C. MILTON WRIGHT HIGH SCHOOL
STREAM RESTORATION

HARFORD COUNTY, MARYLAND

LOCATION MAP
SCALE 1" = 1000'
0 1000 2000

SHEET INDEX

CLIENT/APPLICANT

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

PROPERTY OWNERS

VILLAGES OF THOMAS RUN HOA INC
THOMAS RUN RD
BEL AIR, MD 21014
TAX ACCT - 230589

BOARD OF EDUCATION OF HARFORD COUNTY
102 SOUTH HICKORY AVENUE
BEL AIR, MD. 21014
TAX ACCT - 031349
PH: (410) 638-3210

ENGINEER

HGS, LLC A RES COMPANY
5367 TELEPHONE ROAD,
WARRENTON, VIRGINIA 20187
P: 703.393.4844
F: 703.393.2934

SWM SITE ANALYSIS

PROJECT AREA (LOD): 8.50 Ac.±
ONSITE DISTURBED AREA: 2.31 Ac.±
NET CUT/FILL: 1,202.32 <FILL>.

TOTAL POLLUTANT LOAD REMOVAL TABLE

REMOVAL RATE DESIGNATION	TOTAL NITROGEN REMOVED (lbs/yr)	TOTAL PHOSPHORUS REMOVED (lbs/yr)	TOTAL SUSPENDED SOLIDS REMOVED (TONS/yr)	IMPERVIOUS ACRE CREDIT (Ac.)
STREAM RESTORATION	1,182.0	326.5	56.1	124

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 INCISED CHANNEL WILL BE LIFTED AND RECONNECTED WITH ITS FLOODPLAIN.

210575

EROSION AND SEDIMENT CONTROL
PLAN #: 59863

RECOMMENDED FOR APPROVAL:
HARFORD COUNTY, DPW — 5-26-21

TECHNICAL CONCURRANCE:
HARFORD SOIL CONSERVATION DISTRICT — 5-27-21

APPROVED:
HARFORD SOIL CONSERVATION DISTRICT — 5-28-21

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

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

PE NO. EXPIRATION DATE

CERTIFY MEANS TO STATE OR DECLARE 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.

STATE OF MARYLAND
BAILEY J. WILLIAMS
52852
PROFESSIONAL ENGINEER
4/16/2021

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

res
HGS, LLC. A RES COMPANY
5367 TELEPHONE ROAD, WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

SCALE: 1 INCH

GENERAL NOTES:

1. THE PURPOSE OF THIS PROJECT IS TO CREATE TMDL CREDITS THROUGH STREAM RESTORATION.
2. SOILS INFORMATION IS BASED ON THE USDA WEB SOIL SURVEY'S DATABASE CURRENT DATA AS OF MARCH 2020 FOR HARFORD COUNTY.
3. THE PROPERTY SHOWN HERON HAS NO ARCHEOLOGICAL OR HISTORIC FEATURES AS INCLUDED IN THE STATE OR NATIONAL REGISTER OF HISTORIC PLACES.
4. ALL CONSTRUCTION SHALL CONFORM TO CURRENT HARFORD COUNTY AND STATE HIGHWAY ADMINISTRATION STANDARDS AND SPECIFICATIONS OR APPROVED MODIFICATIONS.
5. SEDIMENT AND EROSION CONTROL WILL BE PROVIDED IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
6. A WETLAND DELINEATION WAS COMPLETED ON THE PROPERTY SHOWN HEREON. LIMITS OF WETLANDS AND STREAMS DEPICTED ON THIS MAP WERE DELINEATED ON NOVEMBER 19, 2019. THE WETLAND DELINEATION WAS ONLY PERFORMED INSIDE THE PROJECT LIMITS AND DOES NOT DEPICT THE FULL EXTENT OF THESE FEATURES ON THE PROPERTY. WETLANDS WERE DELINEATED IN NOVEMBER 2019 IN ACCORDANCE WITH PROCEDURES OUTLINED IN THE U.S. ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, AS WELL AS THE REGIONAL SUPPLEMENT TO THE U.S. ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL ATLANTIC AND GULF COASTAL PLAIN REGION (VERSION 2.0) / EASTERN MOUNTAINS AND PIEDMONT REGION. OTHER WATERS OF THE U.S. ARE DELINEATED BASED ON THE PRESENCE OF AN ORDINARY HIGH WATER MARK, AS DEFINED BY THE U.S. ARMY CORPS OF ENGINEERS DEFINITION OF A WATER OF THE U.S.
7. ALL WETLAND DELINEATIONS, PERMITS AND MITIGATION PLANS SHALL BE OBTAINED AND EVIDENCE OF SUCH BE PROVIDED TO THE COUNTY PRIOR TO LAND DISTURBANCE.
8. THESE STREAMS ARE ALL DESIGNATED USE CLASS III (NON-TIDAL, COLD WATER). IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD OCTOBER 1 THROUGH APRIL 30, INCLUSIVE, DURING ANY YEAR.
9. TOPOGRAPHIC INFORMATION SHOWN IS BASED UPON HARFORD COUNTY GIS AND FIELD-RUN SURVEY CONDUCTED APRIL 10, 2019 AND DECEMBER 8, 2019 BY G.W. STEVENS, JR. & ASSOCIATES. ELEVATIONS SHOWN HEREON ARE REFERRED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 AS DETERMINED BY RTK/GPS OBSERVATIONS AS BROADCASTED BY THE TOPCON TOPNET REAL TIME NETWORK.
10. COORDINATES SHOWN HEREON ARE REFERRED TO THE MARYLAND COORDINATE SYSTEM (NAD 83/2011) AS DETERMINED BY RTK/GPS OBSERVATIONS AS BROADCASTED BY THE TOPCON TOPNET REAL TIME NETWORK.
11. BOUNDARY INFORMATION IS APPROXIMATE ONLY. PROPERTY LIMITS ARE BASED ON AVAILABLE GIS RECORDS. NO BOUNDARY SURVEY HAS BEEN PERFORMED.
12. EXISTING UTILITY INFORMATION SHOWN HEREON IS BASED ON THE BEST AVAILABLE INFORMATION INCLUDING HARFORD COUNTY GIS. TEST PITS SHALL BE DUG WHERE PROPOSED ACTIVITIES ARE OVERTOP OF THE EXISTING UTILITIES.
13. OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. HARFORD COUNTY DPW DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR THE COMPLETENESS OF THE INFORMATION GIVEN. THE CONTRACTOR SHALL VERIFY ALL SUCH INFORMATION TO HIS OWN SATISFACTION. IN THE EVENT THAT INFORMATION IS IN CONFLICT WITH INFORMATION OUTLINED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER PRIOR TO STARTING ANY WORK.
14. BURNING OF COMBUSTIBLE MATERIALS WILL NOT BE PERMITTED ON-SITE.
15. EXISTING CURB AND GUTTER SHALL BE REMOVED TO THE NEAREST JOINT.
16. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES SHOWN HEREON BEFORE STARTING ANY WORK ON THESE PLANS. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR THE COST OF ANY AND ALL DAMAGES WHICH OCCUR AS A RESULT OF A FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL EXISTING UTILITIES TO REMAIN.
17. ALL WORK SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
18. CONTRACTOR SHALL ADJUST ALL FRAMES, GRATES AND COVERS OF ALL EXISTING UTILITIES WITHIN THE LIMITS OF THE CONTRACT TO THE PROPOSED GRADES AS REQUIRED.
19. THE CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM STRUCTURES AT ALL TIMES.
20. CONTRACTOR SHALL INSTALL SEDIMENT CONTROLS PRIOR TO BEGINNING ANY WORK AND SHALL MAINTAIN SEDIMENT CONTROLS THROUGHOUT THE ENTIRE DURATION OF DEMOLITION & CONSTRUCTION ACTIVITIES, IN ACCORDANCE WITH ALL APPLICABLE STATE & COUNTY REQUIREMENTS.
21. ALL EXCAVATION SHALL BE BACKFILLED AND COMPACTED WITH TRACKED EQUIPMENT OR EQUIVALENT.
22. IT SHALL BE DISTINCTLY UNDERSTOOD THAT FAILURE TO MENTION SPECIFICALLY ANY WORK WHICH WOULD NORMALLY BE REQUIRED TO COMPLETE THIS PROJECT SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO COMPLETE SUCH WORK.
23. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ENGINEER OF ANY DEVIATION FROM THIS PLAN PRIOR TO ANY CHANGE BEING MADE. ANY DEVIATION FROM THIS PLAN WITHOUT WRITTEN AUTHORIZATION FROM THE ENGINEER WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
24. THE DEMOLITION INFORMATION SHOWN ON THIS DRAWING IS FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT LIMITS OF DEMOLITION AND REMOVAL OF AFFECTED SITE ITEMS.
25. THE CONTRACTOR SHALL PROVIDE A PRIVATE UTILITY LOCATOR TO LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO BEGINNING ANY CONSTRUCTION. TEST PITS SHALL BE DUG WHERE PROPOSED ACTIVITIES ARE OVERTOP OF EXISTING UTILITIES.

CONSTRUCTION NOTES:

1. ALL EXISTING UNDERGROUND UTILITIES SHALL BE PHYSICALLY LOCATED BY THE CONTRACTOR PRIOR TO THE BEGINNING OF ANY CONSTRUCTION IN THE VICINITY OF THESE UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH UTILITY COMPANIES FOR THE RELOCATION OF SERVICES/UTILITIES IF REQUIRED.
2. THE DEVELOPER IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING ROADS AND UTILITIES WHICH OCCUR AS A RESULT OF PROJECT CONSTRUCTION WITHIN OR CONTIGUOUS TO EXISTING RIGHT-OF-WAY.
3. STREET SURFACES SHALL BE MAINTAINED IN A CLEANED CONDITION. MUD AND DUST FREE AT ALL TIMES. ADEQUATE MEANS SHALL BE PROVIDED TO CLEAN TRUCKS AND OTHER EQUIPMENT USING THE COMPLETED STREETS.
4. LAND CONSERVATION NOTES:
   A.) MEASURES TO CONTROL EROSION, SILTATION AND STORM WATER SHALL BE PROVIDED PURSUANT TO, AND IN COMPLIANCE WITH, ALL CURRENT STATE AND LOCAL REGULATIONS. HOWEVER, THE APPROVAL OF THESE PLANS SHALL IN NO WAY RELIEVE THE DEVELOPER, OR HIS AGENT, OF ANY LEGAL RESPONSIBILITY WHICH MAY BE REQUIRED BY THE CODE OF MARYLAND OR ANY ORDINANCE ENACTED BY HARFORD COUNTY. A GRADING PERMIT IS REQUIRED BEFORE ANY LAND DISTURBING ACTIVITIES ON THE PROJECT ARE UNDERTAKEN.
   B.) ALL SLOPES AND DISTURBED AREAS ARE TO BE TOP-SOILED AND SEEDED WITHIN SEVEN (7) DAYS OF REACHING FINAL GRADE.
   C.) ALL DITCHES ARE TO BE STABILIZED TO THE SATISFACTION OF THE STATE HIGHWAY ADMINISTRATION AND/OR HARFORD COUNTY THROUGH THE USE OF SEEDING, RIP-RAP AND/OR PAVING.
   D.) ADDITIONAL DITCH LININGS SHALL BE PROVIDED AT THE DEVELOPER'S EXPENSE IF DETERMINED NECESSARY BY SHA AND/OR THE HARFORD COUNTY INSPECTOR DURING FIELD REVIEW.
5. CONTRACTOR IS TO REVIEW ALL UPSTREAM AND DOWNSTREAM CONNECTIONS WITH ENGINEER OF RECORD, OR ENGINEER'S DESIGNEE, PRIOR TO CONSTRUCTION..
6. THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE), IN ACCORDANCE WITH THE CLEAN WATER ACT AS AMENDED AND PURSUANT TO THE STATE WATER CONTROL LAW AND REGULATIONS, REQUIRES CONSTRUCTION SITE OPERATORS SECURE, OR WILL SECURE, BY INDICATING PROOF OF APPLICATION, A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES. CONSTRUCTION ACTIVITIES INCLUDE CLEARING, GRADING AND EXCAVATING WHICH RESULTS IN LAND DISTURBANCE EQUAL TO OR GREATER THAN ONE (1) ACRE. IN ORDER TO ENSURE COMPLIANCE WITH THE MDE PERMITTING REQUIREMENT, ALL APPLICATIONS FOR GRADING PERMITS WITHIN HARFORD COUNTY, SUBJECT TO CRITERIA AS PREVIOUSLY DESCRIBED, SHALL BE REQUIRED TO PROVIDE RECEIPT OF PROOF THAT CONSTRUCTION SITE OPERATORS HAVE SECURED OR WILL SECURE A NPDES CONSTRUCTION PERMIT PRIOR TO THE ISSUANCE OF THE GRADING PERMIT.
7. THE APPROVAL OF THESE PLANS SHALL IN NO WAY RELIEVE THE OWNER/DEVELOPER OF COMPLYING WITH OTHER APPLICABLE LOCAL, STATE AND FEDERAL REQUIREMENTS.
8. EMERGENCY VEHICLE ACCESS SHALL BE PROVIDED DURING ALL PHASES OF CONSTRUCTION.
9. PRIOR TO TREE CLEARING THE ENGINEER OF RECORD, OR ENGINEER'S DESGINEE, AND JOB SUPERINTENDENT WILL REVIEW TREES FOR SELECTIVE CLEARING WITHIN THE LIMITS OF DISTURBANCE. IN ANY CASE WHERE A TREE SCHEDULED FOR DEMOLITION CAN BE PROPERLY SAVED THE CONTRACTOR SHALL LEAVE THE TREE IN PLACE.
10. ALL EXISTING SIGNS (EXCLUDING ROADWAY SIGNAGE) THAT ARE DISTURBED DURING CONSTRUCTION SHALL BE RESET AT THE COMPLETION OF THE PROJECT.
11. SURVEYS: ELEVATIONS SHOWN HEREON ARE REFERRED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 AS DETERMINED BY RTK/GPS OBSERVATIONS AS BROADCASTED BY THE TOPCON TOPNET REAL TIME NETWORK.

    COORDINATES SHOWN HEREON ARE REFERRED TO THE MARYLAND COORDINATE SYSTEM (NAD 83/2011) AS DETERMINED BY RTK/GPS OBSERVATIONS AS BROADCASTED BY THE TOPCON TOPNET REAL TIME NETWORK.

NOTICE REQUIRED:
CONTRACTORS SHALL NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATION AND/OR BLASTING AT LEAST TWO (2) WORKING DAYS, BUT NOT MORE THAN TEN (10) WORKING DAYS PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION. NAMES AND TELEPHONE NUMBERS OF THE OPERATORS OF UNDERGROUND UTILITY LINES APPEAR BELOW. THESE NUMBERS SHALL ALSO BE USED TO SERVE IN AN EMERGENCY CONDITION.

COMCAST 1-800-266-2278
VERIZON1-888-553-1555
BGE 1-800-685-0123

CONTACT "MISS UTILITY" PHONE 1-800-257-7777, 48 HOURS IN ADVANCE FOR LOCATION OF ANY UTILITIES.

SITE DATA

1. SITE ADDRESS:	C. MILTON WRIGHT HIGH SCHOOL 1301 NORTH FOUNTAIN GREEN ROAD BEL AIR, MD. 21015
2. PROPERTY OWNERS:	HARFORD COUNTY BOARD OF EDUCATION 102 SOUTH HICKORY AVENUE BEL AIR, MD. 21014 VILLAGES OF THOMAS RUN HOA INC THOMAS RUN RD BEL AIR, MD 21014
3. PLAN PREPARED BY:	HGS, LLC, A RES COMPANY 5367 TELEPHONE ROAD WARRENTON, VA 20187
4. TAX ACCOUNT NO.:	031349 & 230589
5. PROPERTY REFERENCE:	MAP 0041, PARCEL 0212
6. TAX ASSESSMENT DIST.:	03
7. ZONING: EXISTING USE: PROPOSED USE:	URBAN RESIDENTIAL (R2) EXEMPT COMMERICIAL EXEMPT COMMERICIAL
8. SETBACKS:	FRONT REAR SIDE -- -- --
9. PROPERTY AREA:	59.83 ACRES
10. PARKING REQUIREMENTS:	THE SITE CURRENTLY CONTAINS -- +/- SPACES. NO CHANGES TO PARKING IS PROPOSED.
11. FLOODPLAIN INFO.:	THE SITE LIES OUTSIDE OF THE 100-YEAR FLOODPLAIN AS SHOWN ON F.I.R.M. MAP 24025C0162E EFFECTIVE 4/19/16.
12. SOILS:	SEE DRAINAGE AREA MAP / ESC PLAN & NOTES
13. WATERSHED:	BYNUM RUN (BASIN CODE: 02130704)
14. WELL/SEPTIC INFO:	ONSITE WATER / SEWER IS PRIVATE
15. STREAM CLASS/CLOSURE:	USE CLASS III (NON-TIDAL, COLD WATER). IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD OCTOBER 1 THROUGH APRIL 30, INCLUSIVE, DURING ANY YEAR.

59863 210576

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
6-14-2021

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
NOTES

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 2 of 51

GRAPHIC SCALE: 1" = 100'
0' 100' 200' 300'

691915.5'
1502087.1'

CENTERVILLE WAY

VILLAGES OF THOMAS RUN HOMEOWNERS ASSOCIATION INC
GLENDALE LN
TAX ACCT - 229874
PARCEL #: 0496
PLAT #: 59020

BOARD OF EDUCATION OF HARFORD COUNTY
1301 N FOUNTAIN GREEN RD
TAX ACCT - 031349
PARCEL #: 0212
PLAT #:

APROXIMATE LOCATION OF PLAYING FIELDS (TYP.)

689599.0'
1502087.1'

VILLAGES OF THOMAS RUN HOMEOWNERS ASSOCIATION INC
KIDWELL LANE
TAX ACCT - 230570
PARCEL #: 0451
PLAT #: 59018

EX. CONDITIONS SHEET 4
PLANTING SHEET 32
ESC SHEET 41

EX. CONDITIONS SHEET 5
PLANTING SHEET 33
ESC SHEET 42

EX. CONDITIONS SHEET 6
PLANTING SHEET 34
ESC SHEET 43

EX. CONDITIONS SHEET 7
PLANTING SHEET 35
ESC SHEET 44

APROXIMATE LOCATION OF PLAYING FIELDS (TYP.)

BOARD OF EDUCATION OF HARFORD COUNTY
102 S HICKORY AVE
TAX ACCT - 230562
PARCEL #: 0451
PLAT #: 59018

EX. CONDITIONS SHEET 9
PLANTING SHEET 36
ESC SHEET 45

APROXIMATE LOCATION OF PLAYING FIELDS (TYP.)

VILLAGES OF THOMAS RUN HOMEOWNERS ASSOCIATION INC
OXFORD SQ
TAX ACCT - 230554
PARCEL #: 0500
PLAT #: 59021

C. MILTON WRIGHT HIGH SCHOOL BUILDING

VILLAGES OF THOMAS RUN HOA INC
THOMAS RUN RD
TAX ACCT - 230589
PARCEL #: 0524
PLAT #: 59022

MCNEIL, TRAVIS R AND COURTNEY L
1612 DOGWOOD LANE
TAX ACCT - 157678
PARCEL #: 0589
PLAT #: 5065

SAWYERS, NED F AND LOUISE B
1611 DOGWOOD LANE
TAX ACCT - 149491
PARCEL #: 0589
PLAT #: 5065

PLANTING SHEET 38
ESC SHEET 47

EX. CONDITIONS SHEET 8
PLANTING SHEET 39
ESC SHEET 48

APROXIMATE LOCATION OF PLAYING FIELDS (TYP.)

PLANTING SHEET 37
ESC SHEET 46

C. MILTON WRIGHT HIGH SCHOOL PARKING LOT

691915.5'
1500641.3'

N. FOUNTAIN GREEN ROAD

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
- EX. SURVEY LIMITS (LOS)
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. FOREST CONSERVATION EASEMENT (FCE)
- EX. 100-FT STREAM BUFFER (SB)
- EX. SANITARY LINE (SAN)
- EX. WATER LINE (W)
- PR. LIMITS OF DISTURBANCE (LOD)
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

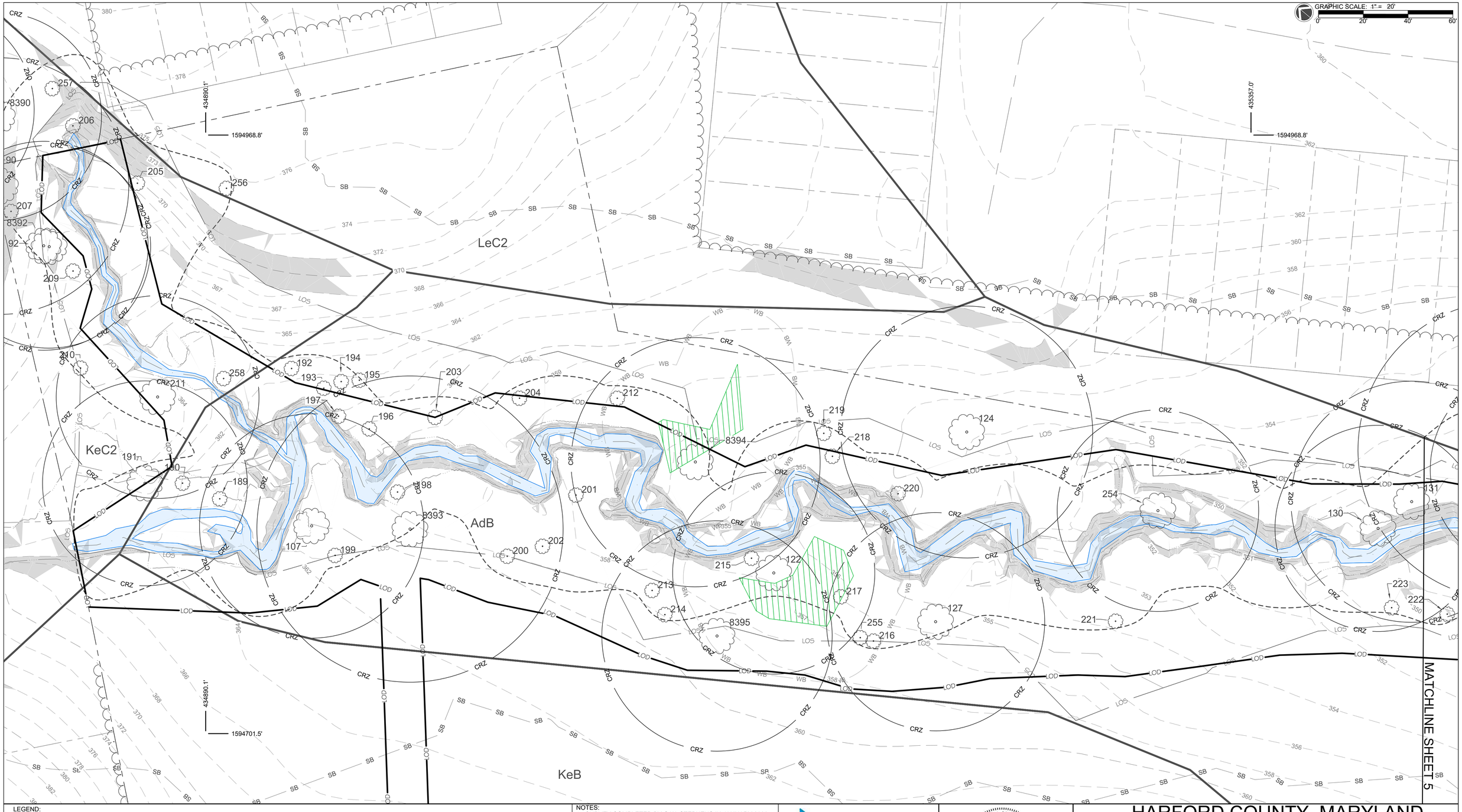
HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION

KEY SHEET

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021



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
- EX. LIMITS OF TREE SURVEY
- EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE (18-24" DBH)
- EX. SPECIMEN TREE
- EX. SPECIMEN TREE CRITICAL ROOT ZONE
- EX. FOREST CONSERVATION EASEMENT
- EX. SOILS BOUNDARY
- EX. STEEP SLOPES
- EX. 100-FT STREAM BUFFER
- EX. 25-FT WETLAND BUFFER
- EX. SANITARY LINE
- EX. WATER LINE
- PR. LIMITS OF DISTURBANCE

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

EXISTING CONDITIONS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

GRAPHIC SCALE: 1" = 20'
0' 20' 40' 60'

419834.1'
1598936.3'

MATCHLINE SHEET 6

MATCHLINE SHEET 4

NeB2

AdB

KeC2

420213.1'
1598668.4'

419834.1'
1598668.4'

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
- EX. LIMITS OF TREE SURVEY
- LOS — EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE (18-24" DBH)
- EX. SPECIMEN TREE
- CRZ — EX. SPECIMEN TREE CRITICAL ROOT ZONE
- FCE — EX. FOREST CONSERVATION EASEMENT
- AsB — EX. SOILS BOUNDARY
- EX. STEEP SLOPES
- SB — EX. 100-FT STREAM BUFFER
- WB — EX. 25-FT WETLAND BUFFER
- SAN — EX. SANITARY LINE
- W — EX. WATER LINE
- LOD — PR. LIMITS OF DISTURBANCE

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
11/26/21

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
EXISTING CONDITIONS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

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
- EX. LIMITS OF TREE SURVEY
- EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE (18-24" DBH)
- EX. SPECIMEN TREE
- EX. SPECIMEN TREE CRITICAL ROOT ZONE
- EX. FOREST CONSERVATION EASEMENT
- EX. SOILS BOUNDARY
- EX. STEEP SLOPES
- EX. 100-FT STREAM BUFFER
- EX. 25-FT WETLAND BUFFER
- EX. SANITARY LINE
- EX. WATER LINE
- PR. LIMITS OF DISTURBANCE

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

EXISTING CONDITIONS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

MATCHLINE SHEET 6

GRAPHIC SCALE: 1" = 20'
0' 20' 40' 60'

418539.9'
1598653.9'

MATCHLINE SHEET 9

418539.9'
1598383.1'

418968.0'
1598383.1'

MANHOLE 316.80'

MANHOLE 12" BELOW GROUND 306.31'

30" CMP SD INV. ELEV. 305.43

30" CMP SD INV. ELEV. 304.82

WaB

NeC2

NeB2

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
- EX. LIMITS OF TREE SURVEY
- EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE (18-24" DBH)
- EX. SPECIMEN TREE
- EX. SPECIMEN TREE CRITICAL ROOT ZONE
- EX. FOREST CONSERVATION EASEMENT
- EX. SOILS BOUNDARY
- EX. STEEP SLOPES
- EX. 100-FT STREAM BUFFER
- EX. 25-FT WETLAND BUFFER
- EX. SANITARY LINE
- EX. WATER LINE
- PR. LIMITS OF DISTURBANCE

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

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

STATE OF MARYLAND
BAILEY W. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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.

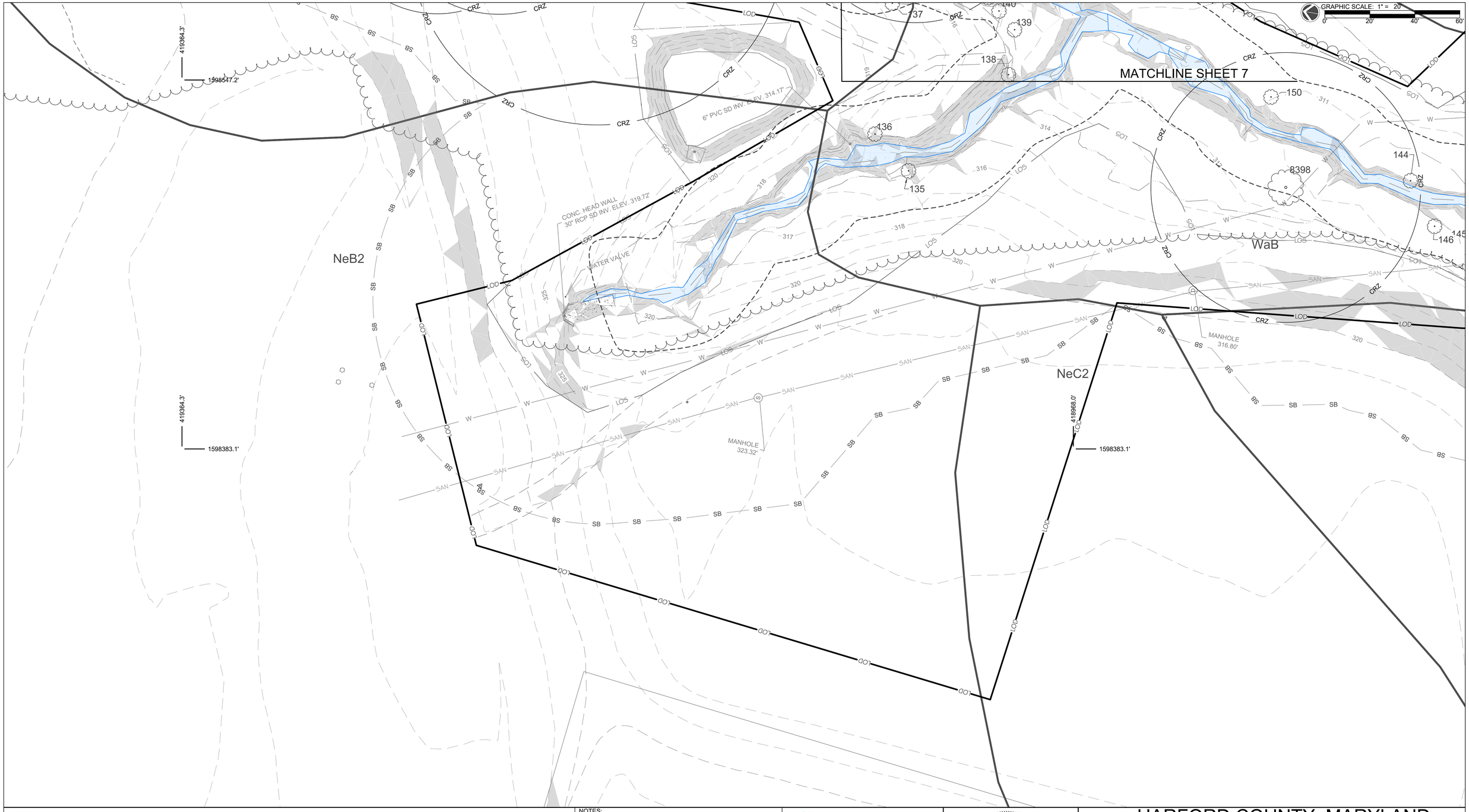
License Number: 52852
Expiration Date: 6-14-2022

HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION
EXISTING CONDITIONS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 7 of 51



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
- EX. LIMITS OF TREE SURVEY
- EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE (18-24" DBH)
- EX. SPECIMEN TREE
- EX. SPECIMEN TREE CRITICAL ROOT ZONE
- EX. FOREST CONSERVATION EASEMENT
- EX. SOILS BOUNDARY
- EX. STEEP SLOPES
- EX. 100-FT STREAM BUFFER
- EX. 25-FT WETLAND BUFFER
- EX. SANITARY LINE
- EX. WATER LINE
- PR. LIMITS OF DISTURBANCE

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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.

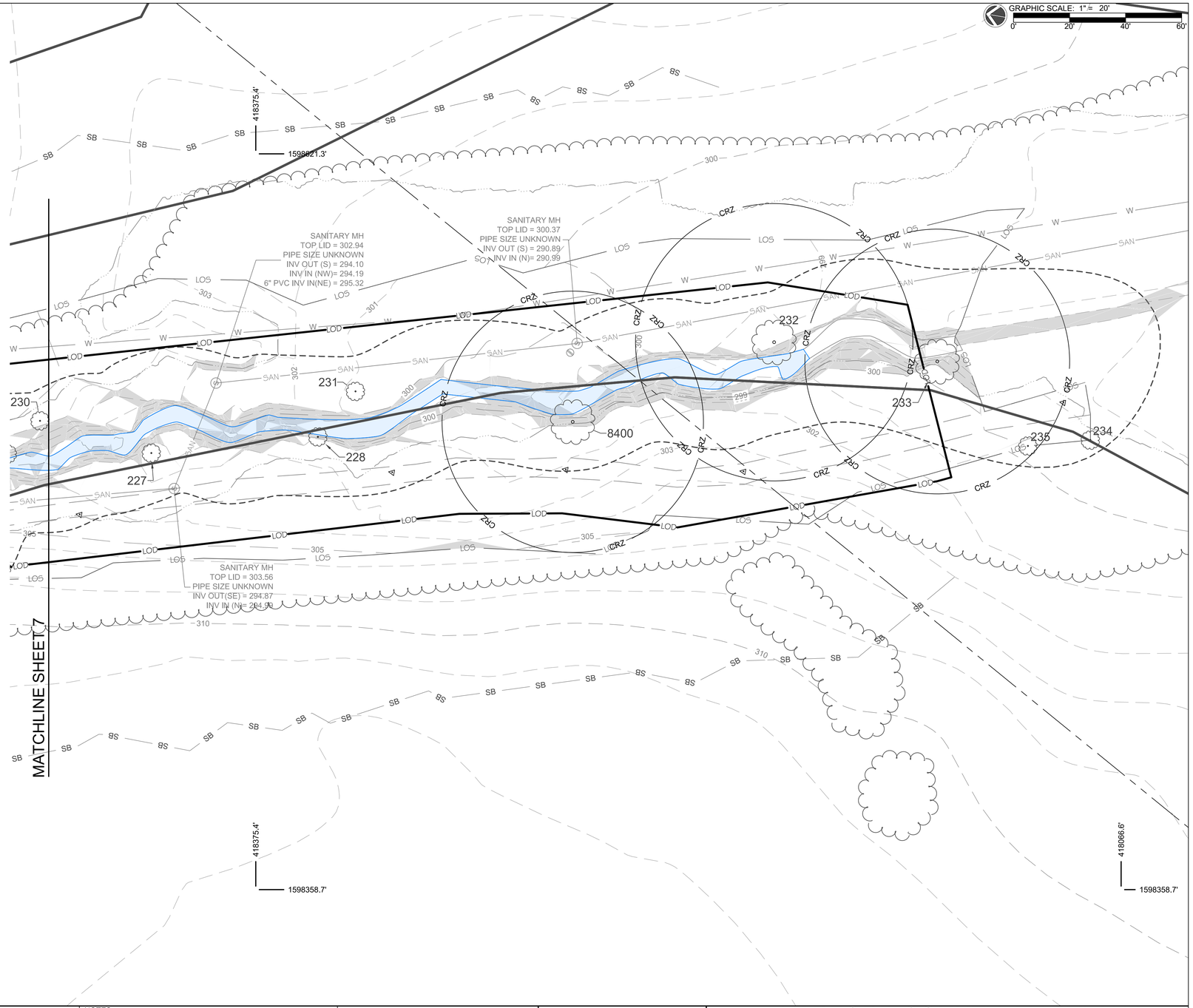
License Number: 52852
Expiration Date: 6-14-2022

HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION
EXISTING CONDITIONS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021



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
- EX. LIMITS OF TREE SURVEY
- LOS — EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE (18-24" DBH)
- EX. SPECIMEN TREE
- CRZ — EX. SPECIMEN TREE CRITICAL ROOT ZONE
- FCE — EX. FOREST CONSERVATION EASEMENT
- AsB — EX. SOILS BOUNDARY
- EX. STEEP SLOPES
- SB — EX. 100-FT STREAM BUFFER
- WB — EX. 25-FT WETLAND BUFFER
- SAN — EX. SANITARY LINE
- W — EX. WATER LINE
- LOD — PR. LIMITS OF DISTURBANCE

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
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

EXISTING CONDITIONS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

Survey Number	Common Name	Scientific Name	DBH	Condition
4	Tulip Poplar	*Liriodendron tulipifera*	43.5"	Poor
5	Tulip Poplar	*Liriodendron tulipifera*	32.5"	Fair
8	Tulip Poplar	*Liriodendron tulipifera*	32.4"	Fair
15	Tulip Poplar	*Liriodendron tulipifera*	31.4"	Poor
18	Tulip Poplar	*Liriodendron tulipifera*	38.4"	Fair
19	Tulip Poplar	*Liriodendron tulipifera*	38.4"	Fair
20	Tulip Poplar	*Liriodendron tulipifera*	34.5"	Fair
32	Tulip Poplar	*Liriodendron tulipifera*	30.2"	Fair
41	American Beech	*Fagus grandifolia*	39"	Fair
44	White Oak	*Quercus alba*	36.4"	Poor
46	Red Oak	*Quercus rubra*	34.2"	Fair
65	American Beech	*Fagus grandifolia*	35.5"	Fair
67	Tulip Poplar	*Liriodendron tulipifera*	56"	Fair
90	Red Oak	*Quercus rubra*	38.2"	Fair
92	Tulip Poplar	*Liriodendron tulipifera*	30.2	Good
107	White Oak	*Quercus alba*	33.4"	Good
122	Tulip Poplar	*Liriodendron tulipifera*	30.1"	Fair
124	Tulip Poplar	*Liriodendron tulipifera*	37.5"	Poor
127	Tulip Poplar	*Liriodendron tulipifera*	32.5"	Good
130	Tulip Poplar	*Liriodendron tulipifera*	30.7"	Fair
131	Tulip Poplar	*Liriodendron tulipifera*	35.9"	Poor
8390	Tulip Poplar	*Liriodendron tulipifera*	31"	Fair
8391	Tulip Poplar	*Liriodendron tulipifera*	31.2"	Fair
8392	Tulip Poplar	*Liriodendron tulipifera*	31.1"	Fair
8393	Tulip Poplar	*Liriodendron tulipifera*	45.6"	Good
8394	Tulip Poplar	*Liriodendron tulipifera*	37.1"	Fair
8395	Tulip Poplar	*Liriodendron tulipifera*	34.3"	Poor
8396	Tulip Poplar	*Liriodendron tulipifera*	31.5"	Fair
8397	Tulip Poplar	*Liriodendron tulipifera*	35"	Fair
8398	Tulip Poplar	*Liriodendron tulipifera*	40"	Poor
8399	Sycamore	*Platanus occidentalis*	35.8"	Fair
8400	Sycamore	*Platanus occidentalis*	31.1"	Fair

