

NOTE: SEE SHEET 9 FOR EXISTING TREE SURVEY
 NOTE: SEE SHEET 34 FOR BORING LOGS

PLAN VIEW
 SCALE: 1" = 20'



REVISIONS

HARFORD COUNTY, MARYLAND

**STILLMEADOW STREAM & OUTFALL RESTORATION
 EXISTING CONDITIONS & DEMOLITION PLAN**

DRAWN BY: EM	CONTRACT NO.: 16-153
DESIGNED BY: MKB	SCALE: 1" = 20'
REVIEWED BY: MKB	SHEET 6 OF 35
	DATE: 07/22/19

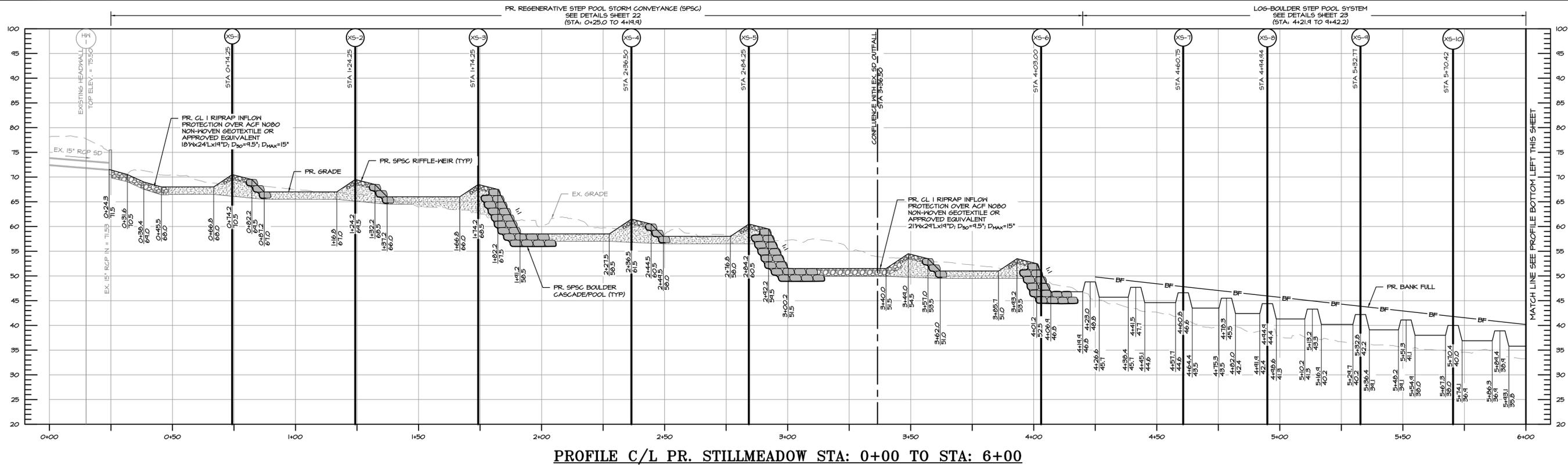
EG-SWMENG- 000372-2018 # 97032

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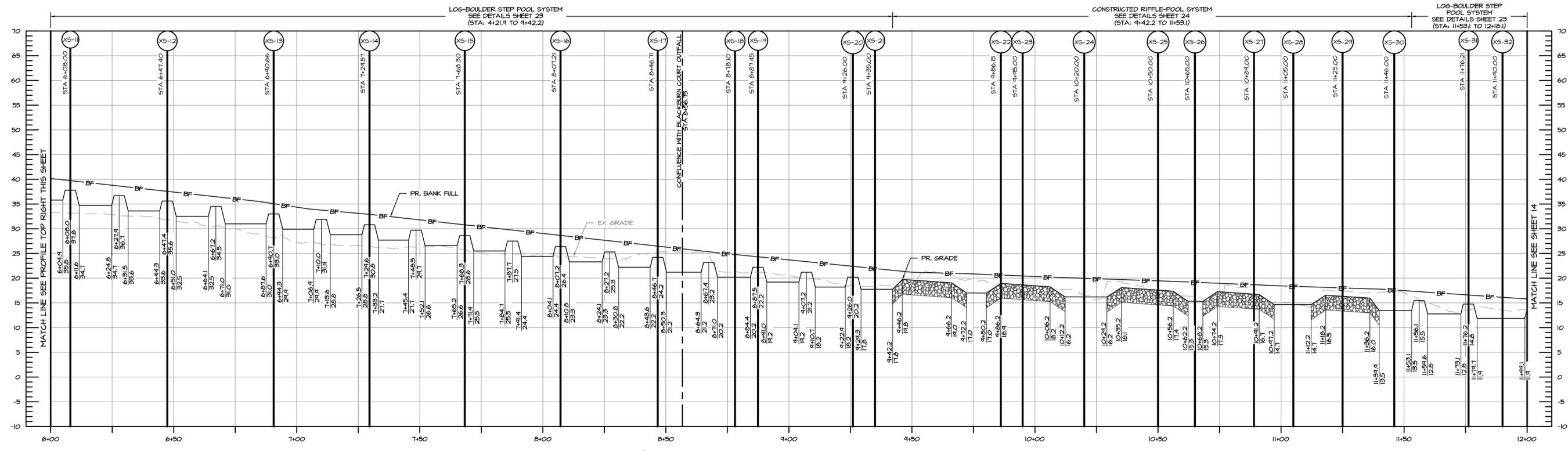


ADC MAP : TAX MAP : HCG BILLING ID No.: HCG DWG ID No.: SCALE: 1" = 20'



PROFILE C/L PR. STILLMEADOW STA: 0+00 TO STA: 6+00

SCALE: HORIZ. 1" = 20'
VERT. 1" = 10'



PROFILE C/L PR. STILLMEADOW STA: 6+00 TO STA: 12+00

SCALE: HORIZ. 1" = 20'
VERT. 1" = 10'

S/C PLAN # 59838 GRA # 15387-2018

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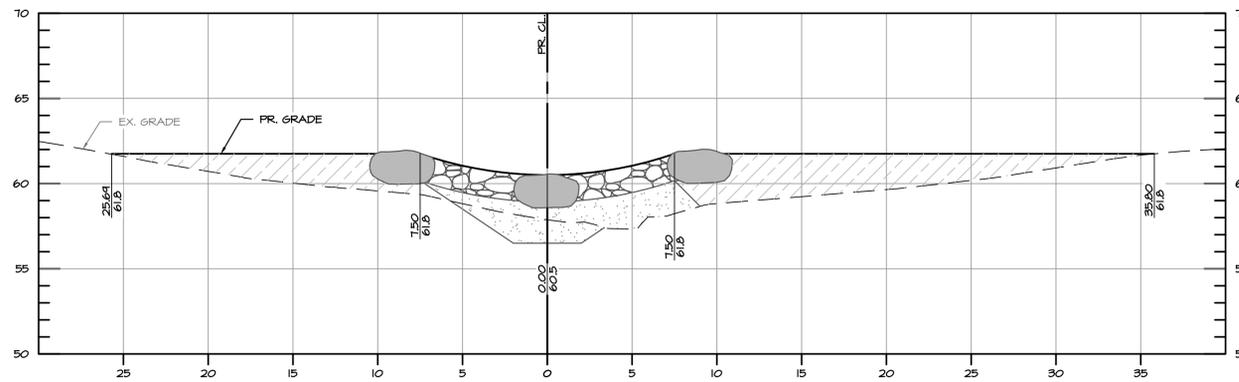
REVISIONS	

HARFORD COUNTY, MARYLAND

STILLMEADOW STREAM & OUTFALL RESTORATION PROFILES

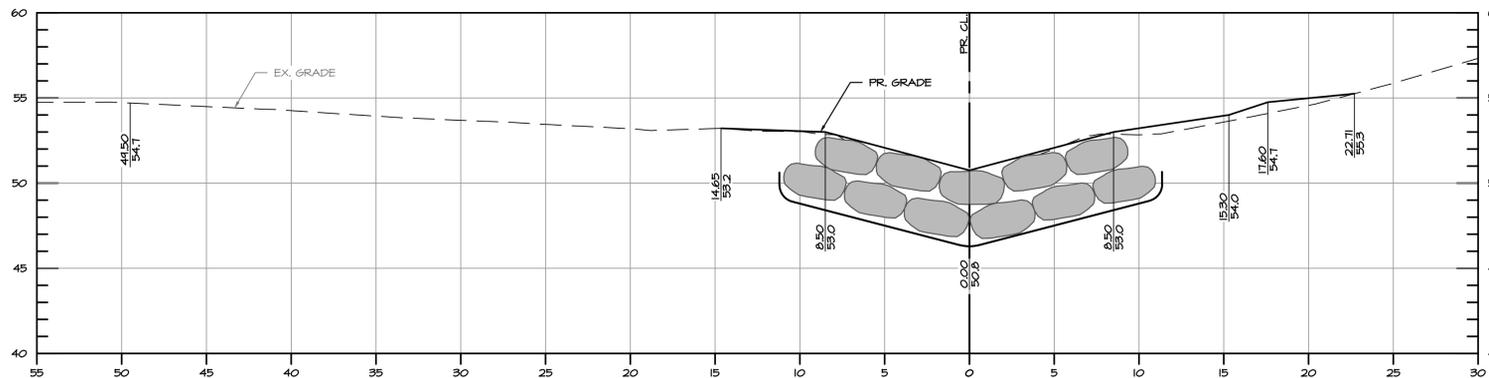
DRAWN BY: BF/EM/JP	CONTRACT NO.: 16-153
DESIGNED BY: MKB/RP/JP	SCALE: AS SHOWN
REVIEWED BY: MKB	SHEET 13 OF 35
	DATE: 07/22/19

ADC MAP : TAX MAP : HCG BILLING ID No.: SCALE: 1" = 10'



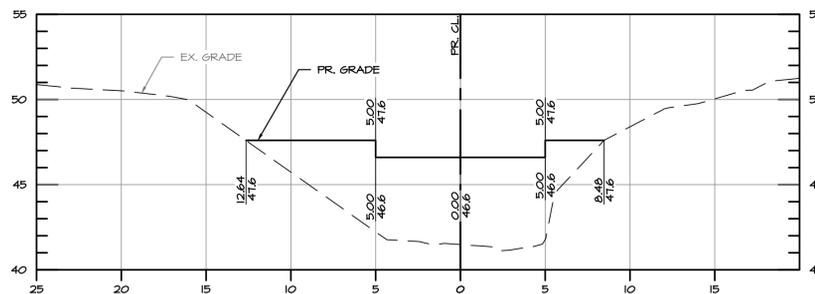
PROPOSED ALIGNMENT SECTION XS-5 STA 2+84

HORIZONTAL: 1" = 5'
VERTICAL: 1" = 5'



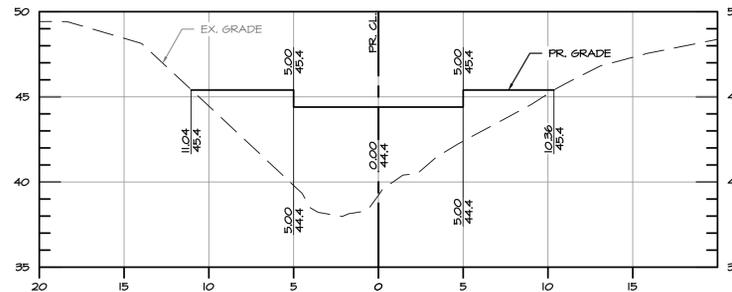
PROPOSED ALIGNMENT SECTION XS-6 STA 4+03

HORIZONTAL: 1" = 5'
VERTICAL: 1" = 5'



PROPOSED ALIGNMENT SECTION XS-7 STA 4+61

HORIZONTAL: 1" = 5'
VERTICAL: 1" = 5'



PROPOSED ALIGNMENT SECTION XS-8 STA 4+95

HORIZONTAL: 1" = 5'
VERTICAL: 1" = 5'

CROSS SECTION LEGEND

- EX. GRADE: - - - - -
- PR. GRADE: _____
- PR. SPSC COBBLE (d₅₀=6")
- PR. SPSC SAND/WOODCHIP MIX
- PR. SPSC/STEP POOL BOULDERS
- PR. FILTER FABRIC
- PR. SUITABLE FILL MATERIAL

NOTE: ROCKS SHOWN ON CROSS SECTION VIEWS ARE SYMBOLIC AND DO NOT REPRESENT INDIVIDUAL STONES. SEE ROCK SIZING TABLES SHEET 22 FOR ACTUAL ROCK DIMENSIONS.

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REVISIONS		HARFORD COUNTY, MARYLAND	
		STILLMEADOW STREAM & OUTFALL RESTORATION CROSS SECTIONS	
DRAWN BY: _____	EM/BF/DL	CONTRACT NO. : _____	16-153
DESIGNED BY: _____	MKB/RP/JP	SCALE : _____	AS SHOWN
REVIEWED BY: _____	MKB	SHEET _____	16 OF 35
		DATE : _____	07/22/19

TAX MAP : ADC MAP : HCG BILLING ID No.: HCG DWG ID No.: SCALE: 1" = 5'

SPSC CONSTRUCTION SPECIFICATIONS

MATERIALS

THE CONTRACTOR WILL NOT BE GRANTED AN EXTENSION OF EXTRA TIME OR EXTRA COMPENSATION DUE TO DELAY CAUSED BY SAMPLING, TESTING, APPROVAL OR DISAPPROVAL OF THE MATERIALS UNDER THE REQUIREMENTS OF THESE SPECIFICATIONS. THE MATERIAL SHALL BE AS SPECIFIED ON THE SPSC ROCK SIZE TABLE AND HEREIN. IF SUFFICIENT MATERIAL IS NOT AVAILABLE FROM THE SITE, THE CONTRACTOR SHALL OBTAIN MATERIAL FROM A QUARRY AND PROVIDE CERTIFICATION OF GRADATION ANALYSIS OR SAMPLE OF STONE TO THE COUNTY FOR APPROVAL PRIOR TO INSTALLATION. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO MAKE ALL NECESSARY ARRANGEMENTS WITH THE SOURCE OF SUPPLY IN A TIMELY FASHION, SO THAT THE CONTRACTOR SHALL MAINTAIN AN ADEQUATE SUPPLY OF ALL MATERIALS AND THAT WORK SHALL NOT BE UNNECESSARILY DELAYED DUE TO INSUFFICIENT SUPPLY.

CASCADE, FOOTER, AND WEIR BOULDERS - BOULDERS SHALL BE AS SPECIFIED ON THE SPSC ROCK SIZE TABLE. BOULDERS SHALL BE SANDSTONE, STACKABLE, OBLONG, AND FLAT IN APPEARANCE, AND DARK BROWN OR DARK GRAY IN COLOR. IN GENERAL, FOOTER ROCKS SHALL BE SELECTED TO BE THE LARGEST ROCKS AVAILABLE. FOOTER ROCKS SHALL BE PLACED AT THE BOTTOM AND DOWNSTREAM SIDE OF THE TRENCH. FOOTER BOULDERS SHALL EXTEND 2 FEET BELOW THE LOWEST POINT IN THE EXCAVATED POOL. GRANITE BOULDERS MAY BE SUBSTITUTED FOR SANDSTONE BOULDERS IF THE CONTRACTOR SHOWS THE COUNTY DUE DILIGENCE IN ATTEMPTING TO LOCATE SANDSTONE BOULDERS. ANY SUBSTITUTION WILL BE AT NO COST TO THE COUNTY.

SUBANGULAR SILICA COBBLE - THE STONE SHALL BE SUBANGULAR SILICA COBBLE AND THE STONE SIZE SHALL BE AS SPECIFIED ON THE SPSC ROCK SIZE TABLE. SUBANGULAR SILICA COBBLE SHALL BE COMPOSED OF A WELL-GRADED MIXTURE OF STONE SIZE SO THAT 50% OF THE PIECES, BY WEIGHT, SHALL BE LARGER THAN THE D50 SIZE DETERMINED BY USING CHARTS PREPARED BY THE US DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE. 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 LARGE VOIDS BETWEEN THE STONES. THE DIAMETER OF THE LARGEST STONE SIZE SHALL NOT EXCEED 1.5 TIMES THE SPECIFIED D50 SIZE.

SAND/WOOD CHIP FILTER MEDIA - SAND SHALL BE AS SPECIFIED ON THE SPSC ROCK SIZE TABLE. SAND SUBSTITUTIONS SUCH AS DIABASE AND GRAYSTONE (ASHTO) #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATED OR OILIMATIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND.

