ANNAPOLIS WATERWORKS PARK STREAM RESTORATION
DESIGN DEVELOPMENT PLAN
ARUNDEL RIVERS FEDERATION
CITY OF ANNAPOLIS - SOUTH RIVER WATERSHED

2607 HOUSLEY RD
ANNAPOLIS, MD 21401

CONSULTANT'S CERTIFICATION

"THE DEVELOPER'S PLAN TO CONTROL SILT AND EROSION IS ADEQUATE TO CONTAIN THE SILT AND EROSION ON THE PROPERTY COVERED BY THE PLAN." I CERTIFY THAT THIS PLAN OF EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THIS SITE, AND WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE ANNE ARUNDEL SOIL CONSERVATION DISTRICT PLAN SUBMITTAL GUIDELINES AND THE CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SEDIMENT AND EROSION CONTROL. I HAVE REVIEWED THIS SEDIMENT AND EROSION CONTROL PLAN WITH THE OWNER/DEVELOPER.

MD. P.E. LICENSE # 30734

MD. LAND SURVEYOR LICENSE# _____

MD. LANDSCAPE ARCHITECT # _____

NAME DOUG STREAKER

FIRM NAME BIOHABITATS, INC.

STREET ADRESS 2081 CLIPPER ROAD
BALTIMORE, MD 21211

SEAL

SIGNATURE

DATE

STANDARD RESPONSIBILITY NOTES

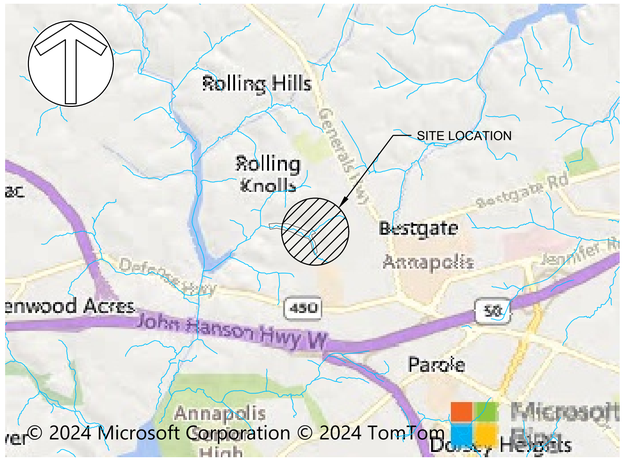
1. I (WE) CERTIFY THAT:
a. ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE IN ACCORDANCE WITH THIS SEDIMENT AND EROSION CONTROL PLAN, AND FURTHER, AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ON-SITE EVALUATION BY THE ANNE ARUNDEL SOIL CONSERVATION DISTRICT(AASCD) BOARD OF SUPERVISORS OR THEIR AUTHORIZED AGENTS.
b. ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE FROM THE MARYLAND DEPARTMENT OF THE ENVIRONMENT'S APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT.
RESPONSIBLE PERSONNEL ON SITE: _____

c. IF APPLICABLE, THE APPROPRIATE ENCLOSURE WILL BE CONSTRUCTED AND MAINTAINED ON SEDIMENT BASIN(S) INCLUDED IN THIS PLAN. SUCH STRUCTURE(S) WILL BE IN COMPLIANCE WITH THE ANNE ARUNDEL COUNTY CODE.
2. THE DEVELOPER IS RESPONSIBLE FOR THE ACQUISITION OF ALL EASEMENTS, RIGHT, AND/OR RIGHTS-OF-WAY THAT MAY BE REQUIRED FOR THE SEDIMENT AND EROSION CONTROL PRACTICES, STORM WATER MANAGEMENT PRACTICES AND THE DISCHARGE OF STORM WATER ONTO OR ACROSS ADJACENT OR DOWNSTREAM PROPERTIES INCLUDED IN THE PLAN.
3. FOR INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT AND/OR TEMPORARY STABILIZATION PER THE AASCD VEGETATIVE ESTABLISHMENT SHALL BE COMPLETED WITHIN THREE CALENDAR DAYS FOR THE SURFACE OF ALL CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN DAYS FOR ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. THE GRADING AND SEDIMENT CONTROL APPROVAL ON THIS PLAN EXTENDS ONLY TO THOSE AREAS WITHIN THE LIMITS OF DISTURBANCE.
5. THE APPROVAL OF THIS PLAN FOR SEDIMENT AND EROSION CONTROL DOES NOT RELIEVE THE DEVELOPER/CONSULTANT FROM COMPLYING WITH FEDERAL, STATE OR COUNTY REQUIREMENTS PERTAINING TO ENVIRONMENTAL ISSUES.
6. THE DEVELOPER MUST REQUEST THAT THE SEDIMENT AND EROSION CONTROL INSPECTOR APPROVE WORK COMPLETED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN, THE GRADING OR BUILDING PERMIT, AND THE ORDINANCE.
7. ALL MATERIAL SHALL BE TAKEN TO A SITE WITH AN APPROVED SEDIMENT AND EROSION CONTROL PLAN.
8. FIRST PHASE INSPECTION AND APPROVAL OF THE SEDIMENT AND EROSION CONTROL INSPECTOR SHALL BE REQUIRED UPON COMPLETION OF THE INSTALLATION OF EROSION AND SEDIMENT CONTROLS PRIOR TO PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THE INITIAL APPROVAL BY THE SEDIMENT AND EROSION CONTROL INSPECTOR IS GIVEN.
a. INSPECTION AND PERMITS MAY ALSO REQUIRE THAT AN INSPECTION AND CERTIFICATION OF THE INSTALLATION OF SEDIMENT CONTROL ALSO BE PERFORMED BY A DESIGN PROFESSIONAL PRIOR TO CONSTRUCTION COMMENCING.
9. APPROVAL FROM THE INSPECTOR MUST BE REQUESTED ON FINAL STABILIZATION OF ALL SITES PRIOR TO REMOVAL OF SEDIMENT AND EROSION CONTROLS.
10. EXISTING TOPOGRAPHY MUST BE FIELD VERIFIED BY RESPONSIBLE PERSONNEL TO THE SATISFACTION OF THE SEDIMENT CONTROL INSPECTOR PRIOR TO COMMENCING WORK.

_____ _____
SIGNATURE OF DEVELOPER/OWNER DATE

PRINT: NAME: _____
TITLE: _____
AFFILIATION: _____
ADDRESS: _____
TELEPHONE NUMBER: _____
EMAIL ADDRESS: _____

VICINITY MAP



SCALE: 1" = 2000'

SITE ANALYSIS TABULATION	
	TOTAL
TOTAL AREA OF PROPERTY	400.8 AC - (CUMULATIVE AREA OF ALL PROPERTIES IMPACTED)
DISTURBED AREA	1.93 AC
IN STREAM AREA NOT TO BE STABILIZED	0 SY
AREA MECHANICALLY STABILIZED	0 AC
AREA VEGETATIVELY STABILIZED	1.58 AC
TOTAL CUT	449.13 CY
TOTAL FILL	2,441.46 CY
TOTAL SPOIL	0 CY
TOTAL IMPORTED FILL	1,992.33 CY

* ESTIMATED INFORMATION NOT INTENDED FOR BIDDING

NOTE:
CUT AND FILL ESTIMATED VOLUMES IN THE TABLE ARE CALCULATED BASED ON CAD 3D SURFACE ANALYSIS BETWEEN EXISTING GRADES SHOWN (TOPOGRAPHIC SURVEY PERFORMED IN 2017) AND PROPOSED FINISHED GRADES. THESE ESTIMATES ARE NOT INTENDED FOR BIDDING AND DO NOT ACCOUNT FOR EXPANSION OR COMPACTION OF SOIL MATERIALS OR OVER EXCAVATION REQUIRED TO MEET SUBGRADE.

OVER EXCAVATION SHALL BE INCIDENTAL TO STRUCTURE PLACEMENT.

SITE INFORMATION TABULATION

A. OWNER INFORMATION -SEE PROPERTY OWNERSHIP TABLE
B. ENGINEER INFORMATION - BIOHABITATS
C. TAX MAP/PARCEL- SEE PROPERTY OWNERSHIP TABLE
D. PLAT REFERENCE - SEE PROPERTY OWNERSHIP TABLE
E. PROPERTY AREA - SEE PROPERTY OWNERSHIP TABLE
F. DISTRICT - 02
G. ZONING - OPEN SPACE (OS)
H. STREAM USE DESIGNATION - CLASS I
I. SUBWATERSHED/WATERSHED - MD 8 DIGIT 02131003/SOUTH RIVER
J. CRITICAL AREA - NO

Property Owner	Tax Map	Parcel	Plat Reference	Property Area (ac)
CITY OF ANNAPOLIS MAYOR & ALDERMN	44	226	L.2410 F.360	395.4
KRG GATEWAY VILLAGE LLC	45	752	180 F.33	5.4
ANNE ARUNDEL COUNTY RIGHT OF WAY	N/A	N/A	N/A	N/A

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3	SHEET LAYOUT KEY MAP
4	EXISTING CONDITIONS
5	EXISTING CONDITIONS
6	EXISTING FEATURES AND SITE RESOURCES NOTES
7	FOREST STAND DELINEATION NOTES
8	FOREST STAND DELINEATION NOTES
9	FOREST STAND DELINEATION PLAN
10	FOREST STAND DELINEATION PLAN
11	GRADING PLAN
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ANNE ARUNDEL SOIL CONSERVATION DISTRICT
SEDIMENT AND EROSION CONTROL APPROVAL

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

Biohabitats
The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
fx: 410.554.0168 / www.biohabitats.com
Restore the Earth & Inspire Ecological Stewardship

Arundel Rivers Federation

ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	BY

APPROVED	DATE	APPROVED	DATE
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT-OF-WAY	

SCALE:	AS SHOWN
DRAWN BY	KB
CHECKED BY	DS/JC
SHEET NO.	1 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

TITLE SHEET

GENERAL NOTES

1. SITE CONDITIONS - THE CONTRACTOR SHALL CONTINUALLY REVIEW SITE CONDITIONS. CONDITIONS REQUIRING CONSTRUCTION DIFFERENT OF THAT SHOWN ON THE PLANS SHALL BE REPORTED TO THE OWNER/ENGINEER PRIOR TO PROCEEDING WITH THE AFFECTED CONSTRUCTION.
2. PROTECTION OF PROPERTY - THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF PUBLIC AND PRIVATE PROPERTY ADJACENT TO HIS WORK AND SHALL EXERCISE DUE CAUTION TO AVOID DAMAGE TO SUCH PROPERTY. THE CONTRACTOR SHALL REPLACE OR REPAIR TO THEIR ORIGINAL CONDITION, ALL IMPROVEMENTS WITHIN OR ADJACENT TO THE AREA OF WORK WHICH ARE NOT DESIGNATED FOR REMOVAL, AND WHICH ARE DAMAGED OR REMOVED AS A RESULT OF HIS OPERATIONS. CONTRACTOR SHALL PERFORM FULL WIDTH REPAIR OR REPLACE ANY DAMAGED ROADS, CURBS, FENCES, DRIVEWAY, AND SIDEWALKS IN KIND AT NO COST TO COUNTY.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL PROPERTY CORNER MARKERS. PROPERTY CORNER MARKERS DAMAGED BY CONSTRUCTION ACTIVITIES SHALL BE REESTABLISHED BY A PROFESSIONAL SURVEYOR LICENSED IN MARYLAND AT NO COST TO COUNTY.
4. SAFETY - NEITHER THE OWNER NOR THE ENGINEER/DESIGNATED SPECIALIST WILL BE RESPONSIBLE FOR ENSURING CONTRACTOR'S COMPLIANCE WITH SAFETY MEASURES OR REGULATIONS. THE CONTRACTOR SHALL DESIGN, CONSTRUCT, AND MAINTAIN ALL SAFETY DEVICES, AND SHALL BE SOLELY RESPONSIBLE FOR CONFORMING TO ALL LOCAL, STATE, FEDERAL, AND CONTRACTUAL SAFETY AND HEALTH STANDARDS, LAWS, AND REGULATIONS.
5. THE CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH THE LATEST STANDARDS OF OSHA DIRECTIVES OR ANY OTHER AGENCY HAVING JURISDICTION FOR ALL ACTIVITIES ASSOCIATED WITH THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH OSHA PERFORMANCE CRITERIA.
6. CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF PROJECT CONSTRUCTION, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY.
7. STANDARDS SPECIFICATIONS - ALL CONSTRUCTION WORK AND INSTALLATION SHALL CONFORM TO THE PROJECT SPECIFICATIONS PROVIDED WITH THE CONTRACT DOCUMENTS AND ANY STANDARD SPECIFICATIONS AS INDICATED ON THESE PLANS.
8. NO CONSTRUCTION ACTIVITIES INCLUDING THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES SHALL BEGIN UNTIL ALL THE REQUIRED EASEMENTS, RIGHT-OF-WAYS AND PERMITS HAVE BEEN OBTAINED.
9. APPROVED PLANS - NO CONSTRUCTION SHALL BE STARTED WITHOUT APPROVED PLANS. ANY CONSTRUCTION DONE WITHOUT APPROVED PLANS AND PRIOR TO NOTIFICATION TO THE INSPECTOR WILL BE AT THE CONTRACTOR'S RISK, UNLESS SPECIFICALLY DIRECTED BY THE OWNER IN WRITING. THE OWNER RESERVES THE RIGHT TO REJECT CONSTRUCTION DONE WITHOUT APPROVED PLANS. THE CONTRACTOR SHALL HAVE COPIES OF THE APPROVED PLANS FOR THIS PROJECT ON THE SITE AT ALL TIMES AND SHALL BE FAMILIAR WITH ALL APPLICABLE STANDARDS AND SPECIFICATIONS.
10. THE CONTRACTOR SHALL MAINTAIN AN AS-BUILT REDLINE SET OF PLANS ON THE SITE AT ALL TIMES.
11. INSPECTIONS - THE CONTRACTOR IS RESPONSIBLE FOR ARRANGING THE REQUIRED INSPECTIONS. THE PRESENCE OR ABSENCE OF AN INSPECTOR WILL NOT RELIEVE THE CONTRACTOR OF FULL RESPONSIBILITY FOR THE PROPER PERFORMANCE OF WORK.
12. ELECTRONIC FILES MAY BE PROVIDED TO THE CONTRACTOR UPON REQUEST FOR THE SOLE PURPOSE OF PROVIDING CONSTRUCTION STAKING FOR GRADING ACTIVITIES. APPROVED PLANS SHALL TAKE PRECEDENCE OVER ELECTRONIC FILES.
13. WRITTEN DIMENSIONS ON THE PLANS AND DETAILS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL AND MAINTENANCE OF ALL DRAINAGE FLOWS DURING CONSTRUCTION.
15. IT SHALL BE UNDERSTOOD THAT FAILURE TO MENTION SPECIFICALLY ANY WORK WHICH WOULD NATURALLY BE REQUIRED TO COMPLETE THE PROJECT SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO COMPLETE SUCH WORK AT NO COST TO COUNTY.
16. THE CONTRACTOR MUST STORE ALL EQUIPMENT, MATERIALS, AND/OR SUPPLIES WITHIN DESIGNATED AREAS OF THE LOD AND ALL CONSTRUCTION ACTIVITIES AND ACCESS MUST REMAIN WITHIN THE LOD AS SHOWN ON THE PLANS.
17. A DISTINCTION BETWEEN NEW AND EXISTING ITEMS HAS BEEN MADE ON THE DRAWINGS BY LINE WEIGHT. BLACK LINES REPRESENT NEW WORK UNDER THIS CONTRACT; GRAY LINES REPRESENT EXISTING FEATURES.
18. SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS, THE ENGINEER AND/OR OWNER IS TO BE NOTIFIED IMMEDIATELY TO RESOLVE THE SITUATION. SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT NOTIFYING THE OWNER, THEN THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THOSE CHANGES.
19. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, SAFETY PRECAUTIONS, AND PROGRAMS UNLESS OTHERWISE NOTED ON THE PLANS.
20. UPON COMPLETION OF THE WORK, BUT PRIOR TO DE-MOBILIZATION, THE CONTRACTOR SHALL REMOVE ALL REMNANTS OF CONSTRUCTION MATERIALS FROM THE SITE. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO A CONDITION EQUAL OR BETTER THAN THE PRE-CONSTRUCTION CONDITIONS.
21. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS "STANDARD DETAILS AND SPECIFICATIONS" UNLESS OTHERWISE NOTED.
22. THE CONTRACTOR SHALL NOTIFY THE ANNE ARUNDEL COUNTY INSPECTIONS PERMITS CENTER (410-222-7780) TWO (2) DAYS PRIOR TO BEGINNING CONSTRUCTION.
23. MDE IN-STREAM CLOSURE PERIOD IS MARCH 1 TO JUNE 15.
24. USFWS TREE REMOVAL RECOMMENDED RESTRICTION PERIOD IS APRIL 1 TO NOVEMBER 14.
25. THE GRADING TOLERANCE IS +/- 0.2' VERTICAL AND +/- 0.5' HORIZONTAL. STRUCTURE ELEVATION/LOCATIONS AND GRADING MAY BE FIELD ADJUSTED AT THE DIRECTION OF THE PROJECT ENGINEER/DESIGNATED SPECIALIST.
26. EXCAVATION TO BE PERFORMED BY MECHANICAL MEANS ONLY. BLASTING AND HYDRAULIC DREDGING IS NOT PERMITTED.
27. IMPORTED FILL MATERIAL MUST BE FREE OF CONTAMINATION LEVELS OF ANY POLLUTANT THAT IS, OR MAY BE CONSIDERED TO REPRESENT, A POSSIBLE HEALTH HAZARD TO THE PUBLIC OR MAY BE DETRIMENTAL TO SURFACE OR GROUND WATER QUALITY, OR WHICH MAY CAUSE DAMAGE TO PROPERTY OR THE DRAINAGE SYSTEM. ALL FILL MATERIAL MUST BE FREE OF HAZARDOUS MATERIALS AND COMPLY WITH ALL APPLICABLE DISTRICT AND FEDERAL REGULATIONS.

EXISTING CONDITIONS NOTES

1. BEARNGS SHOWN ON THIS PLAT ARE REFERRED TO THE SYSTEM OF COORDINATES ESTABLISHED IN THE ANNE ARUNDEL COUNTY SURVEY CONTROL SYSTEM AS REFERENCED FROM THE FOLLOWING TRAVERSE/CONTROL & BENCHMARK STATIONS.
   2195: NORTH: 482598.721 EAST: 1440104.273 ELEV: 84.19
   2196: NORTH: 482965.211 EAST: 1441321.306 ELEV: 90.03
2. CURRENT OWNERSHIP: CITY OF ANNAPOLIS, LIBER 2410 FOLIO 360.
3. THE FIELD WORK FOR THIS SURVEY WAS COMPLETED ON FEBRUARY 19, 2025.
4. UTILITY INFORMATION SHOWN HEREON IS A RESULT OF FIELD LOCATIONS OF VISIBLE SURFACE STRUCTURES SUPPLEMENTED WITH AVAILABLE PLAN INFORMATION PROVIDED TO THIS FIRM AT THE TIME OF THE SURVEY.
5. THE SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT.
6. ELEVATIONS ARE REFERRED TO NAVD 88.
7. EXISTING CONDITIONS AND GRADES MAY HAVE CHANGED SINCE THE ORIGINAL SURVEY WAS COMPLETED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM EXISTING CONDITIONS AND GRADES AND ADJUST QUANTITIES, EARTHWORK AND WORK EFFORTS AS NECESSARY AT NO ADDITIONAL COST TO THE PROJECT OWNER. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE OWNER AND ENGINEER/DESIGNATED SPECIALIST PRIOR TO THE BEGINNING OF CONSTRUCTION.
8. CONTOURS OUTSIDE OF SURVEY LIMITS ARE 2017 AA COUNTY LIDAR DISPLAYED AT 1' CONTOUR INTERVAL.
9. THE PROPERTY BOUNDARY OUTLINES SHOWN HEREON ARE BASED UPON DEEDS AND PLATS OF RECORD AND OVERLAID ONTO THE TOPOGRAPHIC SURVEY. THIS IS NOT TO BE CONSTRUED AS A BOUNDARY SURVEY.
10. WETLAND DELINEATION AND FOREST STAND DELINEATION WERE ORIGINALLY COMPLETED BY BIOHABITATS IN FALL 2024.

UTILITY NOTES

1. VISIBLE ABOVE GROUND UTILITIES HAVE BEEN PROVIDED VIA TOPOGRAPHIC SURVEY. SUBSURFACE UTILITY LOCATIONS AND ELEVATIONS ARE APPROXIMATE AND TAKEN FROM BEST AVAILABLE PLANS, RECORDS, AND/OR FIELD RECONNAISSANCE. OTHER UTILITIES MAY EXIST THAT ARE NOT SHOWN AND SHOULD BE VERIFIED IN THE FIELD BY THE CONTRACTOR. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO LOCATE AND PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
2. THE CONTRACTOR SHALL NOTIFY MISS UTILITY AT 1-800-257-7777 A MINIMUM OF FORTY-EIGHT (48) HOURS BEFORE STARTING WORK. ALL EXISTING UTILITIES MUST BE MARKED IN THE FIELD PRIOR TO CONSTRUCTION.
3. THE CONTRACTOR SHALL CONFIRM EXISTING UTILITY LOCATION AND ELEVATION AT ALL LOCATION(S) WHERE THE PROPOSED WORK CROSSES THE EXISTING UTILITIES. THE ENGINEER IS TO BE NOTIFIED OF THIS INFORMATION IN ADVANCE OF CONSTRUCTION AND IF THERE ARE ANY CONFLICTS WITH THE PROPOSED WORK.
4. THE CONTRACTOR SHALL EXERCISE CARE WHEN DIGGING ADJACENT TO AND CROSSING THE UTILITIES TO ENSURE THAT THESE AND ALL UTILITIES ARE PROTECTED FROM DAMAGE DURING CONSTRUCTION. ANY DAMAGE TO THE UTILITIES IS THE CONTRACTOR'S RESPONSIBILITY.
5. ANY EXISTING UTILITIES NOT IMPACTED BY THE PROPOSED WORK ARE TO BE PROTECTED AND TO REMAIN IN SERVICE.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SPILLAGE OF RAW SEWAGE OR OTHER SUBSTANCES THAT WOULD BE CONSIDERED DANGEROUS TO THE ENVIRONMENT DURING ITS CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL FURNISH ALL NECESSARY EQUIPMENT (PLUGGING, PUMPING, CONTAINMENT EQUIPMENT, ETC.) TO PREVENT SPILLAGE OR AS REQUIRED TO SUCCESSFULLY TRANSPORT SEWAGE TO COMPLETE HIS WORK. ALL SEWAGE TRANSPORT SHALL BE BY A DISPOSAL CONTRACTOR LICENSED IN ALL JURISDICTIONS FOR WHICH THE SEWAGE WILL BE TRANSPORTED.
7. THE CONTRACTOR SHALL VERIFY, BY FIELD MEASUREMENT, THE OUTSIDE DIMENSIONS AND MATERIAL OF ALL PIPES, FITTINGS, AND STRUCTURES TO ASSURE PROPER CLEARANCE AND SPACING PRIOR TO FABRICATION OR INSTALLATION.
8. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES THAT MAY OCCUR AS A RESULT OF THE CONSTRUCTION. DAMAGED UTILITIES ARE TO BE IMMEDIATELY REPORTED TO BOTH THE UTILITY OWNER AND PROJECT ENGINEER. ANY DAMAGE TO EXISTING STRUCTURES INCLUDING SEWER PIPES/MANHOLES, STORM DRAIN PIPES/STRUCTURES SHALL BE REPAIRED TO THE UTILITY OWNER'S SATISFACTION BY THE CONTRACTOR AT HIS/HER OWN EXPENSE.

DEMOLITION

1. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES FOR SHUTOFF, CAPPING AND CONTINUATION OF UTILITY SERVICES AS REQUIRED.
2. CONTRACTOR SHALL REMOVE AND TRANSPORT ALL DEBRIS, RUBBISH AND OTHER MATERIALS RESULTING FROM ALL DEMOLITION OPERATIONS TO A LEGAL DISPOSAL OFF SITE.
3. REMOVAL OF ASPHALT AND CONCRETE PAVEMENT SHALL INCLUDE THE REMOVAL OF ALL SURFACE, BASE AND SUB-BASE MATERIALS UNLESS OTHERWISE SPECIFIED.
4. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY AND DETERMINE THE EXACT LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO COMMENCING WORK.
5. THE CONTRACTOR MUST HAND-DIG OR VACUUM EXCAVATE TEST PITS AT ALL UTILITY CROSSINGS TO DETERMINE THE EXACT LOCATION AND DEPTH OF ALL UTILITIES AS WELL IN DEMOLITION WORK AND PRIOR TO ORDERING PIPE MATERIALS AND STRUCTURE. UTILITIES FOUND DURING DEMOLITION OR CONSTRUCTION ACTIVITIES SHALL BE THE RESPONSIBILITY OF ANY CONTRACTOR ENGAGED IN EXCAVATION AT THIS SITE. THE OWNER AND PROJECT ENGINEER/DESIGNATED SPECIALIST SHALL BE NOTIFIED IMMEDIATELY OF ANY UTILITY FINDINGS WHICH DEVIATE FROM THE CONDITIONS SHOWN.
6. ALL EROSION & SEDIMENT CONTROL METHODS SHALL BE INSTALLED BEFORE THE START OF ANY EXCAVATION AND/OR DEMOLITION. IF ANY ONSITE INSPECTION REVEALS FURTHER EROSION CONTROL MEASURES ARE NECESSARY, THE SAME SHALL BE PROVIDED. REFER TO EROSION AND SEDIMENT CONTROL PLAN AND DETAILS.
7. SEE THE EROSION & SEDIMENT CONTROL PLAN SHEETS FOR ALL EXISTING TREES TO REMAIN AND BE PROTECTED. SEE DRAWING TP-01 FOR TREE PROTECTION AND REMOVAL NOTES AND DETAILS.
8. NOTE PROXIMITY OF ADJACENT STRUCTURES AND UTILITY LINES AND MAINTAIN CONTINUED SERVICE DURING CONSTRUCTION. COORDINATE WITH RESPECTIVE UTILITY COMPANIES AND ENGINEER SHOULD RELOCATION OF SERVICE BE REQUIRED.
9. REMOVAL OF ALL WALLS/RETAINING WALLS AND FENCES SHALL INCLUDE THE REMOVAL OF THEIR FOUNDATION UNLESS OTHERWISE INDICATED ON THESE DRAWINGS.
10. UNLESS OTHERWISE SHOWN ON THESE DRAWINGS, EXISTING PAVEMENT TO REMAIN. CONTRACTOR TO PROVIDE PRE-CONSTRUCTION VIDEO OF EXISTING PAVEMENT. EXISTING PAVEMENT, DISTURBED OR DAMAGED DURING CONSTRUCTION, SHALL BE REPLACED PER COUNTY STANDARDS AND SPECIFICATIONS AT NO ADDITIONAL COST.
11. WHERE PORTIONS OF EXISTING BITUMINOUS OR CONCRETE PAVING ARE TO BE REMOVED, THE EXISTING PAVEMENT SHALL BE SAW-CUT.

GENERAL EROSION AND SEDIMENT CONTROL NOTES

1. THE CONTRACTOR IS REQUIRED TO PROVIDE AND MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL". REFER TO STANDARD DETAILS AND DETAILED SPECIFICATIONS OF EACH PRACTICE SPECIFIED HEREIN.
2. NOTIFY THE COUNTY INSPECTION AND PERMITS 3 DAYS PRIOR TO STARTING WORK ON THIS PROJECT.
3. THE CONTRACTOR SHALL VERIFY SITE CONDITIONS AND REPORT ANY DISCREPANCIES TO THE OWNER AND ENGINEER/DESIGNATED SPECIALIST PRIOR TO THE BEGINNING OF CONSTRUCTION.
4. ALL DISTURBED AREAS NOT STABILIZED DAILY SHALL DRAIN TO A SEDIMENT CONTROL DEVICE. NO DISTURBED AREAS TO BE ALLOWED TO DRAIN DIRECTLY OFF SITE.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ASSURING THAT THE SEDIMENT CONTROL MEASURES ARE FUNCTIONAL ON A DAY-TO-DAY BASIS.
6. DISTURBED AREAS AT STORM DRAIN OUTFALLS SHALL BE STABILIZED IMMEDIATELY AFTER COMPLETION.
7. ALL SEDIMENT CONTROL FACILITIES ARE TO REMAIN IN PLACE UNTIL AREA ABOVE FACILITIES ARE STABILIZED AND PERMISSION FOR REMOVAL HAS BEEN OBTAINED FROM THE DOEE SEDIMENT CONTROL INSPECTOR.
8. EXCESS EXCAVATION AND TRASH/DEBRIS WILL BE HAULED TO AN APPROVED DISPOSAL SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING APPROVALS FOR ALL OFF-SITE BORROW PITS AND DISPOSAL AREAS.
9. SEDIMENT CONTROL MEASURES MUST BE INSPECTED AND MAINTAINED REGULARLY TO ENSURE THAT THE INTENDED PURPOSES ARE ACCOMPLISHED.
10. THE CONTRACTOR IS REQUIRED TO COMPLY WITH INSPECTION AND REPORTING REQUIREMENTS AS DEFINED BY THE PROJECT'S MDE GENERAL PERMIT FOR STORMWATER.
11. AT THE END OF EACH WORKING DAY, ALL SEDIMENT CONTROL PRACTICES WILL BE INSPECTED AND LEFT IN OPERATIONAL CONDITION.
12. DUST CONTROL WILL BE PROVIDED FOR ALL DISTURBED AREAS. REFER TO "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL", PG. H.22, FOR ACCEPTABLE METHODS AND SPECIFICATIONS FOR DUST CONTROL.
13. PUMPING SEDIMENT-LADEN WATER INTO WATERS OF THE STATE IS STRICTLY PROHIBITED.
14. THE CONTRACTOR SHALL PROTECT ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS TO PREVENT THE DEPOSITION OF MATERIALS ON PUBLIC ROAD AND PRIVATE PROPERTY. ALL MATERIAL DEPOSITED ON PUBLIC ROADS SHALL BE MECHANICALLY REMOVED IMMEDIATELY. FLUSHING OF THE ROAD SURFACE IS PROHIBITED.
15. ANY CHANGE TO THE LIMIT OF DISTURBANCE ON THE PLAN REQUIRES RESUBMISSION TO ANNE ARUNDEL COUNTY INSPECTIONS AND PERMITS - GRADING AND SEDIMENT CONTROL FOR APPROVAL.
16. THE CONTRACTOR MUST STORE ALL EQUIPMENT WITHIN THE LOD AND ALL CONSTRUCTION ACTIVITIES AND ACCESS MUST REMAIN WITHIN THE LOD AS SHOW ON THE PLANS.

LEGEND

EXISTING		PROPOSED	
	MAJOR CONTOUR	425	MAJOR CONTOUR
	MINOR CONTOUR	424	MINOR CONTOUR
	PROPERTY LINE		BASELINE
SS SS	SANITARY SEWER	LOD	LIMIT OF DISTURBANCE
SD	STORM DRAIN	100 YR	100 YEAR FLOODPLAIN
W W	WATER SUPPLY	RSF	REINFORCED SILT FENCE
E E	ELECTRIC	BFD BFD	BASE FLOW DIVERSION PIPE
G G	GAS		SPSC RIFFLE
C C	COMMUNICATIONS		VALLEY WIDE RIFFLE
CA CA	CRITICAL AREA BOUNDARY		PLUNGE POOL
CAB CAB	CRITICAL AREA BUFFER		POOL LIMITS
	SOIL TYPE BOUNDARY		POST AND WATTLE STRUCTURE
100YR	100 YEAR FLOODPLAIN (HEC-RAS)		IN-CHANNEL HAUL ROAD (ICHR)
FEMA 100	100 YEAR FLOODPLAIN (FEMA)		STAGING AND STOCKPILING AREA
	STREAM CENTERLINE		CONSTRUCTION ACCESS ROAD
WL WL	WETLAND LIMIT	SCE	STONE CONSTRUCTION ENTRANCE
WB	WETLAND BUFFER		TREE PLANKING
WUS	WATER OF THE US		TREE REMOVAL
	LIMIT OF SURVEY		
	TREELINE		
	TREE		
	TRAVERSE POINT		

FOREST STAND DELINEATION

WB	WETLAND BUFFER
SB SB	STREAM BUFFER
	SOIL BOUNDARY
	STUDY BOUNDARY
FSD	FOREST STAND BOUNDARY
WL WL WL	WETLANDS
CRZ CRZ CRZ	SPECIMEN TREE
	FOREST SURVEY POINT
	SLOPES > 25°
	SLOPES 15° - 25°

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Arundel Rivers Federation

ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	BY	APPROVED / DATE	APPROVED / DATE
		CHIEF ENGINEER	PROJECT MANAGER
		APPROVED / DATE	APPROVED / DATE
		ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT-OF-WAY

SCALE:	NA
DRAWN BY	KB
CHECKED BY	DS/JC
SHEET NO.	2 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

GENERAL NOTES

HORIZONTAL SCALE

0 100 200

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Arundel Rivers FEDERATION

ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED		APPROVED DATE	APPROVED DATE	SCALE: 1"=100'	ANNAPOLIS WATERWORKS PARK STREAM RESTORATION
DATE	BY			DRAWN BY KB	
		CHIEF ENGINEER	PROJECT MANAGER	CHECKED BY DS/JC	
		APPROVED DATE	APPROVED DATE	SHEET NO. 3 OF 30	SHEET LAYOUT KEY MAP
				PROJECT NO. 24015.01	
		ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT-OF-WAY	PROPOSAL NO.	

6/18/2026 M:\CADD\Projects\24015.01 Annapolis Waterworks Park Stream Restoration\CAD\Plans\si01aw.dwg

MATCHLINE - SHEET 5

REGATTA BAY II LTD
PARTNERSHIP
L.13917 F.251

CITY OF ANNAPOLIS
MAYOR & ALDERMN
L.2410 F.360

KRG GATEWAY
VILLAGE LLC
NO DEED
REFFERENCE
PLAT 180 F.33

CENTERLINE OF STREAM
&
THALWEG

EX RIPRAP TO BE
SALVAGED AND
STOCKPILED FOR
REUSE

RIPRAP

CONCRETE HEADWALL

INV 8" HDPE=52.91
INV 56" RCP=48.39

INV 8" HDPE=52.94

STORM DRAIN INLET
TOP ELEV=67.80
INV(SE)21" RCP=63.30

STORM DRAIN MANHOLE
TOP ELEV=67.64
INV(NW)21" RCP=62.94
INV(NE)21" RCP=61.74
INV(SW)21" RCP=63.54

STORM DRAIN INLET
TOP ELEV=67.97
INV(NW) 21" RCP=64.22

CONCRETE RISER (SEE DIAGRAM)
TOP ELEV=67.85
INV 56" RCP=49.00
INV 12" RCP=55.95

POND

HAND RAIL

HAND BOX

CONCRETE CURB
CONCRETE WALK

SD 21" RCP

HOUSLEY ROAD
(60' PUBLIC R/W)

TR 100
TR 101
TR 2
TR 3

EXISTING FEATURES NOTES:

1. ONLY SURVEYED TREES GREATER THAN 10" DBH WITHIN STUDY AREA ARE SHOWN ON THE PLANS. SEE SHEET 6 FOR TREE TABLE.
2. SEE SHEET 22 FOR TREE PROTECTION AND REMOVAL NOTES AND DETAILS.
3. WITHIN THE LOD, CONTRACTOR SHALL CLEAN UP AND PROPERLY DISPOSE OF MISCELLANEOUS DEBRIS.
4. SEE SHEET 6 FOR EXISTING TREE INFORMATION AND NOTES.

