STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

December 21, 2018

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

ATTN: Ms. Nicholle Braspennickx
NCDOT Coordinator

Subject: **Application for Individual Section 404 Individual Permit, Section 401 Water Quality Certification, and Riparian Buffer Certification** for the Widening of NC 150 from the NC 16 Bypass in Catawba County to just west of the US 21/NC 150 Interchange in Iredell County, including the Interchange with I-77. Federal Aid Project No. STP-150(19), Division 12, TIP No. R-2307 and I-5717, Debit $570 from WBS 37944.1.1.

Dear Madam:

The North Carolina Department of Transportation (NCDOT) proposes to improve the NC 150 corridor for a length of approximately 15 miles from the NC 16 Bypass in Catawba County to just west of the US 21/NC 150 Interchange in Iredell County, North Carolina (NCDOT STIP Project No. R-2307). The proposed project also includes improvements to the I-77/NC 150 interchange in Mooresville (NCDOT STIP Project No. I-5717).

This is a Phased Individual Permit application. The project is divided into an A and B section.
Section A (R-2307 A) extends from NC 16 Bypass to SR 1902 (Harvel Road) and
Section B (R-2307 B) extends from Harvel Road to the US 21/NC 150 interchange, and includes the I-5717 component, the I-77 interchange.

This application presents "final" impacts for the B section of the project, and "preliminary" impacts for the A section of the project.

The B section is scheduled to let to construction in July 2019, and the A section is scheduled for October 2024.

Please see the enclosed ENG application form, Division of Mitigation Services (DMS) mitigation acceptance letter, permit drawing review meeting minutes, State Stormwater Management Plan (SMP), permit drawings, buffer drawings, and design plans for the B section of the project, and preliminary drawings from the A section.

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

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

Location:
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

PURPOSE AND NEED

The purpose and need for these projects are to improve capacity and reduce congestion along NC 150 from the NC 16 Bypass to just west of the US 21 Interchange.

NC 150 serves traffic demands and travel patterns for commuters and other travelers within and outside of the project study area and is a major east-west route between Shelby, Lincolnton, and Mooresville. Currently, heavy traffic occurs during peak periods within the project limits, resulting in frequent congestion and delays. Existing traffic congestion within the NC 150 corridor results in excessive travel times for commuters and travelers. Projected growth in the corridor, particularly around the I-77 interchange, will continue to increase these delays and travel times.

A Traffic Forecast Report was completed for the project in September 2013. The findings of the report indicated that 2015 NC 150 traffic volumes exceed two-lane capacity (14,300 vpd) between Sherrills Ford Road and the I-77 Interchange commercial district and that west of Sherrills Ford Road, NC 150 traffic volumes are anticipated to exceed capacity between 2015 and 2020. Existing traffic volumes within the I-77 commercial district already exceed the capacity of a five-lane facility (39,800 vpd). Design year (2040) traffic volumes along NC 150 within the project corridor range from approximately 18,000 vpd at NC 16 Bypass to 58,700 vpd at I-77. East of I-77, projected design year traffic volumes range from 53,100 to 45,300 vpd at US 21. Projected traffic volumes along the entire length of NC 150 will exceed two-lane capacity by 2040. Additionally, five-lane capacity will be exceeded from the Mooresville Crossing shopping center entrance to US 21 by 2040.

Table 2.4.1 of the EA shows the intersection LOS and delay along NC 150 within the project corridor based off of the base year (2015) traffic volumes and the No-Build traffic volumes for the design year (2040).

The proposed action includes widening, replacing several bridges, and access management measures. The proposed roadway cross-section will be a four-lane, divided facility including curb and gutter. In the rural areas, the median is 46 feet wide with eight-foot shoulders. In the more urban/suburban areas, the median is a 23-foot raised median with ten-foot shoulders. The proposed project also includes reconfiguring the I-77/NC 150 interchange.

NEPA DOCUMENT HISTORY

An Environmental Assessment (EA) was completed for this project in March of 2016, and a Finding of No Significant Impact (FONSI) was completed in June 2016. Additional copies will be provided upon request.

In compliance with the NEPA/404 Merger Process, project Concurrence points and dates are noted below:

Concurrence Point 1 was reached on December 12, 2012.

> A revised Concurrence Point 1 meeting was held and reached on August 13, 2014 to include the interchange with I-77 as TIP I-5717. To ensure a coordinated design, NCDOT is combining the two STIP projects into one environmental document. NCDOT proposes this approach because the projects are adjacent to each other and it would be practicable to develop the interchange modifications in coordination with the NC 150 widening improvements.

Concurrence Point 2 was reached on August 13, 2014. A revised CP 2 was reached on October 8, 2015.

Concurrence Point 2A was reached on June 10, 2015.

Concurrence Point 3 was reached on February 8, 2017.

Concurrence Point 4A was reached on March 22, 2017.

Concurrence 4B (for R-2307 B) was held on April 12, 2017.

Concurrence 4C (for R-2307 B) was held on February 7, 2018.

Indirect Cumulative Impact Analysis

A Community Impact Assessment and an Indirect and Cumulative Effects Report and Land Use Scenario Assessment was prepared for this project in June 2014. Copies of the document are available on request.

Indirect Effects Summary

Local planners currently feel that the proposed R-2307 project is likely to have a minor increase on the pace or intensity of development. Since there are so few roads crossing Lake Norman, widening the road is not expected to change travel patterns, but will improve the level of service for drivers currently using the road and those who will begin using the road in the future because of residential and commercial growth within the FLUSA. A four-lane road may attract new businesses or light industries who desire easier access to an interstate, although this effect is expected to be minor since most anticipated major commercial nodes on the corridor are already at the interchanges of NC 150 with an interstate (I-77) or major highway (NC 16 Bypass).

For these reasons, construction of R-2307 is expected to have a minor indirect effect on land use decisions in the FLUSA. The Indirect and Cumulative Effects Screening Matrix resulted in a conclusion of Possible Indirect Scenario Assessment. A Land Use Scenario Assessment has been completed to further evaluate the nature and extent of these potential effects.

Cumulative Effects

Past and Future Projects – Development in the past few years included redevelopment at the NC 150/NC 16 intersection and continued expansion and infill at the NC 150/I-77 interchange. A new library is under construction in the northeast quadrant of NC 150 and Sherrills Ford Road. An interchange was recently completed at I-77 and Brawley School Road. In the FLUSA, several new developments are planned, as described in Section 2.

Current Project – The proposed project would widen approximately 12.5 miles of NC 150 from a two- or three-lane undivided roadway to four lanes with a median, likely with partial control of access along existing alignment and limited control of access on new alignment. A median is proposed to be constructed along the remaining 2 miles of the corridor, which is currently a combination of a four- and five-lane undivided roadway. Three new location alternatives (between 1.7 and 2.2 miles long, depending on alternative) are under consideration to avoid or minimize impacts to the Terrell Historic District.

There are approximately 25,000 acres of land in the FLUSA. Of this, approximately 10,000 acres (40%) is currently developed. Of the 15,000 acres of undeveloped area, less than 1,000 acres (4% of the total) is considered constrained – protected by ponds, stream buffers and floodway restrictions. The remaining 14,000 acres (56% of the total) of land is classified as undeveloped/ unconstrained, which generally represents land within the FLUSA that could be developed in the future.

In summary, several commercial developments have been constructed recently or are planned for construction in the near future. Other infrastructure and development projects are anticipated at a slow but steady pace. This project is expected to result in a minor decrease in travel time for most drivers but may increase access and exposure to properties along a potential new alignment section. According to local planners, development is likely to be concentrated in “village nodes” and at the interchanges at the project termini.

Due to the level of protection of environmental resources, the additional development as a result of the Build Scenarios is not anticipated to result in significant cumulative impacts to natural resources.

CULTURAL RESOURCES

Section 106
On August 25, 2015, NCDOT, FHWA, and HPO met for a consultation about project effects on National Register-listed and -eligible resources. There are two Section 106 eligible resource within the selected alternative, and the project will have No Adverse Effect on both resources. Concurrence forms documenting the effects findings contained in Appendix B of the EA.

Section 4(f)
The Marshall Steam Station is the only 4(f) resource found in the selected alternative. Proposed earthwork would require the acquisition of approximately 0.47 acre of property from the Marshall Steam Station. Level of impact and nature of use resulted in a de minimis finding.

Archaeological Resources
NCDOT provided project information to the HPO on August 13, 2015. Based upon review of that information, HPO did not recommend an archaeological survey in their correspondence of October 13, 2015.

Wild and Scenic River System
There are no Wild and Scenic Rivers in the project area.

RESOURCE STATUS

Wetland and stream determinations within R-2307 were conducted using the field delineation method outlined in the 1987 Corps of Engineers Wetland Delineation Manual and subsequent guidance including the Eastern Mountains and Piedmont Regional Supplement. Mr. Steve Kichefski of the U.S. Army Corps of Engineers (USACE) conducted a preliminary jurisdictional determination on May 27, 2015.

Jurisdictional features within the R-2307 project are all within the Catawba River Basin, Hydrologic Unit Code 03050101.

There are no High Quality Waters (HQWs), Outstanding Resource Waters (ORWs), 303d-listed impaired streams, trout waters, primary nursery areas, or anadromous fish waters within the study area, or within one mile downstream of the study area. Lake Norman is a water supply lake and it, and its tributaries, are designated as Water Supply-IV, Class B, Critical Area waters.

IMPACTS TO WATERS OF THE United States

Tables 1-4 provide impact values and descriptions of jurisdictional water resources for the project. Site numbers correspond with the permit (hydraulic) drawings included in this application.

Table 1-1: U-2307 B "Final" Wetland Impacts (values in acres)

Permit Site	NRTR Site	NC WAM Classification	Wetland Size	Permanent Fill in Wetlands	Mechanized Clearing	Hand Clearing	Impact Description
7	WA	Non-Tidal Freshwater Marsh	0.06	0.05	<0.01	--	Fill for roadway widening.
			Total Wetland Impacts:	0.05	<0.01	--	
			Total Loss of Water Impacts	**0.06**			
			Total Wetland Impacts Requested from DMS:	**0.06**			

Table 1-2: U-2307 A Preliminary Wetland Impacts (values in acres)

Plan Sheet No.	NRTR Site	NC WAM Classification	Wetland Size	Permanent Fill in Wetlands	Preliminary Impact Description
7	WB	Headwater Forest	0.57	0.35	New location roadway.
2	WE	Headwater Forest	0.3	0.08	Fill for roadway widening.
2	WK	Non-Tidal Freshwater Marsh	0.39	0.30	Fill for roadway widening.
			Total Wetland Impacts:	**0.73**	

R-2307 Project Total Wetland Impact:	**0.79**

Table 2-1: R-2307 B Stream Impacts (values in linear feet)

Permit Site	Stream Name/ NRTR ID	Status/ Class	Perm. Channel Impacts	Temp. Channel Impacts	ACOE Required Mitigation	DWR Required Mitigation	Impact Description
7	UT to Lake Norman SK	Intermittent WS-IV, B;CA	117	--	117	0	A 24" RCP will convey UT to Lake Norman under the widened roadway.
8	UT to Lake Norman SL	Perennial WS-IV, B;CA	39	--	107	0	An existing 60" RCP will be extended to convey UT to Lake Norman under the widened roadway.
9			68	17			
10	UT to Lake Norman SM	Perennial WS-IV, B;CA	97	20	97	0	An existing 78" RCP will be extended to convey UT to Lake Norman under the widened roadway.
11	UT to Lake Norman SN	Perennial WS-IV, B;CA	98	19	126	0	An existing 60" RCP will be extended to convey UT to Lake Norman under the widened roadway.
12			28	20			
Total Stream Impacts			**447**	**76**	**447**	**0**	
Total Requested from DMS:					**447**		

Table 2-2: R-2307 A Preliminary Stream Impacts (values in linear feet)

Plan Sheet No.	Stream Name/ NRTR ID	Status/ Class	Perm. Channel Impacts Temp. Channel Impacts	ACOE Required Mitigation	DWR Required Mitigation	Preliminary Impact Description
2	UT Killian Creek SA	Perennial C	204	204	204	An existing 5' x 4.5' Box Culvert will be extended or replaced to convey UT to Killian Creek under the widened roadway.
2	UT Killian Creek SB	Perennial C	193	193	193	An existing 4' x 4' Box Culvert will be extended to convey UT to Killian Creek under the widened roadway.
3	UT Lake Norman SC	Intermittent WS-IV,B;CA	188	188	0	UT to Lake Norman begins outside of any drainage structure. It will be impacted by the widened roadway, and placed into a drainage structure, to be determined.
7	Bettie Creek (1)	Intermittent WS-IV,B;CA	236	236	0	Bettie Creek will be impacted by the new location roadway. The structure that will carry Bettie Creek is to be determined, but will be reviewed at a future Merger Meeting.
8	UT Beaverdam Ck SJ	Intermittent WS-IV,B;CA	46	46	0	UT to Beaverdam Creek and Beaverdam Creek will be impacted by the new location roadway. The structure that will carry UT to Beaverdam and Beaverdam Creek is to be determined, but will be reviewed at a future Merger Meeting.
8	Beaverdam Creek (1)	Perennial WS-IV,B;CA	250	250	250	
Total Stream Impacts			**1,117**	**1,117**	**647**	

R-2307 Project Total Stream Impact:	**1,564**

Table 3-1: U-2307 B Pond/ Lake Norman Impacts (values in acres)

Permit Site	NRTR Site	Pond Size	Permanent Fill	Temporary Fill	Impact Description
1	Lake Norman	32,475	<0.01	<0.01	A standard base ditch will be used to drain a small depressional area (non-jurisdictional) to Lake Norman. The impact is the result of Class II rip-rap placed in the Lake for erosion control/ diffusion of velocity at the end of the ditch. *
2			<0.01	0.02	A standard base ditch will be used to drain a hazardous spill basin to Lake Norman. The impact is the result of Class II rip-rap placed in the Lake for erosion control/ diffusion of velocity at the end of the ditch. *
3			3.11		The existing rock causeway will be expanded to accommodate a new bridge.
4			3.91		
5			0.01	0.02	A standard base ditch will be used to drain a hazardous spill basin to Lake Norman. The impact is the result of Class II rip-rap placed in the Lake for erosion control/ diffusion of velocity at the end of the ditch. *
6			0.02	0.06	A standard base ditch will be used to drain a hazardous spill basin to Lake Norman. The impact is the result of Class II rip-rap placed in the Lake for erosion control/ diffusion of velocity at the end of the ditch. *
Total Pond Impacts:			**7.05**	**0.1**	

* The fill in the lake will be placed so that it does not create a navigational hazard to lake users.

Table 3-2: U-2307 A Pond/ Lake Norman Preliminary Impacts (values in acres)

Plan Sheet No	NRTR Site	Pond Size	Permanent Fill	Preliminary Impact Description
4	Lake Norman/ Reed Creek	32,475**	0.93	Current causeways will need to be widened to accommodate a wider roadway.
4			1.61	
5	Lake Norman/ Mountain Creek		2.15	
6			1.34	
Total Pond Impacts:			**6.03**	

Table 4-1: R-2307 B Riparian Buffer Impacts (values in square feet)

Bridge/Allowable			Road Crossing/ Mitigable		
Zone 1	**Zone 2**	**Total**	**Zone 1**	**Zone 2**	**Total**
4,288	3,494	7,782	20,406	14,922	34,563
Minus Wetlands in Buffer:			*none for this project*		
Total Buffer Mitigation requested from DMS:			**20,406**	**14,922**	

Table 4-2: Buffer Cross-Walk (Buffer Sites to Corresponding Jurisdictional Impact Site)

Buffer Site Number	Jurisdictional Resources Site Number
1	no corresponding JD site/ no impacts to Lake Norman
2	no corresponding JD site/ no impacts to Lake Norman
3	1
4	2
5	3
6	4
7	5
8	no corresponding JD site/ no impacts to Lake Norman
9	6
10	no corresponding JD site/ no impacts to Lake Norman

Table 5: R-2307 Cumulative Impacts

Impact Type		R-2307 B	R-2307 A	R-2307 Total
Wetlands *acres*	Fill	0.05	0.73	0.78
	Excavation	--	--	zero
	Mechanized Clearing	<0.01	--	<0.01
	Total Mitigable	**0.06**	**0.73**	**0.79**
	Temporary	--	--	--
	Hand Clearing	--	--	--
Streams *linear feet*	Permanent Loss of Water Intermittent	117	470	587
	Permanent Loss of Water Perennial	330	657	987
	Total Mitigable	**447**	**1,127**	**1,574**
	Bank Stabilization Intermittent	--	--	--
	Bank Stabilization Perennial	--	--	--
	Total Permanent Impact	**447**	**1,127**	**447**
	Temporary Intermittent	--	--	--
	Temporary Perennial	76	--	76
	Total Temporary Impact	**76**	--	**1,574**
Open Water	Permanent (acres)	7.05	6.03	13.08
	Temporary (acres)	0.1	--	0.1
Buffer *square feet*	Allowable Zone 1	4,288	*Not projected*	4,288
	Mitigable Zone 1	20,406	*Not projected*	20,406
	Minus Zone 1 Wetlands	--	*Not projected*	--
	Total Mitigatable Zone 1	**20,406**	***Not projected***	**20,406**
	Allowable Zone 2	3,494	*Not projected*	3,494
	Mitigable Zone 2	14,922	*Not projected*	14,922
	Minus Zone 2 Wetlands	--	*Not projected*	--
	Total Mitigatable Zone 2	**14,922**	***Not projected***	**14,922**

FEDERALLY PROTECTED SPECIES

Plants and animals with Federal classification of Endangered (E) or Threatened (T) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. The USFWS lists the following federally protected species for Iredell and Catawba Counties.

Table 6: Federally protected species listed for Catawba and Iredell Counties as of June 27, 2018

County	Common Name	Scientific Nome	Federal Status	Habitat Present	Biological Conclusion	Last Survey
Catawba & Iredell	Dwarf-flowered heartleaf	*Hexastylis naniflora*	Threatened	Yes	No Effect	2/23/2013
Catawba & Iredell	Northern long-eared bat	*Myotis septentrionalis*	Threatened	No	Compliant with 4(d)	
Catawba	Schweinitz's sunflower	*Helianthus schweinitzii*	Endangered	Yes	No Effect	9/27/2013
Iredell	Bog turtle	*Clemmys muhlenbergii*	Threatened due to similarity of appearance	No	Not Required	--

Bald Eagle and Golden Eagle Protection Act

The lakeshore of Lake Norman does support bald eagle habitat. A review of the NCNHP Natural Heritage Element Occurrences (NHEO) (July 2014 dataset) indicates one known occurrence, within 1.0 mile of the study area. No nests and no known occurrences were detected within the corridor during field studies conducted between May 2014 and June 2014.

A desktop GIS analysis of the project study area, as well as a 1.13-mile radius (1.0 mile plus 660 feet) of the project limits, was performed in May 2013, using 2012 color aerials. Lake Norman is large enough and sufficiently open to be considered a potential feeding source for the bald eagle.

A survey of the project study area was conducted in May 2013 and no nests were found. Additionally, a review of NCNHP Natural Heritage Element Occurrences (NHEO) (July 2014 dataset) revealed one known occurrence of this species, within 2.0 miles of the project study area. That occurrence is known as the "Catawba #2 Duke Energy Marshall Steam Station" site and had an active nest in 2011. The active nest site is approximately 0.4 miles northwest from the intersection of NC 150 and SR 1902 (Harvel Road). Due to the distance from the study area, (>660 feet), it has been determined that this project will not affect this species.

AVOIDANCE, MINIMIZATION AND MITIGATION

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, at all stages of a project, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts.

Overall avoidance and minimization measures include:

Grass swales were added/created anywhere there was room to allow for stormwater treatment and velocity reduction.

Hazardous spill basins were designed under transmission lines; however, Duke Energy would not permit these stormwater devices under transmission lines.

Specific avoidance and minimization measures include:

Roadway Plansheet 5 (No 404 Site Number, Site 1 and 3 on Buffer Drawings): Avoidance
Roadway slopes were reduced to avoid 404 impacts. (However, Catawba Buffer impacts remain).

Sites 3 and 4: Minimization
The multi-use path on the bridge will be used to collect stormwater so it will not directly discharge into Lake Norman. Stormwater will be collected into hazardous spill basins on either side of the bridge.

Site 5: Avoidance and Minimization
Fill slopes and drainage related impacts were shifted to avoid impacts to the wetland.

Sheet 9 (No 404 Site Number, Site 8 on Buffer Drawings): Avoidance
Fill slopes and drainage related impacts were shifted to avoid impacts to Lake Norman. (However, Catawba Buffer Impacts to remain.

Site 7: Minimization
There will be no roadway drainage directly to this stream. All roadway water is being carried for treatment in a basin.

Sheets 16, 17, 18, 19, 20, 21, 22 (No Jurisdictional Impacts) Minimization
All stormwater on these pages are routed to a basin for treatment and velocity reduction.

Mitigation:

NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent practicable as described above. The remaining unavoidable impacts for R-2307 B, noted below, will be mitigated for by the NC Division of Mitigation Services as noted in the attached acceptance letter.

0.06 acre of riparian wetland,
447 linear feet of streams,
20,406 square feet of Zone 1, and 14,992 square feet of Zone 2 of Catawba Buffer,

The mitigation for the R-2307 A impacts have not been requested, as the projected construction start date for the A section is greater than 5 years.

REGULATORY APPROVALS

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

Section 401 and Catawba River Riparian Buffer Authorization: We are hereby requesting a modification to the 401 Water Quality Certification from the N. C. Division of Water Resources. In compliance with Section 143 215.3D(e) of the NCAC, we will provide $570.00 to act as payment for processing the Section 401 permit application previously noted in this application (see Subject line).

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Michael Turchy at maturchy@ncdot.gov or (919) 707-6157. A copy of this application and distribution list will also be posted on the NCDOT website at:
http://connect.ncdot.gov/resources/Environmental/Pages.

Sincerely,

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.

OMB APPROVAL NO. 0710-0003
EXPIRES: 28 FEBRUARY 2013

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-Environmenal Assessment Unit	Company -
E-mail Address - maturchy@ncdot.gov	E-mail Address -
6. APPLICANT'S ADDRESS:	**9. AGENT'S ADDRESS:**
Address- 1548 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 919-707-6100 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-2307 B Widening of NC 150 from NC 16 to US 21, including the interchange with I-77.

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Multiple water-bodies, see attached permit drawings	Address
15. LOCATION OF PROJECT Latitude: ◦N 35.604806 Longitude: ◦W -80.943649	City - State- Zip-

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

State Tax Parcel ID Municipality

Section - Township - Range -

17. DIRECTIONS TO THE SITE

Western terminus: NC 16 in Catawba County, US 21 in Iredell County. Includes exit 36 on I-77 in Iredell County.

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

The North Carolina Department of Transportation (NCDOT) proposes to improve the NC 150 corridor for a length of approximately 15 miles from the NC 16 Bypass in Catawba County to just west of the US 21/NC 150 Interchange in Iredell County, North Carolina (NCDOT STIP Project No. R-2307). The proposed project also includes improvements to the I-77/NC 150 interchange in Mooresville (NCDOT STIP Project No. I-5717).

This is a Phased Individual Permit application. The project is divided into an A and B section.
Section A (R-2307 A) extends from NC 16 Bypass to SR 1902 (Harvel Road) and
Section B (R-2307 B) extends from Harvel Road to the US 21/NC 150 interchange & includes the I-5717 component, the I-77 interchange.

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

The purpose and need for these projects are to improve capacity and reduce congestion along NC 150 from the NC 16 Bypass to just west of the US 21 Interchange.
NC 150 serves traffic demands and travel patterns for commuters and other travelers within and outside of the project study area and is a major east-west route between Shelby, Lincolnton, and Mooresville. Currently, heavy traffic occurs during peak periods within the project limits, resulting in frequent congestion and delays. Existing traffic congestion within the NC 150 corridor results in excessive travel times for commuters and travelers. Projected growth in the corridor, particularly around the I-77 interchange, will continue to increase these delays and travel times.

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

20. Reason(s) for Discharge

Impacts will result from the widening the roadway and shoulders, lengthening and/or replacing hydraulic structures, as well as bridge construction.

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

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
See attached cover letter	See attached cover letter	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 permit drawings.

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
See Attached Coord.					

* 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 Brun 12/21/18

SIGNATURE OF APPLICANT DATE SIGNATURE OF AGENT DATE

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.

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
TIM BAUMGARTNER
Director

NORTH CAROLINA
Environmental Quality

December 19, 2018

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

Dear Mr. Harris:

Subject: DMS Mitigation Acceptance Letter:

R-2307B, NC 150 Widening from Harvel Road to US 21 (Includes Interchange with I-77), Iredell and Catawba Counties

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the stream, wetland and buffer mitigation for the subject project. Based on the information supplied by you on December 19, 2018, the impacts are located in CU 03050101 of the Catawba River basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Stream and Wetlands	River Basin	CU Location	Eco-Region	Stream			Wetlands		
				Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh
Impacts	Catawba	03050101	CP	0	0	447.0	0.06	0	0

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

All buffer mitigation requests and approvals are administrated through the Riparian Restoration Buffer Fund. The NCDOT will be responsible to ensure that appropriate compensation for the buffer mitigation will be provided in the agreed upon method of fund transfer. Upon receipt of the NCDWR's Buffer Authorization Certification, DMS will transfer funds from the NCDOT 2984 Fund into the Riparian Restoration Buffer Fund. Upon completion of transfer payment, NCDOT will have completed its riparian buffer mitigation responsibility for TIP Number R-2307B. Subsequently, DMS will conduct a review of current NCDOT ILF Program mitigation projects in the river basin to determine if available buffer mitigation credits exist. If there are buffer mitigation credits available, then the Riparian Restoration Buffer Fund will purchase the appropriate amount of buffer mitigation credits from NCDOT ILF Program.

Buffer	River Basin	CU	Eco-Region	Buffer Impacts		
				Zone 1	Zone 2	TOTAL
Impacts	Catawba	03050101	CP	20,406.0	14,922.0	35,328.0

The impacts and associated mitigation needs were under projected by the NCDOT in the 2018 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 increase, 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 Ms. 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, NC Division of Water Resources
File: R-2307B

Subject: Minutes from Merger CP 4B Hydraulic Design Review Meeting held on April 12, 2017 for R-2307B in Iredell and Catawba Counties.

Team Members:

Clarence Coleman - FHWA	(absent)
Felix Davila – FHWA	(present)
Steven Kichefski – USACE	(phone)
Marella Buncick – USFWS	(phone)
Marla Chambers – NCWRC	(present)
Dr. Cynthia Van Der Wiele – USEPA	(absent)
Donna Hood - DWR	(phone)

Date of Minutes: May 16, 2017

Additional Participants:

Bryan Key, NCDOT Roadway Design
Paul Atkinson, NCDOT Hydraulics
Craig Freeman, NCDOT Hydraulics
Colin Mellor, NCDOT NES
Carla Dagnino, NCDOT NES
Michael Turchy, NCDOT NES
Karen Reynolds, NCDOT PDEA
Mark Staley, NCDOT REU
Randy Henegar, TGS Engineers
David Petty, TGS Engineers
Zack Richard, TGS (Minutes)

The project involves improvements to NC 150 from SR 1840 (Greenwood Rd) in Catawba County to US 21 in Iredell County.

The meeting began at 10:30 am.

General Notes / Comments

- TGS Engineers noted design has progressed past conceptual through sheet 23, beyond sheet 24 is purely conceptual.
- DWR requested that all outlet pipes into Hazardous Spill Basins (HSB) be as far away as possible from the HSB outlet structure so that a spill would travel along the full length of the HSB and function as intended.
- DWR requested that riprap at outlets entering Lake Norman and JS streams be larger than Class B. TGS to evaluate enlarging to Class I where appropriate.
- TGS noted where practical proposed ditches are shown to end just outside Lake Norman Full Pond elevation 760' per correspondence with Duke Energy rep regarding anticipated shoreline permit (an exception would be Sheet 6 Str#0608).
- Per DWR inquiry, TGS indicated proposed HSB outlet structures to date are shown as concrete headwalls with sluice gates. DWR advised against sandbags acting as HSB outlet structures.

Sheet 4

- DWR had concerns about the site built on coal ash fill (432+00 to 435+00 LT) and stated there should be no live ditch flow through exposed coal ash. Indicated limits should be determined. TGS recommended borings be taken along/within proposed ROW around coal ash site and precede from there.

Sheet 5

- DWR advised to keep pipe outlets at non-erosive velocities.
- NCWRC expressed concerns about fill in Lake Norman at DRW7. Asked if it was prudent to avoid impacts here by steeping up fill slopes or moving drive. Subsequent comment from NES indicated there will be no JS line at this location as the jurisdiction of Lake Norman is at elevation 760'. NES further advised to steepen slopes to avoid 404, 401, buffer and FERC impacts.
    - Initial evaluation indicates 404, 401 and FERC impacts could be avoided by steepening slopes but not buffer impacts. Therefore, TGS will evaluate options for relocating drive and obtaining additional survey to avoid buffer impacts.

Sheet 6

- TGS noted isolated depression at 452+00 LT shown to be drained with 18" pipe (Str# 0608). Per NCWRC request, TGS to evaluate ditching rather than piping within BZ1.
- Sheet 6-8, -L- Sta. 458+00 to 466+00 LT & 478+00 to 487+00 LT: TGS noted a proposed multi use path (10' paved,3' grassed shoulder) with runoff to sheet flow across grassed shoulder and down fill slope into Lake Norman (i.e. Treatment of this water limited to 3' grassed shoulder). Anticipate grassed say 2:1 fill slope down then rock fill at 2' above full pool to bottom of lake. Dirty water from roadway to be picked up and taken to HSBs.

Sheet 7

- TGS noted the median ditches meet swale criteria and generally, that swales have been proposed wherever practical.

Sheet 8

- TGS noted there are no anticipated impacts to wetland WM at 486+00 LT however are proposing discharge from HSB to dissipate on riprap pad then drain thru the wetland.

Sheet 9

- TGS noted L line runoff here and throughout routed to HSB wherever practical. Also noted proposed runoff from Y lines here and in similar locations is matching existing drainage conditions to the extent practical.

Sheet 11

- TGS noted previously proposed HSB at 520+00 LT was deleted per subsequent Duke Energy correspondence regarding FERC permit/recreation area.
- TGS noted proposed drainage on sheets 10-12 may be re-evaluated to better match existing drainage patterns once Duke Energy transmission issue is resolved.
    - While understanding the FERC permit precludes a HSB here, for the official record, DWR stated they would like to see a HSB in this area for protection of the resources.

Sheet 13

- Per DWR inquiry re outlet into the wetlands 555+00 LT, TGS noted the discharge is offsite drainage and that str# 1318 is a drop box with a pipe out at minimum slope to minimize velocity. Per DWR, TGS to enlarge outlet riprap to Class I.

Sheet 15

- TGS noted proposed str#1523 at 576+00 LT shown to tie to existing 36" pipe and discharge to an existing pond due to evaluation yielding no practical location for a HSB.
- DWR expressed concerns about existing pipes and stormwater retention pond/basin being able to handle proposed flows and noted in its experience many existing pipes are under sized. TGS indicated recommendations to NCDOT will be made for any under sized pipes and applicable pre/post calculations will be performed as part of design process.

Sheet 16/17

- TGS noted stormwater for sheets 16 & 17 is being taken to a HSB on sheet 17.
- TGS stated an additional HSB may be added in the vicinity of 608+00 LT.

Sheet 18/19

- TGS noted stormwater for sheets 18 & 19 is being taken to a HSB on sheet 19.

Sheet 20

- TGS noted stormwater for sheets 20 & 21 is being taken to a HSB on sheet 20.
- DWR okay with outlet location into HSB (i.e. already satisfies second bullet under General comments).
- Agencies questioned the blue line on plans that looks like a stream.
    - TGS noted this blue line is shown in the FS and presumably is a ditch flow line, not a JS stream.
    - USACE confirmed nothing on JDM in this area.

Sheet 22

- TGS noted stormwater for sheets 22 & 23 is being taken to a HSB on sheet 22.

Sheet 23

- TGS noted that there are two system on this sheet tying into existing systems and that from this sheet thru sheet 30 the property along NC 150 is very built out. TGS indicated effort will be made to propose swales and/or HSBs (the Critical Area extends to sheet 26) in this remaining area, however additional locations may not be practical.

Sheet 24

- TGS indicated no practical places for HSBs and will try to maintain existing drainage patterns.

Sheet 26

- TGS noted existing 60" RCP is to be retained and extended upstream and downstream. Riprap shown in the stream as a precaution in case our calculations show it is needed, but will avoid if possible.
- DWR questioned if the upstream area of the 60" RCP cross pipe was a previous stormwater basin. TGS indicated it is on private property and is uncertain. TGS confirmed the riser structure was in ruins as noted in the FS.

Sheet 29

- TGS noted existing 5'x6' RCBC is to be retained pending Division inspection and extended downstream. Portion of outlet channel to be realigned and lined with riprap.
    - Per USACE inquiry, riprap will be keyed in such that finished grade of rip rap would match existing/proposed finished grade of stream.
    - Per DWR inquiry, TGS clarified the "stream plug" label corresponds to the existing stream to be filled in and is unrelated to the storm drainage system outlet pipe shown. Pipe anticipated to outlet on riprap beside culvert wing.
- NCWRC asked if u-turn bulb could be shifted some to avoid JS feature.
    - TGS to investigate. *[Subsequently discussed with Roadway Engineer who indicated u-turn bulb could possibly shift as much as 40' upstation or 60' downstation (these are maximum shifts based on initial assumptions and may not be able to shift that far but would require more detailed analysis to confirm). Analysis indicated a 40' shift upstation would have no impact on culvert length and a 60' shift downstation would allow for shortening the culvert extension up to 12', but given the meander of the stream, I would recommend tying realigned channel to existing stream at same location to best match flow direction. Given this, either alternative would offer no reduction in permanent impact due to fill, therefore I recommended Roadway Engineer not consider further unless we hear otherwise.]*
- USACE expressed concerns with outlet velocities into JS streams.
    - TGS to minimize outlet velocities and to provide stable dissipation.

Sheet 30

- TGS noted existing 4'x5' RCBC is to be retained pending Division inspection and extended up and downstream with 60" RCP.
    - Per DWR inquiry, TGS confirmed proposed drainage system is to cross well above 60" RCP.
    - Per DWR, TGS to minimize drainage system pipe outlet (on sheet 29) slope to practical extent.
- Per DWR inquiry regarding existing pipes noted as rusty, TGS indicated majority of existing pipes are to be filled and/or removed.

Sheets 34, 35, 36

- TGS noted these sheets are going to curb and gutter sections and that existing drainage patterns will be maintained as practical.

The meeting adjourned at 11:50 am.

Subject: Minutes from Merger CP 4C Permit Drawings Review Meeting held on February 7, 2018 for R-2307B in Iredell and Catawba Counties.

Team Members:

Clarence Coleman - FHWA	(absent)
Felix Davila – FHWA	(absent)
Steve Kichefski – USACE	(present)
Bryan Roden-Reynolds – USACE	(present)
Marella Buncick – USFWS	(present)
Marla Chambers – NCWRC	(absent)
Dr. Cynthia Van Der Wiele – USEPA	(absent)
Donna Hood - NCDEQ	(present)

Date of Minutes: March 5, 2018

Additional Participants:

Bryan Key, NCDOT Roadway Design
Paul Atkinson, NCDOT Hydraulics
Craig Freeman, NCDOT Hydraulics
Bill Zerman, NCDOT Hydraulics
Michael Turchy, NCDOT NES
Mark Staley, NCDOT REU (absent but please keep on distribution list)
Allen Raynor, TGS Engineers
Burke Evans, TGS Engineers (phone)
Randy Henegar, TGS Engineers
David Petty, TGS Engineers (Minutes)

The project involves improvements to NC 150 from SR 1840 (Greenwood Rd) in Catawba County to US 21 in Iredell County.

The meeting began at 3:30 pm.

General Notes / Comments

- TGS noted per agency request at 4B, riprap at outlets entering Lake Norman and JS streams enlarged from Class B to Class I throughout project.
- TGS noted the SMP (attached to front of the Wetland & Stream Impact Permit Drawings) lists all proposed swales, hazardous spill basins, filtration basins and dry detention basins.

Wetland & Stream Impact Permit Drawings

Sheet 6

- Site 1: Per DEQ request and no objection from others, the proposed geotextile shown under riprap (Detail 6B) in all jurisdictional areas will be deleted. Similar for Sites 1, 2, 5, 6, 7, 8, 9, 10, 11 & 12.
- Site 2: An inquiry was made as to why the outfall was shown in TDE rather than PDE. It was noted the NCDOT cannot obtain PDE from Duke Energy in this and similar locations.

Sheet 8

- Site 5: It was noted that impacts to wetland WM have been avoided.

Sheet 13

- Site 7:
    - Per DEQ inquiry, TGS noted 24” outlet pipe is proposed at 0.5% slope.
    - It was noted that NCDOT is confirming whether a JS should be shown on the upstream side of the wetland as shown in the EA (stream SK). Following 4C meeting, EAU confirmed stream SK should be shown upstream of wetland WA and sent a request to Location & Surveys on 2/13/2018 for the Final Survey to be updated accordingly.
    - It was discussed that wetland WA is likely a total take based on impacts shown on 4C planset. Wetland WA will be accounted for as a total take on the wetland impact summary sheet.

Sheet 26

- Site 8: TGS noted riprap was proposed in base of channel to provide a stable transition from existing 66” CMP to proposed 60” RCP.
- Site 9: TGS noted riprap is proposed in base of channel at outfall to diffuse flow and provide a stable transition to existing channel (similar for sites 10 & 11). Per USACE inquiry, riprap will be keyed in such that finished grade of rip rap would match existing/proposed finished grade of stream (similar for sites 10 & 11).

Sheet 29

- Site 10: Following up on 4B inquiry as to whether u-turn bulb could be shifted some to avoid JS feature, TGS relayed the following from 4B minutes: *[Subsequently discussed with Roadway Engineer who indicated u-turn bulb could possibly shift as much as 40’ upstation or 60’ downstation (these are maximum shifts based on initial assumptions and may not be able to shift that far but would require more detailed analysis to confirm). Analysis indicated a 40’ shift upstation would have no impact on culvert length and a 60’ shift downstation would allow for shortening the culvert extension up to 12’, but given the meander of the stream, it would be recommended to tie realigned channel to existing stream at same location to best match flow direction. Given this, either alternative would offer no reduction in permanent impact due to fill, therefore it was recommended that Roadway Engineer not consider further.]*
- Per USACE inquiry following 4C meeting, TGS confirmed there are no proposed drops that could possibly break aquatic life passage for the stream between sites 11 & 12 along the existing box culvert to be retained (survey still incorrectly shows as 60” CMP) and proposed 60” dia. pipes. Same applies to the main lines at sites 8,9 & 10.

Buffer Impact Permit Drawings

Sheet 5

- Site 1: Per TGS inquiry, DEQ stated to leave BZ2 impacts for skimmer basin as Mitigable rather than changing to Exempt.
- Site 2: TGS noted per agency request at 4B, proposed drive has been shifted to avoid 404, 401 and FERC impacts while leaving some BZ2 impact for construction of slope. No related objection noted.

Sheet 6

- Site 3: TGS noted, per agency request at 4B, downstream end of pipe has been shortened such that ditching now shown within BZ1.
- Site 4 (& Sheet 8 Site 7): TGS confirmed all roadway runoff on the bridge and causeways flow to one of the two hazardous spill basins on Sheets 6 & 8 and, per inquiry, routing this runoff to the basins precludes basin outfalls from outletting farther outside lake.
- Site 5: Per TGS inquiry, DEQ indicated impacts should be kept as Mitigable as shown to be safe.

Sheet 11

- Site 10: Per Sheet 5 Site 1 discussion above, Site 10 impacts for skimmer basin to be changed from Exempt to Mitigable.

The meeting adjourned at 4:15 pm.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element: 37944.1.FR5/50134. **TIP No.:** R-2307B/I-5717 **County(ies):** Catawba Iredell

General Project Information

WBS Element:	37944.1.FR5/50134.1.FS1	**TIP Number:**	R-2307B/I-5717	**Project Type:**	Roadway Relocation	**Date:**	12/22/2017
NCDOT Contact:	Craig A. Freeman, PE	**Contractor / Designer:**	TGS Engineers (David B. Petty, PE)				
Address:	1590 Mail Service Center Raleigh, NC 27699-1590			**Address:**	706 Hillsborough Street Suite 200 Raleigh NC, 27603		
Phone:	919-707-6721			**Phone:**	919-773-8887 ext. 104		
Email:	cafreeman2@ncdot.gov			**Email:**	dpetty@tgsengineers.com		
City/Town:	Mooresville, NC	**County(ies):**	Catawba	Iredell			
River Basin(s):	Catawba	**CAMA County?**	No	No			
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	6.94 miles	**Surrounding Land Use:**	Commercial, Medium Density Residential

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	121.0 ac.	69.0 ac.
Typical Cross Section Description:	four lane shoulder section with 23'+ grassed median and four to six lane curb and gutter section with 0' to 23' raised grassed median - all 12' lanes	two lane undivided shoulder section and four lane undivided curb and gutter section - all 12' lanes
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 58860 Year: 2039	Existing: 47900 Year: 2019

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

The proposed project involves widening NC 150, an existing two & four-lane undivided arterial, to a four & six-lane median divided superstreet to improve vehicular mobility and safety from Greenwood Rd (SR 1840) in Catawba County to US 21 in Iredell County. The existing 10-span, approximately 1170-ft long by 34-ft wide bridge over Lake Norman will remain in place and transition from one lane in each direction to two eastbound lanes. A proposed 9-span, approx. 1210-ft by 52-ft wide bridge will carry two westbound lanes and a 10-ft multiuse path just upstream of the existing bridge. Bridge to be constructed from anchored barges. Existing causeways will be widened on the upstream side using rock fill up to 2 ft above Duke Energy Full Pond elevation and then grassed sideslopes from there up. There are five proposed culvert extensions over UT's toward end of project – riprap is proposed in base of channels to reduce discharge velocities.

Roadway runoff in the vicinity of the Lake Norman crossing is routed to two hazardous spill basins. Dry detention/filtration basins are proposed on sheets 14, 17(dry detention only) 19, 20 & 22 for both peak attenuation and treatment. Otherwise, stormwater diversion has been minimized. Grassed swales are used for treatment throughout the project, where practical. Outlet pipe slopes are minimized. All BMP's have been incorporated throughout the project to the maximum extent practicable.

Waterbody Information

Surface Water Body (1):	Catawba River (Lake Norman below elevation 760)	**NCDWR Stream Index No.:**	11-(75)		
NCDWR Surface Water Classification for Water Body	**Primary Classification:**	Water Supply IV (WS-IV)	Class B	Critical Area (CA)	
	Supplemental Classification:	None			
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	Yes	Comments: per EA: no effect on Dwarf-flowered heartleaf&Schweinitz's sunflower; unresolved on Northern long-eared bat			
NRTR Stream ID:			**Buffer Rules in Effect:**	Catawba	

Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**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 2.07; Released October 2016)

Additional Waterbody Information

Surface Water Body (2):	McCrary Creek		**NCDWR Stream Index No.:**	11-91		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Water Supply IV (WS-IV)	Class B	Critical Area (CA)	
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	Yes	Comments:	per EA: no effect on Dwarf-flowered heartleaf&Schweinitz's sunflower; unresolved on Northern long-eared bat			
NRTR Stream ID:				**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 2.07; Released October 2016)

WBS Element: 37944.1.FR5 **TIP No.:** R-2307B/I-5717 **County(ies):** Catawba Iredell

Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
4	-Y- 10+50 RT -Y- 11+00 RT	(1)Catawba River (Lake	0.0	3.0	3.0	0.3	33	50	2.30%	0.6	1.4	0.7	1.5	No	Yes
4	-L- 433+00 LT -L- 434+00 LT	(1)Catawba River (Lake	0.0	6.0	6.0	1.0	100	100	2.40%	3.0	1.9	3.9	2.0	No	Yes
5	-L- 436+50 RT -L- 440+00 RT	(1)Catawba River (Lake	0.0	6.0	4.0	1.0	103	350	2.60%	2.6	1.9	3.3	2.0	No	Yes
5	-L- 443+20 RT -L- 445+65 RT	(1)Catawba River (Lake	0.0	6.0	4.0	0.5	50	245	2.60%	1.3	1.6	1.7	1.7	No	Yes
5	-L- 440+20 LT -L- 442+50 LT	(1)Catawba River (Lake	0.0	6.0	4.0	0.7	72	230	2.60%	2.1	1.8	2.7	1.9	No	Yes
5	-L- 442+50 LT -L- 445+50 LT	(1)Catawba River (Lake	0.0	6.0	4.0	0.9	85	300	2.60%	2.3	1.9	3.0	2.3	No	Yes
5/6	-L- 445+50 LT -L- 450+00 LT	(1)Catawba River (Lake	0.0	6.0	4.0	1.0	97	450	0.3 to 2.2%	2.6	1.9	3.4	2.0	No	Yes
6	-L- 449+00 MED -L- 453+50 MED	(1)Catawba River (Lake	0.0	3.0	4.0	0.4	41	50	1.0 to 0.7%	1.2	1.2	1.5	1.3	No	Yes
6	-L- 453+50 MED -L- 457+50 MED	(1)Catawba River (Lake	0.0	3.0	4.0	0.7	72	400	0.50%	1.9	1.2	2.5	1.3	No	Yes
6	-L- 457+50 MED -L- 459+00 MED	(1)Catawba River (Lake	0.0	4.0	4.6	0.3	31	150	0.50%	0.8	0.8	1.0	0.9	No	Yes
6/7	-L- 459+00 MED -L- 465+50 MED	(1)Catawba River (Lake	0.0	4.0	4.6	1.1	114	650	0.30%	2.9	1.1	3.8	1.2	No	Yes
8	-L- 478+00 MED -L- 479+25 MED	(1)Catawba River (Lake	0.0	5.0	4.0	0.3	26	125	0.40%	0.6	0.7	0.8	0.7	No	Yes
8	-L- 479+25 MED -L- 481+50 MED	(1)Catawba River (Lake	0.0	5.0	4.0	0.6	63	225	0.40%	1.5	1.0	1.9	1.1	No	Yes
8	-L- 481+50 MED -L- 485+00 MED	(1)Catawba River (Lake	0.0	4.4	4.0	0.7	71	350	0.30%	1.9	1.0	2.5	1.0	No	Yes
8	-L- 485+00 MED -L- 488+50 MED	(1)Catawba River (Lake	0.0	4.4	4.0	0.6	60	350	0.30%	1.7	1.0	2.3	1.0	No	Yes
9	-L- 497+50 RT -L- 499+50 RT	(1)Catawba River (Lake	0.0	6.0	4.0	0.4	42	200	3.00%	1.1	1.7	1.5	1.8	No	Yes
9	-L- 501+00 RT -L- 506+00 RT	(1)Catawba River (Lake	0.0	3.0	3.0	1.9	193	500	0.40%	5.3	1.6	6.9	1.8	No	Yes
9	-L- 503+50 LT -L- 505+00 LT	(1)Catawba River (Lake	0.0	4.0	6.0	0.4	44	150	0.60%	0.8	0.8	1.0	0.9	No	Yes
9*	-Y2- 13+00 LT -Y2- 14+40 LT	(1)Catawba River (Lake	2.0	4.0	4.0	1.5	152	95	1.90%	3.5	1.9	4.5	2.0	No	Yes

Additional Comments

Swales have been added to attenuate runoff and promote sedimentation and infiltration before discharging through the riparian buffer.
Where slope (and drainage area/discharge) vary, max. applicable velocity is entered.
*200+ ft of existing swale upstream of Sheet 9 -Y2- swale.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element: 37944.1.FR5 **TIP No.:** R-2307B/I-5717 **County(ies):** Catawba Iredell

Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
9	-Y2- 13+70 RT -Y2- 14+40 RT	(1)Catawba River (Lake	0.0	4.0	4.0	0.4	44	70	1.30%	1.2	1.6	1.6	1.7	No	Yes
10	-L- 505+50 LT -L- 508+50 LT	(1)Catawba River (Lake	0.0	6.0	4.0	1.1	110	300	0.3 to 2.0%	2.4	2.0	3.1	2.2	No	Yes
10	-L- 516+00 RT -L- 517+50 RT	(1)Catawba River (Lake	6.0	3.0	3.0	1.7	170	150	2.00%	5.4	2.0	7.0	2.2	No	Yes
11	-L- 523+50 RT -L- 525+75 RT	(1)Catawba River (Lake	0.0	6.0	4.0	0.5	46	225	3.10%	1.3	1.8	1.7	1.9	No	Yes
11	-L- 526+50 RT -L- 529+50 RT	(1)Catawba River (Lake	0.0	6.0	4.0	0.8	82	300	2.4 to 0.8%	2.4	1.9	3.1	2.4	No	Yes
11	-L- 527+50 LT -L- 529+50 LT	(1)Catawba River (Lake	0.0	6.0	4.0	0.5	46	200	2.30%	1.3	1.8	1.7	2.0	No	Yes
12*	-L- 532+50 RT -L- 534+00 RT	(1)Catawba River (Lake	2.0	4.0	4.0	2.7	273	150	0.80%	6.4	1.9	8.3	2.0	No	Yes
12*	-L- 539+50 RT -L- 541+00 RT	(1)Catawba River (Lake	2.0	3.0	3.0	1.7	167	150	1.40%	4.7	1.8	6.1	2.3	No	Yes
12*	-L- 546+00 RT -L- 547+50 RT	(1)Catawba River (Lake	0.0	6.0	4.0	0.3	34	150	2.90%	1.0	1.9	1.3	2.0	No	Yes
25	-Y31- 29+85 LT -Y31- 31+50 LT	(1)Catawba River (Lake	0.0	6.0	4.0	1.1	110	165	1.70%	1.9	1.5	2.5	1.9	No	Yes
25	-Y31- 34+60 LT -Y31- 35+50 LT	(1)Catawba River (Lake	0.0	6.0	6.0	0.4	40	90	1.50%	0.9	1.2	1.2	1.2	No	Yes
25	-Y31- 29+63 RT -Y31- 31+50 RT	(1)Catawba River (Lake	0.0	6.0	4.0	0.7	70	187	1.00%	1.2	1.1	1.5	1.2	No	Yes
25	-Y31- 34+10 RT -Y31- 36+70 RT	(1)Catawba River (Lake	0.0	6.0	4.0	1.6	160	260	1.80%	3.6	1.8	4.7	1.9	No	Yes
33	-Y17- 27+00 RT -Y17- 34+50 RT	(1)Catawba River (Lake	0.0	4.0	4.0	1.1	112	750	1.9 to 0.3%	1.8 to 3.1	1.9	2.4 to 4.0	2.1	No	Yes
35**	-Y26A- 19+20 RT -Y26A- 20+15 RT	(2)McCrary Creek	4.0	3.0	3.0	2.6	260	65	0.30%	9.2	1.5	11.9	1.6	No	Yes
36***	-Y39- 13+50 RT -Y39- 14+25 RT	(1)Catawba River (Lake	6.0	4.0	3.0	2.3	230	75	2.10%	5.9	2.0	7.7	2.2	No	Yes
6	-L- 455+50 LT -L- 457+50 LT	(1)Catawba River (Lake	0.0	3.0	4.0	0.2	21	200	0.40%	0.4	0.7	0.6	0.7	No	Yes

Additional Comments

Swales have been added to attenuate runoff and promote sedimentation and infiltration before discharging through the riparian buffer.
Where slope (and drainage area/discharge) vary, max. applicable velocity is entered.
*Sheet 12 has three separate swales inline for total DA of 2.73 ac (recommend treatment=273 ft) with 450 ft provided.
**Sheet 35 swale ties into an existing 115 ft swale.
*** 400+ ft of existing swale upstream of Sheet 36 swale.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element: 37944.1.FR5/50134.1. **TIP No.:** R-2307B/I-5717 **County(ies):** Catawba Iredell

Level Spreaders, Hazardous Spill Basins, and Forebays

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Level Spreader, Hazardous Spill Basin, or Forebay?	Drainage Area (ac)	New Built-Upon Area (ac)	Required / Minimum Treatment			Treatment Achieved		BMP Associated w/ Buffer Rules?
6	-L- 457+69 LT N: 35.60434, E: -80.94847	(1)Catawba River (Lake	Hazardous Spill Basin	9.6	3.60	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	9474.0	cf	9721.0	cf	N/A
8	-L- 488+59 RT N: 35.60578, E: -80.93816	(1)Catawba River (Lake	Hazardous Spill Basin	17.7	4.60	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	15449.0	cf	15541.0	cf	N/A
14	-L- 560+88 RT N: 35.60149, E: -80.91484	(1)Catawba River (Lake	Forebay	12.9	1.6	0.1 inches of runoff from NBUA	581.0	cf	3753.0	cf	Yes
19	-L- 634+54 RT N: 35.59951, E: -80.89236	(1)Catawba River (Lake	Forebay	10.5	4.30	0.1 inches of runoff from NBUA	1561.0	cf	3312.0	cf	Yes
20	-L- 655+67 LT N: 35.59840, E: -80.88523	(1)Catawba River (Lake	Forebay	35.2	4.60	0.1 inches of runoff from NBUA	1670.0	cf	4257.0	cf	Yes
22	-L- 677+04 RT N: 35.59578, E: -80.87873	(1)Catawba River (Lake	Forebay	15.0	2.70	0.1 inches of runoff from NBUA	980.0	cf	2430.0	cf	Yes

*Hazardous spill basins are pollution prevention measures designed for spill containment rather than stormwater treatment. Under Required / Minimum Treatment and Treatment Achieved, provide the minimum required volume and the actual HSB volume, respectively. Refer to the NCDOT Stormwater Best Management Practices Toolbox (2014) for design guidance.

