



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT L. MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

October 23, 2014

MEMORANDUM TO: Mr. Mike Mills, PE
Division 7 Engineer

FROM: *for* Philip S. Harris, III, P.E. *AS*
Natural Environment Section
Project Development and Environmental Analysis Unit

SUBJECT: NC 68/US 220 Connector from NC 68 at SR 2133 to the
existing intersection of NC 68 and US 220 in Guilford and
Rockingham Counties; WBS No. 34429.1.1
TIP R-2413A

Attached are the modification to the U.S. Army Corps of Engineers Section 404 Individual Permit and the N.C. Division of Water Resources (NCDWR) Section 401 Water Quality Certification. All environmental permits have been received for the construction of this project.

A copy of this permit package will be posted on the NCDOT website at:
<https://connect.ncdot.gov/resources/Environmental>, under *Quick Links > Issued Permits*

cc: w/o attachment (see website for attachments)

Mr. Randy Garris, P.E. State Contract Officer
Mr. Jerry Parker, Division Environ. Officer
Dr. Majed Al-Ghandour, P. E., Program Dev. and TIP
Mr. Glenn Mumford, P.E., Roadway Design
Mr. Matt Lauffer, P.E., Hydraulics
Mr. Tom Koch, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. Robert Memory, Utilities Unit
Mr. Ron Hancock, P.E., State Roadway Construction Engineer
Mr. Kevin Bowen, P.E., State Bridge Construction Engineer
Mr. Eric Midkiff, P.E., PDEA
Ms. LeiLani Paugh, Natural Environment Section
Mr. Randy Griffin, Natural Environment Section
Ms. Beth Harmon, NCEEP
Ms. Karen Capps, PE, Transportation Program Management

PROJECT COMMITMENTS

NC 68- US 220 Connector
From NC 68 at SR 2133 to existing intersection of NC 68 and US 220
Guilford and Rockingham Counties
WBS Element 34429.1.1
TIP Project R-2413

COMMITMENTS FROM PROJECT DEVELOPMENT AND DESIGN

Current status, changes, or additions to the project commitments as shown in the environmental document for the project are printed in italics. All commitments, which are not pertinent to R-2413-A & B have been grayed out.

Hydraulics Unit/ Roadside Environmental Unit:

- Best Management Practices will be employed.

Action: Standard Commitment.

Roadway Design Unit/ PDEA Unit/ Division 7:

- NCDOT will coordinate with resource agencies (USCOE, USFWS, NCWRC and DEM) during the permitting phase of the project to develop a mutually agreeable mitigation plan.

Mitigation opportunities will be explored that will provide for wetland restoration, enhancement, and/or creation within the same drainage as the wetland loss.

Action: There is ongoing coordination with the resource agencies.

Mitigation plans to be included with the permit application.

The use of previously converted farmland will be explored for wetland restoration sites.

Action: No suitable sites found.

The donation of orphaned plots (uneconomic remnants) of farmland and forest to the county greenway and/or parks and recreation programs will be considered

Action: This will be addressed after project construction by Division 7.

Roadway Design/Hydraulics/ Structures/ PDEA/ Roadside Environmental:

- There will be continuing efforts for cooperation between NCDOT and the resource agencies with respect to the crossings of Reedy Fork Creek and the Haw River.

NCDOT will construct a hazardous spill catch basin (HSCB) at the Reedy Fork Creek Crossing, which lies within the Greensboro watershed. Additional HSCBs will be considered for other locations within the Greensboro Watershed during the development of preliminary and final design plans.

NCDOT will provide a self-contained bridge drainage system for the crossing of Reedy Fork Creek. The bridge drainage will be tied in with the hazardous spill catch basin.

Action: This commitment will not be implemented. NCDOT policy does not require the construction of HSCB basin at this site. A Basin is not required if it is over 1/2 mile from the critical area of a stream classified WS-III (Reedy Fork). This project is at 1.9 miles from the critical area. BMP's on the design plans are avoiding direct discharge into the surface water and discharging as far away from the surface water as practicable. Also grassed swales and preformed scour holes are being used where practicable. No hazardous catch basin is being constructed.

NCDOT will provide bridged crossings of Reedy Fork Creek and the Haw River that allow wildlife, pedestrian, and equestrian access along both sides of the waterway. The Reedy Fork Creek crossing will provide 10 feet of natural surface on one bank, and 10 feet of natural surface as well as 10 feet of stabilized trail on the other bank for passage beneath the bridge. *The Haw River crossing will provide 10 feet of natural surface on each side of the channel for passage beneath the bridge.*

Action: The bridge length will accommodate wildlife, pedestrian and equestrian access per the commitment. The trail will be stabilized with vegetation.

PDEA Unit:

- NCDOT will coordinate with the USCOE and the NC Department of Cultural Resources (NCD CR) regarding the possible need for archaeological survey in the vicinity of 404 permit areas to assess the nature, extent, condition and significance of archaeological resources that might be damaged or destroyed by the proposed action.

Action: Coordination between USACE and NCDOT was completed in 2007; Concurrence in November 2007 from SHPO concluded no property is eligible for the National Register.

Contract and Proposal Unit/ Division 7:

- NCDOT will attempt to salvage merchantable timber during the clearing of right-of-way for the project. NCDOT's general contract for right-of-way clearing provides opportunity for contractors to market saleable trees.

Action: This commitment is standard and general in NCDOT contracts.

Roadway Design Unit/ Hydraulics Unit/ Structures Unit:

- The project will include pedestrian culverts at Brookbank Road and at the abandoned railroad. At Deboe Road, a 7.5-foot offset will be included on one side of the bridge for the accommodation of future sidewalks.

Action: (14'X10') pedestrian culverts are included at the Brookbank Road and the abandoned railroad. Also, a 7.5 foot off-set is included for future sidewalks at Deboe Road, Alcorn Road and Bunch Road.

- NCDOT committed to altering their design plans for the southbound off-ramp at NC 150 to avoid direct impacts to the private recreation center for the Henson Forest subdivision.

Action: The current design avoids any impacts to the recreation center.

- NCDOT agreed to include equalizer pipes in the design for water flow between the wetland areas, and include sills in the culverts to prevent head cuts at a crossing of an unnamed tributary to Reedy Fork Creek.

Action: The current design includes 10'X10' equalizer culvert, sills are included in pipes where required and necessary.

- NCDOT will construct a single 7-foot by 8-foot culvert at a crossing of unnamed tributary to Haw River.

Action: The current design includes 10'X8' culvert with sills.

PDEA Unit:

- *Based on preliminary noise studies, NCDOT will evaluate noise abatement measures at the following locations during final design:*

*-Golden Acres Subdivision south of Alcorn Road
-Trailer court at US 220 and NC 65
-Trailer court across US 220 from Spotswood Road
-Homes west of US 220 at Ogborn Mill Road (SR 1100)
-Homes east of US 220 at Ogborn Mill Road (SR 1100)*

NOTE: Noise Barriers: For the updated traffic noise analysis prepared in April 2009, only one barrier was found to be reasonable and feasible. This barrier is located along Section C near Spotswood Road, north of the Connector/US 220 interchange from Station 34+80 to Station 39+60. This barrier is 19 feet high and 1,576 feet long and is located on the west side of US 220.

COMMITMENTS DEVELOPED FROM PERMITTING

Natural Environment Engineering Group and Onsite Mitigation Group:

404 condition 20

Mitigation:

A. In Lieu Fee: In order to compensate for impacts associated with this permit, mitigation shall be provided in accordance with the provisions outlined on the most recent version of the attached Compensatory Mitigation Responsibility Transfer Form. The requirements of this form, including any special conditions listed on this form, are hereby incorporated as special conditions of this permit authorization.

B. Permittee Responsible Mitigation:

1. The Permittee shall fully implement the compensatory mitigation plan, entitled, R-2413 A & B, Plan for Onsite Mitigation, dated (revised) July 1, 2013 for the unavoidable impacts to 2,945 linear feet of streams. Activities prescribed by this plan shall be initiated prior to, or concurrently with, commencement of any construction activities within jurisdictional areas authorized by this permit. The permittee shall (re-establish, rehabilitate, enhance, establish) 2,945 linear feet of streams in accordance with the plan with the following conditions:

a) The permittee, NCDOT, is the party responsible for the implementation, performance and long term management of the compensatory mitigation project.

b) Any changes or modifications to your mitigation plan shall be approved by the Corps.

c) The permittee shall maintain the entire mitigation site in its natural condition, as altered by the work in the mitigation plan, in perpetuity. Prohibited activities within the mitigation site specifically include, but are not limited to: filling; grading; excavating; earth movement of any kind; construction of roads, walkways, buildings, signs, or any other structure; any activity that may alter the drainage patterns on the property; the destruction, cutting, removal, mowing, or other alteration of vegetation on the property; disposal or storage of any garbage, trash, debris or other waste material; graze or water animals, or use for any agricultural or horticultural purpose; or any other activity which would result in the property being adversely impacted or destroyed, except as specifically authorized by this permit.

d) All mitigation areas shall be monitored for a minimum of 5 years or until deemed successful by the Corps in accordance with the monitoring requirements included in the mitigation plan.

2. Remedial Mitigation Plan: If the compensatory mitigation fails to meet the performance standards 5 years after completion of the compensatory mitigation objectives, the compensatory mitigation will be deemed unsuccessful. Within 60 days of notification by the Corps that the compensatory mitigation is unsuccessful, the Permittee shall submit to the Corps an alternate compensatory mitigation proposal to fully offset the functional loss that occurred as a result of the project. The alternate compensatory mitigation proposal may be required to include additional mitigation to compensate for the temporal loss of wetland function associated with the unsuccessful compensatory mitigation activities. The Corps reserves the right to fully evaluate, amend, and approve or reject the alternate compensatory mitigation proposal. Within 120 days of Corps approval, the Permittee will complete the alternate compensatory mitigation proposal.

3. Mitigation Release: The Permittee's responsibility to complete the required compensatory mitigation, as set forth in the Compensatory Mitigation Special Condition of this permit will not be considered fulfilled until mitigation success has been demonstrated and written verification has been provided by the Corps. A mitigation area which has been released will no longer require monitoring or reporting by the Permittee; however the Permittee, Successors and subsequent Transferees remain perpetually responsible to ensure that the mitigation area(s) remain in a condition appropriate to offset the authorized impacts in accordance with the approved mitigation and monitoring plan and the general and special conditions of this permit.

401 condition 4

Compensatory mitigation for impacts to 8,015 linear feet of streams for the R-2413A project and 3,594 for the R-2413B project at a replacement ratio of 1:1 is required. Compensatory mitigation for impacts to jurisdictional streams shall be provided by onsite stream relocations of 2,180 linear feet of stream for the R-2413A project and 765 linear feet for the R-2413B project. The onsite stream relocation shall be constructed in accordance with the design submitted in your application dated received July 19, 2013 and August 23, 2013. All onsite mitigation sites shall be protected in perpetuity by a conservation easement or through NCDOT fee simple acquisition and recorded in the NCDOT Natural Environment Section mitigation geodatabase. Please be reminded that as-builts for the completed streams shall be submitted to the North Carolina Division of Water Resources 401 Wetland Unit with the as-builts for the rest of the project. If the parameters of this condition are not met, then the permittee shall supply additional stream mitigation for the 2,180 linear feet of impacts. All channel relocations will be constructed in a dry work area, will be completed and stabilized, and must be approved on site by NCDWR staff, prior to diverting water into the new channel. Whenever possible, channel relocations shall be allowed to stabilize for an entire growing season. All stream relocations shall have a 50-foot wide native wooded buffer planted on both sides of the stream unless otherwise authorized by this Certification. A transitional phase

incorporating rolled erosion control product (RECP) and appropriate temporary ground cover is allowable.

401 condition 5

The stream mitigation site shall be monitored annually for five years or until success criteria are satisfied. Monitoring protocols shall follow the Monitoring Level I outlined in the Stream Mitigation Guidelines, April 2003.

Division 7/ Roadside Environmental Unit:

401 condition 16

For the 1,149 linear feet of streams being impacted due to site dewatering activities, the site shall be graded to its preconstruction contours and revegetated with appropriated native species.

Permit Modification:

No new special conditions were added.



Department of the Army
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

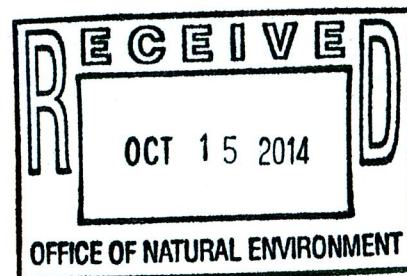
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October 14, 2014

Regulatory Division/1200A

Action ID: SAW-2013-00557

Mr. Richard W. Hancock, P.E.
Manager, Project Development and Environmental Analysis Unit
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina 27699-1598



Dear Mr. Hancock:

Reference the Department of the Army (DA) permit issued on January 28, 2014, to Mr. Richard Hancock, of the North Carolina Department of Transportation for impacts associated with the new location project identified as R-2314 A&B. The project, future I-73, is a 7.8 mile, four-lane divided facility on new location extending from SR 2011 (Edgefield Road) to the Haw River at US 220 in Summerfield, Guilford County, North Carolina. Section A starts at SR 2011 (Edgefield Road) and extends to SR 2127 (Brookbank Road) and Section B starts at SR 2127 and extends to the Haw River at US 220. Coordinates (in decimal degrees) for the site are 36.1775° N, -79.9350° W. The project area contains a portion of Reedy Fork, four (4) unnamed tributaries to Brush Creek, thirty-one (31) unnamed tributaries to Reedy Fork, seven (7) unnamed tributaries to the Haw River, and fourteen (14) adjacent wetland areas in the Cape Fear River Basin (8-Digit Cataloging Unit 03030002).

Impacts authorized by the permit include: 1) the permanent discharge of fill material into 12,912 linear feet of jurisdictional stream channel, 5.47 acres of adjacent riparian wetlands, and 0.6 acre of jurisdictional open waters, and 2) the temporary discharge of fill material into 1,151 linear feet of jurisdictional stream channel and 0.18 acre of adjacent riparian wetlands. Mitigation was implemented for the unavoidable impacts by on-site mitigation as described in the July 18, 2013 mitigation plan, including the revisions provided on January 15, 2014, as well as payment into the North Carolina Ecosystem Enhancement Program.

Also reference your letter to the Corps dated September 25, 2014 (received October 6, 2014), requesting modification of the permit for a net decrease in permanent impacts to streams and a net increase of temporary impacts to streams, for revisions to Sites 1, 2, 3, 4, and 22.

Changes in wetland impacts including those due to mechanized land clearing are also requested as part of the modification, although those requested changes do not result in a net change in wetland impacts. These changes in impacts result from the design-build team slightly realigning the roadway, as shown on Permit Drawings with proposed revision details listed in the table below.

Permit Site # / Station #	Revised Permit Drawing Sheet #		Permanent Stream Impacts (ft)	Impacts Requiring USACE Mitigation (ft) ¹	Temporary Stream Impacts (ft)	Wetland Impact (ac)	Mechanized Clearing (ac)
Site 1 -Y1- 50+00.00 LT	2-4, 4A, 5	Original Impacts New Impacts Difference	719 651 -68	699 630 -69	22 11 -11	0.02* 0.02 0	
Site 2 -L- 117+23.4 0 LT	6-9	Original Impacts New Impacts Difference	490 507 +17	470 484 +14	47 62 +15	0 <0.01 +<0.01	0 <0.01 +<0.01
Site 3 -Y1C- 12+98.52	6, 7, 10, 72-74	Original Impacts New Impacts Difference	244 225 -19	212 193 -19	36 32 -4		
Site 4 -Y1C- 17+80.74	11-14, 72-75	Original Impacts New Impacts Difference	553 550 -3	523 521 -2	42 49 +7	0.24 0.23 -0.01	0.02 0.01 -0.01
Site 22 -Y1C- 25+58.22	72, 76-77	Original Impacts New Impacts Difference	276 193 -83	256 177 -79	22 40 +22		
		Totals	-156	-155	+29	0	0

* Site 1:- A rounding error was noted in the Original Application that listed the impacts as 0.01. That total should have been 0.02, and the revised impacts are now 0.02.

¹ USACE originally permitted Stream Mitigation ratios for all 5 sites was 2:1.

In addition to proposed changes to permitted impacts, your modification request also includes slight modifications in pipe sizes and locations that do not result in changes to originally permitted impacts to Waters of the US. These changes are also reflected in the Wetland and Stream Impacts permit drawings included in the September 25, 2014 modification request.

The Corps has completed the evaluation of your request and determined that it is appropriate and reasonable, and no public notice is required for this modification. Therefore, the permit is modified as listed and shown in the modified drawings in the September 25, 2014 modification request, for a net decrease of permanent impacts to streams of 156 linear feet and a

net increase of temporary impacts to streams of 29 linear feet. This project now totals permanent impacts to 12,756 linear feet of streams, 5.47 acre of wetlands, and 0.6 acre of jurisdictional open waters, and temporary impacts to 1,180 linear feet of jurisdictional stream channel and 0.18 acre of adjacent riparian wetlands.

Further, and given the reduction in overall permanent stream impacts associated with this modification, as well as your request sent via electronic message on October 8, 2014, the following special condition regarding modified compensatory mitigation has been incorporated, replacing Special Condition 20A of the on January 28, 2014 DA Permit:

In order to compensate for impacts associated with this permit, mitigation shall be provided in accordance with the provisions outlined on the most recent version of the attached Compensatory Mitigation Responsibility Transfer Form. The requirements of this form, including any special conditions listed on this form, are hereby incorporated as special conditions of this permit authorization.

All other conditions of the permit, including the permit expiration date of December 31, 2019, remain in effect as written. Should you have questions, contact Mr. David E. Bailey, Raleigh Regulatory Field Office at David.E.Bailey2@usace.army.mil or telephone (919) 554-4884, Extension 30.

Sincerely,



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

Attachment: Select revised permit drawings

Copy Furnished with Attachment:

Mr. Dave Wanucha
Transportation Permitting Unit
Division of Water Resources
North Carolina Department of
Environment and Natural Resources
585 Waughtown Street
Winston-Salem, North Carolina 27107

Mr. Jerry Parker
Division Environmental Supervisor, Division 7
North Carolina Department of Transportation
Post Office Box 14996
Greensboro, North Carolina 27415

Ms. Deanna Riffey
North Carolina Department of Transportation
Division of Highways
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Copy Furnished without Attachment:

U.S. Fish and Wildlife Services
Fish and Wildlife Enhancement
Post Office Box 33726
Raleigh, North Carolina 28516

Mr. Todd Bowers
U.S. Environmental Protection Agency Region 4
Wetlands and Marine Regulatory Section
61 Forsyth Street, Southwest
Atlanta, Georgia 30303

U.S. ARMY CORPS OF ENGINEERS
Wilmington District
Compensatory Mitigation Responsibility Transfer Form

Permittee: North Carolina Department of Transportation
Project Name: NCDOT/R-2413AB/Division 7

Action ID: SAW-2013-00557
County: Guilford

Instructions to Permittee: The Permittee must provide a copy of this form to the Mitigation Sponsor, either an approved Mitigation Bank or the North Carolina Ecosystem Enhancement Program (NCEEP), who will then sign the form to verify the transfer of the mitigation responsibility. Once the Sponsor has signed this form, it is the Permittee's responsibility to ensure that to the U.S. Army Corps of Engineers (USACE) Project Manager identified on page two is in receipt of a signed copy of this form before conducting authorized impacts, unless otherwise specified below. If more than one mitigation Sponsor will be used to provide the mitigation associated with the permit, or if the impacts and/or the mitigation will occur in more than one 8-digit Hydrologic Unit Code (HUC), multiple forms will be attached to the permit, and the separate forms for each Sponsor and/or HUC must be provided to the appropriate mitigation Sponsors.

Instructions to Sponsor: The Sponsor must verify that the mitigation requirements (credits) shown below are available at the identified site. By signing below, the Sponsor is accepting full responsibility for the identified mitigation, regardless of whether or not they have received payment from the Permittee. Once the form is signed, the Sponsor must update the bank ledger and provide a copy of the signed form and the updated bank ledger to the Permittee, the USACE Project Manager, and the Wilmington District Mitigation Office (see contact information on page 2). The Sponsor must also comply with all reporting requirements established in their authorizing instrument.

Permitted Impacts and Compensatory Mitigation Requirements:

Permitted Impacts Requiring Mitigation*

8-digit HUC and Basin: 03030002, Cape Fear River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
9,438				5.47		

*If more than one mitigation sponsor will be used for the permit, only include impacts to be mitigated by this sponsor.

Compensatory Mitigation Requirements:

8-digit HUC and Basin: 03030002, Cape Fear River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
18028				10.94		

Mitigation Site Debited: North Carolina Ecosystem Enhancement Program (NCEEP)

(List the name of the bank to be debited. For umbrella banks, also list the specific site. For NCEEP, list NCEEP. If the NCEEP acceptance letter identifies a specific site, also list the specific site to be debited).

Section to be completed by the Mitigation Sponsor

Statement of Mitigation Liability Acceptance: I, the undersigned, verify that I am authorized to approve mitigation transactions for the Mitigation Sponsor shown below, and I certify that the Sponsor agrees to accept full responsibility for providing the mitigation identified in this document (see the table above), associated with the USACE Permittee and Action ID number shown. I also verify that released credits (and/or advance credits for NCEEP), as approved by the USACE, are currently available at the mitigation site identified above. Further, I understand that if the Sponsor fails to provide the required compensatory mitigation, the USACE Wilmington District Engineer may pursue measures against the Sponsor to ensure compliance associated with the mitigation requirements.

Mitigation Sponsor Name: _____

Name of Sponsor's Authorized Representative: _____

Signature of Sponsor's Authorized Representative

Date of Signature

**USACE Wilmington District
Compensatory Mitigation Responsibility Transfer Form, Page 2**

Conditions for Transfer of Compensatory Mitigation Credit:

- Once this document has been signed by the Mitigation Sponsor and the USACE is in receipt of the signed form, the Permittee is no longer responsible for providing the mitigation identified in this form, though the Permittee remains responsible for any other mitigation requirements stated in the permit conditions.
- Construction within jurisdictional areas authorized by the permit identified on page one of this form can begin only after the USACE is in receipt of a copy of this document signed by the Sponsor, confirming that the Sponsor has accepted responsibility for providing the mitigation requirements listed herein. For authorized impacts conducted by the North Carolina Department of Transportation (NCDOT), construction within jurisdictional areas may proceed upon permit issuance; however, a copy of this form signed by the Sponsor must be provided to the USACE within 30 days of permit issuance. NCDOT remains fully responsible for the mitigation until the USACE has received this form, confirming that the Sponsor has accepted responsibility for providing the mitigation requirements listed herein.
- Signed copies of this document must be retained by the Permittee, Mitigation Sponsor, and in the USACE administrative records for both the permit and the Bank/ILF Instrument. It is the Permittee's responsibility to ensure that the USACE Project Manager (address below) is provided with a signed copy of this form.
- If changes are proposed to the type, amount, or location of mitigation after this form has been signed and returned to the USACE, the Sponsor must obtain case-by-case approval from the USACE Project Manager and/or North Carolina Interagency Review Team (NCIRT). If approved, higher mitigation ratios may be applied, as per current District guidance and a new version of this form must be completed and included in the USACE administrative records for both the permit and the Bank/ILF Instrument.

Comments/Additional Conditions:

- **This Form supersedes the Compensatory Mitigation Responsibility Transfer Form dated January 23, 2014 that was included as part of the DA Permit dated January 28, 2014.**
- **This modification results in a net DECREASE in the number of stream credits required relative to the original DA Permit dated January 28, 2014. The wetland credits required have not changed as a result of this modification.**

This form is not valid unless signed below by the USACE Project Manager and by the Mitigation Sponsor on Page 1. *Once signed, the Sponsor should provide copies of this form along with an updated bank ledger to: 1) the Permittee, 2) the USACE Project Manager at the address below, and 3) the Wilmington District Mitigation Office, Attn: Todd Tugwell, 11405 Falls of Neuse Road, Wake Forest, NC 27587 (email: todd.tugwell@usace.army.mil).* Questions regarding this form or any of the permit conditions may be directed to the USACE Project Manager below.

USACE Project Manager: David Bailey
USACE Field Office: Raleigh Regulatory Field Office
US Army Corps of Engineers
3331 Heritage Trade Drive, Suite 105
Wake Forest, North Carolina 27587
Email: David.E.Bailey2@usace.army.mil



USACE Project Manager Signature

October 14, 2014

Date of Signature

Current Wilmington District mitigation guidance, including information on mitigation ratios, functional assessments, and mitigation bank location and availability, and credit classifications (including stream temperature and wetland groupings) is available at <http://ribits.usace.army.mil>.



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

John E. Skvarla, III
Secretary

October 17, 2014

Mr. Richard W. Hancock, P.E., Manager
Project Development and Environmental Analysis
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina, 27699-1598

Subject: Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act and Jordan Lake Buffer Rules for the proposed new facility from SR 2011 to the Haw River at US 220 Guilford County; WBS No. 34429.1.1; TIP No. R-2413A; NCDWR Project No. 20130517 version 3.

Dear Mr. Hancock:

Attached hereto is a modification of Certification No. 3971 originally issued to The North Carolina Department of Transportation (NCDOT) dated October 28, 2013. Modification version 2 of No. 3971 was issued on February 3, 2014.

If we can be of further assistance, do not hesitate to contact us.

Sincerely,

Thomas A. Reeder, Director
Division of Water Resources

Attachments

cc: Colin Mellor, Supervisor, NCDOT PDEA
David Bailey, US Army Corps of Engineers, Raleigh Field Office (electronic copy only)
Jerry Parker, Division 7 Environmental Officer (electronic copy only)
Dr. Cynthia Van Der Wiele, Environmental Protection Agency (electronic copy only)
Travis Wilson, NC Wildlife Resources Commission (electronic copy only)
Jason Elliott, NCDOT, Natural Environment Section (electronic copy only)
Beth Harmon, Ecosystem Enhancement Program (electronic copy only)
Dave Wanucha, NCDWR Winston-Salem Regional Office (electronic copy only)
File Copy

Transportation and Permitting Unit
1617 Mail Service Center, Raleigh, North Carolina 27699-1617
Location: 512 N. Salisbury St. Raleigh, North Carolina 27604
Phone: 919-807-6300 \ FAX: 919-733-1290
Internet: www.ncwaterquality.org

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**Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act
and Jordan Lake Buffer Rules**

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Resources (NCDWR) Regulations in 15 NCAC 2H .0500 and 15A NCAC 2B .0267. This certification authorizes the NCDOT to revise impacts to jurisdictional wetlands and streams in Guilford County as detailed in Tables 1 and 2 below. This project is **not subject** to the Jordan Lake Rules per 15A NCAC 2B .0267 because this project was authorized in March 1995, prior to the adoption of the Jordan Lake Riparian Buffer Rules. The project shall be constructed pursuant to the modification dated received September 25, 2014. The revised authorized impacts are as described below:

Table 1. Revised Stream Impacts in the Cape Fear River Basin

Site	Impacts and Revisions	Permanent Fill in Perennial Stream (linear ft)	Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
Site 1 -Y1-50+00.00 LT	Original Impacts	719	22	741	719
	New Impacts	651	11	662	651
	Difference	-68	-11	-79	-68
Site 2 -L- 117+23.40 LT	Original Impacts	490	47	537	490
	New Impacts	507	62	569	507
	Difference	+17	+15	+32	+17
Site 3 -Y1C- 12+98.52	Original Impacts	244	36	280	244
	New Impacts	225	32	257	225
	Difference	-19	-4	-23	-19
Site 4 -Y1C- 17+80.74	Original Impacts	553	42	595	553
	New Impacts	550	49	599	550
	Difference	-3	+7	-4	-3
Site 22 -Y1C- 25+58.22	Original Impacts	276	22	298	276
	New Impacts	193	44	237	193
	Difference	-83	+22	+61	-83
Total	--	-156	+29	-13	-156

Table 2. Revised Wetland Impacts in the Cape Fear River Basin

Site	Impacts and Revisions	Permanent Fill (acre)	Mechanized Clearing (acre)	Total Wetland Impact (acre)
Site 1 -Y1-50+00.00 LT	Original Impacts	0.01*	-	0.01
	New Impacts	0.01	-	0.01
	Difference	+0.01	-	0.02
Site 2 -L- 117+23.4 0 LT	Original Impacts	0.0	0.0	0.0
	New Impacts	<0.01	<0.01	<0.01
	Difference	+<0.01	+<0.01	+<0.01
Site 4 -Y1C- 17+80.74	Original Impacts	0.24	0.02	0.26
	New Impacts	0.23	0.01	0.24
	Difference	-0.01	-0.01	-
Total	--	0.00	0.00	-

*As stated in the application submitted by NCDOT, there was a rounding error for Site 1 in the original application. These new data reflect a correction to that error, resulting in no net change in the impacts.

The application provides adequate assurance that the discharge of fill material into the waters of the Cape Fear River Basin in conjunction with the proposed development will not result in a violation of applicable Water Quality Standards and discharge guidelines. Therefore, the State of North Carolina certifies that this activity will not violate the applicable portions of Sections 301, 302, 303, 306, 307 of PL 92-500 and PL 95-217 if conducted in accordance with the application and conditions hereinafter set forth.

This approval is only valid for the purpose and design that you submitted in your modified application dated received September 25, 2014. All the authorized activities and conditions of certification associated with the original Water Quality Certification dated October 28, 2013 and modification dated February 3, 2014 still apply except where superseded by this certification. Should your project change, you are required to notify the NCDWR and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 150 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). Additional buffer impacts may require compensatory mitigation as described in 15A NCAC 02B.0268. For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. This Certification shall become null and void unless the above conditions are made conditions of the Federal 404 and/or Coastal Area Management Act Permit. This Certification shall expire upon the expiration of the 404 or CAMA permit.

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

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

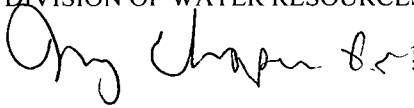
Office of Administrative Hearings
6714 Mail Service Center
Raleigh, NC 27699-6714
Telephone: (919)-431-3000, Facsimile: (919)-431-3100

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

Mr. John Evans, General Counsel
Department of Environment and Natural Resources
1601 Mail Service Center

This the 17th day of October 2014

DIVISION OF WATER RESOURCES

A handwritten signature in black ink, appearing to read "Tom Reeder", with a stylized flourish at the end.

Thomas A. Reeder, Director
Division of Water Resources

WQC No. 3971



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

John E. Skvarla, III
Secretary

NCDWR Project No.: _____

County: _____

Applicant: _____

Project Name: _____

Date of Issuance of 401 Water Quality Certification: _____

Certificate of Completion

Upon completion of all work approved within the 401 Water Quality Certification or applicable Buffer Rules, and any subsequent modifications, the applicant is required to return this certificate to the 401 Transportation Permitting Unit, North Carolina Division of Water Resources, 1617 Mail Service Center, Raleigh, NC, 27699-1617. This form may be returned to NCDWR by the applicant, the applicant's authorized agent, or the project engineer. It is not necessary to send certificates from all of these.

