REVISED ON 2/15/2024

ARLINGTON
VIRGINIA

ENGINEER
DEPARTMENT OF
ENVIRONMENTAL SERVICES

FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629 FAX: 703.228.3606
WWW.ARLINGTONVA.US

OWNER
DES/OSEM/WTRSHD

CONTRACTOR
TO BE DETERMINED

NOT FOR CONSTRUCTION

LOCATION MAP

CONSTRUCTION DRAWINGS FOR:

UPPER LONG BRANCH OUTFALL 16128 REPAIR AT 5TH ROAD S. AND S. KENSINGTON STREET

PROJECT NUMBER: SR06

GENERAL NOTES:

GENERAL CONSTRUCTION NOTES

1. ALL CONSTRUCTION WORK FOR THIS PROJECT SHALL CONFORM TO THE ARLINGTON COUNTY DEPARTMENT OF ENVIRONMENTAL SERVICES, CONSTRUCTION STANDARDS AND SPECIFICATIONS, AND WHERE APPLICABLE THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) ROAD AND BRIDGE SPECIFICATIONS, AND ROAD AND BRIDGE STANDARDS. THE LATEST EDITIONS OF EACH RELEVANT MANUAL SHALL BE USED.
2. ALL CONSTRUCTION AND WORK ACTIVITIES SHALL COMPLY WITH THE VIRGINIA WORK AREA PROTECTION MANUAL AND ALL OTHER RELEVANT WORK SAFETY REQUIREMENTS, LATEST EDITIONS.
3. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PROJECT OFFICER OF ANY DISCREPANCIES BETWEEN ACTUAL FIELD CONDITIONS AND THE APPROVED PLANS.
4. THE CONTRACTOR SHALL CONTACT "MISS UTILITY" AT 811 FOR MARKING THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES (i.e. WATER, SEWER, GAS, TELEPHONE, ELECTRIC, AND CABLE TV) AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION OR CONSTRUCTION. THE CONTRACTOR IS REQUIRED TO IDENTIFY AND PROTECT ALL OTHER UTILITY LINES FOUND IN THE WORK SITE AREA BELONGING TO OTHER OWNERS THAT ARE NOT MEMBERS OF "MISS UTILITY". PRIVATE WATER, SEWER AND GAS LATERALS WILL NOT BE MARKED BY MISS UTILITY OR THE COUNTY. THE CONTRACTOR SHALL LOCATE AND PROTECT THESE SERVICES DURING CONSTRUCTION.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYING OUT THE WORK AND SHALL RETAIN A PROFESSIONAL LAND SURVEYOR LICENSED IN THE COMMONWEALTH OF VIRGINIA TO PROVIDE ALL NECESSARY CONSTRUCTION LAYOUTS AND ESTABLISH ALL CONTROL LINES, GRADES, AND ELEVATION DURING CONSTRUCTION. THE CONTRACTOR SHALL SUBMIT A COPY OF ALL CUT SHEETS FOR REVIEW, PER THE SPECIFICATIONS. THE COST OF ALL NECESSARY SURVEYING SERVICES SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND, UNLESS OTHERWISE SPECIFIED, THE COST SHALL BE INCORPORATED INTO THE COSTS FOR RELEVANT ITEMS.
6. THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THESE PLANS ARE FROM BEST AVAILABLE RECORDS AND SHALL BE CONSIDERED TO BE APPROXIMATE. WHEN CONSTRUCTION ACTIVITY REACHES IN PROXIMITY TO EXISTING UTILITIES, THE TRENCH(ES) SHALL BE OPENED A SUFFICIENT DISTANCE AHEAD OF THE WORK OR TEST PITS SHALL BE MADE TO VERIFY THE EXACT LOCATION AND INVERTS OF THE UTILITY TO ALLOW FOR POSSIBLE CHANGES IN THE LINE OR GRADE AS DIRECTED BY OFFICER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING UTILITIES AND THE RELATED STRUCTURES. ALL EXISTING UTILITY SYSTEMS SHALL BE PROTECTED TO PREVENT DAMAGE DURING THE CONTRACTOR'S OPERATIONS. ANY SYSTEM DAMAGED SHALL BE PROMPTLY REPAIRED AT NO COST TO THE OWNER.
7. EXISTING MANHOLE FRAMES, COVERS, VALVE BOXES, AND OTHER APPURTENANCES SHALL BE ADJUSTED TO THE FINAL GRADE OR REPLACED, AS NECESSARY. UNLESS OTHERWISE SPECIFIED, THE COST FOR THIS SHALL BE CONSIDERED INCIDENTAL TO THE WORK, AND SHALL BE INCORPORATED INTO THE COSTS FOR RELEVANT ITEMS.
8. THE CONTRACTOR SHALL PROVIDE ADA COMPLIANT ACCESS THROUGH OR AROUND THE SITE AT ALL TIMES AND SHALL ENSURE THE SAFETY OF ALL THOSE PASSING THROUGH OR ADJACENT TO THE SITE.
9. ALL SIDEWALK AND CURB AND GUTTER DEMOLITION SHALL BEGIN AND END AT THE CONSTRUCTION JOINT NEAREST TO THE DEPICTED DEMOLITION EXTENTS WITH A NEAT SAWCUT LINE TO FULL DEPTH OF PAVEMENT SECTION.

STORMWATER AND ENVIRONMENTAL PROTECTION

10. THE CONTRACTOR SHALL CONFINE ALL ACTIVITIES AT THE SITE ASSOCIATED WITH CONSTRUCTION ACTIVITIES, TO INCLUDE STORAGE OF EQUIPMENT AND OR MATERIALS, ACCESS TO THE WORK, FORMWORK, ETC. TO WITHIN THE DESIGNATED LIMITS OF DISTURBANCE (LOD).

TREE PROTECTION

11. TREES SHALL BE PROTECTED PER THE REQUIREMENTS OF ARLINGTON PARKS & RECREATION STANDARD.

TRAFFIC CONTROL

12. CONTRACTOR SHALL NOTIFY THE PROJECT OFFICER AT LEAST 3 WORKING DAYS PRIOR TO DISTURBING ANY EXISTING, OR INSTALLING ANY NEW, TRAFFIC SIGNS, SIGNALS, OR OTHER TRAFFIC CONTROL DEVICES.
13. THE CONTRACTOR SHALL PREMARK THE LAYOUT OF ANY PERMANENT TRAFFIC CONTROL STRIPING, INDICATING THE PROPOSED LOCATION AND TYPE OF MARKING TO BE INSTALLED. THE PREMARKING MAY CONSIST OF TYPE D TAPE, CHALK, OR LUMBER CRAYONS. THE CONTRACTOR SHALL ALLOW 3 WORKING DAYS FOR THE INSPECTION AND APPROVAL OF THE PREMARKINGS PRIOR TO PLACING THE PERMANENT MARKINGS.
14. THE CONTRACTOR SHALL SUBMIT ANY REQUESTS FOR TEMPORARY "NO PARKING" RESTRICTIONS TO THE PROJECT OFFICER AT LEAST 5 BUSINESS DAYS PRIOR TO THE DESIRED ONSET OF RESTRICTIONS. PRIOR TO A REQUEST FOR THE REMOVAL OF ACCESS TO ANY ADA PARKING SPACE THE CONTRACTOR MUST HAVE MADE PROVISION FOR ALTERNATIVE ADA PARKING AS INDICATED ON THE APPROVED PLAN OR AS DIRECTED BY THE PROJECT OFFICER.
15. WHEN THE APPROVED PLAN CALLS FOR THE REMOVAL OF ANY PARKING METER THE CONTRACTOR MUST MAKE A REQUEST TO THE PROJECT OFFICER AT LEAST ONE WEEK IN ADVANCE OF THE DESIRED REMOVAL. THE PROJECT OFFICER WILL THEN COORDINATE THE PARKING METER REMOVAL WITH TRAFFIC ENGINEERING AND OPERATIONS.
16. THE CONTRACTOR SHALL PRESERVE ALL BUS STOPS, INCLUDING MAINTAINING ADEQUATE ACCESSIBILITY THROUGH AND ADJACENT TO THE CONSTRUCTION FOR BUSES AND THEIR PASSENGERS. THE CONTRACTOR SHALL NOT CLOSE, RELOCATE, OR OTHERWISE MODIFY A BUS STOP WITHOUT PRIOR REQUEST OF THE PROJECT OFFICER. ANY RELOCATION OR CLOSURE OF A BUS STOP SHALL REQUIRE AT LEAST FOUR WEEKS ADVANCE NOTICE FOR COORDINATION WITH THE COUNTY'S BUS STOP COORDINATOR - 703-228-3049.
17. WHEN CONDITIONS WARRANT DUE TO TRAFFIC VOLUMES, PATTERNS, OR SPECIAL EVENTS, THE COUNTY MAY SUSPEND OR OTHERWISE DIRECT THE CONTRACTOR'S ACTIVITIES TO PROTECT THE PUBLIC AND OR THE COUNTY'S TRANSPORTATION NETWORK.

WATER DISTRIBUTION, STORM AND SANITARY SEWER SYSTEMS

18. UNLESS OTHERWISE DIRECTED, CONTRACTORS ARE EXPRESSLY PROHIBITED FROM OPERATING ANY WATER VALVES OR APPURTENANCES. CONTRACTORS SHALL SUBMIT ALL REQUESTS FOR VALVE OPERATIONS TO THE PROJECT OFFICER AT LEAST 1 WEEK IN ADVANCE OF THE REQUIRED OPERATION.
19. IN THE EVENT OF A WATER OR SEWER EMERGENCY, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE COUNTY'S WATER CONTROL CENTER AT 703-228-6555 AND THE PROJECT OFFICER.
20. THE CONTRACTOR SHALL COORDINATE ALL UTILITY SHUTOFFS, DISCONNECTS, AND/OR ABANDONMENT WITH UTILITY OWNER AND PROJECT OFFICER AT LEAST 1 WEEK IN ADVANCE OF THE REQUIRED INTERRUPTION.

FIRE DEPARTMENT NOTES:

21. ALL EXISTING FIRE HYDRANTS AND FIRE DEPARTMENT CONNECTIONS SHALL BE MAINTAINED UNOBSTRUCTED AND ACCESSIBLE AT ALL TIMES IN ACCORDANCE WITH SECTIONS 507.5.4 AND 507.5.5 OF THE ARLINGTON COUNTY FIRE PREVENTION CODE.
22. ACCESS TO BUILDINGS FOR FIREFIGHTING SHALL BE MAINTAINED AT ALL TIMES. EXISTING FIRE APPARATUS ACCESS ROADS (FIRE LANES) SHALL BE KEPT CLEAR OF OBSTRUCTIONS IN ACCORDANCE WITH SECTION 503.4 OF THE ARLINGTON COUNTY FIRE PREVENTION CODE. ACCESS TO CONSTRUCTION SITES SHALL BE PROVIDED AND MAINTAINED IN ACCORDANCE WITH SECTION 3310 OF THE ARLINGTON COUNTY FIRE PREVENTION CODE.
23. IN THE EVENT THAT EXISTING FIRE DEPARTMENT CONNECTIONS OR FIRE APPARATUS ACCESS ROADS (FIRE LANES) MUST BE OBSTRUCTED TO FACILITATE CONSTRUCTION ACTIVITIES, CONTACT THE ARLINGTON COUNTY FIRE DEPARTMENT FIRE PREVENTION OFFICE AT 703-228-4644 TO COORDINATE REVIEW AND APPROVAL OF TEMPORARY FIRE DEPARTMENT CONNECTIONS AND/OR FIRE APPARATUS ACCESS ROADS PRIOR TO CREATING THE OBSTRUCTION.

SHEET LIST:

C000.1	COVER SHEET
C002.1-C002.2	CONSTRUCTION DETAIL NOTES
C004.1-C004.2	CONSTRUCTION DETAILS
C006.1	LEGEND
C011.1	EXISTING CONDITIONS PLAN
C041.1	GRADING PLAN
C041.2	LONGITUDINAL PROFILE
C041.3	SEDIMENT STABILITY ANALYSIS
C044.1	CROSS SECTIONS
C045.1	GEOMETRIC CONTROL PLAN
C071.1	STORM SEWER DRAINAGE DIVIDES
C075.1	STORM SEWER PLAN & PROFILE
C075.2-C075.3	STORM COMPUTATIONS
C081.1	TREE CONSERVATION PLAN
C081.2-C081.3	TREE INVENTORY
C081.4	TREE CONSERVATION NOTES
C081.5	TREE CONSERVATION DETAILS

ADT

NO DATA - 5TH ROAD S.
NO DATA - S. KENSINGTON ST.

STREET CLASSIFICATION

5TH STREET ST. - NEIGHBORHOOD MINOR
S. KENSINGTON ST. - NEIGHBORHOOD MINOR

POSTED SPEED

5TH STREET S. - 25 MPH
S. KENSINGTON ST. - 25 MPH

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SEAL

30% SUBMISSION

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	7/22/2025
WATER, SEWER, STREETS BUREAU CHIEF	7/22/2025
ENGINEERING BUREAU CHIEF	7/28/2025
Christin Conaway Jolicoeur, PROJECT MANAGER	7/17/2025

REVISIONS	DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

COVER SHEET

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

PLOTTED: JULY 3 2025

SCALE:
AS SHOWN

C000.1

FILLNAME: COVER.DWG PATH: L:\28000\28400\28467.02\CADD\04-ENGR\04-CONCEPT PLOTTED BY: CCD232

REVISED ON 2/15/2024

GENERAL STRUCTURE NOTES

1. REFER TO THE SUPPLEMENTAL SPECIFICATIONS FOR ANY ADDITIONAL INFORMATION ON PROPOSED STRUCTURES. THE "GENERAL STRUCTURE NOTES" AND ADDITIONAL "ROCK AND LOG GRADE CONTROL STRUCTURE NOTES" PROVIDED IN THE CONSTRUCTION DRAWINGS ARE INTENDED TO REITERATE KEY ELEMENTS DESCRIBED IN THE CONSTRUCTION DETAILS AND SPECIFICATIONS. ANY DISCREPANCY BETWEEN INFORMATION IN THIS PLAN SET AND INFORMATION IN THE SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE COUNTY FOR DIRECTION ON HOW TO PROCEED PRIOR TO BIDDING, ORDERING, DELIVERING, OR INSTALLING ANY PROJECT PRODUCTS OR MATERIALS.
2. CONTRACTOR MUST REFER TO THE SPECIFICATIONS, ROCK AND LOG GRADE CONTROL STRUCTURE CONSTRUCTION NOTES, GRADING PLAN, LONGITUDINAL PROFILE, STRUCTURE TABLES AND CONSTRUCTION DETAILS FOR LOCATION, ELEVATION, DIMENSION AND INSTALLATION INFORMATION FOR ALL STRUCTURES.
3. REFER TO THE TYPICAL RIFFLE CROSS-SECTION DETAIL FOR COIR FABRIC AND REINFORCED BED MATERIAL PLACEMENT ALONG ALL STREAM BANKS FOR THIS PROJECT.
4. FOR ANY ROCK STRUCTURE OR LOG STRUCTURE THAT REQUIRES BACKFILL, THE STRUCTURE SHALL BE UNDERLAIN WITH NON-WOVEN POLYPROPYLENE GEOTEXTILE FABRIC, AS NOTED IN THE CONSTRUCTION DETAILS.
5. WHEN EXCAVATION IS REQUIRED TO INSTALL STRUCTURE ROCKS, ANY EXCESS EXCAVATION AREA BEHIND THE HEADER ROCKS SHALL BE BACKFILLED WITH REINFORCED BED MATERIAL, AND FOOTER ROCKS SHALL BE BACKFILLED WITH STRUCTURAL FILL. IF EXCESS EXCAVATION EXCEEDS 3' IN WIDTH, BACKFILL BEYOND 3' SHALL BE STRUCTURAL FILL.
6. GRADING PLANS DEPICT THE GENERAL NEED FOR SILLS AT SPECIFIC LOCATIONS, BUT DUE TO SITE SPECIFIC CONDITIONS MAY REQUIRE SHORTER OR LONGER SILLS THAN DEPICTED ON THE PLANS IN ORDER TO MEET THE ROCK AND LOG GRADE CONTROL STRUCTURE CONSTRUCTION NOTE #6.
7. ROCK AND LOG SYMBOLS SHOWN IN PLAN, PROFILE AND TYPICAL DETAILS THROUGHOUT THE PLAN SET ARE MEANT TO SHOW GENERAL DESIGN INTENT, BUT NOT THE EXACT NUMBER OR SIZE OF ROCKS OR LOGS IN EACH STRUCTURE. THE NUMBER AND SIZE OF ROCKS OR LOGS NEEDED TO CONSTRUCT ANY STRUCTURE IS DICTATED BY THE SIZE OF THE SPECIFIC STRUCTURE AND THE REQUIREMENTS PROVIDED IN THE SPECIFICATIONS AND PLANS. FOR EXAMPLE, THOUGH A DETAIL MAY SHOW ONLY ONE COURSE OF FOOTER ROCK OR ONE LOG, THE EXISTING FIELD CONDITIONS, PROPOSED CHANNEL DIMENSIONS, MINIMUM FOOTER SUBGRADE ELEVATION, PROPOSED STRUCTURE (DIMENSION, LOCATIONS AND ELEVATIONS) AND MINIMUM ROCK OR LOG DIMENSIONS MAY NECESSITATE MORE THAN ONE COURSE OF FOOTER ROCK OR LOG TO PROPERLY CONSTRUCT THE DESIGN.

ROCK AND LOG GRADE CONTROL STRUCTURE CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL REFER TO THE SPECIFICATIONS, CONSTRUCTION DETAILS, CONSTRUCTION NOTES, GRADING PLAN, LONGITUDINAL PROFILE, CROSS SECTIONS, AND STRUCTURE POINT TABLES FOR LOCATION, ELEVATION, DIMENSION, AND INSTALLATION INFORMATION FOR ALL GRADE CONTROL STRUCTURES.
2. ALL STRUCTURE ROCK AND LOG SHALL MEET THE REQUIREMENTS FOR "ROCK" AND "LOG" DEFINED IN THE CONTRACT SPECIFICATIONS AND CONSTRUCTION DRAWINGS.
3. ALL STRUCTURE ROCK AND LOG SHALL MEET THE MINIMUM SIZE REQUIREMENTS SPECIFIED IN THE STRUCTURE ROCK AND LOG DIMENSIONS TABLES AND IN NO CASE SHALL THE SMALLEST DIMENSION OF STRUCTURE ROCK BE LESS THAN 1.5-FEET AND THE CUMULATIVE VOLUME OF THE X, Y AND Z AXIS BE LESS THAN 7.5 CU. FT. FOR A CHANNEL WITH BANKFULL WIDTH LESS THAN 10 FEET OR 18 CU. FT. FOR A CHANNEL WITH BANKFULL WIDTH GREATER THAN 10 FEET. SEE STRUCTURE ROCK TABLE FOR MORE INFORMATION ON DIMENSIONS.
4. THE TERMS "HEADER" AND "TOP" ROCKS AND "HEADER" AND "TOP" LOGS ARE USED INTERCHANGEABLY IN THE SPECIFICATIONS AND PLANS, BUT GENERALLY DESCRIBE THE HIGHEST LAYER OF STRUCTURE ROCK THAT WILL BE VISIBLE ON THE SURFACE AFTER CONSTRUCTION.
5. "FOOTER" ROCKS DESCRIBE THE FIRST COURSE OF ROCK INSTALLED ONTO THE REQUIRED SUBGRADE MATERIAL ELEVATION AND EACH SUBSEQUENT COURSE OF ROCK INSTALLED UNDER THE HEADER ROCKS TO ACHIEVE THE SPECIFIED SUBGRADE AND HEADER ROCK ELEVATIONS.
6. "SILL" ROCKS DESCRIBE STRUCTURE ROCKS SET ADJACENT TO THE HEADER ROCK AT THE TOP OF BANK OR BANKFULL TIE-IN POINTS OF THE STRUCTURE AND EXTEND OUTWARD A MINIMUM OF 4-FEET FROM THE OUTSIDE EDGE OF THE HEADER ROCK AT THE SAME ELEVATION AS THE ADJACENT STRUCTURE POINT AND/OR AT THE PROPOSED GRADE INTO FILL AND/OR IN-SITU BANK MATERIAL. SILLS INSTALLED IN AREAS OF FILL SHALL REQUIRE HEADER AND FOOTER ROCKS AND EXTEND ACROSS THE FULL WIDTH OF THE FILL AREA AND A MINIMUM OF 4-FEET INTO IN-SITU MATERIAL.
7. SEDIMENTARY ROCK (INCLUDING LIMESTONE) SHALL NOT BE USED FOR STRUCTURE ROCK.
8. HACKBERRY TREES SHALL NOT BE USED FOR IN STREAM GRADE CONTROL STRUCTURES.
9. WHERE MULTIPLE COURSES OF STRUCTURE ROCK IS REQUIRED, THE STRUCTURE ROCK SHALL BE UNIFORMLY STACKED IN AN IMBRICATED MANNER, WITH THE EDGES OF ALL STRUCTURE ROCK INSTALLED OVERLAPPING BY A MINIMUM OF 6-INCHES, BOTH HORIZONTALLY AND VERTICALLY.
10. EACH STACKED STRUCTURE ROCK SHALL REST FIRMLY ON TWO UNDERLYING STRUCTURE ROCKS AND SEAMS BETWEEN STRUCTURE ROCKS SHALL NOT ALIGN WITH THE SEAMS BETWEEN THE UNDERLYING STRUCTURE ROCK.
11. THE USE OF SMALLER ROCK AS SHIMS BETWEEN COURSES OF FOOTER ROCKS AND BETWEEN FOOTER ROCKS AND HEADER ROCKS TO INCREASE THE FINAL ELEVATION OF HEADER ROCKS SHALL NOT BE ACCEPTABLE.
12. THE SIZE AND SHAPE OF INDIVIDUAL STRUCTURE ROCKS AND THE SPECIFIED SUBGRADE AND HEADER ROCK ELEVATIONS MAY REQUIRE THE CONTRACTOR TO PLACE THE X, Y, OR Z AXIS OF THE STRUCTURE ROCK IN THE CHANNEL LONGITUDINALLY OR PERPENDICULARLY ALONG THE GRADE CONTROL STRUCTURE LAYOUT.
13. THE BOTTOM ELEVATION OF ALL FOOTER ROCKS MUST EXTEND A MINIMUM OF 1.5 FEET BELOW THE LOWEST OF THE PROPOSED GRADES ASSOCIATED WITH THE STRUCTURE (GENERALLY THE BOTTOM OF THE POOL IMMEDIATELY DOWNSTREAM OF OR ADJACENT TO THE GRADE CONTROL STRUCTURE, IF APPLICABLE).
14. UNLESS OTHERWISE SPECIFIED IN THE CONSTRUCTION DRAWINGS, ALL HEADER ROCKS ARE FOOTER ROCKS. MORE THAN 1 COURSE OF FOOTER ROCK MAY BE NECESSARY TO ACHIEVE THE REQUIRED SUBGRADE ELEVATIONS AND HEADER ROCK ELEVATIONS. DEPTH OF FOOTERS AND NUMBER OF FOOTER ROCK COURSES SHALL BE BASED ON PROPOSED THALWEG DEPTH, SUBGRADE REQUIREMENTS AND HEADER ROCK ELEVATIONS, AS SHOWN ON THE LONGITUDINAL PROFILE, CONSTRUCTION DETAILS AND STRUCTURE TABLES.
15. ALL STRUCTURE ROCKS SHALL BE PLACED SO THAT THE TOPS OF THE ROCKS (AND AS MUCH OF THE ROCK AS POSSIBLE BELOW THE TOPS) ARE IN CONTACT WITH ADJACENT STRUCTURE ROCKS TO FORM A WEIR IN THE CHANNEL. GAPS BETWEEN STRUCTURE ROCKS SHALL BE MINIMIZED TO THE GREATEST EXTENT POSSIBLE.
16. ANY UNAVOIDABLE GAPS BETWEEN STRUCTURE ROCKS (BELOW THE TOPS OF ROCKS) GREATER THAN 2.5" X 4" SHALL BE CHINKED WITH SMALLER ROCKS TO PLUG THE GAPS FROM THE UPSTREAM SIDE OF THE STRUCTURE PRIOR TO FINALIZING BACKFILL. CHINKING MATERIAL SHALL BE THE LARGEST ROCK THAT CAN FIT INTO AND FILL THE GAP BEING CHINKED.
17. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER (OR OWNER'S REPRESENTATIVE) FOR INSPECTION AND APPROVAL OF ALL FOOTER PLACEMENT AND CHINKING PRIOR TO INSTALLING ADDITIONAL COURSES OF FOOTER ROCK, HEADER ROCK, GEOTEXTILE FABRIC AND BACKFILLING WITH REINFORCED BED MATERIAL (RBM).
18. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER (OR OWNER'S REPRESENTATIVE) FOR INSPECTION AND APPROVAL OF ALL HEADER ROCK PLACEMENT AND CHINKING PRIOR TO PLACEMENT OF GEOTEXTILE FABRIC AND BACKFILLING WITH RBM.
19. THE TOP, DOWNSTREAM EDGE OF THE HEADER ROCKS SHALL BE PLACED AT THE LOCATIONS AND ELEVATIONS SPECIFIED IN THE CONSTRUCTION DETAIL, LONGITUDINAL PROFILE AND STRUCTURE POINT TABLE.
20. WHEN EXCAVATION IS REQUIRED TO INSTALL STRUCTURE ROCKS, ANY EXCESS EXCAVATION AREA BEHIND THE HEADER ROCKS SHALL BE BACKFILLED WITH REINFORCED BED MATERIAL, AND FOOTER ROCKS SHALL BE BACKFILLED WITH STRUCTURAL FILL. IF EXCESS EXCAVATION EXCEEDS 3' IN WIDTH, BACKFILL SHALL BE IN ACCORDANCE WITH STREAMBANK FILL SPECIFICATIONS. ANY STRUCTURE ROCK LOCATED IN AN AREA OF FILL SHALL BE BACKFILLED IN ACCORDANCE WITH STREAMBANK FILL SPECIFICATIONS.
21. RBM BACKFILL BETWEEN THE STREAM BANKS AND THE VANE ARMS OF CROSS VANE, MODIFIED CROSS VANE, AND ROCK VANE TYPE STRUCTURES SHALL BE INSTALLED AS A BENCH FOLLOWING THE ELEVATION AND SLOPE OF THE VANE ARM. THE BENCH SHALL WIDTH SHALL BE AT LEAST 3 FEET AT THE UPSTREAM END OF STRUCTURE, UNLESS SHOWN TO BE GREATER ON THE GRADING PLAN, AND SHALL NARROW AS THE VANE ARM SLOPES UPWARD.
22. STRUCTURES SHALL BE UNDERLAIN WITH NON-WOVEN GEOTEXTILE FABRIC. THE FABRIC SHALL EXTEND FROM UNDER THE STRUCTURE UP THE UPSTREAM SIDE OF THE STRUCTURE TO BEYOND THE TOP OF THE PROPOSED GRADE. FABRIC MUST REMAIN VISIBLE UNTIL THE STRUCTURE AS-BUILT SURVEY IS ACCEPTED, AND THEN CUT FLUSH WITH PROPOSED GRADES.
23. THE CONTRACTOR SHALL REFER TO THE LONGITUDINAL PROFILE, CONSTRUCTION DETAILS AND RBM DETAIL FOR TYPE AND MINIMUM THICKNESS OF RBM TO BE INSTALLED IN ASSOCIATION WITH ROCK GRADE CONTROL STRUCTURES.
24. STRUCTURES SPECIFIED WITH SLOPES IN THE CONSTRUCTION DETAILS SHALL BE INSTALLED WITH THE STRUCTURE ROCK PLACED AT CONSISTENT SLOPES WITHOUT UNDULATIONS GREATER THAN TWO-TENTHS OF A FOOT.
25. ALL LOGS, PILE LOGS, LIMBS, BRANCHES AND ROOT FANS USED FOR CONSTRUCTION OF LOG GRADE CONTROL STRUCTURES, IN-STREAM WOODY DEBRIS HABITAT STRUCTURE AND FLOODPLAIN WOODY DEBRIS HABITAT STRUCTURES SHALL MEET THE DIMENSION REQUIREMENTS IDENTIFIED IN THE CONSTRUCTION DRAWINGS.
26. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAKE ALL NECESSARY ARRANGEMENTS TO HARVEST AND STAGE/STOCKPILE ALL TREES IDENTIFIED FOR REMOVAL IN THE CONSTRUCTION DRAWINGS AND ANY ADDITIONAL TREE IDENTIFIED DURING ONSITE INSPECTION AND VERIFICATION WHICH ARE REQUIRED FOR INSTALLATION OF THE LOG GRADE CONTROL STRUCTURES, IN-STREAM WOODY DEBRIS HABITAT STRUCTURE AND FLOODPLAIN WOODY DEBRIS HABITAT STRUCTURES SHOWN IN THE CONSTRUCTION DRAWINGS.
27. THE CONTRACTOR SHALL FELL AND STOCKPILE TREES IDENTIFIED FOR REMOVAL WITH CARE TAKEN TO PRESERVE THE PILE LOGS, TRUNKS, LIMBS, BRANCHES AND ROOT FANS, PER THE INTENDED USE OF THE TREE IN THE CONSTRUCTION OF LOG GRADE CONTROL STRUCTURES, IN-STREAM WOODY DEBRIS HABITAT STRUCTURE AND FLOODPLAIN WOODY DEBRIS HABITAT STRUCTURES SHOWN IN THE CONSTRUCTION DRAWINGS.
28. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PROPER AND NECESSARY HANDLING OF LOGS, PILE LOGS, LIMBS AND ROOT WADS DURING CLEARING, STAGING, TRANSPORTING AND INSTALLATION TO ENSURE AN ADEQUATE SUPPLY OF LOGS, PILE LOGS, LIMBS, BRANCHES AND ROOT WADS ARE AVAILABLE FOR INSTALLATION OF THE LOG GRADE CONTROL STRUCTURES, IN-STREAM WOODY DEBRIS HABITAT STRUCTURE AND FLOODPLAIN WOODY DEBRIS HABITAT STRUCTURES SHOWN IN THE CONSTRUCTION DRAWINGS (SEE LOG DIMENSION TABLE FOR SIZE REQUIREMENTS).
29. WHERE MULTIPLE COURSES OF LOGS ARE REQUIRED, THE STRUCTURE LOGS SHALL BE UNIFORMLY STACKED TO MINIMIZE GAPS BETWEEN THE LOGS AND CABLED TOGETHER.
30. TOLERANCES FOR LOCATIONS, ELEVATIONS, AND DIMENSIONS OF THE STRUCTURES AND CHANNELS ARE PROVIDED IN THE SPECIFICATIONS.
31. STRUCTURE POINTS SHALL BE USED IN CONJUNCTION WITH THE LONGITUDINAL PROFILE AND CONSTRUCTION DETAILS TO DETERMINE STRUCTURE PLACEMENT FOR BOTH ROCK AND LOG GRADE CONTROL STRUCTURES. STRUCTURE POINTS SHALL BE INCLUDED IN THE AS-BUILT SURVEY TO VERIFY CONFORMANCE WITH THE SPECIFIED TOLERANCES. STRUCTURE POINTS ON ROCK GRADE CONTROL STRUCTURES SHALL BE LOCATED ON THE DOWNSTREAM EDGE OF HEADER ROCKS UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DETAILS. ROCK STRUCTURE POINTS SHALL BE MONUMENTED WITH AN ANGLE GRINDER DURING THE AS-BUILT SURVEY, EFFECTIVELY CREATING AN "X" WHERE THE SHOT WAS TAKEN.
32. COIR FIBER MATTING SHALL BE PLACED ALONG THE STREAM BANK, GRADE CONTROL STRUCTURES, HABITAT STRUCTURES, AND ALL GRADED AREAS SHOWN IN THE CONSTRUCTION DRAWINGS. COIR FIBER MATTING SHALL BE UNROLLED ALONG THE EDGE OF THE RBM AND/OR GRADE CONTROL STRUCTURE OR HABITAT STRUCTURE AND INSTALLED IN SEQUENTIAL COURSES ACROSS THE FULL WIDTH OF ANY BANKFULL OR LOW FLOW BENCHES, IF PRESENT, TO THE FULL EXTENTS OF GRADING. COIR FIBER MATTING SHALL BE PLACED IN FULL CONTACT WITH THE STRAW MULCH AND SOIL. ALL EXTERIOR EDGES (THOSE EDGES NOT OVERLAPPING WITH AN ADJACENT COIR FIBER MATTING ROLL) SHALL BE "KEYED" INTO THE GROUND TO A MINIMUM DEPTH OF SIX INCHES, SEAMLESS (WITHOUT ANY BULGES, HUMPS, OR GAPS), STAKED AT TWO-FEET CENTER-TO-CENTER, INSPECTED AND APPROVED BY THE OWNER, AND MONITORED BY THE OWNER FOR THE DURATION OF THE CONSTRUCTION.
33. DOWNSTREAM FACE OF HEADER ROCKS SHALL BE OFFSET A MINIMUM OF 6" UPSTREAM FROM THE DOWNSTREAM FACE OF THE FOOTER ROCK, AS SHOWN IN THE CONSTRUCTION DETAILS OF THE CONTRACT DOCUMENTS.