Additional Comments

Two hazardous spill basins have been provided at the Lake Norman crossing to protect against the accidental spill of hazardous materials due to NC 150 being classified as an arterial and the crossing being within 1/2 mile of the critical area of a water supply source classified as WS-IV. Roadway and adjacent ditch runoff on the bridge, causeways and each adjacent sag is routed to these basins.
Forebays used to provide pretreatment by diffusing flow and removing debris for the basins shown on SMP sheet 6.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element: 37944.1.FR5/50134.1.FS1 **TIP No.:** R-2307B/I-5717 **County(ies):** Catawba Iredell

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?
14	-L- 560+88 RT N: 35.60149, E: -80.91484	(1)Catawba River (Lake	Dry Detention Basin/Filtration Basin	12.9	1.6	0.547	4.32	Yes
17	-L- 602+99 RT N: 35.60326, E: -80.90193	(1)Catawba River (Lake	Dry Detention Basin	11.5	2.5	0.392	1.98	Yes
19	-L- 634+54 RT N: 35.59951, E: -80.89236	(1)Catawba River (Lake	Dry Detention Basin/Filtration Basin	10.5	4.3	0.577	1.69	Yes
20	-L- 655+67 LT N: 35.59840, E: -80.88523	(1)Catawba River (Lake	Dry Detention Basin/Filtration Basin	35.2	4.6	0.873	2.40	Yes
22	-L- 677+04 RT N: 35.59578, E: -80.87873	(2)McCrary Creek	Dry Detention Basin/Filtration Basin	15.0	2.7	0.341	1.59	Yes

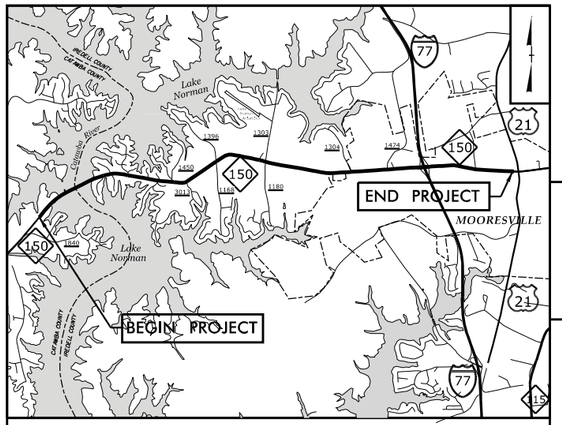
Additional Comments

Dry detention basins have been incorporated to account for the increase in impervious area and the extension of curb & gutter section by attenuating the 10-yr peak basin outflow to at or below the existing peak discharge, and thereby minimizing downgrade erosion. Filtration basins have been used to filter stormwater and reduce pollutants and solids. Forebays have also been used to provide pretreatment by diffusing flow and removing debris.

09/08/99

CONTRACT: TIP PROJECTS: R-2307B & I-5717

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CATAWBA & IREDELL COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2307B, I-5717	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
37944.1.FR5	STP-0150(36)	PE (R-2307B)
50134.1.FS1	NHPP-077-1(221)37	PE (I-5717)
37944.2.4	STP-0150(036)	R/W (R-2307B)
37944.2.5	STP-0150(036)	UTILITIES (R-2307B)
50134.2.1	NHPP-077-1(221)37	R/W, UTILITIES (I-5717)

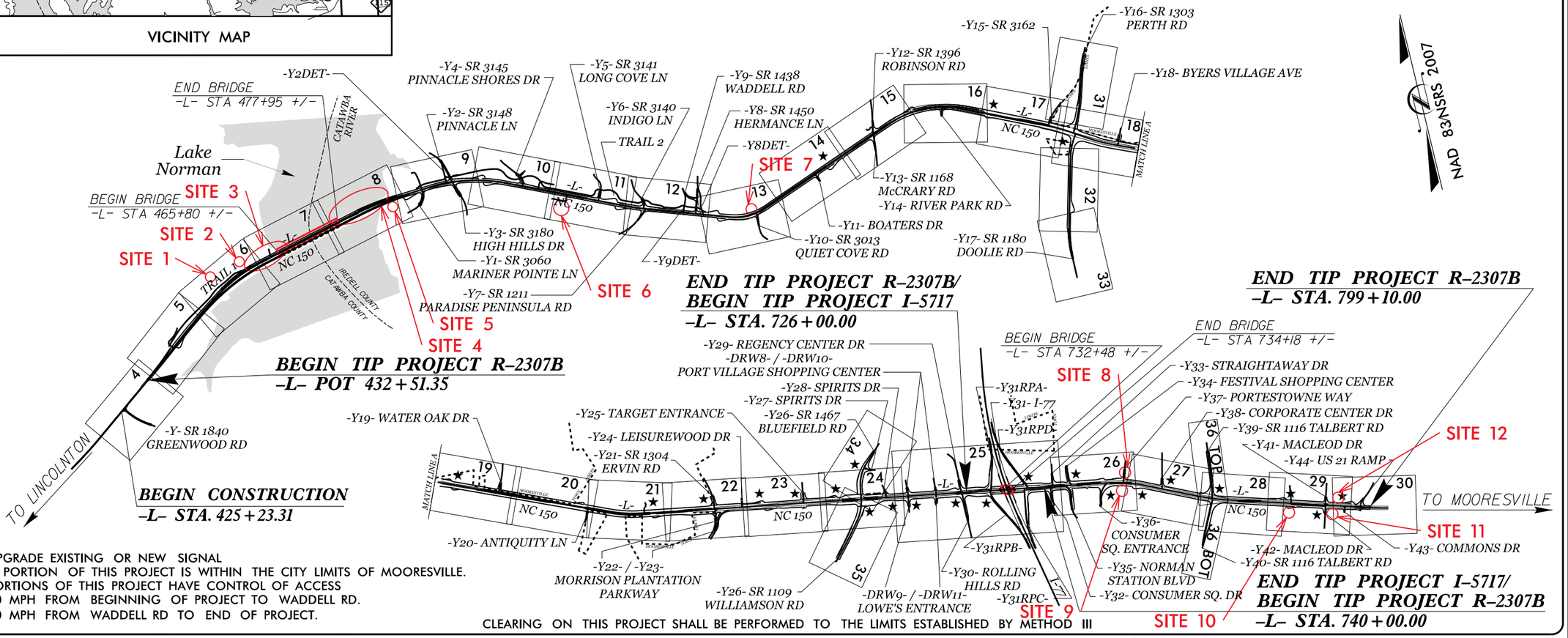
LOCATION: NC 150 FROM SR 1840 (GREENWOOD RD) IN CATAWBA COUNTY TO US 21 IN IREDELL COUNTY

PERMIT DRAWING SHEET 1 OF 22

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, AND SIGNALS

WETLAND & STREAM IMPACTS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



BEGIN TIP PROJECT R-2307B
-L- POT 432+51.35

BEGIN CONSTRUCTION
-L- STA. 425+23.31

END TIP PROJECT R-2307B/
BEGIN TIP PROJECT I-5717
-L- STA. 726+00.00

END TIP PROJECT R-2307B
-L- STA. 799+10.00

END TIP PROJECT I-5717/
BEGIN TIP PROJECT R-2307B
-L- STA. 740+00.00

★ UPGRADE EXISTING OR NEW SIGNAL
A PORTION OF THIS PROJECT IS WITHIN THE CITY LIMITS OF MOORESVILLE.
PORTIONS OF THIS PROJECT HAVE CONTROL OF ACCESS
** 60 MPH FROM BEGINNING OF PROJECT TO WADDELL RD.
50 MPH FROM WADDELL RD TO END OF PROJECT.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

GRAPHIC SCALES

50 25 0 50 100
PLANS

DESIGN DATA

ADT 2019 = 47,900
ADT 2039 = 58,860
K = 8%
D = 55%
T = 6%*
V = **
* TTST 2%+ DUAL 4%
FUNC CLASS = PRINCIPAL ARTERIAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2307B	=	*6.448 mile*
LENGTH STRUCTURES TIP PROJECT R-2307B	=	*0.230 mile*
TOTAL LENGTH TIP PROJECT R-2307B	=	*6.678 mile*
LENGTH ROADWAY TIP PROJECT I-5717	=	*0.233 mile*
LENGTH STRUCTURES TIP PROJECT I-5717	=	*0.032 mile*
TOTAL LENGTH TIP PROJECT I-5717	=	*0.265 mile*
TOTAL LENGTH TIP PROJECT R-2307B / I-5717	=	*6.943 mile*

Prepared For:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610
By:

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
AUGUST 31, 2017

LETTING DATE:
JULY 16, 2019

BURKE EVANS, PE
PROJECT ENGINEER
TRAVIS COOK, EI
PROJECT DESIGN ENGINEER
BRYAN KEY, PE
PROJECT ENGINEER
NCDOT ROADWAY DESIGN

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

7/11/2018
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

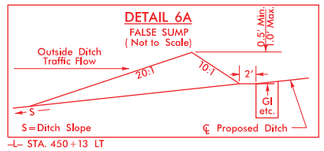
PERMIT DRAWING SHEET 2 OF 22

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

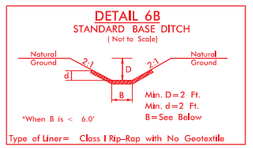
NAD 83/NSRS 2007

DETAIL 6A
FALSE SUMP
(Not to Scale)



–L– STA. 450+13 LT

DETAIL 6B
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class I Rip-Rap with No Geotextile

–L– STA. 453+01,294'LT TO 453+29,328'LT (B=2', DAYLIGHT AT 0.3%)
–L– STA. 458+01,177'LT TO 458+41,192'LT (B=6', SEE PFL FOR GRADE)

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DUKE ENERGY CAROLINAS LLC ⑦

SITE 1

SCALE: 1"=50'

SITE 2

SCALE: 1"=50'

SITE 3

BEGIN 4' CHAIN –TRAIL I– STA.

STANDARD BASE DITCH SEE DETAIL 6B

20'x20'x18" PAD CLASS I RIP RAP 32 TONS,NO GEO

36" CEP w/ROD & LUG AND GASKETS

HAZARDOUS SPILL BASIN SEE DETAIL 6F

12' DRIVE FOR HSB ACCESS (APPROX.)

BERM=768

HW w/SLUICE GATE INV=763.0

CLASS I RIP RAP 7 TONS,17 SY GEO

CUT TO FILL TRANSITION CLASS B RIP RAP 12 TONS, 26 SY GEO

MEDIAN GRASSED SWALE SEE DETAIL 6C

GATE w/FENCE

ROCK FILL IN POND SEE DETAIL 6E

DUKE ENERGY FULL POND ELEV=760.0' (TYP)

CUT TO FILL TRANSITION CLASS B RIP RAP 5 TONS, 10 SY GEO

FALSE SUMP SEE DETAIL 6A

FALSE SUMP SEE DETAIL 6D

–TRAIL I–

–L–

–LEB–

EXISTING R/W

MATCH LINE –L– STA.448+00 SEE SHEET NO.5

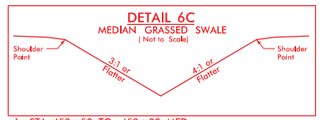
MATCH LINE –L– STA.462+00 SEE SHEET NO.7

ANNIE B. STUTTS IRREVOCABLE TRUST ⑥

LAKE NORMAN DUKE ENERGY CAROLINAS LLC ⑦

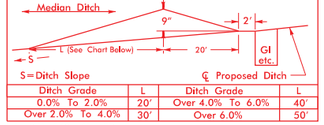
50' 0' 50' 100'
25'

DETAIL 6C
MEDIAN GRASSED SWALE
(Not to Scale)



–L– STA. 453+50 TO 459+00 MED
–L– STA. 459+00 TO 465+50 MED

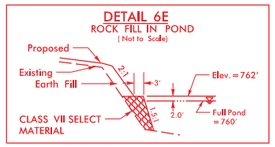
DETAIL 6D
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

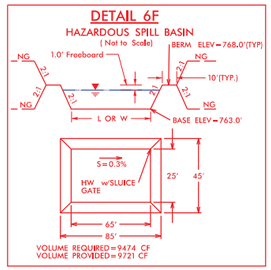
–L– STA. 543+61 MED
–L– STA. 547+60 MED

DETAIL 6E
ROCK FILL IN POND
(Not to Scale)



–L– STA. 458+72 TO 467+11
–L– STA. 476+34 TO 488+38

DETAIL 6F
HAZARDOUS SPILL BASIN
(Not to Scale)



–L– STA 457+69 LT

PTE —— PERMANENT TRAIL EASEMENT

SEE SHEET 38 FOR –L– PROFILE
SEE SHEET 53 FOR –LEB– PROFILE
SEE SHEET 73 FOR –TRAIL– PROFILE
SEE SHEET 2B–1 FOR CURVE DATA

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

7/2/2018
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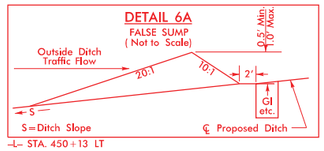
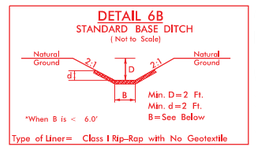
8/17/99





S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 3 OF 22

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

NAD 83/NSRS 2007

SITE 1 | SITE 2 | SITE 3

DUKE ENERGY CAROLINAS LLC ⑦

LAKE NORMAN
DUKE ENERGY CAROLINAS LLC ⑦

ANNIE B. STUTTS IRREVOCABLE TRUST ⑥

-L- STA. 448+00 MATCH LINE SEE SHEET NO.5

-L- STA. 462+00 MATCH LINE SEE SHEET NO.7

-TRAIL I-

-LEB-

-L-

BEGIN 4' CHAIN -TRAIL I- STA.

STANDARD BASE DITCH SEE DETAIL 6B

CUT TO FILL TRANSITION CLASS B RIP RAP 5 TONS, 10 SY GEO

FALSE SUMP SEE DETAIL 6A

MEDIAN GRASSED SWALE SEE DETAIL 6C

CUT TO FILL TRANSITION CLASS B RIP RAP 12 TONS, 26 SY GEO

HAZARDOUS SPILL BASIN SEE DETAIL 6F

12' DRIVE FOR HSB ACCESS (APPROX.)

36" CMP w/FOD & LUG AND GASKETS

BERM=768

HW w/SLUICE GATE INV=763.0

CLASS I RIP RAP 7 TONS/17 SY GEO

GATE w/FENCE

FALSE SUMP SEE DETAIL 6D

ROCK FILL IN POND SEE DETAIL 6E

DUKE ENERGY FULL POND ELEV=760.0' (TYP)

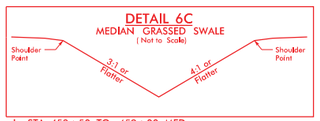
20'x20'x18" PAD CLASS I RIP RAP 32 TONS,NO GEO

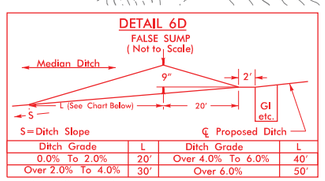
EQUIPMENT CROSSING BRIDGE SEE DETAIL 6E

FLOOD OF WATER JULY 2012

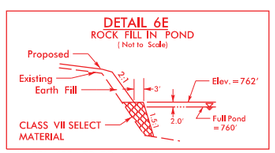
RETAIN

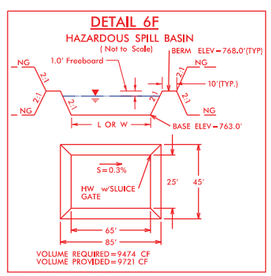
50' 0' 50' 100'
25'





Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'





PTE PERMANENT TRAIL EASEMENT

SEE SHEET 38 FOR -L- PROFILE
SEE SHEET 53 FOR -LEB- PROFILE
SEE SHEET 73 FOR -TRAIL- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

7/2/2018
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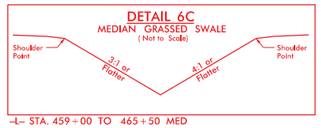

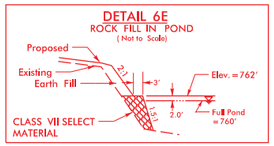

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	7

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

PERMIT DRAWING
SHEET 4 OF 22

▨ DENOTES IMPACTS IN SURFACE WATER

SEE SHEET 39 FOR –L– PROFILE
SEE SHEETS 53 THRU 54 FOR –LEB– PROFILE
SEE SHEET 2B-1 FOR CURVE DATA

8/17/99

7/11/2018
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User:dpettu

8/17/99

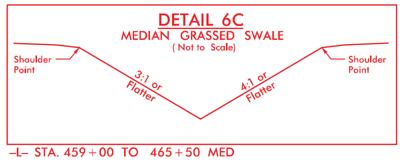
PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

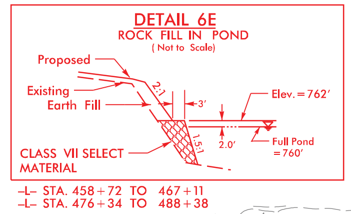
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

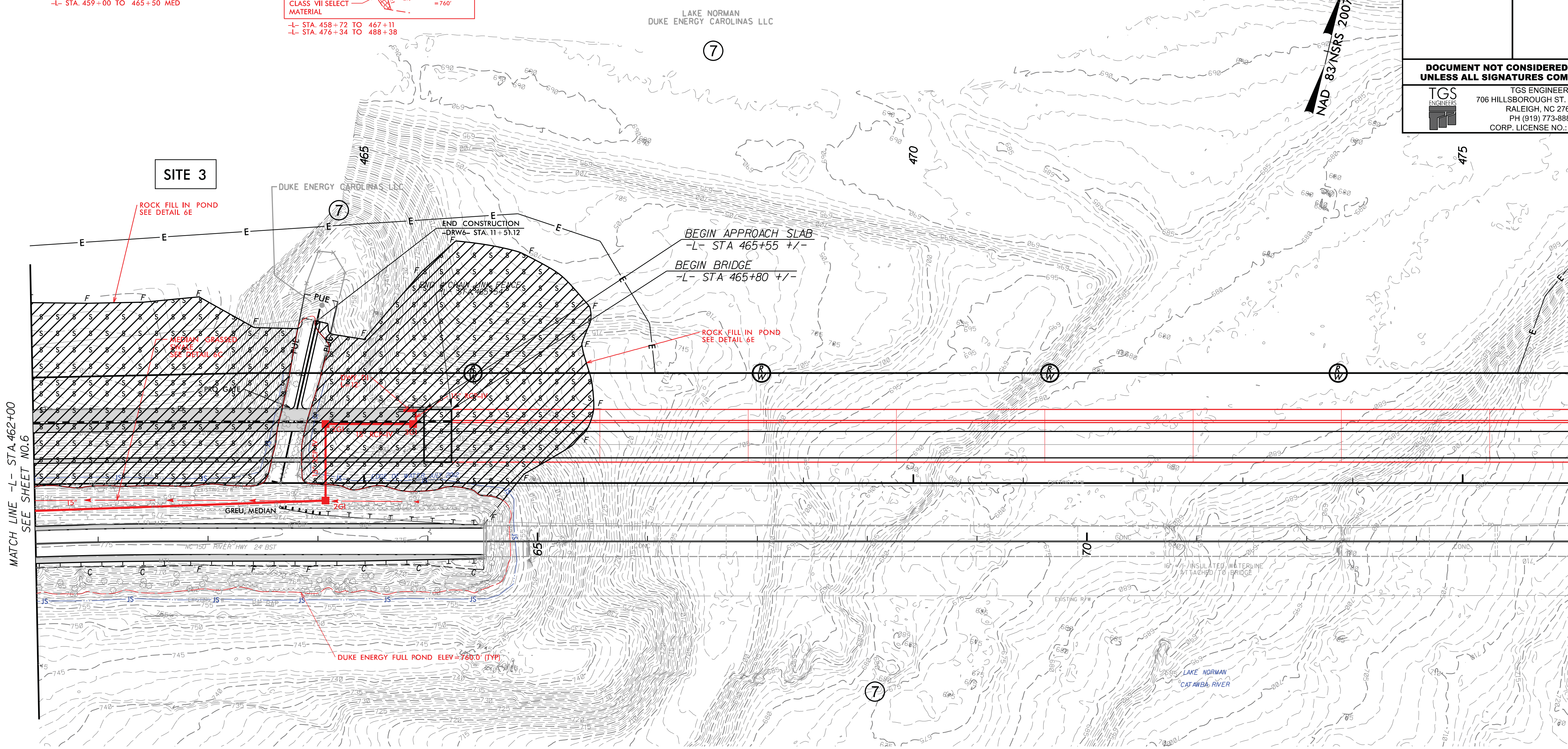
TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

PERMIT DRAWING
SHEET 5 OF 22

S S — DENOTES IMPACTS IN SURFACE WATER







50' 0' 50' 100'
25'

MATCH LINE -L- STA.476+00
SEE SHEET NO.8

SEE SHEET 39 FOR -L- PROFILE
SEE SHEETS 53 THRU 54 FOR -LEB- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA

7/11/2018
X:\NCDOT\R-2307B\Hydraulics\PERMITS_Environmental\Drawings\R-2307B_RDY_PSH_07.dgn

5/14/99

TGS ENGINEERS
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CORP. LICENSE NO.: C-0275

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EXISTING GROUND
PROPOSED GRADE
LEFT DITCH GRADE
RIGHT DITCH GRADE

PERMIT DRAWING
SHEET 6 OF 22

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L–
NC 150

BEGIN BRIDGE
–L– STA. 465+80 +/–

PI = 471+75.00
EL = 785.76'
VC = 500'
K = 352
V = 75 MPH

(+) 0.7195%

(–) 0.6995%

(+) 0.3000%

END MED GRASSED SWALE
–L– STA 465+50 MED
EL=772.73

12.0' MIN. REQUIRED VERTICAL CLEARANCE OVER FULL POND

MIN. LOW BEAM ELEV. REQUIRED = 772.00'

FULL POND ELEV. = 760.00' PER DUKE ENERGY

EXISTING BRIDGE TO BE RETAINED

840 830 820 810 800 790 780 770 760 750 740 730 720 710 700 690 680 670 660 650 640

462 463 464 465 466 467 468 469 470 471 472 473 474 475 476

7/2/2008
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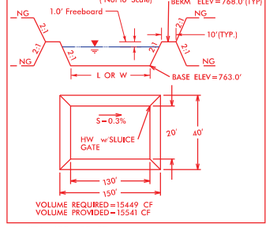
User:gstu

8/17/99

DETAIL 8C
HAZARDOUS SPILL BASIN
(Not to Scale)

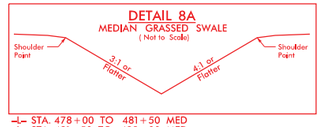


-L- STA 488+59 RT

S S — DENOTES IMPACTS IN SURFACE WATER

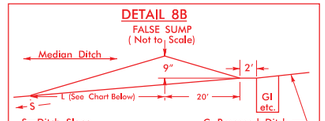
TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 8A
MEDIAN GRASSED SWALE
(Not to Scale)



-L- STA. 478+00 TO 481+50 MED
-L- STA. 481+50 TO 488+00 MED

DETAIL 8B
FALSE SUMP
(Not to Scale)

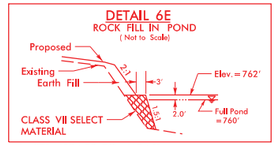


S=Ditch Slope ℄ Proposed Ditch

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

-L- STA. 584+90 MED

DETAIL 6E
ROCK FILL IN POND
(Not to Scale)



-L- STA. 458+72 TO 467+11
-L- STA. 476+34 TO 488+38

LAKE NORMAN
DUKE ENERGY CAROLINAS LLC
7

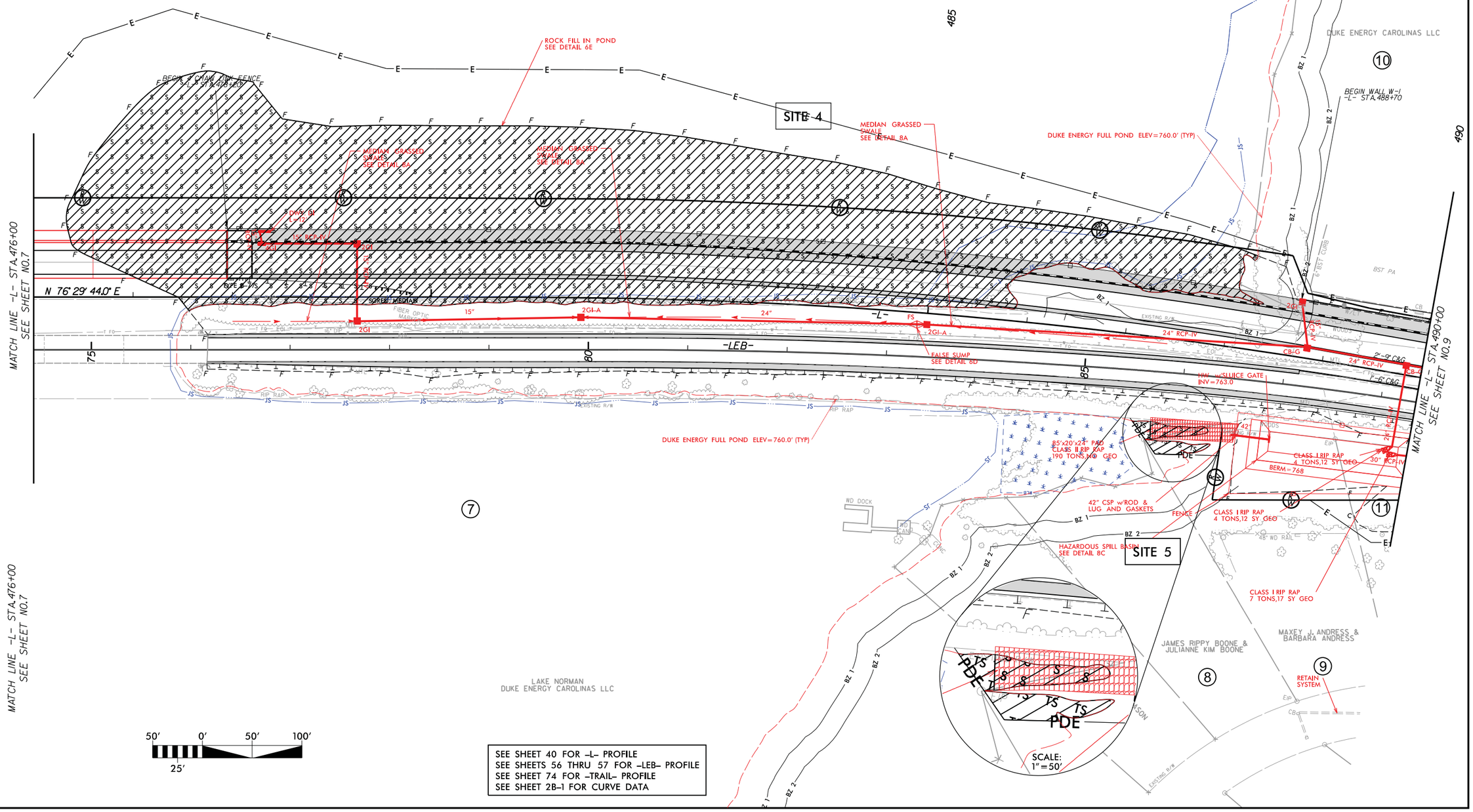
PERMIT DRAWING
SHEET 7 OF 22

NAD 83/NSRS 2007

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



SEE SHEET 40 FOR -L- PROFILE
SEE SHEETS 56 THRU 57 FOR -LEB- PROFILE
SEE SHEET 74 FOR -TRAIL- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA

7/2/2018
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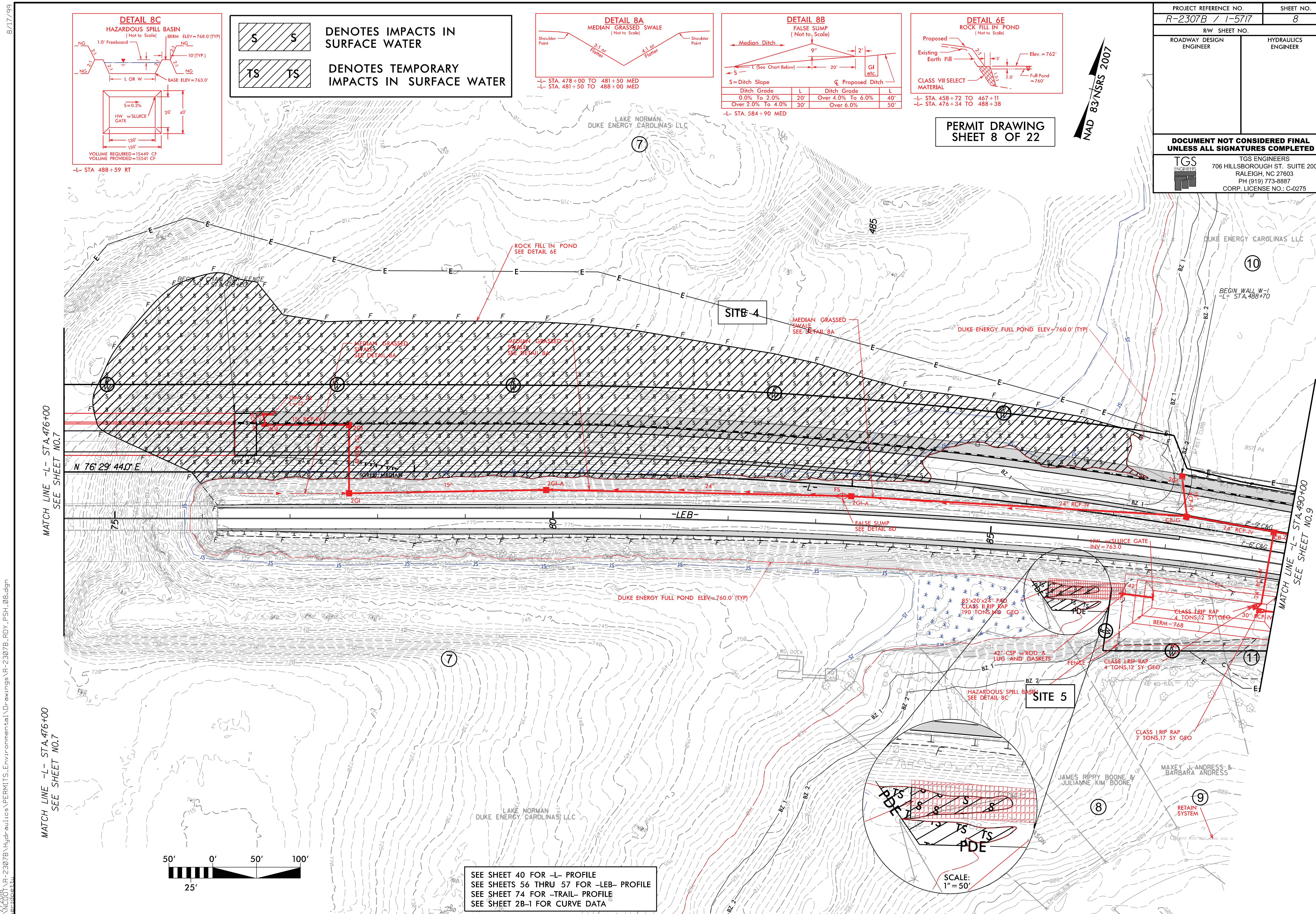
User:dpatton



PROJECT REFERENCE NO. R-2307B / I-5717
SHEET NO. 8
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
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RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275
PERMIT DRAWING SHEET 8 OF 22
NAD 83/NSRS 2007
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DETAIL 8C
HAZARDOUS SPILL BASIN
(Not to Scale)
VOLUME REQUIRED=15449 CF
VOLUME PROVIDED=15541 CF
-L- STA 488+59 RT
DETAIL 8A
MEDIAN GRASSED SWALE
(Not to Scale)
-L- STA. 478+00 TO 481+50 MED
-L- STA. 481+50 TO 488+00 MED
DETAIL 8B
FALSE SUMP
(Not to Scale)
S=Ditch Slope
Ditch Grade L Ditch Grade L
0.0% To 2.0% 20' Over 4.0% To 6.0% 40'
Over 2.0% To 4.0% 30' Over 6.0% 50'
-L- STA. 584+90 MED
DETAIL 6E
ROCK FILL IN POND
(Not to Scale)
CLASS VII SELECT MATERIAL
-L- STA. 458+72 TO 467+11
-L- STA. 476+34 TO 488+38
LAKE NORMAN
DUKE ENERGY CAROLINAS LLC
ROCK FILL IN POND SEE DETAIL 6E
SITE 4
SITE 5
MEDIAN GRASSED SWALE SEE DETAIL 8A
DUKE ENERGY FULL POND ELEV=760.0' (TYP)
FALSE SUMP SEE DETAIL 8D
HW w/SLUICE GATE INV=763.0
85'x20'x24" PAD CLASS II RIP RAP 190 TONS,160 SY GEO
42" CSP w/ROD & LUG AND GASKETS
CLASS I RIP RAP 4 TONS,12 SY GEO
CLASS I RIP RAP 7 TONS,17 SY GEO
HAZARDOUS SPILL BASIN SEE DETAIL 8C
BERM=768
FENCE
BEGIN WALL W-1 -L- STA 488+70
N 76°29'44.0" E
-LEB-
-L-
MATCH LINE -L- STA 476+00 SEE SHEET NO.7
MATCH LINE -L- STA 490+00 SEE SHEET NO.9
JAMES RIPPY BOONE & JULIANNE KIM BOONE
MAXEY J. ANDRESS & BARBARA ANDRESS
RETAIN SYSTEM
PDE
SCALE: 1"=50'
50' 0' 50' 100'
25'
SEE SHEET 40 FOR -L- PROFILE
SEE SHEETS 56 THRU 57 FOR -LEB- PROFILE
SEE SHEET 74 FOR -TRAIL- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
8/17/99

5/14/99

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RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	40
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EXISTING GROUND
PROPOSED GRADE
LEFT DITCH GRADE
RIGHT DITCH GRADE

PERMIT DRAWING
SHEET 9 OF 22

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L–
NC 150

END BRIDGE
–L– STA. 477+95 +/–

PI = 482+80.00
EL = 778.03'
VC = 300'
K = 750
V > 80 MPH

(–)0.6995%
(–) 0.4000%
(–)0.3000%
(+) 0.3000%

12.0' MIN. REQUIRED VERTICAL CLEARANCE OVER FULL POND

BEGIN MED GRASSED SWALE
–L– STA 478+00 MED
EL=773.01

PI MED GRASSED SWALE
–L– STA 481+50 MED
EL=771.61

END MED GRASSED SWALE
–L– STA 488+00 MED
EL=773.56

MIN. LOW BEAM ELEV. REQUIRED = 772.00'

FULL POND ELEV. = 760.00'
PER DUKE ENERGY

840 830 820 810 800 790 780 770 760 750 740 730 720 710 700 690 680 670 660 650 640

476 477 478 479 480 481 482 483 484 485 486 487 488 489 490

7/2/2018
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User:gpatty

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

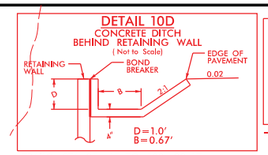
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

PERMIT DRAWING SHEET 10 OF 22

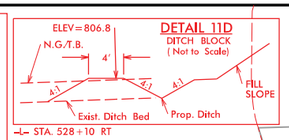
NAD 83 NSRS 2007

DETAIL 10D
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)



-TRAIL2- STA. 95+65 TO 100+88 LT
(SEE XSC FOR GRADE)

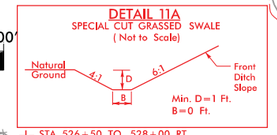
DETAIL 11D
DITCH BLOCK
(Not to Scale)



-L- STA. 528+10 RT

50' 0' 50' 100'
25'

DETAIL 11A
SPECIAL CUT GRASSED SWALE
(Not to Scale)



-L- STA. 526+50 TO 528+00 RT

PINNACLE SHORES OWNERS ASSOCIATION INC

REX A STUMP & KIMBERLY A STUMP

ANGELA S & DANIEL C HARRIS

JESSE JAMES THOMAS III & ROSEANN THOMAS

PINNACLE SHORES OWNERS ASSOC. INC.

