



# APPENDIX D

## CARSINS RUN MITIGATION PLANS AND DESIGN REPORT

**INDEX OF SHEETS**

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REDLINE REVISION NO. 1 JUNE 16, 2020 Modifies Reaches 1 & 3 of the tributary to: lower the raffle top of bank and pool inverts by 0.5', reduces the proposed Bank Height Ratio to less than 1.2, and revises grading in the floodplain.



Maryland  
 Transportation  
 Authority

**JOHN F. KENNEDY MEMORIAL HIGHWAY  
 I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION**

**CARSINS RUN  
 STREAM RESTORATION**

HARFORD COUNTY  
 STRUCTURE NO. : N/A

**CONTRACT NO.: KH-3028-0000**

**STREAM RESTORATION AS-BUILT CERTIFICATION**  
 STREAM CONSTRUCTION

I HEREBY CERTIFY THAT THE PORTION OF THE STREAM RESTORATION SITE SHOWN ON THE PLANS AND IDENTIFIED IN THE STREAM CHECKLIST AS STREAM CONSTRUCTION HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS INCLUDED UNDER THE MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVAL NUMBER 18 - NT - 0086 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 SITE.

ANDREW WHALEY  
 Name (Printed) *Andrew Whaley* Digitally signed by Andrew Whaley  
 Signature Date: 2021.06.05 23:13:47 -0400  
 44904 06/05/2021  
 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 OR PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 44904, EXPIRATION 12/22/2021.

"CERTIFY" MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED ON SUFFICIENT AND APPROPRIATE ONSITE INSPECTIONS AND MATERIAL TESTS CONDUCTED DURING CONSTRUCTION.

EROSION AND SEDIMENT CONTROL REGULATIONS WILL BE STRICTLY ENFORCED DURING CONSTRUCTION.

STATE OF MARYLAND PROFESSIONAL ENGINEER  
 JOSEPH HEWER  
 No. 20454  
 5/19/2020

**CD** CONSTELLATION DESIGN GROUP, INC.  
 CONSULTING ENGINEERS  
 57 W. TIMONIUM ROAD  
 SUITE 200  
 TIMONIUM, MD 21093  
 410-252-1884

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. 20454, EXPIRATION DATE: 5-19-2020.

SHEET NOS. 14-30

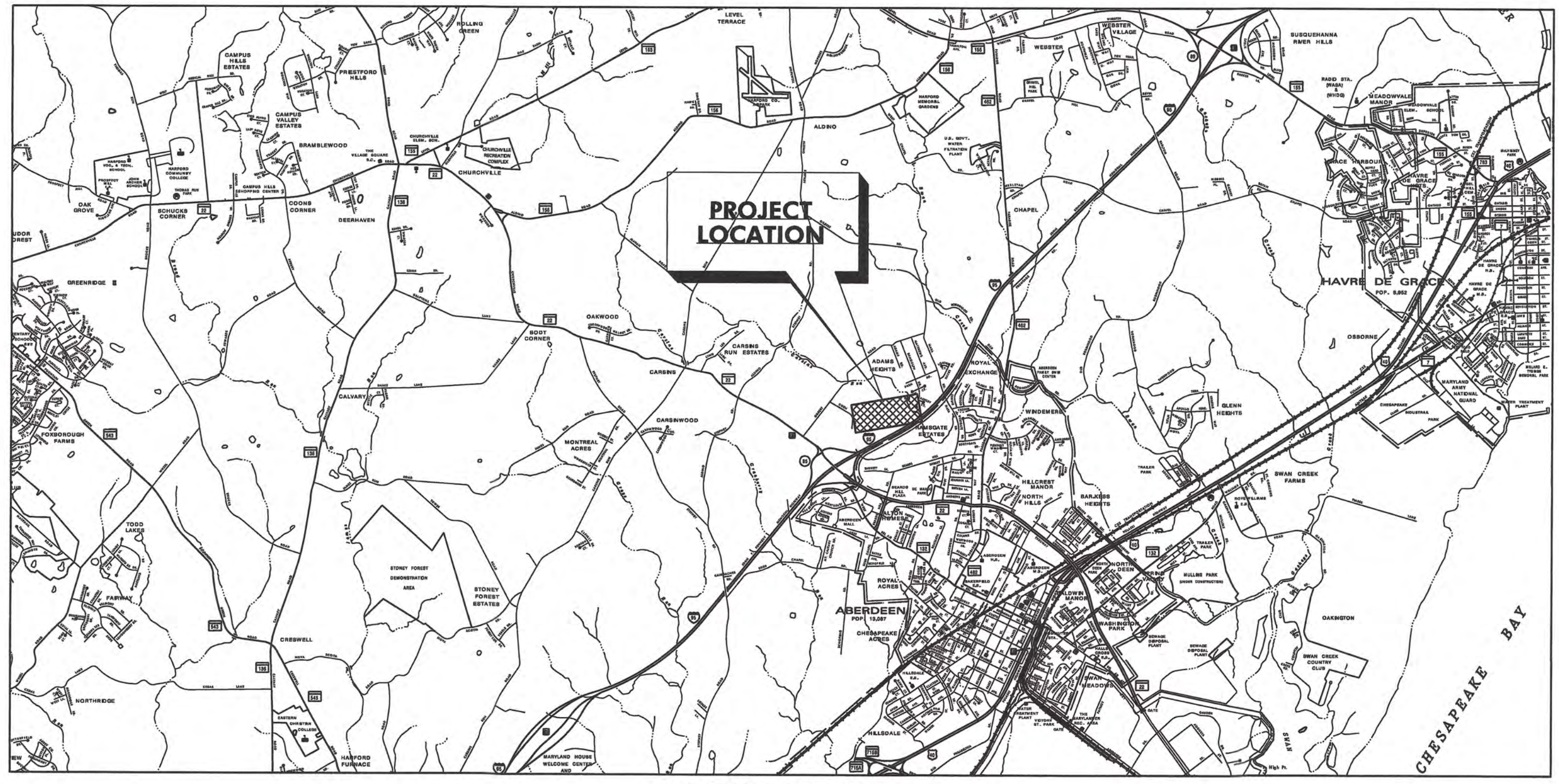
STATE OF MARYLAND PROFESSIONAL ENGINEER  
 KCI  
 No. 33079  
 1-16-2021

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PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 33079, EXPIRATION DATE: 1-16-2021.

SHEET NOS. 1-13, 31-87



**LOCATION MAP**  
 SCALE : 4000'

HORIZONTAL DATUM	NAD 83 / 91
VERTICAL DATUM	NAVD 88

**STANDARDS AND SPECIFICATIONS**

THIS PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE MARYLAND STATE HIGHWAY ADMINISTRATION'S "STANDARDS FOR HIGHWAY AND INCIDENTAL CONSTRUCTION", THE MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION'S "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, JULY 2019" AND ALL REVISIONS THEREOF, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND AS SPECIFIED IN THE CONTRACT DOCUMENTS.

**COMPLETENESS OF DOCUMENTS**

THE MARYLAND TRANSPORTATION AUTHORITY SHALL ONLY BE RESPONSIBLE FOR THE COMPLETENESS OF DOCUMENTS OBTAINED DIRECTLY FROM EMARYLAND MARKETPLACE. ALL RELEVANT DOCUMENTS REQUIRED FOR BIDDING PROJECTS ARE POSTED ON AND ARE DOWNLOADABLE FROM EMARYLAND MARKETPLACE.

**RIGHT OF WAY**

RIGHT OF WAY AND EASEMENT LINES SHOWN ON THESE PLANS ARE FOR ASSISTANCE IN INTERPRETING THE PLANS. THEY ARE NOT OFFICIAL FOR OFFICIAL FEE RIGHT OF WAY AND EASEMENT INFORMATION. SEE APPROPRIATE RIGHT OF WAY PLATS.

**UTILITIES**

THE LOCATION OF UTILITIES SHOWN ON THE PLANS ARE FOR INFORMATION AND GUIDANCE ONLY. NO GUARANTEE IS MADE OF THE ACCURACY OF SAID LOCATIONS. NOTIFICATION TO "MISS UTILITY", 1.800.257.7777, SHALL BE GIVEN 72 HOURS (THREE FULL WORKING DAYS) IN ADVANCE OF WORKING IN THE AREA OF THE SPECIFIC AFFECTED UTILITY. THE NOTIFICATION TO "MISS UTILITY" IS REQUIRED WHENEVER ANY EXCAVATING OR SIMILAR WORK IS TO BE PERFORMED.

NOTIFICATION TO BILL PROSS, THE MDTA UTILITIES COORDINATOR (410.537.7829), SHALL BE GIVEN 72 HOURS (THREE FULL WORKING DAYS) IN ADVANCE OF WORKING IN THE AREA OF MDTA UTILITIES.

**ENVIRONMENTAL INFORMATION**

MDE # 18-NT-0086/201860368

FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN (7) DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.

THE GRADING LIMITS SHOWN ON THE PLANS SHALL NOT BE EXCEEDED. ANY CHANGES IN THE SEDIMENT CONTROL PLAN, THE STORMWATER MANAGEMENT BEST MANAGEMENT PRACTICES (BMP'S) OR OTHER SEGMENT OF WORK MUST BE REVIEWED AND APPROVED BY MDTA ENVIRONMENTAL DIVISION AND MARYLAND DEPARTMENT OF ENVIRONMENT, SEDIMENT AND STORMWATER PLAN REVIEW DIVISION.

ALL STORMWATER MANAGEMENT FACILITIES CONSTRUCTED FOR THIS CONTRACT SHALL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE MDTA BEST MANAGEMENT PRACTICES (BMP) INSPECTION AND REMEDIATION PROGRAM.

**ADA COMPLIANCE**

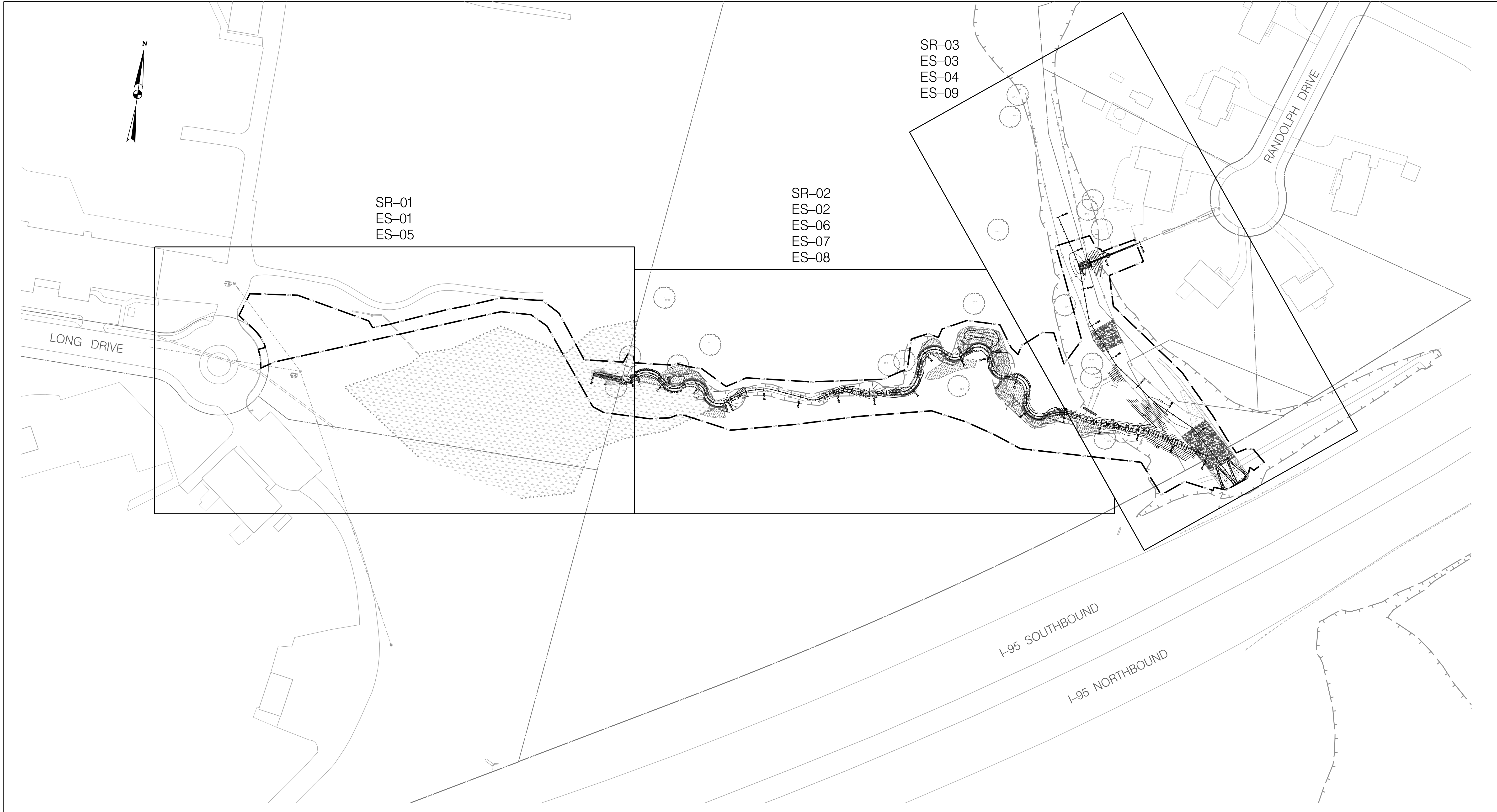
THE DESIGN OF THIS PROJECT HAS INCORPORATED FACILITIES IN COMPLIANCE WITH THE STATE AND FEDERAL LEGISLATION

**ADVERTISEMENT**  
 DATE \_\_\_\_\_

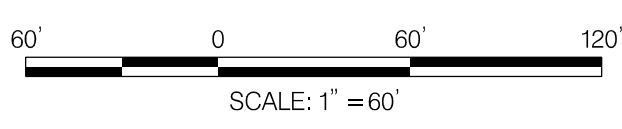
MDE No. 19-SF-0196; 18-NT-0086

ADDENDA ADDENDUM NO. 2 SHEET NOS. 8, 9, 31, 32, 33, 34, 35, 86 REDLINE NO. 1 SHEET NOS. 3, 8, 11-13, 14, 22-30, 31-33, 36-37, 40-44, 54-61, 87	MARYLAND TRANSPORTATION AUTHORITY RECOMMENDED FOR APPROVAL <i>Debra Wynn</i> DIRECTOR OF PROJECT DEVELOPMENT DATE 11/21/19 APPROVED <i>William A. A...</i> CHIEF ENGINEER, OFFICE OF ENGINEERING AND CONSTRUCTION DATE 11/22/2019
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**AS-BUILT**



HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88  
 MDE # 19-SF-0196; 18-NT-0086



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**Maryland Transportation Authority**  
*Engineering Division*



ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
 CARSIN RUN STREAM RESTORATION**  
 JOHN F. KENNEDY MEMORIAL HIGHWAY  
 HARFORD COUNTY  
 KEY MAP

DESIGNED BY SL, AW, SD	DRAWN BY CSD, KP, AW, JS	CHECKED BY SL, CM, JB
CONST. REVIEW BY	DATE OCTOBER, 2019	SCALE 1" = 60'

CONTRACT NO. KH-3028-0000
DRAWING NO. <b>KEY-01</b>
SHEET NO. 2 OF 87

# ABBREVIATIONS

AASHTO ..... American Association of State Highway Transportation Officials	HDWL..... Headwall	RW or RW... Right of Way
ADT..... Average Daily Traffic	HERCP..... Horizontal Elliptical Reinforced Concrete Pipe	RCP ..... Reinforced Concrete Pipe
AHD..... Ahead	HP..... High Point	RCPP..... Reinforced Concrete Pressure Pipe
APPROX..... Approximate	IN..... Inch	R.Q.D. .... Rock Quality Designation
BL or BL..... Baseline	I.S.T..... Inlet Sediment Trap	R.M. .... Rootmat
BK ..... Back /Book	INV..... Invert	S ..... South
BIT..... Bituminous	J.B..... Junction Box	SAN..... Sanitary Sewer
B.C..... Bituminous Concrete	K..... K Inlet	SB or SB ..... Southbound
B.M..... Bench Mark	L..... Length	S.D. .... Storm Drain
BOT..... Bottom	LF ..... Linear Feet	S.D.D. .... Surface Drain Ditch
C.C..... Center of Curve	L.L..... Liquid Limit	SE ..... Super Elevation
CAP..... Corrugated Aluminum Pipe	LP ..... Low Point	SF ..... Silt Fence
CAPA..... Corrugated Aluminum Pipe Arch	L.P. .... Light Pole	SF ..... Square Feet
CATV..... Cable Television	LT..... Left	SHT..... Sheet
C.B.R..... California Bearing Ratio	MAC..... Macadam	SPP ..... Structural Steel Plate Pipe
CL or CL..... Centerline	M.C..... Moisture Content	SPPA..... Structural Steel Plate Pipe Arch
CL..... Class	M.AX..... Maximum	S.P.T..... Standard Penetration Testing
CLF..... Chainlink Fence	M.D.D..... Maximum Dry Content	SRP..... Steel Spiral Rib Pipe - Aluminized Type 2
CMP..... Corrugated Metal Pipe	MOD..... Modified	SRPA..... Steel Spiral Rib Pipe Arch - Aluminized Type 2
C.O..... Cleanout	MIN..... Minimum	SSD..... Stopping Sight Distance
COMB..... Combination	N..... North	SSF..... Super Silt Fence
CONC..... Concrete	NB ..... Northbound	STD..... Standard
CONSTR..... Construction	NE ..... Northeast	STA..... Station
COR..... Corner	N.P..... Non-Plastic	SO..... Single Opening
CORR..... Correction	O.C..... On Center	SY ..... Square Yards
CPP-S..... Corrugated Polyethylene Pipe - Type 'S'	OHE..... Overhead Electric	SWM..... Stormwater Management
CSP..... Corrugated Steel Pipe - Aluminized Type 2	O.M..... Optimum Moisture	T ..... Tangent
CSPA..... Corrugated Steel Pipe Arch - Aluminized Type 2	PAV T..... Pavement	T ..... Telephone
DC..... Degree of Curve	PC ..... Point of Curvature	T.C..... Top of Cover
D.H.V..... Design Hourly Volume	PCC..... Point of Compound Curvature	T.G..... Top of Grate
D.I..... Drop Inlet	P/C..... Point of Crown	T or TL..... Traverse Line
DIA..... Diameter	P/GE..... Profile Grade Elevation	T.M..... Top of Manhole
D.O..... Double Opening	P.G.E..... Profile Ground Elevation	TRAV..... Traverse
E..... East	P.G.L..... Profile Ground Line	TS..... Temporary Swale
E..... Electric	P/R..... Point of Rotation	T.S..... Top of Slab
E..... External Distance	P.I..... Plasticity Index	T.S..... Topsoil
EA..... Each	PI..... Point of Intersection	TYP..... Typical
EB..... Eastbound	POC..... Point On Curve	U.D..... Under Drain
ELEV..... Elevation	POT..... Point On Tangent	U.G..... Underground
ES..... End Section	PPWP..... Polyvinyl Chloride Profile Wall Pipe	U.P..... Utility Pole
EX or EXIST..... Existing	PROP..... Proposed	USDA..... United States Department of Agriculture
FT..... Feet	PRC..... Point of Reverse Curve	VCL..... Vertical Clearance
F or FL..... Flowline	PT..... Point	V.C.L..... Vertical Curve Length
F.B.D..... Flat Bottom Ditch	PT..... Point of Tangency	W..... Water
F.H..... Fire Hydrant	PVC..... Point of Vertical Curve	W..... West
FWD..... Forward	PVC..... Polyvinyl Chloride	WB..... Westbound
G..... Gas	PVI..... Point of Vertical Intersection	WB..... Wetland Buffer
G.V..... Gas Valve	PVRC..... Point of Vertical Reverse Curve	W.M..... Water Meter
H.B..... Handbox	PVT..... Point of Vertical Tangency	W.S..... Wrapped Steel
HDPE..... High Density Polyethylene	R..... Radius	WUS..... Waters of the United States
	R.F..... Rock Fragments	W.V..... Water Valve
	RT..... Right	

# GENERAL NOTES

1. WETLANDS AND WATERWAYS WERE DELINEATED BY KCI TECHNOLOGIES, INC IN FEBRUARY 2018.
2. TOPOGRAPHICAL SURVEY WAS COMPLETED BY KCI TECHNOLOGIES, INC IN FEBRUARY 2018.
3. AREAS OUTSIDE THE LIMIT OF DISTURBANCE HAVE BEEN SUPPLEMENTED WITH ADDITIONAL TWO FOOT CONTOURS, BUILDINGS, PROPERTY LINES, EDGE OF PAVEMENT, AND PARKING LOTS AND ARE FROM HARFORD COUNTY GIS DATA
4. THE CONTRACTOR SHALL CONTACT "MISS UTILITY" AT 1-800-257-7777 AND JEFF ALTER, CHIEF FACILITY MAINTENANCE OFFICER AT THE MARYLAND TRANSPORTATION AUTHORITY, AT (410) 537-1315, 72 HOURS PRIOR TO EXCAVATION FOR MARKING AND LOCATION OF UTILITIES.
5. THE EXISTING UTILITIES AND OBSTRUCTIONS SHOWN ON THESE PLANS ARE FROM THE BEST AVAILABLE RECORDS AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. ALL UTILITY OWNERS SHALL BE NOTIFIED A MINIMUM OF 60 DAYS IN ADVANCE OF CONSTRUCTION.
6. THE LOCATION AND LENGTH OF PROPOSED PIPE AND DRAINAGE STRUCTURES SHALL BE VERIFIED BY THE CONTRACTOR BEFORE ORDERING.
7. ALL WORK ON THE PROJECT SHALL BE DONE IN ACCORDANCE WITH BOTH MDSHA AND THE PROJECT SPECIFICATIONS AND WHERE REFERENCE IS MADE, THE REQUIREMENTS OF THE MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION'S SPECIFICATIONS ENTITLED: '2019 MDOT SHA STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS', DATED JULY 2019 AND REVISIONS THEREOF OR ADDITIONS THERETO, AND THE TECHNICAL SPECIFICATIONS.
8. STANDARDS FOR THIS CONTRACT SHALL BE THOSE OF THE MARYLAND STATE HIGHWAY ADMINISTRATION. IT SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY TO HAVE IN HIS POSSESSION THE MARYLAND SHA "BOOK OF STANDARDS, HIGHWAY AND INCIDENTAL STRUCTURES" WITH THE LATEST UP-TO-DATE MSHA STANDARDS AS OF THE DATE OF ADVERTISEMENT OF THIS PROJECT.
9. THIS PROJECT IS ORIENTED TO CONFORM TO THE MARYLAND STATE PLANE COORDINATE SYSTEM, NAD 83/91. THE LOCATION AND ELEVATION OF BENCHMARKS ARE SHOWN ON THE PLANS. ALL ELEVATIONS ARE IN FEET AND ARE BASED ON THE U.S. COAST AND GEODETIC SURVEY MEAN SEA LEVEL DATUM OF 1988 (NAVD 88). THE CONTRACTOR, IN THE CONSTRUCTION-ALIGNMENT PROCESS AND FOR ALL SURVEY OPERATIONS, SHALL USE ONLY BENCHMARKS NOTED AS "NAD-83-91" (HORIZONTAL DATUM) AND "NAVD 88" (VERTICAL DATUM) ON THE CONSTRUCTION PLANS AND IN THE CONSTRUCTION STAKEOUT INFORMATION FOR HORIZONTAL AND VERTICAL LAYOUT. CONTROL POINTS NOT LISTED AS SUCH SHALL BE USED ONLY UPON PRIOR APPROVAL FROM THE MARYLAND TRANSPORTATION AUTHORITY.
10. REPAIRS TO UTILITIES OR PROPERTY DAMAGE AS A RESULT OF CONTRACTOR'S NEGLIGENCE OR METHOD OF OPERATION SHALL BE MADE AT NO ADDITIONAL COST TO THE MARYLAND TRANSPORTATION AUTHORITY OR OWNER.
11. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY DIMENSIONS AND ELEVATIONS AFFECTING ALL WORK IN THE FIELD. NO SEPARATE OR ADDITIONAL COMPENSATION WILL BE ALLOWED FOR THIS WORK.
12. ALL ROADS, STRUCTURES, PIPES, CURBS, INLETS, ETC. THAT ARE TO REMAIN IN PLACE SHALL BE PROTECTED FROM DAMAGE THROUGHOUT THE DURATION OF THE CONTRACT. ANY DAMAGE TO EXISTING STRUCTURES AND/OR FEATURES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE IN A MANNER APPROVED BY THE ENGINEER.
13. MATERIAL REMOVED DURING CONSTRUCTION SHALL BECOME THE CONTRACTOR'S PROPERTY UNLESS OTHERWISE NOTED ON THE PLANS OR IN THE SPECIAL PROVISIONS. ALL EXCAVATED ROADWAY MATERIALS, INCLUDING EXISTING PAVEMENT, SIDEWALKS, OR COMBINATION CURB & GUTTER, DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR USE IN EMBANKMENTS SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED OF IN AN APPROVED LOCATION.
14. THE MARYLAND TRANSPORTATION AUTHORITY DOES NOT WARRANT THE CORRECTNESS OF THE TOPOGRAPHIC OR UTILITY DATA PRESENTED HEREIN AND IS NOT RESPONSIBLE FOR ANY CONCLUSIONS DRAWN FROM THE DATA.
15. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THE SAFETY OF THE PUBLIC AND ALL WORKERS IS MAINTAINED AT ALL TIMES THROUGHOUT THE TERM OF THE CONTRACT. MOTORISTS SHALL BE GUIDED IN A CLEAR AND POSITIVE MANNER WHILE APPROACHING AND PASSING THROUGH CONSTRUCTION WORK/ EQUIPMENT AREAS.

# LEGEND

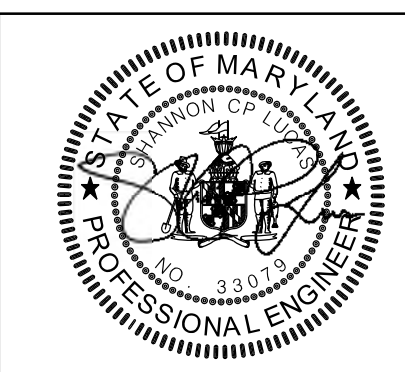
	200	EXISTING CONTOUR
		PROPERTY LINE
		EASEMENT LINE
		WETLAND BOUNDARY
	B	25' WETLAND BUFFER
	WUS	WATERS OF THE U.S.
	WUSE	EPHEMERAL CHANNEL
	FP	100-YEAR FLOODPLAIN MD PERMIT (FEMA)
		EX. 100-YEAR FLOODPLAIN H&H CALCULATED
		PROP. 100-YEAR FLOODPLAIN H&H CALCULATED
		EX. TREE
	CRZ	SPECIMEN TREE / CRITICAL ROOT ZONE
		WOODS LINE
	LOD	LIMITS OF DISTURBANCE
	20+00	PROP. BASELINE OF CONSTRUCTION
	190	PROP. CONTOUR
		CREATED WETLANDS
		TOE BOULDERS
		WOODY TOE
		WOODY DEBRIS PLUG
		RIFFLE GRADE CONTROL
		OUTFALL PROTECTION
		STEP POOL CREST
		CLAY PLUG
		W-WEIR
	21" RCP	PROP. MANHOLE, STORM DRAIN PIPE AND ENDWALL
		TREE TO BE REMOVED
		TREE PROTECTION FENCE
	18" RCP -->	TEMPORARY PIPE (TP)
	18" FL	18 INCH DIAMETER FILTER LOG
	SF	SILT FENCE
		DISCHARGE HOSE
	P	PUMP
	FB	FILTER BAG
		TEMPORARY DIVERSION BARRIER
		8" THICK MULCH ACCESS PATH
		STABILIZED CONSTRUCTION ENTRANCE
	24" CWD -->	24" INCH DIAMETER CLEAR WATER DIVERSION PIPE

# CONVENTIONAL SIGNS (SAMPLES)

PROPOSED MEDIAN BARRIER		PROPOSED PIPE / CULVERT	
ELECTRICAL HAND BOX - SIGNALS		EXISTING PIPE / CULVERT	
FLOW LINE		EXISTING DROP INLET	
STATE, COUNTY OR CITY LINES		UTILITY POLE	
PROPOSED TRAFFIC BARRIER		WETLAND	
EXISTING TRAFFIC BARRIER		VERNAL POOL	
PROPOSED FENCE LINE		WETLAND BUFFER	
EXISTING FENCE LINE		WATERS OF THE U.S.	
RIGHT OF WAY LINE		HEDGE / TREE LINE	
EXISTING ROADWAY		BUSH / TREE	
RAILROAD		CONIFEROUS TREE	
BASE LINE OR SURVEY LINE		GROUND ELEVATION	
FIRE HYDRANT		GRADE ELEVATION	
HISTORIC BOUNDARY			
WETLAND BOUNDARY			
EX. 100-YEAR FLOODPLAIN			

HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88  
 MDE # 19-SF-0196; 18-NT-0086

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**Maryland Transportation Authority**  
 Engineering Division

ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE
1	ADD 100-YEAR FLOODPLAIN-MD PERMIT (FEMA) SL		6/16/20
	REVISE TEXT EX. 100-YEAR FLOODPLAIN-H&H CALCULATED & PROP. 100-YEAR FLOODPLAIN-H&H CALCULATED		

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
 CARAINS RUN STREAM RESTORATION**

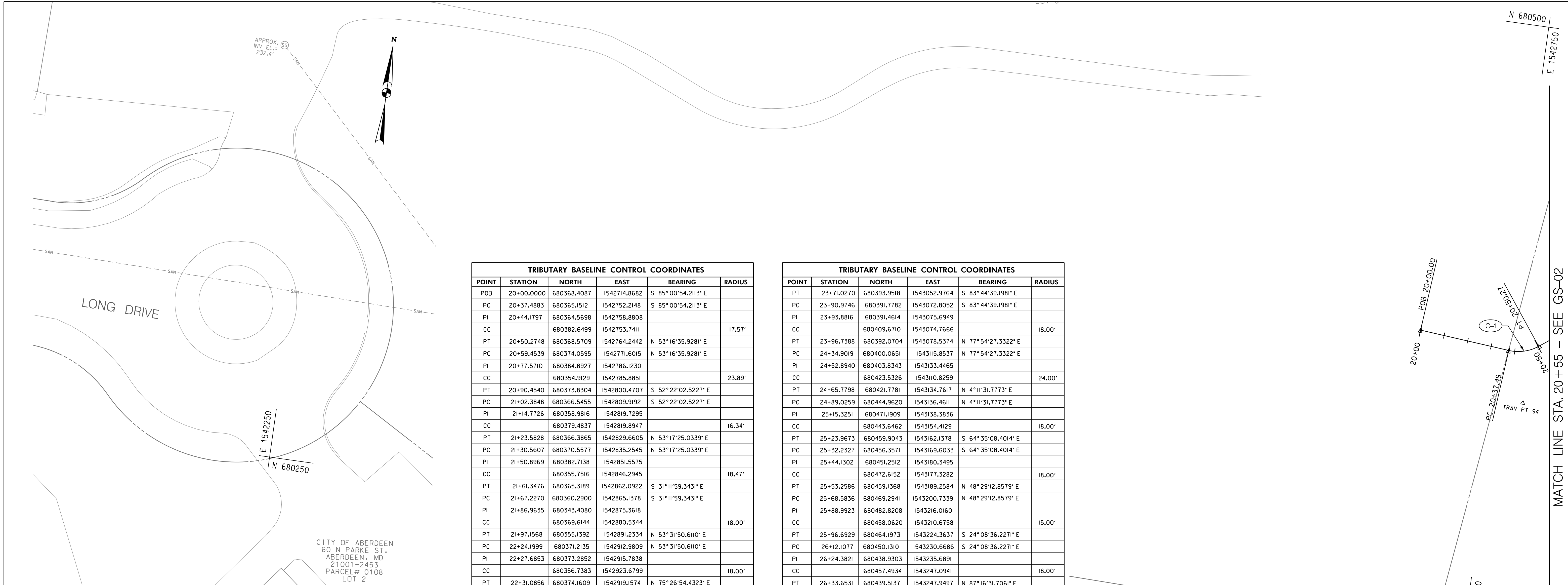
JOHN F. KENNEDY MEMORIAL HIGHWAY  
 HARFORD COUNTY

ABBREVIATIONS AND GENERAL NOTES

DESIGNED BY SL, AW, SD    DRAWN BY CSD, KP, AW, JS    CHECKED BY SL, GM, JB  
 CONST. REVIEW BY \_\_\_\_\_    DATE OCTOBER, 2019    SCALE 1" = 20'

CONTRACT NO. KH-3028-0000  
 DRAWING NO. **AB-01**  
 SHEET NO. 3 OF 87

N 680500  
E 1542750



APPROX. INV. EL. = 232.4'



TRIBUTARY BASELINE CONTROL COORDINATES					
POINT	STATION	NORTH	EAST	BEARING	RADIUS
POB	20+00.0000	680368.4087	1542714.8682	S 85°00'54.2113" E	
PC	20+37.4883	680365.1512	1542752.2148	S 85°00'54.2113" E	
PI	20+44.1797	680364.5698	1542758.8808		
CC		680382.6499	1542753.7411		17.57'
PT	20+50.2748	680368.5709	1542764.2442	N 53°16'35.9281" E	
PC	20+59.4539	680374.0595	1542771.6015	N 53°16'35.9281" E	
PI	20+77.5710	680384.8927	1542786.1230		
CC		680354.9129	1542785.8851		23.89'
PT	20+90.4540	680373.8304	1542800.4707	S 52°22'02.5227" E	
PC	21+02.3848	680366.5455	1542809.9192	S 52°22'02.5227" E	
PI	21+14.7726	680358.9816	1542819.7295		
CC		680379.4837	1542819.8947		16.34'
PT	21+23.5828	680366.3865	1542829.6605	N 53°17'25.0339" E	
PC	21+30.5607	680370.5577	1542835.2545	N 53°17'25.0339" E	
PI	21+50.8969	680382.7138	1542851.5575		
CC		680355.7516	1542846.2945		18.47'
PT	21+61.3476	680365.3189	1542862.0922	S 31°11'59.3431" E	
PC	21+67.2270	680360.2900	1542865.1378	S 31°11'59.3431" E	
PI	21+86.9635	680343.4080	1542875.3618		
CC		680369.6144	1542880.5344		18.00'
PT	21+97.1568	680355.1392	1542891.2334	N 53°31'50.6110" E	
PC	22+24.1999	680371.2135	1542912.9809	N 53°31'50.6110" E	
PI	22+27.6853	680373.2852	1542915.7838		
CC		680356.7383	1542923.6799		18.00'
PT	22+31.0856	680374.1609	1542919.1574	N 75°26'54.4323" E	
PC	22+52.2001	680379.4659	1542939.5946	N 75°26'54.4323" E	
PI	22+54.7800	680380.1141	1542942.0917		
CC		680362.0433	1542944.1171		18.00'
PT	22+57.3250	680380.0348	1542944.6704	S 88°14'19.0688" E	
PC	22+59.8949	680379.9558	1542947.2392	S 88°14'19.0688" E	
PI	22+60.6641	680379.9322	1542948.0080		
CC		680361.9644	1542946.6859		18.00'
PT	22+61.4324	680379.8431	1542948.7720	S 83°20'40.9648" E	
PC	23+13.4330	680373.8164	1543000.4222	S 83°20'40.9648" E	
PI	23+17.9088	680373.2977	1543004.8678		
CC		680391.6951	1543002.5083		18.00'
PT	23+22.2066	680374.9215	1543009.0387	N 68°43'40.4705" E	
PC	23+24.2594	680375.6663	1543010.9516	N 68°43'40.4705" E	
PI	23+27.6200	680376.8854	1543014.0832		
CC		680392.4399	1543004.4213		18.00'
PT	23+30.9040	680379.1524	1543016.5639	N 47°34'39.0849" E	
PC	23+35.5625	680382.2951	1543020.0028	N 47°34'39.0849" E	
PI	23+38.9232	680384.5621	1543022.4836		
CC		680369.0076	1543032.1455		18.00'
PT	23+42.2073	680385.7813	1543025.6152	N 68°43'42.3191" E	
PC	23+61.0900	680392.6317	1543043.2115	N 68°43'42.3191" E	
PI	23+63.0303	680393.3357	1543045.0196		
CC		680375.8581	1543049.7417		18.00'
PT	23+64.9557	680393.6381	1543046.9362	N 81°01'59.2454" E	
PC	23+66.2446	680393.8390	1543048.2094	N 81°01'59.2454" E	
PI	23+68.6500	680394.2139	1543050.5854		
CC		680376.0590	1543051.0150		18.00'

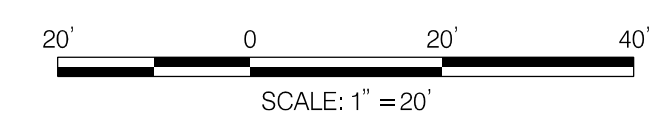
TRIBUTARY BASELINE CONTROL COORDINATES					
POINT	STATION	NORTH	EAST	BEARING	RADIUS
PT	23+71.0270	680393.9518	1543052.9764	S 83°44'39.1981" E	
PC	23+90.9746	680391.7782	1543072.8052	S 83°44'39.1981" E	
PI	23+93.8816	680391.4614	1543075.6949		
CC		680409.6710	1543074.7666		18.00'
PT	23+96.7388	680392.0704	1543078.5374	N 77°54'27.3322" E	
PC	24+34.9019	680400.0651	1543115.8537	N 77°54'27.3322" E	
PI	24+52.8940	680403.8343	1543133.4465		
CC		680423.5326	1543110.8259		24.00'
PT	24+65.7798	680421.7781	1543134.7617	N 4°11'31.7773" E	
PC	24+89.0259	680444.9620	1543136.4611	N 4°11'31.7773" E	
PI	25+15.3251	680471.1909	1543138.3836		
CC		680443.6462	1543154.4129		18.00'
PT	25+23.9673	680459.9043	1543162.1378	S 64°35'08.4014" E	
PC	25+32.2327	680456.3571	1543169.6033	S 64°35'08.4014" E	
PI	25+44.1302	680451.2512	1543180.3495		
CC		680472.6152	1543177.3282		18.00'
PT	25+53.2586	680459.1368	1543189.2584	N 48°29'12.8579" E	
PC	25+68.5836	680469.2941	1543200.7339	N 48°29'12.8579" E	
PI	25+88.9923	680482.8208	1543216.0160		
CC		680458.0620	1543210.6758		15.00'
PT	25+96.6929	680464.1973	1543224.3637	S 24°08'36.2271" E	
PC	26+12.1077	680450.1310	1543230.6686	S 24°08'36.2271" E	
PI	26+24.3821	680438.9303	1543235.6891		
CC		680457.4934	1543247.0941		18.00'
PT	26+33.6531	680439.5137	1543247.9497	N 87°16'31.7061" E	
PC	26+46.5725	680440.1278	1543260.8544	N 87°16'31.7061" E	
PI	26+63.8813	680440.9506	1543278.1437		
CC		680422.1482	1543261.7101		18.00'
PT	26+74.1421	680423.7068	1543279.6425	S 4°58'03.1253" E	
PC	26+88.0312	680409.8699	1543280.8451	S 4°58'03.1253" E	
PI	27+12.8250	680385.1692	1543282.9921		
CC		680411.4285	1543298.7775		18.00'
PT	27+21.9735	680394.8606	1543305.8133	N 66°59'27.0139" E	
PC	27+37.8331	680401.0598	1543320.4112	N 66°59'27.0139" E	
PI	27+39.9541	680401.8888	1543322.3634		
CC		680384.4918	1543327.4470		18.00'
PT	27+42.0556	680402.2414	1543324.4549	N 80°25'53.3102" E	
PC	27+47.4851	680403.1439	1543329.8088	N 80°25'53.3102" E	
PI	27+51.1854	680403.7590	1543333.4577		
CC		680383.4221	1543333.1334		20.00'
PT	27+54.8030	680403.0279	1543337.0850	S 78°36'15.5402" E	
PC	27+85.5657	680396.9497	1543367.2413	S 78°36'15.5402" E	
PI	27+88.1176	680396.4454	1543369.7429		
CC		680426.3582	1543373.1688		30.00'
PT	27+90.6573	680396.3710	1543372.2938	S 88°19'42.7094" E	
PC	28+58.9548	680394.3789	1543440.5623	S 88°19'42.7094" E	
PI	28+62.4320	680394.2774	1543444.0380		
CC		680364.3916	1543439.6872		30.00'
PT	28+65.8783	680393.3837	1543447.3983	S 75°06'20.4610" E	
POE	29+46.3595	680372.6970	1543525.1755	S 75°06'20.4610" E	

TRIBUTARY CURVE DATA						
CURVE NO.	DELTA	Dc	RADIUS (FT)	TANGENT (FT)	LENGTH (FT)	LONG CHORD (FT)
C-1	41°42'29.86"	N 74°07'50.86" E	17.57	6.69	12.79	12.51
C-2	74°21'21.55"	S 89°32'43.30" E	23.89	18.12	31.00	28.87
C-3	74°20'32.44"	S 89°32'18.74" E	16.34	12.39	21.20	19.74
C-4	95°30'35.62"	S 78°57'17.15" E	18.47	20.34	30.79	27.34
C-5	95°16'10.05"	S 78°50'04.37" E	18.00	19.74	29.93	26.60
C-6	21°55'03.82"	N 64°29'22.52" E	18.00	3.49	6.89	6.84
C-7	16°18'46.50"	N 83°36'17.68" E	18.00	2.58	5.12	5.11
C-8	4°53'38.10"	S 85°47'30.02" E	18.00	0.77	1.54	1.54
C-9	27°55'38.56"	N 82°41'29.75" E	18.00	4.48	8.77	8.69
C-10	21°09'01.39"	N 58°09'09.78" E	18.00	3.36	6.64	6.61
C-11	21°09'03.23"	N 58°09'10.70" E	18.00	3.36	6.64	6.61
C-12	12°18'16.93"	N 74°52'50.78" E	18.00	1.94	3.87	3.86
C-13	15°13'21.56"	N 88°38'40.02" E	18.00	2.41	4.78	4.77
C-14	18°20'53.47"	N 87°04'54.07" E	18.00	2.91	5.76	5.74
C-15	73°42'55.55"	N 41°02'59.55" E	24.00	17.99	30.88	28.79
C-16	111°13'19.82"	N 59°48'11.69" E	18.00	26.30	34.94	29.71
C-17	66°55'38.74"	N 81°57'02.23" E	18.00	11.90	21.03	19.85
C-18	107°22'10.92"	S 77°49'41.68" E	15.00	20.41	28.11	24.17
C-19	68°34'52.07"	S 58°26'02.26" E	18.00	12.27	21.55	20.28
C-20	87°45'25.17"	S 48°50'45.71" E	18.00	17.31	27.57	24.95
C-21	108°02'29.86"	S 58°59'18.06" E	18.00	24.79	33.94	29.13
C-22	13°26'26.30"	N 73°42'40.16" E	18.00	2.12	4.22	4.21
C-23	20°57'51.15"	S 89°05'11.12" E	20.00	3.70	7.32	7.28
C-24	9°43'27.17"	S 83°27'59.12" E	30.00	2.55	5.09	5.09
C-25	13°13'22.25"	S 81°43'01.59" E	30.00	3.48	6.92	6.91

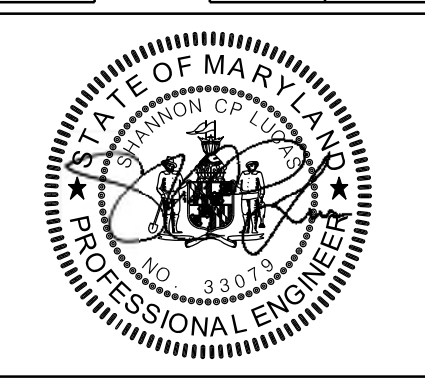
TRAVERSE POINTS				
POINT NO.	NORTH	EAST	ELEVATION	DESCRIPTION
2	680334.7969	1543600.1841	192.57	PIN & CAP
94	680344.3928	1542760.9697	217.88	PIN & CAP
95	680466.6457	1542970.2681	215.27	PIN & CAP
96	680516.6999	1543203.4324	193.94	PIN & CAP
97	680503.3455	1543340.6701	181.59	PIN & CAP
98	680257.1818	1543481.6063	193.98	PIN & CAP
99	680393.4401	1543512.7934	171.48	PIN & CAP

NOTE:  
REFER TO POOL DETAILS DE-01 AND DE-02 AND STREAM  
CROSS SECTIONS HC-01 - HC-42 FOR LOCATION OF THALWEG.

HORIZONTAL DATUM NAD 83/91  
VERTICAL DATUM NAVD 88  
MDE # 19-SF-0196; 18-NT-0086



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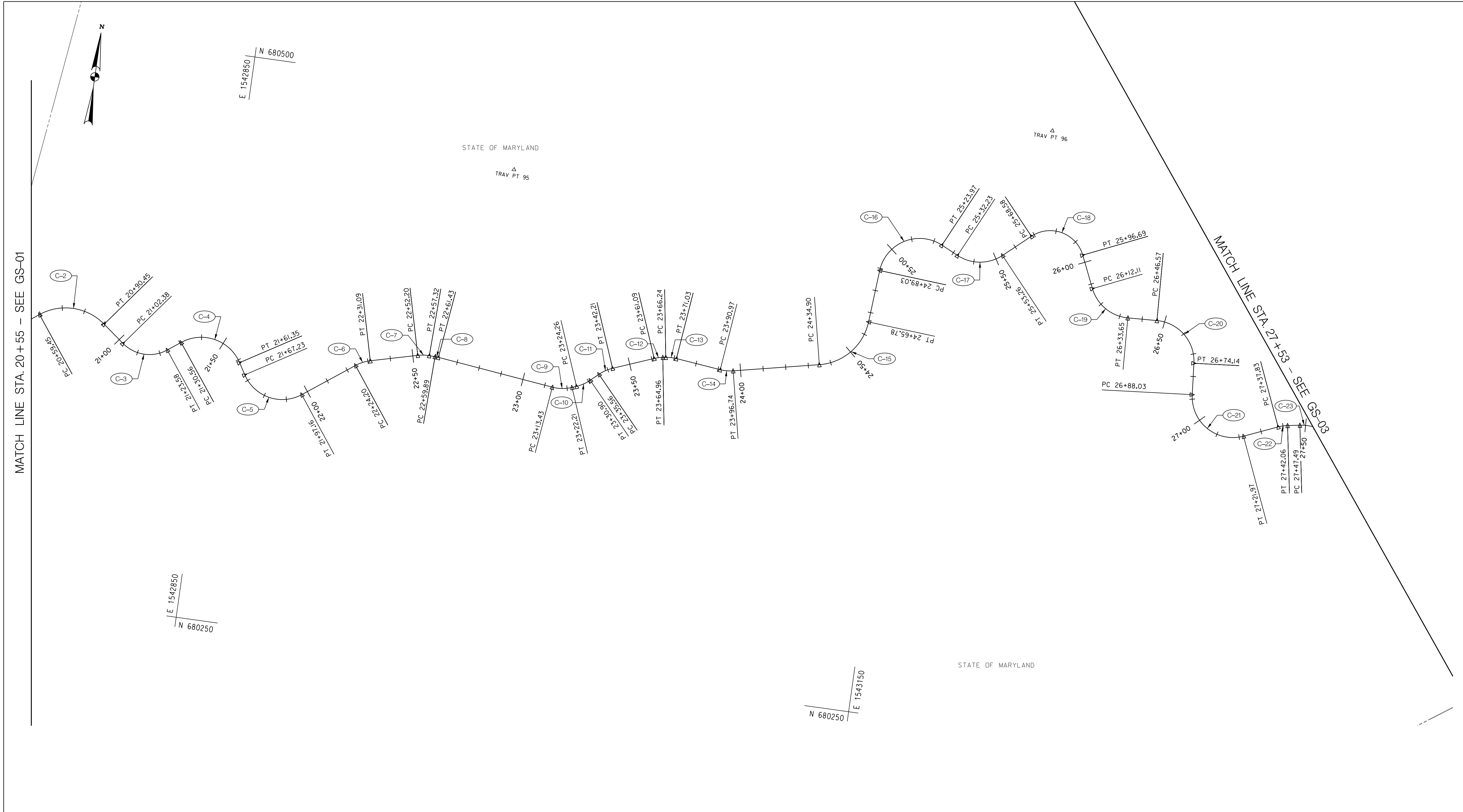
ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
CARNS RUN STREAM RESTORATION**

JOHN F. KENNEDY MEMORIAL HIGHWAY  
HARFORD COUNTY  
GEOMETRIC LAYOUT

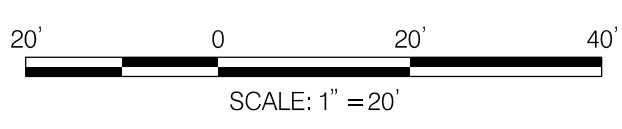
DESIGNED BY SL, AW, SD    DRAWN BY CSD, KP, AW, JS    CHECKED BY SL, GM, JB  
CONST. REVIEW BY \_\_\_\_\_    DATE OCTOBER, 2019    SCALE 1" = 20'

CONTRACT NO. KH-3028-0000  
DRAWING NO. **GS-01**  
SHEET NO. 4 OF 87  
UPDATED: 31JUL18

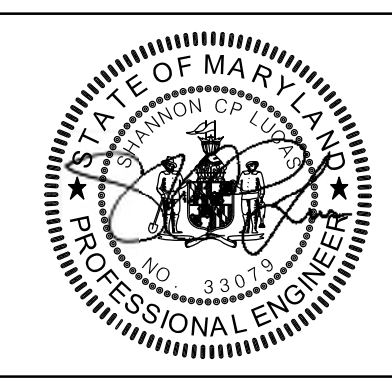


NOTE:  
 REFER TO POOL DETAILS DE-01 AND DE-02 AND STREAM  
 CROSS SECTIONS HC-01 - HC-42 FOR LOCATION OF THALWEG.

HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88  
 MDE # 19-SF-0196; 18-NT-0086



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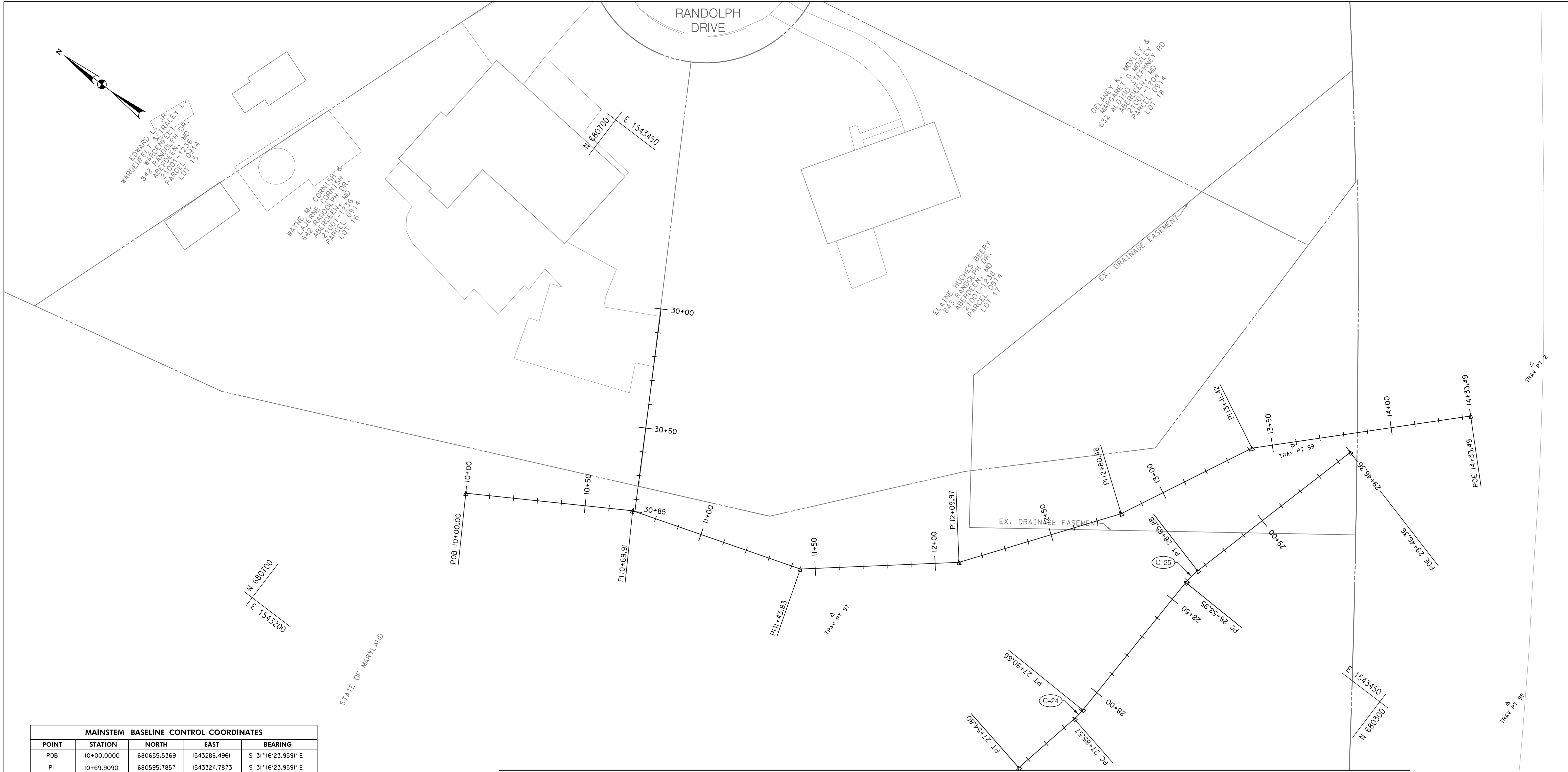
**Maryland Transportation Authority**  
*Engineering Division*



ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
 CARSENS RUN STREAM RESTORATION**  
 JOHN F. KENNEDY MEMORIAL HIGHWAY  
 HARFORD COUNTY  
 GEOMETRIC LAYOUT  
 DESIGNED BY SL, AW, SD    DRAWN BY CSD, KP, AW, JS    CHECKED BY SL, CM, JB  
 CONST. REVIEW BY \_\_\_\_\_    DATE OCTOBER, 2019    SCALE 1" = 20'

CONTRACT NO.  
 KH-3028-0000  
 DRAWING NO.  
**GS-02**  
 SHEET NO.  
 5 OF 87

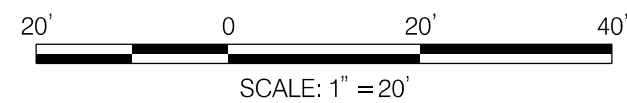


MAINSTEM BASELINE CONTROL COORDINATES				
POINT	STATION	NORTH	EAST	BEARING
POB	10+00.0000	680655.5369	1543288.4961	S 31°16'23.9591" E
PI	10+69.9090	680595.7857	1543324.7873	S 31°16'23.9591" E
PI	10+69.9090	680595.7857	1543324.7873	S 18°08'15.5980" E
PI	11+43.8272	680525.5404	1543347.7982	S 18°08'15.5980" E
PI	11+43.8272	680525.5404	1543347.7982	S 39°40'34.8697" E
PI	12+09.9748	680474.6290	1543390.0301	S 39°40'34.8697" E
PI	12+09.9748	680474.6290	1543390.0301	S 53°57'56.9114" E
PI	12+80.4804	680433.1528	1543447.0456	S 53°57'56.9114" E
PI	12+80.4804	680433.1528	1543447.0456	S 63°52'24.0177" E
PI	13+41.4160	680406.3194	1543501.7550	S 63°52'24.0177" E
PI	13+41.4160	680406.3194	1543501.7550	S 45°38'37.0692" E
POE	14+33.4886	680341.9497	1543567.5874	S 45°38'37.0692" E

NOTE:  
REFER TO POOL DETAILS DE-01 AND DE-02 AND STREAM  
CROSS SECTIONS HC-01 - HC-42 FOR LOCATION OF THALWEG.

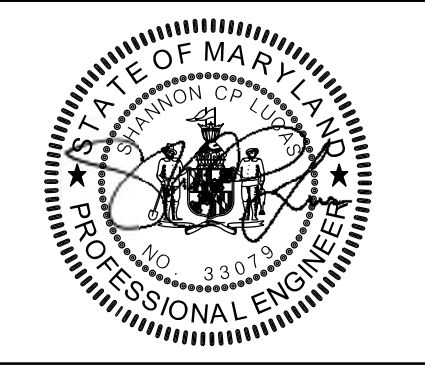
MATCH LINE STA. 27+53 - SEE GS-02

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ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
CARSINS RUN STREAM RESTORATION**

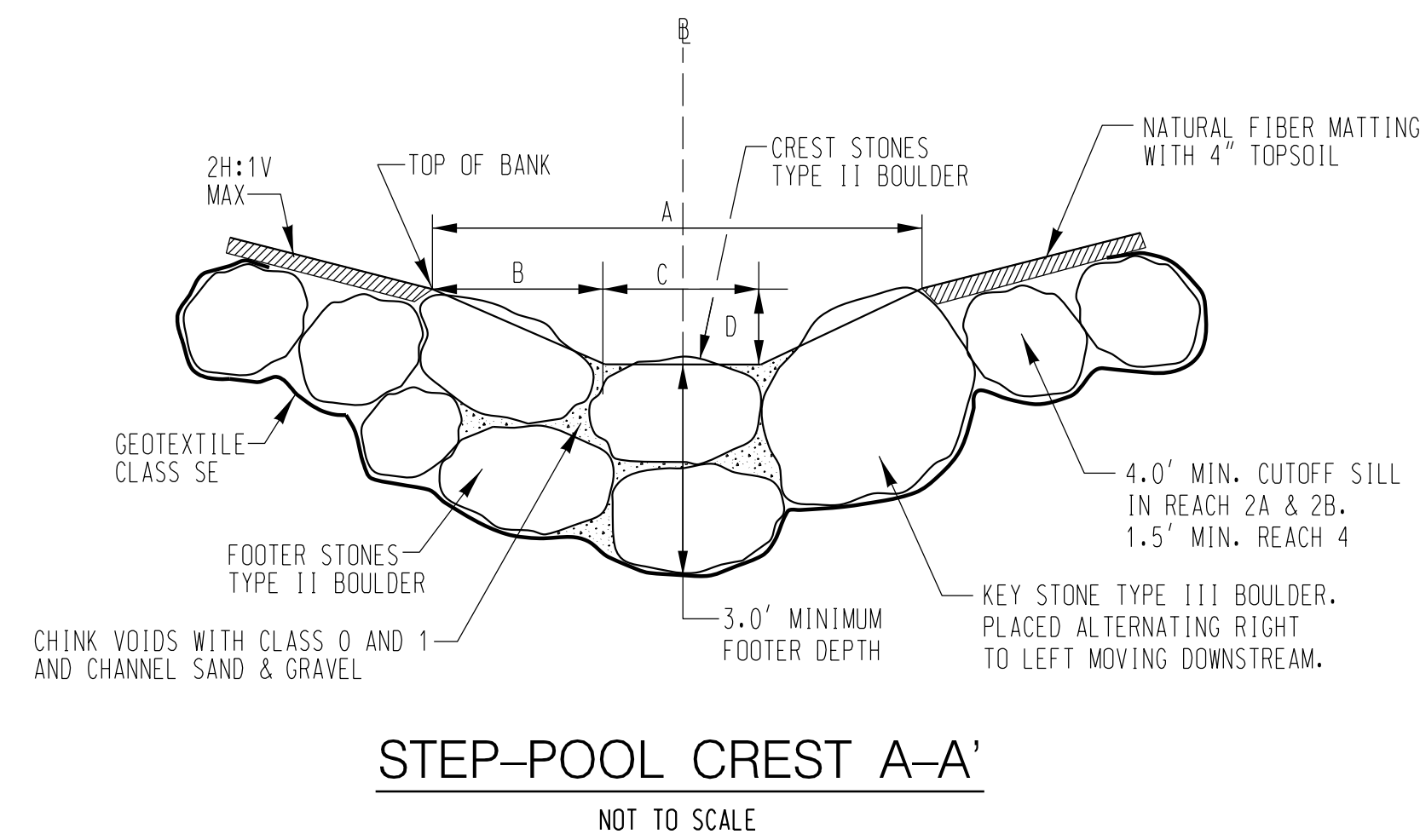
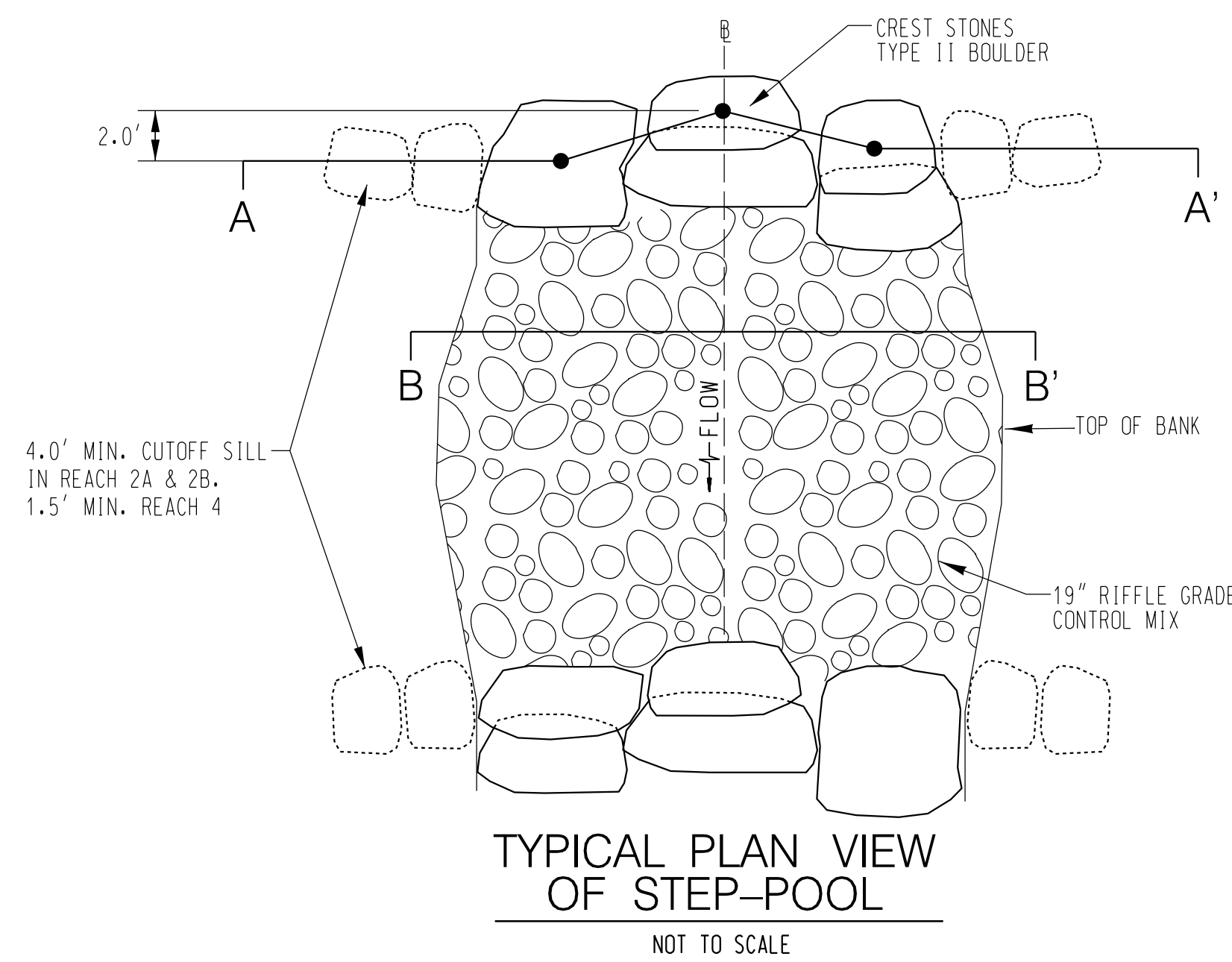
JOHN F. KENNEDY MEMORIAL HIGHWAY  
HARFORD COUNTY  
GEOMETRIC LAYOUT

DESIGNED BY SL, AW, SD  
DRAWN BY CSD, KP, AW, JS  
CHECKED BY SL, GM, JB  
CONST. REVIEW BY \_\_\_\_\_  
DATE OCTOBER, 2019  
SCALE 1" = 20'

CONTRACT NO.  
KH-3028-0000

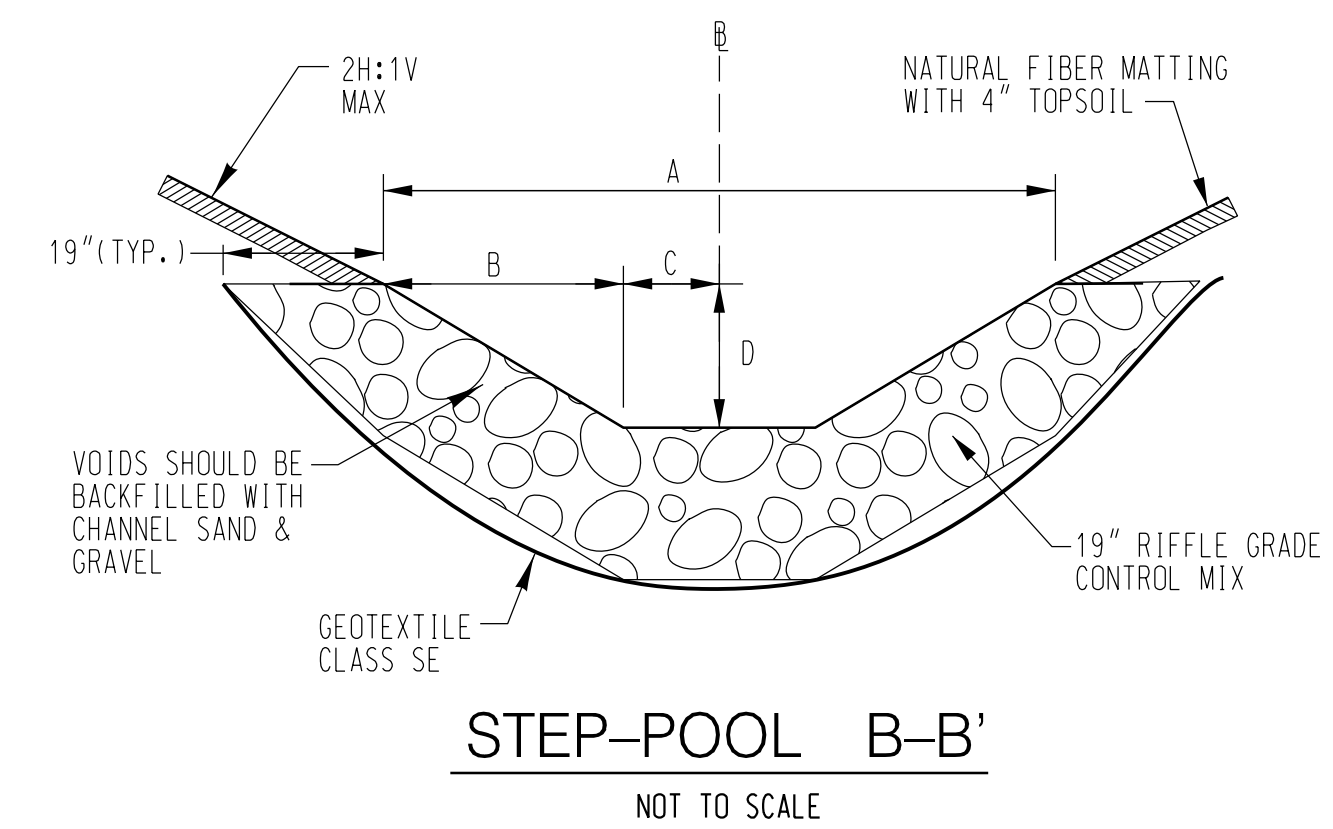
DRAWING NO.  
**GS-03**

SHEET NO.  
6 OF 87

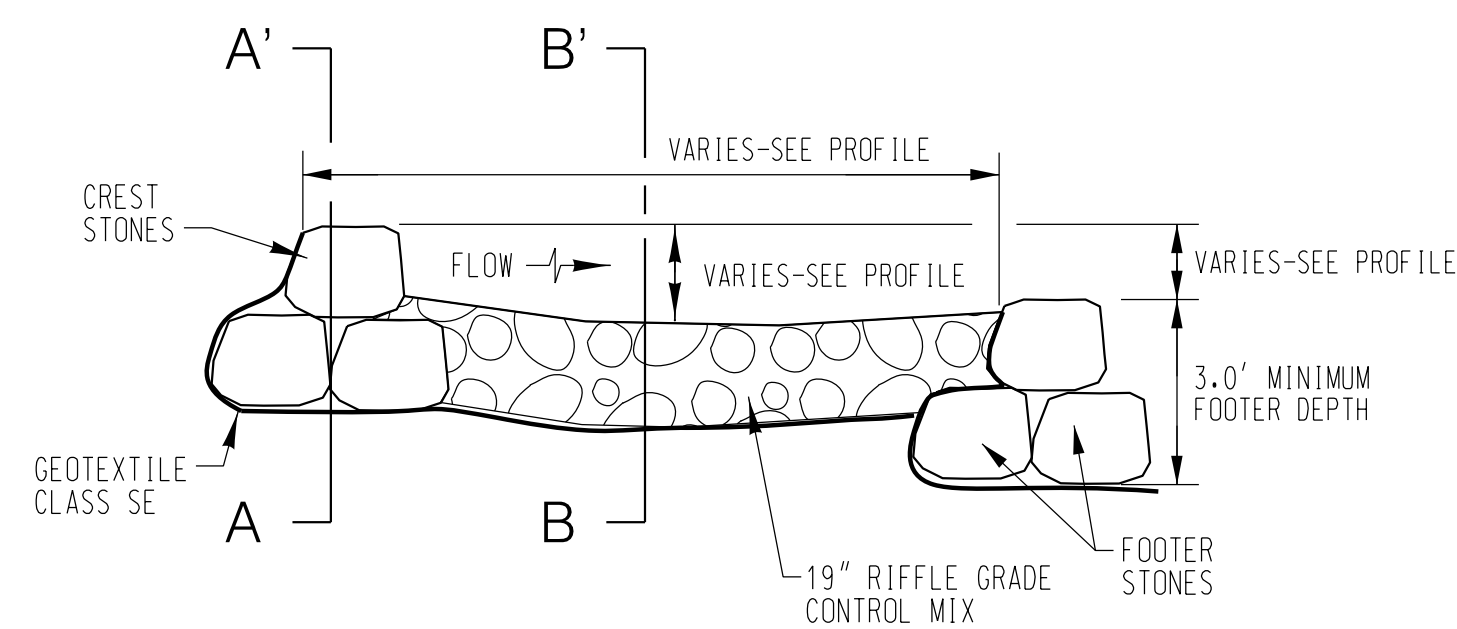


STEP POOL CREST				
LOCATION	A	B	C	D
REACH 2 & 4	6.0'	2.0'	2.0'	1.0'

\* SEE STREAM GRADING PLANS AND PROFILES FOR EXACT LOCATION OF CRESTS



STEP-POOL				
LOCATION	A	B	C	D
REACH 2 & 4	7.0'	2.5'	1.0'	2.0'



NOTES:

- NUMBER OF STONES SHOWN IS FOR GRAPHICAL PURPOSES ONLY. ACTUAL NUMBER OF STONES SHALL DEPEND ON STONE SIZE AND STREAM DIMENSIONS.
- ALL STONES SHALL BE CAREFULLY PLACED AND TIGHT FITTING MINIMIZING VOIDS/GAPS.
- VOIDS IN CRESTS AND POOLS SHALL BE CHINKED WITH CLASS 0 AND CLASS 1 RIPRAP USING THE LARGEST PARTICLE SIZE THAT CAN BE USED TO FILL THE VOID.
- VOIDS SHALL BE FILLED THROUGHOUT CONSTRUCTION OF A STRUCTURE PRIOR TO PLACEMENT OF TOP LAYERS IF APPLICABLE.
- WHERE EXISTING CONDITIONS REQUIRE FILL BEYOND THE MATERIAL SHOWN AND SPECIFIED ON THE STREAM DETAILS, SUITABLE BACKFILL SHALL BE USED TO FILL THE CHANNEL TO ESTABLISH SUBGRADE ELEVATIONS AND DIMENSIONS TO PREPARE FOR SPECIFIED MATERIAL PLACEMENT.

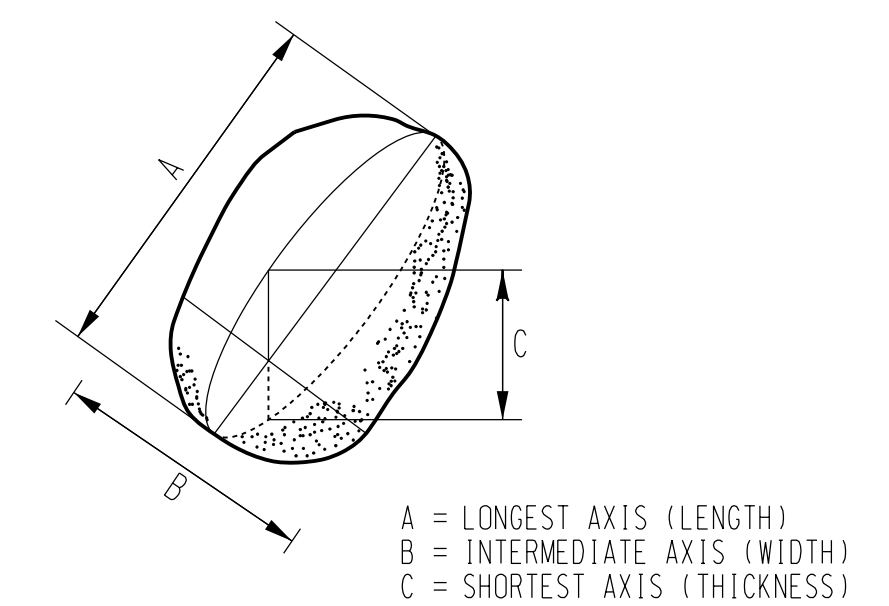
GRANULAR FILTER AND CHANNEL SAND & GRAVEL	
% LESS THAN	US STD SIEVE
100	2.5 in
85-100	1.0 in
60-100	0.5 in
35-70	No. 10
20-50	No. 40
3-20	No. 200

RIFFLE GRADE CONTROL MATERIAL	
% LESS THAN	US STD SIEVE
100	18.0
84	15.7
60	11.0
50	9.5
30	6.0
10	2.0

NOTE: SUITABLE MATERIAL FOR RIFFLE GRADE CONTROL MIX AND CHANNEL SAND & GRAVEL / GRANULAR FILTER MAY BE SALVAGED FROM THE CLASS 5 EXCAVATION THAT IS NOT TOPSOIL AND MEETS THE ABOVE GRADATION AS APPROVED BY THE ENGINEER.

REACH SUMMARY				
REACH	TYPE	CL STA. FROM	CL STA. TO	RESTORED LENGTH
REACH 1	RIFFLE-POOL	20+00.00	21+95.16	195
REACH 2A	STEP POOLS	21+95.16	22+27.03	32
NO ACTION	NA	22+27.03	23+23.20	0
REACH 2B	STEP POOLS	23+23.20	24+28.20	105
REACH 3	RIFFLE-POOL	24+28.20	27+37.83	310
REACH 4	STEP POOLS	27+37.83	29+37.08	199
MAINSTEM	RGC/W-WEIR	11+50	14+44.00	205

SIZES FOR STONE TYPES		
MATERIAL	APPLICATION	SPECIFICATION
TYPE I BOULDER	RGC SILLS; TOE BOULDERS	SELECT CLASS II BOULDERS WITH MIN. INTERMEDIATE (B) AXIS OF 1.5' TO 2.0'
TYPE II BOULDER	STEP POOL CRESTS	SELECT CLASS II BOULDERS WITH MIN. INTERMEDIATE (B) AXIS OF 1.9' TO 2.4'
KEY STONE TYPE III BOULDER	KEY STONE BOULDER IN STEP POOL CRESTS	SELECT CLASS III BOULDERS WITH MIN. INTERMEDIATE (B) AXIS OF 2.5' TO 3.0'
IMBRICATED CLASS III	W-WEIR	LONGEST (A) AXIS OF 4.5' TO 6'; INTERMEDIATE (B) AXIS OF 3.5' TO 4.5'; SHORTEST (C) AXIS OF 1.5' TO 2.2'. STONES SHALL BE BLOCKY IN SHAPE.
RIFFLE GRADE CONTROL MATERIAL (RGC MIX)	RGC WITH SILL; RGC MAINSTEM; POOL PAVEMENT	D50=9.5"; D100=18". MAY BE COMPRISED OF APPROXIMATELY 80% CLASS I RIPRAP, 20% CLASS II RIPRAP, CHINKED WITH CLASS 0; DEPTH 19"
CHANNEL SAND & GRAVEL / GRANULAR FILTER MATERIAL	RGC WASHIN; POOL MATERIAL	50% FINE AGGREGATE SAND (MSHA STANDARD), 25% AASHTO M43-8, 25% AASHTO M43-5



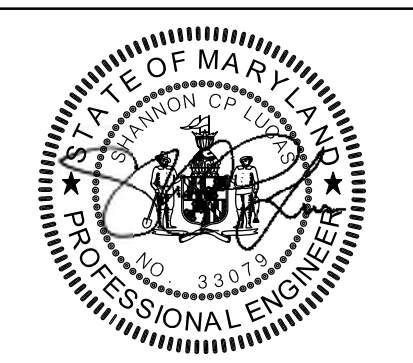
ROCK AXIS DEFINITION

NOT TO SCALE

ALL BOULDERS AND STONE MATERIAL USED TO DO THE WORK SHALL BE ANGULAR ROCK OF APPROPRIATE COLOR (e.g. GREEN/GRAY, BROWN/GRAY, DARK GRAY, AND DARK BROWN) FROM AN APPROVED SOURCE. WHITE COLORED STONE IS NOT ACCEPTABLE. ALL BOULDERS AND STONE MATERIAL SHALL BE FREE FROM LAMINATIONS, WEAK CLEAVAGES AND WILL NOT DISINTEGRATE FROM THE ACTION OF AIR, WATER OR IN HANDLING AND PLACING. GRANULAR SEDIMENTARY STONE IS NOT ACCEPTABLE. CONCRETE WILL NOT BE CONSIDERED AS AN ALTERNATIVE FOR STONE. THE STONE SHALL HAVE A MINIMUM UNIT WEIGHT OF 150-POUNDS PER CUBIC FOOT.

HORIZONTAL DATUM NAD 83/91  
VERTICAL DATUM NAVD 88  
MDE # 19-SF-0196; 18-NT-0086

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ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
CARSINS RUN STREAM RESTORATION**

JOHN F. KENNEDY MEMORIAL HIGHWAY  
HARFORD COUNTY

STREAM DETAILS

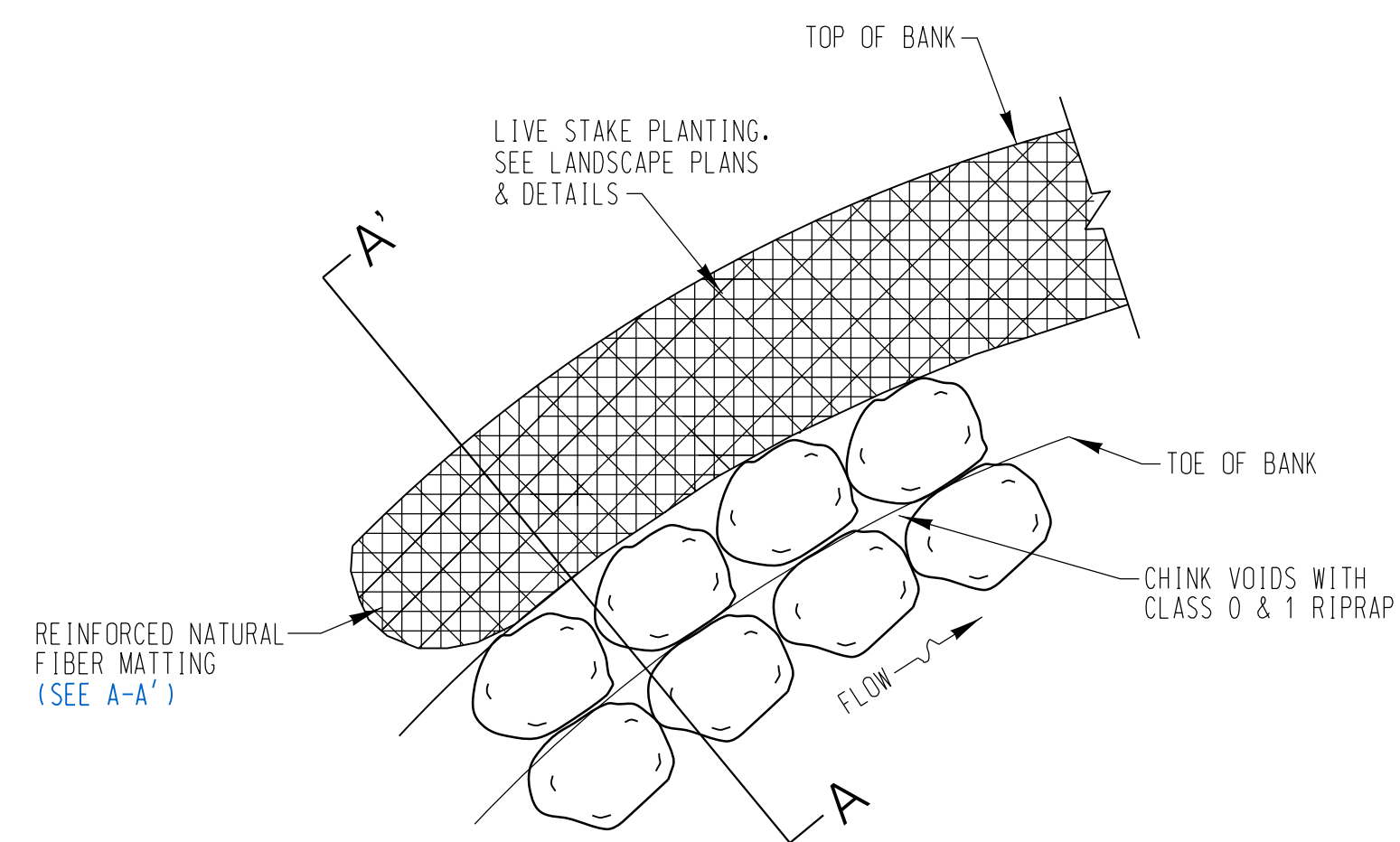
DESIGNED BY SL, AW, SD  
DRAWN BY CSD, KP, AW, JS  
CHECKED BY SL, CM, JB  
CONST. REVIEW BY  
DATE OCTOBER, 2019  
SCALE NOT TO SCALE

CONTRACT NO.  
KH-3028-0000

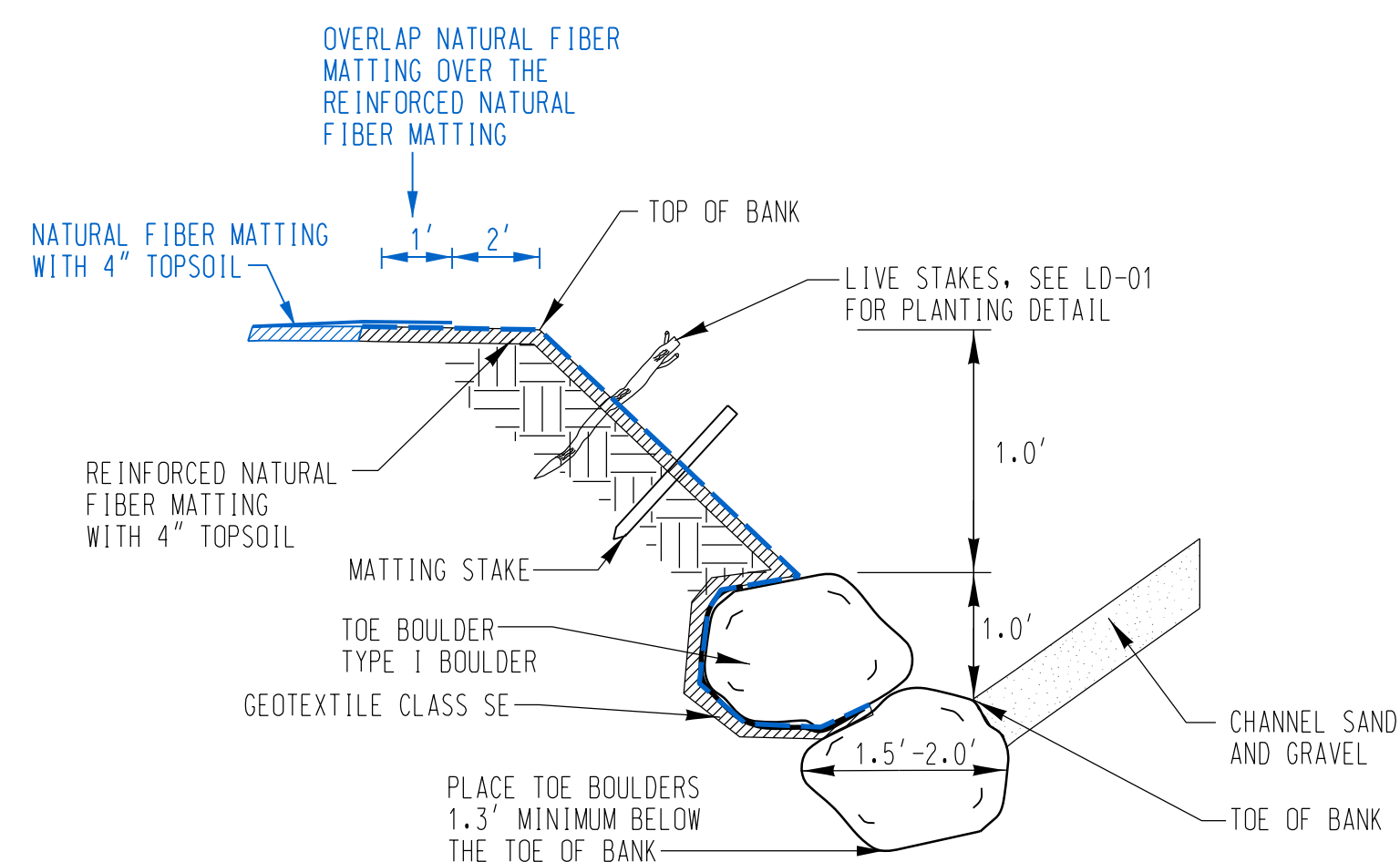
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**DE-01**

SHEET NO.  
7 OF 87

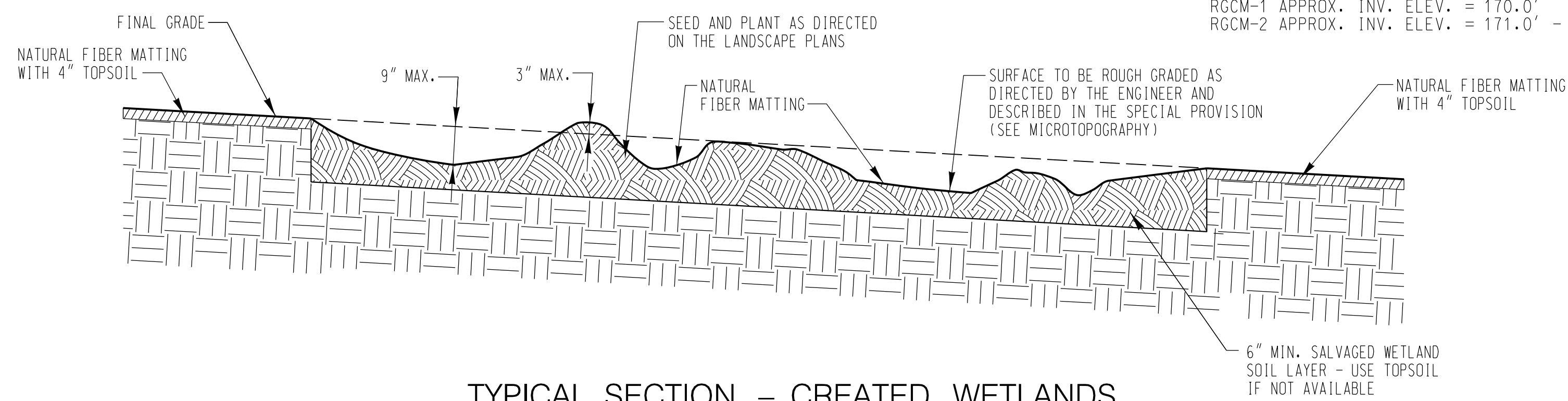




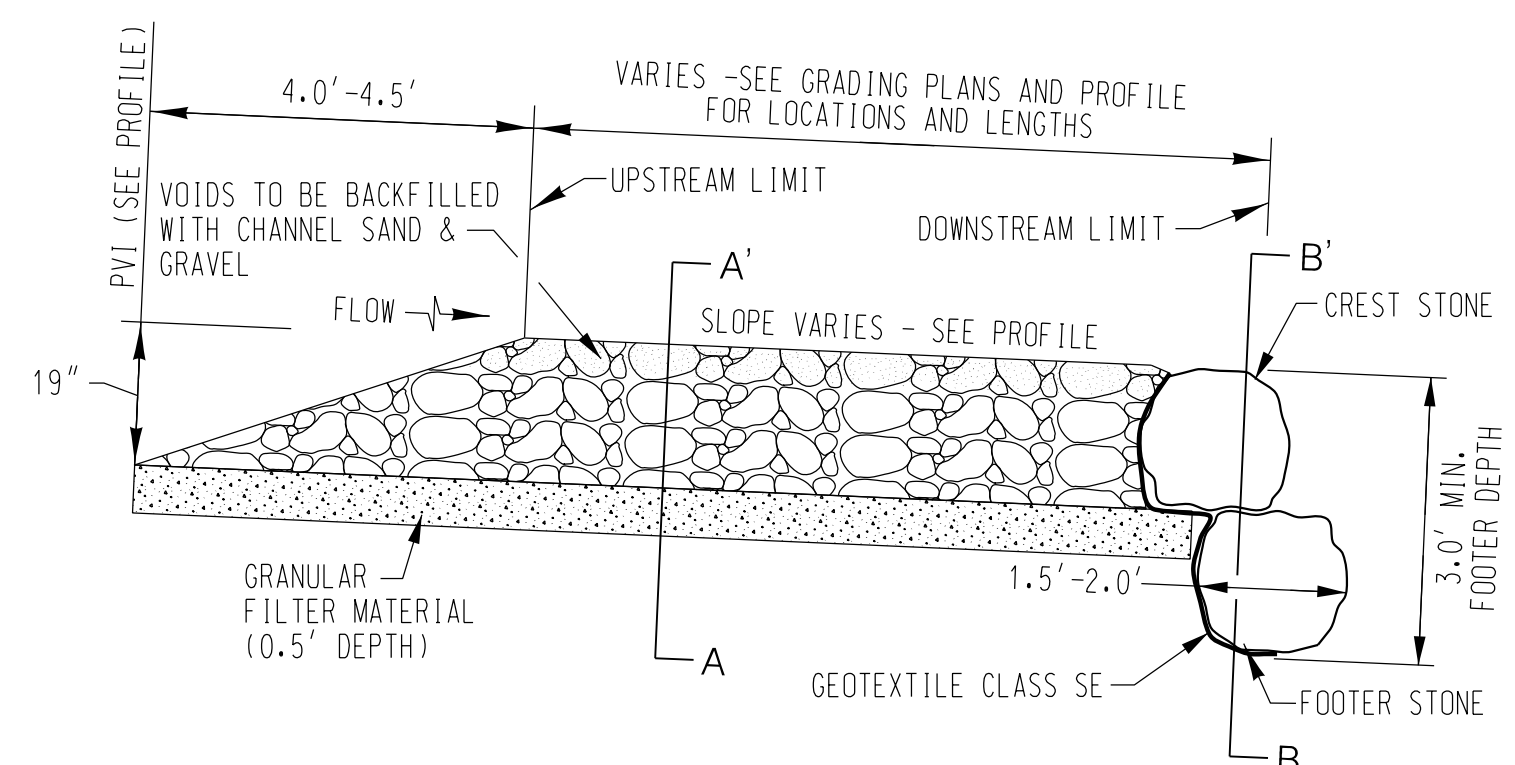
**TOE BOULDER WITH BIOENGINEERING – PLAN VIEW**  
NOT TO SCALE



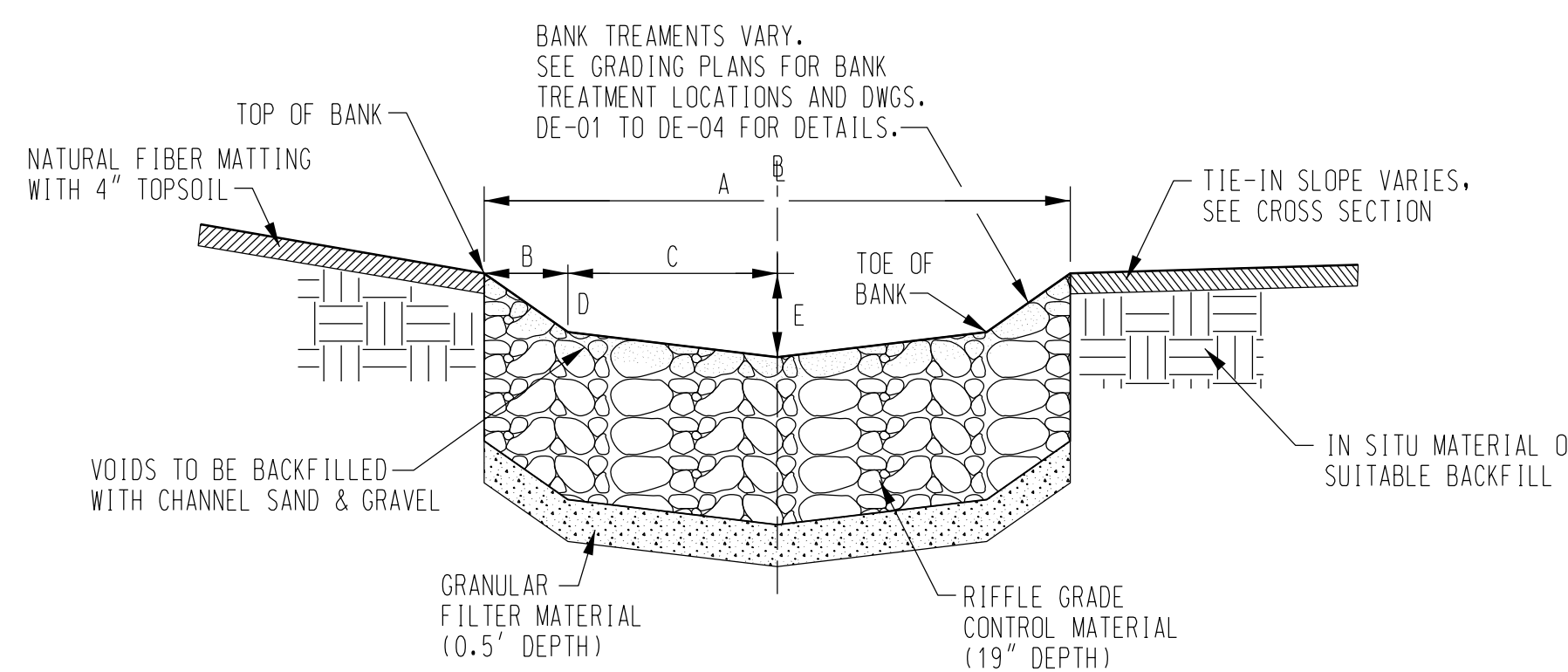
**TOE BOULDER WITH BIOENGINEERING REACHES 1 & 3 – SECTION A-A'**  
NOT TO SCALE



