Transportation

ROY COOPER
Governor

MICHAEL L. HOLDER
Acting Secretary

January 5, 2017

Addendum No. 1
RE: Contract # C203825
WBS # 39999.3.3
F. A. # STP-0107(10)
Jackson County (R-4753)
NC-107 From North Of SR-1002 To NC-281

January 17, 2017 Letting (Advertisement extended from the December 20, 2016 Letting)

To Whom It May Concern:

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

The following revisions have been made to the Roadway plans:

Sheet No.	Revisions
1	Revised the letting date on the Title Sheet
8, 9, 11, 12, 19 and 25	Revised or added a design exception note

Please void the above listed sheets in your plans and staple the revised sheets thereto.

The following revisions have been made to the Structure plans:

Sheet No.	Revisions
Title Sheet	Revised the letting date on the Title Sheet
W-6	Revised note No. 14

Please void the above listed sheets in your plans and staple the revised sheets thereto.

The following revisions have been made to the proposal:

Page No.	Revisions
Proposal Cover	Note added that reads "Includes Addendum No. 1 Dated 01-05-2017". Revised the let date to January 17, 2017.
G-1	Revised the availability and completion dates within the project special provisions entitled "Contract Time and Liquidated Damages" and "Intermediate Contract Time Number 1 and Liquidated Damages"
G-4	Revised the list of parcels with delays within the project special provision entitled "Delay In Right Of Entry"
G-8	Revised the percentages within the project special provision entitled "Schedule of Estimated Completion Progress"
R-1 and R-2	Revised the list of building removals within the project special provision entitled "Building Removal"
GT-2.4	Revised language in the third and fourth paragraph on this page under the Section "3.0 Preconstruction Requirements" within the project special provision entitled "Pile Walls with Options"
GT-2.6	Revised the second paragraph under section "B. Sheet Pile Installation" and the second paragraph under section "C. Secant Pile Installation" within the project special provision entitled "Pile Walls with Options"
GT-2.10	Revised the first and second paragraph under section "5.0 Measurement and Payment" within the project special provision entitled "Pile Walls with Options"
New Page P-81 and P-82	Added new pages to include the "Trout Buffer Zone Waiver"

Please void the Proposal Cover and the above listed pages in your proposal and replace with the revised pages. Add new pages P-81 and P-82 after existing Page No. P-80.

Please delete the EBS file you previously downloaded for the December 20, 2016 letting and download the new EBS file listed for the January 17, 2017 letting. Bid Express will not accept your bid unless the new EBS file associated with the January 17, 2017 letting is used.

The contract will be prepared accordingly.

Sincerely,

DS

R. A. Garris, PE
Contract Officer

RAG/jag

cc: Mr. Lamar Sylvester, PE
Mr. E.A. Green, PE
Mr. Rodger Rochelle, PE
Mr. R.E. Davenport, PE
Mr. Ken Kennedy, PE
Ms. Jaci Kincaid
Project File (2)
Mr. Ray Arnold, PE
Ms. Theresa Canales, PE
Ms. Marsha Sample
Mr. Mike Gwyn
Ms. Penny Higgins
Ms. Lori Strickland
Mr. Mitchell Dixon

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

PROPOSAL

INCLUDES ADDENDUM No. 1 DATED 01-05-2017

DATE AND TIME OF BID OPENING: **JANUARY 17, 2017 AT 2:00 PM**

CONTRACT ID	C203825
WBS	39999.3.3

FEDERAL-AID NO.	STP-0107(10)
COUNTY	JACKSON
T.I.P. NO.	R-4753
MILES	3.769
ROUTE NO.	NC 107
LOCATION	NC-107 FROM NORTH OF SR-1002 TO NC-281.

TYPE OF WORK GRADING, DRAINAGE, PAVING, RETAINING WALLS, AND CULVERTS.

NOTICE:

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

BIDS WILL BE RECEIVED AS SHOWN BELOW:

THIS IS A ROADWAY & STRUCTURE PROPOSAL

5% BID BOND OR BID DEPOSIT REQUIRED

PROJECT SPECIAL PROVISIONS

GENERAL

CONTRACT TIME AND LIQUIDATED DAMAGES:

(8-15-00) (Rev. 12-18-07) 108 SP1 G07 A

The date of availability for this contract is **February 27, 2017**, except that work in jurisdictional waters and wetlands shall not begin until a meeting between the DOT, Regulatory Agencies, and the Contractor is held as stipulated in the permits contained elsewhere in this proposal. This delay in availability has been considered in determining the contract time for this project.

The completion date for this contract is **March 13, 2020**.

Except where otherwise provided by the contract, observation periods required by the contract will not be a part of the work to be completed by the completion date and/or intermediate contract times stated in the contract. The acceptable completion of the observation periods that extend beyond the final completion date shall be a part of the work covered by the performance and payment bonds.

The liquidated damages for this contract are **Two Hundred Dollars ($ 200.00)** per calendar day. These liquidated damages will not be cumulative with any liquidated damages which may become chargeable under Intermediate Contract Time Number 1.

INTERMEDIATE CONTRACT TIME NUMBER 1 AND LIQUIDATED DAMAGES:

(7-1-95) (Rev. 2-21-12) 108 SP1 G13 A

Except for that work required under the Project Special Provisions entitled *Planting, Reforestation* and/or *Permanent Vegetation Establishment*, included elsewhere in this proposal, the Contractor will be required to complete all work included in this contract and shall place and maintain traffic on same.

The date of availability for this intermediate contract time is **February 27, 2017**.

The completion date for this intermediate contract time is **September 15, 2019**.

The liquidated damages for this intermediate contract time are **Two Thousand Dollars ($ 2,000.00)** per calendar day.

Upon apparent completion of all the work required to be completed by this intermediate date, a final inspection will be held in accordance with Article 105-17 and upon acceptance, the Department will assume responsibility for the maintenance of all work except *Planting, Reforestation* and/or *Permanent Vegetation Establishment*. The Contractor will be responsible for and shall make corrections of all damages to the completed roadway caused by his planting operations, whether occurring prior to or after placing traffic through the project.

vegetation establishment and the removal of temporary erosion control measures, whether occurring prior to or after placing traffic on the project.

Payment for *Response for Erosion Control, Seeding and Mulching, Repair Seeding, Supplemental Seeding, Mowing, Fertilizer Topdressing, Silt Excavation,* and *Stone for Erosion Control* will be made at contract unit prices for the affected items. Work required that is not represented by contract line items will be paid in accordance with Articles 104-7 or 104-3 of the *2012 Standard Specifications*. No additional compensation will be made for maintenance and removal of temporary erosion control items.

CONSTRUCTION MORATORIUM:

(7-15-14) SP1 G18A

No in-water work or land disturbance within the 25 ft wide buffer zone will be allowed from **October 15** through **April 15** of any year.

DELAY IN RIGHT OF ENTRY:

(7-1-95) 108 SP1 G22 B

The Contractor will not be allowed right of entry to the following parcels prior to the listed dates unless otherwise permitted by the Engineer.

Parcel No.	Property Owner	Date
18	Tuckurang, LLC	07-01-2017
19	CFGS, Inc.	07-01-2017

MAJOR CONTRACT ITEMS:

(2-19-02) 104 SP1 G28

The following listed items are the major contract items for this contract (see Article 104-5 of the *2012 Standard Specifications*):

Line #	Description
64	Asphalt Concrete Intermediate Course, Type I19.0B
184	Pile Walls With Options

The pay items and the fuel factor used in calculating adjustments to be made will be as follows:

Description	Units	Fuel Usage Factor Diesel
Unclassified Excavation	Gal/CY	0.29
Borrow Excavation	Gal/CY	0.29
Class IV Subgrade Stabilization	Gal/Ton	0.55
Aggregate Base Course	Gal/Ton	0.55
Sub-Ballast	Gal/Ton	0.55
Asphalt Concrete Base Course, Type ____	Gal/Ton	2.90
Asphalt Concrete Intermediate Course, Type ____	Gal/Ton	2.90
Asphalt Concrete Surface Course, Type ____	Gal/Ton	2.90
Open-Graded Asphalt Friction Course	Gal/Ton	2.90
Permeable Asphalt Drainage Course, Type ____	Gal/Ton	2.90
Sand Asphalt Surface Course, Type ____	Gal/Ton	2.90
Aggregate for Cement Treated Base Course	Gal/Ton	0.55
Portland Cement for Cement Treated Base Course	Gal/Ton	0.55
__" Portland Cement Concrete Pavement	Gal/SY	0.245
Concrete Shoulders Adjacent to __" Pavement	Gal/SY	0.245

SCHEDULE OF ESTIMATED COMPLETION PROGRESS:

(7-15-08) (Rev. 5-17-16) 108-2 SP1 G58

The Contractor's attention is directed to the Standard Special Provision entitled *Availability of Funds Termination of Contracts* included elsewhere in this proposal. The Department of Transportation's schedule of estimated completion progress for this project as required by that Standard Special Provision is as follows:

	Fiscal Year	Progress (% of Dollar Value)
2017	(7/01/16 - 6/30/17)	**19**% of Total Amount Bid
2018	(7/01/17 - 6/30/18)	**47**% of Total Amount Bid
2019	(7/01/18 - 6/30/19)	**30**% of Total Amount Bid
2020	(7/01/19 - 6/30/20)	**4**% of Total Amount Bid

The Contractor shall also furnish his own progress schedule in accordance with Article 108-2 of the *2012 Standard Specifications*. Any acceleration of the progress as shown by the Contractor's progress schedule over the progress as shown above shall be subject to the approval of the Engineer.

