EDNEYVILLE COMMUNITY CENTER
LEWIS CREEK STREAM RESTORATION

HENDERSON COUNTY, NORTH CAROLINA

UPPER FRENCH BROAD RIVER BASIN HUC: 06010105

USACE PIN: TBD
NCDWR WQC#: TBD

PROJECT DIRECTORY	
PROJECT OWNER	**HENDERSON COUNTY S&WCD**
	Betsy Gerwig Conservation Engineer betsy.gerwig@usda.gov (828) 697-4949
ENGINEER	**JENNINGS ENVIRONMENTAL PLLC**
Jennings Environmental	Greg Jennings, PHD, PE President (919) 600-4790 greg@jenningsenv.com
SURVEYOR	**PILOT SURVEYING AND ENGINEERING, INC**
PILOT SURVEYING AND ENGINEERING	Cory George, PE, PLS President (336) 565-7023 cory@pilotse.com

SHEET INDEX	
COVER SHEET	0.1
PROJECT NOTES AND SPECIFICATIONS	0.2
STREAM RESTORATION DESIGN CHANNEL SECTIONS	1.1 - 1.2
STREAM RESTORATION DESIGN PLAN AND PROFILE	2.1 - 2.4
STREAM RESTORATION GRADING SECTIONS	3.1 - 3.3
STREAM RESTORATION DETAILS	4.1 - 4.2
EROSION AND SEDIMENTATION CONTROL PLAN	5.1 - 5.2
SITE STABILIZATION AND RE-VEGETATION PLAN	6.1

PERMIT DRAWING

MAY 1, 2023

NOT RELEASED FOR CONSTRUCTION

Jennings Environmental
7 SAMUEL ASHE DRIVE
ASHEVILLE, NC 28805
919.600.4790
NC COA: P-1932

EDNEYVILLE COM. CENTER - LEWIS CREEK STREAM RESTORATION
HENDERSON COUNTY - NORTH CAROLINA

COVER SHEET

PERMIT DRAWING

REVISIONS:
DATE: 05/01/2022
PLOT SIZE: 24" x 36"
AS NOTED
H.D.: NAD83 (NCSP)
V.D.: NAVD88
JE PIN: 5101

0.1

GENERAL PROJECT NOTES AND SPECIFICATIONS

1. DEFINITIONS:
   - 1.1. CONSTRUCTION DOCUMENTS: THE CONTRACT AND APPLICABLE DRAWINGS, DETAILS, SPECIFICATIONS, PERMIT(S), AND/OR ANY OTHER DOCUMENTS (MEETING MINUTES, PUNCH LISTS, BID TABS, ETC.) FOR COMPLETE INFORMATION ABOUT THE REQUIRED WORK. ANY ONE OF THESE PARTS OF THE MAY NOT CONTAIN ALL OF THE INFORMATION REQUIRED TO COMPLETE THE PROJECT WORK.
   - 1.2. PROJECT OWNER: HENDERSON COUNTY SOIL AND WATER CONSERVATION DISTRICT
   - 1.3. ENGINEER: JENNINGS ENVIRONMENTAL PLLC (JE)
   - 1.4. SURVEYOR: PILOT SURVEYING AND ENGINEERING INC.
2. THE WORK ON THIS PROJECT SHALL ADHERE TO THE FOLLOWING SPECIFICATIONS, STANDARDS AND/OR REGULATIONS:
   - 2.1. NC DEQ'S "EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL" (2013)
   - 2.2. GENERAL, REGIONAL AND SPECIAL CONDITIONS OF USACE'S NATIONWIDE PERMIT 13 AND 27.
   - 2.3. GENERAL AND SPECIAL CONDITIONS OF NCDWR'S 401 WATER QUALITY CERTIFICATION
   - 2.4. THE CONSTRUCTION DOCUMENTS
3. NOT ALL EXISTING UTILITIES ARE SHOWN. SOME LOCATIONS MAY BE ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE FOR ALL UTILITY LOCATION AND COORDINATION. ANY UTILITIES SHOWN ON THE CONSTRUCTION DOCUMENTS ARE FOR INFORMATIONAL PURPOSES ONLY AND IN NO WAY RELIEVES THE CONTRACTOR FROM COORDINATING, VERIFYING AND PROTECTING EXISTING UTILITIES. ALL UTILITIES SHALL BE PROTECTED AND REMAIN ACTIVE UNLESS OTHERWISE NOTED.
4. THE BUILDER IS RESPONSIBLE FOR THE PROJECT AREA UNTIL COMPLETION AND FINAL ACCEPTANCE BY THE PROJECT OWNER. THE BUILDER SHALL TAKE ALL PRECAUTIONS NECESSARY AND SHALL BEAR ALL RISK OF LOSS OR DAMAGE. THE BUILDER WILL FURNISH ALL NECESSARY EQUIPMENT, TOOLS, LABOR, TRANSPORTATION, AND SUPERVISION TO COMPLETE THE WORK ACCORDING TO THESE SPECIFICATIONS AND APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS. THE BUILDER SHALL CONFINE ALL ACTIVITIES, INCLUDING EQUIPMENT STORAGE, TO THE LIMITS OF DISTURBANCE, STAGING AREAS, AND DESIGNATED CONSTRUCTION ACCESS POINTS.
5. THE BUILDER SHALL MAINTAIN ALL LIGHTS, GUARDS, SIGNS, TEMPORARY PASSAGES, OR OTHER PRECAUTIONS NECESSARY FOR THE SAFETY OF ALL PERSONS AND ON GOING MINING OPERATIONS AT THE SITE. THE BUILDER SHALL ABIDE BY ALL SAFETY RULES AND CONSTRUCTION CONDITIONS REQUIRED BY GOVERNMENTAL AUTHORITIES AND OTHER ENTITIES, INCLUDING RAILROADS, SO THE PUBLIC IS SAFEGUARDED FROM ACCIDENTS AND DELAYS. GUARDS AND FLAGS REQUIRED BY GOVERNMENTAL OR RAILROAD AUTHORITIES SHALL BE PROVIDED AT THE BUILDER'S EXPENSE, UNLESS DIRECTED OTHERWISE BY THE DESIGNATED REPRESENTATIVE. BUILDER SHALL AT NO TIME COMPROMISE EITHER SAFETY OR ENVIRONMENTAL REQUIREMENTS.
6. THE BUILDER SHALL ONLY USE ACCESS POINTS, ACCESS PATHS AND STAGING AREAS SHOWN ON THE DRAWINGS. ANY ALTERNATE ACCESS PLANNED BY THE BUILDER SHALL BE APPROVED BY THE PROJECT OWNER PRIOR TO USE. ANY NEW ACCESS ROUTES OR STAGING AREAS NEEDED FOR STREAM RELOCATION ACTIVITIES MUST FIRST BE FLAGGED AND MAPPED FOR EVALUATION AND WRITTEN APPROVAL BY MARTIN MARIETTA MUST BE OBTAINED PRIOR TO ANY DISTURBANCE ACTIVITIES.
7. NO NON-PERMITTED FILL IN WETLANDS MAY OCCUR. ALL EXCESS SOILS FROM MASS EXCAVATION, STREAM RELOCATION AND CHANNEL CONSTRUCTION SHALL BE DISPOSED OF IN THE DESIGNATED FILL AREAS.
8. ANY ELECTRONIC OR COMPUTER-AIDED DESIGN (COLLECTIVELY REFERRED TO AS "CAD") FILES ARE SUPPLIED AS A MATTER OF COURTESY ONLY. THE ENGINEER MAKES NO REPRESENTATION, WARRANTY, OR GUARANTEE AS TO THE ACCURACY, RELIABILITY, SUITABILITY, OR FUNCTIONALITY OF SUCH FILES, AND ANY SUCH WARRANTIES THAT MAY OTHERWISE BE IMPLIED BY LAW OR STATUTE ARE HEREBY EXPRESSLY DISCLAIMED. CAD FILES DO NOT INCLUDE A PROFESSIONAL ENGINEER'S STAMP AND ONLY DRAWINGS WITH SUCH STAMP AND THE ENGINEER'S SIGNATURE ARE TO BE CONSIDERED AS TRUE AND FINAL. ANY PERSON(S) OR ORGANIZATION(S) MAKING USE OF OR RELYING UPON CAD FILES IS SOLELY RESPONSIBLE FOR CONFIRMING THE ACCURACY AND COMPLETENESS OF THE INFORMATION INCLUDED IN SUCH FILES, INCLUDING, BUT NOT LIMITED TO, CONFORMANCE WITH THE CURRENT SEALED DRAWINGS AND SPECIFICATIONS, AND ACCEPTS ALL RESPONSIBILITY AND RISK ASSOCIATED WITH THE DOWNLOAD AND USE OF SUCH FILES. THE ENGINEER WILL HAVE NO LIABILITY OR RESPONSIBILITY TO THE RECIPIENT AND/OR USER OR ANY OTHER PERSON OR ENTITY FOR ANY LIABILITY, LOSS, OR DAMAGE CAUSED OR ALLEGED TO BE CAUSED DIRECTLY OR INDIRECTLY BY USE OF CAD FILES. IN THE EVENT OF A CONFLICT OR DISCREPANCY BETWEEN THE SEALED DRAWINGS AND SPECIFICATIONS AND CAD FILES, THE SEALED DRAWINGS AND SPECIFICATIONS SHALL CONTROL.

TOPOGRAPHIC SPECIFICATIONS AND NOTES

8. PILOT SURVEYING AND ENGINEERING INC. PROVIDED A BASE DRAWING AND SITE MAP TO JENNINGS ENVIRONMENTAL PLLC IN SEPTEMBER 2021. HORIZONTAL DATUM IS NAD83(2011) & VERTICAL DATUM IS NAVD88. ALL COORDINATES ARE BASED ON NAD83(2011) AND ALL ELEVATIONS ARE BASED ON NAVD88.
9. CLASS OF TOPOGRAPHIC SURVEY: CLASS A
10. THE DESIGN ELEVATIONS AND GRADES SHOWN IN THE DRAWINGS ARE BASED ON THE SEPTEMBER 2021 SURVEY FROM WHICH ALL COMPUTATIONS OF CUT AND FILL ARE BASED. SLIGHT DISCREPANCIES BETWEEN THE SURVEYED EXITING GROUND SURFACE AND FIELD CONDITIONS AT THE TIME OF CONSTRUCTION CAN RESULT IN VARIATIONS OF TOTAL EXCAVATED QUANTITIES. THESE VARIATIONS SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.

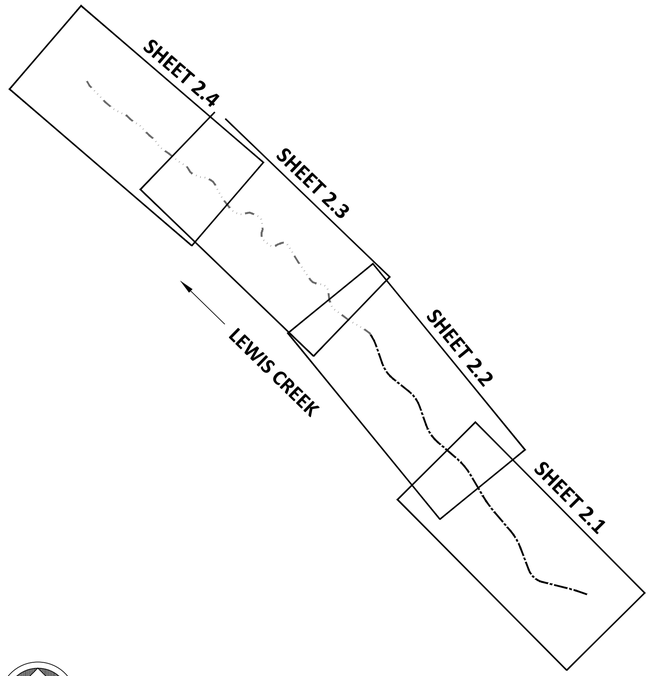
QUANTITIES AND MATERIALS SPECIFICATIONS

11. THE BUILDER SHALL FURNISH ALL MATERIALS NECESSARY TO COMPLETE THE PROPOSED WORK UNLESS OTHER PROVISIONS HAVE BEEN AGREED UPON PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL DELIVER ALL MATERIALS TO THE DESIGNATED ACCESS POINTS AND STAGING AREAS. MATERIAL QUANTITIES, DIMENSIONS AND SIZES SHALL CONFORM TO THE DRAWINGS, NOTES AND SPECIFICATIONS PROVIDED IN THE CONSTRUCTION DOCUMENTS OR ON THE WORK QUANTITIES AND MATERIALS LIST. THE ENGINEER MAY INSPECT AND APPROVE ALL MATERIALS PRIOR TO CONSTRUCTION. IF MATERIALS DO NOT MEET THE MINIMUM REQUIREMENTS SPECIFIED IN THE CONSTRUCTION DOCUMENTS, THE ENGINEER SHALL REJECT THE MATERIALS.
12. THE EROSION CONTROL MEASURES SHOWN IN THE DRAWINGS ARE TO BE INSTALLED AS NEEDED TO KEEP ALL SEDIMENT ON SITE AND OUT OF STREAMS AND WETLANDS. ADDITIONAL EROSION CONTROL MEASURES (ABOVE THOSE SHOWN ON THE DRAWINGS AND ON THE QUANTITIES AND MATERIALS LIST) MAY BE REQUIRED IN ORDER TO KEEP ALL SEDIMENT ON SITE AND OUT OF STREAMS AND WETLANDS.
13. THE USE OF ANY BRAND NAMES/MANUFACTURERS OR MODELS IS INTENDED SOLELY TO DENOTE THE QUALITY STANDARD OF THE DESIRED PRODUCT. ANY USE OF BRAND NAMES IS NOT INTENDED TO RESTRICT BIDDERS TO A SPECIFIC BRAND, MAKE, MANUFACTURER, OR NAME. THE BRAND NAMES / MANUFACTURERS OF MODELS ARE INTENDED TO CONVEY THE GENERAL STYLE, TYPE, CHARACTER, AND QUALITY OF PRODUCT. EQUIVALENT PRODUCTS WILL BE ACCEPTABLE IF THE PROJECT OWNER OR ENGINEER HAS GIVEN APPROVAL OF THE SPECIFIC PRODUCT IN WRITING.
14. THE BUILDER SHALL WARRANTY ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE BY THE PROJECT OWNER AND SHALL REPLACE ANY PORTIONS THAT FAIL DUE TO FAULTY MATERIALS OR WORKMANSHIP, AT NO ADDITIONAL COST TO THE PROJECT OWNER. A SIX (6) MONTH AND ELEVEN (11) MONTH INSPECTION WILL BE PERFORMED DURING THE WARRANTY PERIOD. THE BUILDER SHALL IMMEDIATELY REPAIR ALL ITEMS DETERMINED BY THE PROJECT OWNER OR AUTHORIZED REPRESENTATIVE TO BE DEFECTIVE UPON NOTIFICATION. THE BUILDER SHALL IMMEDIATELY REPAIR OR REPLACE FAILED ITEMS UPON NOTIFICATION BY THE PROJECT OWNER. SEASONALLY INSTALLED ITEMS SHALL BE REPAIRED OR REPLACED DURING THE NEXT AVAILABLE INSTALLATION PERIOD. ITEMS REPAIRED OR REPLACED UNDER THIS PROVISION SHALL HAVE AN ADDITIONAL ONE (1) YEAR WARRANTY PERIOD FROM THE NEW DATE OF ACCEPTANCE. AREAS AND/OR OTHER WORK DISTURBED WHILE ACCESSING AND/OR REPAIRING/REPLACING WARRANTY COVERED ITEMS SHALL BE STABILIZED.