WOOD CHIPS SHALL BE EITHER HARDWOOD OR SOFTWOOD PRODUCED BY A CHIPPING MACHINE TO A MAXIMUM SIZE OF 2 1/2 X 0.5 INCHES. WOOD CHIPS SHALL BE FREE FROM LEAVES, TWIGS, WOOD SHAVINGS, FINES, SAWDUST, TOXIC SUBSTANCES, AND ALL FOREIGN MATERIAL. THE WOODCHIPS ARE ADDED TO THE SAND MIX (PRIOR TO PLACEMENT), APPROXIMATELY 20% BY VOLUME, TO INCREASE THE ORGANIC CONTENT AND PROMOTE PLANT GROWTH AND SUSTAINABILITY.

THE SAND/WOODCHIP MIX FILTER BED SHALL HAVE A MINIMUM DEPTH OF EIGHTEEN (18) INCHES UNDER THE RIFLE CHANNEL/POOL BOTTOM AND A MINIMUM WIDTH OF FOUR (4) FEET AND SHALL BE PLACED AS THE SUBSTRATE DRAINAGE MATERIAL ALONG THE ENTIRE PROJECT LENGTH.

COMPOST - COMPOST SHALL HAVE A PH BETWEEN 5.0 AND 7.0. IT SHALL BE STABLE AND NOT REHEAT UPON RESTACKING. COMPOST SHALL HAVE A MOISTURE CONTENT BETWEEN 30 AND 55 PERCENT, AND A PARTICLE SIZE OF 0.5 INCHES OR LESS. COMPOST SHALL BE SOURCE-SEPARATED COMPOST (TYPE B), APPROVED BY THE MARYLAND DEPARTMENT OF AGRICULTURE (MDA). COMPOST SHALL BE PRODUCED BY AN MDA CERTIFIED COMPOST OPERATOR AND HAVE A SOLUBLE SALT CONCENTRATION NOT TO EXCEED 5 DS (MMHOS/CM). THE SOURCE-SEPARATED COMPOST SHALL BE ONE OF THE FOLLOWING TYPES:
A. TREE LEAF COMPOST
B. NON-TREE LEAF COMPOST. WHEN COMPOST IS FROM LAWN CLIPPINGS, IT SHALL BE TESTED IN CONFORMANCE WITH COMAR 15.18.04.05.

GEOTEXTILE FABRIC - GEOTEXTILE FABRIC SHALL MEET OR EXCEED THE REQUIREMENTS OF ACF N080 POLYPROPYLENE NONWOVEN GEOTEXTILE FABRIC. THE CONTRACTOR SHALL PROVIDE MATERIAL SPECIFICATION TO THE COUNTY FOR APPROVAL. GEOTEXTILE FABRIC SHALL BE PLACED UNDER ALL BOULDERS. REFER TO CONSTRUCTION DRAWINGS FOR PLACEMENT LOCATION, TO PREVENT UNDERCUTTING, A CONTINUOUS SHEET OF GEOTEXTILE FABRIC SHALL BE USED ALONG THE CROSS-SECTION. GEOTEXTILE FABRIC SHALL NOT BE PLACED IN THE POOLS SO AS NOT TO IMPEDE FILTRATION.

CLASS 1 RIPRAP - RIPRAP SHALL MEET CLASS 1 RIPRAP REQUIREMENTS, PER HARFORD COUNTY STANDARD SPECIFICATIONS FOR CONSTRUCTION, SECTION 901.02 AND AS DESCRIBED ON THE CONSTRUCTION DRAWINGS.

BACKFILL - BACKFILL SHALL MEET HARFORD COUNTY STANDARD SPECIFICATIONS FOR CONSTRUCTION, SECTION 916.01 AND AS DESCRIBED ON THE CONSTRUCTION DRAWINGS.

SUBMITTALS

CASCADE, FOOTER, AND WEIR BOULDERS - THE CONTRACTOR WILL LOCATE POTENTIAL SOURCES FOR THE STONE. THE CONTRACTOR AND THE COUNTY OR ITS AGENT WILL JOINTLY VISIT THE SOURCE SITES TO DETERMINE WHETHER THE STONE MEETS THE SPECIFIED REQUIREMENTS AND WHETHER THERE ARE SUFFICIENT QUANTITIES OF THE STONE TO MEET THE PROJECT REQUIREMENTS. THE CONTRACTOR SHALL SUBMIT TO THE COUNTY A CERTIFICATE VERIFYING THE FOLLOWING BOULDER INFORMATION:

- (1) STONE CLASSIFICATION
- (2) STONE DENSITY (I.E., WEIGHT PER CUBIC FOOT)
- (3) WEIGHT OF STONE BEING SUPPLIED.
- (4) STONE QUALITY SHALL MEET ALL OF THE ABOVE SPECIFICATIONS.

SUBANGULAR SILICA COBBLE - THE CONTRACTOR SHALL OBTAIN COBBLE SAMPLES FROM THE QUARRY AND SUBMIT TO THE COUNTY THE SAMPLES AND A CERTIFICATE VERIFYING THE FOLLOWING BOULDER INFORMATION:

- (1) STONE CLASSIFICATION
- (2) STONE DENSITY (I.E., WEIGHT PER CUBIC FOOT)
- (3) WEIGHT OF STONE BEING SUPPLIED.
- (4) STONE QUALITY SHALL MEET ALL OF THE ABOVE SPECIFICATIONS.

SAND/WOOD CHIP FILTER MEDIA - THE CONTRACTOR SHALL PROVIDE THE SOURCE AND MATERIAL SPECIFICATIONS TO THE COUNTY FOR APPROVAL.

COMPOST - THE CONTRACTOR SHALL OBTAIN A COMPOST SAMPLE AND SUBMIT TO THE COUNTY FOR APPROVAL OF THE SAMPLE AND CERTIFICATE WITH THE SOURCE AND SPECIFICATIONS OF THE COMPOST.

GEOTEXTILE FABRIC - THE CONTRACTOR SHALL PROVIDE MATERIAL SPECIFICATION TO THE COUNTY FOR APPROVAL.

CLASS 1 RIPRAP - THE CONTRACTOR SHALL OBTAIN CERTIFICATION FROM THE QUARRY FOR THE ROCK AND SUBMIT TO THE COUNTY FOR APPROVAL. THE CERTIFICATION SHALL INCLUDE:

- (1) STONE SIZE
- (2) STONE DENSITY (I.E., WEIGHT PER CUBIC FOOT)
- (3) THAT SIZES STIPULATED IN THE SPECIFICATIONS ARE BEING SUPPLIED TO THE SITE, WITH SOURCE(S) OF STONE INDICATED
- (4) THAT STONE QUALITY WILL MEET ALL PROJECT SPECIFICATIONS.

CONSTRUCTION

THE SPSC SYSTEM SHALL BE INSTALLED ACCORDING TO THE SEQUENCE OF CONSTRUCTION, THE CONSTRUCTION DRAWINGS, THESE SPECIFICATIONS, AND AS DIRECTED BY THE COUNTY.
CONSTRUCTION OF THE SPSC SYSTEM SHALL BEGIN AT THE DOWNSTREAM END AND PROCEED UPSTREAM TO THE OUTFALL.

THE SAND/WOOD CHIP FILTER MEDIA SHALL BE USED FOR FILLING THE FACILITY BOTTOM TO ACHIEVE THE GRADE NECESSARY FOR THE INSTALLATION OF THE WEIRS. THE SAND/WOODCHIP FILTER BED SHALL HAVE A MINIMUM DEPTH OF 18 INCHES UNDER THE RIFLE CHANNEL AND A MINIMUM WIDTH OF 4 FEET AND SHALL BE PLACED AS THE SUBSTRATE DRAINAGE MATERIAL ALONG THE ENTIRE PROJECT LENGTH.

THE CASCADE SHALL BE CONSTRUCTED WITH A SERIES OF RIBS IN AN ARC FORMATION PERPENDICULAR TO THE FACILITY. THE CENTER AND UPSTREAM APPEX OF EACH RIB SHALL BE SET IN THE PROPOSED SPILLWAY CENTERLINE. RIBS ARE ARRANGED IN A SERIES WITH LOCATIONS INDICATED IN THE CONSTRUCTION DRAWINGS.

FOOTER ROCKS FOR EACH INDIVIDUAL RIB SHALL BE INSTALLED BY EXCAVATING A TRENCH TO ACCOMMODATE BOTH THE FOOTER ROCKS AND A 2-FOOT AREA UPSTREAM. GEOTEXTILE FABRIC SHALL BE PLACED ON THE UPSTREAM SIDE OF THE TRENCH OF EACH RIB, SO THE FOOTER ROCK OVERLAPS THE MATERIAL. A MINIMUM OF 1.0 FOOT, THE GEOTEXTILE FABRIC SHALL SPAN THE WIDTH OF THE RIB. THE FOOTER ROCKS SHALL BE PLACED AT THE BOTTOM OF THE TRENCH AND SHALL ABUT ONE ANOTHER. FOOTER ROCKS SHALL BE FIRMLY EMBEDDED INTO THE TRENCH BOTTOM. THE TOP ELEVATION OF THE FOOTER ROCK PLACED AT THE CENTERLINE OF THE SPILLWAY SHALL BE BELOW THE PROPOSED FINISHED GRADE.

THE TRENCH BEHIND THE FOOTER ROCKS SHALL BE BACKFILLED BEFORE THE TOP ROCKS ARE SET, WITH THE GEOTEXTILE FABRIC BETWEEN THE FOOTER ROCK AND STREAM BED MATERIAL, TAKING CARE TO FILL ALL VOIDS BETWEEN THE FOOTER ROCKS WITH THE BED MATERIAL.

TOP ROCKS SHALL BE PLACED DIRECTLY ON TOP OF THE FOOTER ROCKS AND FIT TIGHTLY AGAINST EACH OTHER. CARE SHOULD BE TAKEN WHEN PLACING TOP ROCKS THAT THE SEAMS BETWEEN TOP ROCKS DO NOT LINE UP WITH THE SEAMS BETWEEN THE FOOTER ROCKS. THE TOP ELEVATION OF THE TOP ROCK PLACED AT THE CENTERLINE OF THE STREAM SHALL BE FLUSH WITH THE PROPOSED STREAM GRADE IMMEDIATELY UPSTREAM AND DOWNSTREAM OF THE CASCADE RIB. STARTING AT THE CENTERLINE, ADJACENT ROCKS SHALL TAPER TO THE OUTSIDE LIMIT OF THE RIB WHERE 1/2 THE DIAMETER OF THE END ROCK SHALL BE KEVED INTO THE BANK.

THE TRENCH BEHIND THE TOP ROCKS SHALL BE BACK-FILLED WITH CASCADE BED MATERIAL, WITH THE GEOTEXTILE FABRIC BETWEEN THE TOP ROCK AND CASCADE BED MATERIAL. THE GEOTEXTILE FABRIC SHALL BE KEVED IN A MINIMUM OF 1 FOOT BELOW THE TOP ROCK OR CUT A MINIMUM OF SIX INCHES BELOW THE TOP ROCK, BEFORE INSTALLING THE STREAM BED MATERIAL TO THE PROPOSED GRADE. THE CONTRACTOR SHALL TAKE CARE TO FILL ALL VOIDS UNDERNEATH AND BETWEEN THE TOP ROCKS. CASCADE BED MATERIAL SHALL BE PLACED A MINIMUM OF 2 FEET UPSTREAM OF THE FIRST RIB OF EACH CASCADE STRUCTURE AS SPECIFIED IN THE CONSTRUCTION DRAWINGS.

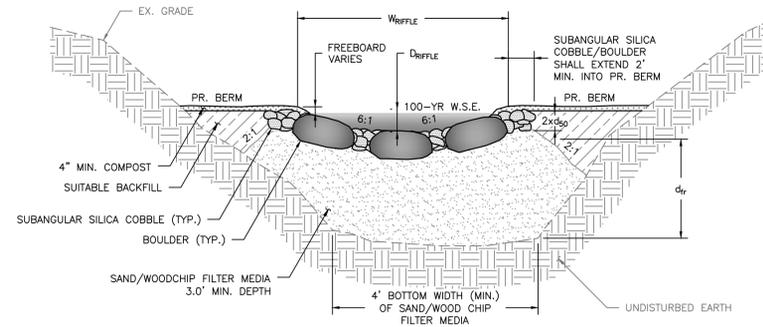
EACH SUCCESSIVE CASCADE RIB SHALL BE INSTALLED FOLLOWING THE STEPS ABOVE. THE TOP ELEVATION OF ROCKS ALONG RIBS SHALL VARY UP TO 1 FOOT TO CREATE VARIED FLOW PATTERNS. THE EXISTING GULLY SHALL BE BACKFILLED PER THE CONSTRUCTION DRAWINGS AND THESE SPECIFICATIONS WITH THE CASCADE INSTALLATION. ONCE THE CASCADE IS COMPLETE AND GULLY HAS BEEN BACKFILLED, THE CONTRACTOR SHALL INSTALL THE RIPRAP OUTFALL PROTECTION FROM THE OUTFALL AND TIE-INTO THE TOP CASCADE RIB.

FOOTER BOULDERS SHALL BE PLACED AT THE INTERFACE OF THE POOLS AND RIFLES AS SHOWN ON THE CONSTRUCTION DRAWINGS. A CONTINUOUS SHEET OF GEOTEXTILE FABRIC SHALL BE USED TO SEPARATE THE SAND/WOOD CHIP FILTER MEDIA AND THE BOULDERS THAT LINE THE FACILITY BOTTOM. ADDITIONAL BOULDERS SHALL BE PLACED ON TOP OF THE FOOTER BOULDERS AT THE WEIR ELEVATION UPSTREAM OF THE FOOTER BOULDERS TO FORM THE WEIR CHANNEL PARABOLIC SHAPE. BOULDERS SHALL BE ARRANGED HORIZONTALLY IN THE CENTER OF THE CHANNEL AND THE ARMS ON EITHER SIDE OF THE CHANNEL SHALL BE EXTENDED PARABOLICALLY/APPROXIMATELY 20 DEGREE ANGLE LONGITUDINALLY TO THE CENTER OF THE POOL. THE BOULDERS SHALL BE ARRANGED TO MAXIMIZE INTERLOCKING. THE FACE OF THE BOULDERS SHALL BE TILTED DOWNSTREAM TO OCCUPY HALF OF THE INCLINE (6° VERTICAL) MADE UP OVER THE ENTIRE LENGTH OF THE WEIR.

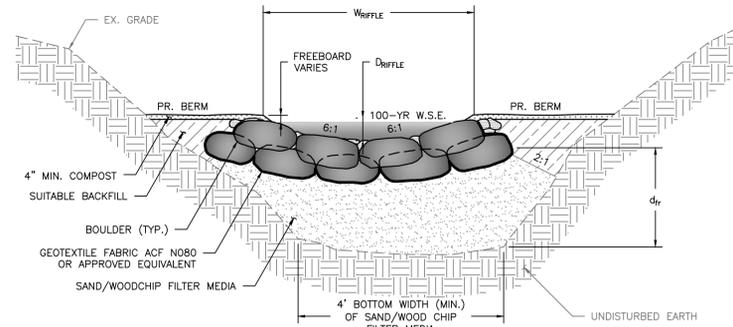
ONCE THE BOULDERS HAVE BEEN PLACED, FILL WITH 75% SUBANGULAR SILICA COBBLE AND 25% BOULDERS TO FORM THE BACKSIDE OF THE WEIR. A SMALL SUBANGULAR SILICA COBBLE APRON SHALL BE PLACED WHERE THE BOULDERS MEET THE POOL ON THE DOWNSTREAM SIDE. ONCE THE WEIR-POOL COMBINATION IS COMPLETE, THE ENTIRE SURFACE SHALL BE STABILIZED WITH WOOD CHIPS AND TEMPORARY SEEDING. ANY DISTURBED AREA SHALL BE STABILIZED AT THE END OF EACH WORKING DAY WITH WOOD CHIPS AND TEMPORARY SEEDING.

DISCONNECT THE DIVERSION PIPE ABOVE THE COMPLETED WEIR IN THE UPSTREAM POOL AND EXCAVATE UPSTREAM POOL FROM SAND BED USING EXCAVATED MATERIAL TO BLEND EDGES OF DOWNSTREAM WEIR AND SURROUNDING GRADE. CONTINUE THE PROCESS OF ALTERNATING POOLS AND RIFLES/WEIRS UP THROUGH THE SYSTEM TO THE CASCADE.