PROJECT SPECIAL PROVISIONS

ROADWAY

CLEARING AND GRUBBING - METHOD II:

(9-17-02) (Rev.8-18-15) 200 SP2 R02A

Perform clearing on this project to the limits established by Method "II" shown on Standard Drawing No. 200.02 of the *2012 Roadway Standard Drawings*. Conventional clearing methods may be used except where permit drawings or conditions have been included in the proposal which require certain areas to be cleared by hand methods.

BUILDING REMOVAL:

(1-1-02) (Rev. 11-15-16) 215 SP2 R15 C

Remove the buildings and appurtenances listed below in accordance with Section 215 of the *2012 Standard Specifications*:

Item 2 – Parcel 006
Left of Survey Station 26+70, Survey Line –L-
1 Story Block Business

Item 6 – Parcel 013
Left of Survey Station 44+20, Survey Line –L-
1 Story Frame Dwelling
(Note: This building shall not be removed until after it is no longer needed for use as a Field Office, please see the Field Office special provision contained elsewhere in the contract)

Item 10 – Parcel 065
Right of Survey Station 196+00, Survey Line –L-
1 Story Metal Business
(Note: This building shall not be removed until after it is no longer needed for use as a Field Office, please see the Field Office special provision contained elsewhere in the contract)

When the description of the work for an item indicates a building partially inside and partially outside the right of way and/or construction area, but does not require the building to be cut off, the entire building shall be removed.

TEMPORARY DETOURS AND TEMPORARY PAVEMENT:

(7-1-95) (Rev. 11-19-13) 1101 SP2 R30B (REV.)

Construct temporary detours and temporary pavement required on this project in accordance with the plans or as directed by the Engineer.

After the detours and temporary pavement have served their purpose, remove the portions deemed unsuitable for use as a permanent part of the project as directed by the Engineer. Salvage and stockpile the aggregate base course removed from the detours and/or temporary pavement at locations within the right of way, as directed by the Engineer, for removal by State Forces. Place pavement and earth material removed from the detours and/or temporary pavement in embankments or dispose of in waste areas furnished by the Contractor.

Aggregate base course and earth material that is removed will be measured and will be paid at the contract unit price per cubic yard for *Unclassified Excavation.* Pavement that is removed will be measured and will be paid at the contract unit price per square yard for *Removal of Existing Asphalt Pavement.* Pipe culverts removed from the detours and/or temporary pavement remain the property of the Contractor. Pipe culverts that are removed will be measured and will be paid at the contract unit price per linear foot for *Pipe Removal.* Payment for the construction of the detours and temporary pavement will be made at the contract unit prices for the various items involved.

Provide walls with cast-in-place reinforced concrete coping. Use coping dimensions shown in the plans. When concrete barrier rail is required, use concrete barrier rail with moment slab as shown in the plans.

Use limit equilibrium methods to ensure global and basal stability for both temporary and permanent conditions.

Submit design calculations for each wall section with different surcharge loads, geometry or material parameters. Include analysis of temporary conditions. Use 100 year water elevations for permanent conditions and 100 year water elevations minus four feet for temporary conditions. Include lateral deflection calculations. Assume no passive resistance above the design elevation.

Rock elevation is determined by the Engineer, based on evidence provided by the Contractor, or visual inspection. Evidence of rock elevation is SPT resistance of greater than 100 blows per foot at no more than three foot intervals for six continuous feet, or excavation providing a rock auger penetration rate over six continuous feet of less than 2" (50 mm) per 5 minutes of drilling at full crowd force, or other evidence such as drilling spoils, of resistance equivalent to or greater than the above specified SPT resistance. Determine rock elevation at each soldier pile location.

For anchored walls, include unit grout/ground bond strengths and lock-off loads for acceptance in accordance with Article 105-2 of the *Standard Specifications*. At least one analysis is required for each wall section with different anchor lengths. When designing anchored walls with computer software, a hand calculation is required for the wall section with the longest anchors. When designing cantilevered walls with computer software, a hand calculation is required for the tallest wall section.

Submit working drawings and design calculations for acceptance in accordance with Article 105-2 of the *Standard Specifications*. Show plan views, typical sections and details including drainage. Show wall profiles with pile and anchor locations including known performance test anchor locations, typical sections and details of piles including reinforced web details, anchors, and drainage. If necessary, include details on working drawings for concrete barrier rail with moment slab and obstructions extending through walls or interfering with piles, anchors, barriers or moment slabs.

B. Pile Wall with Options Construction Plan

Submit 4 copies and a PDF copy of a construction plan at least 30 days before the preconstruction meeting. Do not begin wall construction until the construction plan submittal is accepted. Provide detailed project specific information in the wall construction plan that includes the following:

1. Overall description and sequence of wall construction;
2. For drilled-in piles, installation details including drilling equipment and methods for stabilizing and filling holes and for driven piles, proposed pile driving methods and equipment in accordance with Subarticle 450-3(D)(2) of the *Standard Specifications*;

submittals and with no negative batter (piles leaning forward). Use pile excavation to install soldier piles. After filling holes with concrete or grout to the elevations shown in the accepted submittals, remove any fluids and fill remaining portions of holes with select material or flowable fill. Cure concrete or grout at least 7 days before installing sheet piles.

B. Sheet Pile Installation

Remove material in between soldier piles as necessary to install sheet piles. Position sheet piles with at least 3" of contact in the horizontal direction between the sheet piles and the soldier pile flanges, or interlock the sheet piles with the soldier piles. Fill gaps between sheet piles and soldier piles greater than ¼" with joint filler.

Drive sheet piles 10 feet below design elevation at bottom of wall (see the table on sheet W-6 for design elevation at bottom of wall) or to rock elevation of adjacent soldier piles. If sheet piles are driven to rock elevation, drive sheet piles to refusal. Refusal by itself is not an acceptable installation criterion. In addition to the above requirements, sheet piles must be installed at least two feet below work platforms. If refusal is encountered above rock elevation, excavate to remove obstructions. Do not undermine the roadway during excavation.

C. Secant Pile Installation

Construct secant piles in two stages. Piles constructed during Stage 1 are known as primary or soft piles. Piles constructed during Stage 2 are known as secondary or hard piles. Primary (soft) piles are unreinforced. Secondary (hard) piles are reinforced with soldier piles. Secondary piles are placed between and overlap primary piles.

Construct secant piles 10 feet below design elevation at bottom of wall (see the table on sheet W-6 for design elevation at bottom of wall) or for secondary (hard) piles six feet below rock elevation, or for primary (soft) piles, two feet below rock elevationwhichever is less.

Allow the concrete or grout in primary piles to set for a minimum of 1 day or until sufficient strength is achieved to prevent cracking of the primary pile during construction of the secondary pile. Avoid allowing concrete or grout in primary piles to fully set before drilling for secondary piles. The concrete or grout mix may include additives to control the rate of gain of strength of the concrete. Additives in the concrete or grout mix shall be approved by the Engineer.

Overcast concrete or grout to one foot above the cut-off level to ensure that all concrete at and below cut-off level is homogeneous and free of laitance and deleterious matter. Chip off overcast to cut-off level. Cut away defective concrete in pile heads and replace with new concrete well bonded to the pile head.

Construct secant piles with the following tolerances:

8. Weather conditions including air temperature at time of grout placement;
9. Anchor testing records including load versus movement and time versus creep movement plots; and
10. All other pertinent details related to anchored wall construction.

The Engineer will review the construction records to determine if anchors are acceptable. If the Engineer determines an anchor is unacceptable, revise the anchor design or installation methods. Submit a revised anchored wall design or construction plan for acceptance and provide an acceptable anchor with the revised design or installation methods. If necessary, provide additional anchors with the revised design or installation methods for the unacceptable anchors.

After completing each anchored wall or stage of a wall, provide a PDF copy of all corresponding construction records.

5.0 MEASUREMENT AND PAYMENT

Pile Walls with Options will be measured and paid in square feet. Pile Walls with Options will be measured as the square feet of wall face area with the height equal to the difference between the design elevation at top of wall, as shown in the plans, and design elevation at bottom of wall, as shown in the plans (see the table on sheet W-6 for design elevation at bottom of wall). No measurement will be made for portions of pile walls with options embedded below design elevation at bottom of wall elevations.

The contract unit price for *Pile Walls with Options* will be full compensation for providing designs, submittals, labor, tools, equipment and wall materials, installing piles and anchors, grouting, anchor testing, excavating, backfilling, hauling and removing excavated materials and supplying temporary support of excavations (except for the soil nail wall shown on the plans, which will be paid for elsewhere in the contract), weepholes, stone, riprap, and any incidentals necessary to construct pile walls with options. No additional payment will be made and no extension of completion date or time will be allowed for repairing overexcavations or unstable excavations or unacceptable anchors.

The contract unit price for *Pile Walls with Options* does not include the cost for ditches, barrier or guardrail associated with pile walls with options as these items will be paid for elsewhere in the contract.