STREAM RESTORATION NOTES AND SPECIFICATIONS

15. FIELD CONDITIONS AND PROJECT VARIABILITY MAY REQUIRE ADAPTATION OF THE DRAWINGS AND/OR DETAILS PROVIDED. MINOR VARIATION(S) OR ADAPTATION(S) OF THE PROPOSED WORK SHOWN ON THE DRAWINGS AND/OR DETAILS ARE CONSIDERED INCIDENTAL TO THE WORK.
16. ALL EXCAVATED MATERIAL SHALL BE FILLED IN A DESIGNATED AREA OUTSIDE OF FEMA REGULATED FLOODPLAINS AND JURISDICTIONAL WETLANDS.
17. CONSTRUCTION EQUIPMENT TRACKS AND ACCESS PATHS SHALL BE GRADED AND RE-CONTOURED AFTER CONSTRUCTION TO PREVENT RILL AND GULLY EROSION.
18. CONTRACTOR SHALL USE AN EXCAVATOR WITH A HYDRAULIC THUMB TO INSTALL IN-STREAM STRUCTURES.
19. DESIGN ELEVATIONS AT THE UPSTREAM AND DOWNSTREAM EXTENTS OF THE WORK AND IN THE VICINITY OF TRIBUTARIES AND CONFLUENCES MAY NEED TO BE ADJUSTED TO MEET FIELD CONDITIONS. ADJUSTMENTS SHALL BE MADE IN CONJUNCTION WITH THE ENGINEER AND ARE CONSIDERED INCIDENTAL TO CONSTRUCTION.
20. CHANNEL CONSTRUCTION WORK SHALL BE COMPLETED AND STABILIZED PRIOR TO ALLOWING FLOW TO ENTER INTO THE NEWLY CONSTRUCTED STREAM CHANNEL. THE CONTRACTOR SHALL NOT OPEN UP MORE THAN 200 FEET OF CHANNEL WITHOUT EROSION CONTROL MATTING IN PLACE OR BY APPROVAL OF THE ENGINEER. IF THE CHANNEL CONSTRUCTION WORK IS NOT COMPLETED PRIOR TO ABANDONING THE OLD CHANNEL, A TEMPORARY DIVERSION CHANNEL OR PUMP AROUND SYSTEM SHALL BE USED ACCORDING THE APPROVED E&SC PLAN AND DETAILS. IN-LINE CHANNEL WORK SHALL UTILIZE THE TEMPORARY PUMP AROUND SYSTEM AT ALL TIMES TO MAINTAIN DRY CONDITIONS IN THE WORK AREA.
21. STREAM RESTORATION WORK SHALL BE IMPLEMENTED BY FIRST GRADING THE FLOODPLAIN ADJACENT TO THE CHANNEL TO THE ELEVATIONS AND GRADES SPECIFIED IN THE PLANSHEETS. THE DESIGN CHANNEL SHALL THEN BE EXCAVATED TO THE DESIGN CHANNEL CROSS-SECTION GEOMETRY AND LONGITUDINAL PROFILE SHOWN IN THE DRAWINGS AND DETAILS. THE THALWEG CAN FIRST BE EXCAVATED TO THE ELEVATION SPECIFIED IN THE LONGITUDINAL PROFILE AND EXCAVATION AND FINE GRADING OF THE CROSS-SECTIONS SHALL THEN BE PREFORMED. ANY TEMPORARY STOCKPILING OR DOUBLE HANDLING OF EXCESS EARTH NECESSARY TO BUILD THE CHANNEL SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.
22. BANKFULL CHANNEL DIMENSION TOLERANCES WILL BE HELD TO THE DIMENSIONS SHOWN ON THE TYPICAL CROSS-SECTION PLANSHEETS. ELEVATIONS SHALL BE CONSTRUCTED WITHIN 0.1' (VERTICAL). WIDTHS AND DEPTHS MUST FALL WITHIN RANGES SHOWN IN THE PLANSHEETS. CHANNEL CROSS-SECTION DIMENSIONS SHALL BE WITHIN 0.2' (HORIZONTAL).
23. IF THE EXISTING GROUND IS LESS THAN 0.2' HIGHER THAN THE PROPOSED BANKFULL ELEVATION, IT IS NOT NECESSARY TO EXCAVATE TO THE PROPOSED ELEVATIONS AND GRADES IN THE CONSTRUCTION DOCUMENTS.
24. THE BUILDER SHALL UTILIZE NATIVE ONSITE ROCK, WOOD AND VEGETATION MATERIALS WHERE AVAILABLE AND APPROVED BY THE ENGINEER.
25. IN-STREAM STRUCTURES SHALL BE INSTALLED AS THE CHANNEL IS BEING CONSTRUCTED. INSTREAM STRUCTURES SHALL BE FINISHED TO A SMOOTH SURFACE IN ACCORDANCE WITH THE LINES, GRADES AND ELEVATIONS SHOWN IN THE DRAWINGS AND DETAILS. THE FINISHED STRUCTURE SLOPES AND PROFILE ELEVATIONS SHALL BE WITHIN 0.1' (VERTICAL) OF THE CONSTRUCTION DOCUMENTS.
26. FILTER FABRIC SHALL BE USED FOR IN-STREAM STRUCTURES. ALL FILTER FABRIC SHALL BE 8OZ. NONWOVEN GEOTEXTILE UNLESS OTHERWISE SPECIFIED IN STRUCTURE DETAILS OR SPECIFICATIONS. FILTER FABRIC SHALL BE TRIMMED TIGHT TO THE SURFACE OF THE STRUCTURE AND SHOULD NOT BE OBSERVED BY VISUAL INSPECTION.
27. BOULDER STRUCTURES SHALL BE CONSTRUCTED FROM BOULDERS THAT ARE CUBICAL OR RECTANGULAR IN SHAPE AND SIZED ACCORDING TO THE STRUCTURE DETAILS.
28. LOG STRUCTURES SHALL BE CONSTRUCTED FROM LOGS THAT ARE INTACT, WITH BRANCHES TRIMMED AND IN NON-DECOMPOSED CONDITION AND APPROVED BY ENGINEER.
29. AFTER THE STRUCTURE IS COMPLETE AND FLOW IS RESTORED TO THE CHANNEL, SOME ADJUSTMENT TO THE STRUCTURE OR ADDITIONAL STABILIZATION MEASURE MAY BE NECESSARY TO ACHIEVE THE DESIRED FUNCTION.
30. THE CONSTRUCTED CHANNEL AND FLOODPLAIN SHALL BE STABILIZED AS SOON AS POSSIBLE BY INSTALLING TOP SOIL, TEMPORARY AND PERMANENT SEEDING, ADDING STRAW MULCH TO BARE SOIL AND INSTALLING EROSION CONTROL MATTING FROM THE TOE OF THE BANKFULL CHANNEL TO 6.0' BEYOND THE BANKFULL STAGE. PRIOR TO INSTALLING THE EROSION CONTROL MATTING, APPLY SEED AND THEN STRAW MULCH. SEED SHALL BE BROADCAST EVENLY OF THE AREA USING A BROADCAST SPREADER PRIOR TO COVERING WITH THE EROSION CONTROL MATTING. THE MATTING SHALL BE ROLLED OUT IN THE DIRECTION OF ANTICIPATED RUNOFF FLOW. INSTALL MATTING IN ACCORDANCE WITH THE DETAIL INCLUDED IN THE CONSTRUCTION DOCUMENTS. MATTING MATERIAL USED FOR STREAMSIDE STABILIZATION MUST BE CERTIFIED WEED-FREE STRAW OR OTHER NATURAL WEED-FREE / NON-PROPAGATING VEGETATIVE MATERIALS. REWORKING OF AREAS THAT DO NOT ESTABLISH VEGETATION OR BECOME UNSTABLE SHALL BE NECESSARY IN THE MATTING SEPARATES FROM THE SOIL.
35. EXCESS EARTH MAY BE USED TO BACKFILL THE OLD CHANNEL. TOPSOIL SHALL BE REMOVED FROM EXCAVATION AND FILL AREAS PRIOR EXCAVATION AND GRADING AND RE-APPLIED TO AREAS AFTER ROUGH GRADING IS COMPLETE. 4" - 6" OF TOPSOIL SHALL BE PLACED ON DISTURBED AREAS TO THE ELEVATIONS AND GRADES INCLUDED IN THE CONSTRUCTION DOCUMENTS.
36. ANY AREA DISTURBED BY THE BUILDER SHALL BE PROMPTLY STABILIZED FOR INTERIM AND PERMANENT PURPOSES CONSISTENT WITH STORMWATER BEST MANAGEMENT PRACTICES. STABILIZATION INCLUDES RE-VEGETATION OF ANY EXPOSED SOILS. PLANTED GROUNDCOVER MAY ONLY BE NATIVE VEGETATION. MULCH SHALL BE SPREAD TO COVER DISTURBED CHANNEL AND FLOODPLAIN AREAS. MULCH SHALL BE KEPT OUT OF THE CROWNS OF SHRUBS AND GROUND COVER.

PROJECT OVERVIEW



STANDARD LINES AND SYMBOLS

EXISTING SITE FEATURES

- PARCEL BOUNDARY
- EASEMENT BOUNDARY
- RIGHT-OF-WAY
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- OVERHEAD POWER LINE
- FEMA SFHA ZONE AE
- EXISTING CULVERT
- EXISTING STREAM CENTERLINE
- EXISTING TREE LINE

DESIGN SITE FEATURES

- DESIGN MAJOR CONTOUR
- DESIGN MINOR CONTOUR
- DESIGN GRADING LIMITS
- DESIGN FLOODPLAIN TOE OF SLOPE
- DESIGN CHANNEL PLUG

DESIGN STREAM FEATURES

- DESIGN STREAM BANKFULL
- DESIGN STREAM CENTERLINE
- DESIGN NATIVE RIFFLE
- DESIGN STREAMBANK GRADING
- DESIGN TOE WOOD PROTECTION
- DESIGN LOG J-HOOK VANE
- DESIGN SINGLE ARM LOG VANE

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7 SAMUEL ASHE DRIVE
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EDNEYVILLE COM. CENTER - LEWIS CREEK STREAM RESTORATION

HENDERSON COUNTY - NORTH CAROLINA

PROJECT NOTES AND SPECIFICATIONS

PERMIT DRAWING

REVISIONS:
DATE: 05/01/2022
PLOT SIZE: 24" x 36"
AS NOTED
H.D.: NAD83 (NCSP)
V.D.: NAVD88
JE PIN: 5101

0.2

DESIGN CHANNEL SECTION SPECIFICATIONS

1. CONSTRUCT THE DESIGN CHANNEL SECTION TO THE LINES, ELEVATIONS AND GRADES SHOWN ON THE DRAWINGS AND DETAILS.

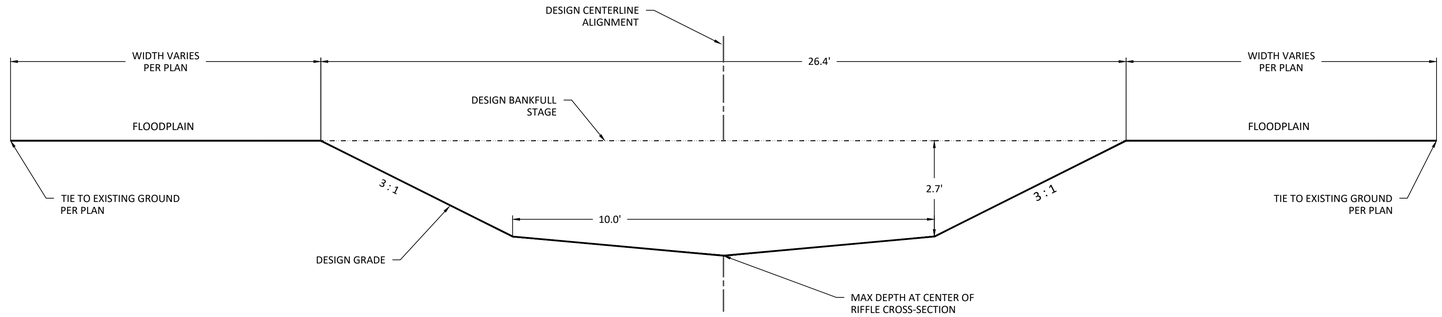
2. CHANNEL CONSTRUCTION WORK SHALL BE IMPLEMENTED BY FIRST GRADING THE FLOODPLAIN ADJACENT TO THE CHANNEL TO THE DESIGN ELEVATIONS AND GRADES SPECIFIED IN THE DRAWINGS AND DETAILS. THE DESIGN CHANNEL SHALL THEN BE EXCAVATED TO THE DESIGN CHANNEL GEOMETRY AND PROFILE. THIS CHANNEL WORK SHALL BE DONE WITH LOW GROUND PRESSURE TRACK EQUIPMENT. DRAWINGS PROVIDE DIMENSIONS, ELEVATIONS AND SLOPES TO AID IN CONSTRUCTION OF THE CHANNEL. THE THALWEG (CENTERLINE) CAN FIRST BE EXCAVATED TO THE ELEVATION SPECIFIED IN THE PROFILE. EXCAVATION OF THE SIDE SLOPES AND FINE GRADING OF THE CHANNEL SHALL THEN BE PREFORMED. ANY TEMPORARY STOCKPILING OR DOUBLE HANDLING OF EXCESS EARTH NECESSARY TO BUILD THE CHANNEL SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.

3. BANKFULL CHANNEL DIMENSIONS WILL BE HELD TO THE DIMENSIONS SHOWN IN THE DESIGN CHANNEL SECTION DETAIL ON THIS SHEET. ELEVATIONS AND DEPTHS SHALL BE CONSTRUCTED TO WITHIN 0.1' (VERTICAL). CHANNEL WIDTHS AND OTHER HORIZONTAL (X,Y) DIMENSIONS SHALL BE WITHIN 0.2'.

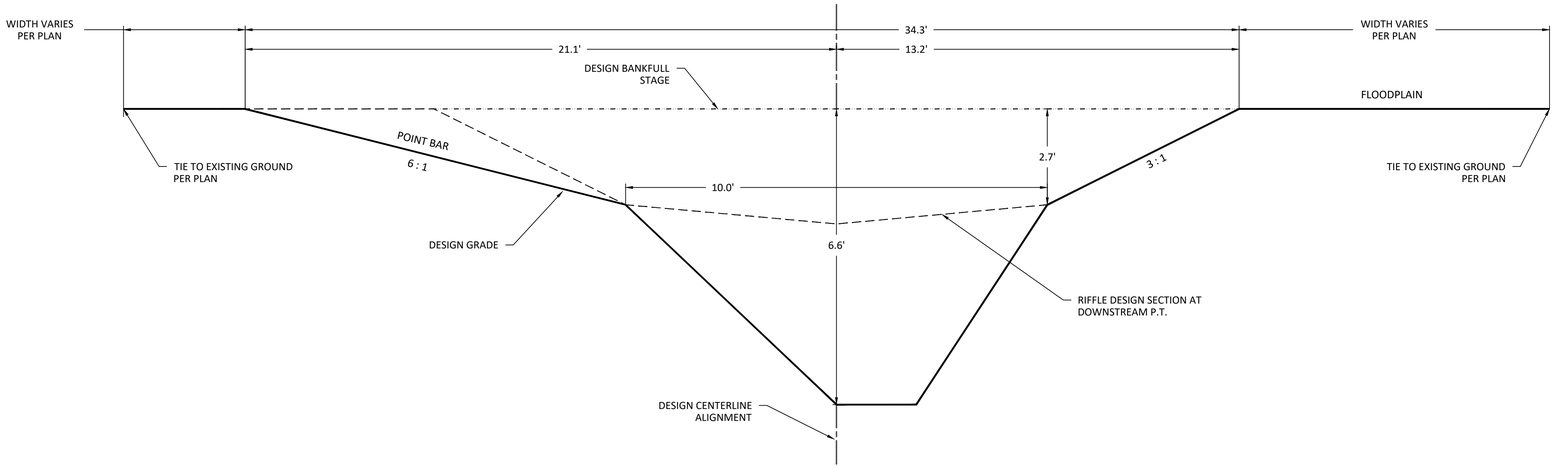
4. IF THE EXISTING FLOODPLAIN IS LESS THAN 0.2' HIGHER THAN THE DESIGN BANKFULL ELEVATION, IT IS NOT NECESSARY TO GRADE THE FLOODPLAIN TO THE FLOODPLAIN TO THE ELEVATIONS AND GRADES IN THE DRAWINGS.

5. IN-STREAM STRUCTURES SHALL BE INSTALLED AS THE CHANNEL IS BEING CONSTRUCTED. INSTREAM STRUCTURES SHALL BE FINISHED TO A SMOOTH SURFACE IN ACCORDANCE WITH THE LINES, GRADES AND ELEVATIONS SHOWN IN THE DRAWINGS AND DETAILS. THE FINISHED STRUCTURE SLOPES AND ELEVATIONS SHALL BE WITHIN 0.1' (VERTICAL) OF THE DRAWINGS AND DETAILS.

6. INSTALL EROSION CONTROL MATTING ON ALL DISTURBED STREAMBANKS TO 3.0' (MIN.) BEYOND THE BANKFULL STAGE.



LEWIS CREEK RIFFLE
STA 0+00 TO 12+38



LEWIS CREEK POOL
STA 0+00 TO 12+38

Jennings Environmental
7 SAMUEL ASHE DRIVE
ASHEVILLE, NC 28805
919.600.4790
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EDNEYVILLE COM. CENTER - LEWIS CREEK STREAM RESTORATION

HENDERSON COUNTY - NORTH CAROLINA

DESIGN CHANNEL SECTIONS: STA 0+00 TO 12+38

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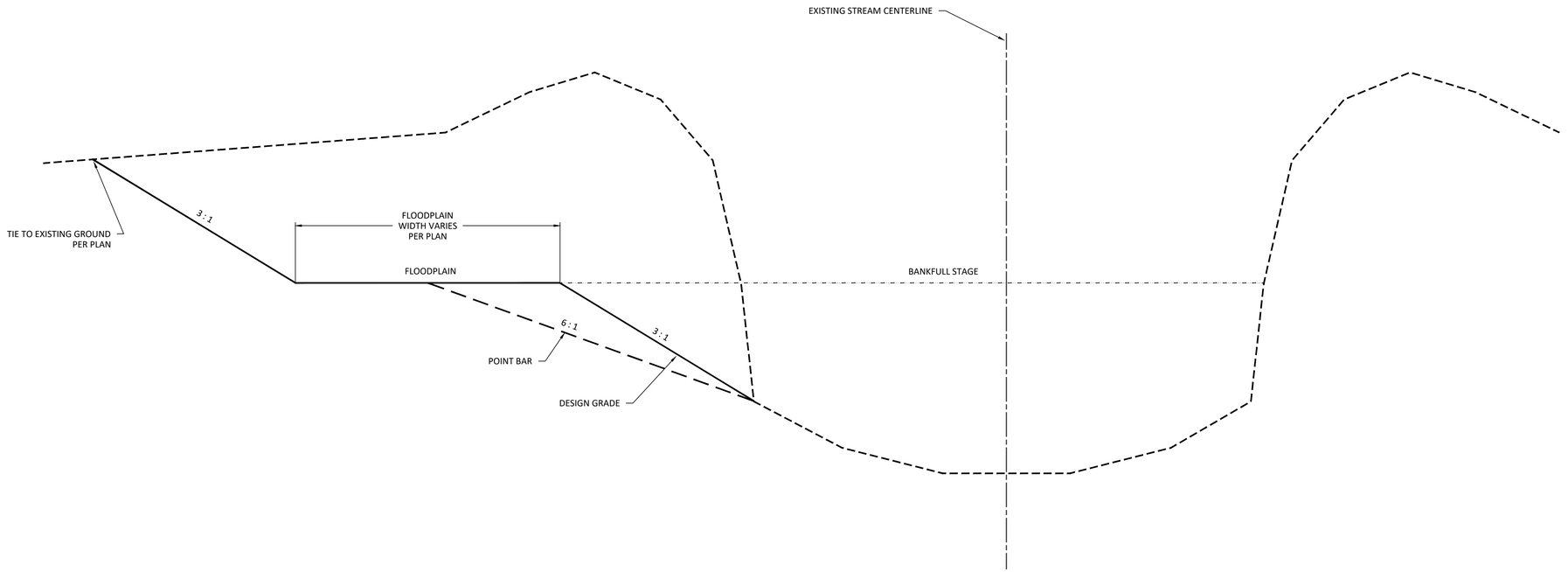
DESIGN CHANNEL SECTION SPECIFICATIONS

1. EXCAVATE THE FLOODPLAIN TO THE DESIGN ELEVATIONS SHOWN IN THE PLAN VIEW.
2. GRADE THE LEFT STREAM BANK AT 3:1 FROM THE EXISTING CHANNEL TOE OF SLOPE. GRADE POINT BARS AT 6:1.
3. THE CONTRACTOR SHALL WORK WITH THE ENGINEER ONSITE TO PRESERVE HEALTHY NATIVE TREES AND STABLE STREAM BANKS.
4. INSTALL EROSION CONTROL MATTING ON ALL DISTURBED STREAM BANKS TO 3.0' BEYOND TOP OF BANK.