DUKE ENERGY FULL POND ELEV=760.0' (TYP)

150' DUKE POWER R/W DB 481PG 91

BEGIN CONSTRUCTION -Y5- STA. 13+50.00

END 4' CHAIN LINK FENCE -TRAIL 2- STA.103+00

END WALL W-2 -L- STA.522+10

CONCRETE DITCH BEHIND RET WALL SEE DETAIL 10D

CLASS B RIP RAP 1 TON5,5 SY GEO

CLASS B RIP RAP 2 TON5,7 SY GEO

GREU 350 TL-3

MATCH LINE -L- STA.518+00 SEE SHEET NO.10

MATCH LINE -L- STA.532+00 SEE SHEET NO.12

SPECIAL CUT GRASSED SWALE SEE DETAIL 11A

LATERAL GRASSED SWALE SEE DETAIL 11B

DITCH BLOCK SEE DETAIL 11D

STANDARD BASE DITCH SEE DETAIL 11C

50'x20'x18" PAD CLASS I RIP RAP 80 TONS,NO GEO

SITE 6

SCALE: 1"=50'

DUKE ENERGY CAROLINAS LLC

22

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

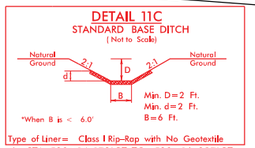
PTE PERMANENT TRAIL EASEMENT

SEE SHEET 42 FOR -L- PROFILE
SEE SHEET 57 FOR -Y5- PROFILE
SEE SHEET 71 FOR -DRW2- PROFILE
SEE SHEETS 74 & 75 -TRAIL2- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-4 FOR INTERSECTION DETAILS

S S DENOTES IMPACTS IN SURFACE WATER

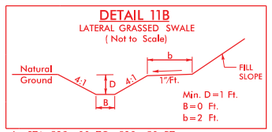
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 11C
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class I Rip-Rap with No Geotextile
-L- STA. 520+14.173' RT TO 520+16.287' RT
(DAYLIGHT AT 7.0%)

DETAIL 11B
LATERAL GRASSED SWALE
(Not to Scale)



-L- STA. 528+00 TO 529+50 RT

7/2/2018
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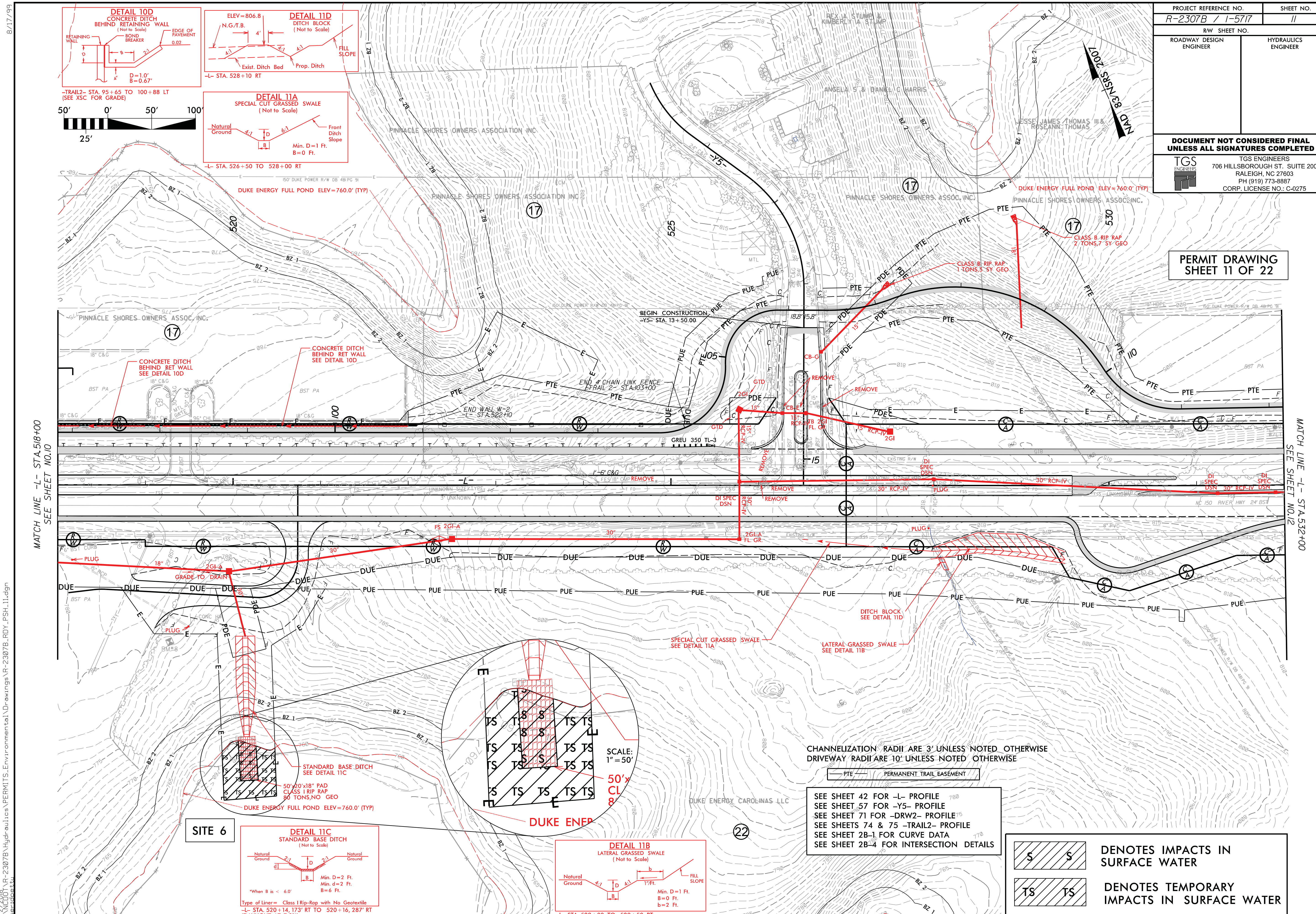
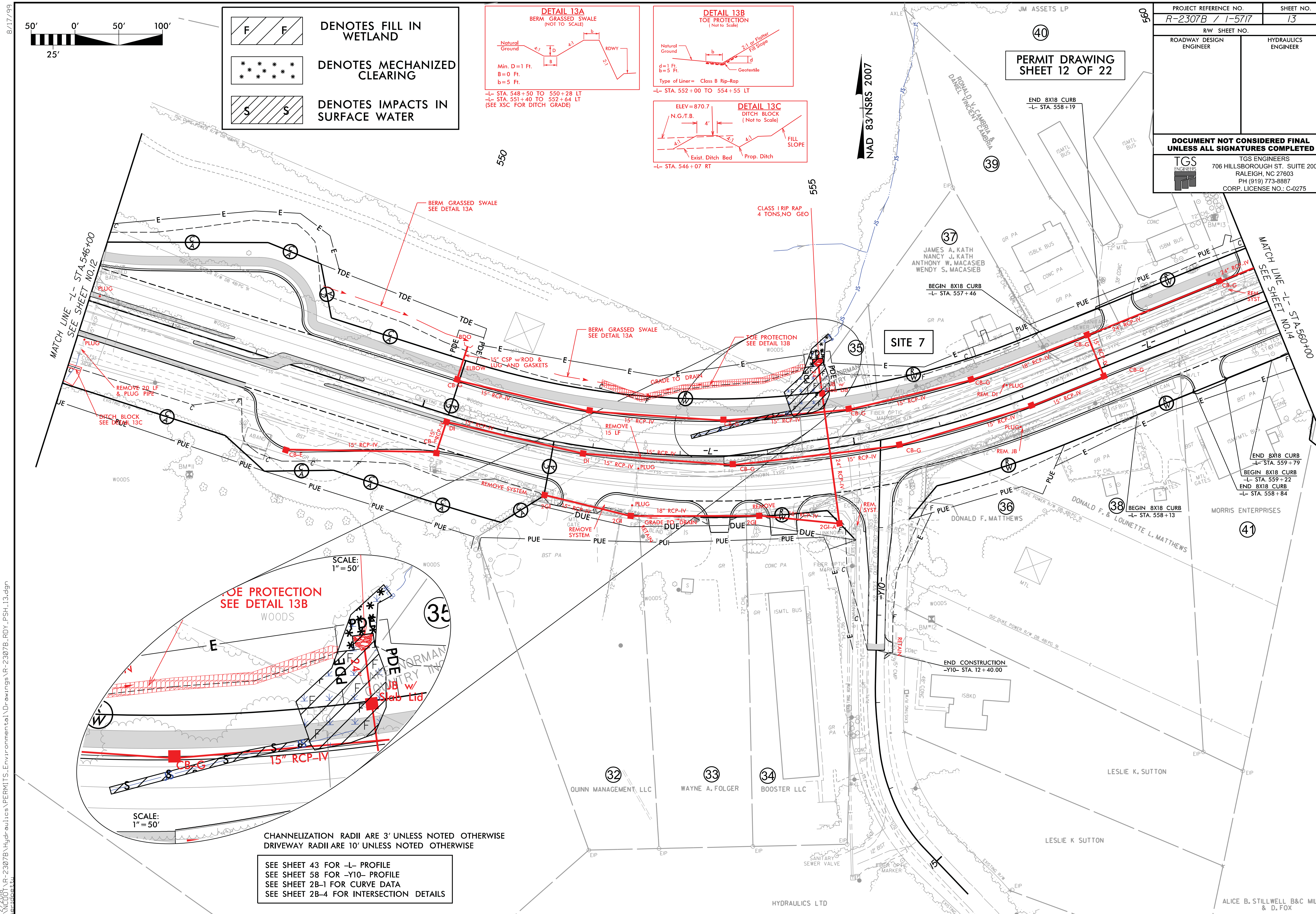
User:jdesty



PROJECT REFERENCE NO.
SHEET NO.
R-2307B / I-5717
11
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
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
PERMIT DRAWING SHEET 11 OF 22
NAD 83/NSRS 2007
DETAIL 10D
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)
RETAINING WALL
BOND BREAKER
EDGE OF PAVEMENT
D=1.0'
B=0.67'
-TRAIL2- STA. 95+65 TO 100+88 LT
(SEE XSC FOR GRADE)
DETAIL 11D
DITCH BLOCK
(Not to Scale)
ELEV=806.8
N.G.T.B.
Exist. Ditch Bed
Prop. Ditch
FILL SLOPE
-L- STA. 528+10 RT
DETAIL 11A
SPECIAL CUT GRASSED SWALE
(Not to Scale)
Natural Ground
Front Ditch Slope
Min. D=1 Ft.
B=0 Ft.
-L- STA. 526+50 TO 528+00 RT
50' 0' 50' 100'
25'
DUKE ENERGY FULL POND ELEV=760.0' (TYP)
PINNACLE SHORES OWNERS ASSOCIATION INC
PINNACLE SHORES OWNERS ASSOC. INC.
REX W. STUMP & KIMBERLY A. STUMP
ANGELA S. & DANIEL G. HARRIS
JESSE JAMES THOMAS III & ROSEANN THOMAS
CLASS B RIP RAP 2 TONS, 7 SY GEO
CLASS B RIP RAP 1 TONS, 5 SY GEO
BEGIN CONSTRUCTION -Y5- STA. 13+50.00
CONCRETE DITCH BEHIND RET WALL SEE DETAIL 10D
END 4' CHAIN LINK FENCE -TRAIL 2- STA. 103+00
END WALL W-2 -L- STA. 522+10
MATCH LINE -L- STA. 518+00 SEE SHEET NO. 10
MATCH LINE -L- STA. 532+00 SEE SHEET NO. 12
GRADE TO DRAIN
DITCH BLOCK SEE DETAIL 11D
SPECIAL CUT GRASSED SWALE SEE DETAIL 11A
LATERAL GRASSED SWALE SEE DETAIL 11B
STANDARD BASE DITCH SEE DETAIL 11C
50'x20'x18" PAD CLASS I RIP RAP 80 TONS, NO GEO
DUKE ENERGY FULL POND ELEV=760.0' (TYP)
SCALE: 1"=50'
SITE 6
DUKE ENERGY CAROLINAS LLC
CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE
PTE PERMANENT TRAIL EASEMENT
SEE SHEET 42 FOR -L- PROFILE
SEE SHEET 57 FOR -Y5- PROFILE
SEE SHEET 71 FOR -DRW2- PROFILE
SEE SHEETS 74 & 75 -TRAIL2- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-4 FOR INTERSECTION DETAILS
DETAIL 11C
STANDARD BASE DITCH
(Not to Scale)
Natural Ground
Min. D=2 Ft.
Min. d=2 Ft.
B=6 Ft.
*When B is < 6.0'
Type of Liner= Class I Rip-Rap with No Geotextile
-L- STA. 520+14, 173' RT TO 520+16, 287' RT
(DAYLIGHT AT 7.0%)
DETAIL 11B
LATERAL GRASSED SWALE
(Not to Scale)
Natural Ground
FILL SLOPE
Min. D=1 Ft.
B=0 Ft.
b=2 Ft.
-L- STA. 528+00 TO 529+50 RT
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
8/17/99



PROJECT REFERENCE NO.
R-2307B / I-5717
SHEET NO.
13
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
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
PERMIT DRAWING
SHEET 12 OF 22
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES IMPACTS IN SURFACE WATER
DETAIL 13A
BERM GRASSED SWALE
(NOT TO SCALE)
-L- STA. 548+50 TO 550+28 LT
-L- STA. 551+40 TO 552+64 LT
(SEE XSC FOR DITCH GRADE)
DETAIL 13B
TOE PROTECTION
(Not to Scale)
Type of Liner= Class B Rip-Rap
-L- STA. 552+00 TO 554+55 LT
DETAIL 13C
DITCH BLOCK
(Not to Scale)
-L- STA. 546+07 RT
NAD 83/NSRS 2007
MATCH LINE -L- STA.546+00 SEE SHEET NO.12
MATCH LINE -L- STA.560+00 SEE SHEET NO.14
SITE 7
BERM GRASSED SWALE SEE DETAIL 13A
TOE PROTECTION SEE DETAIL 13B
CLASS I RIP RAP 4 TONS,NO GEO
DITCH BLOCK SEE DETAIL 13C
BEGIN 8X18 CURB -L- STA. 557+46
END 8X18 CURB -L- STA. 558+19
END CONSTRUCTION -Y10- STA. 12+40.00
JM ASSETS LP
RONALD V. CAMBRIA & DANIEL VINCENT CAMBRIA
JAMES A. KATH
NANCY J. KATH
ANTHONY W. MACASIEB
WENDY S. MACASIEB
DONALD F. MATTHEWS
DONALD F. & LOUNETTE L. MATTHEWS
MORRIS ENTERPRISES
QUINN MANAGEMENT LLC
WAYNE A. FOLGER
BOOSTER LLC
LESLIE K. SUTTON
HYDRAULICS LTD
ALICE B. STILLWELL B&C MILLS & D. FOX
TOE PROTECTION SEE DETAIL 13B
SCALE: 1"=50'
CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE
SEE SHEET 43 FOR -L- PROFILE
SEE SHEET 58 FOR -Y10- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-4 FOR INTERSECTION DETAILS

8/17/99

50' 0' 50' 100'
25'

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

DETAIL 13A
BERM GRASSED SWALE
(NOT TO SCALE)

Natural Ground, 4:1, D, B, b, 4:1, RDWY, 2:1
Min. D=1 Ft.
B=0 Ft.
b=5 Ft.

–L– STA. 548+50 TO 550+28 LT
–L– STA. 551+40 TO 552+64 LT
(SEE XSC FOR DITCH GRADE)

DETAIL 13B
TOE PROTECTION
(Not to Scale)

Natural Ground, b, 2:1 or Flatter Fill Slope, d, Geotextile
d=1 Ft.
b=5 Ft.
Type of Liner= Class B Rip-Rap

–L– STA. 552+00 TO 554+55 LT

DETAIL 13C
DITCH BLOCK
(Not to Scale)

ELEV=870.7, N.G./T.B., 4', 4:1, 4:1, FILL SLOPE, Exist. Ditch Bed, Prop. Ditch

–L– STA. 546+07 RT

NAD 83/NSRS 2007

PERMIT DRAWING
SHEET 13 OF 22

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

MATCH LINE –L– STA.546+00 SEE SHEET NO.12

MATCH LINE –L– STA.560+00 SEE SHEET NO.14

BERM GRASSED SWALE SEE DETAIL 13A

CLASS I RIP RAP 4 TONS,NO GEO

TOE PROTECTION SEE DETAIL 13B

REMOVE 20 LF & PLUG PIPE

DITCH BLOCK SEE DETAIL 13C

15" CSP w/ROD & LUG AND GASKETS

ELBOW

GRADE TO DRAIN

REMOVE 15 LF

REMOVE SYSTEM

SITE 7

BEGIN 8X18 CURB
–L– STA. 557+46

END 8X18 CURB
–L– STA. 558+19

END 8X18 CURB
–L– STA. 559+79

BEGIN 8X18 CURB
–L– STA. 559+22

END 8X18 CURB
–L– STA. 558+84

BEGIN 8X18 CURB
–L– STA. 558+13

END CONSTRUCTION
–Y10– STA. 12+40.00

SCALE:
1"=50'

SCALE:
1"=50'

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 43 FOR –L– PROFILE
SEE SHEET 58 FOR –Y10– PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-4 FOR INTERSECTION DETAILS

JAMES A. KATH
NANCY G. KATH
ANTHONY W. MACASIEB
WENDY S. MACASIEB

DONALD F. MATTHEWS

LESLIE K. SUTTON

QUINN MANAGEMENT, LLC

WAYNE A. FOLGER

BOOSTER LLC

HYDRAULICS LTD

MORRIS ENTERPRISES

ALICE B. STILLWELL, B&C MILLS & D.FOX

7/2/2018
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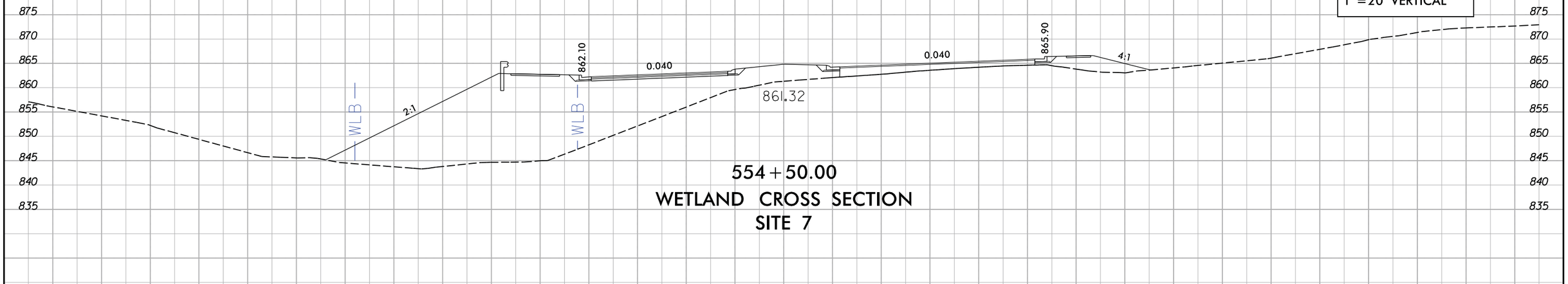
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2307B	X-69

PERMIT DRAWING
SHEET 14 OF 22

F F DENOTES FILL IN WETLAND

SCALE
1" = 20' HORIZONTAL
1" = 20' VERTICAL



554+50.00
WETLAND CROSS SECTION
SITE 7

7/2/2018
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CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 50 FOR -L- PROFILE
SEE SHEET 67 FOR -Y34- &-Y35- PROFILES
SEE SHEET 68 FOR -Y36- &-Y37- PROFILES
SEE SHEETS 2B-1 & 2B-3 FOR CURVE DATA
SEE SHEET 26A FOR R/W & EASEMENT DATA

PERMIT DRAWING SHEET 15 OF 22

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/NSRS 2007

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

REVISIONS
10-5-2017 REVISED EASEMENTS ON PARCELS 218,219 & 222

MOORESVILLE PARTNERS LIMITED
BROOKHAVEN HOMEOWNERS ASSOC INC
PM PREFERRED PROPERTIES LP
TRICOR MOORESVILLE LLC
BELK CHARLOTTE INC.
NATIONSBANK OF NC
CNL FUNDING 2000 A LP
BRANFUL LLC
SUSO 4 MOORESVILLE CS LP
FFC LIMITED PARTNERSHIP
JANE MELLON BOFENKAMP & MARY F MELLON
AUTOBELL CAR WASH INC
CAM LEASING CORPORATION
OMEGA SEAFOOD INC

BEGIN CONSTRUCTION -Y34- STA. 10+20.00
BEGIN CONSTRUCTION -Y37- STA. 10+92.30
END CONSTRUCTION -Y35- STA. 14+70.00
END CONSTRUCT 2'-6" C&G -L- STA.750+99-75/+25
END CONSTRUCTION -Y36- STA. 14+50.00

MATCH LINE -L- STA.742+00 SEE SHEET NO.25
MATCH LINE -L- STA.756+00 SEE SHEET NO.27

SCALE: 1" = 50'

SITE 8
SITE 9

IMPACTS IN SURFACE WATER
TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 26B
PIPE INLET CHANNEL
(Not to Scale)
*CLASS I RIP-RAP SHALL BE BACKFILLED WITH NATIVE MATERIAL TO FILL VOIDS.
-L- STA. 755+26 LT

DETAIL 26A
PIPE OUTLET CHANNEL
(Not to Scale)
Length=20 Ft.
d=5 Ft.
*CLASS I RIP-RAP SHALL BE BACKFILLED WITH NATIVE MATERIAL TO FILL VOIDS.
-L- STA. 755+50 RT

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

REVISIONS

8/17/99

10-5-2017 REVISED EASEMENTS ON PARCELS 218,219 & 222

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 50 FOR -L- PROFILE
SEE SHEET 67 FOR -Y34- &-Y35- PROFILES
SEE SHEET 68 FOR -Y36- &-Y37- PROFILES
SEE SHEETS 2B-1 & 2B-3 FOR CURVE DATA
SEE SHEET 26A FOR R/W & EASEMENT DATA

PERMIT DRAWING
SHEET 16 OF 22

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/NSRS 2007

50' 0' 50' 100'
25'

MOORESVILLE PARTNERS LIMITED
BROOKHAVEN HOMEOWNERS ASSOC INC
PM PREFERRED PROPERTIES LP
TRICOR MOORESVILLE LLC
BELK CHARLOTTE INC.
NATIONSBANK OF NC
CNL FUNDING 2000 A LP
BRANFUL LLC
FFC LIMITED PARTNERSHIP
JANE MELLON BOFENKAMP & MARY F MELLON
AUTOBELL CAR WASH INC
CAM LEASING CORPORATION
SUSO 4 MOORESVILLE GS LP
OMEGA SEAFOOD INC

BEGIN CONSTRUCTION -Y34- STA. 10+20.00
BEGIN CONSTRUCTION -Y37- STA. 10+92.30
BEGIN 2'-6" C&G -Y34- STA.12+51
CONSTRUCT 2'-6" C&G -L- STA.750+99-75/+25
END 2'-6" C&G -L- STA.748+62
END CONSTRUCTION -Y35- STA. 14+70.00
END CONSTRUCTION -Y36- STA. 14+50.00

BEGIN WALL W-25 -L- STA.742+25
END WALL W-25 -L- STA.744+10
BEGIN WALL W-26 -L- STA.744+90
END WALL W-26 -L- STA.748+20
BEGIN WALL W-27 -L- STA.746+55
END WALL W-27 -L- STA.747+00
BEGIN WALL W-28 -L- STA.748+25
END WALL W-28 -L- STA.748+75
END WALL W-24 STA.144+25
BEGIN 8'x8' CURB -L- STA.743+15.39
END 8'x8' CURB -Y35- STA.11+69.96

MATCH LINE -L- STA.742+00 SEE SHEET NO.25

MATCH LINE -L- STA.756+00 SEE SHEET NO.27

SCALE: 1" = 50'

SITE 8

SITE 9

DETAIL 26B
PIPE INLET CHANNEL
(Not to Scale)

Length = 12 Ft.

*CLASS I RIP-RAP SHALL BE BACKFILLED WITH NATIVE MATERIAL TO FILL VOIDS.

-L- STA. 755+26 LT

DETAIL 26A
PIPE OUTLET CHANNEL
(Not to Scale)

Length = 20 Ft.
d = 5 Ft.

*CLASS I RIP-RAP SHALL BE BACKFILLED WITH NATIVE MATERIAL TO FILL VOIDS.

-L- STA. 755+50 RT

IMPACTS IN SURFACE WATER

TEMPORARY IMPACTS IN SURFACE WATER

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	29
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

PERMIT DRAWING SHEET 17 OF 22

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100'
25'

NAD 83\NSRS 2007

262 DAWN PROPERTIES LLC

268 BEK PROPERTIES LLC

269 CHRISTOPHER & KIMBERLY MEDFORD

271 DONALD L HORTON

DLH FAMILY PROPERTIES LLP

270 BEK PROPERTIES LLC

273 MOORESVILLE COMMONS LLC

10

785

790

BEGIN CONSTRUCTION –Y45– STA. 10+50.00

BEGIN CONSTRUCTION –Y41– STA. 12+50.00

BEGIN 8X18 CURB –Y41– STA. 12+78.18

END 8X18 CURB –Y41– STA. 13+22.58

MATCH LINE –L– STA.783+00 SEE SHEET NO.28

MATCH LINE –L– STA.793+00 SEE SHEET NO.30

SITE 10

SITE 11

SCALE: 1"=50'

SCALE: 1"=50'

PIPE OUTLET CHANNEL SEE DETAIL 29A

PIPE OUTLET CHANNEL SEE DETAIL 29B

24" CSP W/ROD & LUG, GASKETS, & 2 ELBOWS

30" CSP W/ROD & LUG, GASKETS, & 2 ELBOWS

COLLAR & EXTEND W/ 78" RCP–IV

OFFSET MH BEHIND CURB REMOVE 32LF EX. 78" BCCMP

6" BEVEL INLET TOP & SIDES

REMOVE 56 LF

FLOWABLE FILL

RETAIN SYSTEM

END CONSTRUCTION –Y42– STA. 11+50.00

IMPACTS IN SURFACE WATER

TEMPORARY IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER

TEMPORARY IMPACTS IN SURFACE WATER

–Y40– MACLEOD — 2019 ADT 2039 ADT

500 / 980 | 250 / 490 | 250 / 490 | 39,470 / 51,310 | –L– NC 150 | 40,640 / 52,800 | 1,440 / 1,600 | 2,600 / 3,080 | 4,030 / 4,670

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 51 FOR –L– PROFILE
SEE SHEET 70 FOR –Y41– & –Y42– PROFILES
SEE SHEET 29A FOR R/W & EASEMENT DATA

DETAIL 29A
PIPE OUTLET CHANNEL
(Not to Scale)

*CLASS I RIP-RAP SHALL BE BACKFILLED WITH NATIVE MATERIAL TO FILL VOIDS.

–L– STA. 784+65 RT

DETAIL 29B
PIPE OUTLET CHANNEL
(Not to Scale)

*CLASS I RIP-RAP SHALL BE BACKFILLED WITH NATIVE MATERIAL TO FILL VOIDS.

–L– STA. 792+60 RT

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User:dstw

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	29
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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CORP. LICENSE NO.: C-0275

PERMIT DRAWING SHEET 18 OF 22

NAD 83 NSRS 2007

50′ 0′ 50′ 100′
25′

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCH LINE –L– STA.783+00 SEE SHEET NO.28

MATCH LINE –L– STA.793+00 SEE SHEET NO.30

BEGIN CONSTRUCTION –Y45– STA. 10+50.00

BEGIN CONSTRUCTION –Y41– STA. 12+50.00

BEGIN 8X18 CURB –Y41– STA. 12+78.18

END 8X18 CURB –Y41– STA. 13+22.58

END CONSTRUCTION –Y42– STA. 11+50.00

SITE 10

SITE 11

SCALE: 1″=50′

SCALE: 1″=50′

IMPACTS IN SURFACE WATER

TEMPORARY IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER

TEMPORARY IMPACTS IN SURFACE WATER

–Y40– MACLEOD

2019 ADT
2039 ADT

500 980
39,470 51,310
250 490
250 490
–L– NC 150
1,440 1,600
2,600 3,080
40,640 52,800
4,030 4,670

–Y40– MACLEOD

CHANNELIZATION RADII ARE 3′ UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10′ UNLESS NOTED OTHERWISE

SEE SHEET 51 FOR –L– PROFILE
SEE SHEET 70 FOR –Y41– & –Y42– PROFILES
SEE SHEET 29A FOR R/W & EASEMENT DATA

DETAIL 29A
PIPE OUTLET CHANNEL
(Not to Scale)

Length=29 Ft.
d=6.5 Ft.

*CLASS I RIP-RAP SHALL BE BACKFILLED WITH NATIVE MATERIAL TO FILL VOIDS.

–L– STA. 784+65 RT

DETAIL 29B
PIPE OUTLET CHANNEL
(Not to Scale)

Length=23 Ft.
d=5 Ft.

*CLASS I RIP-RAP SHALL BE BACKFILLED WITH NATIVE MATERIAL TO FILL VOIDS.

–L– STA. 792+60 RT

7/2/2018
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User:dstu

5/14/99

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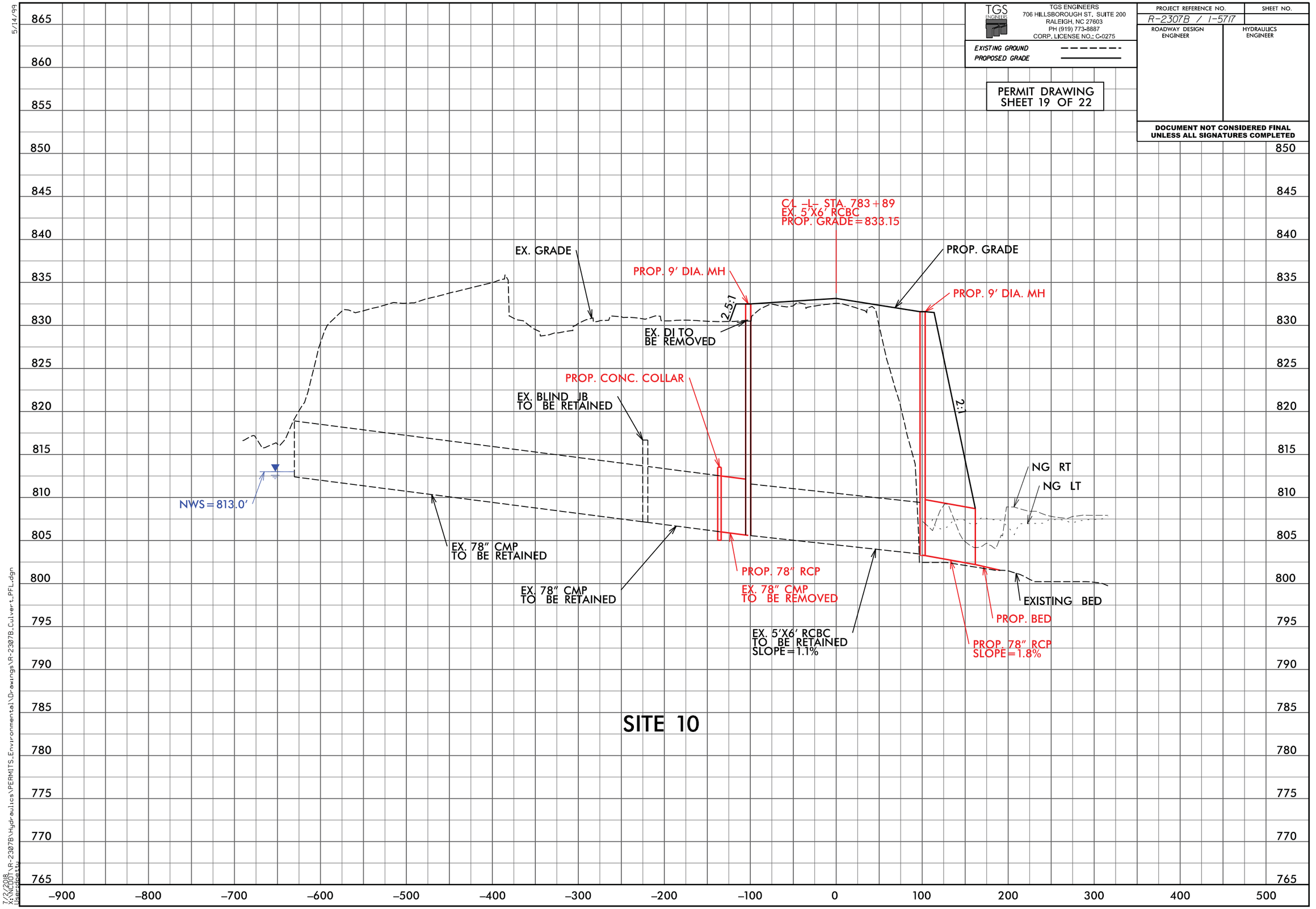
706 HILLSBOROUGH ST, SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

EXISTING GROUND
PROPOSED GRADE

PERMIT DRAWING
SHEET 19 OF 22

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	30
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

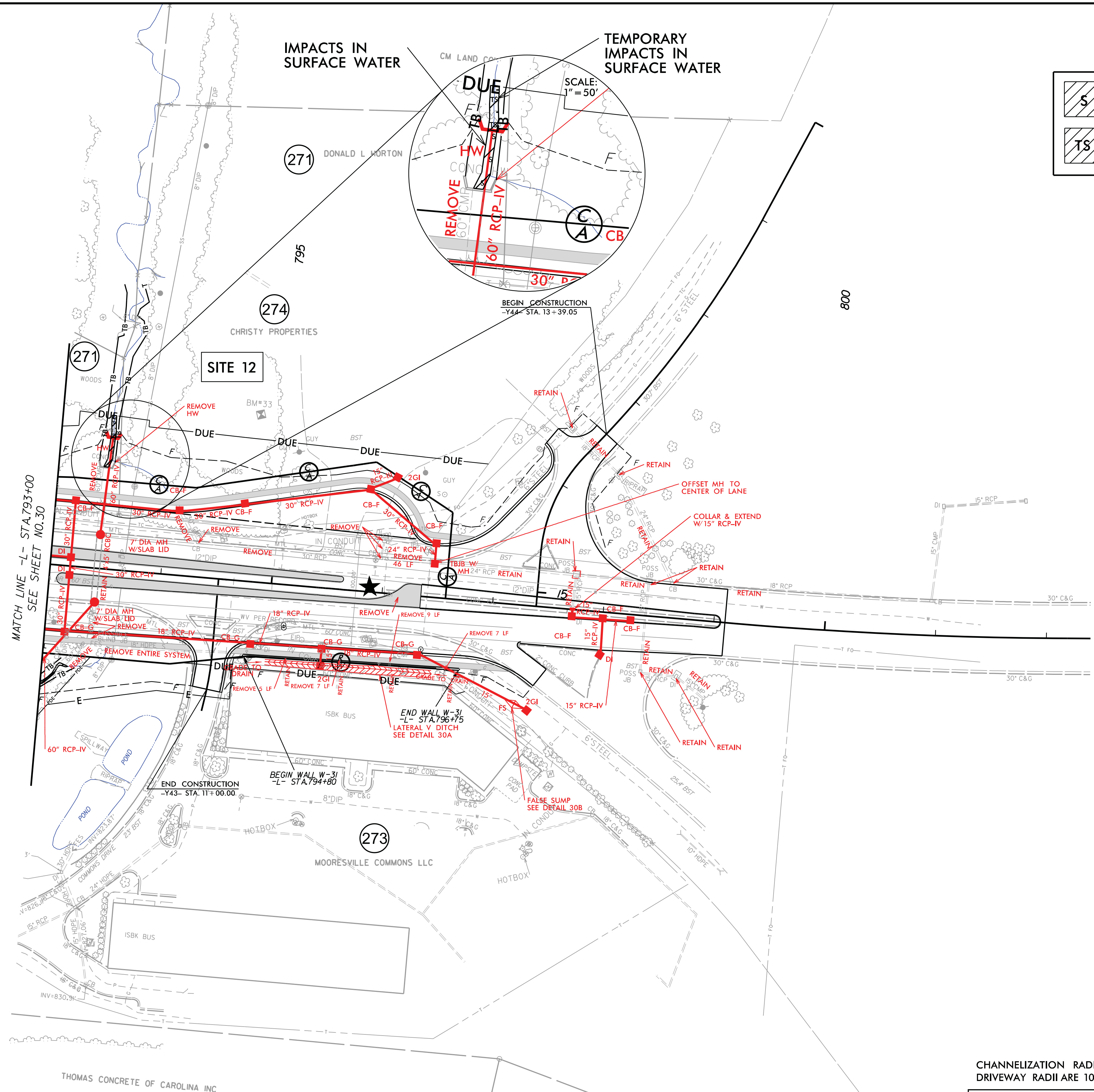
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

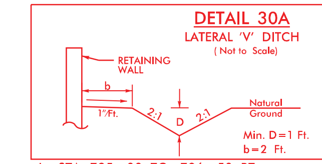
PERMIT DRAWING
SHEET 20 OF 22

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

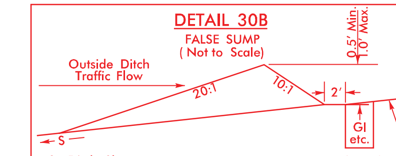


DETAIL 30A
LATERAL 'V' DITCH
(Not to Scale)



-L- STA 795+00 TO 796+50 RT

DETAIL 30B
FALSE SUMP
(Not to Scale)



-L- STA 797+27 RT

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 52 FOR -L- PROFILE
SEE SHEET 70 FOR -Y43- & -Y44- PROFILES
SEE SHEETS 2B-1 & 2B-3 FOR CURVE DATA
SEE SHEET 30A FOR R/W & EASEMENT DATA

10-5-2017 REVISED DUES ON PARCELS 271 & 274.

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	30
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 21 OF 22

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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

IMPACTS IN SURFACE WATER

TEMPORARY IMPACTS IN SURFACE WATER

SCALE: 1" = 50'

50' 0' 50' 100'
25'

NAD 83 NSRS 2007

SITE 12

DONALD L. HORTON

CHRISTY PROPERTIES

MOORESVILLE COMMONS LLC

CROMAX CONCRETE OF CAROLINA INC

BEGIN CONSTRUCTION -Y44- STA. 13+39.05

END CONSTRUCTION -Y43- STA. 11+00.00

BEGIN WALL W-31 -L- STA.794+80

END WALL W-31 -L- STA.796+75
LATERAL V DITCH
SEE DETAIL 30A

FALSE SUMP
SEE DETAIL 30B

OFFSET MH TO CENTER OF LANE

COLLAR & EXTEND W/ 15" RCP-IV

MATCH LINE -L- STA.793+00
SEE SHEET NO.30

10-5-2017 REVISED DUES ON PARCELS 271 & 274.

7/2/2018
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User:dpetty

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 52 FOR -L- PROFILE
SEE SHEET 70 FOR -Y43- & -Y44- PROFILES
SEE SHEETS 2B-1 & 2B-3 FOR CURVE DATA
SEE SHEET 30A FOR R/W & EASEMENT DATA

DETAIL 30A
LATERAL 'V' DITCH
(Not to Scale)

RETAINING WALL
b
1' Ft.
2:1
D
2:1
Natural Ground
Min. D=1 Ft.
b=2 Ft.

-L- STA 795+00 TO 796+50 RT

DETAIL 30B
FALSE SUMP
(Not to Scale)

0.5' Min.
1.0' Max.
Outside Ditch Traffic Flow
20:1
10:1
2'
GI etc.
S
S=Ditch Slope
℄ Proposed Ditch

-L- STA 797+27 RT

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	-L- 453+21/453+40 LT	18" PIPE						< 0.01	< 0.01			
2	-L- 458+40/458+74 LT	36" CSP						< 0.01	0.02			
3	-L- 458+21/467+07 LT	ROCK CAUSEWAY						3.11				
4	-L- 476+33/488+33 LT	ROCK CAUSEWAY						3.91				
5	-L- 487+17/488+00 LT	42" PIPE						0.01	0.02			
6	-L- 519+88/520+50 RT	30" PIPE						0.02	0.06			
7**	-L- 554+25/554+82 LT	24" PIPE	0.05			< 0.01		0.01		117		
8	-L- 755+17/755+36 LT	60" RCP						0.01		39		
9	-L- 755+24/755+53 RT	60" RCP						< 0.01	< 0.01	68	17	
10	-L- 784+30/784+87 RT	78" RCP						0.01	< 0.01	97	20	
11	-L- 792+60/793+23 RT	60" RCP						< 0.01	< 0.01	98	19	
12	-L- 793+40/793+49 LT	60" RCP						< 0.01	< 0.01	28	20	
TOTALS*:			0.05			< 0.01		7.11	0.11	447	76	0

*Rounded totals are sum of actual impacts

NOTES:
0.02 acres of Permanent SW impacts for bridge interior bents at 467+15, 468+50, 469+85, 471+20, 472+55, 473+90, 475+25 and 476+60.
** - Site 7 wetland is accounted for as a total take per 4C meeting minutes.

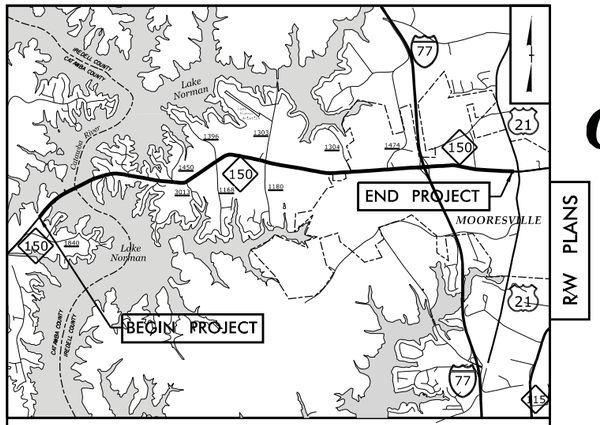
Revised 2016 09 09

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/2/2018
CATAWBA/IREDELL COUNTIES
R-2307B / I-5717
37944.1.FR5 / 50134.1.FS1
SHEET 22 OF 22

09/08/99

CONTRACT: TIP PROJECTS: R-2307B & I-5717

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CATAWBA & IREDELL COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2307B, I-5717	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
37944.1.FR5	STP-0150(36)	PE (R-2307B)
50134.1.FS1	NHPP-077-1(221)37	PE (I-5717)
37944.2.4	STP-0150(036)	R/W (R-2307B)
37944.2.5	STP-0150(036)	UTILITIES (R-2307B)
50134.2.1	NHPP-077-1(221)37	R/W, UTILITIES (I-5717)

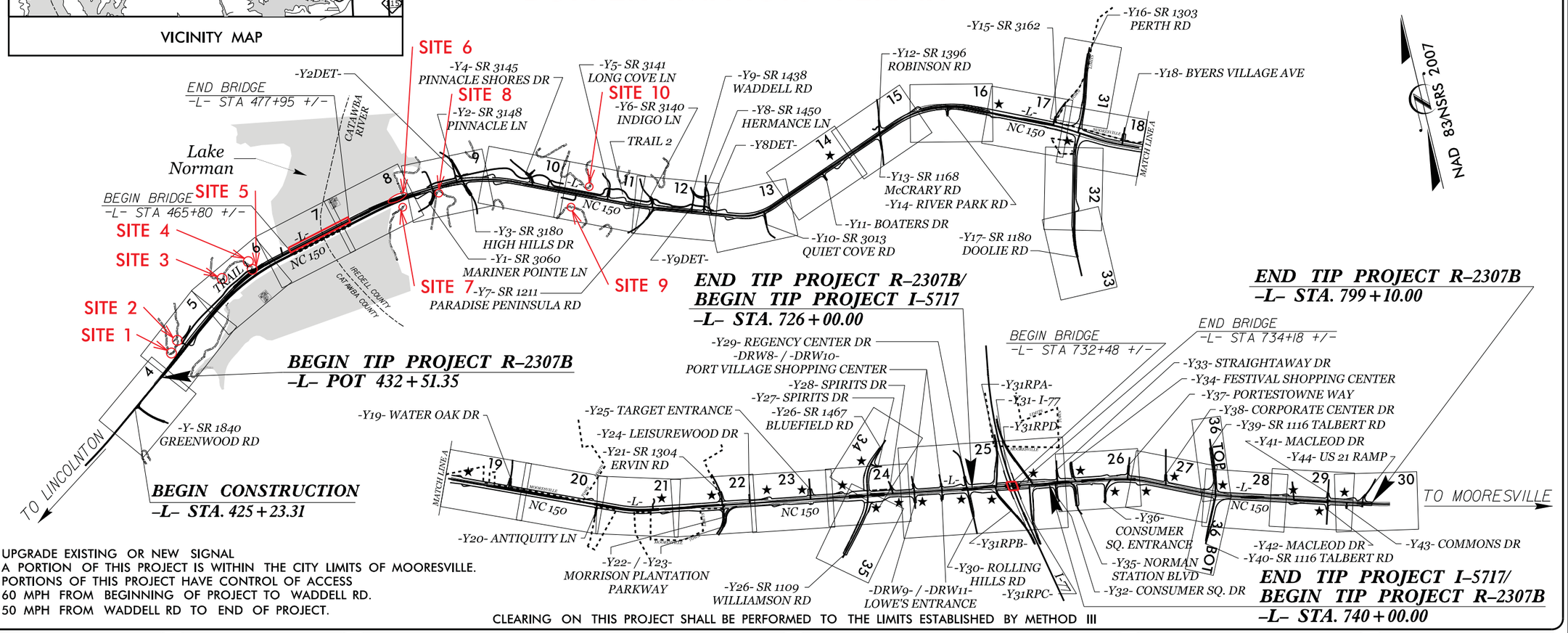
LOCATION: NC 150 FROM SR 1840 (GREENWOOD RD) IN CATAWBA COUNTY TO US 21 IN IREDELL COUNTY

BUFFER DRAWING SHEET 1 OF 7

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, AND SIGNALS

BUFFER IMPACTS PERMIT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



BEGIN TIP PROJECT R-2307B
-L- POT 432+51.35

BEGIN CONSTRUCTION
-L- STA. 425+23.31

END TIP PROJECT R-2307B/
BEGIN TIP PROJECT I-5717
-L- STA. 726+00.00

END TIP PROJECT R-2307B
-L- STA. 799+10.00

END TIP PROJECT I-5717/
BEGIN TIP PROJECT R-2307B
-L- STA. 740+00.00

★ UPGRADE EXISTING OR NEW SIGNAL
A PORTION OF THIS PROJECT IS WITHIN THE CITY LIMITS OF MOORESVILLE.
PORTIONS OF THIS PROJECT HAVE CONTROL OF ACCESS
** 60 MPH FROM BEGINNING OF PROJECT TO WADDELL RD.
50 MPH FROM WADDELL RD TO END OF PROJECT.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

GRAPHIC SCALES

50 25 0 50 100
PLANS

DESIGN DATA

ADT 2019 = 47,900
ADT 2039 = 58,860
K = 8%
D = 55%
T = 6%*
V = **
* TTST 2%+ DUAL 4%
FUNC CLASS = PRINCIPAL ARTERIAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2307B	=	*6.448 mile*
LENGTH STRUCTURES TIP PROJECT R-2307B	=	*0.230 mile*
TOTAL LENGTH TIP PROJECT R-2307B	=	*6.678 mile*
LENGTH ROADWAY TIP PROJECT I-5717	=	*0.233 mile*
LENGTH STRUCTURES TIP PROJECT I-5717	=	*0.032 mile*
TOTAL LENGTH TIP PROJECT I-5717	=	*0.265 mile*
TOTAL LENGTH TIP PROJECT R-2307B / I-5717	=	*6.943 mile*

Prepared For:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610
By:

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
AUGUST 31, 2017

LETTING DATE:
JULY 16, 2019

BURKE EVANS, PE
PROJECT ENGINEER

TRAVIS COOK, EI
PROJECT DESIGN ENGINEER

BRYAN KEY, PE
PROJECT ENGINEER
NCDOT ROADWAY DESIGN

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

7/2/2018
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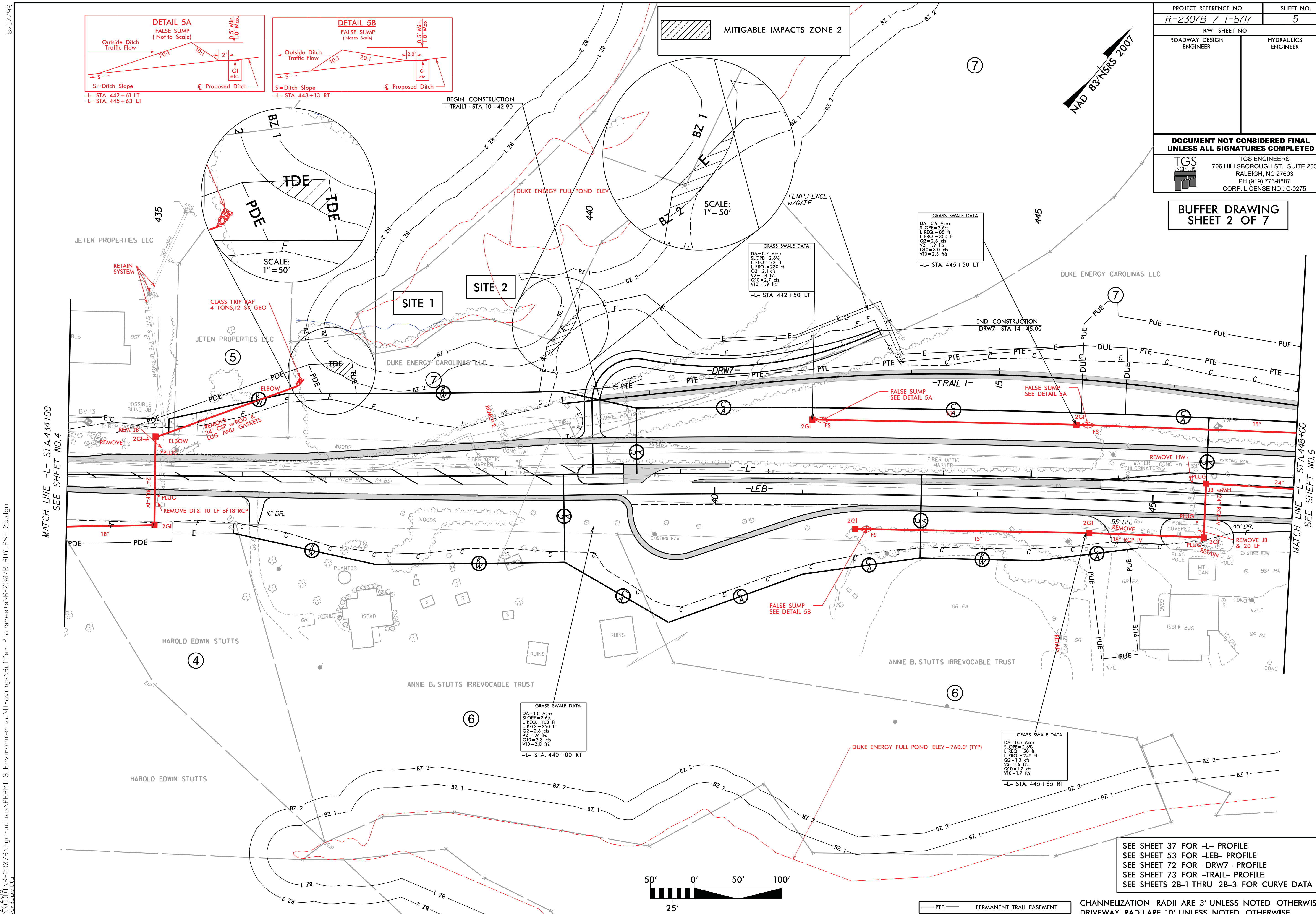
User:dpetty

R-2307B RDY TSH.dgn 7/2/2018 4:53:52 PM TGS



PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

BUFFER DRAWING SHEET 2 OF 7

GRASS SWALE DATA
DA=0.9 Acre
SLOPE=2.6%
L REQ.=85 ft
L PRO.=300 ft
Q2=2.3 cfs
V2=1.9 ft/s
Q10=3.0 cfs
V10=2.3 ft/s
–L– STA. 445+50 LT

GRASS SWALE DATA
DA=0.7 Acre
SLOPE=2.6%
L REQ.=72 ft
L PRO.=230 ft
Q2=2.1 cfs
V2=1.8 ft/s
Q10=2.7 cfs
V10=1.9 ft/s
–L– STA. 442+50 LT

GRASS SWALE DATA
DA=1.0 Acre
SLOPE=2.6%
L REQ.=103 ft
L PRO.=350 ft
Q2=2.6 cfs
V2=1.9 ft/s
Q10=3.3 cfs
V10=2.0 ft/s
–L– STA. 440+00 RT

GRASS SWALE DATA
DA=0.5 Acre
SLOPE=2.6%
L REQ.=50 ft
L PRO.=245 ft
Q2=1.3 cfs
V2=1.6 ft/s
Q10=1.7 cfs
V10=1.7 ft/s
–L– STA. 445+65 RT

SEE SHEET 37 FOR –L– PROFILE
SEE SHEET 53 FOR –LEB– PROFILE
SEE SHEET 72 FOR –DRW7– PROFILE
SEE SHEET 73 FOR –TRAIL– PROFILE
SEE SHEETS 2B-1 THRU 2B-3 FOR CURVE DATA

—PTE— PERMANENT TRAIL EASEMENT

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

8/17/99

7/3/2018
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BUFFER DRAWING SHEET 3 OF 7

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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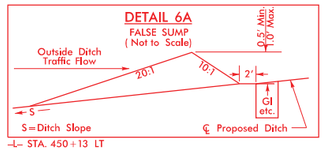
TGS ENGINEERS
706 HILLSBOROUGH ST, SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

NAD 83/NSRS 2007

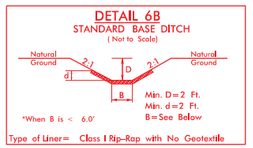
8/17/99

DETAIL 6A
FALSE SUMP
(Not to Scale)



–L– STA. 450+13 LT

DETAIL 6B
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class I Rip-Rap with No Geotextile
–L– STA. 453+01,294'LT TO 453+29,328'LT (B=2', DAYLIGHT AT 0.3%)
–L– STA. 458+01,177'LT TO 458+41,192'LT (B=6', SEE PFL FOR GRADE)

ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2

DUKE ENERGY CAROLINAS LLC ⑦

SITE 3

SCALE: 1"=50'

SCALE: 1"=50'

STANDARD BASE DITCH SEE DETAIL 6B

BEGIN 4' CHAIN –TRAIL 1– STA.

STANDARD BASE DITCH SEE DETAIL 6B

20'x20'x18" PAD CLASS I RIP RAP 32 TONS,NO GEO

SITE 4

SITE 5

460

⑦ LAKE NORMAN
DUKE ENERGY CAROLINAS LLC

GRASS SWALE DATA
DA=0.4 Acre
SLOPE=1.0% to 0.7%
L REQ.=41 ft
L PRO.=50 ft
Q2=1.2 cfs
V2=1.2 ft/s
Q10=1.5 cfs
V10=1.3 ft/s
–L– STA. 453+50 MED

GRASS SWALE DATA
DA=1.0 Acre
SLOPE=0.3% to 2.2%
L REQ.=97 ft
L PRO.=450 ft
Q2=2.6 cfs
V2=1.9 ft/s
Q10=3.4 cfs
V10=2.0 ft/s
–L– STA. 450+00 LT

CUT TO FILL TRANSITION CLASS B RIP RAP 5 TONS, 10 SY GEO

FALSE SUMP SEE DETAIL 6A

CUT TO FILL TRANSITION CLASS B RIP RAP 12 TONS, 26 SY GEO

MEDIAN GRASSED SWALE SEE DETAIL 6C

HAZARDOUS SPILL BASIN SEE DETAIL 6F

12' DRIVE FOR HSB ACCESS (APPROX.)