Payment will be made under:	**Pay Unit**
Pay Item	
Pile Walls with Options	Square Foot

Energy, Mineral and Land Resources
ENVIRONMENTAL QUALITY

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

TRACY DAVIS
Director

December 22, 2016

Mr. Jeremy Goodwin, PE, CPESC, CPSWQ
Soil & Water Engineering Supervisor
N C Department of Transportation
Roadside Environmental Unit
1557 Mail Service Center
Raleigh, NC 27699-1557

Subject: Trout Buffer Zone Waiver
NC 107 from North of SR 1002 to NC 281
TIP Project R-4753
Jackson County

Dear Mr. Goodwin:

This office has received your plan for NC 107 from north of SR 1002 to NC 281 in Jackson County, North Carolina. Your plan was submitted to this office for approval because of the proposed encroachments into the buffer zone of designated trout waters. In accordance with NCGS 113A-57(1) and Title 15A NCAC 4B .0125(c) this letter will serve as written approval to encroach on the buffer zone of the Tuckasegee River, WS-III, Class B, Trout, Caney Fork River WS-III, Trout and their unnamed tributaries. This authority has been delegated to me by Tracy E. Davis, Director, Division of Energy, Mineral and Land Resources, in accordance with NCGS 143B-10. The following conditions will apply to this approval:

1. This approval is based on the plans and specifications received December 12, 2016.

2. No land disturbing activity may take place within the trout buffer zone from October 15 to April 15 of each year.

3. Submit one (1) complete set of final plans to the Asheville Regional Office for the file.

4. Schedule a Preconstruction Conference with the Asheville Regional Office before initiating any land-disturbing activity.

P-82

5. This approval does not absolve the permittee from compliance with the surface water quality turbidity standard. More protective erosion and sedimentation control measures may be required in order to comply with this water quality standard.

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

Sincerely,

Stanley E. Aiken, PEGA
Asheville Regional Engineer

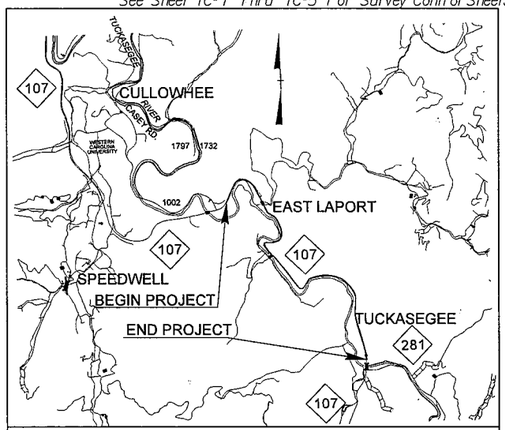
ec: John Holley, PE, State Sedimentation Specialist
Brad Cole, PE, Section Chief
William E. Toby Vinson, Jr., PE, CPESC, CPM, Chief of Program Operations
Jennifer Parrish, CPESC, CPSWQ, Roadside Environmental Engineer, NCDOT (jenniferparish@ncdot.gov)
Jeremy Goodwin, PE, CPESC, CPSWQ, Soil & Water Engineering Supervisor(jagoodwin@ncdot.gov)
Mr. David B. Harris, PE, CPESC, CPSWQ, State Roadside Erosion Control and Vegetation Management Engineer, NCDOT (davidharris@ncdot.gov)

9/8/2016

TIP PROJECT: R-4753

CONTRACT: C203825

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols
See Sheet 1C-1 Thru 1C-5 For Survey Control Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

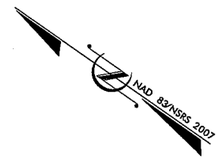
JACKSON COUNTY

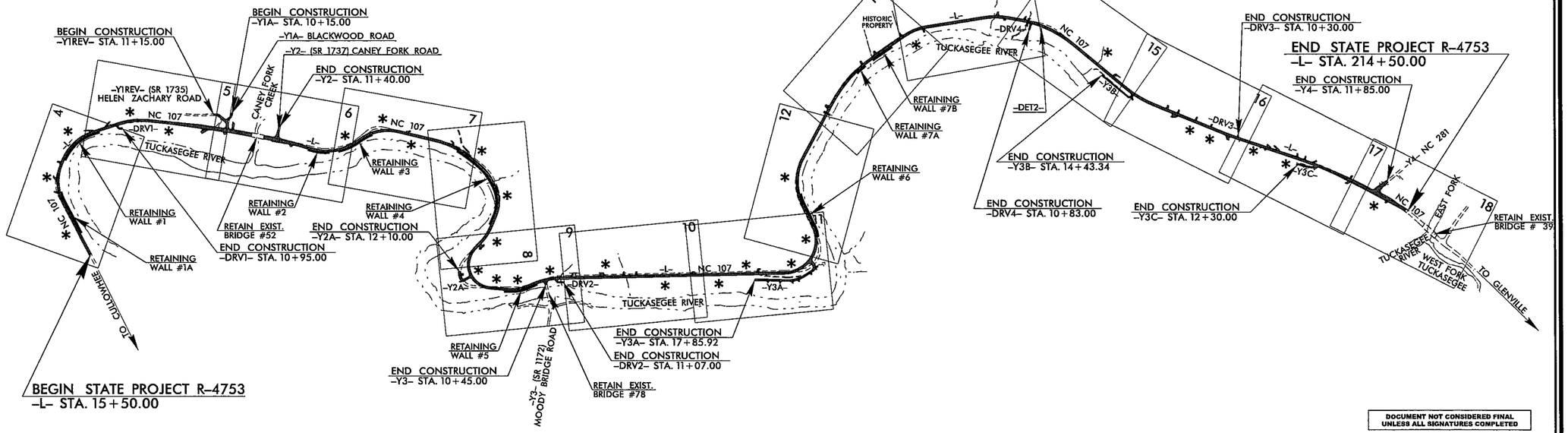
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-4753	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
39999.1.1	STP-0107(10)	P.E.
39999.2.FR2	STP-0107(10)	R/W & UTILITIES
39999.3.3	STP-0107(10)	CONST.

LOCATION: NC 107 FROM NORTH OF SR 1002 TO NC 281

TYPE OF WORK: GRADING, DRAINAGE, PAVING, RETAINING WALLS & CULVERTS

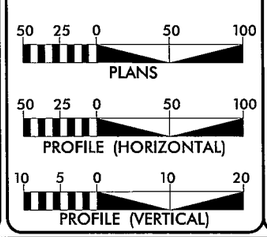




*DESIGN EXCEPTION REQUIRED FOR: DESIGN SPEED, HORIZONTAL CURVE RADIUS, SAG VERTICAL CURVE K, CREST VERTICAL CURVE K, AND VERTICAL AND HORIZONTAL STOPPING SIGHT DISTANCE.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2016 = 6270
ADT 2035 = 8800
K = 10 %
D = 60 %
T = 9 % *
V = 40 MPH
* TTST = 2% DUAL = 7%
FUNC CLASS = MINOR COLLECTOR
"REGIONAL TIER"

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-4753	=	3.743 MILES
LENGTH EXISTING STRUCTURE #52	=	0.026 MILES
TOTAL LENGTH TIP PROJECT R-4753	=	3.769 MILES

Prepared In the Office of:
CDM Smith
CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC CDA No. F-0412

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 29, 2015

LETTING DATE:
JANUARY 17, 2017

DAVID J. CLODGO, P.E.
PROJECT ENGINEER

KIT A PERSIANI, P.E.
PROJECT DESIGN ENGINEER

THAD F. DUNCAN, PE
NCDOT CONTACT

HYDRAULICS ENGINEER
12/19/2016
NORTH CAROLINA PROFESSIONAL SEAL 022100 ENGINEER STEPHEN R. MORGAN P.E.
Docusigned by: Stephen R. Morgan, PE
SIGNATURE:

ROADWAY DESIGN ENGINEER
12/19/2016
NORTH CAROLINA PROFESSIONAL SEAL 035683 ENGINEER DAVID J. CLODGO P.E.
Docusigned by: David J. Clodgo, PE
SIGNATURE:

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

SYSTIME
USER: CLODGODJ
I:\Roadway\Proj\R4753_Rdy_tsh.dgn

DocuSign Envelope ID: AC8A1342-B9C2-41DA-8C4D-9BD0154A997C

PROJECT REFERENCE NO.	SHEET NO.
R-4753	8
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 035683 ENGINEER DAVID J. CLODGO — 12/19/2016 — David J. Clodgo, PE