Applicant's Certification

I, _____, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature: _____ Date: _____

Agent's Certification

I, _____, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature: _____ Date: _____

Engineer's Certification

_____ Partial _____ Final

I, _____, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe (periodically, weekly, full time) the construction of the project for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature _____ Registration No. _____ Date _____

Transportation and Permitting Unit
1617 Mail Service Center, Raleigh, North Carolina 27699-1617
Location: 512 N. Salisbury St. Raleigh, North Carolina 27604
Phone: 919-807-6300 \ FAX: 919-733-1290
Internet: www.ncwaterquality.org

An Equal Opportunity \ Affirmative Action Employer

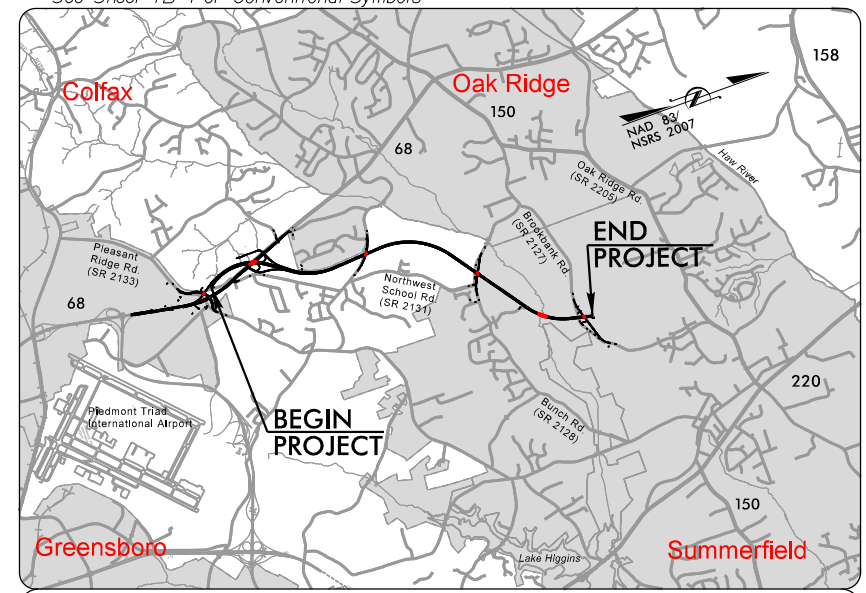
One
North Carolina
Naturally

R-2413A Permit Drawing Update Summary			
(including modification/revision/originals)			
Project: I-73, R-2413A			Date: 9/22/2014
Location: Guilford Co. NC			Des By: THS
Permit Drawings	Plansheets	Site No.	Comments
1 of 81	1	N/A	Cover sheet Added Site 23 (left off original cover), adjusted location circles to be more accurate , includes current prepared by names etc
2-4 of 81	7	1	Permit Modification
4A of 81	Pipe Profile	1	Permit Modification
5 of 81	X Section	1	Original
6-7, 9-10 of 81	8,37	2,3	Permit Modification
8 of 81	Pipe Profile	2C	Original
11-13 of 81	9	4,5	Permit Modification
14 of 81	X Section	4	Original
15 of 81	9	5	Revised Minor system realignment from 0955-0953; Cross pipe 1801 changed from 66" to 60"
16 of 81	Pipe Profile	5	Original
17-19 of 81	12	6	Revised 1113-1115 changed from 2-54" to 48"
20 of 81	Pipe Profile	6	Original
21-23 of 81	13	7	Revised Minor system realignment from 1212-1213, 24" to 18" , 54" to 48"
24 of 81	Pipe Profile	7A	Original
25-27, 29-31 of 81	14	8/9	Revised Minor system realignment from 1412-1414
28 of 81	Pipe Profile	8B	Original
29-30, 32-34 of 81	15, 16	9/10	Revised Minor system realignment from 1507-1508
32-34 of 81	16	10/11	Revised Minor system realignment from 1601-1602
35-36 of 81	Pipe Profile/X Section	10	Original
37-39 of 81	17	12	Revised system and ditches
40 of 81	Pipe Profile	12	Original
41-43 of 81	18	13	Revised Minor system realignment from 1801-1802; Cross pipe 1801 changed from 54" RCP to 60" RCP
44-46 of 81	20	14	Revised Cross pipe 2006 changed from 78" CSP to 72" CSP
47 of 81	Pipe Profile	14	Original
48-50 of 81	21	15,16	Revised undetectable system realignment from 2108-2111, 2113-2115, additional toe protection
51-52 of 81	Pipe Profile/X Section	16	Original
53-55 of 81	22	17,18	Revised Minor system realignment from 2208-2212, 2212-2215 pipe gauge changed
56-58 of 81	Bridge Profile/X Section	18	Original
59-61 of 81	23	19	Revised Minor system realignment from 2310-2311
62 of 81	Pipe Profile	19	Original
63-65 of 81	31	20	Revised Minor system realignment from 3101-3102
66 of 81	X Section	20	Original
66A-66C of 81	33	23	Revised Cross pipe 3305 changed from 30" CSP to 36" CSP
67-69 of 81	34	21	Revised undetectable system realignment from 3409-3410, additional toe protection and ditches
70-71 of 81	Pipe Profile/X Section	21A	Original
72-74 of 81	37	3,4	Permit Modification
75 of 81	X Section	4	Original
76 of 81	37	22	Permit Modification
77 of 81	Sill Detail	22	Original
78 of 81	Permit Impact Summary		Permit Modification
79-80 of 81	Permit Impact Summary		Original
81 of 81	Permit Impact Summary		Permit Modification

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09/08/99

See Sheet 1A for Index of Sheets
See Sheet 1B For Conventional Symbols



VICINITY MAP

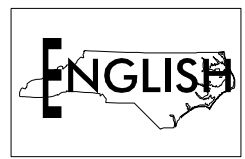
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

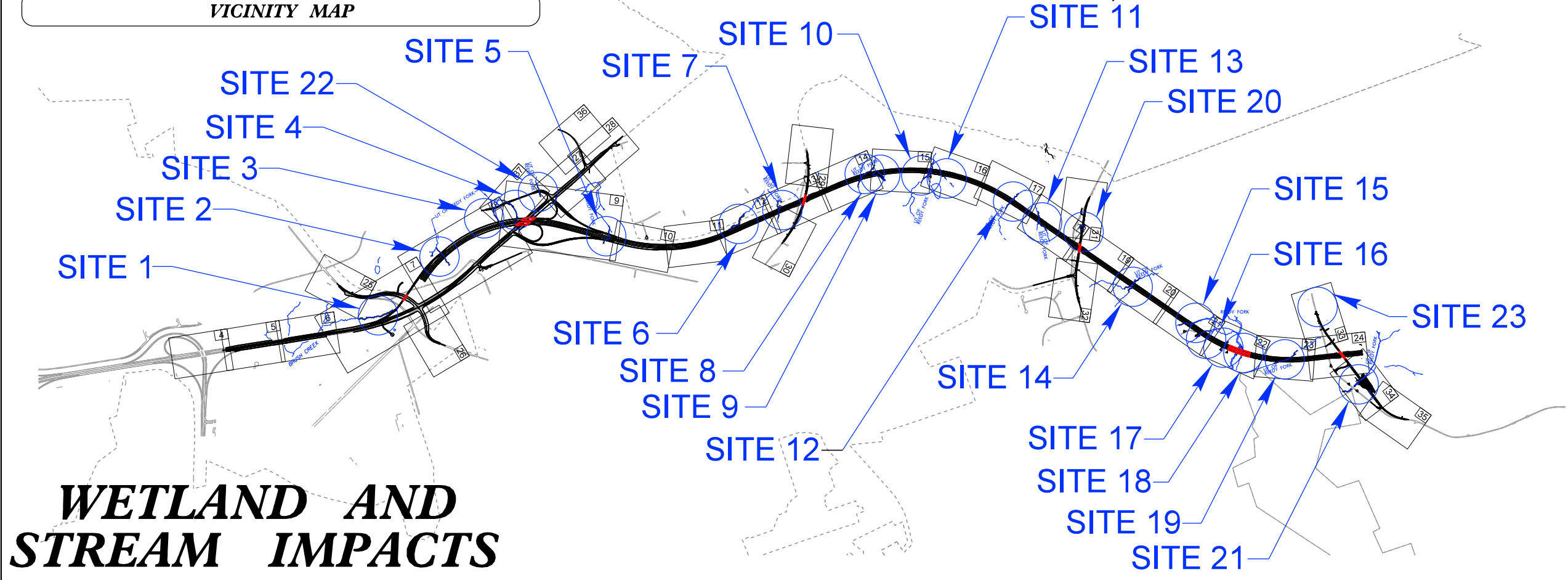
LOCATION: FUTURE I-73 FROM EAST OF SR 2127
(BROOKBANK ROAD) TO HAW RIVER

TYPE OF WORK: GRADING, DRAINAGE, PAVING, WIDENING,
RESURFACING, STRUCTURES, SIGNALS,
SIGNING, LIGHTING, & ITS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2413A	1	
WSB NO.	F.A. PROJ. NO.	DESCRIPTION	
34429.3.S8	NHF-0073(25)	PE	

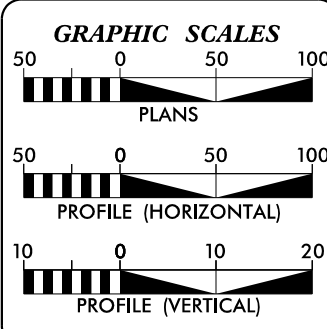


REVISED 9/12/2014
PERMIT DRAWING
SHEET 1 OF 81



**WETLAND AND
STREAM IMPACTS**

THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.



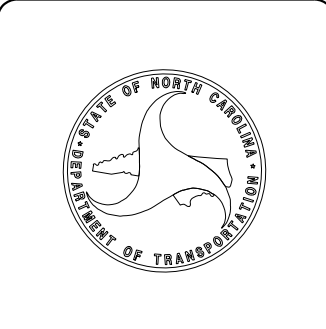
DESIGN DATA

ADT 2014	=	24,500
ADT 2035	=	42,200
DHV	=	11%
D	=	65%
*T	=	15%
V	=	70 mph
(*TTST 10% + DUALS 5%)		
FUNC. CLASS	=	INTERSTATE

PROJECT LENGTH
LENGTH ROADWAY TIP PROJECT R-2413A..... 4.807 mi
LENGTH STRUCTURES TIP PROJECT R-2413A..... 0.146 mi
TOTAL LENGTH TIP PROJECT R-2413A..... 4.953 mi
NCDOT CONTACT
K. Zak Hamidi, P.E. PROJECT ENGINEER - DESIGN BUILD GROUP

PLANS PREPARED BY:
RK&K RUMMEL, KLEPPER & KAHL, LLP 900 RIDGEFIELD DRIVE, SUITE 350 RALEIGH, NORTH CAROLINA 27609 NC LICENSE NO. P-0112
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2012 STANDARD SPECIFICATIONS
J.T. Peacock, Jr., P.E. PROJECT ENGINEER
Brandon J. McInnis, P.E. PROJECT DESIGN ENGINEER
LETTING DATE: APRIL 2014

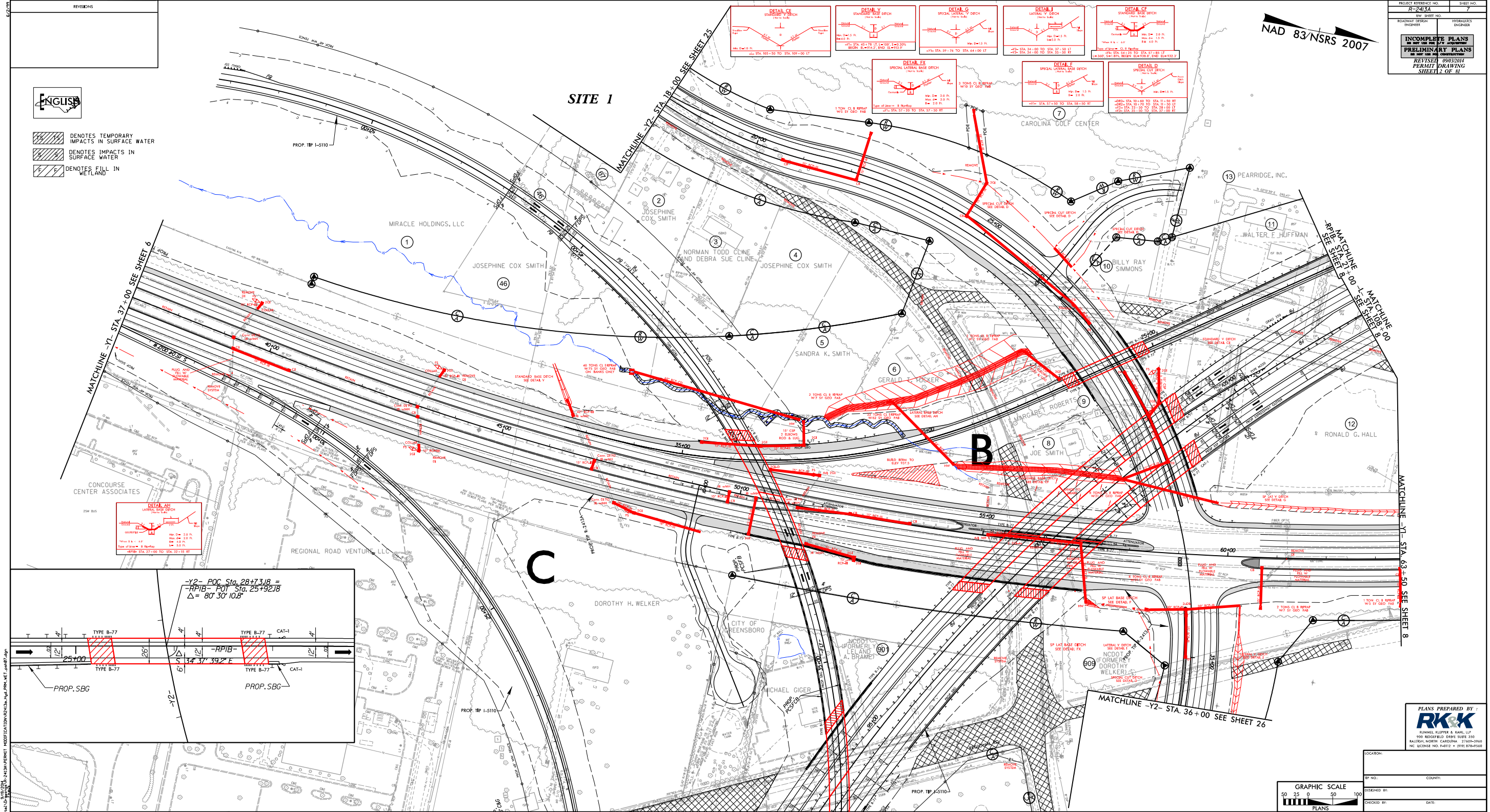
HYDRAULICS ENGINEER
SIGNATURE: _____ P.E.
ROADWAY DESIGN ENGINEER
SIGNATURE: _____ P.E.



TIP PROJECT: R-2413A

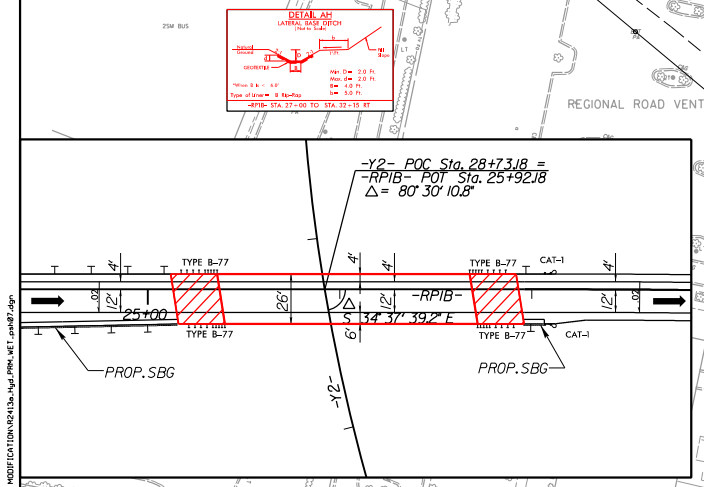
CONTRACT: C203433

9/10/2014 R:\Hydraulics\PERMITS-Environmental\Drawings\R-2413A\R2413a-HYO-PRM-WET.tsh.dgn
Fkeys



REVISIONS	

- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND



DETAIL CE
STANDARD BASE DITCH
MAX. D=1.0 FT.
MIN. D=0.5 FT.
SLOPE: 2:1
LENGTH: 10.0 FT.

DETAIL V
STANDARD V DITCH
MAX. D=1.0 FT.
MIN. D=0.5 FT.
SLOPE: 2:1
LENGTH: 10.0 FT.

DETAIL G
STANDARD G DITCH
MAX. D=1.0 FT.
MIN. D=0.5 FT.
SLOPE: 2:1
LENGTH: 10.0 FT.

DETAIL J
STANDARD J DITCH
MAX. D=1.0 FT.
MIN. D=0.5 FT.
SLOPE: 2:1
LENGTH: 10.0 FT.

DETAIL CF
STANDARD CF DITCH
MAX. D=1.0 FT.
MIN. D=0.5 FT.
SLOPE: 2:1
LENGTH: 10.0 FT.

DETAIL FX
SPECIAL LATERAL BASE DITCH
MAX. D=1.0 FT.
MIN. D=0.5 FT.
SLOPE: 2:1
LENGTH: 10.0 FT.

DETAIL E
SPECIAL E DITCH
MAX. D=1.0 FT.
MIN. D=0.5 FT.
SLOPE: 2:1
LENGTH: 10.0 FT.

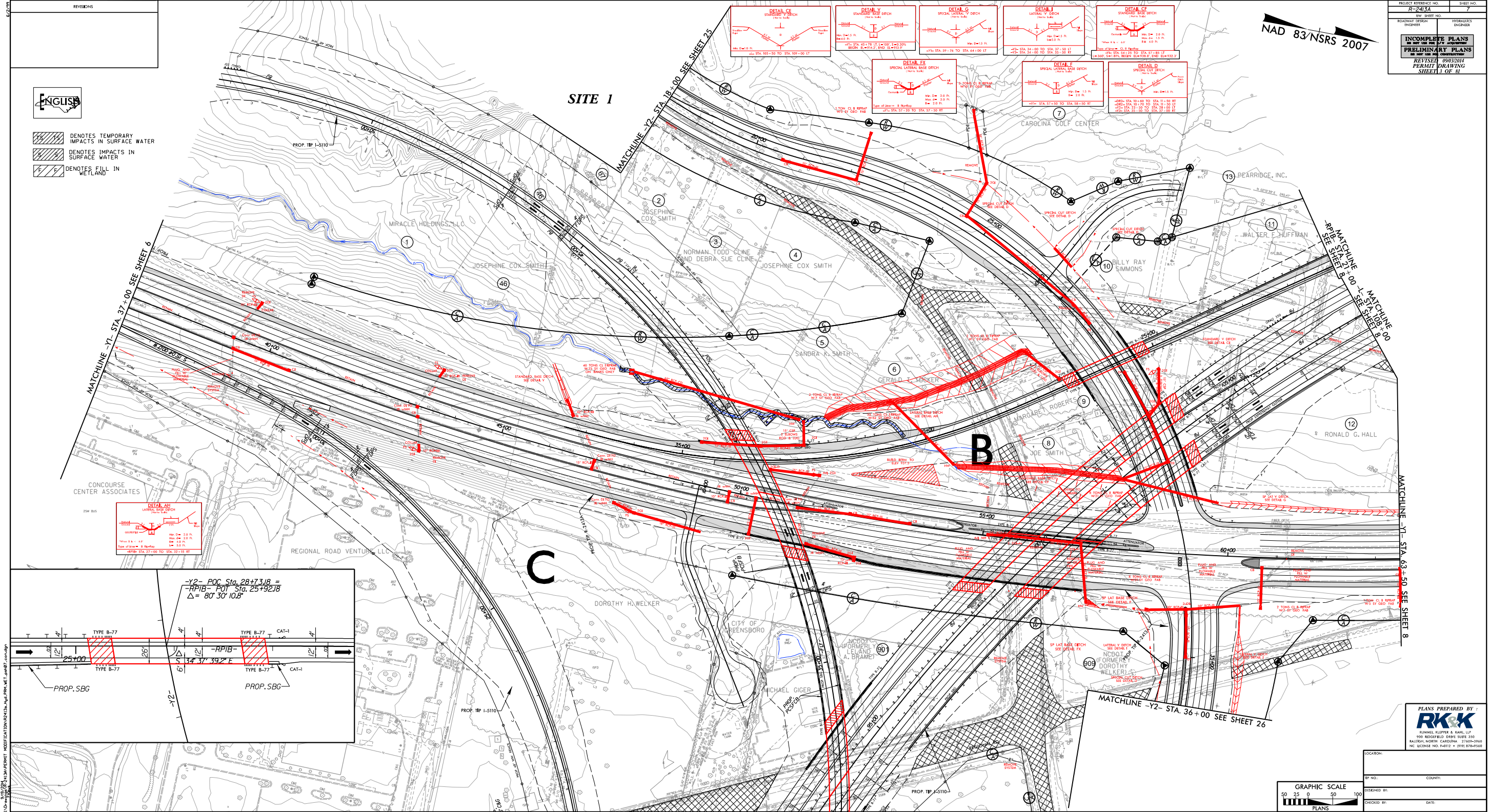
DETAIL D
SPECIAL D DITCH
MAX. D=1.0 FT.
MIN. D=0.5 FT.
SLOPE: 2:1
LENGTH: 10.0 FT.

NAD 83/NSRS 2007

PROJECT REFERENCE NO.	SHEET NO.
7-243A	7
REV. SHEET NO.	
ROADWAY DESIGN	HYDRAULICS
INCHES	FOOT
INCOMPLETE PLANS NO COPY FOR THE USER'S JOBSITE	
PRELIMINARY PLANS NO COPY FOR THE USER'S JOBSITE	
REVISED 08/03/2014 PERMIT DRAWING SHEET 2 OF 81	

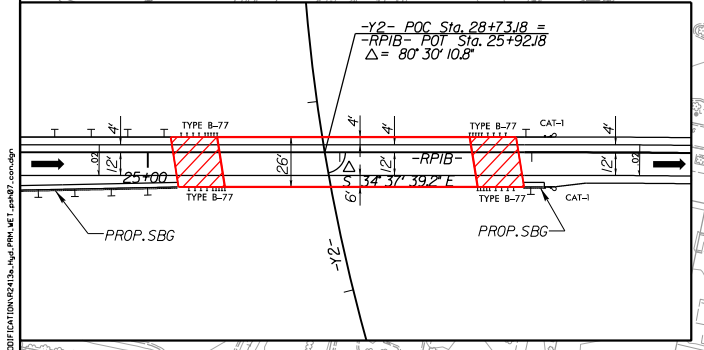
PLANS PREPARED BY:	
R&K	
RALPH WILKINS & ASSOCIATES, INC.	
100 REDFIELD DRIVE, SUITE 310	
RALEIGH, NORTH CAROLINA 27609-2949	
NC LICENSE NO. 6-0112 • (919) 878-9548	
LOCATION:	
TP NO.:	COUNTY:
DESIGNED BY:	
CHECKED BY:	DATE:

GRAPHIC SCALE
0 25 50 100
PLANS



REVISIONS	

- 
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 - DENOTES IMPACTS IN SURFACE WATER
 - DENOTES FILL IN WETLAND



DETAIL CE STANDARD V DITCH
DETAIL V STANDARD V DITCH
DETAIL G SPECIAL LATERAL V DITCH
DETAIL J LATERAL V DITCH
DETAIL CF STANDARD BASE DITCH
DETAIL FX SPECIAL LATERAL BASE DITCH
DETAIL E SPECIAL CUT DITCH
DETAIL D SPECIAL CUT DITCH

NAD 83/NSRS 2007

PROJECT REFERENCE NO.	SHEET NO.
B-243A	7
REV. SHEET NO.	
ROADWAY DESIGN	HYDRAULICS
INCHES	FOOTING
INCOMPLETE PLANS NO COPY FOR THE USER'S JOINTMENT	
PRELIMINARY PLANS NO COPY FOR THE USER'S JOINTMENT	
REVISED 09/03/2014 PERMIT DRAWING SHEET 13 OF 31	

PLANS PREPARED BY:

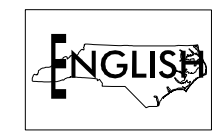
RK&K

ROBERT K. KIRK & ASSOCIATES, LLC
100 REDFIELD DRIVE, SUITE 310
RALEIGH, NORTH CAROLINA 27609-2949
NC LICENSE NO. 6-0112 • (919) 878-9549

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

GRAPHIC SCALE
0 25 50 100
PLANS

8/17/99
8/19/2014
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ENGLISH

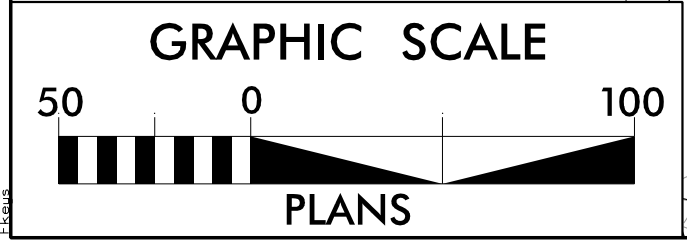
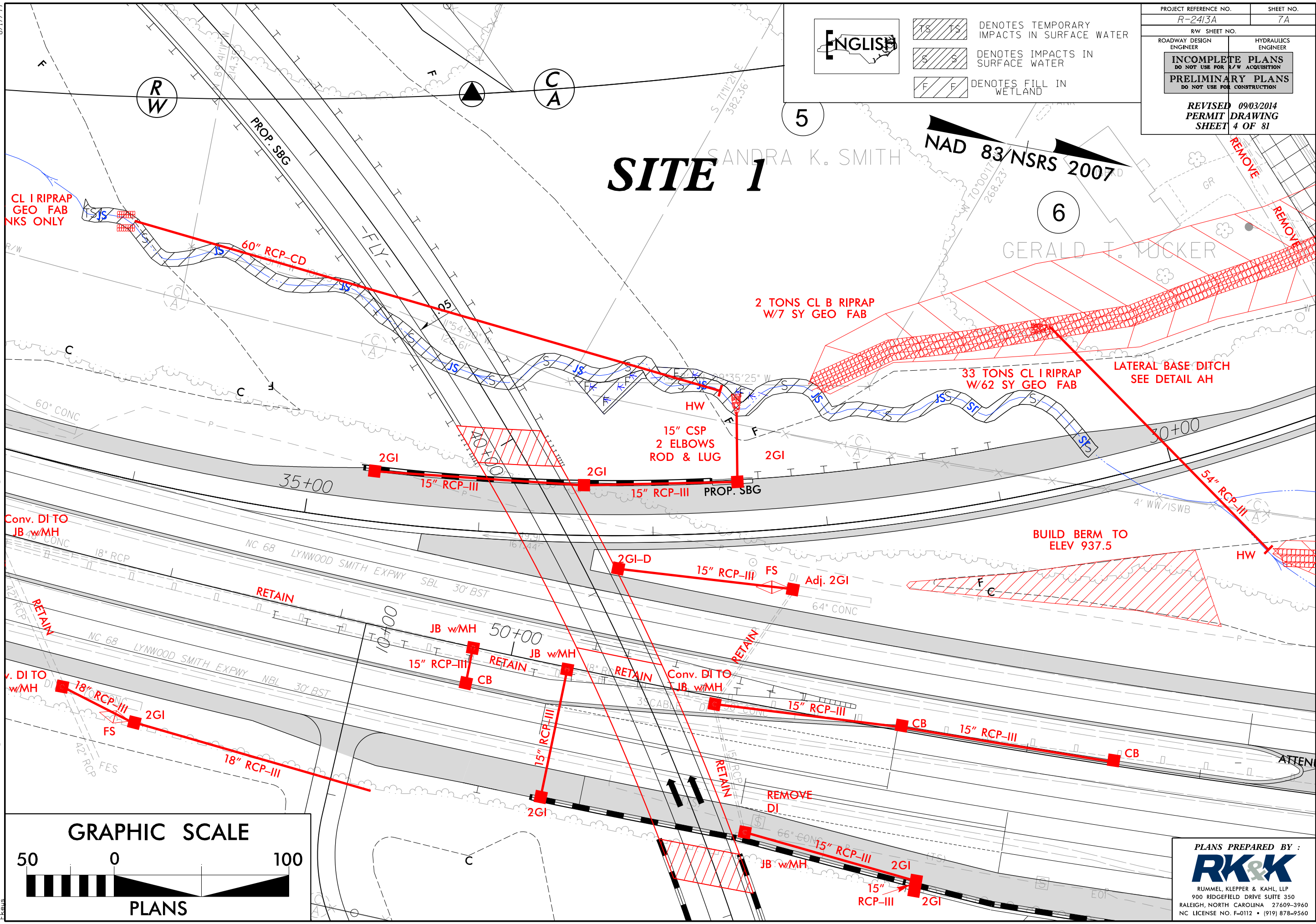
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

F F DENOTES FILL IN WETLAND

PROJECT REFERENCE NO.	SHEET NO.
R-2413A	7A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
REVISED 09/03/2014	DRAWING SHEET 4 OF 81

SITE 1



PLANS PREPARED BY :

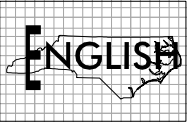
RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

5/14/99

9/7/2014
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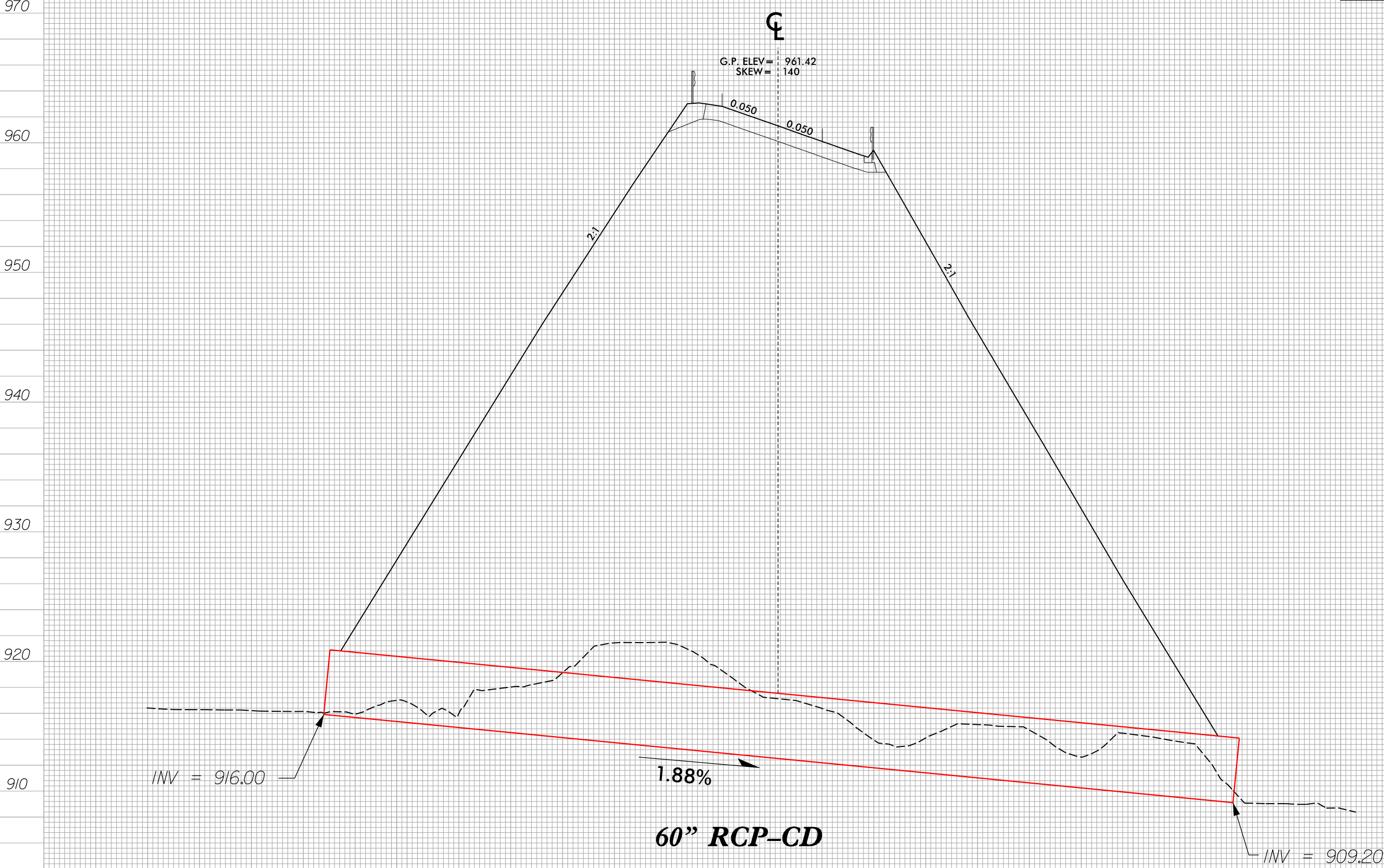
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PROJECT REFERENCE NO.		SHEET NO.	
R-2413A			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
REVISED 09/03/2014		PERMIT DRAWING	
SHEET 4A		OF 81	

SITE 1

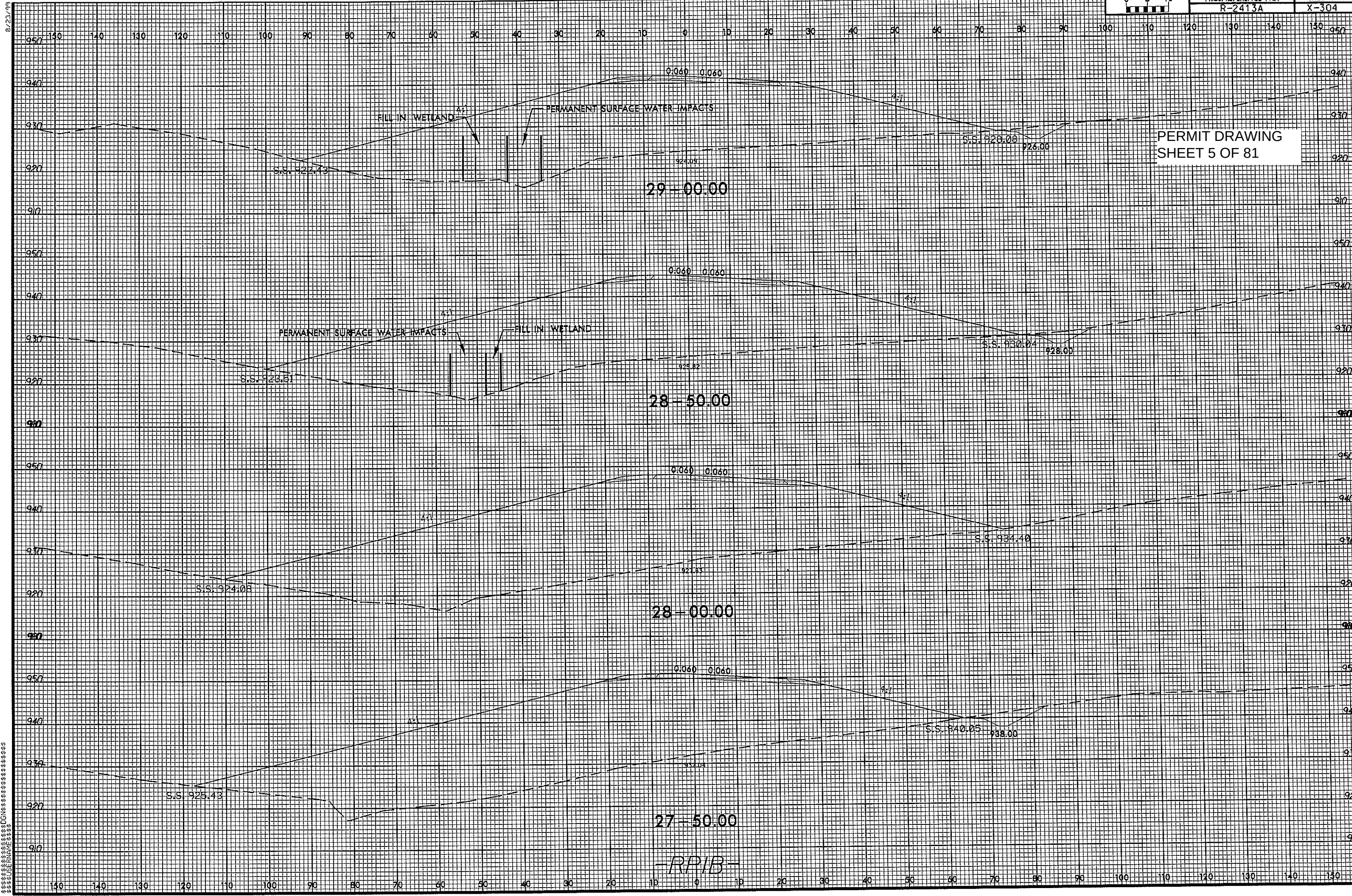
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8/23/99