Survey Number	Common Name	Scientific Name	DBH	Condition
135	Eastern White Pine	*Pinus strobus*	18.2"	Good
136	Eastern White Pine	*Pinus strobus*	21"	Good
137	Slippery Elm	*Ulmus rubra*	20.1"	Poor
138	Tulip Poplar	*Liriodendron tulipifera*	27.5"	Fair
139	Tulip Poplar	*Liriodendron tulipifera*	23"	Good
140	Tulip Poplar	*Liriodendron tulipifera*	19"	Good
141	Tulip Poplar	*Liriodendron tulipifera*	19"	Good
142	Tulip Poplar	*Liriodendron tulipifera*	20.4"	Good
143	Tulip Poplar	*Liriodendron tulipifera*	28"	Good
144	White Ash	*Fraxinus americana*	18"	Poor
145	Black Walnut	*Juglans nigra*	16"	Fair
146	Black Walnut	*Juglans nigra*	17.9"	Fair
147	Sycamore	*Platanus occidentalis*	23"	Good
148	Sycamore	*Platanus occidentalis*	35.8"	Fair
149	Sycamore	*Platanus occidentalis*	21.7"	Good
150	White Ash	*Fraxinus americana*	20"	Poor
151	Sycamore	*Platanus occidentalis*	16"	Fair
152	Tulip Poplar	*Liriodendron tulipifera*	17.5"	Fair
153	Black Walnut	*Juglans nigra*	23.2"	Fair
154	Tulip Poplar	*Liriodendron tulipifera*	26.5"	Fair
155	Black Walnut	*Juglans nigra*	19"	Fair
156	Sweet Gum	*Liquidambar styraciflua*	16.2"	Fair
157	American Beech	*Fagus grandifolia*	19.2"	Good
158	Tulip Poplar	*Liriodendron tulipifera*	29.5"	Fair
159	Tulip Poplar	*Liriodendron tulipifera*	24.6"	Fair
160	Tulip Poplar	*Liriodendron tulipifera*	22.4"	Fair
161	Tulip Poplar	*Liriodendron tulipifera*	25"	Fair
162	Tulip Poplar	*Liriodendron tulipifera*	28"	Good
163	Tulip Poplar	*Liriodendron tulipifera*	24"	Dead
164	American Elm	*Ulmus americana*	25"	Fair
165	Tulip Poplar	*Liriodendron tulipifera*	27", 23.4" (twin)	Fair
166	Red Oak	*Quercus rubra*	26.7"	Poor
167	White Ash	*Fraxinus americana*	22.6"	Poor
168	Tulip Poplar	*Liriodendron tulipifera*	20"	Poor
169	White Ash	*Fraxinus americana*	21.1"	Poor
170	Black Walnut	*Juglans nigra*	19"	Fair
171	Black Oak	*Quercus velutina*	24.7"	Good
172	White Ash	*Fraxinus americana*	16.4"	Poor
173	White Ash	*Fraxinus americana*	22"	Poor
174	Black Walnut	*Juglans nigra*	28.2"	Fair
175	Tulip Poplar	*Liriodendron tulipifera*	20.7"	Fair
176	Black Willow	*Salix nigra*	19"	Poor
177	American Elm	*Ulmus americana*	24.5"	Good
178	White Ash	*Fraxinus americana*	22.1"	Poor
179	Tulip Poplar	*Liriodendron tulipifera*	22"	Fair
180	American Beech	*Fagus grandifolia*	31.5"	Good
181	Tulip Poplar	*Liriodendron tulipifera*	32.5"	Good
182	Tulip Poplar	*Liriodendron tulipifera*	22"	Fair
183	Tulip Poplar	*Liriodendron tulipifera*	24"	Poor
184	American Beech	*Fagus grandifolia*	17.2"	Good
185	White Ash	*Fraxinus americana*	28.3"	Poor
186	Tulip Poplar	*Liriodendron tulipifera*	25"	Fair
187	Tulip Poplar	*Liriodendron tulipifera*	15.8", 23.2" (twin)	Poor
188	Tulip Poplar	*Liriodendron tulipifera*	29.5"	Fair
189	White Ash	*Fraxinus americana*	26.1"	Good
190	Tulip Poplar	*Liriodendron tulipifera*	27"	Good
191	Red Oak	*Quercus rubra*	30.5"	Poor
192	Tulip Poplar	*Liriodendron tulipifera*	16", 19" (twin)	Fair
193	Tulip Poplar	*Liriodendron tulipifera*	24.3"	Good
194	Tulip Poplar	*Liriodendron tulipifera*	19.8"	Good
195	Tulip Poplar	*Liriodendron tulipifera*	27.1"	Good
196	Tulip Poplar	*Liriodendron tulipifera*	23.2"	Fair
197	Tulip Poplar	*Liriodendron tulipifera*	22.7"	Fair
198	American Beech	*Fagus grandifolia*	23"	Good
199	White Ash	*Fraxinus americana*	20.3"	Fair

Survey Number	Common Name	Scientific Name	DBH	Condition
200	White Ash	*Fraxinus americana*	20.3", 22.6" (twin)	Good
201	White Ash	*Fraxinus americana*	25.8", 19.8" (twin)	Fair
202	Black Gum	*Nyssa sylvatica*	15.8"	Good
203	White Oak	*Quercus alba*	15.5"	Poor
204	Red Oak	*Quercus rubra*	20.2"	Good
205	White Ash	*Fraxinus americana*	23"	Poor
206	Red Oak	*Quercus rubra*	18"	Good
207	Red Oak	*Quercus rubra*	27.1"	Dead
208	Tulip Poplar	*Liriodendron tulipifera*	30.2"	Good
209	Red Oak	*Quercus rubra*	29.9"	Good
210	American Beech	*Fagus grandifolia*	23.9"	Good
211	White Ash	*Fraxinus americana*	30.2"	Fair
212	American Elm	*Ulmus americana*	17.8"	Fair
213	White Ash	*Fraxinus americana*	26.2"	Poor
214	Red Maple	*Acer rubrum*	17.7"	Fair
215	Tulip Poplar	*Liriodendron tulipifera*	24"	Fair
216	Tulip Poplar	*Liriodendron tulipifera*	23.5"	Fair
217	Tulip Poplar	*Liriodendron tulipifera*	25.5"	Fair
218	American Elm	*Ulmus americana*	25"	Fair
219	Tulip Poplar	*Liriodendron tulipifera*	25"	Fair
220	White Ash	*Fraxinus americana*	26.3"	Fair
221	Slippery Elm	*Ulmus rubra*	27"	Fair
222	Black Gum	*Nyssa sylvatica*	23"	Fair
223	White Ash	*Fraxinus americana*	27.5"	Poor
224	White Ash	*Fraxinus americana*	31.9"	Poor
225	Black Willow	*Salix nigra*	17"	Dead
226	Willow Oak	*Quercus phellos*	17.2"	Good
227	Slippery Elm	*Ulmus rubra*	26"	Fair
228	Black Walnut	*Juglans nigra*	17"	Fair
229	Sycamore	*Platanus occidentalis*	26.4"	Fair
230	Black Willow	*Salix nigra*	18"	Poor
231	Black Willow	*Salix nigra*	18"	Poor
232	Tulip Poplar	*Liriodendron tulipifera*	33"	Poor
233	White Ash	*Fraxinus americana*	31.5"	Fair
234	Red Maple	*Acer rubrum*	18.5"	Good
235	Tulip Poplar	*Liriodendron tulipifera*	18"	Fair
236	Tulip Poplar	*Liriodendron tulipifera*	20"	Good
237	Red Oak	*Quercus rubra*	26"	Fair
238	Tulip Poplar	*Liriodendron tulipifera*	26.3", 21" (twin)	Fair
239	American Beech	*Fagus grandifolia*	29.4"	Good
240	White Ash	*Fraxinus americana*	24.5"	Poor
241	Tulip Poplar	*Liriodendron tulipifera*	26.8", 20.5" (twin)	Fair
242	Tulip Poplar	*Liriodendron tulipifera*	27.9"	Fair
243	Tulip Poplar	*Liriodendron tulipifera*	22.4"	Fair
244	Black Walnut	*Juglans nigra*	29.2"	Fair
245	White Oak	*Quercus alba*	24.2"	Fair
246	White Ash	*Fraxinus americana*	24.6"	Fair
247	Red Oak	*Quercus rubra*	31.3"	Fair
248	Tulip Poplar	*Liriodendron tulipifera*	32"	Poor
249	Tulip Poplar	*Liriodendron tulipifera*	30", 30", 30" (triple)	Fair
250	Tulip Poplar	*Liriodendron tulipifera*	28"	Fair
251	Tulip Poplar	*Liriodendron tulipifera*	31"	Fair
252	Tulip Poplar	*Liriodendron tulipifera*	44.5"	Fair
253	Tulip Poplar	*Liriodendron tulipifera*	28.5"	Fair
254	American Elm	*Ulmus americana*	30"	Fair
255	Tulip Poplar	*Liriodendron tulipifera*	25.5"	Fair
256	Red Oak	*Quercus rubra*	18.5"	Fair
257	Red Oak	*Quercus rubra*	18"	Good
258	Tulip Poplar	*Liriodendron tulipifera*	26.6"	Fair

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

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

STATE OF MARYLAND · BAILEY J. WILFONG · 52852 · PROFESSIONAL ENGINEER

4/16/2021

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

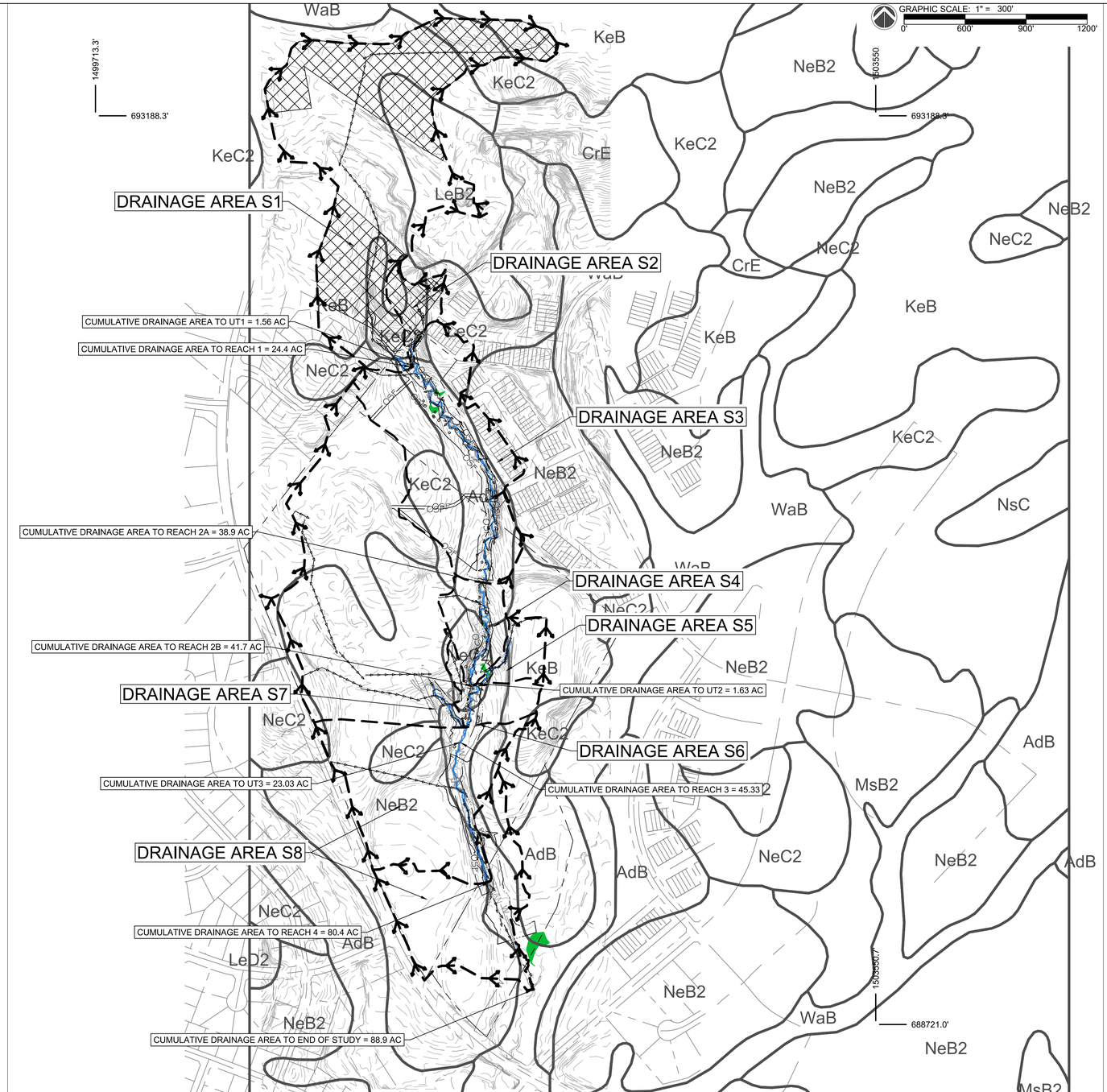
HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION

TREE INDEX TABLE

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021



Map unit symbol	Map unit name	HSG Rating
AdB	Aldino silt loam, 3 to 8 percent slopes	C
CrE	Chrome channery silty clay loam, 15 to 45 percent slopes	C
KeB	Kelly silt loam, 3 to 8 percent slopes	D
KeC2	Kelly silt loam, 8 to 15 percent slopes, moderately eroded	D
LeB2	Legore silt loam, 3 to 8 percent slopes, moderately eroded	C
LeC2	Legore silt loam, 8 to 15 percent slopes, moderately eroded	C
MsC2	Montalto silt loam, 8 to 15 percent slopes, moderately eroded	B
NeB2	Neshaminy silt loam, 3 to 8 percent slopes, moderately eroded	B
NeC2	Neshaminy silt loam, 8 to 15 percent slopes, moderately eroded	B
WaB	Watchung silt loam, 3 to 8 percent slopes	C/D

HYDROLOGY SUMMARY TABLE					
REACH (DA)	DA (AC)	2YR* (cfs)	10YR* (cfs)	100YR* (cfs)	Tc
Reach 1 (S1)	24.4	36.13	66.73	130.76	0.399
Reach 2A (S3)	38.9	37.68	69.76	136.6	0.239
Reach 2B (S4)	41.7	49.2	93.9	190.8	0.265
Reach 3 (S6)	45.33	53.32	103.42	212.46	0.424
Reach 4+ (S8)	88.9	95.15	195.72	421.27	0.293
UT1 (S2)	1.56	2.86	5.32	10.45	0.135
UT2 (S5)	1.63	2.57	4.67	9.01	0.384
UT3 (S7)	23.03	25.67	50.77	104.92	0.328

*Based on ultimate developed landuse per the zoning ordinance and NOAA 24hr Rainfall, Type C Distribution.

+For Hydraulic modeling purposes the Reach 4 downstream terminus used in the Hydrology Summary ends further downstream than the restoration which ends at 80.4 AC.

LEGEND:

- EX. PROPERTY LINE
- EX. PROPERTY ADJACENT
- EX. MAJOR CONTOUR
- EX. MINOR CONTOUR
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- AsB EX. SOILS BOUNDARY
- EX. DRAINAGE DIVIDE
- EX. TIME OF CONCENTRATION FLOW PATH
- PR. REACH DRAINAGE DIVIDE
- PR. 100-YR WSE
- AGRICULTURAL ZONING (1/2-AC RESIDENTIAL)
- R2 ZONING (1/8-AC RESIDENTIAL)

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

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

STATE OF MARYLAND · BAILEY J. WILSON · 52852 · PROFESSIONAL ENGINEER · 04/16/2021

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

DRAINAGE AREA MAP

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 11 of 51

LEGEND:

- EX. PROPERTY LINE
- EX. PROPERTY ADJACENT
- EX. MAJOR CONTOUR
- EX. MINOR CONTOUR
- EX. 100-YR WSE
- EX. CULVERT
- EX. STREAM
- EX. FORESTED WETLAND
- PR. 100-YR WSE
- PR. STREAM CENTERLINE
- PR. BANKFULL
- PR. CULVERT

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

res

HGS, LLC. A RES COMPANY

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

STATE OF MARYLAND · BAILEY J. WILFONG · PROFESSIONAL ENGINEER · 52852

4/16/2021

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

HYDRAULIC ANALYSIS MAP

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

100-Yr WSE COMPARISON					
REACH	EX. XS	EX. 100-YR WSE (FT)	PR. XS	PR. 100-YR WSE (FT)	DIFFERENCE IN WSE (FT)
Reach1	4511	376.82	3625	376.82	0.00
Reach1	4422	374.54	3539	374.54	0.00
Reach1	4369	370.19	3480	370.19	0.00
Reach1	4300	367.63	3412	367.63	0.00
Reach1	4244	364.44	3356	364.44	0.00
Reach1	4215	363.36	3329	363.65	0.29
Reach1	4185	362.12	3290	362.42	0.30
Reach1	4124	360.42	3256	360.90	0.48
Reach 2	3995	358.20	3178	359.32	1.12
Reach 2	3881	356.49	3090	357.69	1.20
Reach 2	3681	353.30	2951	354.77	1.47
Reach 2	3528	351.47	2825	352.11	0.64
Reach 2	3453	350.25	2756	350.58	0.33
Reach 2	3347	347.91	2658	348.86	0.95
Reach 2	3274	346.55	2587	347.58	1.03
Reach 2	3188	344.75	2498	345.29	0.54
Reach 2	3148	343.81	2452	344.20	0.39
Reach 2	3003	339.88	2319	340.78	0.90
Reach 2	2901	338.22	2215	338.73	0.51
Reach 2	2762	337.98	2110	338.03	0.05
Reach 2	2650	338.00	2004	338.04	0.04
Reach 2	2615	337.95	1979	337.88	-0.07
Reach 2	2590	EX. CULVERT	1959	EX. CULVERT	-
Reach 2	2570	333.22	1935	333.22	0.00
Reach 2	2516	330.97	1887	332.31	1.34
Reach 2	2445	329.14	1822	329.91	0.77
Reach 2	2346	326.29	1737	327.42	1.13
Reach 2	2224	323.05	1616	323.53	0.48
Reach 2	2179	321.29	1572	322.17	0.88
Reach 2	2103	319.23	1497	319.65	0.42
Reach 2	2008	316.59	1380	317.49	0.90
Reach 3	1942	316.37	1344	316.46	0.09
Reach 3	1835	314.68	1267	315.43	0.75
Reach 3	1746	314.04	1186	314.26	0.22
Reach 4	1691	313.49	1132	313.82	0.33
Reach 4	1597	312.66	1035	313.49	0.83
Reach 4	-*	-	1000	313.39	-
Reach 4	-*	-	983	313.30	-
Reach 4	-*	-	970	PR. CULVERT	-
Reach 4	1520	311.52	954	311.25	-0.27
Reach 4	-*	-	927	310.97	-
Reach 4	1455	310.66	890	310.58	-0.08
Reach 4	1438	310.28	-*	-	-
Reach 4	1422		EX. CULVERT		
Reach 4	1407	309.46	842	310.02	0.56
Reach 4	1385	309.14	817	309.25	0.11
Reach 4	1289	308.17	730	307.86	-0.31
Reach 4	1178	305.50	620	305.80	0.30
Reach 4	1017	302.45	475	302.69	0.24
Reach 4	874	299.62	326	300.29	0.67
Reach 4	778	298.88	222	298.88	0.00
Reach 4	662	297.38	106	297.38	0.00
Reach 4	540	296.23	0	296.23	0.00
UT1	325	376.54	322	376.54	0.00
UT1	264	374.32	263	374.32	0.00
UT1	203	369.02	204	369.03	0.01
UT1	145	366.07	147	367.35	1.28
UT1	116	365.54	117	366.02	0.48
UT1	83	364.35	86	364.46	0.11
UT1	60	363.46	64	363.49	0.03
UT1	21	360.01	23	360.76	0.75
UT2	277	325.32	285	325.32	0.00
UT2	167	321.35	176	321.35	0.00
UT2	115	318.50	124	318.63	0.13
UT2	36	316.87	51	317.40	0.53
UT3	266	320.61	255	319.92	-0.69
UT3	184	316.59	158	317.40	0.81
UT3	84	313.86	77	314.73	0.87

* SOME CROSS-SECTIONS IN THE VICINITY OF CULVERTS DO NOT HAVE COMPARABLE CROSS-SECTIONS IN BOTH MODELS.

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

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

STATE OF MARYLAND · BAILEY J. WILFONG · 52852 · PROFESSIONAL ENGINEER

4/16/2021

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

100-YR WSE RESULTS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

2-YR SHEAR STRESS COMPARISON					
REACH	EX. XS	EX. SHEAR (LB/SF)	PR. XS	PR. SHEAR (LB/SF)	STABILITY JUSTIFICATION
REACH 1	4511	1.55	3625	1.55	No Change
REACH 1	4422	1.48	3539	1.48	No Change
REACH 1	4369	1.31	3480	1.31	No Change
REACH 1	4300	1.13	3412	1.13	No Change
REACH 1	4244	1.26	3356	1.26	No Change
REACH 1	4215	1.13	3329	0.99	Decrease
REACH 1	4185	1.1	3290	1.11	Stable Shear Value
REACH 1	4124	1.38	3256	0.89	Decrease
REACH 2	3995	1.34	3178	1.04	Decrease
REACH 2	3881	0.58	3090	0.84	Stable Shear Value
REACH 2	3681	1.37	2951	0.98	Decrease
REACH 2	3528	0.31	2825	0.99	Stable Shear Value
REACH 2	3453	1.32	2756	1.05	Decrease
REACH 2	3347	0.6	2658	0.88	Stable Shear Value
REACH 2	3274	1.08	2587	1.07	Decrease
REACH 2	3188	0.62	2498	1.05	Stable Shear Value
REACH 2	3148	1.22	2452	0.95	Decrease
REACH 2	3003	1.17	2319	1.03	Decrease
REACH 2	2901	0.44	2215	0.86	Stable Shear Value
REACH 2	2762	1.42	2110	0.93	Decrease
REACH 2	2650	0.11	2004	0.28	Stable Shear Value
REACH 2	2615	0.09	1979	0.16	Stable Shear Value
REACH 2	2590	0	1959	0	No Change
REACH 2	2570	1.15	1935	1.02	Decrease
REACH 2	2516	1.18	1887	1.16	Decrease
REACH 2	2445	1.24	1822	1.15	Decrease
REACH 2	2346	1.18	1737	1.1	Decrease
REACH 2	2224	1.39	1616	1.12	Decrease
REACH 2	2179	1.28	1572	1.31	Stable Shear Value
REACH 2	2103	1.28	1497	0.89	Decrease
REACH 2	2008	1.27	1380	1.19	Decrease
REACH 3	1942	0.56	1344	0.62	Stable Shear Value
REACH 3	1835	1.12	1267	1.12	No Change
REACH 3	1746	0.73	1186	1.06	Stable Shear Value
REACH 4	1691	0.62	1132	1.24	Stable Shear Value
REACH 4	1597	1.69	1035	1.08	Decrease
REACH 4	-*		1000	0.92	Stable Shear Value
REACH 4	-*		983	1.32	Stable Shear Value
REACH 4	PR. CULVERT				
REACH 4	1520	0.6	954	0.27	Decrease
REACH 4	-*		927	0.84	Stable Shear Value
REACH 4	1455	0.47	890	1.48	Stable Shear Value
REACH 4	1438	0.23	-*	-	-
REACH 4	EX. CULVERT				
REACH 4	1407	1.64	842	1.31	Decrease
REACH 4	1385	0.96	817	1.35	Stable Shear Value
REACH 4	1289	2.17	730	1.31	Decrease
REACH 4	1178	1.27	620	1.42	Stable Shear Value
REACH 4	1017	1.6	475	1.32	Decrease
REACH 4	874	0.48	326	0.92	Stable Shear Value
REACH 4	778	0.91	222	0.9	Decrease
REACH 4	662	0.82	106	0.83	Stable Shear Value
REACH 4	540	0.9	0	0.9	No Change

2-YR VELOCITY COMPARISON					
REACH	EX. XS	EX. VELOCITY (LF/S)	PR. XS	PR. VELOCITY (LF/S)	STABILITY JUSTIFICATION
REACH 1	4511	6.07	3625	6.07	No Change
REACH 1	4422	5.72	3539	5.72	No Change
REACH 1	4369	5.22	3480	5.22	No Change
REACH 1	4300	4.64	3412	4.64	No Change
REACH 1	4244	5.35	3356	5.35	No Change
REACH 1	4215	4.65	3329	4.61	Decrease
REACH 1	4185	5.07	3290	4.89	Decrease
REACH 1	4124	5.34	3256	4.39	Decrease
REACH 2	3995	5.21	3178	4.71	Decrease
REACH 2	3881	3.62	3090	4.26	Stable Velocity
REACH 2	3681	5.31	2951	4.57	Decrease
REACH 2	3528	2.75	2825	4.66	Stable Velocity
REACH 2	3453	5.22	2756	4.74	Decrease
REACH 2	3347	3.57	2658	4.38	Stable Velocity
REACH 2	3274	4.51	2587	4.75	Stable Velocity
REACH 2	3188	3.57	2498	4.72	Stable Velocity
REACH 2	3148	5.03	2452	4.49	Decrease
REACH 2	3003	4.77	2319	4.74	Decrease
REACH 2	2901	3.11	2215	4.18	Stable Velocity
REACH 2	2762	5.46	2110	4.47	Decrease
REACH 2	2650	1.68	2004	2.66	Stable Velocity
REACH 2	2615	1.52	1979	2.12	Stable Velocity
REACH 2	2590	0	1959	0	No Change
REACH 2	2570	4.78	1935	4.54	Decrease
REACH 2	2516	5.05	1887	5.07	Stable Velocity
REACH 2	2445	4.97	1822	4.97	No Change
REACH 2	2346	4.81	1737	4.95	Stable Velocity
REACH 2	2224	5.4	1616	5.07	Decrease
REACH 2	2179	5.05	1572	5.42	Stable Velocity
REACH 2	2103	5.15	1497	4.41	Decrease
REACH 2	2008	5.22	1380	5.18	Decrease
REACH 3	1942	3.66	1344	3.85	Stable Velocity
REACH 3	1835	4.92	1267	5.01	Stable Velocity
REACH 3	1746	4.2	1186	4.94	Stable Velocity
REACH 4	1691	3.91	1132	5.56	Stable Velocity
REACH 4	1597	6.41	1035	5.23	Decrease
REACH 4	-*		1000	4.93	Stable Velocity
REACH 4	-*		983	5.84	Stable Velocity
REACH 4	PR. CULVERT				
REACH 4	1520	4.1	954	2.79	Decrease
REACH 4	-*		927	4.62	Stable Velocity
REACH 4	1455	3.67	890	5.96	Stable Velocity
REACH 4	1438	2.49	-*	-	-
REACH 4	EX. CULVERT				
REACH 4	1407	6.13	842	5.69	Decrease
REACH 4	1385	5.07	817	5.75	Stable Velocity
REACH 4	1289	7.67	730	5.72	Decrease
REACH 4	1178	5.87	620	5.84	Decrease
REACH 4	1017	6.18	475	5.69	Decrease
REACH 4	874	3.52	326	4.93	Stable Velocity
REACH 4	778	4.31	222	4.31	No Change
REACH 4	662	4.58	106	4.59	Stable Velocity
REACH 4	540	5.03	0	5.03	No Change

10-YR SHEAR STRESS COMPARISON					
REACH	EX. XS	EX. SHEAR (LB/SF)	PR. XS	PR. SHEAR (LB/SF)	STABILITY JUSTIFICATION
REACH 1	4511	1.96	3625	1.96	No Change
REACH 1	4422	1.88	3539	1.88	No Change
REACH 1	4369	1.66	3480	1.66	No Change
REACH 1	4300	1.44	3412	1.44	No Change
REACH 1	4244	1.56	3356	1.56	No Change
REACH 1	4215	1.46	3329	1.2	Decrease
REACH 1	4185	1.32	3290	1.32	No Change
REACH 1	4124	1.58	3256	1.27	Decrease
REACH 2	3995	1.66	3178	1.32	Decrease
REACH 2	3881	0.86	3090	1.1	Stable Shear Value
REACH 2	3681	1.69	2951	1.31	Decrease
REACH 2	3528	0.53	2825	1.29	Stable Shear Value
REACH 2	3453	1.69	2756	1.43	Decrease
REACH 2	3347	0.95	2658	1.04	Stable Shear Value
REACH 2	3274	1.29	2587	1.56	Stable Shear Value
REACH 2	3188	0.64	2498	1.42	Stable Shear Value
REACH 2	3148	1.67	2452	1.29	Decrease
REACH 2	3003	1.43	2319	1.39	Decrease
REACH 2	2901	0.56	2215	1.05	Stable Shear Value
REACH 2	2762	1.73	2110	1.31	Decrease
REACH 2	2650	0.09	2004	0.18	Stable Shear Value
REACH 2	2615	0.1	1979	0.22	Stable Shear Value
REACH 2	2590	0	1959	0	No Change
REACH 2	2570	1.53	1935	1.52	Decrease
REACH 2	2516	1.81	1887	1.63	Decrease
REACH 2	2445	1.6	1822	1.64	Stable Shear Value
REACH 2	2346	1.52	1737	1.45	Decrease
REACH 2	2224	1.57	1616	1.56	Decrease
REACH 2	2179	1.59	1572	1.26	Decrease
REACH 2	2103	1.63	1497	1.37	Decrease
REACH 2	2008	1.81	1380	1.59	Decrease
REACH 3	1942	0.65	1344	0.85	Stable Shear Value
REACH 3	1835	1.67	1267	1.58	Decrease
REACH 3	1746	0.86	1186	1.2	Stable Shear Value
REACH 4	1691	0.73	1132	1.65	Stable Shear Value
REACH 4	1597	1.92	1035	0.79	Decrease
REACH 4	-		1000	0.6	Stable Shear Value
REACH 4	-		983	0.91	Stable Shear Value
REACH 4	PR. CULVERT				
REACH 4	1520	1.42	954	0.64	Decrease
REACH 4	-		927	1.09	Stable Shear Value
REACH 4	1455	1.25	890	2.13	Coir 700 Matting
REACH 4	1438	0.56	-	-	-
REACH 4	EX. CULVERT				
REACH 4	1407	1.99	842	1.46	Decrease
REACH 4	1385	0.9	817	1.8	Stable Shear Value
REACH 4	1289	3.43	730	1.85	Decrease
REACH 4	1178	2.61	620	2.07	Decrease
REACH 4	1017	1.82	475	1.73	Decrease
REACH 4	874	0.91	326	2.16	Coir 700 Matting
REACH 4	778	0.74	222	0.74	No Change
REACH 4	662	1.52	106	1.52	No Change
REACH 4	540	1.14	0	1.14	No Change

10-YR VELOCITY COMPARISON					
REACH	EX. XS	EX. VELOCITY (LF/S)	PR. XS	PR. VELOCITY (LF/S)	STABILITY JUSTIFICATION
REACH 1	4511	7.25	3625	7.25	No Change
REACH 1	4422	6.89	3539	6.89	No Change
REACH 1	4369	6.29	3480	6.29	No Change
REACH 1	4300	5.61	3412	5.61	No Change
REACH 1	4244	6.3	3356	6.3	No Change
REACH 1	4215	5.62	3329	5.34	Decrease
REACH 1	4185	5.8	3290	5.6	Decrease
REACH 1	4124	5.95	3256	5.44	Decrease
REACH 2	3995	6.1	3178	5.59	Decrease
REACH 2	3881	4.66	3090	5.08	Stable Velocity
REACH 2	3681	6.2	2951	5.55	Decrease
REACH 2	3528	3.73	2825	5.58	Stable Velocity
REACH 2	3453	6.3	2756	5.81	Decrease
REACH 2	3347	4.73	2658	5.01	Stable Velocity
REACH 2	3274	5.15	2587	5.99	Stable Velocity
REACH 2	3188	3.8	2498	5.76	Stable Velocity
REACH 2	3148	6.17	2452	5.47	Decrease
REACH 2	3003	5.54	2319	5.78	Stable Velocity
REACH 2	2901	3.69	2215	4.86	Stable Velocity
REACH 2	2762	6.28	2110	5.54	Decrease
REACH 2	2650	1.68	2004	2.3	Stable Velocity
REACH 2	2615	1.7	1979	2.64	Stable Velocity
REACH 2	2590	0	1959	0	No Change
REACH 2	2570	5.92	1935	5.9	Decrease
REACH 2	2516	6.51	1887	6.33	Decrease
REACH 2	2445	6.07	1822	6.24	Stable Velocity
REACH 2	2346	5.85	1737	5.98	Stable Velocity
REACH 2	2224	6.16	1616	6.27	Stable Velocity
REACH 2	2179	5.94	1572	5.68	Decrease
REACH 2	2103	6.19	1497	5.67	Decrease
REACH 2	2008	6.52	1380	6.33	Decrease
REACH 3	1942	4.2	1344	4.72	Stable Velocity
REACH 3	1835	6.23	1267	6.25	Stable Velocity
REACH 3	1746	4.87	1186	5.58	Stable Velocity
REACH 4	1691	4.58	1132	6.77	Stable Velocity
REACH 4	1597	7.35	1035	4.89	Decrease
REACH 4	-		1000	4.38	Stable Velocity
REACH 4	-		983	5.4	Stable Velocity
REACH 4	PR. CULVERT				
REACH 4	1520	6.54	954	4.45	Decrease
REACH 4	-		927	5.61	Stable Velocity
REACH 4	1455	6.12	890	7.6	Stable Velocity
REACH 4	1438	4	-	-	-
REACH 4	EX. CULVERT				
REACH 4	1407	7.08	842	6.41	Decrease
REACH 4	1385	5.38	817	7.05	Stable Velocity
REACH 4	1289	10.3	730	7.17	Decrease
REACH 4	1178	8.84	620	7.48	Decrease
REACH 4	1017	7.12	475	6.88	Decrease
REACH 4	874	4.82	326	7.83	Stable Velocity
REACH 4	778	4.2	222	4.2	No Change
REACH 4	662	6.56	106	6.56	No Change
REACH 4	540	5.9	0	5.9	No Change

2-YR SHEAR STRESS COMPARISON					
REACH	EX. XS	EX. SHEAR (LB/SF)	PR. XS	PR. SHEAR (LB/SF)	STABILITY JUSTIFICATION
UT1	325	0.49	322	0.49	No Change
UT1	264	0.42	263	0.42	No Change
UT1	203	0.6	204	0.43	Decrease
UT1	145	0.12	147	0.69	Stable Shear Value
UT1	116	0.47	117	0.72	Stable Shear Value
UT1	83	0.3	86	0.76	Stable Shear Value
UT1	60	0.39	64	0.54	Stable Shear Value
UT1	21	0.77	23	0.49	Decrease
UT2	277	0.3	285	0.3	No Change
UT2	167	0.5	176	0.5	No Change
UT2	115	0.37	124	0.28	Decrease
UT2	36	0.64	51	0.63	Decrease
UT3	266	1.18	255	1.19	Stable Shear Value
UT3	184	1.41	158	1.11	Decrease
UT3	84	0.72	77	1.02	Stable Shear Value

2-YR VELOCITY COMPARISON					
REACH	EX. XS	EX. VELOCITY (LF/S)	PR. XS	PR. VELOCITY (LF/S)	STABILITY JUSTIFICATION
UT1	325	2.6	322	2.6	No Change
UT1	264	2.23	263	2.23	No Change
UT1	203	2.91	204	2.47	Decrease
UT1	145	1.4	147	3.18	Stable Velocity
UT1	116	2.49	117	3.28	Stable Velocity
UT1	83	1.85	86	3.37	Stable Velocity
UT1	60	2.13	64	2.8	Stable Velocity
UT1	21	3.4	23	2.68	Decrease
UT2	277	1.87	285	1.87	No Change
UT2	167	2.55	176	2.55	No Change
UT2	115	2.21	124	2	Decrease
UT2	36	3.01	51	2.98	Decrease
UT3	266	4.85	255	4.9	Stable Velocity
UT3	184	5.52	158	4.77	Decrease
UT3	84	4.05	77	4.54	Stable Velocity

10-YR SHEAR STRESS COMPARISON					
REACH	EX. XS	EX. SHEAR (LB/SF)	PR. XS	PR. SHEAR (LB/SF)	STABILITY JUSTIFICATION
UT1	325	0.65	322	0.65	No Change
UT1	264	0.54	263	0.54	No Change
UT1	203	0.73	204	0.72	Decrease
UT1	145	0.18	147	0.64	Stable Shear Value
UT1	116	0.66	117	0.66	No Change
UT1	83	0.42	86	0.7	Stable Shear Value
UT1	60	0.47	64	0.64	Stable Shear Value
UT1	21	0.93	23	0.6	Decrease
UT2	277	0.43	285	0.43	No Change
UT2	167	0.64	176	0.64	No Change
UT2	115	0.57	124	0.45	Decrease
UT2	36	0.46	51	0.64	Stable Shear Value
UT3	266	1.58	255	1.59	Stable Shear Value
UT3	184	1.87	158	1.45	Decrease
UT3	84	0.73	77	1.4	Stable Shear Value

10-YR VELOCITY COMPARISON					
REACH	EX. XS	EX. VELOCITY (LF/S)	PR. XS	PR. VELOCITY (LF/S)	STABILITY JUSTIFICATION
UT1	325	3.18	322	3.18	No Change
UT1	264	2.73	263	2.73	No Change
UT1	203	3.32	204	3.31	Decrease
UT1	145	1.82	147	3.29	Stable Velocity
UT1	116	3.1	117	3.3	Stable Velocity
UT1	83	2.3	86	3.4	Stable Velocity
UT1	60	2.41	64	3.25	Stable Velocity
UT1	21	3.89	23	3.14	Decrease
UT2	277	2.37	285	2.37	No Change
UT2	167	3.04	176	3.04	No Change
UT2	115	2.88	124	2.66	Decrease
UT2	36	2.69	51	3.19	Stable Velocity
UT3	266	6.03	255	6.09	Stable Velocity
UT3	184	6.83	158	5.83	Decrease
UT3	84	4.44	77	5.66	Stable Velocity

* SOME CROSS-SECTIONS IN THE VICINITY OF CULVERTS DO NOT HAVE COMPARABLE CROSS-SECTIONS IN BOTH MODELS.

DESCRIPTIONS OF THE STABILITY JUSTIFICATIONS:

- STABLE VELOCITY: VELOCITY LESS THAN 8 LF/S
- STABLE SHEAR: SHEAR LESS THAN 2 LB/SF
- DECREASE: THE PROPOSED SHEAR/VELOCITY IS LOWER THAN THE EXISTING.
- NO CHANGE: THE PROPOSED SHEAR/VELOCITY IS THE SAME AS THE EXISTING
- MINOR INCREASE: THE PROPOSED SHEAR/VELOCITY IS WITHIN 10% OF THE EXISTING
- COIR 700 MATTING: THE PROPOSED SHEAR/VELOCITY WILL BE STABLE BECAUSE OF THE 4.5 LB/SF OR 12 LF/S THAT NEDIA KOIR 700 MATTING CAN WITHSTAND RESPECTIVELY.

