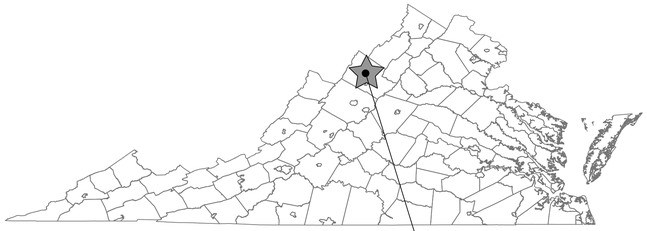
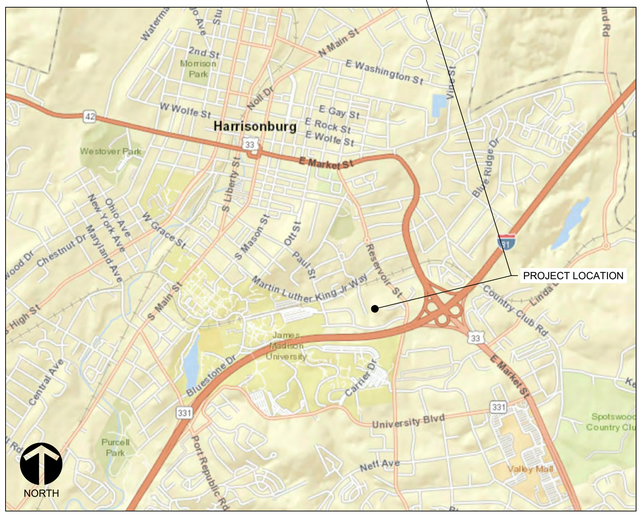
MOUNTAIN VIEW DRIVE STREAM RESTORATION

100% DESIGN





VICINITY MAP

SCALE: N.T.S.

PROJECT INFORMATION

1. CLIENT: CITY OF HARRISONBURG
   CONTACT: TOM HARTMAN, PE
   PHONE: 540.434.5928 EXT: 117
   EMAIL: TOM.HARTMAN@HARRISONBURGVA.GOV
2. PROJECT AGENT: ECOSYSTEM SERVICES, LLC
   PROJECT ENGINEER: KIP MUMAW, P.E.
   ECOSYSTEM SERVICES
   1739-A ALLIED STREET
   CHARLOTTESVILLE, VA 22903
   CONTACT: KIP MUMAW
   PHONE: 540.239.1428
   EMAIL: KIP@ECOSYSTEMSERVICES.US
3. PROPERTY OWNER: MULTIPLE (SEE EXISTING CONDITIONS SHEETS)
4. TOTAL ACREAGE OF DISTURBANCE: +/- 3.09 AC
5. PROJECT WATERSHED: SEIBERTS CREEK > SOUTH FORK SHENANDOAH RIVER BASIN
6. HYDROLOGIC UNIT CODE (8-DIGIT): 02070005
7. PROPERTY ADDRESS: MULTIPLE (SEE EXISTING CONDITIONS SHEETS)
8. PARCEL ID: MULTIPLE (SEE EXISTING CONDITIONS SHEETS)

PROJECT NARRATIVE

LOCATED IN THE CITY OF HARRISONBURG, VIRGINIA, THE PROPOSED WATER QUALITY IMPROVEMENT PROJECT CONSISTS OF RESTORING APPROXIMATELY 1,650 LINEAR FEET OF AN UNNAMED TRIBUTARY TO SIEBERTS CREEK, A TRIBUTARY TO BLACKS RUN. PROPOSED RESTORATION APPROACH WILL INVOLVE CHANNEL FILLING, GRADING, EXCAVATION, AND SELECT STRUCTURE PLACEMENT TO RE-ESTABLISH STABLE DIMENSION, PATTERN, AND PROFILE. STRUCTURES AND BIOENGINEERING MEASURES TO BE UTILIZED INCLUDE BUT ARE NOT LIMITED TO: RIFFLES, BOULDER AND LOG CROSS VANES, BOULDER TOE WITH SOIL LIFTS, IMBRICATED WALLS, AND J-HOOKS. STREAM BANKS AND RIPARIAN BUFFERS WILL BE PLANTED WITH NATIVE TREES, SHRUBS, AND GRASSES. THE MOUNTAIN VIEW DRIVE (MVD) PROJECT IS AN URBAN STREAM RESTORATION PROJECT FOR THE CITY OF HARRISONBURG. THE PROJECT INVOLVES CHANGING THE CROSS-SECTION, PROFILE, AND ALIGNMENT OF THE EXISTING STREAM CHANNEL, INSTALLATION OF INSTREAM STRUCTURES, EROSION AND SEDIMENT CONTROL, AND STREAM CORRIDOR PLANTING. THE PLAN SHEETS SHOULD CLEARLY COMMUNICATE THE EXISTING CONDITIONS INCLUDING ALL CONSTRAINTS TO THE PROJECT, THE PROPOSED DESIGN AND RELEVANT SUPPORTING INFORMATION, SITE ACCESS, ANY CLEARING, AND LIMITS OF DISTURBANCE, AND DETAIL DRAWINGS.

GENERAL NOTES

1. ALL BASEMAPPING AND TOPOGRAPHIC SURVEY INFORMATION IS PROVIDED BY ECOSYSTEM SERVICES, LLC. THE SURVEY WAS COMPLETED IN MAY-JUNE 2018.
2. ADDITIONAL FIELD SURVEYS WERE CONDUCTED BY ECOSYSTEM SERVICES, LLC.
3. ADDITIONAL BASE MAPPING OBTAINED FROM VGIN.
4. HORIZONTAL DATUM: NAD83 VIRGINIA STATE PLANE, NORTH ZONE, US FOOT
5. VERTICAL DATUM: NAVD 88, US FOOT
6. THE CONTRACTOR SHALL CONTACT "MISS UTILITY" AT 811 OR 1-800-552-7001 PRIOR TO ANY LAND DISTURBING ACTIVITIES.
7. ALL WORK SHALL BE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL STANDARDS.
8. ANY WORK THAT IS REQUIRED FOR THE SUCCESSFUL COMPLETION OF THE PROJECT AS SPECIFIED IN THIS SET OF PLANS BUT NOT SPECIFICALLY ADDRESSED IN THE PLAN SET SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO COMPLETE SUCH WORK.
9. THE PROJECT DOES NOT INCLUDE THE ADDITION OF ANY IMPERVIOUS COVER. NO INCREASE IN RUNOFF WILL RESULT FROM THIS PROJECT.
10. NO WORK SHALL BEGIN WITHOUT ACQUISITION OF ALL LOCAL, STATE, AND FEDERAL PERMITS AND APPROVALS.
11. THE CONTRACTOR SHALL CONTACT CITY OF HARRISONBURG REPRESENTATIVE AND ECOSYSTEM SERVICES FOR A PRE-CONSTRUCTION MEETING PRIOR TO ANY LAND DISTURBING ACTIVITIES.
12. SHOULD A DISCREPANCY BE FOUND IN THE PLAN SET, THE CONTRACTOR SHALL CONSULT WITH DESIGN ENGINEER PRIOR TO COMPLETION OF SPECIFIC WORK.
13. ALL GRADING ACTIVITIES SHALL INCLUDE REMOVAL AND TEMPORARY STOCKPILING OF TOP SOIL, EXECUTION OF GRADING , AND REPLACEMENT OF TOPSOIL TO ACHIEVE FINAL GRADES.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING CONDITIONS AS A RESULT OF ITS WORK PERFORMED DURING THE CONTRACT PERIOD. THIS RESPONSIBILITY SHALL INCLUDE RE-SEEDING DISTURBED AREAS AND TEMPORARY ACCESS ROADS.
15. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND STAGING MATERIAL INSIDE THE LIMITS OF DISTURBANCE UNLESS PRIOR APPROVAL BY THE PROJECT ENGINEER IS PROVIDED.
16. CLEARING & GRUBBING SHALL BE CONFINED TO THOSE AREAS NEEDED FOR CONSTRUCTION ACCESS AND GRADING AND SHALL REQUIRE CITY APPROVAL.
17. UNDER NO CIRCUMSTANCES ARE TREES OVER 6 INCHES IN DIAMETER TO BE REMOVED WITHOUT PRIOR APPROVAL FROM THE PROJECT ENGINEER UNLESS OTHERWISE SPECIFIED WITHIN THIS PLAN SET.
18. THE CONTRACTOR IS RESPONSIBLE FOR ALL TAKE-OFF QUANTITIES INCLUDING BUT NOT LIMITED TO FILL, STONE, AND VEGETATIVE MATERIALS.
19. PLAN VIEW LOCATION OF STRUCTURES IS APPROXIMATE. STRUCTURE PLACEMENT SHOULD FOLLOW THE PROFILE VIEW AND STRUCTURE DETAILS.
20. IF SITE OR CONSTRUCTION CONSTRAINTS PREVENT POOL OR STRUCTURE ELEVATIONS FROM BEING CONSISTENT WITH THE PLAN SET, THE CONTRACTOR SHALL CONTACT THE PROJECT ENGINEER TO FIELD MODIFY THE ELEVATIONS.
21. ALL SECTION VIEWS ARE ORIENTED LOOKING DOWNSTREAM UNLESS OTHERWISE SPECIFIED.
22. IN CONFORMANCE WITH DPOR REGULATIONS, SECTION 54.1-112 INVITED BIDDERS MUST DISCLOSE (I) WHETHER BIDDER IS A RESIDENT OR NONRESIDENT OF THE COMMONWEALTH, (II) WHETHER THE PROPER LICENSE OR CERTIFICATE HAS BEEN ISSUED TO THE BIDDER, AND (III) THE INFORMATION REQUIRED OF THE BIDDER TO SHOW EVIDENCE OF PROPER LICENSURE OR CERTIFICATION UNDER THE PROVISIONS OF THE ABOVE MENTIONED CORRESPONDING CHAPTER.

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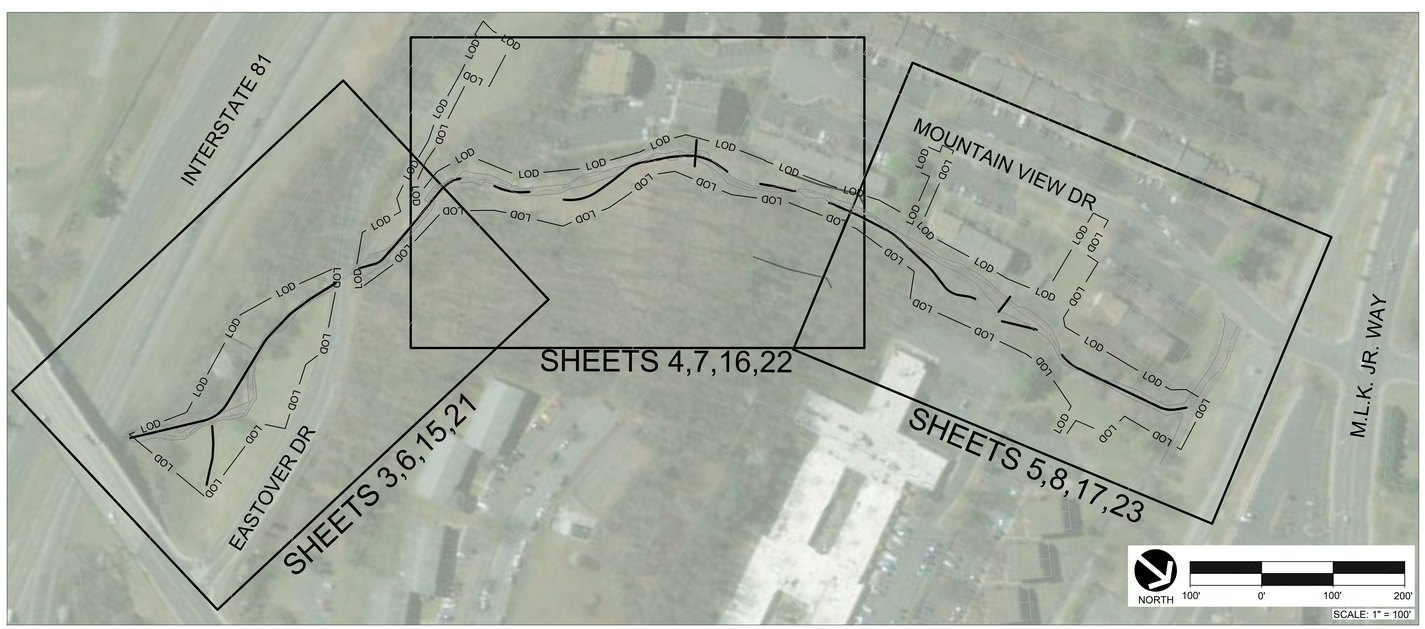

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09/01/21

COMMONWEALTH OF VIRGINIA
WILLIAM KIPLING MUMAW
Lic. No. 040293
PROFESSIONAL ENGINEER

100% DESIGN

MOUNTAIN VIEW DRIVE
STREAM RESTORATION
CITY OF HARRISONBURG, VIRGINIA

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CITY STANDARD GENERAL NOTES

1. WORK IN THIS PROJECT SHALL CONFORM TO THE LATEST EDITIONS OF THE VIRGINIA DEPARTMENT OF TRANSPORTATIONS (VDOT) ROAD AND BRIDGE SPECIFICATIONS, THE VDOT ROAD AND BRIDGE STANDARDS, THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS, THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK, THE VIRGINIA STORMWATER MANAGEMENT REGULATIONS AND THE CITY OF HARRISONBURG DESIGN AND CONSTRUCTION STANDARDS MANUAL. IN THE EVENT OF CONFLICT BETWEEN ANY OF THESE STANDARDS, SPECIFICATIONS OR PLANS, THE MOST STRINGENT SHALL GOVERN. ALL UTILITIES TO BE DEDICATED TO THE CITY OF HARRISONBURG MUNICIPAL WATER AND/OR SANITARY SEWER SYSTEM SHALL BE CONSTRUCTED AND TESTED TO CONFORM TO COMMONWEALTH OF VIRGINIA/STATE BOARD OF HEALTH WATERWORKS AND/OR SEWERAGE REGULATIONS AND THE CITY OF HARRISONBURG DESIGN AND CONSTRUCTION STANDARDS MANUAL.
2. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED CONTINUOUSLY RELOCATED WHEN AND AS NECESSARY AND SHALL BE CHECKED AFTER EVERY RAINFALL. SEEDED AREAS SHALL BE CHECKED REGULARLY AND SHALL BE WATERED, FERTILIZED, RESEEDED, AND MULCHED AS NECESSARY TO OBTAIN A DENSE STAND OF GRASS.
3. ALL DRAIN INLETS SHALL BE PROTECTED FROM SILTATION. INEFFECTIVE PROTECTION DEVICES SHALL BE IMMEDIATELY REPLACED, AND THE INLET CLEANED. FLUSHING IS NOT AN ACCEPTABLE METHOD OF CLEANING.
4. WHEN THE CRUSHED STONE CONSTRUCTION ENTRANCE HAS BEEN COVERED WITH SOIL OR HAS BEEN PUSHED INTO THE SOIL BY CONSTRUCTION TRAFFIC, IT SHALL BE REPLACED WITH A DEPTH OF STONE EQUAL TO THAT OF ORIGINAL APPLICATION.
5. THE LOCATION OF EXISTING UTILITIES AS SHOWN IS APPROXIMATE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL PUBLIC OR PRIVATE UTILITIES THAT LIE IN OR ADJACENT TO THE CONSTRUCTION SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING, AT HIS EXPENSE, ALL EXISTING UTILITIES DAMAGED DURING CONSTRUCTION. FORTY-EIGHT (48) HOURS PRIOR TO ANY EXCAVATION CALL MISS UTILITY 1 (800) 552-7001.
6. ALL UNDERGROUND FACILITIES LOCATED WITHIN THE CITY'S RIGHTS-OF-WAY SHALL BE INSTALLED PRIOR TO THE PLACEMENT OF ANY PART OF THE PAVEMENT STRUCTURE.
7. INSTALLATION OF CONCRETE STORM PIPE SHALL COMPLY WITH VDOT STANDARD DRAWING PB-1.
8. ALL MATERIALS USED FOR FILL OR BACK-FILL SHALL BE FREE OF WOOD, ROOTS, ROCKS, BOULDERS, OR ANY OTHER NON-COMPACTABLE SOIL TYPE MATERIAL. UNSATISFACTORY MATERIALS ALSO INCLUDE MAN-MADE FILLS AND REFUSE DEBRIS DERIVED FROM ANY SOURCE.
9. SATISFACTORY MATERIAL FOR USE AS FILL FOR PUBLIC STREETS INCLUDE MATERIAL CLASSIFIED IN ASTM D-2487 AS GW, GP, GM, GC, SW, SP, SM, SC, ML, AND CL GROUPS. THE MOISTURE CONTENT SHALL BE CONTROLLED WITHIN PLUS OR MINUS 2 PERCENTAGE POINTS OF OPTIMUM TO FACILITATE COMPACTION. GENERALLY, UNSATISFACTORY MATERIALS INCLUDE MATERIALS CLASSIFIED IN ASTM D-2487 AS PT, CH, MH, OL, OH, AND ANY SOIL TOO WET TO FACILITATE COMPACTION. CH AND MH SOILS MAY BE USED SUBJECT TO APPROVAL OF THE CITY ENGINEER. SOILS SHALL HAVE A MINIMUM DRY DENSITY OF 92LB/CUBIC FOOT PER ASTM D-698 AND SHALL HAVE A PLASTICITY INDEX LESS THAN 12.
10. COMPACTION OF FILL MATERIAL UNDER BUILDING SLABS SHALL BE BASED UPON RECOMMENDATIONS OF SOILS ENGINEER AFTER COMPLETION OF STANDARD PROCTOR TEST AND SHALL MEET BEARING REQUIREMENTS OF ARCHITECT FOR BUILDINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TESTING.
11. MATERIALS USED TO CONSTRUCT EMBANKMENTS FOR ANY PURPOSE, BACK-FILL AROUND DRAINAGE STRUCTURES OR IN UTILITY TRENCHES OR ANY OTHER DEPRESSION REQUIRING FILL OR BACK-FILL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY THE STANDARD PROCTOR TEST AS SET OUT IN ASTM STANDARD D-698. THE CONTRACTOR SHALL, PRIOR TO ANY OPERATIONS INVOLVING FILLING OR BACKFILLING, SUBMIT THE RESULT OF THE PROCTOR TEST TO THE CITY'S ON-SITE INSPECTOR TOGETHER WITH A CERTIFICATION THAT THE SOIL TESTED IN REPRESENTATIVE OF THE MATERIALS TO BE USED ON THE PROJECT. TESTS SHALL BE CONDUCTED BY A CERTIFIED MATERIAL TESTING LABORATORY AND THE CERTIFICATIONS MADE BY A LICENSED PROFESSIONAL ENGINEER REPRESENTING THE LABORATORY.
12. CERTIFICATIONS FOR MATERIALS INCLUDING, BUT NOT LIMITED TO STONE, CONCRETE, PIPES, PRECAST UNITS, HANDRAILS, STABILIZATION MATS, TRAFFIC SIGNAL ITEMS, MUST BE PROVIDED TO THE CITY'S ON-SITE INSPECTOR AND APPROVED BY THE INSPECTOR PRIOR TO INSTALLATION. SEE INSPECTOR FOR MATERIALS CERTIFICATION CHECKLIST.
13. EMBANKMENT FILL AND TRENCH BACK-FILL SHALL BE PLACED IN LIFTS AT A MAXIMUM UNCOMPACTED DEPTH OF 8-INCHES AND 6-INCHES, RESPECTIVELY. DENSITY TESTS SHALL BE CONDUCTED AT THE FOLLOWING MINIMUM FREQUENCIES:
    a. EMBANKMENT FOR ROADS, STREETS, DAMS, ETC.: ONE TEST PER LIFT PER 10,000 SQUARE FEET OF LIFT.
    b. BACK-FILL AROUND STRUCTURES AND IN TRENCHES: ONE TEST PER LIFT PER 500 LINEAL FEET OF TRENCH.
14. COMPACTION TESTS FOR STREET PAVEMENT STRUCTURE SHALL BE MADE IN CUT AND FILL AREAS AT THE FOLLOWING MINIMUM FREQUENCIES:
    a. SUB-GRADE: ONE TEST PER LANE PER 500 LINEAL FEET.
    b. STONE BASE: ONE TEST PER LANE PER 6" COMPACTED LIFT PER 500 LINEAL FEET.
    c. HOT ASPHALTIC CONCRETE: ONE TEST PER LANE PER LIFT PER 500 LINEAL FEET.
15. ALL EXCAVATIONS, INCLUDING TRENCHES, SHALL BE KEPT DRY TO PROTECT THEIR INTEGRITY.
16. TEST RESULTS SHALL BE SUBMITTED TO THE CITY ENGINEER. FAILURE TO CONDUCT DENSITY TESTS AND SUBMIT TEST RESULTS SHALL BE CAUSE FOR NONACCEPTANCE OF THE FACILITY. TESTS SHALL BE CONDUCTED AT THE SOLE COST OF THE DEVELOPER OR HIS AGENT.
17. COMBINATION UNDER-DRAINS TYPE CD-1 SHALL BE INSTALLED AT THE LOWER END OF THE CUT SECTIONS. UNDER-DRAINS TYPE CD-2 SHALL BE INSTALLED AT THE LOW POINT OF ALL VERTICAL CURVES.
18. STANDARD UD-1 AND UD-3 UNDER-DRAINS SHALL BE INSTALLED WHERE INDICATED ON PLANS ON FURTHER WHERE DETERMINED NECESSARY IN THE FIELD BY THE CITY INSPECTORS.
19. CITY INSPECTORS HAVE FULL AUTHORITY TO REJECT FILL OR BACKFILL MATERIALS, REQUIRE UNDERCUTTING OR SUB GRADE STABILIZATION, REQUIRE PROVISIONS FOR SUB DRAINAGE, OR REQUIRE OTHER MEASURES WHICH AFFECT THE INTEGRITY OF ROAD AND UTILITY CONSTRUCTION. FAILURE TO COMPLY WITH INSPECTORS' DIRECTIVES SHALL BE CAUSE FOR NON-ACCEPTANCE OF THE FACILITY.
20. TRAFFIC CONTROL ON PUBLIC STREETS SHALL BE IN CONFORMANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND AS FURTHER DIRECTED BY CITY INSPECTORS. CITY INSPECTORS MUST BE NOTIFIED 24-HOURS IN ADVANCE OF ANY PLANNED WORK OR ACTIVITY IN CITY RIGHT-OF-WAY THAT REQUIRES FLAGGING, LANE CLOSURE OR STREET CLOSURE. ALL SIGNAGE AND OTHER CONTROL DEVICES SHALL BE IN PLACE BEFORE SUCH ACTIVITIES CAN COMMENCE.
21. ANY DISCREPANCIES FOUND BETWEEN THE DRAWINGS AND SPECIFICATIONS AND SITE CONDITIONS OR ANY INCONSISTENCIES OR AMBIGUITIES IN DRAWINGS OR SPECIFICATIONS SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER, IN WRITING, WHO SHALL PROMPTLY ADDRESS SUCH INCONSISTENCIES OR AMBIGUITIES. WORK DONE BY THE CONTRACTOR AFTER HIS DISCOVERY OF SUCH DISCREPANCIES, INCONSISTENCIES OR AMBIGUITIES SHALL BE DONE AT THE CONTRACTOR'S RISK.
22. A PRECONSTRUCTION CONFERENCE SHALL BE HELD PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL ARRANGE THE MEETING WITH THE CITY ENGINEER. AT THIS TIME, THE CONTRACTOR SHALL PROVIDE A SCHEDULE AND TRAFFIC CONTROL PLAN FOR WORK WITHIN THE CITY RIGHT-OF-WAY.
23. INSTALL CITY STANDARD STREET CENTERLINE MONUMENTS WHERE REQUIRED FOR NEW STREETS.
24. IF TRAFFIC SIGNAL PLANS HAVE BEEN REVISED OR CHANGED SINCE APPROVAL, THE DEVELOPER MUST PROVIDE TO THE DIRECTOR OF PUBLIC WORKS AS-BUILT DRAWINGS REFLECTING CHANGES. PROVISION OF AS-BUILT DRAWINGS IS A CONDITION OF BOND RELEASE.