LEWIS CREEK
STA 12+38 TO 26+31

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7 SAMUEL ASHE DRIVE
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EDNEYVILLE COM. CENTER - LEWIS CREEK STREAM RESTORATION

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DESIGN CHANNEL SECTIONS: STA 12+39 TO 26+31

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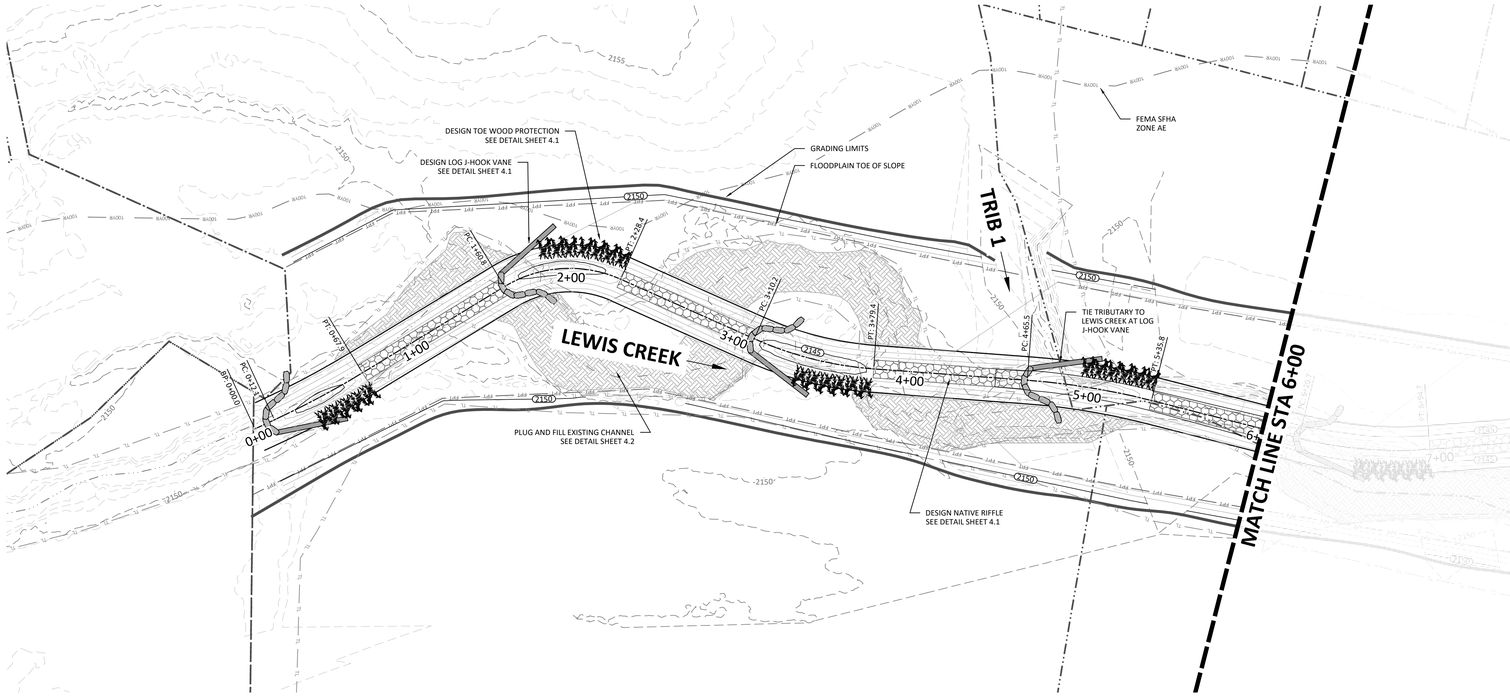
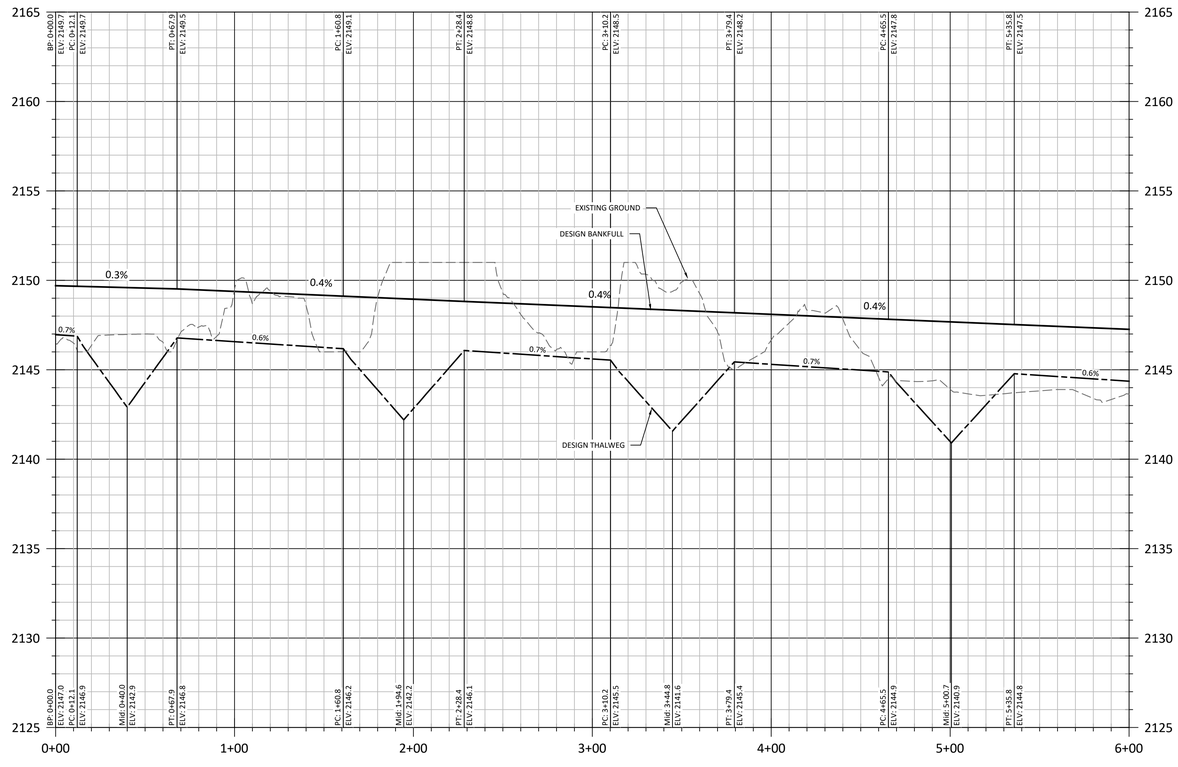
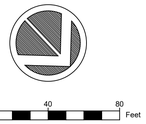
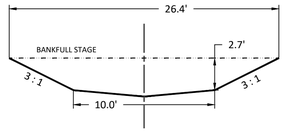


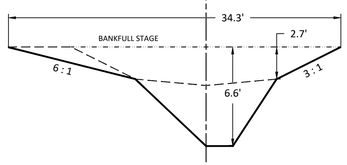




DESIGN CHANNEL SECTIONS

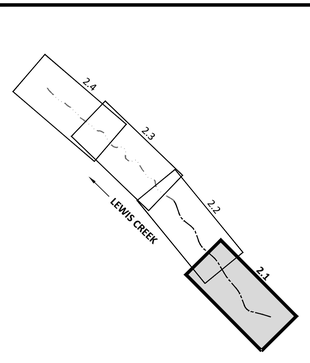


LEWIS CREEK RIFFLE
STA 0+00 TO 12+38



LEWIS CREEK POOL
STA 0+00 TO 12+38

SHEET INDEX



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HENDERSON COUNTY - NORTH CAROLINA

LEWIS CREEK DESIGN PLAN - PROFILE: STA 0+00 TO 6+00

PERMIT DRAWING

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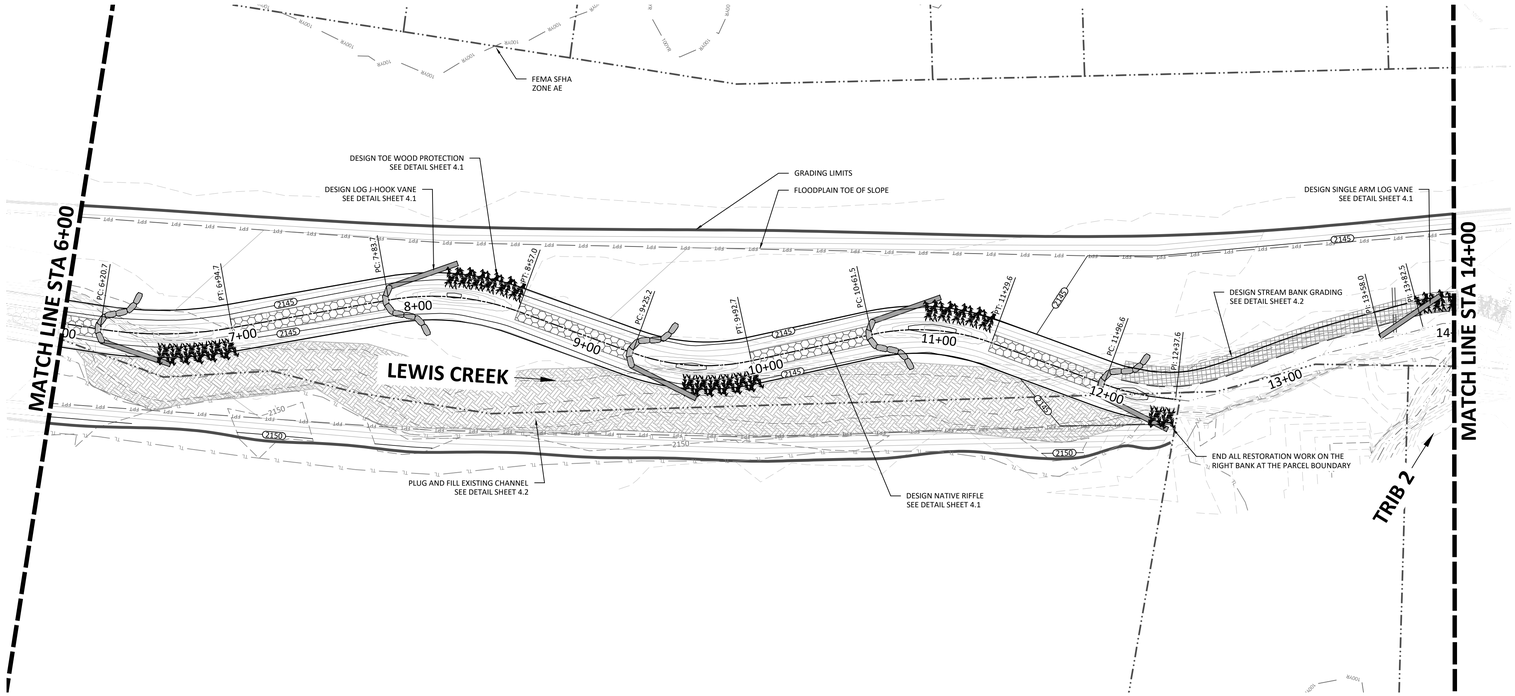
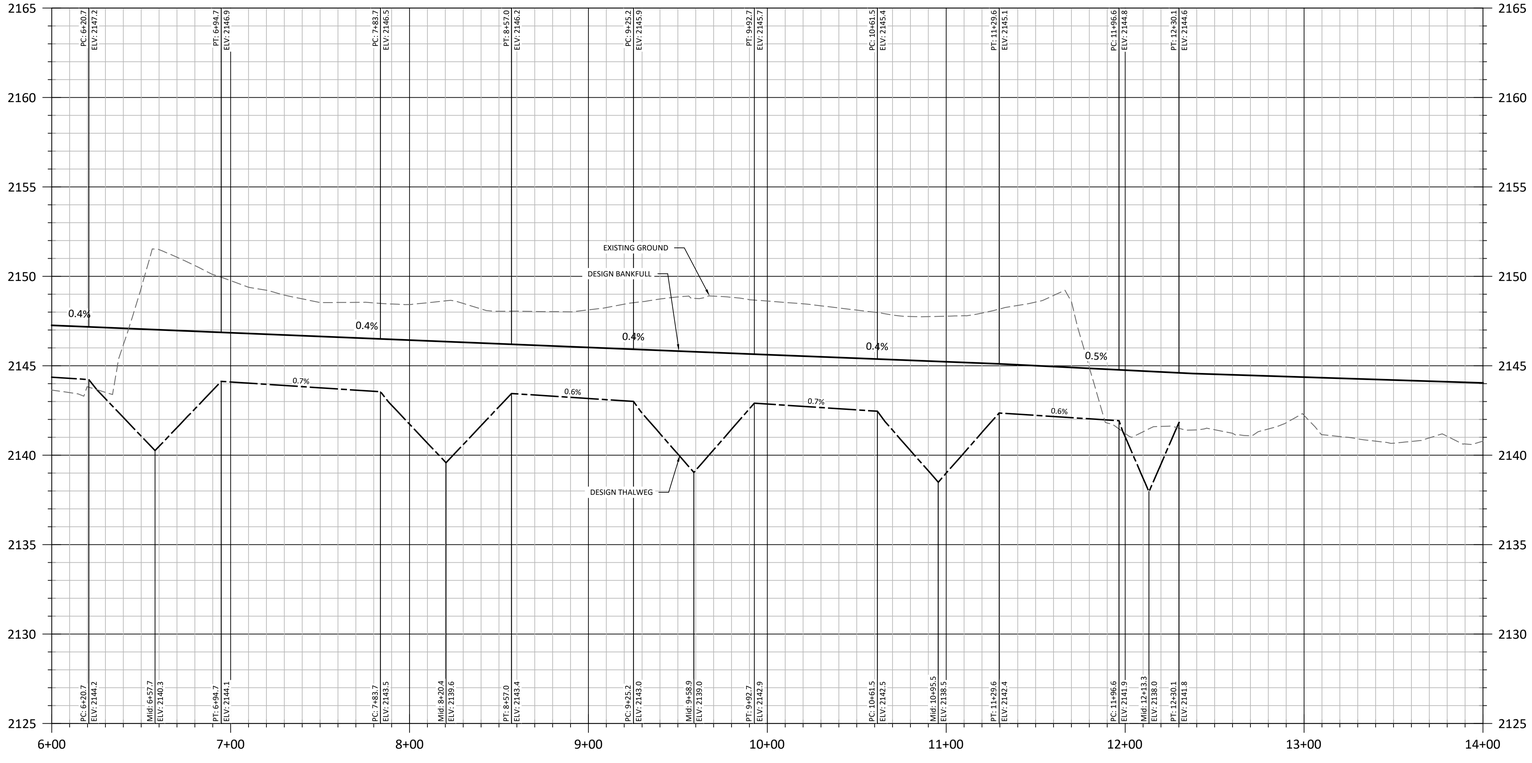
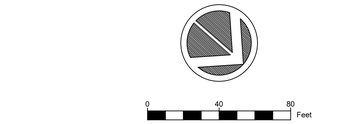
JE PIN: 5101

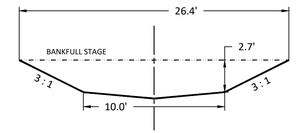
2.1



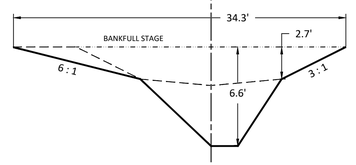




DESIGN CHANNEL SECTIONS

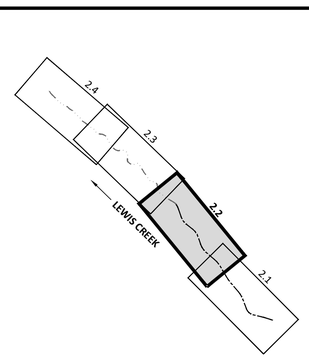


LEWIS CREEK RIFFLE
STA 0+00 TO 12+38



LEWIS CREEK POOL
STA 0+00 TO 12+38

SHEET INDEX



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7 SAMUEL ASHE DRIVE
ASHEVILLE, NC 28805
919.600.4790
NC COA: P-1932

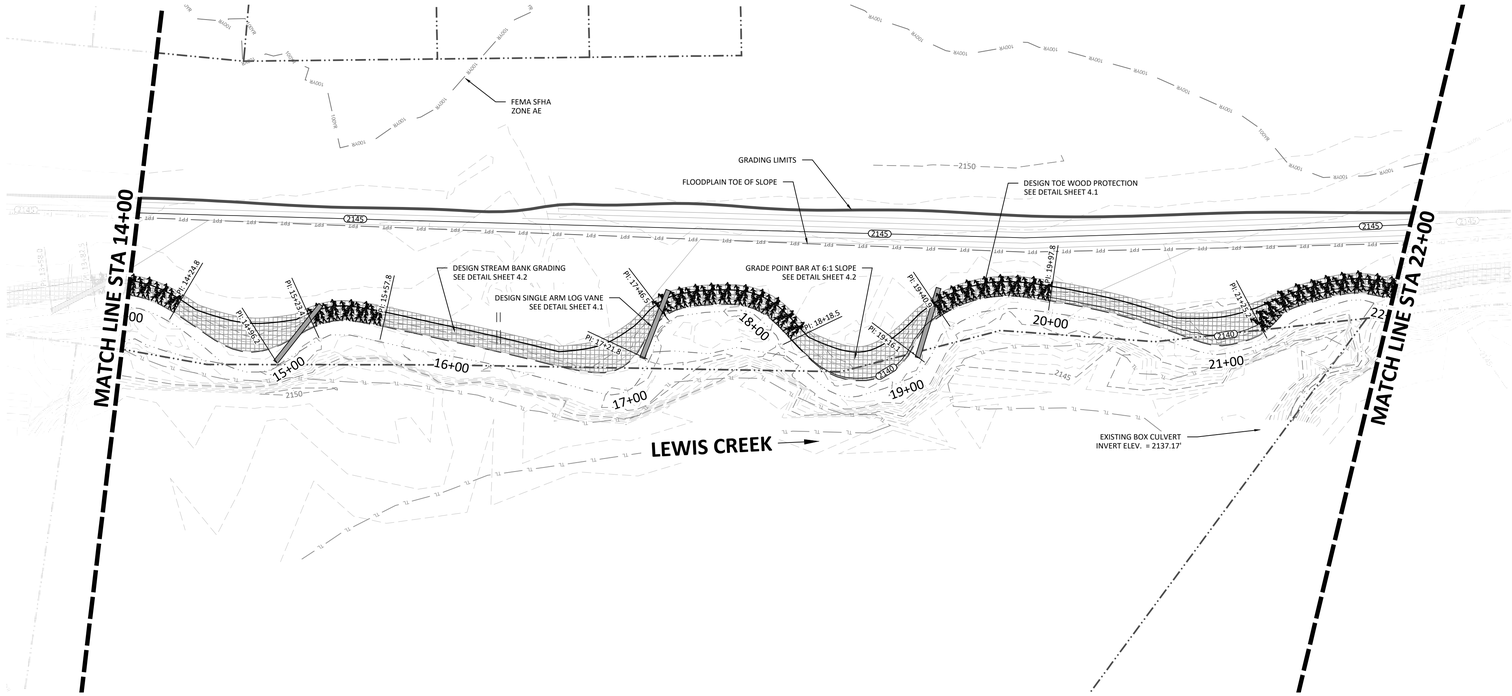
EDNEYVILLE COM. CENTER - LEWIS CREEK STREAM RESTORATION
HENDERSON COUNTY - NORTH CAROLINA