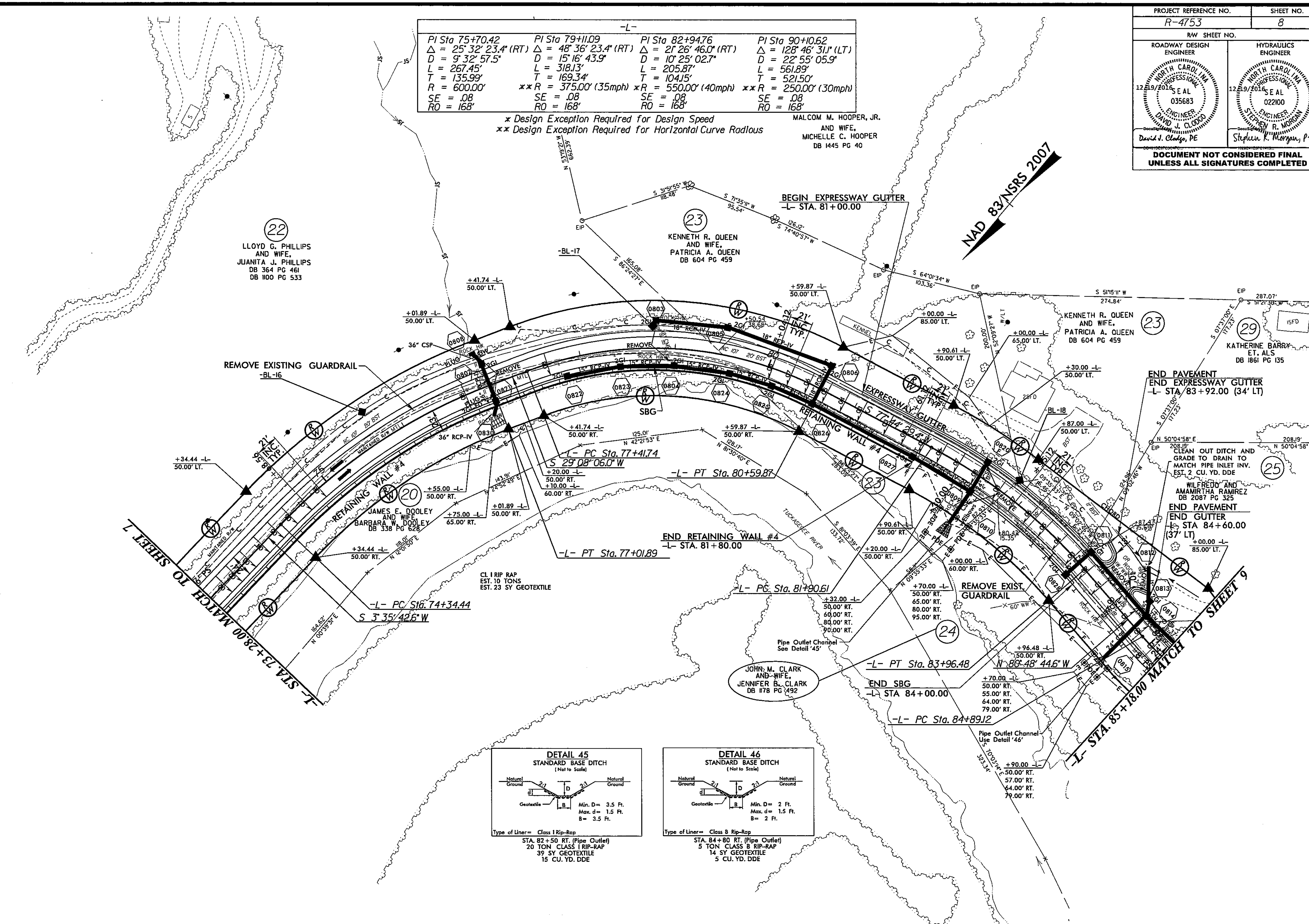
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 022100 ENGINEER STEPHEN R. MORGAN — 12/19/2016 — Stephen R. Morgan, PE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-

PI Sta 75+70.42	PI Sta 79+11.09	PI Sta 82+94.76	PI Sta 90+10.62
Δ = 25° 32' 23.4" (RT)	Δ = 48° 36' 23.4" (RT)	Δ = 21° 26' 46.0" (RT)	Δ = 128° 46' 31.1" (LT)
D = 9° 32' 57.5"	D = 15° 16' 43.9"	D = 10° 25' 02.7"	D = 22° 55' 05.9"
L = 267.45'	L = 318.13'	L = 205.87'	L = 561.89'
T = 135.99'	T = 169.34'	T = 104.15'	T = 521.50'
R = 600.00'	×× R = 375.00' (35mph)	× R = 550.00' (40mph)	×× R = 250.00' (30mph)
SE = .08	SE = .08	SE = .08	SE = .08
RO = 168'	RO = 168'	RO = 168'	RO = 168'

× Design Exception Required for Design Speed
×× Design Exception Required for Horizontal Curve Radious



DETAIL 45
STANDARD BASE DITCH
(Not to Scale)

Natural Ground — Geotextile — Min. D= 3.5 Ft. Max. d= 1.5 Ft. B= 3.5 Ft.
Type of Liner= Class I Rip-Rap

STA. 82+50 RT. (Pipe Outlet)
20 TON CLASS I RIP-RAP
39 SY GEOTEXTILE
15 CU. YD. DDE

DETAIL 46
STANDARD BASE DITCH
(Not to Scale)

Natural Ground — Geotextile — Min. D= 2 Ft. Max. d= 1.5 Ft. B= 2 Ft.
Type of Liner= Class B Rip-Rap

STA. 84+80 RT. (Pipe Outlet)
5 TON CLASS B RIP-RAP
14 SY GEOTEXTILE
5 CU. YD. DDE

Note: All Driveway Radii are 20' Unless Otherwise Noted
Note: Tie all Driveways to the Right of Way Line. Follow the "Pavement Design for Driveways" Memo Dated March 18, 2002 or as Directed by the Engineer
Note: All Proposed Guardrail to Use Weathered Steel Unless Otherwise Noted

SBG = SHOULDER BERM GUTTER
SEE SHEET 21 FOR -L- PROFILE
SEE SHEETS W-1 THRU W-8 FOR RETAINING WALL PLANS

REVISIONS

5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
R-4753	9
RW SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035683 ENGINEER DAVID J. CLODFELTER
12/19/2016
DocuSigned by: David J. Clodfelter, PE

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022100 ENGINEER STEPHEN R. MORGAN
12/19/2016
DocuSigned by: Stephen R. Morgan, PE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

5/14/99

-L- STA. 85+18.00 MATCH TO SHEET 8

2016 ADT / 2035 ADT

NC 107 4810/6800 -L- 4410/6400 NC 107

720/900 320/500

1040/1400

SR 1172 -Y3-

-L-		
PI Sta 90+10.62	PI Sta 93+72.66	PI Sta 96+64.39
Δ = 128° 46' 31.1" (LT)	Δ = 31° 02' 00.1" (LT)	Δ = 24° 23' 40.1" (RT)
D = 22° 55' 05.9"	D = 12° 43' 56.6"	D = 7° 09' 43.1"
L = 561.89'	L = 243.74'	L = 340.61'
T = 521.50'	T = 124.94'	T = 172.93'
** R = 250.00' (30mph)	* R = 450.00' (40mph)	R = 800.00'
SE = .08	SE = .08	SE = .07
RO = 168'	RO = 168'	RO = 147'

-Y2A-	
PI Sta 11+15.01	PI Sta 11+71.65
Δ = 96° 11' 58.0" (RT)	Δ = 25° 54' 57.3" (RT)
D = 190° 59' 09.4"	D = 33° 11' 53.1"
L = 50.37'	L = 78.06'
T = 33.44'	T = 39.71'
R = 30.00'	R = 172.59'

-Y3-	-DRV2-
PI Sta 13+21.27	PI Sta 10+43.03
Δ = 20° 15' 57.1" (RT)	Δ = 85° 55' 02.6" (LT)
D = 12° 14' 33.7"	D = 286° 28' 44.0"
L = 165.53'	L = 29.99'
T = 83.64'	T = 18.62'
R = 468.00'	R = 20.00'

* Design Exception Required For Design Speed
** Design Exception Required For Horizontal Curve Radius

NAD 83/NSRS 2007

PROPOSED DRIVEWAY LOCATION MAY BE ADJUSTED. DO NOT DISTURB JS STREAM

REMOVE EXISTING GUARDRAIL -BL-19

BM#5 ELEVATION 2144.97' SEE SHEET 1C-3

DO NOT DISTURB EXIST. MONUMENT OR WALL

END CONSTRUCTION -Y2A- STA 12+10.00

END GRADE -Y2A- STA 11+40.00

-Y2A- PCC Sta. 11+31.94

-Y2A- PC Sta. 10+81.57

N 65° 30' 54.9" W

-BL-20

REMOVE EXISTING GUARDRAIL

-L- PC Sta. 88+07.07= -Y2A- POT Sta. 10+00.00

-L- PRC Sta. 94+91.46

-L- PC Sta. 92+47.72

-L- PT Sta. 90+51.01

STEEL BEAM GUARDRAIL W/2 TES 2' FROM R/W

R/W TO BE ACQUIRED BY PERMANENT EASEMENT.

BEGIN RETAINING WALL #5 -L- STA. 92+10.00 BEGIN SBG

END RETAINING WALL #5 -L- STA. 95+75.00 END SBG

REMOVE EXISTING -BY5-54 GUARDRAIL

END CONSTRUCTION -Y3- STA 10+45.00 8.25° SUPER INC.

