STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

March 29, 2019

U. S. Army Corps of Engineers
Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, NC 28801-5006

Attention: Mr. Steve Kichefski
NCDOT Coordinator

Subject: **Application for Section 404 Individual Permit and Section 401 Water Quality Certification** for the proposed widening along NC 105 from SR 1136 (Clark's Creek Road) to SR 1107 (NC 105 Bypass) including the replacement of Bridge No. 5 over the Watauga River, Watauga County. TIP No. R-2566B and R-2566BA. Debit $570 from WBS 37512.1.1

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to improve 5.5 miles of NC 105 from SR 1136 (Clark's Creek Road) to SR 1107 (NC 105 Bypass) in Boone, Watauga County (R-2566B). Additionally, NCDOT proposes to replace Bridge 5 over the Watauga River (R-2566BA).

The purpose of this letter is to request approval for a Section 404 Individual Permit and Section 401 Water Quality Certification. In addition to this cover letter, this application package includes the following for R-2566: ENG Form 4345, USFWS concurrence letter, DMS acceptance letter for both sections, 4B Meeting Minutes, stormwater management plan, final permit drawings for Section BA, preliminary permit drawings for Section B, roadway plans for Section BA.

Purpose and Need

This project has two primary purposes and one secondary purpose. A primary purpose of the project is to reduce congestion on NC 105 in order to achieve level of service (LOS) D or better in the design year (2040) during the average highest week day, and to achieve LOS E or better in the design year during the average highest weekend day. One segment on NC 105 between Foscoe and Boone currently operates at LOS E, and several segments and intersections are anticipated to operate at LOS E and F in the design year. Another primary purpose is to reduce rear-end and run-off-road crashes on NC 105. Crash types and rates on NC 105 have indicated a pattern of crashes related to terrain, geometry, congestion, and development. A secondary purpose is to improve bicycle facilities on NC 105 in areas where capacity or safety improvements are proposed.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
ENVIRONMENT ANALYSIS UNIT
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

Telephone: (919) 707-6000
Fax: (919) 212-5785
Customer Service: 1-877-368-4968
Website: www.ncdot.gov

Location:
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

Project Description

The project corridor is 5.5 miles long. No improvements are recommended on the 1-mile section between Clark's Creek Road and the southern intersection of NC 105 and Old Shull's Mill Road. The following improvements are recommended:

Section BA

- Replacement of Bridge 5 over the Watauga River along with the realignment of SR1112 (Broadstone Road) and Old Tweetsie Road.

Section B

- The section between Old Shull's Mill Road and Broadstone Road will consist of two 12-foot lanes (one in each direction) with 6-foot wide paved shoulders on both sides. The current design proposes to extend the existing climbing lane (located near Old Shull's Mill Road) to Broadstone Road.
- The section between Broadstone Road and NC 105 Bypass will consist of four 12-foot lanes, a 23-foot wide raised median and 6-foot wide paved shoulders.
- The intersection of NC 105/Old Shull's Mill Road (south) will be realigned and the NC 105/Old Shull's Mill Road (north) will be closed.

Summary of Impacts

Section BA (Final)

Proposed permanent impacts to jurisdictional areas total 203 linear feet of permanent impacts and 0.15 acre of temporary impacts to jurisdictional streams. There are no impacts to jurisdictional wetlands. There will be no impacts to jurisdictional resources due to utilities for Section BA.

Section B (Preliminary)

Proposed preliminary impacts to jurisdictional areas total 0.54 acre to riparian wetlands, 3,995 linear feet to jurisdictional steams and 0.01 acre to open water. Potential impacts due to utility relocation will be addressed prior to Letting of Section B.

Summary of Mitigation

The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible. The Department has acquired the compensatory mitigation for these unavoidable impacts from the North Carolina Department of Environmental Quality (NCDEQ)-Division of Mitigation Services (DMS) for both the BA section and the preliminary impacts presented for Section B.

Project Schedule

Currently, R-2566BA is scheduled to Let September 17, 2019, however this project may be accelerated if funding becomes available. R-2566B is scheduled to Let on October 18, 2022.

NEPA Document Status

The Environmental Assessment (EA) was approved in September 2016. A Finding of No Significant Impact (FONSI) was completed in June 2018. These documents are available at https://xfer.services.ncdot.gov/pdea/EnvironmentalDocs/Documents/.

NEPA Merger Process

R-2566 was originally proposed as a 16.4-mile project from US 221 in Linville to SR 1107 (NC 105 Bypass) in Boone. Concurrence Points (CP) 1 and 2 were completed in August 2010 and March 2012, respectively for the originally proposed project. The project was shortened removing the A section between Linville and Foscoe. The remaining 5.5-mile, Section B was carried forward and CP 1 and 2 were revisited in August 2014 with the new information. Meetings for CP 3 and 4A were held in March 2017. . Subsequent meetings for CP 4A were held in July 2017 and March 2018 to address concerns from the merger team. An informal CP 4B for Section BA was held in August 2018. It was determined at that time that a CP 4C meeting was not necessary if issues with the design were addressed at an on-site meeting. This on-site meeting occurred on in late August 2018. CP 4B and 4C for Section B will occur once that section reaches preliminary design.

Resource Status

The project is located in Watauga River Basin and lies within Hydrologic Unit 06010103. The Watauga River and its tributaries in the project area is rated as Class B, Tr, HQW. Laurel Fork and its tributaries is rated as Class C, Tr. No streams impacted are listed in the Final 2014 303(d) report. This is within the northern mountain physiographic region.

A jurisdictional wetland and stream verification was conducted on April 19, 2016. Written verification has not been issued.

Impacts to Jurisdictional Resources

Wetlands

Wetland impacts occur in the Watauga River Basin in HUC 06010103. Wetland impacts for R-2566B/BA total 0.54 acre. Table 1 lists the impacts to wetlands for this project. Impacts are based upon final design for R-2566BA and preliminary impacts for R-2566B.

Section BA – Wetland Impacts (Final)

There are no impacts to jurisdictional wetlands associated with Section BA.

Table 1. R-2566B Wetland Impacts (Preliminary)

Permit Drawing Site Number	JD Map Label	Type	Permanent Impacts (ac.)
2	WBZ	Riparian	0.02
3	WBZ	Riparian	0.03
7	WCC	Riparian	0.02
10	WCD	Riparian	0.01
11	WCF	Riparian	0.02

Permit Drawing Site Number	JD Map Label	Type	Permanent Impacts (ac.)
13	WCG	Riparian	0.03
17	WCI	Riparian	0.08
20	WCK	Riparian	0.06
27	WCQ	Riparian	0.03
32	WCU	Riparian	**0.03**
33	WCV	Non-riparian	<0.01
35	WCX	Riparian	0.02
40	WDA	Riparian	<0.01
Additional Impact*			0.17
Total:			**0.54**

***Preliminary impacts were calculated as the slope stake +25 feet. However, it has been determined that in some areas of severe slopes, the true impact may exceed +25 feet.**

Streams

Surface water impacts occur in the Watauga River Basin in HUC 06010103. Permanent stream impacts for R-2566B/BA totals 4,198 linear feet. Tables 2-4 list the site number, reference number, stream name and amount of impact.

Table 2. R-2566BA Streams Impacted and Description (Final)

Permit Drawing Site Number	JD Map Label	Stream Name	Perennial/Intermittent
1	SGS	UT to Watauga River	Perennial
2	Watauga River	Watauga River	Perennial
3	Laurel Fork	Laurel Fork	Perennial
4	SGT	UT to Laurel Fork	Perennial
5	SGU	UT to Laurel Fork	Perennial

Table 3. R-2566BA Stream Impacts (Final)

Permit Drawing Site Number	Impact Type	Permanent Stream Impacts (ft)	Temporary Stream Impacts (ft)
1	24” CSP/Fill	100	10
2	Workpad/Biofiltration conveyance	0	274
3	60” SSP/Dewatering	0	70
4	60” SSP/Fill	73	22
5	60” SSP/Fill	30	21
Total		**203**	**397**

Table 4. R-2566B Streams Impacted and Description (Preliminary)

Permit Drawing Site Number	JD Map Label	Stream Name	Perennial/Intermittent	Permanent Impact (Preliminary)
1	SFU	UT to Watauga River	Perennial	65
4/6/8	SFV	UT to Watauga River	Perennial	479
5/7	SFW	UT to Watauga River	Perennial	169
9	Big Branch	Big Branch	Perennial	163
10	SGB	UT to Watauga River	Perennial	77
11	SGD	UT to Watauga River	Perennial	132
12	SGE	UT to Watauga River	Perennial	93
14/15	SGF	UT to Watauga River	Perennial	66
16	SGH	UT to Watauga River	Perennial	135
18	SGG	UT to Watauga River	Perennial	42
19	SGJ	UT to Watauga River	Perennial	90
20	SGO	UT to Watauga River	Perennial	42
21	SGO/SGP	UTs to Watauga River	Perennial	242
25	SGZ	UT to Laurel Fork	Perennial	217
26	SHB	UT to Laurel Fork	Perennial	152
27	SHC	UT to Laurel Fork	Perennial	248
28	SHD	UT to Laurel Fork	Perennial	50
29	SHE	UT to Laurel Fork	Perennial	54
30	SHF*	UT to Laurel Fork	Perennial	73
31	SHH	UT to Laurel Fork	Perennial	52
32	SHK	UT to Laurel Fork	Perennial	130
34	SHO	UT to Laurel Fork	Perennial	115
35	SHW	UT to Laurel Fork	Perennial	268
36/37	SHZ	UT to Laurel Fork	Perennial	150
38	SIC	UT to Laurel Fork	Perennial	59
39	SID	UT to Laurel Fork	Perennial	40

Permit Drawing Site Number	JD Map Label	Stream Name	Perennial/Intermittent	Permanent Impact (Preliminary)
42	Laurel Fork	Laurel Fork	Perennial	131
Additional Impact**				**461**
Total				**3,995**

***Stream was not included in the JD package but was covered under the NRTR.**
**** Preliminary impacts were calculated as the slope stake +25 feet. However, it has been determined that in some areas of severe slopes, the true impact may exceed +25 feet.**

Open Water

There are no permanent open water impacts associated with Section BA. There is a proposed permanent open water impact associated with Section B. Site 41 is estimated to have <0.01 acre of impact due to fill in a pond.

Protected Species

As of June 27, 2018, the United State Fish and Wildlife Service (USFWS) lists eleven (11) federally protected species for Watauga County (Table 5).

Table 5. Federally protected species listed for Watauga County

Common Name	Scientific Name	Status	Habitat Presence	Biological Conclusion
Bog turtle	*Glyptemys muhlenbergii*	T(S/A)	No	Not Required
Carolina northern flying squirrel	*Glaucomys sabrinus coloratus*	E	No	No Effect
Gray bat	*Myotis grisescens*	E	Yes	MANLAA
Northern long-eared bat	*Myotis septentrionalis*	T	Yes	*
Virginia big-eared bat	*Corynorhinus townsendii virginianus*	E	Yes	MANLAA
Rusty-patched bumble bee	*Bombus affinis*	E	NA	**
Spruce-fir moss spider	*Microhexura montivaga*	E	No	No Effect
BlueRidge goldenrod	*Solidago spithamaea*	T	No	No Effect
Heller's blazing star	*Liatris helleri*	T	No	No Effect
Roan mountain bluet	*Hedyotis purpurea var. montana*	E	No	No Effect
Spreading avens	*Geum radiatum*	E	No	No Effect

MANLAA- May Affect, Not Likely to Adversely Affect
*May Affect – NLEB is compliant with the 4(d) rule.
**The Service does not require surveys for rusty-patched bumble bee in North Carolina because FWS assumes the state is unoccupied by the species.

USFWS Concurrence

Informal concurrence for biological conclusions of May Affect, Not Likely to Adversely Affect was requested for gray bat and Virginia big-eared bat from the USFWS on June 22, 2018. Concurrence was received on June 28, 2018 agreeing with NCDOT's biological conclusion. The Northern long-eared bat is considered to be compliant with the 4(d) rule. All other species listed for Watauga County received biological conclusions of No Effect and did not require concurrence.

Hellbender

The hellbender has been proposed for listing as an endangered species by the USFWS. However, there is currently no date as to when it would receive protected status. NCDOT is coordinating with the USFWS and NCWRC about conservation measures for the species in the event the species receives its official listing during this project's construction. Surveys have been conducted within the project area, identifying areas in which the hellbender is present. Proposed protective measures have been recommended by the NC Wildlife Resources Commission (NCWRC). These measures are the following:

- In-water work moratorium from April 1 to November 1, to protect the early life stages and spawning activities of the hellbender
- Rescue and relocation right before the causeway installation if possible – NCDOT will assist NCWRC with personnel and equipment if the river conditions are acceptable for staff to enter.

Bald and Golden Eagle Protection Act (BGPA)

A desktop-GIS assessment of the project study area, as well as the area within a 1.13-mile radius (1.0 mile plus 660 feet) of the project limits, was performed on March 5, 2019. The Watauga River is large enough and sufficiently open to be considered potential feeding source. A review of the NCNHP database updated January 2019 revealed the presence of an eagle nest along Old Shulls Mill Road at River Pointe Lane. This nest was confirmed to be active as of April 2018. The location of this nest is well outside 660 feet of the construction area of this project and will not be affected.

Moratoria

There is a trout moratorium for all streams in the project area from October 15th through April 15th prohibiting in-water work and land disturbance within 25 feet of the stream. The NCWRC has indicated that this moratorium will be waived in place of the longer moratorium mentioned above for the hellbender.

Cultural Resources

It has been determined that two properties were recommended eligible for listing with the National Register of Historic Places (NRHP); the Prout-Atkins House and Ed & Falah Hollars House. However, the Best-Fit Alternative will not require any right-of-way from these properties. Archaeological surveys were conducted at potential historical sites along the corridor in April 2017. It was determined that potential sites were deemed ineligible for the NRHP.

FEMA Compliance

The project has been coordinated with appropriate state and local officials and the Federal Emergency Management Agency (FEMA) to assure compliance with FEMA, state, and local floodway regulations.

Indirect and Cumulative Effects

NCDOT prepared an Indirect and Cumulative Effects Screening Report in January 2011 which assessed the original proposed project length of 16.4 miles. Project length has since been reduced to approximately 5 miles, comprised of the northernmost portion of the original length. The ICE screening matrix was reevaluated in 2019 given the revised project criteria, rendering a determination of Indirect Scenario Assessment Not Likely. No Land Use Scenario Assessment appears to be warranted for the project as currently proposed. The reduced scope of the project and associated time savings, along with the limited regional population growth, indicate a low probability that the project will affect regional land use patterns over the long term, beyond that which would occur under the No-Build scenario.

Wild and Scenic Rivers

There have been no waterbodies within the study area that have been designated under the National Wild and Scenic Rivers Act of 1968.