LEGEND

- MAJOR CONTOURS (5')
- MINOR CONTOURS (1')
- STREAM/CHANNEL CENTERLINE
- W — W — WATER LINE
- GAS — GAS — GAS
- PARCEL LINE
- VEGETATION LINE
- SS — SS — SS — SANITARY SEWER
- SANITARY SEWER EASEMENT
- FENCE
- AGE — AGE — ABOVE GROUND ELECTRIC
- UGE — UGE — UNDERGROUND ELECTRIC
- T — T — T — TELEPHONE
- GAURDRAIL
- 100YR — 100YR — 100 YEAR FLOOD LINE
- 500YR — 500YR — 500 YEAR FLOOD LINE
- CONCRETE AREA
- RIPRAP
- 237 — EXISTING TREE (10"+ DBH)
- CLEANOUT (CO)
- MANHOLE
- STORM SEWER PIPE
- UTILITY BOX (UB)
- DOWN SPOUT (DS)
- FIBER OPTIC INDICATOR POST (FOIP)
- TRANSFORMER (XFMR)
- BENCHMARK (BM)
- WATER METER (WM)
- LIGHT POLE (LP)
- WATER VALVE (WV)
- STREAM CENTERLINE
- PROPOSED MINOR CONTOURS (1')
- PROPOSED MAJOR CONTOURS (5')
- TOP OF BANK
- FLOODPLAIN BENCH LIMITS
- LOD — LIMITS OF DISTURBANCE
- LOD — OSF
- LOD — LIMITS OF DISTURBANCE
- RIFFLE
- CASCADE
- TEMPORARY ACCESS PATH
- STAGING AND STOCKPILE
- 237 — TREE PROTECTION
- 237 — TREE TO BE REMOVED
- LOG CROSS VANE (LCV)
- BOULDER CROSS VANE
- TOE WOOD
- BOULDER J-HOOK
- IMBRICATED WALL
- HDPE PIPE
- MANHOLE (MH-1)
- STREAM BANK PLANTING
- BUFFER PLANTING
- SANITARY SEWER LINE EASEMENT PLANTING
- EXISTING GROUND PROFILE
- PROPOSED GROUND PROFILE

EROSION & SEDIMENT CONTROL LEGEND

SPEC. NO.	TITLE	KEY	SYMBOL	UNITS	QUANTITY
MGWC 1.2	PUMP AROUND DIVERSION	P	P	EA	AS NEEDED
MGWC 1.2	SANDBAG DIKE	SB	SB	EA	AS NEEDED
3.01	ORANGE SAFETY FENCE	N/A	LOD	LF	3,953
3.02	TEMP. STONE CONSTRUCTION ENTRANCE	CE	CE	EA	5
3.05	SILT FENCE (WITHOUT WIRE SUPPORT)	SF	SF	LF	1,051
3.24	TEMP. VEHICULAR STREAM CROSSING	TB	TB	EA	2
3.38	TREE PROTECTION FENCE	TP		EA	23
N/A	DECK MATS	DM	DM	LF	TBD
3.31	TEMPORARY SEEDING	TS	TS	AC	0.84
3.32	PERMANENT SEEDING	PS	PS	AC	0.84

SWPPP ELEMENTS LEGEND

TITLE	KEY	SYMBOL	UNITS	QUANTITY
PORTA POTTY		PP	PP	1
FUELING STATION		FS	FS	AS NEEDED
CONCRETE WASHOUT STATION		CWS	CWS	AS NEEDED
CHEMICAL STORAGE		CS	CS	AS NEEDED
TRASH CONTAINMENT		TC	TC	AS NEEDED

BENCH MARK DATA:

SYMBOL	NORTHING	EASTING	ELEVATION	DESCRIPTION
[A]	6842348.37	11381197.86	1388.42	TOP OF CAPPED ROD SET
[B]	6842226.80	11380944.29	1365.76	TOP OF CAPPED ROD SET
[C]	6842282.15	11380750.50	1355.47	TOP OF CAPPED ROD SET
[D]	6842544.41	11380421.56	1343.87	TOP OF CAPPED ROD SET
[E]	6842760.42	11380330.99	1339.26	TOP OF CAPPED ROD SET
[F]	6843253.06	11380221.31	1332.91	TOP OF CAPPED ROD SET
[G]	6843187.92	11379995.89	1330.55	TOP OF CAPPED ROD SET

SANITARY SEWER INVERT DATA:

(1)
SANITARY SEWER MH
RIM=1366.38
12"DIP INVin=1359.3
12"DIP INVout=1359.2

(2)
SANITARY SEWER MH
RIM=1363.60
6"TCP INVin=1357.1
12"DIP INVin=1356.3
12"DIP INVout=1356.1

(3)
SANITARY SEWER MH
RIM=1363.36
12"STL INVi=1357.5 (NO FLOW)
8"STL INVin=1357.6
12"STL INV=1357.6 (NO FLOW)
6"TCP INVout=1357.6

(4)
SANITARY SEWER MH
RIM=1376.26
8"PVC INVin=1367.4
8"PVC INVout=1367.4

(5)
SANITARY SEWER MH
RIM=1356.54
12"DIP INVin=1350.8
12"DIP INVout=1350.7

(6)
SANITARY SEWER MH
RIM=1346.46
ABOVE GROUND
12"DIP INVin=1340.4
6"DIP INVin=1341.5
6"DIP INVin=1341.5
12"DIP INVout=1340.2

(7)
SANITARY SEWER MH
RIM=1340.49
12"RCP INVin=1333.4
12"RCP INVout=1333.3

(8)
SANITARY SEWER MH
RIM=1335.71
6"STL INVin=1331.5
12"RCP INVin=1330.2
12"RCP INVout=1330.2

(9)
SANITARY SEWER MH
RIM=1335.71
(ABOVE GROUND)
INVERTS NOT ASCERTAINABLE
F/L=±1326.4 BASED ON SLOPE OF PIPE

(10)
SANITARY SEWER MH
RIM=1335.75
(ABOVE GROUND)
TOP CONCRETE=1335.10
30"STL INVin=1324.6
12"STL INVin=1324.5
24"STL INVin=1324.2

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COMMONWEALTH OF VIRGINIA
WILLIAM KIPLING MUMAW
Lic. No. 049293
PROFESSIONAL ENGINEER

MOUNTAIN VIEW DRIVE STREAM RESTORATION
LEGEND & SUPPLEMENTAL INFORMATION
CITY OF HARRISONBURG, VIRGINIA

REVISION:

PROJECT MANAGER:	JRR
DESIGNED:	WKM/CKA
DRAWN:	JAT/CKA
PROJECT #:	18-0022
DATE:	09/01/21
SHEET:	2

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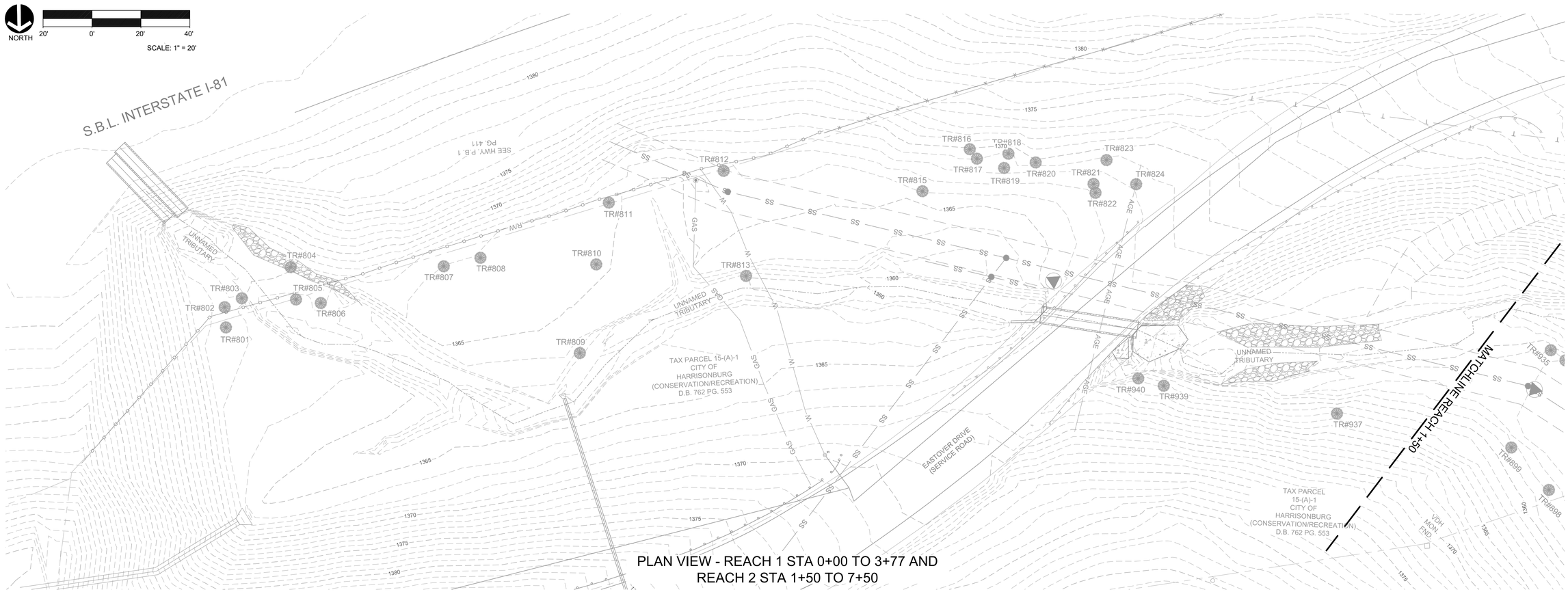

PLAN VIEW - REACH 1 STA 0+00 TO 3+77 AND
REACH 2 STA 1+50 TO 7+50

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EXISTING CONDITIONS
CITY OF HARRISONBURG, VIRGINIA

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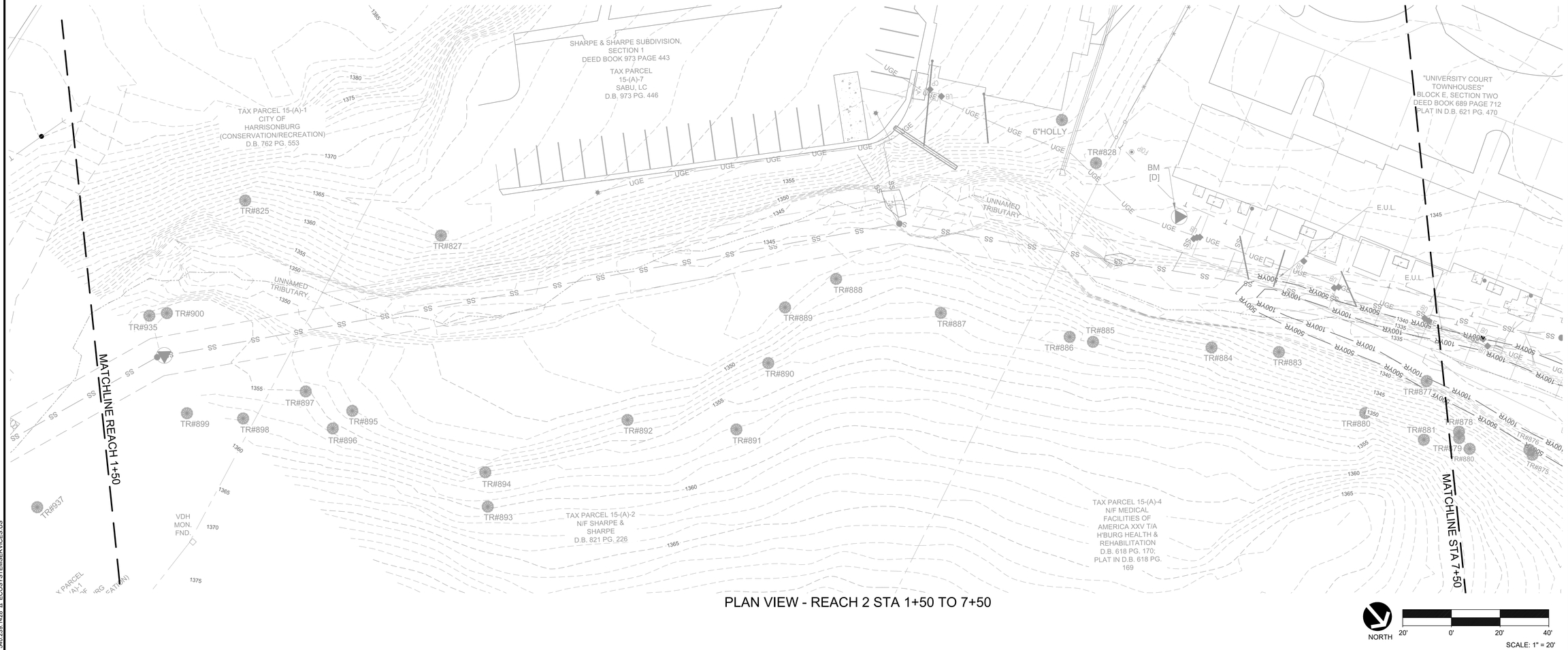

PLAN VIEW - REACH 2 STA 1+50 TO 7+50

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MOUNTAIN VIEW DRIVE STREAM RESTORATION
EXISTING CONDITIONS
CITY OF HARRISONBURG, VIRGINIA

REVISION:

PROJECT MANAGER:	JRR
DESIGNED:	WKM/CKA
DRAWN:	JAT/CKA
PROJECT #:	18-0022
DATE:	09/01/21
SHEET:	4

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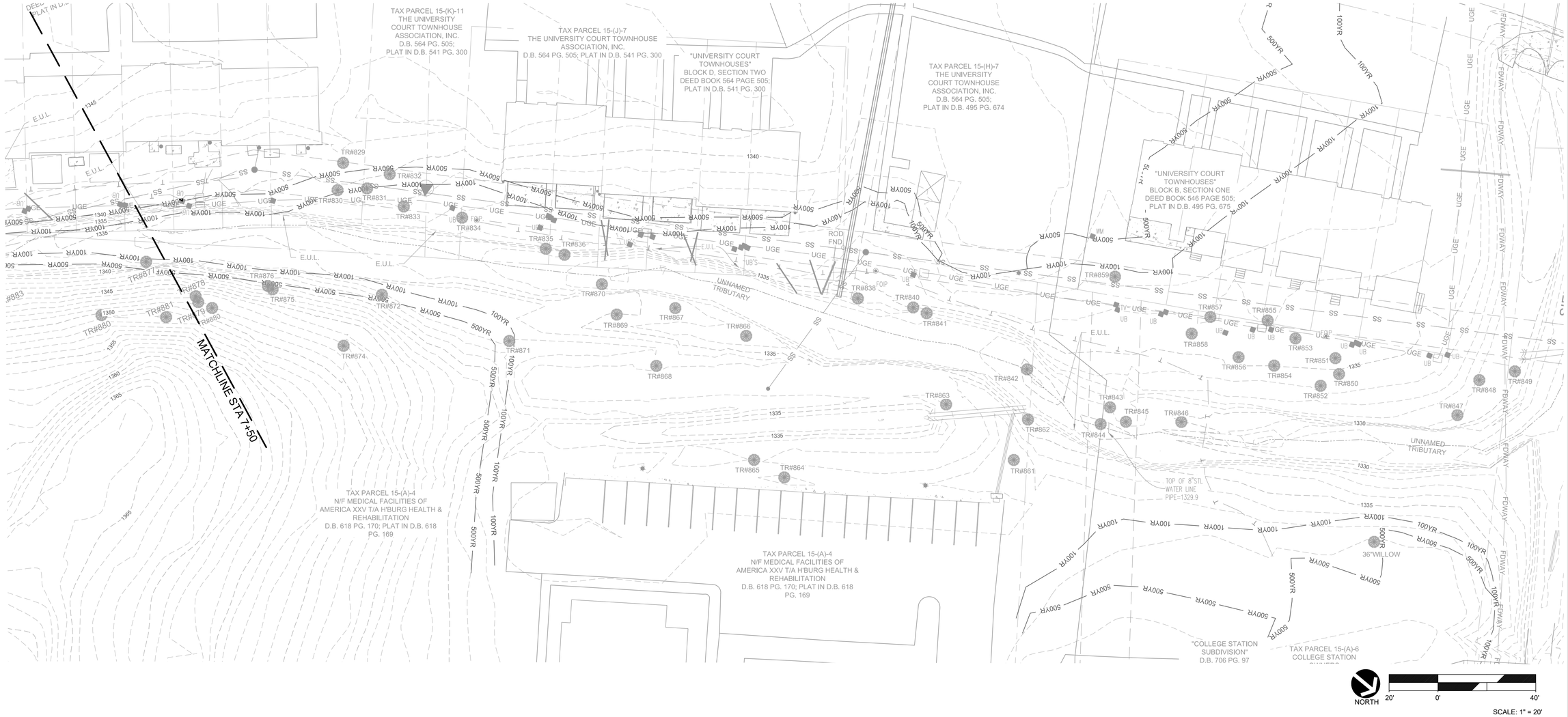

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COMMONWEALTH OF VIRGINIA
WILLIAM KIPLING MUMAW
Lic. No. 049293
PROFESSIONAL ENGINEER

MOUNTAIN VIEW DRIVE STREAM RESTORATION
EXISTING CONDITIONS
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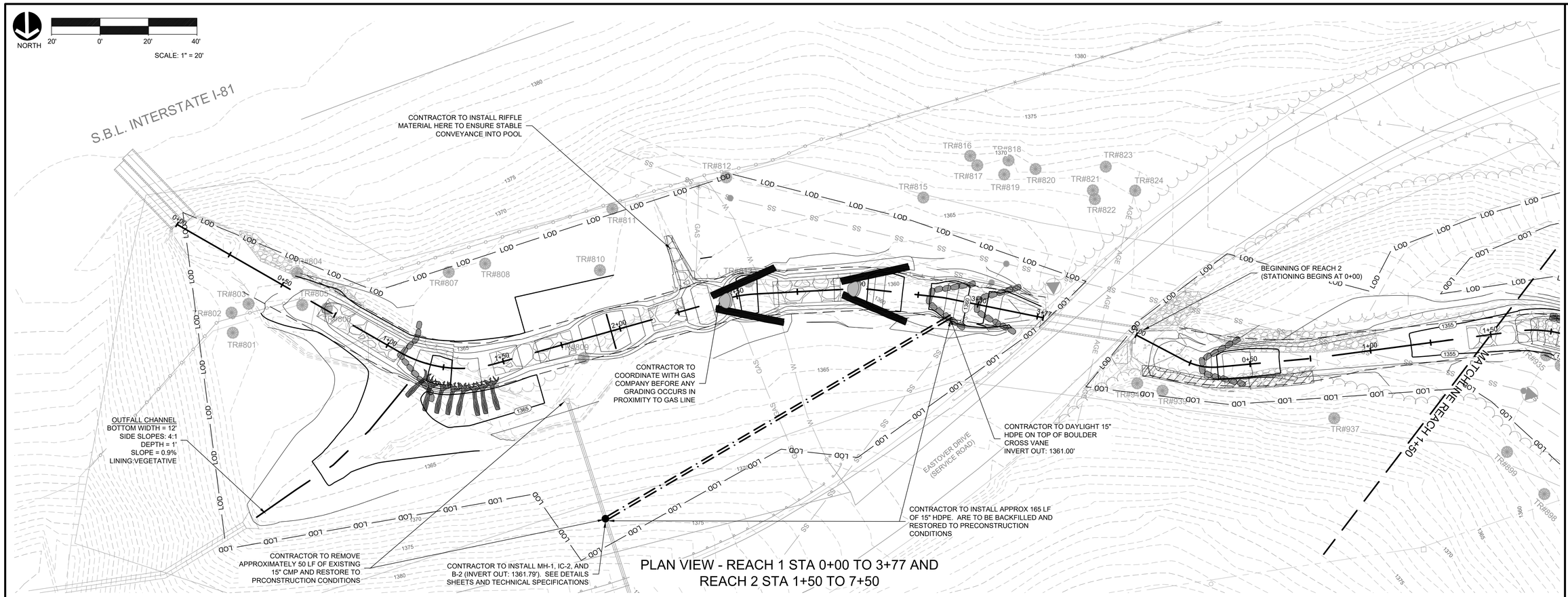
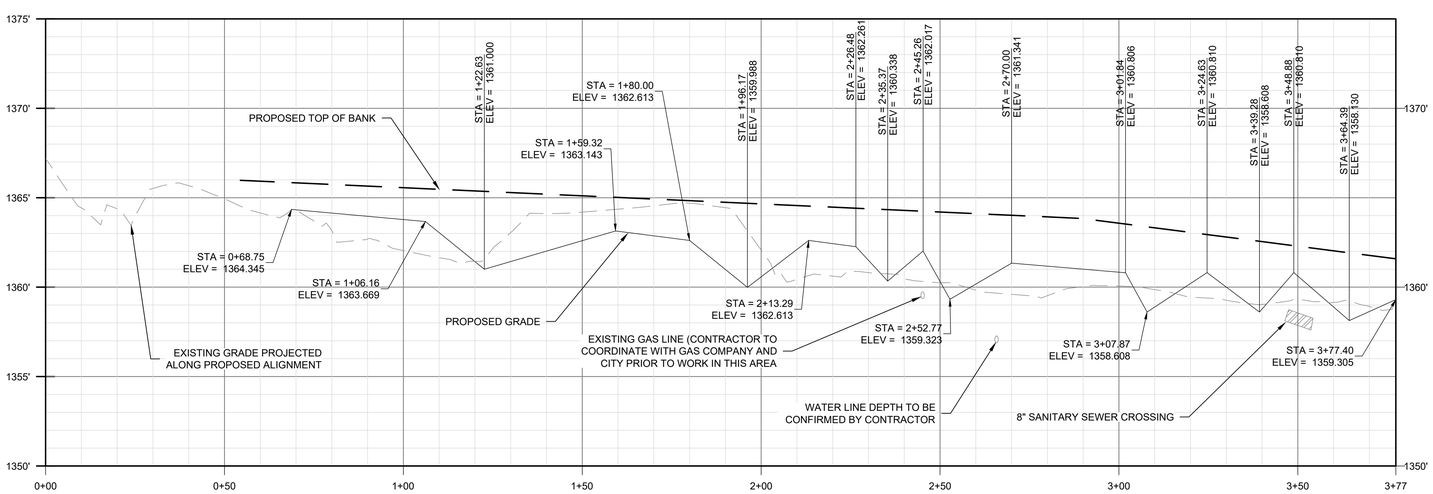
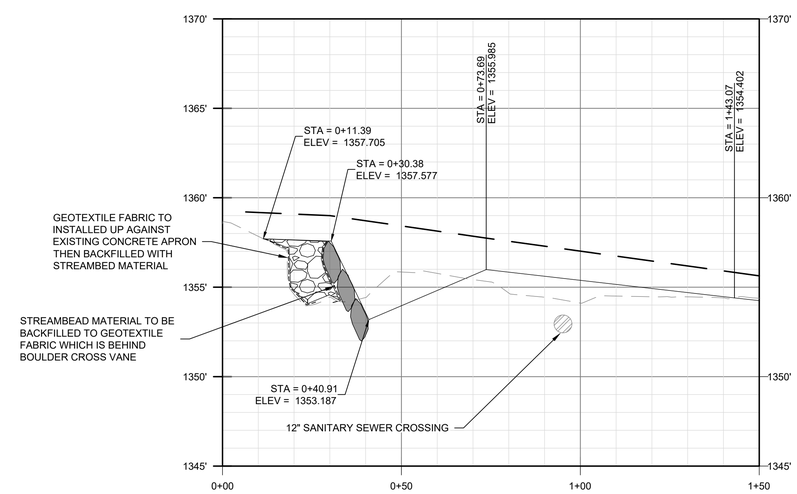


PLAN VIEW - REACH 1 STA 0+00 TO 3+77 AND REACH 2 STA 1+50 TO 7+50



PROFILE VIEW - REACH 1 STA 0+00 TO 3+77



PROFILE VIEW - REACH 2 STA 0+00 TO 1+50

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MOUNTAIN VIEW DRIVE STREAM RESTORATION
GRADING PLAN & PROFILE
CITY OF HARRISONBURG, VIRGINIA

REVISION:

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SHEET:	6

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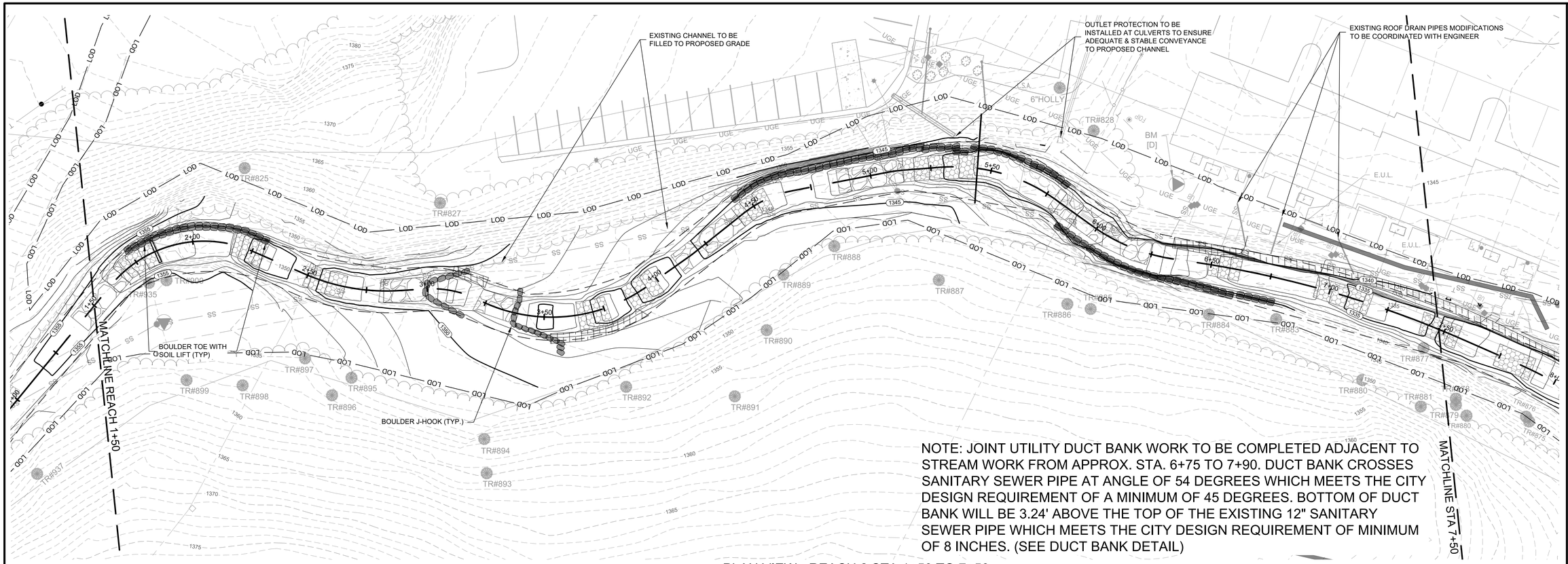
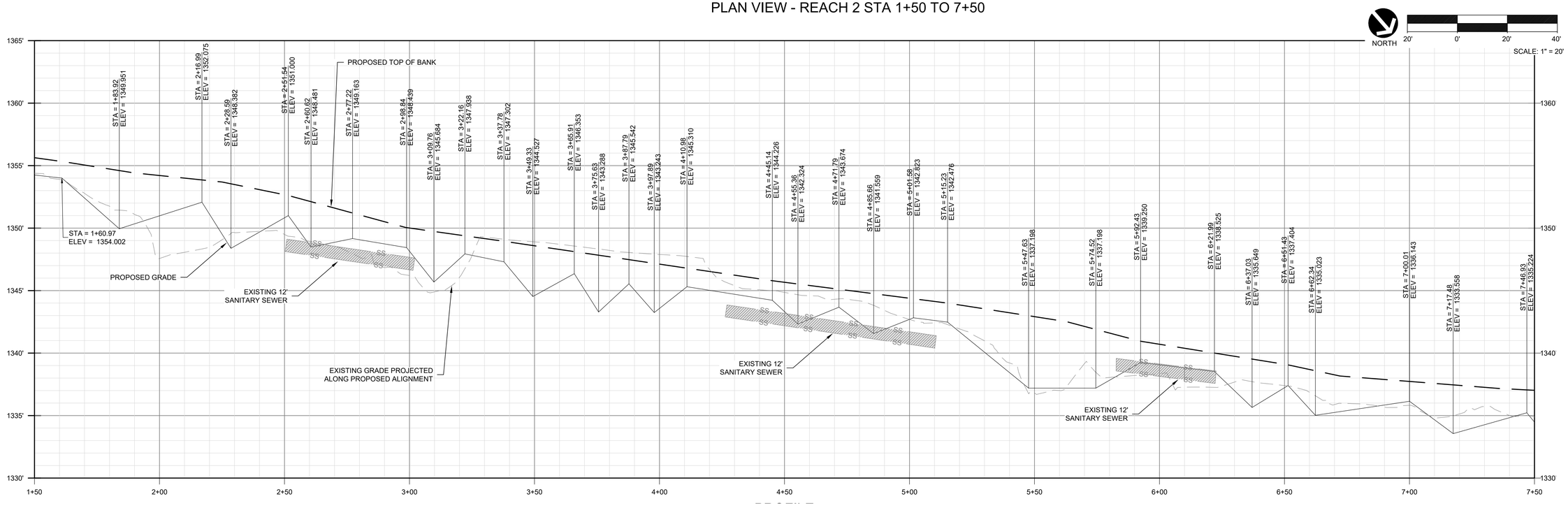


