



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

April 17, 2019

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

Attention: Mr. Steve Kichefski
NCDOT Coordinator

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

Dear Sir:

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

The purpose of this letter is to request approval for a Section 404 Individual Permit and Section 401 Water Quality Certification. In addition to this cover letter, this application package includes the following for R-2566: **DMS acceptance letter** for section B, and **preliminary permit drawings for Section B**. All other information from the previous permit application dated March 29, 2019 remains the same.

UPDATE

Due to revisions in design of the Section B preliminary drawings, the permit application is being updated to address these changes and revise previous information. The interchange of Old Shulls Mill Road (southern connection) (SR1568) to NC 105 will be shifted to the southeast. This shift will allow the intersection to be tied in on a flatter slope, increasing sight lines for turning movements. This shift incurs additional impacts to jurisdictional resources in the B section. Along with this shift of the -Y-line, continued work with slope stakes along the B section has allowed for tightening of impacts along the corridor. This is reflected in a reduction of the proposed impacts to jurisdictional features in the B section. No changes have been made to Section BA.

After submittal of the permit application, USFWS determined that populations of the eastern hellbender in North Carolina did not warrant protection under the Endangered Species Act. NCDOT has agreed to coordinate with NCWRC on project commitments concerning the species, regardless of its federal status.

The permit application as it was presented in the original submittal has not changed substantially. This update contains the information presented in the original submittal with the changes **highlighted** in the this letter, where information has changed.

Purpose and Need

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

Project Description

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

Section BA

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

Section B

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

Summary of Impacts

Section BA (Final)

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

Section B (Preliminary)

Proposed preliminary impacts to jurisdictional areas total **0.57** acre to riparian wetlands, **4,099** linear feet to jurisdictional steams and 0.01 acre to open water. Potential impacts due to utility relocation will be addressed prior to Letting of Section B.

Summary of Mitigation

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

Project Schedule

Currently, R-2566BA is scheduled to Let September 17, 2019, with a permit review date of July 30, 2019. R-2566B is scheduled to Let on October 18, 2022.

NEPA Document Status

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

NEPA Merger Process

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

Resource Status

The project is located in Watauga River Basin and lies within Hydrologic Unit 06010103. The Watauga River and its tributaries in the project area is rated as Class B, Tr, HQW. Laurel Fork and its tributaries is rated as Class C, Tr. No streams impacted are listed in the Final 2016 303(d) report. This is within the northern mountain physiographic region.

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

Impacts to Jurisdictional Resources

Wetlands

Wetland impacts occur in the Watauga River Basin in HUC 06010103. Wetland impacts for R-2566B/BA total **0.57** acre. Table 1 lists the impacts to wetlands for this project. Impacts are based upon final design for R-2566BA and preliminary impacts for R-2566B.

Section BA – Wetland Impacts (Final)

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

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

Permit Drawing Site Number	JD Map Label	Type	Permanent Impacts (ac.)
<u>1A</u>	<u>WBW</u>	<u>Riparian</u>	<u>0.09</u>
<u>1B</u>	<u>WBX</u>	<u>Riparian</u>	<u><0.01</u>
2	WBZ	Riparian	0.02
3	WBZ	Riparian	<u>0.04</u>
7	WCC	Riparian	0.02
10	WCD	Riparian	0.01
11	WCF	Riparian	0.02
13	WCG	Riparian	0.03
17	WCI	Riparian	0.08
20	WCK	Riparian	0.06
27	WCQ	Riparian	0.03
32	WCU	Riparian	0.03
33	WCV	Non-riparian	<0.01
35	WCX	Riparian	0.02
40	WDA	Riparian	<0.01
Additional Impact*			<u>0.10</u>
Total:			<u>0.57</u>

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

Streams

Surface water impacts occur in the Watauga River Basin in HUC 06010103. Permanent stream impacts for R-2566B/BA totals **4,302** linear feet. Tables 2-4 list the site number, reference number, stream name and amount of impact.

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

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

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

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

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

Permit Drawing Site Number	JD Map Label	Stream Name	Perennial/Intermittent	Permanent Impact (Preliminary)
1A/1B	SFS	UT to Watauga River	Perennial	300
1	SFU	UT to Watauga River	Perennial	163
4/6/8	SFV	UT to Watauga River	Perennial	479
5/7	SFW	UT to Watauga River	Perennial	169
9	Big Branch	Big Branch	Perennial	163
10	SGB	UT to Watauga River	Perennial	77
11	SGD	UT to Watauga River	Perennial	132
12	SGE	UT to Watauga River	Perennial	93
14/15	SGF	UT to Watauga River	Perennial	66
16	SGH	UT to Watauga River	Perennial	135
18	SGG	UT to Watauga River	Perennial	42
19	SGJ	UT to Watauga River	Perennial	90
20	SGO	UT to Watauga River	Perennial	42
21	SGO/SGP	UTs to Watauga River	Perennial	242
25	SGZ	UT to Laurel Fork	Perennial	217
26	SHB	UT to Laurel Fork	Perennial	152

Permit Drawing Site Number	JD Map Label	Stream Name	Perennial/Intermittent	Permanent Impact (Preliminary)
28	SHD	UT to Laurel Fork	Perennial	50
29	SHE	UT to Laurel Fork	Perennial	54
30	SHF*	UT to Laurel Fork	Perennial	73
31	SHH	UT to Laurel Fork	Perennial	52
32	SHK	UT to Laurel Fork	Perennial	130
34	SHO	UT to Laurel Fork	Perennial	115
35	SHW	UT to Laurel Fork	Perennial	268
36/37	SHZ	UT to Laurel Fork	Perennial	150
38	SIC	UT to Laurel Fork	Perennial	59
39	SID	UT to Laurel Fork	Perennial	40
42	Laurel Fork	Laurel Fork	Perennial	<u>98</u>
Additional Impact**				<u>200</u>
Total				<u>4,099</u>

*Stream was not included in the JD package but was covered under the NRTR.

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

Open Water

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

Protected Species

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

Table 5. Federally protected species listed for Watauga County

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

Spreading avens	<i>Geum radiatum</i>	E	No	No Effect
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MANLAA- May Affect, Not Likely to Adversely Affect

*May Affect – NLEB is compliant with the 4(d) rule.

**The Service does not require surveys for rusty-patched bumble bee in North Carolina because FWS assumes the state is unoccupied by the species.

USFWS Concurrence

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

Eastern Hellbender

The eastern hellbender was proposed for listing as an endangered species by the USFWS. However, on April 4, 2019, USFWS determined that only the eastern hellbender population in Missouri warranted protection under the Endangered Species Act. NCDOT has been coordinating with the North Carolina Wildlife Resources Commission (NCWRC) about conservation measures for the species. Surveys have been conducted within the project area, identifying areas in which the hellbender is present. Proposed protective measures have been recommended by the NCWRC, in which NCDOT has agreed to implement. These measures are the following:

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

Bald and Golden Eagle Protection Act (BGPA)

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

Moratoria

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

Cultural Resources

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

FEMA Compliance

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

Indirect and Cumulative Effects

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

Wild and Scenic Rivers

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

Mitigation Options

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

Avoidance and Minimization

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

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

Compensation

The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. The unavoidable permanent stream impacts of 307 linear feet and wetland impacts of 0.02 acre will be offset by compensatory mitigation provided by the North Carolina Department of Environmental Quality (NCDEQ)-Division of Mitigation Services (DMS). **Compensation for the preliminary impacts of 4,099 linear feet of streams and 0.57 acre of wetland to the Section B segment of this project are covered by DMS.** Acceptance letters from DMS are attached.

Regulatory Approvals

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

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

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

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

Sincerely,

Carla Dagnino

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

cc:

NCDOT Permit Application Standard Distribution List



NORTH CAROLINA
Environmental Quality

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

TIM BAUMGARTNER
Director

April 12, 2019

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

Dear Mr. Harris:

Subject: Mitigation Acceptance Letter:

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

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the compensatory stream and wetland mitigation for the subject project. Based on the information supplied by you on April 12, 2019, the impacts are located in CU 06010103 of the Watauga River basin in the Northern Mountains (NM) Eco-Region, and are as follows:

Watauga 06010103 NM	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	4,099.0	0	0	0.57	0	0	0	0

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

This mitigation acceptance letter replaces the mitigation acceptance letter issued on March 12, 2019. The impacts and associated mitigation needs were under projected by the NCDOT in the 2019 impact data. DMS will commit to implement sufficient compensatory stream and wetland mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies using the delivery timeline listed in Section F.3.c.iii of the In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from DMS.

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

Sincerely,

James B. Stanfill
DMS Asset Management Supervisor

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



09, 08, / 99

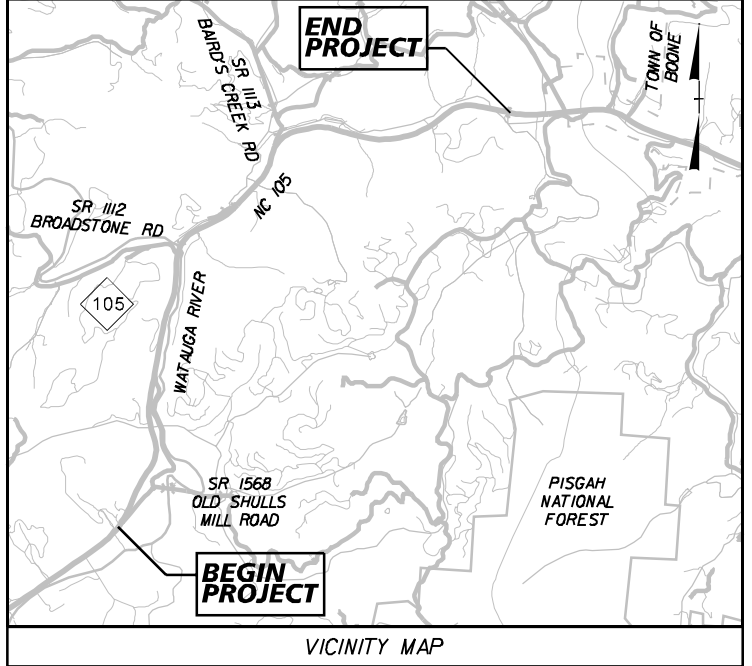
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4/11/2019

TIP PROJECT: R-2566B

CONTRACT:

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



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WATAUGA COUNTY

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

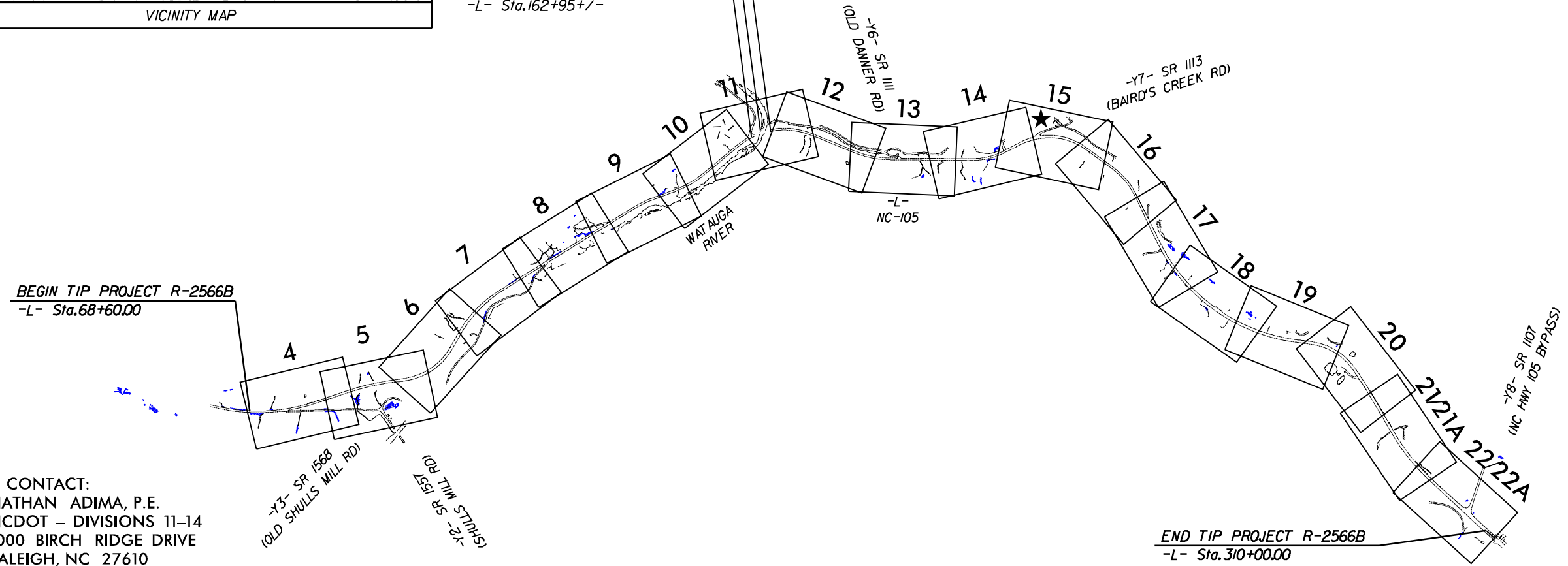
TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNALS, CULVERTS, AND RETAINING WALLS

PRELIMINARY WETLAND AND SURFACE WATER IMPACTS PERMIT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2566B	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
37512.1.1	NHPP-0150(004)	PE	
15% PLANS - FOR REVIEW ONLY NOT FOR UTILITY OR HYDRAULIC DESIGN			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

