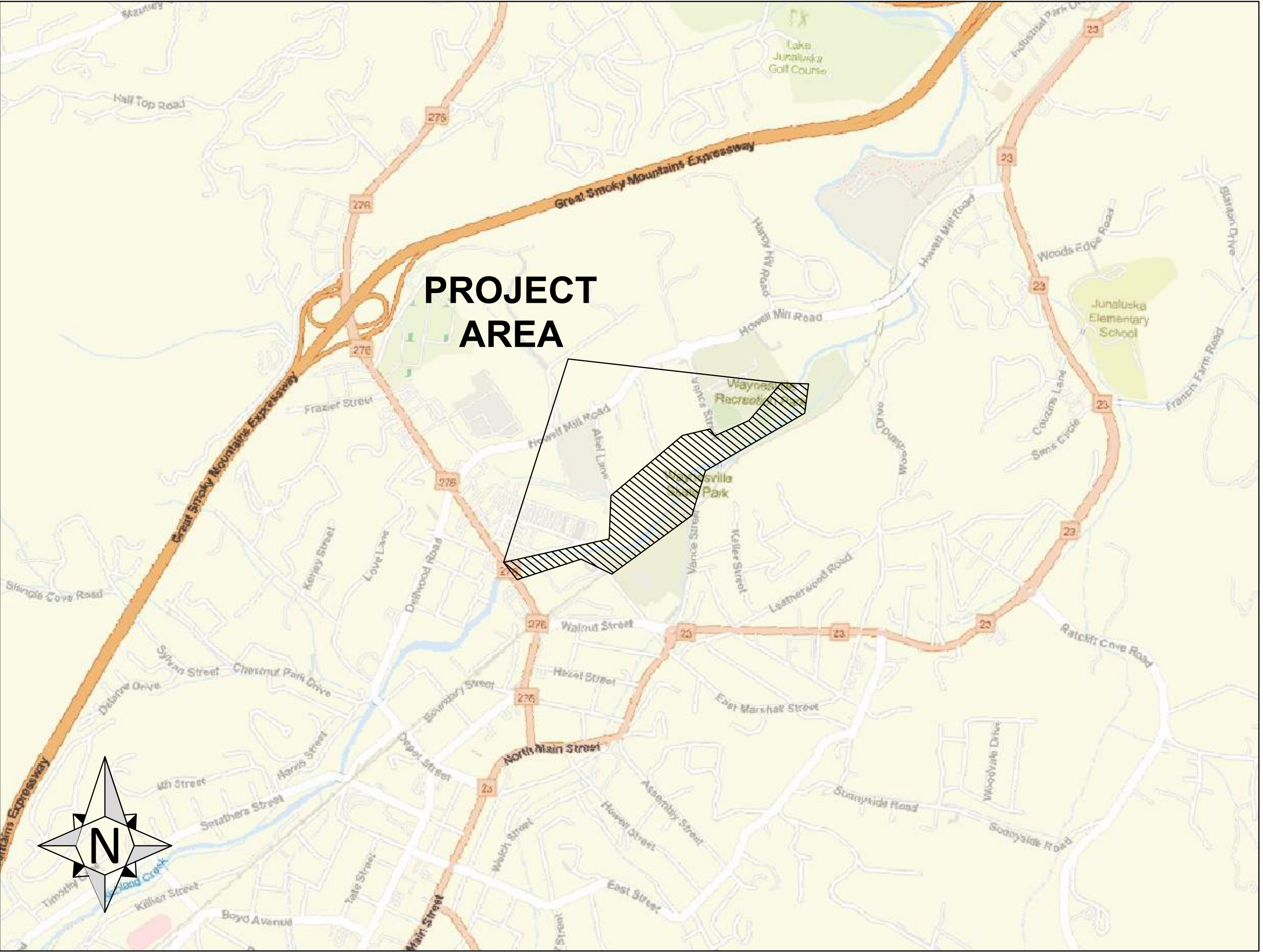


RICHLAND CREEK AND VANCE GREENWAY RESTORATION

HAYWOOD COUNTY, WAYNESVILLE, NC 28786
SEPTEMBER 2026



**PROJECT
AREA**

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**50% DESIGN
NOT FOR CONSTRUCTION**

SITE LOCATION MAP

SCALE: 1" = 1000'
LAT: 35°30'5.02"N LONG: 82°58'50.22"W

PREPARED FOR:
TOWN OF WAYNESVILLE
9 S. MAIN ST.
PO BOX 100
WAYNESVILLE, NC 28786

PREPARED BY:
ES Engineering
NC Affiliate Office: 145 7th Ave West, Suite B
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SEPTEMBER 2026
DATE

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GENERAL NOTES

1. STREAM & GREENWAY RESTORATION PROJECT DESCRIPTION

THE PROJECT IS LOCATED AT (LAT: 35°30'5.02"N LONG: 82°58'50.22"W) THE VANCE ST GREENWAY ALONG RICHLAND CREEK IN THE CITY OF WAYNESVILLE, HAYWOOD COUNTY, NORTH CAROLINA.

THE OBJECTIVE OF THE RICHLAND CREEK AND VANCE GREENWAY RESTORATION PROJECT IS TO RESTORE ERODED STREAMBANK, IMPROVE FLOODPLAIN CONNECTIVITY, CREATE AQUATIC HABITAT, AND INTERCEPT URBAN RUNOFF. THE PROJECT WILL RE-ESTABLISH A STABLE GEOMETRY, RESTORING AN APPROPRIATE RIFFLE-POOL COMPLEX, PROTECTING VULNERABLE STREAMBANKS, AND EMBEDDING STRUCTURAL KEYS AND GRAD CONTROLS TO GUARD AGAINST FUTURE CHANNEL MIGRATION. URBAN RUNOFF FROM KEY SURROUNDING IMPERVIOUS AREAS WILL BE INTERCEPTED PRIOR TO DIRECT RUNOFF ENTERING THE STREAM. THE ENTIRE PROJECT AREA WILL BE RE-VEGETATED USING A VARIETY OF NATIVE SEED, LIVE STAKES, AND BARE ROOTS.

2. STREAM CONSTRUCTION GENERAL SEQUENCE

STREAM CONSTRUCTION WILL FOLLOW THE GENERAL SEQUENCE OF:

- UTILITY COORDINATION (NC 811 NOTIFICATION)
- MOBILIZE TO RICHLAND CREEK, ENSURE ALL EQUIPMENT BROUGHT TO THE SITE IS CLEAN. DIRTY EQUIPMENT SHALL NOT BE PERMITTED;
- INSTALL EROSION AND SEDIMENT CONTROLS;
- CONSTRUCT TEMPORARY ACCESS ROADS AND STAGING AREAS;
- TREE AND VEGETATION CLEARING AND GRUBBING; VEGETATION WILL BE CLEARED DURING APPROPRIATE TIMEFRAME FROM OCTOBER 1ST TO MARCH 31ST;
- SITE LAYOUT AND ESTABLISH WORKING LIMITS;
- INITIATE WATER CONTROL/DIVERSION PROCEDURES;
 - EXCAVATE DIVERSION TRENCH TO DIVERT BASE FLOW UPSTREAM;
- ESTABLISH STREAM CROSSING(S);
- STRIP AND STOCKPILE TOPSOIL AS NECESSARY IN GRADING AREAS;
- BEGIN UPSTREAM AND WORK IN A DOWNSTREAM DIRECTION;
- BEGIN EXCAVATION TO ESTABLISH SUBGRADE;
- IMPORT AND INSTALL BANK STABILIZATION FEATURES'
- CONSTRUCT IN-STREAM HABITAT FEATURES;
- CONSTRUCT GRADE CONTROL AND ROCK VANES WITH ROCK KEY;
- PERFORM FINISH GRADING;
- INSTALL STOCKPILED OR IMPORTED TOPSOIL TO FINISH GRADE;
- SEED, STABILIZE, AND INSTALL EROSION CONTROL FABRIC;
- INSTALL NATIVE TREES, SHRUBS, AND LIVE STAKES. REMOBILIZATION MAY BE NECESSARY DEPENDING ON TIMING OF PLANTINGS;
- DEMOBILIZE.

3. PERMITS

WORK WITHIN PROJECT SITE/LIMITS IS SUBJECT TO U.S. ARMY CORPS OF ENGINEERS (USACE) REGULATORY JURISDICTION (I.E., JURISDICTIONAL WATERS OF THE U.S.). ANY IMPACTS AND PLACEMENT OF FILL TO JURISDICTIONAL WATERS OUTSIDE OF THE PROJECT LIMITS IS PROHIBITED. THE FOLLOWING PERMITS APPLY TO THIS PROJECT:

- NATIONWIDE PERMIT (NWP) 27 AND 13 FROM THE U.S. ARMY CORPS OF ENGINEERS (USACE).
 - THIS PROJECT WILL LIKELY BE SUBJECT TO AN IN-WATER WAIVER FOR SEASONAL SALMONID FROM SEPTEMBER 15TH TO JUNE 30TH.
- NORTH CAROLINA EPA - NOTICE OF INTENT (NOI) FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER AN NPDES GENERAL PERMIT (NCG01).
- FLOODPLAIN DEVELOPMENT PERMIT

A. QUALITY ASSURANCE, QUALITY CONTROL, AND OWNER OVERSIGHT

FIELD OBSERVATION/CONSTRUCTION OVERSIGHT WILL BE CONDUCTED BY *ES ENGINEERING*. A CONSTRUCTION REPRESENTATIVE OF *ES ENGINEERING* SHALL BE CONSULTED WITH PRIOR TO THE CONSTRUCTION AND PLACEMENT OF RESTORATION FEATURES. *THE CONTRACTOR* SHALL COORDINATE WITH THE CONSTRUCTION REPRESENTATIVE FOR EVALUATION OF CHANNEL, GRADING, ANY TEMPORARY STREAM CROSSINGS, SUBGRADES, SUBSTRATES INCLUDING BANK RUN, GRAVELS, COBBLES AND BOULDERS, AND ANY BOULDER HABITAT STRUCTURES AND PLANTINGS.

THE CONSTRUCTION REPRESENTATIVE SHALL DETERMINE THE ACCEPTABILITY OF ALL STREAM CONSTRUCTION AND ITS PROCEDURES. THERE WILL BE CONSTANT REVIEW OF ALL MATERIALS, CONSTRUCTION PRACTICES, AND THE QUALITY AND QUANTITY OF ALL PHASES OF THE RIVER RESTORATION PORTION OF THE PROJECT. THE CONSTRUCTION REPRESENTATIVE SHALL HAVE AUTHORITY TO REQUEST STREAM FEATURE ADJUSTMENTS AS MAY BE NECESSARY TO BEST MEET THE RESTORATION OBJECTIVES. EVALUATION OF CONSTRUCTED GRADES WILL DETERMINE APPROVAL. ALL RESTORATION ELEMENTS SHALL NOT BE CONSIDERED COMPLETE UNTIL APPROVED BY THE CONSTRUCTION REPRESENTATIVE.

THE CONTRACTOR SHALL PRESERVE ALL CORNERSTONES, IRON PINS, AND CONCRETE MONUMENTS, OR ANY TYPE OF LAND MONUMENT. THE CONTRACTOR SHALL HAVE ALL MONUMENTS IN THE PROXIMITY OF THE WORK REFERENCED.

B. CLEARING AND GRUBBING

NO TREE REMOVAL WILL BE PERMITTED OUTSIDE THE LIMITS OF WORK INDICATED ON THE PLANS UNLESS AUTHORIZED. TREE REMOVAL IS SUBJECT TO THREATENED AND ENDANGERED (T&E) BAT REQUIREMENTS. CLEARING MUST OCCUR FROM OCTOBER 1ST TO MARCH 31ST, OR AS SPECIFIED BY THE US FISH & WILDLIFE SERVICE (USFWS).

TREE CLEARING MUST BE REVIEWED BY *ES ENGINEERING* AND THE CITY OF WAYNESVILLE PRIOR TO CUTTING. ONLY TREES MARKED AS TO BE REMOVED SHOULD BE CUT UNLESS INSTRUCTED OTHERWISE BY *ES ENGINEERING*.

C. WATER MANAGEMENT

THE CONTINUATION OF STREAM FLOW FROM UPSTREAM TO DOWNSTREAM BEYOND THE END OF THE PROJECT MUST BE MAINTAINED AT ALL TIMES. TEMPORARY DAMMING TO COMPLETELY STOP FLOW IS PROHIBITED. TEMPORARY DAMMING TO FACILITATE BYPASS PUMPING IS PERMITTED. BYPASS PUMPING IS PERMITTED AS LONG AS PROPER EROSION AND SEDIMENT CONTROL BMP'S ARE FOLLOWED.

D. TOPSOIL AND SEED PREPARATION

TOPSOIL SHALL BE STRIPPED AND STOCKPILED ON-SITE. TOPSOIL SHALL BE RE-SPREAD TO ACHIEVE FINISH GRADE WITH 2.5 - 5-INCHES. PRIOR TO TOPSOIL INSTALLATION SUBGRADE SHALL BE DECOMPACTED TO A MINIMUM DEPTH OF 6-12 INCHES USING RIPPER ATTACHMENT. PRIOR TO SEEDING ALL AREAS MUST BE INSPECTED AND APPROVED BY *ES ENGINEERING*. AFTER TOPSOIL INSTALLATION AREAS SHALL BE PREPPED FOR SEED INSTALLATION USING A SKID STEER TILLER ATTACHMENT. NATIVE AND TEMPORARY SEED MIXES SHALL THEN BE INSTALLED.

FOLLOWING SEED APPLICATION TOPSOILS AND ALL SLOPES GREATER THAN 2:1 (AT A MINIMUM) SHALL BE PROTECTED WITH SUITABLE STRAW MULCH OR EROSION FABRIC DEEMED SUITABLE TO WITHSTAND THE LEVEL OF RISK ASSOCIATED WITH POTENTIAL FLOODING, WIND OR OTHER RISK WITH THE POTENTIAL TO THREATEN TOPSOIL OR SEED VIABILITY.

TOPSOILS SHALL NOT BE OVERCOMPACTED. OVER COMPACTED TOPSOIL OR AREAS DEEMED UNSUITABLE UPON INSPECTION SHALL BE MODIFIED TO SUITABLE GROWING CONDITIONS. TOPSOIL AND SUBGRADE MATERIAL SHOULD BE ABLE TO BE PENETRATED TO FULL SHOVEL DEPTH WITH LIGHT FORCE FROM A NORMAL SPADE SHOVEL.

E. TEMPORARY STREAM CROSSING

TEMPORARY STREAM CROSSING IF NECESSARY AT A LOCATION WHERE CONSTRUCTION EQUIPMENT WILL CROSS THE STREAM THE CONTRACTOR SHALL CONSTRUCT A STABLE CROSSING FROM ONE OF THE FOLLOWING OPTIONS.

TIMBERMAT CROSSING: USING VARIOUS COMBINATIONS AND CONFIGURATIONS OF TIMBERMATS PLACED PARALLEL AND ACROSS CHANNELS CAN BE USED AS A CROSSING(S). A SUITABLE ROCK MATTRESS CAN BE USED AS A FOUNDATION.

HDPE PIPE / ROCK CROSSING: A ROCK MATTRESS ROCK CHANNEL PROTECTION TO PROTECT THE STREAM BED AND BANKS. MATERIAL SHALL CONSIST OF NATURAL RIVER ROCK FROM SAME APPROVED AGGREGATE SOURCE FOR PROJECT. INSTALL TEMPORARY CULVERT PIPING IN ACCORDANCE WITH THE STANDARD TEMPORARY STREAM CROSSING DETAIL. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REMOVE PIPING AND REUSE AS APPROVED BY THE CONSTRUCTION REPRESENTATIVE OR REMOVE MATERIAL FROM THE PROJECT SITE.

AT GRADE STREAM CROSSING: FORD USING THE EXISTING SAND AND GRAVEL STREAM BOTTOM.

F. RIVERBED AND STREAMBANK SUBGRADE

THIS WORK SHALL INCLUDE ALL LABOR, MATERIAL, AND EQUIPMENT NECESSARY TO PRODUCE CHANNEL DIMENSIONS AND PROFILE GRADES AS DETAILED IN THE STREAM REALIGNMENT PLANS. STREAM CHANNEL AND FLOODPLAIN GRADING SHALL BE PERFORMED TO ESTABLISH STABLE EARTHEN BANK ALONG THE NEW BANKFULL ALIGNMENT BY EITHER EXCAVATION OR FILL. IF EARTHEN FILL IS NECESSARY, FILL SHALL BE PLACED IN MINIMUM 9" LOOSE LAYER LIFTS AND COMPACTED MECHANICALLY (E.G., WITH MACHINE BUCKET) FOR STREAMBANK AND/OR FLOODPLAIN CREATION. EARTHEN FILL SHALL BE COMPACTED SO THAT IT IS FIRM AND STABLE AND THERE IS NO PRESENCE OF SOIL PUMPING OR SINKING. REFER TO LIMITS OF PROPOSED STREAMBANK CONSTRUCTION SHOWN ON PLAN, PROFILE AND CROSS-SECTIONS. OVERCOMPACTION IS NOT DESIRABLE BECAUSE IT WILL LIMIT PLANT GROWTH AND ROOT DEVELOPMENT. IF SUBGRADE IN STREAMBANK AND FLOODPLAIN AREAS ARE DEEMED TO BE OVERCOMPACTED BY CONSTRUCTION REPRESENTATIVE, THEN AREA SHALL DECOMPACTED TO A MINIMUM DEPTH OF 1 FT USING A RIPPER ATTACHMENT PRIOR TO APPLICATION OF TOPSOIL TO ACHIEVE FINISH GRADE. THIS INCLUDES ALL ACCESS ROADS THAT ARE WITHIN THE RESTORATION AREA.

G. RIVERINE SUBGRADE SHALL BE EXCAVATED OR INSTALLED PER THE LINES & GRADES ON THE PLAN AND PROFILE DRAWINGS INCLUDED HEREIN. IF EXCAVATION IS PERFORMED INTO NATURAL UNDISTURBED GROUND TO ACHIEVE THE SUBGRADE THEN COMPACTION IS NOT NECESSARY. IF FILL IS NECESSARY TO ACHIEVE SUBGRADE, THEN FILL SHALL BE COMPACTED MECHANICALLY. THE SUBGRADE SHALL BE COMPACTED SO THAT IT IS FIRM AND STABLE AND THAT THERE IS NO VISUAL PRESENCE OF SOIL PUMPING OR SINKING.

COMPACTION OF THE SUBGRADE IS NECESSARY TO CREATE THE FOUNDATION TO ACHIEVE THE FINISH GRADE OF THE STREAMBED PROFILE. A FAILURE TO PROPERLY CREATE THIS FOUNDATION WILL RESULT IN PROFILE SETTLING AND ADVERSE CHANGES IN STREAM SLOPE AND MORPHOLOGY RELATIONSHIPS.

H. SURVEY/DATUM

I. THE ELEVATION DATUM IS NAVD88, AND THE HORIZONTAL DATUM IS NAD83, NC STATE PLANE, US FOOT. DRAWINGS ARE BASED ON FIELD DATA COLLECTED BY *ES ENGINEERING* (145 7TH AVE WEST, SUITE B, HENDERSONVILLE, NC 28792); IN FEBRUARY AND JULY 2026. PARCEL BOUNDARIES AND STREETS WERE OBTAINED FROM HAYWOOD COUNTY COUNTY GIS TO SUPPLEMENT THE FIELD DATA.

J. EXISTING UTILITIES

THE LOCATION OF ALL EXISTING UNDERGROUND UTILITY FACILITIES ARE SHOWN ON THE PLANS FROM DATA AVAILABLE AT THE TIME OF FIELD SURVEY IN ACCORDANCE WITH THE NC UNDERGROUND UTILITY SAFETY AND DAMAGE PREVENTION ACT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFICATION OF THE EXISTING UTILITY OWNERS AND UTILITY PROTECTION SERVICE LISTED BELOW IN ACCORDANCE WITH SECTION 87.122 OF THE NC STATUTE. THE CONTRACTOR SHALL THOROUGHLY REVIEW THE SITE AND BECOME FAMILIAR WITH ALL UTILITIES (WATER, SANITARY, ELECTRIC, GAS, TELEPHONE, FIBER OPTIC, etc.) WITHIN THE LIMITS OF THE PROJECT, WHICH MAY INTERFERE WITH THE PROPOSED CONSTRUCTION. THE DETAILS AND DIMENSIONS SHOWN ON PLANS PERTAINING TO THE EXISTING FACILITIES HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING FACILITIES AND DO NOT NECESSARILY REPRESENT AS-BUILT CONDITIONS. ALL PROJECT WORK HAS BEEN BASED UPON THE DETAILS AND DIMENSIONS PRESENTED ON THESE PLANS AND SPECIFICATIONS. UNEXPECTED UTILITY WORK SHALL BE CONTEMPLATED FOR COMPLETION AND PAID AS A PART OF THE PROJECT GENERAL ALLOWANCE.

BEFORE ANY WORK IS STARTED THAT WILL INTERFERE WITH THE EXISTING UTILITIES, THE CONTRACTOR SHALL CALL THE NORTH CAROLINA UTILITIES PROTECTION SERVICE, AT 1-800-632-4949, SEVENTY-TWO (72) HOURS IN ADVANCE OF THE WORK. NON-MEMBER UTILITIES MUST BE CONTACTED DIRECTLY. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS, AT NO ADDITIONAL EXPENSE TO THE PROJECT, TO AVOID DAMAGE TO EXISTING UNDERGROUND AND OVERHEAD UTILITY LINES DURING THE ENTIRE PROJECT. IN THE EVENT OF DAMAGE TO EXISTING PUBLIC AND/OR PRIVATE UTILITIES, THE AGENCY CONCERNED SHALL BE NOTIFIED IMMEDIATELY AND ALL REPAIR WORK SHALL BE EXECUTED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE RESPECTIVE AGENCY AT NO ADDITIONAL EXPENSE TO THE PROJECT, INCLUDING ANY INSPECTION FEES OR MAINTENANCE CREWS.

PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL COORDINATE UTILITY SUPPORT AND/OR RELOCATION BY THE UTILITY OWNER FOR ALL EXISTING UTILITIES WHICH WILL BE AFFECTED DURING CONSTRUCTION. THE COST FOR ANY REQUIRED PROTECTION OR RELOCATION OF EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

WHERE EXISTING UTILITY POLES ARE IN CLOSE PROXIMITY TO WORK, THE CONTRACTOR SHALL COORDINATE HIS WORK EFFORTS WITH THOSE OF THE UTILITY COMPANIES SUCH THAT THE OPERATION OF THEIR EXISTING FACILITIES CAN BE MAINTAINED AND PROTECTED DURING THE TIME WORK IS GOING ON ADJACENT TO THE POLE.

K. PRECONSTRUCTION VIDEO RECORDING

THE CONTRACTOR SHALL RECORD AN AUDIO/VISUAL RECORDING OF THE PROJECT LIMITS AND ADJACENT AREAS, ESPECIALLY ALONG THE EXISTING CURB NEAR THE CONSTRUCTION ENTRANCE, EXISTING CATCH BASINS/CULVERTS, AND PROPERTIES WHERE EXISTING CONDITIONS MAY BE DISTURBED. THE RECORDING SHALL BE OF DIGITAL FORMAT AND BE PROVIDED TO THE OWNER PRIOR TO MOBILIZATION.

L. RIVERBED SUBSTRATE

THE WENTWORTH SCALE IS USED TO DEFINE SUBSTRATE SIZES AS MEASURED ALONG THE MEDIAN AXIS OF THE SUBSTRATE. THE BROAD RANGES FOR SAND, GRAVEL, COBBLE AND BOULDERS ARE SHOWN IN TABLE 1 BELOW:

TABLE 1 - SUBSTRATE MATERIAL TYPE AND SIZE RANGES	
MATERIAL TYPE	SIZE RANGE
BOULDER	GREATER THAN 10 INCHES
COBBLE	2.5 INCHES TO 10 INCHES
GRAVEL	2 MM TO 2.5 INCHES
SANDS	0.063 MM TO 2 MM
SILTS AND CLAYS	LESS THAN 0.063 MM

THE WENTWORTH SCALE MATERIAL SUB-GRADATIONS AND SIZE RANGES FOR GRAVELS AND COBBLES ARE SHOWN IN TABLE 2 BELOW:

TABLE 2 - GRAVEL AND COBBLE MATERIAL SUB-GRADATIONS AND SIZE RANGES		
MATERIAL SUB-GRADITIONS	SIZE RANGE (MM)	SIZE RANGE (INCHES)
VERY FINE GRAVEL	2-4	0.08-0.15
FINE GRAVEL	4-8	0.15-0.31
MEDIUM GRAVEL	8-16	0.31-0.63
COARSE GRAVEL	16-32	0.63-1.26
VERY COARSE GRAVEL	32-64	1.26-2.52
SMALL COBBLE	64-90	2.52-3.54
MEDIUM COBBLE	90-128	3.54-5.04
LARGE COBBLE	128-180	5.04-7.09
VERY LARGE COBBLE	180-256	7.09-10.08

4. FINAL WALK THROUGH

A FINAL WALK THROUGH FOR EACH MAJOR COMPONENT WILL BE COMPLETED BY THE CONSTRUCTION REPRESENTATIVE. THE MAJOR COMPONENT WILL BE COMPLETED ONLY AFTER THE FINAL WALK THROUGH AND ANY ASSOCIATED PUNCH LIST ITEMS ARE CORRECTED AS REQUIRED PER THE DRAWINGS AND SPECIFICATIONS.

THE MAJOR COMPONENTS OF THIS PROJECT ARE:

- 4,284 LF STREAM RESTORATION ON RICHLAND CREEK;
- 177 LF STREAM RESTORATION ON SHELTON BRANCH;
- BANK STABILIZATION - INCLUDES LOCKED LOGS, ROCK PROTECTION
- LEVEE REMOVAL
- IN-STREAM HABITAT FEATURES; WOODY AND BOULDER HABITAT
- NATIVE PLANTINGS

NOTICE OF FINAL WALK THROUGH NEEDS TO BE GIVEN 48 HOURS IN ADVANCE. CONTRACTOR SHOULD NOT DEMOBILIZE OR REMOVE ACCESS TO AREAS WITHOUT FINAL APPROVAL.

16. IMPLEMENTATION VARIABILITY

THE STREAM RESTORATION AND FLOODPLAIN ENHANCEMENT or BANK STABILIZATION DETAILED IN THESE PLANS REPRESENT AND APPROACH BASED UPON FIELD DATA COLLECTION AND ASSESSMENTS COMPLETED AT AN EARLIER DATE. CONSTRUCTION WILL BE IMPLEMENTED BY THE DESIGN-BUILD TEAM AND MAY VARY FROM THE PLAN BASED ON ACTUAL AND/OR UNFORESEEN FIELD CONDITIONS. MODIFICATIONS MAY BE NECESSARY TO BEST SUIT THE NEEDS OF THE PROJECT GOALS. ALL RESTORATION/ENHANCEMENT WILL BE COMPLETED WITH THE INTENT OF PROVIDING A STABLE AND FUNCTIONAL ECOLOGICAL SYSTEM THAT IS RESILIENT OVER TIME. EVEN NATURAL STABLE SYSTEMS ARE DYNAMIC AND CONSTANTLY CHANGING, PARTICULARLY STREAMS. THEREFORE, ADJUSTMENT IS EXPECTED TO OCCUR IN VARYING DEGREES WITH THE PASSAGE OF TIME AND CHANGING SEASONS. CLIMATIC SHIFTS AND MORE INTENSE RAINFALL EVENTS ARE PLACING ADDED PRESSURE ON OUR NATURAL SYSTEMS. MOVEMENT OF SUBSTRATE, OBSTRUCTIONS TO CHANNEL FROM VEGETATION AND WOODY DEBRIS, MINOR BANK EROSION AND DEPOSITION ARE A FEW OF THE POTENTIAL CHANGES THAT MAY OCCUR BUT ARE NATURAL AND TO BE EXPECTED. IT IS IMPORTANT TO UNDERSTAND AND EVALUATE THE SCALE AND RATE OF CHANGE WITH RESPECT TO OVERALL STABILITY AND PROJECT GOALS. TYPICALLY RESTORATION PROJECTS BECOME MORE RESILIENT WITH TIME AND MATURING VEGETATION, HOWEVER OUR TEAM IS COMMITTED TO CREATING A SUSTAINABLE PROJECT. WE WILL WORK WITH THE OWNER TO UNDERSTAND ANY PERCEIVED CHANGES WITH RESPECT TO THESE GOALS.

GENERAL NOTES

NOT FOR
CONSTRUCTION

NO.	REVISION/ISSUE	DATE

50% DESIGN

ES Engineering

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RICHLAND CREEK AND VANCE
GREENWAY RESTORATION

TOWN OF WAYNESVILLE
9 S. MAIN ST.
PO BOX 100
WAYNESVILLE, NC 28786

GENERAL NOTES &
SPECIFICATIONS

DESIGNED BY: ADH DRAWN BY: TG CHECKED BY: ET	SHEET: G-01
DATE: SEPTEMBER 2026	02 / 32
VERT. SCALE: NA HORZ. SCALE: NA	

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SPECIFICATIONS

1. FLOODPLAIN TOPSOIL FURNISHED AND PLACED, AS NECESSARY

IF PLANS REQUIRE IMPORTED TOPSOIL OR STOCKPILED TOPSOIL IS INSUFFICIENT TO COMPLETE FINISH GRADES THEN AN APPROVED IMPORTED TOPSOIL SHALL THEN BE INSTALLED. IN IDENTIFIED FLOODPLAIN AREAS PER PLAN WHICH GENERALLY CONSISTS OF AREAS BETWEEN THE RIPARIAN CORRIDOR EMBANKMENT SLOPE AND BANKFULL ELEVATION

ES ENGINEERING SHALL APPROVE ANY TOPSOIL MATERIAL TO BE IMPORTED INTO THE SITE. THE CONTRACTOR WILL NOTIFY ES ENGINEERING OF THE SOURCE/LOCATION OF THE IMPORTED TOPSOIL FOR A VISUAL INSPECTION TO BE COMPLETED PRIOR TO IMPORTING MATERIAL TO THE SITE.

TOPSOILS FOR FLOODPLAINS WHICH HAVE A >5% GRAVEL OR COARSE SAND MAY BE ACCEPTABLE UPON APPROVAL FROM THE CONSTRUCTION REPRESENTATIVE

2. RIVERBED BANK RUN (SAND/GRAVEL) SUBSTRATE - FURNISHED AND PLACED, AS PER PLAN

SUITABLE SUBSTRATE MATERIALS USED FOR THIS MATERIAL ARE DEFINED AS FOLLOWS:

AGGREGATE FOR THIS ITEM SHALL BE A NATURAL MATERIAL COMPOSED OF A MIXTURE OF HARD, DURABLE PARTICLES OR FRAGMENTS OF STONE OR GRAVEL AND SAND, SOME COBBLES, AND SMALL AMOUNTS OF SILT, CLAY OR OTHER SIMILAR BINDING MATERIAL, AND SHALL BE FREE OF EXCESSIVE OR DETRIMENTAL AMOUNTS OF CLAY, CLAY LUMPS, LOAM, ROOTS, VEGETABLE MATTER, RUBBISH, WOOD, MULCH, OR OTHER NON-STABLE MATERIALS. ADDITIONAL DESCRIPTION PROVIDED BELOW. IT IS ESTIMATED THAT A MIX OF SAND AND GRAVEL SIZED MATERIAL WITH A SMALL PERCENTAGE OF SMALL COBBLE (I.E., LESS THAN 5%) WOULD BE SUITABLE.

BANK RUN SUBSTRATE IS DEFINED AS NON CRUSHED SAND AND GRAVEL SUBSTRATE MATERIAL WHICH SHALL BE UNWASHED/UNSORTED RAW MATERIAL FROM A LOCAL SAND & GRAVEL OPERATION WITHIN THE WATERSHED OR GEOLOGY. THIS MATERIAL IS SUITABLE FOR THE BASE OR FIRST LAYER PLACED ON THE STREAMBED SUBGRADE IN ALL AREAS. IF MATERIAL IS OUTSIDE SPECIFICATIONS TOLERANCE, MATERIAL CAN BE APPROVED BY THE CONTRACTOR IN COORDINATION WITH CONSTRUCTION REPRESENTATIVE. ALTERNATIVE APPROVED MATERIAL WILL BE BIASED TOWARDS LESS FINES AND MORE COARSE MATERIAL. LIMESTONE SHALL NOT BE USED. SITE VISITS TO THE ACTUAL SAND & GRAVEL OPERATION SHOULD BE ARRANGED WITH THE CONSTRUCTION REPRESENTATIVE TO EVALUATE THE PROPOSED MIX PRIOR TO DELIVERY OF MATERIALS TO THE SITE.

IT IS ANTICIPATED THAT EXISTING SAND AND GRAVEL MATERIAL BORROW FROM THE POINT BAR, STREAMBED AND OTHER EXCAVATION AREAS WILL BE SUITABLE AND REUSED FOR A PORTION OF THE BANK RUN MATERIAL.

3. RIVERBED GRAVEL/COBBLE SUBSTRATE - FURNISHED AND PLACED, AS PER PLAN

DEFINED AS A MIXTURE OF GRAVEL AND COBBLE WITH A WIDE RANGE OF DIMENSIONS/SIZES AS DETAILED BELOW. THE SIZE VARIABILITY IS PARAMOUNT TO HAVE APPROPRIATE FUNCTION AND STABILITY OF THE STREAMBED. IT IS UP TO THE CONTRACTOR AND THE CONSTRUCTION REPRESENTATIVE TO WORK TOGETHER TO APPROVE THE APPROPRIATE SUBSTRATE GRAVEL/COBBLE MIX. SITE VISITS TO THE ACTUAL SAND & GRAVEL OPERATION SHOULD BE ARRANGED WITH THE CONSTRUCTION REPRESENTATIVE TO EVALUATE THE PROPOSED MIX PRIOR TO DELIVERY. MATERIAL SHALL BE FROM A LOCAL SAND & GRAVEL OPERATION. LIMESTONE SHALL NOT BE USED IN THE GRAVEL/COBBLE COMPONENTS.

IT IS ANTICIPATED THAT EXISTING SAND AND GRAVEL MATERIAL BORROW FROM THE POINT BAR, STREAMBED AND OTHER EXCAVATION AREAS WILL BE SUITABLE AND REUSED FOR A PORTION OF THE RIVERBED GRAVEL/COBBLE SUBSTRATE.

