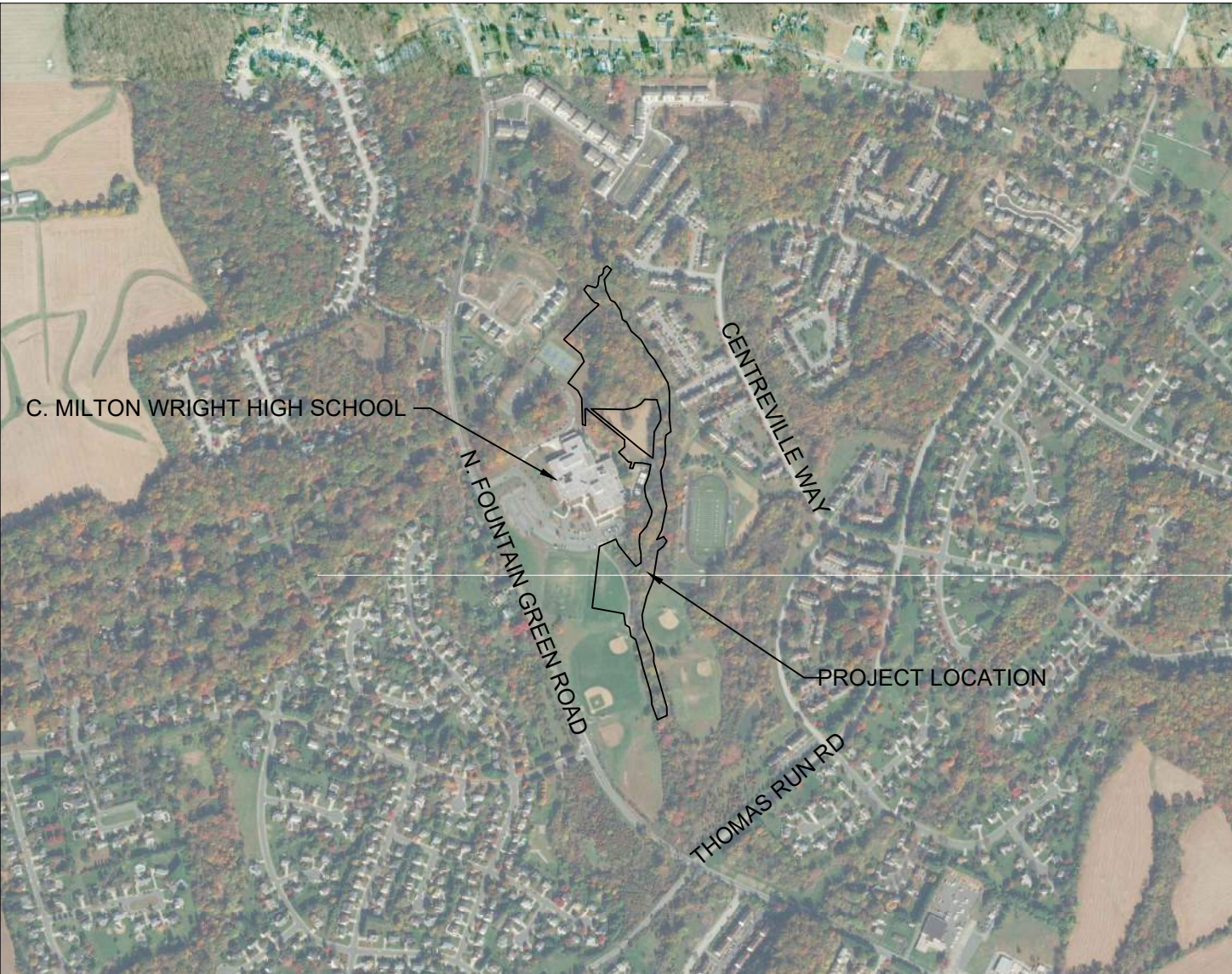
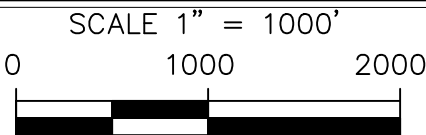


C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION

HARFORD COUNTY, MARYLAND



LOCATION MAP



SHEET INDEX

- 1 - COVER SHEET
- 2 - NOTES
- 3 - KEY SHEET
- 4-8 - EXISTING CONDITIONS
- 9 - TREE INDEX TABLE
- 10 - DRAINAGE AREA MAP
- 11-13 - HYDRAULIC ANALYSIS MAP & RESULTS
- 14 - GRADING PLAN AND PROFILE KEY SHEET
- 15-22 - GRADING PLAN AND PROFILE
- 23-24 - CROSS-SECTIONS
- 25-30 - STREAM DETAILS
- 31-38 - PLANTING PLAN
- 39 - PLANTING NOTES / DETAILS
- 40-47 - EROSION AND SEDIMENT CONTROL PLAN
- 48 - EROSION AND SEDIMENT CONTROL NOTES
- 49-50 - EROSION AND SEDIMENT CONTROL DETAILS

SWM SITE ANALYSIS

TOTAL SITE AREA: 9.17 Ac.±
ONSITE DISTURBED AREA: 2.1 Ac.±
ONSITE PROP. IMPERVIOUS AREA: 0.00 Ac.
SWM WATERSHED: BYNUM RUN (02130704) RESERVOIR (#)

DEVELOPER

HARFORD COUNTY DEPARTMENT OF PUBLIC WORKS
WATERSHED PROTECTION & RESTORATION OFFICE
212 SOUTH BOND STREET, 1ST FLOOR
BEL AIR, MARYLAND 21014
CONTACT PERSON: NICK JENKINS
PH: (410) 638-3217 EXT. 1394

OWNER

HARFORD COUNTY, MARYLAND
220 SOUTH MAIN STREET
BEL AIR, MARYLAND 21014
PH: (410) 638-3210

ENGINEER

HGS, LLC A RES COMPANY
3000 FALLS ROAD, SUITE 300A
BALTIMORE, MD 21211
PH: (713) 520-5400



HGS, LLC. A RES COMPANY

CORPORATE | 5367 TELEPHONE ROAD, WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

ENVIRONMENTAL INFORMATION

THE FOLLOWING ARE NOT ASSOCIATED WITH THIS PROPERTY:

- FEMA 100-YR FLOODPLAIN
- CHESAPEAKE BAY CRITICAL AREA

THIS PROPERTY DOES CONTAIN THE FOLLOWING:

- ENDANGERED SPECIES
- FOREST CONSERVATION EASEMENTS
- EXISTING BMP FACILITIES
- STEEP SLOPES OR ERODIBLE SOILS
- TIDAL / NONTIDAL WETLANDS

PROJECT NARRATIVE

THIS PROJECT WILL RESTORE APPROXIMATELY 3,878 LINEAR FEET OF EXISTING STREAM USING NATURAL CHANNEL DESIGN. THE EXISTING, DEGRADED AND NOISED CHANNEL WILL BE LIFTED AND RECONNECTED WITH ITS FLOODPLAIN.

EROSION AND SEDIMENT CONTROL

PLAN #:

RECOMMENDED FOR APPROVAL:

HARFORD COUNTY, DPW

TECHNICAL CONCURRENCE:

HARFORD SOIL CONSERVATION DISTRICT

APPROVED:

HARFORD SOIL CONSERVATION DISTRICT

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

SIGNATURE

NAME (PRINT)

DATE

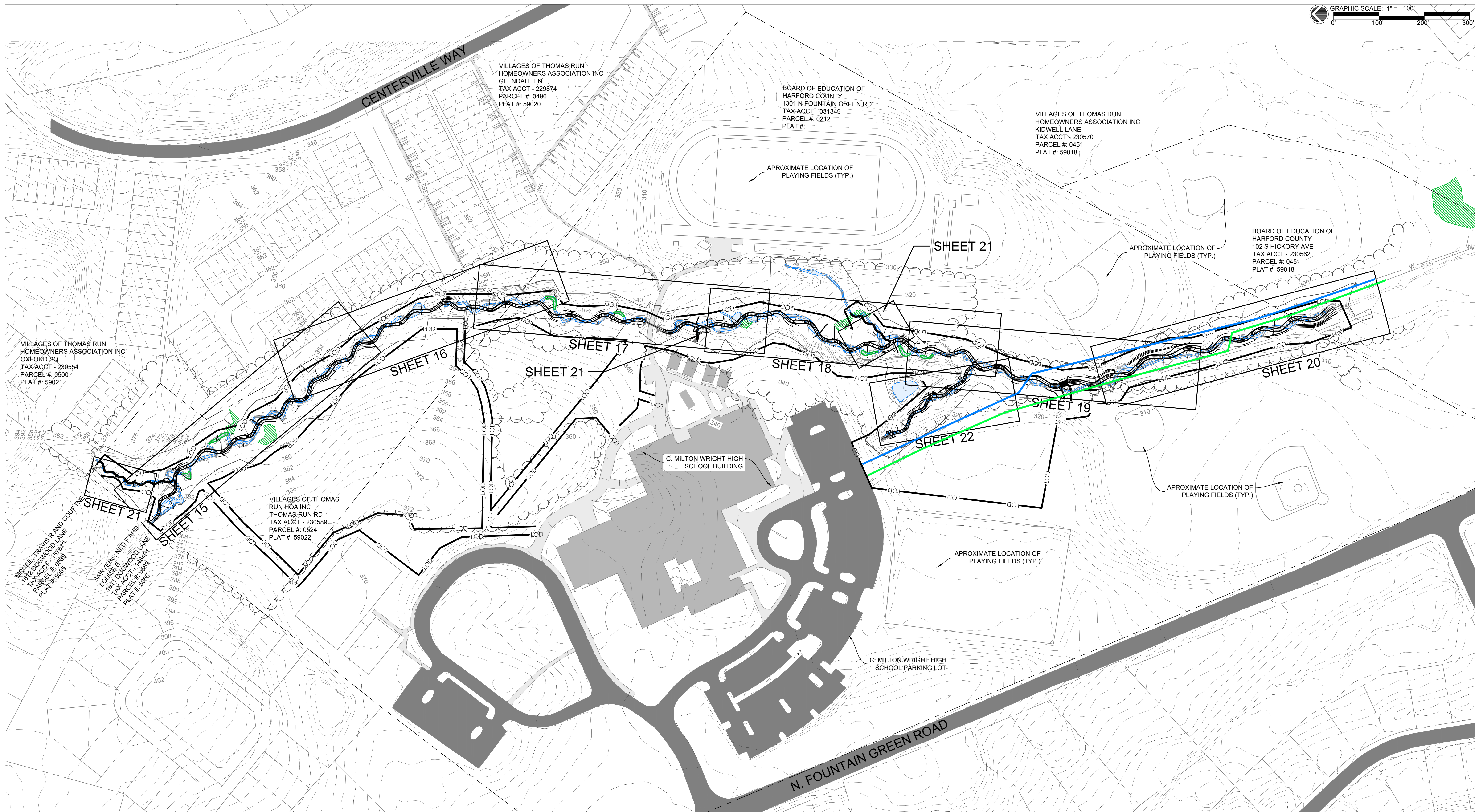
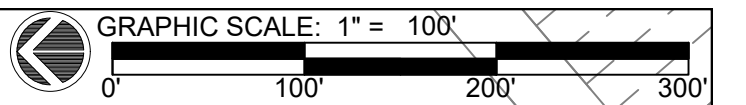
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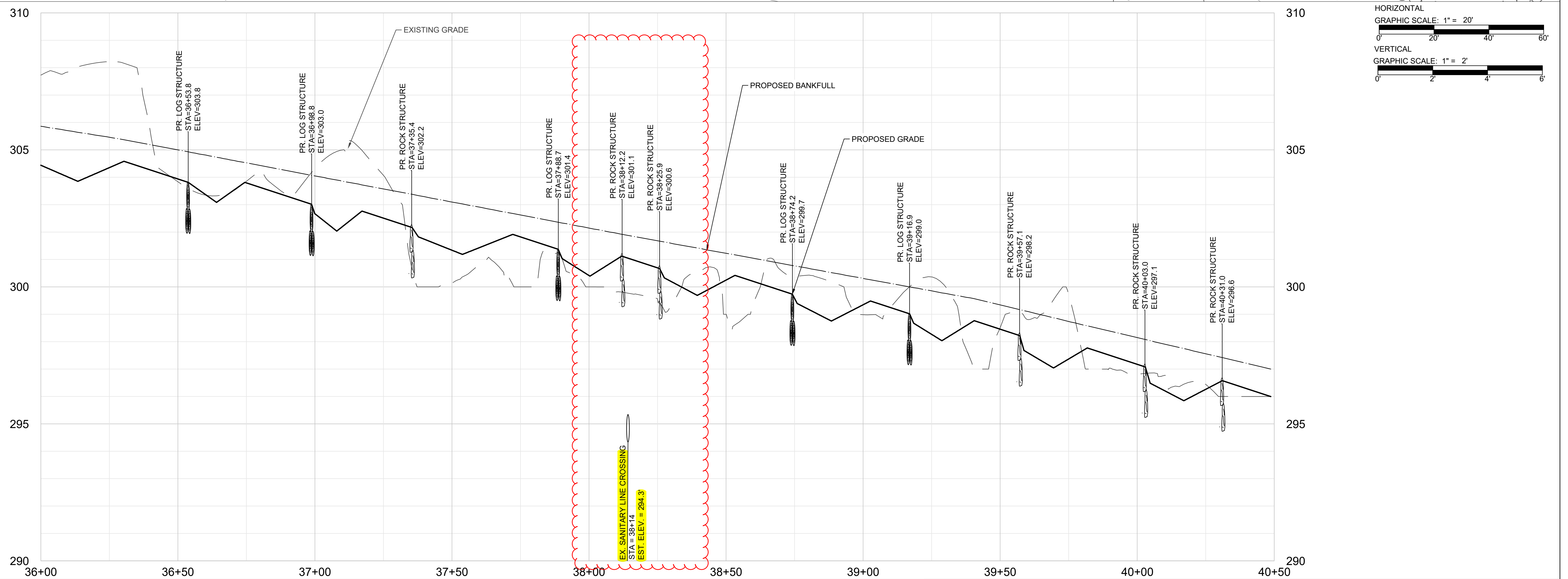
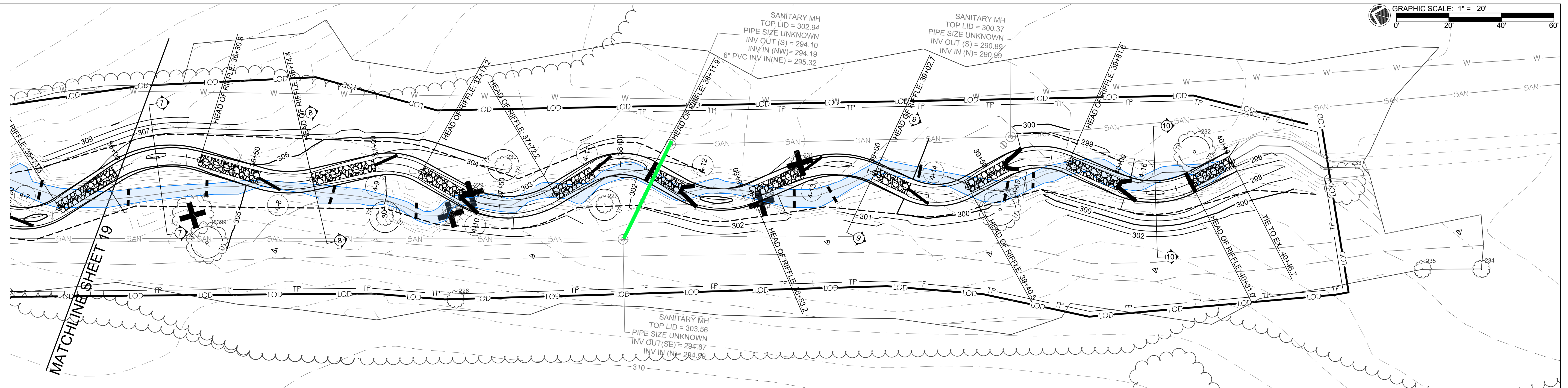
EXPIRATION DATE