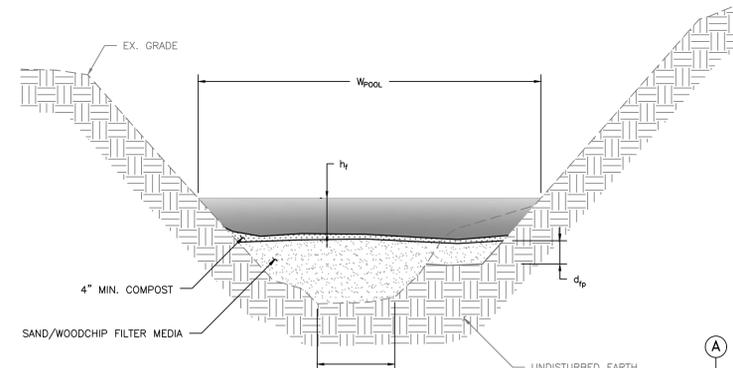
COMPOST SHALL BE BLOWN OVER THE ENTIRE SPSC SITE, INCLUDING IN THE POOL FOR FINAL STABILIZATION AND PERMANENT SEEDING AS INDICATED IN THESE CONSTRUCTION DRAWINGS.



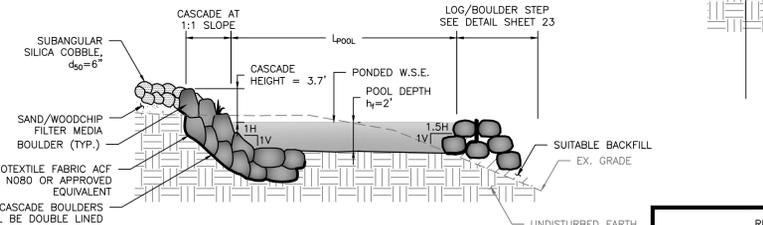
SECTION A
WEIR BACK VIEW (THROUGH COBBLE)
FILTER MEDIA IN FILL
SCALE: NOT TO SCALE



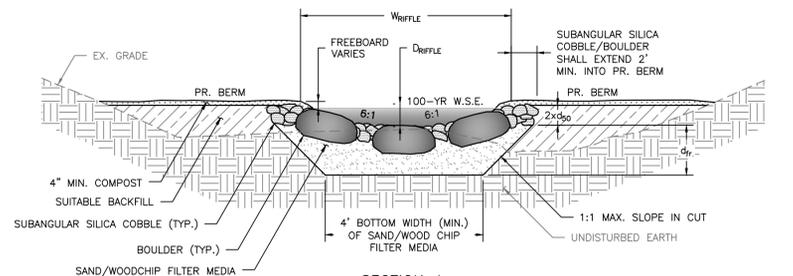
SECTION B
WEIR FRONT VIEW (THROUGH BOULDER)
SCALE: NOT TO SCALE



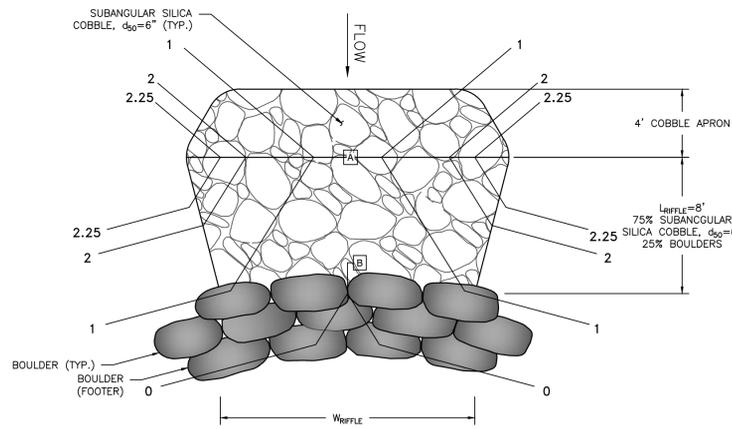
SECTION C
THROUGH POOL
SCALE: NOT TO SCALE



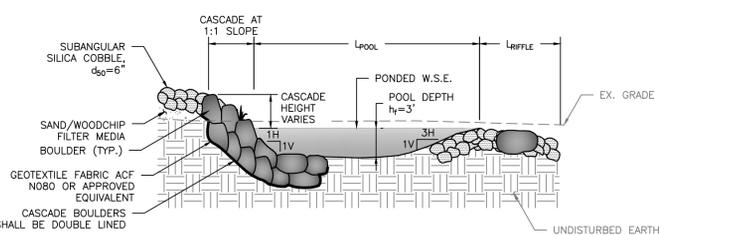
SPSC CASCADE/POOL TO LOG/BOULDER STEP
SCALE: NOT TO SCALE



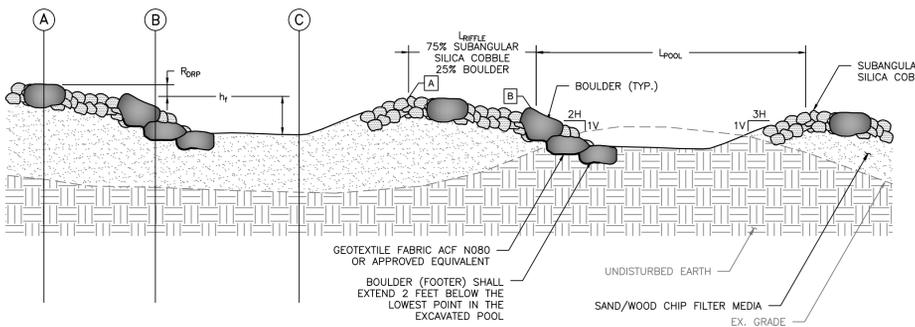
SECTION A
WEIR BACK VIEW (THROUGH COBBLE)
FILTER MEDIA IN CUT
SCALE: NOT TO SCALE



SPSC RIFFLE-WEIR TYPICAL PLAN VIEW
SCALE: NOT TO SCALE



SPSC CASCADE/POOL TYPICAL PROFILE
SCALE: NOT TO SCALE



SPSC RIFFLE/POOL TYPICAL PROFILE
SCALE: NOT TO SCALE

SPSC ROCK SIZE TABLE

ROCK SIZE TABLE			
ROCK TYPE	ROCK SIZE	% BY WEIGHT	
SUBANGULAR SILICA COBBLE	D ₅₀ = 6"	-	
BOULDERS	GREATER THAN 6"x2"x2"	10	
	LESS THAN 3"x2"x2"	80	
SAND/WOODCHIP FILTER MEDIA	SAND: 0.02"-0.04" (AASHTO M-6 OR ASTM C-33)	-	

NOTE:
1. BOULDERS SHALL BE STACKABLE, OBLONG AND FLAT IN APPEARANCE
2. PERCENTAGES BY WEIGHT SHOWN REFER TO THE MAXIMUM ALLOWABLE ROCK SIZE DISTRIBUTION
3. SEE CROSS SECTIONS FOR FILTER MEDIA PLACEMENT

SPSC DATA TABLE

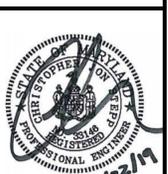
	STILLMEADOW SPSC
L _{RIFLE} (RIFLE LENGTH)	8 FT.
L _{POOL} (POOL LENGTH)	36.2 - 52.0 FT.
h _r (POOL DEPTH)	2.5 - 3.0 FT.
W _{POOL} (POOL WIDTH)	25.5 FT. - 67.0 FT.
W _{RIFLE} (RIFLE WIDTH)	15 FT.
D _{RIFLE} (RIFLE DEPTH)	1.25 FT.
R _{PRAP} (DROP ACROSS RIFLE)	1 FT.
SUBANGULAR SILICA COBBLE d ₅₀	0.50 FT.
d _r (RIFLE FILTER MEDIA DEPTH)	3.0 FT. - 5.0 FT.
d _p (POOL FILTER MEDIA DEPTH)	1.5 FT. - 2.7 FT.

SEE SHEET 24 FOR STRUCTURE TABLE

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HARFORD COUNTY, MARYLAND
STILLMEADOW STREAM & OUTFALL RESTORATION
SPSC NOTES & DETAILS

REVISIONS	DRAWN BY: BF	CONTRACT NO.: 16-153
	DESIGNED BY: BF	SCALE: AS SHOWN
	REVIEWED BY: MKB	SHEET 22 OF 35
		DATE: 07/22/19

STILLMEADOW DRIVE SEQUENCE OF CONSTRUCTION

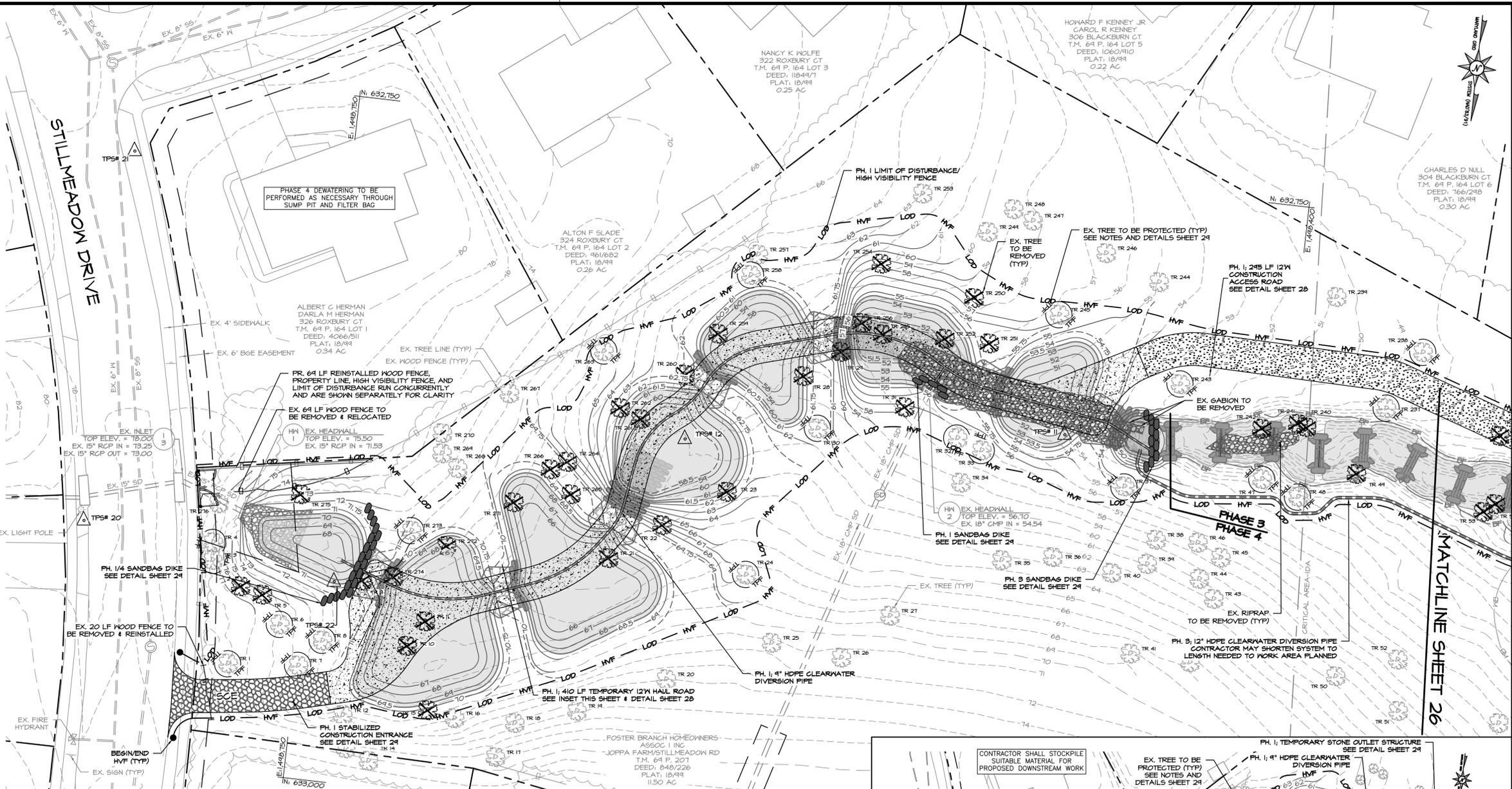
STILLMEADOW DRIVE GENERAL	DAYS
1. HOLD A PRE-CONSTRUCTION MEETING WITH CONTRACTORS, INSPECTORS & ENGINEERS AS NEEDED.	1 DAY
2. 48 HOURS PRIOR TO THE START OF CONSTRUCTION, NOTIFY HARFORD COUNTY S/C INSPECTOR AND MDE, AS REQUIRED, PER STATE PERMITS.	
3. THE CONTRACTOR SHALL CALL "MISS UTILITY" (1-800-257-7777) A MINIMUM OF 48 HOURS IN ADVANCE OF ANY EXCAVATION, BORINGS, PILE DRIVING AND/OR DIGGING FOR THE LOCATION OF GAS, ELECTRIC, TELEPHONE, WATER AND SEWER LINES.	
PHASE 1 - CONSTRUCTION ACCESS AND EROSION AND SEDIMENT CONTROL	
1. PROJECT CONSTRUCTION SHALL NOT START UNTIL ALL RESOURCES NEEDED FOR CONSTRUCTION ARE AT THE PROJECT LOCATION. CLEAR AND GRUB AS NECESSARY TO ESTABLISH LIMITS OF DISTURBANCE AND INSTALL PERIMETER HIGH VISIBILITY FENCE.	2 DAYS
2. CLEAR AND GRUB AS NECESSARY TO INSTALL STILLMEADOW DRIVE STABILIZED CONSTRUCTION ENTRANCE, HAUL ROAD, TEMPORARY STOCKPILE AREAS, AND ASSOCIATED SEDIMENT AND EROSION CONTROL DEVICES.	1 DAY
3. INSTALL STILLMEADOW DRIVE STABILIZED CONSTRUCTION ENTRANCE AND TEMPORARY STOCKPILE AREA TO FACILITATE INSTALLATION OF THE HAUL ROAD. INSTALL SUPER SILT FENCE, TEMPORARY STONE OUTLET STRUCTURE, AND TREE PROTECTION FOR THE PHASE 1 PROPOSED GRADING.	1 DAY
4. GRADE OUTFALL POOL AND INSTALL THE SANDBAG DIKE, CLEARWATER DIVERSION PIPE, AND HAUL ROAD.	2 DAYS
5. REMOVE AND STOCKPILE EXISTING CLASS 1 RIPRAP AND MASS GRADE THE DOWNSTREAM SLOPES TO INSTALL THE HAUL ROAD AND CLEARWATER DIVERSION PIPE. STOCKPILE SUITABLE MATERIAL FOR PROPOSED DOWNSTREAM EARTHWORK. STABILIZE ANY DISTURBED EARTH. REMOVE SUPER SILT FENCE AND THE TEMPORARY STONE OUTLET STRUCTURE.	5 DAYS
6. CLEAR AND GRUB AS NECESSARY TO INSTALL THE FOSTER KNOLL DRIVE STABILIZED CONSTRUCTION ENTRANCE, TEMPORARY CONSTRUCTION ACCESS ROAD, TEMPORARY STOCKPILE AREAS, TEMPORARY STREAM CROSSINGS, AND ASSOCIATED SEDIMENT AND EROSION CONTROL DEVICES.	2 DAYS
7. INSTALL FOSTER KNOLL DRIVE STABILIZED CONSTRUCTION ENTRANCE, TEMPORARY CONSTRUCTION ACCESS ROAD, TEMPORARY STREAM CROSSINGS, TEMPORARY STOCKPILE AREAS, TREE PROTECTIONS AND ASSOCIATED SEDIMENT AND EROSION CONTROL DEVICES.	2 DAYS
PHASE 2 - RIFLE POOL SYSTEM AND LOG-BOULDER STEP POOL SYSTEM	
1. CLEAR AND GRUB TO FACILITATE CHANNEL CONSTRUCTION AND INSTALLATION OF ALL PHASE 2 SEDIMENT AND EROSION CONTROL DEVICES.	1 DAY
2. INSTALL ALL PHASE 2 SEDIMENT AND EROSION CONTROL DEVICES AS SHOWN ON THE CONSTRUCTION DRAWINGS.	1 DAY
3. START PUMP DIVERSION OPERATION IN ORDER TO DEWATER THE PHASE 2 WORK AREA.	
4. STARTING AT THE DOWNSTREAM END OF PHASE 2 AND WORKING UPSTREAM ALONG THE STREAM	25 DAYS
a. GRADE THE BANKS, AS SHOWN ON THE CONSTRUCTION DRAWINGS AND AS DIRECTED IN THE FIELD BY THE PROJECT MANAGER.	
b. INSTALL IN-STREAM STRUCTURES AS SHOWN ON THE CONSTRUCTION DRAWINGS AND AS DIRECTED IN THE FIELD BY THE PROJECT MANAGER.	
7. SHUT DOWN AND REMOVE THE PHASE 2 PUMP DIVERSION AND DOWNSTREAM SANDBAG DIKE.	1 DAY
8. RAKE ALL DISTURBED AREAS ALONG BANKS, APPLY PERMANENT SEED MIX AND FERTILIZER. INSTALL COIR FIBER BLANKETS ALONG BANKS, AS OUTLINED IN THE CONSTRUCTION SPECIFICATIONS.	2 DAYS
9. DISK AND RAKE ALL DISTURBED AREAS WITHIN THE FLOODPLAIN AND OUTSIDE THE IMMEDIATE CONSTRUCTION AREA.	1 DAY
10. APPLY PERMANENT SEED MIX AND FERTILIZER FOR ALL DISTURBED AREAS WITHIN THE FLOODPLAIN AND OUTSIDE THE IMMEDIATE CONSTRUCTION AREA.	1 DAY
PHASE 3 - LOG-BOULDER STEP POOL SYSTEM	
1. CLEAR AND GRUB TO FACILITATE CHANNEL CONSTRUCTION AND INSTALLATION OF ALL PHASE 3 SEDIMENT AND EROSION CONTROL DEVICES.	1 DAY
2. INSTALL ALL PHASE 3 SEDIMENT AND EROSION CONTROL DEVICES AS SHOWN ON THE CONSTRUCTION DRAWINGS.	1 DAY
3. START PUMP DIVERSION OPERATION IN ORDER TO DEWATER THE PHASE 3 WORK AREA.	
4. STARTING AT THE DOWNSTREAM END OF PHASE 3 AND WORKING UPSTREAM ALONG THE STREAM	22 DAYS
a. GRADE THE BANKS, AS SHOWN ON THE CONSTRUCTION DRAWINGS AND AS DIRECTED IN THE FIELD BY THE PROJECT MANAGER.	
b. INSTALL IN-STREAM STRUCTURES, AS SHOWN ON THE CONSTRUCTION DRAWINGS AND AS DIRECTED IN THE FIELD BY THE PROJECT MANAGER.	
7. SHUT DOWN AND REMOVE THE PHASE 3 PUMP DIVERSION AND PHASE 3 SANDBAG DIKES.	1 DAY
8. RAKE ALL DISTURBED AREAS ALONG BANKS, APPLY PERMANENT SEED MIX AND FERTILIZER. INSTALL COIR FIBER BLANKETS ALONG BANKS, AS OUTLINED IN THE CONSTRUCTION SPECIFICATIONS.	2 DAYS
9. DISK AND RAKE ALL DISTURBED AREAS WITHIN THE FLOODPLAIN AND OUTSIDE THE IMMEDIATE CONSTRUCTION AREA.	1 DAY
10. APPLY PERMANENT SEED MIX AND FERTILIZER FOR ALL DISTURBED AREAS WITHIN THE FLOODPLAIN AND OUTSIDE THE IMMEDIATE CONSTRUCTION AREA.	1 DAY
PHASE 4 - STEP POOL STORM CONVEYANCE (SPSC)	
1. CLEAR AND GRUB TO FACILITATE SPSC INSTALLATION OF SEDIMENT AND EROSION CONTROL DEVICES.	1 DAY
2. INSTALL ALL SEDIMENT AND EROSION CONTROL DEVICES AS SHOWN ON THE CONSTRUCTION DRAWINGS.	1 DAY
3. STARTING AT THE DOWNSTREAM END OF PHASE 4 AND WORKING UPSTREAM TOWARDS THE EXISTING STILLMEADOW DRIVE	15 DAYS
a. GRADE AND INSTALL THE SPSCS AND CASCADES AS DIRECTED IN THE FIELD BY THE PROJECT MANAGER.	
b. RAKE ALL DISTURBED AREAS, APPLY PERMANENT SEED MIX AND FERTILIZER, AS OUTLINED IN THE CONSTRUCTION SPECIFICATIONS.	
5. DISK AND RAKE ALL DISTURBED AREAS WITHIN THE FLOODPLAIN AND OUTSIDE OF THE IMMEDIATE CONSTRUCTION AREA.	1 DAY
6. APPLY PERMANENT SEED MIX AND FERTILIZER FOR ALL DISTURBED AREAS WITHIN THE FLOODPLAIN AND OUTSIDE OF THE IMMEDIATE CONSTRUCTION AREA.	1 DAY
7. INSTALL ALL PLANT MATERIAL, AS SHOWN IN THE PLANTING PLANS AND OUTLINED IN THE CONSTRUCTION SPECIFICATIONS.	1 DAY
PHASE 5 - GENERAL	
1. REMOVE REMAINING TEMPORARY STOCKPILE AREAS, CONSTRUCTION ACCESS ROADS, TEMPORARY BRIDGE CROSSING, EROSION AND SEDIMENT CONTROL DEVICES, STABILIZED CONSTRUCTION ENTRANCE, ORANGE SAFETY FENCE ALONG LIMITS OF DISTURBANCE (LOD), AND TREE PROTECTIONS.	1 DAY
2. DISK AND RAKE ALL REMAINING DISTURBED AREAS WITHIN THE FLOODPLAIN AND SLOPES OUTSIDE OF IMMEDIATE CONSTRUCTION AREA.	1 DAY
3. APPLY PERMANENT SEED MIX AND FERTILIZER FOR ALL REMAINING DISTURBED AREAS WITHIN THE FLOODPLAIN AND OUTSIDE OF THE IMMEDIATE CONSTRUCTION AREA.	1 DAY
4. INSTALL REMAINING WOODY PLANT MATERIAL, AS SHOWN IN THE PLANTING PLANS AND OUTLINED IN THE CONSTRUCTION SPECIFICATIONS.	2 DAYS
TOTAL	102 DAYS