SEE SUPPLEMENTAL SPECIFICATIONS FOR ADDITIONAL INFORMATION

FILENAME: TYPICAL SECTIONS & DETAILS.DWG PATH: I:\28000\S\28400\28467.02\CADD\04-ENGR\04-CONCEPT PLOTTED BY: CC0232

ARLINGTON VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
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SEAL

30% SUBMISSION

APPROVALS DATE

DESIGN TEAM ENGINEER SUPERVISOR

WATER, SEWER, STREETS BUREAU CHIEF

ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

CONSTRUCTION DETAIL NOTES

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

PLOTTED: JULY 3 2025

SCALE:
N/A

C002.1

"REINFORCED BED MIXTURE" (RBM) SPECIFICATIONS

REINFORCED BED MIXTURE (RBM) IS UTILIZED IN THE BED OF THE STREAM, AND IN SOME CASES OTHER AREAS, TO PROVIDE A STABLE SUBSTRATE OR FILL AREA. THE RBM PRODUCT VARIES IN ITS MATERIAL, MANUFACTURING PROCESS AND INSTALLATION EXECUTION, AS DESCRIBED BELOW:

MATERIAL: GENERALLY, RBM SHALL CONSIST OF ROCK (RIP RAP) MIXED WITH BANK RUN GRAVEL, COARSE SAND AND TOPSOIL. THERE ARE FOUR (4) TYPES OF RBM, EACH CATEGORIZED BY THEIR LARGEST ROCK SIZE WHICH RANGES FROM VDOT CLASS A1 TO VDOT CLASS III. THEY ARE REFERRED TO AS "SMALL COBBLE RBM", "LARGE COBBLE RBM", "CL A1 RBM", "CL I RBM", "CL II RBM" AND "CLIII RBM" THROUGHOUT THESE PLANS.

EACH TYPE OF RBM MUST MEET THE MATERIAL SPECIFICATIONS PROVIDED IN TABLE 1 BELOW.

TABLE 1		PORTION OF VOLUME PER RBM MIXTURE					
MATERIAL CATEGORY	MATERIAL SIZE RANGE	SMALL COBBLE RBM	LARGE COBBLE RBM	CL A1 RBM	CL I RBM	CL II RBM	CL III RBM
ROCK	SMALL COBBLE - D50 = 4" - 6"	20%	5%				
	LARGE COBBLE - D50 = 8" - 12"	20%	40%				
	VDOT CL A1 RIPRAP - D_{50} = 6.7" - 10.8"			35 - 40%		10 - 15%	10 - 15%
	VDOT CL I RIPRAP - D_{50} = 13.2"				35 - 40%		
	VDOT CL II RIPRAP - D_{50} = 19.2"					55- 65%	
	VDOT CL III RIPRAP - D_{50} = 26.4"						55- 65%
COBBLE	2.5" - 10.1" (64 - 256 mm)			5 - 10%	5 - 10%	3 - 7%	3 - 7%
BANK RUN GRAVEL	WELL GRADED GRAVEL (0.08" - 2.5") D_{50} = 1.3"	15 - 25%	20 -30%	30 - 35%	30 - 35%	7 - 12%	7 - 12%
COARSE SAND	0.04" - 0.08" (1 - 2 mm)	12 - 17%	12 - 17%	12 - 17%	12 - 17%	5 - 10%	5 - 10%
TOPSOIL	LOAM OR SILT LOAM WITH 3 - 5% ORGANIC CONTENT	7 - 12%	7 - 12%	7 - 12%	7 - 12%	3 - 7%	3 - 7%
WOODCHIPS		5 -10%	5 -10%	5 - 10%	5 - 10%		

1. EACH RBM TYPE SHALL CONTAIN THE PERCENTAGE BY VOLUME OF THE MATERIALS AS SPECIFIED IN TABLE 1.
2. THE ROCK PORTION OF ANY RBM MIXTURE SHALL CONSIST OF DIABASE STONE AND/OR RIVER WASHED COBBLE (SIMILAR IN COLOR TO THE NATIVE MATERIAL FOUND ON SITE) AND SHALL HAVE A D_{50} SIZE AS SPECIFIED IN TABLE 1 ABOVE FOR THE TYPE OF RBM SPECIFIED.
3. THE BANK RUN GRAVEL MAY INCLUDE UP TO 5% CLAY, SILT AND/OR SAND AND UP TO 25% COBBLE (D_{50}= 3" - 8"). THE GRAVEL MUST HAVE A NATURAL COLOR SIMILAR TO THE NATIVE MATERIAL FOUND ON SITE.
4. THE SAND PORTION OF THE MIXTURE SHALL CONSIST OF A WELL MIXED SAND PREDOMINANTLY 1.0 - 2.0 MM IN SIZE AND SUBJECT TO THE PROJECT ENGINEER'S APPROVAL. WASHED CONCRETE IS NOT REQUIRED, BUT SAND MUST HAVE A NATURAL COLOR SIMILAR TO THE NATIVE MATERIAL FOUND ON SITE.
5. THE TOPSOIL PORTION OF THE MIXTURE SHALL CONSIST OF 50% SIFTED, UNWASHED COARSE SAND (WITH FINES ALLOWED), 25% COMPOSTED LEAF/BARK MULCH, AND 25% MINERAL SILT OR FINER MATERIAL (STONE DUST FROM ROCK CRUSHING OPERATIONS OR ANY SILT/CLAY).
6. DUE TO INCONSISTENCIES IN MATERIAL NORMALLY ENCOUNTERED IN THE BANK RUN GRAVEL, SAND AND TOPSOIL COMPONENTS, EACH MIX MUST BE REVIEWED AND APPROVED BY THE ENGINEER BEFORE INSTALLATION.

MANUFACTURING PROCESS

7. CL A1 AND CL I RBM TYPES MUST BE MIXED BY THE MANUFACTURER AT THEIR FACILITY. THE MIXTURE MUST BE APPROVED BY THE PROJECT ENGINEER AT THE SITE FOR CONFORMANCE WITH MATERIAL SIZE AND MIXTURE PERCENTAGES PROVIDED IN TABLE 1 PRIOR TO BEING PLACED AS SPECIFIED IN THE PLANS.
8. CL II AND CL III RBM TYPES SHALL CONSIST OF CL A1 RBM MIXED/WASHED INTO THE VOIDS OF CL II OR CL III RIPRAP, RESPECTIVELY. THE CONTRACTOR MUST ORDER THE GRAVEL, SAND AND TOPSOIL PREMIXED FROM THE MANUFACTURER SEPARATELY FROM THE ROCK COMPONENTS. THE GRAVEL, SAND AND TOPSOIL MIXTURE AND ROCK COMPONENT MUST BE APPROVED SEPARATELY BY THE PROJECT ENGINEER AT THE SITE FOR CONFORMANCE WITH MATERIAL SIZE AND MIXTURE PERCENTAGES PROVIDED IN TABLE 1 PRIOR TO BEING PLACED AS SPECIFIED IN THE PLANS.

INSTALLATION/EXECUTION PROCESS

9. THE CONTRACTOR SHALL PREPARE THE SUBGRADE IN PREPARATION OF RBM INSTALLATION TO THE DEPTH REQUIRED TO ACHIEVE THE RBM DEPTH, WIDTH AND INVERTS INDICATED ON THE LONGITUDINAL PROFILE AND TYPICAL DETAILS.
10. FOR CL A1 AND CL I RBM WITH INSTALLATION DEPTHS EQUAL TO OR LESS THAN 18 INCHES, THE PREMIXED PRODUCT MAY BE PLACED IN A SINGLE LIFT. FOR DEPTHS GREATER THAN 18 INCHES, THE RBM MUST BE PLACED IN LIFTS NO GREATER THAN 12 INCHES. THE CONTRACTOR SHALL INSPECT THE INSTALLATION OF RBM TO ENSURE THE PRODUCT IS INSTALLED AS A HETEROGENEOUS MIXTURE VISUALLY FREE OF VOIDS GREATER THAN 1 SQUARE INCH.
11. FOR CL II AND CL III RBM, THE CONTRACTOR SHALL INSTALL THE MIXTURE USING THE FOLLOWING METHOD TO ENSURE MINIMUM VOIDS REMAIN WITHIN THE PLACED MATERIAL:
    1) STARTING AT THE UPSTREAM END OF THE REACH, THE LARGEST ROCK COMPONENT IS INSTALLED FIRST TIGHT ENOUGH SUCH THAT ROCKS ARE IN CONTACT WITH ADJACENT ROCKS AND THE VOIDS BETWEEN ROCKS ARE NO MORE THAN 12 INCHES.
    2) THE CL A1 ROCK IS THEN DROPPED INTO VOIDS GREATER THAN 8 INCHES BUT ARE NOT PLACED TO COVER VOIDS FROM THE TOP. VOIDS SHOULD REMAIN OPEN FROM THE SURFACE.
    3) THE MIXTURE OF GRAVEL, SAND AND TOPSOIL SHALL BE WASHED INTO THE VOIDS BY A "PUMPING AND WASHING" TECHNIQUE, OR TOPDRESSED IF THE PUMPING AND WASHING TECHNIQUE IS NOT FEASIBLE. A TEMPORARY POOL SHALL BE INSTALLED WITHIN THE STREAM CHANNEL AT THE DOWNSTREAM LIMIT OF ACTIVE CHANNEL WORK ZONE. WATER SHALL BE PUMPED FROM THIS POOL TO THE UPSTREAM LIMIT OF THE WORK ZONE TO WASH THE SMALLER MATERIAL MIXTURE INTO THE VOIDS OF THE LARGER ROCK AS MUCH AS NECESSARY SUCH THAT THE OVERALL RBM PRODUCT IS A MIXTURE VISUALLY FREE OF VOIDS GREATER THAN 1 SQUARE INCH.
12. REFER TO THE GRADING PLAN AND LONGITUDINAL PROFILE FOR THE LIMITS OF PLACEMENT, TYPE AND DEPTH OF THE RBM. ADDITIONAL DETAIL REGARDING PLACEMENT IS PROVIDED IN SPECIFIC STRUCTURE AND FEATURE CONSTRUCTION DETAILS.
13. REFER TO THE PLANTING PREPARATION SPECIFICATION (329100) FOR TOPSOIL/FILL MATERIAL PLACEMENT AND INSTALLATION REQUIREMENTS.

REFER TO THE PLANTING PREPARATION SPECIFICATION (329100) FOR ADDITIONAL INFORMATION ON FILL MATERIAL AND TOPSOIL.

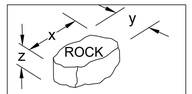
SEE SUPPLEMENTAL SPECIFICATIONS FOR ADDITIONAL INFORMATION

STRUCTURE ROCK TABLE

STRUCTURE ROCK SIZE IS INDICATED BY CHANNEL SIZE AS SPECIFIED IN THE TABLES BELOW.

TABLE A. CHANNEL W-BKF ≤ 10FT			
ROCK	X-AXIS DIMENSION (FT)	Y-AXIS DIMENSION (FT)	Z-AXIS DIMENSION (FT)
FOOTER ROCK	2.5	2	1.5
ANCHOR ROCK	2.5	2	1.5
TOP ROCK	2.5	2	1.5
SPLASH ROCK	2.5	2	1.5
SURFACE HABITAT ROCK	1	1	0.5

ALL STRUCTURE ROCK SHALL MEET THE MINIMUM SIZE REQUIREMENTS SPECIFIED IN THE STRUCTURE ROCK TABLE AND IN NO CASE SHALL THE SMALLEST DIMENSION OF STRUCTURE ROCK BE LESS THAN 1.5 FEET AND THE CUMULATIVE VOLUME OF THE X, Y AND Z AXIS BE LESS THAN 7 CU. FT. FOR A CHANNEL WITH BANKFULL WIDTH LESS THAN 10 FEET.



3 PRIMARY DIMENSIONS OF ROCK:
x = LONGEST DIMENSION
y = INTERMEDIATE DIMENSION
z = SHORTEST DIMENSION

STRUCTURE LOG TABLE

STRUCTURE	LOG DIMENSION	LOG LENGTH*
CROSS VANE TOE LOG	12 IN. MIN.	1.5 - 2 x WBKF
CROSS VANE WOODY DEBRIS TYPE - I	12 IN. MIN.	0.5 - 1 x WBKF
CROSS VANE WOODY DEBRIS TYPE - II	12 IN. MIN.	0.5 - 1 x WBKF
DEBRIS JAM TYPE I & II	12 IN. MIN.	10 FT. MIN.
DEBRIS JAM TYPE III	8 IN. MIN.	10 FT. MIN.
FLOODPLAIN WOOD ASSEMBLAGE	HEADER LOG: 18 IN. MIN. PILE LOG: 12 IN. MIN.	HEADER LOG: 12 FT. MIN. PILE LOG: 6 FT. MIN.
IN-STREAM LOG SILL & LOG SILL SPLASH LOG	12 IN. MIN.	1.5 - 2 x WBKF
IN-STREAM WOODY DEBRIS TYPE-I.A	12 IN. MIN.	MAIN LOG: 1.5 - 2 x WBKF SHORT LOG: 1 - 1.5 x WBKF
IN-STREAM WOODY DEBRIS TYPE-II.A	12 IN. MIN.	MAIN LOG: 1.5 - 2 x WBKF SHORT LOG: 1 - 1.5 x WBKF
IN-STREAM WOODY DEBRIS TYPE-III.A	12 IN. MIN.	1.5 - 2 x WBKF
IN-STREAM WOODY DEBRIS TYPE-I.B	12 IN. MIN.	WBKF
IN-STREAM WOODY DEBRIS TYPE-II.B	12 IN. MIN.	WBKF
IN-STREAM WOODY DEBRIS TYPE-III.B	12 IN. MIN.	WBKF
IN-STREAM WOODY DEBRIS TYPE-IV	12 IN. MIN.	MAIN LOG: 1.5 - 2 x WBKF TOE LOG: 0.5 - 1 x WBKF
IN-STREAM WOODY DEBRIS TYPE-V	12 IN. MIN.	1.5 - 2 x WBKF
LOG SILL CASCADE	12 IN. MIN.	MIAN LOG: 1.5 - 2 x WBKF SHORT LOG: 1 - 1.5 x WBKF
LOG STEP POOLS	MAIN LOG: 12 IN. MIN. LOGS AND LIMBS: 18 IN. MAX.	MAIN LOG: 1.5 - 2 x WBKF LOGS AND LIMBS: 6 FT. MIN.
LOG VANE	20 IN. MIN.	SEE PROFILE AND GRADING PLAN
LOG VANE WITH LOG SILL	20 IN. MIN.	SEE PROFILE AND GRADING PLAN
LOG VANE WITH ROCK SILL	20 IN. MIN.	SEE PROFILE AND GRADING PLAN
POOL ROOT WAD	FAN DIAMETER: 4 FT. MIN.	3 FT. MIN.
ROCK VANE WITH LOG SILL	12 IN. MIN.	1.5 - 2 x WBKF
ROOT WAD TOE WOOD PROTECTION	14 IN. MIN.	FOOTER LOG: 10' - 12' ROOT WAD: 12' - 14' HEADER LOG: 10' - 12'
TOE LOG	18 IN. MIN.	SEE GRADING PLAN
TREE REVETMENT MULTI-LOG	6 IN. MIN.	12 FT. MIN.
WOODY RIFFLE	18 IN. MAX.	6 FT. MIN.

*IN THE EVENT THAT LOGS OF SUFFICIENT LENGTH ARE NOT AVAILABLE ON SITE, CONTRACTOR SHALL CONSULT WITH ARLINGTON COUNTY PROJECT OFFICER AS TO WHAT ALTERNATE COURSE OF ACTION SHALL BE TAKEN.

ARLINGTON VIRGINIA
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SEAL

30% SUBMISSION

APPROVALS DATE

DESIGN TEAM ENGINEER SUPERVISOR

WATER, SEWER, STREETS BUREAU CHIEF

ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

CONSTRUCTION DETAIL NOTES

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

PLOTTED: JULY 3 2025

SCALE:
N/A

C002.2

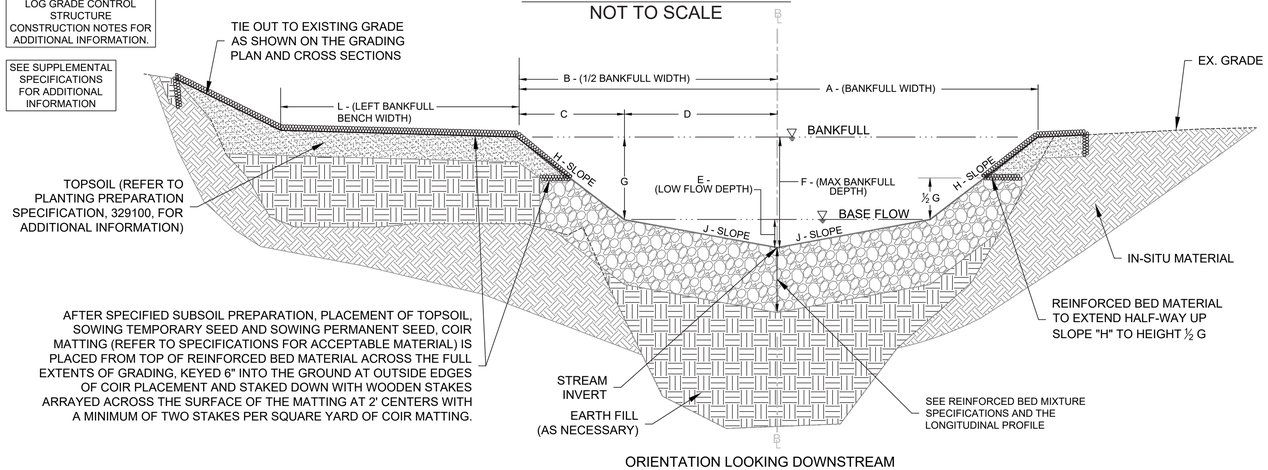
REVISED ON 2/15/2024

SEE GENERAL STRUCTURE NOTES AND THE ROCK AND LOG GRADE CONTROL STRUCTURE CONSTRUCTION NOTES FOR ADDITIONAL INFORMATION.

SEE SUPPLEMENTAL SPECIFICATIONS FOR ADDITIONAL INFORMATION

BANKFULL RIFFLE

NOT TO SCALE



AFTER SPECIFIED SUBSOIL PREPARATION, PLACEMENT OF TOPSOIL, SOWING TEMPORARY SEED AND SOWING PERMANENT SEED, COIR MATTING (REFER TO SPECIFICATIONS FOR ACCEPTABLE MATERIAL) IS PLACED FROM TOP OF REINFORCED BED MATERIAL ACROSS THE FULL EXTENTS OF GRADING, KEYED 6" INTO THE GROUND AT OUTSIDE EDGES OF COIR PLACEMENT AND STAKED DOWN WITH WOODEN STAKES ARRAYED ACROSS THE SURFACE OF THE MATTING AT 2' CENTERS WITH A MINIMUM OF TWO STAKES PER SQUARE YARD OF COIR MATTING.

ORIENTATION LOOKING DOWNSTREAM

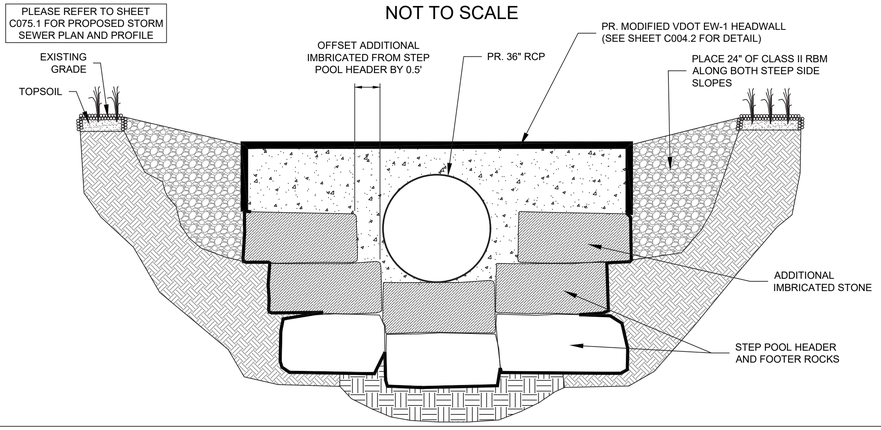
SECTION LOCATION			RIFFLE CROSS-SECTION DIMENSIONS[2]										
REACH ID	PER BASELINE STATION [1]		CROSS-SECTION PARAMETER (FT)										
	FROM	TO	A	B	C	D	E	F	G	H[2]	J[2]	K[3]	L[3]	NOTES
REACH	XX+XX.XX	XX+XX.XX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0:1	0.0:1	0.0	0.0	

BANKFULL RIFFLE NOTES:
1. REFER TO THE GRADING PLAN AND LONGITUDINAL PROFILE SHEETS FOR PLACEMENT OF ROCK STRUCTURES WITHIN THE RIFFLE SECTIONS SPECIFIED ABOVE.
2. VARIABLES "H" & "J" ARE SLOPES EXPRESSED AS HORIZONTAL:VERTICAL (H:V).
3. TYPICAL VALUES GIVEN IN TABLE ABOVE. VARIABLES MAY BE ADJUSTED TO MINIMIZE DISTURBANCE TO TREES, **BUT** THE SPECIFIED SUM OF K AND L MUST BE MET OR EXCEEDED. IF BENCH WIDTHS ARE NOT SPECIFIED OVERBANK AREAS SHOULD BE GRADED WITH A 2% CROSS SLOPE EXTENDING AS FAR AS POSSIBLE WHILE STILL ALLOWING 3:1 (MAX.) TIE OUT SLOPES. VARIABLE "L" IS THE LEFT BENCH WIDTH AND VARIABLE "K" (NOT DEPICTED IN THIS TYPICAL DETAIL) IS THE RIGHT BENCH WIDTH.

ADDITIONAL IMBRICATED STONE

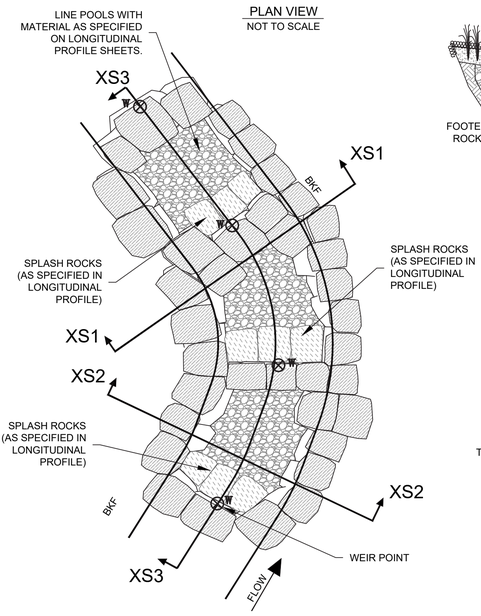
NOT TO SCALE

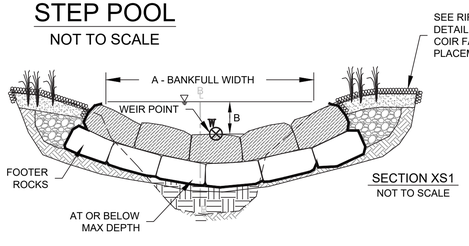
PLEASE REFER TO SHEET C075.1 FOR PROPOSED STORM SEWER PLAN AND PROFILE



STEP POOL

NOT TO SCALE

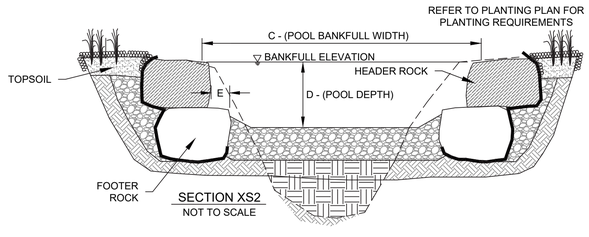




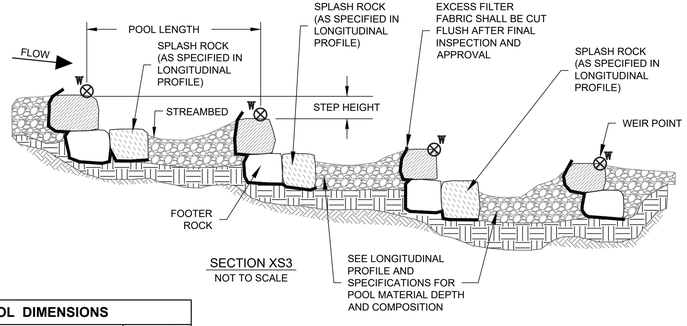
SECTION XS1
NOT TO SCALE

IN ALL CASES HEADER ROCK SEAMS SHALL NOT ALIGN WITH FOOTER ROCK SEAMS BELOW. THERE SHALL BE A MINIMUM OVERLAP OF 6". WHERE MULTIPLE COURSES OF FOOTER ROCK SEAMS SHALL NOT ALIGN WITH UNDERLYING FOOTER ROCK SEAMS.

SEE GENERAL STRUCTURE NOTES AND THE ROCK AND LOG GRADE CONTROL STRUCTURE CONSTRUCTION NOTES FOR ADDITIONAL INFORMATION.



SECTION XS2
NOT TO SCALE



SECTION XS3
NOT TO SCALE

⊗ WEIR POINTS		
STATION	WEIR POINT #	ELEVATION (FT)
XX+XX	1	XXX.XX
XX+XX	2	XXX.XX
XX+XX	3	XXX.XX
XX+XX	4	XXX.XX

STRUCTURE LOCATION			STEP POOL DIMENSIONS					
REACH ID	PER BASELINE STATION		PARAMETER (FT)					NUMBER OF POOLS
	FROM	TO	A	B	C	D	E	
REACH	XX+XX.XX	XX+XX.XX	0.0	0.0	0.0	0.0	0.0	X
REACH	XX+XX.XX	XX+XX.XX	0.0	0.0	0.0	0.0	0.0	X
REACH	XX+XX.XX	XX+XX.XX	0.0	0.0	0.0	0.0	0.0	X

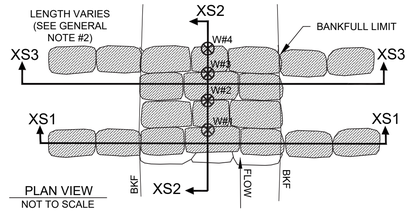
SEE SUPPLEMENTAL SPECIFICATIONS FOR ADDITIONAL INFORMATION

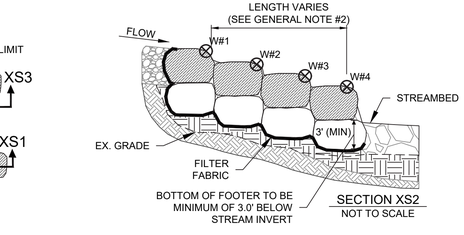
STRUCTURE DETAIL LEGEND

- REINFORCED BED MATERIAL
- IN-SITU MATERIAL
- FILL MATERIAL
- TOPSOIL (6 INCH MIN.)
- NONWOVEN GEOTEXTILE FABRIC
- COIR MATTING
- WEIR POINT
- HEADER (TOP) ROCK
- FOOTER ROCK
- SPLASH ROCK
- ANCHOR ROCK
- STEPPING STONE

ROCK CASCADE

NOT TO SCALE



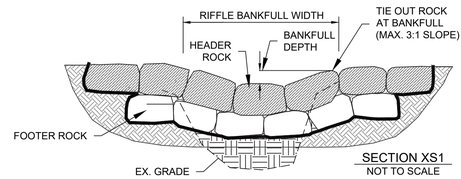


SECTION XS2
NOT TO SCALE

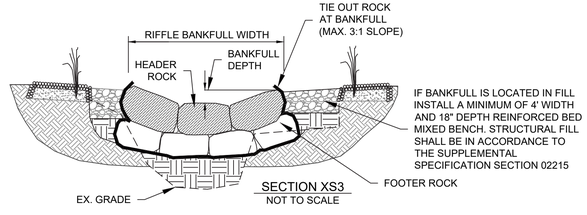
ROCK CASCADE NOTES:
1. SEE ROCK CASCADE WEIR POINTS TABLE FOR WEIR POINT LOCATIONS AND ELEVATIONS.
2. THE BOTTOM ELEVATION OF ALL FOOTER ROCKS MUST EXTEND A MINIMUM OF 1.5 FEET BELOW THE LOWEST OF THE PROPOSED GRADES ASSOCIATED WITH THE STRUCTURE (GENERALLY THE BOTTOM OF THE POOL IMMEDIATELY DOWNSTREAM OF OR ADJACENT TO THE GRADE CONTROL STRUCTURE, IF APPLICABLE).

IN ALL CASES HEADER AND FOOTER ROCK SEAMS SHALL NOT ALIGN WITH FOOTER ROCK SEAMS BELOW. THERE SHALL BE A MINIMUM OVERLAP OF 6". WHERE MULTIPLE COURSES OF FOOTER ROCKS ARE REQUIRED, THE FOOTER ROCK SEAMS SHALL NOT ALIGN WITH UNDERLYING FOOTER ROCK SEAMS.

SEE GENERAL STRUCTURE NOTES AND THE ROCK AND LOG GRADE CONTROL STRUCTURE CONSTRUCTION NOTES FOR ADDITIONAL INFORMATION.