NOTE: JOINT UTILITY DUCT BANK WORK TO BE COMPLETED ADJACENT TO STREAM WORK FROM APPROX. STA. 6+75 TO 7+90. DUCT BANK CROSSES SANITARY SEWER PIPE AT ANGLE OF 54 DEGREES WHICH MEETS THE CITY DESIGN REQUIREMENT OF A MINIMUM OF 45 DEGREES. BOTTOM OF DUCT BANK WILL BE 3.24' ABOVE THE TOP OF THE EXISTING 12" SANITARY SEWER PIPE WHICH MEETS THE CITY DESIGN REQUIREMENT OF MINIMUM OF 8 INCHES. (SEE DUCT BANK DETAIL)

PLAN VIEW - REACH 2 STA 1+50 TO 7+50



PROFILE VIEW - REACH 2 STA 1+50 TO 7+50

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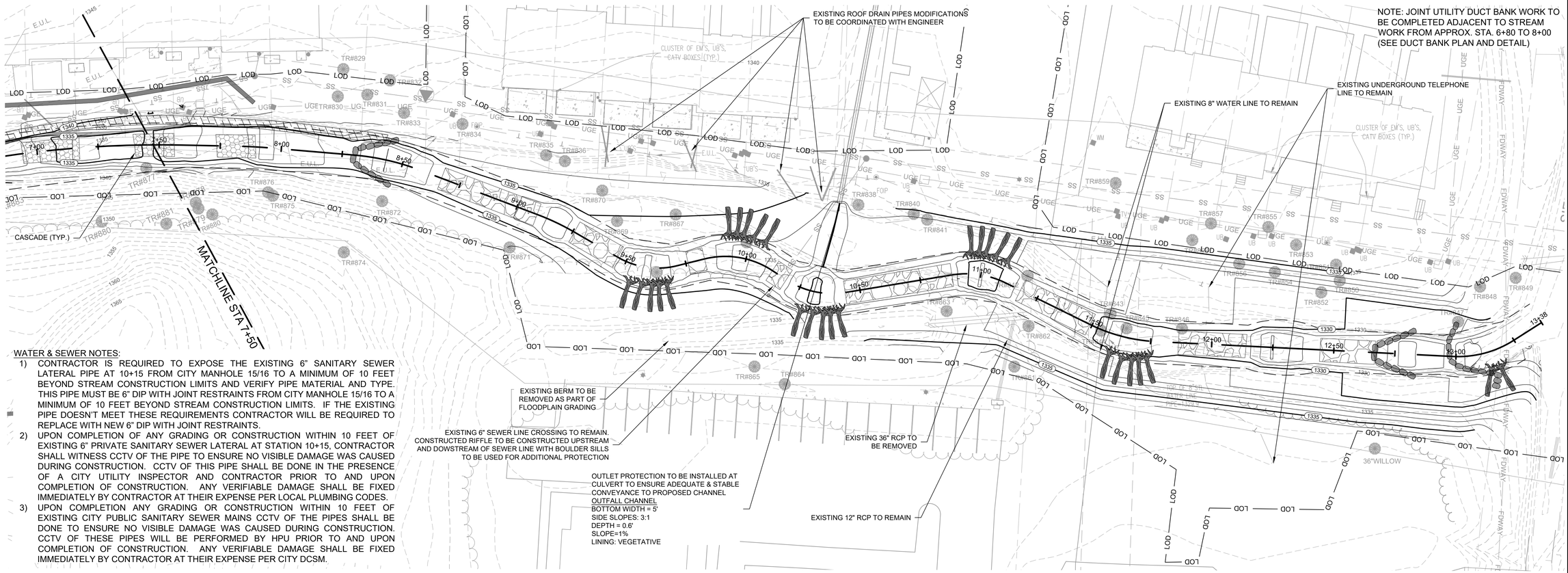
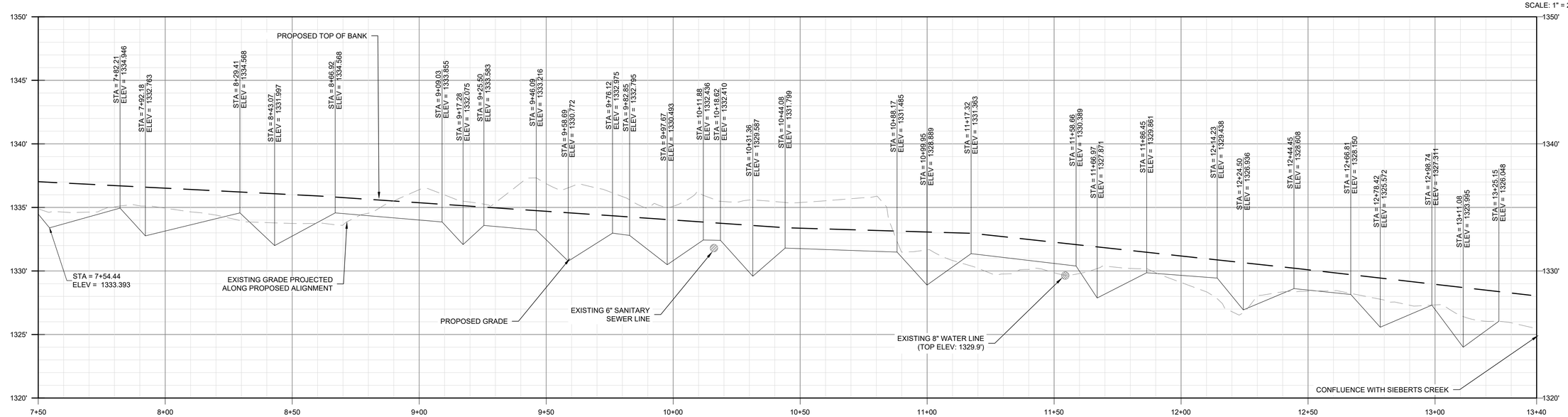


PLAN VIEW - REACH 2 STA 7+50 TO 13+40

WATER & SEWER NOTES:

1) CONTRACTOR IS REQUIRED TO EXPOSE THE EXISTING 6" SANITARY SEWER LATERAL PIPE AT 10+15 FROM CITY MANHOLE 15/16 TO A MINIMUM OF 10 FEET BEYOND STREAM CONSTRUCTION LIMITS AND VERIFY PIPE MATERIAL AND TYPE. THIS PIPE MUST BE 6" DIP WITH JOINT RESTRAINTS FROM CITY MANHOLE 15/16 TO A MINIMUM OF 10 FEET BEYOND STREAM CONSTRUCTION LIMITS. IF THE EXISTING PIPE DOESN'T MEET THESE REQUIREMENTS CONTRACTOR WILL BE REQUIRED TO REPLACE WITH NEW 6" DIP WITH JOINT RESTRAINTS.
2) UPON COMPLETION OF ANY GRADING OR CONSTRUCTION WITHIN 10 FEET OF EXISTING 6" PRIVATE SANITARY SEWER LATERAL AT STATION 10+15, CONTRACTOR SHALL WITNESS CCTV OF THE PIPE TO ENSURE NO VISIBLE DAMAGE WAS CAUSED DURING CONSTRUCTION. CCTV OF THIS PIPE SHALL BE DONE IN THE PRESENCE OF A CITY UTILITY INSPECTOR AND CONTRACTOR PRIOR TO AND UPON COMPLETION OF CONSTRUCTION. ANY VERIFIABLE DAMAGE SHALL BE FIXED IMMEDIATELY BY CONTRACTOR AT THEIR EXPENSE PER LOCAL PLUMBING CODES.
3) UPON COMPLETION ANY GRADING OR CONSTRUCTION WITHIN 10 FEET OF EXISTING CITY PUBLIC SANITARY SEWER MAINS CCTV OF THE PIPES SHALL BE DONE TO ENSURE NO VISIBLE DAMAGE WAS CAUSED DURING CONSTRUCTION. CCTV OF THESE PIPES WILL BE PERFORMED BY HPU PRIOR TO AND UPON COMPLETION OF CONSTRUCTION. ANY VERIFIABLE DAMAGE SHALL BE FIXED IMMEDIATELY BY CONTRACTOR AT THEIR EXPENSE PER CITY DCSM.



PROFILE VIEW - REACH 2 STA 7+50 TO 13+40

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GRADING PLAN & PROFILE
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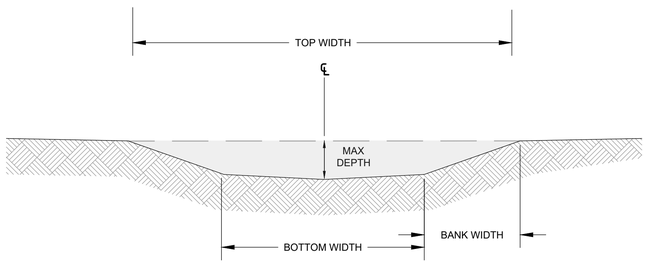
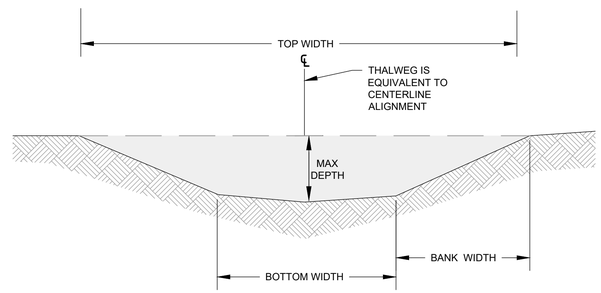
DESIGN PARAMETER SUMMARY TABLE	
PARAMETER	VALUE
TOP WIDTH (FT)	18.00
BOTTOM WIDTH (FT)	9.00
MAX DEPTH (FT)	1.60
BANK WIDTH (FT)	4.30



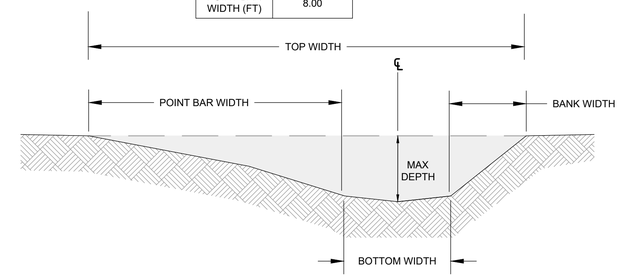
TYPICAL SECTION - RIFFLE
NTS

DESIGN PARAMETER SUMMARY TABLE	
PARAMETER	VALUE
TOP WIDTH (FT)	18-26
BOTTOM WIDTH (FT)	9.50
MAX DEPTH (FT)	1.8-5.6
BANK WIDTH (FT)	5.00



TYPICAL SECTION - POOL CENTER
NTS

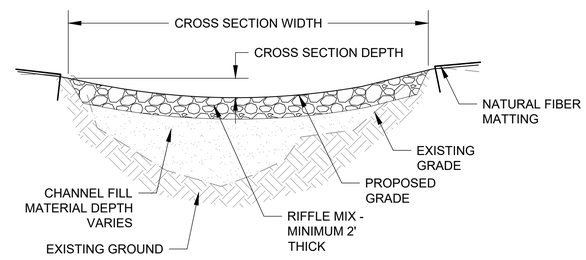
DESIGN PARAMETER SUMMARY TABLE - TYPICAL POOL	
PARAMETER	VALUE
TOP WIDTH (FT)	18-26
BOTTOM WIDTH (FT)	7.00
MAX DEPTH (FT)	1.8-5.6
BANK WIDTH (FT)	4.5
POINT BAR WIDTH (FT)	8.00



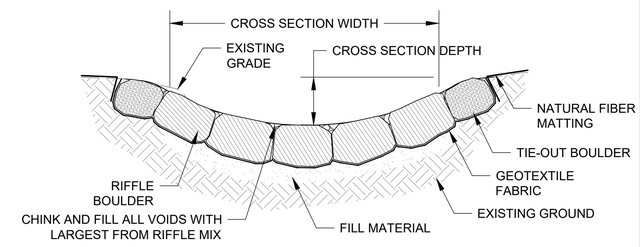
TYPICAL SECTION - POOL MEANDER (RIGHT)
NTS

RIFFLE NOTES:

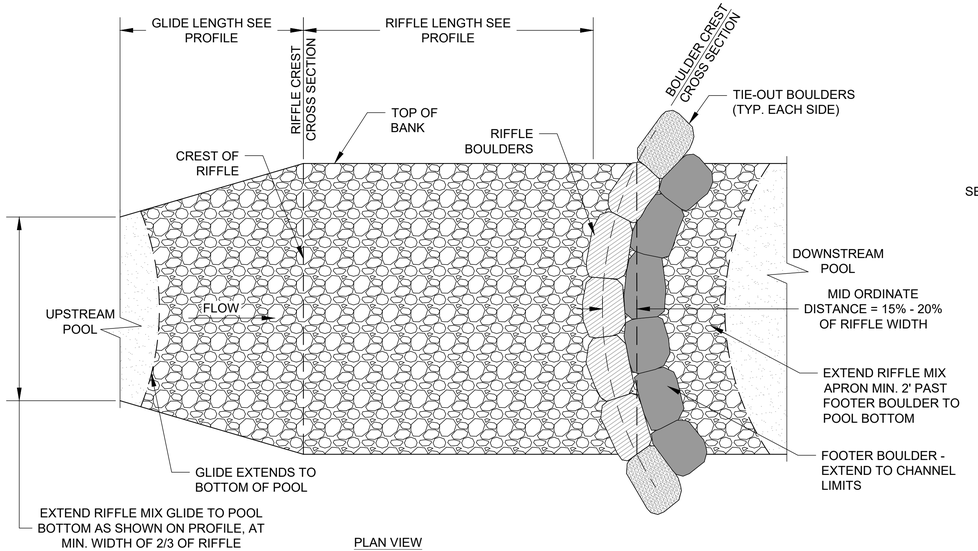
1. SEE PROFILE FOR UPSTREAM AND DOWNSTREAM EXTENT OF PROTECTION (GLIDE AND APRON).
2. SEE TYPICAL SECTIONS FOR DEPTH AND WIDTH OF CHANNEL CROSS SECTION. THE CROSS SECTION SHALL BE CONSTRUCTED IN A PARABOLIC SHAPE.
3. FOR ALL MATERIAL SIZES, REFER TO SPECIFICATIONS AND TABLES PROVIDED ON THIS DETAIL.
4. NATURAL CHANNEL MATERIAL MAY BE HARVESTED ON-SITE PRIOR TO INSTALLATION OF RIFFLE IF IT MEETS THE SPECIFICATIONS.
5. RIFFLE MIX SHALL BE A MINIMUM THICKNESS OF TWICE THE SPECIFIED D50 OF THE MATERIAL OR 2', WHICHEVER IS LARGER.
6. THE NUMBER OF BOULDERS VARIES DEPENDING ON TYPICAL SECTION WIDTH AND BOULDER DIMENSIONS.
7. IN AREAS OF CUT, CHANNEL FILL MATERIAL UNDER RIFFLE MIX IS NOT NEEDED. IN AREAS OF FILL, EXISTING STREAM CHANNEL TO BE FILLED IN 8" LIFTS WITH CHANNEL FILL MATERIAL TO ELEVATION SPECIFIED ON PROFILE.
8. AS NEEDED, EXCAVATE THE DOWNSTREAM TIE OUT AREA FOR FOOTER BOULDERS AND INSTALL THE BOULDER GRADE CONTROL FOOTERS AND RIFFLE BOULDERS, LAYING A CONTINUOUS SHEET OF GEOTEXTILE UNDER ALL BOULDERS. TOP OF RIFFLE BOULDERS SHALL BE PARABOLIC IN SHAPE AND MEET FINISHED GRADE DEFINED BY PROFILE AND CROSS SECTION.
9. THE BOULDERS SHALL BE TILTED DOWNSTREAM AS SHOWN ON THE DETAIL AND NOT STACKED. STAGGER SEAMS OF BOULDERS BETWEEN EACH ROW. INSTALL RIFFLE MIX APRON TO BLEND INTO DOWN STREAM POOL AS SHOWN ON DETAIL.
10. TIE-OUT BOULDER SHALL EXTEND PAST THE TYPICAL CROSS SECTION A MIN. OF ONE BOULDER LENGTH (B-AXIS) INTO EXISTING BANK. WHERE THIS CONFLICTS WITH EXISTING TREE ROOTS OR BEDROCK, TIE-OUT BOULDER MAY BE ELIMINATED OR ADJUSTED AT DIRECTION OF ENGINEER.
11. PLACE RIFFLE MIX UPSTREAM OF THE BOULDER GRADE CONTROL TO THE FINISHED GRADES, COMPRESSING MATERIALS TO MAINTAIN PARABOLIC CROSS SECTION SHAPE.
12. CHANNEL WASH-IN MATERIAL SHALL BE REPEATEDLY WORKED INTO FULL DEPTH OF THE RIFFLE MIX TO FILL VOIDS.
13. EXCAVATE UPSTREAM POOL AND INSTALL RIFFLE MIX GLIDE AS SHOWN ON DETAIL.
14. TRIM ALL GEOTEXTILE AT OR BELOW FINISHED GRADE.
15. ONCE RIFFLE IS CONSTRUCTED, STABILIZE ALL DISTURBED TIE-IN LOCATIONS AS SPECIFIED.
16. LARGE WOODY DEBRIS SHALL BE INSTALLED IN POOLS AS SHOWN ON GRADING PLAN, OR AS DIRECTED BY THE ENGINEER



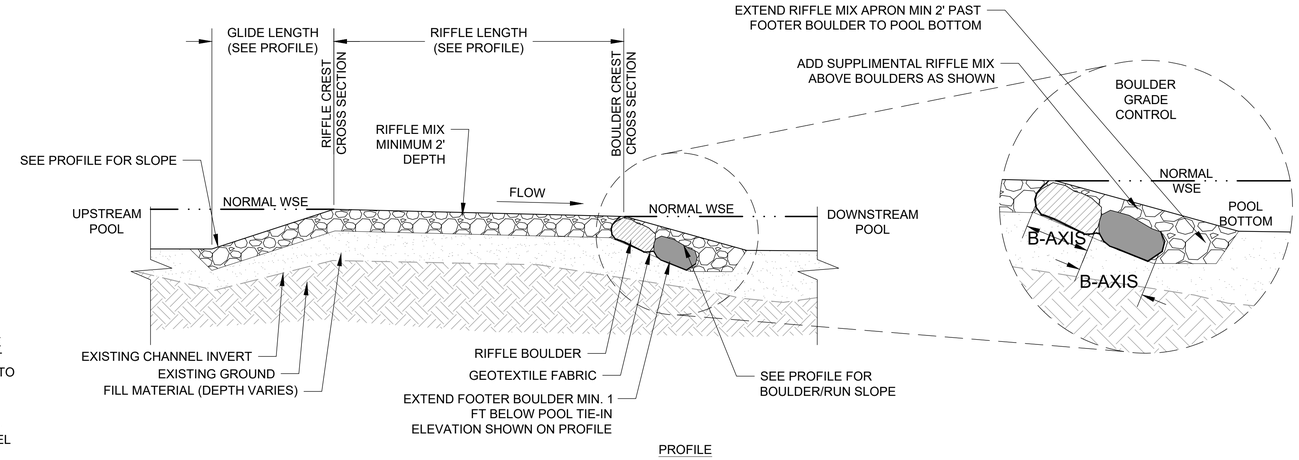
CROSS SECTION - RIFFLE CREST



CROSS SECTION - BOULDER CREST



PLAN VIEW



PROFILE

RIFFLE
NTS

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MOUNTAIN VIEW DRIVE STREAM RESTORATION
TYPICAL SECTIONS & DETAILS
CITY OF HARRISONBURG, VIRGINIA

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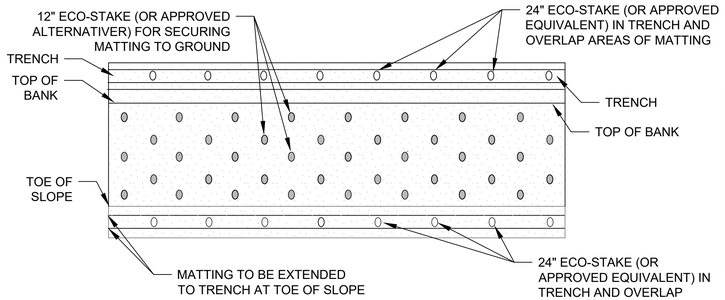
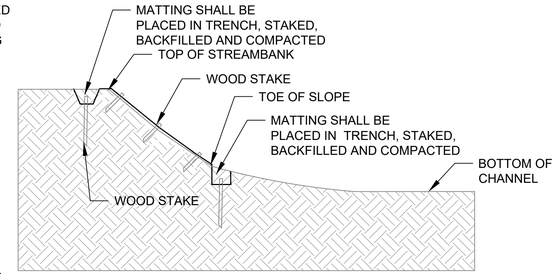


PLAN VIEW



CROSS-SECTION

NATURAL FIBER MATTING SPECIFICATIONS

CUT SLOPES & STREAM BANKS

1. MATTING SHALL BE WOVEN MACHINE SPUN BRISTLE COIR TWINE MADE OF COIR FIBER OBTAINED FROM FRESH WATER CURED COCONUT HUSKS **OR AND APPROVED EQUIVALENT.**
2. MATTING SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:
   - WEIGHT: 29 OZ/SY (ASTM D 3776)
   - THICKNESS: 0.35 IN. (ASTM D 1777)
   - DRY TENSILE STRENGTH:
     - MACHINE DIRECTION - 2024 LBS/SF
     - CROSS DIRECTION - 1160 LBS/SF
     - (ASTM D 4595)
   - WET TENSILE STRENGTH:
     - MACHINE DIRECTION - 1776 LBS/SF
     - CROSS DIRECTION - 936 LBS/SF
     - (ASTM D 4595)
   - OPEN AREA: 38%

FILL SLOPES & SOIL LIFTS

1. MATTING SHALL BE A DOUBLE LAYERED BIODEGRADABLE EROSION CONTROL FABRIC MADE UP OF AN OUTER LAYER OF HIGH STRENGTH COIR FABRIC AND AN INNER LAYER OF LIGHTWEIGHT JUTE FABRIC TIED TOGETHER OR AN APPROVED EQUIVALENT.
2. MATTING SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:
   - WEIGHT: 33.3 OZ/SY (ASTM D 5261)
   - THICKNESS: 0.35 IN. (ASTM D 5199)
   - WIDE WIDTH TENSILE STRENGTH (OUTER LAYER): 1008 X 936 LBS/FT (ASTM D 4595)
   - WIDE WIDTH TENSILE STRENGTH (INNER LAYER): 612 X 468 LBS/FT (ASTM D 4595)
   - SHEAR STRESS: 4.5 PSF

WOOD STAKE SPECIFICATIONS

COTRACTOR SHALL USE THE 12" AND 24" NORTH AMERICAN GREEN ECO-STAKE OR APPROVED EQUIVALENT WITH THE FOLLOWING DIMENSIONS:

	FASTENING STAKE	TRENCH STAKE
LEG LENGTH	11.00 IN (27.94 CM)	-
HEAD WIDTH	1.25 IN (3.18 CM)	-
HEAD THICKNESS	0.40 IN (1.02 CM)	-
LEG WIDTH	0.60 IN (1.52 CM) (TAPERED TO POINT)	-
LEG THICKNESS	0.40 IN (1.02 CM)	0.75 IN (1.90 CM)
TOTAL LENGTH	12.00 IN (30.48 CM)	24.00 IN (60.96 CM)

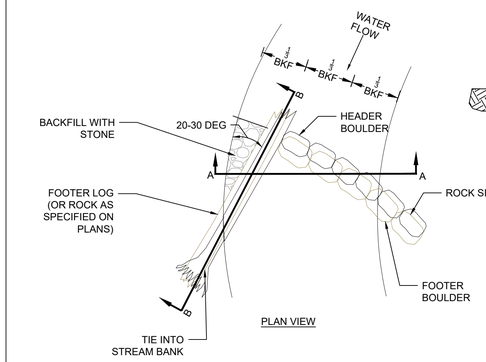
NATURAL FIBER MATTING NOTES

1. TEMPORAY AND PERMANENT SEEDING AND STRAW SHALL BE PLACED PRIOR TO INSTALLATION OF MATTING.
2. 12" ECO-STAKES (FASTENING STAKES) SHALL BE PLACED IN A DIAMOND SHAPE PATTERN PER THE PLAN VIEW.
3. 24" ECO-STAKES (TRENCH STAKES) SHALL BE PLACE A MAXIMUM DISTANCE APART OF 3' ALONG BOTH TOE AND TOP OF BANK TRENCHES AND ALONG OVERLAPPING SECTIONS OF MATTING.
4. FOR TRENCH STAKES, CONTRACTOR CAN USE UTILIZE 2X4' WOOD SECTIONS TO MEET THE DESIRED DIMENSIONS LISTED ABOVE.
5. MATTING SHOULD BE USED TO AID PERMANENT VEGETATED STABILIZATION OF SLOPES 2:1 OR GREATER AND WITH MORE THAN 10 FEET OF VERTICAL RELIEF.
6. NATURAL FIBER MATTING SHOULD BE USED WHEN MULCH CANNOT BE ADEQUATELY TACKED AND WHERE IMMEDIATE GROUND COVER IS REQUIRED TO PREVENT EROSION DAMAGE. 6" MINIMUM OVERLAP IN THE HORIZONTAL

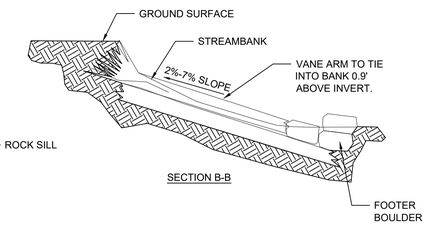
NATURAL FIBER MATTING MAINTENANCE NOTES

1. INSPECT MATTING AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENT. REPAIR IMMEDIATELY.
2. GOOD CONTACT WITH THE GROUND MUST BE MAINTAINED, AND EROSION MUST NOT OCCUR BENEATH THE MATTING.
3. ANY AREAS OF THE MATTING THAT ARE DAMAGED OR NOT IN CLOSE CONTACT WITH THE GROUND SHALL BE REPAIRED AND STAPLED.
4. IF EROSION OCCURS DUE TO POORLY CONTROLLED DRAINAGE, THE PROBLEM SHALL BE FIXED AND THE ERODED AREA PROTECTED.
5. MONITOR AND REPAIR THE MATTING AS NECESSARY UNTIL GROUND COVER IS ESTABLISHED.