Mitigation Options

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

Avoidance and Minimization

All jurisdictional features were delineated, field verified and surveyed within the corridor for R-2566B/BA. Using these features, preliminary designs were adjusted to avoid and/or minimize impacts to jurisdictional areas. NCDOT employs many strategies to avoid and minimize impacts to jurisdictional areas in all of its designs. Many of these strategies have been incorporated into BMP documents that have been reviewed and approved by the resource agencies and which will be followed throughout construction. All wetland areas not affected by the project will be protected from unnecessary encroachment. Individual avoidance and minimization items are as follows:

- The Best-Fit Alternative uses the fewest improvements that would result in meeting the purpose of the project. This alternative also allows to avoid or minimize impacts to the Watauga River and Laurel Fork.
- NCDOT Design Standards in Sensitive Watersheds will be employed throughout the project.
- Minimizing roadway side slopes to the maximum extent possible, including the use of retaining walls in the vicinity of the Watauga River.
- Roadway was shifted away from the Watauga River to minimize impacts.
- Roadway adjacent to the Watauga River will be a three-lane road, as opposed to a 4-lane divided to reduce impacts.
- Roadway and bridge runoff in the vicinity of the Watauga River will be routed to a biofiltration conveyance.

Compensation

The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. The unavoidable permanent stream impacts of 307 linear feet and wetland impacts of 0.02 acre will be offset by compensatory mitigation provided by the North Carolina Department of Environmental Quality (NCDEQ)-Division of Mitigation Services (DMS). Compensation for the preliminary impacts to Section B are covered by DMS. Acceptance letters from DMS are attached.

Regulatory Approvals

Section 404: Application is hereby made for a USACE Individual 404 Permit as required for the above-described activities.

Section 401: We are requesting a Section 401 Water Quality Certification from NCDWR. We are providing this application to NCDEQ, for their approval. Authorization to debit the $570 Permit Application Fee from WBS Element 45449.1.1 is hereby given.

A copy of this permit request and its distribution list will be posted on the NCDOT website at: https://connect.ncdot.gov/resources/Environmental/Pages/default.aspx.

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Jason Dilday at jldilday@ncdot.gov or (919) 707-6111.

Sincerely,

Carla Dagnino

for Philip S. Harris III, P.E., C.P.M.
Environmental Analysis Unit Head

cc:

NCDOT Permit Application Standard Distribution List

U.S. ARMY CORPS OF ENGINEERS

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

Form Approved - OMB No. 0710-0003 Expires: 30-SEPTEMBER-2015

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Philip Middle - S Last - Harris	First - Middle - Last -
Company - NCDOT-EAU	Company -
E-mail Address - pharris@ncdot.gov	E-mail Address -
6. APPLICANT'S ADDRESS:	9. AGENT'S ADDRESS:
Address- 1598 Mail Service Center	Address-
City - Raleigh State - NC Zip - 27699 Country - USA	City - State - Zip - Country -
7. APPLICANT'S PHONE NOs. w/AREA CODE	10. AGENTS PHONE NOs. w/AREA CODE
a. Residence b. Business 919-707-6001 c. Fax	a. Residence b. Business c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

_____ _____

SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)

R-2566

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Watauga River and UTs, Laurel Fork and UTs	Address
15. LOCATION OF PROJECT Latitude: ◦N 36.194317 Longitude: ◦W -81.745241	City - State- Zip-

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID Municipality

Section - Township - Range -

17. DIRECTIONS TO THE SITE

See attached vicinity map and cover letter.

18. Nature of Activity (Description of project, include all features)

R-3421B proposes to widen a 5.5 mile section of NC 105 from Clark's Creek Road (SR1136) to the NC 105 Bypass (NC 1107), which includes the replacement of Bridge 5 over the Watauga River.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

This project has two primary purposes and one secondary purpose. A primary purpose of the project is to reduce congestion on NC 105 in order to achieve level of service (LOS) D or better in the design year (2040) during the average highest week day, and to achieve LOS E or better in the design year during the average highest weekend day. One segment on NC 105 between Foscoe and Boone currently operates at LOS E, and several segments and intersections are anticipated to operate at LOS E and F in the design year. Another primary purpose is to reduce rear-end and run-off-road crashes on NC 105. Crash types and rates on NC 105 have indicated a pattern of crashes related to terrain, geometry, congestion, and development. A secondary purpose is to improve bicycle facilities on NC 105 in areas where capacity or safety improvements are proposed.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Impacts will result from widening the roadway, shoulders, and replacement of bridge components.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type	Type	Type
Amount in Cubic Yards	Amount in Cubic Yards	Amount in Cubic Yards

See attached cover letter.

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres See attached cover letter.

or

Linear Feet See attached cover letter.

23. Description of Avoidance, Minimization, and Compensation (see instructions)

See attached cover letter.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- See attached list.

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

Carla Dagnino — March 29, 2019

SIGNATURE OF APPLICANT — DATE — SIGNATURE OF AGENT — DATE

for Philip S. Harris, P.E.

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

United States Department of the Interior

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

June 28, 2018

Mr. Phil Harris
North Carolina Department of Transportation
Project Development and Environmental Analysis Unit
1598 Mail Service Center
Raleigh, NC 27699-1598

Subject: Endangered Species Concurrence for the Proposed Improvements to NC 105 From SR 1136 to SR 1107, Including Replacing Bridge No. 5 Over the Watauga River, Watauga County, North Carolina, TIP Project Nos. R-2566B and R-2566BA.

Dear Mr. Harris:

We have reviewed your concurrence request and supporting documentation regarding potential impacts to the federally endangered Virginia big-eared bat (*Corynorhinus townsendsii virginianus*) and gray bat (*Myotis grisescens*) from implementation of the subject project. We provide the following comments in accordance with the provisions of section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act).

The North Carolina Department of Transportation (NCDOT) proposes to widen NC 105 from the NC 105 By-pass in Boone to Clark's Creek Road near Foscoe in Watauga County. The project length is about 5.5 miles and includes widening the existing roadway and replacing the bridge over the Watauga River.

At the time this project was originally proposed, there was a known Virginia big-eared bat (VBEB) hibernaculum near the project but there was little to no information about where those bats went in the summer and if a maternity colony was present in the area. In an effort to address these questions regarding VBEBs and potential project impacts, an extensive two year monitoring project, led by Indiana State University (ISU), was conducted from 2013 through 2014. ISU scientists captured 42 female and 2 male VBEBs, fitted them with radio transmitters and tracked them to 35 roost sites including the first known maternity roost site for this species in North Carolina.

All of the summer roosts, with the exception of one, are located in Avery County well to the north and west of the project area. One maternity roost is located in Watauga County near Beech Mountain (~11km northwest of the project). While foraging at night, most bats foraged inside and away from the boundaries of NC 105 in Avery County, near their summer roost sites. The widening for R-2566B and BA, is in an area where Virginia big-eared bats are not known to forage.

Because gray bats are known to use bridges and culverts as roosts, all existing structures impacted by the project that could provide suitable roost habitat for bats were examined for evidence of bat use and none was found. In addition no gray bats are documented from hibernacula in the area and none were seen in summer roost sites occupied by VBEB.

Based on the results of the VBEB monitoring and movement data in the project area, negative structure checks, and a commitment by NCDOT to inspect the existing bridge over the Watauga River for bats prior to bridge demolition, we agree that implementation of this project is "not likely to adversely affect" Virginia big-eared and gray bats. Therefore, the requirements under section 7(c) of the Act are fulfilled. However, obligations under section 7 of the Act 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.

If you have questions about these comments please contact Ms. Marella Buncick of our staff at 828/258-3939, Ext. 237. In any future correspondence concerning these projects, please reference our Log Number 10-244.

Sincerely,

Janet Mizzi
Field Supervisor

cc (electronic): Felix Davila, FHWA
Marissa Cox, NCDOT

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
TIM BAUMGARTNER
Director

NORTH CAROLINA
Environmental Quality

March 12, 2019

Mr. Philip S. Harris, III, P.E.
Environmental Analysis Unit
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Mr. Harris:

Subject: Mitigation Acceptance Letter:

R-2566B, NC 105 Improvements from SR 1136 in Watauga County to SR 1107 in Boone, Watauga County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the compensatory stream and wetland mitigation for the subject project. Based on the information supplied by you on February 28, 2019, the impacts are located in CU 06010103 of the Watauga River basin in the Northern Mountains (NM) Eco-Region, and are as follows:

Watauga 06010103 NM	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	3.995.0	0	0	0.54	0	0	0	0

*Some of the stream and/or wetland impacts may be proposed to be mitigated at a 1:1 mitigation ratio. See permit application for details.

The impacts and associated mitigation needs were under projected by the NCDOT in the 2019 impact data. DMS will commit to implement sufficient compensatory stream and wetland mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies using the delivery timeline listed in Section F.3.c.iii of the In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from DMS.

If you have any questions or need additional information, please contact Beth Harmon at 919-707-8420.

Sincerely,

James B. Stanfill
DMS Asset Management Supervisor

cc: Mr. Monte Matthews, USACE – Raleigh Regulatory Field Office
Ms. Amy Chapman, NCDWR
File: R-2566B

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
TIM BAUMGARTNER
Director

NORTH CAROLINA
Environmental Quality

March 12, 2019

Mr. Philip S. Harris, III, P.E.
Environmental Analysis Unit
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Mr. Harris:

Subject: Mitigation Acceptance Letter:

R-2566BA, NC 105 Improvements from US 221 to SR 1136, Watauga County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the compensatory stream mitigation for the subject project. Based on the information supplied by you on February 28, 2019, the impacts are located in CU 06010103 of the Watauga River basin in the Northern Mountains (NM) Eco-Region, and are as follows:

Watauga 06010103 NM	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	203.0	0	0	0	0	0	0	0

*Some of the stream and/or wetland impacts may be proposed to be mitigated at a 1:1 mitigation ratio. See permit application for details.

The impacts and associated mitigation needs were under projected by the NCDOT in the 2019 impact data. DMS will commit to implement sufficient compensatory stream mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies using the delivery timeline listed in Section F.3.c.iii of the In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from DMS.

If you have any questions or need additional information, please contact Beth Harmon at 919-707-8420.

Sincerely,

James B. Stanfill
DMS Asset Management Supervisor

cc: Mr. Monte Matthews, USACE – Raleigh Regulatory Field Office
Ms. Amy Chapman, NCDWR
File: R-2566BA

Subject: Minutes from Watauga River Bridge Replacement Discussion held on August 8, 2018 for R-2566BA in Watauga County.

Location: NCDOT Century Center Complex – Hydraulics Unit Conference Room

Team Members:

Steve Kichefski – USACE	(present)
Marella Buncick – USFWS	(present)
Claire Ellwanger – USFWS	(present)
– FHWA	(absent)
Christopher Militscher – USEPA	(absent)
Marla Chambers – NCWRC	(present)
Dave Wanucha – NCDWR	(phone)
Robert Patterson, NCDWR	(present)

Additional Participants:

Nathan Adima, NCDOT PMU
Bill Zerman, NCDOT PMU
Beverly Robinson, NCDOT PMU
Brenda Moore, NCDOT Roadway
Craig Lee, NCDOT Hydraulics
Bill Elam, NCDOT Hydraulics (absent)
Jason Dilday, NCDOT EAU
Carla Dagnino, NCDOT EAU
Marissa Cox, NCDOT EAU-BSG
Jared Gray, NCDOT EAU-BSG (absent)
John Jamison, NCDOT EPU
Brian Lipscomb, NCDOT Stormwater
Mark Staley, NCDOT REU (phone)
David Harris, NCDOT REU (absent)
Amber Lee, NCDOT SMU
Keith Pascal, NCDOT SMU
Greg Sealy, NCDOT Utilities (absent)
Cameron Cochran, NCDOT Constr. Unit
Trent Beaver, Div 11 Construction (phone)
Heath Slaughter, Div 11 DEO (absent)
Bob May, Wetherill Engineering
Zach Richard, TGS Engineers
David Petty, TGS Engineers (Minutes)

Date of Minutes: August 20, 2018

The project involves the replacement of Watauga #5, the NC 105 bridge over the Watauga River. The purpose of this meeting is to discuss anticipated temporary and permanent impacts associated with the bridge replacement and roadway approach work.

The meeting began at 8:00 am.

General Notes / Comments

- Nathan Adima (NCDOT PMU) opened the meeting and handled introductions.
- Craig Lee (NCDOT Hydraulics) mentioned this project, R-2566BA (BA section), is contained within a larger future R-2566B (B section) project. The BA section was spilt out due to the bridge needing replacement before the full B section can be ready for Letting due to a bridge inspection giving a low sufficiency rating.
- There was discussion as to whether another meeting would be needed for the BA section and if so, to be referred to as 4C or other. A follow up meeting at the bridge site was requested to discuss constructability issues and related impacts (at which time it can be discussed as to whether an additional meeting is necessary). *Subsequent to this meeting, email correspondence from NCDOT PMU indicated a meeting will be held onsite August 22, 2018 at 9:30 am, prior to the field inspection currently scheduled for that afternoon.*
- David Petty (TGS Engineers, Hydraulics Engineer) discussed redline drainage planset sheet by sheet. TGS noted the proposed right of way shown on the redline drainage plans (the plans posted on the PDEA Merger site in preparation for this meeting) has been superseded. The intent now is for proposed right of way for the BA section to be

sufficient to cover the future B section. In areas where proposed drainage causes jurisdictional impacts, effort has and will be made to design drainage to work for both the current BA section and future B section.

Sheet 4

- TGS mentioned 3 pipe outlets (Str# 402, 405, 409) which substantially carry offsite drainage and discharge on east side of NC 105 and are then dissipated with Class I riprap. These are within the transition from existing to full 4-lane divided typical and are within the area that will be further widened in the future B section. Per inquiry, it was noted that the pipe systems have been designed substantially to work for the B section also. While the inlet structures (2GI's & CB's) may have to be moved out and pipe extended upstream, the proposed pipe and outlets should work for the B section and remain in place.
- TGS noted impacts to UT to Watauga River (SGS) have been minimized with a Berm Ditch Outlet (BDO) being proposed (Str# 406) at the top of the 0.75:1 rock cut slope. Per comment, following field inspection, coordination with the B section designers will take place to confirm BDO is located sufficiently upstream to work for the wider B section (and will be adjusted slightly upstream if necessary).
- Per inquiry, it was noted that there are no longer any proposed retaining walls on the -L- line as these were eliminated with the previous alignment shift.
- Per inquiry regarding UT (SGS) only shown upstream of the existing pipe, Jason Dilday (NCDOT EAU) indicated it discharges from the pipe down the bank with no discernable channel.

Sheet 5

- TGS noted 3 additional pipe outlets (Str# 505,511,516) which are very similar to the 3 on sheet 4 as they substantially carry offsite drainage and are dissipated with either Class B or Class I riprap.
- NCWRC expressed concerns about disturbance to salamanders and hopes to meet onsite to evaluate best places to outlet drainage to avoid disturbances.
- It was noted that the Hellbender Salamander may be proposed by USFWS for listing in September 2018. If it is proposed, it could then be listed as threatened or endangered next fall. NCDOT EAU-BSG is coordinating with Lori Williams (NCWRC) to acquire Hellbender point data from the last Hellbender survey in this area (2011). EAU-BSG is doing a passive Hellbender survey around Labor Day (September 3rd). Current estimation is over a dozen Hellbenders in this area.
- Bridge:
    - TGS noted that the proposed 3 span bridge with a total length of 270' has been laid out to minimize both temporary and permanent impacts to the Watauga River.