**TYPICAL SECTION – CREATED WETLANDS**  
NOT TO SCALE



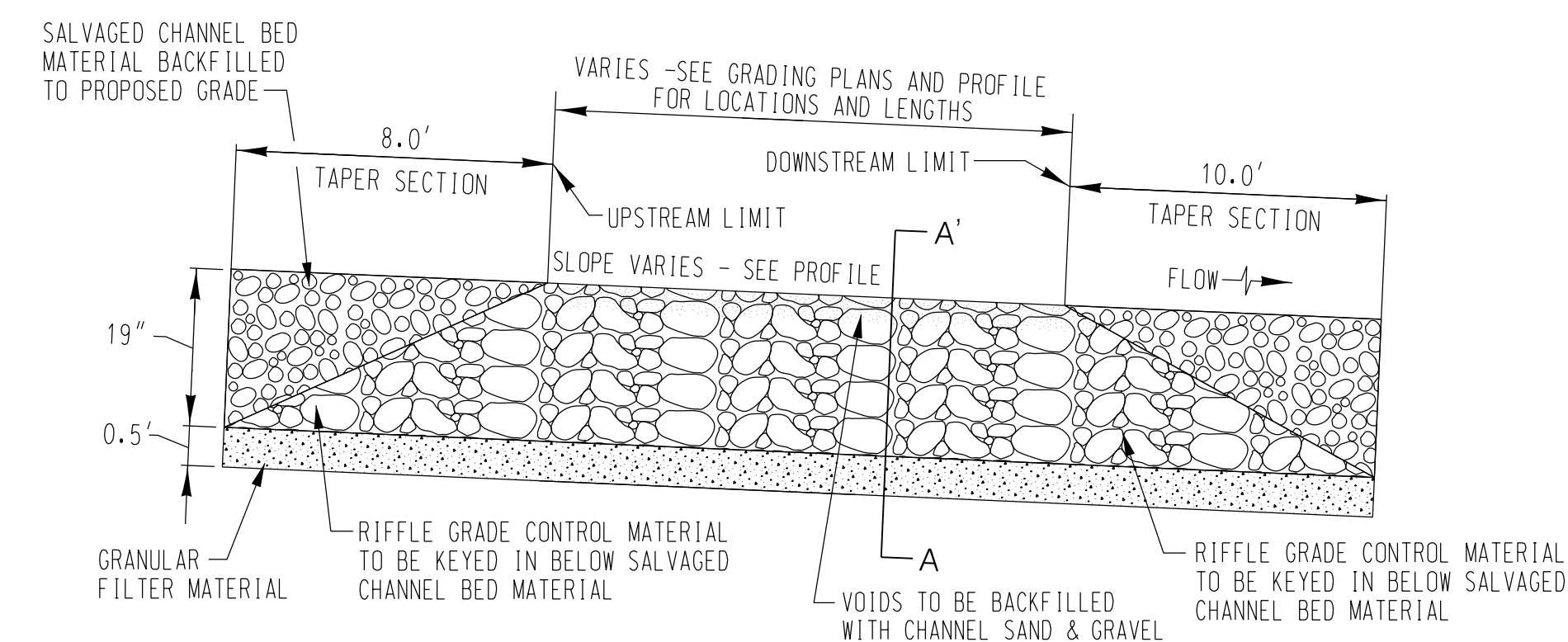
**TYPICAL RIFFLE GRADE CONTROL (RGC) WITH SILL, REACHES 1 & 3 – PROFILE**  
NOT TO SCALE



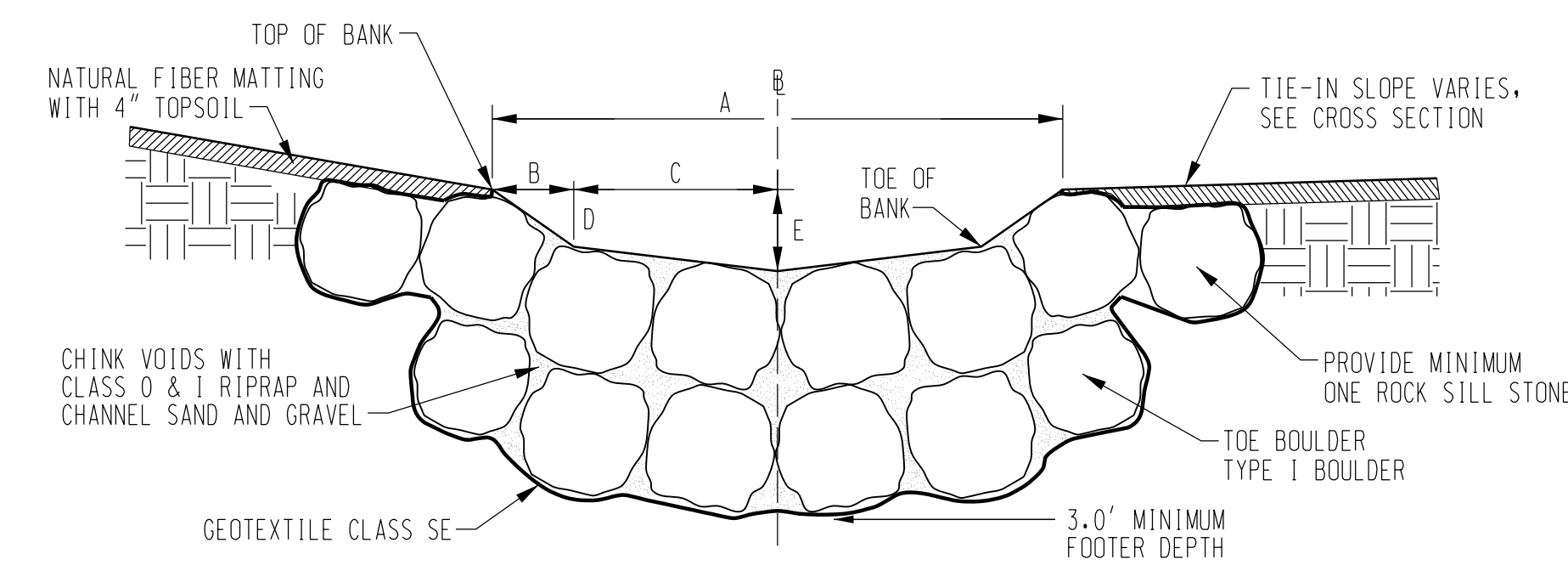
**TYPICAL RIFFLE CROSS SECTION A-A'**  
NOT TO SCALE

1 TYPICAL RIFFLE					
LOCATION	A	B	C	D	E
REACH 1 & 3	8.0'	0.5'	2.5'	0.25'	0.5'
MAINSTEM*	32.0'	2.0'	14.0'	1.0'	2.0'

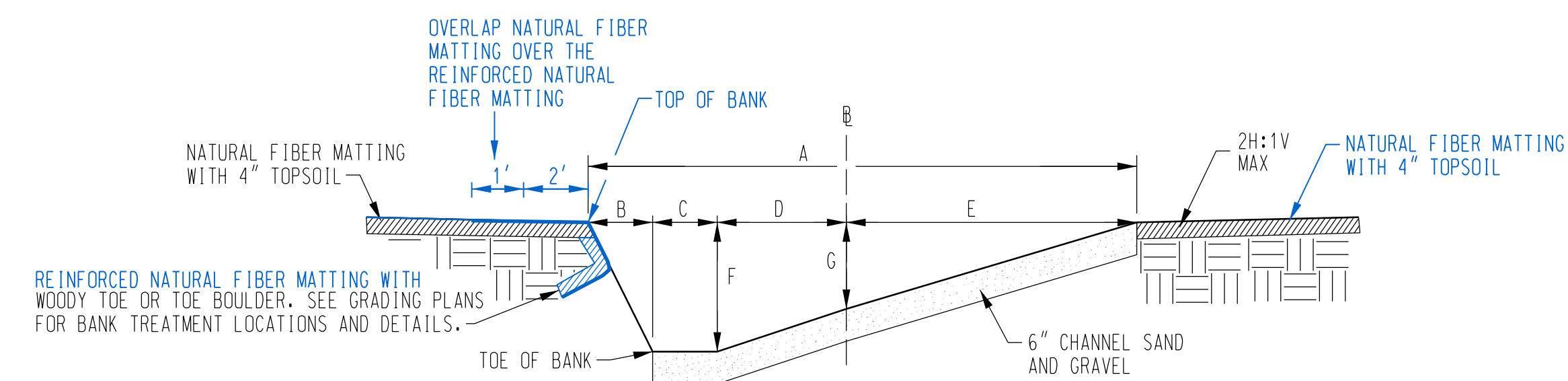
1 AT THE DIRECTION OF THE ENGINEER, THE TOP OF BANK ELEVATIONS MAY BE LOWERED UP TO 0.5' WITH ADDED FLOODPLAIN BENCH AND/OR ADJACENT TO CREATED WETLAND AREAS.  
\* APPROXIMATELY, BLEND TO MATCH EXISTING GRADES:  
RGC-1 APPROX. INV. ELEV. = 170.0'  
RGC-2 APPROX. INV. ELEV. = 171.0' - 170.1'



**TYPICAL RIFFLE GRADE CONTROL MAINSTEM (RGC-M) – PROFILE**  
NOT TO SCALE



**TYPICAL RIFFLE CROSS SECTION AT SILL, SECTION B-B'**  
NOT TO SCALE



**TYPICAL POOL LEFT CROSS SECTION**  
NOT TO SCALE

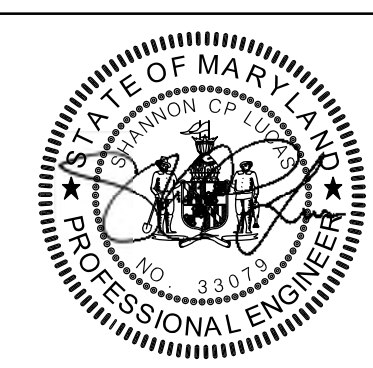
NOTE: POOL RIGHT IS A MIRROR IMAGE OF POOL LEFT

TYPICAL POOL							
LOCATION	A	B	C	D	E	F	G
REACH 1 & 3	8.5'	1.0'	1.0'	2.0'	4.5'	2.0'	1.34'

AT THE DIRECTION OF THE ENGINEER, THE TOP OF BANK ELEVATIONS MAY BE LOWERED UP TO 0.5' WITH ADDED FLOODPLAIN BENCH AND/OR ADJACENT TO CREATED WETLAND AREAS.

HORIZONTAL DATUM NAD 83/91  
VERTICAL DATUM NAVD 88  
MDE # 19-SF-0196; 18-NT-0086

**KCI**  
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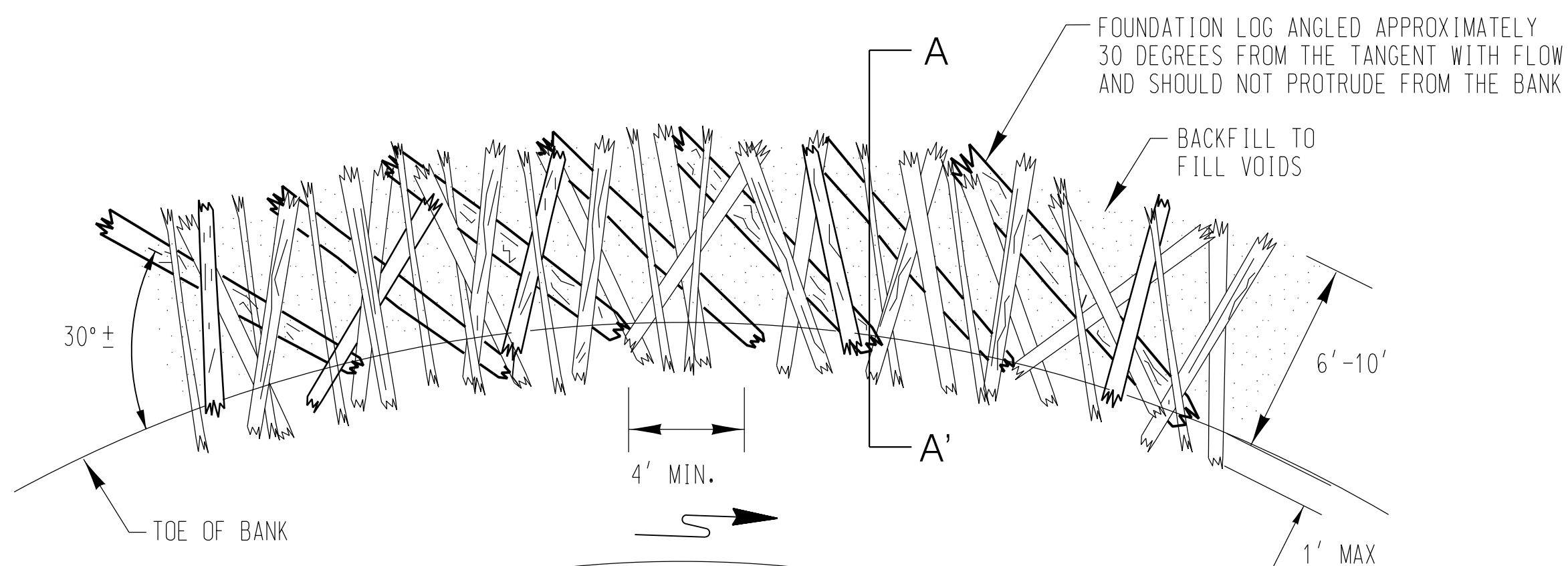
Maryland Transportation Authority  
Engineering Division



ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE
1	ADDENDUM NO. 2 - REVISE MATTING DETAILS	SL	1/16/20
2	REACH 1&3 RIFFLE & GRADING ADJUSTMENTS	SL	6/16/20

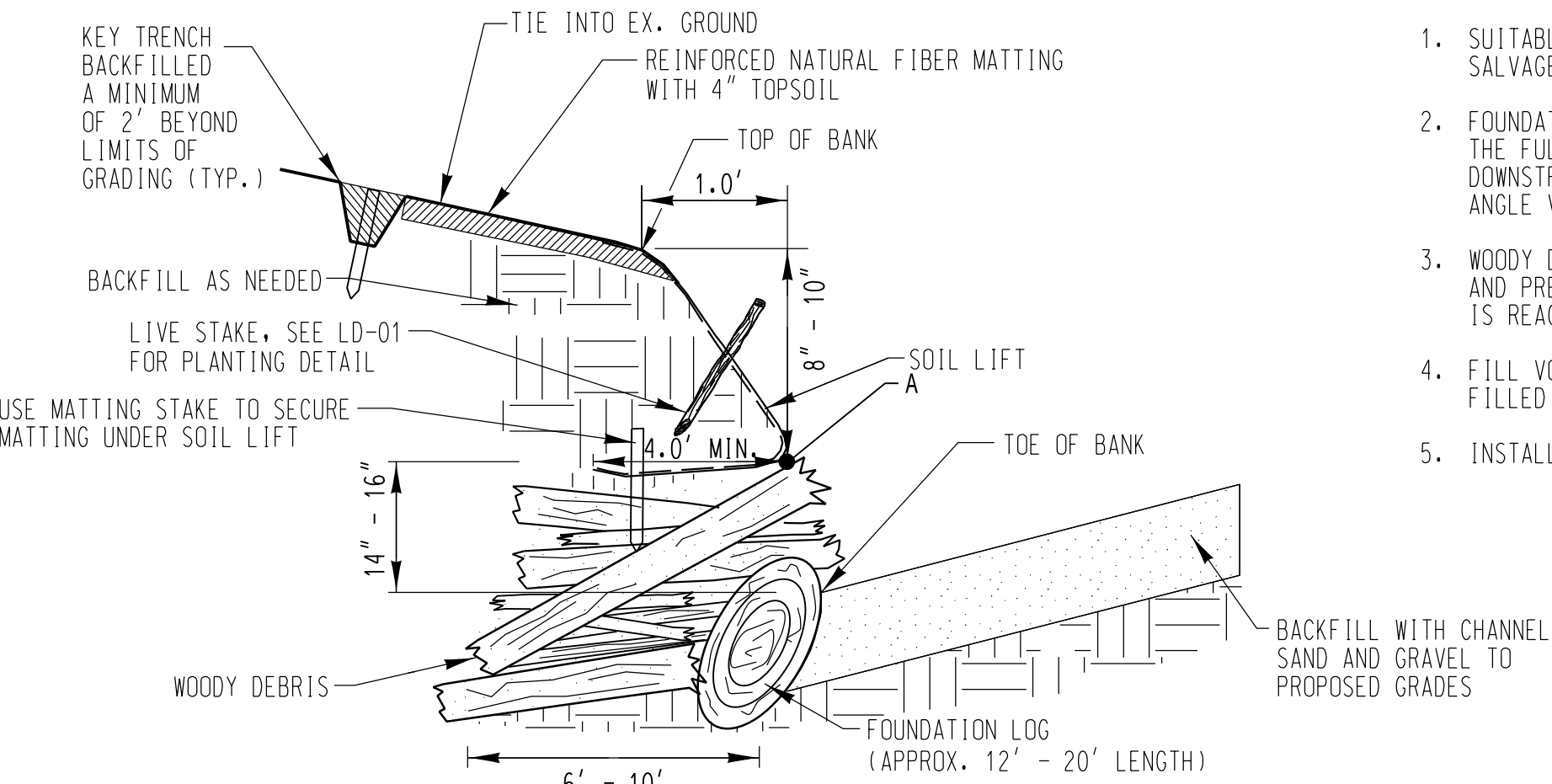
**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
CARSINS RUN STREAM RESTORATION**  
JOHN F. KENNEDY MEMORIAL HIGHWAY  
HARFORD COUNTY  
STREAM DETAILS  
DESIGNED BY SL, AW, SD  
DRAWN BY CSD, KP, AW, JS  
CHECKED BY SL, GM, JB  
CONST. REVIEW BY \_\_\_\_\_  
DATE OCTOBER, 2019  
SCALE NOT TO SCALE

CONTRACT NO.  
KH-3028-0000  
DRAWING NO.  
**DE-02**  
SHEET NO.  
8 OF 87  
UPDATED: 31JUL18



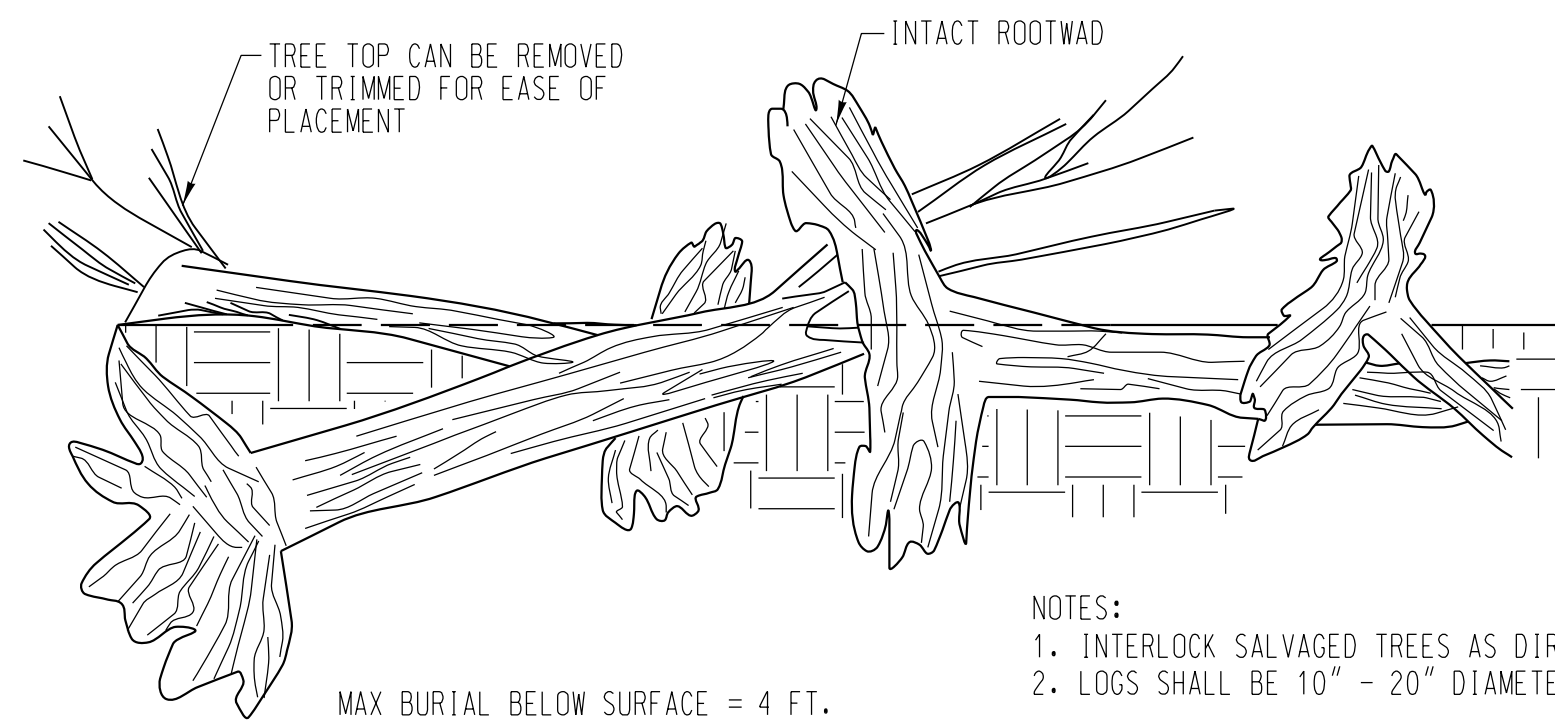
**PLAN VIEW – TYPICAL WOODY TOE**

NOT TO SCALE



**CROSS SECTION A-A' TYPICAL WOODY TOE**

NOT TO SCALE



**WOODY DEBRIS PLUG**

NOT TO SCALE

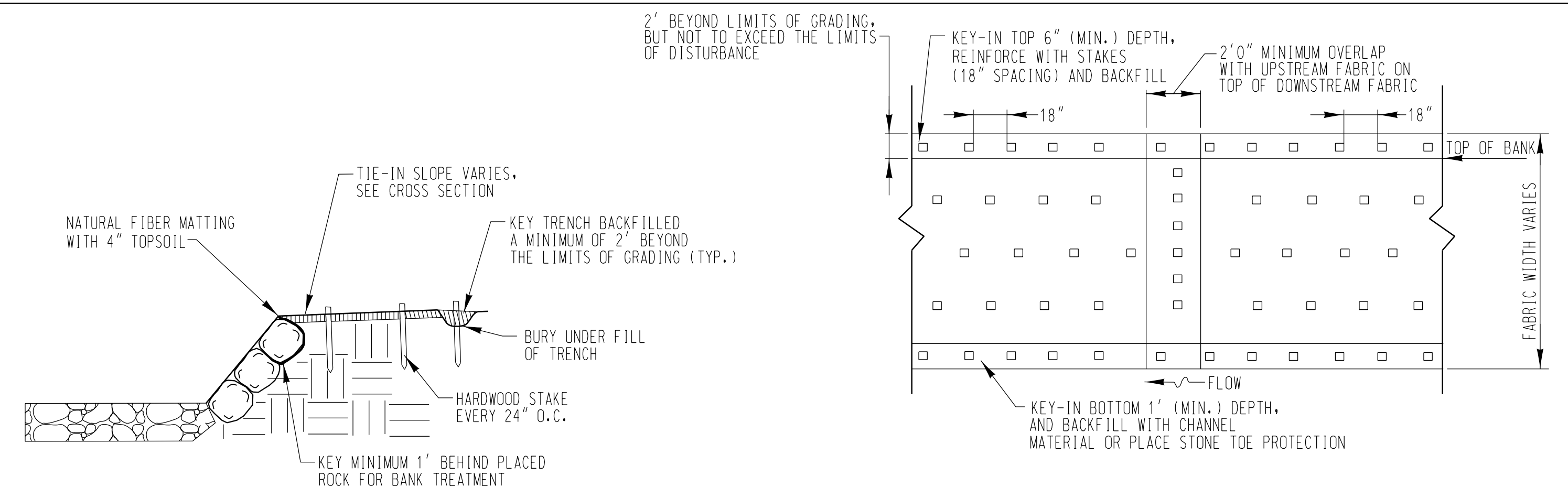
- NOTES:
1. INTERLOCK SALVAGED TREES AS DIRECTED BY THE ENGINEER.
  2. LOGS SHALL BE 10" - 20" DIAMETER AND 10' - 20' IN LENGTH.

NOTES:

1. SUITABLE TREE MATERIALS INCLUDING TRUNKS, TOPS, AND LIMBS, SHALL BE SALVAGED FOR USE IN TOE WOOD APPLICATIONS AS APPROVED BY THE ENGINEER.
2. FOUNDATION LOGS SHALL BE ANGLED WITH THE FLOW TO THE BANK AND EXTEND THE FULL WIDTH OF THE FILL SECTION. ORIENT FOUNDATION LOG SLIGHTLY DOWNSTREAM APPROXIMATELY 30 DEGREES FROM TANGENT TO THE BASELINE. ANGLE VARIES WITH BASELINE CURVATURE.
3. WOODY DEBRIS MATERIAL SHALL BE PLACED RANDOMLY ON FOUNDATION LOGS AND PRESSED FLAT WITH THE BUCKET UNTIL THE FINAL DEPTH OF MATERIAL IS REACHED (SEE SECTION A-A').
4. FILL VOIDS WITH SUITABLE BACKFILL MATERIAL. ENSURE THAT VOIDS ARE FILLED BEFORE PLACING SOIL LIFT.
5. INSTALL SOIL LIFT WITH REINFORCED NATURAL FIBER MATTING.

SUITABLE SALVAGED TREE MATERIALS

MATERIAL	SIZE
FOUNDATION LOGS	6" - 10" DIAMETER
WOODY DEBRIS	2" - 8" DIAMETER



**NATURAL FIBER MATTING (TYPE D SSM)  
TYPICAL CROSS SECTION ADJACENT TO CHANNEL**

NOT TO SCALE

- NOTES:
1. BED AND BANK TREATMENTS SHOWN ARE SCHEMATIC ONLY, REFER TO TYPICAL DETAILS FOR ROCK PLACEMENT.

**TYPICAL PLAN VIEW  
NATURAL FIBER MATTING  
AND REINFORCED NATURAL FIBER MATTING**

NOT TO SCALE

NOTES FOR NATURAL AND REINFORCED NATURAL FIBER MATTING:

1. NATURAL FIBER MATTING TO BE ROLLED LENGTHWISE ALONG STREAMBANK EXTENDING TO THE BOTTOM OF TOE PROTECTION AND A MINIMUM OF TWO FEET PAST THE LIMITS OF GRADING. IF MORE THAN ONE ROLL IS REQUIRED, MID-BANK OVERLAP SHOULD BE A MINIMUM OF ONE FOOT AND SECURELY FASTENED WITH STAKES. AT TRANSITION BETWEEN NATURAL FIBER MATTING AND REINFORCED NATURAL FIBER MATTING, MATTING SHOULD BE OVERLAPPED TWO FEET AND SECURELY FASTENED WITH STAKES.
2. NATURAL FIBER MATTING IS TO BE INSTALLED ON ALL GRADED SLOPES, HIGHLY ERODIBLE SOILS (SEE SHEET 2), AND WETLAND AREAS.
3. NATURAL FIBER MATTING. MATTING FOR THE BANK TREATMENT AREAS SHALL CONSIST OF A MACHINE PRODUCED MAT OF DEGRADABLE NATURAL FIBERS AND SHALL MEET THE MINIMUM SPECIFICATIONS PER:

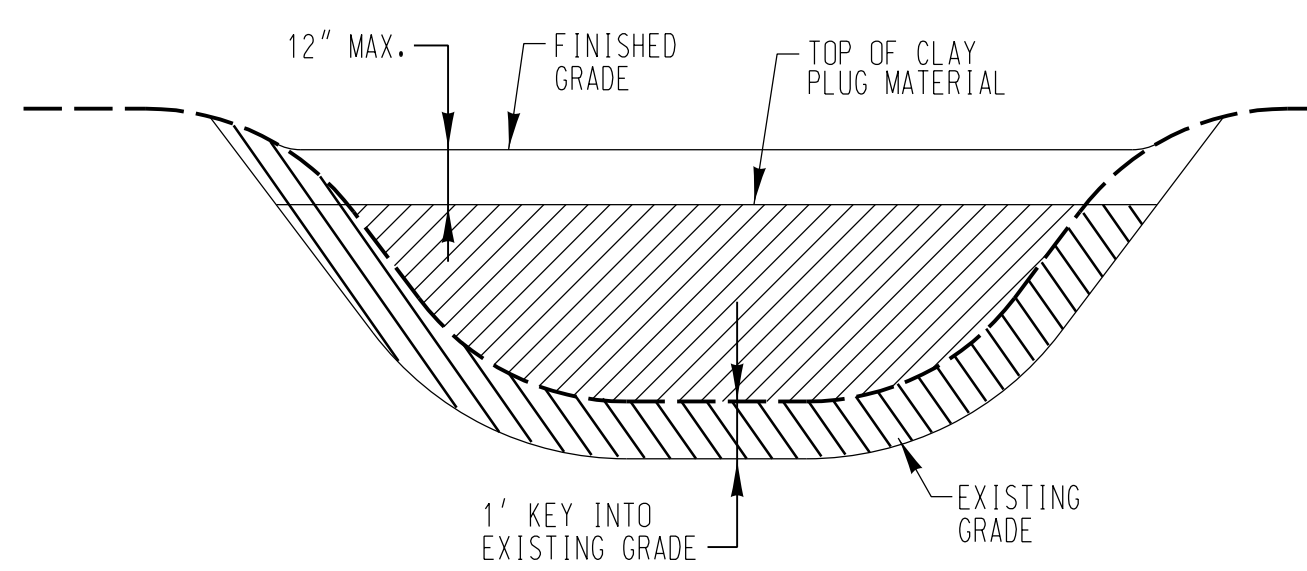
TYPE D SSM PER MSHA 2019 STANDARD 920

4. REINFORCED NATURAL FIBER MATTING. MATTING FOR ALTERNATING ROUGHNESS AND WOODY TOE SHALL CONSIST OF A DOUBLE-LAYERED BIODEGRADABLE FABRIC: A BOTTOM LAYER OF JUTE FABRIC AND A TOP LAYER OF HIGH STRENGTH COIR MATTING, CONNECTED TOGETHER. REINFORCED NATURAL FIBER MATTING SHALL MEET THE FOLLOWING MINIMUM SPECIFICATIONS:

MATERIALS: WOVEN COIR FIBER (TOP LAYER) AND JUTE FABRIC (BOTTOM LAYER)  
 THICKNESS: 0.35 IN.  
 ELONGATION (DRY/WET): 30%/26% (TOP LAYER) AND 8%/9% (BOTTOM LAYER)  
 WEIGHT: 33.3 OZ/SY  
 PERMEABILITY: 1.03 IN/SEC  
 SHEAR STRESS: 4.5 LBS/SQ FT  
 FLOW VELOCITY: 12 FT/SEC

5. REINFORCED NATURAL FIBER MATTING SHOULD BE PLACED AS INDICATED ABOVE IN #1.
6. MATTING STAKES. STAKES FOR SECURING THE MATTING ALONG OTHER PORTIONS OF THE MATTING MATERIAL ABOVE THE TOE TRENCH AND FOR THE KEY-IN TRENCH AT THE TOP OF THE SLOPE SHALL CONSIST OF 1-1/2" X 1-1/2" HARDWOOD STAKES, 18-INCHES IN LENGTH, TAPERED AT THE BOTTOM END FOR EASY INSERTION INTO THE SOIL AND FLAT AT THE TOP END FOR HAMMERING.

SHEAR STRESS: 4.5 LBS/SQ FT  
 FLOW VELOCITY: 12 FT./SEC.  
 LIFE EXPECTANCY: 3 YEARS IN REINFORCED NATURAL FIBER MATTING



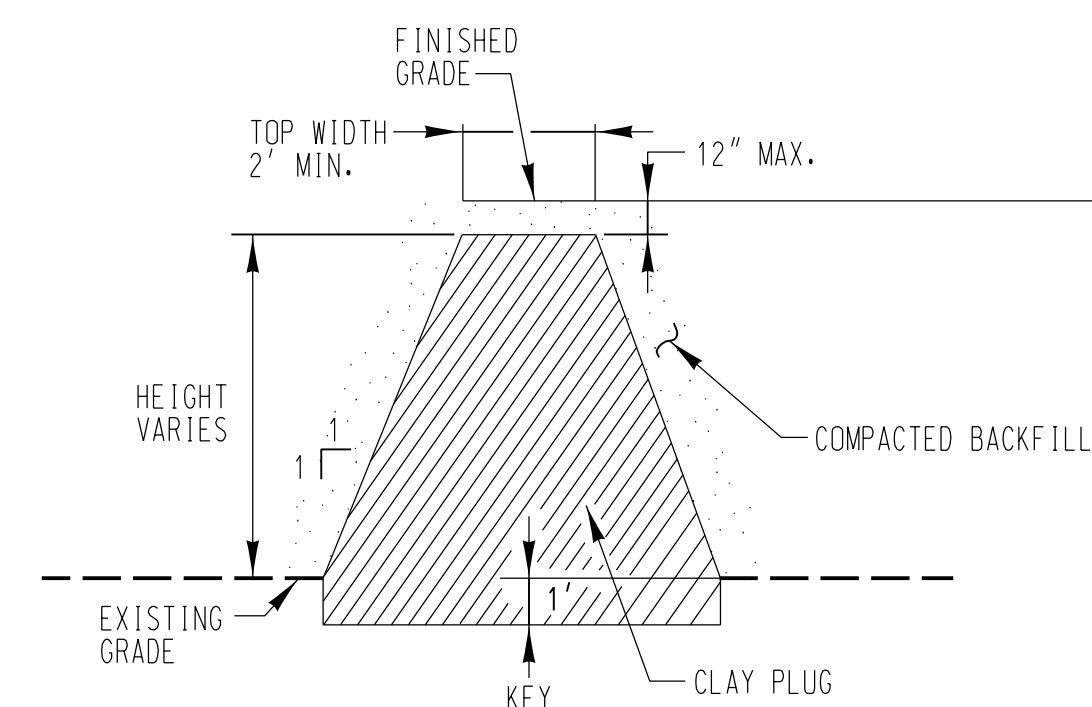
**ELEVATION**

NOTES:

1. CLAY MATERIAL MUST BE UNIFIED SOIL CLASSIFICATION SC OR CL-ML MATERIAL AND MUST BE COMPACTED TO 85% OF AASHTO SPECIFICATION T-99 OR ASTM D698.
2. EXCAVATION INCIDENTAL TO PAY ITEM.

**CLAY PLUG**

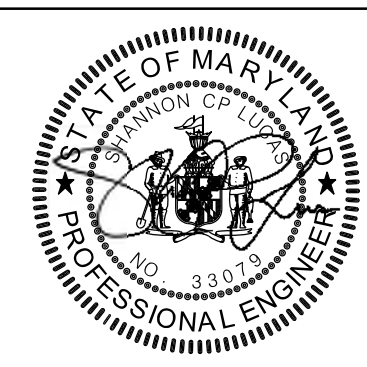
NOT TO SCALE



**CROSS-SECTION**

HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88  
 MDE # 19-SF-0196; 18-NT-0086

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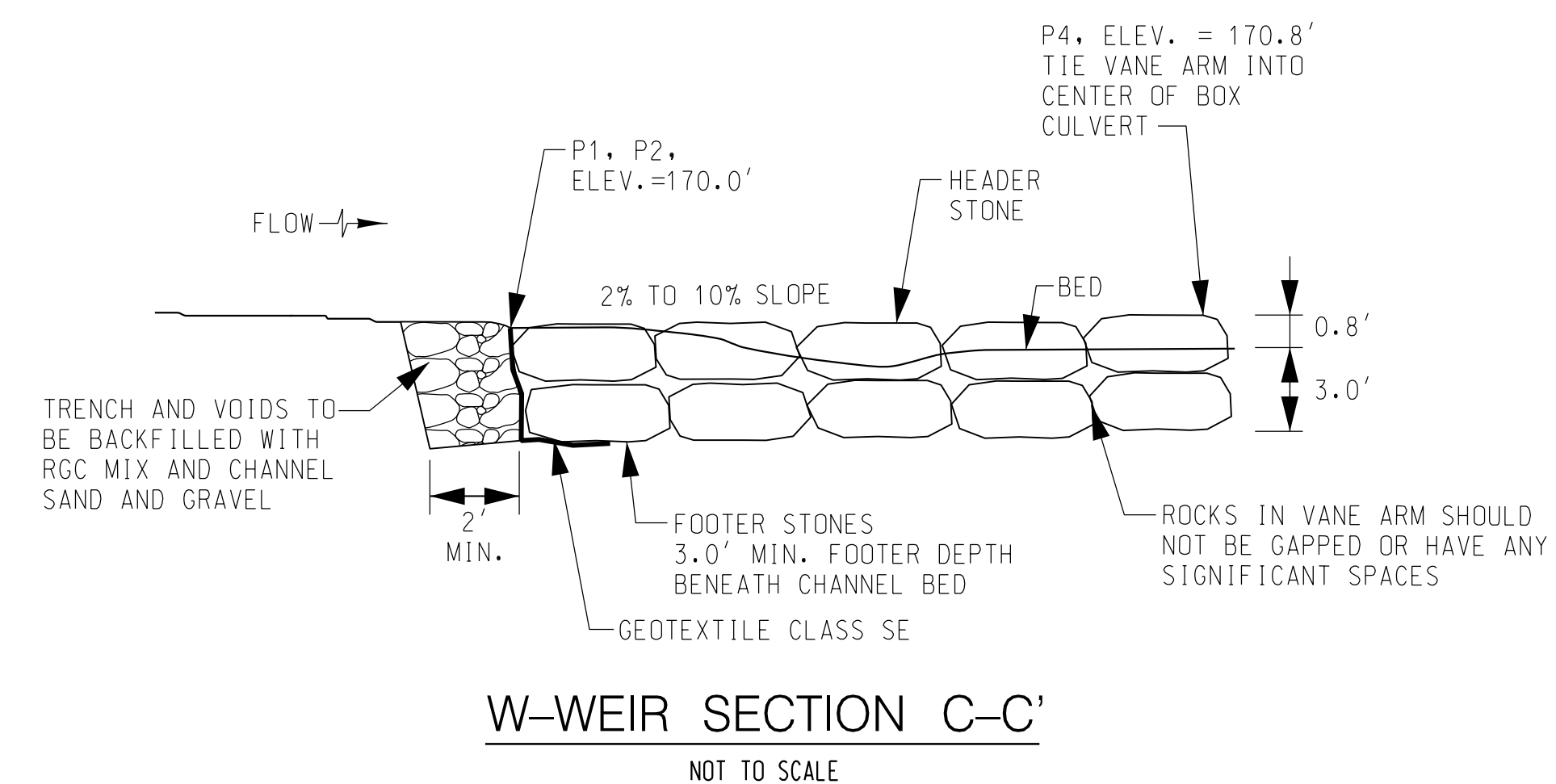
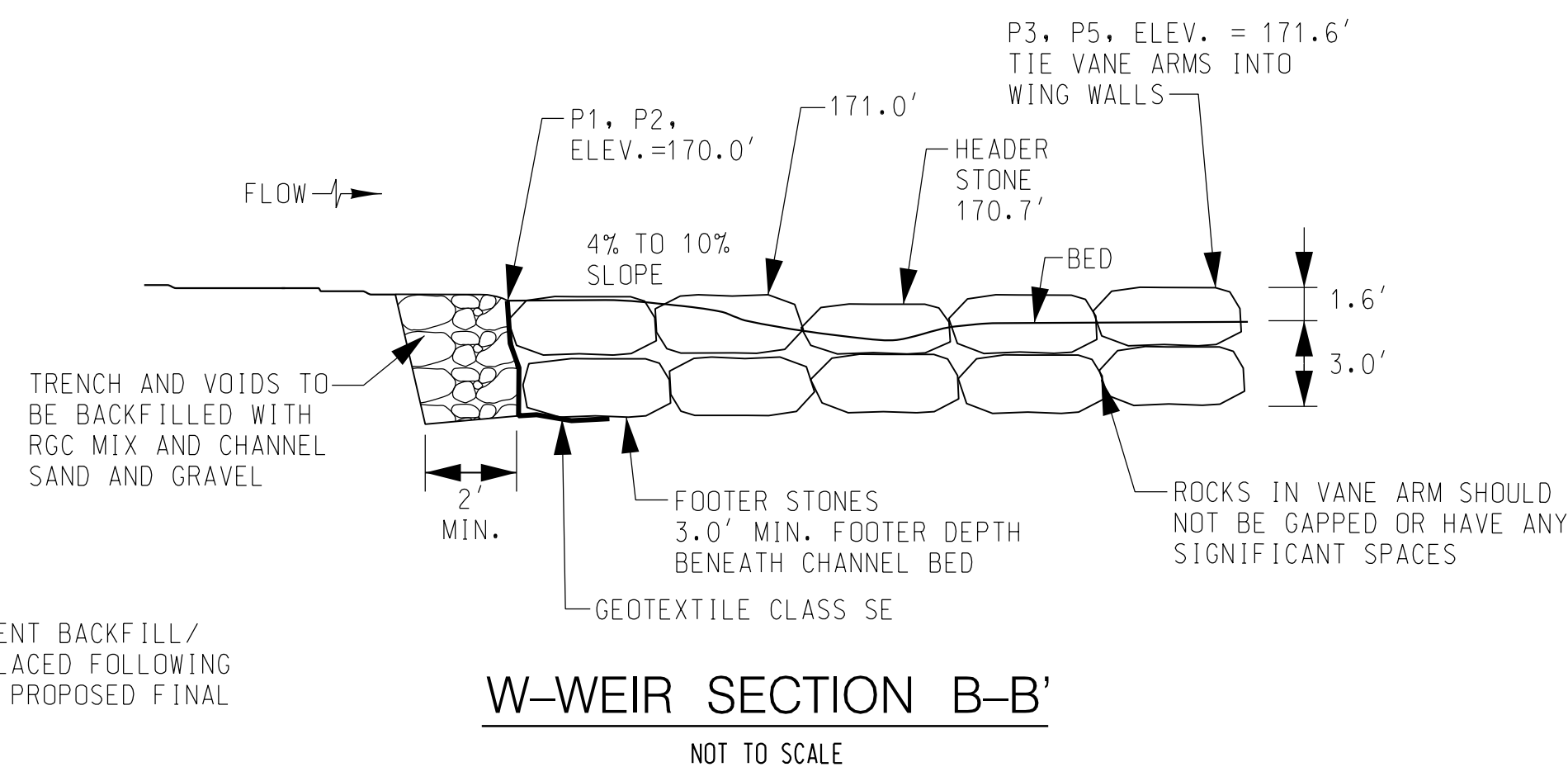
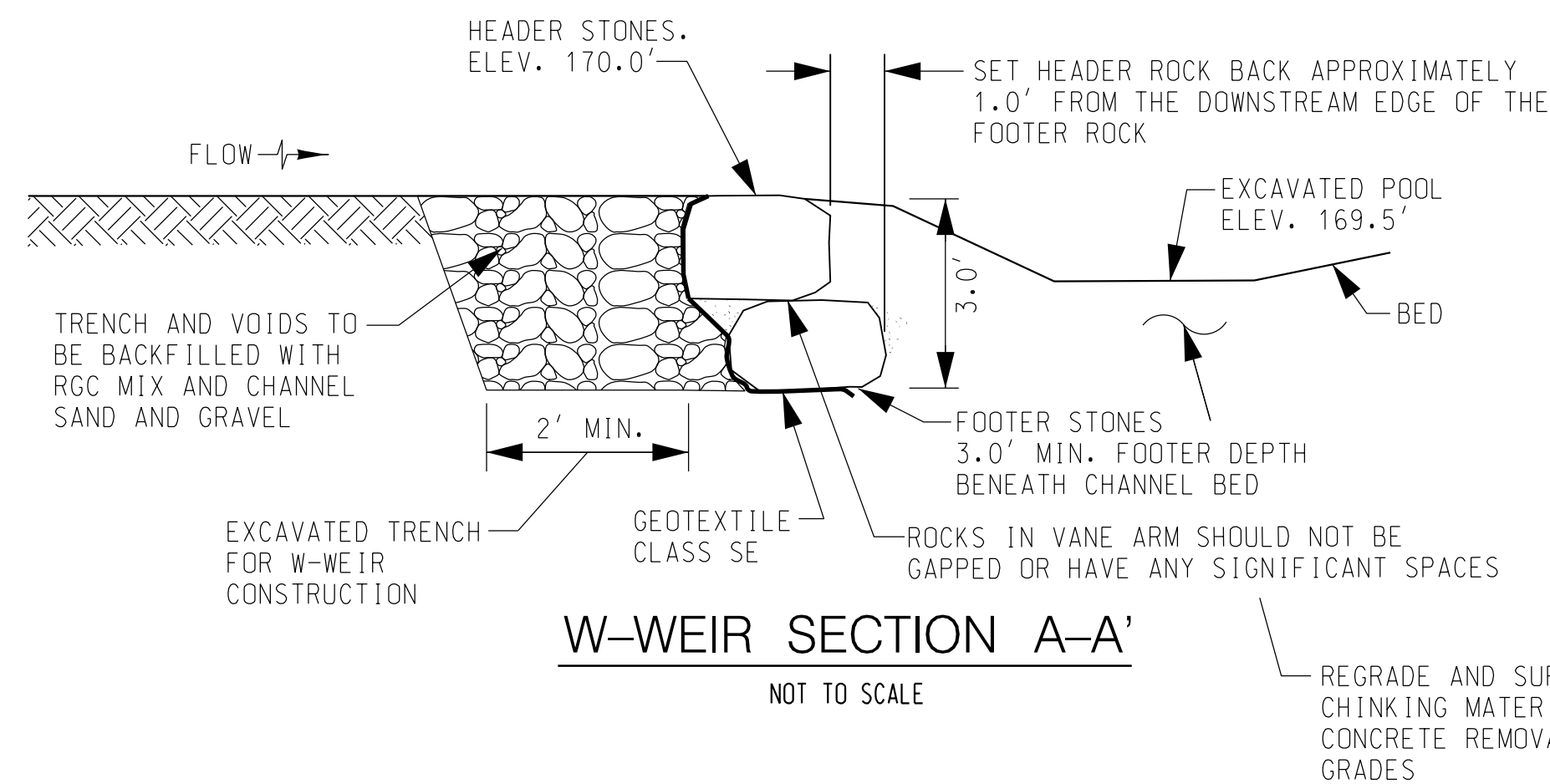
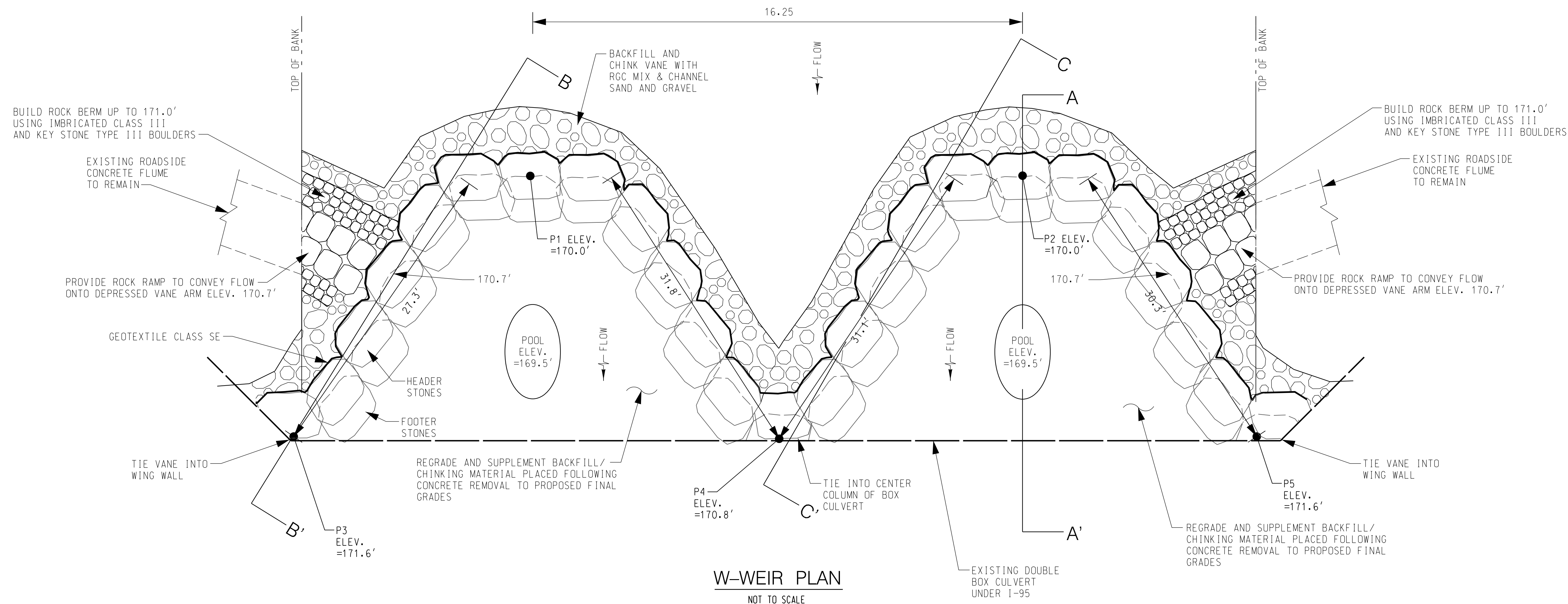
ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
 CARSENS RUN STREAM RESTORATION**

JOHN F. KENNEDY MEMORIAL HIGHWAY  
 HARFORD COUNTY  
 STREAM DETAILS

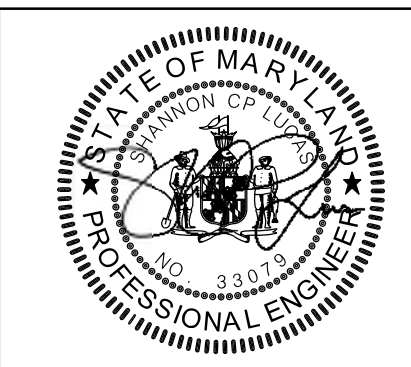
DESIGNED BY SL, AW, SD  
 DRAWN BY CSD, KP, AW, JS  
 CHECKED BY SL, CM, JB  
 CONST. REVIEW BY \_\_\_\_\_  
 DATE OCTOBER, 2019  
 SCALE NOT TO SCALE

CONTRACT NO.  
 KH-3028-0000  
 DRAWING NO.  
**DE-03**  
 SHEET NO.  
 9 OF 87



NOTE:  
 HEADER AND FOOTER STONES  
 SHALL BE IMBRICATED CLASS III  
 LONGEST (A) AXIS = 4.5' TO 6'  
 INTERMEDIATE (B) AXIS = 3.5' TO 4.5'  
 SHORTEST (C) AXIS = 1.5' TO 2.2'  
 STONES SHALL BE BLOCKY IN SHAPE.

HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88  
 MDE # 19-SF-0196; 18-NT-0086



ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

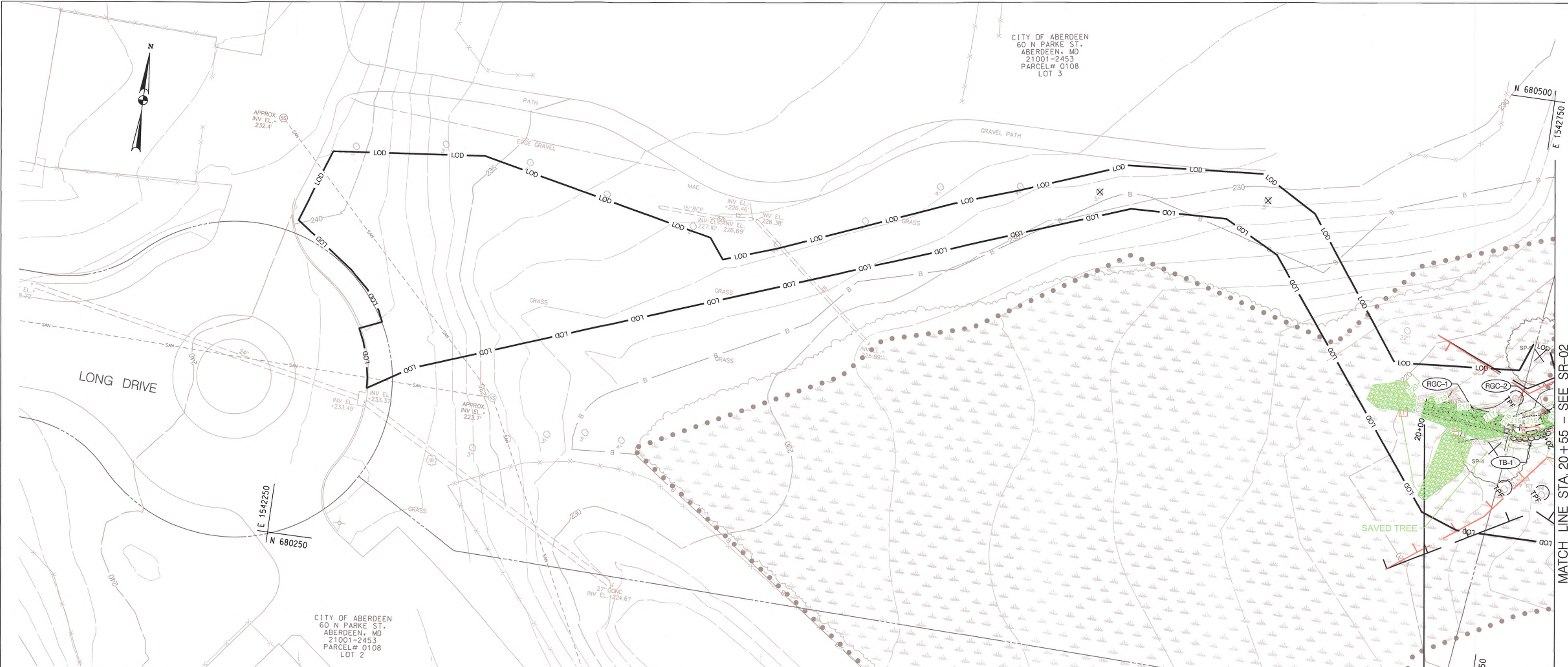
**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
 CARSENS RUN STREAM RESTORATION**

JOHN F. KENNEDY MEMORIAL HIGHWAY  
 HARFORD COUNTY

STREAM DETAILS

DESIGNED BY SL, AW, SD    DRAWN BY CSD, KP, AW, JS    CHECKED BY SL, CM, JB  
 CONST. REVIEW BY    DATE OCTOBER, 2019    SCALE NOT TO SCALE

CONTRACT NO. KH-3028-0000  
 DRAWING NO. **DE-04**  
 SHEET NO. 10 OF 87



CITY OF ABERDEEN  
60 N PARKE ST.  
ABERDEEN, MD  
21001-2453  
PARCEL# 0108  
LOT 3

CITY OF ABERDEEN  
60 N PARKE ST.  
ABERDEEN, MD  
21001-2453  
PARCEL# 0108  
LOT 2

**LEGEND**

- LOD - LIMITS OF DISTURBANCE
- 20+00 - TOP OF BANK
- 190 - PROP. CONTOUR
- Created Wetlands
- Toe Boulders
- Woody Toe
- Woody Debris Plug
- Riffle Grade Control
- Step Pool Crest
- Clay Plug
- Tree to be Removed
- Tree Protection Fence

**RIFFLE GRADE CONTROL WITH SILL (RGC-#)**

LABEL	FROM STATION	TO STATION	RCG MIX VOLUME (CY)	SILL (EA)	PLACING SALVAGED CHANNEL SAND AND GRAVEL - POOLS (CY)	PLACING FURNISHED CHANNEL SAND AND GRAVEL - POOLS (CY)
RGC-1*	20+00.00	20+37.49	13.7 16.9	1	5.15 6.33	3.43 4.22
RGC-2	20+50.10	20+58.80	3.3 4.1	1	1.25 1.53	0.83 1.02
<b>TOTALS:</b>			<b>17.0 21.0</b>	<b>2</b>	<b>6.40 7.86</b>	<b>4.26 5.24</b>

\*BLEND TO EXISTING GRADES  
MATERIALS CONSIDERED INCIDENTAL:  
TYPE I BOULDERS  
GEOTEXTILE CLASS SE  
CHINKING MATERIAL

**TOE BOULDERS (TB-#)**

LABEL	FROM STATION	TO STATION	OFFSET DISTANCE	OFFSET SIDE	PLACING SALVAGED CHANNEL SAND AND GRAVEL - POOLS (CY)	PLACING FURNISHED CHANNEL SAND AND GRAVEL - POOLS (CY)	LENGTH* (LF)
TB-1	20+37.49	20+50.10	4	R	1.12	0.74	15.7

\*LENGTH MEASURED ALONG OUTSIDE BANK  
MATERIALS CONSIDERED INCIDENTAL:  
TYPE I BOULDERS  
REINFORCED NATURAL FIBER MATTING  
CHINKING MATERIAL  
GEOTEXTILE CLASS SE

**STREAM RESTORATION AS-BUILT CERTIFICATION**  
STREAM CONSTRUCTION

I HEREBY CERTIFY THAT THE PORTION OF THE STREAM RESTORATION SITE SHOWN ON THE PLANS AND IDENTIFIED IN THE STREAM CHECKLIST AS STREAM CONSTRUCTION HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS INCLUDED UNDER THE MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVAL, NUMBER 18 - NT - 0086 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 SITE.

ANDREW WHALEY  
Name (Printed) Signature  
44904 04/21/2021  
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 OR PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 44904, EXPIRATION 12/22/2021.

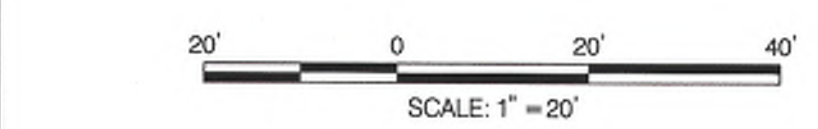
\*CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED ON SUFFICIENT AND APPROPRIATE ONSITE INSPECTIONS AND MATERIAL TESTS CONDUCTED DURING CONSTRUCTION.



REACH 1  
STA 20+00 TO 21+95  
PROVIDE SMOOTH TRANSITION FROM EXISTING CONDITIONS TO PROPOSED CHANNEL

**AS-BUILT**

HORIZONTAL DATUM NAD 83/91  
VERTICAL DATUM NAVD 88  
MDE # 19-SF-0196; 18-NT-0086



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Maryland Transportation Authority  
Engineering Division

**ADDENDUMS & REVISIONS**

NO.	DESCRIPTION	BY	DATE
1	GRADING, RGC, AND EXCAVATION ADJUSTMENTS	SL	6/16/20

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
CARSINS RUN STREAM RESTORATION**

JOHN F. KENNEDY MEMORIAL HIGHWAY  
HARFORD COUNTY  
STREAM GRADING PLAN  
DESIGNED BY SL, AW, SD  
DRAWN BY CSD, KP, AW, JS  
CHECKED BY SL, GM, JB  
CONST. REVIEW BY DATE OCTOBER, 2019 SCALE 1" = 20'

CONTRACT NO. KH-3028-0000  
DRAWING NO. SR-01  
SHEET NO. 11 OF 87  
UPDATED: 31JUL18

STEP POOL (SP-#)	CREST		CREST (EA)	RCGMIX VOLUME (CY)**
	FROM STATION	TO STATION		
SP-1	21+95.16	21+97.16	1	4.5
SP-2	22+05.87	22+08.66	1	4.0
SP-3	22+17.37	22+20.15	1	3.5
SP-4	22+25.03	22+27.03	1	N/A
SP-5*	23+25.00	23+27.79	1	4.5
SP-6	23+36.50	23+39.28	1	4.5
SP-7	23+47.99	23+50.78	1	4.1
SP-8	23+59.49	23+62.27	1	4.3
SP-9	23+70.85	23+73.64	1	4.2
SP-10	23+82.35	23+85.13	1	4.3
SP-11	23+93.84	23+96.63	1	4.2
SP-12	24+05.34	24+08.12	1	4.3
SP-13	24+16.70	24+19.49	1	4.2
TOTAL:			13.0	50.6

RIFLE GRADE CONTROL WITH SILL (RGC-#)						
LABEL	FROM STATION	TO STATION	RCGMIX VOLUME (CY)	SILL (EA)	PLACING SALVAGED CHANNEL SAND AND GRAVEL - POOLS (CY)	PLACING FURNISHED CHANNEL SAND AND GRAVEL - POOLS (CY)
RGC-3	20+90.45	21+02.38	4.55.5	1	1.682.07	1.12 1.36
RGC-4	21+23.58	21+30.56	2.79.3	1	1.011.25	0.680.83
RGC-5	21+61.35	21+67.23	2.49.0	1	0.911.12	0.610.75
RGC-6	24+28.20	24+35.00	3.64.4	1	1.361.67	0.901.11
RGC-7	24+65.78	24+89.03	8.610.5	1	3.220.95	2.142.64
RGC-8	25+23.97	25+32.24	3.19.8	1	1.16 1.42	0.770.95
RGC-9	25+53.26	25+68.58	5.87.1	1	2.172.67	1.451.78
RGC-10	25+96.69	26+12.11	5.87.1	1	2.172.67	1.451.78
RGC-11	26+33.65	26+46.57	4.96.1	1	1.852.27	1.231.51
RGC-12	26+74.14	26+88.03	5.36.5	1	1.982.43	1.321.62
RGC-13	27+37.83	27+53.16	6.07.4	1	2.242.76	1.501.84
TOTALS:			62.64.7	11	19.7524.28	13.1716.19

WOODY TOE (TW-#)							
LABEL	FROM STATION	TO STATION	OFFSET DISTANCE*	OFFSET SIDE	PLACING SALVAGED CHANNEL SAND AND GRAVEL - POOLS (CY)	PLACING FURNISHED CHANNEL SAND AND GRAVEL - POOLS (CY)	LENGTH* (LF)
TW-1	21+30.56	21+61.35	4	L	2.74	1.82	37.5
TW-2	21+67.23	21+95.16	4	R	2.47	1.85	36.6
TW-3	24+35.00	24+65.78	4	R	2.74	1.82	36
TW-4	24+89.03	25+23.97	4	L	3.11	2.07	42.7
TW-5	25+32.24	25+53.26	4	R	1.87	1.25	25.7
TW-6	25+68.58	25+96.69	4	L	2.50	1.66	35.6
TW-7	26+12.11	26+33.65	4	R	1.92	1.28	26.3
TW-8	26+88.03	27+21.97	4	R	3.02	2.02	33.6
TOTAL:					20.36	13.58	274

TOE BOULDERS (TB-#)							
LABEL	FROM STATION	TO STATION	OFFSET DISTANCE*	OFFSET SIDE	PLACING SALVAGED CHANNEL SAND AND GRAVEL - POOLS (CY)	PLACING FURNISHED CHANNEL SAND AND GRAVEL - POOLS (CY)	LENGTH* (LF)
TB-2	20+58.80	20+90.45	4	L	2.84	1.90	36.2
TB-3	21+02.38	21+23.58	4	R	1.92	1.28	26.4
TB-4	26+46.57	26+74.14	4	L	2.44	1.62	41.5
TB-5	27+37.83	27+53.16	4	L	4.09	2.73	18.7
TOTAL:					11.29	7.53	122.8

\*LENGTH MEASURED ALONG OUTSIDE BANK  
MATERIALS CONSIDERED INCIDENTAL:  
TYPE I BOULDERS  
REINFORCED NATURAL FIBER MATTING  
CHINKING MATERIAL  
GEOTEXTILE CLASS SE

\*BLEND TO EXISTING GRADES  
\*\*FOR POOL DOWNSTREAM OF CREST  
MATERIALS CONSIDERED INCIDENTAL:  
TYPE II BOULDERS  
KEYSTONE TYPE III BOULDERS  
CHINKING MATERIAL  
GEOTEXTILE CLASS SE

MATERIALS CONSIDERED INCIDENTAL:  
TYPE I BOULDERS  
GEOTEXTILE CLASS SE  
CHINKING MATERIAL

\*LENGTH MEASURED ALONG OUTSIDE BANK  
MATERIALS CONSIDERED INCIDENTAL:  
FOUNDATION LOGS  
WOODY DEBRIS MATERIAL  
REINFORCED NATURAL FIBER MATTING  
MATTING STAKES

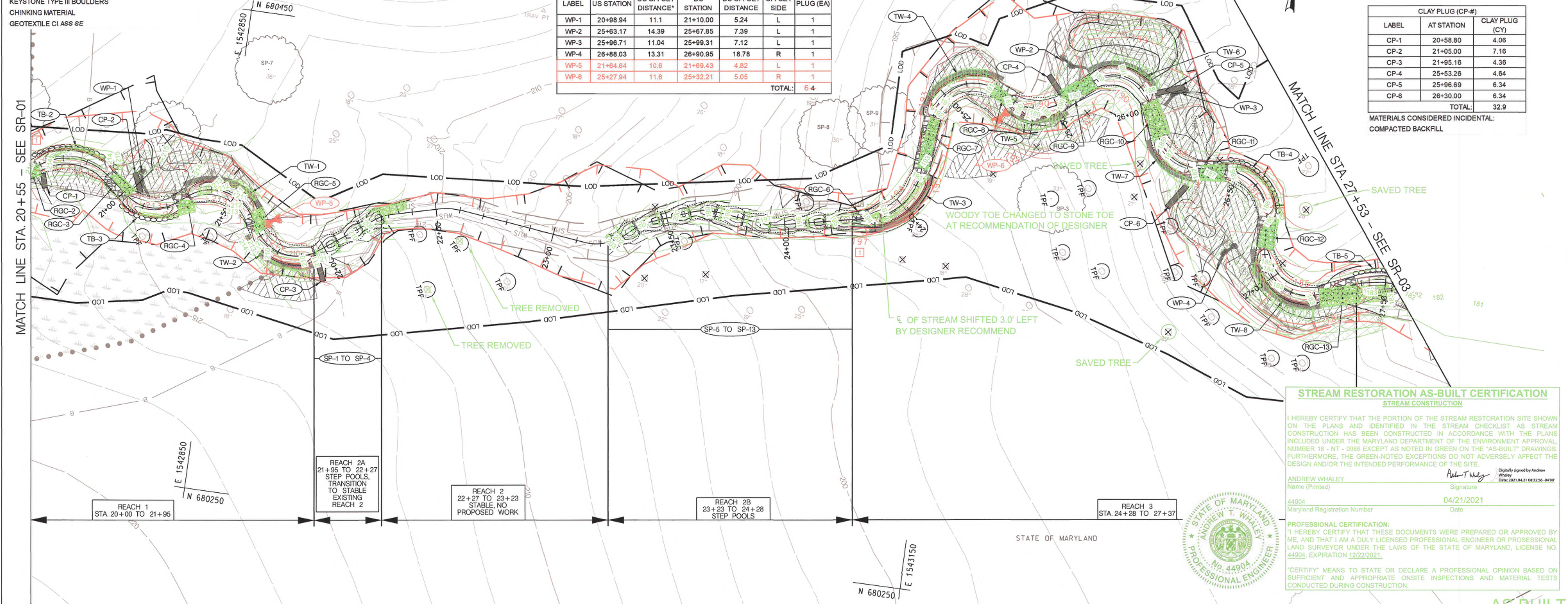
WOODY DEBRIS PLUGS (WP-#)					
LABEL	US STATION	US OFFSET DISTANCE*	DS STATION	DS OFFSET DISTANCE*	PLUG (EA)
WP-1	20+98.94	11.1	21+10.00	5.24	L 1
WP-2	25+63.17	14.39	25+67.85	7.39	L 1
WP-3	25+96.71	11.04	25+99.31	7.12	L 1
WP-4	26+88.03	13.31	26+90.95	18.78	R 1
WP-5	21+64.84	10.6	21+69.43	4.82	L 1
WP-6	25+27.94	11.8	25+32.21	5.05	R 1
TOTAL:					6.4

**LEGEND**

- LOD - LIMITS OF DISTURBANCE
- TOP OF BANK
- PROP. BASELINE OF CONSTRUCTION
- PROP. CONTOUR
- CREATED WETLANDS
- TOE BOULDERS
- WOODY TOE
- WOODY DEBRIS PLUG
- RIFLE GRADE CONTROL
- STEP POOL CREST
- CLAY PLUG
- TREE TO BE REMOVED
- TREE PROTECTION FENCE

CLAY PLUG (CP-#)		
LABEL	AT STATION	CLAY PLUG (CY)
CP-1	20+58.80	4.06
CP-2	21+05.00	7.16
CP-3	21+95.16	4.36
CP-4	25+53.26	4.64
CP-5	25+96.69	6.34
CP-6	26+30.00	6.34
TOTAL:		32.9

MATERIALS CONSIDERED INCIDENTAL:  
COMPACTED BACKFILL



**STREAM RESTORATION AS-BUILT CERTIFICATION**  
STREAM CONSTRUCTION

I HEREBY CERTIFY THAT THE PORTION OF THE STREAM RESTORATION SITE SHOWN ON THE PLANS AND IDENTIFIED IN THE STREAM CHECKLIST AS STREAM CONSTRUCTION HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS INCLUDED UNDER THE MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVAL, NUMBER 18 - NT - 0086 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 SITE.

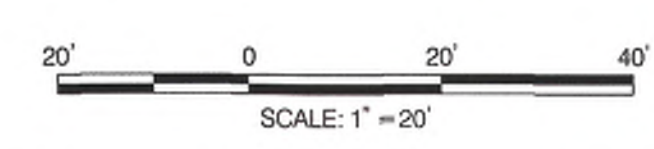
ANDREW WHALEY  
Name (Printed) Signature  
44904 Maryland Registration Number Date: 04/21/2021

PROFESSIONAL CERTIFICATION:  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER OR PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 44904, EXPIRATION 12/22/2021.

\*CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED ON SUFFICIENT AND APPROPRIATE ON-SITE INSPECTIONS AND MATERIAL TESTS CONDUCTED DURING CONSTRUCTION.

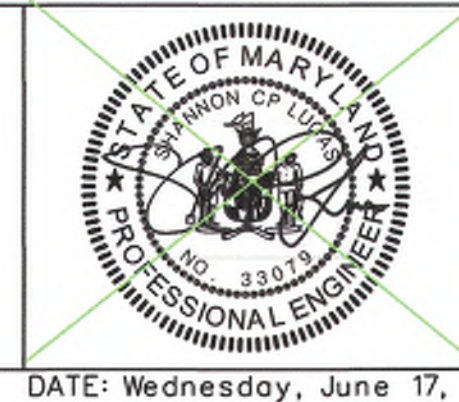


\*DISTURBANCE WITHIN THE LOD SHALL BE LIMITED TO ONLY WHAT IS REQUIRED TO COMPLETE THE PROPOSED WORK



HORIZONTAL DATUM NAVD 83/91  
VERTICAL DATUM NAVD 88  
MDE # 19-SF-0196; 18-NT-0086

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**Maryland Transportation Authority**  
Engineering Division

ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE
1	GRADING, RGC, AND EXCAVATION ADJUSTMENTS	SL	6/16/20

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION**  
**CARSINS RUN STREAM RESTORATION**

JOHN F. KENNEDY MEMORIAL HIGHWAY  
HARFORD COUNTY

STREAM GRADING PLAN

DESIGNED BY SL, AW, SD  
DRAWN BY CSD, KP, AW, JS  
CHECKED BY SL, GM, JB  
CONST. REVIEW BY \_\_\_\_\_ DATE OCTOBER, 2019 SCALE 1\"/>

CONTRACT NO. KH-3028-0000  
DRAWING NO. SR-02  
SHEET NO. 12 OF 87  
UPDATED: 31JUL18

STEP POOL (SP-#)	CREST		CREST (EA)	RCG MIX VOLUME (CY)**
	FROM STATION	TO STATION		
SP-14	27+53.16	27+55.16	1	5.7
SP-15	27+66.65	27+68.65	1	5.7
SP-16	27+80.14	27+82.14	1	5.7
SP-17	27+93.63	27+95.63	1	5.7
SP-18	28+07.12	28+09.12	1	6.9
SP-19	28+22.89	28+24.89	1	5.7
SP-20	28+36.38	28+38.38	1	5.7
SP-21	28+49.88	28+51.88	1	5.7
SP-22	28+63.38	28+65.38	1	5.7
SP-23	28+76.87	28+78.87	1	5.7
SP-24	28+90.37	28+92.37	1	5.7
SP-25	29+03.87	29+05.87	1	5.7
SP-26	29+17.37	29+19.37	1	5.7
SP-27*	29+30.86	29+32.86	1	N/A
SP-28*	29+32.86*	29+37.08*	1	N/A
<b>TOTAL:</b>	<b>15.0</b>	<b>75.3</b>		

POINT	W-WEIR				
	NORTHING	EASTING	STATION	OFFSET DISTANCE*	OFFSET SIDE
P1	680,361.20	1,543,542.00	14+01.53	6'	R
P2	680,369.30	1,543,552.00	14+03.41	10'	L
P3*	680,333.70	1,543,550.00	14+27.70	17.7'	R
P4*	680,342.20	1,543,567.00	14+33.49	0.0'	NA
P5*	680,356.80	1,543,581.00	14+32.69	20'	L

QNTY TOTAL: 1  
RGC MIX VOLUME: 28.7 CY

\*TIE INTO EXISTING DOUBLE BOX CULVERT AND WING WALLS  
MATERIALS CONSIDERED INCIDENTAL:  
IMBRICATED CLASS III  
GEOTEXTILE CLASS SE  
GRANULAR FILTER MATERIAL  
CHINKING MATERIAL

\*BLEND GRADES ORIENTATION AND DIMS. TO TRANSITION TO MAINSTEM  
\*\*FOR POOL DOWNSTREAM OF CREST  
MATERIALS CONSIDERED INCIDENTAL:  
TYPE II BOULDERS  
KEYSTONE TYPE III BOULDERS  
CHINKING MATERIAL  
GEOTEXTILE CLASS SE

LABEL	RIFFLE GRADE CONTROL MAINSTEM (RGCM-#)		PLACING SALVAGED CHANNEL SAND AND GRAVEL-POOLS (CY)	PLACING FURNISHED CHANNEL SAND AND GRAVEL-POOLS (CY)
	FROM STATION	TO STATION		
RGCM-1*	11+59.97	11+87.51	70.4	17.59
RGCM-2*	13+41.42	14+02.12	134.2	33.56
<b>TOTAL:</b>	<b>204.6</b>	<b>76.73</b>	<b>51.15</b>	

REMOVAL OF EXISTING CONCRETE CHANNEL (4" DEPTH)		
FROM STATION	TO STATION	AREA (SY)
13+00.00	14+33.00	460.0
11+55.00	11+87.00	110.0
<b>TOTAL:</b>	<b>570.0</b>	

CLAY PLUG (CP-#)		
LABEL	AT STATION	CLAY PLUG (CY)
CP-7	27+66.65	5.00

**LEGEND**

- LOD - LOD - LIMITS OF DISTURBANCE
- 20+00 TOP OF BANK
- 190 PROP. BASELINE OF CONSTRUCTION
- 190 PROP. CONTOUR
- CREATED WETLANDS
- TOE BOULDERS
- WOODY TOE
- WOODY DEBRIS PLUG
- RIFFLE GRADE CONTROL
- OUTFALL PROTECTION
- STEP POOL CREST
- CLAY PLUG
- W-WEIR
- PROP. MANHOLE, STORM DRAIN PIPE AND ENDWALL
- TREE TO BE REMOVED
- TREE PROTECTION FENCE

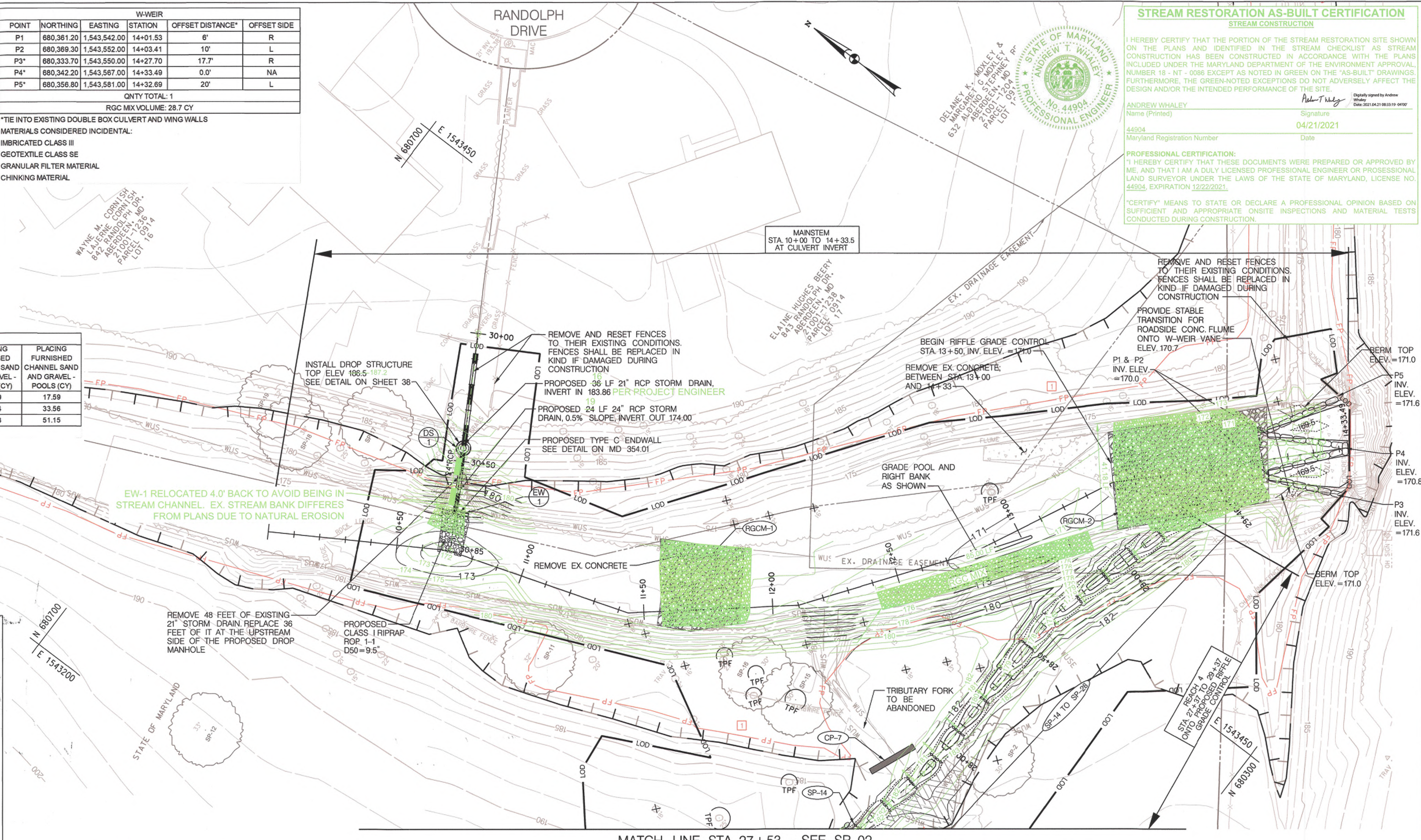
STRUCTURE TABLE				
ID	STANDARD	TOP ELEV.	INVERT OUT	
DS-1	MODIFIED STANDARD 48 INCH DIAMETER DROP MANHOLE	187.2	174.6	
EW-1	SHA MD 354.01	176.6	173.9	

RIPRAP OUTFALL PROTECTION (ROP)						
QUANTITY	ID	LOCATION	TYPE	La	W	d
17 SY	ROP 1-1	STA 30+70.55 TO 30+85	CLASS I	14.5'	10'	19"

PIPE SCHEDULE						
FROM	TO	SIZE	TYPE	INVERT IN	INVERT OUT	LENGTH
DS-1	EW-1	24"	CLASS IV RCP	174.6	173.9	19 FT
30+08	DS-1	21"	CLASS IV RCP	186.06	184.7	16 FT

PIPE REMOVAL SCHEDULE						
FROM	TO	SIZE	TYPE	INVERT IN	INVERT OUT	LENGTH
30+08	30+56	21"	CLASS IV RCP	186.06	183.13	48 FT

REMOVE AND RESET EXISTING FENCE					
FROM	OFFSET	TO	OFFSET	TYPE	LENGTH
30+05	8.7'	30+28	8.7'	4' CHAIN LINK FENCE OR EQUIVALENT	23 FT
30+05	0'	30+38	0'	6' WHITE VINYL FENCE OR EQUIVALENT	33 FT
14+15	46'	14+22	39'	6' CHAIN LINK FENCE OR EQUIVALENT	9 FT
14+26	34'	14+31	29'	6' CHAIN LINK FENCE OR EQUIVALENT	7 FT



**STREAM RESTORATION AS-BUILT CERTIFICATION**  
STREAM CONSTRUCTION

I HEREBY CERTIFY THAT THE PORTION OF THE STREAM RESTORATION SITE SHOWN ON THE PLANS AND IDENTIFIED IN THE STREAM CHECKLIST AS STREAM CONSTRUCTION HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS INCLUDED UNDER THE MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVAL NUMBER 18 - NT - 0086 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 SITE.

**ANDREW WHALEY**  
Name (Printed) Signature  
44904 Maryland Registration Number Date  
04/21/2021

**PROFESSIONAL CERTIFICATION:**  
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**STATE OF MARYLAND**  
ANDREW T. WHALEY  
PROFESSIONAL ENGINEER  
NO. 44904

**Maryland Transportation Authority**  
Engineering Division

ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE
1	ADD 100-YEAR FLOODPLAIN-MD PERMIT (FEMA)	SL	6/16/20

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION**  
**CARSINS RUN STREAM RESTORATION**

JOHN F. KENNEDY MEMORIAL HIGHWAY  
HARFORD COUNTY

**STREAM GRADING PLAN**

DESIGNED BY SL, AW, SD  
DRAWN BY CSD, KP, AW, JS  
CHECKED BY SL, GM, JB  
CONST. REVIEW BY \_\_\_\_\_ DATE OCTOBER, 2019 SCALE 1" = 20'

CONTRACT NO. KH-3028-0000  
DRAWING NO. SR-03  
SHEET NO. 13 OF 87  
UPDATED: 31JUL18

**EROSION AND SEDIMENT CONTROL GENERAL NOTES**

MDE REQUIRES THAT THESE NOTES, IN THEIR ENTIRETY, BE INCLUDED ON THE EROSION AND SEDIMENT CONTROL PLAN. IT IS RECOGNIZED THAT NOT EVERY NOTE MAY APPLY TO ALL PROJECTS. THE REQUIREMENT OF ANY INDIVIDUAL NOTE NOT APPLICABLE TO THE SUBJECT PROJECT IS NOT BINDING UPON THE APPLICANT OR THE APPLICANT'S CONTRACTOR.

1. THE CONTRACTOR SHALL NOTIFY MDE AT (410) 537-3510 SEVEN (7) DAYS BEFORE COMMENCING ANY LAND DISTURBING ACTIVITY AND, UNLESS WAIVED BY MDE, SHALL BE REQUIRED TO HOLD A PRE-CONSTRUCTION MEETING BETWEEN A REPRESENTATIVE OF THE MDE COMPLIANCE PROGRAM, PERMITTEE, CONTRACTOR, AND ANY SUB-CONTRACTORS DOING WORK IN AREAS OF REGULATED WETLAND AND WATER RESOURCES AS PER SPECIAL CONDITIONS OF THE MDE-NTWWD PERMIT, WHICH REQUIRES FOURTEEN (14) DAYS NOTICE TO THE MDE COMPLIANCE PROGRAM PRIOR TO THE MEETING.
2. THE CONTRACTOR SHALL NOTIFY MDE IN WRITING AND BY TELEPHONE AT THE FOLLOWING POINTS:
  - A. THE REQUIRED PRE-CONSTRUCTION MEETING.
  - B. FOLLOWING INSTALLATION OF SEDIMENT CONTROL MEASURES.
  - C. DURING THE INSTALLATION OF SEDIMENT BASINS (TO BE CONVERTED INTO PERMANENT STORMWATER MANAGEMENT STRUCTURES) AT THE REQUIRED INSPECTION POINTS (SEE INSPECTION CHECKLIST ON PLAN). NOTIFICATION PRIOR TO COMMENCING CONSTRUCTION OF EACH STEP IS MANDATORY.
  - D. PRIOR TO REMOVAL OR MODIFICATION OF ANY SEDIMENT CONTROL STRUCTURE(S).
  - E. PRIOR TO REMOVAL OF ALL SEDIMENT CONTROL DEVICES.
  - F. PRIOR TO FINAL ACCEPTANCE.
3. THE PLAN APPROVAL LETTER, APPROVED EROSION AND SEDIMENT CONTROL PLANS, DAILY LOG BOOKS, AND TEST REPORTS SHALL BE AVAILABLE AT THE SITE FOR INSPECTION BY DULY AUTHORIZED OFFICIALS OF MDE AND THE AGENCY RESPONSIBLE FOR THE PROJECT.
4. THE CONTRACTOR SHALL CONSTRUCT ALL EROSION AND SEDIMENT CONTROL MEASURES PER THE APPROVED PLAN AND CONSTRUCTION SEQUENCE AND SHALL HAVE THEM INSPECTED AND APPROVED BY THE MDE INSPECTOR PRIOR TO BEGINNING ANY OTHER LAND DISTURBANCES. MINOR SEDIMENT CONTROL DEVICE LOCATION ADJUSTMENTS MAY BE MADE IN THE FIELD WITH THE APPROVAL OF THE MDE INSPECTOR. THE CONTRACTOR SHALL ENSURE THAT ALL RUNOFF FROM DISTURBED AREAS IS DIRECTED TO THE SEDIMENT CONTROL DEVICES AND SHALL NOT REMOVE ANY EROSION OR SEDIMENT CONTROL MEASURE WITHOUT PRIOR PERMISSION FROM MDE INSPECTOR. THE CONTRACTOR SHALL OBTAIN PRIOR AGENCY AND MDE APPROVAL FOR MODIFICATIONS TO THE EROSION AND SEDIMENT CONTROL PLAN AND/OR SEQUENCE OF CONSTRUCTION.
5. THE MDE INSPECTOR HAS THE OPTION OF REQUIRING ADDITIONAL SAFETY OR SEDIMENT CONTROL MEASURES, IF DEEMED NECESSARY.
6. THE CONTRACTOR SHALL PROTECT ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS TO PREVENT THE DEPOSITION OF MATERIALS ONTO PUBLIC ROADS. ALL MATERIALS DEPOSITED ONTO PUBLIC ROADS SHALL BE REMOVED IMMEDIATELY.
7. THE CONTRACTOR SHALL INSPECT DAILY AND MAINTAIN CONTINUOUSLY IN AN EFFECTIVE OPERATING CONDITION ALL EROSION AND SEDIMENT CONTROL MEASURES UNTIL SUCH TIME AS THEY ARE REMOVED WITH PRIOR PERMISSION FROM THE MDE INSPECTOR.
8. EROSION AND SEDIMENT CONTROL FOR UTILITY CONSTRUCTION SHALL BE PROVIDED IN ACCORDANCE WITH APPROVED PLANS. UTILITY CONSTRUCTION SHALL ONLY BE FOR AREAS WITHIN THE DELINEATED LIMIT OF DISTURBANCE. CALL "MISS UTILITY" AT 1-800-257-7777 48 HOURS PRIOR TO THE START OF WORK. WHEN SAME DAY STABILIZATION IS APPROVED:
  - A. EXCAVATED TRENCH MATERIAL SHALL BE PLACED ON THE HIGH SIDE OF THE TRENCH.
  - B. TRENCHES FOR UTILITY INSTALLATION SHALL BE BACKFILLED, COMPACTED, AND STABILIZED AT THE END OF EACH WORKING DAY. NO MORE TRENCH SHALL BE OPENED THAN CAN BE COMPLETED THE SAME DAY.
9. ALL WATER REMOVED FROM EXCAVATED AREAS SHALL BE PASSED THROUGH AN MDE APPROVED DEWATERING PRACTICE OR PUMPED TO A SEDIMENT TRAP OR BASIN PRIOR TO DISCHARGE TO A FUNCTIONAL STORM DRAIN SYSTEM OR TO STABLE GROUND SURFACE.
10. CONCRETE WASHOUT STRUCTURES SHALL BE USED WHEN CONCRETE TRUCKS, DRUMS, PUMPS, CHUTES, OR OTHER EQUIPMENT IS RINSED OR CLEANED ON-SITE. CONCRETE MUST NOT BE WASHED OUT IN A MANNER THAT WOULD ALLOW CEMENT LADEN WASH WATER TO ENTER ANY STREAM OR WETLAND.
11. CONSTRUCTION ACTIVITIES PRODUCING DUST SHALL IMPLEMENT CONTROL MEASURES TO AVOID THE SUSPENSION OF DUST PARTICLES AND/OR PREVENT DUST FROM BLOWING OFF-SITE OR TO AREAS WITHOUT TREATMENT.
12. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:
  - A. THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND
  - B. SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
13. VEGETATIVE STABILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. REFER TO APPROPRIATE SPECIFICATIONS FOR TEMPORARY SEEDING, PERMANENT SEEDING, MULCHING, SODDING, AND GROUND COVERS.
14. WHEN SEEDING, ALL DISTURBED AREAS WITH SLOPES FLATTER THAN 2:1 SHALL BE STABILIZED WITH 4 INCHES OF TOPSOIL, SEED, AND MULCH. ALL DISTURBED AREAS WITH SLOPES 2:1 OR STEEPER SHALL BE STABILIZED WITH MATTING OVER 2 INCHES OF TOPSOIL AND SEED.
15. ALL SEDIMENT BASINS, TRAP EMBANKMENTS AND SLOPES, PERIMETER DIKES, SWALES AND ALL DISTURBED SLOPES STEEPER OR EQUAL TO 3:1 SHALL BE STABILIZED WITH SEED AND ANCHORED STRAW MULCH, SOD, OR OTHER APPROVED STABILIZATION MEASURES, AS SOON AS POSSIBLE BUT NO LATER THAN THREE (3) CALENDAR DAYS AFTER ESTABLISHMENT. ALL AREAS DISTURBED OUTSIDE OF THE PERIMETER SEDIMENT CONTROL SYSTEM SHALL BE MINIMIZED. MAINTENANCE SHALL BE PERFORMED AS NECESSARY TO ENSURE CONTINUED STABILIZATION.
16. PERMANENT SWALES OR OTHER POINTS OF CONCENTRATED WATER FLOW SHALL BE STABILIZED WITH SEED AND AN APPROVED EROSION CONTROL MATTING, SOD, RIP-RAP, OR OTHER APPROVED STABILIZATION MEASURES.
17. FOR STOCKPILE SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1), THE CONTRACTOR SHALL APPLY SEED AND ANCHORED STRAW MULCH, SOD, OR OTHER APPROVED STABILIZATION MEASURES TO THE FACE OF THE STOCKPILE WITHIN THREE (3) CALENDAR DAYS OF ACTIVITY HAVING CEASED ON THE RESPECTIVE FACE. FOR SLOPES 3:1 OR FLATTER, THE CONTRACTOR SHALL APPLY STABILIZATION MEASURES TO THE FACE OF THE STOCKPILE WITHIN SEVEN (7) CALENDAR DAYS OF ACTIVITY HAVING CEASED ON THE RESPECTIVE FACE. MAINTENANCE SHALL BE PERFORMED AS NECESSARY TO ENSURE CONTINUED STABILIZATION.

18. FOR FINISHED GRADING, THE CONTRACTOR SHALL PROVIDE ADEQUATE GRADIENTS TO PREVENT WATER FROM PONDING FOR MORE THAN TWENTY-FOUR (24) HOURS AFTER THE END OF A RAINFALL EVENT. DRAINAGE COURSES AND SWALE FLOW AREAS MAY TAKE AS LONG AS FORTY-EIGHT (48) HOURS AFTER THE END OF A RAINFALL EVENT TO DRAIN. AREAS DESIGNED TO HAVE STANDING WATER SHALL NOT BE REQUIRED TO MEET THIS REQUIREMENT.
19. WHERE DEEMED APPROPRIATE BY THE ENGINEER OR INSPECTOR, SEDIMENT BASINS AND TRAPS MAY NEED TO BE SURROUNDED WITH AN APPROVED SAFETY FENCE. THE FENCE MUST CONFORM TO LOCAL ORDINANCES AND REGULATIONS. THE DEVELOPER OR OWNER SHALL CHECK WITH LOCAL BUILDING OFFICIALS ON APPLICABLE SAFETY REQUIREMENTS. WHERE SAFETY FENCE IS DEEMED APPROPRIATE AND LOCAL ORDINANCES DO NOT SPECIFY FENCING SIZES AND TYPES, THE FOLLOWING SHALL BE USED AS A MINIMUM STANDARD: THE SAFETY FENCE SHALL BE MADE OF WELDED WIRE AND AT LEAST 42 INCHES HIGH, HAVE POSTS SPACED NO FARTHER APART THAN 8 FEET, HAVE MESH OPENINGS NO GREATER THAN 2 INCHES IN WIDTH AND 4 INCHES IN HEIGHT WITH A MINIMUM OF 14 GAUGE WIRE. SAFETY FENCE SHALL BE MAINTAINED AND IN GOOD CONDITION AT ALL TIMES.
20. ALL SEDIMENT TRAP DEPTH DIMENSIONS ARE RELATIVE TO THE OUTLET ELEVATION. ALL TRAPS SHALL HAVE A STABLE OUTFALL. ALL TRAPS AND BASINS SHALL HAVE STABLE INFLOW POINTS.
21. SEDIMENT SHALL BE REMOVED AND THE TRAP OR BASIN RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE QUARTER OF THE TOTAL DEPTH OF THE TRAP OR BASIN. TOTAL DEPTH SHALL BE MEASURED FROM THE TRAP OR BASIN BOTTOM TO THE CREST OF THE OUTLET.
22. SEDIMENT REMOVED FROM TRAPS (AND BASINS) SHALL BE PLACED AND STABILIZED IN APPROVED AREAS, BUT NOT WITHIN A FLOODPLAIN, WETLAND OR TREE-SAVE AREA. WHEN PUMPING SEDIMENT LADEN WATER, THE DISCHARGE SHALL BE DIRECTED TO AN MDE APPROVED SEDIMENT TRAPPING DEVICE PRIOR TO RELEASE FROM THE SITE. A SUMP PIT MAY BE USED IF SEDIMENT TRAPS THEMSELVES ARE BEING PUMPED OUT.
23. PRIOR TO REMOVAL OF SEDIMENT CONTROL MEASURES, THE CONTRACTOR SHALL STABILIZE AND HAVE ESTABLISHED PERMANENT STABILIZATION FOR ALL CONTRIBUTORY DISTURBED AREAS USING SOD OR AN APPROVED PERMANENT SEED MIXTURE WITH REQUIRED SOIL AMENDMENTS AND AN APPROVED ANCHORED MULCH. WOOD FIBER MULCH MAY ONLY BE USED IN SEEDING SEASON WHERE THE SLOPE DOES NOT EXCEED 10% AND GRADING HAS BEEN DONE TO PROMOTE SHEET FLOW DRAINAGE. AREAS BROUGHT TO FINISHED GRADE DURING THE SEEDING SEASON SHALL BE PERMANENTLY STABILIZED AS SOON AS POSSIBLE, BUT NOT LATER THAN THREE (3) CALENDAR DAYS AFTER ESTABLISHMENT FOR SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) AND SEVEN (7) CALENDAR DAYS FOR FLATTER SLOPES. WHEN PROPERTY IS BROUGHT TO FINISHED GRADE DURING THE MONTHS OF NOVEMBER THROUGH FEBRUARY, AND PERMANENT STABILIZATION IS FOUND TO BE IMPRACTICAL, TEMPORARY SEED AND ANCHORED STRAW MULCH SHALL BE APPLIED TO DISTURBED AREAS. THE FINAL PERMANENT STABILIZATION OF SUCH PROPERTY SHALL BE APPLIED BY MARCH 15 OR EARLIER IF GROUND AND WEATHER CONDITIONS ALLOW.
24. TEMPORARY SEDIMENT CONTROL DEVICES SHALL BE REMOVED WITH PERMISSION OF THE MDE INSPECTOR WITHIN THIRTY (30) CALENDAR DAYS FOLLOWING ESTABLISHMENT OF PERMANENT STABILIZATION IN ALL CONTRIBUTORY DRAINAGE AREAS. UPON REMOVAL OF SEDIMENT CONTROL DEVICES, THE AREA DISTURBED BY REMOVAL SHALL BE STABILIZED WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED, WITHIN 24 HOURS OF SAID REMOVAL. STORMWATER MANAGEMENT STRUCTURES USED TEMPORARILY FOR SEDIMENT CONTROL SHALL BE CONVERTED TO THE PERMANENT CONFIGURATION WITHIN THIS TIME PERIOD AS WELL.
25. OFF-SITE SPOIL OR BORROW AREAS ON STATE OR FEDERAL PROPERTY SHALL HAVE PRIOR APPROVAL BY MDE AND OTHER APPLICABLE STATE, FEDERAL, AND LOCAL AGENCIES; OTHERWISE APPROVAL SHALL BE GRANTED BY THE LOCAL AUTHORITIES. ALL WASTE AND BORROW AREAS OFF-SITE SHALL BE PROTECTED BY SEDIMENT CONTROL MEASURES AND STABILIZED.
26. SITE INFORMATION:
  - A. AREA DISTURBED 2.53 ACRES
  - B. TOTAL CUT 523 CUBIC YARDS 616 CY
  - C. TOTAL FILL 492 CUBIC YARDS 381 CY
  - D. OFF-SITE WASTE / BORROW AREA LOCATION TBD

**DESIGN CERTIFICATION:**

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH THE MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, THE 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUMES I & II INCLUDING SUPPLEMENTS, THE ENVIRONMENT ARTICLE SECTIONS 4-101 THROUGH 116 AND SECTIONS 4-201 AND 215, AND THE CODE OF MARYLAND REGULATIONS (COMAR) 26.17.01 AND COMAR 26.17.02 FOR EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT, RESPECTIVELY.

OCTOBER 7, 2019

DATE

*Donald J. Weaver*

DESIGNER'S SIGNATURE

MD REGISTRATION NO. 20454  
(P.E., R.L.S., R.L.A. OR R.A. (CIRCLE ONE))

DONALD J. WEAVER  
PRINTED NAME

\*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. 20454, EXPIRATION DATE: 5/19/2020.\*

**STANDARD STABILIZATION NOTE**

FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN (7) DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.

**BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLAND BUFFERS, WATERWAYS AND 100-YEAR FLOODPLAINS**

- 1) NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS SHALL BE STOCKPILED OR STORED IN NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN, EXCEPT FOR STONE MATERIALS WITHIN THE TEMPORARY STAGING AND STOCKPILING AREA FOR MAIN STEM WORK SHOWN ON DWG. NO. ES-03.
- 2) PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
- 3) DO NOT USE THE EXCAVATED MATERIAL AS BACKFILL IF IT CONTAINS WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE. IF ADDITIONAL BACKFILL IS REQUIRED, USE CLEAN MATERIAL FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE.
- 4) PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
- 5) REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, OR WATERWAYS, OR PERMANENT MODIFICATION OF THE 100-YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.
- 6) RECTIFY ANY NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, OR 100-YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
- 7) ALL STABILIZATION IN THE NONTIDAL WETLAND AND NONTIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYEGRASS (LOLIUM MULTIFLORUM), MILLET (SETARIA ITALICA), BARLEY (HORDEUM SP.), OATS (UNIOLA SP.), AND/OR RYE (SECALE CEREALE). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NONTIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEEDED AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
- 8) AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST-CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
- 9) TO PROTECT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM:
 

USE 1 WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.

NOTE: SWAN CREEK AND ITS TRIBUTARIES ARE DESIGNATED AS USE 1 WATERS. THUS, IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD OF MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.

- 10) STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.
- 11) CULVERTS SHALL BE CONSTRUCTED AND ANY RIPRAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.
- 12) FOR THE LABELS ASSOCIATED WITH THE DELINEATED WATERS OF THE US AND WETLAND BOUNDARIES/ BUFFERS SHOWN ON THESE PLANS, PLEASE SEE THE NATURAL RESOURCE INVENTORY APPENDIX E OF THE CARNSIN'S RUN DESIGN REPORT.

**OWNERS / DEVELOPERS CERTIFICATION :**

I/WE HEREBY CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT BEFORE BEGINNING THE PROJECT. I/WE HEREBY AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ON-SITE EVALUATION BY APPROPRIATE INSPECTION AND ENFORCEMENT AUTHORITY OR THE STATE OF MARYLAND DEPARTMENT OF THE ENVIRONMENT. I/WE HEREBY CERTIFY THAT STORMWATER MANAGEMENT FACILITIES WILL BE MAINTAINED IN ACCORDANCE WITH APPROVED PLANS.

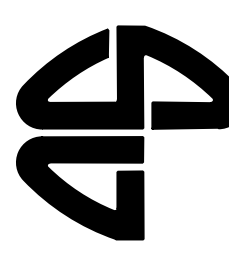


DATE

OWNER / DEVELOPER SIGNATURE

RESPONSIBLE PERSONNEL CERTIFICATION NO.

PRINTED NAME AND TITLE

MDE # 19-SF-0196; 18-NT-0086

 <p>CONSTELLATION DESIGN GROUP, INC. CONSULTING ENGINEERS 57 W. TIMONIUM ROAD SUITE 200 TIMONIUM, MD 21093 410-252-1884</p>		 <p><b>Maryland Transportation Authority</b> <i>Engineering Division</i></p>	<p>ADDENDUMS &amp; REVISIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>BY</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>REVISE CUT / FILL SITE INFORMATION</td> <td style="text-align: center;">JCT</td> <td style="text-align: center;">6/16/20</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	1	REVISE CUT / FILL SITE INFORMATION	JCT	6/16/20													<p><b>I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION CARNSIN'S RUN STREAM RESTORATION</b></p> <p>JOHN F. KENNEDY MEMORIAL HIGHWAY HARFORD COUNTY</p> <p>EROSION &amp; SEDIMENT CONTROL GENERAL NOTES</p> <p>DESIGNED BY <u>DJW</u> DRAWN BY <u>JCT</u> CHECKED BY <u>CDG</u></p> <p>CONST. REVIEW BY _____ DATE <u>OCTOBER 2019</u> SCALE <u>NOT TO SCALE</u></p>	<p>CONTRACT NO. KH-3028-0000</p> <p>DRAWING NO. <b>EN-01</b></p> <p>SHEET NO. 14 OF 87</p>
			NO.	DESCRIPTION	BY	DATE																			
1	REVISE CUT / FILL SITE INFORMATION	JCT	6/16/20																						
			<p>DATE</p>	<p>OWNER / DEVELOPER SIGNATURE</p>																					

**B4 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION**

DEFINITION

USING VEGETATION AS COVER TO PROTECT EXPOSED SOIL FROM EROSION.

PURPOSE

TO PROMOTE THE ESTABLISHMENT OF VEGETATION ON EXPOSED SOIL.

CONDITIONS WHERE PRACTICE APPLIES

ON ALL DISTURBED AREAS NOT STABILIZED BY OTHER METHODS. THIS SPECIFICATION IS DIVIDED INTO SECTIONS ON INCREMENTAL STABILIZATION; SOIL PREPARATION, SOIL AMENDMENTS AND TOPSOILING; SEEDING AND MULCHING; TEMPORARY STABILIZATION; AND PERMANENT STABILIZATION.

EFFECTS ON WATER QUALITY AND QUANTITY

STABILIZATION PRACTICES ARE USED TO PROMOTE THE ESTABLISHMENT OF VEGETATION ON EXPOSED SOIL. WHEN SOIL IS STABILIZED WITH VEGETATION, THE SOIL IS LESS LIKELY TO ERODE AND MORE LIKELY TO ALLOW INFILTRATION OF RAINFALL, THEREBY REDUCING SEDIMENT LOADS AND RUNOFF TO DOWNSTREAM AREAS.

PLANTING VEGETATION IN DISTURBED AREAS WILL HAVE AN EFFECT ON THE WATER BUDGET, ESPECIALLY ON VOLUMES AND RATES OF RUNOFF, INFILTRATION, EVAPORATION, TRANSPIRATION, PERCOLATION AND GROUNDWATER RECHARGE. OVER TIME, VEGETATION WILL INCREASE ORGANIC MATTER CONTENT AND IMPROVE THE WATER HOLDING CAPACITY OF THE SOIL AND SUBSEQUENT PLANT GROWTH.

VEGETATION WILL HELP REDUCE THE MOVEMENT OF SEDIMENT, NUTRIENTS AND OTHER CHEMICALS CARRIED BY RUNOFF TO RECEIVING WATERS. PLANTS WILL ALSO HELP PROTECT GROUNDWATER SUPPLIES BY ASSIMILATING THOSE SUBSTANCES PRESENT WITHIN THE ROOT ZONE.

SEDIMENT CONTROL PRACTICES MUST REMAIN IN PLACE DURING GRADING, SEEDBED PREPARATION, SEEDING, MULCHING AND VEGETATIVE ESTABLISHMENT.

ADEQUATE VEGETATIVE ESTABLISHMENT

INSPECT SEEDED AREAS FOR VEGETATIVE ESTABLISHMENT AND MAKE NECESSARY REPAIRS, REPLACEMENTS AND RESEEDINGS WITHIN THE PLANTING SEASON.

1. ADEQUATE VEGETATIVE STABILIZATION REQUIRES 95 PERCENT GROUNDCOVER.
2. IF AN AREA HAS LESS THAN 40 PERCENT GROUNDCOVER, RESTABILIZE FOLLOWING THE ORIGINAL RECOMMENDATIONS FOR LIME, FERTILIZER, SEEDBED PREPARATION AND SEEDING.
3. IF AN AREA HAS BETWEEN 40 AND 94 PERCENT GROUNDCOVER, OVER-SEED AND FERTILIZE USING HALF THE RATES ORIGINALLY SPECIFIED.
4. MAINTENANCE FERTILIZER RATES FOR PERMANENT SEEDING ARE SHOWN IN TABLE B.6.

**B-4-1 STANDARDS AND SPECIFICATIONS FOR INCREMENTAL STABILIZATION**

DEFINITION

ESTABLISHMENT OF VEGETATIVE COVER ON CUT AND FILL SLOPES

PURPOSE

TO PROVIDE TIMELY VEGETATIVE COVER ON CUT AND FILL SLOPES AS WORK PROGRESSES

CONDITIONS WHERE PRACTICE APPLIES

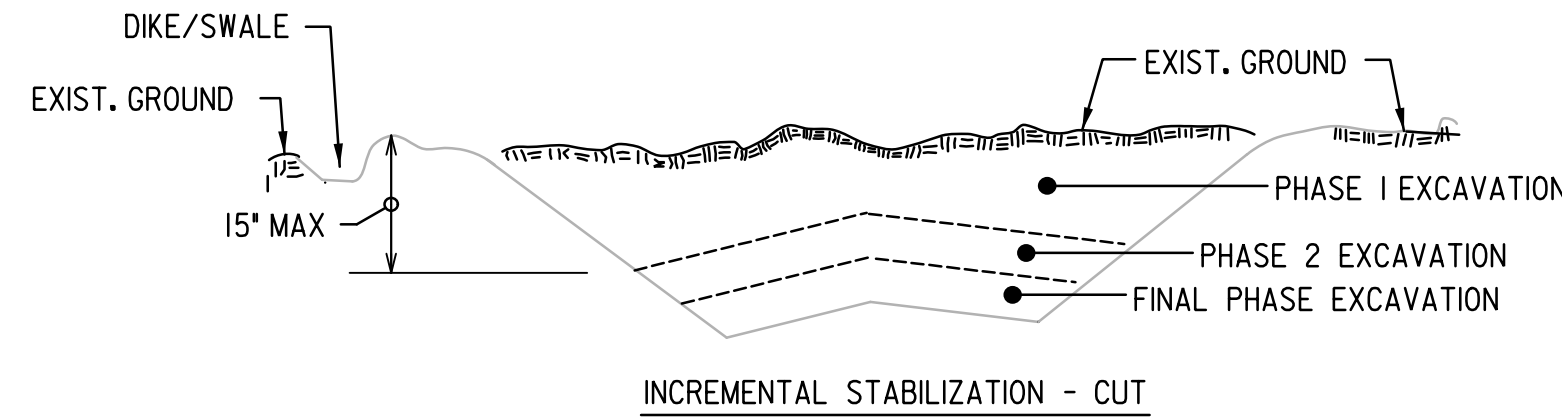
ANY CUT OR FILL SLOPE GREATER THAN 15 FEET IN HEIGHT. THIS PRACTICE ALSO APPLIES TO STOCKPILES.

CRITERIA

INCREMENTAL STABILIZATION - CUT SLOPES

1. EXCAVATE AND STABILIZE CUT SLOPES IN INCREMENTS NOT TO EXCEED 15 FEET IN HEIGHT. PREPARE SEEDBED AND APPLY SEED AND MULCH ON ALL CUT SLOPES AS THE WORK PROGRESSES.
2. CONSTRUCTION SEQUENCE EXAMPLE (REFER TO FIGURE B.1)
  - A. CONSTRUCT AND STABILIZE ALL TEMPORARY SWALES OR DIKES THAT WILL BE USED TO CONVEY RUNOFF AROUND THE EXCAVATION.
  - B. PERFORM PHASE 1 EXCAVATION, PREPARE SEEDBED AND STABILIZE.
  - C. PERFORM PHASE 2 EXCAVATION, PREPARE SEEDBED AND STABILIZE. OVERSEED PHASE 1 AREAS AS NECESSARY
  - D. PERFORM FINAL PHASE EXCAVATION, PREPARE SEEDBED AND STABILIZE. OVERSEED PREVIOUSLY SEEDED AREAS AS NECESSARY.

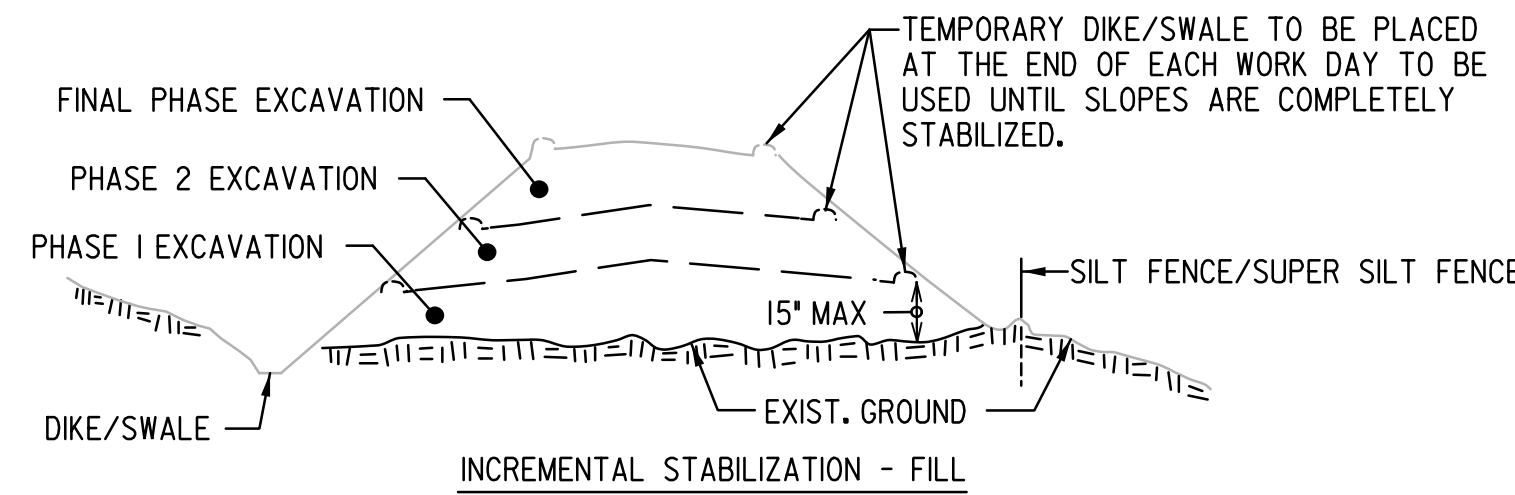
NOTE: ONCE EXCAVATION HAS BEGUN THE OPERATION SHOULD BE CONTINUOUS FROM GRUBBING THROUGH THE COMPLETION OF GRADING AND PLACEMENT OF TOPSOIL (IF REQUIRED) AND PERMANENT SEED AND MULCH. ANY INTERRUPTIONS IN THE OPERATION OR COMPLETING THE OPERATION OUT OF THE SEEDING SEASON WILL NECESSITATE THE APPLICATION OF TEMPORARY STABILIZATION.



B. INCREMENTAL STABILIZATION - FILL SLOPES

1. CONSTRUCT AND STABILIZE FILL SLOPES IN INCREMENTS NOT TO EXCEED 15 FEET IN HEIGHT. PREPARE SEEDBED AND APPLY SEED AND MULCH ON ALL SLOPES AS THE WORK PROGRESSES.
2. STABILIZE SLOPES IMMEDIATELY WHEN THE VERTICAL HEIGHT OF A LIFT REACHES 15 FEET, OR WHEN THE GRADING OPERATION CEASES AS PRESCRIBED IN THE PLANS.
3. AT THE END OF EACH WORKING DAY, INSTALL TEMPORARY WATER CONVEYANCE PRACTICE(S), AS NECESSARY TO INTERCEPT SURFACE RUNOFF AND CONVEY IT DOWN THE SLOPE IN A NON-EROSIVE MANNER.
4. CONSTRUCTION SEQUENCE EXAMPLE (REFER TO FIGURE B.2):
  - A. CONSTRUCT AND STABILIZE ALL TEMPORARY SWALES OR DIKES THAT WILL BE USED TO DIVERT RUNOFF AROUND THE FILL. CONSTRUCT SILT FENCE ON LOW SIDE OF FILL UNLESS OTHER METHODS SHOWN ON THE PLANS ADDRESS THIS AREA.
  - B. AT THE END OF EACH WORKING DAY, INSTALL TEMPORARY WATER CONVEYANCE PRACTICE(S), AS NECESSARY, TO INTERCEPT SURFACE RUNOFF AND CONVEY IT DOWN THE SLOPE IN A NON-EROSIVE MANNER.
  - C. PLACE PHASE 1 FILL, PREPARE SEEDBED AND STABILIZE.
  - D. PLACE PHASE 2 FILL, PREPARE SEEDBED AND STABILIZE.
  - E. PLACE FINAL PHASE FILL, PREPARE SEEDBED AND STABILIZE. OVERSEED PREVIOUSLY AREAS AS NECESSARY.

NOTE: ONCE THE PLACEMENT OF FILL HAS BEGUN, THE OPERATION SHOULD BE CONTINUOUS FROM GRUBBING THROUGH THE COMPLETION OF GRADING AND PLACEMENT OF TOPSOIL (IF REQUIRED) AND PERMANENT SEED AND MULCH. ANY INTERRUPTIONS IN THE OPERATION OR COMPLETING THE OPERATION OUT OF THE SEEDING SEASON WILL NECESSITATE THE APPLICATION OF TEMPORARY STABILIZATION.



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

DEFINITION

THE PROCESS OF PREPARING THE SOILS TO SUSTAIN ADEQUATE VEGETATIVE STABILIZATION.

PURPOSE

TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH.

CONDITIONS WHERE PRACTICE APPLIES

WHERE VEGETATIVE STABILIZATION IS TO BE ESTABLISHED.

CRITERIA

A. SOIL PREPARATION

I. TEMPORARY STABILIZATION

- a. SEEDBED PREPARATION CONSISTS OF LOOSENING SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISC HARROWS OR CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENED, IT MUST NOT BE ROLLED OR DRAGGED SMOOTH BUT LEFT IN THE ROUGHENED CONDITION. SLOPES 3:1 OR FLATTER ARE TO BE TRACKED WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.
- b. APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS.
- c. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.

2. PERMANENT STABILIZATION

- a. A SOIL TEST IS REQUIRED FOR ANY EARTH DISTURBANCE OF 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE:
  - i. SOIL pH BETWEEN 6.0 AND 7.0.
  - ii. SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (ppm).
  - iii. SOIL CONTAINS LESS THAN 40 PERCENT CLAY BUT ENOUGH FINE GRAINED MATERIAL (GREATER THAN 30 PERCENT SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION: IF LOVEGRASS WILL BE PLANTED, THEN A SANDY SOIL (LESS THAN 30 PERCENT SILT PLUS CLAY) WOULD BE ACCEPTABLE.
  - iv. SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT.
  - v. SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.

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

c. GRADED AREAS MUST BE MAINTAINED IN A TRUE AND EVEN GRADE AS SPECIFIED ON THE APPROVED PLAN, THE SCARIFIED OR OTHERWISE LOOSENED TO A DEPTH OF 3 TO 5 INCHES.

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

e. MIX SOIL AMENDMENTS INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS. RAKE LAWN AREAS TO SMOOTH THE SURFACE, REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES AND READY THE AREA FOR SEED APPLICATION. LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDBED PREPARATION. TRACK SLOPES 3:1 OR FLATTER WITH TRACKED EQUIPMENT LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. LEAVE THE TOP 1 TO 3 INCHES OF SOIL LOOSE AND FRIABLE. SEEDBED LOOSENING MAY BE UNNECESSARY ON NEWLY DISTURBED AREAS.

B. TOPSOILING

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

2. TOPSOIL SALVAGED FROM AN EXISTING SITE MAY BE USED PROVIDED IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN THE REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-NRCS.

3. TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:
  - a. THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
  - b. THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUING SUPPLIES OF MOISTURE AND PLANT NUTRIENTS.
  - c. THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.
  - d. THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.

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

5. TOPSOIL SPECIFICATIONS: SOILS TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING CRITERIA:

- a. TOPSOIL MUST BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM OR LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. TOPSOIL MUST NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND MUST CONTAIN LESS THAN 5 PERCENT BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH OR OTHER MATERIALS LARGER THAN 1 1/2 INCHES IN DIAMETER.
- b. TOPSOIL MUST BE FREE OF NOXIOUS PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, NUT SEDGE, POISON IVY, THISTLE OR OTHERS AS SPECIFIED.
- c. TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL.

6. TOPSOIL APPLICATION

- a. EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL.
- b. UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MINIMUM THICKNESS OF 4 INCHES. SPREADING IS TO BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL

PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS MUST BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.

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

CONSTELLATION DESIGN GROUP, INC.  
CONSULTING ENGINEERS  
57 W. TIMONIUM ROAD  
SUITE 200  
TIMONIUM, MD 21093  
410-252-1884

STATE OF MARYLAND  
PROFESSIONAL ENGINEER

Maryland Transportation Authority  
Engineering Division

ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
CARSINS RUN STREAM RESTORATION**

JOHN F. KENNEDY MEMORIAL HIGHWAY  
HARFORD COUNTY

EROSION & SEDIMENT CONTROL GENERAL NOTES

DESIGNED BY DJW	DRAWN BY JCT	CHECKED BY CDG
CONST. REVIEW BY	DATE OCTOBER 2019	SCALE NOT TO SCALE

MDE # 19-SF-0196; 18-NT-0086

CONTRACT NO.  
KH-3028-0000

DRAWING NO.  
**EN-02**

SHEET NO.  
15 OF 87



- C. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)
1. SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OF 5 ACRES OR MORE. SOIL ANALYSIS MAY BE PERFORMED BY A RECOGNIZED PRIVATE OR COMMERCIAL ANALYSIS.
  2. FERTILIZERS MUST BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR ACCURATE APPLICATION BY APPROPRIATE EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS MUST ALL BE DELIVERED TO THE SITE FULLY LABELED ACCORDING TO THE APPLICABLE LAWS AND MUST BEAR THE NAME, TRADE NAME OR TRADEMARK AND WARRANTY OF THE PRODUCER.
  3. LIME MATERIALS MUST BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED EXCEPT WHEN HYDROSEEDING) WHICH CONTAINS AT LEAST 50 PERCENT TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE MUST BE GROUND TO SUCH FINENESS THAT AT LEAST 50 PERCENT WILL PASS THROUGH A #100 MESH SIEVE AND 98 TO 100 PERCENT WILL PASS THROUGH A #20 MESH SIEVE.
  4. LIME AND FERTILIZER ARE TO BE EVENLY DISTRIBUTED AND INCORPORATED INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
  5. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, SPREAD GROUND LIMESTONE AT THE RATE OF 4 TO 8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL.

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

DEFINITION

THE APPLICATION OF SEED AND MULCH TO ESTABLISH VEGETATIVE COVER.

PURPOSE

TO PROTECT DISTURBED SOILS FROM EROSION DURING AND AT THE END OF CONSTRUCTION.

CONDITIONS WHERE PRACTICE APPLIES

TO THE SURFACE OF ALL PERIMETER CONTROLS, SLOPES AND ANY DISTURBED AREA NOT UNDER ACTIVE GRADING.

CRITERIA

- A. SEEDING
- I. SPECIFICATIONS
    - a. ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LAW. ALL SEED MUST BE SUBJECT TO RE-TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED MUST HAVE BEEN TESTED WITHIN THE 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF SOWING SUCH MATERIAL ON ANY PROJECT. REFER TO TABLE B.4 REGARDING THE QUALITY OF SEED. SEED TAGS MUST BE AVAILABLE UPON REQUEST TO THE INSPECTOR TO VERIFY TYPE OF SEED AND SEEDING RATE.
    - b. MULCH ALONE MAY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES ONLY IF THE GROUND IS FROZEN. THE APPROPRIATE SEEDING MIXTURE MUST BE APPLIED WHEN THE GROUND THAWS.
    - c. NOCULANTS: THE INOCULANT FOR TREATING LEGUME SEED IN THE SEED MIXTURES MUST BE A PURE CULTURE OF NITROGEN FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS MUST NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANTS AS DIRECTED ON THE PACKAGE. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING. NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANT AS COOL AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE 75 TO 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE THE INOCULANT LESS EFFECTIVE.
    - d. SOD OR SEED MUST NOT BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHYTO-TOXIC MATERIALS.
  2. APPLICATION
    - a. DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.
      - i. INCORPORATE SEED INTO THE SUBSOIL AT THE RATES PRESCRIBED ON TEMPORARY SEEDING TABLE B.I, PERMANENT SEEDING TABLE B.3 OR SITE-SPECIFIC SEEDING SUMMARIES.
      - ii. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION. ROLL THE SEEDED AREA WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.
    - b. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.
      - i. CULTIPACKING SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST ¼ INCH OF SOIL COVERING. SEEDBED MUST BE FIRM AFTER PLANTING.
      - ii. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
    - c. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER)
      - i. IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES SHOULD NOT EXCEED THE FOLLOWING: NITROGEN, 100 POUNDS PER ACRE TOTAL OF SOLUBLE NITROGEN; P 0 2 5 (PHOSPHOROUS), 200 POUNDS PER ACRE; K 0 2 (POTASSIUM), 200 POUNDS PER ACRE.
      - ii. LIME: USE ONLY GROUND AGRICULTURAL LIMESTONE (UP TO 3 TONS PER ACRE MAY BE APPLIED BY HYDROSEEDING). NORMALLY, NOT MORE THAN 2 TONS ARE APPLIED BY HYDROSEEDING AT ANY ONE TIME. DO NOT USE BURNT OR HYDRATED LIME WHEN HYDROSEEDING.
      - iii. MIX SEED AND FERTILIZER ON SITE AND SEED IMMEDIATELY AND WITHOUT INTERRUPTION.
      - iv. WHEN HYDROSEEDING DO NOT INCORPORATE SEED INTO THE SOIL.

MULCHING

- I. MULCH MATERIALS (In order of preference)
  - a. STRAW CONSISTING OF THOROUGHLY THRESHED WHEAT, RYE, OAT OR BARLEY AND REASONABLY BRIGHT IN COLOR. STRAW IS TO BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW AND NOT MUSTY, MOLDY, CAKED, DECAYED OR EXCESSIVELY DUSTY. NOTE: USE ONLY STERILE STRAW MULCH IN AREAS WHERE ONE SPECIES OF GRASS IS DESIRED.
  - b. WOOD CELLULOSE FIBER MULCH (WCFM) CONSISTING OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBEROUS PHYSICAL STATE.
    - i. WCFM IS TO BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY.
    - ii. WCFM, INCLUDING DYE, MUST CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.
    - iii. WCFM MATERIALS ARE TO BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND WITH SEED, FERTILIZER AND OTHER ADDITIVES TO FORM A HOMOGENEOUS SLURRY. THE MULCH MATERIAL MUST FORM A BLOTTER-LIKE GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND MUST COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDLINGS.
    - iv. WCFM MATERIAL MUST NOT CONTAIN ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.
    - v. WCFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: THE FIBER LENGTH OF APPROXIMATELY 10 MILLIMETERS, DIAMETER APPROXIMATELY 1 MILLIMETER, pH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6 PERCENT MAXIMUM AND WATER HOLDING CAPACITY OF 90 PERCENT MINIMUM.
2. APPLICATION
  - a. APPLY MULCH TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.
  - b. WHEN STRAW MULCH IS USED, SPREAD IT ALL OVER THE SEEDED AREAS AT THE RATE OF 2 TONS PER ACRE TO A UNIFORM LOOSE DEPTH OF 1 TO 2 INCHES. APPLY MULCH TO ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. WHEN USING A MULCH ANCHORING TOOL, INCREASE THE APPLICATION RATE TO 2.5 TONS PER ACRE.
  - c. WOOD CELLULOSE FIBER USED AS MULCH MUST BE APPLIED AT A NET DRY WEIGHT OF 1500 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER TO ATTAIN A MIXTURE WITH A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
3. ANCHORING
  - a. PERFORM MULCH ANCHORING IMMEDIATELY FOLLOWING APPLICATION OF MULCH TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON THE SIZE OF THE AREA AND EROSION HAZARD:
    - i. A MULCH ANCHORING TOOL IS A TRACTOR DRAWN IMPLEMENT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE A MINIMUM OF 2 INCHES. THIS PRACTICE IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PRACTICE SHOULD FOLLOW THE CONTOUR.
    - ii. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. APPLY THE FIBER BINDER AT A NET DRY WEIGHT OF 750 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER AT A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
    - iii. SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRO-TAC), DCA-70, PETROSET, TERRA TAX II, TERRA TAC AR OR OTHER APPROVED EQUAL MAY BE USED. FOLLOW APPLICATION RATES AS SPECIFIED BY THE MANUFACTURER. APPLICATION OF LIQUID BINDERS NEEDS TO BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. USE OF ASPHALT BINDERS IS STRICTLY PROHIBITED.
    - iv. LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO THE MANUFACTURER RECOMMENDATIONS. NETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEET WIDE AND 300 TO 3,000 FEET LONG.

TEMPORARY SEEDING SUMMARY

SEED MIXTURE (FOR HARDINESS ZONE 7A) (FROM TABLE 26)						
NO.	SPECIES	SEEDING RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	FERTILIZER RATE (10-20-20)	LIME RATE
N/A	BARLEY	96	2/15 TO 4/30 8/15 TO 11/30	1 IN.	436 LB/AC (10 LB/1000 SF)	2 TONS/AC (90 LB/1000 SF)
N/A	FOXTAIL MILLET	30	5/1 TO 8/14	0.5 IN.		

**B-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABILIZATION**

DEFINITION

TO STABILIZE DISTURBED SOILS WITH VEGETATION FOR UP TO 6 MONTHS.

PURPOSE

TO USE FAST GROWING VEGETATION THAT PROVIDES COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES

EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR A PERIOD OF 6 MONTHS OR LESS. FOR LONGER DURATION OF TIME, PERMANENT STABILIZATION PRACTICES ARE REQUIRED.

CRITERIA

1. SELECT ONE OR MORE OF THE SPECIES OR SEED MIXTURES LISTED IN TABLE B.I FOR THE APPROPRIATE PLANT HARDINESS ZONE (FROM FIGURE B.3), AND ENTER THEM IN THE TEMPORARY SEEDING SUMMARY BELOW ALONG WITH APPLICATION RATES, SEEDING DATES AND SEEDING DEPTHS. IF THIS SUMMARY IS NOT PUT ON THE PLAN AND COMPLETED, THEN TABLE B.I PLUS FERTILIZER AND LIME RATES MUST BE PUT ON THE PLAN.
2. FOR SITES HAVING SOIL TESTS PERFORMED, USE AND SHOW THE RECOMMENDED RATES BY THE TESTING AGENCY. SOIL TESTS ARE NOT REQUIRED FOR TEMPORARY SEEDING.
3. WHEN STABILIZATION IS REQUIRED OUTSIDE OF A SEEDING SEASON, APPLY SEED AND MULCH OR STRAW MULCH ALONE AS PRESCRIBED IN SECTION B-4-3.I.b AND MAINTAIN UNTIL THE NEXT SEEDING SEASON.

**B-4-8 STANDARDS AND SPECIFICATIONS**

**FOR  
STOCKPILE AREA**

Definition

A mound or pile of soil protected by appropriately designed erosion and sediment control measures.

Purpose

To provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and changes to drainage patterns.

Conditions Where Practice Applies

Stockpile areas are utilized when it is necessary to salvage and store soil for later use.

Criteria

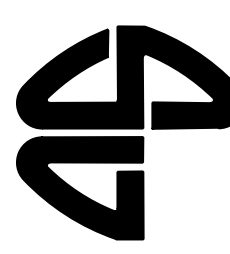


1. The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
2. The footprint of the stockpile must be sized to accommodate the anticipated volume of material and based on a side slope ratio no steeper than 2:1. Benching must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

Maintenance

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

B.43

MDE # 19-SF-0196; 18-NT-0086

 <p>CONSTELLATION DESIGN GROUP, INC. CONSULTING ENGINEERS 57 W. TIMONIUM ROAD SUITE 200 TIMONIUM, MD 21093 410-252-1884</p>	 <p>STATE OF MARYLAND PROFESSIONAL ENGINEER</p>	 <p>Maryland Transportation Authority <i>Engineering Division</i></p>	ADDENDUMS & REVISIONS				<p><b>I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION CARSINS RUN STREAM RESTORATION</b></p> <p>JOHN F. KENNEDY MEMORIAL HIGHWAY HARFORD COUNTY</p> <p>EROSION &amp; SEDIMENT CONTROL GENERAL NOTES</p>	<p>CONTRACT NO. KH-3028-0000</p> <p>DRAWING NO. <b>EN-03</b></p> <p>SHEET NO. 16 OF 87</p>	
			NO.	DESCRIPTION	BY	DATE			
			DESIGNED BY	D JW	DRAWN BY	J CT	CHECKED BY	C DG	
			CONST. REVIEW BY		DATE	OCTOBER 2019	SCALE	NOT TO SCALE	

**B-4-5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION**

**DEFINITION**

TO STABILIZE DISTURBED SOILS WITH PERMANENT VEGETATION.

**PURPOSE**

TO USE LONG-LIVED PERENNIAL GRASSES AND LEGUMES TO ESTABLISH PERMANENT GROUND COVER ON DISTURBED SOILS.

**CONDITIONS WHERE PRACTICE APPLIES**

EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR 6 MONTHS OR MORE.

**CRITERIA**

SEED MIXTURES

I. GENERAL USE

- a. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED IN TABLE B.3 FOR THE APPROPRIATE PLANT HARDINESS ZONE (FROM FIGURE B.3) AND BASED ON THE SITE CONDITION OR PURPOSE FOUND ON TABLE B.2. ENTER SELECTED MIXTURE(S), APPLICATION RATES AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.
- b. ADDITIONAL PLANTING SPECIFICATIONS FOR EXCEPTIONAL SITES SUCH AS SHORELINES, STREAM BANKS OR DUNES OR FOR SPECIAL PURPOSES SUCH AS WILDLIFE OR AESTHETIC TREATMENT MAY BE FOUND IN USDA-NRCS TECHNICAL FIELD OFFICE GUIDE, SECTION 342 - CRITICAL AREA PLANTING.
- c. FOR SITES HAVING DISTURBED AREA OVER 5 ACRES, USE AND SHOW THE RATES RECOMMENDED BY THE SOIL TESTING AGENCY.
- d. FOR AREAS RECEIVING LOW MAINTENANCE, APPLY UREA FORM FERTILIZER (46-0-0) AT 3 1/2 POUNDS PER 1000 SQUARE FEET (150 POUNDS PER ACRE) AT THE TIME OF SEEDING IN ADDITION TO THE SOIL AMENDMENTS SHOWN IN THE PERMANENT SEEDING SUMMARY.

2. TURFGRASS MIXTURES

- a. AREAS WHERE TURFGRASS MAY BE DESIRED INCLUDE LAWNS, PARKS, PLAYGROUNDS AND COMMERCIAL SITES WHICH RECEIVE A MEDIUM TO HIGH LEVEL OF MAINTENANCE.
- b. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED BELOW BASED ON THE SITE CONDITIONS OR PURPOSE. ENTER SELECTED MIXTURE(S), APPLICATION RATES AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.
  - i. KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN AREAS THAT RECEIVE INTENSIVE MANAGEMENT. IRRIGATION REQUIRED IN THE AREAS OF CENTRAL MARYLAND AND EASTERN SHORE. RECOMMENDED CERTIFIED KENTUCKY BLUEGRASS CULTIVARS SEEDING RATE: 1.5 TO 2.0 POUNDS PER 1000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL MIXTURE BY WEIGHT.
  - ii. KENTUCKY BLUEGRASS/PERENNIAL RYE: FULL SUN MIXTURE: FOR USE IN FULL SUN AREAS WHERE RAPID ESTABLISHMENT IS NECESSARY AND WHEN TURF WILL RECEIVE MEDIUM TO INTENSIVE MANAGEMENT. CERTIFIED PERENNIAL RYEGRASS CULTIVARS/CERTIFIED KENTUCKY BLUEGRASS SEEDING RATE: 2 POUNDS MIXTURE PER 1000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL MIXTURE BY WEIGHT.
  - iii. TALL FESCUE/KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN DROUGHT PRONE AREAS AND/OR FOR AREAS RECEIVING LOW TO MEDIUM MANAGEMENT IN FULL SUN TO MEDIUM SHADE. RECOMMENDED MIXTURE INCLUDES; CERTIFIED TALL FESCUE CULTIVARS 95 TO 100 PERCENT, CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 0 TO 5 PERCENT. SEEDING RATE: 5 TO 8 POUNDS PER 1000 SQUARE FEET. ONE OR MORE CULTIVARS MAY BE BLENDED.
  - iv. KENTUCKY BLUEGRASS/FINE FESCUE: SHADE MIXTURE: FOR USE IN AREAS WITH SHADE IN BLUEGRASS LAWNS. FOR ESTABLISHMENT IN HIGH QUALITY, INTENSIVELY MANAGED TURF AREA. MIXTURE INCLUDES; CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 30 TO 40 PERCENT AND CERTIFIED FINE FESCUE AND 60 TO 70 PERCENT. SEEDING RATE: 1 1/2 TO 3 POUNDS PER 1000 SQUARE FEET.

NOTES:  
SELECT TURFGRASS VARIETIES FROM THOSE LISTED IN THE MOST CURRENT UNIVERSITY OF MARYLAND PUBLICATION, AGRONOMY MEMO #77, "TURFGRASS CULTIVAR RECOMMENDATIONS FOR MARYLAND".

CHOOSE CERTIFIED MATERIAL. CERTIFIED MATERIAL IS THE BEST GUARANTEE OF CULTIVAR PURITY. THE CERTIFICATION PROGRAM OF THE MARYLAND DEPARTMENT OF AGRICULTURE, TURF AND SEED SECTION, PROVIDES A RELIABLE MEANS OF CONSUMER PROTECTION AND ASSURES A PURE GENERIC LINE.

c. IDEAL TIMES OF SEEDING FOR TURF GRASS MIXTURES

WESTERN MARYLAND:	MARCH 15 TO JUNE 1, AUGUST 1 TO OCTOBER 1 (HARDINESS ZONES: 5b, 6a)
CENTRAL MARYLAND:	MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONE: 6b)
SOUTHERN MARYLAND, EASTERN SHORE	MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONES: 7a, 7b)

- d. TILL AREAS TO RECEIVE SEED BY DISKING OR OTHER APPROVED METHODS TO A DEPTH OF 2 TO 4 INCHES, LEVEL AND RAKE THE AREAS TO PREPARE A PROPER SEEDBED. REMOVE STONES AND DEBRIS OVER 1 1/2 INCHES IN DIAMETER. THE RESULTING SEEDBED MUST BE IN SUCH CONDITION THAT FUTURE MOWING OF GRASSES WILL POSE NO DIFFICULTY.
- e. IF SOIL MOISTURE IS DEFICIENT, SUPPLY NEW SEEDINGS WITH ADEQUATE WATER FOR PLANT GROWTH (1/2 TO 1 INCH EVERY 3 TO 4 DAYS DEPENDING ON SOIL TEXTURE) UNTIL THEY ARE FIRMLY ESTABLISHED. THIS IS ESPECIALLY TRUE WHEN SEEDINGS ARE MADE LATE IN THE PLANTING SEASON, IN ABNORMALLY DRY OR HOT SEASONS OR ON ADVERSE SITES.

**PERMANENT SEEDING SUMMARY TABLE AND SCHEDULES NOTE:**  
FOR PERMANENT SEEDING TABLE TYPES AND QUANTITIES FOR WETLAND AND NON-WETLAND ZONES, SEE DWG. NO. LD-01.

B. SOD: TO PROVIDE QUICK COVER ON DISTURBED AREAS (2:1 GRADE OR FLATTER).

I. GENERAL SPECIFICATIONS

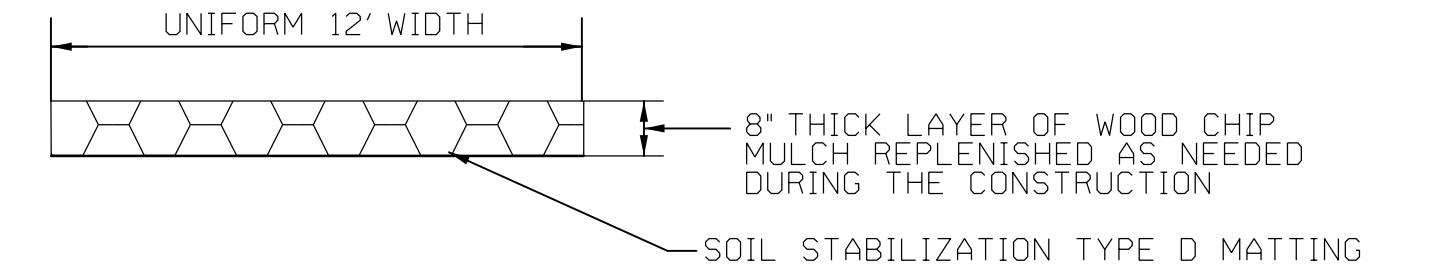
- a. CLASS OF TURFGRASS SOD MUST BE MARYLAND STATE CERTIFIED. SOD LABELS MUST BE MADE AVAILABLE TO THE JOB FOREMAN AND INSPECTOR.
- b. SOD MUST BE MACHINE CUT AT A UNIFORM SOIL THICKNESS OF 61/64 INCH, PLUS OR MINUS 57/64 INCH, AT THE TIME OF CUTTING. MEASUREMENT FOR THICKNESS MUST EXCLUDE TOP GROWTH AND THATCH. BROKEN PADS AND TORN OR UNEVEN ENDS WILL NOT BE ACCEPTABLE.
- c. STANDARD SIZE SECTIONS OF SOD MUST BE STRONG ENOUGH TO SUPPORT THEIR OWN WEIGHT AND RETAIN THEIR SIZE AND SHAPE WHEN SUSPENDED VERTICALLY WITH A FIRM GRASP ON THE UPPER 10 PERCENT OF THE SECTION.
- d. SOD MUST NOT BE HARVESTED OR TRANSPLANTED WHEN MOISTURE CONTENT (EXCESSIVELY DRY OR WET) MAY ADVERSELY AFFECT ITS SURVIVAL.
- e. SOD MUST BE HARVESTED, DELIVERED, AND INSTALLED WITHIN A PERIOD OF 36 HOURS. SOD NOT TRANSPLANTED WITHIN THIS PERIOD MUST BE APPROVED BY AN AGRONOMIST OR SOIL SCIENTIST PRIOR TO ITS INSTALLATION.

2. SOD INSTALLATION

- a. DURING PERIODS OF EXCESSIVELY HIGH TEMPERATURE OR IN AREAS HAVING DRY SUBSOIL, LIGHTLY IRRIGATE THE SUBSOIL IMMEDIATELY PRIOR TO LAYING THE SOD.
- b. LAY THE FIRST ROW OF SOD IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO IT AND TIGHTLY WEDGED AGAINST EACH OTHER. STAGGER LATERAL JOINTS TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH. ENSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE AIR DRYING OF THE ROOTS.
- c. WHEREVER POSSIBLE, LAY SOD WITH THE LONG EDGES PARALLEL TO THE CONTOUR AND WITH STAGGERING JOINTS. ROLL AND TAMP, PEG OR OTHERWISE SECURE THE SOD TO PREVENT SLIPPAGE ON SLOPES. ENSURE SOLID CONTACT EXISTS BETWEEN SOD ROOTS AND THE UNDERLYING SOIL SURFACE.
- d. WATER THE SOD IMMEDIATELY FOLLOWING ROLLING AND TAMPING UNTIL THE UNDERSIDE OF THE NEW SOD PAD AND SOIL SURFACE BELOW THE SOD ARE THOROUGHLY WET. COMPLETE THE OPERATIONS OF LAYING, TAMPING AND IRRIGATING FOR ANY PIECE OF SOD WITHIN EIGHT HOURS.

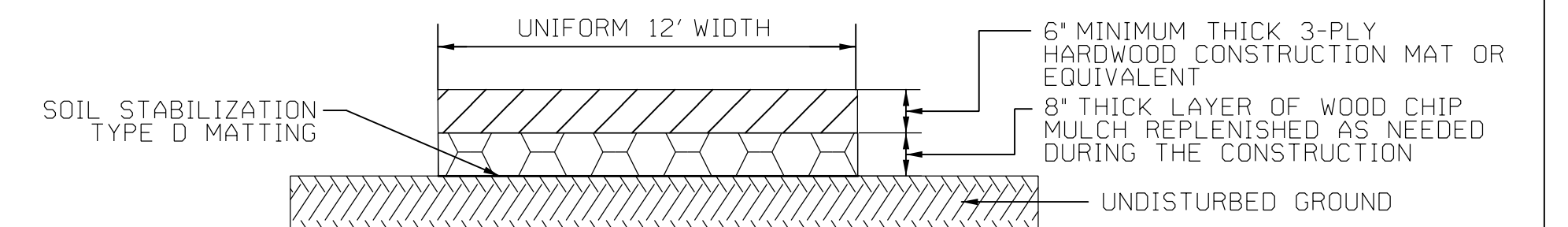
3. SOD MAINTENANCE

- a. IN THE ABSENCE OF ADEQUATE RAINFALL, WATER DAILY DURING THE FIRST WEEK OR AS OFTEN AND SUFFICIENTLY AS NECESSARY TO MAINTAIN MOIST SOIL TO A DEPTH OF 4 INCHES. WATER SOD DURING THE HEAT OF THE DAY TO PREVENT WILTING.
- b. AFTER THE FIRST WEEK, SOD WATERING IS REQUIRED AS NECESSARY TO MAINTAIN ADEQUATE MOISTURE CONTENT.
- c. DO NOT MOW UNTIL THE SOD IS FIRMLY ROOTED. NO MORE THAN 1/3 OF THE GRASS LEAF MUST BE REMOVED BY THE INITIAL CUTTING OR SUBSEQUENT CUTTINGS. MAINTAIN A GRASS HEIGHT OF AT LEAST 3 INCHES UNLESS OTHERWISE SPECIFIED.



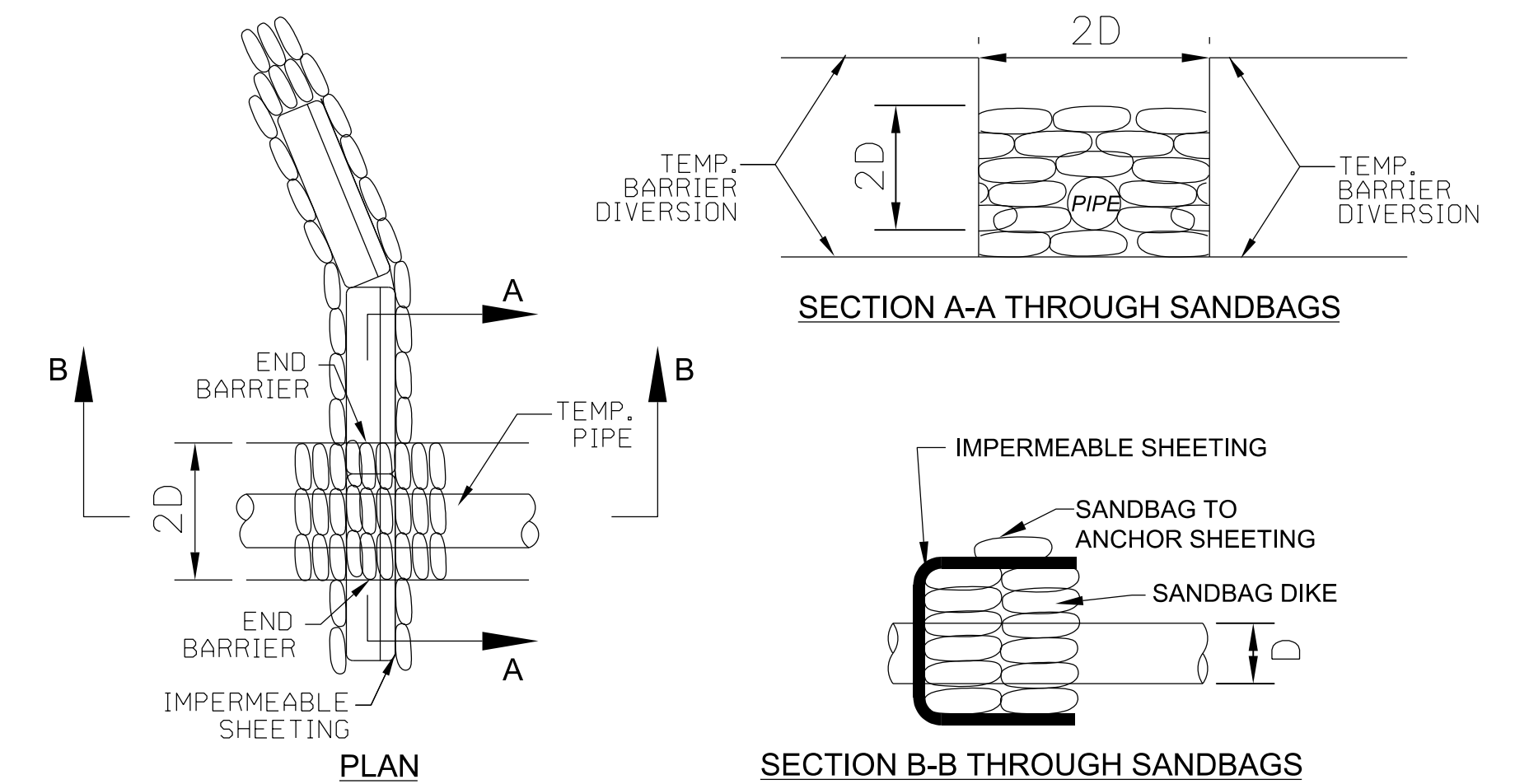
**8" THICK MULCH ACCESS PATH DETAIL**  
N.T.S.

