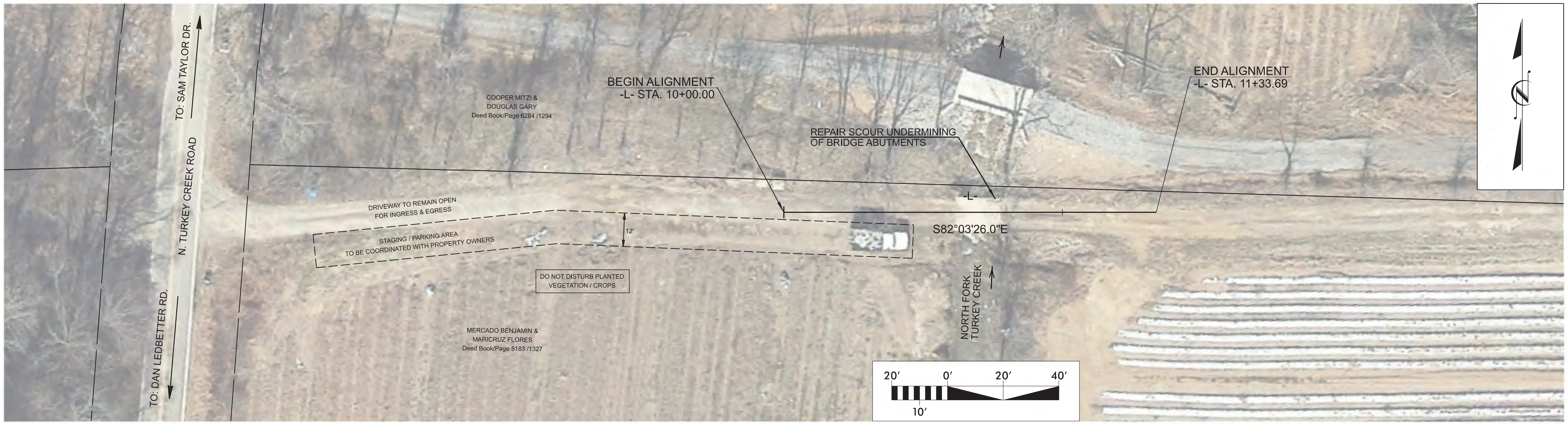
Site # 011-01-98254
Private Bridge Repair 814 North Turkey Creek Rd
over North Fork of Turkey Creek
in Buncombe County

11/14/23



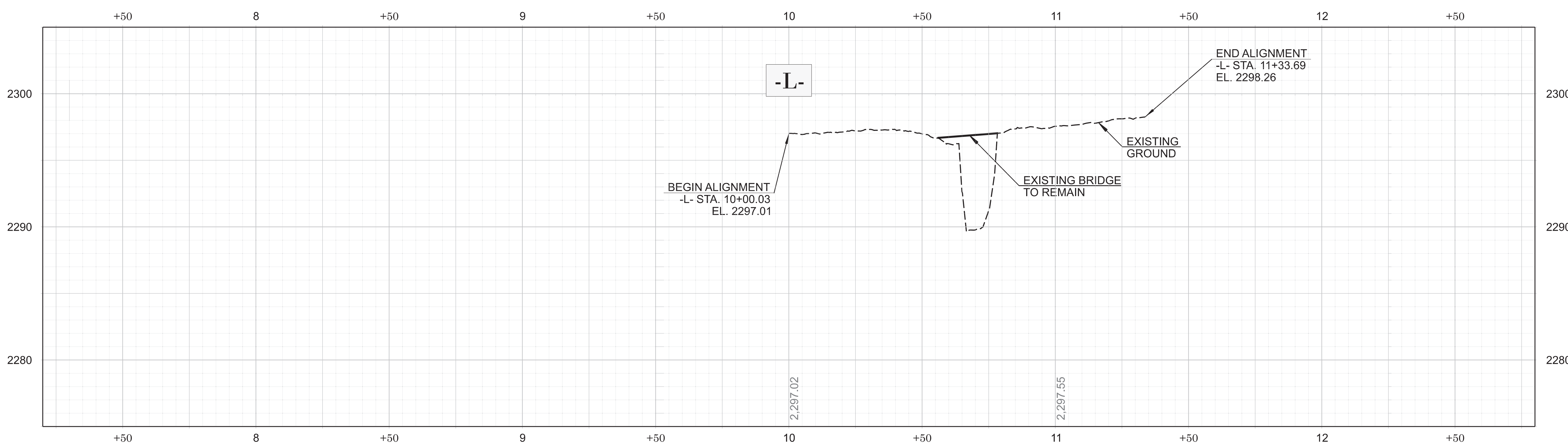
NOTES:

NO PROPOSED ROADWAY WORK
BRIDGE REHABILITATION ONLY

CONTRACTOR SHALL NOT ALLOW MUD, DEBRIS OR AGGREGATE TO ACCUMULATE ON NORTH TURKEY CREEK ROAD. ANY MATERIAL ACCUMULATED ON THE ROAD SHALL BE IMMEDIATELY CLEANED OFF TO PRE-PROJECT CONDITIONS.

THE HYDRAULIC CONVEYANCE OF THE BRIDGE WILL NOT BE IMPACTED BY THE PROPOSED REPAIRS.

FINAL SURVEYS WERE NOT PROVIDED. LIDAR DATED 2017 AND AERIALS DATED 2023 WERE USED FOR DESIGN.



011-01-98254

04

NORTH CAROLINA EMERGENCY MANAGEMENT BUNCOMBE COUNTY

ROADWAY DESIGN ENGINEER

12/9/2025

NORTH CAROLINA PROFESSIONAL SEAL 035663 ENGINEER MICHAEL B. LITTLEFIELD

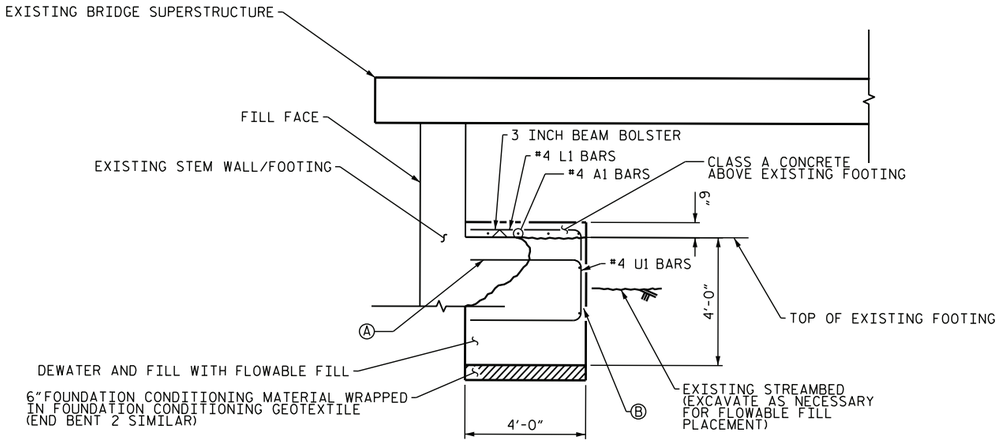
Signed by: Michael B. Littlefield

PREPARED BY

Stantec

Stantec Consulting Services Inc. 801 Jones Franklin Road Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672