HORIZONTAL SCALE
0 20 40

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ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	BY

APPROVED	DATE	APPROVED	DATE
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT-OF-WAY	

SCALE:	1" = 20'
DRAWN BY	KB
CHECKED BY	DS/JC
SHEET NO.	4 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK
STREAM RESTORATION

EXISTING CONDITIONS

6/18/2026 M:\CADD\Projects\24015.01 Annapolis Waterworks Park Stream Restoration\CAD\Plans\ec01aw.dwg

EXISTING FEATURES NOTES:

1. ONLY SURVEYED TREES GREATER THAN 10" DBH WITHIN STUDY AREA ARE SHOWN ON THE PLANS. SEE SHEET 6 FOR TREE TABLE.
2. SEE SHEET 22 FOR TREE PROTECTION AND REMOVAL NOTES AND DETAILS.
3. WITHIN THE LOD, CONTRACTOR SHALL CLEAN UP AND PROPERLY DISPOSE OF MISCELLANEOUS DEBRIS.
4. SEE SHEET 6 FOR EXISTING TREE INFORMATION AND NOTES.

HORIZONTAL SCALE

0 20 40

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ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	BY

APPROVED DATE		APPROVED DATE	
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED DATE		APPROVED DATE	
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT-OF-WAY	

SCALE:	1" = 20'
DRAWN BY	KB
CHECKED BY	DS/JC
SHEET NO.	5 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK
STREAM RESTORATION

EXISTING CONDITIONS

6/18/2026 M:\CADD\Projects\24015.01 Annapolis Waterworks Park Stream Restoration\CAD\Plans\ec01aw.dwg

Tree ID	Species	Scientific Name	DBH	Condition	Notes	Status (TBR or TBP)
2735	American beech	*Fagus grandifolia*	26.9	Excellent		
2736	Tulip poplar	*Liriodendron tulipifera*	29.1	Good		
2737	Chestnut oak	*Quercus montana*	27.0	Fair		TBR
2738	American beech	*Fagus grandifolia*	21.0	Good	English ivy @ base	TBP
2739	Tulip poplar	*Liriodendron tulipifera*	27.3	Fair		
2740	American beech	*Fagus grandifolia*	13.0	Good		TBP
2741	White oak	*Quercus alba*	16.4	Fair	Stream bank undercut	TBR
2742	Tulip poplar	*Liriodendron tulipifera*	18.7	Good		TBP
2743	White oak	*Quercus alba*	25.4	Fair		
2744	American beech	*Fagus grandifolia*	29.9	Fair	Hollow	
2745	Chestnut oak	*Quercus montana*	27.9	Dead	Hazard?	
2746	American beech	*Fagus grandifolia*	13.0	Good		TBR
2747	American beech	*Fagus grandifolia*	24.7	Poor	Trunk decay	TBR
2748	White oak	*Quercus alba*	25.5	Good		
2749	Tulip poplar	*Liriodendron tulipifera*	12.6	Good		
2750	Tulip poplar	*Liriodendron tulipifera*	13.9	Good	Lean	TBR
2751	American beech	*Fagus grandifolia*	30.4	Fair	Upper trunk decay	TBR
2752	Tulip Poplar	*Liriodendron tulipifera*	19.8	Good		TBP
2753	American beech	*Fagus grandifolia*	27.2	Good		
2754	Red maple	*Acer rubrum*	16.0	Poor	Hollow	TBR
2755	Red maple	*Acer rubrum*	23.5	Fair		TBP
2756	American beech	*Fagus grandifolia*	24.4	Good		
2757	Tulip poplar	*Liriodendron tulipifera*	27.9	Fair		
2758	Tulip poplar	*Liriodendron tulipifera*	16.6	Good		
2759	Chestnut oak	*Quercus montana*	14.0	Good		
2760	White oak	*Quercus alba*	18.5	Good		
2761	White oak	*Quercus alba*	19.8	Excellent		
2762	American beech	*Fagus grandifolia*	27.8	Fair	Hollow	
2763	Chestnut oak	*Quercus montana*	21.2	Fair		
2764	American beech	*Fagus grandifolia*	12.6	Fair		
2765	American beech	*Fagus grandifolia*	16.3	Excellent		
2766	Chestnut oak	*Quercus montana*	32.3	Dead	Hazard?	TBR
2767	Tulip poplar	*Liriodendron tulipifera*	45.0	Poor	Hollow	
2768	American beech	*Fagus grandifolia*	19.0	Excellent		
2769	White oak	*Quercus alba*	42.8	Fair		
2770	American beech	*Fagus grandifolia*	30.9	Fair		TBP
2771	Tulip poplar	*Liriodendron tulipifera*	20.7	Fair	Hollow	TBP
2772	Tulip poplar	*Liriodendron tulipifera*	20.1	Good		TBP
2773	Tulip poplar	*Liriodendron tulipifera*	27.7	Good		TBP
2774	Tulip poplar	*Liriodendron tulipifera*	24.7	Good		TBP
2775	Red maple	*Acer rubrum*	12.0	Poor		TBP
2776	American beech	*Fagus grandifolia*	14.8	Fair	Hollow	TBP
2777	White oak	*Quercus alba*	28.4	Dead	Hazard?	TBP
2778	Red maple	*Acer rubrum*	17.9	Good		TBP
2779	Tulip poplar	*Liriodendron tulipifera*	25.7	Fair		TBP
2780	Tulip poplar	*Liriodendron tulipifera*	16.0	Poor	Hollow	TBR
2781	Black gum	*Nyssa sylvatica*	14.4	Fair	Stream bank erosion	TBR
2782	American beech	*Fagus grandifolia*	16.8	Excellent		TBR
2783	Tulip poplar	*Liriodendron tulipifera*	34.7	Good		
2784	American beech	*Fagus grandifolia*	12.7	Excellent		
2785	Red maple	*Acer rubrum*	15.0	Fair		TBP
2786	Tulip poplar	*Liriodendron tulipifera*	27.4	Good		TBP
2787	Red maple	*Acer rubrum*	15.8	Fair	Hollow	TBP
2788	Black gum	*Nyssa sylvatica*	13.5	Good		TBP
2789	American beech	*Fagus grandifolia*	17.2	Good		TBP
2790	American beech	*Fagus grandifolia*	12.5	Good		TBP
2791	American beech	*Fagus grandifolia*	23.6	Good		
2792	Tulip poplar	*Liriodendron tulipifera*	23.7	Fair	Hollow	TBP
2793	Black gum	*Nyssa sylvatica*	12.5	Good		
2794	Tulip poplar	*Liriodendron tulipifera*	24.0	Fair	Hollow	TBP
2795	White oak	*Quercus alba*	29.2	Excellent		
2796	American beech	*Fagus grandifolia*	26.2	Excellent		
2797	Red maple	*Acer rubrum*	14.6	Good		TBP
2798	Red maple	*Acer rubrum*	16.4	Good		
2799	American beech	*Fagus grandifolia*	23.6	Good		
2800	American beech	*Fagus grandifolia*	22.6	Good		
2801	Black gum	*Nyssa sylvatica*	12.3	Fair		
2802	American beech	*Fagus grandifolia*	13.5	Good		
2803	Hickory	*Carya sp.*	22.3	Good		
2804	American beech	*Fagus grandifolia*	13.8	Good		
2805	Tulip poplar	*Liriodendron tulipifera*	25.0	Fair	Hollow	TBP
2806	Unknown	*NA*	32.8	Dead	Hazard?	TBR
2807	Unknown	*NA*	15.0	Dead		TBP
2808	Tulip poplar	*Liriodendron tulipifera*	27.3	Poor		TBP
2809	American beech	*Fagus grandifolia*	34.5	Poor		TBR
2810	Tulip poplar	*Liriodendron tulipifera*	17.0	Good		TBP
2811	Tulip poplar	*Liriodendron tulipifera*	22.5	Poor	Tipped	TBR
2812	American beech	*Fagus grandifolia*	12.6	Good		TBR
2813	Red maple	*Acer rubrum*	13.4	Good		TBR
2814	American beech	*Fagus grandifolia*	22.0	Excellent		
2815	Tulip poplar	*Liriodendron tulipifera*	16.7	Good		
2816	American beech	*Fagus grandifolia*	14.5	Good		
2817	American beech	*Fagus grandifolia*	15.0	Fair	Stream bank erosion	TBP
2818	American beech	*Fagus grandifolia*	13.6	Excellent		TBP
2819	American beech	*Fagus grandifolia*	17.3	Excellent		
2820	White oak	*Quercus alba*	26.1	Fair		TBP
2821	Chestnut oak	*Quercus montana*	38.3	Poor		
2822	American beech	*Fagus grandifolia*	15.5	Good	Stream bank undercut	TBP
2823	American beech	*Fagus grandifolia*	13.5	Fair	Hollow	
2824	American beech	*Fagus grandifolia*	12.5	Good		
2825	Chestnut oak	*Quercus montana*	24.1	Fair		
2826	American beech	*Fagus grandifolia*	17.2	Good		
2827	American beech	*Fagus grandifolia*	16.5	Good		
2828	Chestnut oak	*Quercus montana*	39.4	Good		
2829	Tulip poplar	*Liriodendron tulipifera*	27.6	Fair	Hollow, stream bank erosion	TBP
2830	Black gum	*Nyssa sylvatica*	28.5	Good		TBP
2831	American beech	*Fagus grandifolia*	12.7	Good		TBP
2832	American beech	*Fagus grandifolia*	13.8	Good		TBP
2833	Chestnut oak	*Quercus montana*	14.4	Good		
2834	Tulip poplar	*Liriodendron tulipifera*	24.5	Good		TBP
2835	American beech	*Fagus grandifolia*	15.2	Good		
2836	American beech	*Fagus grandifolia*	16.0	Fair	Hollow	TBR
2837	Red oak	*Quercus rubra*	21.9	Dead	Hazard?	TBR
2838	Tulip poplar	*Liriodendron tulipifera*	27.2	Good	Stream bank undercut	TBR
2839	Chestnut oak	*Quercus montana*	17.0	Poor		TBP
2840	Hickory	*Carya sp.*	15.0	Good		
2841	Hickory	*Carya sp.*	15.7	Good	Stream bank erosion	TBP
2842	Chestnut oak	*Quercus montana*	17.8	Fair		TBP
2843	American beech	*Fagus grandifolia*	12.0	Good		
2844	Tulip poplar	*Liriodendron tulipifera*	26.5	Good		
2845	American beech	*Fagus grandifolia*	21.4	Good		
2846	Tulip poplar	*Liriodendron tulipifera*	35.8	Good	Stream bank erosion	TBP
2847	White oak	*Quercus alba*	26.5	Excellent		TBP
2848	American beech	*Fagus grandifolia*	13.9	Excellent		TBP
2849	Southern red oak	*Quercus falcata*	17.2	Good		
2850	American beech	*Fagus grandifolia*	12.8	Good		

NOTE:

1. STATUS INDICATES TREES WITHIN OR ADJACENT TO LOD THAT WILL BE REMOVED (TBR) OR PROTECTED (TBP) DURING CONSTRUCTION. ALL OTHER TREES ARE OUTSIDE OF THE LOD AND WILL NOT BE IMPACTED.

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Arundel Rivers Federation

ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	BY

APPROVED DATE		APPROVED DATE	
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED DATE		APPROVED DATE	
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT-OF-WAY	

SCALE:	NA
DRAWN BY	KB
CHECKED BY	DS/JC
SHEET NO.	6 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

EXISTING FEATURES AND SITE RESOURCES NOTES

ANNAPOLIS WATERWORKS FSD NARRATIVE

THE ANNAPOLIS WATERWORKS STREAM RESTORATION SITE CONTAINS ONE DISTINCT FOREST STAND. BASED ON DATA COLLECTED ON SITE ON SEPTEMBER 12, 2024, THE FOREST COMMUNITY HAS BEEN CLASSIFIED ACCORDING TO US NATIONAL VEGETATION INVENTORY TYPE AS A MID-ATLANTIC MESIC MIXED HARDWOOD FOREST. THE STREAM IS IN A SMALL VALLEY WITH MODERATELY STEEP WALLS, WITH THE TOPOGRAPHY BECOMING LESS STEEP AND THE FLOODPLAIN WIDENING AS THE WATERWAY MOVES DOWNSTREAM THROUGH THE PROJECT AREA. THERE IS A PALUSTRINE WETLAND IN THE DOWNSTREAM PORTION OF THE STREAM CORRIDOR, ACCORDING TO MARYLAND'S MERLIN DATABASE.

OUTSIDE THE IMMEDIATE STREAM CHANNEL, THE ENTIRE PROJECT SITE IS FORESTED. THE STREAM, BROAD CREEK, ORIGINATES FROM THE OUTFALL OF A STORMWATER DETENTION POND AND GENERALLY FLOWS FROM SOUTHEAST TO NORTHWEST. THERE IS A ROAD AND HEAVY COMMERCIAL DEVELOPMENT WITH HIGH PROPORTIONS OF IMPERVIOUS SURFACES TO THE SOUTHEAST. FORESTED AREAS SURROUND THE PROJECT SITE BEYOND THE OUTFALL, WITH A RESIDENTIAL NEIGHBORHOOD TO THE NORTH, BEYOND A FOREST BUFFER.

THE FOREST STAND AND ITS STRUCTURE ARE OF HIGH QUALITY, WITH CANOPY COVERAGE RANGING FROM 80%-100% THROUGHOUT THE SITE. THERE IS VERY LITTLE ENCROACHMENT OF NON-NATIVE INVASIVE (NNI) PLANT SPECIES, WITH MANY PLANT SPECIES IN ALL STRATA BEING NATIVE TO THE REGION. HOWEVER, DEER HERBIVORY IS VERY HIGH, WHICH IS HAMPERING REGENERATION OF TREE SEEDLINGS AND SLOWING RECRUITMENT EFFORTS OF TREE SPECIES TO HIGHER STRATA. THE SITE AND ITS SURROUNDING FOREST ARE CURRENTLY DESIGNATED ON MARYLAND'S MERLIN DATABASE AS FOREST AND WERE HISTORICALLY CLASSIFIED AS FOREST AS WELL.

THE MIXED HARDWOOD STAND THAT IS WITHIN THE PROJECT AREA PROPOSED LIMITS OF DISTURBANCE (LOD) IS APPROXIMATELY 6.4 ACRES AND IS SURROUNDED BY ADDITIONAL FOREST ON ALL SIDES EXCEPT FOR THE EXTREME SOUTHEAST EDGE, WHICH IS BORDERED BY A ROAD. THE FOREST IN THE PROJECT AREA IS CHARACTERIZED BY A TREE CANOPY DOMINATED BY MATURE BEECH (*FAGUS GRANDIFOLIA*) AND TULIP POPLAR (*LIRIODENDRON TULIPIFERA*) TREES, SEVERAL OF WHICH ARE OF SPECIMEN SIZE. OTHER TREE SPECIES IN THE PROJECT AREA WERE DOCUMENTED AND ARE RED MAPLE (*ACER RUBRUM*), HICKORIES (*CARYA* SPP., LIKELY *CARYA TOMENTOSA*), BLACK GUM (*NYSSA SYLVATICA*), WHITE OAK (*QUERCUS ALBA*), SOUTHERN RED OAK (*QUERCUS FALCATA*), RED OAK (*QUERCUS RUBRA*), AND CHESTNUT OAK (*QUERCUS MONTANA*). ALL THE AFOREMENTIONED SPECIES WERE PRESENT IN THE PROJECT AREA WITH AT LEAST ONE INDIVIDUAL OF 12" DIAMETER AT BREAST HEIGHT (DBH) OR GREATER. OF THE TREES 12" DBH OR GREATER, TEN WERE OF SPECIMEN SIZE. FOUR WERE BEECH, THREE WERE TULIP POPLAR, THREE WERE CHESTNUT OAK, AND ONE WAS A WHITE OAK. ONE WAS IN EXCELLENT CONDITION, THREE WERE GOOD, THREE WERE FAIR, AND THREE WERE IN POOR CONDITION. TWO LARGE TREES WERE DEAD AND STILL STANDING AS OF THE DATE OF DATA COLLECTION.

UNDERSTORY TREE SPECIES IN POLE, SAPLING, AND SEEDLING SIZES OBSERVED AND DOCUMENTED VIA FOREST STAND PLOTS ALSO INCLUDED AMERICAN HOLLY (*ILEX OPACA),* MOCKERNUT HICKORY (*CARYA TOMENTOSA*), IRONWOOD (*CARPINUS CAROLINIANA*), BLACK CHERRY (*PRUNUS SEROTINA*), AND WILLOW OAK (*QUERCUS PHELLOS*). THERE WERE 14 DISTINCT NATIVE TREE SPECIES ACROSS ALL STRATA DOCUMENTED AT THE SITE, WITH AN AVERAGE OF APPROXIMATELY 280 LIVE STEMS PER ACRE. LIVE STEMS 2 INCHES DBH AND GREATER AVERAGED 190 PER ACRE.

WHILE NNI SPECIES WERE RARE, THERE WERE SOME DOCUMENTED AT THE SITE IN SMALL NUMBERS. THE OBSERVED AND DOCUMENTED SPECIES WERE JAPANESE BARBERRY (*BERBERIS THUNGERGII*), JAPANESE HONEYSUCKLE (*LONICERA JAPONICA*), ENGLISH IVY (*HEDERA HELIX*), JAPANESE STILTGRASS (*MICROSTEGIUM VIMINEUM*), MILE-A-MINUTE (*PERSICARIA PERFOLIATA*), AND JAPANESE KNOTWEED (*REYNOUTRIA JAPONICA*). DESPITE THE OCCURRENCES OF THESE NNI SPECIES, THE VAST MAJORITY OF PLANT SPECIES IN THE LOWER STRATA WERE NATIVE. NONE OF THE PLANT SPECIES DOCUMENTED WERE CONSIDERED RARE, THREATENED OR ENDANGERED AS OF THE DATE OF DATA COLLECTION.

THE RETENTION POTENTIAL OF THE PROJECT AREA FOREST STAND IS HIGH, GIVEN ITS HIGH QUALITY, DIVERSITY OF NATIVE PLANT SPECIES, AND SURROUNDING FORESTED BUFFER. ALTHOUGH THE PROPOSED STREAM RESTORATION COULD INVOLVE CLEARING OF FOREST, THESE ARE TEMPORARY IMPACTS WITH NO PERMANENT CHANGE IN LAND USE OR COVER TYPE. REFORESTATION IS PROPOSED FOR ALL AREAS OF TREE REMOVAL WITHIN THE LOD. CONSIDERATION SHOULD BE GIVEN TO MONITORING AND EARLY TREATMENT OF NNI SPECIES, AS WELL AS POTENTIAL PROTECTION OF TREE SEEDLINGS FROM DEER BROWSE.

Property: Annapolis Waterworks Park **Prepared By: B. Salladin**
Stand #: 1 **Plot #:** C **Plot Size:** 1/10 AC **Date: 09/13/2024**
Basal Area (sf/ac): 185

Size Class of Trees >20' in height within sample plot

Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-11.9" dbh			# of Trees 12-19.9" dbh			# of Trees 20-29.9" dbh			# of Trees >30" dbh			TOTAL
Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	
American beech			7					1								8
American holly			1													1
Ironwood			1			2										3
Mockernut Hickory			1													1
Tulip poplar								1			1			1		3
Red maple						1		2								3
																0
																0
																0
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	10			3			4			1			1			19
Number & Size of Standing Dead Trees	0			0			0			0			0			0

Common Understory Species 3'-20':	% of Canopy Closure					TOTAL
American beech	Y	Y	Y	N	Y	80
Barberry	% Understory Cover 3-20'					
Ironwood	Y	N	N	N	N	20
Hickory	% of Herbaceous Cover 0'-3'					
Common Herbaceous Species 0'-3':	Y	Y	Y	Y	W	80
Christmas fern	% Downed Woody Debris					
Greenbriar	Y	Y	Y	N	N	60
Eastern wahoo	% Invasive Cover by Layer					
Netted chain fern	C		U		H	
Sedge	0		0		5	

Percent of Invasive Cover per Plot (All Layers): 8

Plot Successional Stage: Mature Forest

Total Trees per Acre: 190

Property: Annapolis Waterworks Park **Prepared By: B. Salladin**
Stand #: 1 **Plot #:** A **Plot Size:** 1/10 AC **Date: 09/13/2024**
Basal Area (sf/ac): 280

Size Class of Trees >20' in height within sample plot

Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-11.9" dbh			# of Trees 12-19.9" dbh			# of Trees 20-29.9" dbh			# of Trees >30" dbh			TOTAL
Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	
American beech			7		2			3			1					13
American holly			2													2
Black gum		1														1
Chestnut oak								1								1
Hickory		1			1											2
																0
																0
																0
																0
																0
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	11			3			4			1			0			19
Number & Size of Standing Dead Trees				1												1

Common Understory Species 3'-20':	% of Canopy Closure					TOTAL
American beech	Y	Y	Y	Y	Y	100
American holly	% Understory Cover 3-20'					
Black gum	N	N	N	Y	N	20
	% of Herbaceous Cover 0'-3'					
Common Herbaceous Species 0'-3':	N	Y	N	N	N	20
Christmas fern	% Downed Woody Debris					
Greenbriar	Y	N	N	N	N	20
Wintergreen	% Invasive Cover by Layer					
Partridgeberry	C		U		H	
American beech seedlings	0		0		0	

Percent of Invasive Cover per Plot (All Layers): 0

Plot Successional Stage: Mature Forest

Total Trees per Acre: 190

Property: Annapolis Waterworks Park **Prepared By: B. Salladin**
Stand #: 1 **Plot #:** B **Plot Size:** 1/10 AC **Date: 09/13/2024**
Basal Area (sf/ac): 196

Size Class of Trees >20' in height within sample plot

Tree Species	# of Trees 2-5.9" dbh			# of Trees 6-11.9" dbh			# of Trees 12-19.9" dbh			# of Trees 20-29.9" dbh			# of Trees >30" dbh			TOTAL
Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	
American beech			9		2			3								14
American holly			2													2
Black gum					1											1
Chestnut oak								1								1
White oak					1											1
Tulip poplar								1								1
																0
																0
																0
																0
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	11			4			0			5			0			20
Number & Size of Standing Dead Trees	1			1			1			1						4

Common Understory Species 3'-20':	% of Canopy Closure					TOTAL
American beech	Y	Y	Y	N	Y	80
Hickory	% Understory Cover 3-20'					
Mtn Laurel	Y	N	N	N	N	20
	% of Herbaceous Cover 0'-3'					
Common Herbaceous Species 0'-3':	C	N	E	S	W	0
Christmas fern	% Downed Woody Debris					
Greenbriar	Y	N	N	N	N	20
Eastern wahoo	% Invasive Cover by Layer					
	C		U		H	
	0		0		5	

Percent of Invasive Cover per Plot (All Layers): 2

Plot Successional Stage: Mature Forest

Total Trees per Acre: 200

ANNAPOLIS WATERWORKS WETLAND DELINEATION SUMMARY STATEMENT

THREE NONTIDAL WETLANDS (WETLAND 3, 4 AND 5) WERE DELINEATED WITHIN THE LIMITS OF DELINEATION (SEE TABLE 1). WETLANDS 3 AND 4 (W3 AND W4) ARE CLASSIFIED AS PALUSTRINE FORESTED (PFO) AND ARE LOCATED ALONG FLOODPLAIN BENCHES BEGINNING AT THE CONFLUENCE OF BROAD CREEK AND THE MAIN TRIBUTARY. ITS WETLAND HYDROLOGY IS SUPPORTED BY GROUNDWATER, SURFACE RUNOFF FROM THE ADJACENT UPLAND HILLSLOPES, AND OVERBANK FLOWS FROM THE TRIBUTARY. WETLAND 5 (W5) IS CLASSIFIED AS PALUSTRINE FORESTED (PFO) AND PALUSTRINE EMERGENT, IT BEGINS AT THE CONFLUENCE OF THE MAIN TRIBUTARY AND XXX AND CONTINUES TO THE WEST BEYOND THE LIMITS OF DELINEATION. ITS WETLAND HYDROLOGY IS SUPPORTED BY GROUNDWATER, SURFACE RUNOFF FROM THE ADJACENT UPLAND HILLSLOPES, AND OVERBANK FLOWS FROM THE MAIN TRIBUTARY. BASED ON BIOHABITATS BEST PROFESSIONAL JUDGEMENT, IT IS ANTICIPATED THE DELINEATED WETLANDS ARE JURISDICTIONAL UNDER THE CLEAN WATER ACT AND WILL BE REGULATED BY THE US ARMY CORPS OF ENGINEERS (USACE) AND MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE).

Table 1 Nontidal Wetland Summary

Wetland Name	Area Within Survey Limits: Square Feet	Area Within Survey Limits: Acres	Classification (Cowardin et. al., 1979)
Wetland 3	2,702	0.06	PFO
Wetland 4	269	0.006	PFO
Wetland 5	41,588	0.95	PFO/PEM

Annapolis Waterworks Park Project Specimen Trees

Tree ID	Species	Scientific Name	DBH	Condition
2735	American beech	*Fagus grandifolia*	26.9	Excellent
2751	American beech	*Fagus grandifolia*	30.4	Fair
2766	Chestnut oak	*Quercus montana*	32.3	Dead
2767	Tulip poplar	*Liriodendron tulipifera*	45.0	Poor
2769	White oak	*Quercus alba*	42.8	Fair
2770	American beech	*Fagus grandifolia*	30.9	Fair
2783	Tulip poplar	*Liriodendron tulipifera*	34.7	Good
2806	Unknown	*NA*	32.8	Dead
2809	American beech	*Fagus grandifolia*	34.5	Poor
2821	Chestnut oak	*Quercus montana*	38.3	Poor
2828	Chestnut oak	*Quercus montana*	39.4	Good
2846	Tulip poplar	*Liriodendron tulipifera*	35.8	Good

SOILS TABLE

Map Unit Symbol	Soil Series	Hydric Soil Rating	Erodibility Factor
AsF	Annapolis fine sandy loam, 25 to 40 percent slopes	No	0.24
Uz	Urban land	No	N/A
WBA	Widewater and Issue soils, 0 to 2 percent slopes, frequently flooded	Yes	0.37

MD DNR QUALIFIED PROFESSIONAL
SAF CERTIFIED FORESTER
ISA CERTIFIED ARBORIST

Signed: Bryon W. Salladin Date: 05/04/2026

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ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	BY

APPROVED	DATE	APPROVED	DATE
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT-OF-WAY	

SCALE:	NA
DRAWN BY	KB
CHECKED BY	DS/JC
SHEET NO.	7 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

FOREST STAND DELINEATION NOTES

6/18/2026 M:\CADD\Projects\24015.01 Annapolis Waterworks Park Stream Restoration\CAD\Plans\cv01aw.dwg

FWS TRILOGY LETTER

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Chesapeake Bay Ecological Services Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307
Phone: (410) 573-4599 Fax: (410) 266-9127

In Reply Refer To: 03/05/2026 15:19:10 UTC
Project code: 2024-0135287
Project Name: Annapolis Waterworks Park

Federal Nexus: no
Federal Action Agency (if applicable):

Subject: Technical assistance for 'Annapolis Waterworks Park'

Dear Kayla Brown:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on March 05, 2026, for 'Annapolis Waterworks Park' (here forward, Project). This project has been assigned Project Code 2024-0135287 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements may not bbe complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat and Tricolored Bat Range-wide Determination Key (Dkey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid. Note that conservation measures for northern long-eared bat and tricolored bat may differ. If both bat species are present in the action area and the key suggests more conservative measures for one of the species for your project, the Project may need to apply the most conservative measures in order to avoid adverse effects. If unsure which conservation measures should be applied, please contact the appropriate Ecological Services Field Office***

Determination for the Northern Long-Eared Bat and Tricolored Bat

Based upon your IPaC submission and a standing analysis completed by the Service, your project has reached the following effect determination(s):

Species	Listing Status	Determination
Tricolored Bat (*Perimyotis subflavus*)	Proposed Endangered	NLAA

Federal agencies must consult with U.S. Fish and Wildlife Service under section 7(a)(2) of the Endangered Species Act (ESA) when an action *may affect* a listed species. Tricolored bat is proposed for listing as endangered under the ESA, but not yet listed. For actions that may affect a proposed species, agencies cannot consult, but they can *confer* under the authority of section 7(a)(4) of the ESA. Such conferences can follow the procedures for a consultation and be adopted as such if and when the proposed species is listed. Should the tricolored bat be listed, agencies must review projects that are not yet complete, or projects with ongoing effects within the tricolored bat range that previously received a NE or NLAA determination from the key to confirm that the determination is still accurate.

You have indicated that you must remove a hazard tree in order to prevent imminent loss of human life. Be advised that the Act's implementing regulations (50 CFR part 17) include a take exemption pursuant to the defense of human life (for endangered species, see 50 CFR 17.21(c)(2)): "any person may take endangered [or threatened] wildlife in defense of his own life or the lives of others."). The regulations at 50 CFR 17.21(c)(4) require that any person taking, including killing, listed wildlife in defense of human life under this exception must notify our headquarters Office of Law Enforcement, at the address provided at 50 CFR 2.1(b), in writing, within 5 days. In addition, section 11 of the Act enumerates the penalties and enforcement of the Act. In regard to civil penalties, section 11(a)(3) of the Act states, "Notwithstanding any other provision of this [Act], no civil penalty shall be imposed if it can be shown by a preponderance of the evidence that the defendant committed an act based on a good faith belief that he was acting to protect himself or herself, a member of his or her family, or any other individual from bodily harm, from any endangered or threatened species" (16 U.S.C. 1540(a)(3)). Section 11(b)(3) of the Act contains similar language in regard to criminal violations (see 16 U.S.C. 1540(b)(3)). If you think incidental take of listed bats was reasonably certain to have occurred as a result of your hazard tree removal, we advise you to contact the Office of Law Enforcement as outlined above. In the future, we recommend planning ahead so that tree removal of potentially hazardous trees does not become an emergency. If you determine an emergency exists, however, and human life is in imminent danger, do not delay action. Also do not delay action if removal of the hazard tree is part of a federal response to a situation involving an act of God, disaster, casualty, national defense or security emergency, etc. - coordinate with the local USFWS field office as soon as practicable after the emergency is under control.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination key for the northern long-eared bat and tricolored bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Monarch Butterfly *Danaus plexippus* Proposed Threatened

MHT TRILOGY LETTER

Date: October 11, 2024

To: Kayla Brown
Biohabitats Inc

Project Name: Annapolis Waterworks Park Stream Restoration
County: Anne Arundel County
Agency: Corps of Engineers
Second Agency: -- Not noted --
MHT Log #: 202404233

MHT Response: Thank you for providing the Maryland Historical Trust the opportunity to comment on the above-referenced undertaking using the MHT e106 system. The Maryland Historical Trust has reviewed the submitted project for its effects on historic and archeological resources, pursuant to Section 106 of the National Historic Preservation Act of 1966 and/or the Maryland Historical Trust Act of 1985. We offer the following comments and/or concurrence with the agency's findings:

No historic properties will be affected by the proposed undertaking. Additional consultation with our office may be required if there are any significant changes in project scope or location.

Thank you for your cooperation in this review process. Since the MHT response is now complete, this response will appear in the Completed section of your project dashboard. No hard copy of this response or attachments will be sent. If you have questions, please contact the following MHT project reviewers:

Dixie Henry dixie.henry@maryland.gov

Maryland Historical Trust
Project Review and Compliance
100 Community Place
Crownsville, MD 21032
mht.section106@maryland.gov

MHT.Maryland.gov
Planning.Maryland.gov

DNR TRILOGY LETTER

MARYLAND DEPARTMENT OF NATURAL RESOURCES
Wes Moore, Governor
Aruna Miller, Lt. Governor
Josh Kurtz, Secretary
David Goshorn, Deputy Secretary

June 10, 2026

Ms. Kayla Brown
Biohabitats, Inc.
The Stables Building
2081 Clipper Park Road
Baltimore, MD 21211

RE: Environmental Review for Annapolis Waterworks Stream Restoration, Annapolis Waterworks Trail - Housley Road Trailhead, Anne Arundel County, Maryland.

Dear Ms. Brown:

The Wildlife and Heritage Service has determined that there is a wetland on site designated as a Nontidal Wetland of Special State Concern that is associated with the South Basin of Broad Creek. Nontidal Wetlands of Special State Concern are regulated, along with their 100-foot upland buffer, as such by Maryland Department of the Environment. Your project may need review by MDE for any necessary permits related to this wetland.

Part of the reason that this Nontidal Wetland of Special State Concern is designated here is due to the presence of a state-listed endangered orchid documented on the Annapolis Waterworks Park property. This species only occurs at four other known locations in the state and is vulnerable to collection. This orchid may be difficult to survey, as it does not produce above-ground growth every year. A habitat assessment may be warranted, so that potential habitat for this species can be removed from the limits-of-disturbance. It is thought that this rare plant species relies on a soil fungus in order to absorb water and nutrients and that the fungus only grows in well developed, undisturbed, loamy soils. Due to the rare plant's association with soil fungi, any disturbance that dries or compacts the soil may eliminate this occurrence. For further technical assistance regarding conservation measures for the endangered orchid on this site, please contact Katharine McCarthy of the Wildlife and Heritage Service at Katharine.mccarthy@maryland.gov or at 410-260-8569.

Also, invasive species pose a threat to this occurrence of the endangered orchid. The upland slopes and trails around the impoundment are bordered by non-native species such as Japanese honeysuckle (*Lonicera japonica*) and English ivy (*Hedera helix*). We would encourage the applicant to take appropriate measures to prevent the introduction or further spread of invasive species into the rare species habitat.

In addition, our remote analysis suggests that the forested area on this property contains Forest Interior Dwelling Species (FIDS) habitat, especially for birds. Populations of many bird species which depend on this type of forested habitat are declining in Maryland and throughout the Eastern United States. The declines in FIDS populations have been attributed in part to the loss and fragmentation of forests due largely to urbanization, agriculture, and some forest management practices. The key to maintaining suitable breeding habitat for FIDS, and halting or reversing their declines, is the protection of extensive, unbroken forested areas throughout the region. The conservation of FIDS habitat throughout Maryland is strongly encouraged by the Wildlife and Heritage Service.

If the project changes in the future such that the limits of proposed disturbance or overall site boundaries are modified, please provide us with revised project maps and we will provide you with an updated evaluation. Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at lori.byrne@maryland.gov or at (410) 260-8573.

