



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

November 6, 2018

Addendum No. 1

RE: Contract # C204130

WBS # 17BP.14.R.154, 50192.3.1

STATE FUNDED

Macon County (R-5734A)

US-23/441 From US-64 To SR-1652 (Wide Horizon Drive)/SR-1152
(Belden Circle) & Bridge # 314 Over Cartoogechaye Creek

November 20, 2018 Letting

To Whom It May Concern:

The following revisions have been made to the Roadway plans:

Sheet No.	Revisions
UC-04	New note number 7 added
UC-05	New note number 8 added
UC-08	Waterline crossing the creek was lowered to maintain a minimum vertical separation of 5 feet between bottom of creek bed and top of proposed pipe
UC-09	Proposed hydrant at approximate Sta. 56+00 was removed
UC-10	New note number 3 added

Please void Sheet Nos. UC-04, UC-05, UC-08, UC-09 and UC-10 in your plans and staple the revised sheets thereto.

Reference is made to the proposal form furnished to you on this project.

The following revisions have been made to the proposal:

Page No.	Revisions
Proposal Cover	Note added that reads "Includes Addendum No. 1 Dated November 6, 2018".
R-7	Added two notes under Table 610-5 and corrected the note under Table 610-6

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
CONTRACT STANDARDS AND DEVELOPMENT
1591 MAIL SERVICE CENTER
RALEIGH, NC 27699-1591

Telephone: (919) 707-6900
Fax: (919) 250-4127
Customer Service: 1-877-368-4968

Location:
1020 BIRCH RIDGE DR.
RALEIGH, NC 27610

Website: www.ncdot.gov

Page No.	Revisions
P-57	Revised the first paragraph of the project special provision entitled "Permits" to indicate that the permits for the R-5734A portion of the project have been received.
New P-58 thru P-124	New pages have been added to include the required environmental permits for the R-5734A portion of the project

Please void the above listed pages your proposal and staple the revised pages thereto. Please staple New Page Nos. P-58 thru P-124 after revised Page No. P-57 in your proposal.

On the item sheets the following pay item quantities have been revised:

<u>Item</u>	<u>Description</u>	<u>Old Quantity</u>	<u>New Quantity</u>
176-566600000-N-1515	Fire Hydrant	3 EA	2 EA
178-567300000-E-1515	Fire Hydrant Leg	40 LF	28 LF

The Contractor's bid must be based on these revised quantities.

The Expedite File has been updated to reflect these revisions. Please download the Expedite Addendum File and follow the instructions for applying the addendum. Bid Express will not accept your bid unless the addendum has been applied.

The contract will be prepared accordingly.

Sincerely,

DocuSigned by:

 F81B6038A47A442...
 Ronald E. Davenport, Jr., PE
 State Contract Officer

RED/jag
 Attachments

cc: Mr. Lamar Sylvester, PE
 Mr. Brian Burch, PE
 Mr. Ron Hancock, PE
 Mr. Jon Weathersbee, PE
 Mr. Ken Kennedy, PE
 Mr. Mitchell Dixon
 Project File (2)

Mr. Ray Arnold, PE
 Ms. Theresa Canales, PE
 Mr. Mike Gwyn
 Ms. Lori Strickland
 Ms. Jaci Kincaid
 Ms. Penny Higgins
 Mr. Alex Foster

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH, N.C.

PROPOSAL

INCLUDES ADDENDUM No. 1 DATED 11-06-2018

DATE AND TIME OF BID OPENING: **NOVEMBER 20, 2018 AT 2:00 PM**

CONTRACT ID C204130
WBS 17BP.14.R.154, 50192.3.1

FEDERAL-AID NO. STATE FUNDED
COUNTY MACON
T.I.P. NO. R-5734A
MILES 1.113
ROUTE NO. US 23
LOCATION US-23/441 FROM US-64 TO SR-1652 (WIDE HORIZON DR)/SR-1152
(BELDEN CIR), & BRIDGE NO. 314 OVER CARTOOGECHAYE CREEK.
TYPE OF WORK GRADING, DRAINAGE, PAVING, SIGNAL, CULVERT, AND STRUCTURE.

NOTICE:

ALL BIDDERS SHALL COMPLY WITH ALL APPLICABLE LAWS REGULATING THE PRACTICE OF GENERAL CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA WHICH REQUIRES THE BIDDER TO BE LICENSED BY THE N.C. LICENSING BOARD FOR CONTRACTORS WHEN BIDDING ON ANY NON-FEDERAL AID PROJECT WHERE THE BID IS \$30,000 OR MORE, EXCEPT FOR CERTAIN SPECIALTY WORK AS DETERMINED BY THE LICENSING BOARD. BIDDERS SHALL ALSO COMPLY WITH ALL OTHER APPLICABLE LAWS REGULATING THE PRACTICES OF ELECTRICAL, PLUMBING, HEATING AND AIR CONDITIONING AND REFRIGERATION CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA. NOTWITHSTANDING THESE LIMITATIONS ON BIDDING, THE BIDDER WHO IS AWARDED ANY FEDERAL - AID FUNDED PROJECT SHALL COMPLY WITH CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA FOR LICENSING REQUIREMENTS WITHIN 60 CALENDAR DAYS OF BID OPENING.

BIDS WILL BE RECEIVED AS SHOWN BELOW:

THIS IS A ROADWAY & STRUCTURE PROPOSAL

5% BID BOND OR BID DEPOSIT REQUIRED

Page 6-18, Table 610-3, MIX DESIGN CRITERIA, replace with the following:

Mix Type	Design ESALs millions ^A	Binder PG Grade ^B	Compaction Levels		Max. Rut Depth (mm)	Volumetric Properties			
			Gmm @			VMA % Min.	VTM %	VFA Min.-Max.	%Gmm @ Nini
			Nini	Ndes					
S4.75A	< 1	64 - 22	6	50	11.5	16.0	4.0 - 6.0	65 - 80	≤ 91.5
S9.5B	0 - 3	64 - 22	6	50	9.5	16.0	3.0 - 5.0	70 - 80	≤ 91.5
S9.5C	3 - 30	64 - 22	7	65	6.5	15.5	3.0 - 5.0	65 - 78	≤ 90.5
S9.5D	> 30	76 - 22	8	100	4.5	15.5	3.0 - 5.0	65 - 78	≤ 90.0
I19.0C	ALL	64 - 22	7	65	-	13.5	3.0 - 5.0	65 - 78	≤ 90.5
B25.0C	ALL	64 - 22	7	65	-	12.5	3.0 - 5.0	65 - 78	≤ 90.5
Design Parameter						Design Criteria			
All Mix Types	Dust to Binder Ratio ($P_{0.075} / P_{be}$)					0.6 - 1.4 ^C			
	Tensile Strength Ratio (TSR) ^D					85% Min. ^E			

A. Based on 20 year design traffic.

B. Volumetric Properties based on specimens compacted to N_{des} as modified by the Department.

C. Dust to Binder Ratio ($P_{0.075} / P_{be}$) for Type S4.75A is 1.0 - 2.0.

D. NCDOT-T-283 (No Freeze-Thaw cycle required).

E. TSR for Type S4.75A & B25.0C mixes is 80% minimum.

Page 6-19, Table 610-5, BINDER GRADE REQUIREMENTS (BASED ON RBR%), replace with the following:

Mix Type	%RBR ≤ 20%	21% ≤ %RBR ≤ 30%	%RBR > 30%
S4.75A, S9.5B, S9.5C, I19.0C, B25.0C	PG 64-22	PG 64-22 ^A	PG 58-28
S9.5D, OGFC	PG 76-22 ^B	n/a	n/a

A. If the mix contains any amount of RAS, the virgin binder shall be PG 58-28.

B. Maximum Recycled Binder Replacement (%RBR) is 18% for mixes using PG 76-22 binder.

Page 6-20, Table 610-6, PLACEMENT TEMPERATURES FOR ASPHALT, replace with the following:

Asphalt Concrete Mix Type	Minimum Surface and Air Temperature
B25.0C	35°F
I19.0C	35°F
S4.75A, S9.5B, S9.5C	40°F ^A
S9.5D	50°F

A. For the final layer of surface mixes containing recycled asphalt shingles (RAS), the minimum surface and air temperature shall be 50° F.

Page 6-23, Table 610-7, DENSITY REQUIREMENTS, replace with the following:

PROJECT SPECIAL PROVISION

(10-18-95) (Rev. 3-21-17)

Z-1

PERMITS

The Contractor's attention is directed to the following permits, which have been issued to the Department of Transportation by the authority granting the permit.

<u>PERMIT</u>	<u>AUTHORITY GRANTING THE PERMIT</u>
Dredge and Fill and/or Work in Navigable Waters (404)	U. S. Army Corps of Engineers
Water Quality (401)	Division of Environmental Management, DEQ State of North Carolina
Trout Buffer Zone Waiver	Department of Energy, Mineral, and Land Resources, DEQ, State of North Carolina

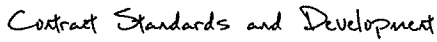
The Contractor shall comply with all applicable permit conditions during construction of this project. Those conditions marked by * are the responsibility of the Department and the Contractor has no responsibility in accomplishing those conditions.

Agents of the permitting authority will periodically inspect the project for adherence to the permits.

The Contractor's attention is also directed to Articles 107-10 and 107-13 of the *2018 Standard Specifications* and the following:

Should the Contractor propose to utilize construction methods (such as temporary structures or fill in waters and/or wetlands for haul roads, work platforms, cofferdams, etc.) not specifically identified in the permit (individual, general, or nationwide) authorizing the project it shall be the Contractor's responsibility to coordinate with the Engineer to determine what, if any, additional permit action is required. The Contractor shall also be responsible for initiating the request for the authorization of such construction method by the permitting agency. The request shall be submitted through the Engineer. The Contractor shall not utilize the construction method until it is approved by the permitting agency. The request normally takes approximately 60 days to process; however, no extensions of time or additional compensation will be granted for delays resulting from the Contractor's request for approval of construction methods not specifically identified in the permit.

Where construction moratoriums are contained in a permit condition which restricts the Contractor's activities to certain times of the year, those moratoriums will apply only to the portions of the work taking place in the restricted waters, wetlands or buffer zones, provided that activities outside those areas is done in such a manner as to not affect the restricted waters, wetlands or buffer zones.

DocuSigned by:

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U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Action Id. SAW-2016-01226 County: Macon County U.S.G.S. Quad: Franklin

GENERAL PERMIT (REGIONAL AND NATIONWIDE) VERIFICATION

Permittee: North Carolina Department of Transportation
Address: Mr. Dave McHenry
253 Webster Rd
Sylva NC, 28779

Size	<u>Approximately one mile</u>	Nearest Town	<u>Franklin</u>
Nearest Waterway	<u>Cartoogechaye Creek</u>	River Basin	<u>Upper Tennessee</u>
USGS HUC	<u>06010202</u>	Coordinates	Latitude: <u>35.1587586462431</u> Longitude: <u>-83.3917613812117</u>

Location description: The R5734A/US441 (Georgia Rd) improvement project begins just south of the intersection of US 441 with US 64, and extends approximately one mile south along US 441 in Franklin, Macon County, North Carolina.

Description of projects area and activity: This permit verification authorizes impacts resulting from the improvement of a one mile section of US 441 South. Specific impacts include the impact to 443 lf of stream channel due to a stream relocation, the temporary impact to 502 lf due to dewatering and construction and the permanent impact to 30 lf of stream channel due to bank stabilization.

Applicable Law: Section 404 (Clean Water Act, 33 USC 1344)
 Section 10 (Rivers and Harbors Act, 33 USC 403)

Authorization: Regional General Permit Number and/or Nationwide Permit Number: GP 198200031 NCDOT Bridges, Widening Projects.... (Authorized 2015)

Special Conditions

- 1) Per the Pre-construction notification dated 4/12/2018 and the US FWS subsequent 8/20/2018 letter, DOT will remove the trees required for bridge replacement during October 15 to April 15, avoiding impacts to potentially roosting bats.
- 2) In order to compensate for impacts associated with this permit, mitigation shall be provided in accordance with the provisions outlined on the most recent version of the attached Compensatory Mitigation Responsibility Transfer Form. The requirements of this form, including any special conditions listed on this form, are hereby incorporated as special conditions of this permit authorization.
- 3) The Permittee shall fully implement the enclosed Memorandum of Agreement between the Permittee, the North Carolina State Historic Preservation Officer and the Wilmington District US Army Corps of Engineers, which is incorporated herein by reference and attached to this permit.
- 4) As noted in the email from the NC Wildlife Resources Commission dated May 15, 2018, the permittee shall adhere to the long trout moratorium (no work within waters between October 15 and April 15 of any given year) and will adhere to Design Standards in Sensitive Waters.

SEE ATTACHED RGP or NWP GENERAL, REGIONAL AND/OR SPECIAL CONDITIONS

Your work is authorized by the above referenced permit provided it is accomplished in strict accordance with the attached conditions and your submitted application dated April 12, 2018 and ensuing record. Any violation of the attached conditions or deviation from your submitted plans may subject the permittee to a stop work order, a restoration order, a Class I administrative penalty, and/or appropriate legal action.

This verification will remain valid until the expiration date identified below unless the nationwide and/or regional general permit authorization is modified, suspended or revoked. If, prior to the expiration date identified below, the nationwide and/or regional

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general permit authorization is reissued and/or modified, this verification will remain valid until the expiration date identified below, provided it complies with all requirements of the modified nationwide permit. If the nationwide and/or regional general permit authorization expires or is suspended, revoked, or is modified, such that the activity would no longer comply with the terms and conditions of the nationwide permit, activities which have commenced (i.e., are under construction) or are under contract to commence in reliance upon the nationwide and/or regional general permit, will remain authorized provided the activity is completed within twelve months of the date of the nationwide and/or regional general permit's expiration, modification or revocation, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend or revoke the authorization.

Activities subject to Section 404 (as indicated above) may also require an individual Section 401 Water Quality Certification. You should contact the NC Division of Water Resources (telephone 919-807-6300) to determine Section 401 requirements.

For activities occurring within the twenty coastal counties subject to regulation under the Coastal Area Management Act (CAMA), prior to beginning work you must contact the N.C. Division of Coastal Management in Morehead City, NC, at (252) 808-2808.

This Department of the Army verification does not relieve the permittee of the responsibility to obtain any other required Federal, State or local approvals/permits.

If there are any questions regarding this verification, any of the conditions of the Permit, or the Corps of Engineers regulatory program, please contact **Crystal Amschler at (828) 271-7980 X 4231 or Crystal.C.Amschler@usace.army.mil**.

Corps Regulatory Official: **AMSCHLER.CRYSTAL.C** Digitally signed by
AMSCHLER.CRYSTAL.CAMILLE.1238614178
DN: cn=US, o=U.S. Government, ou=DoD, ou=PKI,
email=USA.cn=AMSCHLER.CRYSTAL.CAMILLE.1238614178
Date: 2018.10.24 11:06:34 -0400
CAMILLE.1238614178 Date: **October 24, 2018**

Expiration Date of Verification: **April 30, 2020**

Determination of Jurisdiction:

- 1. [X] There are waters, including wetlands, on the above described project area that may be subject to Section 404 of the Clean Water Act (CWA) (33 USC § 1344) and/or Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403). This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331). However, you may request an approved JD, which is an appealable action, by contacting the Corps district for further instruction. Please note, if work is authorized by either a general or nationwide permit, and you wish to request an appeal of an approved JD, the appeal must be received by the Corps and the appeal process concluded prior to the commencement of any work in waters of the United States and prior to any work that could alter the hydrology of waters of the United States.
2. [] There are Navigable Waters of the United States within the above described project area subject to the permit requirements of Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403) and Section 404 of the Clean Water Act (CWA) (33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
3. [] There are waters, including wetlands, within the above described project area that are subject to the permit requirements of Section 404 of the Clean Water Act (CWA) (33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
4. [] A jurisdiction determination was not completed with this request. Therefore, this is not an appealable action. However, you may request an approved JD, which is an appealable action, by contacting the Corps for further instruction.
5. [] The aquatic resources within the above described project area have been identified under a previous action. Please reference the approved jurisdictional determination issued . Action ID: SAW-

A. Basis For Jurisdictional Determination: N/A. An Approved JD has not been completed.

B. Attention USDA Program Participants

This delineation/determination has been conducted to identify the limits of Corps' Clean Water Act jurisdiction for the particular site identified in this request. The delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA Program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

C. Appeals Information for Approved Jurisdiction Determinations (as indicated in A2 and A3 above).

If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the following address:

US Army Corps of Engineers
South Atlantic Division
Attn: Jason Steele, Review Officer
60 Forsyth Street SW, Room 10M15
Atlanta, Georgia 30303-8801
Phone: (404) 562-5137

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by _____.

It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this correspondence.

AMSCHLER.CRYSTAL.

Digitally signed by
AMSCHLER.CRYSTAL.CAMILLE.1238614178
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA,
cn=AMSCHLER.CRYSTAL.CAMILLE.1238614178
Date: 2018.10.24.11:07:23 -0400

Corps Regulatory Official: CAMILLE.1238614178

Date of JD: October 24, 2018

Crystal Amschler

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete our Customer Satisfaction Survey, located online at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0.

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Action ID Number: SAW-2016-01226 County: Macon County

Permittee: North Carolina Department of Transportation, Mr. Dave McHenry

Project Name: NCDOT/R-5734A/US 23/US 441/Div 14

Date Verification Issued: October 24, 2018

Project Manager: Crystal Amschler

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

US ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT
Attn: Crystal Amschler, Project Manager
Asheville Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, North Carolina 28801

Please note that your permitted activity is subject to a compliance inspection by a U. S. Army Corps of Engineers representative. Failure to comply with any terms or conditions of this authorization may result in the Corps suspending, modifying or revoking the authorization and/or issuing a Class I administrative penalty, or initiating other appropriate legal action.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and condition of the said permit, and required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

Date

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND
REQUEST FOR APPEAL**

Applicant: North Carolina Department of Transportation, Mr. Dave McHenry	File Number: SAW-2016-01226	Date: October 24, 2018
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Attached is:	See Section below
<input type="checkbox"/> INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
<input type="checkbox"/> PROFFERED PERMIT (Standard Permit or Letter of permission)	B
<input type="checkbox"/> PERMIT DENIAL	C
<input type="checkbox"/> APPROVED JURISDICTIONAL DETERMINATION	D
<input checked="" type="checkbox"/> PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

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E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:
**District Engineer, Wilmington Regulatory Division,
Attn: Crystal Amschler
69 Darlington Avenue
Wilmington, North Carolina 28403**

If you only have questions regarding the appeal process you may also contact:
Mr. Jason Steele, Administrative Appeal Review Officer
CESAD-PDO
U.S. Army Corps of Engineers, South Atlantic Division
60 Forsyth Street, Room 10M15
Atlanta, Georgia 30303-8801
Phone: (404) 562-5137

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____	Date:	Telephone number:
Signature of appellant or agent.		

For appeals on Initial Proffered Permits send this form to:

District Engineer, Wilmington Regulatory Division, Attn: Crystal Amschler, 69 Darlington Avenue, Wilmington, North Carolina 28403

For Permit denials, Proffered Permits and approved Jurisdictional Determinations send this form to:

**Division Engineer, Commander, U.S. Army Engineer Division, South Atlantic, Attn: Mr. Jason Steele, Administrative Appeal Officer, CESAD-PDO, 60 Forsyth Street, Room 10M15, Atlanta, Georgia 30303-8801
Phone: (404) 562-5137**



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Asheville Field Office
160 Zillicoa Street Suite #B
Asheville, North Carolina 28801

August 20th, 2018

Ms. Crystal Amcshler, NCDOT Regulatory Project Manager
U.S. Army Corps of Engineers
151 Patton Avenue, Room 208
Asheville, NC 28801-2714

Subject: 18-378, Highway Improvements, R5734A US 23/441, Macon County

Dear Ms. Amschler,

On July 25th, 2018, we received your email requesting section 7 concurrence on effects the subject high improvement may have on the federally threatened Indiana Bat (*Myotis sodalists*). The following comments are provided in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act).

Based on the size of the culvert that will be extended for this project (42 feet long, five by six feet wide), we agree that it does not provide suitable bat roosting habitat. We suggest inspecting culverts for bat presence starting at a minimum of five feet tall and 200 feet long. Additionally, you have committed to remove the approximately 50 trees required for highway improvements during October 15th to April 15th, avoiding impacts to potentially roosting bats. Accordingly, we concur with your determination that the proposed bridge replacement project may affect, but is not likely to adversely affect, the Indiana Bat.

As outlined in the Biological Opinion completed on the 4(d) rule for the federally threatened Northern long-eared bat (NLEB, *Myotis septentrionalis*) on 1/5/16, this activity is now excepted from take prohibitions for Northern long-eared bat, based on the project location. Project activities in the action area: (1) would not affect a known hibernation site; (2) are not located within ¼ mile of a known hibernation site, or; (3) are not located within a 150' radius of a known maternity (tree) site. The project location is more than four miles away from any known NLEB location.

Therefore, we believe the requirements under Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 - 1543), are fulfilled. Obligations under Section 7 of the ESA must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.

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If you have questions about these comments please contact Ms. Claire Ellwanger of our staff at 828/258-3939, Ext. 235. In any future correspondence concerning these projects, please reference our Log Number 18-378.

Sincerely,

A handwritten signature in cursive script that reads "Janet Mizzi".

Janet Mizzi
Field Supervisor

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DEPARTMENT OF THE ARMY
Wilmington District, Corps of Engineers
69 Darlington Avenue
Wilmington, North Carolina 28403-1343
April 30, 2015

Regional General Permit No. 198200031
Name of Permittee: North Carolina Department of Transportation
Effective Date: April 30, 2015
Expiration Date: April 30, 2020

DEPARTMENT OF THE ARMY REGIONAL GENERAL PERMIT

A regional general permit (RGP) to perform work in or affecting navigable waters of the United States and waters of the United States, upon recommendation of the Chief of Engineers, pursuant to Section 10 of the Rivers and Harbors Act of March 3, 1899 (33 U.S.C. 403), and Section 404 of the Clean Water Act (33 U.S.C. 1344), is hereby modified and re-issued by authority of the Secretary of the Army by the

District Commander
U.S. Army Engineer District, Wilmington
Corps of Engineers
69 Darlington Avenue
Wilmington, North Carolina 28403-1343

TO AUTHORIZE THE DISCHARGE OF DREDGED OR FILL MATERIAL IN WATERS OF THE UNITED STATES (U.S.), INCLUDING WETLANDS, ASSOCIATED WITH MAINTENANCE, REPAIR, AND CONSTRUCTION PROJECTS CONDUCTED BY THE VARIOUS DIVISIONS OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) INCLUDING THE NCDOT DIVISION OF HIGHWAYS, RAIL, BICYCLE/PEDESTRIAN, ECT.

Activities authorized are:

- a. Construction, maintenance, and repair of bridges, to include work on the approaches, where permanent impacts resulting in a loss of waters of the U.S. will be less than or equal to 500 linear feet (lf) of stream and/or one (1) acre of wetland/non-tidal open water for each single and complete linear project*.
- b. Best-fit widening projects that have undergone interagency review and completed the current interagency Merger Process, which merges the requirements of the National Environmental Policy Act (NEPA) with those found within Section 404 of the Clean Water Act (CWA).

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While there is no impact threshold for these widening projects, the Corps has the discretion to require an individual permit if it determines that the proposed impacts will have more than a minimal impact on the aquatic environment or on other environmental factors, or if the project would normally require an Environmental Impact Statement (EIS) under current Federal Highway Administration (FHWA) guidelines. Best-fit projects may include a small amount of new location roadway for components such as interchanges or intersections, provided the new location portion has been concurred upon by the merger team.

c. Minor widening projects, such as paving and/or widening secondary roads, or interchange improvements, when permanent impacts which result in a loss of waters of the U.S. from installation and/or extension of culverts and/or pipes will be less than or equal to 500 lf of stream and/or one (1) acre of wetland/non-tidal open water for each single and complete linear project*.

d. Stream relocation(s) associated with projects identified in a-c above. Stream relocation lengths are to be evaluated independently and are not included within each respective maximum limit threshold for the authorized actions stated above.

