DRAWING

ASHEVILLE WATER TREATMENT PLANT (AVL WTP) RIVER BANK RESTORATION

HENDERSON COUNTY, NORTH CAROLINA

USACE ACTION ID: TBD

MILLS RIVER PARTNERSHIP CONTRACT #:

PROJECT DIRECTORY		
OWNER	CITY OF ASHEVILLE WATER AUTHORITY	
THECITYOF ASHEVILLE	DAVID MELTON CITY OF ASHEVILLE, WATER RESOURCES DIRECTOR (828) 259-5957 DMELTON@ASHEVILLENC.GOV	
SPONSOR	MILLS RIVER PARTNERSHIP	
Mills River PARTNERSHIP THE RIVER CONNECTS US	MARIA WISE EXECUTIVE DIRECTOR (828) 708-7388 MARIA.MILLSRIVERPARTNERSHIP@GMAIL.COM	
ENGINEER	JENNINGS ENVIRONMENTAL PLLC	
Jennings Environmental	GREG JENNINGS, PHD, PE PRESIDENT (919) 600-4790 GREG@JENNINGSENV.COM	

AVL WTP SITE	High Viola Country C Nis	VArport (200)	Fletcher	5 N
	la Haywan	and the same		
		Brooklavier #30H Links [74]	WATER	
		gave Bridge Rey	COLLAR EX	A BAI
Light	Mills River			
	A Company of the Comp		Moughy ca	
		Total Control of the		25 To and III
				No Ra
Bollston Hees		See all the second	Merditaliji Center	
		orseShoe	77	
		Cos.		
Hardy State on Volley On			CON TOTAL STATE OF THE STATE OF	
0 0.5 1	2 Miles		Laurel Park	10d
NORTH		Sources: Esri, HERE, G	armin, USGS, Intermap, INCREMENT s, Esri (Thailand), NGCC, (d) OpenStre	P. NRCan, Estretapene ME-II, Esti China

SHEET INDEX		
COVER SHEET	1.1	
PROJECT OVERVIEW	2.1	
EROSION AND SEDIMENTATION CONTROL PLAN	3.1 - 3.3	
RIVER BANK RESTORATION PLAN	4.1 - 4.4	
RIVER BANK RESTORATION DETAILS	5.1 - 5.2	
RE-VEGETATION PLAN	6.1	

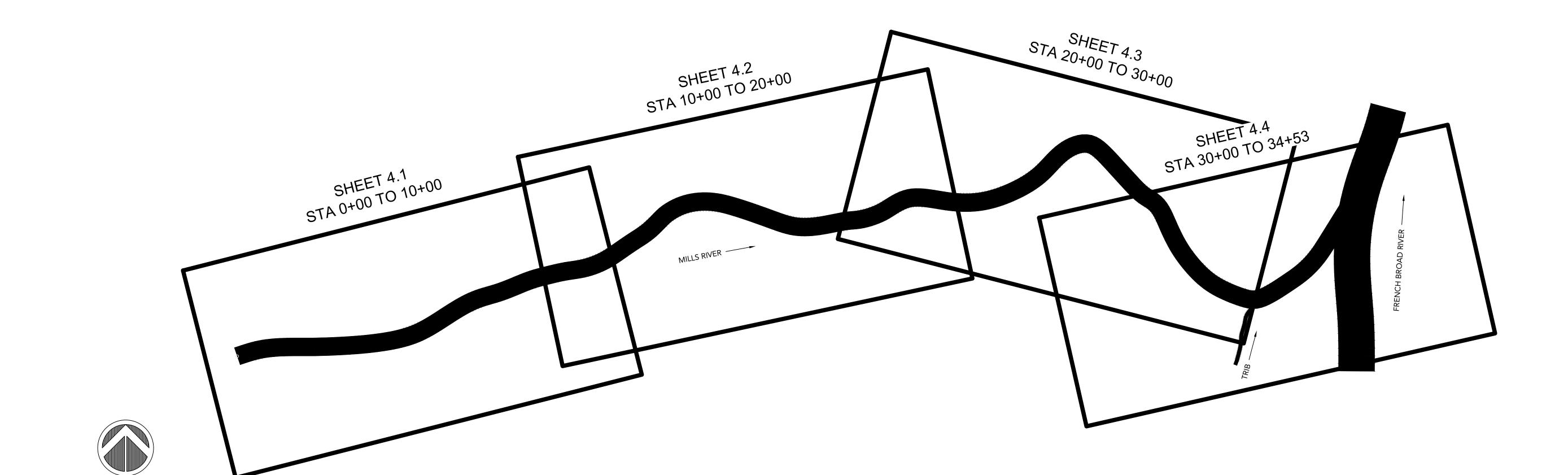
PERMIT DRAWING NOT RELEASED FOR CONSTRUCTION APRIL 22, 2021

OVERVIEW

PROJECT

REVISIONS:

JE PID: 2703



GENERAL PROJECT SPECIFICATION AND NOTES

- 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: CITY OF ASHEVILLE WATER AUTHORITY
- 1.3. PROJECT SPONSOR: MILLS RIVER PARTNERSHIP1.4. ENGINEER: JENNINGS ENVIRONMENTAL PLLC
- 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 AND SPECIAL CONDITIONS OF USACE'S 404
- 2.2. GENERAL AND SPECIAL CONDITIONS OF USACE'S 404 NATIONWIDE PERMIT NUMBERS 13 AND 27
- 2.3. GENERAL AND SPECIAL CONDITIONS OF NCDEQ'S 401 WATER QUALITY CERTIFICATION2.4. THE CONSTRUCTION DOCUMENTS
- 3. NOT ALL EXISTING UTILITIES ARE SHOWN. SOME LOCATIONS MAY BE 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.
- 4. ALL UTILITIES SHALL BE PROTECTED AND REMAIN ACTIVE UNLESS OTHERWISE NOTED.
- 5. THE CONTRACTOR IS RESPONSIBLE FOR THE PROJECT AREA UNTIL COMPLETION AND FINAL ACCEPTANCE BY THE ENGINEER AND PROJECT OWNER. THE CONTRACTOR SHALL CONFINE ALL ACTIVITIES, INCLUDING EQUIPMENT STORAGE, TO THE LIMITS OF DISTURBANCE, STAGING AREAS, AND DESIGNATED CONSTRUCTION ACCESS POINTS.
- 6. THE MANNER IN WHICH THE CONTRACTOR DEALS WITH PEOPLE AND THEIR PROPERTIES WHILE PERFORMING THIS WORK IS EXTREMELY IMPORTANT. THEREFORE, THE CONTRACTOR AND THE CONTRACTOR'S REPRESENTATIVES SHALL MANIFEST A SPIRIT OF FRIENDLINESS AND COOPERATION WHEN DEALING WITH PROPERTY OWNERS AND THE GENERAL PUBLIC WHILE PERFORMING WORK ON THE SITE.

- EXTREME CARE AND DILIGENCE SHALL BE EXERCISED BY THE CONTRACTOR TO ASSURE THE SAFETY OF PERSONS, ANIMALS, AND PROPERTY. IF AT ANY TIME PG DETERMINES THAT THE CONTRACTOR'S METHODS OR EQUIPMENT ARE INADEQUATE FOR SECURING THE SAFETY OF THE CONTRACTOR'S EMPLOYEES OR THE PUBLIC, THE DESIGNATED REPRESENTATIVE MAY DIRECT THE CONTRACTOR TO TAKE SPECIFIC ACTIONS TO ENSURE SAFETY. THE CONTRACTOR SHALL IMPROVE METHODS AS DEEMED APPROPRIATE BY THE DESIGNATED REPRESENTATIVE WITHOUT ADDITIONAL COST TO THE PROJECT OWNER, SO AS TO ASSURE COMPLIANCE WITH SAFETY CONCERNS. FAILURE OF THE DESIGNATED REPRESENTATIVE TO MAKE THIS DEMAND SHALL NOT RELIEVE THE CONTRACTOR OF ANY OBLIGATION TO ENSURE THE SAFE CONDUCT OF ITS WORK.
- 8. THE CONTRACTOR SHALL MAINTAIN ALL LIGHTS, GUARDS, SIGNS, TEMPORARY PASSAGES, OR OTHER PRECAUTIONS NECESSARY FOR THE SAFETY OF ALL PERSONS. THE CONTRACTOR 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 CONTRACTOR'S EXPENSE, UNLESS DIRECTED OTHERWISE BY THE DESIGNATED REPRESENTATIVE. CONTRACTOR SHALL AT NO TIME COMPROMISE EITHER SAFETY OR ENVIRONMENTAL
- REQUIREMENTS.

 9. THE CONTRACTOR SHALL ONLY USE ACCESS PATHS AND STAGING AREAS SHOWN ON THE DRAWINGS. ANY ALTERNATE ACCESS PLANNED BY THE CONTRACTOR SHALL BE APPROVED BY THE ENGINEER AND PROJECT OWNER PRIOR TO USE
- BY THE ENGINEER AND PROJECT OWNER PRIOR TO USE.

 10. NO NON-PERMITTED FILL IN WETLANDS MAY OCCUR. ALL EXCESS SOILS FROM EMBANKMENT EXCAVATION AND CHANNEL WORK SHALL BE PLACED IN DESIGNATED AREAS ON THE SITE.
- 11. SITE SHOULD BE "STORM READY" AT THE END OF EACH WORK DAY AND WORK WEEK.

TOPOGRAPHIC SPECIFICATIONS AND NOTES

- 13. HORIZONTAL DATUM IS NAD83(2011) & VERTICAL DATUM IS NAVD88. ALL COORDINATES ARE BASED ON NAD83(2011) AND ALL ELEVATIONS ARE BASED ON NAVD88.

 THE SPECIFIC PRODUCT IN WRITING.

