

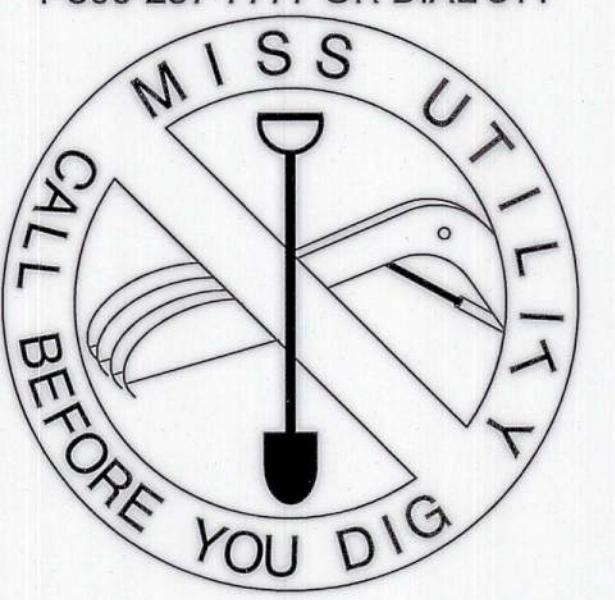
LOWER WHEEL CREEK STREAM RESTORATION REPAIRS

EROSION AND SEDIMENT CONTROL PLAN

WATERSHED PROTECTION AND RESTORATION OFFICE

HARFORD COUNTY, MARYLAND

BEFORE YOU DIG CALL
1-800-257-7777 OR DIAL 811



GENERAL NOTES

1. THIS PROJECT IS INTENDED TO REPAIR OR REPLACE FAILING BANK PROTECTION AND STREAM RESTORATION FEATURES IN THE LOWER WHEEL CREEK STREAM RESTORATION PROJECT. SHEETS 2 AND 3 OF THIS PLANSET USE THE APPROVED LOWER WHEEL CREEK STREAM RESTORATION EROSION AND SEDIMENT CONTROL PLANS (S/C PLAN #59801 WITH APPROVED REVISION DATED 1/20/2016) WITH BLUE LINED MARKUPS FOR THE PROPOSED 2024 REPAIRS.
2. SPECIFICATIONS: ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH MARYLAND STATE HIGHWAY ADMINISTRATIONS STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS LATEST EDITION AND ANY ADDENDA THERETO.
3. UTILITIES: UTILITY LOCATIONS SHOWN ON THE PLANS ARE BASED ON LIMITED INFORMATION AVAILABLE. HOWEVER, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE ACCURACY OF THIS INFORMATION. THE COST OF REPAIR OR REPLACEMENT OF ANY SUCH FACILITIES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE BORNE BY HIM/HER.
4. CONTACT "MISS UTILITY" PHONE 1-800-257-7777, 48 HOURS PRIOR TO THE START OF WORK. THERE SHOULD BE NO EXCAVATION UNTIL THE LOCATIONS OF UNDERGROUND UTILITIES HAVE BEEN DETERMINED.
5. STANDARD DETAILS: REFERENCE MADE TO STANDARDS ARE TAKEN FROM THE HARFORD COUNTY ROAD CODE "BOOK OF STANDARD DETAILS" AND FROM "THE MARYLAND STATE HIGHWAY ADMINISTRATION'S BOOK OF STANDARDS-HIGHWAY AND INCIDENTAL STRUCTURES". IT WILL BE THE CONTRACTOR'S RESPONSIBILITY THAT THE STANDARD DRAWINGS IN HIS/HER POSSESSION ARE THE LATEST REVISED STANDARDS UP TO AND INCLUDING THE DATE OF THE ADVERTISEMENT OF THIS CONTRACT.
6. SOIL CONSERVATION: THE CONTRACTOR SHALL NOT DISTURB THE EXISTING VEGETATION OUTSIDE THE LIMITS OF DISTURBANCE STOCKPILE AREAS. THE CONTRACTOR WILL SECURE AN OFF-SITE AREA AS NECESSARY. PERMITS, SOIL STABILIZATION, CONCRETE TO 24" MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. THE CONTRACTOR WILL OBTAIN APPROVAL OF THE HARFORD COUNTY SOIL CONSERVATION DISTRICT FOR HIS/HER PLANS IN CONTROLLING SEDIMENT EROSION FOR THE BORROW AREA AND DISPOSING OF ANY WASTE EXCAVATION.
7. EXISTING MAILBOXES AND EXISTING SIGNS: ALL EXISTING MAILBOXES, SIGNS AND PAPER BOXES DISTURBED DURING CONSTRUCTION SHALL BE TEMPORARILY RESET IMMEDIATELY AND PERMANENTLY RESET AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE INCIDENTAL TO ALL OTHER ITEMS IN THE CONTRACT.
8. SURVEYS:

TOPOGRAPHIC SURVEY PERFORMED BY BAYLAND CONSULTANTS AND DESIGNERS, INC. FROM 3/7/2011 TO 3/28/2011. HORIZONTAL CONTROL ESTABLISHED FROM GLOBAL POSITIONING SYSTEM (GPS) CONTROL POINTS REFERENCED INTO HARFORD COUNTY SURVEY CONTROL MONUMENTS AND OPEN LOOP TRAVERSE. TRAVERSE POINTS ARE IRON REBAR UNLESS OTHERWISE SPECIFIED.

COORDINATES AND BEARINGS SHOWN HEREON ARE REFERRED TO THE MARYLAND COORDINATE SYSTEM (NAD83/1991) AND ARE BASED ON THE FOLLOWING HARFORD COUNTY SURVEY CONTROL MONUMENTS:

MALL N 37°49'19.5" E 1,494,171.4

MALL AZ MK. N 37°50'02.0" E 1,492,990.45

ELEVATIONS SHOWN HEREON ARE REFERRED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) WITH LOCAL REFERENCE TO THE FOLLOWING HARFORD COUNTY SURVEY CONTROL MONUMENTS:

MALL ELEV. 363.62

MALL AZ MK. ELEV. 348.37

ADDITIONAL SURVEY WAS PERFORMED IN APRIL 2023 BY BAYLAND TO VERIFY CURRENT CONDITIONS IN AREAS OF SPOT REPAIR. HORIZONTAL AND VERTICAL CONTROL ESTABLISHED FROM REAL TIME KINEMATIC (RTK) GLOBAL POSITIONING SYSTEM (GPS) CONTROL POINTS. TRAVERSE POINTS ARE IRON REBAR UNLESS OTHERWISE SPECIFIED. COORDINATES AND BEARINGS SHOWN HEREON ARE REFERRED TO THE MARYLAND COORDINATE SYSTEM (NAD83/1991). ELEVATIONS SHOWN HEREON ARE REFERRED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

INT	NORTHING	FASTING	ELEVATION	DESCRIPTION
TPF512	663,103.13	1,499,999.31	188.01	REBAR W/ NO CAP
TPS501	664,751.10	1,500,263.29	222.80	
TPS502	664,750.90	1,499,541.41	179.02	HUB & TACK ADJUSTED
TPS503	662,184.01	1,498,577.85	173.69	DISK ADJUSTED
TPS700	662,268.61	1,499,000.80	155.30	REBAR W/ YELLOW CAP
TPS702	662,135.73	1,498,742.42	145.38	REBAR W/ YELLOW CAP
TPS703	662,135.73	1,498,749.26	135.25	REBAR W/ YELLOW CAP

ONLY THOSE CONTROL POINTS SHOWN ON THESE PLANS ARE TO BE USED FOR THE CONSTRUCTION OF THIS PROJECT.

9. THE EXISTING UTILITIES, GRADES, AND OBSTRUCTIONS SHOWN ARE FROM THE BEST AVAILABLE RECORDS AND SHALL BE VERIFIED BY THE CONTRACTOR TO HIS SATISFACTION PRIOR TO CONSTRUCTION. NECESSARY PRECAUTIONS SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT EXISTING SERVICES AND MAINS AND ANY DAMAGE TO THEM SHALL BE REPAIRED IMMEDIATELY AT HIS OWN EXPENSE. MISS UTILITY SHALL BE CONTACTED 48 HOURS IN ADVANCE.

10. ALL WORK PERFORMED ON THIS PROJECT SHALL BE IN ACCORDANCE WITH THE LATEST HARFORD COUNTY ROAD CODE "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS" AND "ROADWAY AND STORMWATER DESIGN STANDARDS."

11. CONTOURS SHOWN OUTSIDE OF LIMIT OF WORK ARE BASED ON HARFORD COUNTY 2008 AERIAL TOPOGRAPHY.

12. PROPERTY LINES SHOWN ARE BASED ON HARFORD COUNTY 2013 CADASTRAL DATA.

13. ONLY TREES WITH A 10" DIAMETER OR GREATER THAT ARE WITHIN THE LIMIT OF WORK, WERE FIELD LOCATED IN 2011. OF THESE, ONLY TREES THAT ARE 30" IN DIAMETER OR GREATER ARE SHOWN ON THE PLANS.

14. WETLAND DELINEATION WAS PERFORMED BY BAYLAND IN MARCH 2011.

15. THE 100-YEAR FEMA FLOODPLAIN SHOWN IS FROM FEMA FIRM 24025C0252D EFFECTIVE JANUARY 7th 2000. THE REVISED PR. 100-YEAR FLOODPLAIN SHOWN IS DELINEATED BY BAYLAND IN 2023.