THE PERCENTAGE RANGE FOR EACH MATERIAL SUB-GRADATION RANGE IS LISTED IN TABLE 3 BELOW.

4. RIVERBED BOULDER SUBSTRATE FURNISHED AND PLACED, AS PER PLAN, AS DIRECTED

DEFINED AS ANGULAR IN SHAPE AND COMPRISED OF GRANITE, GNEISS, QUARTZITE OR SIMILAR HARD MATERIAL. FRIABLE MATERIAL OR LOW QUALITY SANDSTONE IS NOT ACCEPTABLE. ANGULAR MATERIAL IS PREFERRED BECAUSE IT INCREASES THE INTERLOCKING ABILITY OF THE STONE AND IS LESS LIKELY TO ROLL OR MOVE. MATERIAL SHALL BE FROM A LOCAL SAND & GRAVEL OPERATION. BOULDERS WILL BE VISUALLY ASSESSED UPON ARRIVAL TO THE SITE BY THE CONSTRUCTION REPRESENTATIVE TO ENSURE THE SIZE CLASSES ARE REPRESENTED AS SPECIFIED.

BOULDERS ARE SUITABLE FOR SPECIFIC HABITAT, GRADE CONTROL STRUCTURES OR STRATEGICALLY POSITIONED ON THE ON THE RIFFLE, RUN OR POOL AREAS TO FUNCTION AS ROUGHNESS ELEMENTS. BOULDERS ARE MEASURED ACROSS THEIR MEDIAN AXIS. LIMESTONE CAN BE USED IN STREAMBED AREAS AS WELL AS ROCK CHANNEL PROTECTION AROUND CULVERTS AND SCOUR POOLS.

NCDOT SIZING IS USED TO IDENTIFY BOULDERS AS DESCRIBED IN TABLE 3 BELOW:

TABLE 3 - BOULDER SIZES		
TYPE	SIZE RANGE (INCHES)	DESCRIPTION
1500 LB	>30"	VERY LARGE TO LARGE
300-1500 LB	18" TO 30"	MEDIUM BOULDER
100-500 LB	12" TO 24"	MEDIUM TO SMALL-MEDIUM BOULDER
30-300 LB	6" TO 18"	SMALL-MEDIUM TO SMALL BOULDER

THE PERCENTAGE RANGE FOR EACH MATERIAL SUB-GRADATION RANGE IS LISTED IN TABLE 4 BELOW:

TABLE 4 - MATERIAL SUB-GRADATION RANGE							
COMPONENT	BANK RUN	GRAVEL	COBBLE	BOULDERS			
				TYPE A+	TYPE A	TYPE B	TYPE C
RIFFLE GRADE CONTROL	5%	0%	0%	5%	20%	50%	20%
FLOODPLAIN FILL - ROCK PROTECTION	5%	0%	0%	5%	25%	50%	15%
ROCK KEY	5%	2%	3%	0%	0%	45%	45%
BENDWAY WEIR	5%	5%	5%	5%	10%	35%	35%

SUBSTRATE COMPONENTS WILL BE VERIFIED BY THE CONSTRUCTION REPRESENTATIVE AT THE SUPPLIERS PLACE OF OPERATION OR ON-SITE. THE SUBSTRATE MIX WILL BE VERIFIED BY A CONSTRUCTION REPRESENTATIVE BY PERFORMING A RANDOM PARTICLE ANALYSIS ON THE PROPOSED MIX BY SPREADING THE MIX OUT ON A 10 FT BY 25 FT AREA. CHANGES OR APPROVAL OF THE SUBSTRATE COMPONENT MIX (I.E. FINAL PERCENTAGES) WILL BE DETERMINED BY THIS ANALYSIS. SHOULD THE EXISTING SAND AND GRAVEL BE USED INSTEAD OF IMPORTING THIS MATERIAL, THIS ANALYSIS DOES NOT NEED TO OCCUR.

5. FLOODPLAIN PROTECTION BANK STABILIZATION INSTALLATION

BANK STABILIZATION ARE AREAS WHERE ANGULAR BOULDERS AND RIP-RAP ARE NEEDED DUE TO EROSION AND BANK INSTABILITY. BANK STABILIZATION INSTALLATION SHALL BEGIN FROM THE LOWEST ELEVATION AND PROGRESS UPWARD IN ELEVATION. A FOUNDATION TOE SHALL BE INSTALLED TO PROTECT AGAINST SCOUR. THE TOE SHALL BE THE FURTHEST LIMIT OF ROCK IDENTIFIED ON PLANS AND CONSIST OF THE LARGEST DIAMETER MATERIAL IN THE IDENTIFIED SIZE CLASS.

ONCE THE FOUNDATION TOE IS ESTABLISHED THE BANK STABILIZATION SHALL PROGRESS IN LIFTS EQUAL TO THE C AXIS (LAYING AXIS) OF THE MATERIAL SPECIFIED. IN BETWEEN LIFTS IT IS VERY IMPORTANT TO CHOKO VOIDS AND SPACES WITH BANK RUN & SAND AND GRAVEL MATERIAL, INCLUDING CAREFULLY CHOKING MATERIAL UNDERWATER. THIS MATERIAL CAN CONSIST OF APPROVED ON-SITE MATERIAL ENCOUNTERED DURING EXCAVATIONS. SAND AND GRAVEL MATERIAL ONLY SHALL BE USED AS CHOKO MATERIAL TO THE BANKFULL ELEVATION AT THE CORRESPONDING STATION OF WORK. CHOKO MATERIAL ABOVE BANKFULL ELEVATION IF APPLICABLE CAN USE APPROVED SUBSOIL OR TOPSOIL.

THE START AND END POINTS OF BANK STABILIZATION AREAS SHALL BE BLENDED INTO THE EXISTING GRADES SO THAT ROCK MATERIAL IS FLUSH TO THE ADJACENT EXISTING BANK. THESE TIE IN LOCATIONS TO EXISTING GRADE SHALL BE COORDINATED AND APPROVED BY THE CONSTRUCTION REPRESENTATIVE.

OUTSIDE MEANDER LOG/TREE HABITAT IS OFTEN IDENTIFIED IN BANK STABILIZATION AREAS. THIS WOODY HABITAT FEATURE SHALL BE INTEGRATED INTO THE BANK STABILIZATION LIFTS. THE FINISHED LOCATION OF THE WOODY HABITAT SHALL BE IN FRONT OF THE BANK STABILIZATION ROCK BUT ANCHORED INTO THE LIFTS OF STABILIZATION ROCK. NON-FUNCTIONAL WOOD COMPLETELY BURIED BY ROCK OR NOT INSTALLED PROPERLY IS NOT ACCEPTABLE.

ROCK TOES SHALL BE 3-FT WIDE BY 3-FT IN DEPTH DESIGNED TO PREVENT FLANKING OF BANK STABILIZATION AND/OR OTHER STRUCTURES OR STREAM GEOMETRY. ROCK TOES ARE TO FOLLOW THE EXISTING OR PROPOSED TOPOGRAPHY IN THE AREA. THEREFORE THE 3FT DEPTH WILL BE FROM FINISH OR EXISTING GRADE. FOR EXAMPLE IF THE STREAMBANK SLOPES UPWARD THEN THE ROCK TOE WILL SLOPE CORRESPONDINGLY SLOPE UPWARD. FINAL ROCK TOE GRADES SHALL BE LOCATED AT ELEVATIONS THAT OFFER THE LOWEST RISK AND MOST PROTECTIVE MEASURES FOR THE GOALS OF THE PROJECT. ROCK SHALL CONSIST OF SOUND, DURABLE, ANGULAR TO SUBANGULAR NATIVE OR REGIONALLY APPROPRIATE GRANITE, GNEISS, QUARTZITE, OR SIMILAR HARD CRYSTALLINE/METAMORPHIC STONE.

6. TEMPORARY STABILIZATION AND NATIVE SEED INSTALLATION

GRAIN RYE (Secale cereale) OR OATS (Avena sativa) AT A RATE OF 30 - 50 LBS PER ACRE SHALL BE INSTALLED TO ALL DISTURBED AREA. NATIVE SEED MIXES ARE TO BE INSTALLED AT THE SPECIFIED RATE IN THE APPROPRIATE AREAS. ALL NATIVE SEED IS TO BE INSTALLED BY HAND SEEDING METHOD DUE TO VARIABILITY OF SEEDS WITHIN MIX. CONTRACTOR IS TO ESTIMATE SEEDING AREA AND WEIGH SEED IN APPROPRIATE QUANTITIES TO ENSURE APPLICATION AT THE CORRECT RATE. A STARTER FERTILIZER IS NOT REQUIRED UNLESS SITE-SPECIFIC SOIL TESTS DEEM A DEFICIENCY IN ONE OR MORE SOIL COMPONENTS. AT THAT TIME, A FERTILIZER RATE WILL BE APPLIED AS NECESSARY TO PROMOTE A HEALTHY NATIVE COMMUNITY. FOLLOWING TEMPORARY AND NATIVE SEED INSTALLATION, SEED IS TO BE LIGHTLY RAKED INTO SOIL. COVER SOIL WITH APPROPRIATE EROSION PROTECTION PER AREA.

7. EROSION CONTROL BLANKET FOR GENERAL PURPOSE - STRAW FABRIC, AS PER PLAN

FABRIC FOR GENERAL EROSION CONTROL SHALL BE AMERICAN EXCELSIOR COMPANY (AEC) STRAW-COCONUT FIBRENET OR APPROVED EQUAL SUBSTITUTE FOR FLOW RATES UP TO 8.5 FT/S AND SHEAR STRESS OF 2.0 LBS/SQ FT.

NO PLASTIC NETTING IS ALLOWED IN EROSION FABRIC. THIS FABRIC SHALL BE USED ON CUT-SLOPES ABOVE THE FLOODPRONE AREAS AND AREAS DIRECTED BY THE CONSTRUCTION REPRESENTATIVE TO CONTROL POTENTIAL EROSION AREAS THAT DO NOT HAVE CONCENTRATED FLOW. SUCH AS, THE RESTORED STREAM BANKS AND FLOODPLAIN. PRIOR TO INSTALLATION, THE AREA UNDER THE FABRIC SHALL BE SEEDD AND FERTILIZED AS DESCRIBED IN ITEM 6 ABOVE. EROSION FABRIC SHALL BE INSTALLED PER THE DETAILS IN THE PLAN AND MANUFACTURES INSTRUCTIONS AND IN ACCORDANCE WITH NC EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL, CHAPTER 6.1.

EROSION FABRIC SHALL BE SECURED IN PLACE USING WOODEN STAKES. METAL STAPLES OR STAKES WILL NOT BE PERMITTED.

TABLE X - RIPRAP STONE SIZES			
WEIGHT (LB)	MEAN SPHERICAL DIA. (FT)	LENGTH (FT)	RECTANGULAR SHAPE WIDTH/HEIGHT (FT)
50	0.8	1.4	0.5
100	1.1	1.8	0.6
150	1.3	2.0	0.7
300	1.6	2.6	0.9
500	1.9	3.0	1.0
1000	2.2	3.7	1.3
1500	2.6	4.7	1.5
2000	2.8	5.4	1.8
4000	3.6	6.0	2.0
6000	4.0	6.9	2.3
8000	4.5	7.6	2.5
20,000	6.1	10.0	3.3

5. FLOODPLAIN AND WETLAND GRADING

FLOODPLAINS AND WETLANDS SHALL BE EXCAVATED TO THE GRADES PROVIDED IN THE PLANS. CONTOURS AND SPOT GRADES SHALL BE CONSIDERED THE FINISHED GRADE ELEVATION OF THE FLOODPLAIN/WETLAND. WETLAND AREAS SHALL HAVE A MINIMUM OF 0.5-FT (6 INCHES) OF SUITABLE TOPSOIL. AN EVALUATION OF TOPSOIL DEPTH SHALL BE PERFORMED TO DETERMINE IF WETLANDS CAN SIMPLY BE SCRAPPED TO ACHIEVE THE DESIRED DEPTH OF TOPSOIL. MICROTOPOGRAPHY VARIATIONS, DEPRESSIONS, AND SMALL HUMMOCKS ARE DESIREABLE AND ENCOURAGED IN BOTH THE SUBGRADE AND FINISHED GRADES. FINISHED GRADES WILL BE CHECKED BASED ON THE AVERAGE ELEVATIONS OF THE AREA.

AREAS WITHIN THE PROPOSED FLOODPLAINS OR WETLANDS NOT DENOTED WITH SPECIFIC ELEVATIONS WILL BE ROUGH GRADED TO LEAVE MICROTOPOGRAPHY AT ITS EXISTING ELEVATIONS AND TO PREPARE SOILS FOR SEEDING AND PLANTINGS.

GENERAL NOTES

NOT FOR CONSTRUCTION

NO.	REVISION/ISSUE	DATE

50% DESIGN

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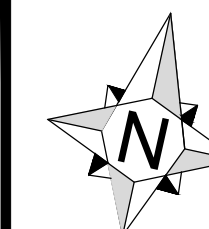
RICHLAND CREEK AND VANCE GREENWAY RESTORATION

TOWN OF WAYNESVILLE
9 S. MAIN ST.
PO BOX 100
WAYNESVILLE, NC 28786

GENERAL NOTES & SPECIFICATIONS

DESIGNED BY: ADH DRAWN BY: TG CHECKED BY: ET	SHEET: G-02
DATE: SEPTEMBER 2026 VERT. SCALE: NA HORZ. SCALE: NA	03 / 32

GENERAL NOTES		
 NOT FOR CONSTRUCTION		
LEGEND		
—— P/L ——	PROPERTY LINE	
— — — EX.	EX. THALWEG ALIGNMENT	
- - - - - EX.	EX. FEMA FLOODWAY	
- - - - - EX.	EX. FEMA FLOOD HAZARD AREA (100-YR)	
- - - - - EX.	EX. FEMA FLOOD HAZARD AREA (500-YR)	
—— EX.	EX. ACTIVE RAIL ROAD	
■ ■ ■ ■ ■ EX.	EX. TRAIL	
—————	POTENTIAL PROP. TRAIL	
0 160 320 GRAPHIC SCALE IN FEET		
NO.	REVISION/ISSUE	DATE
50% DESIGN		
ES Engineering NC Affiliate Office: 145 7th Ave West: Suite B Hendersonville, NC 28792 828-784-8324 NC License C-5299 RICHLAND CREEK AND VANCE GREENWAY RESTORATION TOWN OF WAYNESVILLE 9 S. MAIN ST. PO BOX 100 WAYNESVILLE, NC 28786 SITE KEY PLAN WORK AREAS 1-13		
DESIGNED BY: ADH DRAWN BY: TG CHECKED BY: ET DATE: SEPTEMBER 2026 VERT. SCALE: NA HORIZ. SCALE: 1" = 160' SHEET: C-01 04 / 32		



LEGEND

- | | |
|---|-------------------------------------|
|  | PROPERTY LINE |
|  | EX. CONTOURS |
|  | PROP. CONTOURS |
|  | EX. THALWEG |
|  | EX. DELINEATED WETLAND |
|  | EX. STORM SEWER |
|  | EX. SANITARY SEWER |
|  | EX. WATER MAIN |
|  | EX. OVERHEAD ELECTRIC |
|  | EX. TELECOM |
|  | EX. ACTIVE RAILROAD |
|  | EX. TREE TO REMAIN |
|  | EX. FEMA FLOODWAY |
|  | EX. FEMA FLOOD HAZARD AREA (100-YR) |
|  | EX. FEMA FLOOD HAZARD AREA (500-YR) |
|  | EX. SEWER OUTFALL |
|  | EX. STORM MANHOLE |
|  | EX. SANITARY MANHOLE |
|  | EX. UTILITY POLE |
|  | EX. GUY WIRE |
|  | EX. TELECOM PEDESTAL |
|  | PROP. SPOT GRADE |

NO.	REVISION/ISSUE	DATE

50% DESIGN

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RICHLAND CREEK AND VANCE GREENWAY RESTORATION

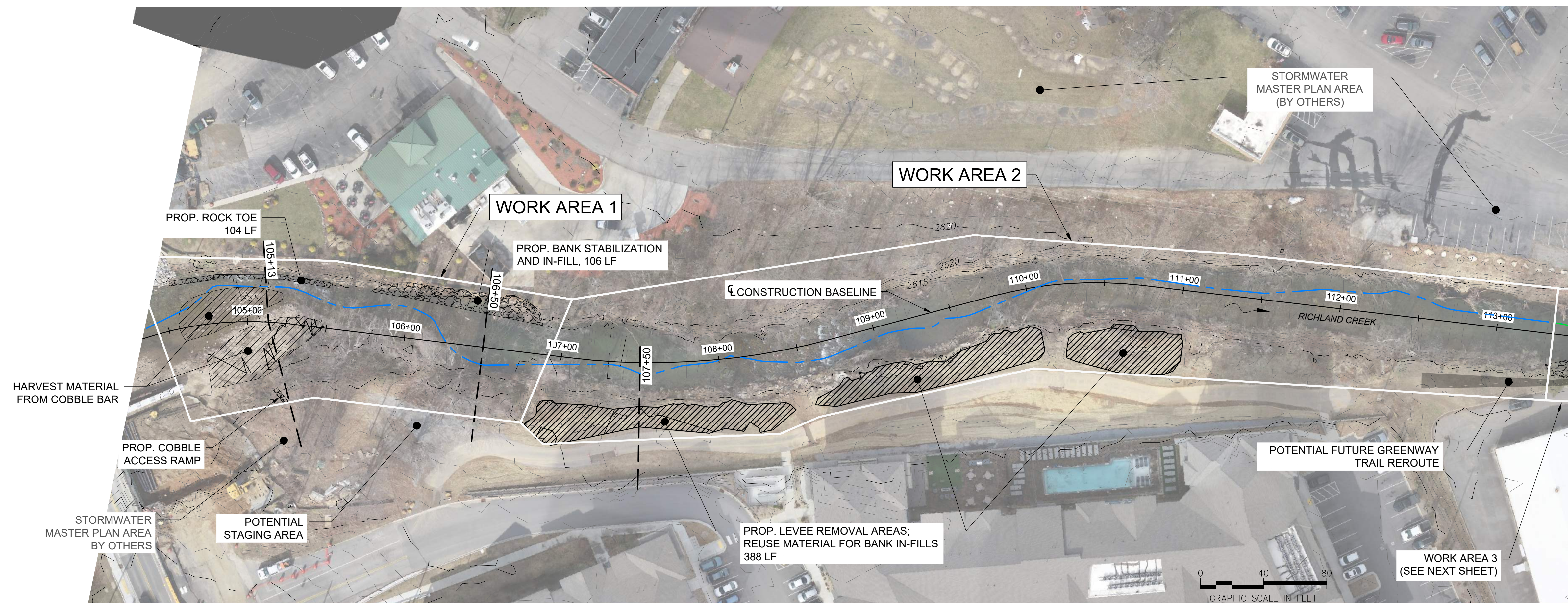
TOWN OF WAYNESVILLE
9 S. MAIN ST.
PO BOX 100
WAYNESVILLE, NC 28786

RESTORATION PLAN

WORK AREAS 1 & 2

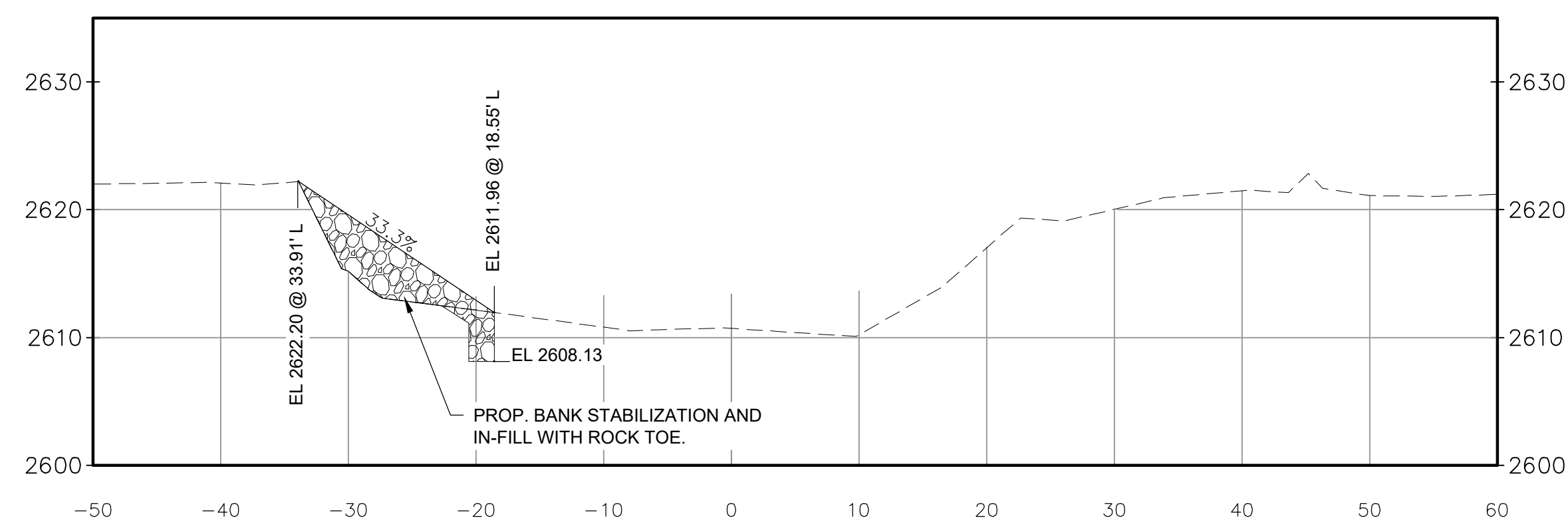
DESIGNED BY:	ADH
DRAWN BY:	TG
CHECKED BY:	ET
DATE: SEPTEMBER 2026	
VERT. SCALE:	1" = 10'
HORZ. SCALE:	AS-SHOWN

SHEET:
C-06
07 / 32



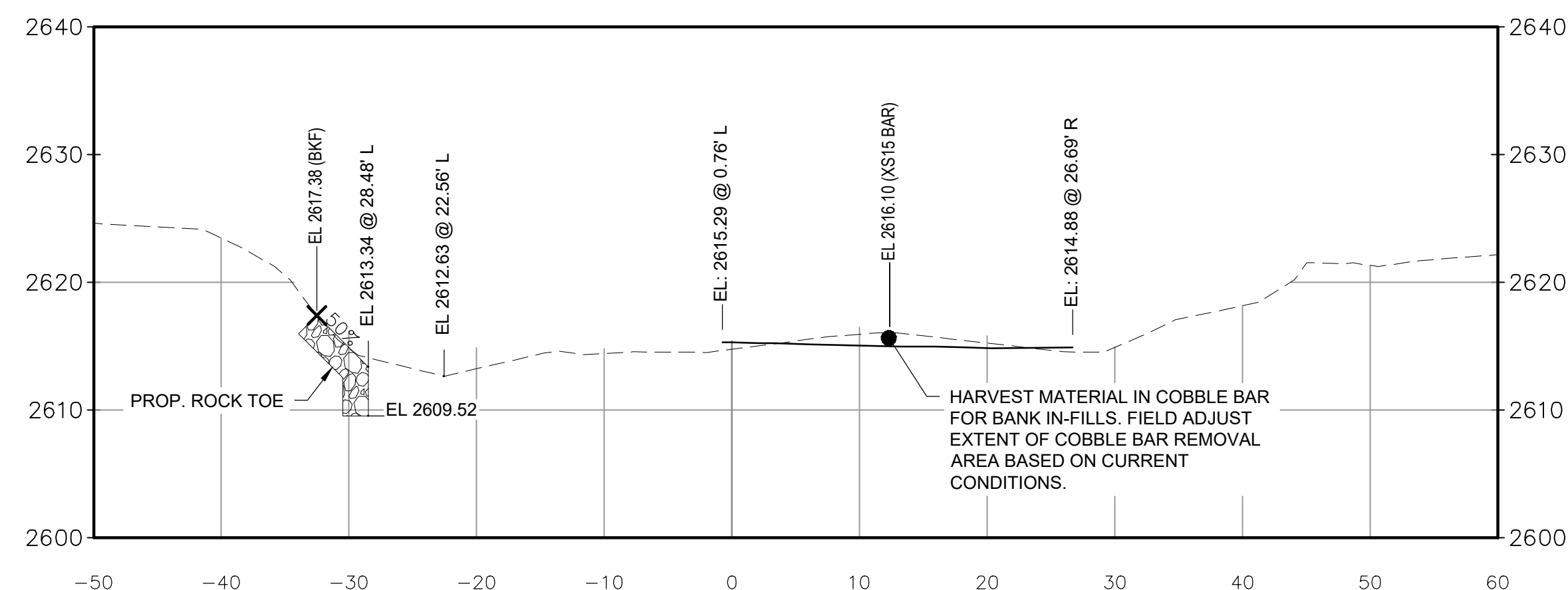
WORK AREA 1 & 2 - PLAN

SCALE: 1" = 40'



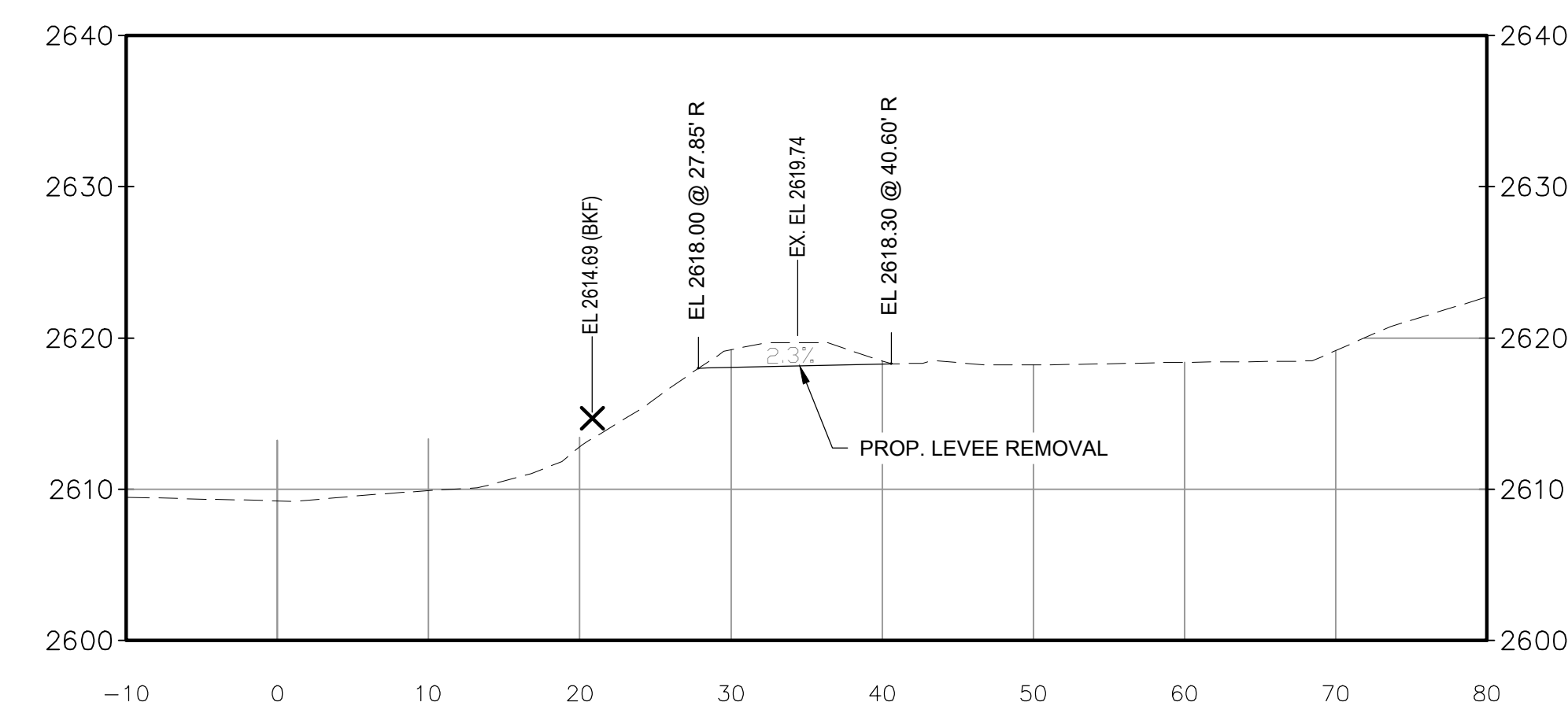
STA. 106+50 - CROSS SECTION

SCALE: 1" = 10'



STA. 105+13 - CROSS SECTION

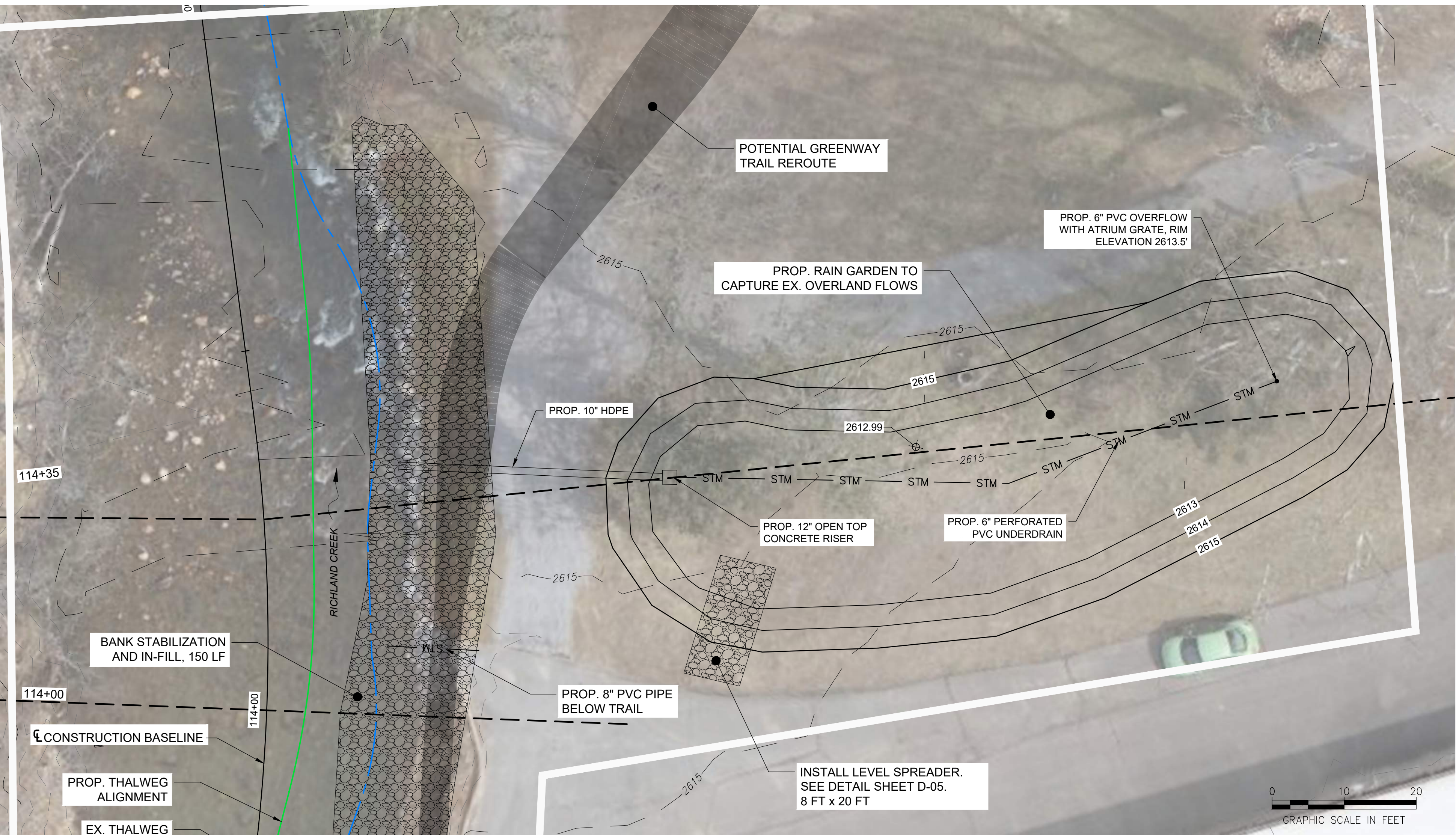
SCALE: 1" = 10'