CERTIFY MEANS TO STATE OR DISCLAIM A PROFESSIONAL OPINION BASED UPON ONSITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ONSITE INSPECTION AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE BY COMMONLY ACCEPTED ENGINEERED STANDARDS. CERTIFY DOES NOT MEAN IMPLY A GUARANTEE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

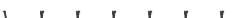





**NOT FOR
CONSTRUCTION**









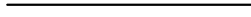









I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the state of Maryland.
License Number: 52852
Expiration Date: 6-14-2022






LEGEND:

— — — — —	EX. PROPERTY LINE
— — — — —	EX. PROPERTY ADJACENT
— — — — —	EX. MAJOR CONTOUR
— — — — —	EX. MINOR CONTOUR
— — — — —	EX. BUILDING/EDGE OF PAVEMENT
— — — — —	EX. TRAIL
	EX. TREELINE
	EX. CULVERT
— — — — —	EX. STREAM CENTERLINE
— — — — — LOS	EX. LIMITS OF TREE SURVEY
— — — — —	EX. 100-YR WSE
	EX. STREAM
	EX. FORESTED WETLAND
	EX. TREE/TREE TO BE REMOVED
	EX. FOREST CONSERVATION EASEMENT
— — — — — FCE	EX. SANITARY SEWER LINE
— — — — — SAN	

	EX. WATER LINE		PR. FLOODPLAIN LOG
	PR. MAJOR CONTOUR		PR. WOOD TOE REVETMENT
	PR. MINOR CONTOUR		PR. RIFFLE
	PR. LIMITS OF DISTURBANCE		DETAIL CALLOUT
	PR. TREE PROTECTION		
	PR. 100-YR WSE		
	PR. GRADED FLOODPLAIN BENCH LIMITS		
	PR. BANKFULL LIMITS		
	PR. STREAM CENTERLINE		
	PR. OXBOW PFO WETLAND		
	PR. CULVERT		
	PR. RIPRAP		
	PR. ROCK STRUCTURE		
	PR. LOG STRUCTURE		

NOTES:

1. SURVEY COMPLETED BY G.W. STEPHENS IN JANUARY 2020.
1' CONTOUR INTERVAL
2. TOPOGRAPHY AND LINEWORK OUTSIDE THE SURVEY LIMITS IS BASED UPON AVAILABLE GIS DATA. 2' CONTOUR INTERVAL
3. WETLAND DELINEATION PERFORMED BY RES WITHIN THE PROJECT AREA IN NOVEMBER, 2019.
4. REFER TO NOTES SHEET 2 FOR COMPLETE NOTES.



SCALE: 1 INCH

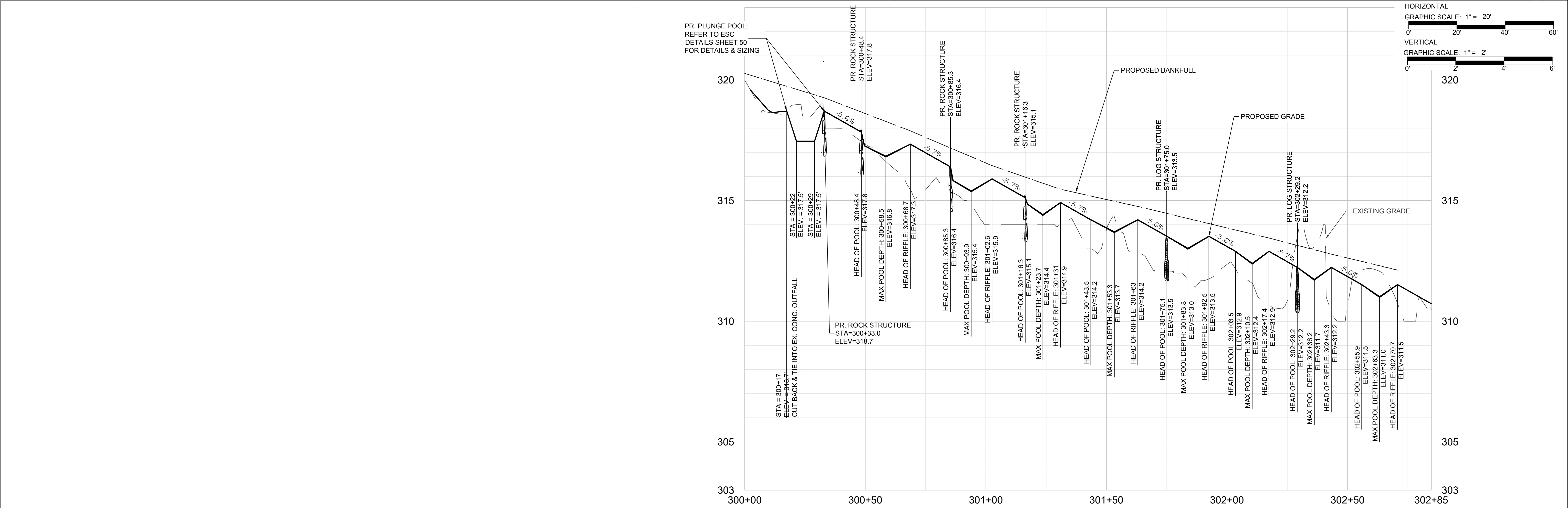
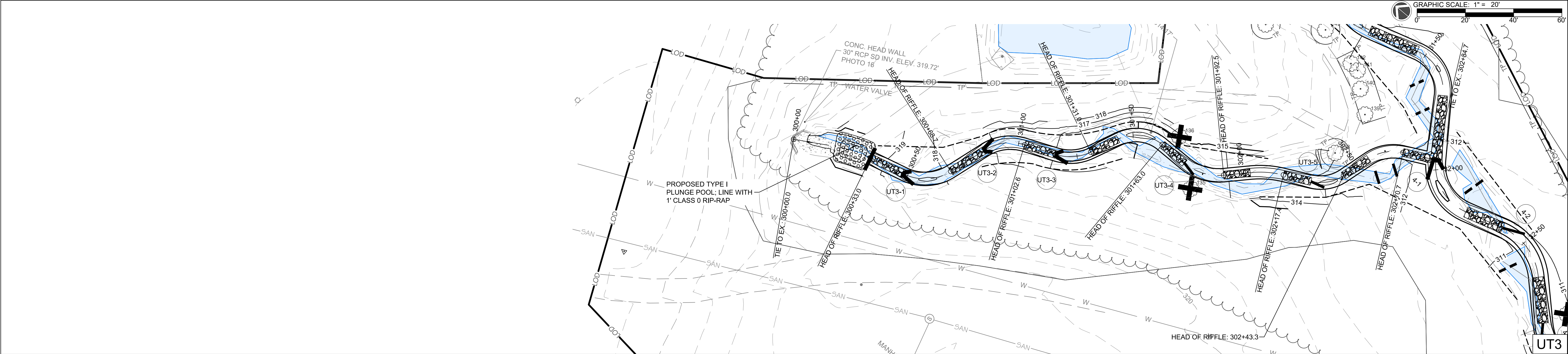


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HARFORD COUNTY, MARYLAND			
C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION			
GRADING PLAN AND PROFILE			
REVISION NO.	DATE	DESCRIPTION	SCALE: SEE SCALE BAR
			DESIGN BY: BW
			DRAWN BY: AM/JC/BW
			CHECKED BY: BW
			PROJECT NO.: 6776
			DATE: 6/8/2020
			SHEET NUMBER 20 of 50



LEGEND:

---	EX. PROPERTY LINE	---	EX. WATER LINE
---	EX. PROPERTY ADJACENT	---	PR. MAJOR CONTOUR
---	EX. MAJOR CONTOUR	---	PR. MINOR CONTOUR
---	EX. MINOR CONTOUR	---	PR. LIMITS OF DISTURBANCE
---	EX. BUILDING/EDGE OF PAVEMENT	---	TP --- PR. TREE PROTECTION
---	EX. TRAIL	---	PR. 100-YR WSE
---	EX. TREELINE	---	PR. GRADED FLOODPLAIN BENCH LIMITS
---	EX. CULVERT	---	PR. BANKFULL LIMITS
---	EX. STREAM CENTERLINE	---	PR. STREAM CENTERLINE
---	EX. LIMITS OF TREE SURVEY	---	PR. OXBOW PFO WETLAND
---	EX. 100-YR WSE	---	PR. CULVERT
---	EX. STREAM	---	PR. RIPRAP
---	EX. FORESTED WETLAND	---	PR. ROCK STRUCTURE
---	EX. TREE/TREE TO BE REMOVED	---	PR. LOG STRUCTURE
---	EX. FOREST CONSERVATION EASEMENT	---	
---	EX. SANITARY SEWER LINE	---	