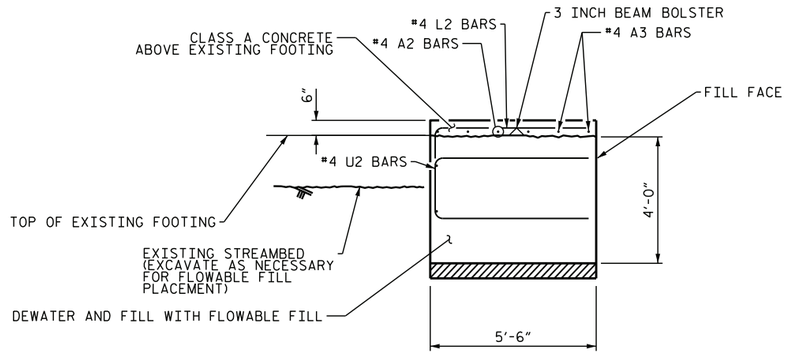
REVISIONS



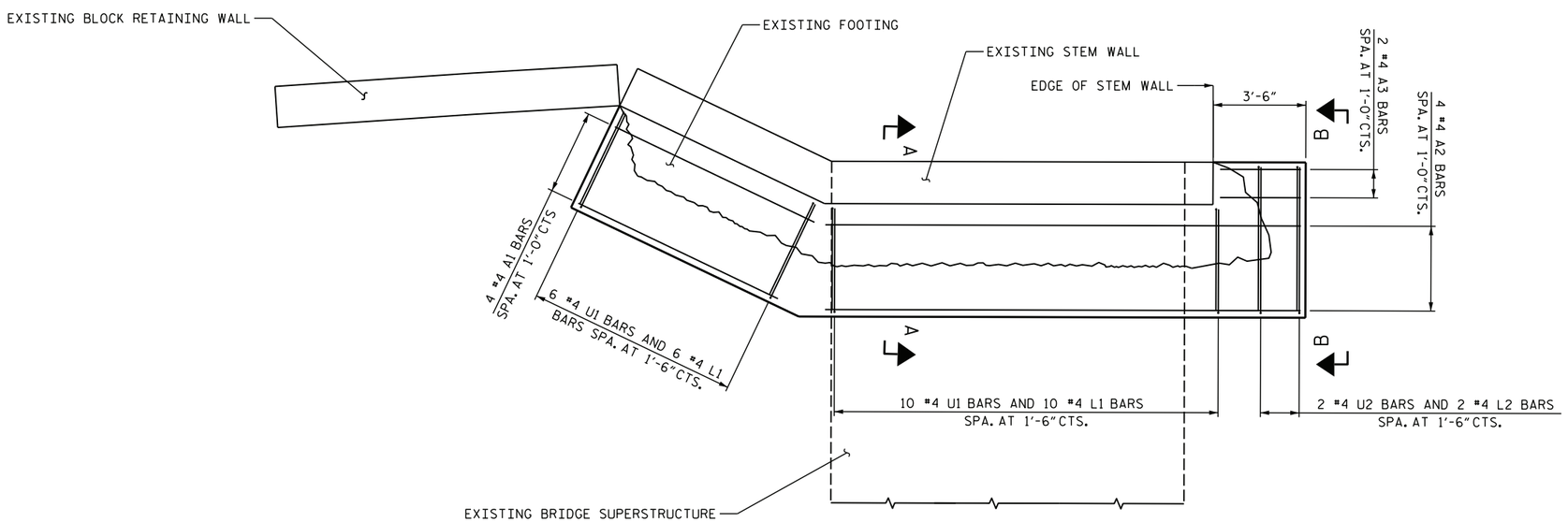
Ⓐ ADHESIVELY ANCHOR 'U' BARS USING AN EPOXY ADHESIVE ANCHORAGE SYSTEM. THE SYSTEM SHALL BE CAPABLE OF DEVELOPING 7KSI TENSION FOR A MINIMUM 6"EMBEDMENT IN 'CRACKED CONCRETE', f'c = 2,500 PSI. INSTALLATION OF THE EPOXY ANCHORED BAR SHALL BE INSTALLED ACCORDING TO MANUFACTURER RECOMMENDATION.

Ⓑ REINFORCEMENT SHALL BE PLACED 2"CLR. UNLESS NOTED OTHERWISE.

SECTION A-A



SECTION B-B



PLAN VIEW

END BENT 1

BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	6	#4	STR	7'-11"	32
A2	6	#4	STR	17'-0"	68
A3	2	#4	STR	3'-2"	4
L1	16	#4	1	4'-7"	49
L2	2	#4	1	5'-11"	8
U1	16	#4	2	9'-1"	97
U2	2	#4	2	12'-0"	16
REINFORCING STEEL					LBS. 274
POUR #1: FLOWABLE FILL					C.Y. 17.5
POUR #2: CASS A CONCRETE					C.Y. 2.1
FOUNDATION CONDITIONING MATERIAL					TONS 3.2
FOUNDATION CONDITIONING GEOTEXTILE					SQ. YD. 55.2

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
2. ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2024 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.
3. UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.
4. ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.
5. WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.
6. REINFORCING BARS MAY BE SHIFTED TO AVOID CONFLICT WITH EXISTING SITE CONDITIONS, BASED ON APPROVAL OF THE ENGINEER.
7. BRIDGE SHALL BE JACKED PRIOR TO FOUNDATION REPAIRS. SEE BRIDGE JACKING NOTES FOR ADDITIONAL DETAILS. THE COST OF JACKING SHALL BE CONSIDERED INCIDENTAL TO BRIDGE REPAIR COST.
8. FOR FLOWABLE FILL DETAILS RELATED TO PLACEMENT, PAYMENT, AND STRENGTH, SEE SPECIAL PROVISIONS.

PROJECT ID. 011-01-98254

BUNCOMBE COUNTY

STATION: 10+70.00 -L-

DESIGNED BY:	WGK	DATE :	11/7/25
DRAWN BY:	WGK	DATE :	11/7/25
CHECKED BY:	TRD	DATE :	11/10/25
DESIGN ENGINEER OF RECORD:	T. DUDECK	DATE :	12/9/25

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Fax. (919) 851-7024
www.stantec.com
License No. F-0672

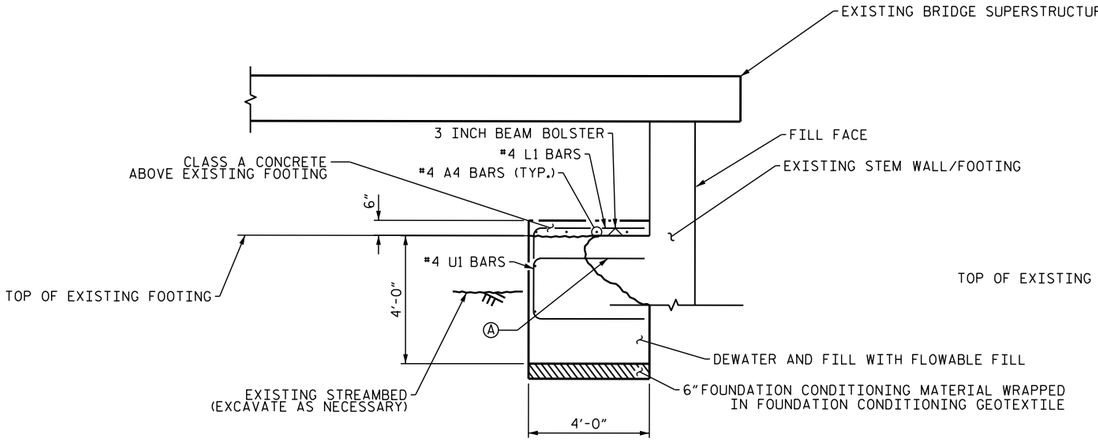
NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS R. DUDECK