-Y3- PC Sta. 12+37.63

-Y3- PT Sta. 14+03.17

HERREN PROPERTIES, INC. DB 1212 PG 793

-L- POC Sta 97+95.42= -DRV2- POT Sta. 10+00.00 S 51° 08' 54.0" W

-L- POC Sta 96+73.50= -Y3- POT Sta. 10+00.00

REMOVE EXIST. GUARDRAIL

END EXPRESSWAY GUTTER -L- STA. 98+03.00

-L- PT Sta. 98+32.07

S 36° 13' 35.7" E

-L- STA. 99+22.00 MATCH TO SHEET 10

END CONSTRUCTION -DRV2- STA. 11+07.00 -DRV2- POT Sta. 11+35.00 -DRV2- PT Sta. 10+54.40

-DRV2- PC Sta. 10+24.41

REMOVE EXIST. GUARDRAIL

JOHN M. CLARK AND WIFE, JENNIFER B. CLARK DB 1178 PG 492 (24)

WILFREDO AND AMAMIRTHA RAMIREZ DB 2087 PG 325 (25)

KATHERINE BARRY, ET. ALS DB 1861 PG 135 (29)

NIALL A. CONNELL AND WIFE, JULIE N. CONNELL DB 1693 PG 728 (26)

NIALL A. CONNELL AND WIFE, JULIE N. CONNELL DB 1698 PG 609 (28)

MALCOM M. HOOPER, JR. AND WIFE, MICHELLE C. HOOPER DB 1445 PG 40 (30)

JOHN M. CLARK DB 541 PG 525 (27)

JOHN M. CLARK DB 854 PG 747 DB 744 PG 289 (31)

JOHN M. CLARK DB 854 PG 747 DB 744 PG 289 (32)

BM#6 ELEVATION 2136.72' SEE SHEET 1C-3

CL B RIP RAP=2 TONS GEOTEXTILE=1 SY

SBG

Pipe Outlet Channel Use Detail '47'

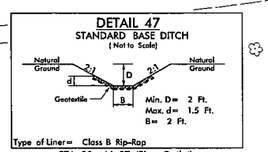
TUCKASEGEE RIVER

SR 1175 WIKE CEMETARY RD 18' BST

SR 1171 ROY TRITT RD 18' BST

SR 1172 MOORE BRIDGE RD 20' BST

DETAIL 47
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class B Rip-Rap

STA. 98+46 RT. (Pipe Outlet)
5 TON CLASS B RIP RAP
14 SY GEOTEXTILE
5 CU. YD. DDE

Note: All Driveway Radii are 20' Unless Otherwise Noted
Note: Tie all Driveways to the Right of Way Line. Follow the "Pavement Design for Driveways" Memo Dated March 18, 2002 or as Directed by the Engineer
Note: All Proposed Guardrail to Use Weathered Steel Unless Otherwise Noted

TES = Terminal End Sections
SEE SHEETS 21 & 22 FOR -L- PROFILE
SEE SHEET 27 FOR -Y2A- PROFILE
SEE SHEET 27 FOR -Y3- PROFILE
SEE SHEET 29 FOR -DRV2- PROFILE
SEE SHEETS W-1 THRU W-8 FOR RETAINING WALL PLANS

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PROJECT REFERENCE NO.	SHEET NO.
R-4753	11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 035683 — David J. Clodgo, PE — 12/19/2016	SEAL 022100 — Stephen R. Morgan, PE — 12/19/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

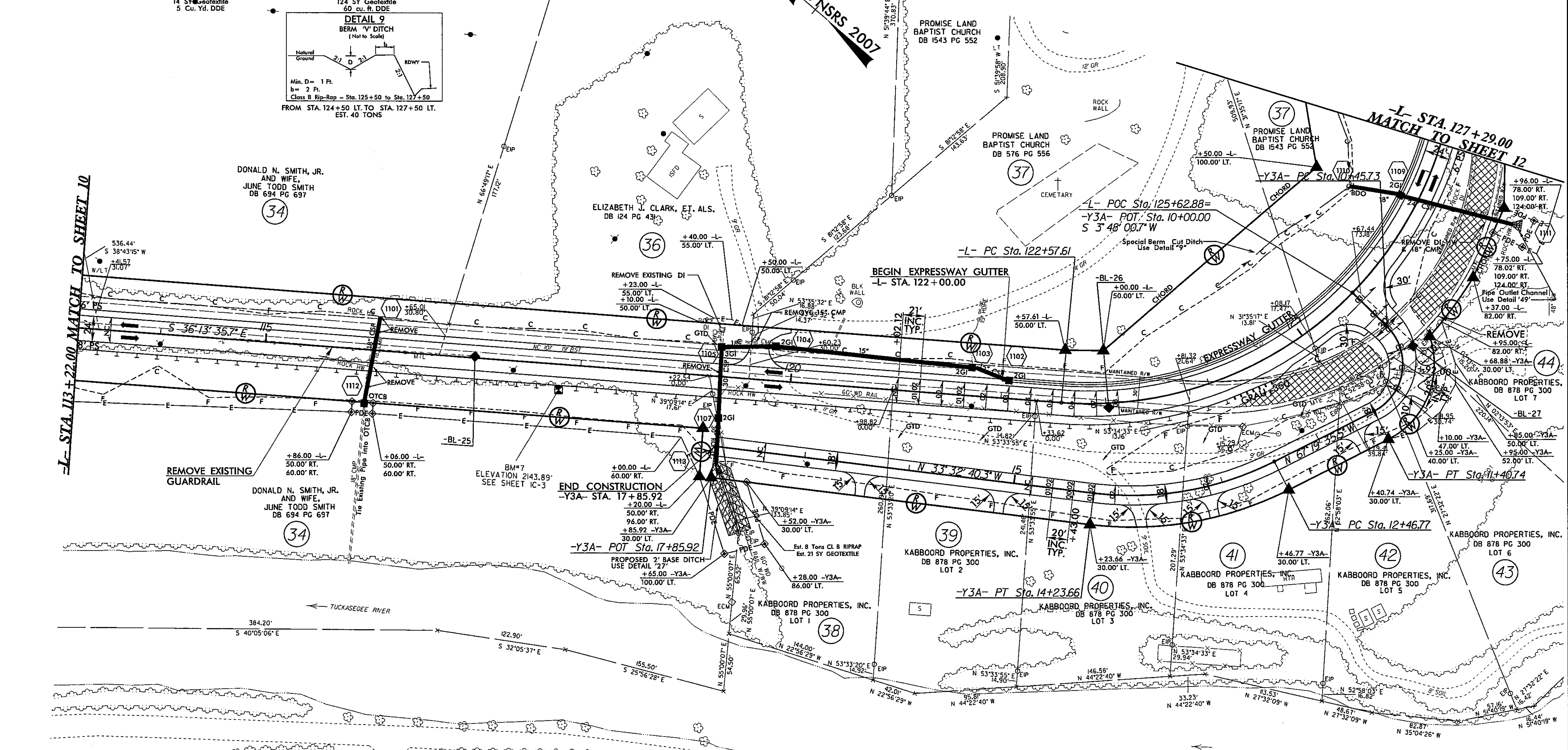
-L-	-Y3A-	
PI Sta 128+00.46	PI Sta 11+15.66	PI Sta 13+37.87
Δ = 114° 22' 34.4" (LT)	Δ = 108° 52' 23.8" (RT)	Δ = 33° 46' 55.2" (RT)
D = 16° 22' 12.8"	D = 114° 35' 29.6"	D = 19° 05' 54.9"
L = 698.68'	L = 95.01'	L = 176.88'
T = 542.85'	T = 69.93'	T = 91.10'
xx R = 350.00' (35mph)	R = 50.00'	R = 300.00'
SE = .08	SE = SEE PLANS	SE = SEE PLANS
RO = 168'		

xx Design Exception Required For Horizontal Curve Radius

DETAIL 49 — STANDARD BASE DITCH (Not to Scale)
Min. D= 2 Ft. Max. d= 1.5 Ft. B= 2 Ft.
Type of Liner= Class B Rip-Rap
STA. 126+87 RT. (Pipe Outlet)
5 Ton Class B Rip-Rap
14 SY Geotextile
5 Cu. Yd. DDE

DETAIL 27 — STANDARD BASE DITCH (Not to Scale)
Min. D= 2 Ft. Max. d= 2 Ft. B= 2 Ft.
Type of Liner= CLASS B Rip-Rap
PIPE OUTLET AT STA. 119+35
47 Ton Class B Rip-Rap
124 SY Geotextile
60 cu. ft. DDE

DETAIL 9 — BERM 'V' DITCH (Not to Scale)
Min. D= 1 Ft. b= 2 Ft.
Class B Rip-Rap – Sta. 125+50 to Sta. 127+50
FROM STA. 124+50 LT. TO STA. 127+50 LT.
EST. 40 TONS



Note: All Driveway Radii are 20' Unless Otherwise Noted
Note: Driveway Connections for Parcels 38, 39, 41, 42, and 43 may be Field Adjusted as Directed by the Engineer.
Note: Tie all Driveways to the Right of Way Line. Follow the "Pavement Design for Driveways" Memo Dated March 18, 2002 or as Directed by the Engineer
Note: All Proposed Guardrail to Use Weathered Steel Unless Otherwise Noted

GTD = GRADE TO DRAIN
BDO = BERM DITCH OUTLET
SEE SHEET 22 & 23 FOR -L- PROFILE
SEE SHEET 27 FOR -Y3A- PROFILE

REVISIONS

5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
R-4753	12
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 035683 ENGINEER DAVID J. CLARK — 12/19/2018 — David J. Clarke, PE

