRAIL 04 CURB	521+08.93	0.67 RT	493,586.59	1,478,383.74	17.38
G4	TRAIL 04 CURB	521+20.64	0.67 RT	493,591.63	1,478,394.49	17.55
G5	TRAIL 04 CURB	521+22.64	0.00 RT	493,593.37	1,478,395.71	18.08
G6	TRAIL 04 CURB	521+20.64	10.00 LT	493,600.38	1,478,388.38	17.70
G7	TRAIL 04 CURB	521+08.93	10.00 LT	493,596.87	1,478,380.91	17.53
G8	TRAIL 04 CURB	521+01.91	10.00 LT	493,596.05	1,478,376.01	17.82
G9	TRAIL 04 CURB	520+90.45	10.00 LT	493,596.88	1,478,367.97	17.69
H1	SPSP 01	521+35.65	37.06 RT	493,584.59	1,478,436.26	17.87
H2	SPSP 01	521+33.75	41.53 RT	493,578.78	1,478,437.94	17.20
H3	SPSP 01	521+32.09	50.89 RT	493,570.26	1,478,443.42	16.92
H4	SPSP 01	521+31.89	57.13 RT	493,566.17	1,478,448.17	17.23
H5	SPSP 01	521+34.32	54.48 RT	493,572.92	1,478,449.56	17.15
H6	SPSP 01	521+36.72	46.42 RT	493,582.10	1,478,445.59	17.30

GP# G02018957      DWG. NO.: ID-04

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 FAX: 410-785-6818

PROFESSIONAL CERTIFICATION  
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 ME, AND THAT I AM A DULY LICENSED  
 PROFESSIONAL ENGINEER UNDER  
 THE LAWS OF THE STATE OF  
 MARYLAND.  
 MD LICENSE NUMBER: 53587  
 EXPIRATION DATE: 12-09-2024



REVISIONS			
NO.	DESCRIPTION	BY	DATE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS			
APPROVED	DATE	APPROVED	DATE
<i>[Signature]</i>	11/20/2023   08:59 EST	<i>[Signature]</i>	11/17/2023   08:00 EST
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<i>[Signature]</i>	11/17/2023   11:56 EST	<i>[Signature]</i>	11/17/2023   18:30 EST
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY	

SCALE: AS NOTED  
 DRAWN BY: DMT  
 CHECKED BY: DMT  
 SHEET NO. 75 OF 116  
 PROJECT NO. P504100  
 CONTRACT NO. P504105  
**BROADNECK PENINSULA TRAIL  
 PHASE IB & V**  
**INTERSECTION DETAIL**