DocuSigned by: Tommy Dudeck 12/9/2025

NORTH CAROLINA EMERGENCY MANAGEMENT
BUNCOMBE COUNTY

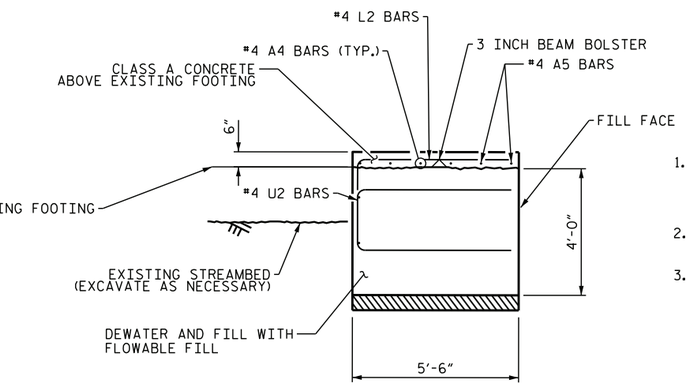
END BENT 1 REPAIRS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	1
1			3			TOTAL SHEETS
2			4			2

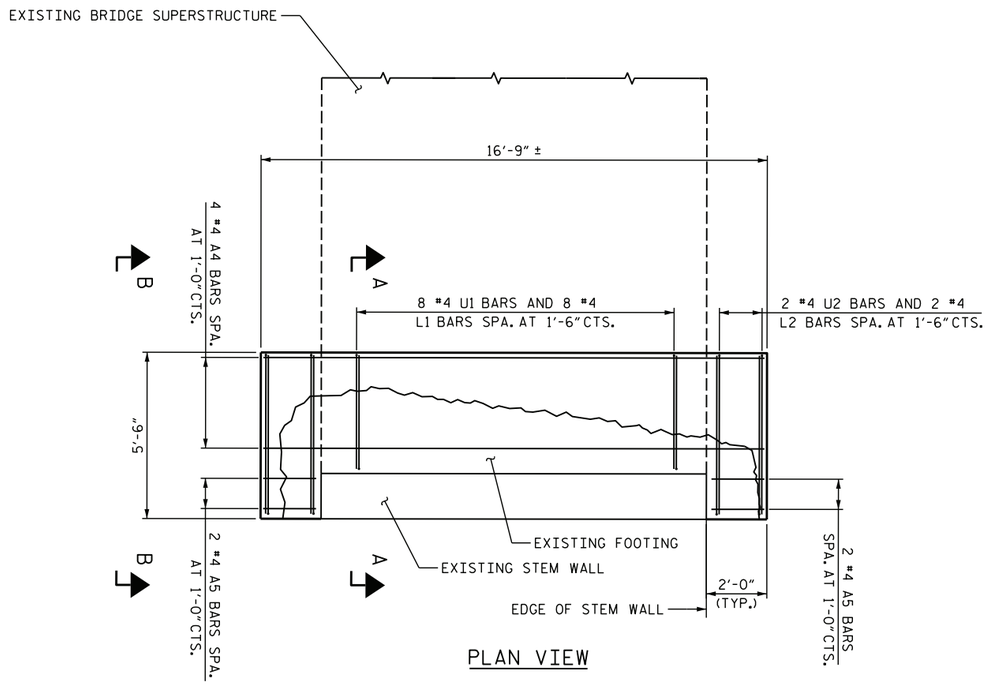


Ⓐ ADHESIVELY ANCHOR 'U' BARS USING AN EPOXY ADHESIVE ANCHORAGE SYSTEM. THE SYSTEM SHALL BE CAPABLE OF DEVELOPING 7KSI TENSION FOR A MINIMUM 6"EMBEDMENT IN 'CRACKED CONCRETE', f'c = 2,500 PSI. INSTALLATION OF THE EPOXY ANCHORED BAR SHALL BE INSTALLED ACCORDING TO MANUFACTURER RECOMMENDATION.

SECTION A-A



SECTION B-B



PLAN VIEW

END BENT 2

BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A4	6	#4	STR	16'-5"	66
A5	4	#4	STR	1'-8"	5
L1	8	#4	1	4'-7"	25
L2	4	#4	1	5'-11"	16
U1	8	#4	2	9'-1"	48
U2	4	#4	2	12'-0"	32
REINFORCING STEEL					LBS. 192
POUR #1: FLOWABLE FILL				C.Y.	11.4
POUR #2: CLASS A CONCRETE				C.Y.	1.4
FOUNDATION CONDITIONING MATERIAL				TONS	2.1
FOUNDATION CONDITIONING GEOTEXTILE				SQ. YD.	37.0

BRIDGE JACKING NOTES

1. PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL INVESTIGATE THE BRIDGE ON THE PROJECT AND DEVELOP A JACKING PLAN TO BE SUBMITTED FOR REVIEW AND APPROVAL TO THE ENGINEER. THIS INCLUDES BUT NOT LIMITED TO ANY CRIBBING, BRACES OR TEMPORARY SHORING.
2. PRIOR TO JACKING, THE CONTRACTOR SHALL ENSURE THERE ARE NO OBSTACLES PREVENTING THE BEAM(S) FROM BEING LIFTED.
3. THE BEAM(S) SHALL BE LIFTED ONLY SUFFICIENTLY SO THAT THE BEAM CLEARS ITS BEARING, AND ALL LOADS ARE SUPPORTED BY THE JACKS. THIS SHOULD NOT EXCEED 1'-4" OF AN INCH. IF ADDITIONAL JACKING IS REQUIRED, THE ENGINEER SHALL BE NOTIFIED AND THE ADDITIONAL JACKING APPROVED. AFTER JACKING IS COMPLETE, AS NEEDED THE CONTRACTOR MAY NEED TO REMOVE THE JACKS AND SUPPORT THE BEAM FOR THE DEAD LOAD AND LIVE LOAD DURING THE REPAIR OPERATION. THE CONTRACTOR SHALL PROVIDE A PLAN TO THE ENGINEER FOR REVIEW AND APPROVAL. IF THE JACKS REMAIN IN PLACE DURING THE ENTIRE JACKING AND REPAIR OPERATION, THESE JACKS SHALL HAVE MECHANICAL LOCK OFF CAPABILITIES.
4. IF, DURING THE JACKING PROCESS, OR WHILE THE BEAM IS BEING SUPPORTED, THE BEAM SHIFTS FROM ITS ORIGINAL POSITION, ALL WORK SHALL CEASE, AND THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
5. ANCHOR BOLTS MAY BE LOOSENED TO AID JACKING OPERATIONS. ALL LOCATIONS SHALL BE DOCUMENTED AND ALL BEARING ANCHORS OR FASTENERS LOOSENED SHALL BE TIGHTENED BACK AFTER REPAIR OPERATIONS WERE COMPLETED AND THE JACKS AND BLOCKING HAVE BEEN REMOVED. THE TIGHTENING OF EACH DOCUMENTED LOCATION SHALL BE VERIFIED THAT THE CONNECTIONS ARE APPROPRIATELY TENSIONED.
6. THE MAXIMUM DIFFERENTIAL BETWEEN ADJACENT BEAMS THAT ARE BEING JACKED SHALL BE LESS THAN 1'-4".
7. THE CONTRACTOR SHALL DETERMINE THE EXPECTED DEADLOADS AND LIVE LOADS TO BE LIFTED DURING YOUR BRIDGE JACKING OPERATION. THESE LOADS SHALL BE PROVIDED TO THE ENGINEER FOR REVIEW AND APPROVAL.
8. THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS AND CALCULATIONS OF JACKING PROCEDURES SEALED BY A PROFESSIONAL ENGINEER IN THE STATE OF NORTH CAROLINA TO THE ENGINEER FOR APPROVAL PRIOR TO BRIDGE JACKING OPERATIONS.
9. PERMANENT STEEL CONNECTIONS, SUCH AS WELDED MEMBERS, SHALL REMAIN IN PLACE DURING JACKING OPERATIONS.
10. TYPE 2 BRIDGE JACKING SHALL BE DONE WITH A HYDRAULIC JACKING SYSTEM THAT LIFTS EACH BEAM ALONG ENTIRE SPAN WITH EQUAL FORCE AND AT AN EQUAL RATE.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE CAUSED TO THE EXISTING STRUCTURE BY BRIDGE JACKING OPERATIONS AT NO ADDITIONAL COST.