STA. 107+50 - CROSS SECTION

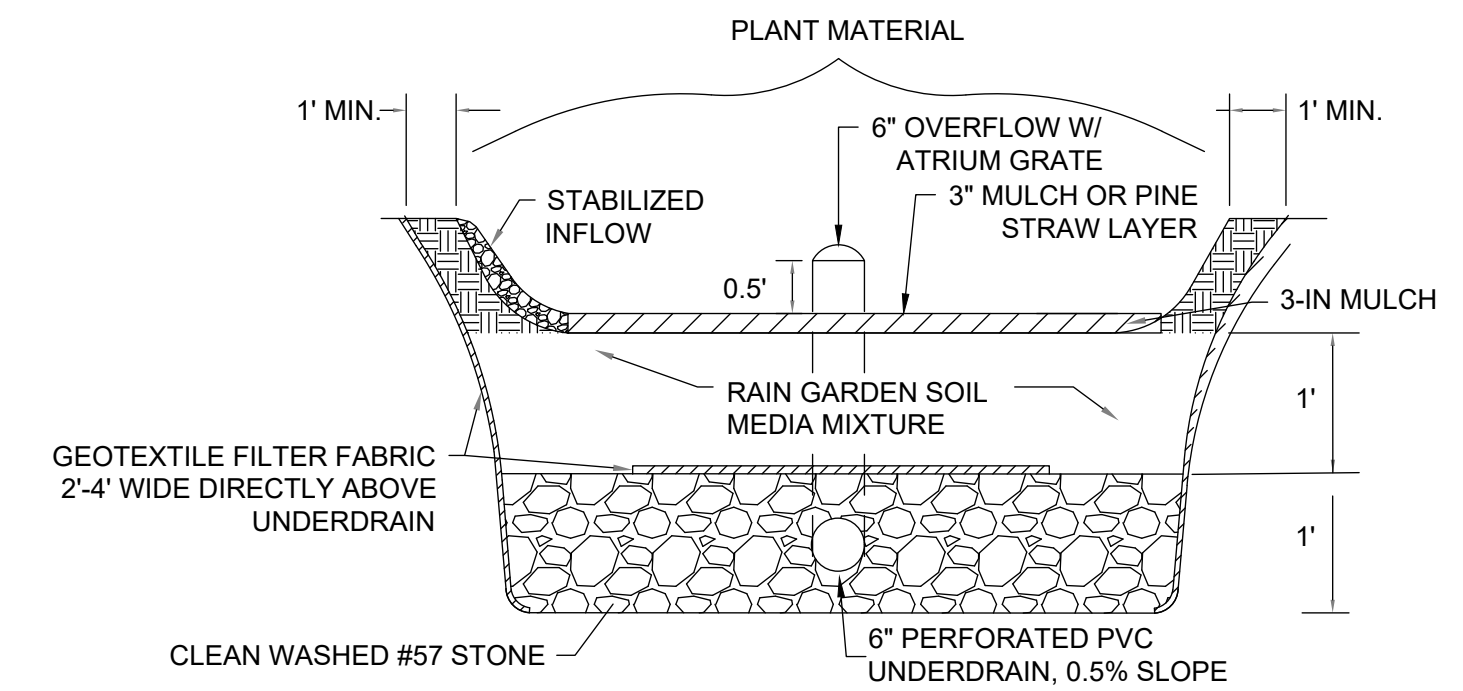
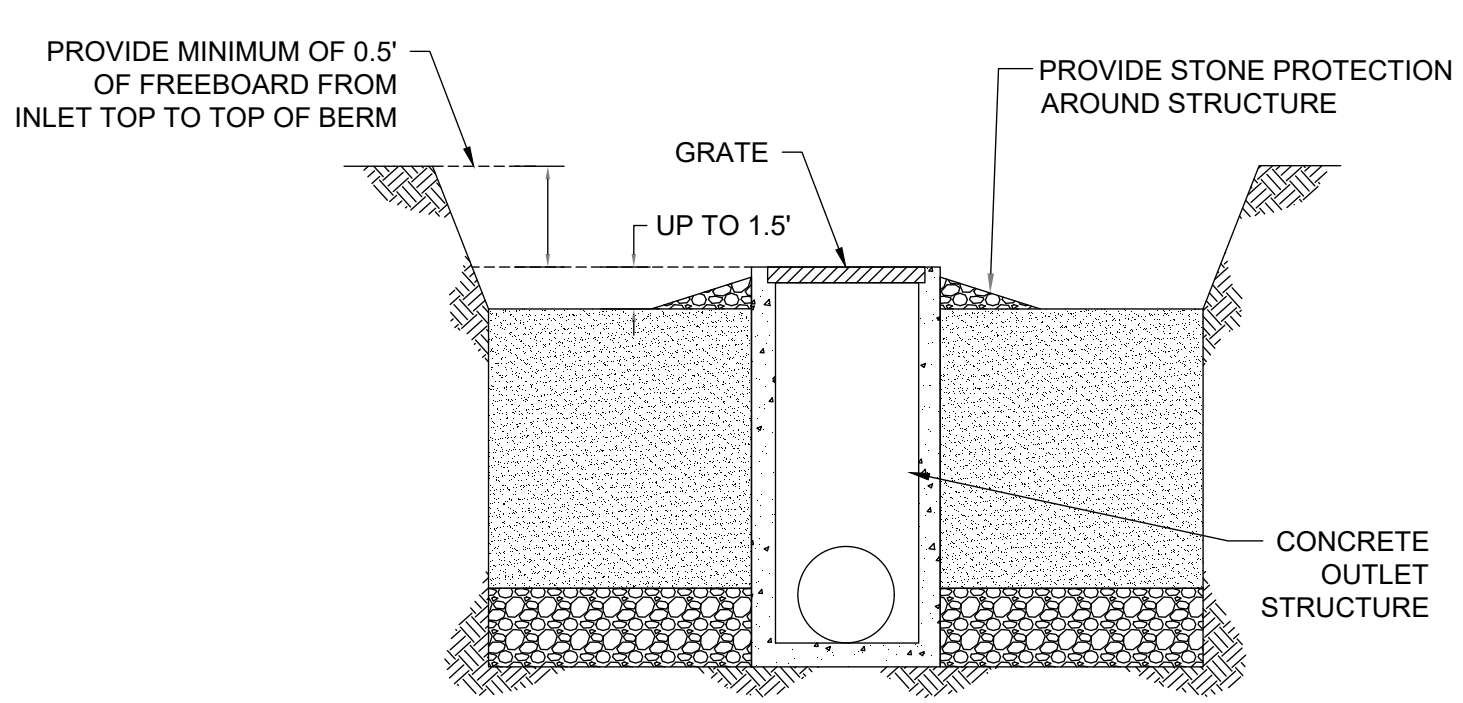
SCALE: 1" = 10'

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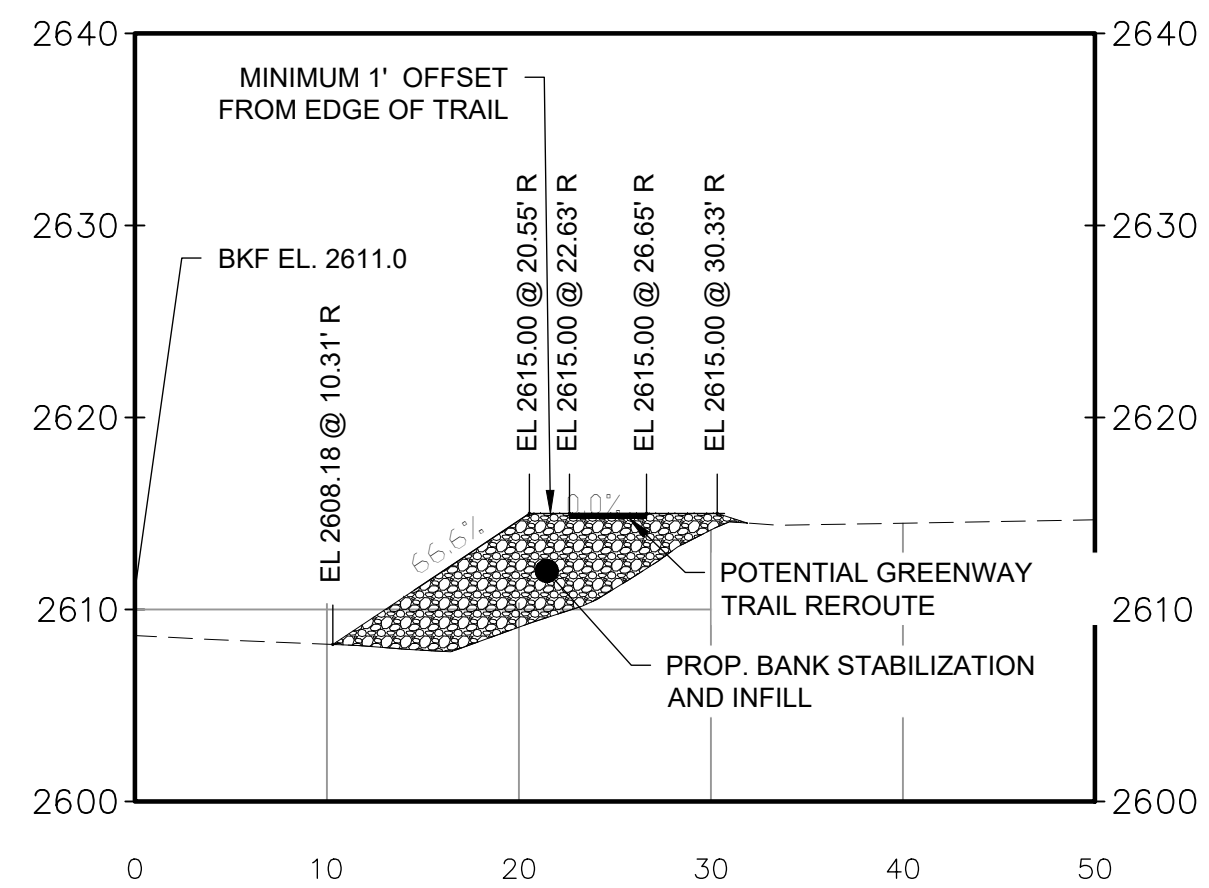


WORK AREA 3 - PLAN

SCALE: 1" = 10'

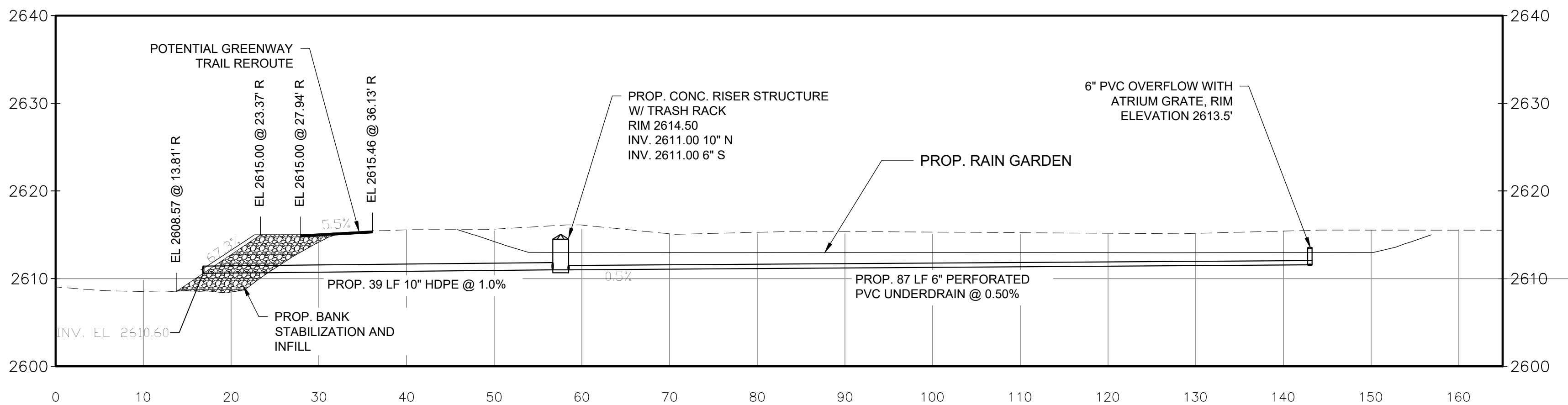


TYPICAL RAIN GARDEN SECTION



STA. 114+00 - CROSS SECTION

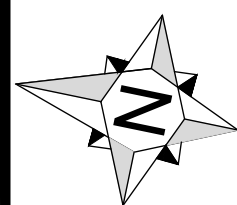
SCALE: 1" = 10'



RAIN GARDEN (STA. 114+35) - CROSS SECTION

SCALE: 1" = 10'

GENERAL NOTES



**NOT FOR
CONSTRUCTION**

LEGEND

	P/L	PROPERTY LINE
	EX. CONTOURS	EXISTING CONTOURS
	PROP. CONTOURS	PROPOSED CONTOURS
	EX. THALWEG	EXISTING THALWEG
	EX. DELINEATED WETLAND	EXISTING DELINEATED WETLAND
	STM	EX. STORM SEWER
	SAN	EX. SANITARY SEWER
	W	EX. WATER MAIN
	OHE	EX. OVERHEAD ELECTRIC
	T	EX. TELECOM
		EX. ACTIVE RAILROAD
		EX. TREE TO REMAIN
		EX. FEMA FLOODWAY
		EX. FEMA FLOOD HAZARD AREA (100-YR)
		EX. FEMA FLOOD HAZARD AREA (500-YR)
		EX. SEWER OUTFALL
		EX. STORM MANHOLE
		EX. SANITARY MANHOLE
		EX. UTILITY POLE
		EX. GUY WIRE
		EX. TELECOM PEDESTAL
	2620	PROP. SPOT GRADE

NO.	REVISION/ISSUE	DATE

50% DESIGN

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RICHLAND CREEK AND VANCE
GREENWAY RESTORATION

TOWN OF WAYNESVILLE
9 S. MAIN ST.
PO BOX 100
WAYNESVILLE, NC 28786

RESTORATION PLAN

WORK AREA 3

DESIGNED BY:	ADH
DRAWN BY:	TG
CHECKED BY:	ET
DATE:	SEPTEMBER 2026

VERT. SCALE: 1" = 10'

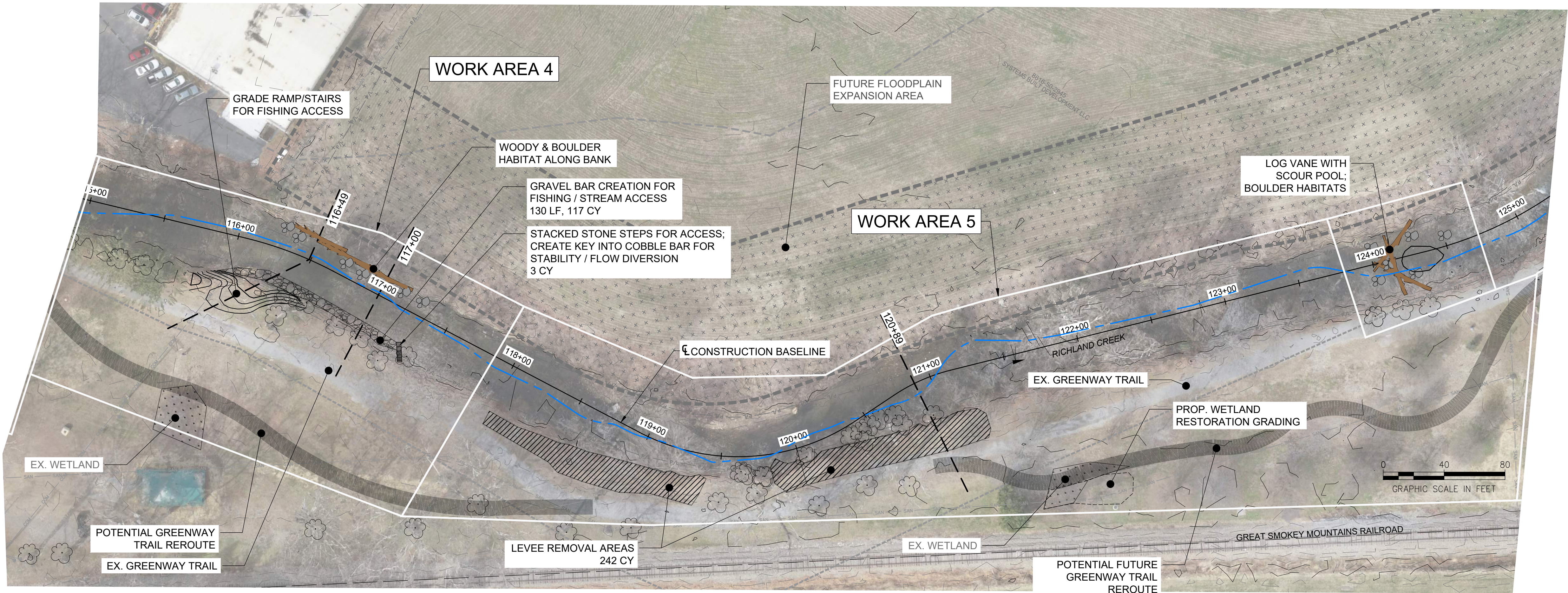
HORZ. SCALE: 1" = 10'

SHEET:

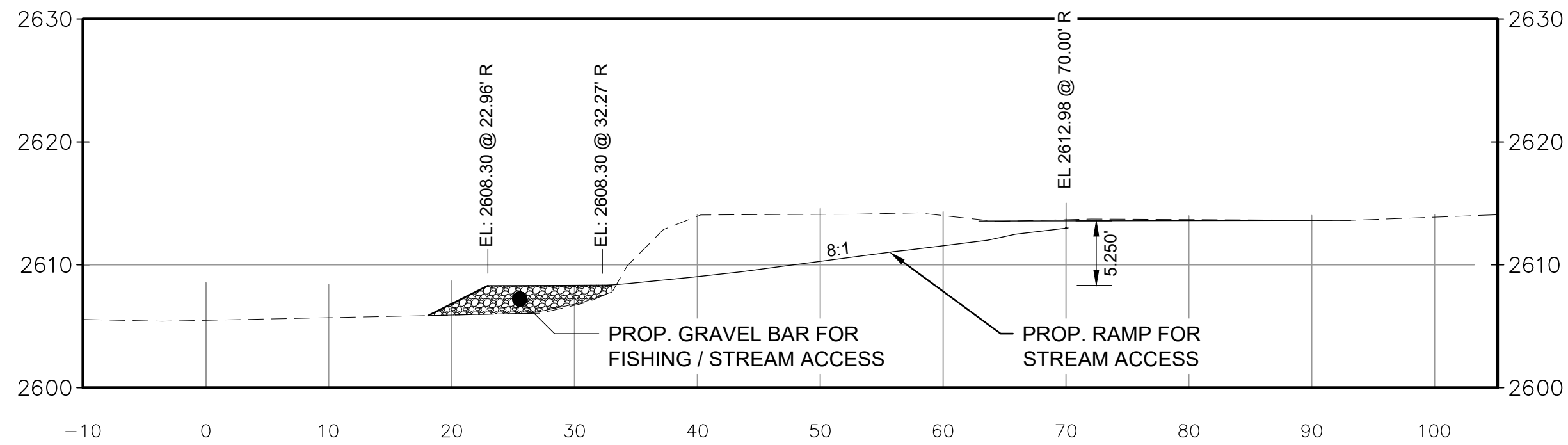
C-07

08 / 32

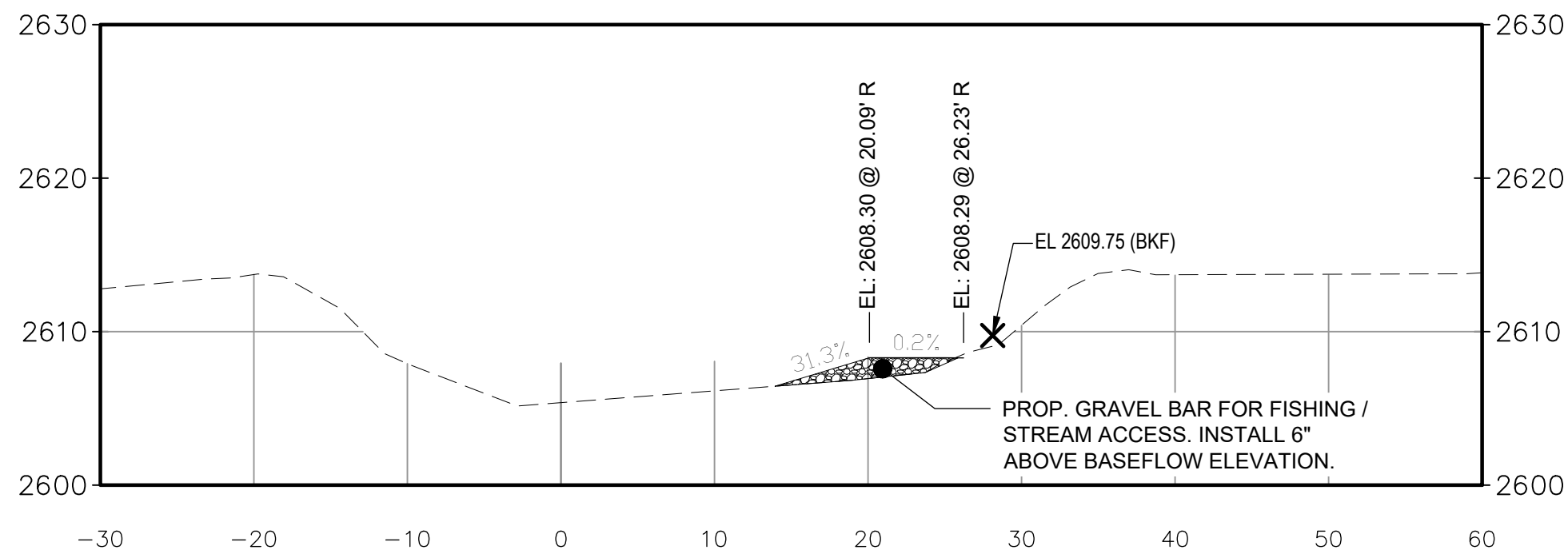
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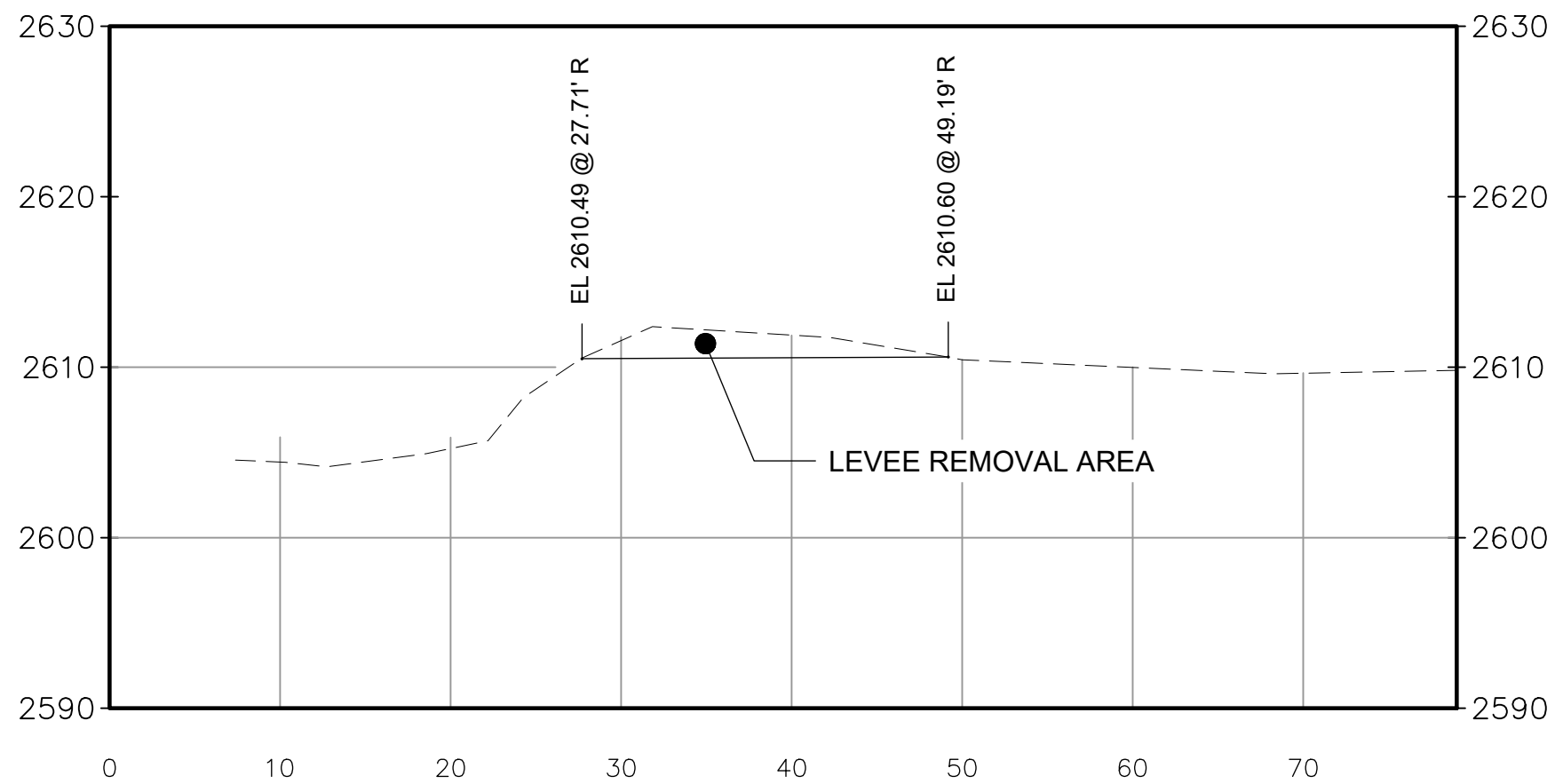
WORK AREA 4 & 5 - PLAN
SCALE: 1" = 40'



STA. 116+49 - CROSS SECTION
SCALE: 1" = 10'



STA. 117+00 - CROSS SECTION
SCALE: 1" = 10'



STA. 120+89 - CROSS SECTION
SCALE: 1" = 10'

GENERAL NOTES		
NOT FOR CONSTRUCTION		
LEGEND		
	P/L	PROPERTY LINE
	EX. CONTOURS	
	PROP. CONTOURS	
	EX. THALWEG	
	EX. DELINEATED WETLAND	
	STM	EX. STORM SEWER
	SAN	EX. SANITARY SEWER
	W	EX. WATER MAIN
	OHE	EX. OVERHEAD ELECTRIC
	T	EX. TELECOM
		EX. ACTIVE RAILROAD
		EX. TREE TO REMAIN
		EX. FEMA FLOODWAY
		EX. FEMA FLOOD HAZARD AREA (100-YR)
		EX. FEMA FLOOD HAZARD AREA (500-YR)
		EX. SEWER OUTFALL
		EX. STORM MANHOLE
		EX. SANITARY MANHOLE
		EX. UTILITY POLE
		EX. GUY WIRE
		EX. TELECOM PEDESTAL
	2620	PROP. SPOT GRADE

NO.	REVISION/ISSUE	DATE

50% DESIGN

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RICHLAND CREEK AND VANCE
GREENWAY RESTORATION

TOWN OF WAYNESVILLE
9 S. MAIN ST.
PO BOX 100
WAYNESVILLE, NC 28786

RESTORATION PLAN

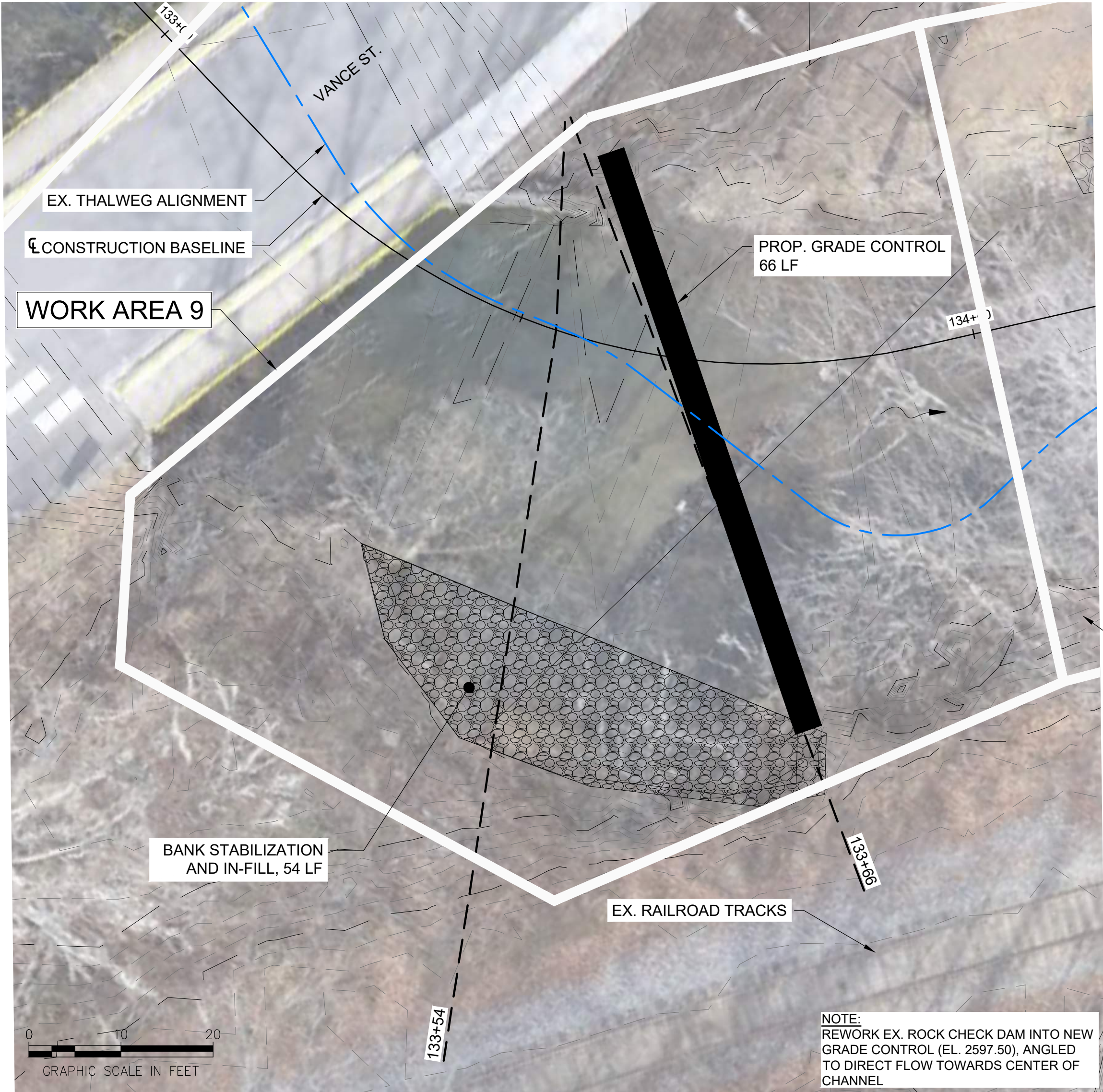
WORK AREAS 4 & 5

DESIGNED BY:	ADH
DRAWN BY:	TG
CHECKED BY:	ET
DATE:	SEPTEMBER 2026

VERT. SCALE: 1" = 10'
HORZ. SCALE: AS SHOWN

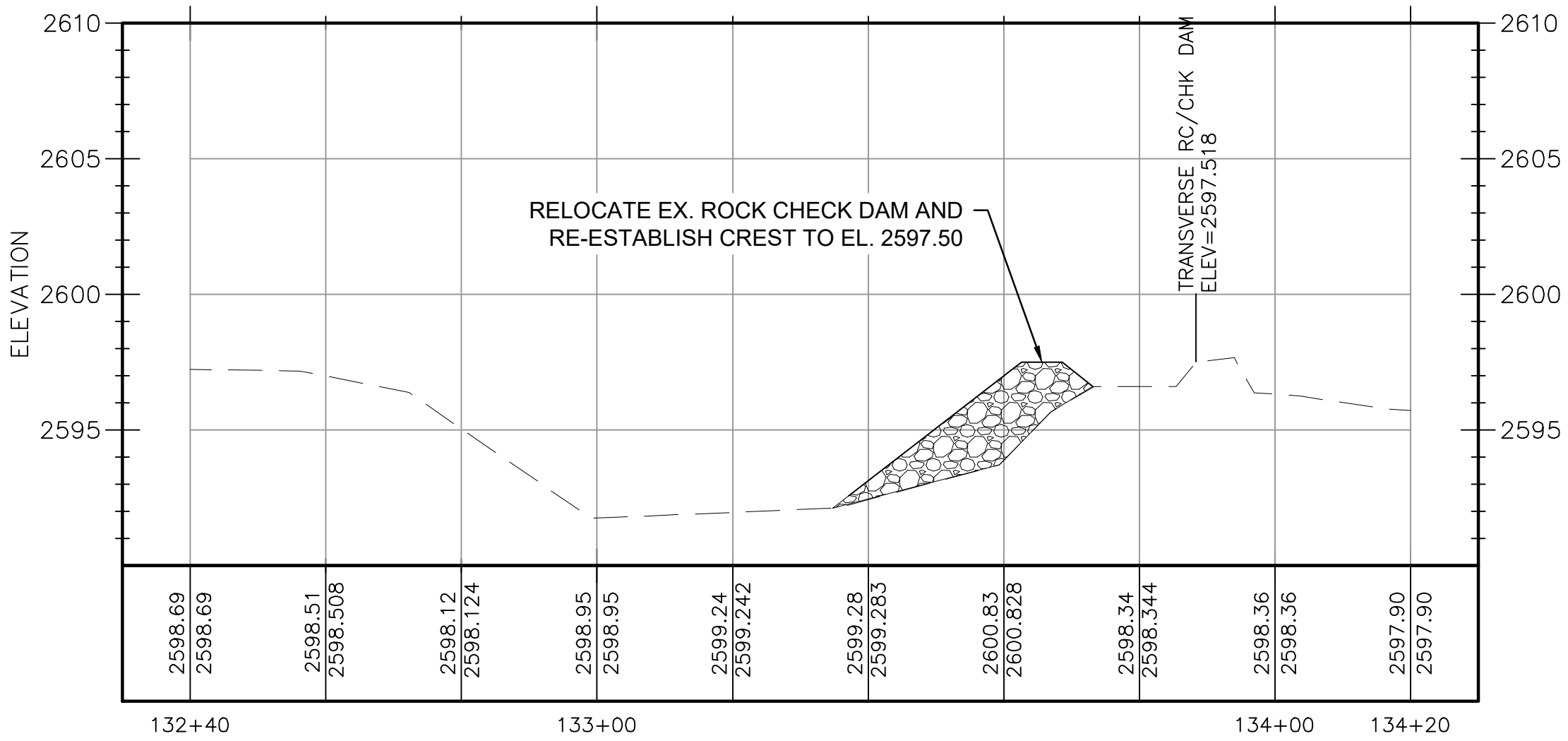
SHEET:
C-08
09 / 32

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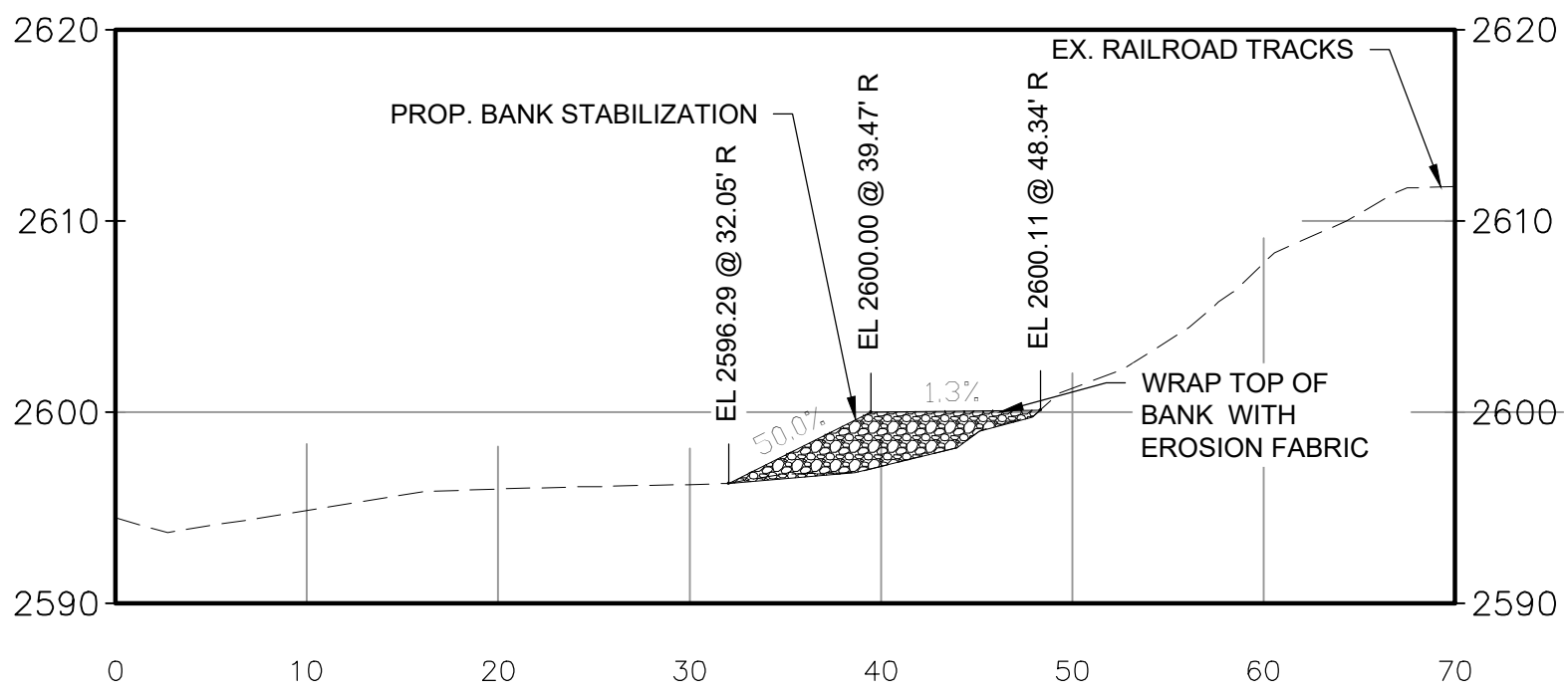