Sincerely,

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2026.0794.aa
Cc: K. McCarthy, DNR

MD DNR QUALIFIED PROFESSIONAL
SAF CERTIFIED FORESTER
ISA CERTIFIED ARBORIST

Signed: Date: 05/04/2026

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CITY OF ANNAPOLIS

REVISED DATE	BY

APPROVED DATE		APPROVED DATE	
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED DATE		APPROVED DATE	
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT-OF-WAY	

SCALE:	NA
DRAWN BY	KB
CHECKED BY	DS/JC
SHEET NO.	8 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

FOREST STAND DELINEATION NOTES

6/18/2026 M:\CADD\Projects\24015.01 Annapolis Waterworks Park Stream Restoration\CAD\Plans\cv01aw.dwg

NOTES:

1. FOREST STAND DELINEATION PLAN BASED ON DATA COLLECTED ON SITE ON SEPTEMBER 12, 2024.

MD DNR QUALIFIED PROFESSIONAL
SAF CERTIFIED FORESTER
ISA CERTIFIED ARBORIST

Signed: ______________ Date: 05/04/2026

Bryon W. Salladin
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410-554-0156 ext. 1030
bsalladin@biohabitats.com

HORIZONTAL SCALE

0 20 40

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CITY OF ANNAPOLIS

REVISED DATE	BY	APPROVED / DATE	APPROVED / DATE			
		CHIEF ENGINEER	PROJECT MANAGER	SCALE:	1" = 20'	ANNAPOLIS WATERWORKS PARK STREAM RESTORATION
		APPROVED / DATE	APPROVED / DATE	DRAWN BY	KB	
				CHECKED BY	DS/JC	FOREST STAND DELINEATION PLAN
				SHEET NO.	9 OF 30	
		ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT-OF-WAY	PROJECT NO.	24015.01	
				PROPOSAL NO.		

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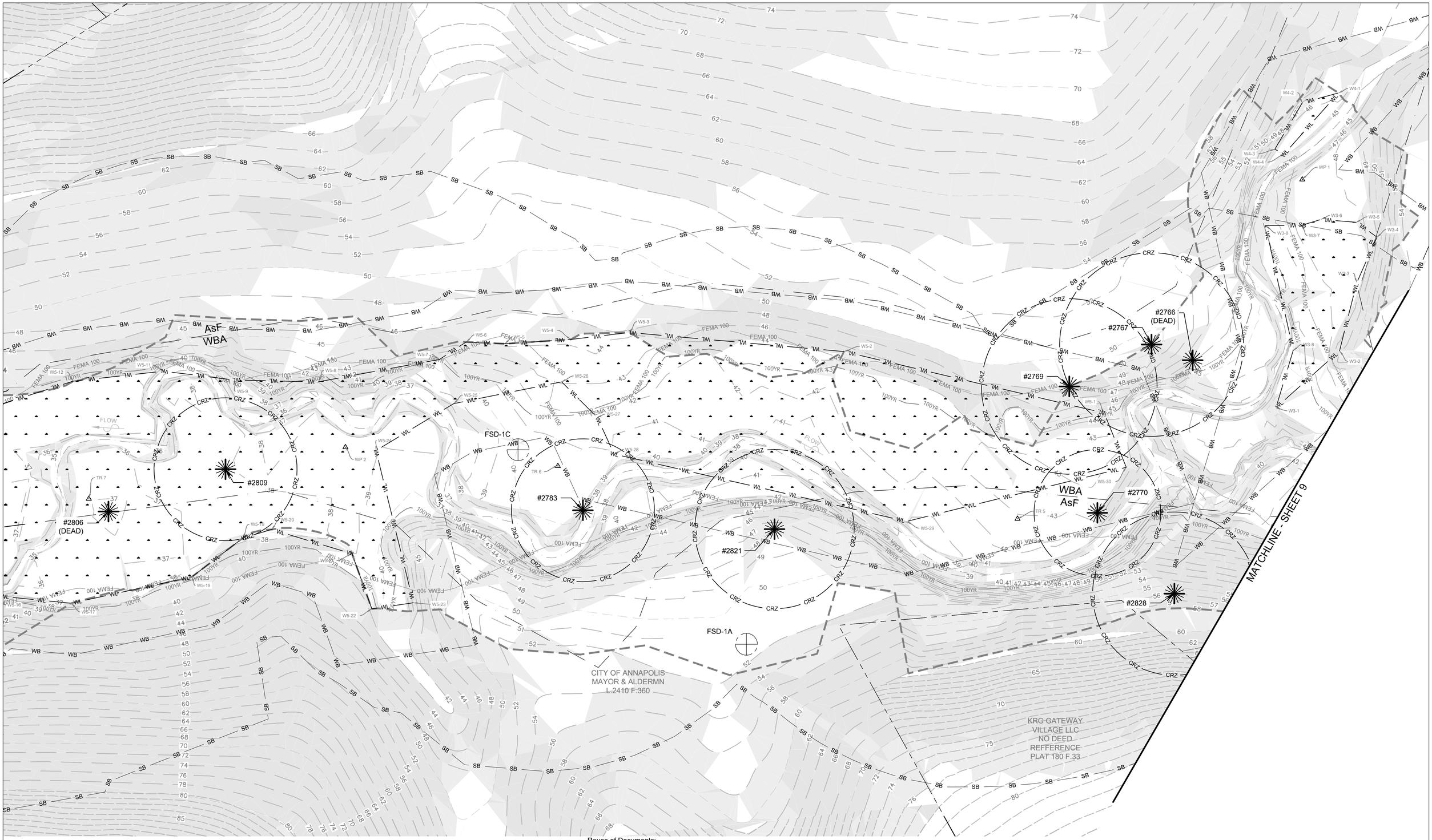

NOTES:

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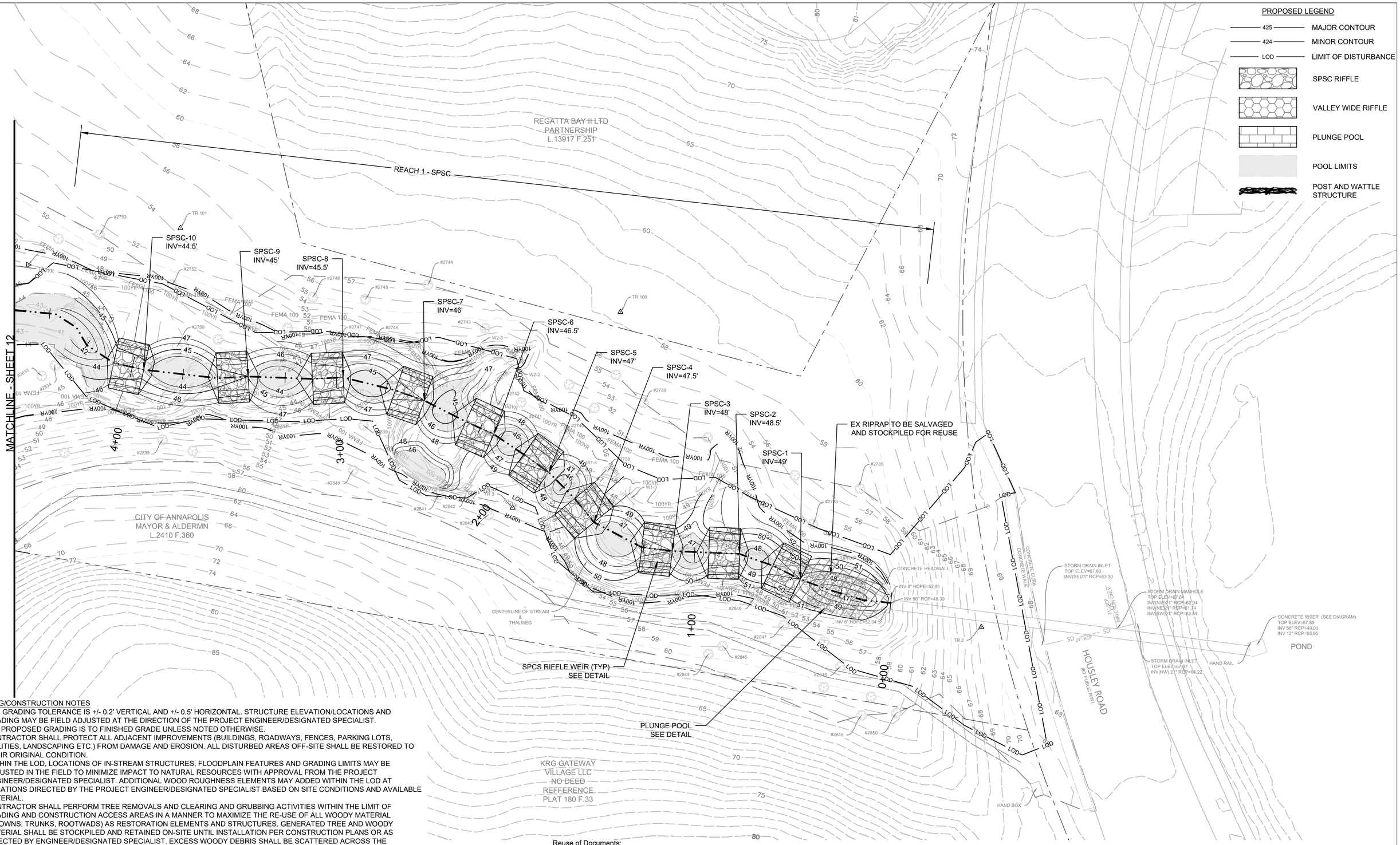
ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

FOREST STAND DELINEATION PLAN



GRADING/CONSTRUCTION NOTES

1. THE GRADING TOLERANCE IS +/- 0.2' VERTICAL AND +/- 0.5' HORIZONTAL. STRUCTURE ELEVATION/LOCATIONS AND GRADING MAY BE FIELD ADJUSTED AT THE DIRECTION OF THE PROJECT ENGINEER/DESIGNATED SPECIALIST.
2. ALL PROPOSED GRADING IS TO FINISHED GRADE UNLESS NOTED OTHERWISE.
3. CONTRACTOR SHALL PROTECT ALL ADJACENT IMPROVEMENTS (BUILDINGS, ROADWAYS, FENCES, PARKING LOTS, UTILITIES, LANDSCAPING ETC.) FROM DAMAGE AND EROSION. ALL DISTURBED AREAS OFF-SITE SHALL BE RESTORED TO THEIR ORIGINAL CONDITION.
4. WITHIN THE LOD, LOCATIONS OF IN-STREAM STRUCTURES, FLOODPLAIN FEATURES AND GRADING LIMITS MAY BE ADJUSTED IN THE FIELD TO MINIMIZE IMPACT TO NATURAL RESOURCES WITH APPROVAL FROM THE PROJECT ENGINEER/DESIGNATED SPECIALIST. ADDITIONAL WOOD ROUGHNESS ELEMENTS MAY ADDED WITHIN THE LOD AT LOCATIONS DIRECTED BY THE PROJECT ENGINEER/DESIGNATED SPECIALIST BASED ON SITE CONDITIONS AND AVAILABLE MATERIAL.
5. CONTRACTOR SHALL PERFORM TREE REMOVALS AND CLEARING AND GRUBBING ACTIVITIES WITHIN THE LIMIT OF GRADING AND CONSTRUCTION ACCESS AREAS IN A MANNER TO MAXIMIZE THE RE-USE OF ALL WOODY MATERIAL (CROWNS, TRUNKS, ROOTWADS) AS RESTORATION ELEMENTS AND STRUCTURES. GENERATED TREE AND WOODY MATERIAL SHALL BE STOCKPILED AND RETAINED ON-SITE UNTIL INSTALLATION PER CONSTRUCTION PLANS OR AS DIRECTED BY ENGINEER/DESIGNATED SPECIALIST. EXCESS WOODY DEBRIS SHALL BE SCATTERED ACROSS THE FLOODPLAIN, PRIMARILY FOCUSED ALONG CONCENTRATED FLOW PATHS TO INTERUPT DIRECT DOWN VALLEY DIRECTION OF OVERBANK FLOWS.
6. ALL TREE REMOVALS SHALL BE DONE IN A MANNER TO MINIMIZE NEGATIVE IMPACTS TO RESIDUAL STANDING TREES, SHRUBS AND WETLANDS.
7. THE GRADING PLAN DOES NOT SHOW ALL ELEMENTS OF EACH STRUCTURE. SEE CONSTRUCTION DETAILS AND NOTES FOR INSTALLATION AND DETAIL OF EACH STRUCTURE.
8. SEE EROSION AND SEDIMENT CONTROL SHEETS FOR CONSTRUCTION ACCESS AND SEDIMENT CONTROL MEASURES.
9. IF NEEDED, IMPORTED ROOTWADS AND WOOD MATERIAL SHALL BE AS FRESHLY HARVESTED TO MAXIMUM EXTENT POSSIBLE, MAXIMUM HARVEST OF FOUR MONTHS PRIOR, WITH MINIMAL DECAY, AND MEET THE SPECIFICATION PROVIDED IN THE CONSTRUCTION DETAILS.
10. SEE DRAWING 22 FOR TREE PROTECTION AND REMOVAL NOTES AND DETAILS.

HORIZONTAL SCALE
0 20 40

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DATE	BY				
		CHIEF ENGINEER		PROJECT MANAGER	
		APPROVED	DATE	APPROVED	DATE
		ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT-OF-WAY	

SCALE:	1" = 20'
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CHECKED BY	DS/JC
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PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

GRADING PLAN

6/18/2026 M:\CADD\Projects\24015.01 Annapolis Waterworks Park Stream Restoration\CAD\Plans\pc01aw.dwg

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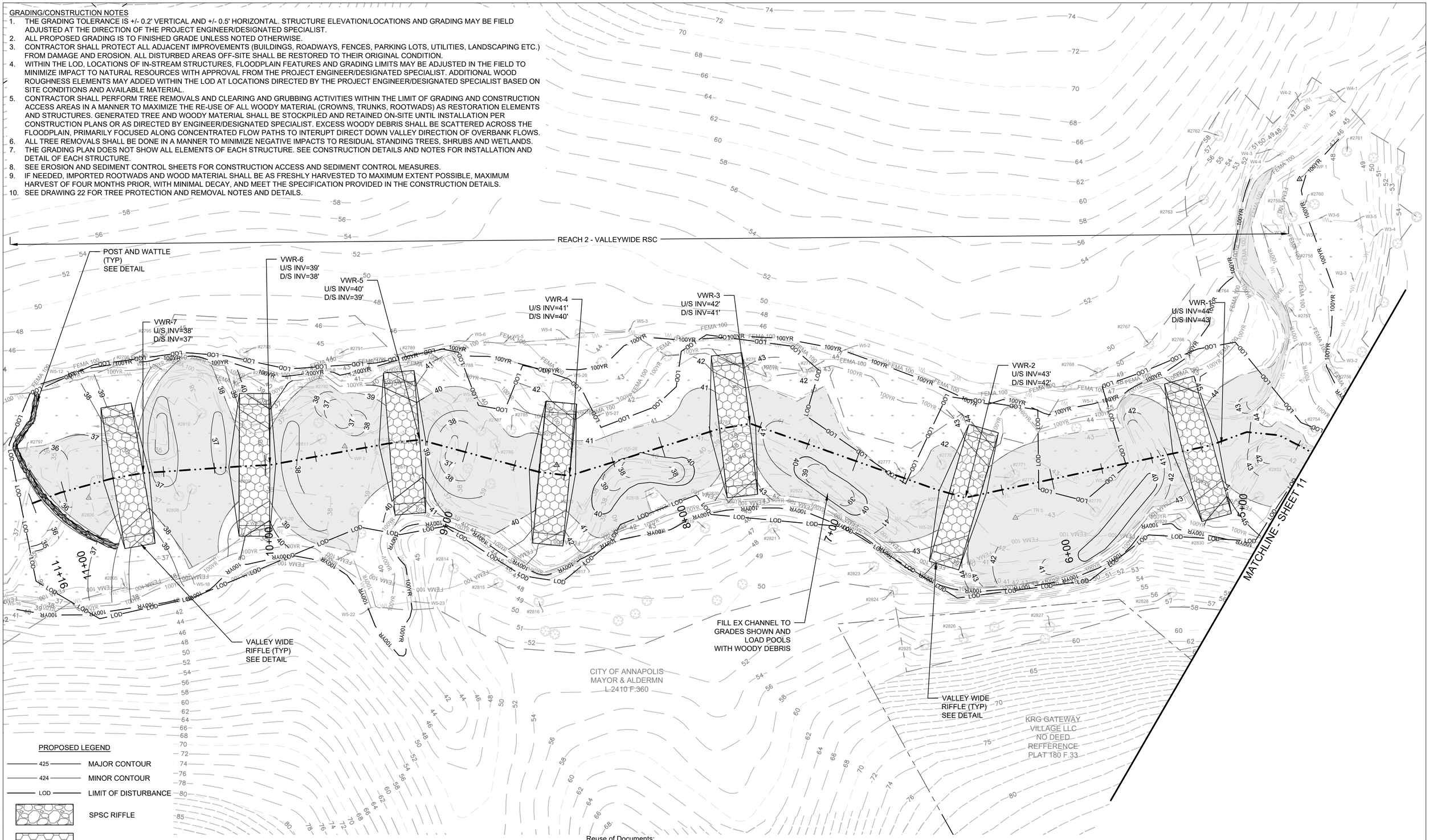
10. SEE DRAWING 22 FOR TREE PROTECTION AND REMOVAL NOTES AND DETAILS.



PROPOSED LEGEND

- 425 — MAJOR CONTOUR
- 424 — MINOR CONTOUR
- LOD — LIMIT OF DISTURBANCE
- SPSC RIFFLE
- VALLEY WIDE RIFFLE
- PLUNGE POOL
- POOL LIMITS
- POST AND WATTLE STRUCTURE

HORIZONTAL SCALE
0 20 40

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Restore the Earth & Inspire Ecological Stewardship

Arundel Rivers Federation

ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	BY

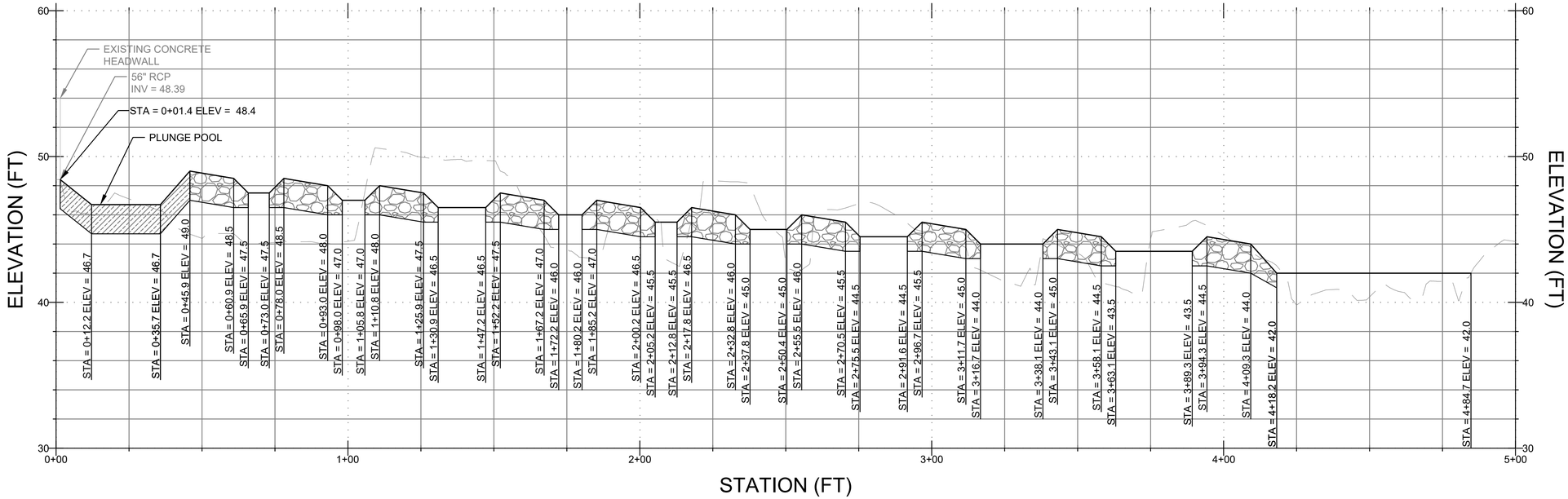
APPROVED	DATE	APPROVED	DATE
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT-OF-WAY	

SCALE:	1" = 20'
DRAWN BY	KB
CHECKED BY	DS/JC
SHEET NO.	12 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

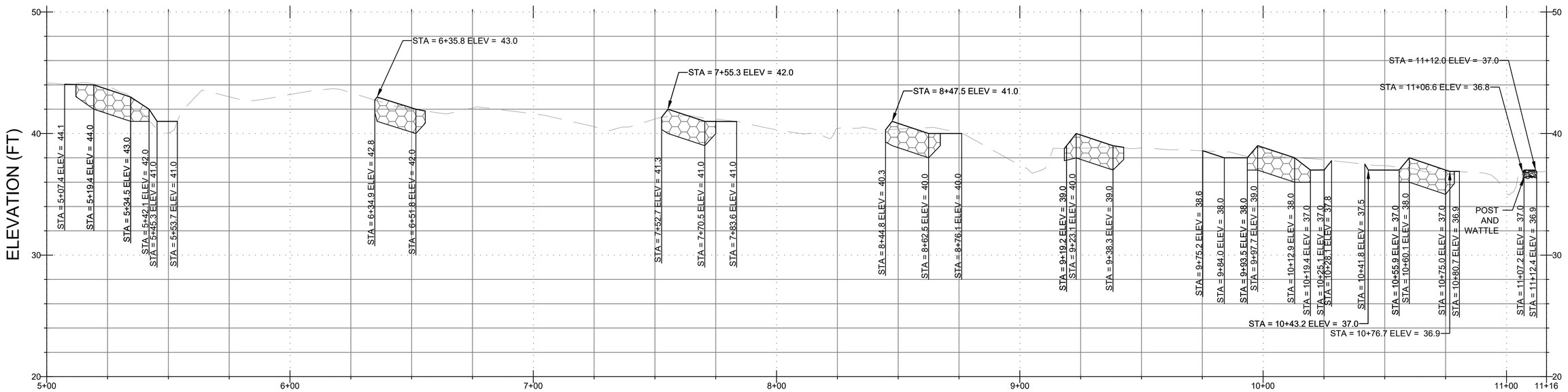
ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

GRADING PLAN

PROFILE VIEW OF REACH 1 - SPSC



PROFILE VIEW OF REACH 2 - VALLEY-WDE RSC



PROFILE LEGEND

EXISTING GROUND

PROPOSED GROUND

RIFFLE

VALLEY-WIDE RIFFLE

PLUNGE POOL

POST AND WATTLE STRUCTURE

VERTICAL SCALE 8 4 0

HORIZONTAL SCALE 0 20 40

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CITY OF ANNAPOLIS

REVISED DATE	BY	APPROVED / DATE	APPROVED / DATE		
				SCALE:	AS SHOWN
		CHIEF ENGINEER	PROJECT MANAGER	DRAWN BY	TB
		APPROVED / DATE	APPROVED / DATE	CHECKED BY	DS/JC
				SHEET NO.	13 OF 30
				PROJECT NO.	24015.01
		ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT-OF-WAY	PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

PROFILE

6/18/2026 M:\CADD\Projects\24015.01 Annapolis Waterworks Park Stream Restoration\CAD\Plans\pr01aw.dwg

STRUCTURE TABLES								
RIFFLES								
REACH 1-SPSC								
DESIGN						AS-BUILT		
ID	Station	Node	Easting	Northing	Elevation	Easting	Northing	Elevation
SPSC-1		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						
SPSC-2		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						
SPSC-3		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						
SPSC-4		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						
SPSC-5		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						
SPSC-6		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						
SPSC-7		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						
SPSC-8		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						
SPSC-9		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						
SPSC-10		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						

NOTE: STRUCTURE TABLES WILL BE PROVIDED ON 90% DESIGN PLANS

STRUCTURE TABLES								
RIFFLES								
REACH 2-VALLEY-WIDE RSC								
DESIGN						AS-BUILT		
ID	Station	Node	Easting	Northing	Elevation	Easting	Northing	Elevation
VWR-1		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						
VWR-2		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						
VWR-3		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						
VWR-4		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						
VWR-5		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						
VWR-6		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						
VWR-7		USL						
		USR						
		A						
		B						
		C						
		D						
		E						
		DSL						
		DSR						

STRUCTURE TABLE INFORMATION WILL BE PROVIDED AT 95% SUBMITTAL

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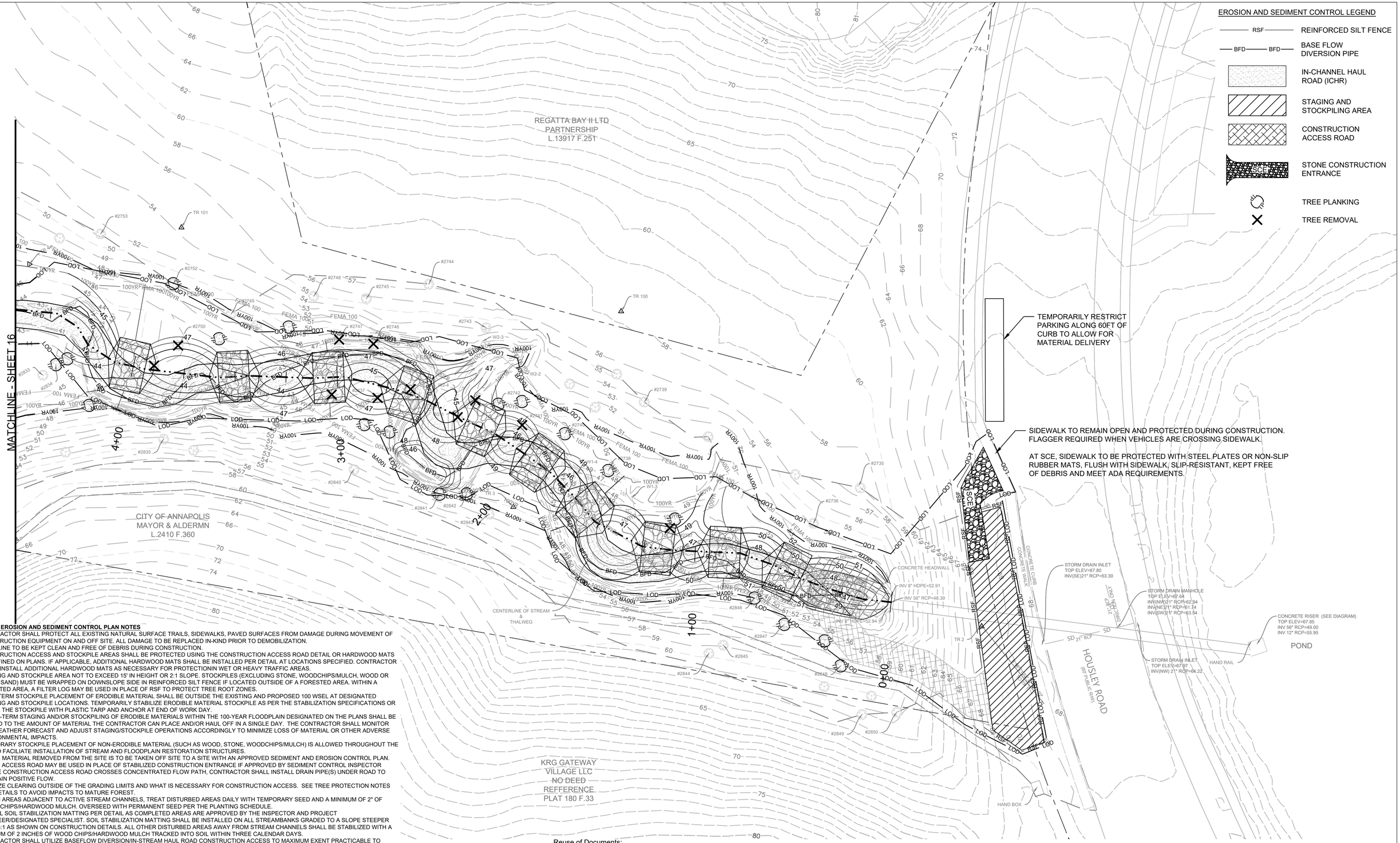
ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED		APPROVED DATE	APPROVED DATE	SCALE: NA	ANNAPOLIS WATERWORKS PARK STREAM RESTORATION
DATE	BY			DRAWN BY TB	
		CHIEF ENGINEER	PROJECT MANAGER	CHECKED BY DS/JC	
		APPROVED DATE	APPROVED DATE	SHEET NO. 14 OF 30	STRUCTURE TABLES
				PROJECT NO. 24015.01	
		ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT-OF-WAY	PROPOSAL NO.	



EROSION AND SEDIMENT CONTROL LEGEND

- RSF — REINFORCED SILT FENCE
- BFD — BFD — BASE FLOW DIVERSION PIPE
- IN-CHANNEL HAUL ROAD (ICHR)
- STAGING AND STOCKPILING AREA
- CONSTRUCTION ACCESS ROAD
- SCE — STONE CONSTRUCTION ENTRANCE
- TREE PLANKING
- TREE REMOVAL

ACCESS / EROSION AND SEDIMENT CONTROL PLAN NOTES

1. CONTRACTOR SHALL PROTECT ALL EXISTING NATURAL SURFACE TRAILS, SIDEWALKS, PAVED SURFACES FROM DAMAGE DURING MOVEMENT OF CONSTRUCTION EQUIPMENT ON AND OFF SITE. ALL DAMAGE TO BE REPLACED IN-KIND PRIOR TO DEMOBILIZATION.
2. CURB LINE TO BE KEPT CLEAN AND FREE OF DEBRIS DURING CONSTRUCTION.
3. CONSTRUCTION ACCESS AND STOCKPILE AREAS SHALL BE PROTECTED USING THE CONSTRUCTION ACCESS ROAD DETAIL OR HARDWOOD MATS AS DEFINED ON PLANS. IF APPLICABLE, ADDITIONAL HARDWOOD MATS SHALL BE INSTALLED PER DETAIL AT LOCATIONS SPECIFIED. CONTRACTOR SHALL INSTALL ADDITIONAL HARDWOOD MATS AS NECESSARY FOR PROTECTIONIN WET OR HEAVY TRAFFIC AREAS.
4. STAGING AND STOCKPILE AREA NOT TO EXCEED 15' IN HEIGHT OR 2:1 SLOPE. STOCKPILES (EXCLUDING STONE, WOODCHIPS/MULCH, WOOD OR CLEAN SAND) MUST BE WRAPPED ON DOWNSLOPE SIDE IN REINFORCED SILT FENCE IF LOCATED OUTSIDE OF A FORESTED AREA. WITHIN A FORESTED AREA, A FILTER LOG MAY BE USED IN PLACE OF RSF TO PROTECT TREE ROOT ZONES.
5. LONG-TERM STOCKPILE PLACEMENT OF ERODIBLE MATERIAL SHALL BE OUTSIDE THE EXISTING AND PROPOSED 100 WSEL AT DESIGNATED STAGING AND STOCKPILE LOCATIONS. TEMPORARILY STABILIZE ERODIBLE MATERIAL STOCKPILE AS PER THE STABILIZATION SPECIFICATIONS OR COVER THE STOCKPILE WITH PLASTIC TARP AND ANCHOR AT END OF WORK DAY.
6. SHORT-TERM STAGING AND/OR STOCKPILING OF ERODIBLE MATERIALS WITHIN THE 100-YEAR FLOODPLAIN DESIGNATED ON THE PLANS SHALL BE LIMITED TO THE AMOUNT OF MATERIAL THE CONTRACTOR CAN PLACE AND/OR HAUL OFF IN A SINGLE DAY. THE CONTRACTOR SHALL MONITOR THE WEATHER FORECAST AND ADJUST STAGING/STOCKPILE OPERATIONS ACCORDINGLY TO MINIMIZE LOSS OF MATERIAL OR OTHER ADVERSE ENVIRONMENTAL IMPACTS.
7. TEMPORARY STOCKPILE PLACEMENT OF NON-ERODIBLE MATERIAL (SUCH AS WOOD, STONE, WOODCHIPS/MULCH) IS ALLOWED THROUGHOUT THE LOD TO FACILIATE INSTALLATION OF STREAM AND FLOODPLAIN RESTORATION STRUCTURES.
8. WASTE MATERIAL REMOVED FROM THE SITE IS TO BE TAKEN OFF SITE TO A SITE WITH AN APPROVED SEDIMENT AND EROSION CONTROL PLAN.
9. MULCH ACCESS ROAD MAY BE USED IN PLACE OF STABILIZED CONSTRUCTION ENTRANCE IF APPROVED BY SEDIMENT CONTROL INSPECTOR
10. WHERE CONSTRUCTION ACCESS ROAD CROSSES CONCENTRATED FLOW PATH, CONTRACTOR SHALL INSTALL DRAIN PIPE(S) UNDER ROAD TO MAINTAIN POSITIVE FLOW.
11. MINIMIZE CLEARING OUTSIDE OF THE GRADING LIMITS AND WHAT IS NECESSARY FOR CONSTRUCTION ACCESS. SEE TREE PROTECTION NOTES AND DETAILS TO AVOID IMPACTS TO MATURE FOREST.
12. WITHIN AREAS ADJACENT TO ACTIVE STREAM CHANNELS, TREAT DISTURBED AREAS DAILY WITH TEMPORARY SEED AND A MINIMUM OF 2" OF WOOD CHIPS/HARDWOOD MULCH. OVERSEED WITH PERMANENT SEED PER THE PLANTING SCHEDULE.
13. INSTALL SOIL STABILIZATION MATTING PER DETAIL AS COMPLETED AREAS ARE APPROVED BY THE INSPECTOR AND PROJECT ENGINEER/DESIGNATED SPECIALIST. SOIL STABILIZATION MATTING SHALL BE INSTALLED ON ALL STREAMBANKS GRADED TO A SLOPE STEEPER THAN 3:1 AS SHOWN ON CONSTRUCTION DETAILS. ALL OTHER DISTURBED AREAS AWAY FROM STREAM CHANNELS SHALL BE STABILIZED WITH A MINIMUM OF 2 INCHES OF WOOD CHIPS/HARDWOOD MULCH TRACKED INTO SOIL WITHIN THREE CALENDAR DAYS.
14. CONTRACTOR SHALL UTILIZE BASEFLOW DIVERSION/IN-STREAM HAUL ROAD CONSTRUCTION ACCESS TO MAXIMUM EXENT PRACTICABLE TO MINIMIZE DISTURBANCE TO FLOODPLAIN RESOURCES.
15. AS SITE CONDITIONS DICTATE; THE CONTRACTOR SHALL INSTALL A STREAM DIVERSION (PUMP AROUND PRACTICE AND/OR CLEAR WATER DIVERSION) TO MAINTAIN A DRY ACTIVE WORK AREA(S). EACH WORK AREA LENGTH SHALL NOT EXCEED WHAT CAN BE COMPLETED IN ONE DAY. STREAM DIVERSION LOCATIONS SHOWN ARE REPRESENTATIVE AND MAY BE ADJUSTED IN THE FIELD TO ACHIEVE DRY WORK AREA(S).
16. WHEN STREAM DIVERSION PRACTICES ARE UTILIZED, THE EXACT LOCATION OF THE PUMPS, HOSES, SEDIMENT DIKES, AND FILTER BAGS MAY BE MODIFIED IN THE FIELD BASED ON EXISTING CONDITIONS. ANY ADJUSTMENTS MUST BE APPROVED BY THE ENGINEER/DESIGNATED SPECIALIST AND SEDIMENT CONTROL INSPECTOR.
17. ENTIRE SITE SHALL BE TEMPORARILY STABILIZED IN ACCORDANCE WITH THE 2019 STREAM RESTORATION STABILZATION NOTES PRIOR TO REMOVING SEDIMENT CONTROLS.
18. UPON COMPLETION OF WORK, ALL WOODCHIPS OR HARDWOOD MULCH USED FOR TEMPORARY STABILIZATION OR CONSTRUCTION ACCESS SHALL BE SPREAD TO A 2" TO 4" THICKNESS WITHIN DISTURBED SOIL SURFACES AND INCORPORATED INTO THE TOP LAYER OF SOIL PRIOR TO PLANTING.
19. WOODCHIPS OR HARDWOOD MULCH USED FOR STABILIZATION SHALL BE DERIVED FROM FRESH OR AGED HARDWOOD INCLUDING BARK, WOOD FRAGMENTS AND GRINDINGS. WOODCHIPS AND HARDWOOD MULCH SHALL BE FREE OF LEAVES, VINES INCLUDING POISON IVY, TRASH AND FOREIGN MATTER, AND MAY INCLUDE CHUNKS UP TO 3 INCHES IN ANY DIMENSION.