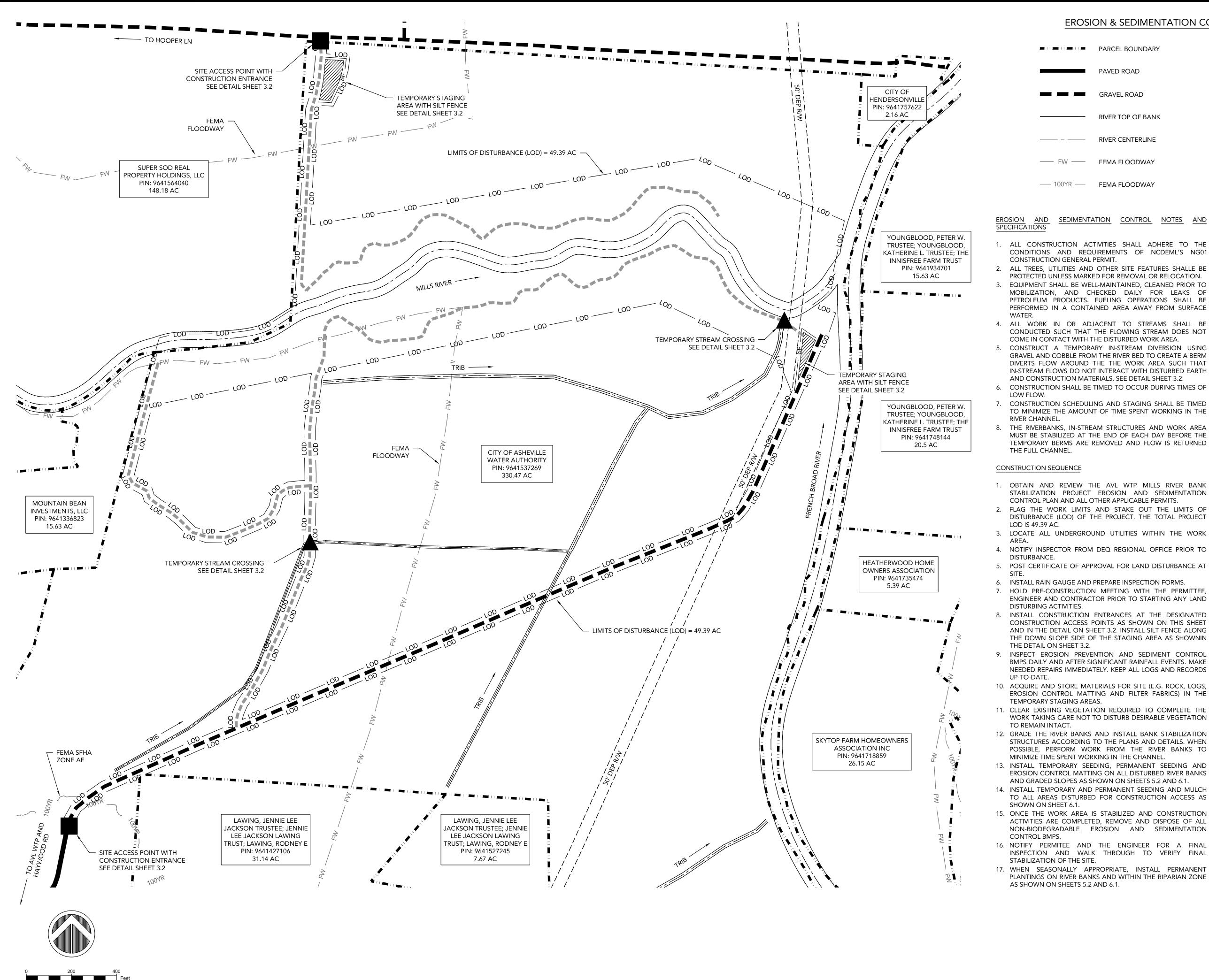
 THE SPECIFIC PRODUCT IN WRITING.
- 14. EXISTING GROUND SURFACES ARE BASED ON NCEM'S QL1 LIDAR DATASET AND ONSITE CONTROL ESTABLISHED BY TURNER LAND SURVEYING TO CLASS A ACCURACY.

QUANTITIES AND MATERIALS SPECIFICATIONS

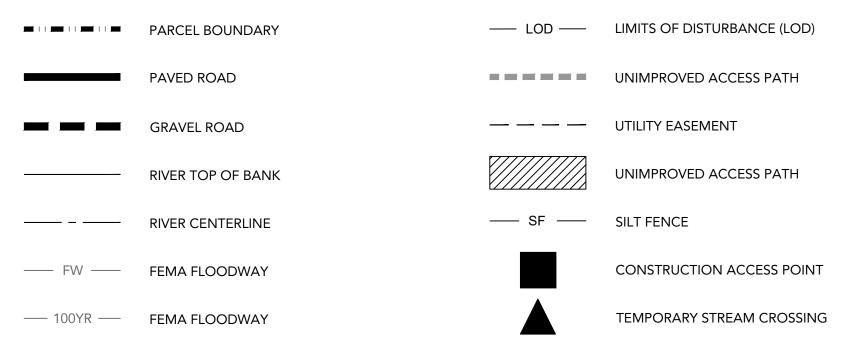
- 15. THE CONTRACTOR SHALL FURNISH ALL MATERIALS NECESSARY TO COMPLETE THE PROPOSED WORK UNLESS OTHER PROVISIONS HAVE BEEN AGREED UPON PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL DELIVER ALL MATERIALS TO THE DESIGNATED ACCESS POINTS AND STAGING AREAS. MATERIAL QUANTITIES, DIMENSIONS AND SIZES SHALL CONFORM TO THE NOTES AND SPECIFICATIONS PROVIDED IN THE CONSTRUCTION DOCUMENTS. 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.
- 16. COSTS INCURRED DUE TO PROJECT DELAYS RESULTING FROM FAILURE OF THE CONTRACTOR TO MEET THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS SHALL BE THE EXPENSE OF THE CONTRACTOR. QUANTITIES LISTED ARE ESTIMATES ONLY AND SHALL BE CONFIRMED BY THE CONTRACTOR.
- 17. THE EROSION CONTROL MEASURES DEPICTED ON THE DRAWINGS SHALL 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) MAY BE REQUIRED IN ORDER TO KEEP ALL SEDIMENT ON SITE AND OUT OF STREAMS AND WETLANDS. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE PROJECT OWNER AND ENGINEER PRIOR TO INSTALLATION OF ADDITIONAL EROSION CONTROL MEASURES.
- 18. ANY ADDITIONAL GRADING OTHER THAN WHAT IS SHOWN ON THE PLANS SHALL REQUIRE PRIOR APPROVAL FROM THE PROJECT OWNER AND ENGINEER.
- 19. 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.
- PROVIDING STORAGE AREAS FOR CONSTRUCTION MATERIALS AND EQUIPMENT. THE MATERIAL AND EQUIPMENT STORAGE SHALL COMPLY WITH THE CONSTRUCTION DOCUMENTS AND ALL LOCAL, STATE AND FEDERAL REGULATIONS THROUGHOUT THE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL

RESTORE THE STORAGE AREA TO ITS ORIGINAL (OR BETTER) CONDITION UPON COMPLETION OF THE PROJECT OR UPON SUCH TIME AS DIRECTED BY THE PROJECT OWNER AND ENGINEER. SUCH RESTORATION SHALL BE AT NO ADDITIONAL COST TO THE PROJECT OWNER. THE CONTRACTOR SHALL WARRANTY ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE OF 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 CONTRACTOR SHALL IMMEDIATELY REPAIR ALL ITEMS DETERMINED BY THE PROJECT OWNER OR AUTHORIZED REPRESENTATIVE TO BE DEFECTIVE UPON NOTIFICATION. THE CONTRACTOR 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.



EROSION & SEDIMENTATION CONTROL PLAN LINES AND SYMBOLS



EROSION AND SEDIMENTATION CONTROL NOTES AND SPECIFICATIONS

- 1. ALL CONSTRUCTION ACTIVITIES SHALL ADHERE TO THE CONDITIONS AND REQUIREMENTS OF NCDEML'S NG01 CONSTRUCTION GENERAL PERMIT
- 2. ALL TREES, UTILITIES AND OTHER SITE FEATURES SHALLE BE PROTECTED UNLESS MARKED FOR REMOVAL OR RELOCATION.
- 3. EQUIPMENT SHALL BE WELL-MAINTAINED, CLEANED PRIOR TO MOBILIZATION, AND CHECKED DAILY FOR LEAKS OF PETROLEUM PRODUCTS. FUELING OPERATIONS SHALL BE PERFORMED IN A CONTAINED AREA AWAY FROM SURFACE
- 4. ALL WORK IN OR ADJACENT TO STREAMS SHALL BE CONDUCTED SUCH THAT THE FLOWING STREAM DOES NOT COME IN CONTACT WITH THE DISTURBED WORK AREA.
- 5. CONSTRUCT A TEMPORARY IN-STREAM DIVERSION USING GRAVEL AND COBBLE FROM THE RIVER BED TO CREATE A BERM DIVERTS FLOW AROUND THE THE WORK AREA SUCH THAT IN-STREAM FLOWS DO NOT INTERACT WITH DISTURBED EARTH AND CONSTRUCTION MATERIALS. SEE DETAIL SHEET 3.2.
- 6. CONSTRUCTION SHALL BE TIMED TO OCCUR DURING TIMES OF LOW FLOW.
- 7. CONSTRUCTION SCHEDULING AND STAGING SHALL BE TIMED TO MINIMIZE THE AMOUNT OF TIME SPENT WORKING IN THE RIVER CHANNEL.
- 8. THE RIVERBANKS, IN-STREAM STRUCTURES AND WORK AREA MUST BE STABILIZED AT THE END OF EACH DAY BEFORE THE TEMPORARY BERMS ARE REMOVED AND FLOW IS RETURNED THE FULL CHANNEL.

CONSTRUCTION SEQUENCE

- 1. OBTAIN AND REVIEW THE AVL WTP MILLS RIVER BANK STABILIZATION PROJECT EROSION AND SEDIMENTATION CONTROL PLAN AND ALL OTHER APPLICABLE PERMITS.
- 2. FLAG THE WORK LIMITS AND STAKE OUT THE LIMITS OF DISTURBANCE (LOD) OF THE PROJECT. THE TOTAL PROJECT LOD IS 49.39 AC.
- 3. LOCATE ALL UNDERGROUND UTILITIES WITHIN THE WORK
- 4. NOTIFY INSPECTOR FROM DEQ REGIONAL OFFICE PRIOR TO DISTURBANCE.
- 5. POST CERTIFICATE OF APPROVAL FOR LAND DISTURBANCE AT
- 6. INSTALL RAIN GAUGE AND PREPARE INSPECTION FORMS.
- 7. HOLD PRE-CONSTRUCTION MEETING WITH THE PERMITTEE, ENGINEER AND CONTRACTOR PRIOR TO STARTING ANY LAND DISTURBING ACTIVITIES.
- 8. INSTALL CONSTRUCTION ENTRANCES AT THE DESIGNATED CONSTRUCTION ACCESS POINTS AS SHOWN ON THIS SHEET AND IN THE DETAIL ON SHEET 3.2. INSTALL SILT FENCE ALONG THE DOWN SLOPE SIDE OF THE STAGING AREA AS SHOWNIN THE DETAIL ON SHEET 3.2.
- 9. INSPECT EROSION PREVENTION AND SEDIMENT CONTROL BMPS DAILY AND AFTER SIGNIFICANT RAINFALL EVENTS. MAKE NEEDED REPAIRS IMMEDIATELY. KEEP ALL LOGS AND RECORDS UP-TO-DATE.
- 10. ACQUIRE AND STORE MATERIALS FOR SITE (E.G. ROCK, LOGS, EROSION CONTROL MATTING AND FILTER FABRICS) IN THE TEMPORARY STAGING AREAS.
- 11. CLEAR EXISTING VEGETATION REQUIRED TO COMPLETE THE WORK TAKING CARE NOT TO DISTURB DESIRABLE VEGETATION TO REMAIN INTACT.
- 12. GRADE THE RIVER BANKS AND INSTALL BANK STABILIZATION STRUCTURES ACCORDING TO THE PLANS AND DETAILS. WHEN POSSIBLE, PERFORM WORK FROM THE RIVER BANKS TO MINIMIZE TIME SPENT WORKING IN THE CHANNEL.
- 13. INSTALL TEMPORARY SEEDING, PERMANENT SEEDING AND EROSION CONTROL MATTING ON ALL DISTURBED RIVER BANKS AND GRADED SLOPES AS SHOWN ON SHEETS 5.2 AND 6.1. 14. INSTALL TEMPORARY AND PERMANENT SEEDING AND MULCH
- TO ALL AREAS DISTURBED FOR CONSTRUCTION ACCESS AS SHOWN ON SHEET 6.1. 15. ONCE THE WORK AREA IS STABILIZED AND CONSTRUCTION
- NON-BIODEGRADABLE EROSION AND SEDIMENTATION CONTROL BMPS. 16. NOTIFY PERMITEE AND THE ENGINEER FOR A FINAL
- INSPECTION AND WALK THROUGH TO VERIFY FINAL STABILIZATION OF THE SITE.
- 17. WHEN SEASONALLY APPROPRIATE, INSTALL PERMANENT PLANTINGS ON RIVER BANKS AND WITHIN THE RIPARIAN ZONE AS SHOWN ON SHEETS 5.2 AND 6.1.