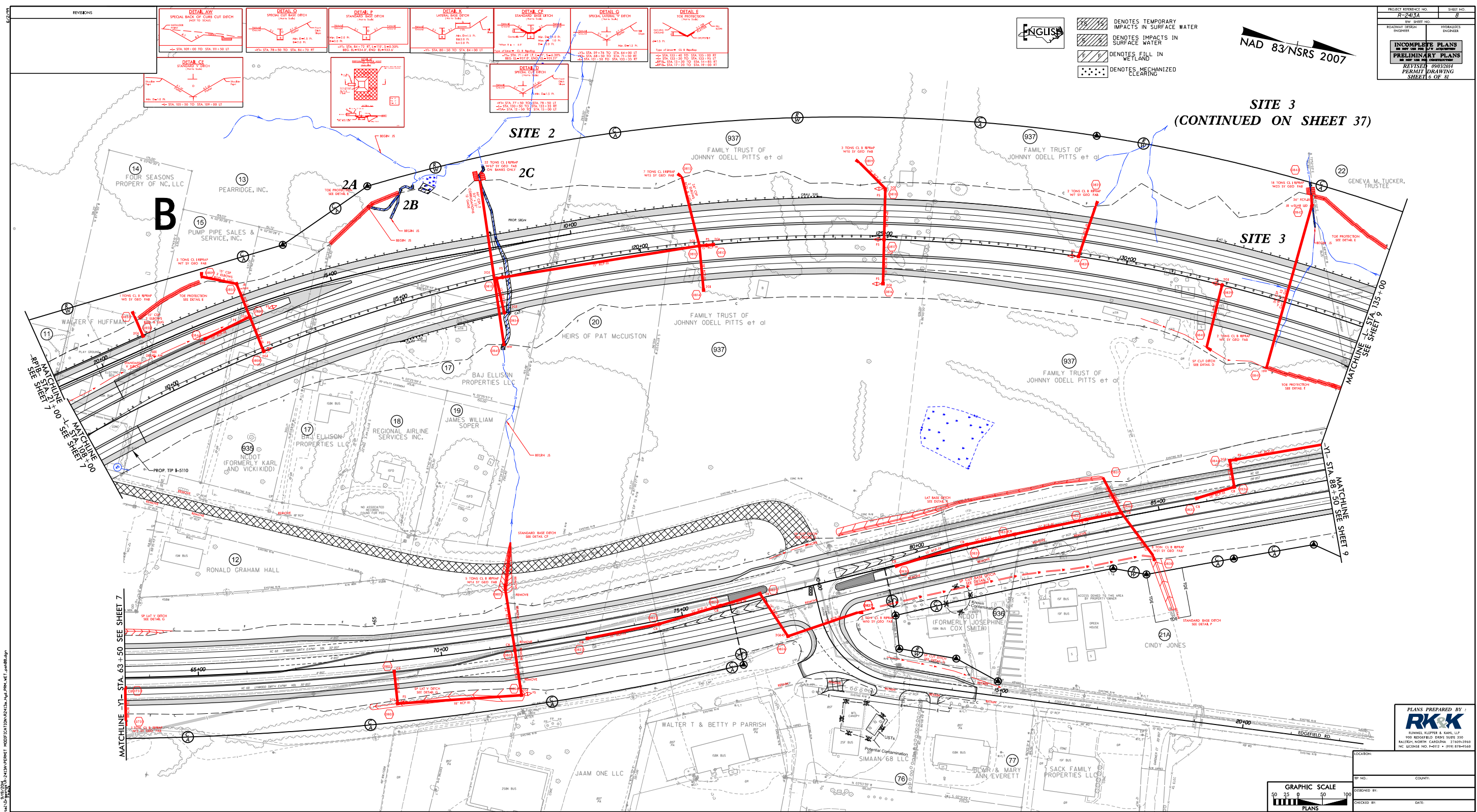


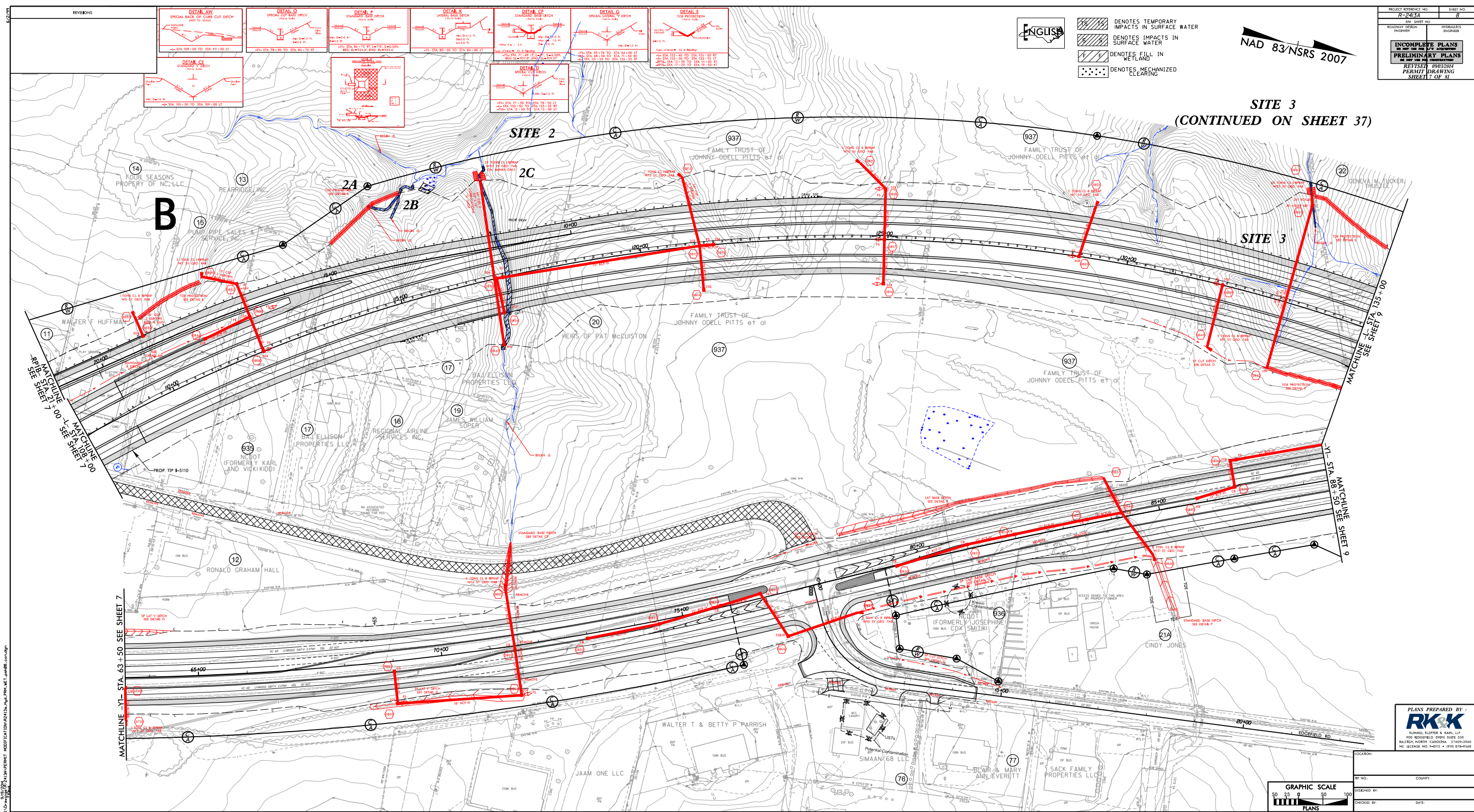
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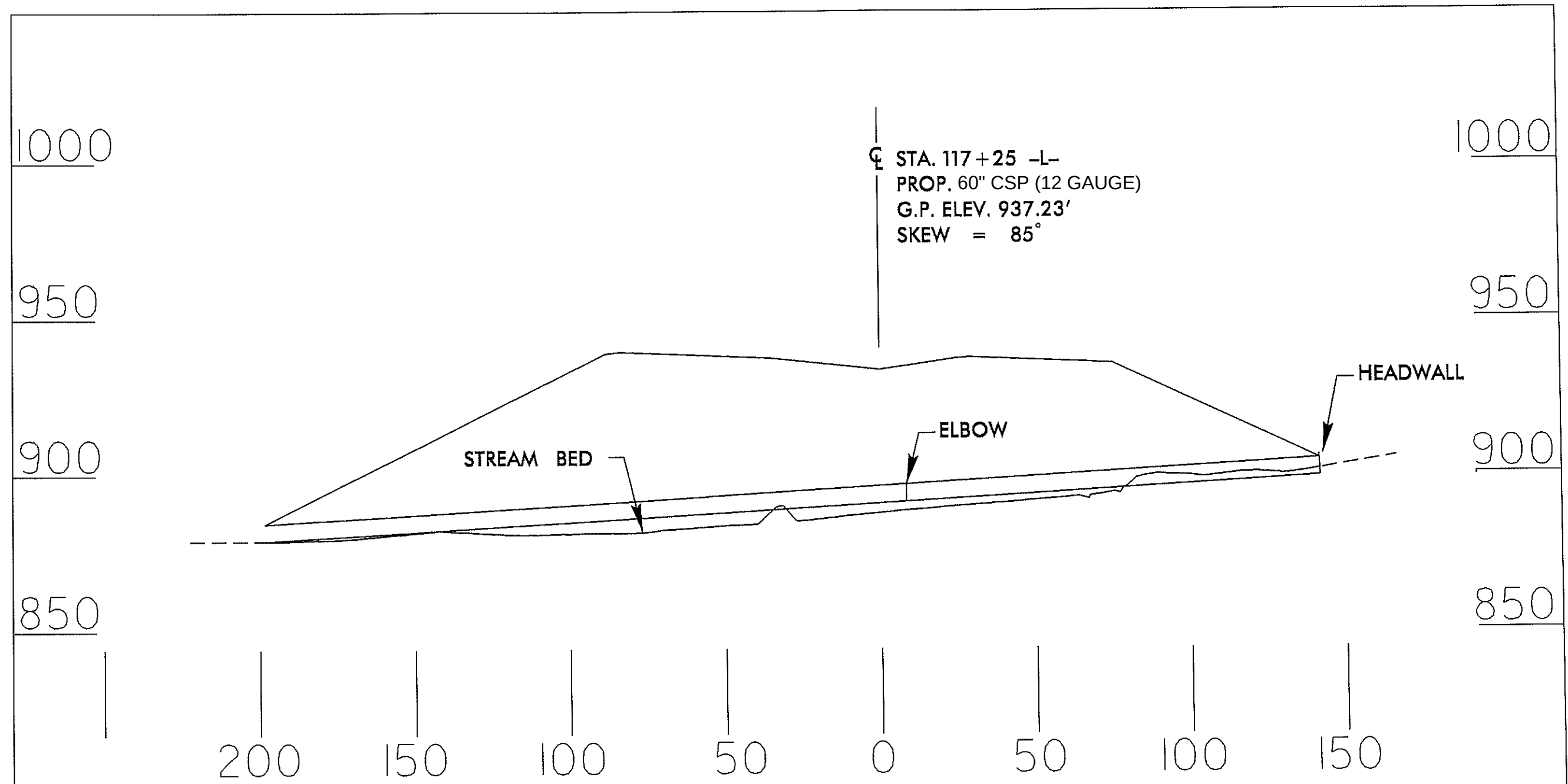


PERMIT DRAWING
SHEET 5 OF 81

-RPIB-







PROFILE

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34429.1.1 (R-2413A)
NC 68 CONNECTOR
FROM FOUR LANES AT
SR 2011 TO SR 2127

PERMIT DRAWING
SHEET 8 OF 81

2 / 13 / 13

8/17/99

8/19/2014
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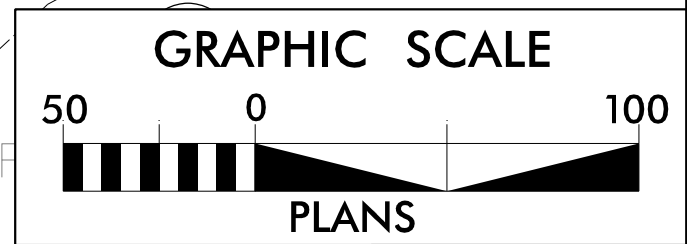
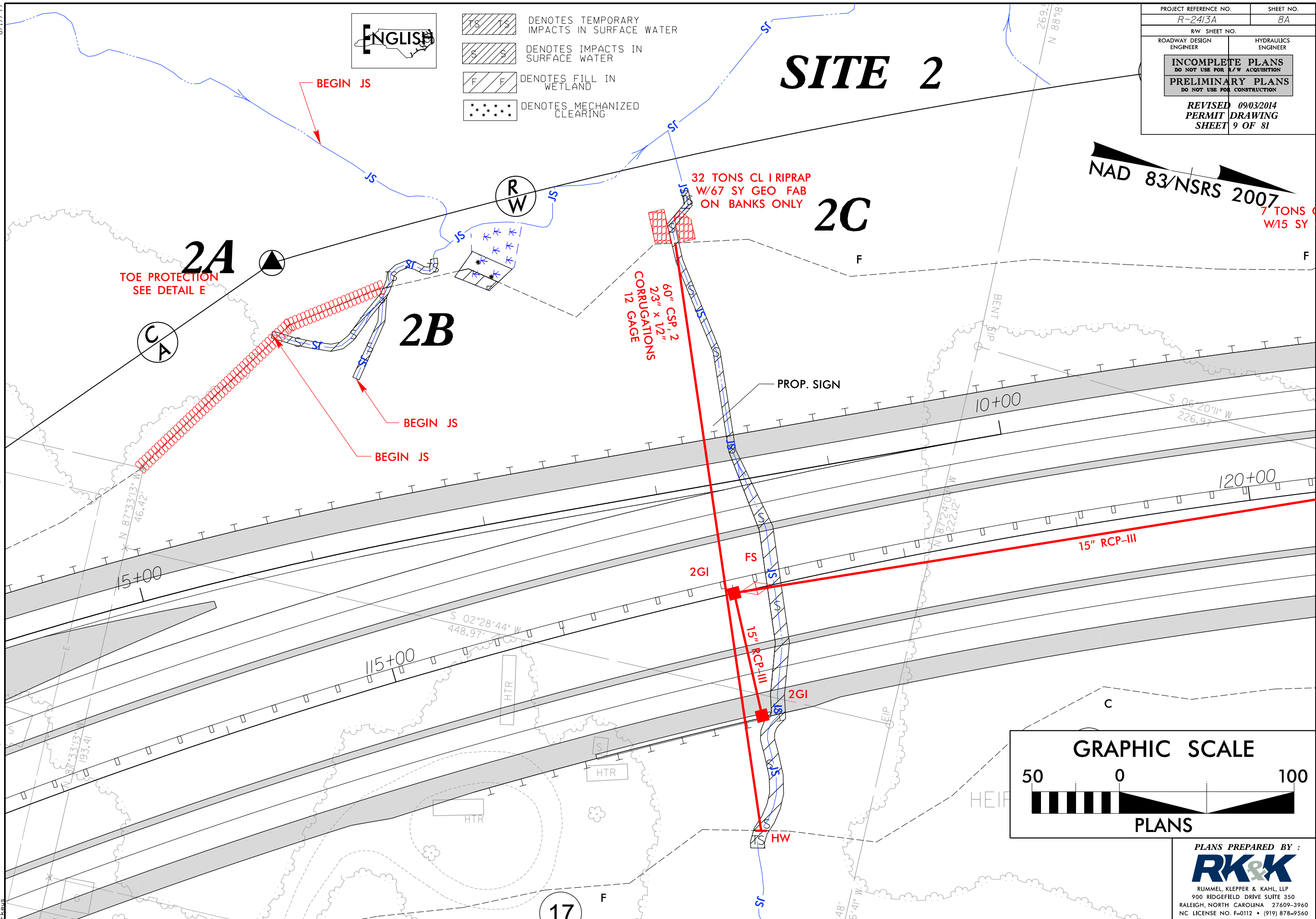


- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING

SITE 2

PROJECT REFERENCE NO.	SHEET NO.
R-2413A	8A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
REVISED PERMIT SHEET	09/03/2014 DRAWING 9 OF 81

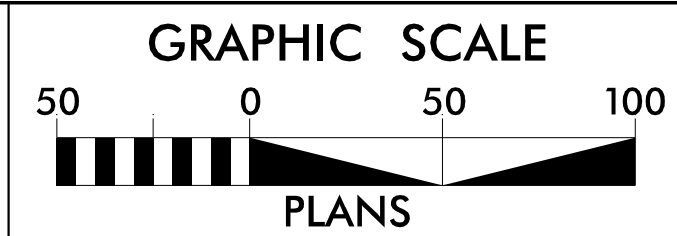
NAD 83/NSRS 2007



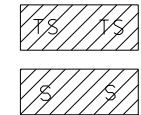
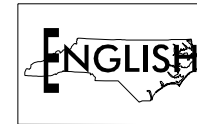
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

8/17/99

SITE 3 (IMPACTS FROM SHEET 8 AND SHEET 37)



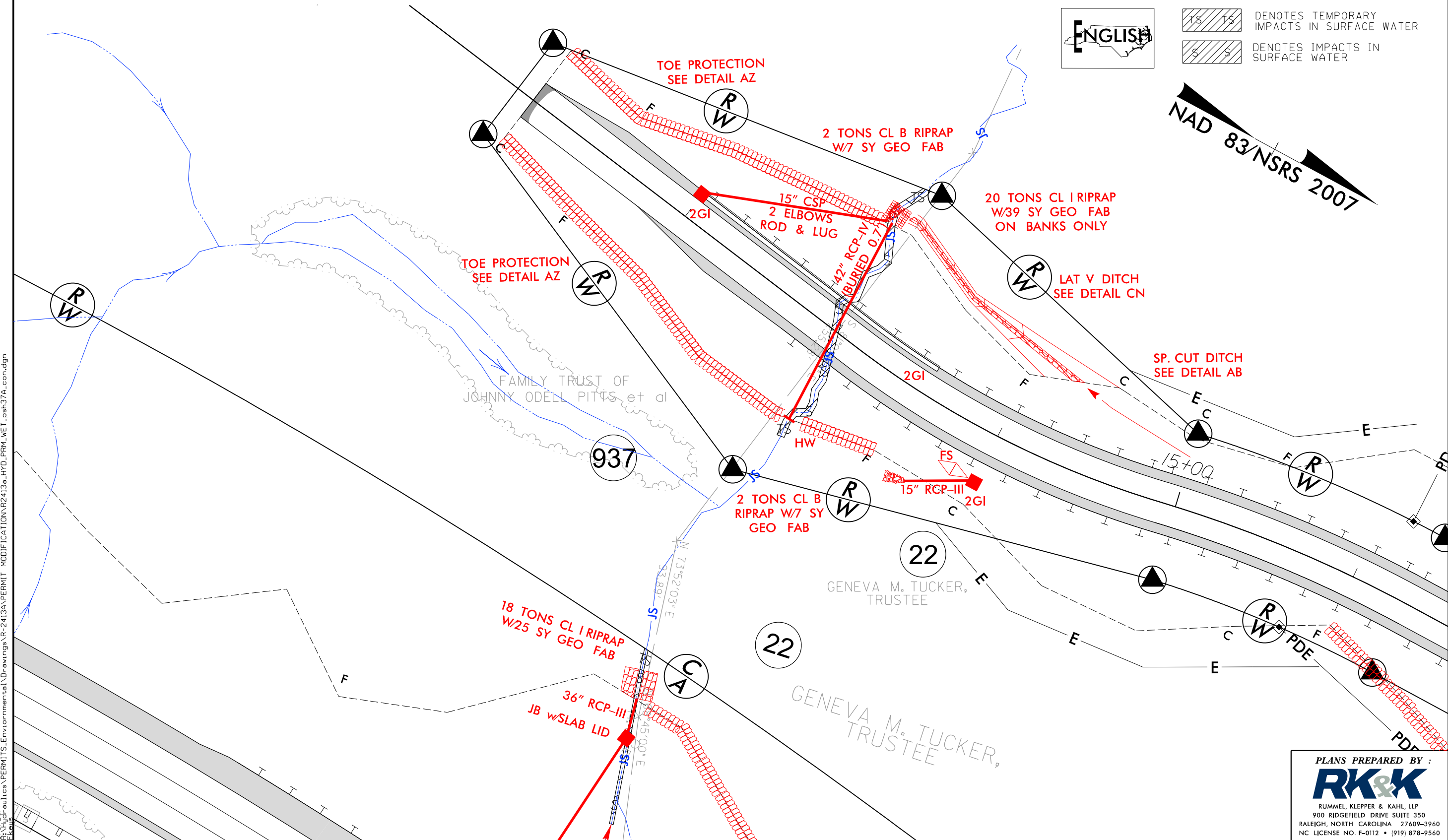
PROJECT REFERENCE NO. R-2413A	SHEET NO. 37A
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
REVISED 09/03/2014 PERMIT DRAWING SHEET 10 OF 81	



TS TS DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN
SURFACE WATER

NAD 83/NSRS 2007

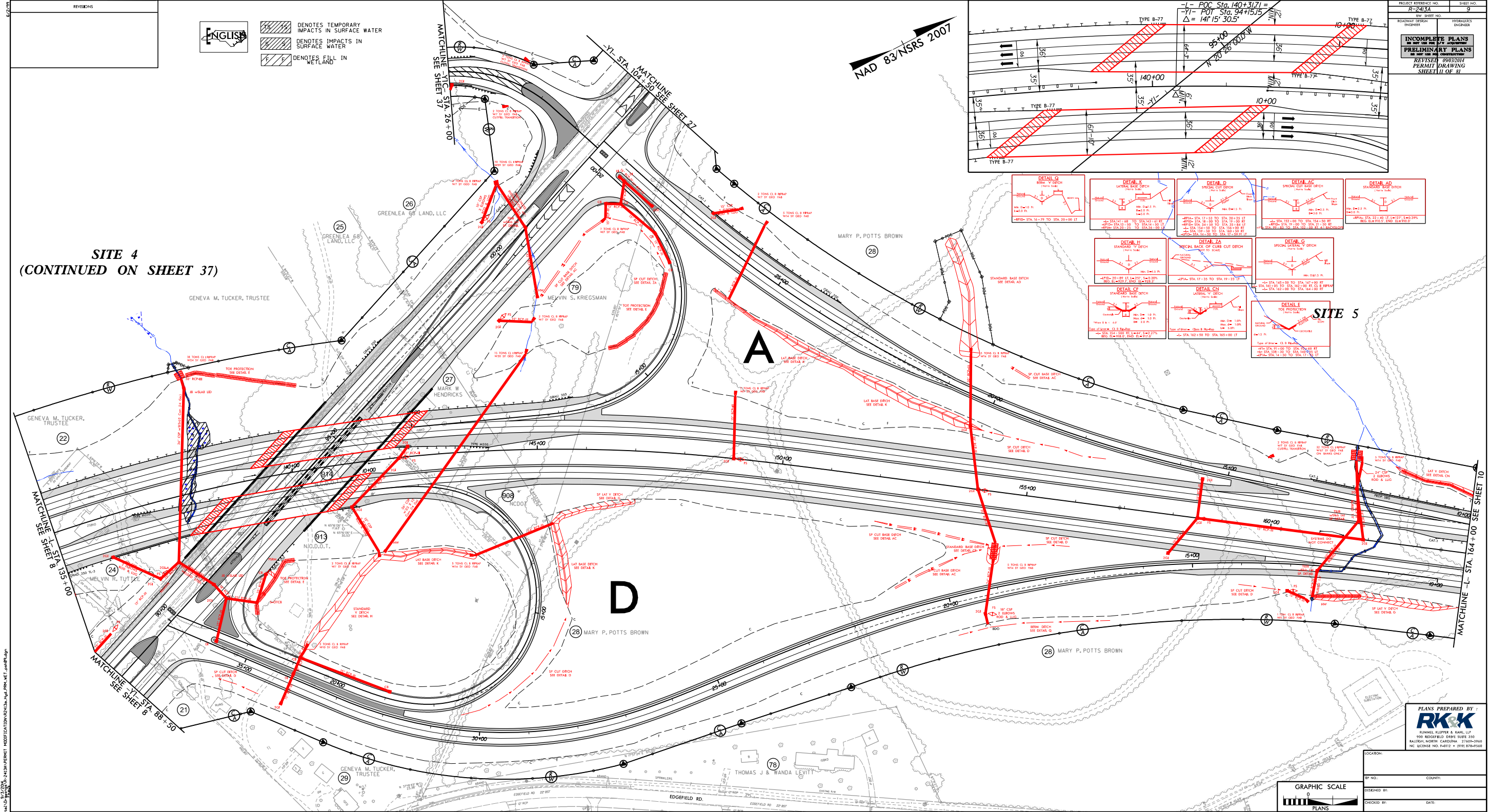


9/3/2014
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rk&k

PLANS PREPARED BY :

RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560



REVISIONS	

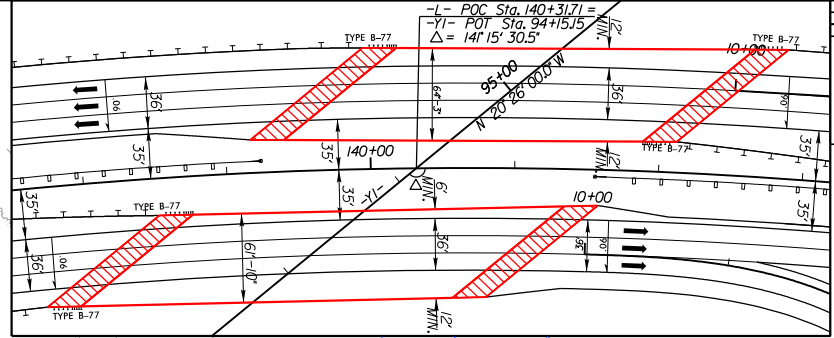
ENGLISH

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

NAD 83/NSRS 2007



DETAIL G
STANDARD V DITCH
14'-0" WIDE
1'-0" DEEP
APPLIC. STA. 16+75 TO STA. 20+00 LT

DETAIL K
LATERAL BASE DITCH
14'-0" WIDE
1'-0" DEEP
APPLIC. STA. 14+00 TO STA. 17+00 RT

DETAIL D
SPECIAL CUT BASE DITCH
14'-0" WIDE
1'-0" DEEP
APPLIC. STA. 17+00 TO STA. 19+00 LT

DETAIL AC
SPECIAL CUT BASE DITCH
14'-0" WIDE
1'-0" DEEP
APPLIC. STA. 19+00 TO STA. 20+00 RT

DETAIL AD
STANDARD BASE DITCH
14'-0" WIDE
1'-0" DEEP
APPLIC. STA. 20+00 TO STA. 21+00 RT

DETAIL H
STANDARD V DITCH
14'-0" WIDE
1'-0" DEEP
APPLIC. STA. 17+00 TO STA. 19+00 LT

DETAIL ZA
SPECIAL BACK OF CURB CUT DITCH
14'-0" WIDE
1'-0" DEEP
APPLIC. STA. 17+00 TO STA. 19+00 LT

DETAIL G
SPECIAL CUT BASE DITCH
14'-0" WIDE
1'-0" DEEP
APPLIC. STA. 19+00 TO STA. 20+00 RT

DETAIL CN
LATERAL V DITCH
14'-0" WIDE
1'-0" DEEP
APPLIC. STA. 17+00 TO STA. 19+00 LT

DETAIL E
TOE PROTECTION
14'-0" WIDE
1'-0" DEEP
APPLIC. STA. 17+00 TO STA. 19+00 LT

PROJECT REFERENCE NO. **R-243A**

SHEET NO. **9**

ROADWAY DESIGN **INCHES**

HYDRAULICS **FOOTING**

INCOMPLETE PLANS
DO NOT USE FOR CONSTRUCTION

REVISED **06/03/2014**
PERMIT DRAWING
SHEET 11 OF 31

PLANS PREPARED BY:
RK&K
RUMBLE, KUPPER & KAM, LLP
100 REDFIELD DRIVE, SUITE 310
RALEIGH, NORTH CAROLINA 27609-2949
NC LICENSE NO. K-0112 • (919) 878-9568

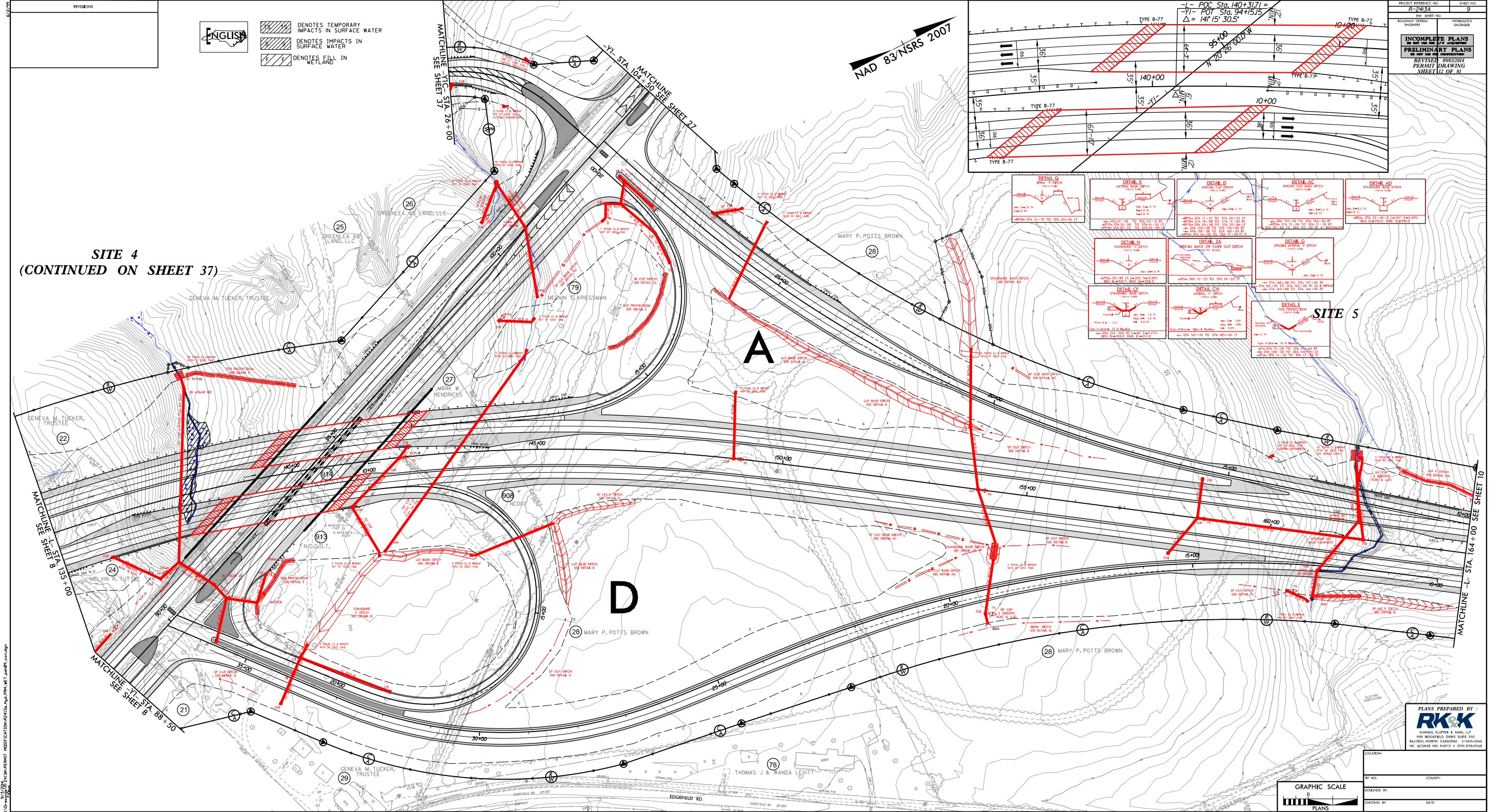
LOCATION: _____

TP NO.: _____ COUNTY: _____

DESIGNED BY: _____

CHECKED BY: _____ DATE: _____

GRAPHIC SCALE
0 10 20 FEET
PLANS



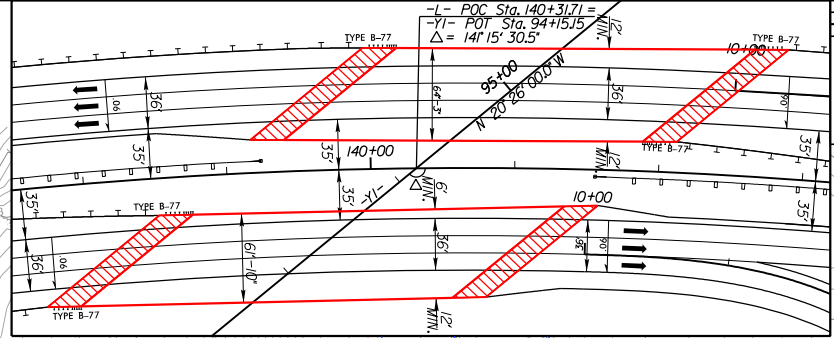
REVISIONS	

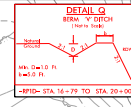


 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

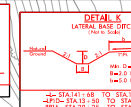
 DENOTES IMPACTS IN SURFACE WATER

 DENOTES FILL IN WETLAND

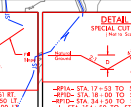




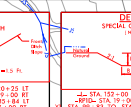
DETAIL G
SP. CUT DITCH
1:1 SLOPE
MIN. DRAINAGE WIDTH: 10 FT.
MAX. DRAINAGE WIDTH: 15 FT.



DETAIL K
LATERAL BASE DITCH
1:1 SLOPE
MIN. DRAINAGE WIDTH: 10 FT.
MAX. DRAINAGE WIDTH: 15 FT.



DETAIL D
SPECIAL CUT DITCH
1:1 SLOPE
MIN. DRAINAGE WIDTH: 10 FT.
MAX. DRAINAGE WIDTH: 15 FT.



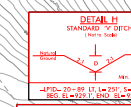
DETAIL AC
SPECIAL CUT BASE DITCH
1:1 SLOPE
MIN. DRAINAGE WIDTH: 10 FT.
MAX. DRAINAGE WIDTH: 15 FT.



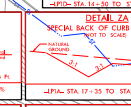
DETAIL AD
STANDARD BASE DITCH
1:1 SLOPE
MIN. DRAINAGE WIDTH: 10 FT.
MAX. DRAINAGE WIDTH: 15 FT.



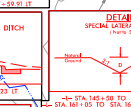
DETAIL H
STANDARD V DITCH
1:1 SLOPE
MIN. DRAINAGE WIDTH: 10 FT.
MAX. DRAINAGE WIDTH: 15 FT.



DETAIL ZA
SPECIAL BACK OF CURB CUT DITCH
1:1 SLOPE
MIN. DRAINAGE WIDTH: 10 FT.
MAX. DRAINAGE WIDTH: 15 FT.



DETAIL G
SPECIAL EXISTING V DITCH
1:1 SLOPE
MIN. DRAINAGE WIDTH: 10 FT.
MAX. DRAINAGE WIDTH: 15 FT.



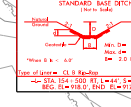
DETAIL AC
STANDARD V DITCH
1:1 SLOPE
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MAX. DRAINAGE WIDTH: 15 FT.



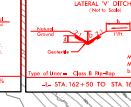
DETAIL AD
STANDARD V DITCH
1:1 SLOPE
MIN. DRAINAGE WIDTH: 10 FT.
MAX. DRAINAGE WIDTH: 15 FT.



DETAIL G
TOP PROTECTION
1:1 SLOPE
MIN. DRAINAGE WIDTH: 10 FT.
MAX. DRAINAGE WIDTH: 15 FT.



DETAIL AC
STANDARD V DITCH
1:1 SLOPE
MIN. DRAINAGE WIDTH: 10 FT.
MAX. DRAINAGE WIDTH: 15 FT.



DETAIL AD
STANDARD V DITCH
1:1 SLOPE
MIN. DRAINAGE WIDTH: 10 FT.
MAX. DRAINAGE WIDTH: 15 FT.