PROJECT ID. 011-01-98254

BUNCOMBE COUNTY

STATION: 10+70.00 -L-

DESIGNED BY:	WGK	DATE :	11/7/25
DRAWN BY:	WGK	DATE :	11/7/25
CHECKED BY:	TRD	DATE :	11/10/25
DESIGN ENGINEER OF RECORD:	T. DUDECK	DATE :	12/9/25

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Fax. (919) 851-7024
www.stantec.com
License No. F-0672

NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER TIMOTHY R. DUDECK

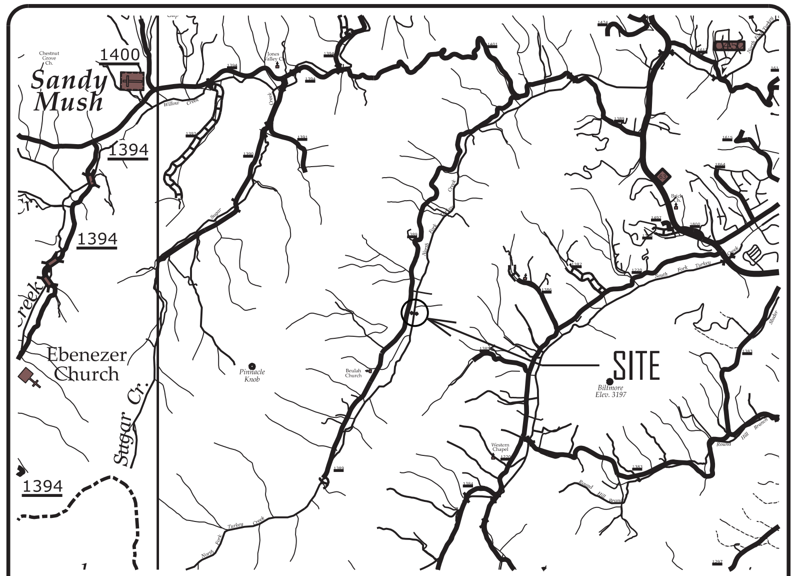
DocuSigned by: Timothy Dudeck 12/9/2025

NORTH CAROLINA EMERGENCY MANAGEMENT
BUNCOMBE COUNTY

END BENT 2 REPAIR

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	2
1			3			TOTAL SHEETS
2			4			2

11/14/23



VICINITY MAP

NOT TO SCALE

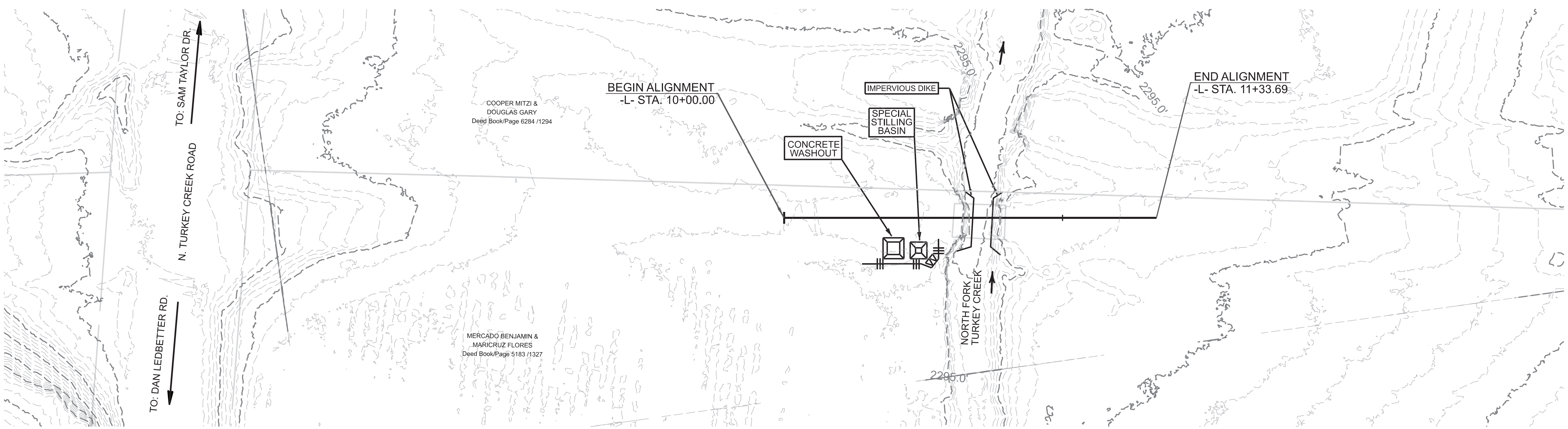
SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 TO 4:1	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH WITH SLOPES STEEPER THAN 4:1. 7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES

EROSION & SEDIMENT CONTROL LEGEND

- Temporary Silt Fence
- Temporary Rock Silt Check Type A
- Impervious Dike
- Special Sediment Control Fence

TOTAL IMPERVIOUS AREA = 0.028 AC
TOTAL DISTURBED AREA = 0.051 AC



NOTE:
NO PROPOSED ROADWAY WORK
BRIDGE REHABILITATION ONLY

NOTE:
FINAL SURVEYS WERE NOT PROVIDED. LIDAR DATED 2017 AND AERIALS DATED 2023 WERE USED FOR DESIGN.

20' 0' 20' 40'
10'

011-01-98254

EC01/CONST.04

NORTH CAROLINA
EMERGENCY MANAGEMENT
BUNCOMBE COUNTY

HYDRAULICS ENGINEER

Signed by:
Josh Dalton
1089AD8C14991C3...
PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
12/24/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

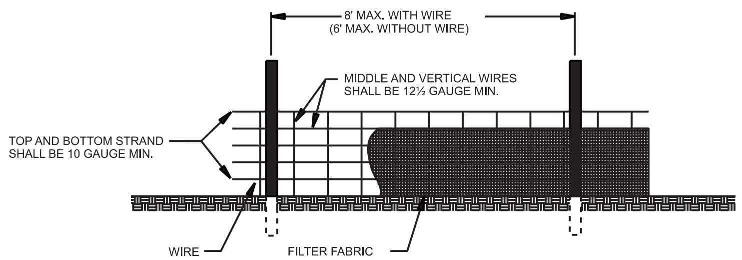
REVISIONS

11/14/23

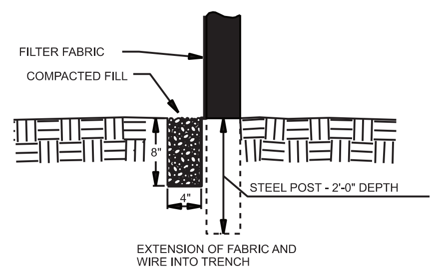
TEMPORARY SILT FENCE

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR TEMPORARY SILT FENCE



NOTES
USE WIRE A MINIMUM OF 32" IN WIDTH AND WITH A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
USE FILTER FABRIC A MINIMUM OF 36" IN WIDTH AND FASTEN ADEQUATELY TO THE WIRE AS DIRECTED BY THE ENGINEER.
PROVIDE 5'-0" STEEL POST OF THE SELF-FASTENER ANGLE STEEL TYPE.