SECTION XS1
NOT TO SCALE



SECTION XS3
NOT TO SCALE

⊗ WEIR POINTS - ROCK CASCADE								
REACH ID	STATION	WEIR POINT #	ELEVATION	ELEV. DROP (FT)	NORTHING	EASTING	BANKFULL WIDTH	BANKFULL DEPTH
REACH #	XX+XX	1	XXX	----	XXX	XXX	XXX	XXX
REACH #	XX+XX	2	XXX	XXX	XXX	XXX	XXX	XXX
REACH #	XX+XX	3	XXX	XXX	XXX	XXX	XXX	XXX
REACH #	XX+XX	4	XXX	XXX	XXX	XXX	XXX	XXX
REACH #	XX+XX	5	XXX	XXX	XXX	XXX	XXX	XXX

SEE SUPPLEMENTAL SPECIFICATIONS FOR ADDITIONAL INFORMATION

ARLINGTON VIRGINIA
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SEAL

30% SUBMISSION

APPROVALS DATE

DESIGN TEAM ENGINEER SUPERVISOR

WATER, SEWER, STREETS BUREAU CHIEF

ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

CONSTRUCTION DETAILS

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

PLOTTED: JULY 3 2025

SCALE:
N/A

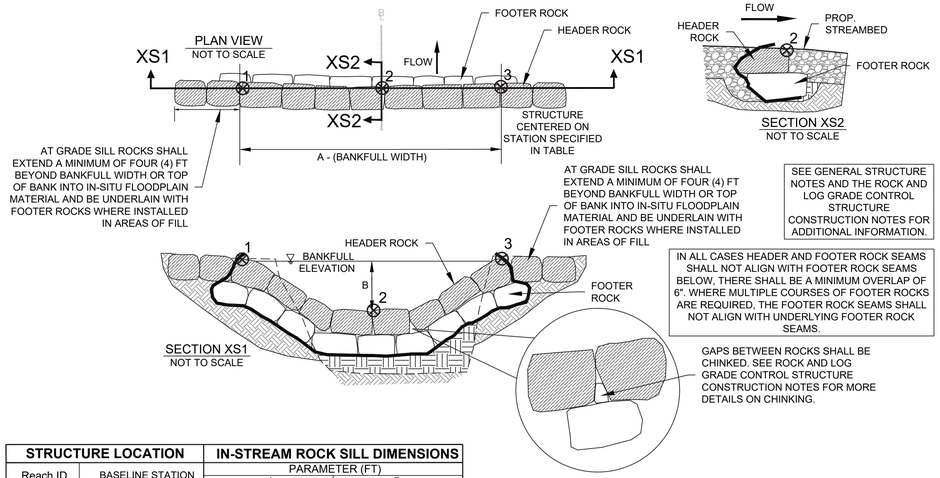
C004.1

REVISED ON 2/15/2024

SEE SUPPLEMENTAL SPECIFICATIONS FOR ADDITIONAL INFORMATION

IN-STREAM ROCK SILL-STRAIGHT

NOT TO SCALE



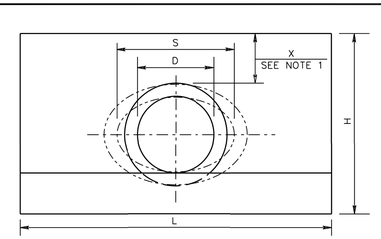
STRUCTURE LOCATION		IN-STREAM ROCK SILL DIMENSIONS	
		PARAMETER (FT)	
Reach ID	BASELINE STATION	A	B
REACH	XX+XX.XX	0.0	0.0
REACH	XX+XX.XX	0.0	0.0
REACH	XX+XX.XX	0.0	0.0
REACH	XX+XX.XX	0.0	0.0

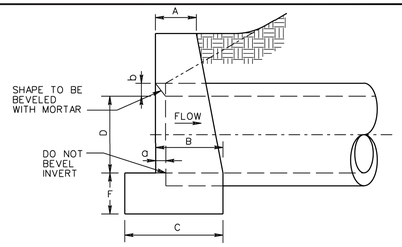
⊗ WEIR POINTS				
STATION	WEIR POINT #	ELEVATION	EASTING	NORTHING
XX+XX	1	XXX.XX	XXXXXXXX.XXX	XXXXXXX.XXX
XX+XX	2	XXX.XX	XXXXXXXX.XXX	XXXXXXX.XXX
XX+XX	3	XXX.XX	XXXXXXXX.XXX	XXXXXXX.XXX

STRUCTURE DETAIL LEGEND

- REINFORCED BED MATERIAL
- IN-SITU MATERIAL
- FILL MATERIAL
- TOPSOIL (6 INCH MIN.)
- NONWOVEN GEOTEXTILE FABRIC
- COIR MATTING
- WEIR POINT
- HEADER (TOP) ROCK
- FOOTER ROCK
- SPLASH ROCK
- ANCHOR ROCK
- STEPPING STONE

EW-1,1A





NOTES:

1. "H" MAY BE REDUCED UNTIL "X" REACHES A MINIMUM OF 4" WHERE ENDWALL WOULD PROTRUDE ABOVE SHOULDER LINE. IN NO CASE SHALL TOP OF ENDWALL PROJECT ABOVE FILL SLOPE, DITCH SLOPE, OR SHOULDER.
2. THIS ITEM MAY BE PRECAST OR CAST IN PLACE.
3. ALL CAST IN PLACE CONCRETE TO BE CLASS A3. FOR PRECAST SEE SHEET 101.02.
4. THIS STANDARD TO BE USED WITH STRAIGHT CROSSINGS AND ALL SKEWS(0° TO 45°).
5. HEADWALL TO BE BEVELED IN ALL AREAS EXCEPT WHERE A CONFLICT WITH INVERT.
6. BEVEL EDGE IS REQUIRED ON THE HEADWALL ON THE INLET END OF THE CULVERT (WHERE THE FLOW ENTERS THE CULVERT).
7. HEADWALL AT THE OUTLET END OF THE CULVERT MAY BE EITHER SQUARE EDGE OR BEVEL EDGE.
8. ON SHALLOW FILLS, WHERE ENDWALLS ARE 1'-0" LESS BELOW SHOULDER LINE, THE TOP OF THE ENDWALL SHALL BE CONSTRUCTED PARALLEL TO THE GRADE OF THE ROAD.
9. ¾" CHAMFER MAY BE PROVIDED ON ALL EDGES AT MANUFACTURER'S OPTION.

EW-1

ENDWALL FOR CIRCULAR PIPE

	DIAMETER OF PIPE CULVERT					
	12"	15"	18"	21" OR 24"	27" OR 30"	33" OR 36"
A	0'-6"	0'-8"	0'-9"	0'-11"	1'-0"	1'-0"
B	0'-11"	1'-1"	1'-3"	1'-6"	1'-9"	2'-0"
C	1'-4"	1'-7"	1'-9"	2'-2"	2'-6"	2'-9"
D	1'-0"	1'-3"	1'-6"	2'-0"	2'-6"	3'-0"
F	0'-6"	0'-8"	0'-8"	0'-9"	0'-9"	0'-9"
H	2'-3"	2'-11"	3'-2"	3'-9"	4'-3"	4'-9"
L	4'-0"	5'-0"	6'-0"	8'-0"	10'-0"	12'-0"
a	0'-1¼"	0'-1¾"	0'-2"	0'-2½"	0'-3¼"	0'-3¾"
b	0'-1"	0'-1¼"	0'-1½"	0'-2"	0'-2½"	0'-3"
	CUBIC YARDS OF CONCRETE					
CONC. PIPE	0.241	0.492	0.697	1.319	2.067	2.947
C.M. PIPE	0.257	0.521	0.739	1.398	2.198	3.145

EW-1A

ENDWALL FOR ELLIPTICAL PIPE

	SIZE OF ELLIPTICAL PIPE CULVERT (SPAN x RISE)							
	23"x14"	30"x19"	34"x22"	38"x24"	42"x27"	45"x29"	49"x32"	53"x34"
A	0'-8"	0'-9"	0'-10"	0'-11"	0'-11"	1'-0"	1'-0"	1'-0"
B	1'-2"	1'-5"	1'-6"	1'-8"	1'-9"	1'-10"	1'-11"	1'-11"
C	1'-8"	1'-11"	2'-1"	2'-4"	2'-5"	2'-7"	2'-8"	2'-9"
D	1'-2"	1'-7"	1'-10"	2'-0"	2'-3"	2'-5"	2'-8"	2'-10"
F	0'-8"	0'-8"	0'-9"	0'-9"	0'-9"	0'-9"	0'-9"	0'-9"
H	2'-10"	3'-3"	3'-7"	3'-9"	4'-0"	4'-2"	4'-5"	4'-7"
L	5'-5"	7'-2"	8'-6"	9'-2"	10'-2"	10'-11"	12'-1"	12'-11"
S	1'-11"	2'-6"	2'-10"	3'-2"	3'-6"	3'-9"	4'-1"	4'-5"
a	0'-2½"	0'-3¼"	0'-3½"	0'-4"	0'-4½"	0'-4¾"	0'-5"	0'-5½"
b	0'-2"	0'-2½"	0'-2¾"	0'-3"	0'-3½"	0'-3¾"	0'-4"	0'-4½"
	CUBIC YARDS OF CONCRETE							
CONC.PIPE	0.502	0.855	1.236	1.500	1.811	2.101	2.512	2.801

SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.	VDOT ROAD AND BRIDGE STANDARDS
105 302	STANDARD ENDWALL FOR PIPE CULVERTS 12" - 36" CIRCULAR AND 23" x 14" - 53" x 34" ELLIPTICAL PIPES VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISION DATE 04/19 · SHEET 1 OF 1 · 101.01

CONTRACTOR SHALL MODIFY THE ENDWALL SUCH THAT THE TOP ELEVATION IS RAISED BY ONE VERTICAL FOOT. CONTRACTOR SHALL SUBMIT A SHOP DRAWING OF THE MODIFIED EW-1 ENDWALL TO THE ARLINGTON COUNTY PROJECT OFFICER FOR REVIEW AND APPROVAL BEFORE COMMENCEMENT OF CONSTRUCTION. THE SHOP DRAWING FOR THIS STRUCTURE CAN BE PRE-CAST OR CAST-IN-PLACE. PLEASE REFER TO SHEET C075.1 FOR PIPE INVERT AND TOP OF ENDWALL ELEVATIONS.

MH-1

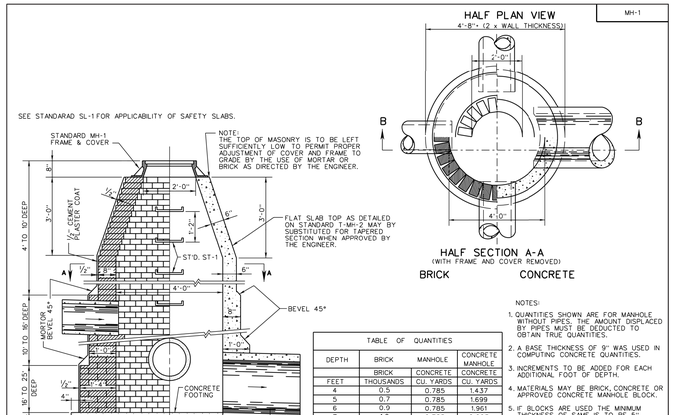


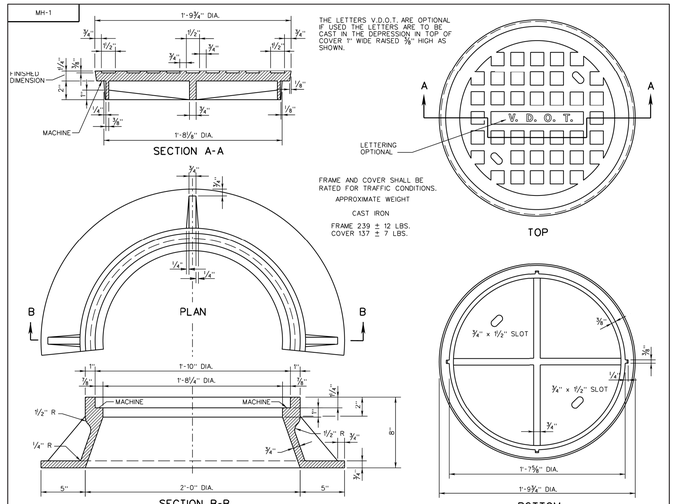
TABLE OF QUANTITIES			
DEPTH	BRICK	MANHOLE	CONCRETE MANHOLE
	BRICK	CONCRETE	CONCRETE
FEET	THOUSANDS	CU. YARDS	CU. YARDS
4	0.5	0.785	1.437
5	0.7	0.785	1.699
6	0.9	0.785	1.961
7	1.0	0.785	2.223
8	1.2	0.785	2.485
9	1.4	0.785	2.747
10	1.6	0.785	3.009
11	1.9	0.970	3.455
12	2.2	0.970	3.817
13	2.5	0.970	4.179
14	2.8	0.970	4.541
15	3.1	0.970	4.903
16	3.4	0.970	5.265
17	4.0	1.173	6.032
INCREMENT	0.45	-	0.582

NOTES:

1. QUANTITIES SHOWN ARE FOR MANHOLE WITHOUT PIPES. THE AMOUNT DISPLACED BY PIPES MUST BE DEDUCTED TO OBTAIN TRUE QUANTITIES.
2. A BASE THICKNESS OF 9" WAS USED IN COMPUTING CONCRETE QUANTITIES.
3. INCREMENTS TO BE ADDED FOR EACH ADDITIONAL FOOT OF DEPTH.
4. MATERIALS MAY BE BRICK, CONCRETE OR APPROVED CONCRETE MANHOLE BLOCK.
5. IF BLOCKS ARE USED THE MINIMUM THICKNESS OF SAME IS TO BE 5". OTHER THICKNESSES ARE TO CONFORM TO WALL THICKNESS SHOWN FOR CONCRETE.
6. ALL CONCRETE TO BE CLASS A3.
7. WHEN SPECIFIED ON PLANS THE INVERT IS TO BE SHAPED IN ACCORDANCE WITH STANDARD IS-1. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE BID PRICE FOR THE STRUCTURE.

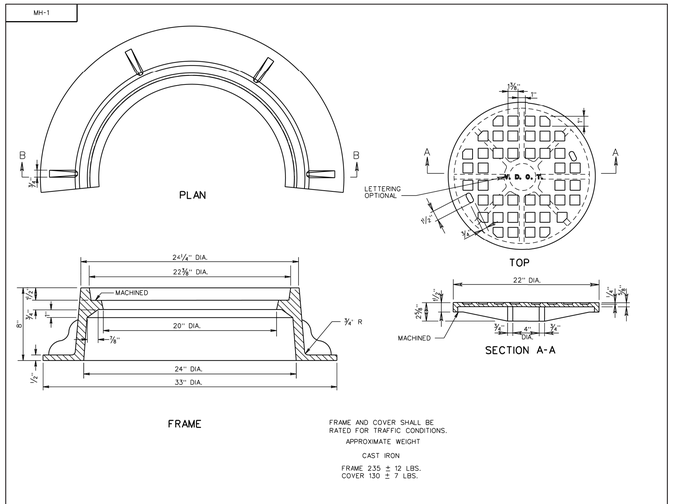
SPECIFICATION REFERENCE	MANHOLE FOR 12" - 48" PIPE CULVERTS VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS
302		REVISION DATE 04/20 · SHEET 1 OF 3 · 106.01

MH-1



SHEET 2 OF 3	REVISION DATE 04/20	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. STANDARD MANHOLE FRAME AND COVER VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE 224 302
VDOT ROAD AND BRIDGE STANDARDS 106.02			

MH-1



SHEET 3 OF 3	REVISION DATE 04/20	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. STANDARD MANHOLE FRAME AND COVER VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE 224 302
VDOT ROAD AND BRIDGE STANDARDS 106.04			

ARLINGTON VIRGINIA

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SEAL

30% SUBMISSION

APPROVALS DATE

DESIGN TEAM ENGINEER SUPERVISOR

WATER, SEWER, STREETS BUREAU CHIEF

ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

CONSTRUCTION DETAILS

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

PLOTTED: JULY 3 2025

SCALE:
N/A

C004.2

FILENAME: TYPICAL SECTIONS & DETAILS.DWG PATH: L:\28000S\28400\28467.02\CADD\04-ENGR\04-CONCEPT PLOTTED BY: CC0232

REVISED ON 2/15/2024

LINETYPE LEGEND

FEATURE	EXISTING	PROPOSED
BUILDING		
CENTERLINE / BASELINE		
COMMUNICATIONS CABLE	COM	COM
CONTOURS - MAJOR, MINOR	250	250
CRITICAL ROOT ZONE	CRZ	CRZ
EASEMENT		
ELECTRIC (UNDERGROUND)	UGE	UGE
FENCE	X	X
FIBER OPTIC	FO	FO
GAS LINE	GAS	GAS
X" GAS LINE (SIZE INCLUDED IF AVAILABLE)	#" g	#" G
GUARDRAIL		
HARDSCAPE FEATURE (MATERIAL NOTED)		
LIMITS OF DISTURBANCE	LOD	LOD
LIMITS OF WORK	LOW	LOW
OVERHEAD WIRES		
PAVEMENT MINI SKIP LINE		
PAVEMENT SKIP LINE		
PROPERTY LINE		
RIGHT-OF-WAY LINE		
ROOT PRUNING	RP	RP
SANITARY SEWER	SAN	SAN
SANITARY SEWER UNDER 20" (SIZE INCLUDED IF AVAILABLE)	#" s	
SANITARY SEWER OVER 20"		
SILT FENCE	X	X
STORM (SIZE NOTED)	STM	
STREAM		
STREET LIGHT CONDUIT	SL	SL
TELEPHONE (UNDERGROUND)	UGT	UGT
TREE LINE		
TREE PROTECTION FENCE	TP	TP
WALL		
WATERLINE UNDER 20" (SIZE INCLUDED IF AVAILABLE)	#" w	
WATERLINE OVER 20"		W

SYMBOL LEGEND

EXISTING FEATURE	PROPOSED FEATURE
EX CABLE PEDESTAL	
EX ELECTRIC BOX	
EX FIRE HYDRANT	PROP FIRE HYDRANT
EX GAS VALVE	PROP GAS VALVE
EX GROUND LIGHT	
EX GUY WIRES	
EX IRON PIPE OR PIN	
EX LIGHT POLE	PROP LIGHT POLE
EX MAILBOX	
EX MONUMENT	
EX PARKING METER	
EX PAY STATION	PROP PAY STATION
EX SANITARY MANHOLE	PROP SANITARY MANHOLE
EX STORM BASIN	PROP STORM CATCH BASIN (TO SCALE)
EX STORM MANHOLE	PROP STORM MANHOLE
EX TELEPHONE PEDESTAL	
EX TRAFFIC CONTROL BOX	
EX TRAFFIC SIGN	PROP TRAFFIC SIGN
EX TRASH CAN	PROP TRASH CAN
EX TRAVERSE	
EX TREES, WOODED AREA	PROPOSED TREE
	PROPOSED TREE REMOVAL
EX UTILITY MANHOLE TYPE INDICATED ELEC, TELE, ETC	
EX UTILITY POLE	PROP UTILITY POLE
EX WATER MANHOLE	PROP WATER MANHOLE
EX WATER METER	PROP WATER METER
EX WATER VALVE	PROP WATER VALVE
EX YARD INLET	PROP YARD INLET (TO SCALE)
EX BENCHMARK	CONSTRUCTION NOTES (LEADER TO AREA AFFECTED)
	DETAIL NUMBER (SEE NOTE)
NORTH ARROW	CURVE NUMBER (SEE CURVE TABLE)
	LINE NUMBER (SEE LINE TABLE)
	TEST HOLE

SYMBOL LEGEND

EXISTING FEATURE	PROPOSED FEATURE
EX STRIPING	PROP STRIPING
EX BUS STOP	PROP BUS STOP

LABEL LEGEND

EXISTING	PROPOSED
EXISTING SANITARY STRUCTURE NUMBER	PROPOSED SANITARY SEWER STRUCTURE NUMBER
EXISTING STORM SEWER STRUCTURE NUMBER	PROPOSED STORM SEWER STRUCTURE NUMBER

HATCH LEGEND

- PROP MILL & OVERLAY SEE TYPICAL SECTION FOR DETAILS
- PROP FULL DEPTH ASPHALT SEE TYPICAL SECTION FOR DETAILS
- PROP CONCRETE
- REPLACE & MATCH EXISTING DRIVEWAY OR LEADWALK. SEE CONSTRUCTION NOTES
- DEMOLITION AREA

WSSI ADDITIONAL LINETYPES:

EXISTING CONDITIONS PLAN:

- DELINEATED TOP OF BANK
- JURISDICTIONAL WETLAND
- EX. PVC PIPE
- SURVEYED TREES (≥3" DIAMETER AT BREAST HEIGHT)

TREE CONSERVATION PLAN:

- SURVEYED TREES (≥3" DIAMETER AT BREAST HEIGHT)
- PRIORITY RATING = 2
- PRIORITY RATING = 3
- PRIORITY RATING = 4
- DEAD TREE
- TREE TO BE REMOVED
- TREE TO BE REMOVED BY HAND
- ROOT PRUNING
- LIMITS OF TREE SURVEY
- ROOT PROTECTION MATTING

DRAINAGE DIVIDES:

- IMPERVIOUS AREA
- DRAINAGE SUBSHEDS
- STRUCTURE NUMBER
- STORM SEWER LINES WITH CATCH BASIN

STORM SEWER PLAN & PROFILE:

- EXISTING HYDRAULIC GRADE LINE
- PROPOSED HYDRAULIC GRADE LINE

GRADING PLAN:

- PR. BANKFULL
- PR. CENTERLINE
- LIMITS OF DISTURBANCE
- PR. GRADING (1' C.I.)
- TEMPORARY ACCESS PATH
- STAGING & STOCKPILE AREA
- CLASS II REINFORCED BED MIX
- STEP POOL
- ROCK CASCADE
- IN-STREAM ROCK SILL

LONGITUDINAL PROFILE:

- EXISTING STREAM INVERT ALONG PROPOSED CENTERLINE
- PROPOSED STREAM INVERT ALONG PROPOSED CENTERLINE
- STRUCTURE ROCKS
- EARTH FILL
- PC = 0+50.00 MEANDER RIGHT PT = 1+00.00 — PC & PT LOCATIONS WITH LINE OR CURVE DESIGNATION REFERENCED FROM STAKEOUT DATA
- CLASS A1 REINFORCED BED MIX
- CLASS II REINFORCED BED MIX

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SEAL

30% SUBMISSION

APPROVALS DATE

DESIGN TEAM ENGINEER SUPERVISOR

WATER, SEWER, STREETS BUREAU CHIEF

ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

LEGEND

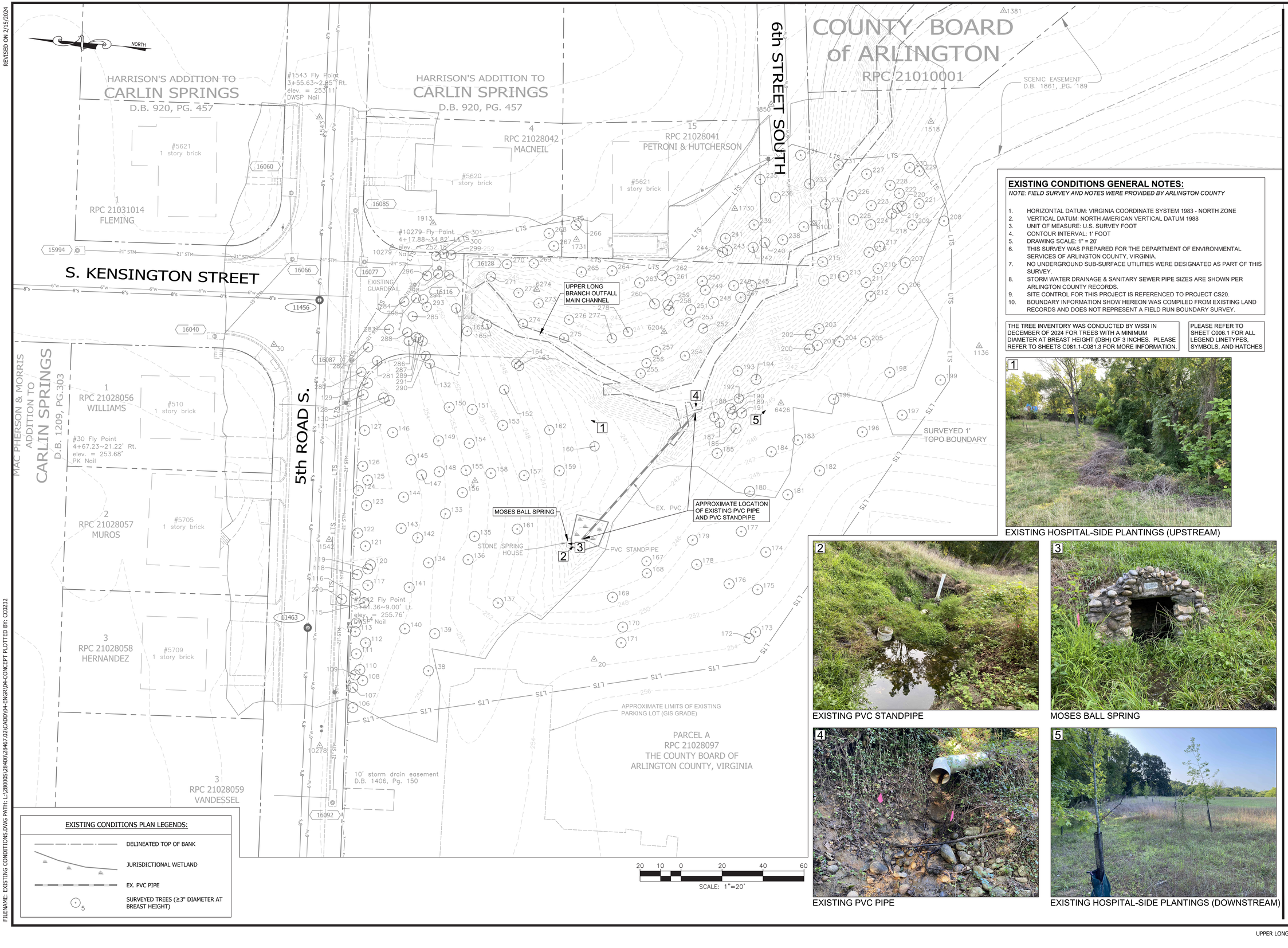
DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

PLOTTED: JULY 3 2025

SCALE:
N/A

C006.1

REVISED ON 2/15/2024



EXISTING CONDITIONS GENERAL NOTES:

NOTE: FIELD SURVEY AND NOTES WERE PROVIDED BY ARLINGTON COUNTY

1. HORIZONTAL DATUM: VIRGINIA COORDINATE SYSTEM 1983 - NORTH ZONE
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM 1988
3. UNIT OF MEASURE: U.S. SURVEY FOOT
4. CONTOUR INTERVAL: 1' FOOT
5. DRAWING SCALE: 1" = 20'
6. THIS SURVEY WAS PREPARED FOR THE DEPARTMENT OF ENVIRONMENTAL SERVICES OF ARLINGTON COUNTY, VIRGINIA.
7. NO UNDERGROUND SUB-SURFACE UTILITIES WERE DESIGNATED AS PART OF THIS SURVEY.
8. STORM WATER DRAINAGE & SANITARY SEWER PIPE SIZES ARE SHOWN PER ARLINGTON COUNTY RECORDS.
9. SITE CONTROL FOR THIS PROJECT IS REFERENCED TO PROJECT CS20.
10. BOUNDARY INFORMATION SHOW HEREON WAS COMPILED FROM EXISTING LAND RECORDS AND DOES NOT REPRESENT A FIELD RUN BOUNDARY SURVEY.

THE TREE INVENTORY WAS CONDUCTED BY WSSI IN DECEMBER OF 2024 FOR TREES WITH A MINIMUM DIAMETER AT BREAST HEIGHT (DBH) OF 3 INCHES. PLEASE REFER TO SHEETS C081.1-C081.3 FOR MORE INFORMATION.

PLEASE REFER TO SHEET C006.1 FOR ALL LEGEND LINETYPES, SYMBOLS, AND HATCHES

1
EXISTING HOSPITAL-SIDE PLANTINGS (UPSTREAM)

2
EXISTING PVC STANDPIPE

3
MOSES BALL SPRING

4
EXISTING PVC PIPE

5
EXISTING HOSPITAL-SIDE PLANTINGS (DOWNSTREAM)

EXISTING CONDITIONS PLAN LEGENDS:

- DELINEATED TOP OF BANK
- JURISDICTIONAL WETLAND
- EX. PVC PIPE
- 5 SURVEYED TREES (≥3" DIAMETER AT BREAST HEIGHT)

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SEAL

30% SUBMISSION

APPROVALS DATE

DESIGN TEAM ENGINEER SUPERVISOR

WATER, SEWER, STREETS BUREAU CHIEF

ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

EXISTING CONDITIONS PLAN

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

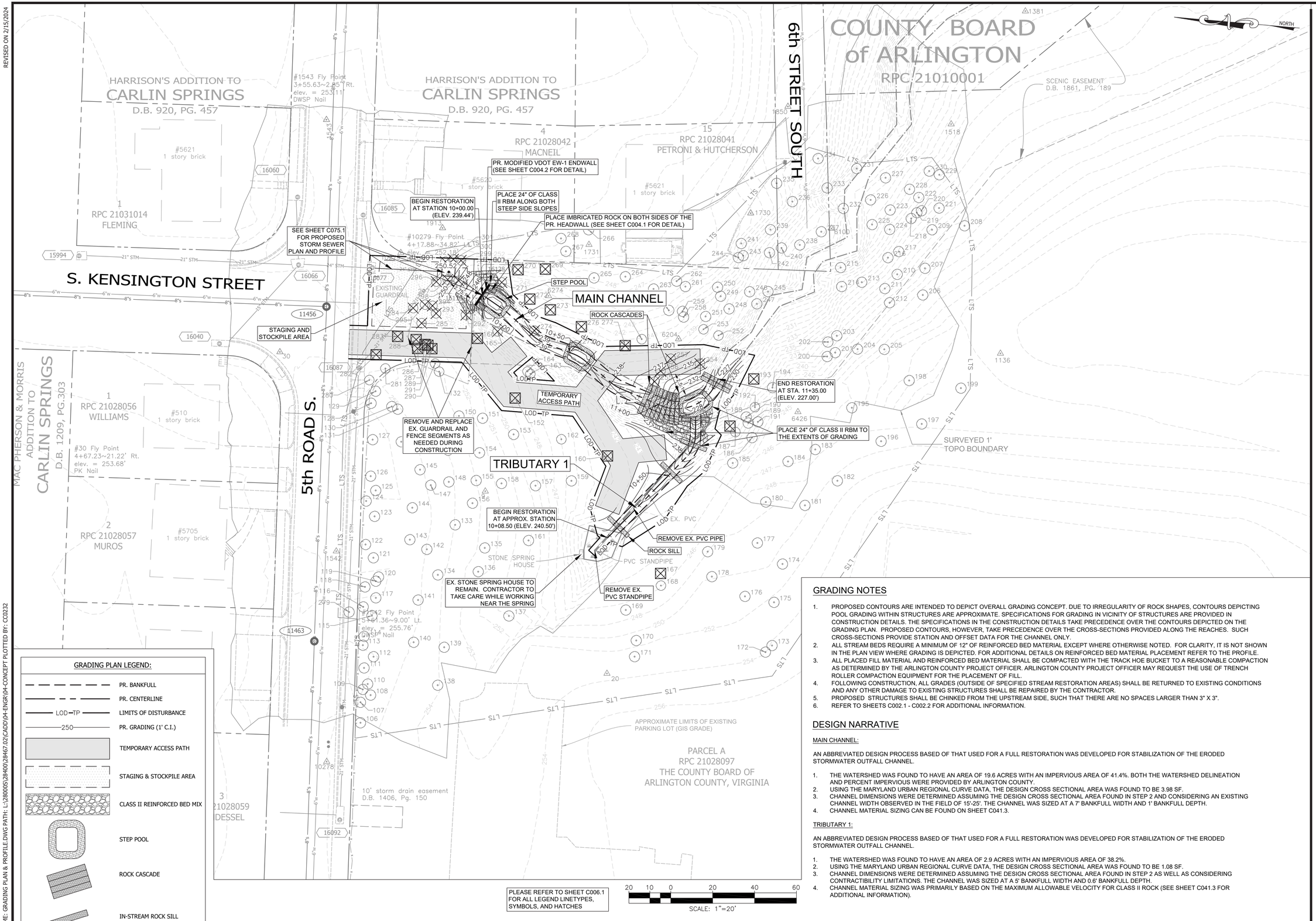
PLOTTED: JULY 3 2025

SCALE:
1" = 20'

C011.1

FILENAME: EXISTING CONDITIONS.DWG PATH: L:\28000\28400\28467.02\(CADD)\04-ENGR\04-CONCEPT PLOTTED BY: CC0232

REVISED ON 2/15/2024



PLEASE REFER TO SHEET C006.1 FOR ALL LEGEND LINETYPES, SYMBOLS, AND HATCHES

GRADING PLAN LEGEND:

- PR. BANKFULL
- PR. CENTERLINE
- LOD—TP — LIMITS OF DISTURBANCE
- 250 — PR. GRADING (1' C.I.)
- TEMPORARY ACCESS PATH
- STAGING & STOCKPILE AREA
- CLASS II REINFORCED BED MIX
- STEP POOL
- ROCK CASCADE
- IN-STREAM ROCK SILL

GRADING NOTES

1. PROPOSED CONTOURS ARE INTENDED TO DEPICT OVERALL GRADING CONCEPT. DUE TO IRREGULARITY OF ROCK SHAPES, CONTOURS DEPICTING POOL GRADING WITHIN STRUCTURES ARE APPROXIMATE. SPECIFICATIONS FOR GRADING IN VICINITY OF STRUCTURES ARE PROVIDED IN CONSTRUCTION DETAILS. THE SPECIFICATIONS IN THE CONSTRUCTION DETAILS TAKE PRECEDENCE OVER THE CONTOURS DEPICTED ON THE GRADING PLAN. PROPOSED CONTOURS, HOWEVER, TAKE PRECEDENCE OVER THE CROSS-SECTIONS PROVIDED ALONG THE REACHES. SUCH CROSS-SECTIONS PROVIDE STATION AND OFFSET DATA FOR THE CHANNEL ONLY.
2. ALL STREAM BEDS REQUIRE A MINIMUM OF 12" OF REINFORCED BED MATERIAL EXCEPT WHERE OTHERWISE NOTED. FOR CLARITY, IT IS NOT SHOWN IN THE PLAN VIEW WHERE GRADING IS DEPICTED. FOR ADDITIONAL DETAILS ON REINFORCED BED MATERIAL PLACEMENT REFER TO THE PROFILE.
3. ALL PLACED FILL MATERIAL AND REINFORCED BED MATERIAL SHALL BE COMPACTED WITH THE TRACK HOE BUCKET TO A REASONABLE COMPACTION AS DETERMINED BY THE ARLINGTON COUNTY PROJECT OFFICER. ARLINGTON COUNTY PROJECT OFFICER MAY REQUEST THE USE OF TRENCH ROLLER COMPACTION EQUIPMENT FOR THE PLACEMENT OF FILL.
4. FOLLOWING CONSTRUCTION, ALL GRADES (OUTSIDE OF SPECIFIED STREAM RESTORATION AREAS) SHALL BE RETURNED TO EXISTING CONDITIONS AND ANY OTHER DAMAGE TO EXISTING STRUCTURES SHALL BE REPAIRED BY THE CONTRACTOR.
5. PROPOSED STRUCTURES SHALL BE CHINKED FROM THE UPSTREAM SIDE, SUCH THAT THERE ARE NO SPACES LARGER THAN 3" X 3".
6. REFER TO SHEETS C002.1 - C002.2 FOR ADDITIONAL INFORMATION.