PROJECT REFERENCE NO. **R-2433A** SHEET NO. **9**

REV. SHEET NO. **1**

ROADWAY DESIGN **INCHES**

HYDRAULICS **FOOTING**

INCOMPLETE PLANS
BY **NOT FOR CONSTRUCTION**
PRELIMINARY PLANS
REVISED **06/03/2014**
PERMIT DRAWING
SHEET **12** OF **31**

PLANS PREPARED BY:
RK&K
RUMBLE, KUMPER & KAM, LLP
100 REDFIELD DRIVE, SUITE 310
RALEIGH, NORTH CAROLINA 27603-2949
NC LICENSE NO. 6-0112 • (919) 878-9568

LOCATION: _____

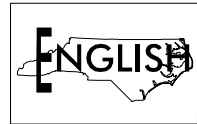
TP NO.: _____ COUNTY: _____

DESIGNED BY: _____

CHECKED BY: _____ DATE: _____

GRAPHIC SCALE
1" = 100'
PLANS

8/17/99



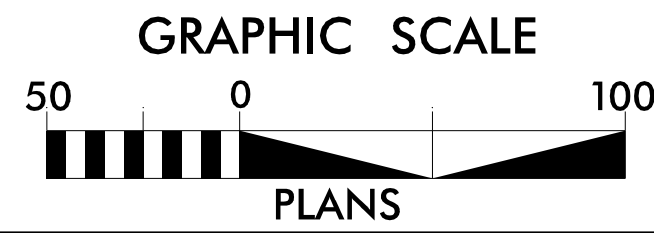
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND

NAD 83/NSRS 2007

SITE 4 (CONTINUED ON SHEET 37)

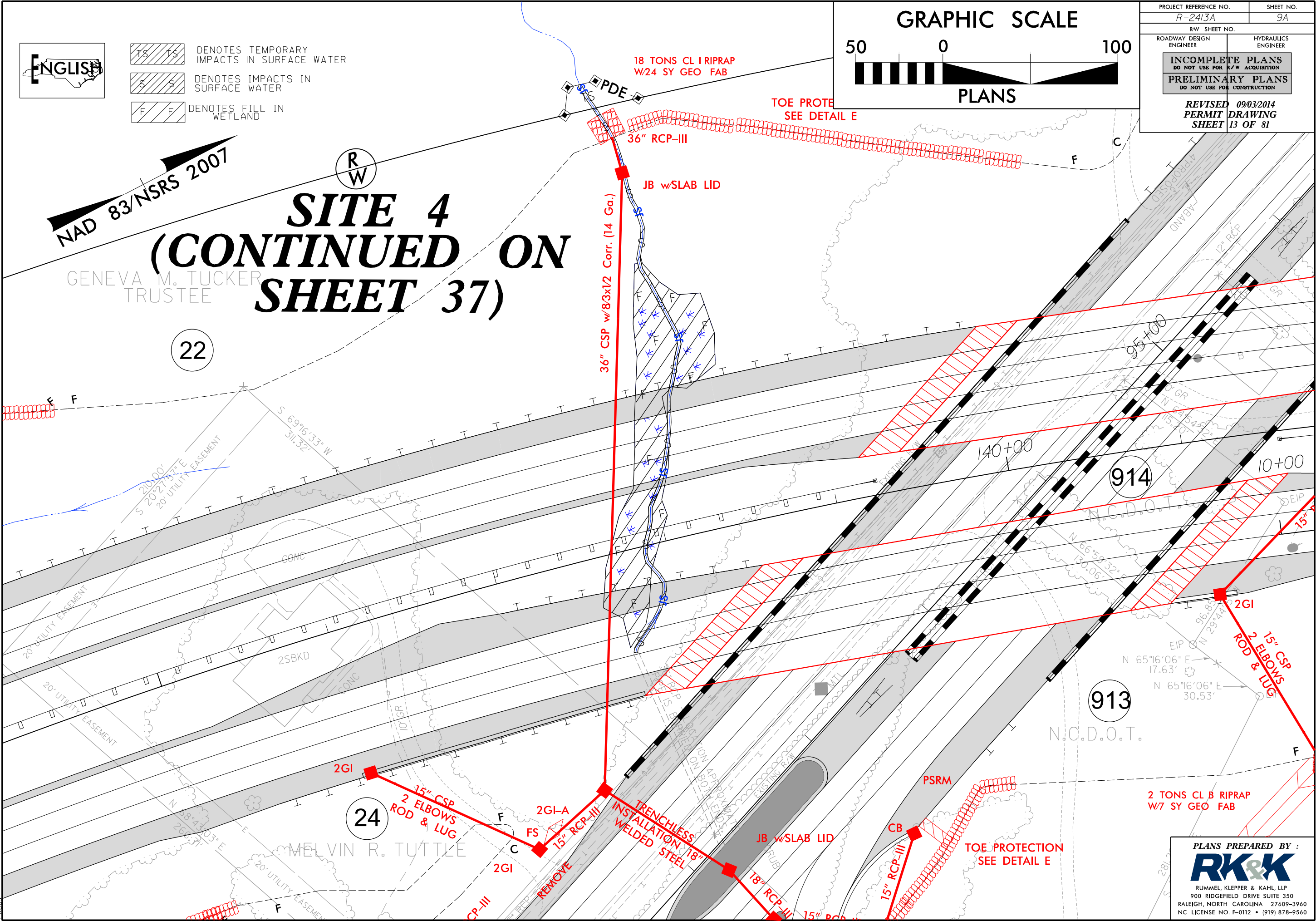
GENEVA M. TUCKER
TRUSTEE

22



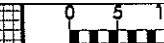
PROJECT REFERENCE NO. R-2413A	SHEET NO. 9A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
REVISED 09/03/2014 PERMIT DRAWING SHEET 13 OF 81	

9/3/2014
R:\Hydraulics\PERMITS_Environmental\Drawings\R-2413A\PERMIT MODIFICATION\R2413a_HYD_PRM_WET_psh09A.con.dgn
RKL



PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

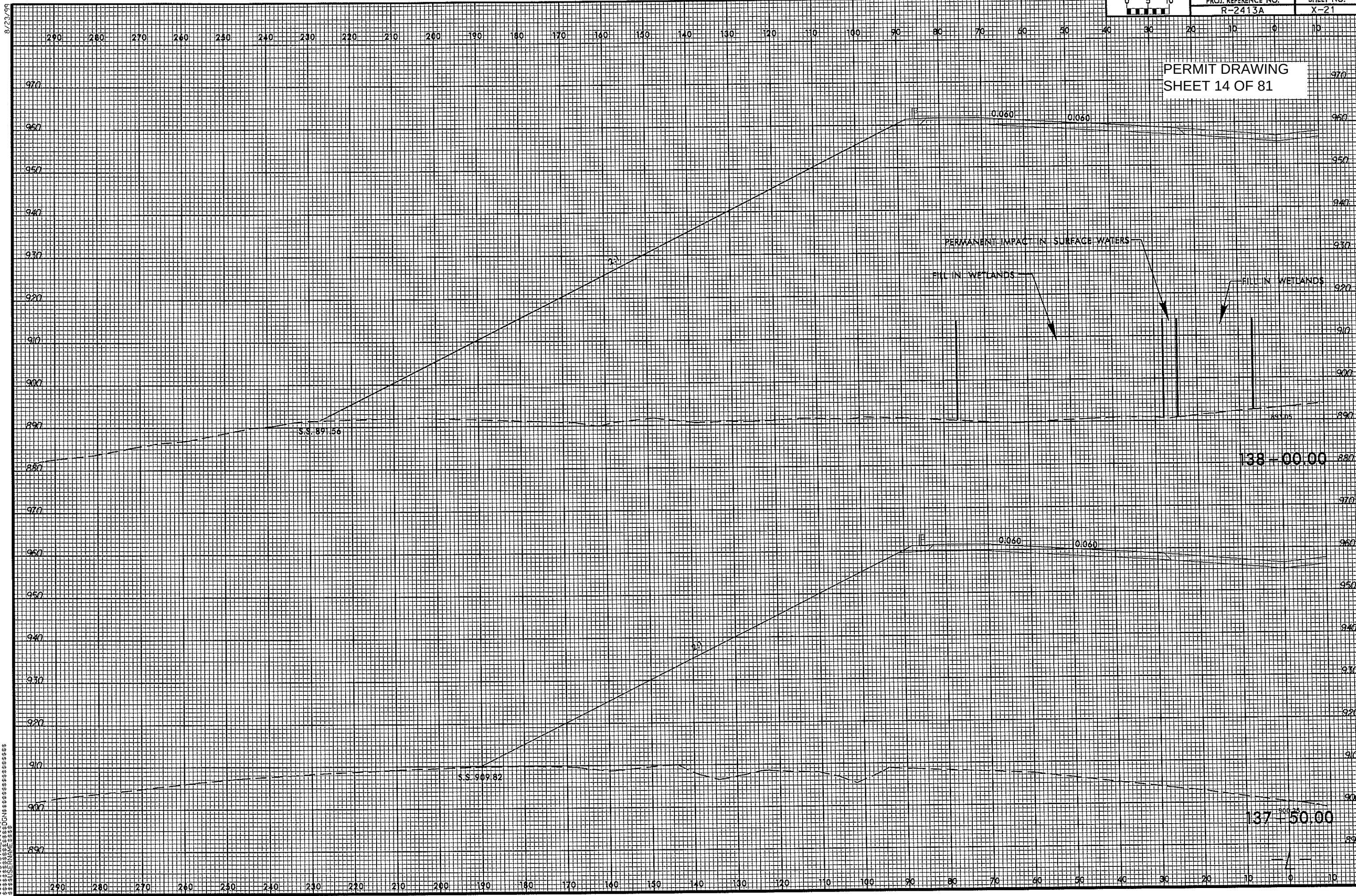
8/23/99



PROJ. REFERENCE NO.
R-2413A

SHEET NO.
X-21

PERMIT DRAWING
SHEET 14 OF 81

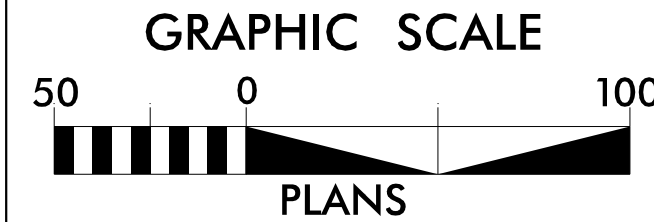


8/17/99

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- | | | | |
|--|----|----|--|
| | TS | TS | DENOTES TEMPORARY IMPACTS IN SURFACE WATER |
| | S | S | DENOTES IMPACTS IN SURFACE WATER |
| | F | F | DENOTES FILL IN WETLAND |

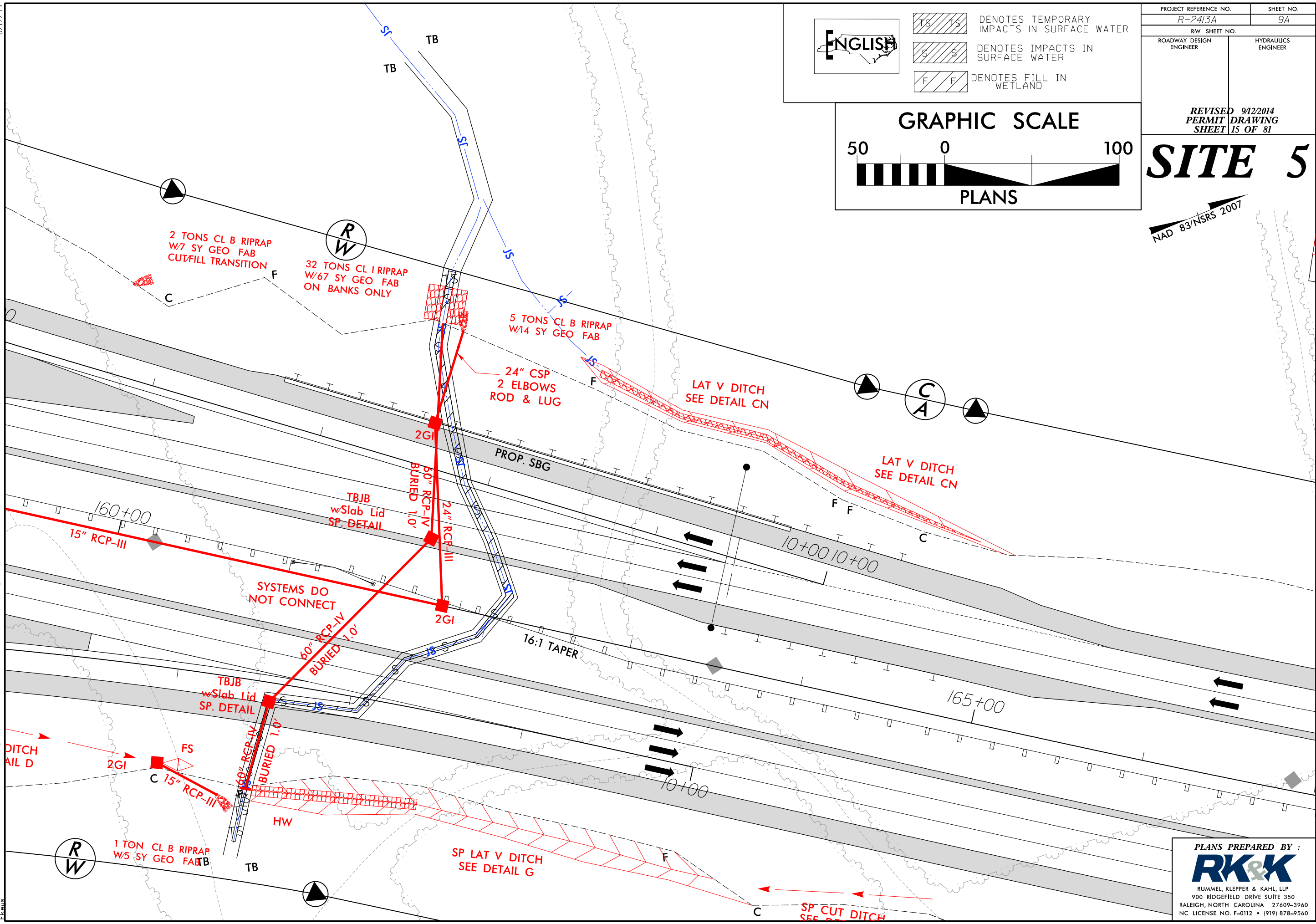


PROJECT REFERENCE NO.	SHEET NO.
R-2413A	9A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISED 9/12/2014
PERMIT DRAWING
SHEET 15 OF 81

SITE 5

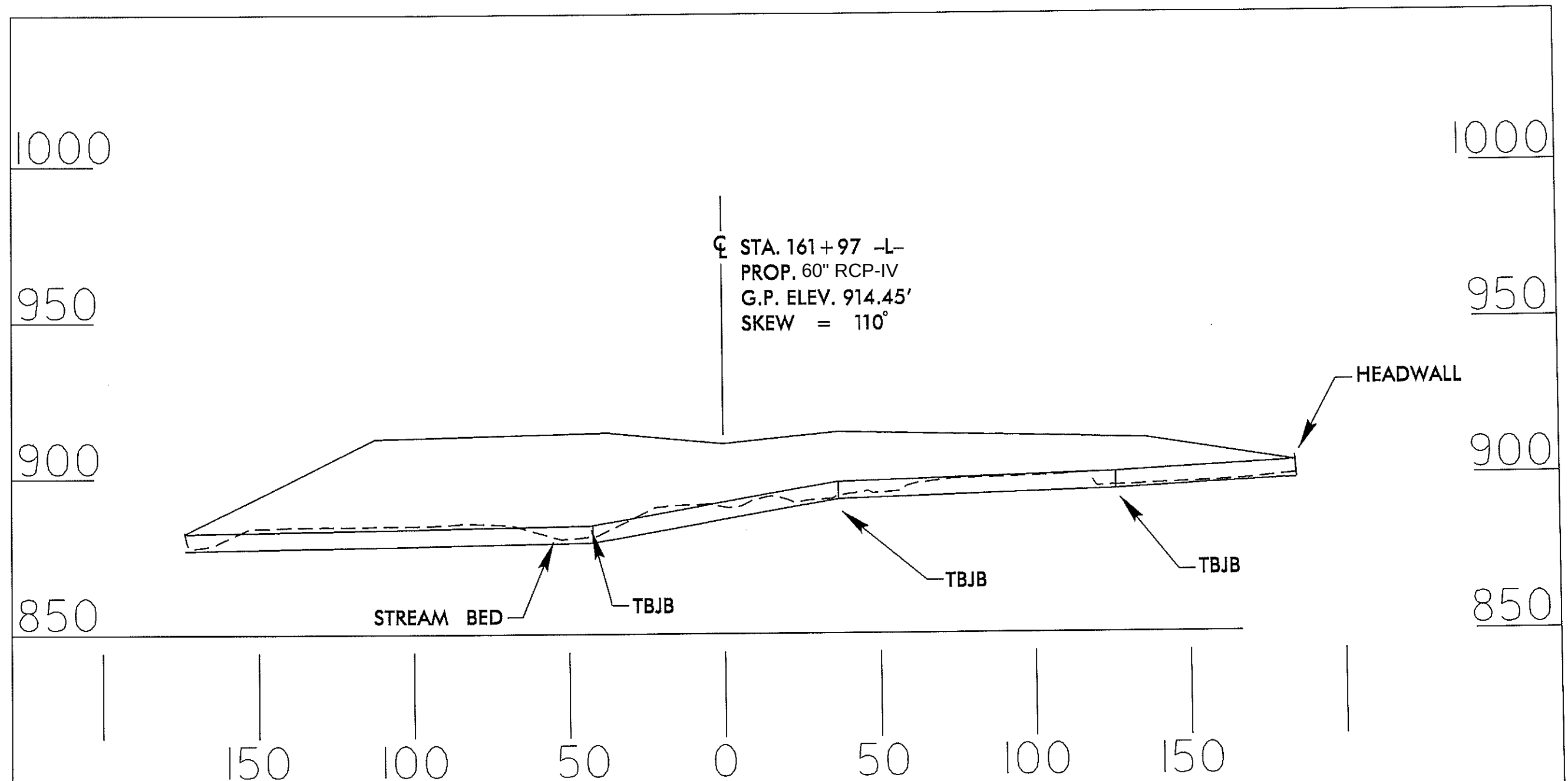
NAD 83/NSRS 2007



PLANS PREPARED BY :

RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

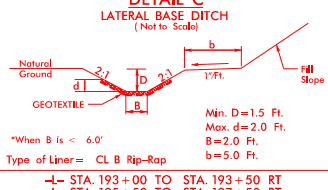
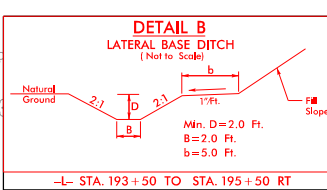
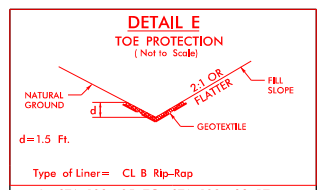
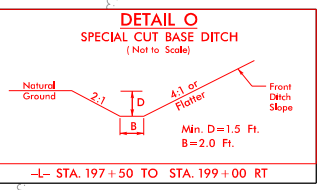
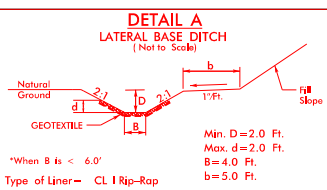
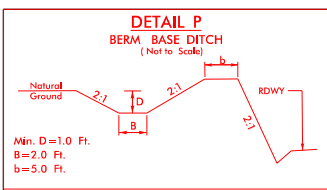
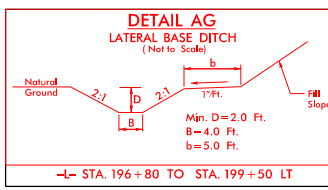


PROFILE

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34429.1.1 (R-2413A)
NC 68 CONNECTOR
FROM FOUR LANES AT
SR 2011 TO SR 2127
PERMIT DRAWING
SHEET 16 OF 81
2 / 13 / 13

8/17/99

8/10/2014
B:\Hydraulics\PERMITS\Environmental\Drawings\NR-2413A\NR2413a_HYD_PRM_WET_psh12.dgn



CURB & GUTTER LOCATIONS			
DESCRIPTION	ALN	STATION	STATION LOC
SBG	-L-	191+00.00	199+75.00 LT
SBG	-L-	192+75.00	196+43.00 RT

PROJECT REFERENCE NO. **R-2413A** SHEET NO. **12**

RW SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

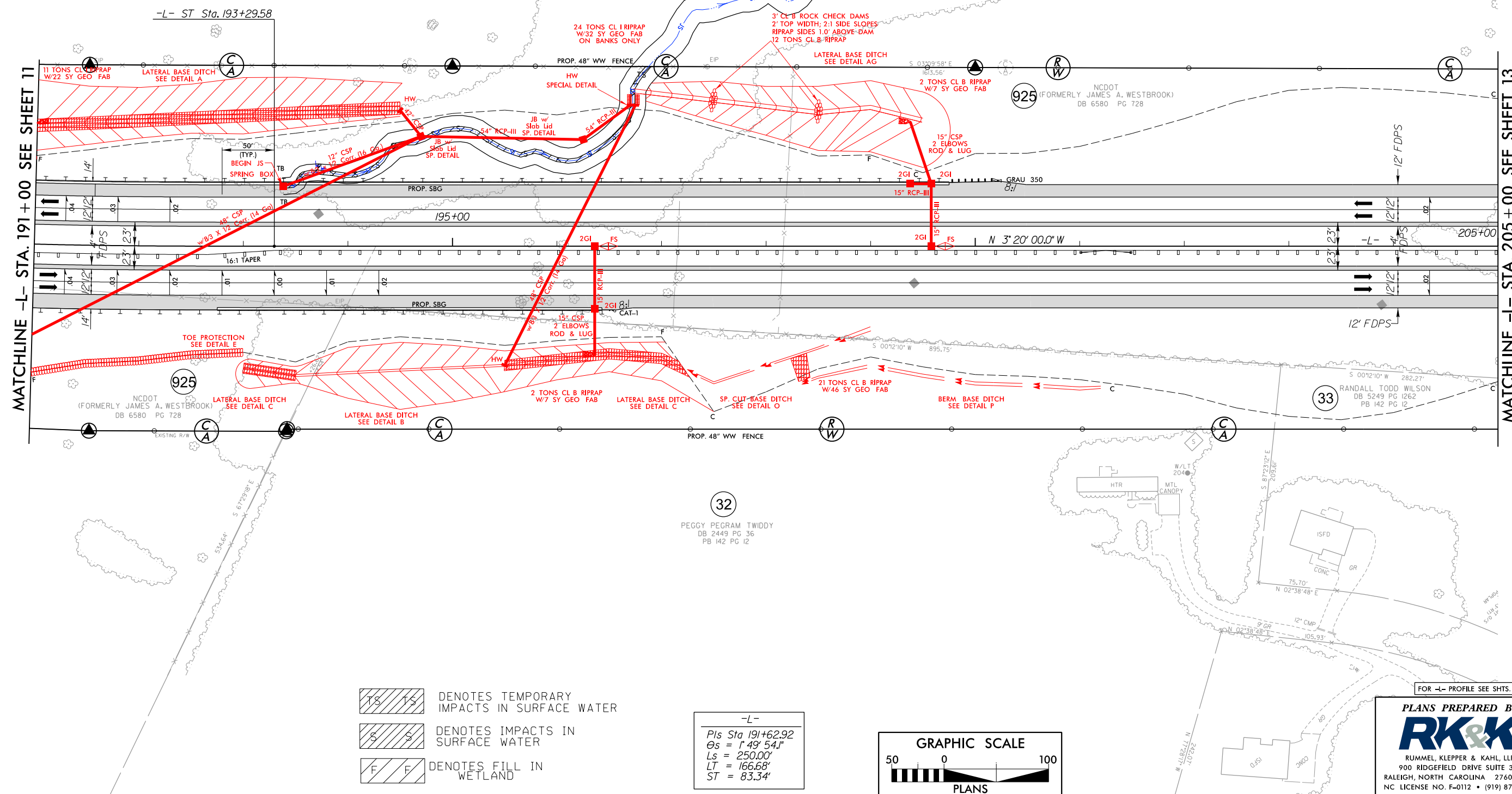
REVISED 9/12/2014
PERMIT DRAWING
SHEET 17 OF 81

NAD 83/NSRS 2007

ENGLISH

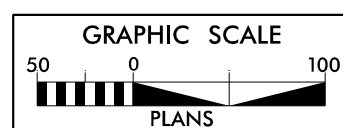
SITE 6

BRANCH WATER FARMS INC.
DB 5992 PG 1054



- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND

-L-
Pls Sta 191+62.92
Os = 1' 49' 54.1"
Ls = 250.00'
LT = 166.68'
ST = 83.34'



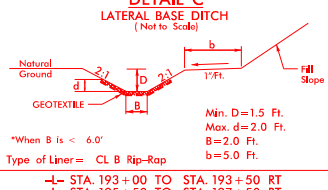
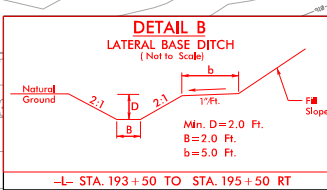
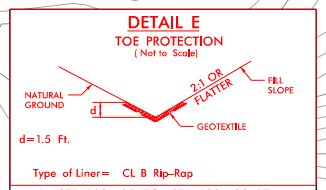
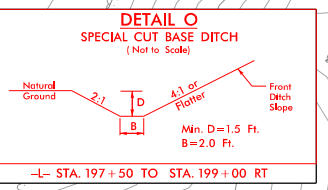
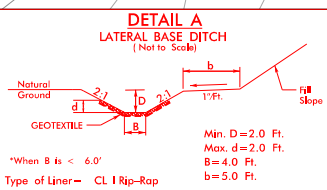
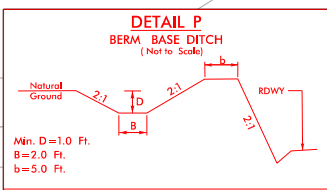
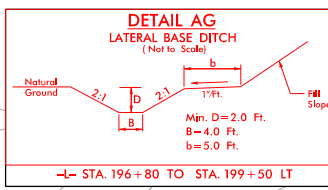
FOR -L- PROFILE SEE SHTS. 40 & 41

PLANS PREPARED BY :

RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

8/17/99
8/10/2014
B:\Hydraulics\PERMITS\Environmental\Drawings\NR-2413A\NR2413a_HYD_PRRM_WET_psh12_con.dgn



CURB & GUTTER LOCATIONS			
DESCRIPTION	ALN	STATION	STATION LOC
SBG	-L-	191+00.00	199+75.00 LT
SBG	-L-	192+75.00	196+43.00 RT

PROJECT REFERENCE NO. R-2413A
SHEET NO. 12

RW SHEET NO. ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER

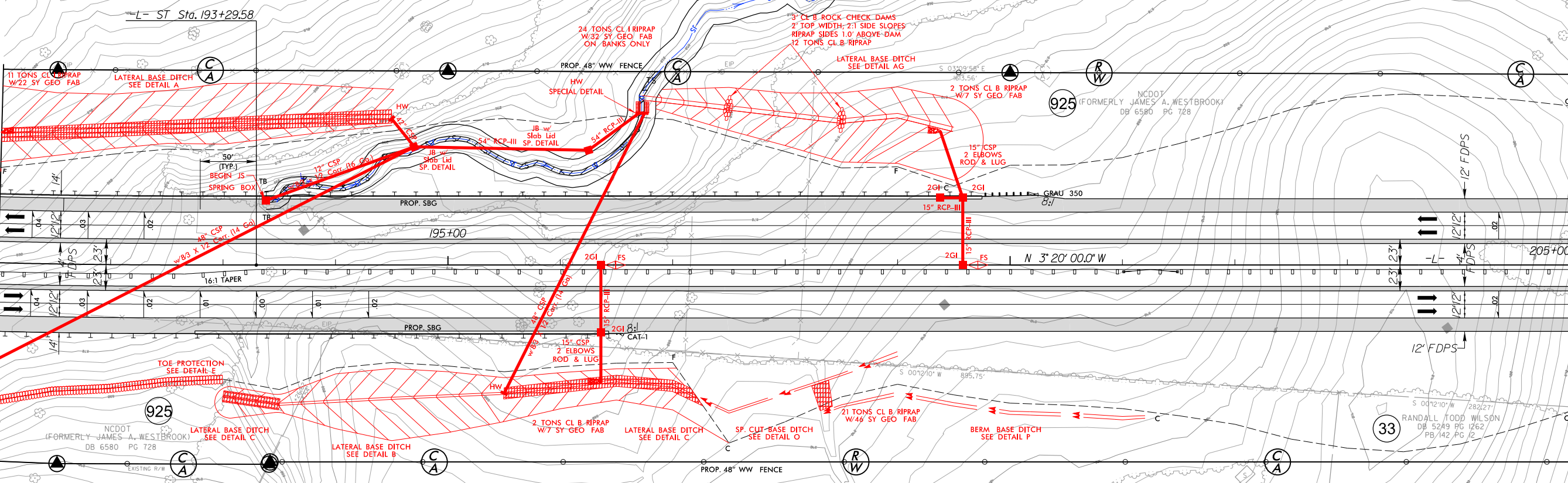
REVISED 9/12/2014
PERMIT DRAWING
SHEET 18 OF 81

NAD 83/NSRS 2007

ENGLISH

SITE 6

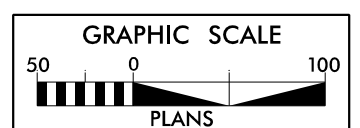
MATCHLINE -L- STA. 191+00 SEE SHEET 11



MATCHLINE -L- STA. 205+00 SEE SHEET 13

- TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S DENOTES IMPACTS IN SURFACE WATER
- F F DENOTES FILL IN WETLAND

-L-
Pls Sta 191+62.92
Os = 1' 49' 54.1"
Ls = 250.00'
LT = 166.68'
ST = 83.34'

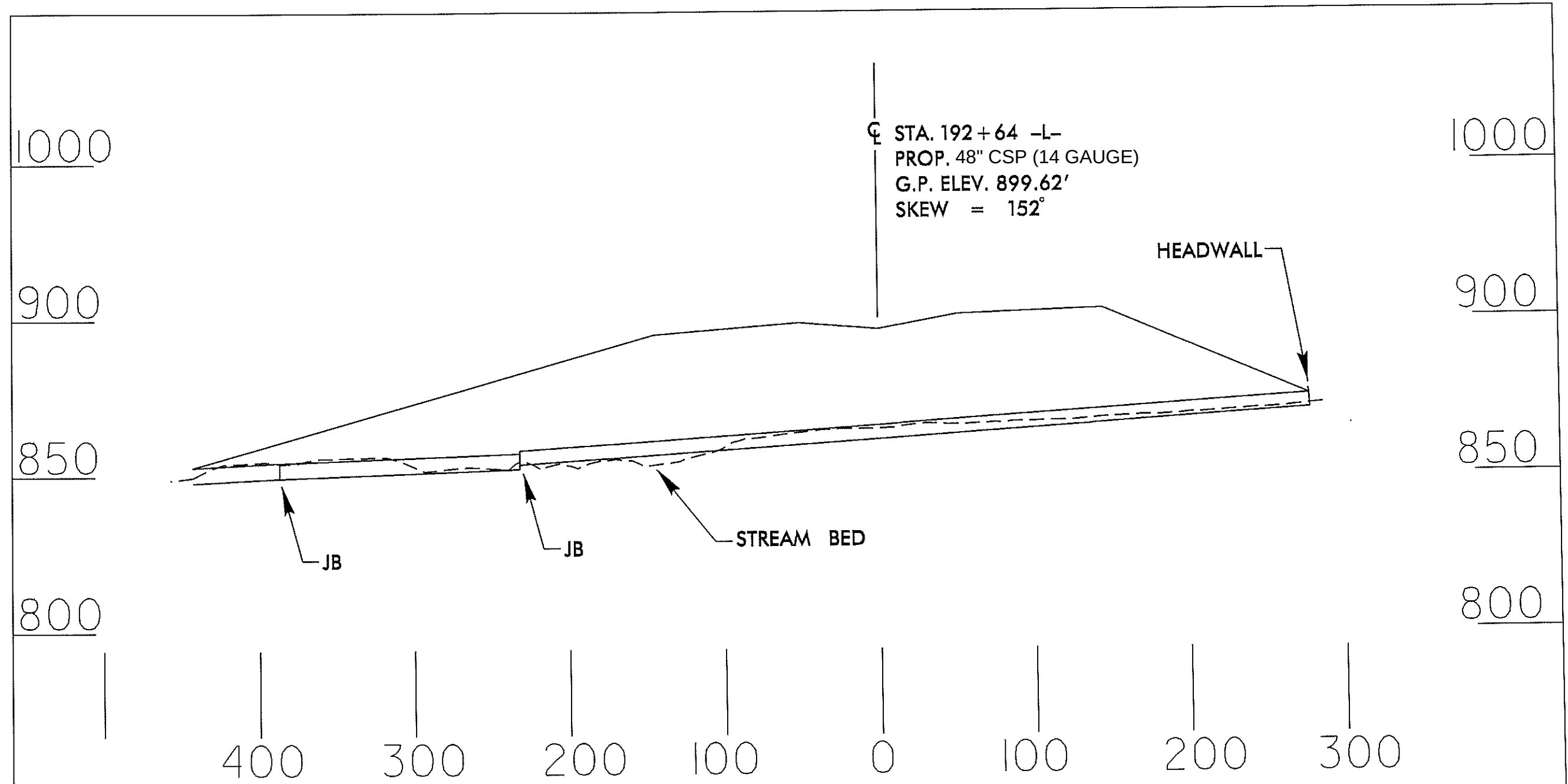


FOR -L- PROFILE SEE SHTS. 40 & 41

PLANS PREPARED BY :

RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

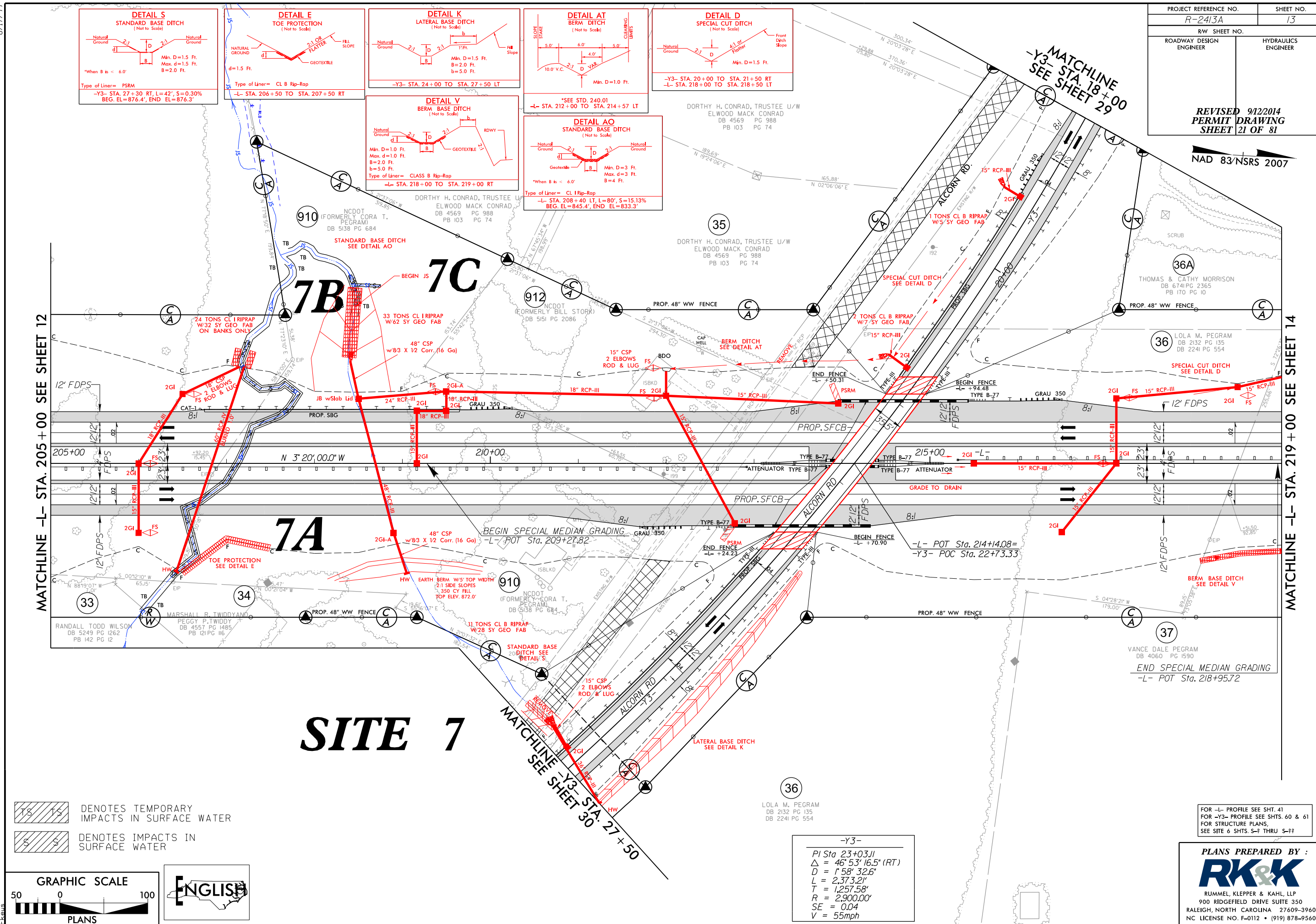


PROFILE

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34429.1.1 (R-2413A)
NC 68 CONNECTOR
FROM FOUR LANES AT
SR 2011 TO SR 2127
PERMIT DRAWING
SHEET 20 OF 81
2 / 13 / 13

8/17/99

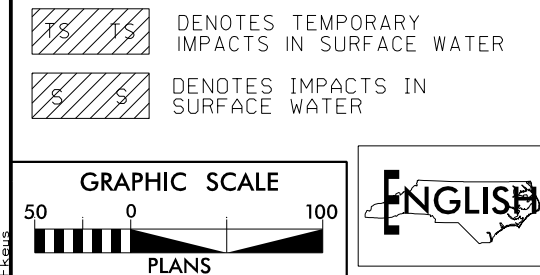
8/10/2014
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PROJECT REFERENCE NO.	R-2413A
SHEET NO.	13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISED 9/12/2014
PERMIT DRAWING
SHEET 21 OF 81

NAD 83/NSRS 2007



-Y3-
PI Sta 23+03.11
Δ = 46° 53' 16.5" (RT)
D = 1° 58' 32.6"
L = 2,373.21'
T = 1,257.58'
R = 2,900.00'
SE = 0.04
V = 55mph

FOR -L- PROFILE SEE SHT. 41
FOR -Y3- PROFILE SEE SHTS. 60 & 61
FOR STRUCTURE PLANS,
SEE SITE 6 SHTS. S-? THRU S-??