- Proposed end bent excavation has been minimized. It is proposed at the maximum practical elevations to allow for bridge inspection and to avoid riprap slope extending down in the river at the upstream end of end bent 1.
- Runoff on the existing bridge discharges directly to the Watauga River, however; runoff from the proposed bridge is collected and routed to a BMP in the east quadrant. A Base Grassed Swale is currently shown. Brian Lipscomb (NCDOT Stormwater) noted, due to anticipated subsurface conditions and likely difficulty in establishing grass cover, this may be changed to a Biofiltration Conveyance consisting of step pools with rock at surface and filter media underneath.
- TGS provided a hardcopy of a preliminary sketch of Class II rip rap temporary workpads proposed at elevation 2729' on each side of the river which are necessary for removal of the existing cast-in-place concrete piers and spread footings. Cameron Cochran (NCDOT Construction Unit) discussed construction issues and the need to extend temporary workpads upstream to the upstream face of the proposed bridge. He expressed concerns about equipment access under the existing bridge with respect to the current layout of proposed interior bents and said he will evaluate further. Cameron indicated the likelihood of temporary workpads remaining in place for a substantial portion of the construction duration to build the upstream portion of the bridge, then to demolish the existing bridge and complete construction of the bridge. Cameron anticipates the workpads will need to be in on both sides of the river at the same time to set the center spans, which may block more than 50% of the stream. *Per request, following this meeting, TGS sent preliminary sketch of temporary workpad area to Cameron for his markups and further consideration prior to the onsite meeting anticipated in late August.*
- It was noted that giant boulders in area may also pose construction issues.
- It was noted the upstream wingwall of end bent 1 is shown to catch the localized shoulder fill and prevent the need for a riprap lined slope normal to the wing spilling down in the river.

<u>Sheet 6</u>

- TGS noted the proposed system (Str # 601,602,603,604) to replace the existing 60" CMP and 36" CMP has been designed to accommodate both the BA section and future B section as well as to minimize impacts to the UT's to Laurel Fork (SGT &SGU) and Laurel Fork.
  - Class I riprap is proposed in base of channel at the proposed 72" RCP outfall (Str# 604) to diffuse flow and provide a stable transition to Laurel Fork. Concerns were expressed about the outlet channel and making sure it will be stable and have the lowest possible velocities. TGS to evaluate outfall channel stability.
  - TGS noted there are no proposed drops throughout the system or at the outlet – an improvement over existing conditions as the 60" CMP outlet is perched 2'. After discussion and in consideration of minimizing outlet velocities and stability given the topographic constraints, Steve Kichefski (USACE) noted that aquatic

passage could be waived in favor of more stability since existing pipe outlet is perched 2’ and not currently providing wildlife passage. TGS to evaluate revising system to possibly include a drop at the 10’ diameter manhole to reduce outlet pipe slope.

- TGS noted both inlets are currently proposed to be buried – an improvement over existing conditions as the existing 60” CMP is not buried. NCDOT Hydraulics noted that, if the inlets were to be buried, the steep stream would likely wash out any sediment and therefore, recommend the inlets not be buried. TGS to revise plans adding a note that reads “No burial at inlet” and a waiver is to be included in the permit drawing submittal.
- TGS noted the plan is to add a stream plug detail at the outlet of the existing 60” CMP.
- TGS noted 10’ of temporary impacts for a pump-around outside the trout moratorium are anticipated upstream of each inlet.
- Per inquiry, it was noted that drainage system construction techniques would be discussed at the field inspection with the Division currently scheduled for August 22, 2018. Preliminary assumption is an open cut as bore and jack is very likely not feasible due to proximity to Laurel Fork and topographic constraints.

The meeting adjourned at 9:10 am.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

General Project Information

WBS Element:	37512.1.4	**TIP Number:**	R-2566BA	**Project Type:**	Bridge Replacement	**Date:**	10/13/2018
NCDOT Contact:	Craig J. Lee, PE (Hydraulics Unit)			**Contractor / Designer:**	TGS Engineers (David B. Petty, PE)		
Address:	1590 Mail Service Center Raleigh, NC 27699-1590			**Address:**	706 Hillsborough St Suite 200 Raleigh, NC 27603		
Phone:	919-707-6708			**Phone:**	919-773-8887		
Email:	cilee@ncdot.gov			**Email:**	dpetty@tgsengineers.com		
City/Town:	Boone			**County(ies):**	Watauga		
River Basin(s):	Watauga			**CAMA County?**	No		
Wetlands within Project Limits?	No						

Project Description

Project Length (lin. miles or feet):	0.43 miles	**Surrounding Land Use:**	rural, some rural residential

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	4.1 ac.	2.1 ac.
Typical Cross Section Description:	two to five lane shoulder section with 12' lanes, 0' to 11' raised grassed median, 6' to 8' paved shoulders and 2' to 3' turf shoulders	two 12' lane shoulder section, 2' to 3' paved shoulders and 0' to 3' turf shoulders
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 18000 Year: 2040	Existing: 15000 Year: 2019

General Project Narrative: (Description of Minimization of Water Quality Impacts)

The proposed project involves the replacement of the structurally deficient bridge over the Watauga River on NC 105 near Broadstone Rd (SR 1112) as well as widening NC 105, an existing two-lane undivided principal arterial, to a two to five-lane median divided highway to relieve congestion and improve safety. The existing five-span, approximately 263-ft long by 32-ft wide bridge will be replaced with a two-span, approx. 270-ft by 102-ft wide bridge. There are three proposed pipe replacements on unnamed tributaries. Riprap is proposed in base of the outfall channels to reduce discharge velocities.

Runoff on the existing bridge discharges directly in the Watauga River; however, the proposed bridge will have no direct discharge into the river. Roadway and bridge runoff in the vicinity of the Watuaga River crossing is routed to a biofiltration conveyance on sheet 5 for both peak attenuation and treatment. Stormwater diversion has been minimized. Outlet pipe slopes are minimized and discharge disspated with riprap pads. BMP's have been incorporated throughout the project to the maximum extent practicable given the crystalline rock and topographic constraints.

The existing bridge has two bents in the Watauga River which will be removed. The proposed bridge will have one bent at water's edge.

Waterbody Information

Surface Water Body (1):	Watauga River		**NCDWR Stream Index No.:**	8-(1)	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class B		
		Supplemental Classification:	Trout Waters (Tr)	High Quality Waters (HQW)	
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Watauga River			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element:	37512.1.4	**TIP No.:**	R-2566BA	**County(ies):**	Watauga	**Page**	2	**of** 3

Additional Waterbody Information

Surface Water Body (2):	Laurel Fork		**NCDWR Stream Index No.:**	8-10		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	Trout Waters (Tr)			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	Laurel Fork			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 37512.1.4 **TIP No.:** R-2566BA **County(ies):** Watauga

Other Best Management Practices

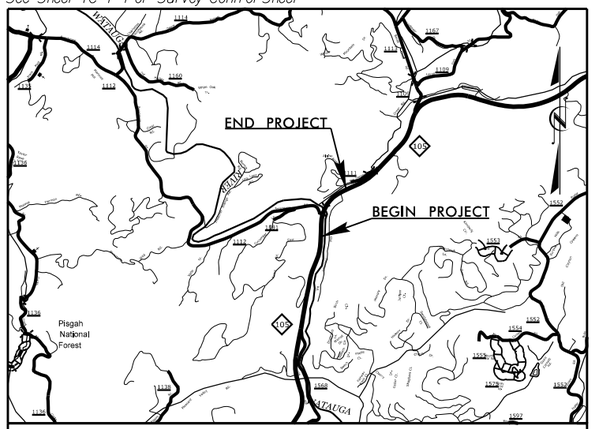
Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	BMP Type	Drainage Area (ac)	New Built-Upon Area (ac)	Volume Treated (ac-ft)	Precipitation Depth Treated over NBUA (in)	BMP Associated w/ Buffer Rules?
5	-L- 164+60 RT 36.1942, -81.7450	(1)Watauga River	Biofiltration Conveyance	3.3	1.2	n/a	#VALUE!	No

Additional Comments

TIP PROJECT: R-2566BA

CONTRACT: _

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Plan Sheet Symbols
See Sheet 1C-1 For Survey Control Sheet



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WATAUGA COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2566BA	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
37512.1.4	NHP-0105(005)	PE
37512.2.3		UTIL., ROW

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

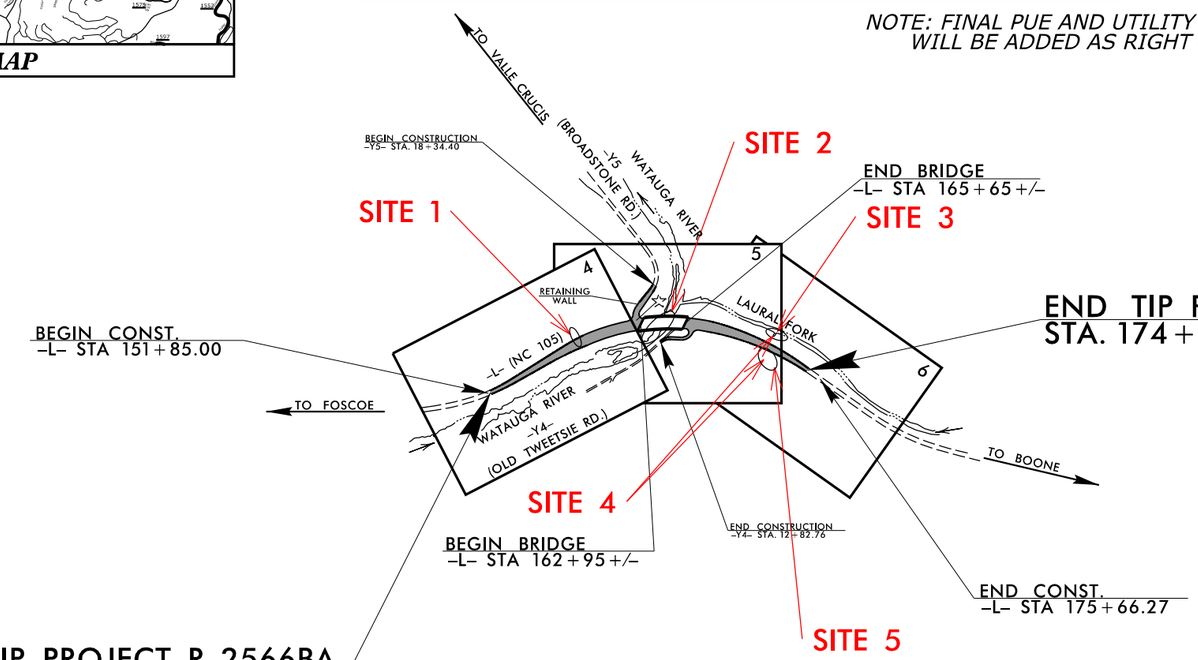
LOCATION: NC 105 – CONSTRUCT NEW BRIDGE OVER WATAUGA RIVER AND LEFT-TURN LANE AT SR 1112 (BROADSTONE RD.) WITHIN THE LIMITS OF R-2566B

TYPE OF WORK: DRAINAGE, GRADING, PAVING, SIGNAL & STRUCTURE

PERMIT DRAWING
SHEET 1 OF 9

WETLAND AND SURFACE WATER IMPACTS PERMIT

NOTE: FINAL PUE AND UTILITY PARCEL LIST WILL BE ADDED AS RIGHT OF WAY REVISION



NAD 83/
NSRS 2007

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

☆ EXISTING TRAFFIC SIGNAL TO BE RETROFITTED

HYDRAULIC ENGINEERS

TGS ENGINEERS
TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

GRAPHIC SCALES

PLANS 50 25 0 50 100
PROFILE (HORIZONTAL) 50 25 0 50 100
PROFILE (VERTICAL) 10 5 0 10 20

DESIGN DATA

ADT 2019 = 15,000
ADT 2040 = 18,000
K = 10 %
D = 60 %
T = 6 % *
V = 60 MPH
* TTST=2% DUAL=4%
FUNC CLASS=ARTERIAL

STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2566BA = 0.378 MILES
LENGTH STRUCTURE TIP PROJECT R-2566BA = 0.051 MILES
TOTAL LENGTH OF TIP PROJECT R-2566BA = 0.429 MILES

Prepared for the North Carolina Department of Transportation in the Office of:

WETHERILL ENGINEERING
1223 JONES FRANKLIN ROAD
Raleigh, N.C. 27606
license No. F-0277
Bus: 919 851 8077
Fax: 919 851 8107

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 21, 2018

LETTING DATE: SEPTEMBER 17, 2019

EDWARD G. WETHERILL, PE
PROJECT ENGINEER

BOB A. MAY, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT: NATHAN N. ADIMA, PE
ROADWAY DESIGN: PROJECT ENGINEER

HYDRAULICS ENGINEER

_____ P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

_____ P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

10/13/2018
X:\NCDOT\R-2566BA\Hydraulics\PERMITS_Environmental\Drawings\R-2566BA_Rdy_psh_01_tsh.dgn
User:dpetty

5/14/99

PERMIT DRAWING
SHEET 2 OF 9

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TGS ENGINEERS
706 HILLSBOROUGH ST, SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

PROJECT REFERENCE NO.	SHEET NO.
R-2566BA	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NSRS 2007 NC GRID

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MCLEAN INNOVATIVE HOMES, LLC

JOSE S. GALLARDO

JOHN F. AYERS, TRUST

JOHN F. AYERS, TRUST

JOHN F. AYERS, TRUST

KATHLEEN A. GERAGHTY

BETTY P. COLEMAN

BETTY P. COLEMAN

GAIL L. TOWNSEND TATUM

150 155 160

STA. 160+00.00 SEE SHT. 5

MATCHLINE -L- STA.