LEWIS CREEK DESIGN PLAN - PROFILE: STA 6+00 TO 14+00

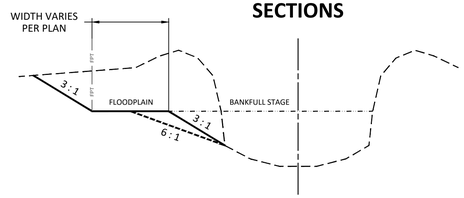
PERMIT DRAWING

REVISIONS:
DATE: 05/01/2022
PLOT SIZE: 24" x 36"
1" = 40'
H.D.: NAD83 (NCSP)
V.D.: NAVD88
JE PIN: 5101

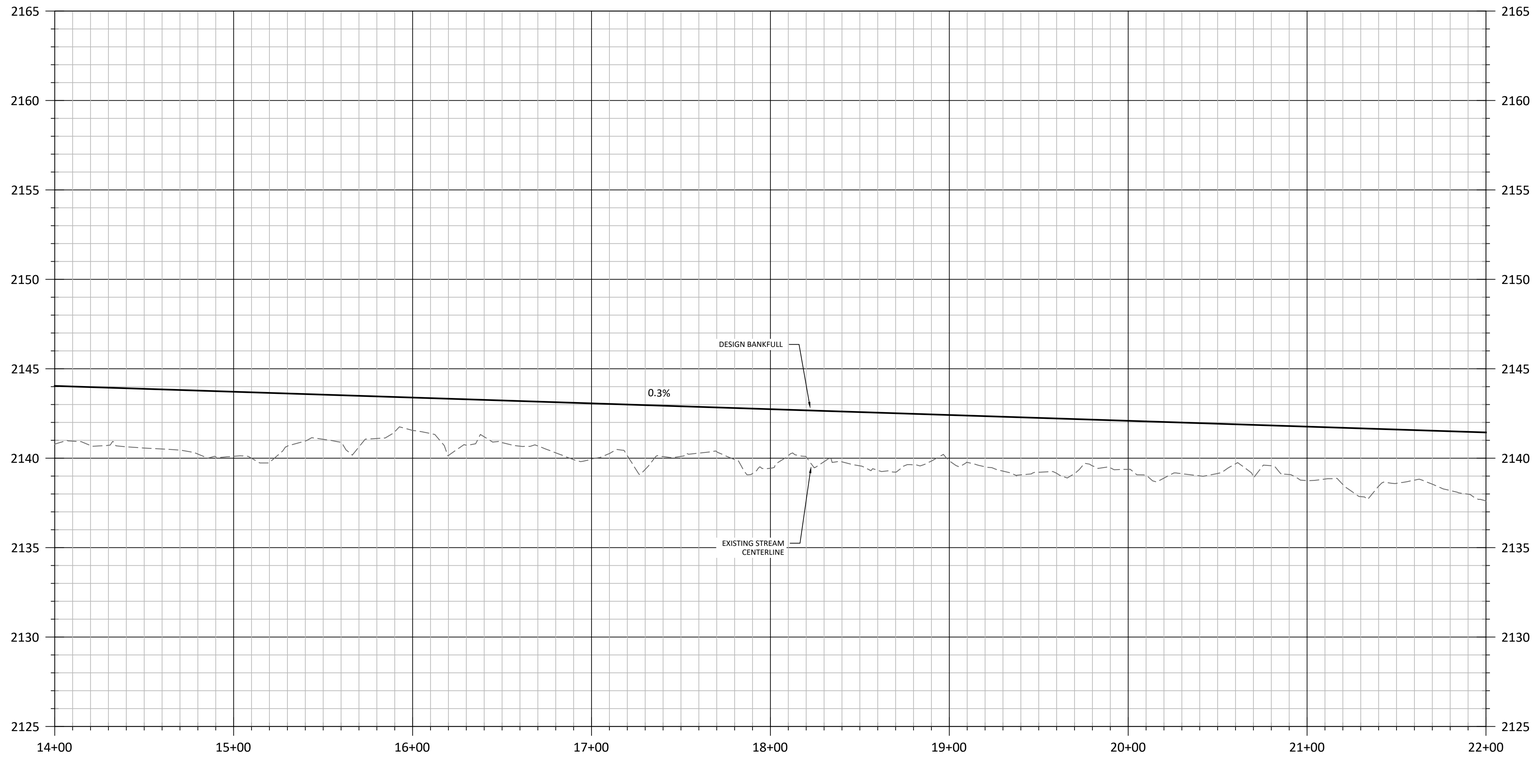
2.2



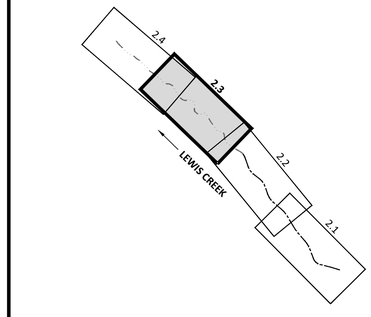
DESIGN CHANNEL SECTIONS



LEWIS CREEK
STA 12+38 TO 26+31



SHEET INDEX



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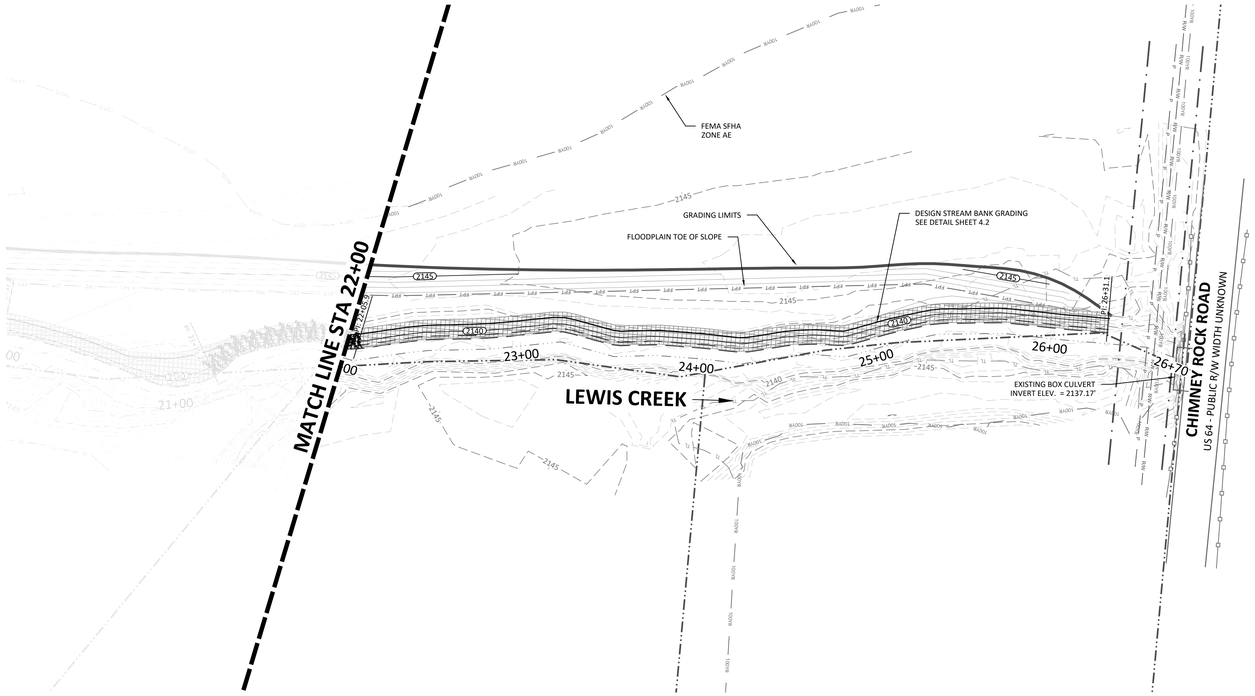
EDNEYVILLE COM. CENTER - LEWIS CREEK STREAM RESTORATION
HENDERSON COUNTY - NORTH CAROLINA

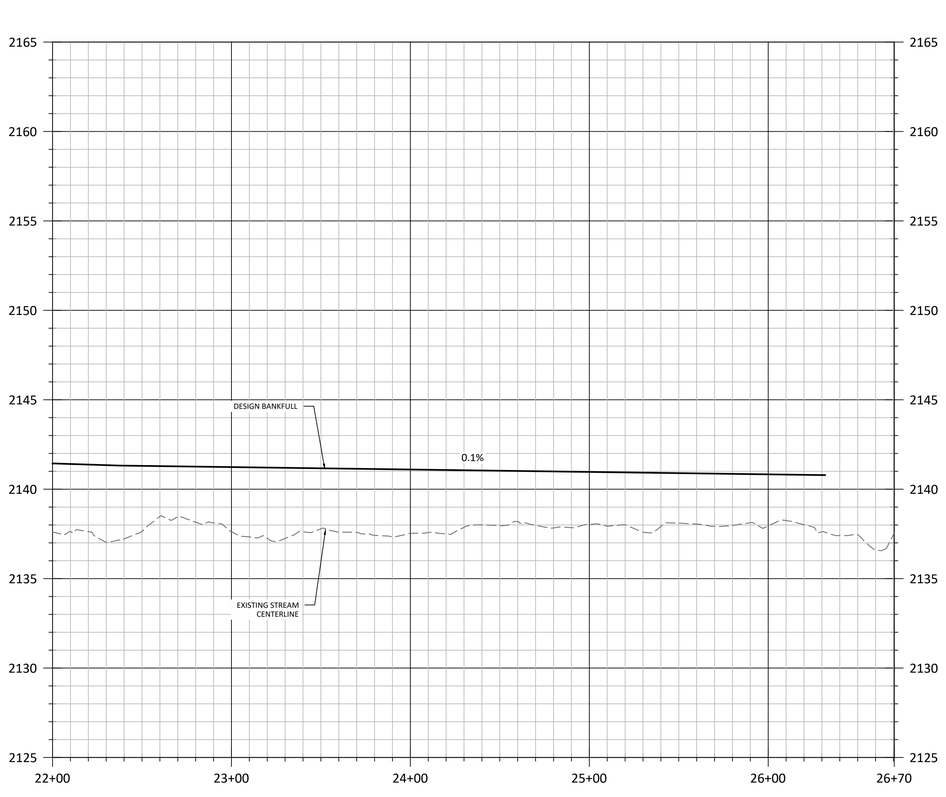
LEWIS CREEK DESIGN PLAN - PROFILE: STA 14+00 TO 22+00

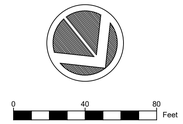
PERMIT DRAWING

REVISIONS:
DATE: 05/01/2022
PLOT SIZE: 24" x 36"
1" = 40'
H.D.: NAD83 (NCSP)
V.D.: NAVD88
JE PIN: 5101

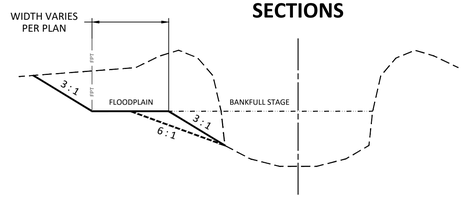
2.3





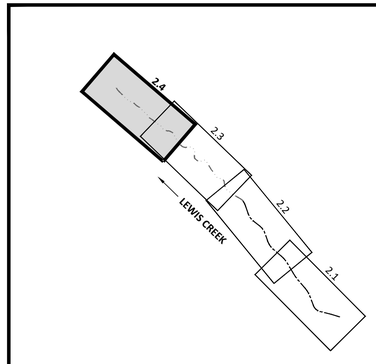


DESIGN CHANNEL SECTIONS



LEWIS CREEK
STA 12+38 TO 26+31

SHEET INDEX



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EDNEYVILLE COM. CENTER - LEWIS CREEK STREAM RESTORATION
HENDERSON COUNTY - NORTH CAROLINA

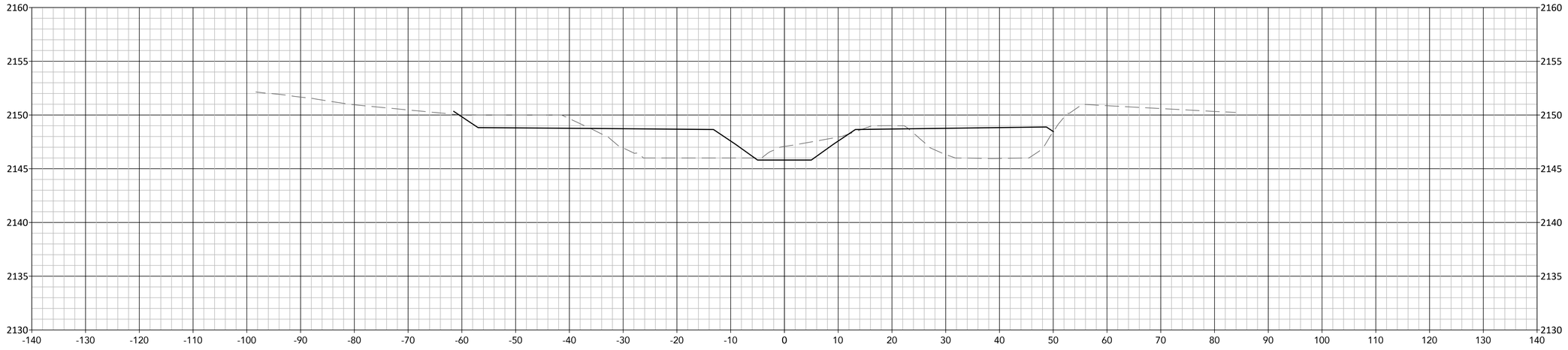
LEWIS CREEK DESIGN PLAN - PROFILE: STA 22+00 TO 26+70

PERMIT DRAWING

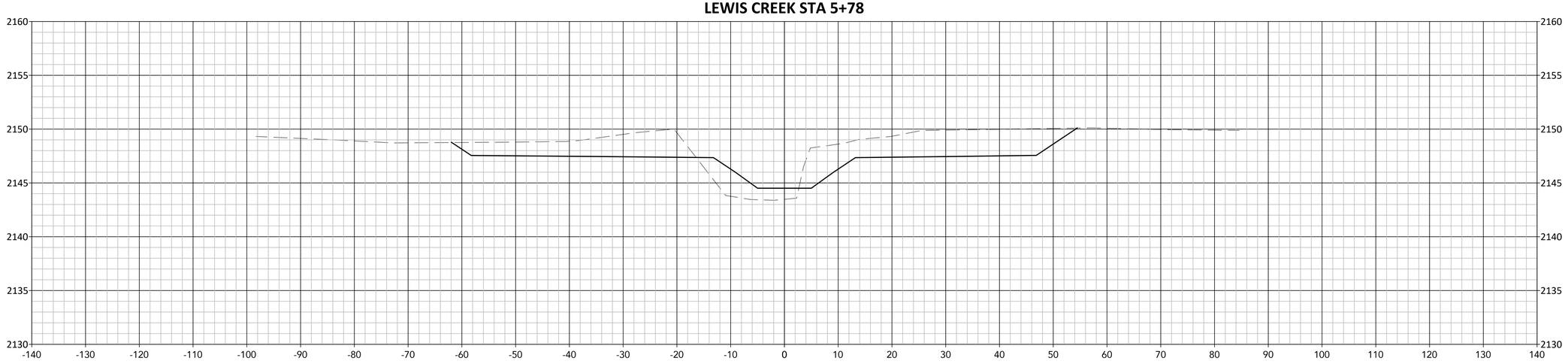
REVISIONS:
DATE: 05/01/2022
PLOT SIZE: 24" x 36"
1" = 40'
H.D.: NAD83 (NCSP)
V.D.: NAVD88
JE PIN: 5101

2.4

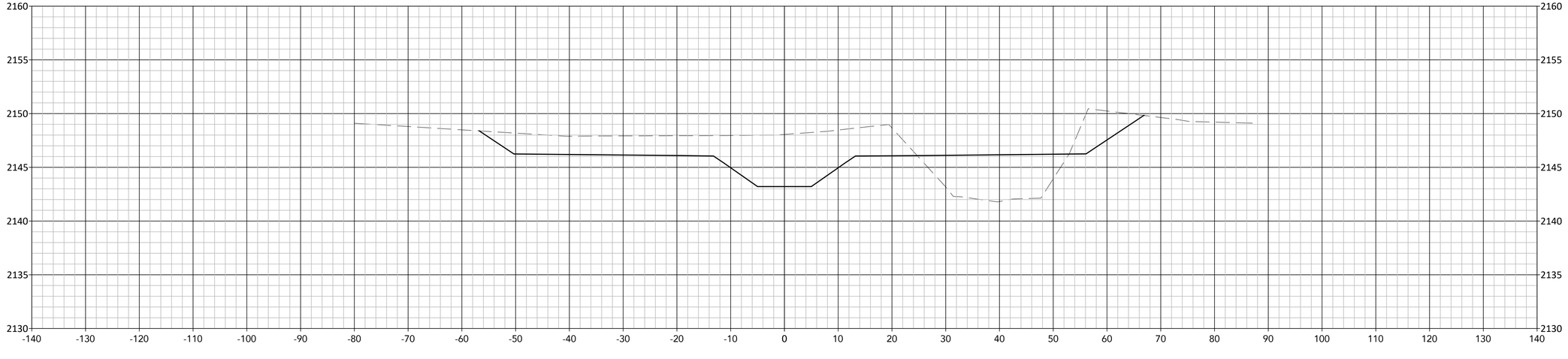
LEWIS CREEK STA 2+69



LEWIS CREEK STA 5+78



LEWIS CREEK STA 8+95



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NC COA: P-1932

EDNEYVILLE COM. CENTER - LEWIS CREEK STREAM RESTORATION

HENDERSON COUNTY - NORTH CAROLINA

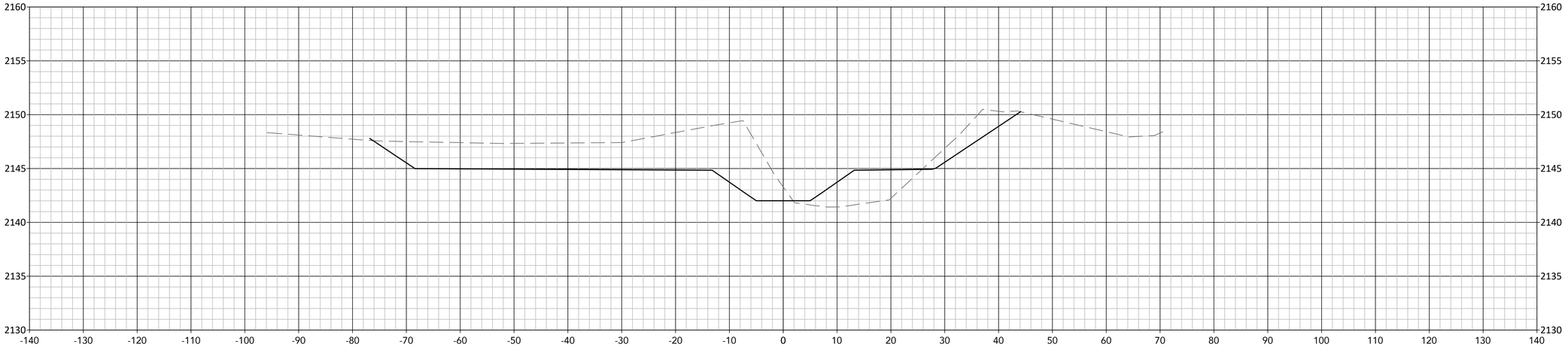
DESIGN GRADING SECTIONS

PERMIT DRAWING

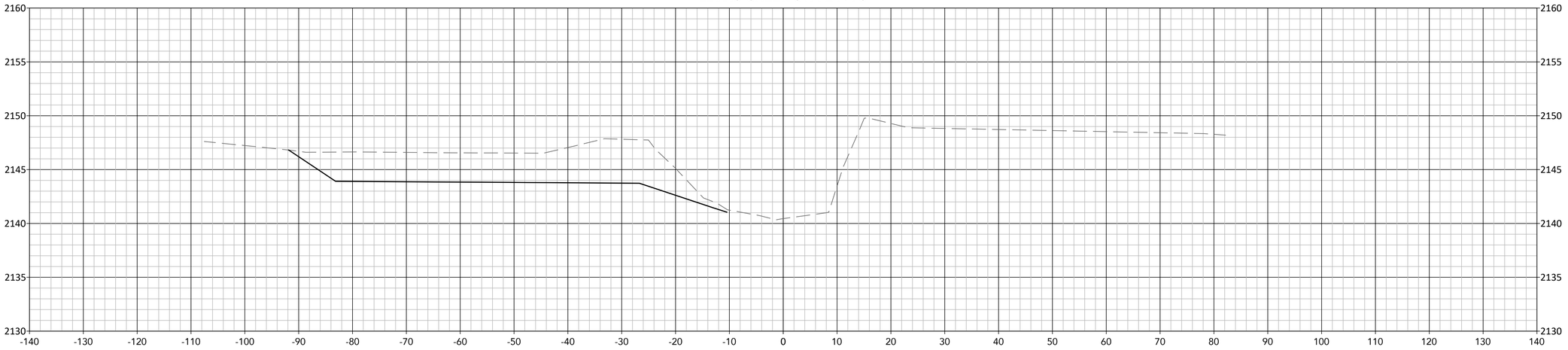
REVISIONS:
DATE: 05/01/2022
PLOT SIZE: 24" x 36"
1" = 10'
H.D.: NAD83 (NCSP)
V.D.: NAVD88
JE PIN: 5101