AVL

S Te

•

Ш

REVISIONS:

H.D.: NAD83 (SCSP) V.D.: NAVD88

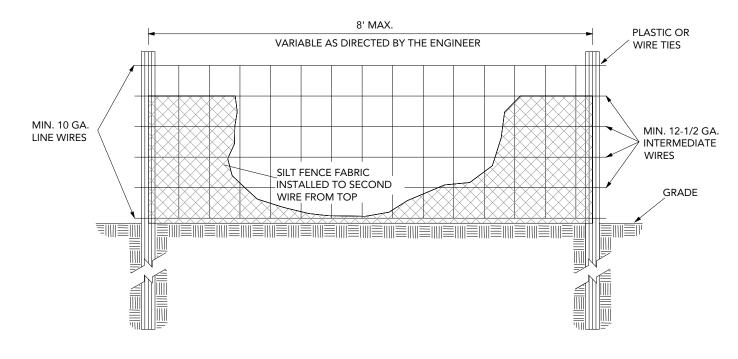
JE PID: 2703

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

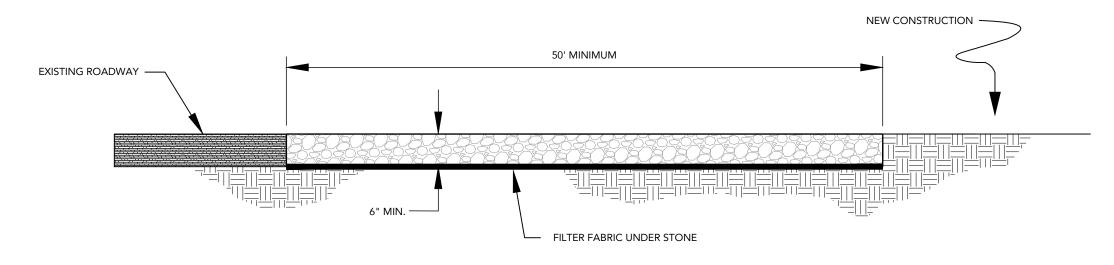
ADDITIONAL INFORMATION, NOTES AND SPECIFICATIONS.



DETAILED FRONT NOT TO SCALE

TEMPORARY SILT FENCE NOTES

- 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.
- 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.



A' 12' MINIMUM

DETAILED CROSS-SECTION A - A' NOT TO SCALE

STANDARD CONSTRUCTION ENTRANCE DETAIL

-INSTALL COIR EROSION CONTROL WATTLES AT CROSSING APPROACH AS SHOWN IN THE DRAWINGS — CHANNEL TOP OF BANK CHANNEL TOE OF SLOPE **CLEAR SPAN** TEMPORARY STREAM CROSSING MINIMUM WIDTH = 10.0' STABILIZE ALL STREAMBANKS DISTURBED -DURING INSTALLATION WITH TEMPORARY SEEDING AND EROSION CONTROL MATTING

50' MINIMUM

2"-3" STONE TO BE USED

(NCDOT CLASS A OR RAILROAD

BALLAST)

DETAILED PLAN

NOT TO SCALE

- EXISTING

ROADWAY

DETAILED PLAN NOT TO SCALE

TEMPORARY STREAM CROSSING NOTES

- 1. ALL TEMPORARY STREAM CROSSING 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.
- 3. THE CONTRACTOR SHALL SELECT A STRUCTURE AND MATERIAL FOR THE CROSSING THAT IS SUFFICIENT TO SUPPORT ALL EQUIPMENT (LOADED) ON THE SITE.
- 4. KEEP CLEARING AND EXCAVATION OF THE STREAMBANKS AND BED AND APPROACH SECTIONS TO A MINIMUM.
- 5. THE CROSSING SHALL PROVIDE A CLEAR SPAN OF THE CHANNEL WITH SOOTH TRANSITIONS ON INGRESS AND EGRESS POINTS.
- 6. KEEP STREAM CROSSING AT RIGHT ANGLES TO THE STREAM FLOW.
- ALIGN ROAD APPROACHES WITH THE CENTERLINE OF THE CROSSING FOR A MINIMUM DISTANCE OF 30 FT. RAISE ABUTMENTS AND CULVERT FILLS A MINIMUM OF 1 FT ABOVE THE ADJOINING APPROACH SECTION TO PREVENT EROSION FROM SURFACE RUNOFF AND TO ALLOW FLOOD FLOWS AROUND THE STRUCTURE.
- 8. ALL STREAMBANKS AND BED MATERIAL DISTURBED DURING INSTALLATION OF THE CROSSING SHALL BE STABILIZED WITH TEMPORARY SEEDING AND EROSION CONTROL MATTING OR RIPRAP. COIR EROSION CONTROL WATTLES SHALL BE INSTALLED AT ALL INGRESS AND EGRESS POINTS AS SHOWN IN THE DRAWINGS.
- 9. REMOVE TEMPORARY STREAM CROSSINGS IMMEDIATELY WHEN THEY ARE NO LONGER NEEDED. RESTORE THE STREAM CHANNEL TO ITS ORIGINAL CROSS-SECTION, AND SMOOTH AND APPROPRIATELY STABILIZE ALL
- 10. RE-DRESSING OF CHANNEL AND BANKFULL BENCH/FLOODPLAIN WILL LIKELY BE REQUIRED FOLLOWING REMOVAL OF THE CROSSING AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.
- 11. SEE SECTION 6.70.1 OF NC DEMLR'S EROSION AND SEDIMENT CONTROL DESIGN MANUAL (2013) FOR ADDITIONAL INFORMATION, NOTES AND SPECIFICATIONS.

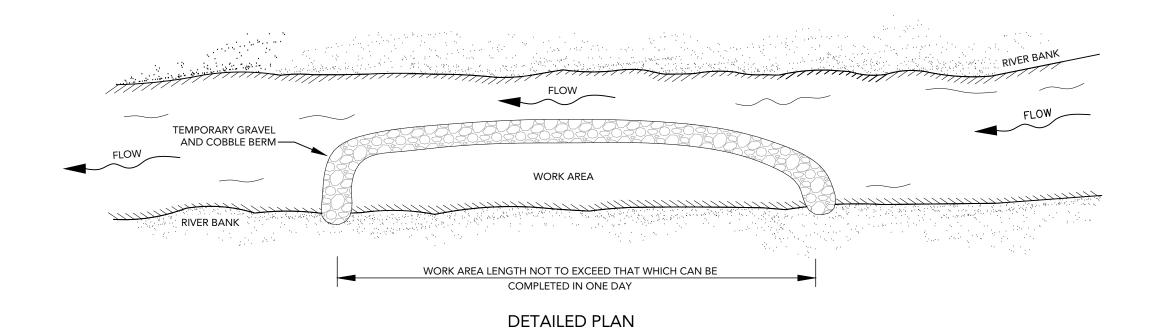
- SILT FENCE GEOTEXTILE FABRIC

- STEEL POST

- WOVEN WIRE FABRIC

DETAILED SIDE NOT TO SCALE

TEMPORARY SILT FENCE DETAIL



NOT TO SCALE

TEMPORARY IN-STREAM DIVERSION NOTES

- 1. ALL WORK IN OR ADJACENT TO STREAMS SHALL BE CONDUCTED SUCH THAT THE FLOWING STREAM DOES NOT COME IN CONTACT WITH THE DISTURBED WORK AREA.
- 2. CONSTRUCT A TEMPORARY IN-STREAM DIVERSION USING GRAVEL AND COBBLE FROM THE RIVER BED TO CREATE A BERM DIVERTS FLOW AROUND THE THE WORK AREA SUCH THAT IN-STREAM FLOWS DO NOT INTERACT WITH DISTURBED EARTH AND CONSTRUCTION MATERIALS.
- 3. CONSTRUCTION SHALL BE TIMED TO OCCUR DURING TIMES OF LOW FLOW.
- 6. CONSTRUCTION SCHEDULING AND STAGING SHALL BE TIMED TO MINIMIZE THE AMOUNT OF TIME SPENT WORKING IN THE RIVER CHANNEL.
- 7. THE RIVERBANKS, IN-STREAM STRUCTURES AND WORK AREA MUST BE STABILIZED AT THE END OF EACH DAY BEFORE THE TEMPORARY BERMS ARE REMOVED AND FLOW IS RETURNED THE FULL CHANNEL.

PERMIT DRAWING

REVISIONS:

S Te

• —

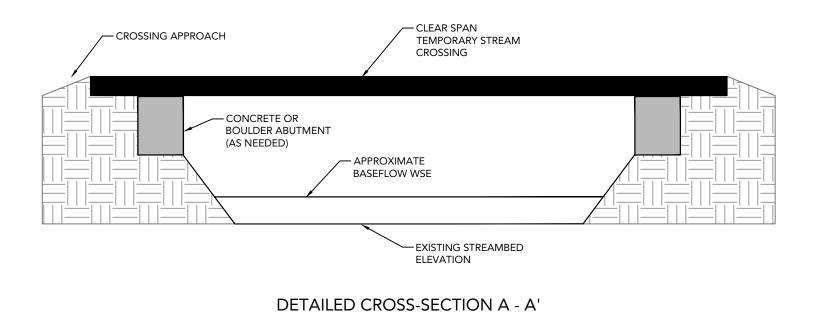
Ш

RIVE

AVL

DATE: 04/22/2021 PLOT SIZE: 24" x 36"

H.D.: NAD83 (SCSP) V.D.: NAVD88 JE PID: 2703



NOT TO SCALE

TEMPORARY STREAM CROSSING DETAIL

TEMPORARY IN-STREAM DIVERSION DETAIL

GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT

mplementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The ermittee shall comply with the Erosion and Sediment Control plan approved by the lelegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

Required Ground Stabilization Timeframes			
Site Area Description many calenda days after cea		Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
(a)	Perimeter dikes, swales, ditches, and perimeter slopes	7	None
(b)	High Quality Water (HQW) Zones	7	None
(c)	Slopes steeper than 3:1	7	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed
(d)	Slopes 3:1 to 4:1	14	-7 days for slopes greater than 50' in length and with slopes steeper than 4:1 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed
(e)	Areas with slopes flatter than 4:1	14	 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed unless there is zero slope

practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

Stabilize the ground sufficiently so that rain rechniques in the table below:	will not dislouge the soil. Ose one of the
Temporary Stabilization	Permanent Stabilization
 Temporary grass seed covered with straw or other mulches and tackifiers Hydroseeding Rolled erosion control products with or without temporary grass seed Appropriately applied straw or other mulch Plastic sheeting 	 Permanent grass seed covered with straw or other mulches and tackifiers Geotextile fabrics such as permanent soil reinforcement matting Hydroseeding Shrubs or other permanent plantings covered with mulch Uniform and evenly distributed ground cover sufficient to restrain erosion Structural methods such as concrete, asphalt o retaining walls Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

SECTION A: SELF-INSPECTION

(1) Rain gauge

maintained in

good working

(2) E&SC

(3) Stormwater

outfalls (SDOs)

wetlands onsite

or offsite

accessible)

(6) Ground

stabilization

were delayed shall be noted in the Inspection Record.