WORK AREA 9 - PLAN
SCALE: 1" = 10'

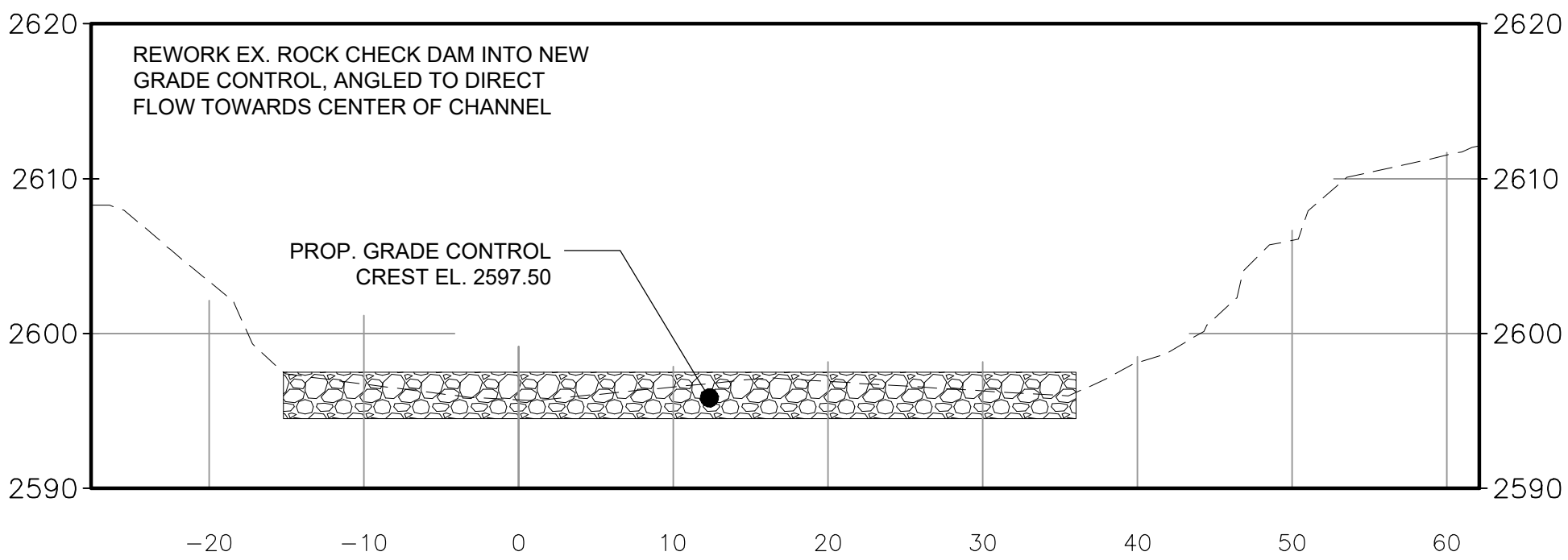
WORK AREA 10
SEE NEXT SHEET



WORK AREA 9 - PROFILE
HORZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 5'

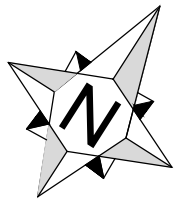


STA. 133+54 - CROSS SECTION
SCALE: 1" = 10'



PROP. GRADE CONTROL (STA. 133+66) - CROSS SECTION
SCALE: 1" = 10'

GENERAL NOTES



**NOT FOR
CONSTRUCTION**

LEGEND

	P/L	PROPERTY LINE
	EX. CONTOURS	EX. CONTOURS
	PROP. CONTOURS	PROP. CONTOURS
	EX. THALWEG	EX. THALWEG
	EX. DELINEATED WETLAND	EX. DELINEATED WETLAND
	STM	EX. STORM SEWER
	SAN	EX. SANITARY SEWER
	W	EX. WATER MAIN
	OHE	EX. OVERHEAD ELECTRIC
	T	EX. TELECOM
		EX. ACTIVE RAILROAD
		EX. TREE TO REMAIN
		EX. FEMA FLOOD HAZARD AREA (100-YR)
		EX. FEMA FLOOD HAZARD AREA (500-YR)
		EX. SEWER OUTFALL
		EX. STORM MANHOLE
		EX. SANITARY MANHOLE
		EX. UTILITY POLE
		EX. GUY WIRE
		EX. TELECOM PEDESTAL
	2620	PROP. SPOT GRADE

NO.	REVISION/ISSUE	DATE

50% DESIGN

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RICHLAND CREEK AND VANCE
GREENWAY RESTORATION

TOWN OF WAYNESVILLE
9 S. MAIN ST.
PO BOX 100
WAYNESVILLE, NC 28786

RESTORATION PLAN

WORK AREA 9

DESIGNED BY: ADH
DRAWN BY: TG
CHECKED BY: ET

DATE: SEPTEMBER 2026

VERT. SCALE: AS SHOWN
HORZ. SCALE: AS SHOWN

SHEET:

C-12

13 / 32

**NOT FOR
CONSTRUCTION**

	P/L	PROPERTY LINE
		EX. CONTOURS
		PROP. CONTOURS
		EX. THALWEG
		EX. DELINEATED WETLAND
	STM	EX. STORM SEWER
	SAN	EX. SANITARY SEWER
	W	EX. WATER MAIN
	OHE	EX. OVERHEAD ELECTRIC
	T	EX. TELECOM
		EX. ACTIVE RAILROAD
		EX. TREE TO REMAIN
		EX. FEMA FLOODWAY
		EX. FEMA FLOOD HAZARD AREA (100-YR)
		EX. FEMA FLOOD HAZARD AREA (500-YR)
		EX. SEWER OUTFALL
		EX. STORM MANHOLE
		EX. SANITARY MANHOLE
		EX. UTILITY POLE
		EX. GUY WIRE
		EX. TELECOM PEDESTAL
	2620	PROP. SPOT GRADE

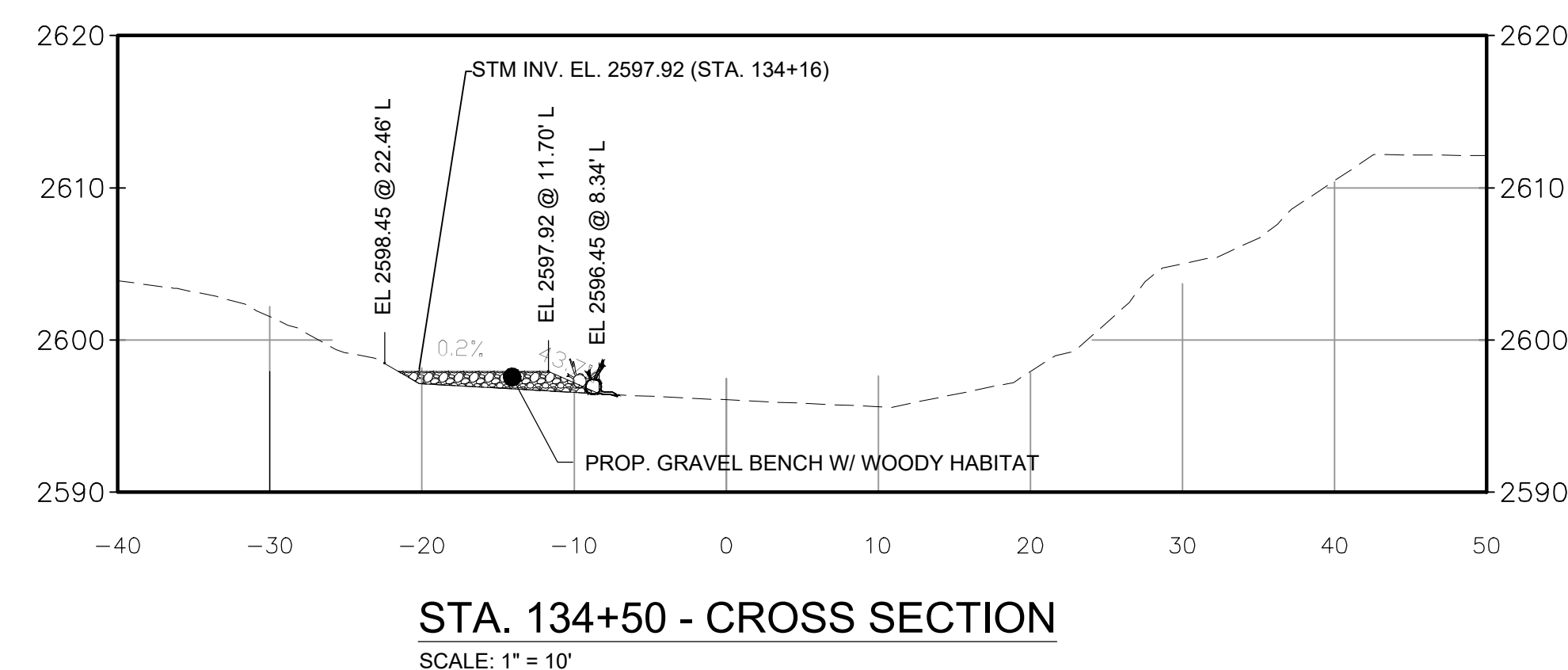
50% DESIGN

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WORK AREA 10

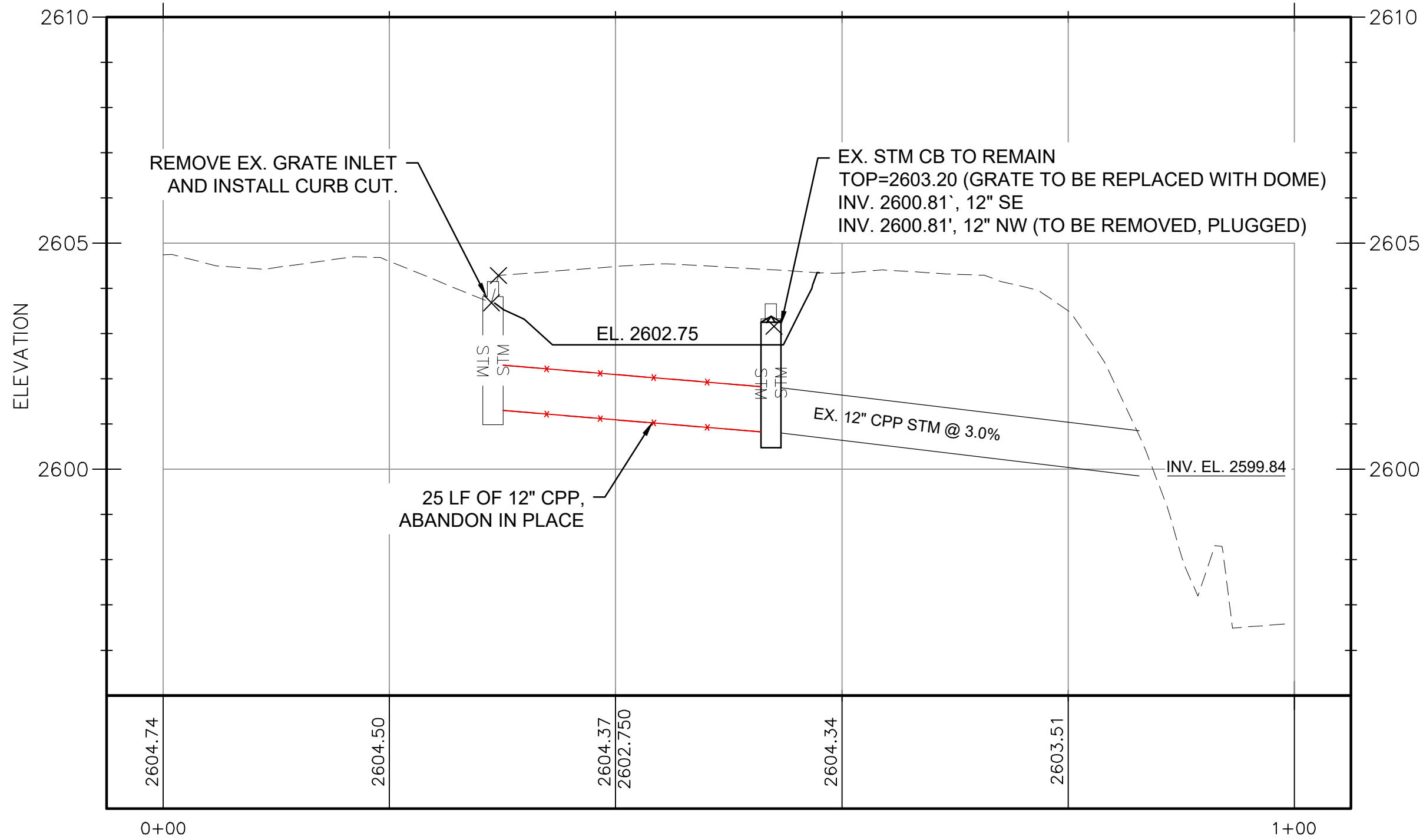
14 / 32



C:\USERS\GREGORY\ONE DRIVE - ACTUATES CAD FILES HOSTING - ES ENGINEERING\B-0154 RICHLAND CREEK RESTORATION DESIGN\B-0154 RICHLAND CREEK RESTORATION DESIGN\B-0154 AREA 11 C-14 - 9/10/2026 4:50:19 PM - THAD GREGORY

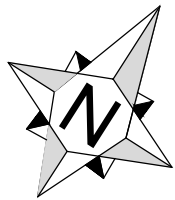


WORK AREA 11 - PLAN
SCALE: 1" = 10'



STORM WATER CAPTURE AREA - PROFILE
HORIZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 5'

GENERAL NOTES



**NOT FOR
CONSTRUCTION**

LEGEND

— P/L —	PROPERTY LINE
- - -	EX. CONTOURS
- - -	PROP. CONTOURS
— — —	EX. THALWEG
[Pattern]	EX. DELINEATED WETLAND
— STM —	EX. STORM SEWER
— SAN —	EX. SANITARY SEWER
— W —	EX. WATER MAIN
— OHE —	EX. OVERHEAD ELECTRIC
— T —	EX. TELECOM
— — —	EX. ACTIVE RAILROAD
[Tree]	EX. TREE TO REMAIN
- - - - -	EX. FEMA FLOODWAY
- - - - -	EX. FEMA FLOOD HAZARD AREA (100-YR)
- - - - -	EX. FEMA FLOOD HAZARD AREA (500-YR)
○	EX. SEWER OUTFALL
⊙	EX. STORM MANHOLE
⊙	EX. SANITARY MANHOLE
⊙	EX. UTILITY POLE
⊙	EX. GUY WIRE
[Box]	EX. TELECOM PEDESTAL
⊕ 2620	PROP. SPOT GRADE

NO.	REVISION/ISSUE	DATE

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RICHLAND CREEK AND VANCE
GREENWAY RESTORATION

TOWN OF WAYNESVILLE
9 S. MAIN ST.
PO BOX 100
WAYNESVILLE, NC 28786

RESTORATION PLAN

WORK AREA 11

DESIGNED BY: ADH
DRAWN BY: TG
CHECKED BY: ET

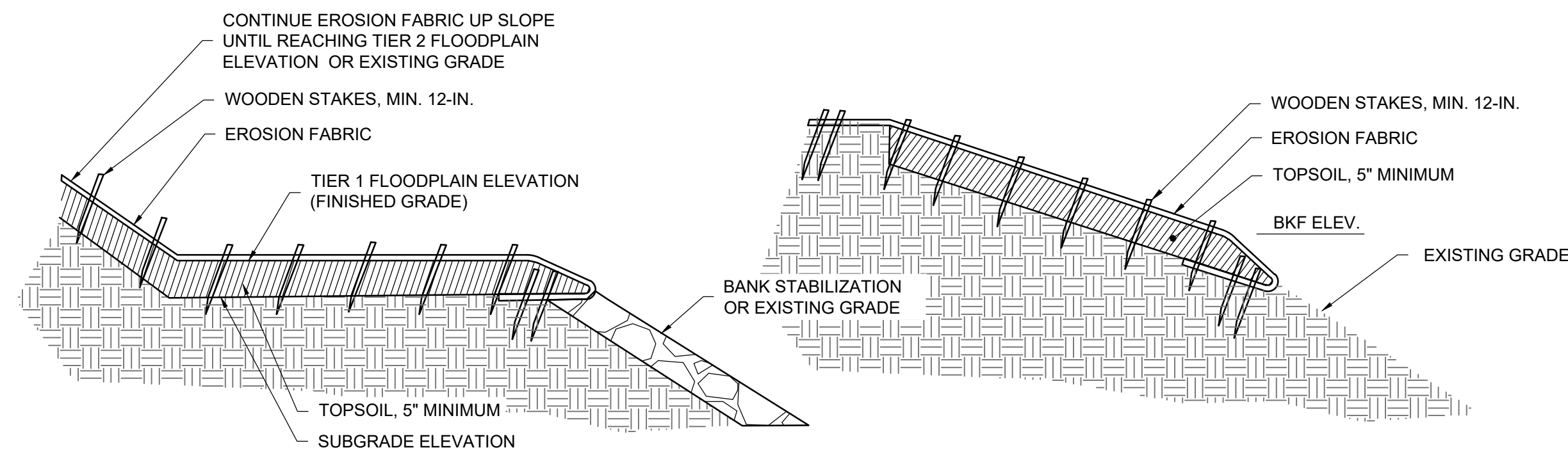
DATE: SEPTEMBER 2026

VERT. SCALE: AS SHOWN
HORIZ. SCALE: AS SHOWN

SHEET:

C-08

15 / 32



EX. GRADE

GRADE SOIL EMBANKMENT
AT 3:1 SLOPE;
PLACE EROSION FABRIC ON
DISTURBED AREAS

NOTE: REFER TO PLAN VIEW SHEETS FOR
EXTENTS OF GRADE OUT AREAS.

TOPSOIL, 5"-MIN

BKF ELEV.

BASE FLOW WATER ELEVATION

WOODY HABITAT #1
(SEE DETAIL NEXT SHEET)

SUBSTRATE: EXISTING OR PLACED

UPPER BANK PLANTINGS:

EXISTING STREAM BANK

LOWER BANK PLANTINGS:

3.0 / 2.0 (PER PLAN)

1.0

GRADE AT 3:1

COIR FABRIC

LIVE STAKING/BAREROOT TRENCH

TOE ROCK

ORDINARY HIGH WATER MARK

SUBSTRATE

PLAN VIEW

HIGH ENOUGH TO CATCH THE NEXT ROW OF LOGS. PLACE SECOND ROW OF LOGS BEHIND AND ON TOP OF FIRST ROW. BE SURE NOT TO BUILD A VERTICAL LOG CRIB, SHOULD NOT BE STEEPER THAN 1:1. PLACE BRANCHES ON TOP OF LOG THEN USE WOOD PINS TO SECURE LOGS. REPEAT UNTIL THE DESIRED HEIGHT IS ACHIEVED. TYPICALLY THIS EXTENDS ABOVE BASE FLOW TO APPROXIMATELY 1/4 BANKFULL HEIGHT. THE LAST ONE OR TWO LIFTS OR IMMEDIATELY ABOVE BASE WATER LEVEL, BRANCHES CAN BE INTERMIXED WITH LIVE STAKES OR LIVE CUTTINGS.

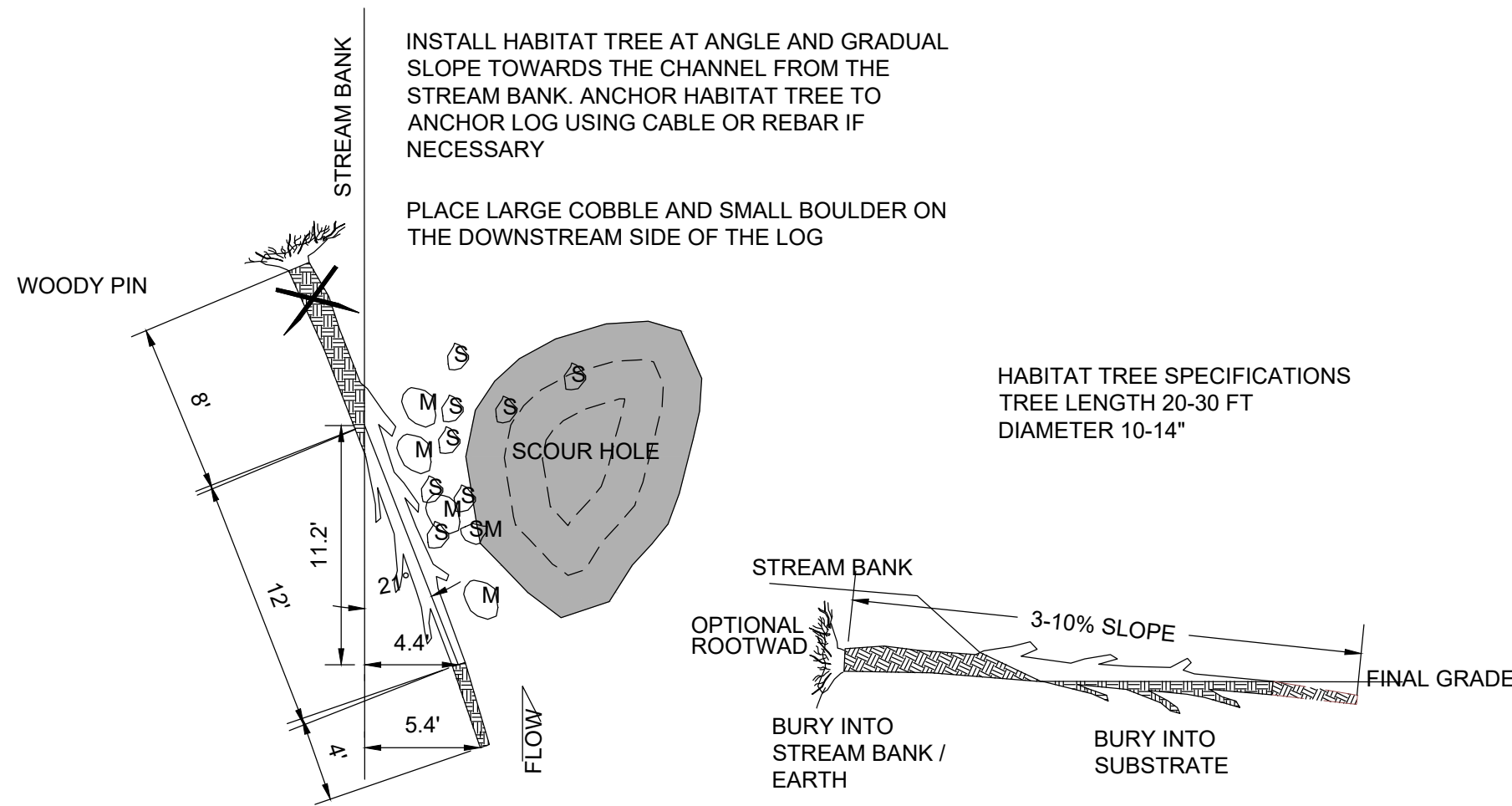
NO.	REVISION/ISSUE	DATE

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RICHLAND CREEK AND VANCE
GREENWAY RESTORATION

STANDARD DETAILS

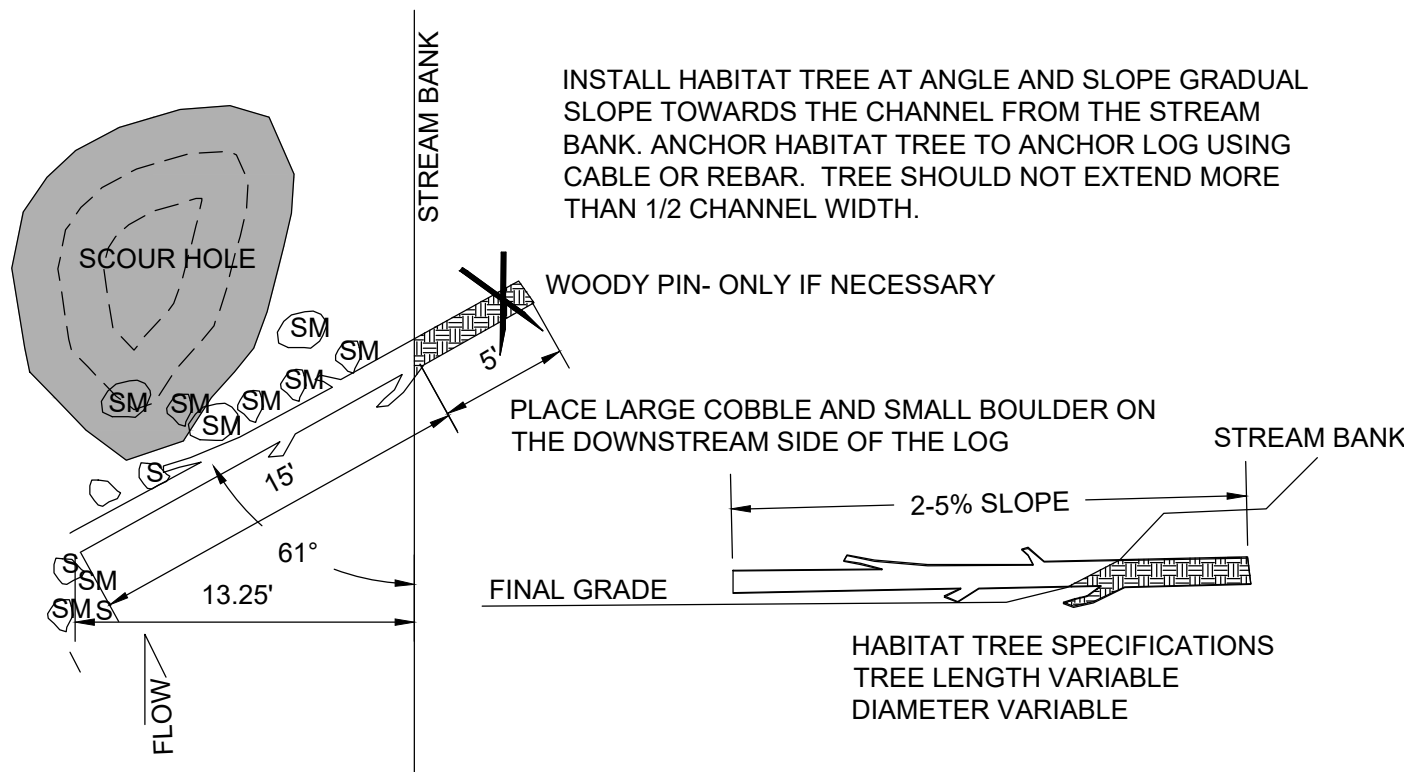
SHEET:
D-01
17 / 32



PLAN VIEW

BANK PROFILE

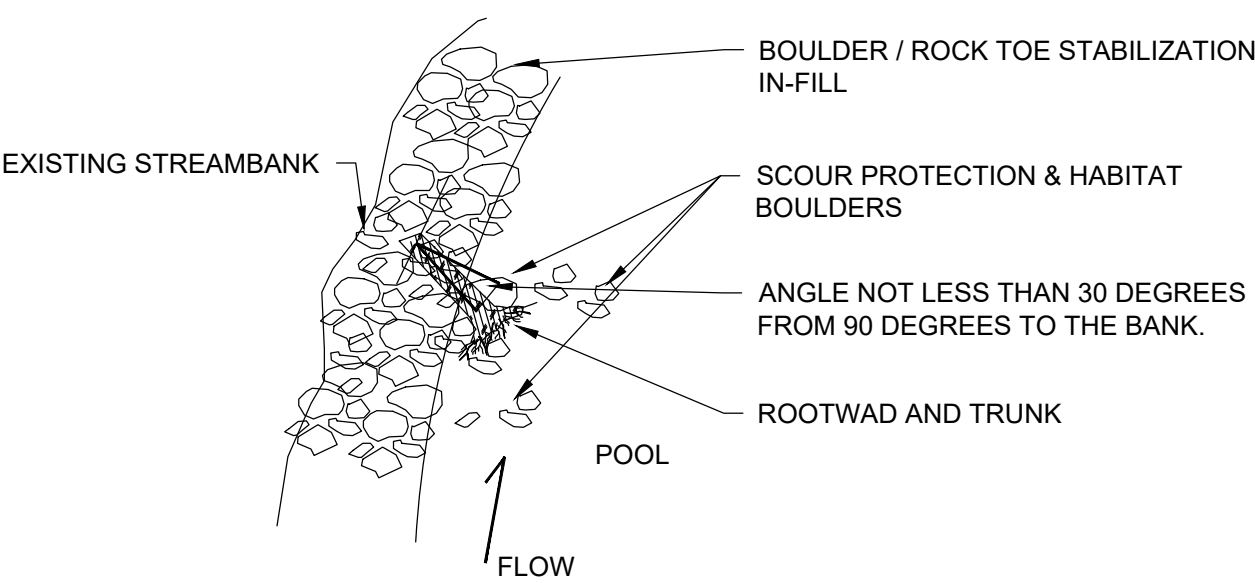
WOODY HABITAT #4 STREAMBED LOG/BOULDER HABITAT