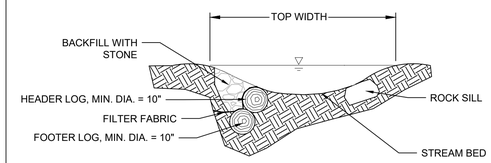
NATURAL FIBER MATTING DETAIL



PLAN VIEW



SECTION B-B

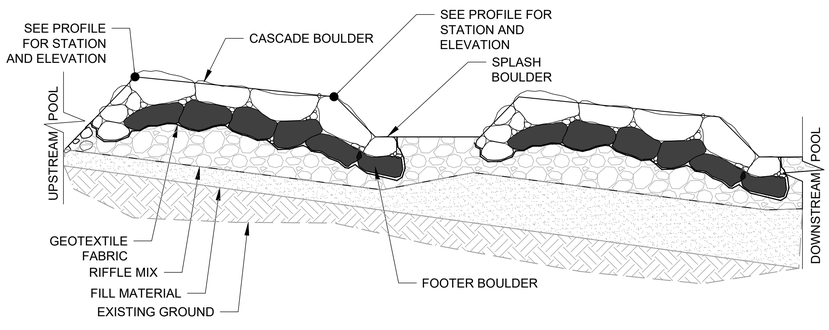


SECTION A-A

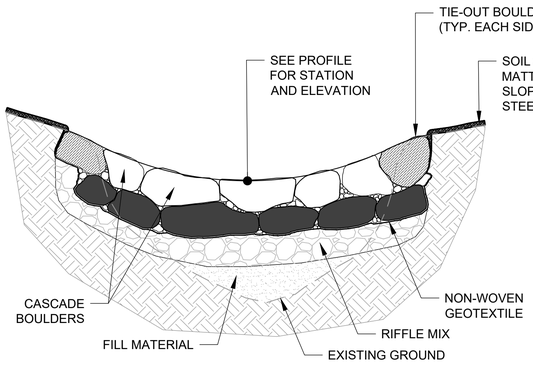
NOTES

1. GEOTEXTILE FABRIC SHALL BE PLACED ON THE UPSTREAM SIDE OF THE STRUCTURE 1/4 DIAMETER FROM THE TOP OF THE LOG. GEOTEXTILE FABRIC SHALL BE BURIED IN THE BOTTOM OF THE CHANNEL AND SHALL BE PLACED THE ENTIRE LENGTH OF THE STRUCTURE.
2. A TRENCH SHALL BE DUG IN SUCH A MANNER THAT THE FOOTER BOULDERS, LOGS, AND A MINIMUM OF 2/3 OF THE HEADER BOULDER IS BURIED BENEATH THE BED SURFACE ELEVATION.
3. A HYDRAULIC EXCAVATOR WITH A BUCKET THAT CONTAINS A HYDRAULIC THUMB SHALL BE USED TO PLACE BOULDERS AND LOGS WITH THE SUPERVISION OF THE ENGINEER.
4. SEE BOULDER SIZING SPECIFICATIONS FOR HEADER AND FOOTER DIMENSIONS.
5. FOOTER LOG SHALL BE PLACED FIRST WITH HEADER LOG PLACED ON TOP PRIOR TO BACKFILLING THE TRENCH.
6. THE HEADER BOULDER SHALL BE PLACED AT 0.2 FT ABOVE THE CHANNEL INVERT 1/3 OF THE WAY ACROSS THE CHANNEL FROM THE OUTSIDE BANK.
7. THERE SHALL BE GAPS BETWEEN THE HEADER BOULDERS OF AT LEAST 0.2 FT.
8. HEADER LOGS SHALL SLOPE FROM THE ELEVATION AT THE TIE OUT BOULDER, AT THE HEAD OF THE VANE, TO AN ELEVATION 0.9' HIGHER AT A SLOPE OF 2%-5%. VANE ARM LENGTHS SHALL VARY DEPENDING ON POOL LENGTH, RADIUS OF CURVATURE, AND CHANNEL INVERT ELEVATION BUT FALL WITHIN THE RANGE OF 12-15 FEET IN LENGTH.
9. HEADER AND FOOTER LOGS SHALL HAVE A DIAMETER OF 10" OR GREATER AND BE TIED SECURELY INTO THE BANK IN SUCH A WAY THAT IT ELIMINATES THE POSSIBILITY OF STREAMFLOW DIVERTING AROUND THEM.
10. ANY SOIL DISTURBED DURING THE PLACEMENT OF J-HOOK VANES, SHALL BE SEEDED USING TEMPORARY AND PERMANENT SEEDING METHODS.
11. GEOTEXTILE FABRIC SHALL BE PLACED ON THE UPSTREAM SIDE OF THE VANE STRUCTURE TO PREVENT WASHOUT OF SEDIMENT THROUGH BOULDER GAPS. GEOTEXTILE FABRIC SHALL EXTEND FROM THE BOTTOM OF THE FOOTER BOULDER TO THE FINISHED GRADE ELEVATION AND SHALL BE PLACED THE ENTIRE LENGTH OF THE STRUCTURE. GEOTEXTILE FABRIC SHALL BE CUT NEATLY AT THE ELEVATION OF BACKFILL.

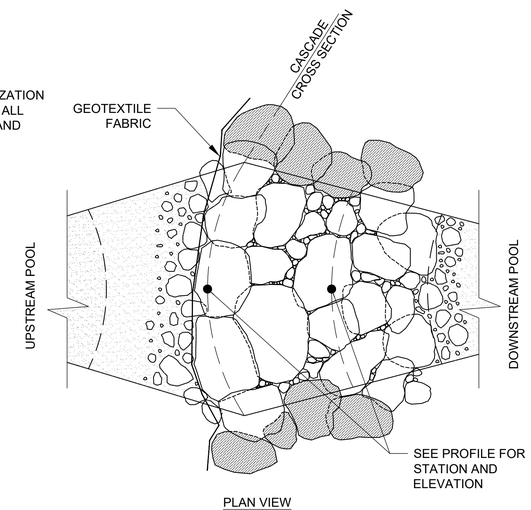
LOG OR BOULDER J-HOOK DETAIL



PROFILE



CROSS SECTION



PLAN VIEW

CASCADE NOTES:

1. SEE TYPICAL SECTIONS FOR DEPTH AND WIDTH OF CHANNEL CROSS SECTION. THE CROSS SECTION SHALL BE CONSTRUCTED IN A PARABOLIC SHAPE.
2. FOR ALL MATERIAL SIZES, REFER TO SPECIFICATIONS AND TABLES PROVIDED ON THIS DETAIL.
3. NATURAL CHANNEL MATERIAL MAY BE HARVESTED ON-SITE PRIOR TO INSTALLATION OF CASCADE IF IT MEETS THE SPECIFICATIONS.
4. RIFFLE MIX SHALL BE A MINIMUM THICKNESS OF TWICE THE SPECIFIED D50 OF THE MATERIAL OR 2', WHICHEVER IS LARGER.
5. THE NUMBER OF BOULDERS VARIES DEPENDING ON TYPICAL SECTION WIDTH AND BOULDER DIMENSIONS.
6. IN AREAS OF CUT, CHANNEL FILL MATERIAL UNDER RIFFLE MIX IS NOT NEEDED. IN AREAS OF FILL, EXISTING STREAM CHANNEL TO BE FILLED IN 8" LIFTS WITH CHANNEL FILL MATERIAL TO ELEVATION SPECIFIED ON PROFILE.
7. AS NEEDED, EXCAVATE THE DOWNSTREAM TIE OUT AREA FOR FOOTER BOULDERS AND INSTALL THE BOULDER GRADE CONTROL FOOTERS AND CASCADE BOULDERS, LAYING A CONTINUOUS SHEET OF GEOTEXTILE UNDER ALL BOULDERS. TOP OF CASCADE BOULDERS SHALL BE PARABOLIC IN SHAPE AND MEET FINISHED GRADE DEFINED BY STRUCTURE TABLE NODES.
8. THE BOULDERS SHALL BE TILTED DOWNSTREAM AS SHOWN ON THE DETAIL AND NOT STACKED. STAGGER SEAMS OF BOULDERS BETWEEN EACH ROW. INSTALL RIFFLE MIX APRON TO BLEND INTO OWN STREAM POOL AS SHOWN ON DETAIL.
9. TIE-OUT BOULDER SHALL EXTEND A MIN. OF ONE BOULDER LENGTH PAST THE (B-AXIS) INTO EXISTING BANK. WHERE THIS CONFLICTS WITH EXISTING TREE ROOTS OR BEDROCK, TIE-OUT BOULDER MAY BE ELIMINATED OR ADJUSTED AT DIRECTION OF ENGINEER.
10. PLACE RIFFLE MIX UPSTREAM OF THE BOULDER GRADE CONTROL TO THE FINISHED GRADES, COMPRESSING MATERIALS TO MAINTAIN PARABOLIC CROSS SECTION SHAPE.
11. CHANNEL WASH-IN MATERIAL SHALL BE REPEATEDLY WORKED INTO FULL DEPTH OF THE RIFFLE MIX TO FILL VOIDS.
12. EXCAVATE UPSTREAM POOL AND INSTALL RIFFLE MIX GLIDE AS SHOWN ON DETAIL.
13. TRIM ALL GEOTEXTILE FABRIC AT OR BELOW FINISHED GRADE.
14. ONCE CASCADE IS CONSTRUCTED, STABILIZE ALL DISTURBED TIE-IN LOCATIONS AS SPECIFIED.

CASCADE (C)

NTS

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COMMONWEALTH OF VIRGINIA
WILLIAM KIPLING MUMAW
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PROFESSIONAL ENGINEER

MOUNTAIN VIEW DRIVE STREAM RESTORATION
DETAILS
CITY OF HARRISONBURG, VIRGINIA

REVISION:

PROJECT MANAGER:	JRR
DESIGNED:	WKM/CKA
DRAWN:	JAT/CKA
PROJECT #:	18-0022
DATE:	09/01/21
SHEET:	10

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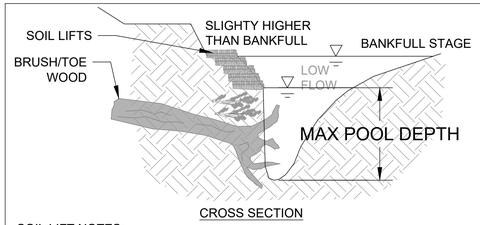

CROSS SECTION

SOIL LIFT NOTES:

1. EXCAVATE STREAM BANK AND CREATE A FLAT BENCH FROM TOP OF BANK TO STREAM BED.
2. SOIL STABILIZATION MATTING SHALL BE PLACED FROM THE FRONT OF THE BENCH, EXTENDING APPROXIMATELY 2 FEET ONTO THE BENCH. SECURE THE BACK END OF THE MATTING WITH SOD STAPLES TO PREVENT MOVEMENT DURING BACKFILL OPERATIONS. EXCESS MATTING WILL EXTEND TOWARD THE CENTER OF THE CHANNEL AND SHOULD BE FOLDED OR ROLLED TO AVOID TEARS OR PUNTURES BY EQUIPMENT.
3. WHERE SOIL STABILIZATION MATTING ROLL ENDS OVERLAP (PERPENDICULAR TO STREAM PROFILE), OVERLAP MATTING A MINIMUM OF 5 FEET. ONE WIDTH OF MATTING (8 FEET) IS TO BE USED FOR THE SOIL LIFT. NO OVERLAP OF MATTING EDGES IS ALLOWED.
4. BACKFILL FROM BACK EDGE OF MATTING TO MEET THE PROPOSED GRADE AND COMPACT TO FORM A 3:1 SLOPE.
5. APPLY PERMANENT SEED MIX TO FRONT PORTION OF LIFT.
6. EXTEND EXCESS SOIL STABILIZATION MATTING ALONG SURFACE OF SLOPE AND ACROSS TOP OF LIFT A MINIMUM OF THREE FEET, PULLING MATTING TAUT BUT NOT STRETCHED SUCH THAT CONTACT WITH SOIL IS MAINTAINED IN ALL AREAS.
7. REPEAT STEPS 2 THROUGH 6 UNTIL DESIRED ELEVATION IS MET.
8. FOR TOP AND FINAL SOIL LIFT EXTEND EXCESS SOIL STABILIZATION MATTING ALONG SURFACE OF SLOPE AND ACROSS FLOODPLAIN A MINIMUM OF THREE FEET, PULLING MATTING TAUT BUT NOT STRETCHED SUCH THAT CONTACT WITH SOIL IS MAINTAINED IN ALL AREAS.
9. KEY SOIL STABILIZATION MATTING INTO FLOODPLAIN A MINIMUM OF 6 INCHES ON REAR EDGE OF SOIL LIFT.

SOIL LIFT DETAIL

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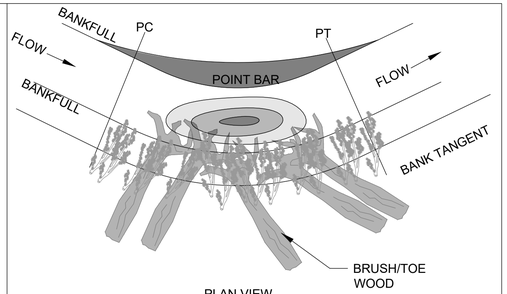


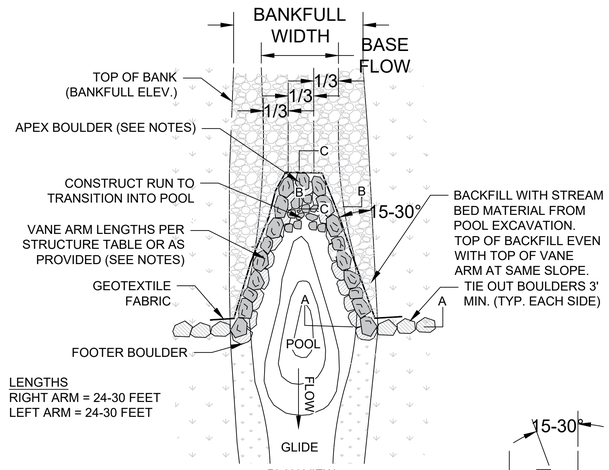
PLAN VIEW

BRUSH TOE NOTES:

1. FOOTER LOGS SHALL BE USED TO ESTABLISH FOUNDATION UNDERNEATH BRUSH TOE MATERIAL.
2. FOOTER LOGS SHALL BE A HARDWOOD SPECIES WITH A MINIMUM TRUNK DIAMETER OF 6".
3. LENGTH OF FOOTER LOGS SHALL BE A MINIMUM OF 2' BEYOND BANKFULL STAGE AND A MINIMUM OF 5' INTO THE BANK, WHICHEVER IS GREATER.
4. PLACE FOOTER LOGS BOTH PERPENDICULAR AND PARALLEL TO FLOW.
5. PLACE BRUSH TOE MATERIAL PERPENDICULAR TO FOOTER LOGS. BRUSH MATERIAL CAN CONSIST OF SMALL LOGS, LIMBS, TREE TOPS AND BRUSH.
6. BRUSH MATERIAL SHALL BE COMPACTED WITH TEMPORARY COUNTER WEIGHT OR OTHER METHOD PRIOR TO BACKFILLING OVER THE FILLER MATERIAL.
7. WHEN BACKFILLING AROUND BRUSH MATERIAL, TOP DRESS AND COMPACT WITH STONE OR SOIL TO FIRMLY SECURE AND FILL ALL GAPS.

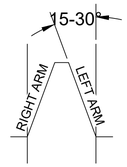
BRUSH/TOE WOOD TOE DETAIL

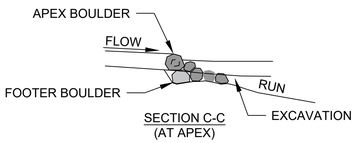
NTS



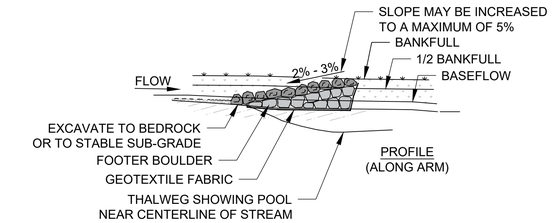
LENGTHS
RIGHT ARM = 24-30 FEET
LEFT ARM = 24-30 FEET

PLAN VIEW

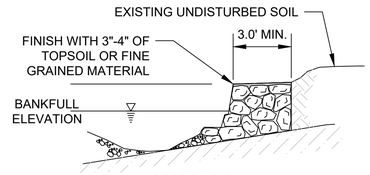




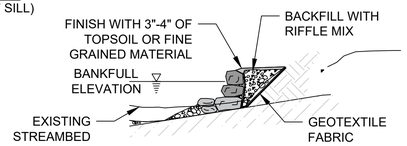
SECTION C-C
(AT APEX)



PROFILE
(ALONG ARM)



SECTION A-A
(AT CUTOFF SILL)



SECTION B-B
(AT VANE ARM)

BOULDER NOTES:

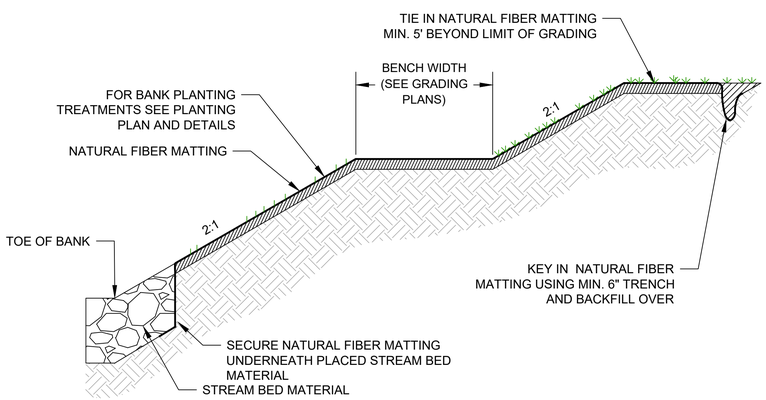
A. PROVIDE A RANGE OF BOULDER SIZES FOR FLEXIBILITY TO MEET DESIGN GRADES & LINES. AT LEAST 80% OF THE BOULDER SHALL MEET OR EXCEED THE AVERAGE SIZE BOULDER REQUIREMENTS; UP TO 15% OF BOULDER MAY BE IN THE MINIMUM TO AVERAGE SIZE CATEGORY; AND 5% MAY BE SMALLER FRAGMENTS FOR CHINKING USE.
B. SMALLER HEIGHT BOULDERS ARE REQUIRED TO TAPER STRUCTURES AT APEX ON BEDROCK. FOOTER BOULDERS SHALL MEET STRUCTURE BOULDER REQUIREMENTS.
C. FOR MAIN STRUCTURE BOULDER, SILL, AND FOOTER BOULDER, THE BOULDER SOURCE SHALL BE FROM AN ACCEPTABLE WVDOH QUARRY OR FROM ENGINEER APPROVED SOURCE.
D. ON-SITE COBBLE AND BOULDERS MAY BE USED TO FILL VOIDS AND FOR SPLASH BOULDERS, BUT NOT FOR USE AS ANY MAIN STRUCTURE BOULDER.

ROCK CROSS VANE NOTES:

1. THE SLOPE, ANGLE, & LENGTH OF THE VANE ARMS MAY BE ADJUSTED WITHIN THE SPECIFIED RANGE TO MEET EXISTING SITE CONDITIONS.
2. NON-WOVEN GEOTEXTILE FABRIC AS DESCRIBED IN THE SPECIFICATIONS. PLACE GEOTEXTILE BEHIND THE ARM (UPSTREAM SIDE), DRAPED FROM TOP OF BOULDER STRUCTURE TO BOTTOM OF FOOTER BOULDER AND EXTEND A MINIMUM OF HALF THE TRENCH BOTTOM WIDTH. TRIM EXCESS OR VISIBLE FABRIC.
3. FOR STEEP STREAM SLOPES OR WHERE ADDITIONAL GRADE DROP IS REQUIRED, STEPS MAY BE ADDED ACCORDING TO THE CROSS VANE (WITH STEP) DETAIL.
4. BOULDER VANE ARMS MAY NOT BE SYMMETRICAL. ARM LENGTHS MAY BE SKEWED TO MATCH EXISTING SITE CONDITIONS OR STREAM ALIGNMENT.
5. PROVIDE GAPS BETWEEN APEX BOULDERS ⅓ TO ½ THE DIAMETER OF BOULDERS. NO GAPS BETWEEN APEX BOULDERS WHEN INSTALLED ON BEDROCK OR HIGH BEDLOAD STREAMS.
6. THE NUMBER OF BOULDER COURSES VARIES BY BANK HEIGHT AND DEPTH TO STABLE SUBSTRATE.

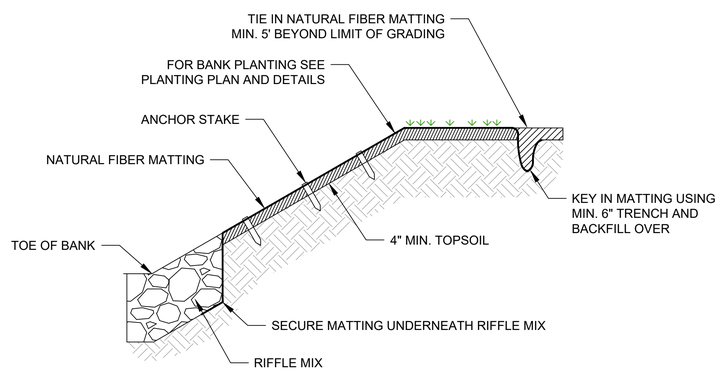
ROCK CROSS VANE (RCV) DETAIL

NTS



BENCH & BANK GRADING DETAIL

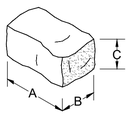
NTS



BANK GRADING DETAIL

NTS

BOULDER DIMENSIONS (FT)			
BOULDER TYPE	A-AXIS	B-AXIS	C-AXIS
REACH 1 (UPSTREAM OF EASTOVER)	3.0	2.0	1.0
REACH 2 (DOWNSTREAM OF EASTOVER)	3.5	3.0	1.5



B: Intermediate Axis
A: Long Axis
C: Short Axis

RIFFLE GRADATION TABLE		
LOCATION	REACH 1 (UPSTREAM OF EASTOVER)	REACH 2 (DOWNSTREAM OF EASTOVER)
CUMULATIVE % FINER	SIZE (IN)	SIZE (IN)
16	2.0	2.0
30	3.5	5.0
50	12.0	18.0
84	16.0	24.0
95	17.5	26.0

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COMMONWEALTH OF VIRGINIA
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Lic. No. 049293
PROFESSIONAL ENGINEER

MOUNTAIN VIEW DRIVE STREAM RESTORATION
DETAILS
CITY OF HARRISONBURG, VIRGINIA

REVISION:

PROJECT MANAGER: JRR
DESIGNED: WKM/CKA
DRAWN: JAT/CKA
PROJECT #: 18-0022
DATE: 09/01/21
SHEET: 11

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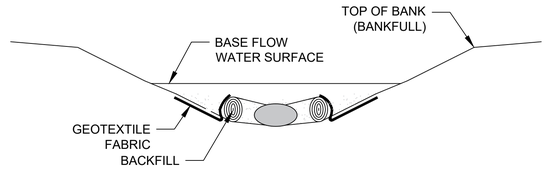
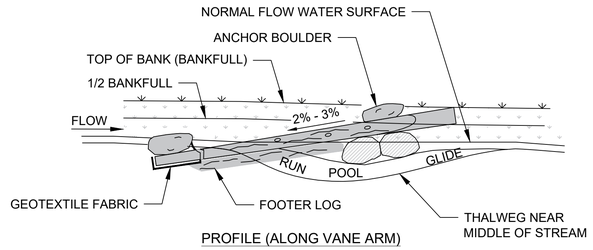
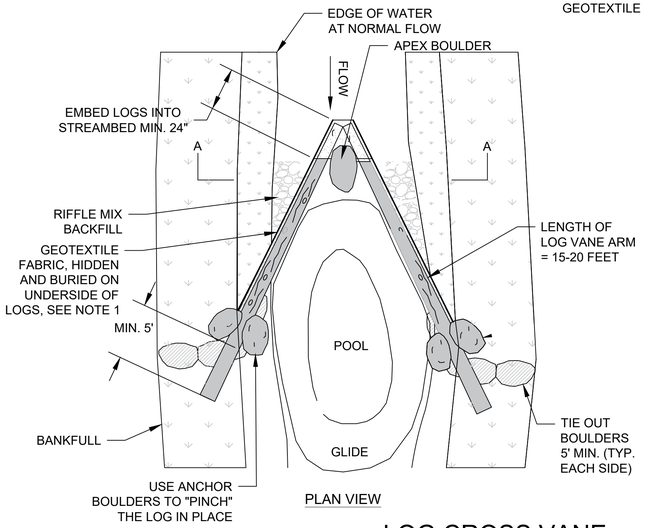


CROSS-SECTION A-A (AT ANCHOR LOG)



PROFILE (ALONG VANE ARM)



PLAN VIEW

LOG CROSS VANE NOTES:

1. USE NONWOVEN GEOTEXTILE FABRIC. FASTEN FABRIC EVERY 6 TO 12 INCHES WITH COMMON 10D NAILS AND WASHERS AT MIDPOINT ALONG LENGTH OF LOG. INSTALL LENGTHWISE ALONG THE LOG ARM SO THAT THERE ARE NO SEAMS OR OVERLAPS. AFTER BACKFILLING, THE FABRIC SHOULD BE HIDDEN.
2. ADDITIONAL REQUIREMENTS ARE PROVIDED IN THE TECHNICAL SPECIFICATIONS MANUAL.