- 1. ACCESS ROUTES TO BE VERIFIED BY ENGINEER AND INSPECTOR AT PRE-CONSTRUCTION MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER AND MDE INSPECTOR.
- 2. TYPE D MATTING MAY BE ALTERED AT DIRECTION OF THE MDE INSPECTOR.
- 3. CONTRACTOR SHALL MAINTAIN MULCH AND TYPE D MATTING THROUGHOUT CONSTRUCTION PERIOD.
- 4. SCARIFICATION OF COMPACTED MULCH TO OCCUR UPON REMOVAL OF THE MULCH ACCESS PATH, AT DIRECTION OF THE ENGINEER.
- 5. THE MULCH ACCESS PATH IS DESIGNED TO PREVENT COMPACTION OF EXISTING SOILS USING LOW PRESSURE EQUIPMENT. IF THE CONTRACTOR INTENDS TO USE ANY EQUIPMENT WITH HIGHER LOADS, ADDITIONAL PROTECTION MEASURES MUST BE PROVIDED, AT NO ADDITIONAL COST, AND THOSE MEASURES MUST BE APPROVED BY THE ENGINEER PRIOR TO IMPLEMENTATION.



**TIMBER MATTING FOR ACCESS PATH DETAIL**  
N.T.S.

- 1. HARDWOOD MATS TO BE INSTALLED AS INDICATED ON CONTRACT DOCUMENTS, WITHIN THE SPECIFICATION IN THE IFB.
- 2. ACCESS ROUTES TO BE VERIFIED BY THE ENGINEER AT PRE-CONSTRUCTION MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER.
- 3. TYPE D MATTING SHALL BE PLACED WITH SEAMS PARALLEL TO THE FLOW OF TRAFFIC, OVERLAP FABRIC BY 18" MINIMUM AT SEAMS.
- 4. CONTRACTOR SHALL MAINTAIN TIMBER MATTING, MULCH, AND TYPE D MATTING THROUGHOUT FULL DURATION OF CONSTRUCTION PERIOD.



SEE DETAIL C-6 & C-7 FOR OTHER DETAILS AND CONSTRUCTION SPECIFICATIONS

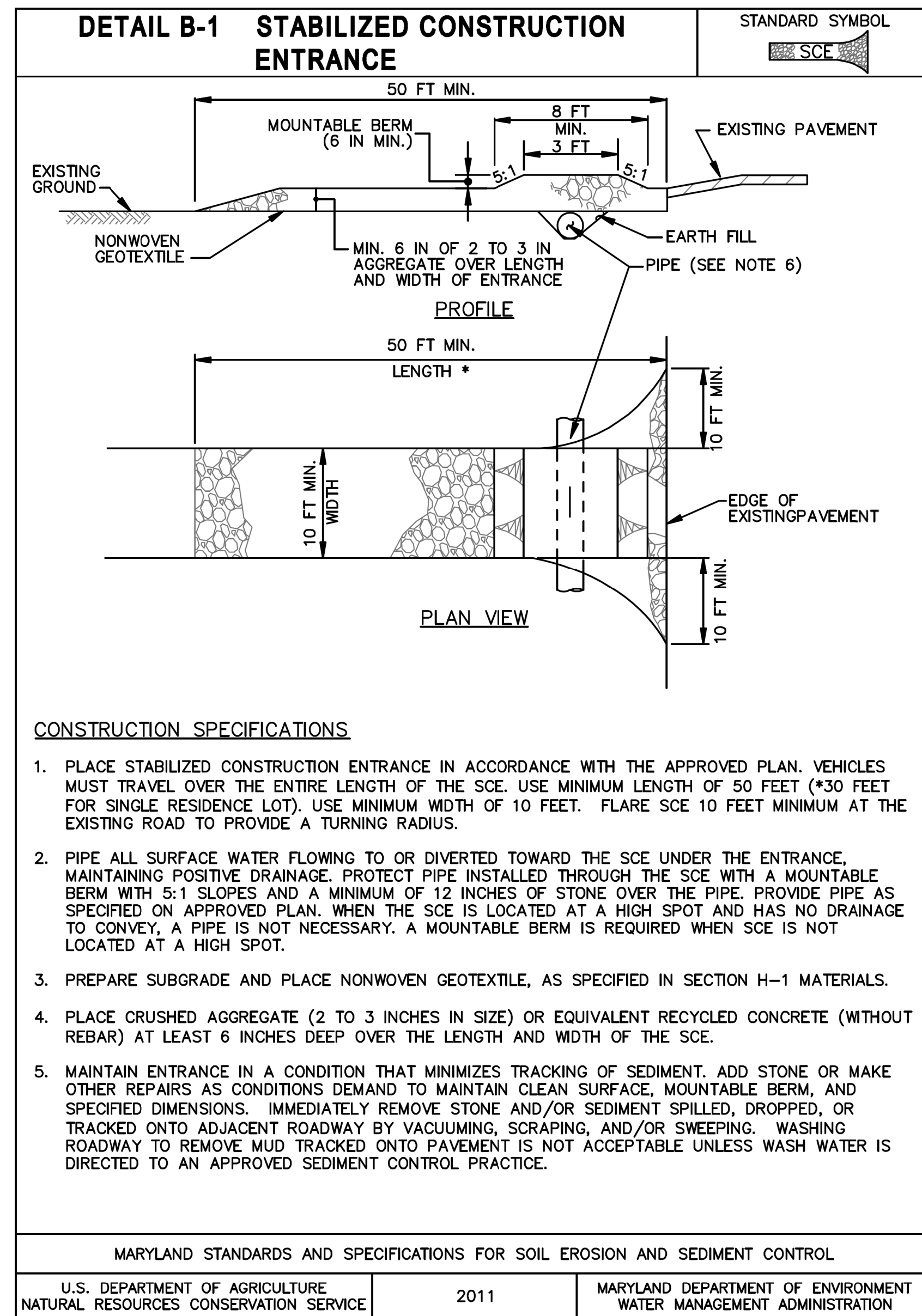
**TEMPORARY PIPE THROUGH TEMPORARY BARRIER DIVERSION DETAIL**  
N.T.S.

**MAINTENANCE AND REMOVAL OF PUMP-AROUND PRACTICE(S) NOTE:**

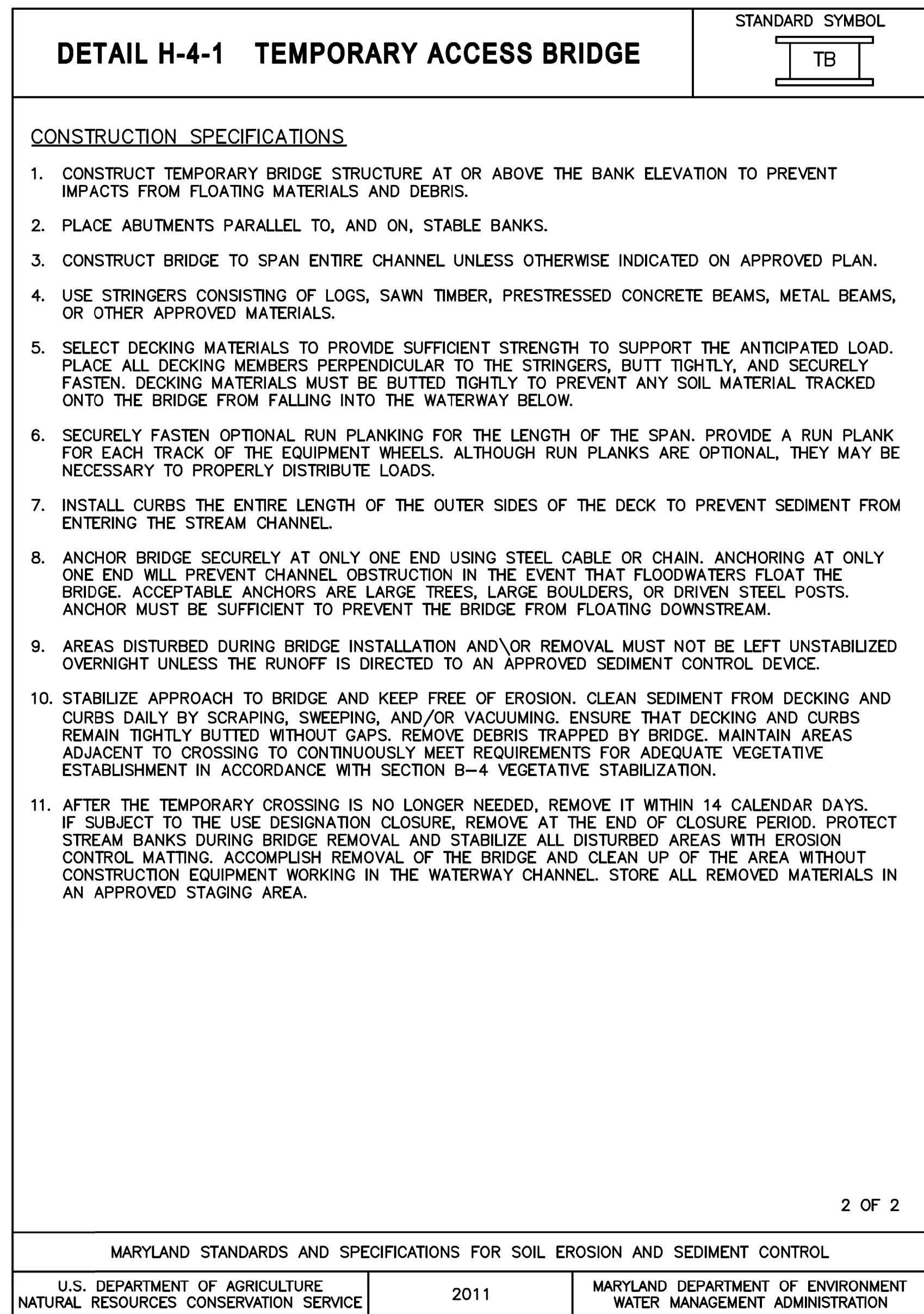
WHEN USING A PUMP-AROUND PRACTICE, AT THE END OF EACH WORK DAY, THE WORK AREA MUST BE STABILIZED AND FLOW RETURNED TO THE CHANNEL. THIS MAY REQUIRE REMOVAL OF THE TEMPORARY BARRIER DIVERSIONS AND/ OR SANDBAGS FROM THE FLOW CHANNEL AS APPROVED BY THE PROJECT ENGINEER. FOR DETAIL OF PUMP-AROUND PRACTICE, PLEASE SEE DWG. NO. EN-08.

MDE # 19-SF-0196; 18-NT-0086

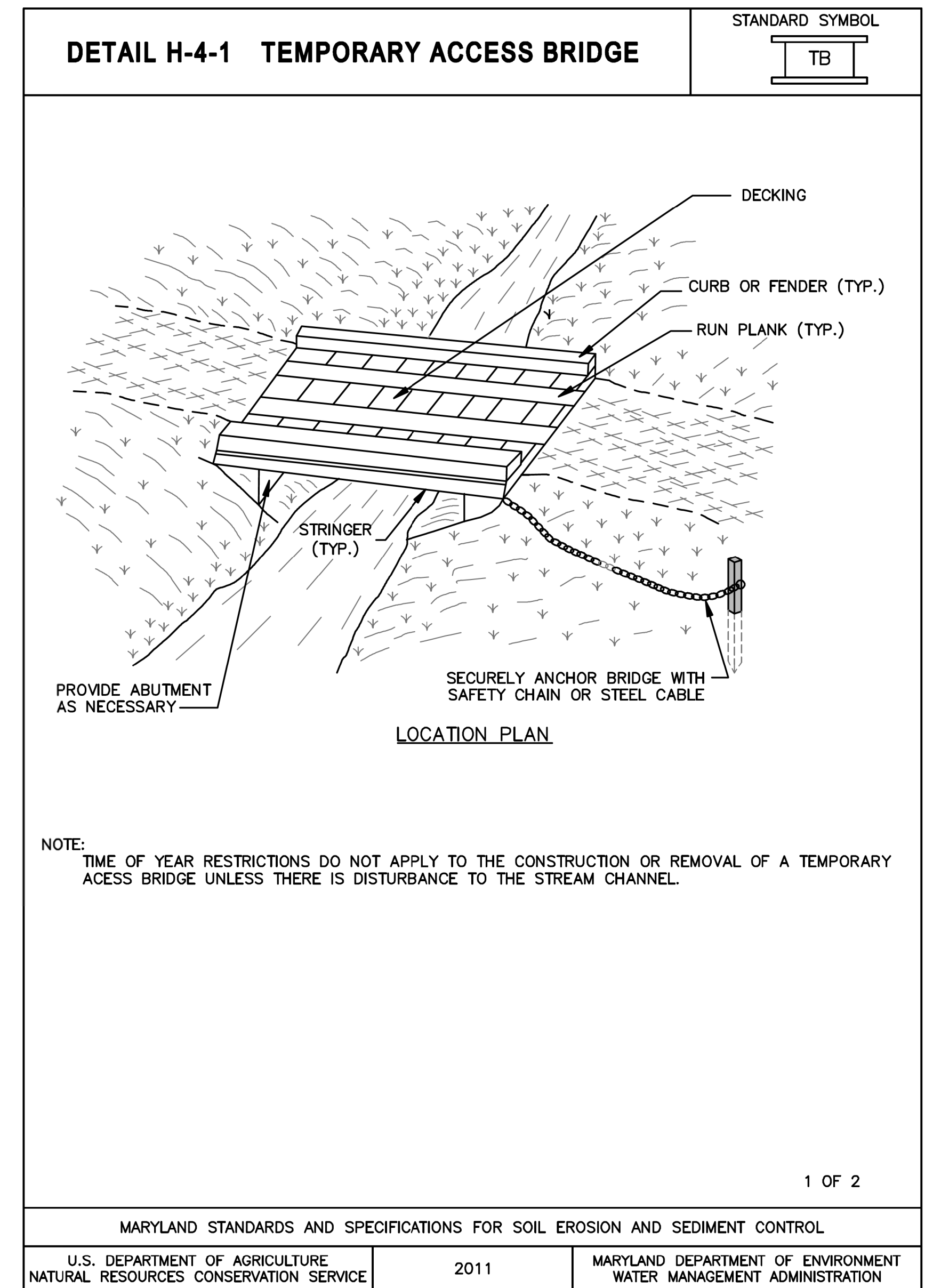
<p>CONSTELLATION DESIGN GROUP, INC. CONSULTING ENGINEERS 57 W. TIMONIUM ROAD SUITE 200 TIMONIUM, MD 21093 410-252-1884</p>		<p>Maryland Transportation Authority <i>Engineering Division</i></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">ADDENDUMS &amp; REVISIONS</th> </tr> <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> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	ADDENDUMS & REVISIONS				NO.	DESCRIPTION	BY	DATE																									<p><b>I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION CARAINS RUN STREAM RESTORATION</b></p> <p>JOHN F. KENNEDY MEMORIAL HIGHWAY HARFORD COUNTY</p> <p>EROSION &amp; SEDIMENT CONTROL GENERAL NOTES</p> <p>DESIGNED BY <u>  DJW  </u>      DRAWN BY <u>  JCT  </u>      CHECKED BY <u>  CDG  </u></p> <p>CONST. REVIEW BY _____      DATE <u>  OCTOBER 2019  </u>      SCALE <u>  NOT TO SCALE  </u></p>	<p>CONTRACT NO. KH-3028-0000</p> <p>DRAWING NO. <b>EN-04</b></p> <p>SHEET NO. 17 OF 87</p>
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B.2



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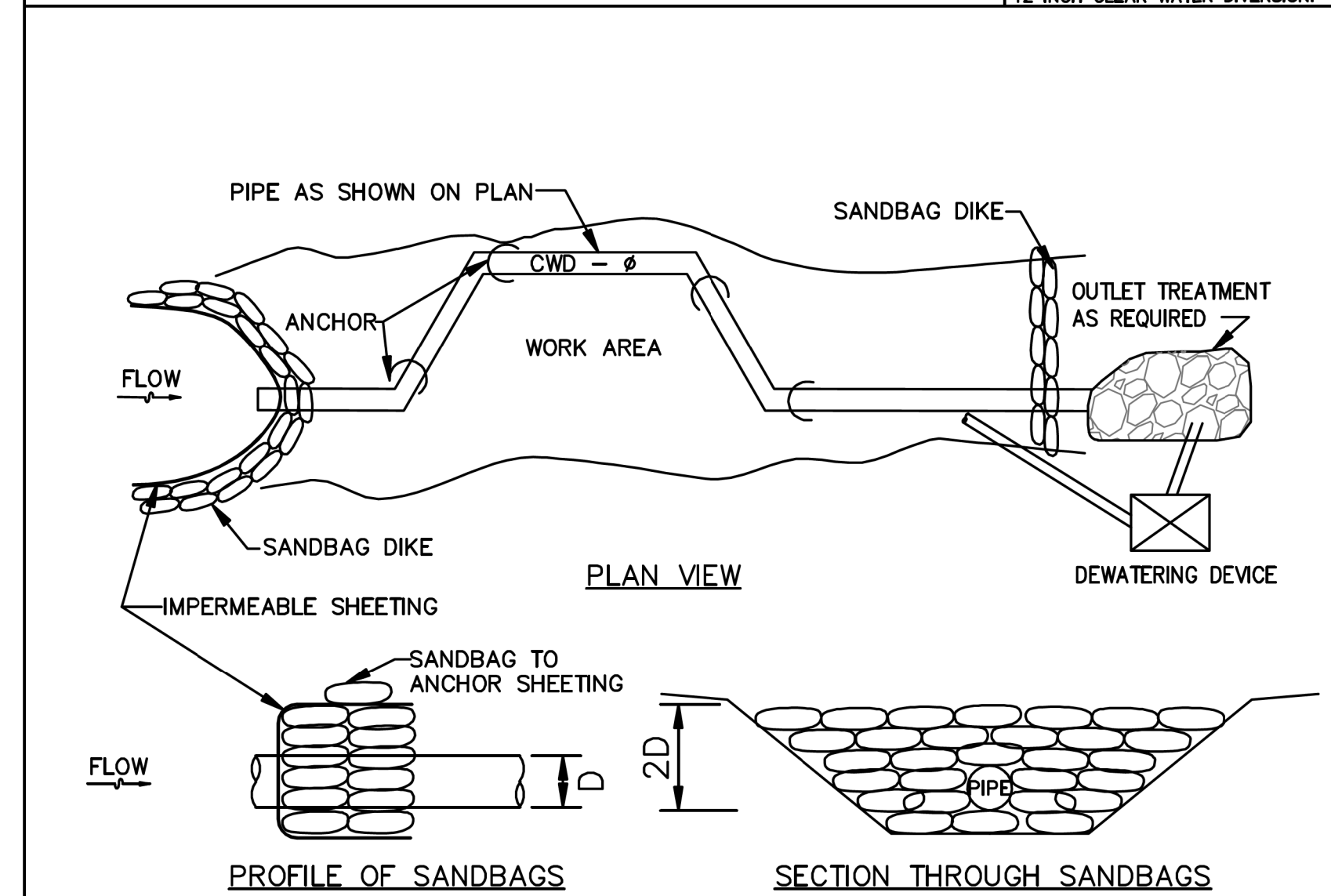


H.17

MDE # 19-SF-0196; 18-NT-0086

<p>CONSTELLATION DESIGN GROUP, INC. CONSULTING ENGINEERS 57 W. TIMONIUM ROAD SUITE 200 TIMONIUM, MD 21093 410-252-1884</p>	<p>STATE OF MARYLAND REGISTERED PROFESSIONAL ENGINEER</p>	<p>Maryland Transportation Authority <i>Engineering Division</i></p>	<p>ADDENDUMS &amp; 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> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	NO.	DESCRIPTION	BY	DATE																					<p><b>I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION CARNSINS RUN STREAM RESTORATION</b></p> <p>JOHN F. KENNEDY MEMORIAL HIGHWAY HARFORD COUNTY</p> <p>EROSION &amp; SEDIMENT CONTROL GENERAL NOTES</p> <p>DESIGNED BY <u>DJW</u>    DRAWN BY <u>JCT</u>    CHECKED BY <u>CDG</u></p> <p>CONST. REVIEW BY _____    DATE <u>OCTOBER 2019</u>    SCALE <u>NOT TO SCALE</u></p>	<p>CONTRACT NO. KH-3028-0000</p> <p>DRAWING NO. <b>EN-05</b></p> <p>SHEET NO. 18 OF 87</p>
			NO.	DESCRIPTION	BY	DATE																							
<p>FILE: p:\MDTAPWAPPI\MDTA_PW_OEC\Documents\20 - OEC Design Projects\KH (Kennedy Highway)\ETL NB Extension\KH-3028 - Carnsins Run Stream Mitigation\00 CADD\Plans\pEN.P005-CarnsinsRun.dgn</p> <p>DATE: Monday, October 07, 2019 AT 01:19 PM</p>			<p>UPDATED: 31JUL18</p>																										

**DETAIL C-6 CLEAR WATER DIVERSION PIPE** STANDARD SYMBOL **CWD - 12**  
 DESIGNATION CWD-12 REFERS TO 12 INCH CLEAR WATER DIVERSION.

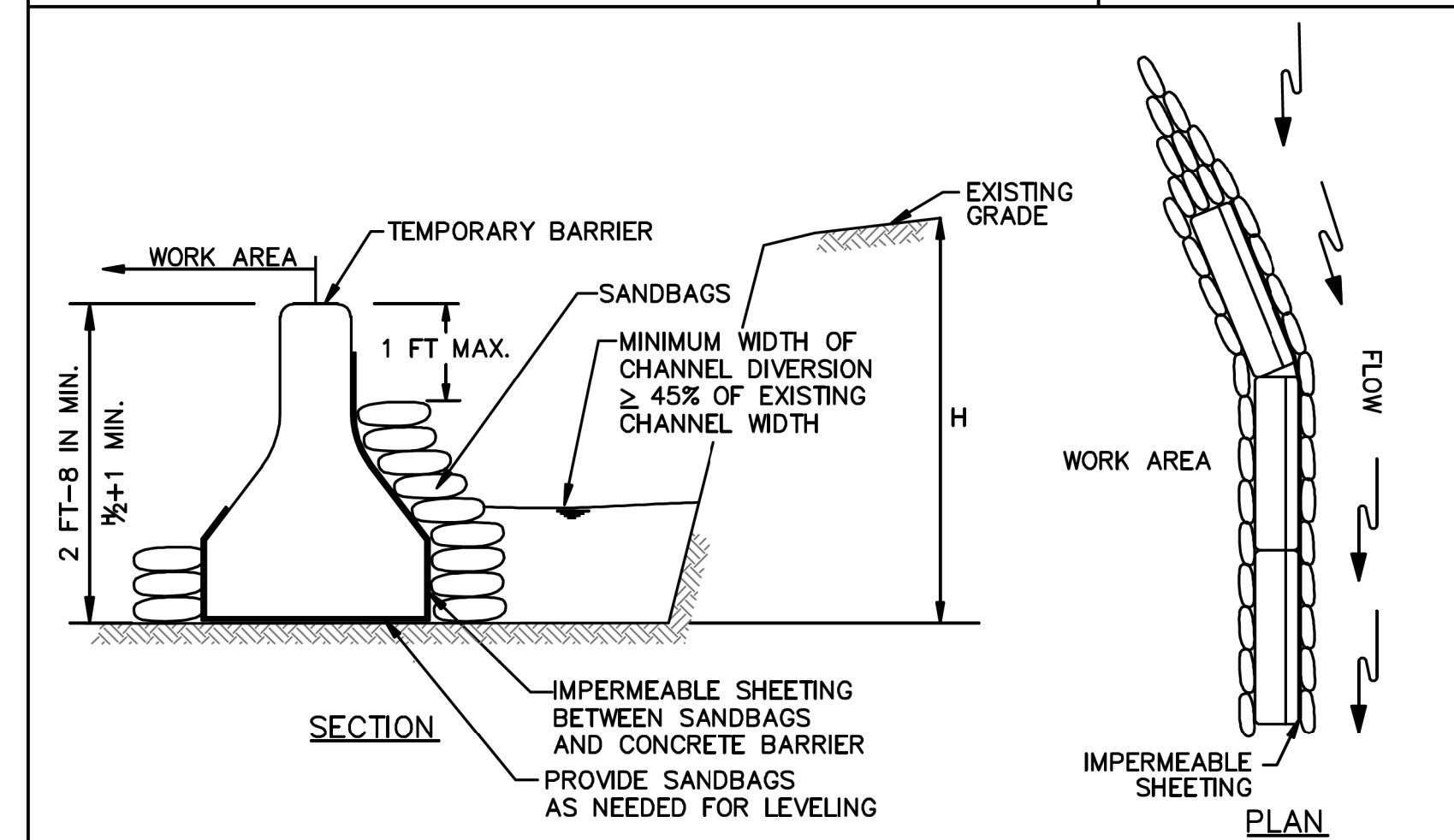


- CONSTRUCTION SPECIFICATIONS**
1. FLEXIBLE PIPE IS PREFERRED. HOWEVER, CORRUGATED METAL PIPE OR EQUIVALENT PVC PIPE CAN BE USED. MAKE ALL JOINTS WATERTIGHT.
  2. FOR SANDBAGS USE MATERIALS THAT ARE RESISTANT TO ULTRA-VIOLENT RADIATION, TEARING, AND PUNCTURE AND WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE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

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL  
 U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

C.20

**DETAIL C-7 TEMPORARY BARRIER DIVERSION** STANDARD SYMBOL **TBD**

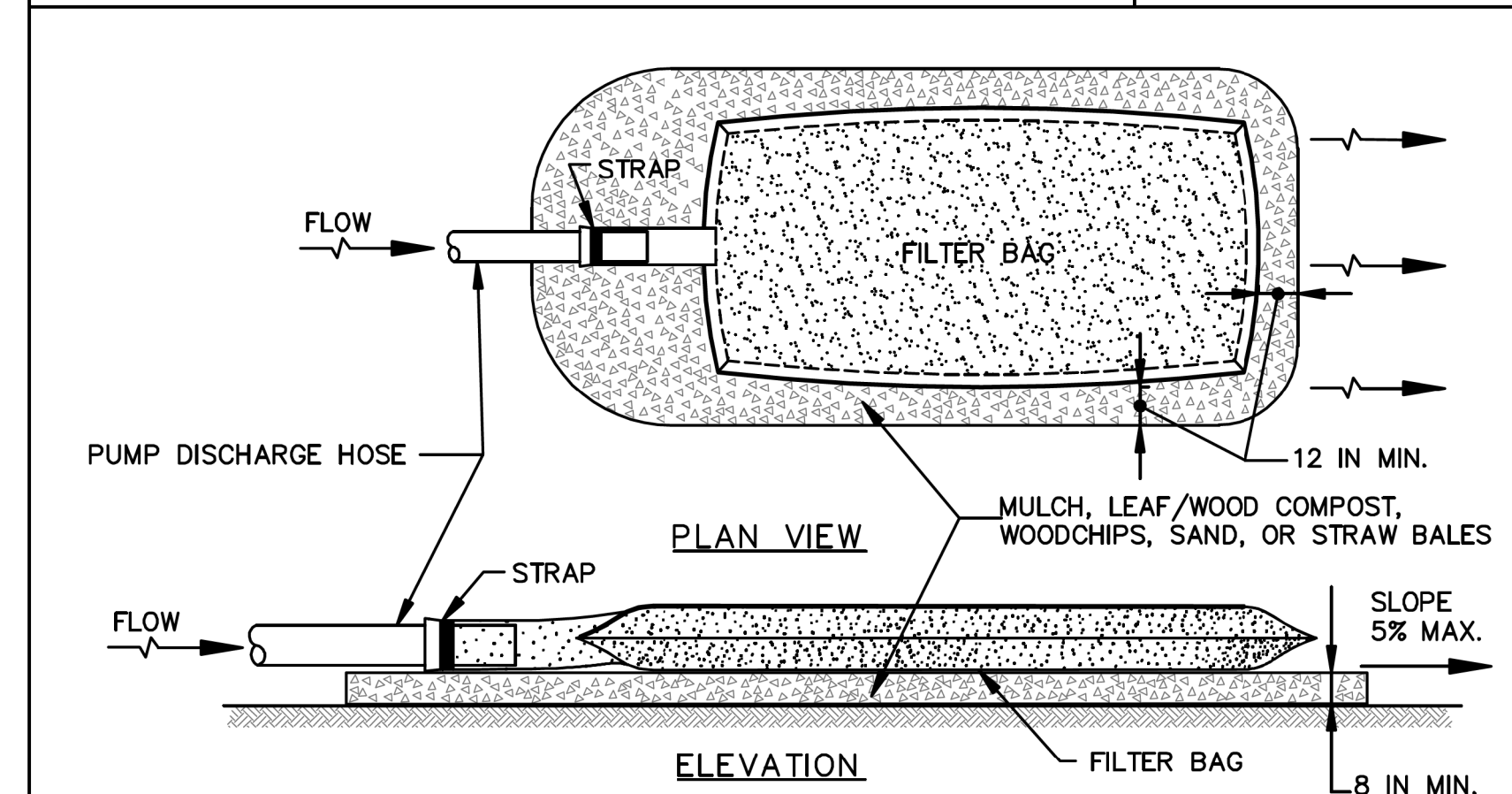


- CONSTRUCTION SPECIFICATIONS**
1. FOR SANDBAGS USE MATERIALS THAT ARE RESISTANT TO ULTRA-VIOLENT RADIATION, TEARING, AND PUNCTURE AND WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF FILL MATERIAL.
  2. USE BARRIER MADE OF CONCRETE OR OTHER APPROVED MATERIAL.
  3. USE 10 MIL OR THICKER, UV RESISTANT, IMPERMEABLE SHEETING OR OTHER APPROVED MATERIAL THAT IS IMPERMEABLE AND RESISTANT TO PUNCTURING AND TEARING.
  4. ESTABLISH TOP ELEVATION AT  $H/2 + 1$  FOOT FOR PROJECTS OF DURATION LESS THAN 2 WEEKS OR AS SPECIFIED ON APPROVED PLAN.
  5. INSTALL DIVERSION STRUCTURE FROM UPGRADE TO DOWNGRADE.
  6. PLACE IMPERMEABLE SHEETING SUCH THAT UPGRADE PORTION OVERLAPS DOWNGRADE PORTION BY A MINIMUM OF 18 INCHES.
  7. USE SANDBAG BASE FOR LEVELING AND TO ESTABLISH MINIMUM TOP ELEVATION OF THE BARRIER AS REQUIRED.
  8. DISPOSE OF ALL EXCAVATED MATERIALS IN AN APPROVED DISPOSAL AREA OUTSIDE OF THE 100-YEAR FLOODPLAIN.
  9. DEWATER WORK AREA USING AN APPROVED EROSION AND SEDIMENT CONTROL PRACTICE AS SPECIFIED ON APPROVED PLAN.
  10. KEEP ABUTMENTS BETWEEN CONCRETE BARRIERS WATER TIGHT. REPLACE SANDBAGS AND IMPERMEABLE SHEETING IF TORN.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL  
 U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

C.22

**DETAIL F-4 FILTER BAG** STANDARD SYMBOL **FB**



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

GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT <sup>2</sup>	ASTM D-4491
PERMITTIVITY (SEC <sup>-1</sup> )	1.2 SEC <sup>-1</sup>	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632
  6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL  
 U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

F.9

**CONSTELLATION DESIGN GROUP, INC.**  
 CONSULTING ENGINEERS  
 57 W. TIMONIUM ROAD  
 SUITE 200  
 TIMONIUM, MD 21093  
 410-252-1884

**Maryland Transportation Authority**  
 Engineering Division

ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

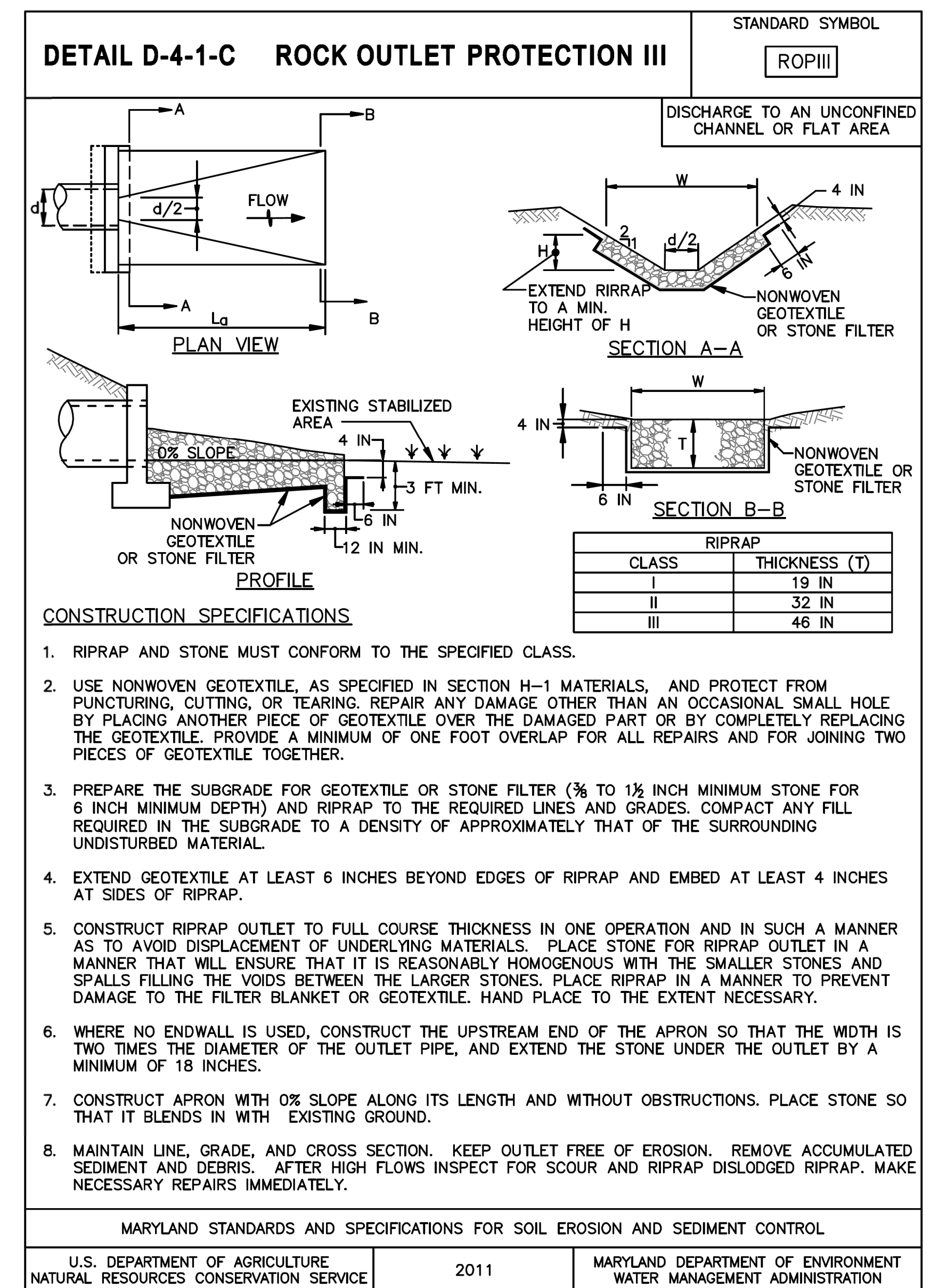
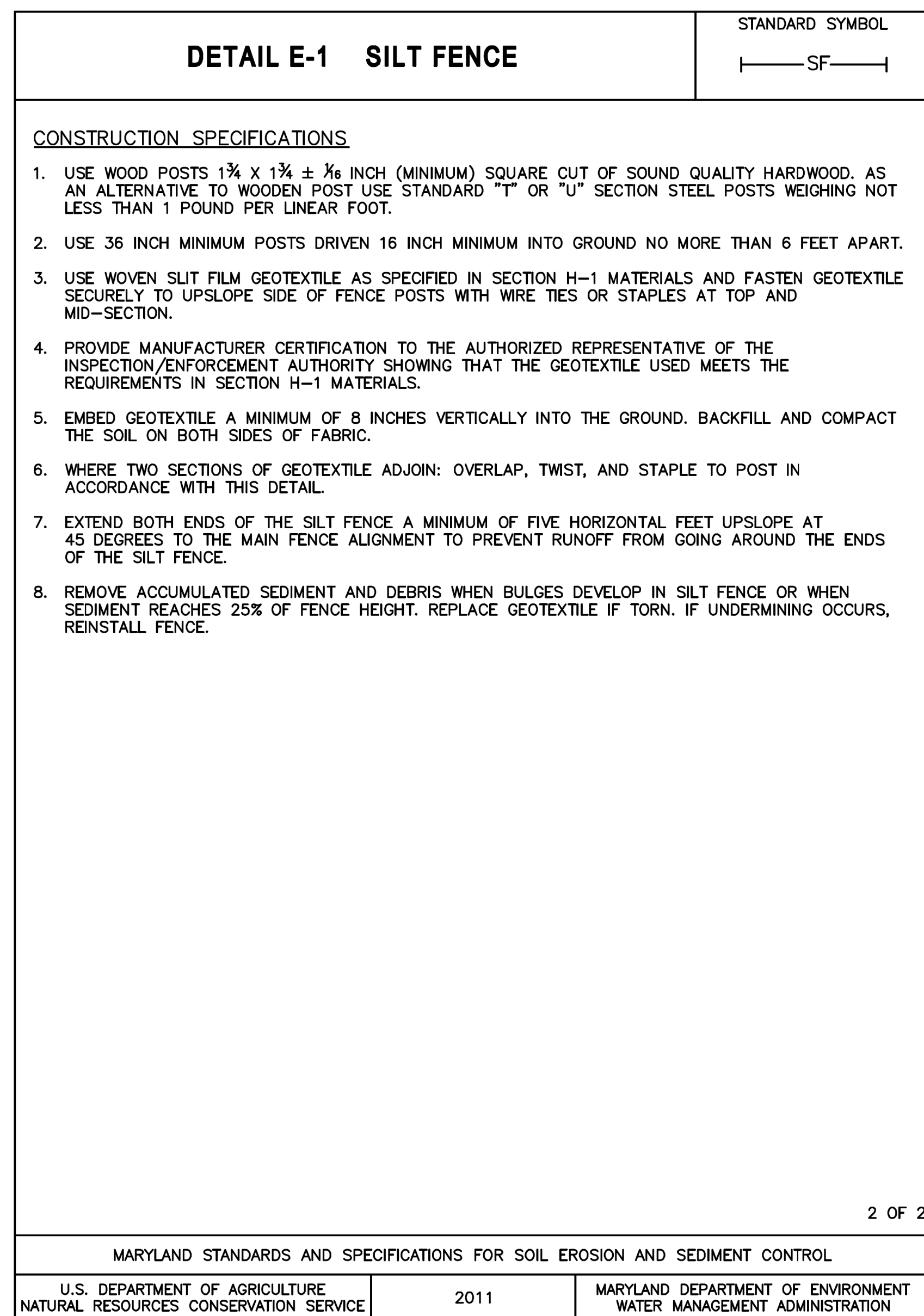
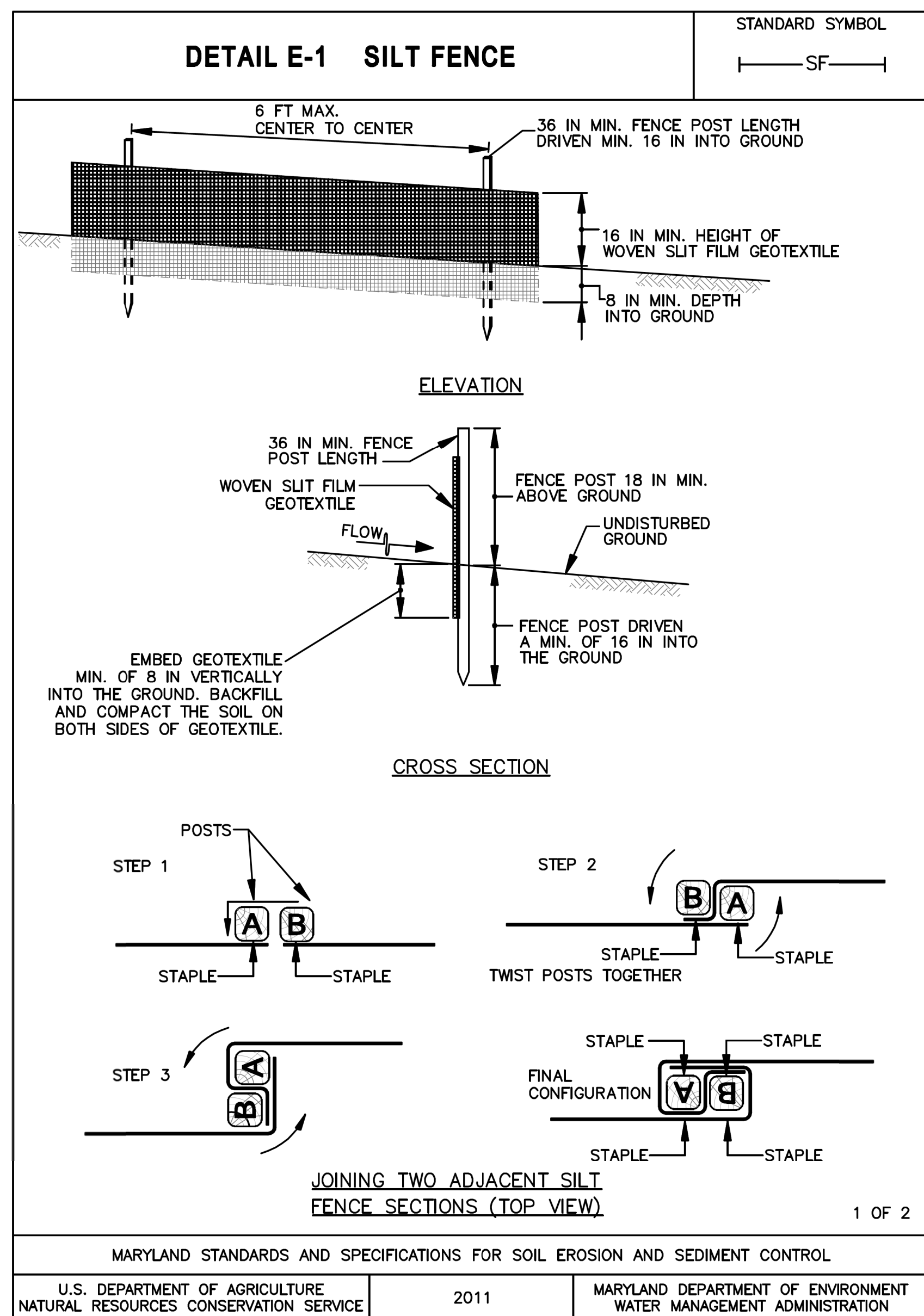
**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
 CARNS RUN STREAM RESTORATION**

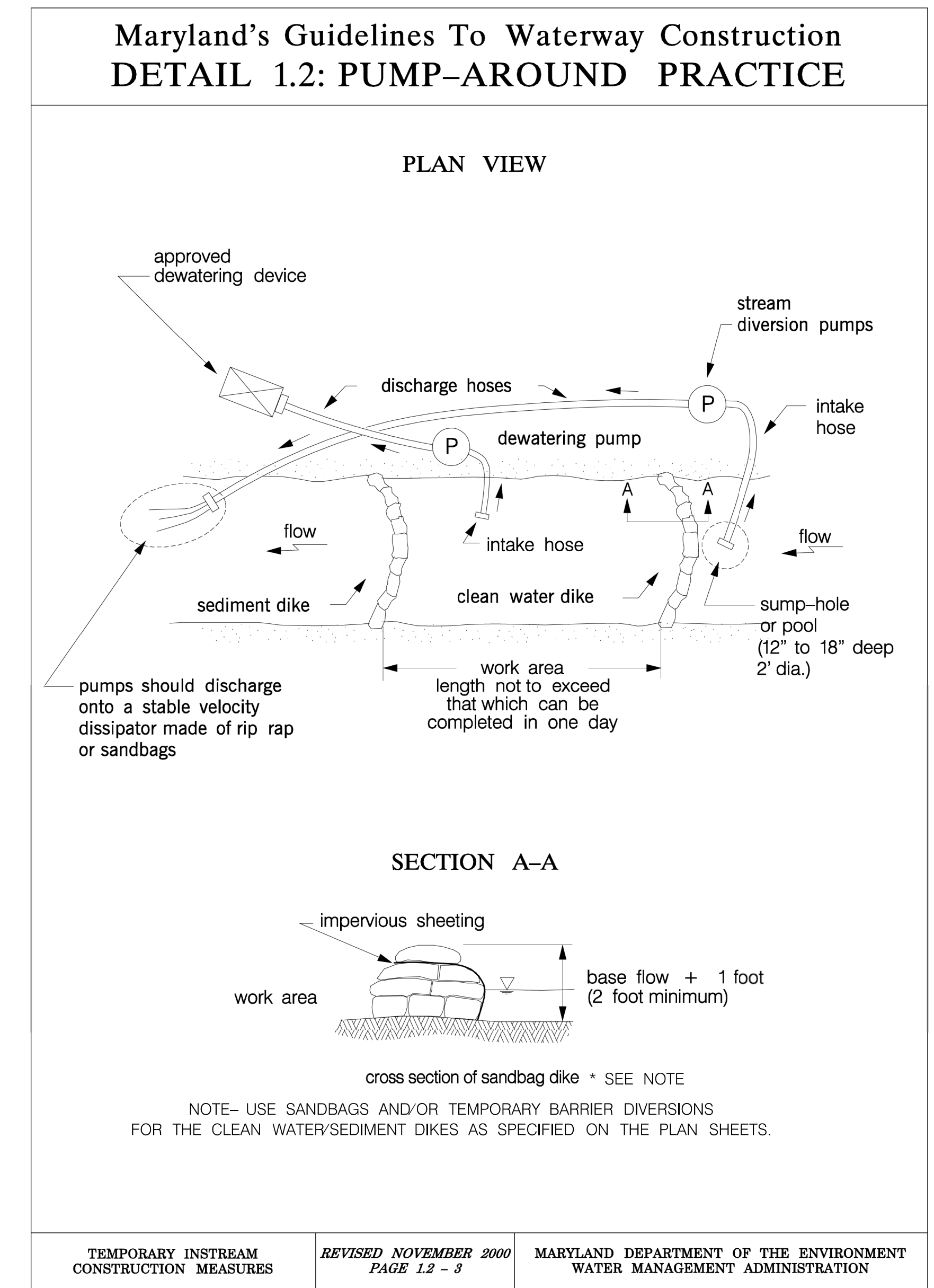
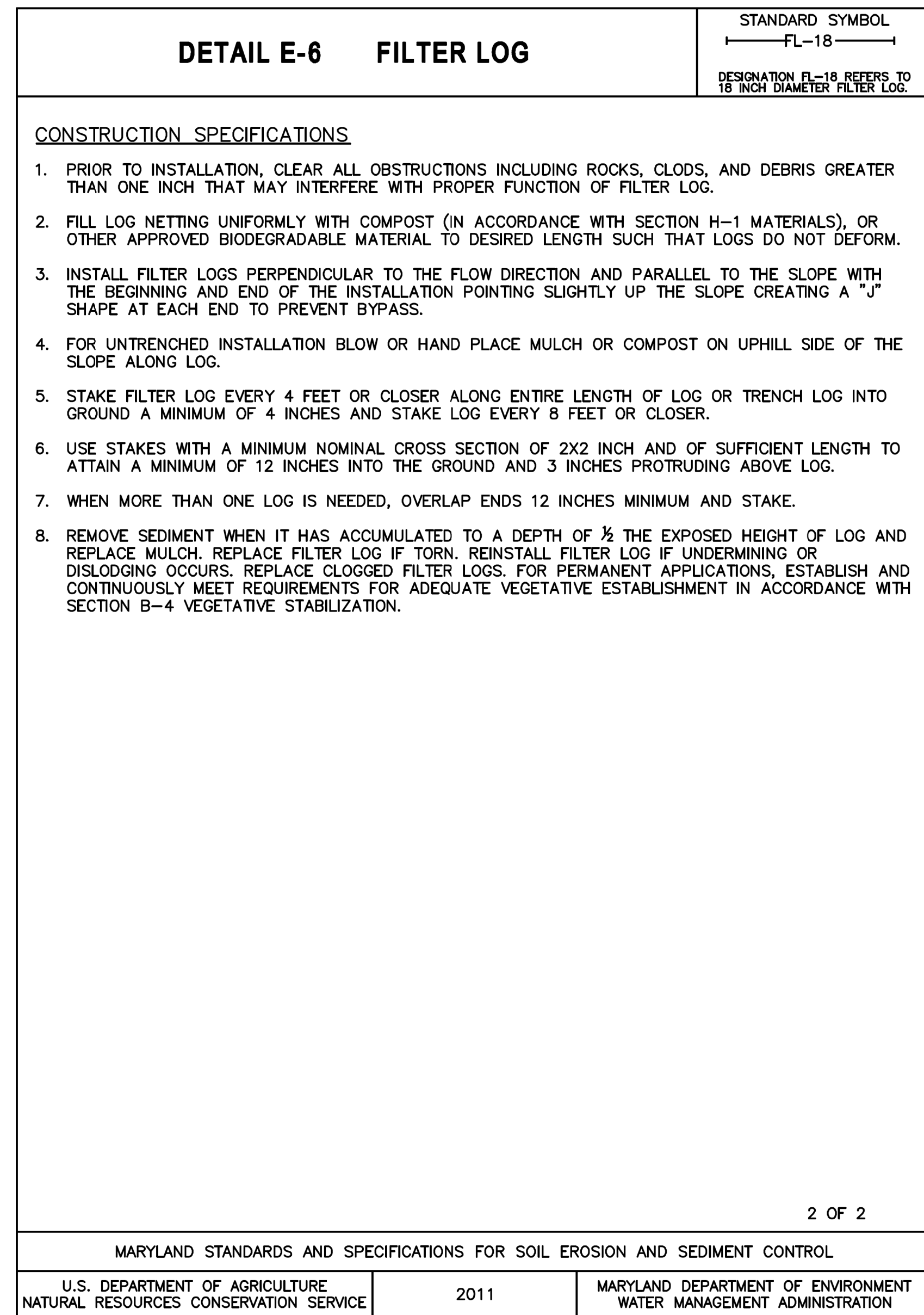
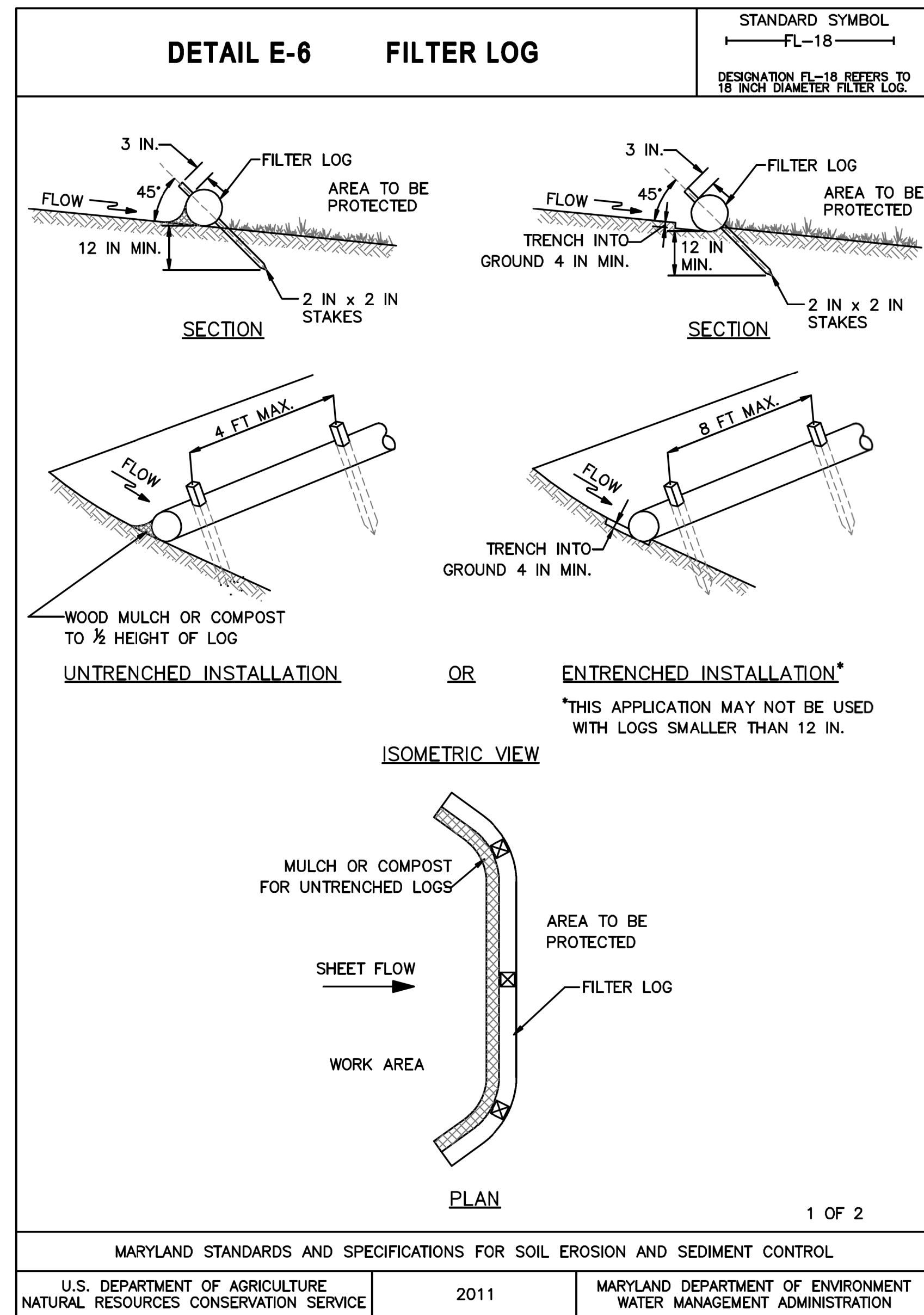
JOHN F. KENNEDY MEMORIAL HIGHWAY  
 HARFORD COUNTY