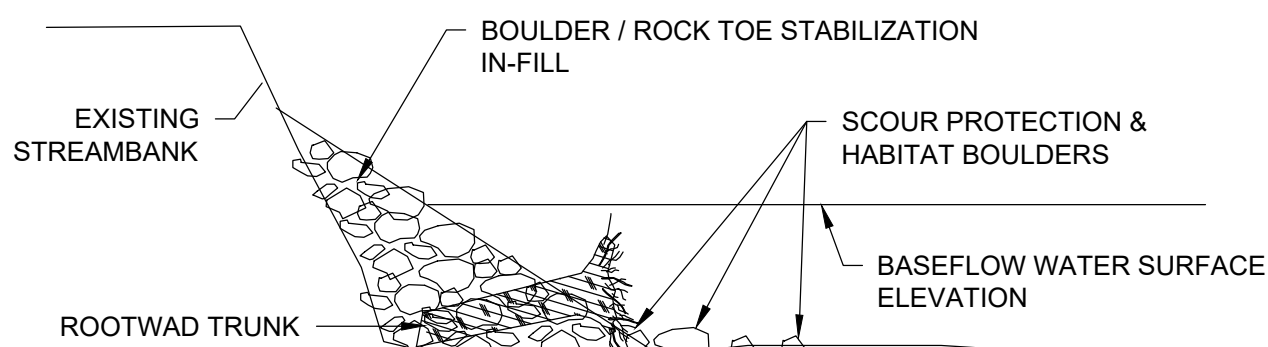
PLAN VIEW

CROSS SECTION

WOODY HABITAT #3 ANGLED VANE

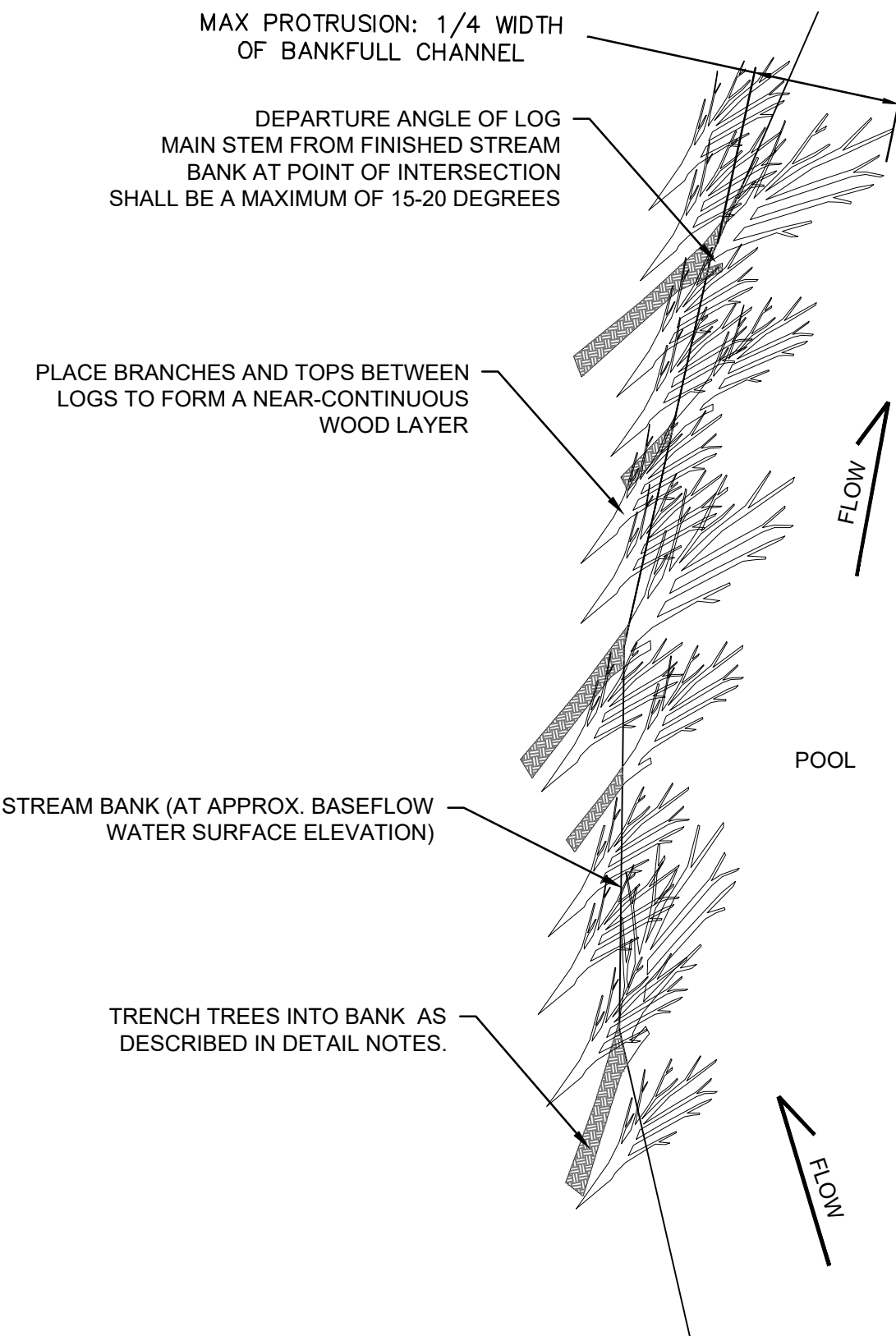


PLAN VIEW



CROSS SECTION

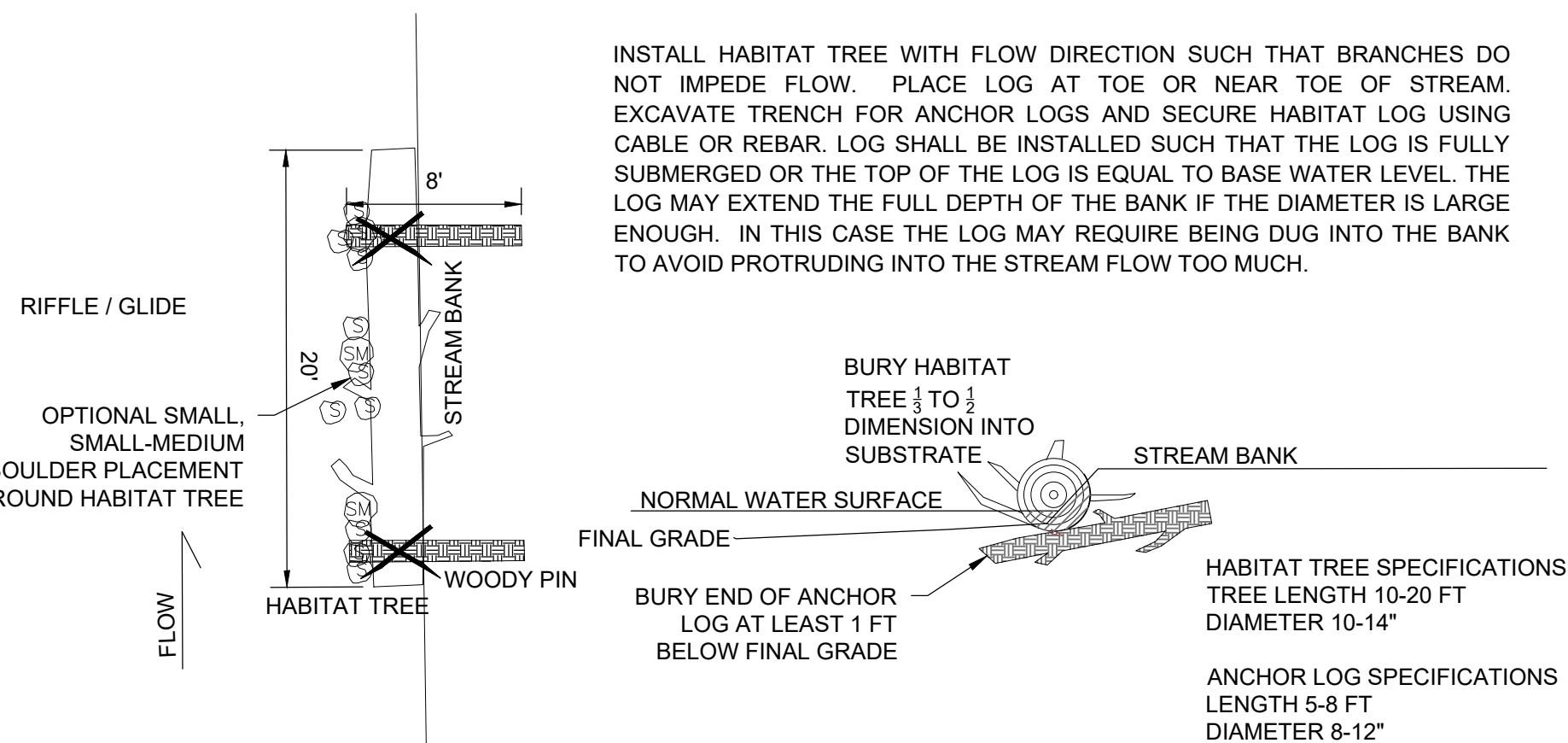
WOODY HABITAT #7
STREAMBANK ROOTWAD SCOUR POOL



PLAN VIEW

OUTSIDE MEANDER LOG HABITAT STRUCTURE TABLE					
STRUCTURE NUMBER	BANK	BEGIN STA	END STA	TOTAL LENGTH (LF)	CP 1
WT-1	LEFT	6+12	6+55	43	766.0'
WT-2	RIGHT	8+86	10+98	212	764.6'
WT-3	RIGHT	13+49	15+97	248	762.8'
WT-4	LEFT	27+98	30+29	231	759.0'

WOODY HABITAT #1 OUTSIDE MEANDER LOG/BRANCH HABITAT



PLAN VIEW

CROSS SECTION

WOODY HABITAT #5 SHALLOW BANK LOG HABITAT

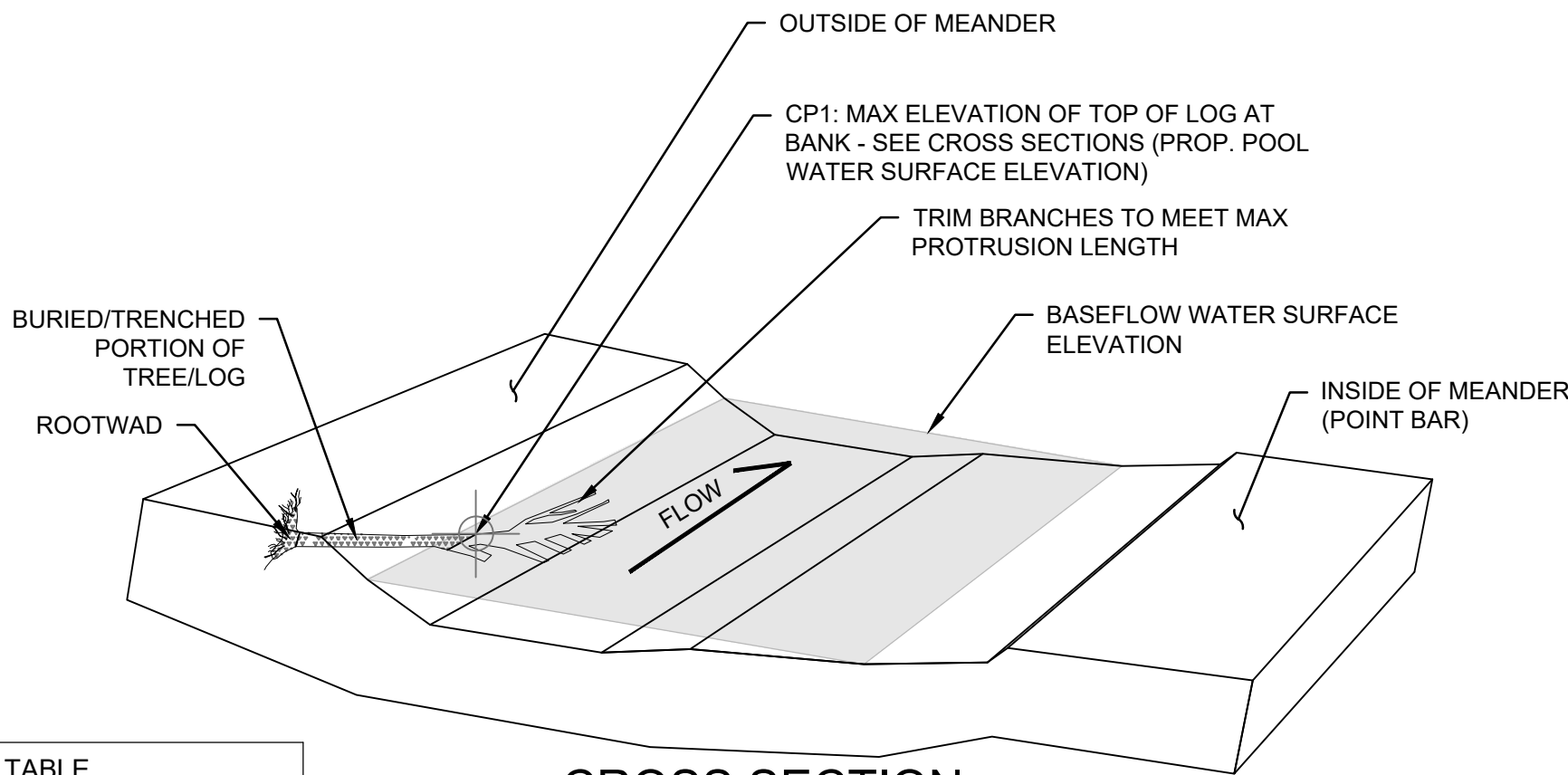
NOTES:

MATERIALS & SIZING:

- INSTALLED WOODY HABITAT SHALL BE SIZED APPROPRIATELY FOR THE SPECIFIC MEANDER GEOMETRY, SPECIFIC LOCATION, AVAILABILITY AND DIRECTION BY ENGINEER OR THE ENGINEER'S REPRESENTATIVE.
- MATERIAL SHALL BE A MINIMUM OF 15-FT IN LENGTH, WITH 5-FT OF THAT LENGTH TRENCHED INTO THE BANK.
- MATERIAL SHALL BE A MINIMUM OF 4 - 5 INCHES IN DIAMETER.
- ALL BRANCHES LESS THAN 3-INCHES IN DIAMETER SHALL BE REMOVED PRIOR TO INSTALLATION OF TREES/LOGS.
- WOODY MATERIAL REMOVED/HARVESTED FROM THE STREAM (EX. LOG JAM) CAN BE USED FOR THESE FEATURES.

INSTALLATION:

- WOODY HABITAT SHALL BE INSTALLED SUCH THAT A MINIMUM OF 90% OF ALL WOOD IS BELOW THE BASEFLOW WATER SURFACE ELEVATION.
- INSTALL TREE/LOG WITH ROOTWAD ATTACHED IF POSSIBLE
- PLACE ROCK SHOWN IN THESE DRAWINGS AS BELOW TREE/LOG PRIOR TO TREE/LOG PLACEMENT. CONTRACTOR SHALL NOT ASSUME THAT ROCK CAN BE PLACED BELOW TREE/LOG AFTER TREE/LOG IS ANCHORED.
- NO STAKING OR PINS ARE REQUIRED
- TRENCHING:
 - WOODY HABITAT WILL BE INSTALLED IN A DOWNSTREAM ORIENTATION
 - TRENCH ANGLE SHALL BE 15-20 DEGREES TO POINT OF INTERSECTION WITH FINISHED STREAM BANK
 - TRENCH SLOPE SHALL BE ANGLED DOWNWARD TO ENSURE STEM AND BRANCHES ARE BELOW THE POOL WATER SURFACE ELEVATION BUT NOT ALLOW THE BURIED PORTION OF THE TREE/LOG TO BE EXPOSED
 - ANY ROCK TOE PROTECTION BELOW POOL WATER SURFACE ELEVATION SHOULD BE INSTALLED PRIOR TO TRENCHING
 - DO NOT OVER-EXCAVATE TRENCH
 - TRENCH SHALL BE BACKFILLED IN 9-INCH LIFTS WITH THE ORIGINAL MATERIAL AND COMPACTED WITH THE EXCAVATOR BUCKET TO ENSURE STABILITY
 - BRANCHES EXTENDING BEYOND THE MAX PROTRUSION CAN EITHER BE TRIMMED OR HINGE-CUT AND PINNED IN PLACE.



CROSS SECTION

GENERAL NOTES

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GREENWAY RESTORATION

TOWN OF WAYNESVILLE
9 S. MAIN ST.
PO BOX 100
WAYNESVILLE, NC 28786

STANDARD DETAILS

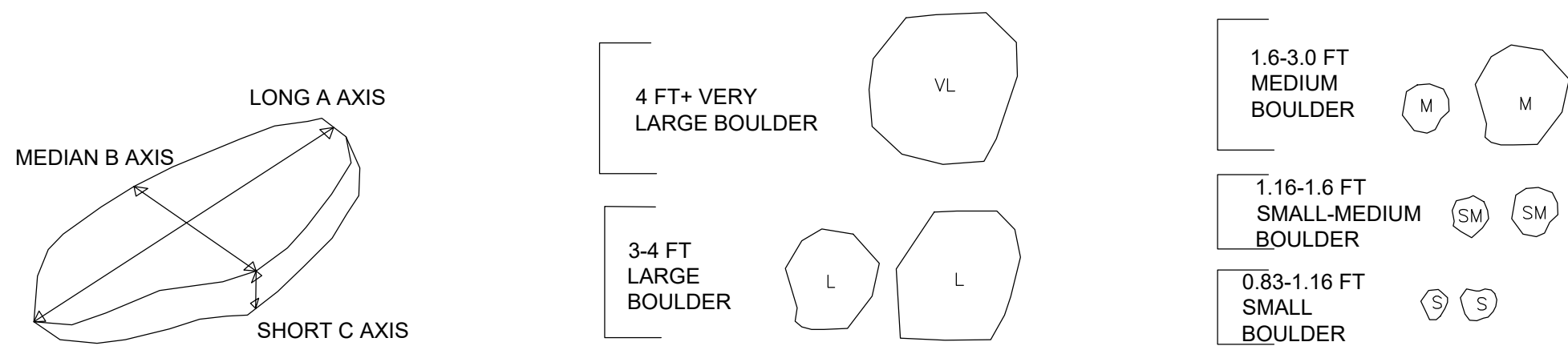
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DRAWN BY: TG
CHECKED BY: ET
DATE: SEPTEMBER 2026
VERT. SCALE: NA
HORZ. SCALE: NA

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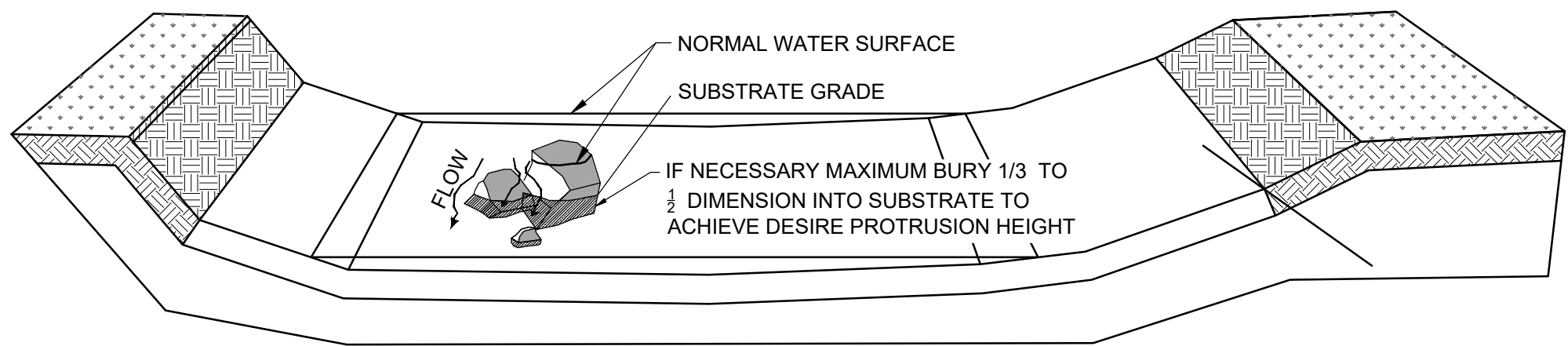
D-02

18 / 32

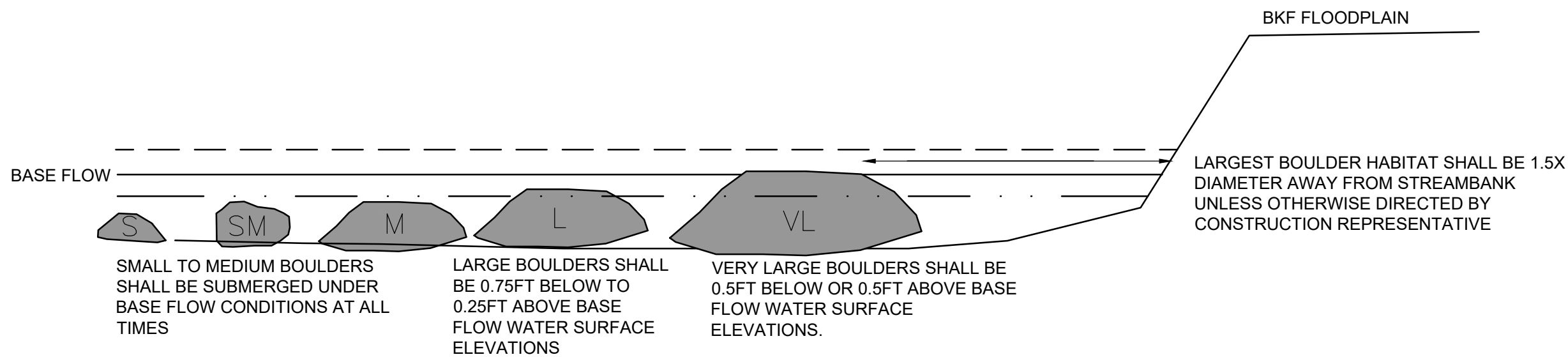
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TYPICAL BOULDER SIZES BY TYPE MEASURED BY MEDIAN B-AXIS

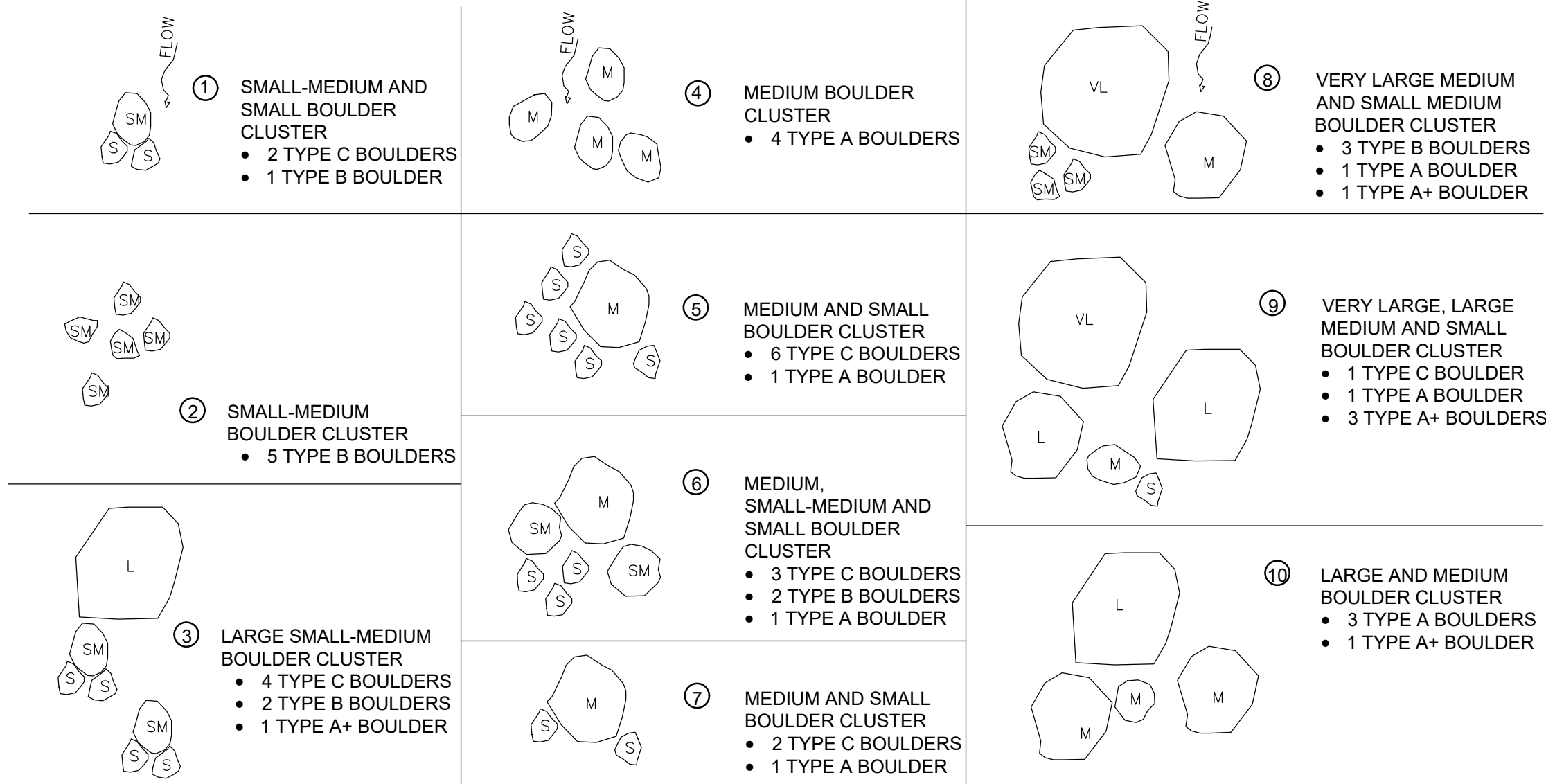


TYPICAL BOULDER HABITAT INSTALLATION
SUPPLEMENTAL BOULDERS AND BOULDER CLUSTERS



RIFFLE, RUN, GLIDE BOULDER HABITAT STREAMBED PROTRUSION DETAIL

NOTE: ALL BOULDER HABITAT TYPES SHALL BE FULLY SUBMERGED 1.5 FT MINIMUM BELOW WATER SURFACE ELEVATION IN POOL AREAS.



BOULDERS HABITATS ARE TO BE PLACED PER PLAN AND AT THE DISCRETION OF THE CONSTRUCTION REPRESENTATIVE. BOULDERS SHALL BE PLACED SUCH THAT THEIR PROTRUSION HEIGHT IS LESS THAN 1/3 BANKFULL HEIGHT IN A RIFFLE. BOULDERS PLACED INTO POOL HABITATS SHALL NOT PROTRUDE MORE THAN 1FT FROM FINISH GRADE ELEVATION UNLESS OTHERWISE DIRECTED. FLAT OR ANGULAR BOULDERS ARE PREFERRED TO ROUNDED BOULDERS. BOULDERS SHALL NOT BE PLACED IN A POSITION THAT CAUSES LATERAL SCOUR INTO A STREAMBANK. BOULDERS PLACED NEAR STREAMBANKS SHALL BE AT LEAST 1.5 BOULDER DIAMETER OF EXPOSED SURFACE FROM STREAMBANK.

BOULDER HABITATS (1-10)

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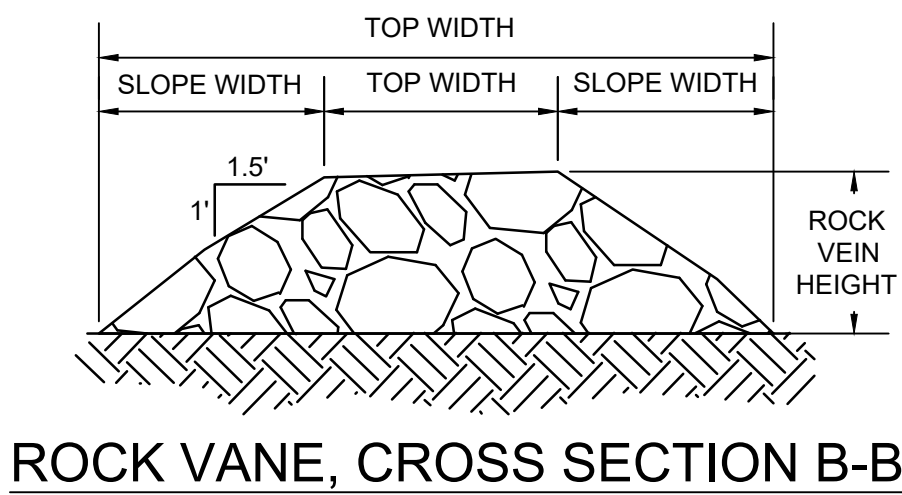
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GREENWAY RESTORATION

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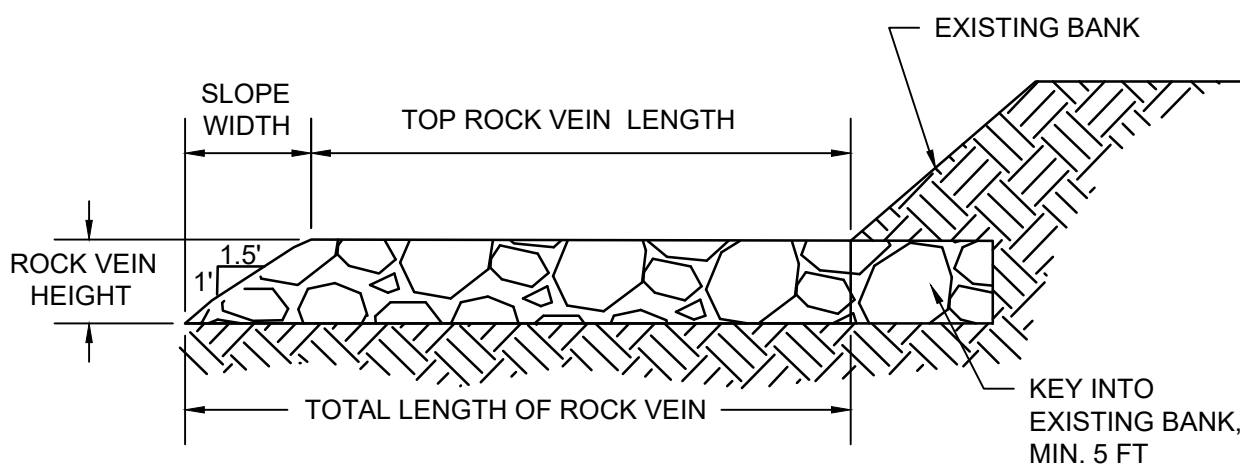
STANDARD DETAILS

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VERT. SCALE: NA
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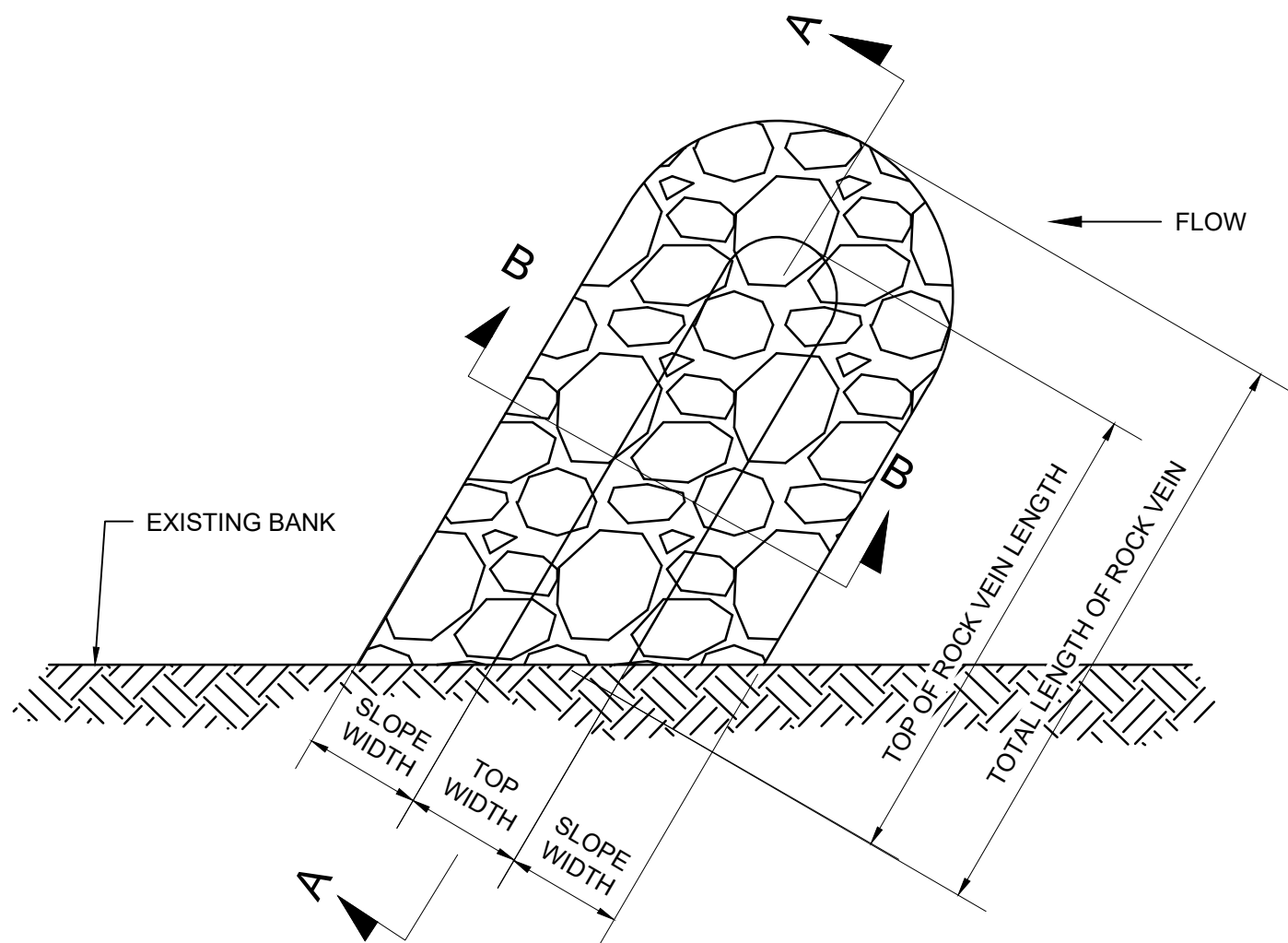
SHEET:
D-03
19 / 32