HORIZONTAL SCALE
0 20 40

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Arundel Rivers Federation

ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	BY

APPROVED DATE		APPROVED DATE	
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED DATE		APPROVED DATE	
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT-OF-WAY	

SCALE:	1" = 20'
DRAWN BY	TB
CHECKED BY	DS/JC
SHEET NO.	15 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK
STREAM RESTORATION

EROSION & SEDIMENT
CONTROL PLAN

6/18/2026 M:\CADD\Projects\24015.01 Annapolis Waterworks Park Stream Restoration\CAD\Plans\esc-01.dwg

EROSION AND SEDIMENT CONTROL LEGEND

- RSF — REINFORCED SILT FENCE
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- TP — TREE PLANKING
- TREE REMOVAL

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17. ENTIRE SITE SHALL BE TEMPORARILY STABILIZED IN ACCORDANCE WITH THE 2019 STREAM RESTORATION STABILZATION NOTES PRIOR TO REMOVING SEDIMENT CONTROLS.
18. UPON COMPLETION OF WORK, ALL WOODCHIPS OR HARDWOOD MULCH USED FOR TEMPORARY STABILIZATION OR CONSTRUCTION ACCESS SHALL BE SPREAD TO A 2" TO 4" THICKNESS WITHIN DISTURBED SOIL SURFACES AND INCORPORATED INTO THE TOP LAYER OF SOIL PRIOR TO PLANTING.
19. WOODCHIPS OR HARDWOOD MULCH USED FOR STABILIZATION SHALL BE DERIVED FROM FRESH OR AGED HARDWOOD INCLUDING BARK, WOOD FRAGMENTS AND GRINDINGS. WOODCHIPS AND HARDWOOD MULCH SHALL BE FREE OF LEAVES, VINES INCLUDING POISON IVY, TRASH AND FOREIGN MATTER, AND MAY INCLUDE CHUNKS UP TO 3 INCHES IN ANY DIMENSION.

CITY OF ANNAPOLIS
MAYOR & ALDERMN
L.2410 F.360

KRG GATEWAY
VILLAGE LLC
NO DEED
REFFERENCE
PLAT 180 F.33

MATCHLINE - SHEET 15

HORIZONTAL SCALE
0 20 40

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ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

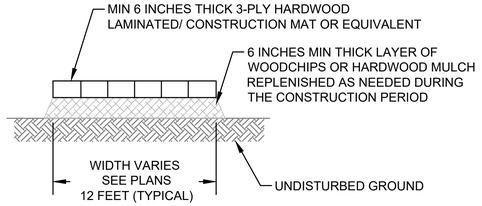
REVISED DATE	BY

APPROVED DATE		APPROVED DATE	
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED DATE		APPROVED DATE	
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT-OF-WAY	

SCALE:	1" = 20'
DRAWN BY	TB
CHECKED BY	DS/JC
SHEET NO.	16 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

EROSION & SEDIMENT CONTROL PLAN

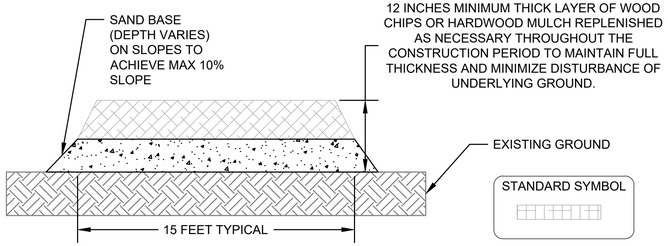


NOTES:

1. HARDWOOD MATS ARE NEEDED ALONG THE STREAM VALLEY BOTTOM WITHIN WETLANDS AND WHERE SATURATED SOIL CONDITIONS PERSIST. CONTRACTOR SHALL INSTALL HARDWOOD MATS AS NEEDED FOR ADDITIONAL PROTECTION IN WET OR HEAVY TRAFFIC AREAS.
2. ON SLOPES, IF ACCESS ROAD REMAINS GREATER THAN 10%, CONTRACTOR SHALL UTILIZE HARDWOOD MATS ON THE SECTIONS OF ROAD THAT ARE GREATER THAN 10%.
3. ACCESS ROUTES TO BE VERIFIED BY THE ENGINEER AT THE EROSION AND SEDIMENT CONTROL MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER.
4. THE CONTRACTOR SHALL ENSURE THAT EQUIPMENT IS KEPT ON MATS AT ALL TIMES WHERE MATS ARE PRESENT.
5. THE CONTRACTOR SHALL MAINTAIN ACCESS ROADS THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF PROJECT, WOODCHIPS SHALL BE SPREAD TO A MAXIMUM DEPTH OF 2 INCHES.
6. SCARIFICATION OF COMPACTED WOODCHIPS OR HARDWOOD MULCH TO OCCUR UPON REMOVAL OF THE ACCESS ROAD, AT DIRECTION OF THE ENGINEER.

HARDWOOD MAT CROSS SECTION

NOT TO SCALE



NOTES:

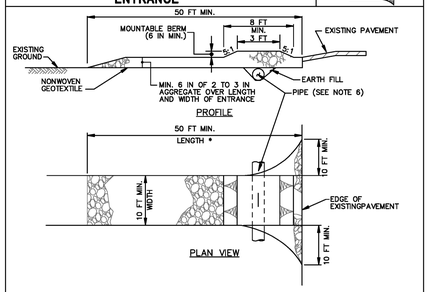
1. ACCESS ROUTES TO BE VERIFIED BY ENGINEER AT EROSION AND SEDIMENT CONTROL MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER.
2. CONTRACTOR SHALL MAINTAIN CONSTRUCTION ACCESS THROUGHOUT CONSTRUCTION PERIOD, REPLENISHING MULCH AS NECESSARY.
3. UPON COMPLETION OF PROJECT, ACCESS PATHS SHALL BE RESTORED TO FINISHED GRADE BY UNCOMPACTED WOOD CHIPS/HARDWOOD MULCH AND INCORPORATED INTO GRADE, AND PLACEMENT OF SCATTERED WOODY DEBRIS TO ROUGHEN PATH. IF ACCESS PATH GETS DEPRESSED BELOW GRADE, BORROW MAY BE REQUIRED AT DIRECTION OF ENGINEER/DESIGNATED SPECIALIST TO RE-ESTABLISH GRADES THAT MATCH FLOODPLAIN.
4. STAGING AND STOCKPILING AREAS TO BE PROTECTED USING SAME PROTECTION AND REPLENISHMENT REQUIREMENTS.
5. ON SLOPED SURFACES, GRADES ALONG MULCH ACCESS ROAD SHALL BE ADJUSTED THROUGH A COMBINATION OF EXCAVATION WITHIN UPSLOPE AREA AND FILL AT TOE OF SLOPE WITH SAND TO ACHIEVE RUNNING SLOPE OF 10%.
6. IF ACCESS ROAD REMAINS GREATER THAN 10%, CONTRACTOR SHALL UTILIZE HARDWOOD MATS ON THE SECTIONS OF ROAD THAT ARE GREATER THAN 10%.

CONSTRUCTION ACCESS ROAD SECTION

NOT TO SCALE

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

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

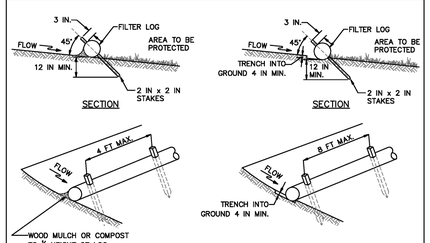
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-6 FILTER LOG

STANDARD SYMBOL: FL-18

DESIGNATION FL-18 REFERS TO 18 INCH DIAMETER FILTER LOG



1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-6 FILTER LOG

STANDARD SYMBOL: FL-18

DESIGNATION FL-18 REFERS TO 18 INCH DIAMETER FILTER LOG

CONSTRUCTION SPECIFICATIONS

1. PRIOR TO INSTALLATION, CLEAR ALL OBSTRUCTIONS INCLUDING ROCKS, CLODS, AND DEBRIS GREATER THAN ONE INCH THAT MAY INTERFERE WITH PROPER FUNCTION OF FILTER LOG.
2. FILL LOG NETTING UNIFORMLY WITH COMPOST (IN ACCORDANCE WITH SECTION H-1 MATERIALS), OR OTHER APPROVED BIODEGRADABLE MATERIAL TO DESIRED LENGTH SUCH THAT LOGS DO NOT DEFORM.
3. INSTALL FILTER LOGS PERPENDICULAR TO THE FLOW DIRECTION AND PARALLEL TO THE SLOPE WITH THE BEGINNING AND END OF THE INSTALLATION POINTING SLIGHTLY UP THE SLOPE CREATING A "J" SHAPE AT EACH END TO PREVENT BYPASS.
4. FOR UNTRENCHED INSTALLATION BLOW OR HAND PLACE MULCH OR COMPOST ON UPHILL SIDE OF THE SLOPE ALONG LOG.
5. STAKE FILTER LOG EVERY 4 FEET OR CLOSER ALONG ENTIRE LENGTH OF LOG OR TRENCH LOG INTO GROUND A MINIMUM OF 4 INCHES AND STAKE LOG EVERY 8 FEET OR CLOSER.
6. USE STAKES WITH A MINIMUM NOMINAL CROSS SECTION OF 2X2 INCH AND OF SUFFICIENT LENGTH TO ATTAIN A MINIMUM OF 12 INCHES INTO THE GROUND AND 3 INCHES PROTRUDING ABOVE LOG.
7. WHEN MORE THAN ONE LOG IS NEEDED, OVERLAP ENDS 12 INCHES MINIMUM AND STAKE.
8. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO A DEPTH OF ½ THE EXPOSED HEIGHT OF LOG AND REPLACE MULCH. REPLACE FILTER LOG IF TORN. REINSTALL FILTER LOG IF UNDERMINING OR DISLODGING OCCURS. REPLACE CLOGGED FILTER LOGS. FOR PERMANENT APPLICATIONS, ESTABLISH AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

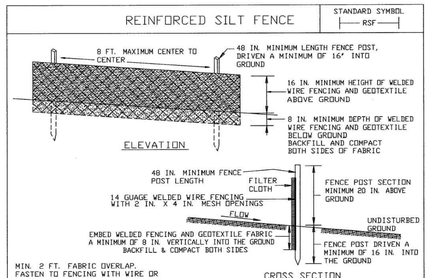
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

REINFORCED SILT FENCE

STANDARD SYMBOL: RSF



CONSTRUCTION SPECIFICATIONS

1. Metal fence post shall be a minimum of 48 inches long, driven 16 inches minimum into the ground and no more than 8 feet apart. Post shall be standard T or U section weighing not less than 1.00 pound per linear foot. Reinforcement shall be 14 guage welded wire fencing with 2 inch X 4 inch mesh openings.
2. Geotextile shall be fastened securely to each fence post with wire ties or zip ties at top and mid section. Where ends of geotextile fabric come together, they shall be overlapped, folded and wire tied or zip tied to post to prevent sediment bypass.
3. Use a woven geotextile, as specified in section H-1 materials, and fasten to the upslope side of the fence posts with wire or zip ties at top and midsection. The Manufacturer's certification that the fabric meets the requirements in section H-1 must be made available to the inspection/enforcement authority.
4. Extend both ends of reinforced silt fence a minimum of five (5) horizontal feet upslope at 45 degrees to the main fence alignment to prevent runoff from going around the ends.
5. Renove accumulated sediment and debris when bulges develop in the reinforced silt fence fabric or when sediment reaches 25% of the fence height. Replace geotextile if torn. If undermining occurs, reinstall fence.

ANNE ARUNDEL SOIL CONSERVATION DISTRICT	2015	

REINFORCED SILT FENCE

Design Criteria

Reinforced Silt Fence Desisgn Constraints

Average Slope Steepness	Maximum Slope Length	Maximum Silt Fence Length
Flatter than 50:1 (<2%)	300 feet*	Unlimited
50:1 to 10:1 (2-10%)	125 feet	1,000 feet
10:1 to 5:1 (10-20%)	100 feet	750 feet
5:1 (>20%)	40 feet	250 feet

*Maximum slope length is unlimited on the Hydrolic Soil Group (HSG) "A" soils

1. The use of Reinforced Silt Fence must conform to the design constraints listed above.
2. The area downgrade of the Reinforced Silt Fence must be undisturbed ground.
3. Reinforced Silt Fence must be placed along the contour.
4. Reinforced Silt Fence should be used with caution in areas where rocky soils may prevent trenching.
5. Extend both ends of reinforced silt fence a minimum of five (5) horizontal feet upslope and 45 degrees to the main fence alignment to prevent runoff fron going around the edges

ANNE ARUNDEL SOIL CONSERVATION DISTRICT	2015	

STEP POOL STORM CONVEYANCE STABILIZATION NOTES:

1. TEMPORARY STABILIZATION NOTE:
1.1. TEMPORARY STABILIZATION FOR ANY AREA OF EARTH DISTURBED AROUND THE POOLS AND RIFFLE ZONES OF A SPSC (E.G., STEP POOL STORM CONVEYANCE SYSTEM) SHALL BE CONSIDERED ACHIEVED WHEN UNIFORMLY COVERING THE AREA WITH 2 TO 4 INCHES OF WOOD CHIPS. ANNUAL RYE MAY BE UTILIZED FOR THE TEMPORARY SEEDING APPLICATION PERIOD FOUND UNDER THE ANNE ARUNDEL SOIL CONSERVATION DISTRICT'S (AASCD) VEGETATIVE ESTABLISHMENT SPECIFICATION OR 2011 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
2. PERMANENT STABILIZATION NOTE:
2.1. PERMANENT STABILIZATION FOR AN AREA OF EARTH DISTURBANCE OF A SPSC SHALL BE CONSIDERED ACHIEVED WHEN THE BANKS AND FLOODPLAIN ARE COVERED WITH FULLY BIODEGRADABLE STABILIZATION MATTING INSTALLED PER MANUFACTURER'S INSTRUCTIONS AND A (NATIVE PLANTS) PLANTING PLAN HAS BEEN IMPLEMENTED.

MAINTENANCE NOTE:

CONTRACTOR SHALL INSPECT AND MAINTAIN ALL SEDIMENT CONTROL MEASURES AND DEVICES AFTER EVERY STORM EVENT. MAINTENANCE SHALL INCLUDE, BUT NOT BE LIMITED TO THE REMOVAL OF ALL ACCUMULATED SEDIMENT. GEOTEXTILE FABRIC SHALL BE REPLACED AS NEEDED TO ENSURE PROPER FUNCTION.

TEMPORARY STOCKPILES NOTES:

TEMPORARY STOCKPILES SHALL BE:

1.) LOCATED WITHIN THE LIMIT OF DISTURBANCE (LOD).

2.) DRAIN TO A FUNCTIONING SEDIMENT CONTROL DEVICE.

3.) POSITIONED TO NOT IMPEDE UPON, OR IMPAIR THE FUNCTION OF SAID DEVICE.

4.) POSITIONED TO NOT ALTER DRAINAGE DIVIDES.

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Restore the Earth & Inspire Ecological Stewardship

Arundel Rivers FEDERATION
ARUNDELRIVERS.ORG

ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	BY

APPROVED DATE	APPROVED DATE
CHIEF ENGINEER	PROJECT MANAGER
APPROVED DATE	APPROVED DATE
ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT-OF-WAY

SCALE:	NTS
DRAWN BY	KB
CHECKED BY	DS/JC
SHEET NO.	17 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

EROSION & SEDIMENT CONTROL DETAILS

6/18/2026 M:\CADD\Projects\24015.01 Annapolis Waterworks Park Stream Restoration\CAD\Plans\dt01aw.dwg

MGWC 1.2: PUMP-AROUND PRACTICE

DESCRIPTION THE WORK SHALL CONSIST OF INSTALLING A TEMPORARY PUMP AROUND AND SUPPORTING MEASURES TO DIVERT FLOW AROUND INSTREAM CONSTRUCTION SITES.

IMPLEMENTATION SEQUENCE SEDIMENT CONTROL MEASURES, PUMP-AROUND PRACTICES, AND ASSOCIATED CHANNEL AND BANK CONSTRUCTION SHALL BE COMPLETED IN THE FOLLOWING SEQUENCE (REFER TO DETAIL 1.2):

1. CONSTRUCTION ACTIVITIES INCLUDING THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES SHALL NOT BEGIN UNTIL ALL NECESSARY EASEMENTS AND/OR RIGHT-OF-WAYS HAVE BEEN ACQUIRED. ALL EXISTING UTILITIES SHALL BE MARKED IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES THAT MAY RESULT FROM CONSTRUCTION AND SHALL REPAIR THE DAMAGE AT HIS/HER OWN EXPENSE TO THE COUNTY'S OR UTILITY COMPANY'S SATISFACTION.

2. THE CONTRACTOR SHALL NOTIFY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT OR WMA SEDIMENT CONTROL INSPECTOR AT LEAST 5 DAYS BEFORE BEGINNING CONSTRUCTION. ADDITIONALLY, THE CONTRACTOR SHALL INFORM THE LOCAL ENVIRONMENTAL PROTECTION AND RESOURCE MANAGEMENT INSPECTION AND ENFORCEMENT DIVISION AND THE PROVIDER OF LOCAL UTILITIES A MINIMUM OF 48 HOURS BEFORE STARTING CONSTRUCTION.

3. THE CONTRACTOR SHALL CONDUCT A PRE-CONSTRUCTION MEETING ON SITE WITH THE WMA SEDIMENT CONTROL INSPECTOR, THE COUNTY PROJECT MANAGER, AND THE ENGINEER TO REVIEW LIMITS OF DISTURBANCE, EROSION AND SEDIMENT CONTROL REQUIREMENTS, AND THE SEQUENCE OF CONSTRUCTION. THE CONTRACTOR SHALL STAKE OUT ALL LIMITS OF DISTURBANCE PRIOR TO THE PRE-CONSTRUCTION MEETING SO THEY MAY BE REVIEWED. THE PARTICIPANTS WILL ALSO DESIGNATE THE CONTRACTOR'S STAGING AREAS AND FLAG ALL TREES WITHIN THE LIMIT OF DISTURBANCE WHICH WILL BE REMOVED FOR CONSTRUCTION ACCESS. TREES SHALL NOT BE REMOVED WITHIN THE LIMIT OF DISTURBANCE WITHOUT APPROVAL FROM THE WMA OR LOCAL AUTHORITY.

4. CONSTRUCTION SHALL NOT BEGIN UNTIL ALL SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED AND APPROVED BY THE ENGINEER AND THE SEDIMENT CONTROL INSPECTOR. THE CONTRACTOR SHALL STAY WITHIN THE LIMITS OF THE DISTURBANCE AS SHOWN ON THE PLANS AND MINIMIZE DISTURBANCE WITHIN THE WORK AREA WHENEVER POSSIBLE.

5. UPON INSTALLATION OF ALL SEDIMENT CONTROL MEASURES AND APPROVAL BY THE SEDIMENT CONTROL INSPECTOR AND THE LOCAL ENVIRONMENTAL PROTECTION AND RESOURCE MANAGEMENT INSPECTION AND ENFORCEMENT DIVISION, THE CONTRACTOR SHALL BEGIN WORK AT THE UPSTREAM SECTION AND PROCEED DOWNSTREAM BEGINNING WITH THE ESTABLISHMENT OF STABILIZED CONSTRUCTION ENTRANCES. IN SOME CASES, WORK MAY BEGIN DOWNSTREAM IF APPROPRIATE. THE SEQUENCE OF CONSTRUCTION MUST BE FOLLOWED UNLESS THE CONTRACTOR GETS WRITTEN APPROVAL FOR DEVIATIONS FROM THE WMA OR LOCAL AUTHORITY. THE CONTRACTOR SHALL ONLY BEGIN WORK IN AN AREA WHICH CAN BE COMPLETED BY THE END OF THE DAY INCLUDING GRADING ADJACENT TO THE CHANNEL. AT THE END OF EACH WORK DAY, THE WORK AREA MUST BE STABILIZED AND THE PUMP AROUND REMOVED FROM THE CHANNEL. WORK SHALL NOT BE CONDUCTED IN THE CHANNEL DURING RAIN EVENTS.

6. SANDBAG DIKES SHALL BE SITUATED AT THE UPSTREAM AND DOWNSTREAM ENDS OF THE WORK AREA AS SHOWN ON THE PLANS, AND STREAM FLOW SHALL BE PUMPED AROUND THE WORK AREA. THE PUMP SHALL DISCHARGE ONTO A STABLE VELOCITY DISSIPATER MADE OF RIPRAP OR SANDBAGS. TEMPORARY MEASURE FOR DEWATERING INCHANNEL CONSTRUCTION SITES.

7. WATER FROM THE WORK AREA SHALL BE PUMPED TO A SEDIMENT FILTERING MEASURE SUCH AS A DEWATERING BASIN, SEDIMENT BAG, OR OTHER APPROVED SOURCE. THE MEASURE SHALL BE LOCATED SUCH THAT THE WATER DRAINS BACK INTO THE CHANNEL BELOW THE DOWNSTREAM SANDBAG DIKE.

8. TRAVERSING A CHANNEL REACH WITH EQUIPMENT WITHIN THE WORK AREA WHERE NO WORK IS PROPOSED SHALL BE AVOIDED. IF EQUIPMENT HAS TO TRAVERSE SUCH A REACH FOR ACCESS TO ANOTHER AREA, THEN TIMBER MATS OR SIMILAR MEASURES SHALL BE USED TO MINIMIZE DISTURBANCE TO THE CHANNEL. TEMPORARY STREAM CROSSINGS SHALL BE USED ONLY WHEN NECESSARY AND SHALL BE USED ONLY WHERE NOTED ON THE PLANS OR SPECIFIED. (SEE SECTION 4, STREAM CROSSINGS, MARYLAND GUIDELINES TO WATERWAY CONSTRUCTION).

9. ALL STREAM RESTORATION MEASURES SHALL BE INSTALLED AS INDICATED BY THE PLANS AND ALL BANKS GRADED IN ACCORDANCE WITH THE GRADING PLANS AND TYPICAL CROSS-SECTIONS. ALL GRADING MUST BE STABILIZED AT THE END OF EACH DAY WITH SEED AND MULCH OR SEED AND MATTING AS SPECIFIED ON THE PLANS.

10. AFTER AN AREA IS COMPLETED AND STABILIZED, THE CLEAN WATER DIKE SHALL BE REMOVED. AFTER THE FIRST SEDIMENT FLUSH, A NEW CLEAN WATER DIKE SHALL BE ESTABLISHED UPSTREAM FROM THE OLD SEDIMENT DIKE. FINALLY, UPON ESTABLISHMENT OF A NEW SEDIMENT DIKE BELOW THE OLD ONE, THE OLD SEDIMENT DIKE SHALL BE REMOVED.

11. A PUMP AROUND MUST BE INSTALLED ON ANY TRIBUTARY OR STORM DRAIN OUTFALL WHICH CONTRIBUTES BASEFLOW TO THE WORK AREA. THIS SHALL BE ACCOMPLISHED BY LOCATING A SANDBAG DIKE AT THE DOWNSTREAM END OF THE TRIBUTARY OR STORM DRAIN OUTFALL AND PUMPING THE STREAM FLOW AROUND THE WORK AREA. THIS WATER SHALL DISCHARGE ONTO THE SAME VELOCITY DISSIPATER USED FOR THE MAIN STEM PUMP AROUND.

12. IF A TRIBUTARY IS TO BE RESTORED, CONSTRUCTION SHALL TAKE PLACE ON THE TRIBUTARY BEFORE WORK ON THE MAIN STEM REACHES THE TRIBUTARY CONFLUENCE. CONSTRUCTION IN THE TRIBUTARY, INCLUDING PUMP AROUND PRACTICES, SHALL FOLLOW THE SAME SEQUENCE AS FOR THE MAIN STEM OF THE RIVER OR STREAM. WHEN CONSTRUCTION ON THE TRIBUTARY IS COMPLETED, WORK ON THE MAIN STEM SHALL RESUME. WATER FROM THE TRIBUTARY SHALL CONTINUE TO BE PUMPED AROUND THE WORK AREA IN THE MAIN STEM.

13. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ACCESS TO AND MAINTAINING ALL EROSION AND SEDIMENT CONTROL DEVICES UNTIL THE SEDIMENT CONTROL INSPECTOR APPROVES THEIR REMOVAL.

14. AFTER CONSTRUCTION, ALL DISTURBED AREAS SHALL BE REGRADED AND REVEGETATED AS PER THE PLANTING PLAN.

15. IF, IN THE JUDGMENT OF THE ENGINEER, INADEQUATE ENERGY DISSIPATION OR CHANNEL BED EROSION IS OCCURRING, THE CONTRACTOR SHALL BE REQUIRED TO INCREASE THE MATERIAL OR PLACEMENT SIZE OF THE OUTFALL PROTECTION AT THE DIRECTION OF THE ENGINEER.

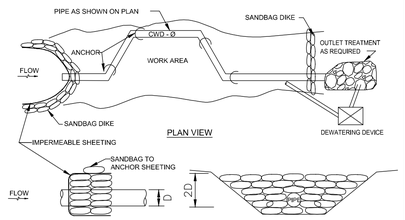
16. THE CONDITION OF THE OUTLET PROTECTION SANDBAGS IS TO BE CHECKED TWICE PER DAY (START OF WORK DAY AND MID-DAY) TO ENSURE THAT SAND IS NOT ESCAPING BAGS. DAMAGED OR LEAKING BAGS ARE TO BE REMOVED AND REPLACED.

17. OUTFALL PROTECTION MATERIALS AND GEOTEXTILE SHALL BE REMOVED FROM THE CHANNEL AT THE COMPLETION OF EACH CONSTRUCTION STAGE.

DETAIL C-6 CLEAR WATER DIVERSION PIPE

STANDARD SYMBOL: CWD - 6

DESIGNATION CWD-6 REFERS TO 6 INCH CLEAR WATER DIVERSION.



CONSTRUCTION SPECIFICATIONS

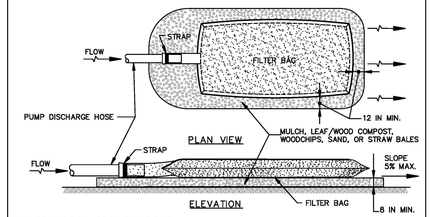
1. FLEXIBLE PIPE IS PREFERRED, HOWEVER, CORRUGATED METAL PIPE OR EQUIVALENT PVC PIPE CAN BE USED. MAKE ALL JOINTS WATERTIGHT.
2. FOR SANDBAGS USE MATERIALS THAT ARE RESISTANT TO ULTRA-VIOLENT RADIATION, TEARING, AND PUNCTURE AND WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF FILL MATERIAL.
3. USE 10 MIL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

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL F-4 FILTER BAG

STANDARD SYMBOL: ☒FB



CONSTRUCTION SPECIFICATIONS

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

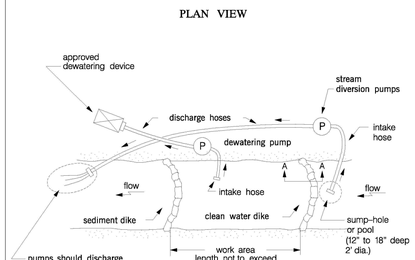
GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT²	ASTM D-4491
PERMITTIVITY (SEC^{-1})	1.2 SEC^{-1}	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632

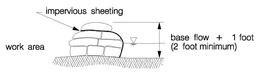
6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

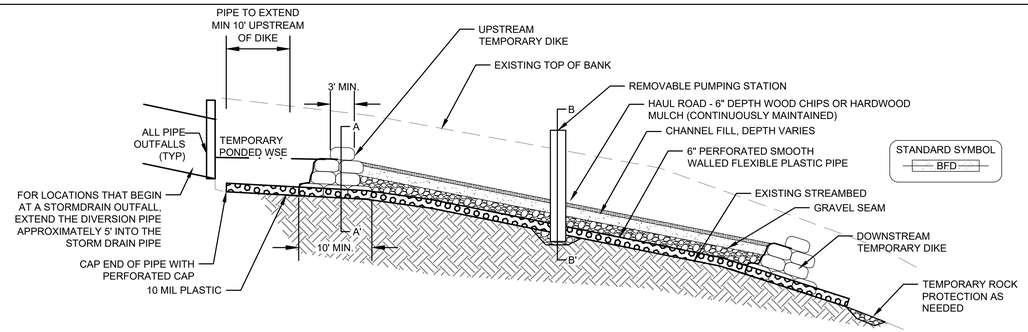
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

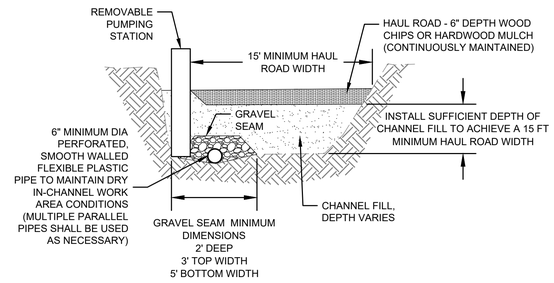
Maryland's Guidelines To Waterway Construction
DETAIL 1.2: PUMP–AROUND PRACTICE



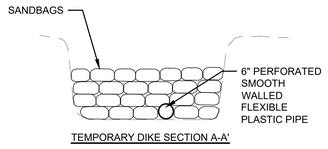


TEMPORARY INSTREAM CONSTRUCTION MEASURES	*REVISED NOVEMBER 2000 PAGE 1.2 – 3*	MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION





REMOVABLE PUMPING STATION SECTION B-B'



TEMPORARY DIKE SECTION A-A'

IN CHANNEL HAUL ROAD/ BASE FLOW DIVERSION

NOT TO SCALE

IN-CHANNEL HAUL ROAD/BASE FLOW DIVERSION EXECUATION:

1. INSTALL PERFORATED FLEXIBLE DIVERSION PIPE(S) ALONG THE EXISTING CHANNEL THALWEG FROM THE UPSTREAM END OF THE WORK AREA TO THE DOWNSTREAM LIMIT, ENSURING THAT DIVERSION PIPE DISCHARGES TO A STABLE SURFACE.
2. FOR LOCATIONS THAT BEGIN AT A STORM DRAIN OUTFALL, INSERT THE DIVERSION PIPE APPROXIMATELY 5' INTO THE STORM DRAIN PIPE WHEN POSSIBLE. IF OUTFALL HAS SEVERELY ERODED THE RECEIVING STREAMBED AND PIPE IS NO LONGER AT A SIMILAR ELEVATION AS THE STREAMBED, START UNDERDRAIN PIPE AT THE END OF THE STORM DRAIN PIPE.
3. FOR LOCATIONS THAT BEGIN WITHOUT A STORM DRAIN OUTFALL, EXTEND DIVERSION PIPE A MINIMUM OF 10 FT UPSTREAM OF DIKE LOCATION.
4. CAP THE UPSTREAM END OF THE PIPE WITH A PERFORATED END CAP.
5. SECURE ENTIRE LENGTH OF DIVERSION PIPE EVERY 15 FT WITH SANDBAGS, STAKES AND WIRE TIES TO KEEP PIPE IN PLACE AS FILL IS INSTALLED ABOVE IT. FOR THE LENGTH OF PIPE INSERTED INTO A STORM DRAIN PIPE, SECURE WITH SANDBAGS ALONG ENTIRE LENGTH OF INSERTED PIPE.
6. INSTALL UPSTREAM AND DOWNSTREAM DIKES USING SANDBAGS WITH DIVERSION PIPE EXTENDING PAST EACH. BEGIN INSTALLING GRAVEL SEAM, FILLING OVERTOP THE DIVERSION PIPE. KEEP DIVERSION PIPE ABOVE UPSTREAM DIKE EXPOSED TO ALLOW PONDED WATER TO CONTINUOUSLY DRAIN.
7. APPROXIMATELY EVERY 400 FT OF CHANNEL, INSTALL A 24" PERFORATED HDPE PIPE VERTICALLY FROM THE BOTTOM OF THE GRAVEL SEAM TO A MIN OF 24" ABOVE FLOODPLAIN GRADE ALONG THE BANK TO FUNCTION AS A REMOVABLE PUMPING STATION. REMOVABLE PUMPING STATION SHALL BE USED AS SUMP PIT FOR DEWATERING PURPOSES AS NEEDED.
8. INSTALL CHANNEL FILL ABOVE GRAVEL SEAM TO APPROXIMATE ELEVATION OF PROPOSED POOL, AT MINIMUM HEIGHT TO ACHIEVE A WORKING HAUL ROAD WIDTH OF 15 FT.
9. INSTALL AND MAINTAIN 6 INCHES OF WOODCHIPS OR HARDWOOD MULCH AS SURFACE OF HAUL ROAD.
10. CONTRACTOR SHALL ACTIVELY MAINTAIN DIVERSION PIPE AND IN-CHANNEL HAUL ROAD WIDTH AND DEPTH DURING THE DURATION OF ITS USE.
11. A STREAM PUMP AROUND SHALL BE USED IN TANDEM WITH DIVERSION PIPE WHEN NECESSARY TO MAINTAIN A DRY WORK AREA.
12. AS CONSTRUCTION OF IN-STREAM WORK PROGRESSES UPSTREAM, THE DOWNSTREAM TEMPORARY DIKE SHALL BE RELOCATED TO THE DOWNSTREAM LIMIT OF WORK EACH DAY. COMPLETED IN-STREAM GRADE CONTROL STRUCTURES (RIFFLES, CASCADES, ETC) MAY BE USED IN LIEU OF THE DOWNSTREAM TEMPORARY DIKE.
13. SECTION OF DIVERSION PIPE SHALL BE REMOVED DURING INSTALLATION OF STREAM STRUCTURES AND GRADING OF POOLS TO RESTORE FLOW TO SURFACE.
14. AS STREAM WORK IS COMPLETED AND DIVERSION PIPE REMOVED, GRAVEL SEAM SHALL BE CHOKED UP WITH SEDIMENT APPROXIMATELY EVERY 100 FT. EACH GRAVEL SEAM INTERRUPTION SHALL BE 1' LONG SECTION OF CHOKED SEAM, FOR THE FULL WIDTH AND DEPTH.
15. WOODCHIPS FROM HAUL ROAD SHALL BE INCORPORATED INTO CHANNEL FILL AS WORK IS COMPLETED.