GATE w/FENCE

36" CEP w/ROD & LUG AND GASKETS

BERM=768

HW w/SLUICE GATE INV=763.0

CLASS I RIP RAP 7 TONS,17 SY GEO

DUKE ENERGY FULL POND ELEV=760.0' (TYP)

ROCK FILL IN POND SEE DETAIL 6E

MEDIAN GRASSED SWALE SEE DETAIL 6C

–TRAIL 1–

–L–

–LEB–

FALSE SUMP SEE DETAIL 6D

FALSE SUMP SEE DETAIL 6D

MATCH LINE –L– STA.448+00 SEE SHEET NO.5

MATCH LINE –L– STA.462+00 SEE SHEET NO.7

EXISTING TRANSPORTATION FACILITY (TYP)

ANNIE B. STUTTS IRREVOCABLE TRUST

⑥

DUKE ENERGY FULL POND ELEV=760.0' (TYP)

GRASS SWALE DATA
DA=0.7 Acre
SLOPE=0.5%
L REQ.=72 ft
L PRO.=400 ft
Q2=1.9 cfs
V2=1.2 ft/s
Q10=2.5 cfs
V10=1.3 ft/s
–L– STA. 457+50 MED

GRASS SWALE DATA
DA=0.3 Acre
SLOPE=0.5%
L REQ.=31 ft
L PRO.=150 ft
Q2=0.8 cfs
V2=0.8 ft/s
Q10=1.0 cfs
V10=0.9 ft/s
–L– STA. 459+00 MED

ANNIE B. STUTTS IRREVOCABLE TRUST

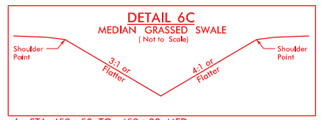
⑥

EXISTING TRANSPORTATION FACILITY (TYP)

GRASS SWALE DATA
DA=1.1 Acre
SLOPE=0.3%
L REQ.=114 ft
L PRO.=650 ft
Q2=2.9 cfs
V2=1.1 ft/s
Q10=3.8 cfs
V10=1.2 ft/s
–L– STA. 459+00 MED

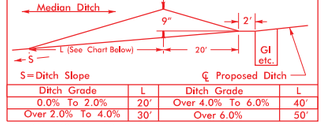
50' 0' 50' 100'
25'

DETAIL 6C
MEDIAN GRASSED SWALE
(Not to Scale)



–L– STA. 453+50 TO 459+00 MED
–L– STA. 459+00 TO 465+50 MED

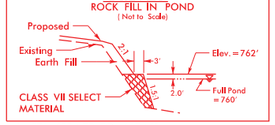
DETAIL 6D
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

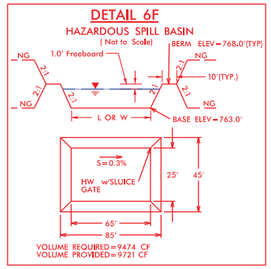
–L– STA. 543+61 MED
–L– STA. 547+60 MED

DETAIL 6E
ROCK FILL IN POND
(Not to Scale)



–L– STA. 458+72 TO 467+11
–L– STA. 476+34 TO 488+38

DETAIL 6F
HAZARDOUS SPILL BASIN
(Not to Scale)



VOLUME REQUIRED=9474 CF
VOLUME PROVIDED=9721 CF

–L– STA 457+69 LT

LAKE NORMAN
DUKE ENERGY CAROLINAS LLC
⑦

PTE —— PERMANENT TRAIL EASEMENT

SEE SHEET 38 FOR –L– PROFILE
SEE SHEET 53 FOR –LEB– PROFILE
SEE SHEET 73 FOR –TRAIL– PROFILE
SEE SHEET 2B–1 FOR CURVE DATA

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

7/2/2018
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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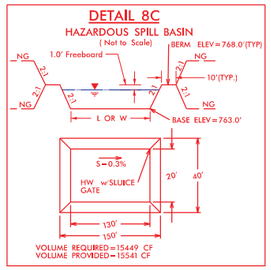
TGS ENGINEERS
706 HILLSBOROUGH ST, SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

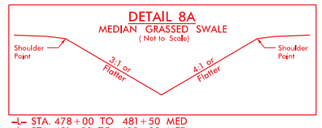
NAD 83/NSRS 2007

DETAIL 8C
HAZARDOUS SPILL BASIN
(Not to Scale)



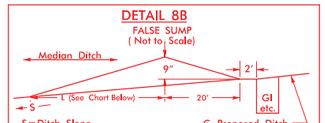
-L- STA 488+59 RT

DETAIL 8A
MEDIAN GRASSED SWALE
(Not to Scale)



-L- STA. 478+00 TO 481+50 MED
-L- STA. 481+50 TO 488+00 MED

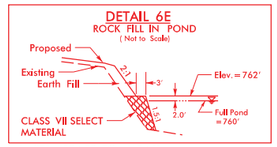
DETAIL 8B
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

-L- STA. 584+90 MED

DETAIL 6E
ROCK FILL IN POND
(Not to Scale)



-L- STA. 458+72 TO 467+11
-L- STA. 476+34 TO 488+38

LAKE NORMAN
DUKE ENERGY CAROLINAS LLC
7

480

485

490

BUFFER DRAWING
SHEET 4 OF 7

- ALLOWABLE IMPACTS ZONE 1
- ALLOWABLE IMPACTS ZONE 2
- MITIGABLE IMPACTS ZONE 1
- MITIGABLE IMPACTS ZONE 2

BEGIN 4' CHAIN LINK FENCE
-L- STA.478+20

ROCK FILL IN POND
SEE DETAIL 6E

GRASS SWALE DATA
DA=0.6 Acre
SLOPE=0.3%
L REQ.=60 ft
L PRO.=350 ft
Q2=1.7 cfs
V2=1.0 fps
Q10=2.3 cfs
V10=1.0 fps
-L- STA. 485+00 MED

EXISTING TRANSPORTATION FACILITY (TYP)

MEDIAN GRASSED SWALE SEE DETAIL 8A

MEDIAN GRASSED SWALE SEE DETAIL 8A

MEDIAN GRASSED SWALE SEE DETAIL 8A

DUKE ENERGY FULL POND ELEV=760.0' (TYP)

SITE 6

DWY, DI
L=12'

15" RCP-IV

2GI

4GI

TYPE B-77

N 76° 29' 44.0" E

GREEN MEDIAN

FIBER OPTIC MARKER

15"

24"

2GI-A

FS

FALSE SUMP
SEE DETAIL 6D

24" RCP-IV

CB-G

INV w/SLUICE GATE
INV=763.0

DUKE ENERGY FULL POND ELEV=760.0' (TYP)

85'x20'x2' PAD
CLASS II RIP RAP
190 TONS,NO GEO

PDE

CLASS I RIP RAP
4 TONS,12 SY GEO

30" RCP-IV

BERM=768

42" CSP w/ROD & LUG AND GASKETS

FENCE

HAZARDOUS SPILL BASIN
SEE DETAIL 8C

SITE 7

EXISTING TRANSPORTATION FACILITY (TYP)

CLASS I RIP RAP
7 TONS,17 SY GEO

BZ 1

BZ 2

DUKE ENERGY CAROLINAS LLC
10

BEGIN WALL W-1
-L- STA.488+70

6' BST CURB

BST PA

MATCH LINE -L- STA.476+00
SEE SHEET NO.7

MATCH LINE -L- STA.490+00
SEE SHEET NO.9

GRASS SWALE DATA
DA=0.3 Acre
SLOPE=0.4%
L REQ.=26 ft
L PRO.=125 ft
Q2=0.6 cfs
V2=0.7 fps
Q10=0.8 cfs
V10=0.7 fps
-L- STA. 479+25 MED

GRASS SWALE DATA
DA=0.6 Acre
SLOPE=0.4%
L REQ.=63 ft
L PRO.=225 ft
Q2=1.5 cfs
V2=1.0 fps
Q10=1.9 cfs
V10=1.1 fps
-L- STA. 481+50 MED

GRASS SWALE DATA
DA=0.7 Acre
SLOPE=0.3%
L REQ.=71 ft
L PRO.=350 ft
Q2=1.9 cfs
V2=1.0 fps
Q10=2.5 cfs
V10=1.0 fps
-L- STA. 481+50 MED

LAKE NORMAN
DUKE ENERGY CAROLINAS LLC

PAUL T. & BRENDA C. MASON
8

JAMES RIPPY BOONE & JULIANNE KIM BOONE

MAXEY J. ANDRESS & BARBARA ANDRESS
9

RETAIN SYSTEM

50' 0' 50' 100'
25'

SEE SHEET 40 FOR -L- PROFILE
SEE SHEETS 56 THRU 57 FOR -LEB- PROFILE
SEE SHEET 74 FOR -TRAIL- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA

7/2/2018
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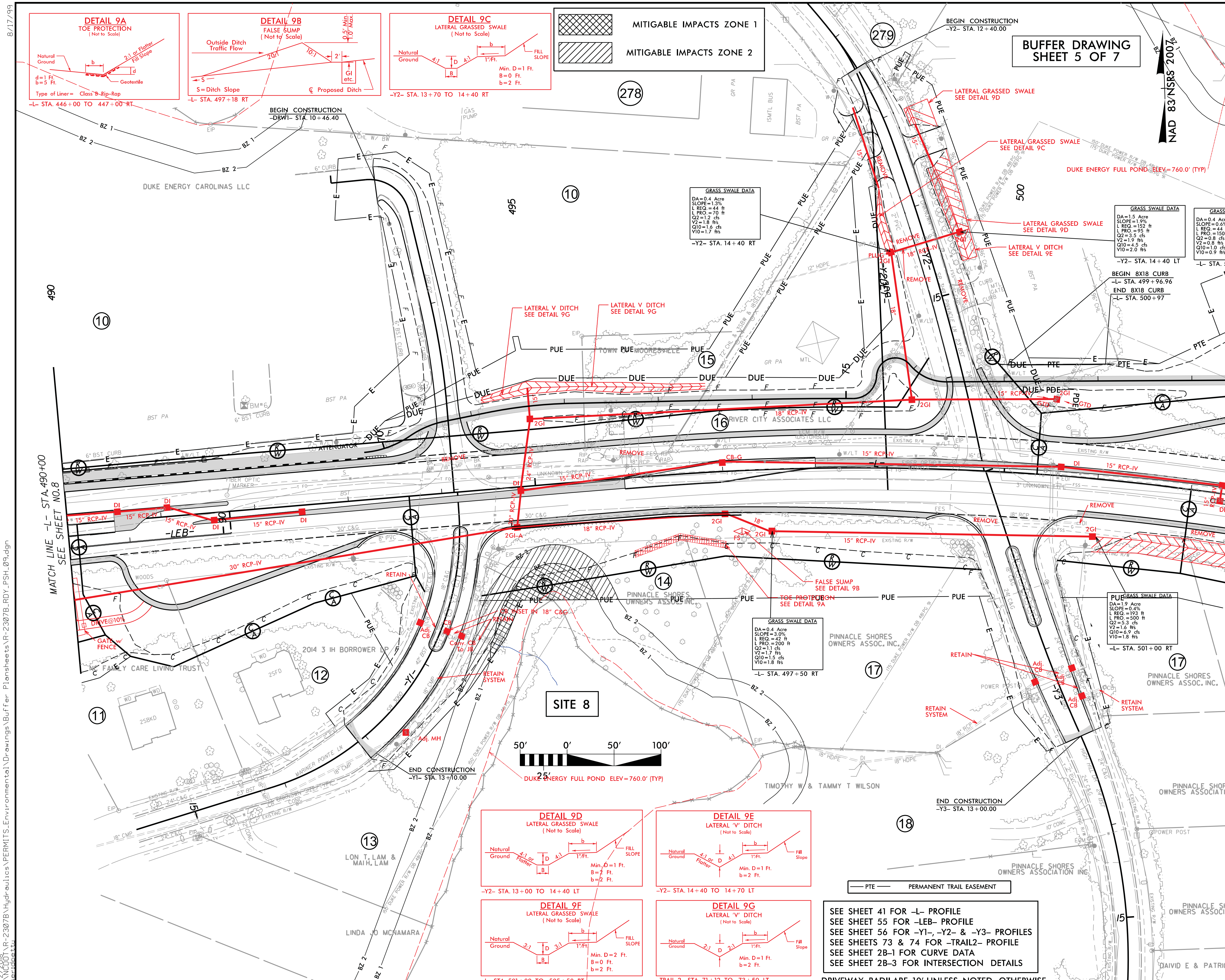

DETAIL 9A
TOE PROTECTION
(Not to Scale)
Natural Ground
2:1 or Flatter Fill Slope
d=1 Ft.
b=5 Ft.
Geotextile
Type of Liner= Class B Rip-Rap
-L- STA. 446+00 TO 447+00 RT
DETAIL 9B
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow
S=Ditch Slope
℄ Proposed Ditch
-L- STA. 497+18 RT
DETAIL 9C
LATERAL GRASSED SWALE
(Not to Scale)
Natural Ground
FILL SLOPE
Min. D=1 Ft.
B=0 Ft.
b=2 Ft.
-Y2- STA. 13+70 TO 14+40 RT
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
BUFFER DRAWING
SHEET 5 OF 7
BEGIN CONSTRUCTION
-Y2- STA. 12+40.00
BEGIN CONSTRUCTION
-DRW1- STA. 10+46.40
NAD 83/NSRS 2007
DUKE ENERGY CAROLINAS LLC
LATERAL GRASSED SWALE
SEE DETAIL 9D
LATERAL GRASSED SWALE
SEE DETAIL 9C
DUKE ENERGY FULL POND ELEV=760.0' (TYP)
GRASS SWALE DATA
DA=0.4 Acre
SLOPE=1.3%
L REQ.=44 ft
L PRO.=70 ft
Q2=1.2 cfs
V2=1.8 ft/s
Q10=1.6 cfs
V10=1.7 ft/s
-Y2- STA. 14+40 RT
GRASS SWALE DATA
DA=1.5 Acre
SLOPE=1.9%
L REQ.=152 ft
L PRO.=95 ft
Q2=3.5 cfs
V2=1.9 ft/s
Q10=4.5 cfs
V10=2.0 ft/s
-Y2- STA. 14+40 LT
GRASS SWALE DATA
DA=0.4 Acre
SLOPE=0.6%
L REQ.=44 ft
L PRO.=150 ft
Q2=0.8 cfs
V2=0.8 ft/s
Q10=1.0 cfs
V10=0.9 ft/s
-L- STA. 503+50 LT
LATERAL GRASSED SWALE
SEE DETAIL 9D
LATERAL V DITCH
SEE DETAIL 9E
BEGIN 8X18 CURB
-L- STA. 499+96.96
END 8X18 CURB
-L- STA. 500+97
PINNACLE SHORES OWNERS ASSOC. INC.
LATERAL V DITCH
SEE DETAIL 9G
LATERAL V DITCH
SEE DETAIL 9G
RIVER CITY ASSOCIATES LLC
MATCH LINE -L- STA. 490+00
SEE SHEET NO.8
MATCH LINE -L- STA. 504+00
SEE SHEET NO.10
FALSE SUMP
SEE DETAIL 9B
TOE PROTECTION
SEE DETAIL 9A
GRASS SWALE DATA
DA=0.4 Acre
SLOPE=3.0%
L REQ.=42 ft
L PRO.=200 ft
Q2=1.1 cfs
V2=1.7 ft/s
Q10=1.5 cfs
V10=1.8 ft/s
-L- STA. 497+50 RT
GRASS SWALE DATA
DA=1.9 Acre
SLOPE=0.4%
L REQ.=193 ft
L PRO.=500 ft
Q2=5.3 cfs
V2=1.6 ft/s
Q10=6.9 cfs
V10=1.8 ft/s
-L- STA. 501+00 RT
LATERAL GRASSED SWALE
SEE DETAIL 9F
2014 3 IH BORROWER LP
FAMILY CARE LIVING TRUST
PINNACLE SHORES OWNERS ASSOC. INC.
SITE 8
END CONSTRUCTION
-Y1- STA. 13+10.00
DUKE ENERGY FULL POND ELEV=760.0' (TYP)
TIMOTHY W & TAMMY T WILSON
END CONSTRUCTION
-Y3- STA. 13+00.00
PINNACLE SHORES OWNERS ASSOCIATION INC
LON T. LAM & MAI H. LAM
LINDA J. MCNAMARA
DAIVID E & PATRICIA K TOWNSEND
DETAIL 9D
LATERAL GRASSED SWALE
(Not to Scale)
Natural Ground
4:1 or Flatter
FILL SLOPE
Min. D=1 Ft.
B=2 Ft.
b=2 Ft.
-Y2- STA. 13+00 TO 14+40 LT
DETAIL 9E
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
4:1 or Flatter
Fill Slope
Min. D=1 Ft.
b=2 Ft.
-Y2- STA. 14+40 TO 14+70 LT
DETAIL 9F
LATERAL GRASSED SWALE
(Not to Scale)
Natural Ground
FILL SLOPE
Min. D=2 Ft.
B=0 Ft.
b=2 Ft.
-L- STA. 501+00 TO 505+50 RT
DETAIL 9G
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
Fill Slope
Min. D=1 Ft.
b=2 Ft.
-TRAIL 2- STA. 71+12 TO 73+50 LT
PTE PERMANENT TRAIL EASEMENT

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	9

RW SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

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

SEE SHEET 41 FOR -L- PROFILE
SEE SHEET 55 FOR -LEB- PROFILE
SEE SHEET 56 FOR -Y1-, -Y2- & -Y3- PROFILES
SEE SHEETS 73 & 74 FOR -TRAIL2- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-3 FOR INTERSECTION DETAILS

DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

8/17/99

7/3/2018
X:\NCDOT\R-2307B\Hydraulics\PERMITS_Environmental\Drawings\Buffer Plansheets\R-2307B_RDY_PSH_09.dgn

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 6 OF 7

ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2

DETAIL 10D
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)
RETAINING WALL, BOND BREAKER, EDGE OF PAVEMENT, 0.02, 2:1, D=1.0', B=0.67'

DETAIL 11D
DITCH BLOCK
(Not to Scale)
ELEV=806.8, N.G./T.B., 4', 4:1, 4:1, Exist. Ditch Bed, Prop. Ditch, FILL SLOPE

DETAIL 11A
SPECIAL CUT GRASSED SWALE
(Not to Scale)
Natural Ground, 4:1, D, B, 6:1, Front Ditch Slope, Min. D=1 Ft., B=0 Ft.

-TRAIL2- STA. 95+65 TO 100+88 LT
(SEE XSC FOR GRADE)

-L- STA. 528+10 RT

-L- STA. 526+50 TO 528+00 RT

50' 0' 50' 100'
25'

SCALE: 1"=50'

SITE 10

SITE 9

DUKE ENERGY FULL POND ELEV=760.0' (TYP)

BEGIN CONSTRUCTION -Y5- STA. 13+50.00

END 4' CHAIN LINK FENCE -TRAIL 2- STA.103+00

END WALL W-2 -L- STA.522+10

CONCRETE DITCH BEHIND RET WALL SEE DETAIL 10D

CLASS B RIP RAP 1 TONS,5 SY GEO

CLASS B RIP RAP 2 TONS,7 SY GEO

GRASS SWALE DATA
DA=0.5 Acre
SLOPE=2.3%
L REQ.=46 ft
L PRO.=200 ft
Q2=1.3 cfs
V2=1.8 fps
Q10=1.7 cfs
V10=2.0 fps
-L- STA. 527+50 LT

GRASS SWALE DATA
DA=0.5 Acre
SLOPE=2.3%
L REQ.=46 ft
L PRO.=225 ft
Q2=1.3 cfs
V2=1.8 fps
Q10=1.7 cfs
V10=1.9 fps
-L- STA. 523+50 RT

GRASS SWALE DATA
DA=0.8 Acre
SLOPE=2.4% to 0.8%
L REQ.=82 ft
L PRO.=300 ft
Q2=2.4 cfs
V2=1.9 fps
Q10=3.1 cfs
V10=2.4 fps
-L- STA. 526+50 RT

SPECIAL CUT GRASSED SWALE SEE DETAIL 11A

LATERAL GRASSED SWALE SEE DETAIL 11B

DITCH BLOCK SEE DETAIL 11D

STANDARD BASE DITCH SEE DETAIL 11C

50'x20'x18" PAD CLASS I RIP RAP 80 TONS,NO GEO

DETAIL 11C
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 2:1, d, D, 2:1, B, Min. D=2 Ft., Min. d=2 Ft., B=6 Ft.
*When B is < 6.0'
Type of Liner= Class I Rip-Rap with No Geotextile
-L- STA. 520+14.173' RT TO 520+16.287' RT (DAYLIGHT AT 7.0%)

DETAIL 11B
LATERAL GRASSED SWALE
(Not to Scale)
Natural Ground, 4:1, D, B, 4:1, b, 17Ft., FILL SLOPE, Min. D=1 Ft., B=0 Ft., b=2 Ft.
-L- STA. 528+00 TO 529+50 RT

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

— PTE — PERMANENT TRAIL EASEMENT

SEE SHEET 42 FOR -L- PROFILE
SEE SHEET 57 FOR -Y5- PROFILE
SEE SHEET 71 FOR -DRW2- PROFILE
SEE SHEETS 74 & 75 -TRAIL2- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-4 FOR INTERSECTION DETAILS

MATCH LINE -L- STA.518+00 SEE SHEET NO.10

MATCH LINE -L- STA.532+00 SEE SHEET NO.12

REX A STUMP & KIMBERLY A STUMP

ANGELA S & DANIEL C HARRIS

JESSE JAMES THOMAS III & ROSEANN THOMAS

PINNACLE SHORES OWNERS ASSOC, INC.

DUKE ENERGY CAROLINAS LLC

22

NAD 83 NSRS 2007

7/2/2018
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User:jdestu

RIPARIAN BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	Roadway	-L- 436+90/437+28 LT			X					415	415		
2	Roadway	-L- 439+50/439+85 LT			X					474	474		
3	Ditch	-L- 452+83/453+36 LT			X	1,072	882	1,954					
4	Ditch	-L- 457+90/458+53 LT	X			1,254	1,125	2,379					
5	Roadway	-L- 457+71/458+93 LT	X						5,745	3,820	9,564		
6	Roadway	-L- 485+78/488+83 LT	X						11,213	4,284	15,497		
7	Shoreline Protection	-L- 488+18/488+35 RT	X				225	225					
8	Roadway	-L- 493+96/495+76 RT			X				3,449	5,164	8,612		
9	Ditch	-L- 519+85/520+46 RT			X	1,962	1,262	3,224					
10	Temp. S&EC	-L- 522+76/523+07 LT			X					766			
TOTAL:						4,288	3,494	7,782	20,406	14,922	34,563	0.0	0.0

Notes:
There are no wetland impacts within buffer impacts on this project.

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
R-2307B / I-5717
CATAWBA/ IREDELL COUNTIES
PROJECT: 37944.1.FR5 / 50134.1.FS1

DATE 7/2/2018
SHEET 7 OF 7

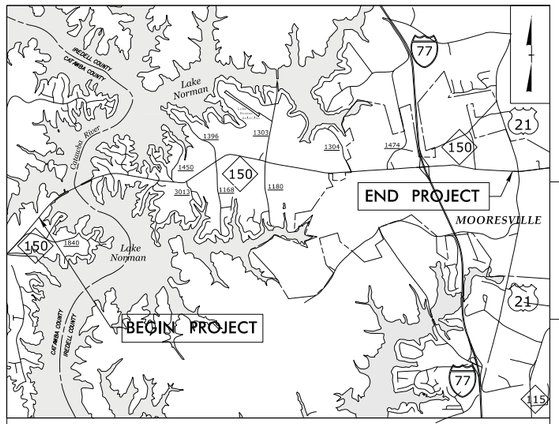
Rev. SEP 2016

Rev. May 2006

09/08/99

CONTRACT: TIP PROJECTS: R–2307B & I–5717

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CATAWBA & IREDELL COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R–2307B, I–5717	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
37944.1.FR5	STP–0150(36)	PE (R–2307B)
50134.1.FS1	NHPP–077–1(221)37	PE (I–5717)
37944.2.4	STP–0150(036)	R/W (R–2307B)
37944.2.5	STP–0150(036)	UTILITIES (R–2307B)
50134.2.1	NHPP–077–1(221)37	R/W, UTILITIES (I–5717)

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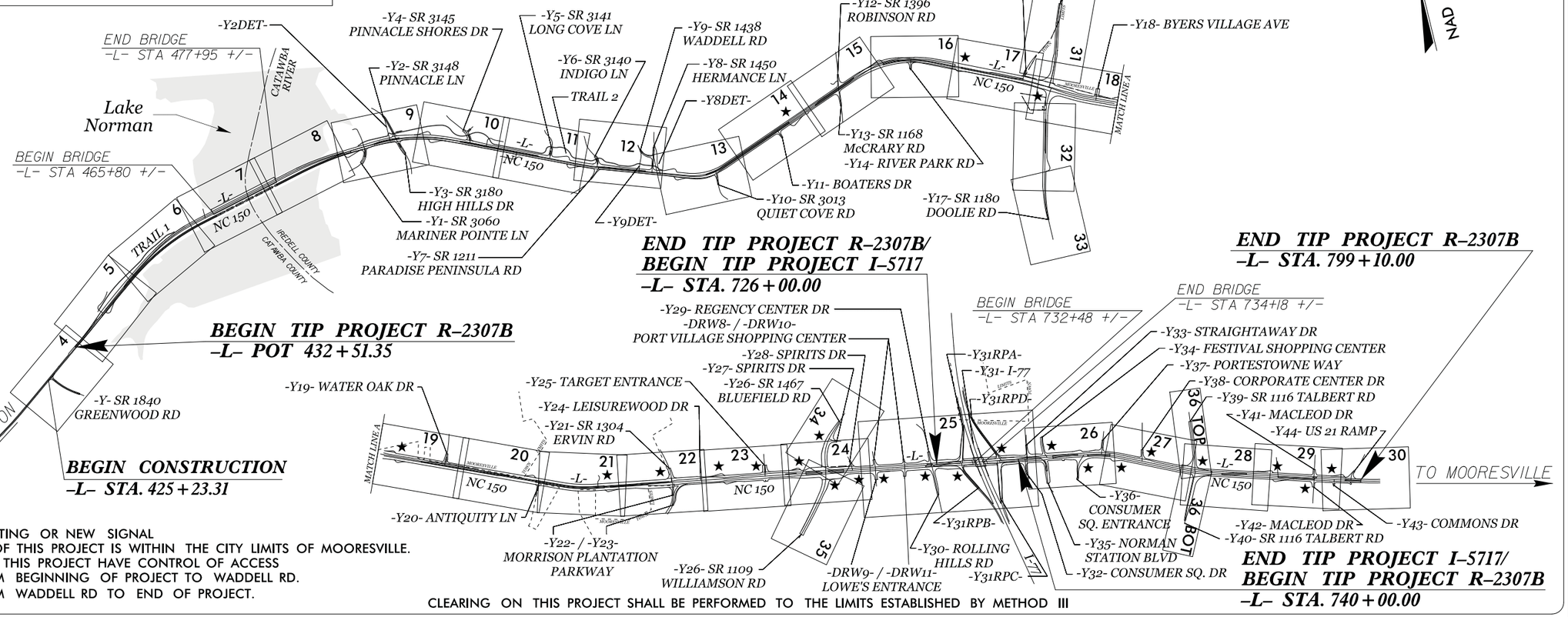
LOCATION: NC 150 FROM SR 1840 (GREENWOOD RD) IN CATAWBA COUNTY TO US 21 IN IREDELL COUNTY

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, AND SIGNALS

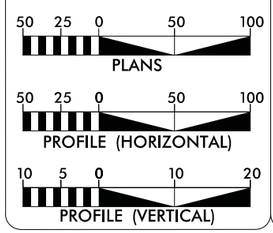
NAD 83/NSRS 2007



★ UPGRADE EXISTING OR NEW SIGNAL
A PORTION OF THIS PROJECT IS WITHIN THE CITY LIMITS OF MOORESVILLE.
PORTIONS OF THIS PROJECT HAVE CONTROL OF ACCESS
** 60 MPH FROM BEGINNING OF PROJECT TO WADDELL RD.
50 MPH FROM WADDELL RD TO END OF PROJECT.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

GRAPHIC SCALES



DESIGN DATA

ADT 2019 = 47,900
ADT 2039 = 58,860
K = 8%
D = 55%
T = 6%*
V = **
* TTST 2%+ DUAL 4%
FUNC CLASS =
PRINCIPAL ARTERIAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R–2307B	=	*6.448 mile*
LENGTH STRUCTURES TIP PROJECT R–2307B	=	*0.230 mile*
TOTAL LENGTH TIP PROJECT R–2307B	=	*6.678 mile*
LENGTH ROADWAY TIP PROJECT I–5717	=	*0.233 mile*
LENGTH STRUCTURES TIP PROJECT I–5717	=	*0.032 mile*
TOTAL LENGTH TIP PROJECT I–5717	=	*0.265 mile*
TOTAL LENGTH TIP PROJECT R–2307B / I–5717	=	*6.943 mile*

Prepared For:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610
By:
TGS ENGINEERS
706 HILLSBOROUGH ST
SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
AUGUST 31, 2017

LETTING DATE:
JULY 16, 2019

BURKE EVANS, PE
PROJECT ENGINEER
PAUL SCHULKEN, EI
PROJECT DESIGN ENGINEER
BRYAN KEY, PE
PROJECT ENGINEER
NCDOT ROADWAY DESIGN

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

4/16/2018
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PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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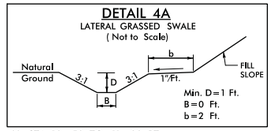
CORP. LICENSE NO.: C-0275

REVISIONS

8/17/99

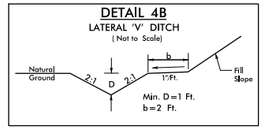
4-18-2018 REVISED EASEMENTS ON PARCEL 1.

DETAIL 4A
LATERAL GRASSED SWALE
(Not to Scale)



-Y- STA. 10+50 TO 11+00 RT

DETAIL 4B
LATERAL 'V' DITCH
(Not to Scale)



-L- STA. 432+31 TO 433+03 RT

NAD 83/NSRS 2007

-L- POT Sta. 425+83.82 = -Y- POT Sta. 10+00.00

BEGIN CONSTRUCTION -Y- STA. 10+11.37

BEGIN CONSTRUCTION -L- STA. 425+23.31

DUKE ENERGY CAROLINAS LLC
DB 2954 PG 421

DUKE ENERGY CAROLINAS LLC
DB 1620 PG 232

JETEN PROPERTIES LLC
DB 2271PG 945

JETEN PROPERTIES LLC
DB 2280 PG 1480
PB 52 PG 79

EVELYN GABRIEL STUTTS
DB 701PG 450

ANNIE & CLYDE HOLDSCLAW, HEIRS
DB 1598 PG 821

MITCHELL LEWIS PARKER
DB 1066 PG 444

MATTIE ROSE DEVELOPMENT INC
DB 3211PG 1384
PB 66 PG 178

HAROLD EDWIN STUTTS
DB 1206 PG 370 & 371

-L- N 53° 20' 38.2" E

S 36° 39' 21.8" E

BEGIN T.I.P. PROJECT R-2307B
-L- POT 432+51.35

-Y- PC Sta. 11+10.97

-L- PC Sta. 432+51.35

-Y- PT Sta. 14+89.34

-Y- PC Sta. 15+73.16

-Y- PT Sta. 16+55.81

MATCH LINE -L- STA.434+00 SEE SHEET NO.5

BL-22

BL-23

BY-59

EXISTING DRIVEWAY WITHIN NCDOT R/W TO BE REMOVED

LATERAL GRASSED SWALE SEE DETAIL 4A

LATERAL V DITCH SEE DETAIL 4B

CUT TO FILL TRANSITION CLASS B RIP RAP 26 TONS,58 SY GEO

END CONSTRUCTION -Y- STA. 15+80.00

-Y?- GREENWOOD RD	2019 ADT / 2039 ADT
21,580 / 32,460	-L- NC 150
500 / 500	270 / 590 — 21,340 / 32,540
770 / 1,090	

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 37 FOR -L- PROFILE
SEE SHEET 55 FOR -Y- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-2 FOR INTERSECTION DETAILS

4/16/2018
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User:bevans

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	5

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
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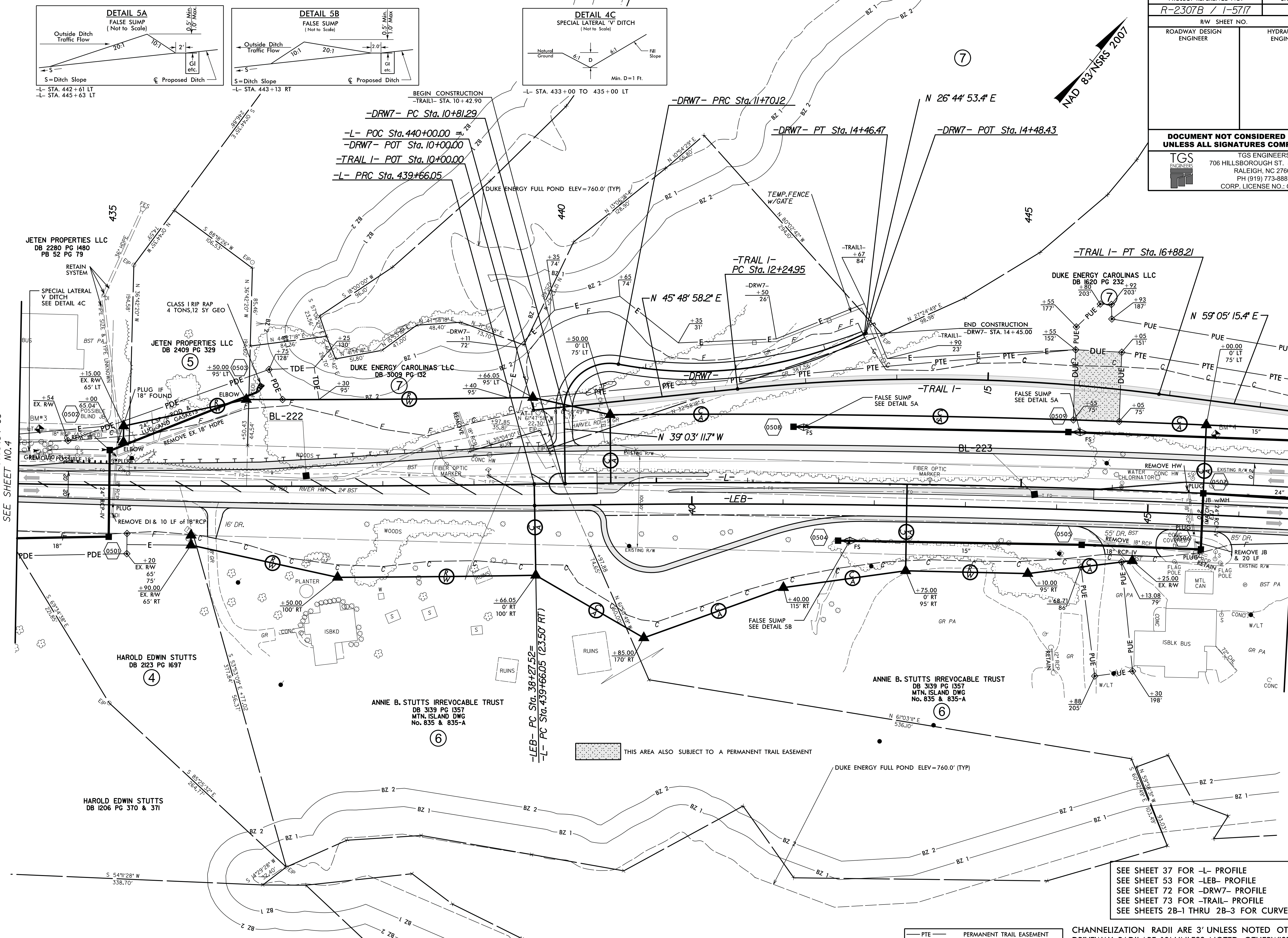
CORP. LICENSE NO.: C-0275

8/17/99

REVISIONS

4-18-2018 REVISED EASEMENTS ON PARCELS 6 & 7.
9-19-2018 REVISED DITCH AND EASEMENTS ON PARCEL 3 TO AVOID IMPACTS TO SIGN AND LIGHT POLES.
11-13-2018 ADDED HATCHED SHADED AREA TO DENOTE OVERLAP OF PTE WITH OTHER EASEMENT TYPES.(DBE)



DETAIL 5A
FALSE SUMP
(Not to Scale)
-L- STA. 442+61 LT
-L- STA. 445+63 LT
DETAIL 5B
FALSE SUMP
(Not to Scale)
-L- STA. 443+13 RT
DETAIL 4C
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Min. D=1 Ft.
-L- STA. 433+00 TO 435+00 LT
NAD 83/NSRS 2007
BEGIN CONSTRUCTION
-TRAIL1- STA. 10+42.90
-DRW7- PC Sta. 10+81.29
-L- POC Sta. 440+00.00 =
-DRW7- POT Sta. 10+00.00
-TRAIL 1- POT Sta. 10+00.00
-L- PRC Sta. 439+66.05
-DRW7- PRC Sta. 11+70.12
-DRW7- PT Sta. 14+46.47
-DRW7- POT Sta. 14+48.43
N 26° 44' 53.4" E
-TRAIL 1- PC Sta. 12+24.95
-TRAIL 1- PT Sta. 16+88.21
N 45° 48' 58.2" E
N 39° 03' 11.7" W
N 59° 05' 15.4" E
END CONSTRUCTION
-DRW7- STA. 14+45.00
DUKE ENERGY FULL POND ELEV=760.0' (TYP)
JETEN PROPERTIES LLC
DB 2280 PG 1480
PB 52 PG 79
JETEN PROPERTIES LLC
DB 2409 PG 329
DUKE ENERGY CAROLINAS LLC
DB 3009 PG 132
DUKE ENERGY CAROLINAS LLC
DB 1620 PG 232
HAROLD EDWIN STUTTS
DB 2123 PG 1697
HAROLD EDWIN STUTTS
DB 1206 PG 370 & 371
ANNIE B. STUTTS IRREVOCABLE TRUST
DB 3139 PG 1357
MTN. ISLAND DWG
No. 835 & 835-A
MATCH LINE -L- STA. 434+00
SEE SHEET NO. 4
MATCH LINE -L- STA. 448+00
SEE SHEET NO. 6
-LEB- PC Sta. 38+27.52=
-L- PC Sta. 439+66.05 (23.50' RT)
BL-222
BL-223
THIS AREA ALSO SUBJECT TO A PERMANENT TRAIL EASEMENT

SEE SHEET 37 FOR -L- PROFILE
SEE SHEET 53 FOR -LEB- PROFILE
SEE SHEET 72 FOR -DRW7- PROFILE
SEE SHEET 73 FOR -TRAIL- PROFILE
SEE SHEETS 2B-1 THRU 2B-3 FOR CURVE DATA

—PTE— PERMANENT TRAIL EASEMENT

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

11/9/2018
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PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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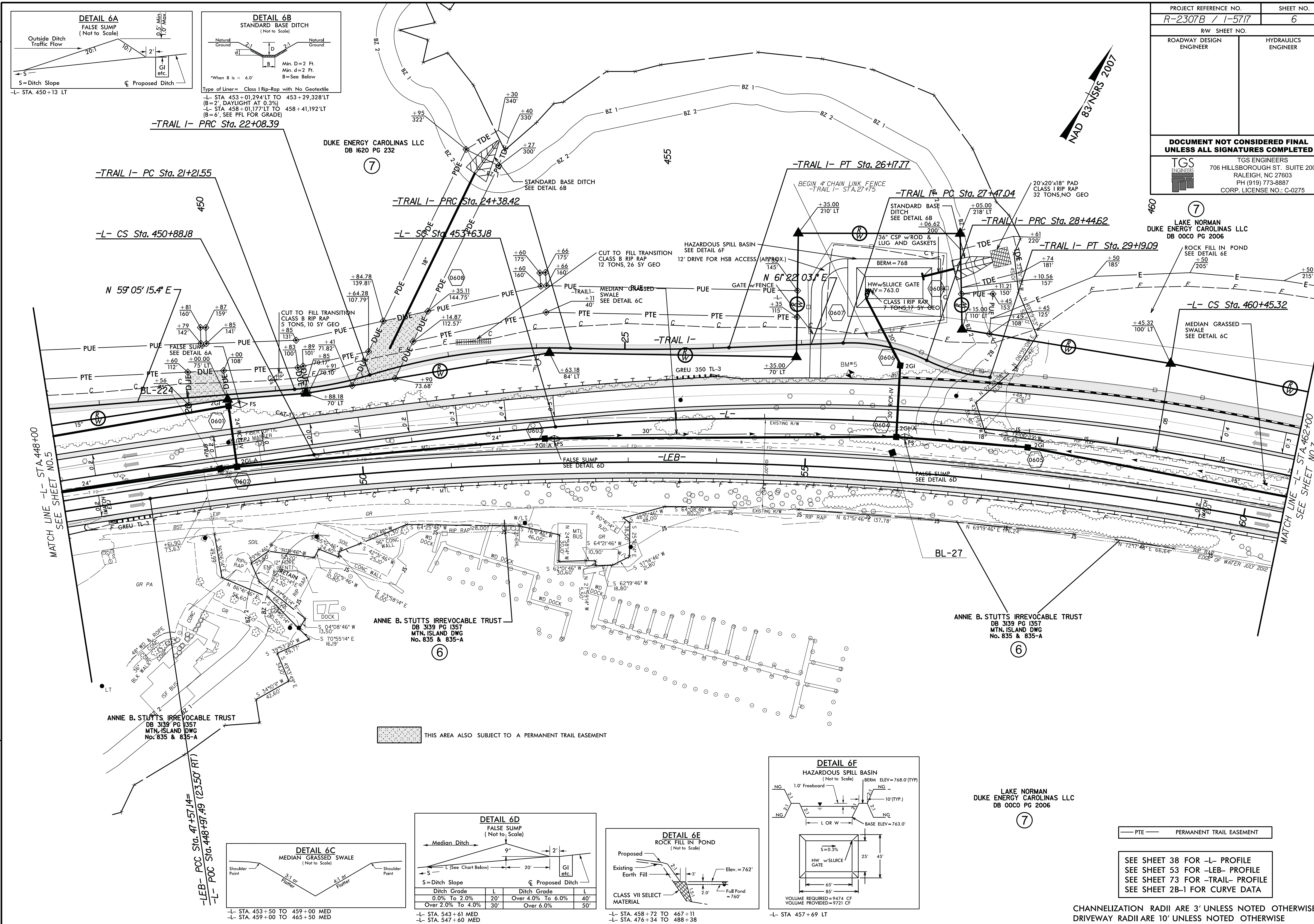
8/17/99

REVISIONS

4-18-2018 REVISED EASEMENTS ON PARCEL 7.
11-13-2018 ADDED HATCHED SHADED AREA TO DENOTE OVERLAP OF PTE WITH OTHER EASEMENT TYPES.(DBE)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

—PTE— PERMANENT TRAIL EASEMENT

SEE SHEET 38 FOR -L- PROFILE
SEE SHEET 53 FOR -LEB- PROFILE
SEE SHEET 73 FOR -TRAIL- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

11/9/2018
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User:bevans

8/17/99

REVISIONS

4-18-2018 REVISED EASEMENTS ON PARCEL 7.