(during normal

At least once per

event > 1.0 inch in

7 calendar days

and within 24

hours of a rain

and within 24

hours of a rain

7 calendar days

and within 24

hours of a rain

7 calendar days

and within 24

hours of a rain

event \geq 1.0 inch in

After each phase

of grading

24 hours

event ≥ 1.0 inch in

24 hours

(4) Perimeter of At least once per

(5) Streams or At least once per

- Select flocculants that are appropriate for the soils being exposed during
- construction, selecting from the NC DWR List of Approved PAMS/Flocculants. Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
- Apply flocculants at the concentrations specified in the NC DWR List of Approved PAMS/Flocculants and in accordance with the manufacturer's instructions.
- Provide ponding area for containment of treated Stormwater before discharging

PART III

SELF-INSPECTION, RECORDKEEPING AND REPORTING

Self-inspections are required during normal business hours in accordance with the table

below. When adverse weather or site conditions would cause the safety of the inspection

personnel to be in jeopardy, the inspection may be delayed until the next business day on

which it is safe to perform the inspection. In addition, when a storm event of equal to or

greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be

performed upon the commencement of the next business day. Any time when inspections

approved by the Division.

Identification of the measures inspected,

. Name of the person performing the inspection,

Indication of whether the measures were operating

5. Description of maintenance needs for the measure.

Identification of the discharge outfalls inspected,

sheen, floating or suspended solids or discoloration,

3. An explanation as to the actions taken to control future

Name of the person performing the inspection,

Indication of visible sediment leaving the site,

event > 1.0 inch in | 2. Description, evidence, and date of corrective actions taken, and

Description, evidence, and date of corrective actions taken

Evidence of indicators of stormwater pollution such as oil

Description, evidence, and date of corrective actions taken.

If visible sedimentation is found outside site limits, then a record

1. Actions taken to clean up or stabilize the sediment that has left

If the stream or wetland has increased visible sedimentation or a

Records of the required reports to the appropriate Division

Description, evidence and date of corrective actions taken, and

Regional Office per Part III, Section C, Item (2)(a) of this permit

ream has visible increased turbidity from the construction

ctivity, then a record of the following shall be made:

The phase of grading (installation of perimeter E&SC

drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent

Documentation that the required ground stabilization

timeframe or an assurance that they will be provided as

measures have been provided within the required

measures, clearing and grubbing, installation of storm

. Date and time of the inspection,

. Date and time of the inspection,

of the following shall be made:

the site limits,

ground cover).

soon as possible.

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

spection records must include

If no daily rain gauge observations are made during weekend or

holiday periods, and no individual-day rainfall information is available, record the cumulative rain measurement for those un-

attended days (and this will determine if a site inspection is

needed). Days on which no rainfall occurred shall be recorded as

"zero." The permittee may use another rain-monitoring device

Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

EQUIPMENT AND VEHICLE MAINTENANCE

Maintain vehicles and equipment to prevent discharge of fluids.

to a recycling or disposal center that handles these materials.

- Provide drip pans under any stored equipment. Identify leaks and repair as soon as feasible, or remove leaking equipment from the
- Collect all spent fluids, store in separate containers and properly dispose as
- hazardous waste (recycle when possible). Remove leaking vehicles and construction equipment from service until the problem
- Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

- Never bury or burn waste. Place litter and debris in approved waste containers. 2. Provide a sufficient number and size of waste containers (e.g dumpster, trash
- receptacle) on site to contain construction and domestic wastes. 3. Locate waste containers at least 50 feet away from storm drain inlets and surface
- waters unless no other alternatives are reasonably available. 4. Locate waste containers on areas that do not receive substantial amounts of runoff
- from upland areas and does not drain directly to a storm drain, stream or wetland. 5. Cover waste containers at the end of each workday and before storm events or
- provide secondary containment. Repair or replace damaged waste containers.
- Anchor all lightweight items in waste containers during times of high winds. 7. Empty waste containers as needed to prevent overflow. Clean up immediately if
- containers overflow.
- 8. Dispose waste off-site at an approved disposal facility. 9. On business days, clean up and dispose of waste in designated waste containers.

PAINT AND OTHER LIQUID WASTE

- 1. Do not dump paint and other liquid waste into storm drains, streams or wetlands. 2. Locate paint washouts at least 50 feet away from storm drain inlets and surface
- waters unless no other alternatives are reasonably available. 3. Contain liquid wastes in a controlled area.
- 4. Containment must be labeled, sized and placed appropriately for the needs of site. 5. Prevent the discharge of soaps, solvents, detergents and other liquid wastes from

- PORTABLE TOILETS Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
- Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
- Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

Item to Document

(c) Ground cover is located and installed

in accordance with the approved E&SC

(d) The maintenance and repair

2. Additional Documentation

requirement not practical:

upon request. [40 CFR 122.41]

have been performed.

to E&SC Measures.

requirements for all E&SC Measures

(e) Corrective actions have been taken

shown on the approved E&SC Plan.

described:

- Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably
- Protect stockpile with silt fence installed along toe of slope with a minimum offset of
- five feet from the toe of stockpile.
- Provide stable stone access point when feasible.
- Stabilize stockpile within the timeframes provided on this sheet and in accordance with the approved plan and any additional requirements. Soil stabilization is defined as vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.

SELF-INSPECTION. RECORDKEEPING AND REPORTING

The approved E&SC plan as well as any approved deviation shall be kept on the site. The

approved E&SC plan must be kept up-to-date throughout the coverage under this permit.

Documentation Requirements

E&SC Measure shown on the approved E&SC

Plan. This documentation is required upon the

initial installation of the E&SC Measures or if

the E&SC Measures are modified after initial

Plan or complete, date and sign an inspection

Initial and date a copy of the approved E&SC

Plan or complete, date and sign an inspection

report to indicate compliance with approved

Complete, date and sign an inspection report.

Initial and date a copy of the approved E&SC

report to indicate the completion of the

Plan or complete, date and sign an inspection

report to indicate completion of the

The following items pertaining to the E&SC plan shall be documented in the manner

(a) Each E&SC Measure has been installed Initial and date each E&SC Measure on a copy

and does not significantly deviate from the of the approved E&SC Plan or complete, date

locations, dimensions and relative elevations | and sign an inspection report that lists each

(b) A phase of grading has been completed. | Initial and date a copy of the approved E&SC

installation.

construction phase.

corrective action.

In addition to the E&SC Plan documents above, the following items shall be kept on the

and available for agency inspectors at all times during normal business hours, unless the

(a) This general permit as well as the certificate of coverage, after it is received.

a similar inspection form that includes all the required elements. Use of

shown to provide equal access and utility as the hard-copy records.

Division provides a site-specific exemption based on unique site conditions that make this

(b) Records of inspections made during the previous 30 days. The permittee shall record

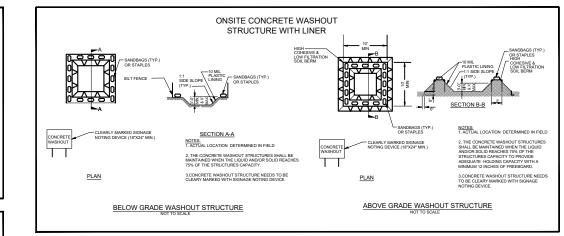
(c) All data used to complete the Notice of Intent and older inspection records shall be

the required observations on the Inspection Record Form provided by the Division or

electronically-available records in lieu of the required paper copies will be allowed if

maintained for a period of three years after project completion and made available

ground cover specifications.



CONCRETE WASHOUTS

- Do not discharge concrete or cement slurry from the site.
- 2. Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
- Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within lot perimeter silt fence.
- Install temporary concrete washouts per local requirements, where applicable. If an alternate method or product is to be used, contact your approval authority for review and approval. If local standard details are not available, use one of the two types of temporary concrete washouts provided on this detail.
- Do not use concrete washouts for dewatering or storing defective curb or sidewalk sections. Stormwater accumulated within the washout may not be pumped into or discharged to the storm drain system or receiving surface waters. Liquid waste must
- be pumped out and removed from project. Locate washouts at least 50 feet from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. At a minimum, install protection of storm drain inlet(s) closest to the washout which could receive
- spills or overflow. Locate washouts in an easily accessible area, on level ground and install a stone entrance pad in front of the washout. Additional controls may be required by the
- Install at least one sign directing concrete trucks to the washout within the project
- limits. Post signage on the washout itself to identify this location. Remove leavings from the washout when at approximately 75% capacity to limit overflow events. Replace the tarp, sand bags or other temporary structural components when no longer functional. When utilizing alternative or proprietary products, follow manufacturer's instructions.
- 10. At the completion of the concrete work, remove remaining leavings and dispose of in an approved disposal facility. Fill pit, if applicable, and stabilize any disturbance caused by removal of washout.

HERBICIDES, PESTICIDES AND RODENTICIDES

- 1. Store and apply herbicides, pesticides and rodenticides in accordance with label
- Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.
- Do not store herbicides, pesticides and rodenticides in areas where flooding is possible or where they may spill or leak into wells, stormwater drains, ground water or surface water. If a spill occurs, clean area immediately.
- 4. Do not stockpile these materials onsite.

HAZARDOUS AND TOXIC WASTE

- 1. Create designated hazardous waste collection areas on-site.
- 2. Place hazardous waste containers under cover or in secondary containment. 3. Do not store hazardous chemicals, drums or bagged materials directly on the ground

PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that must be reported

- Permittees shall report the following occurrences:
- (a) Visible sediment deposition in a stream or wetland.

(b) Oil spills if:

- They are 25 gallons or more,
- They are less than 25 gallons but cannot be cleaned up within 24 hours,
- They cause sheen on surface waters (regardless of volume), or
- They are within 100 feet of surface waters (regardless of volume).
- Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.
- (b) Anticipated bypasses and unanticipated bypasses.
- (c) Noncompliance with the conditions of this permit that may endanger health or the

2. Reporting Timeframes and Other Requirements

After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Division's Emergency Response personnel at (800) 662-7956, (800) 858-0368 or (919) 733-3300.