IN-CHANNEL HAUL ROAD/BASE FLOW DIVERSION MATERIALS:

1. PERFORATED PIPE SHALL BE SMOOTHED WALLED FLEXIBLE PLASTIC PIPE (HDPE) SIZED TO MAINTAIN DRY CONDITIONS, 6" DIA MINIMUM. MULTIPLE ROWS ALLOWABLE
2. GRAVEL SEAM SHALL BE COMPOSED OF EITHER WASHED PEA GRAVEL (3/8 INCH DIAMETER, ROUNDED PARTICLES) OR WASHED #57 CRUSHED STONE (1/2 TO 1" DIAMETER).
3. WOOD STAKES SHALL BE 2" X 2" HARDWOOD STAKES, 1 FOOT LONG.
4. CHANNEL FILL MATERIAL SHALL BE COMPOSED OF 80% IMPORTED OR ON-SITE SALVAGED MATERIAL MIXED WITH 20% HARDWOOD MULCH BY VOLUME. IMPORTED MATERIAL SHALL CONSIST OF SAND, LOAMY SAND, SANDY LOAM AND LOAM TEXTURES, AS DEFINED BY USDA. MATERIAL GRADATION SHALL BE UP TO 20% CLAY (<0.002 MM) UP TO 50% SILT (0.002 MM TO 0.05 MM), 30% TO 100% SAND (0.05 MM TO 2.0 MM), AND UP TO 5% GRAVEL (2.0MM TO 2.0 IN). SALVAGED MATERIAL SHALL ONLY BE GENERATED FROM APPROVED ON-SITE GRADING ACTIVITIES AND MEET THE SPECIFICATIONS FOR IMPORTED MATERIAL. HARDWOOD MULCH SHALL CONSIST OF NATURAL UNCOMPOSTED WOOD AND BARK FROM HARDWOOD TREES THAT HAVE BEEN MILLED TO A MINIMUM PARTICLE SIZE OF 1 X 1/2 X 1/4 INCH AND MAXIMUM PARTICLE SIZE OF 4 X 4 X 2 INCH WITH LESS THAN 20% SAWDUST.
5. HAUL ROAD - 6 INCHES MINIMUM THICK LAYER OF WOOD CHIPS OR HARDWOOD MULCH REPLENISHED AS NECESSARY THROUGHOUT THE CONSTRUCTION PERIOD TO MAINTAIN FULL THICKNESS.

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Restore the Earth & Inspire Ecological Stewardship

Arundel Rivers Federation

ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	BY

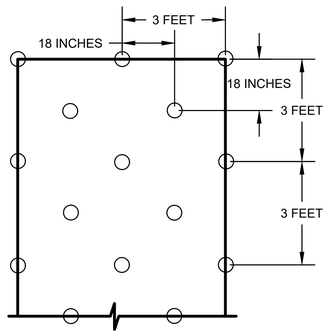
APPROVED	DATE	APPROVED	DATE
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT-OF-WAY	

SCALE:	AS SHOWN
DRAWN BY	KB
CHECKED BY	DS/JC
SHEET NO.	18 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

EROSION & SEDIMENT CONTROL DETAILS

NOTES:
1. ANCHOR PATTERN 2 ANCHORS/SQUARE YARD
2. WOODEN STAKES (AT LEAST 12 INCHES LONG) SHALL BE USED TO ANCHOR COIR MATTING TO THE GROUND SURFACE.
3. KEY COIR MATTING INTO TOE OF SLOPE. SECURE WITH 2 INCHES X 2 INCHES X 12 INCHES HARDWOOD STAKES. CONTRACTOR SHALL CUT NOTCH INTO SIDE OF STAKE 1 INCH FROM TOP.
4. USE 2 INCHES X 2 INCHES X 12 INCHES HARDWOOD STAKES TO SECURE ALL OTHER AREAS OF COIR MATTING, USING NOTCHES AS IN #3
5. ALL MATTING SHALL OVERLAP IN A DOWN VALLEY OR DOWNSTREAM DIRECTION, WITH A MINIMUM OVERLAP OF 6 INCHES.
6. ALL MATTING SHALL BE COIR MAT 700 OR EQUIVALENT



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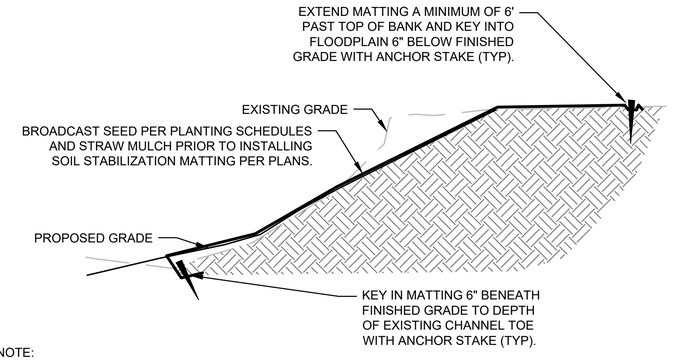
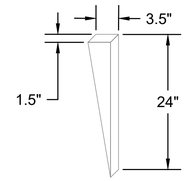


NOTE:
1. ALL MATTING SHALL BE COIR MAT 700 SERIES (700 GRAMS/SQUARE METER) OR EQUIVALENT UNLESS APPROVED BY ENGINEER.
2. WITHIN SPSC REACHES, COIR MATTING SHALL BE INSTALLED ON THE FINISHED GRADE OF ALL GRADED/DISTURBED STREAMBANKS ABOVE POOL ELEVATION THAT ARE 3:1 OR STEEPER, OR AT DIRECTION OF THE COUNTY.
3. WITHIN RSC REACHES (VALLEY-WIDE RIFFLES AND CASCADES), COIR MATTING SHALL BE INSTALLED ON THE FINISHED GRADE OF ALL GRADED/DISTURBED VALLEY WALL TIES IN AND ALL SURFACES THAT ARE 3:1 OR STEEPER, OR AT DIRECTION OF THE COUNTY.

CROSS SECTION

SOIL STABILIZATION MATTING

NOT TO SCALE



NOTE: ANCHOR STAKES SHALL BE TAPERED TWO FOOT LONG WOODEN STAKES CONSISTING OF STANDARD 2" X 4" WOODEN BOARDS CUT DIAGONALLY.

ANCHOR STAKE DETAIL

NOT TO SCALE

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SCALE:	NTS
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SHEET NO.	19 OF 30
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PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

EROSION & SEDIMENT CONTROL DETAILS

2019 STREAM RESTORATION STABILIZATION NOTES:

TEMPORARY STABILIZATION

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

1. TEMPORARY STABILIZATION FOR ANY DISTURBED AREAS ON THE FLOODPLAIN AND TERRACES ADJACENT TO THE RESTORED STREAM CHANNEL SHALL BE CONSIDERED ACHIEVED USING ONE OF THE FOLLOWING MEASURES:
   a. THE DISTURBED AREA IS UNIFORMLY COVERED WITH 2 TO 4 INCHES OF WOOD CHIPS
   b. THE DISTURBED AREA HAS BEEN SEEDED WITH ANNUAL RYE GRASS FOLLOWING THE TEMPORARY SEEDING APPLICATION PERIODS FOUND UNDER THE ANNE ARUNDEL SOIL CONSERVATION DISTRICT (AASCD) VEGETATIVE ESTABLISHMENT SPECIFICATION OR 2011 STANDARDS AND SPECIFICATIONS FOR SOIL SOIL EROSION AND SEDIMENT CONTROL. NO SOIL TEST, LIME, OR FERTILIZER WILL BE REQUIRED.

PERMANENT STABILIZATION

CONDITIONS WHERE PRACTICE APPLIES: EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR 6 MONTHS OR MORE.

1. PERMANENT STABILIZATION FOR CONSTRUCTED STREAM BANKS GREATER THAN 6 INCHES SHALL BE CONSIDERED ACHIEVED WHEN ALL STREAM BANKS ARE SEEDED (NATIVE SEED MIX) AND LINED WITH A FULLY BIODEGRADABLE STABILIZATION MATTING WITH APPROPRIATE STRENGTH PROPERTIES DEPENDENT ON LOCAL SHEAR STRESS CONDITIONS
2. PERMANENT STABILIZATION FOR DISTURBED FLOODPLAIN AND TERRACES ADJACENT TO THE RESTORED STREAM CHANNEL SHALL BE CONSIDERED ACHIEVED USING ONE OF THE FOLLOWING MEASURES:
   a. THE DISTURBED AREA IS COVERED WITH 2 TO 4 INCHES OF COMPOST (APPLIED OVER ANY WOOD CHIPS USED FOR TEMPORARY STABILIZATION) AND THE NATIVE PLANTING PLAN (INCLUDING PERMANENT SEEDING) HAS BEEN IMPLEMENTED.
   b. THE DISTURBED AREA IS COVERED WITH 2 TO 4 INCHES OF WOOD CHIPS TRACKED INTO SOIL AND THE NATIVE PLANTING PLAN (INCLUDING PERMANENT SEEDING) HAS BEEN IMPLEMENTED.
   c. THE DISTURBED AREA IS COVERED WITH 2 TO 4 INCHES OF TOPSOIL (FURNISHED OR SALVAGED) AND FULLY BIODEGRADABLE STABILIZATION MATTING INSTALLED PER MANUFACTURER'S INSTRUCTIONS AND A NATIVE PLANTING PLAN (INCLUDING PERMANENT SEEDING) HAS BEEN IMPLEMENTED, REGARDLESS OF SOIL TREATMENT,
   d. THE DISTURBED AREAS SHALL RECEIVE HYDROSEEDING OR FLEXIBLE GROWTH MEDIUM (FGM) AFTER THE ESTABLISHMENT OF FINAL GRADES AND MICROTOPOGRAPHY (IF APPLICABLE) IN ACCORDANCE WITH THE PROJECT CONSTRUCTION DETAILS OR LANDSCAPING PLANS.
   e. THE DISTURBED AREA HAS ADEQUATE VEGETATIVE ESTABLISHMENT WITH 95% GROUNDCOVER.

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 1 INCHES IN DIAMETER.
   b. TOPSOIL MUST BE FREE OF NOXIOUS PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, NUT SEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.
   c. TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL.
6. TOPSOIL APPLICATION
   a. EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL.
   b. UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MINIMUM THICKNESS OF 4 INCHES. SPREADING IS TO BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS MUST BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
   c. TOPSOIL MUST NOT BE PLACED IF THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.

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.

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 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 AND RATE OF SEED USED.
   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; P2O5 (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.

MULCHING

1. MULCH MATERIALS (IN ORDER OF PREFERENCE)
   a. STRAW CONSISTING OF THOROUGHLY THRESHED WHEAT, RYE, OAT, OR BARLEY AND REASONABLY BRIGHT IN COLOR. STRAW IS TO BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW AND NOT MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY. NOTE: ONLY STERILE STRAW MULCH SHOULD BE USED 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 SEED, FERTILIZER AND OTHER ADDITIVES TO FORM A HOMOGENEOUS SLURRY. THE MULCH MATERIAL MUST FORM A BLOTTER-LIKE GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND MUST COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDLINGS.
   iv. WCFM MATERIAL MUST NOT CONTAIN ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.
   v. WCFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: FIBER LENGTH OF APPROXIMATELY 10 MILLIMETERS, DIAMETER APPROXIMATELY 1 MILLIMETER, PH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6 PERCENT MAXIMUM AND WATER HOLDING CAPACITY OF 90 PERCENT MINIMUM.
2. APPLICATION:
   a. APPLY MULCH TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.
   b. WHEN STRAW MULCH IS USED, SPREAD IT OVER ALL SEEDED AREAS AT THE RATE OF 2 TONS PER ACRE TO A UNIFORM LOOSE DEPTH OF 1 TO 2 INCHES. APPLY MULCH TO ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. WHEN USING A MULCH ANCHORING TOOL, INCREASE THE APPLICATION RATE TO 2.5 TONS PER ACRE.
   c. WOOD CELLULOSE FIBER USED AS MULCH MUST BE APPLIED AT A NET DRY WEIGHT OF 1500 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER TO ATTAIN A MIXTURE WITH A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
3. ANCHORING:
   a. PERFORM MULCH ANCHORING IMMEDIATELY FOLLOWING APPLICATION TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY REFERENCE), DEPENDING UPON THE SIZE OF THE AREA AND EROSION HAZARD:
   i. 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 BE USED ON THE CONTOUR IF POSSIBLE.
   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 TAX II, TERRA TACK AR OR OTHER APPROVED EQUAL MAY BE USED WITH WRITTEN APPROVAL FROM DESIGN PROJECT MANAGER. 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.

STEP POOL STORM CONVEYANCE STABILIZATION NOTES:

1. TEMPORARY STABILIZATION NOTE:

1.1. TEMPORARY STABILIZATION FOR ANY AREA OF EARTH DISTURBED AROUND THE POOLS AND RIFFLE ZONES OF A SPSC (E.G., STEP POOL STORM CONVEYANCE SYSTEM) SHALL BE CONSIDERED ACHIEVED WHEN UNIFORMLY COVERING THE AREA WITH 2 TO 4 INCHES OF WOOD CHIPS. ANNUAL RYE MAY BE UTILIZED FOR THE TEMPORARY SEEDING APPLICATION PERIOD FOUND UNDER THE ANNE ARUNDEL SOIL CONSERVATION DISTRICT'S (AASCD) VEGETATIVE ESTABLISHMENT SPECIFICATION OR 2011 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.

2. PERMANENT STABILIZATION NOTE:

2.1. PERMANENT STABILIZATION FOR AN AREA OF EARTH DISTURBANCE OF A SPSC SHALL BE CONSIDERED ACHIEVED WHEN THE BANKS AND FLOODPLAIN ARE COVERED WITH FULLY BIODEGRADABLE STABILIZATION MATTING INSTALLED PER MANUFACTURER'S INSTRUCTIONS AND A (NATIVE PLANTS) PLANTING PLAN HAS BEEN IMPLEMENTED.

VEGETATIVE ESTABLISHMENT NOTES

FOLLOWING INITIAL SOIL DISTURBANCES OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN THREE CALENDAR DAYS FOR THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) AND SEVEN DAYS FOR ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

1. PERMANENT SEEDING:

1.A. SOIL TESTS: LIME AND FERTILIZER WILL BE APPLIED PER SOIL TESTS RESULTS FOR SITES GREATER THAN 5 ACRES. SOIL TESTS WILL BE DONE AT COMPLETION OF INITIAL ROUGH GRADING OR AS RECOMMENDED BY THE SEDIMENT CONTROL INSPECTOR. RATES AND ANALYSES WILL BE PROVIDED TO THE GRADING INSPECTOR AS WELL AS THE CONTRACTOR. OCCURANCE OF ACID SULFATE SOILS (GRAYING BLACK COLOR) WILL REQUIRE COVERING WITH A MINIMUM OF 12 INCHES OF CLEAN SOIL WITH 6 INCHES MINIMUM CAPPING OF TOP SOIL. NO STOCKPILING OF MATERIALS ALLOWED. IF NEEDED, SOIL TESTS SHOULD BE DONE BEFORE AND AFTER A 6-WEEK INCUBATION PERIOD TO ALLOW OXIDATION OF SULFATES.

THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE:

a. SOIL PH SHALL BE BETWEEN 6.0 AND 7.0

b. SOLUBLE SALTS SHALL BE LESS THAN 500 PARTS PER MILLION (PPM).

c. THE SOIL SHALL CONTAIN LESS THAN 40% CLAY BUT ENOUGH FINE GRAINED MATERIAL (>30% SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION IS IF LOVEGRASS OR SERECIA LESPEDEZA IS TO BE PLANTED, THEN A SANDY SOIL (<30% SILT PLUS CLAY) WOULD BE ACCPETABLE.

d. SOIL SHALL CONTAIN 1.5% MINIMUM ORGANIC MATTER BY WEIGHT.

e. SOIL MUST CONTAIN SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.

f. IF THESE CONDITIONS CANNOT BE MET BY SOILS ON SITE, ADDING TOPSOIL IS REQUIRED IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SOIL PREPARATION, TOPSOILING AND SOIL AMENDMENTS FROM THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL OR AMENDMENTS MADE AS RECOMMENDED BY A CERTIFIED AGRONOMIST.

1.B. SEEDBED PREPARATION: AREA TO BE SEEDED SHALL BE LOOSE AND FRIABLE TO A DEPTH OF AT LEAST 3-5 INCHES. THE TOP LAYER SHALL BE LOOSENED BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING OCCURS. FOR SITES LESS THAN 5 ACRES, APPLY 100 POUNDS DOLOMITIC LIMESTONE AND 21 POUNDS OF 10-10-10 FERTILIZER PER 1,000 SQUARE FEET. HARROW OR DISK LIME AND FERTILIZER INTO THE SOIL TO A DEPTH OF AT LEAST 3-5 INCHES OF SLOPES FLATTER THAN 3:1.

1.C. SEEDING: APPLY 5.6 POUNDS PER 1,000 SQUARE FEET OF TALL FESCUE BETWEEN FEBRUARY 1 AND APRIL 30 OR BETWEEN AUGUST 15 AND OCTOBER 31. APPLY SEED UNIFORMLY ON A MOIST FIRM SEEDBED WITH A CYCLONE SEEDER, CULTIPACKER SEEDER OR HYDROSEEDER (SLURRY INCLUDES SEEDS AND FERTILIZER, RECOMMENDED ON STEEP SLOPES ONLY). MAXIMUM SEED DEPTH SHOULD BE $\frac{1}{4}$ INCH IN CLAYEY SOILS AND $\frac{1}{2}$ INCH IN SANDY SOILS WHEN USING OTHER THAN THE HYDROSEEDER METHOD. IRRIGATE WHERE NECESSARY TO SUPPORT ADEQUATE GROWTH UNTIL VEGETATION IS FIRMLY ESTABLISHED. IF OTHER SEED MIXES ARE TO BE USED, SELECT FROM TABLE B3 AND B5 OF THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.

1.D. MULCHING: MULCH SHALL BE APPLIED TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING. DURING THE TIME PERIODS WHEN SEEDING IS NOT PERMITTED, MULCH SHALL BE APPLIED IMMEDIATELY AFTER GRADING. MULCH SHALL BE UNROTTED, UNCHOPPED, SMALL GRAIN STRAW APPLIED AT A RATE OF 2 TONS PER ACRE OR 90 POUNDS PER 1,000 SQUARE FEET (2 BALES). APPLY MULCH TO ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. IF A MULCH-ANCHORING TOOL IS USED, APPLY 2.5 TONS PER ACRE. MULCH MATERIALS SHALL BE RELATIVELY FREE OF ALL KINDS OF WEEDS AND SHALL BE COMPLETELY FREE OF PROHIBITED NOXIOUS WEEDS. SPREAD MULCH UNIFORMLY, MECHANICALLY OR BY HAND, TO A DEPTH OF 1-2 INCHES.

1.E. SECURING STRAW MULCH: STRAW MULCH SHALL BE SECURED IMMEDIATELY FOLLOWING MULCH APPLICATION TO MINIMIZE MOVEMENT BY WIND OR WATER. THE FOLLOWING METHODS ARE PERMITTED:

i. USING A MULCH-ANCHORING TOOL WHICH IS DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE TO A MINIMUM DEPTH OF 2 INCHES. THIS IS THE MOST EFFECTIVE METHOD FOR SECURING MULCH, HOWEVER, IT IS LIMITED TO RELATIVELY FLAT AREAS WHERE EQUIPMENT CAN OPERATE SAFELY.

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

iii. LIQUID BINDERS MAY BE USED. APPLY AT HIGHER RATES AT THE EDGE WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF SLOPES. THE REMAINDER OF THE AREA SHOULD APPEAR UNIFORM AFTER BINDER APPLICATION. BINDERS LISTED IN THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL OR APPROVED EQUAL SHALL BE APPLIED AT RATES RECOMMENDED BY THE MANUFACTURERS.

iv. LIGHTWEIGHT PLASTIC NETTING MAY BE USED TO SECURE MULCH. THE NETTING WILL BE STAPLED TO THE GROUND ACCORDING TO MANUFACTURER'S RECOMMENDATION.

2. TEMPORARY SEEDING:

LIME: 100 POUNDS OF DOLOMITIC LIMESTONE PER 1,000 SQUARE FEET.
FERTILIZER: 15 POUNDS OF 10-10-10 PER 1,000 SQUARE FEET.
SEED: PERENNIAL RYE - 0.92 POUNDS PER 1,000 SQUARE FEET (FEBRUARY 1 THROUGH APRIL 30 OR AUGUST 15 THROUGH OCTOBER 31).
MILLET - 0.92 POUNDS PER 1,000 SQUARE FEET (MAY 1 THROUGH APRIL 15).
MULCH: SAME AS 1 D AND E ABOVE.

3. NO FILLS MAY BE PLACED ON FROZEN GROUND. ALL FILL IS TO BE PLACED IN APPROXIMATELY HORIZONTAL LAYERS, EACH LAYER HAVING A LOOSE THICKNESS OF NOT MORE THAN 8 INCHES. ALL COMPACTION REQUIREMENTS ARE IN ACCORDANCE TO ANNE ARUNDEL COUNTY STANDARD SPECIFICATIONS FOR CONSTRUCTION AS WELL AS THE AA COUNTY DESIGN MANUAL AND STANDARD DETAILS. FILLS FOR POND EMBANKMENTS SHALL BE COMPACTED AS PER MD-378 CONSTRUCTION SPECIFICATIONS. ALL OTHER FILLS SHALL BE COMPACTED SUFFICIENTLY SO AS TO BE STABLE AND PREVENT EROSION AND SLIPPAGE.

4. PERMANENT SOD: INSTALLATION OF SOD SHOULD FOLLOW PERMANENT SEEDING DATES. SEEDBED PREPARATION FOR SOD SHALL BE AS NOTED IN SECTION (B) ABOVE. PERMANENT SOD IS TO BE TALL FESCUE, STATE APPROVED SOD; LIME AND FERTILIZER PER PERMANENT SEEDING SPECIFICATIONS AND LIGHTLY IRRIGATE SOIL PRIOR TO LAYING SOD. SOD IS TO BE LAID ON THE CONTOUR WITH ALL ENDS TIGHTLY ABUTTING. JOINTS ARE TO BE STAGGERED BETWEEN ROWS. WATER AND ROLL OR TAMP SOD TO INSURE POSITIVE ROOT CONTACT WITH THE SOIL. ALL SLOPES STEEPER THAN 3:1, AS SHOWN, ARE TO BE PERMANENTLY SODDED OR PROTECTED WITH AN APPROVED EROSION CONTROL NETTING. ADDITIONAL WATERING FOR ESTABLISHMENT MAY BE REQUIRED. SOD IS NOT TO BE INSTALLED ON FROZEN GROUND. SOD SHALL NOT BE TRANSPLANTED WHEN MOISTURE CONTENT (DRY OR WET) AND/OR EXTREME TEMPERATURE MAY ADVERSELY AFFECT ITS SURVIVAL. IN THE ABSENCE OF ADEQUATE RAINFALL, IRRIGATION SHOULD BE PERFORMED TO ENSURE ESTABLISHMENT OF SOD.

5. MINING OPERATIONS: SEDIMENT CONTROL PLANS FOR MINING OPERATIONS MUST INCLUDE THE FOLLOWING SEEDING DATES AND MIXTURES: FOR SEEDING DATES OF FEBRUARY 1 THROUGH APRIL 30 AND AUGUST 15 THROUGH OCTOBER 31, USE SEED MIXTURE OF TALL FESCUE AT THE RATE OF 2 POUNDS PER 1,000 SQUARE FEET AND SERICEA LESPEDEZA AT THE MINIMUM RATE OF 0.5 POUNDS FOR 1,000 SQUARE FEET.

6. TOPSOIL SHALL BE APPLIED AS PER THE STANDARD AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS FROM THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.

7. USE OF THESE VEGETATIVE ESTABLISHMENT SPECIFICATIONS DOES NOT PRECLUDE THE PERMITTEE OR CONTRACTOR FROM MEETING ALL THE REQUIREMENTS SET FORTH IN THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.

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

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

EROSION AND SEDIMENT CONTROL GENERAL NOTES

1. REFER TO "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" FOR STANDARD DETAILS AND DETAILED SPECIFICATIONS OF EACH PRACTICE SPECIFIED HEREIN.

2. WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, MINOR FIELD ADJUSTMENTS CAN AND WILL BE MADE TO INSURE THE CONTROL OF ANY SEDIMENT. CHANGES IN THE SEDIMENT PRACTICES REQUIRE PRIOR APPROVAL OF THE SEDIMENT CONTROL INSPECTOR AND THE ANNE ARUNDEL COUNTY SOIL CONSERVATION DISTRICT.

3. AT THE END OF EACH WORKING DAY, ALL SEDIMENT CONTROL PRACTICES WILL BE INSPECTED AND LEFT IN OPERATIONAL CONDITION.

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

5. ANY CHANGE TO THE GRADING PROPOSED ON THIS PLAN REQUIRES RE-SUBMISSION TO ANNE ARUNDEL COUNTY SOIL CONSERVATION DISTRICT FOR APPROVAL.

6. DUST CONTROL WILL BE PROVIDED FOR ALL DISTURBED AREAS. REFER TO "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL", PG. H.22, FOR ACCEPTABLE METHODS AND SPECIFICATIONS FOR DUST CONTROL.

7. ANY VARIATIONS FROM THE SEQUENCE OF OPERATIONS STATED ON THIS PLAN REQUIRES THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR AND THE ANNE ARUNDEL COUNTY SOIL CONSERVATION DISTRICT PRIOR TO INITIATION OF THE CHANGE.

8. EXCESS CUT OR BORROW MATERIAL SHALL GO TO, OR COME FROM, RESPECTIVELY, A SITE WITH AN OPEN GRADING PERMIT AND APPROVED SEDIMENT CONTROL PLAN.

9. THE FOLLOWING ITEM MAY BE USED AS APPLICABLE: REFER TO "MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION" BY THE WATER MANAGEMENT ADMINISTRATION (WMA) OF THE MARYLAND DEPARTMENT OF THE ENVIRONMENT, REVISED NOVEMBER 2000, FOR STANDARD DETAILS AND DETAILED SPECIFICATIONS OF EACH PRACTICE SPECIFIED HEREIN FOR WATERWAY CONSTRUCTION.

10. PUMPING SEDIMENT-LADEN WATER INTO WATERS OF THE STATE IS STRICTLY PROHIBITED. ANY PORTABLE DEWATERING DEVICE MUST BE LOCATED WITHIN THE LIMIT OF DISTURBANCE.

11. THE CONTRACTOR SHALL DISTURB A MAXIMUM OF 200 FEET PER DAY. THE SEQUENCE OF CONSTRUCTION SHOWS LIMITS PER PHASE. THE DAILY LIMITS OF CONSTRUCTION WILL BE SET BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR PUMP AROUND TECHNIQUES.

12. SITE ENGINEER OR ENGINEER'S TECHNICAL REPRESENTATIVE TO BE ON-SITE TO OVERSEE AND APPROVE ALL ACTIVITY.

13. THE CONTRACTOR SHALL PROTECT ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS TO PREVENT THE
DEPOSITION OF MATERIALS ON PUBLIC ROAD AND PRIVATE PROPERTY. ALL MATERIAL DEPOSITED ON PUBLIC ROADS SHALL BE MECHANICALLY REMOVED IMMEDIATELY. FLUSHING OF THE ROAD SURFACE IS PROHIBITED.

14. STABILIZE ALL DISTURBED AREAS NOT DRAINING TO A SEDIMENT CONTROL DEVICE AT THE END OF EACH DAY.

15. CONTRACTOR SHALL LIMIT THE WORK ACTIVITIES IN SUCH A MANNER THAT ALL DISTURBED AREAS CAN BE STABILIZED TO THE FINAL GRADE AND THE PLACEMENT OF TOP SOIL CAN BE PERFORMED AT THE END OF EACH WORKING DAY.

16. NO DISTURBED AREA SHALL BE LEFT UNSTABILIZED OVERNIGHT UNLESS THE RUNOFF IS DIRECTED TO AN MDE APPROVED SEDIMENT CONTROL DEVICE.

STANDARD RESPONSIBILITY NOTES:

1. I (WE) CERTIFY THAT:

1.A. ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE IN ACCORDANCE WITH THIS SEDIMENT AND EROSION CONTROL PLAN, AND FURTHER, AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ON-SITE EVALUATION BY THE ANNE ARUNDEL SOIL CONSERVATION DISTRICT (AASCD) BOARD OF SUPERVISORS OR THEIR AUTHORIZED AGENTS.

1.B. ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE FROM THE MARYLAND DEPARTMENT OF THE ENVIRONMENT'S APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT.

RESPONSIBLE PERSONNEL ON SITE:

1.C. IF APPLICABLE, THE APPROPRIATE ENCLOSURE WILL BE CONSTRUCTED AND MAINTAINED ON SEDIMENT BASIN(S) INCLUDED IN THIS PLAN. SUCH STRUCTURE(S) WILL BE IN COMPLIANCE WITH THE ANNE ARUNDEL COUNTY CODE.

2. THE DEVELOPER IS RESPONSIBLE FOR THE ACQUISITION OF ALL EASEMENTS, RIGHT AND/OR RIGHT-OF-WAY THAT MAY BE REQUIRED FOR THE SEDIMENT AND EROSION CONTROL PRACTICES, STORM WATER MANAGEMENT PRACTICES AND THE DISCHARGE OF STORM WATER ONTO OR ACROSS ADJACENT OR DOWNSTREAM PROPERTIES INCLUDED IN THE PLAN.

3. FOR INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT AND/OR TEMPORARY STABILIZATION PER THE AASCD VEGETATIVE ESTABLISHMENT SHALL BE COMPLETED WITHIN THREE CALENDAR DAYS FOR THE SURFACE OF ALL CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN DAYS FOR ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

4. THE GRADING AND SEDIMENT CONTROL APPROVAL ON THIS PLAN EXTENDS ONLY TO THOSE AREAS WITHIN THE LIMITS OF DISTURBANCE.

5. THE APPROVAL OF THIS PLAN FOR SEDIMENT AND EROSION CONTROL DOES NOT RELIEVE THE DEVELOPER/CONSULTANT FROM COMPLYING WITH FEDERAL, STATE, OR COUNTY REQUIREMENTS PERTAINING TO ENVIRONMENTAL ISSUES.

6. THE DEVELOPER MUST REQUEST THAT THE SEDIMENT AND EROSION CONTROL INSPECTOR APPROVE WORK COMPLETED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN, THE GRADING OR BUILDING PERMIT, AND THE ORDINANCE.

7. ALL MATERIAL SHALL BE TAKEN TO A SITE WITH AN APPROVED SEDIMENT AND EROSION CONTROL PLAN.

8. FIRST PHASE INSPECTION AND APPROVAL OF THE SEDIMENT AND EROSION CONTROL INSPECTOR SHALL BE REQUIRED UPON COMPLETION OF THE INSTALLATION OF EROSION AND SEDIMENT CONTROLS PRIOR TO PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THE INITIAL APPROVAL BY THE SEDIMENT AND EROSION CONTROL INSPECTOR IS GIVEN. INSPECTION AND PERMITS MAY ALSO REQUIRE THAT AN INSPECTION AND CERTIFICATION OF THE INSTALLATION OF SEDIMENT CONTROL ALSO BE PERFORMED BY A DESIGN PROFESSIONAL PRIOR TO CONSTRUCTION COMMENCING.

9. APPROVAL FROM THE INSPECTOR MUST BE REQUESTED ON FINAL STABILIZATION OF ALL SITES PRIOR TO REMOVAL OF SEDIMENT AND EROSION CONTROLS.

10. EXISTING TOPOGRAPHY MUST BE FIELD VERIFIED BY RESPONSIBLE PERSONNEL TO THE SATISFACTION OF THE SEDIMENT CONTROL INSPECTOR PRIOR TO COMMENCING WORK.

SIGNATURE OF DEVELOPER/OWNER ____________ DATE ____________

PRINT: ____________
NAME: ____________
TITLE: ____________
AFFILIATION: ____________

ADDRESS: ____________
TELEPHONE NUMBER: ____________
EMAIL ADDRESS: ____________

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ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	BY	APPROVED / DATE	APPROVED / DATE			
		CHIEF ENGINEER	PROJECT MANAGER	SCALE:	NA	ANNAPOLIS WATERWORKS PARK STREAM RESTORATION
		APPROVED / DATE	APPROVED / DATE	DRAWN BY	KB	
				CHECKED BY	DS/JC	EROSION AND SEDIMENT CONTROL NOTES
				SHEET NO.	20 OF 30	
				PROJECT NO.	24015.01	
		ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT-OF-WAY	PROPOSAL NO.		

SEQUENCE OF CONSTRUCTION

GENERAL NOTES:

1. CONSTRUCTION ACTIVITIES INCLUDING THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES SHALL NOT BEGIN UNTIL ALL REQUIRED EASEMENTS AND RIGHT-OF-WAYS HAVE BEEN OBTAINED. CONSTRUCTION SHALL NOT BEGIN ON A REACH UNTIL ALL SEDIMENT AND EROSION CONTROL MEASURES FOR THAT SECTION HAVE BEEN INSTALLED AND APPROVED BY THE PROJECT ENGINEER/DESIGNATED SPECIALIST AND THE SEDIMENT CONTROL INSPECTOR.

2. SPECIFIC TREES TO BE HARVESTED FOR STREAM RESTORATION ELEMENTS AND TREE PROTECTION MEASURES FOR TREES TO REMAIN SHALL BE DETERMINED AND MARKED IN THE FIELD BY THE DESIGNATED SPECIALIST PER NOTES AND DETAILS ON TP-01. ALL TREE HARVESTING SHALL BE DONE IN A MANNER TO MAXIMIZE THEIR USAGE IN THE PROPOSED RESTORATION STRUCTURES (IE MAINTAIN SPECIFIED TRUNK LENGTHS, ROOT WADS, ETC) AND TO MINIMIZE NEGATIVE IMPACTS TO RESIDUAL STANDING TREES, SHRUBS AND WETLANDS. TREE FELLING TO BE DONE IN ACCORDANCE WITH OSHA LOGGING STANDARD, 29 CFR 1910.266.

3. THE LIMIT OF DISTURBANCE (LOD) SHOWN ON THE PLANS ENCOMPASSES ALL ACTIVITIES RELATED TO THE STREAM CHANNEL IMPROVEMENTS, CONSTRUCTION ACCESS AND PLANTING ZONES. ALL HEAVY EQUIPMENT AND VEHICLE ACCESS SHALL GENERALLY FOLLOW THE PRIMARY CONSTRUCTION ACCESS PATH AND GRADING AREA AS SHOWN ALONG THE CHANNELS, BUT MAY BE ADJUSTED IN THE FIELD TO MINIMIZE IMPACT TO NATURAL RESOURCES WITH APPROVAL FROM THE PROJECT ENGINEER/DESIGNATED SPECIALIST.