3.1

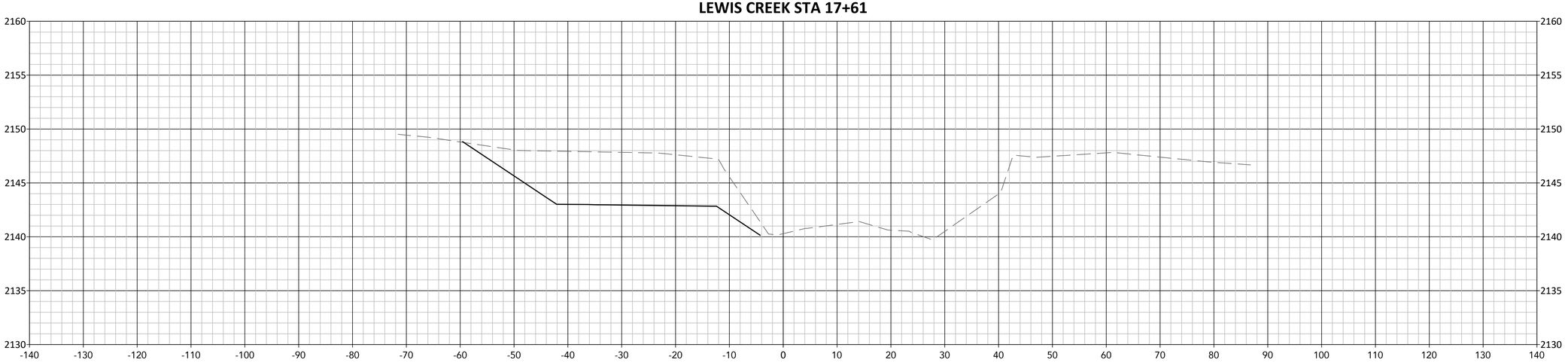
LEWIS CREEK STA 11+85



LEWIS CREEK STA 14+70



LEWIS CREEK STA 17+61



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EDNEYVILLE COM. CENTER - LEWIS CREEK STREAM RESTORATION

HENDERSON COUNTY - NORTH CAROLINA

DESIGN GRADING SECTIONS

PERMIT DRAWING

REVISIONS:
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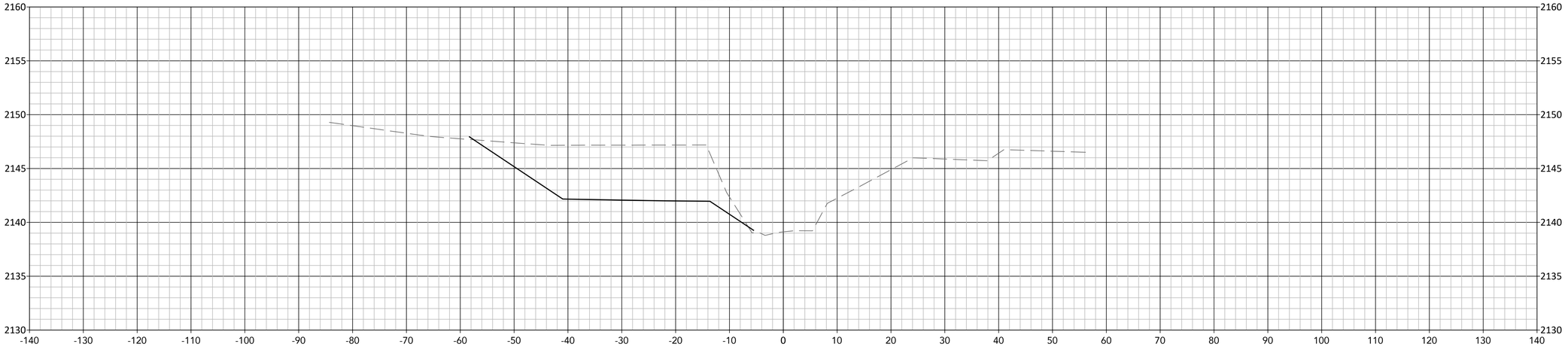
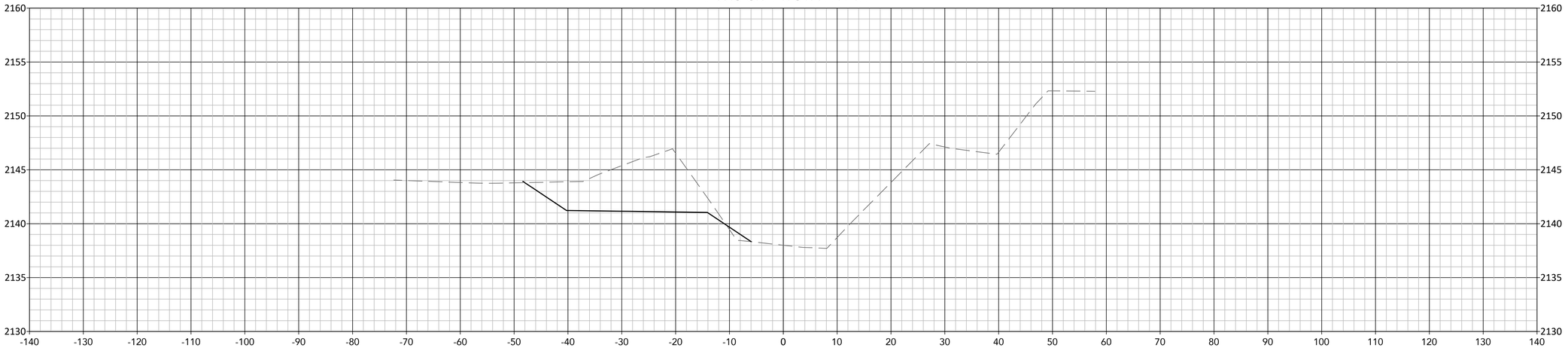
1" = 10'
H.D.: NAD83 (NCSP)
V.D.: NAVD88
JE PIN: 5101

3.2

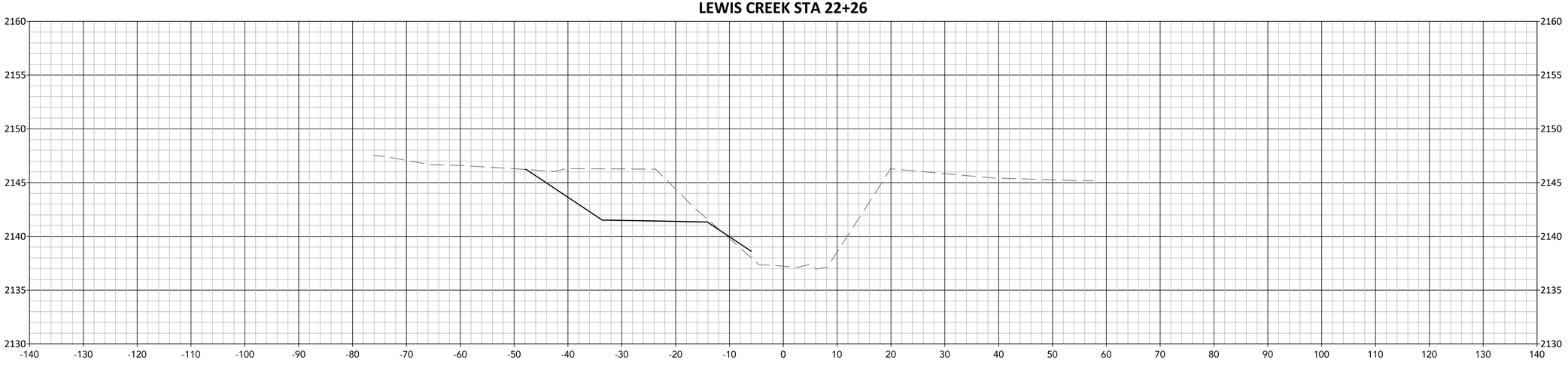
LEWIS CREEK STA 20+32



LEWIS CREEK STA 24+41



LEWIS CREEK STA 22+26



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EDNEYVILLE COM. CENTER - LEWIS CREEK STREAM RESTORATION

HENDERSON COUNTY - NORTH CAROLINA

DESIGN GRADING SECTIONS

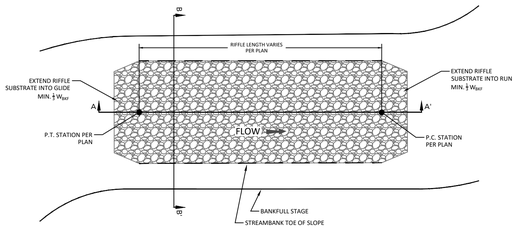
PERMIT DRAWING

REVISIONS:
DATE: 05/01/2022
PLOT SIZE: 24" x 36"
1" = 10'
H.D.: NAD83 (NCSP)
V.D.: NAVD88
JE PIN: 5101

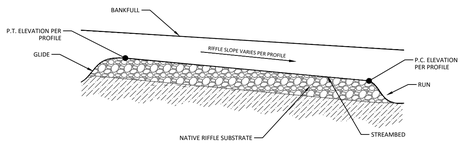
3.3

NATIVE RIFFLE NOTES AND SPECIFICATIONS

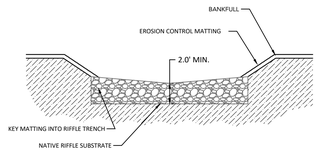
1. FOR INSTALLATION, THE CONTRACTOR SHALL OVER EXCAVATE THE LENGTH OF THE RIFFLE AND BACKFILL THE TRENCH WITH NATIVE GRAVEL AND COBBLE SUBSTRATE AVAILABLE ONSITE TO THE ELEVATIONS SHOWN ON THE PROPOSED PROFILE.
2. RIFFLE MATERIAL SHALL EXTEND A MINIMUM OF $\frac{1}{2}$ W_{BKF} U/S OF THE P.T. INTO THE GLIDE AND A MINIMUM OF $\frac{1}{2}$ W_{BKF} D/S OF THE P.C. INTO THE RUN.
3. THE RIFFLE MATERIAL SHALL BE PLACED AT A UNIFORM THICKNESS SUCH THAT, IN CROSS-SECTION, ITS LOWEST ELEVATION OCCURS IN THE CENTER OF THE CHANNEL.
4. RIFFLE MATERIAL SHALL BE COMPACTED USING AN EXCAVATOR BUCKET SUCH THE DEEPEST POINT OF THE CHANNEL IS ALONG THE CENTERLINE AND THAT FUTURE SETTLEMENT OF THE MATERIAL IS KEPT TO A MINIMUM.
5. THE SURFACE OF THIS STRUCTURE SHALL BE FINISHED TO A SMOOTH AND COMPACT SURFACE IN ACCORDANCE WITH THE LINES, GRADES, AND CROSS-SECTIONS OR ELEVATIONS SHOWN ON THE DRAWINGS. THE DEGREE OF FINISH FOR INVERT ELEVATIONS SHALL BE WITHIN 0.1 FT OF THE GRADES AND ELEVATIONS INDICATED.
6. RE-DRESSING OF CHANNEL AND BANKFULL BENCH/FLOODPLAIN WILL LIKELY BE REQUIRED FOLLOWING INSTALLATION OF IN-STREAM STRUCTURES AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.
7. RIFFLES SHALL BE CONSTRUCTED OF NATIVE GRAVEL AND COBBLE SUBSTRATE AVAILABLE WITHIN THE SITE. THE ENGINEER MUST APPROVE THE USE OF ALL ONSITE NATIVE MATERIAL. ALL STONE USED FOR RIFFLE CONSTRUCTION SHALL BE MIXED WITH FINER ALLUVIUM AVAILABLE ONSITE SUCH THAT THE RIFFLE MATERIAL IS WELL-GRADED WHEN PLACED IN THE RIFFLE TRENCH.



DETAILED PLAN
NOT TO SCALE

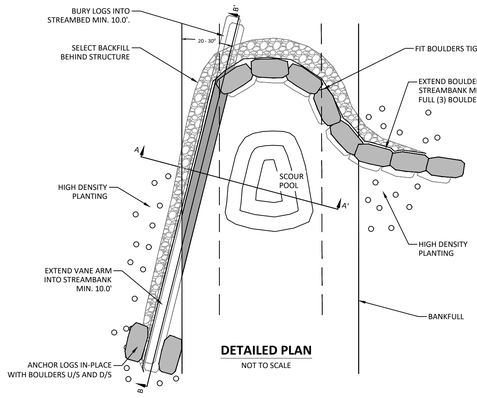


DETAILED SECTION A - A'
NOT TO SCALE



DETAILED SECTION B - B'
NOT TO SCALE

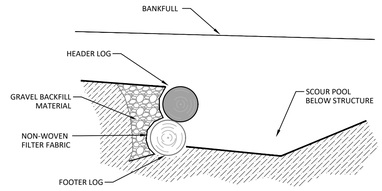
NATIVE RIFFLE DETAIL



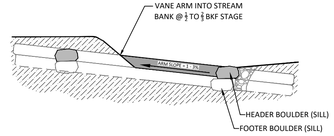
DETAILED PLAN
NOT TO SCALE

LOG J-HOOK VANE NOTES AND SPECIFICATIONS

1. ALL LOGS SHALL BE RELATIVELY STRAIGHT AND LIMBS AND BRANCHES SHALL BE TRIMMED FLUSH. LOGS SHALL HAVE MINIMUM DIAMETER OF 1.5'. HEADER LOGS SHALL BE UNDERLAIN BY FOOTER LOGS TO PROVIDE A SILL UNLESS OTHERWISE DIRECTED BY THE ENGINEER. HEADER LOGS SHALL BE OFFSET SLIGHTLY DOWNSTREAM OF THE FOOTER LOG. THE HEADER LOG OF THE VANE ARE SHALL TIE INTO THE STREAMBANK AT $\frac{1}{3}$ TO $\frac{2}{3}$ BANKFULL STAGE. THE LOG VANE ARM SHALL EXTEND INTO THE OUTSIDE STREAMBANK AND STREAMBED A MINIMUM OF 10.0 FT ON EACH END. ALL GAPS/VOIDS LARGER THAN 1 INCHES BETWEEN THE HEADER AND FOOTER LOGS SHALL BE CHINKED WITH LIMBS AND/OR BRUSH ON THE UPSTREAM SIDE PRIOR TO PLACEMENT OF THE GEOTEXTILE.
2. ALL BOULDERS USED FOR THE STRUCTURE SHALL BE STRUCTURAL STONE, CUBICAL OR RECTANGULAR IN SHAPE. THE ENGINEER MUST APPROVE THE USE OF BOULDERS THAT MAY BE AVAILABLE ONSITE. BOULDERS SHALL BE 3.0' X 5.0' X 2.5' (W X L X H) +/- 0.5'. THE MINIMUM ACCEPTABLE BOULDER THICKNESS (H) IS 2.0'. BOULDERS LONGER (L) THAN 5.5' WILL BE ACCEPTED. GAPS BETWEEN BOULDERS SHALL BE MINIMIZED BY FITTING BOULDERS TOGETHER AND PLUGGING WITH NC DOT CLASS A ROCK OR CHINKING STONE APPROVED BY ENGINEER. HEADER BOULDERS SHALL BE UNDERLAIN BY FOOTER BOULDERS TO PROVIDE A FOUNDATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER. HEADER BOULDERS SHALL BE OFFSET 1.0 FT UPSTREAM OF THE FOOTER.
3. SET BOULDER INVERTS AT ELEVATION SHOWN ON THE PLAN AND PROFILE SHEETS. NO ELEVATIONS OF THE BOULDERS MAY VARY FROM THE PLAN SHEETS WITHOUT DIRECTION FROM THE ENGINEER.
4. ON THE UPSTREAM SIDE OF THE STRUCTURE A LAYER OF NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED AS SHOWN IN THE DETAIL ALONG THE ENTIRE LENGTH OF THE LOG VANE AND BOULDER J-HOOK. SECURE ALL GEOTEXTILE FABRIC ON TOP OF FOOTER LOG USING 3 INCH 10D GALVANIZED COMMON NAIL ON 12 IN SPACING ALONG LOG. NAIL NON-WOVEN GEOTEXTILE TO EDGE OF HEADER LOG AND BACKFILL.
5. GRAVEL MATERIAL CONSISTING OF A WELL-GRADED BLEND OF SURGE STONE AND ASTM #57 ROCK MIXED WITH EARTH SHALL BE USED TO BACKFILL THE STRUCTURE. BACKFILL MATERIAL SHALL BE COMPACTED SUCH THAT FUTURE SETTLEMENT OF THE MATERIAL IS KEPT TO A MINIMUM.
6. PLACE BOULDERS UPSTREAM AND DOWNSTREAM OF THE LOG VANE ARM IN THE STREAMBANK. THE FINISHED ELEVATION OF THE BOULDERS SHALL BE BELOW THE FINISHED GRADE OF THE ADJACENT FLOODPLAIN AND SHALL NOT PROTRUDE OUT OF THE STREAMBANK.
7. DIMENSIONS AND SLOPES OF STRUCTURES DESCRIBED IN THE DETAIL MAY BE ADJUSTED BY DESIGN ENGINEER TO FIT CONDITIONS ONSITE.
8. THE SURFACE OF THIS STRUCTURE SHALL BE FINISHED TO A SMOOTH AND COMPACT SURFACE IN ACCORDANCE WITH THE LINES, GRADES, AND CROSS-SECTIONS OR ELEVATIONS SHOWN ON THE DRAWINGS. THE DEGREE OF FINISH FOR INVERT ELEVATIONS SHALL BE WITHIN 0.1 FT OF THE GRADES AND ELEVATIONS INDICATED.
9. RE-DRESSING OF CHANNEL AND BANKFULL BENCH/FLOODPLAIN WILL LIKELY BE REQUIRED FOLLOWING INSTALLATION OF IN-STREAM STRUCTURES AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.