NOTES:

1. SURVEY COMPLETED BY G.W. STEPHENS IN JANUARY 2020.
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4. REFER TO NOTES SHEET 2 FOR COMPLETE NOTES.

res

HGS, LLC. A RES COMPANY

5367 TELEPHONE ROAD
WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

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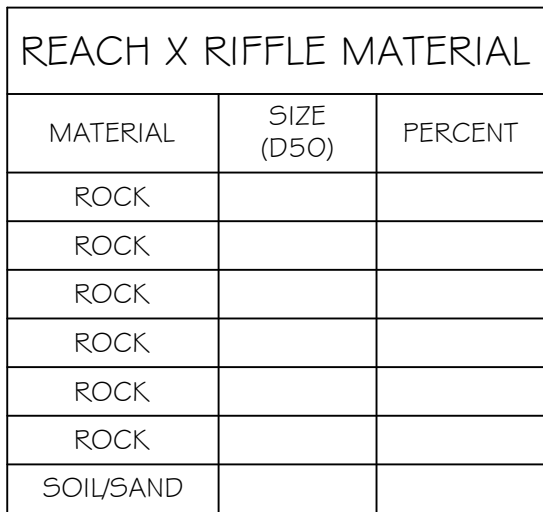
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HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL
STREAM RESTORATION
GRADING PLAN AND PROFILE

REVISION NO.	DATE	DESCRIPTION	SCALE: SEE SCALE BAR
		DESIGN BY: BW	
		DRAWN BY: AM/JC/BW	
		CHECKED BY: BW	
		PROJECT NO.: 6776	
		DATE: 6/8/2020	
		SHEET NUMBER	22 of 50

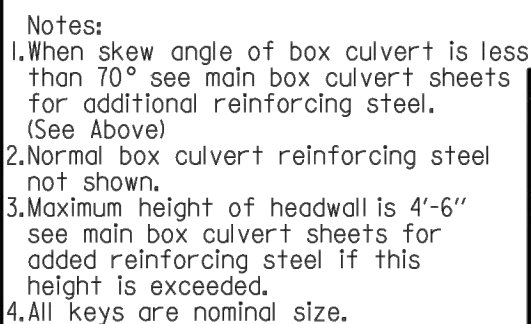


3 CONSTRUCTED RIFFLE
NOT TO SCALE

*NOTE: SEE RIFFLE CROSS-SECTION
GEOMETRY TABLE FOR CHANNEL DIMENSIONS

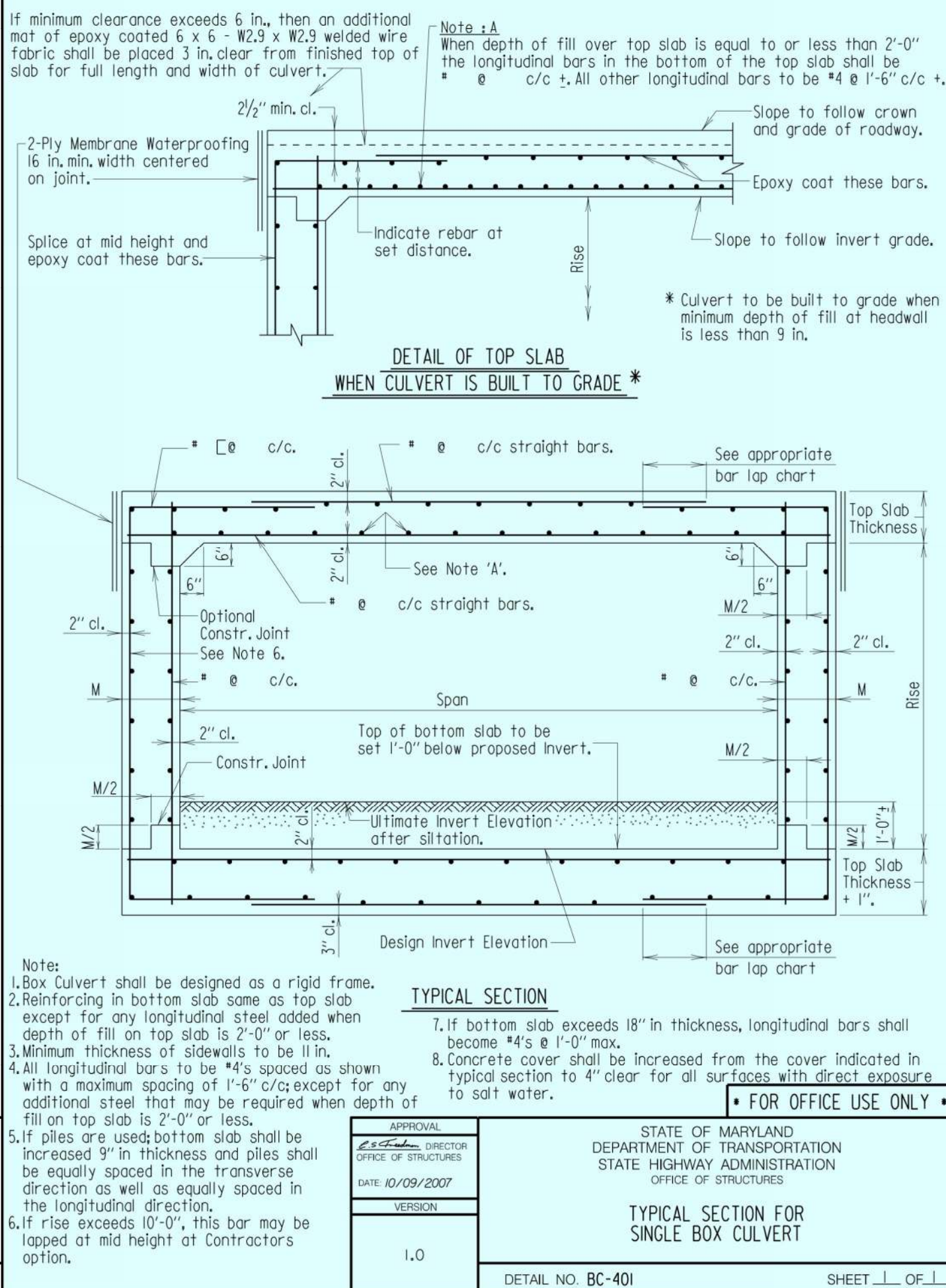
CULVERT NOTES:

1. STANDARD DETAIL FOR DESIGN PURPOSES ONLY, MANUFACTURER TO PROVIDE CONSTRUCTION SPECS AND SHOP DRAWINGS PER MDSHA STANDARD DESIGN.
2. SEE SHEET 19 FOR PROFILE AND SHEET 24 FOR CROSS-SECTION.
3. CONTRACTOR SHALL HAVE SOIL BORINGS AND BEARING CAPACITY TESTS COMPLETED BY A LICENSED GEOTECHNICAL ENGINEER AT THE LOCATION OF THE PROPOSED CULVERT TWO (2) WEEKS IN ADVANCE OF CONSTRUCTION REACHING THE AREA SO THAT THE ENGINEER CAN CONFIRM THE SPECIFIED MUD MAT IS NECESSARY. ADEQUATE ACCESS TO THE LOCATION WILL NEED TO BE PROVIDED IN ADVANCE OF THE TESTING.

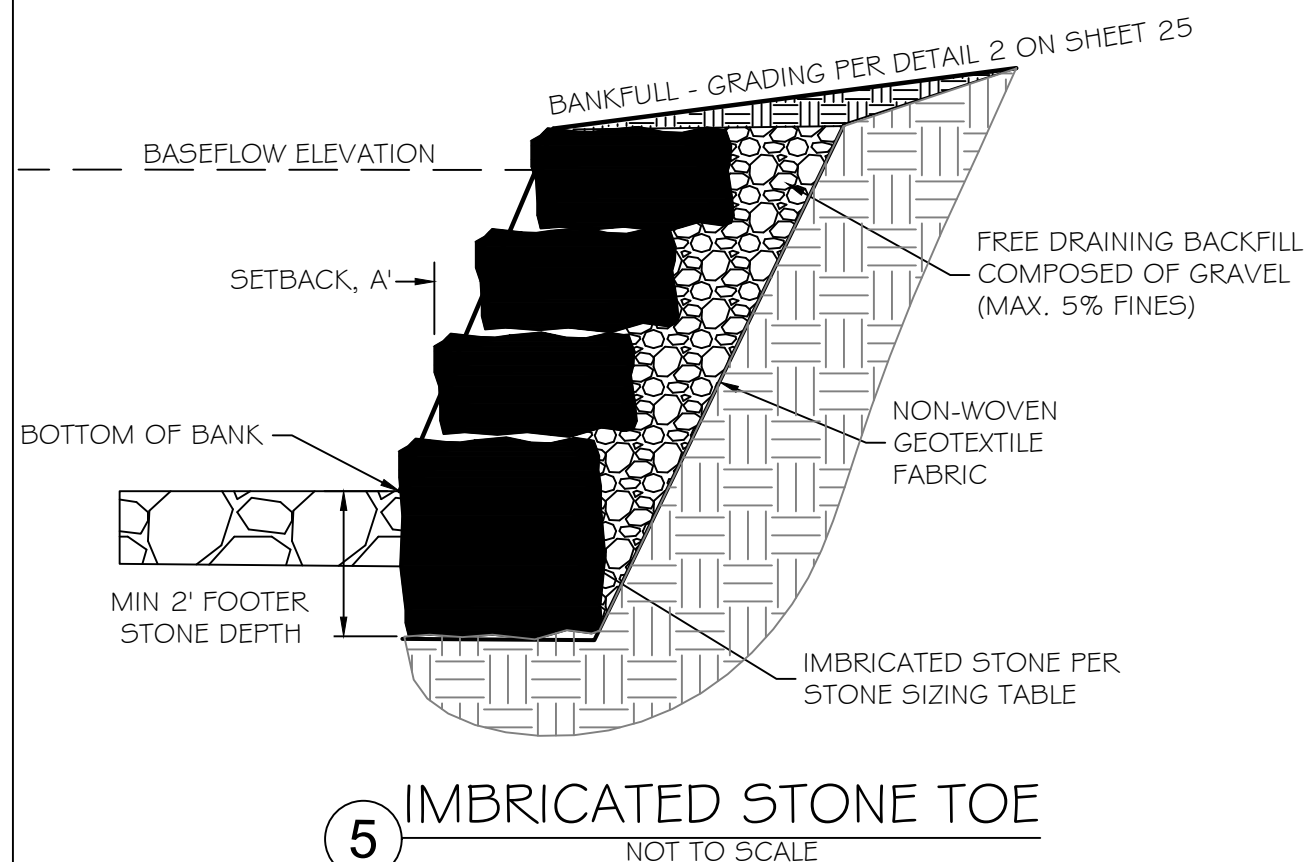


5. Design is valid for live load surcharge.

S or T	Key Size	
	a	$a/2$
Less than 12"	3"	$1\frac{1}{2}"$
12" to 18"	4"	2"
18" and over	6"	3"



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5 IMBRICATED STONE TOE
NOT TO SCALE

NOTES:

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3. WETLAND DELINEATION PERFORMED BY RES WITHIN THE PROJECT AREA IN NOVEMBER, 2019.
4. REFER TO NOTES SHEET 2 FOR COMPLETE NOTES.