**Single and complete linear project:* A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term "single and complete project" is defined as that portion of the total linear project proposed or accomplished by one owner/developer or partnership or other association of owners/developers that includes all crossings of a single water of the U.S. (i.e., a single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for purposes of this RGP. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Generally, off-site detours are preferred to avoid and minimize impacts to the human and natural environment. However, if an off-site detour is considered impracticable, then an on-site detour may be considered as a necessary component of the actions described above. Impacts from the detour may be considered temporary and may not require compensatory mitigation if the impacted area is restored to its pre-project condition after construction is complete. If the construction of a detour (on-site or off-site) includes standard undercutting methods, removal of all material and backfilling with suitable material is required.

1. Special Conditions.

a. The applicant must submit a pre-construction notification (PCN) with specified attachments to the District Engineer and receive written verification from the Corps that the proposed work complies with this RGP prior to commencing any activity authorized by this RGP.

b. If the project will not impact a designated "Area of Environmental Concern" (AEC) in the twenty (20) counties of North Carolina covered by the North Carolina Coastal Area Management Act (CAMA), then a consistency submission is not required. If the project will impact a designated AEC and meets the definition of "development", then the applicant must

obtain the required CAMA permit. Development activities may not commence until a copy of the approved CAMA permit is furnished to the appropriate Wilmington District Regulatory Field Office (Wilmington Field Office – 69 Darlington Avenue, Wilmington, NC 28403 or Washington Field Office – 2407 West 5th Street, Washington, NC 27889).

The twenty (20) CAMA counties in North Carolina include Beaufort, Bertie, Brunswick, Camden, Carteret, Chowan, Craven, Currituck, Dare, Gates, Hertford, Hyde, New Hanover, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Tyrrell, and Washington.

c. Discharges into Waters of the U.S. designated by either the North Carolina Division of Marine Fisheries (NCDMF) or the North Carolina Wildlife Resources Commission (NCWRC) as anadromous fish spawning areas are prohibited during the period between February 1 and June 30, without prior written approval from NCDMF, NCWRC, National Marine Fisheries Service (NMFS), and the Corps. Discharges into waters of the U.S. designated by NCDMF as primary nursery areas and discharges into waters of the U.S. designated by NCWRC as primary nursery areas in inland waters shall be coordinated with NCDCM (per existing agreement with NCDMF) and NCWRC prior to being authorized by this RGP. Coordination with NCDCM and NCWRC may result in a required construction moratorium during periods of significant biological productivity or critical life stages.

The applicant should contact:

NC Division of Marine Fisheries
3441 Arendell Street
Morehead City, NC 28557
Telephone 252-726-7021
or 800-682-2632

North Carolina Wildlife Resources Commission
Habitat Conservation Program Manager
1721 Mail Service Center
Raleigh, NC 27699-1721
Telephone (919) 733-7638

d. This permit does not authorize the use of culverts in areas designated as anadromous fish spawning areas by the NCDMF or the NCWRC.

e. Waters of the U.S. designated as sturgeon spawning areas are excluded during the period between February 1 and June 30, without prior written approval from NMFS.

f. If the project is located within the twenty (20) counties of North Carolina designated as coastal counties by CAMA, then all pipe and culvert inverts will be buried at least one foot below normal bed elevation when they are placed within the Public Trust AEC and/or the Estuarine Waters AEC as designated by CAMA. If the project is not located within the twenty (20) counties of North Carolina designated as coastal counties by CAMA, then culvert inverts will be buried at least one foot below the bed of the stream for culverts greater than 48 inches in diameter. Culverts 48 inches in diameter or less shall be buried or placed on the stream bed as practicable and appropriate to maintain aquatic passage, and every effort shall be made to maintain the existing channel slope. The potential for destabilization of the channel and head cutting upstream should be considered in the placement of the culvert. A waiver from the depth specifications in this condition may be requested in writing. The waiver will only be issued if it can be demonstrated that the impacts of complying with this condition would result in more adverse impacts to the aquatic environment. Culverts placed in wetlands do not have to be buried.

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g. No work shall be authorized by this RGP within the twenty coastal counties, as defined by the NCDCM, without prior consultation with NOAA Fisheries. For each activity reviewed by the Corps where it is determined that the activity may affect Essential Fish Habitat (EFH) for federally managed species, an EFH Assessment shall be prepared by the applicant and forwarded to the Corps and NOAA Fisheries for review and comment prior to authorization of work.

h. Discharges of dredged or fill material into waters of the U.S., including wetlands, must be minimized or avoided to the maximum extent practicable.

i. No activity may result in substantial permanent disruption of the movement of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area. The dimension, pattern, and profile of the stream above and below a pipe or culvert should not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. It is acceptable to use rock vanes at culvert outlets to ensure, enhance, or maintain aquatic passage. Pre-formed scour holes are acceptable when designed for velocity reduction. The width, height, and gradient of a proposed opening should be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. Spring flow should be determined from gauge data, if available. In the absence of such data, bankfull flow can be used as a comparable level. Where adjacent floodplain is available, flows exceeding bank-full should be accommodated by installing culverts at the floodplain elevation, if practicable. If multiple culverts are used, the construction of floodplain benches and/or sills to maintain base flow is required, if practicable.

j. Upon completion of any work authorized by this RGP, all temporary fills (to include culverts, etc.) will be completely removed from waters of the U.S. and the areas will be restored to preconstruction conditions, to include pre-project elevations and contours, restoring natural hydrology and stream corridors, and reestablishing native vegetation/riparian corridors. This work will be completed within 60 days of completion of project construction. If this timeframe occurs while a required moratorium of this permit is in effect, the temporary fill shall be removed in its entirety within 60 days of the moratorium end date. If vegetation cannot be planted due to the time of the year, all disturbed areas will be seeded with a native mix appropriate for the impacted area, and vegetation will be planted in the fall. A native seed mix may contain non-invasive small grain annuals (e.g. millet and rye grain) to ensure adequate cover while native vegetation becomes established. The PCN must include a restoration plan showing how all temporary fills and structures will be removed and how the area will be restored to pre-project conditions.

k. All activities authorized by this RGP shall, to the extent practicable, be conducted "in the dry", with barriers installed between work areas and aquatic habitat to protect that habitat from sediment, concrete, and other pollutants. Where concrete is utilized, measures will be taken to prevent live or fresh concrete, including bags of uncured concrete, from coming into contact with waters of the U.S. until the concrete has cured/hardened. All water in the work area that has been in contact with concrete shall only be returned to waters of the U.S. when it no longer poses a threat to aquatic organisms (concrete is set and cured).

l. In cases where new alignment approaches are to be constructed and the existing approach fill in waters of the U.S. is to be abandoned and no longer maintained as a roadway, the

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abandoned fill shall be removed and the area will be restored to preexisting wetland/stream conditions and elevations, to include restoring natural hydrology and stream corridors, and reestablishing native vegetation/riparian corridors, to the extent practicable. This activity may qualify as compensatory mitigation credit for the project and will be assessed on a case-by-case basis in accordance with Special Conditions "q" and "r" below. A restoration plan detailing this activity will be required with the submittal of the PCN.

m. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

n. The project must be implemented and/or conducted so that all reasonable and practicable measures to ensure that equipment, structures, fill pads, and work associated with the project do not adversely affect upstream and/or downstream reaches. Adverse effects include, but are not limited to, channel instability, flooding, and/or shoreline/streambank erosion. During construction, the permittee shall routinely monitor for these effects, cease all work if/when detected, take initial corrective measures to correct actively eroding areas, and notify the Corps immediately. Permanent corrective measures may require additional authorization from the Corps.

o. All PCNs will describe sedimentation and erosion control structures and measures proposed for placement in waters of the U.S. To the extent practicable, structures and measures should be depicted on maps, surveys or drawings showing location and impacts to jurisdictional wetlands and streams. In addition, appropriate soil and erosion control measures must be established and maintained during construction. All fills, temporary and permanent, must be adequately stabilized at the earliest practicable date to prevent erosion of fill material into adjacent waters or wetlands.

p. Before discharging dredged or fill material into waters of the U.S. in the twenty-five (25) mountain counties of North Carolina, the applicant will submit a PCN to the NCWRC and the Corps concurrently. The PCN shall summarize alternatives to conducting work in mountain trout waters considered during the planning process, detail why alternatives were or were not selected, and contain a compensatory mitigation plan for all unavoidable adverse impacts to mountain trout waters. For proposals where a bridge is replaced with a culvert, the PCN must also include details of any on-site evaluations that were conducted to determine that installation of a culvert will not adversely affect passage of fish or other aquatic biota at the project site. This information must include factors such as the proposed slope of the culvert and determinations of how the slope will be expected to allow or impede passage, the necessity of baffles and/or sills to ensure passage, design considerations to ensure that expected baseflow will be maintained for passage and that post-construction velocities will not prevent passage, site conditions that will or will not allow proper burial of the culvert, existing structures (e.g., perched culverts, waterfalls, etc.) and/or stream patterns up and downstream of the culvert site that could affect passage and bank stability, and any other considerations regarding passage. The level of detail for this information should be based on site conditions (i.e., culverts on a slope over 3% will most likely

require more information than culverts on a slope that is less than 1%, etc.). Also, in order to evaluate potential impacts, describe bedforms that will be impacted by the proposed culvert – e.g., pools, glides, riffles, etc. The NCWRC will respond both to the proponent and directly to the Corps.

The twenty-five (25) designated trout counties of North Carolina include Alleghany, Caldwell, Watauga, Ashe, Mitchell, Wilkes, Avery, Burke, Stokes, Surry, Buncombe, Henderson, Polk, Cherokee, Jackson, Rutherford, Clay, Macon, Swain, Graham, Madison, Transylvania, Haywood, McDowell, and Yancey.

The applicant may contact NCWRC at:

North Carolina Wildlife Resources
Commission
Ms. Marla Chambers
Western NCDOT Permit Coordinator
206 Charter Street
Albemarle, NC 28001
Office: 704-982-9181

q. Compensatory mitigation will be required for permanent impacts resulting in a loss of waters of the U.S., including wetlands, from culverts/pipes and associated fill. Mitigation will also be required for stream relocation projects. The applicant will attach a proposed mitigation plan to the PCN. Mitigation proposals will be in accordance with currently approved Wilmington District and/or Corps-wide mitigation regulations and guidance. The Corps Project Manager will make the final determination concerning the appropriate amount and type of mitigation.

r. Stream relocation(s) associated with projects may be authorized under this RGP. As stated above, mitigation will be required for all relocation projects. If the stream relocation is conducted in accordance with the requirements stated below in 1-5, the relocated segment of stream may* be considered toward reducing the amount of compensatory mitigation required. A relocation plan must be submitted with the PCN that addresses all factors required within the current Wilmington District, Corps of Engineers Stream Mitigation Guidelines, which can include, but may not be limited to:

(1) The relocated stream has pattern, profile, and dimension based on natural channel design. If natural channel design construction is not possible due to site constraints, the relocated stream must have pattern, profile, and dimension similar to, or better than, the existing stream. Note that site constraints do not include those situations where NCDOT chooses not to acquire additional adjacent property that is available for purchase.

(2) The new stream meets the current buffer requirements as stated in current District stream mitigation guidance. If the required buffer widths cannot be obtained, a project-by-project decision will be completed to determine if additional compensatory mitigation is required.

(3) The new location allows the relocated stream to remain stable (e.g., in a

valley vs. on a slope, no bends that will impact stability, etc.).

(4) There is no loss of channel for any reason (e.g., old channel is 200' and new channel is 150' = 50' channel loss; part of the new channel is put in a culvert; the new channel (sides and bottom) is hardened with concrete, rip rap, etc.).

(5) The Corps will determine if monitoring and reporting will be required for a specific project and the parameters of any required monitoring and reporting. If monitoring is required, a monitoring plan must be included with the PCN and meet current requirements.

All relocation plans must clearly depict both the existing channel and the proposed (relocated) channel.

* Conducting stream relocation(s) in accordance with 1-5 above may not fully compensate for the impact and may require additional compensatory mitigation. The Corps Project Manager will determine if the proposed amount of mitigation is adequate on a project-by-project basis.

If stream relocation cannot be conducted in accordance with 1-5 above, mitigation at a 2:1 ratio will typically be required unless: (1) the applicant provides a Stream Quality Assessment Worksheet or NCSAM documentation (when available) that supports a different mitigation ratio; (2) the Corps Project Manager determines that the relocated stream, while not in full compliance with 1-5 above, warrants partial mitigation, or; (3) the Corps determines that the existing stream is an excellent quality stream, in which case a 3:1 mitigation ratio may be required. The Corps Project Manager will make the final determination concerning the appropriate amount and type of mitigation.

If the Corps determines that the proposed stream relocation is of such a magnitude that it cannot be authorized by this RGP, an Individual Permit will be required.

s. The applicant shall sign and return the compliance certificate that is attached to the RGP verification letter.

t. In the event that any Federal agency maintains an objection or any required State authorization is outstanding, no notice to proceed will be given until objections are resolved and State authorizations are issued.

u. The Corps may place additional special conditions, limitations, or restrictions on any verification of the use of RGP 31 on a project-by-project basis.

2. General Conditions.

a. Except as authorized by this RGP or any Corps approved modification to this RGP, no excavation, fill or mechanized land-clearing activities shall take place within waters or wetlands, at any time in the construction or maintenance of this project. This permit does not authorize temporary placement or double handling of excavated or fill material within waters or wetlands outside the permitted area. This prohibition applies to all borrow and fill activities connected with this project.

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b. Authorization under this RGP does not obviate the need to obtain other federal, state, or local authorizations.

c. All work authorized by this RGP must comply with the terms and conditions of the applicable CWA Section 401 Water Quality Certification for this RGP issued by the NCDWR.

d. The permittee shall employ all sedimentation and erosion control measures necessary to prevent an increase in sedimentation or turbidity within waters and wetlands outside the permit area. This shall include, but is not limited to, the immediate installation of silt fencing or similar appropriate devices around all areas subject to soil disturbance or the movement of earthen fill, and the immediate stabilization of all disturbed areas. Additionally, the project must remain in full compliance with all aspects of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statutes Chapter 113A Article 4).

e. The activities authorized by this RGP must not interfere with the public's right to free navigation on all navigable waters of the U.S. No attempt will be made by the permittee to prevent the full and free use by the public of all navigable waters at or adjacent to the authorized work for a reason other than safety.

f. The permittee understands and agrees that, if future operations by the U.S. require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the U.S. No claim shall be made against the U.S. on account of any such removal or alteration.

g. The permittee, upon receipt of a notice of revocation of this permit or upon its expiration before completion of the work will, without expense to the U.S. and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the affected water of the U.S. to its former conditions.

h. The permittee will allow the Wilmington District Engineer or his representative to inspect the authorized activity at any time deemed necessary to assure that the activity is being performed or maintained in strict accordance with the Special and General Conditions of this permit.

i. This RGP does not grant any property rights or exclusive privileges.

j. This permit does not authorize any injury to the property or rights of others.

k. This RGP does not authorize the interference with any existing or proposed federal project.

l. In issuing this permit, the Federal Government does not assume any liability for the following:

(1) Damages to the permitted project or uses thereof as a result of other permitted

or unpermitted activities or from natural causes.

(2) Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the U.S. in the public interest.

(3) Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

(4) Design or construction deficiencies associated with the permitted work.

(5) Damage claims associated with any future modification, suspension, or revocation of this permit.

m. Authorization provided by this RGP may be modified, suspended or revoked in whole or in part if the Wilmington District Engineer, acting for the Secretary of the Army, determines that such action is in the best public interest. The term of this RGP shall be five (5) years unless subject to modification, suspension or revocation. Any modification, suspension or revocation of this authorization will not be the basis for any claim for damages against the U.S. Government.

n. This RGP does not authorize any activity, which the District Engineer determines, after any necessary investigations, will adversely affect:

(1) Rivers named in Section 3 of the Wild and Scenic Rivers Act (15 U.S.C. 1273), those proposed for inclusion as provided by Sections 4 and 5 of the Act, and wild, scenic and recreational rivers established by state and local entities.

(2) Sites included in or determined eligible for listing in the National Registry of Natural Landmarks.

(3) NOAA designated marine sanctuaries, National Estuarine Research Reserves, and coral reefs.

(4) Submerged Aquatic Vegetation (SAV) as defined by the N.C. Division of Marine Fisheries at 15A NCAC 03I .0101(4)(i).

o. Endangered Species.

(1) No activity is authorized under this RGP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under this RGP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.

(2) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees (and when FHWA is the lead federal agency) must provide the district engineer with the appropriate documentation to demonstrate compliance with

those requirements. The district engineer will review the documentation and determine whether it is sufficient to address ESA compliance for the RGP activity, or whether additional ESA consultation is necessary.

(3) Non-federal permittees must submit a PCN to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect federally-listed endangered or threatened species or designated critical habitat, the PCN must include the name(s) of the endangered or threatened species that might be affected by the proposed work or that utilize the designated critical habitat that might be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-federal applicant of the Corps' determination within 45 days of receipt of a complete PCN notification. In cases where the non-federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed. If the non-federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(4) As a result of formal or informal consultation with the U.S. Fish and Wildlife Service (USFWS) or NMFS, the district engineer may add species-specific endangered species conditions to the RGP.

(5) Authorization of an activity by a RGP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the USFWS or the NMFS, the ESA prohibits any person subject to the jurisdiction of the U.S. to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(6) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the USFWS and NMFS or their world wide web pages at <http://www.fws.gov/> or <http://www.fws.gov/ipac> and <http://www.noaa.gov/fisheries.html> respectively.

p. The permittee is responsible for obtaining any "take" permits required under the USFWS's regulations governing compliance with the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act. The permittee should contact the appropriate local office of the USFWS to determine if such "take" permits are required for a particular activity.

q. For proposed activities the sixteen counties listed below, applicants must provide a

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copy of the PCN to the USFWS, 160 Zillicoa Street, Asheville, North Carolina 28801. This PCN must be sent concurrently to the USFWS and the Corps Project Manager for that specific county.

Counties with tributaries that drain to designated critical habitat that require notification to the Asheville USFWS: Avery, Cherokee, Forsyth, Graham, Haywood, Henderson, Jackson, Macon, Mecklenburg, Mitchell, Stokes, Surry, Swain, Transylvania, Union and Yancey.

Applicants may contact the appropriate USFWS office listed below or the US Army Corps of Engineers:

US Fish and Wildlife Service
Asheville Field Office
160 Zillicoa Street
Asheville, NC 28801
Telephone: (828) 258-3939

Asheville USFWS Office counties: All counties west of and including Anson, Stanly, Davidson, Forsyth and Stokes Counties.

US Fish and Wildlife Service
Raleigh Field Office
Post Office Box 33726
Raleigh, NC 27636-3726
Telephone: (919) 856-4520

Raleigh USFWS Office counties: all counties east of and including Richmond, Montgomery, Randolph, Guilford, and Rockingham Counties.

r. Permittees are advised that development activities in or near a floodway may be subject to the National Flood Insurance Program that prohibits any development, including fill, within a floodway that results in any increase in base flood elevations. This RGP does not authorize any activity prohibited by the National Flood Insurance Program.

s. The permittee must make every reasonable effort to perform the work authorized herein in a manner so as to minimize any adverse impact on fish, wildlife and natural environmental values.

t. All activities authorized by this RGP that involve the use of riprap material for bank stabilization, the following measures shall be applied:

(1) Filter cloth must be placed underneath the riprap as an additional requirement of its use in North Carolina waters.

(2) The placement of riprap shall be limited to the areas depicted on submitted work plan drawings and not be placed in a manner that prevents or impedes fish passage.

(3) The riprap material shall be clean and free from loose dirt or any pollutant

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except in trace quantities that will not have an adverse environmental effect.

(4) It shall be of a size sufficient to prevent its movement from the authorized alignment by natural forces under normal conditions.

(5) The riprap material shall consist of clean rock or masonry material such as, but not limited to, granite, marl, or broken concrete.

(6) A waiver from the specifications in this general condition may be requested in writing. The waiver will only be issued if it can be demonstrated that the impacts of complying with this condition will result in greater adverse impacts to the aquatic environment.

u. The permittee must install and maintain, at his expense, any signal lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, on authorized facilities. For further information, the permittee should contact the U.S. Coast Guard Marine Safety Office at (910) 772-2191.

v. The permittee must maintain any structure or work authorized by this permit in good condition and in conformance with the terms and conditions of this permit. The Permittee is not relieved of this requirement if the Permittee abandons the structure or work. Transfer in fee simple of the work authorized by this permit will automatically transfer this permit to the property's new owner, with all of the rights and responsibilities enumerated herein. The permittee must inform any subsequent owner of all activities undertaken under the authority of this permit and provide the subsequent owner with a copy of the terms and conditions of this permit.

w. At his sole discretion, any time during the processing cycle, the Wilmington District Engineer may determine that this RGP will not be applicable to a specific proposal. In such case, the procedures for processing an individual permit in accordance with 33 CFR 325 will be available.

x. The activity must comply with applicable FEMA approved state or local floodplain management requirements.

y. All fill material placed in waters or wetlands shall be generated from an upland source and will be clean and free of any pollutants except in trace quantities. Metal products, organic materials (including debris from land clearing activities), or unsightly debris will not be used.

z. All excavated material will be disposed of in approved upland disposal areas.

aa. Historic Properties.

(1) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places (NRHP), the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(2) Federal permittees (or when FHWA is the lead federal agency) should follow their own procedures for complying with the requirements of Section 106 of the NHPA. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address Section 106 compliance for this RGP activity, or whether additional Section 106 consultation is necessary.

(3) Non-federal permittees must submit a PCN to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the NRHP, including previously unidentified properties. For such activities, the PCN must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO), as appropriate, and the NRHP (see 33 CFR 330.4(g)). When reviewing PCNs, district engineers will comply with the current procedures for addressing the requirements of Section 106 of the NHPA. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-federal applicant has identified historic properties on which the activity may have the potential to cause effects and so notified the Corps, the non-federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

(4) The district engineer will notify the prospective permittee within 45 days of receipt of a complete PCN whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR §800.3(a)). If NHPA Section 106 consultation is required and will occur, the district engineer will notify the non-federal applicant that he or she cannot begin work until Section 106 consultation is completed. If the non-federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(5) Prospective permittees should be aware that Section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit will relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the

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undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

bb. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the NRHP.


cc. There will be no unreasonable interference with navigation or the right of the public to riparian access by the existence or use of activities authorized by this RGP.

dd. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

ee. This RGP will not be applicable to proposed construction when the Wilmington District Engineer determines that the proposed activity will significantly affect the quality of the human environment and determines that an EIS must be prepared.

ff. Activities which have commenced (i.e. are under construction) or are under contract to commence in reliance upon this general permit will remain authorized provided the activity is completed within twelve months of the date of the general permit's expiration, modification, or revocation. Activities completed under the authorization of this general permit which were in effect at the time the activity was completed continue to be authorized by the general permit.

BY AUTHORITY OF THE SECRETARY OF THE ARMY:



Kevin P. Landers Sr.
Colonel, U. S. Army
District Commander



ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

LINDA CULPEPPER
Interim Director

April 17, 2018
Macon County
NCDWR Project No. 20180523
Road Improvements on US 441S
TIP Project No. R-5734A

APPROVAL of 401 WATER QUALITY CERTIFICATION with ADDITIONAL CONDITIONS

Mr. David G. McHenry, Environmental Officer
NCDOT, Division 14
253 Webster Road
Sylva, North Carolina 28779

Dear Mr. McHenry:

You have our approval, in accordance with the conditions listed below, for the following impacts for the purpose of roadway improvements in Macon County:

Stream Impacts in the Little Tennessee River Basin

Site	Permanent Fill in Perennial Stream (linear ft)	Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear ft)
S1	443		443
S2		458	458
S3	10		10
S4	20		60
S5		44	20
TOTAL	473	502	991

Total Stream Impact for Project: 991 linear feet.