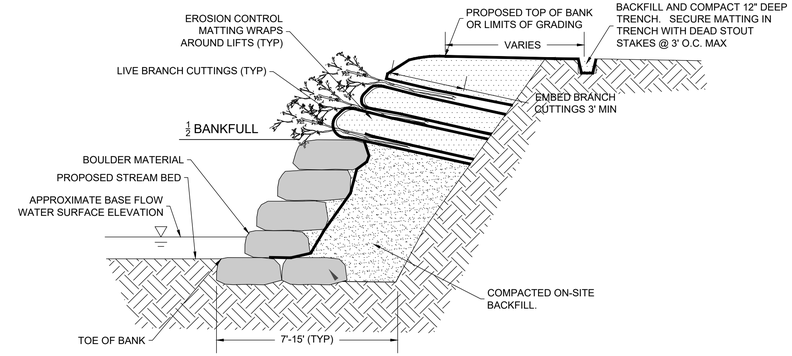
BOULDER NOTES:

1. AT LEAST 80% OF THE BOULDER SHALL MEET OR EXCEED THE AVERAGE SIZE BOULDER REQUIREMENTS; UP TO 15% OF BOULDER MAY BE IN THE MINIMUM TO AVERAGE SIZE CATEGORY; AND 5% MAY BE SMALLER FRAGMENTS FOR CHINKING.
2. SMALLER HEIGHT BOULDERS ARE REQUIRED TO TAPER STRUCTURES AT APEX ON BEDROCK. FOOTER BOULDERS SHALL MEET STRUCTURE BOULDER REQUIREMENTS.
3. FOR MAIN STRUCTURE BOULDER, SILL, AND FOOTER BOULDER, THE BOULDER SOURCE SHALL BE FROM AN ACCEPTABLE QUARRY/FROM AN ENGINEER APPROVED SOURCE.
4. RIFFLE MATERIAL TO BE USED TO FILL VOIDS, BUT NOT FOR USE AS ANY MAIN STRUCTURE BOULDER.

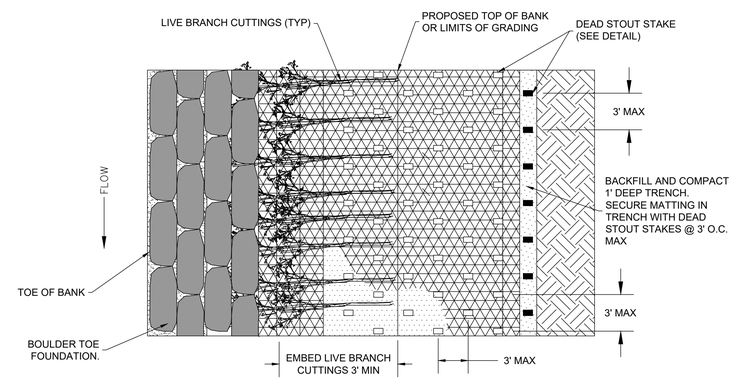
LOG CROSS VANE

BOULDER TOE WITH SOIL LIFT

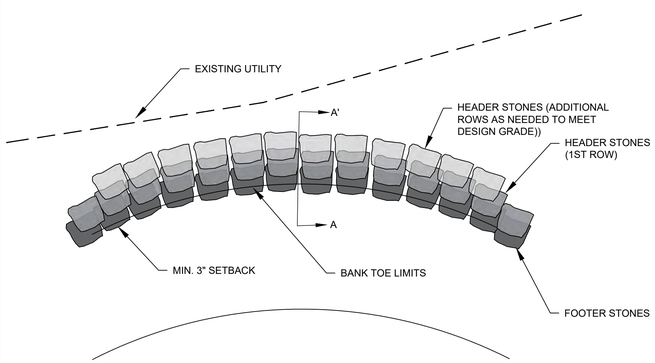
SCALE: NTS



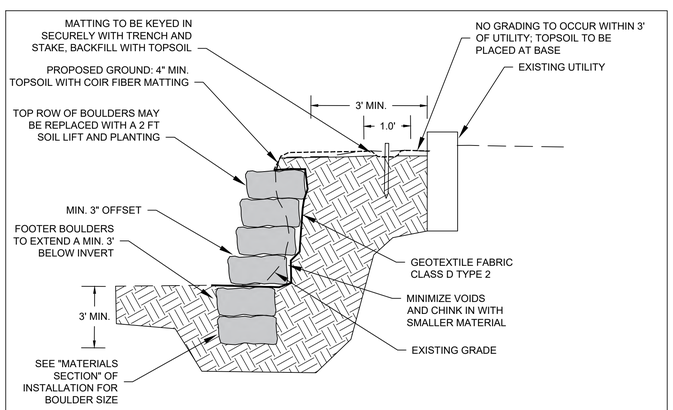
SECTION VIEW



PLAN VIEW



IMBRICATED WALL DETAIL - PLAN VIEW N.T.S.



IMBRICATED WALL DETAIL - SECTION VIEW A-A' N.T.S.

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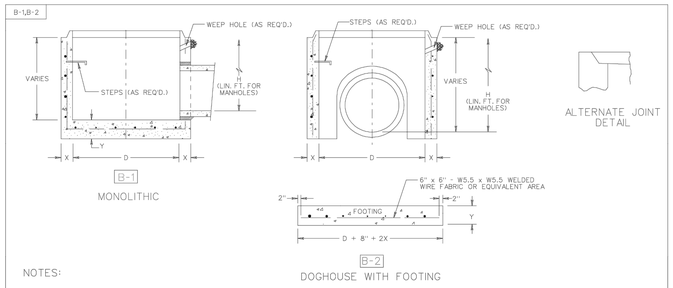
B-1,B-2



NOTES:

1. SEE GENERAL NOTES FOR ADDITIONAL INFORMATION ON WEEP HOLES, STEP REQUIREMENTS, "H" (LIN. FT. FOR MANHOLES) DIMENSIONS, ETC.
2. ALL BASE UNITS ARE TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO M199.
3. CONCRETE SHALL BE 4000 PSI.
4. WHERE OPENINGS ARE REQUIRED FOR PIPE, THEY SHALL BE FORMED, DRILLED, OR NEATLY CUT AS APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL FURNISH THE FABRICATOR WITH THE ANGLES BETWEEN CENTER LINES, THE INVERT ELEVATIONS, AND THE SIZE OF ALL PIPES TO ENTER THE MANHOLE. HOLES ARE TO BE A MINIMUM OF 4" TO A MAXIMUM OF 8" LARGER THAN THE OUTSIDE DIAMETER OF THE PROPOSED PIPE.
5. DIMENSIONS SHOWN ARE MINIMUM. ACTUAL DIMENSIONS MAY VARY WITH MANUFACTURER.
6. "D" IS NOMINAL DIAMETER.
7. IN THE EVENT THE INVERT OF THE OUTFALL PIPE IS HIGHER THAN THE BOTTOM OF THE STRUCTURE, THE INVERT OF THE STRUCTURE SHALL BE SHAPED WITH CEMENT MORTAR TO PREVENT STANDING OR PONDING OF WATER IN THE STRUCTURE.
8. TONGUE AND GROOVE JOINT ARE TO BE OF FABRICATOR'S DESIGN MEETING VDOT APPROVAL. JOINTS ARE TO BE SEALED WITH MORTAR, O-RING GASKETS, OR BUTYL RUBBER.

DIMENSIONS

D	X MINIMUM	Y MINIMUM	SUGGESTED MAX. PIPE SIZE	ABSOLUTE MAXIMUM ☆
* 36"	4"	6"	18"	21"
48"	5"	6"	24"	27"
60"	5"	8"	36"	42"
72"	6"	8"	48"	54"
84"	7"	8"	60"	66"
96"	8"	8"	66"	72"

* DEPTH "H" OF 36" DIAMETER BASE UNIT RESTRICTED TO 4'-0" MAXIMUM.

☆ ONE THROUGH PIPE ONLY, (ONE PIPE ENTERING AND ONE PIPE EXITING STRUCTURE)

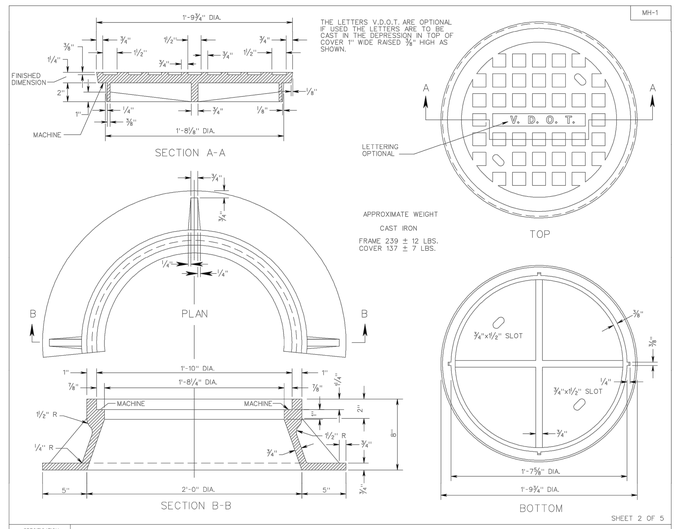
STANDARD PRECAST BASE UNITS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE: 105, 302

10.3.11

MH-1

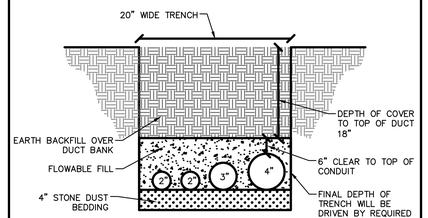


SPECIFICATION REFERENCE: 224, 302

STANDARD MANHOLE FRAME AND COVER

VIRGINIA DEPARTMENT OF TRANSPORTATION

106.02



NOTES:

1. SHENTEL: SINGLE 2" CONDUIT
2. SEGRA/LUMOS: SINGLE 2" CONDUIT
3. VERIZON: SINGLE 3" CONDUIT
4. COMCAST: SINGLE 4" CONDUIT
5. CONDUIT WILL HAVE A MINIMUM 2" SPACING.
6. LONG SWEEP 90 DEGREE BENDS SHALL BE USED WHEN TURNING UP AT PULL BOXES (NO TRUE 90 DEGREE TURNS).
7. CONTRACTOR SHALL INSTALL PULL STRING (MINIMUM 200LB TENSILE STRENGTH) IN ALL CONDUIT.

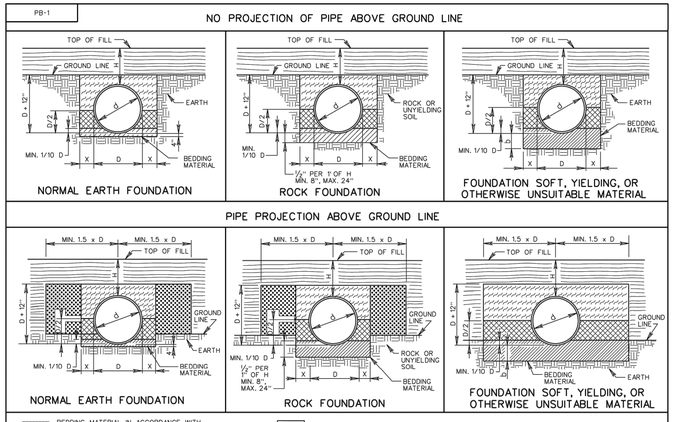
NO SCALE

JOINT UTILITY DUCT BANK DETAIL

*JOINT UTILITY DUCT BANK DESIGN COMPLETED AND PROVIDED BY GAY AND NEEL, INC.

PB-1

NO PROJECTION OF PIPE ABOVE GROUND LINE



- BEDDING MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.
- CLASS I BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.
- FOR PLASTIC PIPE CLASS I BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.
- FOR ALL OTHER PIPE REGULAR BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.
- EMBANKMENT
- REGULAR BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.

NOTES:

FOR GENERAL NOTES ON PIPE BEDDING, SEE INSTALLATION OF PIPE CULVERTS AND STORM SEWERS GENERAL NOTES ON SHEET 107.00.

CRUSHED GLASS CONFORMING TO THE SIZE REQUIREMENTS FOR CRUSHER RUN AGGREGATE SIZE 25 AND 26 MAY BE USED IN PLACE OF CLASS I BACKFILL.

VDOT

ROAD AND BRIDGE STANDARDS

SHEET 1 OF 4 | REVISION DATE 07/12

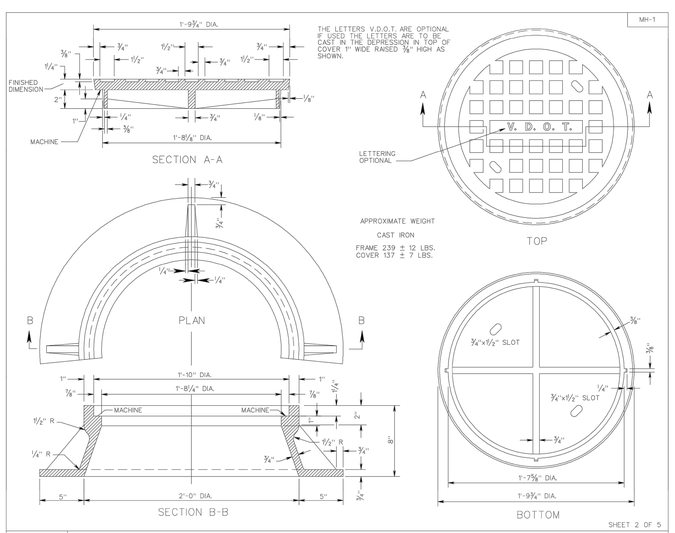
107.01

INSTALL. OF PIPE CULVERTS AND STORM SEWERS
CIRC. PIPE BEDDING AND BACKFILL - METHOD "A"

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE: 302, 303

MH-1



SPECIFICATION REFERENCE: 224, 302

STANDARD MANHOLE FRAME AND COVER

VIRGINIA DEPARTMENT OF TRANSPORTATION

106.02

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COMMONWEALTH OF VIRGINIA
WILLIAM KIPLING MUMAW
Lic. No. 049293
PROFESSIONAL ENGINEER

MOUNTAIN VIEW DRIVE STREAM RESTORATION
DETAILS - STORMWATER INFRASTRUCTURE
CITY OF HARRISONBURG, VIRGINIA

REVISION:

PROJECT MANAGER:	JRR
DESIGNED:	WKM/CKA
DRAWN:	JAT/CKA
PROJECT #:	18-0022
DATE:	09/01/21
SHEET:	13

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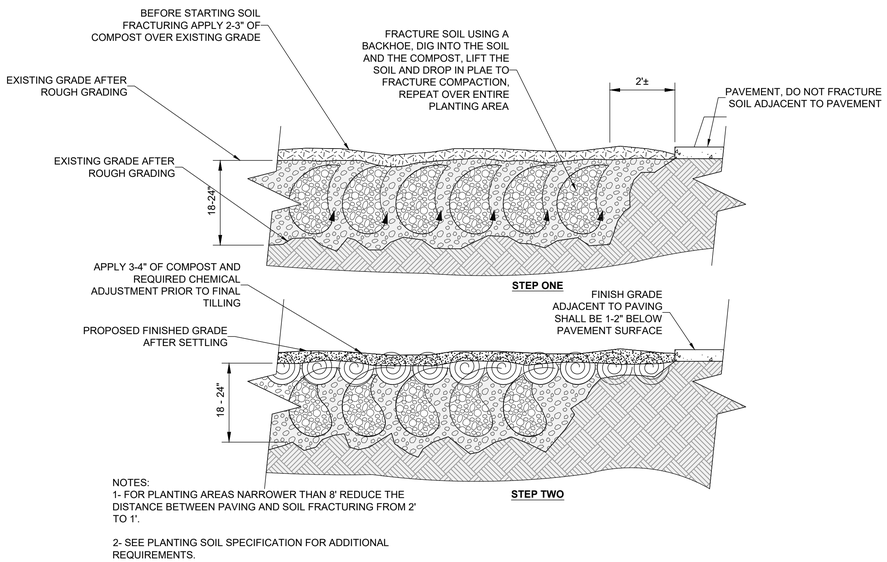
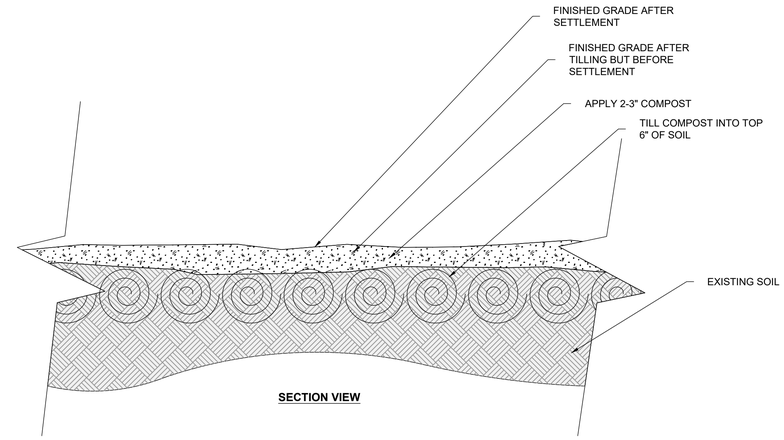


NOTES:
1- FOR PLANTING AREAS NARROWER THAN 8' REDUCE THE DISTANCE BETWEEN PAVING AND SOIL FRACTURING FROM 2' TO 1'.

2- SEE PLANTING SOIL SPECIFICATION FOR ADDITIONAL REQUIREMENTS.

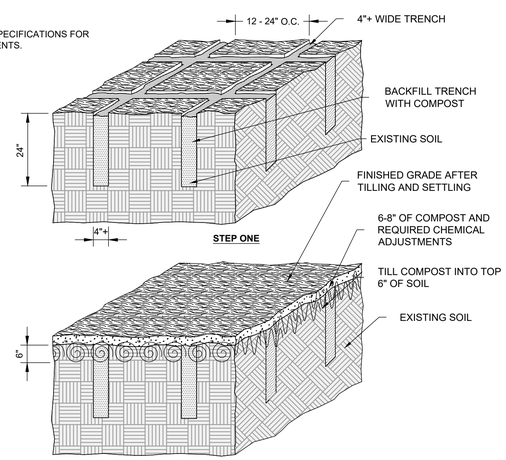
COMPACTED SUB SOIL
NTS



NOTES:
1- SEE PLANTING SOIL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

COMPACTED SURFACE SOIL
NTS

NOTES:
1- SEE PLANTING SOIL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.



MODIFIED EXISTING SOIL-COMPACTED SUBSOIL (RIPPING)
NTS

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MOUNTAIN VIEW DRIVE STREAM RESTORATION
DETAILS - SOILS
CITY OF HARRISONBURG, VIRGINIA

REVISION:

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SHEET:	14

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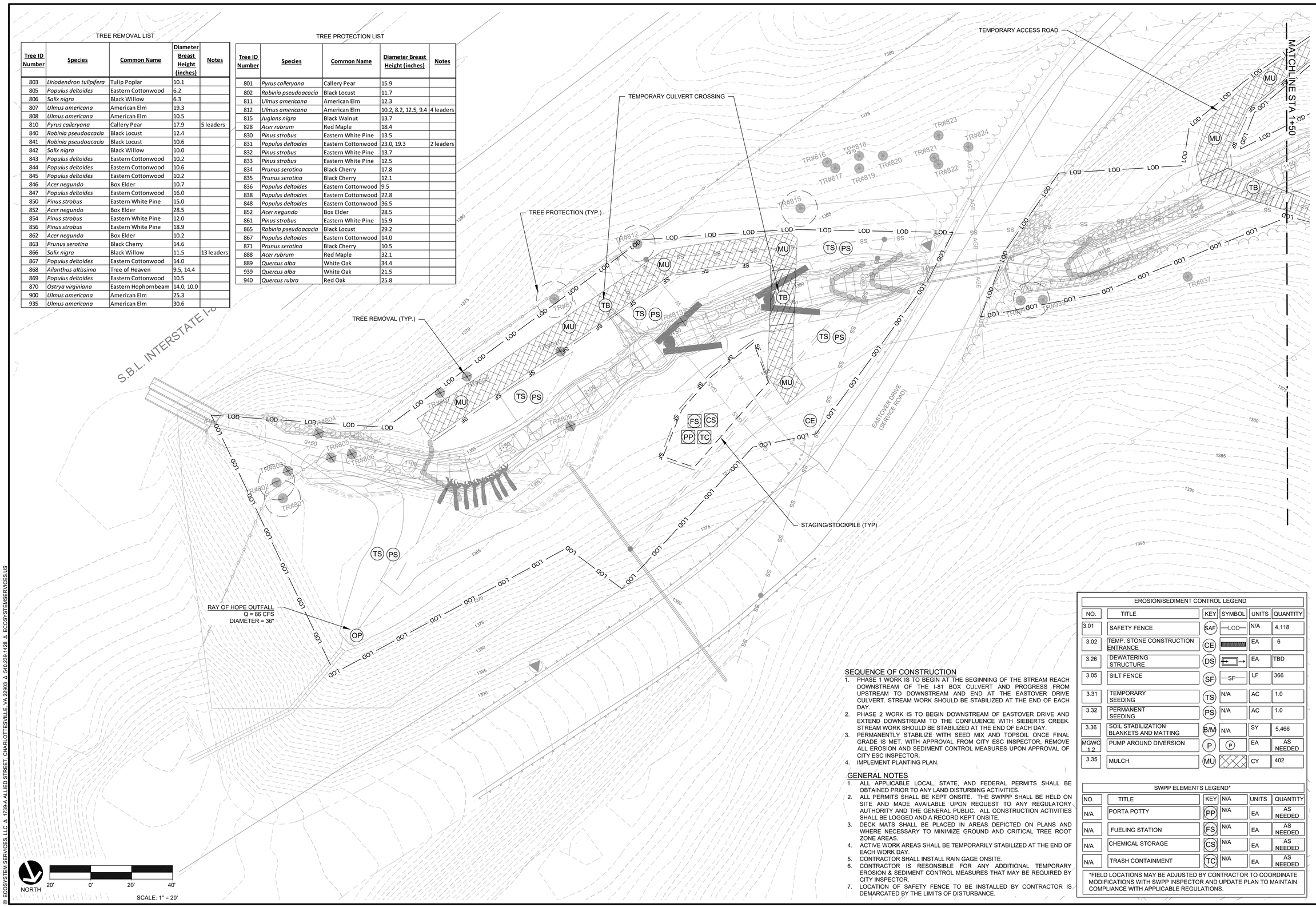
TREE REMOVAL LIST

Tree ID Number	Species	Common Name	Diameter Breast Height (inches)	Notes
803	*Liriodendron tulipifera*	Tulip Poplar	10.1	
805	*Populus deltoides*	Eastern Cottonwood	6.2	
806	*Salix nigra*	Black Willow	6.3	
807	*Ulmus americana*	American Elm	19.3	
808	*Ulmus americana*	American Elm	10.5	
810	*Pyrus calleryana*	Callery Pear	17.9	5 leaders
840	*Robinia pseudoacacia*	Black Locust	12.4	
841	*Robinia pseudoacacia*	Black Locust	10.6	
842	*Salix nigra*	Black Willow	10.0	
843	*Populus deltoides*	Eastern Cottonwood	10.2	
844	*Populus deltoides*	Eastern Cottonwood	10.6	
845	*Populus deltoides*	Eastern Cottonwood	10.2	
846	*Acer negundo*	Box Elder	10.7	
847	*Populus deltoides*	Eastern Cottonwood	16.0	
850	*Pinus strobus*	Eastern White Pine	15.0	
852	*Acer negundo*	Box Elder	28.5	
854	*Pinus strobus*	Eastern White Pine	12.0	
856	*Pinus strobus*	Eastern White Pine	18.9	
862	*Acer negundo*	Box Elder	10.2	
863	*Prunus serotina*	Black Cherry	14.6	
866	*Salix nigra*	Black Willow	11.5	13 leaders
867	*Populus deltoides*	Eastern Cottonwood	14.0	
868	*Ailanthus altissima*	Tree of Heaven	9.5, 14.4	
869	*Populus deltoides*	Eastern Cottonwood	10.5	
870	*Ostrya virginiana*	Eastern Hophornbeam	14.0, 10.0	
900	*Ulmus americana*	American Elm	25.3	
935	*Ulmus americana*	American Elm	30.6	

TREE PROTECTION LIST

Tree ID Number	Species	Common Name	Diameter Breast Height (inches)	Notes
801	*Pyrus calleryana*	Callery Pear	15.9	
802	*Robinia pseudoacacia*	Black Locust	11.7	
811	*Ulmus americana*	American Elm	12.3	
812	*Ulmus americana*	American Elm	10.2, 8.2, 12.5, 9.4	4 leaders
815	*Juglans nigra*	Black Walnut	13.7	
828	*Acer rubrum*	Red Maple	18.4	
830	*Pinus strobus*	Eastern White Pine	13.5	
831	*Populus deltoides*	Eastern Cottonwood	23.0, 19.3	2 leaders
832	*Pinus strobus*	Eastern White Pine	13.7	
833	*Pinus strobus*	Eastern White Pine	12.5	
834	*Prunus serotina*	Black Cherry	17.8	
835	*Prunus serotina*	Black Cherry	12.1	
836	*Populus deltoides*	Eastern Cottonwood	9.5	
838	*Populus deltoides*	Eastern Cottonwood	22.8	
848	*Populus deltoides*	Eastern Cottonwood	36.5	
852	*Acer negundo*	Box Elder	28.5	
861	*Pinus strobus*	Eastern White Pine	15.9	
865	*Robinia pseudoacacia*	Black Locust	29.2	
867	*Populus deltoides*	Eastern Cottonwood	14.0	
871	*Prunus serotina*	Black Cherry	10.5	
888	*Acer rubrum*	Red Maple	32.1	
889	*Quercus alba*	White Oak	34.4	
939	*Quercus alba*	White Oak	21.5	
940	*Quercus rubra*	Red Oak	25.8	



SEQUENCE OF CONSTRUCTION

1. PHASE 1 WORK IS TO BEGIN AT THE BEGINNING OF THE STREAM REACH DOWNSTREAM OF THE I-81 BOX CULVERT AND PROGRESS FROM UPSTREAM TO DOWNSTREAM AND END AT THE EASTOVER DRIVE CULVERT. STREAM WORK SHOULD BE STABILIZED AT THE END OF EACH DAY.
2. PHASE 2 WORK IS TO BEGIN DOWNSTREAM OF EASTOVER DRIVE AND EXTEND DOWNSTREAM TO THE CONFLUENCE WITH SIEBERTS CREEK. STREAM WORK SHOULD BE STABILIZED AT THE END OF EACH DAY.
3. PERMANENTLY STABILIZE WITH SEED MIX AND TOPSOIL ONCE FINAL GRADE IS MET. WITH APPROVAL FROM CITY ESC INSPECTOR, REMOVE ALL EROSION AND SEDIMENT CONTROL MEASURES UPON APPROVAL OF CITY ESC INSPECTOR.
4. IMPLEMENT PLANTING PLAN.