NOT FOR
CONSTRUCTION

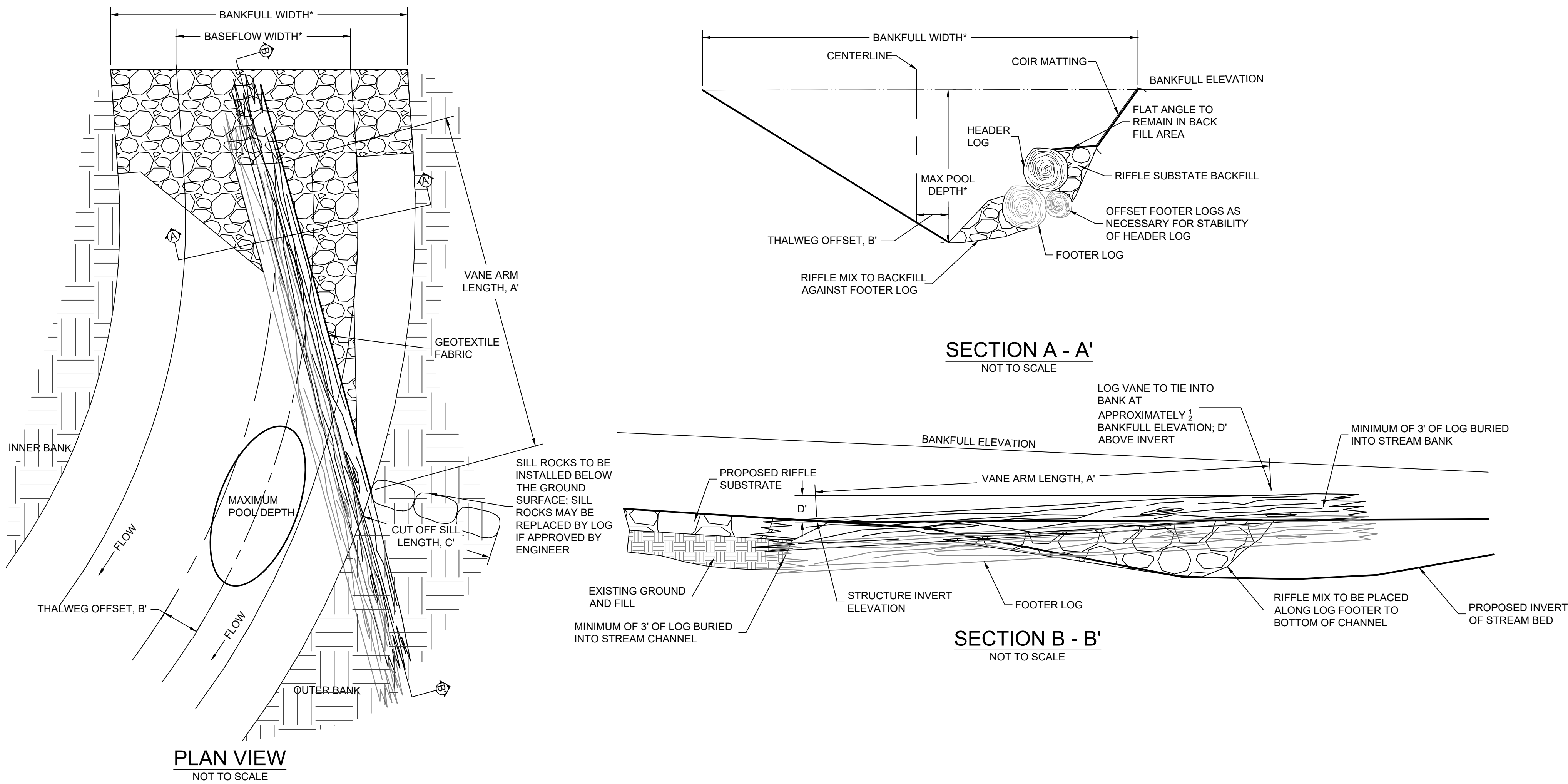
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License Number: 52852
Expiration Date: 6-14-2022

HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION STREAM DETAILS

REVISION NO.	DATE	DESCRIPTION	SCALE: SEE SCALE BAR DESIGN BY: BW DRAWN BY: AM/JC/BW CHECKED BY: BW PROJECT NO.: 6776 DATE: 6/8/2020
			SHEET NUMBER 25 of 50



STRUCTURE TABLE												
REACH	STRUCTURE #	STATION	INVERT ELEV.	VANE ARM LENGTH, A'	LOG LENGTH (FT)	THALWEG OFFSET, B'	VANE ARM TIE-IN HEIGHT, D'	CUT OFF SILL LENGTH, C'	MIN. LOG DIAMETER (IN)	CUT OFF SILL HEIGHT (A)	CUT OFF SILL STONE DEPTH (B)	CUT OFF SILL STONE LENGTH (C)
STRUCTURE #												

TO BE COMPLETED WITH FINAL DESIGN

1 LOG VANE
NOT TO SCALE

*NOTE: SEE CROSS-SECTION GEOMETRY TABLE FOR CHANNEL DIMENSIONS AND SLOPES.

NOTES:
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SCALE: 1 INCH



HGS, LLC. A RES COMPANY

5367 TELEPHONE ROAD
WARRENTON, VIRGINIA 20187
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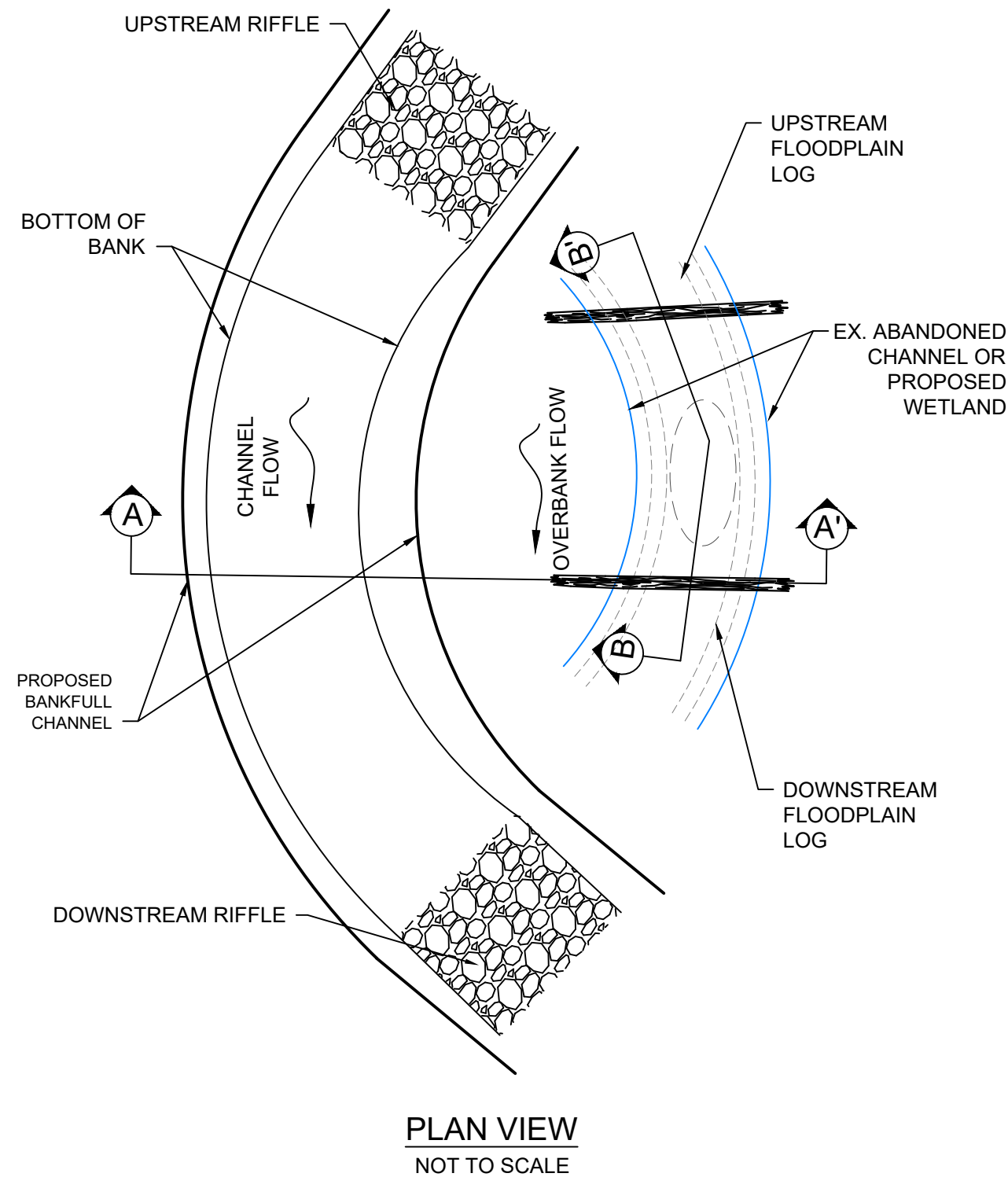
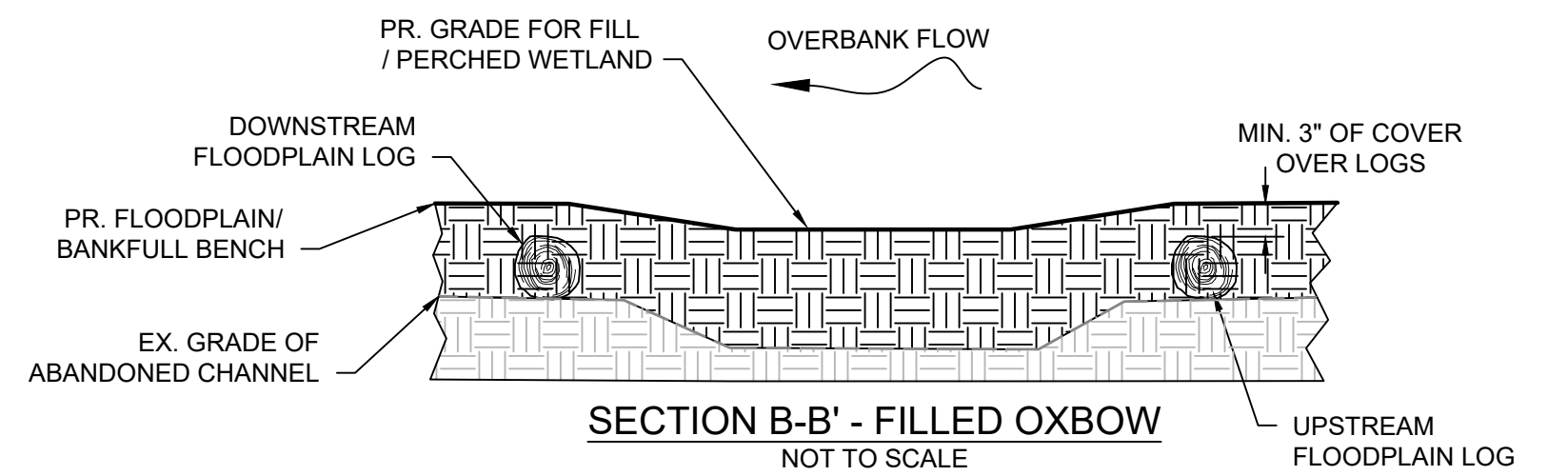
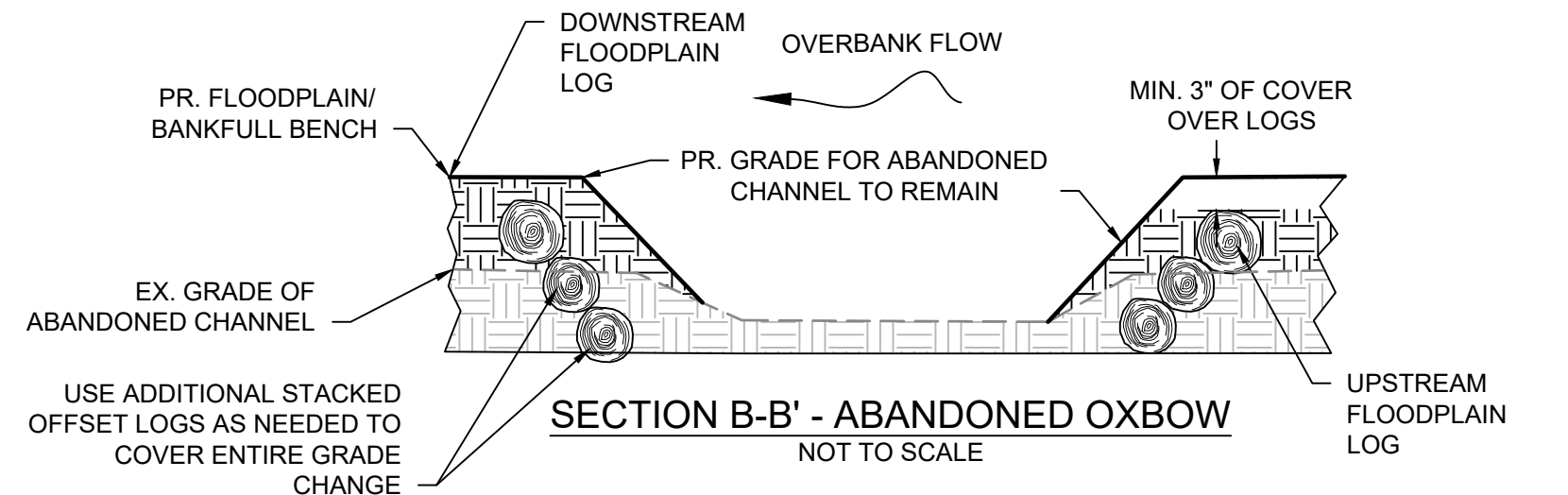
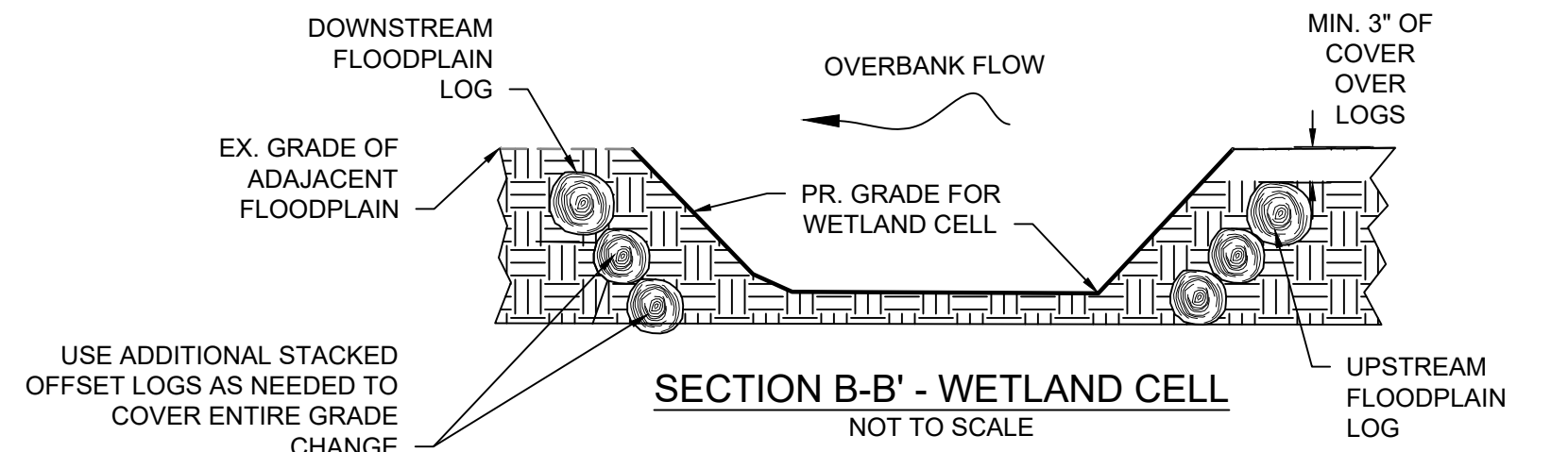
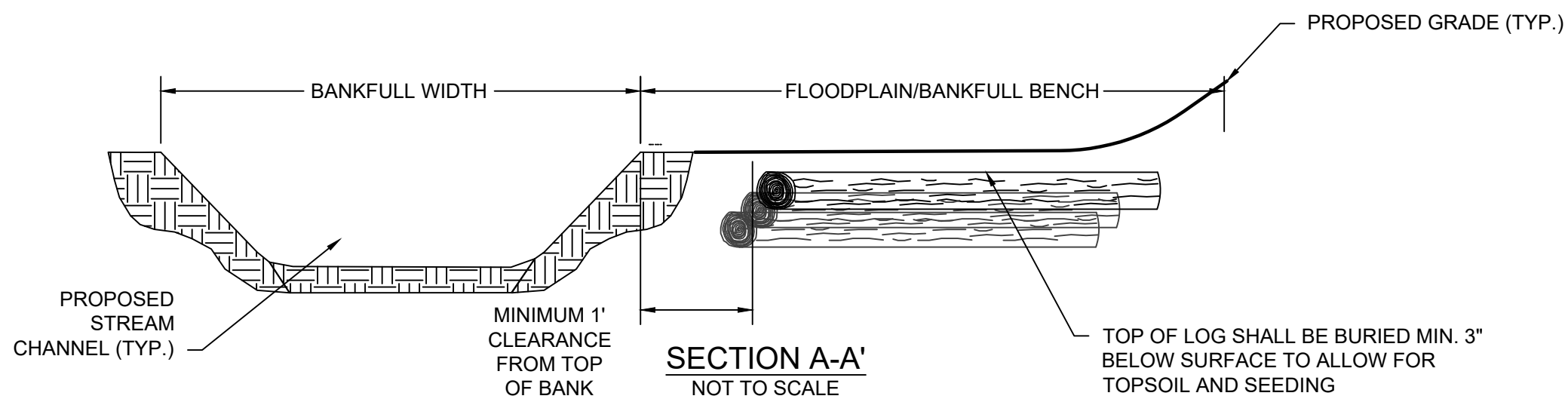
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HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL
STREAM RESTORATION
STREAM DETAILS