EROSION & SEDIMENT CONTROL GENERAL NOTES

DESIGNED BY DJW DRAWN BY JCT CHECKED BY CDG  
 CONST. REVIEW BY   DATE OCTOBER 2019 SCALE NOT TO SCALE

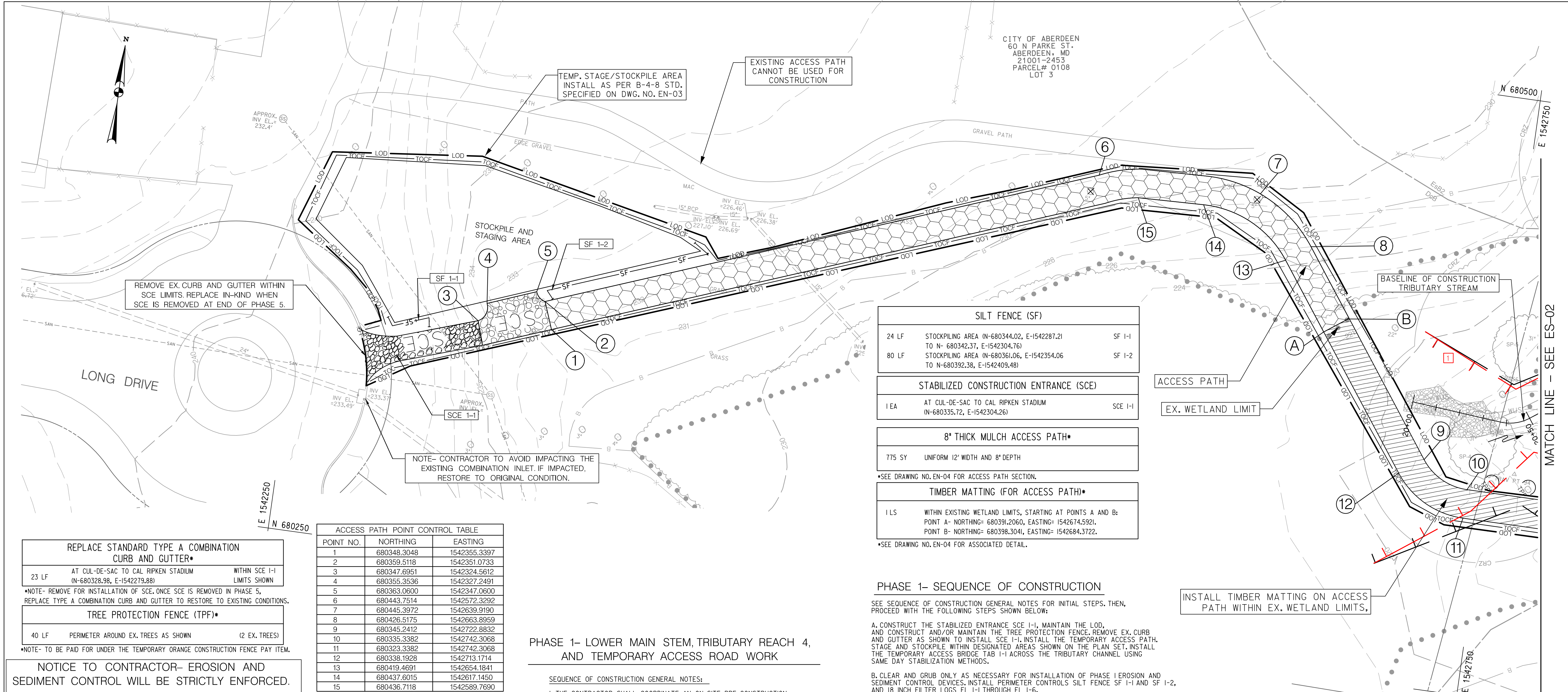
MDE # 19-SF-0196; 18-NT-0086  
 CONTRACT NO. KH-3028-0000  
 DRAWING NO. **EN-06**  
 SHEET NO. 19 OF 87





MDE # 19-SF-0196; 18-NT-0086

<p>CONSTELLATION DESIGN GROUP, INC. CONSULTING ENGINEERS 57 W. TIMONIUM ROAD SUITE 200 TIMONIUM, MD 21093 410-252-1884</p>		<p>Maryland Transportation Authority <i>Engineering Division</i></p>	<p>ADDENDUMS &amp; REVISIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">NO.</th> <th style="width: 65%;">DESCRIPTION</th> <th style="width: 10%;">BY</th> <th style="width: 20%;">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> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	NO.	DESCRIPTION	BY	DATE																					<p><b>I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION CARSINS RUN STREAM RESTORATION</b></p> <p>JOHN F. KENNEDY MEMORIAL HIGHWAY HARFORD COUNTY</p> <p>EROSION &amp; SEDIMENT CONTROL GENERAL NOTES</p> <p>DESIGNED BY <u>DJW</u>    DRAWN BY <u>JCT</u>    CHECKED BY <u>CDG</u></p> <p>CONST. REVIEW BY _____    DATE <u>OCTOBER 2019</u>    SCALE <u>NOT TO SCALE</u></p>	<p>CONTRACT NO. KH-3028-0000</p> <p>DRAWING NO. <b>EN-08</b></p> <p>SHEET NO. 21 OF 87</p>
			NO.	DESCRIPTION	BY	DATE																							
<p>FILE: p:\MDTAPWAPPI\MDTA_PW_OEC\Documents\20 - OEC Design Projects\KH (Kennedy Highway)\ETL NB Extension\KH-3028 - Carsins Run Stream Mitigation\00 CADD\Plans\pEN_P008_CarsinsRun.dgn</p> <p>DATE: Monday, October 07, 2019 AT 01:32 PM</p>			<p>UPDATED: 31JUL18</p>																										



CITY OF ABERDEEN  
60 N PARKE ST.  
ABERDEEN, MD  
21001-2453  
PARCEL# 0108  
LOT 3

REMOVE EX. CURB AND GUTTER WITHIN SCE LIMITS. REPLACE IN-KIND WHEN SCE IS REMOVED AT END OF PHASE 5.

TEMP. STAGE/STOCKPILE AREA INSTALL AS PER B-4-8 STD. SPECIFIED ON DWG. NO. EN-03

EXISTING ACCESS PATH CANNOT BE USED FOR CONSTRUCTION

NOTE- CONTRACTOR TO AVOID IMPACTING THE EXISTING COMBINATION INLET. IF IMPACTED, RESTORE TO ORIGINAL CONDITION.

SILT FENCE (SF)		
24 LF	STOCKPILING AREA (N-680344.02, E-1542287.21 TO N- 680342.37, E-1542304.76)	SF I-1
80 LF	STOCKPILING AREA (N-680361.06, E-1542354.06 TO N-680392.38, E-1542409.48)	SF I-2

STABILIZED CONSTRUCTION ENTRANCE (SCE)		
1 EA	AT CUL-DE-SAC TO CAL RIPKEN STADIUM (N-680335.72, E-1542304.26)	SCE I-1

8" THICK MULCH ACCESS PATH*		
775 SY	UNIFORM 12' WIDTH AND 8' DEPTH	

\*SEE DRAWING NO. EN-04 FOR ACCESS PATH SECTION.

TIMBER MATTING (FOR ACCESS PATH)*		
1 LS	WITHIN EXISTING WETLAND LIMITS, STARTING AT POINTS A AND B: POINT A- NORTHING= 680391.2060, EASTING= 1542674.5921. POINT B- NORTHING= 680398.3041, EASTING= 1542684.3722.	

\*SEE DRAWING NO. EN-04 FOR ASSOCIATED DETAIL.

REPLACE STANDARD TYPE A COMBINATION CURB AND GUTTER*		
23 LF	AT CUL-DE-SAC TO CAL RIPKEN STADIUM (N-680328.98, E-1542279.88)	WITHIN SCE I-1 LIMITS SHOWN

\*NOTE- REMOVE FOR INSTALLATION OF SCE. ONCE SCE IS REMOVED IN PHASE 5, REPLACE TYPE A COMBINATION CURB AND GUTTER TO RESTORE TO EXISTING CONDITIONS.

TREE PROTECTION FENCE (TPF)*		
40 LF	PERIMETER AROUND EX. TREES AS SHOWN	(2 EX. TREES)

\*NOTE- TO BE PAID FOR UNDER THE TEMPORARY ORANGE CONSTRUCTION FENCE PAY ITEM.

ACCESS PATH POINT CONTROL TABLE		
POINT NO.	NORTHING	EASTING
1	680348.3048	1542355.3397
2	680359.5118	1542351.0733
3	680347.6951	1542324.5612
4	680355.3536	1542327.2491
5	680363.0600	1542347.0600
6	680443.7514	1542572.3292
7	680445.3972	1542639.9190
8	680426.5175	1542663.8959
9	680345.2412	1542722.8832
10	680335.3382	1542742.3068
11	680323.3382	1542742.3068
12	680338.1928	1542713.1714
13	680419.4691	1542654.1841
14	680437.6015	1542617.1450
15	680436.7118	1542589.7690

NOTICE TO CONTRACTOR- EROSION AND SEDIMENT CONTROL WILL BE STRICTLY ENFORCED.

LEGEND	
NOTE- SEE DWG. NO. AB-01 FOR OTHER FEATURES.	
	CREATED WETLAND
	LIMITS OF DISTURBANCE
	TREE PROTECTION FENCE (TPF)
	PROP. CHANNEL
	PROP. CONTOUR
	18 INCH DIAMETER FILTER LOG
	SILT FENCE
	EX. TREE REMOVAL
	DISCHARGE HOSE
	PUMP
	TIMBER MATTING FOR ACCESS PATH
	FILTER BAG
	TEMP. DIVERSION BARRIER
	8" THICK MULCH ACCESS PATH
	PROPOSED RIPRAP
	STABILIZED CONSTRUCTION ENTRANCE
	24 INCH DIAMETER CLEAR WATER DIVERSION PIPE
	RIGHT OF WAY LINE

PHASE 1- LOWER MAIN STEM, TRIBUTARY REACH 4, AND TEMPORARY ACCESS ROAD WORK

SEQUENCE OF CONSTRUCTION GENERAL NOTES:

- THE CONTRACTOR SHALL COORDINATE AN ON-SITE PRE-CONSTRUCTION MEETING AS PER GENERAL NOTE 1 ON DWG. NO. EN-01. THE LOD SHALL BE STAKED OUT PRIOR TO THIS MEETING.
- THE CONTRACTOR TO SECURE NECESSARY EASEMENTS OR RIGHTS-OF-ENTRY PRIOR TO THE START OF THE PROJECT AND SUBMIT ALL NECESSARY EASEMENTS OR RIGHT-OF-ENTRY DOCUMENTS TO MDE PLAN REVIEW PRIOR TO THE START OF WORK.
- INSTALL TREE PROTECTION FENCE (TPF) AS SHOWN ON THE PLANS AND RECEIVE APPROVAL FROM THE INSPECTOR BEFORE ANY CLEARING.
- CONSTRUCTION SHALL BE PERFORMED FOR THE FOLLOWING STREAM SEGMENTS:

PHASE	LOCATION	STATIONS	LENGTH
PHASE 1	LOWER MAIN STEM, TRIBUTARY REACH 4, TEMP. ACCESS RD.	STA. 12+34 TO STA. 14+48	214 LF MAIN
PHASE 2	TRIBUTARY REACH 2B	STA. 28+21 TO STA. 29+46	125 LF TRIB.
PHASE 3	TRIBUTARY REACH 3	STA. 10+40 TO STA. 12+56	216 LF MAIN
PHASE 4	TRIBUTARY REACH 1	STA. 20+00 TO STA. 22+59	259 LF TRIB.
PHASE 5	TRIBUTARY REACH 2B	STA. 22+49 TO STA. 24+86	237 LF TRIB.
PHASE 6	TRIBUTARY REACH 3	STA. 24+70 TO STA. 28+02	332 LF TRIB.

PHASE 1- SEQUENCE OF CONSTRUCTION

SEE SEQUENCE OF CONSTRUCTION GENERAL NOTES FOR INITIAL STEPS. THEN, PROCEED WITH THE FOLLOWING STEPS SHOWN BELOW:

A. CONSTRUCT THE STABILIZED ENTRANCE SCE I-1, MAINTAIN THE LOD, AND CONSTRUCT AND/OR MAINTAIN THE TREE PROTECTION FENCE. REMOVE EX. CURB AND GUTTER AS SHOWN TO INSTALL SCE I-1. INSTALL THE TEMPORARY ACCESS PATH. STAGE AND STOCKPILE WITHIN DESIGNATED AREAS SHOWN ON THE PLAN SET. INSTALL THE TEMPORARY ACCESS BRIDGE TAB I-1 ACROSS THE TRIBUTARY CHANNEL USING SAME DAY STABILIZATION METHODS.

B. CLEAR AND GRUB ONLY AS NECESSARY FOR INSTALLATION OF PHASE I EROSION AND SEDIMENT CONTROL DEVICES. INSTALL PERIMETER CONTROLS SILT FENCE SF I-1 AND SF I-2, AND 18 INCH FILTER LOGS FL I-1 THROUGH FL I-6.

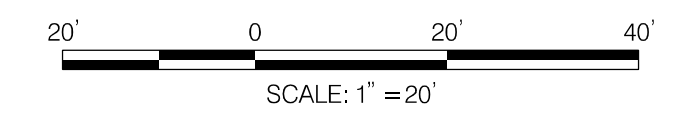
C. WORKING FROM DOWNSTREAM TO UPSTREAM, INSTALL TEMP. BARRIER DIVERSIONS IN THE STREAM CHANNEL AND UTILIZE PUMP AROUND SYSTEMS, WHICH INCLUDES THE FOLLOWING CONTROLS: TEMP. BARRIER DIVERSIONS TBD I-1 AND TBD I-2, FILTER BAG FB I-1, SANDBAGS SB I-1 THROUGH SB I-4, PUMP PA I-1 AND PA I-2, AND CLEAR WATER DIVERSION PIPES CWD I-1 AND CWD I-2. DEWATER BETWEEN THE TEMP. BARRIER DIVERSIONS. ALL WATER COLLECTING IN THE WORK AREA SHALL BE PUMPED TO FILTER BAG FB I-1.

D. ONCE TEMP. DIVERSION BARRIERS ARE INSTALLED, THE WORK AREA DEWATERED, PUMP AROUND PRACTICES FUNCTIONING, AND WITH APPROVAL FROM THE INSPECTOR, REMOVE EXISTING CONCRETE FLUME FROM APPROX. STA. 13+00 TO THE EX. DUAL BOX CULVERTS. CONSTRUCT AND GRADE STREAM CHANNEL AND IN STREAM STRUCTURES AS SHOWN ON THE PLANS, WITHIN THE PHASE I STA. LIMITS AS SPECIFIED IN SEQUENCE OF CONSTRUCTION GENERAL NOTE 4 ON DRAWING NO. ES-01. INSTALL MAIN STEM WORK FIRST, USING THE TEMPORARY STOCKPILE AREA AND FILTER LOG FL I-5 AS SHOWN ON THE EXHIBIT ON DRAWING NO. ES-03. ONCE MAIN STEM WORK IS COMPLETED, REMOVE TEMPORARY STOCKPILE AREA AND COMPLETE THE TRIBUTARY REACH 4 GRADING UP TO TBD I-1 AS SHOWN. INSTALL LANDSCAPING WITHIN THE PHASE I LOD. STABILIZE THE PHASE I WORK ZONE WITHIN THE REMOVED CONCRETE FLUME AS SHOWN IN THE STREAM RESTORATION PLANS.

E. ONCE PHASE I WORK IS COMPLETE AND UPON ESC INSPECTOR APPROVAL, REMOVE ALL CONTROLS EXCEPT FOR TAB I-1, TBD I-2, SF I-1, SF I-2, PA I-1, SB I-2, SB I-3, FL I-1, FL I-2, AND SCE I-1 AND PROCEED TO PHASE 2. RETAIN SCE I-1 FOR ALL FUTURE PHASES OF THE PROJECT. RETAIN FL I-1 AND FL I-2 FOR PHASES 2 AND 5 OF THE PROJECT. MAINTAIN THE PHASE I DIVERSION CONTROLS SB I-2, SB I-3, TBD I-2, AND PA I-1 UNTIL THE PHASE 2 DIVERSION CONTROLS TBD 2-2 AND PA 2-2 ARE INSTALLED.

INSTALL TIMBER MATTING ON ACCESS PATH WITHIN EX. WETLAND LIMITS.

- NOTES:
- THE EROSION AND SEDIMENT CONTROL (ES) PLAN IS PRESENTED IN FIVE (5) CONSTRUCTION PHASES SHOWN ON PLAN SHEET ES-01 THROUGH ES-09.
  - SEE SHEETS SR-01 TO SR-03 FOR PROPOSED STREAM RESTORATION MEASURES, AND PR-01 TO PR-03 FOR PROPOSED PROFILES. FOR LANDSCAPING PLANS, SEE DWG. NO. LP-01 TO LP-03.
  - THE CONTRACTOR AND ITS DRIVERS SHALL TAKE EXTRA PRECAUTION WHEN DRIVING AND HAULING MATERIALS ON THE ACCESS ROAD, SITE AREAS AND CHANNEL TO MINIMIZE IMPACT TO EXISTING FEATURES SUCH AS TREES, WETLANDS, WATERS OF THE U.S., THE STREAM BED, CHANNEL SLOPES, AND NEWLY CONSTRUCTED FEATURES.
  - FOR MAINTENANCE AND REMOVAL OF PUMP AROUND PRACTICES, SEE CRITERIA SPECIFIED ON DWG. NO. EN-04.



HORIZONTAL DATUM NAD 83/91  
VERTICAL DATUM NAVD 88  
MDE # 19-SF-0196; 18-NT-0086

CONSTELLATION DESIGN GROUP, INC.  
CONSULTING ENGINEERS  
57 W. TIMONIUM ROAD  
SUITE 200  
TIMONIUM, MD 21093  
410-252-1884

Maryland Transportation Authority  
Engineering Division

ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE
1	FLOODPLAIN LINE REVISION	JCT	6/16/20

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
CARSINS RUN STREAM RESTORATION**

PHASE I  
EROSION & SEDIMENT CONTROL PLAN

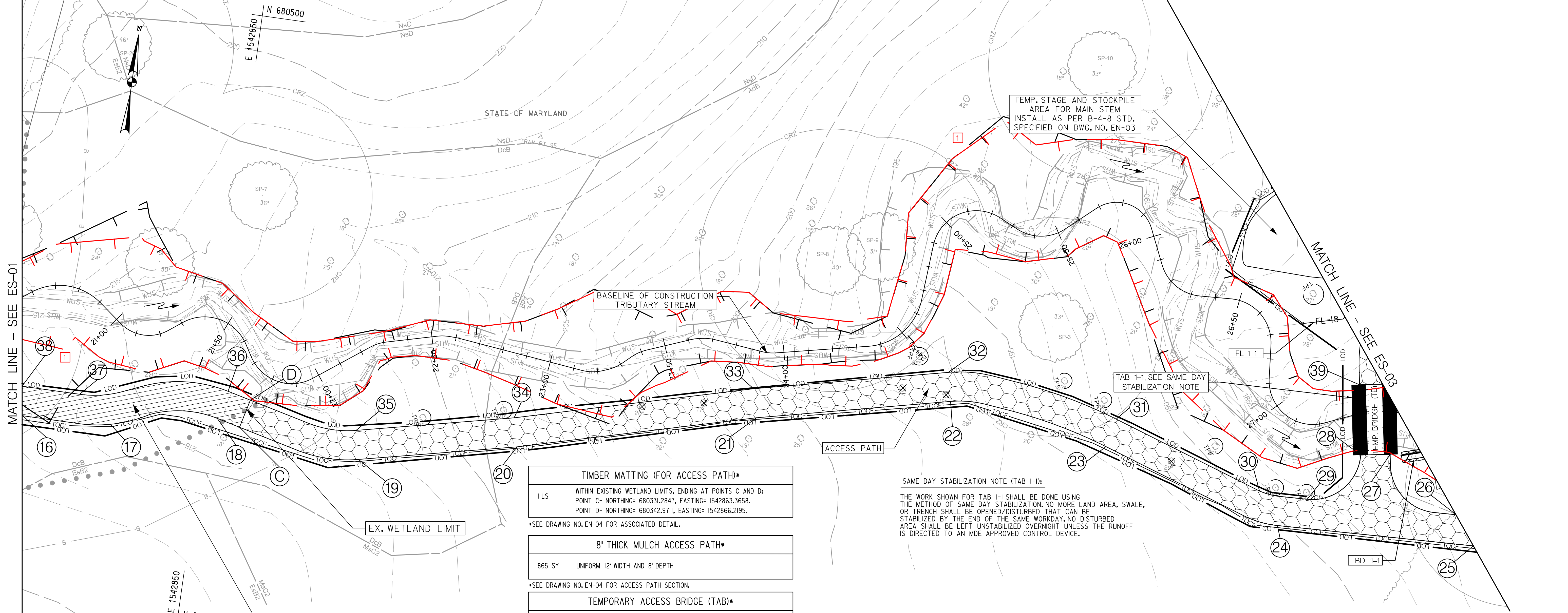
JOHN F. KENNEDY MEMORIAL HIGHWAY  
HARFORD COUNTY

DESIGNED BY DJW    DRAWN BY JCT    CHECKED BY CDG  
CONST. REVIEW BY    DATE OCTOBER 2019    SCALE 1" = 20'

CONTRACT NO. KH-3028-0000  
DRAWING NO. **ES-01**  
SHEET NO. 22 OF 87  
UPDATED: 31JUL18

MATCH LINE - SEE ES-01

MATCH LINE - SEE ES-03



**TIMBER MATTING (FOR ACCESS PATH)\***

1 LS WITHIN EXISTING WETLAND LIMITS, ENDING AT POINTS C AND D:  
 POINT C- NORTHING= 680331.2847, EASTING= 1542863.3658.  
 POINT D- NORTHING= 680342.9711, EASTING= 1542866.2195.

\*SEE DRAWING NO. EN-04 FOR ASSOCIATED DETAIL.

**8" THICK MULCH ACCESS PATH\***

865 SY UNIFORM 12" WIDTH AND 8" DEPTH

\*SEE DRAWING NO. EN-04 FOR ACCESS PATH SECTION.

**TEMPORARY ACCESS BRIDGE (TAB)\***

1 LS TRIBUTARY- STA. 27+43, 18' RT TO 11' LT TAB 1-1

\*INSTALL TEMPORARY ACCESS BRIDGE AS PER STD. H-4-1 WITHIN THE 2011 MD ESC STANDARD AND SPECIFICATIONS MANUAL. INSTALL USING SAME DAY STABILIZATION.

**TEMPORARY BARRIER DIVERSION (TBD)**

9 LF TRIB- STA. 27+60, 17' RT TO STA. 27+68, 15' RT H=2 FT. 8 IN. MIN. \* TBD 1-1

\*NOTE- THE TOP ELEVATION OF THE TBD SHOULD TIE INTO THE EX. GROUND ELEVATION ON BOTH ENDS OF THE TBD. EXCAVATE CHANNEL AS NEEDED TO TIE INTO EX. GROUND.

**18 INCH FILTER LOG (FL)**

9 LF TRIBUTARY- STA. 26+60, 7' LT TO STA. 26+69, 32' LT FL 1-1

- NOTES:
1. THE EROSION AND SEDIMENT CONTROL (ESC) PLAN IS PRESENTED IN FIVE (5) CONSTRUCTION PHASES SHOWN ON PLAN SHEET ES-01 THROUGH ES-05.
  2. SEE SHEETS SR-01 TO SR-03 FOR PROPOSED STREAM RESTORATION MEASURES, AND PR-01 TO PR-03 FOR PROPOSED PROFILES. FOR LANDSCAPING PLANS, SEE DWG. NO. LP-01 TO LP-03.
  3. THE CONTRACTOR AND ITS DRIVERS SHALL TAKE EXTRA PRECAUTION WHEN DRIVING AND HAULING MATERIALS ON THE ACCESS ROAD, SITE AREAS AND CHANNEL TO MINIMIZE IMPACT TO EXISTING FEATURES SUCH AS TREES, WETLANDS, WATERS OF THE U.S., THE STREAM BED, CHANNEL SLOPES, AND NEWLY CONSTRUCTED FEATURES.
  4. FOR MAINTENANCE AND REMOVAL OF PUMP AROUND PRACTICES, SEE CRITERIA SPECIFIED ON DWG. NO. EN-04.

**SAME DAY STABILIZATION NOTE (TAB 1-1):**

THE WORK SHOWN FOR TAB 1-1 SHALL BE DONE USING THE METHOD OF SAME DAY STABILIZATION. NO MORE LAND AREA, SWALE, OR TRENCH SHALL BE OPENED/DISTURBED THAT CAN BE STABILIZED BY THE END OF THE SAME WORKDAY. NO DISTURBED AREA SHALL BE LEFT UNSTABILIZED OVERNIGHT UNLESS THE RUNOFF IS DIRECTED TO AN MDE APPROVED CONTROL DEVICE.

**PHASE 1- LOWER MAIN STEM, TRIBUTARY REACH 4, AND TEMPORARY ACCESS ROAD WORK**

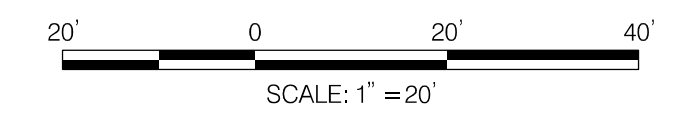
**TREE PROTECTION FENCE (TPF)\***

180 LF PERIMETER AROUND EX. TREES AS SHOWN (9 EX. TREES)

\*NOTE- TO BE PAID FOR UNDER THE TEMPORARY ORANGE CONSTRUCTION FENCE PAY ITEM.

**NOTICE TO CONTRACTOR- EROSION AND SEDIMENT CONTROL WILL BE STRICTLY ENFORCED.**

ACCESS PATH POINT CONTROL TABLE		
POINT NO.	NORTHING	EASTING
16	680323.3550	1542775.3053
17	680324.8866	1542811.5235
18	680333.3975	1542854.7131
19	680324.7365	1542914.5590
20	680338.9498	1542978.4333
21	680364.5271	1543074.3223
22	680382.2681	1543152.3950
23	680372.7672	1543218.2623
24	680350.4194	1543292.6148
25	680353.3702	1543373.5837
26	680365.1481	1543364.6447
27	680385.8430	1543334.4678
28	680383.8410	1543322.4924
29	680362.8334	1543303.2595
30	680363.4483	1543283.3615
31	680384.5517	1543220.8723
32	680393.9698	1543149.7360
33	680376.1793	1543071.4454
34	680350.6090	1542975.5825
35	680336.4500	1542911.9525
36	680345.0550	1542857.5597
37	680335.3382	1542797.2710
38	680335.3455	1542773.3557
39	680412.4837	1543317.9820



HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88  
 MDE # 19-SF-0196; 18-NT-0086

**LEGEND**

NOTE- SEE DWG. NO. AB-01 FOR OTHER FEATURES.

	CREATED WETLAND		TEMPORARY ACCESS BRIDGE
	LIMITS OF DISTURBANCE		FILTER BAG
	TREE PROTECTION FENCE (TPF)		TEMP. DIVERSION BARRIER
	PROP. CHANNEL		8" THICK MULCH ACCESS PATH
	PROP. CONTOUR		PROPOSED RIPRAP
	18 INCH DIAMETER FILTER LOG		STABILIZED CONSTRUCTION ENTRANCE
	217		24 INCH DIAMETER CLEAR WATER DIVERSION PIPE
	SILT FENCE		RIGHT OF WAY LINE
	EX. TREE REMOVAL		TIMBER MATTING FOR ACCESS PATH
	DISCHARGE HOSE		
	PUMP		

CONSTELLATION DESIGN GROUP, INC.  
 CONSULTING ENGINEERS  
 57 W. TIMONIUM ROAD  
 SUITE 200  
 TIMONIUM, MD 21093  
 410-252-1884

Maryland Transportation Authority  
 Engineering Division

ADDENDUMS & REVISIONS		
NO.	DESCRIPTION	BY DATE
1	FLOODPLAIN LINE REVISION	JCT 6/16/20

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
 CARNS RUN STREAM RESTORATION**

JOHN F. KENNEDY MEMORIAL HIGHWAY  
 HARFORD COUNTY  
 PHASE I  
 EROSION & SEDIMENT CONTROL PLAN

DESIGNED BY DJW DRAWN BY JCT CHECKED BY CDG  
 CONST. REVIEW BY DATE OCTOBER 2019 SCALE 1" = 20'

CONTRACT NO. KH-3028-0000  
 DRAWING NO. **ES-02**  
 SHEET NO. 23 OF 87



TEMPORARY BARRIER DIVERSION (TBD)	
48 LF TRIB- STA. 27+68, 15' RT TO STA. 27+94, 26' LT H=2 FT. 8 IN. MIN.	TBD I-1
67 LF MAIN- STA. 12+33, 13' RT TO STA. 12+42, 53' LT H=4.5 FT. MIN.	TBD I-2

8" THICK MULCH ACCESS PATH*	
300 SY UNIFORM 12' WIDTH AND 8" DEPTH	

SANDBAGS (SB)	
18 CY MAIN STEM- STA. 4+02, 45' RT TO STA. 4+29, 36' RT H= 4 FT.	SB I-1
9 CY MAIN STEM- AT EX. BOX CULVERT AS SHOWN ON PLAN H= 4 FT.	SB I-2
9 CY MAIN STEM- AT EX. BOX CULVERT AS SHOWN ON PLAN H= 4 FT.	SB I-3
23 CY MAIN STEM- STA. 14+07, 37' LT TO STA. 14+31, 37' LT H= 4 FT.	SB I-4

FILTER BAG (FB)	
1 EA TRIBUTARY- STA. 29+05, 48' RT	FB I-1

18 INCH FILTER LOG (FL)	
18 LF MAIN STEM- STA. 11+85, 85' RT TO STA. 11+74, 76' RT	FL I-1
57 LF MAIN STEM- STA. 11+45, 62' RT TO STA. 11+76, 61' RT	FL I-2
76 LF MAIN STEM- STA. 11+81, 20' RT TO STA. 12+11, 54' RT	FL I-3
28 LF MAIN STEM- STA. 11+59, 17' RT TO STA. 11+83, 15' RT	FL I-4
116 LF MAIN STEM- STA. 12+30, 50' RT TO STA. 13+13, 63' RT	FL I-5
23 LF MAIN STEM- STA. 12+11, 54' RT TO STA. 12+22, 68' RT	FL I-6

PUMP AROUND (PA)	
MAIN STEM- STA. 12+31, 1' LT TO EX. BOX CULVERT.	PA I-1
MAIN STEM- STA. 13+83, 69' RT TO STA. 14+12, 9' RT	PA I-2

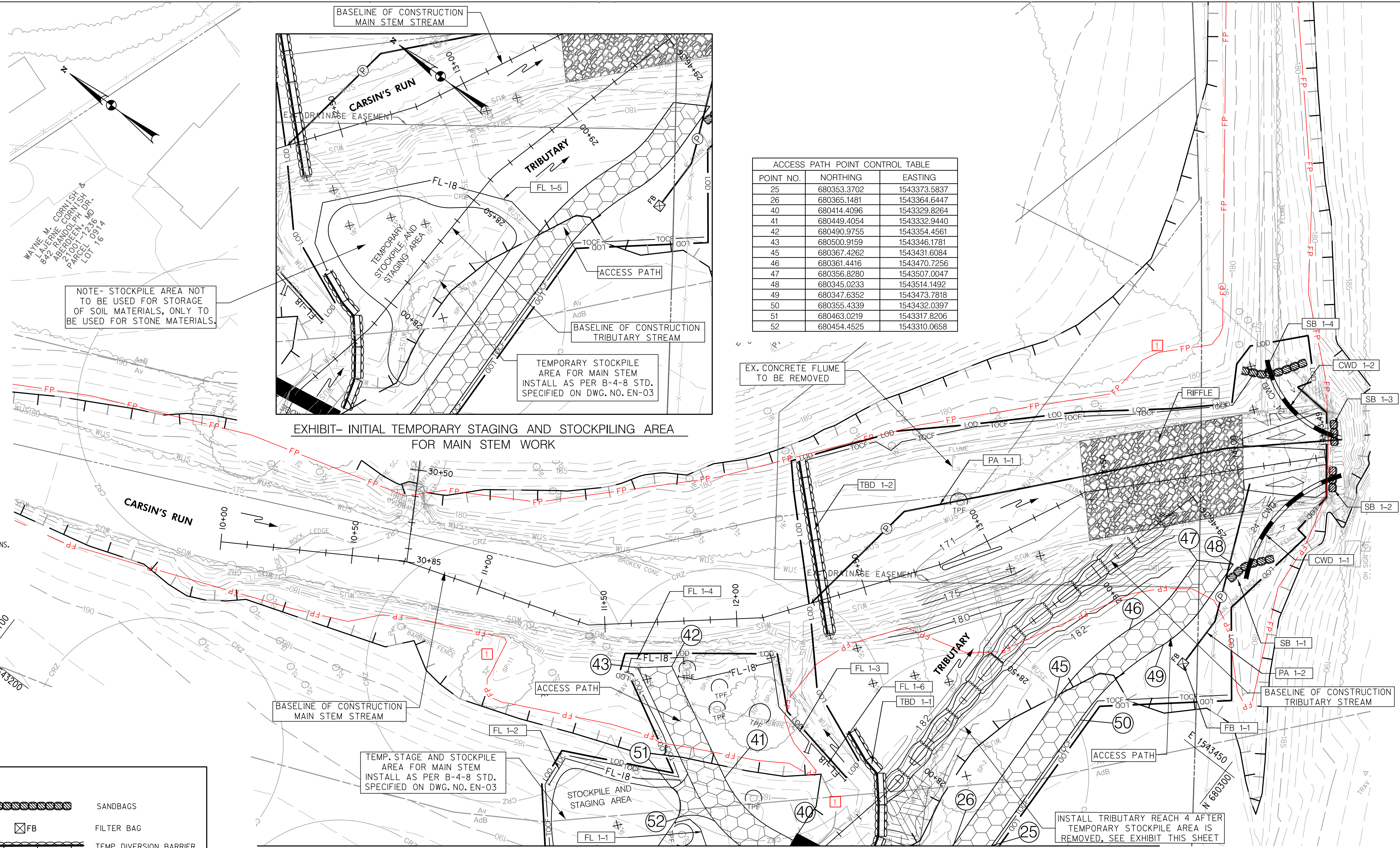
24 INCH CLEAR WATER DIVERSION PIPE*	
56 LF MAIN STEM- STA. 14+07, 43' RT TO D/S OF EX. CULVERT DA=4.80 AC. CWD I-1	
44 LF MAIN STEM- STA. 14+16, 38' LT TO D/S OF EX. CULVERT DA=3.85 AC. CWD I-2	

- NOTES:
1. THE EROSION AND SEDIMENT CONTROL (ES) PLAN IS PRESENTED IN FIVE (5) CONSTRUCTION PHASES SHOWN ON PLAN SHEET ES-01 THROUGH ES-09.
  2. SEE SHEETS SR-01 TO SR-03 FOR PROPOSED STREAM RESTORATION MEASURES, AND PR-01 TO PR-03 FOR PROPOSED PROFILES. FOR LANDSCAPING PLANS, SEE DWG. NO. LP-01 TO LP-03.
  3. THE CONTRACTOR AND ITS DRIVERS SHALL TAKE EXTRA PRECAUTION WHEN DRIVING AND HAULING MATERIALS ON THE ACCESS ROAD, SITE AREAS AND CHANNEL TO MINIMIZE IMPACT TO EXISTING FEATURES SUCH AS TREES, WETLANDS, WATERS OF THE U.S., THE STREAM BED, CHANNEL SLOPES, AND NEWLY CONSTRUCTED FEATURES.
  4. FOR MAINTENANCE AND REMOVAL OF PUMP AROUND PRACTICES, SEE CRITERIA SPECIFIED ON DWG. NO. EN-04.
  5. THE REMOVAL AND REPLACEMENT OF SITE FENCE WITHIN THE LOD TO INSTALL THE PROPOSED IMPROVEMENTS TO BE INCLUSIVE IN THE 'REMOVING AND REPLACING OF IN-KIND FENCES' PAY ITEM.

**LEGEND**

NOTE- SEE DWG. NO. AB-01 FOR OTHER FEATURES.

	SANDBAGS		FILTER BAG
	CREATED WETLAND		TEMP. DIVERSION BARRIER
	LIMITS OF DISTURBANCE		8" THICK MULCH ACCESS PATH
	TREE PROTECTION FENCE (TPF)		PROPOSED RIPRAP
	PROP. CHANNEL		STABILIZED CONSTRUCTION ENTRANCE
	PROP. CONTOUR		24" CWD
	18 INCH DIAMETER FILTER LOG		RIGHT OF WAY LINE
	SILT FENCE		
	EX. TREE REMOVAL		
	DISCHARGE HOSE		
	PUMP		

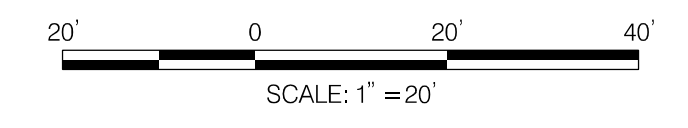


ACCESS PATH POINT CONTROL TABLE		
POINT NO.	NORTHING	EASTING
25	680353.3702	1543373.5837
26	680365.1481	1543364.6447
40	680414.4096	1543329.8264
41	680449.4054	1543332.9440
42	680490.9755	1543354.4561
43	680500.9159	1543346.1781
45	680367.4262	1543431.6084
46	680361.4416	1543470.7256
47	680356.8280	1543507.0047
48	680345.0233	1543514.1492
49	680347.6352	1543473.7818
50	680355.4339	1543432.0397
51	680463.0219	1543317.8206
52	680454.4525	1543310.0658

TREE PROTECTION FENCE (TPF)*		
140 LF PERIMETER AROUND EX. TREES AS SHOWN	(7 EX. TREES)	

\*NOTE- TO BE PAID FOR UNDER THE TEMPORARY ORANGE CONSTRUCTION FENCE PAY ITEM.

PHASE 1- LOWER MAIN STEM, TRIBUTARY STREAM (REACH 4), AND TEMPORARY ACCESS ROAD WORK



HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88  
 MDE # 19-SF-0196; 18-NT-0086

**CONSTELLATION DESIGN GROUP, INC.**  
 CONSULTING ENGINEERS  
 57 W. TIMONIUM ROAD  
 SUITE 200  
 TIMONIUM, MD 21093  
 410-252-1884



**Maryland Transportation Authority**  
 Engineering Division

ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE
1	ADD 100-YR FLOODPLAIN- MD PERMIT (FEMA)	JCT	6/16/20

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
 CARSINS RUN STREAM RESTORATION**

JOHN F. KENNEDY MEMORIAL HIGHWAY  
 HARFORD COUNTY  
 PHASE 1  
 EROSION & SEDIMENT CONTROL PLAN

DESIGNED BY DJW    DRAWN BY JCT    CHECKED BY CDG  
 CONST. REVIEW BY    DATE OCTOBER 2019    SCALE 1" = 20'

CONTRACT NO. KH-3028-0000
DRAWING NO. <b>ES-03</b>
SHEET NO. 24 OF 87

RIPRAP OUTLET PROTECTION (ROP)		
•	MAIN STEM- STA. 12+52, 2' RT	(10'LX10'WX19"D) ROP 2-1
•	MAIN STEM- STA. 10+38, 2' RT	(5'LX5'WX19"D) ROP 2-2

TEMPORARY BARRIER DIVERSION (TBD)		
•	32 LF TRIB- STA. 27+62, 6' LT TO STA. 27+94, 8' LT	H=2 FT. 8 IN. MIN. TBD 2-1
•	MAIN- STA. 12+41, 15' RT TO STA. 12+49, 53' LT	H=4.5 FT. MIN. TBD 1-2
•	45 LF MAIN- STA. 10+41, 17' RT TO STA. 10+44, 27' LT	H=4.5 FT. MIN. TBD 2-2

FILTER BAG (FB)		
•	1 EA	MAIN STEM- STA. 12+61, 29' RT
		FB 2-1

PUMP AROUND (PA)		
•	MAIN STEM- STA. 12+35, 27' RT TO STA. 12+40, 2' RT	PA 2-1
•	MAIN STEM- STA. 10+38, 2' RT TO STA. 12+48, 1' RT	PA 2-2
•	MAIN STEM- STA. 10+38, 1' LT TO STA. 10+70, 40' LT	PA 2-3

**PHASE 2- SEQUENCE OF CONSTRUCTION**

INSTALL PHASE 2 TREE PROTECTION FENCE (TPF) AS SHOWN ON THE PLANS AND RECEIVE APPROVAL FROM THE INSPECTOR BEFORE ANY CLEARING.

A. MAINTAIN THE STABILIZED ENTRANCE SCE 1-1 AND TBD 1-2 FROM PHASE 1, AND CONSTRUCT AND/OR MAINTAIN THE TREE PROTECTION FENCE, STAGE AND STOCKPILE WITHIN DESIGNATED AREAS SHOWN ON THE PLAN SET. MAINTAIN THE TEMPORARY ACCESS BRIDGE TAB 1-1 ACROSS THE TRIBUTARY CHANNEL. MAINTAIN FILTER LOGS FL 1-1 AND FL 1-2 FROM PHASE 1.

B. CLEAR AND GRUB ONLY AS NECESSARY FOR INSTALLATION OF PHASE 2 EROSION AND SEDIMENT CONTROL DEVICES.

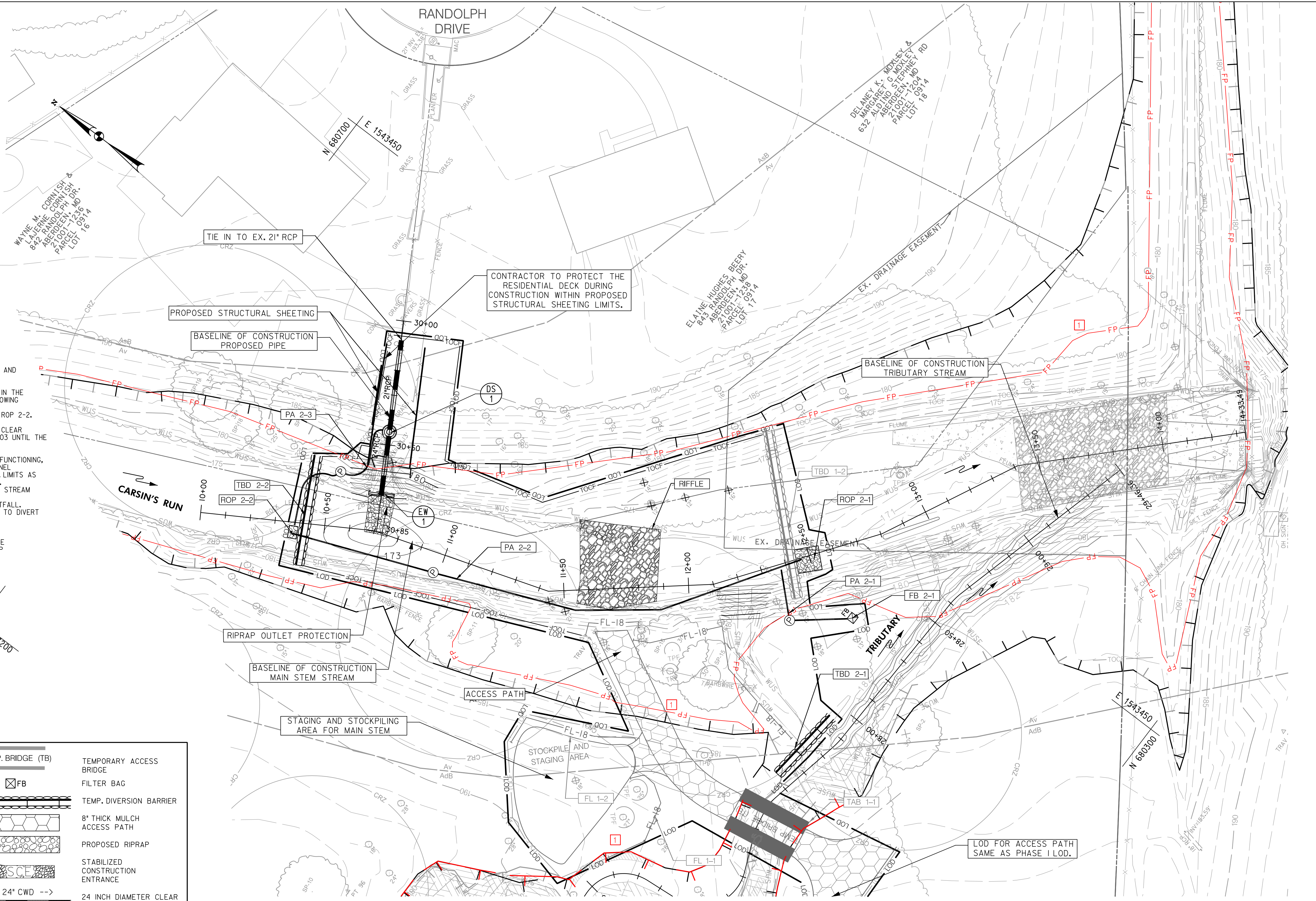
C. WORKING FROM DOWNSTREAM TO UPSTREAM, INSTALL TEMP. BARRIER DIVERSIONS IN THE STREAM CHANNEL AND UTILIZE PUMP AROUND SYSTEMS, WHICH INCLUDES THE FOLLOWING CONTROLS: TEMP. BARRIER DIVERSIONS TBD 2-1 AND TBD 2-2, FILTER BAG FB 2-1, PUMP AROUND PA 2-1 AND PA 2-2, AND RIPRAP OUTLET PROTECTION ROP 2-1 AND ROP 2-2. DEWATER BETWEEN THE TEMP. BARRIER DIVERSIONS. ALL WATER COLLECTING IN THE WORK AREA SHALL BE PUMPED TO FILTER BAG FB 2-1. MAINTAIN THE PHASE 1 CLEAR WATER DIVERSION SB 1-2, SB 1-3, TBD 1-2, AND PA 1-1 AS SHOWN ON DWG. NO. ES-03 UNTIL THE PHASE 2 CLEAR WATER DIVERSION PA 2-2, TBD 2-2 HAS BEEN INSTALLED.