ROCK VANE, CROSS SECTION B-B

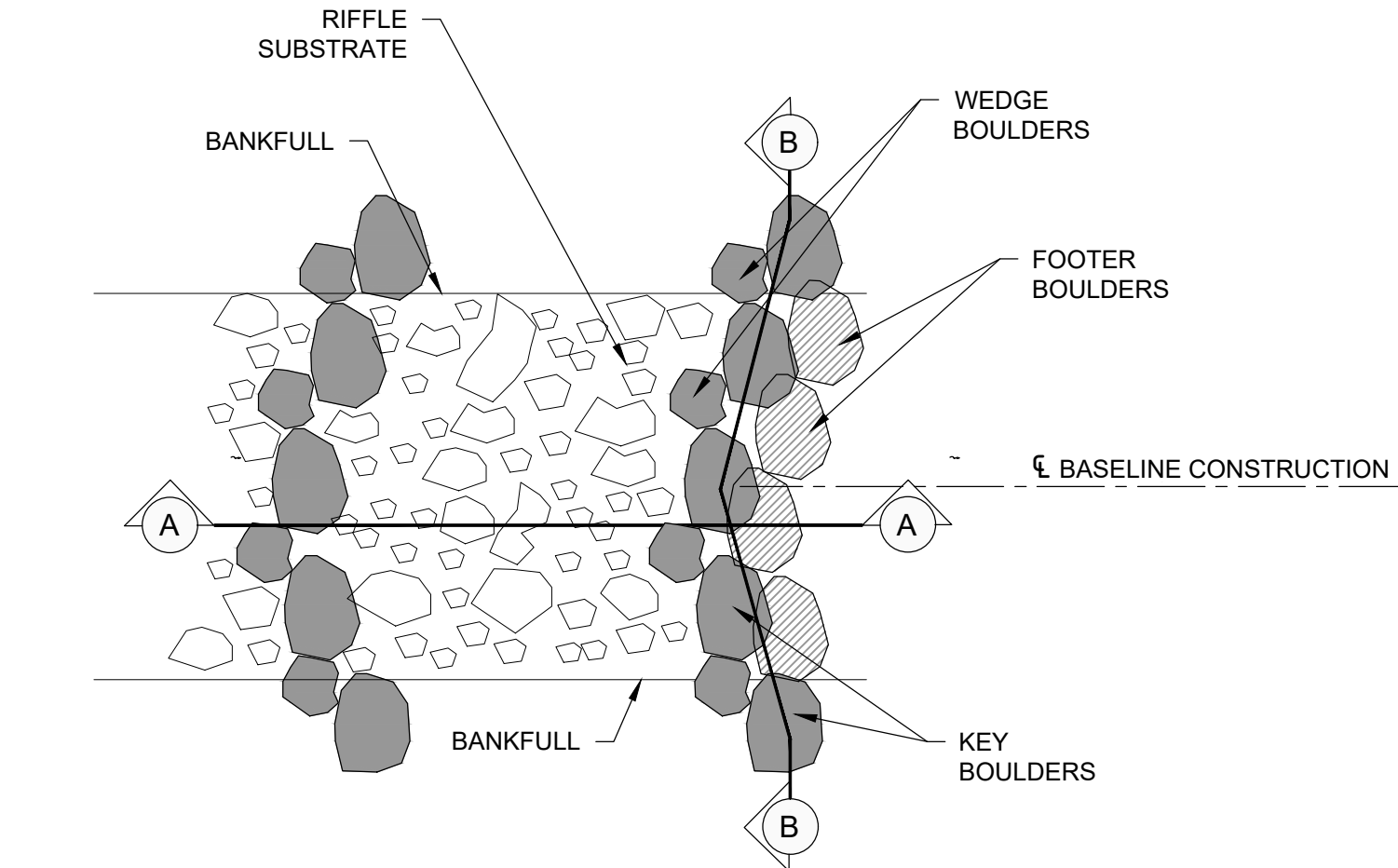


ROCK VANE, CROSS SECTION A-A

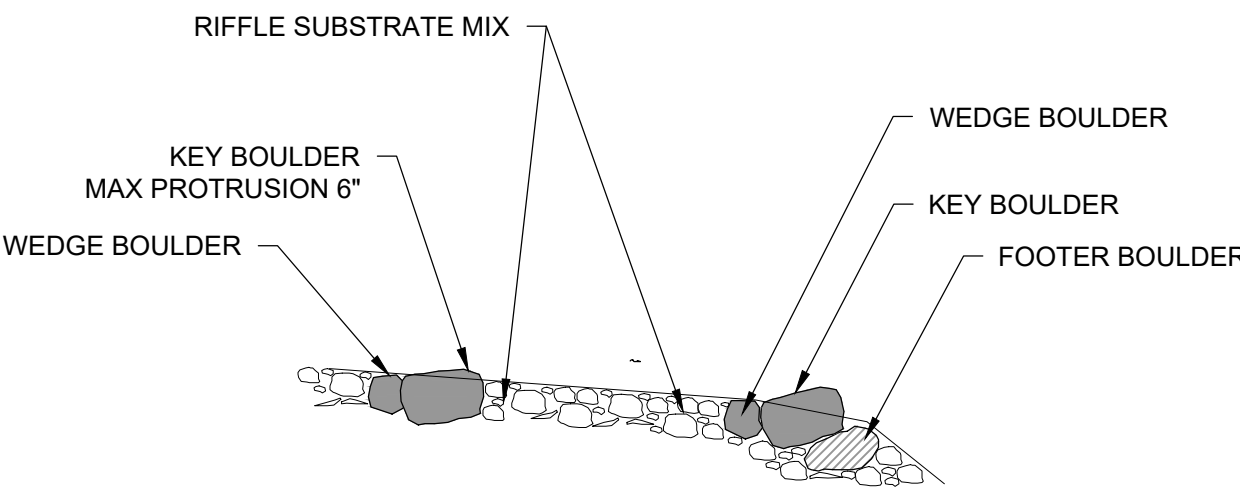


ROCK VANE - PLAN VIEW

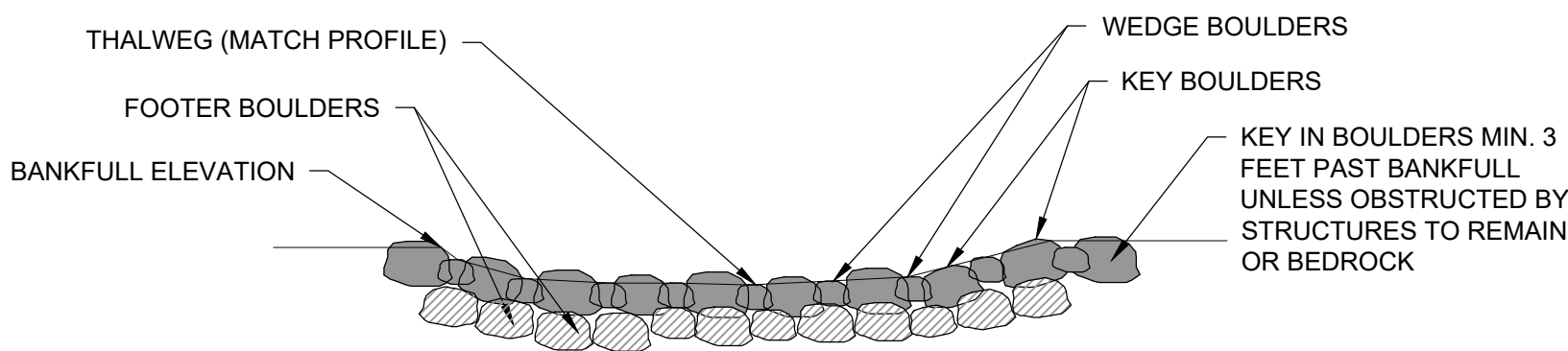
ROCK VANE - DETAIL
NOT TO SCALE



GRADE CONTROL PLAN VIEW



A GRADE CONTROL PROFILE VIEW



B GRADE CONTROL CROSS SECTION VIEW

- NOTES:
- FOOTER BOULDERS ARE ONLY REQUIRED IN GRADE CONTROLS AT THE DOWNSTREAM EXTENT OF RIFFLES. MID-RIFFLE GRADE CONTROLS DO NOT REQUIRE FOOTER BOULDERS. HOWEVER, GRADE CONTROL MATERIAL NEEDS TO BE EMBEDDED TO ACT AS A STRUCTURAL CONTROL TO HOLD THE SUBSTRATE MIX AND FINISH GRADES SHOULD BE FLUSH WITH THE RIFFLE AS TO NOT PRODUCE ANY UNNECESSARY TURBULENCE OR SCOUR.
 - ALL BOULDERS SHALL MEET THE FOLLOWING MINIMUM SIZE REQUIREMENTS:
 - FOOTER BOULDERS SHALL HAVE A MINIMUM DIMENSION ON ANY AXIS OF 36".
 - KEY BOULDERS SHALL HAVE A MINIMUM DIMENSION ON ANY AXIS OF 36".
 - WEDGE BOULDERS SHALL HAVE A MINIMUM DIMENSION ON ANY AXIS OF 24".
 - SEQUENCE OF CONSTRUCTION:
 - EXCAVATE AS NECESSARY TO ACCOMMODATE ALL BOULDERS.
 - FOOTER BOULDERS SHALL BE PLACED FIRST AND DOWNSTREAM OF THE FINISH GRADE BOULDER LOCATION SUCH THAT THE BOULDERS WILL LIE IN COMPRESSION. PLACE FOOTER BOULDERS SUCH THAT EACH BOULDER FITS SNUGLY AGAINST ADJACENT BOULDERS. FILL GAPS BETWEEN FOOTER BOULDERS WITH ALLUVIAL OR OTHER ROCK MATERIAL.
 - PLACE KEY BOULDERS SUCH THAT THEY ANGLE "BACK" UPSTREAM AND ARE FIRMLY SEATED ON FOOTER BOULDERS.
 - LEAVE A MAXIMUM OF 1-FOOT OF SPACE BETWEEN KEY BOULDERS. KEY BOULDERS SHALL PROTRUDE NO MORE THAN 6" ABOVE PROPOSED GRADE OF RIFFLE.
 - PLACE WEDGE BOULDERS BETWEEN KEY BOULDERS AND LOCK INTO PLACE WITH RIFFLE SUBSTRATE MIX. WEDGE BOULDERS SHALL MATCH THE TYPICAL CROSS SECTION AND PROPOSED GRADE SHAPE OF THE RIFFLE.

GENERAL NOTES

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RICHLAND CREEK AND VANCE
GREENWAY RESTORATION

TOWN OF WAYNESVILLE
9 S. MAIN ST.
PO BOX 100
WAYNESVILLE, NC 28786

STANDARD DETAILS

DESIGNED BY: ADH
DRAWN BY: TG
CHECKED BY: ET

DATE: SEPTEMBER 2026

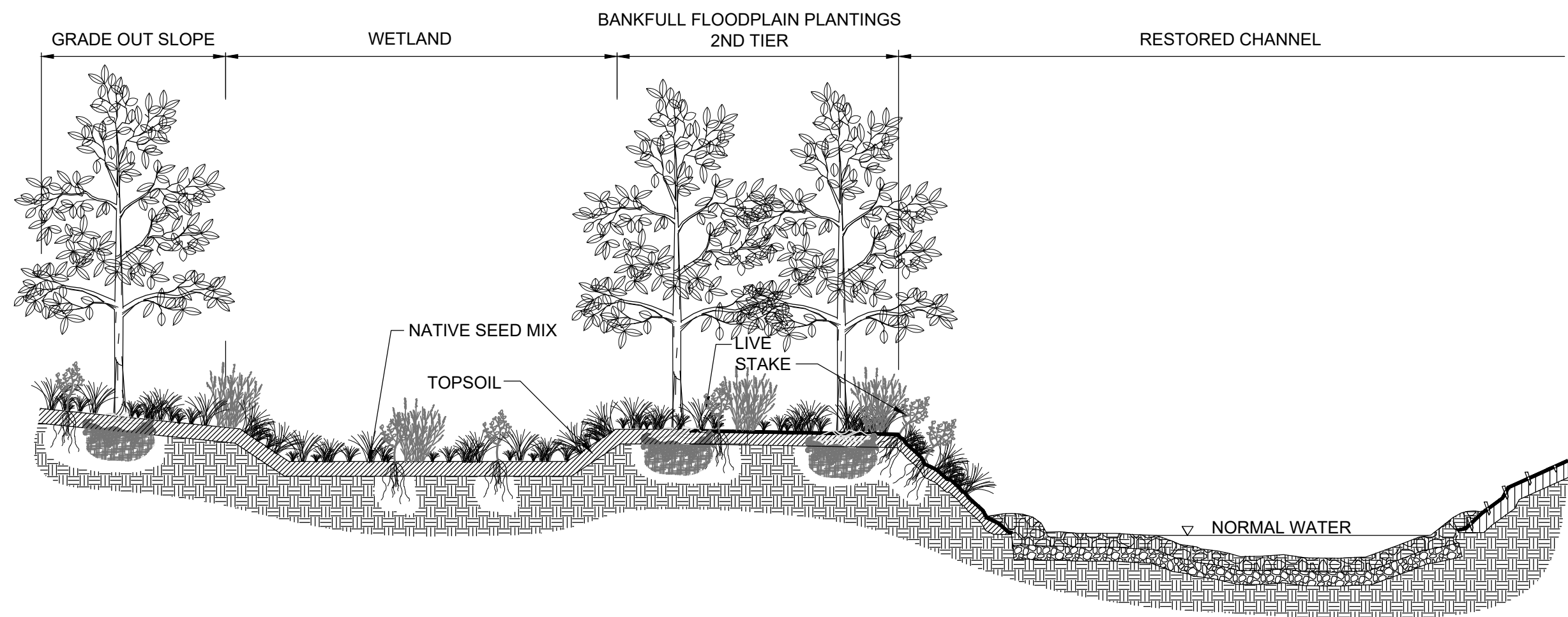
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HORZ. SCALE: NA

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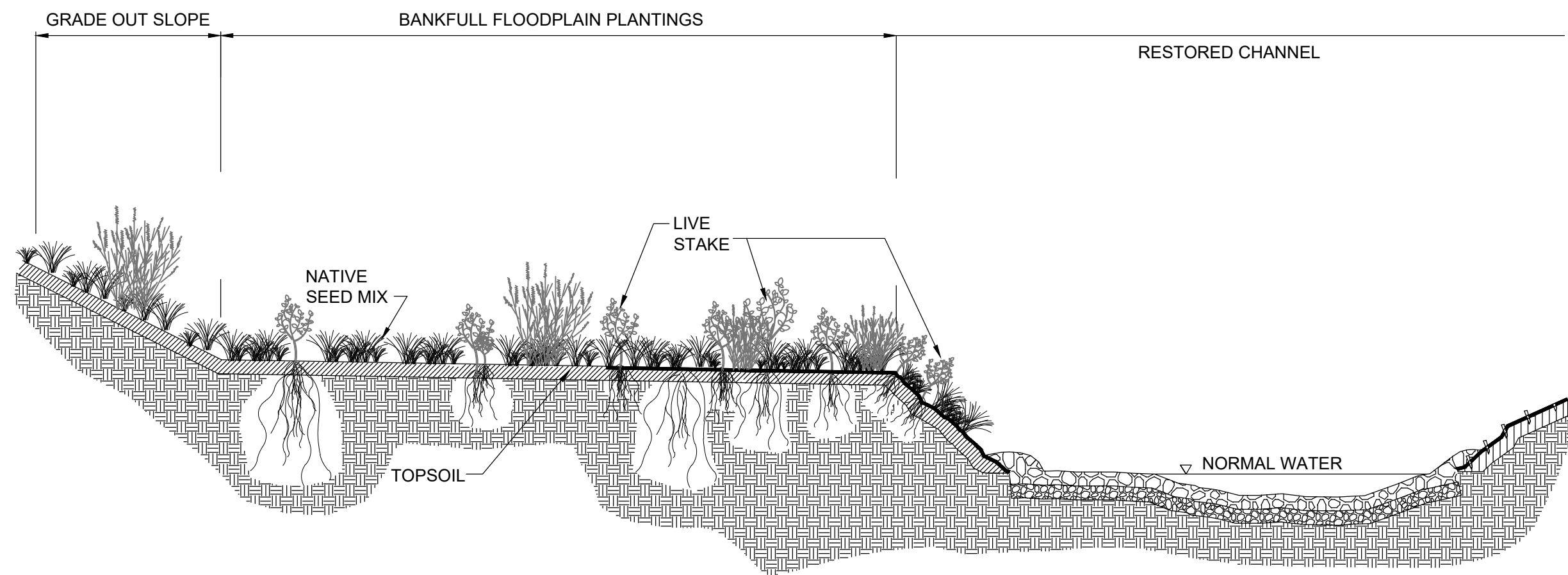
D-04

20 / 32

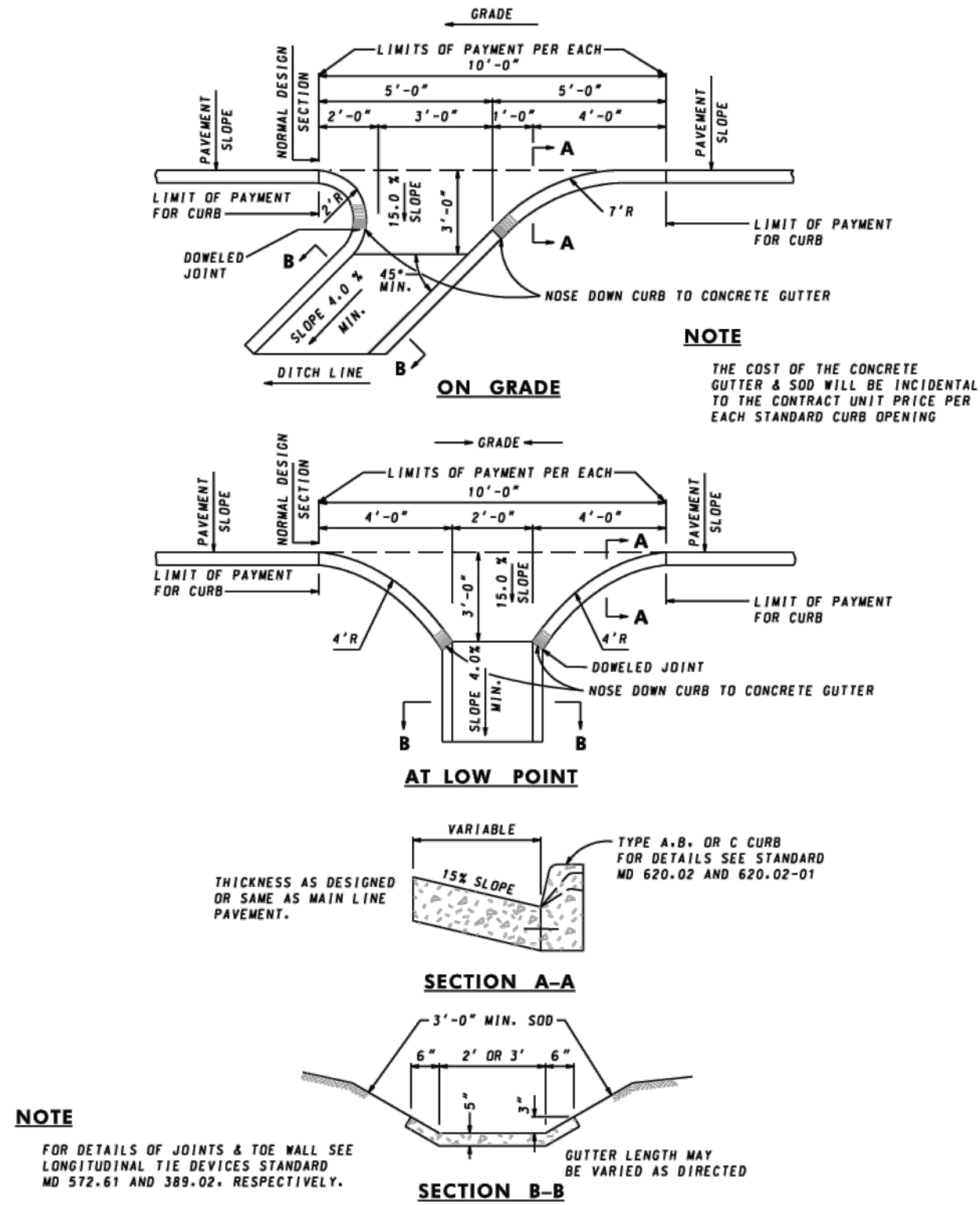
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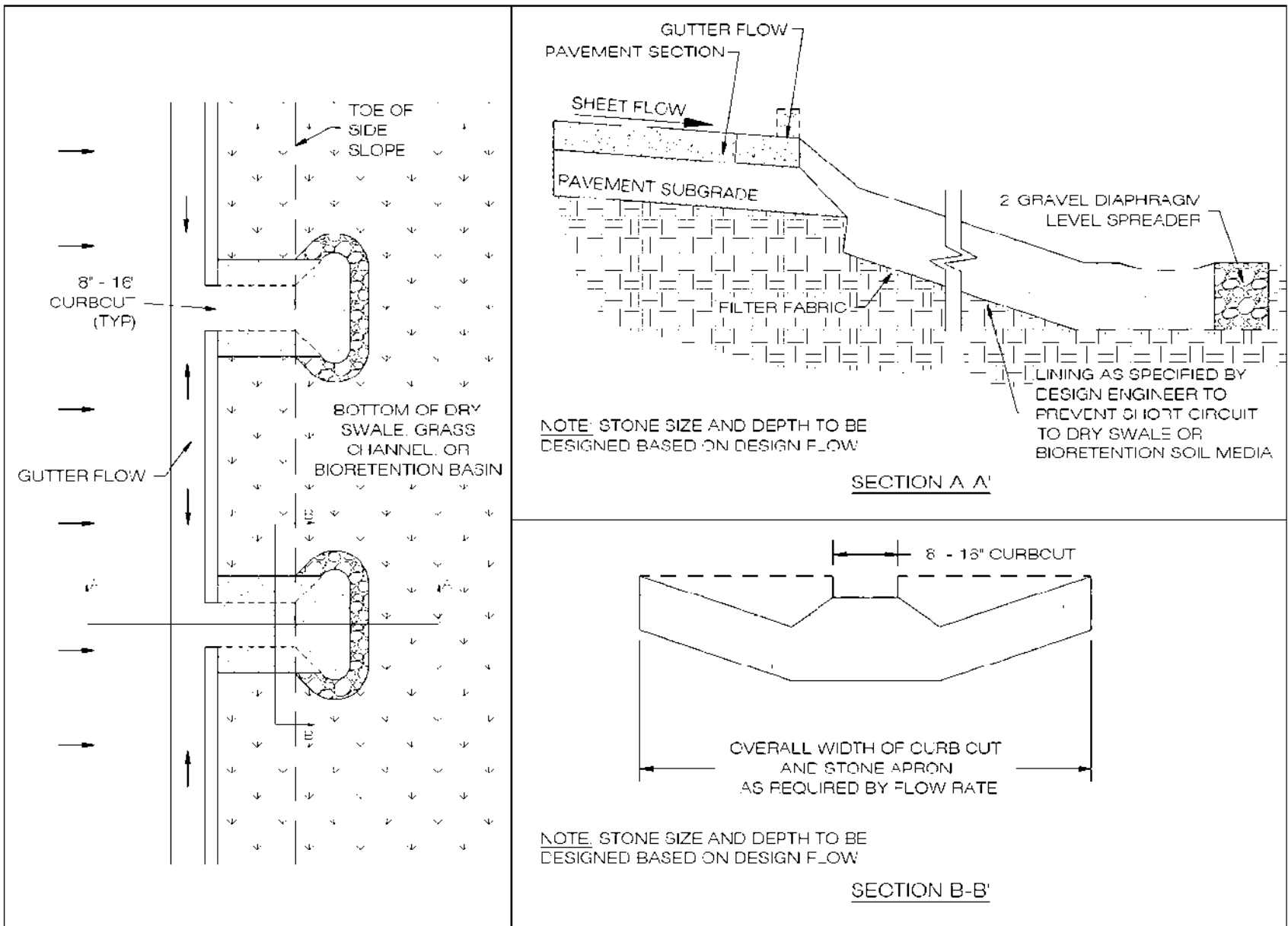
WETLAND PLANTING DETAIL



RESTORATION FLOODPLAIN PLANTING SCHEMATIC



CURB CUT PAVEMENT DETAIL



LEVEL SPREADER DETAIL

GENERAL NOTES

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STANDARD DETAILS

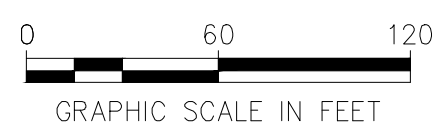
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DRAWN BY: TG
CHECKED BY: ET
DATE: SEPTEMBER 2026
VERT. SCALE: NA
HORZ. SCALE: NA

SHEET:
D-05
21 / 32

1. 5450 LIVES STAKES BASED ON 5265 LF WITH AN ASSUMPTION OF 3 ROWS PLANTED 3-FT O.C.
2. 1167 CONTAINERIZED TREES BASED ON 2.67 AC WITH AN ASSUMPTION OF 10-FT O.C. PLANTING.
3. 450 HERBACEOUS PLUGS BASED ON 0.20 AC WITH AN ASSUMPTION OF 4.5-FT O.C. PLANTING.

LEGEND

- | | |
|---|--|
|  | PROP. LIVE STAKE AREA
5265 LF |
|  | PROP. RIPARIAN BUFFER
2.7 AC |
|  | PROP. POLLINATOR AREA
0.26 AC |
|  | PROP. RAIN GARDEN
PLANTINGS/ WETLAND SEED
MIX 0.093 AC |
|  | PROP. WETLAND
RESTORATION AREA 0.05 AC |
|  | EX. GREENWAY TRAIL |
|  | PROP. GREENWAY TRAIL |
|  | EX. FEMA FLOODWAY |
|  | EX. FEMA FLOOD
HAZARD AREA (100-YR) |
|  | EX. FEMA FLOOD
HAZARD AREA (500-YR) |



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GREENWAY RESTORATION

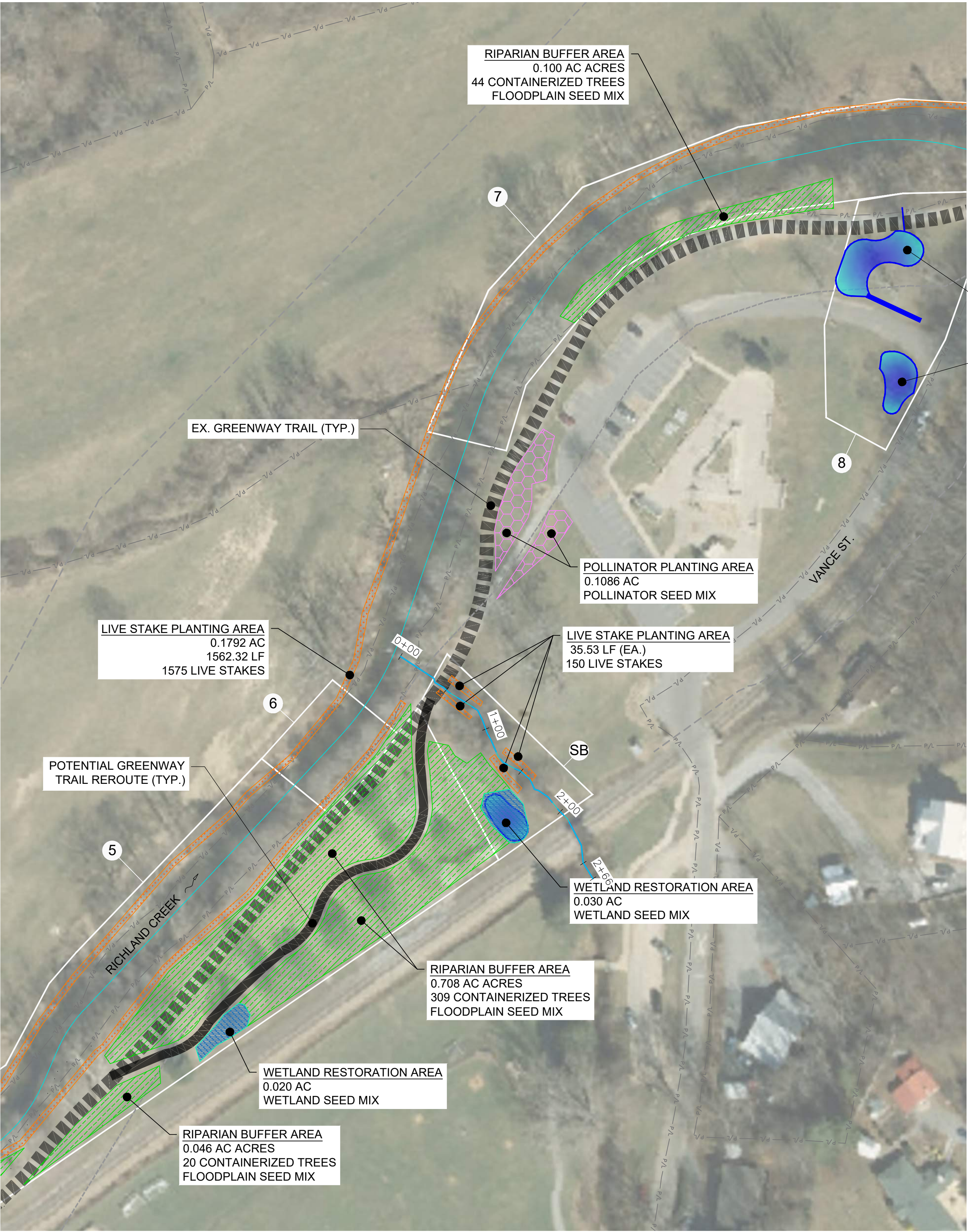
TOWN OF WAYNESVILLE
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WAYNESVILLE, NC 28786

PLANTING AND SEEDING PLAN

DESIGNED BY:	ADH
DRAWN BY:	TG
CHECKED BY:	ET
DATE: SEPTEMBER 2026	
VERT. SCALE:	NA
HORZ. SCALE:	1" = 60'

SHEET:
PL-01
22 / 32

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GENERAL NOTES

N

NOT FOR CONSTRUCTION

LEGEND

PROP. LIVE STAKE AREA

5265 LF

PROP. RIPARIAN BUFFER

2.7 AC

PROP. POLLINATOR AREA

0.26 AC

PROP. RAIN GARDEN PLANTINGS/ WETLAND SEED MIX

0.093 AC

PROP. WETLAND RESTORATION AREA

0.05 AC

EX. GREENWAY TRAIL

PROP. GREENWAY TRAIL

EX. FEMA FLOODWAY

EX. FEMA FLOOD HAZARD AREA (100-YR)

EX. FEMA FLOOD HAZARD AREA (500-YR)

060120

GRAPHIC SCALE IN FEET

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RICHLAND CREEK AND VANCE GREENWAY RESTORATION

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PLANTING AND SEEDING PLAN

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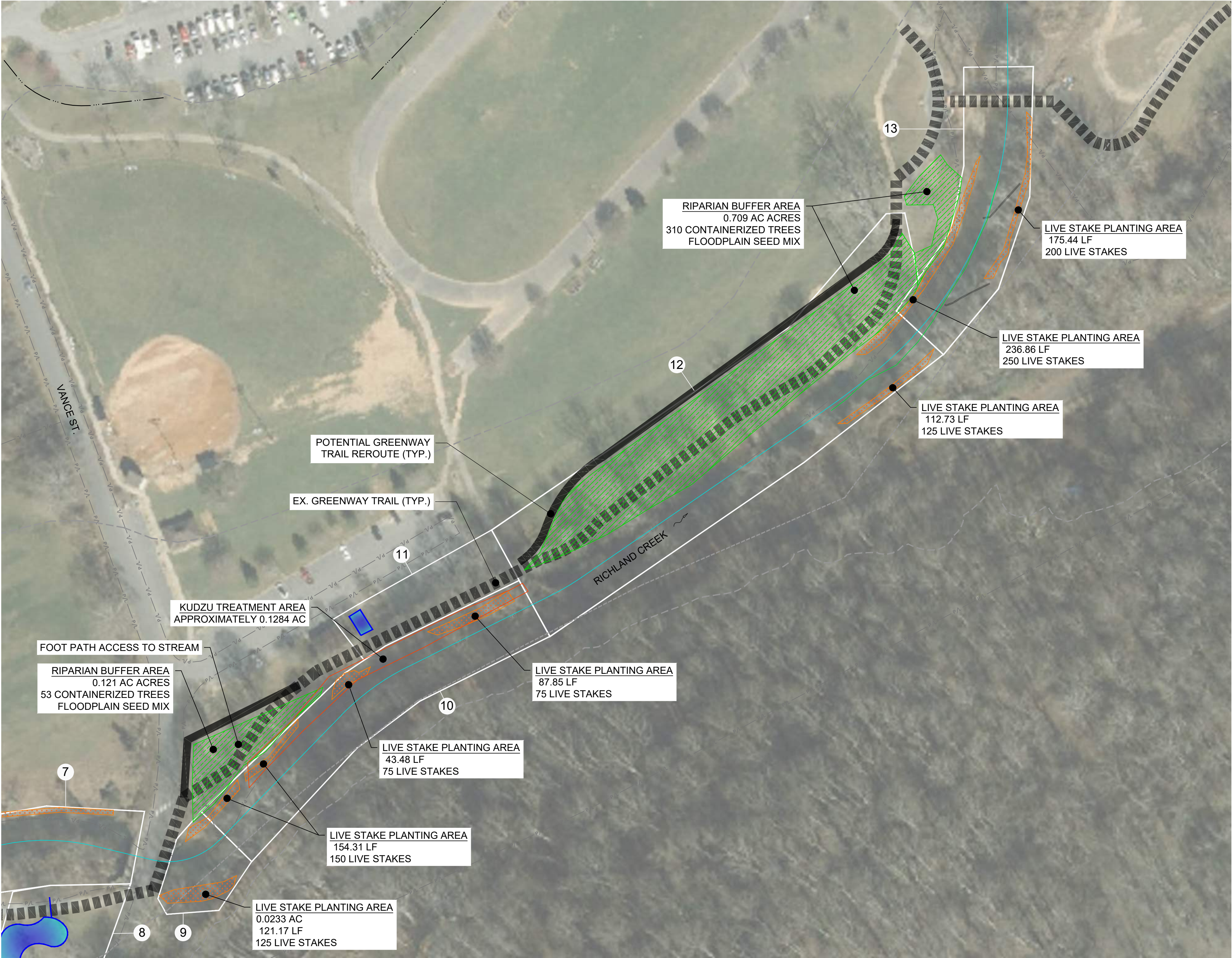
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SHEET:

PL-02

23 / 32

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GENERAL NOTES

N

NOT FOR CONSTRUCTION

LEGEND

PROP. LIVE STAKE AREA

5265 LF

PROP. RIPARIAN BUFFER

2.7 AC

PROP. POLLINATOR AREA

0.26 AC

PROP. RAIN GARDEN PLANTINGS/ WETLAND SEED MIX

0.093 AC

PROP. WETLAND RESTORATION AREA

0.05 AC

EX. GREENWAY TRAIL

PROP. GREENWAY TRAIL

EX. FEMA FLOODWAY

EX. FEMA FLOOD HAZARD AREA (100-YR)

EX. FEMA FLOOD HAZARD AREA (500-YR)

KUDZU TREATMENT AREA

0.128 AC

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CHECKED BY: ET

DATE: SEPTEMBER 2026

VERT. SCALE: NA

HORZ. SCALE: 1" = 60'

SHEET: PL-03

24 / 32

Graminoids					
Genus	Species	Common Name	Planting Group*	Moisture	Light
<i>Carex</i>	<i>cherokeensis</i>	cherokee sedge	3, 4	dry - wet	adaptable
<i>Chasmanthium</i>	<i>latifolium</i>	river oats	3, 4	moist -wet	adaptable
<i>Chasmanthium</i>	<i>laxum</i>	slender spikegrass	3, 4	moist -wet	part shade - shade
<i>Juncus</i>	<i>effusus</i>	soft rush	4	moist -wet	adaptable
<i>Panicum</i>	<i>virgatum</i>	switchgrass	4	moist -wet	sun
<i>Scirpus</i>	<i>atrovirens</i>	green bulrush	4	moist -wet	adaptable
<i>Scirpus</i>	<i>cyperinus</i>	woolgrass	4	moist -wet	sun

*Planting group: 1 = live stakes; 2 = containers; 3 = pollinator garden; 4 = stormwater/rain gardens

Forbs					
Genus	Species	Common Name	Planting Group*	Moisture	Light
<i>Anacis</i>	<i>tripteris</i>	tall coreopsis	3, 4	moist - wet	sun - part shade
<i>Asclepias</i>	<i>exaltata</i>	poke milkweed	3, 4	moist	part shade
<i>Asclepias</i>	<i>incarnata</i>	swamp milkweed	3, 4	moist - wet	sun
<i>Asclepias</i>	<i>tuberosa</i>	butterfly milkweed	3	dry - moist	sun
<i>Conoclinium</i>	<i>coelestinum</i>	blue mistflower	3, 4	moist - wet	sun - part shade
<i>Eupatorium</i>	<i>perfoliatum</i>	Boneset	3, 4	moist - wet	sun
<i>Eutrochium</i>	<i>spp.</i>	Joe-Pye-weed	3, 4	moist - wet	sun - part shade
<i>Eryngium</i>	<i>yuccifolium</i>	rattlesnake master	3, 4	dry - moist	sun
<i>Hibiscus</i>	<i>moscheutos</i>	eastern rose-mallow	3, 4	moist - wet	sun - part shade
<i>Helianthus</i>	<i>angustifolius</i>	narrow leaf sunflower	3, 4	moist - wet	sun
<i>Iris</i>	<i>shrevei</i>	midwestern blue flag	3	moist - wet	sun - part shade
<i>Lobelia</i>	<i>cardinalis</i>	cardinal flower	3, 4	moist - wet	adaptable
<i>Lobelia</i>	<i>siphilitica</i>	great blue lobelia	3, 4	moist - wet	adaptable
<i>Mimulus</i>	<i>ringens</i>	monkey flower	4	moist - wet	full sun
<i>Mondarda</i>	<i>fistulosa</i>	Appalachian bergamot	3, 4	moist	full sun
<i>Peltandra</i>	<i>virginica</i>	green arrow-arum	4	wet - inundated	adaptable
<i>Pontederia</i>	<i>cordata</i>	pickerweed	4	wet - inundated	sun - part shade
<i>Pycnanthemum</i>	<i>muticum</i>	white mountain mint	3, 4	moist	full sun
<i>Pycnanthemum</i>	<i>virginianum</i>	Virginia mountain mint	3, 4	moist	full sun
<i>Rudbeckia</i>	<i>laciniata</i>	cultead coneflower	3, 4	moist - wet	sun - part shade
<i>Rudbeckia</i>	<i>triloba</i>	three-lobed coneflower	3, 4	moist	sun - part shade
<i>Sagittaria</i>	<i>latifolia</i>	Arrowhead	3, 4	wet - inundated	sun - part shade
<i>Saururus</i>	<i>cernuus</i>	lizard's-tail	4	wet - inundated	adaptable
<i>Solidago</i>	<i>juncea</i>	early goldenrod	4	moist	sun
<i>Solidago</i>	<i>rugosa</i>	rough goldenrod	3, 4	moist - wet	sun - part shade
<i>Silphium</i>	<i>perfoliatum</i>	cup plant	3, 4	moist - wet	sun - part shade
<i>Symphytotrichum</i>	<i>novae-angliae</i>	New England aster	3, 4	moist - wet	sun
<i>Symphytotrichum</i>	<i>punciceum</i>	swamp aster	4	moist - wet	sun
<i>Verbena</i>	<i>hastata</i>	blue vervain	3, 4	moist - wet	sun
<i>Vernonia</i>	<i>noveboracensis</i>	NY ironweed	3, 4	moist - wet	sun - part shade

*Planting group: 1 = live stakes; 2 = containers; 3 = pollinator garden; 4 = stormwater/rain gardens

STEP 1 **STEP 2** **STEP 3** **STEP 4** **STEP 5** **STEP 6**

1. DRIVE GRAB HOE INTO THE GROUND, LIFT HANDLE, AND PULL HOE BACK.
2. PLACE SEEDLING AGAINST STRAIGHT SIDE AT CORRECT DEPTH.
3. FILL BORROW OF HOLE AND PACK SOIL AGAINST ROOTS.
4. FINISH FILLING IN SOIL AND PACK IT WITH HEEL.
5. FIRM AROUND SEEDLING WITH THE FOOT.
6. 6. INSTALL TREE TUBE WITH STAKE TO SECURE IN PLACE.