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

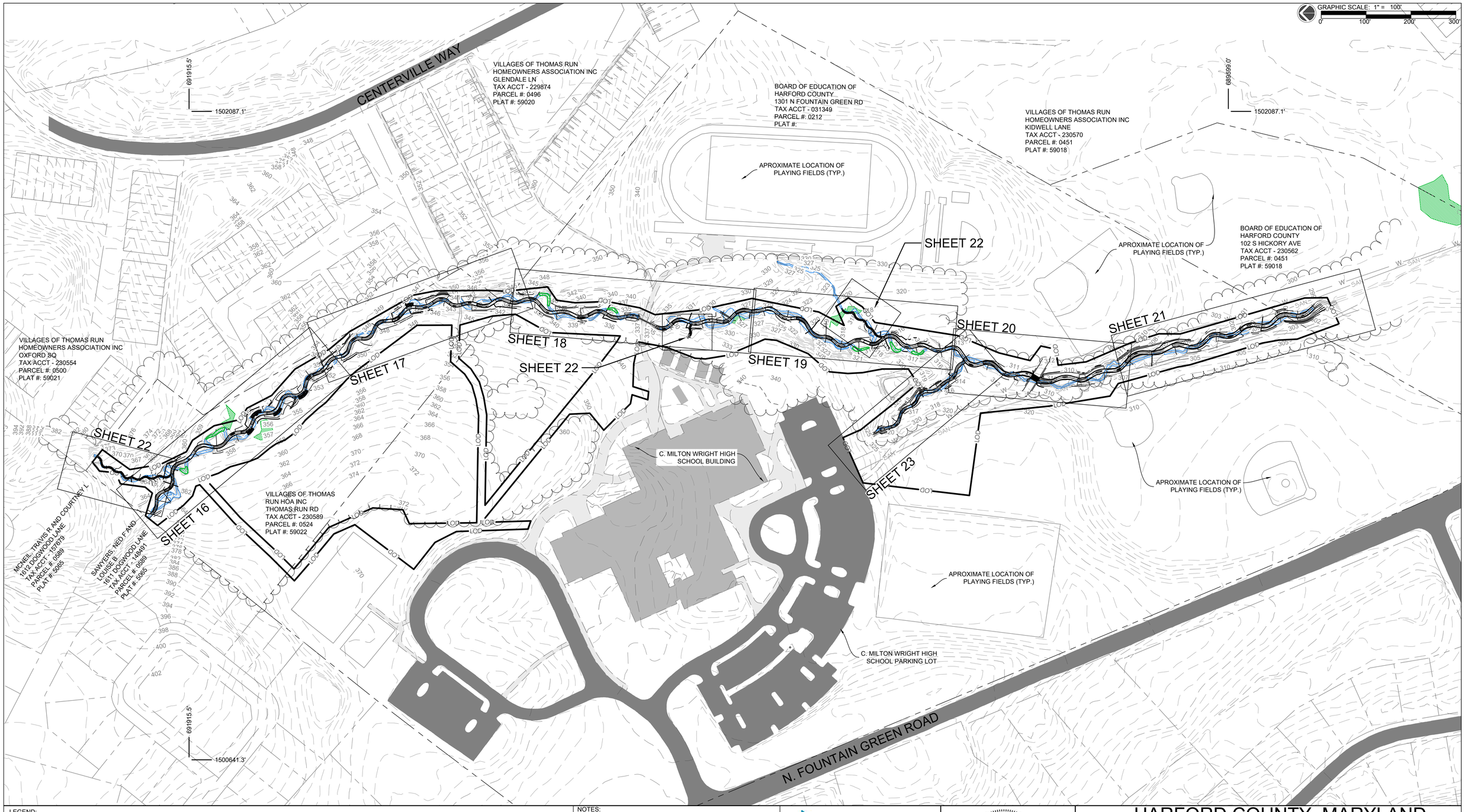
HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL
STREAM RESTORATION

2/10-YR VELOCITY/SHEAR RESULTS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021



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
- EX. STREAM
- EX. FORESTED WETLAND
- EX. SANITARY SEWER LINE
- EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- LOD — PR. LIMITS OF DISTURBANCE
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- PR. CULVERT

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

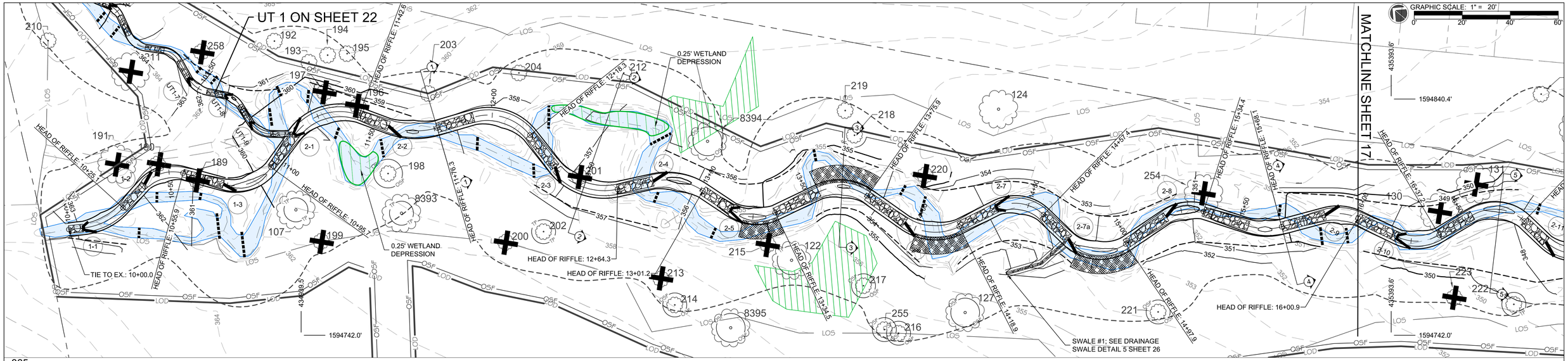
HARFORD COUNTY, MARYLAND

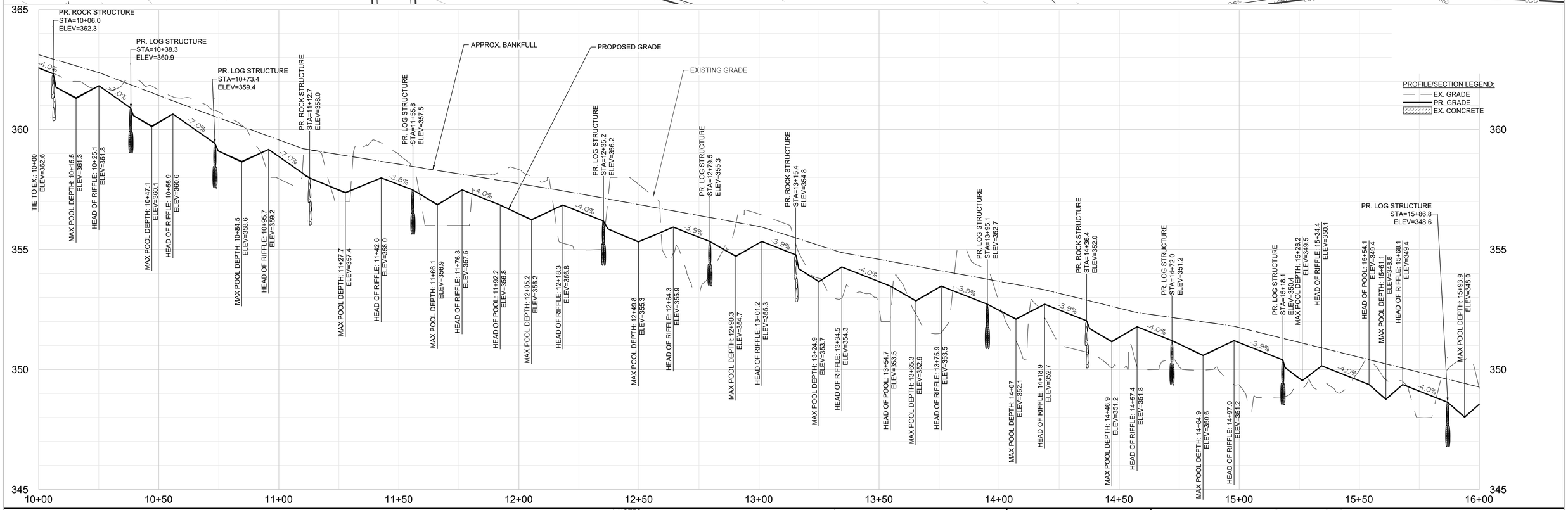
C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION

GRADING PLAN AND PROFILE KEY SHEET

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 15 of 51





PROFILE/SECTION LEGEND:
- EX. GRADE
- PR. GRADE
- EX. CONCRETE

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
- EX. LIMITS OF TREE SURVEY
- LOS — EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE/TREE TO BE REMOVED
- FCE — EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- LOD — PR. LIMITS OF DISTURBANCE
- TP — PR. TREE PROTECTION
- OSF — PR. ORANGE SAFETY FENCE
- PR. 100-YR WSE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- PR. CULVERT
- PR. RIPRAP
- (##) — PR. ROCK STRUCTURE
- (##) — PR. LOG STRUCTURE
- PR. FLOODPLAIN LOG
- S# — PR. ROCK SILL
- PR. WOOD TOE REVETMENT
- PR. RIFFLE
- DETAIL CALLOUT (DETAIL # / PAGE #)

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

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

STATE OF MARYLAND — BAILEY J. WILFONG — 52852 — PROFESSIONAL ENGINEER — 4/16/2021

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

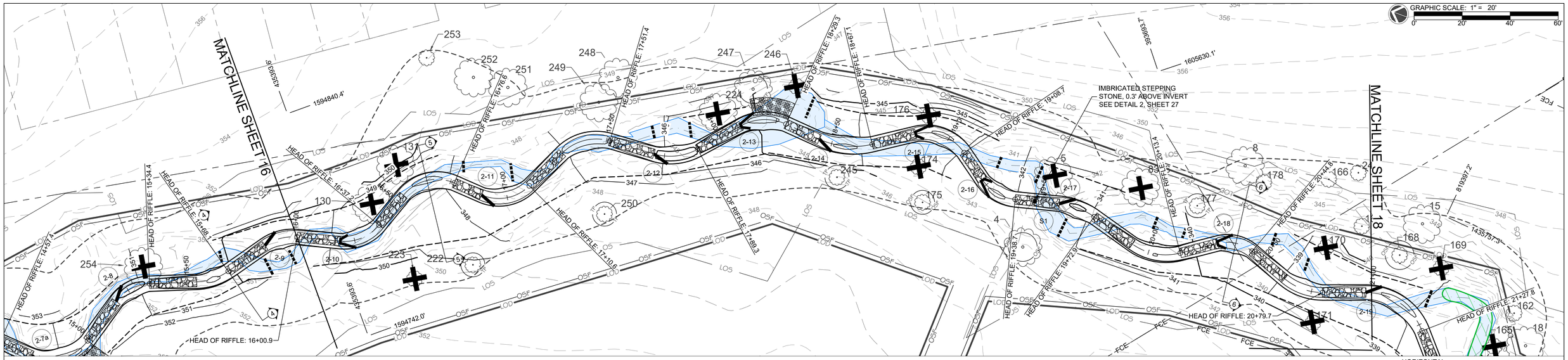
HARFORD COUNTY, MARYLAND

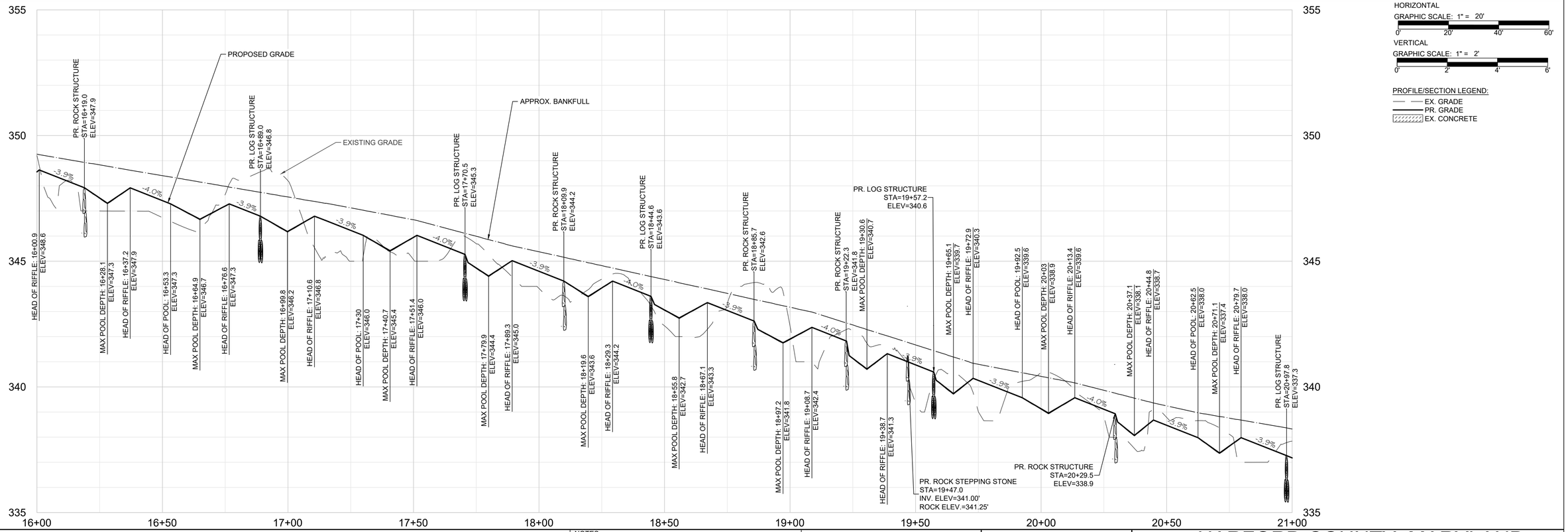
C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION

GRADING PLAN AND PROFILE

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 16 of 51





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
- EX. LIMITS OF TREE SURVEY
- LOS — EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE/TREE TO BE REMOVED
- FCE — EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- LOD — PR. LIMITS OF DISTURBANCE
- TP — PR. TREE PROTECTION
- OSF — PR. ORANGE SAFETY FENCE
- PR. 100-YR WSE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- PR. CULVERT
- PR. RIPRAP
- PR. ROCK STRUCTURE
- PR. LOG STRUCTURE
- PR. FLOODPLAIN LOG
- PR. ROCK SILL
- PR. WOOD TOE REVETMENT
- PR. RIFFLE
- DETAIL CALLOUT (DETAIL # / PAGE #)

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

res
HGS, LLC. A RES COMPANY
5367 TELEPHONE ROAD
WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

STATE OF MARYLAND — BAILEY J. WILDING — 52852 — PROFESSIONAL ENGINEER — 4/16/2021

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

GRADING PLAN AND PROFILE

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 17 of 51

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
- EX. LIMITS OF TREE SURVEY
- LOS — EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE/TREE TO BE REMOVED
- FCE — EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- LOD — PR. LIMITS OF DISTURBANCE
- TP — PR. TREE PROTECTION
- OSF — PR. ORANGE SAFETY FENCE
- PR. 100-YR WSE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- PR. CULVERT
- PR. RIPRAP
- ## 1/28 PR. ROCK STRUCTURE
- ## 1/27 PR. LOG STRUCTURE
- 4/26 PR. FLOODPLAIN LOG
- S# 3/27 PR. ROCK SILL
- 1/29 PR. WOOD TOE REVETMENT
- 3/26 PR. RIFFLE
- DETAIL # / PAGE # — DETAIL CALLOUT

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

res
HGS, LLC. A RES COMPANY
5367 TELEPHONE ROAD
WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

STATE OF MARYLAND · BAILEY J. WILFONG · 52852 · PROFESSIONAL ENGINEER · 4/16/2021

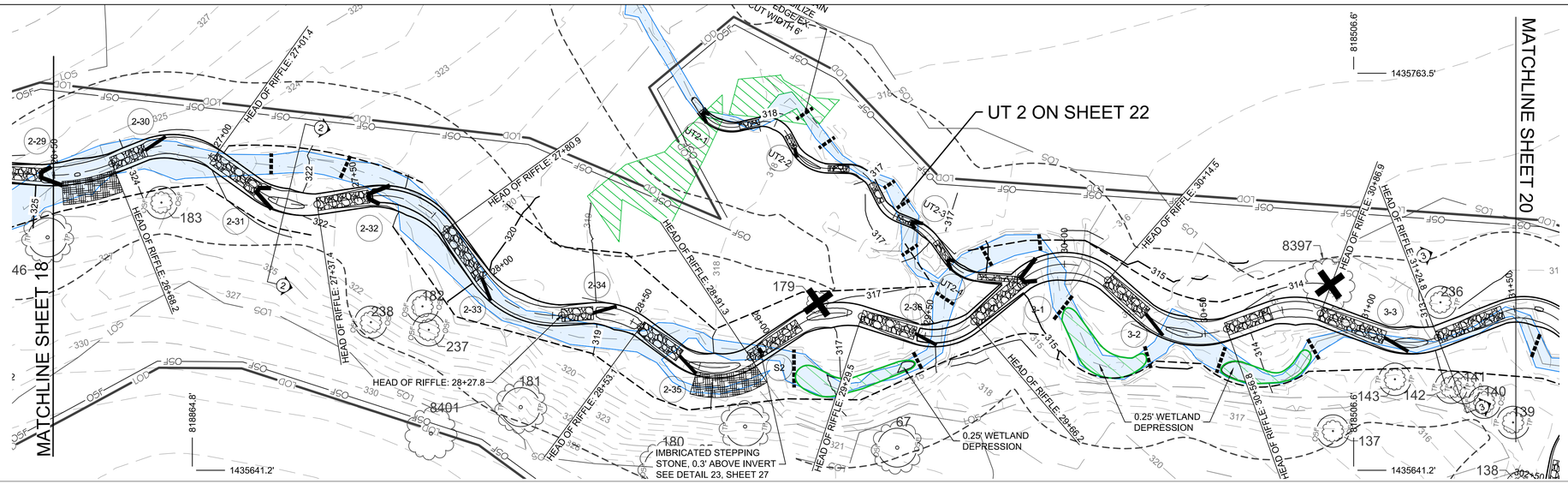
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the state of Maryland.
License Number: 52852
Expiration Date: 6-14-2022

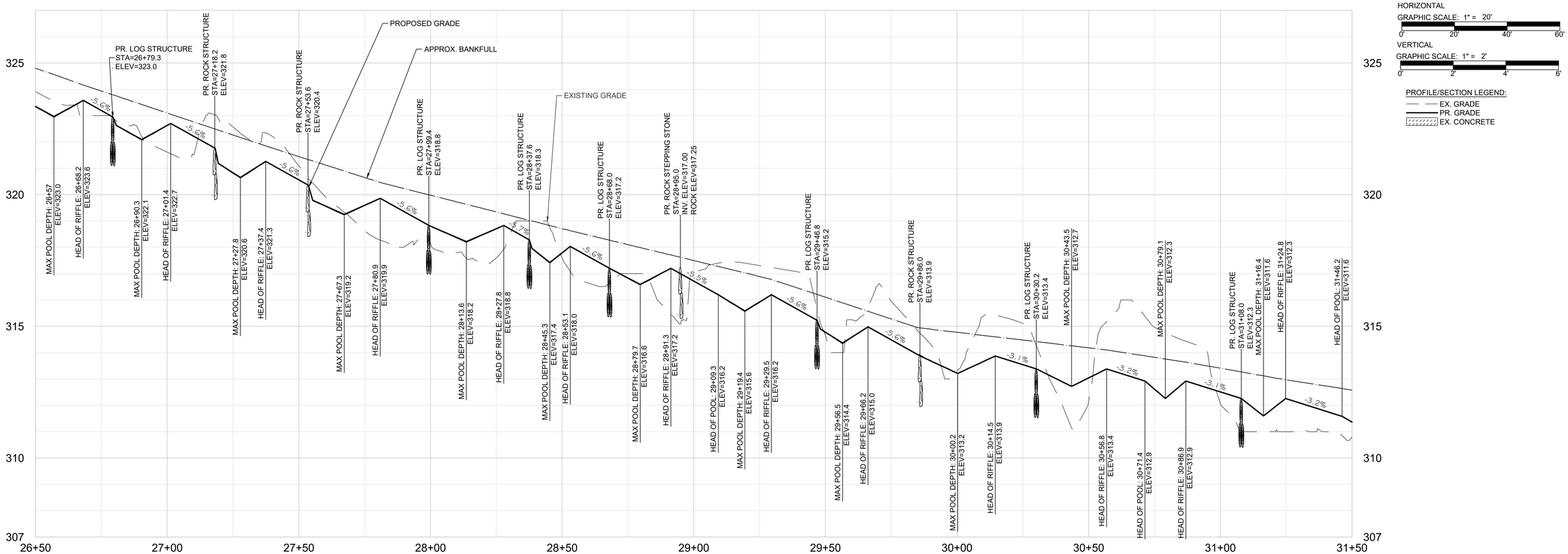
HARFORD COUNTY, MARYLAND

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

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021





HORIZONTAL
GRAPHIC SCALE: 1" = 20'
0' 20' 40' 60'
VERTICAL
GRAPHIC SCALE: 1" = 2'
0' 2' 4' 6'

PROFILE/SECTION LEGEND:
EX. GRADE
PR. GRADE
EX. CONCRETE

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
- EX. LIMITS OF TREE SURVEY
- LOS — EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE/TREE TO BE REMOVED
- FCE — EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- LOD — PR. LIMITS OF DISTURBANCE
- TP — PR. TREE PROTECTION
- OSF — PR. ORANGE SAFETY FENCE
- PR. 100-YR WSE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- PR. CULVERT
- PR. RIPRAP
- PR. ROCK STRUCTURE
- PR. LOG STRUCTURE
- PR. FLOODPLAIN LOG
- PR. ROCK SILL
- PR. WOOD TOE REVETMENT
- PR. RIFFLE
- DETAIL CALLOUT

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

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

STATE OF MARYLAND
BAILEY J. WILKING
52852
PROFESSIONAL ENGINEER
4/16/2021

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.

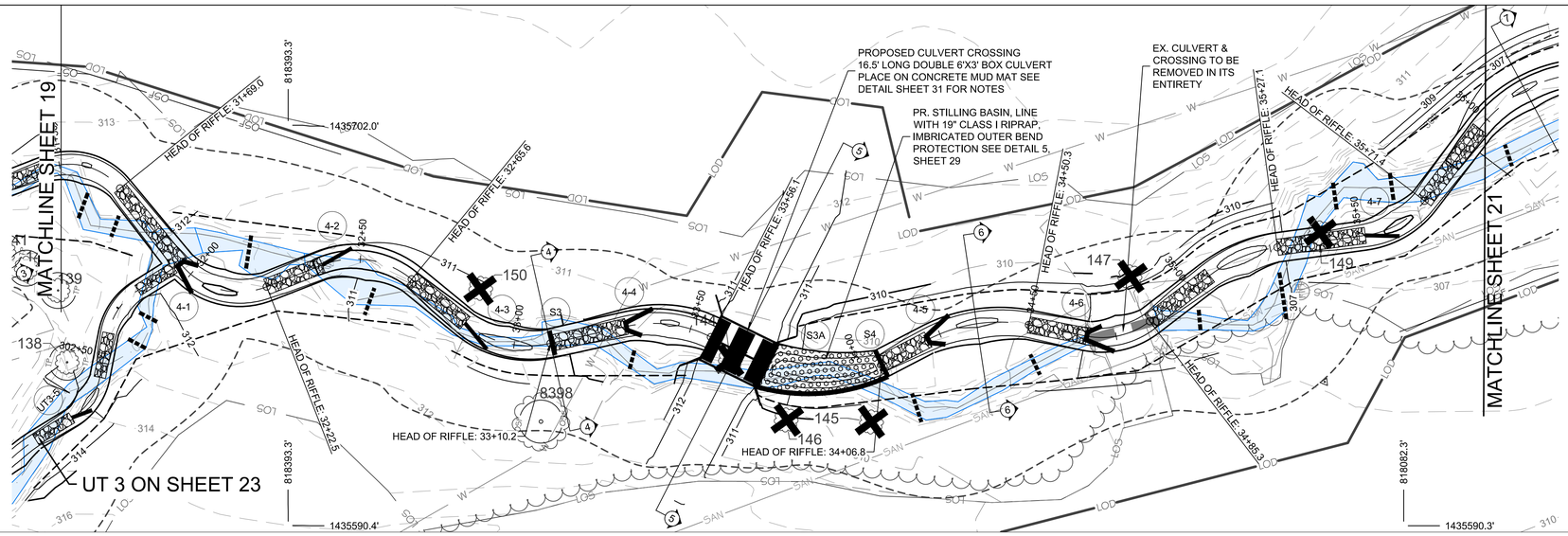
License Number: 52852
Expiration Date: 6-14-2022

HARFORD COUNTY, MARYLAND

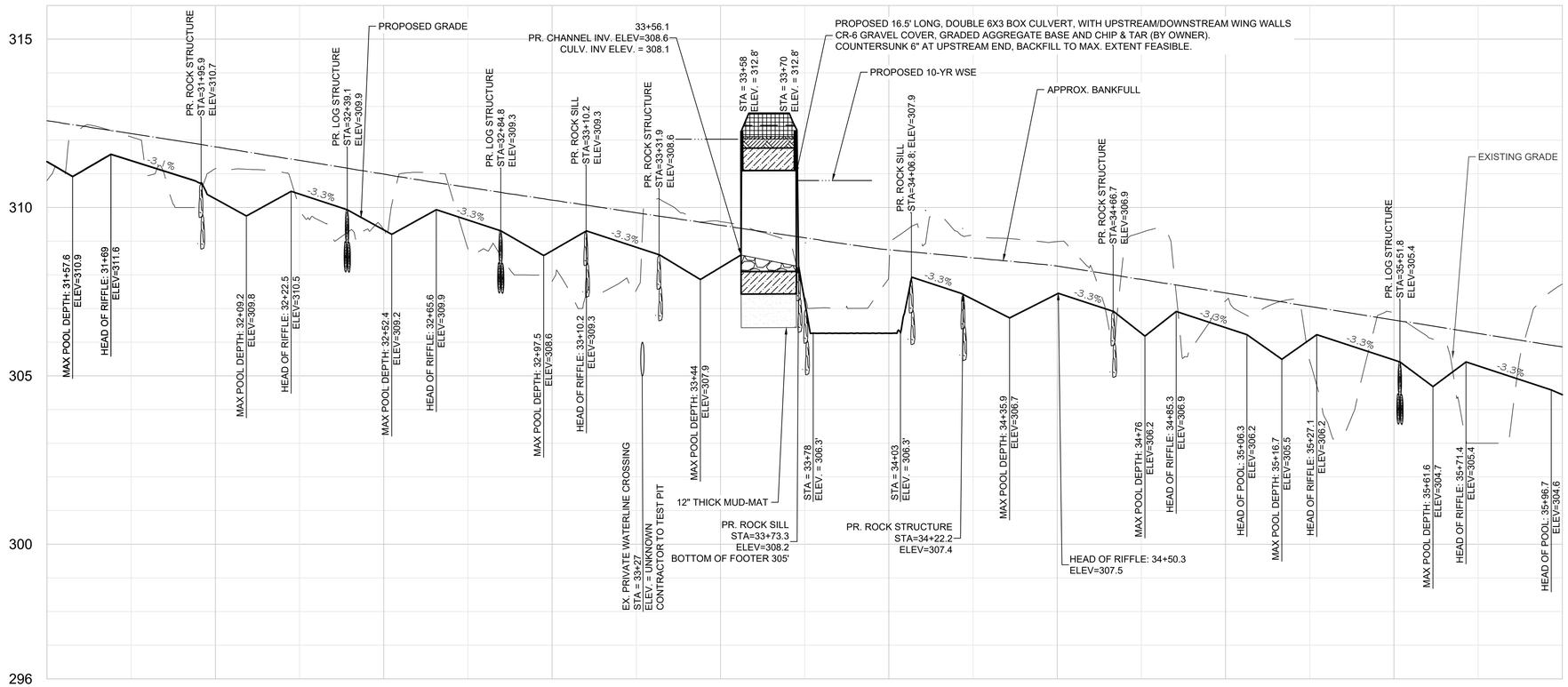
C. MILTON WRIGHT HIGH SCHOOL
STREAM RESTORATION
GRADING PLAN AND PROFILE

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021



GRAPHIC SCALE: 1" = 20'
0' 20' 40' 60'



HORIZONTAL
GRAPHIC SCALE: 1" = 20'
0' 20' 40' 60'
VERTICAL
GRAPHIC SCALE: 1" = 2'
0' 2' 4' 6'

PROFILE/SECTION LEGEND:
- EX. GRADE
- PR. GRADE
- EX. CONCRETE
- RIFFLE MIX
- PRECAST CONCRETE
- CONC. MUD MAT
- CR-6 AGGREGATE
- GRADED AGGREGATE BASE

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
- EX. LIMITS OF TREE SURVEY
- EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE/TREE TO BE REMOVED
- EX. FOREST CONSERVATION EASEMENT
- EX. SANITARY SEWER LINE
- EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- PR. LIMITS OF DISTURBANCE
- PR. TREE PROTECTION
- PR. ORANGE SAFETY FENCE
- PR. 100-YR WSE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- PR. CULVERT
- PR. RIPRAP
- PR. ROCK STRUCTURE
- PR. LOG STRUCTURE
- PR. FLOODPLAIN LOG
- PR. ROCK SILL
- PR. WOOD TOE REVETMENT
- PR. RIFFLE
- DETAIL CALLOUT

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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.

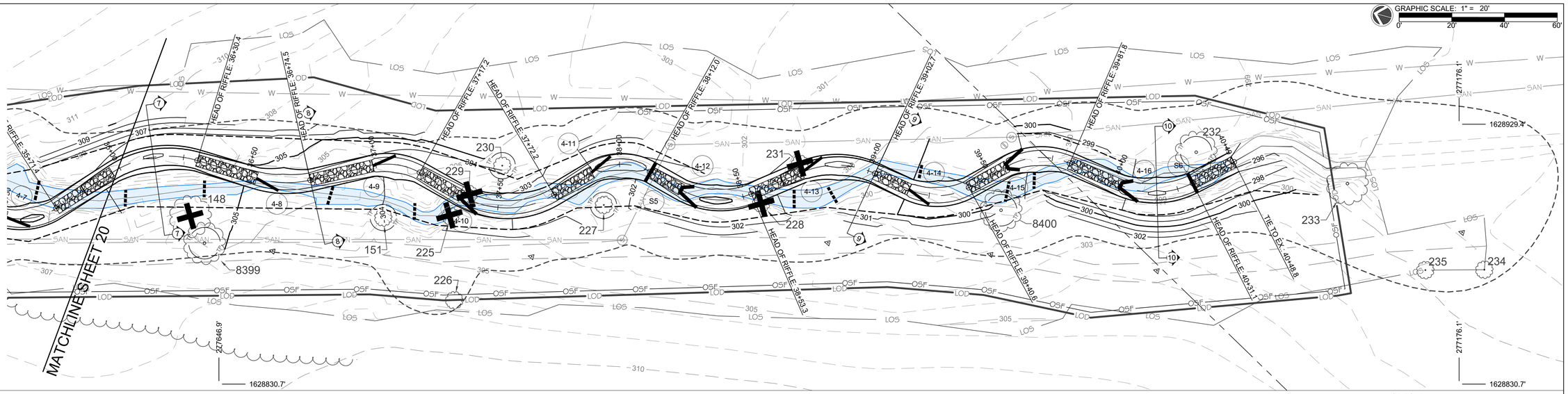
License Number: 52852
Expiration Date: 6-14-2022

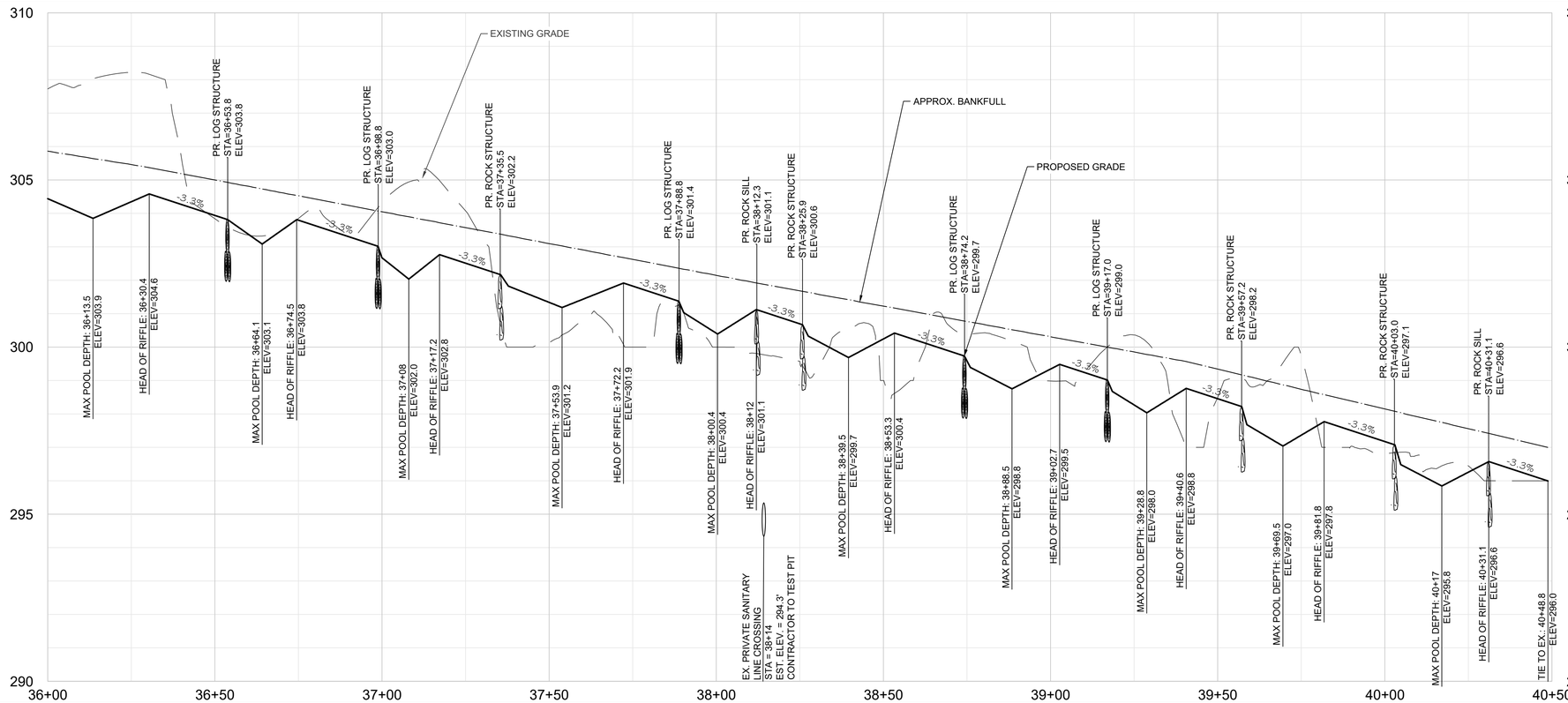
HARFORD COUNTY, MARYLAND

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

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 20 of 51





HORIZONTAL
GRAPHIC SCALE: 1" = 20'
0' 20' 40' 60'

VERTICAL
GRAPHIC SCALE: 1" = 2'
0' 2' 4' 6'

PROFILE/SECTION LEGEND:
- EX. GRADE
- PR. GRADE
- EX. CONCRETE

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
- EX. LIMITS OF TREE SURVEY
- LOS EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE/TREE TO BE REMOVED
- FCE EX. FOREST CONSERVATION EASEMENT
- SAN EX. SANITARY SEWER LINE
- W EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- LOD PR. LIMITS OF DISTURBANCE
- TP PR. TREE PROTECTION
- OSF PR. ORANGE SAFETY FENCE
- PR. 100-YR WSE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- PR. CULVERT
- PR. RIPRAP
- ## 2% PR. ROCK STRUCTURE
- ## 1% PR. LOG STRUCTURE
- S# 2% PR. FLOODPLAIN LOG
- 2% PR. ROCK SILL
- 2% PR. WOOD TOE REVETMENT
- 2% PR. RIFFLE
- DETAIL # / PAGE # DETAIL CALLOUT

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

res
HGS, LLC. A RES COMPANY
5367 TELEPHONE ROAD
WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

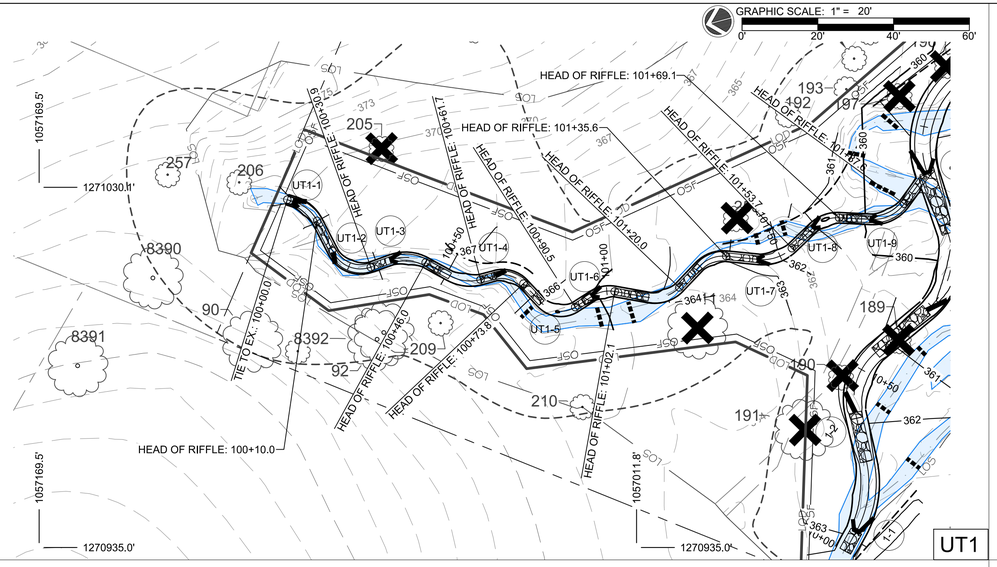
HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION

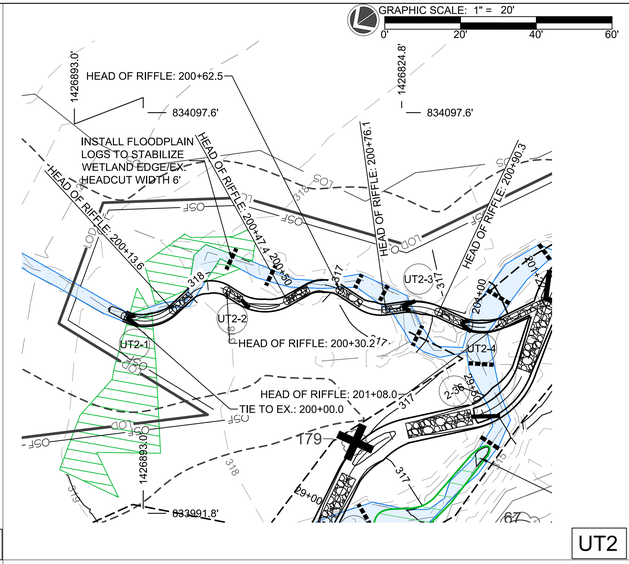
GRADING PLAN AND PROFILE

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

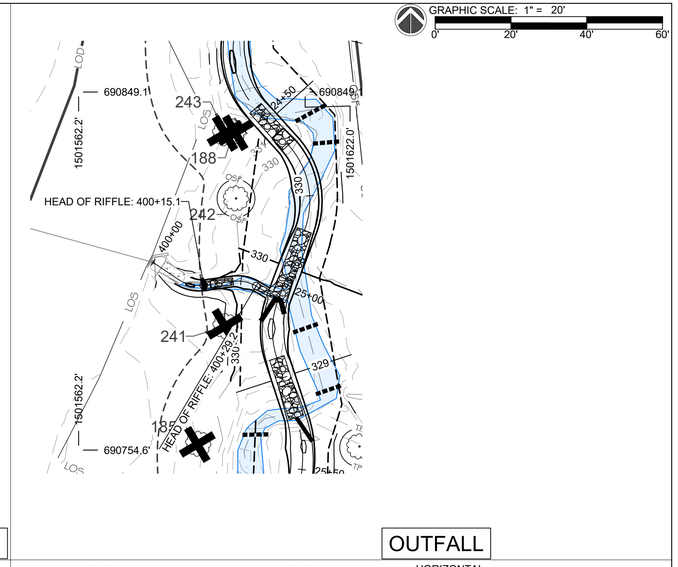
SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021