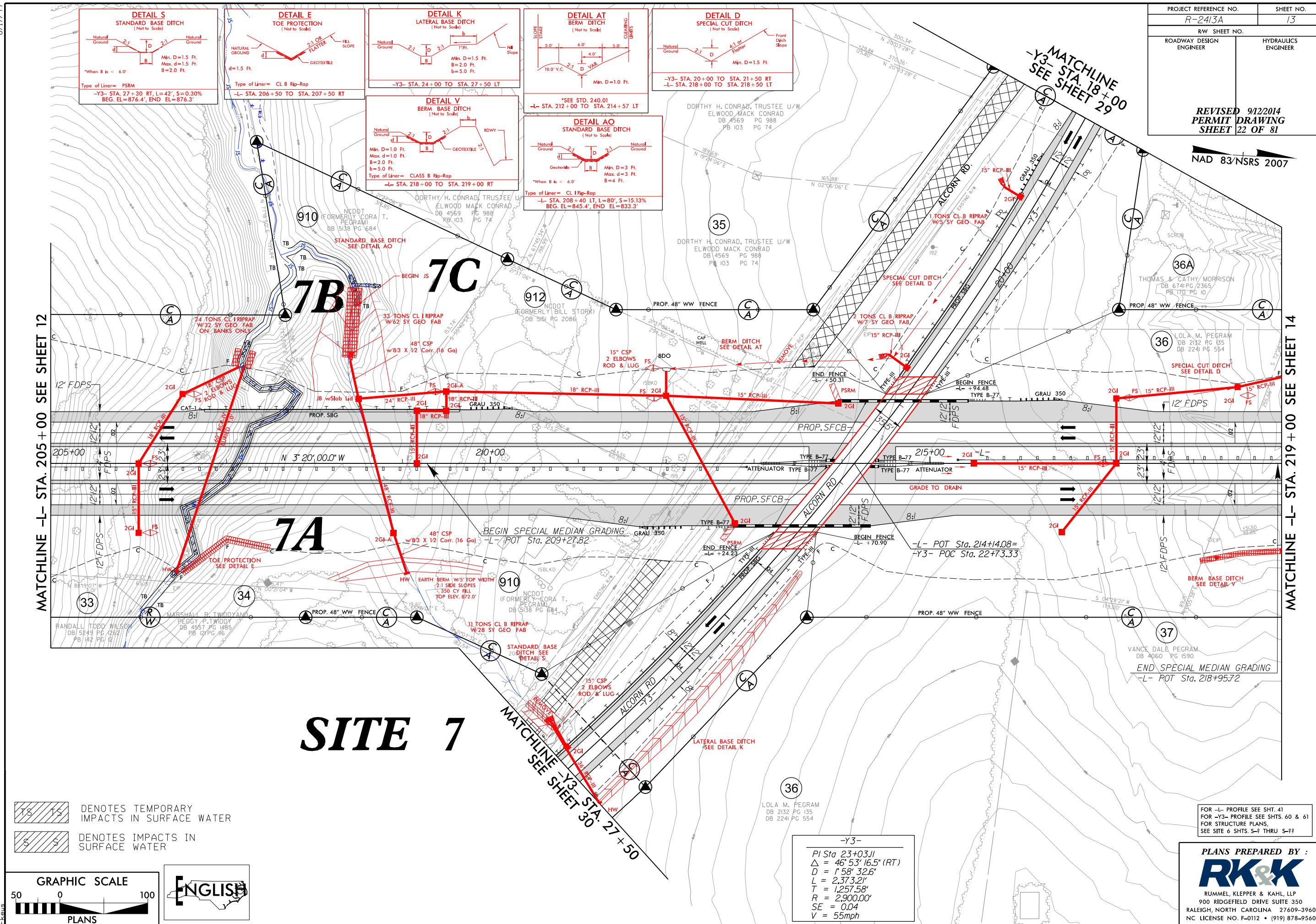
PLANS PREPARED BY :

RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

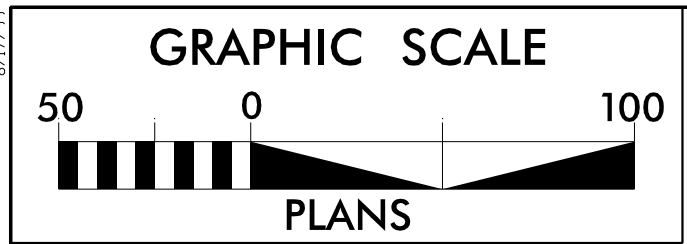
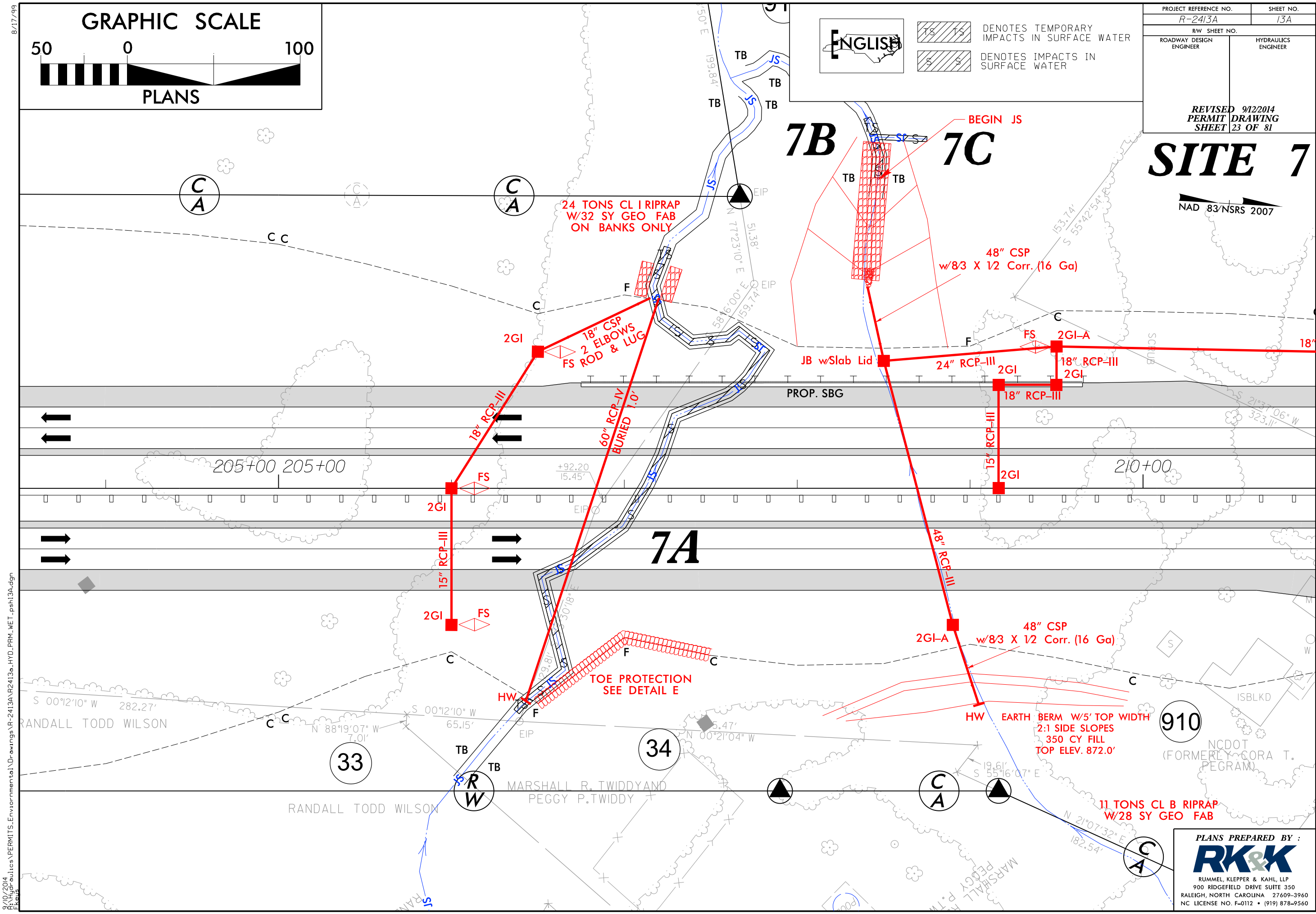
8/17/99

8/10/2014
B:\Hydro\Permits\Environmental\Drawings\2413A\2413a_HYD_Plan_WET_psh13.con.dgn
E:\Users\jlewis



MATCHLINE -L- STA. 205+00 SEE SHEET 12

MATCHLINE -L- STA. 219+00 SEE SHEET 14



TS TS

TS TS

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S

S S

DENOTES IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2413A	13A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
REVISED 9/12/2014 PERMIT DRAWING SHEET 23 OF 81	

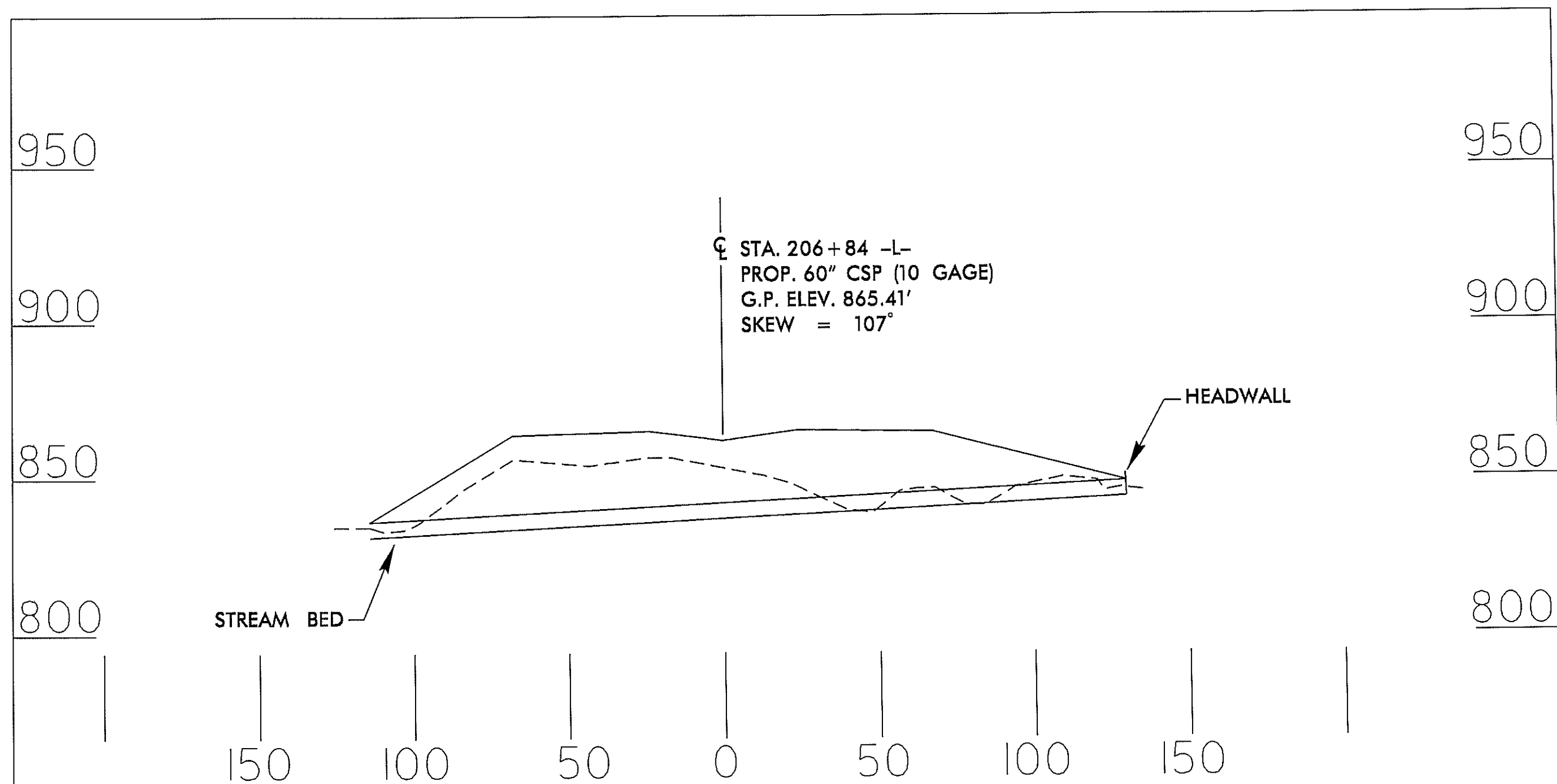
SITE 7

NAD 83/NSRS 2007

PLANS PREPARED BY :

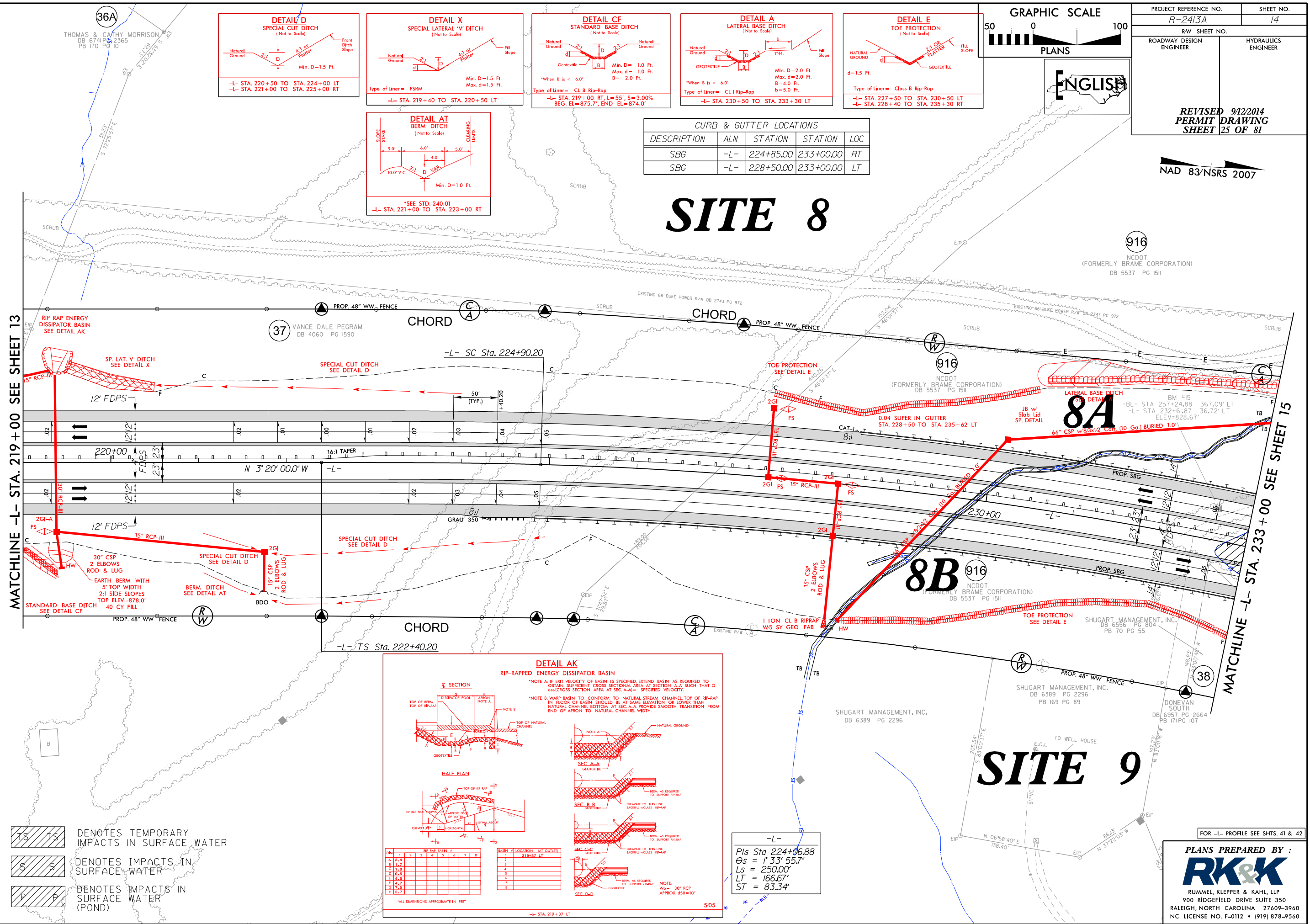
RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

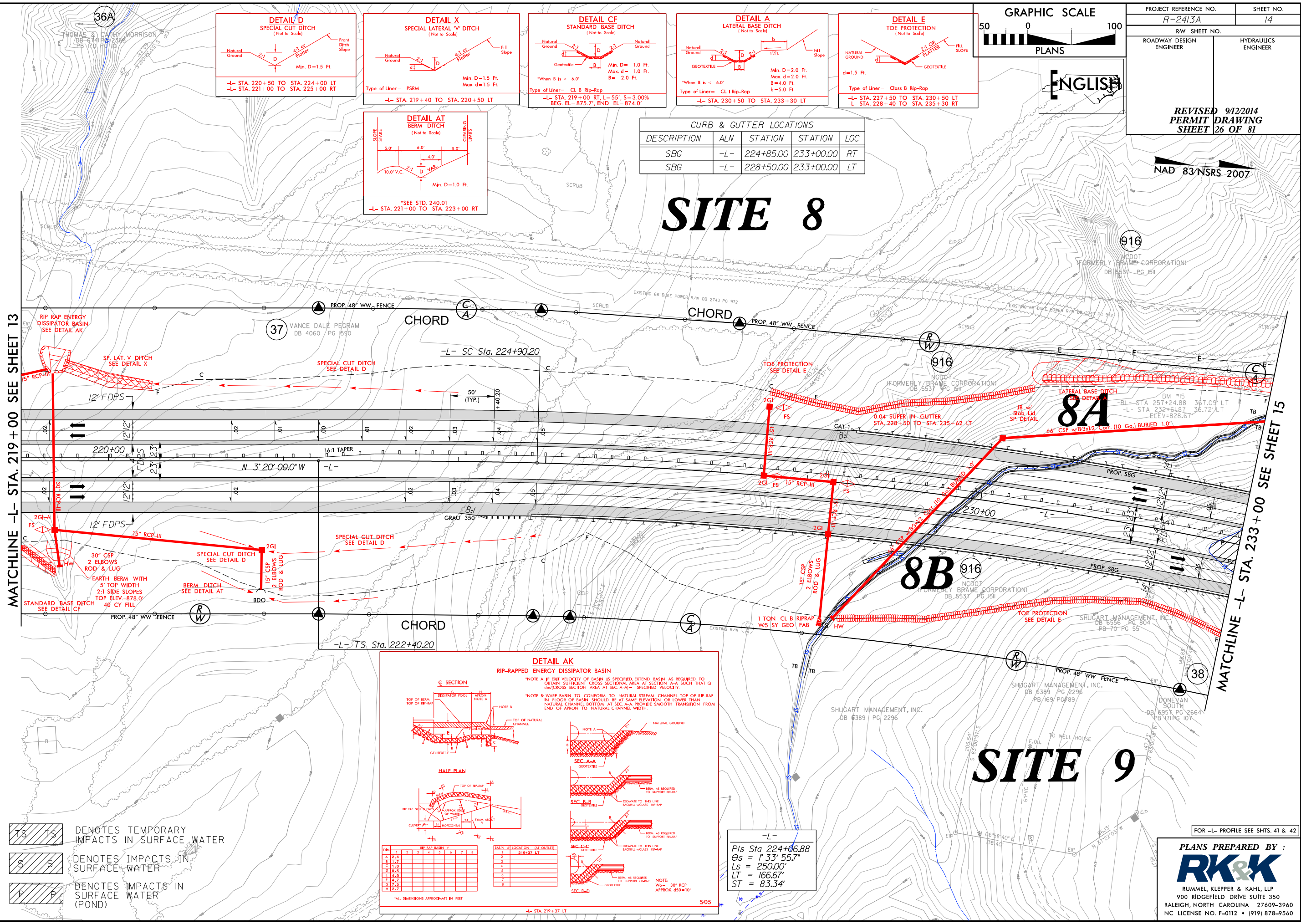


PROFILE

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34429.1.1 (R-2413A)
NC 68 CONNECTOR
FROM FOUR LANES AT
SR 2011 TO SR 2127
PERMIT DRAWING
SHEET 24 OF 81
2 / 13 / 13

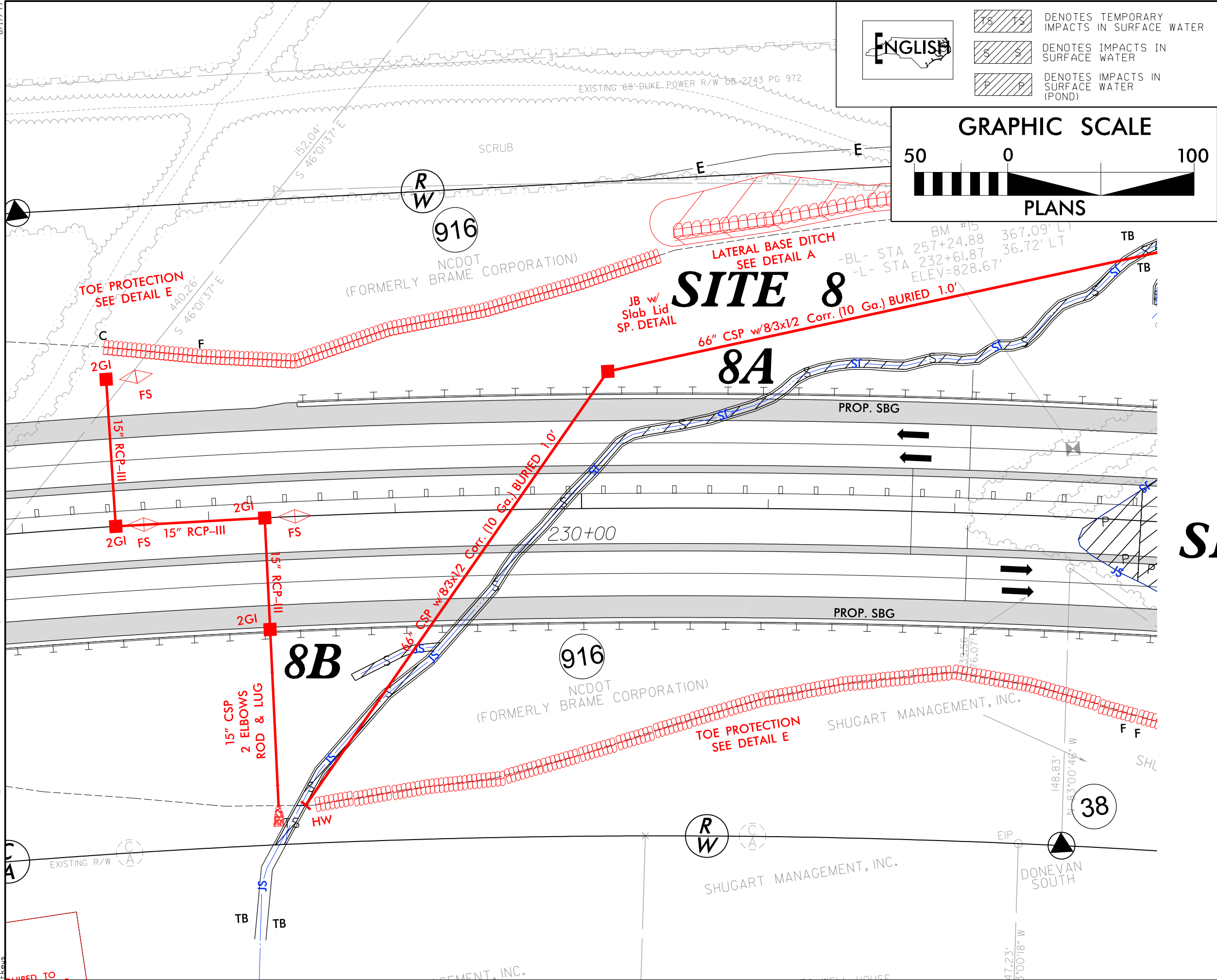


8/17/99
8/10/2014
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E:\Users\jlewis

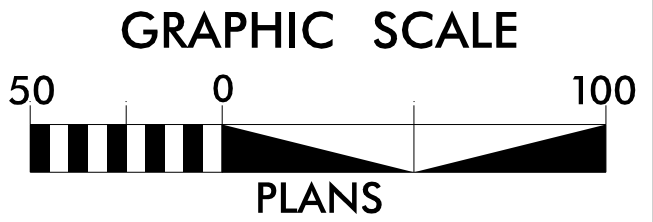


8/17/99

8/10/2014 R:\Hydro\Permits\Environmental\Drawings\NR-2413A\NR2413a_HYD_PRM_WET_psh14A.dgn



TS	TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
S	S	DENOTES IMPACTS IN SURFACE WATER
P	P	DENOTES IMPACTS IN SURFACE WATER (POND)

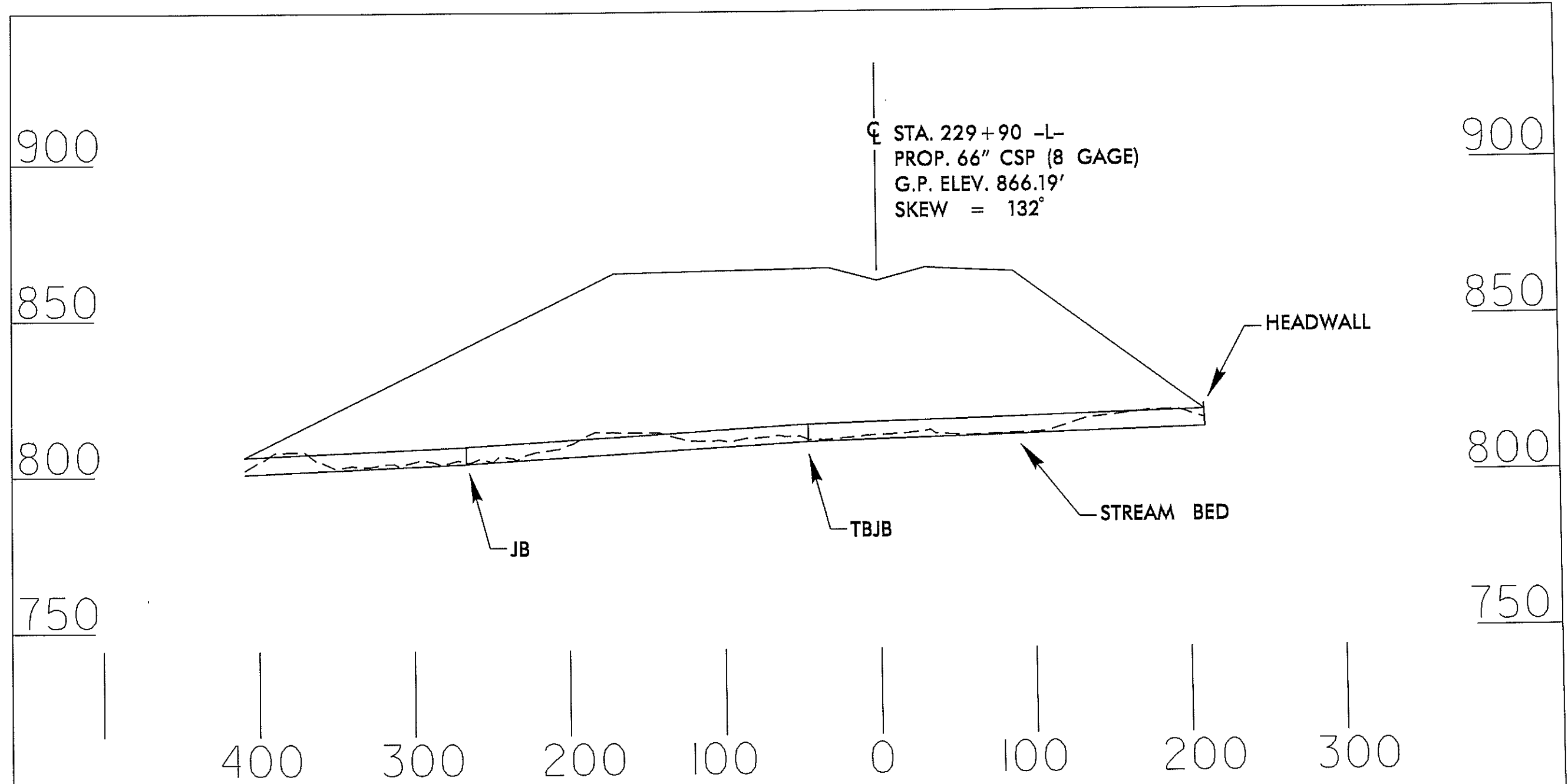


PROJECT REFERENCE NO.	SHEET NO.
R-2413A	14A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
REVISED PERMIT SHEET	9/12/2014 DRAWING 27 OF 81

NAD 83/NSRS 2007

SITE 9

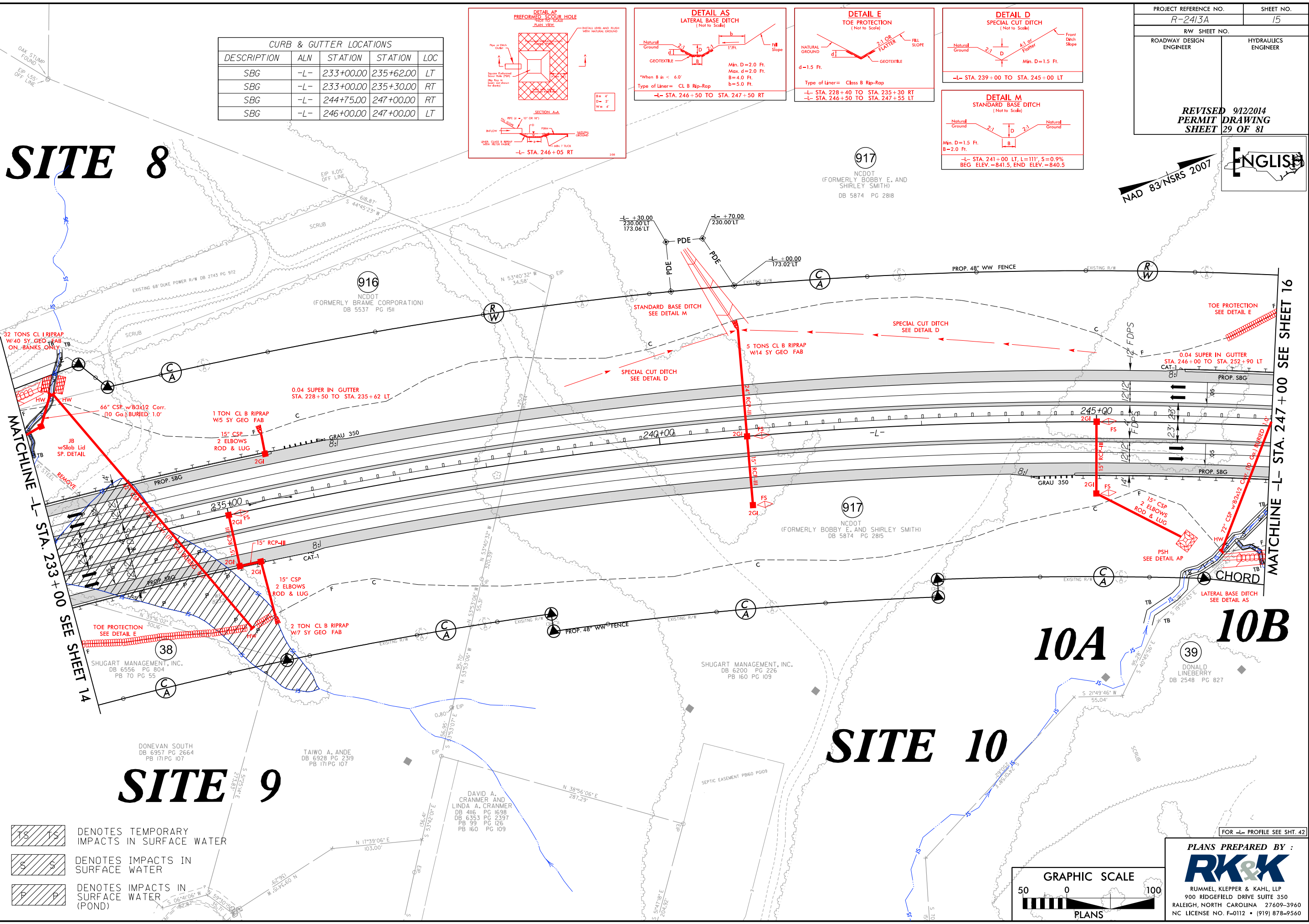
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560



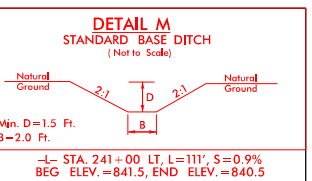
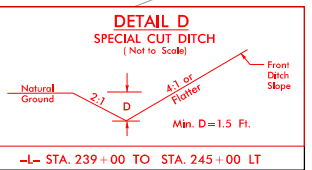
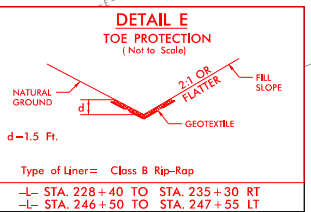
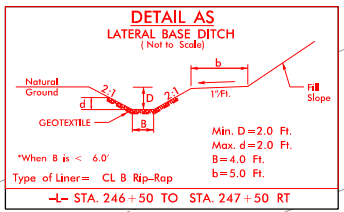
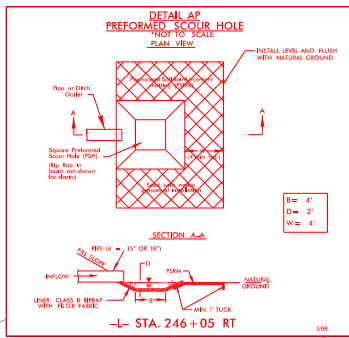
PROFILE

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34429.1.1 (R-2413A)
NC 68 CONNECTOR
FROM FOUR LANES AT
SR 2011 TO SR 2127
PERMIT DRAWING
SHEET 28 OF 81
2 / 13 / 13

8/17/99
8/10/2014
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E:\Users\jlewis



CURB & GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	233+00.00	235+62.00	LT
SBG	-L-	233+00.00	235+30.00	RT
SBG	-L-	244+75.00	247+00.00	RT
SBG	-L-	246+00.00	247+00.00	LT



PROJECT REFERENCE NO.
R-2413A

SHEET NO.
15

RW SHEET NO.