R-2566BA (BY OTHERS)
END BRIDGE
BRIDGE CONSTRUCTION (BY OTHERS)
-L- Sta.165+65+/-

BEGIN BRIDGE
BRIDGE CONSTRUCTION (BY OTHERS)
-L- Sta.162+95+/-

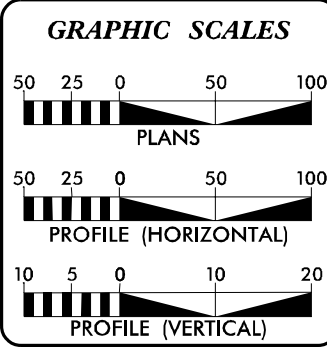


NCDOT CONTACT:
NATHAN ADIMA, P.E.
NCDOT - DIVISIONS 11-14
1000 BIRCH RIDGE DRIVE
RALEIGH, NC 27610

- ★ TRAFFIC SIGNAL
- ⚡ EXISTING TRAFFIC SIGNAL TO BE UPGRADED

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

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



DESIGN DATA

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

FUNCTIONAL CLASSIFICATION: ARTERIAL
RURAL REGIONAL TIER
* 2% TTST 4% DUAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2566B	=	4.032 MILES
TOTAL LENGTH TIP PROJECT R-2566B	=	4.032 MILES

PLANS PREPARED FOR THE NCDOT BY:

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: 10/09/2020

LETTING DATE: 10/18/2022

Kimley»Horn

TONY SPACEK, P.E.
PROJECT ENGINEER

BRANDON MURR, EIT
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

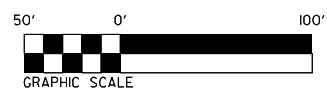


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 REVISIONS
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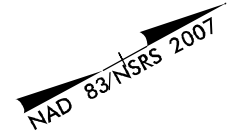
-L-		
PI Sta 69+03.11	PI Sta 77+25.46	PIs Sta 82+29.57
$\Delta = 15' 12' 35.3''$ (LT)	$\Delta = 15' 23' 55.6''$ (LT)	$\Theta_s = 1' 27' 13.6''$
$D = 2' 02' 46.6''$	$D = 1' 42' 37.2''$	$L_s = 170.00'$
$L = 743.29'$	$L = 900.34'$	$LT = 113.34'$
$T = 373.84'$	$T = 456.20'$	$ST = 56.67'$
$R = 2,800.00'$	$R = 3,350.00'$	
SE = 5% (EXIST.)	SE = 5%	
DS = 65 MPH	DS = 70 MPH	
RO = 135'	RO = 170'	

-YI-	
PI Sta 11+55.36	PI Sta 21+27.42
$\Delta = 92' 59' 28.6''$ (LT)	$\Delta = 15' 10' 18.8''$ (RT)
$D = 57' 17' 44.8''$	$D = 2' 51' 53.2''$
$L = 162.30'$	$L = 529.60'$
$T = 105.36'$	$T = 266.36'$
$R = 100.00'$	$R = 2,000.00'$
SE = 4%	SE = 3%
DS = 20 MPH	DS = 30 MPH
RO = 20'	RO = 42'

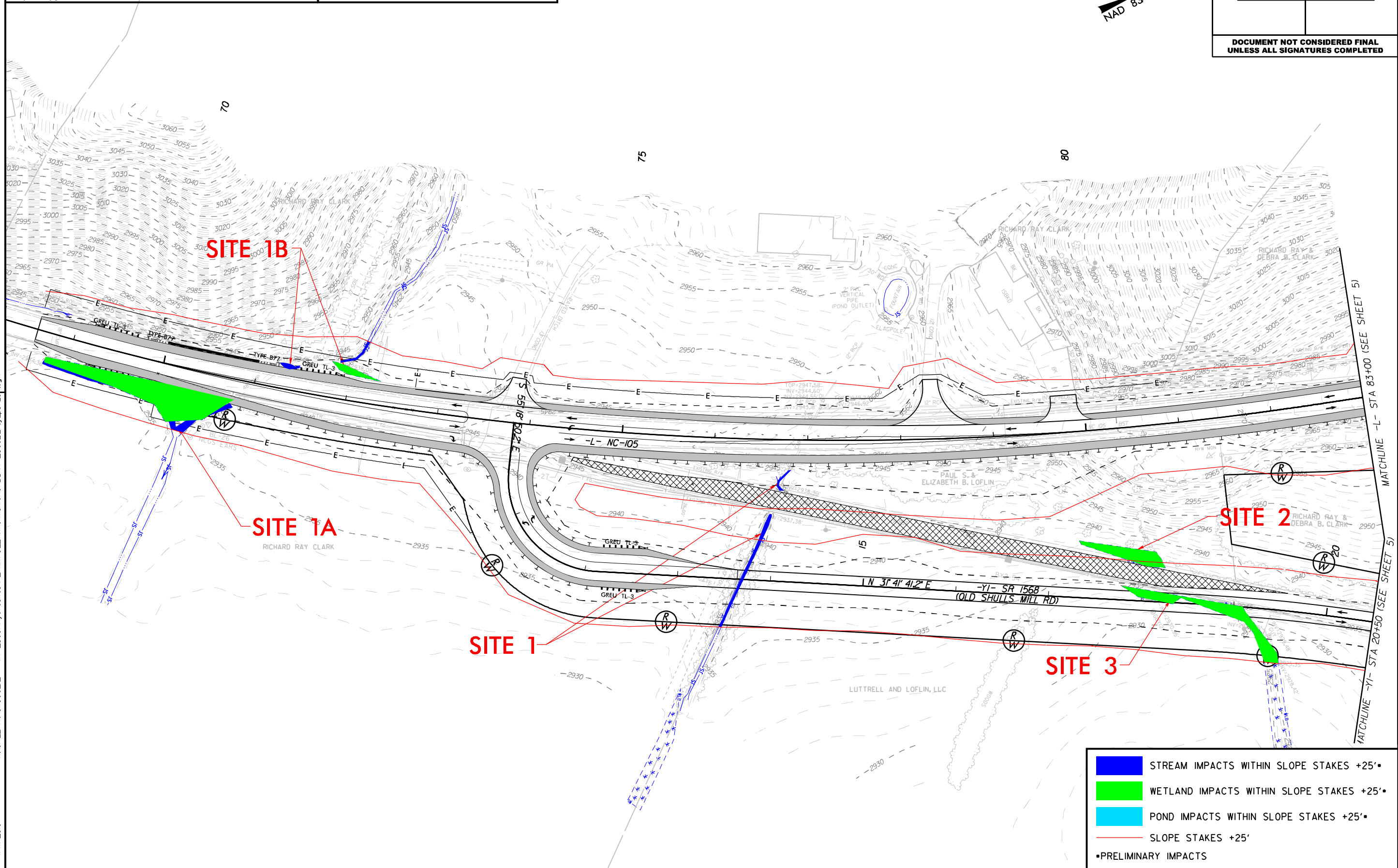
SEE SHEET 23 FOR -L- PROFILE
SEE SHEET 35 FOR -YI- PROFILE



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



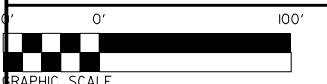
PROJECT REFERENCE NO. R-2566B	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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

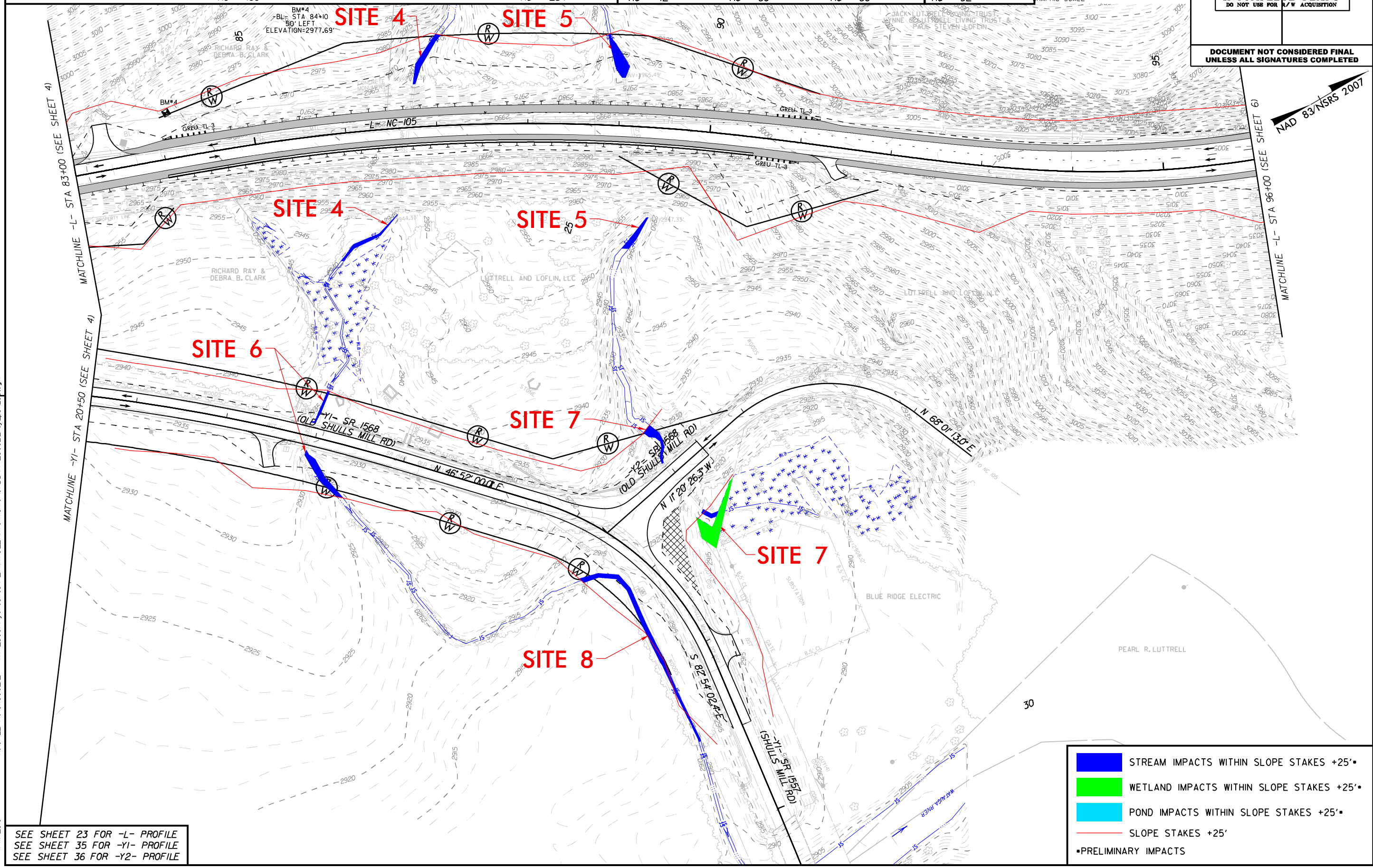
-L-		-L-		-L-		-Y1-		-Y1-		-Y2-	
PIs Sta 82+29.57	PIs Sta 84+66.92	PI Sta 87+54.47	PIs Sta 90+40.15	PIs Sta 93+20.23	PI Sta 98+46.09	PI Sta 21+27.42	PI Sta 26+96.76	PI Sta 29+49.90	PI Sta 13+16.56		
$\Delta s = 1' 27" 13.6"$	$\Delta s = 2' 39" 51.3"$	$\Delta = 12' 52" 10.3" (RT)$	$\Delta s = 2' 39" 51.3"$	$\Delta s = 6' 05" 39.1"$	$\Delta = 44' 18" 56.6" (LT)$	$\Delta = 15' 10" 18.8" (RT)$	$\Delta = 50' 13" 57.6" (RT)$	$\Delta = 0' 30" 41.8" (RT)$	$\Delta = 79' 21" 39.3" (RT)$		
$Ls = 170.00'$	$Ls = 186.00'$	$D = 2' 51" 53.2"$	$Ls = 186.00'$	$Ls = 234.00'$	$D = 5' 12" 31.3"$	$D = 2' 51" 53.2"$	$D = 19' 05" 54.9"$	$D = 0' 30" 00.0"$	$D = 36' 57" 54.1"$		
$LT = 113.34'$	$LT = 124.01'$	$L = 449.23'$	$LT = 124.01'$	$LT = 156.09'$	$L = 850.80'$	$L = 529.60'$	$L = 263.02'$	$L = 102.32'$	$L = 214.69'$		
$ST = 56.67'$	$ST = 62.01'$	$T = 225.56'$	$ST = 62.01'$	$ST = 78.08'$	$T = 447.96'$	$T = 266.36'$	$T = 140.63'$	$T = 51.6'$	$T = 218.59'$		
		$R = 2,000.00'$			$R = 1,000.00'$	$R = 2,000.00'$	$R = 300.00'$	$R = 11,459.16'$	$R = 155.00'$		
		$SE = 6\%$			$SE = 6\%$	$SE = 3\%$	$SE = 4\%$	$SE = EXIST$	$SE = EXIST$		
		$DS = 65 MPH$			$DS = 55 MPH$	$DS = 30 MPH$	$DS = 30 MPH$	$DS = EXIST$	$DS = EXIST$		
		$RO = 186'$			$RO = 234'$	$RO = 42'$	$RO = 56'$	$RO = 56'$	$RO = 52'$		

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 CHARLOTTE, N.C. 28202



PROJECT REFERENCE NO. R-2566B	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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REVISIONS

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4/11/2019

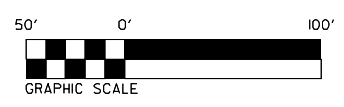
SEE SHEET 23 FOR -L- PROFILE
 SEE SHEET 35 FOR -Y1- PROFILE
 SEE SHEET 36 FOR -Y2- PROFILE

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

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 REVISIONS
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 4/11/2019