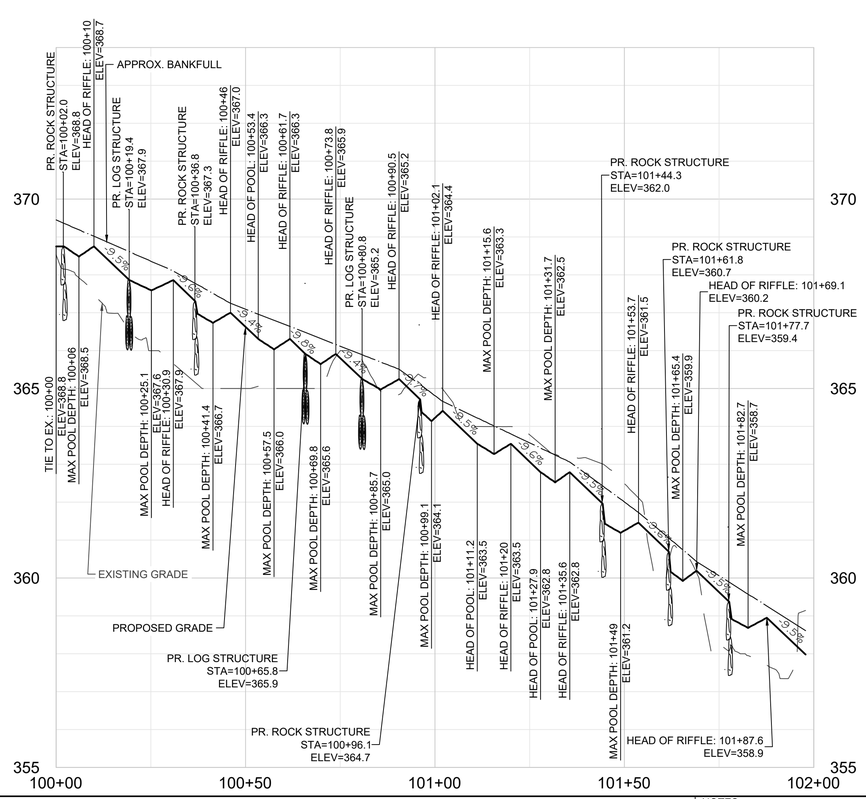
UT1

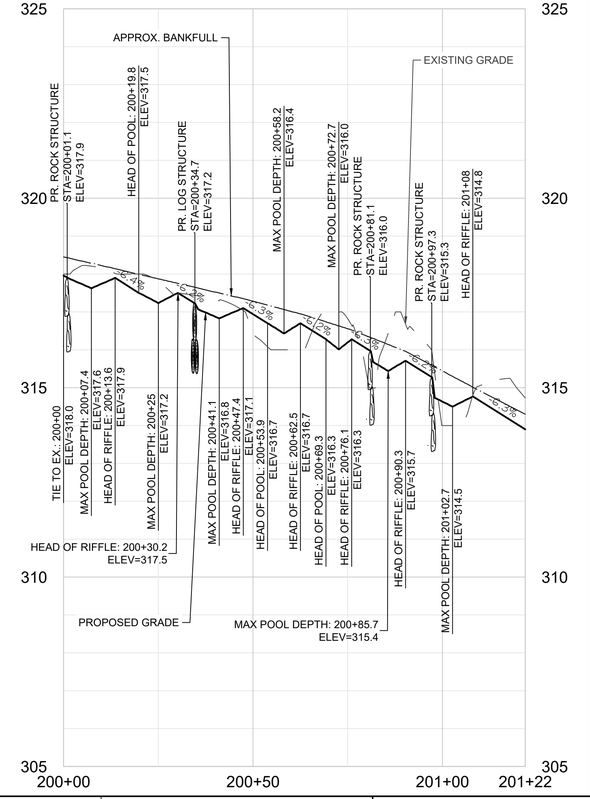


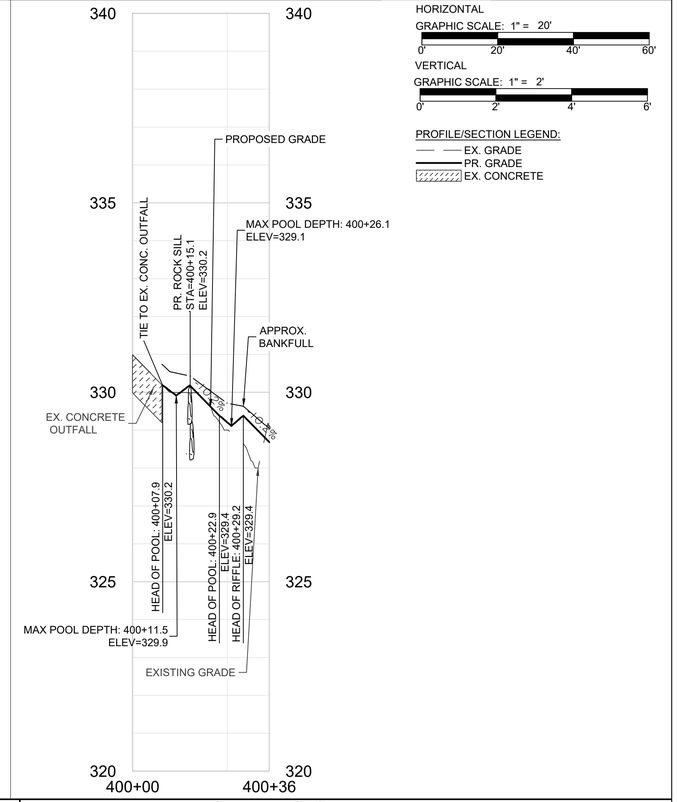
UT2



OUTFALL







HORIZONTAL
GRAPHIC SCALE: 1" = 20'
0' 20' 40' 60'
VERTICAL
GRAPHIC SCALE: 1" = 2'
0' 2' 4' 6'

PROFILE/SECTION LEGEND:
- EX. GRADE
- PR. GRADE
- EX. CONCRETE

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
- EX. LIMITS OF TREE SURVEY
- LOS — EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- FCE — EX. TREE/TREE TO BE REMOVED
- EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- LOD — PR. LIMITS OF DISTURBANCE
- TP — PR. TREE PROTECTION
- OSF — PR. ORANGE SAFETY FENCE
- PR. 100-YR WSE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- PR. CULVERT
- PR. RIPRAP
- ## — PR. ROCK STRUCTURE
- ## — PR. LOG STRUCTURE
- PR. FLOODPLAIN LOG
- S# — PR. ROCK SILL
- PR. WOOD TOE REVETMENT
- PR. RIFFLE
- DETAIL CALLOUT (DETAIL # / PAGE #)

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

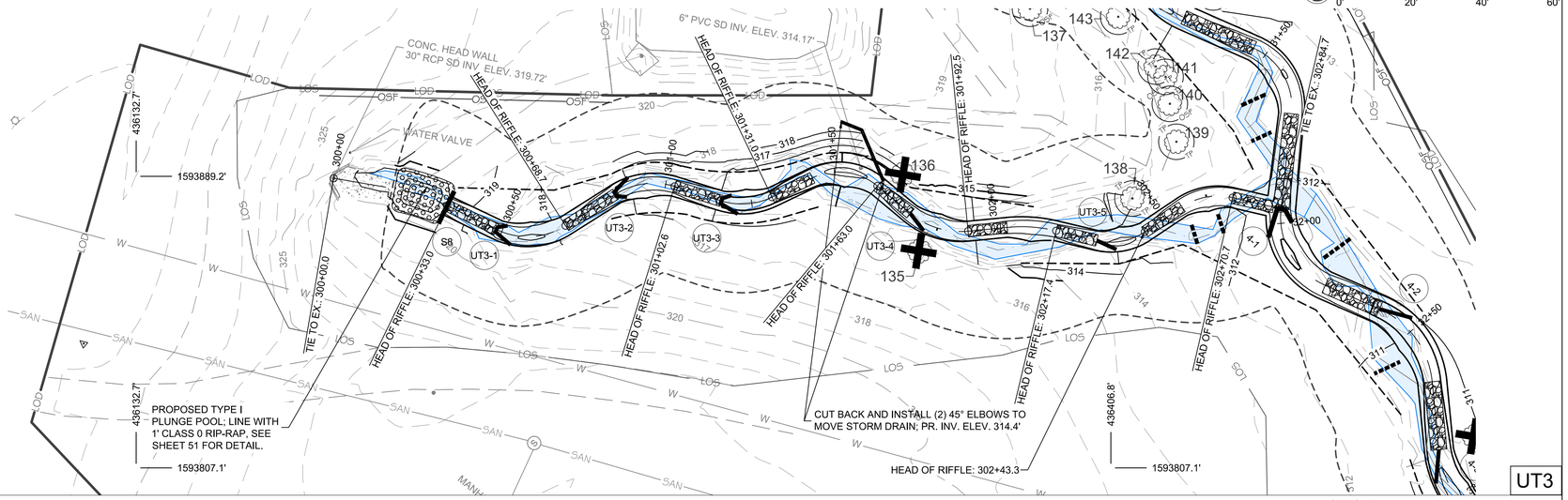
HARFORD COUNTY, MARYLAND

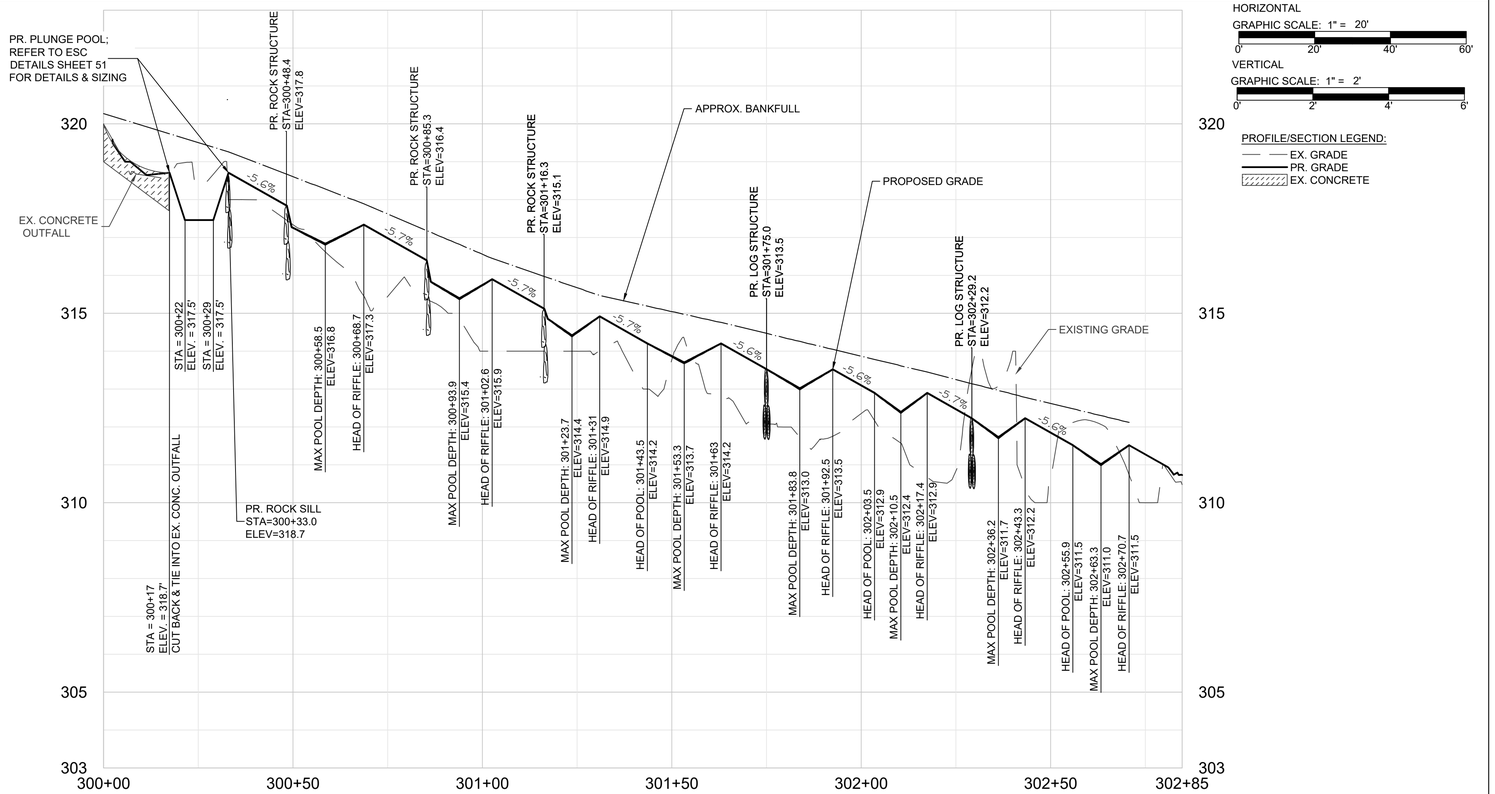
C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION

GRADING PLAN AND PROFILE

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 22 of 51





HORIZONTAL
GRAPHIC SCALE: 1" = 20'
0' 20' 40' 60'
VERTICAL
GRAPHIC SCALE: 1" = 2'
0' 2' 4' 6'

PROFILE/SECTION LEGEND:
- EX. GRADE
- PR. GRADE
- EX. CONCRETE

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
- EX. LIMITS OF TREE SURVEY
- EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE/TREE TO BE REMOVED
- EX. FOREST CONSERVATION EASEMENT
- EX. SANITARY SEWER LINE
- EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- PR. LIMITS OF DISTURBANCE
- PR. TREE PROTECTION
- PR. ORANGE SAFETY FENCE
- PR. 100-YR WSE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- PR. CULVERT
- PR. RIPRAP
- PR. ROCK STRUCTURE
- PR. LOG STRUCTURE
- PR. FLOODPLAIN LOG
- PR. ROCK SILL
- PR. WOOD TOE REVETMENT
- PR. RIFFLE
- DETAIL CALLOUT

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

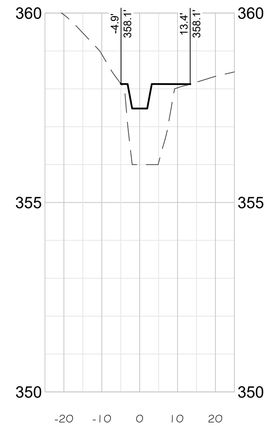
C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION

GRADING PLAN AND PROFILE

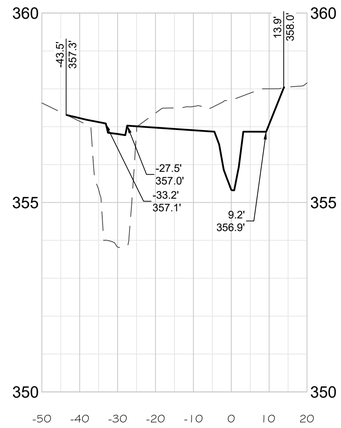
REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

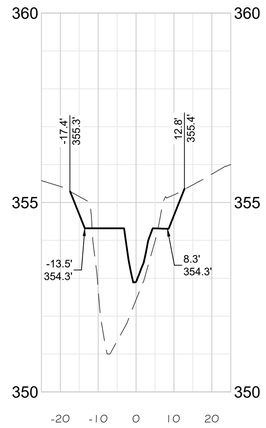
UPPER MAINSTEM (UT) XS #1, STATION 11+76.3



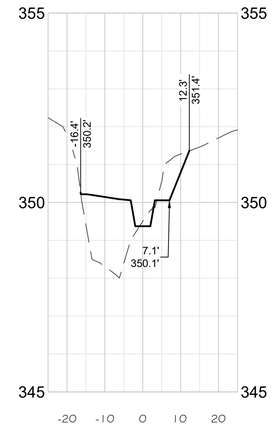
UPPER MAINSTEM (UT) XS #2, STATION 12+50.0



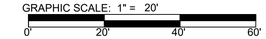
UPPER MAINSTEM (UT) XS #3, STATION 13+64.6



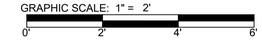
UPPER MAINSTEM (UT) XS #4, STATION 15+68.1



HORIZONTAL
GRAPHIC SCALE: 1" = 20'



VERTICAL
GRAPHIC SCALE: 1" = 2'

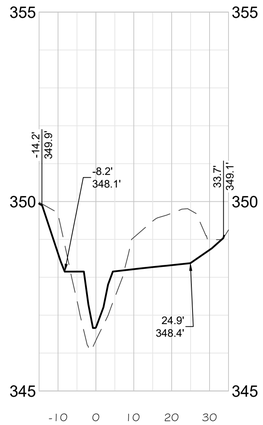


PROFILE/SECTION LEGEND:

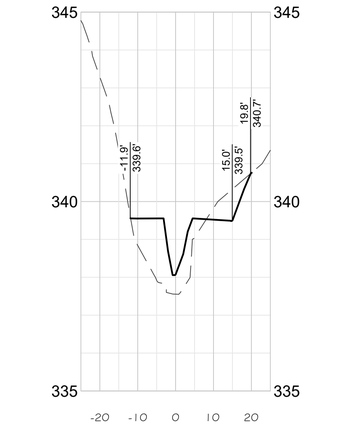
- EX. GRADE
- PR. GRADE
- EX. CONCRETE

NOTE: CROSS-SECTIONS ARE TO DEPICT THE RELATIONSHIP OF THE CHANNEL TO THE FLOODWAY GRADING. REFER TO PROFILE & CHANNEL GEOMETRY DETAILS (1 & 2 ON SHEET 26) FOR SPECIFIC CHANNEL GRADING.

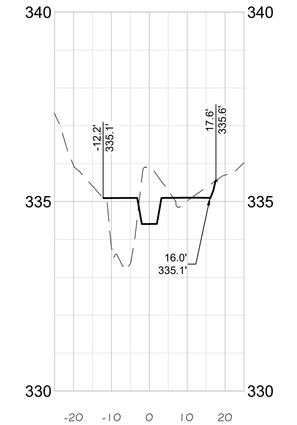
UPPER MAINSTEM (UT) XS #5, STATION 16+65.0



UPPER MAINSTEM (UT) XS #6, STATION 20+37.1



UPPER MAINSTEM (UT) XS #7, STATION 22+88.3



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

HGS, LLC. A RES COMPANY

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

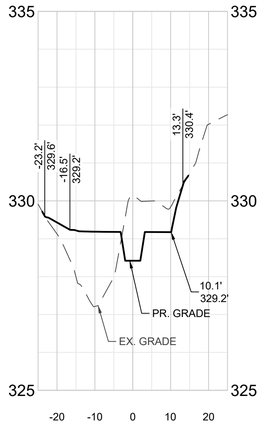
C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION

CROSS-SECTIONS

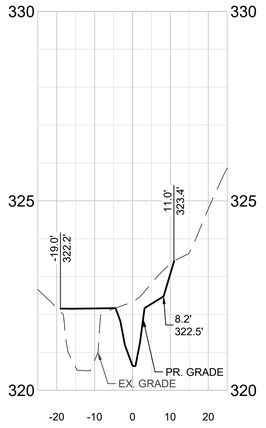
REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

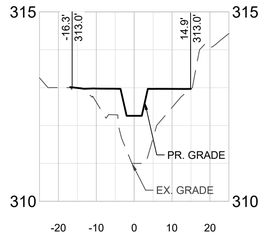
LOWER MAINSTEM (UT) XS #1, STATION 25+19.5



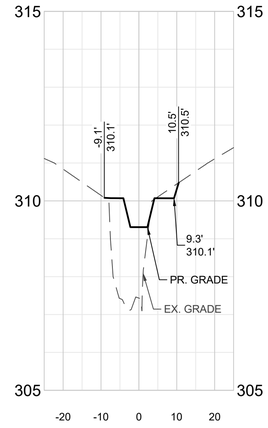
LOWER MAINSTEM (UT) XS #2, STATION 27+27.8



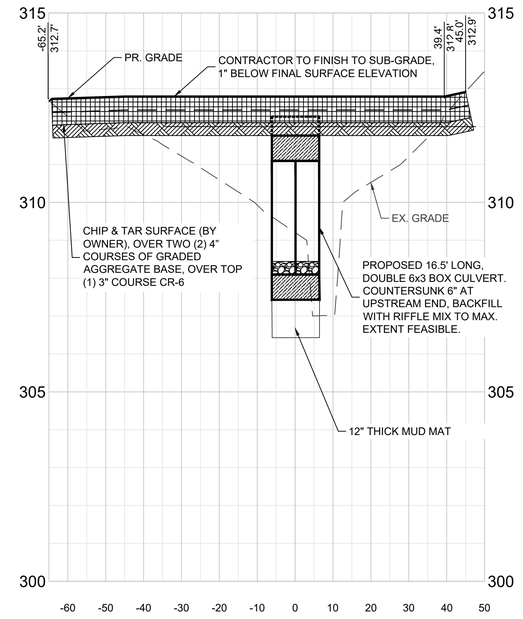
LOWER MAINSTEM (UT) XS #3, STATION 31+24.8



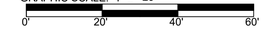
LOWER MAINSTEM (UT) XS #4, STATION 33+10.2



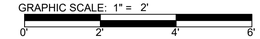
LOWER MAINSTEM (UT) XS #5, STATION 33+64.4



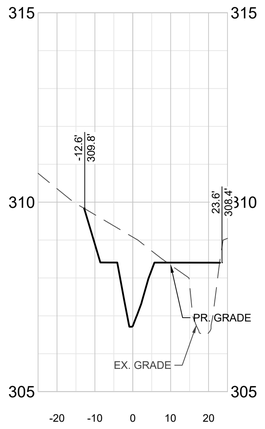
HORIZONTAL
GRAPHIC SCALE: 1" = 20'



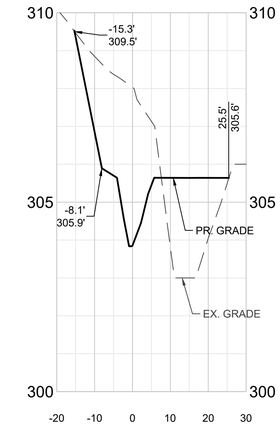
VERTICAL
GRAPHIC SCALE: 1" = 2'



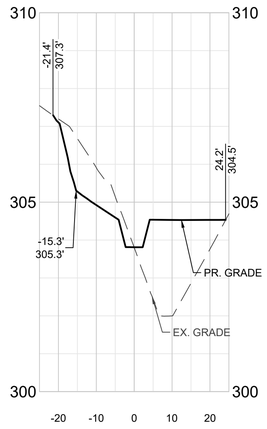
LOWER MAINSTEM (UT) XS #6, STATION 34+35.7



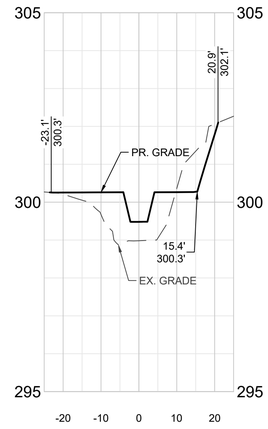
LOWER MAINSTEM (UT) XS #7, STATION 36+13.5



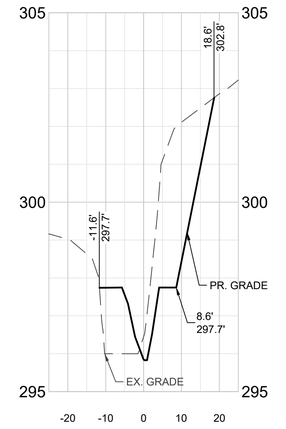
LOWER MAINSTEM (UT) XS #8, STATION 36+74.4



LOWER MAINSTEM (UT) XS #9, STATION 39+02.7



LOWER MAINSTEM (UT) XS #10, STATION 40+17.0



PROFILE/SECTION LEGEND:

- EX. GRADE
- PR. GRADE
- EX. CONCRETE
- RIFFLE MIX
- PRECAST CONCRETE
- CONC. MUD MAT
- CR-6 AGGREGATE
- GRADED AGGREGATE BASE

NOTE: CROSS-SECTIONS ARE TO DEPICT THE RELATIONSHIP OF THE CHANNEL TO THE FLOODWAY GRADING. REFER TO PROFILE & CHANNEL GEOMETRY DETAILS (1 & 2 ON SHEET 26) FOR SPECIFIC CHANNEL GRADING.

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

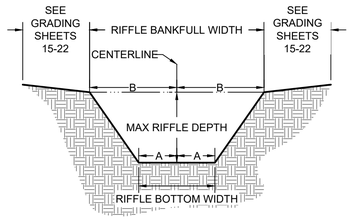
HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION

CROSS-SECTIONS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

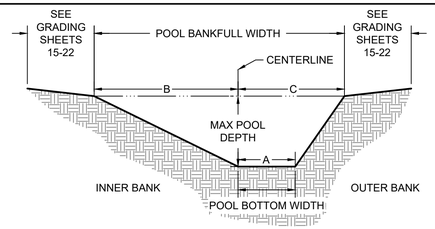
SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021



RIFFLE CROSS-SECTION GEOMETRY						
REACH	STATION	A-CENTERLINE OFFSET TO BOTTOM OF BANK (FT)	RIFFLE BOTTOM WIDTH (FT)	MAX RIFFLE DEPTH (FT)	B-CENTERLINE OFFSET TO TOP OF BANK (FT)	RIFFLE BANKFULL WIDTH (FT)
REACH 1	10+00-11+13	1.6	3.2	0.6	2.8	5.6
REACH 2A	11+13-23+73	2.0	4.0	0.6	3.2	6.4
REACH 2B	24+20-29+86	2.0	4.0	0.6	3.2	6.4
REACH 3	29+86-31+96	2.0	4.0	0.7	3.6	7.2
REACH 4	31+96-40+49	2.3	4.5	0.8	4.1	8.2
UT1	100+00-101+98	0.9	1.8	0.3	1.4	2.8
UT2	200+00-201+22	0.9	1.8	0.3	1.4	2.8
UT3	300+00-302+85	1.6	3.2	0.6	2.8	5.6
Outfall Swale	400+00-400+36	0.9	1.8	0.3	1.4	2.8

*REACH PROFILE DATA SHALL BE USED TO DETERMINE DEPTH AT SPECIFIC STATIONS.

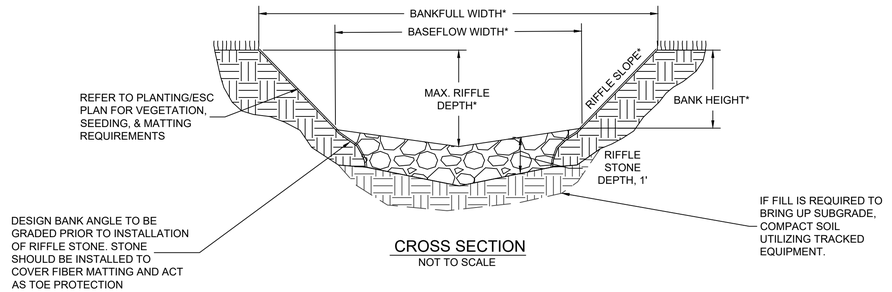
1 RIFFLE CROSS-SECTION GEOMETRY
NOT TO SCALE



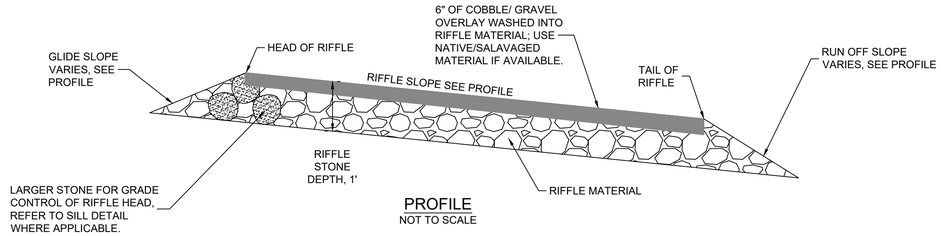
POOL CROSS-SECTION GEOMETRY							
REACH	STATION	A-CENTERLINE OFFSET TO OUTER BANK (FT)	POOL BOTTOM WIDTH (FT)	B-CENTERLINE OFFSET TO TOP OF INNER BANK (FT)	MAX POOL DEPTH (FT)	C-CENTERLINE OFFSET TO TOP OUTER BANK (FT)	POOL BANKFULL WIDTH (FT)
REACH 1	10+00-11+13	0.6	0.6	4.1	1.1	2.8	6.9
REACH 2A	11+13-23+73	0.8	0.8	4.5	1.2	3.2	7.7
REACH 2B	24+20-29+86	0.8	0.8	4.5	1.2	3.2	7.7
REACH 3	29+86-31+96	0.8	0.8	5.1	1.4	3.6	8.7
REACH 4	31+96-40+49	0.9	0.9	5.7	1.5	4.1	9.8
UT1	100+00-101+98	0.4	0.4	1.9	0.5	1.4	3.3
UT2	200+00-201+22	0.4	0.4	1.9	0.5	1.4	3.3
UT3	300+00-302+85	0.6	0.6	4.1	1.1	2.8	6.9
Outfall Swale	400+00-400+36	0.4	0.4	1.9	0.5	1.4	3.3

*REACH PROFILE DATA SHALL BE USED TO DETERMINE DEPTH AT SPECIFIC STATIONS.

2 POOL CROSS-SECTION GEOMETRY
NOT TO SCALE



CROSS SECTION
NOT TO SCALE

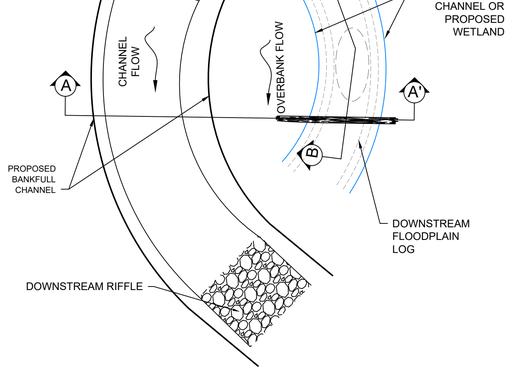


PROFILE
NOT TO SCALE

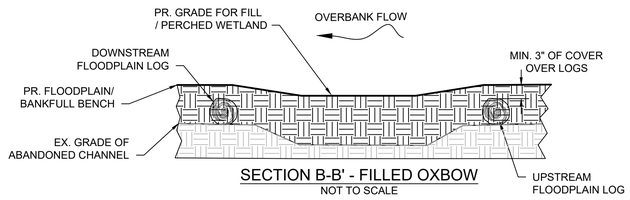
RIFFLE MIX		
MATERIAL	SIZE (D50)	PERCENT
SOIL/SAND	-	5
ROCK	0.2"	20
ROCK	1.5"	35
ROCK	5"	30
ROCK	8.5"	10

3 CONSTRUCTED RIFFLE
NOT TO SCALE

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

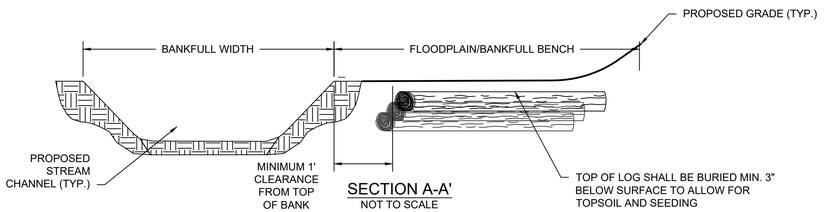


PLAN VIEW
NOT TO SCALE



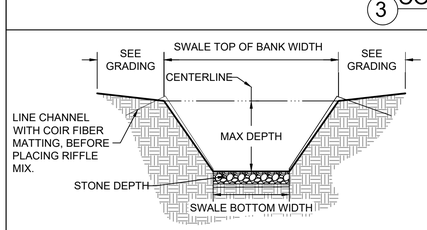
SECTION B-B' - FILLED OXBOW
NOT TO SCALE

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



SECTION A-A'
NOT TO SCALE

4 FLOODPLAIN LOG
NOT TO SCALE



DRAINAGE SWALE CROSS-SECTION GEOMETRY							
SWALE #	LENGTH (FT)	SWALE BOTTOM WIDTH (FT)	MAX DEPTH (FT)	SWALE TOP OF BANK WIDTH (FT)	STONE DEPTH (FT)	UPSTREAM TIE-IN ELEVATION (FT)	DOWNSTREAM TIE-IN ELEVATION (FT)
1.0	28.5	1.0	0.3	3.0	0.5	354.00	351.22
2.0	24.2	1.0	0.3	3.0	0.5	326.54	326.13

NOTE: STONE BOTTOM SHALL CONSIST OF RIFFLE MATERIAL WITH A GREATER PERCENTAGE OF FINES AND NO CLASS 1. SEE DETAIL 3 ABOVE FOR RIFFLE MIX.

5 DRAINAGE SWALE
NOT TO SCALE

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

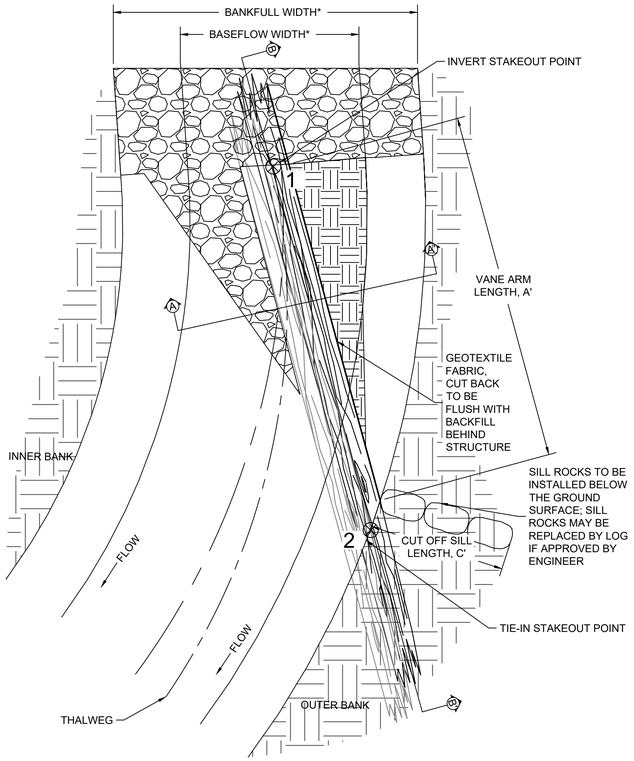
C. MILTON WRIGHT HIGH SCHOOL
STREAM RESTORATION
STREAM DETAILS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

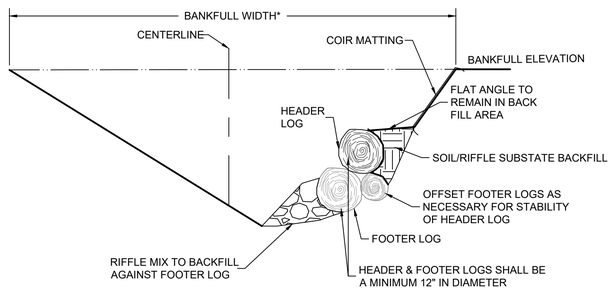
SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

LOG STRUCTURE TABLE										
REACH	STRUCTURE #	STATION	INVERT ELEV.	VANE ARM LENGTH, A'	LOG LENGTH (FT)	VANE ARM TIE-IN HEIGHT, B'	MIN. CUT OFF SILL LENGTH, C'	CUT OFF SILL STONE HEIGHT (A)	CUT OFF SILL STONE DEPTH (B)	CUT OFF SILL STONE LENGTH (C)
1	1-2	10+38.3	360.9	6	12	0.3	6	12-18"	12-18"	18-24"
1	1-3	10+73.4	359.4	6	12	0.3	6	12-18"	12-18"	18-24"
2A	2-2	11+55.8	357.5	7	13	0.4	6.5	12-18"	12-18"	18-24"
2A	2-3	12+35.2	356.2	7	13	0.4	6.5	12-18"	12-18"	18-24"
2A	2-4	12+79.5	355.3	7	13	0.4	6.5	12-18"	12-18"	18-24"
2A	2-6	13+95.1	352.7	7	13	0.4	6.5	12-18"	12-18"	18-24"
2A	2-7a	14+72.0	351.2	7	13	0.4	6.5	12-18"	12-18"	18-24"
2A	2-8	15+18.1	350.4	7	13	0.4	6.5	12-18"	12-18"	18-24"
2A	2-9	15+86.8	348.6	7	13	0.4	6.5	12-18"	12-18"	18-24"
2A	2-11	16+89.0	346.8	7	13	0.4	6.5	12-18"	12-18"	18-24"
2A	2-12	17+70.5	345.3	7	13	0.4	6.5	12-18"	12-18"	18-24"
2A	2-14	18+44.6	343.6	7	13	0.4	6.5	12-18"	12-18"	18-24"
2A	2-17	19+57.2	340.6	7	13	0.4	6.5	12-18"	12-18"	18-24"
2A	2-19	20+97.8	337.3	7	13	0.4	6.5	12-18"	12-18"	18-24"
2A	2-20	21+87.1	335.7	7	13	0.4	6.5	12-18"	12-18"	18-24"
2A	2-21	22+24.1	335.2	7	13	0.4	6.5	12-18"	12-18"	18-24"
2B	2-26	25+36.1	327.5	7.5	13.5	0.4	6.5	12-18"	12-18"	18-24"
2B	2-28	26+09.8	325.1	7.5	13.5	0.4	6.5	12-18"	12-18"	18-24"
2B	2-30	26+79.3	323.0	7.5	13.5	0.4	6.5	12-18"	12-18"	18-24"
2B	2-33	27+99.4	318.8	7.5	13.5	0.4	6.5	12-18"	12-18"	18-24"
2B	2-34	28+37.6	318.3	7.5	13.5	0.4	6.5	12-18"	12-18"	18-24"
2B	2-35	28+68.0	317.2	7.5	13.5	0.4	6.5	12-18"	12-18"	18-24"
2B	2-36	29+46.8	315.2	7.5	13.5	0.4	6.5	12-18"	12-18"	18-24"
3	3-2	30+30.2	313.4	8.5	14.5	0.4	7.5	12-18"	12-18"	18-24"
3	3-3	31+08.0	312.3	8.5	14.5	0.4	7.5	12-18"	12-18"	18-24"
4	4-2	32+39.1	309.9	9.5	15.5	0.5	8.5	12-18"	12-18"	18-24"
4	4-3	32+84.8	309.3	9.5	15.5	0.5	8.5	12-18"	12-18"	18-24"
4	4-7	35+51.8	305.4	9.5	15.5	0.5	8.5	12-18"	12-18"	18-24"
4	4-8	36+53.8	303.8	9.5	15.5	0.5	8.5	12-18"	12-18"	18-24"
4	4-9	36+98.8	303.0	9.5	15.5	0.5	8.5	12-18"	12-18"	18-24"
4	4-11	37+88.8	301.4	9.5	15.5	0.5	8.5	12-18"	12-18"	18-24"
4	4-13	38+74.2	299.7	9.5	15.5	0.5	8.5	12-18"	12-18"	18-24"
4	4-14	39+17.0	299.0	9.5	15.5	0.5	8.5	12-18"	12-18"	18-24"
UT1	UT1-2	100+19.4	367.9	3	9	0.1	5	12-18"	12-18"	12-18"
UT1	UT1-4	100+65.8	365.9	3	9	0.1	5	12-18"	12-18"	12-18"
UT1	UT1-5	100+80.8	365.3	3	9	0.1	5	12-18"	12-18"	12-18"
UT2	UT2-2	200+34.7	317.2	3	9	0.1	5	12-18"	12-18"	12-18"
UT3	UT3-4	301+75.0	313.5	6	12	0.3	6	12-18"	12-18"	12-18"
UT3	UT3-5	302+29.2	312.2	6	12	0.3	6	12-18"	12-18"	12-18"

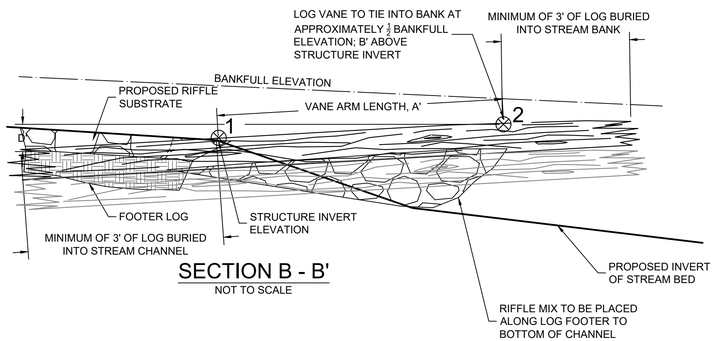
NOTES:
THE TWO POINTS NOTED AS STAKEOUT POINTS SHALL BE SURVEY LOCATED IN THE FIELD TO A 10TH OF A FOOT ACCURACY.
SEE CROSS-SECTION GEOMETRY TABLE FOR CHANNEL DIMENSIONS AND SLOPES.