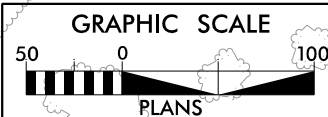
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

REVISED 9/12/2014
PERMIT DRAWING
SHEET 29 OF 81

ENGLISH

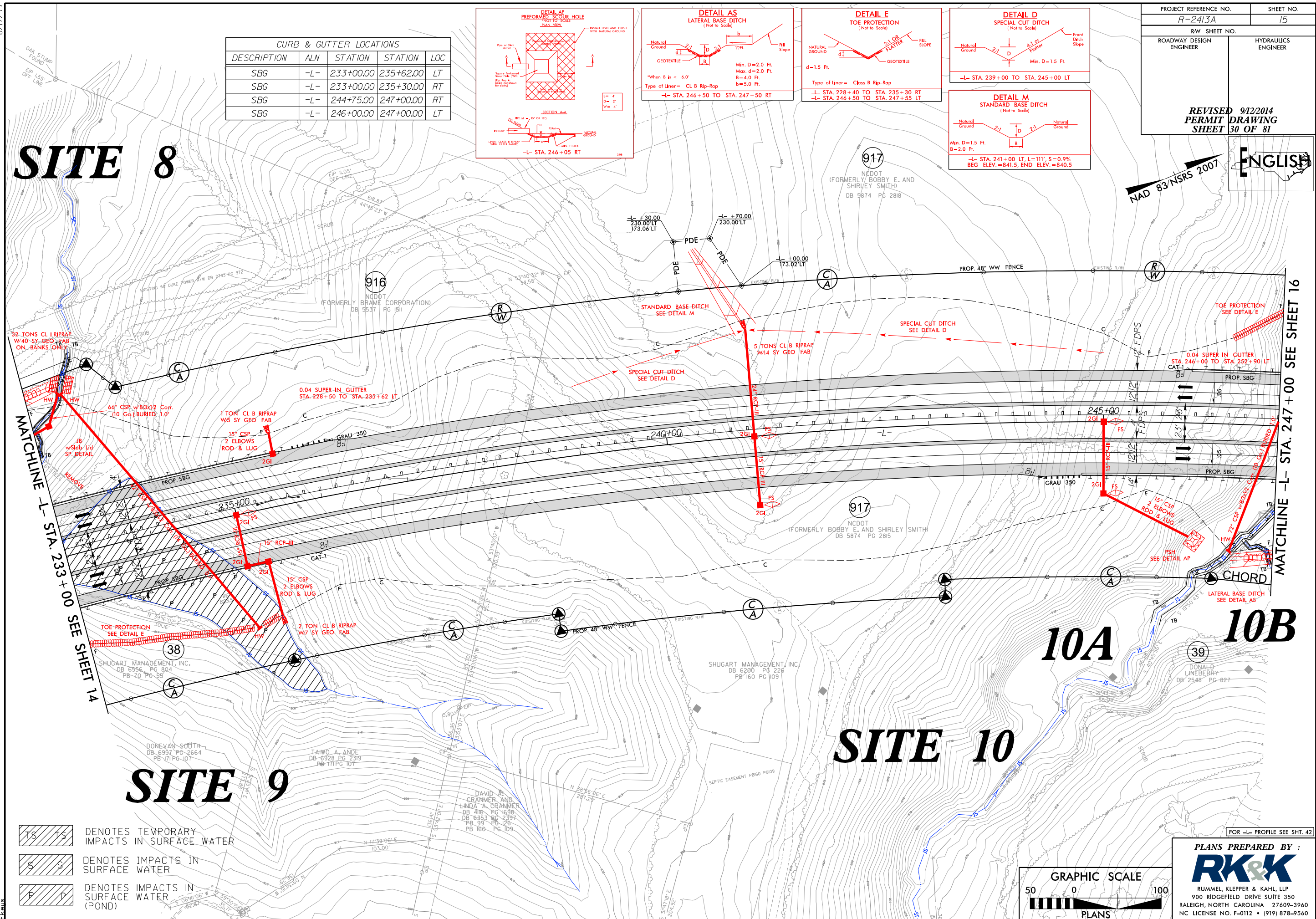
- TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S DENOTES IMPACTS IN SURFACE WATER
- P P DENOTES IMPACTS IN SURFACE WATER (POND)



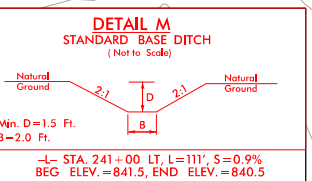
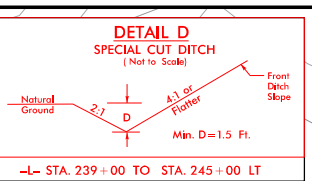
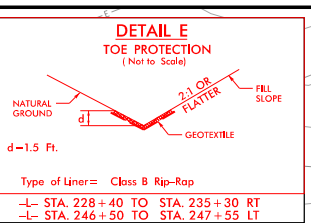
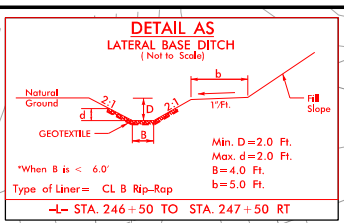
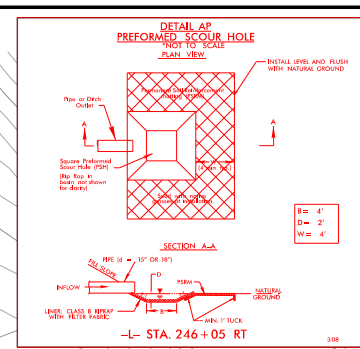
PLANS PREPARED BY :
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RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
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NC LICENSE NO. F-0112 • (919) 878-9560

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CURB & GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	233+00.00	235+62.00	LT
SBG	-L-	233+00.00	235+30.00	RT
SBG	-L-	244+75.00	247+00.00	RT
SBG	-L-	246+00.00	247+00.00	LT



PROJECT REFERENCE NO.
R-2413A

SHEET NO.
15

RW SHEET NO.

ROADWAY DESIGN ENGINEER

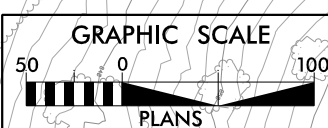
HYDRAULICS ENGINEER

REVISED 9/12/2014
PERMIT DRAWING
SHEET 30 OF 81

NAD 83 NSRS 2007

ENGLISH

- TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S DENOTES IMPACTS IN SURFACE WATER
- P P DENOTES IMPACTS IN SURFACE WATER (POND)



PLANS PREPARED BY :

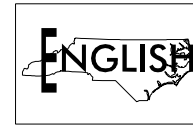
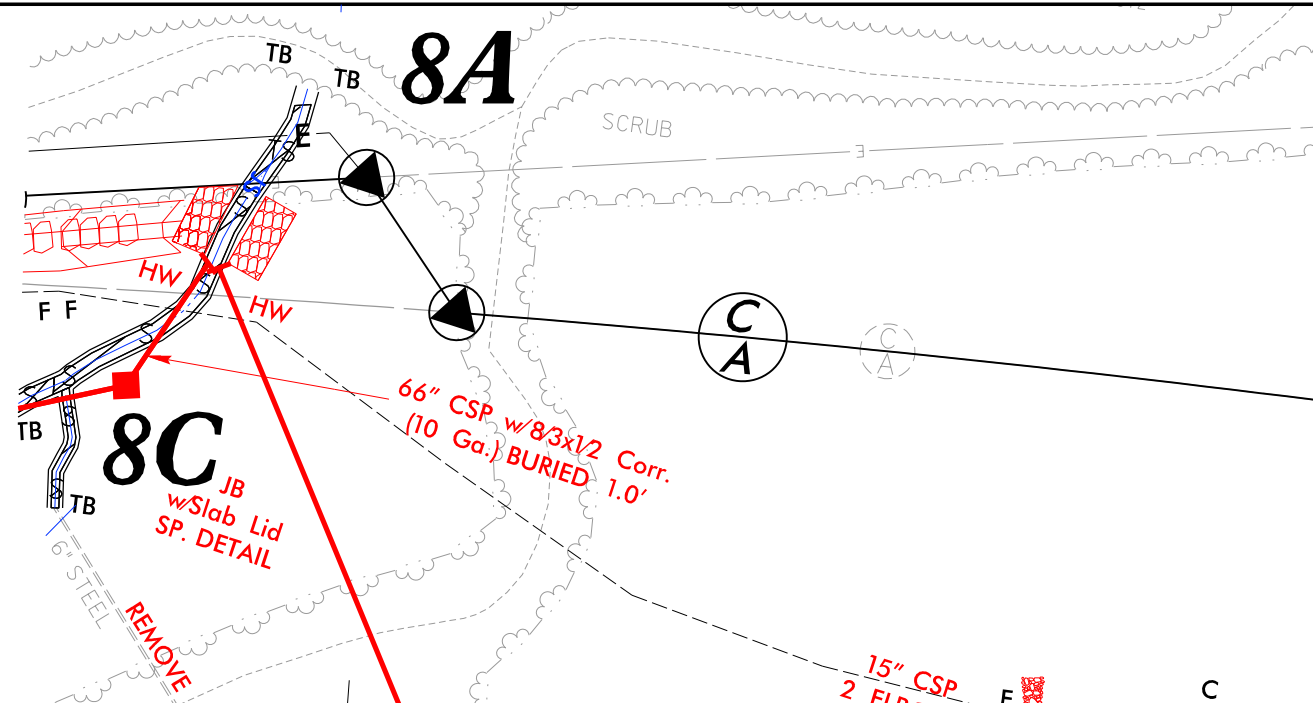
RK&K

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900 RIDGEFIELD DRIVE SUITE 350
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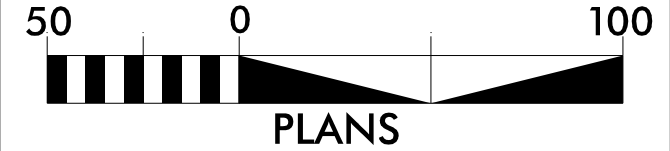
SITE 8

8A



- TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S DENOTES IMPACTS IN SURFACE WATER
- P P DENOTES IMPACTS IN SURFACE WATER (POND)

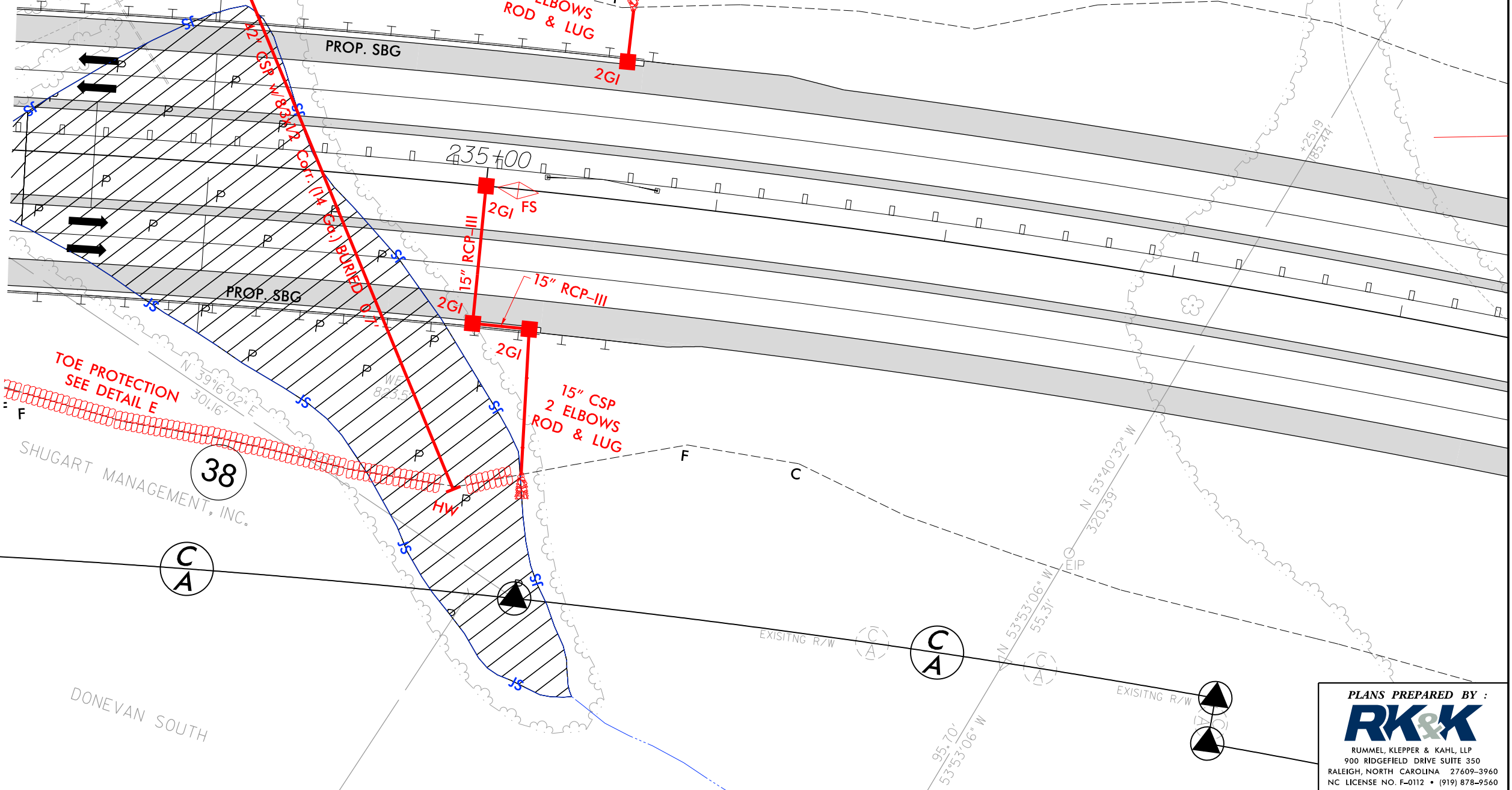
GRAPHIC SCALE



PROJECT REFERENCE NO. R-2413A		SHEET NO. 15A	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		REVISED 9/12/2014 PERMIT DRAWING SHEET 31 OF 81	

NAD 83/NSRS 2007

SITE 9



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8/10/2014
B:\Hydraulics\PERMITS\Environmental\Drawings\2413A\2413a_HYD_PRM_WET_psh16.dgn
E:\psh16

GRAPHIC SCALE
50 0 100
PLANS
ENGLISH

DETAIL AS
LATERAL BASE DITCH
(Not to Scale)

Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=5.0 Ft.
b=5.0 Ft.

*When B is < 6.0'

Type of Liner = CL B Rip-Rap

—L- STA. 245+50 TO STA. 247+50 RT
—L- STA. 247+60 TO STA. 249+50 LT

DETAIL Q
BERM "V" DITCH
(Not to Scale)

Min. D=1.0 Ft.
b=5.0 Ft.

—L- STA. 258+90 TO STA. 264+90 RT

DETAIL E
TOE PROTECTION
(Not to Scale)

d=1.5 Ft.

Type of Liner = Class B Rip-Rap

—L- STA. 246+50 TO STA. 247+55 LT
—L- STA. 249+50 TO STA. 251+80 LT
—L- STA. 249+60 TO STA. 251+30 RT

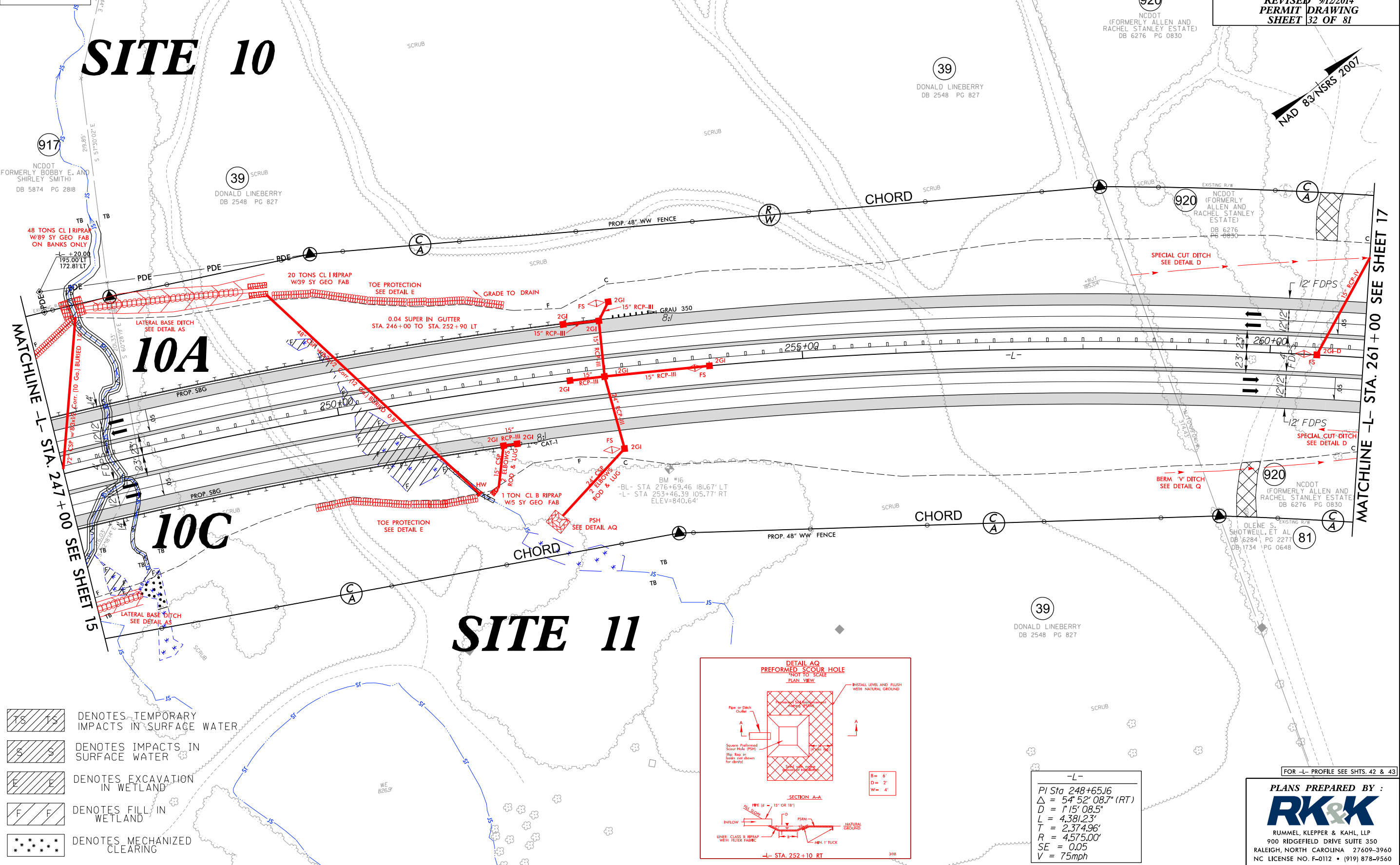
DETAIL D
SPECIAL CUT DITCH
(Not to Scale)

Min. D=1.5 Ft.

—L- STA. 258+50 TO STA. 261+00 LT
—L- STA. 260+50 TO STA. 266+00 RT

CURB & GUTTER LOCATIONS			
DESCRIPTION	ALN	STATION	LOC
SBG	-L-	247+00.00	252+90.00 LT
SBG	-L-	247+00.00	251+90.00 RT

PROJECT REFERENCE NO. R-2413A
SHEET NO. 16
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
REVISED 9/12/2014
PERMIT DRAWING
SHEET 32 OF 81



DETAIL AQ
PREFORMED SCOUR HOLE
(NOT TO SCALE)
PLAN VIEW

SECTION A-A

—L- STA. 252+10 RT

—L—
PI Sta 248+65.16
 $\Delta = 54^\circ 52' 08.7''$ (RT)
D = 1' 15" 08.5"
L = 4,381.23'
T = 2,374.96'
R = 4,575.00'
SE = 0.05
V = 75mph

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8/10/2014
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R:\Hydraulics\PERMITS\Environmental\Drawings\2413A\2413a_HYD_PRM_WET_psh16_con.dgn

GRAPHIC SCALE
50 0 100
PLANS
ENGLISH

DETAIL AS
LATERAL BASE DITCH
(Not to Scale)
Natural Ground
Geotextile
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=4.0 Ft.
b=5.0 Ft.
*When B is < 6.0'
Type of Liner= CL B Rip-Rap
-L- STA. 245+50 TO STA. 247+50 RT
-L- STA. 247+60 TO STA. 249+50 LT

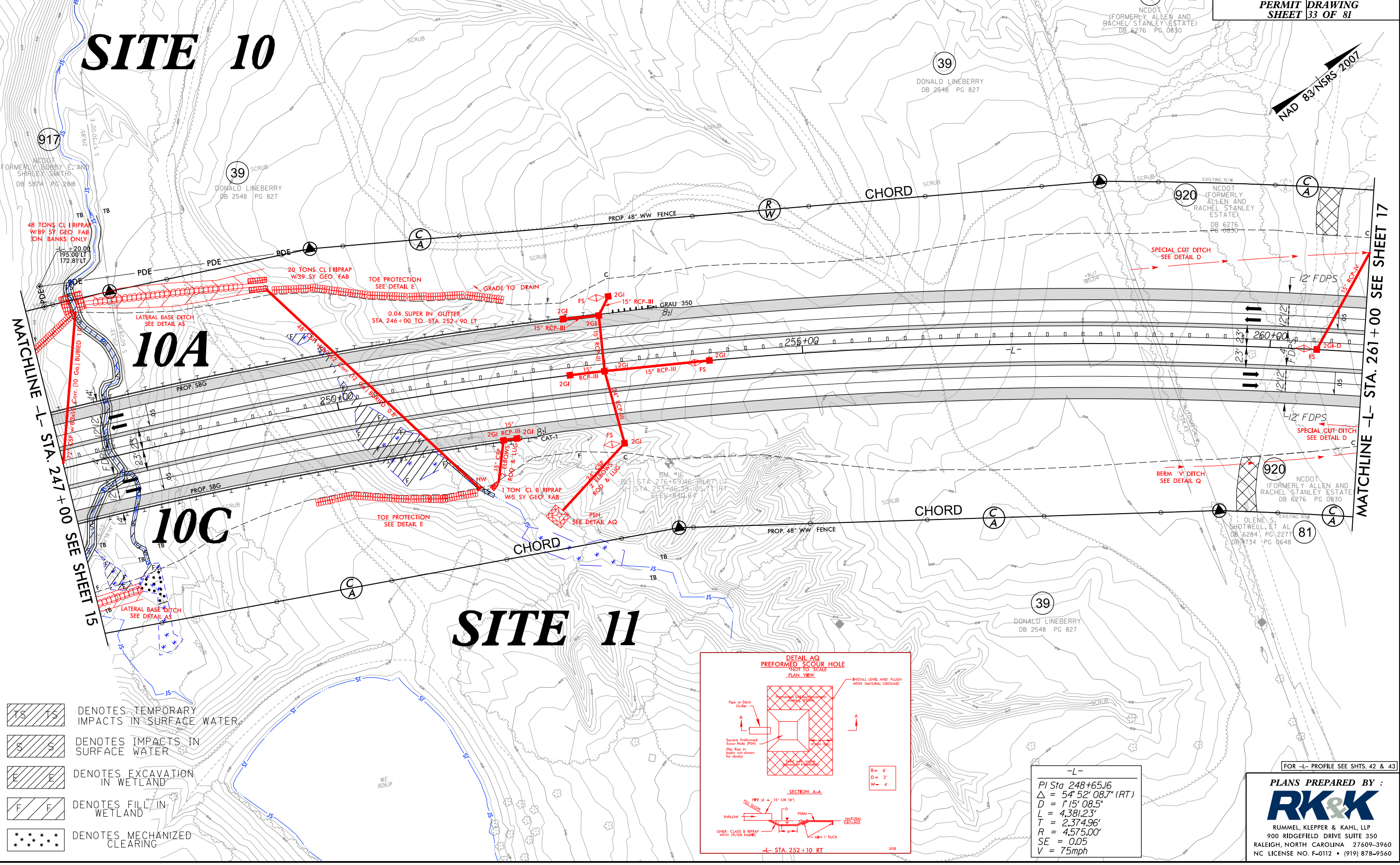
DETAIL Q
BERM "V" DITCH
(Not to Scale)
Natural Ground
Min. D=1.0 Ft.
b=5.0 Ft.
-L- STA. 258+90 TO STA. 264+90 RT

DETAIL E
TOE PROTECTION
(Not to Scale)
Natural Ground
d=1.5 Ft.
Type of Liner= Class B Rip-Rap
-L- STA. 246+50 TO STA. 247+55 LT
-L- STA. 249+50 TO STA. 251+80 LT
-L- STA. 249+60 TO STA. 251+30 RT

DETAIL D
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
Min. D=1.5 Ft.
-L- STA. 258+50 TO STA. 261+00 LT
-L- STA. 260+50 TO STA. 266+00 RT

CURB & GUTTER LOCATIONS			
DESCRIPTION	ALN	STATION	STATION LOC
SBG	-L-	247+00.00	252+90.00 LT
SBG	-L-	247+00.00	251+90.00 RT

PROJECT REFERENCE NO. R-2413A
SHEET NO. 16
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
REVISED 9/12/2014
PERMIT DRAWING
SHEET 33 OF 81

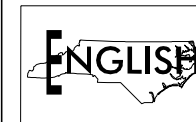


- TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S DENOTES IMPACTS IN SURFACE WATER
- E E DENOTES EXCAVATION IN WETLAND
- F F DENOTES FILL-IN WETLAND
- * * * * * DENOTES MECHANIZED CLEARING

DETAIL AQ
PREFORMED SCOUR HOLE
(NOT TO SCALE)
PLAN VIEW
INSTALL LEVEL AND FLUSH WITH NATURAL GROUND
SECTION A-A
-L- STA. 252+10 RT

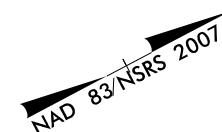
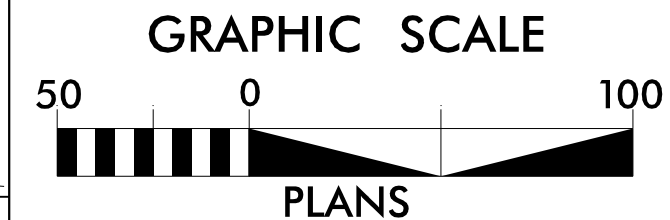
-L-
PI Sta 248+65J6
 $\Delta = 54' 52'' 08.7'' (RT)$
 $D = 1' 15'' 08.5''$
 $L = 4.38123'$
 $T = 2.37496'$
 $R = 4.57500'$
 $SE = 0.05$
 $V = 75mph$

FOR -L- PROFILE SEE SHTS. 42 & 43
PLANS PREPARED BY :
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	DENOTES EXCAVATION IN WETLAND
	DENOTES FILL IN WETLAND
	DENOTES MECHANIZED CLEARING

 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 DENOTES IMPACTS IN SURFACE WATER



SITE 10

48 TONS CL I RIPRAP
W/89 SY GEO FAB
ON BANKS ONLY

20 TONS CL I RIPRAP
W/39 SY GEO FAB

TOE PROTECTION
SEE DETAIL E

0.04 SUPER IN GUTTER
STA. 246+00 TO STA. 252+90 LT

GRADE TO DRAIN

0.04 SUPER IN GUTTER
STA. 246+00 TO STA. 252+90 LT

TOE PROTECTION
SEE DETAIL E

LATERAL BASE DITCH
SEE DETAIL AS

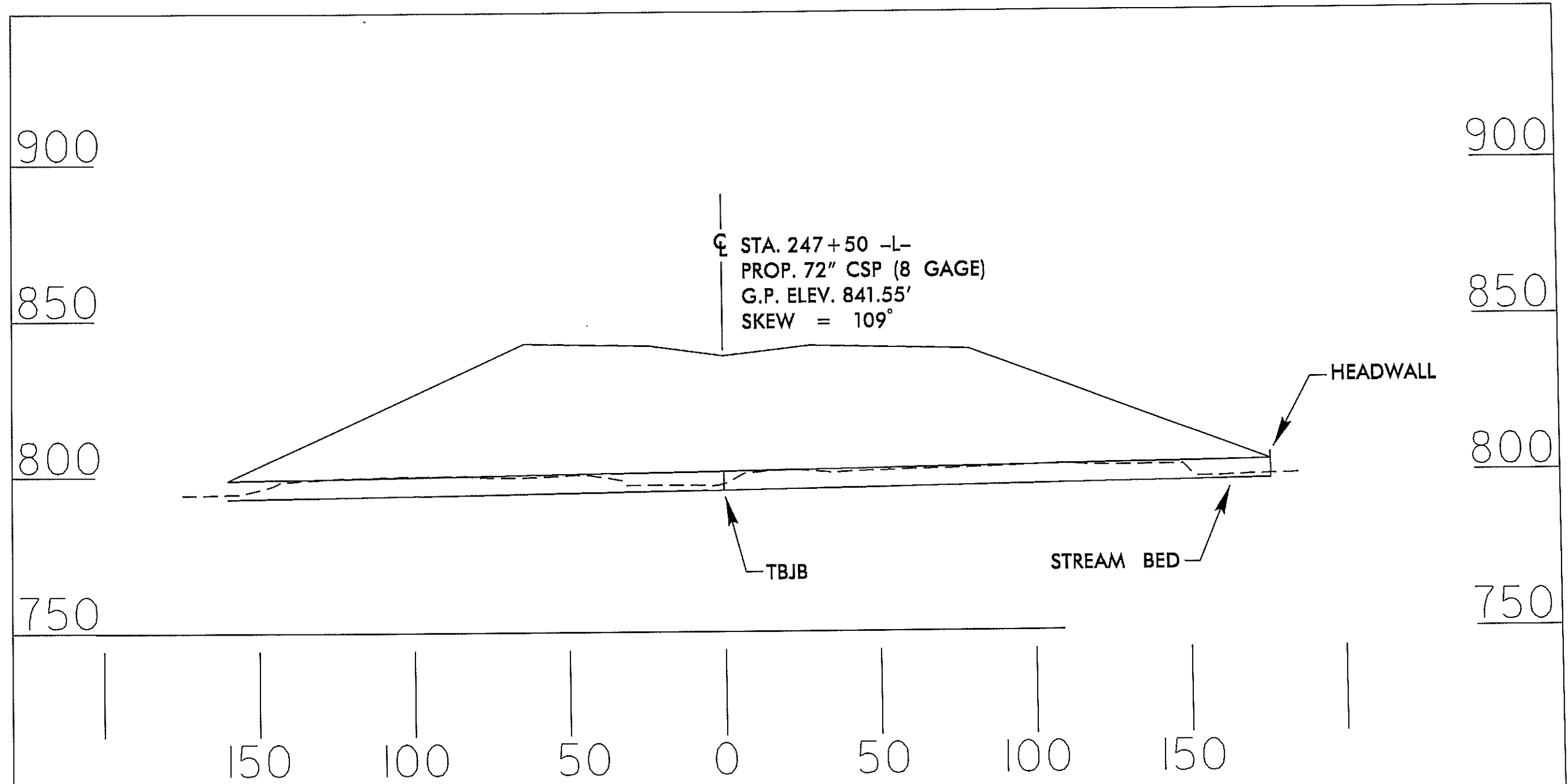
10C

SITE 11

10A

10B

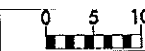
PLANS PREPARED BY :
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900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560