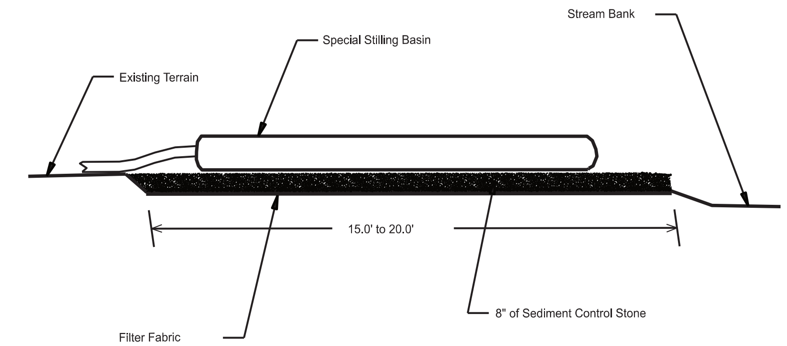


SHEET 1OF 1 1605.01

SPECIAL STILLING BASIN

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR SPECIAL STILLING BASIN



Note: Provide Stabilized Outlet to Streambank

Not To Scale

SHEET 1OF 1 1630.06

SPECIAL SEDIMENT CONTROL FENCE

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR SPECIAL SEDIMENT CONTROL FENCE

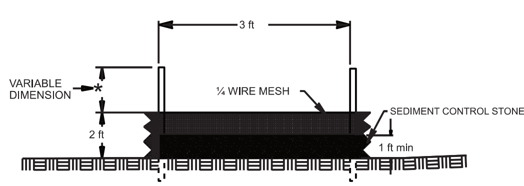
GENERAL NOTES:

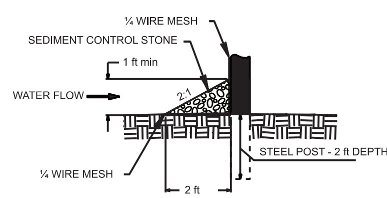
USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.

USE HARDWARE CLOTH 24 GAUGE WIRE MESH WITH 1/4 INCH MESH OPENINGS.

INSTALL 5 FT. SELF FASTENER ANGLE STEEL POST 2 FT. DEEP MINIMUM.

SPACE POST A MAXIMUM OF 3 FT.





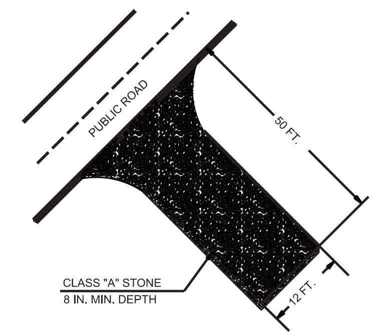
SHEET 1OF 1 1606.01

GRAVEL CONSTRUCTION ENTRANCE

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR GRAVEL CONSTRUCTION ENTRANCE

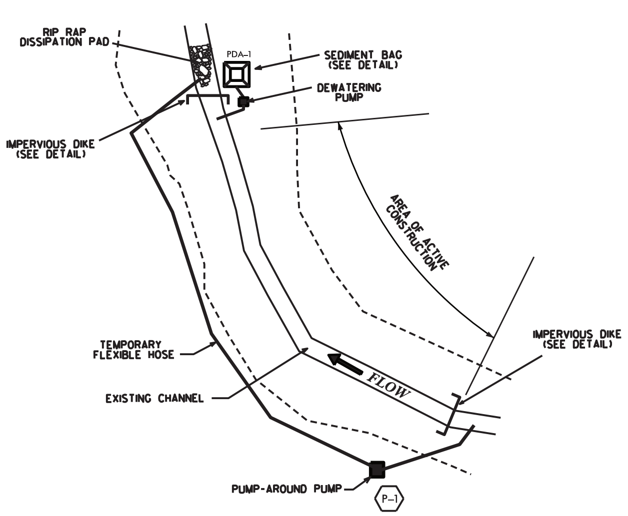
NOTES:
1. PROVIDE TURNING RADIUS SUFFICIENT TO ACCOMMODATE LARGE TRUCKS.
2. LOCATE ENTRANCE(S) TO PROVIDE FOR UTILIZATION BY ALL CONSTRUCTION VEHICLES.
3. MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOPDRESSING WITH STONE WILL BE NECESSARY.
4. ANY MATERIAL TRACKED ONTO THE ROADWAY MUST BE CLEANED UP IMMEDIATELY.
5. LOCATE GRAVEL CONSTRUCTION ENTRANCE AT ALL POINTS OF INGRESS AND EGRESS UNTIL SITE IS STABILIZED. PROVIDE FREQUENT CHECKS OF THE DEVICE AND TIMELY MAINTENANCE.
6. NUMBER AND LOCATION OF CONSTRUCTION ENTRANCES TO BE DETERMINED BY THE ENGINEER.
7. USE CLASS 'A' STONE OR OTHER COARSE AGGREGATE APPROVED BY THE ENGINEER.



NOTE: PLACE FILTER FABRIC BENEATH STONE

SHEET OF 1 1607.01

TYPICAL PUMP-AROUND & DEWATERING OPERATION



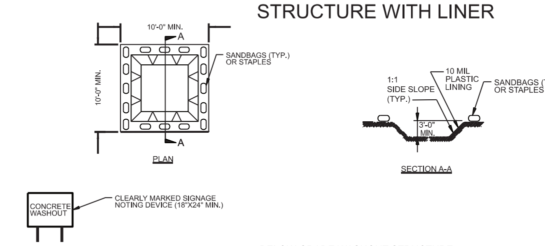
CONSTRUCTION SEQUENCE FOR TYPICAL PUMP-AROUND:

1. INSTALL UPSTREAM PUMP AND TEMPORARY FLEXIBLE HOSE.
2. PLACE UPSTREAM IMPERVIOUS DIKE, DOWNSTREAM RIP RAP DISSIPATION PAD, AND BEGIN PUMPING OPERATIONS FOR STREAM DIVERSION.
3. PLACE DOWNSTREAM IMPERVIOUS DIKE.
4. INSTALL SEDIMENT BAG AND ASSOCIATED PUMP. DEWATER THE ENTRAPPED AREA.
5. PERFORM STREAM RESTORATION WORK IN ACCORDANCE WITH THE PLANS.
6. EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES. REMOVE IMPERVIOUS DIKES, PUMPS, TEMPORARY FLEXIBLE HOSE, AND DISSIPATION PAD (BEGIN WITH DOWNSTREAM IMPERVIOUS DIKE FIRST).
7. ALL GRADING AND STABILIZATION MUST BE COMPLETED WITHIN THE PUMP AROUND AREAS BETWEEN THE IMPERVIOUS DIKES. THE IMPERVIOUS LOCATIONS AS SHOWN ON THIS SHEET ONLY REPRESENT THE UPPER AND LOWER EXTENT OF WORK FOR EACH STREAM SEGMENT. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE LOCATION OF THE IMPERVIOUS DIKES.
8. REMOVE SEDIMENT BAG(S) AND BACKFILL. STABILIZE DISTURBED AREA WITH SEED AND MULCH.