PLAN VIEW
NOT TO SCALE

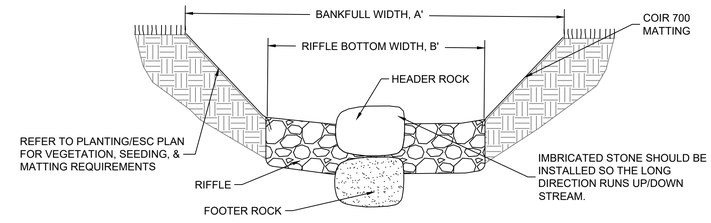


SECTION A - A'
NOT TO SCALE



SECTION B - B'
NOT TO SCALE

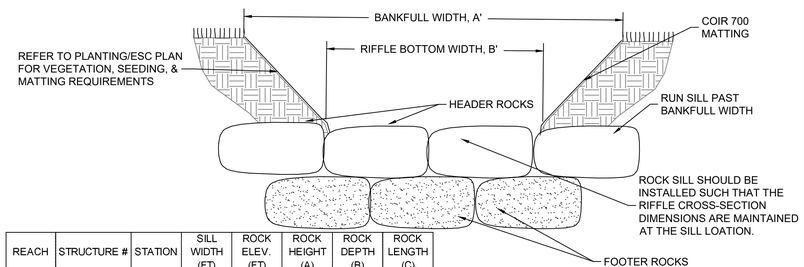
1 LOG VANE
NOT TO SCALE



STEPPING STONE							
REACH	STRUCTURE #	STATION	SILL WIDTH (FT)	ROCK ELEV. (FT)	ROCK HEIGHT (A)	ROCK DEPTH (B)	ROCK LENGTH (C)
REACH 2	S1*	19+47.0	1-1.5	341.3	12-18"	12-18"	18-24"
REACH 2	S2*	28+95.0	1-1.5	317.3	12-18"	12-18"	18-24"

NOTE: STRUCTURE'S PURPOSE IS TO CREATE A SLIGHTLY HIGH SPOT FOR PEDESTRIAN USE, PLACE ONLY 1 IMBRICATED STONE ORIENTED UP-DOWN STREAM AND SET 0.3' ABOVE CHANNEL ELEV. EXACT LOCATION CAN VARY WITHIN THE RIFFLE TO ALIGN WITH TRAIL. PLACE MINIMUM 3' DOWNSTREAM FROM HEAD OF RIFFLE

2 STEPPING STONE
NOT TO SCALE



REACH	STRUCTURE #	STATION	SILL WIDTH (FT)	ROCK ELEV. (FT)	ROCK HEIGHT (A)	ROCK DEPTH (B)	ROCK LENGTH (C)
REACH 4	S3	33+10.2	8.2	309.3	12-18"	12-18"	18-24"
REACH 4	S3A	33+73.3	13.5	308.2	12-18"	12-18"	18-24"
REACH 4	S4	34+06.8	8.2	307.8	12-18"	12-18"	18-24"
REACH 4	S5	38+12.3	8.2	301.1	12-18"	12-18"	18-24"
REACH 4	S6	40+31.1	8.2	296.6	12-18"	12-18"	18-24"
OUTFALL SWALE	S7	400+15.1	3	330.2	12-18"	12-18"	12-18"
UT3	S8	300+33.0	5.6	318.7	12-18"	12-18"	12-18"

3 ROCK SILL
NOT TO SCALE

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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.

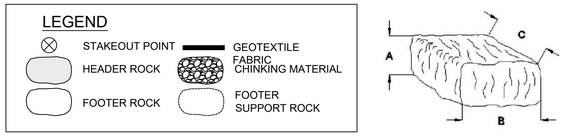
License Number: 52852
Expiration Date: 6-14-2022

HARFORD COUNTY, MARYLAND

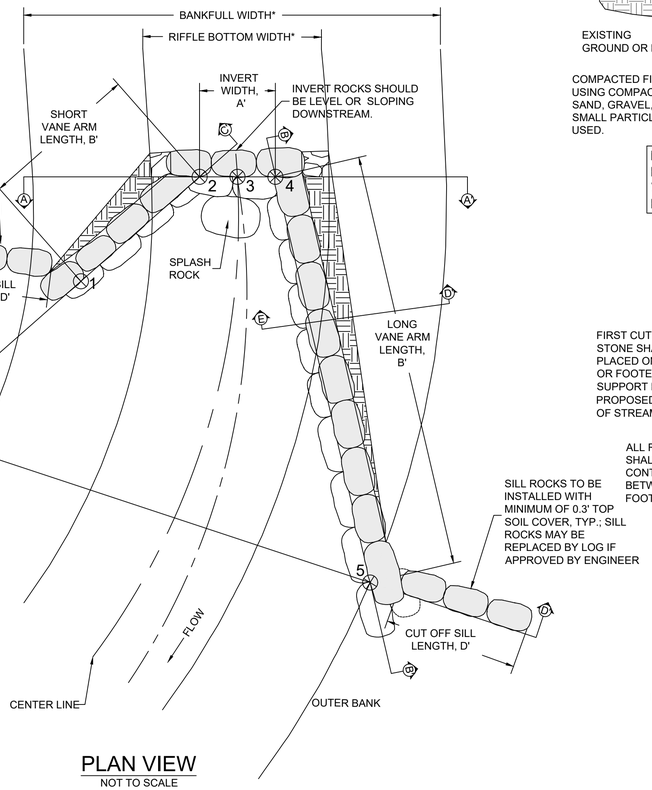
C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION
STREAM DETAILS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

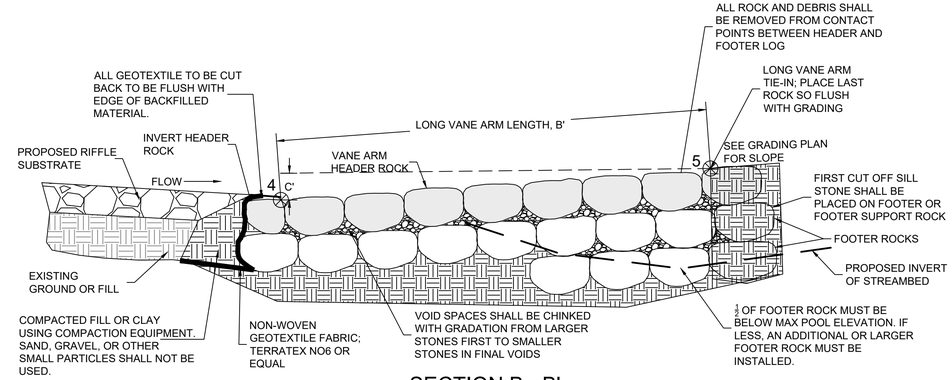
SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021



*NOTE: SEE CROSS-SECTION GEOMETRY TABLE FOR CHANNEL DIMENSIONS AND SLOPES.
ALL STAKEOUT POINTS SHOULD BE SURVEY LOCATED TO A 10TH OF A FOOT ACCURACY IN THE FIELD.

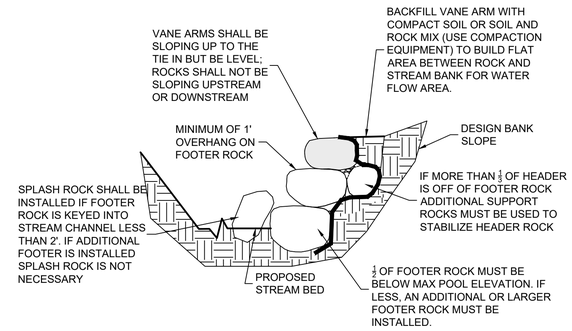


PLAN VIEW
NOT TO SCALE

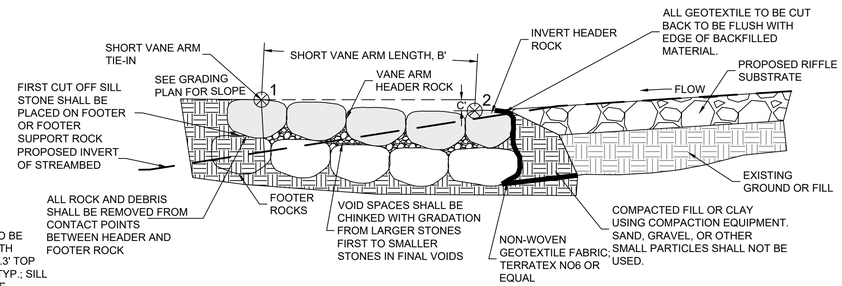


SECTION B - B'
NOT TO SCALE

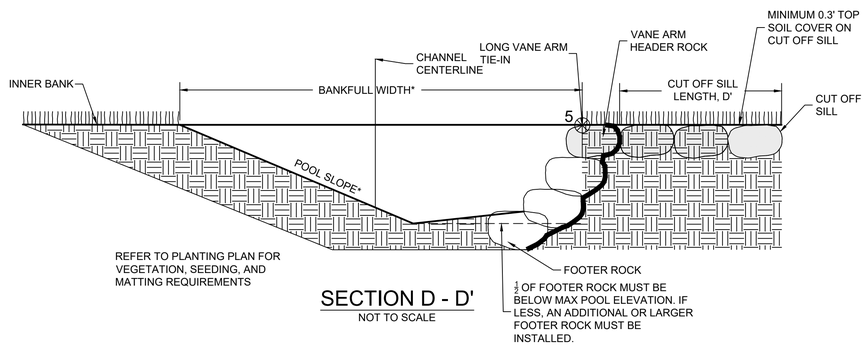
NOTE: SEAMS OF HEADER ROCK SHALL NOT ALIGN WITH SEAMS OF FOOTER ROCKS



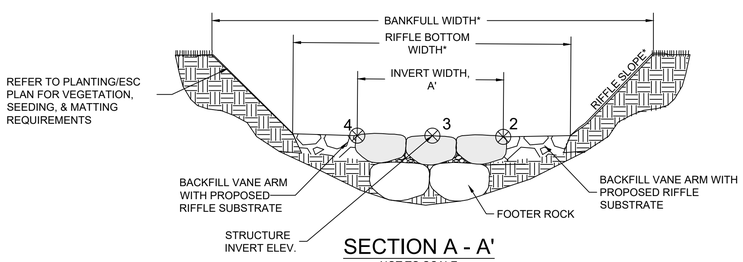
SECTION E - D'
NOT TO SCALE



SECTION C - C'
NOT TO SCALE



SECTION D - D'
NOT TO SCALE



SECTION A - A'
NOT TO SCALE

1 OFFSET CROSS VANE/STEP POOL
NOT TO SCALE

ROCK CROSS-VANE STRUCTURE TABLE

REACH	STRUCTURE #	STATION	INVERT WIDTH, A'	INVERT ELEV.	VANE ARM LENGTH, B'		VANE ARM TIE-IN HEIGHT, C'		CUT OFF SILL LENGTH, D'	ROCK HEIGHT (A)	ROCK DEPTH (B)	ROCK LENGTH (C)
					LONG	SHORT	LONG	SHORT				
1	1-1	10+06.0	1.4	362.3	5.6	2.8	0.3	0.15	6	12-18"	12-18"	18-24"
2A	2-1	11+12.7	1.6	358.0	7	3.5	0.4	0.2	7	12-18"	12-18"	18-24"
2A	2-4	13+15.4	1.6	354.8	7	3.5	0.4	0.2	7	12-18"	12-18"	18-24"
2A	2-7	14+36.4	1.6	352.0	7	3.5	0.4	0.2	7	12-18"	12-18"	18-24"
2A	2-10	16+19.0	1.6	347.9	7	3.5	0.4	0.2	7	12-18"	12-18"	18-24"
2A	2-13	18+09.9	1.6	344.2	7	3.5	0.4	0.2	7	12-18"	12-18"	18-24"
2A	2-15	18+85.7	1.6	342.6	7	3.5	0.4	0.2	7	12-18"	12-18"	18-24"
2A	2-16	19+22.3	1.6	341.8	7	3.5	0.4	0.2	7	12-18"	12-18"	18-24"
2A	2-18	20+29.5	1.6	338.9	7	3.5	0.4	0.2	7	12-18"	12-18"	18-24"
2A	2-22	22+67.7	1.6	334.4	7	3.5	0.4	0.2	7	12-18"	12-18"	18-24"
2A	2-23	23+44.5	1.6	333.0	7	3.5	0.4	0.2	7	12-18"	12-18"	18-24"
2B	2-24	24+19.6	1.6	331.0	7	3.5	0.4	0.2	7	12-18"	12-18"	18-24"
2B	2-25	25+03.9	1.6	328.7	7	3.5	0.4	0.2	7	12-18"	12-18"	18-24"
2B	2-27	25+71.5	1.6	326.4	7	3.5	0.4	0.2	7	12-18"	12-18"	18-24"
2B	2-29	26+45.9	1.6	324.1	7	3.5	0.4	0.2	7	12-18"	12-18"	18-24"
2B	2-31	27+18.2	1.6	321.8	7	3.5	0.4	0.2	7	12-18"	12-18"	18-24"
2B	2-32	27+53.6	1.6	320.4	7	3.5	0.4	0.2	7	12-18"	12-18"	18-24"
3	3-1	29+86.0	1.8	313.9	7.5	3.8	0.4	0.2	7.5	12-18"	12-18"	18-24"
4	4-1	31+95.9	2.1	310.7	8.5	4.3	0.5	0.3	8.5	12-18"	12-18"	18-24"
4	4-4	33+31.9	2.1	308.6	8.5	4.3	0.5	0.3	8.5	12-18"	12-18"	18-24"
4	4-5	34+22.2	2.1	307.4	8.5	4.3	0.5	0.3	8.5	12-18"	12-18"	18-24"
4	4-6	34+66.7	2.1	306.9	8.5	4.3	0.5	0.3	8.5	12-18"	12-18"	18-24"
4	4-10	37+35.5	2.1	302.2	8.5	4.3	0.5	0.3	8.5	12-18"	12-18"	18-24"
4	4-12	38+25.9	2.1	300.7	8.5	4.3	0.5	0.3	8.5	12-18"	12-18"	18-24"
4	4-15	39+57.2	2.1	298.2	8.5	4.3	0.5	0.3	8.5	12-18"	12-18"	18-24"
4	4-16	40+03.0	2.1	297.1	8.5	4.3	0.5	0.3	8.5	12-18"	12-18"	18-24"
UT1	UT1-1	100+02.0	0.7	368.8	3	1.5	0.2	0.1	5	12-18"	12-18"	12-18"
UT1	UT1-3	100+36.8	0.7	367.3	3	1.5	0.2	0.1	5	12-18"	12-18"	12-18"
UT1	UT1-6	100+96.1	0.7	364.7	3	1.5	0.2	0.1	5	12-18"	12-18"	12-18"
UT1	UT1-7	101+44.3	0.7	362.0	3	1.5	0.2	0.1	5	12-18"	12-18"	12-18"
UT1	UT1-8	101+61.8	0.7	360.7	3	1.5	0.2	0.1	5	12-18"	12-18"	12-18"
UT1	UT1-9	101+77.7	0.7	359.4	3	1.5	0.2	0.1	5	12-18"	12-18"	12-18"
UT2	UT2-1	200+01.1	0.7	317.9	3	1.5	0.2	0.1	5	12-18"	12-18"	12-18"
UT2	UT2-3	200+81.1	0.7	316.0	3	1.5	0.2	0.1	5	12-18"	12-18"	12-18"
UT2	UT3-4	200+97.3	0.7	315.3	3	1.5	0.2	0.1	5	12-18"	12-18"	12-18"
UT3	UT3-1	300+48.4	1.4	317.8	5.6	2.8	0.3	0.2	6	12-18"	12-18"	12-18"
UT3	UT3-2	300+85.3	1.4	316.4	5.6	2.8	0.3	0.2	6	12-18"	12-18"	12-18"
UT3	UT3-3	301+16.3	1.4	315.1	5.6	2.8	0.3	0.2	6	12-18"	12-18"	12-18"

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

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

STATE OF MARYLAND
BAILEY J. WILSONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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.

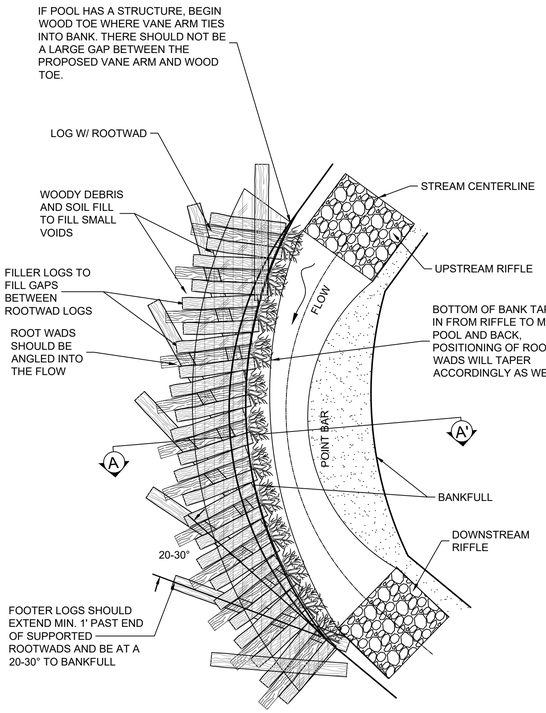
License Number: 52852
Expiration Date: 6-14-2022

HARFORD COUNTY, MARYLAND

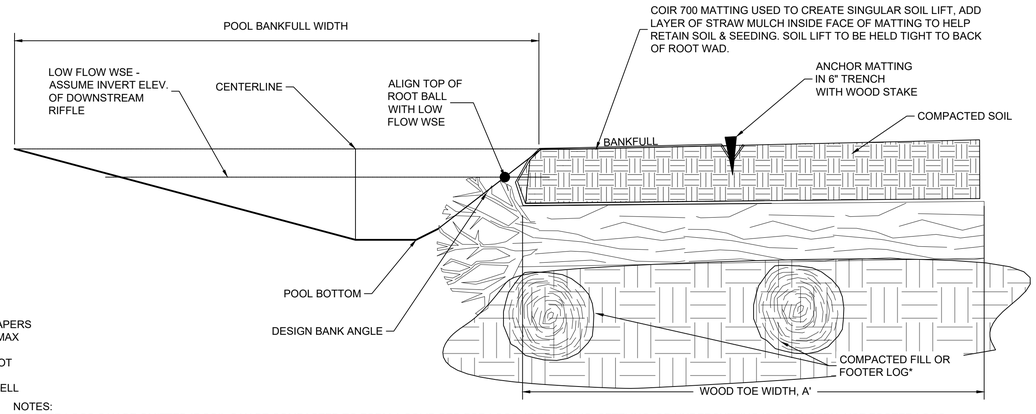
C. MILTON WRIGHT HIGH SCHOOL
STREAM RESTORATION
STREAM DETAILS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021



PLAN VIEW
NOT TO SCALE

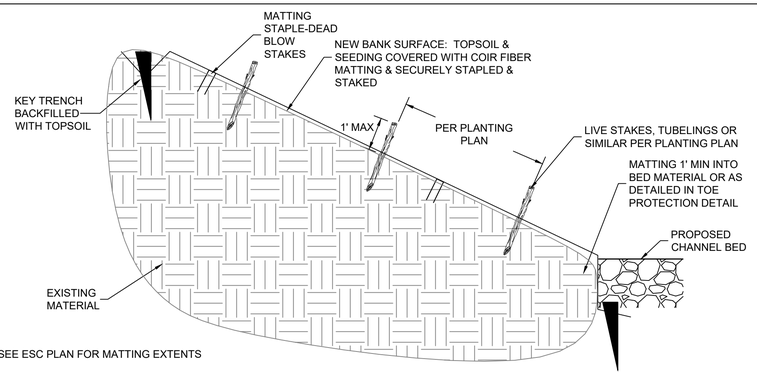


NOTES:
*FOOTER LOGS CAN BE OMITTED IF SOIL CAN BE COMPACTED TO FORM A SOLID BED FOR LOGS. IF SLUMPING, SETTLING, OR UNDERCUTTING IS A CONCERN, USE FOOTER LOGS.

1. ROOTWADS SHALL BE TOUCHING OR OVERLAPPING SO THAT THERE ARE NO GAPS ALONG THE FACE OF THE REVETMENT.
2. FILLER LOGS SHALL BE ANY SCRAP LOGS NOT USED FOR ROOTWADS AND TIGHTLY FITTED IN TO HOLD THE ROOTWADS IN PLACE. USE WOODY DEBRIS AND SOIL TO FILL SMALLER VOID SPACES.
3. THE WOODY DEBRIS AND SOIL FILL SHALL BE COMPACTED WITH EXCAVATOR BUCKET IN THE VOIDS AROUND THE LOGS AND ON TOP OF THE WOOD TOE LAYER TO PROVIDE AN EVEN SURFACE FOR THE BOTTOM SOIL LIFT.
4. THE SOIL USED FOR LIVE LIFTS SHALL BE FREE OF STICKS, ROOTS, AND ROCKS LARGER THAN GRAVEL. THIS SOIL SHALL CONTAIN NO LESS THAN 50% TOPSOIL.
5. FOR SINGULAR LIFT COIR 700 MAY BE USED AND LIFT SHOULD MATCH CHANNEL GEOMETRY. THE SOIL LIFT SHALL BE HELD TIGHT TO THE BACK OF THE ROOTS, PREVENTING ANY LARGE GAPS WHERE SCOUR CAN OCCUR.
6. USE HIGH DENSITY LIVE STAKING DURING THE PLANTING SEASON IN THE LIFT, PER THE SEEDING AND PLANTING SCHEDULE PROVIDED IN THE PLANS.
7. THE OVERALL SLOPE CREATED BY THE WOOD TOE AND LIVE LIFT SHALL MATCH THE PROPOSED CROSS SECTION SHAPE FOR THE OUTER BANK OF THE PROPOSED POOL.
8. THE SURFACE SHALL BE FINISHED TO A SMOOTH AND COMPACT SURFACE IN ACCORDANCE WITH THE ELEVATIONS, GRADES, AND/OR CROSS-SECTIONS SHOWN IN THE PLANS.
9. ROOTWADS SHALL BE HELD LOW IN THE CHANNEL, THE BULK OF THE ROOTWAD SHALL BE BELOW THE LOW-FLOW WSE.
10. REDRESSING OF CHANNEL, BENCHES, AND FLOODPLAIN WILL LIKELY BE REQUIRED FOLLOWING INSTALLATION OF THIS STRUCTURE AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION. ADDITIONAL ROOTWADS OR RIPRAP MAY BE USED TO ADDRESS AREAS OF CONCERN FOR EROSION, ESPECIALLY AT THE ENDS OF THIS STRUCTURE.
11. OFFSET FROM THE CENTERLINE APPLIES ONLY AT THE MIDPOINT OF THE POOL. WOOD TOE REVETMENT SHOULD TRANSITION TO AND FROM THE RIFFLE CROSS-SECTION FROM THAT PONT.

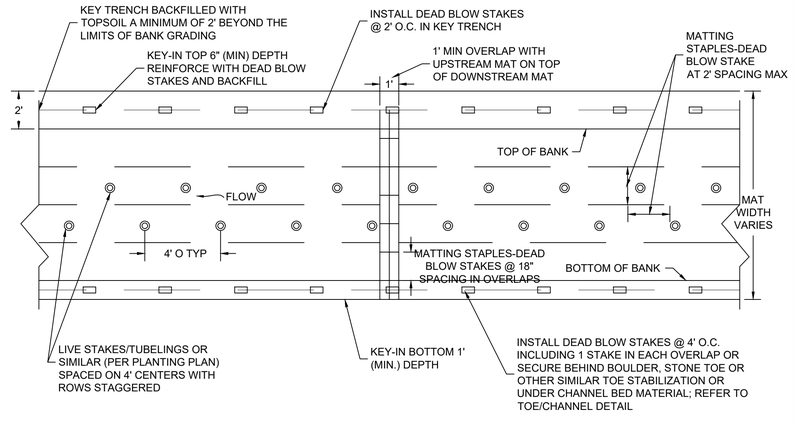
WOOD TOE TABLE			
REACH	START STATION	END STATION	WOOD TOE WIDTH, A'
2	13+21.3	13+45.5	6
2	13+54.7	13+75.9	6
2	14+00.9	14+18.9	6
2	14+77.8	14+97.9	6
2	18+16.0	18+29.3	6
2	25+77.6	25+90.2	6
2	26+51.9	26+68.2	6
2	28+74.6	28+91.3	6

1 WOOD TOE REVETMENT
NOT TO SCALE

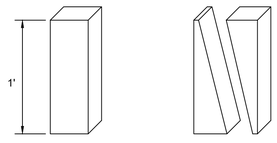


NOTE: SEE ESC PLAN FOR MATTING EXTENTS

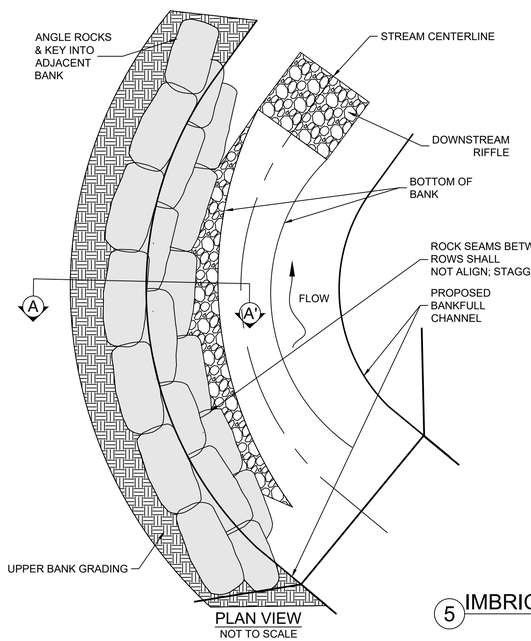
2 COIR FIBER MATTING WITH LIVE STAKES
NOT TO SCALE



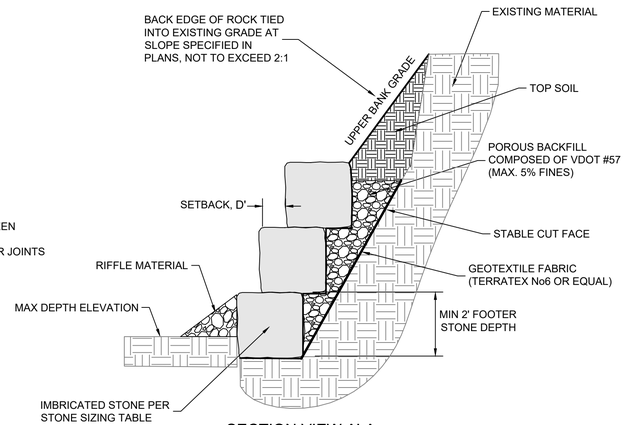
3 COIR FIBER MATTING DETAIL IN-CHANNEL INSTALLATION
NOT TO SCALE



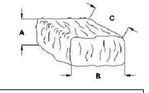
4 DEAD BLOW STAKE
NOT TO SCALE



PLAN VIEW
NOT TO SCALE



SECTION VIEW A'-A
NOT TO SCALE



WALL TABLE			
ROCK HEIGHT (A)	ROCK DEPTH (B)	ROCK LENGTH (C)	SETBACK, D'
12-18"	12-18"	18-24"	6"

5 IMBRICATED OUTER BEND PROTECTION
NOT TO SCALE

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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.

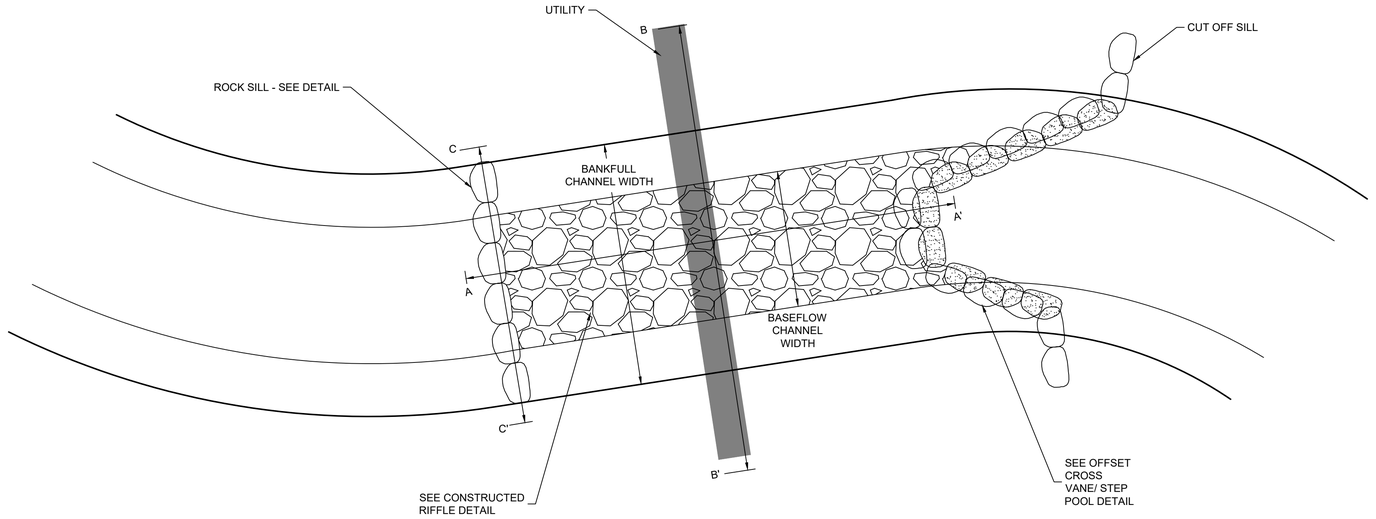
License Number: 52852
Expiration Date: 6-14-2022

HARFORD COUNTY, MARYLAND

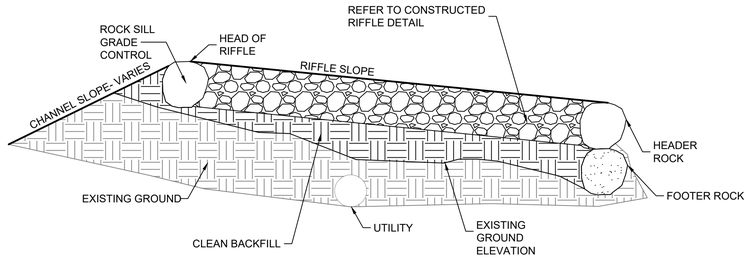
C. MILTON WRIGHT HIGH SCHOOL
STREAM RESTORATION
STREAM DETAILS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

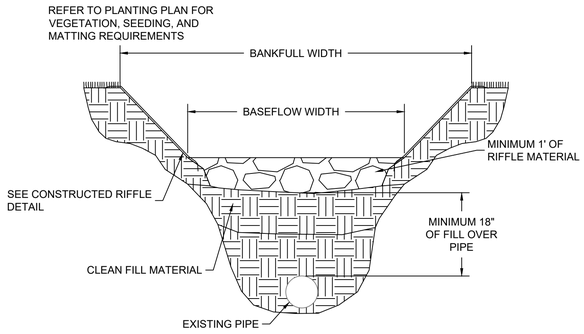
SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 29 of 51



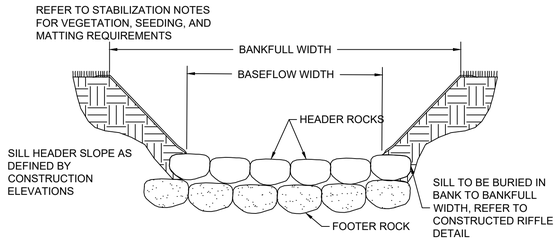
PLAN VIEW
NOT TO SCALE



SECTION A - A'
NOT TO SCALE



SECTION B - B'
NOT TO SCALE



SECTION C - C'
NOT TO SCALE

THIS DETAIL FOR GENERAL INFORMATION ONLY, REFER TO INDIVIDUAL CONSTRUCTION DETAILS FOR MORE INFORMATION.

1 UTILITY PROTECTION
NOT TO SCALE

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

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

STATE OF MARYLAND
BAILEY J. WILSONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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.

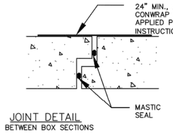
License Number: 52852
Expiration Date: 6-14-2022

HARFORD COUNTY, MARYLAND

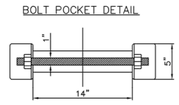
C. MILTON WRIGHT HIGH SCHOOL
STREAM RESTORATION
STREAM DETAILS

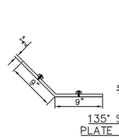
REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 30 of 51

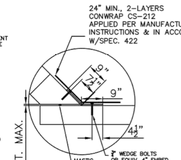


JOINT DETAIL
BETWEEN BOX SECTIONS

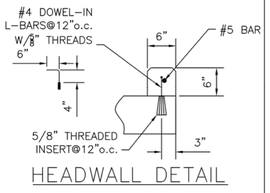




135° STEEL
PLATE DETAIL

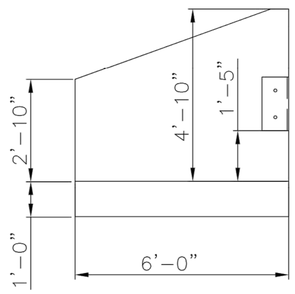


TYP. WINGWALL
CONNECTION
ANGLE VARIES AS REQ'D

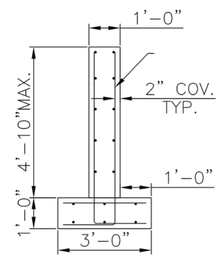


HEADWALL DETAIL

NOTE: PARAPET/RAILING, INCLUDING CONNECTION TO HEADWALL, BY OTHERS.



TYPICAL WING
WALL



3/9/21

SPECIALTY ENGINEERING SERVICES PROVIDED BY:
CONCRETE ENGINEERING SOLUTIONS, LLC
101 PINEVIEW ESTATES
MOUNTAIN TOP, PA 18707
PHONE:570-868-2681
FAX: 570-868-2682

REVISION SIGNOFF		
	Date	Initial
1		
2		
3		
4		
5		
6		
7		
8		

Maryland Concrete Inc.
CULVERT DETAILS
CM WRIGHT HIGH SCHOOL
443 491 3598 (o) 410 357 5297 (f)
DRAWN: BKM11/18/2020
CHECKED: TLG
SCALE: AS SHOWN
No. MC0577-5

3			
2			
1	2/18/2021	REDUCED WING LENGTH AND ADJ REINFORCEMENT	BKM / TLG
0	11/18/2020	ISSUED FOR CONSTRUCTION	BKM / TLG
	DATE	REVISION DESCRIPTION	DESIGNER/CHECKER

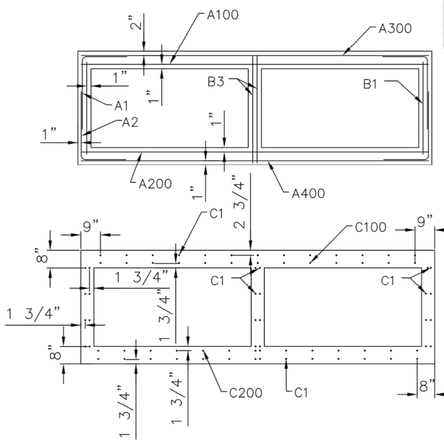
SPECIALTY ENGINEERING SERVICES PROVIDED BY:
CONCRETE ENGINEERING SOLUTIONS, LLC
101 PINEVIEW ESTATES
MOUNTAIN TOP, PA 18707
PHONE:570-868-2681
FAX: 570-868-2682

REVISION SIGNOFF		
	Date	Initial
1		
2		
3		
4		
5		
6		
7		
8		

Maryland Concrete Inc.
3' x 6' BOX CULVERT WINGS
CM WRIGHT HIGH SCHOOL
443 491 3598 (o) 410 357 5297 (f)
DRAWN: TLG 11/18/2020
CHECKED:
SCALE: AS SHOWN
No. MC0577-4

3			
2			
1	2/18/2021	REDUCED WING LENGTH AND ADJ REINFORCEMENT	BKM / TLG
0	11/18/2020	ISSUED FOR CONSTRUCTION	BKM /

Bot Slab(Int)	A200	7	4	10"	S	13'-3"	–	–	82.0
Top Slab(Ext)	A300	11	5	8"	S	13'-3"	–	–	152.0
Bot Slab(Ext)	A400	7	5	10"	S	13'-3"	–	–	97.0
Corner(Top)	A1	14	5	10"	L	4'-9"	2'-0"	3'-9"	69.0
Corner(Bot)	A2	14	5	10"	L	4'-10"	2'-0"	3'-10"	71.0
Wall(Int)	B1	12	4	1'-0"	S	5'-5"	–	–	28.0
Int Wall	B3	12	4	1'-0"	S	4'-0"	–	–	32.0
Longit. Top (Int)	C100	13	4	1'-0"	S	5'-5"	–	–	47.0
Longit. Bot (Int)	C200	13	4	1'-0"	S	5'-5"	–	–	47.0
Longit. Top (Ext)	C1	13	4	1'-0"	S	5'-5"	–	–	47.1
Longit. Bot (Ext)	C1	13	4	1'-0"	S	5'-5"	–	–	47.1
Longit. Wall (Ext)	C1	9	4	1'-0"	S	5'-5"	–	–	29.0
Longit. Wall (Int)	C1	8	4	1'-0"	S	5'-5"	–	–	29.0
Longit. Int	C1	9	4	1'-0"	S	5'-5"	–	–	29.0
									883

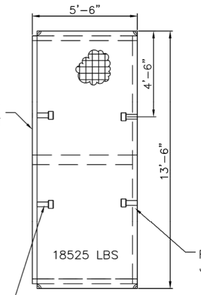


3/9/21

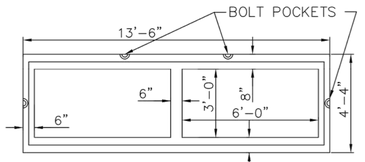
SPECIALTY ENGINEERING SERVICES PROVIDED BY:
CONCRETE ENGINEERING SOLUTIONS, LLC
101 PINEVIEW ESTATES
MOUNTAIN TOP, PA 18707
PHONE:570-868-2681
FAX: 570-868-2682

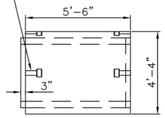
REVISION SIGNOFF		
	Date	Initial
1		
2		
3		
4		
5		
6		

Maryland Concrete Inc.
3' x 6' BOX CULVERT REINFORCEMENT
CM WRIGHT HIGH SCHOOL
443 491 3598 (o) 410 357 5297 (f)
DRAWN: BKM 11/18/20
No. MC0577-3



BOLT POCKETS EXTERIOR TOP & SIDES





3/9/21

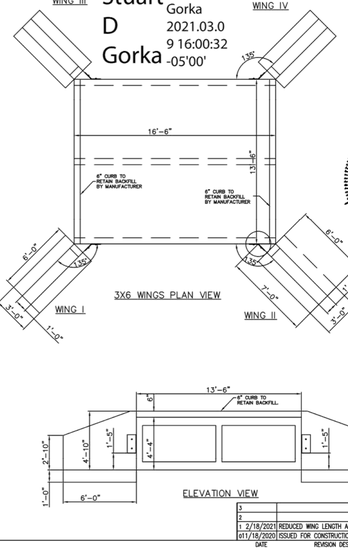
SPECIALTY ENGINEERING SERVICES PROVIDED BY:
CONCRETE ENGINEERING SOLUTIONS, LLC
101 PINEVIEW ESTATES
MOUNTAIN TOP, PA 18707
PHONE:570-868-2681
FAX: 570-868-2682

REVISION SIGNOFF		
	Date	Initial
1		
2		
3		
4		
5		
6		
7		
8		

Maryland Concrete Inc.
3' x 6' BOX CULVERT SECTION
CM WRIGHT HIGH SCHOOL
443 491 3598 (o) 410 357 5297 (f)
DRAWN: BKM11/18/2020
CHECKED: TLG
SCALE: AS SHOWN
No. MC0577-2

3			
2			
1	2/18/2021	REDUCED WING LENGTH AND ADJ REINFORCEMENT	BKM / TLG
0	11/18/2020	ISSUED FOR CONSTRUCTION	BKM / TLG
	DATE	REVISION DESCRIPTION	DESIGNER/CHECKER

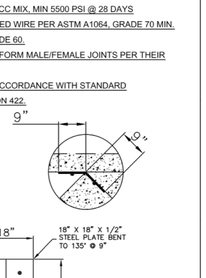
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 43524,
Expiration Date: 5/15/2021 .