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 022100 ENGINEER STEPHEN R. MORGAN — 12/19/2018 — Stephen R. Morgan, PE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-	
PI Sta 128+00.46	PI Sta 135+01.76
Δ = 114° 22' 34.4" (LT)	Δ = 53° 57' 06.0" (RT)
D = 16° 22' 12.8"	D = 10° 25' 02.7"
L = 698.68'	L = 517.90'
T = 542.85'	T = 279.95'
**R = 350.00' (35mph)	*R = 550.00' (40mph)
SE = .08	SE = .08
RO = 168'	RO = 168'

*Design Exception Required For Design Speed
**Design Exception Required For Horizontal Curve Radius

NAD 83/NSRS 2007

REVISIONS 5/14/99

-L- STA 127+29.00 MATCH TO SHEET 11

-L- STA 141+79.00 MATCH TO SHEET 13

PROMISE LAND BAPTIST CHURCH DB 1543 PG 552 — (37)

ELIZABETH J. CLARK, ET. ALS. DB 124 PG 431 — (36)

KABBOORD PROPERTIES, INC. DB 878 PG 300 LOT 7 — (44)

THOMAS C. BEUTELL AND WIFE, JOAN A. BEUTELL DB 398 PG 123 — (46)

BEGIN RETAINING WALL #8 -L- STA. 128+35.00 BEGIN SBG

END RETAINING WALL #6 -L- STA. 133+35.00

BEGIN EXPRESSWAY GUTTER -L- STA. 138+00

END EXPRESSWAY GUTTER -L- STA 132+21.81

END EXPRESSWAY GUTTER -L- STA 141+30.00

END SBG -L- STA 138+00.00

-L- PC Sta. 132+21.81

-L- PT Sta. 129+56.29

-L- PT Sta. 137+39.71

EASEMENT NOT FOR CONSTRUCTION STAGING PURPOSES

REMOVE EXISTING GUARDRAIL

RETAINING WALL #6

TUCKASEGEE RIVER

Special Cut Ditch Use Detail '9'

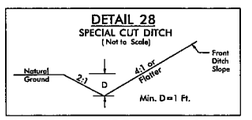
Special Cut Ditch Use Detail '28'

Special Lateral Cut Ditch Use Detail '11'

BASE DITCH AT PIPE OUTLET SEE DETAIL '10' Class I Rip-Rap

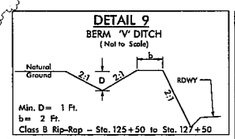
CL B RIP RAP=2 TONS GEOTEXTILE=7 SY

DETAIL 28
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 137+00 LT. TO STA. 137+50 LT.

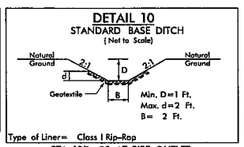
DETAIL 9
BERM 'V' DITCH
(Not to Scale)



Class B Rip-Rap – Sta. 125+50 to Sta. 127+50

FROM STA. 124+50 LT. TO STA. 127+50 LT.
EST. 40 TONS

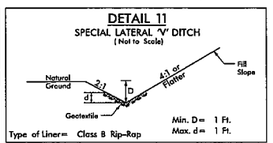
DETAIL 10
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class I Rip-Rap

STA. 137+55 AT PIPE OUTLET
15 TON CLASS I RIP RAP
30 SY GEOTEXTILE
11 CU. YD. DDE

DETAIL 11
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= Class B Rip-Rap

FROM STA. 141+50 TO STA. 142+00 LT.
18 TON CLASS B RIP RAP
52 SY GEOTEXTILE

SBG = SHOULDER BERM GUTTER
GTD = GRADE TO DRAIN
SEE SHEET 23 FOR -L- PROFILE
SEE SHEETS W-1 THRU W-8 FOR RETAINING WALL PLANS

Note: All Proposed Guardrail to Use Weathered Steel Unless Otherwise Noted

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User:cdurrett

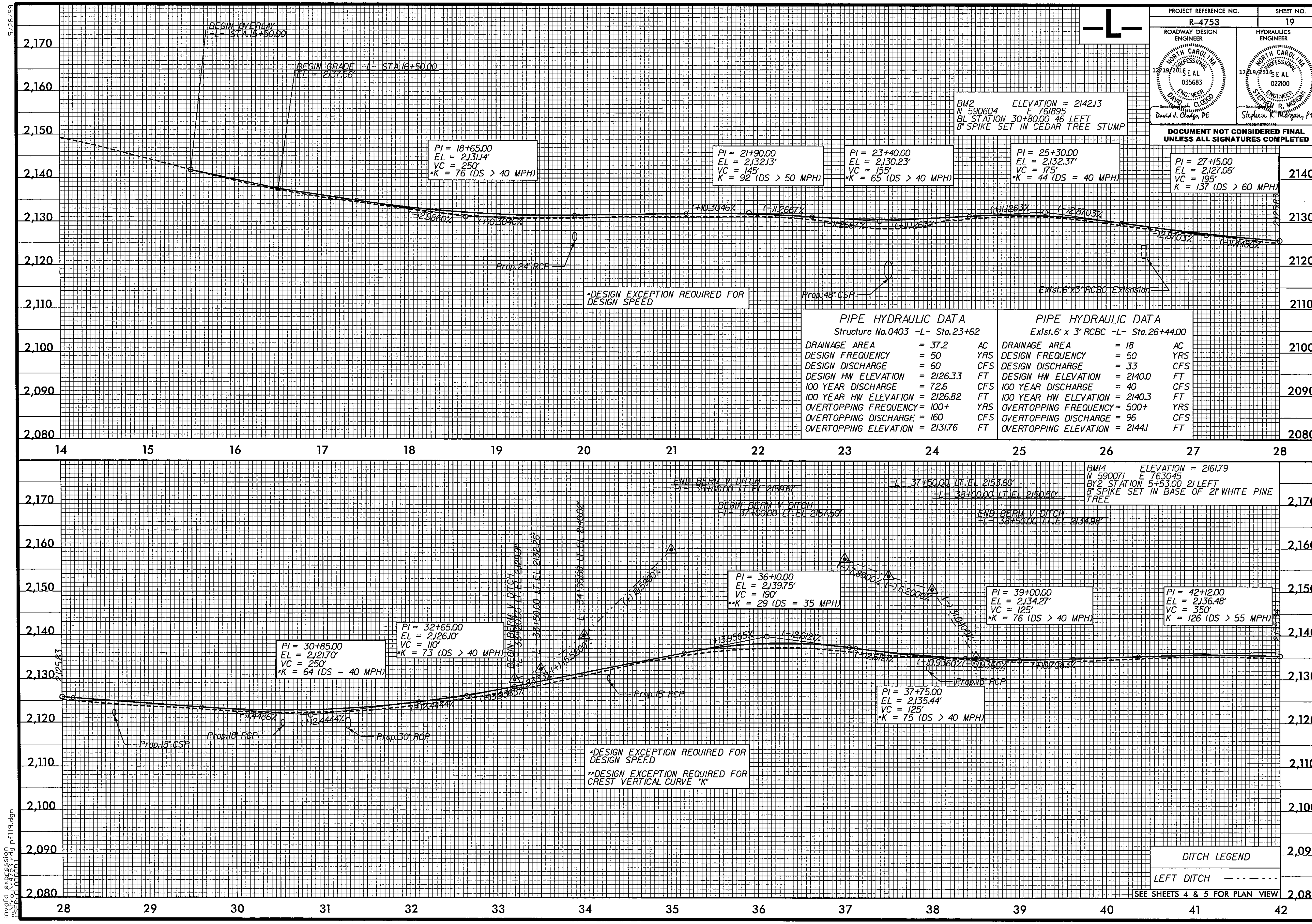
PROJECT REFERENCE NO.	SHEET NO.
R-4753	19

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035683 DAVID J. CLODGO — 12/19/2016 — DocuSigned by: David J. Clodgo, PE

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022100 STEPHEN R. MORGAN — 12/19/2016 — DocuSigned by: Stephen R. Morgan, PE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-



PIPE HYDRAULIC DATA
Structure No.0403 -L- Sta.23+62

DRAINAGE AREA	= 37.2	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 60	CFS
DESIGN HW ELEVATION	= 2126.33	FT
100 YEAR DISCHARGE	= 72.6	CFS
100 YEAR HW ELEVATION	= 2126.82	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 160	CFS
OVERTOPPING ELEVATION	= 2131.76	FT

PIPE HYDRAULIC DATA
Exist.6' x 3' RCBC -L- Sta.26+44.00

DRAINAGE AREA	= 18	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 33	CFS
DESIGN HW ELEVATION	= 2140.0	FT
100 YEAR DISCHARGE	= 40	CFS
100 YEAR HW ELEVATION	= 2140.3	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 96	CFS
OVERTOPPING ELEVATION	= 2144.1	FT

PROJECT REFERENCE NO.	SHEET NO.
R-4753	25

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035683 ENGINEER DAVID J. CLODGO
12/19/2016
DocuSigned by: David J. Clodgo, PE

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022100 ENGINEER STEPHEN R. MORGAN
12/19/2016
DocuSigned by: Stephen R. Morgan, PE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PIPE HYDRAULIC DATA
Structure No.1602 -L- Sta.186+52

DRAINAGE AREA	= 13	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 27	CFS
DESIGN HW ELEVATION	= 2168.49	FT
100 YEAR DISCHARGE	= 29	CFS
100 YEAR HW ELEVATION	= 2168.61	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 63.5	CFS
OVERTOPPING ELEVATION	= 2171.14	FT