The project shall be constructed in accordance with your application received April 12, 2018. After reviewing your application, we have decided that these impacts are covered by General Water Quality Certification Number 4135. This certification corresponds to the **Regional General Permit 31** issued by the Corps of Engineers. In addition, you should acquire any other federal, state or local permits before you proceed with your project including (but not limited to) Sediment and Erosion Control, Non-Discharge and Water Supply Watershed regulations. This approval will expire with the accompanying 404 permit.

This approval is valid solely for the purpose and design described in your application (unless modified below). Should your project change, you must notify the NCDWR and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If total wetland fills for this project (now or in the future) exceed one acre, or of total

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impacts to streams (now or in the future) exceed 150 linear feet, compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7) For this approval to remain valid, you must adhere to the conditions listed in the attached certification(s) and any additional conditions listed below.

Condition(s) of Certification:

Project Specific Conditions

1. The permittee will need to adhere to all appropriate in-water work moratoria (including the use of pile driving or vibration techniques) prescribed by the NC Wildlife Resources Commission. No in-water work is permitted between October 15 and April 15 of any year, without prior approval from the NC Division of Water Resources and the NC Wildlife Resources Commission.

In-stream work and land disturbance within the 25-foot buffer zone are prohibited during the trout-spawning season of October 15 through April 15 to protect the egg and fry stages of trout.

2. The NCDOT Division Environmental Officer or Environmental Assistant will conduct a pre-construction meeting with all appropriate staff to ensure that the project supervisor and essential staff understand the potential issues with stream and pipe alignment at the permitted site. NCDWR staff shall be invited to the pre-construction meeting. [15A NCAC 02H.0506(b)(2) and (b)(3)]
3. Compensatory mitigation for 443 linear feet of impact to streams is required. We understand that you have chosen to perform compensatory mitigation for impacts to streams through the North Carolina Division of Mitigation Service (DMS) (formerly NCEEP), and that the DMS has agreed to implement the mitigation for the project. The DMS has indicated in a letter dated March 13, 2018 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the DMS Mitigation Banking Instrument signed July 28, 2010.

General Conditions

1. Unless otherwise approved in this certification, placement of culverts and other structures in open waters and streams shall be placed below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and downstream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by NCDWR. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact NCDWR for guidance on how to proceed and to determine whether or not a permit modification will be required. [15A NCAC 02H.0506(b)(2)]
2. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills. [15A NCAC 02B.0200]
3. During the construction of the project, no staging of equipment of any kind is permitted in waters of the U.S., or protected riparian buffers. [15A NCAC 02H.0506(b)(2)]
4. The dimension, pattern and profile of the stream above and below the crossing shall not be modified. Disturbed floodplains and streams shall be restored to natural geomorphic conditions. [15A NCAC 02H.0506(b)(2)]
5. The use of rip-rap above the Normal High Water Mark shall be minimized. Any rip-rap placed for stream stabilization shall be placed in stream channels in such a manner that it does not impede aquatic life passage. [15A NCAC 02H.0506(b)(2)]

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- * 6. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval. [15A NCAC 02H .0507(c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]
7. All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water. [15A NCAC 02H.0506(b)(3) and (c)(3)]
8. Heavy equipment shall be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the introduction of other pollutants into the stream. [15A NCAC 02H.0506(b)(3)]
9. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials. [15A NCAC 02H.0506(b)(3)]
10. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification. [15A NCAC 02H.0506(b)(3)]
11. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited. [15A NCAC 02H.0506(b)(3)]
12. The permittee and its authorized agents shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act) and any other appropriate requirements of State and Federal law. If the NCDWR determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, the NCDWR may reevaluate and modify this certification. [15A NCAC 02B.0200]
13. All fill slopes located in jurisdictional wetlands shall be placed at slopes no flatter than 3:1, unless otherwise authorized by this certification. [15A NCAC 02H.0506(b)(2)]
14. A copy of this Water Quality Certification shall be maintained on the construction site at all times. In addition, the Water Quality Certification and all subsequent modifications, if any, shall be maintained with the Division Engineer and the on-site project manager. [15A NCAC 02H .0507(c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]
15. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization shall be clearly marked by highly visible fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this certification. [15A NCAC 02H.0501 and .0502]
16. The issuance of this certification does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (i.e. local, state, and federal) having jurisdiction, including but not limited to applicable buffer rules, stormwater management rules, soil erosion and sedimentation control requirements, etc.
17. The Permittee shall report any violations of this certification to the Division of Water Resources within 24 hours of discovery. [15A NCAC 02B.0506(b)(2)]
- * 18. Upon completion of the project (including any impacts at associated borrow or waste sites), the NCDOT Division Engineer shall complete and return the enclosed "Certification of Completion Form" to notify the NCDWR when all work included in the 401 Certification has been completed. [15A NCAC 02H.0502(f)]
19. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated with this permit without appropriate modification. Should waste or borrow sites, or access roads to waste or borrow sites, be located in wetlands or streams, compensatory mitigation will be required since that is a direct impact from road construction activities.[15A NCAC 02H.0506(b)(3) and (c)(3)]

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20. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards [15A NCAC 02H.0506(b)(3) and (c)(3)]:
- a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*.
 - b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
 - c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.
 - d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.
21. Sediment and erosion control measures shall not be placed in wetlands or waters unless otherwise approved by this Certification. [15A NCAC 02H.0506(b)(3) and (c)(3)]

If you wish to contest any statement in the attached Certification you must file a petition for an administrative hearing. You may obtain the petition form from the office of Administrative hearings. You must file the petition with the office of Administrative Hearings within sixty (60) days of receipt of this notice. A petition is considered filed when it is received in the office of Administrative Hearings during normal office hours. The Office of Administrative Hearings accepts filings Monday through Friday between the hours of 8:00am and 5:00pm, except for official state holidays. The original and one (1) copy of the petition must be filed with the Office of Administrative Hearings.

The petition may be faxed-provided the original and one copy of the document is received by the Office of Administrative Hearings within five (5) business days following the faxed transmission. The mailing address for the Office of Administrative Hearings is:

Office of Administrative Hearings
6714 Mail Service Center
Raleigh, NC 27699-6714
Telephone: (919) 431-3000, Facsimile: (919) 431-3100

A copy of the petition must also be served on DEQ as follows:

Mr. Bill F. Lane, General Counsel
Department of Environmental Quality
1601 Mail Service Center

This letter completes the review of the Division of Water Resources under Section 401 of the Clean Water Act. If you have any questions, please contact Kevin Barnett at (828)230-8470 or kevin.barnett@ncdenr.gov.

Sincerely,



Linda Culpepper, Interim Director
Division of Water Resources

Electronic copy only distribution:

Lori Beckwith, US Army Corps of Engineers, Asheville Field Office
Marla Chambers, NC Wildlife Resources Commission
File Copy

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES

WATER QUALITY GENERAL CERTIFICATION NO. 4135

GENERAL CERTIFICATION FOR PROJECTS ELIGIBLE FOR US ARMY CORPS OF ENGINEERS

- **NATIONWIDE PERMIT NUMBER 14 (LINEAR TRANSPORTATION PROJECTS), AND**
- **REGIONAL GENERAL PERMIT 198200031 (NCDOT BRIDGES, WIDENING PROJECTS, INTERCHANGE IMPROVEMENTS)**

Water Quality Certification Number 4135 is issued in conformity with the requirements of Section 401, Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Regulations in 15A NCAC 02H .0500 and 15A NCAC 02B .0200 for the discharge of fill material to surface waters and wetland areas as described in 33 CFR 330 Appendix A (B) (14) of the US Army Corps of Engineers regulations and Regional General Permit 198200031.

The State of North Carolina certifies that the specified category of activity will not violate applicable portions of Sections 301, 302, 303, 306 and 307 of the Public Laws 92-500 and 95-217 if conducted in accordance with the conditions hereinafter set forth.

Effective date: December 1, 2017

Signed this day: December 1, 2017

By



for Linda Culpepper
Interim Director

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Activities meeting any one (1) of the following thresholds or circumstances require written approval for a 401 Water Quality Certification from the Division of Water Resources (DWR):

- a) If any of the conditions of this Certification (listed below) cannot be met; or
- b) Any temporary or permanent impacts to wetlands, open waters and/or streams, except for construction of a driveway to a single family residential lot that is determined to not be part of a larger common plan of development, as long as the driveway involves a travel lane of less than 25 feet and total stream impacts of less than 60 feet, including any topographic/slope stabilization or in-stream stabilization needed for the crossing; or
- c) Any stream relocation or stream restoration; or
- d) Any high-density project, as defined in 15A NCAC 02H .1003(2)(a) and by the density thresholds specified in 15A NCAC 02H .1017, which:
 - i. Disturbs one acre or more of land (including a project that disturbs less than one acre of land that is part of a larger common plan of development or sale); and
 - ii. Has permanent wetland, stream or open water impacts; and
 - iii. Is proposing new built-upon area; and
 - iv. Does not have a stormwater management plan reviewed and approved under a state stormwater program¹ or a state-approved local government stormwater program².

Projects that have vested rights, exemptions, or grandfathering from state or locally-implemented stormwater programs and projects that satisfy state or locally-implemented stormwater programs through use of community in-lieu programs **require written approval**; or

- e) Any permanent impacts to waters, or to wetlands adjacent to waters, designated as: ORW (including SAV), HQW (including PNA), SA, WS-I, WS-II, or North Carolina or National Wild and Scenic River.
- f) Any permanent impacts to waters, or to wetlands adjacent to waters, designated as Trout except for driveway projects that are below threshold (b) above provided that:
 - i. The impacts are not adjacent to any existing structures
 - ii. All conditions of this General Certification can be met, including adherence to any moratoriums as stated in Condition #10; and
 - iii. A *Notification of Work in Trout Watersheds Form* is submitted to the Division at least 60 days prior to commencement of work; or
- g) Any permanent impacts to coastal wetlands [15A NCAC 07H .0205], or Unique Wetlands (UWL); or
- h) Any impact associated with a Notice of Violation or an enforcement action for violation(s) of NC Wetland Rules (15A NCAC 02H .0500), NC Isolated Wetland Rules (15A NCAC 02H .1300), NC Surface Water or Wetland Standards (15A NCAC 02B .0200), or State Regulated Riparian Buffer Rules (15A NCAC 02B .0200); or

¹ e.g. Coastal Counties, HQW, ORW, or state-implemented Phase II NPDES

² e.g. Delegated Phase II NPDES, Water Supply Watershed, Nutrient-Sensitive Waters, or Universal Stormwater Management Program

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- * i) Any impacts to subject water bodies and/or state regulated riparian buffers along subject water bodies in the Neuse, Tar-Pamlico, or Catawba River Basins or in the Randleman Lake, Jordan Lake or Goose Creek Watersheds (or any other basin or watershed with State Regulated Riparian Area Protection Rules [Buffer Rules] in effect at the time of application) *unless*:
 - i. The activities are listed as “EXEMPT” from these rules; or
 - ii. A Buffer Authorization Certificate is issued by the NC Division of Coastal Management (DCM); or
 - iii. A Buffer Authorization Certificate or a Minor Variance is issued by a delegated or designated local government implementing a state riparian buffer program pursuant to 143-215.23

Activities included in this General Certification that do not meet one of the thresholds listed above do not require written approval.

I. ACTIVITY SPECIFIC CONDITIONS:

- * 1. If this Water Quality Certification is used to access residential, commercial or industrial building sites, then all parcels owned by the applicant that are part of the single and complete project authorized by this Certification must be buildable without additional impacts to streams or wetlands. If required in writing by DWR, the applicant shall provide evidence that the parcels are buildable without requiring additional impacts to wetlands, waters, or state regulated riparian buffers. [15A NCAC 02H .0506(b)(4) and (c)(4)]
- 2. For road and driveway construction purposes, this Certification shall only be utilized from natural high ground to natural high ground. [15A NCAC 02H .0506(b)(2) and (c)(2)]
- * 3. Deed notifications or similar mechanisms shall be placed on all lots with retained jurisdictional wetlands, waters, and state regulated riparian buffers within the project boundaries in order to assure compliance with NC Wetland Rules (15A NCAC 02H .0500), NC Isolated Wetland Rules (15A NCAC 02H .1300), and/or State Regulated Riparian Buffer Rules (15A NCAC 02B .0200). These mechanisms shall be put in place at the time of recording of the property or individual parcels, whichever is appropriate. [15A NCAC 02H .0506(b)(4) and (c)(4)]
- 4. For the North Carolina Department of Transportation, compliance with the NCDOT’s individual NPDES permit NCS000250 shall serve to satisfy this condition. All other high-density projects that trigger threshold item (d) above shall comply with one of the following requirements: [15A NCAC 02H .0506(b)(5) and (c)(5)]

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- a. Provide a completed Stormwater Management Plan (SMP) for review and approval, including all appropriate stormwater control measure (SCM) supplemental forms and associated items, that complies with the high-density development requirements of 15A NCAC 02H .1003. Stormwater management shall be provided throughout the entire project area in accordance with 15A NCAC 02H .1003. For the purposes of 15A NCAC 02H .1003(2)(a), density thresholds shall be determined in accordance with 15A NCAC 02H .1017.
- b. Provide documentation (including calculations, photos, etc.) that the project will not cause degradation of downstream surface waters. Documentation shall include a detailed analysis of the hydrological impacts from stormwater runoff when considering the volume and velocity of stormwater runoff from the project built upon area and the size and existing condition of the receiving stream(s).

Exceptions to this condition require application to and written approval from DWR.

II. GENERAL CONDITIONS:

- * 1. When written authorization is required, the plans and specifications for the project are incorporated into the authorization by reference and are an enforceable part of the Certification. Any modifications to the project require notification to DWR and may require an application submittal to DWR with the appropriate fee. [15A NCAC 02H .0501 and .0502]
2. No waste, spoil, solids, or fill of any kind shall occur in wetlands or waters beyond the footprint of the impacts (including temporary impacts) as authorized in the written approval from DWR; or beyond the thresholds established for use of this Certification without written authorization. [15A NCAC 02H .0501 and .0502]

No removal of vegetation or other impacts of any kind shall occur to state regulated riparian buffers beyond the footprint of impacts approved in a Buffer Authorization or Variance or as listed as an exempt activity in the applicable riparian buffer rules. [15A NCAC 02B .0200]

- * 3. In accordance with 15A NCAC 02H .0506(h) and Session Law 2017-10, compensatory mitigation may be required for losses of greater than 300 linear feet of perennial streams and/or greater than one (1) acre of wetlands. Impacts associated with the removal of a dam shall not require mitigation when the removal complies with the requirements of Part 3 of Article 21 in Chapter 143 of the North Carolina General Statutes. Impacts to isolated and other non-404 jurisdictional wetlands shall not be combined with 404 jurisdictional wetlands for the purpose of determining when impact thresholds trigger a mitigation requirement. For linear publicly owned and maintained transportation projects that are not determined to be part of a larger common plan of development by the US Army Corps of Engineers, compensatory mitigation may be required for losses of greater than 300 linear feet per perennial stream.

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Compensatory stream and/or wetland mitigation shall be proposed and completed in compliance with G.S. 143-214.11. For applicants proposing to conduct mitigation within a project site, a complete mitigation proposal developed in accordance with the most recent guidance issued by the US Army Corps of Engineers Wilmington District shall be submitted for review and approval with the application for impacts.

4. All activities shall be in compliance with any applicable State Regulated Riparian Buffer Rules in Chapter 2 of Title 15A.
5. When applicable, all construction activities shall be performed and maintained in full compliance with G.S. Chapter 113A Article 4 (Sediment and Pollution Control Act of 1973). Regardless of applicability of the Sediment and Pollution Control Act, all projects shall incorporate appropriate Best Management Practices for the control of sediment and erosion so that no violations of state water quality standards, statutes, or rules occur. [15A NCAC 02H .0506(b)(3) and (c)(3) and 15A NCAC 02B .0200]

Design, installation, operation, and maintenance of all sediment and erosion control measures shall be equal to or exceed the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*, or for linear transportation projects, the *NCDOT Sediment and Erosion Control Manual*.

All devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) sites, including contractor-owned or leased borrow pits associated with the project. Sufficient materials required for stabilization and/or repair of erosion control measures and stormwater routing and treatment shall be on site at all times.

For borrow pit sites, the erosion and sediment control measures shall be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*. Reclamation measures and implementation shall comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act and the Mining Act of 1971.

If the project occurs in waters or watersheds classified as Primary Nursery Areas (PNAs), SA, WS-I, WS-II, High Quality Waters (HQW), or Outstanding Resource Waters (ORW), then the sedimentation and erosion control designs shall comply with the requirements set forth in 15A NCAC 04B .0124, *Design Standards in Sensitive Watersheds*.

6. Sediment and erosion control measures shall not be placed in wetlands or waters except within the footprint of temporary or permanent impacts authorized under this Certification. Exceptions to this condition require application to and written approval from DWR. [15A NCAC 02H .0501 and .0502]
7. Erosion control matting that incorporates plastic mesh and/or plastic twine shall not be used along streambanks or within wetlands. Exceptions to this condition require application to and written approval from DWR. [15A NCAC 02B .0201]

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8. An NPDES Construction Stormwater Permit (NCG010000) is required for construction projects that disturb one (1) or more acres of land. The NCG010000 Permit allows stormwater to be discharged during land disturbing construction activities as stipulated in the conditions of the permit. If the project is covered by this permit, full compliance with permit conditions including the erosion & sedimentation control plan, inspections and maintenance, self-monitoring, record keeping and reporting requirements is required. [15A NCAC 02H .0506(b)(5) and (c)(5)]

The North Carolina Department of Transportation (NCDOT) shall be required to be in full compliance with the conditions related to construction activities within the most recent version of their individual NPDES (NCS000250) stormwater permit. [15A NCAC 02H .0506(b)(5) and (c)(5)]

9. All work in or adjacent to streams shall be conducted so that the flowing stream does not come in contact with the disturbed area. Approved best management practices from the most current version of the *NC Sediment and Erosion Control Manual*, or the *NC DOT Construction and Maintenance Activities Manual*, such as sandbags, rock berms, cofferdams, and other diversion structures shall be used to minimize excavation in flowing water. Exceptions to this condition require application to and written approval from DWR. [15A NCAC 02H .0506(b)(3) and (c)(3)]
10. If activities must occur during periods of high biological activity (e.g. sea turtle nesting, fish spawning, or bird nesting), then biological monitoring may be required at the request of other state or federal agencies and coordinated with these activities. [15A NCAC 02H .0506 (b)(2) and 15A NCAC 04B .0125]

All moratoriums on construction activities established by the NC Wildlife Resources Commission (WRC), US Fish and Wildlife Service (USFWS), NC Division of Marine Fisheries (DMF), or National Marine Fisheries Service (NMFS) shall be implemented. Exceptions to this condition require written approval by the resource agency responsible for the given moratorium. A copy of the approval from the resource agency shall be forwarded to DWR.

Work within a designated trout watershed of North Carolina (as identified by the Wilmington District of the US Army Corps of Engineers), or identified state or federal endangered or threatened species habitat, shall be coordinated with the appropriate WRC, USFWS, NMFS, and/or DMF personnel.

11. Culverts shall be designed and installed in such a manner that the original stream profiles are not altered and allow for aquatic life movement during low flows. The dimension, pattern, and profile of the stream above and below a pipe or culvert shall not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed culvert shall be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. [15A NCAC 02H .0506(b)(2) and (c)(2)]

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Placement of culverts and other structures in streams shall be below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20% of the culvert diameter for culverts having a diameter less than or equal to 48 inches, to allow low flow passage of water and aquatic life.

If multiple pipes or barrels are required, they shall be designed to mimic the existing stream cross section as closely as possible including pipes or barrels at flood plain elevation and/or sills where appropriate. Widening the stream channel shall be avoided.

When topographic constraints indicate culvert slopes of greater than 5%, culvert burial is not required, provided that all alternative options for flattening the slope have been investigated and aquatic life movement/connectivity has been provided when possible (e.g. rock ladders, cross vanes, etc.). Notification, including supporting documentation to include a location map of the culvert, culvert profile drawings, and slope calculations, shall be provided to DWR 60 calendar days prior to the installation of the culvert.

When bedrock is present in culvert locations, culvert burial is not required provided that there is sufficient documentation of the presence of bedrock. Notification, including supporting documentation such as, a location map of the culvert, geotechnical reports, photographs, etc. shall be provided to DWR a minimum of 60 calendar days prior to the installation of the culvert. If bedrock is discovered during construction, then DWR shall be notified by phone or email within 24 hours of discovery.

If other site-specific topographic constraints preclude the ability to bury the culverts as described above and/or it can be demonstrated that burying the culvert would result in destabilization of the channel, then exceptions to this condition require application to and written approval from DWR.

Installation of culverts in wetlands shall ensure continuity of water movement and be designed to adequately accommodate high water or flood conditions. When roadways, causeways, or other fill projects are constructed across FEMA-designated floodways or wetlands, openings such as culverts or bridges shall be provided to maintain the natural hydrology of the system as well as prevent constriction of the floodway that may result in destabilization of streams or wetlands.

The establishment of native woody vegetation and other soft stream bank stabilization techniques shall be used where practicable instead of rip-rap or other bank hardening methods.

12. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means to the maximum extent practicable (e.g. grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Exceptions to this condition require application to and written approval from DWR. [15A NCAC 02H .0506(b)(5)]

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13. Application of fertilizer to establish planted/seeded vegetation within disturbed riparian areas and/or wetlands shall be conducted at agronomic rates and shall comply with all other Federal, State and Local regulations. Fertilizer application shall be accomplished in a manner that minimizes the risk of contact between the fertilizer and surface waters. [15A NCAC 02B .0200 and 15A NCAC 02B .0231]
14. If concrete is used during construction, then all necessary measures shall be taken to prevent direct contact between uncured or curing concrete and waters of the state. Water that inadvertently contacts uncured concrete shall not be discharged to waters of the state. [15A NCAC 02B .0200]
15. All proposed and approved temporary fill and culverts shall be removed and the impacted area shall be returned to natural conditions within 60 calendar days after the temporary impact is no longer necessary. The impacted areas shall be restored to original grade, including each stream's original cross sectional dimensions, planform pattern, and longitudinal bed profile. For projects that receive written approval, no temporary impacts are allowed beyond those included in the application and authorization. All temporarily impacted sites shall be restored and stabilized with native vegetation. [15A NCAC 02H .0506(b)(2) and (c)(2)]
16. All proposed and approved temporary pipes/culverts/rip-rap pads etc. in streams shall be installed as outlined in the most recent edition of the *North Carolina Sediment and Erosion Control Planning and Design Manual* or the *North Carolina Surface Mining Manual* or the *North Carolina Department of Transportation Best Management Practices for Construction and Maintenance Activities* so as not to restrict stream flow or cause dis-equilibrium during use of this Certification. [15A NCAC 02H .0506(b)(2) and (c)(2)]
17. Any rip-rap required for proper culvert placement, stream stabilization, or restoration of temporarily disturbed areas shall be restricted to the area directly impacted by the approved construction activity. All rip-rap shall be placed such that the original stream elevation and streambank contours are restored and maintained. Placement of rip-rap or other approved materials shall not result in de-stabilization of the stream bed or banks upstream or downstream of the area or in a manner that precludes aquatic life passage. [15A NCAC 02H .0506(b)(2)]
18. Any rip-rap used for stream or shoreline stabilization shall be of a size and density to prevent movement by wave, current action, or stream flows and shall consist of clean rock or masonry material free of debris or toxic pollutants. Rip-rap shall not be installed in the streambed except in specific areas required for velocity control and to ensure structural integrity of bank stabilization measures. [15A NCAC 02H .0506(b)(2)]
19. Applications for rip-rap groins proposed in accordance with 15A NCAC 07H .1401 (NC Division of Coastal Management General Permit for construction of Wooden and Rip-rap Groins in Estuarine and Public Trust Waters) shall meet all the specific conditions for design and construction specified in 15A NCAC 07H .1405.