D. ONCE TEMP. DIVERSION BARRIERS ARE INSTALLED AND PUMP AROUND PRACTICES FUNCTIONING, AND WITH APPROVAL FROM THE INSPECTOR, CONSTRUCT AND GRADE STREAM CHANNEL AND IN STREAM STRUCTURES AS SHOWN ON THE PLANS, WITHIN THE PHASE 2 STA. LIMITS AS SPECIFIED IN SEQUENCE OF CONSTRUCTION GENERAL NOTE 4 ON DRAWING NO. ES-01. IN ADDITION, INSTALL THE CLAY CORE DOWNSTREAM OF TBD 2-1 AS SHOWN ON THE STREAM RESTORATION PLANS TO BLOCK AND BACKFILL THE EXISTING TRIBUTARY CHANNEL. INSTALL THE 21" RCP AND ASSOCIATED DROP MANHOLE STRUCTURE AND RIPRAP OUTFALL. BLOCK THE MANHOLE OUTLET TO THE 21" RCP AND INSTALL PA 2-3 PUMP SYSTEM TO DIVERT CLEAR WATER ENTERING THE MANHOLE TO A LOCATION AS SHOWN OUTSIDE THE LOD AT ROP 2-1. INSTALL LANDSCAPING WITHIN THE PHASE 2 LOD.

E. ONCE PHASE 2 WORK IS COMPLETE AND UPON ESC INSPECTOR APPROVAL, REMOVE ALL PHASE 2 CONTROLS AND UNBLOCK THE MANHOLE CONNECTION INTO THE 21" RCP AND PROCEED TO PHASE 3.

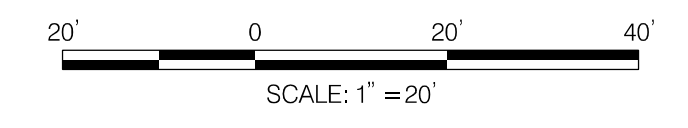
- NOTES:
1. THE EROSION AND SEDIMENT CONTROL (ES) PLAN IS PRESENTED IN FIVE (5) CONSTRUCTION PHASES SHOWN ON PLAN SHEET ES-01 THROUGH ES-09.
  2. SEE SHEETS SR-01 TO SR-03 FOR PROPOSED STREAM RESTORATION MEASURES, AND PR-01 TO PR-03 FOR PROPOSED PROFILES. FOR LANDSCAPING PLANS, SEE DWG. NO. LP-01 TO LP-03.
  3. THE CONTRACTOR AND ITS DRIVERS SHALL TAKE EXTRA PRECAUTION WHEN DRIVING AND HAULING MATERIALS ON THE ACCESS ROAD, SITE AREAS AND CHANNEL TO MINIMIZE IMPACT TO EXISTING FEATURES SUCH AS TREES, WETLANDS, WATERS OF THE U.S., THE STREAM BED, CHANNEL SLOPES, AND NEWLY CONSTRUCTED FEATURES.
  4. FOR MAINTENANCE AND REMOVAL OF PUMP AROUND PRACTICES, SEE CRITERIA SPECIFIED ON DWG. NO. EN-04.
  5. THE REMOVAL AND REPLACEMENT OF SITE FENCE WITHIN THE LOD TO INSTALL THE PROPOSED IMPROVEMENTS TO BE INCLUSIVE IN THE "REMOVING AND REPLACING OF IN-KIND FENCES" PAY ITEM.

LEGEND	
NOTE- SEE DWG. NO. AB-01 FOR OTHER FEATURES.	
	CREATED WETLAND
	LIMITS OF DISTURBANCE
	TREE PROTECTION FENCE (TPF)
	PROP. CHANNEL
	PROP. CONTOUR
	18 INCH DIAMETER FILTER LOG
	SILTY FENCE
	EX. TREE REMOVAL
	DISCHARGE HOSE
	PUMP
	TEMP. BRIDGE (TB)
	TEMPORARY ACCESS BRIDGE
	FILTER BAG
	TEMP. DIVERSION BARRIER
	8" THICK MULCH ACCESS PATH
	PROPOSED RIPRAP
	STABILIZED CONSTRUCTION ENTRANCE
	24 INCH DIAMETER CLEAR WATER DIVERSION PIPE
	RIGHT OF WAY LINE



NOTICE TO CONTRACTOR- EROSION AND SEDIMENT CONTROL WILL BE STRICTLY ENFORCED.

**PHASE 2- UPPER MAIN STEM WORK**



HORIZONTAL DATUM NAD 83/91
VERTICAL DATUM NAVD 88
MDE # 19-SF-0196; 18-NT-0086

CONSTELLATION DESIGN GROUP, INC.  
CONSULTING ENGINEERS  
57 W. TIMONIUM ROAD  
SUITE 200  
TIMONIUM, MD 21093  
410-252-1884

STATE OF MARYLAND  
PROFESSIONAL ENGINEER

Maryland Transportation Authority  
Engineering Division

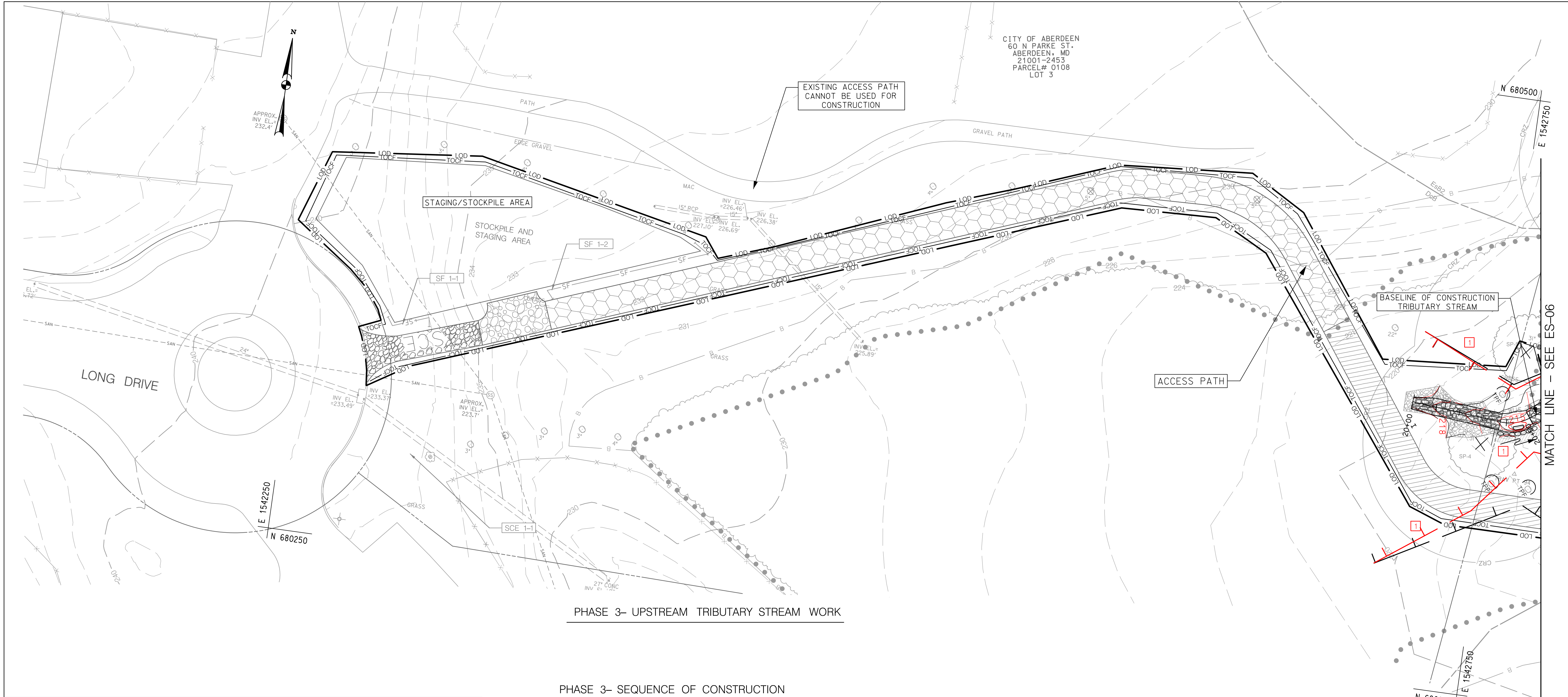
ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE
1	ADD 100-YR FLOODPLAIN- MD PERMIT (FEMA)	JCT	6/16/20

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
CARBINS RUN STREAM RESTORATION**

JOHN F. KENNEDY MEMORIAL HIGHWAY  
HARFORD COUNTY  
PHASE 2  
EROSION & SEDIMENT CONTROL PLAN

DESIGNED BY DJW    DRAWN BY JCT    CHECKED BY CDG  
CONST. REVIEW BY    DATE OCTOBER 2019    SCALE 1" = 20'

CONTRACT NO. KH-3028-0000
DRAWING NO. <b>ES-04</b>
SHEET NO. 25 OF 87



**PHASE 3- UPSTREAM TRIBUTARY STREAM WORK**

**PHASE 3- SEQUENCE OF CONSTRUCTION**

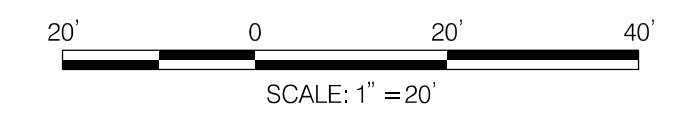
- INSTALL PHASE 3 TREE PROTECTION FENCE (TPF) AS SHOWN ON THE PLANS AND RECEIVE APPROVAL FROM THE INSPECTOR BEFORE ANY CLEARING.
- A. MAINTAIN THE STABILIZED ENTRANCE SCE 1-1 AND CONSTRUCT AND/OR MAINTAIN THE TREE PROTECTION FENCE, STAGE AND STOCKPILE WITHIN DESIGNATED AREAS SHOWN ON THE PLAN SET, MAINTAIN THE TEMPORARY ACCESS BRIDGE TAB 1-1 ACROSS THE TRIBUTARY CHANNEL.
- B. CLEAR AND GRUB ONLY AS NECESSARY FOR INSTALLATION OF PHASE 3 EROSION AND SEDIMENT CONTROL DEVICES.
- C. WORKING FROM DOWNSTREAM TO UPSTREAM, INSTALL SANDBAGS IN THE STREAM CHANNEL AND UTILIZE PUMP AROUND SYSTEMS, WHICH INCLUDES THE FOLLOWING CONTROLS: SANDBAG SB 3-2, FILTER BAG FB 3-1, AND PUMP AROUND PA 3-2. DEWATER BETWEEN THE SANDBAG, ALL WATER COLLECTING IN THE WORK AREA SHALL BE PUMPED TO FILTER BAG FB 3-1.
- D. ONCE THE SANDBAG IS INSTALLED AND PUMP AROUND PRACTICES FUNCTIONING, AND WITH APPROVAL FROM THE INSPECTOR, CONSTRUCT AND GRADE STREAM CHANNEL AND IN STREAM STRUCTURES AS SHOWN ON THE PLANS, WITHIN THE PHASE 3 STA. LIMITS AS SPECIFIED IN SEQUENCE OF CONSTRUCTION GENERAL NOTE 4 ON DRAWING NO. ES-01. INSTALL LANDSCAPING WITHIN THE PHASE 3 LOD.
- E. ONCE PHASE 3 WORK IS COMPLETE AND UPON ESC INSPECTOR APPROVAL, REMOVE ALL PHASE 3 CONTROLS EXCEPT FOR SB 3-2 AND PROCEED TO PHASE 4. MAINTAIN PHASE 3 DIVERSION CONTROLS SB 3-2 UNTIL SB 4-1 AND PA 4-1 ARE INSTALLED IN PHASE 4.

**NOTICE TO CONTRACTOR- EROSION AND SEDIMENT CONTROL WILL BE STRICTLY ENFORCED.**

TREE PROTECTION FENCE (TPF)*		
60 LF	PERIMETER AROUND EX. TREES AS SHOWN	(3 EX. TREES)

\*NOTE- TO BE PAID FOR UNDER THE TEMPORARY ORANGE CONSTRUCTION FENCE PAY ITEM.

- NOTES:**
1. THE EROSION AND SEDIMENT CONTROL (ES) PLAN IS PRESENTED IN FIVE (5) CONSTRUCTION PHASES SHOWN ON PLAN SHEET ES-01 THROUGH ES-09.
  2. SEE SHEETS SR-01 TO SR-03 FOR PROPOSED STREAM RESTORATION MEASURES, AND PR-01 TO PR-03 FOR PROPOSED PROFILES. FOR LANDSCAPING PLANS, SEE DWG. NO. LP-01 TO LP-03.
  3. THE CONTRACTOR AND ITS DRIVERS SHALL TAKE EXTRA PRECAUTION WHEN DRIVING AND HAULING MATERIALS ON THE ACCESS ROAD, SITE AREAS AND CHANNEL TO MINIMIZE IMPACT TO EXISTING FEATURES SUCH AS TREES, WETLANDS, WATERS OF THE U.S., THE STREAM BED, CHANNEL SLOPES, AND NEWLY CONSTRUCTED FEATURES.
  4. FOR MAINTENANCE AND REMOVAL OF PUMP AROUND PRACTICES, SEE CRITERIA SPECIFIED ON DWG. NO. EN-04.



HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88  
 MDE # 19-SF-0196; 18-NT-0086

**LEGEND**  
 NOTE- SEE DWG. NO. AB-01 FOR OTHER FEATURES.

	CREATED WETLAND		TIMBER MATTING FOR ACCESS PATH
	SANDBAG BARRIER		DIVERSION FENCE
	LIMITS OF DISTURBANCE		FILTER BAG
	TREE PROTECTION FENCE (TPF)		TEMP. DIVERSION BARRIER
	PROP. CHANNEL		8" THICK MULCH ACCESS PATH
	PROP. CONTOUR		PROPOSED RIPRAP
	18 INCH DIAMETER FILTER LOG		STABILIZED CONSTRUCTION ENTRANCE
	217		24 INCH DIAMETER CLEAR WATER DIVERSION PIPE
	18" FL		RIGHT OF WAY LINE
	SILT FENCE		
	EX. TREE REMOVAL		
	DISCHARGE HOSE		
	PUMP		

CONSTELLATION DESIGN GROUP, INC.  
 CONSULTING ENGINEERS  
 57 W. TIMONIUM ROAD  
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 410-252-1884

**Maryland Transportation Authority**  
*Engineering Division*

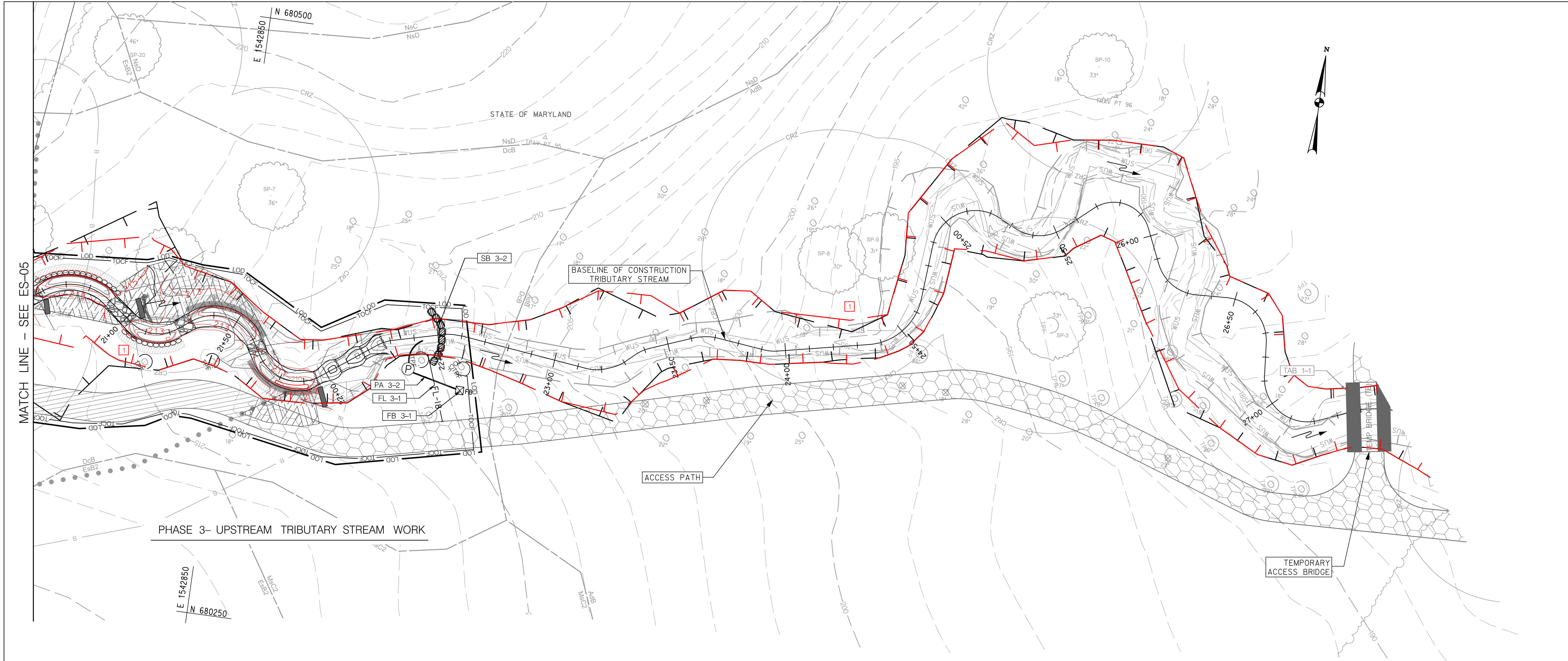
ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE
1	GRADING, RGC, AND EXCAVATION ADJUSTMENTS	JCT	6/16/20

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
 CARNS RUN STREAM RESTORATION**

JOHN F. KENNEDY MEMORIAL HIGHWAY  
 HARFORD COUNTY  
 PHASE 3  
 EROSION & SEDIMENT CONTROL PLAN

DESIGNED BY	DJW	DRAWN BY	JCT	CHECKED BY	CDG
CONST. REVIEW BY		DATE	OCTOBER 2019	SCALE	1" = 20'

CONTRACT NO.	KH-3028-0000
DRAWING NO.	<b>ES-05</b>
SHEET NO.	26 OF 87



MATCH LINE - SEE ES-05

**PHASE 3- UPSTREAM TRIBUTARY STREAM WORK**

**LEGEND**

NOTE- SEE DWG. NO. AB-01 FOR OTHER FEATURES.

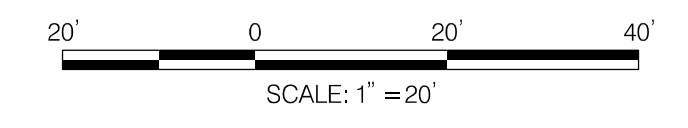
	CREATED WETLAND
	LIMITS OF DISTURBANCE
	TREE PROTECTION FENCE (TPF)
	PROP. CHANNEL
	PROP. CONTOUR
	18 INCH DIAMETER FILTER LOG
	SILT FENCE
	EX. TREE REMOVAL
	DISCHARGE HOSE
	PUMP

	TEMPORARY ACCESS BRIDGE
	FILTER BAG
	TEMP. DIVERSION BARRIER
	8" THICK MULCH ACCESS PATH
	PROPOSED RIPRAP
	STABILIZED CONSTRUCTION ENTRANCE
	24" DIAMETER CLEAR WATER DIVERSION PIPE
	RIGHT OF WAY LINE
	SANDBAG BARRIER

**NOTICE TO CONTRACTOR- EROSION AND SEDIMENT CONTROL WILL BE STRICTLY ENFORCED.**

- NOTES:**
1. THE EROSION AND SEDIMENT CONTROL (ES) PLAN IS PRESENTED IN FIVE (5) CONSTRUCTION PHASES SHOWN ON PLAN SHEET ES-01 THROUGH ES-09.
  2. SEE SHEETS SR-01 TO SR-03 FOR PROPOSED STREAM RESTORATION MEASURES, AND PR-01 TO PR-03 FOR PROPOSED PROFILES. FOR LANDSCAPING PLANS, SEE DWG. NO. LP-01 TO LP-03.
  3. THE CONTRACTOR AND ITS DRIVERS SHALL TAKE EXTRA PRECAUTION WHEN DRIVING AND HAULING MATERIALS ON THE ACCESS ROAD, SITE AREAS AND CHANNEL TO MINIMIZE IMPACT TO EXISTING FEATURES SUCH AS TREES, WETLANDS, WATERS OF THE U.S., THE STREAM BED, CHANNEL SLOPES, AND NEWLY CONSTRUCTED FEATURES.
  4. FOR MAINTENANCE AND REMOVAL OF PUMP AROUND PRACTICES, SEE CRITERIA SPECIFIED ON DWG. NO. EN-04.

<p><b>PUMP AROUND (PA)</b></p> <ul style="list-style-type: none"> <li>• TRIBUTARY- STA. 22+43, 2' RT TO STA. 22+63, 22' RT PA 3-2</li> <li>• COST FOR HOSE AND PUMP INCIDENTAL TO MAINTENANCE OF STREAM FLOW PAY ITEM.</li> </ul>	
<p><b>18 INCH FILTER LOG (FL)</b></p> <ul style="list-style-type: none"> <li>28 LF TRIBUTARY- STA. 22+45, 8' RT TO STA. 22+47, 36' RT FL 3-1</li> </ul>	
<p><b>SANDBAGS (SB)</b></p> <ul style="list-style-type: none"> <li>6 CY TRIB- STA. 22+44, 11' LT TO STA. 22+46, 12' RT H=2 FT. MIN. SB 3-2</li> <li>•NOTE- THE TOP ELEVATION OF THE SB SHOULD TIE INTO THE EX. GROUND ELEVATION ON BOTH TERMINAL ENDS OF THE SB BARRIER.</li> </ul>	
<p><b>TREE PROTECTION FENCE (TPF)*</b></p> <ul style="list-style-type: none"> <li>80 LF PERIMETER AROUND EX. TREES AS SHOWN (4 EX. TREES)</li> <li>•NOTE- TO BE PAID FOR UNDER THE TEMPORARY ORANGE CONSTRUCTION FENCE PAY ITEM.</li> </ul>	
<p><b>FILTER BAG (FB)</b></p> <ul style="list-style-type: none"> <li>1 EA TRIBUTARY- STA. 22+65, 22' RT FB 3-1</li> </ul>	



HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88  
 MDE # 19-SF-0196; 18-NT-0086



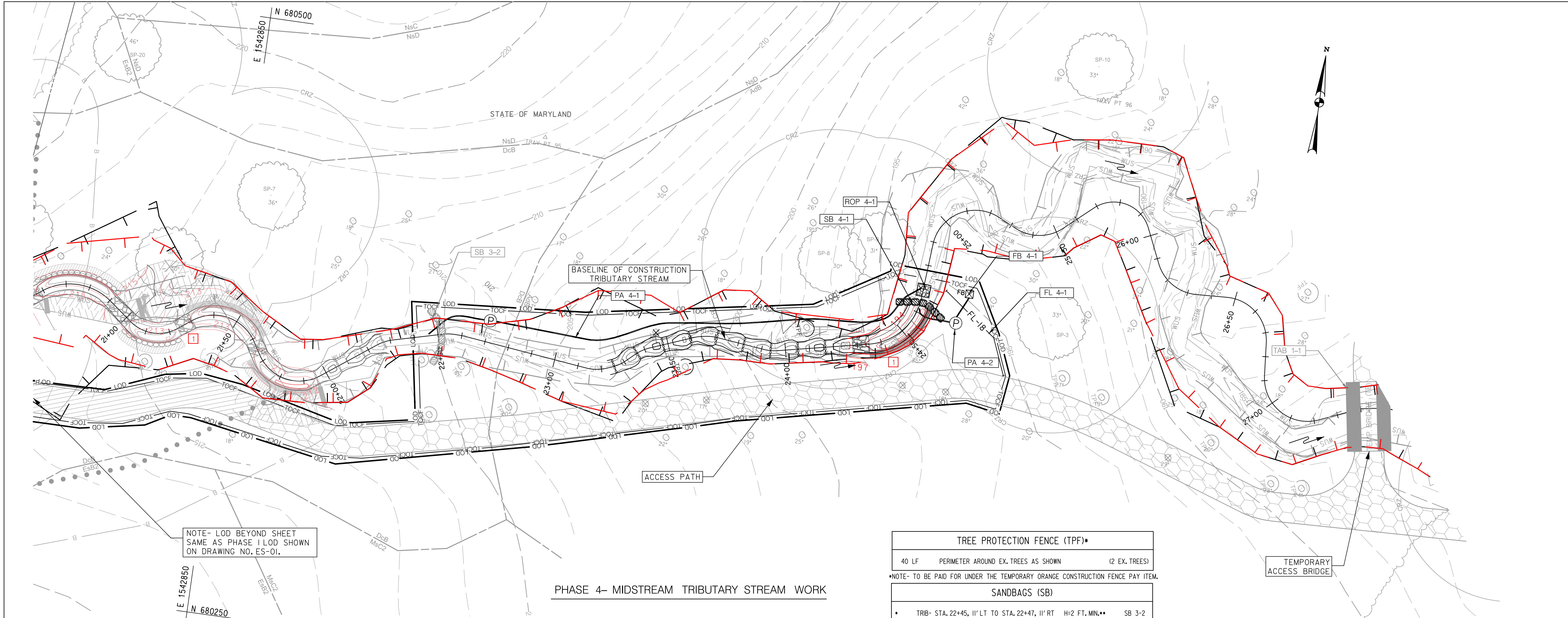
ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE
1	GRADING, RGC, AND EXCAVATION ADJUSTMENTS	JCT	6/16/20

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION  
 CARNS RUN STREAM RESTORATION**

JOHN F. KENNEDY MEMORIAL HIGHWAY  
 HARBOR COUNTY  
 PHASE 3  
 EROSION & SEDIMENT CONTROL PLAN

DESIGNED BY DJW DRAWN BY JCT CHECKED BY CDG  
 CONST. REVIEW BY DATE OCTOBER 2019 SCALE 1" = 20'

CONTRACT NO. KH-3028-0000  
 DRAWING NO. **ES-06**  
 SHEET NO. 27 OF 87



NOTE- LOD BEYOND SHEET SAME AS PHASE 1 LOD SHOWN ON DRAWING NO. ES-01.

**PHASE 4- MIDSTREAM TRIBUTARY STREAM WORK**

**PHASE 4- SEQUENCE OF CONSTRUCTION**

INSTALL PHASE 4 TREE PROTECTION FENCE (TPF) AS SHOWN ON THE PLANS AND RECEIVE APPROVAL FROM THE INSPECTOR BEFORE ANY CLEARING.

A. MAINTAIN THE STABILIZED ENTRANCE SCE 1-1, MAINTAIN THE LOD, AND CONSTRUCT AND/OR MAINTAIN THE TREE PROTECTION FENCE, STAGE AND STOCKPILE WITHIN DESIGNATED AREAS SHOWN ON THE PLAN SET. MAINTAIN THE TEMPORARY ACCESS BRIDGE TAB 1-1 ACROSS THE TRIBUTARY CHANNEL.

B. CLEAR AND GRUB ONLY AS NECESSARY FOR INSTALLATION OF PHASE 4 EROSION AND SEDIMENT CONTROL DEVICES. INSTALL PERIMETER CONTROL- 18 INCH FILTER LOG FL 4-1.

C. WORKING FROM DOWNSTREAM TO UPSTREAM, INSTALL SANDBAGS IN THE STREAM CHANNEL AND UTILIZE PUMP AROUND SYSTEMS, WHICH INCLUDES THE FOLLOWING CONTROLS: SANDBAGS SB 4-1, FILTER BAG FB 4-1, PUMP AROUND PA 4-1 AND RIPRAP OUTLET PROTECTION ROP 4-1. DEWATER BETWEEN THE SANDBAGS. ALL WATER COLLECTING IN THE WORK AREA SHALL BE PUMPED TO FILTER BAG FB 4-1.

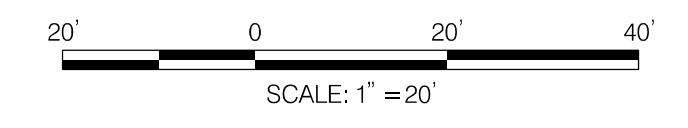
D. ONCE SANDBAGS ARE INSTALLED AND PUMP AROUND PRACTICES FUNCTIONING, AND WITH APPROVAL FROM THE INSPECTOR, CONSTRUCT AND GRADE STREAM CHANNEL AND IN STREAM STRUCTURES AS SHOWN ON THE PLANS, WITHIN THE PHASE 4 STA. LIMITS AS SPECIFIED IN SEQUENCE OF CONSTRUCTION GENERAL NOTE 4 ON DRAWING NO. ES-01. INSTALL LANDSCAPING WITHIN THE PHASE 4 LOD.

E. ONCE PHASE 4 WORK IS COMPLETE AND UPON ESC INSPECTOR APPROVAL, REMOVE ALL PHASE 4 CONTROLS EXCEPT FOR SB 3-2, SB 4-1, AND PA 4-1 AND PROCEED TO PHASE 5. MAINTAIN PHASE 4 DIVERSION CONTROLS SB 3-2, SB 4-1, AND PA 4-1 UNTIL SB 5-1 AND PA 5-1 ARE INSTALLED IN PHASE 5.

TREE PROTECTION FENCE (TPF)*		
40 LF	PERIMETER AROUND EX. TREES AS SHOWN	(2 EX. TREES)
*NOTE- TO BE PAID FOR UNDER THE TEMPORARY ORANGE CONSTRUCTION FENCE PAY ITEM.		
SANDBAGS (SB)		
6 CY	TRIB- STA. 22+45, 11' LT TO STA. 22+47, 11' RT H=2 FT. MIN.**	SB 3-2
	TRIB- STA. 24+60, 10' LT TO STA. 24+62, 12' RT H=2 FT. MIN.**	SB 4-1
*NOTE- QUANTITY SPECIFIED ON PHASE 3 PLAN SHEET (DWG. NO. ES-06).		
**NOTE- THE TOP ELEVATION OF THE SB SHOULD TIE INTO THE EX. GROUND ELEVATION ON BOTH TERMINAL ENDS OF THE SB BARRIER.		
PUMP AROUND (PA)		
	TRIBUTARY- STA. 22+46, 1' LT TO STA. 24+69, BASELINE	PA 4-1
	TRIBUTARY- STA. 24+62, BASELINE TO STA. 24+71, 19' RT	PA 4-2
* COST FOR HOSE AND PUMP INCIDENTAL TO MAINTENANCE OF STREAM FLOW PAY ITEM.		
18 INCH FILTER LOG (FL)		
44 LF	TRIBUTARY- STA. 24+57, 45' RT TO STA. 24+71, 10' RT	FL 4-1
FILTER BAG (FB)		
1 EA	TRIBUTARY- STA. 24+72, 19' RT	FB 4-1
RIPRAP OUTLET PROTECTION (ROP)		
	TRIBUTARY- STA. 24+69, BASELINE (5'LX5'WX19'D)	ROP 4-1
* COST OF RIPRAP TO BE INCIDENTAL TO MAINTENANCE OF STREAM FLOW PAY ITEM.		

**NOTICE TO CONTRACTOR- EROSION AND SEDIMENT CONTROL WILL BE STRICTLY ENFORCED.**

- NOTES:
1. THE EROSION AND SEDIMENT CONTROL (ES) PLAN IS PRESENTED IN FIVE (5) CONSTRUCTION PHASES SHOWN ON PLAN SHEET ES-01 THROUGH ES-09.
  2. SEE SHEETS SR-01 TO SR-03 FOR PROPOSED STREAM RESTORATION MEASURES, AND PR-01 TO PR-03 FOR PROPOSED PROFILES. FOR LANDSCAPING PLANS, SEE DWG. NO. LP-01 TO LP-03.
  3. THE CONTRACTOR AND ITS DRIVERS SHALL TAKE EXTRA PRECAUTION WHEN DRIVING AND HAULING MATERIALS ON THE ACCESS ROAD, SITE AREAS AND CHANNEL TO MINIMIZE IMPACT TO EXISTING FEATURES SUCH AS TREES, WETLANDS, WATERS OF THE U.S., THE STREAM BED, CHANNEL SLOPES, AND NEWLY CONSTRUCTED FEATURES.
  4. FOR MAINTENANCE AND REMOVAL OF PUMP AROUND PRACTICES, SEE CRITERIA SPECIFIED ON DWG. NO. EN-04.



HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88  
 MDE # 19-SF-0196; 18-NT-0086

LEGEND	
NOTE- SEE DWG. NO. AB-01 FOR OTHER FEATURES.	
	CREATED WETLAND
	LIMITS OF DISTURBANCE
	TREE PROTECTION FENCE (TPF)
	PROP. CHANNEL
	PROP. CONTOUR
	18 INCH DIAMETER FILTER LOG
	SILT FENCE
	EX. TREE REMOVAL
	DISCHARGE HOSE
	PUMP
	TEMP. BRIDGE (TB) TEMPORARY ACCESS BRIDGE
	FILTER BAG
	TEMP. DIVERSION BARRIER
	8" THICK MULCH ACCESS PATH
	PROPOSED RIPRAP
	STABILIZED CONSTRUCTION ENTRANCE
	24" CWD --> 24 INCH DIAMETER CLEAR WATER DIVERSION PIPE
	RIGHT OF WAY LINE
	SANDBAG BARRIER

CONSTELLATION DESIGN GROUP, INC.  
 CONSULTING ENGINEERS  
 57 W. TIMONIUM ROAD  
 SUITE 200  
 TIMONIUM, MD 21093  
 410-252-1884

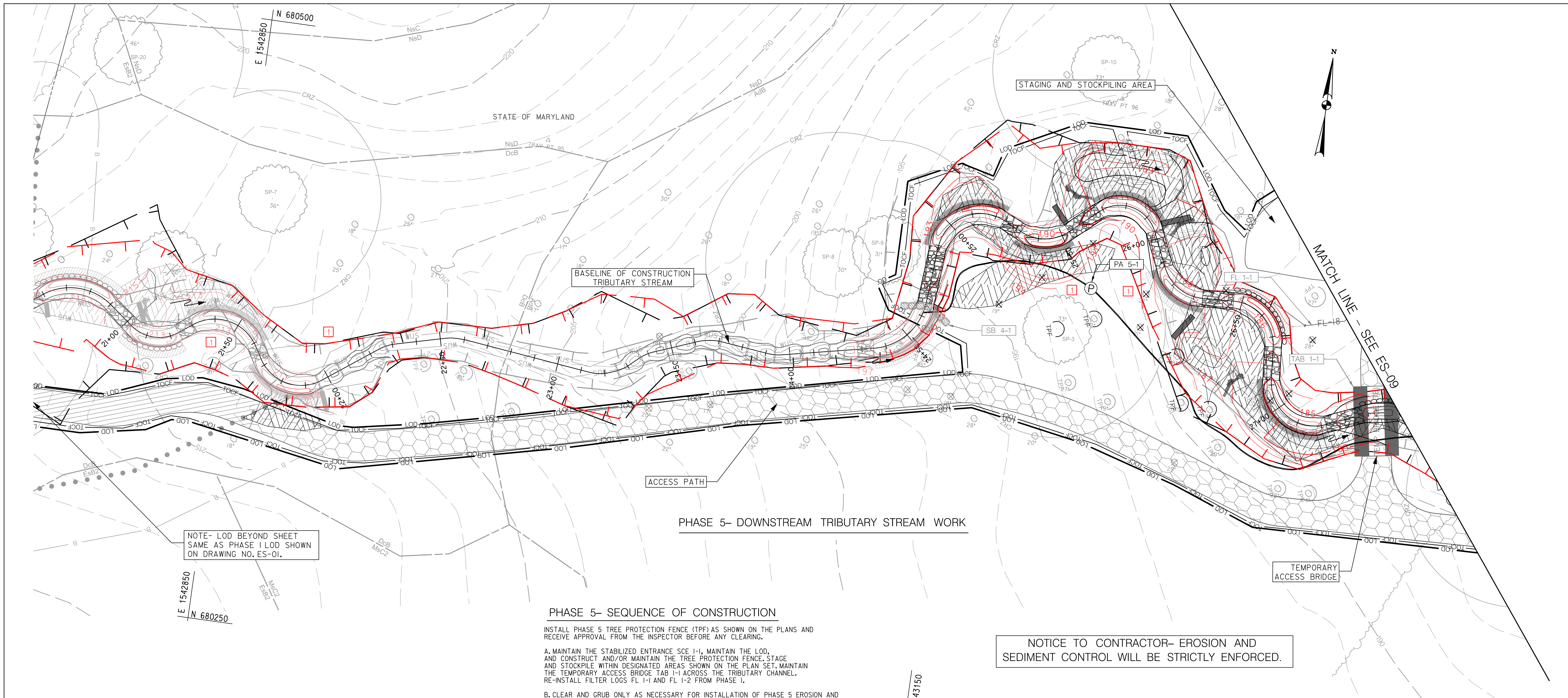
**Maryland Transportation Authority**  
*Engineering Division*

ADDENDUMS & REVISIONS		
NO.	DESCRIPTION	BY DATE
1	GRADING, RGC, AND EXCAVATION ADJUSTMENTS	JCT 6/16/20

**I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION**  
**CARSINS RUN STREAM RESTORATION**

JOHN F. KENNEDY MEMORIAL HIGHWAY  
 HARBOR COUNTY  
 PHASE 4  
 EROSION & SEDIMENT CONTROL PLAN

DESIGNED BY DJW	DRAWN BY JCT	CHECKED BY CDG	SHEET NO. 28 OF 87
CONST. REVIEW BY	DATE OCTOBER 2019	SCALE 1" = 20'	



NOTE- LOD BEYOND SHEET SAME AS PHASE I LOD SHOWN ON DRAWING NO. ES-01.

**PHASE 5- DOWNSTREAM TRIBUTARY STREAM WORK**

**PHASE 5- SEQUENCE OF CONSTRUCTION**

INSTALL PHASE 5 TREE PROTECTION FENCE (TPF) AS SHOWN ON THE PLANS AND RECEIVE APPROVAL FROM THE INSPECTOR BEFORE ANY CLEARING.

A. MAINTAIN THE STABILIZED ENTRANCE SCE I-1. MAINTAIN THE LOD, AND CONSTRUCT AND/OR MAINTAIN THE TREE PROTECTION FENCE, STAGE AND STOCKPILE WITHIN DESIGNATED AREAS SHOWN ON THE PLAN SET. MAINTAIN THE TEMPORARY ACCESS BRIDGE TAB I-1 ACROSS THE TRIBUTARY CHANNEL. RE-INSTALL FILTER LOGS FL I-1 AND FL I-2 FROM PHASE I.

B. CLEAR AND GRUB ONLY AS NECESSARY FOR INSTALLATION OF PHASE 5 EROSION AND SEDIMENT CONTROL DEVICES. INSTALL PERIMETER CONTROL- 18 INCH FILTER LOG FL 5-1.

C. WORKING FROM DOWNSTREAM TO UPSTREAM, INSTALL SANDBAGS IN THE STREAM CHANNEL AND UTILIZE PUMP AROUND SYSTEMS, WHICH INCLUDES THE FOLLOWING CONTROLS: TEMP. SANDBAGS SB 5-1, FILTER BAG FB 5-1, PUMP AROUND PA 5-1 AND PA 5-2, AND RIPRAP OUTLET PROTECTION ROP 5-1. ONCE SB 5-1 AND PA 5-1 IS INSTALLED, MOVE SB 4-1 TO THE NEW STATION AND OFFSET LOCATION AS SPECIFIED ON THIS PLAN SHEET, AND REMOVE SB 3-2 AND PA 4-1, WHICH ARE SHOWN ON DWG. NO. ES-01. DEWATER BETWEEN THE SANDBAGS. ALL WATER COLLECTING IN THE WORK AREA SHALL BE PUMPED TO FILTER BAG FB 5-1.

D. ONCE SANDBAGS ARE INSTALLED AND PUMP AROUND PRACTICES FUNCTIONING, AND WITH APPROVAL FROM THE INSPECTOR, CONSTRUCT AND GRADE STREAM CHANNEL AND IN STREAM STRUCTURES AS SHOWN ON THE PLANS, WITHIN THE PHASE 5 STA. LIMITS AS SPECIFIED IN SEQUENCE OF CONSTRUCTION GENERAL NOTE 4 ON DRAWING NO. ES-01, EXCEPT FOR THE STREAM CHANNEL WITHIN THE TAB I-1 LIMITS. AFTER THE PHASE 5 PROPOSED FEATURES ARE CONSTRUCTED, REMOVE TAB I-1 AND INSTALL THE REMAINDER GRADING AND STRUCTURES WITHIN THE TAB I-1 LIMITS. INSTALL LANDSCAPING WITHIN THE PHASE 5 LOD.

E. WHEN ALL AREAS ARE STABILIZED AND PERMANENT VEGETATION IS ESTABLISHED, AND WITH PERMISSION OF THE INSPECTOR, THE CONTRACTOR IS TO REMOVE ALL REMAINING SEDIMENT CONTROL MEASURES, STABILIZE THE STAGING AND STOCKPILING AREAS, STABILIZE ALL REMAINING AREAS DAMAGED BY THE REMOVAL PROCESS, PERMANENTLY STABILIZE REMAINDER OF PROJECT SITE AS PER THE LANDSCAPING PLANS, AND REMOVE ALL REMAINING TREE PROTECTION FENCE WITHIN THE PROJECT LIMITS. ONCE SCE I-1 HAS BEEN REMOVED, REPLACE THE CURB AND GUTTER AT THE CUL-DE-SAC TO RESTORE THE CURB AND GUTTER TO ITS EXISTING CONDITION. NOTE THAT THE 8" THICK MULCH ACCESS PATH AND TIMBER MATTING (IN WETLAND AREAS) IS TO BE REMOVED AFTER CONSTRUCTION IS COMPLETE AND AFTER THE SURROUNDING PROJECT SITE HAS BEEN PERMANENTLY STABILIZED.

**NOTICE TO CONTRACTOR- EROSION AND SEDIMENT CONTROL WILL BE STRICTLY ENFORCED.**

LEGEND	
NOTE- SEE DWG. NO. AB-01 FOR OTHER FEATURES.	
	CREATED WETLAND
	LIMITS OF DISTURBANCE
	TREE PROTECTION FENCE (TPF)
	PROP. CHANNEL
	PROP. CONTOUR
	18 INCH DIAMETER FILTER LOG
	SILT FENCE
	EX. TREE REMOVAL
	DISCHARGE HOSE
	PUMP
	TEMP. BRIDGE (TB)
	TEMPORARY ACCESS BRIDGE
	TIMBER MATTING FOR ACCESS PATH
	FILTER BAG
	TEMP. DIVERSION BARRIER
	8" THICK MULCH ACCESS PATH
	PROPOSED RIPRAP
	STABILIZED CONSTRUCTION ENTRANCE
	24 INCH DIAMETER CLEAR WATER DIVERSION PIPE
	RIGHT OF WAY LINE
	SANDBAG BARRIER

TREE PROTECTION FENCE (TPF)*		
100 LF	PERIMETER AROUND EX. TREES AS SHOWN	(5 EX. TREES)

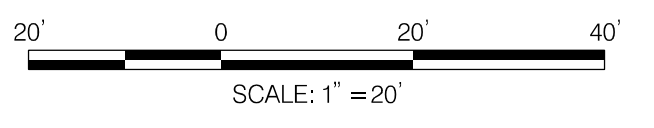
SANDBAGS (SB)		
•	TRIB- STA. 24+60, 10' LT TO STA. 24+62, 12' RT	H=2 FT. MIN.** SB 4-1

\*NOTE- QUANTITY SPECIFIED ON PHASE 4 PLAN SHEET (DWG. NO. ES-07).  
 \*\*NOTE- THE TOP ELEVATION OF THE SB SHOULD TIE INTO THE EX. GROUND ELEVATION ON BOTH TERMINAL ENDS OF THE SB BARRIER.

PUMP AROUND (PA)		
•	TRIBUTARY- STA. 24+62, BASELINE TO STA. 27+61, 8' RT	PA 5-1

\* COST FOR HOSE AND PUMP INCIDENTAL TO MAINTENANCE OF STREAM FLOW PAY ITEM.

- NOTES:
1. THE EROSION AND SEDIMENT CONTROL (ES) PLAN IS PRESENTED IN FIVE (5) CONSTRUCTION PHASES SHOWN ON PLAN SHEET ES-01 THROUGH ES-09.
  2. SEE SHEETS SR-01 TO SR-03 FOR PROPOSED STREAM RESTORATION MEASURES, AND PR-01 TO PR-03 FOR PROPOSED PROFILES. FOR LANDSCAPING PLANS, SEE DWG. NO. LP-01 TO LP-03.
  3. THE CONTRACTOR AND ITS DRIVERS SHALL TAKE EXTRA PRECAUTION WHEN DRIVING AND HAULING MATERIALS ON THE ACCESS ROAD, SITE AREAS AND CHANNEL TO MINIMIZE IMPACT TO EXISTING FEATURES SUCH AS TREES, WETLANDS, WATERS OF THE U.S., THE STREAM BED, CHANNEL SLOPES, AND NEWLY CONSTRUCTED FEATURES.
  4. FOR MAINTENANCE AND REMOVAL OF PUMP AROUND PRACTICES, SEE CRITERIA SPECIFIED ON DWG. NO. EN-04.



HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88  
 MDE # 19-SF-0196; 18-NT-0086

CONSTELLATION DESIGN GROUP, INC.  
 CONSULTING ENGINEERS  
 57 W. TIMONIUM ROAD  
 SUITE 200  
 TIMONIUM, MD 21093  
 410-252-1884

**Maryland Transportation Authority**  
*Engineering Division*

ADDENDUMS & REVISIONS			I-95 EXPRESS TOLL LANES NORTHBOUND EXTENSION CARSINS RUN STREAM RESTORATION	CONTRACT NO. KH-3028-0000
NO.	DESCRIPTION	BY		
1	GRADING, RGC, AND EXCAVATION ADJUSTMENTS	JCT	6/16/20	DRAWING NO. <b>ES-08</b>

JOHN F. KENNEDY MEMORIAL HIGHWAY  
 HARFORD COUNTY  
 PHASE 5  
 EROSION & SEDIMENT CONTROL PLAN

DESIGNED BY	DJW	DRAWN BY	JCT	CHECKED BY	CDG	SHEET NO. 29 OF 87
CONST. REVIEW BY		DATE	OCTOBER 2019	SCALE	1" = 20'	