16. WHEEL CREEK IS A USE I-P STREAM WITH A STREAM CLOSURE PERIOD FROM MARCH 1st THROUGH JUNE 15th.

Owner:
HARFORD COUNTY DEPARTMENT OF PUBLIC WORKS DIVISION OF HIGHWAYS AND STORMWATER MANAGEMENT
212 SOUTH BOND STREET, 3RD FLOOR
BEL AIR, MARYLAND 21014
CONTACT: ELIZABETH COLLINS
PH: (410) 638-3545 EXT 1394

Prepared By :
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BAYLAND JOB NO. 4_4601

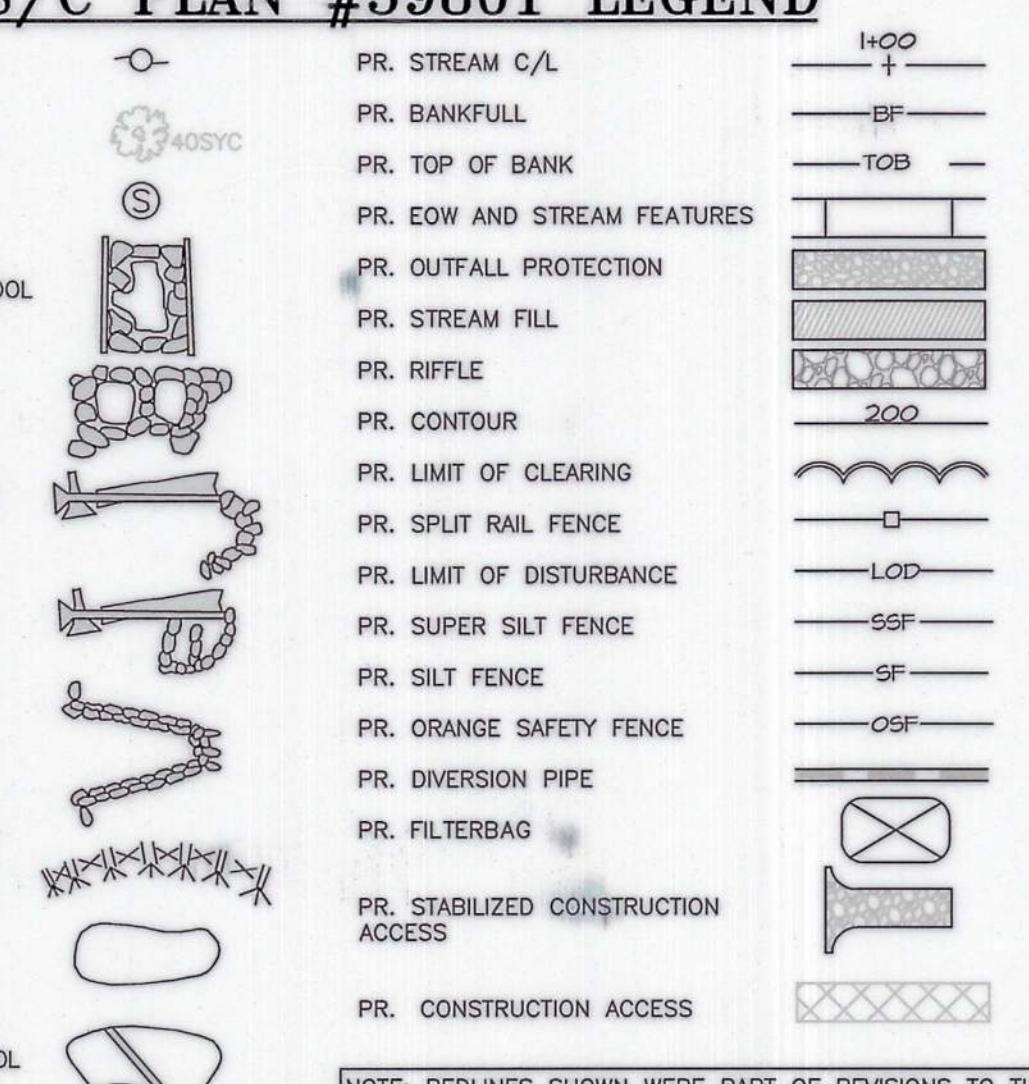
INDEX OF SHEETS

NO.	DESCRIPTION	SHEET NAME
1	TITLE SHEET	GN-01
2	ESC PLANS	ES-01
3	ESC PLANS	ES-02
4	ESC DETAILS	ED-01
5	ESC DETAILS	ED-02

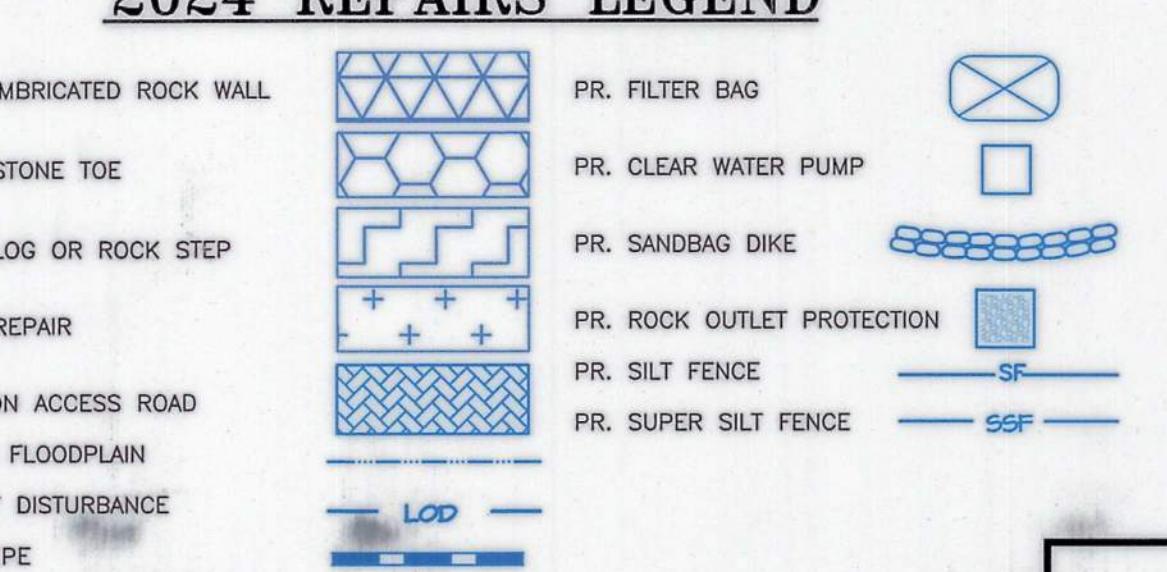
ABBREVIATION KEY

RTB	RIGHT TOP OF BANK
EOW	EDGE OF WATER
BP	BANKFULL
FP	FLOOD PRONE AREA
TOB	TOP OF BANK (PROPOSED)
MMS#	MIDDLE MAINSTEM (REACH REFERENCE)
LMS#	LOWER MAINSTEM (REACH REFERENCE)
MB#	MIDDLE BRANCH (REACH REFERENCE)
XS	XS SECTION
STA	STATION
EX	EXISTING
INV	INVERT
RCP	REINFORCED CONCRETE PIPE
PP	PLASTIC PIPE
EL	ELEVATION
POP	POPLAR (TREE)
MAP	MAPLE (TREE)
SYC	SYCAMORE (TREE)
CED	CEDAR (TREE)
BEE	BEECH (TREE)
OAK	OAK (TREE)
WQAK	WHITE OAK (TREE)
CL	CENTERLINE
WQV	WATER QUALITY

S/C PLAN #59801 LEGEND

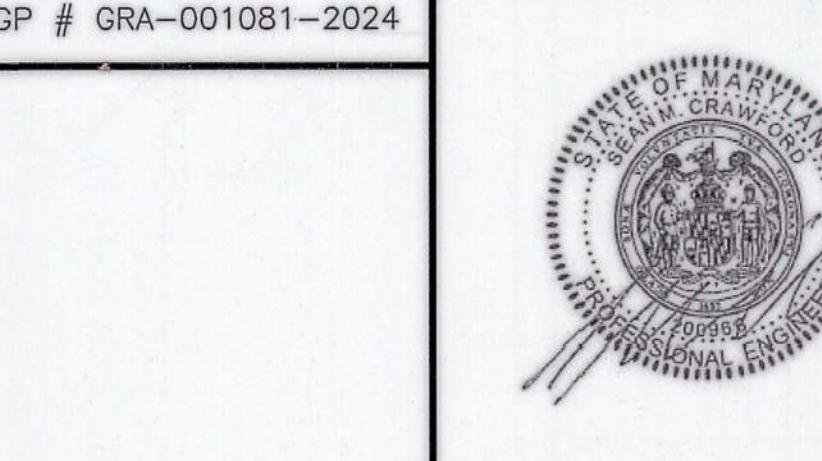


2024 REPAIRS LEGEND



S/C PLAN # 59900

REVISIONS



EROSION AND SEDIMENT CONTROL
PLAN #: 59900

TECHNICAL REVIEW BY:

Harford Soil Conservation District
APPROVED BY:
Harford Soil Conservation District



LOCATION MAP

SCALE: 1"-2000"

DEVELOPER'S/LANDOWNER'S CERTIFICATION

I/WE CERTIFY THAT ALL PROPOSED WORK SHOWN ON THESE CONSTRUCTION DRAWING(S) WILL BE ACCOMPLISHED PURSUANT TO THESE PLANS. I/WE ALSO UNDERSTAND THAT IT IS MY/OUR RESPONSIBILITY TO HAVE THE CONSTRUCTION SUPERVISED AND CERTIFIED, INCLUDING THE SUBMITAL OF "AS-BUILT" PLANS WITHIN 30 DAYS OF COMPLETION, BY A REGISTERED PROFESSIONAL ENGINEER.

Joseph J. Siemek, PE
SIGNED
6-10-24
DATE
PRINTED NAME
Joseph J. Siemek, PE, Director of Public Works

ENGINEER'S CERTIFICATION

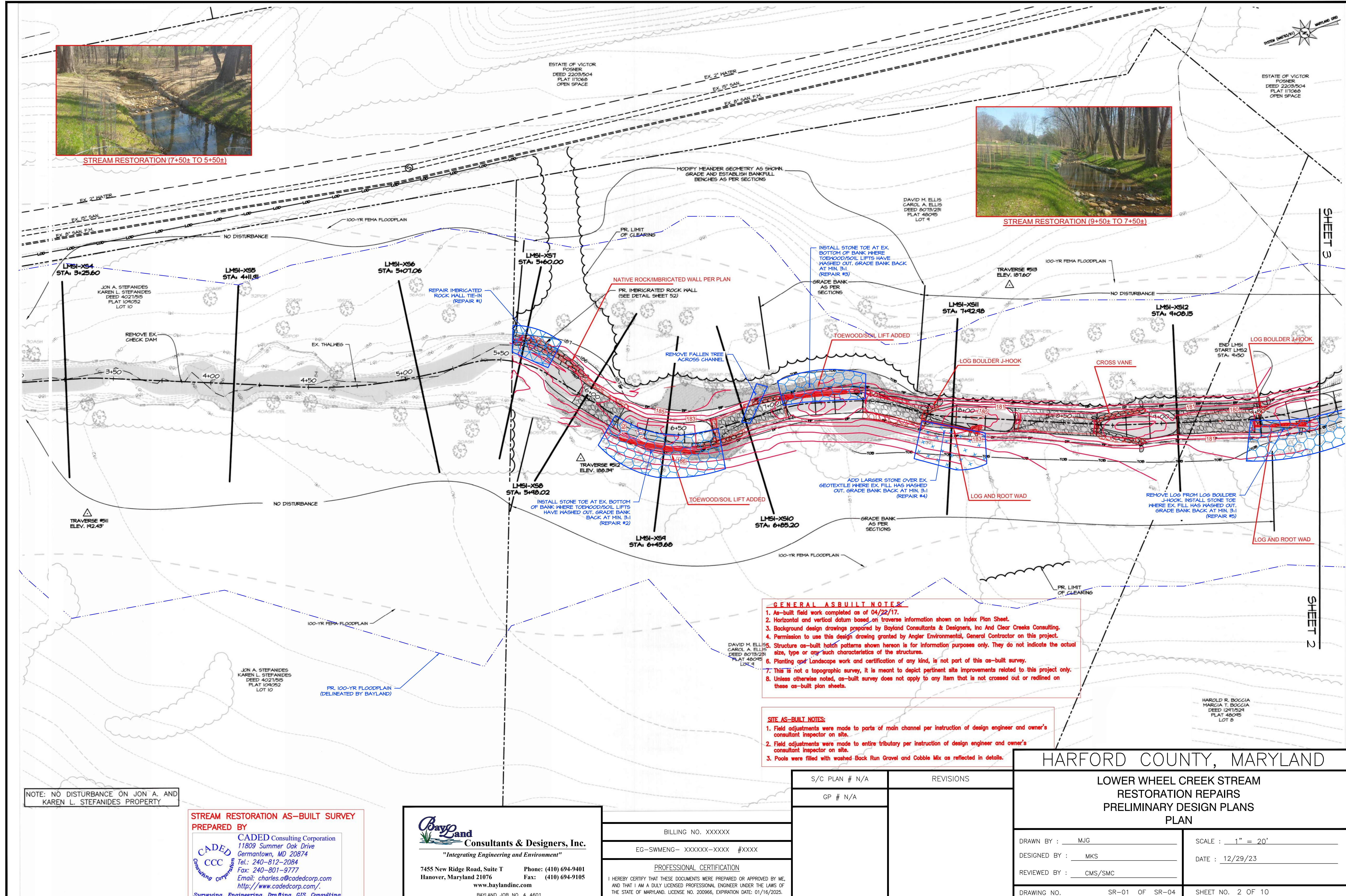
I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL AND STORM WATER MANAGEMENT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED WITH THE 2011 MARYLAND STANDARD AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.