4. WITHIN THE LOD, LOCATIONS OF STREAM AND FLOODPLAIN STRUCTURES AND GRADING MAY BE ADJUSTED IN THE FIELD TO MINIMIZE IMPACT TO NATURAL RESOURCES AND MAXIMIZE FUNCTION WITH APPROVAL FROM THE PROJECT ENGINEER/DESIGNATED SPECIALIST. ADDITIONAL WOOD ELEMENTS MAY BE ADDED WITHIN THE LOD AT LOCATIONS DIRECTED BY THE PROJECT ENGINEER/DESIGNATED SPECIALIST BASED ON SITE CONDITIONS AND AVAILABLE MATERIAL.

5. WHEN STREAM DIVERSION PRACTICES ARE UTILIZED, THE EXACT LOCATION OF THE PUMPS, HOSES, SEDIMENT DIKES, AND FILTER BAGS MAY BE MODIFIED IN THE FIELD BASED ON EXISTING CONDITIONS. ANY ADJUSTMENTS MUST BE APPROVED BY THE CONSTRUCTION MANAGER AND SEDIMENT CONTROL INSPECTOR.

6. FOR ALL ASPECTS OF STREAM WORK AND THROUGHOUT THE TIMEFRAME OF CONSTRUCTION OF THE STREAM IMPROVEMENTS, THE FOLLOWING APPLIES:

   6.1 THE CONTRACTOR SHALL BE RESPONSIBLE FOR ASSURING THAT THE SEDIMENT CONTROL MEASURES ARE FUNCTIONAL ON A DAY TO DAY BASIS. ALL DRAINAGE WITHIN THE IMMEDIATE WORK AREA MUST DRAIN TO AN MDE APPROVED E&S DEVICE.

   6.2 NO INSTREAM WORK IS ALLOWED WITHIN PERENNIAL AND INTERMITTENT REACHES FROM MARCH 1ST TO JUNE 15TH OF ANY YEAR TO MINIMIZE IMPACT TO AQUATIC SPECIES.

7. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, TEMPORARY STABILIZATION SHALL BE COMPLETED AT THE END OF EVERY WORKING DAY AND ROUTINELY MONITORED BY CONTRACTOR UNTIL PROPOSED CONSTRUCTION IS COMPLETED.

8. WOODCHIPS OR HARDWOOD MULCH MAY BE USED FOR STABILIZATION WITHIN A FORESTED AREA; AND SHALL BE DERIVED FROM FRESH OR AGED HARDWOOD INCLUDING BARK, WOOD FRAGMENTS AND GRINDINGS. WOODCHIPS AND HARDWOOD MULCH SHALL BE FREE OF LEAVES, VINES INCLUDING POISON IVY, TRASH AND FOREIGN MATTER, AND MAY INCLUDE CHUNKS UP TO 3 INCHES IN ANY DIMENSION. WITHIN THE TURFGRASS AREAS, STRAW MULCH SHALL BE USED FOR TEMPORARY STABILIZATION.

9. THE DIVERSION HOSE SHALL BE DISCHARGED IN A NON-EROSIVE MANNER AS SHOWN ON THE EROSION AND SEDIMENT CONTROL DETAIL SHEET (MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION DETAIL 1.2). THE CONTRACTOR SHALL SIZE PUMPING OPERATIONS ADEQUATELY TO DIVERT STREAM BASE FLOW. AT THE END OF EACH WORKING DAY, THE CONTRACTOR SHALL STABILIZE ALL DISTURBED AREAS THAT DO NOT DRAIN TO AN MDE APPROVED SEDIMENT CONTROL MEASURE. SET AND RE-SET PUMP AROUND PRACTICE AND ASSOCIATED CONTROLS AS NEEDED TO PERFORM GRADING OPERATIONS ON A DAILY BASIS.

10. CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH THE SEQUENCE OF CONSTRUCTION, CONSTRUCTION PLANS AND EROSION AND SEDIMENT CONTROL DETAILS AND NOTES. DO NOT CLEAR AND GRUB THE ENTIRE PROJECT AREA. CLEAR AND GRUB ONLY AS DIRECTED BY THE PROJECT ENGINEER/DESIGNATED SPECIALIST AND ONLY WHERE CONSTRUCTION ACCESS IS NEEDED, OR GRADING IS TAKING PLACE AND CAN BE STABILIZED IN ONE WORKING DAY (IN 250 FT INCREMENTS MAXIMUM). MULTIPLE REACHES MAY BE UNDER CONSTRUCTION CONCURRENTLY, OR IN A DIFFERENT REACH ORDER OR DIRECTION OF WORK THAN LISTED IN THE SEQUENCE WITH WRITTEN APPROVAL FROM THE COUNTY PROJECT MANAGER AND PROJECT ENGINEER/DESIGNATED SPECIALIST, AS LONG AS THE REACH SEDIMENT CONTROL MEASURES ARE APPROVED. SIDE CHANNELS MAY BE CONSTRUCTED SIMULTANEOUSLY WITH MAIN CHANNEL WORK.

PRE-CONSTRUCTION NOTIFICATIONS

1. THE CONTRACTOR SHALL NOTIFY THE ANNE ARUNDEL COUNTY DEPARTMENT OF INSPECTIONS AND PERMITS (410-222-7780) AT LEAST 48 HOURS BEFORE COMMENCING WORK. WORK MAY NOT COMMENCE UNTIL THE PERMITTEE OR THE RESPONSIBLE PERSONNEL HAVE MET ON SITE WITH THE SEDIMENT AND EROSION CONTROL INSPECTOR TO REVIEW THE APPROVED PLANS.

2. THE CONTRACTOR SHALL NOTIFY MDE COMPLIANCE INSPECTOR AT 410-537-3510 AT LEAST 24 HOURS BEFORE COMMENCING WORK.

3. THE CONTRACTOR SHALL CALL MISS UTILITY AT 1-800-277-7777 A MINIMUM OF FORTY-EIGHT (48) HOURS BEFORE STARTING CONSTRUCTION. ALL EXISTING UTILITIES MUST BE MARKED IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES THAT MAY OCCUR AS A RESULT OF THE CONSTRUCTION. DAMAGED UTILITIES ARE TO BE IMMEDIATELY REPORTED TO BOTH THE UTILITY OWNER AND PROJECT ENGINEER/DESIGNATED SPECIALIST. ANY DAMAGE TO EXISTING STRUCTURES INCLUDING SEWER PIPES/MANHOLES, STORM DRAIN PIPES/STRUCTURES SHALL BE REPAIRED TO THE UTILITY OWNER'S SATISFACTION AT THE CONTRACTOR'S EXPENSE.

PRE-CONSTRUCTION SITE SETUP AND EROSION AND SEDIMENT CONTROL REACH (RELATES TO EACH CONSTRUCTION IMPLEMENTATION REACH)

1. THE CONTRACTOR SHALL STAKE OUT THE NECESSARY LOD OF REACH. (5 DAYS)

2. THE CONTRACTOR SHALL CONDUCT A PRE-CONSTRUCTION MEETING ONSITE WITH SEDIMENT CONTROL INSPECTOR AND THE PROJECT ENGINEER/DESIGNATED SPECIALIST TO REVIEW THE CONSTRUCTION ACCESS, EROSION AND SEDIMENT CONTROL REQUIREMENTS, AND THE SEQUENCE OF CONSTRUCTION. THE PARTICIPANTS WILL ALSO VERIFY THE LOCATION OF THE TEMPORARY STOCKPILE AREA AND ANY NECESSARY STAGING AREA, AND FLAG ANY TREES WITHIN THE LIMITS OF DISTURBANCE WHICH WILL BE PROTECTED USING TREE PLANKING OR TREE PROTECTION FENCE, SEE DETAILS ON TP-01. STAKING WILL BE COMPLETED PRIOR TO THE PRE-CONSTRUCTION MEETING WITH THE INSPECTOR AND PROJECT ENGINEER/DESIGNATED SPECIALIST. (2 DAYS)

3. CONSTRUCTION ACCESS LOCATIONS SHALL BE ESTABLISHED AS SHOWN ON THE PLANS, INCLUDING THE INSTALLATION OF A STABILIZED CONSTRUCTION ENTRANCES AND ASSOCIATED STAGING AND STOCKPILE AREAS. INSTALL TEMPORARY ACCESS BRIDGES AND CONSTRUCTION ACCESS ROAD AS SHOWN (SEE EROSION AND SEDIMENT PLAN AND CONSTRUCTION ACCESS ROAD DETAIL ON ES SHEETS). CONTRACTOR SHALL REPLENISH MULCH ALONG ACCESS ROAD AS NECESSARY THROUGHOUT CONSTRUCTION TO MAINTAIN FULL THICKNESS AND MINIMIZE DISTURBANCE OF UNDERLYING GROUND. CONTRACTOR SHALL INSTALL HARDWOOD MATS AS NECESSARY FOR ADDITIONAL PROTECTION IN WET OR HEAVY TRAFFIC AREAS TO PROTECT UNDERLYING GROUND. RETAIN HARVESTED LOGS, ROOT WADS, SLASH AND OTHER WOODY DEBRIS SUITABLE FOR USE AS INSTREAM STRUCTURES AND WOODY DEBRIS PLACEMENT ON-SITE; DO NOT CHIP MATERIALS THAT MEET THE REQUIREMENTS OF ANY STRUCTURE OR TREATMENT. (5 DAYS)

4. THE CONTRACTOR SHALL CLEAR MINIMUM AREA NECESSARY TO INSTALL SEDIMENT CONTROLS AND THE STAGING/LAYDOWN AREAS. MECHANICAL STABILIZATION WILL BE REQUIRED ON THE STAGING/LAYDOWN AREAS AND HEAVY USE AREAS, INCLUDING TRAVEL LANES. (2 DAYS)

5. THE CONTRACTOR SHALL INSTALL THE TREE PROTECTION MEASURES (ORANGE FENCE AND PLANKING) AS AGREED UPON WITH THE DESIGNATED SPECIALIST PER THE NOTES AND DETAILS ON TP-01. (1 DAY)

6. INSTALL PERIMETER CONTROLS AROUND STAGING AND STOCKPILE AREAS. STOCKPILE PLACEMENT OF ERODIBLE MATERIAL SHALL BE OUTSIDE THE EXISTING AND PROPOSED 100 WSEL AND SURROUNDED ALONG THE PERIMETER WITH REINFORCED SILT FENCE (RSF) IF LOCATED OUTSIDE OF A FORESTED AREA. WITHIN A FORESTED AREA, A FILTER LOG MAY BE USED AROUND STOCKPILE AREAS IN PLACE OF RSF TO PROTECT TREE ROOT ZONES.STAGING AND STOCKPILE AREA NOT TO EXCEED 15' IN HEIGHT OR 2:1 SLOPE. BORROW MATERIAL TO BE TAKEN OFF SITE TO A SITE WITH AN APPROVED SEDIMENT AND EROSION CONTROL PLAN. TEMPORARILY STABILIZE STOCKPILE AS PER THE STABILIZATION SPEC OR COVER THE STOCKPILE WITH PLASTIC TARP AND ANCHOR AT THE END OF EACH WORKDAY. STAGING AND STOCKPILING AREAS TO BE PROTECTED USING SAME PROTECTION AND REPLENISHMENT REQUIREMENTS AS MULCH ACCESS ROAD. (1 DAY)

7. THE SEDIMENT AND EROSION CONTROL INSPECTOR WILL BE NOTIFIED UPON COMPLETION OF THE SEDIMENT CONTROL INSTALLATION. UPON COMPLETION OF CONTROL INSTALLATION AND WITH APPROVAL OF THE SEDIMENT AND EROSION CONTROL INSPECTOR, THE CONTRACTOR MAY BEGIN GRADING OPERATIONS (1 DAY).

CONSTRUCTION IMPLEMENTATION REACH 2 - STA 11+00 TO 4+75

1. WITH APPROVAL FROM EROSION AND SEDIMENT CONTROL INSPECTOR, BEGIN IMPLEMENTATION OF THIS REACH.

2. PERFORM THE CLEARING AND GRUBBING AND DEMOLITION OPERATIONS NECESSARY THIS REACH OF STREAM CONSTRUCTION. CARE MUST BE TAKEN TO MINIMIZE SITE DISTURBANCE AND UNNECESSARY CLEARING AND GRUBBING. RETAIN HARVESTED LOGS, ROOT WADS, SLASH AND OTHER WOODY DEBRIS SUITABLE FOR USE AS INSTREAM STRUCTURES AND WOODY DEBRIS PLACEMENT ON-SITE. (5 DAYS)

3. THE CONTRACTOR SHALL STAKE OUT PROPOSED BASELINE STATIONING AS SHOWN ON THE GEOMETRY PLAN AND STRUCTURES AS SHOWN ON THE GRADING PLAN. (5 DAYS)

4. AS SITE CONDITIONS DICTATE; THE CONTRACTOR SHALL INSTALL A STREAM DIVERSION (PUMP AROUND PRACTICE OR CLEAR WATER DIVERSION) TO MAINTAIN A DRY ACTIVE WORK AREA(S) AND PERFORM PROPOSED GRADING AND STREAM AND FLOODPLAIN STRUCTURE INSTALLATION PER GRADING PLAN AND CONSTRUCTION DETAILS. INSTALLATION SHALL GENERALLY BEGIN AT THE DOWNSTREAM END OF REACH AND WORK IN AN UPSTREAM DIRECTION. COINCIDENTALLY INSTALL PROPOSED IMPROVEMENTS ON ALL SIDE CHANNELS AND STORM DRAIN OUTFALLS AS MAIN STEM WORK PROCEEDS. EACH WORK AREA LENGTH SHALL NOT EXCEED WHAT CAN BE COMPLETED IN ONE DAY. PUMP-AROUND PRACTICE SHALL FOLLOW MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION DETAIL 1.2, WHICH INCLUDES INSTALLATION OF SANDBAG DIKES STREAM DIVERSION PUMPS AND HOSES, AND APPROVED DEWATERING DEVICE. CLEAR WATER DIVERSION PRACTICE SHALL FOLLOW MDE DETAIL C-6, WHICH INCLUDES INSTALLATION OF SANDBAG DIKES, DIVERSION PIPES AND APPROVED DEWATERING DEVICE. (30 DAYS)

5. TREAT DISTURBED FLOODPLAIN AREAS DAILY WITH TEMPORARY SEED AND A MINIMUM OF 2 INCHES OF WOODCHIPS OR HARDWOOD MULCH STABILIZATION. AS COMPLETED AREAS ARE APPROVED BY THE INSPECTOR AND PROJECT ENGINEER/DESIGNATED SPECIALIST, PERMANENTLY STABILIZE WITH PERMANENT SEED PER THE PLANTING SCHEDULE AND WOODCHIPS/HARDWOOD MULCH. INSTALL SOIL STABILIZATION MATTING PER DETAILS. SOIL STABILIZATION MATTING SHALL BE INSTALLED ON ALL GRADED STREAMBANKS AS SPECIFIED ON CONSTRUCTION DETAILS (DISTURBED SLOPES THAT ARE 3:1 OR STEEPER). ALL OTHER DISTURBED AREAS SHALL BE STABILIZED WITH A MINIMUM OF 2 INCHES OF WOOD CHIPS/HARDWOOD MULCH TRACKED INTO SOIL ALONG WITH THE PERMANENT SEED WITHIN THREE CALENDAR DAYS. LENGTH OF EACH ACTIVE WORK AREA SHALL NOT EXCEED WHAT CAN BE COMPLETED IN ONE DAY. INSTALLATION SHALL GENERALLY BEGIN AT THE DOWNSTREAM END OF REACH AND WORK IN AN UPSTREAM DIRECTION. INSTALL PROPOSED IMPROVEMENTS ON ALL SIDE CHANNELS AND STORM DRAIN OUTFALLS AS MAIN STEM WORK PROCEEDS. (30 DAYS CONCURRENT WITH #4 ABOVE)

6. PRIOR TO COMPLETING THE PHASE, THE CONTRACTOR AND OWNER SHALL REVIEW THE ALIGNMENT OF A POST-RESTORATION ADAPTIVE MANAGEMENT PATH (SEE MULCH PATH DETAIL) THAT FOLLOWS THE FULL LENGTH OF RESTORATION GENERALLY ALONG THE TOE OF THE SLOPE AND REFINE IT BASED ON POST-RESTORATION CONDITIONS. ONCE AGREED UPON, CONTRACTOR SHALL INSTALL A 6' WIDE PATH THAT INCLUDES 6" OF SAND WITH A 6" SURFACE LAYER OF WOODCHIPS ALONG APPROVED ALIGNMENT WITHIN THE LOD.

7. INSTALL ALL HERBACEOUS AND WOODY PLANT MATERIAL (PLUGS, LIVE STAKE, BARE ROOT, CONTAINER, SHRUBS TREES) WITH APPROVAL OF ENGINEER/DESIGNATED SPECIALIST, PER THE LANDSCAPE PLAN AND DETAILS. THE CONTRACTOR MAY CHOOSE TO INSTALL PLANT MATERIAL AFTER ALL REACHES OF CONSTRUCTION ARE COMPLETE. IF THE CONTRACTOR CHOOSES THIS OPTION, THEN THE CONTRACTOR MUST NOTIFY THE COUNTY AND OBTAIN PERMISSION TO INSTALL PLANT MATERIAL AFTER ALL CONSTRUCTION REACHES ARE COMPLETE. (10 DAYS)

8. UPON PERMANENT STABILIZATION OF THE WORK AREA, AND WITH APPROVAL FROM THE INSPECTOR AND ENGINEER/DESIGNATED SPECIALIST, THE CONTRACTOR MAY REMOVE E&SC DEVICES AND PROCEED TO NEXT REACH. ANY AREAS DISTURBED BY REMOVING THE E&SC DEVICES SHALL BE STABILIZED IMMEDIATELY AND RESTORED TO PRECONSTRUCTION CONDITIONS. (5 DAYS)

CONSTRUCTION IMPLEMENTATION REACH 1 - STA 4+75 TO 0+00

1. WITH APPROVAL FROM EROSION AND SEDIMENT CONTROL INSPECTOR, BEGIN IMPLEMENTATION OF THIS REACH.

2. PERFORM THE CLEARING AND GRUBBING AND DEMOLITION OPERATIONS NECESSARY THIS REACH OF STREAM CONSTRUCTION. CARE MUST BE TAKEN TO MINIMIZE SITE DISTURBANCE AND UNNECESSARY CLEARING AND GRUBBING. RETAIN HARVESTED LOGS, ROOT WADS, SLASH AND OTHER WOODY DEBRIS SUITABLE FOR USE AS INSTREAM STRUCTURES AND WOODY DEBRIS PLACEMENT ON-SITE. (5 DAYS)

3. THE CONTRACTOR SHALL STAKE OUT PROPOSED BASELINE STATIONING AS SHOWN ON THE GEOMETRY PLAN AND STRUCTURES AS SHOWN ON THE GRADING PLAN. (5 DAYS)

4. AS SITE CONDITIONS DICTATE; THE CONTRACTOR SHALL INSTALL A STREAM DIVERSION (PUMP AROUND PRACTICE OR CLEAR WATER DIVERSION) TO MAINTAIN A DRY ACTIVE WORK AREA(S) AND PERFORM PROPOSED GRADING AND STREAM AND FLOODPLAIN STRUCTURE INSTALLATION PER GRADING PLAN AND CONSTRUCTION DETAILS. INSTALLATION SHALL GENERALLY BEGIN AT THE DOWNSTREAM END OF REACH AND WORK IN AN UPSTREAM DIRECTION. COINCIDENTALLY INSTALL PROPOSED IMPROVEMENTS ON ALL SIDE CHANNELS AND STORM DRAIN OUTFALLS AS MAIN STEM WORK PROCEEDS. EACH WORK AREA LENGTH SHALL NOT EXCEED WHAT CAN BE COMPLETED IN ONE DAY. PUMP-AROUND PRACTICE SHALL FOLLOW MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION DETAIL 1.2, WHICH INCLUDES INSTALLATION OF SANDBAG DIKES STREAM DIVERSION PUMPS AND HOSES, AND APPROVED DEWATERING DEVICE. CLEAR WATER DIVERSION PRACTICE SHALL FOLLOW MDE DETAIL C-6, WHICH INCLUDES INSTALLATION OF SANDBAG DIKES, DIVERSION PIPES AND APPROVED DEWATERING DEVICE. (30 DAYS)

5. TREAT DISTURBED FLOODPLAIN AREAS DAILY WITH TEMPORARY SEED AND A MINIMUM OF 2 INCHES OF WOODCHIPS OR HARDWOOD MULCH STABILIZATION. AS COMPLETED AREAS ARE APPROVED BY THE INSPECTOR AND PROJECT ENGINEER/DESIGNATED SPECIALIST, PERMANENTLY STABILIZE WITH PERMANENT SEED PER THE PLANTING SCHEDULE AND WOODCHIPS/HARDWOOD MULCH. INSTALL SOIL STABILIZATION MATTING PER DETAILS. SOIL STABILIZATION MATTING SHALL BE INSTALLED ON ALL GRADED STREAMBANKS AS SPECIFIED ON CONSTRUCTION DETAILS (DISTURBED SLOPES THAT ARE 3:1 OR STEEPER). ALL OTHER DISTURBED AREAS SHALL BE STABILIZED WITH A MINIMUM OF 2 INCHES OF WOOD CHIPS/HARDWOOD MULCH TRACKED INTO SOIL ALONG WITH THE PERMANENT SEED WITHIN THREE CALENDAR DAYS. LENGTH OF EACH ACTIVE WORK AREA SHALL NOT EXCEED WHAT CAN BE COMPLETED IN ONE DAY. INSTALLATION SHALL GENERALLY BEGIN AT THE DOWNSTREAM END OF REACH AND WORK IN AN UPSTREAM DIRECTION. INSTALL PROPOSED IMPROVEMENTS ON ALL SIDE CHANNELS AND STORM DRAIN OUTFALLS AS MAIN STEM WORK PROCEEDS. (30 DAYS CONCURRENT WITH #4 ABOVE)

6. PRIOR TO COMPLETING THE PHASE, THE CONTRACTOR AND OWNER SHALL REVIEW THE ALIGNMENT OF A POST-RESTORATION ADAPTIVE MANAGEMENT PATH (SEE MULCH PATH DETAIL) THAT FOLLOWS THE FULL LENGTH OF RESTORATION GENERALLY ALONG THE TOE OF THE SLOPE AND REFINE IT BASED ON POST-RESTORATION CONDITIONS. ONCE AGREED UPON, CONTRACTOR SHALL INSTALL A 6' WIDE PATH THAT INCLUDES 6" OF SAND WITH A 6" SURFACE LAYER OF WOODCHIPS ALONG APPROVED ALIGNMENT WITHIN THE LOD.

7. INSTALL ALL HERBACEOUS AND WOODY PLANT MATERIAL (PLUGS, LIVE STAKE, BARE ROOT, CONTAINER, SHRUBS TREES) WITH APPROVAL OF ENGINEER/DESIGNATED SPECIALIST, PER THE LANDSCAPE PLAN AND DETAILS. THE CONTRACTOR MAY CHOOSE TO INSTALL PLANT MATERIAL AFTER ALL REACHES OF CONSTRUCTION ARE COMPLETE. IF THE CONTRACTOR CHOOSES THIS OPTION, THEN THE CONTRACTOR MUST NOTIFY THE COUNTY AND OBTAIN PERMISSION TO INSTALL PLANT MATERIAL AFTER ALL CONSTRUCTION REACHES ARE COMPLETE. (10 DAYS)

8. UPON PERMANENT STABILIZATION OF THE WORK AREA, AND WITH APPROVAL FROM THE INSPECTOR AND ENGINEER/DESIGNATED SPECIALIST, THE CONTRACTOR MAY REMOVE E&SC DEVICES AND PROCEED TO NEXT REACH. ANY AREAS DISTURBED BY REMOVING THE E&SC DEVICES SHALL BE STABILIZED IMMEDIATELY AND RESTORED TO PRECONSTRUCTION CONDITIONS. (5 DAYS)

LANDSCAPING

1. COMPLETE INSTALLATION OF ALL REMAINING TREE, SHRUB AND HERBACEOUS MATERIAL NOT INSTALLED PREVIOUSLY UNDER COMPLETED REACHES PER THE PLANTING PLAN AND DETAILS. (20 DAYS)

PROJECT COMPLETION

1. COMPLETE IN-KIND RESTORATION OF ANY DAMAGE TO EXISTING INFRASTRUCTURE EITHER ON-SITE OR OFF-SITE. THIS INCLUDES BUT IS NOT LIMITED TO: SIDEWALK, CURB AND GUTTER, PAVEMENT, TRAFFIC CALMING DEVICES, UTILITY APPURTENANCES, TREES, SIGNS, ETC.

2. COMPLETE FINAL PERMANENT VEGETATIVE STABILIZATION OF SITE PER THE LANDSCAPE PLAN.

3. CONDUCT A PUNCH LIST WALK-THROUGH WITH THE COUNTY PROJECT MANAGER, THE DESIGN PROJECT MANAGER, AND THE COUNTY SEDIMENT CONTROL INSPECTOR AND CORRECT ANY OUTSTANDING ITEMS.WITH WRITTEN APPROVAL FROM THE COUNTY SEDIMENT CONTROL INSPECTOR AND APPROVAL FROM COUNTY PROJECT MANAGER, REMOVE ANY REMAINING SEDIMENT CONTROL DEVICES AND IMMEDIATELY STABILIZE ANY DISTURBED AREAS.

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Restore the Earth & Inspire Ecological Stewardship

Arundel Rivers Federation
ARUNDELRIVERS.ORG

ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	REVISED BY

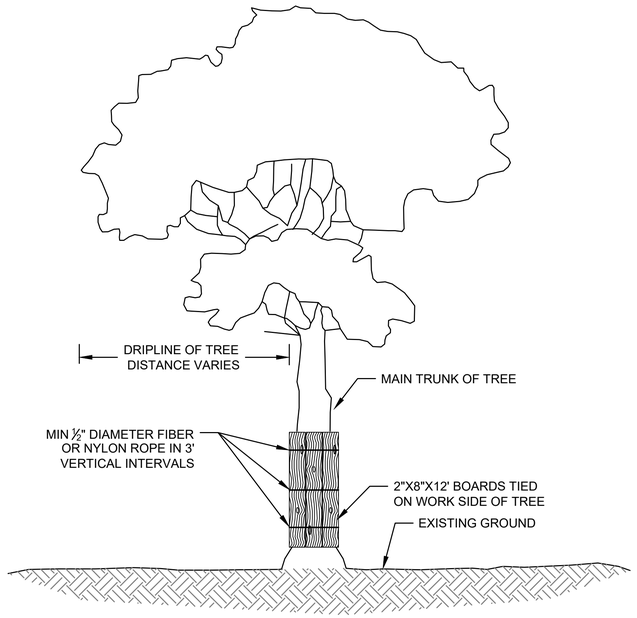
APPROVED DATE	APPROVED DATE	
CHIEF ENGINEER	PROJECT MANAGER	
APPROVED DATE	APPROVED DATE	
ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT-OF-WAY	

SCALE:	NA
DRAWN BY	KB
CHECKED BY	DS/JC
SHEET NO.	21 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

SEQUENCE OF CONSTRUCTION

6/18/2026 M:\CADD\Projects\24015.01 Annapolis Waterworks Park Stream Restoration\CAD\Plans\dt01aw.dwg



NOTES:

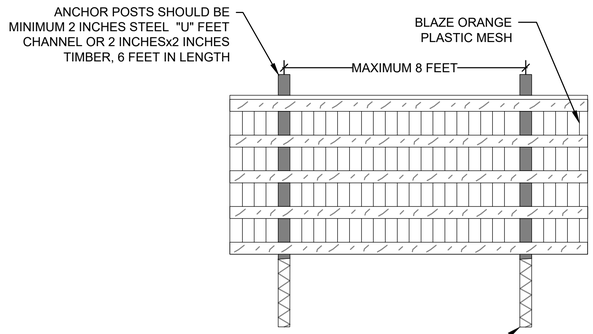
1. PROTECTION MEASURES WILL BE SET AS PART OF THE REVIEW PROCESS.
2. TIE SUFFICIENT 2"X8"X12' BOARDS AROUND MAIN TRUNK OF TREE WITH ½" DIAMETER ROPE (FIBER OR NYLON) TO PROTECT ALL AREAS EXPOSED TO CONSTRUCTION.
3. INSTALL WIRE EYE BOLTS WITH MINIMUM INNER DIAMETER OF ⅝" AND MINIMUM LENGTH OF 4" FIRMLY IN EACH PLANK WHERE FIBER OR NYLON ROPES CROSS OVER PLANKS.
4. WHERE SIGNIFICANT TREE BRANCHES EXIST WHICH PREVENT PLANK INSTALLATION, PLANKING SHALL EXTEND TO THE ELEVATION OF THE LOWEST BRANCH.

TREE PLANKING

NOT TO SCALE

GENERAL TREE PROTECTION AND REMOVAL NOTES

1. WITHIN PHASE B, PLANS SHOW SURVEYED TREES 24" AND GREATER DBH WITHIN THE STUDY AREA. IN SELECT AREAS, LOCATIONS OF ADDITIONAL TREES BETWEEN 12" AND 23" DBH ARE SHOWN, BUT THE PLANS DO NOT SHOW ALL 12" TO 23" DBH TREES WITHIN THE STUDY AREA. NO TREES LESS THAN 12" DBH ARE SHOWN.
2. WITHIN PHASE C, PLANS SHOW SURVEYED TREES 12" AND GREATER DBH WITHIN THE STUDY AREA. NO TREES LESS THAN 12" DBH ARE SHOWN.
3. SEE SHEET EF-XX FOR TREE (>/=30" DBH) TABLE.
4. THE PLANS IDENTIFY THE ANTICIPATED TREE SAVES AND REMOVALS ON ALL TREES GREATER THAN 24" DBH. ALL SMALLER TREES WITHIN THE LOD WILL BE EVALUATED FOR PROTECTION OR REMOVAL, AND ARE NOT EXPLICITLY SHOWN ON THE PLANS.
5. AT THE BEGINNING OF EACH PHASE OF WORK, THE CONTRACTOR SHALL IDENTIFY IN THE FIELD ALL POTENTIAL TREE REMOVALS OF TREES DIRECTLY WITHIN THE LIMITS OF GRADING AND/OR CONSTRUCTION ACCESS USING A NON-PERMANENT METHOD (FLAGGING OR WASHABLE PAINT). ALL OTHER TREES WITHIN THE LOD NOT MARKED IN THE FIELD FOR REMOVAL SHALL BE CONSIDERED TREE SAVES. INTENT IS FOR CONTRACTOR TO MAXIMIZE THE NUMBER OF TREE SAVES.
6. THE CONTRACTOR'S TREE REMOVALS AND SAVES SHALL BE REVIEWED WITH ARUNDEL RIVERS FEDERATION, CITY OF ANNAPOLIS TO OBTAIN CONCURRENCE BASED ON TREE HEALTH, CONDITION, SPECIES, OBSTRUCTION TO CONSTRUCTION ACCESS, CONFLICTS WITH GRADING AND NEED FOR SELECTIVE HARVESTING. FIELD ADJUSTMENTS TO CONSTRUCTION ACCESS AND WORK LIMITS MAY BE MADE AT THIS TIME WITH AGREEMENT BY ALL PARTIES AND REMOVAL MARKINGS ADJUSTED ACCORDINGLY. AT THIS TIME, TREE PROTECTION MEASURES (PLANKING AND FENCING) FOR TREES TO REMAIN SHALL BE DEFINED. GROUP OF TREES MAY BE GROUPED AS ONE PROTECTION AREA.
7. CONTRACTOR SHALL INSTALL AGREED UPON TREE PROTECTION MEASURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL TREES, SHRUBS AND VEGETATION AS AGREED TO REMAIN. WHEN POSSIBLE, TREES SHALL BE PROTECTED AT THE DRIP LINE AND NO VEHICLE, MATERIAL OR EQUIPMENT SHALL BE STORED WITHIN THIS AREA UNLESS OTHERWISE NOTED.
8. ANY LIMB OR ROOT PRUNING NECESSARY TO PROTECTED TREES THAT MAY BE DAMAGED BY CONSTRUCTION ACCESS OR GRADING WILL BE DONE BY A LICENSED ARBORIST.
9. ALL TREE REMOVALS SHALL BE DONE IN A MANNER TO MAXIMIZE THEIR USAGE IN THE STRUCTURES (IE MAINTAIN SPECIFIED TRUNK LENGTHS, ROOT WADS, ETC) AND TO MINIMIZE NEGATIVE IMPACTS TO RESIDUAL STANDING TREES, SHRUBS AND WETLANDS. TREE FELLING TO BE DONE IN ACCORDANCE WITH OSHA LOGGING STANDARD, 29 CFR 1910.266.
10. TREE PROTECTION MEASURES SHALL BE MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION.
11. FOLLOWING CONSTRUCTION AND WITH THE APPROVAL OF THE COUNTY, ALL TREE PROTECTION MEASURES, FLAGGING AND METAL TREE TAGS SHALL BE REMOVED BY THE CONTRACTOR.
12. GENERATED TREE AND WOODY MATERIAL SHALL BE STOCKPILED AND RETAINED ON-SITE UNTIL INSTALLATION PER CONSTRUCTION PLANS OR AS DIRECTED BY COUNTY REPRESENTATIVE/PROJECT ENGINEER/DESIGNATED SPECIALIST.