(a) Visible sediment • Within 24 hours, an oral or electronic notification.

Reporting Timeframes (After Discovery) and Other Requirements

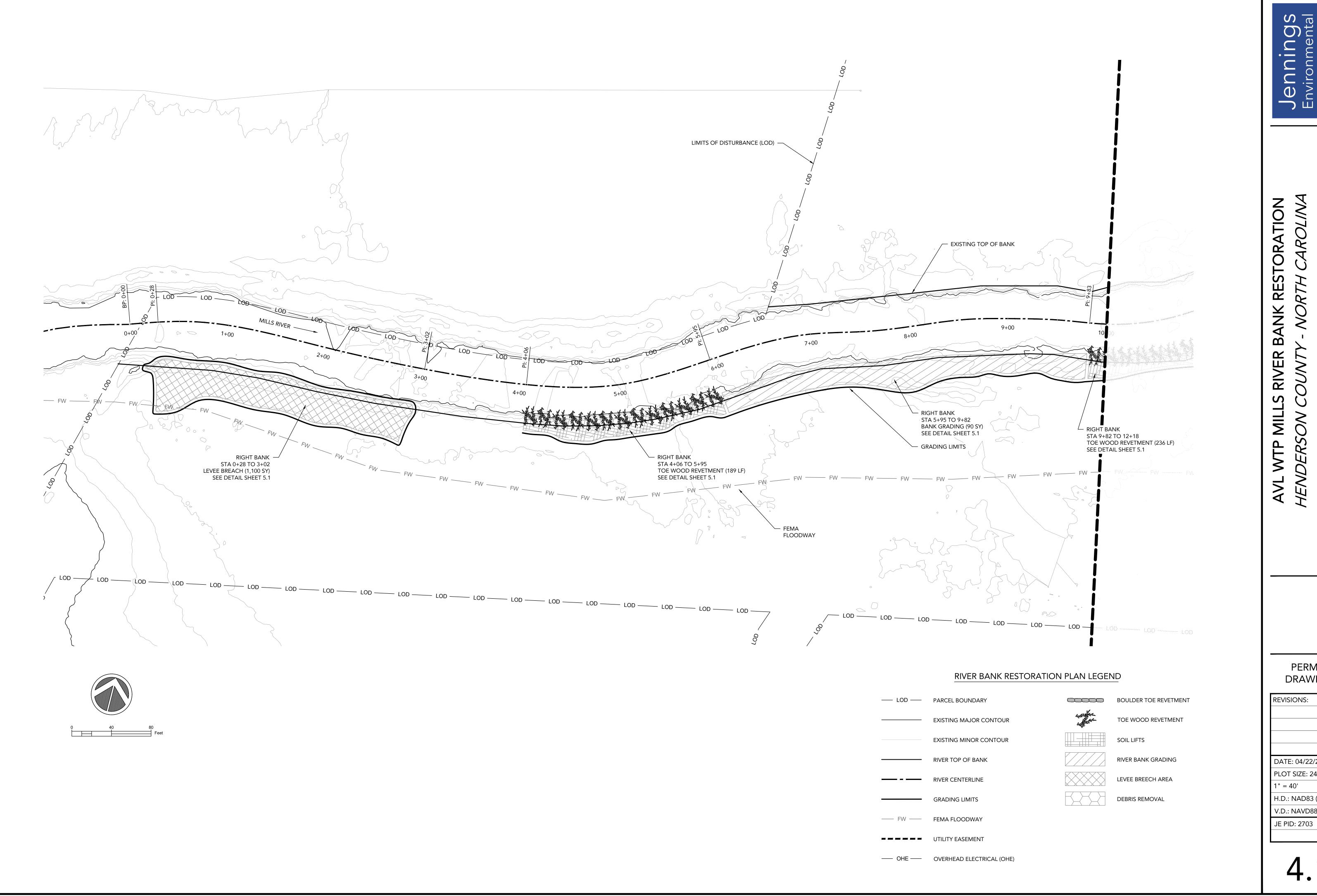
(a) visible seamlene	William 24 Hours, an orar of electronic floringation.
deposition in a	Within 7 calendar days, a report that contains a description of the
stream or wetland	sediment and actions taken to address the cause of the deposition.
	Division staff may waive the requirement for a written report on a
	case-by-case basis.
	If the stream is named on the NC 303(d) list as impaired for sediment-
	related causes, 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	Within 24 hours, an oral or electronic notification. The notification
release of	shall include information about the date, time, nature, volume and
hazardous	location of the spill or release.
substances per Item	·
1(b)-(c) above	
(c) Anticipated	A report at least ten days before the date of the bypass, if possible.
bypasses [40 CFR	The report shall include an evaluation of the anticipated quality and
122.41(m)(3)]	effect of the bypass.
(d) Unanticipated	Within 24 hours, an oral or electronic notification.
bypasses [40 CFR	Within 7 calendar days, a report that includes an evaluation of the
122.41(m)(3)]	quality and effect of the bypass.
(e) Noncompliance	Within 24 hours, an oral or electronic notification.
with the conditions	Within 7 calendar days, a report that contains a description of the
of this permit that	noncompliance, and its causes; the period of noncompliance,
may endanger	including exact dates and times, and if the noncompliance has not
health or the	been corrected, the anticipated time noncompliance is expected to
environment[40	continue; and steps taken or planned to reduce, eliminate, and
CFR 122.41(I)(7)]	prevent reoccurrence of the noncompliance. [40 CFR 122.41(I)(6).
	Division staff may waive the requirement for a written report on a
	case-by-case basis.
	'

$\mathbf{\Omega}$ RIVE

PERMIT DRAWING

REVISIONS:

DATE: 04/22/2021 PLOT SIZE: 24" x 36" H.D.: NAD83 (SCSP) V.D.: NAVD88 JE PID: 2703

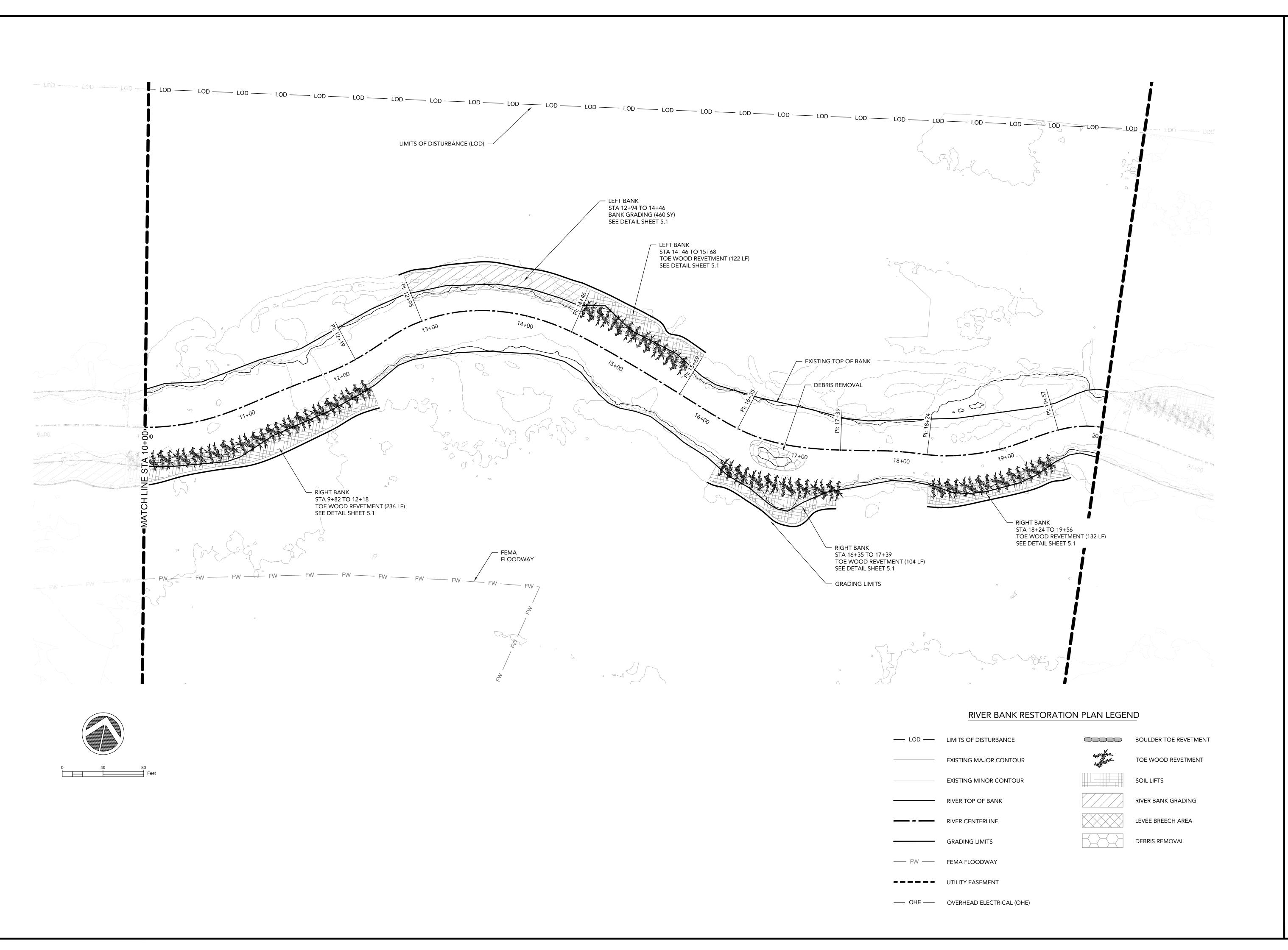


RESTORATION

PERMIT DRAWING

DATE: 04/22/2021 PLOT SIZE: 24" x 36" 1" = 40'

H.D.: NAD83 (SCSP) V.D.: NAVD88



Jennings Environmental

AVL WTP MILLS RIVER BANK RESTORATION HENDERSON COUNTY - NORTH CAROLINA

R BANK RESTORATION

RIVE

PERMIT DRAWING

DATE: 04/22/2021
PLOT SIZE: 24" x 36"