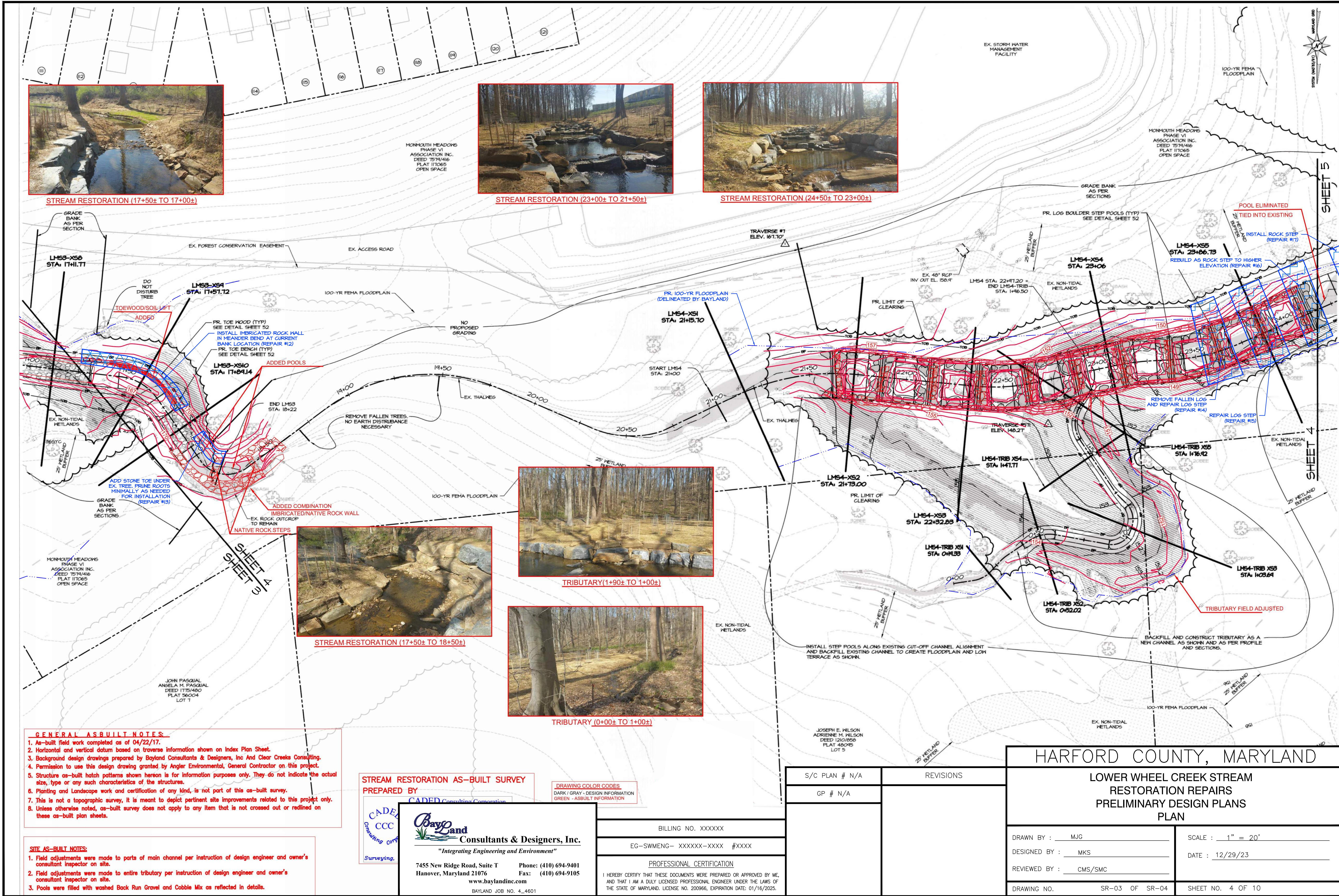
Harford
5/30/2024
DATE
ENGINEER
PRINTED NAME
SEAN CRAWFORD
200966
MD PE REGISTRATION NO.
240836

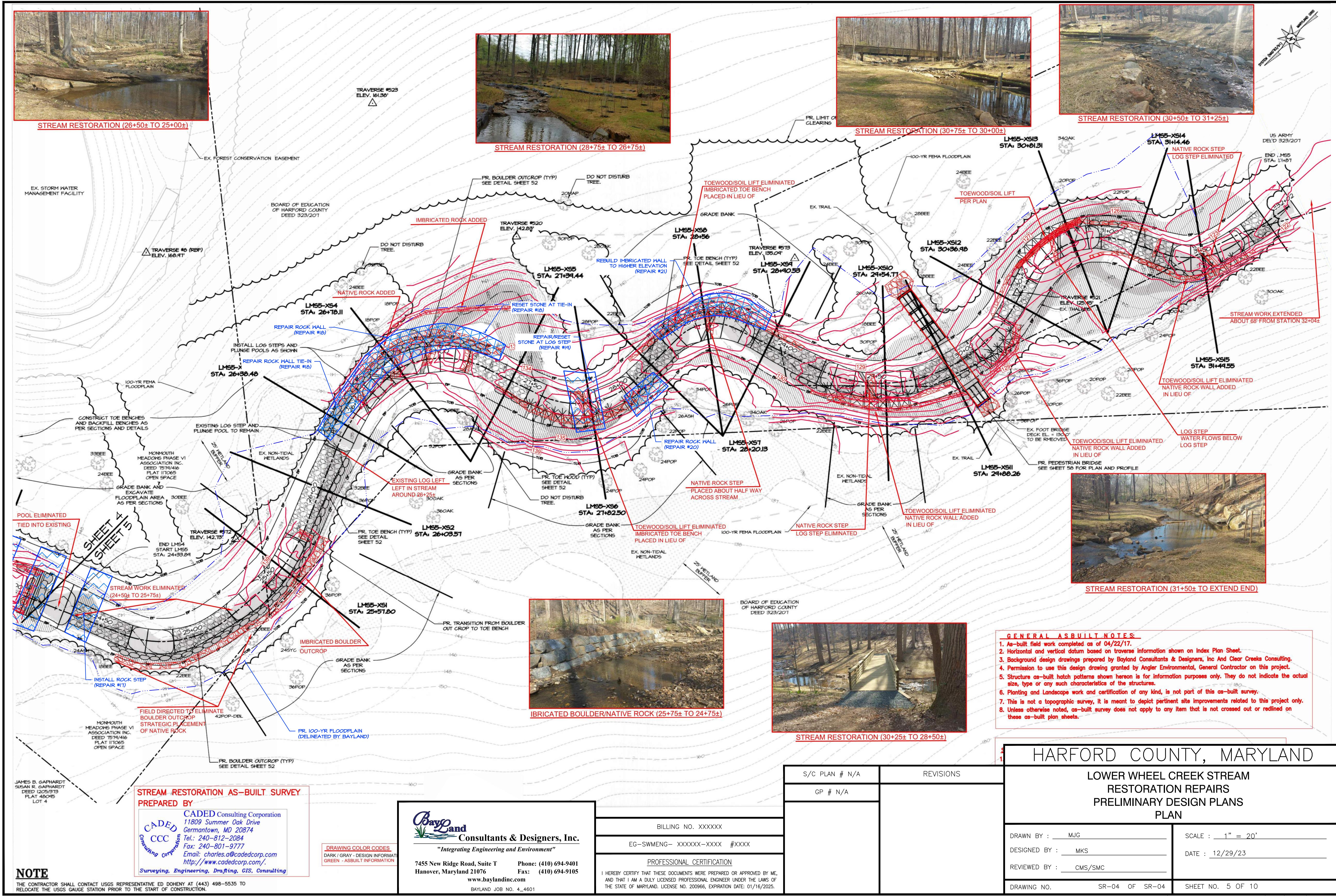
HARFORD COUNTY, MARYLAND
LOWER WHEEL CREEK STREAM
RESTORATION REPAIRS
EROSION AND SEDIMENT CONTROL PLAN
TITLE SHEET