UT TO WATAUGA RIVER (SC4)

WATAUGA RIVER

SITE 1

SCALE: 1" = 50'

5'x2' CONC HW

24" CMP

30" BST

RETAIN

4'x2' CONC HW

18" RCP

CB-F

2GI

REMOVE HW

FLOWABLE FILL

24" CSP

BDO

ELBOW

24" RCP-IV

GI

RIP RAP AT EMBANKMENT SEE DETAIL 4A

PDE

AUE

DUE

-L- +30.00 EX RW 86.76 105.00

-L- +70.00 EX RW 90.50 105.00

GR PA

JS

ST

F

C

DETAIL 4A
RIP RAP AT EMBANKMENT
(Not to Scale)

Type of Liner = Class I Rip-Rap Geotextile

FROM -L- STA 152+91 TO 153+11 RT
FROM -L- STA 155+40 TO 155+63 RT
FROM -L- STA 158+42 TO 158+58 RT

100' 0' 100'
GRAPHIC SCALE

SEE SHT. 7 FOR -L- PROFILE

3/25/2019
...R-2566BA\Hydraulics\PERMITS_Environmental\Drawings\R-2566BA_Rdy_psh_04.dgn
jgarrison

R-2566BA_Rdy_psh_04.dgn 3/25/2019 3:02:00 PM TGS

5/14/99

PERMIT DRAWING
SHEET 3 OF 9

NAD 83/NSRS 2007 NC GRID

WETHERILL ENGINEERING
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Raleigh, N.C. 27606
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TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
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TGS ENGINEERS
706 HILLSBOROUGH ST, SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

PROJECT REFERENCE NO.	SHEET NO.
R-2566BA	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MCLEAN INNOVATIVE HOMES, LLC

JOSE S. GALLARDO

JOHN F. AYERS, TRUST

KATHLEEN A. GERAGHTY

BETTY P. COLEMAN

GAIL L. TOWNSEND/TATUM

WATAUGA RIVER

SITE 1

MATCHLINE -L- STA. 160+00.00 SEE SHT. 5

SCALE: 1" = 50'

2GU REMOVE HW
FLOWABLE FILL
18" RCP-IV
2GI REMOVE HW
CB-F
24" RCP-IV
FLOWABLE FILL
24" CSP
FBDO
ELBOW
24" RCP-IV
2GU REMOVE HW
FLOWABLE FILL

RIP RAP AT EMBANKMENT SEE DETAIL 4A

PDE
AUE
DUE

-L- +30.00 EX RW 86.76 105.00

-L- +70.00 EX RW 90.50 105.00

DETAIL 4A
RIP RAP AT EMBANKMENT
(Not to Scale)

Pipe — 18" — GEOTEXTILE

Type of Liner = Class I Rip-Rap Geotextile

FROM -L- STA 152+91 TO 153+11 RT
FROM -L- STA 155+40 TO 155+63 RT
FROM -L- STA 158+42 TO 158+58 RT

100' 0' 100'
GRAPHIC SCALE

SEE SHT. 7 FOR -L- PROFILE

3/25/2019
R-2566BA\Hydraulics\PERMITS_Environmental\Drawings\R-2566BA_Rdy_psh_04.dgn
User:rlpugh

R-2566BA_Rdy_psh_04.dgn 3/25/2019 3:00:04 PM TGS

5/14/99

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO.	SHEET NO.
R-2566BA	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 4 OF 9

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

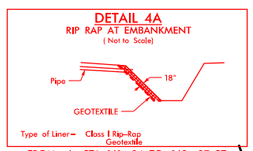
TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/NSRS 2007 NC GRID

DETAIL 4A
RIP RAP AT EMBANKMENT
(Not to Scale)



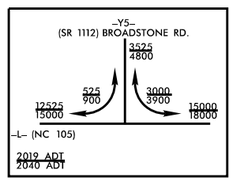
Type of Liner= Class I Rip-Rap Geotextile
FROM –L– STA 161+94 TO 162+07 RT

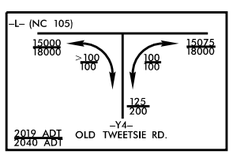
ELLIOTT S. & FRANCES WHITE
JOHN F. AYERS, TRUST
THOMAS D. BLALOCK
DENNIS M. MCLAURIN
KELLY M. PARSONS
SHORE FAMILY LIMITED PARTNERSHIP
BOBBY R. BROWN
SANDRA J. HIGGINS
STEVEN F. MICHEL
BRYCE M. GANDY
BETTY P. COLEMAN
RICHARD E. BURGIN
CHARLES W. BLOEHM

–Y5– PC Sta. 16+11.40
–Y5– PCC Sta. 17+07.48
–Y5– PCC Sta. 18+01.83
–Y5– PC Sta. 20+86.96
–Y5– PT Sta. 21+58.69
–Y5– PT Sta. 19+48.93
–Y5– POT Sta. 21+95.89
–L– POC Sta. 162+74.00
–Y4– POT Sta. 10+00.00
–L– POC Sta. 166+40.00
–Y5– PCC Sta. 18+98.12
–Y4– POT Sta. 14+27.76
–L– PCC Sta. 168+60.77

MATCHLINE –L– STA. 160+00.00 SEE SHEET 4
MATCHLINE –L– STA. 170+00.00 SEE SHEET 6

RETAIN & CLEAN OUT
CLASS B RIP RAP 2 TONS,7 SY GEO
SPECIAL LATERAL 'V' DITCH (SEE DETAIL 5A)
RIP RAP AT EMBANKMENT SEE DETAIL 4A
SITE 2
TEMPORARY WORKPADS
MAINTAIN 1.5:1 AROUND RADIUS
TRANSITION FROM 1:1 TO 2:1
ELBOWS(2) 24" CSP
SPECIAL CUT DITCH (SEE DETAIL 5C)
MAXIMUM LIMITS OF BIOFILTRATION CONVEYANCE (YET TO BE DESIGNED)
CLASS B RIP RAP
SEE SHEET 2X-X





☆ EXISTING TRAFFIC SIGNAL TO BE RETROFITTED

SCALE: 1" = 50'

100' 0' 100'
GRAPHIC SCALE

SEE SHT. 7 FOR –L– PROFILE
SEE SHT. 8 FOR –Y4– PROFILE
SEE SHT. 8 FOR –Y5– PROFILE
SEE SHTS. S–1 THRU S–2 FOR STRUCTURE PLANS
SEE SHT. 2A–4 FOR RETAINING WALL

3/25/2009
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User:dgarris

5/14/99

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO.	SHEET NO.
R-2566BA	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 5 OF 9

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/NSRS 2007 NC GRID

DETAIL 4A
RIP RAP AT EMBANKMENT
(Not to Scale)

Type of Liner– Class I Rip-Rap Geotextile
FROM –L– STA 161+94 TO 162+07 RT

–Y5– PC Sta. 16+11.40
–Y5– PCC Sta. 17+07.48
–Y5– PCC Sta. 18+01.83
–Y5– PC Sta. 20+86.96
–Y5– PT Sta. 21+58.69
–Y5– PCC Sta. 18+98.12
–Y5– PT Sta. 19+48.93
–Y4– POT Sta. 10+00.00
–L– POC Sta. 166+40.00
–Y5– POT Sta. 21+95.89
–L– POC Sta. 162+74.00
–Y4– POT Sta. 14+27.76
–L– PCC Sta. 168+60.77

MATCHLINE –L– STA. 160+00.00 SEE SHEET 4

MATCHLINE –L– STA. 170+00.00 SEE SHEET 6

ELLIOTT S. & FRANCES WHITE
JOHN F. AYERS, TRUST
SANDRA J. HIGGINS
THOMAS DJ BULLOCK
DENNIS M. MCLAURIN
SHORE FAMILY LIMITED PARTNERSHIP
BOBBY R. BROWN
KELLY M. PARSONS
BRYCE M. GANDY
STEVEN T. MICHEL
BETTY P. COLEMAN
RICHARD E. BURGIN
CHARLES W. BLOEHM

RETAIN & CLEAN OUT 18" CMP

CLASS B RIP RAP 2 TONS, 7 SY GEO

18" RCP-IV

TB 2GI

SPECIAL LATERAL "V" DITCH (SEE DETAIL 5A)

CB-F

RIP RAP AT EMBANKMENT (SEE DETAIL)

CLASS B RIP RAP 2 TONS, 7 SY GEO

SITE 2

MAXIMUM LIMITS OF BIOFILTRATION CONVEYANCE (YET TO BE DESIGNED)

TEMPORARY WORKPADS

MAINTAIN 1.5:1 AROUND RADIUS

TRANSITION FROM 1.5:1 TO 2:1

LAUREL FORK

WATAUGA RIVER

18" 4GI SEE SHEET 2X-X

ELBOWS(2) 24" CSP

24" RCP-IV

2GI

SPECIAL CUT DITCH (SEE DETAIL 5C)

REMOVE

–Y5– (SR 1112) BROADSTONE RD.

3525/4800 525/900 3000/3900 15000/18000 12525/15000

–L– (NC 105)

2019 ADT 2040 ADT

–L– (NC 105)

15000/18000 >100/100 100/100 15075/18000 125/200

–Y4– OLD TWEETSIE RD.

2019 ADT 2040 ADT

EXISTING TRAFFIC SIGNAL TO BE RETROFITTED

SCALE: 1" = 50'

100' 0' 100'
GRAPHIC SCALE

SEE SHT. 7 FOR –L– PROFILE
SEE SHT. 8 FOR –Y4– PROFILE
SEE SHT. 8 FOR –Y5– PROFILE
SEE SHTS. S-1 THRU S-? FOR STRUCTURE PLANS
SEE SHT. 2A-4 FOR RETAINING WALL

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S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING SHEET 6 OF 9

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TGS ENGINEERS
706 HILLSBOROUGH ST, SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

PROJECT REFERENCE NO.	SHEET NO.
R-2566BA	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

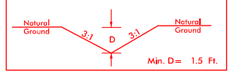
CHARLES W. CONNOR, JR.

NC GRID NAD 83/NSRS 2007

SCALE: 1" = 50'

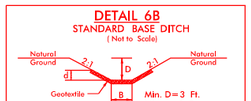
SCALE: 1" = 50'

DETAIL 6A
STANDARD 'V' DITCH
(Not to Scale)



FROM –L– STA 172+60 TO 173+00 RT

DETAIL 6B
STANDARD BASE DITCH
(Not to Scale)



Type of Liner = Class II Rip-Rap

FROM –L– STA 171+41@104'LT TO 171+41@96'LT
FROM –L– STA 171+99@113'LT TO 172+03@95'LT

DETAIL 6C
TOE PROTECTION
(Not to Scale)

Type of Liner = Class B Rip-Rap

FROM STA –L– 171+46 TO 172+00 RT

SITE 3
SITE 4
SITE 5

FILL ABANDONED STREAM WITH CLASS II RIP RAP
STANDARD BASE DITCH SEE DETAIL 6A
STANDARD V DITCH SEE DETAIL 6A
TB JB w/Slab Lid
60" SPP
60" WSP INSTALLATION
60" WSP REINSTALLATION
FLOWABLE FILL
REMOVE
NO BURIAL AT INLET
TOE PROTECTION SEE DETAIL 6C 15 TONS CL B 33 SY GEO
END CONSTRUCTION –L– STA. 175+66.27
SEE SHT. 8 FOR –L– PROFILE

MATCHLINE –L– STA. 170+00.00 SEE SHT. 5

ROBERT C. AYERS
DONALD W. BAUCOM
BEN FRANTZEN
RICHARD A. MYERS
CAROL QUINTERO
HARRY G. REID
JONATHAN M. SPARROW
CHARLES W. BLOEHM
ROBERT BENTLEY LIFE ESTATE
PERRY G. BENTLEY
MARTHA CRANDALL
DEXTER BENTLEY
JOSEPHINE B. BINGHAM & S.L. WHITAKER

WD COVERED BRIDGE
BENTLY RD
SR 1111 OLD MATCHLINE RD
NC 105 28' BST
1SFD
1.5SFD
OUTHOUSE
ROCK WALL
BLK RET WALL
30" CMP = 24" RCP
18" CMP
15" CMP
5' CONC HW
EXISTING R/W

100' 0' 100'
GRAPHIC SCALE

3/25/2019
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User:rlhall

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5/14/99

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING SHEET 7 OF 9

NC GRID
NAD 83/NSRS 2007

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Fax: 919 851 8107
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CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

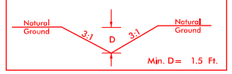
TGS ENGINEERS
706 HILLSBOROUGH ST, SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

PROJECT REFERENCE NO.	SHEET NO.
R-2566BA	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

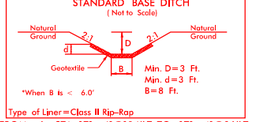
CHARLES W. CONNOR, JR.

DETAIL 6A
STANDARD 'V' DITCH
(Not to Scale)



FROM –L– STA 172+60 TO 173+00 RT

DETAIL 6B
STANDARD BASE DITCH
(Not to Scale)



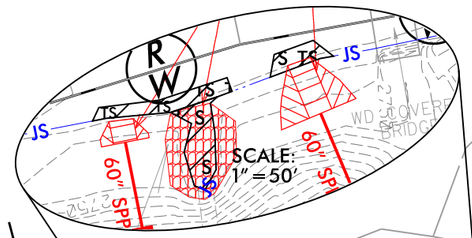
Type of Liner=Class II Rip-Rap

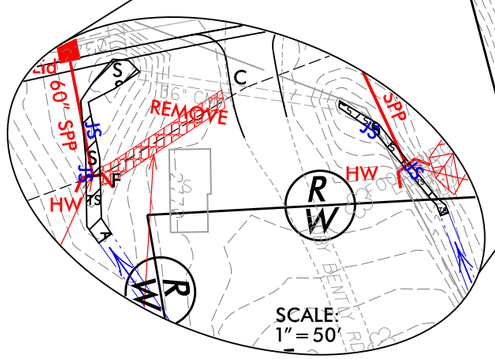
FROM –L– STA 171+41@104'LT TO 171+41@96'LT
FROM –L– STA 171+99@113'LT TO 172+03@95'LT

DETAIL 6C
TOE PROTECTION
(Not to Scale)

Type of Liner=Class B Rip-Rap

FROM STA –L– 171+46 TO 172+00 RT





SEE SHT. 8 FOR –L– PROFILE

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jshepherd

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5/28/99

BM7
N 899,026 E 1,189,650 ELEV.=2,817.94'
RR SPIKE IN BASE OF 24" DBL TULIP POPLAR

–L–

BEGIN GRADE
–L– STA. 151+99.39
EL = 2,787.16'

50'
INCIDENTAL
MILLING

PI = 154+25.00
EL = 2,778.05'
VC = 175'
K = 256
V_{DES} = 60 MPH

PI = 156+52.00
EL = 2,770.44'
VC = 275'
K = 137
V_{DES} = 60 MPH

-1.40357%
-1.35327%
-1.35302%
-1.34947%

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Raleigh, N.C. 27606
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CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TGS ENGINEERS
706 HILLSBOROUGH ST, SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

PROJECT REFERENCE NO.	SHEET NO.
R-2566BA	7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 8 OF 9

SEE SHT. 4 FOR –L– ALIGNMENT

BM8
–L– STA. 163+34.40, 150.43' RT., ELEV.=2,749.41'
RR SPIKE IN BASE 16" TULIP POPLAR

–L–

PI = 161+40.00
EL = 2,763.85'
VC = 200'
K = 192
V_{DES} = 60 MPH

–L– STA. 162+74.00
–L– STA. 21+95.89

BEGIN BRIDGE
–L– STA. 162+95.89

–L– STA. 164+30+/-
1@119', 1@151'
PLATE GIRDER W/4'-0" CAPS
SKEW 120 DEGREES

END BRIDGE
–L– STA. 165+55.71

–L– STA. 166+40.00
–L– STA. 10+00.00

PI = 168+50.00
EL = 2,761.69'
VC = 440'
K = 137
V_{DES} = 60 MPH

TEMPORARY WORKPADS AT ELEV. 2729'

LIMIT STREAMFLOW BLOCKAGE
TO 50% AT ONE TIME

NWS=2727'

BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	= 12,244	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 2,743.5	FT
BASE DISCHARGE	= 15,538	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2,745.2	FT
OVERTOPPING DISCHARGE	= 25,567+	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 2,765.1	FT
DATE OF SURVEY	= 4/5/2018	
W.S. ELEVATION AT DATE OF SURVEY	= 2,727.0	FT

SEE SHT5. 5 FOR –L– ALIGNMENT

3/05/2018
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WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	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	158+60/158+72 LT	24" CSP						< 0.01	< 0.01	100	10	
2	162+93/165+13	Temporary Workpad							0.12		274	
2	164+12/164+70 RT	Biofiltration conveyance							0.01			
3	171+33/172+10	60" SSP							< 0.01		70	
4	171+39/171+72	60" SSP						0.01	< 0.01	73	22	
5	172+30/172+63 RT	60" SSP						< 0.01	< 0.01	30	21	
TOTALS*:								0.02	0.15	203	397	0

*Rounded totals are sum of actual impacts

NOTES:
<0.01 acres of Permanent SW impacts for bridge interior bent (drilled shafts) at 164+14.