NOTES:

1. PROTECTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
2. BOUNDARIES OF PROTECTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICES.
3. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

BLAZE ORANGE FENCE (TREE PROTECTION FENCE)

NOT TO SCALE

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ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

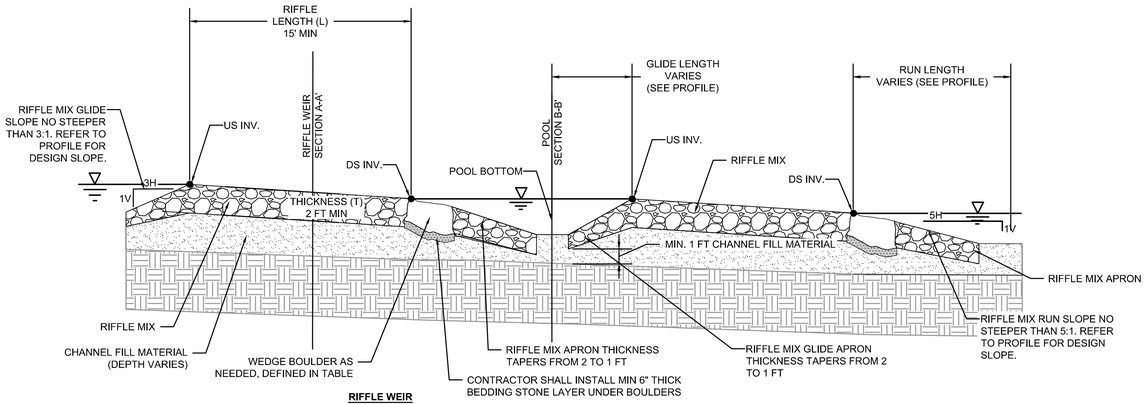
REVISED DATE	REVISED BY

APPROVED	DATE	APPROVED	DATE
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT-OF-WAY	

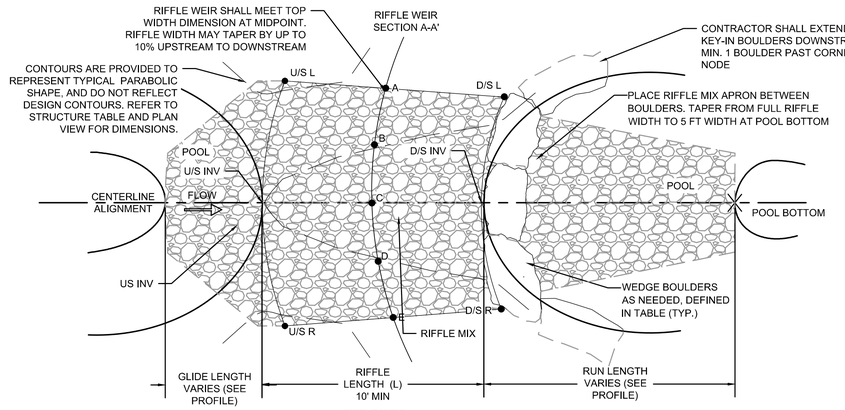
SCALE:	NTS
DRAWN BY	KB
CHECKED BY	DS/JC
SHEET NO.	22 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

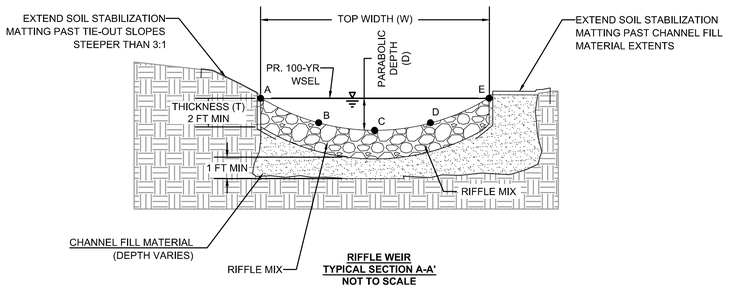
TREE PROTECTION AND REMOVAL DETAILS AND NOTES



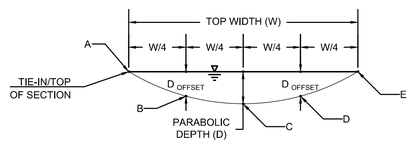
RIFFLE WEIR
CENTERLINE PROFILE
NOT TO SCALE



RIFFLE WEIR
PLAN VIEW
NOT TO SCALE



RIFFLE WEIR
TYPICAL SECTION A-A'
NOT TO SCALE



D_{OFFSET} = DEPTH OF PARABOLIC SECTION AT W/4 OFFSET.

PARABOLIC SECTION DIMENSIONS
NOT TO SCALE

RIFFLE WEIR DIMENSION TABLE								
REACH ID	US STA.	DA STA.	L (FT)	W (FT)	H (FT)*	D (FT)	D_{OFFSET} (FT)	D50 (IN)
REACH 1 SPSC	0+00	4+50	15	25	0.5	2.75	1.88	7

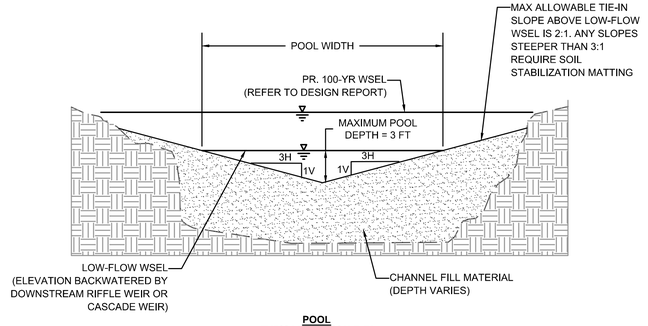
*RIFFLE WEIR HEIGHT (H) IS EQUAL TO THE UPSTREAM INVERT MINUS THE DOWNSTREAM INVERT

RIFFLE WEIR NOTES:

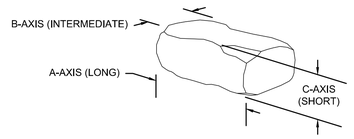
1. COUNTY REPRESENTATIVE WILL BE ON-SITE TO GUIDE RIFFLE INSTALLATION IN THE FIELD.
2. THE CROSS SECTION SHALL BE CONSTRUCTED IN A PARABOLIC SHAPE BETWEEN GIVEN NODES.
3. NATURAL CHANNEL MATERIAL MAY BE HARVESTED ON-SITE PRIOR TO INSTALLATION OF RIFFLE WEIR IF IT MEETS THE SPECIFICATIONS FOR USE AS WASH-IN OR RIFFLE MIX.
4. THE NUMBER OF BOULDERS VARIES DEPENDING ON TYPICAL SECTION WIDTH AND BOULDER DIMENSIONS.
5. THE BOULDERS SHALL BE TILTED DOWNSTREAM AS SHOWN ON THE DETAIL AND NOT STACKED.
6. TIE-OUT BOULDER SHALL EXTEND PAST THE DOWNSTREAM CORNER NODES A MIN. OF ONE BOULDER LENGTH (B-AXIS) INTO EXISTING BANK. WHERE THIS CONFLICTS WITH EXISTING TREE ROOTS OR BEDROCK, TIE-OUT BOULDER MAY BE ELIMINATED OR ADJUSTED AT DIRECTION OF ENGINEER.
7. RIFFLE MIX SHALL BE COMPOSED PRIMARILY OF A BASE COARSE MIX OF ANGULAR MATERIAL, WHICH SHALL MAKE UP APPROXIMATELY 70% OF THE TOTAL RIFFLE MIX VOLUME. TO MEET THE GRADATION OF A 7" D50, THIS BASE COARSE MIX CAN BE ACHIEVED USING THE FOLLOWING COMPOSITION:
   - -20% NO 57 STONE
   - -20% #2 STONE
   - -40% CLASS I RIP RIP
   - -20% CLASS II RIP RIP
8. THE WEARING SURFACE OF EACH RIFFLE SHALL BE AUGMENTED WITH SILICA COBBLE AND RANDOM BOULDERS PIECES MIXED INTO THE TOP LAYER OF THE BASE COARSE. THIS SHALL MAKE UP APPROXIMATELY 30% OF THE TOTAL RIFFLE MIX VOLUME. THIS AUGMENTED WEARING SURFACE MATERIAL SHALL BE COMPOSED OF THE FOLLOWING:
   - -70% 7" D50 SILICA COBBLE (SEE GRADATION ABOVE) RANGING FROM ROUNDED TO SUB-ANGULAR SHAPE.
   - -30% SUB-ANGULAR RANDOM BOULDERS (AVERAGE OF 18" D50)
9. ALL RIFFLE MIX SHALL BE WASHED-IN WITH SAND AND GRAVEL IN LIFTS SO IT IS INCORPORATED WITHIN THE FULL DEPTH TO CHOKE VOIDS PRIOR TO FINAL STABILIZATION. THE SAND AND GRAVEL ARE AN INCIDENTAL SUPPLEMENT TO THE RIFFLE MIX.
10. THE FINAL WEARING SURFACE SHALL BE A TIGHT STONE MATRIX OF ALL MATERIALS, WORKED TOGETHER WITH NO LOOSE MATERIAL.
11. TRIM ALL GEOTEXTILE AT OR BELOW FINISHED GRADE, IF USED.
12. ONCE RIFFLE WEIR IS CONSTRUCTED, STABILIZE ALL DISTURBED LOCATIONS AS SPECIFIED.
13. CONTOURS ARE PROVIDED TO REPRESENT TYPICAL PARABOLIC SHAPE, AND DO NOT REFLECT DESIGN CONTOURS. REFER TO STRUCTURE TABLE AND PLAN VIEW FOR DIMENSIONS.
14. SEE STRUCTURE TABLES ON SHEET ST-01 FOR NODE LOCATION INFORMATION.
15. SEE PROFILE FOR UPSTREAM AND DOWNSTREAM INVERT ELEVATION (U/S-INV AND D/S-INV).

RIFFLE MIX GRADATION TABLE			
D50 MEDIAN STONE SIZE (INCHES)	% OF MATERIAL SMALLER THAN TYPICAL STONE	TYPICAL STONE EQUIVALENT DIAMETER (INCHES)	TYPICAL STONE WEIGHT (POUNDS)*
6	70 - 100	12	85
	50 - 70	9	35
	35 - 50	6	10
	2 - 10	2	0.4
9	70 - 100	15	160
	50 - 70	12	85
	35 - 50	9	35
	2 - 10	3	1.3
12	70 - 100	21	440
	50 - 70	18	275
	35 - 50	12	85
	2 - 10	4	3
18	100	30	1280
	50 - 70	24	650
	35 - 50	18	275
	2 - 10	6	10
24	100	42	3500
	50 - 70	33	1700
	35 - 50	24	650
	2 - 10	9	35

*ASSUMED UNIT WEIGHT OF 165 $\frac{LBS}{FT^3}$



POOL
TYPICAL SECTION B-B'
NOT TO SCALE



BOULDER AXIS
NOT TO SCALE

BOULDER DIMENSIONS (IN)				
	A-AXIS	B-AXIS	C-AXIS	UNIT WEIGHT, LBS/FT³*
WEDGE BOULDERS	24-36"	24-36"	12-24"	145

CONTRACTOR SHALL USE SANDSTONE BOULDERS. IF CONTRACTOR CAN DEMONSTRATE THAT SOURCE SUPPLY IS LIMITED, GRANITE IS (165 LBS/FT^3) MAY BE AN ACCEPTABLE SUBSTITUTE WITH PRIOR APPROVAL

NOTES:

1. THE MEDIAN A-AXIS DIMENSION AVERAGED ACROSS THE FULL STRUCTURE SHALL EQUAL A MINIMUM OF 30".
2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SELECT MATERIAL THAT IS APPROPRIATELY SIZED TO ALLOW FOR ECONOMICAL CONSTRUCTION OF RIFFLE WEIR STRUCTURES MEETING THE DESIGN DIMENSIONS DESCRIBED IN THIS PLAN.

STANDARD SPSC STABILIZATION NOTES (AASCD)

PERMANENT STABILIZATION NOTES (INCLUDE ONE OF THE FOLLOWING):
PERMANENT STABILIZATION FOR AN AREA OF EARTH DISTURBANCE OF A SPSC SHALL BE CONSIDERED ACHIEVED WHEN THE AREA IS COVERED WITH 2 TO 4 INCHES OF COMPOST (APPLIED OVER WOODCHIPS TRACKED INTO SOIL AND A (NATIVE PLANTS) PLANTING PLAN HAS BEEN IMPLEMENTED, REGARDLESS OF SOIL TREATMENT.

PERMANENT STABILIZATION FOR AN AREA OF EARTH DISTURBANCE OF A SPSC SHALL BE CONSIDERED ACHIEVED WHEN THE BANKS AND FLOODPLAIN ARE COVERED WITH FULLY BIODEGRADABLE STABILIZATION MATTING INSTALLED PER MANUFACTURER'S INSTRUCTIONS AND A (NATIVE PLANTS) PLANTING PLAN HAS BEEN IMPLEMENTED.

ALL DISTURBED AREAS SHALL RECEIVE HYDROSEEDING OR FLEXIBLE GROWTH MEDIUM (FGM) AFTER THE ESTABLISHMENT OF FINAL GRADES AND MICROTOPOGRAPHY (IF APPLICABLE) IN ACCORDANCE WITH THE PROJECT LANDSCAPING PLANS.

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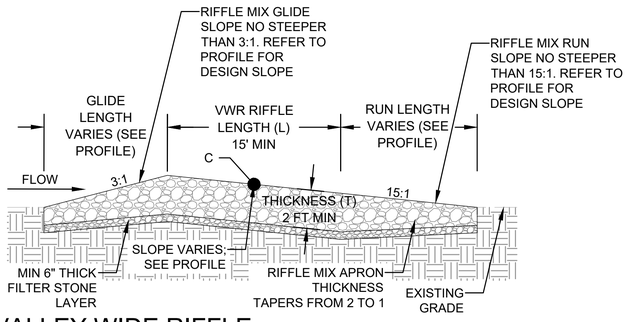
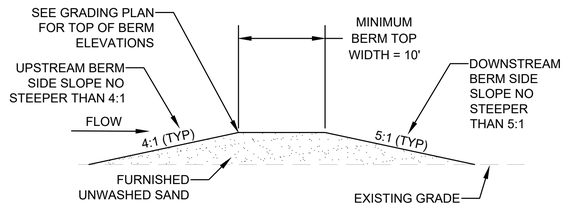
ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	BY	APPROVED DATE	APPROVED DATE	SCALE: NTS	ANNAPOLIS WATERWORKS PARK STREAM RESTORATION
				DRAWN BY KB	
		CHIEF ENGINEER	PROJECT MANAGER	CHECKED BY DSJC	
		APPROVED DATE	APPROVED DATE	SHEET NO. 23 OF 30	DETAILS
				PROJECT NO. 24015.01	
		ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT-OF-WAY	PROPOSAL NO.	



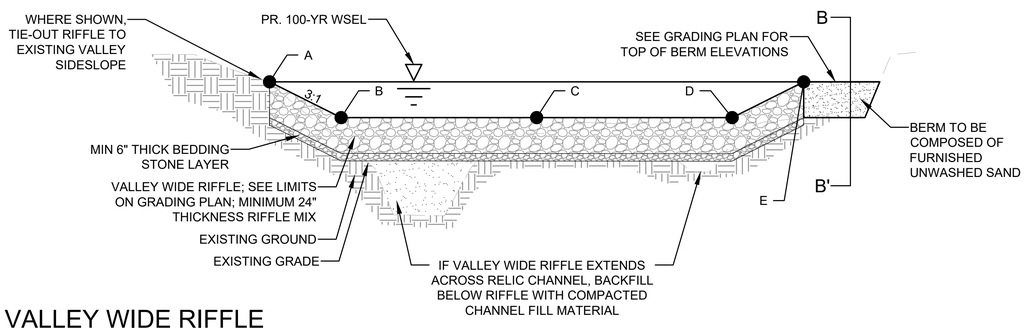
VALLEY WIDE RIFFLE
PROFILE VIEW (A-A')

NOT TO SCALE



VALLEY WIDE RIFFLE
PROFILE VIEW (B - B')

NOT TO SCALE

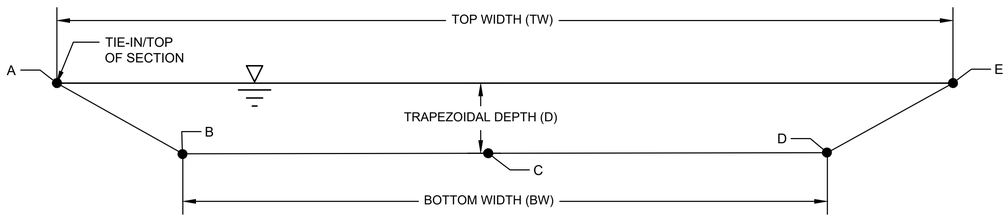


VALLEY WIDE RIFFLE
SECTION VIEW (A - A')

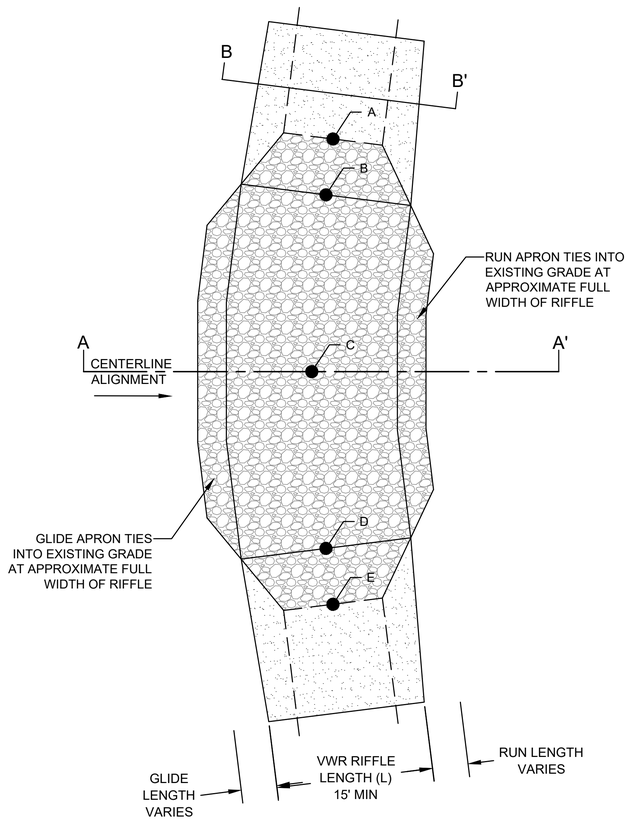
NOT TO SCALE

VALLEY WIDE RIFFLE NOTES:

1. NATURAL CHANNEL MATERIAL MAY BE HARVESTED ON-SITE FROM EXISTING CHANNEL PRIOR TO INSTALLATION OF RIFFLE WEIR IF IT MEETS THE SPECIFICATIONS FOR USE AS WASH-IN OR RIFFLE MIX.
2. PRIOR TO INSTALLING VALLEY WIDE RIFFLE, EXISTING CHANNEL SHALL BE FILLED, WITH MATERIAL TRACKED INTO CHANNEL TO ACHIEVE A WELL COMPACTED SURFACE.
3. VALLEY WIDE RIFFLE TO BE PLACED PERPENDICULAR TO THE VALLEY AS SHOWN ON THE PLAN.
4. THE CROSS SECTION SHALL BE CONSTRUCTED IN A TRAPEZOIDAL SHAPE BETWEEN GIVEN NODES.
5. TO MEET THE RIFFLE MIX GRADATION OF A 6" D50, THIS CAN BE ACHIEVED USING THE FOLLOWING COMPOSITION:
   - -20% NO 57 STONE
   - -30% #2 STONE
   - -50% CLASS I RIP RIP
6. ALL RIFFLE MIX SHALL BE WASHED-IN WITH SAND AND GRAVEL IN LIFTS SO IT IS INCORPORATED WITHIN THE FULL DEPTH TO CHOKE VOIDS PRIOR TO FINAL STABILIZATION. THE SAND AND GRAVEL ARE AN INCIDENTAL SUPPLEMENT TO THE RIFFLE MIX.
7. CONTRACTOR SHALL TRACK OVER STRUCTURE SEVERAL TIMES WITH THE EXCAVATOR TO COMPRESS THE VALLEY WIDE RIFFLE MATERIAL IN PLACE IN ONE FOOT LIFTS, ENSURING IT FORMS A COMPACTED, CONSOLIDATED VALLEY WIDE RIFFLE FOR THE FULL DEPTH.
8. THE FINAL WEARING SURFACE SHALL BE A TIGHT STONE MATRIX OF ALL MATERIALS, WORKED TOGETHER WITH NO LOOSE MATERIAL.
9. ONCE RIFFLE WEIR IS CONSTRUCTED, STABILIZE ALL DISTURBED LOCATIONS AS SPECIFIED.
10. SEE STRUCTURE TABLES ON SHEET 14 FOR NODE LOCATION INFORMATION.
11. SEE PROFILE FOR UPSTREAM AND DOWNSTREAM INVERT ELEVATIONS (U/S-INV AND D/S-INV)



TRAPEZOIDAL SECTION DIMENSIONS
NOT TO SCALE



VALLEY WIDE RIFFLE
PLAN VIEW

NOT TO SCALE

VALLEY WIDE RIFFLE MIX MATERIAL GRADATION TABLE			
D50 MEDIAN STONE SIZE (INCHES)	% OF MATERIAL SMALLER THAN TYPICAL STONE	TYPICAL STONE EQUIVALENT DIAMETER (INCHES)	TYPICAL STONE WEIGHT (POUNDS)*
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	2 - 10	6	10
24	100	42	3500
	50 - 70	33	1700
	35 - 50	24	650
	2 - 10	9	35

*ASSUMED UNIT WEIGHT OF 165 $\frac{LBS}{FT}$

VALLEY WIDE WEIR DIMENSION TABLE								
REACH ID	US STA.	DA STA.	L (FT)	TW (FT)	BW (FT)	H (FT)	D (FT)	RIFFLE MIX D50 (IN)
REACH 2 RSC	4+50	11+00	15	70	35	1.00	1.60	9

*RIFFLE WEIR HEIGHT (H) IS EQUAL TO THE UPSTREAM INVERT MINUS THE DOWNSTREAM INVERT

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ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	BY

APPROVED DATE	APPROVED DATE	SCALE: NTS
CHIEF ENGINEER	PROJECT MANAGER	DRAWN BY KB
APPROVED DATE	APPROVED DATE	CHECKED BY DS/JC
ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT-OF-WAY	SHEET NO. 21 OF 30
		PROJECT NO. 24015.01
		PROPOSAL NO.

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

DETAILS

STREAM VALLEY BOTTOM WOOD ROUGHNESS NOTES:

SEQUENCE

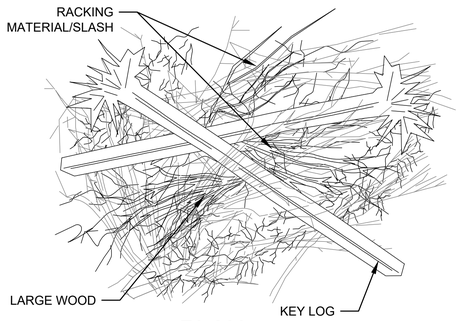
1. AFTER TREE SAVE AND REMOVAL DETERMINATIONS HAVE BEEN APPROVED BY THE COUNTY, CONTRACTOR SHALL BEGIN TREE REMOVAL OPERATION. HARVEST AND RETAIN WOODY MATERIAL ON-SITE THAT COMPLIES WITH THE MATERIAL SPECIFICATIONS, LEAVING AS MUCH OF THE BRANCHING AND ROOT FAN INTACT AS POSSIBLE. MATERIALS SHALL BE HANDLED AND STORED ON-SITE IN A MANNER SO AS TO MINIMIZE DAMAGE TO BRANCHING AND ROOT FANS. TREES IDENTIFIED FOR REMOVAL WITHIN GRADING LIMITS SHALL BE REMOVED BY PUSHING OVER, WITH THE ROOTBALL INTACT TO MAXIMUM EXTENT PRACTICABLE.
2. AS EXISTING STREAM CHANNEL IS BEING FILLED, CONTRACTOR SHALL INCORPORATE WOOD ROUGHNESS ELEMENTS AND SLASH INTO THE CHANNEL FILL AT THE DIRECTION OF ANNE ARUNDEL COUNTY.
3. ONCE GRADING IS COMPLETE, CONTRACTOR SHALL COORDINATE WITH ANNE ARUNDEL COUNTY TO ESTABLISH LIMITS OF WOOD ROUGHNESS TREATMENT WITHIN THE STREAM VALLEY BOTTOM. INSTALL WOOD ROUGHNESS ELEMENTS AND SLASH THROUGHOUT THE SET LIMITS, AT THE DIRECTION OF ANNE ARUNDEL COUNTY, INCORPORATING INTO THE FINISHED GRADE (APPROXIMATELY 40% INCORPORATED INTO GRADE). CONTRACTOR SHALL INSTALL OVERLAPPING KEY LOGS AND LARGE WOOD ELEMENTS OVERTOP RACKING AND SLASH MATERIAL TO PIN IN PLACE. THE APPROXIMATE DENSITY OF WOOD ROUGHNESS SHALL BE 4 CROSSING KEY LOG MEMBERS, 6 LARGE WOOD MEMBERS AND 8 RACKING MEMBERS FOR EVERY 2,000 SF OF ROUGHENED FLOODPLAIN.
4. FINAL SURFACE OF STREAM VALLEY BOTTOM SHALL BE A ROUGH, DENSE MATRIX OF WOOD WITHIN THE LIMITS DEFINED IN THE FIELD, WITH HUMMOCK AND HOLLOW MICROTOPOGRAPHY THAT VARIES WITHIN +/- 1 FT OF THE EXISTING/PROPOSED GRADE. CONFIGURATION OF WOOD ROUGHNESS ELEMENTS SHALL APPEAR NATURAL AND VARY ACROSS THE LIMITS. ALL EXPOSED LOG ENDS SHALL HAVE BROKEN OR ROUGHENED END, RATHER THAN SAW CUT END WHEN POSSIBLE.
5. FOLLOWING PLACEMENT OF WOOD ROUGHNESS ELEMENTS, CONTRACTOR SHALL SPREAD 2" OF WOODCHIPS TO STABILIZE ALL EXPOSED SURFACES.
6. THIS DETAIL DEPICTS THE TYPICAL PREFERRED COMPOSITION AND CONFIGURATION OF WOOD ROUGHNESS. ALTERATION OF THIS COMPOSITION/CONFIGURATION DUE TO ISSUES OBTAINING NECESSARY MATERIALS OR OTHER REASON IS ACCEPTABLE ONLY WITH PRIOR APPROVAL FROM ANNE ARUNDEL COUNTY.

WOOD ROUGHNESS MATERIALS

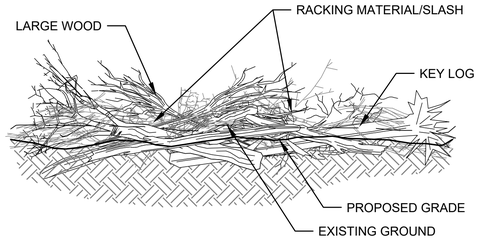
1. KEY LOGS - WOOD PIECES GREATER THAN 18" DBH WITH ATTACHED ROOTWADS AND OVER 35 FEET LONG.
2. LARGE WOOD - WOOD PIECES WITH 12-18" DBH WITH AND WITHOUT ATTACHED ROOTWAD AND OVER 25 FEET LONG.
3. RACKING MATERIAL - WOOD PIECES WITH 8-12" DBH WITH AND WITHOUT ROOTWADS, AND OVER 15 FEET LONG.
4. SLASH - WOODY VEGETATION SMALLER THAN DIMENSIONS ABOVE AT A THICKNESS OF 1 FT ON AVERAGE.
5. THE SOURCE OF WOODY MATERIAL SHALL BE GENERATED FROM ON-SITE. MATERIAL SHALL HAVE A CONSIDERABLE NUMBER OF BRANCHES THAT REMAIN EXPOSED AND IN CONTACT WITH THE STREAM FLOW AFTER INSTALLATION.

QUANTITIES

1. REACH 2: BETWEEN VALLEY WIDE RIFFLES, INSTALL APPROXIMATELY 56 PIECES OF KEY LOGS, 84 PIECES OF LARGE WOOD, 112 PIECES OF RACKING MATERIAL AND 1,050 CY OF SLASH MATERIAL.
2. IF TREE REMOVAL ON ONE REACH GENERATES MORE WOOD THAN REQUIRED WITHIN THAT REACH, EXCESS WOOD SHALL BE STOCKPILED AND TRANSPORTED FOR USE AS NEEDED WITHIN ANOTHER REACH OR PHASE.



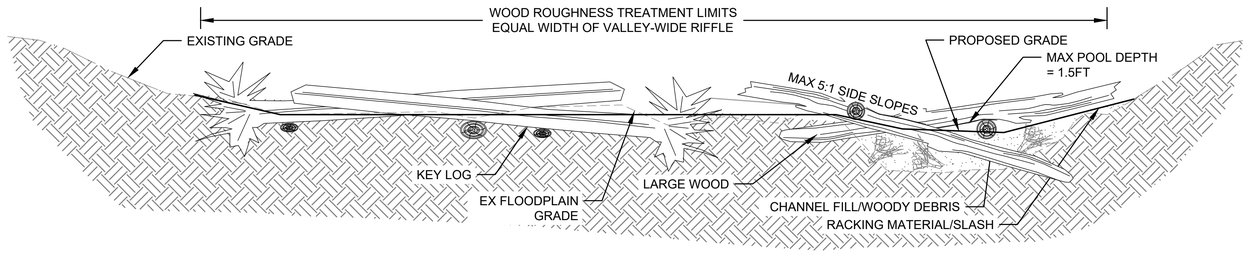
PLAN



SECTION

STREAM VALLEY BOTTOM WOOD ROUGHNESS PLAN (TYPICAL)

NOT TO SCALE



STREAM VALLEY BOTTOM WOOD ROUGHNESS SECTION (TYPICAL)

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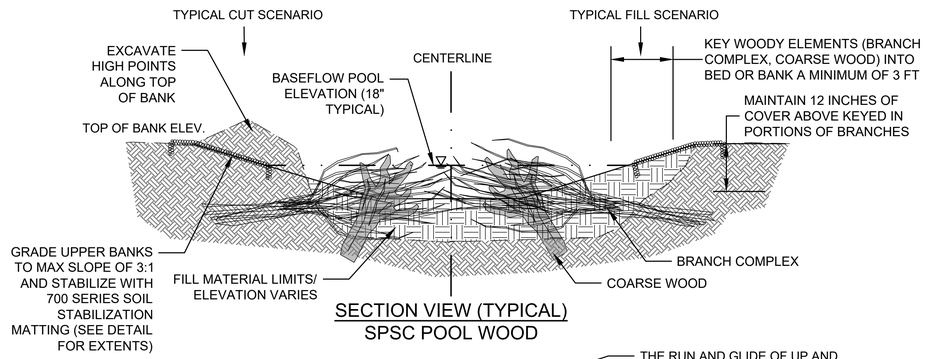
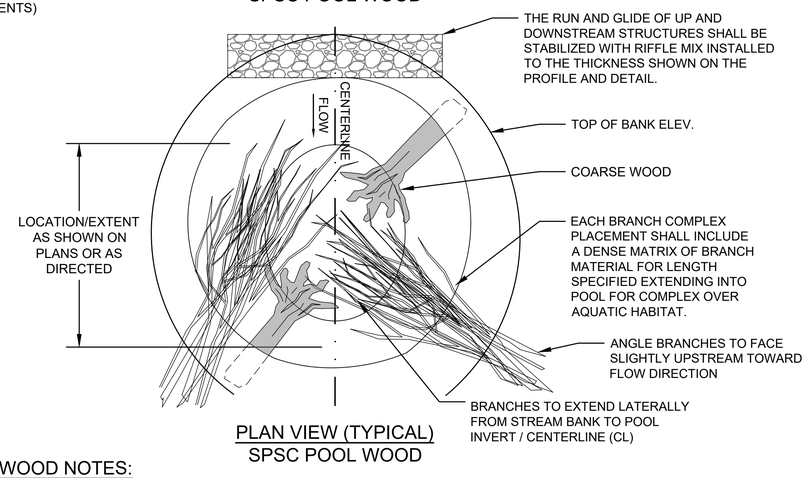


SECTION VIEW (TYPICAL)
SPSC POOL WOOD



PLAN VIEW (TYPICAL)
SPSC POOL WOOD

SPSC POOL WOOD NOTES:

1. AFTER TREE SAVE AND REMOVAL DETERMINATIONS HAVE BEEN APPROVED BY ANNE ARUNDEL COUNTY, CONTRACTOR SHALL BEGIN TREE REMOVAL OPERATION. HARVEST AND RETAIN WOODY MATERIAL ON-SITE THAT COMPLIES WITH THE MATERIAL SPECIFICATIONS, LEAVING AS MUCH OF THE BRANCHING AND ROOT FAN INTACT AS POSSIBLE. MATERIALS SHALL BE HANDLED AND STORED ON-SITE IN A MANNER SO AS TO MINIMIZE DAMAGE TO BRANCHING AND ROOT FANS.
2. INSTALL SPSC POOL WOOD WITHIN EACH SPSC POOL, OR AS DIRECTED BY ANNE ARUNDEL COUNTY. EACH POOL TREATMENT SHALL INCLUDE A MINIMUM OF TWO BRANCH COMPLEXES AND TWO COARSE WOOD ELEMENTS, UNLESS OTHERWISE DIRECTED BY ANNE ARUNDEL COUNTY.
3. COARSE WOOD ELEMENT SHALL CONSIST OF TRUNKS OR LARGE LIMBS BETWEEN 12 TO 18 INCH DBH AND MINIMUM OF 5 FEET LONG. KEY COARSE WOOD A MINIMUM OF 3 FEET INTO BED OR TOE OF BANK. BASE OF ROOT FLARE/BRANCHES SHALL BE PLACED TIGHT TO FINISHED GRADE OF POOL. ROOT BALL/BRANCHES SHALL BE MOSTLY SUBMERGED DURING BASE FLOW.
4. BRANCH COMPLEXES SHALL CONSIST OF A DENSE MIX OF PARTIALLY BURIED BRANCHES ALONG POOL BOTTOM AS DIRECTED BY THE COUNTY. BRANCH MATERIAL SHALL RANGE FROM APPROXIMATELY 2 TO 12 INCHES DBH MATERIAL BUNDLED TOGETHER INTO A 24 INCH DIAMETER BUNDLE. EACH BUNDLE SHALL BE A MINIMUM OF 5 FEET LONG, AND SHALL BE KEYED HORIZONTALLY INTO THE STREAM BANK A MINIMUM OF 3 FEET. BRANCHES SHALL EXTEND HORIZONTALLY TO THE POOL INVERT (APPROXIMATE CENTERLINE OF CHANNEL). PROVIDE AT LEAST 12 INCHES OF FIRMLY TAMPED COVER ABOVE BRANCH MATERIAL AT ENDS KEYED INTO BANK. VERTICALLY, BRANCH COMPLEXES SHALL BE INSTALLED APPROXIMATELY 1' BELOW POOL BED AND PROTRUDE ABOVE POOL BED A MAXIMUM OF 1 FOOT. PROTRUSION HEIGHTS SHALL VARY.
5. PLACEMENT OF POOL WOODY TREATMENT MATERIAL SHALL APPEAR NATURAL AND VARY BETWEEN POOLS. ALL EXPOSED LOG ENDS SHALL HAVE BROKEN OR ROUGHENED END, RATHER THAN SAW CUT END WHEN POSSIBLE.
6. MATERIAL USED AS COARSE WOOD AND BRANCH COMPLEXES SHALL HAVE A CONSIDERABLE NUMBER OF BRANCHES THAT REMAIN IN CONTACT WITH THE STREAM FLOW AFTER INSTALLATION TO TRAP LEAVES AND DETRITUS.
7. BACKFILL AROUND WOODY ELEMENTS WITH CHANNEL FILL MATERIAL AS NEEDED TO MEET POOL GRADES SHOWN ON PROFILE.
8. ONCE A POOL BRANCH TREATMENT IS CONSTRUCTED, IMMEDIATELY STABILIZE ALL DISTURBED TIE-IN LOCATIONS AS SPECIFIED.
9. THIS DETAIL DEPICTS THE TYPICAL PREFERRED COMPOSITION AND CONFIGURATION OF POOL WOOD ELEMENTS. ALTERATION OF THIS COMPOSITION/CONFIGURATION DUE TO ISSUES OBTAINING NECESSARY MATERIALS OR OTHER REASON IS ACCEPTABLE ONLY WITH PRIOR APPROVAL FROM THE COUNTY.