-L-			
PI Sta 98+46.09	PIs Sta 103+27.02	PIs Sta 106+42.97	PI Sta 110+79.92
$\Delta = 44'18"56.6"$ (LT)	$\Theta_s = 6'05"39.1"$	$\Theta_s = 3'39"25.8"$	$\Delta = 27'30"12.6"$ (RT)
$D = 5'12"31.3"$	$L_s = 234.00'$	$L_s = 240.00'$	$D = 3'02"51.5"$
$L = 850.80'$	$LT = 156.09'$	$LT = 160.03'$	$L = 705.58'$
$T = 447.96'$	$ST = 78.08'$	$ST = 80.03'$	$T = 356.99'$
$R = 1,100.00'$			$R = 1,880.00'$
$SE = 6\%$			$SE = 6\%$
$DS = 55$			$DS = 65$
$RO = 234'$			$RO = 240'$

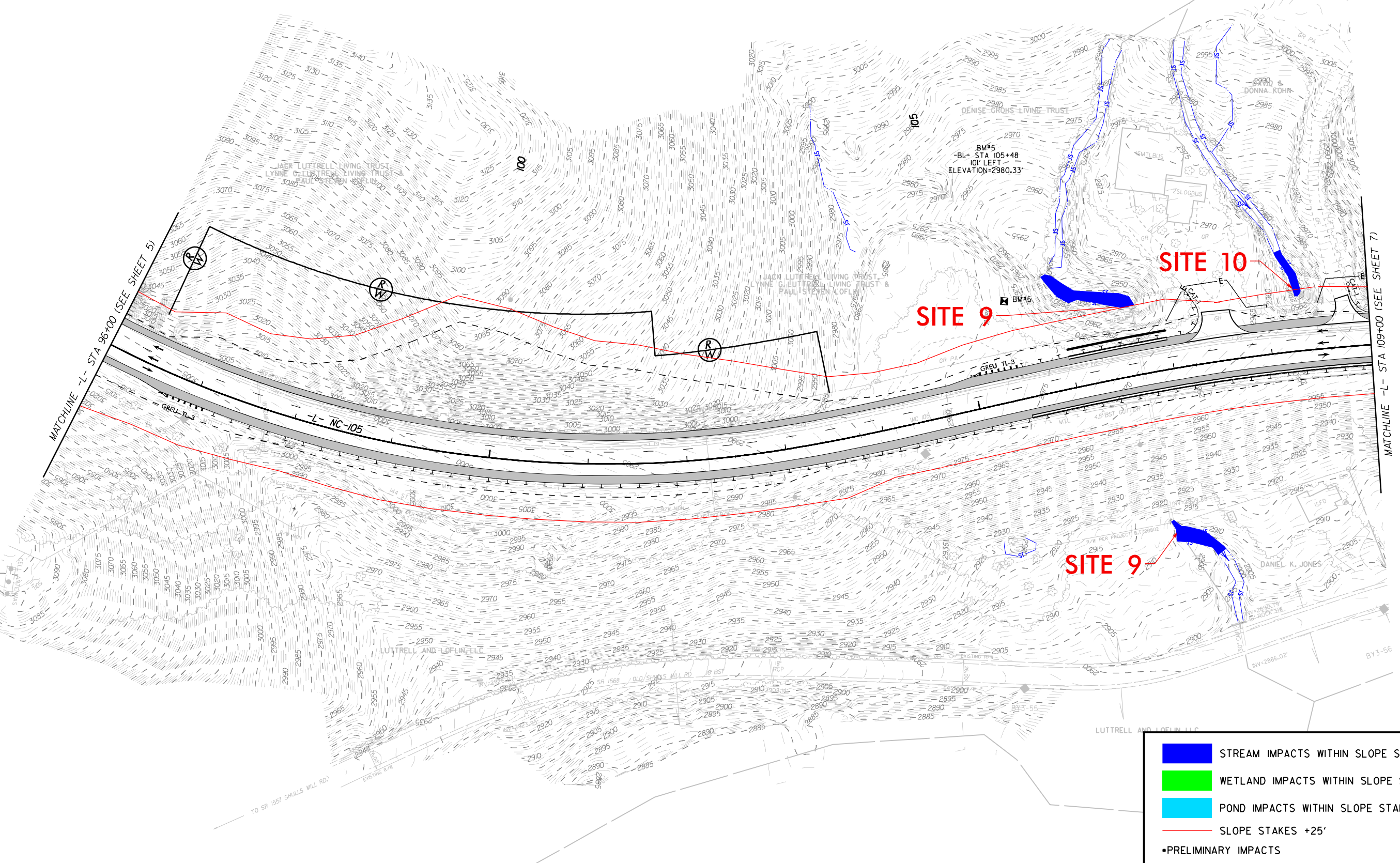
SEE SHEET 24 FOR -L- PROFILE



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PROJECT REFERENCE NO. R-2566B	SHEET NO. 6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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

-L-
 PI Sta 110+79.92 PIs Sta 115+08.54
 $\Delta = 21^{\circ} 30' 12.6''$ (RT) $\Theta_s = 3^{\circ} 39' 25.8''$
 $D = 3^{\circ} 02' 51.5''$ $L_s = 240.00'$
 $L = 705.58'$ $LT = 160.03'$
 $T = 356.99'$ $ST = 80.03'$
 $R = 1880.00'$
 $SE = 6\%$
 $DS = 65$
 $RO = 240'$

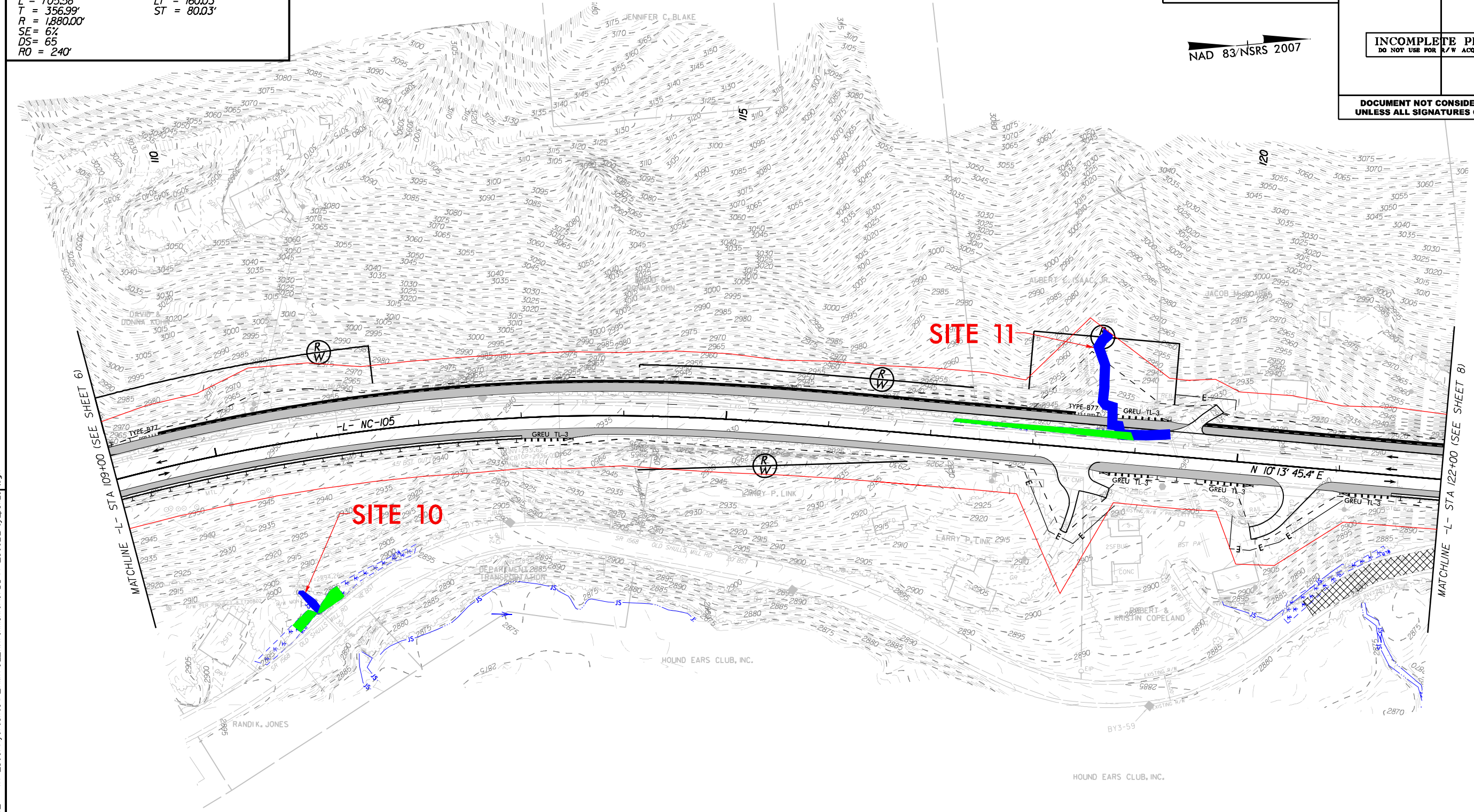
SEE SHEET 24 FOR -L- PROFILE



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PROJECT REFERENCE NO. R-2566B	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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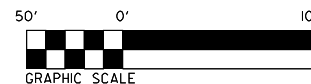


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4/11/2019

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



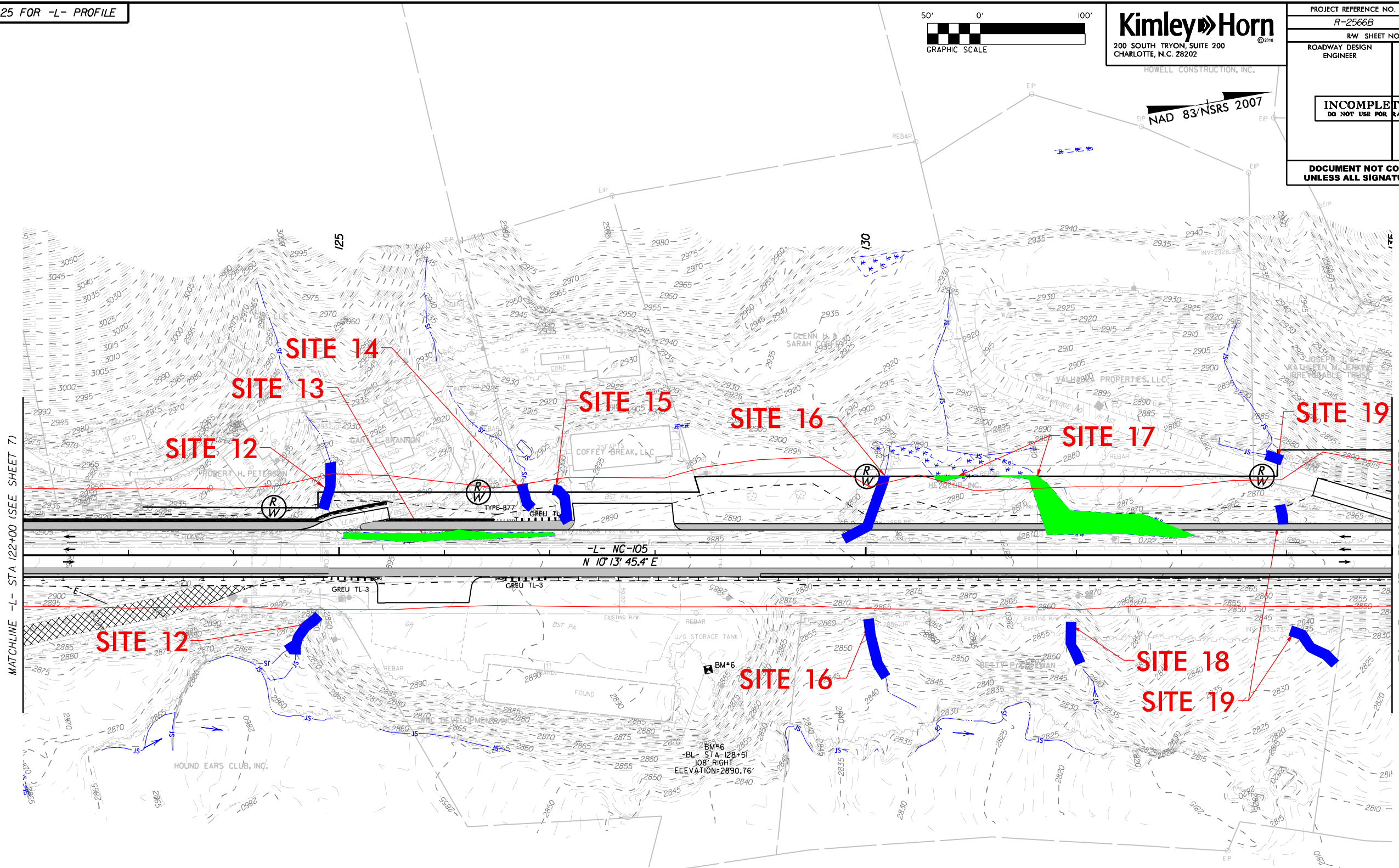
Kimley Horn
200 SOUTH TRYON, SUITE 200
CHARLOTTE, N.C. 28202
HOWELL CONSTRUCTION, INC.