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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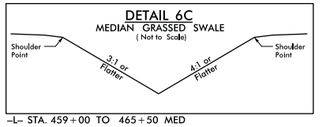
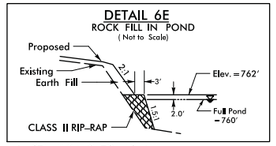
NAD 83/NSRS 2007

DETAIL 6C
MEDIAN GRASSED SWALE
(Not to Scale)



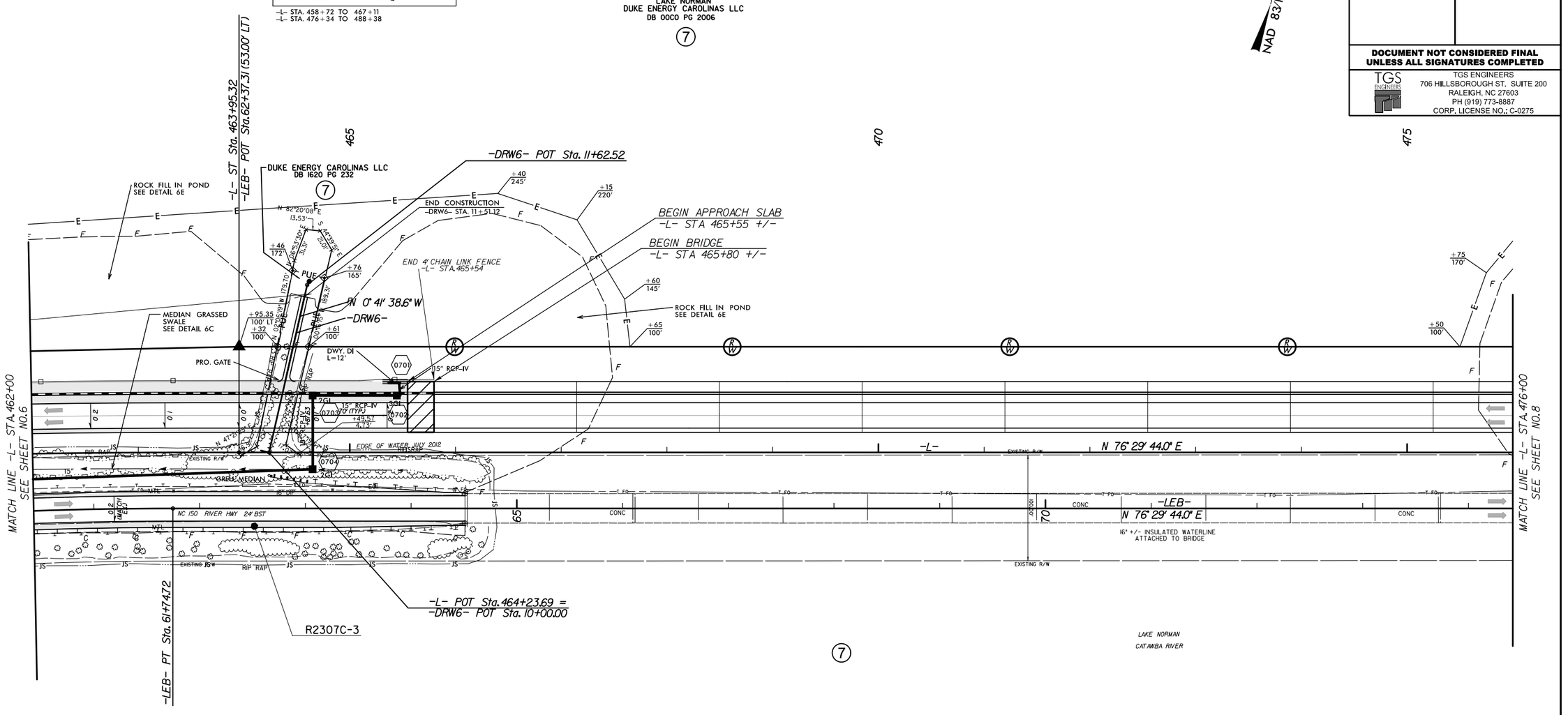
–L– STA. 459+00 TO 465+50 MED

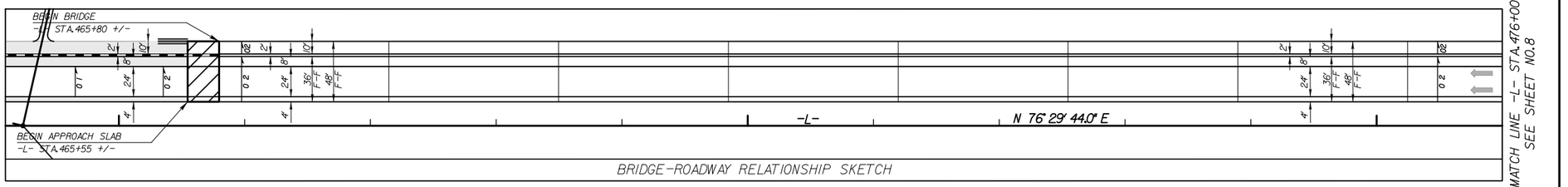
DETAIL 6E
ROCK FILL IN POND
(Not to Scale)



–L– STA. 458+72 TO 467+11
–L– STA. 476+34 TO 488+38

LAKE NORMAN
DUKE ENERGY CAROLINAS LLC
DB 00CO PG 2006
7





BRIDGE–ROADWAY RELATIONSHIP SKETCH

SEE SHEET 39 FOR –L– PROFILE
SEE SHEETS 53 THRU 54 FOR –LEB– PROFILE
SEE SHEET 2B-1 FOR CURVE DATA

4/16/2018
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User:devans

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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TGS ENGINEERS
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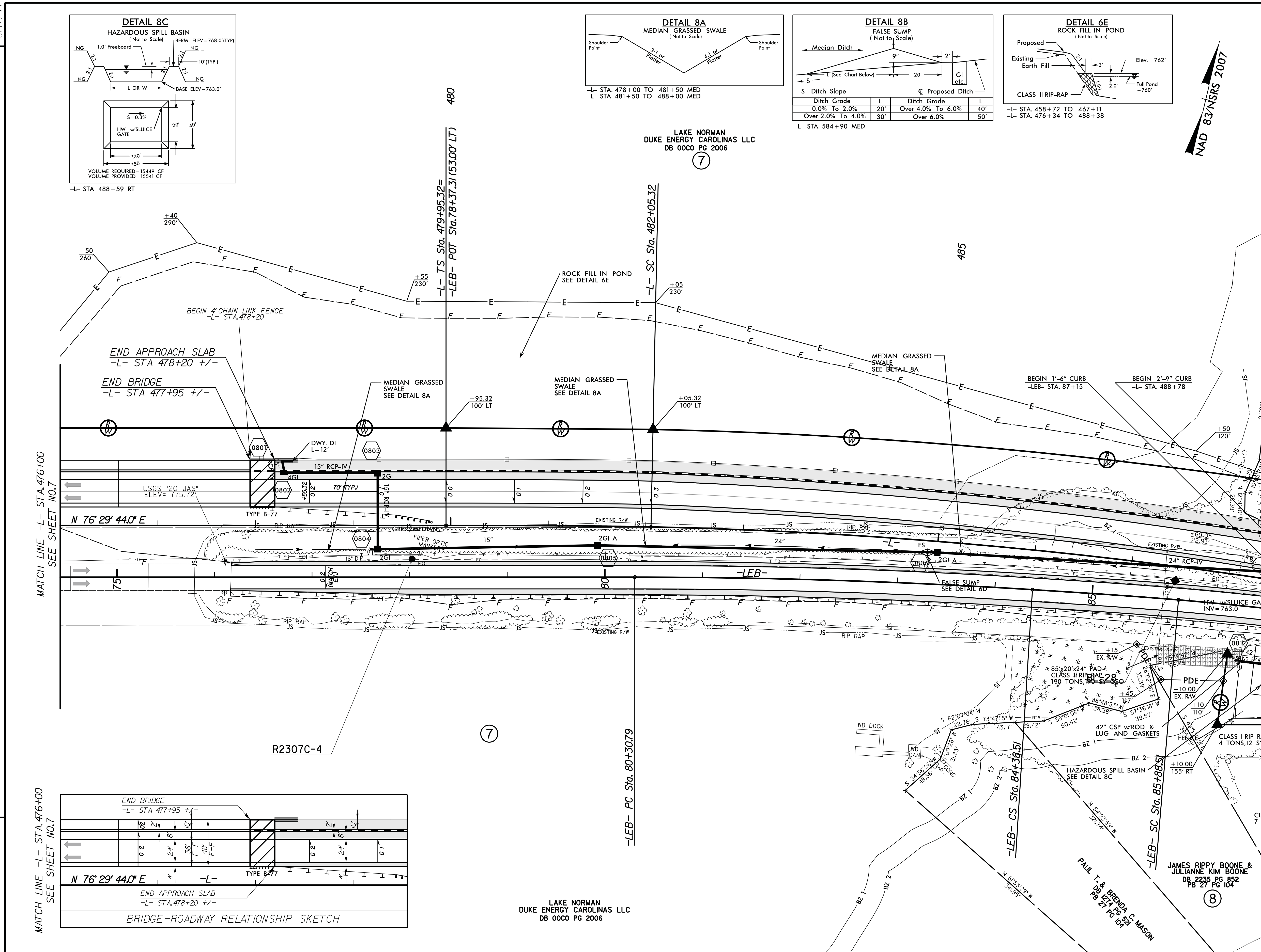

DETAIL 8C
HAZARDOUS SPILL BASIN
(Not to Scale)
1.0' Freeboard
BERM ELEV=768.0'(TYP)
BASE ELEV=763.0'
L OR W
S=0.3%
HW w/SLUICE GATE
VOLUME REQUIRED=15449 CF
VOLUME PROVIDED=15541 CF
-L- STA 488+59 RT
DETAIL 8A
MEDIAN GRASSED SWALE
(Not to Scale)
Shoulder Point
3:1 or Flatter
4:1 or Flatter
-L- STA. 478+00 TO 481+50 MED
-L- STA. 481+50 TO 488+00 MED
DETAIL 8B
FALSE SUMP
(Not to Scale)
Median Ditch
S=Ditch Slope
℄ Proposed Ditch
Ditch Grade | L | Ditch Grade | L
0.0% To 2.0% | 20' | Over 4.0% To 6.0% | 40'
Over 2.0% To 4.0% | 30' | Over 6.0% | 50'
-L- STA. 584+90 MED
DETAIL 6E
ROCK FILL IN POND
(Not to Scale)
Proposed
Existing Earth Fill
Elev.=762'
Full Pond =760'
CLASS II RIP-RAP
-L- STA. 458+72 TO 467+11
-L- STA. 476+34 TO 488+38
NAD 83/NSRS 2007
LAKE NORMAN
DUKE ENERGY CAROLINAS LLC
DB 00CO PG 2006
7
DUKE ENERGY CAROLINAS LLC
DB 68 PG 152
MT ISLAND FILE No. 1106
10
-L- TS Sta. 479+95.32=
-LEB- POT Sta.78+37.31 (53.00' LT)
-L- SC Sta. 482+05.32
-L- CS Sta. 489+38.25
ROCK FILL IN POND
SEE DETAIL 6E
BEGIN 4' CHAIN LINK FENCE
-L- STA.478+20
END APPROACH SLAB
-L- STA 478+20 +/-
END BRIDGE
-L- STA 477+95 +/-
MEDIAN GRASSED SWALE
SEE DETAIL 8A
BEGIN 1'-6" CURB
-LEB- STA. 87+15
BEGIN 2'-9" CURB
-L- STA. 488+78
BEGIN WALL W-1
-L- STA.488+70
MATCH LINE -L- STA.476+00
SEE SHEET NO.7
MATCH LINE -L- STA.490+00
SEE SHEET NO.9
N 76° 29' 44.0" E
USGS "20 JAS"
ELEV= 775.72'
TYPE B-77
FALSE SUMP
SEE DETAIL 8B
HW w/SLUICE GATE
INV=763.0
-LEB-
-L-
-LEB- PC Sta. 80+30.79
-LEB- CS Sta. 84+38.51
-LEB- SC Sta. 85+88.51
85'x20'x24" PAD
CLASS II RIP RAP
190 TONS,190 SY GEO
42" CSP w/ROD & LUG AND GASKETS
HAZARDOUS SPILL BASIN
SEE DETAIL 8C
CLASS I RIP RAP
4 TONS,12 SY GEO
CLASS I RIP RAP
7 TONS,17 SY GEO
BERM=768
R2307C-4
PAUL T. & BRENDA C. MASON
JAMES RIPPY BOONE &
JULIANNE KIM BOONE
DB 2235 PG 852
PB 27 PG 104
8
MAXEY J. ANDRESS &
BARBARA ANDRESS
DB 1733 PG 1580
PB 27 PG 104
9
11
RETAIN SYSTEM
WD DOCK
END BRIDGE
-L- STA 477+95 +/-
END APPROACH SLAB
-L- STA.478+20 +/-
BRIDGE-ROADWAY RELATIONSHIP SKETCH

SEE SHEET 40 FOR -L- PROFILE
SEE SHEETS 56 THRU 57 FOR -LEB- PROFILE
SEE SHEET 74 FOR -TRAIL- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA

REVISIONS
4-18-2018 REVISED EASEMENTS ON PARCEL 7.

8/17/99

4/16/2018
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User:bevans

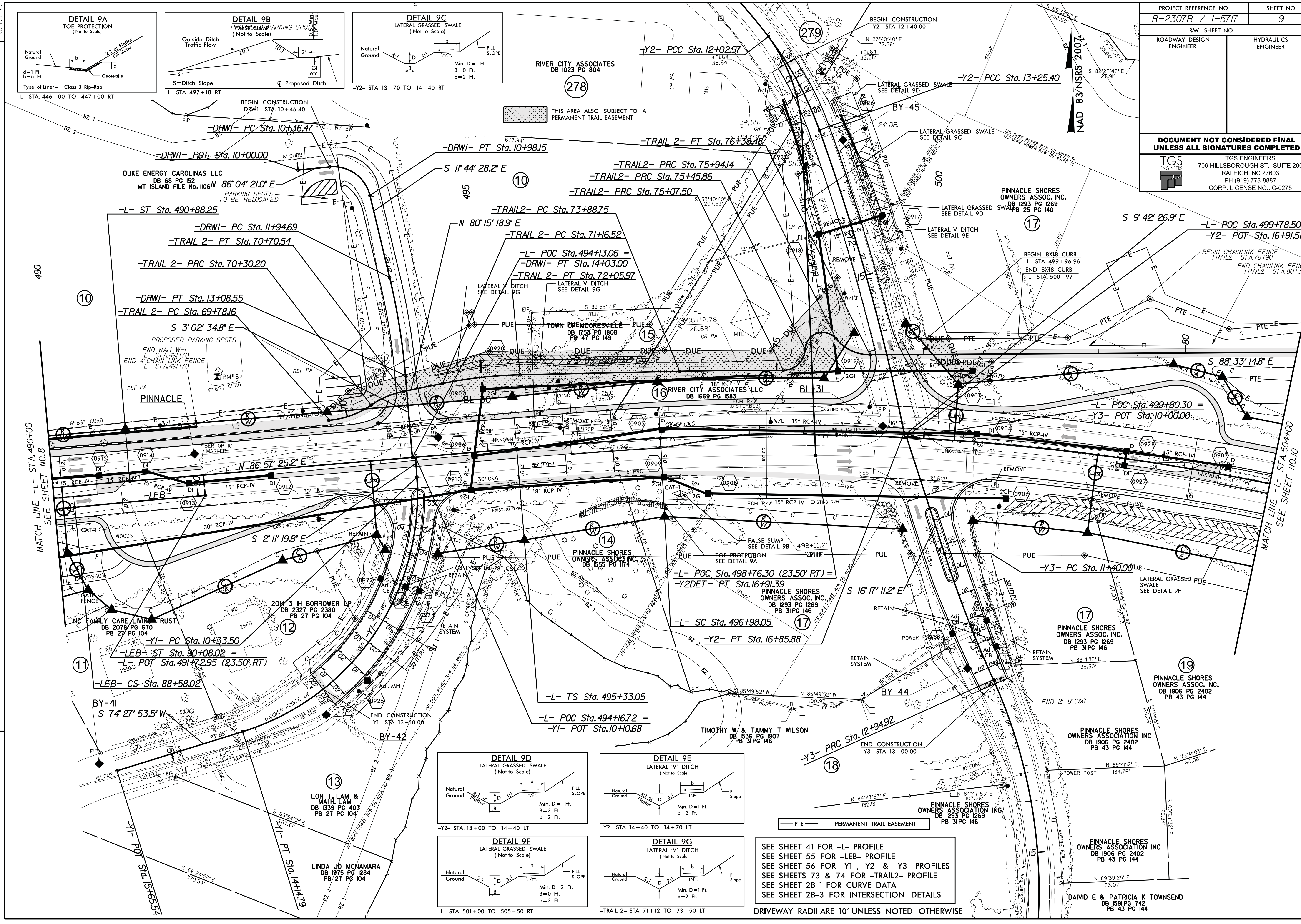
PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

REVISIONS

4-18-2018 REVISED EASEMENTS ON PARCELS 10,13-17,19 278 & 279.
11-13-2018 RENUMBERED PARCEL 278 TO 16. ADDED HATCHED SHADED AREA TO DENOTE OVERLAP OF PTE WITH OTHER EASEMENT TYPES.(DBE)



SEE SHEET 41 FOR -L- PROFILE
SEE SHEET 55 FOR -LEB- PROFILE
SEE SHEET 56 FOR -Y1-, -Y2- & -Y3- PROFILES
SEE SHEETS 73 & 74 FOR -TRAIL2- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-3 FOR INTERSECTION DETAILS

DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

11/9/2018
x:\ncdot\r-2307b\roadway\proj\R-2307B_RDY_PSH_09.dgn
User:bevans

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

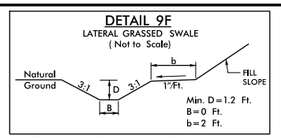
8/17/99

REVISIONS

4-18-2018 REVISED EASEMENTS ON PARCELS 17,19 & 20-22.
11-13-2018 ADDED HATCHED SHADED AREA TO DENOTE OVERLAP OF PTE WITH OTHER EASEMENT TYPES.(DBE)

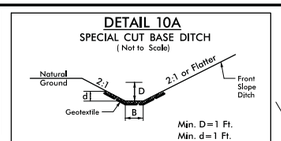
NAD 83/NSRS 2007

DETAIL 9F
LATERAL GRASSED SWALE
(Not to Scale)



–L– STA. 501+00 TO 505+50 RT

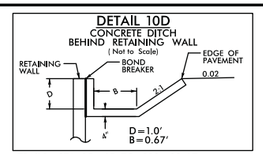
DETAIL 10A
SPECIAL CUT BASE DITCH
(Not to Scale)



Type of Liner= Class B Rip-Rap

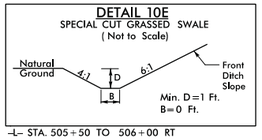
–DRW3– STA. 11+03 TO 13+25 RT
(SEE XSC FOR GRADE)

DETAIL 10D
CONCRETE DITCH
BEHIND RETAINING WALL
(Not to Scale)



–TRAIL2– STA. 95+65 TO 100+88 LT
(SEE XSC FOR GRADE)

DETAIL 10E
SPECIAL CUT GRASSED SWALE
(Not to Scale)



–L– STA. 505+50 TO 506+00 RT

THIS AREA ALSO SUBJECT TO A PERMANENT TRAIL EASEMENT

–Y4– POT Sta. 10+00.00
–Y4– PC Sta. 10+06.48
–Y4– PT Sta. 11+01.16
–Y4– PC Sta. 14+16.47
–Y4A– POT Sta. 11+50.00
–Y4A– POT Sta. 10+00.00
–Y4– POT Sta. 14+53.04
–Y4– PT Sta. 16+18.93
–TRAIL2– PCC Sta. 84+92.64
–TRAIL2– PC Sta. 81+87.20
–TRAIL2– PCC Sta. 89+33.34
–TRAIL2– PRC Sta. 86+90.03
–TRAIL2– PRC Sta. 90+71.62
–TRAIL2– PRC Sta. 94+65.20
–TRAIL2– PT Sta. 95+62.45
2 TONS,7 SY GEO
–DRW3– PC Sta. 11+21.72
–DRW3– PRC Sta. 12+07.14
–DRW3– PT Sta. 13+28.41
–DRW3– POT Sta. 14+01.55
–L– POT Sta. 5+12+61.02 =
–Y4– POT Sta. 16+48.32
–L– POT Sta. 5+5+70.003 =
–DRW3– POT Sta. 14+01.55
–L– CS Sta. 507+88.15
–L– ST Sta. 510+63.15
–L– STA. 504+00 SEE SHEET NO. 9
MATCH LINE –L– STA. 5+18+00 SEE SHEET NO. 11

BY-48
BY-47
BL-32
BL-33

S 24° 08' 03.1" E
S 65°04'08" E 39.10'
S 65°35'19" E 367.19'
S 37° 41' 47.5" E
N 65°32'17" W 353.96'
N 59° 57' 36.2" E
S 12° 44' 17.0" W
S 24° 27' 09.8" W
N 65° 57' 11.8" W
S 65° 32' 50.2" E
N 30°33'45" E 33.19'
S 35°33'59" W 26.74'
S 35°33'59" W 225.06'
S 46°44'45" W 122.44'
S 48°16'20" E 245.98'
S 32°09'40" E 110.07'
N 09°43'27" W 140.37'
N 89°39'25" E 84.45'
N 09°13'15" W 50.49'
S 89°53'10" W 116.22'

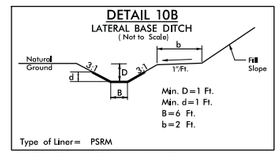
BEGIN CONSTRUCTION –Y4– STA. 13+80.00
END CONSTRUCTION –Y4A– STA. 10+90.00
BEGIN CONSTRUCTION –DRW3– STA. 10+92.26
BEGIN 4' CHAIN LINK FENCE –TRAIL 2– STA. 94+50
TIE TO EX DITCH
BEGIN WITH CHAIN –L– S
FILL EX. DITCH
CONCRETE DITCH BEHIND RET WALL SEE DETAIL 10D
SPECIAL CUT BASE DITCH SEE DETAIL 10A
LATERAL GRASSED SWALE SEE DETAIL 9F
SPECIAL CUT GRASSED SWALE DETAIL 10E
LATERAL BASE DITCH SEE DETAIL 10B
LATERAL GRASSED SWALE SEE DETAIL 10C
CLASS B RIP RAP EST. 2 TONS GEOTEXTILE EST. 7 SY
CLASS B RIP RAP 2 TONS,7 SY GEO
AREA BETWEEN PTE AND R/W TO BE INCLUDED IN TEMP. CONST. ESMT.
REMOVE SYSTEM
REMOVE 10 LF OF 18" RCP
PROP. SBG –L– STA. 509+02.00 TO 512+30.00 RT
BEGIN 8X18 CURB –L– STA. 508+50
END 8X18 CURB –L– STA. 508+64
BEGIN 8X18 CURB –L– STA. 509+29
END 8X18 CURB –L– STA. 512+42
McCRARY ACCESS AREA
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 41 FOR –L– PROFILE
SEE SHEET 56 FOR –Y4– & –Y4A– PROFILE
SEE SHEET 71 FOR –DRW3– PROFILE
SEE SHEET 74 FOR –TRAIL2– PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-3 FOR INTERSECTION DETAILS

—PTE— PERMANENT TRAIL EASEMENT

17 PINNACLE SHORES OWNERS ASSOCIATION INC DB 1293 PG 1269 PB 25 PG 142
PINNACLE SHORES OWNERS ASSOC. INC. DB 1293 PG 1269 PB 25 PG 140
20 PROMENADE ON THE LAKE LLC DB 1611 PG 123 PB 41 PG 103
JACK R. WILLIAMS DB 1399 PG 740 PB 41 PG 104 21

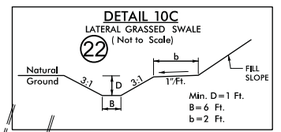
DETAIL 10B
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= PSRM

–L– STA. 514+50 TO 516+00 RT

DETAIL 10C
LATERAL GRASSED SWALE
22 (Not to Scale)



–L– STA. 516+00 TO 517+50 RT

11/9/2018
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User:bevans

8/17/99

REVISIONS

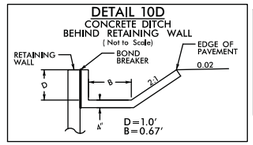
4-18-2018 REVISED EASEMENTS ON PARCELS 17 & 22.
11-13-2018 ADDED HATCHED SHADED AREA TO DENOTE OVERLAP OF PTE WITH OTHER EASEMENT TYPES.(DBE)

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

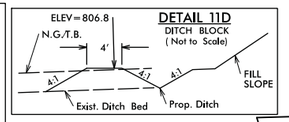
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

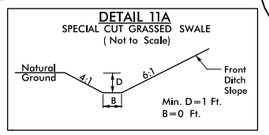
DETAIL 10D
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)



DETAIL 11D
DITCH BLOCK
(Not to Scale)



DETAIL 11A
SPECIAL CUT GRASSED SWALE
(Not to Scale)



BY-54
BY-49
S 0° 21' 35.0" E
-Y5- POT Sta. 10+00.00
-Y5- PC Sta. 10+06.07
-Y5- PT Sta. 10+77.27
-Y5- PC Sta. 11+55.00
-DRW3- POT Sta. 10+00.00
-TRAIL2- PT Sta. 105+88.06
-Y5- PT Sta. 13+05.98
-TRAIL2- PRC Sta. 104+91.40
-TRAIL2- PC Sta. 103+70.74
-TRAIL2- PC Sta. 106+46.52
-TRAIL2- PRC Sta. 107+20.29
-TRAIL2- PRC Sta. 109+94.56
-TRAIL2- PT Sta. 110+96.90
BEGIN CONSTRUCTION -Y5- STA. 13+50.00
S 24° 34' 06.0" W
S 65° 25' 54.0" E
S 66° 37' 36.1" E
S 65° 32' 50.2" E
S 25° 29' 48.5" E
N 62° 27' 03.8" W
S 24° 27' 09.8" W
-DRW2- PC Sta. 10+83.44
-DRW2- PT Sta. 11+56.56
-DRW2- PC Sta. 13+28.25
-DRW2- PT Sta. 13+42.15
-DRW2- POT Sta. 13+71.33
-L- POT Sta. 526+51.22 = -Y5- POT Sta. 15+30.08
-L- TS Sta. 530+23.56
MATCH LINE -L- STA. 518+00 SEE SHEET NO.10
MATCH LINE -L- STA. 532+00 SEE SHEET NO.12
NAD 83/NSRS 2007

PINNACLE SHORES OWNERS ASSOCIATION INC
DB 1293 PG 1269
PB 27 PG 98

PINNACLE SHORES OWNERS ASSOC. INC.
DB 1293 PG 1269
PB 25 PG 148

PINNACLE SHORES OWNERS ASSOC. INC.
DB 1293 PG 1269
PB 27 PG 98

REX A STUMP & KIMBERLY A STUMP
DB 1189 PG 1442
PB 27 PG 98

ANGELA S & DANIEL C HARRIS
DB 2065 PG 2017
PB 27 PG 98

JESSE JAMES THOMAS III & ROSEANN THOMAS
DB 1126 PG 765
PB 27 PG 98

150' DUKE POWER R/W DB 481PG 91

200' DUKE POWER R/W DB 481PG 91

CONCRETE DITCH BEHIND RET WALL SEE DETAIL 10D

END WALL W-2 WITH CHAINLINK FENCE -L- STA. 522+10

END 4' CHAIN LINK FENCE -TRAIL 2- STA.103+00

BEGIN 4' CHAINLINK FENCE -TRAIL2- STA.107+50.00

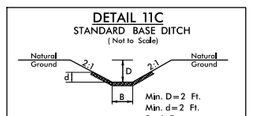
END 4' CHAINLINK FENCE -TRAIL2- STA.109+89.00

CLASS B RIP RAP 2 TONS,7 SY GEO

50'x20'x18" PAD CLASS I RIP RAP 80 TONS,NO GEO

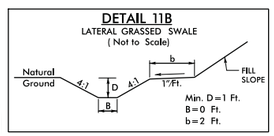
THIS AREA ALSO SUBJECT TO A PERMANENT TRAIL EASEMENT

DETAIL 11C
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class I Rip-Rap with No Geotextile
-L- STA. 520+14, 173' RT TO 520+16, 287' RT (DAYLIGHT AT 7.0%)

DETAIL 11B
LATERAL GRASSED SWALE
(Not to Scale)



DUKE ENERGY CAROLINAS LLC
DB 968 PG 250
PB 25 PG 160
MT ISLAND FILE No. 1107
(22)

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

PTE —— PERMANENT TRAIL EASEMENT

SEE SHEET 42 FOR -L- PROFILE
SEE SHEET 57 FOR -Y5- PROFILE
SEE SHEET 71 FOR -DRW2- PROFILE
SEE SHEETS 74 & 75 -TRAIL2- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-4 FOR INTERSECTION DETAILS

11/9/2018
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User:bevans

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

REVISIONS

8/17/99

4-18-2018 REVISED EASEMENTS ON PARCELS 17,22-31,276 & 280.
5-23-2018 REVISED EASEMENTS ON PARCELS 25,30,31 & 276.
10-9-2018 REVISED PROPERTY OWNER AND DEED BOOK DATA FOR PARCEL 280.
11-13-2018 RENUMBERED PARCEL 30 TO 31 AND ADDED SAME OWNER LINE. ADDED HATCHED SHADED AREA TO DENOTE OVERLAP OF PTE WITH OTHER EASEMENT TYPES.(DBE)

11/9/2018
User:devers

DETAIL 12A
TOE PROTECTION
(Not to Scale)
Natural Ground, 2:1 or Flatter Fill Slope, b, d, d=1 Ft., b=5 Ft., Geotextile
Type of Liner= Class B Rip-Rap
–TRAIL 2– STA. 118+22 TO 121+51 LT

DETAIL 12B
LATERAL GRASSED SWALE
(Not to Scale)
Natural Ground, 3:1, D, 3:1, b, 1'-Ft., FILL SLOPE, B
Min. D=1 Ft. B=4 Ft. b=2 Ft.
–L– STA. 539+00 TO 541+00 RT

DETAIL 12C
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 3:1, d, D, 3:1, b, 1'-Ft., Fill Slope
Min. D=1 Ft. Min. d=1 Ft. b=2 Ft.
Type of Liner= PSRM
–L– STA. 541+00 TO 542+50 RT

DETAIL 12D
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground, 2:1, d, D, 4:1 or Flatter, Front Ditch Slope
Type of Liner= PSRM
Min. D=1 Ft. Min. d=1 Ft.
–Y8– STA. 9+20 TO 10+50 LT

DETAIL 12E
LATERAL GRASSED SWALE
(Not to Scale)
Natural Ground, 4:1, D, 4:1, b, 1'-Ft., FILL SLOPE, B
Min. D=1 Ft. B=2 Ft. b=2 Ft.
–L– STA. 532+50 TO 534+00 RT

THIS AREA ALSO SUBJECT TO A PERMANENT TRAIL EASEMENT

NAD 83/NSRS 2007

DERRICK A & YVONNE W NEAL
DB 1217 PG 671
PB 27 PG 98

CARL B RENFRO
DB 1361 PG 1030
PB 27 PG 98

STEVEN J. HARTLE AND WIFE
ASHLEY PRICE HARTLE
DB 2557 PG 1447

CAROLINA WATER SERVICES INC
DB 1057 PG 744
PB 26 PG 55

JEREMY PATRICK MICHELONE
AMY JANE MICHELONE
DB 1793 PG 1919

GENE SWEATT
MONICA SWEATT
DB 2468 PG 1675
PB 66 PG 32, LOT 2

GENE SWEATT
MONICA SWEATT
DB 2483 PG 517
PB 66 PG 32, LOT 1

CAROLINA WATER SERVICES, INC. OF NORTH CAROLINA
DB 1057 PG 744
PB 26 PG 55, LOT 102

PINNACLE SHORES OWNERS ASSOC. INC.
DB 1293 PG 1269
PB 27 PG 98

DAVID W. & MARIA DEGENHART
DB 1697 PG 1495
PB 31PG 145

LOUIS A. SARRO
DB 1660 PG 906
PB 31PG 145

TED ROOSEVELT BOWERS JR & VERONICA BOWERS
DB 2186 PG 230
PB 31PG 145

LAKE LUXURY HOMES LLC
DB 2356 PG 1902
PB 49 PG 20

RONNIE L.SMITH & LEE A. SMITH
DB 2084 PG 2258
PB 57 PG 80

–Y6– PC Sta. 11+36.02
–Y6– PT Sta. 12+11.89
–Y6– PC Sta. 12+20.04
–Y6– PT Sta. 12+96.29
–Y6– PC Sta. 13+98.90
–Y6– PT Sta. 15+51.92
–Y6– PT Sta. 15+94.18
–L– CS Sta. 534+89.94
–L– SC Sta. 532+23.56
–Y7– PT Sta. 12+84.51
–Y7– PC Sta. 13+00.40
–L– POS Sta. 535+16.67 =
–Y7– POT Sta. 10+00.00
–L– ST Sta. 536+89.94
–Y7– PC Sta. 11+04.53
–Y9– POT Sta. 9+90.00
–Y9– PC Sta. 10+06.80
–Y9– PCC Sta. 10+81.48
–Y9– PT Sta. 12+67.84
–Y8– POT Sta. 10+00.00
–Y8– PC Sta. 11+06.16
–Y8– POT Sta. 11+85.43
–Y9– POT Sta. 13+39.80
–Y8– PT Sta. 11+94.50
–TRAIL2– PRC Sta. 116+06.52
–TRAIL2– PT Sta. 116+75.71
–TRAIL2– PC Sta. 117+92.53
–TRAIL2– PRC Sta. 118+63.60
–TRAIL2– PT Sta. 119+06.91
–TRAIL2– PC Sta. 120+26.50
–TRAIL2– PRC Sta. 121+90.01
–TRAIL2– PT Sta. 123+36.86
–TRAIL2– PC Sta. 114+72.78
–TRAIL2– PT Sta. 114+21.72
–TRAIL2– PC Sta. 113+57.50
–TRAIL2– PT Sta. 126+66.87
–TRAIL2– PRC Sta. 125+79.77
–TRAIL2– PC Sta. 125+04.14
–L– POT Sta. 544+21.54 =
–Y8– POT Sta. 14+68.79

BEGIN CONSTRUCTION –Y6– STA. 14+00.00
BEGIN CONSTRUCTION –Y9– STA. 10+80.00
BEGIN CONSTRUCTION –Y8– STA. 10+40.00 SPECIAL CUT DITCH SEE DETAIL 12D
BEGIN 4' CHAIN LINK FENCE –TRAIL 2– STA.115+25
BEGIN 4' CHAIN LINK FENCE –TRAIL 2– STA.119+35
END CONSTRUCTION –Y7– STA. 12+50.00
TRANSITION 2'-9" CURB TO 1'-6" CURB STA.536+23.27 TO 536+89.94
PROP. SBG –L– STA. 538+00.00 TO 541+05.00 LT
TOE PROTECTION SEE DETAIL 12A

CLASS B RIP RAP 1 TONS,5 SY GEO
CLASS B RIP RAP 2 TONS,7 SY GEO
CLASS B RIP RAP 3 TONS,10 SY GEO
CLASS B RIP-RAP 2 TONS,7 SY GEO

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 42 FOR –L– PROFILE
SEE SHEET 57 FOR –Y6–, –Y7–, –Y8– & –Y9– PROFILES
SEE SHEET 75 FOR –TRAIL2– PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-4 FOR INTERSECTION DETAILS

PTE PERMANENT TRAIL EASEMENT

MATCH LINE –L– STA.532+00 SEE SHEET NO.11
MATCH LINE –L– STA.546+00 SEE SHEET NO.13

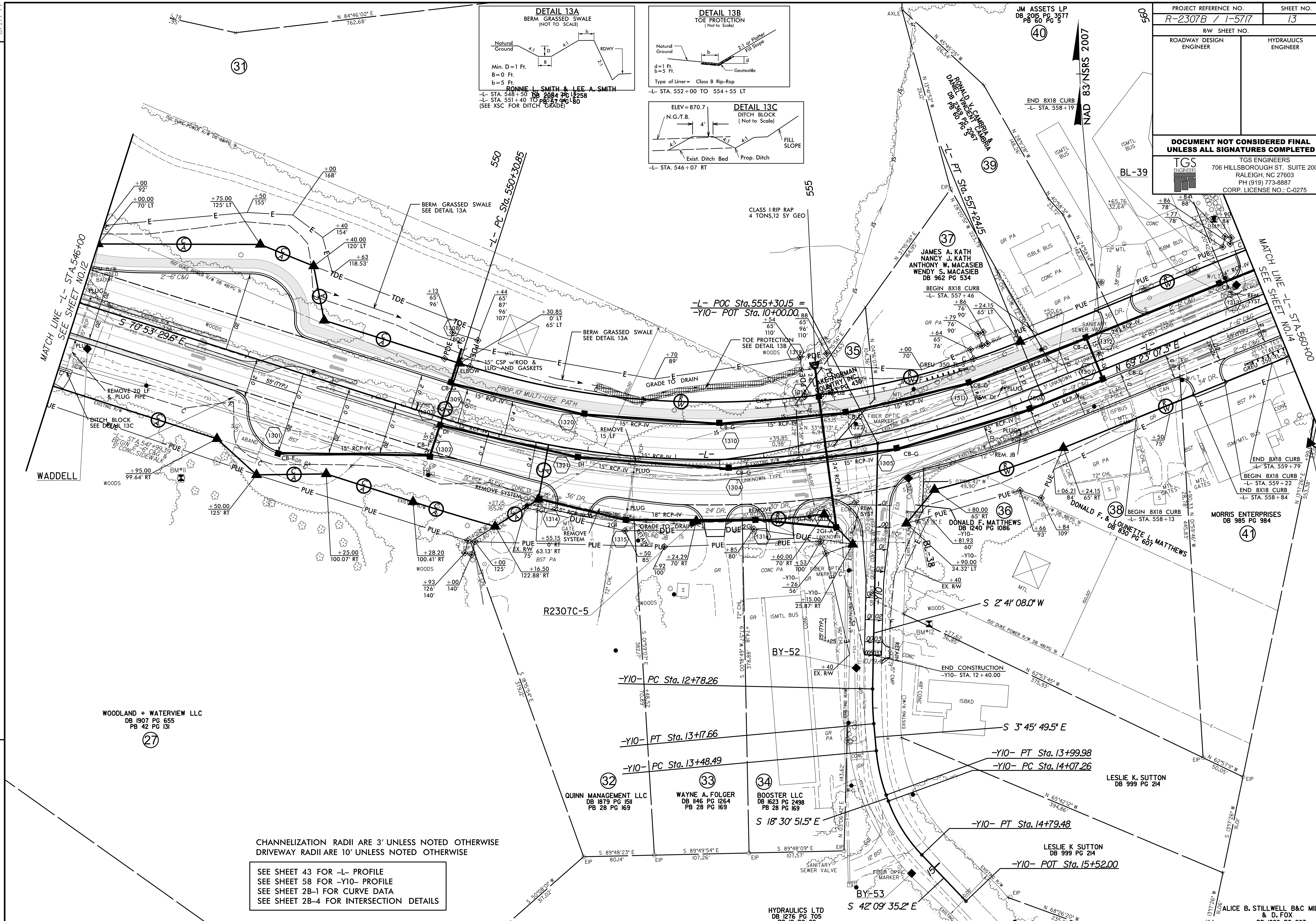
PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

REVISIONS
3-2-2018 REVISED EASEMENTS ON PARCELS 27,32-34 & 36-40.

8/17/99



CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 43 FOR -L- PROFILE
SEE SHEET 58 FOR -Y10- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-4 FOR INTERSECTION DETAILS

4/17/2018
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User:bevans

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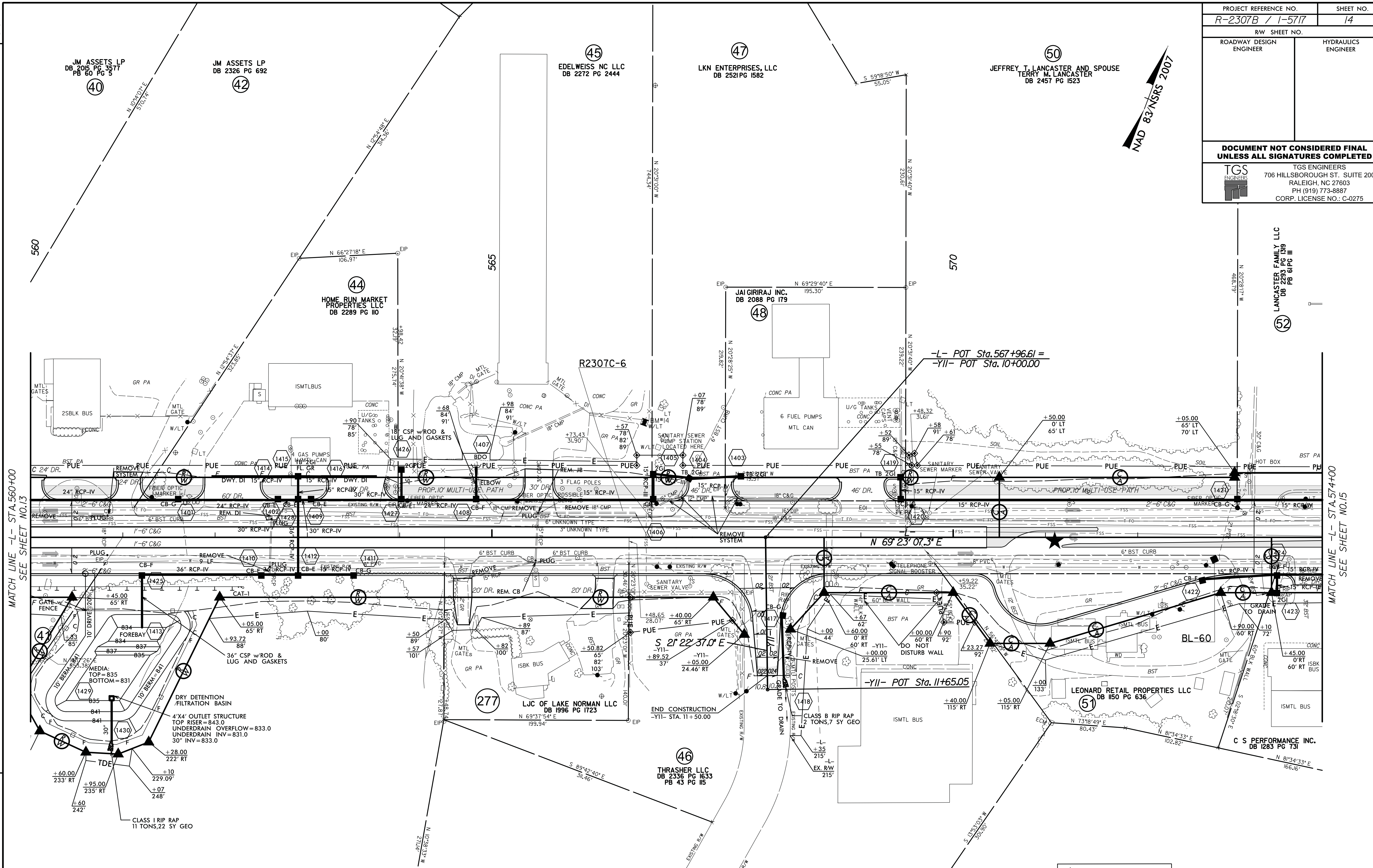
TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

REVISIONS

4-18-2018 REVISED EASEMENTS ON PARCELS 42,44-50,52 & 277.
9-26-2018 REVISED PROPERTY OWNER AND DEED BOOK DATA FOR PARCELS 47 & 50.
11-13-2018 ADDED "DO NOT DISTURB" NOTE ON PARCEL 47.(DBE)

8/17/99



NAD 83/NSRS 2007
JM ASSETS LP
DB 2015 PG 3577
PB 60 PG 5
40
JM ASSETS LP
DB 2326 PG 692
42
45
EDELWEISS NC LLC
DB 2272 PG 2444
47
LKN ENTERPRISES, LLC
DB 2521 PG 1582
50
JEFFREY T. LANCASTER AND SPOUSE
TERRY M. LANCASTER
DB 2457 PG 1523
44
HOME RUN MARKET PROPERTIES LLC
DB 2289 PG 110
JAI GIRIRAJ INC.
DB 2088 PG 179
48
LANCASTER FAMILY LLC
DB 2293 PG 139
PB 61 PG 111
52
R2307C-6
-L- POT Sta. 567+96.61 =
-Y11- POT Sta. 10+00.00
PROP. 10' MULTI-USE PATH
N 69°23' 07.3" E
MATCH LINE -L- STA. 560+00
SEE SHEET NO. 13
MATCH LINE -L- STA. 574+00
SEE SHEET NO. 15
S 21°22' 37.0" E
-Y11- POT Sta. 11+65.05
END CONSTRUCTION
-Y11- STA. 11+50.00
DRY DETENTION /FILTRATION BASIN
4'X4' OUTLET STRUCTURE
TOP RISER=843.0
UNDERDRAIN OVERFLOW=833.0
UNDERDRAIN INV=831.0
30" INV=833.0
MEDIA:
TOP=835
BOTTOM=831
FOREBAY
36" CSP w/ROD & LUG AND GASKETS
CLASS I RIP RAP
11 TONS, 22 SY GEO
CLASS B RIP RAP
2 TONS, 7 SY GEO
277
LJC OF LAKE NORMAN LLC
DB 1996 PG 1723
46
THRASHER LLC
DB 2336 PG 1633
PB 43 PG 115
LEONARD RETAIL PROPERTIES LLC
DB 1150 PG 636
51
C S PERFORMANCE INC.
DB 1283 PG 731
BL-60
43
ALICE B. STILLWELL B&C MILLS
& D. FOX
DB 1826 PG 263
49
THRASHER LLC
DB 2336 PG 1633
PB 43 PG 115
DO NOT DISTURB WALL
TELEPHONE SIGNAL BOOSTER
SANITARY SEWER PUMP STATION LOCATED HERE
6 FUEL PUMPS
MTL CAN
4 GAS PUMPS
ISMTLBUS
560
565
570

UPGRADE EXISTING OR NEW SIGNAL

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 43 FOR -L- PROFILE
SEE SHEET 58 FOR -Y11- PROFILE
SEE SHEET 2B-4 FOR INTERSECTION DETAILS

11/9/2018
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PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

REVISIONS

8/17/99

4-18-2018 REVISED EASEMENTS ON PARCELS 52-62.

MATCH LINE -L- STA.574+00
SEE SHEET NO.14

MATCH LINE -L- STA.588+00
SEE SHEET NO.16

NAD 83/NSRS 2007

LANCASTER FAMILY LLC
DB 2293 PG 1339
PB 61PG III

BRYANT F LANCASTER ETAL
DB 2293 PG 1316
PB 61PG III

BIG DADDYS PROPERTIES LLC
DB 2293 PG 1324
PB 61PG III

JAMES W PARTIN
DB 2194 PG 829

KEITH M & STACY F WINDSOR
DB 2096 PG 2394

BEAM DISTRIBUTORS LLC
DB 1813 PG 801

SMITH & SMITH PROPERTIES INC.
DB 1790 PG 1813

BIG DADDYS PROPERTIES LLC
DB 2293 PG 1329

GREER FAMILY ENTERPRISES LLC
DB 1952 PG 2024

C S PERFORMANCE INC.
DB 1283 PG 131

ALICE B. STILLWELL
CATHERINE T. MILLS
DAVID M. FOX
DB 18262 PG 268

HIPAR INVESTMENTS LLC
DB 1848 PG 470

GREG BIFFLE INC.
DB 1690 PG 2042
PB 52 PG 85

-L- POT Sta.580+66.47 = -Y12- POT Sta. 16+32.39

-L- POT Sta.580+67.56 = -Y13- POT Sta. 10+00.00

-L- PC Sta. 583+84.09

-DRW4- PT Sta. 11+33.94

-DRW4- POT Sta. 11+52.71

N 42° 44' 12.2" W

-Y12- PC Sta. 11+95.96

-Y12- PT Sta. 13+21.38

S 7° 02' 30.6" W

-DRW4- PCC Sta. 10+87.03

-DRW4- PRC Sta. 10+63.28

-DRW4- PC Sta. 15+12.39

S 79° 21' 54.0" W

S 10° 38' 06.0" W

-Y12- POT Sta. 15+00.00

-DRW4- POT Sta. 10+00.00

-Y13- PC Sta. 13+53.78

N 81°34'33" E 166.16'

S 81°34'33" W 418.17'

-Y13- POT Sta. 15+74.77

-Y13- PT Sta. 15+01.09

S 9° 44' 24.1" W

S 5° 31' 12.0" W

N 69° 23' 07.3" E

BEGIN CONSTRUCTION -Y12- STA. 13+85.00

END CONSTRUCTION -Y13- STA. 13+00.00

BY-84

BY-85

BL-6

RETAIN SYSTEM

REMOVE 30 LF

REMOVE 40 LF

REMOVE SYSTEM

REMOVE 45 LF

RETAIN 15" RCP & TIE INTO 2GI

PROP.10' MULTI-USE PATH

LATERAL GRASSED SWALE SEE DETAIL 15A

GRADE TO DRAIN

RAISED PAVEMENT SUSPECT MANHOLE

FIBER OPTIC MARKER

-Y11- ROBINSON RD

-Y12- McCRARY RD

2019 ADT	2039 ADT
850	1,090
24,100	36,580
200	200
650	890
-L- NC 150	
25,130	38,250
300	300
880	1,280
1,180	1,580

DETAIL 15A
LATERAL GRASSED SWALE
(Not to Scale)

Natural Ground — 3:1 — D — 3:1 — b — 1':Ft. — Fill Slope

Min. D=0.5 Ft.
b=2 Ft.

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 44 FOR -L- PROFILE
SEE SHEET 58 FOR -Y12- & -Y13- PROFILES
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-5 FOR INTERSECTION DETAILS

4/17/2018
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PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

NAD 83 NSRS 2007

8/17/99

REVISIONS

4-18-2018 REVISED EASEMENTS ON PARCELS 61-69.
9-19-2018 REVISED PROPERTY OWNER NAME TO PARCEL 71.
10-9-2018 REVISED PROPERTY OWNER AND DEED BOOK DATA FOR PARCEL 70.(DBE)

62 CYNTHIA ANNE GEORGE DB 723 PG 786

64 MILLER WALLACE LLC DB 1885 PG 523

66 AFLP #2 LLC+LAB INVESTMENTS DB 1592 PG 1004

68 C S RENTALS OF LAKE NORMAN INC DB 2150 PG 119

70 PATTEN SEED CO. DB 2418 PG 2022

69 PEOPLES BANK DB 1785 PG 1782 PB 52 PG 68

63 GREG BIFFLE INC. DB 1690 PG 2042 PB 52 PG 95

61 GREG BIFFLE INC. DB 1690 PG 2042 PB 52 PG 95

65 GREG BIFFLE INC. DB 1690 PG 2042 PB 52 PG 95

67 111 RIVERPARK ROAD LLC DB 2176 PG 1018 PB 35 PG 65

71 THRESHOLD CAROLINAS 15 - RP LLC, ET AL DB 2450 PG 251

-L- POC Sta. 594+24.00 = -Y14- POT Sta. 10+00.00

-Y14- POT Sta. 11+76.26

-L- PT Sta. 598+29.72

MATCH LINE -L- STA. 588+00 SEE SHEET NO.15

MATCH LINE -L- STA. 602+00 SEE SHEET NO.17

BY-88 BY-89 BY-90

PROP. 10' MULTI-USE PATH

LIMITS OF GRADE TO DRAIN COINCIDE WITH CONSTRUCTION EASEMENT

GRADE TO DRAIN

END CONSTRUCTION -Y14- STA. 11+50.00

END OF RECORD INFORMATION

FILL W/ FLOWABLE FILL

OPEN FIELD

BL-62 BL-63 BL-64

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 44 FOR -L- PROFILE
SEE SHEET 58 FOR -Y14- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-5 FOR INTERSECTION DETAILS
SEE SHEET 2B-X FOR BULB DETAILS

10/8/2018
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User:devans

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

REVISIONS

11-8-2017 REVISED EASEMENTS ON PARCELS 71-77.
5-23-2018 ADDED DB DATA TO PARCEL 72 FOR PARCEL 73.
5-23-2018 REVISED OWNER AND DB DATA FOR PARCEL 73.
9-19-2018 REVISED C/A BETWEEN POND AND APARTMENT BUILDING ON PARCEL 71.
9-19-2018 ADDED PROPERTY OWNER NAME TO PARCEL 71.
10-9-2018 REVISED PROPERTY OWNER AND DEED BOOK DATA FOR PARCEL 70.(DBE)

8/17/99

10/8/2018
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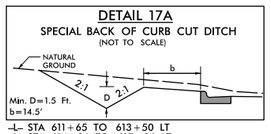
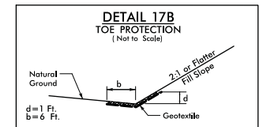
DETAIL 17A
SPECIAL BACK OF CURB CUT DITCH
(NOT TO SCALE)



–L– STA 611+65 TO 613+50 LT
–L– STA 614+04 TO 617+36 LT

DETAIL 17B
TOE PROTECTION
(Not to Scale)



–L– STA 608+00 TO 612+00 LT

NAD 83/NSRS 2007

BY-91

(70) PATTEN SEED CO.
DB 2418 PG 2022

(72) PEGGY P BROTHERTON
DB 439 PG 074
DB 1206 PG 1547

(75) BRIDGESTONE LLC
DB 1121 PG 805

(77) BEROTH OIL COMPANY
DB 1841 PG 758
PB 45 PG 105

(71) THRESHOLD CAROLINAS 15 – RP LLC, ET AL
DB 2450 PG 251

(73) TRIANGLE PALISAIDES AT WATERS EDGE LLC
DB 2497 PG 1121
PB 62 PG 22

(74) BEREA BAPTIST CHURCH
DB 832 PG 18

(74) BEREA BAPTIST CHURCH
DB 708 PG 386

(76) ZIP PROPERTIES INC.
DB 1855 PG 337

(84) ZIP PROPERTIES INC
DB 1649 PG 979

★ UPGRADE EXISTING OR NEW SIGNAL

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 45 FOR –L– PROFILE
SEE SHEET 58 FOR –Y15– PROFILE
SEE SHEETS 2B-1 & 2B-2 FOR CURVE DATA
SEE SHEET 2B-6 FOR INTERSECTION DETAILS
SEE SHEET 2B-13 FOR BULB DETAILS

MATCH LINE –L– STA.602+00 SEE SHEET NO.16

MATCH LINE –L– STA.616+00 SEE SHEET NO.18

–Y15– PT Sta. 12+93.22

–Y15– PC Sta. 12+94.05

–L– PC Sta. 612+79.72

–L– POC Sta.613+77.76 = –Y15– POT Sta. 14+92.06

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

REVISIONS

8/17/99

11-8-2017 REVISED EASEMENTS ON PARCELS 77-78,82-84,104-107 & 110.
1-12-2018 REMOVED AUE FROM PARCEL 110.
4-18-2018 REVISED PUE ON PARCEL 104.
5-23-2018 REVISED TOPO AND SLOPE STAKES AND OWNER FOR PARCEL 109. ADDED DO NOT DISTURB NOTE.