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20. All mechanized equipment operated near surface waters shall be inspected and maintained regularly to prevent contamination of surface waters from fuels, lubricants, hydraulic fluids, or other toxic materials. Construction shall be staged in order to minimize the exposure of equipment to surface waters to the maximum extent practicable. Fueling, lubrication and general equipment maintenance shall be performed in a manner to prevent, to the maximum extent practicable, contamination of surface waters by fuels and oils. [15A NCAC 02H .0506(b)(3) and (c)(3) and 15A NCAC 02B .0211 (12)]
21. Heavy equipment working in wetlands shall be placed on mats or other measures shall be taken to minimize soil disturbance. [15A NCAC 02H .0506(b)(3) and (c)(3)]
22. In accordance with 143-215.85(b), the applicant shall report any petroleum spill of 25 gallons or more; any spill regardless of amount that causes a sheen on surface waters; any petroleum spill regardless of amount occurring within 100 feet of surface waters; and any petroleum spill less than 25 gallons that cannot be cleaned up within 24 hours.
- * 23. If an environmental document is required under the State Environmental Policy Act (SEPA), then this General Certification is not valid until a Finding of No Significant Impact (FONSI) or Record of Decision (ROD) is issued by the State Clearinghouse. If an environmental document is required under the National Environmental Policy Act (NEPA), then this General Certification is not valid until a Categorical Exclusion, the Final Environmental Assessment, or Final Environmental Impact Statement is published by the lead agency. [15A NCAC 01C .0107(a)]
24. This General Certification does not relieve the applicant of the responsibility to obtain all other required Federal, State, or Local approvals before proceeding with the project, including those required by, but not limited to, Sediment and Erosion Control, Non-Discharge, Water Supply Watershed, and Trout Buffer regulations.
25. The applicant and their authorized agents shall conduct all activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act), and any other appropriate requirements of State and Federal Law. If DWR determines that such standards or laws are not being met, including failure to sustain a designated or achieved use, or that State or Federal law is being violated, or that further conditions are necessary to assure compliance, then DWR may revoke or modify a written authorization associated with this General Water Quality Certification. [15A NCAC 02H .0507(d)]
26. The permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this Certification. A copy of this Certification, including all conditions shall be available at the project site during the construction and maintenance of this project. [15A NCAC 02H .0507 (c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]

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- * 27. When written authorization is required for use of this Certification, upon completion of all permitted impacts included within the approval and any subsequent modifications, the applicant shall be required to return a certificate of completion (available on the DWR website <https://edocs.deq.nc.gov/Forms/Certificate-of-Completion>). [15A NCAC 02H .0502(f)]
- 28. Additional site-specific conditions, including monitoring and/or modeling requirements, may be added to the written approval letter for projects proposed under this Water Quality Certification in order to ensure compliance with all applicable water quality and effluent standards. [15A NCAC 02H .0507(c)]
- 29. If the property or project is sold or transferred, the new permittee shall be given a copy of this Certification (and written authorization if applicable) and is responsible for complying with all conditions. [15A NCAC 02H .0501 and .0502]

III. GENERAL CERTIFICATION ADMINISTRATION:

- * 1. In accordance with North Carolina General Statute 143-215.3D(e), written approval for a 401 Water Quality General Certification must include the appropriate fee. An applicant for a CAMA permit under Article 7 of Chapter 113A of the General Statutes for which a Water Quality Certification is required shall only make one payment to satisfy both agencies; the fee shall be as established by the Secretary in accordance with 143-215.3D(e)(7).
- 2. This Certification neither grants nor affirms any property right, license, or privilege in any waters, or any right of use in any waters. This Certification does not authorize any person to interfere with the riparian rights, littoral rights, or water use rights of any other person and this Certification does not create any prescriptive right or any right of priority regarding any usage of water. This Certification shall not be interposed as a defense in any action respecting the determination of riparian or littoral rights or other rights to water use. No consumptive user is deemed by virtue of this Certification to possess any prescriptive or other right of priority with respect to any other consumptive user regardless of the quantity of the withdrawal or the date on which the withdrawal was initiated or expanded.
- 3. This Certification grants permission to the Director, an authorized representative of the Director, or DWR staff, upon the presentation of proper credentials, to enter the property during normal business hours. [15A NCAC 02H .0502(e)]
- 4. This General Certification shall expire on the same day as the expiration date of the corresponding Nationwide Permit and/or Regional General Permit. The conditions in effect on the date of issuance of Certification for a specific project shall remain in effect for the life of the project, regardless of the expiration date of this Certification. This General Certification is rescinded when the US Army Corps of Engineers reauthorizes any of the corresponding Nationwide Permits and/or Regional General Permits or when deemed appropriate by the Director of the Division of Water Resources.

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5. Non-compliance with or violation of the conditions herein set forth by a specific project may result in revocation of this General Certification for the project and may also result in criminal and/or civil penalties.
- * 6. The Director of the North Carolina Division of Water Resources may require submission of a formal application for Individual Certification for any project in this category of activity if it is deemed in the public's best interest or determined that the project is likely to have a significant adverse effect upon water quality, including state or federally listed endangered or threatened aquatic species, or degrade the waters so that existing uses of the water or downstream waters are precluded.

History Note: Water Quality Certification (WQC) Number 4135 issued December 1, 2017 replaces WQC Number 4088 issued March 3, 2017; WQC 3886 issued March 12, 2012; WQC Number 3820 issued April 6, 2010; WQC Number 3627 issued March 2007; WQC Number 3404 issued March 2003; WQC Number 3375 issued March 18, 2002; WQC Number 3289 issued June 1, 2000; WQC Number 3103 issued February 11, 1997; WQC Number 2732 issued May 1, 1992; WQC Number 2666 issued January 21, 1992; WQC Number 2177 issued November 5, 1987.



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ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

WILLIAM E. VINSON, JR.
Interim Director

August 28, 2018

Mr. David McHenry
Environmental Officer
N C Department of Transportation/ Division 14
253 Webster Road
Sylva, NC 28779

Subject: Trout Buffer Zone Waiver
TIP R5734A
Macon County

Dear Mr. McHenry:

This office has received your plan for widening on US 441 over and adjacent to Cartoogechaye Creek and upper tributaries in Macon County, North Carolina. Your plan was submitted to this office for approval because of the proposed encroachments into the buffer zone of designated trout waters. In accordance with NCGS 113A-57(1) and Title 15A NCAC 4B .0125(c) this letter will serve as written approval to encroach on the buffer zone of the Cartoogechaye Creek Class B; Trout and its unnamed tributaries. This authority has been delegated to me by William E. (Toby) Vinson, Jr., Interim Director, Division of Energy, Mineral and Land Resources. This approval is based on the plans received via email on May 4, 2018. The following conditions will apply to this approval:

1. It is required that the plantings in the trout buffer are selected from the attached Guidelines for Riparian Buffer Restoration. (15A NCAC 04B .0125(d))
2. Staging areas and material stockpiles shall be located out of the trout buffer zone. Stockpiles will be encompassed with silt fence excluding points of access. (G.S. 113A-57)

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3. Contact the North Carolina Wildlife Resources Commission to determine if a moratorium between October 15 and April 15 is applicable. The contact information is:

Andrea Leslie
Mountain Habitat Conservation Coordinator
NC Wildlife Resources Commission
20830 Great Smoky Mountain Expressway
Waynesville, NC 28786
828-558-6011; 828-400-4223 (cell)
www.ncwildlife.org

4. This approval does not absolve the permittee from compliance with the surface water turbidity standard. More protective erosion and sedimentation control measures may be required to comply with this water quality standard. (G.S. 113A-54.1(a))

Your cooperation in protecting our environment is most appreciated. If you have any questions about this approval, please contact me at stan.aiken@ncdenr.gov or (828) 296-4610.

Sincerely,



Stanley E. Aiken, PE^{GA}
Regional Engineer
Land Quality Section

Enclosure: Guidelines for Riparian Buffer Restoration

cc: William E. Vinson, Jr, PE, CPESC, CPM, Interim Director, DEMLR
(toby.vinson@ncdenr.gov)
Julie Coco, PE, State Sediment Specialist (julie.coco@ncdenr.gov)
Zan Price, PE, Division of Water Resources (zan.price@ncdenr.gov)
David McHenry, Environmental Officer, NCDOT (dgmchenry@ncdot.gov)

Guidelines for Riparian Buffer Restoration

Department of Environment and Natural Resources
Division of Water Quality
Wetlands Restoration Program
Raleigh, NC
January 2001



Purpose of these Guidelines

Riparian buffers have been identified as a valuable tool for protection of water quality when properly designed and established in the appropriate landscape setting. For this reason, the goal of the North Carolina Wetlands Restoration Program (NCWRP) is to implement projects to restore riparian buffers that have the greatest value for reducing pollutants in our surface waters as well as provide important aquatic and wildlife habitat. The purpose of these guidelines is to provide the technical information necessary for the successful planning and establishment of riparian buffers. The guidelines are intended for use by private consultants in developing restoration plans for the NCWRP but should also have utility for private landowners as well as local governments involved in the restoration of riparian buffers.



Criteria for Priority
Riparian Buffer Restoration Projects

A number of factors determine the success of particular riparian buffer restoration projects. In addition to the physical characteristics of the site, issues such as land costs, land ownership, and logistical constraints must be taken into consideration. The following physical characteristics are intended to provide general guidance when identifying sites and are not intended to exclude sites that may have merit based on other criteria.

- Woody vegetation absent or sparse (less than 100 stems per acre that are ≥ 5 inches diameter at breast height) measured within 50 feet of intermittent and perennial streams, lakes, ponds, and shorelines.
- Adjacent to headwater streams or those streams defined as first, second, or third order.
- Project length greater than 1,000 feet (for projects implemented by the NCWRP).
- Ditches, gullies, or evidence of concentrated flow within 50 feet of intermittent and perennial streams, lakes, ponds, and estuaries.
- Adjacent source of nitrogen including cropland, pasture, golf course, residential development, ball fields, etc.
- Water table depth within three to four feet of surface as determined by characteristics of soil cores.



Components of a Riparian Buffer
Restoration/Enhancement Plan

Site Assessment

The riparian area to be restored should be evaluated with respect to these factors that control the viability of riparian plants:

- Soil moisture
- Soil pH
- Soil texture
- Seasonal high water table depth
- Flooding potential
- Aspect, topography, and microtopographic relief

Site Preparation

The restoration/enhancement plan should address these items regarding preparation of the site for planting:

- Plow or rip site to improve compacted soil and/or eliminate areas where channelized flow has developed.
- Control of sod-forming grasses such as fescue and Kentucky bluegrass that will compete with plantings for nutrients.
- Control of invasive, exotic plants that would hinder the re-establishment of woody vegetation. Proposals for pesticide use should always be reviewed by the North Carolina Division of Water Quality staff to insure compliance with the Neuse and Tar-Pamlico Riparian Buffer Rules.

Common Invasive Exotic Plants
in North Carolina
Ailanthus altissima (Tree-of-Heaven)
Albizia julibrissin (Mimosa)
Elaeagnus umbellata (Autumn
Olive)
Hedera helix (English Ivy)
Lespedeza cuneata (Korean or
Sericea Lespedeza)
Ligustrum sinense (Chinese Privet)
Lonisera japonica (Japanese
Honeysuckle)
Microstegium vimineum (Japanese
Grass)
Paulownia tomentosa (Princess
Tree)
Pueraria lobata (Kudzu)
Rosa multiflora (Multiflora Rose)
Wisteria sinensis (Chinese Wisteria)

- Stabilize areas of bare soil. Refer to the following list for species of grasses/sedge appropriate for soil stabilization. The majority of these species are by necessity not native to North Carolina. At present, there are only a few species of native grasses useful for erosion control that are commercially available. Please note that fescue grasses should not be used for soil stabilization. Fescue grasses, particularly tall fescue, are competitive and will inhibit the eventual re-establishment of native species.

Agrostis alba (Redtop)

Found in fields, pastures, roadsides, and other disturbed places throughout North Carolina, this native warm season grass should be

used sparingly for erosion control and soil stabilization.

Carex stricta (Sedge)

This sedge occurs naturally in marshes and low meadows throughout the mountains and northern piedmont and coastal plain of North Carolina. This species has utility in a mix for soil stabilization in moist areas.

Dactylis glomerata (Orchardgrass)

This perennial, cool season bunchgrass is a good alternative to fescue because it is less competitive and allows native herbs to colonize the site.

Hordeum spp. (Barley)

A number of species of barley can be used for soil stabilization. Barley is a cool season, annual grass that when moisture is available will germinate in the fall, stay green during the winter, and then die in the spring as competition for warm season plants increases.

Panicum clandestinum (Deer
Tongue)

This native, perennial, warm season bunchgrass can be used in moist low woods primarily in the piedmont and mountains.

Panicum spp. (Panic Grasses)

A number of species of panic grasses can be used for soil stabilization

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depending on the moisture regime and soils of the site.

Panicum virgatum (Switchgrass)

This native, perennial, warm season bunchgrass can tolerate a wide range of moisture regimes. It can be used along streams, in wet or dry woods, brackish and freshwater marshes, sloughs, swales, and low pinelands primarily in the eastern piedmont and coastal plain.

Pennisetum glaucum (Brown Top or Pearl Millet)

This fast-growing, robust, annual grass exhibits good drought tolerance which makes this species an important warm season option for soil stabilization.

Phalaris arundinacea (Reed Canarygrass)

A native to North Carolina, this perennial cool season grass is used for the stabilization of pond shorelines, drainage ditches, and streambanks in the mountains and western piedmont. It is established by planting freshly cut stem slips or rhizome fragments. Please note that this species is aggressive and forms large monotypic stands that displace other species. It should only be used if no other species are available.

Secale cereale (Winter Rye or Rye Grain)

Winter rye is a cold-hardy annual grass that will germinate and grow at low temperatures. By maturing early, it offers less competition

during the late spring, a critical time in the establishment of perennial species. Winter rye germinates quickly and is tolerant of poor soils.

Sorghum bicolor (Sudangrass)

Only the small-stemmed varieties of this annual warm season grass should be used. Sudangrass is useful for temporary seeding, and it is adapted to soils relatively high in clay content. Seed for common Sudangrass is not always available, but other small-stemmed types may be used, such as the hybrid Trudan. The coarse-stemmed Sorghum-Sudangrass hybrids are not appropriate for erosion control.

Suppliers of Grass Seed*

Ernst Conservation Seeds
9006 Mercer Pike
Meadville, PA 16335
814-336-2404
800-873-3321

Lofts Seed Company, Inc.
P.O. Box 26223
Winston-Salem, NC 27114-6223
800-543-7333

Mellow Marsh Farm
205 Anolis Road
Pittsboro, NC 27312
919-542-3532

Southern Tier Consulting, Inc.
2701-A Route 305
P.O. Box 30
West Clarksville, NY 14786
800-848-7614

*North Carolina suppliers are preferred.



Riparian Buffer Design

Species Diversity and Composition

The most effective riparian buffers have trees and shrubs to provide perennial root systems and long-term nutrient storage. The design of a riparian buffer can be modified to fit the landscape and the landowner's needs, for example, by replacing shrubs with more trees, substituting some of the trees with shrubs, or incorporating a grass zone. In any scenario, the width of the woody vegetation should be at least 30 feet directly adjacent to the streambank/shoreline.

Choose 10-12 species of native trees and/or shrubs appropriate for site based on site assessment and reference conditions. In addition, please note that this list is alphabetical and does not take into account the assemblages of plants

found in nature. The inventory of plants found on the reference site can help determine an appropriate assemblage for the restoration site. In addition, the North Carolina Natural Heritage Program's *Classification of the Natural Communities of North Carolina: Third Approximation* is a valuable reference on natural assemblages of plants (Shafele, Michael P. and Alan S. Weakley, 1990).

Typically, there should be at least three or four understory trees for every canopy tree to provide structural diversity similar to mature forests. Where shrub species are incorporated into the planting plan, they should be distributed more densely at outer edge of riparian buffer to reduce light penetration and recolonization by invasive exotic species. Refer to Table 1 for a list of native tree and shrub species appropriate for use in riparian buffers.

Table 1. Master List of Native Plants

Native Regions	Light Requirements	Moisture Requirements
M= Mountains	S= Shade	L= Low Moisture
P= Piedmont	P= Partial Sun	M= Moderate Moisture
C= Coastal Plain	F= Full Sun	H= High Moisture
		A= Aquatic

Scientific Name	Common Name	Region			Light			Moisture				
		M	P	C	S	P	F	L	M	H	A	
Medium to Large Trees												
<i>Acer barbatum</i>	Southern sugar maple		X	X	X	X				X		
<i>Acer saccharinum</i>	silver maple		X		X	X	X		X			
<i>Acer saccharum</i>	sugar maple	X					X	X	X			
<i>Betula alleghaniensis</i>	yellow birch	X			X	X			X			
<i>Betula lenta</i>	cherry birch, sweet birch	X			X	X			X			
<i>Betula nigra</i>	river birch	X	X	X		X	X		X	X		
<i>Carya aquatica</i>	water hickory			X		X	X			X		
<i>Carya cordiformis</i>	bitternut hickory	X	X	X	X	X	X		X	X		
<i>Carya glabra</i>	pignut hickory	X	X	X	X	X	X	X	X			

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Scientific Name	Common Name	Region			Light			Moisture				
		M	P	C	S	P	F	L	M	H	A	
<i>Carya ovata</i>	shagbark hickory	X	X	X	X	X	X	X				
<i>Carya tomentosa</i>	mockernut hickory	X	X	X	X	X	X	X	X			
<i>Cellis laevigata</i>	sugarberry, hackberry		X	X	X	X			X			
<i>Chamaecyparis thyoides</i>	Atlantic white cedar			X		X	X		X	X		
<i>Cladrastis kentuckea</i>	yellowwood	X			X	X			X			
<i>Diospyros virginiana</i>	persimmon	X	X	X	X	X	X	X	X			
<i>Fagus grandifolia</i>	American beech	X	X	X	X	X			X			
<i>Fraxinus americana</i>	white ash	X	X	X	X	X			X			
<i>Fraxinus pennsylvanica</i>	green ash	X	X	X	X	X			X	X		
<i>Fraxinus profunda</i>	pumpkin ash, red ash		X	X		X				X		
<i>Juglans nigra</i>	black walnut	X	X	X	X	X			X			
<i>Liriodendron tulipifera</i>	tulip poplar, yellow poplar	X	X	X	X	X	X		X			
<i>Magnolia acuminata</i>	cucumber magnolia	X	X		X	X			X			
<i>Magnolia fraseri</i>	Fraser magnolia	X				X			X			
<i>Nyssa aquatica</i>	water tupelo			X	X	X	X			X	X	
<i>Nyssa sylvatica</i>	black gum	X	X	X	X	X	X	X	X			
<i>Nyssa sylvatica var. biflora</i>	swamp black gum			X	X	X	X			X		
<i>Oxydendrum arboreum</i>	sourwood	X	X	X		X	X	X	X			
<i>Picea rubens</i>	red spruce	X			X	X	X		X			
<i>Pinus echinata</i>	shortleaf pine	X	X	X		X	X	X				
<i>Pinus palustris</i>	longleaf pine		X	X			X	X	X			
<i>Pinus rigida</i>	pitch pine	X					X	X				
<i>Pinus serotina</i>	pond pine			X			X		X	X		
<i>Pinus strobus</i>	white pine	X	X			X	X		X			
<i>Platanus occidentalis</i>	sycamore	X	X	X		X	X		X	X		
<i>Populus deltoides</i>	eastern cottonwood		X	X			X			X		
<i>Populus heterophylla</i>	swamp cottonwood			X		X	X			X		
<i>Prunus serotina</i>	black cherry	X	X	X	X	X	X	X	X			
<i>Quercus alba</i>	white oak	X	X	X		X	X	X	X			
<i>Quercus bicolor</i>	swamp white oak		X		X	X				X		
<i>Quercus coccinea</i>	scarlet oak	X	X		X	X		X				
<i>Quercus falcata</i>	Southern red oak	X	X	X	X	X		X	X			
<i>Quercus pagoda</i>	cherrybark oak		X	X	X	X			X	X		
<i>Quercus laurifolia</i>	laurel oak			X	X	X	X		X	X		
<i>Quercus lyrata</i>	overcup oak		X	X	X	X				X		
<i>Quercus margaretta</i>	sand post oak			X		X	X	X				
<i>Quercus marilandica</i>	black jack oak	X	X	X	X	X		X				
<i>Quercus michauxii</i>	swamp chestnut oak		X	X	X	X	X		X	X		
<i>Quercus nigra</i>	water oak		X	X	X	X	X	X	X			
<i>Quercus phellos</i>	willow oak		X	X	X	X	X		X	X		
<i>Quercus prinus</i>	chestnut oak	X	X		X	X		X				
<i>Quercus rubra</i>	Northern red oak	X	X		X	X		X	X			
<i>Quercus shumardii</i>	shumard oak		X	X	X	X			X	X		
<i>Quercus stellata</i>	post oak	X	X	X	X	X		X				
<i>Quercus velutina</i>	black oak	X	X	X	X	X		X				
<i>Quercus virginiana</i>	live oak			X		X	X	X				
<i>Robinia pseudoacacia</i>	black locust	X	X	X		X	X		X			
<i>Taxodium ascendens</i>	pond-cypress			X		X	X				X	
<i>Taxodium distichum</i>	bald-cypress			X		X	X					X

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Scientific Name	Common Name	Region			Light			Moisture			
		M	P	C	S	P	F	L	M	H	A
<i>Tilia americana</i> var. <i>heterophylla</i>	basswood	X	X		X	X			X		
<i>Tsuga canadensis</i>	Eastern hemlock	X	X		X	X	X		X		
<i>Tsuga caroliniana</i>	Carolina hemlock	X	X			X	X	X			
<i>Ulmus alata</i>	winged elm		X	X	X	X	X	X	X		
<i>Ulmus americana</i>	American elm	X	X	X	X	X			X		
Small Trees											
<i>Amelanchier arborea</i>	downy serviceberry, shadbush	X	X	X	X	X			X		
<i>Amelanchier canadensis</i>	Canada serviceberry			X				X	X	X	
<i>Amelanchier laevis</i>	smooth serviceberry	X				X	X	X	X		
<i>Asimina triloba</i>	pawpaw	X	X	X	X	X			X		
<i>Carpinus caroliniana</i>	ironwood, American hornbeam	X	X	X	X	X			X	X	
<i>Cercis canadensis</i>	eastern redbud	X	X	X	X	X			X		
<i>Chionanthus virginicus</i>	white fringetree, old man's beard	X	X	X		X	X		X		
<i>Cornus alternifolia</i>	alternate-leaf dogwood	X			X	X			X		
<i>Cornus florida</i>	flowering dogwood	X	X	X	X	X			X	X	
<i>Crateagus crus-galli</i>	cockspur hawthorn	X	X	X		X	X	X	X		
<i>Crateagus flabellata</i>	fanleaf hawthorn	X	X			X			X		
<i>Crateagus flava</i>	October haw	X	X	X		X	X		X		
<i>Cyrilla racemiflora</i>	titi			X		X	X		X	X	
<i>Fraxinus caroliniana</i>	water ash			X	X	X				X	
<i>Gordonia lasianthus</i>	loblolly bay			X	X	X	X		X	X	
<i>Halesia tetraptera</i> (<i>H. carolina</i>)	common silverbell	X	X		X	X			X		
<i>Ilex opaca</i>	American holly	X	X	X	X	X			X	X	X
<i>Juniperus virginiana</i>	Eastern red cedar	X	X	X		X	X	X	X		
<i>Magnolia tripetala</i>	umbrella tree	X	X		X				X		
<i>Magnolia virginiana</i>	sweetbay magnolia		X	X	X	X	X		X	X	
<i>Morus rubra</i>	red mulberry	X	X	X	X	X			X		
<i>Osmanthus americana</i>	wild olive, devilwood			X	X	X			X		
<i>Ostrya virginiana</i>	Eastern hop-hornbeam	X	X		X	X			X		
<i>Persea borbonia</i>	red bay			X	X	X	X	X	X		
<i>Persea palustris</i>	swamp bay			X	X	X	X		X	X	
<i>Pinus pungens</i>	table mountain pine	X					X	X			
<i>Prunus americana</i>	American wild plum	X	X			X			X		
<i>Prunus caroliniana</i>	Carolina laurel-cherry			X		X	X	X	X		
<i>Quercus incana</i>	bluejack oak			X		X	X	X			
<i>Quercus laevis</i>	turkey oak			X		X	X	X			
<i>Rhus glabra</i>	smooth sumac	X	X				X	X	X		
<i>Rhus hirta</i> (<i>Rhus typhina</i>)	staghorn sumac	X					X	X			
<i>Salix caroliniana</i>	swamp willow	X	X	X		X	X		X	X	
<i>Salix nigra</i>	black willow	X	X	X		X	X		X	X	
<i>Sassafras albidum</i>	sassafras	X	X	X		X	X	X	X		
<i>Staphylea trifolia</i>	bladdernut		X		X				X	X	
<i>Symplocos tinctoria</i>	horse-sugar, sweetleaf	X	X	X	X	X			X	X	
<i>Ulmus rubra</i>	slippery elm	X	X		X	X			X		
Shrubs											
<i>Aesculus sylvatica</i>	painted buckeye	X	X		X	X			X		
<i>Alnus serrulata</i> *	common alder	X	X	X	X	X	X			X	X