DESIGN NARRATIVE

MAIN CHANNEL:

AN ABBREVIATED DESIGN PROCESS BASED OF THAT USED FOR A FULL RESTORATION WAS DEVELOPED FOR STABILIZATION OF THE ERODED STORMWATER OUTFALL CHANNEL.

1. THE WATERSHED WAS FOUND TO HAVE AN AREA OF 19.6 ACRES WITH AN IMPERVIOUS AREA OF 41.4%. BOTH THE WATERSHED DELINEATION AND PERCENT IMPERVIOUS WERE PROVIDED BY ARLINGTON COUNTY.
2. USING THE MARYLAND URBAN REGIONAL CURVE DATA, THE DESIGN CROSS SECTIONAL AREA WAS FOUND TO BE 3.98 SF.
3. CHANNEL DIMENSIONS WERE DETERMINED ASSUMING THE DESIGN CROSS SECTIONAL AREA FOUND IN STEP 2 AND CONSIDERING AN EXISTING CHANNEL WIDTH OBSERVED IN THE FIELD OF 15'-25'. THE CHANNEL WAS SIZED AT A 7' BANKFULL WIDTH AND 1' BANKFULL DEPTH.
4. CHANNEL MATERIAL SIZING CAN BE FOUND ON SHEET C041.3.

TRIBUTARY 1:

AN ABBREVIATED DESIGN PROCESS BASED OF THAT USED FOR A FULL RESTORATION WAS DEVELOPED FOR STABILIZATION OF THE ERODED STORMWATER OUTFALL CHANNEL.

1. THE WATERSHED WAS FOUND TO HAVE AN AREA OF 2.9 ACRES WITH AN IMPERVIOUS AREA OF 38.2%.
2. USING THE MARYLAND URBAN REGIONAL CURVE DATA, THE DESIGN CROSS SECTIONAL AREA WAS FOUND TO BE 1.08 SF.
3. CHANNEL DIMENSIONS WERE DETERMINED ASSUMING THE DESIGN CROSS SECTIONAL AREA FOUND IN STEP 2 AS WELL AS CONSIDERING CONTRACTIBILITY LIMITATIONS. THE CHANNEL WAS SIZED AT A 5' BANKFULL WIDTH AND 0.6' BANKFULL DEPTH.
4. CHANNEL MATERIAL SIZING WAS PRIMARILY BASED ON THE MAXIMUM ALLOWABLE VELOCITY FOR CLASS II ROCK (SEE SHEET C041.3 FOR ADDITIONAL INFORMATION).

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SEAL

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APPROVALS DATE

DESIGN TEAM ENGINEER SUPERVISOR

WATER, SEWER, STREETS BUREAU CHIEF

ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

GRADING PLAN

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

PLOTTED: JULY 3 2025

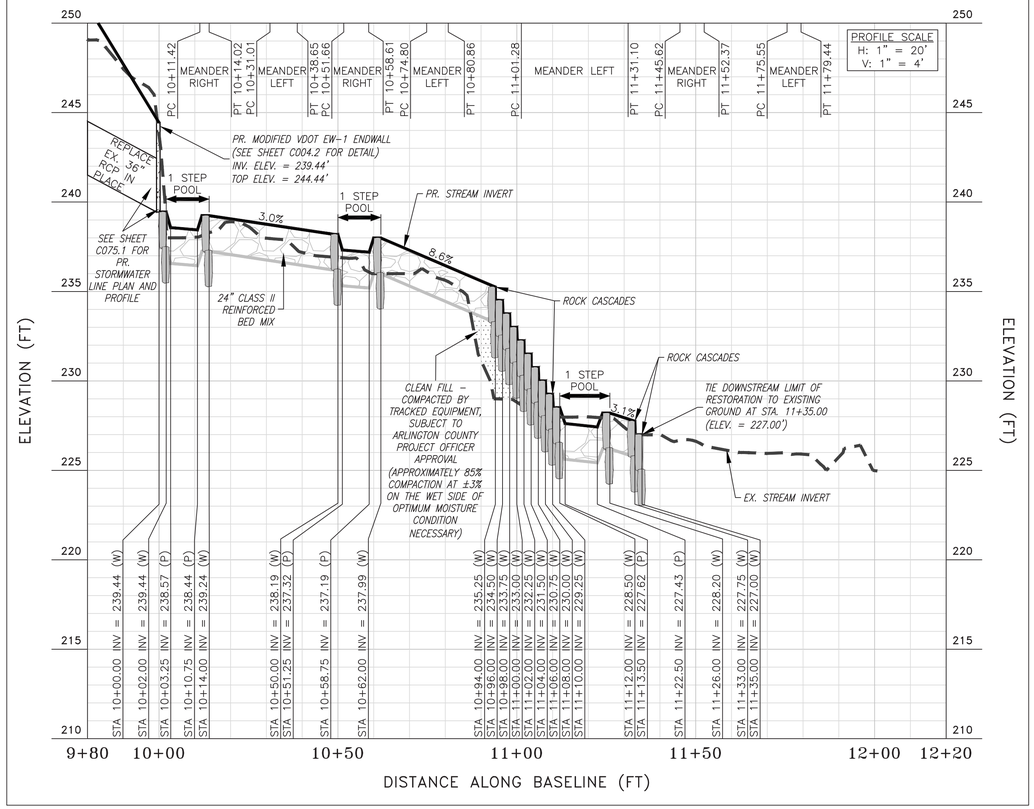
SCALE:
1" = 20'

C041.1

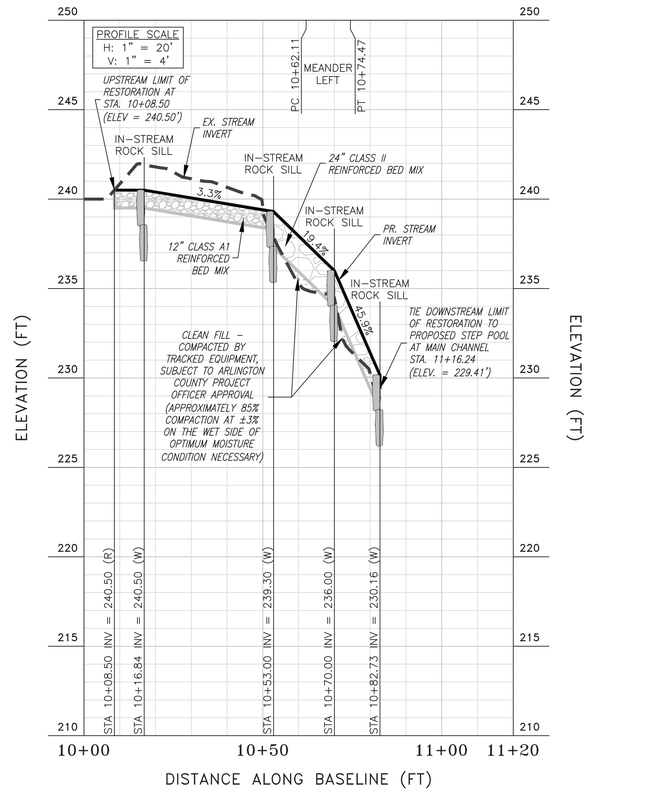
FILENAME: GRADING PLAN & PROFILE.DWG PATH: L:\28005\28400\28467.02\CADD\04-ENGR\04-CONCEPT PLOTTED BY: CC0232

REVISED ON 2/15/2024

UPPER LONG BRANCH OUTFALL – MAIN CHANNEL LONGITUDINAL PROFILE



UPPER LONG BRANCH OUTFALL – TRIBUTARY 1 LONGITUDINAL PROFILE



LONGITUDINAL PROFILE LEGEND:

- EXISTING STREAM INVERT ALONG PROPOSED CENTERLINE
- PROPOSED STREAM INVERT ALONG PROPOSED CENTERLINE
- STRUCTURE ROCKS
- EARTH FILL
- PC & PT LOCATIONS WITH LINE OR CURVE DESIGNATION REFERENCED FROM STAKEOUT DATA (PC = 0+50.00 MEANDER RIGHT PT = 1+00.00)
- CLASS A1 REINFORCED BED MIX
- CLASS II REINFORCED BED MIX

PLEASE REFER TO SHEET C006.1 FOR ALL LEGEND LINETYPES, SYMBOLS, AND HATCHES

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SEAL

30% SUBMISSION

APPROVALS DATE

DESIGN TEAM ENGINEER SUPERVISOR

WATER, SEWER, STREETS BUREAU CHIEF

ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

LONGITUDINAL PROFILE

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

PLOTTED: JULY 3 2025

SCALE:
AS SHOWN

C041.2

FILENAME: GRADING PLAN & PROFILE.DWG PATH: L:\28000S\28400\28467.02\CADD\04-ENGR\04-CONCEPT PLOTTED BY: CC0232

REVISED ON 2/15/2024

SUBSTRATE SIZING CALCULATIONS FOR THE REINFORCED BED

The contributing watershed to Upper Long Branch Outfall is a fully developed urban watershed lacking a sufficient sediment supply of adequate size to allow the existing stream system to maintain equilibrium. To address the lack of sediment input and to prevent the proposed stream restoration design from downcutting and widening following construction, the proposed stream channel presented in this plan set is intended to function at a threshold condition (i.e. the “armor” portion of the bed material is not entrained and transported). To achieve the desired threshold condition, the size (D_{50}) of the large rock (“armor”) portion of the reinforced bed mix is determined by first calculating the "mean depth" boundary shear stress (i.e. Shield's Equation) for the proposed channel using the hydraulic radius (approximately the mean depth, Equation 1). The "mean depth" boundary shear stress value is then inserted into a regression equation to determine the particle size D_{50} needed to achieve a stable stream bed (Equation 2) (Rosgen 2006, Leopold et. al. 1964).

A Factor of Safety greater than or equal to 1.5 is desired and is based on the ratio of the computed rock size versus provided rock size (Equation 3). As a check, the above process is repeated using the "maximum" boundary shear stress (Equation 4). The term "maximum" boundary shear stress is used because typically, boundary shear stress calculations are performed using the hydraulic radius (approximately the mean riffle depth, refer to Equations 1 and 2). Using the "maximum" boundary shear stress as a check of the initial calculation provides a conservative estimate of the required D_{50} for the "armor" rock. For this conservative estimate, a Factor of Safety greater than 1.0 is desired and is based on the ratio of the computed rock size versus the provided rock size (Equation 6). This step-by-step procedure is presented below:

STEP 1: "ARMOR" SIZE DETERMINATION

Based on the calculations below, the D_{50} particle size needed to achieve a stable stream bed would be 9.3 inches for Upper Long Branch Outfall Main Channel (Equation 2). However, to meet the required Factor of Safety, the D_{50} particle size used will be 19.2 inches depending on cross section and slope. The armor rock used exceeds the target Factor of Safety for all proposed cross sections and is therefore of sufficient size to be used as the stable armor component in the reinforced bed mix. Channel Material Sizing for Tributary 1 was based on the maximum allowable velocity for Class II Rock. According to the Fairfax County Public Facilities Manual, the maximum allowable velocity for Class II rock is 11.5 FPS (Section 6-1604.3, Table 6.22), which is greater than the maximum calculated velocity of Tributary 1 at roughly 8.6 FPS.

EQUATION 1 ("MEAN DEPTH" BOUNDARY SHEAR STRESS)

EQUATION 1 (MEAN DEPTH BOUNDARY SHEAR STRESS)

$\tau_0 = \gamma_f * R * S$

WHERE:			Upper Long Branch Outfall Class 2
γ_f	= SPECIFIC WEIGHT OF WATER	(LB/FT^3) =	62.4
R	= HYDRAULIC RADIUS (A_{BKF}/WP)	(FT) =	0.5
A_{BKF}	= BANKFULL AREA	(FT^2) =	3.95
WP	= WETTED PERIMETER	(FT) =	7.3
D_{BKF}	= BANKFULL MEAN DEPTH (A_{BKF}/W_{BKF})	(FT) =	0.56
W_{BKF}	= BANKFULL WIDTH	(FT) =	7.0
S	= MAXIMUM RIFFLE SLOPE	(FT/FT) =	0.086
THEREFORE:			
τ_0	= BOUNDARY SHEAR STRESS	(LB/FT^2) =	2.9

EQUATION 2 ("ARMOR" PORTION PARTICLE SIZE)

EQUATION 2 ("ARMOR" PORTION PARTICLE SIZE)

$D_{50} = 3.07 * T_0^{1.042}$

WHERE:			Upper Long Branch Outfall Class 2
τ_0	= MEAN DEPTH BOUNDARY SHEAR STRESS (FROM EQ. 1)	(LB/FT^2) =	2.9
THEREFORE:			
D_{50}	= STABLE MEAN DIAMETER OF THE "ARMOR" ROCK	(IN) =	9.3

EQUATION 3 (FACTOR OF SAFETY)

EQUATION 3 (FACTOR OF SAFETY)

$FS = D_{50\text{-}Actual}/D_{50}$

WHERE:			Upper Long Branch Outfall Class 2
$D_{50\text{-}Actual}$	= ACTUAL MEAN DIAMETER OF THE "ARMOR" ROCK (FROM QUARRY)	(IN) =	19.2
D_{50}	= STABLE MEAN DIAMETER OF THE "ARMOR" ROCK (FROM EQ. 2)	(IN) =	9.3
THEREFORE:			
FS	= FACTOR OF SAFETY	=	2.06

STEP 2: CONSERVATIVE ESTIMATE OF STABLE "ARMOR" ROCK (CALCULATE THE BOUNDARY SHEAR STRESS USING THE MAXIMUM RIFFLE DEPTH).

EQUATION 4 (MAXIMUM DEPTH BOUNDARY SHEAR STRESS)

EQUATION 4 (MAXIMUM DEPTH BOUNDARY SHEAR STRESS)

$\tau_{0\text{-}MAX} = \gamma_f * D_{MAX} * S$

WHERE:			Upper Long Branch Outfall Class 2
γ_f	= SPECIFIC WEIGHT OF WATER	(LB/FT^3) =	62.4
D_{MAX}	= MAXIMUM RIFFLE DEPTH	(FT) =	1
S	= MAXIMUM RIFFLE SLOPE	(FT/FT) =	0.086
THEREFORE:			
$\tau_{0\text{-}MAX}$	= MAXIMUM DEPTH BOUNDARY SHEAR STRESS	(LB/FT^2) =	5.4

EQUATION 5 (DETERMINE "ARMOR" PORTION PARTICLE SIZE)

EQUATION 5 ("ARMOR" PORTION PARTICLE SIZE)

$D_{50} = 3.07 * T_{0\text{-}MAX}^{1.042}$

WHERE:			Upper Long Branch Outfall Class 2
$\tau_{0\text{-}MAX}$	= MAXIMUM DEPTH BOUNDARY SHEAR STRESS (FROM EQ. 4)	(LB/FT^2) =	5.366
THEREFORE:			
$D_{50\text{-}MAX}$	= STABLE MEAN DIAMETER OF THE "ARMOR" ROCK	(IN) =	17.7

EQUATION 6 (FACTOR OF SAFETY)

EQUATION 6 (FACTOR OF SAFETY)

$FS = D_{50\text{-}Actual}/D_{50}$

WHERE:			Upper Long Branch Outfall Class 2
$D_{50\text{-}Actual}$	= ACTUAL MEAN DIAMETER OF THE "ARMOR" ROCK (FROM QUARRY)	(IN) =	19.2
$D_{50\text{-}MAX}$	= STABLE MEAN DIAMETER OF THE "ARMOR" ROCK (FROM EQ. 5)	(IN) =	17.7
THEREFORE:			
FS	= FACTOR OF SAFETY	=	1.09

UTILIZATION OF FINE PARTICLES

The shear stress computations presented above represent the force required to initiate movement of non-imbricated particles. The reinforced bed mix used in this project shall have fine grain particles (i.e. gravel, sand, and topsoil) mixed with the “armor” material to fill the void spaces in the rocks (see the Reinforced Bed Mixture Specifications on sheet C002.2 for mixture ratios). The mixing of the fine grain substrate material with the armor rock will promote imbrication, further enhancing the reinforced bed material stability. In addition to providing enhanced stability, this smaller substrate material will force water to flow primarily along the surface of the stream bed as opposed to through voids between the large rock. Further, the variety of substrate particle sizes will increase species diversity by providing aquatic macroinvertebrates, fish, and amphibians with a larger number of niches to colonize. Finally, the smaller bed material fractions will improve the aesthetic properties of the restored stream by allowing "sorting" to occur during the significant flow events following construction. Smaller particles may move out of the riffles and deposit on or form point bars (and other depositional features) and/or deposit in pools. The result is a variety of stream facets and natural gradation of particle sizes created by varying energy environments of the stream system. This creates a more natural appearance than could be practicably graded during construction. For these reasons, and since a significant upstream sediment source is not otherwise present in this fully developed urban watershed, the inclusion of the fine particles are a recommended component of the reinforced bed material.

Literature Cited

Leopold, Luna B., Wolman, Gordon M., and Miller, John P. Fluvial Processes In Geomorphology. Dover Publications, New York, 169 - 172, 1964.

Rosgen, Dave. Watershed Assessment of River Stability and Sediment Supply (WARSSS). Wildland Hydrology, Fort Collins, 5-129 - 5-136, 2006.

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APPROVALS DATE

DESIGN TEAM ENGINEER SUPERVISOR

WATER, SEWER, STREETS BUREAU CHIEF

ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

SEDIMENT STABILITY ANALYSIS

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

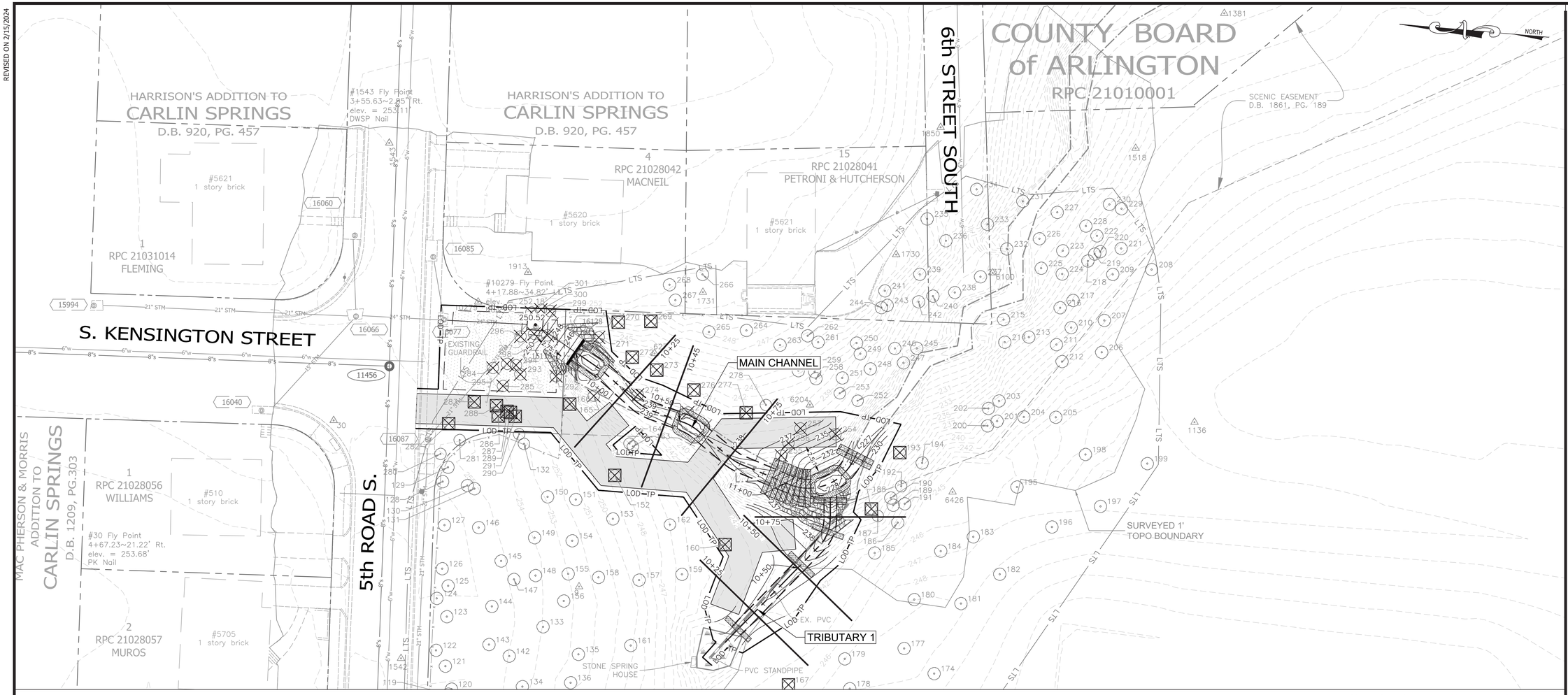
PLOTTED: JULY 3 2025

SCALE:
N/A

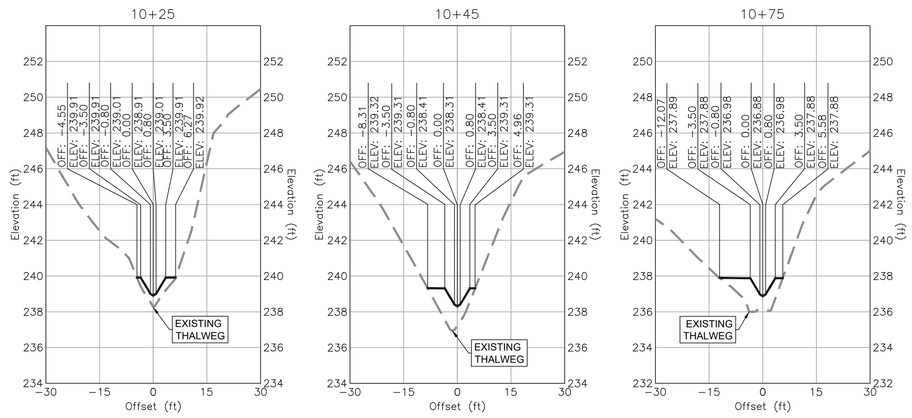
C041.3

FILENAME: SEDIMENT STABILITY ANALYSIS.DWG PATH: L:\28000\28400\28467.02\CADD\04-ENGR\04-CONCEPT PLOTTED BY: CC0232

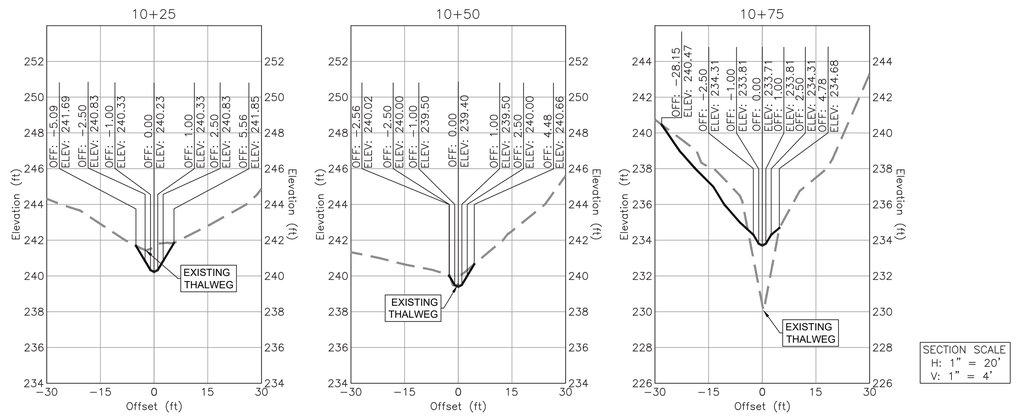
REVISED ON 2/15/2024



MAIN CHANNEL:



TRIBUTARY 1:



SECTION SCALE
H: 1" = 20'
V: 1" = 4'

PLEASE REFER TO SHEET C006.1 FOR ALL LEGEND LINETYPES, SYMBOLS, AND HATCHES

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ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

CROSS SECTIONS

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

PLOTTED: JULY 3 2025

SCALE:
AS SHOWN

C044.1

FILENAME: CROSS SECTIONS.DWG PATH: L:\28000S\28400\28467.02\CADD\04-ENGR\04-CONCEPT PLOTTED BY: CC0232

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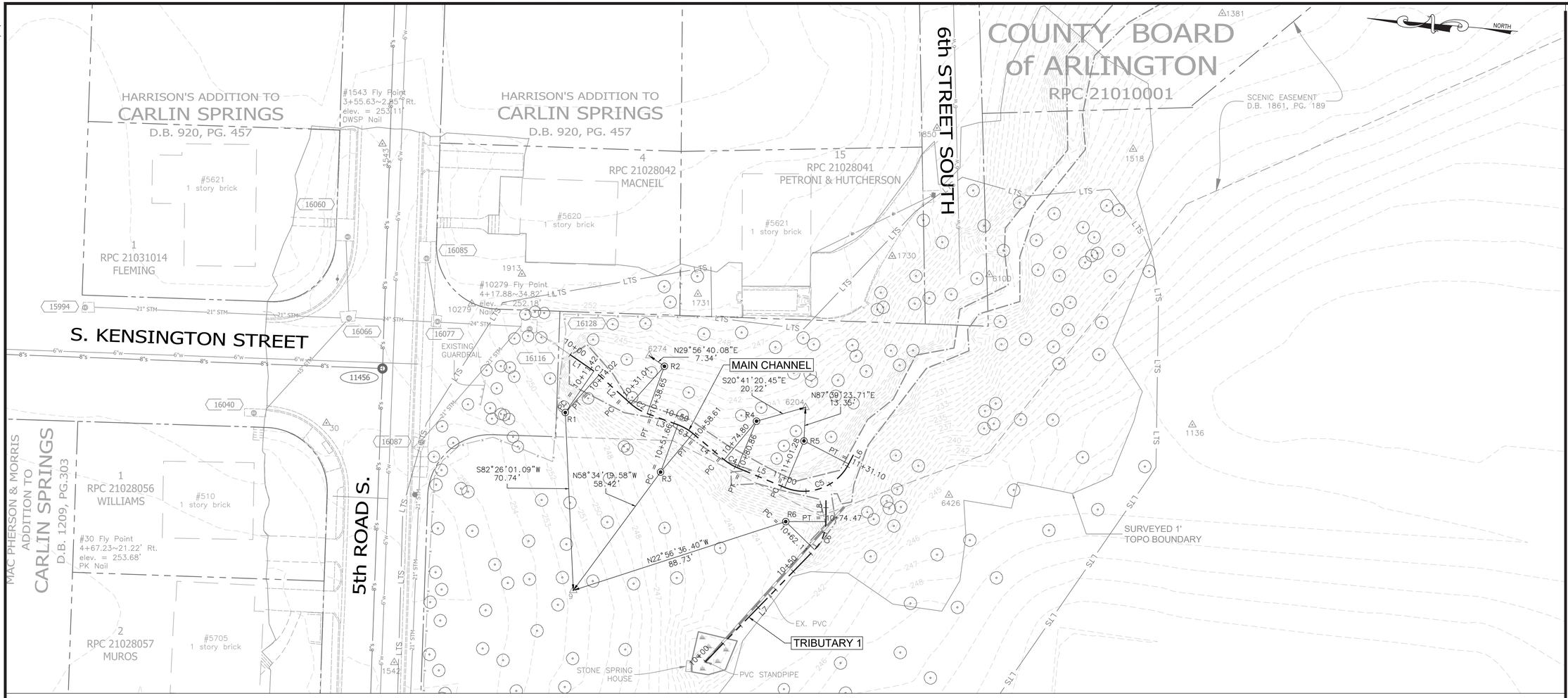

20 10 0 20 40 60

SCALE: 1"=20'

UPPER LONG BRANCH OUTFALL MAIN CHANNEL:

GEOMETRY TABLE						
NO.	LENGTH	RADIUS	BEARING/DELTA	TANGENT	CHORD BEARING	CHORD
L1	11.42'	--	S 29°32'08" W	--	--	--
C1	2.60'	20.00'	07°26'14"	1.30'	N 33°15'15" E	2.59'
L2	16.99'	--	S 36°58'22" W	--	--	--
C2	7.64'	20.00'	21°52'29"	3.86'	S 26°02'08" W	7.59'
L3	13.01'	--	S 15°05'53" W	--	--	--
C3	6.95'	20.00'	19°53'57"	3.51'	N 25°02'51" E	6.91'
L4	16.20'	--	S 34°59'50" W	--	--	--
C4	6.05'	20.00'	17°20'29"	3.05'	S 26°19'36" W	6.03'
L5	20.42'	--	S 17°39'21" W	--	--	--
C5	29.82'	20.00'	85°25'25"	18.46'	S 25°03'21" E	27.13'
L6	3.90'	--	S 67°46'04" E	--	--	--

RADIUS POINT LOCATION TABLE		
NO.	NORTHING	EASTING
R1	6999666.8683	11874291.8882
R2	6999629.2339	11874313.6241
R3	6999627.0921	11874271.6162
R4	6999590.8828	11874295.0941
R5	6999571.4201	11874288.8992

TRIBUTARY 1:

GEOMETRY TABLE						
NO.	LENGTH	RADIUS	BEARING/DELTA	TANGENT	CHORD BEARING	CHORD
L7	62.11'	--	S 50°43'22" E	--	--	--
C6	12.37'	16.00'	44°16'52"	6.51'	S 72°51'48" E	12.06'
L8	8.26'	--	N 84°59'46" E	--	--	--

RADIUS POINT LOCATION TABLE		
NO.	NORTHING	EASTING
R6	6999575.8478	11874256.3533

PLEASE REFER TO SHEET C006.1
FOR ALL LEGEND LINETYPES,
SYMBOLS, AND HATCHES

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ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

GEOMETRIC CONTROL PLAN

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

PLOTTED: JULY 3 2025

SCALE:
1" = 20'