NAD 83/NSRS 2007

DETAIL 17A
SPECIAL BACK OF CURB CUT DITCH
(NOT TO SCALE)

-L- STA. 614+04 TO 617+36 LT (b=14.5 ft)
-L- STA. 625+50 TO 627+83 RT (b=9.5 ft)

MATCH LINE -Y16- STA.23+50
SEE SHEET NO.31

MATCH LINE -L- STA.616+00
SEE SHEET NO.17

MATCH LINE -L- STA.630+00
SEE SHEET NO.19

MATCH LINE -Y17- STA.14+00
SEE SHEET NO.32

-Y16- PT Sta. 24+93.26

-L- PT Sta. 617+69.03

-L- PC Sta. 620+69.03

-L- PT Sta. 625+90.38

-Y18- POT Sta. 10+00.00

-L- POT Sta. 626+79.33 = -Y18- POT Sta. 13+20.63 FILL WITH FLOWABLE FILL

-Y17- PC Sta. 10+92.10

BEGIN CONSTRUCTION -Y18- STA. 11+20.00

77 BEROTH OIL COMPANY
DB 1841 PG 758
PB 45 PG 105
RUINS
SPECIAL BACK OF CURB CUT DITCH SEE DETAIL 17A

78 ZIP PROPERTIES INC.
DB 1752 PG 41
END WALL W-3
-L- STA.617+60

82 MCDONALDS REAL ESTATE CO.
DB 2005 PG 1
PB 53 PG 112

105 HT PERTH RD LLC
DB 1582 PG 1304
PB 53 PG 112

107 NC NNN FINANCIAL ASSOC LLC & PROSPECT NC NNN LLC
DB 2288 PG 1463
PB 53 PG 112

108 HT PERTH RD LLC
DB 1582 PG 1304
PB 53 PG 112

109 D2/DARIO, LLC
DB 2466 PG 604
PB 51PG 38

110 SAM J. & BARBARA BAKER
DB 1797 PG 2354
DB 1756 PG 1431

83 SAM J. & BARBARA H. BAKER
DB 1612 PG 1522
DB 1756 PG 1434
PB 51PG 146

85 SAM J & BARBARA H BAKER
DB 1612 PG 1522
PB 51PG 146

84 ZIP PROPERTIES INC
DB 1649 PG 979

106 CARLENE LOUISE SMITH
DB 573 PG 227
DB 1749 PG 2201

104 CARLENE LOUISE SMITH
DB 210 PG 94
DB 1749 PG 2204

R2307C-7

BL-66 BL-67 BL-68

DETAIL 18A
LATERAL 'V' DITCH
(Not to Scale)

-L- STA. 620+38 TO 621+00 RT

★ UPGRADE EXISTING OR NEW SIGNAL

-Y16- PERTH RD
-Y17- DOOLIE RD
-L- NC 150

	2019 ADT	2039 ADT
-Y16- PERTH RD	11,040	13,200
-L- NC 150 W of -Y16-	25,130	38,250
-L- NC 150 E of -Y16-	4,240	5,440
-L- NC 150 W of -Y17-	5,330	5,970
-L- NC 150 E of -Y17-	3,210	4,250
-Y17- DOOLIE RD	450	690
-L- NC 150 W of -Y18-	28,980	42,340
-L- NC 150 E of -Y18-	5,120	6,720

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 45 FOR -L- PROFILE
SEE SHEET 59 FOR -Y16- PROFILE
SEE SHEET 60 FOR -Y17- PROFILE
SEE SHEET 61 FOR -Y18- PROFILE
SEE SHEETS 2B-1 & 2B-2 FOR CURVE DATA
SEE SHEET 2B-7 FOR INTERSECTION DETAIL

5/22/2018
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PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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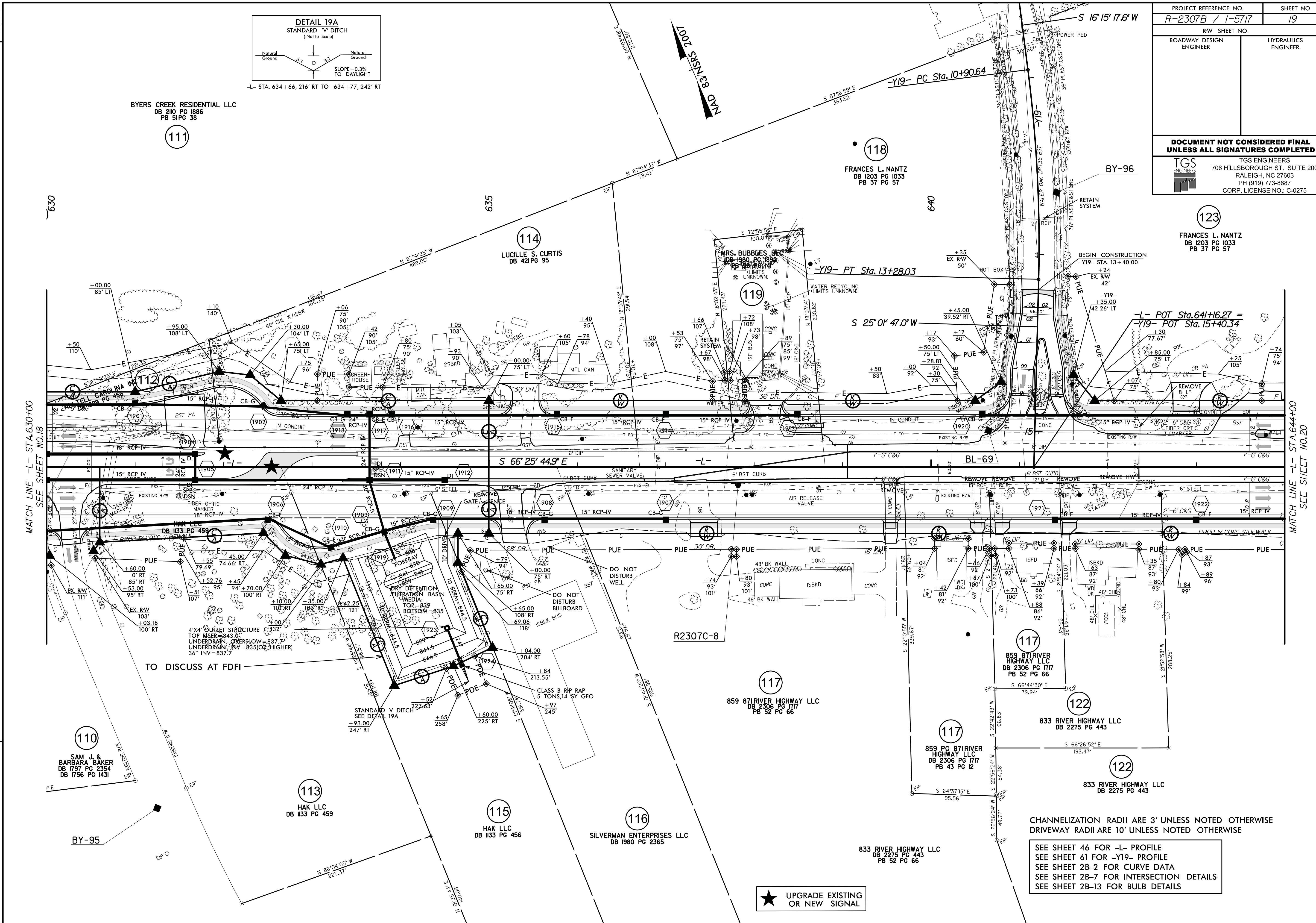
TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

REVISIONS

11-8-2017 REVISED EASEMENTS ON PARCELS 110,113-124
1-12-2017 REMOVED AUE LINE FROM PARCELS 120,121 & 122
10-9-2018 ADDED NOTES 'DO NOT DISTURB BILLBOARD' AND 'DO NOT DISTURB WELL' TO PARCEL 116,RENUMBERED PARCELS 120 AND 121 TO PARCEL 117. RENUMBERED PARCELS 124 AND 125 TO PARCEL 122.(DBE)

8/17/99



DETAIL 19A
STANDARD 'V' DITCH
(Not to Scale)
SLOPE=0.3% TO DAYLIGHT
-L- STA. 634+66, 216' RT TO 634+77, 242' RT
NAD 83/NSRS 2007
BYERS CREEK RESIDENTIAL LLC
DB 2110 PG 1886
PB 51 PG 38
LUCILLE S. CURTIS
DB 421 PG 95
MRS. BUBBLES LLC
DB 1980 PG 1892
FRANCES L. NANTZ
DB 1203 PG 1033
PB 37 PG 57
-Y19- PC Sta. 10+90.64
-Y19- PT Sta. 13+28.03
S 16° 15' 17.6" W
S 25° 01' 47.0" W
BEGIN CONSTRUCTION -Y19- STA. 13+40.00
-L- POT Sta. 641+16.27 = -Y19- POT Sta. 15+40.34
S 66° 25' 44.9" E
BL-69
BY-96
BY-95
MATCH LINE -L- STA. 630+00 SEE SHEET NO. 18
MATCH LINE -L- STA. 644+00 SEE SHEET NO. 20
HAK LLC
DB 1133 PG 459
DRY DETENTION FILTRATION BASIN
MEDIA: TOP=839 BOTTOM=835
4'X4' OUTLET STRUCTURE
TOP RISER=843.0'
UNDERDRAIN OVERFLOW=837.7
UNDERDRAIN INV=835(OR HIGHER)
36" INV=837.7
TO DISCUSS AT FDFI
STANDARD V DITCH SEE DETAIL 19A
CLASS B RIP RAP 5 TONS, 14 SY GEO
DO NOT DISTURB WELL
DO NOT DISTURB BILLBOARD
R2307C-8
SAM J. & BARBARA BAKER
DB 1797 PG 2354
DB 1756 PG 1431
HAK LLC
DB 1133 PG 456
SILVERMAN ENTERPRISES LLC
DB 1980 PG 2365
859 871 RIVER HIGHWAY LLC
DB 2306 PG 1717
PB 52 PG 66
833 RIVER HIGHWAY LLC
DB 2275 PG 443
833 RIVER HIGHWAY LLC
DB 2275 PG 443
PB 52 PG 66
859 PG 871 RIVER HIGHWAY LLC
DB 2306 PG 1717
PB 43 PG 12
UPGRADE EXISTING OR NEW SIGNAL

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 46 FOR -L- PROFILE
SEE SHEET 61 FOR -Y19- PROFILE
SEE SHEET 2B-2 FOR CURVE DATA
SEE SHEET 2B-7 FOR INTERSECTION DETAILS
SEE SHEET 2B-13 FOR BULB DETAILS

10/8/2018
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User:bevans

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

8/17/99

REVISIONS

11-8-2017 REVISED EASEMENTS ON PARCELS 123-132,134
5-23-2018 REVISED C/A AND ADDED DRIVEWAY FOR PARCEL 132 AT STA 657+00 LT.
10-9-2018 REVISED PROPERTY OWNER AND DEED BOOK DATA FOR PARCELS 129 & 130. RENUMBERED PARCELS 124 AND 125 TO PARCEL 122(DBE)

MATCH LINE -L- STA 644+00
SEE SHEET NO.19

MATCH LINE -L- STA 658+00
SEE SHEET NO.21

DETAIL 20A
STANDARD BASE DITCH
(Not to Scale)

B=5 Ft. SLOPE=0.3% TO DAYLIGHT

-L- STA 655+45, 331'LT TO 655+67, 287'LT

123 FRANCES L. NANTZ
DB 1203 PG 1033
PB 37 PG 57

126 HGST GROUP LLC
DB 1378 PG 1071
PB 40 PG 98

132 POLLY HAGER MOORE
DB 614 PG 824

122 833 RIVER HIGHWAY LLC
DB 2275 PG 443

128 PRINCETON ASSET MANAGEMENT LP
DB 1696 PG 1742

129 PHILLIP ROTELLA AND SPOUSE DEBRA ROTELLA
DB 2464 PG 211

130 PHILLIP ROTELLA AND SPOUSE DEBRA ROTELLA
DB 2464 PG 211

131 BEAM PROPERTIES RLLLP
DB 1902 PG 2048
PB 36 PG 134

127 WILLIAM STEWART JR. & MARCK ALEXANDER
DB 2140 PG 1185

134

DRY DETENTION /FILTRATION BASIN

4'X4' OUTLET STRUCTURE
TOP RISER=816.8
UNDERDRAIN OVERFLOW=811.0
UNDERDRAIN INV=808.0
42" INV=811.0

TOP MEDIA(EXPANDED SLATE)=813
BOTTOM MEDIATOP #57=809
BOTTOM #57=808
65LF OF 6" DIA PERF. HDPE @9'O.C.
MAX FILTER AREA=6175 SF
(25 3' FROM TOE OF TRANSITION BERM FOR RIP RAP TIE)

STANDARD BASE DITCH SEE DETAIL 20A
CLASS I RIP RAP 20 TONS,39 SY GEO

10' BERM=819
TOP TRANSITION BERM=815
GRAVEL BASE=812

10' DRIVE GATEwFENCE

FILL WITH FLOWABLE FILL

ISBK BUS
ISBLK BUS
ISF BUS

-L- POT Sta.657+54.84 = -Y20- POT Sta. 10+00.00
-Y20- POT Sta. 12+68.48
END CONSTRUCTION -Y20- STA. 11+51.84

BL-70
BL-71

S 66°25'44.9" E
S 25°19'56.8" W

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 46 FOR -L- PROFILE
SEE SHEET 61 FOR -Y20- PROFILE
SEE SHEET 2B-7 FOR INTERSECTION DETAILS

10/8/2018
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User:bevans

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

8/17/99

REVISIONS

11-8-2017 REVISED EASEMENTS ON PARCELS 133-143
1-12-2017 REMOVED STRAY PUE LINE FROM PARCELS 139 & 143

DETAIL 21A
SPECIAL BERM
(Not to Scale)
Prop. Cut Slope
Exist. Ditch Bed

-L- STA. 660+95 LT
-L- STA. 666+17 LT
-L- STA. 667+27 LT
-L- STA. 670+00 LT

133 DEBORAH JOHNSON KNOX & LARRY KNOX DB 780 PG 804

135 PATRICIA M. NEEL DB 395 PG 155

136 GERALD W. NEEL BRIAN T. NEEL & BRADLEY S. NEEL DB 2179 PG 1271

139 ROBERT H. HOWARD DB 475 PG 431 PB 55 PG 31

143 ROBERT H. HOWARD DB 372 PG 153 PB 55 PG 31

137 AUSTIN STAR ENTERPRISES LLC DB 1735 PG 588

134 BEAM PROPERTIES RLLLP DB 1974 PG 698 PB 36 PG 134

138 INTERNATIONAL CHURCH OF FOURSQUARE GOSPEL DB 625 PG 886

140 PBR REALTY LLC DB 2098 PG 2097 PB 42 PG 102

141 S & S #2 FAMILY LTD. PARTNERSHIP DB 1419 PG 828 PB 42 PG 102

142 GEORGE WINSTON MORRISON TRUST DB 1718 PG 390 PB 55 PG 17

-DRW5- PRC Sta. 11+21.11
-DRW5- POT Sta. 12+15.00
N 26° 06' 59.6" W
-DRW5- PT Sta. 12+04.88
-DRW5- PC Sta. 10+75.00
N 9° 50' 27.2" E
-L- POT Sta. 667+80.00 = -DRW5- POT Sta. 10+00.00
-L- PC Sta. 661+58.80
-L- PT Sta. 667+07.56
END CONSTRUCTION -DRW5- STA. 12+10.00
BL-72
BY-98
NAD 83/NSRS 2007

MATCH LINE -L- STA.658+00 SEE SHEET NO.20

MATCH LINE -L- STA.672+00 SEE SHEET NO.22

★ UPGRADE EXISTING OR NEW SIGNAL

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 47 FOR -L- PROFILE
SEE SHEET 71 FOR -DRW6- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-14 FOR BULB DETAILS

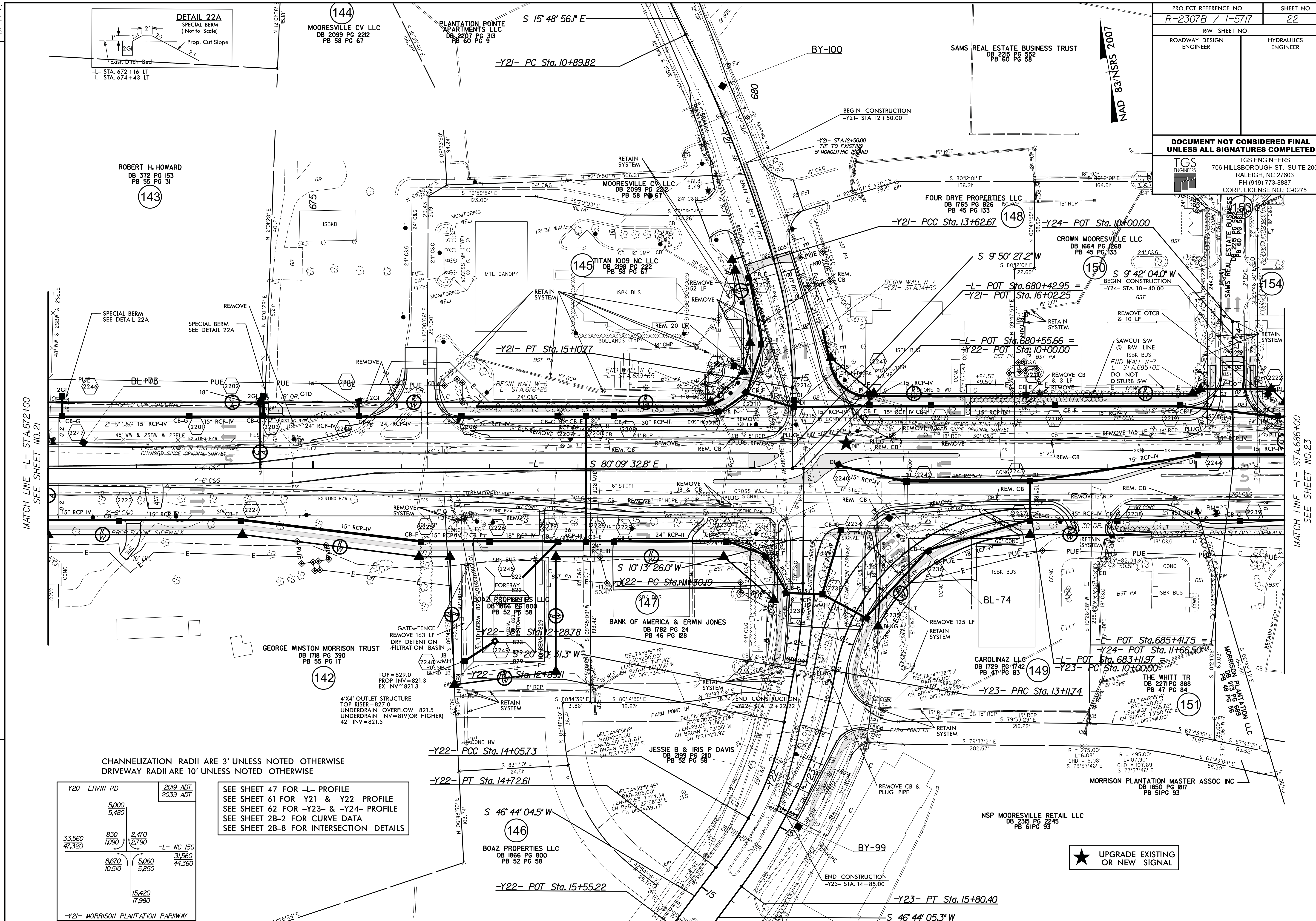
1/10/2018
C:\Projects\r-2307b\roadway\proj\R-2307B_RDY_PSH_21.dgn
User:bevans

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

NAD 83/NSRS 2007



DETAIL 22A
SPECIAL BERM
(Not to Scale)
Prop. Cut Slope
Exist. Ditch Bed
-L- STA. 672+16 LT
-L- STA. 674+43 LT
144
MOORESVILLE CV LLC
DB 2099 PG 2212
PB 58 PG 67
PLANTATION POINTE APARTMENTS LLC
DB 2207 PG 313
PB 60 PG 9
S 15° 48' 56.1" E
BY-100
-Y21- PC Sta. 10+89.82
SAMS REAL ESTATE BUSINESS TRUST
DB 2215 PG 552
PB 60 PG 58
BEGIN CONSTRUCTION
-Y21- STA. 12+50.00
-Y21- STA. 12+50.00
TIE TO EXISTING
5' MONOLITHIC ISLAND
ROBERT H. HOWARD
DB 372 PG 153
PB 55 PG 31
143
MOORESVILLE CV LLC
DB 2099 PG 2212
PB 58 PG 67
FOUR DRYE PROPERTIES LLC
DB 1765 PG 826
PB 45 PG 133
148
-Y21- PCC Sta. 13+62.67
-Y24- POT Sta. 10+00.00
CROWN MOORESVILLE LLC
DB 1664 PG 1268
PB 45 PG 133
150
153
154
145
TITAN 1009 NC LLC
DB 2198 PG 222
PB 58 PG 67
S 9° 50' 27.2" W
-L- POT Sta. 680+42.95 =
-Y21- POT Sta. 16+02.25
S 9° 42' 04.0" W
BEGIN CONSTRUCTION
-Y24- STA. 10+40.00
-Y21- PT Sta. 15+10.77
-L- POT Sta. 680+55.66 =
-Y22- POT Sta. 10+00.00
BEGIN WALL W-6
-L- STA. 676+85
END WALL W-6
-L- STA. 679+65
BEGIN WALL W-7
-Y21- STA. 14+50
END WALL W-7
-L- STA. 685+05
MATCH LINE -L- STA. 672+00
SEE SHEET NO. 21
MATCH LINE -L- STA. 686+00
SEE SHEET NO. 23
-L-
S 80° 09' 32.8" E
S 10° 13' 26.0" W
-Y22- PC Sta. 11+30.19
BOAZ PROPERTIES LLC
DB 1866 PG 800
PB 52 PG 58
147
BANK OF AMERICA & ERWIN JONES
DB 1782 PG 24
PB 46 PG 128
GEORGE WINSTON MORRISON TRUST
DB 1718 PG 390
PB 55 PG 17
142
-Y22- PT Sta. 12+28.78
S 5° 20' 50.1" W
-Y22- PC Sta. 12+89.11
TOP=829.0
PROP INV=821.3
EX INV=821.3
4'X4' OUTLET STRUCTURE
TOP RISER=827.0
UNDERDRAIN OVERFLOW=821.5
UNDERDRAIN INV=819(OR HIGHER)
42" INV=821.5
GATE w/FENCE
REMOVE 163 LF
DRY DETENTION /FILTRATION BASIN
BL-74
CAROLINAZ LLC
DB 1729 PG 1742
PB 47 PG 83
149
-L- POT Sta. 685+41.75 =
-Y24- POT Sta. 11+66.50
-L- POT Sta. 683+11.97 =
-Y23- PC Sta. 10+00.00
-Y23- PRC Sta. 13+11.74
THE WHITT TR
DB 2271 PG 888
PB 47 PG 84
151
MORRISON PLANTATION LLC
DB 1173 PG 689
PB 48 PG 56
END CONSTRUCTION
Y22- STA. 12+22.22
-Y22- PCC Sta. 14+05.73
-Y22- PT Sta. 14+72.61
JESSIE B & IRIS P DAVIS
DB 2199 PG 2110
PB 52 PG 58
MORRISON PLANTATION MASTER ASSOC INC
DB 1850 PG 1817
PB 51 PG 93
NSP MOORESVILLE RETAIL LLC
DB 2315 PG 2245
PB 61 PG 93
S 46° 44' 04.5" W
146
BOAZ PROPERTIES LLC
DB 1866 PG 800
PB 52 PG 58
BY-99
END CONSTRUCTION
-Y23- STA. 14+85.00
-Y22- POT Sta. 15+55.22
-Y23- PT Sta. 15+80.40
S 46° 44' 05.3" W

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

-Y20- ERVIN RD
2019 ADT
2039 ADT
5,000
5,480
850
1,090
2,470
2,790
33,560
47,320
-L- NC 150
31,560
44,360
8,670
10,510
5,060
5,850
15,420
17,980
-Y21- MORRISON PLANTATION PARKWAY

SEE SHEET 47 FOR -L- PROFILE
SEE SHEET 61 FOR -Y21- & -Y22- PROFILE
SEE SHEET 62 FOR -Y23- & -Y24- PROFILE
SEE SHEET 2B-2 FOR CURVE DATA
SEE SHEET 2B-8 FOR INTERSECTION DETAILS

★ UPGRADE EXISTING OR NEW SIGNAL

REVISIONS

11-8-2017 REVISED EASEMENTS ON PARCELS 142-145,147-152 & 154.
1-12-2017 REMOVED STRAY PUE LINE FROM PARCELS 143,144,145,148 & 150.
10-9-2018 CORRECTED PUE ON PARCEL 142.(DBE)

8/17/99

10/8/2018
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6/2/99

REVISIONS

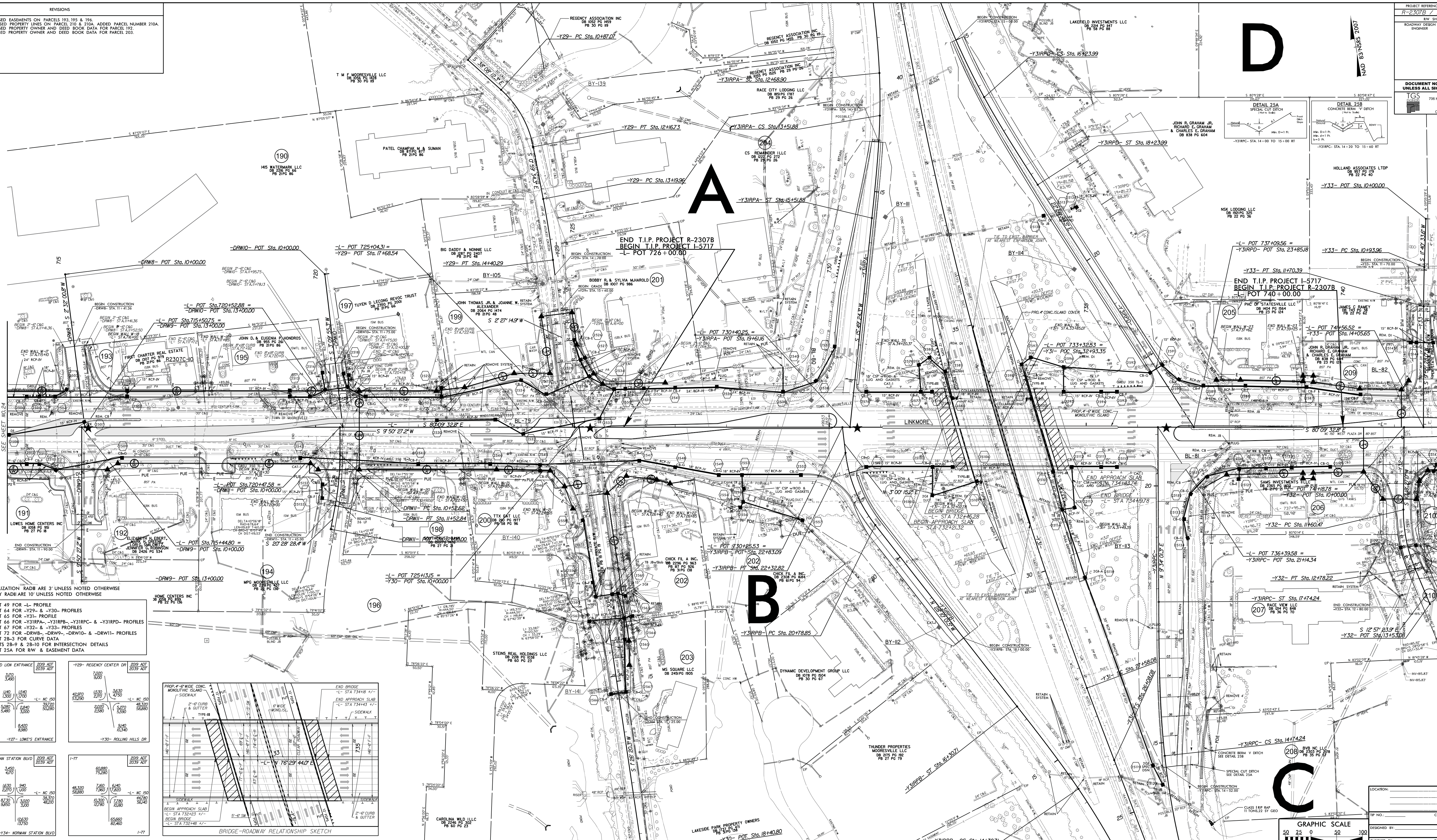
10-5-2017 REVISED EASEMENTS ON PARCELS 193, 195 & 196.
5-23-2018 REVISED PROPERTY LINES ON PARCEL 210 & 210A. ADDED PARCEL NUMBER 210A.
10-9-2018 REVISED PROPERTY OWNER AND DEED BOOK DATA FOR PARCEL 192.
REVISED PROPERTY OWNER AND DEED BOOK DATA FOR PARCEL 203.

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

NAD 83/NSRS 2007



CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 49 FOR -L- PROFILE
SEE SHEET 64 FOR -Y29- & -Y30- PROFILES
SEE SHEET 65 FOR -Y31- PROFILE
SEE SHEET 66 FOR -Y31RPA-, -Y31RPB-, -Y31RPC- & -Y31RPD- PROFILES
SEE SHEET 67 FOR -Y32- & -Y33- PROFILES
SEE SHEET 72 FOR -DRW8-, -DRW9-, -DRW10- & -DRW11- PROFILES
SEE SHEET 2B-3 FOR CURVE DATA
SEE SHEETS 2B-9 & 2B-10 FOR INTERSECTION DETAILS
SEE SHEET 25A FOR R/W & EASEMENT DATA

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION:
TIP NO.: COUNTY:
DESIGNED BY:
CHECKED BY: DATE:

8/17/99

REVISIONS

10-5-2017 REVISED EASEMENTS ON PARCELS 218,219 & 222
11-29-2017 REMOVED AUE FROM PARCELS 210 & 216
5-23-2018 REVISED PROPERTY LINES ON PARCELS 210A & 214, ADDED PARCEL NUMBER AND OWNER DATA FOR 210A.
5-23-2018 ADDED SIDEWALK AND "DO NOT DISTURB SIGN" NOTE AND RW AND EASEMENTS AT SOUTHERNMOST DRIVEWAY ON PARCEL 217.
10-9-2018 REVISED PROPERTY OWNER AND DEED BOOK DATA FOR PARCEL 221.(DBE)

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

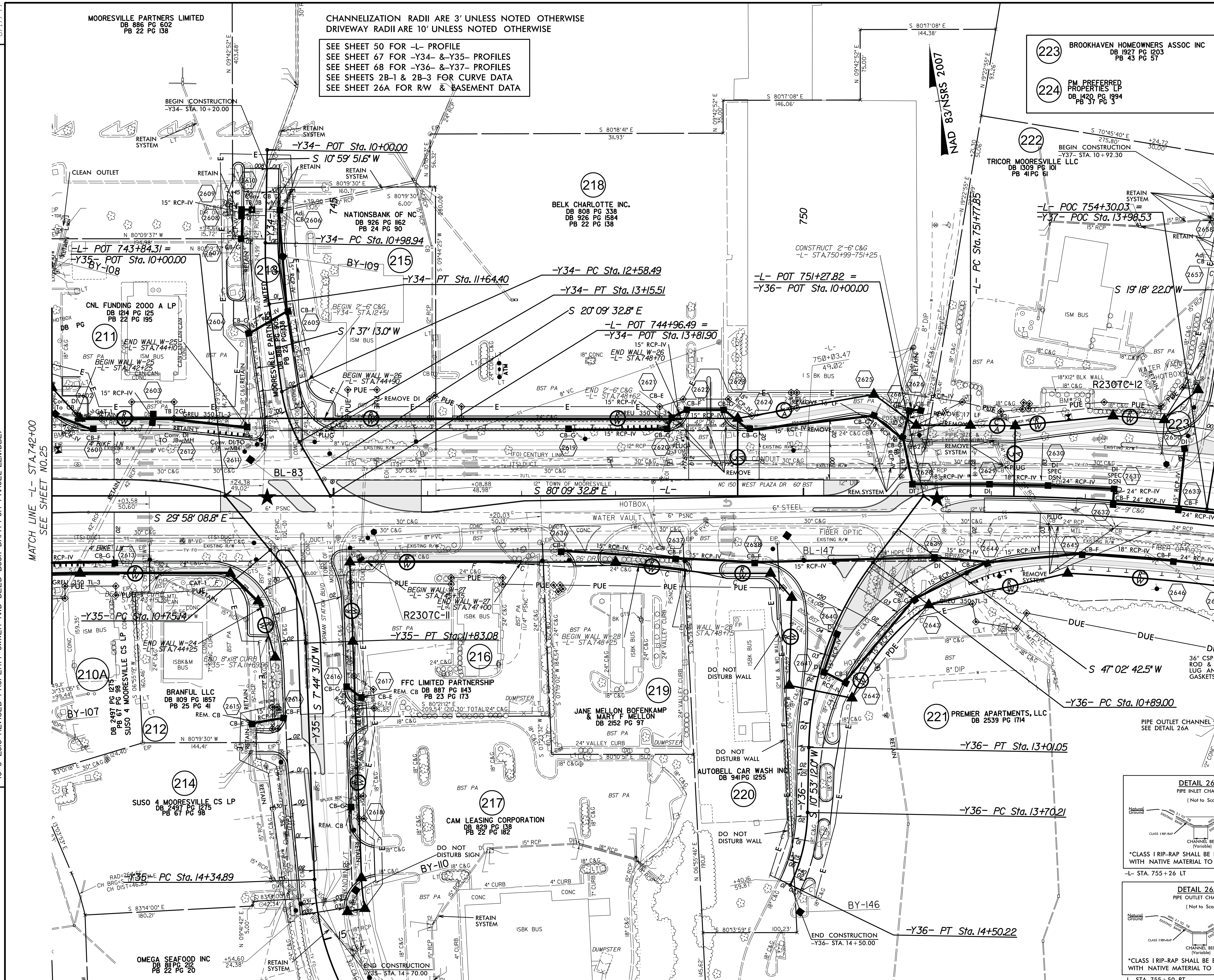
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 50 FOR -L- PROFILE
SEE SHEET 67 FOR -Y34- &-Y35- PROFILES
SEE SHEET 68 FOR -Y36- &-Y37- PROFILES
SEE SHEETS 2B-1 & 2B-3 FOR CURVE DATA
SEE SHEET 26A FOR R/W & EASEMENT DATA

(223) BROOKHAVEN HOMEOWNERS ASSOC INC, DB 1927 PG 1203, PB 43 PG 57
(224) PM PREFERRED PROPERTIES LP, DB 1420 PG 1994, PB 37 PG 3



NAD 83/NSRS 2007
MOORESVILLE PARTNERS LIMITED DB 886 PG 602 PB 22 PG 138
BEGIN CONSTRUCTION -Y34- STA. 10+20.00
-Y34- POT Sta. 10+00.00
S 10° 59' 51.6" W
-Y34- PC Sta. 10+98.94
-Y34- PT Sta. 11+64.40
-Y34- PC Sta. 12+58.49
-Y34- PT Sta. 13+15.51
S 20° 09' 32.8" E
-L- POT 744+96.49 = -Y34- POT Sta. 13+81.90
-L- POT 743+84.31 = -Y35- POT Sta. 10+00.00
NATIONSBANK OF NC DB 926 PG 1162 PB 24 PG 90
BELK CHARLOTTE INC. DB 808 PG 338 DB 926 PG 1584 PB 22 PG 138
CNL FUNDING 2000 A LP DB 1214 PG 125 PB 22 PG 195
-L- POT 751+27.82 = -Y36- POT Sta. 10+00.00
-L- PC Sta. 751+77.85
TRICOR MOORESVILLE LLC DB 1309 PG 101 PB 41 PG 61
BEGIN CONSTRUCTION -Y37- STA. 10+92.30
-L- POC 754+30.03 = -Y37- POC Sta. 13+98.53
S 19° 18' 22.0" W
R2307C-12
MATCH LINE -L- STA.742+00 SEE SHEET NO.25
MATCH LINE -L- STA.756+00 SEE SHEET NO.27
S 80° 09' 32.8" E
S 29° 58' 08.8" E
BL-83
BL-147
NC 150 WEST PLAZA DR 60' BST
-Y35- PC Sta. 10+75.14
-Y35- PT Sta. 11+83.08
-Y35- PC Sta. 14+34.89
S 7° 44' 31.0" W
R2307C-11
BRANFUL LLC DB 1109 PG 1857 PB 25 PG 41
SUSO 4 MOORESVILLE CS LP DB 2497 PG 1275 PB 67 PG 98
FFC LIMITED PARTNERSHIP DB 887 PG 1143 PB 23 PG 173
JANE MELLON BOFENKAMP & MARY F MELLON DB 2152 PG 97
CAM LEASING CORPORATION DB 829 PG 138 PB 22 PG 182
AUTOBELL CAR WASH INC DB 941 PG 1255
PREMIER APARTMENTS, LLC DB 2539 PG 1714
OMEGA SEAFOOD INC DB 811 PG 212 PB 22 PG 20
S 47° 02' 42.5" W
-Y36- PC Sta. 10+89.00
-Y36- PT Sta. 13+01.05
-Y36- PC Sta. 13+70.21
-Y36- PT Sta. 14+50.22
S 10° 53' 12.0" W
END CONSTRUCTION -Y36- STA. 14+50.00
END CONSTRUCTION -Y35- STA. 14+70.00
BY-107
BY-108
BY-109
BY-110
BY-146
DO NOT DISTURB WALL
DO NOT DISTURB SIGN
PIPE INLET CHANNEL SEE DETAIL 26B
PIPE OUTLET CHANNEL SEE DETAIL 26A

DETAIL 26B
PIPE INLET CHANNEL
(Not to Scale)

Length = 12 Ft.

*CLASS I RIP-RAP SHALL BE BACKFILLED WITH NATIVE MATERIAL TO FILL VOIDS.

-L- STA. 755+26 LT

DETAIL 26A
PIPE OUTLET CHANNEL
(Not to Scale)

Length = 20 Ft.
d = 5 Ft.

*CLASS I RIP-RAP SHALL BE BACKFILLED WITH NATIVE MATERIAL TO FILL VOIDS.

-L- STA. 755+50 RT

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	26A

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

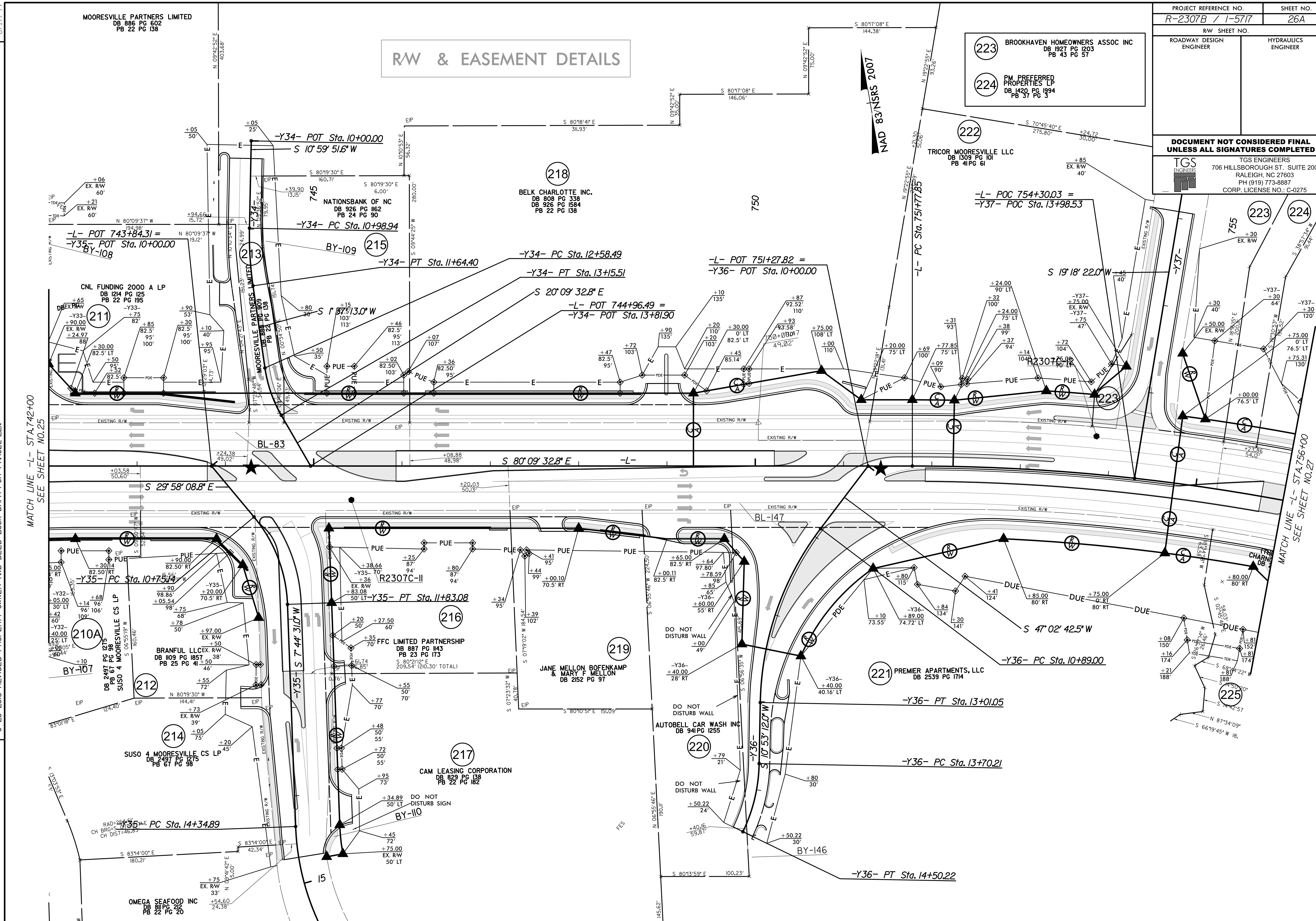
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

R/W & EASEMENT DETAILS

REVISIONS

10-5-2017 REVISED EASEMENTS ON PARCELS 218,219 & 222
11-29-2017 REMOVED AUE FROM PARCELS 210 & 216
5-23-2018 REVISED PROPERTY LINES ON PARCELS 210A & 214, ADDED PARCEL NUMBER AND OWNER DATA FOR 210A.
5-23-2018 ADDED SIDEWALK AND 'DO NOT DISTURB SIGN' NOTE AND REVISED R/W AND EASEMENTS AT SOUTHERNMOST DRIVEWAY ON PARCEL 217.
9-26-2018 REVISED PROPERTY OWNER AND DEED BOOK DATA FOR PARCEL 221.