The diagrams illustrate the structure of bamboo. The 'CROSS SECTION' shows a vertical cut through a bamboo culm, revealing a woven pattern of fibers. A label 'BAMBOO SKEWER' points to a vertical line passing through the center. The 'PLAN VIEW' shows a top-down perspective of a bamboo culm, which is irregularly shaped and contains numerous small, triangular nodes arranged in a grid-like pattern.

- ## HERBACEOUS PLUG PLANTING

PRUNE ONLY DEAD AND BROKEN BRANCHES, NEVER CUT A LEADER

SET TOP OF ROOT COLLAR 1" ABOVE FINISHED GRADE

PRIOR TO PLACEMENT, REMOVE CONTAINER FROM ROOTBALL. MASSAGE AND LOOSEN ROOTS

FINISHED GRADE

PLANTING MIXTURE, DO NOT COMPACT AFTER PLACEMENT

UNDISTURBED SUBGRADE

MINIMUM 2X ROOTBALL WIDTH

INSTALLATION SPECIFICATIONS

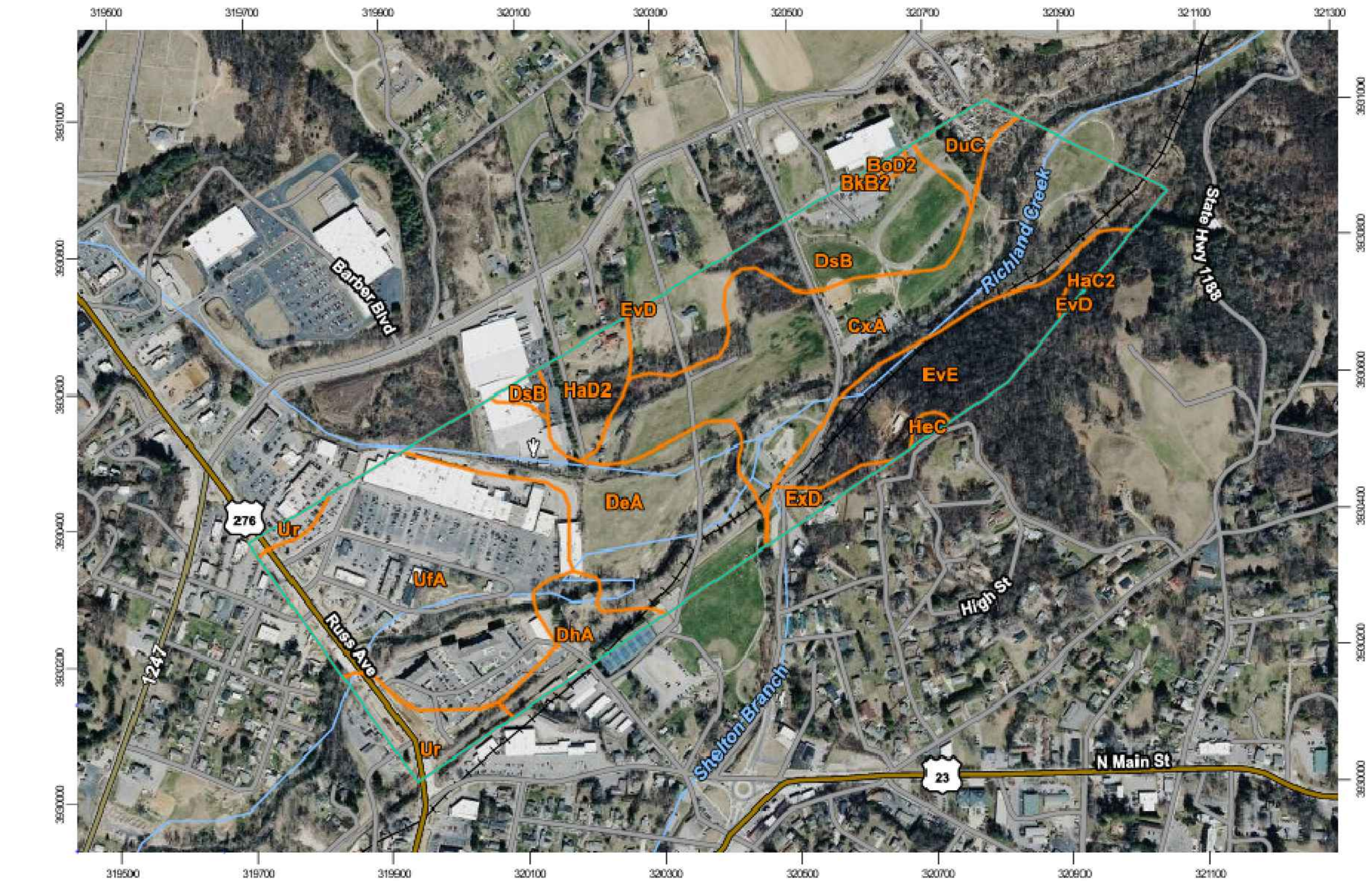
1. LIVE STAKES SHALL RANGE FROM 1/2" TO 1" IN DIAMETER AND BE FROM 2 TO 3 FT IN LENGTH
2. CARE SHALL BE TAKEN NOT TO DAMAGE THE LIVE STAKES DURING INSTALLATION.
3. A PILOT HOLE WILL BE REQUIRED TO ENSURE THAT THE LIVE STAKE IS NOT DAMAGED WHEN DRIVEN THROUGH THE SUBSOIL. PILOT HOLE SHALL BE MADE THROUGH THE USE OF A STEEL SPIKE, REBAR, OR SIMILAR TOOL TO WORK AN OPENING THROUGH THE SUBSOIL.
4. LIVE STAKES SHALL BE CUT TO A POINT ON THE BASAL END FOR INSERTION IN THE GROUND.
5. SEE CONTRACT DOCUMENTS FOR SPECIES, SIZE, SPACING, LOCATION, AND FINAL DETERMINATION ON USE OF LIVE STAKES.
6. USE A DEAD BLOW HAMMER TO DRIVE LIVE STAKES INTO THE PILOT HOLE.
7. LEAVE BETWEEN 4" AND 8" OF LIVE STAKE EXPOSED ABOVE FINISH GRADE.
8. TAMP SOIL AROUND LIVE STAKES.

SHEET:
PL-04
25 / 32

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GRADING AND STABILIZATION ACTIVITIES LOG					
DESCRIPTION AND LOCATION ON GRADING ACTIVITY	DATE GRADING ACTIVITY INITIATED	DATE GRADING ACTIVITY CEASED	DATE WHEN STABILIZATION MEASURES INITIATED	TYPE OF STABILIZATION MEASURE	DESCRIPTION OF STABILIZATION MEASURE
				PERMANENT/TEMPORARY	
				PERMANENT/TEMPORARY	
				PERMANENT/TEMPORARY	
				PERMANENT/TEMPORARY	
				PERMANENT/TEMPORARY	
				PERMANENT/TEMPORARY	
				PERMANENT/TEMPORARY	
				PERMANENT/TEMPORARY	

SWPPP AMENDMENT LOG			
AMENDMENT NO.	DESCRIPTION OF THE AMENDMENT	DATE OF THE AMENDMENT	AMENDMENT PREPARED BY [NAME(S) AND TITLE]
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			



Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BkB2	Braddock clay loam, 2 to 8 percent slopes, eroded	0.0	0.0%
BoD2	Braddock clay loam, 15 to 30 percent slopes, eroded, stony	0.3	0.2%
CxA	Cullowhee-Nikwasi complex, 0 to 2 percent slopes, frequently flooded	32.1	25.3%
DeA	Delwood cobbly sandy loam, 0 to 3 percent slopes, occasionally flooded	19.0	15.0%
DhA	Delwood-Urban land complex, 0 to 3 percent slopes, occasionally flooded	4.6	3.6%
DsB	Dillsboro loam, 2 to 8 percent slopes	15.3	12.0%
DuC	Dillsboro-Urban land complex, 2 to 15 percent slopes	2.5	2.0%
EvD	Evard-Cowee complex, 15 to 30 percent slopes	0.3	0.2%
EvE	Evard-Cowee complex, 30 to 50 percent slopes	12.7	9.9%
ExD	Evard-Cowee-Urban land complex, 15 to 30 percent slopes	1.7	1.3%
HaC2	Hayesville clay loam, 8 to 15 percent slopes, eroded	0.0	0.0%
HaD2	Hayesville clay loam, 15 to 30 percent slopes, eroded	4.3	3.4%
HeC	Hayesville-Urban land complex, 2 to 15 percent slopes	0.4	0.3%
UfA	Udorthents-Urban land complex, 0 to 3 percent slopes, rarely flooded	29.4	23.1%
Ur	Urban land	4.6	3.6%
Totals for Area of Interest		127.2	100.0%

CONTACT INFORMATION

OWNER(S)

COMPANY NAME: HAYWOOD WATERWAYS ASSOCIATION INC.
ADDRESS: PO BOX 389, WAYNESVILLE, NC 28786
POINT OF CONTACT:
EMAIL:
PHONE:

PROJECT ENGINEER/CONSTRUCTION REPRESENTATIVE

COMPANY NAME: ES ENGINEERING
ADDRESS: 5070 STOW RD. STOW, OH 44224
POINT OF CONTACT: ANGELINA HOTZ, P.E.
EMAIL: AHOTZ@ENVIROSCIENCEINC.COM
PHONE: 330-502-3361

GENERAL CONTRACTOR

COMPANY NAME: ENVIROSCIENCE INC.
ADDRESS: 5070 STOW RD. STOW, OH 44224
POINT OF CONTACT: TOM PREWITT
EMAIL: TPREWITT@ENVIROSCIENCEINC.COM
PHONE: 330-217-2550

CONSTRUCTION START DATE: TBD
CONSTRUCTION DURATION: TBD

GENERAL NOTES

NOT FOR CONSTRUCTION

NO.	REVISION/ISSUE	DATE

50% DESIGN

ES Engineering

NC Affiliate Office: 145 7th Ave West: Suite B
Hendersonville, NC 28792
828-784-8324 | NC License C-5299

RICHLAND CREEK AND VANCE GREENWAY RESTORATION

TOWN OF WAYNESVILLE
9 S. MAIN ST.
PO BOX 100
WAYNESVILLE, NC 28786

SWPPP COVER SHEET

DESIGNED BY: ADH
DRAWN BY: TG
CHECKED BY: ET

DATE: SEPTEMBER 2026

VERT. SCALE: NA
HORZ. SCALE: NA

SHEET:
SW-01

26 / 32

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SWPPP NOTES

TYPE OF CONSTRUCTION ACTIVITY

1. EROSION AND SEDIMENT CONTROL. BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE CONDUCTED PER THIS STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND IN ACCORDANCE WITH NCDEQ REQUIREMENTS. THE SWPPP SHALL BE AVAILABLE AT THE PROJECT SITE FOR REFERENCE TO BMP ACTIVITY. THE VARIABILITY OF EROSION AND SEDIMENT CONTROL BMP'S MAY BE MODIFIED AS APPROPRIATE TO COMPLETE THE NECESSARY RESTORATION ACTIVITIES.
2. TOTAL AREA OF DISTURBANCE: XX AC. THE RESTORATION PROJECT INCLUDING IMPORT OF ROCK, AND EARTHMOVING ACTIVITIES FOR STREAM STABILIZATION, REALIGNMENT, RIFFLE AND POOL IMPROVEMENTS, BANK STABILIZATION AND FLOODPLAIN FEATURES.
3. RICHLAND CREEK IS THE RECEIVING STREAM FOR ALL PROJECT RUNOFF.
4. RUNOFF COEFFICIENTS/IMPERVIOUS AREA: THERE WILL BE NO INCREASE IN IMPERVIOUS AREA UPON COMPLETION OF PROJECT.
5. REFER TO SHEET SW-04 FOR GROUND STABILIZATION TIMELINES, WASTE HANDLING, AND HAZARDOUS MATERIAL HANDLING REQUIREMENTS.
6. VEGETATIVE BUFFER: WHERE POSSIBLE, BUFFER STRIPS WILL BE LEFT BETWEEN TILLING AREAS AND EXISTING DRAINAGE WAYS TO USE NON-STRUCTURAL CONTROLS AND PRESERVE EXISTING VEGETATION BUFFER.
7. CONTRACTOR IS TO ADHERE TO ALL REQUIREMENTS INCLUDED ON SHEET SW-03 FOR INSPECTION, RECORDKEEPING, AND REPORTING OF SWPPP MEASURES.
8. CONSTRUCTION ENTRANCES, AND SWPPP ITEMS SHALL REMAIN IN PLACE UNTIL EARTHWORK AND DEMOLITION OPERATIONS ARE COMPLETE AND THE SITE IS STABLE. THE SITE IS CONSIDERED STABLE WHEN 75% VEGETATIVE COVER HAS BEEN ESTABLISHED WITHIN 60 DAYS OF INITIAL SEEDING AND 90% COVERAGE AFTER ON YEAR ON ALL DISTURBED AREAS. CONTRACTOR SHALL KEEP SILT FROM ENTERING ANY STORM DRAINAGE SYSTEM.
9. IF AT ANY TIME UTILITY COMPANIES ARE REQUIRED TO PARTICIPATE IN CONSTRUCTION, UTILITY COMPANIES MUST COMPLY WITH ALL STORM WATER POLLUTION PREVENTION MEASURES AS DEFINED ON THE STORM WATER POLLUTION PREVENTION PLANS, DETAILS AND NOTES.
- 10.IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ALL SEDIMENTATION AND STORM WATER POLLUTION PREVENTION ITEMS AT ALL TIMES.
- 11.NO SOLID (OTHER THAN SEDIMENT) OR LIQUID WASTE, INCLUDING BUILDING MATERIALS, SHALL BE DISCHARGED IN STORM WATER RUNOFF. PROPERLY DISPOSE OF ANY LIQUID IN A CONCRETE WASHOUT THAT HAS NOT EVAPORATED.
- 12.THERE WILL BE NO OPEN BURNING.
13. TRACKING OF SEDIMENTS BY VEHICLES WILL BE MINIMIZED BY UTILIZING THE CONSTRUCTION ENTRANCE AS THE ONLY ENTRANCE FOR VEHICLES. LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFF-SITE VEHICLE TRACKING. SEDIMENT/SOIL TRACKED OFF-SITE SHALL BE REMOVED BY CONTRACTOR AND PROPERLY DISPOSED OF.
14. THE SWPPP SHALL BE KEPT ONSITE AT ALL TIMES DURING CONSTRUCTION. IT IS THE CONTRACTORS RESPONSIBILITY TO MARK (IN A DOMINANT COLOR) DAILY ANY MINOR MODIFICATIONS MADE TO THE APPROVED SWPPP SO AS TO KEEP RECORD OF THE MODIFICATIONS MADE IN THE FIELD.
15. ALL SOIL DISTURBING ACTIVITIES AT THE SITE ARE TO RECEIVE A COMPLETE AND A UNIFORM PERENNIAL VEGETATIVE COVER (E.G., EVENLY DISTRIBUTED, WITHOUT LARGE BARE AREAS) WITH A DENSITY OF AT LEAST 75% VEGETATIVE COVER TO BE ESTABLISHED WITHIN 60 DAYS OF INITIAL SEEDING AND 90% COVERAGE AFTER ON YEAR. FOLLOWING SITE STABILIZATION, ALL TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE REMOVED AND DISPOSED. ALL TRAPPED SEDIMENT SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION.
16. ALL FUEL TANKS SHALL BE STAGED WITHIN THE DESIGNATED EQUIPMENT STAGING AREAS AS SHOWN ON THE PLANS. FUELING ACTIVITIES SHALL BE VISUALLY MONITORED AT ALL TIMES TO MANAGE ACCIDENTAL SPILLAGE. IDLE EQUIPMENT, PETROCHEMICALS AND TOXIC/HAZARDOUS MATERIALS SHALL NOT BE STORED IN THE FLOODPLAIN OR NEAR DRAINAGE WAYS OR STREAMS THAT COULD CONVEY SUCH MATERIALS TO THE STREAM. PETROCHEMICALS AND TOXIC/HAZARDOUS MATERIALS SHALL NOT BE DISCHARGED INTO THE STREAM, ITS FLOODPLAIN OR ANY DRAINAGE WAYS/DITCHES. REFUELING OF EQUIPMENT SHALL NOT OCCUR IN THE FLOODPLAIN OR NEAR ANY DRAINAGE WAYS, DITCHES OR WITHIN 50 FEET OF STREAMS. FUEL TANKS SHALL BE CONTAINED OR DIKED. VISUAL MONITORING WOULD NOT BE SUFFICIENT IN THE EVENT OF A SPILL. SUBSTANCES SUCH AS OIL, DIESEL FUEL, HYDRAULIC FLUID, ANTIFREEZE, ETC. THAT IS SPILLED, LEAKED, OR RELEASED ONTO THE SOIL SHALL BE IMMEDIATELY CONTAINED USING SOIL BERMS AND/OR ABSORBENT PADS/STOCKS.
- A) SPILL REQUIREMENTS IN THE EVENT OF SMALL RELEASE (<25 GALLONS): IMPACTED SOIL SHALL BE DUG UP AND FREE LIQUIDS SHALL BE COLLECTED FOR DISPOSAL AT A LICENSED SANITARY LANDFILL OR OTHER APPROVED PETROLEUM CONTAMINATED SOIL REMEDIATION FACILITY (NOT A CONSTRUCTION/DEMOLITION DEBRIS LANDFILL).
- B) REFER TO SHEET SW-03 FOR SPILL REPORTING REQUIREMENTS.

PERMITS

WORK WITHIN PROJECT SITE/LIMITS IS SUBJECT TO U.S. ARMY CORPS OF ENGINEERS (USACE) REGULATORY JURISDICTION (I.E., JURISDICTIONAL WATERS OF THE U.S.). ANY IMPACTS AND PLACEMENT OF FILL TO JURISDICTIONAL WATERS OUTSIDE OF THE PROJECT LIMITS IS PROHIBITED. THE FOLLOWING PERMITS APPLY TO THIS PROJECT:

1. NATIONWIDE PERMIT (NWP) 27 AND 13 FROM THE U.S. ARMY CORPS OF ENGINEERS (USACE).
2. THIS PROJECT WILL BE SUBJECT TO AN IN-WATER WORK WAIVER FOR SEASONAL SALMONID FROM SEPTEMBER 15TH TO JUNE 30TH.
3. NORTH CAROLINA EPA - NOTICE OF INTENT (NOI) FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER AND NPDES GENERAL PERMIT (NCG01).

FLOODPLAIN DEVELOPMENT PERMIT

DUST CONTROL

1. VEGETATIVE COVER AND MULCH - APPLY TEMPORARY OR PERMANENT SEEDING AND MULCH TO AREA THAT WILL REMAIN IDLE FOR OVER 14 DAYS. TO THE EXTENT POSSIBLE, EXISTING TREES AND LARGE SHRUBS SHALL REMAIN IN PLACE TO REDUCE SOIL AND AIR MOVEMENT ACROSS DISTURBED AREAS. SEE TEMPORARY SEEDING, PERMANENT SEEDING, AND MULCHING PRACTICES.
2. WATERING - SPRAY SITE WITH WATER UNTIL THE SURFACE IS WET BEFORE AND DURING GRADING AND REPEAT AS NEEDED TO PREVENT GENERATION OF VISIBLE AIRBORNE DUST. ESPECIALLY ON HAUL ROADS AND OTHER HEAVY TRAFFIC ROUTE. WATERING SHALL BE DONE AT A RATE THAT PREVENTS DUST BUT DOES NOT CAUSE SOIL EROSION. WETTING AGENTS SHALL BE UTILIZED ACCORDING TO MANUFACTURERS INSTRUCTIONS. CHEMICAL AND ORGANIC AGENTS SHOULD NOT BE APPLIED UNDER FROZEN CONDITIONS, RAINY CONDITIONS, OR WHEN THE TEMPERATURE IS BELOW 40-DEGREES (F). THESE AGENTS WILL NOT BE USED IN THE FLOODPLAIN.
3. STONE - GRADED ROADWAYS AND OTHER SUITABLE AREAS WILL BE STABILIZED USING CRUSHED STONE OR COARSE GRAVEL AS SOON AS PRACTICAL AFTER REACHING AN INTERIM OR FINAL GRADE. CRUSHED STONE OR COARSE GRAVEL CAN BE USED AS A PERMANENT COVER TO PROVIDE CONTROL OF SOIL EMISSIONS.
4. BARRIERS - EXISTING WINDBREAK VEGETATION SHALL BE MARKED AND PRESERVED. SNOW FENCING OR OTHER SUITABLE BARRIER MAY BE PLACED PERPENDICULAR TO PREVAILING AIR CURRENTS AT INTERVALS OF ABOUT 15 TIMES THE BARRIER HEIGHT TO CONTROL AIR CURRENTS AND BLOWING SOIL. THIS MATERIAL WILL NOT BE USED IN THE FLOODPLAIN.
5. CALCIUM CHLORIDE - THIS CHEMICAL MAY BE APPLIED BY MECHANICAL SPREADER AS LOOSE, DRY GRANULES OR FLAKES AT A RATE THAT KEEPS THE SURFACE MOIST BUT NOT SO HIGH AS TO CAUSE WATER POLLUTION OR PLANT DAMAGE. APPLICATION RATES SHOULD BE STRICTLY IN ACCORDANCE WITH SUPPLIERS SPECIFIED RATES. THIS MATERIAL WILL NOT BE USED IN THE FLOODPLAIN.
6. OPERATION AND MAINTENANCE - SITE SHALL BE CONTINUOUSLY MONITORED TO VERIFY EFFECTIVENESS OF DUST CONTROL MEASURES. WHEN TEMPORARY DUST CONTROL MEASURES ARE USED, REPETITIVE TREATMENT SHOULD BE APPLIED AS NEEDED TO ACCOMPLISH CONTROL.

SUGGESTED GENERAL SEQUENCE OF CONSTRUCTION

CONSTRUCTION SHALL NOT BEGIN UNTIL ALL SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED. THE CONTRACTOR SHALL MINIMIZE DISTURBANCE WITHIN THE WORKING AREA WHEREVER POSSIBLE.

STREAM CONSTRUCTION WILL FOLLOW THE GENERAL SEQUENCE OF:

- UTILITY COORDINATION (NC 811 NOTIFICATION)
- MOBILIZE TO RICHLAND CREEK, ENSURE ALL EQUIPMENT BROUGHT TO THE SITE IS CLEAN. DIRTY EQUIPMENT SHALL NOT BE PERMITTED;
- INSTALL EROSION AND SEDIMENT CONTROLS;
- CONSTRUCT TEMPORARY ACCESS ROADS AND STAGING AREAS;
- TREE AND VEGETATION CLEARING AND GRUBBING; VEGETATION WILL BE CLEARED DURING APPROPRIATE TIMEFRAME FROM OCTOBER 1ST TO MARCH 31ST;
- SITE LAYOUT AND ESTABLISH WORKING LIMITS;
- INITIATE WATER CONTROL/DIVERSION PROCEDURES;
 - EXCAVATE DIVERSION TRENCH TO DIVERT BASE FLOW UPSTREAM;
- ESTABLISH STREAM CROSSING(S);
- STRIP AND STOCKPILE TOPSOIL AS NECESSARY IN GRADING AREAS;
- BEGIN UPSTREAM AND WORK IN A DOWNSTREAM DIRECTION;
- BEGIN EXCAVATION TO ESTABLISH SUBGRADE;
- IMPORT AND INSTALL BANK STABILIZATION FEATURES'
- CONSTRUCT IN-STREAM HABITAT FEATURES;
- CONSTRUCT GRADE CONTROL AND ROCK VANES WITH ROCK KEY;
- PERFORM FINISH GRADING;
- INSTALL STOCKPILED OR IMPORTED TOPSOIL TO FINISH GRADE;
- SEED, STABILIZE, AND INSTALL EROSION CONTROL FABRIC;
- INSTALL NATIVE TREES, SHRUBS, AND LIVE STAKES. REMOBILIZATION MAY BE NECESSARY DEPENDING ON TIMING OF PLANTINGS;
- DEMOBILIZE.

CERTIFICATION

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHERED AND EVALUATED THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

NAME:

TITLE:

SIGNATURE:

DATE:

SUBCONTRACTOR(S)

ALL SUBCONTRACTORS INVOLVED IN EARTH DISTURBING ACTIVITY ARE REQUIRED TO SIGN A SUBCONTRACTOR CERTIFICATION AND SUBMIT AN OHIO EPA CO-PERMITTEE FORM. A COPY OF SIGNED CO-PERMITTEE FORMS SHALL BE KEPT WITH THE SWPPP.

GENERAL NOTES

NOT FOR
CONSTRUCTION

NO.	REVISION/ISSUE	DATE

50% DESIGN

ES Engineering

NC Affiliate Office: 145 7th Ave West: Suite B
Hendersonville, NC 28792
828-784-8324 | NC License C-5299

RICHLAND CREEK AND VANCE
GREENWAY RESTORATION

TOWN OF WAYNESVILLE
9 S. MAIN ST.
PO BOX 100
WAYNESVILLE, NC 28786

SWPPP
GENERAL NOTES

DESIGNED BY: ADH DRAWN BY: TG CHECKED BY: ET	SHEET: SW-02
DATE: SEPTEMBER 2026	27 / 32
VERT. SCALE: NA HORZ. SCALE: NA	

NOTE: The rain inspection resets the required 7 calendar day inspection requirement.

2. Additional Documentation to be Kept on Site

In addition to the E&SC plan documents above, the following items shall be kept on the site and available for inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

- (a) This General Permit as well as the Certificate of Coverage, after it is received.
- (b) Records of inspections made during the previous twelve months. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

3. Documentation to be Retained for Three Years*

*All data used to complete the e-NOI and all inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

Occurrence	Reporting Timeframe (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	• Within 24 hours, an oral or electronic notification. • Within 7 Calendar Days, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. • If the stream is named on the NC 303(d) list as impaired for sediment-related caused, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per item 1(b)-(c) above	• Within 24 Hours, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• A report at least ten days before the date of the bypass, if possible. The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• Within 24 Hours, an oral or electronic notification • Within 7 calendar days, a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment [40 CFR 122.41(l)(7)]	• Within 24 Hours, an oral or electronic notification • Within 7 calendar days, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate and prevent recurrence of the noncompliance. [40 CFR 122.41(l)(6). • Division staff may waive the requirement for a written report on a case-by-case basis.

- (a) The E&SC plan authority has been provided with documentation of the non-surface withdrawal and the specific time periods or conditions in which it will occur. The non-surface withdrawal shall not commence until the E&SC plan authority has approved these items,
- (b) The non-surface withdrawal has been reported as an anticipated bypass in accordance with Part III, Section C, Item (2)(c) and (d) of this permit,
- (c) Dewatering discharges are treated with controls to minimize discharges of pollutants from stormwater that is removed from the sediment basin. Examples of appropriate controls include properly sited, designed and maintained dewatering tanks, weir tanks, and filtration systems,
- (d) Vegetated, upland areas of the sites or a properly designed stone pad is used to the extent feasible at the outlet of the dewatering treatment devices described in Item (c) above,
- (e) Velocity dissipation devices such as check dams, sediment traps, and riprap are provided at the discharge points of all dewatering devices, and
- (f) Sediment removed from the dewatering treatment devices described in Item (c) above is disposed of in a manner that does not cause deposition of sediment into waters of the United States.



Effective:
April 1, 2024

50% DESIGN

ES Engineering

NC Affiliate Office: 145 7th Ave West: Suite E
Hendersonville, NC 28792
828-784-8324 | NC License C-5299

RICHLAND CREEK AND VANCE GREENWAY RESTORATION

TOWN OF WAYNESVILLE
9 S. MAIN ST.
PO BOX 100
WAYNESVILLE, NC 28786

NCG01 NOTES

DESIGNED BY: ADH
DRAWN BY: TG
CHECKED BY: ET

DATE: SEPTEMBER 2020

VERT. SCALE: NA

HORZ. SCALE: NA

SHEET:
SW-03

28 / 32

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GENERAL NOTES

NOT FOR
CONSTRUCTION

NO.	REVISION/ISSUE	DATE

50% DESIGN

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NC Affiliate Office: 145 7th Ave West, Suite B
Hendersonville, NC 28792
828-784-8324 | NC License C-5299

RICHLAND CREEK AND VANCE
GREENWAY RESTORATION

TOWN OF WAYNESVILLE
9 S. MAIN ST.
PO BOX 100
WAYNESVILLE, NC 28786

NCG01 NOTES

DESIGNED BY: ADH
DRAWN BY: TG
CHECKED BY: ET

DATE: SEPTEMBER 2026

VERT. SCALE: NA
HORZ. SCALE: NA

SHEET:

SW-04

29 / 32

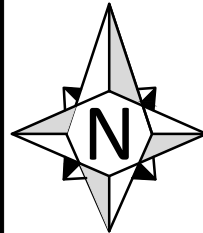
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NOTES:

1. ALL EX. WETLANDS ARE TO BE FLAGGED AND PROTECTED WITH ORANGE CONSTRUCTION FENCING PRIOR TO STARTING CONSTRUCTION. THE CONSTRUCTION WORK AREA LIMITS SHALL BE INDICATED WITH CONSTRUCTION FENCE.
2. TIMBERMATS ARE TO BE USED AS NECESSARY, TO AVOID DAMAGING (RUTTING) TRAILS DUE TO WET OR SOFT SOILS. THE LOCATION OF A TIMBERMAT CROSSING WILL BE DETERMINED IN THE FIELD, IF NECESSARY FOR CONSTRUCTION.
3. ALL DISTURBED / GRADED AREAS NOT RECEIVING EROSION FABRIC STILL REQUIRE SEED AND STRAW TO PREVENT EROSION. SEE PLANTING PLAN FOR SEED MIXES AND LOCATIONS.
4. REFER TO THE STANDARD DETAIL SHEETS FOR EROSION FABRIC INSTALLATION DETAILS.
5. EROSION FABRIC MAY BE REQUIRED BEYOND THE HATCH SHOWN ON THIS SHEET FOR ADDITIONAL DISTURBED AREAS, NOT INDICATED ON THE PLAN AS PROP. GRADING/CONTOURS.