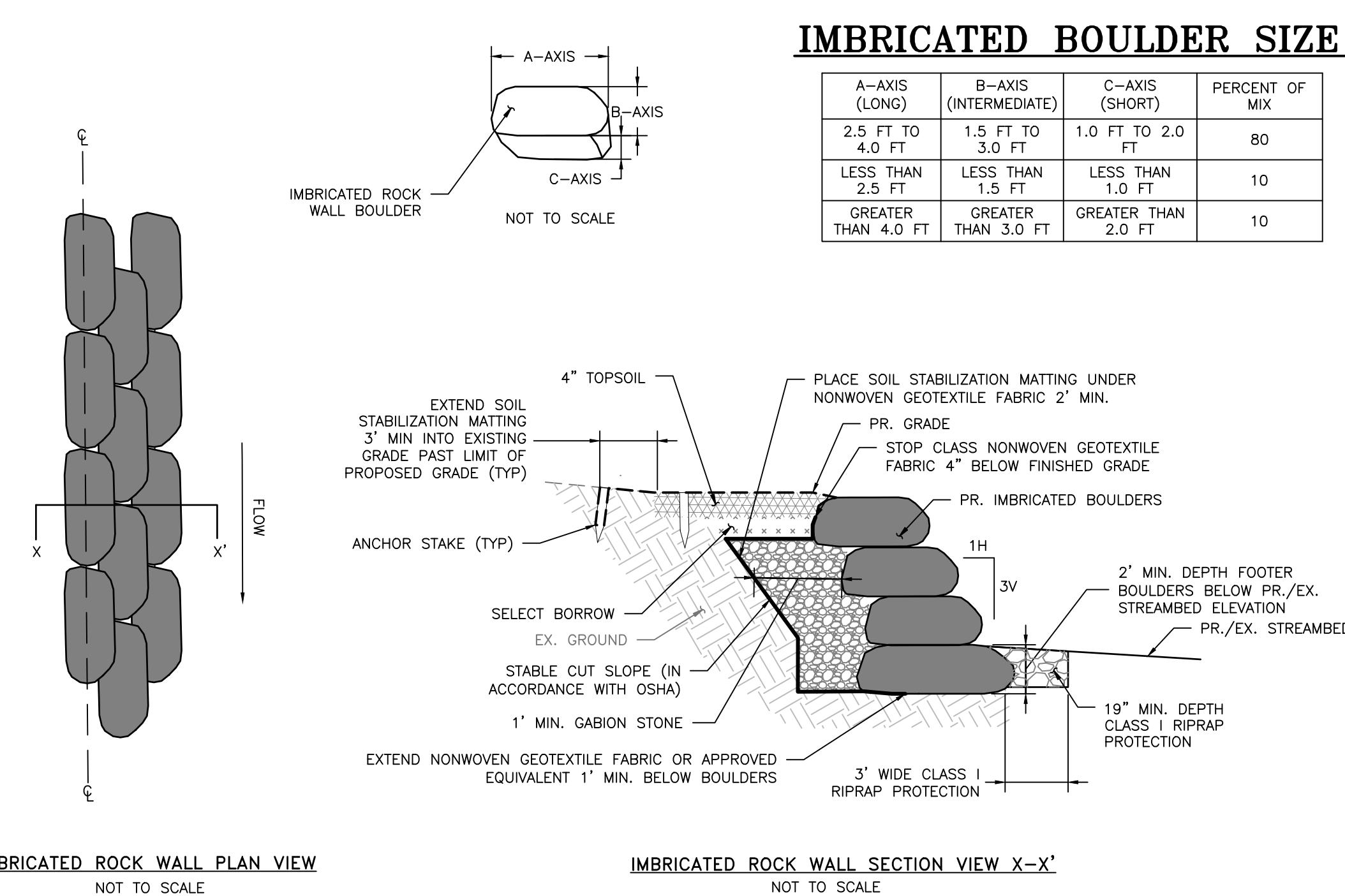
DRAWN BY : MJG
DESIGNED BY : MKS
REVIEWED BY : CMS/SMC
DRAWING NO. GN-01 OF GN-01
SHEET NO. 1 OF 5

NOTE: REDLINES SHOWN WERE PART OF REVISIONS TO THE S/C PLAN #59801 COMPLETED 1/20/2016.
THE 2023 REPAIR PROJECT IS DEPICTED IN BLUE LINE REVISIONS.
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 200966, EXPIRATION DATE: 01/16/2025.





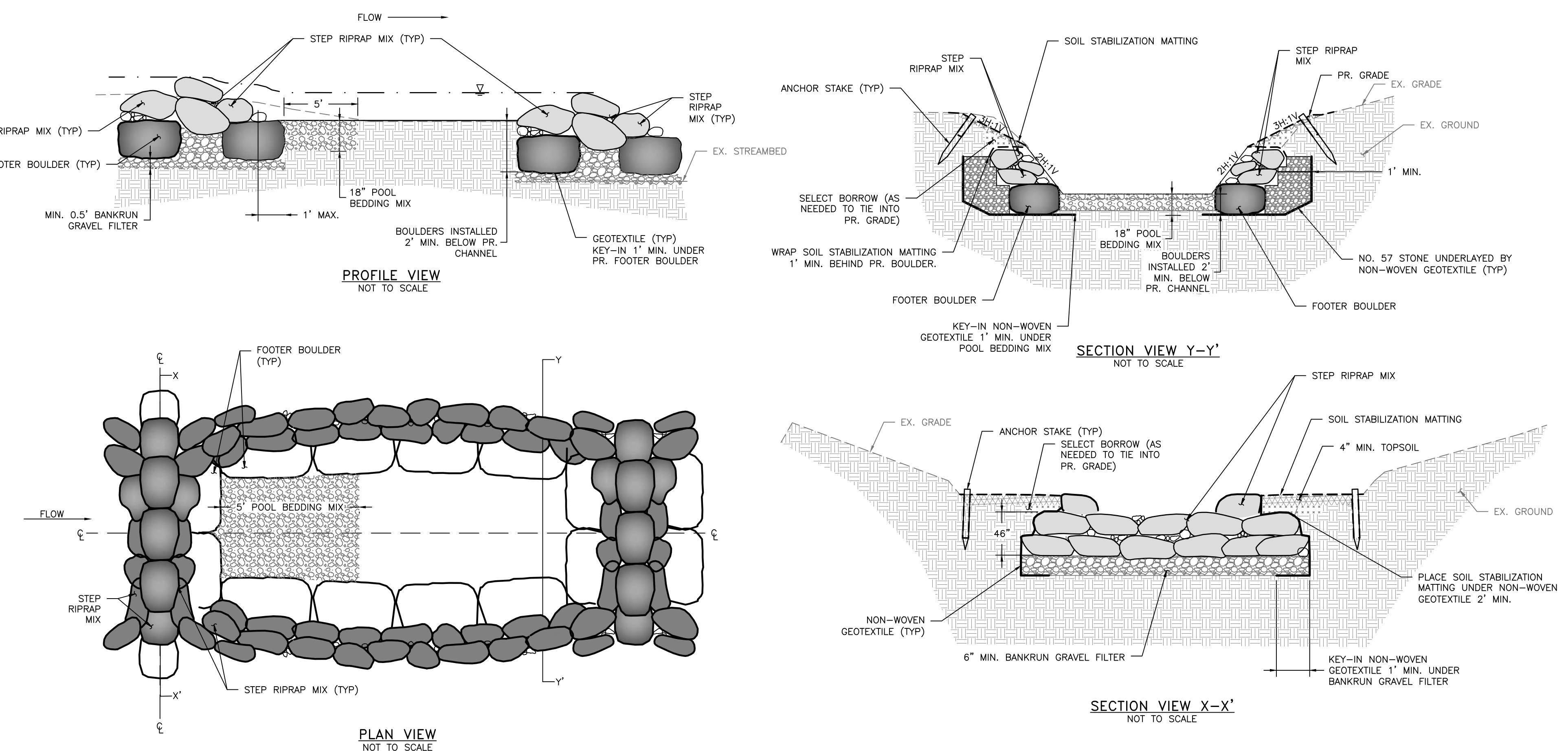




IMBRICATED ROCK WALL DETAIL

IMBRICATED ROCK WALL NOTES:

- ALL MATERIALS SHALL BE UNDERLAIN BY NONWOVEN GEOTEXTILE FABRIC. REFER TO THE CONTRACT DOCUMENTS FOR SPECIFICATIONS.
- WHEN BACKFILLING, ALL MATERIAL SHALL BE COMPAKED FIRMLY IN ALL VOIDS TO SECURE STONE. ALL SOIL SHALL BE COMPAKED TO MD-378 STANDARDS.
- IMBRICATED ROCK SHALL BE CONSTRUCTED SUCH THAT ALL BOULDERS SECURELY INTERLOCK, AND SHALL NOT ROTATE IN PLACE.
- IMBRICATED ROCK SHALL BE OBLONG AND FLAT IN APPEARANCE WITH A MINIMUM OF TWO PARALLEL FACES, AND SHALL BE STACKABLE.
- ALL ROCK SHALL BE GRANITE ROCK THAT IS TAN, DARK BROWN, OR DARK GRAY IN COLOR. ROCKS NOT MEETING SPECIFICATIONS SHALL BE REMOVED AND REPLACED AT NO COST TO THE CITY.
- SMALLER ROCK WILL BE UTILIZED TO FILL VOID SPACES BETWEEN THE IMBRICATED ROCKS TO THE SATISFACTION OF THE COUNTY.
- THE MINIMUM DRY UNIT WEIGHT FOR ROCK SHALL BE 160 PCF.
- TOP OF IMBRICATED ROCK (GNDLINE, 1 FT MIN. FROM GNDLINE) GAPS BETWEEN IMBRICATED ROCK SHALL NOT BE COINCIDENT ABOVE AND BELOW.
- TOP OF IMBRICATED ROCK WALLS THAT ARE MARKED TO BE REPAIRED SHALL CONSIST OF REMOVING STONES, BACKFILLING WITH GABION STONE AND EXISTING IMBRICATED ROCK WALLS THAT ARE MARKED TO BE REPAIRED SHALL CONSIST OF REMOVING STONES, BACKFILLING WITH GABION STONE AND GROUTABLE FILL (AS NEEDED) AS SHOWN IN THESE DETAILS, AND REINSTALLING STONES. AREAS OF REPAIR EXHIBITED SLUMPING AND WASHOUT DUE TO POOR COMPAKATION AND UNSUITABLE MATERIAL FOR USE IN IMBRICATED WALLS.
- EXISTING IMBRICATED ROCK WALLS THAT ARE TO BE BUILT TO A HIGHER ELEVATION SHALL CONSIST OF REMOVING STONES, BACKFILLING WITH GABION STONE AND SUITABLE FILL (AS NEEDED) AS SHOWN IN THESE DETAILS, AND REINSTALLING STONES. THE IMBRICATED ROCK WALL SHALL BE BUILT TO THE ELEVATION WHERE EROSION IS OCCURRING ABOVE THE EXISTING IMBRICATED ROCK WALL.



ROCK STEP POOL DETAIL

ROCK STEP POOL NOTES:

- SMALL STONES SHALL BE USED TO MINIMIZE VOID SPACE.
- ROCK SHALL BE GRANITE THAT IS TAN, BROWN, OR GREY IN COLOR. NO WHITE STONE SHALL BE USED.
- TOP OF BOULDERS SHALL BE OBLONG AND FLAT IN APPEARANCE, SHALL BE STACKABLE, AND SHALL HAVE A MINIMUM OF TWO PARALLEL FACES.
- IF BEDROCK IS ENCOUNTERED, DO NOT DISTURB BEDROCK. COORDINATE WITH THE ENGINEER.