NOTES:

1. ALL EXCAVATION SHALL BE PERFORMED IN ONLY DRY OR ISOLATED SECTIONS OF CHANNEL
2. IMPERVIOUS DIKES ARE TO BE USED TO ISOLATE WORK FROM STREAM FLOW WHEN NECESSARY
3. ALL GRADED STREAM BANKS SHALL BE SEEDED, MULCHED, AND MATTED AT THE END OF EACH WORKING DAY. ALL OTHER GRADED AREAS SHALL BE SEEDED IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS.
4. MAINTENANCE OF STREAM FLOW OPERATIONS SHALL BE INCIDENTAL TO THE WORK. THIS INCLUDES POLYETHYLENE SHEETING, DIVERSION PIPES, PUMPS, AND HOSES.
5. PUMPS AND HOSES SHALL BE OF A SUFFICIENT SIZE AND NUMBER TO DEWATER THE WORK AREA.
6. RIP RAP DISSIPATION PAD TO BE INSTALLED DOWNSTREAM OF LOWER IMPERVIOUS DIKE

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



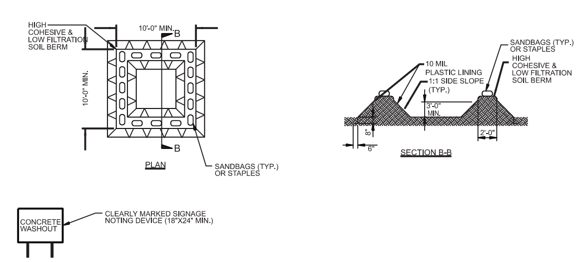
BELOW GRADE WASHOUT STRUCTURE

NOT TO SCALE

NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.



NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.

ABOVE GRADE WASHOUT STRUCTURE

011-01-98254

EC02

NORTH CAROLINA EMERGENCY MANAGEMENT BUNCOMBE COUNTY

HYDRAULICS ENGINEER

Signed by: Josh Dalton

SEAL 26971 ENGINEER JOSHUA C. DALTON

12/24/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SUNGATE DESIGN GROUP, P.A.

REVISIONS

SUNGATE/belam - $$$-DATE-$$$

11/14/23

Date:

Page:

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

Implementing 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 permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes

Site Area Description	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 feet 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

Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as 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.

GROUND STABILIZATION SPECIFICATION

Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

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 or retaining walls · Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

1. Select flocculants that are appropriate for the soils being exposed during construction, selecting from the *NC DWR List of Approved PAMS/Flocculants*.
2. Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
3. Apply flocculants at the concentrations specified in the *NC DWR List of Approved PAMS/Flocculants* and in accordance with the manufacturer's instructions.
4. Provide ponding area for containment of treated Stormwater before discharging offsite.
5. Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

EQUIPMENT AND VEHICLE MAINTENANCE

1. Maintain vehicles and equipment to prevent discharge of fluids.
2. Provide drip pans under any stored equipment.
3. Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
4. Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
5. Remove leaking vehicles and construction equipment from service until the problem has been corrected.
6. Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials.

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

1. 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.
6. 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 construction sites.

PORTABLE TOILETS

1. 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.
2. Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
3. 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.

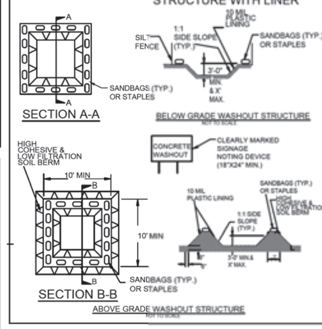
EARTHEN STOCKPILE MANAGEMENT

1. 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 available.
2. Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
3. Provide stable stone access point when feasible.
4. 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.

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.

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD
2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY.
3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD
2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

CONCRETE WASHOUTS

1. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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 approving authority.
8. 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.
9. 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 restrictions.
2. 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.
3. 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.

NORTH CAROLINA *Environmental Quality*

EFFECTIVE DATE: 11/12/2020

NCG-01 GROUND COVER & MATERIALS HANDLING

Impervious Dike:

Description

This work consists of furnishing, installing, maintaining, and removing an *Impervious Dike* for the purpose of diverting normal stream flow around the construction site. The Contractor shall construct an impervious dike in such a manner approved by the Engineer. The impervious dike shall not permit seepage of water into the construction site or contribute to siltation of the stream. The impervious dike shall be constructed of an acceptable material in the locations noted on the plans or as directed.

Materials

Acceptable materials shall include but not be limited to sheet piles, sandbags, and/or the placement of an acceptable size stone lined with polypropylene or other impervious geotextile.

Earth material shall not be used to construct an impervious dike when it is in direct contact with the stream unless vegetation can be established before contact with the stream takes place.

Measurement and Payment

Impervious Dike will be measured and paid as the actual number of linear feet of impervious dike(s) constructed, measured in place from end to end of each separate installation that has been completed and accepted. Such price and payment will be full compensation for all work including but not limited to furnishing materials, construction, maintenance, and removal of the impervious dike.

SPECIAL STILLING BASIN:

Description

This work consists of furnishing, placing, and removing special stilling basin(s) as directed. The special stilling basin can be used to filter pumped water during construction of drilled piers, footing excavation, and/or culvert construction. The special stilling basin can also be used for sediment storage at the outlet of temporary slope drain pipe(s).

Materials

Refer to Division 10

Item	Section
Filter Fabric for Drainage, Type 2	1056
Sediment Control Stone	1005

The filter fabric and sediment control stone shall be clean and shall not contain debris.

The special stilling basin shall be a water permeable fabric bag that traps sand, silt, and fines as sediment-laden water is pumped into it, or as runoff flows into it through the temporary slope drain pipe(s).

The special stilling basin shall be a bag constructed to a minimum size of 10' x 15' made from a nonwoven fabric. It shall have a sewn-in 8" (maximum) spout for receiving pump discharge. The bag seams shall be sewn with a double needle machine using a high strength thread. The seams shall have a minimum wide width strength as follows:

Test Method	Minimum Specifications
ASTM D-4884	60 lb/in

The fabric used to construct the bag shall be stabilized to provide resistance to ultra-violet degradation and meet the following specifications for flow rates, strength, and permeability:

Property	Test Method	Minimum Specifications
Weight	ASTM D-3776	8.0 oz/yd
Grab tensile	ASTM D-4632	200.0 lb
Puncture	ASTM D-4833	130.0 lb
Flow rate	ASTM D-4491	80.0 gal/min/sf
Permittivity	ASTM D-4491	1.2 1/sec
UV Resistance	ASTM D-4355	70.0%

Construction Methods

The Contractor shall install the special stilling basin(s), filter fabric, and stone in accordance with Standard Drawing No. 1630.06 and at locations on the plans and as directed. The special stilling basin(s) shall be placed on level ground.

The special stilling basin(s) shall be constructed such that it is portable and can be used adjacent to each drilled pier, footing and/or culvert, as required by the project commitments. If needed, temporary slope drain pipe(s) or pump discharge hoses will be attached to the special stilling basin(s) to divert runoff or pumped effluent directly into the special stilling basin(s). The special stilling basin may be cut to allow slope drain pipe to be inserted if needed and tied off tightly. The remaining sleeve or spout of the bag, if present, may be used to connect more than one special stilling basin in series as directed. If not used in this manner, the sleeve shall be tied off tightly to allow the bag to contain the effluent and force it to filter through the sides of the special stilling basin. The special stilling basin(s) shall be placed so the incoming runoff or pumped effluent flows into and through it without causing erosion to adjacent slopes or streambanks. In areas of turbidity and water quality concern, the special stilling basin(s) shall be placed up grade and its runoff directed into a sediment control measure before being allowed to discharge into jurisdictional waters.