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Scientific Name	Common Name	Region			Light			Moisture			
		M	P	C	S	P	F	L	M	H	A
<i>Aronia arbutifolia</i>	red chokeberry	X	X	X	X	X			X	X	
<i>Baccharis halimifolia</i>	silverling		X	X			X	X	X	X	
<i>Callicarpa americana</i>	American beautyberry		X	X	X	X	X		X		
<i>Calycanthus floridus</i>	sweet-shrub	X	X		X	X			X		
<i>Castanea pumila</i>	Allegheny chinkapin	X	X	X	X	X	X	X			
<i>Ceanothus americanus</i>	New Jersey tea	X	X	X		X	X	X			
<i>Cephalanthus occidentalis</i>	buttonbush	X	X	X		X	X				X
<i>Clethra acuminata</i>	mountain sweet pepperbush	X			X	X			X		
<i>Clethra alnifolia</i>	sweet pepperbush			X	X	X			X	X	
<i>Comptonia peregrina</i>	sweet fern	X	X			X	X				
<i>Cornus amomum</i>	silky dogwood	X	X	X	X	X				X	X
<i>Cornus stricta</i>	swamp dogwood			X	X	X				X	
<i>Corylus americana</i>	American hazel, hazelnut	X	X		X	X			X		
<i>Euonymus americanus</i>	hearts-a-bustin', strawberry bush	X	X	X	X	X		X	X		
<i>Fothergilla gardenii</i>	witch-alder			X		X			X	X	
<i>Gaylussacia frondosa</i>	dangleberry			X	X	X	X		X	X	
<i>Hamamelis virginiana</i>	witch hazel	X	X	X	X	X		X	X		
<i>Hydrangea arborescens</i>	wild hydrangea	X	X		X	X			X		
<i>Ilex coriacea</i>	gallberry			X	X	X			X	X	
<i>Ilex decidua</i>	deciduous holly, possumhaw		X	X	X	X			X		
<i>Ilex glabra</i>	inkberry			X	X	X	X		X	X	
<i>Ilex verticillata</i>	winterberry	X	X	X	X	X	X		X	X	
<i>Ilex vomitoria</i>	yaupon holly			X	X	X	X	X			
<i>Itea virginica</i>	Virginia willow		X	X	X	X				X	
<i>Kalmia angustifolia</i> var. <i>caroliniana</i>	lamb-kill, sheep-kill			X		X	X		X	X	
<i>Kalmia latifolia</i>	mountain laurel	X	X		X	X		X	X		
<i>Leucothoe axillaris</i>	coastal dog-hobble			X	X	X			X		
<i>Leucothoe fontanesiana</i>	dog-hobble	X	X		X				X		
<i>Leucothoe racemosa</i>	fetterbush		X	X	X	X			X	X	
<i>Lindera benzoin</i>	spicebush	X	X		X				X		
<i>Lyonia ligustrina</i>	northern maleberry	X	X	X		X			X	X	
<i>Lyonia lucida</i>	shining fetterbush			X	X	X			X		
<i>Myrica cerifera</i> *	Southern wax-myrtle		X	X	X	X	X	X	X	X	
<i>Myrica cerifera</i> var. <i>pumila</i> *	dwarf Southern wax-myrtle			X		X	X	X	X		
<i>Myrica heterophylla</i> *	bayberry, evergreen bayberry			X	X	X			X		
<i>Pieris floribunda</i>	evergreen mountain fetterbush	X					X	X	X		
<i>Rhododendron atlanticum</i>	dwarf azalea			X		X			X		
<i>Rhododendron calendulaceum</i>	flame azalea	X			X	X			X		
<i>Rhododendron catawbiense</i>	Catawba rhododendron	X	X		X	X	X	X	X		
<i>Rhododendron maximum</i>	rosebay rhododendron	X	X		X	X		X	X		
<i>Rhododendron periclymenoides</i>	pinxter flower, wild azalea	X	X	X	X	X			X		
<i>Rhododendron viscosum</i>	swamp azalea	X		X		X	X		X	X	
<i>Rhus copallina</i>	winged sumac	X	X	X		X	X	X	X		
<i>Rosa carolina</i>	pasture rose, Carolina rose	X	X	X		X	X	X	X		
<i>Rosa palustris</i>	swamp rose	X	X	X		X	X				X
<i>Rubus allegheniensis</i>	Alleghany blackberry	X	X				X	X			
<i>Rubus cuneifolius</i>	blackberry		X	X		X	X	X	X		
<i>Rubus odoratus</i>	purple flowering raspberry	X				X			X		
<i>Salix humilis</i>	prairie willow	X	X				X	X			

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Scientific Name	Common Name	Region			Light			Moisture			
		M	P	C	S	P	F	L	M	H	A
<i>Salix sericea</i>	silky willow	X	X	X		X	X				X
<i>Sambucus canadensis</i>	common elderberry	X	X	X			X		X	X	
<i>Spiraea alba</i>	narrow-leaved meadowsweet	X					X		X		
<i>Spiraea latifolia</i>	broad-leaved meadowsweet	X					X		X		
<i>Spiraea tomentosa</i>	meadowsweet	X	X	X		X	X			X	
<i>Stewartia malacodendron</i>	silky camellia			X	X	X			X		
<i>Stewartia ovata</i>	mountain camellia	X	X		X	X			X		
<i>Styrax grandifolia</i>	bingleaf snowbell		X	X	X	X			X		
<i>Vaccinium arboreum</i>	sparkleberry		X	X	X	X		X	X		
<i>Vaccinium corymbosum</i>	highbush blueberry	X	X	X	X	X	X	X	X	X	
<i>Vaccinium crassifolium</i>	creeping blueberry			X		X			X		
<i>Vaccinium elliotii</i>	mayberry			X	X				X		
<i>Vaccinium stamineum</i>	deerberry, gooseberry	X	X	X	X	X		X			
<i>Vaccinium pallidum</i>	lowbush blueberry	X	X		X	X		X			
<i>Viburnum acerifolium</i>	maple-leaf viburnum	X	X		X	X		X	X		
<i>Viburnum dentatum</i>	Southern arrowwood viburnum	X	X	X	X	X	X		X		
<i>Viburnum nudum</i>	possumhaw viburnum	X	X	X	X	X				X	
<i>Viburnum prunifolium</i>	blackhaw viburnum	X	X	X	X	X			X		
<i>Viburnum rafinesquianum</i>	downy arrowwood		X		X	X			X		
<i>Viburnum rufidulum</i>	rusty blackhaw		X	X	X	X		X			
<i>Xanthorhiza simplicissima</i>	yellowroot	X	X	X	X			X	X		

* These species fix nitrogen and should not be used for riparian restoration adjacent to Nutrient Sensitive Waters.

Where grasses are incorporated into the planting plan on the outside of the buffer strip, only native grasses should be used. Native grasses produce a much more extensive and deep root system than commonly used non-native grasses such as fescue.

<p>Common Native Grasses</p> <p><i>Andropogon gerardii</i> (Big Bluestem)</p> <p><i>Andropogon virginicus</i> (Broomsedge)</p> <p><i>Arundinaria gigantea</i> (Giant Cane)</p> <p><i>Eragrostis spectabilis</i> (Purple Love Grass)</p> <p><i>Panicum anceps</i> (Beaked Panicum)</p> <p><i>Panicum clandestinum</i> (Deertongue)</p> <p><i>Panicum hemitomom</i> (Maidencane)</p> <p><i>Panicum virgatum</i> (Switchgrass)</p> <p><i>Schizachyrium scoparium</i> (Little Bluestem)</p> <p><i>Sorghastrum nutans</i> (Indiangrass)</p> <p><i>Tridens flavus</i> (Purple-Top)</p> <p><i>Tripsacum dactyloides</i> (Gama Grass)</p>

Planting Density

Trees should be planted at a density sufficient to provide 320 trees per acre at maturity. To achieve this density, approximately 436 (10x10 feet spacing) to 681 (8x8 feet spacing) trees per acre should be planted initially. Shrubs should be planted at a density sufficient to provide 1,200 shrubs per acre. Refer to Table 2 for the number of trees and shrubs per acre based on various methods of spacing.

Table 2. Number of Trees/Shrubs per Acre by Various Methods of Spacing

Spacing (feet)	Trees/Shrubs (number)
2x2	10,890
3x3	4,840
4x4	2,722
5x5	1,742
6x6	1,210
7x7	889
8x8	681
9x9	538
10x10	436
11x11	360
12x12	302
13x13	258



Plant Size

In many cases, the most cost effective and successful size plant material is bare root seedlings. Some species such as the hickories do poorly as bare root seedlings and will be much more successful as containerized seedlings. In either case, tree shelters should be used to accelerate growth and increase survivability of seedlings. In addition, management of competing vegetation after planting is easier, mowing and weed wacker strikes are prevented, herbicides are isolated from trunk contact, and grazing by deer are restricted. The use of tree shelters may only be practical from an economic standpoint for more expensive seedlings of species difficult to establish, such as red oak. Reductions in maintenance costs and increased seedling vigor associated with tree shelters suggest that tree shelter plantings may be a more cost-effective approach than planting unprotected larger material. In urban or other high visibility areas, some specimen trees and shrubs should be incorporated into the planting plan for projects implemented by the NCWRP.

When live stakes or dormant cuttings are incorporated in a planting plan, choose only the previous season's growth. Live stakes should typically be approximately 3/4 inch in diameter and three feet long, and dormant cuttings should be approximately 1/2 inch in diameter and two feet long.

Supplier of Tree Shelters:
 Treessentials Company
 2371 Waters Drive
 Mendota Heights, MN 55120-1163
 800-248-8239

Suppliers of Native Plant Material

Local nurseries are the best option in acquiring plants that will be successful. Plants grown from seeds or cuttings collected close to the restoration area will be the most likely to survive and reproduce. The following is a list of nurseries that supply native plant material. This list is not considered exhaustive or an endorsement by the NCWRP but merely a source of potential vendors of native plants.

Carolina Greenery
375 Carthage Road
West End, NC 27376-8731
910-947-3150

Cedar Point Nursery and Garden Center
100 Commercial Court
Swansboro, NC 28584
252-393-6880

Coastal Plain Conservation Nursery
3067 Conners Drive
Edenton, NC 27932
252-482-5707

Cure Nursery
880 Buteo Road
Pittsboro, NC 27312
919-542-6186

Denton's Nursery
3535 NC 42 West
Wilson, NC 27893
252-237-0022

Fern Valley Farms
1624 Fern Valley Road
Yadkinville, NC 27055
336-463-2412

Hoffman Nursery
5520 Bahama Road
Rougemont, NC 27572
919-479-6620

Laurel Springs Nursery
401 Regal Street
Hendersonville, NC 28792
828-692-4012
888-823-4622

McLamb Nursery, Inc.
640 Greenleaf Road
Angier, NC 27501-9801
919-894-3709
800-900-3709

Mellow Marsh Farm
205 Anolis Road
Pittsboro, NC 27312
919-542-3532

NC Division of Forest Resources
Claridge Nursery
762 Claridge Nursery Road
Goldsboro, NC 27530
919-731-7988

NC Division of Forest Resources
Edwards Nursery
701 Sanford Drive
Morganton, NC 28655
828-438-6270

NC Division of Forest Resources
Linville Nursery
6321 Linville Falls Highway
Newland, NC 28657
828-733-5236

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Niche Gardens
1111 Dawson Road
Chapel Hill, NC 27516
919-967-0078

We-Du Nurseries
Rt. 5, Box 724
Marion, NC 28752
828-738-8300

Taylor's Nursery, Inc.
3705 New Bern Avenue
Raleigh, NC 27610
919-231-6161

Woodlander's, Inc.
1128 Colleton Ave.
Aiken, SC 29801
803-648-7522

Wa Ya Nursery & Tree Farm
11199 Canada Road
Tuckasegee, NC 28783
828-293-5720

For more information about suppliers of native plants contact:

Native Plant Sources'
North Carolina Botanical Garden
University of North Carolina at Chapel Hill
CB 3375, Totten Center
Chapel Hill, NC 27599-3375
919-962-0522

Planting Layout

The planting plan should indicate that trees and shrubs will be planted in a random pattern. For inexperienced planting crews, pre-labeled flagged wires can be used to mark the random location of plantings. These flags can also be color coded for each particular species. Various colors of spray paint can also be used to differentiate species.

Planting Practices

When planting seedlings, it is helpful to mark the plants with colored flagging to make them easier to locate during maintenance tasks. The flagging can also be color-coded to mark plants that have died for replacement at a later date.

Tree protectors are also helpful for locating plants.

Tree seedlings should be kept moist and should not be exposed for extended periods of time. A correctly planted tree should have the following general characteristics:

- Planted so that the root collar is slightly below the soil surface.
- Have the main roots nearly straight or spread out.
- Have soil firm around the roots.
- Have the tree in an upright position and have it nearly even with the general ground level, not sunk in a hole or raised on a mound.

Please note that the Neuse and Tar-Pamlico Riparian Buffer Rules allow for a one time fertilizer application to establish newly planted vegetation. Ongoing fertilizer application is prohibited by these rules.



Riparian Buffer Maintenance

Control of Grasses and Forbs

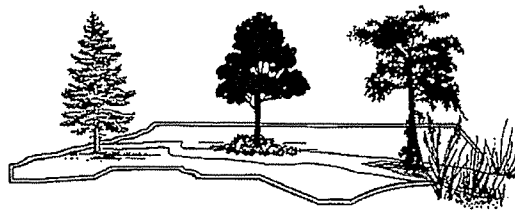
In the early stages of riparian buffer establishment, competition for nutrients by adjacent grasses and forbs will substantially inhibit seedling growth. Release from herbaceous competition has been demonstrated as the most cost-effective method to accelerate the growth of seedlings. The plan for buffer establishment must incorporate control of the herbaceous layer. Options for weed control include four to six inches of well-aged hardwood mulch, weed control fabrics, or pre-emergent herbicide. Typically, mowing to control

weeds will be impractical based on the random distribution of plantings. Weed control should be continued for three years from the time of planting.

Areas of Concentrated Flow

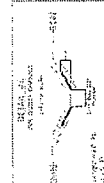
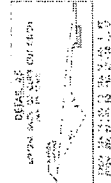
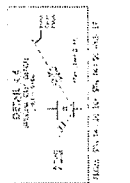
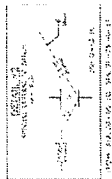
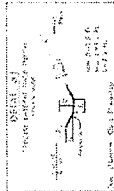
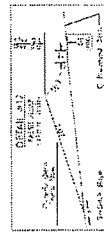
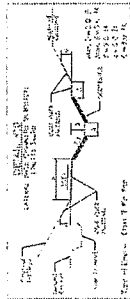
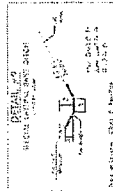
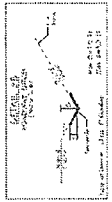
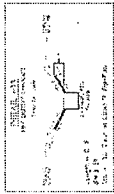
During the required five year monitoring period, the riparian buffer should be inspected for evidence of concentrated flow. If concentrated flow has begun to form, a level spreader or other best management practice should be installed to diffuse the flow before it enters the restored riparian buffer.

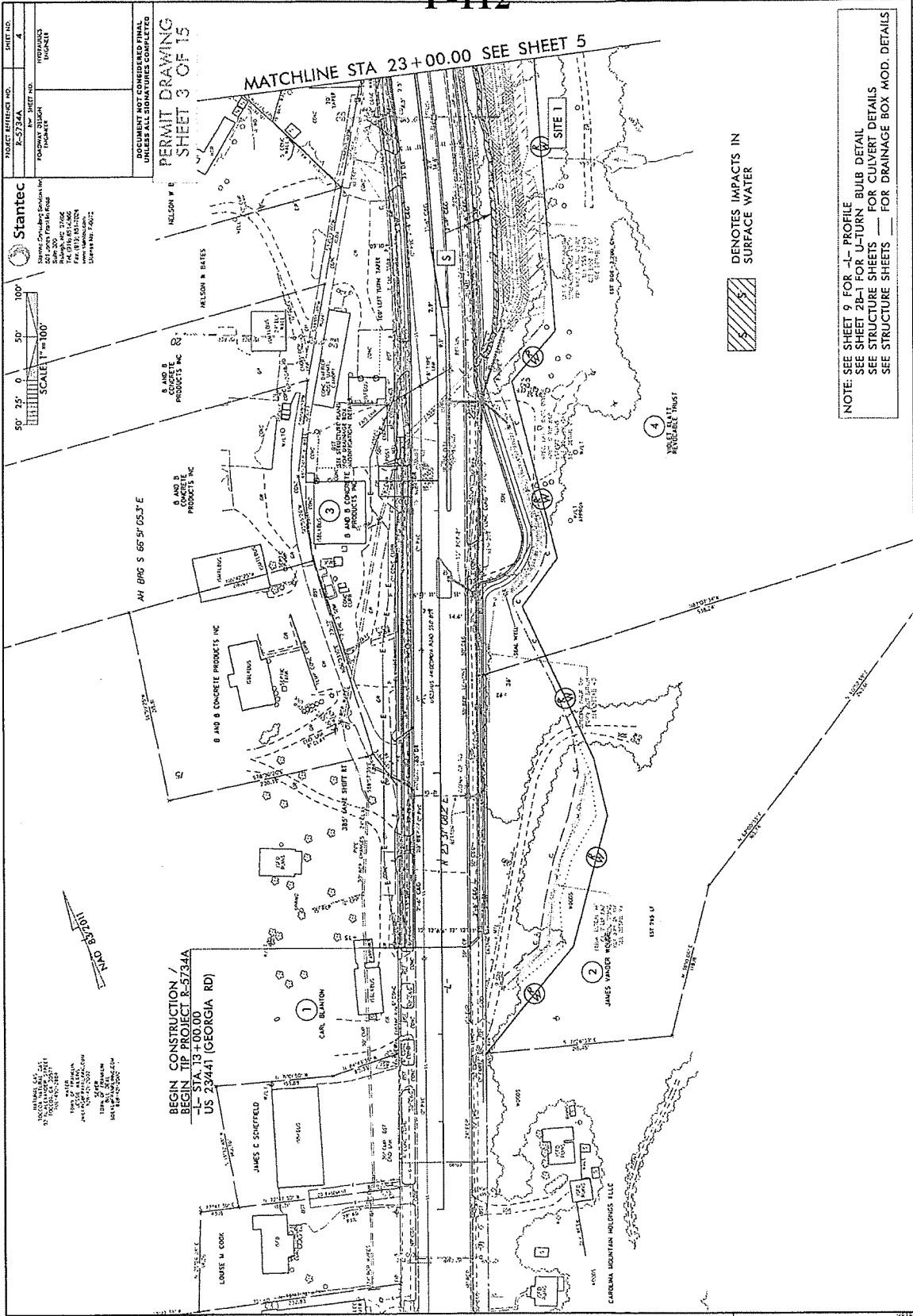
Prepared by Cherri L. Smith, North Carolina Wetlands Restoration Program. Illustrations by Karen M. Lynch and design by Marcia Nye.



N.C. Wetlands Restoration Program
NC DENR DWQ

PROJECT NUMBER: 10	SHEET NO.	207
ROADWAY DESIGN	INSTRUMENT	ENGINEER
INCOMPLETE PLANS DO NOT PERMIT CONSTRUCTION		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
PERMIT DRAWING SHEET 2 OF 15		





PROJECT REFERENCE NO.	R-57344A	SHEET NO.	4
PROJECT NAME	PERMIT DRAWING SHEET 3 OF 15	DATE	11/14/2012
DESIGNER	STANTEC	SCALE	1" = 100'

Stantec
 Stantec Consulting Solutions Inc
 1000 West 17th Street
 Suite 300
 Fort Collins, CO 80521
 Tel: 970.221.4400
 Fax: 970.221.4400
 Email: info@stantec.com

PERMIT DRAWING
 SHEET 3 OF 15

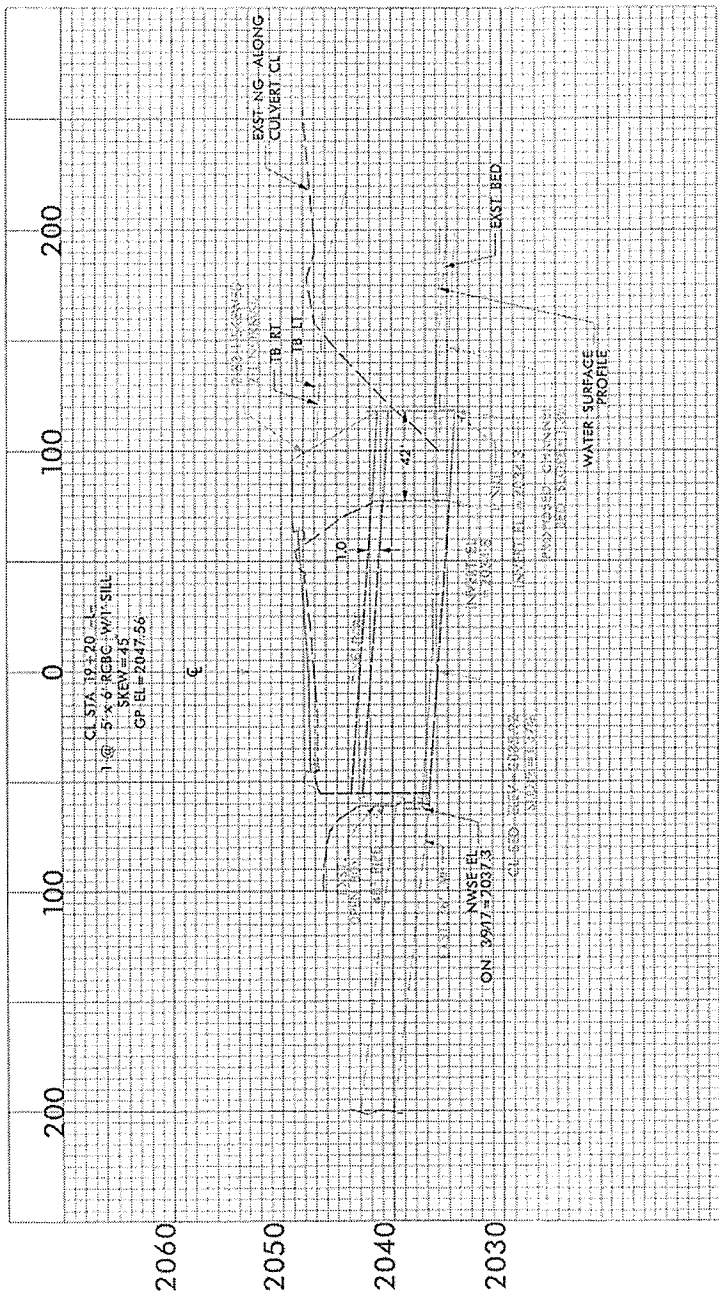
NOT TO SCALE
 UNLESS OTHERWISE SPECIFIED