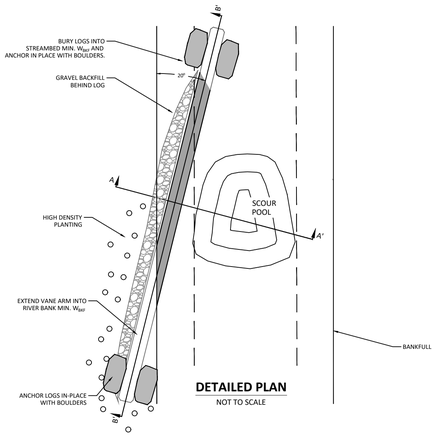


DETAILED SECTION A - A'
NOT TO SCALE



DETAILED SECTION B - B'
NOT TO SCALE

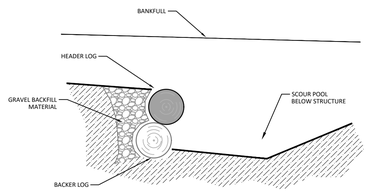
LOG J-HOOK DETAIL



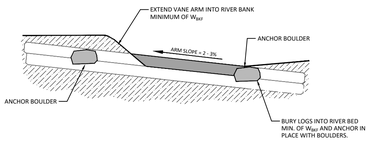
DETAILED PLAN
NOT TO SCALE

LOG VANE SPECIFICATIONS

1. ALL LOGS SHALL BE RELATIVELY STRAIGHT AND LIMBS AND BRANCHES SHALL BE TRIMMED FLUSH. LOGS SHALL HAVE MINIMUM DIAMETER OF 1.5'. HEADER LOGS SHALL BE HAVE BACKER LOGS TO PROVIDE A SILL UNLESS OTHERWISE DIRECTED BY THE ENGINEER. HEADER LOGS SHALL BE OFFSET SLIGHTLY DOWNSTREAM OF THE FOOTER LOG. THE LOG VANE ARM SHALL EXTEND INTO THE OUTSIDE RIVER BANK AND RIVER BED A MINIMUM OF W_{BKF} ON EACH END. ALL GAPS/VOIDS LARGER THAN 1 INCHES BETWEEN THE HEADER AND FOOTER LOGS SHALL BE CHINKED WITH LIMBS AND/OR BRUSH ON THE UPSTREAM SIDE PRIOR TO PLACEMENT OF THE GRAVEL BACKFILL.
2. ALL BOULDERS USED TO ANCHOR THE STRUCTURE SHALL BE STRUCTURAL STONE, CUBICAL OR RECTANGULAR IN SHAPE. THE ENGINEER MUST APPROVE THE USE OF BOULDERS THAT MAY BE AVAILABLE ONSITE. BOULDERS DIMENSIONS SHALL BE 4.0' X 3.0' X 3.0' (L X W X H) +/- 0.5 FT. THE MINIMUM ACCEPTABLE BOULDER THICKNESS (H) IS 2.5'. BOULDERS LONGER (L) THAN 4.5' WILL BE ACCEPTED.
3. SET STRUCTURE INVERTS AND ELEVATIONS AS DIRECTED BY THE ENGINEER ONSITE.
4. SURGE STONE, GRAVEL AND SAND SHALL BE USED TO BACKFILL THE STRUCTURE. BACKFILL MATERIAL SHALL BE COMPACTED SUCH THAT FUTURE SETTLEMENT OF THE MATERIAL IS KEPT TO A MINIMUM.
5. PLACE ANCHOR BOULDERS UPSTREAM AND DOWNSTREAM OF THE LOG VANE ARM IN THE RIVER BANK AND RIVER BED. THE FINISHED ELEVATION OF THE BOULDERS SHALL BE BELOW THE FINISHED GRADE OF THE ADJACENT FLOODPLAIN AND RIVER BED AND SHALL NOT PROTRUDE.
6. DIMENSIONS AND SLOPES OF STRUCTURES DESCRIBED IN THE DETAIL MAY BE ADJUSTED BY DESIGN ENGINEER TO FIT CONDITIONS ONSITE.
7. THE SURFACE OF THIS STRUCTURE SHALL BE FINISHED TO A SMOOTH AND COMPACT SURFACE IN ACCORDANCE WITH THE LINES, GRADES, AND CROSS-SECTIONS OR ELEVATIONS SHOWN ON THE DRAWINGS. THE DEGREE OF FINISH FOR INVERT ELEVATIONS SHALL BE WITHIN 0.1 FT OF THE GRADES AND ELEVATIONS INDICATED.
8. RE-DRESSING OF CHANNEL AND BANKFULL BENCH/FLOODPLAIN WILL LIKELY BE REQUIRED FOLLOWING INSTALLATION OF IN-STREAM STRUCTURES AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.

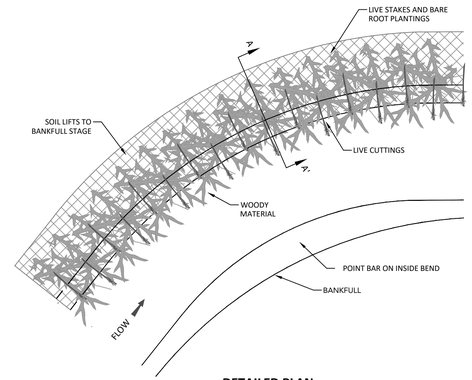


DETAILED SECTION A - A'
NOT TO SCALE



DETAILED SECTION B - B'
NOT TO SCALE

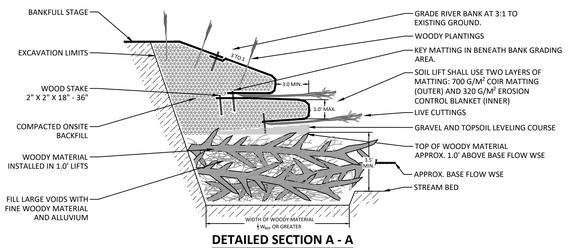
LOG VANE DETAIL



DETAILED PLAN
NOT TO SCALE

TOE WOOD PROTECTION WITH SOIL LIFTS NOTES AND SPECIFICATIONS

1. WOODY MATERIAL USED IN THE BRUSH TOE SHALL CONSIST OF LOGS, LARGE BRANCHES AND WOODY DEBRIS RANGING IN DIAMETER FROM 1" TO 12". LARGE VOIDS SHALL BE FILLED WITH FINE WOODY MATERIAL AND DEBRIS. ALL MATERIALS ARE TO BE APPROVED BY THE ENGINEER. WOODY MATERIAL SHALL BE INSTALLED IN 1.0' LIFTS. EACH LIFT SHALL BE COMPACTED WITH THE EXCAVATOR BUCKET AND COVERED WITH A LAYER OF ALLUVIUM OR MIXED SOIL AND GRAVEL TO FORM A DENSE LAYER OF WOODY MATERIAL AND ALLUVIAL TO LINES, ELEVATIONS AND GRADES IN THE DRAWINGS.
2. UNCONSOLIDATED GRAVEL AND TOPSOIL SHALL BE INSTALLED ABOVE WOODY MATERIAL BEFORE THE LIVE CUTTINGS AND SOIL LIFTS ARE INSTALLED.
4. PLACE LAYER OF LIVE CUTTINGS (MIN. 4' LENGTH) A 2.0' O.C. ON THE GRAVEL AND TOPSOIL LEVELING COURSE SUCH THAT APPROXIMATELY 6 INCHES TO 1 FOOT OF EACH LIVE BRANCH WILL BE EXPOSED AND THE REMAINDER (2' TO 4') OF EACH LIVE BRANCH WILL BE COVERED BY THE SOIL LIFT. LIVE BRANCHES SHALL BE AN EQUAL FRACTION OF BLACK WILLOW (*SALIX NIGRA*), SILKY WILLOW (*SALIX SERICEA*) AND SILKY DOGWOOD (*CORNUS AMOMUM*) AND APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
5. INSTALL A SOIL LIFT ABOVE THE LIVE CUTTINGS. THE SOIL LIFT SHALL NOT EXCEED 1.0' THICKNESS. LIFTS SHALL INCLUDE ALL SOIL PREPARATION, TEMPORARY AND PERMANENT SEEDING AND MULCH. SOIL LIFTS SHALL USE TWO LAYERS OF BIODEGRADABLE MATTING: 700 G/M^2 COIR MATTING (OUTER) AND 320 G/M^2 EROSION CONTROL BLANKET (INNER). EROSION CONTROL PRODUCTS USED FOR SOIL LIFTS SHALL BE MADE OF 100% NATURAL FIBERS AND MATERIALS AND BE BIODEGRADABLE UNDER NORMAL CLIMATE CONDITIONS. EROSION CONTROL MATTING CONTAINING PLASTICS OR PLASTIC BASED MATERIALS SHALL NOT BE USED.
6. LIVE TRANSPLANTS AVAILABLE ON THE SITE MAY REPLACE SOIL LIFTS AS DIRECTED BY THE ENGINEER.
7. GRADE THE RIVER BANK AT 3:1 TO THE EXISTING GROUND. SEE BANK GRADING DETAIL ON THIS SHEET.
8. KEY EROSION CONTROL MATTING IN BENEATH BANK GRADING AREA AND INSTALL MATTING ON ALL DISTURBED RIVER BANKS.
9. THE SURFACE OF THIS STRUCTURE SHALL BE FINISHED TO A SMOOTH AND COMPACT SURFACE IN ACCORDANCE WITH THE LINES, GRADES, AND CROSS-SECTIONS OR ELEVATIONS SHOWN ON THE DRAWINGS. THE DEGREE OF FINISH FOR ELEVATIONS SHALL BE WITHIN 0.1 FT OF THE GRADES AND ELEVATIONS INDICATED OR APPROVED BY THE ENGINEER.
10. RE-DRESSING OF CHANNEL AND BANKFULL BENCH/FLOODPLAIN WILL LIKELY BE REQUIRED FOLLOWING INSTALLATION OF IN-STREAM STRUCTURES AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.



DETAILED SECTION A - A
NOT TO SCALE

TOE WOOD PROTECTION WITH SOIL LIFTS DETAIL

Jennings Environmental
7 SAMUEL ASHE DRIVE
ASHEVILLE, NC 28805
919.600.4790
NC COA: P-1932

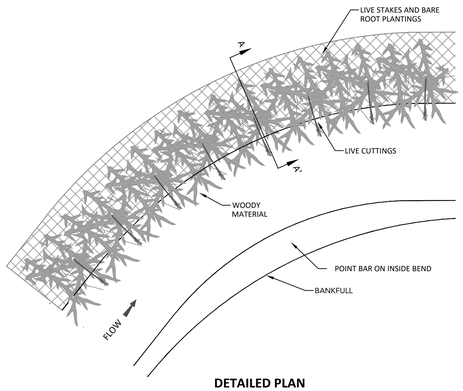
EDNEYVILLE COM. CENTER - LEWIS CREEK STREAM RESTORATION
HENDERSON COUNTY - NORTH CAROLINA

STREAM RESTORATION DETAILS

PERMIT DRAWING

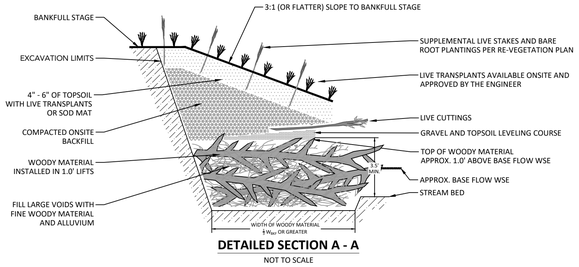
REVISIONS:
DATE: 05/01/2022
PLOT SIZE: 24" x 36"
NTS
H.D.: NAD83 (NCSP)
V.D.: NAVD88
JE PIN: 5101

4.1



DETAILED PLAN

NOT TO SCALE



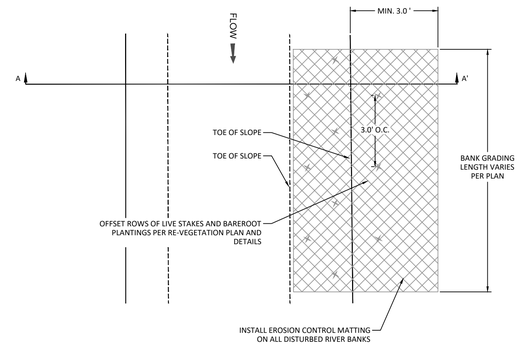
DETAILED SECTION A - A

NOT TO SCALE

TOE WOOD PROTECTION WITH LIVE TRANSPLANTS DETAIL

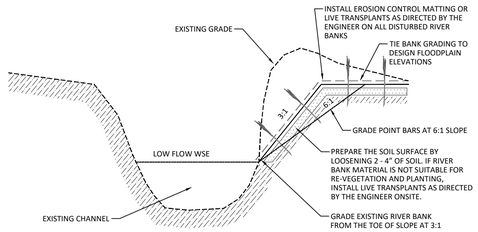
TOE WOOD PROTECTION WITH LIVE TRANSPLANTS NOTES AND SPECS.

1. WOODY MATERIAL USED IN THE BRUSH TOE SHALL CONSIST OF LOGS, LARGE BRANCHES AND WOODY DEBRIS RANGING IN DIAMETER FROM 1" TO 12". LARGE VOIDS SHALL BE FILLED WITH FINE WOODY MATERIAL AND DEBRIS. ALL MATERIALS ARE TO BE APPROVED BY THE ENGINEER. WOODY MATERIAL SHALL BE INSTALLED IN 1.0' LIFTS. EACH LIFT SHALL BE COMPACTED WITH THE EXCAVATOR BUCKET AND COVERED WITH A LAYER OF ALLUVIUM OR MIXED SOIL AND GRAVEL TO FORM A DENSE LAYER OF WOODY MATERIAL AND ALLUVIAL TO LINES, ELEVATIONS AND GRADES IN THE DRAWINGS.
2. UNCONSOLIDATED GRAVEL AND TOPSOIL SHALL BE INSTALLED ABOVE WOODY MATERIAL BEFORE THE LIVE CUTTINGS AND SOIL LIFTS ARE INSTALLED.
4. PLACE LAYER OF LIVE CUTTINGS (MIN. 4' LENGTH) A 2.0' O.C. ON THE GRAVEL AND TOPSOIL LEVELING COURSE SUCH THAT APPROXIMATELY 6 INCHES TO 1 FOOT OF EACH LIVE BRANCH WILL BE EXPOSED AND THE REMAINDER (2' TO 4') OF EACH LIVE BRANCH WILL BE COVERED BY THE SOIL LIFT. LIVE BRANCHES SHALL BE AN EQUAL FRACTION OF BLACK WILLOW (*SALIX NIGRA*), SILKY WILLOW (*SALIX SERICEA*) AND SILKY DOGWOOD (*CORNUS AMOMUM*) AND APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
5. INSTALL A 4" - 6" THICK SOD MAT OR LAYER OF LIVE TRANSPLANTS WITH TOPSOIL INTACT. GRADE SLOPE AT 3:1 OR FLATTER TO THE BANKFULL STAGE. ALL LIVE TRANSPLANTS USED FOR BANK PROTECTION SHALL BE APPROVED BY THE ENGINEER.
6. INSTALL SUPPLEMENTAL PLANTINGS ON THE BANK AS SHOWN IN THE RE-VEGETATION PLAN.
7. THE SURFACE OF THIS STRUCTURE SHALL BE FINISHED TO A SMOOTH AND COMPACT SURFACE IN ACCORDANCE WITH THE LINES, GRADES, AND CROSS-SECTIONS OR ELEVATIONS SHOWN ON THE DRAWINGS. THE DEGREE OF FINISH FOR ELEVATIONS SHALL BE WITHIN 0.1 FT OF THE GRADES AND ELEVATIONS INDICATED OR APPROVED BY THE ENGINEER.
8. RE-DRESSING OF CHANNEL AND BANKFULL BENCH/FLOODPLAIN WILL LIKELY BE REQUIRED FOLLOWING INSTALLATION OF IN-STREAM STRUCTURES AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.



DETAILED PLAN

NOT TO SCALE

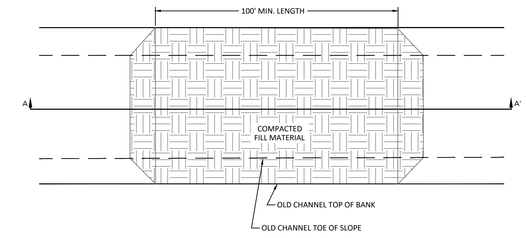


DETAILED SECTION A - A

STREAM BANK GRADING DETAIL

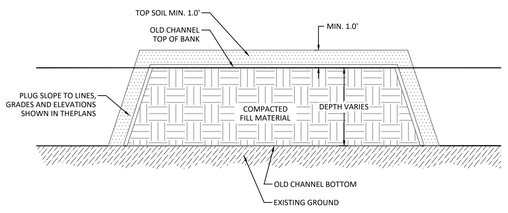
STREAMBANK GRADING NOTES AND SPECIFICATIONS

1. ALL BANK GRADING WORK SHALL TAKE PLACE DURING DRY WORKING CONDITIONS. THE CONTRACTOR SHALL MINIMIZE THE EXPORT OF SEDIMENT TO ADJACENT SURFACE WATERS TO THE MAXIMUM EXTENT PRACTICABLE BY USING ADDITIONAL E&SC MEASURES AS NEEDED OR AS DIRECTED BY THE ENGINEER ONSITE.
2. FOR IMPLEMENTATION, THE CONTRACTOR SHALL GRADE THE RIVER BANK FROM THE EXISTING TOE OF SLOPE AT 3:1 TO THE ELEVATIONS AND GRADES MATCHING THE DESIGN FLOODPLAIN ELEVATIONS. ALL EXCAVATED MATERIAL SHALL HAULED AND PLACED IN DESIGNATED AREAS ONSITE. GRADE POINT BARS AT 6:1 SLOPE.
3. IF RIVER BANK MATERIAL IS NOT SUITABLE FOR PLANTING AND RE-VEGETATION, INSTALL LIVE TRANSPLANTS AS DIRECTED BY THE ENGINEER ONSITE.
4. TRANSPLANTS AVAILABLE ONSITE MAY BE INSTALLED IN THE TOPSOIL AS DIRECTED BY THE ENGINEER ON SITE.
5. THE SURFACE OF THIS FEATURE SHALL BE FINISHED TO A SMOOTH AND COMPACT SURFACE IN ACCORDANCE WITH THE LINES, GRADES, AND CROSS-SECTIONS OR ELEVATIONS SHOWN ON THE DRAWINGS.
6. STABILIZATION OF THE WORK AREA WITH TEMPORARY AND PERMANENT SEEDING AND MULCHING IS REQUIRED FOLLOWING GRADING OF THE RIVER BANK. INSTALL WOODY PLANTING AND VEGETATION AS SHOWN ON THE APPROVED RE-VEGETATION PLAN.