Site2:Limit streamflow blockage to 50% at one time;Biofiltration conveyance linear impacts accounted for in workpad impacts

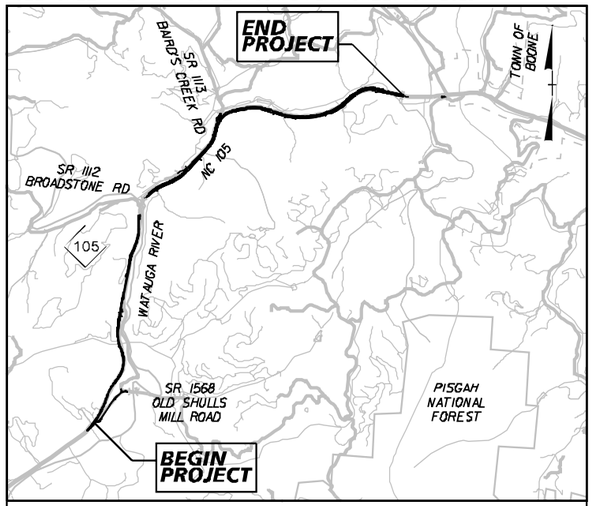
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
3/25/2019
WATAUGA COUNTY
R-2566BA
37512.1.4
SHEET 9 OF 9

09/08/99

TIP PROJECT: R-2566B

CONTRACT:

SEE SHEET 1A FOR INDEX OF SHEETS (FUTURE)
SEE SHEET 1B FOR CONVENTIONAL PLAN SHEET SYMBOLS



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WATAUGA COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2566B	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
37512.1.1	NHPP-0150(004)	PE

FOR REVIEW ONLY, NOT FOR UTILITY OR HYDRAULIC DESIGN

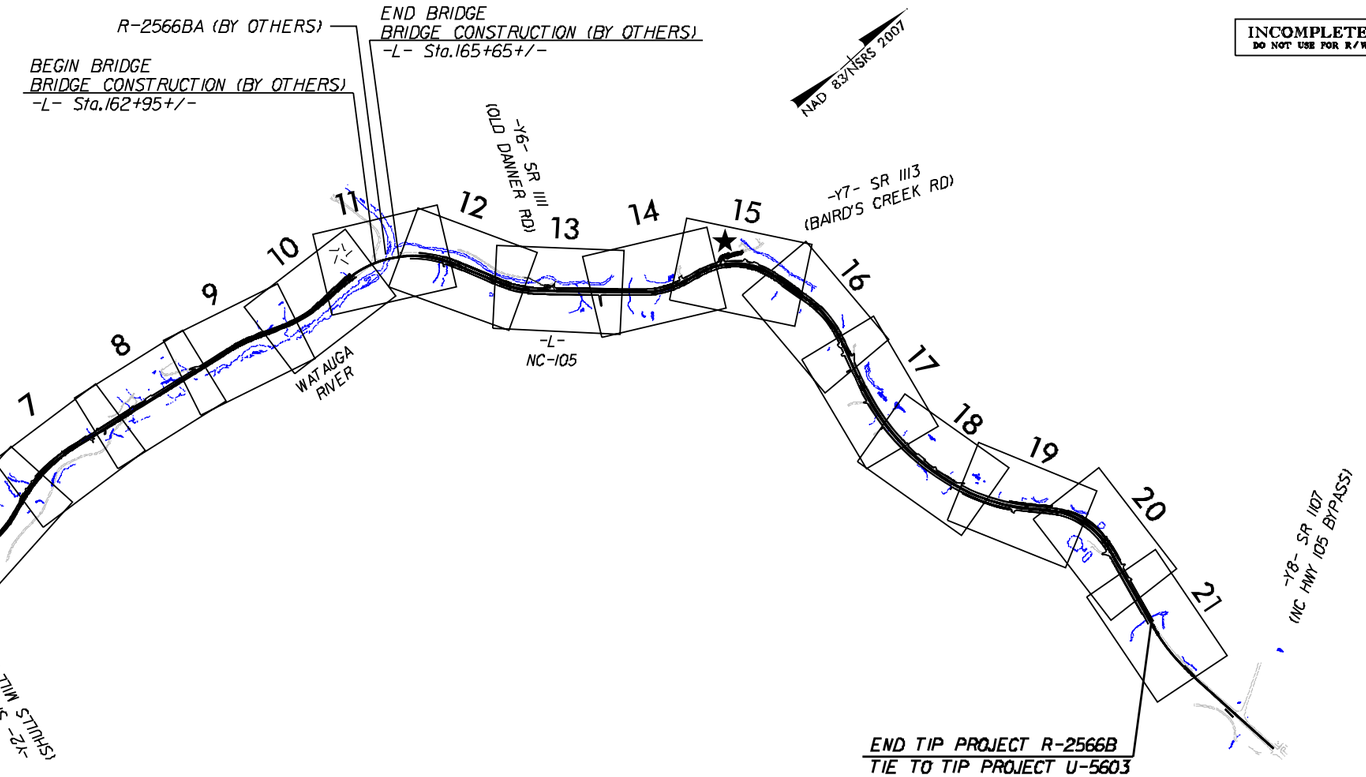
LOCATION: *NC 105 FROM SR 1568 (OLD SHULLS MILL RD) IN WATAUGA TO SR 1107 (NC 105 BYPASS)*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, SIGNALS, CULVERTS, AND RETAINING WALLS*

PRELIMINARY WETLAND AND SURFACE WATER IMPACTS PERMIT

15% PLANS - FOR REVIEW ONLY
NOT FOR UTILITY OR HYDRAULIC DESIGN

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

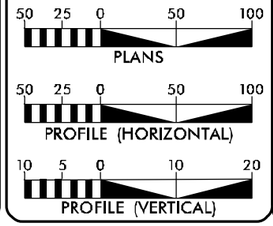


NCDOT CONTACT:
NATHAN ADIMA, P.E.
NCDOT – DIVISIONS 11–14
1000 BIRCH RIDGE DRIVE
RALEIGH, NC 27610

★ TRAFFIC SIGNAL
☆ EXISTING TRAFFIC SIGNAL TO BE UPGRADED

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

GRAPHIC SCALES



DESIGN DATA

ADT 2022 = 15700 VPD
ADT 2040 = 18300 VPD
K = 9%
D = 60%
T = 6%*
V = 50 & 60 MPH

FUNCTIONAL CLASSIFICATION: RURAL ARTERIAL

* 2% TTST 4% DUAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2566B = 4.032 MILES

TOTAL LENGTH TIP PROJECT R-2566B = 4.032 MILES

PLANS PREPARED FOR THE NCDOT BY: Kimley»Horn

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: 10/09/2020

LETTING DATE: 10/18/2022

TONY SPACEK, P.E.
PROJECT ENGINEER

BRANDON MURR, EIT
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2/15/2019 K:\CHL_PRJ\0I0362\2 - 1R-2566\Hydraulics\PERMITS_Environmental\CADD\R-2566B_tsh.dgn

-L-			
PI Sta 68+38.63	PI Sta 77+22.28	PIs Sta 82+29.57	PIs Sta 84+66.92
Δ = 17° 38' 02.1" (LT)	Δ = 15° 30' 34.3" (LT)	Θs = 1° 27' 13.6"	Θs = 2° 39' 51.3"
D = 2° 02' 46.6"	D = 1° 42' 37.2"	Ls = 170.00'	Ls = 186.00'
L = 861.76'	L = 906.82'	LT = 113.34'	LT = 124.01'
T = 434.31'	T = 456.20'	ST = 56.67'	ST = 62.01'
R = 2,800.00'	R = 3,350.00'		
RO = 135'	SE = 5%		
	DS = 70		
	RO = 110'		

-Y1-
PI Sta 11+02.21
Δ = 76° 59' 10.0" (LT)
D = 71° 37' 11.0"
L = 107.49'
T = 63.62'
R = 80.00'
RO = 55'

SEE SHEET 23 FOR -L- PROFILE
SEE SHEET 34 FOR -Y1- PROFILE

50' 0' 100'
GRAPHIC SCALE

Kimley»Horn ©
200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

PROJECT REFERENCE NO.	SHEET NO.
R-2566B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NSRS 2007

REVISIONS
5/14/99

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2/15/2019

70 75 80

BEGIN TIP PROJECT R-2566B
-L- Sta.73+00.00

-L- PCC Sta.72+72.56

-L- CS Sta.81+72.90

MATCHLINE -L- STA 83+00 (SEE SHEET 5)

MATCHLINE -Y1- STA 20+50 (SEE SHEET 5)

SITE 1

SITE 2

SITE 3

-L- POC Sta.78+40.71=
-Y1- PC Sta.10+00.00

BEGIN CONSTRUCTION
-Y1- STA.10+24.00

-Y1- PC Sta.10+38.59

-Y1- PT Sta.11+46.08

RICHARD RAY CLARK
DB 1562 PG 444

LUTTRELL AND LOFLIN, LLC
DB 4911 PG 515

NOTE: RE-ALIGNMENT OF OLD SHULLS MILL ROAD (-Y1-) IS CURRENTLY UNDER CONSIDERATION. THE RE-ALIGNMENT WOULD EXTEND THE PROJECT TIE-IN LOCATION TO APPROXIMATELY STATION 69+00 -L- AND WOULD RESULT IN ADDITIONAL IMPACTS. ADDITIONAL IMPACTS WERE INCLUDED FOR IN THE IMPACT SUMMARY TABLE TO TRY AND ACCOUNT FOR THIS POTENTIAL REVISION.

STREAM IMPACTS WITHIN SLOPE STAKES +25'*
WETLAND IMPACTS WITHIN SLOPE STAKES +25'*
POND IMPACTS WITHIN SLOPE STAKES +25'*
SLOPE STAKES +25'
*PRELIMINARY IMPACTS

-L-				
PIs Sta 84+66.92	PI Sta 87+54.47	PIs Sta 90+40.15	PIs Sta 93+20.23	PI Sta 98+46.09
Es = 2° 39' 51.3"	△ = 12° 52' 10.3" (RT)	Es = 2° 39' 51.3"	Es = 6° 05' 39.1"	△ = 44° 18' 56.6" (LT)
Ls = 186.00'	D = 2° 51' 53.2"	Ls = 186.00'	Ls = 234.00'	D = 5° 12' 31.3"
LT = 124.01'	L = 449.23'	LT = 124.01'	LT = 156.09'	L = 850.80'
ST = 62.01'	T = 225.56'	ST = 62.01'	ST = 78.08'	T = 447.96'
	R = 2,000.00'			R = 1,100.00'
	SE= 6%			SE= 6%
	DS= 70			DS= 55
	RO = 240'			RO = 230'

-Y1-		
PI Sta 17+74.67	PI Sta 22+02.78	PI Sta 24+55.93
△ = 7° 00' 00.0" (RT)	△ = 50° 13' 57.6" (RT)	△ = 0° 30' 41.8" (RT)
D = 2° 51' 53.2"	D = 19° 05' 54.9"	D = 0° 30' 00.0"
L = 244.35'	L = 263.02'	L = 102.32'
T = 122.33'	T = 140.63'	T = 51.16'
R = 2,000.00'	R = 300.00'	R = 11,459.16'
RO = 42'	RO = 56'	

-Y2-
PI Sta 13+16.56
△ = 79° 21' 39.3" (RT)
D = 36° 57' 54.1"
L = 214.69'
T = 128.59'
R = 155.00'
RO = 50'

Kimley»Horn ©
200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

50' 0' 100'
GRAPHIC SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2566B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

5/14/99

BM#4
BL: STA 84+10
50' LEFT
ELEVATION=2977.69'

SITE 4
SITE 5
SITE 4
SITE 5
SITE 6
SITE 7
SITE 7
SITE 8

-L- NC-105

MATCHLINE -L- STA 83+00 (SEE SHEET 4)
MATCHLINE -L- STA 96+00 (SEE SHEET 6)
MATCHLINE -Y1- STA 20+50 (SEE SHEET 4)

-Y1- SR 1568 (OLD SHULLS MILL RD)
-Y2- SR 1568 (OLD SHULLS MILL RD)
-Y1- SR 1557 (SHULLS MILL RD)

N 46° 52' 00.0" E
N 68° 01' 13.0" E
N 17° 20' 26.3" W
S 82° 54' 02.4" E

NAD 83/NSRS 2007

RICHARD RAY & DEBRA B. CLARK
TERRELL AND LOFLIN, LLC
BLUE RIDGE ELECTRIC
PEARL R. LUTTRELL

STREAM IMPACTS WITHIN SLOPE STAKES +25'•
WETLAND IMPACTS WITHIN SLOPE STAKES +25'•
POND IMPACTS WITHIN SLOPE STAKES +25'•
SLOPE STAKES +25'
•PRELIMINARY IMPACTS

SEE SHEET 23 FOR -L- PROFILE
SEE SHEET 34 FOR -Y1- PROFILE
SEE SHEET 35 FOR -Y2- PROFILE

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2/15/2019

-L-			
PI Sta 98+46.09	PIs Sta 103+27.02	PIs Sta 106+42.97	PI Sta 110+79.92
Δ = 44° 18' 56.6" (LT)	Θs = 6° 05' 39.1"	Θs = 3° 39' 25.8"	Δ = 21° 30' 12.6" (RT)
D = 5° 12' 31.3"	Ls = 234.00'	Ls = 240.00'	D = 3° 02' 51.5"
L = 850.80'	LT = 156.09'	LT = 160.03'	L = 705.58'
T = 447.96'	ST = 78.08'	ST = 80.03'	T = 356.99'
R = 1,100.00'			R = 1,880.00'
SE = 6%			SE = 6%
DS = 55			DS = 65
RO = 234'			RO = 240'

SEE SHEET 24 FOR -L- PROFILE

50' 0' 100'
GRAPHIC SCALE

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200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

PROJECT REFERENCE NO.	SHEET NO.
R-2566B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NSRS 2007

REVISIONS 5/14/99

MATCHLINE -L- STA 96+00 (SEE SHEET 5)

MATCHLINE -L- STA 109+00 (SEE SHEET 7)

-L- NC-105

BM#5
-BL- STA 105+48
101' LEFT
ELEVATION=2980.33'

SITE 10

SITE 9

SITE 9

	STREAM IMPACTS WITHIN SLOPE STAKES +25'*
	WETLAND IMPACTS WITHIN SLOPE STAKES +25'*
	POND IMPACTS WITHIN SLOPE STAKES +25'*
	SLOPE STAKES +25'

*PRELIMINARY IMPACTS

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2/15/2019

-L-

PI Sta 110+79.92
Δ = 21° 30' 12.6" (RT)
D = 3° 02' 51.5"
L = 705.58'
T = 356.99'
R = 1,880.00'
SE = 6%
DS = 65
RO = 240'

PIs Sta 115+08.54
Θs = 3° 39' 25.8"
Ls = 240.00'
LT = 160.03'
ST = 80.03'

SEE SHEET 24 FOR -L- PROFILE

50' 0' 100'
GRAPHIC SCALE

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200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

PROJECT REFERENCE NO.	SHEET NO.
R-2566B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NSRS 2007

REVISIONS

5/14/99

SITE 11

SITE 10

-L- NC-105

MATCHLINE -L- STA 109+00 (SEE SHEET 6)

MATCHLINE -L- STA 122+00 (SEE SHEET 8)

N 10° 13' 45.4" E

HOUND EARS CLUB, INC.