PIPE HYDRAULIC DATA
Structure No.1603 -L- Sta.190+00

DRAINAGE AREA	= 6.2	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 13	CFS
DESIGN HW ELEVATION	= 2173.15	FT
100 YEAR DISCHARGE	= 14.1	CFS
100 YEAR HW ELEVATION	= 2173.25	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 24	CFS
OVERTOPPING ELEVATION	= 2175.1	FT

PIPE HYDRAULIC DATA
Structure No.1607 -L- Sta.192+08

DRAINAGE AREA	= 57	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 80	CFS
DESIGN HW ELEVATION	= 2178.8	FT
100 YEAR DISCHARGE	= 97	CFS
100 YEAR HW ELEVATION	= 2197.6	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 171	CFS
OVERTOPPING ELEVATION	= 2181.46	FT

*DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED

PI = 182+70.00
EL = 2,167.43'
VC = 250'
K = 178 (DS > 60 MPH)

PI = 187+50.00
EL = 2,172.75'
VC = 125'
K = 371 (DS > 75 MPH)

PI = 189+60.00
EL = 2,174.37'
VC = 90'
*K = 71 (DS > 40 MPH)

PI = 191+65.00
EL = 2,178.55'
VC = 305'
*K = 65 (DS > 40 MPH)

PI = 194+30.00
EL = 2,196.42'
VC = 225'
K = 163 (DS > 60 MPH)

(+)2.509% (+)1.108% (+)1.108% (+)1.230% (+)0.771% (+)0.771% (+)2.039% (+)8.400% (+)6.743% (+)6.743% (+)5.361% (+)4.660%

Prop.36" RCP
Prop.24" RCP
Prop.48" RCP

2165.59
2206.53

BEGIN SPECIAL CUT DITCH -L- 185+00.00 LT. EL 2167.34'
END SPECIAL CUT DITCH -L- 186+00.00 LT. EL 2168.57'
BEGIN SPECIAL CUT DITCH -L- 193+50.00 RT. EL 2179.31'
END SPECIAL CUT DITCH -L- 194+60.00 RT. EL 2196.60'

BMI0 ELEVATION = 2166.53
N 581099 E 769251
BL STATION 196+12.00 12 RIGHT
CHISELED SQUARE ON SOUTH END OF HW

PI = 197+40.00
EL = 2,213.04'
VC = 290'
**K = 29 (DS = 35 MPH)

BMI1 ELEVATION = 2198.64
N 579827 E 769659
BL STATION 209+50.00 50 LEFT
8" SPIKE SET IN BASE OF 20" WILD CHERRY TREE

PI = 200+35.00
EL = 2,199.40'
VC = 130'
*K = 65 (DS > 40 MPH)

PI = 202+20.00
EL = 2,194.54'
VC = 100'
K = 105 (DS > 50 MPH)

PI = 203+80.00
EL = 2,191.86'
VC = 190'
K = 63 (DS > 45 MPH)

PI = 207+30.00
EL = 2,175.45'
VC = 160'
K = 292 (DS > 70 MPH)

(+)5.361% (-)4.623% (-)12.627% (-)7.782% (-)7.782% (-)7.675% (+)1.000% (-)1.675% (-)4.688% (-)3.448% (-)5.886% (-)5.886% (-)5.237%

*DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED
**DESIGN EXCEPTION REQUIRED FOR CREST VERTICAL CURVE "K"

Prop.24" CSP
Prop.15" RCP

2205.53
2164.22

BEGIN SPECIAL CUT DITCH -L- 202+50.00 LT. EL 2199.34'
END SPECIAL CUT DITCH -L- 203+00.00 LT. EL 2190.84'
BEGIN SPECIAL CUT DITCH -L- 205+50.00 RT. EL 2186.07'
END SPECIAL CUT DITCH -L- 206+43.00 RT. EL 2175.76'

DITCH LEGEND
LEFT DITCH
RIGHT DITCH

SEE SHEETS 16, 17 & 18 FOR PLAN VIEW

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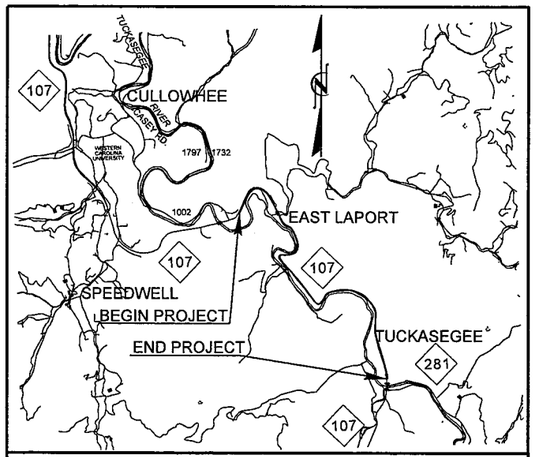
USER: CJOHNSON

TIP PROJECT: R-4753

CONTRACT: C203825



VICINITY MAP N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

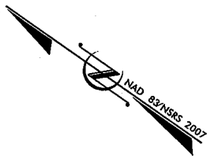
JACKSON COUNTY

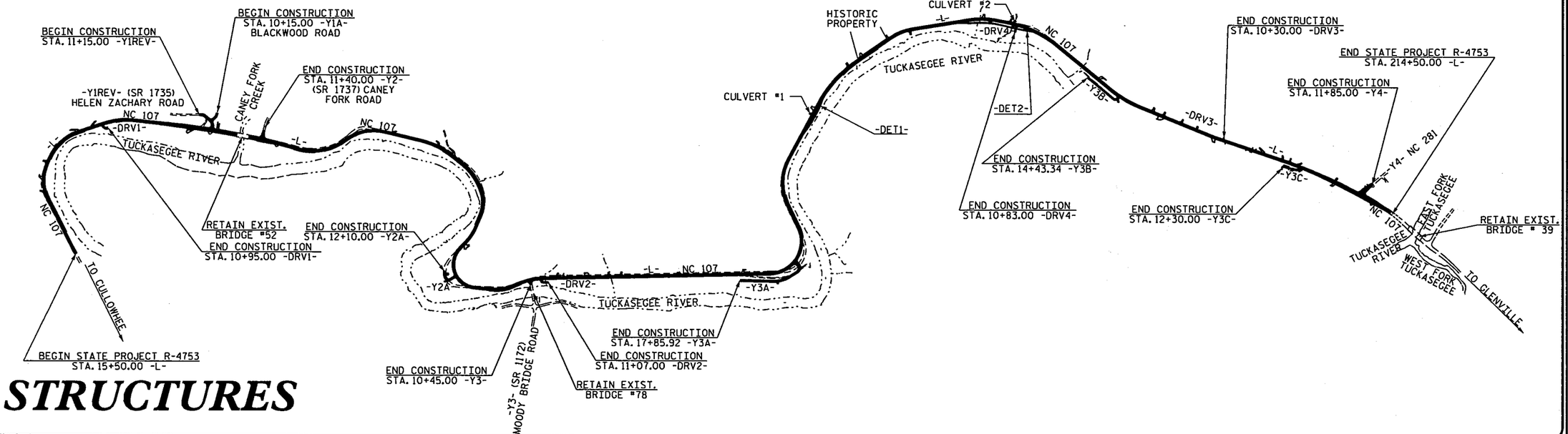
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-4753		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
39999.1.1	STP-0107(10)	P.E.
39999.2.FR2	STP-0107(10)	R/W & UTILITIES
39999.3.3	STP-0107(10)	CONST.

LOCATION: NC 107 FROM NORTH OF SR 1002 TO NC 281

TYPE OF WORK: GRADING, DRAINAGE, PAVING, RETAINING WALLS & CULVERTS





STRUCTURES

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2016 = 6270
ADT 2035 = 8800
K = 10 %
D = 60 %
T = 9 % *
V = 40 MPH
* (TTST 2 %, DUAL 7 %)

FUNC CLASS = MINOR COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-4753 = 3.743 MILES
LENGTH EXISTING STRUCTURE #52 = 0.026 MILES

TOTAL LENGTH TIP PROJECT R-4753 = 3.769 MILES

Prepared In the Office of:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE :

JANUARY 17, 2017

PROJECT ENGINEER

W. S. ARAFAT, P.E.
PROJECT DESIGN ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
R-4753	W-6

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL #028669 ENGINEER RICHARD S WEBB

Docu Signed by: Scott Webb 1/3/2017
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

NOTES:

1. FOR PILE WALLS WITH OPTIONS, SEE PILE WALLS WITH OPTIONS PROVISION.
2. A CONCRETE BARRIER RAIL WITH MOMENT SLAB IS REQUIRED ABOVE RETAINING WALL NO. 2 AND 3. SEE PLANS FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS. MODIFY CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS TO ACCOMODATE RETAINING WALLS AS NEEDED.
3. BEFORE BEGINNING WALL DESIGN FOR RETAINING WALL NO. 1A, 1, 2, 3, 4, 5, 6, 7A & 7B. SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.
4. DESIGN RETAINING WALL NO. 1A, 1, 2, 3, 4, 5, 6, 7A & 7B FOR THE FOLLOWING:

   1) DESIGN LIFE = 75 YEARS

   2) #57 STONE BACKFILL PARAMETERS:
   UNIT WEIGHT, γ = 110 LB/CF
   FRICTION ANGLE, ϕ = 38 DEGREES
   COHESION, c = 0 LB/SF