PROJECT REFERENCE NO. R-2566B	SHEET NO. 8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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4/11/2019



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

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 REVISIONS
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 4/11/2019

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

SEE SHEET 25 FOR -L- PROFILE

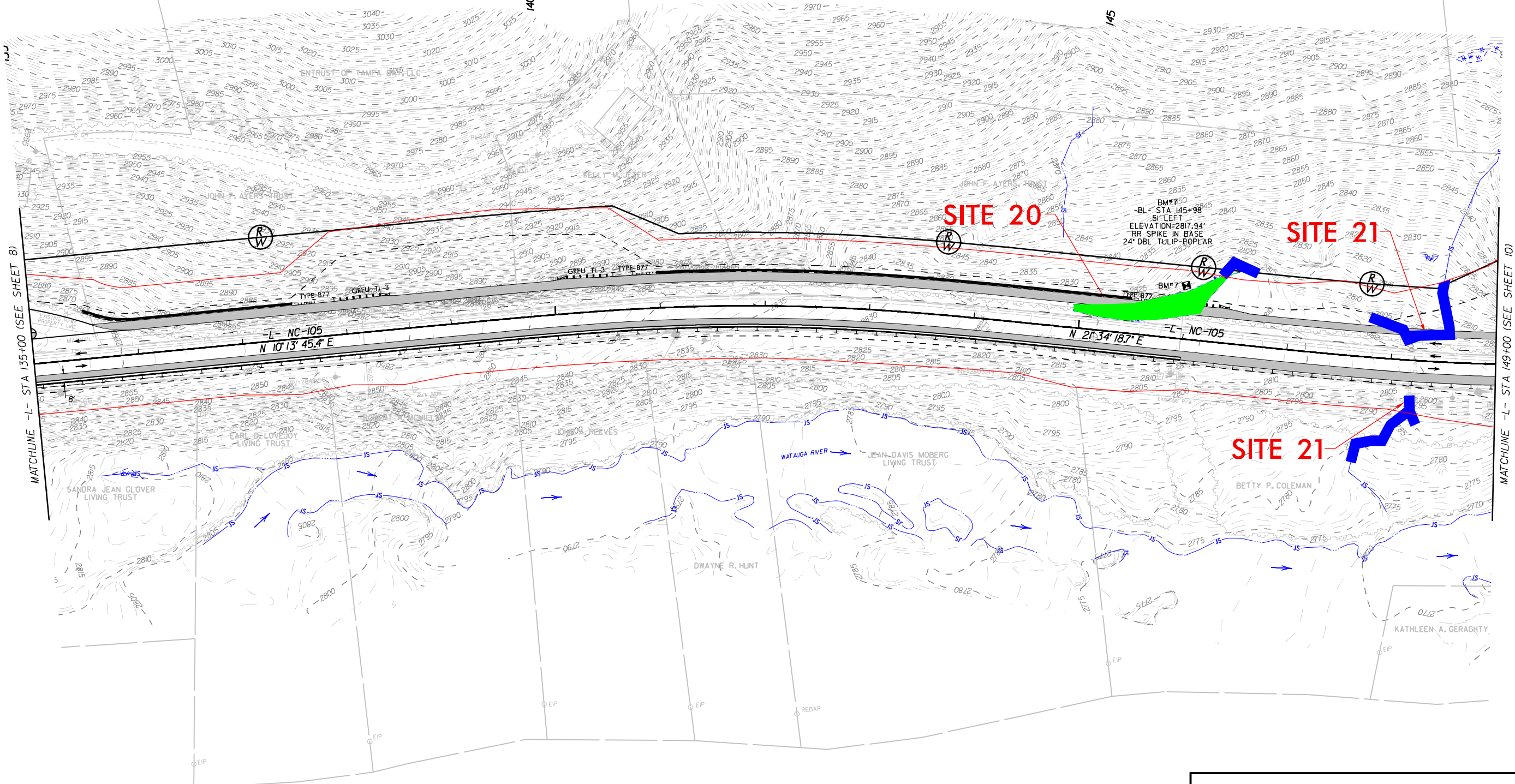


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 200 SOUTH TRYON, SUITE 200
 CHARLOTTE, N.C. 28202

PI Sta 150+76.47
 $\Delta = 13' 16'' 58.0'' (LT)$
 $D = 3' 34'' 51.6''$
 $L = 370.93'$
 $T = 186.30'$
 $R = 1,600.00'$
 $SE = 6\%$
 $DS = 60$

MCLEAN INNOVATIVE HOMES, LLC

PROJECT REFERENCE NO. R-2566B	SHEET NO. 9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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

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 4/11/2019

-L-			
PI Sta 150+76.47	PIs Sta 153+41.4	PIs Sta 158+39.08	PI Sta 165+98.50
$\Delta = 13^{\circ} 16' 58.0"$ (LT)	$\Theta s = 4^{\circ} 17' 49.9"$	$\Theta s = 6^{\circ} 52' 31.8"$	$\Delta = 5^{\circ} 31' 45.6"$ (RT)
$D = 3^{\circ} 34' 51.6"$	$Ls = 240.00'$	$Ls = 324.00'$	$D = 4^{\circ} 14' 38.9"$
$L = 370.93'$	$LT = 160.05'$	$LT = 216.16'$	$L = 1214.13'$
$T = 186.30'$	$ST = 80.04'$	$ST = 108.15'$	$T = 651.59'$
$R = 1600.00'$			$R = 1350.00'$
$SE = 6\%$			$SE = 6\%$
$DS = 60$			$DS = 60$
$RO = 240'$			$RO = 324'$

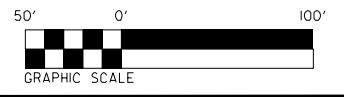
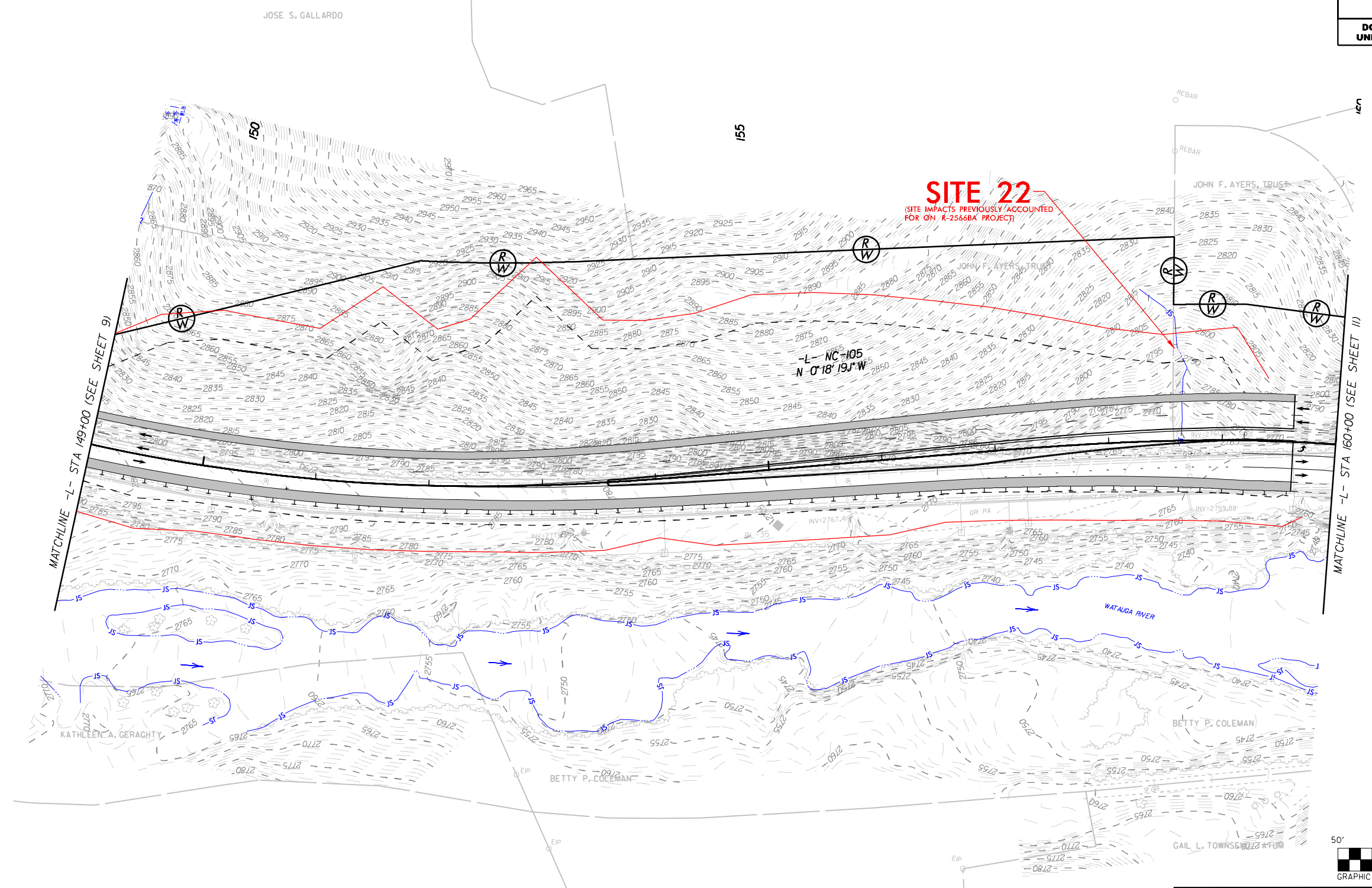
SEE SHEET 26 FOR -L- PROFILE

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

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 CHARLOTTE, N.C. 28202

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PROJECT REFERENCE NO. R-2566B	SHEET NO. 10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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

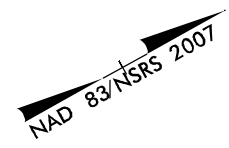
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 REVISIONS
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 4/11/2019

-L-
 PI Sta 165+98.50
 $\Delta = 51' 31" 45.6" (RT)$
 $D = 4' 14" 38.9"$
 $L = 1214.13'$
 $T = 651.59'$
 $R = 1350.00'$
 $SE = 6\%$
 $DS = 60$
 $RO = 324'$

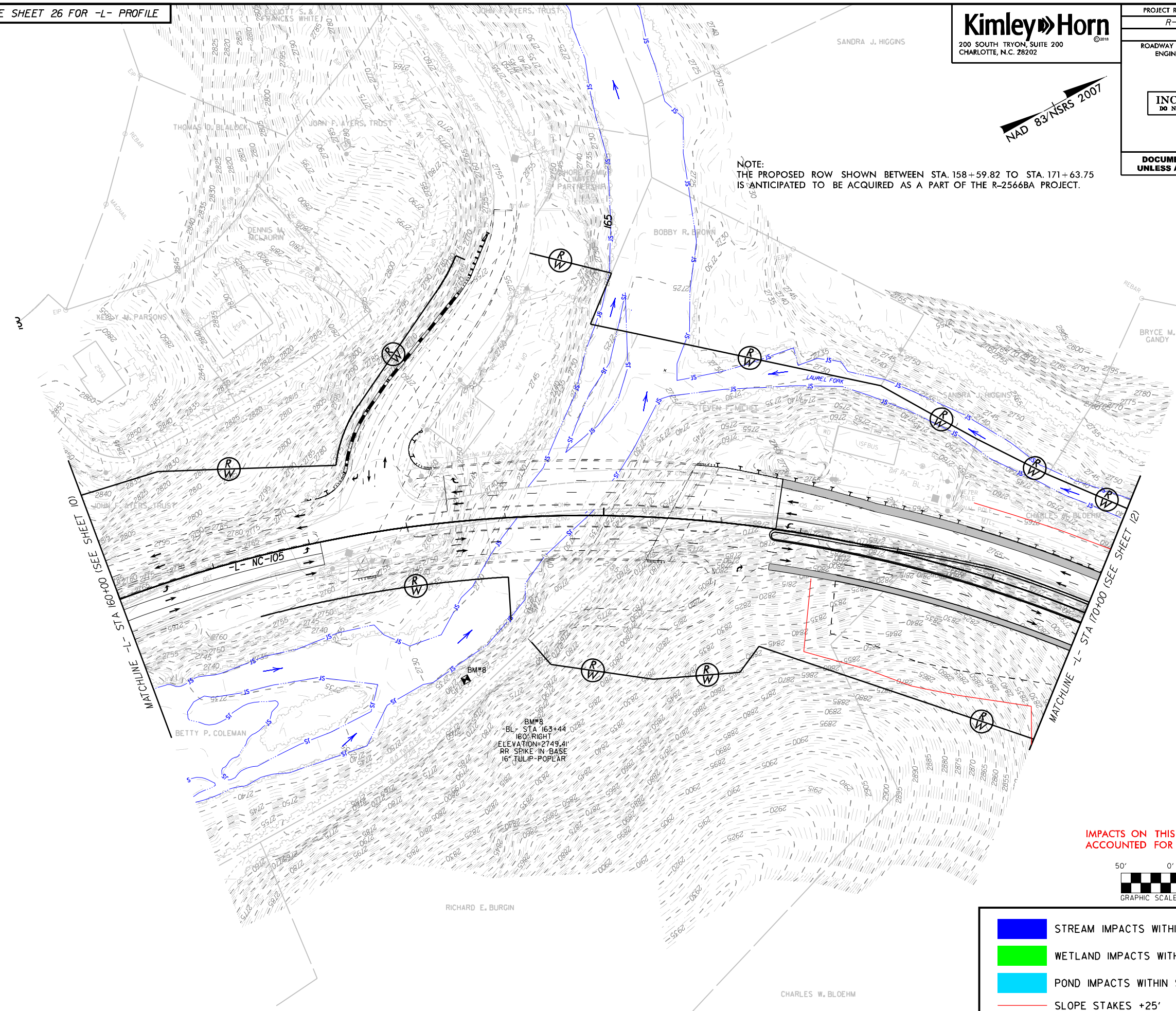
SEE SHEET 26 FOR -L- PROFILE

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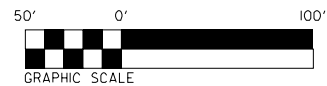
PROJECT REFERENCE NO. R-2566B	SHEET NO. 11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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



IMPACTS ON THIS SHEET PREVIOUSLY ACCOUNTED FOR ON R-2566BA PROJECT.