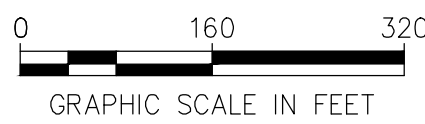
GENERAL NOTES



**NOT FOR
CONSTRUCTION**

LEGEND

- P/L ——— PROPERTY LINE
- EX. THALWEG
- SAN ——— SAN ——— EX. SANITARY SEWER
- STM ——— EX. STORM SEWER
- — — — — FEMA FLOOD HAZZARD AREA (100-YR)
- EX. ACTIVE RAIL LINE
- EX. TRAIL
- EX. TRAIL TO BE REMOVED
- PROPOSED TRAIL
- PROP. SILT FENCE
- PROP. STAGING AREA
- PROP. LIMITS OF DISTURBANCE
- SF
- CE
- SILT FENCE
- CONSTRUCTION ENTRANCE



NO.	REVISION/ISSUE	DATE

50% DESIGN

ES Engineering

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30	32

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SPECIFICATIONS FOR SILT FENCE

- SILT FENCE SHALL BE CONSTRUCTED BEFORE UPSLOPE LAND DISTURBANCE BEGINS.
- ALL SILT FENCE SHALL BE PLACED AS CLOSE TO THE CONTOUR AS POSSIBLE SO THAT WATER WILL NOT CONCENTRATE AT LOW POINTS IN THE FENCE AND SO THAT SMALL SWALES OR DEPRESSIONS THAT MAY CARRY SMALL CONCENTRATED FLOWS TO THE SILT FENCE ARE DISSIPATED ALONG ITS LENGTH.
- ENDS OF THE SILT FENCES SHALL BE BROUGHT UPSLOPE SLIGHTLY SO THAT WATER PONDED BY THE SILT FENCE WILL BE PREVENTED FROM FLOWING AROUND THE ENDS.
- SILT FENCE SHALL BE PLACED ON THE FLATTEST AREA AVAILABLE.
- WHERE POSSIBLE, VEGETATION SHALL BE PRESERVED FOR 5 FEET (OR AS MUCH AS POSSIBLE) UPSLOPE FROM THE SILT FENCE. IF VEGETATION IS REMOVED, IT SHALL BE REESTABLISHED WITHIN 7 DAYS FROM THE INSTALLATION OF THE SILT FENCE.
- THE HEIGHT OF THE SILT FENCE SHALL BE A MINIMUM OF 16 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
- THE SILT FENCE SHALL BE PLACED IN AN EXCAVATED OR SLICED TRENCH CUT A MINIMUM OF 6 INCHES DEEP. THE TRENCH SHALL BE MADE WITH A TRENCHER, CABLE LAYING MACHINE, SLICING MACHINE, OR OTHER SUITABLE DEVICE THAT WILL ENSURE AN ADEQUATELY UNIFORM TRENCH DEPTH.
- THE SILT FENCE SHALL BE PLACED WITH THE STAKES ON THE DOWNSLOPE SIDE OF THE GEOTEXTILE. A MINIMUM OF 8 INCHES OF GEOTEXTILE MUST BE BELOW THE GROUND SURFACE. EXCESS MATERIAL SHALL LAY ON THE BOTTOM OF THE 6-INCH DEEP TRENCH. THE TRENCH SHALL BE BACKFILLED AND COMPACTED ON BOTH SIDES OF THE FABRIC.
- SEAMS BETWEEN SECTIONS OF SILT FENCE SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST WITH A MINIMUM OF 6-IN. OVERLAP PRIOR TO DRIVING INTO THE GROUND. (SEE DETAILS)
- MAINTENANCE--SILT FENCE SHALL ALLOW RUNOFF TO PASS ONLY AS DIFFUSE FLOW THROUGH THE GEOTEXTILE. IF RUNOFF OVER-TOPS THE SILT FENCE, FLOWS UNDER THE FABRIC OR AROUND THE FENCE ENDS, OR IN ANY OTHER WAY ALLOWS A CONCENTRATED FLOW DISCHARGE, ONE OF THE FOLLOWING SHALL BE PERFORMED, AS APPROPRIATE: 1) THE LAYOUT OF THE SILT FENCE SHALL BE CHANGED, 2) ACCUMULATED SEDIMENT SHALL BE REMOVED, OR 3) OTHER PRACTICES SHALL BE INSTALLED.
- SEDIMENT DEPOSITS SHALL BE ROUTINELY REMOVED WHEN THE DEPOSIT REACHES APPROXIMATELY ONE-HALF OF THE HEIGHT OF THE SILT FENCE. SILT FENCES SHALL BE INSPECTED AFTER EACH RAINFALL AND AT LEAST DAILY DURING A PROLONGED RAINFALL. THE LOCATION OF EXISTING SILT FENCE SHALL BE REVIEWED DAILY TO ENSURE ITS PROPER LOCATION AND EFFECTIVENESS. IF DAMAGED, THE SILT FENCE SHALL BE REPAIRED IMMEDIATELY.

CRITERIA FOR SILT FENCE MATERIALS
FENCE POST - THE LENGTH SHALL BE A MINIMUM OF 32 INCHES. WOOD POSTS WILL BE 2-BY-2-IN. NOMINAL DIMENSIONED HARDWOOD OF SOUND QUALITY. THEY SHALL BE FREE OF KNOTS, SPLITS, AND OTHER DEFECTS THAT WILL WEAKEN THE POSTS. THE MAXIMUM SPACING BETWEEN POSTS SHALL BE 10 FT. POSTS SHALL BE DRIVEN A MINIMUM 16 INCHES INTO THE GROUND, WHERE POSSIBLE. IF NOT POSSIBLE, THE POSTS SHALL BE ADEQUATELY SECURED TO PREVENT OVERTURNING OF THE FENCE DUE TO SEDIMENT/WATER LOADING.

SILT FENCE FABRIC CHART

TABLE 6.3.2 MINIMUM CRITERIA FOR SILT FENCE FABRIC (ODOT, 2002)

FABRIC PROPERTIES	VALUES	TEST METHOD
MINIMUM TENSILE STRENGTH	120 LBS. [535 N]	ASTM D 4632
MAXIMUM ELONGATION AT 60 LBS	50%	ASTM D 4632
MINIMUM PUNCTURE STRENGTH	50 LBS [220 N]	ASTM D 4833
MINIMUM TEAR STRENGTH	40 LBS [180 N]	ASTM D 4533
APPARENT OPENING SIZE	≤ 0.84 mm	ASTM D 4751
MINIMUM PERMITTIVITY	1x10-2 SEC. -1	ASTM D 4491
UV EXPOSURE STRENGTH RETENTION	70%	ASTM D 4355

SILT FENCE AND DIVERSIONS:

SHEET FLOW RUNOFF FROM DENUDED AREAS SHALL BE INTERCEPTED BY SILT FENCE OR DIVERSIONS TO PROTECT ADJACENT PROPERTIES, WATER RESOURCES, AND WETLANDS FROM SEDIMENT TRANSPORTED VIA SHEET FLOW. WHERE INTENDED TO PROVIDE SEDIMENT CONTROL, SILT FENCE SHALL BE PLACED ON A LEVEL CONTOUR AND SHALL BE CAPABLE OF TEMPORARILY PONDING RUNOFF. THE RELATIONSHIP BETWEEN THE MAXIMUM DRAINAGE AREA TO SILT FENCE FOR A PARTICULAR SLOPE RANGE IS SHOWN IN TABLE 3 BELOW. STORM WATER DIVERSION PRACTICES SHALL BE USED TO KEEP RUNOFF AWAY FROM DISTURBED AREAS AND SLEEP SLOPES. SUCH DEVICES, WHICH INCLUDE SWALES, DIKES OR BERMS, MAY RECEIVE STORM WATER RUNOFF FROM AREAS UP TO 10 ACRES. PLACING SILT FENCE IN PARALLEL DOES NOT EXTEND THE PERMISSIBLE DRAINAGE AREA WHICH IS SERVED BY THE SILT FENCE.

MAXIMUM DRAINAGE AREA TO SILT FENCE

TABLE 3

MAXIMUM DRAINAGE AREA (ACRES) TO 100 LINEAR FEET OF SILT FENCE	RANGE OF SLOPE FOR A DRAINAGE AREA (%)
0.5	<2%
0.25	>2% BUT <20%
0.125	>20% BUT <50%

SALVAGING AND STOCKPILING

- DETERMINE THE DEPTH AND SUITABILITY OF TOPSOIL AT THE SITE. REFER TO THE COUNTY SOIL SURVEY REPORT OF CONTACT LOCAL SWCD.
 - PRIOR TO STRIPPING TOPSOIL, INSTALL APPROPRIATE DOWNSLOPE EROSION AND SEDIMENTATION CONTROLS SUCH AS SEDIMENT TRAPS AND BASINS.
 - REMOVE THE SOIL MATERIAL NO DEEPER THAN WHAT THE COUNTY SOIL SURVEY DESCRIBES AS 'SURFACE SOIL' (ie. A OR AP HORIZON)
 - CONSTRUCT STOCKPILES IN ACCESSIBLE LOCATIONS THAT DO NOT INTERFERE WITH NATURAL DRAINAGE. INSTALL APPROPRIATE SEDIMENT CONTROLS TO TRAP SEDIMENT SUCH AS SILT FENCE IMMEDIATELY ADJACENT TO THE STOCKPILE OR SEDIMENT TRAPS OR BASINS DOWNSTREAM OF THE STOCKPILE. STOCKPILE SIDE SLOPES SHALL NOT EXCEED A RATION OF 2:1.
 - IF TOPSOIL IS STORED FOR MORE THAN 14 DAYS, IT SHOULD BE TEMPORARY SEEDED, OR COVERED WITH A TARP.
- SPREADING THE TOPSOIL**
- PRIOR TO APPLYING TOPSOIL, THE TOPSOIL SHOULD BE PULVERIZED.
 - TO ENSURE BONDING, GRADE THE SUBSOIL AND ROUGHEN THE TOP 3-4 INCHES BY DISKING.
 - DO NOT APPLY WHEN SITE IS WET, MUDDY, OR FROZEN, BECAUSE IT MAKES SPREADING DIFFICULT, CAUSES COMPACTION PROBLEMS, AND INHIBITS BONDING WITH SUBSOIL.
 - APPLY TOPSOIL EVENLY TO A DEPTH OF AT LEAST 4 INCHES AND COMPACT SLIGHTLY TO IMPROVE CONTACT AND SUBSOIL.
 - AFTER SPREADING, GRADE AND STABILIZE WITH SEEDING OR APPROPRIATE VEGETATION.

TEMPORARY SEEDING

- STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SUCH AS DIVERSIONS AND SEDIMENT TRAPS SHALL BE INSTALLED AND STABILIZED WITH TEMPORARY SEEDING PRIOR TO GRADING THE REST OF THE CONSTRUCTION-SITE.
- TEMPORARY SEED SHALL BE APPLIED BETWEEN CONSTRUCTION OPERATIONS ON SOIL THAT WILL NOT BE GRADED OR REWORKED FOR 14 DAYS OR GREATER. THESE IDLE AREAS SHALL BE SEEDED WITHIN 7 DAYS AFTER GRADING. SEVERAL APPLICATIONS OF TEMPORARY SEEDING ARE NECESSARY ON TYPICAL CONSTRUCTION PROJECTS.
- THE SEEDBED SHALL BE PULVERIZED AND LOOSE TO ENSURE THE SUCCESS OF ESTABLISHING VEGETATION. TEMPORARY SEEDING SHALL NOT BE POSTPONED IF IDEAL SEEDBED PREPARATION IS NOT POSSIBLE.
- SOIL AMENDMENTS--APPLICATIONS OF TEMPORARY VEGETATION SHALL ESTABLISH ADEQUATE STANDS OF VEGETATION WHICH MAY REQUIRE THE USE OF SOIL AMENDMENTS. SOIL TESTS SHOULD BE TAKEN ON THE SITE TO PREDICT THE NEED FOR LIME AND FERTILIZER. BASE RATES FOR LIME AND FERTILIZER SHALL BE USED.
- SEEDING METHOD--SEED SHALL BE APPLIED UNIFORMLY WITH A CYCLONE SPREADER, DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER. WHEN FEASIBLE, SEED THAT HAS BEEN BROADCAST SHALL BE COVERED BY RAKING OR DRAGGING AND THEN LIGHTLY TAMPED INTO PLACE USING A ROLLER OR CULTIPACKER. IF HYDROSEEDING IS USED, THE SEED AND FERTILIZER WILL BE MIXED ON-SITE AND THE SEEDING SHALL BE DONE IMMEDIATELY AND WITHOUT INTERRUPTION.

MULCHING TEMPORARY SEEDING:

- APPLICATIONS OF TEMPORARY SEEDING SHALL INCLUDE MULCH WHICH SHALL BE APPLIED DURING OR IMMEDIATELY AFTER SEEDING. SEEDINGS MADE DURING OPTIMUM SEEDING DATES ON FAVORABLE SOIL CONDITIONS AND ON VERY FLAT AREAS MAY NOT NEED MULCH TO ACHIEVE ADEQUATE STABILIZATION. FOLLOWING SEED APPLICATION TOPSOILS AND ALL SLOPES GREATER THAN 2:1 SHALL BE PROTECTED WITH SUITABLE FOR THE PROJECT, SEE GENERAL NOTES, SHEET 3.
- MATERIALS:
STRAW--IF STRAW IS USED, IT SHALL BE UNROTTED SMALL-GRAIN STRAW APPLIED AT 2 TONS/AC. OR 90 LB. / 1,000 SQ. FT. (TWO TO THREE BALES). THE MULCH SHALL BE SPREAD UNIFORMLY BY HAND OR MECHANICALLY SO THE SOIL SURFACE IS COVERED. FOR UNIFORM DISTRIBUTION OF HAND-SPREAD MULCH, DIVIDE AREA INTO APPROXIMATELY 1,000 SQ. FT. SECTIONS AND SPREAD TWO 45 LB. BALES OF STRAW IN EACH SECTION.

HYDROSEEDERS--IF WOOD CELLULOSE FIBER IS USED, IT SHALL BE USED AT 2,000 LB. / AC. OR 46 LB. /1,000 SQ. FT.

OTHER--OTHER ACCEPTABLE MULCHES INCLUDE MULCH MATTINGS APPLIED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS OR WOOD CHIPS APPLIED AT 6 TONS / AC.

- STRAW MULCH SHALL BE ANCHORED IMMEDIATELY TO MINIMIZE LOSS BY WIND OR WATER. ANCHORING METHODS:

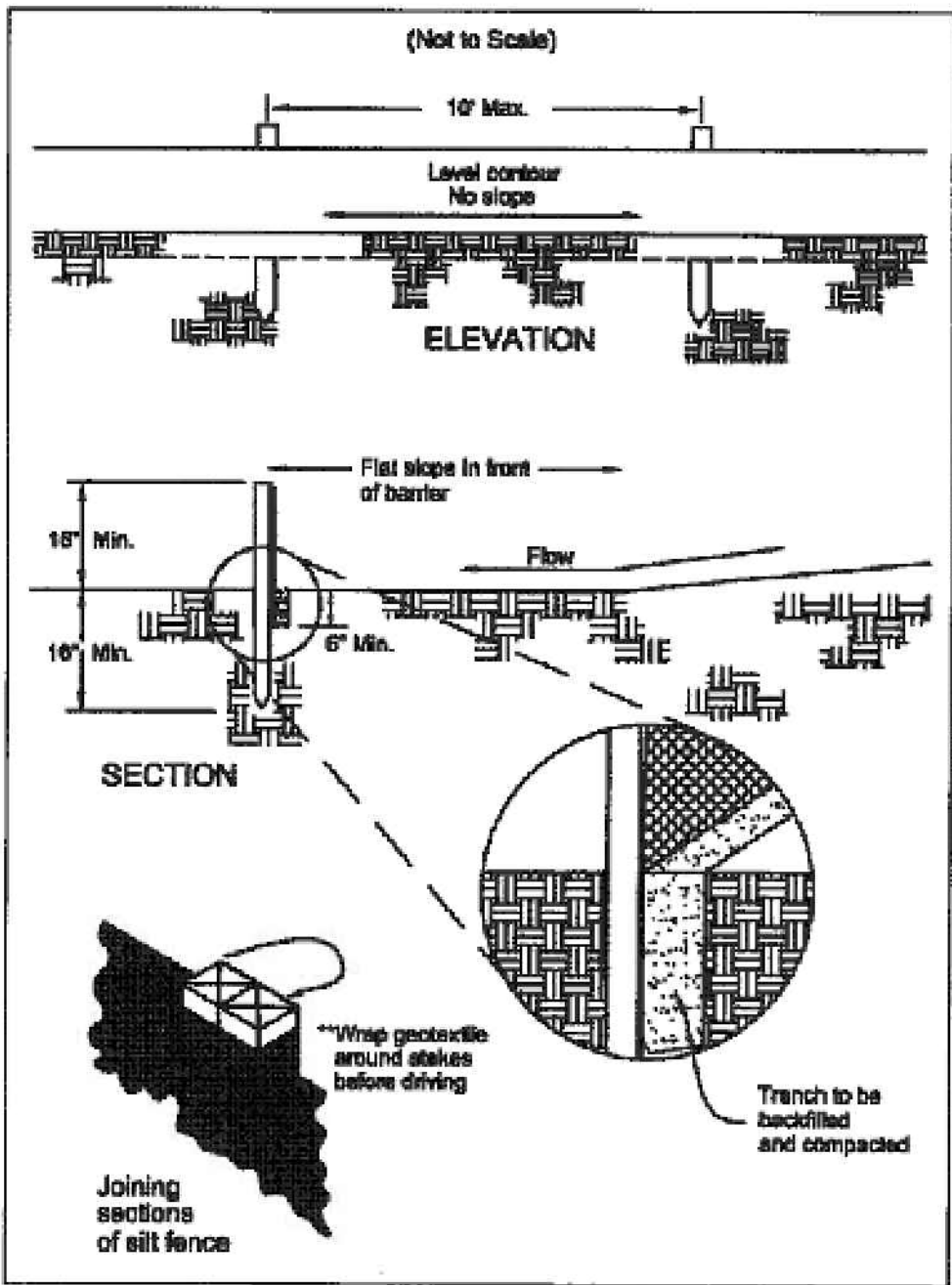
MECHANICAL--A DISK, CRIMPER OR SIMILAR TYPE TOOL SHALL BE SET STRAIGHT TO PUNCH OR ANCHOR THE MULCH MATERIAL INTO THE SOIL. STRAW MECHANICAL ANCHORED SHALL NOT BE FINELY CHOPPED BUT, GENERALLY BE LEFT LONGER THAN 6 IN.

MULCH NETTINGS--NETTINGS SHALL BE USE ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. NETTING MAY BE NECESSARY TO HOLD MULCH IN PLACE IN AREAS OF CONCENTRATED RUNOFF AND ON CRITICAL SLOPES. NETTING SHALL BE BIODEGRADABLE JUTE, NO PLASTIC. SEE SPECIFICATION FOR EROSION FABRIC ON SHEET 3, AND DETAILS FOR INSTALLATION LOCATION ON STANDARD DETAIL SHEETS.

SYNTHETIC BINDERS--SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRI-TAC), DCA-70, PETROSET, TERRA-TACK OR EQUAL MAY BE USED AT RATES RECOMMENDED BY THE MANUFACTURER.

WOOD-CELLULOSE FIBER--WOOD-CELLULOSE FIBER BINDER SHALL BE APPLIED AT A NET DRY WEIGHT OF 750 LB. /AC. THE WOOD-CELLULOSE FIBER SHALL BE MIXED WITH WATER AND THE MIXTURE SHALL CONTAIN A MAXIMUM OF 50 LB. / 100 GAL.

TS TEMPORARY SEEDING NOT TO SCALE

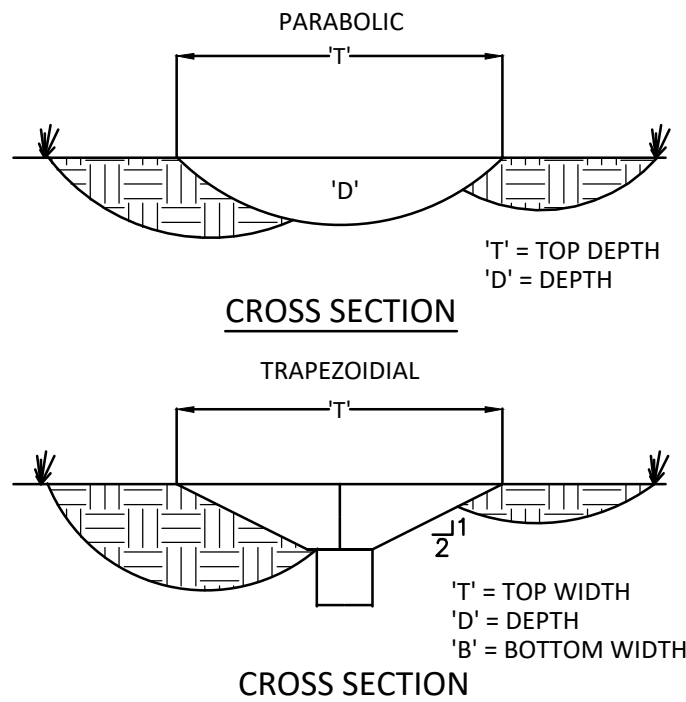


SF SILT FENCE NOT TO SCALE

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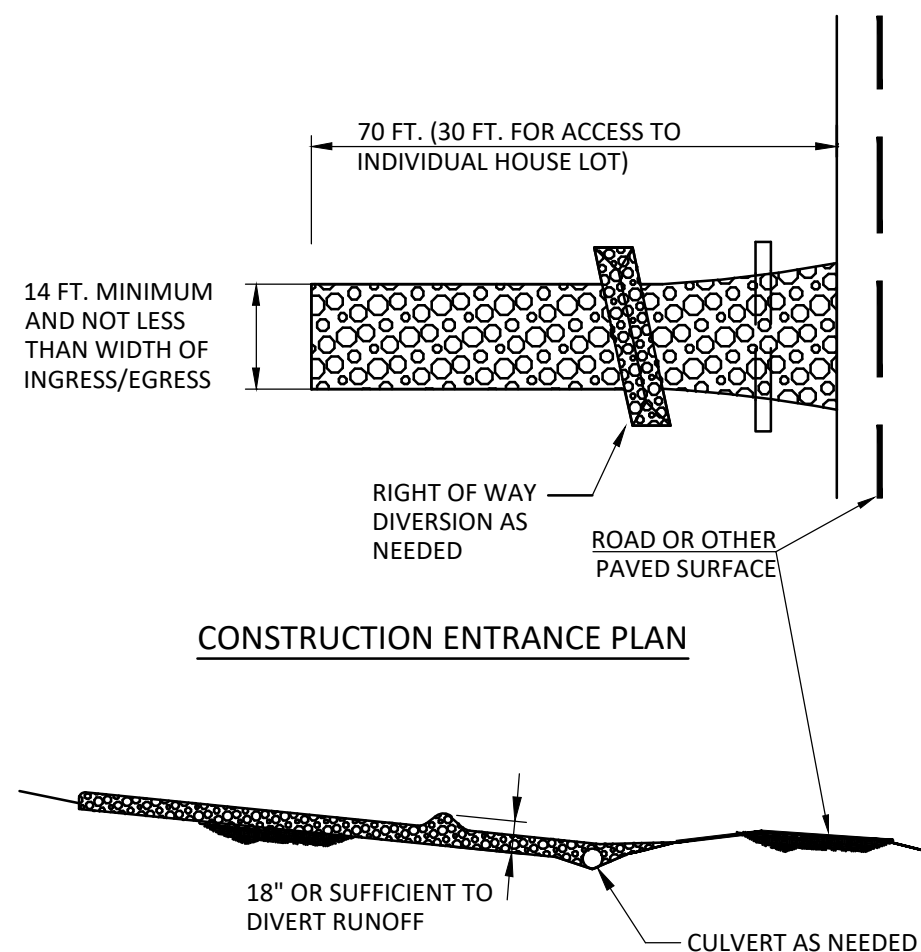
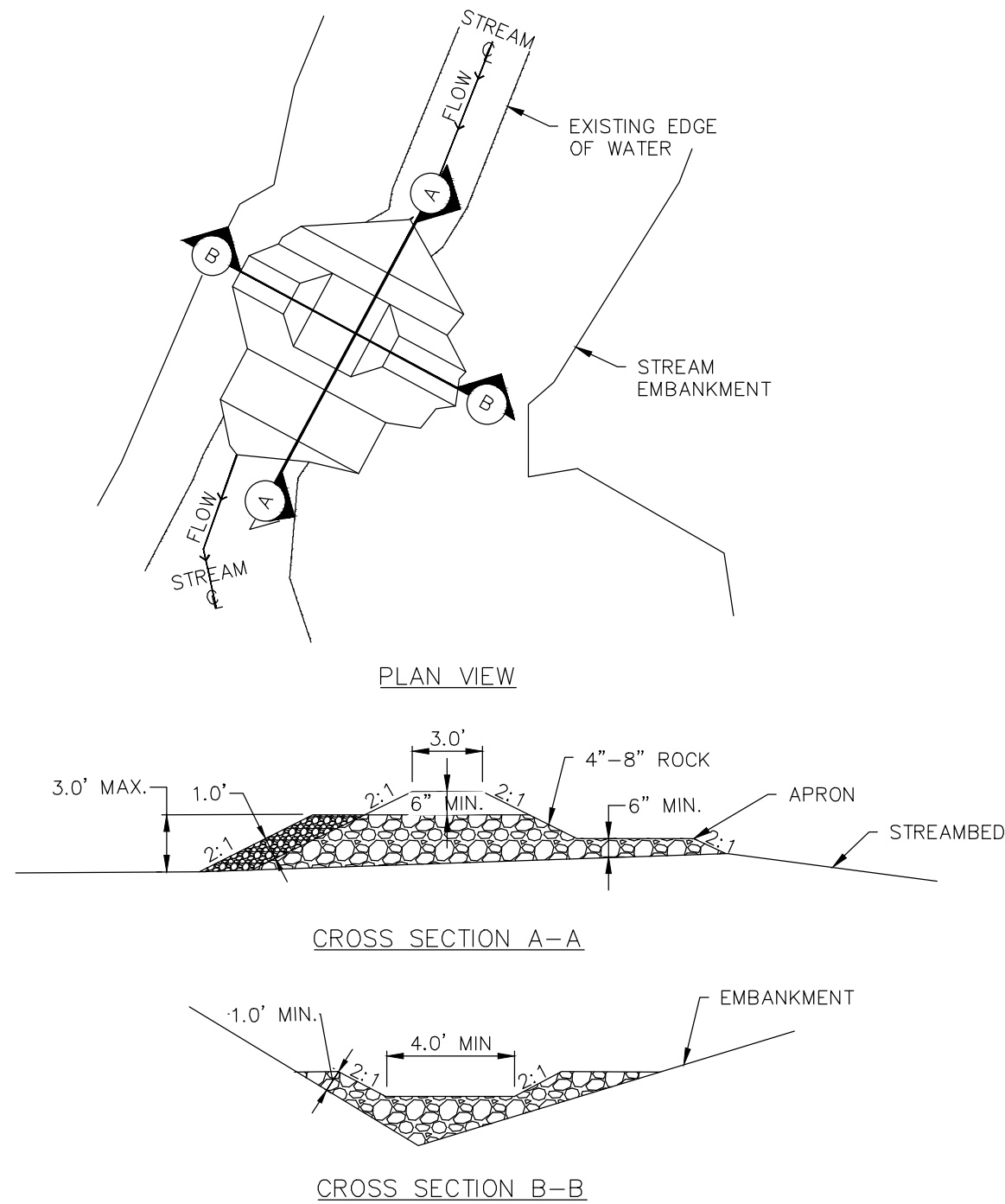
- THE CHECK DAM SHALL BE CONSTRUCTED OF 4-8 INCH DIAMETER OR ODOT TYPE D STONE, PLACED SO THAT IT COMPLETELY COVERS THE WIDTH OF THE CHANNEL. ODOT TYPE D STONE IS ACCEPTABLE, BUT SHOULD BE UNDERLAIN WITH A GRAVEL FILTER CONSISTING OF ODOT NO. 3 OR 4 SUITABLE FILTER FABRIC.
- THE UPSTREAM SIDE OF THE CHECK DAM SHALL HAVE A LAYER OF ODOT #57 AGGREGATE.
- SEDIMENT SHALL BE REMOVED FROM BEHIND THE DAM WHEN IT REACHES ½ THE HEIGHT OF THE CHECK DAM.
- MAXIMUM HEIGHT OF CHECK DAM SHALL NOT EXCEED 3.0 FEET.
- THE MIDPOINT OF THE ROCK CHECK DAM SHALL BE A MINIMUM OF 6 INCHES LOWER THAN THE SIDES IN ORDER TO DIRECT FLOW ACROSS THE CENTER AND AWAY FROM THE CHANNEL SIDES.
- THE BASE OF THE CHECK DAM SHALL BE ENTRENCHED APPROXIMATELY 6 INCHES WHEN FEASIBLE.
- A SPLASH APRON SHALL BE CONSTRUCTED WHERE CHECK DAMS ARE EXPECTED TO BE IN USE FOR AN EXTENDED PERIOD OF TIME. A STONE APRON SHALL BE CONSTRUCTED IMMEDIATELY DOWNSTREAM OF THE CHECK DAM TO PREVENT FLOWS FROM UNDERCUTTING THE STRUCTURE. THE APRON SHOULD BE 6 IN. THICK AND ITS LENGTH TWO TIMES THE HEIGHT OF THE DAM.
- STONE PLACEMENT SHALL BE PERFORMED EITHER BY HAND OR MECHANICALLY AS LONG AS THE CENTER OF CHECK DAM IS LOWER THAN THE SIDES AND EXTENDS ACROSS ENTIRE CHANNEL.
- SIDE SLOPES SHALL BE A MINIMUM OF 2:1.

CD TEMPORARY ROCK SILT DAM NOT TO SCALE



- ALL TREES, BRUSH, STUMPS, AND OTHER UNSUITABLE MATERIAL SHALL BE REMOVED FROM THE SITE
- THE CHANNEL SHALL BE EXCAVATED AND SHAPED TO THE PROPER GRADE AND CROSS SECTION
- FILL MATERIAL USED IN THE CONSTRUCTION OF THE CHANNEL SHALL BE WELL COMPACTED IN UNIFORM LAYERS NOT EXCEEDING 9 INCHES USING THE WHEEL TREADS OR TRACKS OF THE CONSTRUCTION EQUIPMENT TO PREVENT UNEQUAL SETTLEMENT.
- EXCESS EARTH SHALL BE GRADED OR DISPOSED OF SO THAT IT WILL NOT RESTRICT FLOW TO THE CHANNEL OR INTERFERE WITH ITS FUNCTIONING.
- STABILIZATION SHALL BE DONE ACCORDING TO THE APPROPRIATE SPECIFICATIONS FOR PERMANENT SEEDING, VEGETATIVE PRACTICES, SODDING AND MATTING.
- CONSTRUCTION SHALL BE SEQUENCED SO THAT NEWLY CONSTRUCTED CHANNELS ARE STABILIZED PRIOR TO BECOMING OPERATIONAL TO AID IN THE ESTABLISHMENT OF VEGETATION, SURFACE WATER MAY BE PREVENTED FROM ENTERING THE NEWLY CONSTRUCT CHANNEL THROUGH THE ESTABLISHMENT PERIOD.
- GULLIES THAT MAY FORM IN THE CHANNEL OR OTHER EROSION DAMAGE THAT OCCURS BEFORE THE GRASS LINING BECOMES ESTABLISHED SHALL BE REPAIRED WITHOUT DELAY.

GS GRASS SWALE DETAIL NOT TO SCALE



CONSTRUCTION ENTRANCE PROFILE NOT TO SCALE

- STONE SIZE--ODOT #2 (1.5 - 2.5 INCH) STONE SHALL BE USED, OR RECYCLED CONCRETE PAVEMENT.
- LENGTH--THE CONSTRUCTION ENTRANCE SHALL BE AS LONG AS REQUIRED TO STABILIZE HIGH TRAFFIC AREAS BUT NOT LESS THAN 70 FT. (EXCEPTION: APPLY 30 FT. MINIMUM TO SINGLE RESIDENCE LOT).
- THICKNESS--THE STONE LAYER SHALL BE AT LEAST 6-IN. THICK FOR LIGHT DUTY ENTRANCES OR AT LEAST 10-IN. FOR HEAVY DUTY USE.
- WIDTH--THE ENTRANCE SHALL BE AT LEAST 14-FT. WIDE, BUT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
- GEOTEXTILE--A GEOTEXTILE SHALL BE LAID OVER THE ENTIRE AREA PRIOR TO PLACING STONE. IT SHALL BE COMPOSED OF STRONG ROT-PROOF POLYMERIC FIBERS AND MEET THE FOLLOWING SPECIFICATIONS:

GEOTEXTILE SPEC. FOR CONSTRUCTION ENTRANCE	
MINIMUM TENSILE STRENGTH	200 LBS.
MINIMUM PUNCTURE STRENGTH	80 PSI
MINIMUM TEAR STRENGTH	50 LBS.
MINIMUM BURST STRENGTH	320 PSI
MINIMUM ELONGATION	20%
EQUIVALENT OPENING SIZE	EOS < 0.60 mm
PERMITTIVITY	1x10-3 CM/SEC

- TIMING--THE CONSTRUCTION ENTRANCE SHALL BE INSTALLED AS SOON AS IS PRACTICABLE BEFORE MAJOR GRADING ACTIVITIES.
- CULVERT--A PIPE OR CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE IF NEEDED TO PREVENT SURFACE WATER FLOWING ACROSS THE ENTRANCE OR TO PREVENT RUNOFF FROM BEING DIRECTED OUT ONTO PAVED SURFACES.
- WATER BAR--A WATER BAR SHALL BE CONSTRUCTED AS PART OF THE CONSTRUCTION ENTRANCE IF NEEDED TO PREVENT SURFACE RUNOFF FROM FLOWING THE LENGTH OF THE CONSTRUCTION ENTRANCE AND OUT ONTO PAVED SURFACES.
- MAINTENANCE--TOP DRESSING OF ADDITIONAL STONE SHALL BE APPLIED AS CONDITIONS DEMAND. MUD SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADS, OR ANY SURFACE WHERE RUNOFF IS NOT CHECK BY SEDIMENT CONTROLS, SHALL BE REMOVED IMMEDIATELY. REMOVAL SHALL BE ACCOMPLISHED BY SCRAPING OR SWEEPING.
- CONSTRUCTION ENTRANCES SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES AND PREVENT OFF-SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE CONSTRUCTION-SITE SHALL BE RESTRICTED FROM MUDDY AREAS.
- REMOVAL--THE ENTRANCE SHALL REMAIN IN PLACE UNTIL THE DISTURBED AREA IS STABILIZED OR REPLACED WITH A PERMANENT ROADWAY OR ENTRANCE.

CE CONSTRUCTION ENTRANCE NOT TO SCALE

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