POOL BEDDING MIX

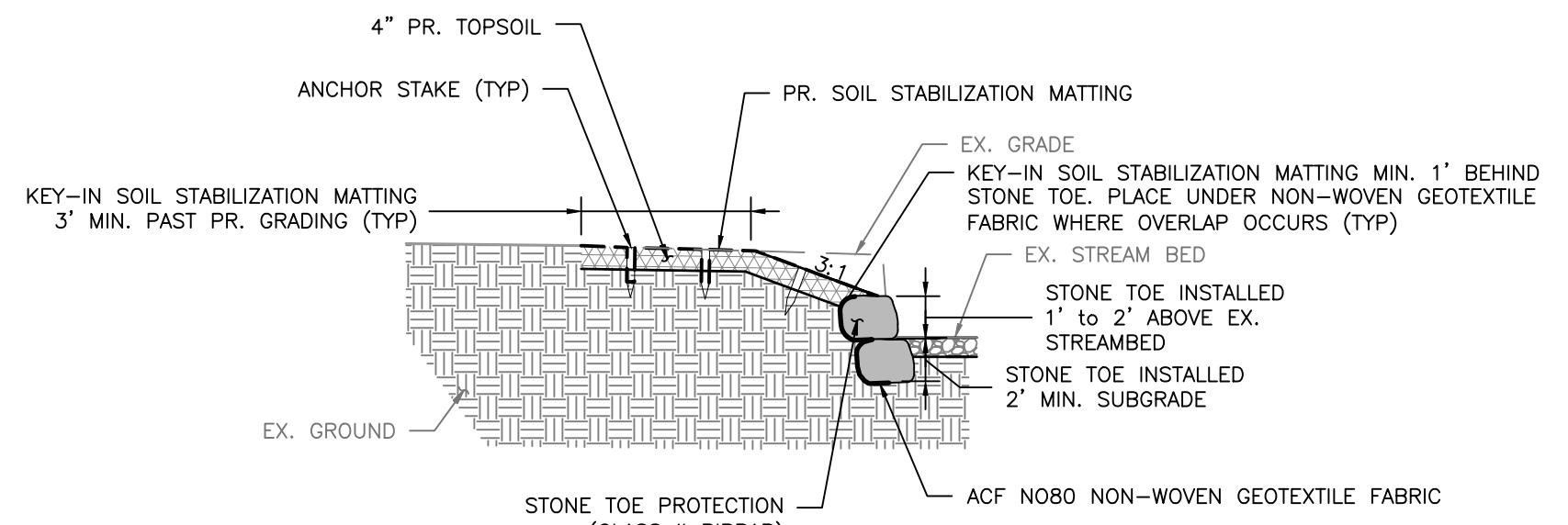
ROCK	ROCK SIZE	PERCENT OF MIX
GRAVEL	0.5 TO 2.5 INCHES	15%
CLASS 0 RIPRAP	D50 = 6"	15%
CLASS I RIPRAP	D50 = 9.5"	70%

STEP RIPRAP MIX

ROCK	ROCK SIZE	PERCENT OF MIX
CLASS 0 RIPRAP	D50 = 6"	15%
CLASS I RIPRAP	D50 = 9.5"	15%
CLASS III RIPRAP	D50 = 23"	70%

NOTES:

- ONSITE SALVAGED STONE MAY BE USED IF IT MEETS SIZING REQUIREMENTS IN THE POOL BEDDING MIX AND STEP RIPRAP MIX TABLES.



STONE TOE PROTECTION

NOT TO SCALE

STONE TOE PROTECTION NOTES:

- STONE SHALL BE UNDERLAIN BY NONWOVEN GEOTEXTILE FABRIC.
- WHEN BACKFILLING, ALL MATERIAL SHALL BE COMPAKED FIRMLY IN ALL VOIDS TO SECURE STONE. ALL SOIL SHALL BE COMPAKED TO MD-378 STANDARDS.
- STONE TOE PROTECTION SHALL BE CONSTRUCTED SUCH THAT ALL STONES SECURELY INTERLOCK AND SHALL NOT ROTATE IN PLACE.
- ALL ROCK SHALL BE GRANITE ROCK THAT IS TAN, DARK BROWN, OR DARK GRAY IN COLOR. ROCKS NOT MEETING SPECIFICATIONS SHALL BE REMOVED AND REPLACED AT NO COST TO THE CITY.
- SMALLER ROCK WILL BE UTILIZED TO FILL VOID SPACES BETWEEN STONE TO THE SATISFACTION OF THE COUNTY.
- THE MINIMUM DRY UNIT WEIGHT FOR ROCK SHALL BE 160 PCF.

STONE TOE MIX

ROCK	ROCK SIZE	PERCENT OF MIX
CLASS 0 RIPRAP	D50 = 6"	10%
CLASS I RIPRAP	D50 = 9.5"	10%
CLASS II RIPRAP	D50 = 16"	80%



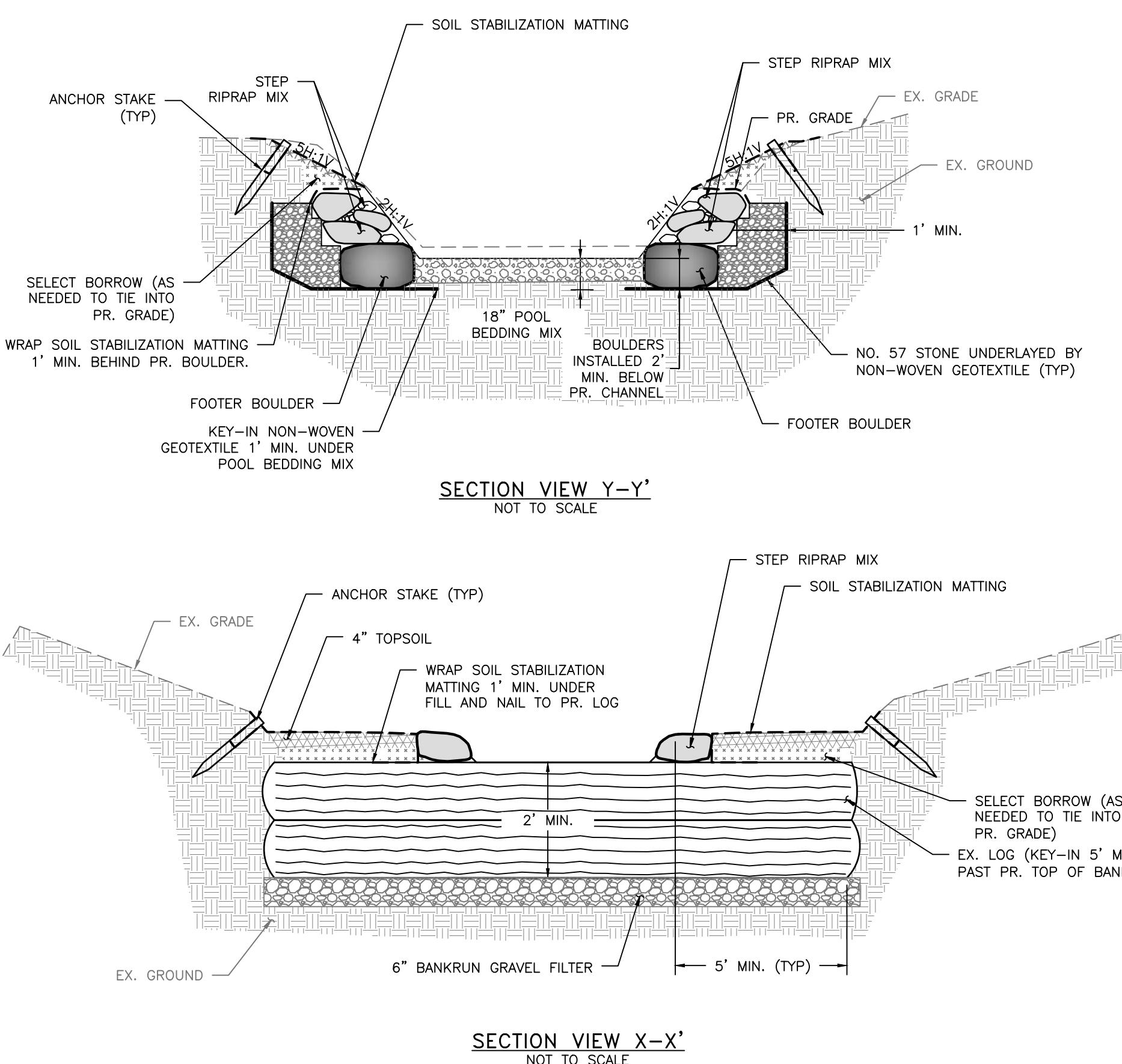
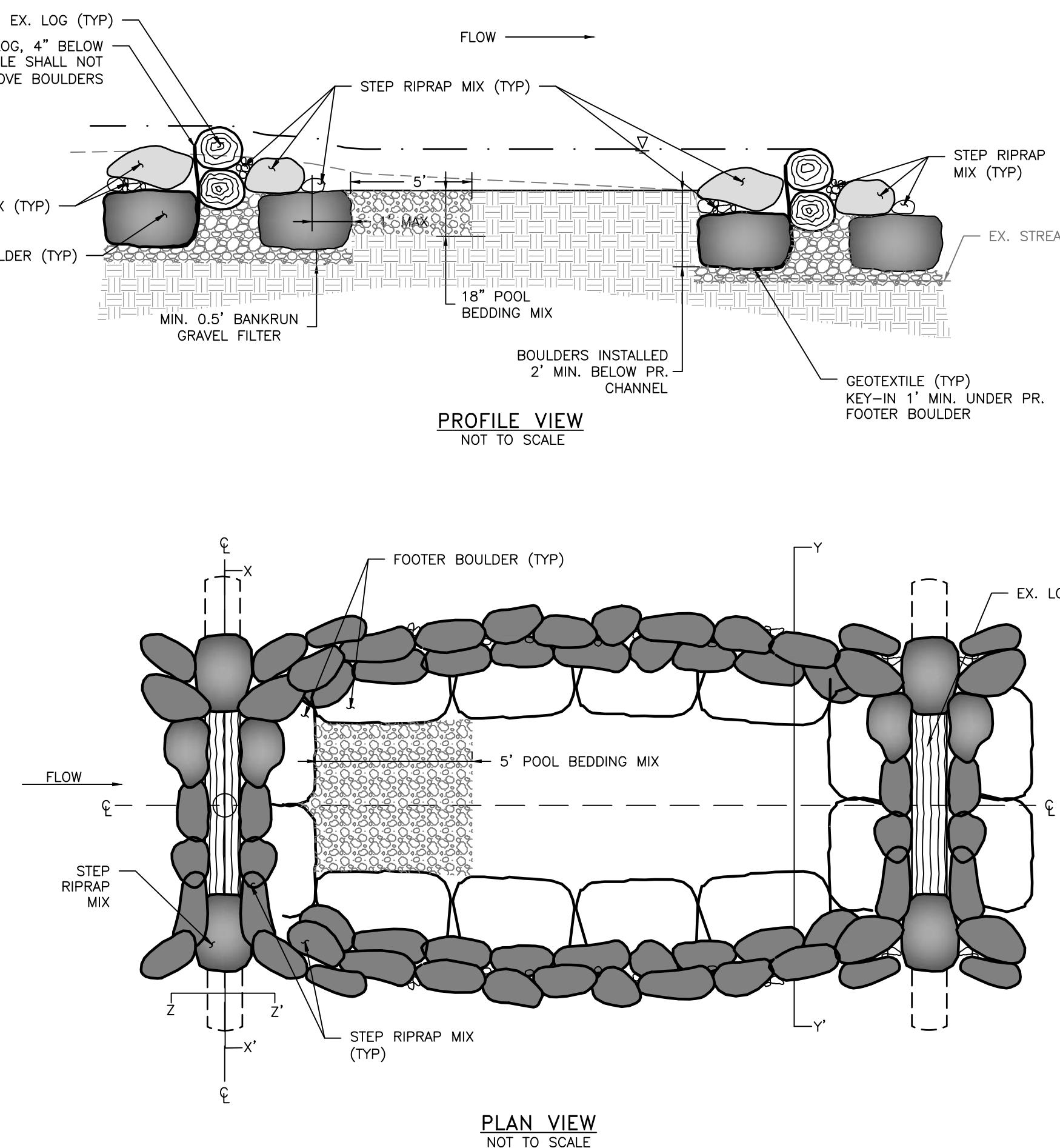
BILLING NO. XXXXXX
EG-SWMENG- XXXXXX-XXXX #XXXX
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME,
AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF
THE STATE OF MARYLAND, LICENSE NO. 200966, EXPIRATION DATE: 01/16/2025.