C045.1

FILENAME: GEOMETRY PLAN.DWG PATH: L:\2800\05\28400\28467.02\CADD\04-ENGR\04-CONCEPT PLOTTED BY: CCO232

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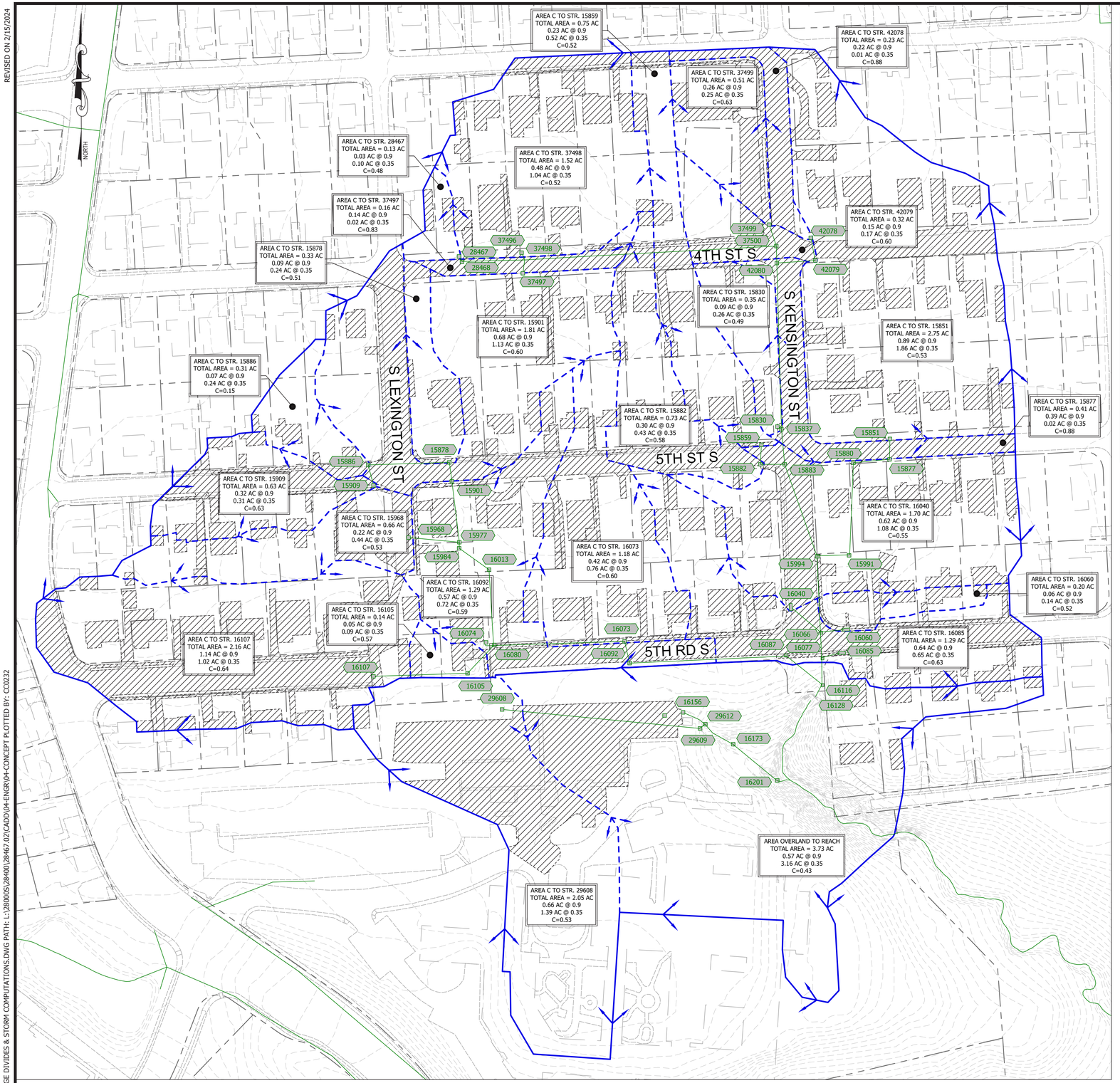

STORM SEWER TABLE (EXISTING)

#15994
TOP = 254.33
21" RCP OUT = 248.20 (16066)

#16040
TOP = 254.40
15" RCP OUT = 249.97 (16066)

#16060
TOP = 252.29
15" RCP OUT = 249.57 (16066)

#16066
TOP = 252.98
15" RCP IN = 249.11 (16040)
15" RCP IN = 248.68 (16060)
21" RCP IN = 246.66 (15994)
24" RCP OUT = 245.88 (16077)

#16077
TOP = 252.54
15" RCP IN = 248.12** (16085)
24" RCP IN = 245.09** (16066)
24" RPC OUT = 244.99** (16116)

#16085
TOP = 252.17
15" RCP OUT = 247.34 (16077)

#16087
TOP = 254.16
21" RCP IN = 246.73 (16092)
21" RCP OUT = 246.66 (16116)

#16092
TOP = 254.79
21" RCP IN = 247.14 (16073)
21" RCP OUT = 247.04 (16087)

#16116
TOP = 249.91
21" RCP IN = 243.68** (16087)
24" RCP IN = 242.96** (16077)
36" RCP OUT = 241.55** (16128)

#16128
INV. 36" RCP = 239.44 (16116)

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PLEASE REFER TO SHEET C006.1 FOR ALL LEGEND LINETYPES, SYMBOLS, AND HATCHES

STORM SEWER DRAINAGE DIVIDES LEGEND:

- IMPERVIOUS AREA
- DRAINAGE SUBSHEDS
- 16128 — STRUCTURE NUMBER
- STORM SEWER LINES WITH CATCH BASIN

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DESIGN TEAM ENGINEER SUPERVISOR

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ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

STORM SEWER DRAINAGE DIVIDES

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

PLOTTED: JULY 3 2025

SCALE:
1" = 70'

C071.1

FILENAME: DRAINAGE DIVIDES & STORM COMPUTATIONS.DWG PATH: L:\28000S\28490\28467.02\CADD\04-ENGR\04-CONCEPT PLOTTED BY: CC0232

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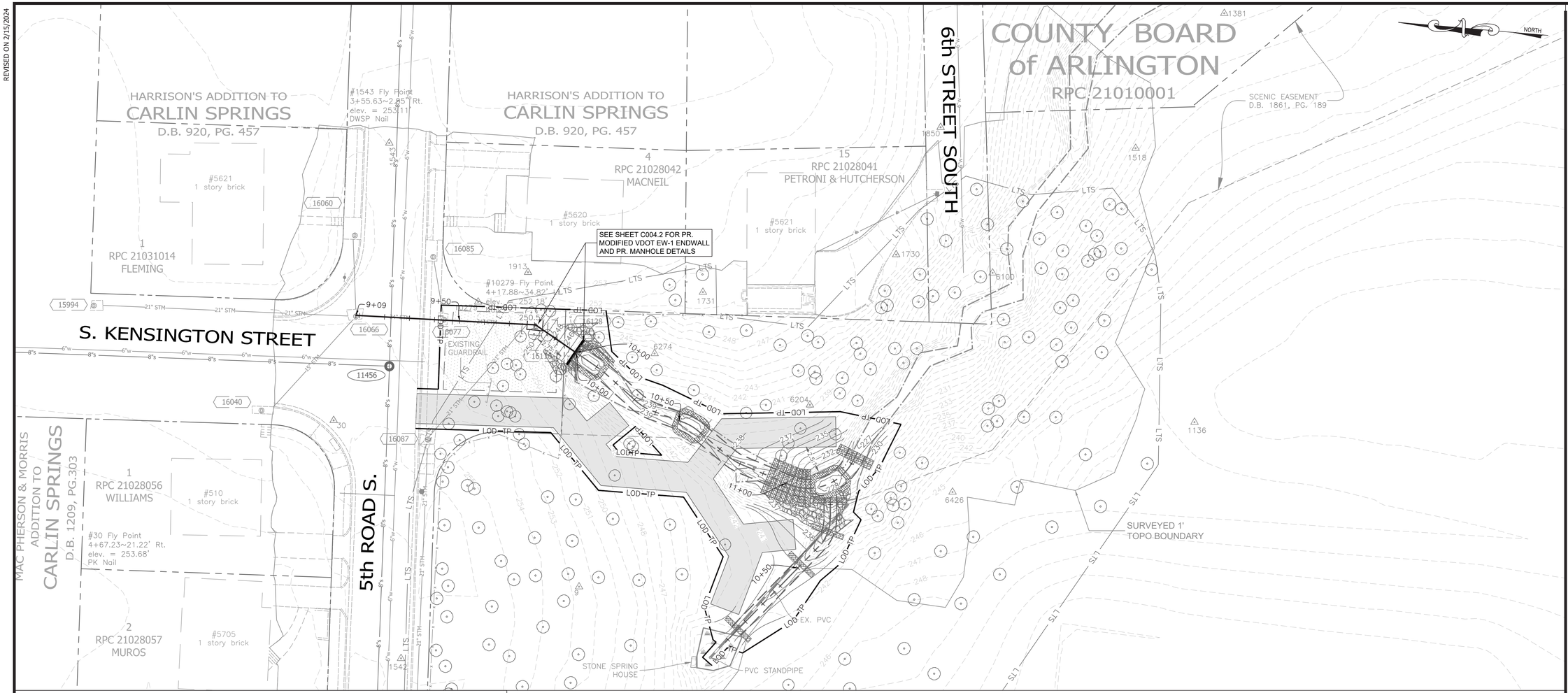

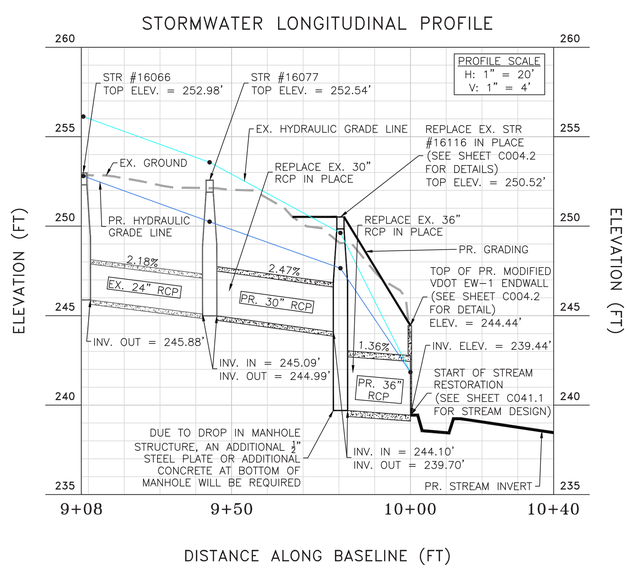

EXISTING AND PROPOSED HYDRAULIC GRADE LINE CALCULATIONS CAN BE FOUND ON SHEET C075.2.

PLEASE REFER TO SHEET C006.1 FOR ALL LEGEND LINETYPES, SYMBOLS, AND HATCHES

STORM SEWER PLAN & PROFILE LEGEND:

- EXISTING HYDRAULIC GRADE LINE
- PROPOSED HYDRAULIC GRADE LINE

20 10 0 20 40 60

SCALE: 1"=20'

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ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

STORM SEWER PLAN & PROFILE

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

PLOTTED: JULY 3 2025

SCALE:
AS SHOWN

C075.1

FILENAME: STORM SEWER PLAN & PROFILE.DWG PATH: L:\28000S\28400\28467.02\CADD\04-ENGR\04-CONCEPT PLOTTED BY: CDO232

REVISED ON 2/15/2024

Hydraulic Grade Line Computations (Existing)

Inlet Structure	Upstream Structure	Outlet Water Surface Elev. (ft)	D_o (in)	Q_o (cfs)	L_o (ft)	S_{f_o} (%)	H_f (ft)	Junction Loss V_o (ft/s)	Junction Loss H_o (ft)	Q_i	V_i (ft/s)	Q_iV_i	$V_i^2/2g$ (ft)	H_i (ft)	Angle (°)	H_a (ft)	H_t (ft)	1.3 H_t (ft)	0.5 H_t (ft)	Final H (ft)	Inlet Water Surface Elev. (ft)	Rim Elev. (ft)
16128		Outlet Pipe Dia. = 36.00						Outlet Pipe Inv. = 239.44		0.8xDia + Pipe Inv. = 241.84				Outlet WSEL =						Starting WSEL =	241.84	
16116		241.84	36	69.64	19.05	1.0903%	0.21	27.79	3.00					1.89		2.68	7.57	0.00		7.78	249.62	249.91
	16077									39.11	18.65	729.37	5.40	1.89	32	2.00						
	16087									32.53	16.05	522.02	4.00	1.40	83	2.68						
16077		249.62	24	39.11	36.02	2.9886%	1.08	18.65	1.35					0.79		0.74	2.88	0.00		3.96	253.57	252.54
	16066									34.18	12.09	413.36	2.27	0.79	0	0.00						
	16085									5.52	8.61	47.51	1.15	0.40	77	0.74						
16066		253.57	24	34.18	36.30	2.2833%	0.83	12.09	0.57					0.72		0.44	1.73	0.00		2.56	256.13	252.98
	15994									27.78	11.55	320.77	2.07	0.72	0	0.00						
	16040									6.35	7.42	47.08	0.85	0.30	51	0.44						
	16060									0.71	4.92	3.47	0.38	0.13	85	0.26						
15994		256.13	21	27.78	107.00	3.0731%	3.29	11.55	0.52					0.48		0.58	1.58	0.00		4.86	260.99	254.33
	15883									16.56	9.37	155.27	1.36	0.48	17	0.29						
	15991									12.10	7.26	87.78	0.82	0.29	91	0.58						
15883		260.99	18	16.56	133.10	2.4866%	3.31	9.37	0.34					0.39		0.34	1.07	0.00		4.38	265.37	256.47
	15837									11.60	8.49	98.49	1.12	0.39	14	0.20						
	15882									5.50	5.91	32.49	0.54	0.19	71	0.34						
15837		265.37	18	11.60	48.50	1.2189%	0.59	8.49	0.28					0.64		0.20	1.12	0.00		1.71	267.08	257.24
	42080									10.70	10.81	115.72	1.82	0.64	4	0.09						
	15830									1.16	5.03	5.86	0.39	0.14	52	0.20						
42080		267.08	18	10.70	227.00	1.0381%	2.36	10.81	0.45					0.55		0.26	1.27	0.00		3.62	270.70	264.16
	37500									8.24	10.07	82.90	1.57	0.55	0	0.00						
	42079									2.66	4.96	13.19	0.38	0.13	88	0.26						
37500		270.70	18	8.24	23.50	0.6147%	0.14	10.07	0.39					0.14		0.30	0.84	0.00		0.98	271.69	265.48
	37498									6.54	5.16	33.74	0.41	0.14	91	0.29						
	37499									2.18	9.62	20.99	1.44	0.50	17	0.30						
37498		271.69	24	6.54	341.00	0.0836%	0.29	5.16	0.10					0.20		0.35	0.65	0.00		0.94	272.63	265.34
	28468									0.42	3.61	1.53	0.20	0.07	0	0.00						
	37496									5.37	6.05	32.44	0.57	0.20	71	0.35						
	37497									0.90	5.55	5.00	0.48	0.17	79	0.31						
28468		272.63	15	0.42	91.25	0.0043%	0.00	3.61	0.05					0.14		0.23	0.42	0.00		0.42	273.05	266.34
	28467									0.42	5.06	2.14	0.40	0.14	63	0.23						
28467		273.05	15	0.42	9.23	0.0043%	0.00	5.06	0.12					0.12	0.16		0.16			0.16	273.21	266.86
16087		249.62	21	32.53	65.10	4.2136%	2.74	16.05	1.00					0.99		1.19	3.19	0.00		5.93	255.54	254.91
	16092									32.53	13.52	439.81	2.84	0.99	39	1.19						
16092		255.54	21	32.53	214.00	4.2136%	9.02	13.52	0.71					1.21		2.29	4.21	0.00		13.23	268.78	255.63
	16073									27.60	14.95	412.48	3.47	1.21	80	2.29						
16073		268.78	21	27.60	31.00	3.0338%	0.94	14.95	0.87					0.92		1.70	3.49	4.54		5.48	274.25	255.65
	16080									22.97	13.00	298.47	2.62	0.92	79	1.70						
16080		274.25	18	22.97	180.10	4.7800%	8.61	13.00	0.66					0.31		0.62	1.58	0.00		10.19	284.44	257.34
	16013									13.40	7.58	101.58	0.89	0.31	88	0.62						
	16074									0.00	0.00	0.00	0.00	0.00	90	0.00						
	16105									9.93	8.09	80.31	1.02	0.36	45	0.48						
16013		284.44	18	13.40	104.60	1.6268%	1.70	7.58	0.22					0.31		0.46	0.99	0.00		2.69	287.14	258.31
	15984									13.40	7.58	101.58	0.89	0.31	51	0.46						
15984		287.14	18	13.40	50.40	1.6268%	0.82	7.58	0.22					0.31		0.48	1.02	0.00		1.84	288.97	259.74
	15977									13.40	7.58	101.58	0.89	0.31	56	0.48						
15977		288.97	18	13.40	8.30	1.6268%	0.14	7.58	0.22					0.24		0.25	0.71	0.00		0.85	289.82	259.75
	15901									11.22	6.67	74.85	0.69	0.24	9	0.08						
	15968									2.37	4.86	11.55	0.37	0.13	86	0.25						
15901		289.82	18	11.22	84.40	1.1415%	0.96	6.67	0.17					0.17		0.00	0.34	0.44		1.41	291.23	260.61
	15878									4.06	5.56	22.58	0.48	0.17	0	0.00						
15878		291.23	18	4.06	26.20	0.1493%	0.04	5.56	0.12					0.14		0.27	0.54	0.70		0.74	291.97	261.03
	15886									3.00	5.12	15.35	0.41	0.14	84	0.27						
15886		291.97	18	3.00	111.60	0.0813%	0.09	5.12	0.10					0.14		0.30	0.54	0.00		0.63	292.59	262.11
	15909									2.69	5.03	13.54	0.39	0.14	103	0.30						
15909		292.59	15	2.69	29.00	0.1740%	0.05	5.03	0.12					0.12	0.15		0.20	292.80	262.03			
16085		253.57	15	5.52	30.00	0.7296%	0.22	8.61	0.35					0.35	0.45		0.67	254.24	253.19			
16040		256.13	15	6.35	52.70	0.9657%	0.51	7.42	0.26					0.26	0.33		0.84	256.97	254.32			
16060		256.13	15	0.71	32.70	0.0119%	0.00	4.92	0.11					0.11	0.15		0.15	256.28	253.19			
15991		260.99	21	12.10	50.60	0.5830%	0.30	7.26	0.20					0.29		0.56	1.05	0.00		1.35	262.34	254.00
	15880									12.27	7.28	89.30	0.82	0.29	86	0.56						
15880		262.34	21	12.27	126.70	0.6001%	0.76	7.28	0.21					0.29		0.55	1.05	0.00		1.81	264.15	255.27
	15877									12.34	7.28	89.91	0.82	0.29	82	0.55						
15877		264.15	21	12.34	49.70	0.6070%	0.30	7.28	0.21					0.35		0.68	1.24	0.00		1.54	265.68	255.72
	15851									9.90	8.06	79.79	1.01	0.35	84	0.68						
15851		265.68	15	9.90	28.10	2.3465%	0.66	8.06	0.30					0.30	0.39		1.05	266.74	256.14			
15882		265.37	15	5.50	33.50	0.7243%	0.24	5.91	0.14					0.14	0.28		0.55	0.71		0.95	266.33	257.79
	15859									2.65	5.00	13.25	0.39	0.14	93	0.28						
15859		266.33	15	2.65	26.80	0.1680%	0.05	5.00	0.12					0.12	0.15		0.20	266.52	257.78			
15830		267.08	15	1.16	4.70	0.0325%	0.00	5.03	0.12					0.12	0.15		0.15	267.24	257.65			
42079		270.70	18	2.66	52.70	0.0641%	0.03	4.96	0.10					0.09		0.19	0.38	0.49		0.53	271.23	263.21
	42078									1.37	4.11	5.65	0.26	0.09	97	0.19						
42078		271.23	18	1.37	32.00	0.0171%	0.01	4.11	0.08					0.08	0.10		0.11	271.34	264.13			
37499		271.69	15	2.18	28.90	0.1140%	0.03	9.62	0.43					0.43	0.56		0.59	272.28	265.98			
37496		272.63	15	5.37	7.50	0.6901%	0.05	6.05	0.17					0.17	0.22		0.27	272.90	265.63			
37497		272.63	15	0.90	25.00	0.0195%	0.00	5.55	0.14					0.14	0.19		0.19	272.82	264.76			
16074		284.44	4	0.00	16.20	0.0000%	0.00	0.00	0.00					0.00	0.00		0.00	284.44	257.38			
16105		284.44	15	9.93	50.40	2.3617%	1.19	8.09	0.25					0.32		0.43	1.00	0.00		2.19	286.63	257.34
	16107									9.39	7.65	71.78	0.91	0.32	45	0.43						
16107		286.63	15	9.39	129.10	2.1109%	2.73	7.65	0.27					0.27	0.35		3.08	289.71	257.95			
15968		289.82	15	2.37	70.00	0.1352%	0.09	4.86	0.11					0.11	0.14		0.24	290.06	261.35			

Hydraulic Grade Line Computations (Proposed)

Inlet Structure	Upstream Structure	Outlet Water Surface Elev. (ft)	D_o (in)	Q_o (cfs)	L_o (ft)	S_{f_o} (%)	H_f (ft)	Junction Loss V_o (ft/s)	Junction Loss H_o (ft)	Q_i	V_i (ft/s)	Q_iV_i	$V_i^2/2g$ (ft)	H_i (ft)	Angle (°)	H_a (ft)	H_t (ft)	1.3 H_t (ft)	0.5 H_t (ft)	Final H (ft)	Inlet Water Surface Elev. (ft)	Rim Elev. (ft)
16128		Outlet Pipe Dia. = 36.00						Outlet Pipe Inv. = 239.44		0.8xDia + Pipe Inv. = 241.84				Outlet WSEL =						Starting WSEL =	241.84	
16116		241.84	36	69.61	19.05	1.0892%	0.21	12.46	0.60					1.03		2.68	4.31	5.61		5.81	247.65	250.52
	16077									39.11	13.76	538.27	2.94	1.03	32	1.09						
	16087									32.53	16.05	522.02	4.00	1.40	83	2.68						
16077		247.65	30	39.11	36.02	0.9091%	0.33	13.76	0.74					0.79		0.74	2.27	0.00		2.59	250.25	252.54
	16066									34.18	12.09	413.36	2.27	0.79	0	0.00						
	16085									5.52	8.61	47.51	1.15	0.40	77	0.74						
16066		250.25	24	34.18	36.30	2.2833%	0.83	12.09	0.57					0.72		0.44	1.73	0.00		2.56	252.80	252.98
	15994									27.78	11.55	320.77	2.07	0.72	0	0.00						
	16040									6.35	7.42	47.08	0.85	0.30	51	0.44						
	16060									0.71	4.92	3.47	0.38	0.13	85	0.26						
15994		252.80	21	27.78	107.00	3.0731%	3.29	11.55	0.52					0.48		0.58	1.58	0.00		4.86	257.67	254.33
	15883									16.56	9.37	155.27	1.36	0.48	17	0.29						
	15991									12.10	7.26	87.78	0.82	0.29	91	0.58						
15883		257.67	18	16.56	133.10	2.4866%	3.31	9.37	0.34					0.39		0.34	1.07	0.00		4.38	262.05	256.47
	15837									11.60	8.49	98.49	1.12	0.39	14	0.20						
	15882									5.50	5.91	32.49	0.54	0.19	71	0.34						
15837		262.05	18	11.60	48.50	1.2189%	0.59	8.49	0.28					0.64		0.20	1.12	0.00		1.71	263.75	257.24
	42080									10.70	10.81	115.72	1.82	0.64	4	0.09						
	15830									1.16	5.03	5.86	0.39	0.14	52	0.20						
42080		263.75	18	10.70	227.00	1.0381%	2.36	10.81	0.45					0.55		0.26	1.27	0.00		3.62	267.38	264.16
	37500									8.24	10.07	82.90	1.57	0.55	0	0.00						
	42079									2.66	4.96	13.19	0.38	0.13	88	0.26						
37500		267.38	18	8.24	23.50	0.6147%	0.14	10.07	0.39					0.14		0.30	0.84	0.00		0.98	268.36	265.48
	37498									6.54	5.16	33.74	0.41	0.14	91	0.29						
	37499									2.18	9.62	20.99	1.44	0.50	17	0.30						
37498		268.36	24	6.54	341.00	0.0836%	0.29	5.16	0.10					0.20		0.35	0.65	0.00		0.94	269.30	265.34
	28468									0.42	3.61	1.53	0.20	0.07	0	0.00						
	37496									5.37	6.05	32.44	0.57	0.20	71	0.35						
	37497									0.90	5.55	5.00	0.48	0.17	79	0.31						
28468		269.30	15	0.42	91.25	0.0043%	0.00	3.61	0.05					0.14		0.23	0.42	0.00		0.42	269.73	266.34
	28467									0.42	5.06	2.14	0.40	0.14	63	0.23						
28467		269.73	15	0.42	9.23	0.0043%	0.00	5.06	0.12					0.12	0.16		0.16			0.16	269.88	266.86
16087		247.65	21	32.53	65.10	4.2136%	2.74	16.05	1.00					0.99		1.19	3.19	0.00		5.93	253.58	254.91
	16092									32.53	13.52	439.81	2.84	0.99	39	1.19						
16092		253.58	21	32.53	214.00	4.2136%	9.02	13.52	0.71					1.21		2.29	4.21	0.00		13.23	266.81	255.63
	16073									27.60	14.95	412.48	3.47	1.21	80	2.29						
16073		266.81	21	27.60	31.00	3.0338%	0.94	14.95	0.87					0.92		1.70	3.49	4.54		5.48	272.29	255.65
	16080									22.97	13.00	298.47	2.62	0.92	79	1.70						
16080		272.29	18	22.97	180.10	4.7800%	8.61	13.00	0.66					0.31		0.62	1.58	0.00		10.19	282.48	257.34
	16013									13.40	7.58	101.58	0.89	0.31	88	0.62						
	16074									0.00	0.00	0.00	0.00	0.00	90	0.00						
	16105									9.93	8.09	80.31	1.02	0.36	45	0.48						
16013		282.48	18	13.40	104.60	1.6268%	1.70	7.58	0.22					0.31		0.46	0.99	0.00		2.69	285.18	258.31
	15984									13.40	7.58	101.58	0.89	0.31	51	0.46						
15984		285.18	18	13.40	50.40	1.6268%	0.82	7.58	0.22					0.31		0.48	1.02	0.00		1.84	287.01	259.74
	15977									13.40	7.58	101.58	0.89	0.31	56	0.48						
15977		287.01	18	13.40	8.30	1.6268%	0.14	7.58	0.22					0.24		0.25	0.71	0.00		0.85	287.86	259.75
	15901									11.22	6.67	74.85	0.69	0.24	9	0.08						
	15968									2.37	4.86	11.55	0.37	0.13	86	0.25						
15901		287.86	18	11.22	84.40	1.1415%	0.96	6.67	0.17					0.17		0.00	0.34	0.44		1.41	289.27	260.61
	15878									4.06	5.56	22.58	0.48	0.17	0	0.00						
15878		289.27	18	4.06	26.20	0.1493%	0.04	5.56	0.12					0.14		0.27	0.54	0.70		0.74	290.00	261.03
	15886									3.00	5.12	15.35	0.41	0.14	84	0.27						
15886		290.00	18	3.00	111.60	0.0813%	0.09	5.12	0.10					0.14		0.30	0.54	0.00		0.63	290.63	262.11
	15909									2.69	5.03	13.54	0.39	0.14	103	0.30						
15909		290.63	15	2.69	29.00	0.1740%	0.05	5.03	0.12					0.12	0.15		0.20	290.84	262.03			
16085		250.25	15	5.52	30.00	0.7296%	0.22	8.61	0.35					0.35	0.45		0.67	250.92	253.19			
16040		252.80	15	6.35	52.70	0.9657%	0.51	7.42	0.26					0.26	0.33		0.84	253.65	254.32			
16060		252.80	15	0.71	32.70	0.0119%	0.00	4.92	0.11					0.11	0.15		0.15	252.96	253.19			
15991		257.67	21	12.10	50.60	0.5830%	0.30	7.26	0.20					0.29		0.56	1.05	0.00		1.35	259.01	254.00
	15880									12.27	7.28	89.30	0.82	0.29	86	0.56						
15880		259.01	21	12.27	126.70	0.6001%	0.76	7.28	0.21					0.29		0.55	1.05	0.00		1.81	260.82	255.27
	15877									12.34	7.28	89.91	0.82	0.29	82	0.55						
15877		260.82	21	12.34	49.70	0.6070%	0.30	7.28	0.21					0.35		0.68	1.24	0.00		1.54	262.36	255.72
	15851									9.90	8.06	79.79	1.01	0.35	84	0.68						
15851		262.36	15	9.90	28.10	2.3465%	0.66	8.06	0.30					0.30	0.39		1.05	263.41	256.14			
15882		262.05	15	5.50	33.50	0.7243%	0.24	5.91	0.14					0.14	0.28		0.55	0.71		0.95	263.00	257.79
	15859									2.65	5.00	13.25	0.39	0.14	93	0.28						
15859		263.00	15	2.65	26.80	0.1680%	0.05	5.00	0.12					0.12	0.15		0.20	263.20	257.78			
15830		263.75	15	1.16	4.70	0.0325%	0.00	5.03	0.12					0.12	0.15		0.15	263.91	257.65			
42079		267.38	18	2.66	52.70	0.0641%	0.03	4.96	0.10					0.09		0.19	0.38	0.49		0.53	267.91	263.21
	42078									1.37	4.11	5.65	0.26	0.09	97	0.19						
42078		267.91	18	1.37	32.00	0.0171%	0.01	4.11	0.08					0.08	0.10		0.11	268.01	264.13			
37499		268.36	15	2.18	28.90	0.1140%	0.03	9.62	0.43					0.43	0.56		0.59	268.96	265.98			
37496		269.30	15	5.37	7.50	0.6901%	0.05	6.05	0.17					0.17	0.22		0.27	269.58	265.63			
37497		269.30	15	0.90	25.00	0.0195%	0.00	5.55	0.14					0.14	0.19		0.19	269.49	264.76			
16074		282.48	4	0.00	16.20	0.0000%	0.00	0.00	0.00					0.00	0.00		0.00	282.48	257.38			
16105		282.48	15	9.93	50.40	2.3617%	1.19	8.09	0.25					0.32		0.43	1.00	0.00		2.19	284.67	257.34
	16107									9.39	7.65	71.78	0.91	0.32	45	0.43						
16107		284.67	15	9.39	129.10	2.1109%	2.73	7.65	0.27					0.27	0.35		3.08	287.75	257.95			
15968		287.86	15	2.37	70.00	0.1352%	0.09	4.86	0.11					0.11	0.14		0.24	288.10	261.35			

Storm Drain Design Computations (Existing)

From Point	To Point	Drainage Area Acres	Runoff Coefficient C	CA Incr.	CA Offsite	CA Accum.	Inlet Time min	Time of Conc. min	Rainfall in/hr	Runoff Q cfs	Invert Elevations Upper End	Invert Elevations Lower End	Length ft	Slope %	Diameter in	Capacity cfs	Velocity fps	Flow Time min	Remarks
28467	28468	0.13	0.48	0.06	0.00	0.06	5.00	5.00	6.79	0.42	263.61	263.19	9.23	4.55%	15	13.78	5.06	0.03	
28468	37498	0.00	0.00	0.00	0.00	0.06	5.00	5.03	6.78	0.42	263.09	261.50	91.25	1.74%	15	8.53	3.61	0.42	
37498	37500	0.00	0.00	0.00	0.00	0.99	5.00	5.45	6.64	6.54	261.48	259.45	341.00	0.60%	24	17.45	5.16	1.10	
37500	42080	0.00	0.00	0.00	0.00	1.31	5.00	6.55	6.30	8.24	259.41	258.70	23.50	3.02%	18	18.26	10.07	0.04	No DS Inv.
42080	15837	0.00	0.00	0.00	0.00	1.70	5.00	6.59	6.29	10.70	258.60	251.62	227.00	3.07%	18	18.42	10.81	0.35	No US Inv.
15837	15883	0.00	0.00	0.00	0.00	1.87	5.00	6.94	6.19	11.60	251.52	250.74	48.50	1.61%	18	13.32	8.49	0.10	No US/DS Inv.
15883	15994	0.00	0.00	0.00	0.00	2.69	5.00	7.04	6.17	16.56	250.64	248.48	133.10	1.62%	18	13.38	-	0.00	No US/DS Inv.
15994	16066	0.00	0.00	0.00	0.00	4.50	5.00	7.04	6.17	27.78	248.38	246.66	107.00	1.61%	21	20.09	-	0.00	No US Inv.
16066	16077	0.00	0.00	0.00	0.00	5.54	5.00	7.04	6.17	34.18	245.88	245.09	36.30	2.18%	24	33.37	12.09	0.05	
16077	16116	0.00	0.00	0.00	0.00	6.36	5.00	7.09	6.15	39.11	244.99	242.96	36.02	5.64%	24	53.71	18.65	0.03	
16116	16128	0.00	0.00	0.00	0.00	11.34	5.00	7.12	6.14	69.64	241.55	239.44	19.05	11.08%	36	221.98	27.79	0.01	
37496	37498	1.52	0.52	0.79	0.00	0.79	5.00	5.00	6.79	5.37	261.57	261.49	7.50	1.07%	15	6.67	6.05	0.02	
37497	37498	0.16	0.83	0.13	0.00	0.13	5.00	5.00	6.79	0.90	263.17	262.39	25.00	3.12%	15	11.41	5.55	0.08	
37499	37500	0.51	0.63	0.32	0.00	0.32	5.00	5.00	6.79	2.18	262.34	260.28	28.90	7.13%	15	17.25	9.62	0.05	
42078	42079	0.23	0.88	0.20	0.00	0.20	5.00	5.00	6.79	1.37	259.65	259.33	32.00	1.00%	18	10.50	4.11	0.