3/9/21

SPECIFICATIONS

- MDOT/SHA APPROVED SCC MIX, MIN 5500 PSI @ 28 DAYS
- REINFORCEMENT: WELDED WIRE PER ASTM A1064, GRADE 70 MIN. REBAR: ASTM A615, GRADE 60.
- MANUFACTURER SHALL FORM MALE/FEMALE JOINTS PER THEIR OWN DESIGN
- ALL JOINTS SEALED IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 422.



STEEL PLATE
DETAIL

ELEVATION VIEW

SPECIALTY ENGINEERING SERVICES PROVIDED BY:
CONCRETE ENGINEERING SOLUTIONS, LLC
101 PINEVIEW ESTATES
MOUNTAIN TOP, PA 18707
PHONE:570-868-2681
FAX: 570-868-2682

REVISION SIGNOFF		
	Date	Initial
1		
2		
3		
4		
5		
6		
7		
8		

Maryland Concrete Inc.
3' x 6' x 16.5' BOX CULVERT
CM WRIGHT HIGH SCHOOL
443 491 3598 (o) 410 357 5297 (f)
DRAWN: BKM11/18/2020
CHECKED: TLG
SCALE: AS SHOWN
No. MC0577-1

3			
2			
1	2/18/2021	REDUCED WING LENGTH AND ADJ REINFORCEMENT	BKM / TLG
0	11/18/2020	ISSUED FOR CONSTRUCTION	BKM / TLG
	DATE	REVISION DESCRIPTION	DESIGNER/CHECKER

CULVERT NOTES:

1. MANUFACTURER TO PROVIDE SHOP DRAWINGS FOR APPROVAL.
2. DESIGN COMPUTATIONS & LOADINGS CAN BE FOUND IN DESIGN REPORT.
3. SEE SHEET 20 FOR STREAM/CULVERT PROFILE AND SHEET 25 FOR CROSS-SECTION.

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

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

4/16/2021

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.

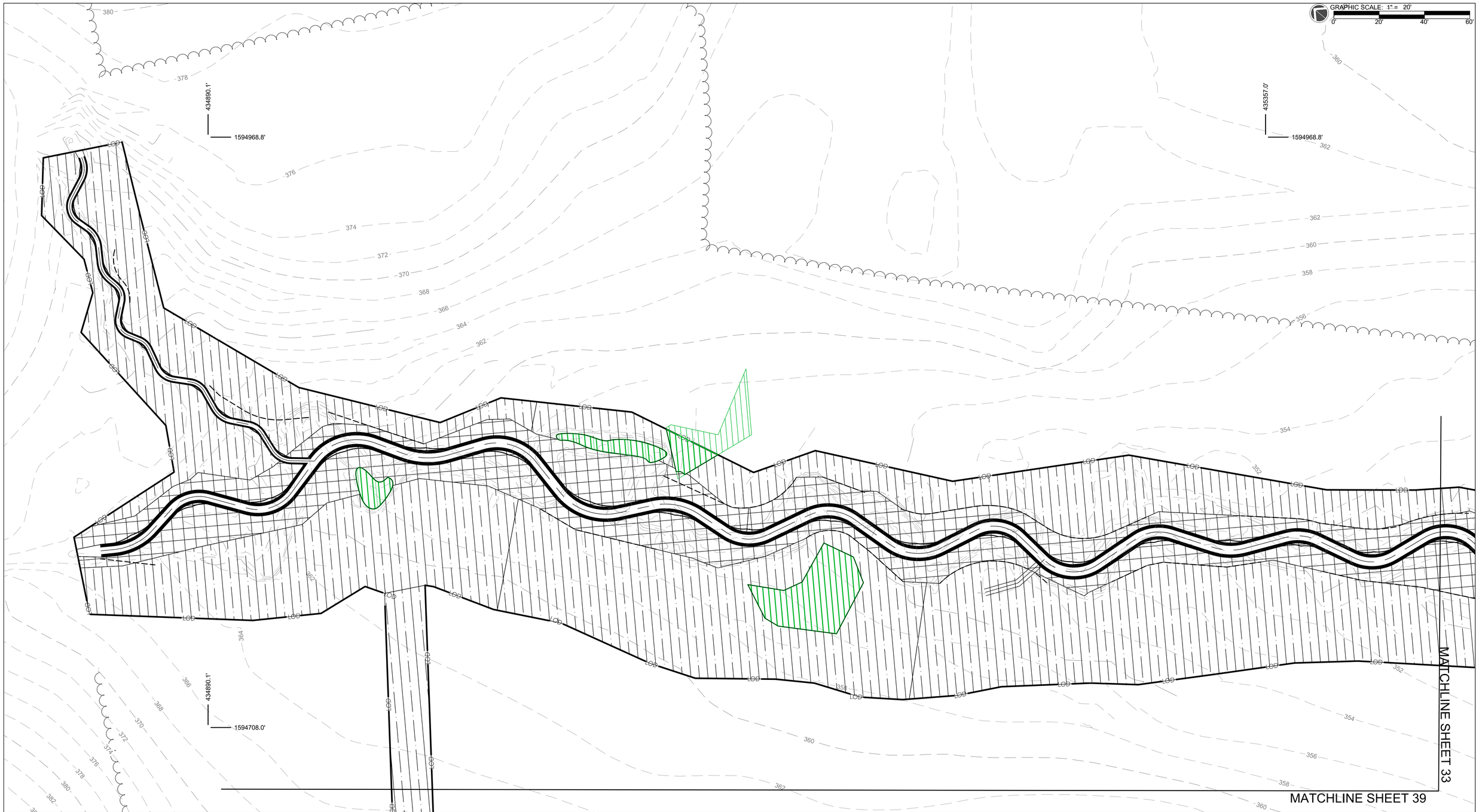
License Number: 52852
Expiration Date: 6-14-2022

HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL
STREAM RESTORATION
CULVERT DETAILS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021



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
- EX. FORESTED WETLAND
- FCE — EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- LOD — PR. LIMITS OF DISTURBANCE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. CULVERT
- PR. RIPRAP
- PR. FORESTED WETLAND ZONE
- PR. STREAMBANK ZONE
- PR. FLOODPLAIN ZONE
- PR. UPLAND ZONE
- PR. PERMANENT SEEDING

SCALE: 1 INCH

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.

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

PLANTING PLAN

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

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
- EX. FORESTED WETLAND
- FCE — EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- LOD — PR. LIMITS OF DISTURBANCE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. CULVERT
- PR. RIPRAP
- PR. FORESTED WETLAND ZONE
- PR. STREAMBANK ZONE
- PR. FLOODPLAIN ZONE
- PR. UPLAND ZONE
- PR. PERMANENT SEEDING

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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
PLANTING PLAN

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 33 of 51

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
- EX. FORESTED WETLAND
- FCE — EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- LOD — PR. LIMITS OF DISTURBANCE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. CULVERT
- PR. RIPRAP
- PR. FORESTED WETLAND ZONE
- PR. STREAMBANK ZONE
- PR. FLOODPLAIN ZONE
- PR. UPLAND ZONE
- PR. PERMANENT SEEDING

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

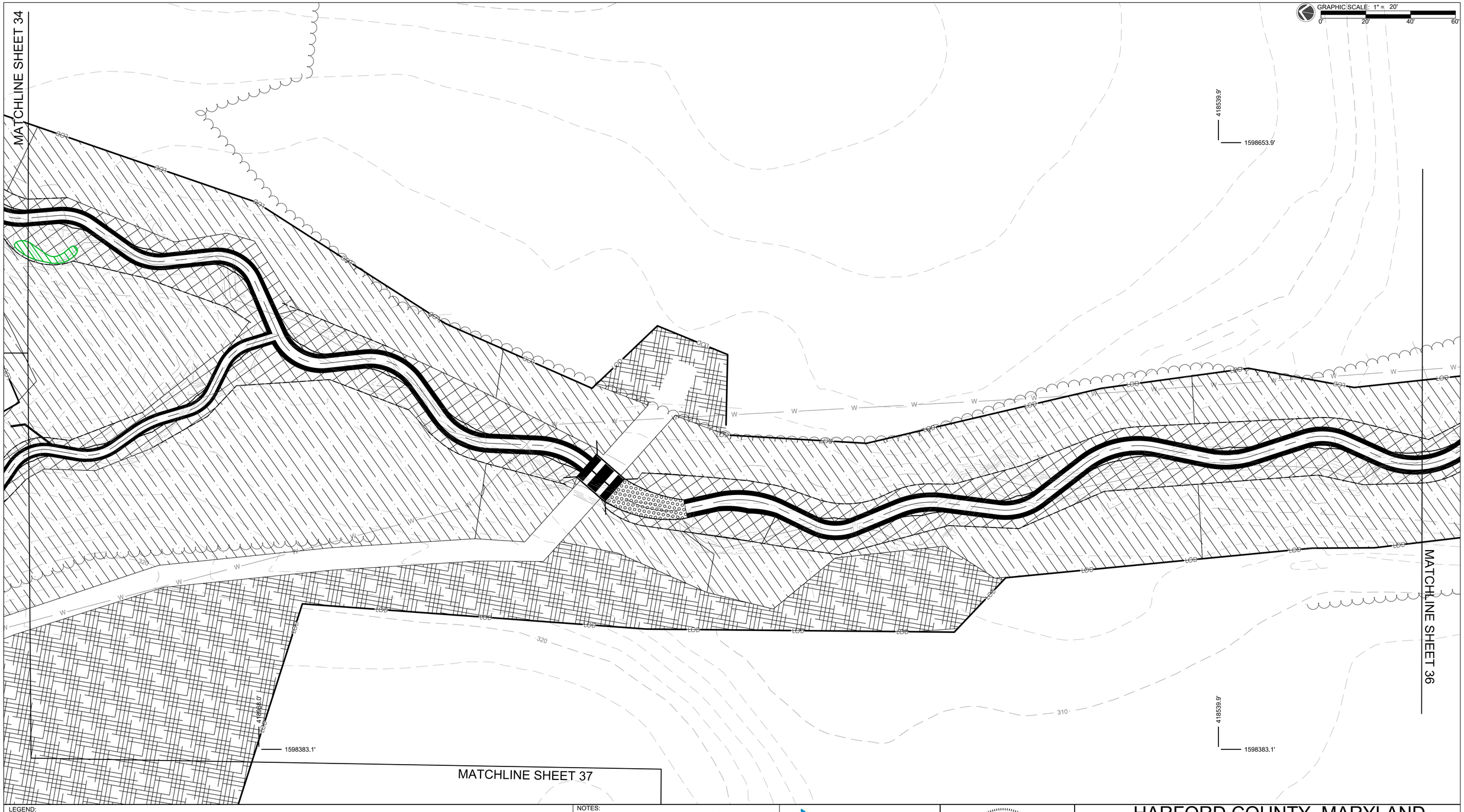
HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION

PLANTING PLAN

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021



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
- EX. FORESTED WETLAND
- FCE — EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- LOD — PR. LIMITS OF DISTURBANCE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. CULVERT
- PR. RIPRAP
- PR. FORESTED WETLAND ZONE
- PR. STREAMBANK ZONE
- PR. FLOODPLAIN ZONE
- PR. UPLAND ZONE
- PR. PERMANENT SEEDING

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

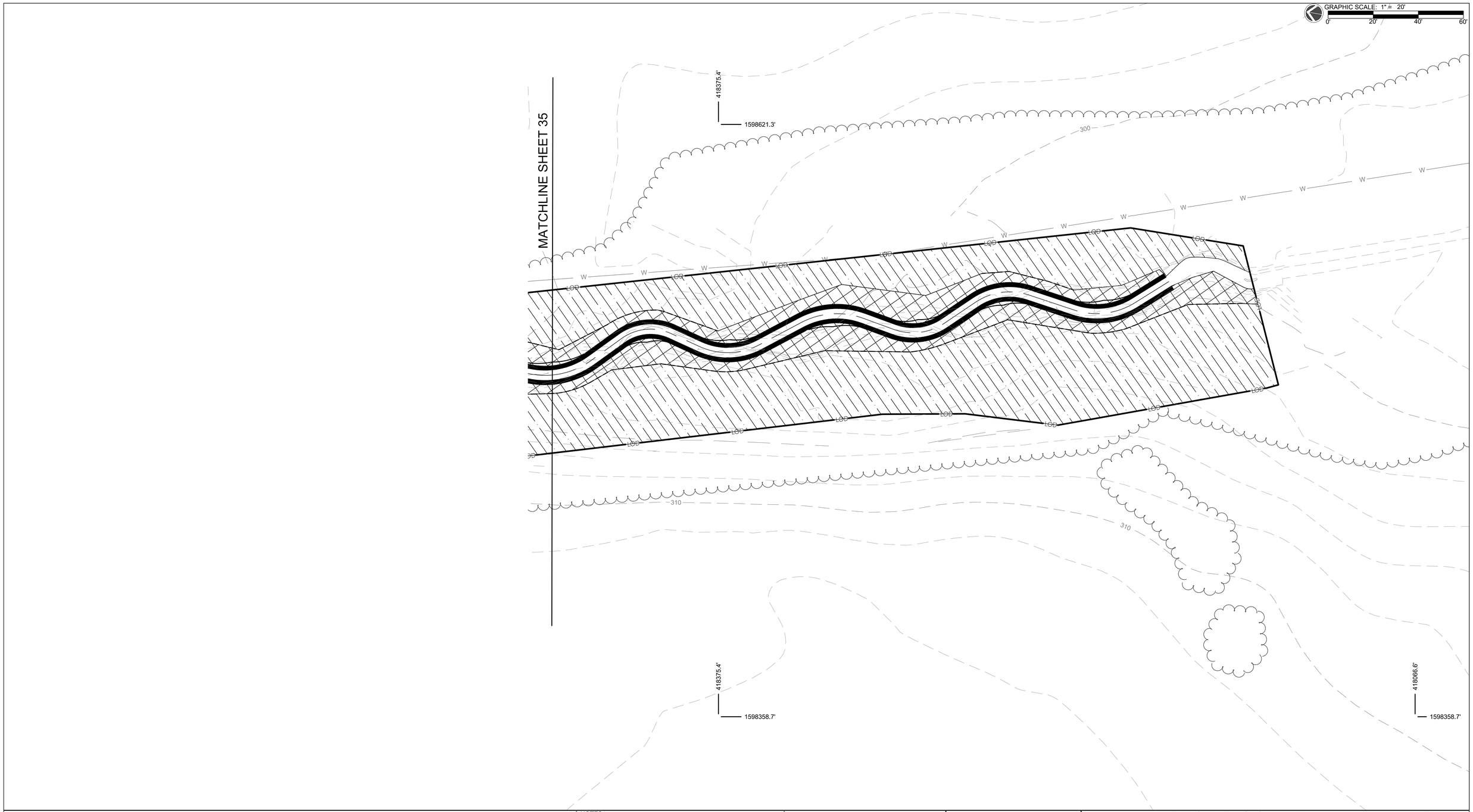
HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION

PLANTING PLAN

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 35 of 51



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
- EX. FORESTED WETLAND
- FCE — EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- LOD — PR. LIMITS OF DISTURBANCE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. CULVERT
- PR. RIPRAP
- PR. FORESTED WETLAND ZONE
- PR. STREAMBANK ZONE
- PR. FLOODPLAIN ZONE
- PR. UPLAND ZONE
- PR. PERMANENT SEEDING

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

PLANTING PLAN

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

GRAPHIC SCALE: 1" = 20'
0' 20' 40' 60'

MATCHLINE SHEET 32

434922.2'
1594636.9'

435405.8'
1594636.9'

434922.2'
1594376.0'

MATCHLINE SHEET 38

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
- EX. FORESTED WETLAND
- FCE — EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- LOD — PR. LIMITS OF DISTURBANCE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. CULVERT
- PR. RIPRAP
- PR. FORESTED WETLAND ZONE
- PR. STREAMBANK ZONE
- PR. FLOODPLAIN ZONE
- PR. UPLAND ZONE
- PR. PERMANENT SEEDING

SCALE: 1 INCH

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.

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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.

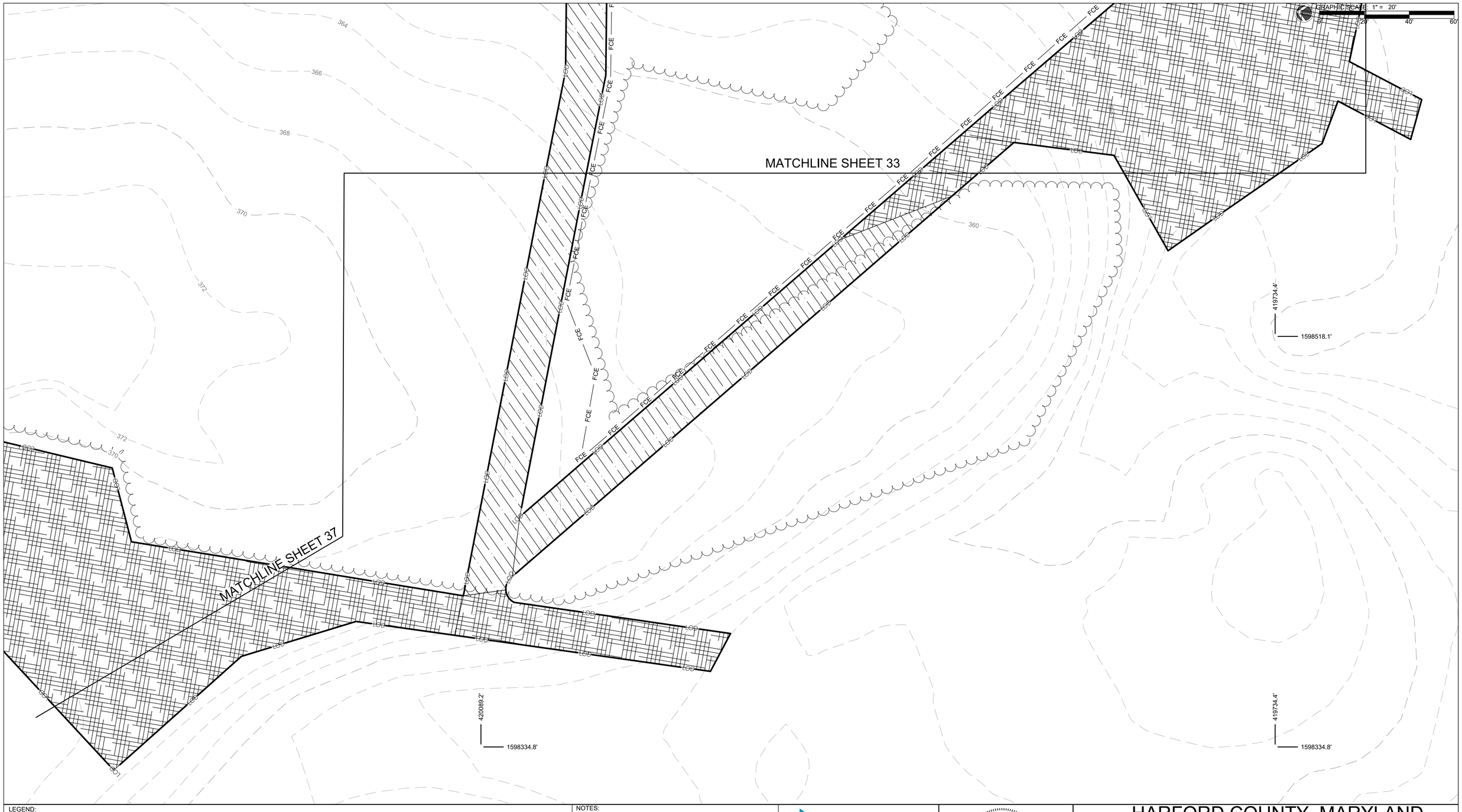
License Number: 52852
Expiration Date: 6-14-2022

HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION
PLANTING PLAN

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 37 of 51



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
- EX. FORESTED WETLAND
- FCE — EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- LOD — PR. LIMITS OF DISTURBANCE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. CULVERT
- PR. RIPRAP
- PR. FORESTED WETLAND ZONE
- PR. STREAMBANK ZONE
- PR. FLOODPLAIN ZONE
- PR. UPLAND ZONE
- PR. PERMANENT SEEDING

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

PLANTING PLAN

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 38 of 51

MATCHLINE SHEET 34

MATCHLINE SHEET 35

419364.3'

1598498.2'

419364.3'

1598383.1'

419868.0'

1598383.1'

GRAPHIC SCALE: 1" = 20'

0' 20' 40' 60'

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
- EX. FORESTED WETLAND
- FCE — EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- LOD — PR. LIMITS OF DISTURBANCE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. CULVERT
- PR. RIPRAP
- PR. FORESTED WETLAND ZONE
- PR. STREAMBANK ZONE
- PR. FLOODPLAIN ZONE
- PR. UPLAND ZONE
- PR. PERMANENT SEEDING

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER

4/16/2021

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
PLANTING PLAN

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

STREAM BANK TREE PLANTING

(BELOW TOP OF BANK)

LINEAR FEET OF BANK 7288 (INCLUDES BANKS ON EACH SIDE OF CHANNEL)
PLANTS PER LINEAR FOO 0.33 (3 FOOT O.C. SPACING AVG.)
TOTAL PLANTS 2405

SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS	SIZE	STOCK	%	QUANTITY
Alnus serrulata	Smaath Alder	FACW	8-12"	Bareraat	20%	481
Cephalanthus occidentali	Buttanbush	OBL	2-3'	Livestakes	15%	361
Cornus amomum	Silky dogwood	FACW	2-3'	Livestakes	20%	481
Salix sericea	Silky Willaw	OBL	2-3'	Livestakes	25%	601
Platanus accidentalis	Sycamare	FACW	2-3'	Livestakes	20%	481
					100%	**2,405**

Note: Stream bank plantings shall be installed below tap of bank, where coir matting is placed along t

FORESTED WETLAND TREE PLANTING

(BELOW TOP OF BANK)

SQUARE FEET 3375
PLANT SPACING (O.C.) 3.00
TOTAL PLANTS 375

SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS	SIZE	STOCK	%	QUANTITY
Alnus serrulata	Smooth Alder	FACW	8-12"	Bareroot	20%	75
Cephalanthus occidentali	Buttonbush	OBL	2-3'	Livestakes	15%	56
Cornus amomum	Silky dogwood	FACW	2-3'	Livestakes	20%	75
Salix sericea	Silky Willow	OBL	2-3'	Livestakes	25%	94
Platanus occidentalis	Sycamore	FACW	2-3'	Livestakes	20%	75
					100%	**375**

UPLAND TREE PLANTING

ACRES 4.69
PLANTS PER ACRE 600
TOTAL PLANTS 2,814

SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS	SIZE	STOCK	%	QUANTITY
CANOPY (80%)						
Quercus rubra	Red Oak	FACU	8-12" Height	Bareroot	10%	281
Acer rubrum	Red maple	FAC	8-12" Height	Bareroot	15%	422
Liriodendron tulipifera	Tulip poplar	FACU	8-12" Height	Bareroot	15%	422
Quercus montana	Chestnut oak	UPL	8-12" Height	Bareroot	10%	281
Quercus alba	White oak	FACU	8-12" Height	Bareroot	15%	422
Quercus rubra	Northern red oak	FACU	8-12" Height	Bareroot	15%	422
UNDERSTORY/SHRUB (20%)						
Cercis canadensis	Eastern redbud	UPL	8-12" Height	Bareroot	5%	141
Cornus florida	Flowering dogwood	FAC	8-12" Height	Bareroot	7.5%	211
Viburnum acerifolium	Mapleleaf viburnum	FACU	8-12" Height	Bareroot	7.5%	211
					100%	**2,814**

FLOODPLAIN TREE PLANTING

ACRES 1.20
PLANTS PER ACRE 600
TOTAL PLANTS 720

SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS	SIZE	STOCK	%	QUANTITY
CANOPY (75%)						
Acer rubrum	Red maple	FAC	8-12" Height	Bareroot	10%	72
Quercus bicolor	Swamp white oak	FAC	8-12" Height	Bareroot	10%	72
Magnolia virginiana	Sweetbay magnolia	FACW	8-12" Height	Bareroot	5%	36
Nyssa sylvatica	Black gum	FAC	8-12" Height	Bareroot	10%	72
Platanus occidentalis	Sycamore	FAC	2-3' Height	Bareroot	20%	144
Quercus michauxii	Swamp chestnut oak	FACW	8-12" Height	Bareroot	10%	72
Quercus phellos	Willow oak	FACW	8-12" Height	Bareroot	10%	72
UNDERSTORY/SHRUB (25%)						
Asimina triloba	Pawpaw	FACW	8-12" Height	Bareroot	5%	36
Lindera benzoin	Spicebush	FACW	2-3' Height	Bareroot	5%	36
Sambucus nigra	Elderberry	OBL	2-3' Height	Bareroot	5%	36
Salix nigra	Black willow	OBL	2-3' Height	Bareroot	5%	36
Viburnum dentatum	Southern arrowwood	FACW	8-12" Height	Bareroot	5%	36
					100%	**720**

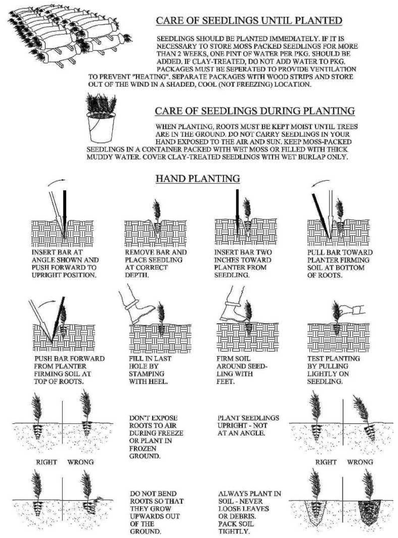
NOTE: SEE ESC PLAN SHEET 50 FOR PERMANENT SEED MIX

FLOODPLAIN/WETLAND/STREAM BANK HERBACEOUS SEEDIN

ACRES 1.49
POUNDS PER ACRE 25
TOTAL POUND 37.25

SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS	%
Grasses (42.1%)/Sedges (46.9%)			
Scirpus cyperinus	Woolgrass	OBL	0.1%
Carex lurida	Lurid Sedge	OBL	5.0%
Carex vulpinoidea	Fox Sedge	OBL	16.9%
Carex frankii	Franks sedge	OBL	5.0%
Elymus virginicus	Va Wildrye	FACW	20.0%
Juncus effusus	Common Sedge	FACW	20.0%
Dichanthelium clandestinum	Deer Tongue	FACW	20.0%
Cinna arundinacea	Wood reedgrass	FACW	2.0%
Forbs (11%)			
Helianthus angustifolius	Swamp Sunflower	FACW	1.0%
Persicaria pensylvanicum	PA Smartweed	FACW	5.0%
Bidens aristosa	Showy Tickseed (NC)	FACW	5.0%
			100.0%

PLANTING BARE-ROOTED SEEDLLINGS



UPLAND HERBACEOUS SEEDING

ACRES 4.69
POUNDS PER ACRE 25
TOTAL POUND 117.25

SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS	%
Grasses(89.5%)			
Agrostis perennans	Autumn Bentgrass	FACU	5.0%
Andropogon virginicus	Broomsedge	FACU	5.0%
Chasmanthium latifolium	River Oats	FACU	15.0%
Elymus virginicus	VA Wildrye	FACW	15.0%
Dichanthelium clandestinum	Deertongue	FACW	14.5%
Schizachyrium scoparium	Little Bluestem	FACU	25.0%
Tridens flavus	Purpletop	FACU	10.0%
Forbs (10.5%)			
Rubeckia hirta	Black Eyed Susan	FACU	0.5%
Helianthus helianthoides	OxEye Sunflower	NI	2.0%
Cichorium intybus	Blue Chickory	NI	1.0%
Coreopsis lanclolata	Longleaf Coreopsis	FACU	1.0%
Chamaecrista fasciculata	Partridge Pea	FACU	3.0%
Bidens aristosa	Showy Tickseed (NC)	FACW	3.0%
			100.0%

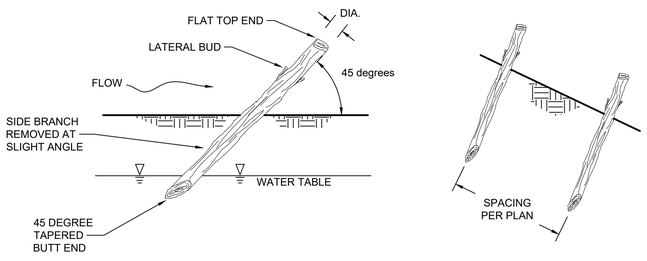
PLANTING NOTES:

1. PLANTS AND SEEDS SHALL BE OBTAINED FROM A COMMERCIAL SUPPLIER. THE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH RELIABLE SOURCES TO ENSURE THAT AN ADEQUATE SUPPLY OF THE REQUIRED PLANT AND SEED MATERIALS IS AVAILABLE.
2. IN THE EVENT THAT A PLANT OR SEED SPECIFIED IS NOT COMMERCIALLY AVAILABLE, THE CONTRACTOR MAY REQUEST A SUBSTITUTION IN WRITING. ALL REQUESTS FOR SUBSTITUTIONS SHALL BE MADE AT LEAST 1 MONTH PRIOR TO INSTALLATION AND BE APPROVED BY THE OWNER.
3. ALL PLANT MATERIALS RECEIVED FROM COMMERCIAL SUPPLIERS SHALL CONFORM TO THE CURRENT ISSUE OF THE AMERICAN STANDARD FOR NURSERY STOCK, PUBLISHED BY THE AMERICAN ASSOCIATIONS OF NURSERYMEN.
4. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL PLANT MATERIAL IN THE APPROPRIATE SEASON FOR EACH TYPE OF STOCK. THE PLANTING SEASON FOR CONTAINER TREES, SHRUBS, TUBELINGS, CONTAINER SEEDLINGS, AND LIVE STAKES SHALL BE FROM NOVEMBER 1 THROUGH DECEMBER 15, AND FEBRUARY 15 THROUGH APRIL 1. LIVE STAKES AND BAREROOT TREES AND SHRUBS MUST BE INSTALLED IN THE DORMANT SEASON. ADJUSTMENTS TO THE PLANTING SEASONS MAY BE MADE BY THE OWNER BASED ON SEASONAL AND SITE CONDITIONS.
5. ALL PLANT MATERIAL SHALL BE UNIFORMLY SHAPED AND HAVE A VIGOROUS ROOT SYSTEM. THE PLANT MATERIAL SHALL BE HEALTHY, AND FREE OF DEFECTS, DECAY, ABRASIONS OF THE BARK, PLANT DISEASE, INSECT PEST EGGS, AND ALL FORMS OF INFESTATIONS. THE PLANT MATERIALS MUST BE FRESH AND FREE OF TRANSPLANT SHOCK OR VISIBLE WILT. UNHEALTHY PLANT STOCK ARE UNACCEPTABLE AND WILL BE REJECTED.
6. ALL CONTAINER GROWN STOCK, INCLUDING PLUGS, SHALL HAVE BEEN PROPAGATED FOR A SUFFICIENT TIME FOR THE ROOTS TO HAVE DEVELOPED SUFFICIENTLY TO HOLD THE SOILS TOGETHER WHEN REMOVED FROM THE CONTAINER. CONTAINER STOCK WITH POORLY DEVELOPED ROOTS ARE UNACCEPTABLE AND WILL BE REJECTED.
7. NO SEEDING OR PLANTING SHALL OCCUR WHEN THE SOIL IS FROZEN OR THE SITE IS FLOODED.
8. THE CONTRACTOR SHALL NOTIFY THE OWNER A MINIMUM OF 48 HOURS PRIOR TO THE COMMENCING OF PLANTING OR SEEDING OPERATIONS.
9. THE FINAL LOCATION OF PLANT MATERIAL, AS WELL AS LOCATION OF PLANTING ZONES, WILL BE SUBJECT TO THE APPROVAL OF THE OWNER. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE REPLANTING OR RESEEDING ANY PLANT MATERIAL INSTALLED WITHOUT APPROVAL OF THE OWNER.
10. EACH CONTAINER PLANT SHALL BE FERTILIZED WITH 20-10-5 CONTROLLED RELEASE TABLETS. FORMULATIONS VARY CONSIDERABLY BY MANUFACTURER, AND OTHER FORMULATIONS ARE ACCEPTABLE, PROVIDED THE TABLETS ARE NOT WATER-SOLUBLE. THE TABLETS SHALL BE BURIED NEAR THE PLANT'S ROOT SYSTEM. THE PLANT STOCK SHALL BE FERTILIZED AT THE FOLLOWING RATES:

STOCK	TABLETS
BAREROOT	ONE 10 GRAM TABLET

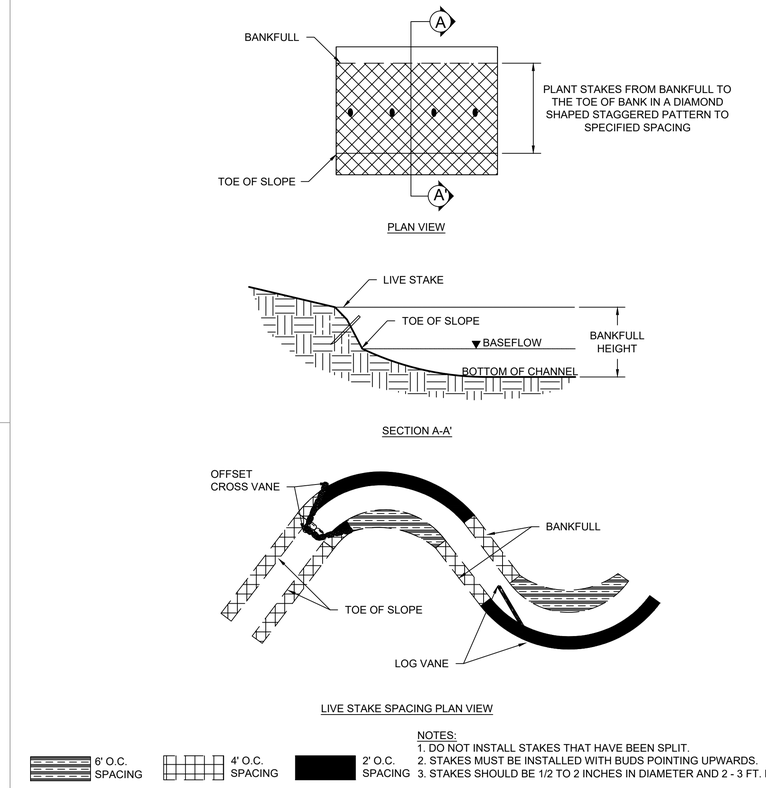
11. DURING PLANTING THE CONTRACTOR SHALL WATER EACH PLANT WITH THE FOLLOWING MINIMUM QUANTITIES OF WATER, UNLESS OWNER DETERMINES THERE IS SUFFICIENT SOIL MOISTURE ON SITE:

PLUGS 1 PINT OF WATER



LIVE STAKES SHOULD BE LONG ENOUGH TO REACH BELOW THE GROUNDWATER TABLE (LENGTH OF 2 TO 3 FEET). ADDITIONALLY, THE STAKES SHOULD HAVE A DIAMETER IN THE RANGE OF 0.75 TO 1.5 INCHES AND SHOULD BE INSERTED AT A 45 DEGREE ANGLE TO THE BANK POINTED DOWNSTREAM. AT LEAST ⅓ OF THE STAKE LENGTH SHOULD BE ABOVE GROUND.

1 LIVE STAKES
NOT TO SCALE



NOTES:
1. DO NOT INSTALL STAKES THAT HAVE BEEN SPLIT.
2. STAKES MUST BE INSTALLED WITH BUDS POINTING UPWARDS.
3. STAKES SHOULD BE 1/2 TO 2 INCHES IN DIAMETER AND 2 - 3 FT. LONG.

2 LIVE STAKE LAYOUT
NOT TO SCALE

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

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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
PLANTING NOTES/DETAILS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 40 of 51

210577

EROSION & SEDIMENT #: 59863 / GRADING PERMIT #: 11786-2020

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. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE/TREE TO BE REMOVED
- FCE — EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- LOD — PR. LIMITS OF DISTURBANCE
- TP — PR. TREE PROTECTION
- OSF — PR. ORANGE SAFETY FENCING
- PR. 100-YR WSE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- SSM — PR. STABILIZATION MATTING
- TB — PR. TEMP ACCESS BRIDGE
- TM — PR. TIMBER MAT
- MP — PR. MULCH GROUND PROTECTION
- SF — PR. SILT FENCE
- TS &MU — PR. TEMP. SEED & MULCH
- PS &MU — PR. PERM SEED & MULCH
- FB PD — PR. PUMP-AROUND DIVERSION WITH FILTER BAG
- TS — PR. STOCKPILE

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.
5. SEE SEQUENCE ITEM #10, SHEET 49 FOR IN-STREAM WORK CONSIDERATION.
6. CONTRACTOR SHALL INSTALL IN-STREAM STRUCTURES OR COMPLETE IN-STREAM STRUCTURES THAT CAN BE FINALIZED BY THE END OF THAT WORK DAY. IN NO CASE CAN A PUMP AROUND PRACTICE EXTEND BEYOND THE WORK DAY.
7. CONTRACTOR MAY ADD PUMP AROUND PRACTICES TO COVER WORK AS PLANNED.
8. NO IN-STREAM WORK MAY START UNTIL ALL NECESSARY RESOURCES ARE ON SITE.