GENERAL NOTES

1. ALL APPLICABLE LOCAL, STATE, AND FEDERAL PERMITS SHALL BE OBTAINED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
2. ALL PERMITS SHALL BE KEPT ONSITE. THE SWPPP SHALL BE HELD ON SITE AND MADE AVAILABLE UPON REQUEST TO ANY REGULATORY AUTHORITY AND THE GENERAL PUBLIC. ALL CONSTRUCTION ACTIVITIES SHALL BE LOGGED AND A RECORD KEPT ONSITE.
3. DECK MATS SHALL BE PLACED IN AREAS DEPICTED ON PLANS AND WHERE NECESSARY TO MINIMIZE GROUND AND CRITICAL TREE ROOT ZONE AREAS.
4. ACTIVE WORK AREAS SHALL BE TEMPORARILY STABILIZED AT THE END OF EACH WORK DAY.
5. CONTRACTOR SHALL INSTALL RAIN GAGE ONSITE.
6. CONTRACTOR IS RESONSIBLE FOR ANY ADDITIONAL TEMPORARY EROSION & SEDIMENT CONTROL MEASURES THAT MAY BE REQUIRED BY CITY INSPECTOR.
7. LOCATION OF SAFETY FENCE TO BE INSTALLED BY CONTRACTOR IS DEMARCATED BY THE LIMITS OF DISTURBANCE.

EROSION/SEDIMENT CONTROL LEGEND

NO.	TITLE	KEY	SYMBOL	UNITS	QUANTITY
3.01	SAFETY FENCE	SAF	—LOD—	N/A	4,118
3.02	TEMP. STONE CONSTRUCTION ENTRANCE	CE		EA	6
3.26	DEWATERING STRUCTURE	DS		EA	TBD
3.05	SILT FENCE	SF	—SF—	LF	366
3.31	TEMPORARY SEEDING	TS	N/A	AC	1.0
3.32	PERMANENT SEEDING	PS	N/A	AC	1.0
3.36	SOIL STABILIZATION BLANKETS AND MATTING	B/M	N/A	SY	5,466
MGWC 1.2	PUMP AROUND DIVERSION	P	P	EA	AS NEEDED
3.35	MULCH	MU		CY	402

SWPP ELEMENTS LEGEND*

NO.	TITLE	KEY	N/A	UNITS	QUANTITY
N/A	PORTA POTTY	PP	N/A	EA	AS NEEDED
N/A	FUELING STATION	FS	N/A	EA	AS NEEDED
N/A	CHEMICAL STORAGE	CS	N/A	EA	AS NEEDED
N/A	TRASH CONTAINMENT	TC	N/A	EA	AS NEEDED

*FIELD LOCATIONS MAY BE ADJUSTED BY CONTRACTOR TO COORDINATE MODIFICATIONS WITH SWPP INSPECTOR AND UPDATE PLAN TO MAINTAIN COMPLIANCE WITH APPLICABLE REGULATIONS.

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EROSION AND SEDIMENT CONTROL
CITY OF HARRISONBURG, VIRGINIA

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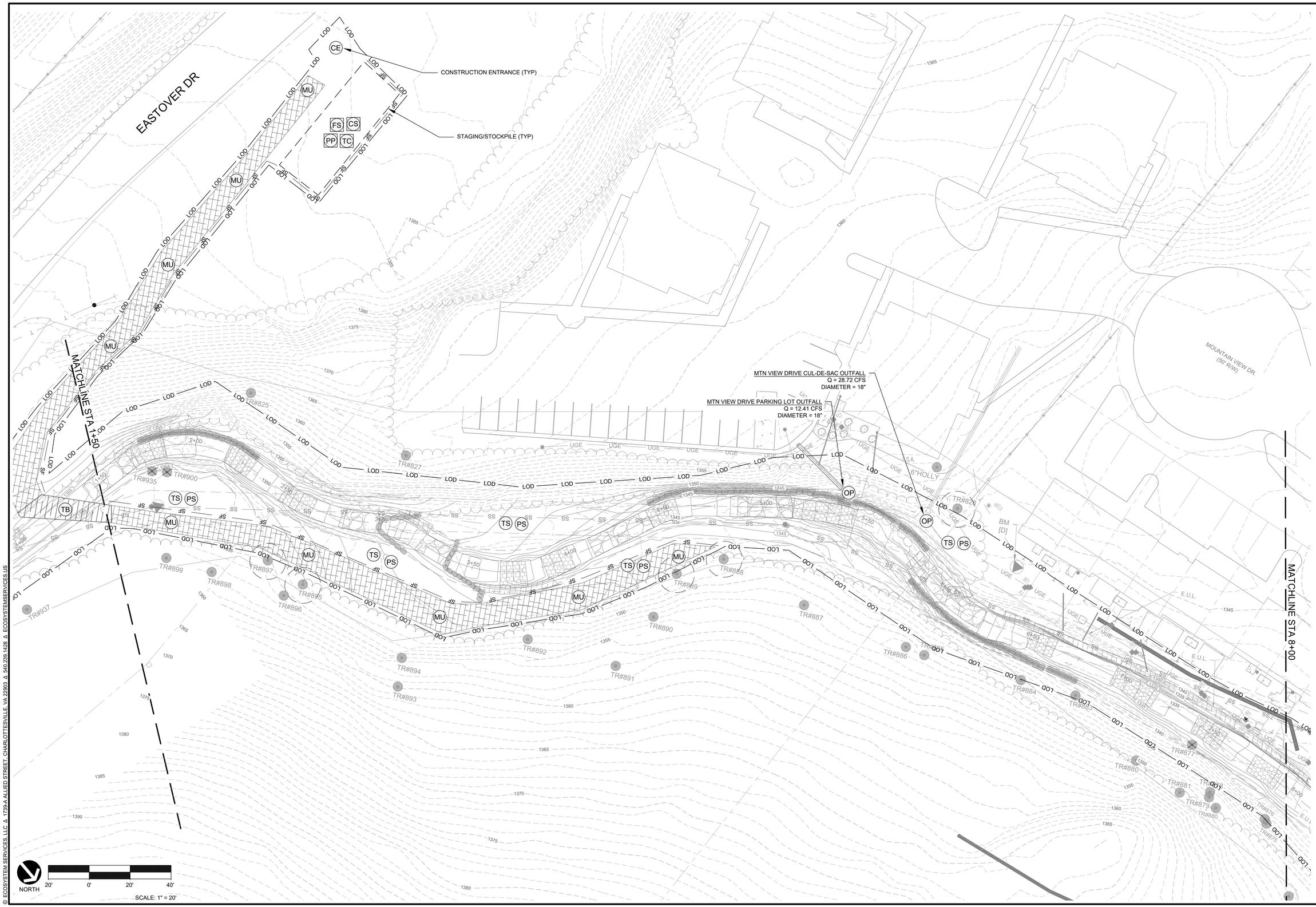

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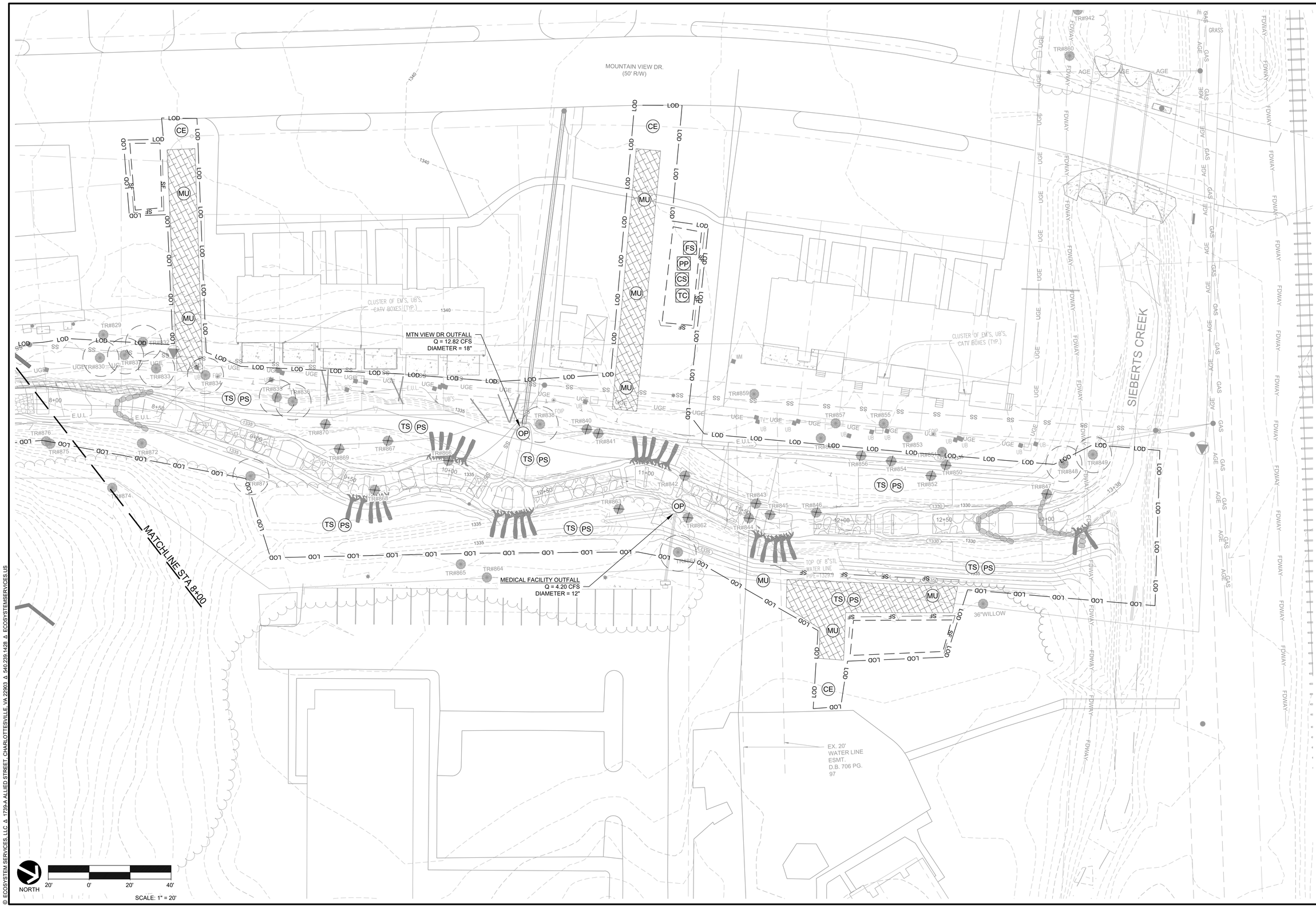

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EROSION & SEDIMENT CONTROL NARRATIVE

SITE DESCRIPTION

THE PROJECT AREA (+/- 3.14 AC) IS CONTAINED WITHIN MULTIPLE PRIVATE AND PUBLICLY OWNED PARCELS THAT CONTAIN BOTH SIEBERTS CREEK AND ONE UNNAMED TRIBUTARY. THE PROJECT PROPERTY IS LOCATED IN THE RIDGE AND VALLEY PHYSIOGRAPHIC PROVINCE AND ALL WATER RESOURCES ARE PART OF THE BLACKS RUN-LOWER NORTH RIVER WATERSHED WHICH DRAINS TO THE SOUTH FORK SHENANDOAH RIVER WATERSHED (HUC: 02070005).

AREA TOPOGRAPHY IS MODERATE TO STEEP ALONG THE STREAM VALLEYS WITH 10% - 25+% SLOPES AND MOSTLY FLAT AND GENTLY SLOPING WITH 0-5% SLOPES LOCATED IN THE STREAM VALLEY FLOOR.

ADJACENT PROPERTY

LAND USES IN THE VICINITY INCLUDE EXISTING RESIDENTIAL, COMMERCIAL AND INDUSTRIAL DEVELOPMENT.

OFFSITE AREAS

NO OFFSITE AREAS ARE ASSOCIATED WITH THIS PROJECT. IF ADDITIONAL MATERIAL IS REQUIRED TO BE TAKEN OFFSITE, A PROPER DISPOSAL LOCATION WITH AN APPROVED SWPPP AND ESC PLAN WILL BE PROVIDED.

SOILS

THE SOILS WITHIN THE PROJECT LIMITS INCLUDE THE FOLLOWING:

1) CARBO-ENDCAV-ROCK OUTCROP COMPLEX, 7-15% SLOPES (12C)
2) FLUVAQUENTS (28A)
3) FREDERICK AND LODI SILT LOAMS, 2-7% SLOPES (29B2)
3) FREDERICK AND LODI SILT LOAMS, 7-15% SLOPES (29C2)
4) FREDERICK AND LODI SILT LOAMS, 15-25% SLOPES (29D2)
5) TIMBERVILLE VARIANT SILT LOAM, 0-7% SLOPES (68B)
6) URBAN LAND (73)

CRITICAL EROSION AREAS:

THE PROJECT SITE IS A CRITICAL AREA. THE PROJECT AREA CONSISTS OF AN EXISTING STREAM. THE PROPOSED RESTORATION WILL IMPACT THE EXISTING RESOURCES DURING CONSTRUCTION. ALL EROSION AND SEDIMENT CONTROL PRACTICES EMPLOYED ARE DESIGNED TO PROTECT THIS RESOURCE FROM SEDIMENTATION DURING CONSTRUCTION AND MUST BE MAINTAINED IN ACCORDANCE WITH THE SPECIFICATIONS IN THIS PLAN.

EROSION AND SEDIMENT CONTROL MEASURES:

UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, THIRD EDITION (1992). NO EROSION AND SEDIMENT CONTROL STRUCTURE SHALL BE REMOVED WITHOUT THE APPROVAL OF THE EROSION AND SEDIMENT CONTROL INSPECTOR.

PUMP AROUND PRACTICE - STD. & SPEC. 5.1 (THE VIRGINIA STREAM RESTORATION AND BEST MANAGEMENT PRACTICES GUIDE, 2004.).
PUMP AROUND PRACTICE WILL BE INSTALLED WHERE NECESSARY TO ENSURE PROPER STREAM FLOW MAINTENANCE AND CLEAN WATER DISCHARGE FROM ACTIVE WORK AREAS. SPECIFIC LOCATIONS ARE NOT SPECIFIED ON PLANS AS THE LOCATION AND METHODS WILL VARY THROUGHOUT THE DURATION.

DEWATERING DEVICE - STD. AND SPEC. 3.26 OR DIRT SEDIMENT BAG.
FILTER BAG OR AN APPROVED ALTERNATIVE SHALL BE USED AS PART OF THE PUMP AROUND PRACTICE.

TEMPORARY STONE CONSTRUCTION ENTRANCE- STD. & SPEC. 3.02
A TEMPORARY STONE CONSTRUCTION ENTRANCE WILL BE PROVIDED AS SHOWN ON THESE PLANS.

SILT FENCE- STD. & SPEC. 3.05
SILT FENCE WILL BE INSTALLED AT LOCATIONS SHOWN ON THESE PLANS IN ORDER TO INTERCEPT AND DETAIN SMALL AMOUNTS OF SEDIMENT FROM THE DISTURBED AREAS DURING CONSTRUCTION OPERATIONS IN ORDER TO PREVENT SEDIMENT FROM LEAVING THE SITE.

TEMPORARY SEEDING & MULCHING -STD. 3.31 & SPEC & 3.35
TEMPORARY SEEDING AND MULCHING WILL BE APPLIED WITHIN 7 DAYS TO DENUDED AREAS WHICH MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN 30 DAYS. FOR TEMPORARY SEEDING USE 50% OF THE RECOMMENDED RATES OF FERTILIZER, LIME AND FULL AMOUNT OF SEED AND MULCH REQUIRED FOR REGULAR SEEDING. MULCHING SHALL CONSIST OF HARDWOOD MULCH.

Common Name	Botanical Name	Application Rate (lbs/ac)	Planting Period
Rye Grain	*Secale cerale*	25	Nov. 1st - April 30th
Wheat	*Triticum aestivum*	30	Nov. 1st - April 30th
German Millet	*Setaria italic*	10	May 1st - Sept. 30th
Browntop Millet	*Urochloa ramosa*	10	May 1st - Sept. 30th

PERMANENT SEEDING-STD. & SPEC 3.32
PERMANENT SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN (7) DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN (7) DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRAD BUT WILL REMAIN UNDISTURBED FOR LONGER THAN FOURTEEN (14) DAYS.

Species	Common Name	Indicator Status	Percent of Total
Virginia Wild Rye	*Elymus virginicus*	FACW	20
Switchgrass	*Panicum virgatum*	FAC	25
Little bluestem	*Schizachyrium scoparium*	FACU	15
Soft rush	*Juncus effusus*	FACW	10
Deer tongue	*Dichanthelium clandestinum*	FAC	10
Indiangrass	*Sorghastrum nutans*	FACU	10
Wingstem	*Verbesina alternifolia*	FAC	5
White Oldfield Aster	*Symphyotrichum pilosum*	FAC	5

STABILIZATION NOTES

1. GENERAL SEEDING SHALL OCCUR WITHIN SEVEN DAYS OF REACHING FINAL GRADE.
2. PLANTING AT OTHER TIMES THAN SPECIFIED MAY BE DONE ONLY UNDER SPECIFIC CONDITIONS AND WITH THE CONSENT OF THE ENGINEER.
3. ALL OPERATIONS SHALL BE PERFORMED ONLY WHEN THE SOIL IS IN PROPER CONDITION TO PERMIT SATISFACTORY WORK.
4. SURFACE SHALL BE CLEARED OF ALL GRADE STAKES, SURFACE TRASH OR OTHER OBJECTS, WHICH WOULD HINDER INSTALLATION OF SEED.
5. SEED SHALL BE APPLIED WITH AN APPROPRIATE METHOD EITHER BY HYDROSEEDING/HYDROMULCHING OR BROADCAST SPREAD.
6. HYDROSEED OR HYDRO MULCH SHALL BE DYED GREEN TO AID IN VISUAL METERING DURING APPLICATION AND SHALL BE APPLIED AT A RATE OF 1200 POUNDS PER ACRE.
7. UNLESS HYDROSEEDING/HYDROMULCHING METHODS ARE USED, SEED SHALL BE RAKED AND LIGHTLY ROLLED. SEED SHALL BE COVERED WITH STRAW MULCH AT A RATE OF 1.5 TONS PER ACRE AND SHALL BE OF STANDARD QUALITY AND FREE OF WEEDS.

MAINTENANCE SCHEDULE

IN GENERAL, THE CONTRACTOR SHALL CHECK ALL EROSION AND SEDIMENT CONTROL MEASURES EVERY FOUR DAYS AND WITHIN 24-HOURS OF THE END OF A STORM EVENT THAT IS 0.25 INCHES OR GREATER. CORRECTIVE ACTION(S) SHALL BE COMPLETED AS SOON AS PRACTICABLE, BUT NO LATER THAN SEVEN DAYS AFTER DISCOVERY OR A LONGER PERIOD AS ESTABLISHED BY THE VSMP AUTHORITY, TO MAINTAIN THE CONTINUED EFFECTIVENESS OF THE CONTROL MEASURES

UNLESS OTHERWISE SPECIFIED, ALL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION. A COPY OF THE APPROVED ESC PLAN SHALL BE MADE AVAILABLE ONSITE AT ALL TIMES.

1. TEMPORARY STONE CONSTRUCTION ENTRANCE SHALL BE MAINTAINED IN A CONDITION, WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHT-OF-WAYS. PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR THE WASHING AND REWORKING OF EXISTING STONE SHALL BE EXECUTED AS CONDITIONS DEMAND. ALL MATERIALS SPILLED, DROPPED, WASHED OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY, BUT NO LATER THAN THE END OF EACH WORKDAY.

2. SILT FENCE SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT AND WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, REPAIRED, AND SEEDED.

3. DISTURBED AREAS AND AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM.

4. WHERE DISCHARGE LOCATIONS OR POINTS ARE ACCESSIBLE, THEY SHALL BE INSPECTED TO ASCERTAIN WHETHER EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATERS. WHERE DISCHARGE LOCATIONS ARE INACCESSIBLE, NEARBY DOWNSTREAM LOCATIONS SHALL BE INSPECTED TO THE EXTENT THAT SUCH INSPECTIONS ARE PRACTICABLE.

5. LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE SHALL BE INSPECTED DAILY FOR EVIDENCE OF OFFSITE SEDIMENT TRACKING.

6. INLET PROTECTION SHALL BE CHECKED REGULARLY FOR SEDIMENT BUILD-UP, WHICH WILL PREVENT DRAINAGE. IF THE GRAVEL IS CLOGGED WITH SEDIMENT, IT SHALL BE REMOVED AND CLEANED OR REPLACED.

7. TREE PROTECTION SHALL BE CHECKED REGULARLY FOR DAMAGE AND REPAIRED AS NECESSARY. SITE INSPECTION FOR ADDITIONAL AREAS THAT WARRANT TREE PROTECTION SHOULD BE CONDUCTED DAILY.

EROSION AND SEDIMENT CONTROL NOTES

1. THE OWNER/DEVELOPER MUST NOTIFY LOCALITY AT LEAST 24 HOURS PRIOR TO THE START OF CONSTRUCTION IN ACCORDANCE WITH APPLICABLE LOCAILTY ORDINANCES AND POLICIES.
2. THE OWNER/DEVELOPER GRANTS THE RIGHT-OF-ENTRY ON THIS PROPERTY TO THE DESIGNATED PERSONNEL FOR THE PURPOSE OF INSPECTING AND MONITORING FOR COMPLIANCE WITH TITLE 10.01, CHAPTER 5, ARTICLE 4 OF THE CODE OF VIRGINIA, EROSION AND SEDIMENT CONTROL LAW AND THE DESIGN AND CONSTRUCTION STANDARDS MANUAL SECTION 750.04 (C).
3. ALL EROSION CONTROL MEASURES SHOWN ON THE APPROVED PLAN MUST BE IN PLACE AND INSPECTED AND APPROVED BY THE DESIGNATED AUTHORITY PRIOR TO CLEARING, STRIPPING OF TOPSOIL OR GRADING.
4. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN AND PERMIT SHALL BE KEPT ON THE SITE AT ALL TIMES.
5. THE CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE DESIGNATED AUTHORITY.
6. ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL COMPLETE AND ADEQUATE STABILIZATIONS IS ACHIEVED.
7. WATER MUST BE PUMPED INTO AN APPROVED FILTERING DEVICE DURING DEWATERING OPERATIONS.
8. ALL EROSION AND SEDIMENT CONTROL PRACTICES MUST BE CONSTRUCTED AND MAINTAINED ACCORDING TO THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, CHAPTER 840, "EROSION AND SEDIMENT CONTROL REGULATIONS". THE DEVELOPER/DEVELOPER'S REPRESENTATIVE SHALL INSPECT ALL EROSION AND SEDIMENT CONTROL MEASURES AT A MINIMUM EVERY FOUR DAYS AND WITHIN 2 HRS OF EACH SIGNIFICANT RAINFALL. THE FOLLOWING ITEMS WILL BE CHECKED IN PARTICULAR: 1) SILT FENCE BARRIERS WILL BE CHECKED REGULARLY FOR UNDERMINING OR DETERIORATION OF THE FABRIC. 2) SEDIMENT SHALL BE REMOVED WHEN THE LEVEL OF SEDIMENT DEPOSITION REACHES HALF WAY TO THE TOP OF THE BARRIER 3) SEEDED AREAS WILL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED AND RESEEDED AS NEEDED 4) STREAM DIVERSIONS SHALL BE INSPECTED DAILY AND AFTER EACH RAIN TO ENSURE THEY'RE FUNCTIONING PROPERLY AND THAT THE INTEGRITY OF THE LINING ARE NOT IMPAIRED. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES MUST BE MADE IMMEDIATELY AFTER THE INSPECTION.
9. PERMANENT SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN (7) DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN (7) DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN UNDISTURBED FOR LONGER THAN FOURTEEN (14) DAYS. SEEDING AND SELECTION OF THE SEED MIXTURE SHALL BE IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK 3.32. ROADS AND PARKING AREAS SHALL BE STABILIZED WITHIN SEVEN (7) DAYS AFTER FINAL GRADE IS REACHED.
10. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES WILL BE REMOVED WITHIN 30 DAYS AFTER ADEQUATE SITE STABILIZATION AND AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, AS AUTHORIZED BY THE DESIGNATED VESCP INSPECTORS. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES WILL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.
11. WHEN THE SEDIMENT IS TRANSPORTED ONTO A PAVED ROAD SURFACE, THE ROAD WILL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT WILL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING WILL BE ALLOWED ONLY AFTER SEDIMENT IS DISPOSED IN THIS MANNER.
12. AREAS WHICH ARE NOT TO BE DISTURBED WILL BE CLEARLY MARKED BY FLAGS, SIGNS, ETC.
13. TREE SAVE AREAS SHALL BE CLEARLY MARKED IN THE FIELD BY ORANGE SAFETY FENCE.
14. ORANGE SAFETY FENCE MUST BE INSTALLED AROUND ALL SILT TRAPS AND SEDIMENT BASINS.