NOTES:
1. THE SEQUENCE OF CONSTRUCTION IS INTENDED TO CONVEY INSTALLATION OF SEDIMENT CONTROLS AND GENERAL INSTRUCTION TO THE CONTRACTOR. THE SEQUENCE MAY BE ADJUSTED IN THE FIELD WITH THE SEDIMENT CONTROL INSPECTOR'S PERMISSION TO ACCOMMODATE CONTRACTOR'S MEANS AND METHODS.
2. CONTRACTOR SHALL ONLY REMOVE EROSION AND SEDIMENT CONTROL DEVICES WITH SEDIMENT CONTROL INSPECTOR'S PERMISSION.

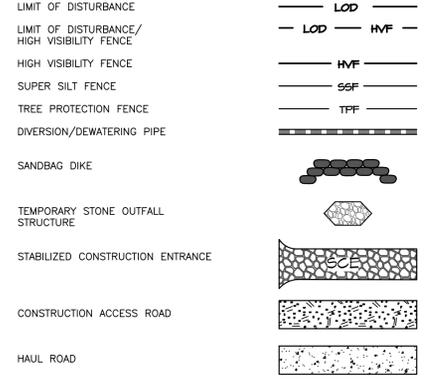
SUMMARY OF ESC QUANTITIES

PHASE 1	QUANTITY	UNIT
STABILIZED CONSTRUCTION ENTRANCE:	2	EA
CONSTRUCTION ACCESS ROAD:	800	LF
HAUL ROAD:	410	LF
HIGH VISIBILITY FENCE:	3,120	LF
DIVERSION PIPE:	350	LF
SAND BAG DIKE:	60	LF
SUPER SILT FENCE:	60	LF
FILTER LOG:	125	LF
WETLAND PROTECTION MATTING:	130	LF
TEMPORARY STONE OUTLET STRUCTURE:	1	EA
TREE PROTECTION FENCE:	700	LF
TREE PROTECTION PLANKING:	38	EA
PHASE 3		
DIVERSION PIPE:	540	LF
FILTER BAG:	1	EA
DIVERSION/DEWATERING PUMP:	2	EA
SUMP PIT:	1	EA
SAND BAG DIKE:	50	LF
MOUNTABLE BERM:	2	EA
PHASE 4		
DIVERSION PIPE:	30	LF
FILTER BAG:	1	EA
DIVERSION/DEWATERING PUMP:	1	EA
SUMP PIT:	1	EA
SAND BAG DIKE:	25	LF

- NOTES:**
1. THIS SUMMARY OF SEDIMENT CONTROL QUANTITIES IS FOR USE BY THE HARFORD COUNTY SOIL CONSERVATION DISTRICT ONLY. THIS SUMMARY IS NOT INTENDED TO BE USED BY THE CONTRACTOR FOR ESTIMATING AND BIDDING PURPOSES.
2. STOCKPILE HEIGHT CANNOT EXCEED 15'. STOCKPILE MAX SLOPE CANNOT EXCEED 2:1. IF ADDITIONAL STOCKPILE AREAS ARE NEEDED WITHIN THE LOD, THE CONTRACTOR MUST GET APPROVAL FROM THE INSPECTOR. ADDITIONAL STOCKPILES MUST BE WRAPPED WITH SILT FENCE.
3. NO DISTURBED AREA SHALL BE LEFT OVERNIGHT. STABILIZE ON DAILY BASIS.
4. MATTING SHOWN SHALL BE INSTALLED OVER EX. WETLANDS WHERE CONSTRUCTION ACCESS IS REQUIRED.
5. FOR EROSION AND SEDIMENT CONTROL DETAILS, SEE SHEETS 28 & 29.



SEDIMENT CONTROL LEGEND



PROJECT CONSTRUCTION SHALL NOT START UNTIL ALL RESOURCES NEEDED FOR CONSTRUCTION ARE AT THE PROJECT LOCATION

EROSION AND SEDIMENT CONTROL PLAN

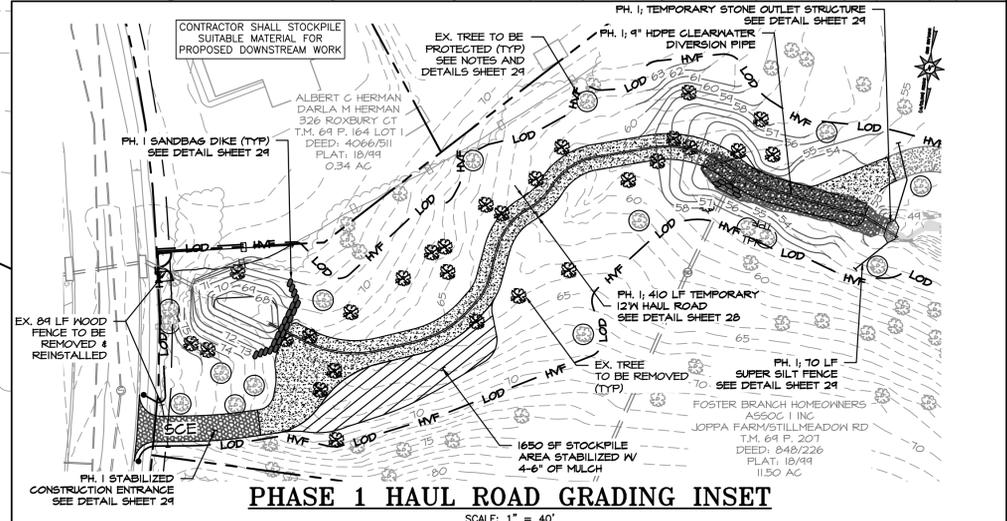
SCALE: 1" = 20'

S/C PLAN # 59838 | GRA # 15387-2018

EG-SWMENG-000372-2018 | # 97032

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REVISIONS

HARFORD COUNTY, MARYLAND

**STILLMEADOW STREAM & OUTFALL RESTORATION
EROSION & SEDIMENT CONTROL PLAN**

DRAWN BY: BF/EM | CONTRACT NO.: 16-153

DESIGNED BY: MKB | SCALE: 1" = 20'

REVIEWED BY: MKB | SHEET 25 OF 35

DATE: 07/22/19

TAX MAP 1, ADC MAP 1, HCG BILLING ID No., HCG DWG ID No., SCALE: 1" = 40'

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

- A. SOIL PREPARATION
1. TEMPORARY STABILIZATION
 - a. SEEDBED PREPARATION CONSISTS OF LOOSENING SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISC HARROWS OR CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENEED, IT MUST NOT BE ROLLED OR TRACKED WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.
 - b. APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS.
 - c. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
 2. PERMANENT STABILIZATION
 - a. A SOIL TEST IS REQUIRED FOR ANY EARTH DISTURBANCE OF 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE:
 - i. SOIL PH BETWEEN 6.0 AND 7.0.
 - ii. SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (PPM).
 - iii. SOIL CONTAINS LESS THAN 40 PERCENT CLAY BUT ENOUGH FINE GRAINED MATERIAL (GREATER THAN 30 PERCENT SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION: IF LOVEGRASS WILL BE PLANTED, THEN A SANDY SOIL (LESS THAN 30 PERCENT SILT PLUS CLAY) WOULD BE ACCEPTABLE.
 - iv. SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT.
 - v. SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
 - b. APPLICATION OF AMENDMENTS OR TOPSOIL IS REQUIRED IF ON-SITE SOILS DO NOT MEET THE ABOVE CONDITIONS.
 - c. GRADED AREAS MUST BE MAINTAINED IN A TRUE AND EVEN GRADE AS SPECIFIED ON THE APPROVED PLAN, THEN SCARIFIED OR OTHERWISE LOOSENEED TO A DEPTH OF 3 TO 5 INCHES.
 - d. APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE RESULTS OF A SOIL TEST.
 - e. MIX SOIL AMENDMENTS INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS. RAKE LAWN AREAS TO SMOOTH THE SURFACE. REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDBED PREPARATION. TRACK SLOPES 3:1 OR FLATTER WITH TRACKED EQUIPMENT LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. LEAVE THE TOP 1 TO 3 INCHES OF SOIL LOOSE AND FRAGILE. SEEDBED LOOSENING MAY BE UNNECESSARY ON NEWLY DISTURBED AREAS.
 3. TOPSOILING
 1. TOPSOIL IS PLACED OVER PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION. THE PURPOSE IS TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH. SOILS OF CONCERN HAVE LOW MOISTURE CONTENT, LOW NUTRIENT LEVELS, LOW PH, MATERIALS TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION.
 2. TOPSOIL SALVAGED FROM AN EXISTING SITE MAY BE USED PROVIDED IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN THE REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-NRCS.
 3. TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:
 - a. THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
 - b. THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUING SUPPLIES OF MOISTURE AND PLANT NUTRIENTS.
 - c. THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.
 - d. THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.
 4. AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN.
 5. TOPSOIL SPECIFICATIONS: 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 CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1½ 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.
 4. TOPSOIL APPLICATION
 - a. EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL.
 - b. UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MINIMUM THICKNESS OF 4 INCHES. SPREADING IS TO BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS MUST BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
 - c. TOPSOIL MUST NOT BE PLACED IF THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.
 5. 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 CHEMICAL ANALYSES.
 2. FERTILIZERS MUST BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR ACCURATE APPLICATION BY APPROPRIATE EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS MUST ALL BE DELIVERED TO THE SITE FULLY LABELED ACCORDING TO THE APPLICABLE LAWS AND MUST BEAR THE NAME, TRADE NAME OR TRADEMARK AND WARRANTY OF THE PRODUCER.
 3. LIME MATERIALS MUST BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED EXCEPT WHEN HYDROSEEDING) WHICH CONTAINS AT LEAST 50 PERCENT TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE MUST BE GROUND TO SUCH FINENESS THAT AT LEAST 50 PERCENT WILL PASS THROUGH A #100 MESH SIEVE AND 98 TO 100 PERCENT WILL PASS THROUGH A #20 MESH SIEVE.
 4. LIME AND FERTILIZER ARE TO BE EVENLY DISTRIBUTED AND INCORPORATED INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
 5. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, SPREAD GROUND LIMESTONE AT THE RATE OF 4 TO 8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL.