223 BROOKHAVEN HOMEOWNERS ASSOC INC DB 1927 PG 1203 PB 43 PG 57
224 PM PREFERRED PROPERTIES LP DB 1420 PG 1994 PB 37 PG 3
MOORESVILLE PARTNERS LIMITED DB 886 PG 602 PB 22 PG 138
NAD 83/NSRS 2007
218 BELK CHARLOTTE INC. DB 808 PG 338 DB 926 PG 1584 PB 22 PG 138
222 TRICOR MOORESVILLE LLC DB 1309 PG 101 PB 41 PG 61
NATIONSBANK OF NC DB 926 PG 1162 PB 24 PG 90
215
213
MOORESVILLE PARTNERS LIMITED DB 886 PG 909 PB 22 PG 138
211 CNL FUNDING 2000 A LP DB 1214 PG 125 PB 22 PG 195
-Y34- POT Sta. 10+00.00
S 10° 59' 51.6" W
-Y34- PC Sta. 10+98.94
-Y34- PT Sta. 11+64.40
-Y34- PC Sta. 12+58.49
-Y34- PT Sta. 13+15.51
S 20° 09' 32.8" E
-L- POT 744+96.49 = -Y34- POT Sta. 13+81.90
-L- POT 743+84.31 = -Y35- POT Sta. 10+00.00
-L- POT 751+27.82 = -Y36- POT Sta. 10+00.00
-L- PC Sta. 751+77.85
-L- POC 754+30.03 = -Y37- POC Sta. 13+98.53
S 19° 18' 22.0" W
S 80° 09' 32.8" E
-L-
S 29° 58' 08.8" E
BL-83
BL-147
MATCH LINE -L- STA.742+00 SEE SHEET NO.25
MATCH LINE -L- STA.756+00 SEE SHEET NO.27
-Y35- PC Sta. 10+75.14
-Y35- PT Sta. 11+83.08
-Y35- S 7° 44' 31.0" W
-Y35- PC Sta. 14+34.89
R2307C-II
210A SUSO 4 MOORESVILLE CS LP DB 2497 PG 1275 PB 67 PG 98
BRANFUL LLC DB 1109 PG 1857 PB 25 PG 41
212
214 SUSO 4 MOORESVILLE CS LP DB 2497 PG 1275 PB 67 PG 98
216 FFC LIMITED PARTNERSHIP DB 887 PG 1143 PB 23 PG 173
217 CAM LEASING CORPORATION DB 829 PG 138 PB 22 PG 182
DO NOT DISTURB SIGN
BY-107
BY-108
BY-109
BY-110
BY-146
219 JANE MELLON BOFENKAMP & MARY F MELLON DB 2152 PG 97
220 AUTOBELL CAR WASH INC DB 941 PG 1255
DO NOT DISTURB WALL
221 PREMIER APARTMENTS, LLC DB 2539 PG 1714
S 47° 02' 42.5" W
-Y36- PC Sta. 10+89.00
-Y36- PT Sta. 13+01.05
-Y36- PC Sta. 13+70.21
-Y36- PT Sta. 14+50.22
-Y36- S 10° 53' 12.0" W
225
OMEGA SEAFOOD INC DB 811 PG 212 PB 22 PG 20
EXISTING R/W
PUE
PDE
DUE

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

REVISIONS

8/17/99

11-8-2017 REVISED EASEMENTS ON PARCEL 229.
12-20-2017 REVISION ON 11-8-2017 WAS FOR PARCEL 230 RATHER THAN 229.
9-19-2018 REVISED EASEMENTS ON PARCELS 228,231 & 232. DELETED PARCEL NUMBER 227.
10-9-2018 REVISED PROPERTY OWNER AND DEED BOOK DATA FOR PARCEL 228.(DBE)
11-13-2018 ADDED RETAINING WALL W-38 ALONG PARCELS 233 & 235.(DBE)

11/9/2018
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226 PRECISION FRANCHISING INC DB 1235 PG 1650 PB 37 PG 3

224 PM PREFERRED PROPERTIES LP DB 1420 PG 1994 PB 37 PG 3

230 294 W PLAZA LLC DB 2307 PG 1811

229 CISA COMMERCIAL PROP LLC DB 2264 PG 526 PB 34 PG 5

236 SHERRILL KELLY K DB 781 PG 587 PB 28 PG 143

238 CAROLINA PROJECTS LTD DB 955 PG 1390

DP OF IREDELL LLC DB 1469 PG 514 PB 25 PG 179

233 DHRUVIN & MARGI INC DB 2321 PG 1649 PB 56 PG 76

234 GRIFFIN BROTHERS AUTO CENTERS LLC DB 2097 PG 170 PB 28 PG 143

235

232 LAND GROWTH LLC DB 2314 PG 90 PB 3 PG 79

231 CPM INVESTMENTS LLC DB 1641 PG 255

228 6K PROPERTIES LLC DB 2467 PG 2460

225 6K PROPERTIES LLC DB 2467 PG 2460

237 CIRCLE K STORES INC DB 205 PG 1856 PB 3 PG 79

249 TALBERT ROAD LLC DB 2242 PG 148 PB 3 PG 79

250 TALBERT ROAD L DB 2225 PG 155 PB 3 PG 79

252 TALBERT ROAD LLC DB 2225 PG 155 PB 3 PG 79

NOTE: USE DOUBLE GUARDRAIL POSTS FROM -L- STA. 756+25 TO 757+34 LT

BEGIN CONSTRUCTION -Y38- STA. 14+60.00

-L- PC Sta. 767+54.97

-L- PT Sta. 757+92.84

-L- POT 761+37.57 = -Y38- POT Sta. 16+56.03

-Y37- COPORATE CENTER DR

	2019 ADT	2039 ADT
-L- NC 150	38,240	49,440
	37,660	48,940
-Y37- COPORATE CENTER DR	1,050	1,290
-Y38- CAROLINA AUTO DIRECT ENTRANCE	640	800

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 50 FOR -L- PROFILE
SEE SHEET 68 FOR -Y38- PROFILE
SEE SHEET 27A FOR R/W & EASEMENT DATA

MATCH LINE -L- STA.756+00 SEE SHEET NO.26

MATCH LINE -L- STA.769+00 SEE SHEET NO.28

R/W & EASEMENT DETAILS

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	27A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

REVISIONS

8/17/99

11-8-2017 REVISED EASEMENTS ON PARCEL 229.
12-20-2017 REVISION ON 11-8-2017 WAS FOR PARCEL 230 RATHER THAN 229.
9-19-2018 REVISED EASEMENTS ON PARCELS 228,231 & 232. DELETED PARCEL NUMBER 227.
10-9-2018 REVISED PROPERTY OWNER AND DEED BOOK DATA FOR PARCEL 228.(DBE)
11-13-2018 ADDED RETAINING WALL W-38 ALONG PARCELS 233 & 235.(DBE)

11/9/2018
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User:bevans

236 SHERRILL KELLY K
DB 781 PG 587
PB 28 PG 143

238 CAROLINA PROJECTS LTD
DB 955 PG 1390

RYOTTRE
DB 2264 PG 1167

DP OF IREDELL LLC
DB 1469 PG 514
PB 25 PG 179

230 294 W PLAZA LLC
DB 2307 PG 1811

224 PM PREFERRED PROPERTIES LP
DB 1420 PG 1994
PB 37 PG 3

226 PRECISION FRANCHISING INC
DB 1235 PG 1650
PB 37 PG 3

229 CISA COMMERCIAL PROP LLC
DB 2264 PG 526
PB 34 PG 5

233 DHRUVIN & MARGI INC
DB 2321 PG 1649
PB 56 PG 76

GRIFFIN BROTHERS AUTO CENTERS LLC
DB 2097 PG 170
PB 28 PG 143

234

235

236 DP OF IREDELL LLC
DB 1469 PG 514
PB 25 PG 179

238

237

225 6K PROPERTIES LLC
DB 2467 PG 2460

228 6K PROPERTIES LLC
DB 2467 PG 2460

231 CPM INVESTMENTS LLC
DB 1641 PG 255

232 LAND GROWTH LLC
DB 2314 PG 90
PB 3 PG 79

249 TALBERT ROAD LLC
DB 2242 PG 148
PB 3 PG 79

250 TALBERT ROAD L
DB 2225 PG 155
PB 3 PG 79

252 TALBERT ROAD LLC
DB 2225 PG 155
PB 3 PG 79

CIRCLE K STORES INC
DB 205 PG 1856
PB 3 PG 79

SHERRILL KELLY K
DB 781 PG 587
PB 28 PG 143

-L- PC Sta. 767+54.97

-L- PT Sta. 757+92.84

-L- POT 761+37.57 =
-Y38- POT Sta. 16+56.03

BEGIN CONSTRUCTION
-Y38- STA. 14+60.00

BEGIN WALL W-38
-Y38- STA.15+60

END WALL W-29
-L- STA.757+35

END WALL W-30
-L- STA.758+83

END WALL W-38
-L- STA.763+80

BEGIN WALL W-41
-L- STA.761+70

END WALL W-41
-L- STA.763+70

BEGIN WALL W-42
-L- STA.764+25

END WALL W-42
-L- STA.768+10

BL-150

BL-151

BM=30

MATCH LINE -L- STA.756+00
SEE SHEET NO.26

MATCH LINE -L- STA.769+00
SEE SHEET NO.28

NAD 83/NSRS 2007

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

REVISIONS

8/17/99 10-9-2018 COMBINED PARCELS 264 & 265 TO PARCEL 264(DBE)
11-13-2018 REVISED DRIVEWAY AND SLOPE STAKES FOR PARCELS 267 & 268. ADDED CONSTRUCTION EASEMENT.(DBE)

NAD 83/NSRS 2007

237	CIRCLE K STORES INC DB 205 PG 1856 PB 3 PG 79
238	CAROLINA PROJECTS LTD DB 955 PG 1390
249	TALBERT ROAD LLC DB 2242 PG 148 PB 3 PG 79
250	TALBERT ROAD LLC DB 2225 PG 1557 PB 3 PG 79
269	CHRISTOPHER & KIMBERLY MEDFORD DB 1170 PG 1776 PB 26 PG 1

247 CMW PROPERTIES DB 880 PG 72 PB 34 PG 68

262 DAWN PROPERTIES LLC DB 1754 PG 2422 PB 22 PG 142

262 269 DAWN PROPERTIES LLC DB 1754 PG 2242 PB 26 PG 1

MATCH LINE -Y39- STA.17+00 SEE SHEET NO.36

MATCH LINE -L- STA.769+00 SEE SHEET NO.27

MATCH LINE -L- STA.783+00 SEE SHEET NO.29

MATCH LINE -Y40- STA.14+00 SEE SHEET NO.36

-Y39- PT Sta.19+48.08
S 13°09'03.0" W
-L- POC 770+58.95 =
-Y39- POT Sta. 20+20.04

-L- PT Sta.773+34.12

-L- POC 770+69.27 =
-Y40- POT Sta. 10+00.00

S 73°14'52" E

S 23°27'27" W

BEGIN WALL W-44 -L- STA.771+15

END WALL W-44 -L- STA.772+55

BEGIN WALL W-45 -L- STA.778+62

END WALL W-45 -L- STA.779+45

BEGIN WALL W-43 -L- STA.776+45

END WALL W-43 -L- STA.777+50

NC 150 WEST PLAZA DR 60' BST

-Y39- TALBERT RD

2019 ADT	2039 ADT
7,830	8,950
37,660	48,940
3,270	3,590
2,180	2,580
1,420	1,500
4,850	5,570
40,000	52,000
8,640	9,840

-L- NC 150

-Y39- TALBERT RD

248 MOORESVILLE SAVINGS BANK DB 770 PG 990 PB 3 PG 79

258 A W WOODS JR DB 165 PG 201 PB 3 PG 79

259 RACE CITY HOLDINGS LLC DB 2097 PG 2364 PB 3 PG 79

260 LOYD INVESTMENTS LLC DB 2285 PG 1726 PB 3 PG 79

261 PLAZA ROAD DEV A LLC DB 1332 PG 1962 PB 3 PG 79

263 DAWN PROPERTIES LLC DB 2141 PG 1204 PB 3 PG 113

264 DAWN PROPERTIES LLC DB 2328 PG 1175 PB 3 PG 79

DAWN PROPERTIES LLC DB 2328 PG 1172 PB 3 PG 79

266 JUNIPER PROPERTIES LLC DB 1201 PG 71 PB 3 PG 79

267 ANNA THI NGUYEN DB 1822 PG 2407 PB 3 PG 79

268 BEK PROPERTIES LLC DB 1377 PG 147 PB 3 PG 79

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 51 FOR -L- PROFILE
SEE SHEET 69 FOR -Y39- & -Y40- PROFILES
SEE SHEET 2B-1 & 2B-3 FOR CURVE DATA
SEE SHEET 28A FOR R/W & EASEMENT DATA

11/9/2018
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User:bevans

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	28A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

R/W & EASEMENT DETAILS

237	CIRCLE K STORES INC DB 205 PG 1856 PB 3 PG 79
238	CAROLINA PROJECTS LTD DB 955 PG 1390
249	TALBERT ROAD LLC DB 2242 PG 148 PB 3 PG 79
250	TALBERT ROAD LLC DB 2225 PG 1557 PB 3 PG 79
269	CHRISTOPHER & KIMBERLY MEDFORD DB 1170 PG 1776 PB 26 PG 1

REVISIONS

10-9-2018 COMBINED PARCELS 264 & 265 TO PARCEL 264.(DBE)
11-13-2018 REVISED DRIVEWAY AND SLOPE STAKES FOR PARCELS 267 & 268. ADDED CONSTRUCTION EASEMENT.(DBE)

8/17/99

11/9/2018
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User:bevans

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

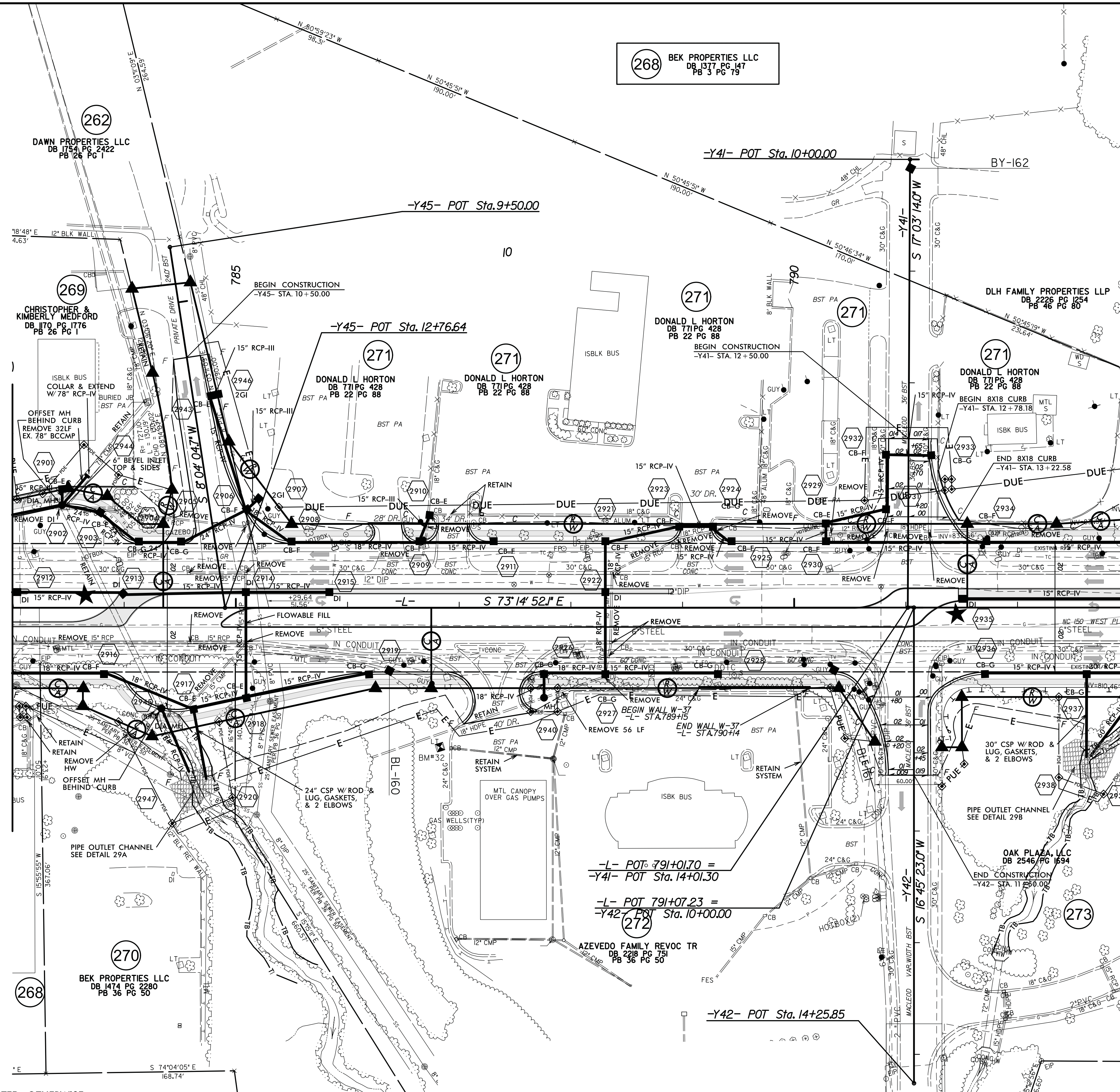
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

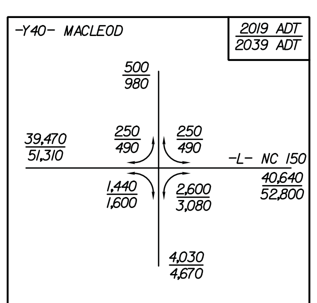
8/17/99

REVISIONS

5-23-2018 ADDED PROPERTY LINES BETWEEN PARCELS 270 & 272.
10-9-2018 REVISED PROPERTY OWNER AND DEED BOOK DATA FOR PARCEL 273.(DBE)



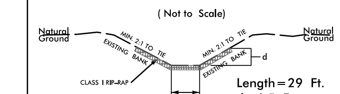
268
BEK PROPERTIES LLC
DB 1377 PG 147
PB 3 PG 79
262
DAWN PROPERTIES LLC
DB 1754 PG 2422
PB 26 PG 1
269
CHRISTOPHER & KIMBERLY MEDFORD
DB 1170 PG 1776
PB 26 PG 1
271
DONALD L HORTON
DB 771 PG 428
PB 22 PG 88
DLH FAMILY PROPERTIES LLP
DB 2226 PG 1254
PB 46 PG 80
270
BEK PROPERTIES LLC
DB 1474 PG 2280
PB 36 PG 50
272
AZEVEDO FAMILY REVOC TR
DB 2218 PG 751
PB 36 PG 50
273
OAK PLAZA, LLC
DB 2546 PG 1694
-Y41- POT Sta. 10+00.00
-Y45- POT Sta.9+50.00
-Y45- POT Sta. 12+76.64
BEGIN CONSTRUCTION -Y45- STA. 10+50.00
BEGIN CONSTRUCTION -Y41- STA. 12+50.00
BEGIN 8X18 CURB -Y41- STA. 12+78.18
END 8X18 CURB -Y41- STA. 13+22.58
S 17° 03' 14.0" W
S 8° 04' 04.7" W
S 73° 14' 52.1" E
S 16° 45' 23.0" W
MATCH LINE -L- STA.783+00 SEE SHEET NO.28
MATCH LINE -L- STA.793+00 SEE SHEET NO.30
BEGIN WALL W-37 -L- STA.789+15
END WALL W-37 -L- STA.790+14
-L- POT 791+01.70 = -Y41- POT Sta. 14+01.30
-L- POT 791+07.23 = -Y42- POT Sta. 10+00.00
-Y42- POT Sta. 14+25.85
END CONSTRUCTION -Y42- STA. 11+50.00
PIPE OUTLET CHANNEL SEE DETAIL 29A
PIPE OUTLET CHANNEL SEE DETAIL 29B
24" CSP W/ROD & LUG, GASKETS, & 2 ELBOWS
30" CSP W/ROD & LUG, GASKETS, & 2 ELBOWS
MTL CANOPY OVER GAS PUMPS
ISBLK BUS
ISBK BUS
BY-162
BL-160
NAD 83/NSRS 2007



CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 51 FOR -L- PROFILE
SEE SHEET 70 FOR -Y41- & -Y42- PROFILES
SEE SHEET 29A FOR R/W & EASEMENT DATA

DETAIL 29A
PIPE OUTLET CHANNEL
(Not to Scale)

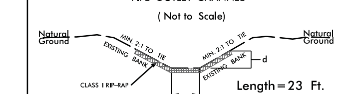


Length = 29 Ft.
d = 6.5 Ft.

*CLASS I RIP-RAP SHALL BE BACKFILLED WITH NATIVE MATERIAL TO FILL VOIDS.

-L- STA. 784+65 RT

DETAIL 29B
PIPE OUTLET CHANNEL
(Not to Scale)



Length = 23 Ft.
d = 5 Ft.

*CLASS I RIP-RAP SHALL BE BACKFILLED WITH NATIVE MATERIAL TO FILL VOIDS.

-L- STA. 792+60 RT

10/8/2018
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User:bevans

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	29A

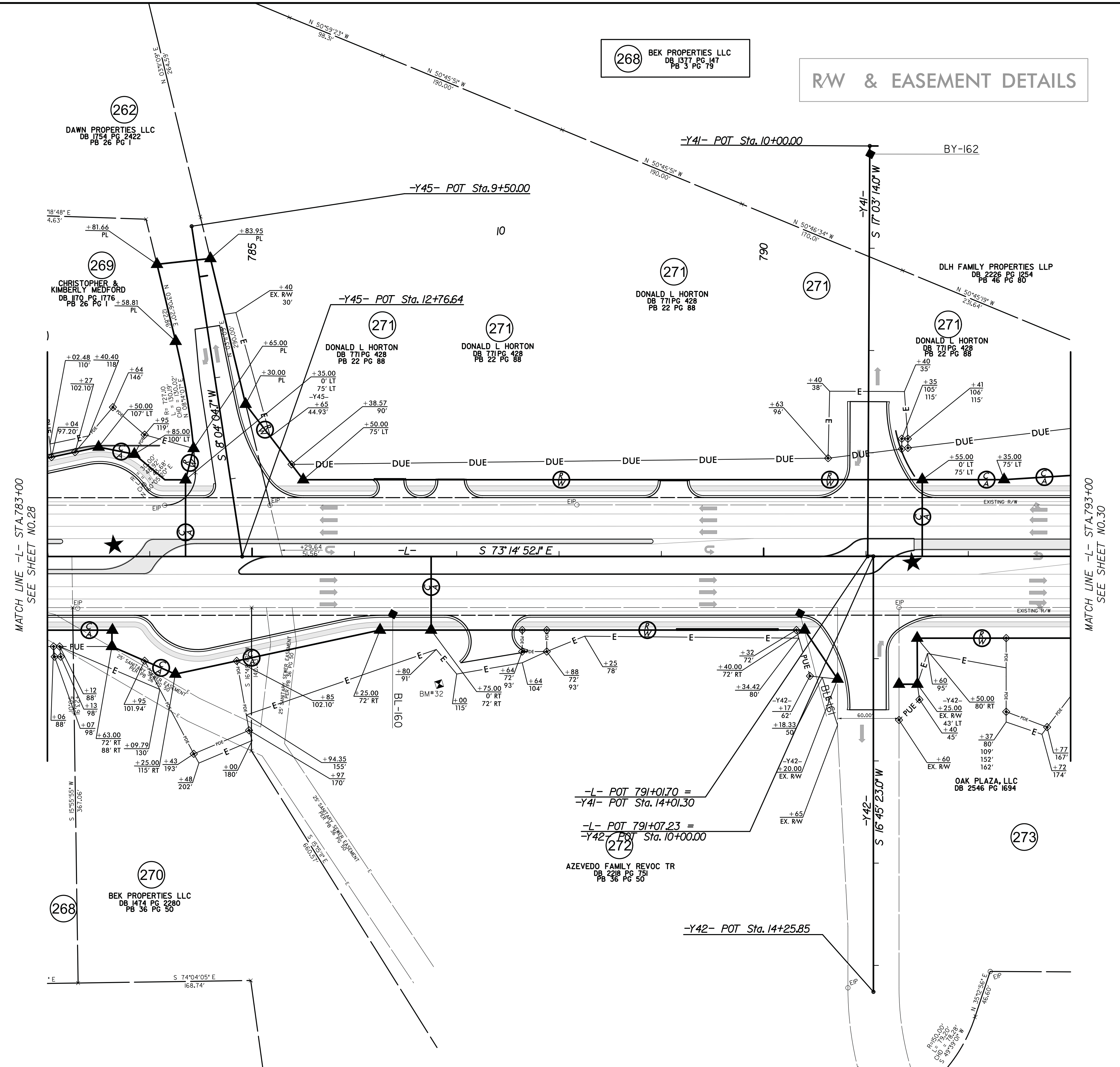
R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

R/W & EASEMENT DETAILS



268 BEK PROPERTIES LLC DB 1377 PG 147 PB 3 PG 79
262 DAWN PROPERTIES LLC DB 1754 PG 2422 PB 26 PG 1
269 CHRISTOPHER & KIMBERLY MEDFORD DB 1170 PG 1776 PB 26 PG 1
271 DONALD L HORTON DB 771 PG 428 PB 22 PG 88
DLH FAMILY PROPERTIES LLP DB 2226 PG 1254 PB 46 PG 80
270 BEK PROPERTIES LLC DB 1474 PG 2280 PB 36 PG 50
272 AZEVEDO FAMILY REVOC TR DB 2218 PG 751 PB 36 PG 50
OAK PLAZA, LLC DB 2546 PG 1694
273
-Y45- POT Sta. 9+50.00
-Y45- POT Sta. 12+76.64
-Y41- POT Sta. 10+00.00
BY-162
-L- S 73° 14' 52.1" E
-L- POT 791+01.70 = -Y41- POT Sta. 14+01.30
-L- POT 791+07.23 = -Y42- POT Sta. 10+00.00
-Y42- POT Sta. 14+25.85
-Y41- S 17° 03' 14.0" W
-Y42- S 16° 45' 23.0" W
MATCH LINE -L- STA. 783+00 SEE SHEET NO. 28
MATCH LINE -L- STA. 793+00 SEE SHEET NO. 30
NAD 83/NSRS 2007
BL-160
BM#32

REVISIONS

5-23-2018 ADDED PROPERTY LINES BETWEEN PARCELS 270 & 272.
10-9-2018 REVISED PROPERTY OWNER AND DEED BOOK DATA FOR PARCEL 273.(DBE)

8/17/99

10/8/2018
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PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

10-5-2017 REVISED DUES ON PARCELS 271 & 274.
9-19-2018 ADDED "DO NOT DISTURB EX. S/W AND HANDRAIL" NOTE ON PARCEL 273.
10-9-2018 REVISED PROPERTY OWNER AND DEED BOOK DATA FOR PARCEL 273.(DBE)

MATCH LINE -L- STA.793+00
SEE SHEET NO.30

271 DONALD L HORTON
DB 771 PG 428
PB 22 PG 88

CM LAND COMPANY
DB 757 PG 348
PB 21 PG 23

274 CHRISTY PROPERTIES
DB 970 PG 999

273 OAK PLAZA, LLC
DB 2546 PG 1694

THOMAS CONCRETE OF CAROLINA INC
DB 1961 PG 2106
PB 5 PG 55

-Y44- POT Sta. 10+00.00
-Y44- PC Sta. 10+92.90
-Y44- PRC Sta. 13+64.37
-Y44- PT Sta. 14+65.30
-L- POT 794+52.12 = -Y43- POT Sta. 10+00.00
-Y43- PC Sta. 10+67.61
-Y43- PT Sta. 11+06.68
-Y43- POT Sta. 11+20.00
-L- PC Sta. 799+09.69
-L- POT Sta. 15+12.76
-L- PT Sta. 802+18.81
-L- POT Sta. 802+39.71

BEGIN CONSTRUCTION -Y44- STA. 13+39.05
END CONSTRUCTION -Y43- STA. 11+06.00
BEGIN WALL W-3 -L- STA.794+80
END WALL W-3 -L- STA.795+75
OFFSET MH TO CENTER OF LANE
COLLAR & EXTEND W/15" RCP-IV
LATERAL V DITCH SEE DETAIL 30A
FALSE SUMP SEE DETAIL 30B
DO NOT DISTURB EX. S/W AND HANDRAIL

S 16° 45' 07.9" W
S 25° 42' 22.2" W
S 73° 14' 52" E
S 77° 53' 04.2" E
S 72° 55' 38" E 520.21'
S 57° 24' 19" E 398.41'
S 40° 15' 35.7" W
N 76° 41' 26" W 503.37'

END T.I.P. PROJECT R-2307B
-L- POC 799+10.00

BL-164 BM#33
BL-165
BL-166
BM#34

NAD 83/NSRS 2007

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 52 FOR -L- PROFILE
SEE SHEET 70 FOR -Y43- & -Y44- PROFILES
SEE SHEETS 2B-1 & 2B-3 FOR CURVE DATA
SEE SHEET 30A FOR R/W & EASEMENT DATA

DETAIL 30A
LATERAL 'V' DITCH
(Not to Scale)
RETAINING WALL
b
1'-Ft.
2:1
D
2:1
Natural Ground
Min. D=1 Ft.
b=2 Ft.
-L- STA 795+00 TO 796+50 RT

DETAIL 30B
FALSE SUMP
(Not to Scale)
0.5' Min
1.0' Max.
Outside Ditch Traffic Flow
20:1
10:1
2'
GI etc.
S
S=Ditch Slope
℄ Proposed Ditch
-L- STA 797+27 RT

10/8/2018
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User:bevans

R/W & EASEMENT DETAILS

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	30A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

8/17/99

10-5-2017 REVISED DUES ON PARCELS 271 & 274.
9-19-2018 ADDED "DO NOT DISTURB EX.S/W AND HANDRAIL" NOTE ON PARCEL 273.
10-9-2018 REVISED PROPERTY OWNER AND DEED BOOK DATA FOR PARCEL 273.(DBE)

MATCH LINE -L- STA.793+00
SEE SHEET NO.30

CM LAND COMPANY
DB 757 PG 348
PB 2 PG 23

271 DONALD L HORTON
DB 771 PG 428
PB 22 PG 88

274 CHRISTY PROPERTIES
DB 970 PG 999

273 OAK PLAZA, LLC
DB 2546 PG 1694

THOMAS CONCRETE OF CAROLINA INC
DB 1961 PG 2106
PB 5 PG 55

-Y44- POT Sta. 10+00.00
N 76°41'26" W 503.37'
-Y44- PC Sta. 10+92.90
S 40° 15' 35.7" W
-Y44- PRC Sta. 13+64.37
-L- POT 794+52.12 =
-Y43- POT Sta. 10+00.00
-Y44- PT Sta. 14+65.30
S 16° 45' 07.9" W
-L- POT Sta. 15+12.76
-L- PC Sta. 799+09.69
S 73°14' 52.1" E
-Y43- PC Sta. 10+67.61
-Y43- PT Sta. 11+06.58
S 25° 42' 22.2" W
-Y43- POT Sta. 11+20.00
-L- PT Sta. 802+18.81
-L- POT Sta. 802+39.71
S 77° 53' 04.2" E
END T.I.P. PROJECT R-2307B
-L- POC 799+10.00
S 72°55'38" E 520.21'
S 57°24'18" E 398.41'
BL-164
BL-165
BL-166
BM#33
BM#34
EX. R/W
DUE
DO NOT DISTURB EX. S/W AND HANDRAIL
NAD 83 NSRS 2007

10/8/2018
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User:bevans

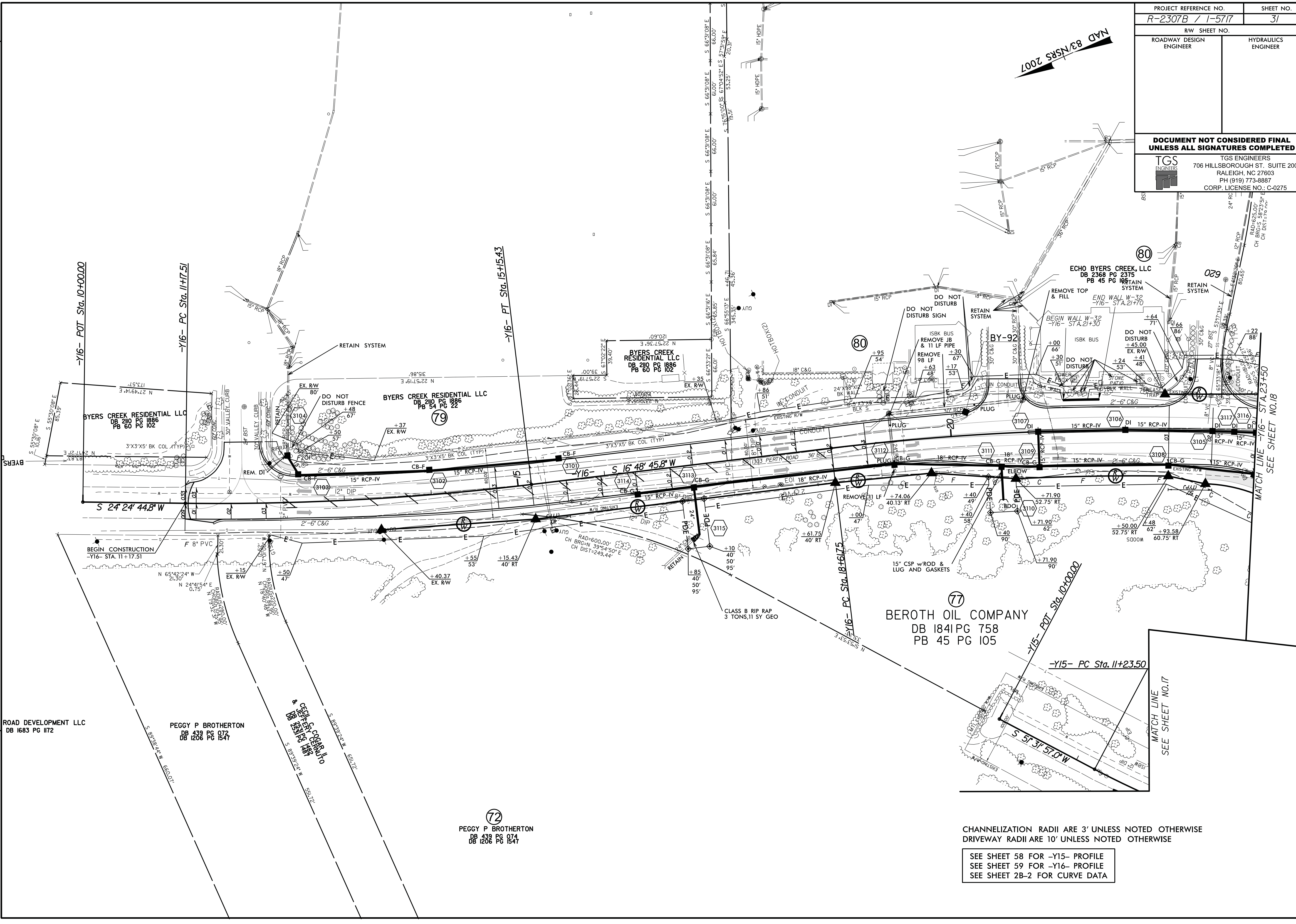
PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

REVISIONS

11-8-2017 REVISED R/W OFFSETS ON PARCELS 72 & 81.
5-23-2018 REVISED PARCEL 72 PROPERTY LINES AND DB DATA, ADDED PROPERTY LINES FOR COGAR/CERNUTO PROPERTY.
REVISED SLOPE STAKES AND EASEMENTS ON THESE PROPERTIES.
5-23-2018 DELETED PARCEL NUMBER 81. REVISED OWNER FOR PARCEL 80.



NAD 83/NSRS 2007
-Y16- POT Sta. 10+00.00
-Y16- PC Sta. 11+17.51
-Y16- PT Sta. 15+15.43
-Y16- PC Sta. 18+61.75
-Y15- POT Sta. 10+00.00
-Y15- PC Sta. 11+23.50
S 24° 24' 44.8" W
S 16° 48' 45.8" W
S 51° 31' 57.0" W
BEGIN CONSTRUCTION -Y16- STA. 11+17.51
BYERS CREEK RESIDENTIAL LLC DB 2110 PG 1886 PB 60 PG 102
BYERS CREEK RESIDENTIAL LLC DB 2110 PG 1886 PB 54 PG 22
79
ECHO BYERS CREEK, LLC DB 2368 PG 2375 PB 45 PG 105
80
BEROTH OIL COMPANY DB 1841 PG 758 PB 45 PG 105
77
PEGGY P BROTHERTON DB 439 PG 072 DB 1206 PG 1547
PEGGY P BROTHERTON DB 439 PG 074 DB 1206 PG 1547
72
CECIL C COGAR II & JEFFERY CERNUTO
ROAD DEVELOPMENT LLC DB 1683 PG 1172
SR 1303 PERTH ROAD
RETAIN SYSTEM
DO NOT DISTURB FENCE
DO NOT DISTURB SIGN
REMOVE JB & 11 LF PIPE
CLASS B RIP RAP 3 TONS, 11 SY GEO
15" CSP w/ROD & LUG AND GASKETS
MATCH LINE -Y16- STA. 23+50 SEE SHEET NO. 18
MATCH LINE SEE SHEET NO. 17

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 58 FOR -Y15- PROFILE
SEE SHEET 59 FOR -Y16- PROFILE
SEE SHEET 2B-2 FOR CURVE DATA

8/17/99

5/22/2018
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User:bevans

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

NAD 83/NSRS 2007

REVISIONS

8/17/99

11-8-2017 REVISED EASEMENTS ON PARCELS 84,86-92 & 94.
10-9-2018 ADDED NOTE "DO NOT DISTURB WELL" TO PARCEL 89.(DBE)

-Y17- PT Sta.14+40.60

-Y17- PC Sta.26+64.73

MATCH LINE -Y17- STA.14+00 SEE SHEET NO.18

MATCH LINE -Y17- STA.27+00 SEE SHEET NO.33

SAM J & BARBARA H BAKER
DB 1162 PG 1522
PB 51PG 146
86

EQUITABLE INVESTMENTS LLC
DB 1931PG 329
88 IS MTL BUS

89
CARLOS & JOANNE SIEGA
REVOC INTER VIVOS TRUST
DB 2319 PG 1840

91
JOEL R & KELLY C SETTLE
DB 11E PG 826

93
GREG BIFFLE INC
DB 1616 PG 1804

95
GREG BIFFLE INC
DB 1601PG 0871

87
TRIANGLE REAL ESTATE OF GASTONIA INC
DB 2337 PG 93

90
PAULETTE C CHILDERS
DB 2244 PG 2009
PB 56 PG 129

92
K MICHAEL & MARSHA DEATON
DB 760 PG 535
PB 50 PG 16

94
IREDELL COUNTY
DB 1209 PG 575

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 60 FOR -Y17- PROFILE
SEE SHEET 2B-2 FOR CURVE DATA
SEE SHEET 2B-15 FOR BULB DETAILS

10/8/2018
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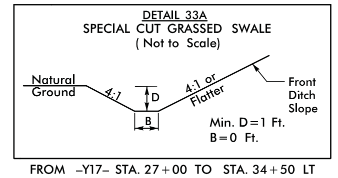
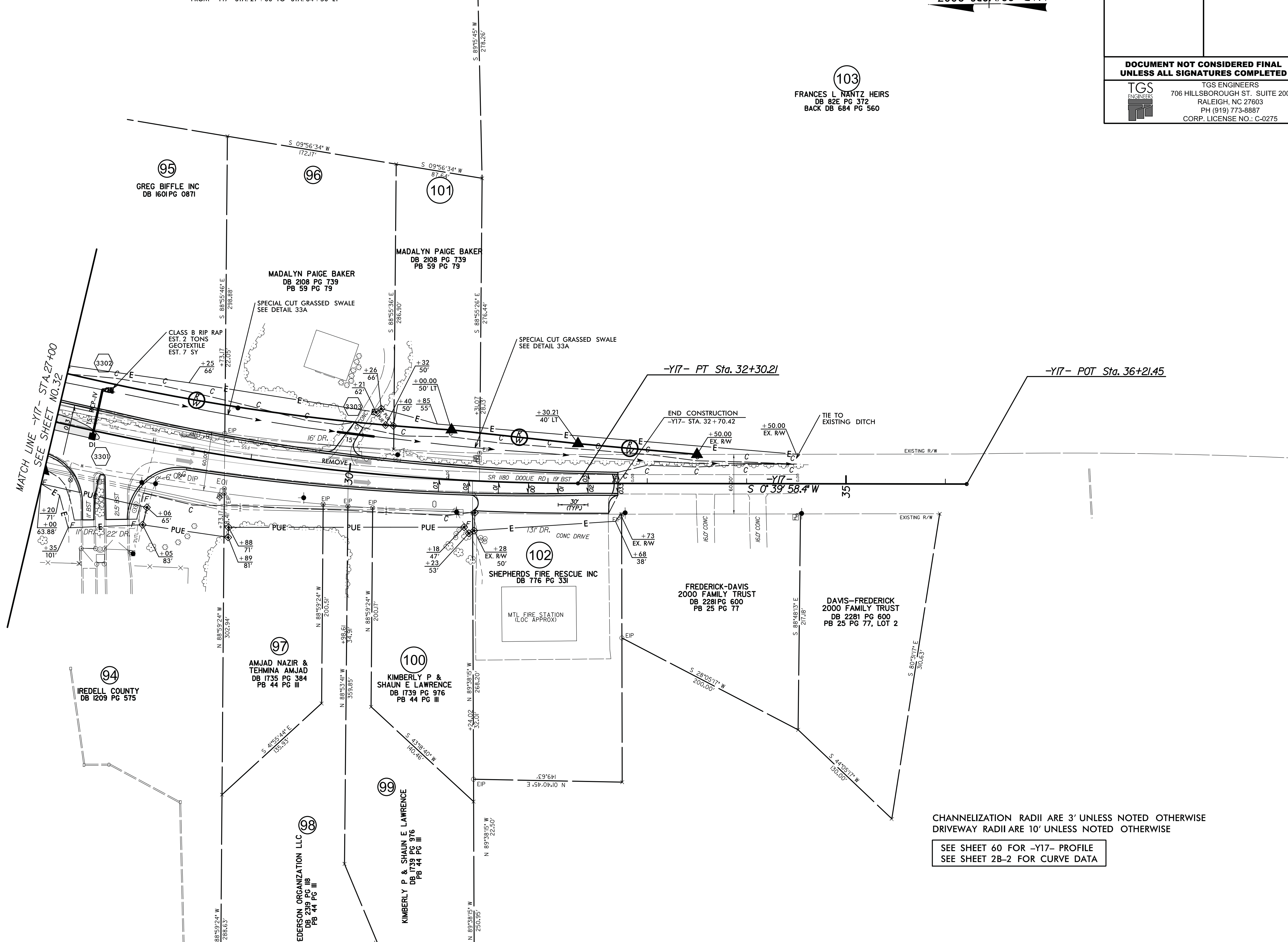
User:devans

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	33
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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





NAD 83/NSRS 2007
103
FRANCES L NANTZ HEIRS
DB 82E PG 372
BACK DB 684 PG 560
95
GREG BIFFLE INC
DB 1601 PG 0871
96
101
MADALYN PAIGE BAKER
DB 2108 PG 739
PB 59 PG 79
SPECIAL CUT GRASSED SWALE
SEE DETAIL 33A
CLASS B RIP RAP
EST. 2 TONS
GEOTEXTILE
EST. 7 SY
MATCH LINE -Y17- STA.27+00
SEE SHEET NO.32
-Y17- PT Sta. 32+30.21
-Y17- POT Sta. 36+21.45
END CONSTRUCTION
-Y17- STA. 32+70.42
TIE TO EXISTING DITCH
EXISTING R/W
SR 1180 DOOLIE RD 19' BST
-Y17-
S 0°39'58.4" W
102
SHEPHERDS FIRE RESCUE INC
DB 776 PG 331
MTL FIRE STATION
(LOC APPROX)
FREDERICK-DAVIS
2000 FAMILY TRUST
DB 2281 PG 600
PB 25 PG 77
DAVIS-FREDERICK
2000 FAMILY TRUST
DB 2281 PG 600
PB 25 PG 77, LOT 2
97
AMJAD NAZIR &
TEHMINA AMJAD
DB 1735 PG 384
PB 44 PG 111
100
KIMBERLY P &
SHAUN E LAWRENCE
DB 1739 PG 976
PB 44 PG 111
94
IREDELL COUNTY
DB 1209 PG 575
98
PEDERSON ORGANIZATION LLC
DB 2319 PG 118
PB 44 PG 111
99
KIMBERLY P & SHAUN E LAWRENCE
DB 1739 PG 976
PB 44 PG 111

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 60 FOR -Y17- PROFILE
SEE SHEET 2B-2 FOR CURVE DATA

REVISIONS

11-8-2017 REVISED EASEMENTS ON PARCELS 94,96-103.

8/17/99

11/7/2017
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User:bevans

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	34
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

NAD 83/NSRS 2007

CRIPPLE CREEK LLC
DB 2078 PG 947

MOORESVILLE ABC
DB 818 PG 737
PB 21PG 86

BY-104

172
CRIPPLE CREEK LLC
DB 2078 PG 947

176

175
GARY & DONNA MIDDLEBROOK
DB 1326 PG 116
PB 39 PG 12

171

173
DDRTC WINSLOW BAY COMMONS LLC
DB 1829 PG 206
PB 39 PG 11

174
DDRTC WINSLOW BAY COMMONS LLC
DB 1829 PG 206
PB 40 PG 92

170

BY-103

-Y27- POT Sta. 12+12.20

S 76° 48' 50.0" E

-Y27- PT Sta. 11+35.67

-Y26- POT Sta. 10+00.00

-Y27- PC Sta. 10+70.08

-Y26- PC Sta. 14+41.04

S 51° 45' 39.0" E

-Y26- POT Sta. 15+14.69
-Y27- POT Sta. 10+00.00

-Y26- S 45° 40' 18.7" W

BEGIN CONSTRUCTION
-Y26- STA. 11+71.47

END WALL 34-B
-Y26- STA.16+??

BEGIN WALL 34-A
-Y26- STA.16+??

BEGIN WALL 34-I
-Y26- STA.15+??

END WALL 34-I
-L- STA.16+??

MATCH LINE -Y26- STA 14+50
SEE SHEET NO. 24

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 63 FOR -Y26- PROFILE
SEE SHEET 64 FOR -Y27- PROFILE
SEE SHEET 2B-2 FOR CURVE DATA
SEE SHEET 34A FOR R/W & EASEMENT DATA

8/31/2017
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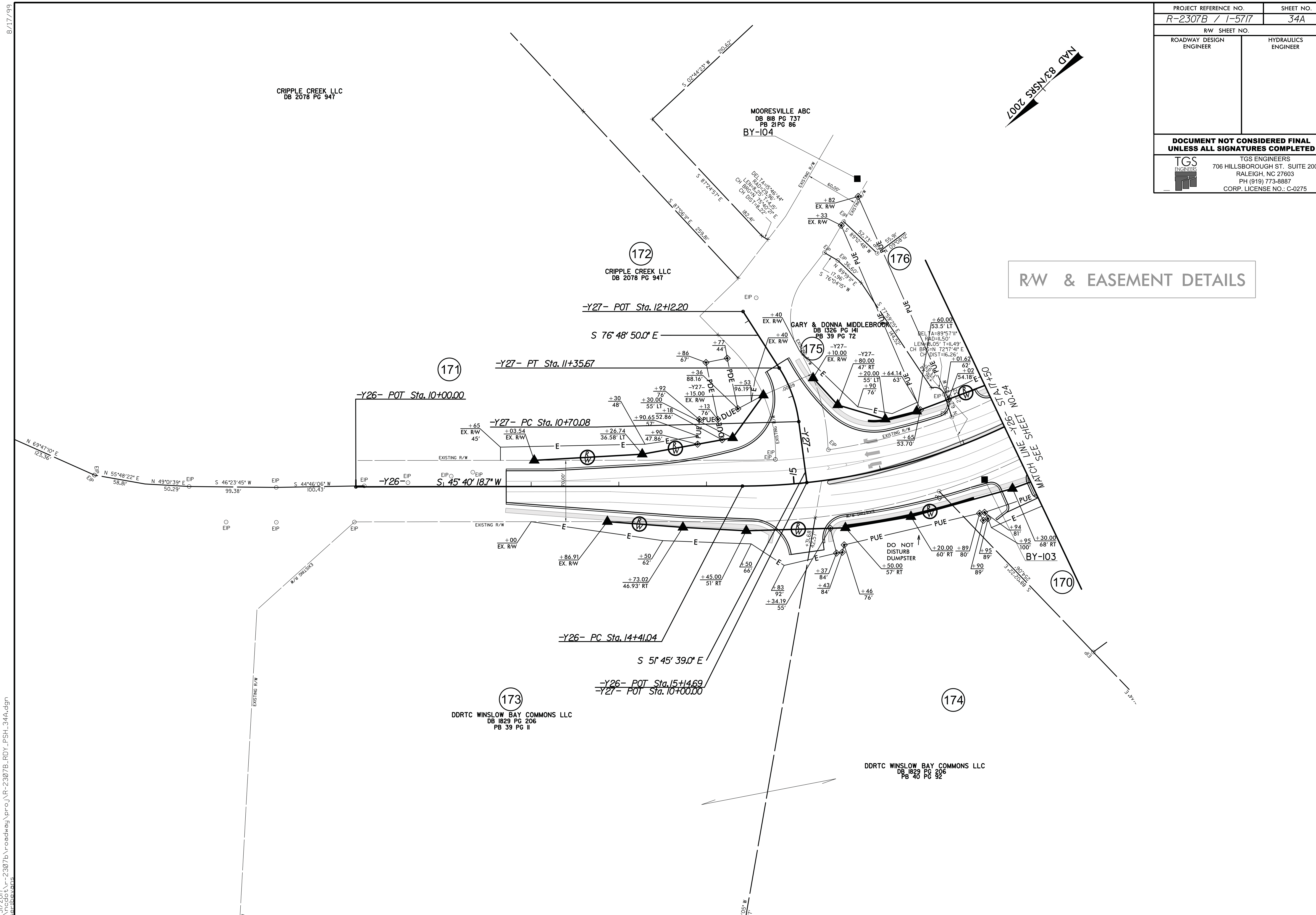
User:bevans

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	34A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



8/17/99

8/31/2017
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PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	35

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

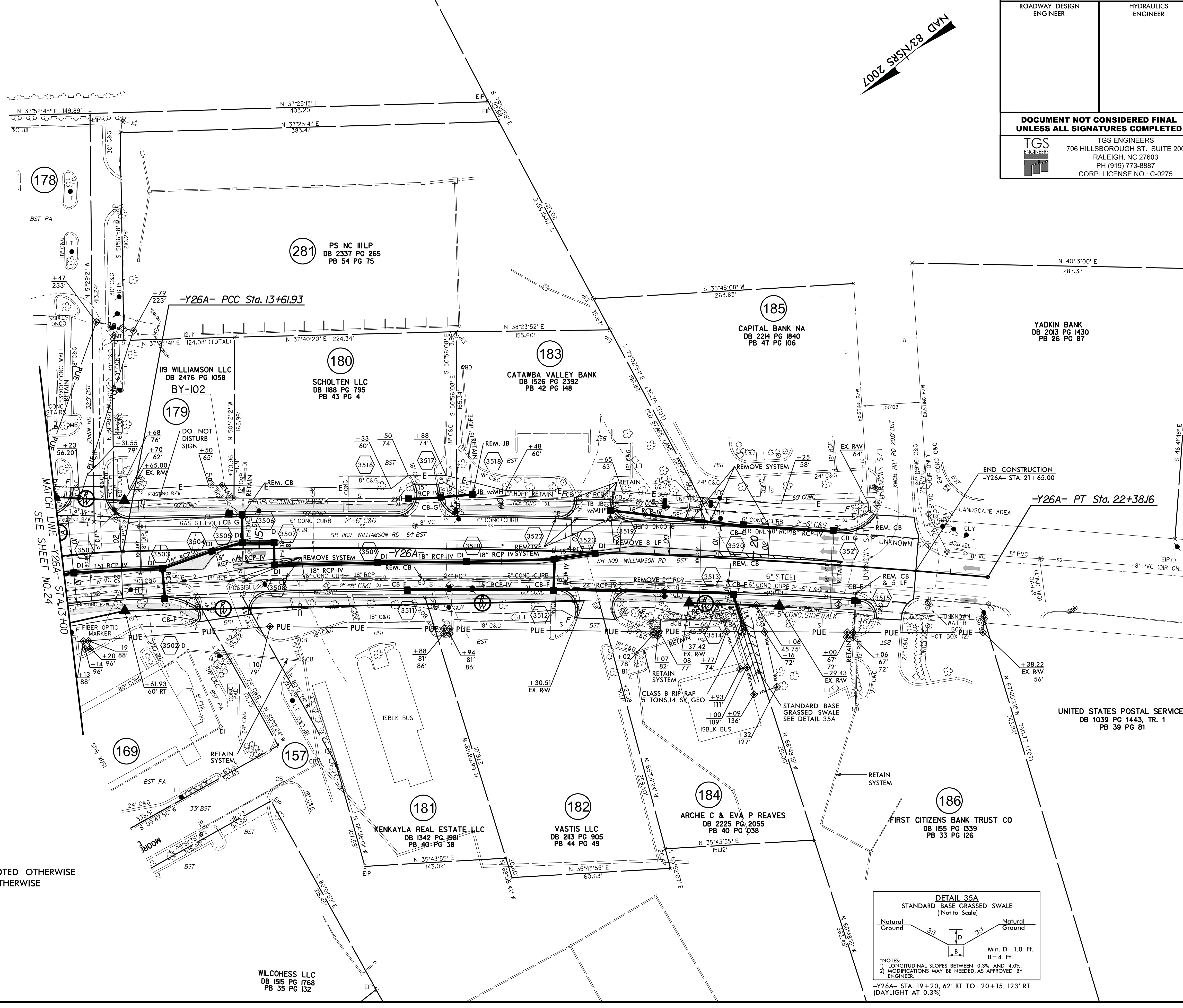
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

8/17/99

REVISIONS

4-18-2018 ADDED PARCEL NUMBER 281.
10-9-2018 REVISED PROPERTY OWNER AND DEED BOOK DATA FOR PARCEL 179. REVISED SLOPE STAKES AT SIGN AND ADDED NOTE 'DO NOT DISTURB SIGN' TO PARCEL 179.(DBE)



CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 63 FOR -Y26A- PROFILE
SEE SHEET 2B-2 FOR CURVE DATA

DETAIL 35A
STANDARD BASE GRASSED SWALE
(Not to Scale)

Natural Ground 3:1 D B 3:1 Natural Ground

Min. D = 1.0 Ft.
B = 4 Ft.