S/C PLAN # N/A	REVISIONS
GP # N/A	

HARFORD COUNTY, MARYLAND	
LOWER WHEEL CREEK STREAM RESTORATION REPAIRS PRELIMINARY DESIGN PLANS DETAILS	
DRAWN BY : MJG	SCALE : AS SHOWN
DESIGNED BY : MKS	DATE : 12/29/23
REVIEWED BY : CMS/SMC	
DRAWING NO. DE-01 OF DE-02	SHEET NO. 6 OF 10

REPAIR DESCRIPTION TABLE

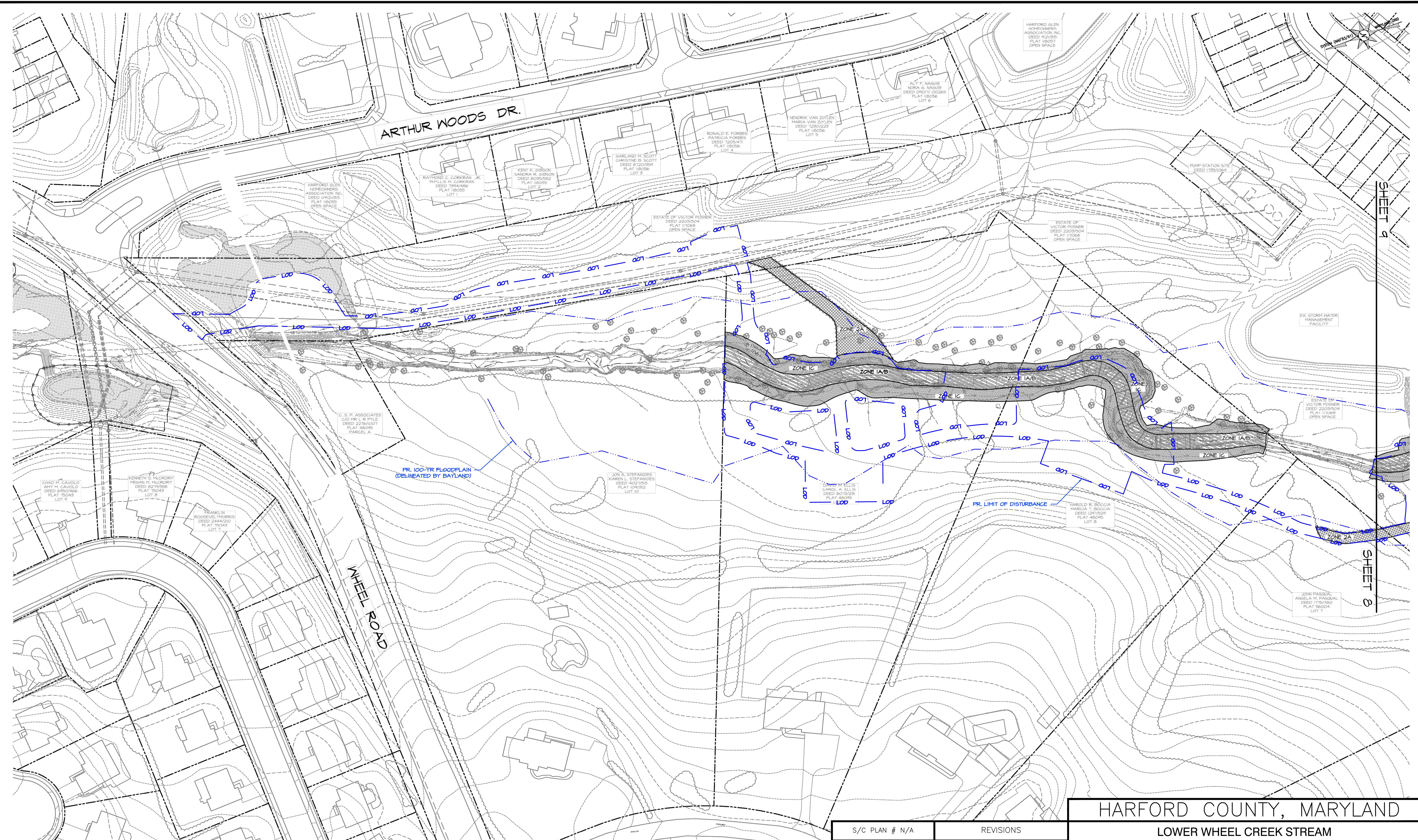
REPAIR NUMBER	DESCRIPTION OF REPAIR
1	BACKFILL WITH 1' MINIMUM GABION STONE AND SELECT BORROW AS NEEDED.
2	STONE TOE IS TO BE INSTALLED AT EXISTING BOTTOM OF BANK LOCATION WHERE TOEWOOD AND SOIL LIFTS HAVE WASHED OUT AND BANK IS ERODING. BOTTOM OF BANK ELEVATION IS AT APPROX. 182.4. LENGTH OF STONE TOE TO BE INSTALLED IS APPROX. 49 LF. BANK SHOULD BE CUT BACK AT A MINIMUM 3:1 SLOPE ABOVE STONE TOE.
3	STONE TOE IS TO BE INSTALLED AT EXISTING BOTTOM OF BANK LOCATION WHERE TOEWOOD AND SOIL LIFTS HAVE WASHED OUT AND BANK IS ERODING. BOTTOM OF BANK ELEVATION IS AT APPROX. 181.5. LENGTH OF STONE TOE TO BE INSTALLED IS APPROX. 27 LF. BANK SHOULD BE CUT BACK AT A MINIMUM 3:1 SLOPE ABOVE STONE TOE (TREES SHOULD NOT BE IMPACTED DURING GRADING)
4	PLACE LARGE STONE OVER EXPOSED GEOTEXTILE BEHIND LOG FOR APPROX. 13 LF. CUT ERODING BANK BACK AT A MINIMUM 3:1 SLOPE.
5	REMOVE LOG FROM LOG J-HOOK. STONE TOE IS TO BE INSTALLED AT EXISTING BOTTOM OF BANK LOCATION WHERE STONE HAS WASHED OUT AND BANK IS ERODING. BOTTOM OF BANK ELEVATION IS AT APPROX. 178.7. LENGTH OF STONE TOE TO BE INSTALLED IS APPROX. 45 LF. BANK SHOULD BE CUT BACK AT A MINIMUM 3:1 SLOPE ABOVE STONE TOE.
6	REMOVE IMBRICATED WALL AND BACKFILL WITH MINIMUM 1' GABION STONE AND SELECT BORROW AS NEEDED. RESET IMBRICATED ROCK WALL TO SAME ELEVATIONS.
7	REMOVE STONES WHERE IMBRICATED WALL IS FAILING AND BACKFILL WITH MINIMUM 1' GABION STONE AND SELECT BORROW AS NEEDED. RESET IMBRICATED ROCK WALL TO SAME ELEVATIONS.
8	RELOCATE STONE FROM MIDDLE OF CHANNEL TO EXISTING BOTTOM OF BANK LOCATION. BOTTOM OF BANK ELEVATION IS AT APPROX. 172.0. LENGTH OF STONE TOE TO BE INSTALLED IS APPROX. 57 LF. FOOTER FOR STONE TOE TO BE FURNISHED. BANK SHOULD BE CUT BACK AT A MINIMUM 3:1 SLOPE ABOVE STONE TOE.
9	IMBRICATED ROCK WALL IS TO BE INSTALLED AT EXISTING BOTTOM OF BANK LOCATION WHERE TOEWOOD AND SOIL LIFTS HAVE WASHED OUT AND BANK IS ERODING. LENGTH OF IMBRICATED ROCK WALL TO BE INSTALLED IS APPROX. 62 LF WITH A HEIGHT OF 3 FT. TOE BENCH TIE-IN SHALL BE RESET TO TIE-IN TO IMBRICATED ROCK WALL.
10	STONE TOE IS TO BE INSTALLED AT EXISTING BOTTOM OF BANK LOCATION WHERE TOEWOOD AND SOIL LIFTS HAVE WASHED OUT AND BANK IS ERODING. BOTTOM OF BANK ELEVATION IS AT APPROX. 169.1. LENGTH OF STONE TOE TO BE INSTALLED IS APPROX. 67 LF. BANK SHOULD BE CUT BACK AT A MINIMUM 3:1 SLOPE ABOVE STONE TOE.
11	IMBRICATED ROCK WALL IS TO BE INSTALLED AT EXISTING BOTTOM OF BANK LOCATION WHERE TOEWOOD AND SOIL LIFTS HAVE WASHED OUT AND BANK IS ERODING. LENGTH OF IMBRICATED ROCK WALL TO BE INSTALLED IS APPROX. 59 LF WITH A HEIGHT OF 3 FT. TOE BENCH TIE-IN SHALL BE RESET TO TIE-IN TO IMBRICATED ROCK WALL.
12	IMBRICATED ROCK WALL IS TO BE INSTALLED AT EXISTING BOTTOM OF BANK LOCATION WHERE TOEWOOD AND SOIL LIFTS HAVE WASHED OUT AND BANK IS ERODING. LENGTH OF IMBRICATED ROCK WALL TO BE INSTALLED IS APPROX. 53 LF WITH A HEIGHT OF 2.5 FT. TOE BENCH TIE-IN SHALL BE RESET TO TIE-IN TO IMBRICATED ROCK WALL.
13	STONE TOE IS TO BE INSTALLED AT EXISTING BOTTOM OF BANK LOCATION WHERE BANK IS ERODING. PRUNE TREE ROOTS AS NEEDED. LENGTH OF STONE TOE TO BE INSTALLED IS APPROX. 16 LF.
14	REMOVE FALLEN TREES ACROSS CHANNEL AND LOG STEPS. RESET IMBRICATED STONES THAT HAVE BEEN DISPLACED TO ORIGINAL ELEVATION.
15	RESET IMBRICATED STONES THAT HAVE BEEN DISPLACED TO ORIGINAL ELEVATION.
16	REBUILD ROCK STEP AT INVERT 143.6
17	INSTALL ROCK STEP AT INVERT 142.6
18	RESET FAILING STONE AND ADD ADDITIONAL STONE TO MIN. ELEVATION 138.1. BACKFILL WITH SELECT BORROW AS NEEDED. RESET STONE AT DOWNSTREAM TIE-IN AT NEW BANK LOCATION.
19	BACKFILL WITH SELECT BORROW WHERE EROSION HAS OCCURRED ON LEFT BANK OF LOG STEP. RESET STONE AS NEEDED.
20	REMOVE STONES WHERE ROCK WALL IS FAILING AND BACKFILL WITH MINIMUM 1' GABION STONE AND SELECT BORROW AS NEEDED. RESET ROCK WALL TO SAME ELEVATIONS.
21	REBUILD IMBRICATED ROCK WALL TO HEIGHT OF 4' BEGINNING AT APPROX. STA 28+55 (APPROX. 60 LF). BACKFILL IMBRICATED ROCK WALL WITH MINIMUM 1' GABION STONE AND SELECT BORROW AS NEEDED.