REVISION NO.	DATE	DESCRIPTION	SCALE: SEE SCALE BAR
		DESIGN BY: BW	
		DRAWN BY: AM/JC/BW	
		CHECKED BY: BW	
		PROJECT NO.: 6776	
		DATE: 6/8/2020	
		SHEET NUMBER	26 of 50



1 **FLOODPLAIN LOG**
NOT TO SCALE

- NOTES:
1. BURIED LOGS MAY BE PLACED IN SINGLE OR MULTIPLE CONFIGURATIONS BASED ON SITE CONDITIONS, DESIGN CONSIDERATIONS, AND/OR AVAILABLE MATERIAL.
 2. A LONGER SILL MAY BE ACHIEVED, WHERE A SINGLE LOG OF SUFFICIENT LENGTH NOT BE AVAILABLE, BY OVERLAPPING PARALLEL LOGS BY A MINIMUM OF 2 FEET.
 3. LOGS SHOULD BE PLACED PERPENDICULAR TO PROJECTED OVERBANK FLOWPATHS.
 4. WHERE MULTIPLE BURIED LOGS ARE UTILIZED, THE LOGS SHOULD MAKE SECURE CONTACT WITH ONE ANOTHER.
 5. REFER TO PLANTING AND/OR ESC PLAN FOR VEGETATION, SEEDING, AND MATTING REQUIREMENTS

- NOTES:
1. SURVEY COMPLETED BY G.W. STEPHENS IN JANUARY 2020. 1' CONTOUR INTERVAL.
 2. TOPOGRAPHY AND LINWORK OUTSIDE THE SURVEY LIMITS IS BASED UPON AVAILABLE GIS DATA. 2' CONTOUR INTERVAL.
 3. WETLAND DELINEATION PERFORMED BY RES WITHIN THE PROJECT AREA IN NOVEMBER, 2019.
 4. REFER TO NOTES SHEET 2 FOR COMPLETE NOTES.

 SCALE: 1 INCH



**NOT FOR
CONSTRUCTION**

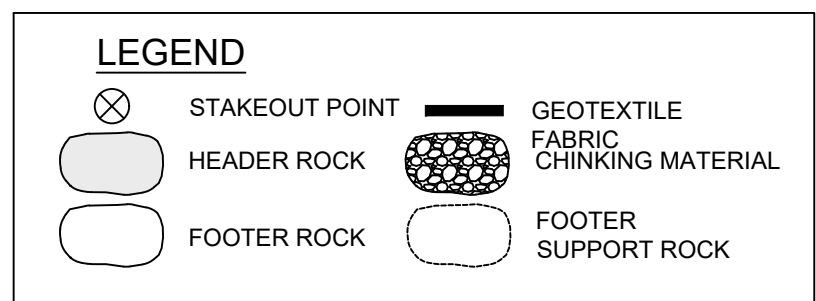
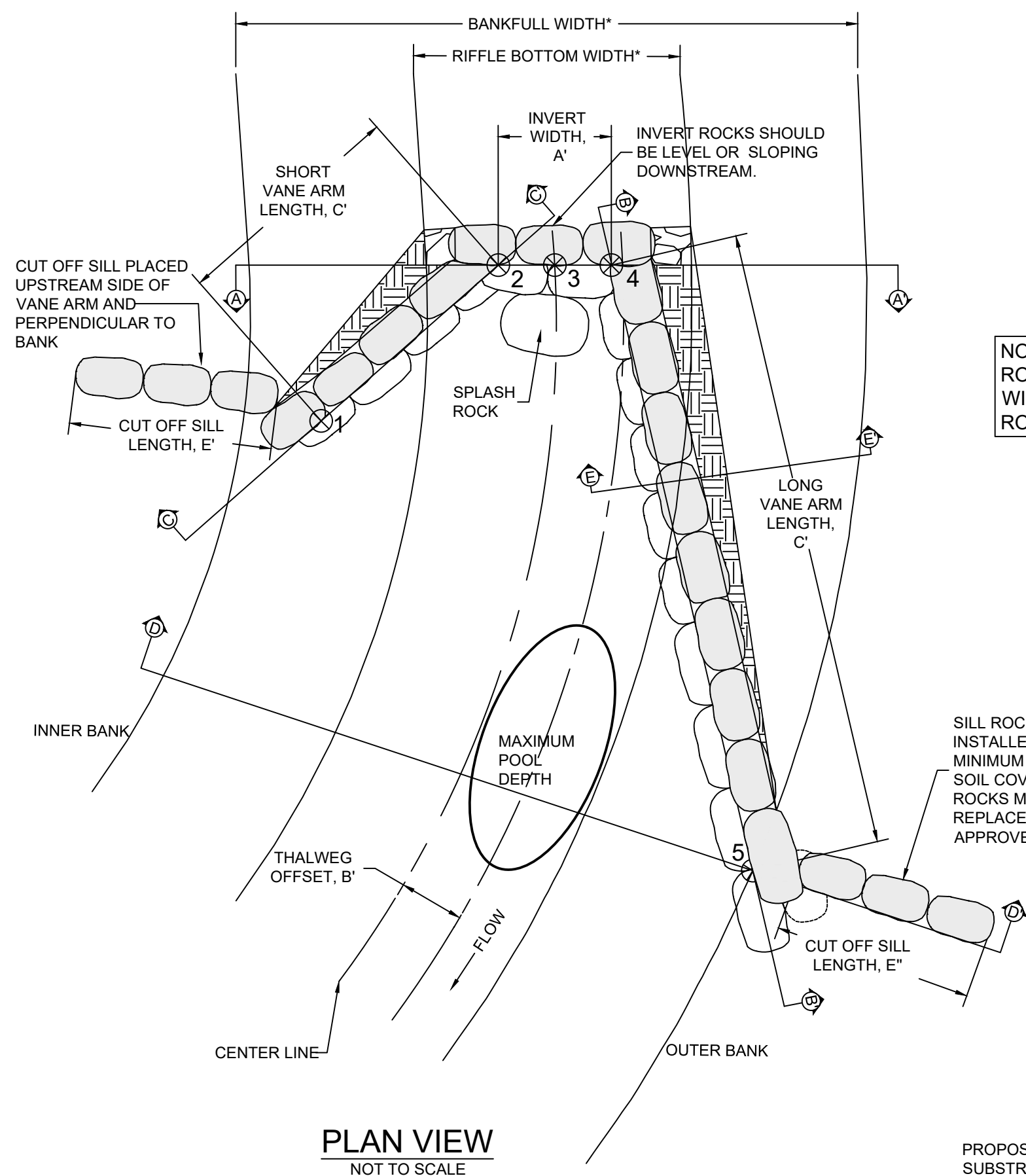
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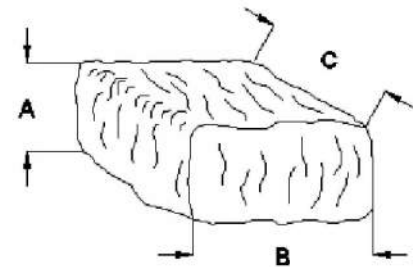
HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION STREAM DETAILS

REVISION NO.	DATE	DESCRIPTION	SCALE: SEE SCALE BAR
			DESIGN BY: BW
			DRAWN BY: AM/JC/BW
			CHECKED BY: BW
			PROJECT NO.: 6776
			DATE: 6/8/2020
			SHEET NUMBER 27 of 50