REVISED ON 2/15/2024

WinTR-55 Current Data Description

--- Identification Data ---

User: AJunge
Project: SR06
Subtitle:
State: Virginia
County: Arlington
Filename: <new file>

Date: 1/16/2024
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
DA		Outlet	19.56	76	0.166

Total area: 19.56 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.15	4.05	4.84	6.06	7.14	8.3	2.69

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

Arlington County, Virginia

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.15	4.05	4.84	6.06	7.14	8.3	2.69

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

Arlington County, Virginia

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)
SUBAREAS			
DA	29.85	65.26	145.64
REACHES			
OUTLET	29.85	65.26	145.64

Arlington County, Virginia

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)	10-Yr (cfs) (hr)	100-Yr (cfs) (hr)
SUBAREAS			
DA	29.85 12.00	65.26 11.99	145.64 11.98
REACHES			
OUTLET	29.85	65.26	145.64

Arlington County, Virginia

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
DA	19.56	0.166	76	Outlet	

Total Area: 19.56 (ac)

Arlington County, Virginia

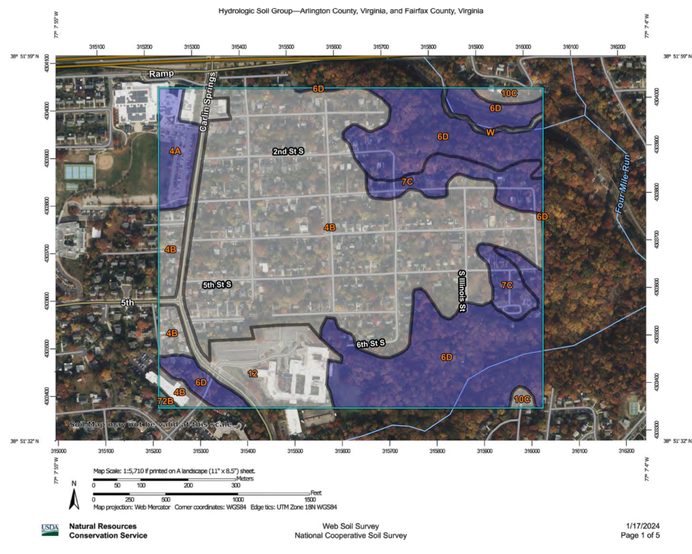
Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
DA							
SHEET	50	0.0100	0.150				0.125
SHALLOW	309	0.0160	0.050				0.041
CHANNEL	984	0.0220	0.013				
Time of Concentration							0.166

Arlington County, Virginia

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
DA	Open space; grass cover > 75% (good)	B	11.47	61
	Paved parking lots, roofs, driveways	B	8.09	98
	Total Area / Weighted Curve Number		19.56	76



ALL SHEET CONTENT HAS BEEN PROVIDED BY ARLINGTON COUNTY AND SHALL NOT BE USED FOR CONSTRUCTION

FILENAME: DRAINAGE DIVIDES & STORM COMPUTATIONS.DWG PATH: L:\28000S\28400\28467.02\CADD\04-ENGR\04-CONCEPT PLOTTED BY: CCO232

ARLINGTON VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL

30% SUBMISSION

APPROVALS DATE

DESIGN TEAM ENGINEER SUPERVISOR

WATER, SEWER, STREETS BUREAU CHIEF

ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

STORM COMPUTATIONS

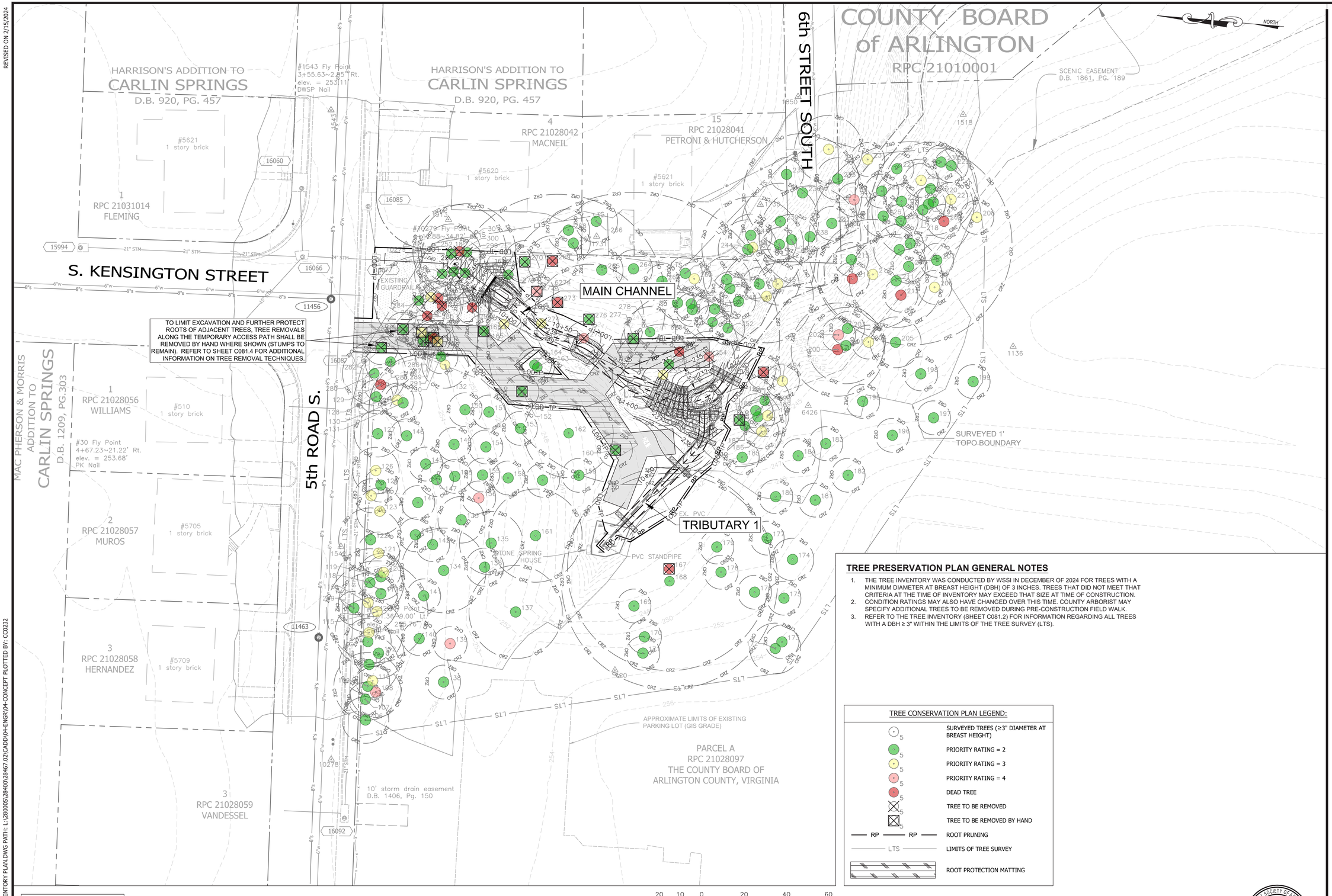
DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

PLOTTED: JULY 3 2025

SCALE:
N/A

C075.3

REVISED ON 2/15/2024



PLEASE REFER TO SHEET C006.1 FOR ALL LEGEND LINETYPES, SYMBOLS, AND HATCHES

TREE PRESERVATION PLAN GENERAL NOTES

1. THE TREE INVENTORY WAS CONDUCTED BY WSSI IN DECEMBER OF 2024 FOR TREES WITH A MINIMUM DIAMETER AT BREAST HEIGHT (DBH) OF 3 INCHES. TREES THAT DID NOT MEET THAT CRITERIA AT THE TIME OF INVENTORY MAY EXCEED THAT SIZE AT TIME OF CONSTRUCTION.
2. CONDITION RATINGS MAY ALSO HAVE CHANGED OVER THIS TIME. COUNTY ARBORIST MAY SPECIFY ADDITIONAL TREES TO BE REMOVED DURING PRE-CONSTRUCTION FIELD WALK.
3. REFER TO THE TREE INVENTORY (SHEET C081.2) FOR INFORMATION REGARDING ALL TREES WITH A DBH ≥ 3" WITHIN THE LIMITS OF THE TREE SURVEY (LTS).

TREE CONSERVATION PLAN LEGEND:

- SURVEYED TREES (≥3" DIAMETER AT BREAST HEIGHT)
- PRIORITY RATING = 2
- PRIORITY RATING = 3
- PRIORITY RATING = 4
- DEAD TREE
- TREE TO BE REMOVED
- TREE TO BE REMOVED BY HAND
- RP — RP — ROOT PRUNING
- LTS — LIMITS OF TREE SURVEY
- ROOT PROTECTION MATTING

NATIONAL SOCIETY OF CONSULTING ARBORISTS
CARY HULSE
ISA# PD-1080A
REGISTERED ARBORIST

ARLINGTON
VIRGINIA
DEPARTMENT OF
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FACILITIES & ENGINEERING DIVISION
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SEAL

30% SUBMISSION

APPROVALS DATE

DESIGN TEAM ENGINEER SUPERVISOR

WATER, SEWER, STREETS BUREAU CHIEF

ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

TREE CONSERVATION PLAN

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

PLOTTED: JULY 3 2025

SCALE:
1" = 20'

C081.1

FILENAME: TREE INVENTORY PLAN.DWG PATH: L:\28000\28400\28467.02\CADD\04-ENGR\04-CONCEPT PLOTTED BY: CC0232

REVISED ON 2/15/2024

Date: 7/1/2025

Tree Protection Action Key

Project: Upper Long Branch

Tree #	DBH (Diameter at 4.5 feet above grade)	Common Name	Botanical Name	Condition Rating %	Condition Rating	Native Status	Approx Canopy Radius (FT)	Approx Tree Height (FT)	Number of Stems	Calculated DBH	SRZ Structural Critical Root Zone (radius) in Feet	CRZ Critical Root Zone Radius in Ft (1 ft radius/in DBH)	CRZ Critical Root Zone Radius in Ft (1.5 ft radius/in DBH)	Priority (1-4)	CRZ % Impact	Replacements: Species Rating	Replacements: Total Score	Replacements: Replacement Value	Replacements: Replacements Required	Removal (Standard)	By-Hand Removal	Preservation Measures: Trunk Amoring	Preservation Measures: Tree Protection Fence	Preservation Measures: Arborist Monitoring	Preservation Measures: Root Protection/Deck Mating	Preservation Measures: Root Pruning	Additional Notes	Condition Notes
106	11	pine, eastern white	Pinus strobus	50%	Fair	Non-Native	6	25	1	11	5	11	17	2	NONE	60%	3	1	0				X					Vines
107	7	pine, eastern white	Pinus strobus	50%	Fair	Non-Native	3	20	1	7	3	8	11	2	NONE	60%	2	1	0				X					Narrow Crown, Small DW (1-2"), Vines
108	12	pine, eastern white	Pinus strobus	25%	Poor	Non-Native	7	45	1	12	5	12	18	4	NONE	60%	2	1	0				X					Large DW (3"+), Low Vigor, Stressed, Serious Decline, Vines
109	16	pine, eastern white	Pinus strobus	50%	Fair	Non-Native	9	50	1	16	7	16	24	2	NONE	60%	5	1	0				X					Large DW (3"+), Small DW (1-2"), Vines
110	5	mulberry, white	Morus alba	50%	Fair	Invasive	5	12	1	5	2	8	8	3	NONE	20%	1	1	0				X				invasive	Co-Dominant Stems, Small DW (1-2"), Vines
111	14	pine, eastern white	Pinus strobus	50%	Fair	Non-Native	10	50	1	14	6	14	21	2	NONE	60%	4	1	0				X					Large DW (3"+), Small DW (1-2"), Vines
112	12	pine, eastern white	Pinus strobus	50%	Fair	Non-Native	9	45	1	12	5	12	18	2	NONE	60%	4	1	0				X					Large DW (3"+), Small DW (1-2"), Vines
113	11	pine, eastern white	Pinus strobus	50%	Fair	Non-Native	11	40	1	11	5	11	17	2	NONE	60%	3	1	0				X					Small DW (1-2"), Vines
114	16	pine, eastern white	Pinus strobus	40%	Poor	Non-Native	13	40	1	16	7	16	24	3	NONE	60%	4	1	0				X					Large DW (3"+), Small DW (1-2"), Stressed
115	24	pine, eastern white	Pinus strobus	45%	Fair	Non-Native	13	40	1	24	11	24	36	3	NONE	60%	5	2	0				X					Excessive Lean, Large DW (3"+), Small DW (1-2")
116	14	cherry, black	Prunus serotina	40%	Poor	Native	6	20	1	14	6	14	21	3	NONE	70%	4	1	0				X					Trunk Decay, Large DW (3"+), Small DW (1-2")
117	7	pine, eastern white	Pinus strobus	50%	Fair	Non-Native	7	18	1	7	3	8	11	2	NONE	60%	2	1	0				X					Excessive Lean, Large DW (3"+), Small DW (1-2")
118	16	pine, eastern white	Pinus strobus	60%	Fair	Non-Native	10	50	1	16	7	16	24	2	NONE	60%	5	2	0				X					Small DW (1-2")
119	11	pine, eastern white	Pinus strobus	50%	Fair	Non-Native	8	35	1	11	5	11	17	2	NONE	60%	3	1	0				X					One Sided, Small DW (1-2")
120	3	mulberry, white	Morus alba	50%	Fair	Invasive	3	10	1	3	1	8	5	3	NONE	20%	0	1	0				X				invasive	Excessive Lean, Small DW (1-2"), Vines
121	10	pine, eastern white	Pinus strobus	45%	Fair	Non-Native	10	40	1	10	5	10	15	3	NONE	60%	3	1	0				X					Suppressed, Large DW (3"+), Small DW (1-2")
122	15	pine, eastern white	Pinus strobus	50%	Fair	Non-Native	15	50	1	15	7	15	23	2	NONE	60%	5	1	0				X					Excessive Lean, Co-Dominant Stems, Small DW (1-2"), Vines
123	11	mulberry, white	Morus alba	50%	Fair	Invasive	8	18	1	11	5	11	17	3	NONE	20%	1	1	0				X				invasive	Small DW (1-2"), Vines
124	5,5,4	mulberry, white	Morus alba	45%	Fair	Invasive	9	16	3	9	4	9	12	3	NONE	20%	1	1	0				X				invasive	Co-Dominant Stems, Large DW (3"+), Small DW (1-2"), Vines
125	3	cherry, black	Prunus serotina	55%	Fair	Native	5	10	1	3	1	8	5	2	NONE	70%	1	1	0				X					Small DW (1-2"), Vines
126	11	mulberry, white	Morus alba	55%	Fair	Invasive	10	20	1	11	5	11	17	3	NONE	20%	1	1	0				X				invasive	Small DW (1-2"), Vines
127	11	elm, slippery	Ulmus rubra	55%	Fair	Native	10	35	1	11	5	11	17	2	NONE	80%	5	1	0				X					Small DW (1-2"), Vines
128	4	walnut, black	Juglans nigra	50%	Fair	Native	4	25	1	4	2	8	6	2	NONE	75%	2	1	0				X					
129	8	cherry, black	Prunus serotina	0%	Dead	Native	5	14	1	8	4	8	12	4	DEAD	70%	0	0	0				X					
130	6	mulberry, white	Morus alba	55%	Fair	Invasive	10	30	1	6	3	8	9	3	NONE	20%	1	1	0				X				invasive	Small DW (1-2"), Vines
131	5,8	elm, Chinese	Ulmus parvifolia	60%	Fair	Introduced	11	40	2	10	4	10	14	2	NONE	70%	4	1	0				X					Co-Dominant Stems, Small DW (1-2"), Vines
132	7,8	mulberry, white	Morus alba	50%	Fair	Invasive	10	30	2	11	5	11	16	3	NONE	20%	1	1	0				X	X	X	X	invasive	Excessive Lean, Co-Dominant Stems, Small DW (1-2"), Vines
133	11	redcedar, eastern	Juniperus virginiana	50%	Fair	Native	10	50	1	11	5	11	17	2	NONE	80%	4	1	0				X					Included Bark/Weak Union, Co-Dominant Stems
134	20	redcedar, eastern	Juniperus virginiana	60%	Fair	Native	11	55	1	20	9	20	30	2	NONE	80%	10	2	0				X					Large DW (3"+), Small DW (1-2")
135	15	redcedar, eastern	Juniperus virginiana	60%	Fair	Native	10	40	1	15	7	15	23	2	NONE	80%	7	2	0				X					Small DW (1-2")
136	9	redcedar, eastern	Juniperus virginiana	45%	Fair	Native	7	25	1	9	4	9	14	2	NONE	80%	3	1	0				X					Narrow Crown, Small DW (1-2"), Stressed
137	22	walnut, black	Juglans nigra	55%	Fair	Native	18	60	1	22	10	22	33	2	NONE	75%	9	2	0				X					Small DW (1-2")
138	2	oak, willow	Quercus phellos	60%	Fair	Native	3	10	1	2	1	8	3	2	NONE	90%	1	1	0				X					
139	2	redbud, eastern	Cercis canadensis	30%	Poor	Native	3	8	1	2	1	8	3	4	NONE	80%	0	1	0				X				girdled by deer	
140	2	oak, white	Quercus alba	60%	Fair	Native	3	12	1	2	1	8	3	2	NONE	95%	1	1	0				X					
141	2	oak, willow	Quercus phellos	60%	Fair	Native	3	10	1	2	1	8	3	2	NONE	90%	1	1	0				X					
142	2	planetree, London	Platanus × hispanica	55%	Fair	Non-Native	2	10	1	2	1	8	3	2	NONE	70%	1	1	0				X					
143	2	oak, willow	Quercus phellos	60%	Fair	Native	3	10	1	2	1	8	3	2	NONE	90%	1	1	0				X					
144	2	blackgum	Nyssa sylvatica	50%	Fair	Native	3	10	1	2	1	8	3	2	NONE	85%	1	1	0				X				shifting root ball	
145	2	hornbeam, American	Carpinus caroliniana	70%	Good	Native	2	8	1	2	1	8	3	2	NONE	80%	1	1	0				X					
146	2	sweetgum, American	Liquidambar styraciflua	65%	Good	Native	2	10	1	2	1	8	3	2	NONE	75%	1	1	0				X					
147	2	planetree, London	Platanus × hispanica	60%	Fair	Non-Native	2	10	1	2	1	8	3	2	NONE	70%	1	1	0				X					
148	2	redbud, eastern	Cercis canadensis	60%	Fair	Native	3	8	1	2	1	8	3	2	NONE	80%	1	1	0				X					
149	2	redbud, eastern	Cercis canadensis	65%	Good	Native	3	8	1	2	1	8	3	2	NONE	80%	1	1	0				X					
150	2	redbud, eastern	Cercis canadensis	50%	Fair	Native	2	10	1	2	1	8	3	2	NONE	80%	1	1	0				X				antler rub	
151	2	planetree, London	Platanus × hispanica	60%	Fair	Non-Native	2	10	1	2	1	8	3	2	NONE	70%	1	1	0				X					
152	2	planetree, London	Platanus × hispanica	60%	Fair	Non-Native	2	10	1	2	1	8	3	2	100%	70%	1	1	1	X								Hardware
153	2	redbud, eastern	Cercis canadensis	60%	Fair	Native	2	10	1	2	1	8	3	2	NONE	80%	1	1	0				X					
154	2	oak, swamp white	Quercus bicolor	65%	Good	Native	2	10	1	2	1	8	3	2	NONE	95%	1	1	0				X					
155	2	planetree, London	Platanus × hispanica	60%	Fair	Non-Native	2	10	1	2	1	8	3	2	NONE	70%	1	1	0				X					Hardware
156	2	planetree, London	Platanus × hispanica	10%	Critical	Non-Native	2	10	1	2	1	8	3	4	NONE	70%	0	1	0				X				fallen	Hardware
157	2	planetree, London	Platanus × hispanica	55%	Fair	Non-Native	2	10	1	2	1	8	3	2	NONE	70%	1	1	0				X					Hardware
158	2	sweetgum, American	Liquidambar styraciflua	65%	Good	Native	2	8	1	2	1	8	3	2	NONE	75%	1	1	0				X					
159	2	planetree, London	Platanus × hispanica	60%	Fair	Non-Native	2	10	1	2	1	8	3	2	NONE	70%	1	1	0				X					Hardware
160	2	redbud, eastern	Cercis canadensis	60%	Fair	Native	2	12	1	2	1	8	3	2	100%	80%	1	1	1	X							antler rub	Hardware
161	22	walnut, black	Juglans nigra	55%	Fair	Native	18	55	1	22	10	22	33	2	NONE	75%	9	2	0				X					Small DW (1-2")
162	21	walnut, black	Juglans nigra	55%	Fair	Native	15	50	1	21	9	21	32	2	NONE	75%	9	2	0				X	X	X	X		Small DW (1-2")
163	4	catalpa, northern	Catalpa speciosa	50%	Fair	Introduced	7	18	1	4	2	8	6	2	6%	35%	1	1	0			X	X	X	X	X		Small DW (1-2"), Vines
164	3,3	catalpa, northern	Catalpa speciosa	50%	Fair	Introduced	5	18	2	5	2	8	6	2	6%	35%	1	1	0			X	X	X	X	X		Co-Dominant Stems, Small DW (1-2"), Vines
165	6	cherry, black	Prunus serotina	40%	Poor	Native	4	20	1	6	3	8	9	3	100%	70%	2	1	1	X								Trunk Decay, Large DW (3"+), Small DW (1-2")
166	5	catalpa, northern	Catalpa speciosa	45%	Fair	Introduced	6	16	1	5	2	8	8	2	100%	35%	1	1	1	X								Suppressed, Small DW (1-2"), Vines
167	32	oak, white	Quercus alba	0%	Dead	Native	0	20	1	32	14	48	48	4	DEAD	95%	0	0	0	X							snag	
168	34	oak, white	Quercus alba	60%	Fair	Native	0	20	1	34	15	51	51	2	12%	95%	19	4	0			X	X	X		X		Co-Dominant Stems, Small DW (1-2")

Date: 7/1/2025

Tree Protection Action Key

Project: Upper Long Branch

Tree #	DBH (Diameter at 4.5 feet above grade)	Common Name	Botanical Name	Condition Rating %	Condition Rating	Native Status	Approx Canopy Radius (FT)	Approx Tree Height (FT)	Number of Stems	Calculated DBH	SRZ Structural Critical Root Zone (radius) in Feet	CRZ Critical Root Zone Radius in Ft (1 ft radius/in DBH)	CRZ Critical Root Zone Radius in Ft (1.5 ft radius/in DBH)	Priority (1-4)	CRZ % Impact	Replacements: Species Rating	Replacements: Total Score	Replacements: Replacement Value	Replacements: Replacements Required	Removal (Standard)	By-Hand Removal	Preservation Measures: Trunk Amoring	Preservation Measures: Tree Protection Fence	Preservation Measures: Arborist Monitoring	Preservation Measures: Root Protection/Deck Mating	Preservation Measures: Root Pruning	Additional Notes	Condition Notes
169	2	redbud, eastern	Cercis canadensis	65%	Good	Native	2	12	1	2	1	8	3	2	NONE	80%	1	1	0				X					Hardware
170	2	oak, pin	Quercus palustris	50%	Fair	Native	3	12	1	2	1	8	3	2	NONE	80%	1	1	0				X				exposed root ball	Hardware
171	2	blackgum	Nyssa sylvatica	60%	Fair	Native	3	10	1	2	1	8	3	2	NONE	85%	1	1	0				X					Surface Roots, Hardware
172	8,6,4,5	whitecedar, Atlantic	Chamaecyparis thyoides	50%	Fair	Non-Native	7	20	4	12	5	12	18	2	NONE	60%	4	1	0				X					Co-Dominant Stems, Small DW (1-2")
173	5,4	whitecedar, Atlantic	Chamaecyparis thyoides	50%	Fair	Non-Native	6	14	2	7	3	8	10	2	NONE	60%	2	1	0				X					Co-Dominant Stems, Small DW (1-2")
174	10	whitecedar, Atlantic	Chamaecyparis thyoides	50%	Fair	Non-Native	7	16	1	10	5	10	15	2	NONE	60%	3	1	0				X					Small DW (1-2")
175	2	oak, scarlet	Quercus coccinea	60%	Fair	Native	3	8	1	2	1	8	3	2	NONE	80%	1	1	0				X					Hardware
176	2	oak, swamp white	Quercus bicolor	60%	Fair	Native	2	8	1	2	1	8	3	2	NONE	95%	1	1	0				X					Hardware
177	2	oak, swamp white	Quercus bicolor	60%	Fair	Native	2	12	1	2	1	8	3	2	NONE	95%	1	1	0				X					Hardware
178	2	oak, swamp white	Quercus bicolor	60%	Fair	Native	2	8	1	2	1	8	3	2	NONE	95%	1	1	0				X					Hardware
179	2	redbud, eastern	Cercis canadensis	65%	Good	Native	2	10	1	2	1	8	3	2	NONE	80%	1	1	0				X					
180	2	hornbeam, American	Carpinus caroliniana	65%	Good	Native	8	2	1	2	1	8	3	2	NONE	80%	1	1	0				X					Hardware
181	2	blackgum	Nyssa sylvatica	50%	Fair	Native	2	8	1	2	1	8	3	2	NONE	85%	1	1	0				X					Surface Roots, Hardware
182	2	sweetgum, American	Liquidambar styraciflua	60%	Fair	Native	2	6	1	2	1	8	3	2	NONE	75%	1	1	0				X					Hardware
183	2	redbud, eastern	Cercis canadensis	65%	Good	Native	2	10	1	2	1	8	3	2	NONE	80%	1	1	0				X					Hardware
184	2	sweetgum, American	Liquidambar styraciflua	60%	Fair	Native	2	8	1	2	1	8	3	2	NONE	75%	1	1	0				X					Hardware
185	3,2	catalpa, northern	Catalpa speciosa	60%	Fair	Introduced	6	16	2	4	2	8	5	2	NONE	35%	1	1	0				X					Co-Dominant Stems, Small DW (1-2"), Vines
186	3,2	catalpa, northern	Catalpa speciosa	40%	Poor	Introduced	6	16	2	4	2	8	5	3	NONE	35%	1	1	0				X					Trunk Decay, Co-Dominant Stems, Small DW (1-2"), Vines
187	18	walnut, black	Juglans nigra	55%	Fair	Native	18	60	1	18	8	18	27	2	22%	75%	7	2	0			X	X	X	X		X	Large DW (3"+), Small DW (1-2")
188	11,15,12	oak, northern red	Quercus rubra	55%	Fair	Native	20	70	3	23	10	23	33	2	34%	85%	10	3	3		X							Co-Dominant Stems, Small DW (1-2"), Vines
189	5	elm, slippery	Ulmus rubra	60%	Fair	Native	4	18	1	5	2	8	8	2	NONE	80%	2	1	0				X					Small DW (1-2")
190	4	elm, slippery	Ulmus rubra	60%	Fair	Native	4	16	1	4	2	8	6	2	NONE	80%	2	1	0				X					Small DW (1-2")
191	10	mulberry, white	Morus alba	50%	Fair	Invasive	9	25	1	10	5	10	15	3	NONE	20%	1	1	0				X				invasive	Large DW (3"+), Small DW (1-2"), Vines
192	12	walnut, black	Juglans nigra	60%	Fair	Native	10	55	1	12	5	12	10	2	0%	75%	5	2	0				X	X	X	X		Small DW (1-2"), Vines
193	7	ZZ Unknown snag	ZZ Unknown snag	0%	Dead	Unknown	1	14	1	7	3	8	11	4	DEAD	#N/A	0	0	0	X								
194	8	boxelder	Acer negundo	45%	Fair	Native	6	25	1	8	4	8	12	3	NONE	50%	2	1	0				X					Trunk Decay, Co-Dominant Stems, Large DW (3"+), Small DW (1-2"), Stressed, Branch Decay, Vines
195	2	redbud, eastern	Cercis canadensis	50%	Fair	Native	2	10	1	2	1	8	3	2	NONE	80%	1	1	0				X				antler rub	
196	2	sweetgum, American	Liquidambar styraciflua	60%	Fair	Native	2	10	1	2	1	8	3	2	NONE	75%	1	1	0				X					Hardware
197	2	blackgum	Nyssa sylvatica	50%	Fair	Native	2	8	1	2	1	8	3	2	NONE	85%	1	1	0				X				antler rub	
198	2	redbud, eastern	Cercis canadensis	50%	Fair	Native	2	10	1	2	1	8	3	2	NONE	80%	1	1	0				X				antler rub	
199	2	blackgum	Nyssa sylvatica	65%	Good	Native	2	8	1	2	1	8	3	2	NONE	85%	1	1	0				X					Hardware
200	22	ZZ Unknown snag	ZZ Unknown snag	0%	Dead	Unknown	1	30	1	22	10	22	33	4	DEAD	#N/A	0	0	0				X					
201	18	maple, red	Acer rubrum	50%	Fair	Native	12	45	1	18	8	18	27	2	NONE	85%	8	2	0				X					Large DW (3"+), Small DW (1-2"), Vines
202	4	cherry, black	Prunus serotina	20%	Critical	Native	4	12	1	4	2	8	6	4	NONE	70%	1	1	0				X					Basal Decay, Trunk Decay, Large DW (3"+), Small DW (1-2"), Low Vigor, Branch Decay
203	6	maple, red	Acer rubrum	50%	Fair	Native	6	20	1	6	3	8	9	2	NONE	85%	3	1	0				X					Large DW (3"+), Small DW (1-2"), Vines
204	8	mulberry, white	Morus alba	50%	Fair	Invasive	10	25	1	8	4	8	12	3	NONE	20%	1	1	0				X				invasive	Excessive Lean, Large DW (3"+), Small DW (1-2"), Vines
205	12	elm, slippery	Ulmus rubra	55%	Fair	Native	10	55	1	12	5	12	18	2	NONE	80%	5	2	0				X					Small DW (1-2")
206	5	pear, Callery	Pyrus calleryana	50%	Fair	Invasive	6	16	1	5	2	8	8	3	NONE	20%	1	1	0				X				invasive	Small DW (1-2"), Vines
207	4	cherry, black	Prunus serotina	50%	Fair	Native	5	12	1	4	2	8	6	2	NONE	70%	1	1	0				X					Small DW (1-2")
208	4	cherry, black	Prunus serotina	40%	Poor	Native	5	16	1	4	2	8	6	3	NONE	70%	1	1	0				X					Suppressed, Large DW (3"+), Small DW (1-2"), Vines
209	3	redcedar, eastern	Juniperus virginiana	0%	Dead	Native	2	8	1	3	1	8	5	4	DEAD	80%	0	0	0				X					
210	6	hickory, mockernut	Carya tomentosa	50%	Fair	Native	9	55	1	6	3	8	9	2	NONE	80%	2	1	0				X					Small DW (1-2"), Vines
211	22	maple, red	Acer rubrum	55%	Fair	Native	10	55	1	22	10	22	33	2	NONE	85%	10	3	0				X					Trunk Decay, Large DW (3"+), Small DW (1-2"), Vines
212	8	ZZ Unknown snag	ZZ Unknown snag	0%	Dead	Unknown	1	10	1	8	4	8	12	4	DEAD	#N/A	0	0	0				X					
213	26	tuliptree	Liriodendron tulipifera	30%	Poor	Native	12	80	1	26	12	26	39	3	NONE	75%	8	2	0				X				cavity 17"x16"x47"	Basal Decay, Trunk Decay, Co-Dominant Stems, Large DW (3"+), Small DW (1-2")
214	3	cherry, black	Prunus serotina	0%	Dead	Native	2	10	1	3	1	8	5	4	DEAD	70%	0	0	0				X					Large DW (3"+), Small DW (1-2"), Vines
215	3	oak, northern red	Quercus rubra	55%	Fair	Native	6	20	1	3	1	8	5	2	NONE	85%	1	1	0				X					Small DW (1-2")
216	12	hickory, mockernut	Carya tomentosa	60%	Fair	Native	11	55	1	12	5	12	18	2	NONE	80%	8	2	0				X					Small DW (1-2")
217	23,22	tuliptree	Liriodendron tulipifera	50%	Fair	Native	17	80	2	32	14	48	48	2	NONE	75%	12	3	0				X				I	Excessive Lean, Included Bark/Weak Union, Co-Dominant Stems, Large DW (3"+), Small DW (1-2"), Broken Limbs, Vines
218	24	tuliptree	Liriodendron tulipifera	50%	Fair	Native	13	80	1	24	11	24	36	2	NONE	75%	9	2	0				X				I	Excessive Lean, Large DW (3"+), Small DW (1-2"), Vines
219	3	hickory, mockernut	Carya tomentosa	60%	Fair	Native	3	16	1	3	1	8	5	2	NONE	80%	1	1	0				X					
220	5	cherry, black	Prunus serotina	60%	Fair	Native	4	16	1	5	2	8	8	2	NONE	70%	2	1	0				X					Small DW (1-2")
221	5	maple, red	Acer rubrum	40%	Poor	Native	4	14	1	5	2	8	8	3	NONE	85%	2	1	0				X					Large DW (3"+), Small DW (1-2"), Broken Limbs
222	22	tuliptree	Liriodendron tulipifera	55%	Fair	Native	14	80	1	22	10	22	33	2	NONE	75%	9	2	0				X				I	Large DW (3"+), Small DW (1-2")
223	4	holly, American	Ilex opaca	65%	Good	Native	6	20	1	4	2	8	6	2	NONE	80%	2	1	0				X					
224	7	cherry, sweet	Prunus avium	60%	Fair	Introduced	7	35	1	7	3	8	11	2	NONE	40%	2	1	0				X					Vines
225	10	oak, white	Quercus alba	50%	Fair	Native	7	40	1	10	5	10	15	2	NONE	95%	5	1	0				X					Small DW (1-2"), Vines, Stream Erosion
226	8	elm, slippery	Ulmus rubra	50%	Fair	Native	5	20	1	8	4	8	12	2	NONE	80%	3	1	0				X					Vines, Stream Erosion
227	3	elm, slippery	Ulmus rubra	55%	Fair	Native	4	16	1	3	1	8	5	2	NONE	80%	1	1	0				X					Vines