NOTE: SEE SHEET 9 FOR "I" PROFILE
 SEE SHEET 2B FOR "U-TURN" BULB DETAIL
 SEE STRUCTURE SHEETS FOR CULVERT DETAILS
 SEE STRUCTURE SHEETS FOR DRAINAGE BOX MOD. DETAILS

REVISIONS
 REV REVISION 1: REMOVED HATCH FROM PARCELS 1, 2, AND 5, ADDED ICE TO PARCELS 1, 2, AND 5, ADDED BIRD BOON ON PARCEL 3 (0.22018)
 REV REVISION 2: CHANGED NAME ON PARCELS 4 AND 5, ADDED CLAIM ON PARCEL 3 (0.22018)
 REV REVISION 3: CHANGED NAME ON PARCELS 1, 2, AND 5, ADDED ICE TO PARCELS 1, 2, AND 5, ADDED BIRD BOON ON PARCEL 3 (0.22018)

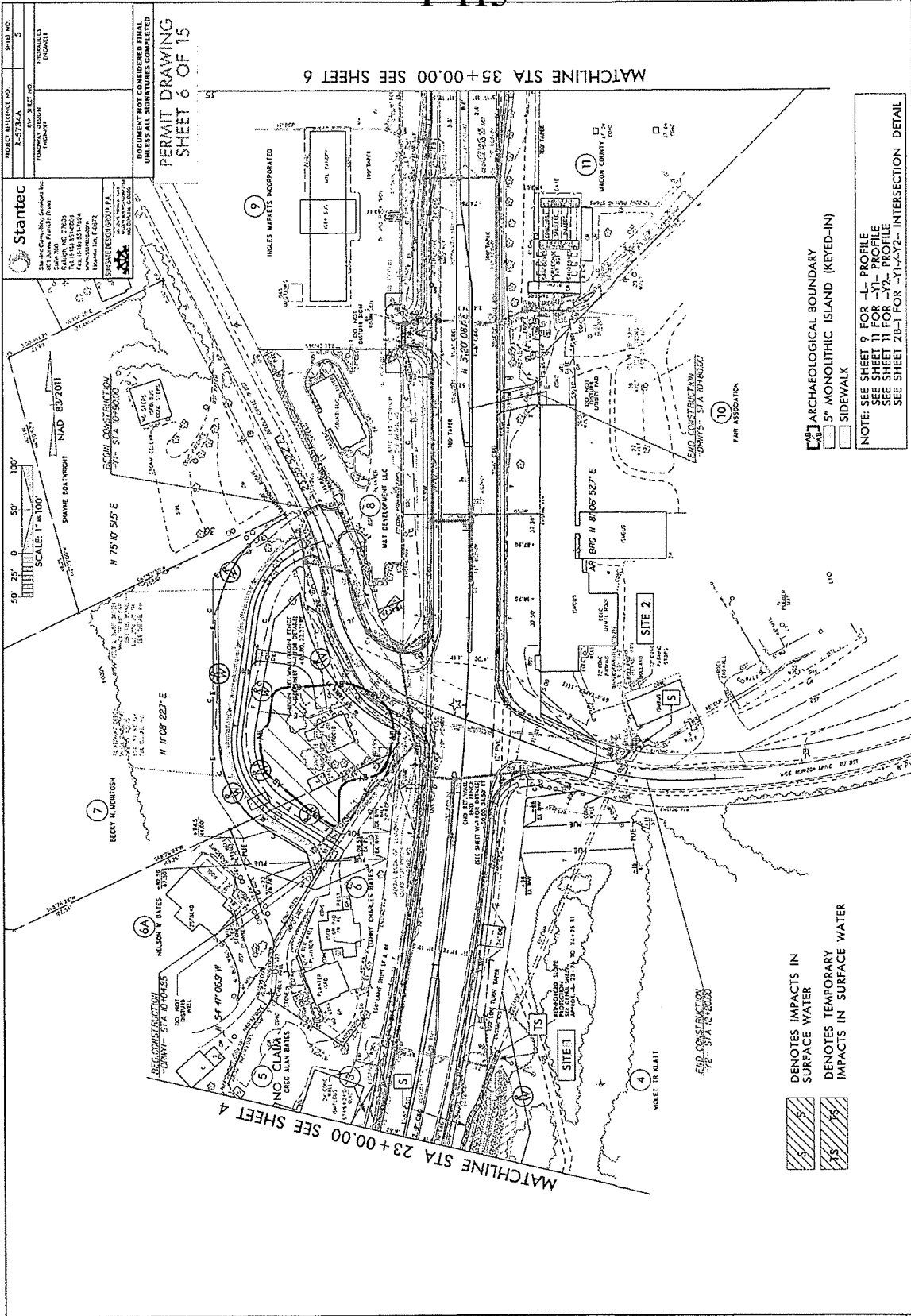
PROJECT NUMBER	75
DATE	12/15/07
PROJECT LOCATION	STATION 19+20
PROJECT NAME	STATION 19+20
DESIGNED BY	ANTHONY J. JAMES
CHECKED BY	ANTHONY J. JAMES

DOCUMENT NOT TO BE REPRODUCED OR COPIED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER.
 PERMIT DRAWING
 SHEET 5 OF 15



CL STA 19+20 = 1
 1 @ 5'-6\"/>

NWSE EL
 ON: 2997 = 7037.3
 CL 450' 10\"/>



PROJECT REFERENCE NO. 2017-09-12
 PROJECT SHEET NO. P-115
 PROJECT NAME: FARM ROAD IMPROVEMENT PROJECT

Stantec
 Stantec Consulting Services Inc.
 1000 North Fairfax Road
 Fairfax, VA 22030
 Tel: 703.752.2000
 Fax: 703.752.2004
 www.stantec.com

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SHEET 6 OF 15

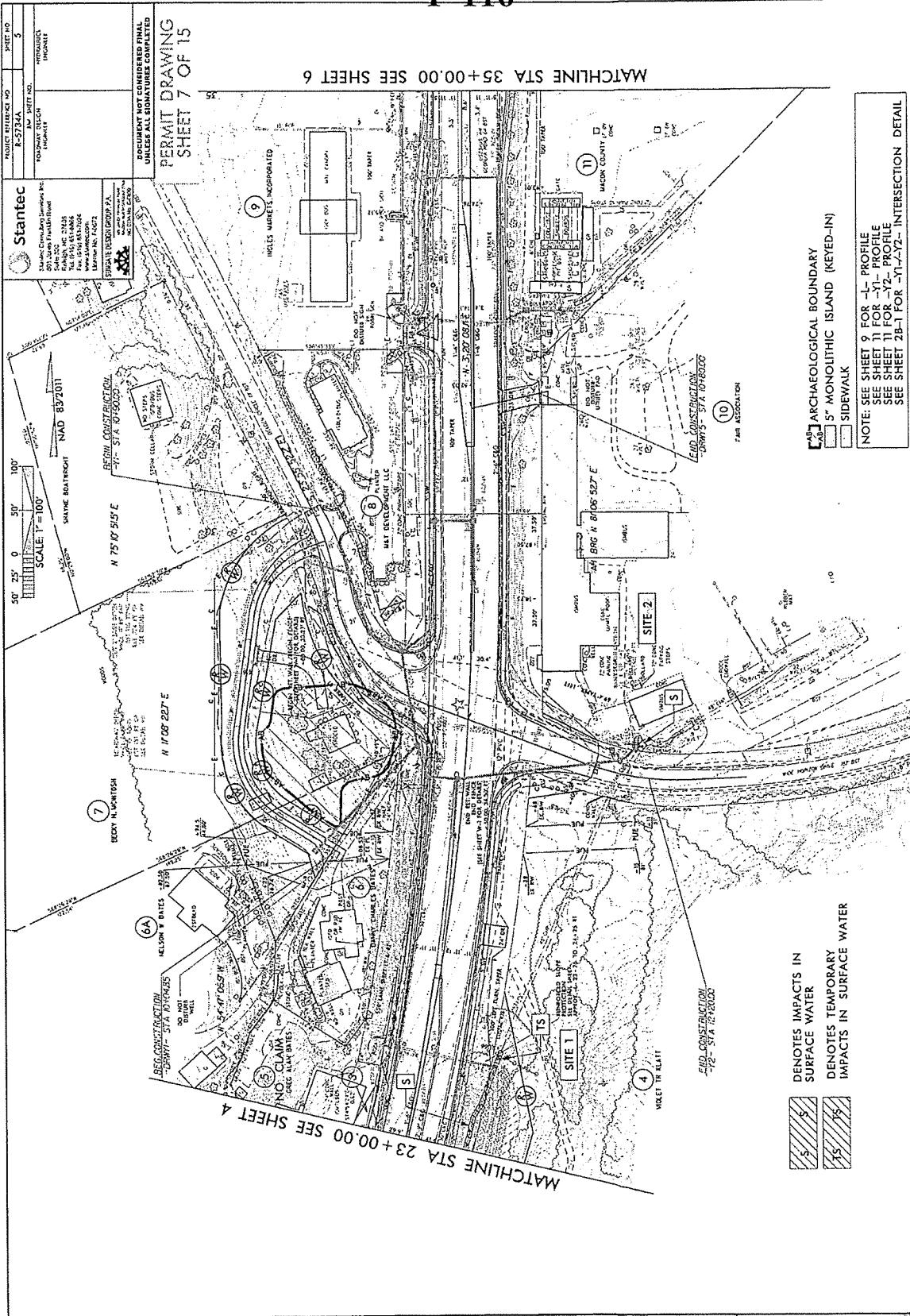
MATCHLINE STA 35+00.00 SEE SHEET 6

SCALE: 1" = 100'
 NAD 83/2011
 50' 25' 0" 50' 100'

 ARCHAEOLOGICAL BOUNDARY
 5" MONOLITHIC ISLAND (KEYED-IN)
 SIDEWALK
 NOTE: SEE SHEET 9 FOR -L- PROFILE
 SEE SHEET 11 FOR -Y1- PROFILE
 SEE SHEET 11 FOR -Y2- PROFILE
 SEE SHEET 2B-1 FOR -Y1/-Y2- INTERSECTION DETAIL

DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

RW REVISION 1: REMOVED PRT FROM PARCELS 13, AND 5, HOTTED NO CLAIM ON PARCELS 5, ADDED ICE TO PARCELS 1, 7, AND 10 (REV. 09/12)
 RW REVISION 2: EXTENDED PUE ON PARCEL 7 AND ADDED RW FOR DRIVEWAY (REV. 10/13/08)
 RW REVISION 3: ADDED PUE ON PARCEL 6A ADJACENT NORTH EAST OF PARCEL 6, CHANGED NAME ON PARCEL 2 & 9 (12/2018)
 RW REVISION 4: ADDED ICE TO PARCEL 10 ADJACENT DRINKING FIRE (REV. 01/13)
 RW REVISION 5: ADDED ICE TO PARCELS 1, 7, AND 10 (REV. 09/12)



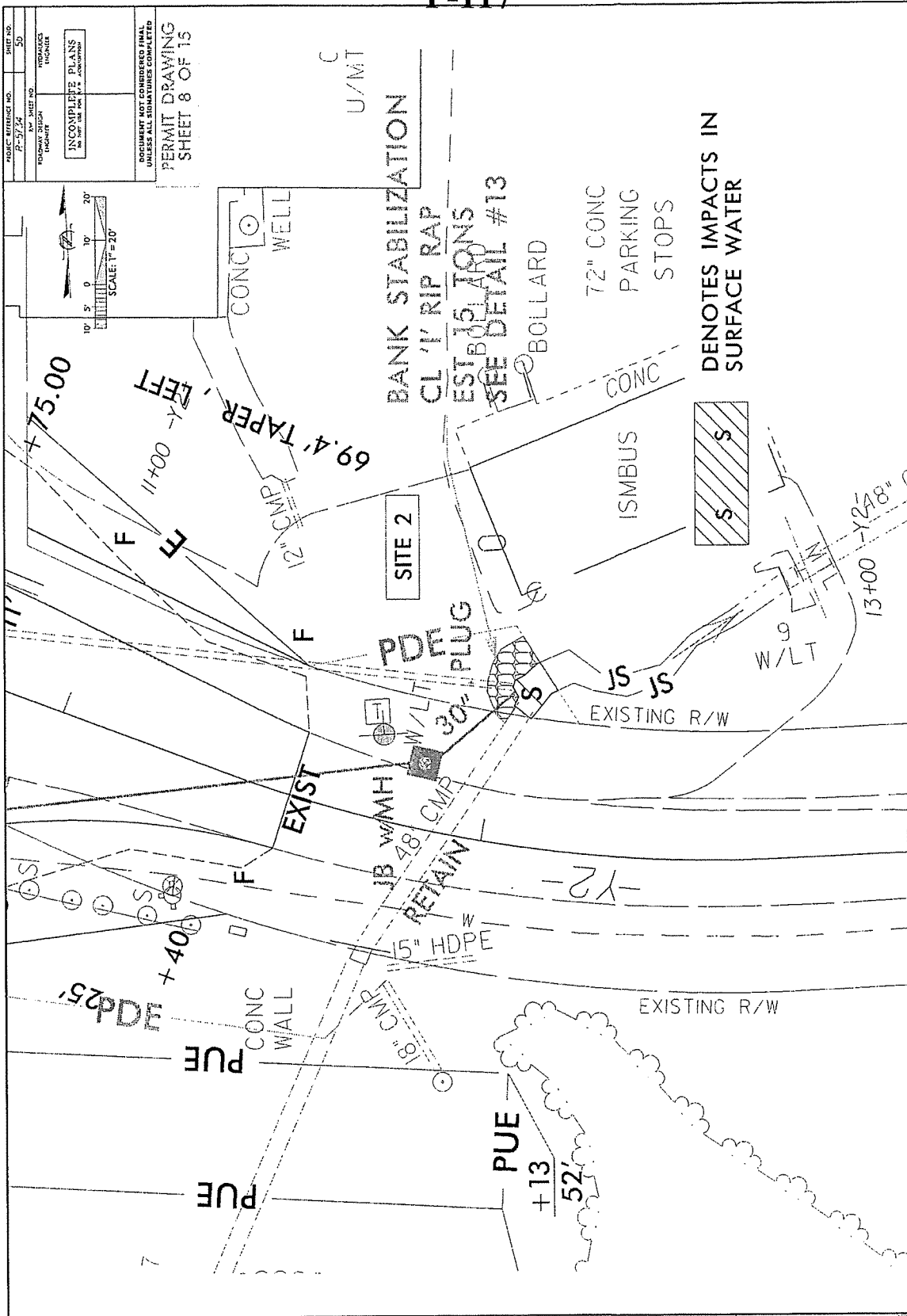
Stantec
 14000 Riverchase Way, Suite 200, Houston, TX 77057
 Project: Riverchase
 Drawing: P-116
 Date: 08/14/2017
 Author: [Name]
 Checker: [Name]
 Title: [Title]

PERMIT DRAWING
 SHEET 7 OF 15
 DOCUMENT NOT COMPLETED FINAL
 UNLESS ALL SIGNATURES COMPLETED

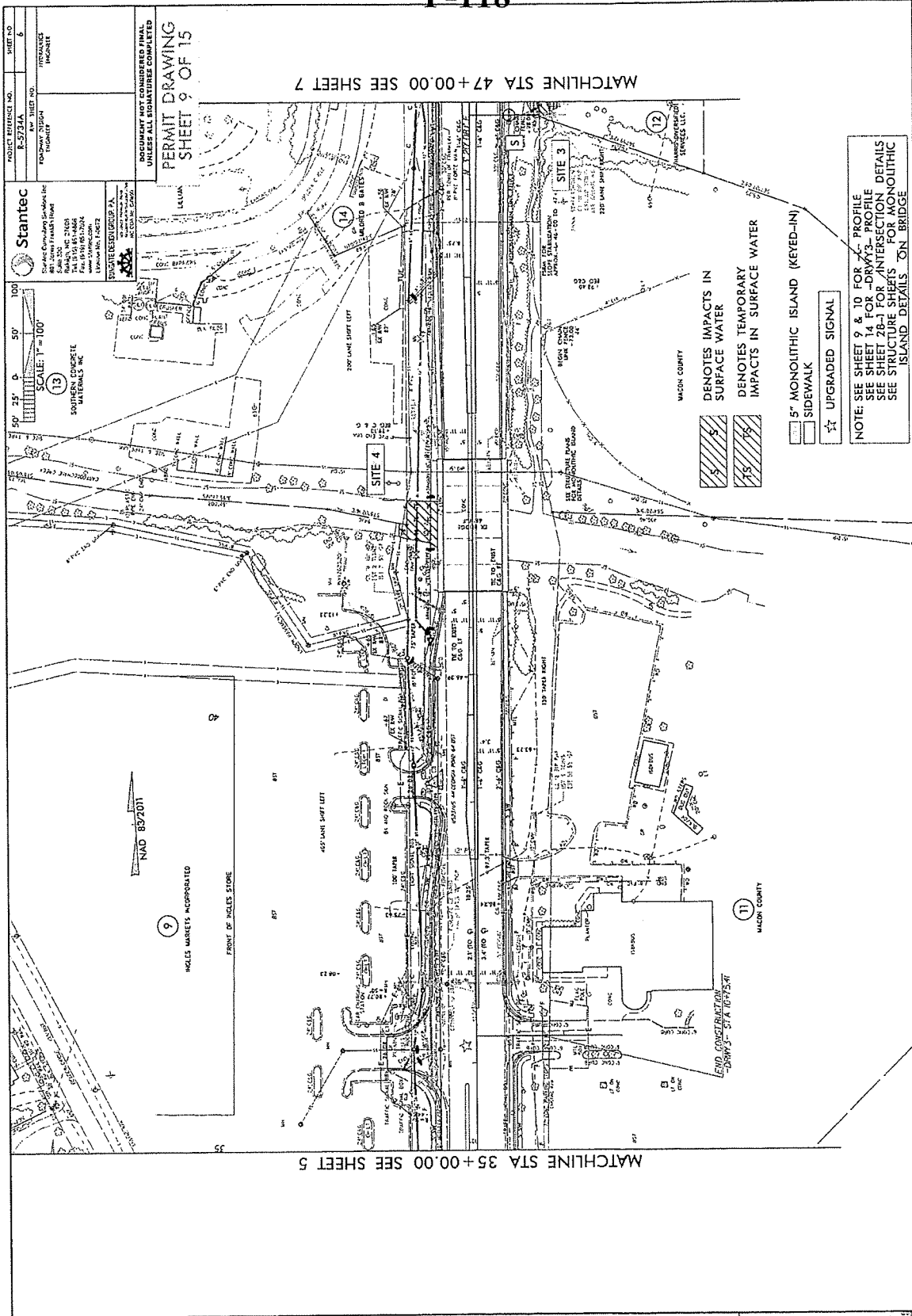
MATCHLINE STA 23+00.00 SEE SHEET 4
 MATCHLINE STA 35+00.00 SEE SHEET 6

- ARCHAEOLOGICAL BOUNDARY
 - 5" MONOLITHIC ISLAND (KEYED-IN)
 - SIDEWALK
- NOTE: SEE SHEET 9 FOR -L- PROFILE
 SEE SHEET 11 FOR -Y- PROFILE
 SEE SHEET 2B-1 FOR -Y1-Y2- INTERSECTION DETAIL

REVISIONS
 RW REVISION 1: REMOVED PILE FROM PARCELS 13, AND 3 NOTED NO CLAIM ON PARCELS 5, ADDED TCE TO PARCELS 1, 3, AND 10 - DRYS - ON PARCEL 10 (2017 09 12)
 RW REVISION 2: EXTENDED PILE ON PARCELS 7 AND ADDED RW FOR DRYWATER (2017 10 03)
 RW REVISION 3: ADDED PARCEL 6A, ADDED NORTH FACE OF PARCEL 4, CHANGED NAME ON PARCELS 7 & 9 (2.01.17)
 RW REVISION 4: ADDED TCE TO PARCEL 11, ADDED DRAINAGE PIPE (2017 11 19)



REVISIONS
 1
 2



REVISIONS
 RW REVISION 3 CHANGED NAME ON PARCEL 9 (1.2.2018)
 RW REVISION 4 CONVERT EXISTING ROW TO CA ON PARCEL 12 (2018.01.19)
 8/17/19

PROJECT NUMBER NO. B-2734A
 SHEET NO. 6
 DRAWING TITLE ROADWAY IMPROVEMENT
 PROJECT PROPERTY

Stantec
 STANTEC CONSULTING SERVICES INC.
 400 JONES FARM RD
 RALEIGH, NC 27603
 TEL: 919.851.7000
 FAX: 919.851.7004
 WWW.STANTEC.COM

SCALE: 1" = 100'
 SOURCE: CONCRETE MATERIALS, INC.

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED
 PERMIT DRAWING
 SHEET 9 OF 15

PERMIT DRAWING
SHEET 11 OF 15

PROJECT TYPICAL DETAILS

Stantec
 Stantec Consulting Services Inc.
 10000 Franklin Road
 Suite 300
 Raleigh, NC 27606
 Tel. (919) 851-6866
 Fax. (919) 851-7024
 www.stantec.com
 License No. F-6572

PROJECT REFERENCE NO. UC-08P
 DESIGNED BY: JSA
 DRAWN BY: BDR
 CHECKED BY: MCM
 APPROVED BY: [Signature]
 REVISED: [Signature]
 DATE: 11/17/10
 PROJECT: UTILITY CONSTRUCTION
 DRAWING: UNLESS ALL SIGNATURES COMPLETED

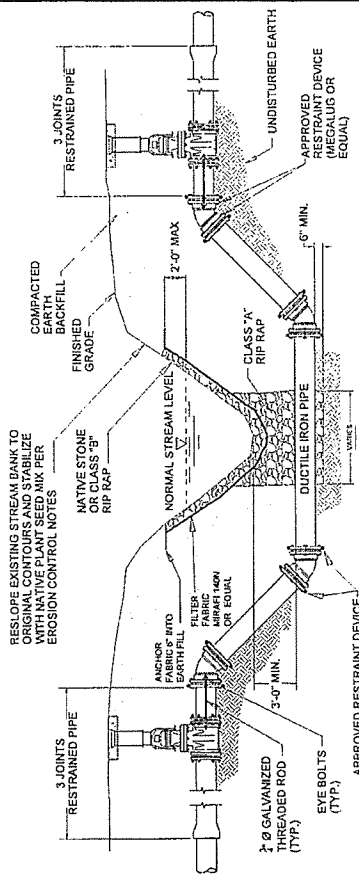
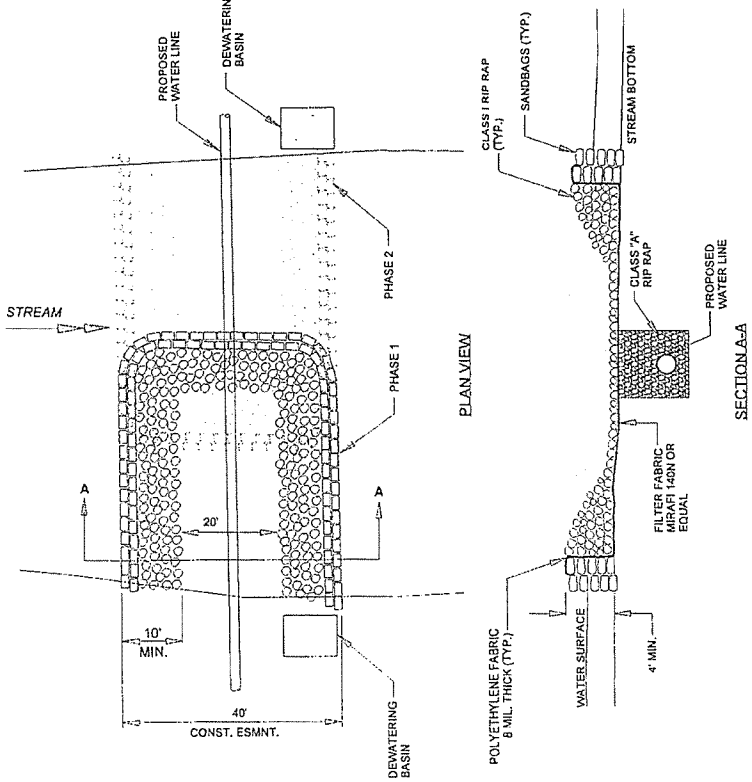
UTILITY CONSTRUCTION

INCOMPLETE PLANS
 SEE THE TOWN OF FRANKLIN
 FOR THE LATEST REVISIONS

- COFFER DAM CONSTRUCTION NOTES:
1. MATERIAL FROM THE STREAM BED WILL NOT BE USED FOR THE COFFER DAM.
 2. NO EARTHEN MATERIAL WILL BE USED FOR THE COFFER DAM OR PLACED IN THE STREAM FOR ANY REASON.
 3. DISTURBANCE OF THE STREAM BED IS TO BE LIMITED TO THE CONSTRUCTION WORKS COMPLETION.
 4. COFFER DAM MATERIAL IS TO BE APPROVED BY ENGINEER.