TEMPORARY SEEDING SUMMARY						
HARDINESS ZONE (FROM FIGURE B.3): 7a SEED MIXTURE (FROM TABLE B.1)					FERTILIZER RATE (10-20-20)	LIME RATE
NO.	SPECIES	APPLICATION RATE (lb/acre)	SEEDING DATES	SEEDING DEPTHS		
1	ANNUAL RYEGRASS	40 (1lb/1000 sf)	2/15 - 4/30 8/15 - 11/30	0.5"	436 lb/acre (10 lb/1000 sf)	2 tons/acre (90 lb/1000 sf)
2	BARLEY	96 (2.2lb/1000 sf)	2/15 - 4/30 8/15 - 11/30	1.0"		
3	OATS	72 (1.7lb/1000 sf)	2/15 - 4/30 8/15 - 11/30	1.0"		
4	RYE	112 (2.8lb/1000 sf)	2/15 - 4/30 8/15 - 12/15	1.0"		
5	FOXTAIL MILLET	30 (0.7lb/1000 sf)	5/1 - 8/14	0.5"		

SPSC STABILIZATION NOTES

1. TEMPORARY STABILIZATION FOR ANY AREA OF EARTH DISTURBANCE AROUND THE POOLS AND RIFPLE ZONES OF A STREAM RESTORATION PROJECT SHALL BE CONSIDERED ACHIEVED WHEN COVERING AREA WITH 4 TO 8 INCHES OF COMPOST OR 2 TO 4 INCHES OF WOOD CHIPS.
2. PERMANENT STABILIZATION FOR AN AREA OF EARTH DISTURBANCE AROUND THE POOLS AND RIFPLES ZONES OF A STREAM RESTORATION PROJECT SHALL BE CONSIDERED ACHIEVED WHEN COVERING THE AREA WITH 4 INCHES OF COMPOST OR 2 TO 4 INCHES OF WOOD CHIPS AND THE PLANTING PLAN HAS BEEN IMPLEMENTED.
3. THE CONTRACTOR WILL NEED TO DEWATER VIA SUMP PIT AND FILTER BAG WHEN NECESSARY DURING GRADING OF STEP POOLS.

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 VERIFY TYPE OF SEED AND SEEDING RATE.
 - b. MULCH ALONE MAY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES ONLY IF THE GROUND IS FROZEN. THE APPROPRIATE SEEDING MIXTURE MUST BE APPLIED WHEN THE GROUND THAWS.
 - c. INOCULANTS: THE INOCULANT FOR TREATING LEGUME SEED IN THE SEED MIXTURES MUST BE A PURE CULTURE OF NITROGEN FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS MUST NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANTS AS DIRECTED ON THE PACKAGE. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING. NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANT AS COOL AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE 75 TO 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE THE INOCULANT LESS EFFECTIVE.
 - d. SOD OR SEED MUST NOT BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHYTO-TOXIC MATERIALS.
 2. APPLICATION
 - a. DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.
 - i. INCORPORATE SEED INTO THE SUBSOIL AT THE RATES PRESCRIBED ON TEMPORARY SEEDING TABLE B.1, PERMANENT SEEDING TABLE B.3, OR SITE-SPECIFIC SEEDING SUMMARIES.
 - ii. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION. ROLL THE SEEDED AREA WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.
 - b. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.
 - i. CULTIPACKING SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST 1/4 INCH OF SOIL COVERING. SEEDBED MUST BE FIRM AFTER PLANTING.
 - ii. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
 - c. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER).
 - i. IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES SHOULD NOT EXCEED THE FOLLOWING: NITROGEN, 100 POUNDS PER ACRE TOTAL OF SOLUBLE NITROGEN; 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.
 3. ANCHORING
 - a. PERFORM MULCH ANCHORING IMMEDIATELY FOLLOWING APPLICATION OF MULCH TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON THE SIZE OF THE AREA AND EROSION HAZARD:
 - i. A MULCH ANCHORING TOOL IS A TRACTOR DRAWN IMPLEMENT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE A MINIMUM OF 2 INCHES. THIS PRACTICE IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PRACTICE SHOULD FOLLOW THE CONTOUR.
 - ii. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. APPLY THE FIBER BINDER AT A NET DRY WEIGHT OF 750 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER AT A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
 - iii. SYNTHETIC BINDERS SUCH AS ACRYLIC CLR (AGRO-TACK), DCA-70, PETROSET, TERRA TX II, TERRATAK AR OR OTHER APPROVED EQUAL MAY BE USED. FOLLOW APPLICATION RATES AS SPECIFIED BY THE MANUFACTURER. APPLICATION OF LIQUID BINDERS NEEDS TO BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. USE OF ASPHALT BINDERS IS STRICTLY PROHIBITED.
 - iv. LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER RECOMMENDATIONS. NETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEET WIDE AND 300 TO 3,000 FEET LONG.

PERMANENT SEEDING SUMMARY								
HARDINESS ZONE (FROM FIGURE B.3): 7a SEED MIXTURE (FROM TABLE B.3)			FERTILIZER RATE (10-20-20)					
NO.	SPECIES	APPLICATION RATE (lb/acre)	SEEDING DATES	SEEDING DEPTHS	N	P ₂ O ₅	K ₂ O	LIME RATE
1	SWITCHGRASS CREEPING RED FESCUE BUSH CLOVER	10 10 2	2/15 - 4/30 5/1 - 5/15	1" - 1 1/2"	45 lb/acre (1.0 lb/ 1000 sf)	90 lb/acre (2.0 lb/ 1000 sf)	90 lb/acre (2.0 lb/ 1000 sf)	2 tons/acre (90 lb/ 1000 sf)
3	DEERTONGUE SHEEP FESCUE COMMON LESPEDEZEA	20 10 10	2/15 - 4/30 5/1 - 5/15	1" - 1 1/2"				

- NOTES:
1. SEEDING RATES FOR THE WARM-SEASON GRASSES ARE IN POUNDS OF PURE LIVE SEED (PLS). ACTUAL PLANTING RATES SHALL BE ADJUSTED TO REFLECT PERCENT SEED GERMINATION AND PURITY. AS TESTED, ADJUSTMENTS ARE USUALLY NOT NEEDED FOR THE COOL-SEASON GRASSES. SEEDING RATES LISTED ABOVE ARE FOR TEMPORARY SEEDINGS, WHEN PLANTED ALONE, WHEN PLANTED AS A NURSE CROP WITH PERMANENT SEED MIXES, USE 1/3 OF THE SEEDING RATE LISTED ABOVE FOR BARLEY, OATS, AND WHEAT. FOR SMALLER-SEEDED GRASSES (ANNUAL RYEGRASS, PEARL MILLET, FOXTAIL MILLET), DO NOT EXCEED MORE THAN 5% (BY WEIGHT) OF THE OVERALL PERMANENT SEEDING MIX. CEREAL RYE GENERALLY SHOULD NOT BE USED AS A NURSE CROP, UNLESS PLANTING WILL OCCUR IN VERY LATE FALL BEYOND THE SEEDING DATES FOR OTHER TEMPORARY SEEDINGS. CEREAL RYE HAS ALLELOPATHIC PROPERTIES THAT INHIBIT THE GERMINATION AND GROWTH OF OTHER PLANTS. IF IT MUST BE USED AS A NURSE CROP, SEED AT 1/3 OF THE RATE LISTED ABOVE. OATS ARE THE RECOMMENDED NURSE CROP FOR WARM-SEASON GRASSES.
 2. FOR SANDY SOILS, PLANT SEEDS AT TWICE THE DEPTH LISTED ABOVE.
 3. THE PLANTING DATES LISTED ARE AVERAGES FOR EACH ZONE AND MAY REQUIRE ADJUSTMENT TO REFLECT LOCAL CONDITIONS, ESPECIALLY NEAR THE BOUNDARIES OF THE ZONE.

S/C PLAN # 59838 GRA # 15387-2018

EG-SWMENG-000372-2018 # 97032

Clear Creeks Consulting

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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 WATER 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.

BEST MANAGEMENT PRACTICES FOR WORKING IN NON TIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS AND 100 YEAR FLOOD PLAINS

1. NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS SHALL BE STOCKPILED OR STORED IN NON TIDAL WETLANDS, NON TIDAL WETLAND BUFFERS, WATERWAYS OR THE 100-YEAR FLOODPLAIN.
2. PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE FLOW INTO OR OUT OF NON TIDAL WETLANDS, NON TIDAL WETLAND BUFFERS, WATERWAYS OR THE 100 YEAR FLOODPLAIN.
3. DO NOT USE EXCAVATED MATERIAL AS BACK FILL IF IT CONTAINS WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE. IF ADDITIONAL BACK FILL IS REQUIRED, USE CLEAN MATERIAL FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE.
4. PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO NON TIDAL WETLANDS, NON TIDAL WETLAND BUFFERS, OR WATERWAYS OR THE 100 YEAR FLOODPLAIN.
5. REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NON TIDAL WETLANDS, NON TIDAL WETLAND BUFFERS, OR WATERWAYS, OR PERMANENT MODIFICATION OF THE 100 YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.
6. RECTIFY ANY NON TIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS OR 100 YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
7. ALL STABILIZATION IN THE NON TIDAL WETLAND AND NON TIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYEGRASS(LONIUM MULTIFLORUM), MILLET(SETARIA ITALICA), BARLEY(HORDEUM SP.), OATS (UNIOIA SP.) AND/OR RYE (SECALE CEREALE). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON PERSISTENT VEGETATION MAY BE ACQUISABLE BUT MUST BE APPROVED BY THE NON TIDAL WETLANDS AND WATERWAYS DIVISION, KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEEDED AND MULCHED TO REDUCE EROSION.
8. AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED, AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
9. TO PROTECT AQUATIC SPECIES, IN STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM:
 - 9.1. USE 1 WATERERS; IN STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THRU JUNE 15, INCLUSIVE, DURING ANY YEAR.
 10. STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.
 11. CULVERTS SHALL BE CONSTRUCTED AND ANY RIPRAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.

CARE OF WATER DURING CONSTRUCTION

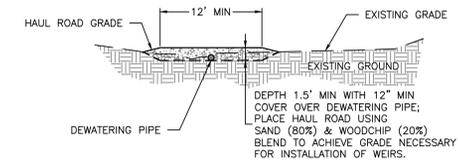
1. CLEANWATER DIVERSIONS FROM POINT SOURCES MAY BE OMITTED IF NO BASE FLOW IS PRESENT.
2. BECAUSE OF SEASONAL VARIATIONS IN FLOW, THE SIZE OF PUMP AND THE SIZE AND TYPE OF PIPING NECESSARY TO CONVEY CLEANWATER FOR ANY PUMPED CLEANWATER DIVERSIONS SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE SEDIMENT CONTROL INSPECTOR. CARE SHOULD BE TAKEN BY THE CONTRACTOR AS TO NOT OVER OR UNDERSIZE THE PUMP/PIPING NECESSARY TO CONVEY ANY BASE FLOW.
3. DIVERSION PIPES, PUMPS, SUMP PITS, AND ASSOCIATED SEDIMENT FILTRATION DEVICES SHALL BE FIELD LOCATED BY THE CONTRACTOR AND ARE SHOWN ON THE PLANS TO ILLUSTRATE POTENTIAL ALIGNMENTS AND PLACEMENT.
4. WITH THE SEDIMENT CONTROL INSPECTORS APPROVAL, ANY DIVERSION PIPES, PUMPS, SUMP PITS, AND ASSOCIATED SEDIMENT FILTRATION DEVICES MAY BE RELOCATED WITHIN THE LIMIT OF DISTURBANCE TO ACCOMMODATE CONSTRUCTION ACTIVITIES AT NO ADDITIONAL COST.
5. THE CONTRACTOR SHALL SUFFICIENTLY DEWATER THE WORK AREA BEFORE COMMENCING ANY GRADING OPERATIONS. ADDITIONAL SUMP PUMPS, AT NO ADDITIONAL COST, MAY BE NECESSARY AT LOCATIONS WHERE GROUNDWATER IS INFILTRATING THE WORK AREA.
6. DEWATERING OF THE WORK AREA MAY REQUIRE ADDITIONAL TREATMENT BEYOND AN APPROVED DEWATERING PRACTICE TO REDUCE TURBIDITY IN THE DISCHARGE TO RECEIVING WATERS.
7. ANY FUEL SHALL BE STORED ABOVE THE 100-YR FLOOD ELEVATION.
8. THE CONTRACTOR SHALL ENSURE THAT ALL SEDIMENT CONTROLS ARE IN WORKING CONDITION AT THE END OF EACH WORKING DAY TO PREVENT SEDIMENT LADEN MATERIAL FROM DISCHARGING FROM THE WORK AREA.
9. USE FLOCCULANT AS NEEDED TO ADDRESS SEDIMENT DISCHARGE ISSUES (POND CLEAR OR APPROVED EQUIVALENT). FLOCCULANT SHALL BE ANIONIC AND NON-TOXIC.

EXCAVATION NOTES

1. AT A MINIMUM ANY SATURATED SEDIMENT SHALL BE PARTIALLY DEWATERED ON-SITE BEFORE TRANSPORT TO THE DISPOSAL AREA.
2. THE DISPOSAL SITE SHALL HAVE AN ACTIVE GRADING PERMIT.
3. SATURATED MATERIAL SHALL BE TRANSPORTED IN LINED OR WATER TIGHT TRUCKS. ADEQUATELY COVERED/TARPED OVER THE TOP. SUFFICIENT FREEBORD MUST BE MAINTAINED TO PREVENT SPILLING OVER THE SIDES.
4. CONTRACTOR SHALL KEEP STREET FREE OF ANY EXCAVATED MATERIAL. IF NECESSARY, CONTRACTOR MAY BE REQUIRED TO PERFORM ROUTINE STREET SWEEPING AND/OR STREET CLEANING.

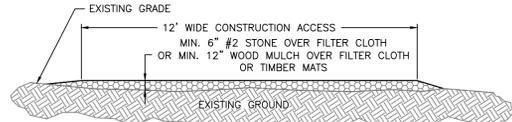
NOTES

1. ANY STOCKPILES SHALL BE WITHIN THE FACILITY BOTTOM FOOTPRINT. MAXIMUM HEIGHT SHALL NOT EXCEED 15 FEET & MAXIMUM SLOPE SHALL NOT EXCEED 2:1.
2. WITH SEDIMENT CONTROL INSPECTOR APPROVAL, STOCKPILING AND STAGING SHALL OCCUR WITHIN THE LIMIT OF DISTURBANCE, BE STABILIZED WITH 4"-6" OF MULCH.
3. THE CONTRACTOR MUST MAINTAIN 10 FT OF CLEARANCE AT ALL TIMES FROM ELECTRIC LINES IN ORDER TO COMPLY WITH THE MARYLAND HIGH VOLTAGE LINE ACT. THE CONTRACTOR SHALL CONDUCT A TEST PIT IF THE GREW IS DIGGING NEAR ANY ELECTRIC CABLE.
4. ANY DAMAGE TO RESIDENTIAL DRIVEWAY AND PUBLIC ROADS RESULTING FROM CONSTRUCTION TO BE REPAIRED AND REPLACED IN KIND.



HAUL ROAD

SCALE: NOT TO SCALE



TEMPORARY CONSTRUCTION ACCESS ROAD

SCALE: NOT TO SCALE

HARFORD COUNTY, MARYLAND

STILLMEADOW STREAM & OUTFALL RESTORATION SEDIMENT CONTROL NOTES & DETAILS

DRAWN BY: EM	CONTRACT NO.: 16-153
DESIGNED BY: EM	SCALE: AS SHOWN
REVIEWED BY: MKB	SHEET 28 OF 35
	DATE: 07/22/19

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BUFFER MANAGEMENT PLAN CALCULATIONS

STEP 1: ESTABLISHMENT OR MITIGATION

DISTURBANCE TO THE 100-FOOT AND/OR EXPANDED BUFFER? (YES / NO)
 IF YES, MITIGATION IS REQUIRED, PROCEED TO STEP 2. OTHERWISE, SKIP TO STEP 5.

SELECT	ACTIVITY	ACTION
	PROJECT COMPLETELY OUTSIDE BUFFER, NO BUFFER IMPACTS	ESTABLISHMENT
X	DISTURBANCE TO BUFFER OR VEGETATION REMOVAL IN BUFFER	MITIGATION
	SOME DISTURBANCE IN BUFFER AND SOME OUTSIDE BUFFER	ESTABLISHMENT & MITIGATION

STEP 2, 3 & 4: DETERMINING MITIGATION FOR WORK IN THE BUFFER

SELECT	ACTIVITY	MITIGATION RATIO
X	SHORE EROSION CONTROL*	1:1
	RIPARIAN WATER ACCESS (TEMPORARY DISTURBANCE)	1:1
	RIPARIAN WATER ACCESS (PERMANENT DISTURBANCE)	2:1
	WATER-DEPENDENT FACILITIES	2:1
	VARIANCE	3:1
	VIOLATION	4:1

*RESTORATION ACTIVITY PROPOSED TO REDUCE EROSION THROUGH CONTROLLED CONVEYANCE AND TREATMENT OF STORMWATER RUNOFF.