RANDI K. JONES

ROBERT & KRISTIN COPELAND

LARRY T. LINE

JENNIFER C. BLAKE

BY3-59

STREAM IMPACTS WITHIN SLOPE STAKES +25'*

WETLAND IMPACTS WITHIN SLOPE STAKES +25'*

POND IMPACTS WITHIN SLOPE STAKES +25'*

SLOPE STAKES +25'

*PRELIMINARY IMPACTS

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2/15/2019

SEE SHEET 25 FOR -L- PROFILE

GRAPHIC SCALE 50' 0' 100'

Kimley»Horn
200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

PROJECT REFERENCE NO.	SHEET NO.
R-2566B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NSRS 2007

HOWELL CONSTRUCTION, INC.

SITE 12
SITE 13
SITE 14
SITE 15
SITE 16
SITE 17
SITE 18
SITE 19

-L- NC-105
N 10°13' 45.4" E

BM#6
-BL- STA: 128+51
108' RIGHT
ELEVATION=2890.76'

MATCHLINE -L- STA 122+00 (SEE SHEET 7)

MATCHLINE -L- STA 135+00 (SEE SHEET 9)

STREAM IMPACTS WITHIN SLOPE STAKES +25'*
WETLAND IMPACTS WITHIN SLOPE STAKES +25'*
POND IMPACTS WITHIN SLOPE STAKES +25'*
SLOPE STAKES +25'
*PRELIMINARY IMPACTS

REVISIONS
5/14/99

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2/15/2019

-L-				
PIs Sta 140+52.37	PI Sta 141+90.52	PIs Sta 143+28.71	PIs Sta 148+10.22	PI Sta 150+76.47
Θs = 3° 49' 11.0"	Δ = 3° 42' 12.1" (RT)	Θs = 3° 49' 11.0"	Θs = 4° 17' 49.9"	Δ = 13° 16' 58.0" (LT)
Ls = 240.00'	D = 3° 10' 59.2"	Ls = 240.00'	Ls = 240.00'	D = 3° 34' 51.6"
LT = 160.04'	L = 116.34'	LT = 160.04'	LT = 160.05'	L = 370.93'
ST = 80.03'	T = 58.19'	ST = 80.03'	ST = 80.04'	T = 186.30'
	R = 1,800.00'			R = 1,600.00'
	SE = 6%			SE = 6%
	DS = 65			DS = 60
	RO = 240'			RO = 240'

SEE SHEET 25 FOR -L- PROFILE

50' 0' 100'
GRAPHIC SCALE

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200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

NAD 83/NSRS 2007

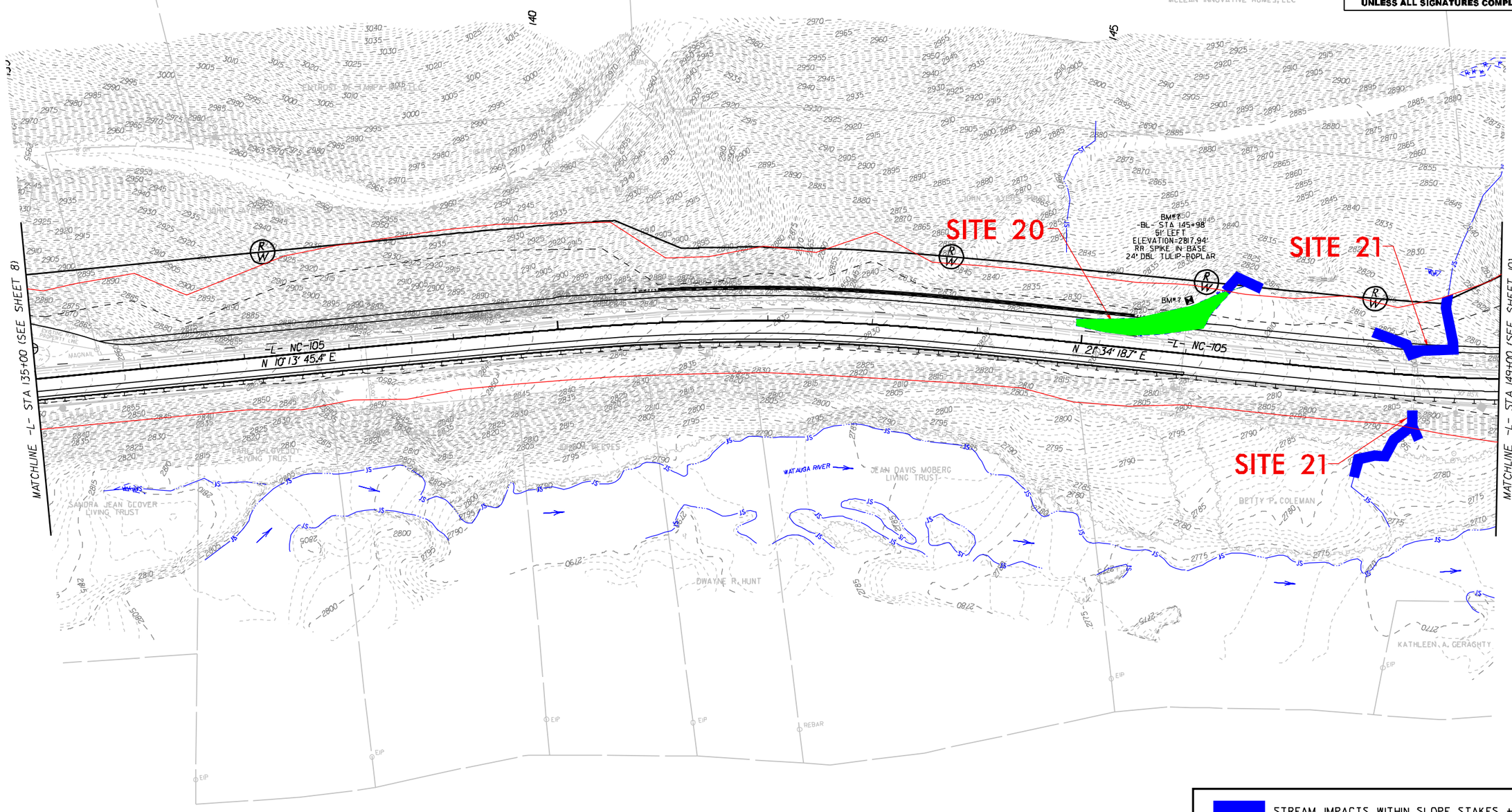
PROJECT REFERENCE NO.	SHEET NO.
R-2566B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS
5/14/19

MCLEAN INNOVATIVE HOMES, LLC



STREAM IMPACTS WITHIN SLOPE STAKES +25'*
WETLAND IMPACTS WITHIN SLOPE STAKES +25'*
POND IMPACTS WITHIN SLOPE STAKES +25'*
SLOPE STAKES +25'
*PRELIMINARY IMPACTS

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2/15/2019

-L-			
PI Sta 150+76.47	PIs Sta 153+41.14	PIs Sta 158+39.08	PI Sta 165+98.50
Δ = 13° 16' 58.0" (LT)	Θs = 4° 17' 49.9"	Θs = 6° 52' 31.8"	Δ = 51° 31' 45.6" (RT)
D = 3° 34' 51.6"	Ls = 240.00'	Ls = 324.00'	D = 4° 14' 38.9"
L = 370.93'	LT = 160.05'	LT = 216.16'	L = 1,214.13'
T = 186.30'	ST = 80.04'	ST = 108.15'	T = 651.59'
R = 1,600.00'			R = 1,350.00'
SE = 6%			SE = 6%
DS = 60			DS = 60
RO = 240'			RO = 324'

SEE SHEET 26 FOR -L- PROFILE

NOTE:
THE PROPOSED ROW SHOWN BETWEEN STA. 158 – 59.82 TO STA. 171 – 63.75 IS ANTICIPATED TO BE ACQUIRED AS A PART OF THE R-2566BA PROJECT.

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200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

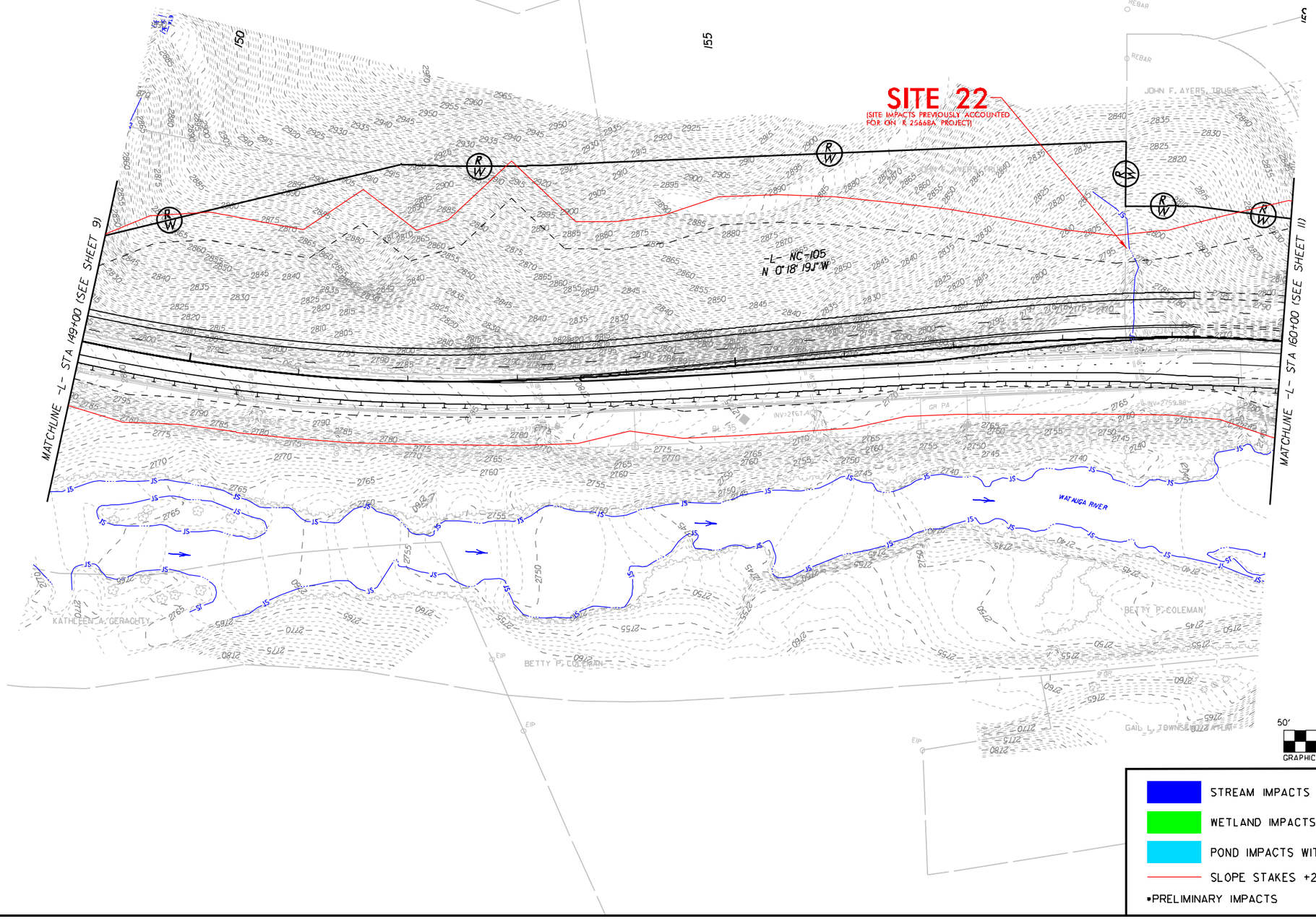
NAD 83/NSRS 2007

PROJECT REFERENCE NO.	SHEET NO.
R-2566B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS
5/14/99



STREAM IMPACTS WITHIN SLOPE STAKES +25'*
WETLAND IMPACTS WITHIN SLOPE STAKES +25'*
POND IMPACTS WITHIN SLOPE STAKES +25'*
SLOPE STAKES +25'
*PRELIMINARY IMPACTS

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2/15/2019

-L-
PI Sta 165+98.50
Δ = 51° 31' 45.6" (RT)
D = 4° 14' 38.9"
L = 1,214.13'
T = 651.59'
R = 1,350.00'
SE = 6%
DS = 60
RO = 324'