- PHASE 1: CONSTRUCT COFFER DAM TO CENTERLINE OF STREAM, ONE-HALF (1/2) OF THE STREAM CHANNELS TO BE OPEN AT ALL TIMES.
1. UTILIZE DEWATERING BASIN TO DRAIN WORK AREA.
 2. INSTALL PROPOSED WATERLINE TO END OF COFFER DAM.
 3. CONTAMINATION TO THE STREAM FROM WORK TO BE AVOIDED.
 4. REMOVE COFFER DAM.

- PHASE 2: RESLOPE EXISTING STREAM BANK TO ENCOMPASS END OF WATER LINE CONSTRUCTED IN PHASE 1, ONE-HALF (1/2) OF THE STREAM CHANNEL IS TO BE OPEN AT ALL TIMES.
1. UTILIZE DEWATERING BASIN TO DRAIN WORK AREA.
 2. INSTALL REMAINING PROPOSED WATER LINE.
 3. CONTAMINATION TO THE STREAM FROM WORK TO BE AVOIDED.
 4. REMOVE COFFER DAM.



- WATER LINE CROSSING NOTES:
1. CONTRACTOR WILL RESTRAIN JOINTS TO BE WITHIN 10'-0" OF THE BANK OR AS SPECIFIED BY THE TOWN OF FRANKLIN.
 2. APPROVED RESTRAINING DEVICES INCLUDE RESTRAINING CLAMPS (MEGALUGS), OR FIELD LOCK GASKETS AND RESTRAINT SYSTEM WILL BE PROVIDED BY APPROVED PIPE MANUFACTURERS.
 3. SEE TRENCH DETAIL FOR ACTUAL TRENCH WIDTH.
 4. NO FERTILIZER TO BE USED WITHIN 10'-0" OF STREAM BANK.

WATER LINE CREEK CROSSING DETAIL

WETLAND AND SURFACE WATER IMPACTS SUMMARY														
Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS							
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)		
1	19+74 to 24+31 -L- RT	ROADWAY FILL							0.05	< 0.01	443	558	15	
2	10+02 TO 12+14 .S2- LT	BANK STABILIZATION							< 0.01		10			
3	46+85 to 47+07 -L- RT	BANK STABILIZATION							< 0.01		20			
4	41+92 to 42+47 -L- LT	UTILITY CONSTRUCTION								0.04			44	
TOTALS:									0.06	0.04	473	59	0	

*Rounded totals are sum of actual impacts

NOTES:

- Site 1: Temporary Surface Water Impacts = 75 SF
- Site 2: Permanent Surface Water Impacts = 74 SF
- Site 3: Permanent Surface Water Impacts = 230 SF
- Site 4: Temporary Surface Water Impacts = 1787 SF

NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 3-21-18
 MACON COUNTY
 R-8734A
 S0192.1.1

SHEET 15 OF 15

County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
ROADWAY ITEMS						
0001	0000100000-N	800	MOBILIZATION	Lump Sum	L.S.	
0002	0000400000-N	801	CONSTRUCTION SURVEYING	Lump Sum	L.S.	
0003	0015000000-N	205	SEALING ABANDONED WELLS	1 EA		
0004	0030000000-N	SP	TYPE II MODIFIED APPROACH FILL, STATION ***** (14+94.00 -L-)	Lump Sum	L.S.	
0005	0043000000-N	226	GRADING	Lump Sum	L.S.	
0006	0050000000-E	226	SUPPLEMENTARY CLEARING & GRUB- BING	2 ACR		
0007	0057000000-E	226	UNDERCUT EXCAVATION	1,050 CY		
0008	0134000000-E	240	DRAINAGE DITCH EXCAVATION	3,630 CY		
0009	0195000000-E	265	SELECT GRANULAR MATERIAL	3,300 CY		
0010	0196000000-E	270	GEOTEXTILE FOR SOIL STABILIZA- TION	3,500 SY		
0011	0199000000-E	SP	TEMPORARY SHORING	200 SF		
0012	0223000000-E	275	ROCK PLATING	200 SY		
0013	0225000000-E	SP	REINFORCED SOIL SLOPES	130 SY		
0014	0318000000-E	300	FOUNDATION CONDITIONING MATE- RIAL, MINOR STRUCTURES	1,441 TON		
0015	0320000000-E	300	FOUNDATION CONDITIONING GEO- TEXTILE	5,114 SY		
0016	0335200000-E	305	15" DRAINAGE PIPE	248 LF		
0017	0335400000-E	305	24" DRAINAGE PIPE	28 LF		
0018	0335500000-E	305	30" DRAINAGE PIPE	112 LF		
0019	0335850000-E	305	*** DRAINAGE PIPE ELBOWS (15")	2 EA		

County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0020	0366000000-E	310	15" RC PIPE CULVERTS, CLASS III	396 LF		
0021	0372000000-E	310	18" RC PIPE CULVERTS, CLASS III	400 LF		
0022	0378000000-E	310	24" RC PIPE CULVERTS, CLASS III	40 LF		
0023	0390000000-E	310	36" RC PIPE CULVERTS, CLASS III	88 LF		
0024	0402000000-E	310	48" RC PIPE CULVERTS, CLASS III	608 LF		
0025	0448000000-E	310	**** RC PIPE CULVERTS, CLASS IV (48")	92 LF		
0026	0448200000-E	310	15" RC PIPE CULVERTS, CLASS IV	2,528 LF		
0027	0448300000-E	310	18" RC PIPE CULVERTS, CLASS IV	376 LF		
0028	0448400000-E	310	24" RC PIPE CULVERTS, CLASS IV	304 LF		
0029	0448500000-E	310	30" RC PIPE CULVERTS, CLASS IV	544 LF		
0030	0448600000-E	310	36" RC PIPE CULVERTS, CLASS IV	836 LF		
0031	0448700000-E	310	42" RC PIPE CULVERTS, CLASS IV	388 LF		
0032	0588000000-E	310	18" CS PIPE CULVERTS, 0.064" THICK	36 LF		
0033	0594000000-E	310	24" CS PIPE CULVERTS, 0.064" THICK	12 LF		
0034	0636000000-E	310	*** CS PIPE ELBOWS, ***** THICK (18", 0.064")	1 EA		
0035	0986000000-E	SP	GENERIC PIPE ITEM 15" CURED IN PLACE PIPE	106 LF		
0036	0986000000-E	SP	GENERIC PIPE ITEM 18" CURED IN PLACE PIPE	255 LF		

County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0037	0986000000-E	SP	GENERIC PIPE ITEM 24" CURED IN PLACE PIPE	155 LF		
0038	0986000000-E	SP	GENERIC PIPE ITEM 30" CURED IN PLACE PIPE	185 LF		
0039	0995000000-E	340	PIPE REMOVAL	1,746 LF		
0040	1099500000-E	505	SHALLOW UNDERCUT	150 CY		
0041	1099700000-E	505	CLASS IV SUBGRADE STABILIZA- TION	250 TON		
0042	1121000000-E	520	AGGREGATE BASE COURSE	516 TON		
0043	1220000000-E	545	INCIDENTAL STONE BASE	2,050 TON		
0044	1275000000-E	600	PRIME COAT	175 GAL		
0045	1297000000-E	607	MILLING ASPHALT PAVEMENT, **** DEPTH (1-1/2")	2,590 SY		
0046	1330000000-E	607	INCIDENTAL MILLING	5,100 SY		
0047	1491000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0C	7,050 TON		
0048	1503000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C	4,810 TON		
0049	1523000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	9,610 TON		
0050	1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	1,130 TON		
0051	1693000000-E	654	ASPHALT PLANT MIX, PAVEMENT REPAIR	200 TON		
0052	2022000000-E	815	SUBDRAIN EXCAVATION	67.2 CY		
0053	2026000000-E	815	GEOTEXTILE FOR SUBSURFACE DRAINS	200 SY		
0054	2036000000-E	815	SUBDRAIN COARSE AGGREGATE	33.6 CY		

County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0055	2044000000-E	815	6" PERFORATED SUBDRAIN PIPE	200 LF		
0056	2070000000-N	815	SUBDRAIN PIPE OUTLET	1 EA		
0057	2077000000-E	815	6" OUTLET PIPE	6 LF		
0058	2253000000-E	840	PIPE COLLARS	3.148 CY		
0059	2264000000-E	840	PIPE PLUGS	0.13 CY		
0060	2275000000-E	SP	FLOWABLE FILL	52 CY		
0061	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	101 EA		
0062	2308000000-E	840	MASONRY DRAINAGE STRUCTURES	61.1 LF		
0063	2364000000-N	840	FRAME WITH TWO GRATES, STD 840.16	25 EA		
0064	2366000000-N	840	FRAME WITH TWO GRATES, STD 840.24	8 EA		
0065	2367000000-N	840	FRAME WITH TWO GRATES, STD 840.29	4 EA		
0066	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	10 EA		
0067	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	16 EA		
0068	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	25 EA		
0069	2396000000-N	840	FRAME WITH COVER, STD 840.54	18 EA		
0070	2451000000-N	852	CONCRETE TRANSITIONAL SECTION FOR DROP INLET	22 EA		
0071	2538000000-E	846	***-** CONCRETE CURB & GUTTER (2'-9")	460 LF		
0072	2542000000-E	846	1'-6" CONCRETE CURB & GUTTER	2,800 LF		

County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0073	2549000000-E	846	2'-6" CONCRETE CURB & GUTTER	11,560		
				LF		
0074	2556000000-E	846	SHOULDER BERM GUTTER	48		
				LF		
0075	2570000000-N	SP	MODIFIED CONCRETE FLUME	1		
				EA		
0076	2591000000-E	848	4" CONCRETE SIDEWALK	4,600		
				SY		
0077	2605000000-N	848	CONCRETE CURB RAMPS	39		
				EA		
0078	2612000000-E	848	6" CONCRETE DRIVEWAY	714		
				SY		
0079	2619000000-E	850	4" CONCRETE PAVED DITCH	50		
				SY		
0080	2655000000-E	852	5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)	1,600		
				SY		
0081	2657000000-E	852	*** MONOLITHIC CONCRETE MEDIAN (*****) (5-1/2", KEYED IN)	20		
				SY		
0082	2738000000-E	SP	GENERIC PAVING ITEM REINFORCED CONCRETE DRIVEWAY	259		
				SY		
0083	2761000000-E	848	GENERIC PAVING ITEM 8" CONCRETE DRIVEWAY	90		
				SY		
0084	2800000000-N	858	ADJUSTMENT OF CATCH BASINS	10		
				EA		
0085	2830000000-N	858	ADJUSTMENT OF MANHOLES	4		
				EA		
0086	2845000000-N	858	ADJUSTMENT OF METER BOXES OR VALVE BOXES	7		
				EA		
0087	2860000000-N	859	CONVERT EXISTING CATCH BASIN TO JUNCTION BOX	1		
				EA		
0088	2905000000-N	859	CONVERT EXISTING DROP INLET TO JUNCTION BOX	2		
				EA		
0089	2995000000-N	SP	GENERIC DRAINAGE ITEM CONVERT EXISTING CATCH BASIN TO TRAFFIC BEARING JUNCTION BOX	2		
				EA		
0090	3030000000-E	862	STEEL BEAM GUARDRAIL	2,000		
				LF		

County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0091	3045000000-E	862	STEEL BEAM GUARDRAIL, SHOP CURVED	112.5 LF		
0092	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	15 EA		
0093	3195000000-N	862	GUARDRAIL END UNITS, TYPE AT-1	1 EA		
0094	3210000000-N	862	GUARDRAIL END UNITS, TYPE CAT-1	6 EA		
0095	3215000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE III	7 EA		
0096	3287000000-N	SP	GUARDRAIL END UNITS, TYPE TL-3	6 EA		
0097	3288000000-N	SP	GUARDRAIL END UNITS, TYPE TL-2	4 EA		
0098	3360000000-E	863	REMOVE EXISTING GUARDRAIL	1,555 LF		
0099	3380000000-E	862	TEMPORARY STEEL BEAM GUARDRAIL	287.5 LF		
0100	3389150000-N	SP	TEMPORARY GUARDRAIL END UNITS, TYPE ***** (TL-3)	1 EA		
0101	3435000000-N	SP	GENERIC GUARDRAIL ITEM GUARDRAIL POST CAPS	161 EA		
0102	3533000000-E	866	CHAIN LINK FENCE, **** FABRIC (60")	73 LF		
0103	3536000000-E	866	CHAIN LINK FENCE, 48" FABRIC	382 LF		
0104	3539000000-E	866	METAL LINE POSTS FOR **** CHAIN LINK FENCE (60")	7 EA		
0105	3542000000-E	866	METAL LINE POSTS FOR 48" CHAIN LINK FENCE	32 EA		
0106	3545000000-E	866	METAL TERMINAL POSTS FOR *** CHAIN LINK FENCE (60")	4 EA		
0107	3548000000-E	866	METAL TERMINAL POSTS FOR 48" CHAIN LINK FENCE	4 EA		

County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0108	3575000000-E	SP	GENERIC FENCING ITEM WALL MOUNTED PEDESTRIAN HANDRAIL	182 LF		
0109	3628000000-E	876	RIP RAP, CLASS I	1,176 TON		
0110	3635000000-E	876	RIP RAP, CLASS II	50 TON		
0111	3649000000-E	876	RIP RAP, CLASS B	332 TON		
0112	3656000000-E	876	GEOTEXTILE FOR DRAINAGE	5,083 SY		
0113	4048000000-E	902	REINFORCED CONCRETE SIGN FOUN- DATIONS	3 CY		
0114	4054000000-E	902	PLAIN CONCRETE SIGN FOUNDA- TIONS	1 CY		
0115	4057000000-E	SP	OVERHEAD FOOTING	49 CY		
0116	4060000000-E	903	SUPPORTS, BREAKAWAY STEEL BEAM	3,159 LB		
0117	4066000000-E	903	SUPPORTS, SIMPLE STEEL BEAM	415 LB		
0118	4072000000-E	903	SUPPORTS, 3-LB STEEL U-CHANNEL	2,250 LF		
0119	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUC- TURE AT STA ***** (13+25 -LPD-)	Lump Sum	L.S.	
0120	4082100000-N	906	SUPPORTS, OVERHEAD SIGN STRUC- TURE AT STA ***** (69+00 -L-)	Lump Sum	L.S.	
0121	4096000000-N	904	SIGN ERECTION, TYPE D	13 EA		
0122	4102000000-N	904	SIGN ERECTION, TYPE E	118 EA		
0123	4108000000-N	904	SIGN ERECTION, TYPE F	13 EA		
0124	4110000000-N	904	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)	4 EA		

County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0125	4116100000-N	904	SIGN ERECTION, RELOCATE TYPE **** (GROUND MOUNTED) (A)	1 EA		
0126	4116100000-N	904	SIGN ERECTION, RELOCATE TYPE **** (GROUND MOUNTED) (B)	1 EA		
0127	4116100000-N	904	SIGN ERECTION, RELOCATE TYPE **** (GROUND MOUNTED) (D)	2 EA		
0128	4116100000-N	904	SIGN ERECTION, RELOCATE TYPE **** (GROUND MOUNTED) (E)	2 EA		
0129	4116100000-N	904	SIGN ERECTION, RELOCATE TYPE **** (GROUND MOUNTED) (F)	2 EA		
0130	4138000000-N	907	DISPOSAL OF SUPPORT, STEEL BEAM	1 EA		
0131	4152000000-N	907	DISPOSAL OF SIGN SYSTEM, STEEL BEAM	1 EA		
0132	4155000000-N	907	DISPOSAL OF SIGN SYSTEM, U- CHANNEL	80 EA		
0133	4192000000-N	907	DISPOSAL OF SUPPORT, U-CHANNEL	1 EA		
0134	4360000000-N	SP	GENERIC SIGNING ITEM DISPOSAL OF SIGN SYSTEM ON SPAN WIRE	1 EA		
0135	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	680 SF		
0136	4405000000-E	1110	WORK ZONE SIGNS (PORTABLE)	288 SF		
0137	4410000000-E	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	57 SF		
0138	4415000000-N	1115	FLASHING ARROW BOARD	1 EA		
0139	4430000000-N	1130	DRUMS	555 EA		
0140	4435000000-N	1135	CONES	80 EA		

County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0141	4445000000-E	1145	BARRICADES (TYPE III)	64 LF		
0142	4480000000-N	1165	TMA	1 EA		
0143	4510000000-N	1190	LAW ENFORCEMENT	32 HR		
0144	4650000000-N	1251	TEMPORARY RAISED PAVEMENT MARKERS	8 EA		
0145	4685000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	7,750 LF		
0146	4686000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	17,551 LF		
0147	4688000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (6", 90 MILS)	975 LF		
0148	4690000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (6", 120 MILS)	419 LF		
0149	4695000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)	1,420 LF		
0150	4697000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (8", 120 MILS)	2,313 LF		
0151	4700000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS)	265 LF		
0152	4710000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)	655 LF		
0153	4721000000-E	1205	THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS)	36 EA		
0154	4725000000-E	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	114 EA		
0155	4726110000-E	1205	HEATED-IN-PLACE THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	52 EA		
0156	4770000000-E	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)	684 LF		

County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0157	4810000000-E	1205	PAINT PAVEMENT MARKING LINES (4")	46,348 LF		
0158	4820000000-E	1205	PAINT PAVEMENT MARKING LINES (8")	5,877 LF		
0159	4835000000-E	1205	PAINT PAVEMENT MARKING LINES (24")	1,602 LF		
0160	4840000000-N	1205	PAINT PAVEMENT MARKING CHARAC- TER	16 EA		
0161	4845000000-N	1205	PAINT PAVEMENT MARKING SYMBOL	162 EA		
0162	4850000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (4")	343 LF		
0163	4875000000-N	1205	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS	11 EA		
0164	4895000000-N	SP	GENERIC PAVEMENT MARKING ITEM IN LANE ROUTE SHIELD	1 EA		
0165	4900000000-N	1251	PERMANENT RAISED PAVEMENT MARKERS	4 EA		
0166	4905000000-N	1253	SNOWPLOWABLE PAVEMENT MARKERS	874 EA		
0167	5255000000-N	1413	PORTABLE LIGHTING	Lump Sum	L.S.	
0168	5325800000-E	1510	8" WATER LINE	20 LF		
0169	5326000000-E	1510	10" WATER LINE	20 LF		
0170	5326200000-E	1510	12" WATER LINE	2,045 LF		
0171	5329000000-E	1510	DUCTILE IRON WATER PIPE FITTINGS	14,400 LB		
0172	5558000000-E	1515	12" VALVE	4 EA		
0173	5571000000-E	1515	*** TAPPING SLEEVE & VALVE (1")	3 EA		
0174	5588000000-E	1515	** AIR RELEASE VALVE (12")	2 EA		

County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0175	5648000000-N	1515	RELOCATE WATER METER	6	EA	
0176	5666000000-N	1515	FIRE HYDRANT	2	EA	
0177	5672000000-N	1515	RELOCATE FIRE HYDRANT	1	EA	
0178	5673000000-E	1515	FIRE HYDRANT LEG	28	LF	
0179	5686500000-E	1515	WATER SERVICE LINE	89	LF	
0180	5691100000-E	1520	4" SANITARY GRAVITY SEWER	134	LF	
0181	5691300000-E	1520	8" SANITARY GRAVITY SEWER	1,503	LF	
0182	5691500000-E	1520	12" SANITARY GRAVITY SEWER	2,496	LF	
0183	5691600000-E	1520	16" SANITARY GRAVITY SEWER	185	LF	
0184	5768000000-N	1520	SANITARY SEWER CLEAN-OUT	4	EA	
0185	5768500000-E	1520	SEWER SERVICE LINE	71	LF	
0186	5775000000-E	1525	4' DIA UTILITY MANHOLE	122	EA	
0187	5781000000-E	1525	UTILITY MANHOLE WALL 4' DIA	17	LF	
0188	5800000000-E	1530	ABANDON 6" UTILITY PIPE	376	LF	
0189	5801000000-E	1530	ABANDON 8" UTILITY PIPE	947	LF	
0190	5802000000-E	1530	ABANDON 10" UTILITY PIPE	1,673	LF	
0191	5804000000-E	1530	ABANDON 12" UTILITY PIPE	2,168	LF	
0192	5810000000-E	1530	ABANDON 16" UTILITY PIPE	124	LF	
0193	5816000000-N	1530	ABANDON UTILITY MANHOLE	14	EA	
0194	5835700000-E	1540	16" ENCASEMENT PIPE	90	LF	
0195	5836000000-E	1540	24" ENCASEMENT PIPE	89	LF	

County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0196	5872500000-E	1550	BORE AND JACK OF *** (16")	90 LF		
0197	5872500000-E	1550	BORE AND JACK OF *** (24")	89 LF		
0198	5912000000-N	SP	GENERIC UTILITY ITEM TEMPORARY SANITARY SEWER BY- PASS PUMPING	Lump Sum	L.S.	
0199	6000000000-E	1605	TEMPORARY SILT FENCE	9,870 LF		
0200	6006000000-E	1610	STONE FOR EROSION CONTROL, CLASS A	760 TON		
0201	6009000000-E	1610	STONE FOR EROSION CONTROL, CLASS B	1,205 TON		
0202	6012000000-E	1610	SEDIMENT CONTROL STONE	1,475 TON		
0203	6015000000-E	1615	TEMPORARY MULCHING	9 ACR		
0204	6018000000-E	1620	SEED FOR TEMPORARY SEEDING	700 LB		
0205	6021000000-E	1620	FERTILIZER FOR TEMPORARY SEED- ING	3.5 TON		
0206	6024000000-E	1622	TEMPORARY SLOPE DRAINS	400 LF		
0207	6029000000-E	SP	SAFETY FENCE	400 LF		
0208	6030000000-E	1630	SILT EXCAVATION	1,090 CY		
0209	6036000000-E	1631	MATTING FOR EROSION CONTROL	26,850 SY		
0210	6037000000-E	SP	COIR FIBER MAT	1,510 SY		
0211	6042000000-E	1632	1/4" HARDWARE CLOTH	3,840 LF		
0212	6045000000-E	SP	*** TEMPORARY PIPE (18")	80 LF		
0213	6070000000-N	1639	SPECIAL STILLING BASINS	9 EA		
0214	6071012000-E	SP	COIR FIBER WATTLE	460 LF		