LOG STEP POOL DETAIL

LOG STEP POOL NOTES:
1. SMALL STONES SHALL BE USED TO MINIMIZE VOID SPACE.
2. ROCK SHALL BE GRANITE AND TAN, BROWN, OR GREEN COLOR. NO WHITE STONE SHALL BE USED.
3. FOOTER BOULDERS SHALL BE OBLONG AND FLAT IN APPEARANCE, SHALL BE STACKABLE, AND SHALL HAVE A MINIMUM OF TWO PARALLEL FACES.
4. SEE SHEET 6 FOR ROCK AND POOL BEDDING MIX SIZING.
5. NO NEW LOG STEPS ARE PROPOSED FOR THE SPOT REPAIRS. THESE DETAILS ARE INTENDED TO CONVEY THE REPAIRS TO THE EXISTING LOG STEPS. NO NEW LOGS ARE REQUIRED FOR THE REPAIRS.

S/C PLAN # N/A	REVISIONS	HARFORD COUNTY, MARYLAND	
GP # N/A		LOWER WHEEL CREEK STREAM RESTORATION REPAIRS PRELIMINARY DESIGN PLANS DETAILS	SCALE : AS SHOWN
BILLING NO. XXXXXX		DRAWN BY : MJG	DATE : 12/29/23
EG-SWMENG- XXXXX-XXXX #XXXX		DESIGNED BY : MKS	SCALE : 1 inch
PROFESSIONAL CERTIFICATION		REVIEWED BY : CMS/SMC	
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. 200966, EXPIRATION DATE: 01/16/2025.		DRAWING NO. DE-02 OF DE-02	SHEET NO. 7 OF 10



HARFORD COUNTY, MARYLAND

LOWER WHEEL CREEK STREAM RESTORATION REPAIRS PRELIMINARY DESIGN PLANS LANDSCAPING PLAN

S/C PLAN # N/A	REVISIONS	DRAWN BY : MJG	SCALE : 1" = 50'
GP # N/A		DESIGNED BY : MKS	
		REVIEWED BY : CMS/SMC	
		DRAWING NO. LP-01 OF LP-02	SHEET NO. 8 OF 10

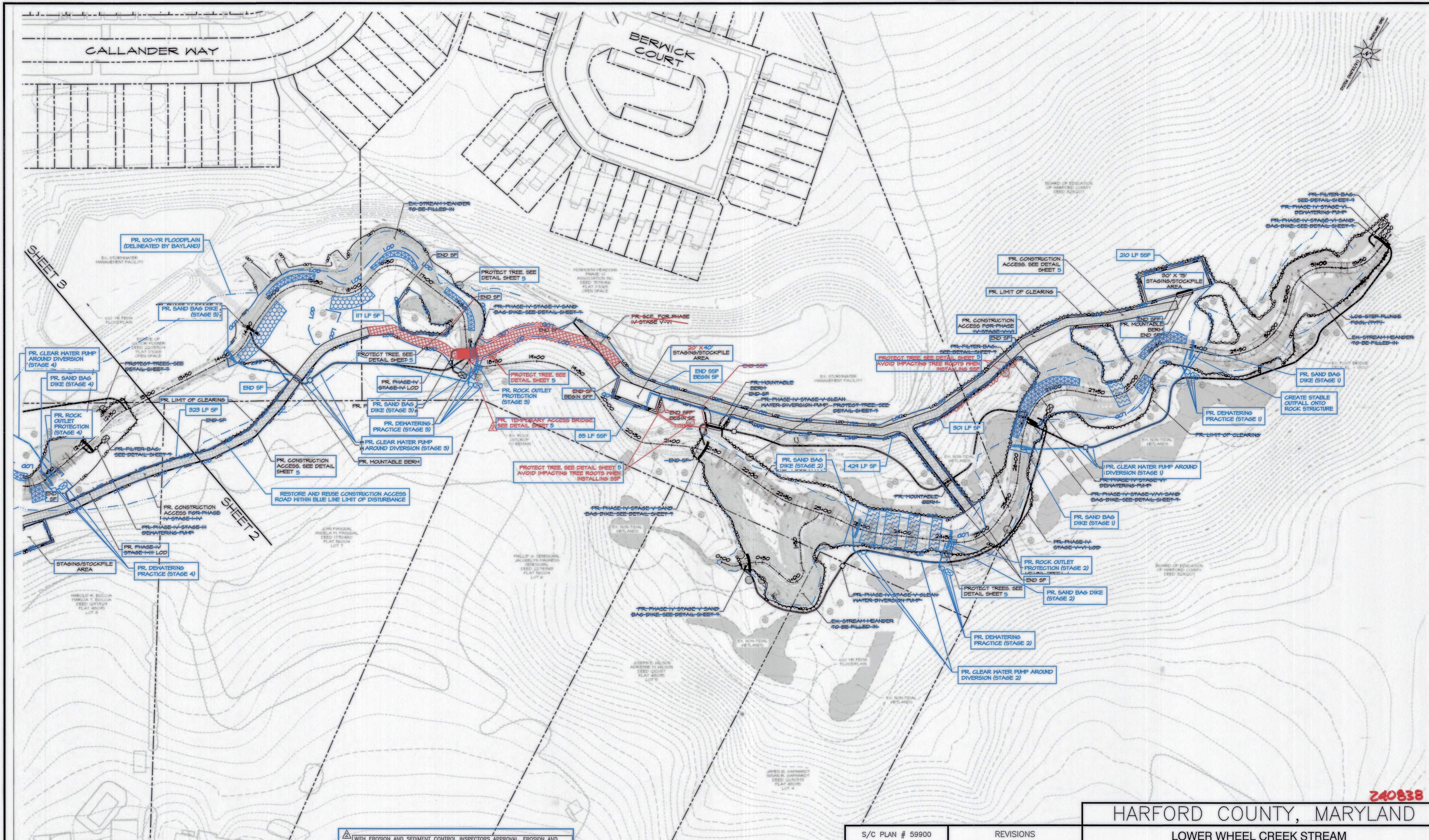


"Integrating Engineering and Environment"

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BAYLAND JOB NO. 4_4601

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PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME,
AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF
THE STATE OF MARYLAND, LICENSE NO. 200966, EXPIRATION DATE: 01/16/2025.



STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

A. SOIL PREPARATION

- 1. TEMPORARY STABILIZATION**
 - SEEDING PREPARATION CONSISTS OF LOOSENING SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENERED, IT MUST NOT BE ROLLED OR DRAGGED SMOOTH BUT LEFT IN THE ROUGHENED CONDITION. SLOPES 3:1 OR FLATTER ARE TO BE TRACKED WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.
 - APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS.
 - INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
- 2. PERMANENT STABILIZATION**
 - A SOIL TEST IS REQUIRED FOR ANY EARTH DISTURBANCE OF 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE:
 - SOIL PH BETWEEN 6.0 AND 7.0.
 - SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (PPM).
 - SOIL CONTAINS LESS THAN 40 PERCENT CLAY BUT ENOUGH FINE GRAINED MATERIAL (GREATER THAN 30 PERCENT SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION: IF LOVEGRASS WILL BE PLANTED, THEN A SANDY SOIL (LESS THAN 30 PERCENT SILT PLUS CLAY) WOULD BE ACCEPTABLE.
 - SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT.
 - SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
 - APPLICATION OF AMENDMENTS OR TOPSOIL IS REQUIRED IF ON-SITE SOILS DO NOT MEET THE ABOVE CONDITIONS.
 - GRADED AREAS MUST BE MAINTAINED IN A TRUE AND EVEN GRADE AS SPECIFIED ON THE APPROVED PLAN, THEN SCARIFIED OR OTHERWISE LOOSENERED TO A DEPTH OF 3 TO 5 INCHES.
 - APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE RESULTS OF A SOIL TEST.
 - MIX SOIL AMENDMENTS INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE METHODS. RAKE LAWN AREAS TO SMOOTH THE SURFACE, REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. LOOSEEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT ON A ROUGHENED SURFACE WHERE SITE CONDITIONS DO NOT PERMIT NORMAL SEEDING. PREPARATION TRUCK SLOPES 3:1 OR FLATTER WITH TRACKED EQUIPMENT LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. LEAVE THE TOP 1 TO 3 INCHES OF SOIL LOOSE AND FRIBLLE. SEEDBED LOOSENING MAY BE UNNECESSARY ON NEWLY DISTURBED AREAS.

B. TOPSOILING

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

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

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

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

b. THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUOUS SUPPLIES OF MOISTURE AND PLANT NUTRIENTS.

c. THE ORIGINAL SOIL IS BEVEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.

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

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

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

a. TOPSOIL MUST BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, OR LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. TOPSOIL MUST NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND MUST CONTAIN LESS THAN 5 PERCENT BY VOLUME OF CINDER, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1/2 INCHES IN DIAMETER.

b. TOPSOIL MUST BE FREE OF NOxious PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, NUT SEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.

c. TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL.