The special stilling basin(s) shall be replaced and disposed of when it is ¾ full of sediment or when it is impractical for the bag to filter the sediment out at a reasonable flow rate. Prior approval from the Engineer shall be received before removal and replacement.

The Contractor shall be responsible for providing a sufficient quantity of bags to contain silt from pumped effluent during construction of drilled piers, footing excavation, and/or culvert construction. A sufficient quantity of special stilling basins shall be provided to contain sediment from temporary slope drain runoff.

Measurement and Payment

Special Stilling Basin will be measured and paid as the actual number of bags used during temporary slope drain installation, drilled pier construction, footing excavation, and/or culvert construction as specified and accepted.

Filter Fabric for Drainage will be measured and paid for in accordance with Article 876-4 of the *Standard Specifications*.

Sediment Control Stone will be measured and paid for in accordance with Article 1610-4 of the *Standard Specifications*.

Such price and payment will be full compensation for all work covered by this section, including but not limited to, furnishing all materials, placing and maintaining the special stilling basin(s), and removal and disposal of silt accumulations and bag.

Date:

Page:

NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR LATE WINTER AND EARLY SPRING

SEEDING MIXTURE

Species	Rate
Centipede	5 lbs/acre
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates

Coastal or Eastern Piedmont for Centipede- Sept. 1 - May 1
Coastal and Piedmont for Indian Woodoats and Virginia Wild Rye- Feb 15 - April 1
Mountains for Indian Woodoats and Virginia Wild Rye- March 1 - May 15

Maintenance:

Significant maintenance may be required to obtain desired cover once centipede is planted. Acceptable for sodding.

NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR SUMMER

SEEDING MIXTURE

Species	Rate
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates

Mountains - July 15- Aug 15
Piedmont - Aug 15 - Oct 15

Maintenance:

Indian Woodoats and Virginia Wild Rye are both sun and shade tolerant.

NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR FALL

SEEDING MIXTURE

Species	Rate
Hard Fescue	15 lbs/acre
Switchgrass	2.5-3.5 lbs/acre*
Indian Grass	5-7 lbs/acre*
Big Bluestem	5-7 lbs/acre*
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates

Mountains - Hard Fescue- Aug 1 - June 1
Mountains- Switchgrass, Indian Grass, Big Bluestem- Dec 1 - April 15
Piedmont and Coastal- Switchgrass, Indian Grass, Big Bluestem- Dec 1 - April 1
Coastal- Indian Woodoats and Virginia Wild Rye- Sept 1 - Nov 1

Maintenance:

Hard Fescue is not recommended for slopes > 5%. Prefers shade.

SEED BED PREPARATION:

LIMING- Apply lime according to soil test recommendations. If the pH (acidity) of the soil is not known, an application of ground agricultural limestone at the rate of 1 to 1 $\frac{1}{2}$ tons/acre on coarse-textured soils and 2-3 tons/acre on fine-textured soils is usually sufficient. Apply limestone uniformly and incorporate into the top 4-6 inches of soil. Soils with a pH of 6 or higher need not be limed.

FERTILIZER- Base application rates on soil tests. When these are not possible, apply a 10-10-10 grade fertilizer at 700-1,000 lb/acre. Both fertilizer and lime should be incorporated into the top 4-6 inches of soil. If a hydraulic seeder is used, do not mix seed and fertilizer more than 30 minutes before application.

SURFACE ROUGHENING- If recent tillage operations have resulted in a loose surface additional roughening may not be required, except to break up large clods. If rainfall causes the surface to become sealed or crusted, loosen it just prior to seeding by raking, harrowing, or other suitable methods for fine grading. The finished grade shall be a smooth even soil surface with a loosen uniformly fine texture. All ridges and depressions shall be removed and filled to provide the approved surface drainage. Planting is to be done immediately after finished grades are obtained and seedbed preparation is completed.

NOTES:

1. Permanent seeding, sodding or other means of stabilization are required when all construction work is completed according to the NPDES timeframe's table.
2. A North Carolina Department of Agriculture soils test (or equal) is highly recommended to be obtained for all areas to be seeded, sprigged, sodded or planted.
3. Use a seeding mix that will produce fast growing nurse crops and includes non-invasive species that will eventually provide a permanent groundcover. Soil blankets may be used in lieu of nurse crops. Mat, tack or crimp mulch, as needed to stabilize seeded areas until root establishment. Mulch must be applied uniformly over the soil with a cover density of at least 80%.
4. Ground cover shall be maintained until permanent vegetation is established and stable against accelerated erosion.

NORTH CAROLINA *Environmental Quality*

EFFECTIVE DATE: 11/12/2020

PERMANENT SEEDING RECOMMENDATIONS

DATE:

PAGE:

TEMPORARY SEEDING RECOMMENDATIONS FOR LATE WINTER AND EARLY SPRING

Seeding Mixture

Species	Rate (lb/acre)
Rye (grain)	120
Annual lespedeza (Kobe in Piedmont and Coastal Plain, Korean in Mountains)	50

Omit annual lespedeza when duration of temporary cover is not to extend beyond June.

Seeding Dates

Mountains—Above 2500 feet: Feb. 15 - May 15
Below 2500 feet: Feb. 1- May 1
Piedmont—Jan. 1 - May 1
Coastal Plain—Dec. 1 - Apr. 15

Mulch

Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance

Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

TEMPORARY SEEDING RECOMMENDATIONS FOR SUMMER

Seeding Mixture

Species	Rate (lb/acre)
German millet	40

In the Piedmont and Mountains, a small-stemmed Sudangrass may be substituted at a rate of 50 lb/acre.

Seeding Dates

Mountains — May 15 - Aug. 15
Piedmont — May 1 - Aug. 15
Coastal Plain — Apr. 15 - Aug. 15

Mulch

Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance

Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

TEMPORARY SEEDING RECOMMENDATIONS FOR FALL

Seeding Mixture

Species	Rate (lb/acre)
Rye (grain)	120

Seeding Dates

Mountains — Aug. 15 - Dec. 15
Coastal Plain and Piedmont — Aug. 15 - Dec. 31

Mulch

Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance

Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Kobe (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

SEED BED PREPARATION:

LIMING- Apply lime according to soil test recommendations. If the pH (acidity) of the soil is not known, an application of ground agricultural limestone at the rate of 1-1$\frac{1}{2}$ tons/acre on coarse-textured soils and 2-3 tons/acre on fine-textured soils is usually sufficient. Apply limestone uniformly and incorporate into the top 4-6 inches of soil. Soils with a pH of 6 or higher need not be limed.

FERTILIZER- Base application rates on soil tests. When these are not possible, apply a 10-10-10 grade fertilizer at 700 - 1,000 lb/acre. Both fertilizer and lime should be incorporated into the top 4-6 inches of soil. If a hydraulic seeder is used, do not mix seed and fertilizer more than 30 minutes before application.

SURFACE ROUGHENING- If recent tillage operations have resulted in a loose surface additional roughening may not be required, except to break up large clods. If rainfall causes the surface to become sealed or crusted, loosen it just prior to seeding by raking, harrowing, or other suitable methods for fine grading. The finished grade shall be a smooth even soil surface with a loosen uniformly fine texture. All ridges and depressions shall be removed and filled to provide the approved surface drainage. Planting is to be done immediately after finished grades are obtained and seedbed preparation is completed.