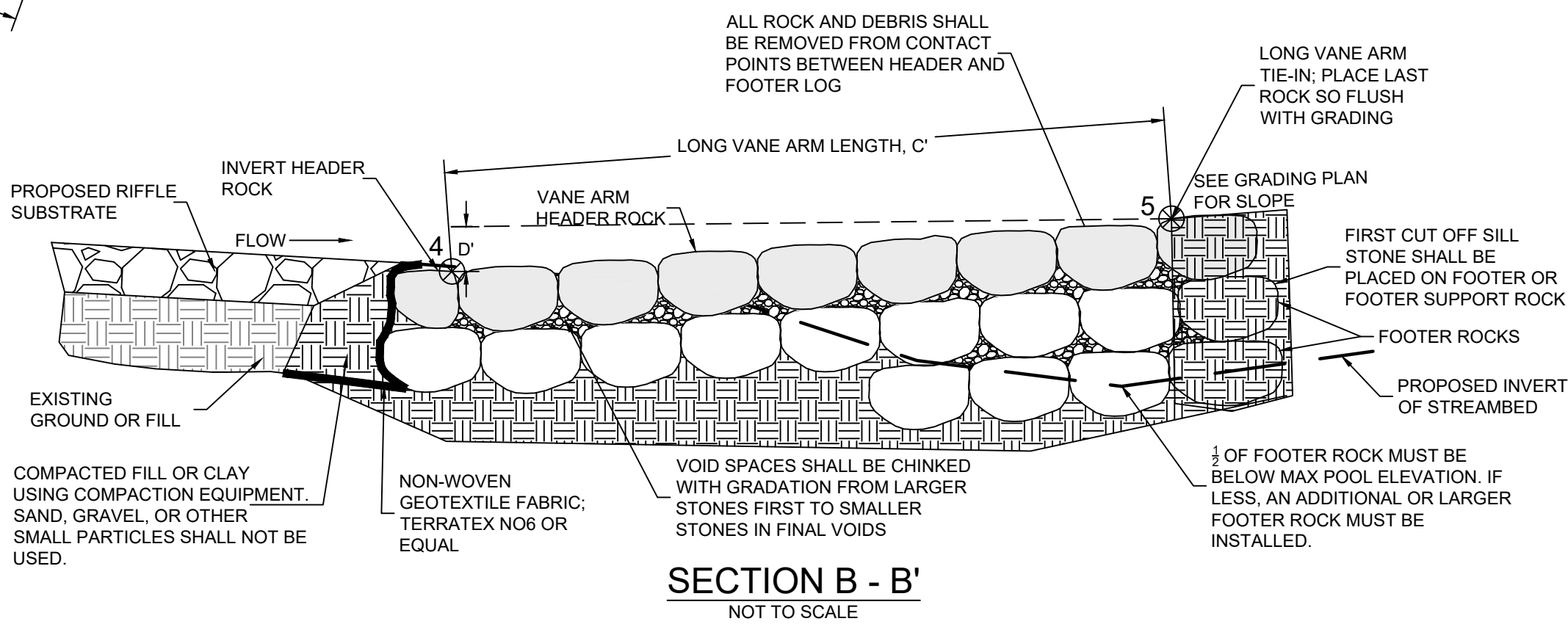
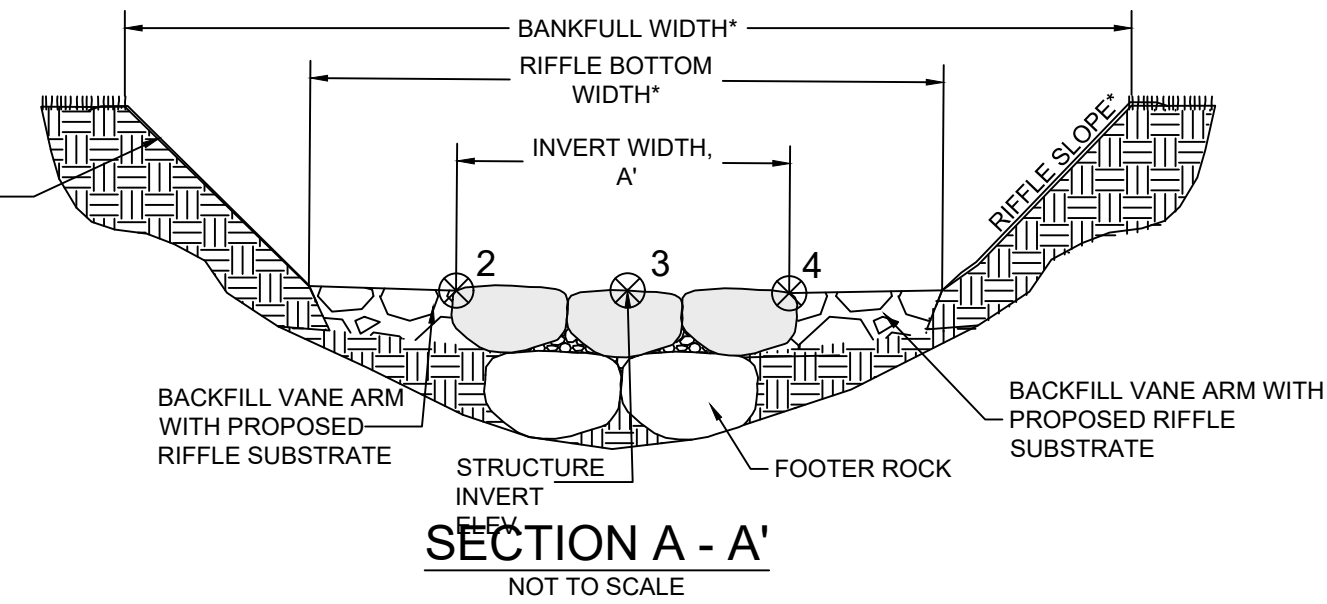
*NOTE: SEE CROSS-SECTION GEOMETRY TABLE FOR CHANNEL DIMENSIONS AND SLOPES.



NOTE: SEAMS OF HEADER ROCK SHALL NOT ALIGN WITH SEAMS OF FOOTER ROCKS

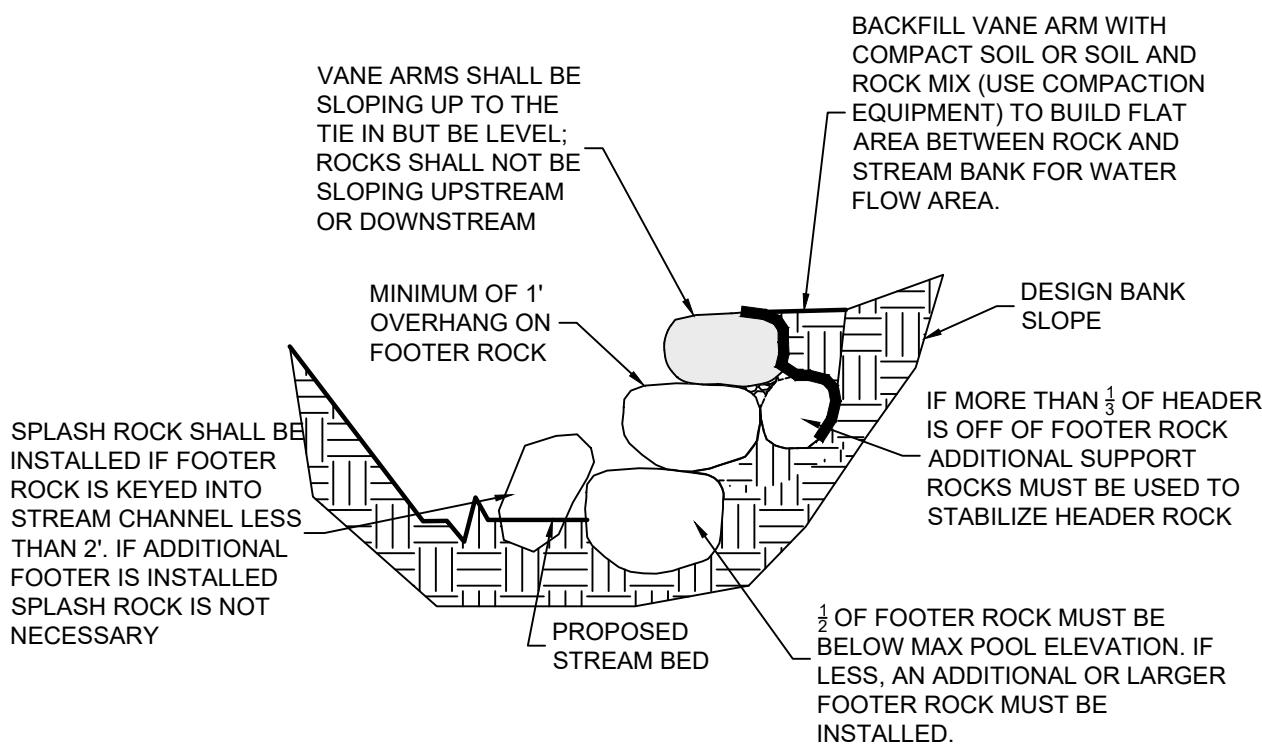
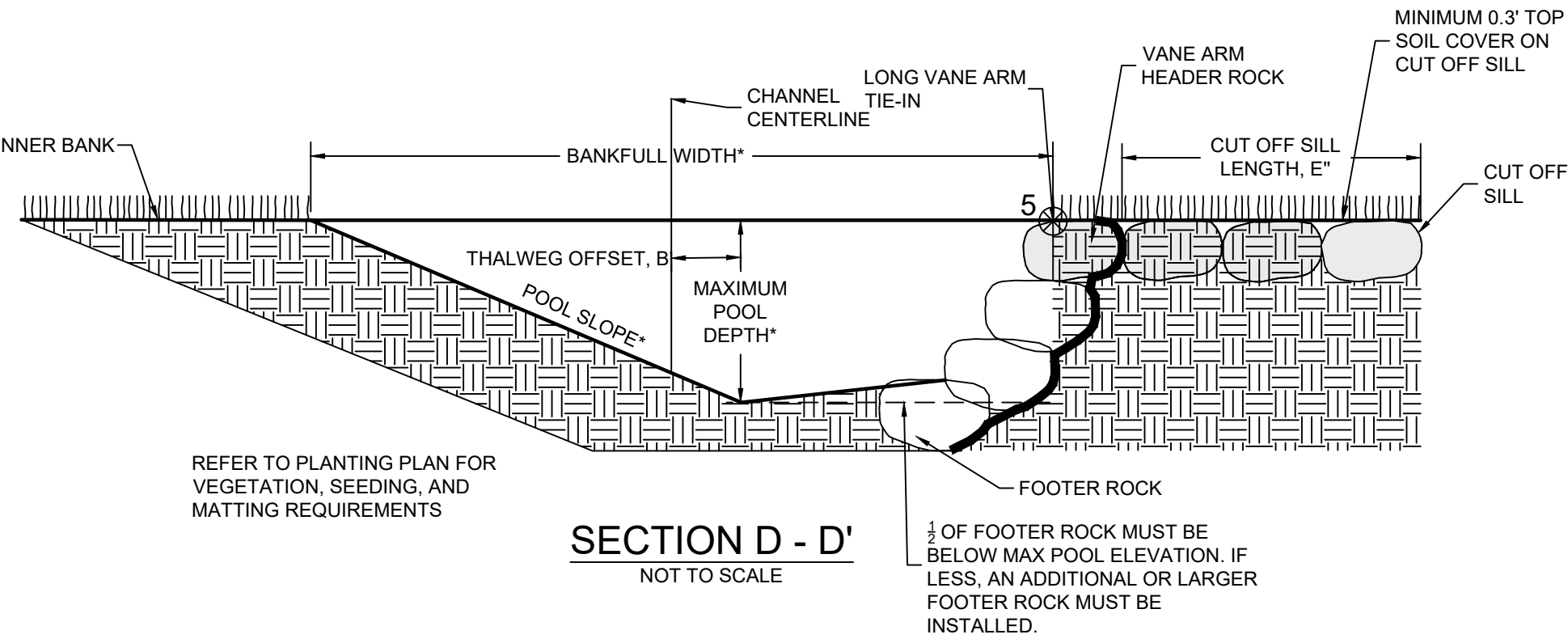
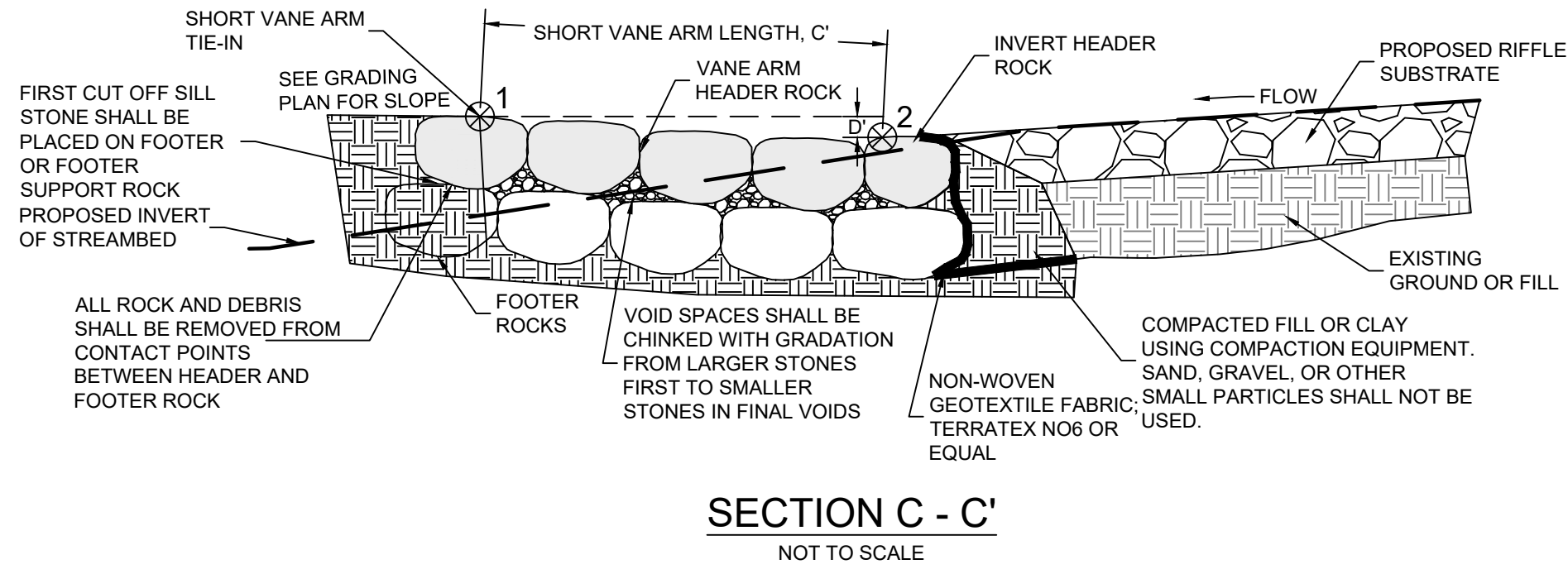
REFER TO PLANTING/ESC PLAN FOR VEGETATION, SEEDING, & MATTING REQUIREMENTS