PROFILE

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34429.1.1 (R-2413A)
NC 68 CONNECTOR
FROM FOUR LANES AT
SR 2011 TO SR 2127
PERMIT DRAWING
SHEET 35 OF 81
2 / 13 / 13

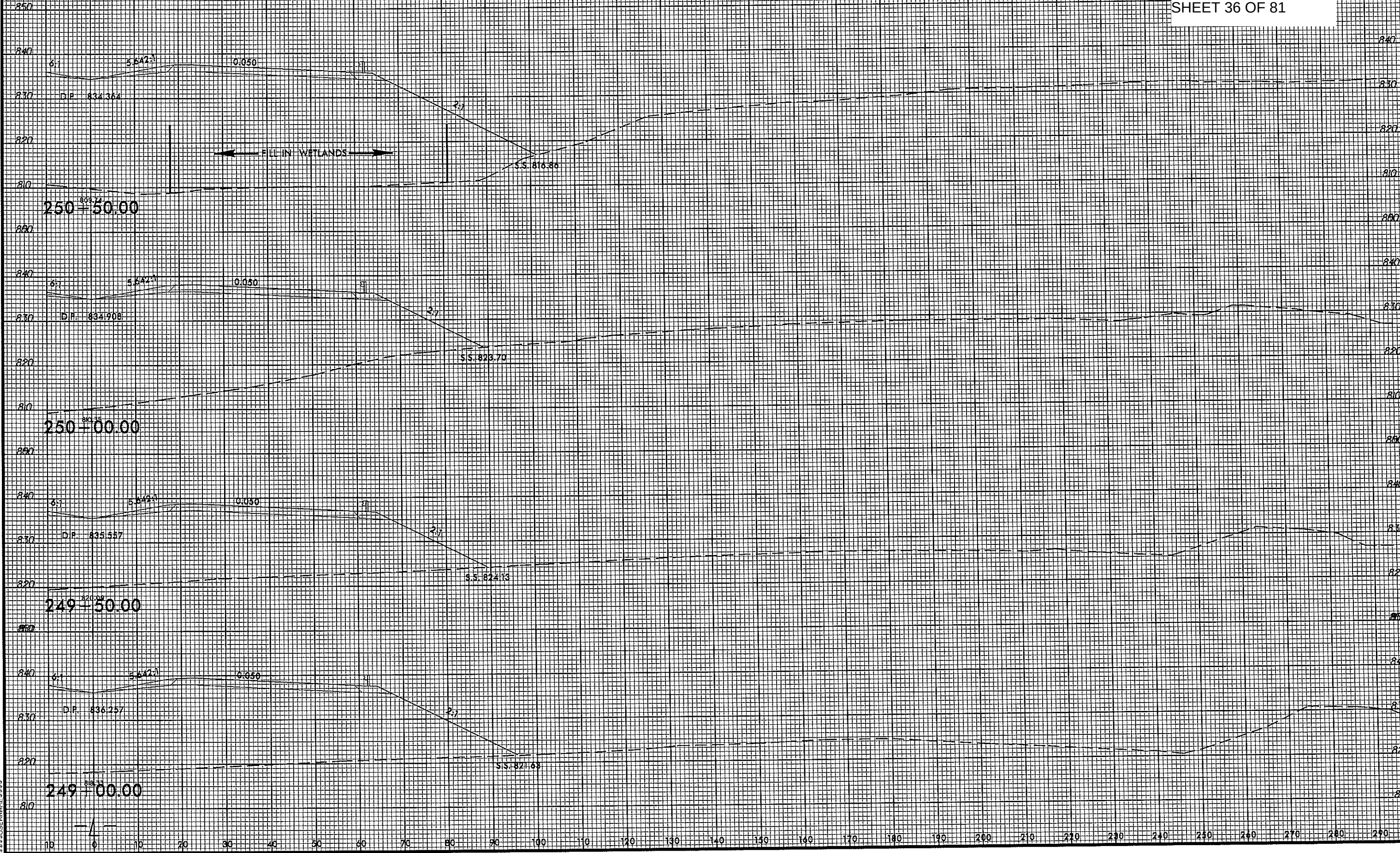
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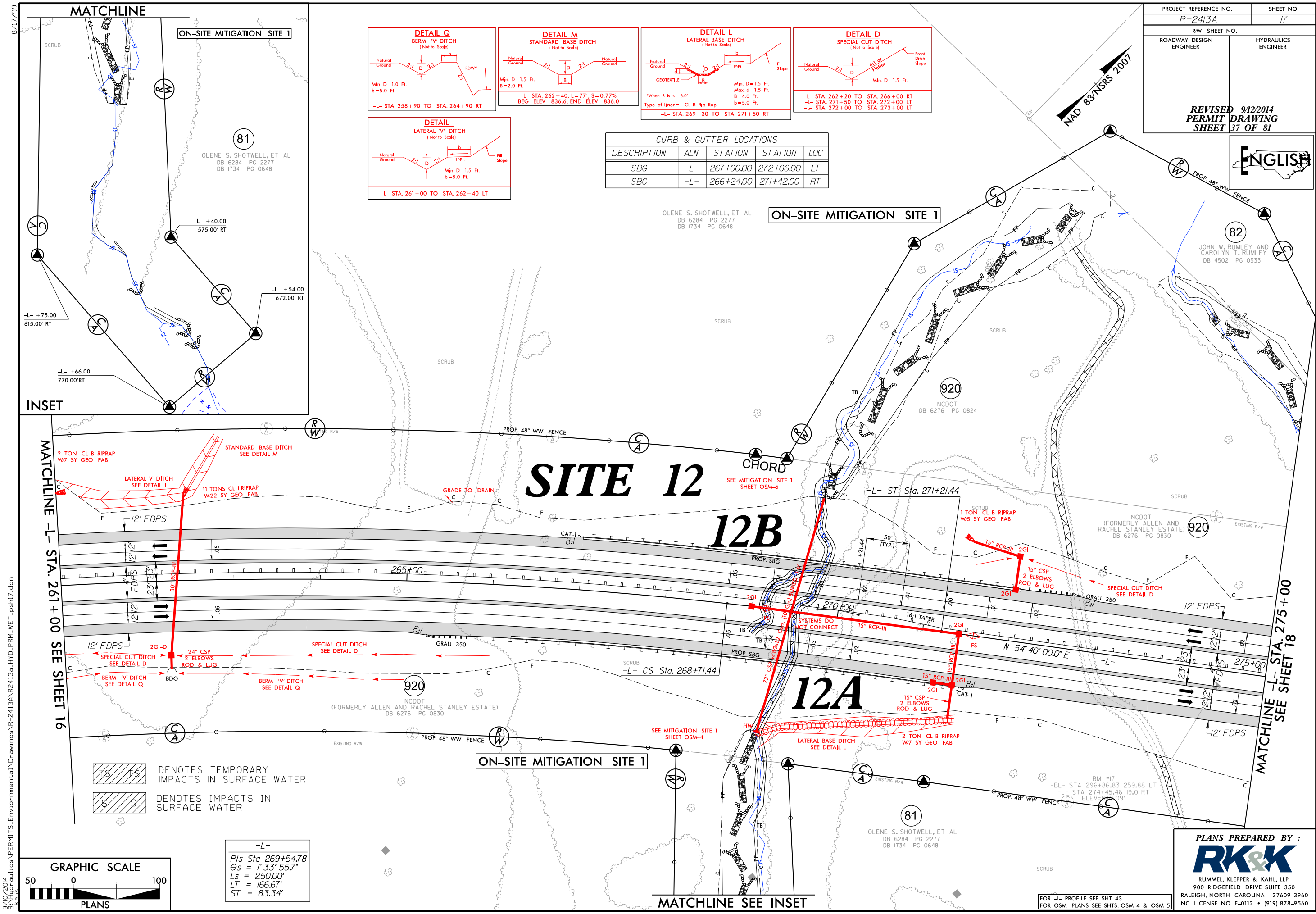


PROJ. REFERENCE NO.
R-2413A

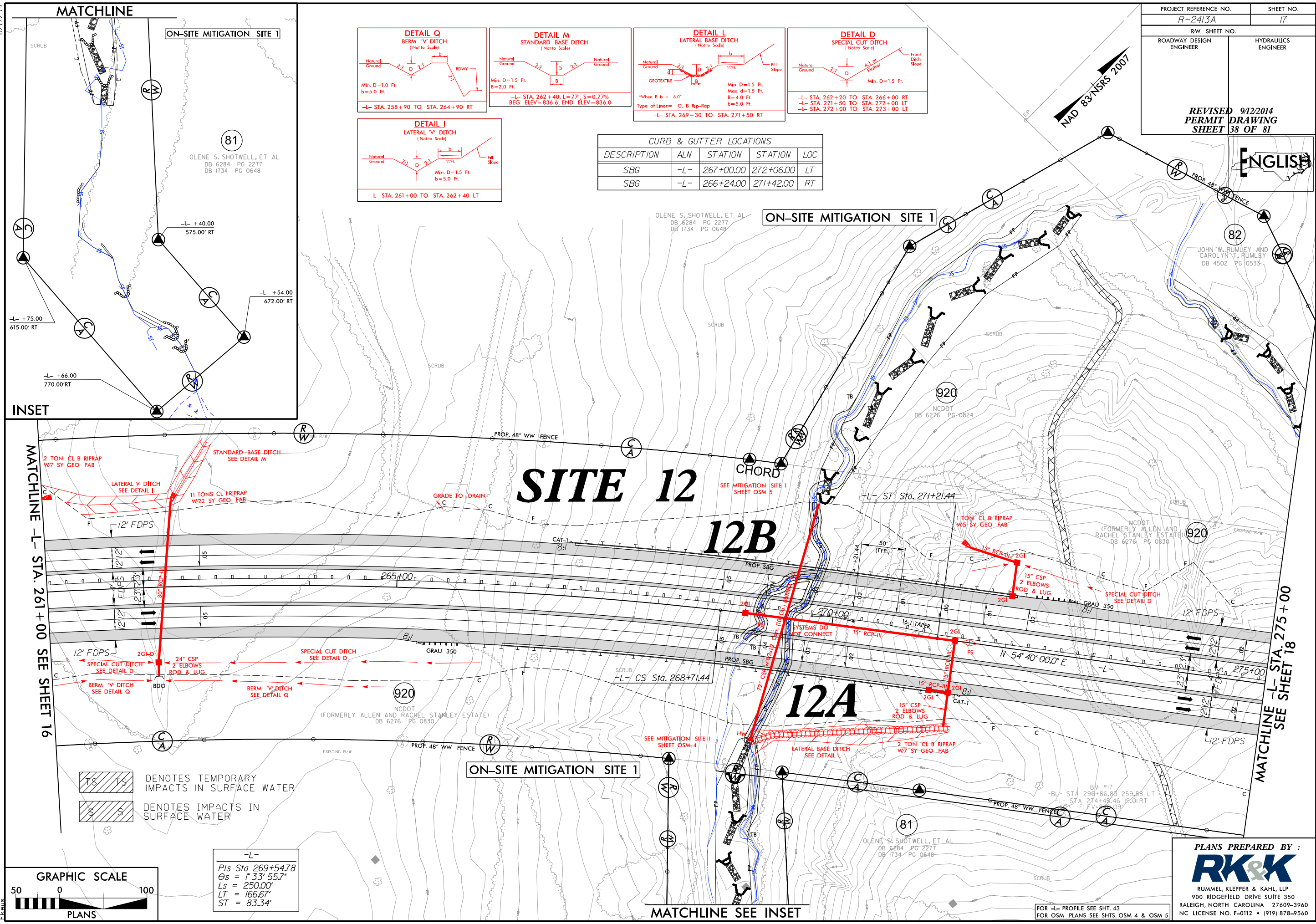
SHEET NO.
X-226

PERMIT DRAWING
SHEET 36 OF 81

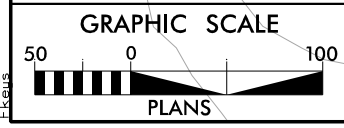




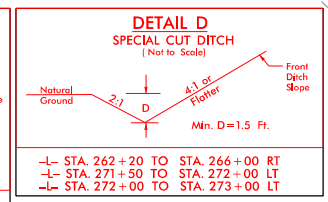
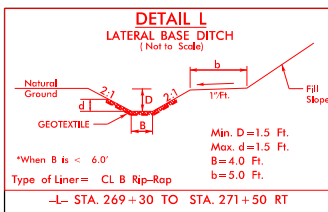
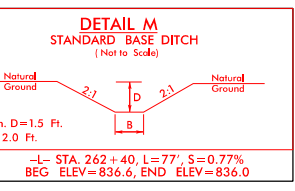
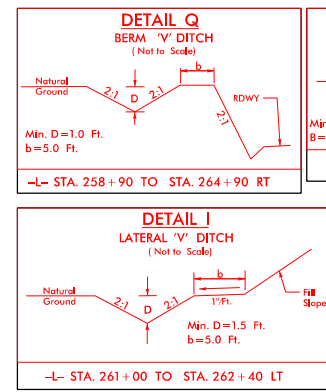
8/17/99
8/10/2014
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RKL



INSET



-L-
Pls Sta 269+54.78
Gs = 1' 33" 55.7"
Ls = 250.00'
LT = 166.67'
ST = 83.34'



CURB & GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	267+00.00	272+06.00	LT
SBG	-L-	266+24.00	271+42.00	RT

PROJECT REFERENCE NO. R-2413A		SHEET NO. 17
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		
REVISED 9/12/2014 PERMIT DRAWING SHEET 38 OF 81		

ENGLISH

MATCHLINE -L- STA. 275+00
SEE SHEET 18

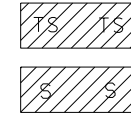
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SITE 12

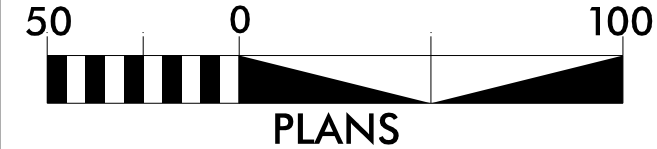
920

NCDOT



DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES IMPACTS IN SURFACE WATER

GRAPHIC SCALE



PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-2413A	17A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISED 9/12/2014
PERMIT DRAWING
SHEET 39 OF 81

NAD 83/NRS 2007

SEE MITIGATION SITE 1
SHEET OSM-5

SCRUB
1 TON CL B RIPRAP
W/5 SY GEO FAB

NCDOT
(FORMERLY ALLEN AND
RACHEL STANLEY ESTATE) 920

EXISTING R/W

12B

PROP. SBG

2GI

TB

TB

PROP. SBG

SYSTEMS DO
NOT CONNECT

15" RCP-III

16:1 TAPER

2GI

FS

15" RCP-III

2GI

15" CSP
2 ELBOWS
ROD & LUG

2 TON CL B RIPRAP
W/7 SY GEO FAB

LATERAL BASE DITCH
SEE DETAIL L

SPECIAL CUT DITCH
SEE DETAIL D

MITIGATION SITE 1
SHEET OSM-4

12A

HW

FP

TB

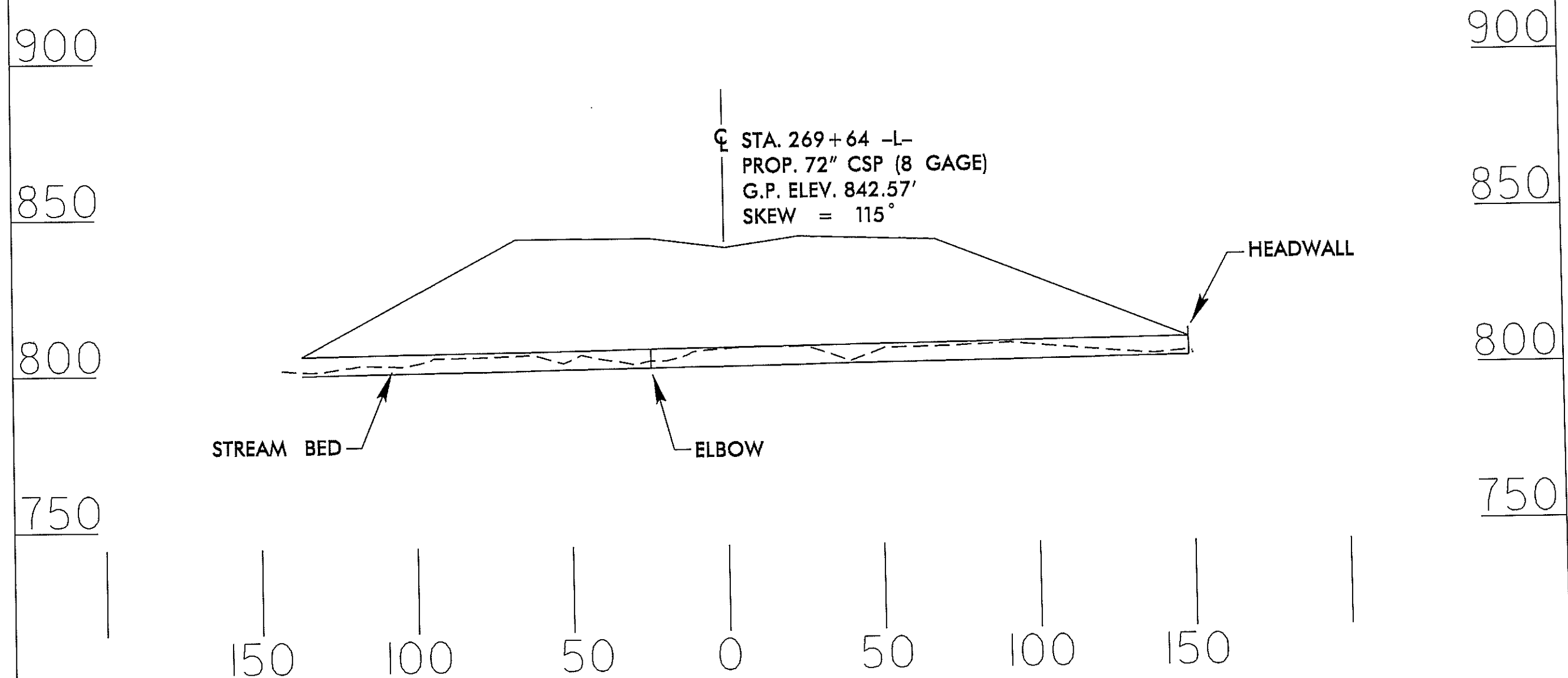
EXISTING R/W

81

OLENE S. SHOTWELL, ET AL

BM #17
-BL- STA 296+86.83 259.88 LT
-L- STA 274+45.46 19.01 RT
ELEV=878.09'

PLANS PREPARED BY :
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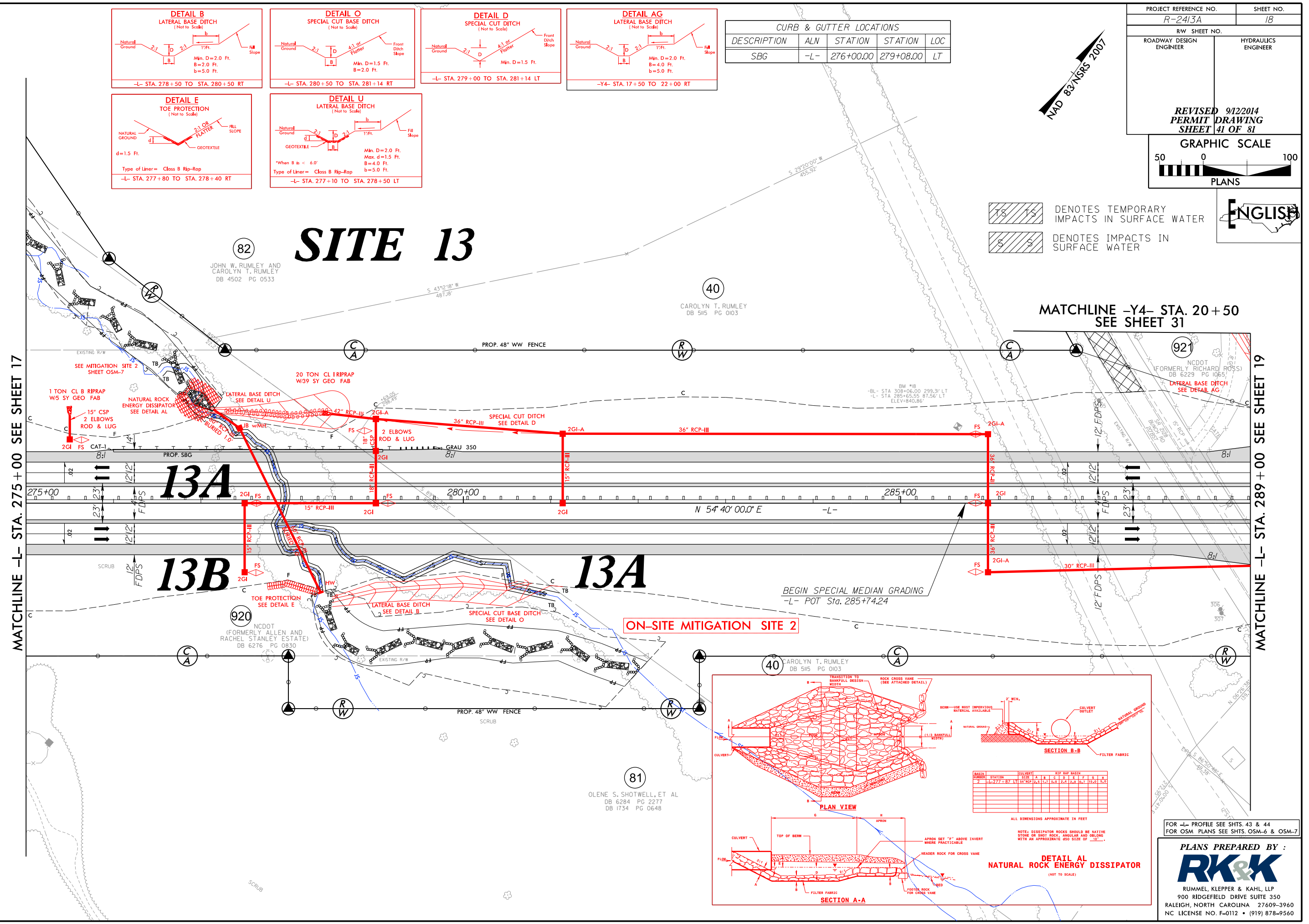
PROFILE

NCDOT
 DIVISION OF HIGHWAYS
 GUILFORD COUNTY
 PROJECT: 34429.1.1 (R-2413A)
 NC 68 CONNECTOR
 FROM FOUR LANES AT
 SR 2011 TO SR 2127

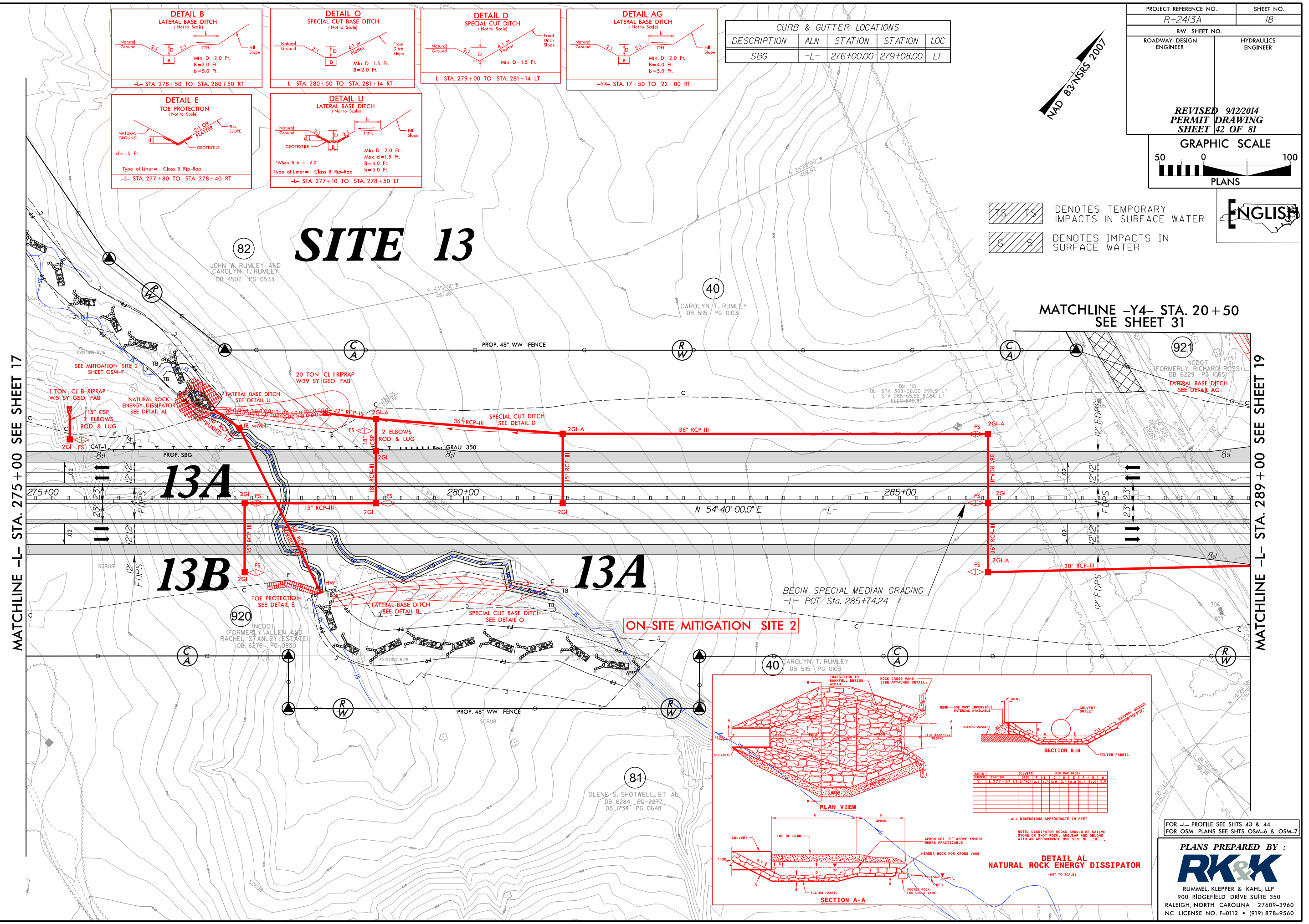
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 SHEET 40 OF 81

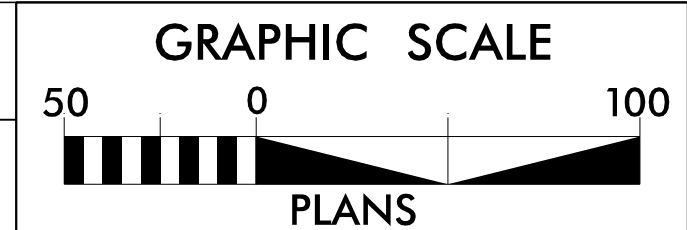
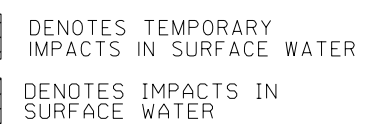
2 / 13 / 13

8/17/99
8/10/2014
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8/17/99
8/10/2014
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20 TON CL I RIPRAP
W/39 SY GEO FAB

1 TON CL B RIPRAP
W/5 SY GEO FAB

NATURAL ROCK
ENERGY DISSIPATOR
SEE DETAIL AL

LATERAL BASE DITCH
SEE DETAIL U

15" CSP
2 ELBOWS
ROD & LUG

2GI FS

PROP. SBG

13A

2GI-A

ELBOWS
OD & LUG

2

36" RCP-III

SPECIAL CUT DITCH
SEE DETAIL D

2GI-A

2GI

15" RCP-III

2G

13B

TOE PROTECTION
SEE DETAIL E

LATERAL BASE DITCH
SEE DETAIL B

SPECIAL CUT BASE DITCH
SEE DETAIL O

ON-SITE

PLANS PREPARED BY :



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NC LICENSE NO. F-0112 • (919) 878-9560

8/17/99
8/10/2014
R:\Hydro\PERMITS\Environmental\Drawings\2413A\2413A_HYD_PRM_WET_psh20.dgn

DETAIL E
TOE PROTECTION
(Not to Scale)

DETAIL M
STANDARD BASE DITCH
(Not to Scale)

DETAIL D
SPECIAL CUT DITCH
(Not to Scale)

DETAIL Z
STANDARD BASE DITCH
(Not to Scale)

DETAIL V
STANDARD BASE DITCH
(Not to Scale)

DETAIL AT
BERM DITCH
(Not to Scale)

DETAIL AM
MEDIAN V DITCH
(Not to Scale)

CURB & GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	303+45.00	310+85.00	RT
SBG	-L-	305+70.00	311+08.00	LT

SITE 14

PROJECT REFERENCE NO.
R-2413A

SHEET NO.
20

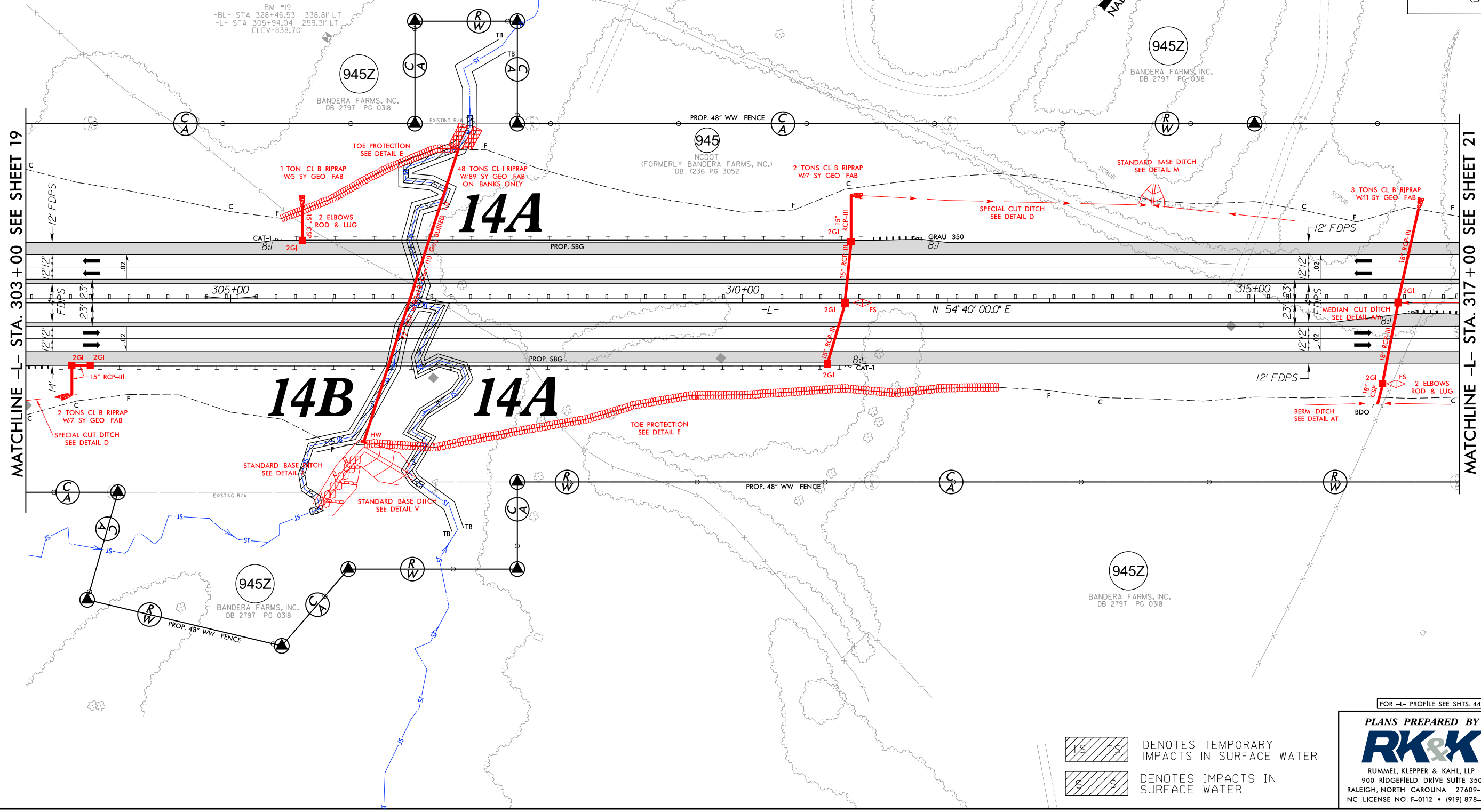
RW SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

REVISED 9/12/2014
PERMIT DRAWING
SHEET 44 OF 81

GRAPHIC SCALE
50 0 100
PLANS
ENGLISH



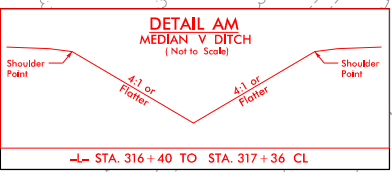
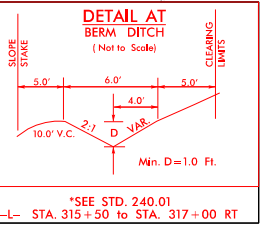
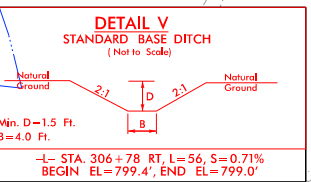
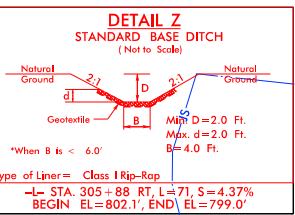
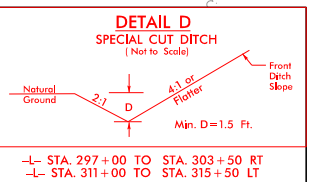
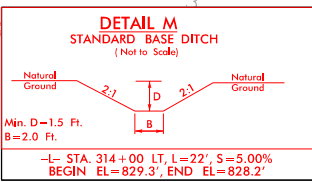
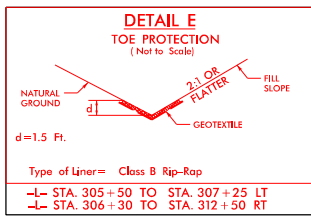
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 DENOTES IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHTS. 44 & 45