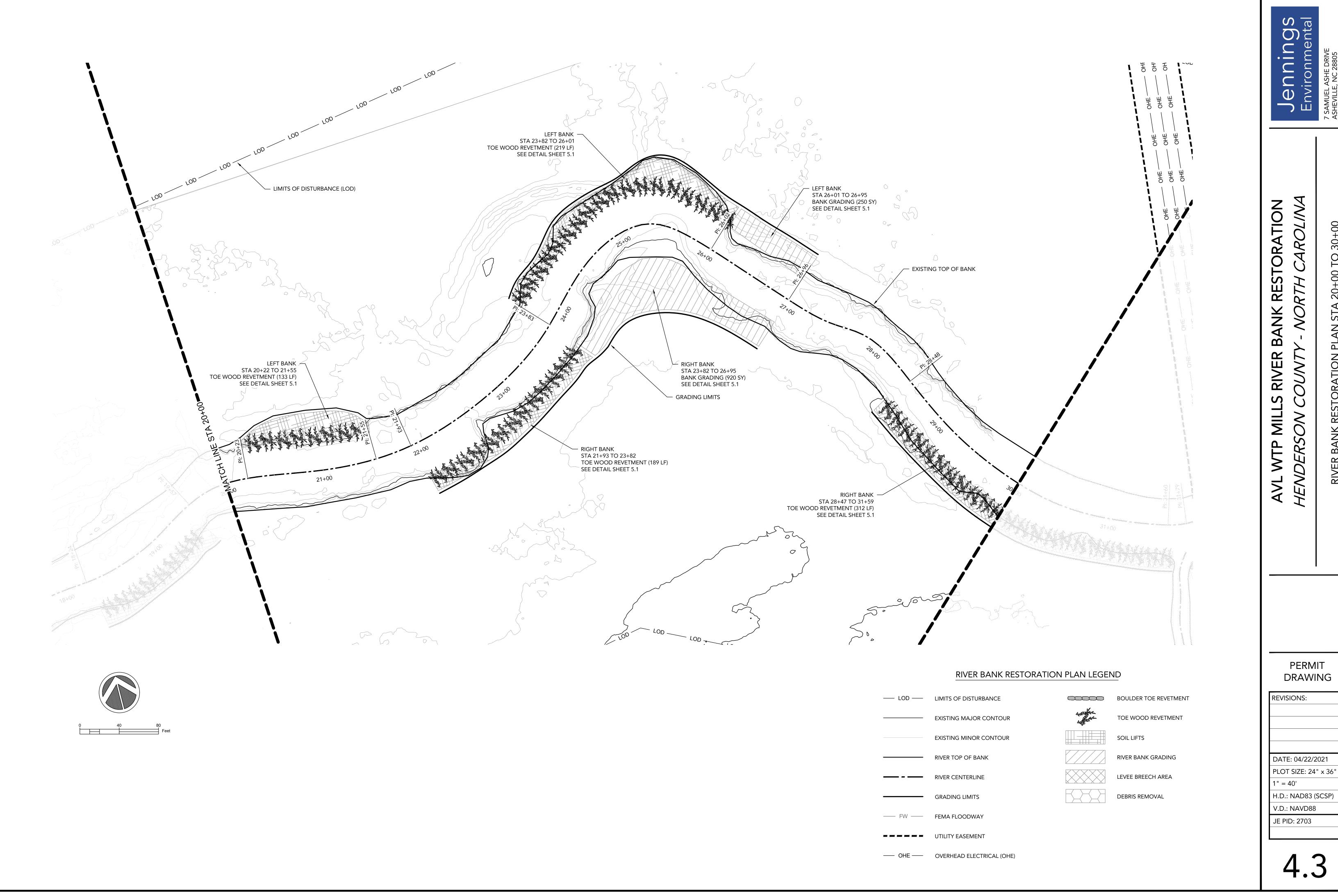
REVISIONS:

1" = 40' H.D.: NAD83 (SCSP) V.D.: NAVD88

V.D.: NAVD88

JE PID: 2703

4.2

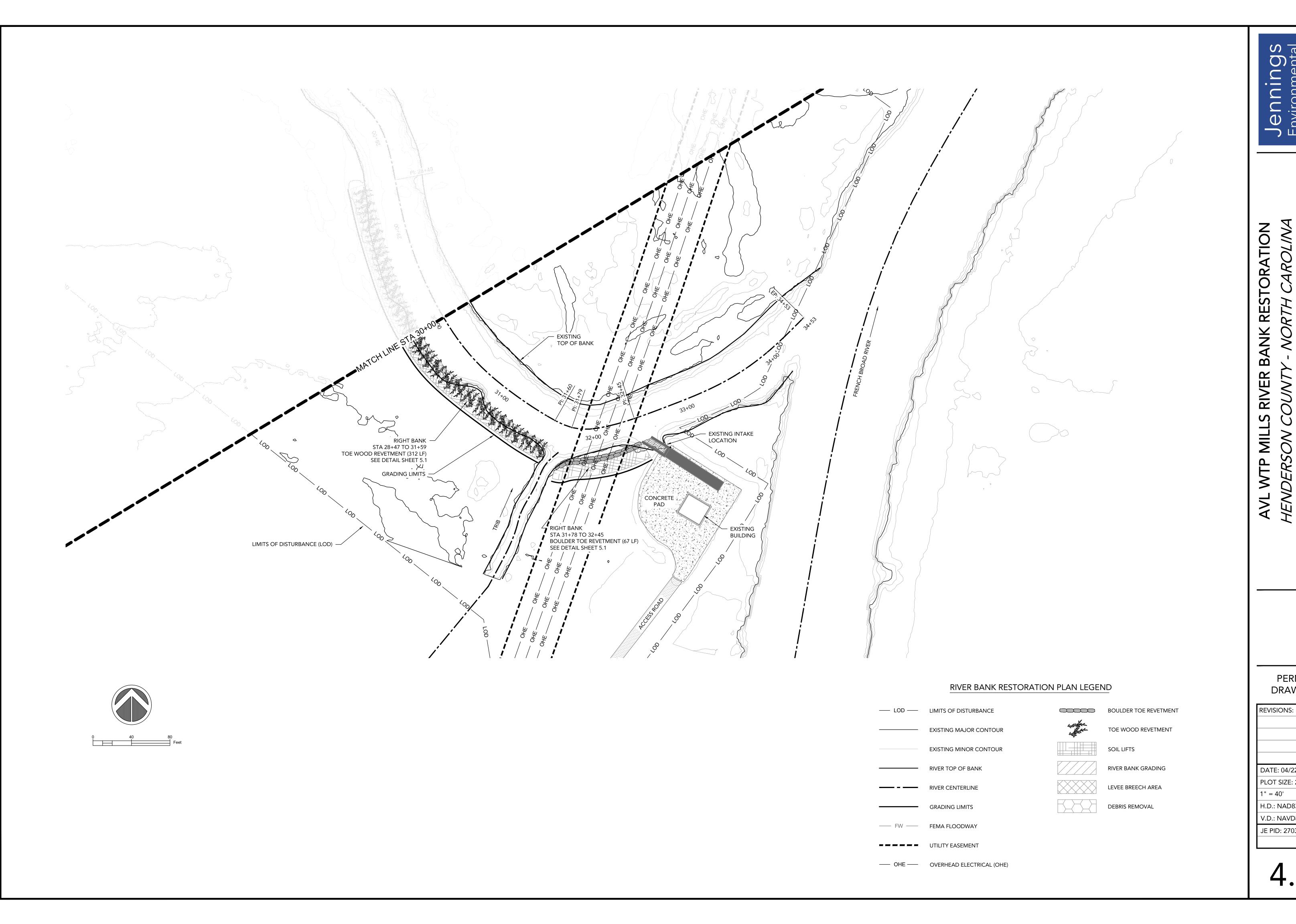


30+00

R BANK RESTORATION

PERMIT DRAWING

H.D.: NAD83 (SCSP)



RESTORATION BANK RIVER MILLS AVL V

> PERMIT DRAWING

DATE: 04/22/2021 PLOT SIZE: 24" x 36"

1" = 40' H.D.: NAD83 (SCSP)

V.D.: NAVD88 JE PID: 2703

—— MIN. 6.0 ' —

— INSTALL EROSION CONTROL MATTING

RIVER BANK GRADING DETAIL

LIVE CUTTINGS INSTALLED

BETWEEN LIFTS 2.0' O.C.

POINT BAR ON INSIDE BEND

INSTALL EROSION CONTROL MATTING — ON ALL DISTURBED RIVER BANKS

TOE OF SLOPE —

TOE OF SLOPE -

OFFSET ROWS OF LIVE —

PLANTINGS PER **RE-VEGETATION PLAN**

AND DETAILS

STAKES AND BAREROOT

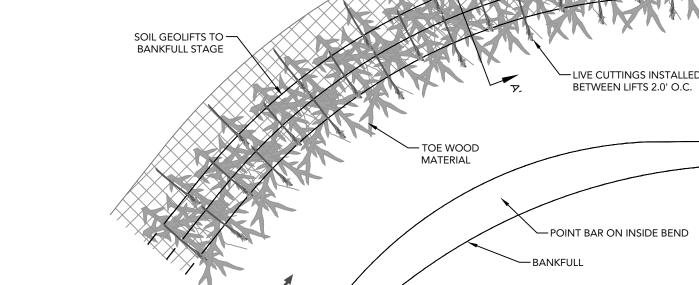
DETAILED SECTION A - A

SOIL GEOLIFTS TO -

BANKFULL STAGE

RIVER BANK GRADING NOTES

- 1. BANK GRADING AREAS ALONG THE MILLS RIVER HAVE BEEN IDENTIFIED IN THE DRAWINGS. THE LENGTH AND EXTENT OF THE BANK GRADING AREAS VARIES WITHIN THE SITE. FOUR (4) PROPOSED BANK GRADING LOCATIONS ARE SHOWN ON THE PLANSHEETS.
- 2. 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.
- 3. 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 SURROUNDING AREA. ALL EXCAVATE MATERIAL SHALL HAULED AND PLACED IN DESIGNATED FILL AREAS ONSITE.
- 4. IF RIVER BANK MATERIAL IS NOT SUITABLE FOR PLANTING AND RE-VEGETATION, 2" TO 3" OF TOPSOIL SHALL BE
- 5. TRANSPLANTS AVAILABLE ONSITE MAY BE INSTALLED IN THE TOPSOIL AS DIRECTED BY THE ENGINEER ON SITE.
- 7. 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



DETAILED PLAN NOT TO SCALE

INSTALL SOIL LIFTS UP TO - SOIL LIFTS SHALL USE 2 LAYERS OF MATTING: 26OZ. / YD² COIR MATTING (OUTER) AND 11.2 OZ/YD² COCONUT EXCAVATION LIMITS -FIBER BLANKET (INNER). WOOD STAKE -— LIVE CUTTINGS BETWEEN LIFTS 2" X 2" X 18" - 36" COMPACTED ONSITE -BACKFILL UNCONSOLIDATED GRAVEL AND TOPSOIL TOP OF TOE WOOD = 2.0' ABOVE BASE FLOW WSE WOODY MATERIAL -APPROXIMATE LOW FLOW WSE **INSTALLED IN 1.0** LIFTS ABOVE LOGS LOGS WITH ROOTWADS INSTALLED AT BASE OF WOODY DEBRIS —BASE OF TOE WOOD

DETAILED SECTION A - A NOT TO SCALE

TOE WOOD NOTES

- 1. WOODY MATERIAL USED IN THE TOE WOOD STRUCTURE 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. A LAYER OF LOGS WITH ROOD WADS INTACT SHALL BE INSTALLED ALONG THE BASE OF THE STRUCTURE. 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.
- 3. PLACE LAYER OF LIVE CUTTINGS (MIN. 4' LENGTH) A 2.0' O.C. ON THE GRAVEL AND TOPSOIL 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 OF THE SPECIES SPECIFIED FOR LIVE STAKES OR APPROVED BY THE ENGINEER.
- 4. INSTALL SOIL LIFTS FROM THE LIVE CUTTINGS UP TO THE BANKFULL STAGE. LIFTS SHALL NOT EXCEED 1.0' THICKNESS. LIFTS SHALL INCLUDE ALL SOIL PREPARATION, TEMPORARY AND PERMANENT SEEDING AND MULCH. SOIL LIFTS SHALL USE 2 LAYERS OF MATTING: 26OZ. / YD² COIR MATTING (OUTER) AND 11.2 OZ/YD² COCONUT FIBER BLANKET (INNER). EROSION CONTROL MATTING 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.
- 5. PLACE SOIL BACKFILL UP TO THE LIFT HEIGHT SPECIFIED OF NO GREATER THAN 1.0 FT BEING CAREFUL NOT TO PUSH/PULL OR TEAR THE FABRIC PREVIOUSLY PLACED.
- 6. REPEAT STEPS #3, #4 AND #5 AS NEEDED TO INSTALL SOIL LIFTS UP TO THE BANKFULL STAGE.
- 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.