DEQ NORTH CAROLINA Department of Environmental Quality

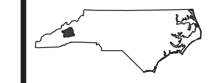
TEMPORARY SEEDING

Effective Date: 9/1/2023
In accordance with the 2013
Design Manual Updates

011-01-98254

EC03

NORTH CAROLINA
EMERGENCY MANAGEMENT
BUNCOMBE COUNTY



HYDRAULICS
ENGINEER

Signed by:
Josh Dalton
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PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

12/24/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

REVISIONS

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 0	**TIP** 0	**COUNTY** BUNCOMBE	**GEOLOGIST** Zuo. Z	
SITE DESCRIPTION Site 011-01-98254 814 N Turkey Creek Rd				**GROUND WTR (ft)**
BORING NO. B-1	**STATION** N/A	**OFFSET** N/A	**ALIGNMENT** N/A	**0 HR.** N/A
COLLAR ELEV. 2,299.0 ft	**TOTAL DEPTH** 39.3 ft	**NORTHING** 712,551	**EASTING** 880,227	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE TER4106 Geoprobe 3126GT 98% 01/24/2025		**DRILL METHOD** NW Casing w/ Advancer		**HAMMER TYPE** Automatic
DRILLER Burnette, B.	**START DATE** 10/30/25	**COMP. DATE** 10/30/25	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2300											
	2,299.0	0.0								GROUND SURFACE	0.0
	2,298.0	1.0	2	2	2	4				Topsoil, 1.5 inches	
2295	2,295.5	3.5	8	8	10	18				**ARTIFICIAL FILL** Well-Graded Sand with Silt (A-1), trace mica and gravel, brown, moist, loose	4.5
	2,293.0	6.0	38	12	12	24				**ALLUVIAL** Poorly graded sand (A-3), fine to medium grained, brown, moist, medium dense	6.0
2290	2,290.5	8.5	0	1	1	2				**ALLUVIAL** Poorly Graded Gravel with Sand (A-1), light brown, moist, medium dense	8.5
2285	2,285.5	13.5	9	12	12	24				**RESIDUAL** Silty Sand (A-1), gray and white, moist, very loose to medium dense	
2280	2,280.5	18.5	10	18	26	44					18.5
										RESIDUAL Sandy Silt (A-4), trace mica, gray and white, moist, hard	
2275	2,275.5	23.5	100/0.5			100/0.5					23.5
										WEATHERED ROCK (Brown Biotite Gneiss)	
2270	2,270.5	28.5	23	17	83						
2265	2,265.5	33.5	13	22	43	65				gray and white	
2260	2,260.5	38.5	57	43/0.3		100/0.8					
	2,259.7	39.3								brown and gray	39.3
										Boring Terminated at Elevation 2,259.7 ft in weathered rock (biotite gneiss)	
										Cave in 17 ft	

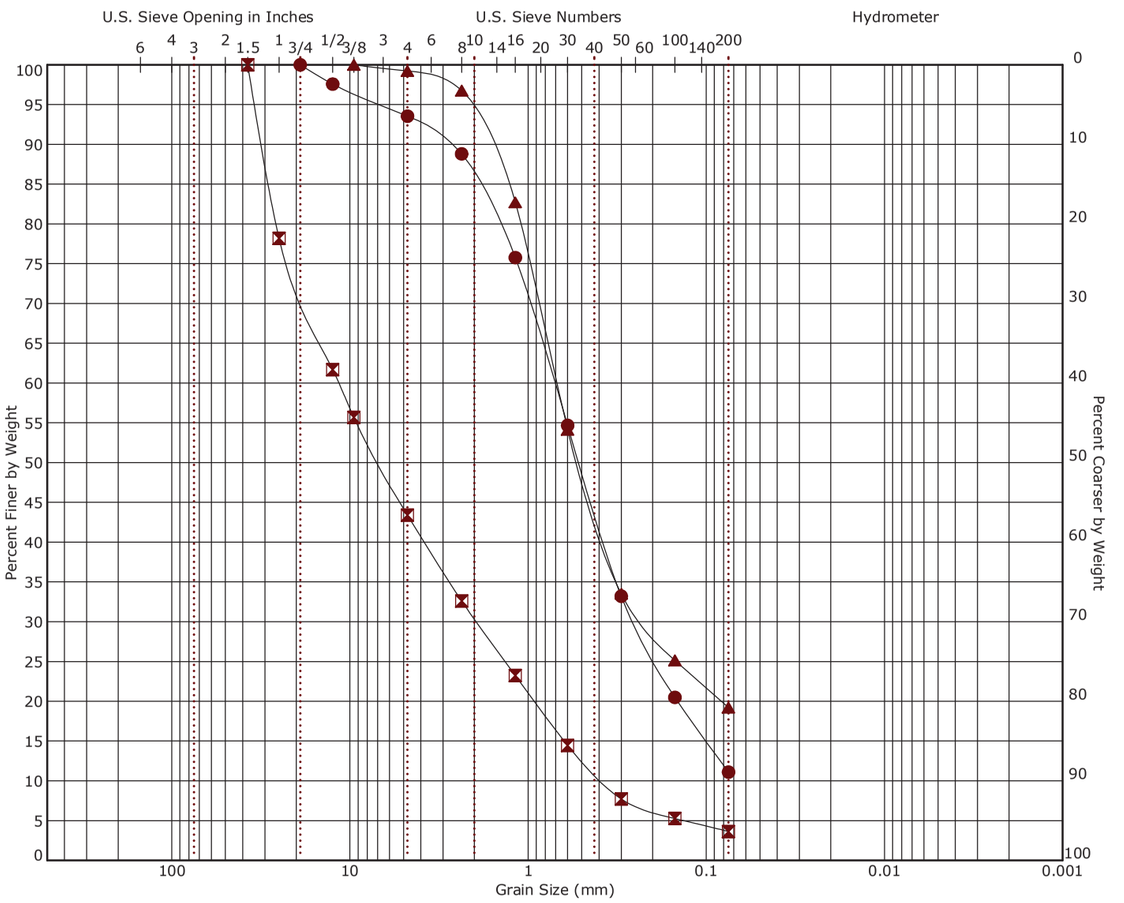
NCDOT BORE SINGLE KF255054 LOG.GPJ NC_DOT.GDT 11/14/25

N. Turkey Creek Rd Private Bridge
814 North Turkey Creek Road | Leicester, NC
Terracon Project No. KF255054

7 Glenn Bridge Road, Suite A
Arden, NC

Grain Size Distribution

ASTM D422 / ASTM C136



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

	Boring ID	Depth (Ft)	USCS Classification	USCS	AASHTO	LL	PL	PI	Cc	Cu
●	B-1	1 - 2.5	WELL-GRADED SAND with SILT	SW-SM	A-1-b (0)	NP	NP	NP	1.29	10.29
⊠	B-1	6 - 7.5	POORLY GRADED GRAVEL with SAND	GP	A-1-a (0)	NP	NP	NP	0.86	30.48
▲	B-1	13.5 - 15	SILTY SAND	SM	A-1-b (0)	NP	NP	NP		

	Boring ID	Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
●	B-1	1 - 2.5	19	0.712	0.252		0.0	6.4	82.5	11.1		
⊠	B-1	6 - 7.5	37.5	11.57	1.945	0.38	0.0	56.6	39.8	3.6		
▲	B-1	13.5 - 15	9.5	0.69	0.224		0.0	0.8	80.0	19.2		