County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0215	6071020000-E	SP	POLYACRYLAMIDE (PAM)	350 LB		
0216	6071030000-E	1640	COIR FIBER BAFFLE	45 LF		
0217	6084000000-E	1660	SEEDING & MULCHING	10.5 ACR		
0218	6087000000-E	1660	MOWING	6.5 ACR		
0219	6090000000-E	1661	SEED FOR REPAIR SEEDING	150 LB		
0220	6093000000-E	1661	FERTILIZER FOR REPAIR SEEDING	0.5 TON		
0221	6096000000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	250 LB		
0222	6108000000-E	1665	FERTILIZER TOPDRESSING	5.75 TON		
0223	6111000000-E	SP	IMPERVIOUS DIKE	300 LF		
0224	6114500000-N	1667	SPECIALIZED HAND MOWING	20 MHR		
0225	6117000000-N	SP	RESPONSE FOR EROSION CONTROL	50 EA		
0226	6117500000-N	SP	CONCRETE WASHOUT STRUCTURE	13 EA		
0227	6123000000-E	1670	REFORESTATION	5.1 ACR		
0228	6126000000-E	SP	STREAMBANK REFORESTATION	0.31 ACR		
0229	6132000000-N	SP	GENERIC EROSION CONTROL ITEM FABRIC INSERT INLET PROTECTION DEVICE CLEANOUT	86 EA		
0230	6132000000-N	SP	GENERIC EROSION CONTROL ITEM FABRIC INSERT INLET PROTECTION DEVICE	43 EA		
0231	7048500000-E	1705	PEDESTRIAN SIGNAL HEAD (16", 1 SECTION W/COUNTDOWN)	14 EA		
0232	7060000000-E	1705	SIGNAL CABLE	13,955 LF		
0233	7120000000-E	1705	VEHICLE SIGNAL HEAD (12", 3 SECTION)	45 EA		

County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0234	7132000000-E	1705	VEHICLE SIGNAL HEAD (12", 4 SECTION)	10	EA	
0235	7144000000-E	1705	VEHICLE SIGNAL HEAD (12", 5 SECTION)	14	EA	
0236	7264000000-E	1710	MESSENGER CABLE (3/8")	1,085	LF	
0237	7300000000-E	1715	UNPAVED TRENCHING (*****) (1, 2")	3,015	LF	
0238	7301000000-E	1715	DIRECTIONAL DRILL (*****) (2, 2")	1,905	LF	
0239	7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	55	EA	
0240	7360000000-N	1720	WOOD POLE	4	EA	
0241	7372000000-N	1721	GUY ASSEMBLY	7	EA	
0242	7444000000-E	1725	INDUCTIVE LOOP SAWCUT	5,200	LF	
0243	7456000000-E	1726	LEAD-IN CABLE (*****) (14-2)	13,000	LF	
0244	7481000000-N	SP	SITE SURVEY	3	EA	
0245	7481200000-N	SP	LUMINAIRE ARM FOR VIDEO SYSTEM	12	EA	
0246	7481240000-N	SP	CAMERA WITHOUT INTERNAL LOOP EMULATOR PROCESSING UNIT	12	EA	
0247	7481260000-N	SP	EXTERNAL LOOP EMULATOR PRO- CESSING UNIT	3	EA	
0248	7481280000-N	SP	RELOCATE CAMERA SENSOR UNIT	9	EA	
0249	7575142000-N	1736	900MHZ SERIAL SPREAD SPECTRUM RADIO	4	EA	
0250	7588000000-N	SP	METAL POLE WITH SINGLE MAST ARM	16	EA	
0251	7613000000-N	SP	SOIL TEST	16	EA	

County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0252	7614100000-E	SP	DRILLED PIER FOUNDATION	144 CY		
0253	7631000000-N	SP	MAST ARM WITH METAL POLE DE-SIGN	16 EA		
0254	7636000000-N	1745	SIGN FOR SIGNALS	18 EA		
0255	7642200000-N	1743	TYPE II PEDESTAL WITH FOUNDATION	14 EA		
0256	7684000000-N	1750	SIGNAL CABINET FOUNDATION	4 EA		
0257	7696000000-N	1751	CONTROLLERS WITH CABINET (***** (TYPE 2070E, BASE MOUNTED)	4 EA		
0258	7744000000-N	1751	DETECTOR CARD (TYPE 170)	34 EA		
0259	7901000000-N	1753	CABINET BASE EXTENDER	4 EA		
0260	7960000000-N	SP	METAL POLE FOUNDATION REMOVAL	1 EA		
0261	7972000000-N	SP	METAL POLE REMOVAL	1 EA		
0262	7980000000-N	SP	GENERIC SIGNAL ITEM PROTECTIVE COATING FOR PUSHBUTTON POST (BLACK)	14 EA		
0263	7980000000-N	SP	GENERIC SIGNAL ITEM PROTECTIVE COATING FOR SINGLE MAST ARM POLE (BLACK)	16 EA		
CULVERT ITEMS						
0264	8126000000-N	414	CULVERT EXCAVATION, STA ***** (19+20.00 -L-)	Lump Sum	L.S.	
0265	8133000000-E	414	FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	16 TON		
0266	8196000000-E	420	CLASS A CONCRETE (CULVERT)	41.7 CY		

County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0267	8245000000-E	425	REINFORCING STEEL (CULVERT)	3,911 LB		
WALL ITEMS						
0268	8802014000-E	SP	SOLDIER PILE RETAINING WALLS	4,459 SF		
STRUCTURE ITEMS						
0269	8017000000-N	SP	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMP ACCESS AT STA ***** (14+94.00 -L-)	Lump Sum	L.S.	
0270	8035000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION ***** (14+94.00 -L-)	Lump Sum	L.S.	
0271	8065000000-N	SP	ASBESTOS ASSESSMENT	Lump Sum	L.S.	
0272	8121000000-N	412	UNCLASSIFIED STRUCTURE EXCAVA- TION AT STATION ***** (14+94.00 -L-)	Lump Sum	L.S.	
0273	8175000000-E	420	CLASS AA CONCRETE (BRIDGE)	43.7 CY		
0274	8182000000-E	420	CLASS A CONCRETE (BRIDGE)	59.4 CY		
0275	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (14+94.00 -L-)	Lump Sum	L.S.	
0276	8217000000-E	425	REINFORCING STEEL (BRIDGE)	10,862 LB		
0277	8224000000-E	425	EPOXY COATED REINFORCING STEEL (BRIDGE)	1,092 LB		
0278	8328200000-E	450	PILE DRIVING EQUIPMENT SETUP FOR *** STEEL PILES (HP 12 X 53)	14 EA		
0279	8364000000-E	450	HP12X53 STEEL PILES	980 LF		

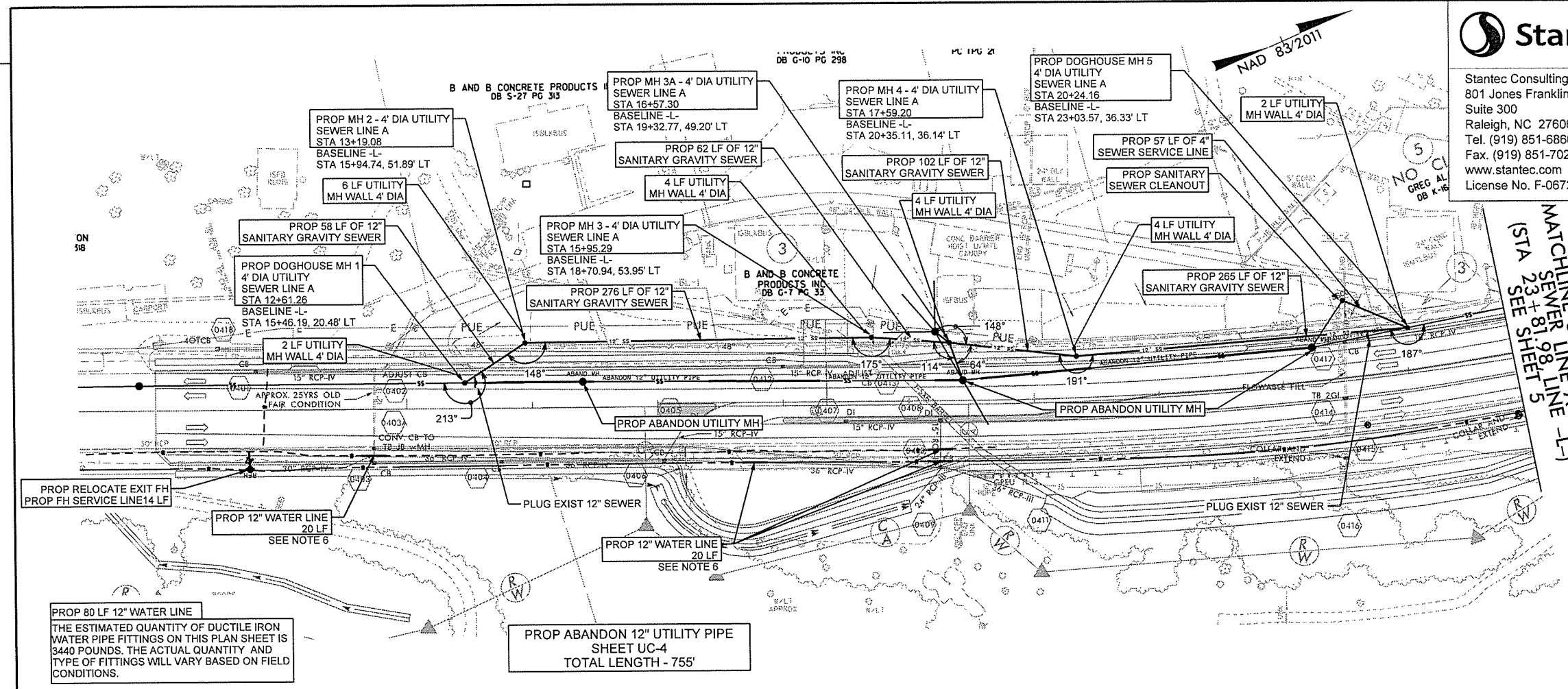
County : Macon

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0280	8482000000-E	460	THREE BAR METAL RAIL	92.2 LF		
0281	8505000000-E	460	VERTICAL CONCRETE BARRIER RAIL	100 LF		
0282	8608000000-E	876	RIP RAP CLASS II (2'-0" THICK)	285 TON		
0283	8622000000-E	876	GEOTEXTILE FOR DRAINAGE	320 SY		
0284	8657000000-N	430	ELASTOMERIC BEARINGS	Lump Sum	L.S.	
0285	8753200000-E	430	3'-0" X 3'-3" PRESTRESSED CONC BOX BEAMS	1,100 LF		
1556/Nov05/Q330495.338/D1250663908000/E285			Total Amount Of Bid For Entire Project :			



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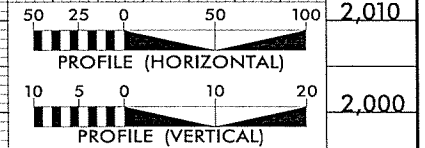
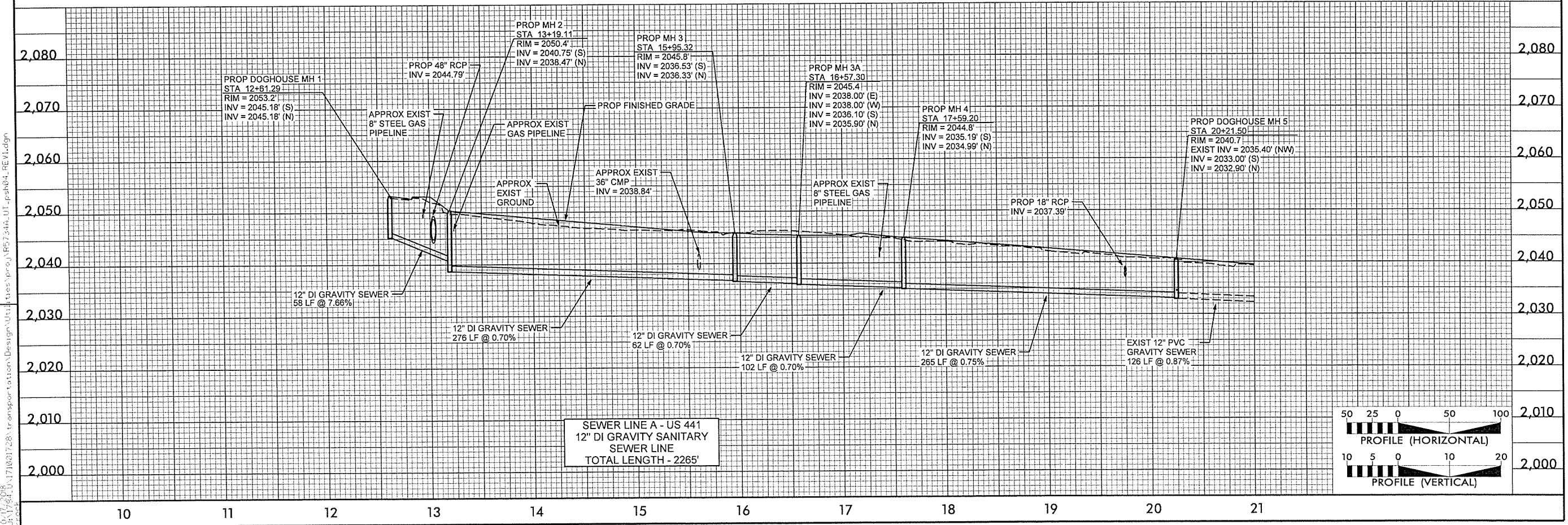
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DESIGNED BY: WMH	
DRAWN BY: RGR/MCM	
CHECKED BY: MCM	
APPROVED BY:	
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UTILITY CONSTRUCTION



- NOTES:
1. MAINTAIN MINIMUM 24" COVER BELOW FINISHED GRADE FOR ALL SEWER LINES.
 2. ALL THE LOCATIONS WHERE PROPOSED SEWER CROSSES DRAINAGE SYSTEM PROVIDE 18" MINIMUM VERTICAL CLEARANCE.
 3. RELOCATE ALL SEWER SERVICES ON EXISTING SEWER (TO BE ABANDONED) TO NEW SEWER LINE.
 4. ABANDON SEWER LINE IN LOCATIONS SHOWN. ABANDONMENTS INCLUDE ALL FITTINGS AND APPURTENANCES. ABANDONMENT OF THE SEWER LINE TO BE IN ACCORDANCE WITH THE TOWN OF FRANKLIN'S REQUIREMENTS.
 5. ALL ABANDONED LINES 8" OR LARGER FILLED WITH CDF.
 6. REPLACE EXISTING WATER FOUND TO BE IN CONFLICT WITH THE PROPOSED STORM SEWER. REPLACE EXISTING PIPE WITH PROP DUCTILE IRON RESTRAINED JOINT PIPE CENTERED OVER THE PROPOSED STORM SEWER PIPE AND INCLUDE FOUR PROP 12" 45 DEGREE BENDS AS NECESSARY TO MAINTAIN 18 INCH CLEARANCE.
 7. MAINTAIN MINIMUM 36" COVER BELOW FINISHED GRADE FOR ALL WATER LINES.



REVISIONS

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PROP 20 LF 8" WATER LINE
PROP 20 LF 12" WATER LINE

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 1300 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

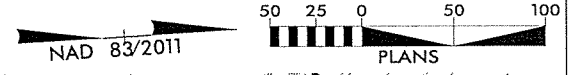
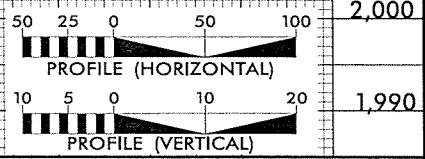
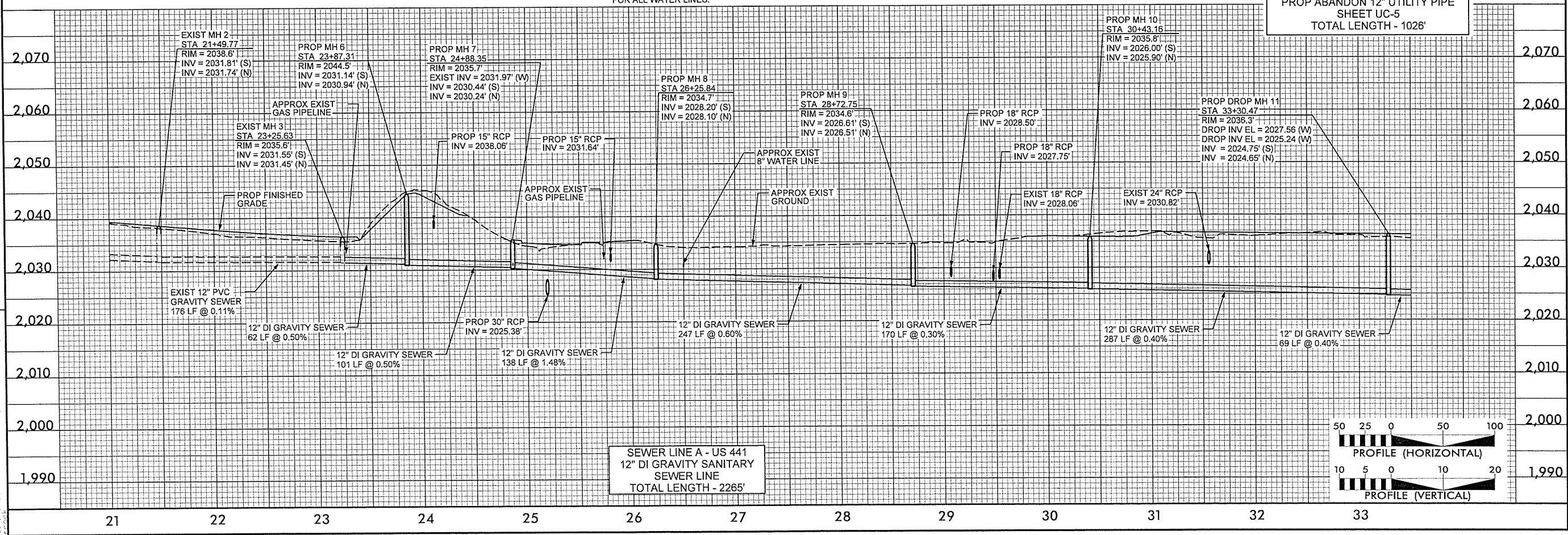
MATCHLINE STA 21+00.00,
SEWER LINE A
(STA 23+81.98 LINE -L-)
SEE SHEET 4

REVISIONS

NOTES:

1. MAINTAIN MINIMUM 24" COVER BELOW FINISHED GRADE FOR ALL SEWER LINES.
2. ALL THE LOCATIONS WHERE PROPOSED SEWER CROSSES DRAINAGE SYSTEM PROVIDE 18" MINIMUM VERTICAL CLEARANCE.
3. RELOCATE ALL SEWER SERVICES ON EXISTING SEWER (TO BE ABANDONED) TO NEW SEWER LINE.
4. ABANDON SEWER LINE IN LOCATIONS SHOWN. ABANDONMENTS INCLUDES ALL FITTINGS AND APPURTENANCES. ABANDONMENT OF THE SEWER LINE TO BE IN ACCORDANCE WITH THE TOWN OF FRANKLIN'S REQUIREMENTS.
5. ALL ABANDONED LINES 8" OR LARGER FILLED WITH CDF.
6. REPLACE EXISTING WATER FOUND TO BE IN CONFLICT WITH THE PROPOSED STORM SEWER. REPLACE EXISTING PIPE WITH PROP 12" DUCTILE IRON RESTRAINED JOINT PIPE CENTERED OVER THE PROPOSED STORM SEWER PIPE AND INCLUDE FOUR NEW 45 DEGREE BENDS AS NECESSARY TO MAINTAIN 18 INCH CLEARANCE.
7. PROP 12" WATER LINE, TYP 1 LOCATION. PROP 8" WATER LINE, TYP 1 LOCATION.
8. MAINTAIN MINIMUM 36" COVER BELOW FINISHED GRADE FOR ALL WATER LINES.

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UTILITY CONSTRUCTION

OUTSIDE DROP FOR CONNECTION TO EXIST SERVICE

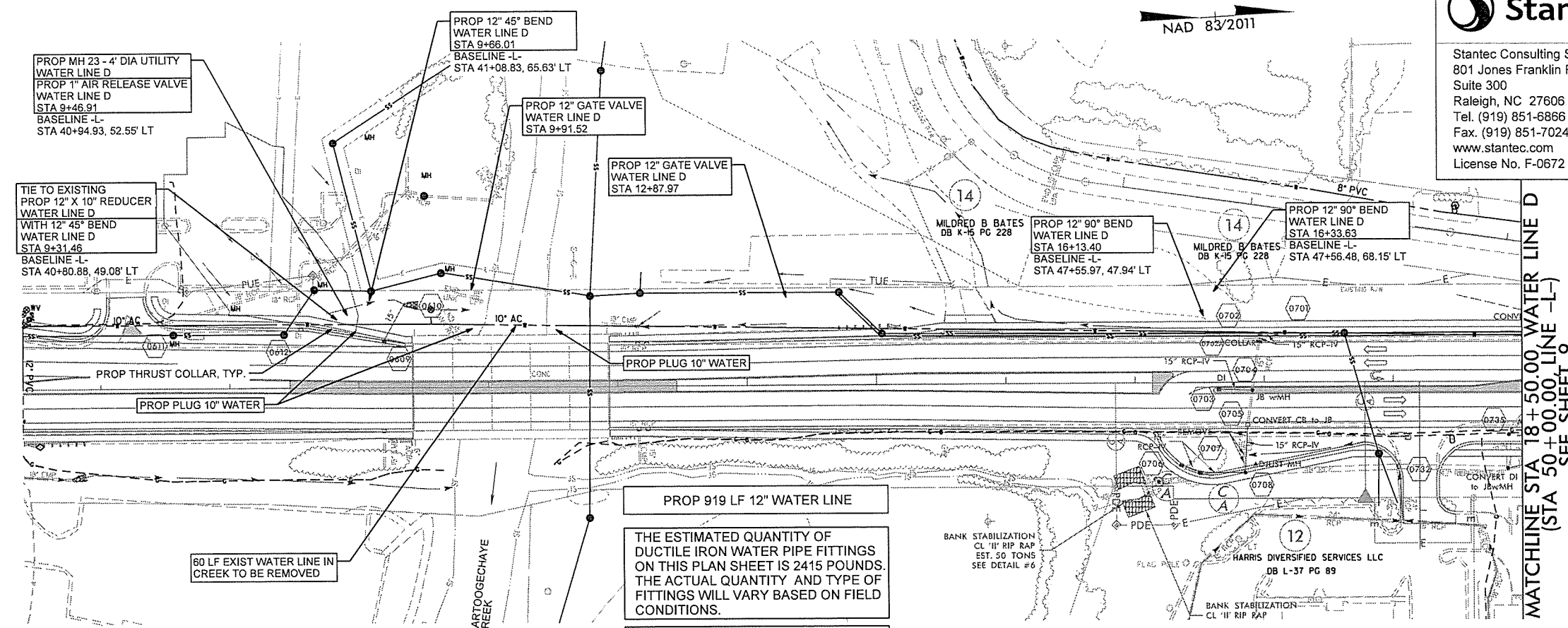
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(STA 36+38.50, LINE -L-)
SEE SHEET 6



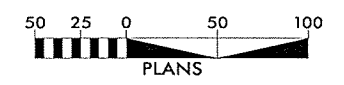
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UTILITY CONSTRUCTION



- NOTES:
1. RELOCATE ALL EXISTING WATER LINE SERVICES TO THE NEW WATER LINE. FOLLOW TOWN OF FRANKLIN STANDARD SERVICE CONNECTION DETAILS. COORDINATE SERVICE TIE OVER WITH PROPERTY OWNER AND TOWN OF FRANKLIN.
 2. MAINTAIN MINIMUM 36" COVER BELOW FINISHED GRADE FOR ALL WATER LINES.
 3. ALL THE LOCATIONS WHERE PROPOSED WATER CROSSES DRAINAGE SYSTEM PROVIDE 18" MINIMUM VERTICAL CLEARANCE.
 4. RELOCATE ALL WATER SERVICES ON EXISTING WATER (TO BE ABANDONED) TO NEW WATER LINE.
 5. ABANDON WATER LINE IN LOCATIONS SHOWN. ABANDONMENTS INCLUDES ALL FITTINGS AND APPURTENANCES. ABANDONMENT OF THE WATER LINE TO BE IN ACCORDANCE WITH THE TOWN OF FRANKLIN'S REQUIREMENTS.
 6. ALL ABANDONED LINES 8" OR LARGER FILLED WITH CDF.

PROP 919 LF 12" WATER LINE

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 2415 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

ABANDON EXIST 10" WATER LINE SHEET UC-8 TOTAL LENGTH - 842'

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