LEVEE BREACH DETAIL

- LIVE STAKES AND BARE ROOT PLANTINGS

BREACH GRADING AND -**EXCAVATION LIMITS** BREACH AREA - EXISTING PUSHUP LEVEE

LEVEE BREACH NOTES

- 1. PUSHUP LEVEES ARE LOCATED ON THE PARCEL ALONG THE FRENCH BROAD RIVER. THE HEIGHT AND LENGTH OF THE LEVEES VARIES WITHIN THE SITE. FIVE PROPOSED BREACH LOCATIONS ARE SHOWN ON THE PLANSHEETS. 2. ALL LEVEE BREACH WORK SHALL TAKE PLACE DURING DRY WORKING CONDITIONS. THE CONTRACTOR SHALL
- BY USING ADDITIONAL E&SC MEASURES AS NEEDED OR AS DIRECTED BY THE ENGINEER ONSITE. 3. FOR IMPLEMENTATION, THE CONTRACTOR SHALL EXCAVATE THE BREACH AREA BY CUTTING THE EXISTING LEVEE AT 4:1 SLOPE TO GRADES MATCHING THE SURROUNDING AREA. ALL EXCAVATE MATERIAL SHALL HAULED AND PLACED IN DESIGNATED FILL AREAS ONSITE.

MINIMIZE THE EXPORT OF SEDIMENT TO ADJACENT SURFACE WATERS TO THE MAXIMUM EXTENT PRACTICABLE

- 4. TOP SOIL SUITABLE FOR ESTABLISHING NATIVE VEGETATION SHALL BE INSTALLED IN THE LEVEE BREACH AREA
- TO A MINIMUM DEPTH OF 1.0'. 5. TRANSPLANTS AVAILABLE ONSITE MAY BE INSTALLED IN THE TOP SOIL AS DIRECTED BY THE ENGINEER ON SITE.
- 6. 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.
- 7. STABILIZATION OF THE WORK AREA WITH TEMPORARY AND PERMANENT SEEDING AND MULCHING IS REQUIRED FOLLOWING EXCAVATION OF THE LEVEE BREACH AREA. INSTALL WOODY PLANTING AND VEGETATION AS

TOE WOOD DETAIL

PERMIT DRAWING

REVISIONS:

• —

<

Ш

 $\mathbf{\alpha}$

 $\mathbf{\Omega}$

RIVE

4

 $\overline{\simeq}$

 \mathcal{E}

DATE: 04/22/2021 PLOT SIZE: 24" x 36" H.D.: NAD83 (SCSP)

V.D.: NAVD88

JE PID: 2703

BOULDER TOE NOTES

- 1. ALL BOULDERS SHALL BE STRUCTURAL STONE, CUBICAL OR RECTANGULAR IN SHAPE. BOULDERS AVAILABLE ONSITE MAY BE USED IF APPROVED BY THE ENGINEER. 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
- 2. A BEDDING COURSE CONSISTING OF 50% NCDOT CLASS B AND 50% NCDOT CLASS A SHALL BE INSTALLED BELOW THE FIRST ROW OF BOULDERS. IF BEDROCK IS ENCOUNTERED ONSITE, THE FIRST LIFT OF BOULDERS SHALL BE PLACED DIRECTLY ON THE BEDROCK. ALL BOULDERS SHALL FIT TIGHTLY TOGETHER. INSTALL EACH LIFT OF BOULDERS WITH A 0.5' SETBACK FROM THE FRONT EDGE OF THE PREVIOUS LIFT OF BOULDERS.
- 3. UNCONSOLIDATED GRAVEL AND TOPSOIL SHALL BE INSTALLED AS A LEVELING COURSE THE ABOVE BOULDERS BEFORE THE LIVE CUTTINGS AND SOIL LIFTS ARE INSTALLED.
- 4. PLACE LAYER OF LIVE CUTTINGS (MIN. 4' LENGTH) A 1.0' O.C. ON THE GRAVEL AND TOPSOIL 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 OF THE SPECIES SPECIFIED FOR LIVE STAKES OR APPROVED BY THE ENGINEER.
- 5. INSTALL SOIL LIFTS FROM THE LIVE CUTTINGS UP TO THE BANKFULL STAGE. LIFTS SHALL NOT EXCEED 1.0' THICKNESS. LIFTS SHALL INCLUDE ALL SOIL PREPARATION, TEMPORARY AND PERMANENT SEEDING AND MULCH. SOIL LIFTS SHALL USE 2 LAYERS OF MATTING: 26OZ. / YD² COIR MATTING (OUTER) AND 11.2 OZ/YD² COCONUT FIBER BLANKET (INNER). EROSION CONTROL MATTING 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. PLACE SOIL BACKFILL UP TO THE LIFT HEIGHT SPECIFIED OF NO GREATER THAN 1.0 FT BEING CAREFUL NOT TO PUSH/PULL OR TEAR THE FABRIC PREVIOUSLY PLACED.
- 7. REPEAT STEPS #4, #5 AND #6 AS NEEDED TO INSTALL SOIL LIFTS UP TO THE BANKFULL STAGE.
- 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.
- 9. RE-DRESSING OF CHANNEL AND BANKFULL BENCH/FLOODPLAIN WILL LIKELY BE REQUIRED FOLLOWING

DETAILED PLAN NOT TO SCALE - LIVE STAKES AND BARE ROOT PLANTINGS - INSTALL SOIL LIFTS UP TO BANKFULL - SOIL LIFTS SHALL USE 2 LAYERS OF MATTING: 26OZ. / YD² COIR MATTING (OUTER) AND 11.2 OZ/YD² COCONUT **EXCAVATION LIMITS -**FIBER BLANKET (INNER). WOOD STAKE -2" X 2" X 18" - 36" — LIVE CUTTINGS BETWEEN LIFTS COMPACTED ONSITE -**BACKFILL** - UNCONSOLIDATED GRAVEL AND TOPSOIL - TOP OF BOULDERS 50% NCDOT CLASS A -50% NCDOT CLASS B - APPROXIMATE LOW FLOW WSE ROCK BACKFILL AND BEDDING COURSE PLACE BOULDERS ON ROCK BEDDING AND LEVELING COURSE NON-WOVEN -FILTER FABRIC BOULDERS —

DETAILED SECTION A - A

NOT TO SCALE

- 8. THE SURFACE OF THIS STRUCTURE SHALL BE FINISHED TO A SMOOTH AND COMPACT SURFACE IN
- INSTALLATION OF IN-STREAM STRUCTURES AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.

TOP SOIL MIN. 1.0'-– 100.0' MIN. LENGTH —— PUSHUP LEVEE BREACH AREA FINISHED GRADE SHOWN IN THE EXISTING PUSHUP LEVEE — DRAWINGS OR AS DIRECTED BY **ENGINEER ONSITE** PRE-FILL GROUND ELEVATION

BOULDER TOE DETAIL

BANKFULL TOE OF SLOPE EROSION CONTROL MATTING FROM TOE OF CHANNEL TO 6.0' BEYOND BANKFULL STAGE DETAILED PLAN NOT TO SCALE

VERTICAL OVERLAP —

ECO-STAKES

DETAILED STAKING PLAN

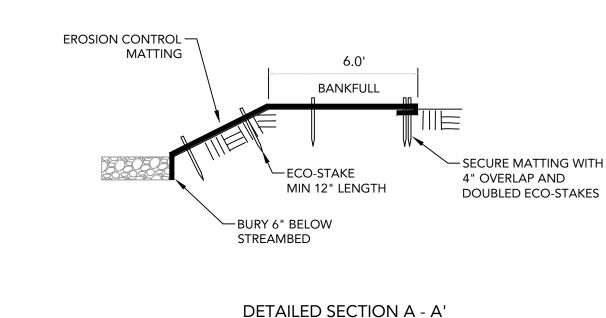
NOT TO SCALE

MIN. 12" WITH DOUBLE

4" MIN. HORIZONTAL — OVERLAP

EROSION CONTROL MATTING NOTES

- 1. EROSION CONTROL MATTING IS USED TO PROTECT RECENTLY CONSTRUCTED STREAMBANKS FROM EROSION. THE MATTING WILL REMAIN INTACT WHILE THE BANK AND RIPARIAN VEGETATION MATURES, PROVIDING CRITICAL BANK PROTECTION.
- BEFORE INSTALLING EROSION CONTROL MATTING, RAKE SOIL LEVEL, ADD TEMPORARY AND PERMANENT SEED, SOIL PREPARATION AND MULCH.
- 3. 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.
- 4. 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.
- 5. EROSION CONTROL MATTING 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.