SILL ROCKS TO BE INSTALLED WITH MINIMUM OF 0.3' TOP SOIL COVER, TYP.; SILL ROCKS MAY BE REPLACED BY LOG IF APPROVED BY ENGINEER



ROCK CROSS-VANE STRUCTURE TABLE										
REACH	STRUCTURE #	STATION	INVERT WIDTH, A'	INVERT ELEV.	THALWEG OFFSET, B'	VANE ARM LENGTH, C'		VANE ARM TIE-IN HEIGHT	CUT OFF SILL LENGTH, E'	ROCK HEIGHT (A)
						LONG	SHORT			
						ROCK DEPTH (B)				ROCK LENGTH (C)
						LONG	SHORT			

TO BE COMPLETED WITH FINAL DESIGN



1 OFFSET CROSS VANE/STEP POOL
NOT TO SCALE

NOTES:
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SCALE: 1 INCH

res
HGS, LLC. A RES COMPANY
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WARRENTON, VIRGINIA 20187
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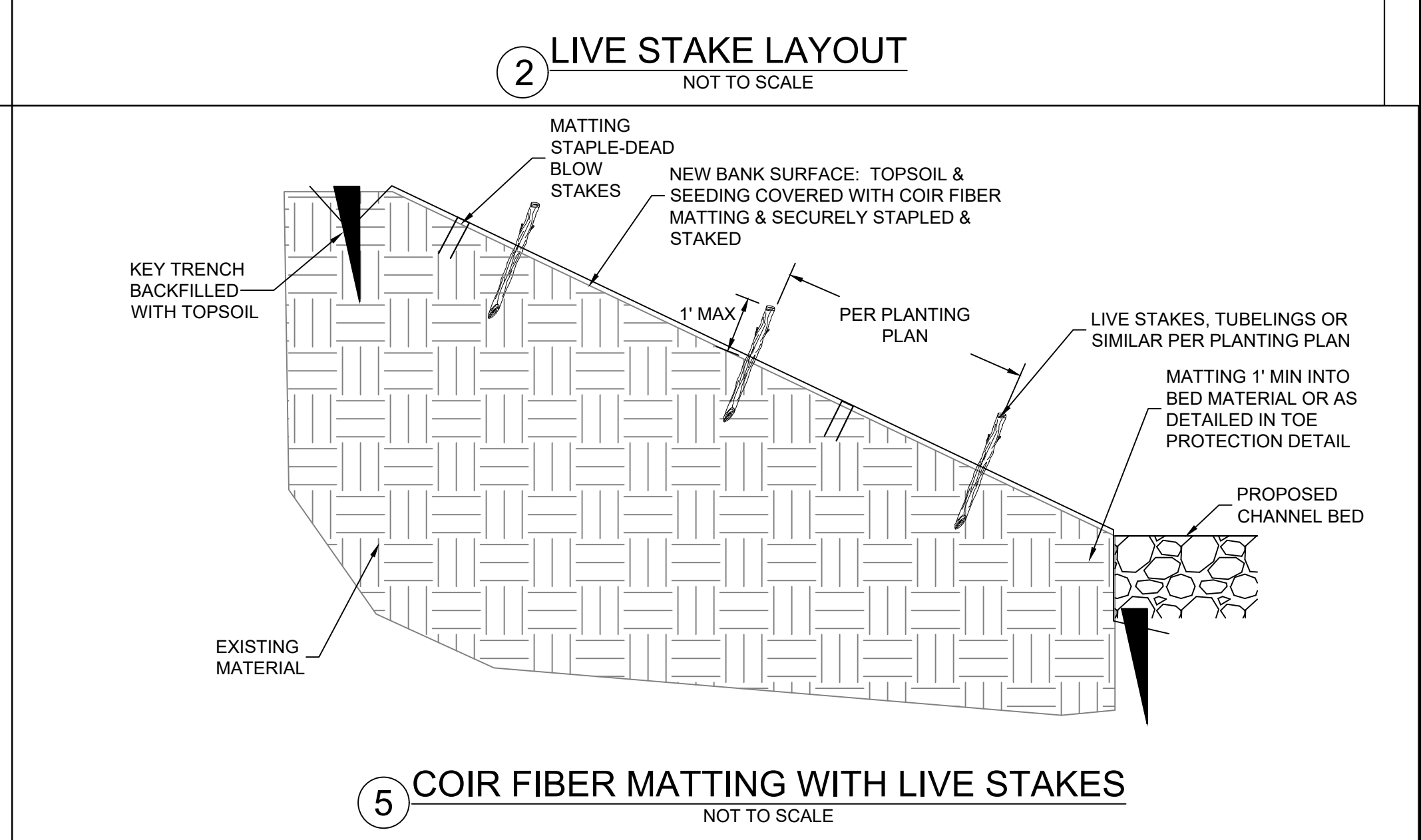
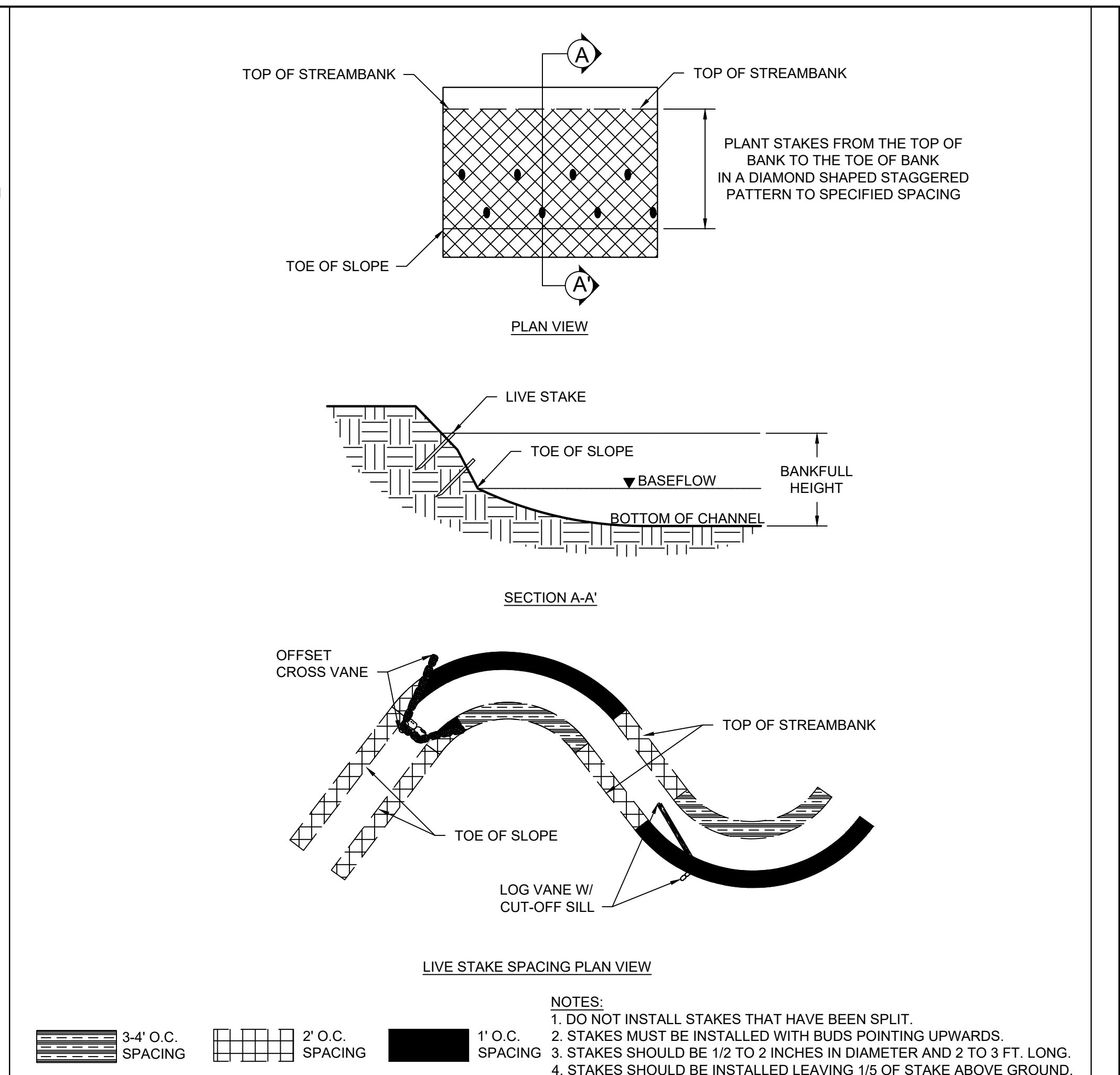
NOT FOR CONSTRUCTION