SCALE: 1 INCH

res

HGS, LLC. A RES COMPANY

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

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER

4/16/2021

[illegible]

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

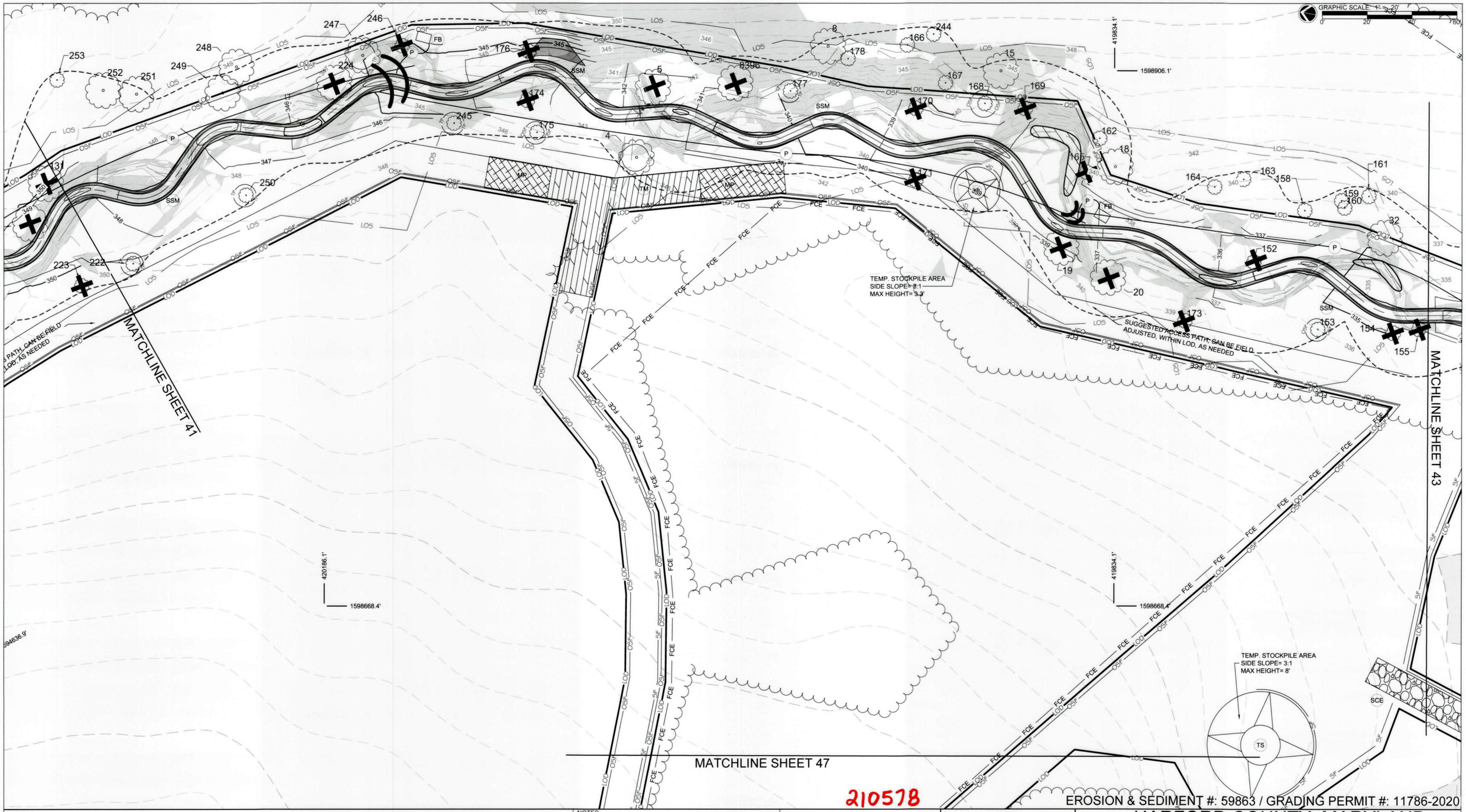
EROSION AND SEDIMENT CONTROL PLAN

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

SHEET NUMBER 41 of 51

5. SEE SEQUENCE ITEM #10, SHEET 49 FOR IN-STREAM WORK CONSIDERATION.
6. CONTRACTOR SHALL INSTALL IN-STREAM STRUCTURES OR COMPLETE IN-STREAM STRUCTURES THAT CAN BE FINALIZED BY THE END OF THAT WORK DAY. IN NO CASE CAN A PUMP AROUND PRACTICE EXTEND BEYOND THE WORK DAY.
7. CONTRACTOR MAY ADD PUMP AROUND PRACTICES TO COVER WORK AS PLANNED.
8. NO IN-STREAM WORK MAY START UNTIL ALL NECESSARY RESOURCES ARE ON SITE.



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
- EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE/TREE TO BE REMOVED
- EX. FOREST CONSERVATION EASEMENT
- EX. SANITARY SEWER LINE
- EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- PR. LIMITS OF DISTURBANCE
- PR. TREE PROTECTION
- PR. ORANGE SAFETY FENCING
- PR. 100-YR WSE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- PR. STABILIZATION MATTING
- PR. TEMP ACCESS BRIDGE
- PR. TIMBER MAT
- PR. MULCH GROUND PROTECTION
- PR. SILT FENCE
- PR. TEMP. SEED & MULCH
- PR. PERM SEED & MULCH
- PR. PUMP-AROUND DIVERSION WITH FILTER BAG
- PR. STOCKPILE

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.
5. SEE SEQUENCE ITEM #10, SHEET 49 FOR IN-STREAM WORK CONSIDERATION.
6. CONTRACTOR SHALL INSTALL IN-STREAM STRUCTURES OR COMPLETE IN-STREAM STRUCTURES THAT CAN BE FINALIZED BY THE END OF THAT WORK DAY. IN NO CASE CAN A PUMP AROUND PRACTICE EXTEND BEYOND THE WORK DAY.
7. CONTRACTOR MAY ADD PUMP AROUND PRACTICES TO COVER WORK AS PLANNED.
8. NO IN-STREAM WORK MAY START UNTIL ALL NECESSARY RESOURCES ARE ON SITE.

SCALE: 1 INCH

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

STATE OF MARYLAND
DAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

210578

EROSION & SEDIMENT #: 59863 / GRADING PERMIT #: 11786-2020

HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL
STREAM RESTORATION
EROSION AND SEDIMENT CONTROL PLAN

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

GRAPHIC SCALE: 1" = 20'
0' 20' 40' 60'

MATCHLINE SHEET 42

MATCHLINE SHEET 44

MATCHLINE SHEET 48

419628.1'
1598851.0'

419193.6'
1598851.0'

419628.1'
1598598.3'

CONC. HEAD WALL
42" CMP SD INV. ELEV. 332.57'

CONC. HEAD WALL
42" CMP SD INV. ELEV. 331.38'

CONC. HEAD WALL
15" RCP SD INV. ELEV. 330.80'

SUGGESTED ACCESS PATH, CAN BE FIELD ADJUSTED, WITHIN LOD, AS NEEDED

TEMP. STOCKPILE AREA
SIDE SLOPE= 3:1
MAX HEIGHT= 4.5

TEMP. STOCKPILE AREA
SIDE SLOPE= 3:1
MAX HEIGHT= 4.5

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. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- FCE — EX. TREE/TREE TO BE REMOVED
- EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- LOD — PR. LIMITS OF DISTURBANCE
- TP — PR. TREE PROTECTION
- OSF — PR. ORANGE SAFETY FENCING
- PR. 100-YR WSE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- SSM — PR. STABILIZATION MATTING
- TB — PR. TEMP ACCESS BRIDGE
- TM — PR. TIMBER MAT
- MP — PR. MULCH GROUND PROTECTION
- 5F — PR. SILT FENCE
- TS&MU — PR. TEMP. SEED & MULCH
- PS&MU — PR. PERM SEED & MULCH
- FB PD — PR. PUMP-AROUND DIVERSION WITH FILTER BAG
- TS — PR. STOCKPILE

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.
5. SEE SEQUENCE ITEM #10, SHEET 49 FOR IN-STREAM WORK CONSIDERATION.
6. CONTRACTOR SHALL INSTALL IN-STREAM STRUCTURES OR COMPLETE IN-STREAM STRUCTURES THAT CAN BE FINALIZED BY THE END OF THAT WORK DAY. IN NO CASE CAN A PUMP AROUND PRACTICE EXTEND BEYOND THE WORK DAY.
7. CONTRACTOR MAY ADD PUMP AROUND PRACTICES TO COVER WORK AS PLANNED.
8. NO IN-STREAM WORK MAY START UNTIL ALL NECESSARY RESOURCES ARE ON SITE.

SCALE: 1 INCH

res
HGS, LLC. A RES COMPANY
5367 TELEPHONE ROAD
WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

210579

EROSION & SEDIMENT #: 59863 / GRADING PERMIT #: 11786-2020

HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL
STREAM RESTORATION
EROSION AND SEDIMENT CONTROL PLAN

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

MATCHLINE SHEET 43

GRAPHIC SCALE 1" = 20'
0' 20' 40' 60'

418539.9'
1598653.9'

TEMP. STOCKPILE AREA
SIDE SLOPE= 3:1
MAX HEIGHT= 3.3'

MANHOLE
316.80'

MANHOLE 12" BELOW
GROUND 306.31'

30" CMP SD INV. ELEV. 305.43

30" CMP SD INV. ELEV. 304.82

USE DIVERSION BERM AT BREAK IN SF FOR CONSTRUCTION ACCESS; LOCATION CAN BE IDENTIFIED IN THE FIELD, SHALL BE NO MORE THAN 15' WIDE

418968.0'
1598383.1'

418539.9'
1598383.1'

MATCHLINE SHEET 48

MATCHLINE SHEET 45

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. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE/TREE TO BE REMOVED
- FCE — EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- LOD — PR. LIMITS OF DISTURBANCE
- TP — PR. TREE PROTECTION
- OSF — PR. ORANGE SAFETY FENCING
- PR. 100-YR WSE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- SSM — PR. STABILIZATION MATTING
- TB — PR. TEMP ACCESS BRIDGE
- TM — PR. TIMBER MAT
- MP — PR. MULCH GROUND PROTECTION
- 5F — PR. SILT FENCE
- TS&MU — PR. TEMP. SEED & MULCH
- PS&MU — PR. PERM SEED & MULCH
- FB PD — PR. PUMP-AROUND DIVERSION WITH FILTER BAG
- TS — PR. STOCKPILE

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.
5. SEE SEQUENCE ITEM #10, SHEET 49 FOR IN-STREAM WORK CONSIDERATION.
6. CONTRACTOR SHALL INSTALL IN-STREAM STRUCTURES OR COMPLETE IN-STREAM STRUCTURES THAT CAN BE FINALIZED BY THE END OF THAT WORK DAY. IN NO CASE CAN A PUMP AROUND PRACTICE EXTEND BEYOND THE WORK DAY.
7. CONTRACTOR MAY ADD PUMP AROUND PRACTICES TO COVER WORK AS PLANNED.
8. NO IN-STREAM WORK MAY START UNTIL ALL NECESSARY RESOURCES ARE ON SITE.

SCALE: 1 INCH

res
HGS, LLC. A RES COMPANY
5367 TELEPHONE ROAD
WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

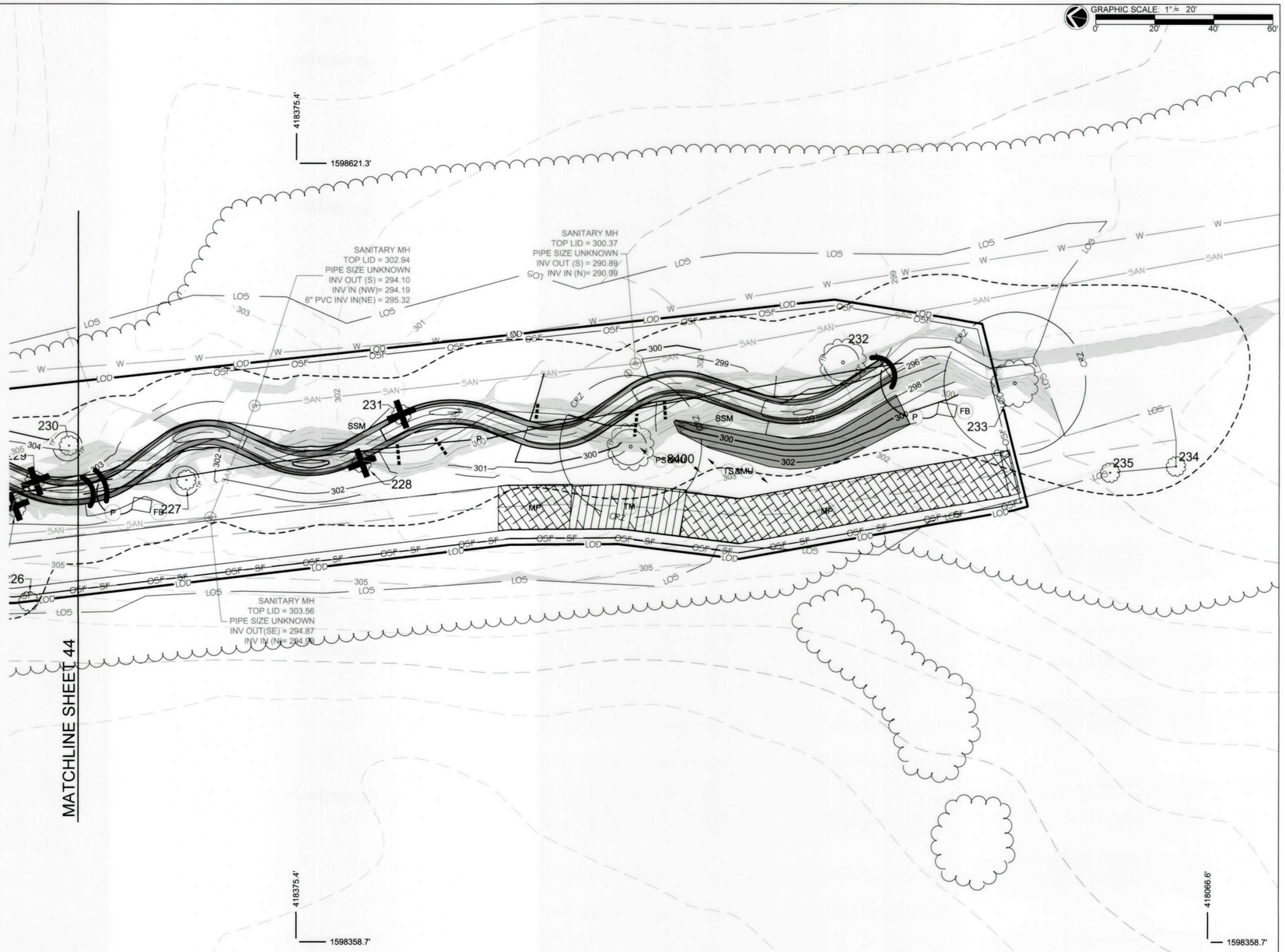
210580 EROSION & SEDIMENT #: 59863 / GRADING PERMIT #: 11786-2020

HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL
STREAM RESTORATION
EROSION AND SEDIMENT CONTROL PLAN

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 44 of 51



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. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE/TREE TO BE REMOVED
- FCE — EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- LOD — PR. LIMITS OF DISTURBANCE
- TP — PR. TREE PROTECTION
- OSF — PR. ORANGE SAFETY FENCING
- PR. 100-YR WSE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- SSM — PR. STABILIZATION MATTING
- TB — PR. TEMP ACCESS BRIDGE
- TM — PR. TIMBER MAT
- MP — PR. MULCH GROUND PROTECTION
- SF — PR. SILT FENCE
- TS &MU — PR. TEMP. SEED & MULCH
- PS &MU — PR. PERM SEED & MULCH
- FB — PD — PR. PUMP-AROUND DIVERSION WITH FILTER BAG
- TS — PR. STOCKPILE

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.
5. SEE SEQUENCE ITEM #10, SHEET 49 FOR IN-STREAM WORK CONSIDERATION.
6. CONTRACTOR SHALL INSTALL IN-STREAM STRUCTURES OR COMPLETE IN-STREAM STRUCTURES THAT CAN BE FINALIZED BY THE END OF THAT WORK DAY. IN NO CASE CAN A PUMP AROUND PRACTICE EXTEND BEYOND THE WORK DAY.
7. CONTRACTOR MAY ADD PUMP AROUND PRACTICES TO COVER WORK AS PLANNED.
8. NO IN-STREAM WORK MAY START UNTIL ALL NECESSARY RESOURCES ARE ON SITE.

SCALE: 1 INCH

res
HGS, LLC. A RES COMPANY
5367 TELEPHONE ROAD
WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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

210581 EROSION & SEDIMENT #: 59863 / GRADING PERMIT #: 11786-2020

HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION
EROSION AND SEDIMENT CONTROL PLAN

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

GRAPHIC SCALE: 1" = 20'
0' 20' 40' 60'

MATCHLINE SHEET 41

434922.2'
1594636.9'

435296.5'
1594636.9'

434922.2'
1594376.0'

MATCHLINE SHEET 47

210582

EROSION & SEDIMENT #: 59863 / GRADING PERMIT #: 11786-2020

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
- EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE/TREE TO BE REMOVED
- EX. FOREST CONSERVATION EASEMENT
- EX. SANITARY SEWER LINE
- EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- PR. LIMITS OF DISTURBANCE
- PR. TREE PROTECTION
- PR. ORANGE SAFETY FENCING
- PR. 100-YR WSE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- PR. STABILIZATION MATTING
- PR. TEMP ACCESS BRIDGE
- PR. TIMBER MAT
- PR. MULCH GROUND PROTECTION
- PR. SILT FENCE
- PR. TEMP. SEED & MULCH
- PR. PERM SEED & MULCH
- PR. PUMP-AROUND DIVERSION WITH FILTER BAG
- PR. STOCKPILE

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.
5. SEE SEQUENCE ITEM #10, SHEET 49 FOR IN-STREAM WORK CONSIDERATION.
6. CONTRACTOR SHALL INSTALL IN-STREAM STRUCTURES OR COMPLETE IN-STREAM STRUCTURES THAT CAN BE FINALIZED BY THE END OF THAT WORK DAY. IN NO CASE CAN A PUMP AROUND PRACTICE EXTEND BEYOND THE WORK DAY.
7. CONTRACTOR MAY ADD PUMP AROUND PRACTICES TO COVER WORK AS PLANNED.
8. NO IN-STREAM WORK MAY START UNTIL ALL NECESSARY RESOURCES ARE ON SITE.

SCALE: 1 INCH

res
HGS, LLC. A RES COMPANY
5367 TELEPHONE ROAD
WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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
EROSION AND SEDIMENT CONTROL PLAN

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

MATCHLINE SHEET 42

MATCHLINE SHEET 46

GRAPHIC SCALE: 1" = 20'
0' 20' 40' 60'

TEMP. STOCKPILE AREA
SIDE SLOPE= 3:1
MAX HEIGHT= 8'

PROTECT EX. SIDEWALK FROM EQUIPMENT DAMAGE.

SCE

4200882'
1598334.8'

419734.4'
1598518.1'

419734.4'
1598334.8'

210583

EROSION & SEDIMENT #: 59863 / GRADING PERMIT #: 11786-2020

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
- EX. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE/TREE TO BE REMOVED
- EX. FOREST CONSERVATION EASEMENT
- EX. SANITARY SEWER LINE
- EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- PR. LIMITS OF DISTURBANCE
- PR. TREE PROTECTION
- PR. ORANGE SAFETY FENCING
- PR. 100-YR WSE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- PR. STABILIZATION MATTING
- PR. TEMP ACCESS BRIDGE
- PR. TIMBER MAT
- PR. MULCH GROUND PROTECTION
- PR. SILT FENCE
- PR. TEMP. SEED & MULCH
- PR. PERM SEED & MULCH
- PR. PUMP-AROUND DIVERSION WITH FILTER BAG
- PR. STOCKPILE

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.
5. SEE SEQUENCE ITEM #10, SHEET 49 FOR IN-STREAM WORK CONSIDERATION.
6. CONTRACTOR SHALL INSTALL IN-STREAM STRUCTURES OR COMPLETE IN-STREAM STRUCTURES THAT CAN BE FINALIZED BY THE END OF THAT WORK DAY. IN NO CASE CAN A PUMP AROUND PRACTICE EXTEND BEYOND THE WORK DAY.
7. CONTRACTOR MAY ADD PUMP AROUND PRACTICES TO COVER WORK AS PLANNED.
8. NO IN-STREAM WORK MAY START UNTIL ALL NECESSARY RESOURCES ARE ON SITE.

SCALE: 1 INCH

res
HGS, LLC. A RES COMPANY
5367 TELEPHONE ROAD
WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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
EROSION AND SEDIMENT CONTROL PLAN

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 47 of 51

MATCHLINE SHEET 43

MATCHLINE SHEET 44

419364.3'
1598498.2'
419364.3'
1598383.1'
418968.0'
1598383.1'

GRAPHIC SCALE: 1" = 20'

6" PVC SD INV. ELEV. 314.17'

CONC. HEAD WALL
30" RCP SD INV. ELEV. 319.72'

WATER VALVE

TEMP. STOCKPILE AREA
SIDE SLOPE= 3:1
MAX HEIGHT= 3.3'

USE DIVERSION BERM AT BREAK IN SF FOR CONSTRUCTION ACCESS; LOCATION CAN BE IDENTIFIED IN THE FIELD, SHALL BE NO MORE THAN 15' WIDE

TEMP. STOCKPILE AREA
SIDE SLOPE= 3:1
MAX HEIGHT= 14'

STAGING & LAYDOWN

MANHOLE
323.32'

MANHOLE
316.80'

SCE

8398

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. SURVEY LIMITS
- EX. 100-YR WSE
- EX. STREAM
- EX. FORESTED WETLAND
- EX. TREE/TREE TO BE REMOVED
- FCE — EX. FOREST CONSERVATION EASEMENT
- SAN — EX. SANITARY SEWER LINE
- W — EX. WATER LINE
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- LOD — PR. LIMITS OF DISTURBANCE
- TP — PR. TREE PROTECTION
- OSF — PR. ORANGE SAFETY FENCING
- PR. 100-YR WSE
- PR. FLOODWAY GRADING LIMITS
- PR. BANKFULL LIMITS
- PR. STREAM CENTERLINE
- PR. OXBOW PFO WETLAND
- SM — PR. STABILIZATION MATTING
- TB — PR. TEMP ACCESS BRIDGE
- TM — PR. TIMBER MAT
- MP — PR. MULCH GROUND PROTECTION
- SF — PR. SILT FENCE
- TS &MU — PR. TEMP. SEED & MULCH
- PS &MU — PR. PERM SEED & MULCH
- FB PD — PR. PUMP-AROUND DIVERSION WITH FILTER BAG
- TS — PR. STOCKPILE

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.
5. SEE SEQUENCE ITEM #10, SHEET 49 FOR IN-STREAM WORK CONSIDERATION.
6. CONTRACTOR SHALL INSTALL IN-STREAM STRUCTURES OR COMPLETE IN-STREAM STRUCTURES THAT CAN BE FINALIZED BY THE END OF THAT WORK DAY. IN NO CASE CAN A PUMP AROUND PRACTICE EXTEND BEYOND THE WORK DAY.
7. CONTRACTOR MAY ADD PUMP AROUND PRACTICES TO COVER WORK AS PLANNED.
8. NO IN-STREAM WORK MAY START UNTIL ALL NECESSARY RESOURCES ARE ON SITE.

SCALE: 1 INCH

res
HGS, LLC. A RES COMPANY
5367 TELEPHONE ROAD
WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

STATE OF MARYLAND
BAILEY J. WILKENS
52852
PROFESSIONAL ENGINEER
4/16/2021

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

210584

EROSION & SEDIMENT #: 59863 / GRADING PERMIT #: 11786-2020

HARFORD COUNTY, MARYLAND

C. MILTON WRIGHT HIGH SCHOOL
STREAM RESTORATION

EROSION AND SEDIMENT CONTROL PLAN

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 48 of 51

E&S NARRATIVE:

PROJECT DESCRIPTION:

THE PURPOSE OF THIS PROJECT IS TO CREATE TMDL CREDITS THROUGH STREAM RESTORATION. THE PROJECT SITE IS LOCATED 1301 N FOUNTAIN GREEN RD, BEL AIR, HARFORD COUNTY, MARYLAND. THE LIMITS OF DISTURBANCE COVERS 8.50 ACRES, THE LIMITS OF GRADING IS 2.31 AC; THE TOTAL CUT FOR THE PROJECT IS 1,221.5 CY, THE TOTAL FILL IS 2,423.82 CY, FOR A NET FILL REQUIRED OF 1202.32 CY.

EXISTING SITE CONDITIONS:

THE EXISTING SITE IS A WOODED VALLEY CORRIDOR WITH VARYING BOTTOM WIDTH. THE VALLEY RUNS BETWEEN C. MILTON WRIGHT HIGH SCHOOL, THE ATHLETIC FIELDS, AND THE VILLAGES OF THOMAS RUN NEIGHBORHOOD.

ADJACENT AREAS:

THE PROPERTY IS SURROUNDED BY THE ACADEMIC BUILDINGS AND PARKING LOT OF C. MILTON WRIGHT HIGH SCHOOL ON THE WEST, THE VILLAGES OF THOMAS RUN NEIGHBORHOOD ON THE NORTH EAST SIDE AND ATHLETIC FIELDS ON THE SOUTH EAST SIDE. THE MAINSTEM CONVERGES JUST DOWNSTREAM OF THE RESTORATION WITH ANOTHER UNNAMED TRIBUTARY BEFORE CROSSING UNDER THOMAS RUN RD.

OFFSITE AREAS:

AS PART OF THIS PROJECT NO OFFSITE AREAS WILL BE AFFECTED.

SOILS:

REFER TO ESC PLAN SHEET FOR SOILS MAP; THE SOILS WITHIN THE LIMITS OF DISTURBANCE ARE SUMMARIZED BELOW:

Map Unit Symbol	Map Unit Name	K Factor	Drainage Class	Hydrologic Soil Group	Hydric Rating	Highly Erodible Soil
AdB	Aldino silt loam, 3 to 8 percent slopes	0.49	Moderatly Well Drained	C	5	Yes
KeB	Kelly silt loam, 3 to 8 percent slopes	0.49	Moderatly Well Drained	D	5	Yes
KeC2	Kelly silt loam, 8 to 15 percent slopes, moderately eroded	0.49	Moderatly Well Drained	D	5	Yes
NeB2	Neshaminy silt loam, 3 to 8 percent slopes, moderately eroded	0.37	Well Drained	B	0	Yes
NeC2	Neshaminy silt loam, 8 to 15 percent slopes, moderately eroded	0.37	Well Drained	B	0	Yes
WaB	Watchung silt loam, 3 to 8 percent slopes	0.28	Poorly Drained	C/D	90	No

CRITICAL AREAS:

THERE ARE CRITICAL ENVIRONMENTAL AREAS LOCATED WITHIN THE PROJECT AREA. THESE AREAS INCLUDE STREAMS, WETLANDS, STEEP SLOPES AND SPECIMEN TREES. THESE AREAS WILL EXPERIENCE SERIOUS DEGRADATION IF SEDIMENT LEAVES THE SITE AND DRAINS INTO THESE FEATURES OR IF THEY GET IMPAIRED IN ANOTHER WAY. THEREFORE, EXTRA CARE WILL BE TAKEN TO MINIMIZE THE EXPOSURE OF THESE WATER FEATURES TO SEDIMENT AND TO PREVENT EROSION OF THE ADJACENT BANK. ADDITIONALLY, THESE AREAS SHOULD BE INSPECTED MORE FREQUENTLY FOR SIGNS OF EROSION.

EROSION & SEDIMENT CONTROL MEASURES:

UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. THE MINIMUM STANDARD OF THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL AND EROSION AND SEDIMENT CONTROL SHALL BE ADHERED TO UNLESS OTHERWISE WAIVED OR APPROVED BY A VARIANCE. THE E&S INSPECTOR HAS THE AUTHORITY TO ADD OR DELETE E&S CONTROLS AS NECESSARY IN THE FIELD AS SITE CONDITIONS CHANGE. IN ADDITION, NO E&S CONTROLS, INCLUDING SEDIMENT BASINS OR TRAPS, CAN BE REMOVED WITHOUT WRITTEN AUTHORIZATION. ADDITIONALLY, NO EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED UNTIL ALL UPSLOPE AREAS HAVE BEEN STABILIZED.

STABILIZED CONSTRUCTION ENTRANCE (B-1): A STABILIZED CONSTRUCTION ENTRANCE SHALL BE INSTALLED WHERE INDICATED ON THE PLANS. IT WILL BE NEEDED TO CLEAN THE TIRES OF VEHICLES AND EQUIPMENT DURING WET CONDITIONS IN ORDER TO PREVENT MUD/ROCKS/DEBRIS FROM BEING TRACKED OFF SITE OR INTO PUBLIC ROADWAYS.

STOCKPILE AREA (B-4-8): SOIL STOCKPILES ARE SHOWN IN THE LAYDOWN/STAGING AREAS AND ALONG THE STREAM. THE STOCKPILE AREAS ALONG THE STREAM ARE SMALL AND INTENDED TO BE USED FOR SHORT DURATIONS.

PLUNGE POOL (D-4-2): A PLUNGE POOL SHALL BE INSTALLED WHERE INDICATED ON THE PLANS TO DISSIPATE THE ENERGY OF A DISCHARGE AND PREVENT SCOUR AT A PIPE OUTFALL. THE PLUNGE POOL IS SCHEDULED TO BE LEFT IN PLACE UPON THE COMPLETION OF CONSTRUCTION.

SILT FENCE (E-1): SILT FENCE SEDIMENT BARRIERS WITHOUT WIRE BACKING SHALL BE INSTALLED ON THE DOWNSLOPE SIDE OF AREAS WITH MINIMAL GRADES TO FILTER SEDIMENT-LADEN RUNOFF FROM SHEET FLOW.

PUMP-AROUND PRACTICE (THE MARYLAND GUIDELINES TO WATERWAY CONSTRUCTION; MGWC 1.2): A PUMP-AROUND SYSTEM SHALL BE INSTALLED TO TEMPORARILY DIVERT FLOW AROUND IN-STREAM CONSTRUCTION SITES. THIS FORM OF DIVERSION IS NECESSARY WHEN RESTORATION PRACTICES SPAN THE ENTIRE WIDTH OF THE STREAM CHANNEL AND/OR A LINEAR REACH OF STREAM SEGMENT IS TO BE SIMULTANEOUSLY WORKED ON. THIS PRACTICE ALSO LIMITS POTENTIAL FOR DOWNSTREAM SEDIMENTATION BECAUSE IN-STREAM WORK WILL BE COMPLETED IN THE DRY AND ALL DENUDED AREAS WILL BE STABILIZED BEFORE RE-INTRODUCTION OF WATER BACK INTO STREAM CHANNEL. THE TOTAL WORK AREA OF THE PUMP-AROUND SHOULD NOT EXCEED THE LENGTH OF AREA THAT CAN BE COMPLETED AND STABILIZED IN ONE (1) WORKING DAY. THE PUMP-AROUND LOCATIONS SHOWN ON THE PLAN ARE SCHEMATIC AND SHOULD BE PLACED IN THE FIELD BASED ON THE CONSTRUCTION SCHEDULE. THE PUMP-AROUND SHOULD BE COMPLETED AND REMOVED AT THE END OF EACH DAY. THIS PRACTICE SHOULD ALSO BE LIMITED TO BASE OR LOW-FLOW CONDITIONS WERE APPLICABLE TO ENSURE ADEQUACY OF PUMP EQUIPMENT. PRACTICE IS MOST APPLICABLE IN SMALL TO MEDIUM WATERSHEDS WITH RELATIVELY SMALL BASE FLOW DISCHARGES. THIS ALLOWS FOR MULTIPLE PUMPING OPTIONS AND EQUIPMENT TO SUFFICIENTLY HANDLE NECESSARY PUMP CAPACITY. USE OF PRACTICE NOT LIMITED TO WATERSHED SIZE BUT BY CAPACITY OF PUMP AND HEIGHT OF IN-STREAM BARRIERS. PUMP SELECTION SHALL BE SIZED TO ADEQUATELY PUMP BASE FLOW AT A HEAD GREATER THAN THE IN-STREAM BARRIER HEIGHT. DOWN STREAM GEOTEXTILE LINED FLOW TRANSITION POINT MAY BE USED. THIS FEATURE ALLOWS FOR DISPERSION OF PUMP DISCHARGE TO A NON-EROSIVE VELOCITY WITHIN THE EXISTING STREAM CHANNEL. ALL OTHER APPLICABLE ESC MEASURES, AS SHOWN ON THE PLAN, SHALL BE USED IN CONJUNCTION WITH PUMP AROUND.

TEMPORARY ACCESS BRIDGE (H-4-1): TEMPORARY ACCESS BRIDGE SHOULD BE INSTALLED WHEN IT IS NECESSARY FOR CONSTRUCTION TRAFFIC TO CROSS A FLOWING WATERCOURSE. A STRUCTURAL CROSSING IS NECESSARY TO PREVENT VEHICLES FROM DAMAGING STREAMBANKS AND CONTINUALLY TRACKING SEDIMENT AND OTHER POLLUTANTS INTO THE FLOW REGIME. HOWEVER, THESE STRUCTURES ARE CONSIDERED CHANNEL CONSTRICTIONS AND SHOULD BE PLANNED TO BE IN SERVICE FOR THE SHORTEST PRACTICAL PERIOD OF TIME AND REMOVED AS SOON AS THEIR FUNCTION IS COMPLETED. TEMPORARY ACCESS SHOWN BASED ON EXISTING STREAM, ACCESS BRIDGE MAY SPAN PROPOSED AS CONSTRUCTION PROGRESSES.

VEGETATIVE STABILIZATION (B-4): ALL DISTURBED AREAS OUTSIDE OF THE STREAM AREA TO BE PERMANENTLY SEEDED UPON THE REMOVAL OF TEMPORARY STABILIZATION PRACTICES. PERMANENT SEEDING PER B-4-3 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING AND IN ACCORDANCE WITH B-4-5 PERMANENT SEEDING SHALL BE UTILIZED IN UPLAND AREAS. STREAM BANKS SHALL BE STABILIZED WITH A RIPARIAN SEED MIX PER THE TABLE PROVIDED.

SOIL STABILIZATION BLANKETS & MATTING (B-4-6): SOIL STABILIZATION BLANKETS/MATTING SHALL BE INSTALLED WHERE INDICATED ON THE PLANS TO AID IN CONTROLLING EROSION IN CRITICAL AREAS AS WELL AS AIDING IN THE ESTABLISHMENT OF VEGETATION FOR PERMANENT STABILIZATION ON PREVIOUSLY DISTURBED SLOPES. BLANKETS/MATTING SHALL BE INSTALLED PER SPECIFICATION B-4-6 AND STREAM RESTORATION DETAILS.

ORANGE SAFETY FENCING: ORANGE SAFETY FENCING IS TO BE PLACED AROUND THE TREES AND VEGETATED AREAS WHICH WILL NOT BE DISTURBED TO PROTECT THE TREES AND OTHER VEGETATION FROM CONSTRUCTION EQUIPMENT. THE PERIMETER TREE PROTECTION LINE MUST ALSO INCLUDE SIGNS POSTED 150' MAX IN ACCORDANCE WITH THE FOREST CONSERVATION REQUIREMENTS, SEE PROVIDED SIGN DETAIL.

TREE PROTECTION (SEE PROVIDED DETAIL): TREES IN HIGH TRAFFIC AREAS OR DIRECTLY ADJACENT TO GRADING OPERATIONS SHALL BE PLANKED TO PROVIDE ADDITIONAL PROTECTION TO THE TREE FROM EQUIPMENT DAMAGE.

TIMBER MATTING (SEE PROVIDED DETAIL): TIMBER MATS SHOULD BE UTILIZED WHERE SHOWN ON THE PLANS TO PROVIDE ACCESS FOR EQUIPMENT AND CONSTRUCTION ACTIVITIES TO PLACES WERE THE EXISTING GROUND NEED TO BE PROTECTED FROM THE EQUIPMENT. APPLICATIONS OF TIMBER MATS CAN INCLUDE UTILITY CROSSINGS, ASPHALT PROTECTION, WETLAND CROSSINGS, OR WHERE ACCESS ROUTES CROSS CRITICAL ROOT ZONES ETC. TIMBER MATS SHOULD BE PUT IN FOR THE LEAST AMOUNT OF TIME NECESSARY AND REMOVED WHEN NO LONGER NEEDED. MULCH SHOULD BE USED TO FILL GAPS BETWEEN MATS AT TURNS.

MULCH GROUND PROTECTION: A 12" MULCH LAYER, OVERTOP OF GEOTECHNICAL FABRIC, SHALL BE USED FOR GROUND PROTECTION WHERE SHOWN ALONG ACCESS ROADS AND IN WETLAND BUFFER AREAS. MULCH SHALL BE REMOVED POST CONSTRUCTION IN ALL WETLANDS. IF THERE ARE SELECT AREAS WHERE THE OWNER WOULD LIKE TO KEEP MULCH, GEOTECHNICAL FABRIC CAN BE OMITTED IN THOSE LOCATIONS.

MANAGEMENT STRATEGIES:

1. CONSTRUCTION WILL BE SEQUENCED SO THAT GRADING OPERATIONS CAN BEGIN AND END AS QUICKLY AS POSSIBLE.
2. SEDIMENT TRAPPING / DIVERTING MEASURES WILL BE INSTALLED AS A FIRST STEP IN GRADING AND WILL BE SEEDED & MULCHED IMMEDIATELY FOLLOWING INSTALLATION.
3. TEMPORARY SEEDING OR OTHER STABILIZATION WILL FOLLOW IMMEDIATELY AFTER GRADING.
4. AREAS WHICH ARE NOT TO BE DISTURBED WILL BE CLEARLY MARKED BY FLAGS, SIGNS, ETC.
5. THE JOB SUPERINTENDENT SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL PRACTICES.
6. AFTER ACHIEVING ADEQUATE STABILIZATION OF PERMANENT SEEDING, THE TEMPORARY E&S CONTROLS WILL BE CLEANED UP AND REMOVED.

PERMANENT STABILIZATION:

ALL DISTURBED AREAS ARE TO BE STABILIZED WITH PERMANENT SEEDING AND MULCHING IN ACCORDANCE WITH THE PLANTING PLAN AFTER LAND DISTURBING ACTIVITIES ARE COMPLETED.

MAINTENANCE:

IN GENERAL, ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED DAILY AND AFTER EACH SIGNIFICANT RAINFALL. THE SILT FENCE BARRIERS WILL BE CHECKED REGULARLY FOR UNDERMINING OR DETERIORATION OF THE FABRIC. SEDIMENT SHALL BE REMOVED WHEN THE LEVEL OF SEDIMENT DEPOSITION REACHES HALFWAY TO THE TOP OF THE BARRIER. FILTERING DEVICES WILL BE INSPECTED FREQUENTLY AND REPAIRED/REPLACED ONCE THE SEDIMENT BUILD-UP PREVENTS THE STRUCTURE FROM FUNCTIONING AS DESIGNED. ALL SOIL STABILIZATION MATTING SHOULD BE INSPECTED PERIODICALLY FOLLOWING INSTALLATION, PARTICULARLY AFTER RAINSTORMS TO CHECK FOR EROSION AND UNDERMINING. ANY DISLOCATION OR FAILURE SHOULD BE REPAIRED IMMEDIATELY. IF WASHOUTS OR BREAKAGE OCCURS, REINSTALL THE MATERIAL AFTER REPAIRING THE DAMAGE TO THE SLOPE OR DITCH. SEEDED AREAS WILL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED AND RESEEDED AS NEEDED.