MITIGATION CALCULATIONS	
DISTURBANCE AREA	AREA, SF
TOTAL DISTURBANCE IN THE BUFFER	51,933
SHORE EROSION CONTROL DISTURBANCE RATIOS	
PERMANENT (1:1)	0
TEMPORARY (1:1)	51,933
TOTAL MITIGATION REQUIRED FOR DISTURBANCE	51,933
TREE REMOVAL MITIGATION (BASED ON CANOPY REDUCTION)*	
19.3" DBH TREE (TR49)	607
19.3" DBH TREE (TR53)	569
13.1" DBH TREE (TR54)	955
16.7" DBH TREE (TR72)	380
18.5" DBH TREE (TR73)	52
13.2" DBH TREE (TR74)	99
27.7" DBH TREE (TR80)	1590
18.7" DBH TREE (TR85)	65
24.2" DBH TREE (TR87)	986
26.3" DBH TREE (TR96)	0
13.4" DBH TREE (TR148)	66
13.2" DBH TREE (TR161)	802
13.6" DBH TREE (TR192)	177
14.9" DBH TREE (TR193)	32
16.6" DBH TREE (TR210)	94
12.2" DBH TREE (TR211)	0
13.0" DBH TREE (TR234)	56
13.0" DBH TREE (TR236)	199
18.7" DBH TREE (TR240)	44
15.4" DBH TREE (TR241)	158
13.9" DBH TREE (TR242)	26
TOTAL MITIGATION REQUIRED FOR TREE REMOVAL	6,957
TOTAL MITIGATION REQUIRED	58,890

*MITIGATION REQUIREMENTS FOR TREE REMOVAL HAVE BEEN ADJUSTED TO REFLECT THE REDUCTION OF FOREST CANOPY CREATED DUE TO THE TREE REMOVAL.

STEP 5: ESTABLISHMENT FOR DEVELOPMENT

ESTABLISHMENT REQUIRED? (YES / NO)**

SELECT	DEVELOPMENT CATEGORY	BEFORE PROGRAM DATE	BEFORE PROGRAM DATE
N/A	NEW DEVELOPMENT ON VACANT LOT	TOTAL LOT COVERAGE	FULL ESTABLISHMENT
N/A	NEW SUBDIVISION OR NEW LOT	FULL ESTABLISHMENT	
N/A	NEW LOT WITH EXISTING DWELLING UNIT	ESTABLISHMENT = TOTAL LOT COVERAGE	
N/A	CONVERSION OF LAND USE TO ANOTHER LAND USE	FULL ESTABLISHMENT	
N/A	ADDITION OR ACCESSORY STRUCTURE	ESTABLISHMENT = INCREASE IN LOT COVERAGE	
N/A	SUBSTANTIAL ALTERATION	ESTABLISHMENT = TOTAL LOT COVERAGE	

STEP 6: ADJUST FOR EXISTING FOREST COVER

FULL ESTABLISHMENT OF BUFFER REQUIRED? (YES/NO)

STEP 7: ELIGIBILITY FOR NATURAL REGENERATION

IF THE PROJECT REQUIRES BUFFER ESTABLISHMENT GREATER THAN ONE ACRE, THEN 50% OF THE AREA REQUIRED CAN BE ESTABLISHED THROUGH NATURAL REGENERATION, AS LONG AS IT IS WITHIN 50 FEET OF MATURE FOREST, AND A SUPPLEMENTAL PLANTING PLAN & FINANCIAL ASSURANCE ARE PROVIDED. IF ELIGIBLE, IDENTIFY THE NATURAL REGENERATION AREA ON THE PLAN AND REDUCE THE PLANTING REQUIREMENT BY THE NATURAL REGENERATION SQUARE FOOTAGE.

TOTAL AREA OF BUFFER REQUIRED TO BE ESTABLISHED (STEP 5 OR STEP 6)

NONE

(YES / NO)

NATURAL REGENERATION PERMITTED? (IF ESTABLISHMENT > 1 ACRE, YES, OTHERWISE, NO)

STEP 8: DETERMINE STOCKING

- IDENTIFY AREAS OF NATURAL REGENERATION
- USE TABLE BELOW TO EVALUATE THE AREA THAT MUST BE PLANTED USING LANDSCAPING STOCK AND AREA THAT MAY BE PLANTED USING FLEXIBLE STOCKING

SELECT	AMOUNT	OPTIONS
	LESS THAN 1 ACRE	LANDSCAPING STOCK
X	1 ACRE OR MORE	MIN. 50% LANDSCAPING STOCK, REMAINDER FLEXIBLE

MITIGATION REQUIREMENT:

STOCKING REQUIREMENT: LANDSCAPE STOCK: 100% X (ACRES) = (ACRES)
 FLEXIBLE STOCK: 0% X (ACRES) = 0.0 (ACRES)

STEP 9: CLUSTER PLANTING EVALUATION

SEE STEP 10 FOR PLANTING

STEP 10: LANDSCAPE SCHEDULE: SPECIES, STOCK, SIZE, AND QUANTITY

BUFFER PLANTING AREA SCHEDULE

NATIVE FLOODPLAIN SEED MIX COMPOSITION		
% COMPOSITION	BOTANICAL NAME	COMMON NAME
20.60%	PANICUM CLANDESTINUM	DEERTONGUE
20.00%	ELYMUS RIPARIUS	RIVERBANK WILDRYE
10.00%	ANDROPOGON GERARDII	BIG BLUESTEM
10.00%	CAREX LURIDA	LURID (SHALLOW) SEDGE
10.00%	CAREX VULPINODEA	FOX SEDGE
8.00%	CAREX SCOPARIA	BLUNT BROOM SEDGE
7.20%	PANICUM VIRGATUM	SWITCHGRASS
3.00%	JUNCUS EFFUSUS	SOFT RUSH
2.00%	HELIOPSIS HELIANTHOIDES	OXEYE SUNFLOWER
2.00%	VERBENA HASTATA	BLUE VERVAIN
1.00%	ASCLEPIAS INCARNATA	SWAMP MILKWEED
1.00%	ASTER PUNICEUS	PURPLESTEM ASTER
1.00%	DESMODIUM PANICULATUM	PANICLEDLEAF TICKREFOIL
1.00%	EUPATORIUM PEROLIATUM	BONESET
0.50%	ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER
0.50%	ASTER UMBELLATUS	FLAT TOPPED WHITE ASTER
0.50%	EUPATORIUM FISTULOSUM	JOE PYE WEED
0.50%	MONARDA FISTULOSA	WILD BERGAMOT
0.50%	VERNONIA NOVEBORACENSIS	NEW YORK IRONWEED
0.50%	ZIZIA AUREA	GOLDEN ALEXANDERS
0.10%	MIMULUS RINGENS	SQUARE STEMMED MONKEYFLOWER
0.10%	PHYCNANTHEMUM TENUIFOLIUM	NARROWLEAF MOUNTAINMINT

NATIVE UPLAND SEED MIX COMPOSITION		
% COMPOSITION	BOTANICAL NAME	COMMON NAME
55.40%	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM
15.00%	ELYMUS VIRGINICUS	VIRGINIA WILDRYE
5.00%	ELYMUS HYSTRIX	BOTTLEBRUSH GRASS
3.60%	ECHINACEA PURPUREA	PURPLE CONEFLOWER
3.50%	CHAMAECRISTA FASCICULATA	PARTRIDGE PEA
3.00%	PENSTEMON DIGITALIS	TALL WHITE BEARSTONGUE
3.00%	RUDEBECKIA HIRTA	BLACKEYED SUSAN
2.00%	HELIOPSIS HELIANTHOIDES	OXEYE SUNFLOWER
2.00%	LIATRIS SPICATA	MARSH (DENSE) BLAZING STAR
1.00%	ANEMONE VIRGINIANA	THIMBLEWEED
1.00%	ASTER PRENANTHOIDES	ZIGZAG ASTER
1.00%	PENSTEMON LAEVIGATUS	APPALACHIAN BEARSTONGUE
1.00%	RUDEBECKIA FULGIDA VAR. FULGIDA	ORANGE CONEFLOWER
0.50%	JUNCUS TENUIS	PATH RUSH
0.50%	SOLIDAGO BICOLOR	WHITE (SILVER ROD) GOLDENROD
0.50%	ZIZIA AUREA	GOLDEN ALEXANDERS
0.40%	ASTER LOWRIANUS	LOWRIE'S BLUE WOOD ASTER
0.40%	MONARDA FISTULOSA	WILD BERGAMOT
0.40%	PHYCNANTHEMUM TENUIFOLIUM	NARROWLEAF MOUNTAINMINT
0.30%	SOLIDAGO JUNCEA	EARLY GOLDENROD
0.20%	BAPTISIA TINCTORIA	YELLOW FALSE INDIGO
0.20%	EUPATORIUM RUGOSUM	WHITE SNAKEROOT
0.10%	PENSTEMON HIRSUTUS	HAIRY BEARSTONGUE

COVER/NURSE CROP SEEDING TABLE			
SEEDING RATE	BOTANICAL NAME	COMMON NAME	SEEDING DATE
30 LB/AC	SECALE CEREALE	CEREAL RYE	11/1-2/28
30 LB/AC	AVENA SATIVA	GRAIN OATS	3/1-4/30
10 LB/AC	SETARIA ITALICA	FOXTAIL MILLET	5/1-8/31
10 LB/AC	LOLIUM MULTIFLORUM	ANNUAL RYEGRASS	9/1-10/31

CRITICAL AREA MITIGATION SUMMARY

CATEGORY	AREA, SF
TOTAL MITIGATION REQUIRED	54,267
MITIGATION PROVIDED	
ZONE D	6,508
ZONE E	21,852
ZONE F	15,575
ZONE G	4,413
ZONE H	6,110
TOTAL MITIGATION PROVIDED	54,458

ZONE D: CHANNEL FRINGE CRITICAL AREA PLANTING SCHEDULE - 4,841 SF						
BOTANICAL NAME/ TECHNICAL DESCRIPTION	COMMON NAME	INDICATOR STATUS	SPACING	QUANTITY	CREDIT TOTAL, SF	
SMALL SHRUBS -18" CONTAINERIZED				SF CREDIT PER UNIT =	25	
VIBURNUM NUDUM	POSSUMHAW	OBL	RANDOM - 5' OC	100	2500	
TUBELINGS				SF CREDIT BASED ON AREA COVERED		
CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	OBL	RANDOM - 4' OC	50	800	
QUERCUS BICOLOR	SWAMP WHITE OAK	FACW	RANDOM - 4' OC	100	1600	
VIBURNUM DENTATUM	ARROWWOOD	FAC	RANDOM - 4' OC	50	800	
LIVE STAKES				SF CREDIT BASED ON AREA COVERED		
CORNUS AMOMUM	SILKY DOGWOOD	FACW	12" OC	404	404	
SALIX NIGRA	BLACK WILLOW	OBL	12" OC	404	404	
SEEDING				SF CREDIT BASED ON AREA COVERED		
NATIVE SEED MIX (ERNMX 154 OR EQUIVALENT)	NATIVE FLOODPLAIN SEED MIX	N/A	N/A	1 LB	4,841	
COVER/NURSE CROP, SEE TABLE FOR RATE & DATES		N/A	N/A	SEED	N/A	
TOTAL:				1108	6,508	

ZONE G: SUPPLEMENTAL RIPARIAN FOREST CRITICAL AREA PLANTING SCHEDULE - 8,109 SF						
BOTANICAL NAME/ TECHNICAL DESCRIPTION	COMMON NAME	INDICATOR STATUS	SPACING	QUANTITY	CREDIT TOTAL, SF	
CANOPY TREES - 3/4" CALIPER				SF CREDIT PER UNIT =	100	
NYSSA SYLVATICA	BLACK GUM	FAC	NATURALIZED AT 10' OC	10	1000	
QUERCUS BICOLOR	SWAMP WHITE OAK	FACW	NATURALIZED AT 10' OC	10	1000	
QUERCUS PHELLOS	WILLOW OAK	FACW	NATURALIZED AT 10' OC	10	1000	
CANOPY TREE CREDIT					34.0%	
UNDERSTORY TREES - 3/4" CALIPER				SF CREDIT PER UNIT =	75	
ASIMINA TRILOBA	PAW PAW	FAC	NATURALIZED AT 8.5' OC	15	1125	
CARPINUS CAROLIANA	IRONWOOD	FAC	NATURALIZED AT 8.5' OC	15	1125	
MAGNOLIA VIRGINIANA	SWEETBAY MAGNOLIA	FACW	NATURALIZED AT 8.5' OC	15	1125	
UNDERSTORY TREE CREDIT					38.2%	
LARGE SHRUBS - 36" CONTAINERIZED					50	
ILEX VERTICILLATA	WINTERBERRY	FACW	NATURALIZED AT 7' OC	10	500	
VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	FACW	NATURALIZED AT 7' OC	10	500	
VIBURNUM DENTATUM	SOUTHERN ARROWWOOD	FAC	NATURALIZED AT 7' OC	10	500	
LARGE SHRUB TREE CREDIT					17.0%	
SMALL SHRUBS -18" CONTAINERIZED				SF CREDIT PER UNIT =	25	
CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	OBL	NATURALIZED AT 5' OC	10	250	
PHOTONIA MELANOCARPA	BLACK CHOKEBERRY	FAC	NATURALIZED AT 5' OC	10	250	
ROSA PALUSTRIS	SWAMP ROSE	OBL	NATURALIZED AT 5' OC	10	250	
SMALL SHRUB TREE CREDIT					8.5%	
HERBACEOUS						
QUARTS				SF CREDIT PER UNIT =	2	
ONOCLEA SENSIBILIS	SENSITIVE FERN	FACW	1' O.C.	50	100	
OSMUNDIA CINNAMOMEA	CINNAMON FERN	FACW	1' O.C.	50	100	
HERBACEOUS CREDIT					2.3%	
TOTAL:				215	8,825	

ZONE H: SUPPLEMENTAL UPLAND FOREST CRITICAL AREA PLANTING SCHEDULE - 22,107 SF						
BOTANICAL NAME/ TECHNICAL DESCRIPTION	COMMON NAME	INDICATOR STATUS	SPACING	QUANTITY	CREDIT TOTAL, SF	
CANOPY TREES - 3/4" CALIPER				SF CREDIT PER UNIT =	100	
QUERCUS ALBA	WHITE OAK	FACU	NATURALIZED AT 10' OC	20	2000	
QUERCUS FALCATA	SOUTHERN RED OAK	FACU	NATURALIZED AT 10' OC	20	2000	
QUERCUS RUBRA	NORTHERN RED OAK	FACU	NATURALIZED AT 10' OC	20	2000	
FAGUS GRANDIFOLIA	AMERICAN BEECH	FACU	NATURALIZED AT 10' OC	20	2000	
NYSSA SYLVATICA	BLACK GUM	FAC	NATURALIZED AT 10' OC	20	2000	
CANOPY TREE CREDIT					41.6%	
UNDERSTORY TREES - 3/4" CALIPER				SF CREDIT PER UNIT =	75	
CERCIS CANADENSIS	EASTERN REDBUD	UPL	NATURALIZED AT 8.5' OC	20	1500	
CHIONANTHUS VIRGINICUS	WHITE FRINGETREE	UPL	NATURALIZED AT 8.5' OC	20	1500	
CORNUS FLORIDA	FLOWERING DOGWOOD	FACU	NATURALIZED AT 8.5' OC	20	1500	
UNDERSTORY TREE CREDIT					18.7%	
LARGE SHRUBS - 36" CONTAINERIZED					50	
HAMAMELIS VIRGINIANA	WITCH HAZEL	FACW	NATURALIZED AT 7' OC	10	500	
ILEX GLABRA	INKBERRY	FACU	NATURALIZED AT 7' OC	10	500	
KALMIA LATIFOLIA	MOUNTAIN LAUREL	FACU	NATURALIZED AT 7' OC	10	500	
MORELLA PENNSYLVANICA	NORTHERN BAYBERRY	FAC	NATURALIZED AT 7' OC	10	500	
LARGE SHRUB TREE CREDIT					8.3%	
SMALL SHRUBS -18" CONTAINERIZED				SF CREDIT PER UNIT =	25	
VACCINIUM ANGUSTIFOLIUM	LOWBUSH BLUEBERRY	FACU	NATURALIZED AT 5' OC	100	2500	
VIBURNUM ACERIFOLIUM	MAPLE-LEAF VIBURNUM	FACU	NATURALIZED AT 5' OC	100	5000	
SMALL SHRUB TREE CREDIT					20.8%	
HERBACEOUS						
QUARTS				SF CREDIT PER UNIT =	2	
POLYSTICHUM ACROSTICHOIDES	CHRISTMAS FERN	FACU	1' O.C.	10	20	
HERBACEOUS CREDIT					0.1%	
TOTAL:				300	24,020	