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

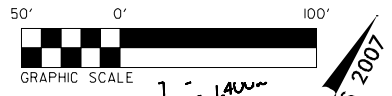
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 4/11/2019

-L-			
PI Sta 165+98.50	PIs Sta 172+69.20	PIs Sta 180+43.89	PI Sta 182+60.47
$\Delta = 5^{\circ} 31' 45.6"$ (RT)	$\Theta s = 6^{\circ} 52' 31.8"$	$\Theta s = 6^{\circ} 37' 47.8"$	$\Delta = 8^{\circ} 52' 54.5"$ (LT)
$D = 4^{\circ} 14' 38.9"$	$Ls = 324.00'$	$Ls = 324.00'$	$D = 4^{\circ} 05' 33.2"$
$L = 1214.13'$	$LT = 216.16'$	$LT = 216.15'$	$L = 217.02'$
$T = 651.59'$	$ST = 108.15'$	$ST = 108.14'$	$T = 108.73'$
$R = 1,350.00'$			$R = 1,400.00'$
$SE = 6\%$			$SE = 6\%$
$DS = 60$			$DS = 60$
$RO = 324'$			$RO = 324'$

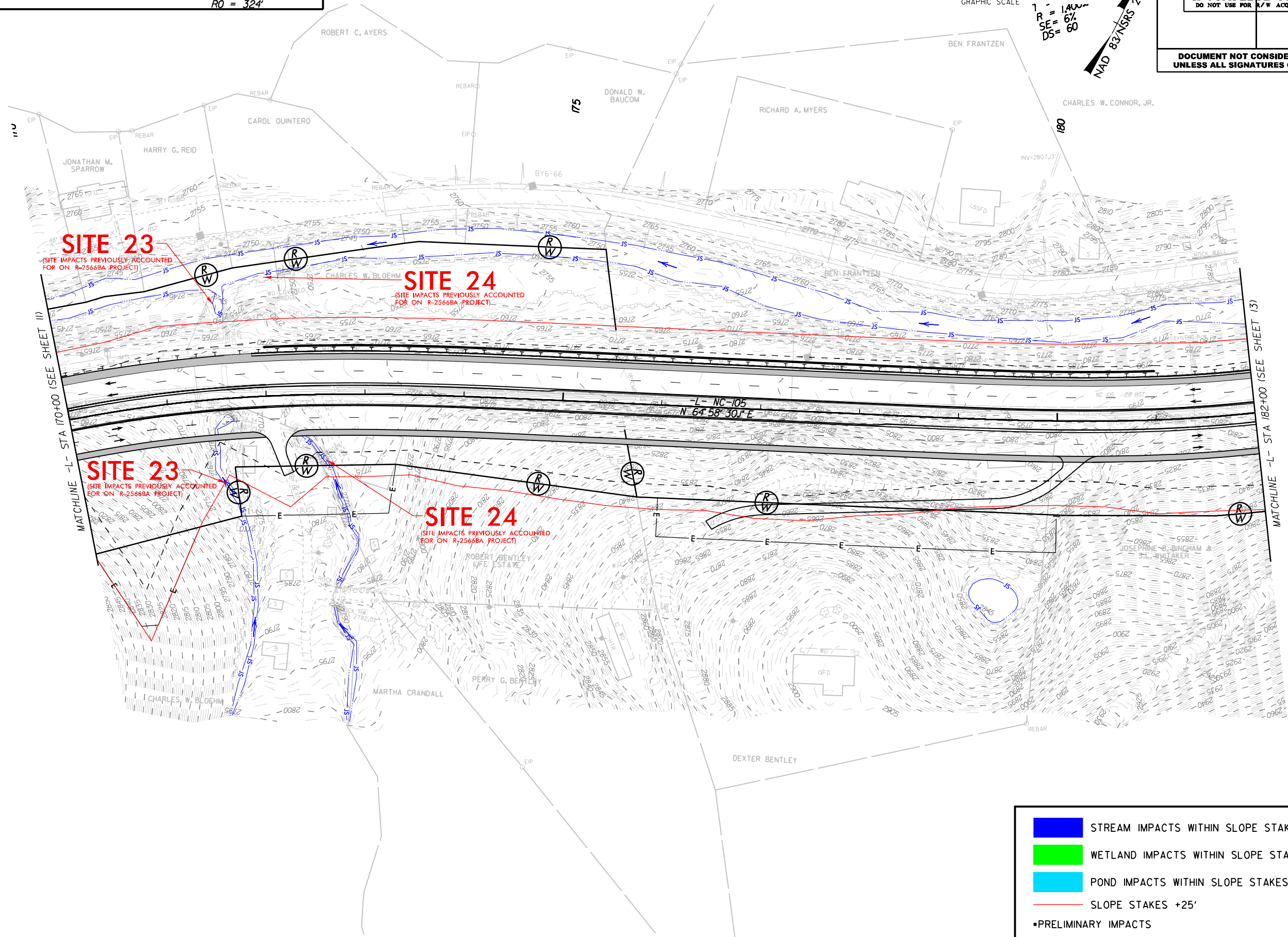
SEE SHEET 27 FOR -L- PROFILE

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

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



PROJECT REFERENCE NO. R-2566B	SHEET NO. 12
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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

5/14/99

-L-	
PI Sta 182+60.47	PIs Sta 184+76.90
$\Delta = 8^{\circ} 52' 54.5" (LT)$	$\Theta s = 6^{\circ} 37' 47.8"$
$D = 4^{\circ} 05' 33.2"$	$Ls = 324.00'$
$L = 217.02'$	$LT = 216.15'$
$T = 108.73'$	$ST = 108.14'$
$R = 1,400.00'$	
$SE = 6\%$	
$DS = 60$	
$RO = 324'$	

-Y3-		
PI Sta 10+71.40	PI Sta 11+47.94	PI Sta 12+23.00
$\Delta = 60^{\circ} 06' 59.4" (LT)$	$\Delta = 9^{\circ} 19' 55.6" (RT)$	$\Delta = 17^{\circ} 59' 12.5" (RT)$
$D = 133^{\circ} 14' 45.6"$	$D = 8^{\circ} 18' 13.5"$	$D = 47^{\circ} 44' 47.3"$
$L = 45.12'$	$L = 112.38'$	$L = 37.67'$
$T = 24.88'$	$T = 56.32'$	$T = 18.99'$
$R = 43.00'$	$R = 690.00'$	$R = 120.00'$
$SE = 3\%$	$SE = EXIST$	$SE = EXIST$
$DS = 15$	$DS = 15$	$DS = EXIST$
$RO = 39'$	$RO = 39'$	$RO = EXIST$

SEE SHEET 27 FOR -L- PROFILE
SEE SHEET 36 FOR -Y3- PROFILE

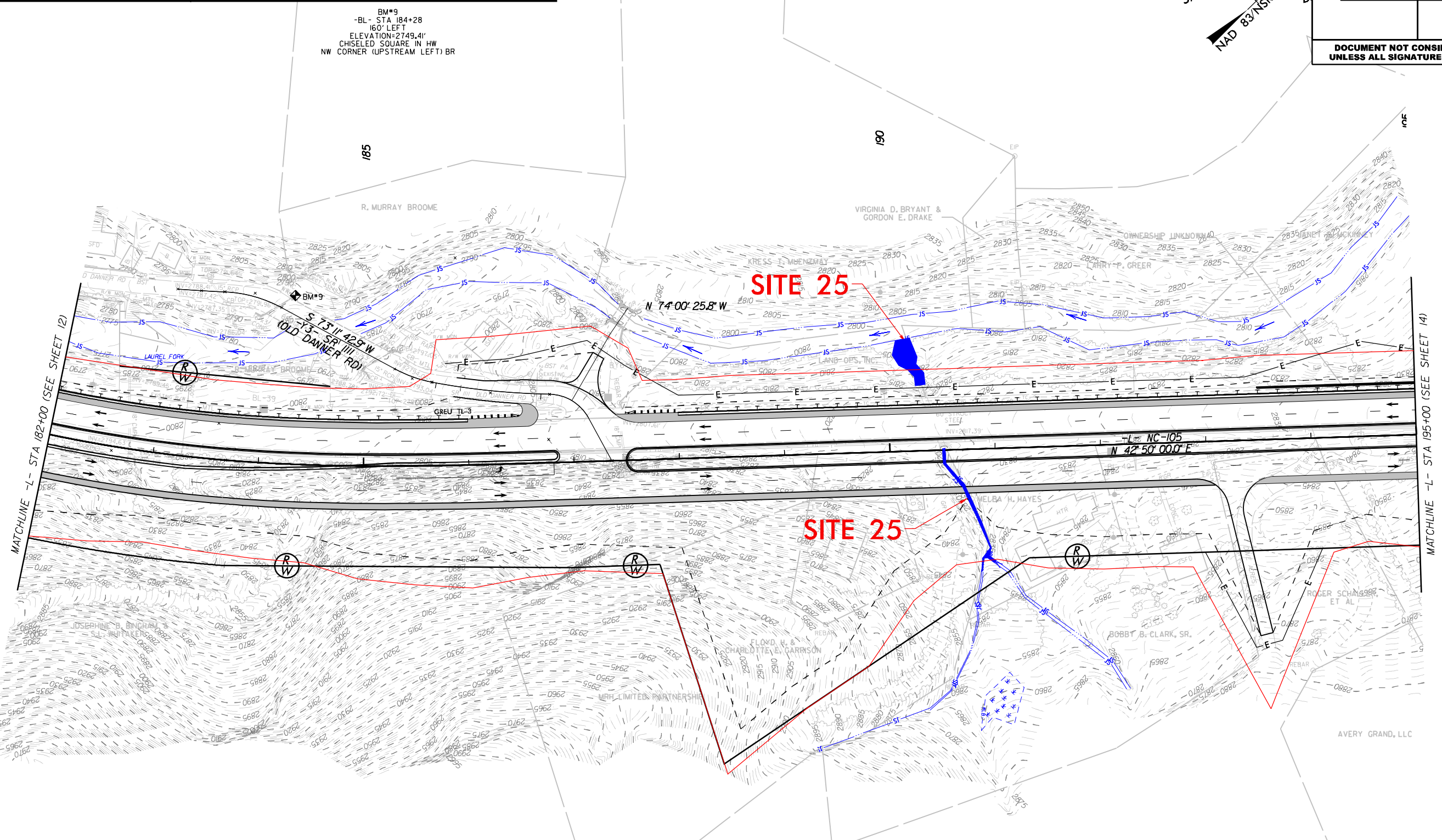


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PIs Sta 195+20.9
 $\Theta s = 8^{\circ} 25' 20.9"$
 $Ls = 294.00'$
 $LT = 196.22'$
 $ST = 98.20'$

PROJECT REFERENCE NO. R-2566B	SHEET NO. 13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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



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

REVISIONS

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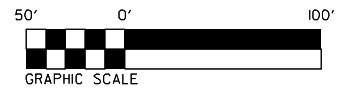
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4/11/2019

REVISIONS

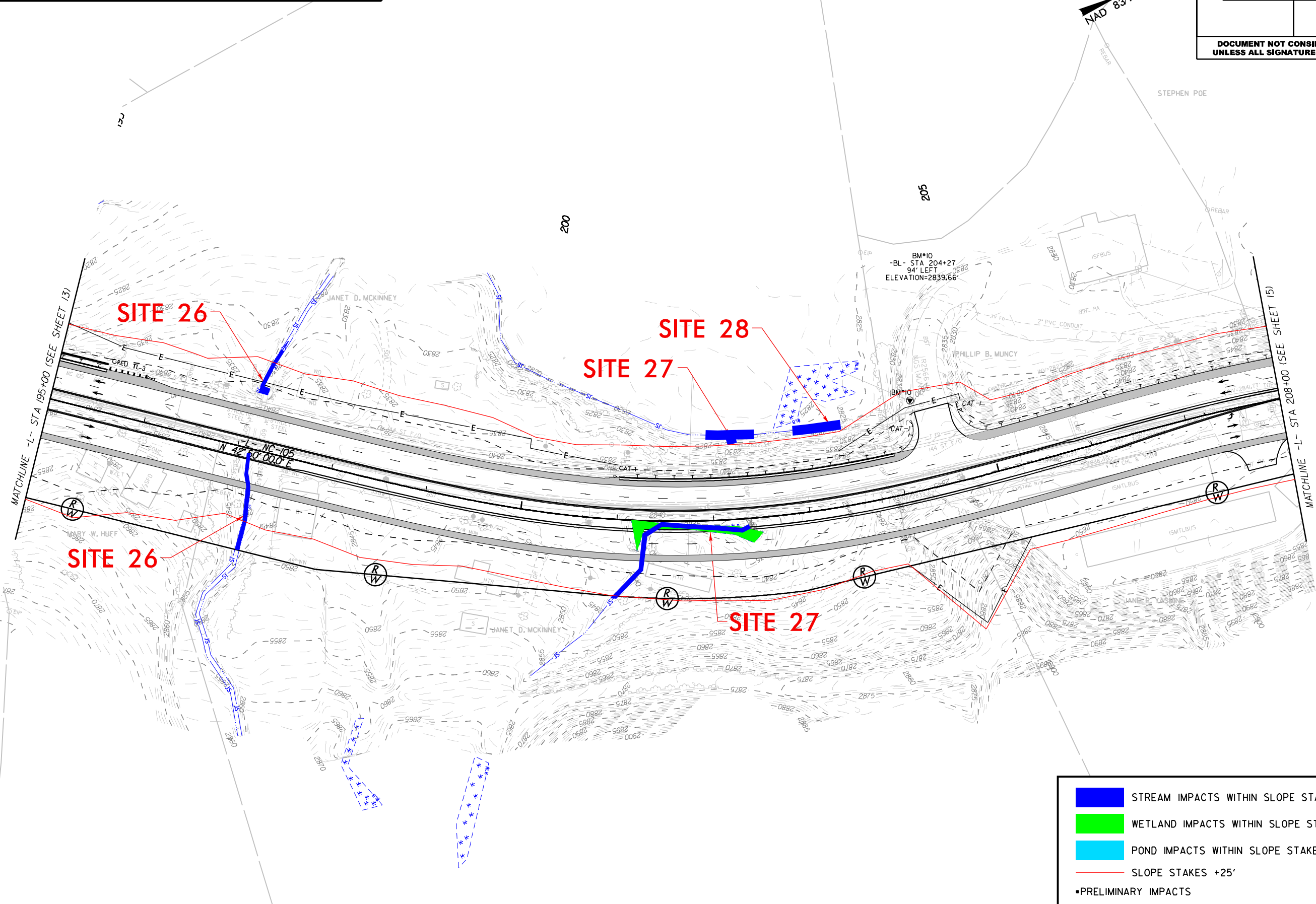
-L-			
PIs Sta 199+67.34	PI Sta 201+77.0	PIs Sta 203+86.36	PIs Sta 207+78.43
$\Theta s = 8' 25' 20.9"$	$\Delta = 12' 46' 44.4" (LT)$	$\Theta s = 8' 25' 20.9"$	$\Theta s = 9' 21' 29.9"$
$Ls = 294.00'$	$D = 5' 43' 46.5"$	$Ls = 294.00'$	$Ls = 294.00'$
$LT = 196.22'$	$L = 223.04'$	$LT = 196.22'$	$LT = 196.22'$
$ST = 98.20'$	$T = 111.98'$	$ST = 98.20'$	$ST = 98.25'$
	$R = 1,000.00'$		
	$SE = 6\%$		
	$DS = 50$		
	$RO = 294'$		