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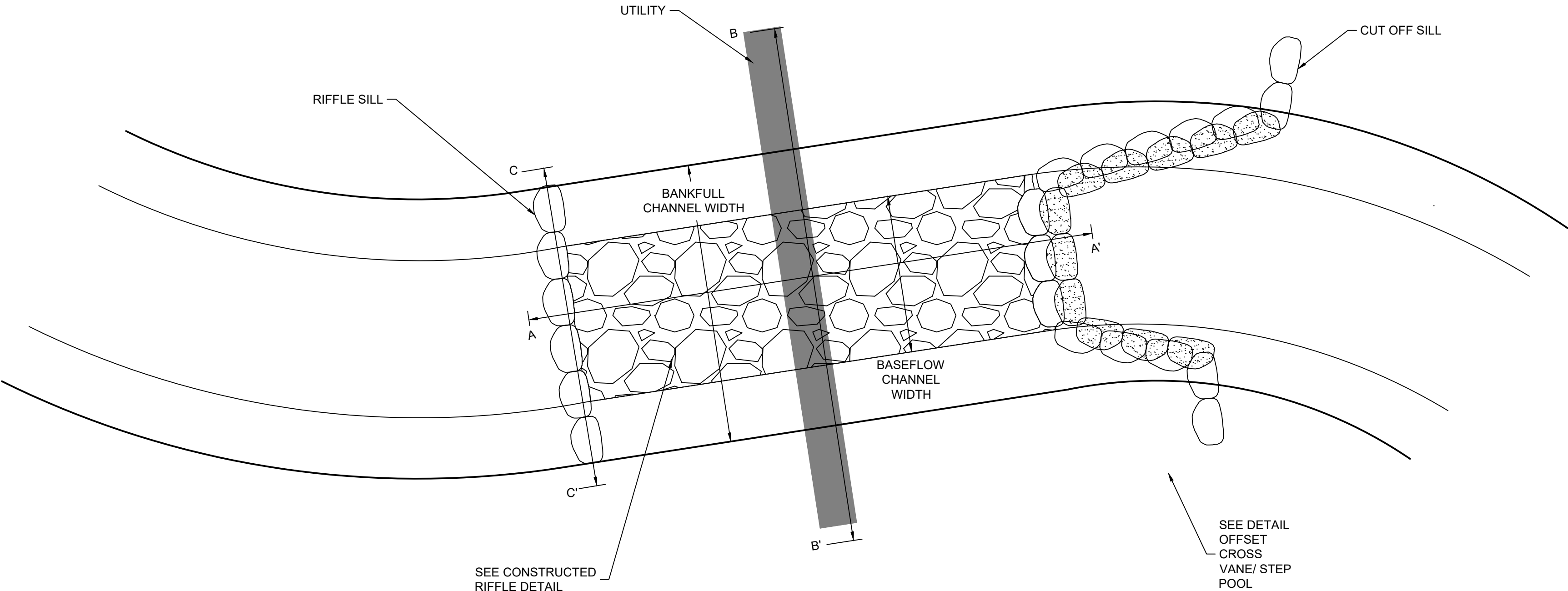
HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL
STREAM RESTORATION
STREAM DETAILS

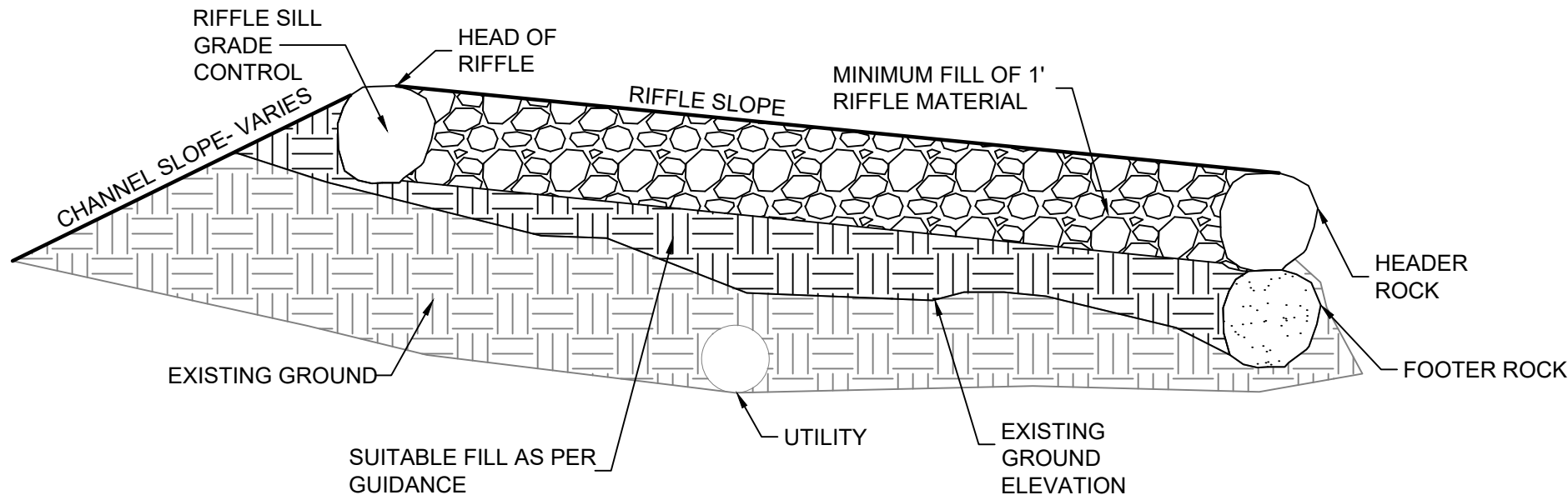
REVISION NO.	DATE	DESCRIPTION	SCALE: SEE SCALE BAR
		DESIGN BY: BW	
		DRAWN BY: AM/JC/BW	
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		DATE: 6/8/2020	
SHEET NUMBER			28 of 50



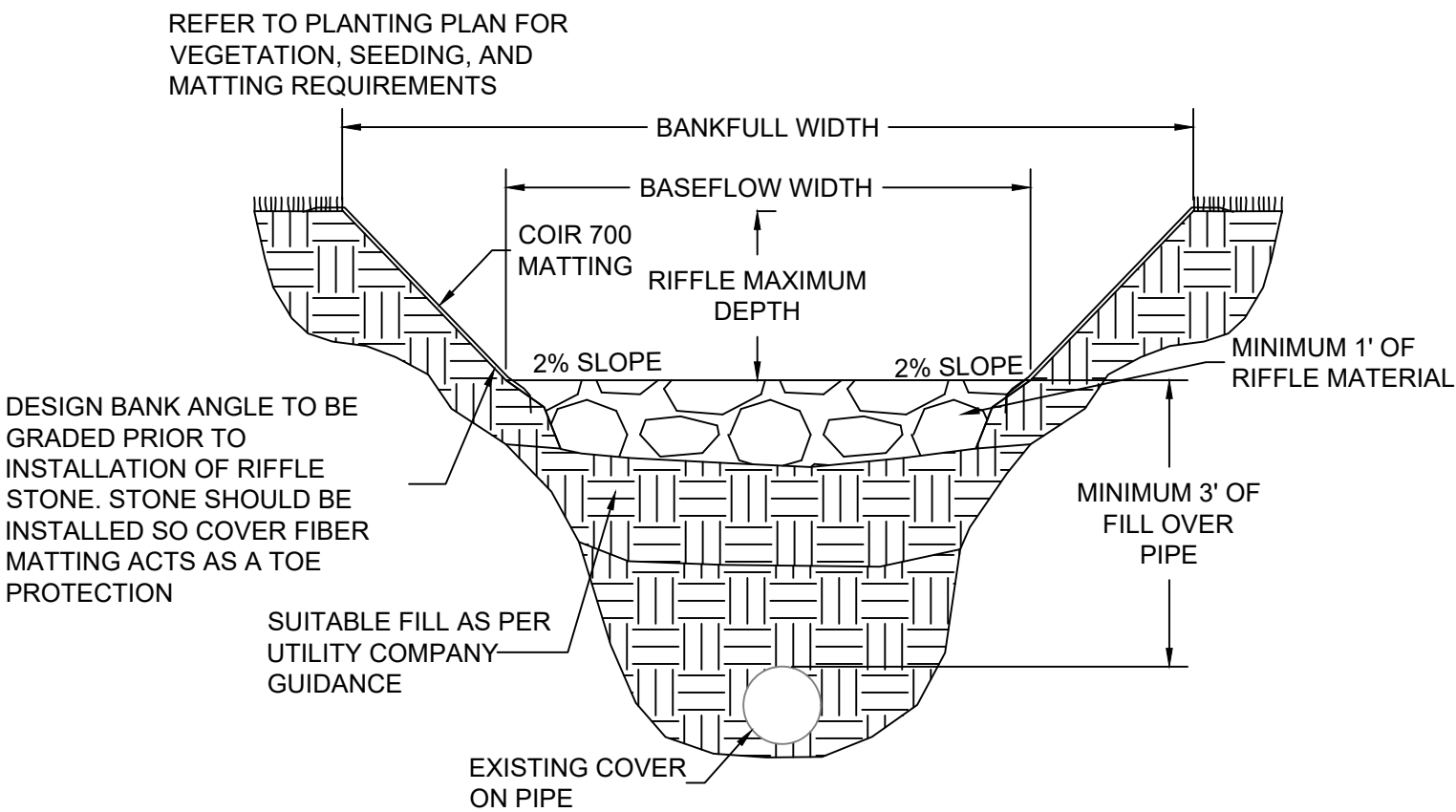
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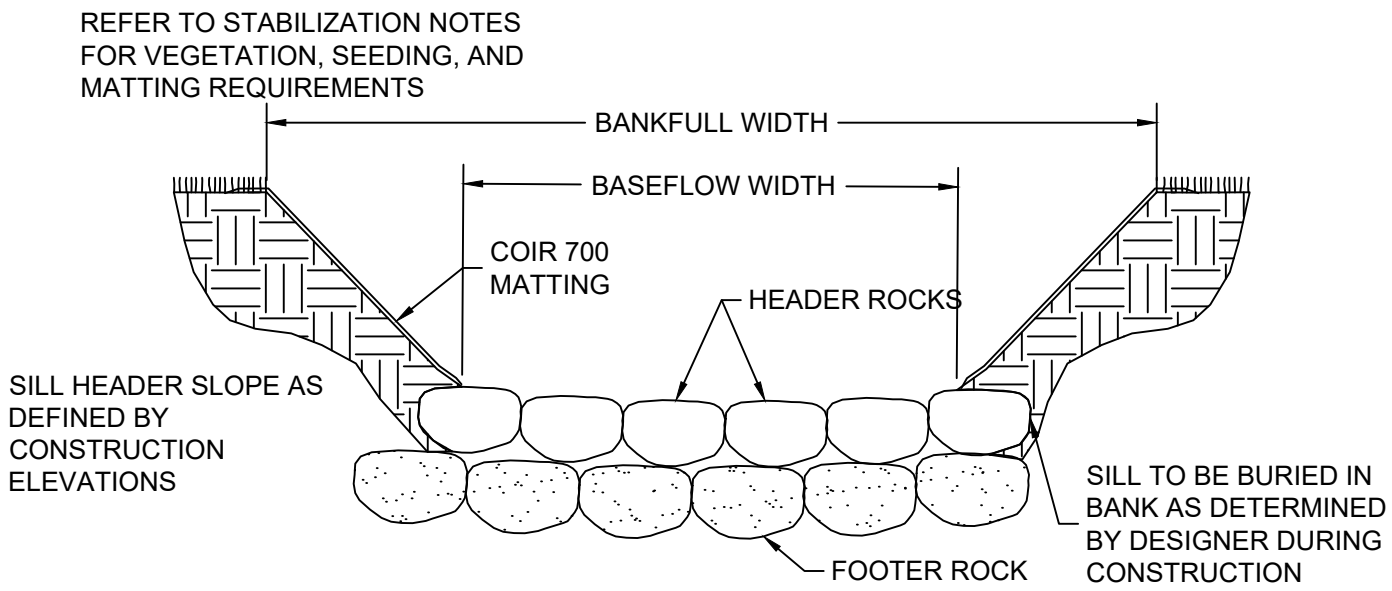
PLAN VIEW
NOT TO SCALE



SECTION A - A'
NOT TO SCALE



SECTION B - B'
NOT TO SCALE



SECTION C - C'
NOT TO SCALE

1 UTILITY PROTECTION
NOT TO SCALE

NOTES:
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3. WETLAND DELINEATION PERFORMED BY RES WITHIN THE PROJECT AREA IN NOVEMBER, 2019.
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SCALE: 1 INCH

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HGS, LLC. A RES COMPANY
5367 TELEPHONE ROAD
WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
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**NOT FOR
CONSTRUCTION**

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 Number: 52852
Expiration Date: 6-14-2022

HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION STREAM DETAILS

REVISION NO.	DATE	DESCRIPTION	SCALE: SEE SCALE BAR
			DESIGN BY: BW
			DRAWN BY: AM/JC/BW
			CHECKED BY: BW
			PROJECT NO.: 6776
			DATE: 6/8/2020
			SHEET NUMBER 30 of 50