PRIORITY* RATING KEY

1 - HIGH PRIORITY FOR PRESERVATION - TREE MAY BE IN EXCELLENT CONDITION OR HAVE UNIQUE VALUE OR IS UNIQUELY DESIRABLE
2 - MODERATE PRIORITY FOR PRESERVATION - TREE IS DESIRABLE AND TYPICALLY IN GOOD OR FAIR CONDITION, BUT NO UNIQUE VALUE
3 - LOW PRIORITY FOR PRESERVATION - TREE IS LESS DESIRABLE, MAY BE IN FAIR OR POOR CONDITION, AND NO UNIQUE VALUE
4 - REMOVAL RECOMMENDED - TREE IS INVASIVE, UNSOUND, UNHEALTHY, OR OTHERWISE UNDESIRABLE AND SHOULD BE REMOVED

* PRIORITY IS A QUALITATIVE RATING MEANT TO CAPTURE A TREE'S "PRIORITY FOR PRESERVATION" USING ITS CONDITION AS A GUIDE BUT ALSO CONSIDERING OTHER FACTORS SUCH AS NATIVE/INVASIVE STATUS, SPECIES DESIRABILITY, SPECIES LONGEVITY, UNIQUENESS, AESTHETICS, ETC.

DEAD TREES AND TREES MARKED FOR REMOVAL MAY BE LEFT AS WILDLIFE HABITAT SNAGS WHERE DEEMED APPROPRIATE BY COUNTY URBAN FORESTER AND CONTRACT ARBORIST

COORDINATE WITH COUNTY URBAN FORESTER AND WSSI ARBORIST PRIOR TO ANY TREE REMOVAL

WSSI ARBORIST:
CARY HULSE, RCA #757
ISA CERTIFIED ARBORIST PD-1080A, TRAQ
chulse@wetlands.com 703-679-5715

INTERNATIONAL SOCIETY OF ARBORICULTURE
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CERTIFIED ARBORIST

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SEAL

30% SUBMISSION

APPROVALS DAT

REVISED ON 2/15/2024

Date: 7/1/2025

Tree Protection Action Key

Project: Upper Long Branch

Tree #	DBH (Diameter at 4.5 feet above grade)	Common Name	Botanical Name	Condition Rating %	Condition Rating	Native Status	Approx Canopy Radius (FT)	Approx Tree Height (FT)	Number of Stems	Calculated DBH	SRZ: Structural Critical Root Zone (radius) in Feet	CRZ: Critical Root Zone Radius in Ft (1 ft radius/in DBH)	CRZ: Critical Root Zone Radius in Ft (1.5 ft radius/in DBH)	Priority (1-4)	CRZ % Impact	Replacements: Species Rating	Replacements: Total Score	Replacements: Replacement Value	Replacements: Replacements Required	Removal (Standard)	By-Hand Removal	Preservation Measures: Trunk Amoring	Preservation Measures: Tree Protection Fence	Preservation Measures: Arborist Monitoring	Preservation Measures: Root Protection/Deck Matting	Preservation Measures: Root Pruning	Additional Notes	Condition Notes
228	3	crapemyrtle, common	Lagerstroemia indica	40%	Poor	Non-Native	3	14	1	3	1	8	5	3	NONE	80%	1	1	0				X					Trunk Decay, Small DW (1-2"), Vines
229	3	cherry, sweet	Prunus avium	55%	Fair	Introduced	3	12	1	3	1	8	5	2	NONE	40%	1	1	0				X					Vines
230	7	oak, white	Quercus alba	50%	Fair	Native	5	30	1	7	3	8	11	2	NONE	95%	3	1	0				X					Narrow Crown, Small DW (1-2"), Vines
231	8	maple, red	Acer rubrum	40%	Poor	Native	4	14	1	8	4	8	12	3	NONE	85%	3	1	0				X					Surface Roots, Small DW (1-2"), Vines, Stream Erosion
232	3,3,2	holly, American	Ilex opaca	25%	Poor	Native	2	8	3	5	2	8	7	4	NONE	80%	1	1	0				X					Surface Roots, Co-Dominant Stems, Large DW (3"+), Small DW (1-2"), Low Vigor, Stressed, Broken Limbs, Stream Erosion
233	10	walnut, black	Juglans nigra	50%	Fair	Native	10	30	1	10	5	10	15	2	NONE	75%	4	1	0				X					Large DW (3"+), Small DW (1-2"), Vines, Stream Erosion
234	16	cherry, sweet	Prunus avium	45%	Fair	Introduced	11	50	1	16	7	16	24	3	NONE	40%	3	1	0				X				trunk cavity 20"x5"x4"	Excessive Lean, Trunk Decay
235	6	dogwood, flowering	Cornus florida	65%	Good	Native	7	20	1	6	3	8	9	2	NONE	70%	3	1	0				X					
236	28	tuliptree	Liriodendron tulipifera	60%	Fair	Native	19	80	1	28	13	28	42	2	NONE	75%	13	3	0				X					Large DW (3"+), Small DW (1-2")
237	8	walnut, black	Juglans nigra	55%	Fair	Native	10	45	1	8	4	8	12	2	NONE	75%	3	1	0				X					Mechanical Damage, Stream Erosion
238	18,16	tuliptree	Liriodendron tulipifera	50%	Fair	Native	18	75	2	25	11	25	36	2	NONE	75%	9	2	0				X					Co-Dominant Stems, Large DW (3"+), Small DW (1-2"), Stream Erosion
239	18	walnut, black	Juglans nigra	55%	Fair	Native	14	55	1	18	8	18	27	2	NONE	75%	7	2	0				X					Excessive Lean, Small DW (1-2")
240	12	hickory, mockernut	Carya tomentosa	60%	Fair	Native	9	45	1	12	5	12	18	2	NONE	80%	5	2	0				X					Small DW (1-2")
241	10	oak, pin	Quercus palustris	65%	Good	Native	7	40	1	10	5	10	15	2	NONE	80%	5	2	0				X					Small DW (1-2")
242	3	hickory, mockernut	Carya tomentosa	60%	Fair	Native	4	12	1	3	1	8	5	2	NONE	80%	1	1	0				X					Small DW (1-2")
243	24	oak, northern red	Quercus rubra	40%	Poor	Native	13	60	1	24	11	24	36	3	NONE	85%	8	2	0				X					Large DW (3"+), Small DW (1-2")
244	14	walnut, black	Juglans nigra	55%	Fair	Native	10	50	1	14	6	14	21	2	NONE	75%	6	2	0				X					Excessive Lean, Small DW (1-2")
245	10	oak, white	Quercus alba	40%	Poor	Native	8	50	1	10	5	10	15	3	NONE	95%	4	1	0				X					Small DW (1-2"), Stream Erosion
246	3	elm, slippery	Ulmus rubra	65%	Good	Native	3	12	1	3	1	8	5	2	NONE	80%	2	1	0				X					
247	22	oak, northern red	Quercus rubra	40%	Poor	Native	16	60	1	22	10	22	33	3	NONE	85%	7	2	0				X					Large DW (3"+), Small DW (1-2"), Stream Erosion
248	8	elm, slippery	Ulmus rubra	50%	Fair	Native	5	18	1	8	4	8	12	2	NONE	80%	3	1	0				X					Small DW (1-2"), Stream Erosion
249	6	oak, white	Quercus alba	50%	Fair	Native	4	18	1	6	3	8	9	2	NONE	95%	3	1	0				X					Small DW (1-2"), Vines
250	11	cherry, black	Prunus serotina	65%	Good	Native	5	45	1	11	5	11	17	2	NONE	70%	5	2	0				X					Small DW (1-2")
251	6	oak, white	Quercus alba	55%	Fair	Native	5	25	1	6	3	8	9	2	NONE	95%	3	1	0				X					Small DW (1-2")
252	4	elm, slippery	Ulmus rubra	50%	Fair	Native	5	16	1	4	2	8	6	2	9%	80%	2	1	0			X	X	X		X		Small DW (1-2"), Stream Erosion
253	3	elm, slippery	Ulmus rubra	55%	Fair	Native	4	12	1	3	1	8	5	2	1%	80%	1	1	0			X	X	X		X		
254	12	oak, white	Quercus alba	15%	Critical	Native	5	30	1	12	5	12	18	4	100%	95%	2	1	1	X								One Sided, Trunk Decay, Large DW (3"+), Small DW (1-2"), Low Vigor, Stressed, Serious Decline, Stream Erosion
255	24	oak, white	Quercus alba	40%	Poor	Native	15	65	1	24	11	24	36	3	100%	95%	9	2	2	X								One Sided, Excessive Lean, Large DW (3"+), Small DW (1-2"), Vines, Stream Erosion
256	9,11	maple, red	Acer rubrum	50%	Fair	Native	7	35	2	15	6	15	21	2	100%	85%	6	2	2	X								Co-Dominant Stems, Large DW (3"+), Small DW (1-2")
257	28	oak spp.	Quercus spp.	0%	Dead	Non-Native	0	18	1	28	13	28	42	4	DEAD	#N/A	0	0	0	X								
258	7	hickory, mockernut	Carya tomentosa	65%	Good	Native	6	25	1	7	3	8	11	2	NONE	80%	4	1	0				X					Small DW (1-2")
259	3	oak, northern red	Quercus rubra	60%	Fair	Native	3	20	1	3	1	8	5	2	NONE	85%	2	1	0				X					
260	8	oak, northern red	Quercus rubra	55%	Fair	Native	4	40	1	8	4	8	12	2	NONE	85%	4	1	0				X					Narrow Crown, Small DW (1-2")
261	8	oak, northern red	Quercus rubra	40%	Poor	Native	4	35	1	8	4	8	12	3	NONE	85%	3	1	0				X					Narrow Crown, One Sided, Large DW (3"+), Small DW (1-2"), Low Vigor
262	8	ash, green	Fraxinus pennsylvanica	50%	Fair	Native	5	40	1	8	4	8	12	2	NONE	25%	1	1	0				X					Small DW (1-2")
263	5	oak, northern red	Quercus rubra	55%	Fair	Native	5	30	1	5	2	8	8	2	NONE	85%	2	1	0				X					Narrow Crown, Small DW (1-2")
264	9	ash, green	Fraxinus pennsylvanica	60%	Fair	Native	9	45	1	9	4	9	14	2	NONE	25%	1	1	0				X					Small DW (1-2")
265	10	oak, white	Quercus alba	50%	Fair	Native	9	40	1	10	5	10	15	2	NONE	95%	5	1	0				X					Excessive Lean, Small DW (1-2"), Vines
266	3,3,4,4 ,3,4,4	crapemyrtle, common	Lagerstroemia indica	60%	Fair	Non-Native	6	16	7	10	4	10	14	2	NONE	80%	5	1	0				X					Co-Dominant Stems, Small DW (1-2")
267	5	mulberry, white	Morus alba	60%	Fair	Invasive	5	18	1	5	2	8	8	2	NONE	20%	1	1	0				X					Small DW (1-2")
268	10	cherry, black	Prunus serotina	50%	Fair	Native	10	40	1	10	5	10	15	2	NONE	70%	4	1	0				X					Small DW (1-2")
269	12	ZZ Unknown snag	ZZ Unknown snag	0%	Dead	Unknown	0	8	1	12	5	12	18	4	DEAD	#N/A	0	0	0		X							
270	10	elm, slippery	Ulmus rubra	60%	Fair	Native	11	45	1	10	5	10	15	2	18%	80%	5	1	1		X							Excessive Lean, Small DW (1-2")
271	15	maple, Norway	Acer platanoides	55%	Fair	Invasive	16	60	1	15	7	15	23	2	100%	35%	3	1	1	X								Large DW (3"+), Small DW (1-2"), Stream Erosion
272	6	cherry, black	Prunus serotina	25%	Poor	Native	5	18	1	6	3	8	9	4	19%	70%	1	1	1		X							Large DW (3"+), Small DW (1-2"), Low Vigor, Serious Decline, Vines, Stream Erosion
273	34	ZZ Unknown dead tree	ZZ Unknown dead tree	0%	Dead	Unknown	13	55	1	34	15	51	51	4	DEAD	#N/A	0	0	0		X							
274	5	maple, silver	Acer saccharinum	40%	Poor	Native	3	25	1	5	2	8	8	3	100%	55%	1	1	1	X								Excessive Lean, Trunk Decay, Small DW (1-2"), Low Vigor, Stressed, Vines, Stream Erosion
275	8	mulberry, white	Morus alba	30%	Poor	Invasive	7	30	1	8	4	8	12	4	100%	20%	0	1	1	X							invasive	Excessive Lean, Surface Roots, Large DW (3"+), Small DW (1-2"), Low Vigor, Stressed, Broken Limbs, Vines

Date: 7/1/2025

Tree Protection Action Key

Project: Upper Long Branch

Tree #	DBH (Diameter at 4.5 feet above grade)	Common Name	Botanical Name	Condition Rating %	Condition Rating	Native Status	Approx Canopy Radius (FT)	Approx Tree Height (FT)	Number of Stems	Calculated DBH	SRZ: Structural Critical Root Zone (radius) in Feet	CRZ: Critical Root Zone Radius in Ft (1 ft radius/in DBH)	CRZ: Critical Root Zone Radius in Ft (1.5 ft radius/in DBH)	Priority (1-4)	CRZ % Impact	Replacements: Species Rating	Replacements: Total Score	Replacements: Replacement Value	Replacements: Replacements Required	Removal (Standard)	By-Hand Removal	Preservation Measures: Trunk Amoring	Preservation Measures: Tree Protection Fence	Preservation Measures: Arborist Monitoring	Preservation Measures: Root Protection/Deck Matting	Preservation Measures: Root Pruning	Additional Notes	Condition Notes
276	22,14	oak, white	Quercus alba	50%	Fair	Native	15	65	2	27	12	27	39	2	39%	95%	12	3	3		X							
277	26,13, 28,22	tuliptree	Liriodendron tulipifera	50%	Fair	Native	22	75	4	46	21	69	69	2	52%	75%	17	4	4		X							Trunk Decay, Co-Dominant Stems, Large DW (3"+), Small DW (1-2"), Stream Erosion
278	12	sweetgum, American	Liquidambar styraciflua	60%	Fair	Native	11	50	1	12	5	12	18	2	NONE	75%	5	2	0					X	X	X	X	Small DW (1-2")
279	5,3	maple, Japanese	Acer palmatum	60%	Fair	Introduced	3	12	2	6	3	8	9	2	NONE	75%	3	1	0					X				Co-Dominant Stems
280	15	catalpa, northern	Catalpa speciosa	50%	Fair	Introduced	9	40	1	15	7	15	23	2	NONE	35%	3	1	0					X	X	X	X	Excessive Lean, Large DW (3"+), Small DW (1-2"), Vines
281	10,6	cherry, black	Prunus serotina	55%	Fair	Native	9	35	2	12	5	12	17	2	NONE	70%	5	1	0					X	X	X	X	Excessive Lean, Co-Dominant Stems, Small DW (1-2"), Vines
282	3	oak, white	Quercus alba	65%	Good	Native	3	16	1	3	1	8	5	2	100%	95%	2	1	1		X							Small DW (1-2")
283	4	cherry, black	Prunus serotina	60%	Fair	Native	5	20	1	4	2	8	6	2	100%	70%	2	1	1		X							Small DW (1-2"), Vines
284	21	catalpa, northern	Catalpa speciosa	50%	Fair	Introduced	12	50	1	21	9	21	32	2	100%	35%	4	1	1	X								Large DW (3"+), Small DW (1-2"), Vines
285	7	pine, eastern white	Pinus strobus	0%	Dead	Non-Native	3	12	1	7	3	8	11	4	DEAD	60%	0	0	0	X							fallen on fence	
286	5	elm, slippery	Ulmus rubra	55%	Fair	Native	7	25	1	5	2	8	8	2	100%	80%	2	1	1		X						tree 285 leaning against	Small DW (1-2"), Vines
287	3	sweetgum, American	Liquidambar styraciflua	50%	Fair	Native	4	14	1	3	1	8	5	2	100%	75%	1	1	1		X							Small DW (1-2")
288	2,2,2,2	cherry, black	Prunus serotina	40%	Poor	Native	2	6	4	4	2	8	6	3	100%	70%	1	1	1		X						tree 285 leaning on	Suppressed, Small DW (1-2"), Vines
289	5	ZZ Unknown snag	ZZ Unknown snag	0%	Dead	Unknown	0	6	1	5	2	8	8	4	DEAD	#N/A	0	0	0		X							
290	6	elm, slippery	Ulmus rubra	60%	Fair	Native	7	30	1	6	3	8	9	2	NONE	80%	3	1	0				X	X	X	X		Small DW (1-2"), Vines
291	7	mulberry, white	Morus alba	45%	Fair	Invasive	6	16	1	7	3	8	11	3	100%	20%	1	1	1		X						tree 292 leaning against; invasive	Excessive Lean, Small DW (1-2")
292	6	cherry, black	Prunus serotina	0%	Dead	Native	1	12	1	6	3	8	9	4	DEAD	70%	0	0	0	X							fallen on tree 291	
293	9	pine, eastern white	Pinus strobus	0%	Dead	Non-Native	0	18	1	9	4	9	14	4	DEAD	60%	0	0	0	X								
294	5	pine, eastern white	Pinus strobus	0%	Dead	Non-Native	0	25	1	5	2	8	8	4	DEAD	60%	0	0	0	X								
295	3	cherry, black	Prunus serotina	35%	Poor	Native	2	10	1	3	1	8	5	3	100%	70%	1	1	1	X								Small DW (1-2"), Low Vigor
296	13	pine, eastern white	Pinus strobus	50%	Fair	Non-Native	7	40	1	13	6	13	20	2	100%	60%	4	1	1	X								Small DW (1-2"), Vines
297	16	walnut, black	Juglans nigra	50%	Fair	Native	13	55	1	16	7	16	24	2	100%	75%	6	2	2	X								Excessive Lean, Small DW (1-2"), Broken Limbs, Branch Decay, Vines
298	6,3	catalpa, northern	Catalpa speciosa	50%	Fair	Introduced	5	20	2	7	3	8	10	2	100%	35%	1	1	1	X								Co-Dominant Stems
299	20,12	cherry, black	Prunus serotina	50%	Fair	Native	14	50	2	24	10	24	35	2	100%	70%	8	2	2	X								Excessive Lean, Co-Dominant Stems, Large DW (3"+), Small DW (1-2")
300	22	cherry, black	Prunus serotina	0%	Dead	Native	7	40	1	22	10	22	33	4	DEAD	70%	0	0	0	X								Excessive Lean
301	14	walnut, black	Juglans nigra	55%	Fair	Native	13	55	1	14	6	14	21	2	100%	75%	6	2	2	X								Excessive Lean, Small DW (1-2"), Vines

TOTALS: 40 | 20 | 19

NOTE:
CRZ Impact % excludes the areas of deck matting/root protection matting as impact.

PRIORITY* RATING KEY

1 - HIGH PRIORITY FOR PRESERVATION - TREE MAY BE IN EXCELLENT CONDITION OR HAVE UNIQUE VALUE OR IS UNIQUELY DESIRABLE
2 - MODERATE PRIORITY FOR PRESERVATION - TREE IS DESIRABLE AND TYPICALLY IN GOOD OR FAIR CONDITION, BUT NO UNIQUE VALUE
3 - LOW PRIORITY FOR PRESERVATION - TREE IS LESS DESIRABLE, MAY BE IN FAIR OR POOR CONDITION, AND NO UNIQUE VALUE
4 - REMOVAL RECOMMENDED - TREE IS INVASIVE, UNSOUND, UNHEALTHY, OR OTHERWISE UNDESIRABLE AND SHOULD BE REMOVED

* PRIORITY IS A QUALITATIVE RATING MEANT TO CAPTURE A TREE'S "PRIORITY FOR PRESERVATION" USING ITS CONDITION AS A GUIDE BUT ALSO CONSIDERING OTHER FACTORS SUCH AS NATIVE/INVASIVE STATUS, SPECIES DESIRABILITY, SPECIES LONGEVITY, UNIQUENESS, AESTHETICS, ETC.

DEAD TREES AND TREES MARKED FOR REMOVAL MAY BE LEFT AS WILDLIFE HABITAT SNAGS WHERE DEEMED APPROPRIATE BY COUNTY URBAN FORESTER AND CONTRACT ARBORIST

COORDINATE WITH COUNTY URBAN FORESTER AND WSSI ARBORIST PRIOR TO ANY TREE REMOVAL

WSSI ARBORIST:
CARY HULSE, RCA #757
ISA CERTIFIED ARBORIST PD-1080A, TRAQ
chulse@wetlands.com 703-679-5715

ARLINGTON VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
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SEAL

30% SUBMISSION

APPROVALS DATE

DESIGN TEAM ENGINEER SUPERVISOR

WATER, SEWER, STREETS BUREAU CHIEF

ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

TREE INVENTORY

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

PLOTTED: JULY 3 2025

SCALE:
1" = 20'

C081.3

FILENAME: TREE INVENTORY PLAN.DWG PATH: L:\28000\5\2840\28467.02\CADD\04-ENGR\04-CONCEPT PLOTTED BY: CDO232

REVISED ON 2/15/2024

TREE PRESERVATION SPECIFICATIONS AND NARRATIVE

1. GENERAL
   - 1.1. REFER TO THE TREE PROTECTION ACTION KEY (TPAK) FOR SPECIFIC RECOMMENDATIONS FOR EACH TREE.
   - 1.2. PRIOR TO ANY DEMOLITION OR CONSTRUCTION WORK WITHIN OR ADJACENT TO TREE PROTECTION AREAS (TPA), A PRE-CONSTRUCTION SITE WALK SHALL BE HELD TO INCLUDE THE CONTRACT ARBORIST AND PROJECT ARBORIST WITH THE CONTRACTOR, ARCHITECT, *ARLINGTON COUNTY URBAN FORESTER*, AND OWNER.
   - 1.3. SUBSTITUTIONS OR ALTERNATIVE METHODS OR MATERIALS SHALL BE REVIEWED AND APPROVED BY *ARLINGTON COUNTY URBAN FORESTER*.
   - 1.4. ALL TREE PROTECTION MEASURES MUST BE IN PLACE PRIOR TO COMMENCEMENT OF DEMOLITION, SITE CLEARING OR CONSTRUCTION AND MAINTAINED THROUGHOUT CONSTRUCTION. TREE PROTECTION MEASURES MAY ONLY BE REMOVED WITH *ARLINGTON COUNTY URBAN FORESTER* APPROVAL.
   - 1.5. ALL MEASURES WILL BE REVIEWED AFTER INSTALLATION AND APPROVED BY OWNER AND *ARLINGTON COUNTY URBAN FORESTER*.
2. BY-HAND TREE REMOVAL (REMOVAL BY ARBORIST)
   - 2.1. TREES DESIGNATED AS "BY-HAND REMOVAL" OR "REMOVAL BY ARBORIST" SHALL BE REMOVED "BY HAND", TO MINIMIZE POTENTIAL FOR DAMAGE TO REMAINING TREES AND ROOTS.
   - 2.2. TREES SHALL BE REMOVED BY A QUALIFIED ARBORIST OR TREE CLEARING CONTRACTOR. ALL WORK SHALL BE DIRECTLY SUPERVISED BY A CERTIFIED ARBORIST.
   - 2.3. TRUCKS AND MECHANIZED EQUIPMENT SHALL NOT ENTER THE FENCED TREE PROTECTION AREAS, EXCEPT WHERE EXPLICITLY APPROVED BY THE PROJECT ARBORIST AND UTILIZING APPROVED ROOT PROTECTION DEVICE.
   - 2.4. STUMPS SHALL BE LEFT IN PLACE OUTSIDE OF THE LOD EXCEPT IN AREAS OF TURF. STUMPS IN TURF/LANDSCAPE AREAS OR WITHIN ROOT AERATION MATTING AREAS SHALL BE GROUND.
   - 2.5. STUMP GRINDING SHALL BE DONE WITH SMALL MACHINES SPECIFICALLY DESIGNED FOR THAT PURPOSE. NO STUMPS SHALL BE EXCAVATED EXCEPT AS DESCRIBED HEREIN. STUMPS SHALL BE GROUND NOT MORE THAN 8" BELOW GRADE AND CARE MUST BE TAKEN TO MINIMIZE DAMAGE TO ROOTS OF RETAINED TREES.
   - 2.6. STUMPS MAY ALSO BE LEFT TALL AS WILDLIFE HABITAT SNAGS IF APPROVED BY THE OWNER AND *ARLINGTON COUNTY URBAN FORESTER*
3. TREE PROTECTION FENCE
   - 3.1. INSTALL AND MAINTAIN TEMPORARY TREE PROTECTION FENCE FOR EACH TREE PROTECTION AREA AS SHOWN ON THE PLAN. INSTALLATION IS TYPICALLY AFTER ROOT PRUNING AND PRIOR TO CLEARING & GRADING.
   - 3.2. SILT FENCE SHALL BE COORDINATED FOR INSTALLATION TO ENHANCE PROTECTION AND AVOID UNNECESSARY ROOT CUTS BY SILT FENCE INSTALLATION.
   - 3.3. FENCE SHALL REMAIN FOR THE DURATION OF CONSTRUCTION. FENCE MAY BE REMOVED ONLY AFTER ALL CONSTRUCTION AND FINAL LANDSCAPING IS COMPLETE AND WITH *ARLINGTON COUNTY URBAN FORESTER* APPROVAL.
4. TREE PROTECTION AREA SIGNS
   - 4.1. TREE PROTECTION AREA SIGNS SHALL BE AFFIXED TO ALL TREE PROTECTION FENCE AT 30' SPACING AVERAGE.
   - 4.2. SIGNS SHALL BE BILINGUAL (ENGLISH AND SPANISH).
   - 4.3. SIGNS SHALL NOT BE AFFIXED DIRECTLY TO TREES. SEE DETAIL.
   - 4.4. SIGN MATERIAL SHALL BE WATERPROOF, HEAVY VINYL OR SIMILAR.
   - 4.5. SIGNS SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.
5. ROOT PRUNE
   - 5.1. THE EXACT LOCATION AND DEPTH WILL BE DETERMINED DURING THE PRE-CONSTRUCTION MEETING. SPECIFIC EQUIPMENT & METHODS WILL BE DETERMINED BY PROJECT ARBORIST AND *ARLINGTON COUNTY URBAN FORESTER* BASED UPON DEPTH & TREE IMPACT. (SEE DETAIL)
   - 5.2. HAND PRUNE EXPOSED ROOTS OVER 1.5" DIAMETER WITHIN CRZS OF SIGNIFICANT TREES. STEEP SLOPES, DEEP EXCAVATIONS AND PAVEMENT/CURB REMOVAL WILL BE REVIEWED WHEN OPEN FOR HAND ROOT PRUNING DURING CONSTRUCTION.
   - 5.3. COORDINATE WITH SILT FENCE INSTALLATION TO MINIMIZE UNNECESSARY ROOT DAMAGE.
   - 5.4. ROOT PRUNING SHALL BE PERFORMED BY A CERTIFIED ARBORIST.
6. ROOT PROTECTION/DECK MATTING
   - 6.1. TEMPORARY MATTING TO PROTECT EXISTING ROOTS AND SOILS FROM PROPOSED SHORT-TERM CONSTRUCTION TRAFFIC IMPACTS.
   - 6.2. TO PREPARE SITE, REMOVE ANY DEBRIS BY HAND AND SPREAD AN EVEN LAYER OF WOOD CHIPS 12" THICK OVER THE ENTIRE AREA TO RECEIVE MATTING.
   - 6.3. MATTING SHALL BE INSTALLED IN A SINGLE LAYER ON MULCH.
   - 6.4. TOPSOIL SHALL NOT BE DISTURBED OR REMOVED. NO GRUBBING, GRADING, EXCAVATION OR EQUIPMENT TRAFFIC SHALL BE ALLOWED IN THE AREA TO RECEIVE MATTING. EQUIPMENT MAY TRAVEL ON MATTING AFTER IT IS INSTALLED.
   - 6.5. MATTING MATERIAL SHALL WOODED DECK MATS/TIMBER MATS OR APPROVED EQUIVALENT.
   - 6.6. MATTING SHALL BE INSTALLED UNDER ARBORIST SUPERVISION.
   - 6.7. INSTALLATION OF SILT FENCE FOR EROSION CONTROL SHALL BE COORDINATED WITH THE PROJECT ARBORIST AND DESIGN TEAM TO PREVENT DAMAGE TO TREE ROOTS FROM TRENCHING OPERATIONS. TRENCHLESS EROSION CONTROL MEASURES (SUCH AS COMPOST FILTER SOCKS OR SIMILAR DEVICES) MAY BE USED IN LIEU OF OR IN COMBINATION WITH SILT FABRIC.
   - 6.8. MATTING SHALL NOT BE REMOVED WITHOUT APPROVAL BY PROJECT ARBORIST AND *ARLINGTON COUNTY URBAN FORESTER*. NO GRADING, DISTURBANCE, OR EQUIPMENT ACCESS SHALL TAKE PLACE IN MATTING AREAS BEFORE MATTING IS INSTALLED OR AFTER MATTING IS REMOVED.
7. TREE TRUNK ARMORING
   - 7.1. TRUNKS OF TREES IN CLOSE PROXIMITY TO CONSTRUCTION SHALL BE PROTECTED WITH A WRAP OF CLOSED CELL FOAM COVERED BY 2X4 LUMBER, OR APPROVED EQUIVALENT.
   - 7.2. WRAP SHALL BE NOT LESS THAN 10' HIGH ON TRUNK OR UP TO THE LOWEST LIMB (WHICHEVER IS LESS). EXPOSED ROOT FLARE SHALL ALSO BE FULLY COVERED. ADDITIONAL/ALTERNATIVE MATTING MAY BE REQUIRED TO COVER LARGE BUTTRESS OR SURFACE ROOTS.
   - 7.3. WRAP SHALL BE TIED WITH RATCHET STYLE STRAP OR WIRE. TIE MATERIAL SHALL NOT CONTACT TRUNK.
   - 7.4. WRAP SHALL BE REMOVED PROMPTLY AFTER CONSTRUCTION.
   - 7.5. IF WRAP IS TO TO BE IN PLACE FOR MORE THAN 1 MONTH DURING THE GROWING SEASON, THE CONTRACT ARBORIST SHALL RE-ADJUST THE WRAP AND STRAPPING TO MINIMIZE DAMAGE AND IMPACTS TO TRUNK GROWTH.
8. MISCELLANEOUS TREE PROTECTION REQUIREMENTS
   - 8.1. NO TOXIC MATERIALS SHALL BE STORED WITHIN 100' OF TREE PROTECTION AREAS.
   - 8.2. ALL WORK IN OR NEAR TREE PROTECTION AREAS SHALL BE PERFORMED IN A MANNER TO MINIMIZE DAMAGE TO TREES, SHRUBS, GROUND COVER, SOIL AND ROOT SYSTEMS.
   - 8.3. MECHANIZED EQUIPMENT SHALL NOT BE PERMITTED TO ENTER ANY TREE PROTECTION AREAS WITHOUT EXPLICIT APPROVAL BY THE PROJECT ARBORIST AND *ARLINGTON COUNTY URBAN FORESTER*, AND WITH ADEQUATE APPROVED ROOT PROTECTION DEVICES.
9. CANOPY PRUNING & SUPPORT CABLES
   - 9.1. WHERE REQUIRED FOR CONSTRUCTION ACCESS, PRUNING FOR SPECIFIC CLEARANCE SHALL BE REVIEWED AND APPROVED BY THE OWNER AND *ARLINGTON COUNTY URBAN FORESTER*.
   - 9.2. ALL PRUNING SHALL BE IN CONFORMANCE WITH CURRENT ANSI A300 STANDARDS AND ISA BEST MANAGEMENT PRACTICES.
   - 9.3. PRUNING SHALL REMOVE ONLY DEAD, DYING, DAMAGED OR BROKEN BRANCHES GREATER THAN 1" IN DIAMETER. PRUNING OF SMALL TREES MAY INCLUDE REMOVAL OF LIMBS TO IMPROVE STRUCTURE. PRUNING FOR CLEARANCE SHALL BE LIMITED TO THE MINIMUM NEEDED TO AVOID DIRECT CONFLICTS.
   - 9.4. FOLIAGE REMOVAL SHALL NOT BE MORE THAN 25% OF THE TOTAL LIVE CANOPY VOLUME OF ANY TREE IN ANY ONE SEASON. PRUNING SHALL NOT REMOVE INTERIOR BRANCHING EXCEPT AS OTHERWISE STATED.
10. PUBLICATIONS INCLUDED BY REFERENCE