*NOTES:
1) LONGITUDINAL SLOPES BETWEEN 0.3% AND 4.0%.
2) MODIFICATIONS MAY BE NEEDED, AS APPROVED BY ENGINEER.

-Y26A- STA. 19+20, 62' RT TO 20+15, 123' RT (DAYLIGHT AT 0.3%)

10/8/2018
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2307B / I-5717	36
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

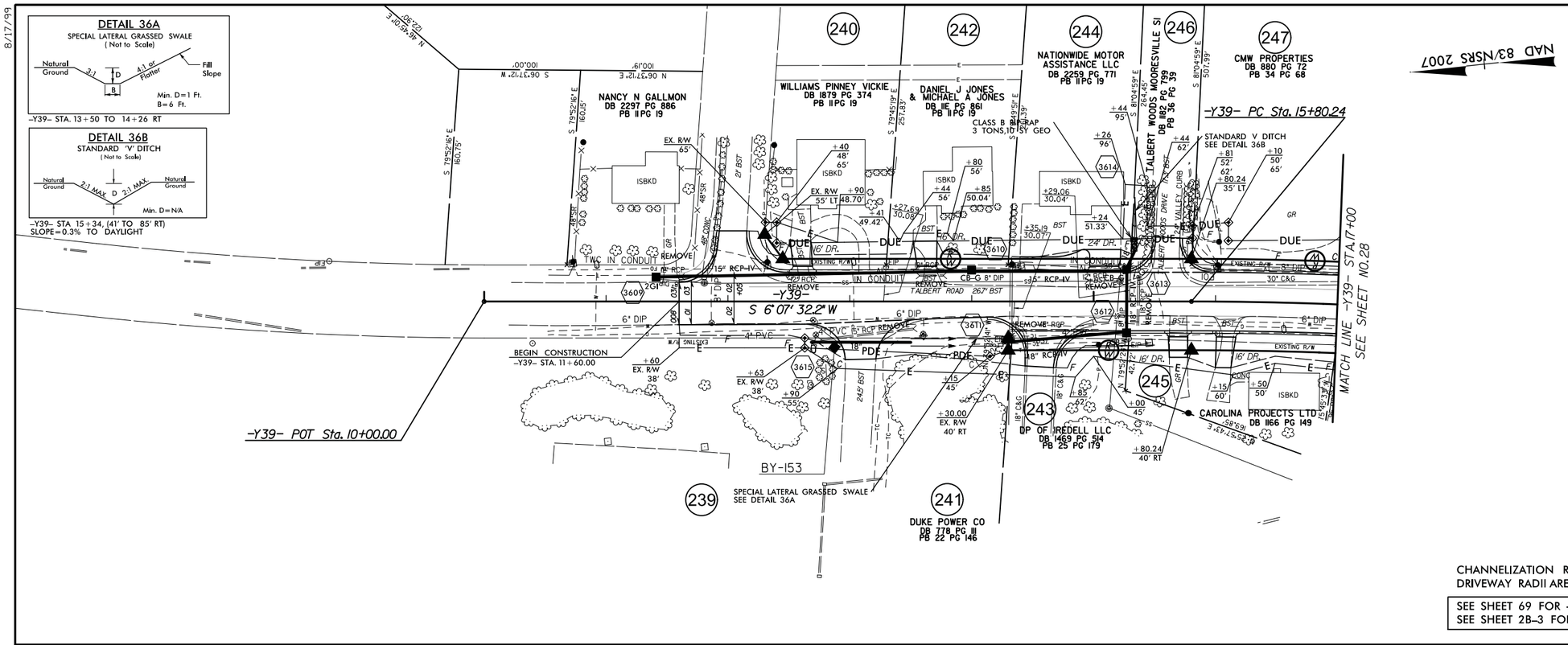
TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

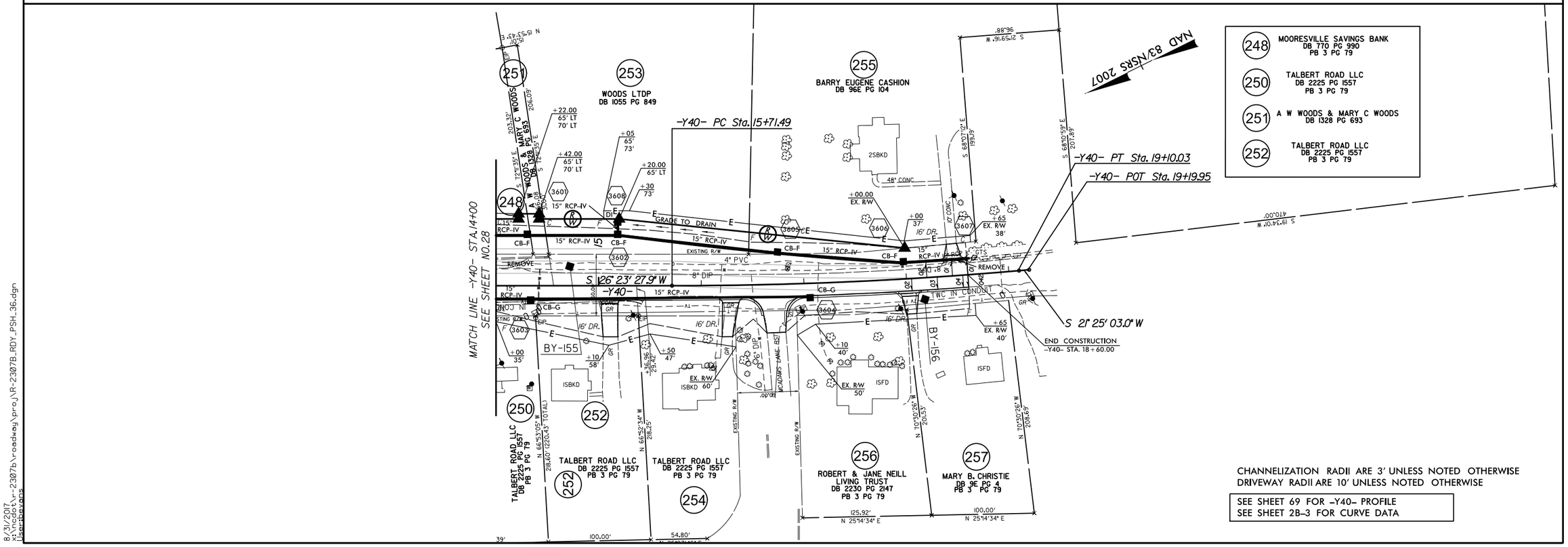
DETAIL 36A
SPECIAL LATERAL GRASSED SWALE
(Not to Scale)

–Y39– STA. 13+50 TO 14+26 RT

DETAIL 36B
STANDARD 'V' DITCH
(Not to Scale)

–Y39– STA. 15+34, (41' TO 85' RT)
SLOPE=0.3% TO DAYLIGHT





8/31/2017
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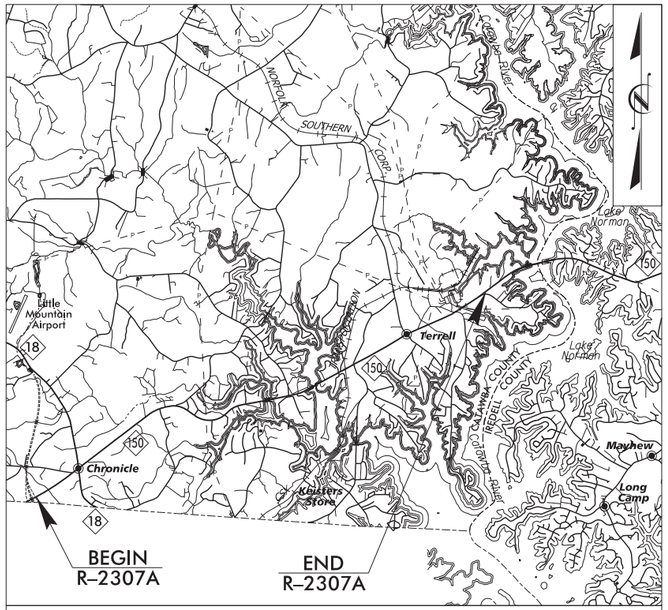
User:beyans

09/08/99

TIP PROJECT: R-2307A

CONTRACT:



VICINITY MAP N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

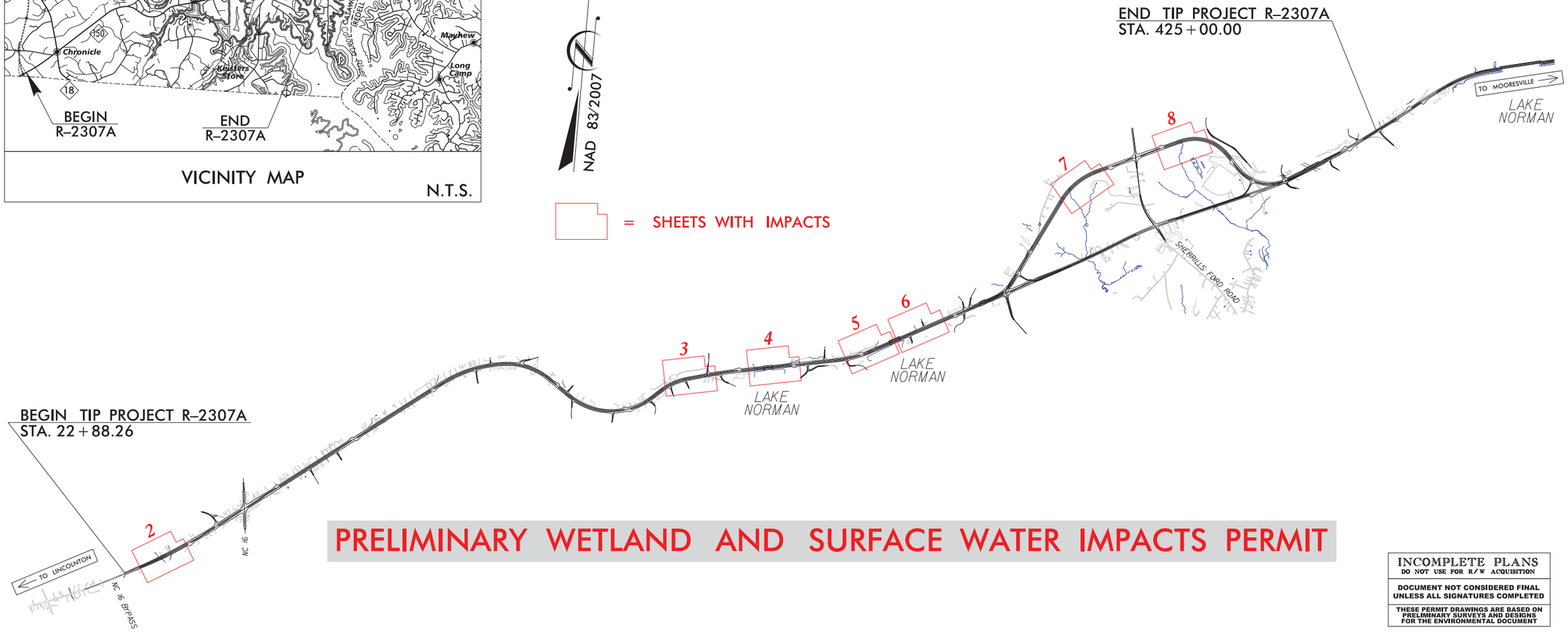
CATAWBA & IREDELL

LOCATION: PROPOSED NC 150 WIDENING FROM NC 16 BYPASS TO GREENWOOD ROAD

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2307A	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
37944.1.1	STP-150(19)		

NAD 83/2007

= SHEETS WITH IMPACTS



PRELIMINARY WETLAND AND SURFACE WATER IMPACTS PERMIT

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

THESE PERMIT DRAWINGS ARE BASED ON PRELIMINARY SURVEYS AND DESIGNS FOR THE ENVIRONMENTAL DOCUMENT

GRAPHIC SCALES

50 0 100
PLANS

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2307A = 7.616 MILES

Prepared in the Office of:

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

2018 STANDARD SPECIFICATIONS

PERMIT DRAWING DATE:
NOVEMBER 15, 2018

DEAN SARVIS, P.E.
PROJECT ENGINEER

PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

11/15/2018
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cmozingo

PROJECT REFERENCE NO.	SHEET NO.
R-2307	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

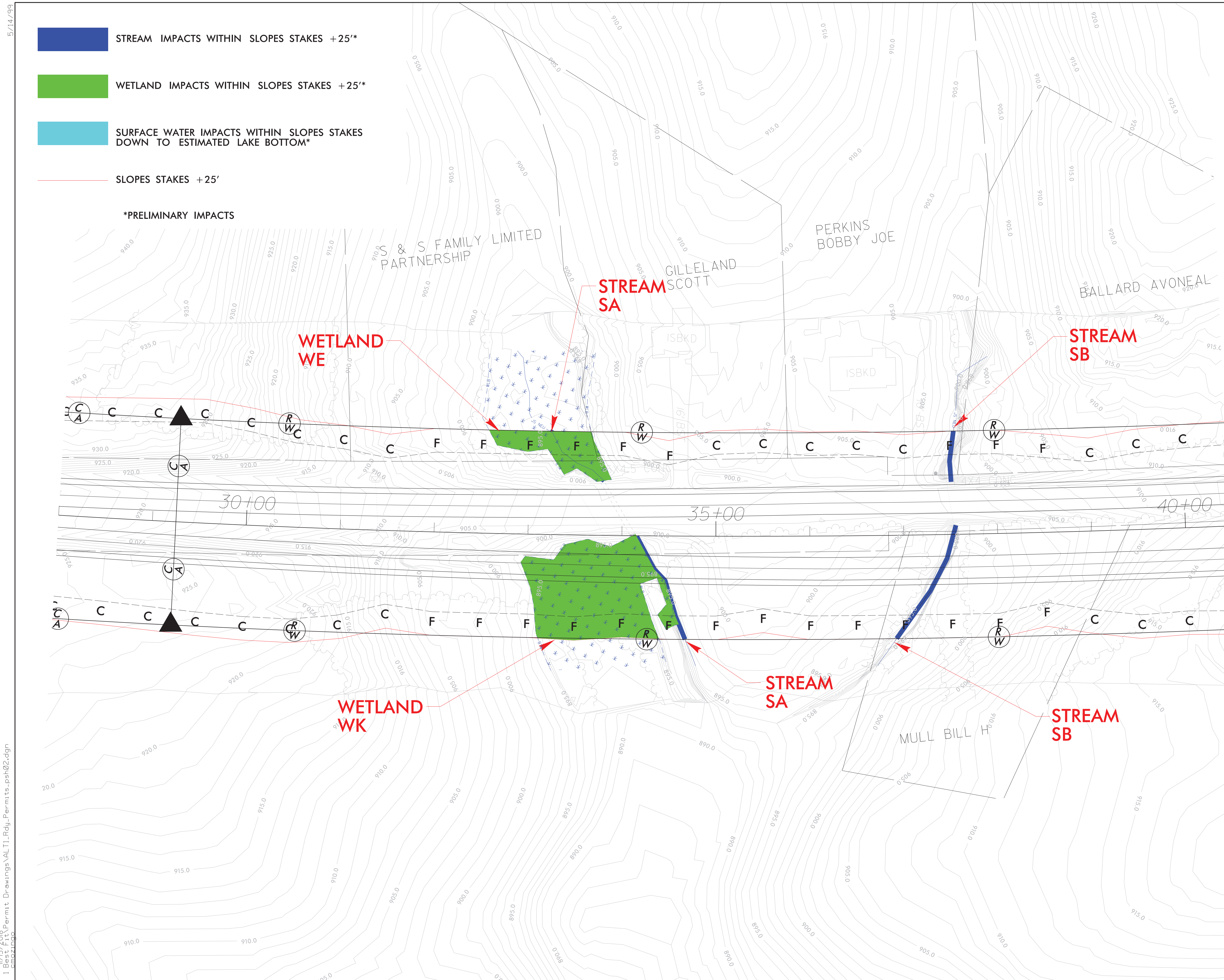
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

THESE PERMIT DRAWINGS ARE BASED ON PRELIMINARY SURVEYS AND DESIGNS FOR THE ENVIRONMENTAL DOCUMENT

50 0 100
GRAPHIC SCALE

NOVEMBER 15, 2018



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11/15/2018
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cmozingo

PROJECT REFERENCE NO.	SHEET NO.
R-2307	3
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

THESE PERMIT DRAWINGS ARE BASED ON PRELIMINARY SURVEYS AND DESIGNS FOR THE ENVIRONMENTAL DOCUMENT

50 0 100
GRAPHIC SCALE

NOVEMBER 15, 2018

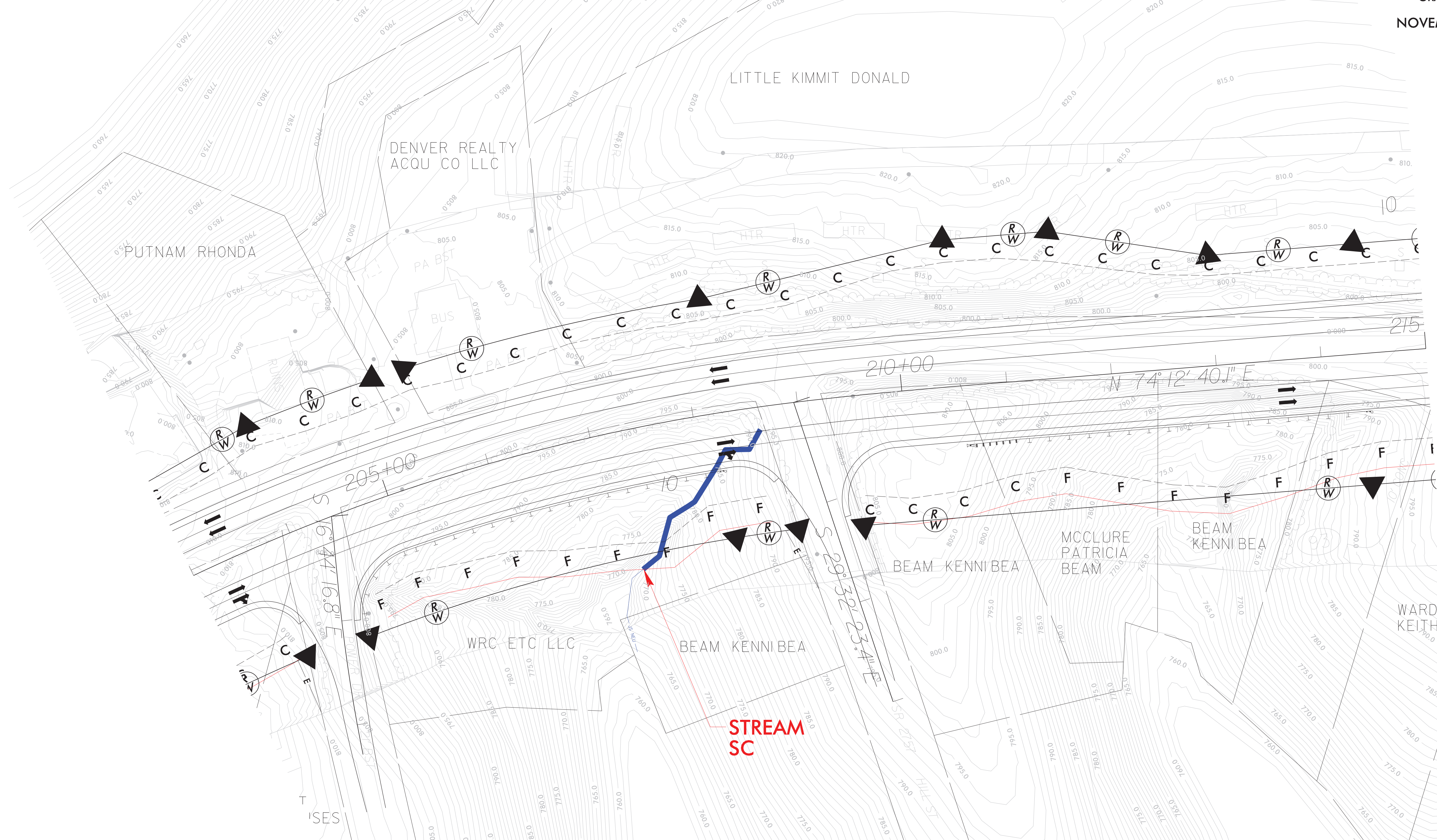
STREAM IMPACTS WITHIN SLOPES STAKES +25'*

WETLAND IMPACTS WITHIN SLOPES STAKES +25'*

SURFACE WATER IMPACTS WITHIN SLOPES STAKES DOWN TO ESTIMATED LAKE BOTTOM*

SLOPES STAKES +25'

*PRELIMINARY IMPACTS



5/14/99
11/15/2018 | Best Fit\Permit Drawings\ALT1_Rdy_Permits_psh03.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2307	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

THESE PERMIT DRAWINGS ARE BASED ON PRELIMINARY SURVEYS AND DESIGNS FOR THE ENVIRONMENTAL DOCUMENT

50 0 100
GRAPHIC SCALE

NOVEMBER 15, 2018

STREAM IMPACTS WITHIN SLOPES STAKES +25'*

WETLAND IMPACTS WITHIN SLOPES STAKES +25'*

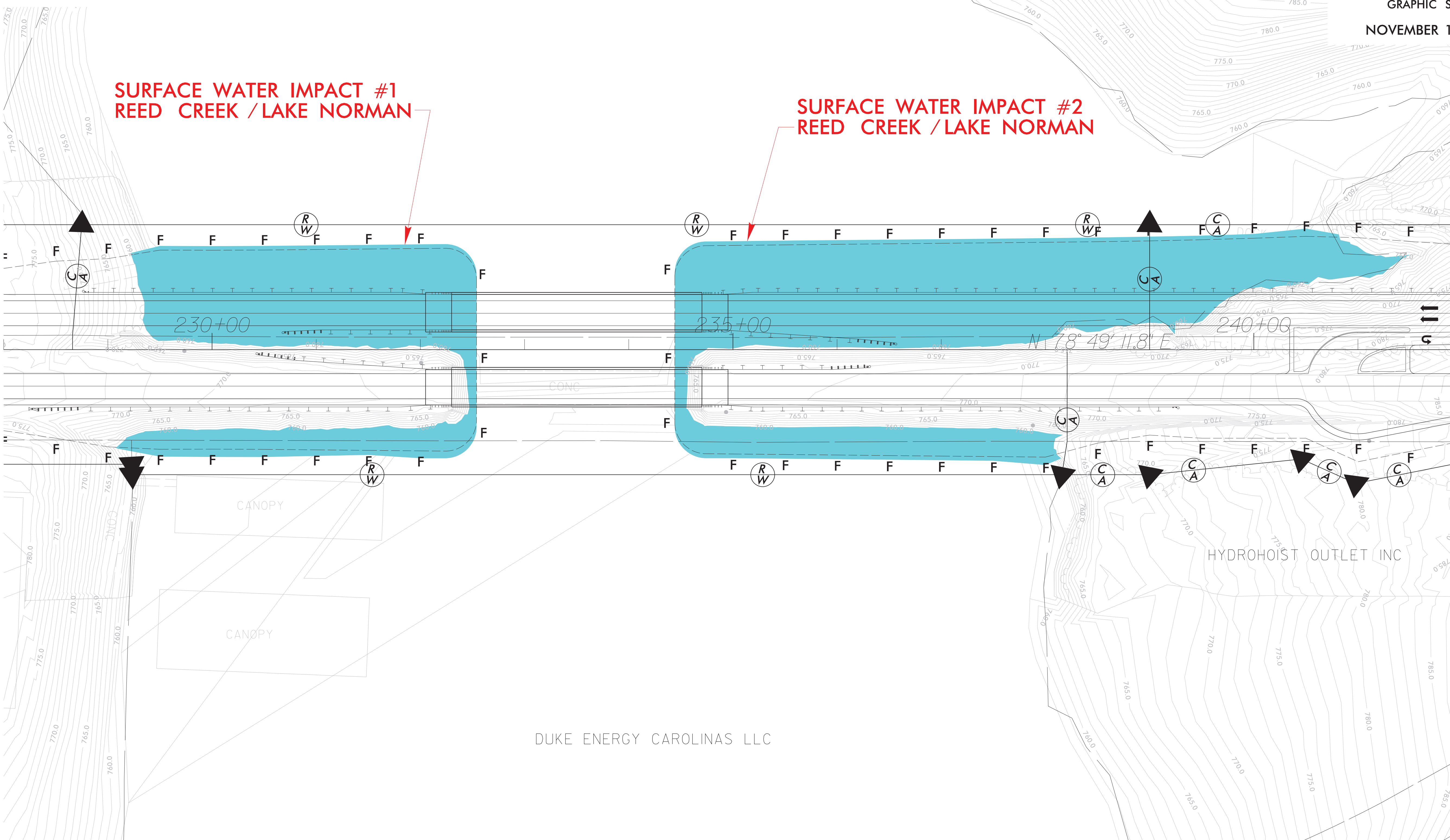
SURFACE WATER IMPACTS WITHIN SLOPES STAKES DOWN TO ESTIMATED LAKE BOTTOM*

SLOPES STAKES +25'

*PRELIMINARY IMPACTS

DUKE ENERGY CAROLINAS LLC

NAD 83/2007



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PROJECT REFERENCE NO.	SHEET NO.
R-2307	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

THESE PERMIT DRAWINGS ARE BASED ON PRELIMINARY SURVEYS AND DESIGNS FOR THE ENVIRONMENTAL DOCUMENT

NOVEMBER 15, 2018

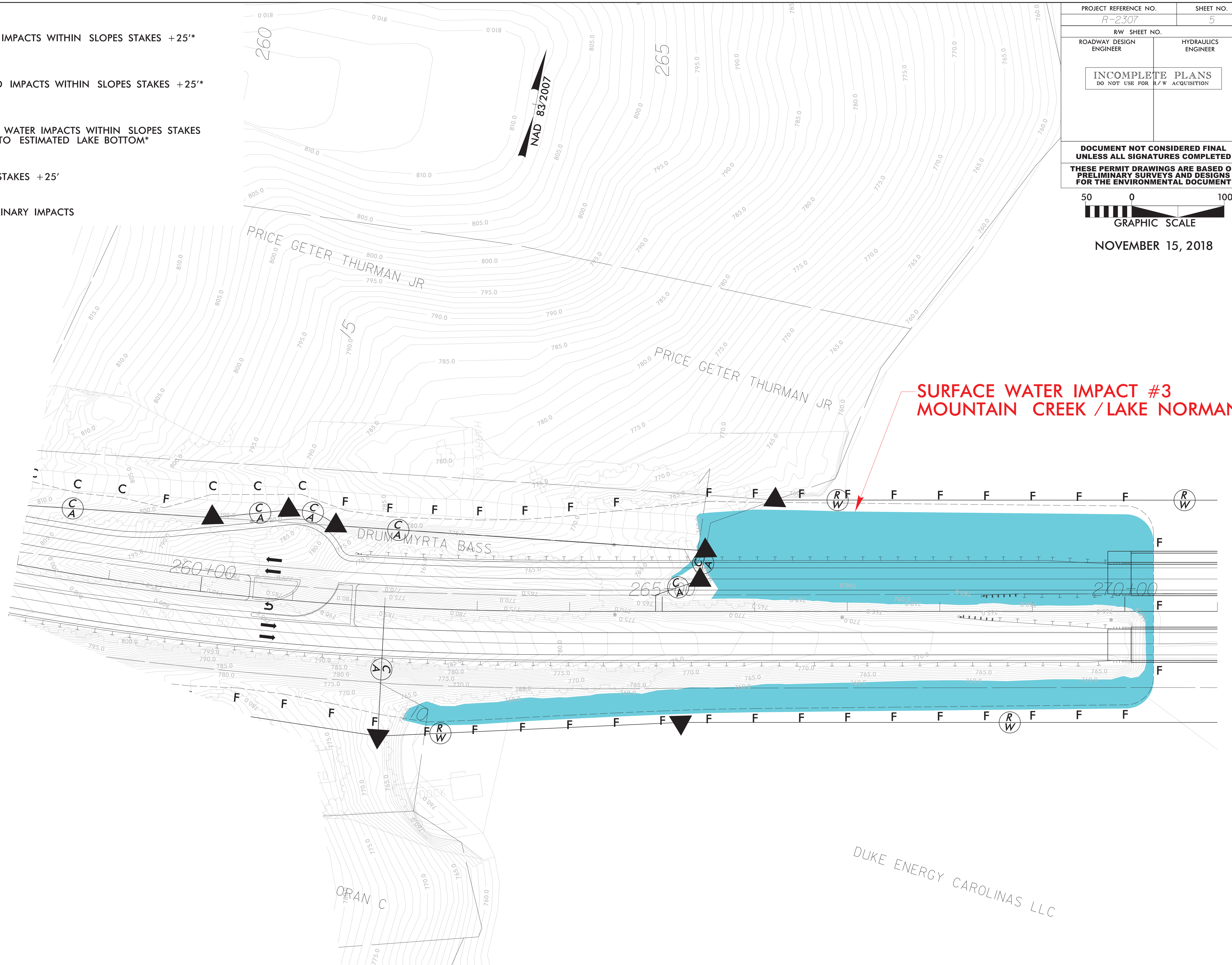
STREAM IMPACTS WITHIN SLOPES STAKES +25'*

WETLAND IMPACTS WITHIN SLOPES STAKES +25'*

SURFACE WATER IMPACTS WITHIN SLOPES STAKES DOWN TO ESTIMATED LAKE BOTTOM*

SLOPES STAKES +25'

*PRELIMINARY IMPACTS



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cmazingo

PROJECT REFERENCE NO.	SHEET NO.
R-2307	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

THESE PERMIT DRAWINGS ARE BASED ON PRELIMINARY SURVEYS AND DESIGNS FOR THE ENVIRONMENTAL DOCUMENT

50 0 100
GRAPHIC SCALE

NOVEMBER 15, 2018

STREAM IMPACTS WITHIN SLOPES STAKES +25'*

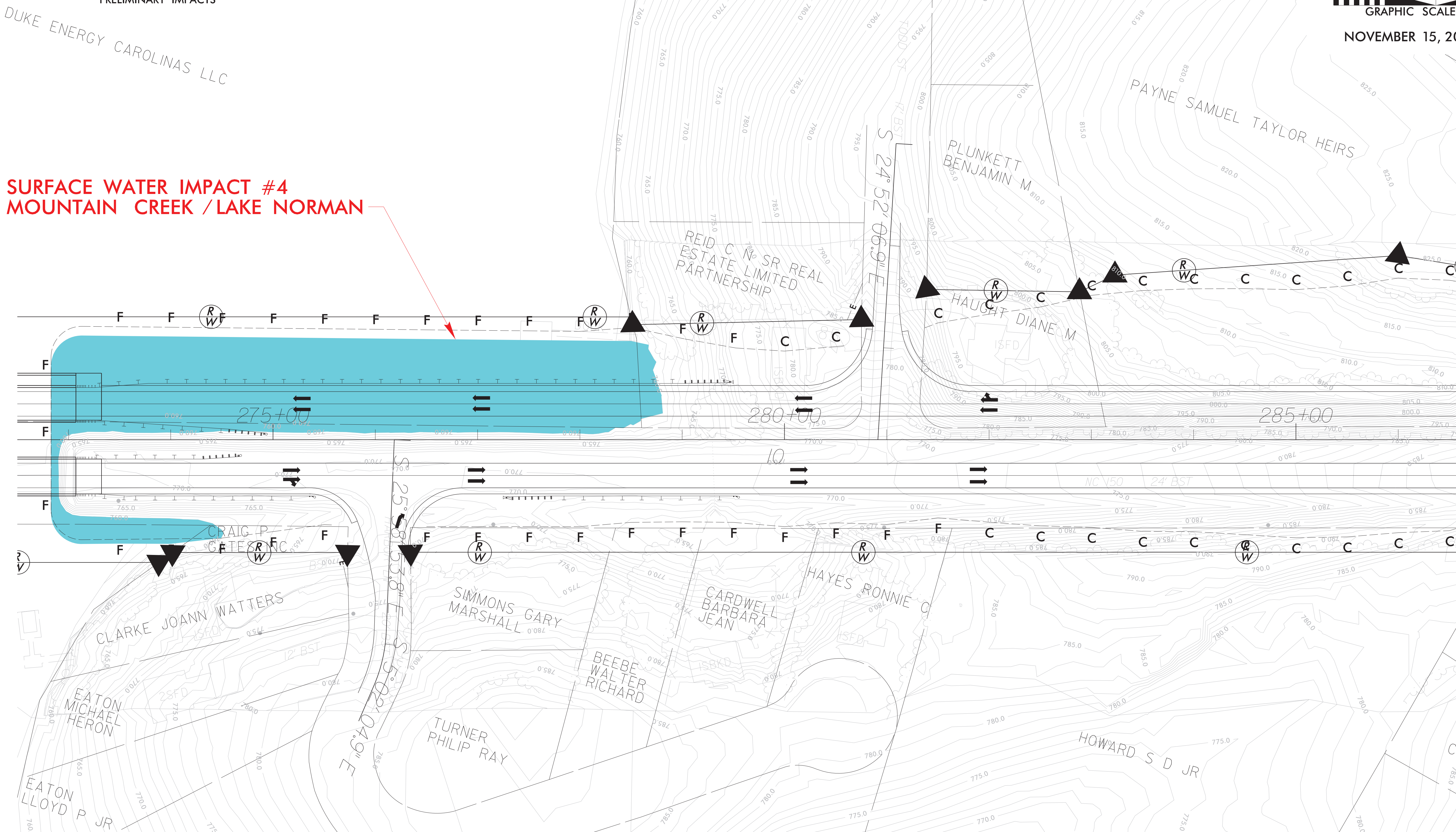
WETLAND IMPACTS WITHIN SLOPES STAKES +25'*

SURFACE WATER IMPACTS WITHIN SLOPES STAKES DOWN TO ESTIMATED LAKE BOTTOM*

SLOPES STAKES +25'

*PRELIMINARY IMPACTS

SURFACE WATER IMPACT #4
MOUNTAIN CREEK / LAKE NORMAN



5/14/99

11/15/2018
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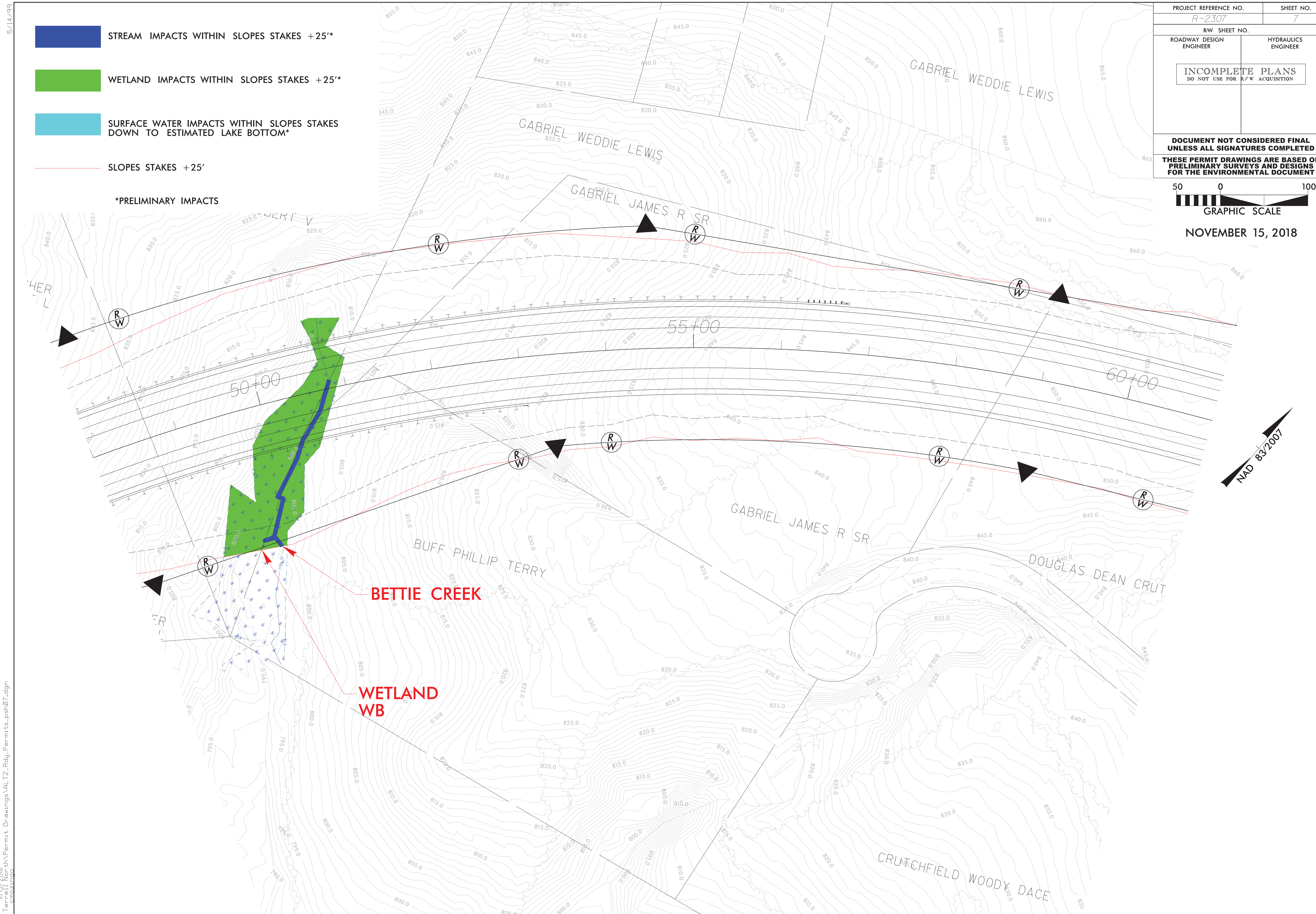

STREAM IMPACTS WITHIN SLOPES STAKES +25'*
WETLAND IMPACTS WITHIN SLOPES STAKES +25'*
SURFACE WATER IMPACTS WITHIN SLOPES STAKES DOWN TO ESTIMATED LAKE BOTTOM*
SLOPES STAKES +25'
*PRELIMINARY IMPACTS
PROJECT REFERENCE NO.
R-2307
SHEET NO.
7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
THESE PERMIT DRAWINGS ARE BASED ON PRELIMINARY SURVEYS AND DESIGNS FOR THE ENVIRONMENTAL DOCUMENT
50 0 100
GRAPHIC SCALE
NOVEMBER 15, 2018
NAD 83/2007
GABRIEL WEDDIE LEWIS
GABRIEL WEDDIE LEWIS
GABRIEL JAMES R SR
GABRIEL JAMES R SR
BUFF PHILLIP TERRY
DOUGLAS DEAN CRUT
CRUTCHFIELD WOODY DACE
50+00
55+00
60+00
BETTIE CREEK
WETLAND WB

5/14/99

11/15/2018
Terrell North\Permit Drawings\ALT2_Rdy_Permits_psh07.dgn
cmozingo
ALT 2

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2307	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

THESE PERMIT DRAWINGS ARE BASED ON PRELIMINARY SURVEYS AND DESIGNS FOR THE ENVIRONMENTAL DOCUMENT

50 0 100
GRAPHIC SCALE

NOVEMBER 15, 2018

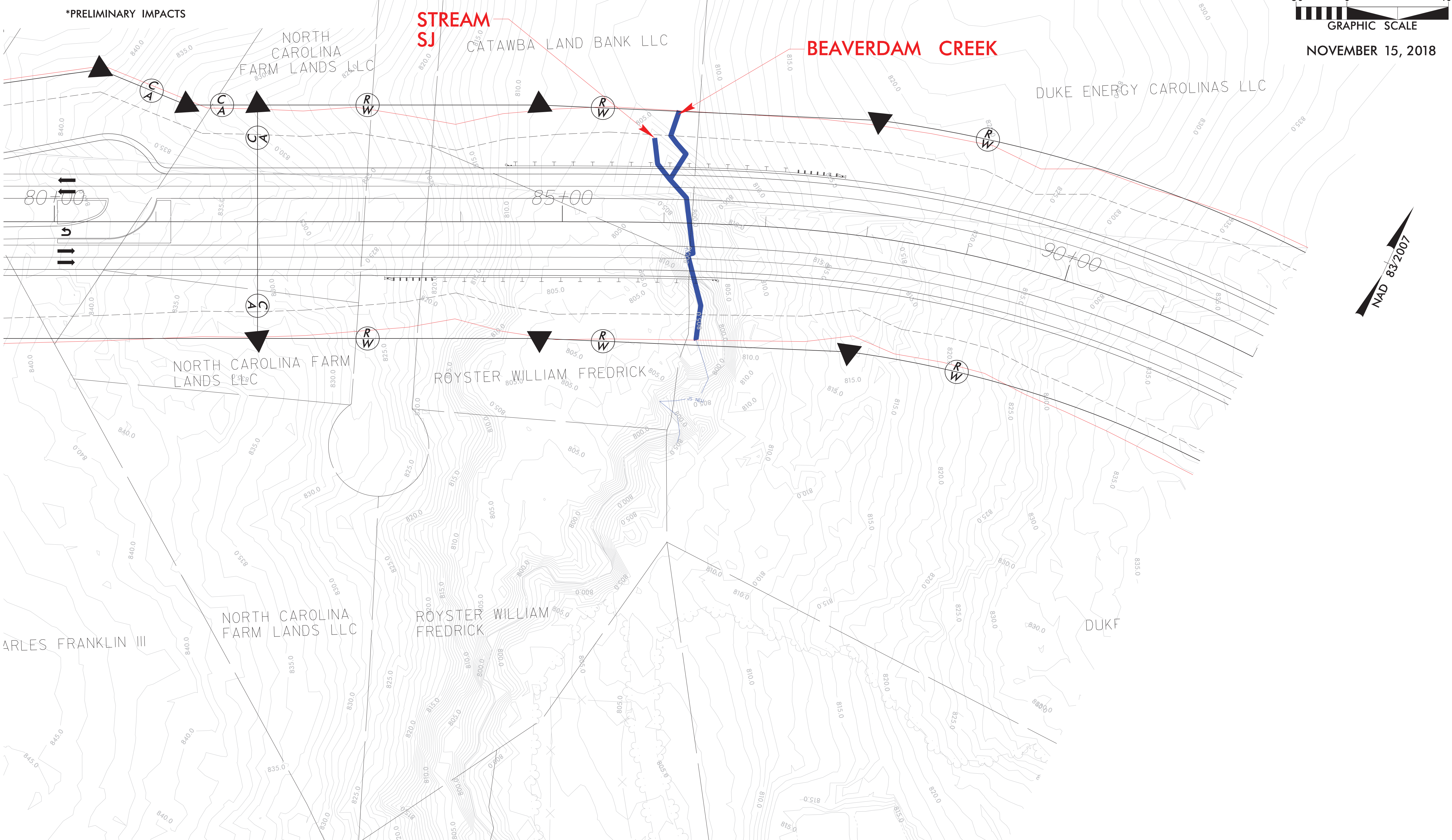
STREAM IMPACTS WITHIN SLOPES STAKES +25'*

WETLAND IMPACTS WITHIN SLOPES STAKES +25'*

SURFACE WATER IMPACTS WITHIN SLOPES STAKES DOWN TO ESTIMATED LAKE BOTTOM*

SLOPES STAKES +25'

*PRELIMINARY IMPACTS



11/15/2018
ALT 2 Terrell North\Permit Drawings\ALT2_Rdy_Permits_psh08.dgn
cmozingo

R-2307A Preliminary Permit Impact Summary Table November 15, 2018					
Plan Sheet Number	**Station (From/To)**	**Identifier**	**Wetland Impacts Within Slope Stakes +25' (Acres)**	**Stream Impacts Within Slope Stakes +25' (Linear Feet)**	**Surface Water Impacts Within Slope Stakes +25' (Acres)**
2	32+57/33+88 -LALT1- LT	WE	0.08		
2	32+93/34+61 -LALT1- RT	WK	0.30		
2	33+23/33+80 -LALT1- LT	SA		81	
2	34+15/34+68 -LALT1- RT	SA		123	
2	36+88/37+55 -LALT1- RT	SB		138	
2	37+51/37+55 -LALT1- LT	SB		55	
3	207+24/208+62 -LALT1- RT	SC		188	
4	229+07/232+54 -LALT1- LT & RT	SURFACE WATER IMPACT #1 REED CREEK/LAKE NORMAN			0.93
4	234+44/241+49 -LALT1- LT & RT	SURFACE WATER IMPACT #2 REED CREEK/LAKE NORMAN			1.61
5	262+24/270+31 -LALT1- LT & RT	SURFACE WATER IMPACT #3 MOUNTAIN CREEK/LAKE NORMAN			2.15
6	272+83/278+81 -LALT1- LT & RT	SURFACE WATER IMPACT #4 MOUNTAIN CREEK/LAKE NORMAN			1.34
7	49+09/51+09 -LALT2- LT & RT	WB	0.35		
7	49+63/50+83 -LALT2- LT & RT	BETTIE CREEK		236	
8	85+89/86+06 -LALT2- LT	SJ		46	
8	86+05/86+39 -LALT2- LT & RT	BEAVERDAM CREEK		250	
TOTAL			0.73	1117.00	6.03