CONSTRUCTION SEQUENCE:

NOTE: STREAM REACHES SHOULD BE CONSTRUCTED UPSTREAM TO DOWNSTREAM. IF POSSIBLE, CONVERGING REACHES SHOULD BE CONSTRUCTED SIMULTANEOUSLY SUCH THAT CONSTRUCTION OF BOTH REACHES APPROACH THE NEW CONFLUENCE SIMULTANEOUSLY. IF SIMULTANEOUS CONSTRUCTION IS NOT POSSIBLE A TEMPORARY CONFLUENCE CAN BE CONSTRUCTED BETWEEN THE EXISTING CONVERGING REACH AND THE PROPOSED/CONSTRUCTED REACH. THE PROJECT SEQUENCING SHOULD BE EXECUTED SUCH THAT TEMPORARY CONFLUENCES ARE IN PLACE FOR THE SHORTEST AMOUNT OF TIME POSSIBLE. THE ENGINEER OF RECORD, OR THEIR DESIGNEE, SHALL APPROVE ALL TEMPORARY CONFLUENCES THAT ARE INTENDED TO BE LEFT IN PLACE FOR MORE THAN 5 DAYS. OUTSIDE OF MINIMIZING THE DURATION OF TEMPORARY CONFLUENCES THE CONTRACTOR MAY SEQUENCE THE CONSTRUCTION OF THE REACHES/TRIBUTARIES AS THEY SEE FIT.

1. PRE-CONSTRUCTION MEETINGS (DAY 0-3): PRIOR TO CLEARING OF TREES, INSTALLING SEDIMENT CONTROL MEASURES, OR GRADING, A PRECONSTRUCTION MEETING MUST BE CONDUCTED ON-SITE WITH CONTRACTORS, INSPECTORS (INCLUDING MDE) & ENGINEERS AS NEEDED.
2. 48 HOURS PIRIOR TO THE START OF CONSTRUCTION NOTIFY HARFORD COUNTY S/C INSPECTOR AT 410-638-3627 EXT. 2434 OR 1268 AND MDE, AS REQUIRED PER STATE PERMITS.
3. LOD STAKEOUT (DAY 0-3): THE LIMITS OF DISTURBANCE MUST BE FIELD MARKED PRIOR TO CLEARING OF TREES, GRUBBING, INSTALLATION OF SEDIMENT CONTROL MEASURES, CONSTRUCTION, OR OTHER LAND DISTURBING ACTIVITIES.
4. CLEAR & GRUB (DAYS 4-7): CLEAR AND GRUB AS NECESSARY FOR THE INSTALLATION OF PERIMETER CONTROLS; INCLUDING THE STABILIZED CONSTRUCTION ENTRANCE, TREE PROTECTION FENCING & SILT FENCE (DAYS 7-12).
5. CONSTRUCT AND STABILIZE PERIMETER CONTROLS (DAYS 7-12).
6. CLEAR, GRUB, AND GRADE FOR INSTALLATION OF SEDIMENT CONTROL DEVICES (DAYS 12-15)
7. WRITTEN APPROVAL (DAY 16): ONCE THE SEDIMENT CONTROL DEVICES ARE INSTALLED, THE PERMITTEE MUST OBTAIN WRITTEN APPROVAL FROM THE INSPECTOR BEFORE PROCEEDING WITH ANY ADDITIONAL CLEARING, GRUBBING, OR GRADING.
8. PERFORM REMAINING CLEARING/GRUBBING (DAYS 17-25): AS NECESSARY TO PERFORM CONSTRUCTION OPERATIONS. CLEARING WITHIN THE LOD SHALL BE KEPT TO THE MINIMUM NECESSARY AND REVIEWED WITH THE ENGINEER PRIOR TO CLEARING.
9. STAKE OUT THE PROPOSED ALIGNMENT (DAYS 26-30) OF THE CHANNEL IN THE FIELD AND REVIEW WITH THE ENGINEER PRIOR TO GROUND DISTURBANCE. THE DOWNSTREAM & UPSTREAM TIE-IN TO THE EXISTING STREAM MUST BE REVIEWED TO DETERMINE IF MODIFICATIONS ARE REQUIRED TO ADJUST THE DESIGN TO CURRENT STREAM CONDITIONS.
10. PERFORM STREAM CHANNEL/FLOODPLAIN CONSTRUCTION (DAYS 30-100). NOTE: THE FOLLOWING SEQUENCE SHOULD BE REPEATED ON A DAILY BASIS ALONG A SECTION OF STREAM THAT CAN BE COMPLETED WITHIN ONE DAY. ON AN AVERAGE PROJECT, THE ESTIMATED LENGTH OF STREAM TO BE CONSTRUCTED PER DAY CAN RANGE ANYWHERE BETWEEN 50 AND 100 FEET. HOWEVER, THE DAILY RATE OF COMPLETION CAN VARY FROM THIS RANGE DEPENDING ON THE COMPLEXITY AND SIZE OF THE PROPOSED SECTION OF STREAM.

ALL STREAM CONSTRUCTION SHOULD BEGIN UPSTREAM AND PROCEED DOWNSTREAM. TO THE GREATEST EXTENT POSSIBLE NEW SEGMENTS OF CHANNEL SHALL BE CONSTRUCTED OFF-LINE/"IN-THE-DRY" WHERE THE PROPOSED CHANNEL DIVERGES FROM THE EXISTING STREAM CHANNEL BY AT LEAST A ½ BANKFULL WIDTH. IN THESE CONDITIONS, THE STREAM FLOW WILL REMAIN IN THE EXISTING STREAM CHANNEL WHILE THE PROPOSED CHANNEL IS BEING CONSTRUCTED. ANY GROUNDWATER SHALL BE PUMPED OUT THROUGH A DEWATERING PUMP INTO AN APPROVED FILTERING DEVICE. ONCE THE PROPOSED STREAM CHANNEL IS GRADED, SEEDED AND MATTED THE DOWNSTREAM TEMPORARY CONNECTION AND THE UPSTREAM CONNECTION TO THE ALREADY CONSTRUCTED PROPOSED CHANNEL CAN BE MADE AND FLOW INTRODUCED TO THE PROPOSED CHANNEL. THE CONSTRUCTION OF THE PROPOSED CHANNEL SHALL GENERALLY FOLLOW THE SEQUENCE BELOW:

A. SETUP PUMP-AROUND DIVERSION: IF WORKING OFF-LINE IS NOT POSSIBLE, INSTALL PUMP-AROUND DIVERSION FOR THE SECTION OF STREAM UNDER ACTIVE CONSTRUCTION. DIVERTING ONLY THE NECESSARY PORTION OF THE STREAM AS NEEDED TO EXPOSE THE CONSTRUCTION AREA. THE CLEAN WATER BYPASS SHALL OUTFALL INTO A STABILIZED SECTION OF EXISTING CHANNEL AND THE BED SHALL BE TEMPORARILY LINED WITH EITHER RIP-RAP OR RIFFLE MATERIAL TO PREVENT EROSION. ALL SEDIMENT LADEN WATER SHALL BE PUMPED THROUGH A FILTER BAG ONTO A SURFACE WITH A MAXIMUM 5% SLOPE. WORK SHALL BE PLANNED SUCH THAT FLOW CAN BE RETURNED TO THE CHANNEL AT THE END OF EACH WORKDAY BY REMOVING THE PORTION OF THE DAM RESTRICTING BASEFLOW THROUGH THE ACTIVE PUMP-AROUND SEGMENT.

*PUMP-AROUND DIVERSIONS SHOWN ON PLANS CAN BE MINIMIZED OR ELIMINATED IF SECTIONS OF PROPOSED CHANNEL CAN BE BUILT OFFLINE WITHOUT DISTURBANCE TO THE EXISTING STREAM CHANNEL (PER DESCRIPTION ABOVE).

B. SALVAGE TOPSOIL: STRIP TOPSOIL FROM AREA TO BE GRADED AND STOCKPILE FOR REUSE ACROSS THE DISTURBED STREAM BANKS & RIPARIAN AREAS.

C. CHANNEL EXCAVATION: EXCAVATE THE CHANNEL PER THE PLANS. DURING EXCAVATION OF THE CHANNEL ANY ACCUMULATION OF GROUND WATER SHALL BE PUMPED OUT OF THE CHANNEL THROUGH A FILTER BAG ONTO A STABILIZED AREA ENSURING NO EROSION OCCURS AROUND THE OUTFALL OF THE FILTER BAG.

D. INSTALLATION OF STRUCTURES (LOG OR ROCK): USING LOGS (SALVAGED FROM SITE CLEARING IF AVAILABLE) OR ROCKS INSTALL THE STRUCTURES PER THE PLANS, ENSURING THAT THE TOP OF THE LOG/HEADER ROCK EXPOSED IN THE CHANNEL IS EVEN WITH THE INVERT OF THE STREAM CHANNEL.

E. CHANNEL STABILIZATION: STABILIZE THE STREAM BED WITH STONE AS INDICATED IN THE STREAM DESIGN PLANS, ENSURING THAT THE SURFACE OF THE STONE MATCHES THE PROFILE ELEVATION.

F. BANK STABILIZATION: INSTALL TOPSOIL, SEEDING & COIR MATTING ON THE STREAM BANKS, AS SHOWN IN THE PLANTING/STREAM DETAILS SECURING THE MATTING AS SHOWN.

G. DOWNSTREAM TIE-IN: COMPLETE THE GRADING OF THE CHANNEL ON THE DOWNSTREAM END, ENSURING A GRADUAL TRANSITION INTO THE DIMENSIONS OF THE EXISTING STREAM CHANNEL. INSTALL TOPSOIL, SEEDING, COIR MATTING & BED MATERIAL TO STABILIZE IN THE TEMPORARY TIE-IN.

H. UPSTREAM TIE-INS: AFTER THE COMPLETION ALL OTHER DOWNSTREAM GRADING, GRADE THE STREAM CHANNEL UPSTREAM TO THE EXISTING STREAM CHANNEL (OR PREVIOUSLY COMPLETED SECTION), ENSURING A GRADUAL TRANSITION FROM THE DIMENSIONS OF THE EXISTING STREAM CHANNEL TO THE PROPOSED CHANNEL. INSTALL TOPSOIL, SEEDING, COIR MATTING & BED MATERIAL TO STABILIZE CHANNEL TIE-IN.

I. RETURNING FLOW TO CHANNEL: AFTER THE ENTIRE STREAM CHANNEL (OR SECTION) HAS BEEN CONSTRUCTED AND STABILIZED, AND ALL TIE-INS COMPLETED, OPEN THE PROPOSED SECTION OF CHANNEL TO STREAM FLOW, REMOVING STREAM DIVERSION PUMPS AND COFFERDAMS TO ALLOW PASSAGE OF CURRENT BASEFLOW.

J. GRADING OR FILLING OF EXISTING CHANNEL / FLOODPLAIN GRADING: WORK OUTSIDE OF THE PROPOSED CHANNEL, INCLUDING GRADING OR FILLING OF THE EXISTING CHANNEL AND FLOODPLAIN GRADING, CAN BE COMPLETED AFTER FLOW HAS BEEN INTRODUCED TO THE PROPOSED CHANNEL. FLOODPLAIN GRADING/GRADING OUTSIDE OF EXISTING & PROPOSED CHANNELS, CAN BE COMPLETED PRIOR TO CONSTRUCTING THE PROPOSED CHANNEL IF IT CAUSES NO DISTURBANCE TO THE EXISTING STREAM.

K. TOPSOILING AND SEEDING FLOODPLAIN: APPLY SALVAGED TOPSOIL, SPREAD SEEDING AS SPECIFIED ON THE PLANTING PLAN, AND INSTALL MATTING WHERE SHOWN TO THE DISTURBED RIPARIAN & UPLAND AREA. AREAS WITH HIGHLY ERODIBLE SOIL SHALL BE STABILIZED WITH EITHER TEMPORARY OR PERMANENT SEED WITHIN 48 HRS OF ACHIEVING FINAL GRADE.

L. PLANTING: IN THE APPROVED PLANTING SEASON, INSTALL ADDITIONAL TREE/SHRUB PLANTINGS AS SHOWN ON THE PLANTING PLAN

10. INSPECT AND PERFORM MAINTENANCE (DAYS 20-100) (AS REQUIRED) OF E&S CONTROLS ON A WEEKLY BASIS AND THE NEXT DAY AFTER EACH RAIN EVENT.
11. E&S APPROVAL (DAY 101): OBTAIN WRITTEN APPROVAL OF COUNTY SEDIMENT CONTROL INSPECTOR TO REMOVE E&S CONTROLS.
12. REMOVE E&S CONTROLS (DAYS 102-105): REMOVE E&S CONTROLS & INSTALL PERMANENT SEEDING AND MULCH IN DISTURBED AREAS NOT ALREADY STABILIZED. REFER TO PLANTING NOTES & DETAILS (SHEET 40).
13. DAILY INSPECTION AND MAINTENANCE (DAYS 7-105) OF PERMANENT SEEDING AND MULCHING IS REQUIRED UNTIL PERMANENT SEEDING IS ESTABLISHED AND A GOOD STAND IS MAINTAINED.

**ANY CHANGES OR REVISIONS TO THE SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION AND APPROVED BY DPW; PHASING OF THE WORK IS ACCEPTABLE AND RECOMMENDED. STEPS 3-10 SHOULD BE REPEATED PER PHASE.

ENGINEER'S CERTIFICATION

I certify that this plan for erosion and sediment control and stormwater management represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the *2011 Maryland Standard and Specifications for Soil Erosion and Sediment Control*

Engineer — 4/16/2021 Date

OWNER'S CERTIFICATION

I/we certify that all development and construction will be done according to this plan of development and plan for erosion and sediment control and that any responsible personnel involved in the construction project will have a certification of attendance at a Department of Natural Resources Approved Training Program for the control of sediment and erosion before beginning the project . I also authorize periodic onsite inspection by the Harford Soil Conservation District or their authorized agents, or as deemed necessary

Owner — 6/4/2021 Date

210585

EROSION & SEDIMENT #: 59863 / GRADING PERMIT #: 11786-2020

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.
5. SEE SEQUENCE ITEM #10, SHEET 49 FOR IN-STREAM WORK CONSIDERATION.
6. CONTRACTOR SHALL INSTALL IN-STREAM STRUCTURES OR COMPLETE IN-STREAM STRUCTURES THAT CAN BE FINALIZED BY THE END OF THAT WORK DAY. IN NO CASE CAN A PUMP AROUND PRACTICE EXTEND BEYOND THE WORK DAY.
7. CONTRACTOR MAY ADD PUMP AROUND PRACTICES TO COVER WORK AS PLANNED.
8. NO IN-STREAM WORK MAY START UNTIL ALL NECESSARY RESOURCES ARE ON SITE.

SCALE: 1 INCH

res
HGS, LLC. A RES COMPANY
5367 TELEPHONE ROAD
WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

STATE OF MARYLAND — BAILEY J. WILFONG — 52852 — PROFESSIONAL ENGINEER — 4/16/2021

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
EROSION AND SEDIMENT CONTROL NOTES

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 49 of 51

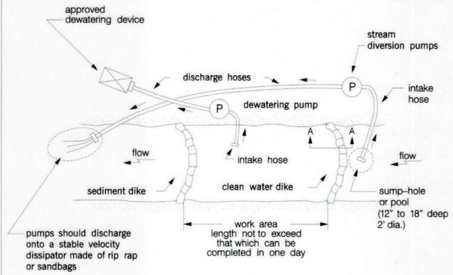
HARFORD COUNTY SEDIMENT CONTROL NOTES

1. The contractor/owner is responsible for obtaining all necessary permits. Further, no construction activity shall take place until all required permits have been obtained.
2. The limits of disturbance shall be clearly delineated in the field prior to grading of the site to ensure compliance with approved plans. All Forest Retention areas will be delineated with Blaze Orange Fence as well as any SWM infiltration practice prior to any clearing. Work beyond the limits of disturbance and in any area inside the Forest Retention and SWM infiltration area is considered to be a violation of this plan.
3. All sediment control practices must be installed prior to any construction activity. Upon completion of the installation of perimeter sediment control practices the site must be inspected by the Department of Public Works (DPW). No additional construction activity will be authorized without the approval from DPW.
4. All points of ingress and egress shall be protected to prevent tracking of mud into public ways. During construction, every means will be taken to control soil erosion and siltation. If necessary a wash rack may need to be established.
5. Earth dikes, sediment traps, etc. will be located as shown on these drawings. Field changes and minor adjustments are permissible as long as the installation functions and conforms to specifications. The site inspector prior to installation must approve all such changes. Major changes to the approved plan will require re-approval by the Harford Soil Conservation District.
6. Following initial soil disturbance or re-disturbance permanent or temporary stabilization shall be completed within:
   a) Three calendar days on slopes greater than 3:1, all waterways and to the surface of all perimeter controls.
   b) Seven calendar days as to all other disturbed or graded areas of the project site.
7. Dust Control must be managed as part of all Sediment Control plans. Failure to do so is a violation of this plan.
8. Sediment basins must be built to design specifications shown on the plan. If the basin is to be used as a future SWM facility, the basin will be built in accordance with the latest MD-378 standards and specifications. Specified materials must be used. No changes or modifications will be made without written authorization of the Harford Soil Conservation District.
9. Temporary fencing shall be placed around all sediment basins, traps, and ponds during construction and site grading.
10. At the end of each working day all sediment control practices will be inspected and left operational. A weekly log will be kept in accordance with NOI/NPDES regulations. A copy of the approved sediment control plans shall be available at the site at all times.
11. Ensure positive drainage to all road inlets during all phases of road construction to ensure positive flow to traps and or basins.
12. Cut and/or fill shall be done in conformance with 2011 Erosion and Sediment Control Standards and Specifications for land grading.
13. Surface flows over cut and fill slopes shall be controlled by either redirecting flows from traversing the slopes or by installing mechanical devices to safely convey water down slopes without causing erosion.
14. Off-site waste or borrow areas shall have an approved erosion and sediment control plan prior to the import or export of material to/from the project site.
15. All material originating from the development of the property and deposited on the public right-of-way shall be immediately removed.
16. Storm drain inlets and outlets shall be protected per 2011 Erosion and Sediment Control standards and specifications.
17. Topsoil, liming, fertilizing, seeding, mulching, sod, etc. are all essential parts of the sediment control plan and must be completed along with all other practices.
18. Traps to be removed shall be dewatered as per the 2011 Erosion and Sediment Control standards and specifications.
19. Prior to removal of traps or conversion of sediment basins to SWM facilities, the storm drains will be flushed
20. Sediment control practices will be maintained until all disturbed areas for which the practices were installed have been stabilized. Sediment control practices may be removed only with the authorization of the DPW inspector. All disturbed areas resulting from the removal of sediment control devices shall be stabilized immediately. Removal prior to inspector's approval constitutes a violation.

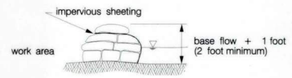
Revised July 2019

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

PLAN VIEW



SECTION A–A



cross section of sandbag dike

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

MGWC 1.2: PUMP-AROUND PRACTICE

Temporary measure for dewatering in-channel construction sites

DESCRIPTION

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

IMPLEMENTATION SEQUENCE

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

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

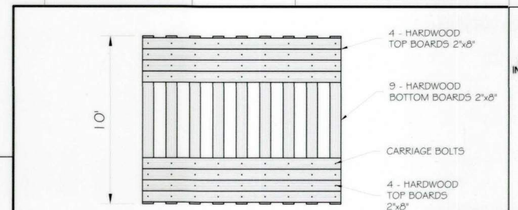
TEMPORARY INSTREAM CONSTRUCTION MEASURES | *MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES REVISED NOVEMBER 2000*

MGWC 1.2: PUMP-AROUND PRACTICE

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

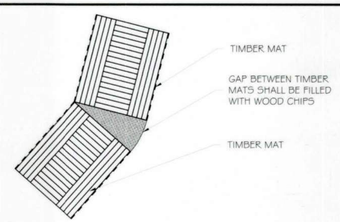
TEMPORARY INSTREAM CONSTRUCTION MEASURES | *MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES REVISED NOVEMBER 2000*

PAGE 1.2 - 2



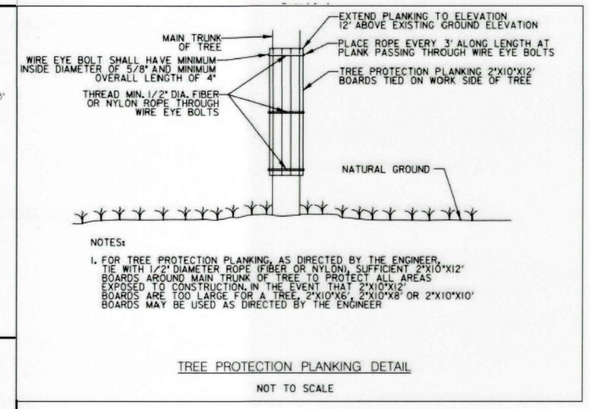
TIMBER MAT
NOT TO SCALE

TYPE:	LAMINATED 2 PLY MAT
MATERIAL:	HARDWOOD
APPLICATION:	STRAIGHT ROADS WITH MODERATE TURNS ON SANDY AND MUDDY ROADS
WEIGHT:	1,600 LBS EACH
WEIGHT CAPACITY:	40 TONS



TIMBER MAT
TREATMENT OF ROAD TURNS
NOT TO SCALE

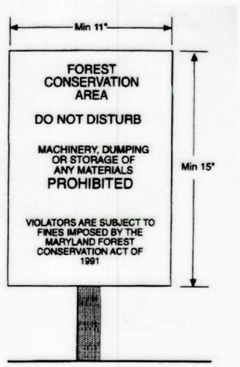
TIMBER MAT
TEMPORARY ACCESS ROAD



NOTES:
1. FOR TREE PROTECTION PLANKING, AS DIRECTED BY THE ENGINEER, TIE WITH 1/2" DIAMETER ROPE (FIBER OR NYLON), SUFFICIENT 2"X10"X12' BOARDS AROUND MAIN TRUNK OF TREE TO PROTECT ALL AREAS EXPOSED TO CONSTRUCTION. IN THE EVENT THAT 2"X10"X12' BOARDS ARE TOO LARGE FOR A TREE, 2"X10"X6', 2"X10"X8' OR 2"X10"X10' BOARDS MAY BE USED AS DIRECTED BY THE ENGINEER

TREE PROTECTION PLANKING DETAIL
NOT TO SCALE

Figure 4.7.1 Forest Retentions Area Signs



Notes:
1. Bottom of signs to be higher than top of tree protection fence.
2. Signs to be placed approximately 50' feet apart. Conditions on site affecting visibility may warrant placing signs closer or farther apart.
3. Attachment of signs to trees is prohibited.

PERMANENT VEGETATIVE STABILIZATION

ALL DISTURBED AREAS, WHICH ARE NOT TO BE PAVED, SHALL BE PERMANENTLY STABILIZED AS FOLLOWS:

A) SEEDBED PREPARATION:
Loosen upper three inches by raking, discing, or other acceptable means after spreading four inches of topsoil.

B) SOIL AMENDMENTS:
Apply 500 lbs per acre of 10-10-10 fertilizer and two tons per acre of lime.

C) SEEDING:*
FOR PERIODS OF MARCH 1 TO MAY 15 AND AUGUST 15 TO OCTOBER 15: Seed with 125 lbs per acre of Tall Fescue, 15 lbs per acre of Perennial Ryegrass, and 10 lbs of Kentucky Bluegrass.

FOR PERIOD OF MAY 16 TO AUGUST 14: Seed with 110 lbs per acre of Tall Fescue and 3 lbs per acre of Weeping Lovegrass.

FOR PERIOD OF OCTOBER 16 TO FEBRUARY 28, PROTECT SITE BY: Option 1: 2 tons per acre of well anchored straw mulch and seed as soon as possible in the spring, Option 2: use sod, or Option 3: seed with 60 lbs per acre of tall fescue and mulch with 2 tons per acre of well anchored straw.
NOTE: For quick cover with tall fescue, add 2 lbs of small grain per 1,000 sq. ft.

D) MULCHING SPECIFICATIONS:
Mulch shall be applied to all seeded areas immediately after seeding.

Apply 2 tons per acre of straw over all seeded areas. If a mulch anchoring tool is to be used, the rate shall be increased to 2.5 tons per acres.**

Mulch anchoring shall be performed immediately following mulch application to minimize loss by wind and water. the type of mulch anchoring used must comply with the ***2011 MARYLAND STANDARD AND SPECIFICATIONS***.

* IF OTHER SEED MIXES ARE TO BE SUBSTITUTED, THEY MUST COMPLY WITH THE ***2011 MARYLAND STANDARD AND SPECIFICATIONS, CHAPTER B, TABLE B-3****(PAGES B 26 TO B 31)*
** IF A DIFFERENT TYPE OF MULCH IS TO BE USED, IT MUST COMPLY WITH THE ***2011 MARYLAND STANDARD AND SPECIFICATION, CHAPTER B: MULCHING*** *(PAGES B 6 & B 7)*

Temporary Seeding Summary

Hardiness Zone (from Figure B.3): 6b Seed Mixture (from Table B.1):				Fertilizer Rate (10-20-20)	Lime Rate
Species	**Application Rate (lb/ac)**	**Seeding Dates**	**Seeding Depths**		
Annual Ryegrass (Iolium perenne ssp. Multiflorum)	40	Mar.1-May 15; Aug.1-Oct. 15	0.5	436 lb/ac (10 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)
Foxtrail Millet (Setaria italica)	30	May 16 to Jul. 31	0.5		

REFER TO SITE SPECIFIC PLANTING PLAN AND NOTES FOR WHICH AREAS ARE TO RECEIVE PERMANENT SEEDING; SHEETS 32-40

210586

EROSION & SEDIMENT #: 59863 / GRADING PERMIT #: 11786-2020

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.
5. SEE SEQUENCE ITEM #10, SHEET 49 FOR IN-STREAM WORK CONSIDERATION.
6. CONTRACTOR SHALL INSTALL IN-STREAM STRUCTURES OR COMPLETE IN-STREAM STRUCTURES THAT CAN BE FINALIZED BY THE END OF THAT WORK DAY. IN NO CASE CAN A PUMP AROUND PRACTICE EXTEND BEYOND THE WORK DAY.
7. CONTRACTOR MAY ADD PUMP AROUND PRACTICES TO COVER WORK AS PLANNED.
8. NO IN-STREAM WORK MAY START UNTIL ALL NECESSARY RESOURCES ARE ON SITE.

SCALE: 1 INCH

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

STATE OF MARYLAND · BAILEY J. WILSON · 52852 · PROFESSIONAL ENGINEER

4/16/2021

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

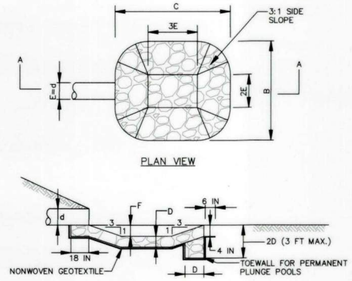
C. MILTON WRIGHT HIGH SCHOOL
STREAM RESTORATION
EROSION AND SEDIMENT CONTROL DETAILS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021

DETAIL D-4-2 PLUNGE POOL

STANDARD SYMBOL: PP



SECTION A–A

CONSTRUCTION SPECIFICATIONS

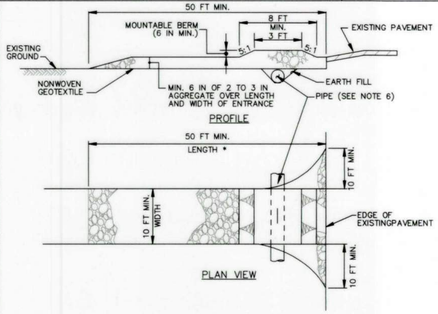
1. USE SPECIFIED CLASS OF RIPRAP.
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS, AND PROTECT FROM PUNCHING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE.
3. PREPARE THE SUBGRADE FOR THE PLUNGE POOL TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
4. EMBED THE GEOTEXTILE A MINIMUM OF 4 INCHES AND EXTEND THE GEOTEXTILE A MINIMUM OF 6 INCHES BEYOND THE EDGE OF THE SCOUR HOLE.
5. STONE FOR THE PLUNGE POOL MAY BE PLACED BY EQUIPMENT. CONSTRUCT TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. DELIVER AND PLACE THE STONE FOR THE PLUNGE POOL IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE STONE FOR THE PLUNGE POOL IN A MANNER TO PREVENT DAMAGE TO THE GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.
6. AT THE PLUNGE POOL OUTLET, PLACE THE STONE SO THAT IT MEETS THE EXISTING GRADE.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

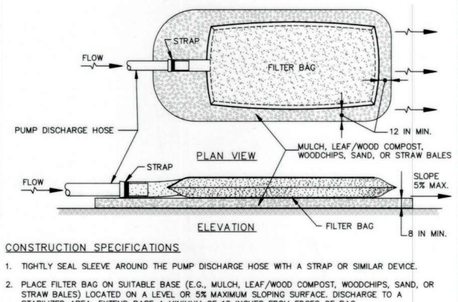
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING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

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL F-4 FILTER BAG

STANDARD SYMBOL: ⊠FB



CONSTRUCTION SPECIFICATIONS

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

GRAB TENSILE	250 LB	ASTM D–4632
PUNCTURE	150 LB	ASTM D–4833
FLOW RATE	70 GAL/MIN/FT²	ASTM D–4491
PERMITTIVITY (SEC^{-1})	1.2 SEC^{-1}	ASTM D–4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D–4355
APPARENT OPENING SIZE (AOS)	0.15–0.18 MM	ASTM D–4751
SEAM STRENGTH	90%	ASTM D–4632

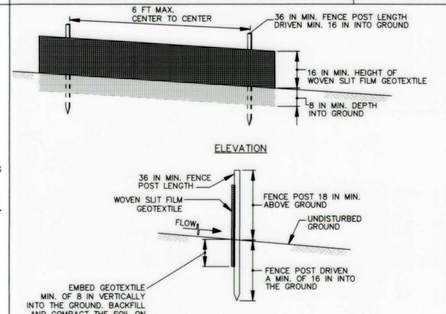
6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: —SF—



1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: —SF—

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± ⅛ INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID–SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H–1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

PLUNGE POOL D-4-2

OUTFALL INFO			TYPE I								
Culv. Dia. d/E, (ft)	TW (ft)	Q10 (cfs)	Plunge Pool Width, B, (ft)	Plunge Pool Length, C, (ft)	Min. D50-Type 1 (ft)	Min. D50-Type 1 (in)	Stone Size (Refer Table H.2)	Rip Rap Depth-Type 1 (2xD50) (in)	Plunge Pool Bottom Length (ft)	Plunge Pool Bottom Width (ft)	Plunge Pool Depth-F
2.5	2	50.85	12.5	15	0.35	4.16	Class 0/RipRap	11.00	7.5	5	1.25

Table H.2: Stone Size

TYPE	SIZE RANGE	d_{50}	d_{100}	AASHTO	MIDSIZE WEIGHT[3]
NUMBER 57[1]	3/8 to 1 ½ inch	½ in	1 ½ in	M-43	N/A
NUMBER 1	2 to 3 inch	2 ½ in	3 in	M-43	N/A
RIPRAP[2] (CLASS 0)	4 to 7 inch	5 ½ in	7 in	N/A	N/A
CLASS I	N/A	9 ½ in	15 in	N/A	40 lb
CLASS II	N/A	16 in	24 in	N/A	200 lb
CLASS III	N/A	23 in	34 in	N/A	600 lb

[1] This classification is to be used on the upstream face of stone outlets and check dams.

[2] This classification is to be used for gabions.

[3] Optimum gradation is 50 percent of the stone being above and 50 percent below the midsize.

Stone must be composed of a well graded mixture of stone sized so that fifty (50) percent of the pieces by weight are larger than the size determined by using the charts. A well graded mixture, as used herein, is defined as a mixture composed primarily of larger stone sizes but with a sufficient mixture of other sizes to fill the smaller voids between the stones. The diameter of the largest stone in such a mixture must not exceed the respective d_{100} selected from Table H.2. The d_{50} refers to the median diameter of the stone. This is the size for which 50 percent, by weight, will be smaller and 50 percent will be larger.

Note: Recycled concrete equivalent may be substituted for all stone classifications for temporary control measures only. Concrete broken into the sizes meeting the appropriate classification, containing no steel reinforcement, and having a minimum density of 150 pounds per cubic foot may be used as an equivalent.

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

STANDARD SYMBOL: TSSMC – * lb/ft² (* INCLUDE SHEAR STRESS)

CONSTRUCTION SPECIFICATIONS

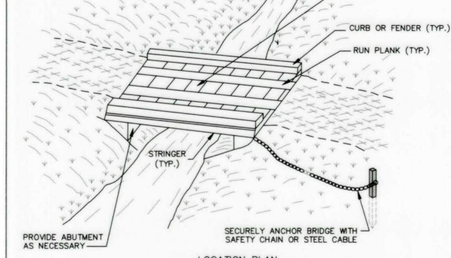
1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN–MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON–LEACHING AND NON–TOXIC TO VEGETATION AND SEED GERMINATION AND NON–INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH–SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTERLINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MAT SMOOTHLY AND FIRMLY ON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. KEY–IN UPSTREAM END OF EACH MAT ROLL BY DIGGING A 6 INCH (MINIMUM) TRENCH AT THE UPSTREAM END OF THE MATTING, PLACING THE ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END.
7. OVERLAP OR ABUT THE ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL H-4-1 TEMPORARY ACCESS BRIDGE

STANDARD SYMBOL: TB



NOTE:
TIME OF YEAR RESTRICTIONS DO NOT APPLY TO THE CONSTRUCTION OR REMOVAL OF A TEMPORARY ACESS BRIDGE UNLESS THERE IS DISTURBANCE TO THE STREAM CHANNEL.

1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL H-4-1 TEMPORARY ACCESS BRIDGE

STANDARD SYMBOL: TB

CONSTRUCTION SPECIFICATIONS

1. CONSTRUCT TEMPORARY BRIDGE STRUCTURE AT OR ABOVE THE BANK ELEVATION TO PREVENT IMPACTS FROM FLOATING MATERIALS AND DEBRIS.
2. PLACE ABUTMENTS PARALLEL TO, AND ON, STABLE BANKS.
3. CONSTRUCT BRIDGE TO SPAN ENTIRE CHANNEL UNLESS OTHERWISE INDICATED ON APPROVED PLAN.
4. USE STRINGERS CONSISTING OF LOGS, SAWN TIMBER, PRESTRESSED CONCRETE BEAMS, METAL BEAMS, OR OTHER APPROVED MATERIALS.
5. SELECT DECKING MATERIALS TO PROVIDE SUFFICIENT STRENGTH TO SUPPORT THE ANTICIPATED LOAD. PLACE ALL DECKING MEMBERS PERPENDICULAR TO THE STRINGERS, BUTT TIGHTLY, AND SECURELY FASTEN. DECKING MATERIALS MUST BE BUTTED TIGHTLY TO PREVENT ANY SOIL MATERIAL TRACKED ONTO THE BRIDGE FROM FALLING INTO THE WATERWAY BELOW.
6. SECURELY FASTEN OPTIONAL RUN PLANKING FOR THE LENGTH OF THE SPAN. PROVIDE A RUN PLANK FOR EACH TRACK OF THE EQUIPMENT WHEELS. ALTHOUGH RUN PLANKS ARE OPTIONAL, THEY MAY BE NECESSARY TO PROPERLY DISTRIBUTE LOADS.
7. INSTALL CURBS THE ENTIRE LENGTH OF THE OUTER SIDES OF THE DECK TO PREVENT SEDIMENT FROM ENTERING THE STREAM CHANNEL.
8. ANCHOR BRIDGE SECURELY AT ONLY ONE END USING STEEL CABLE OR CHAIN. ANCHORING AT ONLY ONE END WILL PREVENT CHANNEL OBSTRUCTION IN THE EVENT THAT FLOODWATERS FLOAT THE BRIDGE. ACCEPTABLE ANCHORS ARE LARGE TREES, LARGE BOULDERS, OR DRIVEN STEEL POSTS. ANCHOR MUST BE SUFFICIENT TO PREVENT THE BRIDGE FROM FLOATING DOWNSTREAM.
9. AREAS DISTURBED DURING BRIDGE INSTALLATION AND\OR REMOVAL MUST NOT BE LEFT UNSTABILIZED OVERNIGHT UNLESS THE RUNOFF IS DIRECTED TO AN APPROVED SEDIMENT CONTROL DEVICE.
10. STABILIZE APPROACH TO BRIDGE AND KEEP FREE OF EROSION. CLEAN SEDIMENT FROM DECKING AND CURBS DAILY BY SCRAPING, SWEEPING, AND/OR VACUUMING. ENSURE THAT DECKING AND CURBS REMAIN TIGHTLY BUTTED WITHOUT GAPS. REMOVE DEBRIS TRAPPED BY BRIDGE. MAINTAIN AREAS ADJACENT TO CROSSING TO CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION.
11. AFTER THE TEMPORARY CROSSING IS NO LONGER NEEDED, REMOVE IT WITHIN 14 CALENDAR DAYS. IF SUBJECT TO THE USE DESIGNATION CLOSURE, REMOVE AT THE END OF CLOSURE PERIOD. PROTECT STREAM BANKS DURING BRIDGE REMOVAL AND STABILIZE ALL DISTURBED AREAS WITH EROSION CONTROL MATTING. ACCOMPLISH REMOVAL OF THE BRIDGE AND CLEAN UP OF THE AREA WITHOUT CONSTRUCTION EQUIPMENT WORKING IN THE WATERWAY CHANNEL. STORE ALL REMOVED MATERIALS IN AN APPROVED STAGING AREA.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

210587

EROSION & SEDIMENT #: 59863 / GRADING PERMIT #: 11786-2020

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.
5. SEE SEQUENCE ITEM #10, SHEET 49 FOR IN-STREAM WORK CONSIDERATION.
6. CONTRACTOR SHALL INSTALL IN-STREAM STRUCTURES OR COMPLETE IN-STREAM STRUCTURES THAT CAN BE FINALIZED BY THE END OF THAT WORK DAY. IN NO CASE CAN A PUMP AROUND PRACTICE EXTEND BEYOND THE WORK DAY.
7. CONTRACTOR MAY ADD PUMP AROUND PRACTICES TO COVER WORK AS PLANNED.
8. NO IN-STREAM WORK MAY START UNTIL ALL NECESSARY RESOURCES ARE ON SITE.

SCALE: 1 INCH

res
HGS, LLC. A RES COMPANY
5367 TELEPHONE ROAD
WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

STATE OF MARYLAND
BAILEY J. WILFONG
52852
PROFESSIONAL ENGINEER
4/16/2021

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
EROSION AND SEDIMENT CONTROL DETAILS

REVISION NO.	DATE	DESCRIPTION
	11-26-19	CONCEPT / 30%
	06-15-20	TECHNICAL / 75%
	01-08-21	STATE PERMIT / 95%
	02-25-21	COUNTY PERMIT / 95%
	04-16-21	FINAL PERMIT

SCALE: SEE SCALE BAR
DESIGN BY: BW
DRAWN BY: AM/JC/BW
CHECKED BY: BW
PROJECT NO.: 6776
DATE: 4/16/2021
SHEET NUMBER 51 of 51