SEE SHEET 26 FOR -L- PROFILE

Kimley»Horn
200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

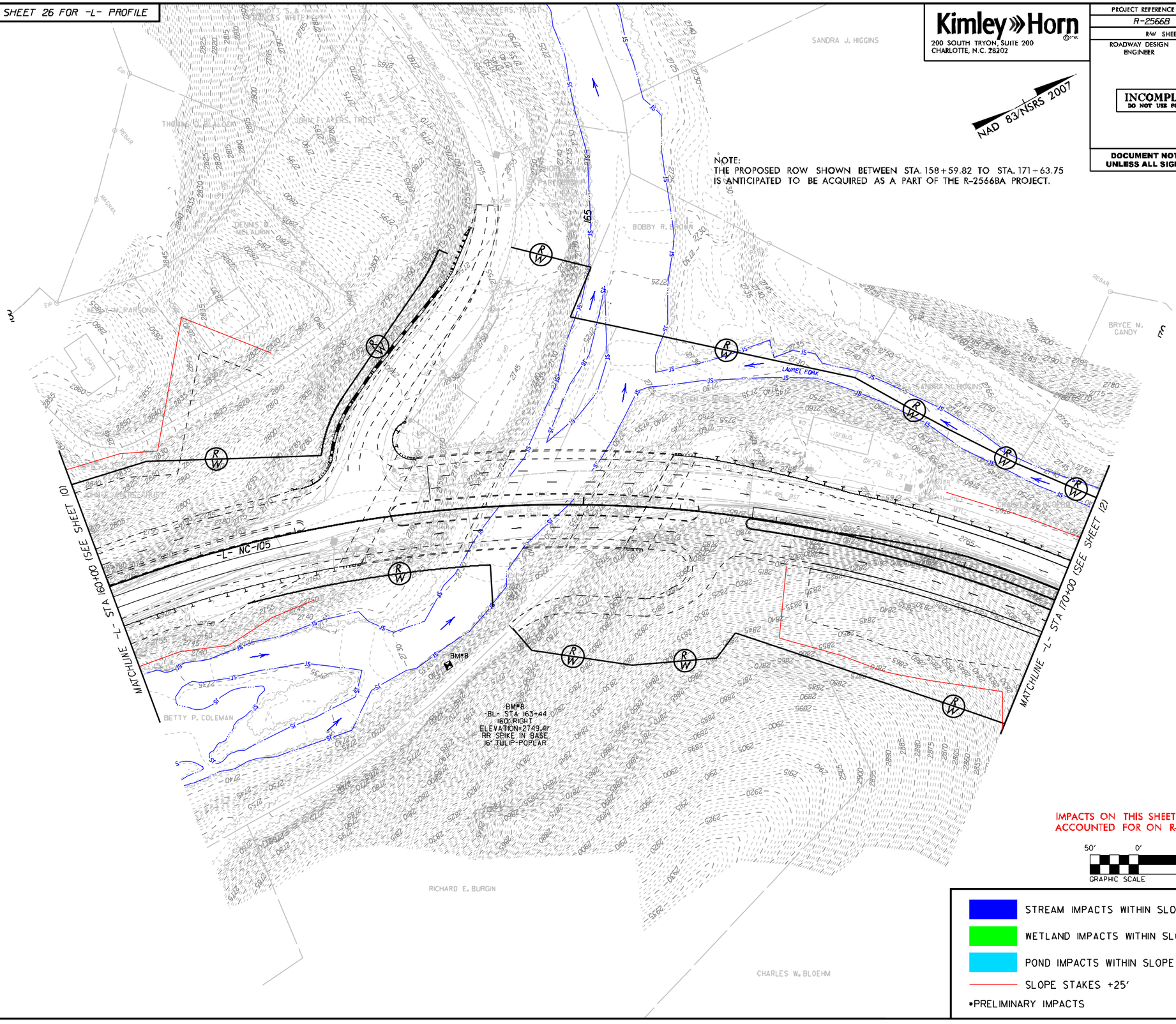
PROJECT REFERENCE NO.	SHEET NO.
R-2566B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NSRS 2007

NOTE:
THE PROPOSED ROW SHOWN BETWEEN STA. 158+59.82 TO STA. 171-63.75 IS ANTICIPATED TO BE ACQUIRED AS A PART OF THE R-2566BA PROJECT.



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2/15/2019

-L-			
PI Sta 165+98.50	PIs Sta 172+69.20	PIs Sta 180+43.89	PI Sta 182+60.47
△ = 5° 31' 45.6" (RT)	θs = 6° 52' 31.8"	θs = 6° 37' 47.8"	△ = 8° 52' 54.5" (LT)
D = 4° 14' 38.9"	Ls = 324.00'	Ls = 324.00'	D = 4° 05' 33.2"
L = 1,214.13'	LT = 216.16'	LT = 216.15'	L = 217.02'
T = 651.59'	ST = 108.15'	ST = 108.14'	T = 108.73'
R = 1,350.00'			R = 1,400.00'
SE = 6%			SE = 6%
DS = 60			DS = 60
RO = 324'			RO = 324'

SEE SHEET 27 FOR -L- PROFILE

NOTE:
THE PROPOSED ROW SHOWN BETWEEN STA. 158+59.82 TO STA. 171+63.75 IS ANTICIPATED TO BE ACQUIRED AS A PART OF THE R-2566BA PROJECT.

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CHARLOTTE, N.C. 28202

PROJECT REFERENCE NO.	SHEET NO.
R-2566B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

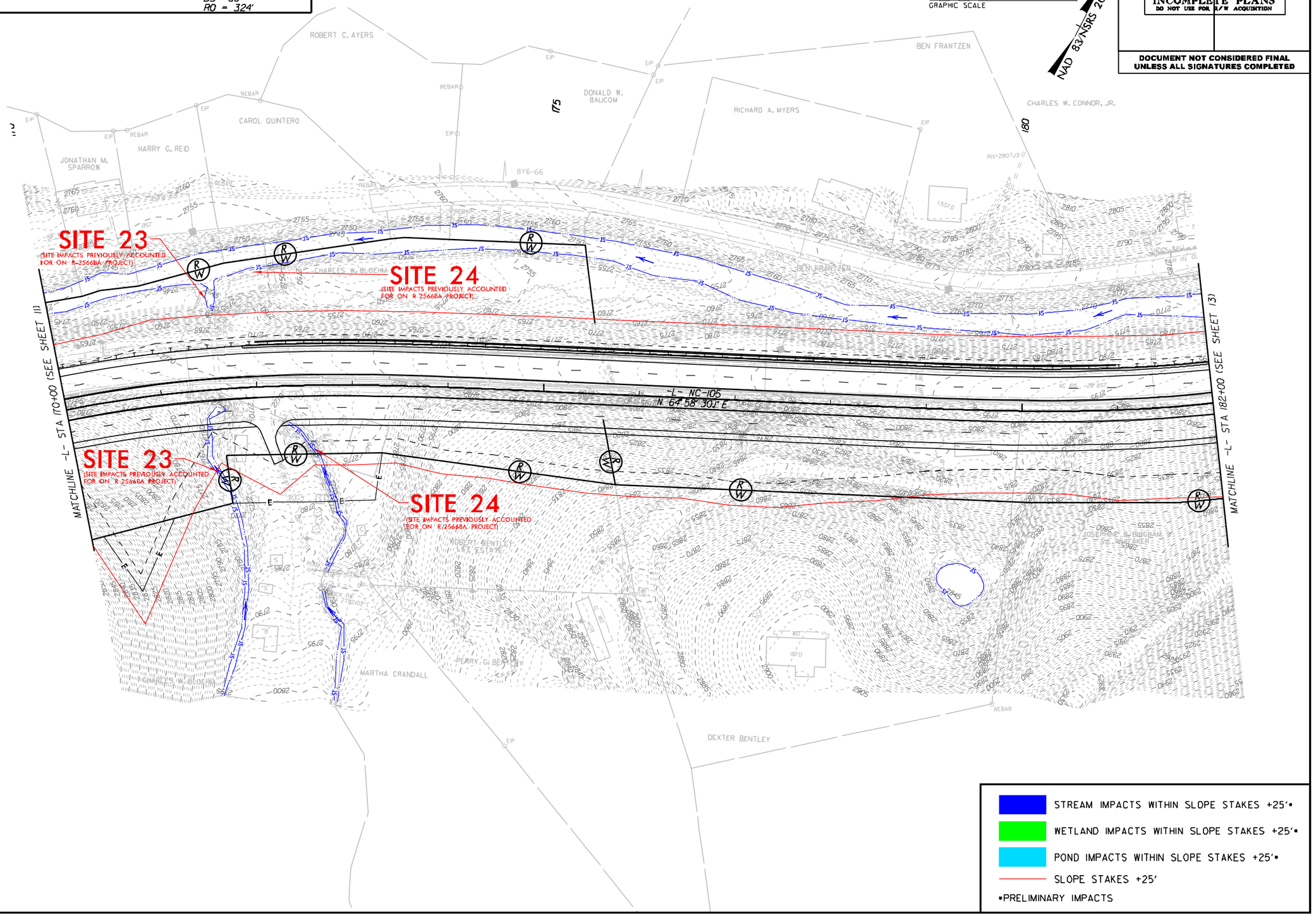
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

50' 0' 100'
GRAPHIC SCALE

NAD 83/NSRS 2007

REVISIONS

5/14/99



STREAM IMPACTS WITHIN SLOPE STAKES +25'•
WETLAND IMPACTS WITHIN SLOPE STAKES +25'•
POND IMPACTS WITHIN SLOPE STAKES +25'•
SLOPE STAKES +25'
•PRELIMINARY IMPACTS

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2/15/2019

-L-		-Y3-			
PI Sta 182+60.47	PIs Sta 184+76.90	PI Sta 10+71.40	PI Sta 11+47.94	PI Sta 12+23.00
△ = 8°52' 54.5" (LT)	Θs = 6°37' 47.8"	△ = 60°06' 59.4" (LT)	△ = 9°19' 55.6" (RT)	△ = 17°59' 12.5" (RT)
D = 4°05' 33.2"	Ls = 324.00'	D = 133°14' 45.6"	D = 8°18' 13.5"	D = 41°44' 47.3"
L = 217.02'	LT = 216.15'	L = 45.12'	L = 112.38'	L = 37.67'
T = 108.73'	ST = 108.14'	T = 24.88'	T = 56.32'	T = 18.99'
R = 1,400.00'		R = 43.00'	R = 690.00'	R = 120.00'
SE = 6%		RO = 1216'	SE = NC	
DS = 60			DS = 30	
RO = 324'				

SEE SHEET 27 FOR -L- PROFILE
SEE SHEET 34 FOR -Y3- PROFILE

50' 0' 100'
GRAPHIC SCALE

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200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

PROJECT REFERENCE NO.	SHEET NO.
R-2566B	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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REVISIONS
5/14/19

BM#9
-BL- STA 184+28
160' LEFT
ELEVATION=2749.41'
CHISELED SQUARE IN HW
NW CORNER (UPSTREAM LEFT) BR

SITE 25

SITE 25

N 74°00'25.8"W

S 73°11'42.9"W

-Y3- SR 1111 (OLD DANNER RD)

-L- NC-105
N 42°50'00.0"E

MATCHLINE -L- STA 182+00 (SEE SHEET 12)

MATCHLINE -L- STA 195+00 (SEE SHEET 14)

R. MURRAY BROOME

VIRGINIA D. BRYANT & GORDON E. DRAKE

WELBA W. HAYES

DUDLEY SCHALLER, ALL

DOBBY B. CLARK, SR.

AVERY GRAND, LLC

NOTE: GRADE TO BE REVISED IN THIS AREA BASED ON 15% REVIEW COMMENTS. IMPACTS IN THIS AREA WILL REVISE. IMPACTS SHOWN IN ATTEMPT TO ACCOUNT FOR INCREASED IMPACTS DUE TO GRADE REVISION.

STREAM IMPACTS WITHIN SLOPE STAKES +25'*
WETLAND IMPACTS WITHIN SLOPE STAKES +25'*
POND IMPACTS WITHIN SLOPE STAKES +25'*
SLOPE STAKES +25'
*PRELIMINARY IMPACTS

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2/15/2019

-L-			
PIs Sta 199+67.34	PI Sta 201+77.10	PIs Sta 203+86.36	PIs Sta 207+78.43
Θs = 8° 25' 20.9"	△ = 12° 46' 44.4" (LT)	Θs = 8° 25' 20.9"	Θs = 9° 21' 29.9"
Ls = 294.00'	D = 5° 43' 46.5"	Ls = 294.00'	Ls = 294.00'
LT = 196.22'	L = 223.04'	LT = 196.22'	LT = 196.27'
ST = 98.20'	T = 111.98'	ST = 98.20'	ST = 98.25'
	R = 1,000.00'		
	SE = 6%		
	DS = 50		
	RO = 294'		

SEE SHEET 28 FOR -L- PROFILE

GRAPHIC SCALE 50' 0' 100'

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200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

PROJECT REFERENCE NO.	SHEET NO.
R-2566B	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NSRS 2007

SITE 26

SITE 27

SITE 28

MATCHLINE -L- STA 195+00 (SEE SHEET 13)

MATCHLINE -L- STA 208+00 (SEE SHEET 15)

-L- NC-105
N 42° 50' 00.0" E

BM=10
-BL- STA 204+27
94' LEFT
ELEVATION=2839.66'

JANET D. MCKINNEY

PHILLIP B. MUNCY

STEPHEN POE

NOTE: GRADE TO BE REVISED IN THIS AREA BASED ON 15% REVIEW COMMENTS. IMPACTS IN THIS AREA WILL REVISE. IMPACTS SHOWN IN ATTEMPT TO ACCOUNT FOR INCREASED IMPACTS DUE TO GRADE REVISION.