ZONE E: RIPARIAN FOREST CRITICAL AREA PLANTING SCHEDULE - 18,867 SF						
BOTANICAL NAME/ TECHNICAL DESCRIPTION	COMMON NAME	INDICATOR STATUS	SPACING	QUANTITY	CREDIT TOTAL, SF	
CANOPY TREES - 3/4" CALIPER				SF CREDIT PER UNIT =	100	
BETULA NIGRA	RIVER BIRCH	FACW	NATURALIZED AT 10' OC	17	1700	
NYSSA SYLVATICA	BLACK GUM	FAC	NATURALIZED AT 10' OC	20	2000	
PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	FACW	NATURALIZED AT 10' OC	15	1500	
QUERCUS BICOLOR	SWAMP WHITE OAK	FACW	NATURALIZED AT 10' OC	15	1500	
QUERCUS PALUSTRIS	PIN OAK	FACW	NATURALIZED AT 10' OC	15	1500	
QUERCUS PHELLOS	WILLOW OAK	FACW	NATURALIZED AT 10' OC	15	1500	
TAXODIUM DISTICHUM	BALD CYPRESS	OBL	NATURALIZED AT 10' OC	12	1200	
ULMUS AMERICANA	AMERICAN ELM	FAC	NATURALIZED AT 10' OC	12	1200	
CANOPY TREE CREDIT					55.4%	
UNDERSTORY TREES - 3/4" CALIPER				SF CREDIT PER UNIT =	75	
ASIMINA TRILOBA	PAW PAW	FAC	NATURALIZED AT 8.5' OC	14	1050	
CARPINUS CAROLIANA	IRONWOOD	FAC	NATURALIZED AT 8.5' OC	1		

GENERAL GEOTECHNICAL NOTES

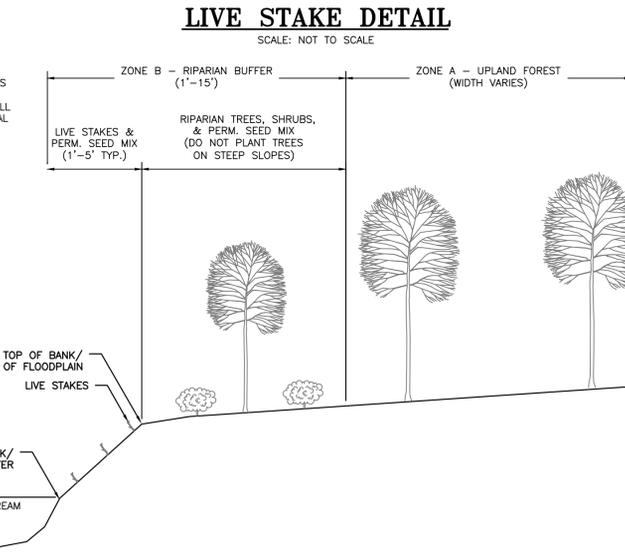
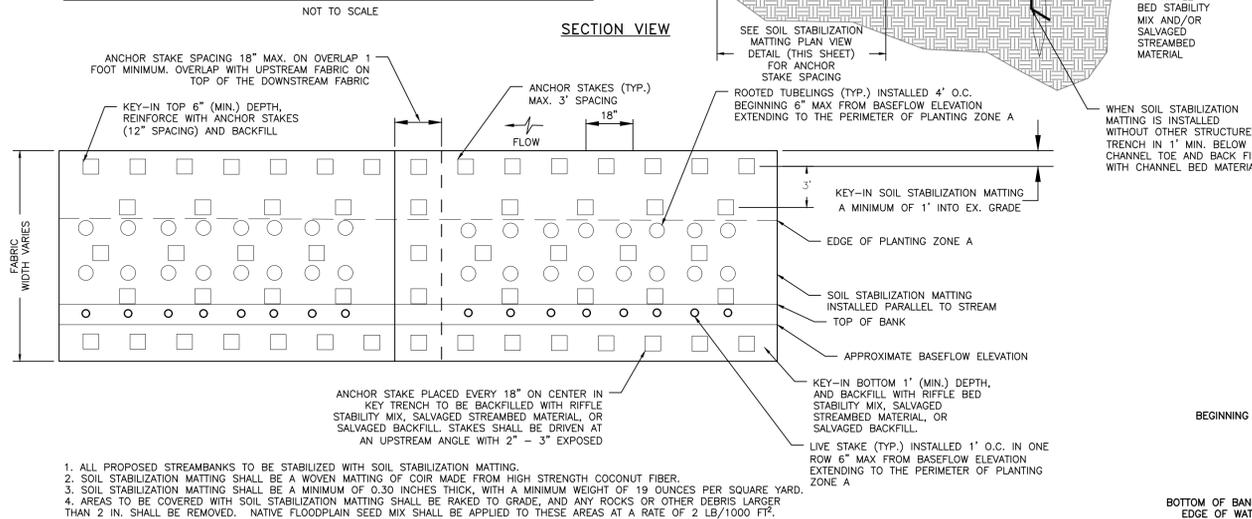
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SUBGRADE INSPECTIONS AND SOIL COMPACTION TESTING ASSOCIATED WITH THE PROPOSED WORK. THIS WORK SHALL BE COMPLETED BY OR UNDER THE SUPERVISION OF A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF MARYLAND, IF REQUESTED BY THE OWNER/DEVELOPER OR AS INDICATED ON THE APPROVED PLANS. THIS ENGINEER IS HEREOF REFERRED TO AS THE GEOTECHNICAL ENGINEER AND SHALL BE FROM AN INDEPENDENT FIRM FROM THAT OF THE CONTRACTOR.
- ALL FILL AREAS SHALL BE CLEANED OF ALL VEGETATION AND DEBRIS, STRIPPED OF ALL TOPSOIL, AND THEN SCARIFIED TO A MINIMUM DEPTH OF 12 INCHES PRIOR TO THE PLACEMENT OF FILL. FILL MATERIAL SHALL BE PLACED IN CONTROLLED LIFTS WITH A MAXIMUM THICKNESS OF 8" PRIOR TO COMPACTION THAT IS CONTINUOUS OVER THE ENTIRE AREA WHERE FILL IS TO BE PLACED. EACH LAYER OF FILL SHALL BE COMPACTED WITH THE MINIMUM NUMBER OF PASSES NECESSARY TO PRODUCE A FULL ASYMPTOTIC COMPACTION.
- FOR STRUCTURAL AREAS, UNLESS OTHERWISE NOTED BY THE APPROVED PLANS, COMPACTION SHALL BE CARRIED OUT WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT TO A DRY DENSITY OF 95% OF THE MAXIMUM DENSITY (STANDARD PROCTOR DENSITY PER ASTM D-698 AND AASHTO METHOD T-99).
- FOR VEGETATIVE AREAS, UNLESS OTHERWISE NOTED BY THE APPROVED PLANS, COMPACTION SHALL BE CARRIED OUT AT A LESS THAN OPTIMUM MOISTURE CONTENT (E.G., AT A WATER CONTENT OF LESS THAN 13% ON A SOIL HAVING AN OPTIMUM CONTENT OF 15%) TO A DRY DENSITY OF BETWEEN 80% AND 85% OF THE MAXIMUM DENSITY (STANDARD PROCTOR DENSITY PER ASTM D-698).
- ALL SOILS USED IN FILL AND BACKFILL MUST BE MOISTENED OR AERATED TO WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT. WHERE THE SOIL LAYER IS TOO DRY, THE CONTRACTOR MUST APPLY WATER UNIFORMLY USING APPROVED EQUIPMENT TO INCREASE THE MOISTURE CONTENT TO WITHIN 2% OF THE OPTIMUM. WHERE THE SOIL LAYER IS TOO WET, THE CONTRACTOR MUST DRY THE SOILS BY FLOWING OR DISKING TO AERATE THE SOIL AND REDUCE THE MOISTURE CONTENT TO WITHIN 2% OF THE OPTIMUM.
- IF THE EXISTING ONSITE MATERIAL IS ROCKY, THEN THE SAME CAN BE USED UP TO 9 INCHES BELOW THE FINAL ELEVATION OR SUBBASE. THE REMAINING FILL MUST BE SELECT EARTH FILL. SOFT SPOTS IDENTIFIED DURING COMPACTION SHALL BE UNDERCUT AND BACKFILLED APPROPRIATELY.
- ALL SELECT EARTH FILL SHALL BE FREE FROM ORGANICS, FROZEN MATERIAL, AND ROCKS/STONES GREATER THAN 2" INCHES IN ANY DIMENSION. ALL FILL MATERIAL MUST BE FREE FROM WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL OR OTHER DELETERIOUS MATERIALS.
- ALL IMPORTED EARTH FILL MATERIAL SHALL HAVE A MINIMUM DENSITY OF 105 POUNDS PER CUBIC FOOT FOR THE MAXIMUM DRY DENSITY ACCORDING TO AASHTO T-180, METHOD C; AND SHALL NOT HAVE A LIQUID LIMIT GREATER THAN 30 NOR A PLASTICITY INDEX GREATER THAN 6 ACCORDING TO ASTM D-4318. ALL OTHER MATERIALS SHALL MEET THE REQUIREMENTS STATED IN CATEGORY 900 OF THE LATEST EDITION OF THE MARYLAND STATE HIGHWAY ADMINISTRATION (MSHA) STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS.
- NRCS-MD POND CODE NO. 378 STANDARDS/SPECIFICATIONS (MD-378) SHALL SUPERSEDE THESE NOTES FOR ANY FILL SUBJECT TO MD-378 WHEN THESE NOTES ARE LESS STRINGENT AND/OR IN THE CASE OF CONFLICT, ANY REFERENCE TO THE ENGINEER IN THE MD-378 SHALL BE THE PROFESSIONAL ENGINEER WHO SIGNED AND SEALED THE DESIGN PLANS. ANY REFERENCE TO THE GEOTECHNICAL ENGINEER SHALL BE THE GEOTECHNICAL ENGINEER IN THESE GENERAL NOTES.
- THE CONTRACTOR SHALL SUBMIT ALL REQUIRED PROCTOR DENSITY RESULTS OF TESTED FILL TO THE OWNER/DEVELOPER FOR REVIEW AND ACCEPTANCE. AT A MINIMUM, WHEN TESTING IS REQUIRED, COMPACTION TESTS SHALL BE COMPLETED FOR EVERY LIFT OF FILL AND THE TESTING FREQUENCY SHALL BE AT LEAST ONCE PER 150 LINEAR FEET OF TRENCH OR ONCE PER 1,500 SQUARE FEET OF FILL. AT A MINIMUM, WHEN TESTING IS REQUIRED, THERE SHALL BE AT LEAST ONE COMPACTION TEST PER LIFT AND AT LEAST TWO COMPACTION TESTS PER DAY. THE GEOTECHNICAL ENGINEER SHALL SUPPLY THE OWNER/DEVELOPER WITH CERTIFIED COMPACTION TEST RESULTS, INCLUDING CERTIFICATION OF PIPE BEDDING SUBGRADE AND/OR FILL SUBGRADE, WHERE APPROPRIATE.
- ALL REQUIRED INSPECTIONS, TESTS, SUPPORTING DATA, REPORTS, AND CERTIFICATIONS SHALL BE PROVIDED TO THE OWNER/DEVELOPER AND SHALL BE SIGNED AND SEALED BY THE GEOTECHNICAL ENGINEER. DAILY INSPECTION REPORTS, IF REQUIRED, MAY BE PROVIDED WITHOUT BEING IMMEDIATELY SIGNED AND SEALED BY THE GEOTECHNICAL ENGINEER. THESE REPORTS SHALL BE COMPILED, REVIEWED, SIGNED AND SEALED, AND SUBMITTED TO THE OWNER/DEVELOPER NO LATER THAN 30 DAYS AFTER THE COMPLETION OF THE PROJECT.

NOTE: TREES AND SHRUBS SHALL BE PLANTED AS DIRECTED BY COUNTY PROJECT MANAGER IN THE FIELD.

LANDSCAPE NOTES

- ALL PLANT SPECIES SHALL BE NATIVE TO THE CHESAPEAKE AND ATLANTIC COASTAL BAYS REGION BASED ON THE U.S. FISH AND WILDLIFE SERVICE PUBLICATION, NATIVE PLANTS FOR WILDLIFE HABITAT AND CONSERVATION LANDSCAPING.
- SPECIES CLASSIFICATION (CANOPY TREE, UNDERSTORY TREE, ETC.) IS IN ACCORDANCE WITH MATURE HEIGHTS AS SET FORTH IN THE U.S. FISH AND WILDLIFE SERVICE PUBLICATION, NATIVE PLANTS FOR WILDLIFE HABITAT AND CONSERVATION LANDSCAPING.
- SPECIES HAVE BEEN SELECTED BASED ON AN ANALYSIS OF SURROUNDING NATIVE FOREST AND DEVELOPED WOODLAND COVER.

SOIL STABILIZATION MATTING DETAILS



SOIL BORING LOG

DEPTH	BORING #1	EL.
0.0'	61.9	GROUND SURFACE
2.0'/59.9		BROWN SANDY LOAM (SW)
4.0'/57.9		TAN CLAYEY SAND (SC)
5.0'/56.9		TAN CLAYEY SAND WITH REDOX (SC)
BOTTOM EL. 56.9		

SOIL BORING LOG

DEPTH	BORING #2	EL.
0.0'	61.0	GROUND SURFACE
2.5'/58.5		TAN SAND WITH GRAVEL (SW)
5.0'/56.0		TAN SANDY CLAY WITH GRAVEL (SC)
BOTTOM EL. 56.0		

SOIL BORING LOG

DEPTH	BORING #3	EL.
0.0'	35.4	GROUND SURFACE
0.5'/34.9		DARK BROWN SAND WITH ORGANICS (SM)
1.0'/34.4		TAN/ GREY SAND WITH GRAVEL (SW)
5.0'/30.4		RED CLAY (CL)
BOTTOM EL. 30.4		

SOIL BORING LOG

DEPTH	BORING #4	EL.
0.0'	34.9	GROUND SURFACE
0.5'/34.4		DARK BROWN SAND WITH ORGANICS (SM)
1.5'/33.4		TAN SANDY CLAY WITH GRAVEL (SW)
5.0'/29.9		RED/ GREY CLAY (CL)
BOTTOM EL. 29.9		

SOIL BORING LOG

DEPTH	BORING #5	EL.
0.0'	14.7	GROUND SURFACE
1.0'/13.7		DARK BROWN SAND WITH ORGANICS (SM)
2.0'/12.7		DARK BROWN/ GREY CLAYEY SAND WITH GRAVEL (SC)
3.0'/11.7		WET TAN CLAY (CL)
4.5'/10.2		WET GREY CLAYEY SAND WITH GRAVEL (SC)
BOTTOM EL. 10.2		

SOIL BORING LOG

DEPTH	BORING #6	EL.
0.0'	14.6	GROUND SURFACE
1.0'/13.6		DARK BROWN SAND WITH ORGANICS (SM)
3.0'/11.6		TAN/ ORANGE CLAY WITH TRACE GRAVEL/ SAND (CL)
5.0'/9.6		WET ORANGE/ GREY CLAY WITH TRACE GRAVEL/ SAND (CL)
BOTTOM EL. 9.6		

SOIL BORING LOG

DEPTH	BORING #7	EL.
0.0'	3.4	GROUND SURFACE
1.0'/2.4		DARK BROWN SAND WITH GRAVEL (SW)
2.0'/1.4		MOIST TAN/ ORANGE SAND WITH GRAVEL (SG)
3.5'/-0.1		MOIST GREY CLAY WITH REDOX (CL)
4.0'/-0.6		MOIST TAN/ ORANGE CLAY WITH GRAVEL (CL)
5.0'/-1.6		WET GREY CLAYEY SAND WITH GRAVEL (SC)
BOTTOM EL. -1.6		

SOIL BORING LOG

DEPTH	BORING #8	EL.
0.0'	2.7	GROUND SURFACE
1.5'/1.2		DARK BROWN SANDY LOAM WITH ORGANICS (SM)
2.5'/0.2		WET GREY CLAYEY SAND WITH GRAVEL (SC)
3.0'/-0.3		MOIST GREY CLAY WITH RED/ BLACK REDOX (CL)
4.0'/-1.3		WET GREY/ ORANGE CLAY (CL)
5.0'/-2.3		WET GREY/ TAN CLAYEY SAND (SC)
BOTTOM EL. -2.3		