SEE SHEET 28 FOR -L- PROFILE



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

PROJECT REFERENCE NO. R-2566B	SHEET NO. 14
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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

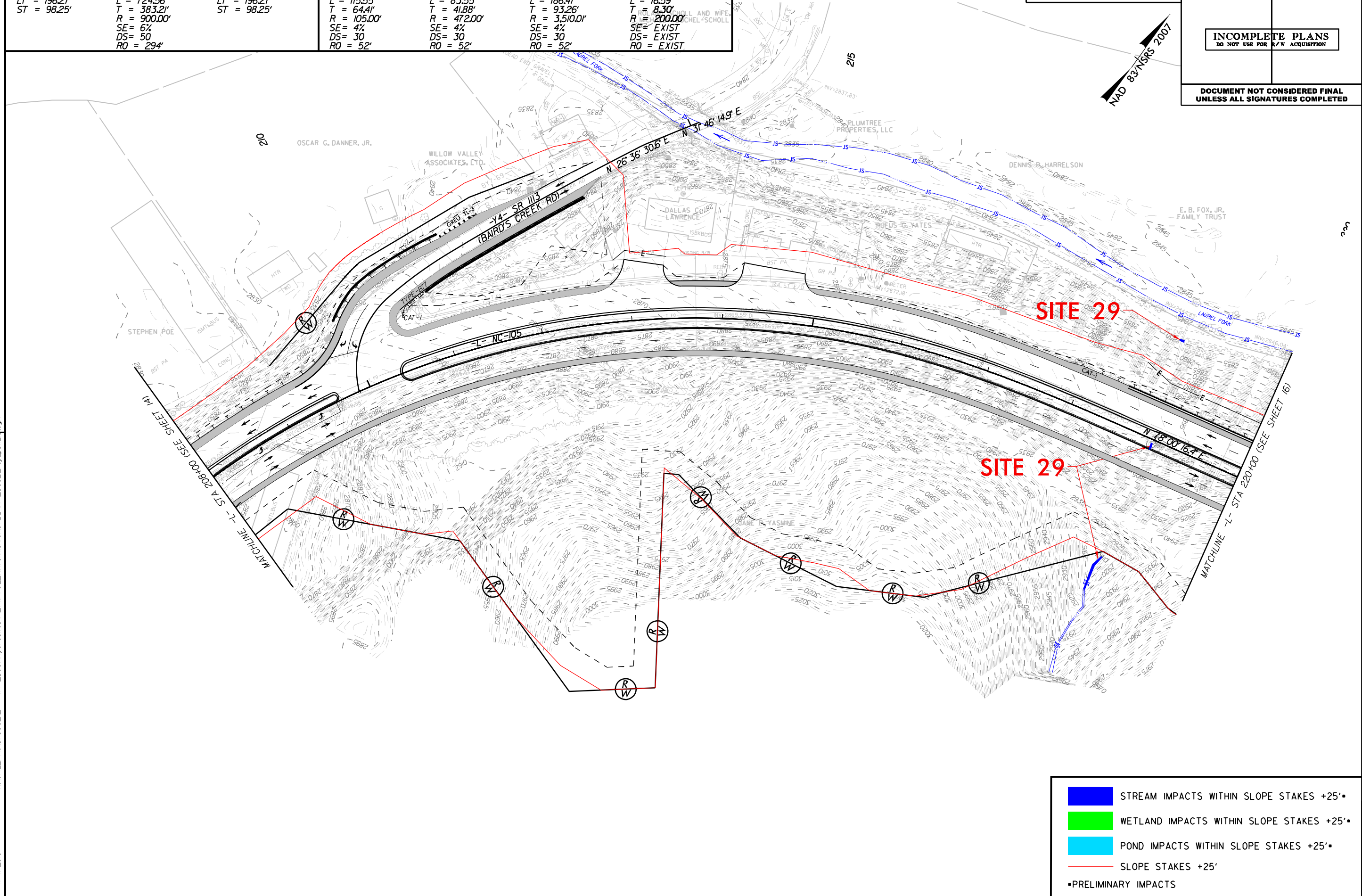
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 4/11/2019

-L-			-Y4-			
PI Sta 207+78.43	PI Sta 212+59.36	PI Sta 216+98.97	PI Sta 10+64.41	PI Sta 11+57.44	PI Sta 12+92.36	PI Sta 14+43.76
$\Delta s = 9' 21" 29.9"$	$\Delta = 46' 07" 37.8" (RT)$	$\Delta s = 9' 21" 29.9"$	$\Delta = 63' 03" 17.2" (RT)$	$\Delta = 10' 08" 30.7" (RT)$	$\Delta = 3' 02" 38.0" (RT)$	$\Delta = 4' 45" 11.9" (RT)$
$Ls = 294.00'$	$D = 6' 21" 58.3"$	$Ls = 294.00'$	$D = 54' 34" 02.7"$	$L = 12' 08" 19.9"$	$D = 1' 37" 56.5"$	$D = 28' 38" 52.4"$
$LT = 196.27'$	$L = 724.56'$	$LT = 196.27'$	$L = 115.55'$	$L = 83.55'$	$L = 186.47'$	$L = 16.59'$
$ST = 98.25'$	$T = 383.21'$	$ST = 98.25'$	$T = 64.41'$	$T = 41.88'$	$T = 93.26'$	$T = 8.30'$
	$R = 900.00'$		$R = 105.00'$	$R = 472.00'$	$R = 3,510.01'$	$R = 200.00'$
	$SE = 6\%$		$SE = 4\%$	$SE = 4\%$	$SE = 4\%$	$SE = EXIST$
	$DS = 50$		$DS = 30$	$DS = 30$	$DS = 30$	$DS = EXIST$
	$RO = 294'$		$RO = 52'$	$RO = 52'$	$RO = 52'$	$RO = EXIST$

SEE SHEET 28 FOR -L-5 PROFILE
 SEE SHEET 37 FOR -Y4- PROFILE
 GRAPHIC SCALE 100'

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

PROJECT REFERENCE NO. R-2566B	SHEET NO. 15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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

5/14/99
 REVISIONS
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 4/11/2019

-L-		
PIs Sta 223+68.86 $\Theta s = 7^{\circ} 01' 07.4"$ $L s = 294.00'$ $L T = 196.15'$ $S T = 98.14'$	P/ Sta 226+29.18 $\Delta = 15^{\circ} 25' 16.0" (RT)$ $D = 4^{\circ} 46' 28.7"$ $L = 322.98'$ $T = 162.47'$ $R = 1200.00'$ $SE = 6\%$ $DS = 55'$ $RO = 294'$	PIs Sta 228+87.83 $\Theta s = 7^{\circ} 01' 07.4"$ $L s = 294.00'$ $L T = 196.15'$ $S T = 98.14'$

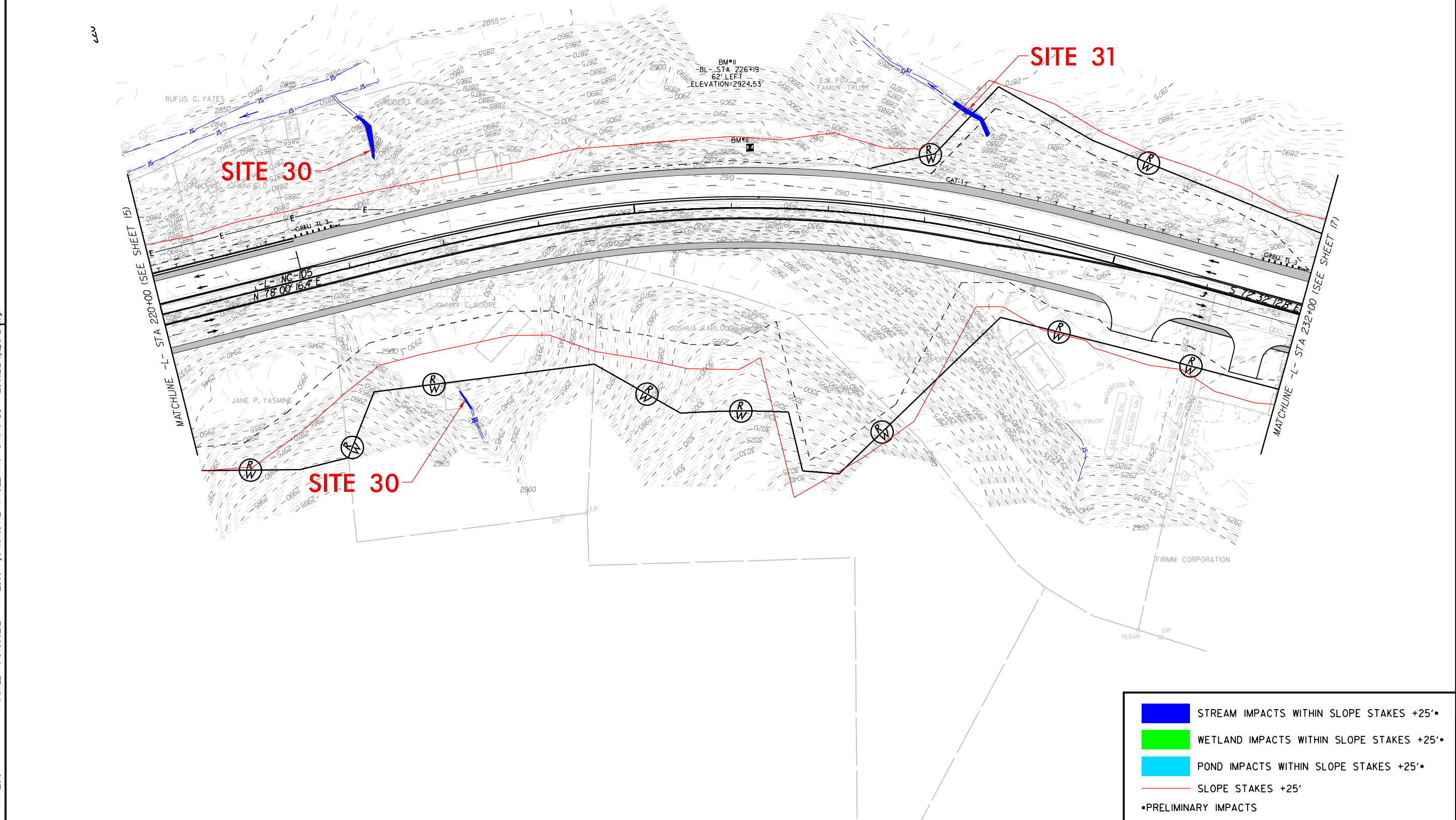
SEE SHEET 29 FOR -L- PROFILE



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

PROJECT REFERENCE NO. R-2566B	SHEET NO. 16
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

2.30
 NAD 83/NSRS 2007



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 4/11/2019

-L-
 PI Sta 236+41.21
 Δs = 1°54'12.2"
 Ls = 196.00'
 LT = 130.67'
 ST = 65.34'
 PI Sta 247+33.03
 Δ = 38°22'19.3" (LT)
 D = 1°56'32.0"
 L = 1,975.67'
 T = 1,026.49'
 R = 2,950.00'
 SE = 4%
 DS = 55
 RO = 196'