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		CHIEF ENGINEER	PROJECT MANAGER	SCALE: NTS	ANNAPOLIS WATERWORKS PARK STREAM RESTORATION
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		ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT-OF-WAY	SHEET NO. 25 OF 30	
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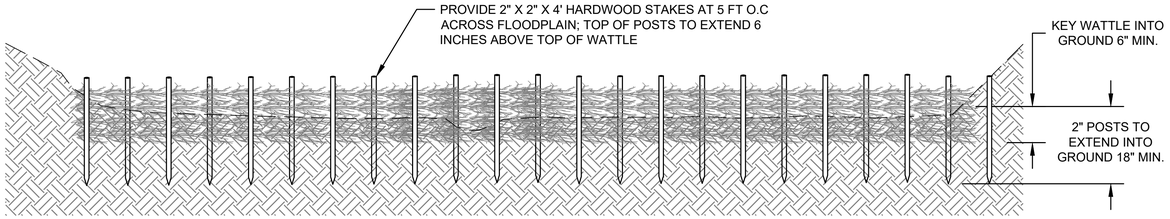
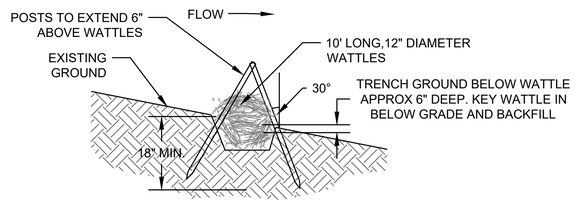


SECTION A-A"



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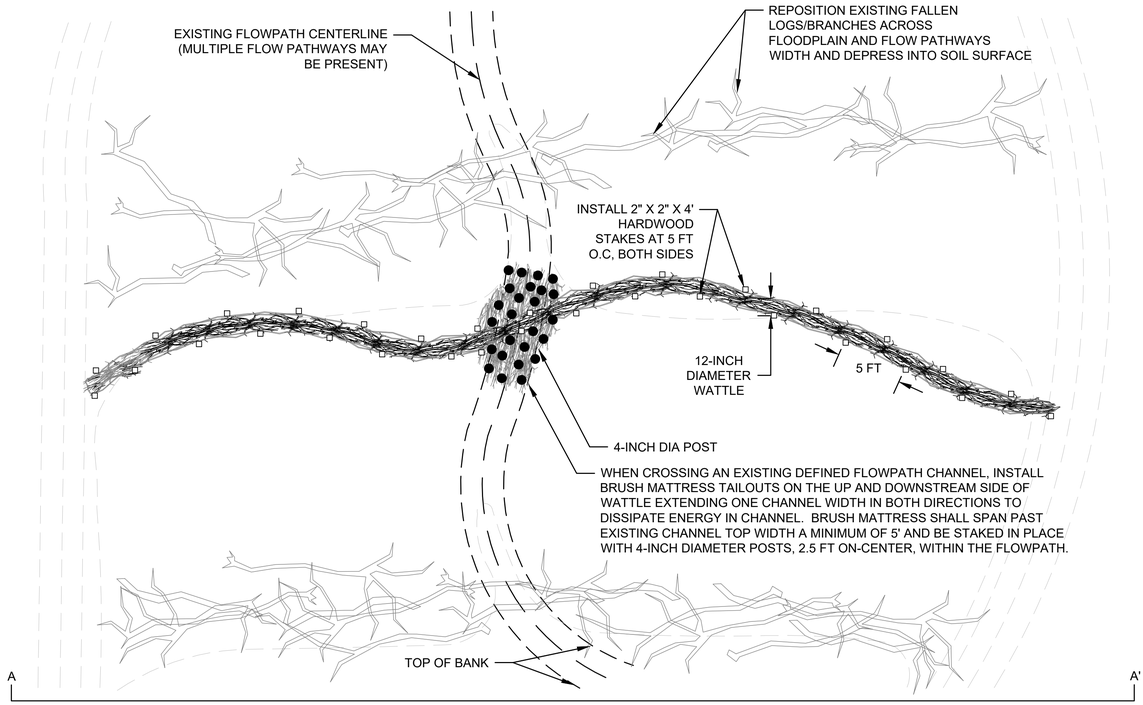


PLAN

POST AND WATTLE

NOT TO SCALE

POST AND WATTLE EXECUTION:

1. INSTALL POST AND WATTLE STRUCTURES AT LOCATIONS AND ELEVATIONS SHOWN ON PLAN AND PROFILE, OR AS DIRECTED BY ENGINEER/DESIGNATED SPECIALIST.
2. HARVEST WOODY MATERIAL ON-SITE THAT COMPLIES WITH THE MATERIAL SPECIFICATIONS. HARVEST MATERIAL AS PART OF THE CLEARING, TREE SALVAGING, AND HABITAT MATERIAL SALVAGING AND STOCKPILING OPERATIONS ONSITE, LEAVING AS MUCH OF THE BRANCHING AND ROOT FAN INTACT AS POSSIBLE. MATERIALS SHALL BE HANDLED AND STORED IN A MANNER SO AS TO MINIMIZE DAMAGE TO BRANCHING AND ROOT FANS.
3. HAND EXCAVATE A SHALLOW 5" DEPTH TRENCH ACROSS THE FLOODPLAIN AT LOCATIONS SHOWN. LAY WATTLES WITHIN TRENCH AND BACKFILL WITH EXCAVATED MATERIAL.
4. INSTALL WOODEN STAKES AT 5 FT ON-CENTER, BOTH SIDES, ALTERNATING STAKE LOCATIONS.
5. WHEN CROSSING AN EXISTING DEFINED FLOWPATH CHANNEL, INSTALL BRUSH MATTRESS TAILOUTS ON THE UP AND DOWNSTREAM SIDE OF WATTLE EXTENDING ONE CHANNEL WIDTH IN BOTH DIRECTIONS TO DISSIPATE ENERGY IN CHANNEL. BRUSH MATTRESS SHALL SPAN PAST EXISTING CHANNEL TOP WIDTH A MINIMUM OF 5' AND BE STAKED IN PLACE WITH 4-INCH DIAMETER POSTS, 2.5 FT ON-CENTER, WITHIN THE FLOWPATH.
6. BETWEEN WATTLES, CONTRACTOR SHALL REPOSITION EXISTING FALLEN LOGS/BRANCHES ACROSS FLOODPLAIN AND FLOW PATHWAYS WIDTH AND DEPRESS INTO SOIL SURFACE AS FEASIBLE.
7. ONCE CONSTRUCTED, IMMEDIATELY STABILIZE ALL DISTURBED TIE-IN LOCATIONS AS SPECIFIED.
8. WHERE POSSIBLE, ALL MATERIAL SHALL BE DRIVEN OR PUSHED INTO STREAM BED AND BANKS TO DEPTHS SPECIFIED WITH MINIMAL EXCAVATION. SHARPEN ENDS OF LOG WITH A CHAINSAW AND DRIVE SHARPENED INTO GROUND AS DIRECTED BY THE ENGINEER/DESIGNATED SPECIALIST.

POST AND WATTLE MATERIALS:

1. WATTLES SHALL CONSIST OF GREEN BRANCH CUTTINGS/BRUSH COMPOSED OF 1 TO 2 INCH DIAMETER MATERIALS, 5 TO 10 FEET LONG, WOVEN, COMPRESSED, AND BUNDLED TOGETHER TO FORM A MINIMUM OF 10 FT OF WATTLE. MATERIAL SHALL BE COMPRESSED USING A RATCHET STRAP OF SIMILAR METHOD AND TIED WITH A NATURAL FIBER ROPE.
2. BRUSH MATTRESS SHALL BE 50% BRUSH MIXED WITH 50% SALVAGED OR IMPORTED BED MATERIAL WITH A D50 OF 2". THE BRUSH COMPONENT SHALL BE COMPOSED OF AN EVEN MIX OF SMALL LIMBS AND ROOTWAD BETWEEN 4 TO 8 INCHES IN DIAMETER AND 3 TO 6 FOOT LONG, MIXED EVENLY WITH SMALLER DIAMETER AND LENGTH BRUSH.
3. WOOD STAKES SHALL BE 2" X 2" HARDWOOD STAKES, 4 FEET LONG.
4. WOOD POSTS SHALL BE MIN OF 4" DIAMETER SALVAGED OR FURNISHED WOOD POSTS, 4 FEET LONG.
5. ALL WOODY MATERIAL SHALL BE OBTAINED ONSITE TO MAXIMUM EXTENT POSSIBLE. ROT-RESISTANT SPECIES ARE PREFERRED FOR USE IF AVAILABLE. BUT ANY WOOD FREE OF DEFECTS, MAJOR DAMAGE AND DECAY CAN BE USED AS AVAILABLE.

SUBMITTAL REQUIREMENTS:

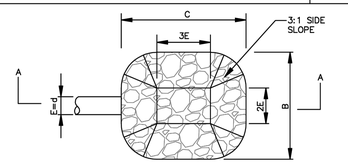
1. WATTLES: SUBMITTAL APPROVAL REQUIRED IF IMPORTED
2. BRUSH MATTRESS: NA
3. WOOD STAKES: SUBMITTAL APPROVAL REQUIRED IF IMPORTED
4. WOOD POSTS: SUBMITTAL APPROVAL REQUIRED IF IMPORTED

INSPECTION REQUIREMENTS:

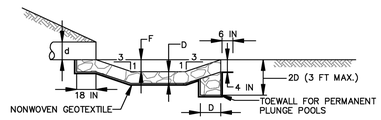
1. CONTRACTOR SHALL PERFORM INITIAL QC ON ALL MATERIALS.
2. ENGINEER/DESIGNATED SPECIALIST TO VISUALLY INSPECT AND PROVIDE FINAL ACCEPTANCE OF EACH STRUCTURE BASED ON SITE INSPECTOR OR CONTRACTOR PROVIDED DOCUMENTATION (PHOTOS, ELEVATIONS).

DETAIL D-4-2 PLUNGE POOL

STANDARD SYMBOL: PP



PLAN VIEW



SECTION A–A

CONSTRUCTION SPECIFICATIONS

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

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

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fx: 410.554.0168 / www.biohabitats.com
Restore the Earth & Inspire Ecological Stewardship

Arundel Rivers Federation

ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	BY

APPROVED	DATE	APPROVED	DATE
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT-OF-WAY	

SCALE:	NTS
DRAWN BY	KB
CHECKED BY	DS/JC
SHEET NO.	26 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

DETAILS

6/18/2026 M:\CADD\Projects\24015.01 Annapolis Waterworks Park Stream Restoration\CAD\Plans\dt01aw.dwg

PLANTING LEGEND

- OAK FLOODPLAIN FOREST
- MESIC OAK/BEECH FOREST
- FLOODPLAIN POOLS
- LOW DENSITY FLOODPLAIN PLANTING
- TURF GRASS
- LIVE STAKES
- SMALL FOREST POD (NOT SHOWN TO SCALE)
- SHRUB POD (NOT SHOWN TO SCALE)

MATCHLINE - SHEET 28

REGATTA BAY II LTD
PARTNERSHIP
L.13917 F.251

CITY OF ANNAPOLIS
MAYOR & ALDERMN
L.2410 F.360

KRG GATEWAY
VILLAGE LLC
NO DEED
REFFERENCE
PLAT 180 F.33

LOW DENSITY FLOODPLAIN FOREST ZONE (TYP.)

FLOODPLAIN POOL ZONE

OAK FLOODPLAIN FOREST PLANTING ZONE (TYP.)

MESIC OAK/BEECH FOREST PLANTING ZONE (TYP.)

CENTERLINE OF STREAM & THALWEG

FOREST POD (TYP.)

SHRUB POD (TYP.)

STORM DRAIN INLET
TOP ELEV=67.80
INV(SE)21" RCP=63.30

STORM DRAIN MANHOLE
TOP ELEV=67.64
INV(NW)21" RCP=62.94
INV(NE)21" RCP=61.74
INV(SW)21" RCP=63.54

STORM DRAIN INLET
TOP ELEV=67.97
INV(NW) 21" RCP=64.22

CONCRETE RISER (SEE DIAGRAM)
TOP ELEV=67.85
INV 56" RCP=49.00
INV 12" RCP=55.95

POND

HAND RAIL

HAND BOX

CONCRETE CURB

CONCRETE WALK

21" RCP

SD

SD 21" RCP

HOUSLEY ROAD
(60' PUBLIC R/W)

HORIZONTAL SCALE
0 20 40

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ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	BY

APPROVED	DATE	APPROVED	DATE
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT-OF-WAY	

SCALE:	1" = 20'
DRAWN BY	TB
CHECKED BY	DS/JC
SHEET NO.	27 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK
STREAM RESTORATION

LANDSCAPE PLAN

6/18/2026 M:\CADD\Projects\24015.01 Annapolis Waterworks Park Stream Restoration\CAD\Plans\pl01aw.dwg

PLANTING LEGEND

- OAK FLOODPLAIN FOREST
- MESIC OAK/BEECH FOREST
- FLOODPLAIN POOLS
- LOW DENSITY FLOODPLAIN PLANTING
- TURF GRASS
- LIVE STAKES
- SMALL FOREST POD (NOT SHOWN TO SCALE)
- SHRUB POD (NOT SHOWN TO SCALE)

LOW DENSITY FLOODPLAIN FOREST ZONE (TYP.)

OAK FLOODPLAIN FOREST PLANTING ZONE (TYP.)

MESIC OAK/BEECH FOREST PLANTING ZONE (TYP.)

FOREST POD (TYP.)

SHRUB POD (TYP.)

MATCHLINE - SHEET 27

CITY OF ANNAPOLIS
MAYOR & ALDERMN
L.2410 F.360

KRG GATEWAY
VILLAGE LLC
NO DEED
REFFERENCE
PLAT 180 F.33

HORIZONTAL SCALE
0 20 40

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ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

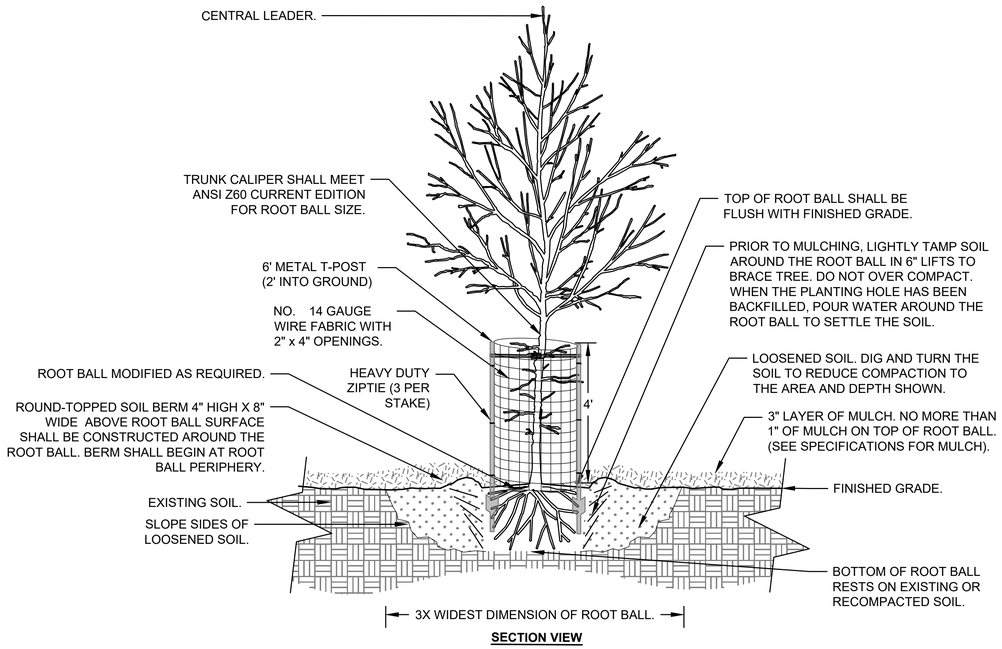
REVISED DATE	BY

APPROVED	DATE	APPROVED	DATE
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT-OF-WAY	

SCALE:	1" = 20'
DRAWN BY	TB
CHECKED BY	DS/JC
SHEET NO.	28 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

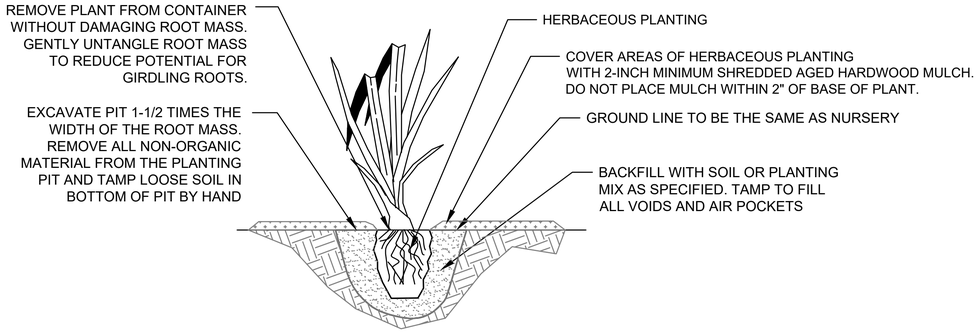
LANDSCAPE PLAN



SECTION VIEW

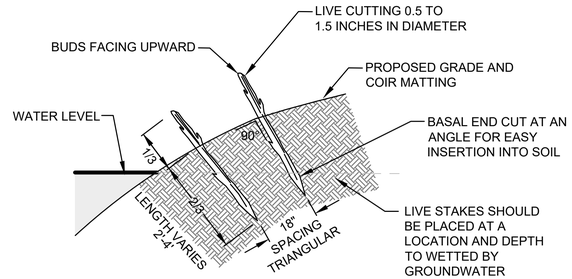
STANDALONE TREE PLANTING

NOT TO SCALE



HERBACEOUS PLANTING

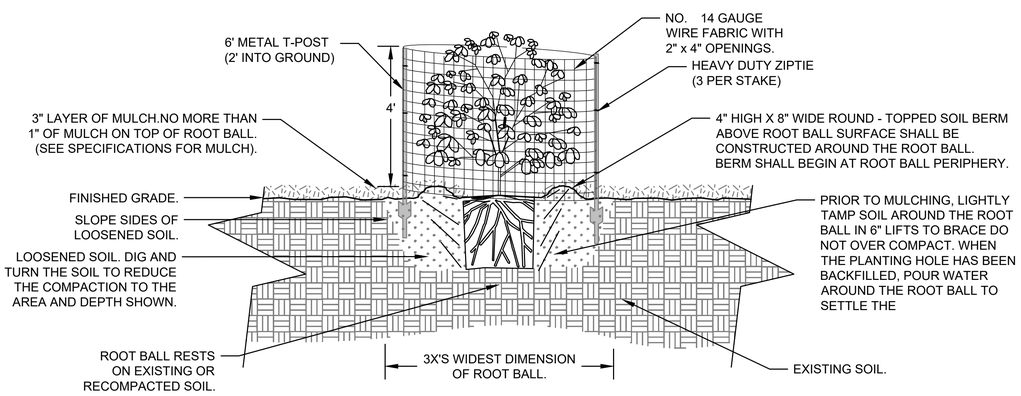
NOT TO SCALE



NOTE: DO NOT PLANT LIVE STAKE MATERIAL MORE THAN 1FT ABOVE CHANNEL BASEFLOW ELEVATION

LIVE STAKE INSTALLATION CROSS SECTION- TYPICAL

NOT TO SCALE

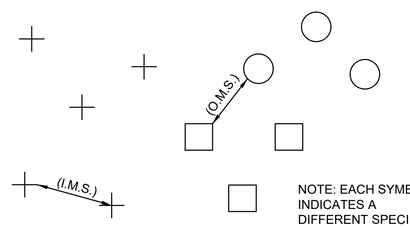


NOTE: SHRUBS MAY BE FENCED INDIVIDUALLY OR IN GROUPS, FOLLOWING FIELD PLACEMENT.

SECTION VIEW

STANDALONE SHRUB PLANTING

NOT TO SCALE



NOTE: EACH SYMBOL INDICATES A DIFFERENT SPECIES

1. PLANTS ARE ARRANGED IN CLUSTERS CONSISTING OF THE SAME SPECIES.
2. SPACING BETWEEN EACH CLUSTER IS DETERMINED BY THE OVERALL MINIMUM SPACING (O.M.S.) DISTANCE.
3. SPACING BETWEEN EACH SPECIES WITHIN EACH CLUSTER IS DETERMINED BY THE INDIVIDUAL MINIMUM SPACING (I.M.S.) DISTANCE.
4. CLUSTERS SHALL CONSIST OF ODD NUMBERS WITH NO LESS THAN 3 AND NO MORE THAN 7 INDIVIDUALS OF ONE SPECIES.

PLANT SPACING - CLUSTER PLAN VIEW

NOT TO SCALE

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ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

LANDSCAPE DETAILS

PLANT COMPOSITION SCHEDULE - ANNAPOLIS WATERWORKS PARK

AREA (sq ft) 23847
ZONE: Oak Floodplain Forest **AREA (acres)** 0.55
FOREST PODS **# FOREST PODS = 35**

Quantity	Key	Scientific Name	Size	Spacing Type	Frequency (%)	Overall Minimum Spacing (ft)	Individual Species Spacing (ft)	Notes
		Trees				see detail		
		Overstory - ES						
42		*Quercus phellos*	#7	FOREST POD	15%		3	
28		*Quercus palustris*	#7	FOREST POD	10%		3	
		Overstory - LS						
14		*Quercus lyrata*	#7	FOREST POD	5%		3	
14		*Quercus pagoda*	#7	FOREST POD	5%		3	
44		*Quercus michauxii*	#7	FOREST POD	15%		3	
		Understory						
28		*Betula nigra*	#7	FOREST POD	10%		3	
28		*Carpinus caroliniana*	#7	FOREST POD	10%		3	
28		*Ilex opaca*	#7	FOREST POD	10%		3	
28		*Nyssa sylvatica*	#7	FOREST POD	10%		3	
28		*Magnolia virginiana*	#7	FOREST POD	10%		3	
282					**100%**			
		Bare Root Trees				see detail	see detail	
315		*Carya cordiformis*		FOREST POD	100%			
315					**100%**			
		Shrubs				see detail		
35		*Calycanthus floridus*	#3	FOREST POD	20%		3	
35		*Ilex verticillata*	#3	FOREST POD	20%		3	
18		*Itea virginica*	#3	FOREST POD	10%		3	
35		*Lindera benzoin*	#3	FOREST POD	20%		3	
26		*Viburnum dentatum*	#3	FOREST POD	15%		3	
26		*Viburnum nudum*	#3	FOREST POD	15%		3	
175					**100%**			

SHRUB PODS **# SHRUB PODS = 68**

Quantity	Key	Scientific Name	Size	Spacing Type	Frequency (%)	Overall Minimum Spacing (ft)	Individual Species Spacing (ft)	Notes
		Shrubs				see detail		
95		*Calycanthus floridus*	#3	SHRUB POD	20%		3	
95		*Ilex verticillata*	#3	SHRUB POD	20%		3	
48		*Itea virginica*	#3	SHRUB POD	10%		3	
95		*Lindera benzoin*	#3	SHRUB POD	20%		3	
71		*Viburnum dentatum*	#3	SHRUB POD	15%		3	
71		*Viburnum nudum*	#3	SHRUB POD	15%		3	
475					**100%**			

NOTES:
ES = early successional LS = late successional
See Forest and Shrub Pod Planting Details for guidance on plant layout and spacing. Pod locations shown on plan.
Planting Composition Schedule supersedes Plant Summary Schedule.

PLANT COMPOSITION SCHEDULE - ANNAPOLIS WATERWORKS PARK

AREA (sq ft) 17783
ZONE: Mesic Oak/Beech Forest **AREA (acres)** 0.41
FOREST PODS **# FOREST PODS = 26**

Quantity	Key	Scientific Name	Size	Spacing Type	Frequency (%)	Overall Minimum Spacing (ft)	Individual Species Spacing (ft)	Notes
		Trees				see detail		
		Overstory - ES						
31		*Quercus nigra*	#7	FOREST POD	15%		3	
21		*Pinus strobus*	#7	FOREST POD	10%		3	
		Overstory - LS						
10		*Fagus grandifolia*	#3	FOREST POD	5%		3	
10		*Quercus rubra*	#7	FOREST POD	5%		3	
32		*Quercus alba*	#7	FOREST POD	15%		3	
		Understory Trees						
31		*Betula nigra*	#7	FOREST POD	15%		3	
31		*Ilex opaca*	#7	FOREST POD	15%		3	
21		*Nyssa sylvatica*	#7	FOREST POD	10%		3	
21		*Symplocos tinctoria*	#7	FOREST POD	10%		3	
208					**100%**			
		Bare Root Trees				see detail	see detail	
117		*Carya glabra*	BARE ROOT	FOREST POD	50%			
117		*Sassafras albidum*	BARE ROOT	FOREST POD	50%			
234					**100%**			
		Shrubs				see detail		
20		*Gaylussacia baccata*		FOREST POD	15%		3	
20		*Euonymus americanus*		FOREST POD	15%		3	
12		*Vaccinium angustifolium*		FOREST POD	20%		3	
33		*Viburnum acerifolium*		FOREST POD	25%		3	
33		*Viburnum dentatum*		FOREST POD	25%		3	
118					**100%**			

SHRUB PODS **# SHRUB PODS = 50**

Quantity	Key	Scientific Name	Size	Spacing Type	Frequency (%)	Overall Minimum Spacing (ft)	Individual Species Spacing (ft)	Notes
		Shrubs				see detail		
53		*Gaylussacia baccata*		SHRUB POD	15%		3	
53		*Euonymus americanus*		SHRUB POD	15%		3	
70		*Vaccinium angustifolium*		SHRUB POD	20%		3	
87		*Viburnum acerifolium*		SHRUB POD	25%		3	
87		*Viburnum dentatum*		SHRUB POD	25%		3	
350					**100%**			

NOTES:
ES = early successional LS = late successional
See Forest and Shrub Pod Planting Details for guidance on plant layout and spacing. Pod locations shown on plan.
Planting Composition Schedule supersedes Plant Summary Schedule.

PLANT COMPOSITION SCHEDULE - ANNAPOLIS WATERWORKS PARK

AREA (sq ft) 317
ZONE: Floodplain Pools **AREA (acres)** 0.01

Quantity	Scientific Name	Size	Spacing Type	Frequency (%)	Overall Minimum Spacing (ft)	Individual Species Spacing (ft)	Notes
	Perennials				**2**		
16	*Carex tribuloides*	SP4	CLUSTER	20%		1	
16	*Cinna arundinacea*	SP4	CLUSTER	20%		1	
16	*Glyceria striata*	SP4	CLUSTER	20%		1	
16	*Saururus cernuus*	SP4	CLUSTER	20%		1	
16	*Onoclea sensibilis*	SP4	CLUSTER	20%		1	
79				**100%**			

NOTES:
See Plant Cluster Spacing detail.
Planting Composition Schedule supersedes Plant Summary Schedule.

PLANT COMPOSITION SCHEDULE - ANNAPOLIS WATERWORKS PARK

AREA (sq ft) 23866
ZONE: Low Density Floodplain Plantings **AREA (acres)** 0.55
SHRUB PODS **# SHRUB PODS = 41**

Quantity	Key	Scientific Name	Size	Spacing Type	Frequency (%)	Overall Minimum Spacing (ft)	Individual Species Spacing (ft)	Notes
		Shrubs				see detail		
57		*Calycanthus floridus*	#3	SHRUB POD	20%		3	
57		*Ilex verticillata*	#3	SHRUB POD	20%		3	
57		*Lindera benzoin*	#3	SHRUB POD	20%		3	
31		*Vaccinium angustifolium*	#3	SHRUB POD	10%		3	
43		*Viburnum dentatum*	#3	SHRUB POD	15%		3	
43		*Viburnum nudum*	#3	SHRUB POD	15%		3	
288					**100%**			

NOTES:
ES = early successional LS = late successional
See Shrub Pod Planting Details for guidance on plant layout and spacing. Pod locations shown on plan.
Planting Composition Schedule supersedes Plant Summary Schedule.

SOIL BIOENGINEERING COMPOSITION SCHEDULE

Linear Feet (LF) **266**

QTY	Scientific Name	Spacing Type	Frequency (%)	Spacing (ft)	Notes
	Live Stakes			**2**	
47	*Alnus serrulata*		35%		
33	*Cornus sericea*		25%		
53	*Salix interior*		40%		
133			**100%**		

NOTES:
See Live Stake Planting Detail for guidance on plant layout and spacing. Live stake locations shown on plan.
Planting Composition Schedule supersedes Plant Summary Schedule.

SEED MIX SCHEDULE

Area (ac): 0.55
ZONE: Oak Floodplain Forest seed mix **Seeding Rate (lbs/ac): 35**

Quantity (lbs P.L.S.)	Scientific Name	Common Name	Unit	% Mix	Notes
0.29	*Asclepias incarnata*	*swamp milkweed*	LB of P.L.S. 76%	1.5%	
0.29	*Aster umbellatus*	*flat-topped white aster*	LB of P.L.S. 76%	1.5%	
0.29	*Boehmeria cylindrica*	*false nettle*	LB of P.L.S. 76%	1.5%	
1.15	*Cinna arundinacea*	*stout woodreed*	LB of P.L.S. 76%	6.0%	
0.19	*Carex intumescens*	*star sedge*	LB of P.L.S. 76%	1.0%	
0.96	*Carex lupulina, MD ecotype*	*hop sedge, MD ecotype*	LB of P.L.S. 76%	5.0%	
0.57	*Carex tribuloides*	*blunt broom sedge*	LB of P.L.S. 76%	3.0%	
1.92	*Dichanthelium clandestinum*	*deertongue grass*	LB of P.L.S. 76%	10.0%	
3.83	*Elymus virginicus*	*virginia wildrye*	LB of P.L.S. 76%	20.0%	
2.11	*Glyceria striata*	*fowl manna grass*	LB of P.L.S. 76%	11.0%	
0.57	*Iris versicolor*	*blue flag iris*	LB of P.L.S. 76%	3.0%	
0.57	*Leersia virginica*	*whitegrass*	LB of P.L.S. 76%	3.0%	
0.04	*Lobelia siphilitica*	*great blue lobelia*	LB of P.L.S. 76%	0.2%	
0.57	*Lycopus virginicus*	*Virginia bugleweed*	LB of P.L.S. 76%	3.0%	
0.19	*Onoclea sensibilis*	*sensitive fern*	LB of P.L.S. 76%	1.0%	
4.22	*Pancum rigidulum*	*redtop panicgrass*	LB of P.L.S. 76%	22.0%	
0.38	*Rudbeckia hirta*	*black eyed susan*	LB of P.L.S. 76%	2.0%	
0.38	*Solidago patula*	*roughleaf goldenrod*	LB of P.L.S. 76%	2.0%	
0.38	*Symphyotrichum lateriflorum*	*calico aster*	LB of P.L.S. 76%	2.0%	
0.25	*Vernonia noveboracensis*	*new york ironweed*	LB of P.L.S. 76%	1.3%	
19.16				**100.0%**	

NOTES
APPLY SEED WITH COVER CROP. If planting Sept 1 - Apr 30, use oats (Avena sativa) at 20-32 lb/ac OR Grain rye (Secale cereale) at 30 lb/ac. If seeding May 1-Aug 31, use millet (Urochloa racemosa) at 6-8 lb/ac. See info from seed supplier.
Scientific name prevails.

SEED MIX SCHEDULE

Area (ac): 0.41
ZONE: Mesic Oak/Beech Forest seed mix **35**

Quantity (lbs P.L.S.)	Scientific Name	Common Name	Unit	% Mix	Notes
0.11	*Aquilegia canadensis*	*eastern columbine*	LB of P.L.S. 76%	0.8%	
0.21	*Asclepias tuberosa*	*butterfly milkweed*	LB of P.L.S. 76%	1.5%	
0.19	*Aster pilosus*	*heath aster*	LB of P.L.S. 76%	1.4%	
0.07	*Chamaecrista fasciculata*	*partridge pea*	LB of P.L.S. 76%	0.5%	
2.35	*Elymus virginicus*	*virginia wildrye*	LB of P.L.S. 76%	17.0%	
0.14	*Geum laciniatum*	*rough avens*	LB of P.L.S. 76%	1.0%	
0.35	*Lespedeza virginica*	*slender lespedeza*	LB of P.L.S. 76%	2.5%	
0.28	*Liatris pycnostachya*	*prairie blazing star*	LB of P.L.S. 76%	2.0%	
0.17	*Pycnanthemum incanum*	*hoary mountain mint*	LB of P.L.S. 76%	1.2%	
0.55	*Rudbeckia hirta*	*black eyed susan*	LB of P.L.S. 76%	4.0%	
8.83	*Schizachyrium scoparium*	*little bluestem*	LB of P.L.S. 76%	64.0%	
0.41	*Senna hebecarpa*	*maryland senna*	LB of P.L.S. 76%	3.0%	
0.07	*Sisyrinchium angustifolium*	*narrow leaf blue eyed grass*	LB of P.L.S. 76%	0.5%	
0.03	*Solidago bicolor*	*white goldenrod*	LB of P.L.S. 76%	0.2%	
0.06	*Solidago juncea*	*early goldenrod*	LB of P.L.S. 76%	0.4%	
13.80				**100.0%**	

NOTES
APPLY SEED WITH COVER CROP. If planting Sept 1 - Apr 30, use oats (Avena sativa) at 20-32 lb/ac OR Grain rye (Secale cereale) at 30 lb/ac. If seeding May 1-Aug 31, use millet (Urochloa racemosa) at 6-8 lb/ac. See info from seed supplier.
Scientific name prevails.

SEED MIX SCHEDULE

Area (ac): 0.07
ZONE: Turfgrass **Seeding Rate (lbs/ac): 150**

Quantity (lbs P.L.S.)	Scientific Name	Common Name	Unit	% Mix	Notes
25.07	*Festuca arundinacea*	*Tall fescue*	LB of P.L.S. 76%	30.0%	
25.07	*Lolium perenne*	*Perennial ryegrass*	LB of P.L.S. 76%	30.0%	
25.07	*Poa pratensis*	*Kentucky bluegrass*	LB of P.L.S. 76%	30.0%	
8.36	*Lolium multiflorum*	*Annual ryegrass*	LB of P.L.S. 76%	10.0%	
83.56				**100.0%**	

NOTES
APPLY SEED WITH COVER CROP. If planting Sept 1 - Apr 30, use oats (Avena sativa) at 20-32 lb/ac OR Grain rye (Secale cereale) at 30 lb/ac. If seeding May 1-Aug 31, use millet (Urochloa racemosa) at 6-8 lb/ac. See info from seed supplier.
Scientific name prevails.

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Restore the Earth & Inspire Ecological Stewardship

Arundel Rivers Federation
ARUNDELRIVERS.ORG

ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

REVISED DATE	BY

APPROVED	DATE	APPROVED	DATE
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT-OF-WAY	

SCALE:	NA
DRAWN BY	KB
CHECKED BY	DS/JC
SHEET NO.	30 OF 30
PROJECT NO.	24015.01
PROPOSAL NO.	

ANNAPOLIS WATERWORKS PARK STREAM RESTORATION

LANDSCAPE SCHEDULE

6/18/2026 M:\CADD\Projects\24015.01 Annapolis Waterworks Park Stream Restoration\CAD\Plans\dt01aw.dwg