MINIMUM STANDARDS NARRATIVE

1. MS-1 : SOIL STABILIZATION WILL BE ACHIEVED PER STABILIZATION NOTES AND EROSION AND SEDIMENT CONTROL NARRATIVE.
2. MS-2: SILT FENCE SHALL BE INSTALLED ALONG PERIMETER OF ALL TEMPORARY STOCKPILES.
3. MS-3: PERMANENT STABILIZATION WILL BE COMPLETED PURSUANT OF NOTES PROVIDED.
4. MS-4: NOT APPLICABLE.
5. MS-5: IMMEDIATE STABILIZATION SHALL OCCUR ON ALL EARTHEN STRUCTURES AFTER INSTALLATION.
6. MS-6: NOT APPLICABLE.
7. MS-7: NOT APPLICABLE.
8. MS-8: NOT APPLICABLE.
9. MS-9: DECK MATS, EROSION CONTROL BLANKETS/MATTING TO BE USED IN PROTECTION/STABILIZATION OF STEEP SLOPE AREAS. THE PROJECT HAS BEEN DESIGNED TO MINIMIZE DISTURBANCE TO SUCH SLOPES AND ELIMINATE STEEP SLOPE AREAS WHERE POSSIBLE THROUGH GRADING ESPECIALLY ALONG THE STREAM CORRIDOR.
10. MS-10: NOT APPLICABLE.
11. MS-11: NOT APPLICABLE.
12. MS-12: A PUMP AROUND SYSTEM WILL BE WILL BE UTILIZED DURING INSTREAM WORK TO PROTECT DOWNSTREAM WATERWAYS.
13. MS-13: TEMPORARY STREAM CROSSING WILL BE EXECUTED PER VESCH SPEC 3.24.
14. MS-14: STREAM WORK IS BEING REGULATED BY U.S. ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT 27. LAND DISTURBANCE ACTIVITIES ARE BEING REGULATED BY VDEQ VDPES PERMIT AND LOCALITY GRADING PERMIT. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW THESE LAWS AND REGULATIONS.
15. MS-15: STREAM CHANNEL STABILIZATION WILL BE COMPLETED PURSUANT TO NOTES PROVIDED.
16. MS-16: NOT APPLICABLE.
17. MS-17: A STONE CONSTRUCTION ENTRANCE (WITH WASH RACK IF NECESSARY) WILL BE INSTALLED AS DEPICTED ON PLANS.
18. MS-18: REMOVAL OF TEMPORARY MEASURES WILL BE COMPLETED ACCORDING TO NOTES PROVIDED.
19. MS-19: THE PROPOSED STREAM RESTORATION DESIGN IS CONSISTENT WITH § 62.1-44.15:52 OF THE VIRGINIA LEGISLATIVE CODE, "*STREAM RESTORATION AND RELOCATION PROJECTS THAT INCORPORATES NATURAL CHANNEL DESIGN CONCEPTS ARE NOT MAN-MADE CHANNELS AND SHALL BE EXEMPT FROM ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS AS DEFINED IN ANY REGULATIONS PROMULGATED PURSUANT TO THIS SECTION OR § 62.1-44.15:54 or 62.1-44.15:65*". THIS STREAM RESTORATION PROJECT ADDRESSES POLLUTANT REDUCTION TMDL REQUIREMENTS AND IS DESIGNED TO REDUCE STREAMBANK EROSION. SEE NOTE BELOW MORE INFORMATION.

STORMWATER RUNOFF CONSIDERATIONS

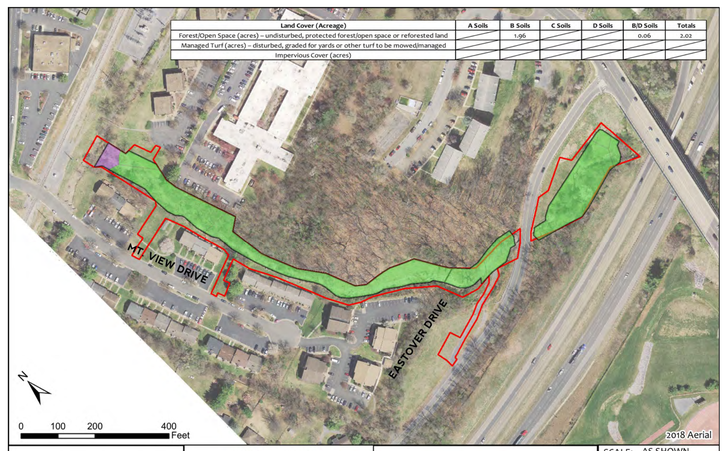
CHANNEL PROTECTION: THIS PROJECT COMPLIES WITH THE ENERGY BALANCE METHOD THROUGH THE CONVERSION OF LAWN AREA TO A PROTECTED OPEN SPACE RIPARIAN BUFFER (I.E., RESULTING IN A LOWER CURVE NUMBER AND THUS A LOWER PEAK AND VOLUME OF ADJACENT STORMWATER).THIS STREAM RESTORATION PROJECT SEEKS TO DISSIPATE ENERGY THROUGH BIO-ENGINEERING AND CHANNEL MODIFICATIONS THAT EMULATE HIGH FUNCTIONING NATURAL SYSTEMS. THE DESIGN RECOGNIZES THE URBAN NATURE OF THE CONTRIBUTING DRAINAGE AREA AND INCLUDES ELEMENTS, SUCH AS, REINFORCED BED MATERIAL AND BENCHING, TO CREATE A MORE STABLE NATURAL CHANNEL. THE PROJECT ANTICIPATES FUTURE WATERSHED DEVELOPMENT AND TECHNIQUES USED, IN COMBINATION WITH STATE STORMWATER REGULATIONS FOR NEW AND REDEVELOPMENT, WILL HELP GUARD AGAINST FUTURE DEGRADATION. NATIVE RIPARIAN PLANTINGS ARE INCLUDED TO ENHANCE THE STREAM CORRIDOR AND WILL BE PROTECTED THROUGH ESTABLISHMENT OF A PERMANENT EASEMENT (SEE EXHIBIT BELOW).

FLOOD PROTECTION: THIS PROJECT DISCHARGES TO A MAPPED FLOODPLAIN OF SIEBERTS CREEK AS SHOWN ON THE PLANS AND FIRM MAP NUMBER 51165C0403D.

WATER QUALITY COMPLIANCE: AS OUTLINED IN THE ABOVE "CHANNEL PROTECTION" SECTION, AN OPEN SPACE EASEMENT HAS BEEN CREATED THAT RESULTS IN A REDUCTION OF ADJACENT POLLUTANTS FROM THE LANDSCAPE. THE VIRGINIA RUNOFF REDUCTION DOCUMENTATION HAS BEEN PROVIDED THAT CONFIRMS THE ASSOCIATED POLLUTANT REDUCTIONS.

BASED ON THE ABOVE INFORMATION AND ASSOCIATED CALCULATIONS PROVIDED, THIS PROJECT MEETS THE REQUIREMENT OF STATE CODE 9VAC25-870-66 (WATER QUANTITY) AND 9VAC25-870-65 (WATER QUALITY).

Land Cover (Acreage)	A Soils	B Soils	C Soils	D Soils	B/D Soils	Totals
Forest/Open Space (acres) – undisturbed, protected forest/open space or reforested land		1.96			0.06	2.02
Managed Turf (acres) – disturbed, graded for yards or other turf to be mowed/managed						
Impervious Cover (acres)						



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VRRM MAP
MOUNTAIN VIEW DRIVE
STREAM RESTORATION
HARRISONBURG, VIRGINIA

Legend
Soil_Group
B
B/D
Open Space Easement
Permanent Access Easement

SCALE: AS SHOWN
PROJECT NO: 18-0022
PM: JRR
DRAWN BY: AA
SOURCE: VGIN
DATE: 08/16/2021
SHEET: 1 OF 1

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COMMONWEALTH OF VIRGINIA
WILLIAM KIPLING MUMAW
Lic. No. 049293
PROFESSIONAL ENGINEER

MOUNTAIN VIEW DRIVE STREAM RESTORATION
EROSION AND SEDIMENT CONTROL DETAILS
CITY OF HARRISONBURG, VIRGINIA

REVISION:

PROJECT MANAGER: JRR
DESIGNED: WKM/CKA
DRAWN: JAT/CKA
PROJECT #: 18-0022
DATE: 09/01/21
SHEET:
18

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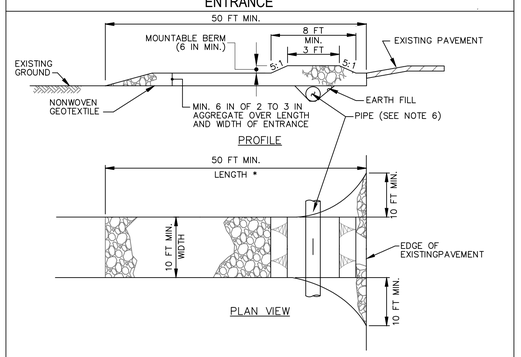
STABILIZED CONSTRUCTION ENTRANCE



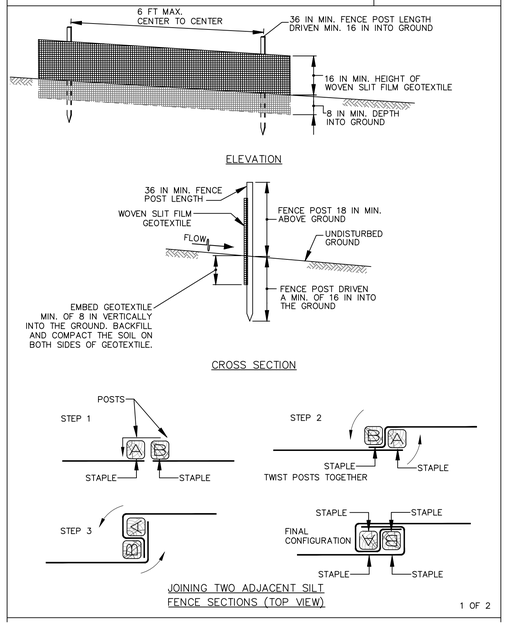
CONSTRUCTION SPECIFICATIONS

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

STONE CONSTRUCTION ENTRANCE
STD. & SPEC. 3.02 (CE)

SILT FENCE DETAIL

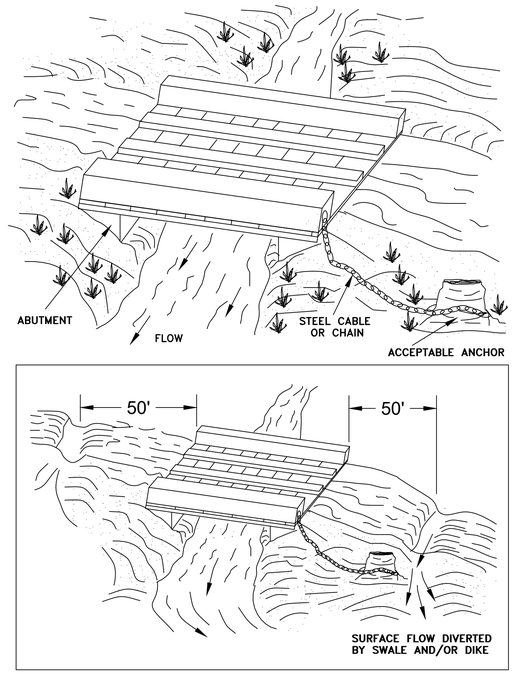
STANDARD SYMBOL —SF—



1 OF 2

SILT FENCE -
STD. & SPEC. 3.05

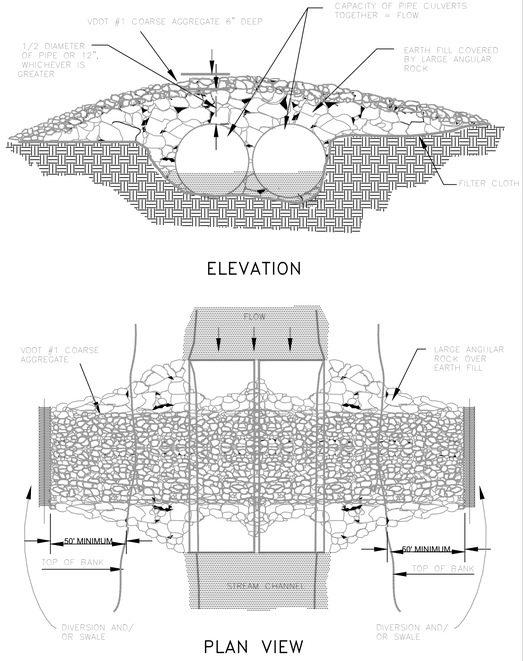
TEMPORARY BRIDGE CROSSING



1983 Maryland Standards and Specifications for Soil Erosion and Sediment Control

PLATE. 3.24-1

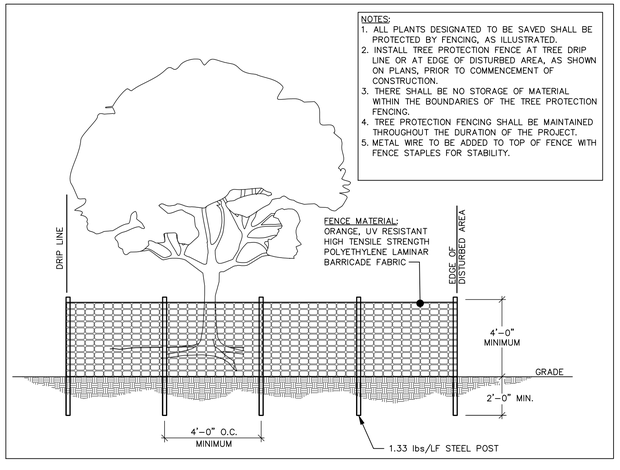
TEMPORARY CULVERT CROSSING



SOURCE: VA. DSWC

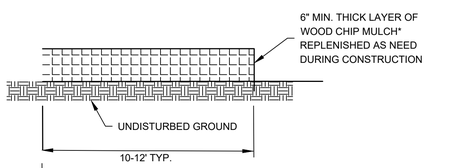
PLATE. 3.24-2

TEMPORARY VEHICULAR STREAM CROSSING - STD. & SPEC. 3.24 (TB)

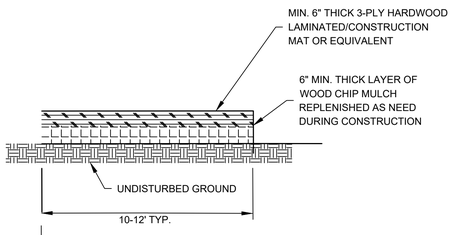


NOTES:
1. ALL PLANTS DESIGNATED TO BE SAVED SHALL BE PROTECTED BY FENCING, AS ILLUSTRATED.
2. INSTALL TREE PROTECTION FENCE AT TREE DRIP LINE OR AT EDGE OF DISTURBED AREA, AS SHOWN ON PLANS, PRIOR TO COMMENCEMENT OF CONSTRUCTION.
3. THERE SHALL BE NO STORAGE OF MATERIAL WITHIN THE BOUNDARIES OF THE TREE PROTECTION FENCING.
4. TREE PROTECTION FENCING SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT.
5. METAL WIRE TO BE ADDED TO TOP OF FENCE WITH FENCE STAPLES FOR STABILITY.

TREE PROTECTION FENCE -
STD. & SPEC. 3.38 (TP)



MULCH ACCESS ROAD DETAIL
NOT TO SCALE



NOTES:

1. ACCESS ROUTES TO BE VERIFIED BY ENGINEER AT PRE-CONSTRUCTION MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY DESIGN ENGINEER.

2. CONTRACTOR SHALL MAINTAIN MULCH MAT THROUGHOUT CONSTRUCTION PERIOD. MULCH CAN REMAIN IN PLACE AT A MAXIMUM DEPTH OF 1'.

3. THE HAUL ROAD IS DESIGNED TO PREVENT COMPACTION OF EXISTING SOILS USING LOW GROUND PRESSURE EQUIPMENT WHICH EXERTS NO MORE THAN 8 PSI. IF THE CONTRACTOR INTENDS TO USE ANY EQUIPMENT WITH HIGHER LOADS, ADDITIONAL PROTECTION MEASURES MUST BE PROVIDED SUCH AS HARDWOOD MATS (SEE DETAIL TO THE LEFT).

*CLEARED AUTUMN OLIVE BRUSH MATERIAL MAY BE USED AS A SUBSTITUTE FOR CHIPPED MULCH AS APPROVED BY ENGINEER

HARDWOOD MAT AND MULCH ACCESS ROAD DETAIL
NOT TO SCALE

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MOUNTAIN VIEW DRIVE STREAM RESTORATION
EROSION AND SEDIMENT CONTROL DETAILS
CITY OF HARRISONBURG, VIRGINIA

REVISION:

PROJECT MANAGER:	JRR
DESIGNED:	WKM/CKA
DRAWN:	JAT/CKA
PROJECT #:	18-0022
DATE:	09/01/21
SHEET:	19

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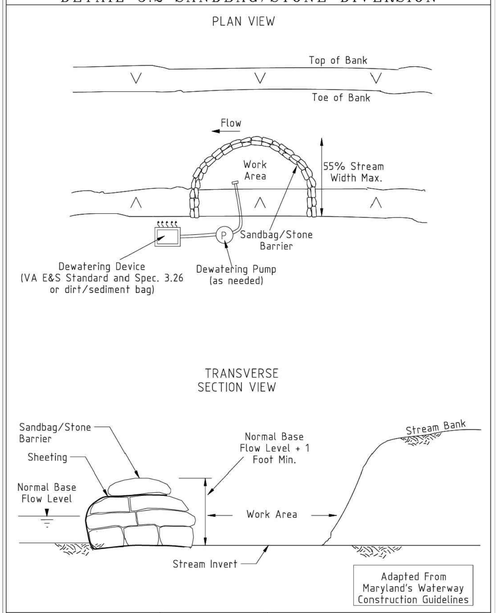
The Virginia Stream Restoration & Stabilization Best Management Practices Guide
DETAIL 5.2: SANDBAG/STONE DIVERSION

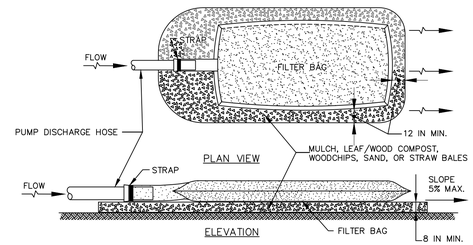


TEMPORARY INSTREAM CONSTRUCTION MEASURES	DECEMBER 2003	VIRGINIA DEPARTMENT OF CONSERVATION RECREATION

SANDBAG/STONE DIVERSION - STD. & SPEC. 5.1

DETAIL F-4 FILTER BAG

STANDARD SYMBOL ⊠FB



CONSTRUCTION SPECIFICATIONS

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

GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT^2	ASTM D-4491
PERMITTIVITY (SEC^{-1})	1.2 SEC^{-1}	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632

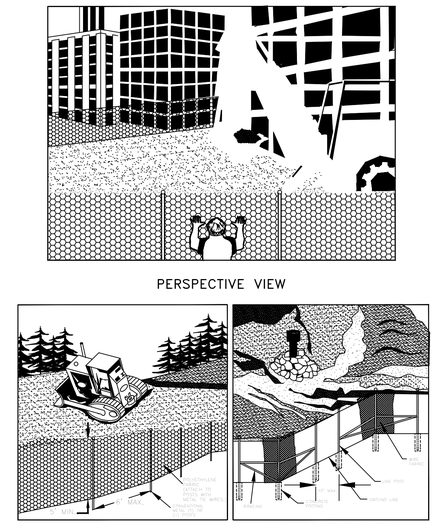
6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL		
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DEWATERING PRACTICE -STD. & SPEC. 3.26

NOTE
THE "VIRGINIA STREAM RESTORATION & STABILIZATION BEST MANAGEMENT PRACTICES GUIDE" STATES THAT A "DIRT/SEDIMENT BAG" CAN BE USED IN PLACE OF "VA E&S STANDARD AND SPEC 3.26" (DETAIL 5.2 SANDBAG/STON DIVERSION). THE MARYLAND "FILTER BAG" DETAIL IS TYPICAL TO USE FOR VIRGINIA PROJECTS.

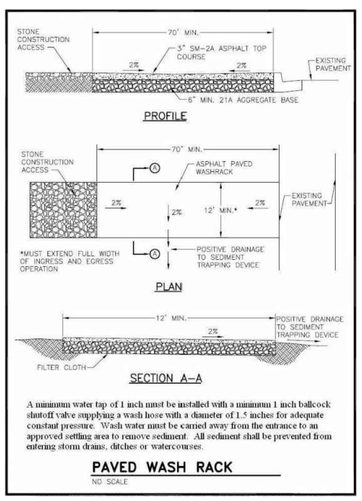
SAFETY FENCE



SOURCE: CONWED PLASTICS
VDOT ROAD AND BRIDGE STANDARDS

PLATE. 3.01

SAFETY FENCE -STD. & SPEC. 3.01

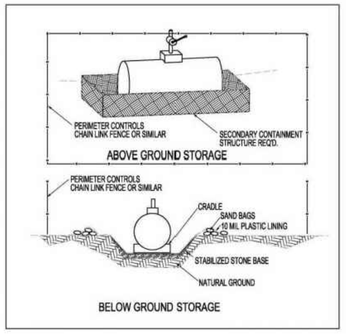


A minimum water tap of 1 inch must be installed with a minimum 1 inch ballcock shutoff valve supplying a wash hose with a diameter of 1.5 inches for adequate constant pressure. Wash water must be carried away from the entrance to an approved settling area to remove sediment. All sediment shall be prevented from entering storm drains, ditches or watercourses.

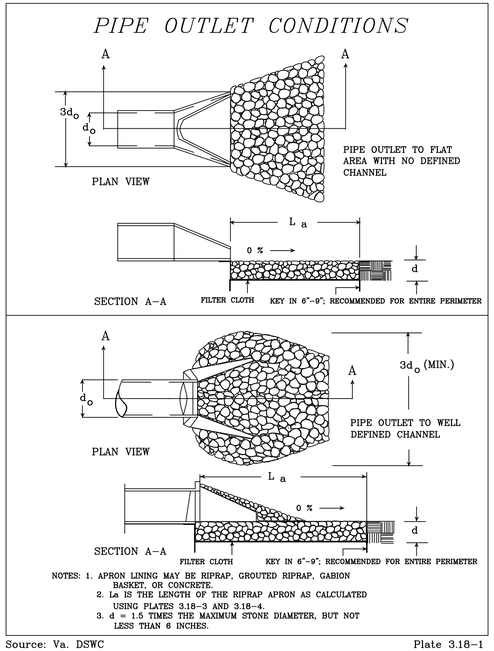
PAVED WASH RACK

NO SCALE

Figure 3-7: Typical Detail for Fuel Storage Area



PIPE OUTLET CONDITIONS

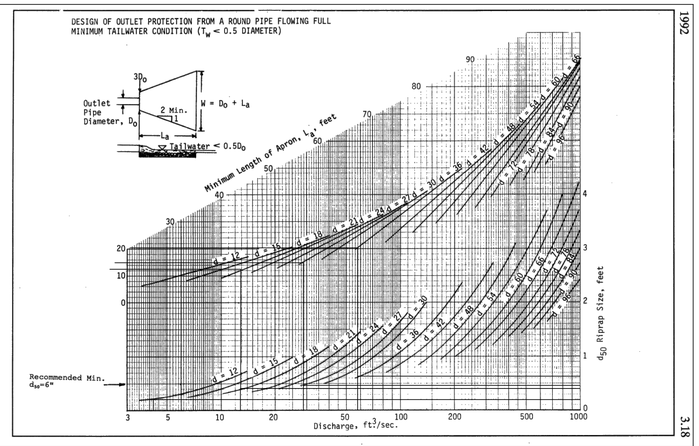


NOTES: 1. APRON LINING MAY BE RIPRAP, GROUTED RIPRAP, GABION BASKET, OR CONCRETE.
2. La IS THE LENGTH OF THE RIPRAP APRON AS CALCULATED USING PLATES 3.18-3 AND 3.18-4.
3. d = 1.5 TIMES THE MAXIMUM STONE DIAMETER, BUT NOT LESS THAN 6 INCHES.