   3) SOIL ASSUMED MATERIAL PARAMETERS:
   UNIT WEIGHT, γ = 120 LB/CF
   FRICTION ANGLE, ϕ = 28 DEGREES
   COHESION, c = 0 LB/SF

   4) ROCK ASSUMED MATERIAL PARAMETERS:
   UNIT WEIGHT, γ= 145 LB/CF
   FRICTION ANGLE, ϕ = 39 DEGREES
   COHESION, c = 0 LB/SF
5. SEE PILE WALL WITH OPTIONS PROVISION FOR DETERMINING ROCK ELEVATION.
6. DESIGN RETAINING WALL NO. 1A, 1, 2, 3, 4, 5, 6, 7A & 7B FOR A LIVE LOAD (TRAFFIC) SURCHARGE.
7. DESIGN RETAINING WALLS FOR PIPE EXTENDING UNDER OR THROUGH THE WALL AT THE FOLLOWING LOCATIONS: 28+59, 30+53, 31+30, 76+91, 150+04 AND 151+76. BEFORE BEGINNING WALL DESIGN OR CONSTRUCTION, VERIFY PIPE LOCATION AND ELEVATION. COORDINATE PLANS AND DETAILS WITH THE UTILITY DRAINAGE CONTRACTOR. ENSURE PIPE OUTLET DOES NOT WASHOUT THE FRONT SLOPE OF THE WALL. SUBMIT PLANS AND DETAILS FOR REVIEW.
8. EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH GROUND ANCHORS FOR RETAINING WALL NO. 1A, 1, 2, 3, 4, 5, 6, 7A & 7B.
9. "TEMPORARY SHORING" MAY BE REQUIRED FOR RETAINING WALL NO. 1A, 1, 2, 3, 4, 5, 6, 7A & 7B CONSTRUCTION IN ACCORDANCE WITH THE TEMPORARY SOIL NAIL SHORING PROVISION. SEE TRAFFIC CONTROL PLANS.
10. LOCATION OF PERFORMANCE TESTS TO BE DETERMINED BY ENGINEER.
11. NO VALUE ENGINEERING WILL BE ALLOWED FOR THE TEMPORARY SOIL NAIL WALL. NO PAYMENT WILL BE MADE FOR TEMPORARY SOIL NAIL WALL INSTALLATION BELOW DESIGN ELEVATION.
12. FOR PERMANENT DESIGN CONDITION USE 100 YEAR WATER ELEVATION. FOR TEMPORARY DESIGN CONDITION USE 100 YEAR WATER ELEVATION MINUS FOUR FEET.
13. USE CANTILEVERED SHEET PILE, ANCHORED SHEET PILE, CANTILEVERED PANEL WALL OR ANCHORED PANEL WALL TYPICAL SECTION AT THE DESIGNER'S CHOICE.
14. SHEET PILES SHALL EXTEND TO 10 FEET BELOW BOTTOM OF WALL ELEVATION OR REFUSAL AT ROCK ELEVATION. PRIMARY (SOFT) PILES SHALL EXTEND TO 10 FEET BELOW BOTTOM OF WALL ELEVATION OR 2 FEET BELOW ROCK ELEVATION. SEE PILE WALLS WITH OPTIONS PROVISION TO DETERMINE ROCK ELEVATION.
15. WELD TO EACH WALL A STEEL SIGN, SATISFACTORY TO THE ENGINEER, SHOWING THE FINAL GRADE ELEVATION AT OUTSIDE OF WALL AND DEPTH TO THE DESIGN ELEVATION. EMBOSS OR ENGRAVE THE SIGN.
16. NOTE THAT BOULDERS MAY BE PRESENT THROUGHOUT THE PROJECT SITE. THE PRESENCE OF BOULDERS SHALL NOT BE CONSIDERED A CHANGED CONDITION.
17. NCDOT SHOULD INSPECT PILE WALLS WITH OPTIONS AFTER MAJOR STORM EVENTS AND ON EVIDENCE OF EXCESSIVE EROSION NCDOT SHOULD TAKE APPROPRIATE ACTION.

EXAMPLE CONSTRUCTION SEQUENCE FOR ANCHORED SHEET PILE WALLS:

1. INSTALL TEMPORARY SOIL NAIL WALL AND EXCAVATE FOR WORK PLATFORM, IF NECCESSARY.
2. PERFORM VERIFICATION TESTS ON THE SOIL NAIL WALL TO 1.25 DESIGN CAPACITY.
3. INSTALL SOLDIER PILES, SOFT PILES, SHEET PILES AND WALERS.
4. INSTALL BOTTOM ROW OF ANCHORS.
5. PROOF TEST ANCHORS TO 1.25 DESIGN CAPACITY.
6. INSTALL ANCHOR CASING. (IF USING TURNBUCKLE, INSTALL TURNBUCKLE AND TIE ROD).
7. GROUT REMAINING LENGTH OF ANCHOR.
8. INSTALL ANCHOR HEAD AND STRESS TO PREVENT MOVEMENT.
9. BACKFILL AND COMPACT UNTIL AT LEAST 2 FEET ABOVE BOTTOM ANCHOR ELEVATION. USE CAUTION WHEN BACKFILLING AROUND ANCHORS.
10. LOCK OFF LOWEST ANCHOR ROW.
11. BACKFILL TO TOP ANCHOR ROW ELEVATION, (IF THERE IS NO TOP ANCHOR ROW BACKFILL TO GRADE)
12. REPEAT STEPS 4 THROUGH 8 FOR SECOND ANCHOR ROW.
13. BACKFILL AND COMPACT TO GRADE.
14. LOCK OFF SECOND ANCHOR ROW.
15. INSTALL COPING OR MOMENT SLAB.
16. THE SOIL NAIL WALL WILL STAY IN PLACE.

EXAMPLE CONSTRUCTION SEQUENCE FOR CANTILEVERED SHEET PILE WALLS:

1. INSTALL TEMPORARY SOIL NAIL WALL AND EXCAVATE FOR WORK PLATFORM, IF NECCESSARY.
2. INSTALL SOLDIER PILES, SOFT PILES, SHEET PILES AND WALERS.
3. BACKFILL TO GRADE AND COMPACT.
4. INSTALL COPING OR MOMENT SLAB.
5. THE SOIL NAIL WALL WILL STAY IN PLACE.

100 YEAR WATER ELEVATION

RETAINING WALL NO.	STATION	ELEVATION (FEET)
1A	18+00 -L-	2114.4
1A	23+00 -L-	2115.4
1	26+61 -L-	2116.2
1	31+75 -L-	2117.1
2	54+77 -L-	2123.1
2	57+05 -L-	2123.4
3	58+00 -L-	2123.6
3	62+10 -L-	2124.0
4	71+70 -L-	2125.3
4	81+80 -L-	2127.0
5	92+10 -L-	2129.8
5	95+75 -L-	2130.8
6	128+35 -L-	2135.8
6	133+35 -L-	2136.5
7A	148+25 -L-	2138.0
7B	153+05 -L-	2139.0

ESTIMATED WALL QUANTITIES

RETAINING WALL NO.	WALL AREA (SQUARE FEET)
1A	10700
1	7800
2	3700
3	11300
4	31000
5	8000
6	13000
7A	1500
7B	3500
TOTAL QUANTITY = 90,400 SF	

WALL STATION LIMITS DESIGN ELEVATION

RETAINING WALL NO.	STATION LIMITS	DESIGN ELEVATION AT BOTTOM OF WALL
1A	Sta. 18+00.00-L- to Sta. 23+00.00 -L-	2110
1	Sta. 26+61.00-L- to Sta. 27+50.00 -L-	2110
1	Sta. 27+50.00-L- to Sta. 28+00.00 -L-	2109
1	Sta. 28+00.00 -L- to Sta. 28+75.00 -L-	2108
1	Sta. 28+75.00-L- to Sta. 31+75.00 -L-	2107
2	Sta. 54+77.16 -L- to Sta. 57+05.00 -L-	2122
3	Sta. 58+00.00 -L- to Sta. 59+50.00 -L-	2115
3	Sta. 59+50.00 -L- to Sta. 62+10.00 -L-	2112
4	Sta. 71+70.00 -L- to Sta. 74+50.00 -L-	2115
4	Sta. 74+50.00 -L- to Sta. 78+00.00 -L-	2116
4	Sta. 78+00.00 -L- to Sta. 80+00.00 -L-	2117
4	Sta. 80+00.00 -L- to Sta. 81+80.00 -L-	2118
5	Sta. 92+10.00 -L- to Sta. 95+75.00 -L-	2119
6	Sta. 128+35.00 -L- to Sta. 129+00.00 -L-	2129
6	Sta. 129+00.00 -L- to Sta. 129+50.00 -L-	2127
6	Sta. 129+50.00 -L- to Sta. 133+35.00 -L-	2125
7A	Sta. 148+25.00 -L- to Sta. 149+50.00 -L-	2130
7B	Sta. 150+50.00 -L- to Sta. 153+05.00 -L-	2131

PREPARED BY: RSW	DATE: 9/8/2016
REVIEWED BY: MSM/SCC	DATE: 9/8/2016

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

WALL NOTES AND DETAILS

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		