    PUBLICATIONS LISTED HEREIN ARE PART OF THIS WORK TO EXTENT REFERENCED:
   - 10.1. ANSI A300 STANDARD PRACTICES FOR TREES, SHRUBS, AND OTHER WOODY PLANT MAINTENANCE
     - 10.1.1. PART 1 -- 2017, TREE PRUNING
     - 10.1.2. PART 2 -- 2018, SOIL MANAGEMENT
     - 10.1.3. PART 3 -- 2013, SUPPLEMENTAL SUPPORT SYSTEMS
     - 10.1.4. PART 4 -- 2014, LIGHTNING PROTECTION SYSTEMS
     - 10.1.5. PART 5 -- 2019, MANAGEMENT OF TREES AND SHRUBS DURING SITE PLANNING, SITE DEVELOPMENT, AND CONSTRUCTION
     - 10.1.6. PART 6 -- 2018, PLANTING AND TRANSPLANTING
     - 10.1.7. PART 8 -- 2020, ROOT MANAGEMENT
     - 10.1.8. PART 9 -- 2017, TREE RISK ASSESSMENT
     - 10.1.9. PART 10 -- 2016, IPM
   - 10.2. ANSI Z133.1 -- 2017 AND MOST RECENT UPDATES, ARBORICULTURAL OPERATIONS -- SAFETY REQUIREMENTS
11. BY-HAND WORK ONLY AREAS/SPECIAL ARBORIST TREATMENT AREAS
   - 11.1. AREAS DESIGNATED FOR BY-HAND WORK (SPECIAL ARBORIST TREATMENT) ARE AREAS WITHIN THE GENERAL CONTRACTORS SCOPE OF WORK THAT REQUIRE SPECIAL EFFORTS TO MINIMIZE DAMAGE TO ROOTS OF ADJACENT TREES AND MINIMIZE SOIL COMPACTION.
   - 11.2. ALL WORK WITHIN THESE AREAS MUST BE DONE UNDER THE DIRECT SUPERVISION OF A CERTIFIED ARBORIST. THE CONTRACT ARBORIST SHALL PROVIDE A QUALIFIED ARBORIST TO OVERSEE ALL WORK. THE ARBORIST SHALL HAVE AUTHORITY TO DIRECT WORK BY OTHER CONTRACTORS/SUBS WITHIN THIS AREA. THE ARBORIST SHALL ENSURE THAT ALL WORK (DEMOLITION, CONSTRUCTION, SITE PREP, UTILITY, OR OTHER) IS DONE IN A MANNER THAT MINIMIZES SOIL COMPACTION, ROOT DAMAGE, TREE TRUNK/BRANCH DAMAGE, ETC.
   - 11.3. PRIOR TO ANY DEMOLITION OR CONSTRUCTION WORK WITHIN OR ADJACENT TO SPECIAL TREATMENT AREAS, A PRE-CONSTRUCTION SITE WALK SHALL BE HELD TO INCLUDE THE CONTRACT ARBORIST AND PROJECT ARBORIST WITH THE CONTRACTOR, *ARLINGTON COUNTY URBAN FORESTER*, AND OWNER.
   - 11.4. ALL TREE PROTECTION MEASURES WITHIN SPECIAL TREATMENT AREAS MUST BE IN PLACE PRIOR TO COMMENCEMENT OF DEMOLITION, SITE CLEARING OR CONSTRUCTION AND MAINTAINED THROUGHOUT CONSTRUCTION. TREE PROTECTION MEASURES WITHIN SPECIAL TREATMENT AREAS MAY ONLY BE REMOVED WITH *ARLINGTON COUNTY URBAN FORESTER* APPROVAL.
   - 11.5. ALL MEASURES WILL BE REVIEWED AFTER INSTALLATION AND APPROVED BY OWNER AND *ARLINGTON COUNTY URBAN FORESTER*.
   - 11.6. ALL WORK WITHIN SPECIAL TREATMENT AREAS SHALL CONFORM TO THE FOLLOWING MEASURES TO MINIMIZE COMPACTION, MINIMIZE ROOT DAMAGE/DISTURBANCE, AND SHALL BE APPLIED AS DIRECTED BY THE CONTRACT ARBORIST, PROJECT ARBORIST, AND *ARLINGTON COUNTY URBAN FORESTER*.
     - 11.6.1. SPECIAL DEMOLITION PROCEDURES
       - 11.1.1.1. DEMOLITION OF WALLS, FOOTINGS, WALKS, CURBS, AND OTHER IMPROVEMENTS OR HARDSCAPE WITHIN TREE PROTECTION AREAS (TPAS) SHALL BE PERFORMED BY THE CONTRACT ARBORIST AND DIRECTLY SUPERVISED BY A CERTIFIED ARBORIST.
       - 11.1.1.2. ALL WORK SHALL BE PERFORMED "BY-HAND". NO EQUIPMENT MAY BE USED WITHIN DESIGNATED SPECIAL TREATMENT AREAS.
       - 11.1.1.3. UTILITIES SHOULD BE ABANDONED IN PLACE WHEREVER POSSIBLE.
       - 11.1.1.4. MECHANIZED EQUIPMENT SHALL NOT ENTER THE TPAS, EXCEPT WHERE EXPLICITLY APPROVED BY THE PROJECT ARBORIST AND UTILIZING APPROVED ROOT PROTECTION DEVICE.
       - 11.1.1.5. BACKFILL OF VOIDS FROM DEMOLITION WITHIN THE TPAS SHALL BE LOOSELY PLACED TOPSOIL. ONLY THE AMOUNT OF SOIL NECESSARY TO FILL THE VOID WITHOUT SPREADING OVER EXISTING ADJACENT GRADES SHALL BE ALLOWED.
       - 11.1.1.6. ROOTS ENCOUNTERED DURING DEMOLITION SHALL BE REVIEWED ON A CASE-BY-CASE BASIS BY THE CONTRACT ARBORIST. THE ARBORIST SHALL PROVIDE APPROPRIATE TREATMENT OR PRUNING METHODS AS NEEDED AND IN GENERAL CONFORMANCE WITH ACCEPTED INDUSTRY STANDARDS AND THIS SECTION.
     - 11.1.2. EXCAVATION WITHIN CRZS
       - 11.1.2.1. EXCAVATION FOR PROPOSED GRADE CUTS, UTILITIES, DRAINAGE PLUMBING, LIGHTING CONDUITS, HARDSCAPE, IRRIGATION, OR OTHER IMPROVEMENTS WITHIN TREE PROTECTION AREAS (TPAS) SHALL BE EXCAVATED BY HAND OR BY SUPERSONIC AIRTOOL (SSAT) TO MINIMIZE DAMAGE TO ROOT SYSTEMS.
       - 11.1.2.2. OWNER, CONTRACTOR, CONTRACT ARBORIST, AND *ARLINGTON COUNTY URBAN FORESTER* SHALL REVIEW THE PROPOSED LOCATION(S) DURING THE PRE-CONSTRUCTION MEETING.
       - 11.1.2.3. PRE-WATERING OF THE PROPOSED AREAS OF EXCAVATION DURING SUMMER AND FALL MONTHS IS RECOMMENDED TO MAINTAIN ROOT / SOIL MOISTURE.
       - 11.1.2.4. THE CONTRACT ARBORIST SHALL PROVIDE A QUALIFIED ARBORIST CREW EXPERIENCED WITH SUCH WORK TO PROTECT ADJACENT TREES, OPEN THE EXCAVATION, HAND PRUNE MINOR ROOTS, AND IDENTIFY AND PROTECT PRIORITY ROOTS TO REMAIN. COORDINATION WITH THE APPROPRIATE SUB-CONTRACTOR SHALL BE MADE TO DETERMINE APPROPRIATE WIDTH, DEPTH & SEQUENCING, UTILITY INSTALLATION, BACKFILL, COMPLETION, AND COVER.
       - 11.1.2.5. ALL WORK WITHIN TPAS SHALL BE DIRECTLY SUPERVISED BY A CERTIFIED ARBORIST.
       - 11.1.2.6. COMPACTION OF EXISTING SOILS SHALL BE MINIMIZED.
     - 11.1.3. GRADE FILL PLACEMENT WITHIN CRZS
       - 11.1.3.1. PROPOSED GRADE FILL WITHIN PROTECTED TREE CRZS SHALL UTILIZE A WELL DRAINED SOIL MATERIAL WITH HIGH SAND/LOAM CONTENT AND LOW CLAY CONTENT IN ORDER TO PROMOTE DRAINAGE AND AERATION INTO EXISTING GRADE. GRADE FILL SHALL NOT EXCEED 6" DEPTH.
       - 11.1.3.2. SHOULD EXISTING SOILS WITHIN PROTECTED CRZS BE DESIGNATED AS "COMPACTED", THEN DECOMPACTION USING AN AIR-TOOL SHALL BE DONE PRIOR TO OR IN CONJUNCTION WITH FILL PLACEMENT. DEPTH OF AIR TOOL DECOMPACTION SHALL BE 12" OR UNTIL REFUSAL. PRE-WATERING DURING DROUGHT TIMES IS REQUIRED.
       - 11.1.3.3. PLACEMENT OF FILL SHALL NOT FURTHER COMPACT EXISTING SOIL. USE OF RUBBER TRACKED, LOW-PSI EQUIPMENT IS REQUIRED, OR EQUIVALENT.
       - 11.1.3.4. GRADE FILL SHALL NOT BE PLACED TO COVER THE ROOT FLARE. USE CAUTION TO AVOID GOUGES OR SCRAPES TO TRUNK OR ROOT FLARE.
       - 11.1.3.5. WOOD CHIP MULCH SHALL BE INSTALLED AFTER FINAL GRADING.
     - 11.1.4. LANDSCAPE PLANTING EXCAVATION
       - 11.1.4.1. PROPOSED LANDSCAPE PLANTING OF B&B AND CONTAINERIZED PLANTS WITHIN CRITICAL ROOT ZONES WITHIN TPAS SHALL BE REVIEWED BY THE CONTRACT ARBORIST, CONTRACTOR, AND *ARLINGTON COUNTY URBAN FORESTER* IN THE FIELD TO DETERMINE POTENTIAL FOR DAMAGE TO PRIORITY ROOTS SYSTEMS OF SELECT TREES AND LAYOUT THE LIMIT OF WORK.
       - 11.1.4.2. PRE-WATERING OF THE PROPOSED AREAS OF EXCAVATION DURING SUMMER AND FALL MONTHS IS RECOMMENDED TO MAINTAIN ROOT / SOIL MOISTURE.
       - 11.1.4.3. THE CONTRACT ARBORIST SHALL PROVIDE A QUALIFIED ARBORIST CREW EXPERIENCED WITH THE SSAT AND LANDSCAPE PLANTING EXCAVATION TO PROTECT ADJACENT NATURAL RESOURCES AND CONSTRUCTION WORK, OPEN THE EXCAVATION, HAND PRUNE MINOR ROOTS, AND IDENTIFY AND PROTECT PRIORITY ROOTS TO REMAIN. COORDINATION WITH THE APPROPRIATE SUB-CONTRACTOR SHALL BE MADE TO DETERMINE APPROPRIATE WIDTH, DEPTH, SEQUENCING.
       - 11.1.4.4. ALL WORK WITHIN TPAS SHALL BE DIRECTLY SUPERVISED BY A CERTIFIED ARBORIST.
       - 11.1.4.5. THE CONTRACT ARBORIST SHALL PROVIDE ADEQUATE PROTECTION FOR PEDESTRIANS, STRUCTURES, VEHICLES, ETC. DURING THIS OPERATION.
     - 11.1.5. ARBORIST OVERSIGHT
       - 11.1.5.1. THE CONTRACT ARBORIST SHALL DIRECTLY OVERSEE ANY WORK, DEMOLITION, EXCAVATION, FILL PLACEMENT, OR CONSTRUCTION WITHIN SPECIAL TREATMENT AREAS.
       - 11.1.5.2. THE CONTRACT ARBORIST SHALL ENSURE THAT THE CREWS PERFORMING WORK WITHIN SPECIAL TREATMENT AREAS MINIMIZE SOIL COMPACTION AND AVOID ROOT DAMAGE.
       - 11.1.5.3. THE CONTRACT ARBORIST SHALL PROVIDE REGULAR PROGRESS REPORTS THE PROJECT ARBORIST, OWNER, AND *ARLINGTON COUNTY URBAN FORESTER*. WEEKLY REPORTING IS TYPICALLY ACCEPTABLE, BUT MORE FREQUENT REPORTING MAY BE REQUIRED IN AREAS OF INTENSIVE WORK OR NEAR CRITICAL TREES AS DETERMINED BY THE OWNER AND PROJECT TEAM.
       - 11.1.5.4. IN THE EVENT THAT SOIL, ROOTS, OR TREES ARE DISTURBED/DAMAGED BEYOND PLANNED, APPROVED, OR ACCEPTABLE LEVELS, THE CONTRACT ARBORIST SHALL IMMEDIATELY NOTIFY THE PROJECT ARBORIST, OWNER, AND *ARLINGTON COUNTY URBAN FORESTER* TO DETERMINE APPROPRIATE REMEDIAL/MITIGATION STRATEGIES.
       - 11.1.5.5. IF ROOTS ARE ENCOUNTERED DURING ANY WORK WITHIN THE SPECIAL TREATMENT AREAS, THE CONTRACT ARBORIST SHALL REVIEW IMMEDIATELY. ROOTS MAY BE PRUNED OR PROTECTED AT THE CONTRACT ARBORIST'S DISCRETION. ROOTS GREATER THAN 1"ø SHOULD NOT BE CUT. ALL ROOT DAMAGE/PRUNING SHALL BE DOCUMENTED WITH PHOTOS AND INCLUDED IN THE REGULAR REPORTS.
     - 11.1.6. EROSION CONTROL COORDINATION
       - 11.1.6.1. TRENCHING FOR CONVENTIONAL SILT FENCE CAN DAMAGE TREE ROOTS.
       - 11.1.6.2. INSTALLATION OF SILT FENCE FOR EROSION CONTROL SHALL BE COORDINATED WITH THE CONTRACT ARBORIST AND PROJECT TEAM TO PREVENT DAMAGE TO TREE ROOTS FROM TRENCHING OPERATIONS. TRENCHLESS EROSION CONTROL MEASURES (SUCH AS COMPOST FILTER SOCKS OR SIMILAR DEVICES) SHOULD BE USED IN LIEU OF OR IN COMBINATION WITH SILT FABRIC IF POSSIBLE.

ARLINGTON COUNTY STANDARD TREE CONSERVATION NOTES

1. BEFORE ANY GRADING, DEMOLITION, OR OTHER DISTURBANCE, INCLUDING TREE REMOVAL, A PRE-CONSTRUCTION MEETING SHALL BE HELD WITH AN ARLINGTON COUNTY URBAN FORESTER. CHANGES TO THE PLAN, BASED ON FIELD CONDITIONS, MAY BE REQUESTED BY THE URBAN FORESTER AT THE TIME OF THE PRE-CONSTRUCTION MEETING.
2. TREE PROTECTION SHALL BE INSTALLED PER PLAN, WITH ANY CHANGES REQUESTED AT THE PRE-CONSTRUCTION MEETING, AND INSPECTED BY AN ARLINGTON COUNTY URBAN FORESTER. EROSION AND SEDIMENT CONTROLS ARE INSPECTED BY THE DEPARTMENT OF ENVIRONMENTAL SERVICES.
3. REMOVAL OF TREES, NOTED FOR REMOVAL ON THE PLAN, INSIDE A TREE PRESERVATION AREA SHALL BE PERFORMED, BY HAND, WITHOUT GROUND DISTURBANCE, OR DISTURBANCE TO NEARBY PRESERVED TREES. TREES IN THESE AREAS SHALL BE CUT FLUSH TO THE GROUND, WITHOUT STUMP GRINDING.
4. NO CHANGES SHALL BE MADE TO TREE CONSERVATION OR PROPOSED LANDSCAPE UNLESS DIRECTED OR APPROVED BY AN ARLINGTON COUNTY URBAN FORESTER.
5. FOLLOW ANSI STANDARDS WHEN PRUNING TREES. ANY PRUNING BEYOND 5% OF THE CANOPY SHALL BE COMMUNICATED AND APPROVED TO THE URBAN FORESTER
6. DO NOT REMOVE TREES ON OTHER PROPERTIES, OR RIGHTS-OF-WAY, WITHOUT WRITTEN PERMISSION OF THE OWNER.
7. TREE PROTECTION AREAS SHALL HAVE ALL NON-NATIVE INVASIVE VINES REMOVED AT THE END OF THE PROJECT. WHERE DEEMED NECESSARY BY THE COUNTY URBAN FORESTER TO ENSURE TREE SURVIVAL, THE PROTECTION AREA SHALL BE COVERED WITH SHREDDED HARDWOOD MULCH, OR OTHER ORGANIC MULCH AS APPROVED BY THE COUNTY URBAN FORESTER.
8. AT THE END OF THE PROJECT, CONSERVED AND PLANTED TREES MUST BE INSPECTED AND APPROVED BY AN ARLINGTON COUNTY URBAN FORESTER.

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SEAL

30% SUBMISSION

APPROVALS DATE

DESIGN TEAM ENGINEER SUPERVISOR

WATER, SEWER, STREETS BUREAU CHIEF

ENGINEERING BUREAU CHIEF

PROJECT MANAGER

REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

TREE CONSERVATION NOTES

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

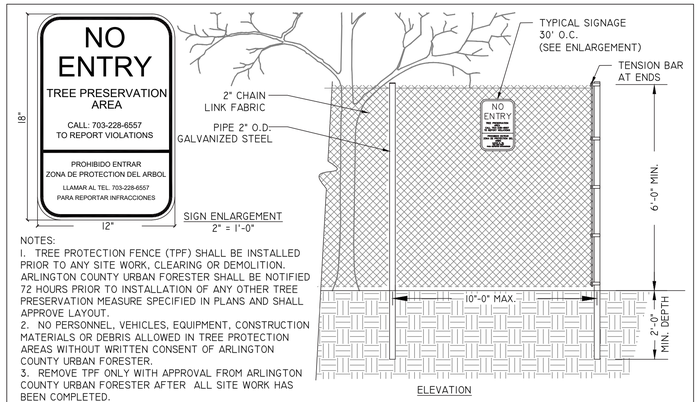
PLOTTED: JULY 3 2025

SCALE:
N/A

C081.4

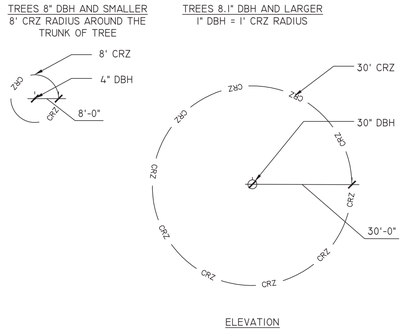
FILENAME: TREE INVENTORY PLAN.DWG PATH: L:\28000S\28400\28467.02\CADD\04-ENGR\04-CONCEPT PLOTTED BY: CC0232

REVISED ON 2/15/2024



NOTES:
1. TREE PROTECTION FENCE (TPF) SHALL BE INSTALLED PRIOR TO ANY SITE WORK, CLEARING OR DEMOLITION. ARLINGTON COUNTY URBAN FORESTER SHALL BE NOTIFIED 72 HOURS PRIOR TO INSTALLATION OF ANY OTHER TREE PRESERVATION MEASURE SPECIFIED IN PLANS AND SHALL APPROVE LAYOUT.
2. NO PERSONNEL, VEHICLES, EQUIPMENT, CONSTRUCTION MATERIALS OR DEBRIS ALLOWED IN TREE PROTECTION AREAS WITHOUT WRITTEN CONSENT OF ARLINGTON COUNTY URBAN FORESTER.
3. REMOVE TPF ONLY WITH APPROVAL FROM ARLINGTON COUNTY URBAN FORESTER AFTER ALL SITE WORK HAS BEEN COMPLETED.
4. SIGN MATERIAL TO BE WEATHER RESISTANT.

1 C081.5 — 6' CHAIN LINK TREE PROTECTION FENCE — 1/2" = 1'-0"
311300.1 (2016) (02231.1)



NOTES:

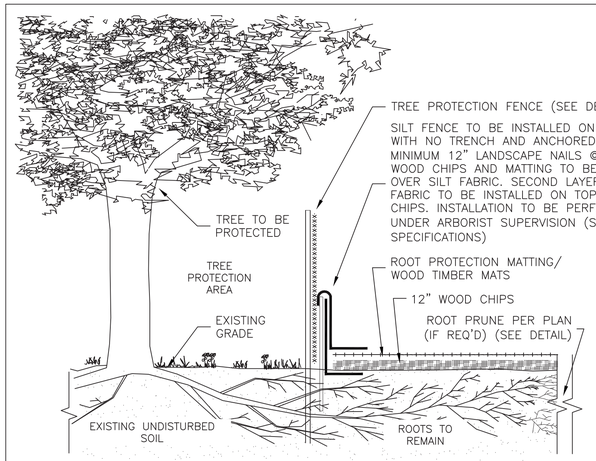
1. GRAPHICALLY, THE CRITICAL ROOT ZONE (CRZ) IS REPRESENTED AS A CIRCULAR REGION MEASURED OUTWARD FROM A TREE TRUNK REPRESENTING THE AREA OF ROOTS THAT MUST BE MAINTAINED OR PROTECTED FOR THE TREE'S SURVIVAL.

2. THE CRZ OF A TREE IS THE ZONE IN WHICH MOST OF THE MAJORITY OF THE ROOTS LAY. 95% OF THE ROOTS OF MOST TREES WILL BE FOUND IN THE UPPER 12-18" OF THE SOIL. MOST OF THE ROOTS THAT SUPPLY THE NUTRIENTS AND WATER TO THE TREE ARE FOUND JUST BELOW THE SOIL SURFACE. THE TOTAL AMOUNT OF A TREE'S ROOTS ARE GENERALLY PROPORTIONAL TO THE VOLUME OF THE TREE'S CANOPY. THEREFORE, IF THE ROOTS ONLY PENETRATE A THIN LAYER OF SOIL, THEN THE ROOTS MUST SPREAD FAR FROM THE TREE, BEYOND THE EXTENSION OF THE CANOPY.

3. PLOT ACCURATE TRUNK LOCATIONS OF ALL TREES GREATER THAN 3" DIAMETER AT BREAST HEIGHT (DBH) AND/OR TREE STANDS WITHIN DEVELOPMENT AREAS ON ALL PLANS FOR THE PROJECT AND DELINEATE THEIR ESTIMATED CRITICAL ROOT ZONE.

4. PLOT ACCURATE TRUNK LOCATIONS OF OFFSITE TREES WHICH WILL HAVE THEIR CRZ AFFECTED BY DEVELOPMENT AND DELINEATE THEIR ESTIMATED CRITICAL ROOT ZONE.

2 C081.5 — TREE PROTECTION DETAIL FOR DETERMINING CRITICAL ROOT ZONE — N.T.S.
311300.3 (2019)



NOTES:
1. MATTING SURFACE MATERIAL SHALL BE WOOD TIMBER MATS OR APPROVED EQUIVALENT.
2. MATTING AND WOOD CHIPS SHALL BE INSTALLED UNDER ARBORIST SUPERVISION.
3. TO BE USED FOR DESIGNATED TEMPORARY CONSTRUCTION ACCESS AND STOCKPILE AREAS.
4. MATTING SHALL BE PLACED ON 12" WOOD CHIPS UNLESS OTHERWISE DIRECTED.
5. FOR HEAVY TRAFFIC AREAS, ADDITIONAL LAYERS OF GEOTEXTILE, OR HARDENED SURFACE LAYER MAY BE NEEDED.

3 C081.5 — TEMPORARY ROOT PROTECTION/DECK MATTING (TYPICAL)
SCALE: NTS

NOTES:
1. TREE PROTECTION AREA WILL BE DETERMINED AS PART OF THE PLAN REVIEW PROCESS. EXACT LOCATION, DEPTH AND METHODS OF ROOT PRUNING TO BE DETERMINED IN THE FIELD BY PROJECT ARBORIST.
2. EXACT LOCATION OF TREE PROTECTION AREAS SHALL BE STAKED OR FLAGGED PRIOR TO TRENCHING.
3. TRENCH SHOULD BE BACKFILLED IMMEDIATELY OR INCORPORATED WITH SILT FENCE INSTALLATION.
4. ROOTS SHOULD BE SEVERED BY ROCK SAW, TRENCHER, VIBRATORY PLOW OR APPROVED EQUIVALENT.
5. ROOTS OVER 1.5" DIAMETER SHOULD BE CLEANLY CUT BY HAND. ROOT PRUNING ADJACENT TO SPECIMEN TREES MAY REQUIRE SOIL REMOVAL BY SUPERSONIC AIR TOOL TO MINIMIZE TREE AND ROOT IMPACTS.
6. COORDINATE WITH SILT FENCE INSTALLATION (IF REQUIRED) TO MINIMIZE ROOT IMPACTS FROM ADDITIONAL TRENCHING.

4 C081.5 — ROOT PRUNING (TYPICAL)
SCALE: NTS

NOTES:
1. TRUNK WRAP MATERIAL SHALL BE CLOSED CELL FOAM, AND WRAPPED AROUND THE TRUNK AT LEAST TWICE. TRUNK WRAP MATERIAL SHALL EXTEND ABOVE AND BELOW WOODEN 2X4 OR 2x6 PLANKS. PLANKS SHALL BE SECURED USING TWO RATCHET STYLE STRAPS.
2. ADDITIONAL MATTING/PROTECTION SHALL BE REQUIRED IF THE ROOT FLARE AND SURFACE ROOTS ARE NOT FULLY COVERED.
3. TRUNK PROTECTION SHALL BE INSTALLED BY A CERTIFIED ARBORIST.
4. TRUNK PROTECTION SHALL BE INSTALLED PRIOR TO ANY SITE WORK, CLEARING OR DEMOLITION.
5. TRUNK PROTECTION SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION. REMOVE TRUNK PROTECTION ONLY WITH ARBORIST APPROVAL AND AFTER ALL SITE WORK HAS BEEN COMPLETED.
6. TRUNK PROTECTION SHALL BE REMOVED PROMPTLY AFTER CONSTRUCTION.
7. TRUNK PROTECTION SHALL BE ADJUSTED BY THE CONTRACT ARBORIST AT LEAST MONTHLY DURING THE GROWING SEASON TO AVOID IMPACT TO TRUNK GROWTH.
8. MAJOR LIMBS MAY ALSO REQUIRE THIS PROTECTION AS DIRECTED BY THE PROJECT ARBORIST.

5 C081.5 — TREE TRUNK PROTECTION ARMORING (TYP)
SCALE: NTS

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SEAL

30% SUBMISSION

APPROVALS DATE

DESIGN TEAM ENGINEER SUPERVISOR

WATER, SEWER, STREETS BUREAU CHIEF

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REVISIONS DATE

UPPER LONG BRANCH OUTFALL 16128 REPAIR
(30% PLAN SET)
SR06
ARLINGTON COUNTY, VIRGINIA

TREE CONSERVATION DETAILS

DESIGNED: CSC
DRAWN: CSC
CHECKED: JTK

PLOTTED: JULY 3 2025

SCALE:
N/A

C081.5

FILENAME: TREE INVENTORY PLAN.DWG PATH: L:\28000S\28400\28467.02\CADD\04-ENGR\04-CONCEPT PLOTTED BY: CCO232