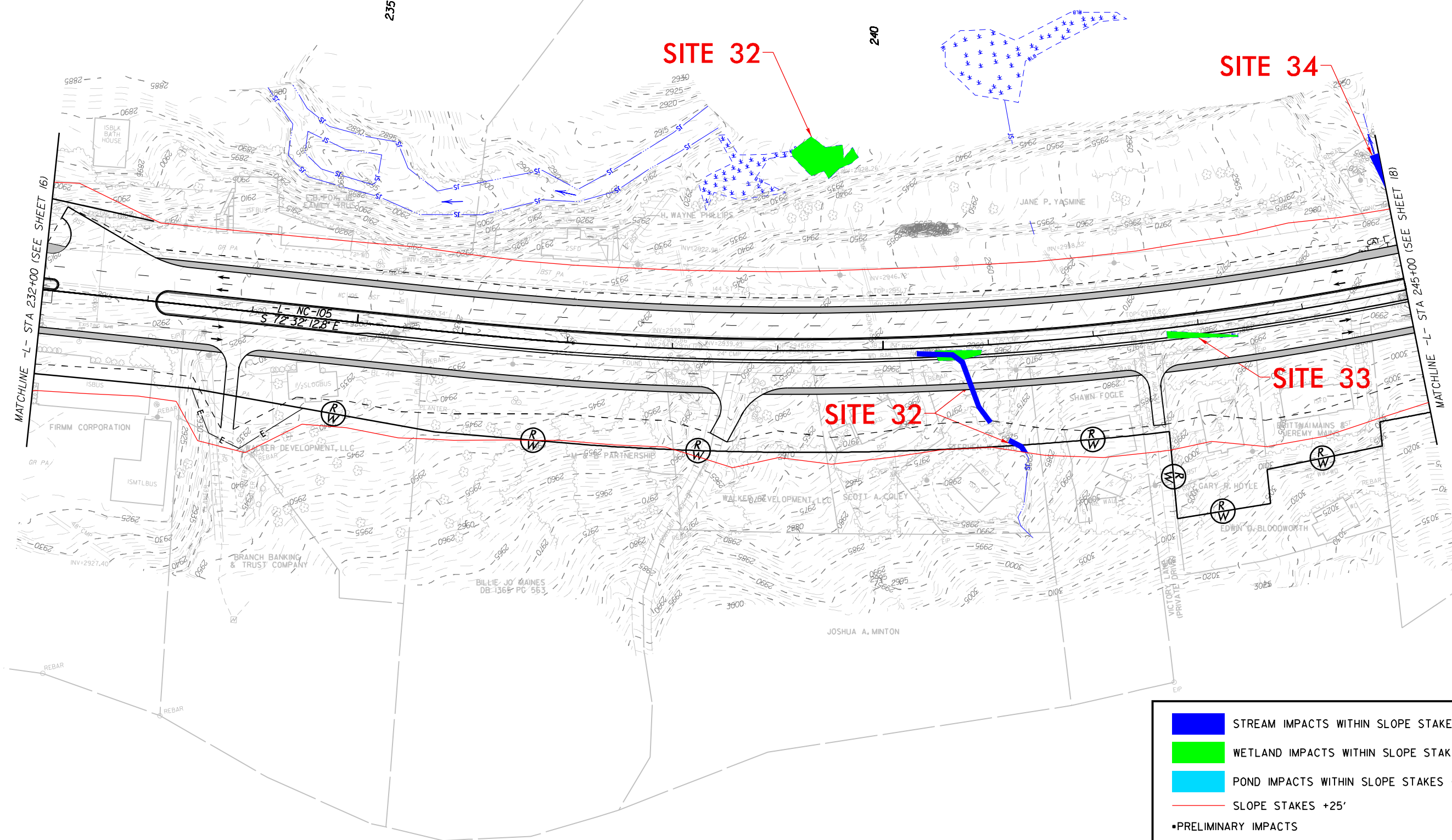
SEE SHEET 29 FOR -L- PROFILE



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

PROJECT REFERENCE NO. R-2566B	SHEET NO. 17
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PI Sta 247+33.03
 Δ = 38°22'19.3" (LT)
 D = 1°56'32.0"
 L = 1,975.67'
 T = 1,026.49'
 R = 2,950.00'
 SE = 4%
 DS = 55
 RO = 193'
 NAD 83/NSRS 2007
 Δ = 2°23'74.75"
 L = 373.85'
 T = 240.00'
 SE = 4%
 DS = 50

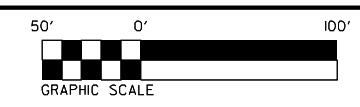


- STREAM IMPACTS WITHIN SLOPE STAKES +25'
- WETLAND IMPACTS WITHIN SLOPE STAKES +25'
- POND IMPACTS WITHIN SLOPE STAKES +25'
- SLOPE STAKES +25'
- PRELIMINARY IMPACTS

-L-
 PI Sta 247+33.03 Δ = 38° 22' 19.3" (LT)
 D = 1' 56' 32.0" L = 1975.67'
 T = 1026.49' R = 2,950.00'
 SE = 4% DS = 55 RO = 196'

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

SEE SHEET 30 FOR -L- PROFILE



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

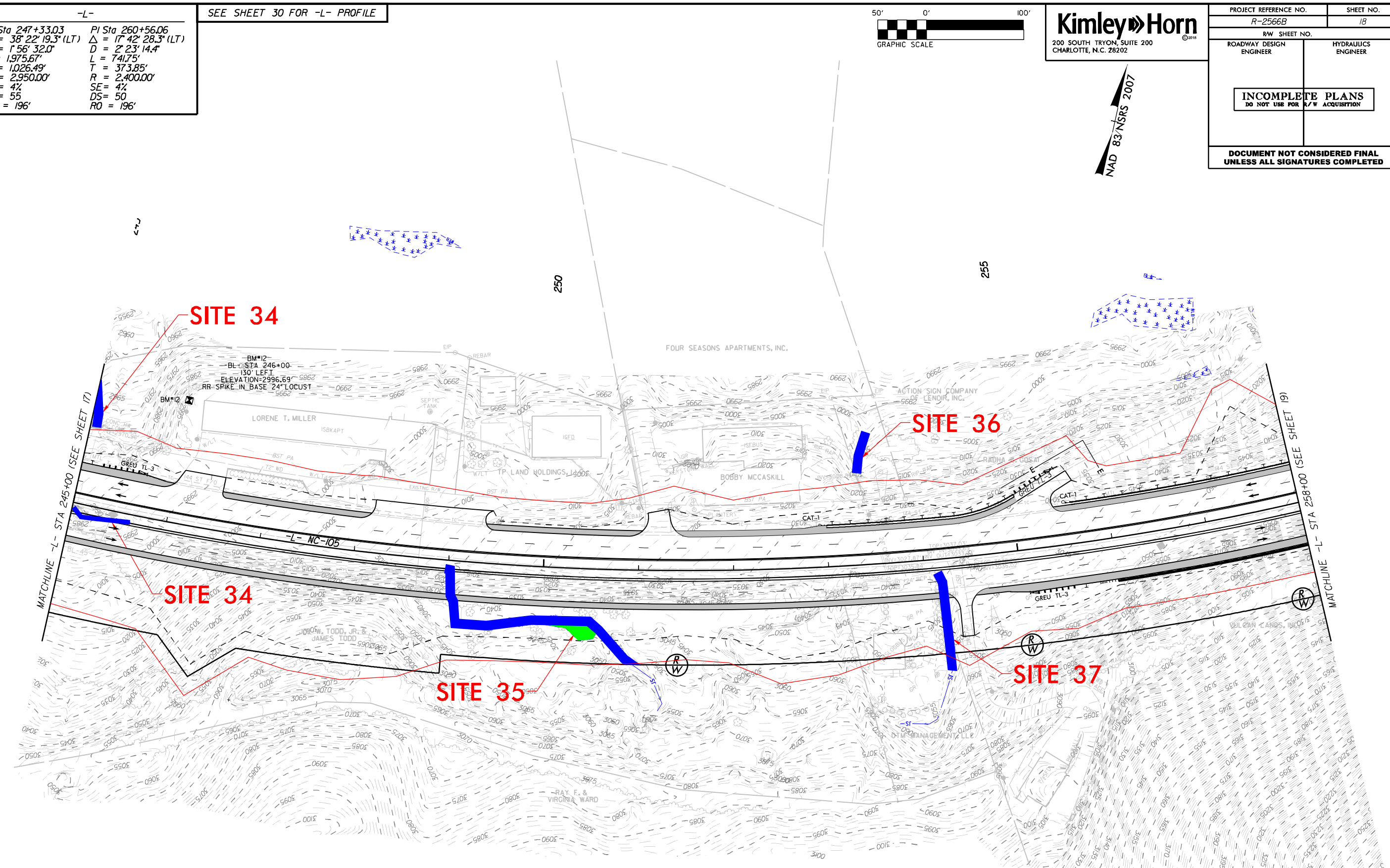
PROJECT REFERENCE NO. R-2566B	SHEET NO. 18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



REVISIONS

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4/11/2019



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

5/14/99
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 4/11/2019

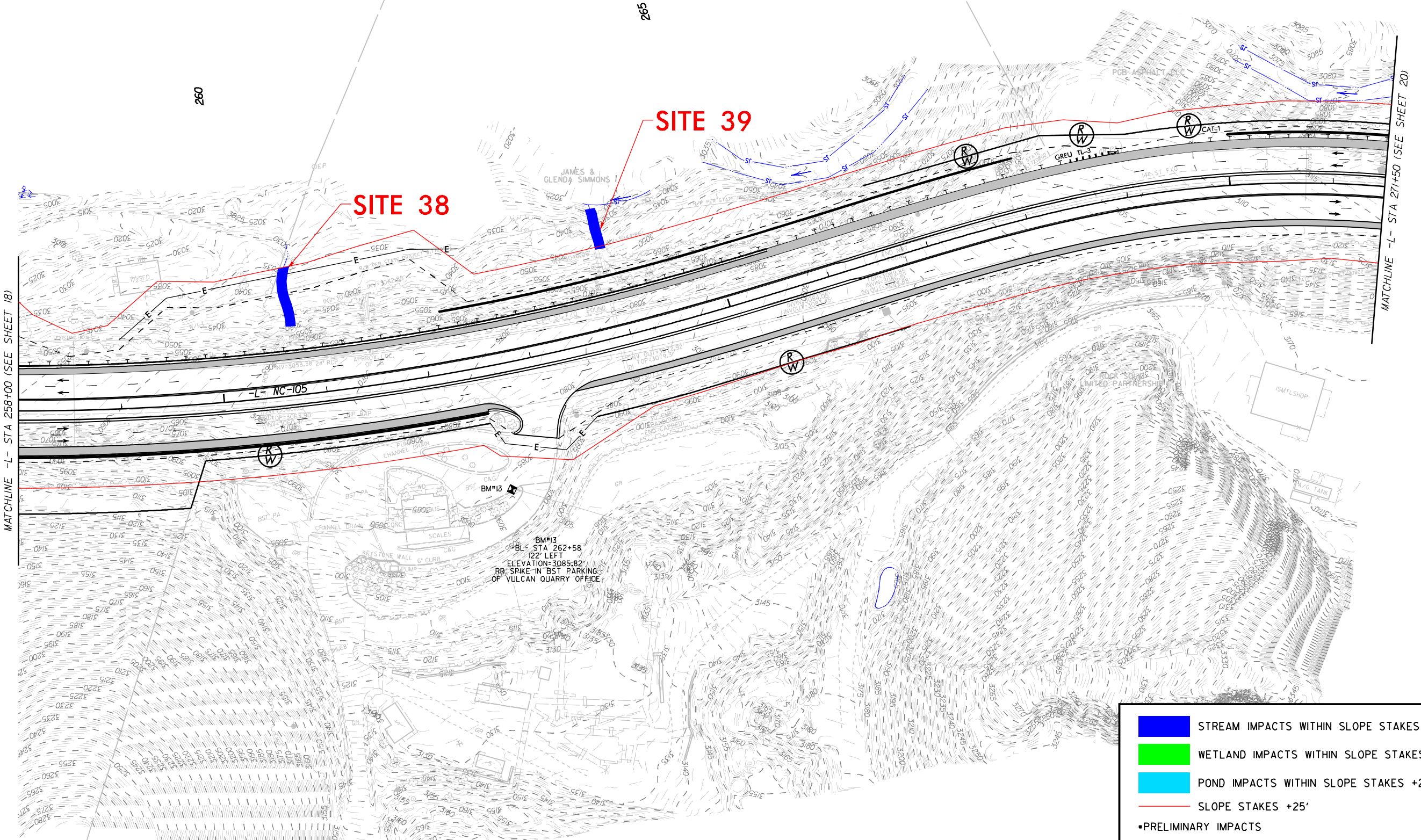
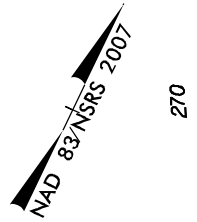
-L-			
PI Sta 260+56.06	PIs Sta 264+89.30	PIs Sta 268+16.18	PI Sta 272+63.32
$\Delta = 17^{\circ} 42' 28.3" (LT)$	$\Theta_s = 2^{\circ} 20' 22.5"$	$\Theta_s = 8^{\circ} 25' 20.9"$	$\Delta = 38^{\circ} 30' 53.3" (RT)$
$D = 2^{\circ} 23' 14.4"$	$L_s = 196.00'$	$L_s = 294.00'$	$D = 5^{\circ} 43' 46.5"$
$L = 741.75'$	$LT = 130.68'$	$LT = 196.22'$	$L = 672.21'$
$T = 373.85'$	$ST = 65.34'$	$ST = 98.20'$	$T = 349.36'$
$R = 2,400.00'$			$R = 1,000.00'$
$SE = 4\%$			$SE = 6\%$
$DS = 50$			$DS = 50$
$RO = 196'$			$RO = 294'$

SEE SHEET 31 FOR -L- PROFILE



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

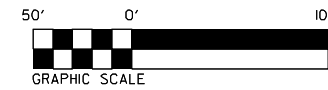
PROJECT REFERENCE NO. R-2566B	SHEET NO. 19
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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

-L-

SEE SHEET 32 FOR -L- PROFILE



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

PROJECT REFERENCE NO. R-2566B	SHEET NO. 20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