NOT TO SCALE



—EDGE OVERLAP

MIN. 4" WITH DOUBLE

-EROSION CONTROL

BANKFULL STAGE

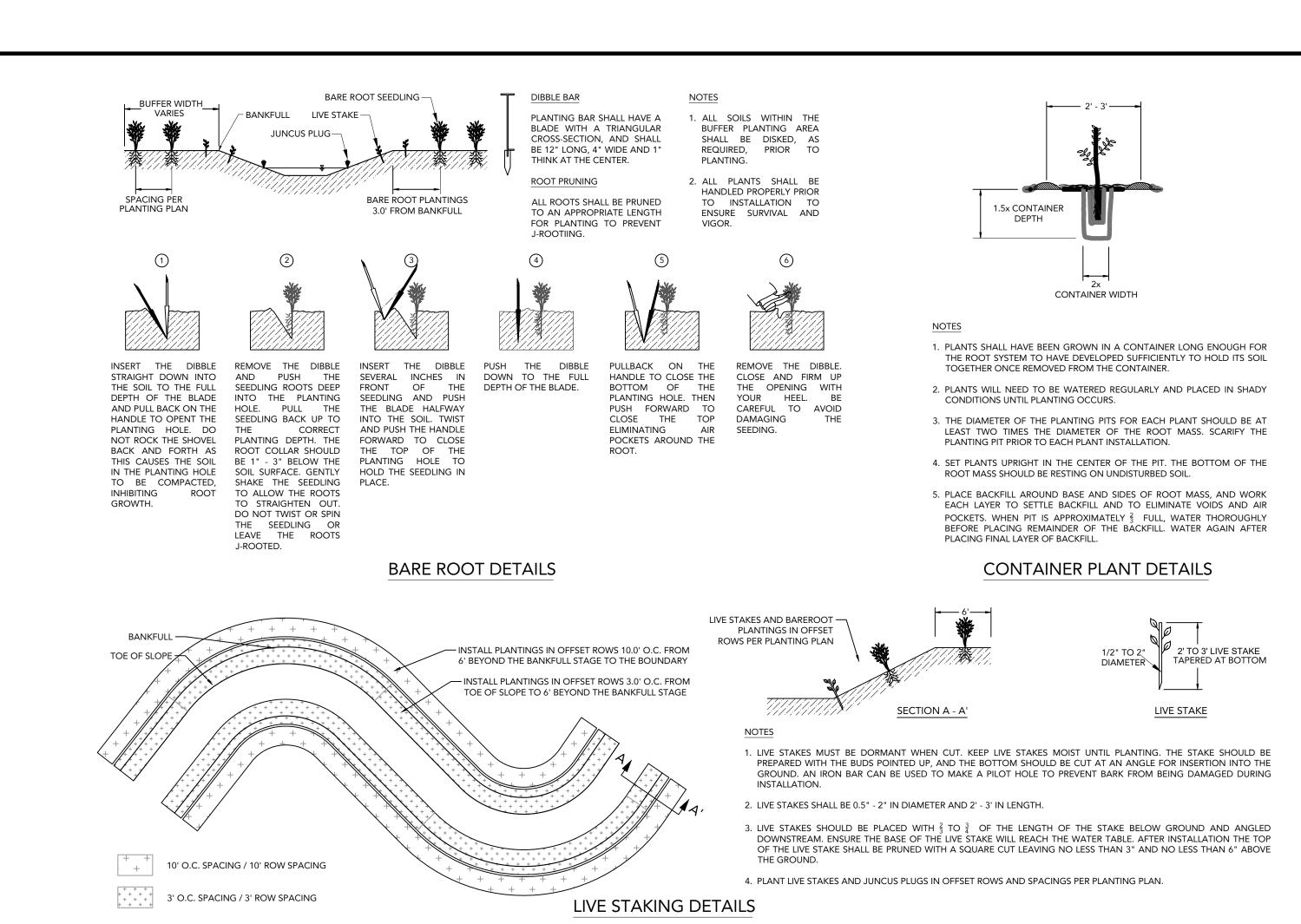
OFFSET ROWS AT

-SINGLE 12" ECO-STAKES

MATTING

2'-3' O.C.

ECO-STAKES AT 2' O.C.



RE-VEGETATION AND PLANTING DETAILS

AVL WTP MILLS RIVER BANK RESTORATION HENDERSON COUNTY - NORTH CAROLINA

DET

ATION

 $\mathbf{\Omega}$

S Te

-

PERMIT DRAWING

REVISIONS:

DATE: 04/22/2021
PLOT SIZE: 24" x 36"
NTS
H.D.: NAD83 (SCSP)

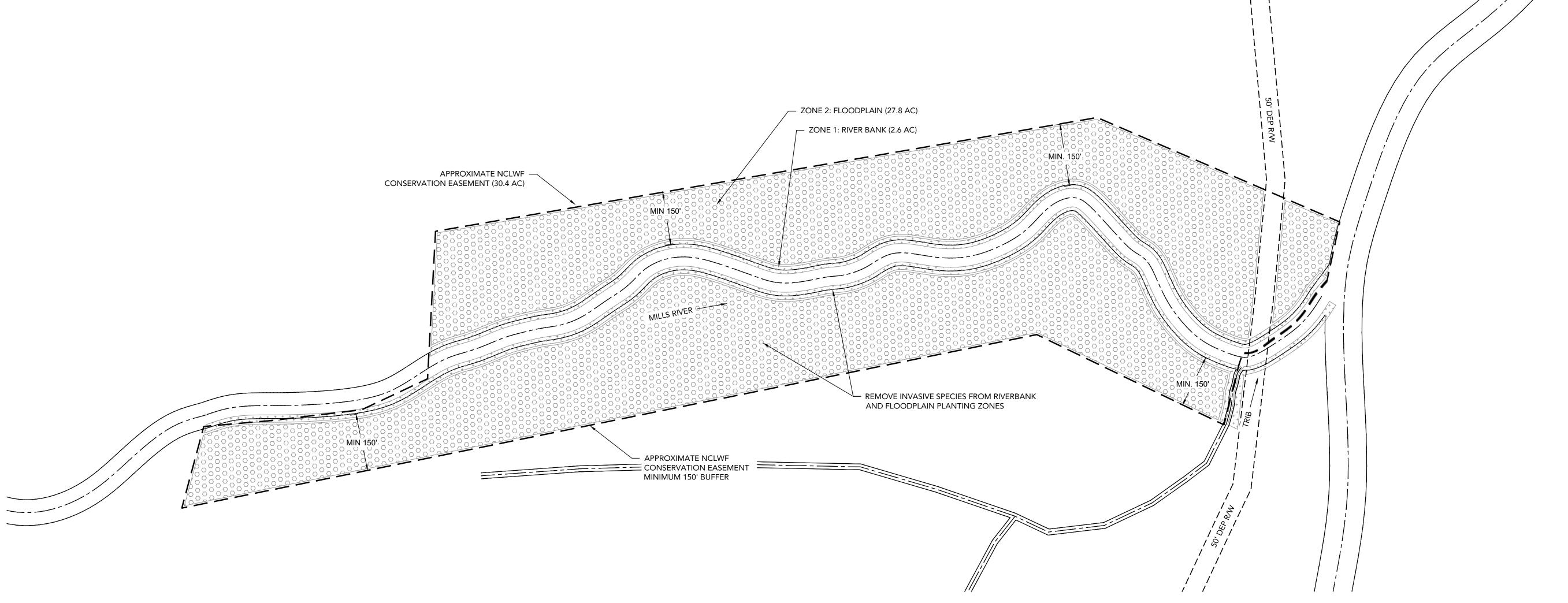
V.D.: NAVD88

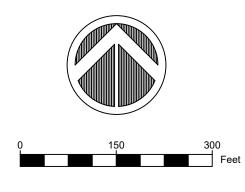
JE PID: 2703

F 2

REVISIONS:

V.D.: NAVD88 JE PID: 2703





RE-VEGETATION PLAN LEGEND

— MCLWF EASEMENT (APPROX.) — — — UTILITY EASEMENT ----- RIVER CENTERLINE

RIVER TOB OF BANK **ZONE 1: RIVER BANK**

ZONE 2: FLOODPLAIN

INVASIVE SPECIES MANAGEMENT

1. WITHIN THE PROPOSED NCLWF CONSERVATION EASEMENT, REMOVE INVASIVE VEGETATION USING PHYSICAL AND MECHANICAL METHODS. APPLY A CUT STUMP HERBICIDE TREATMENT TO THE BASE OF ALL INVASIVE SPECIES REMOVED AND BURY THE PLANT MATERIAL ONSITE INCLUDING THE FOLLOWING SPECIES:

1.1. CHINESE PRIVET (*LIGUSTRUM SINENSE*)

1.2. ORIENTAL BITTERSWEET (CELASTRUS ORBICULATUS)

LIVE STAKES, BAREROOTS AND CONTAINER **PLANTING**

2. SEE DETAIL SHEET 3.2 FOR DETAILED PLANTING NOTES AND INSTRUCTIONS. ZONE 1 AND ZONE 2 PLANTINGS SHALL BE INSTALLED AS LIVE STAKES OR BAREROOT STOCK DEPENDING AVAILABILITY. SPECIES LIST MAY BE ADJUSTED BY THE ENGINEER DEPENDING ON SPECIES AVAILABILITY. SEE THIS SHEET FOR DETAILED VEGETATION SCHEDULES.

TEMPORARY SEEDING AND MULCHING

- 3. ALL SEED AND SEED VARIETIES MUST BE FREE OF STATE AND FEDERALLY LISTED NOXIOUS WEED SEED AND INVASIVE SPECIES.
- 4. 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.
- 5. 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

- 6. 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.
- 7. ALL SEED AND SEED VARIETIES MUST BE FREE OF STATE AND FEDERALLY LISTED NOXIOUS WEED SEED AND INVASIVE
- 8. 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.
- 9. 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.

TEMPORARY SEEDING		
DATE	ТҮРЕ	APPLICATION RATE (LBS/AC)
	RYE GRAIN	120
JAN 1 - MAY 1	GROUND AGRICULTURAL LIMESTONE	2,000
JAN 1 - IVIAT 1	10-10-10 FERTILIZER	750
	STRAW MULCH	4,000
	GERMAN MILLET	50
MAY 1 - AUG 15	GROUND AGRICULTURAL LIMESTONE	2,000
MAT 1 - AUG 15	10-10-10 FERTILIZER	750
	STRAW MULCH	4,000
AUG 45 - REG 00	RYE GRAIN	120
	GROUND AGRICULTURAL LIMESTONE	2,000
AUG 15 - DEC 30	10-10-10 FERTILIZER	750
	STRAW MULCH	4,000

PERMANENT SEEDING - 25 LBS / AC			
SPECIES	COMMON NAME	PERCENT	
Agrostis perennans	AUTUMN BENTGRASS	15	
Andropogon gerardii	BIG BLUESTEM	10	
Schizachyrium scoparium	LITTLE BLUESTEM	5	
Monarda didyma	SCARLET BEEBALM	10	
Dichanthelium clandestinum	DEER-TONGUE WITCHGRASS	20	
Juncus effusus	SOFT RUSH	5	
Tridens flavus	PUPRLE TOP	15	
Rudbeckia hirta	BLACKEYED SUSAN	5	
Sorghastrum nutans	INDIAN GRASS	5	
Helianthus angustifolius	SWAMP SUNFLOWER	5	
Panicum anceps	BEAKED PANICGRASS	5	

ZONE 1 (3.0 AC) - S	TREAMBANK PLANTINGS - 3' O.C.	(4,800 STEMS / AC)
SPECIES	COMMON NAME	PERCENT
Cornus amomum	SILKY DOGWOOD	30%
Salix sericea	SILKY WILLOW	30%
Sambucus canadensis	ELBERBERRY	20%
Alnus serrulata	HAZEL ALDER	20%

ZONE 2 (28.0 AC) - FLOODPLAIN PLANTINGS - 10' O.C. (450 STEMS / AC)		
SPECIES	COMMON NAME	PERCENT
Betula nigra	RIVER BIRCH	20%
Platanus occidentalis	SYCAMORE	20%
Liriodendron tulipifera	TULIP POPLAR	10%
Physocarpus opulifolius	NINE BARK	10%
Carpinus caroliniana	AMERICAN HORNBEAM	10%
Hamamelis virginiana	WITCH HAZEL	10%
Liriodendren tulipifera	YELLOW POPLAR	10%
Corylus americana	AMERICAN HAZELNUT	10%