DETAILED PLAN

NOT TO SCALE



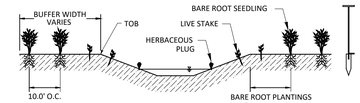
DETAILED SECTION A - A'

NOT TO SCALE

CHANNEL PLUG DETAIL

CHANNEL PLUG NOTES

1. ALL CHANNEL WORK SHALL TAKE PLACE DURING DRY WORKING CONDITIONS. THE CONTRACTOR SHALL MINIMIZE THE EXPORT OF SEDIMENT TO ADJACENT SURFACE WATERS TO THE MAXIMUM EXTENT PRACTICABLE BY USING E&SC MEASURES AS NEEDED.
2. FOR INSTALLATION, THE CONTRACTOR SHALL PLACE SUITABLE CLAY FILL MATERIAL IN THE EXISTING CHANNEL UP TO THE TOP OF BANK. FILL MATERIAL SHOULD BE LOCATED WITHIN THE SITE AND APPROVED FOR USE BY THE ENGINEER. THE CHANNEL PLUG SHALL BE COMPACTED AS DIRECTED AND UNTIL APPROVED BY THE ENGINEER ON SITE.
3. TOP SOIL SUITABLE FOR ESTABLISHING NATIVE VEGETATION SHALL BE INSTALLED ON TOP OF THE COMPACTED FILL MATERIAL TO A MINIMUM DEPTH OF 1.0' ABOVE THE COMPACTED FILL MATERIAL.
4. TRANSPLANTS AVAILABLE ONSITE MAY BE INSTALL IN THE TOP SOIL AS DIRECTED BY THE ENGINEER ON SITE.
5. THE SURFACE OF THIS STRUCTURE SHALL BE FINISHED TO A SMOOTH AND COMPACT SURFACE IN ACCORDANCE WITH THE LINES, GRADES, AND CROSS-SECTIONS OR ELEVATIONS SHOWN ON THE DRAWINGS.
6. RE-DRESSING AND STABILIZATION OF THE SURROUNDING WORK AREA WITH TEMPORARY AND PERMANENT SEEDING AND MULCHING WILL LIKELY BE REQUIRED FOLLOWING INSTALLATION OF THE DITCH PLUG AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.



DIBBLE BAR

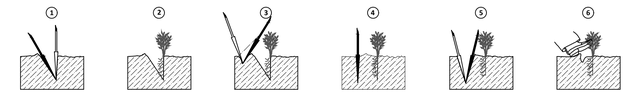
PLANTING BAR SHALL HAVE A BLADE WITH A TRIANGULAR CROSS-SECTION, AND SHALL BE 12" LONG, 4" WIDE AND 1" THINK AT THE CENTER.

ROOT PRUNING

ALL ROOTS SHALL BE PRUNED TO AN APPROPRIATE LENGTH FOR PLANTING TO PREVENT J-ROOTING.

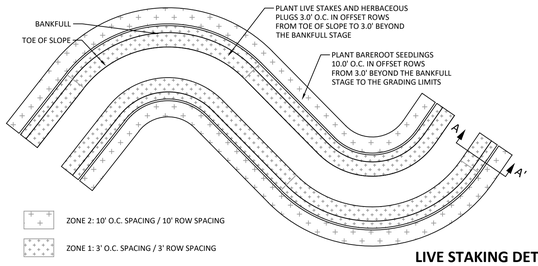
NOTES

1. ALL SOILS WITHIN THE BUFFER PLANTING AREA SHALL BE FINE GRADED AND / OR DISKED, AS REQUIRED, PRIOR TO PLANTING.
2. PLANT BAREROOT SEEDLINGS 10.0' O.C. IN OFFSET ROWS FROM 3.0' BEYOND THE BANKFULL STAGE TO THE GRADING LIMITS



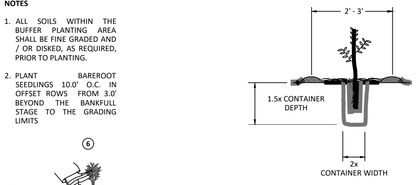
1. INSERT THE DIBBLE STRAIGHT DOWN INTO THE SOIL TO THE FULL DEPTH OF THE BLADE AND PULL BACK ON THE HANDLE TO OPENT THE PLANTING HOLE. DO NOT ROCK THE SHOVEL BACK AND FORTH AS THIS CAUSES THE SOIL IN THE PLANTING HOLE TO BE COMPACTED, INHIBITING ROOT GROWTH.
2. REMOVE THE DIBBLE AND PUSH THE SEEDLING ROOTS DEEP INTO THE PLANTING HOLE. PULL THE SEEDLING BACK UP TO THE CORRECT PLANTING DEPTH. THE ROOT COLLAR SHOULD BE 1" - 3" BELOW THE SOIL SURFACE. GENTLY SHAKE THE SEEDLING TO ALLOW THE ROOTS TO STRAIGHTEN OUT. DO NOT TWIST OR SPIN THE SEEDLING OR LEAVE THE ROOTS J-ROOTED.
3. INSERT THE DIBBLE SEVERAL INCHES IN FRONT OF THE SEEDLING AND PUSH THE BLADE HALFWAY INTO THE SOIL. TWIST AND PUSH THE HANDLE FORWARD TO CLOSE THE TOP OF THE PLANTING HOLE TO HOLD THE SEEDLING IN PLACE.
4. PUSH THE DIBBLE DOWN TO THE FULL DEPTH OF THE BLADE.
5. PULLBACK ON THE HANDLE TO CLOSE THE BOTTOM OF THE PLANTING HOLE. THEN PUSH FORWARD TO CLOSE THE TOP ELIMINATING AIR POCKETS AROUND THE ROOT.
6. REMOVE THE DIBBLE. CLOSE AND FIRM UP THE OPENING WITH YOUR HEEL. BE CAREFUL TO AVOID DAMAGING THE SEEDING.

BARE ROOT DETAILS



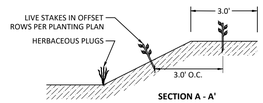
LIVE STAKING DETAILS

CONTAINER PLANT DETAILS



NOTES

1. PLANTS SHALL HAVE BEEN GROWN IN A CONTAINER LONG ENOUGH FOR THE ROOT SYSTEM TO HAVE DEVELOPED SUFFICIENTLY TO HOLD ITS SOIL TOGETHER ONCE REMOVED FROM THE CONTAINER.
2. PLANTS WILL NEED TO BE WATERED REGULARLY AND PLACED IN SHADY CONDITIONS UNTIL PLANTING OCCURS.
3. THE DIAMETER OF THE PLANTING PITS FOR EACH PLANT SHOULD BE AT LEAST TWO TIMES THE DIAMETER OF THE ROOT MASS. SCARIFY THE PLANTING PIT PRIOR TO EACH PLANT INSTALLATION.
4. SET PLANTS UPRIGHT IN THE CENTER OF THE PIT. THE BOTTOM OF THE ROOT MASS SHOULD BE RESTING ON UNDISTURBED SOIL.
5. PLACE BACKFILL AROUND BASE AND SIDES OF ROOT MASS, AND WORK EACH LAYER TO SETTLE BACKFILL AND TO ELIMINATE VOIDS AND AIR POCKETS. WHEN PIT IS APPROXIMATELY ½ FULL, WATER THOROUGHLY BEFORE PLACING REMAINDER OF THE BACKFILL. WATER AGAIN AFTER PLACING FINAL LAYER OF BACKFILL.



SECTION A - A'

LIVE STAKE

NOTES

1. LIVE STAKES MUST BE DORMANT WHEN CUT. KEEP LIVE STAKES MOIST UNTIL PLANTING. THE STAKE SHOULD BE PREPARED WITH THE BUDS POINTED UP, AND THE BOTTOM SHOULD BE CUT AT AN ANGLE FOR INSERTION INTO THE GROUND. AN IRON BAR CAN BE USED TO MAKE A PILOT HOLE TO PREVENT BARK FROM BEING DAMAGED DURING INSTALLATION.
2. LIVE STAKES SHALL BE 0.5" - 2" IN DIAMETER AND 2' - 3' IN LENGTH.
3. LIVE STAKES SHOULD BE PLACED WITH ⅓ TO ⅔ OF THE LENGTH OF THE STAKE BELOW GROUND AND ANGLED DOWNSTREAM. ENSURE THE BASE OF THE LIVE STAKE WILL REACH THE WATER TABLE. AFTER INSTALLATION THE TOP OF THE LIVE STAKE SHALL BE PRUNED WITH A SQUARE CUT LEAVING NO LESS THAN 3" AND NO LESS THAN 6" ABOVE THE GROUND.
4. PLANT LIVE STAKES AND HERBACEOUS PLUGS IN OFFSET ROWS AND SPACINGS PER PLANTING PLAN.

RE-VEGETATION AND PLANTING DETAILS

Jennings Environmental
7 SAMUEL ASHE DRIVE
ASHEVILLE, NC 28805
919.600.4790
NC COA: P-1932

EDNEYVILLE COM. CENTER - LEWIS CREEK STREAM RESTORATION

HENDERSON COUNTY - NORTH CAROLINA

STREAM RESTORATION DETAILS

PERMIT DRAWING

REVISIONS:
DATE: 05/01/2022
PLOT SIZE: 24" x 36"
NTS
H.D.: NAD83 (NCSP)
V.D.: NAVD88
JE PIN: 5101

4.2

EROSION AND SEDIMENTATION CONTROL (E&SC) PLAN
TBD WITH FINAL DRAWING

Jennings Environmental
7 SAMUEL ASHE DRIVE
ASHEVILLE, NC 28805
919.600.4790
NC COA: P-1932

EDNEYVILLE COM. CENTER - LEWIS CREEK STREAM RESTORATION
HENDERSON COUNTY - NORTH CAROLINA

EROSION AND SEDIMENTATION CONTROL (E&SC) PLAN

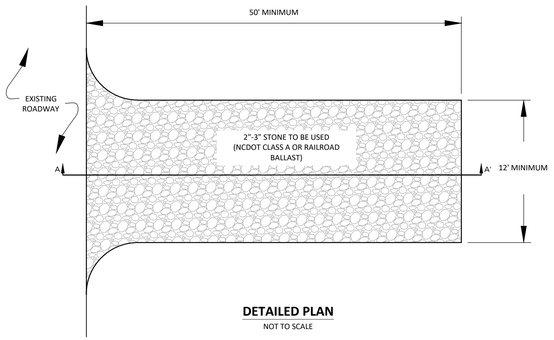
PERMIT DRAWING

REVISIONS:
DATE: 05/01/2022
PLOT SIZE: 24" x 36"
NTS
H.D.: NAD83 (NCSP)
V.D.: NAVD88
JE PIN: 5101

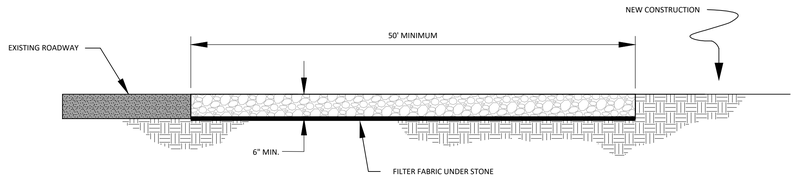
5.1

STANDARD CONSTRUCTION ENTRANCE NOTES AND SPECIFICATIONS

1. CLEAR THE ENTRANCE AND EXIT AREA OF ALL VEGETATION ROOTS, AND OTHER OBJECTIOABLE MATERIAL AND PROPERLY GRADE THE AREA.
2. PLACE THE 2"-3" STONE TO THE SPECIFIC GRADE AND DIMENSIONS SHOWN ON THE PLAND AND SMOOTH IT.
3. USE GEOTEXTILE FABRICS TO IMPROVE STABILITY OF THE FOUNDATION IN LOCATIONS SUBJECT TO SEEPAGE OR A HIGH WATER TABLE.
4. INSTALL SILT FENCE OR TREE PROTECTION FENCE UP TO ENSURE CONSTRUCTION ENTRANCE IS USED.
5. IF CONSTRUCTION ON THE SITES ARE SUCH THAT THE MUD IS NOT REMOVED BY THE VEHICLE TRAVELING OVER THE STONE, THEN THE LENGTH OF THE CONSTRUCTION ENTRANCE SHALL BE INCREASED.
6. SEE SECTION 6.06.1 OF NC DEMLR'S EROSION AND SEDIMENT CONTROL DESIGN MANUAL (2013) FOR ADDITIONAL INFORMATION, NOTES AND SPECIFICATIONS.



DETAILED PLAN
NOT TO SCALE

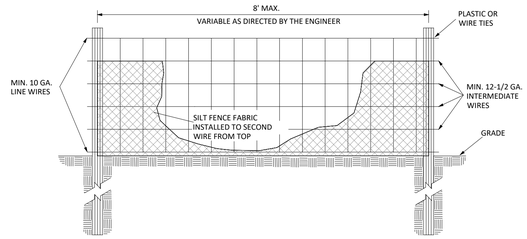


DETAILED CROSS-SECTION A - A'
NOT TO SCALE

STANDARD CONSTRUCTION ENTRANCE DETAIL

TEMPORARY SILT FENCE NOTES AND SPECIFICATIONS

1. CONSTRUCT THE SILT FENCE WITH STANDARD STRENGTH OR EXTRA STRENGTH SYNTHETIC FILTER FABRICS.
2. SUPPORT THE STANDARD STRENGTH FILTER FABRIC BY WIRE MESH FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS. EXTEND THE WIRE MESH SUPPORT TO THE BOTTOM THE TRENCH. FASTEN THE WIRE REINFORCEMENT, THEN FABRIC ON THE UPSLOPE SIDE OF THE FENCE POST. WIRE OR PLASTIC ZIP TIES SHOULD HAVE A MINIMUM 50 POUND TENSILE STRENGTH.
3. WHEN A WIRE MESH SUPPORT FENCE IS USED, SPACE POSTS A MAXIMUM OF 8 FT APART. SUPPORT POSTS SHOULD BE DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 2 FT.
4. EXTRA STRENGTH FILTER FABRIC WITH 6 FT POST SPACINGS DOES NOT REQUIRE WIRE MESH SUPPORT FENCE.
5. EXCAVATE A TRENCH APPROXIMATELY 4 INCHES WIDE AND 8 INCHES DEEP ALONG THE PROPOSE LINE OF POSTS AND UPSLOPE OF THE BARRIER.
6. PLACE 12 INCHES OF FABRIC ALONG THE BOTTOM AND SIDE OF THE TRENCH.
7. BACKFILL THE TRENCH WITH SOIL PLACED OVER THE FILTER FABRIC AND COMPACT. THOROUGH COMPACTION OF THE BACKFILL IS CRITICAL TO SILT FENCE PERFORMANCE.
8. DO NOT ATTACH FILTER FABRIC TO EXISTING TREES.
9. CONSTRUCTION SITE RUNOFF SHALL NOT RUN PARALLEL WITH THE FENCE.
10. END OF SILT FENCE NEEDS TO BE TURNED UPHILL.
11. SEE SECTION 6.62.1 OF NC DEMLR'S EROSION AND SEDIMENT CONTROL DESIGN MANUAL (2013) FOR ADDITIONAL INFORMATION, NOTES AND SPECIFICATIONS.



DETAILED FRONT
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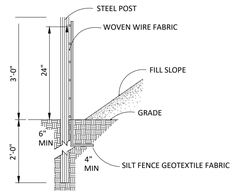
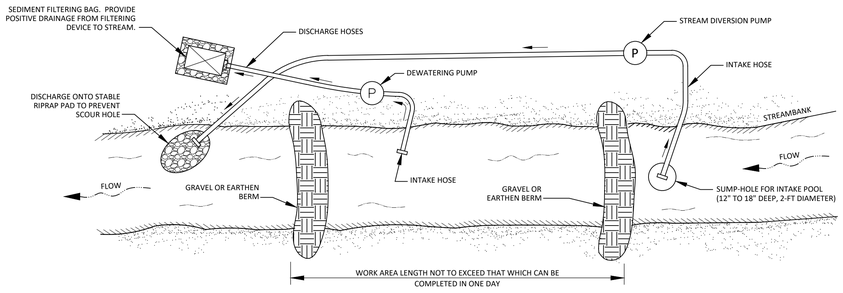


DETAILED SIDE
NOT TO SCALE

TEMPORARY SILT FENCE DETAIL



DETAILED PLAN
NOT TO SCALE

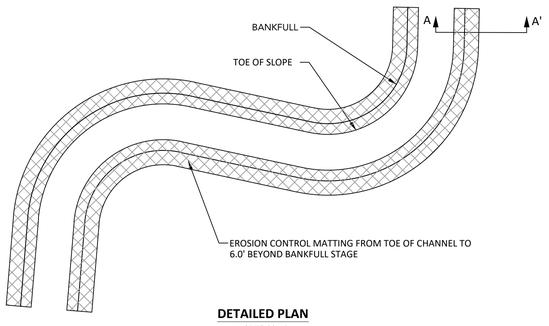
TEMPORARY PUMP AROUND SYSTEM NOTES AND SPECIFICATIONS

1. BERMS SHALL BE SITUATED AT THE UPSTREAM AND DOWNSTREAM ENDS OF THE WORK AREA, AND STREAM FLOW SHALL BE PUMPED AROUND THE WORK AREA. THE DIVERSION PUMP SHOULD DISCHARGE ONTO A STABLE VELOCITY DISSIPATER CONSTRUCTED OF RIPRAP. DIVERSION PUMP DISCHARGE SHALL NOT GENERATE SCOUR, EROSION OR THE EXPORT OF EXCESS SEDIMENT TO SURFACE WATERS.
2. WATER FROM THE WORK AREA SHALL BE PUMPED TO A SEDIMENT FILTERING BAG. THE MEASURE SHALL BE LOCATED ON A RIPRAP OR GRAVEL PAD SUCH THAT THE WATER DRAINS BACK INTO THE CHANNEL BELOW THE DOWNSTREAM BERM WITHOUT CAUSING FURTHER EROSION.
3. THE CONTRACTOR SHALL SIZE THE PUMP AROUND SYSTEM SUFFICIENTLY FOR A RANGE OF POSSIBLE BASEFLOW DISCHARGES AND THE SYSTEM SHALL RUN CONTINUOUSLY WHILE WORKING IN THE STREAM.
4. THE STREAMBANKS AND WORK AREA MUST BE STABILIZED AT THE END OF EACH DAY BEFORE THE PUMP AROUND SYSTEM IS SHUT DOWN AND BEFORE FLOW IS RETURNED THE CHANNEL.