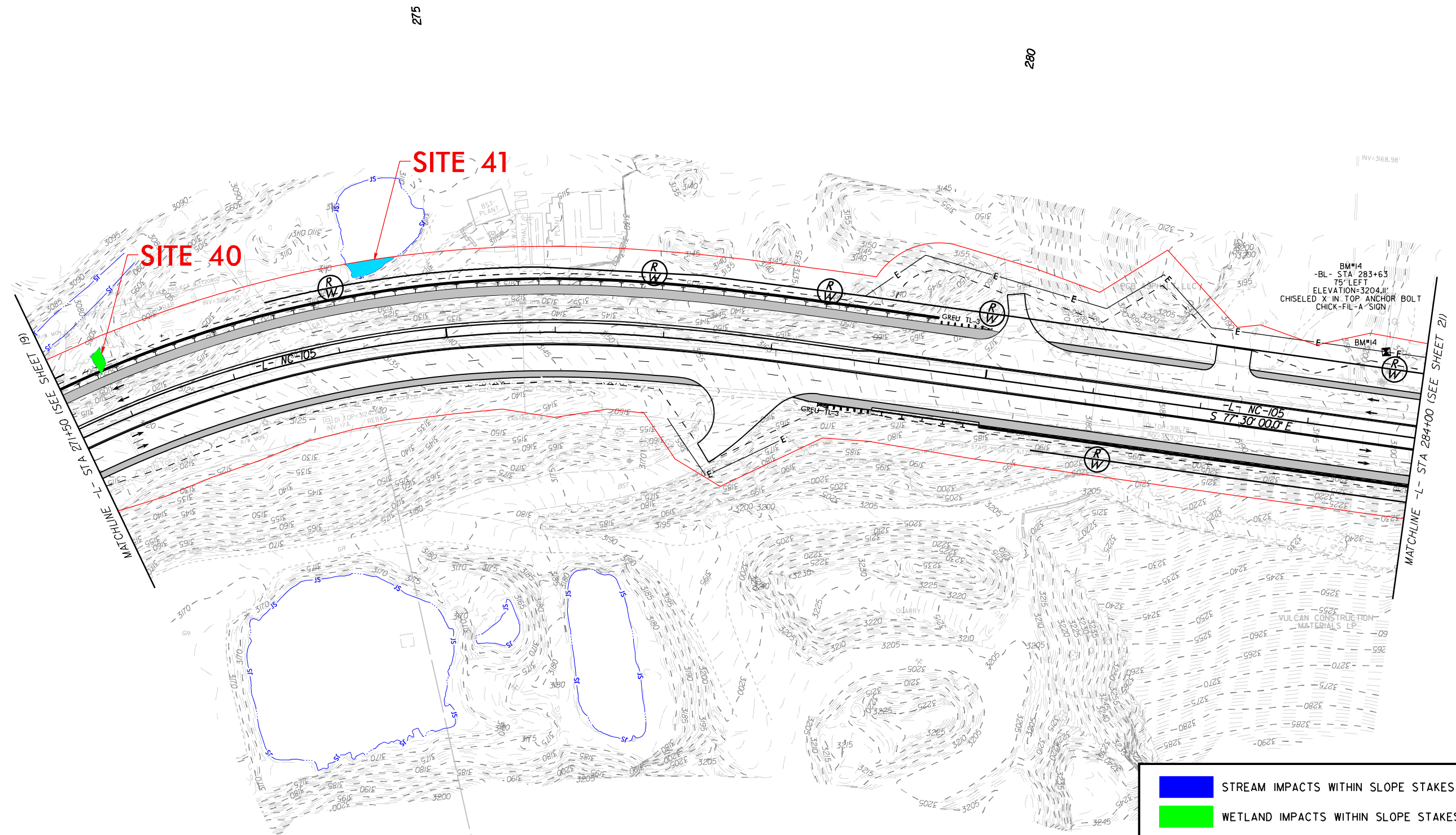
NAD 83/NSRS 2007

PI Sta 272+63.32 PIs Sta 276+84.37
 $\Delta = 38^{\circ} 30' 53.3''$ (RT) $\Theta_s = 8^{\circ} 25' 20.9''$
 $D = 5^{\circ} 43' 46.5''$ $L_s = 294.00'$
 $L = 672.21'$ $LT = 196.22'$
 $T = 349.36'$ $ST = 98.20'$
 $R = 1000.00'$
 $SE = 6\%$
 $DS = 50$
 $RO = 294'$

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4/11/2019



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

5/14/99
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4/11/2019

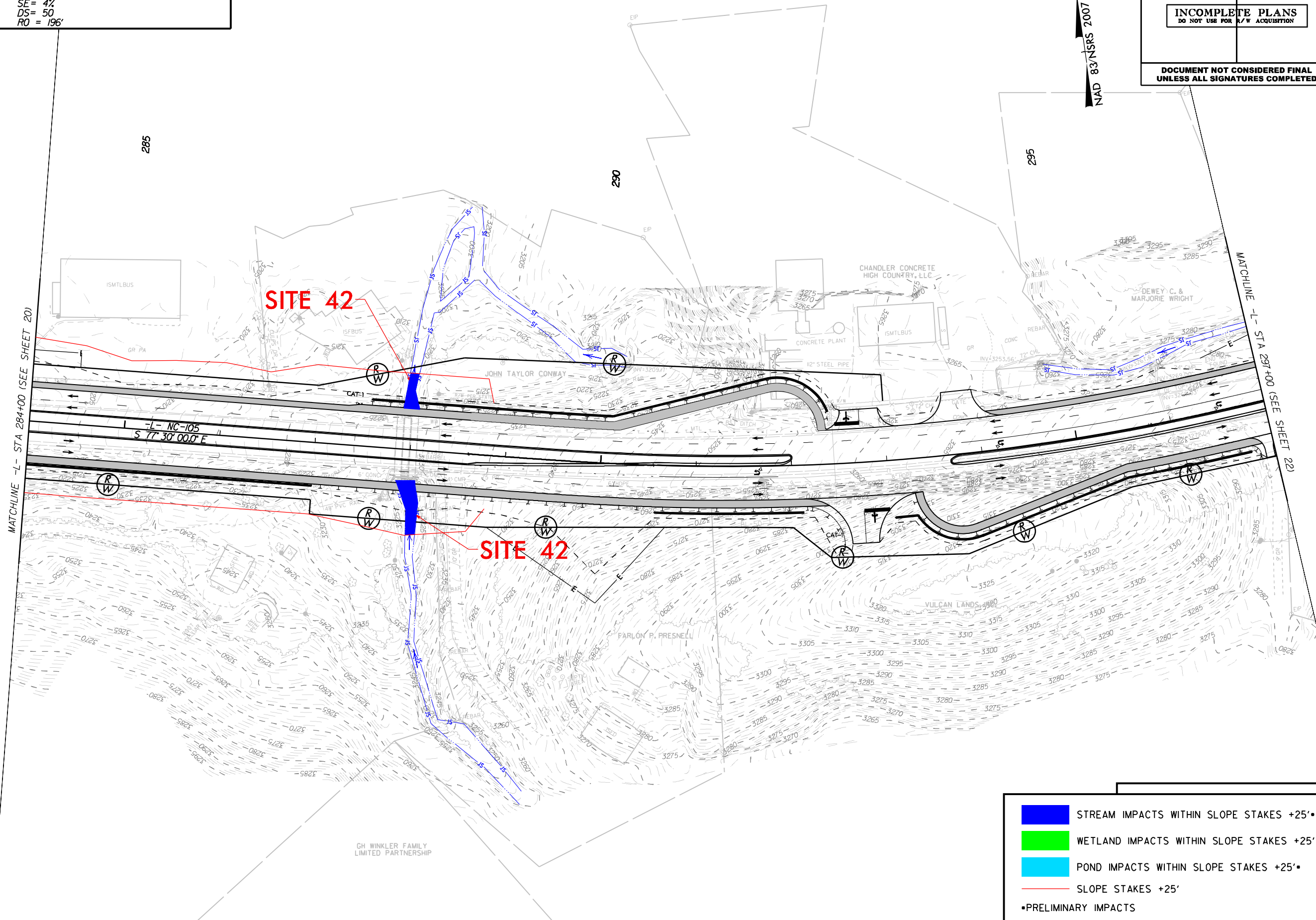
-L-		
PIs Sta 289+92.17	PI Sta 293+19.90	PIs Sta 296+45.39
$\Theta_s = 2' 26' 28.7''$	$\Delta = 13' 01' 02.7''$ (LT)	$\Theta_s = 2' 26' 28.7''$
LS = 196.00'	D = 2' 29' 28.0"	LS = 196.00'
LT = 130.68'	L = 522.55'	LT = 130.68'
ST = 65.34'	T = 262.4'	ST = 65.34'
	R = 2,300.00'	
	SE = 4%	
	DS = 50	
	RO = 196'	

SEE SHEET 33 FOR -L- PROFILE



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

PROJECT REFERENCE NO. R-25666B	SHEET NO. 21
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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

R-2566B Preliminary Permit Impact Summary Table						
Plan Sheet Number	Station (To/From)	Site Identifier	Wetland Impacts Within Slope Stakes +25' (Acres)	Stream Impacts Within Slope Stakes +25' (Linear Feet)	Pond Impacts Within Slope Stakes +25' (Acres)	
4	68+74/70+81 -L- RT	1A	0.09			
4	68+74/70+81 -L- RT	1A		235		
4	71+87/72+15 -L- LT	1B	< 0.01			
4	71+27/71+51 -L- LT	1B		25		
4	71+78/72+36 -L- LT	1B		40		
4	13+48 RT/13+97 LT -Y1-	1		134		
4	76+68/76+83 -L- RT	1		29		
4	17+78/19+54 -Y1- RT	2	0.02			
4	17+78 LT/19+54 RT -Y1-	3	0.04			
5	86+77/87+09 -L- LT	4		62		
5	85+79/86+50 -L- RT	4		81		
5	88+84/89+09 -L- LT	5		51		
5	89+09/89+39 -L- RT	5		43		
5	17+97/18+08 -Y1- LT	6		38		
5	17+99/18+48 -Y1- RT	6		57		
5	10+95/11+16 -Y2- LT	7		47		
5	10+74/11+43 -Y2- RT	7	0.02	28		
5	26+37/28+99 -Y1- RT	8		241		
6	105+88/106+72 -L- LT	9		101		
6	106+69/107+23 -L- RT	9		62		
6	108+13/108+34 -L- LT	10		50		
7	110+43/111+03 -L- RT	10	0.01	27		
7	117+20/118+98 -L- LT	11	0.02			
7	118+51/119+34 -L- LT	11		132		
8	124+80/124+97 -L- LT	12		46		
8	124+48/124+85 -L- RT	12		47		
8	125+03/127+06 -L- LT	13	0.03			
8	126+68/126+87 -L- LT	14		26		
8	127+02/127+22 -L- LT	15		40		
8	129+76/130+23 -L- LT	16		76		
8	129+98/130+23 -L- RT	16		59		
8	130+64/130+97 -L- LT	17	< 0.01			
8	131+23/133+13 -L- LT	17	0.08			
8	131+90/132+08 -L- RT	18		42		
8	133+78/133+97 -L- LT	19		16		
8	133+88/134+02 -L- LT	19		19		
8	134+01/134+49 -L- RT	19		55		
9	144+93/146+67 -L- LT	20	0.06	42		
9	147+75/148+53 -L- LT	21		130		
9	147+65/148+31 -L- RT	21		112		
10	158+28/158+76 -L- LT	22		Impacts Previously Accounted for on R-2566BA Project		
12	171+33/171+72 -L- LT	23		Impacts Previously Accounted for on R-2566BA Project		
12	171+39/171+66 -L- RT	23		Impacts Previously Accounted for on R-2566BA Project		
12	171+84/172+10 -L- LT	24		Impacts Previously Accounted for on R-2566BA Project		
12	172+30/172+63 -L- RT	24		Impacts Previously Accounted for on R-2566BA Project		
13	190+05/190+36 -L- LT	25		72		
13	190+49/190+99 -L- RT	25		145		
14	197+08/197+23 -L- LT	26		50		
14	197+11/197+27 -L- RT	26		102		
14	200+98/202+38 -L- RT	27		190		
14	201+14/202+51 -L- RT	27	0.03			
14	201+94/202+50 -L- LT	27		58		
14	202+93/203+47 -L- LT	28		50		
15	218+97/219+00 -L- RT	29		9		
15	218+80/218+86 -L- LT	29		3		
15	218+93/218+99 -L- LT	29		42		
16	222+43/222+55 -L- LT	30		51		
16	222+81/222+91 -L- RT	30		22		
16	228+09/228+50 -L- LT	31		52		
17	239+13/239+81 -L- LT	32	0.03			
17	240+31/241+00 -L- RT	32		110		
17	240+48/240+94 -L- RT	32	< 0.01			
17	241+12/241+31 -L- RT	32		20		
17	242+69/243+37 -L- RT	33	< 0.01			
17/18	244+91/245+12 -L- LT	34		50		
18	244+99/245+63 -L- RT	34		65		
18	248+96/251+04 -L- RT	35		268		
18	249+79/250+59 -L- RT	35	0.02			
18	253+30/253+54 -L- LT	36		45		
18	254+09/254+25 -L- RT	37		105		
19	260+62/260+78 -L- LT	38		59		
19	263+85/263+97 -L- LT	39		40		
20	271+85/271+97 -L- LT	40	< 0.01			
20	274+19/274+63 -L- LT	41				< 0.01
21	287+86/288+13 -L- RT	42		60		
21	287+89/288+09 -L- LT	42		38		
Additional (*)			0.10	200		
TOTAL			0.57	4099		0.01

* = Additional stream impacts included to account for potential new outfall locations into Watauga River and Laurel Fork.
Additional wetland impacts included to account for minor potential impacts throughout the corridor beyond the 25' offset from slope stakes.