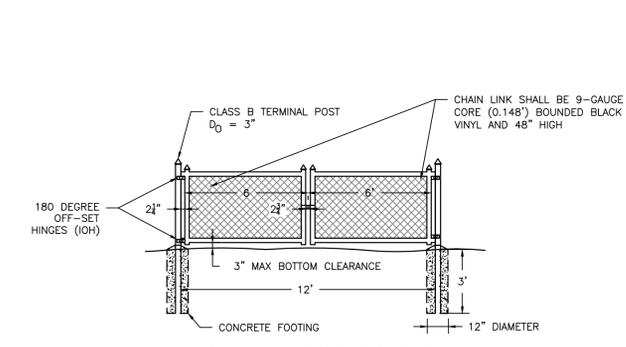
SOIL BORING LOG

DEPTH	BORING #9	EL.
0.0'	69.3	GROUND SURFACE
1.0'/68.3		DARK BROWN SANDY LOAM (SW)
2.0'/67.3		DARK BROWN SANDY CLAY (CH)
3.0'/66.3		TAN SILTY SAND (CL-ML)
3.5'/62.8		SANDY CLAY WITH GRAVEL (CH)
BOTTOM EL. 62.8		

SOIL BORING LOG

DEPTH	BORING #10	EL.
0.0'	60.4	GROUND SURFACE
1.0'/59.4		DARK BROWN SANDY LOAM (SW)
2.0'/58.4		BROWN SANDY CLAY (CH)
3.0'/57.4		TAN SANDY CLAY (CH)
3.5'/56.9		ORANGE/TAN CLAYEY SAND (SM)
4.5'/55.9		GREY CLAY WITH REDOX (CH)
5.0'/55.4		WATER TABLE
BOTTOM EL. 55.4		

ACCESS GATE DETAIL

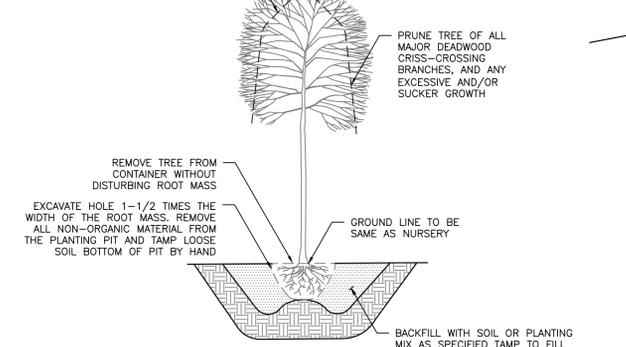


NOTE: EACH GATE HALF SHALL HAVE A CENTER ANCHOR INDUSTRIAL LOCKING DEVICE INCLUDING RECEIVING PIPE, SET IN 24" x 9" CONCRETE TO SUPPORT THE GATE WHEN CLOSED. EACH SECTION SHALL ALSO BE SUPPLIED WITH A HOLD BACK DEVICE TO SECURE THE GATE IN AN OPEN POSITION WHEN NEEDED.

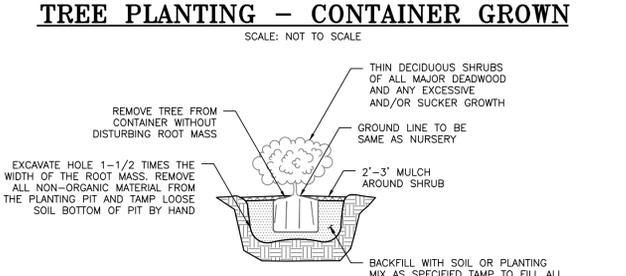
GENERAL PLANTING NOTES

- ALL PLANT MATERIALS SHALL BE NURSERY GROWN AND SHALL CONFORM TO AMERICAN ASSOCIATION OF NURSERYMEN, INC. STANDARDS.
- CONTRACTOR IS RESPONSIBLE TO VERIFY ALL UTILITY LOCATIONS PRIOR TO PLANTING MATERIAL. IF CONFLICTS ARISE, BAYLAND, INC. MUST BE NOTIFIED PRIOR TO ANY GROUND BREAKING.
- WETLAND PLANTING WILL BE ACCOMPLISHED BETWEEN MARCH 15TH AND MAY 15TH (SPRING PLANTING SEASON) OR SEPTEMBER 15TH AND NOVEMBER 15TH (FALL PLANTING SEASON).
- TREES AND SHRUBS SHALL BE PLANTED FROM MARCH 1 TO JUNE 15 AND FROM SEPTEMBER 15 TO DECEMBER 15. PLANTING MAY BE CONTINUED DURING THE WINTER MONTHS PROVIDING THERE IS NO FROST IN THE GROUND AND FROST FREE TOPSOIL PLANTING MIXTURES ARE USED.
- NO CONTAINER-GROWN MATERIAL SHALL BE PLANTED IF NOT ACCUSTOMED TO THE CURRENT WEATHER CONDITIONS. CONTRACTOR IS RESPONSIBLE FOR GENERAL MAINTENANCE INCLUDING WATERING.
- ALL PLANTING MATERIAL AND PLANTING METHODS SHALL CONFORM TO CONSTRUCTION SPECIFICATIONS.
- DISTURBED AREAS WITHIN THE LIMITS OF DISTURBANCE SHALL BE STABILIZED PER THE DETAILS AND SPECIFICATIONS FOR VEGETATIVE ESTABLISHMENT.
- IF A MINIMUM COVERAGE OF 80% IS NOT ACHIEVED IN THE PLANTED AQUATIC BENCH AFTER THE SECOND GROWING SEASON, A REINFORCEMENT PLANTING WILL BE REQUIRED.

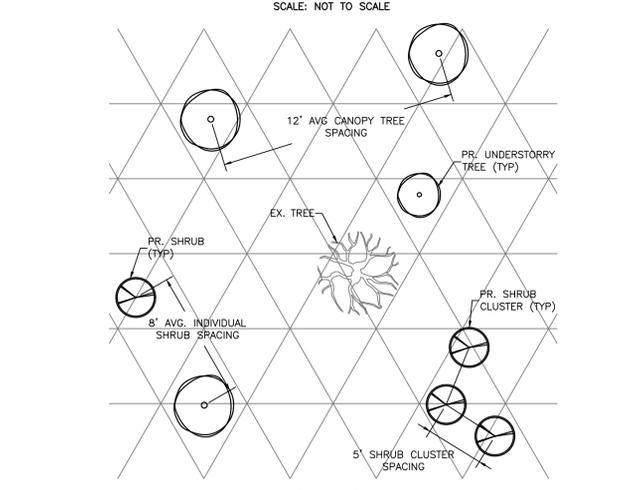
TREE PLANTING - CONTAINER GROWN



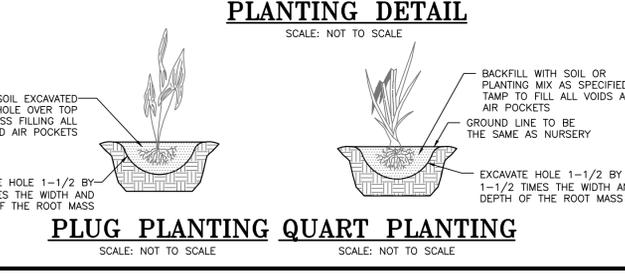
SHRUB PLANTING - CONTAINER GROWN



TYPICAL RIPARIAN ZONES SECTION



TYPICAL 30'X30' NATURALIZED PLANTING DETAIL



S/C PLAN # 59838 GRA # 15387-2018

EG-SWMENG- 000372-2018 # 97032

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"Integrating Engineering and Environment"

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BAYLAND JOB NO. 4_3801

REVISIONS

HARFORD COUNTY, MARYLAND

STILLMEADOW STREAM & OUTFALL RESTORATION PLANTING DETAILS, NOTES & BORINGS

DRAWN BY: JT/EM CONTRACT NO.: 16-153

DESIGNED BY: JP SCALE: AS SHOWN

REVIEWED BY: MKB SHEET 34 OF 35

DATE: 07/22/19

SOILS CHART

SYMBOL	SOIL	HSG	K
BeC	BELTSVILLE SILT LOAM (SLOPES 5%-10%)	C	0.43
Cx	CUT AND FILL LAND	-	-
EsB2	ELSBORO LOAM (SLOPES 2%-5%) MODERATELY ERODED	B	0.49
MiaA	MATTAPEX SILT LOAM (SLOPES 0%-2%) NORTHERN COASTAL PLAIN	C	0.49
MiaB	MATTAPEX SILT LOAM (SLOPES 2%-5%) NORTHERN COASTAL PLAIN	C	0.49
RuB	RUSSETT FINE SANDY LOAM (SLOPES 0%-5%)	C	0.32
RuD	RUSSETT FINE SANDY LOAM (SLOPES 5%-15%)	C	0.32
SIC2	SASSAFRAS LOAM (SLOPES 10%-15%) MODERATELY ERODED	B	0.32
SsD	SASSAFRAS AND JOPPA SOILS (SLOPES 10%-15%)	B	0.49
Tm	TIDAL MARSH	D	-

TC NODES CHART

DRAINAGE AREA	POINT	ELEVATION
1	A	98
	B	94
	C	79
	D	71.5
	E/SP01	67.5
2	A	95
	B	94
	C	90
	D	86
	E	81.5
	F	60
	G	26.25
	H/SP05	24.25
3	A	88
	B	86.25
	C	49
	D/SP02	21.5
4	A	88
	B	78.5
	C/SP03	21.5
	D	8.5
	E	6.1
	F/SP04	0

EXISTING CONDITIONS HYDROLOGY

	AREA (AC.)	CN	Tc (hr)	Q1 (cfs)	Q2 (cfs)	Q10 (cfs)	Q100 (cfs)
DA 1 (SP01)	7.4	80	0.211	3.92	5.99	16.51	27.34
DA 3	3.7	68	0.374	0.32	0.67	3.66	7.89
SP02	11.1	-	-	4.09	6.43	19.64	34.53
DA 2 (SP05)	34.4	81	0.238	18.66	28.14	74.29	122.53
SP03	45.5	-	-	22.71	34.55	96.06	161.36
DA 4	18.3	80	0.231	9.19	14.11	39.85	66.93
OUTLET (SP04)	63.8	-	-	31.73	48.36	131.43	220.34

PROPOSED CONDITIONS HYDROLOGY

	AREA (AC.)	CN	Tc (hr)	Q1 (cfs)	Q2 (cfs)	Q10 (cfs)	Q100 (cfs)
DA 1 (BMP 1) (SP01)	7.4	80	0.211	3.92	5.99	16.51	27.34
DA 3	3.7	68	0.374	0.32	0.67	3.66	7.89
SP02	11.1	-	-	3.91	5.99	16.47	27.34
DA 2 (SP05)	34.4	81	0.238	18.66	28.14	74.29	122.53
SP03	45.5	-	-	22.71	34.55	93.69	156.69
DA 4	18.3	80	0.231	9.19	14.11	38.89	64.91
OUTLET (SP04)	63.8	-	-	31.62	48.19	131.28	219.72

LAND USE MATRICES

DA 1

	A	B	C	D	TOTAL
OPEN SPACE	-	0.23	3.83	-	4.06
IMPERVIOUS	-	0.19	2.32	-	2.51
WOODS	-	0.59	0.20	-	0.79
TOTAL	-	1.01	6.35	-	7.36

DA 2

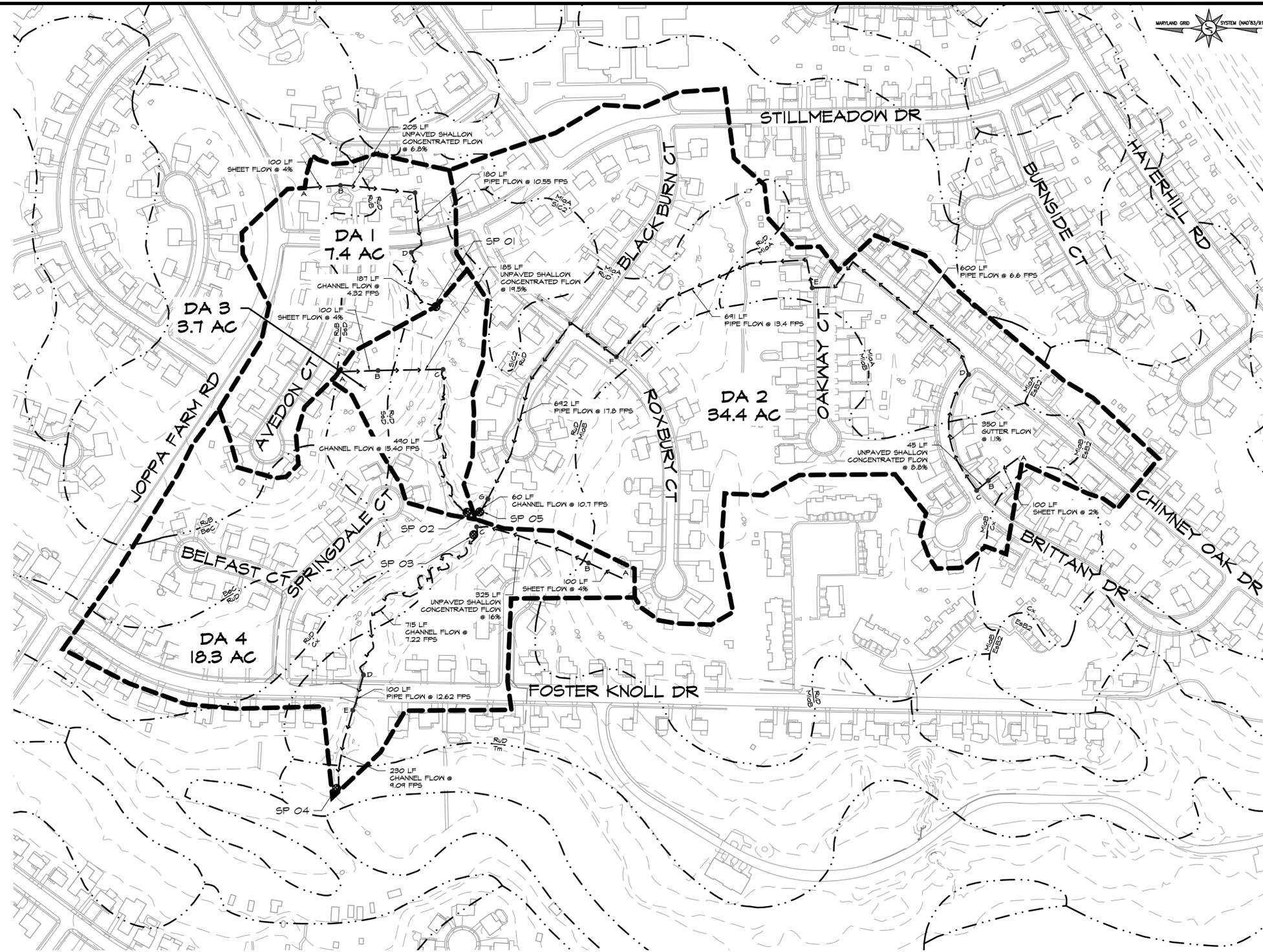
	A	B	C	D	TOTAL
OPEN SPACE	-	1.69	16.88	0.43	19.00
IMPERVIOUS	-	1.43	9.71	0.31	11.45
WOODS	-	0.35	3.63	-	3.98
TOTAL	-	3.47	30.22	0.74	34.43

DA 3

	A	B	C	D	TOTAL
OPEN SPACE	-	0.14	0.48	-	0.62
IMPERVIOUS	-	0.05	0.15	-	0.20
WOODS	-	0.88	1.96	-	2.84
TOTAL	-	1.01	6.35	-	7.36

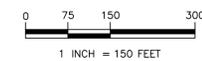
DA 4

	A	B	C	D	TOTAL
OPEN SPACE	-	0.13	6.74	1.40	8.27
IMPERVIOUS	-	0.12	4.34	0.75	5.21
WOODS	-	0.25	3.98	0.58	4.81
TOTAL	-	0.50	15.06	2.73	18.39



DRAINAGE AREA MAP

SCALE: 1" = 150'



EG-SWMENG- 000372-2018 # 97032



S/C PLAN # 59838 GRA # 15387-2018



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REVISIONS

HARFORD COUNTY, MARYLAND

STILLMEADOW STREAM & OUTFALL RESTORATION DRAINAGE AREA MAP

DRAWN BY: EM/BF
DESIGNED BY: FHM
REVIEWED BY: MKB

CONTRACT NO.: 16-153
SCALE: AS SHOWN
SHEET 35 OF 35
DATE: 07/22/19