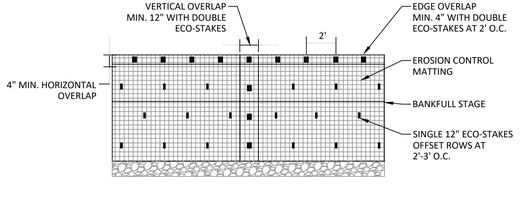
TEMPORARY PUMP AROUND SYSTEM DETAIL

EROSION CONTROL MATTING NOTES AND SPECIFICATIONS

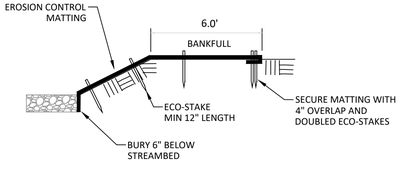
1. EROSION CONTROL MATTING IS USED TO PROTECT RECENTLY CONSTRUCTED STREAM BANKS FROM EROSION. THE MATTING WILL REMAIN INTACT WHILE THE BANK AND RIPARIAN VEGETATION MATURES, PROVIDING CRITICAL BANK PROTECTION.
2. STREAM BANK EROSION CONTROL MATTING MATERIAL SPECIFICATIONS:
   - 2.1. MACHINE DIRECTION TENSILE STRENGTH: 77 LB/IN
   - 2.2. CROSS MATCH DIRECTION TENSILE STRENGTH: 86 LB/IN
   - 2.3. APPARENT OPENING SIZE: 0.59" x 0.67"
   - 2.4. PERCENT OPENING: 49%
   - 2.5. MASS: 700 G/M^2
3. BEFORE INSTALLING EROSION CONTROL MATTING, RAKE SOIL LEVEL, ADD TEMPORARY AND PERMANENT SEED, SOIL PREPARATION AND MULCH.
4. EROSION CONTROL MATTING SHALL BE PLACED ALONG THE LENGTH OF THE NEW CHANNEL FROM THE TOE OF SLOPE OUT TO A MINIMUM OF 6.0' BEYOND THE BANKFULL STAGE.
5. SECURE MATTING IN PLACE BY STAKING AND OVERLAPPING AT THE SEEMS WITH A SHINGLE-TYPE METHOD SUCH THAT THE OVERLAPPING PIECE IS IN THE SAME DIRECTION AND AS THE STREAM FLOW AS SHOWN IN THE DETAIL. ADDITIONAL STAKING SHALL BE APPLIED BY THE CONTRACTOR AT NO ADDITIONAL COST IF THE MATTING SEPARATES FROM THE SOIL MORE THAN ONE INCH UNDER A REASONABLE PULL.
6. EROSION CONTROL MATTING SHALL USED ON ALL STREAM BANKS SHALL HAVE A DENSITY OF MADE OF 100% NATURAL FIBERS AND MATERIALS AND BE BIODEGRADABLE UNDER NORMAL CLIMATE CONDITIONS. EROSION CONTROL MATTING CONTAINING PLASTICS OR PLASTIC BASED MATERIALS SHALL NOT BE USED.



DETAILED PLAN
NOT TO SCALE



DETAILED STAKING PLAN
NOT TO SCALE



DETAILED SECTION A - A'
NOT TO SCALE

EROSION CONTROL MATTING DETAIL

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EDNEYVILLE COM. CENTER - LEWIS CREEK STREAM RESTORATION
HENDERSON COUNTY - NORTH CAROLINA
EROSION AND SEDIMENTATION CONTROL (E&SC) DETAILS

PERMIT DRAWING

REVISIONS:
DATE: 05/01/2022
PLOT SIZE: 24" x 36"
NTS
H.D.: NAD83 (NCSP)
V.D.: NAVD88
JE PIN: 5101

5.2

GENERAL RE-VEGETATION AND PLANTING NOTES

1. FINAL VEGETATION SPECIES SELECTION MAY CHANGE DUE TO REFINEMENT OR SPECIES AVAILABILITY AT THE TIME OF PLANTING. SPECIES SUBSTITUTIONS WILL BE COORDINATED BETWEEN THE BANK MANAGER, ENGINEER AND PLANTING CONTRACTOR PRIOR TO THE PROCUREMENT OF PLANT/SEED STOCK.
2. LARGER NATIVE TREE SPECIES TO BE PRESERVED WILL BE FLAGGED BY THE ENGINEER PRIOR TO CONSTRUCTION ACTIVITIES. ANY TREES HARVESTED FOR WOODY MATERIAL WILL BE UTILIZED TO PROVIDE BED AND BANK STABILIZATION AND COVER OR NESTING HABITAT ON THE FLOODPLAIN. ANY EXCESS WOODY MATERIALS MAY USED TO BACKFILL OLD CHANNELS.
3. ALL DISTURBED AREAS WILL BE STABILIZED USING TEMPRORY AND PERMERMANET SEEDING AS DEFINED IN THE SEEDING SCHEDULE AND THE APPROVED E&SC PLANS.
4. SUPPLEMENTAL PLANTING ACTIVITIES MAY BE REQUIRED WITHIN THE CONSERVATION EASEMENT.

TEMPORARY SEEDING AND MULCHING NOTES

5. TEMPORARY SEEDING AND MULCHING SHALL BE APPLIED TO ALL AREAS AND ACCESS ROUTES DISTURBED DURING CONSTRUCTION.
6. ALL SEED AND SEED VARIETIES MUST BE FREE OF STATE AND FEDERALLY LISTED NOXIOUS WEED SEED AND INVASIVE SPECIES.
7. ALL DISTURBED AREAS WILL BE SEEDED WITH TEMPORARY SEED AND MULCHED WITH WHEAT STRAW. SEEDING WILL BE PERFORMED USING A BROADCAST SPREADER. OTHER METHODS MAY BE USED BUT MUST BE APPROVED BY ENGINEER IN ADVANCE OF INSTALLATION.
8. MAINTENANCE OF SEEDED AREAS SHALL CONSIST OF WATERING, WEED AND PEST CONTROL, FERTILIZATION, EROSION REPAIR, RESEEDING, AND INCIDENTAL OPERATIONS AS NECESSARY TO ESTABLISH A HEALTHY, VIGOROUS, WEED FREE AND DISEASE FEE UNIFORM STAND OF GRASS. ALL AREAS WHICH FAIL TO SHOW A UNIFORM STAND OF GRASS FOR ANY REASON SHALL BE TREATED REPEATEDLY UNTIL A UNIFORM STAND OF AT LEAST 90% COVERAGE IS ATTAINED WITH NO BARE AREA GREATER THAN FIVE SQUARE FEET.

PERMANENT SEEDING NOTES

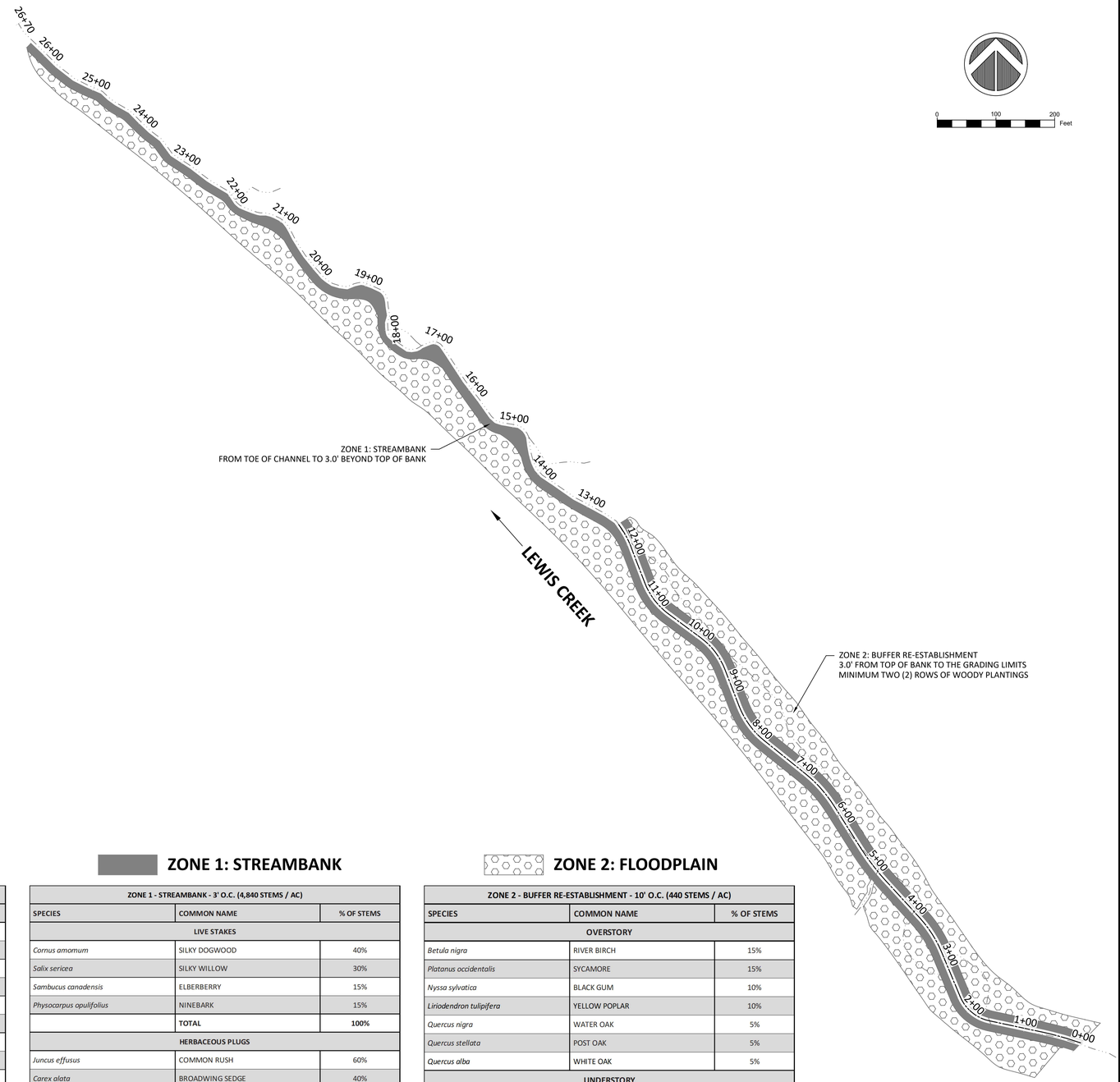
9. PERMANENT SEEDING SHALL OCCUR IN CONJUNCTION WITH TEMPORARY SEEDING WHERE APPLICABLE. IDEALLY, PERMANENT SEEDING SHALL OCCUR DURING THE PLANTING SEASON FOR EACH SEED TYPE. AREAS FERTILIZED FOR TEMPORARY SEEDING SHALL BE SUFFICIENTLY FERTILIZED FOR PERMANENT SEEDING; ADDITIONAL FERTILIZER IS NOT REQUIRED FOR PERMANENT SEEDING.
10. ALL SEED AND SEED VARIETIES MUST BE FREE OF STATE AND FEDERALLY LISTED NOXIOUS WEED SEED AND INVASIVE SPECIES.
11. THE CONTRACTOR SHALL LOOSEN THE SOIL TO A MINIMUM DEPTH OF 4-INCHES AND GRADE TO A SMOOTH, EVEN SURFACE WITH A LOOSE, UNIFORMLY FINE TEXTURE. THE AREAS TO BE SEEDED ARE THEN TO BE ROLLED AND RAKED TO REMOVE RIDGES AND FILL DEPRESSIONS TO MEET FINISH GRADES. THE CONTRACTOR IS TO LIMIT SUB GRADE AND FINISH GRADE PREPARATION TO AREAS THAT WILL BE PLANTED IMMEDIATELY. PREPARED AREAS ARE TO BE RESTORED IF ERODED OR OTHERWISE DISTURBED AFTER FINE GRADING AND BEFORE PLANTING.
12. SEED SHALL BE SOWN WITH A SPREADER OR A SEEDING MACHINE. SEED IS NOT TO BE BROADCAST OR DROPPED WHEN WIND VELOCITY EXCEEDS 5 MPH. SEED SHALL BE EVENLY DISTRIBUTED BY SOWING IN TWO DIRECTIONS AT RIGHT ANGLES TO EACH OTHER. WET SEED OR SEED THAT IS MOLDY OR OTHERWISE DAMAGED IN TRANSIT OR STORAGE IS NOT TO BE USED. AFTER BEGIN SOWN, THE SEED SHALL BE RAKED INTO THE TOP 1/4 INCH OF THE TOPSOIL, LIGHTLY ROLLED, AND WATERED WITH FINE SPRAY. SEEDED AREAS ON STREAM BANKS SHALL BE PROTECTED WITH COIR FIBER MATTING.

ZONE 1: STREAMBANK

13. LIVESTAKES AND HERBACEOUS PLUGS LISTED IN THE PLANTING SCHEDULE SHALL BE PLANTED IN OFFSET ROWS AT A DENSITY OF 4,840 STEMS PER ACRE (3.0' O.C.) FROM TOE OF THE RESTORED CHANNEL TO 3.0' OUTSIDE THE BANKFULL STAGE. HERBACEOUS PLUGS SHALL BE PLANTED ALONG THE TOE OF THE CHANNEL IN THE OUTSIDE OF THE POOL MEANDER BENDS.

ZONE 2: FLOODPLAIN

14. WOODY SPECIES LISTED IN THE PLANTING SCHEDULE SHALL BE PLANTED IN OFFSET ROWS AT A DENSITY OF 440 STEMS PER ACRE (10.0' O.C.) FROM 3.0' OUTSIDE THE BANKFULL STAGE TO THE GRADING LIMITS. EXACT PLACEMENT OF THE SPECIES SHALL BE DETERMINED BY THE CONTRACTOR'S VEGETATION SPECIALIST PRIOR TO SITE PLANTING AND BASED ON THE WETNESS CONDITIONS OF PLANTING LOCATIONS.



TEMPORARY SEEDING SCHEDULE

TEMPORARY SEEDING		
DATE	**TYPE**	**APP. RATE (LBS/AC)**
JAN 1 - MAY 1	RYE GRAIN *(Secale cereale)*	120
	COMMON OATS *(Avena sativ)*	100
	RED CLOVER *(Trifolium incarnatum)*	20
	GROUND AG. LIMESTONE	2,000
	10-10-10 FERTILIZER	750
	STRAW MULCH	4,000
MAY 1 - AUGUST 1	GERMAN MILLET *(Setaria italica)*	50
	COMMON OATS (Avena sativ)	100
	RED CLOVER *(Trifolium incarnatum)*	20
	GROUND AG. LIMESTONE	2,000
	10-10-10 FERTILIZER	750
	STRAW MULCH	4,000
AUGUST 1 - DECEMBER 31	RYE GRAIN *(Secale cereale)*	120
	WINTER WHEAT *(Triticum aestivum)*	100
	RED CLOVER *(Trifolium incarnatum)*	20
	GROUND AG. LIMESTONE	2,000
	10-10-10 FERTILIZER	750
	STRAW MULCH	4,000

PERMANENT SEEDING SCHEDULE

PERMANENT RIPARIAN SEEDING - 25 LBS / AC		
SPECIES	**COMMON NAME**	**PERCENT**
Juncus effusus	COMMON RUSH	5%
Coreopsis lanceolata	LANCE LEAF TICKSEED	10%
Agrostis perennans	AUTUMN BENTGRASS	5%
Elymus virginicus	VIRGINIAI WILDRYE	10%
Andropogon gerardii	BIG BLUESTEM	10%
Schizachyrium scoparium	LITTLE BLUESTEM	5%
Panicum virgatum	SWITCH GRASS	15%
Tripsacum dactyloides	EASTERN GAMAGRASS	5%
Sorghastrum nutans	INDIAN GRASS	5%
Rudbeckia hirta	BLACKEYED SUSAN	10%
Chamaecrista (Cassia) fasiculata	SHOWY PARTRIDGE PEA	10%
Bidens aristosa	SHOWY BIDENS	5%
Helianthus angustifolius	SWAMP SUNFLOWER	5%
	TOTAL	**100%**

ZONE 1: STREAMBANK

ZONE 1 - STREAMBANK - 3' O.C. (4,840 STEMS / AC)		
SPECIES	**COMMON NAME**	**% OF STEMS**
LIVE STAKES		
Cornus amomum	SILKY DOGWOOD	40%
Salix sericea	SILKY WILLOW	30%
Sambucus canadensis	ELBERBERRY	15%
Physocarpus opulifolius	NINEBARK	15%
	TOTAL	**100%**
HERBACEOUS PLUGS		
Juncus effusus	COMMON RUSH	60%
Carex alata	BROADWING SEDGE	40%
	TOTAL	**100%**

ZONE 2: FLOODPLAIN

ZONE 2 - BUFFER RE-ESTABLISHMENT - 10' O.C. (440 STEMS / AC)		
SPECIES	**COMMON NAME**	**% OF STEMS**
OVERSTORY		
Betula nigra	RIVER BIRCH	15%
Platanus occidentalis	SYCAMORE	15%
Nyssa sylvatica	BLACK GUM	10%
Liriodendron tulipifera	YELLOW POPLAR	10%
Quercus nigra	WATER OAK	5%
Quercus stellata	POST OAK	5%
Quercus alba	WHITE OAK	5%
UNDERSTORY		
Diospyros virginiana	PRISIMMON	5%
Alnus serrulata	HAZEL ALDER	5%
Prunus serotina	BLACK CHERRY	5%
Asimina triloba	PAWPAW	5%
Hamamelis virginiana	WITCH HAZEL	5%
Lindera benzoin	SPICEBUSH	5%
Carpinus caroliniana	IRONWOOD	5%
	TOTAL	**100%**

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HENDERSON COUNTY - NORTH CAROLINA

RE-VEGETATION PLAN

PERMIT DRAWING

REVISIONS:
DATE: 05/01/2022
PLOT SIZE: 24" x 36"
1" = 100'
H.D.: NAD83 (NCSP)
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6.1