STREAM IMPACTS WITHIN SLOPE STAKES +25'*
WETLAND IMPACTS WITHIN SLOPE STAKES +25'*
POND IMPACTS WITHIN SLOPE STAKES +25'*
SLOPE STAKES +25'
*PRELIMINARY IMPACTS

REVISIONS 5/14/99

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-L-		
PIs Sta 207+78.43	PI Sta 212+59.36	PIs Sta 216+98.97
Θs = 9° 21' 29.9"	△ = 46° 07' 37.8" (RT)	Θs = 9° 21' 29.9"
Ls = 294.00'	D = 6° 21' 58.3"	Ls = 294.00'
LT = 196.27'	L = 724.56'	LT = 196.27'
ST = 98.25'	T = 383.21'	ST = 98.25'
	R = 900.00'	
	SE = 6%	
	DS = 50	
	RO = 294°	

-Y4-		
PI Sta 10+64.41	PI Sta 11+57.44	PI Sta 12+92.36
△ = 63° 03' 17.2" (RT)	△ = 10° 08' 30.7" (RT)	△ = 3° 02' 38.0" (RT)
D = 54° 34' 02.7"	D = 12° 08' 19.9"	D = 1° 37' 56.5"
L = 115.55'	L = 83.55'	L = 186.47'
T = 64.41'	T = 41.88'	T = 93.26'
R = 105.00'	R = 472.00'	R = 3,510.01'
RO = 52°		

SEE SHEET 28 FOR -L- PROFILE
SEE SHEET 35 FOR -Y4- PROFILE

50' 0' 100'
GRAPHIC SCALE

Kimley»Horn ©
200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

PROJECT REFERENCE NO.	SHEET NO.
R-2566B	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83 NSRS 2007

REVISIONS 5/14/99

ROLAND SCHOLL AND WIFE, MICHAELA BUCHEL-SCHOLL
WILLOW VALLEY ASSOCIATES, LP
OSCAR G. DANNER, JR.
PLUMTREE PROPERTIES, LLC
DENNIS R. HARRELSON
DALLAS TOLBERT LAWRENCE
E. B. FOX, JR. FAMILY TRUST
STEPHEN POE
-Y4- SR 1113 (BAIRD'S CREEK RD)
-L- NC 105
LAUREL FORK
SITE 29
SITE 29
MATCHLINE -L- STA 208+00 (SEE SHEET 14)
MATCHLINE -L- STA 220+00 (SEE SHEET 16)
N 78° 00' 16.4" E

STREAM IMPACTS WITHIN SLOPE STAKES +25'•
WETLAND IMPACTS WITHIN SLOPE STAKES +25'•
POND IMPACTS WITHIN SLOPE STAKES +25'•
SLOPE STAKES +25'
•PRELIMINARY IMPACTS

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2/15/2019

-L-		
PIs Sta 223+68.86	PI Sta 226+29.18	PIs Sta 228+87.83
Θs = 7° 01' 07.4"	△ = 15° 25' 16.0" (RT)	Θs = 7° 01' 07.4"
Ls = 294.00'	D = 4° 46' 28.7"	Ls = 294.00'
LT = 196.15'	L = 322.98'	LT = 196.15'
ST = 98.14'	T = 162.47'	ST = 98.14'
	R = 1,200.00'	
	SE = 6%	
	DS = 55	
	RO = 294'	

SEE SHEET 29 FOR -L- PROFILE

GRAPHIC SCALE 50' 0' 100'

Kimley»Horn ©
200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

PROJECT REFERENCE NO.	SHEET NO.
R-2566B	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NSRS 2007

REVISIONS 5/14/19

SITE 31

SITE 30

BM#11
-BL- STA 226+19
62' LEFT
ELEVATION=2924.53'

BM#10

-L- STA 220+00 (SEE SHEET 15)

-L- STA 232+00 (SEE SHEET 17)

MATCHLINE -L- STA 220+00 (SEE SHEET 15)

MATCHLINE -L- STA

-L- NC 105
N 78° 00' 16.4" E

S 72° 32' 12.8" E

RUFUS G. YATES

JANE P. YASMINE

JOHNNY C. MOORE

FIRMM CORPORATION

EIP

REBAR

STREAM IMPACTS WITHIN SLOPE STAKES +25'*

WETLAND IMPACTS WITHIN SLOPE STAKES +25'*

POND IMPACTS WITHIN SLOPE STAKES +25'*

SLOPE STAKES +25'

*PRELIMINARY IMPACTS

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2/15/2019

-L-

PIs Sta 236+41.21
Θs = 1° 54' 12.2"
Ls = 196.00'
LT = 130.67'
ST = 65.34'

PI Sta 247+33.03
Δ = 38° 22' 19.3" (LT)
D = 1° 56' 32.0"
L = 1,975.67'
T = 1,026.49'
R = 2,950.00'
SE = 4%
RO=193'
DS= 55
RO = 196'

SEE SHEET 29 FOR -L- PROFILE

GRAPHIC SCALE 50' 0' 100'

Kimley»Horn ©
200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

PROJECT REFERENCE NO.	SHEET NO.
R-2566B	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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REVISIONS

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SITE 32

SITE 34

SITE 33

235

240

MATCHLINE -L- STA 232+00 (SEE SHEET 16)

MATCHLINE -L- STA 245+00 (SEE SHEET 18)

-L- NC-105
S 72°32'12.8" E

ISBLK BATH HOUSE

FIRMM CORPORATION

ISMTLBUS

ISBUS

BRANCH BANKING & TRUST COMPANY

BILLIE JO MAINES
DB 1365 PG 563

WALKER DEVELOPMENT, LLC

SCOTT A. COLEY

JANE P. YASMINE

SHAWN FOGE

CARY B. HYLE

EDWARD D. BLOODWORTH

JOSHUA A. MINTON

VICTORY LANE (PRIVATE)

REBAR

EIP

STREAM IMPACTS WITHIN SLOPE STAKES +25'*

WETLAND IMPACTS WITHIN SLOPE STAKES +25'*

POND IMPACTS WITHIN SLOPE STAKES +25'*

SLOPE STAKES +25'

*PRELIMINARY IMPACTS

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2/15/2019

-L-

PI Sta 247+33.03
Δ = 38° 22' 19.3" (LT)
D = 1° 56' 32.0"
L = 1,975.67'
T = 1,026.49'
R = 2,950.00'
SE = 4%
RO = 193'
DS = 55
RO = 196'

PI Sta 260+56.06
Δ = 17° 42' 28.3" (LT)
D = 2° 23' 14.4"
L = 741.75'
T = 373.85'
R = 2,400.00'
SE = 4%
DS = 50
RO = 196'

SEE SHEET 30 FOR -L- PROFILE

50' 0' 100'
GRAPHIC SCALE

Kimley»Horn ©
200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

PROJECT REFERENCE NO.	SHEET NO.
R-2566B	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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2/15/2019

SITE 34

SITE 35

SITE 36

SITE 37

MATCHLINE -L- STA 245+00 (SEE SHEET 17)

MATCHLINE -L- STA 258+00 (SEE SHEET 19)

-L- NC-105

BM#12
-BL- STA 246+00
130' LEFT
ELEVATION=2996.69'
RR SPIKE IN BASE 24" LOCUST

BM#12

FOUR SEASONS APARTMENTS, INC.

LORENE T. MILLER

WLT LP LAND HOLDINGS I

BOBBY MCCASKILL

ACTION SIGN COMPANY LENOIR, INC.

JAMES TODD, JR. & JAMES TODD

RAY E. & VIRGINIA WARD

STREAM IMPACTS WITHIN SLOPE STAKES +25'•
WETLAND IMPACTS WITHIN SLOPE STAKES +25'•
POND IMPACTS WITHIN SLOPE STAKES +25'•
SLOPE STAKES +25'
•PRELIMINARY IMPACTS

REVISIONS

5/14/99

-L-

PI Sta 260+56.06	PIs Sta 264+89.30	PIs Sta 268+16.18	PI Sta 272+63.32
Δ = 11° 42' 28.3" (LT)	Θs = 2° 20' 22.5"	Θs = 8° 25' 20.9"	Δ = 38° 30' 53.3" (RT)
D = 2° 23' 14.4"	Ls = 196.00'	Ls = 294.00'	D = 5° 43' 46.5"
L = 741.75'	LT = 130.68'	LT = 196.22'	L = 672.21'
T = 373.85'	ST = 65.34'	ST = 98.20'	T = 349.36'
R = 2,400.00'			R = 1,000.00'
SE = 4%			SE = 6%
DS = 50			DS = 50
RO = 196'			RO = 294'

SEE SHEET 31 FOR -L- PROFILE

50' 0' 100'
GRAPHIC SCALE

Kimley»Horn ©
200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

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PROJECT REFERENCE NO.	SHEET NO.
R-2566B	19
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

260

265

270

SITE 38

SITE 39

MATCHLINE -L- STA 258+00 (SEE SHEET 18)

MATCHLINE -L- STA 271+50 (SEE SHEET 20)

-L- NC-105

JAMES & GLENDA SIMMONS

BM#13
-BL- STA 262+58
122' LEFT
ELEVATION=3085.82'
RR SPIKE IN BST PARKING
OF VULCAN QUARRY OFFICE

STREAM IMPACTS WITHIN SLOPE STAKES +25'*
WETLAND IMPACTS WITHIN SLOPE STAKES +25'*
POND IMPACTS WITHIN SLOPE STAKES +25'*
SLOPE STAKES +25'
*PRELIMINARY IMPACTS

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2/15/2019

-L-

PI Sta 272+63.32
Δ = 38° 30' 53.3" (RT)
D = 5° 43' 46.5"
L = 672.21'
T = 349.36'
R = 1,000.00'
SE = 6%
DS = 50
RO = 294'

PIs Sta 276+84.37
Θs = 8° 25' 20.9"
Ls = 294.00'
LT = 196.22'
ST = 98.20'

SEE SHEET 32 FOR -L- PROFILE

GRAPHIC SCALE 50' 0' 100'

Kimley»Horn ©
200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

NAD 83/NSRS 2007

PROJECT REFERENCE NO.	SHEET NO.
R-2566B	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS 5/14/19

275

280

SITE 41

SITE 40

BM#14
-BL- STA 283+63
75' LEFT
ELEVATION=3204.11'
CHISELED X IN TOP ANCHOR BOLT
CHICK-FIL-A SIGN

-L- NC-105
S 77° 30' 00.0" E

MATCHLINE -L- STA 282+50 (SEE SHEET 19)

MATCHLINE -L- STA 284+00 (SEE SHEET 21)

STREAM IMPACTS WITHIN SLOPE STAKES +25'*
WETLAND IMPACTS WITHIN SLOPE STAKES +25'*
POND IMPACTS WITHIN SLOPE STAKES +25'*
SLOPE STAKES +25'
*PRELIMINARY IMPACTS

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-L-

PIs Sta 289+92.17
Θs = 2° 26' 28.7"
Ls = 196.00'
LT = 130.68'
ST = 65.34'

PI Sta 293+19.90
Δ = 13° 01' 02.7" (LT)
D = 2° 29' 28.0"
L = 522.55'
T = 262.41'
R = 2,300.00'
SE = 4%
DS = 50
RO = 198°

PIs Sta 296+45.39
Θs = 2° 26' 28.7"
Ls = 196.00'
LT = 130.68'
ST = 65.34'

SEE SHEET 33 FOR -L- PROFILE

50' 0' 100'
GRAPHIC SCALE

Kimley»Horn ©
200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202

PROJECT REFERENCE NO.	SHEET NO.
R-2566B	21

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NSRS 2007

REVISIONS 5/14/99

SITE 42

SITE 42

MATCHLINE -L- STA 284+00 (SEE SHEET 20)

-L- NC-105
S 77° 30' 00.0" E

ISMTLBUS

JOHN TAYLOR CONWAY

CHANDLER CONCRETE HIGH COUNTRY, LLC

CONCRETE PLANT

DEWEY C. & MARJORIE WRIGHT

GH WINKLER FAMILY LIMITED PARTNERSHIP

STREAM IMPACTS WITHIN SLOPE STAKES +25'*
WETLAND IMPACTS WITHIN SLOPE STAKES +25'*
POND IMPACTS WITHIN SLOPE STAKES +25'*
SLOPE STAKES +25'
*PRELIMINARY IMPACTS

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2/15/2019

R-2566B Prelimary Permit Impact Summary Table					
Plan Sheet Number	Station (To/From)	Site Identifier	Wetland Impacts Within Slope Stakes +25' (Acres)	Stream Impacts Within Slope Stakes +25' (Linear Feet)	Pond Impacts Within Slope Stakes +25' (Acres)
4	76+47/76+63 -L- RT	1		36	
4	76+68/76+83 -L- RT	1		29	
4	12+29/13+27 -Y1- LT	2	0.02		
4	12+83/14+60 -Y1- RT	3	0.03		
5	86+77/87+09 -L- LT	4		62	
5	85+79/86+50 -L- RT	4		81	
5	88+84/89+09 -L- LT	5		51	
5	89+09/89+39 -L- RT	5		43	
5	17+97/18+08 -Y1- LT	6		38	
5	17+99/18+48 -Y1- RT	6		57	
5	10+95/11+16 -Y2- LT	7		47	
5	10+74/11+43 -Y2- RT	7	0.02	28	
5	21+46/24+05 -Y1- RT	8		241	
6	105+88/106+72 -L- LT	9		101	
6	106+69/107+23 -L- RT	9		62	
6	108+13/108+34 -L- LT	10		50	
7	110+43/111+03 -L- RT	10	0.01	27	
7	117+20/118+98 -L- LT	11	0.02		
7	118+51/119+34 -L- LT	11		132	
8	124+80/124+97 -L- LT	12		46	
8	124+48/124+85 -L- RT	12		47	
8	125+03/127+06 -L- LT	13	0.03		
8	126+68/126+87 -L- LT	14		26	
8	127+02/127+22 -L- LT	15		40	
8	129+76/130+23 -L- LT	16		76	
8	129+98/130+23 -L- RT	16		59	
8	130+64/130+97 -L- LT	17	< 0.01		
8	131+23/133+13 -L- LT	17	0.08		
8	131+90/132+08 -L- RT	18		42	
8	133+78/133+97 -L- LT	19		16	
8	133+88/134+02 -L- LT	19		19	
8	134+01/134+49 -L- RT	19		55	
9	144+93/146+67 -L- LT	20	0.06	42	
9	147+75/148+53 -L- LT	21		130	
9	147+65/148+31 -L- RT	21		112	
10	158+28/158+76 -L- LT	22	Impacts Previously Accounted for on R-2566BA Project		
12	171+33/171+72 -L- LT	23	Impacts Previously Accounted for on R-2566BA Project		
12	171+39/171+66 -L- RT	23	Impacts Previously Accounted for on R-2566BA Project		
12	171+84/172+10 -L- LT	24	Impacts Previously Accounted for on R-2566BA Project		
12	172+30/172+63 -L- RT	24	Impacts Previously Accounted for on R-2566BA Project		
13	190+05/190+36 -L- LT	25		72	
13	190+49/190+99 -L- RT	25		145	
14	197+08/197+23 -L- LT	26		50	
14	197+11/197+27 -L- RT	26		102	
14	200+98/202+38 -L- RT	27		190	
14	201+14/202+51 -L- RT	27	0.03		
14	201+94/202+50 -L- LT	27		58	
14	202+93/203+47 -L- LT	28		50	
15	218+97/219+00 -L- RT	29		9	
15	218+80/218+86 -L- LT	29		3	
15	218+93/218+99 -L- LT	29		42	
16	222+43/222+55 -L- LT	30		51	
16	222+81/222+91 -L- RT	30		22	
16	228+09/228+50 -L- LT	31		52	
17	239+13/239+81 -L- LT	32	0.03		
17	240+31/241+00 -L- RT	32		110	
17	240+48/240+94 -L- RT	32	< 0.01		
17	241+12/241+31 -L- RT	32		20	
17	242+69/243+37 -L- RT	33	< 0.01		
17/18	244+91/245+12 -L- LT	34		50	
18	244+99/245+63 -L- RT	34		65	
18	248+96/251+04 -L- RT	35		268	
18	249+79/250+59 -L- RT	35	0.02		
18	253+30/253+54 -L- LT	36		45	
18	254+09/254+25 -L- RT	37		105	
19	260+62/260+78 -L- LT	38		59	
19	263+85/263+97 -L- LT	39		40	
20	271+85/271+97 -L- LT	40	< 0.01		
20	274+19/274+63 -L- LT	41			< 0.01
21	287+86/288+13 -L- RT	42		60	
21	287+89/288+09 -L- LT	42		71	
Additional (*)			0.17	461	
TOTAL			0.54	3995	0.01

* = Additional stream impacts included to account for potential new outfall locations into Watauga River and Laurel Fork and also for some additional impacts due to the potential realignment of Old Shulls Mill Road (-Y1-) at the beginning of the project that would result in extending the project tie-in to Station 69+00 -L-. Additional wetland impacts included to account for potential realignment of -Y1- and other minor potential impacts throughout the corridor.