6. TOPSOIL APPLICATION

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

b. UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MAXIMUM THICKNESS OF 1 INCH. SPREADING CAN BE PERFORMED IN SUCH A MANNER THAT THE SOIL CAN BE DROPPED IN A MAXIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS MUST BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.

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

C. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)

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

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

3. LIME MATERIALS MUST BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED EXCEPT WHEN HYDROSEEDING) WHICH CONTAINS AT LEAST 50 PERCENT TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE MUST BE GROUND TO SUCH FINENESS THAT AT LEAST 50 PERCENT WILL PASS THROUGH A #100 MESH SIEVE AND 98 TO 100 PERCENT WILL PASS THROUGH A #20 MESH SIEVE.

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

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

NOTE: MODIFICATION OF STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS BY INSECURITIES IN THE SURFACE SHALL BE ALLOWED WITHIN REAS DESIGNATED FOR FLOODPLAIN MICROTOPOGRAPHY.

STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

A. SEEDING

1. SPECIFICATIONS

a. ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LAW. ALL SEED MUST BE SUBJECT TO RE-TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED MUST HAVE BEEN TESTED WITHIN THE 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF SOWING SUCH MATERIAL ON ANY PROJECT. REFER TO TABLE B.4 REGARDING THE QUALITY OF SEED. SEED TAGS MUST BE AVAILABLE UPON REQUEST TO THE INSPECTOR TO PROVIDE THE DATE OF SEEDING AND THE SOWING RATE.

b. MULCH ALONE MAY BE APPLIED DURING THE FALL AND SPRING SEEDING DATES ONLY IF THE GROUND IS FROZEN. THE APPROPRIATE SEEDING MIXTURE MUST BE APPLIED WHEN THE GROUND THAWs.

c. INCULCANTS: THE INOCULANT FOR TREATING LEGUME SEED IN THE SEED PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS MUST NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANTS AS DIRECTED ON THE PACKAGE. USE FOUR TIMES THE RATE OF INOCULANT TO THE SEED. HYDROSEEDING NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANT AS COOL AS POSSIBLE UNTIL USE. TEMPERATURES ABOVE 75 TO 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE THE INOCULANT LESS EFFECTIVE.

d. SOD OR SEED MUST NOT BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHYTO-TOXIC MATERIALS.

2. APPLICATION

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

i. INCORPORATE SEED INTO THE SUBSOIL AT THE RATES PRESCRIBED ON TEMPORARY SEEDING TABLE B.1, PERMANENT SEEDING TABLE B.3, OR SITE-SPECIFIC SEEDING SUMMARIES.

ii. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY THE SOWING RATE IN EACH DIRECTION. ROLL THE SEEDED AREA WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.

b. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.

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

ii. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY A FULL THE SOWING RATE IN EACH DIRECTION.

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

i. IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATE SHOULD NOT EXCEED THE FOLLOWING: NITROGEN, 100 POUNDS PER ACRE TOTAL; OF SOLUBLE NITROGEN; P205 (PHOSPHOROUS), 200 POUNDS PER ACRE; K2O (POTASSIUM), 200 POUNDS PER ACRE.

ii. LIME: USE ONLY GROUND AGRICULTURAL LIMESTONE (UP TO 3 TONS PER ACRE MAY BE APPLIED BY HYDROSEEDING). NORMALLY, NOT MORE THAN 2 TONS ARE APPLIED BY HYDROSEEDING AT ANY ONE TIME. DO NOT USE BURNT OR HYDRATED LIME WHEN HYDROSEEDING.

iii. MIX SEED AND FERTILIZER ON SITE AND SEED IMMEDIATELY AND WITHOUT INTERRUPTION.

iv. WHEN HYDROSEEDING DO NOT INCORPORATE SEED INTO THE SOIL.

B. MULCHING

1. MULCH MATERIALS (IN ORDER OF PREFERENCE)

a. STRAW CONSISTING OF THOROUGHLY THRESHED WHEAT, RYE, OAT, OR BARLEY, AND RECENTLY BRIGHT IN COLOR. STRAW IS TO BE FREE OF NOxious WEED SEEDS AS SPECIFIED IN THE MARYLAND STATE LAW AND NOT MUSTY, MOULDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY. NOTE: USE ONLY STERILE STRAW MULCH IN AREAS WHERE ONE SPECIES OF GRASS IS DESIRED.

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

i. WCFM IS TO BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY.

ii. WCFM, INCLUDING DYE, MUST CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.

iii. WCFM MATERIALS ARE TO BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER MULCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND WITH THE FERTILIZER AND OTHER ADDITIVES TO FORM A HOMOGENEOUS SLURRY. THE MULCH MATERIAL MUST FORM A BLOTTING AND GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND MUST COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDINGS.

iv. WCFM MATERIAL MUST NOT CONTAIN ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.

v. WCFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: FIBER LENGTH OF APPROXIMATELY 10 MILLIMETERS, DIAMETER APPROXIMATELY 1 MILLIMETER, PH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6 PERCENT MAXIMUM AND WATER HOLDING CAPACITY OF 90 PERCENT MINIMUM.

2. APPLICATION

a. APPLY MULCH TO ALL SEDED AREAS IMMEDIATELY AFTER SEEDING.

b. WHEN STRAW MULCH IS USED, SPREAD IT OVER ALL SEDED AREAS AT THE RATE OF 2 TONS PER ACRE TO A UNIFORM LOOSE DEPTH OF 1 TO 2 INCHES. APPLY MULCH TO ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. WHEN USING A MULCH ANCHORING TOOL, INCREASE THE APPLICATION RATE TO 2.5 TONS PER ACRE.

c. WOOD CELLULOSE FIBER USED AS MULCH MUST BE APPLIED AT A NET DRY WEIGHT OF 500 POUNDS PER ACRE. ADD THE WOOD CELLULOSE FIBER WITH A MIXTURE OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.

3. ANCHORING

a. PERFORM MULCH ANCHORING IMMEDIATELY FOLLOWING APPLICATION OF MULCH TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON THE SIZE AND AREA AND EROSION HAZARD:

i. A MULCH ANCHORING TOOL, WHICH IS A DOWEL IMPLANT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE A MINIMUM OF 2 INCHES. THIS PRACTICE IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PRACTICE SHOULD FOLLOW THE CONTOUR.

ii. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. APPLY THE FIBER BINDER AT A NET DRY WEIGHT OF 750 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER AT A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.

iii. SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRO-TACK), DCA-70, PETROSET, TERRA RX II, TERRATEC AR OR OTHER APPROVED EQUAL MAY BE USED. THESE BINDERS ARE SPECIALLY DESIGNED TO BE HEAVIER THAN WATER. MANUFACTURER APPLICATION OF LIQUID BINDERS NEEDS TO BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. USE OF ASPHALT BINDERS IS STRICTLY PROHIBITED.

iv. LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER RECOMMENDATIONS. NETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEET WIDE AND 300 TO 3,000 FEET LONG.

11. CULVERTS SHALL BE CONSTRUCTED AND ANY RIP RAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.

HARFORD COUNTY SEDIMENT CONTROL NOTES

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

a. **SEED BED PREPARATION:** LOOSEN UPPER THREE INCH BY RAKING, DISCING, OR OTHER ACCEPTABLE MEANS AFTER SPREADING FOUR INCHES OF TOP SOIL.

b. **SOIL AMENDMENTS:** APPLY 500 LBS. PER ACRE OF 10-10-10 FERTILIZER AND TWO TONS PER ACRE OF LIME.

c. **SEEDING:** FOR PERIODS 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. PER ACRE OF KENTUCKY BLUEGRASS.

FOR PERIOD OF MARCH 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: OPTIONS (1) 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, (2) USE SOD OR (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 SEDED AREAS IMMEDIATELY AFTER SEEDING. APPLY TWO TONS PER ACRE OF STRAW OVER ALL SEDED AREAS. IF MULCH ANCHORING TOOL IS TO BE USED, THE RATE SHALL BE INCREASED TO 2.5 TONS PER ACRE.** 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 1994 MARYLAND STANDARDS AND SPECIFICATIONS.

* IF OTHER SEED MIXES ARE TO BE SUBSTITUTED, THEY MUST COMPLY WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS, CHAPTER 20, TABLE 25. ** IF A DIFFERENT TYPE OF MULCH IS TO BE USED, IT MUST COMPLY WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS, CHAPTER 20.

HARFORD COUNTY TEMPORARY VEGETATIVE STABILIZATION

STAGES 1 TO 5 CAN BE CONSTRUCTED IN ANY ORDER, SEPARATELY AND/OR CONCURRENTLY, AT THE DISCRETION OF THE CONTRACTOR.

SEQUENCE:

1. CLEAR AND GRUB AS NECESSARY AND INSTALL STABILIZED CONSTRUCTION ENTRANCE, CONSTRUCTION ACCESS ROAD, TEMPORARY STOCKPILE AREAS, AND ASSOCIATED SEDIMENT AND EROSION CONTROL DEVICES.

2. INSTALL TREE PROTECTION MEASURES, HIGH VISIBILITY FENCE, TEMPORARY TRAFFIC CONTROL SIGNS, AND PRUNE AS NEEDED TO COMPLETE PROPOSED WORK.

STAGE 1 - STATION 26+15 TO STATION 29+00

1. INSTALL CLEAR WATER PUMP AROUND DIVERSION INCLUDING SAND BAG DIKES, PUMPS AND DIVERSION PIPES. CLEAR WATER PUMP AROUND DIVERSION SHALL BE USED FOR BASEFLOW ONLY. INSTALL DEWATERING PRACTICE TO DETERMINE SITE OF DIVERSION.

2. ONCE APPROVAL HAS BEEN OBTAINED FROM THE SEDIMENT CONTROL INSPECTOR, BEGIN WORK IN THE STAGE 1 AREA. REPAIR THE ROCK WALLS, IMBRIATED ROCK WALL, STONE TOE, AND LOG STEP IN ACCORDANCE WITH THE PLANS AND AS DIRECTED IN THE FIELD.

3. AFTER THE WORK AREA HAS BEEN STABILIZED AND WITH APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR, SHUTDOWN AND REMOVE/RELOCATE PUMP AND DEWATERING PRACTICES AS NEEDED TO COMPLETE NEXT STAGE OF WORK.

STAGE 2 - STATION 23+40 TO STATION 24+60

1. INSTALL CLEAR WATER PUMP AROUND DIVERSION INCLUDING SAND BAG DIKES, PUMPS AND DIVERSION PIPES. CLEAR WATER PUMP AROUND DIVERSION SHALL BE USED FOR BASEFLOW ONLY. INSTALL DEWATERING PRACTICE TO DETERMINE SITE OF DIVERSION.

2. ONCE APPROVAL HAS BEEN OBTAINED FROM THE SEDIMENT CONTROL INSPECTOR, BEGIN WORK IN THE STAGE 2 AREA. RE