Source: Va. DSWC Plate 3.18-1

OUTLET PROTECTION - STD. & SPEC. 3.18 (OP)

Source: USDA-SCS



1992 3.18

Plate 3.18-3

OUTLET PROTECTION SUMMARY				
OUTFALL ID	PIPE DIAMETER (IN)	DISCHARGE (CFS)	MINIMUM APRON LENGTH (FT)	MIN. D50 STONE SIZE (FT)
RAY OF HOPE	36	57.55	20.00	0.62
MTN VIEW DR. CUL-DE-SAC	18	28.72	18.00	0.46
MTN VIEW DR. PARKING LOT	18	12.41	12.50	0.40
MTN VIEW DR.	18	12.82	12.50	0.40
MEDICAL FACILITY	12	4.20	9.00	0.20

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COMMONWEALTH OF VIRGINIA
WILLIAM KIPLING MUMAW
Lic. No. 049293
PROFESSIONAL ENGINEER

MOUNTAIN VIEW DRIVE STREAM RESTORATION
EROSION AND SEDIMENT CONTROL DETAILS
CITY OF HARRISONBURG, VIRGINIA

REVISION:

PROJECT MANAGER:	JRR
DESIGNED:	WKM/CKA
DRAWN:	JAT/CKA
PROJECT #:	18-0022
DATE:	09/01/21
SHEET:	20

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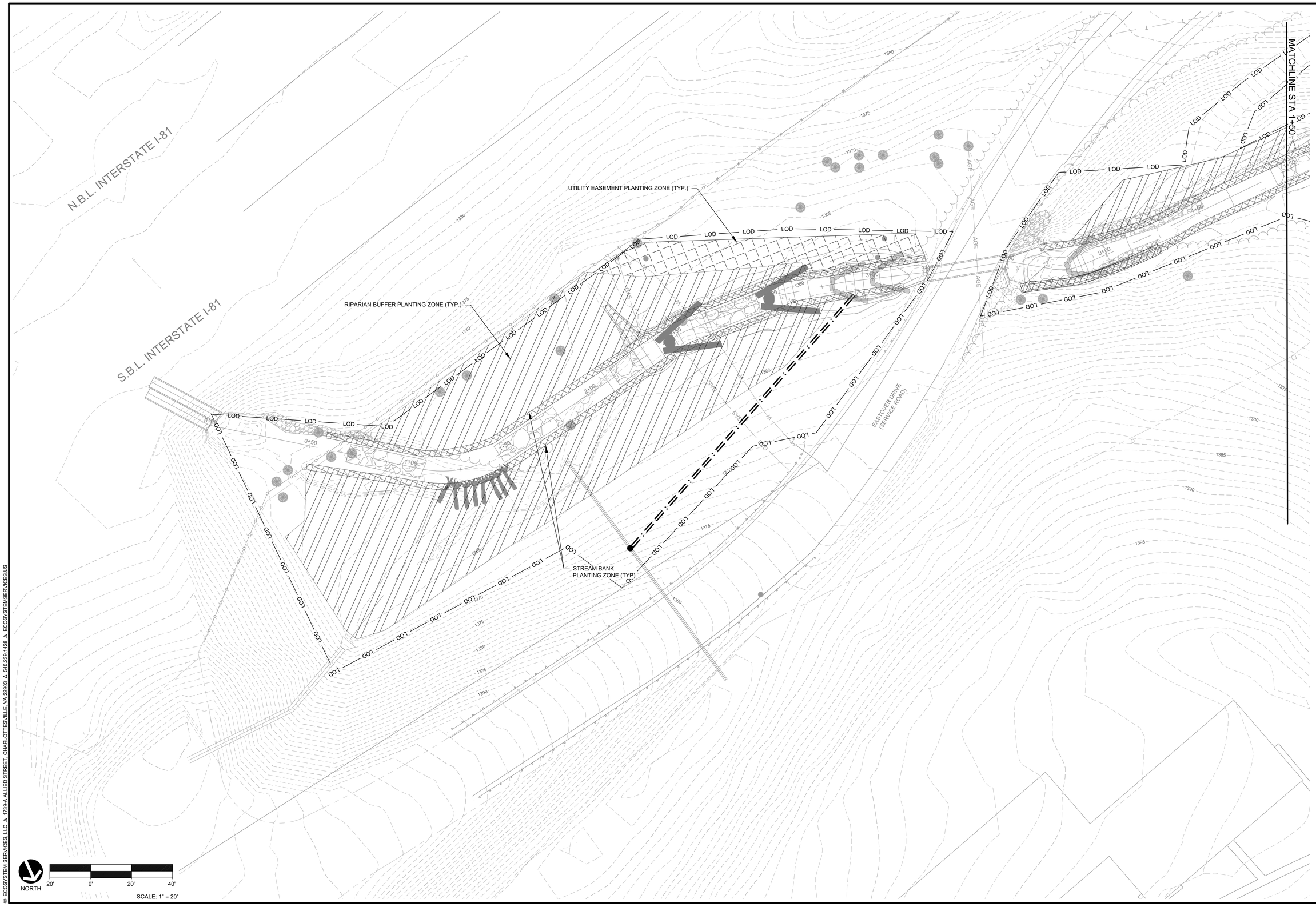

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PLANTING PLAN
CITY OF HARRISONBURG, VIRGINIA

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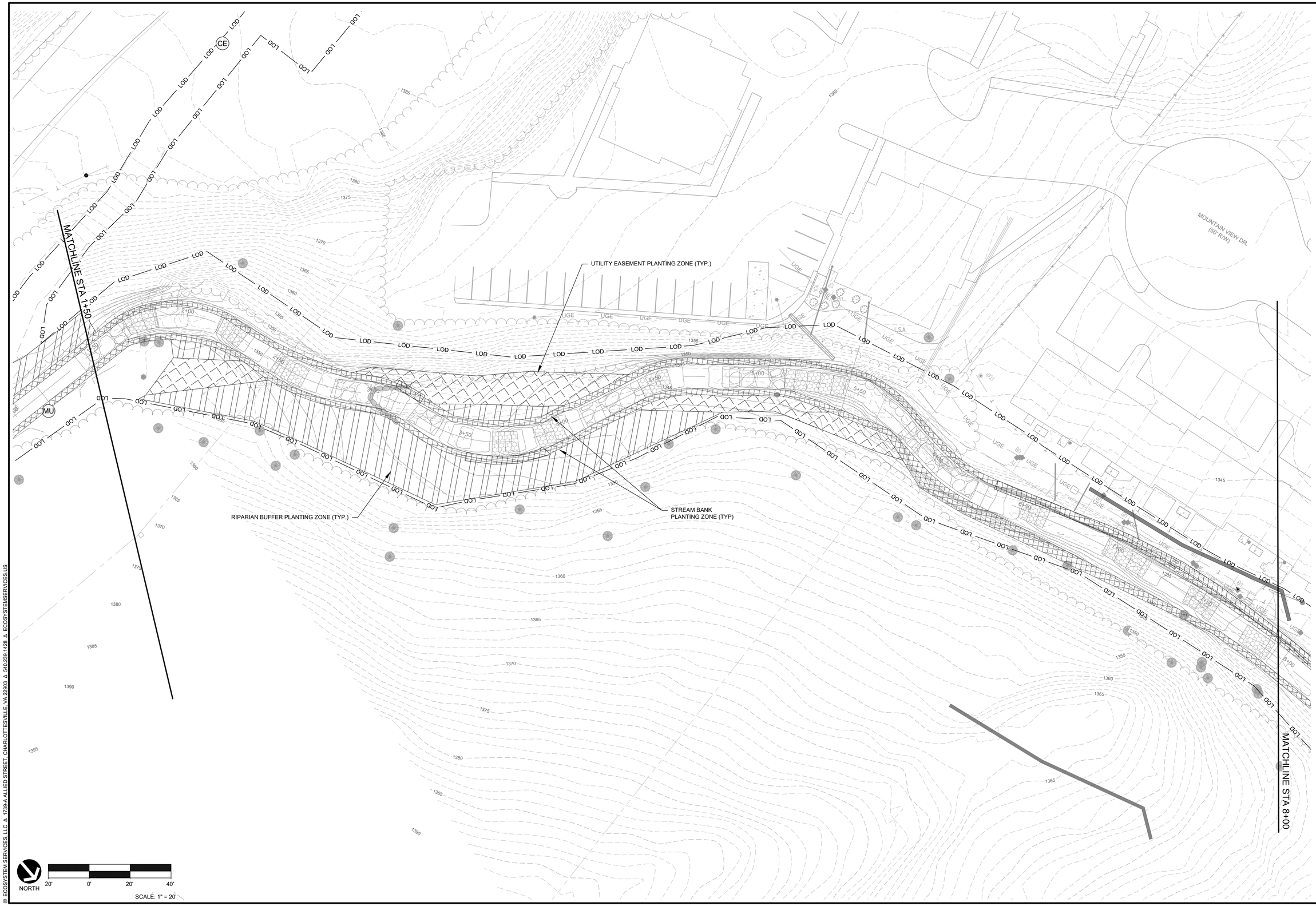

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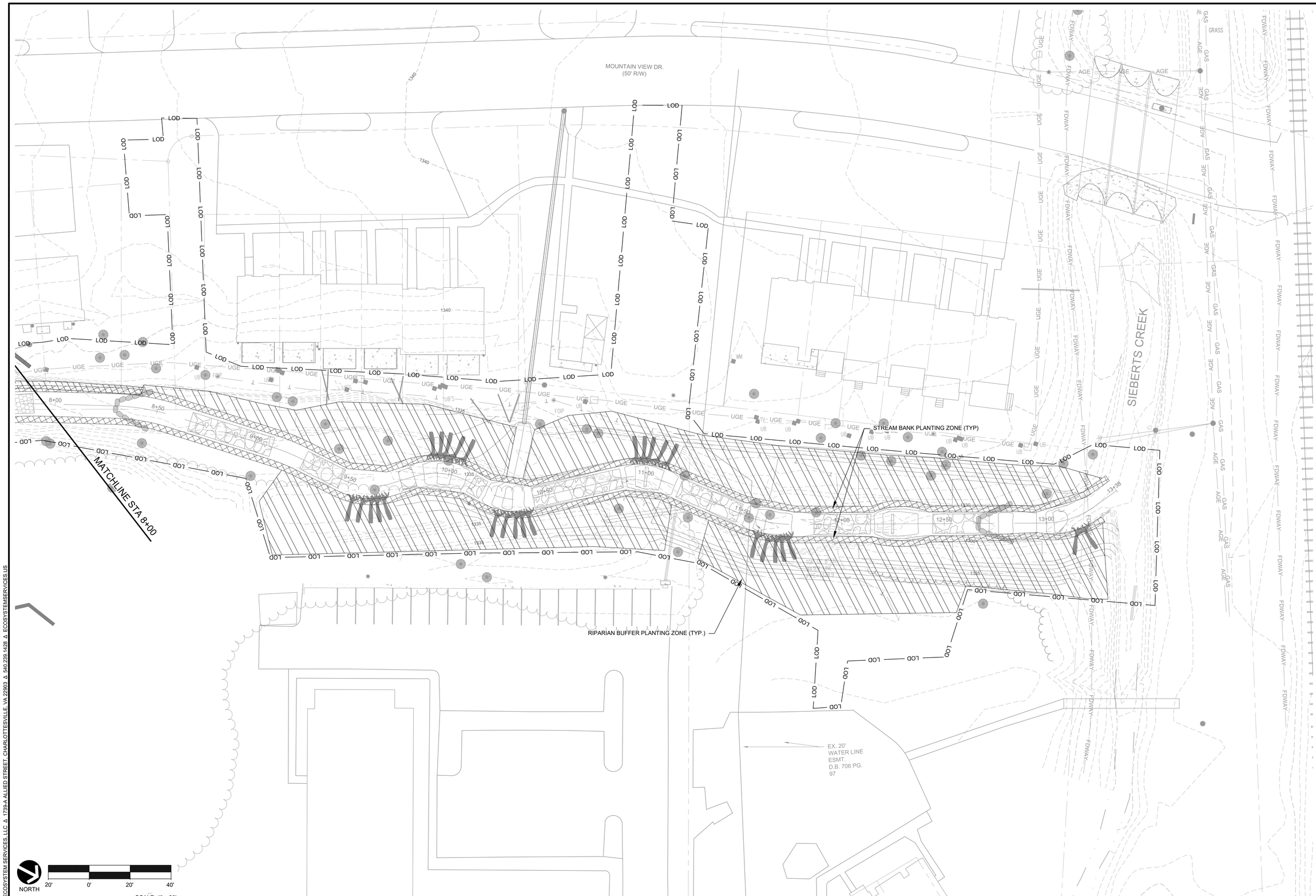

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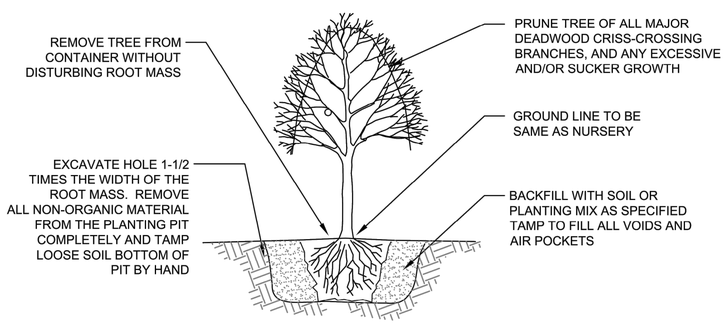
STREAMBANK PLANTING ZONE (0.24 AC):

	Species Name	Common Name	Spacing	Stock Type	% of Total	Calculated Quantity
LIVESTAKES	*Physocarpus opulifolius*	Ninebark	3' O.C.	Livestake	25%	367
	Cephalanthus occidentalis	Buttonbush	3' O.C.	Livestake	25%	367
	Cornus amomum	Silky Dogwood	3' O.C.	Livestake	25%	367
	Salix sericea	Silky Willow	3' O.C.	Livestake	25%	367
Total					**100%**	**1467**
STREAMBANK HERBACEOUS VEGETATION	*Carex crinita*	Fringed Sedge	3' O.C.	1 quart container	10%	147
	Schoenoplectus cyperinus	Woolgrass	3' O.C.	1 quart container	10%	147
	Juncus effusus	Soft Rush	3' O.C.	1 quart container	10%	147
	Panicum virgatum	Switchgrass	3' O.C.	1 quart container	25%	367
	Schoenoplectus pungens	Common Three Square	3' O.C.	1 quart container	10%	147
	Eutrochium fistulosum	Joe Pye Weed	3' O.C.	1 quart container	15%	220
	Elymus riparius	River Bank Wild Rye	3' O.C.	1 quart container	10%	147
	Uniola latifolia	River Oats	3' O.C.	1 quart container	10%	147
Total					**100%**	**1467**

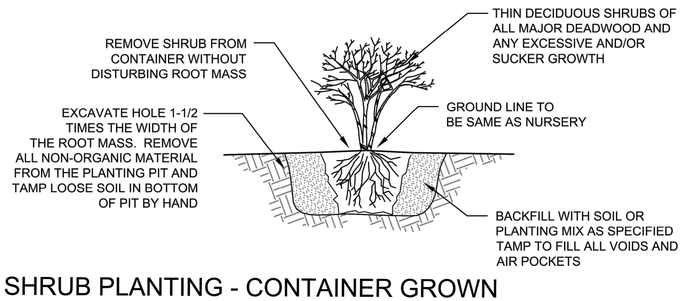
BUFFER PLANTING ZONE (1.03 AC):

	Species Name	Common Name	Spacing	Stock Type	% of Total	Calculated Quantity
OVERSTORY RIPARIAN BUFFER	*Plantanus occidentalis*	Sycamore	10' O.C.	3 gallon container	25%	97
	Diospyros virginiana	Eastern Persimmon	10' O.C.	3 gallon container	25%	97
	Nyssa sylvatica	Black Gum	10' O.C.	3 gallon container	25%	97
	Betula nigra	River Birch	10' O.C.	3 gallon container	25%	97
Total					**100%**	**387**
UNDERSTORY RIPARIAN BUFFER	*Acer rubrum*	Red Maple	6' O.C.	3 gallon container	10%	108
	Carpinus caroliniana	Ironwood	6' O.C.	3 gallon container	10%	108
	Cephalanthus occidentalis	Common Buttonbush	6' O.C.	3 gallon container	15%	161
	Lindera Benzoin	Spicebush	6' O.C.	3 gallon container	10%	108
	Cornus amomum	Silky Dogwood	6' O.C.	3 gallon container	10%	108
	Sambucus canadensis	Common Elderberry	6' O.C.	3 gallon container	15%	161
	Physocarpus opulifius	Common Ninebark	6' O.C.	3 gallon container	10%	108
	Aronia melanocarpa	Black Chokeberry	6' O.C.	3 gallon container	10%	108
	Calycanthus floridus	Sweetshrub	6' O.C.	3 gallon container	10%	108
Total					**100%**	**1075**
HERBACEOUS RIPARIAN BUFFER	*Panicum virgatum*	Switchgrass	3' O.C.	1 quart container	30%	1283
	Eutrochium fistulosum	Joe Pye Weed	3' O.C.	1 quart container	10%	428
	Elymus riparius	River Bank Wild Rye	3' O.C.	1 quart container	15%	642
	Uniola latifolia	River Oats	3' O.C.	1 quart container	15%	642
	Monarda didyma	Scarlet Beebalm	3' O.C.	1 quart container	10%	428
	Lupinus perennis	Wild Lupine	3' O.C.	1 quart container	5%	214
	Juncus effusus	Soft Rush	3' O.C.	1 quart container	10%	428
	Carex crinita	Fringed Sedge	3' O.C.	1 quart container	5%	214
Total					**100%**	**4277**



TREE PLANTING - CONTAINER GROWN

NOT TO SCALE



SHRUB PLANTING - CONTAINER GROWN

NOT TO SCALE

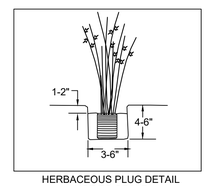
SANITARY SEWER LINE EASEMENT PLANTING ZONE (0.13 AC):

	Species Name	Common Name	Spacing	Stock Type	% of Total	Calculated Quantity
SHRUB RIPARIAN UTILITY ZONE	*Calycanthus floridus*	Sweetshrub	6' O.C.	3 gallon container	25%	40
	Sambucus canadensis	Common Elderberry	6' O.C.	3 gallon container	25%	40
	Cephalanthus occidentalis	Common Buttonbush	6' O.C.	3 gallon container	25%	40
	Lindera Benzoin	Spicebush	6' O.C.	3 gallon container	25%	40
Total					**100%**	**162**
HERBACEOUS RIPARIAN UTILITY ZONE	*Carex crinita*	Fringed Sedge	3' O.C.	1 quart container	10%	65
	Schoenoplectus cyperinus	Woolgrass	3' O.C.	1 quart container	5%	32
	Juncus effusus	Soft Rush	3' O.C.	1 quart container	10%	65
	Panicum virgatum	Switchgrass	3' O.C.	1 quart container	20%	130
	Schoenoplectus pungens	Common Three Square	3' O.C.	1 quart container	5%	32
	Eutrochium fistulosum	Joe Pye Weed	3' O.C.	1 quart container	5%	32
	Elymus riparius	River Bank Wild Rye	3' O.C.	1 quart container	5%	32
	Uniola latifolia	River Oats	3' O.C.	1 quart container	10%	65
	Monarda didyma	Scarlet Beebalm	3' O.C.	1 quart container	5%	32
	Lupinus perennis	Wild Lupine	3' O.C.	1 quart container	5%	32
	Rudbeckia hirta	Black-Eyed Susan	3' O.C.	1 quart container	5%	32
	Liatris spicata	Marsh Blazing Star	3' O.C.	1 quart container	5%	32
	Baptisia australis	Blue Wild Indigo	3' O.C.	1 quart container	5%	32
	Symphyotrichum novae-angliae	New England Aster	3' O.C.	1 quart container	5%	32
Total					**100%**	**648**

PERMANENT SEED MIX (1.38 AC @ 25 LBS/AC)

Species	Common Name	Indicator Status	Percent of Total
Virginia Wild Rye	*Elymus virginicus*	FACW	20
Switchgrass	*Panicum virgatum*	FAC	25
Little bluestem	*Schizachyrium scoparium*	FACU	15
Soft rush	*Juncus effusus*	FACW	10
Deer tongue	*Dichanthelium clandestinum*	FAC	10
Indiangrass	*Sorghastrum nutans*	FACU	10
Wingstem	*Verbesina alternifolia*	FAC	5
White Oldfield Aster	*Symphyotrichum pilosum*	FAC	5

ELECTRICITY(HEC) NOTE:
NO PLANTINGS SHALL BE WITHIN 5' OF ELECTRIC LINES AND THAT 3' OF CLEARANCE AROUND THE BACK AND SIDES AND 10' OF CLEARANCE IN FRONT OF ELECTRICAL EQUIPMENT NEEDS TO BE MAINTAINED.



HERBACEOUS PLUG DETAIL
NOT TO SCALE

LANDSCAPE SPECIFICATIONS

1. PLANT MATERIAL NAMES ARE IN COMPLIANCE WITH HORTUS THIRD. SIZES AND GRADING ARE TO COMPLY WITH THE LATEST EDITION OF AMERICAN STANDARDS FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.

2. ALL WORK SHALL BE COORDINATED WITH TRADES.

3. USE EXISTING TOPSOIL AND/OR PROVIDE NEW TOPSOIL, WHICH IS FERTILE, PRIABLE, NATURAL LOAM, SURFACE SOIL, REASONABLY FREE OF SUBSOIL, FOREIGN MATTER, ROOTS, STUMPS AND STONES LARGER THAN 2" IN DIMENSION.

4. CONTRACTOR SHALL ASCERTAIN LOCATION OF ALL UTILITIES PRIOR TO EXCAVATION.

5. CONTRACTOR SHALL MAINTAIN PLANT MATERIAL DURING INSTALLATION. MAINTENANCE SHALL BECOME RESPONSIBILITY OF OWNER UPON ACCEPTANCE OF WORK.

6. WHEN THE LANDSCAPE WORK IS COMPLETED, THE OWNERS REPRESENTATIVE WILL, UPON WRITTEN REQUEST, MAKE AN INSPECTION TO DETERMINE ACCEPTABILITY. IF WORK IS NOT ACCEPTABLE, REPLACE REJECTED WORK AND CONTINUE MAINTENANCE UNTIL REINSPECTION AND APPROVAL.

7. GUARANTEE ALL MATERIALS AND LABOR FOR 12 CALENDAR MONTHS AFTER ACCEPTANCE.

A. MAKE REPLACEMENTS OF ALL DEAD PLANTS IN IMPAIRED CONDITIONS IN EARLY FALL FOLLOWING PLANTING.
B. AND ADDITIONALLY IN THE EARLY SPRING FOR THE SAME OR OTHER MATERIALS WHICH ARE DEAD OR IMPAIRED FROM THE WINTER CONDITIONS.

8. WITHIN 10 DAYS AFTER ACCEPTANCE, THE CONTRACTOR SHALL DELIVER AN OUTLINE OF MAINTENANCE PROCEDURES RECOMMENDED FOR THIS PLANTING TO THE OWNER.

9. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY DURING THE GUARANTEE PERIOD TO PROVIDE WRITTEN NOTICE TO THE OWNER OF ANY MAINTENANCE PRACTICE WHICH IN THEIR OPINION WILL AFFECT THE GUARANTEE IF NOT REMEDIED PROMPTLY.

10. DO NOT MAKE SUBSTITUTIONS. BID MATERIALS SHOWN ON PLANS. CONTRACTOR IS ENCOURAGED TO PROVIDE WRITTEN ALTERNATE LIST OF MATERIALS, SIZES AND NUMBERS. SUBSTITUTION FOR COST EFFECTIVE MAINTENANCE OF DESIGN INTEGRITY.

11. THE PROJECT ENGINEER RESERVES THE RIGHT TO ACCEPT OR REJECT ANY MATERIAL THAT HE/SHE DEEMS UNACCEPTABLE. REJECTED MATERIAL SHALL BE REMOVED PROMPTLY FROM THE SITE.

12. ALL PLANT MATERIAL SHALL BE NURSERY GROWN UNLESS OTHERWISE SPECIFIED. PRUNING SHALL BE DONE BEFORE PLANTING OR DURING THE PLANTING OPERATION.

13. ALL PLANT MATERIAL SHALL BE COVERED AND PROTECTED FROM EXCESSIVE DRYING DURING TRANSIT.

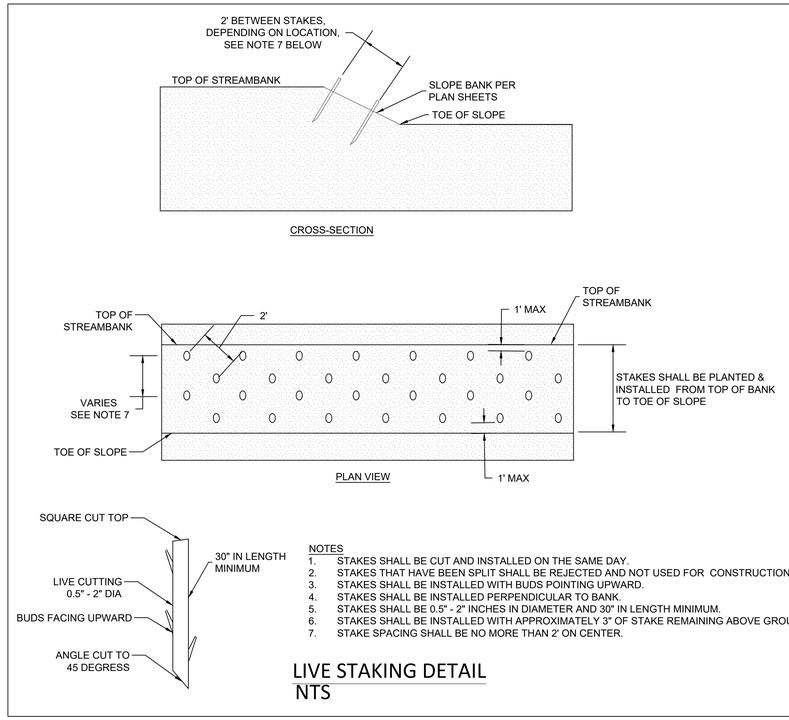
14. ANTI-DESICCANTS SHALL BE APPLIED ON ALL MATERIAL DUG WHILE IN FOLIAGE.

15. MULCH MATERIAL SHALL BE EITHER SHREDDED HARDWOOD MULCH OR APPROVED EQUAL. MATERIAL SHALL BE MULCHING GRADE, UNIFORM IN SIZE, AND FREE OF FOREIGN MATTER.

16. TOPSOIL MIXTURE SHALL BE 2 PARTS EXISTING SOIL MIXED EVENLY WITH 1 PART SPHAGNUM PEAT MOSS OR PEAT HUMUS. EXISTING SOIL SHALL BE FREE OF STONES, LUMPS, PLANTS, ROOTS, AND OTHER DEBRIS OVER 1 1/2 INCHES. IT SHALL NOT CONTAIN TOXIC SUBSTANCES HARMFUL TO PLANT GROWTH. TOPSOIL SHALL HAVE A pH RANGE OF 5.0 TO 7.0.

17. PLANTING PROCEDURES FOR TREES AND SHRUBS

A. PLANTING SHALL OCCUR IN ACCORDANCE WITH ALL DETAILS.
B. TREES AND SHRUBS SHALL BE PLACED IN THE PLANTING PIT BY LIFTING FROM THE BALL (NEVER FROM THE BRANCHES OF TRUNK). ALL PLANT MATERIAL SHALL BE PLACED IN A STRAIGHT POSITION WITHIN THE PLANTING PIT WITH THE MOST DESIRABLE SIDE PLACED TOWARDS THE PROMINENT VIEW (SIDEWALK, STREET, ETC.)
C. THE TREE PIT SHALL BE BACK FILLED WITH A SOIL MIXTURE AS PER SPECIFICATIONS. THE PIT SHALL BE FILLED HALFWAY INITIALLY AND TAMPED FIRMLY. ALL ROPES, WIRES, ETC. ON THE ROOTBALL SHALL BE CUT AND THE BURLAP OR BALL WRAP PULLED BACK TO THE EDGE OF THE ROOTBALL. COMPLETE BACKFILLING PLANT PIT AND TAMP FIRMLY. BACKFILL SOIL SHALL NOT COVER TOP OF ROOTBALL. MULCH ROOTBALL AND SAUCER WITH MINIMUM 3 INCHES SHREDDED OR CHIPPED HARDWOOD OR PINE MULCH. WATER THOROUGHLY OR UNTIL PLANT PIT IS FILLED.



NOTES
1. STAKES SHALL BE CUT AND INSTALLED ON THE SAME DAY.
2. STAKES THAT HAVE BEEN SPLIT SHALL BE REJECTED AND NOT USED FOR CONSTRUCTION.
3. STAKES SHALL BE INSTALLED WITH BUDS POINTING UPWARD.
4. STAKES SHALL BE INSTALLED PERPENDICULAR TO BANK.
5. STAKES SHALL BE 0.5" - 2" INCHES IN DIAMETER AND 30" IN LENGTH MINIMUM.
6. STAKES SHALL BE INSTALLED WITH APPROXIMATELY 3" OF STAKE REMAINING ABOVE GROUND.
7. STAKE SPACING SHALL BE NO MORE THAN 2' ON CENTER.

LIVE STAKING DETAIL
NTS

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PLANTING SCHEDULE & DETAILS
CITY OF HARRISONBURG, VIRGINIA

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