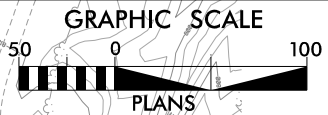
PLANS PREPARED BY :
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8/10/2014
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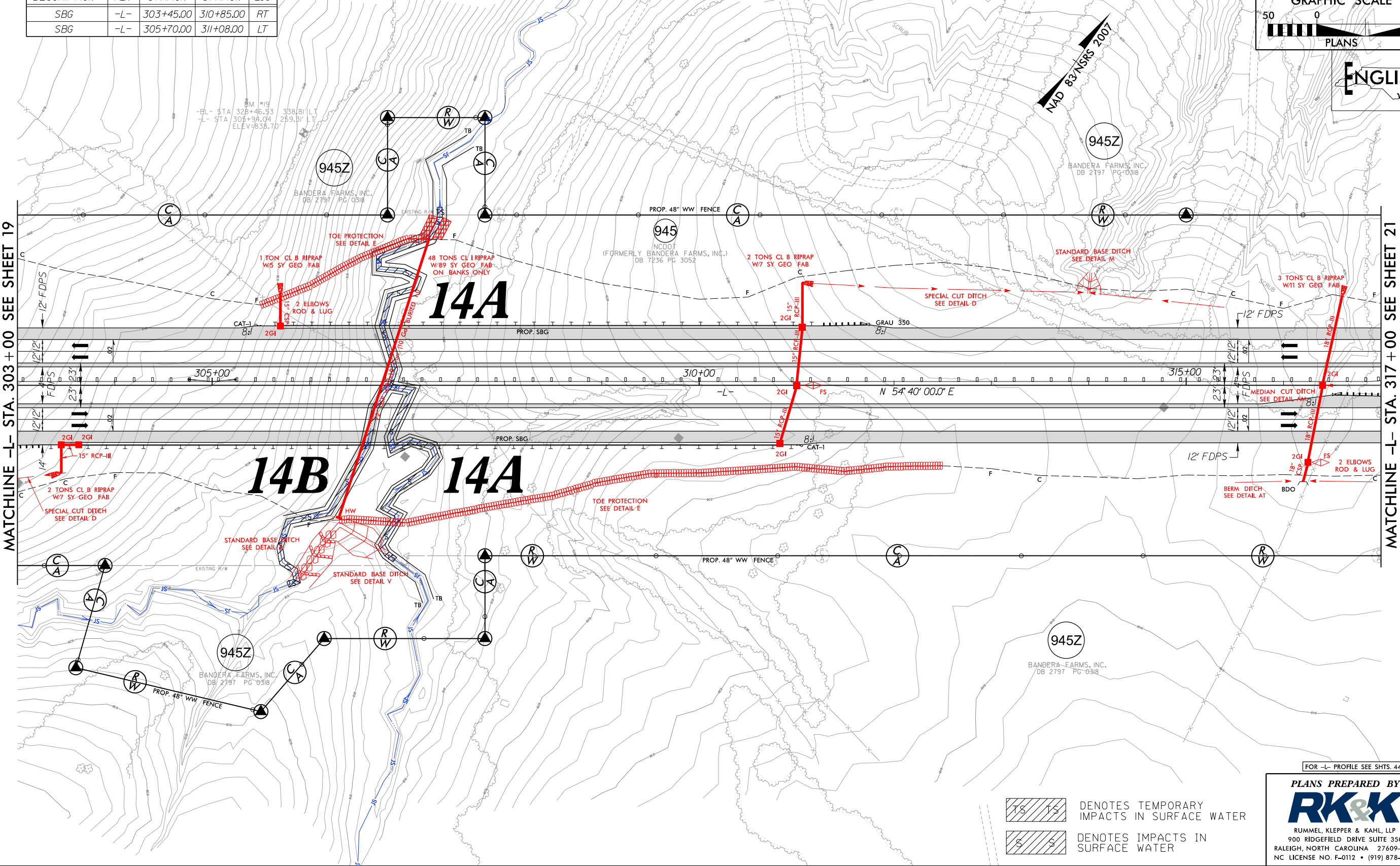


PROJECT REFERENCE NO. R-2413A		SHEET NO. 20
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
REVISED 9/12/2014 PERMIT DRAWING SHEET 45 OF 81		



CURB & GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	303+45.00	310+85.00	RT
SBG	-L-	305+70.00	311+08.00	LT

SITE 14



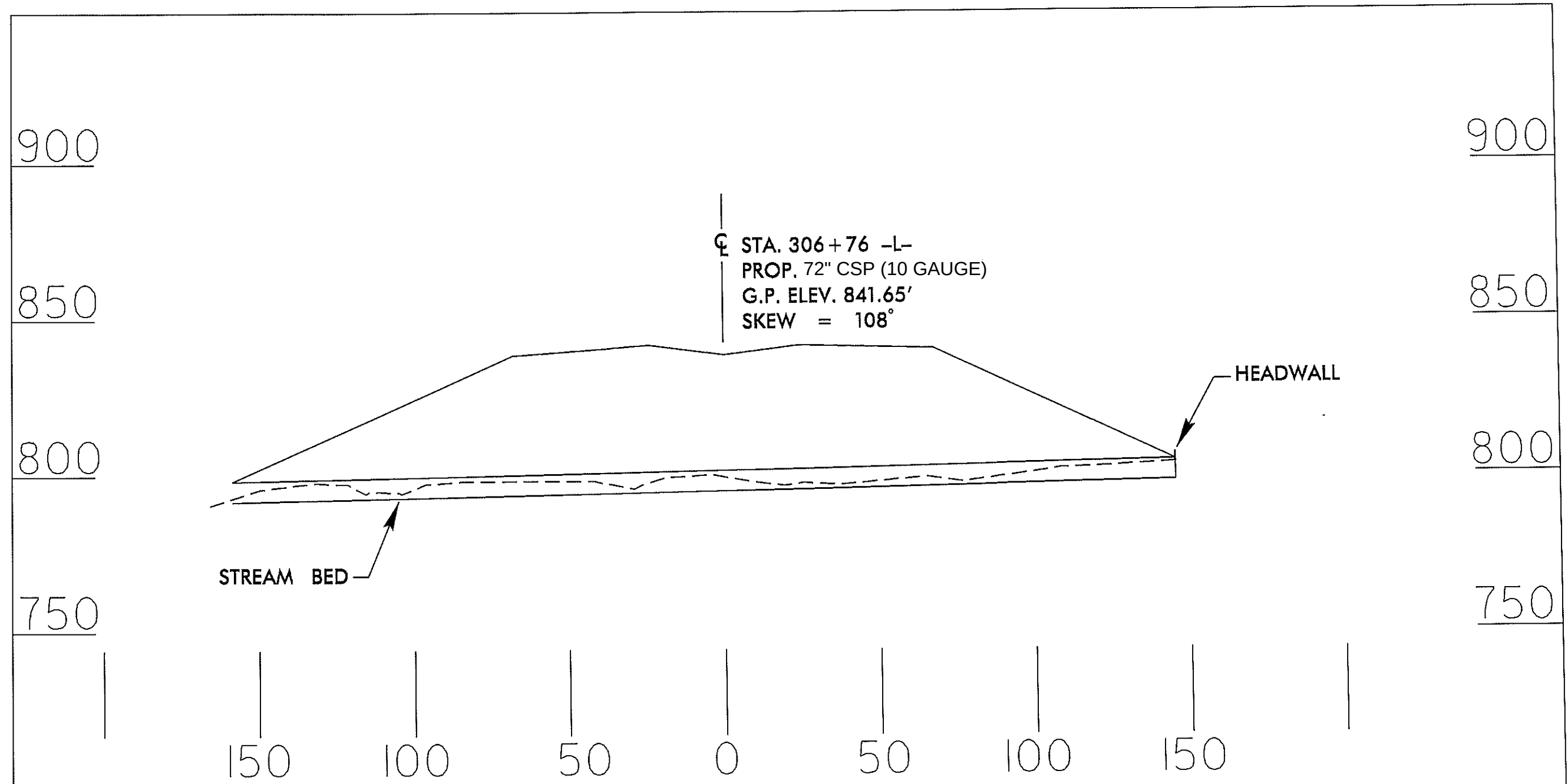
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 DENOTES IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHTS. 44 & 45

PLANS PREPARED BY :
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Timeline of the 19th century:

- 1800
- 1810
- 1820
- 1830
- 1840
- 1850
- 1860
- 1870
- 1880
- 1890
- 1900



PROFILE

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34429.1.1 (R-2413A)
NC 68 CONNECTOR
FROM FOUR LANES AT
SR 2011 TO SR 2127
PERMIT DRAWING
SHEET 47 OF 81
2 / 13 / 13

SITE 16

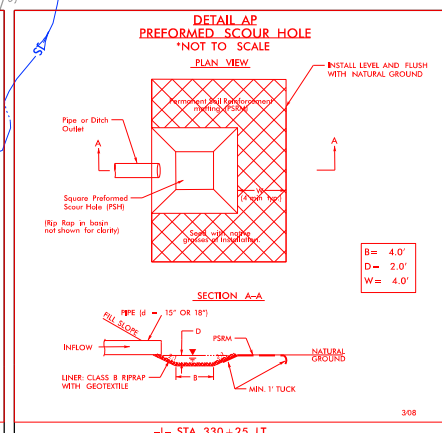
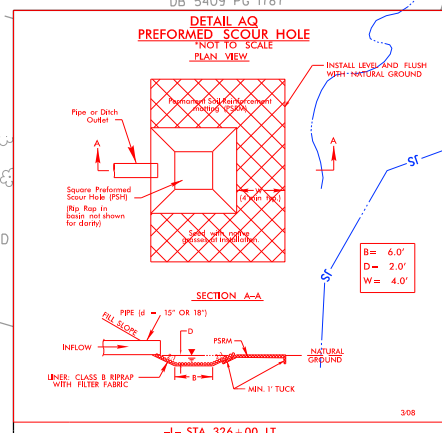
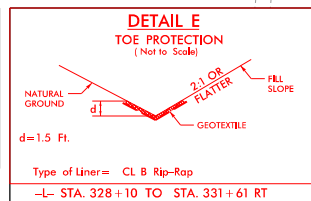
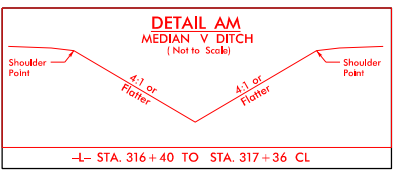
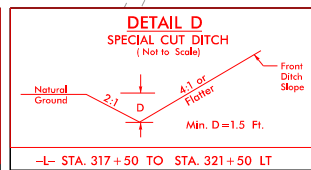
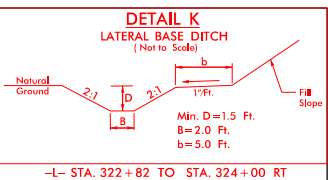
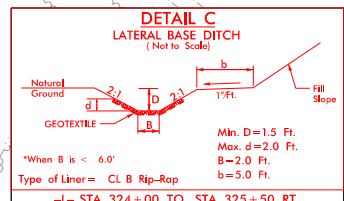
16A

16B

15A

MATCHLINE -L- STA. 331+00 SEE SHEET 22

CURB & GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	320+65.00	331+00.00	RT
SBG	-L-	323+50.00	331+00.00	LT



44
ARTHUR M. IHRIG AND
ANN S. IHRIG
DB 4988 PG 0198

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FOR -L- PROFILE SEE SHT. 4

-L-
Pls Sta 328+62.22
$\theta_s = 1^\circ 49' 54.1''$
$L_s = 250.00'$
$LT = 166.68'$
$ST = 83.34'$

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

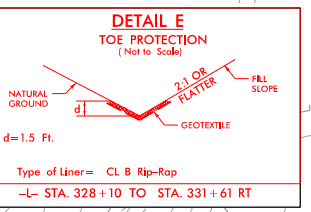
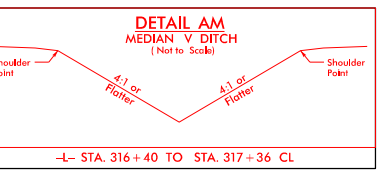
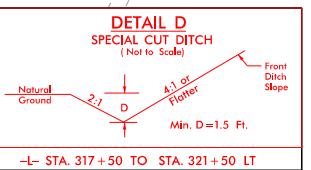
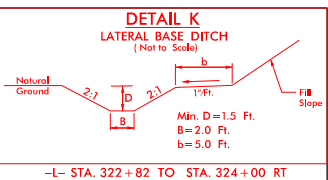
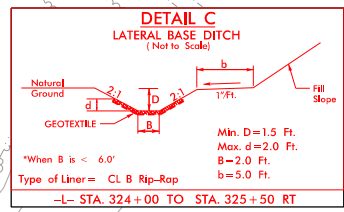
F F DENOTES FILL IN WETLAND

WATCHLINE -L- STA. 317+00 SEE SHEET 20

MATCHLINE - L-51A.331 - 88

8/10/2014
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8/17/99

8/17/99
8/10/2014
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CURB & GUTTER LOCATIONS

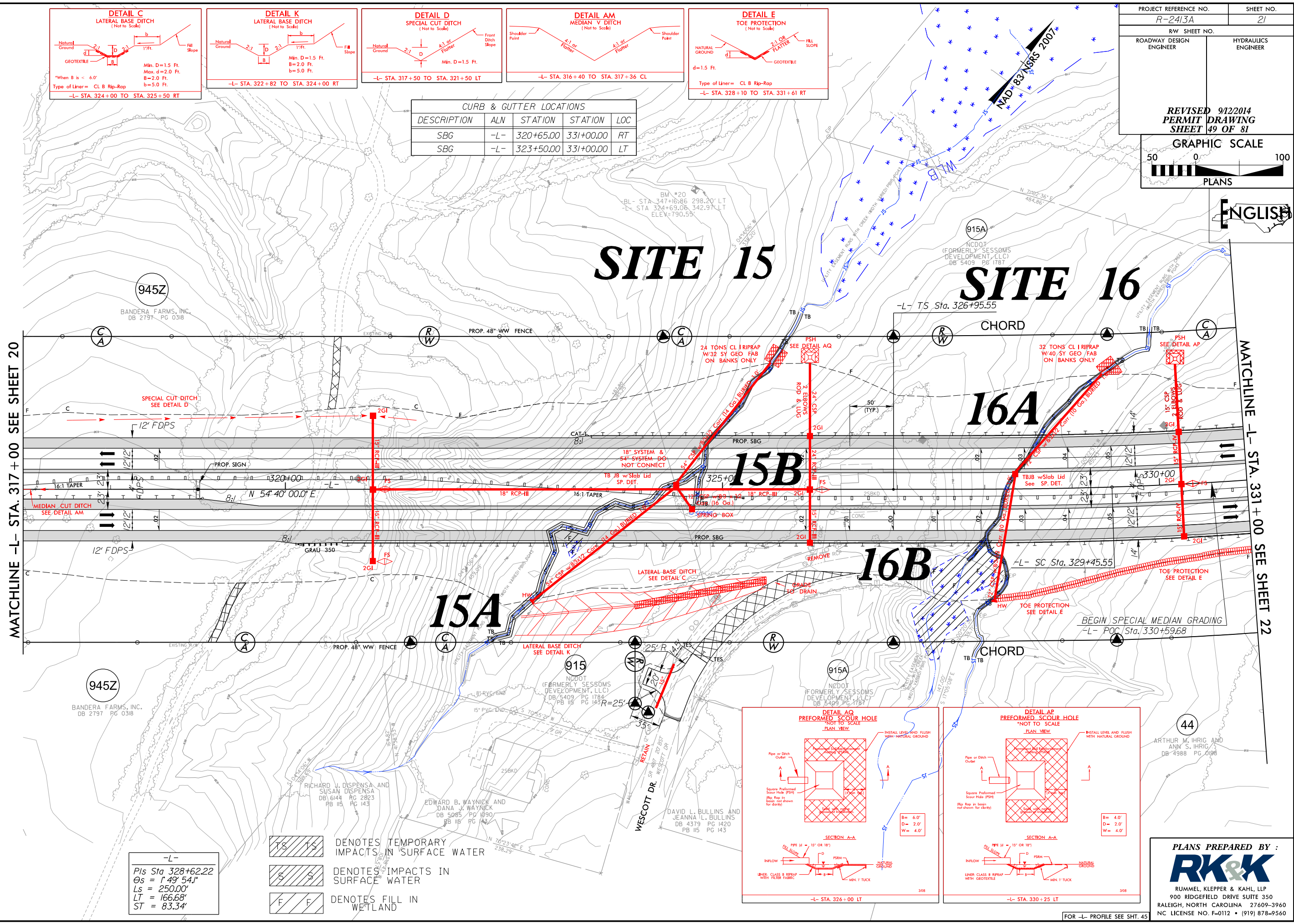
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	320+65.00	331+00.00	RT
SBG	-L-	323+50.00	331+00.00	LT

PROJECT REFERENCE NO. **R-2413A** SHEET NO. **21**

RW SHEET NO. ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

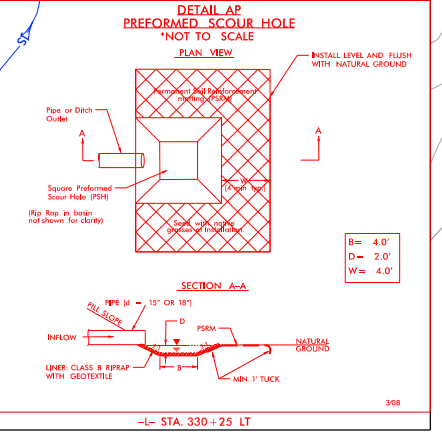
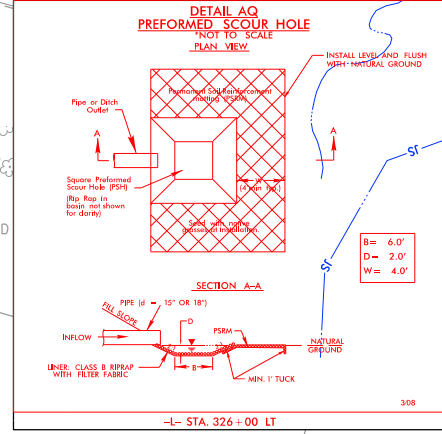
REVISED 9/12/2014
PERMIT DRAWING
SHEET 49 OF 81

GRAPHIC SCALE
50 0 100
PLANS



-L-
Pls Sta 328+62.22
Gs = 1' 49' 54.1"
Ls = 250.00'
LT = 166.68'
ST = 83.34'

- TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S DENOTES IMPACTS IN SURFACE WATER
- F F DENOTES FILL IN WETLAND



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FOR -L- PROFILE SEE SHT. 45

8/17/99
8/10/2014
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PROJECT REFERENCE NO.
R-2413A

SHEET NO.
21A

RW SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

REVISED PERMIT SHEET *9/12/2014*
50 OF 81

DRAWING
50 OF 81

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

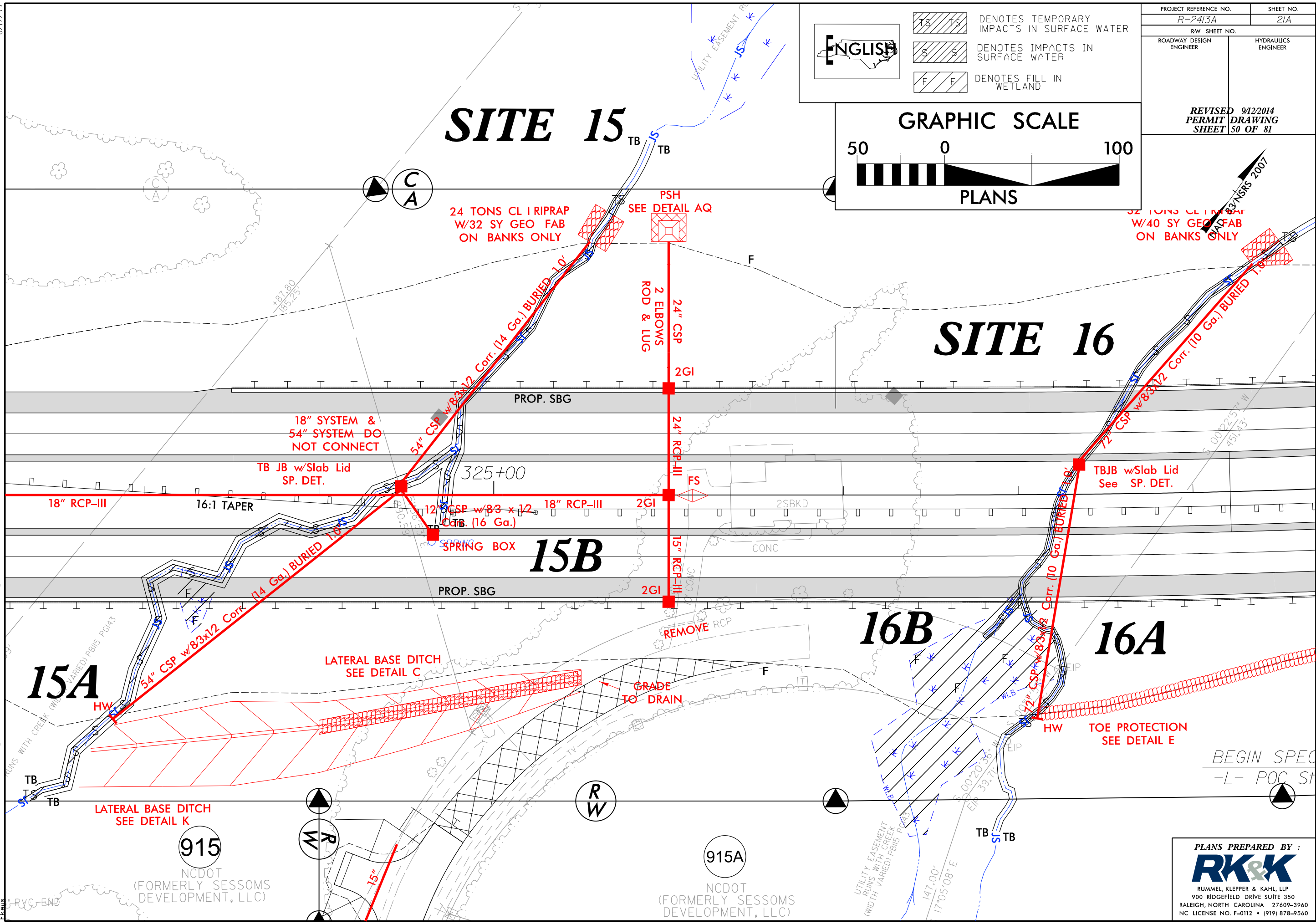
F F DENOTES FILL IN WETLAND

ENGLISH

GRAPHIC SCALE

50 0 100

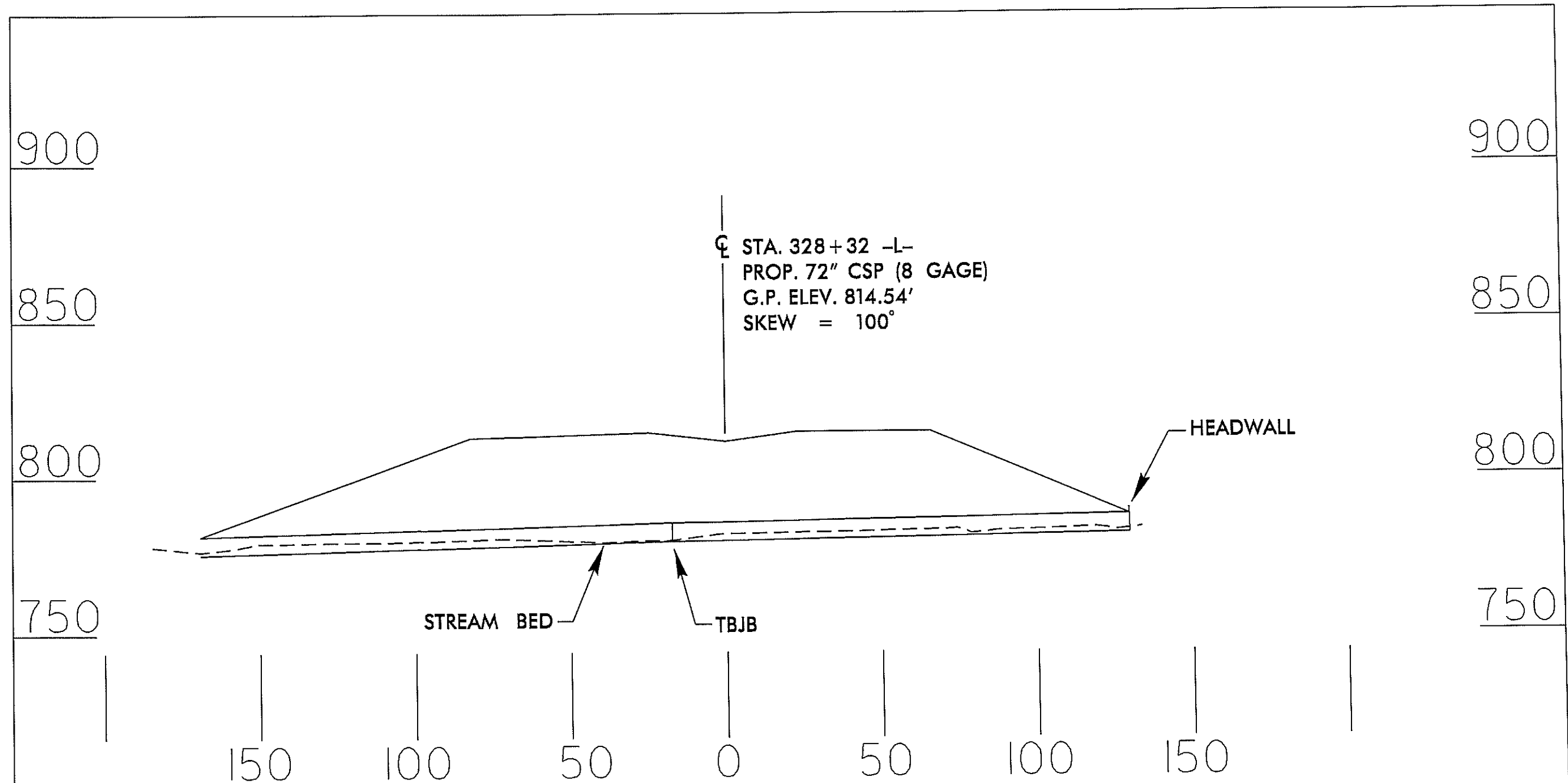
PLANS



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PROFILE

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34429.1.1 (R-2413A)
NC 68 CONNECTOR
FROM FOUR LANES AT
SR 2011 TO SR 2127
PERMIT DRAWING
SHEET 51 OF 81
2 / 13 / 13

8/23/99



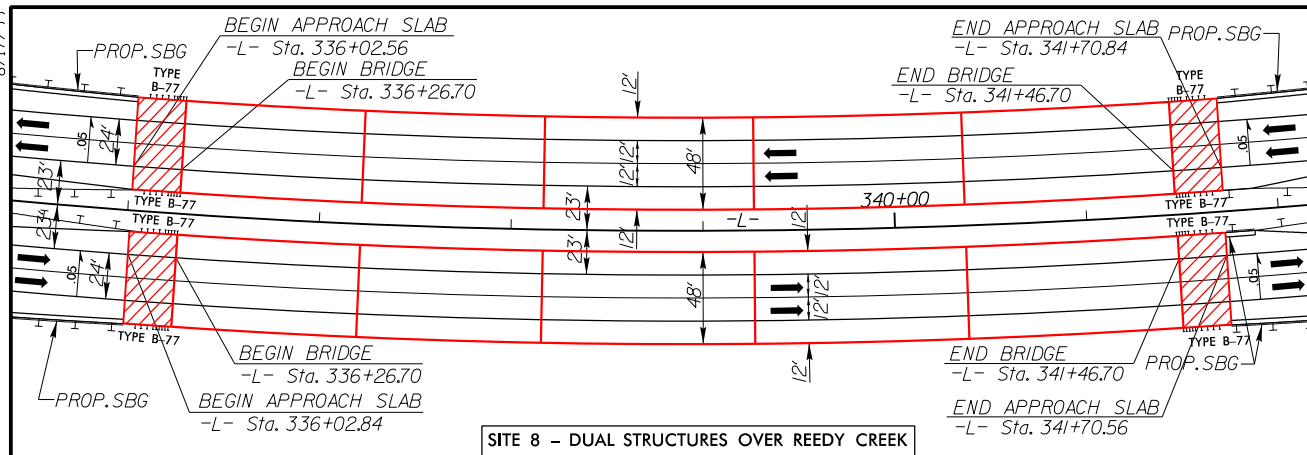
PROJ. REFERENCE NO.
R-2413A

SHEET NO.
X-267

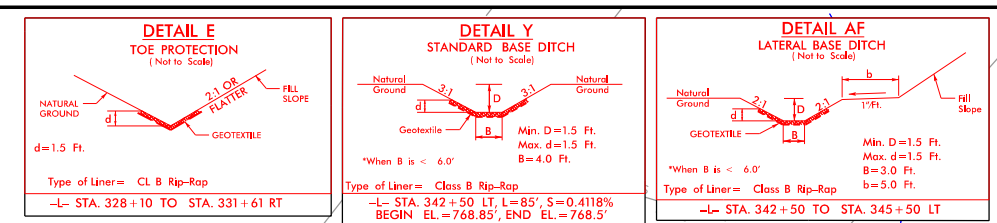
PERMIT DRAWING
SHEET 52 OF 81



8/17/99
8/10/2014
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REVISIONS



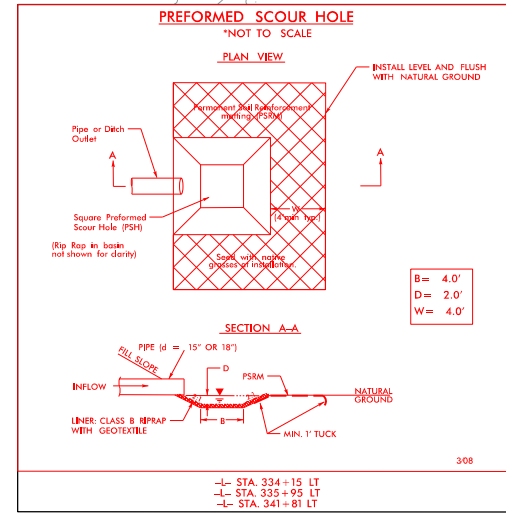
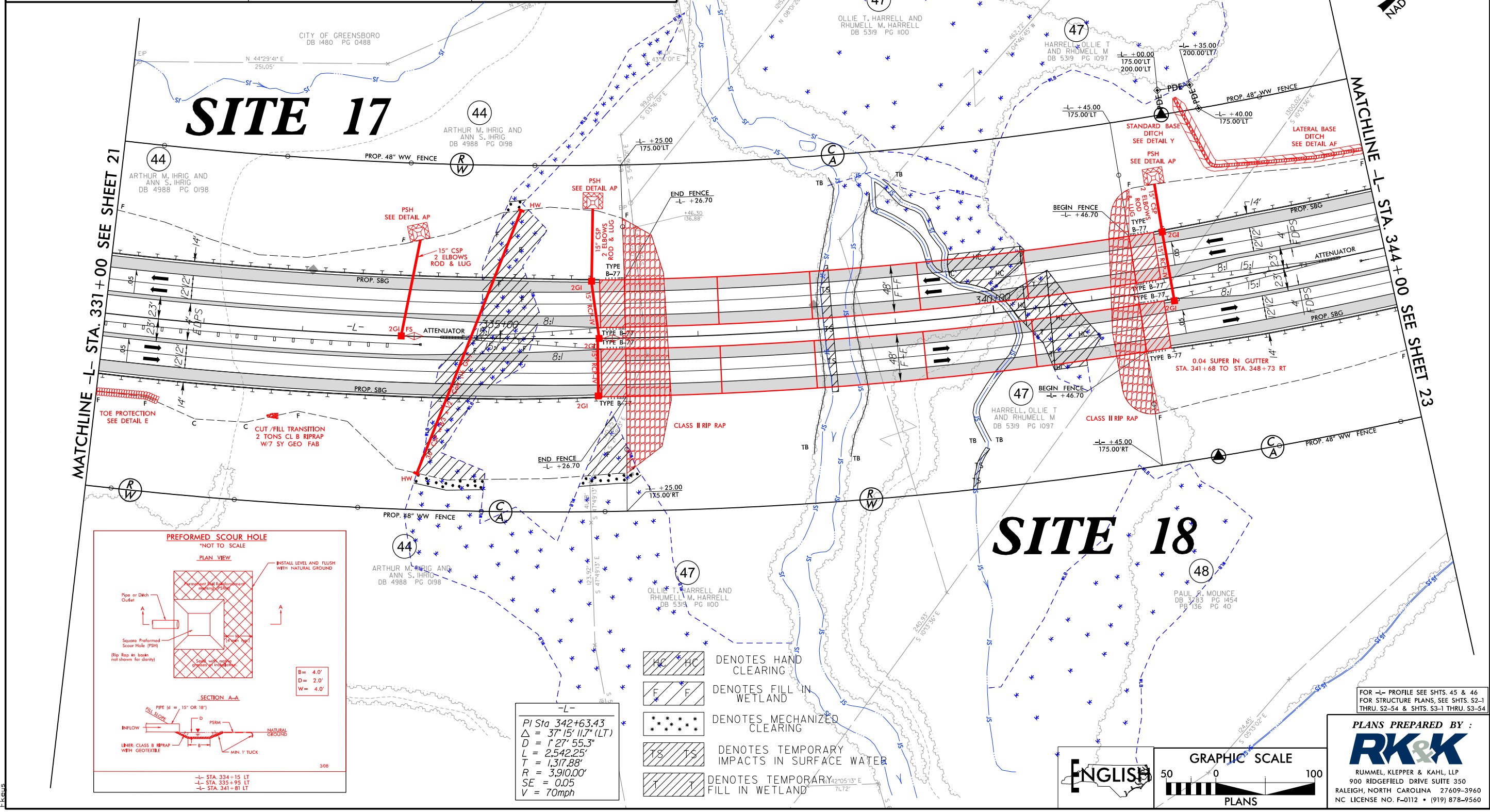
SITE 8 - DUAL STRUCTURES OVER REEDY CREEK



CURB & GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	331+00.00	336+01.33	LT
SBG	-L-	341+72.07	344+00.00	LT
SBG	-L-	331+00.00	336+02.06	RT
SBG	-L-	341+71.34	344+00.00	RT
SBG	-L-	341+71.62	341+87.00	MED RT

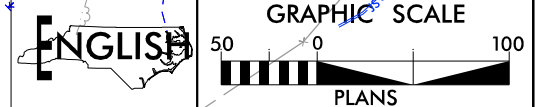
PROJECT REFERENCE NO. R-2413A		SHEET NO. 22
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		

REVISED 9/12/2014
PERMIT DRAWING
SHEET 53 OF 81



-L-
PI Sta 342+63.43
Δ = 37° 15' 11.7" (LT)
D = 1' 27" 55.3"
L = 2,542.25'
T = 1,317.88'
R = 3,910.00'
SE = 0.05
V = 70mph

- HC HC DENOTES HAND CLEARING
- F F DENOTES FILL IN WETLAND
- * * * * * DENOTES MECHANIZED CLEARING
- TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- 1 1 DENOTES TEMPORARY FILL IN WETLAND



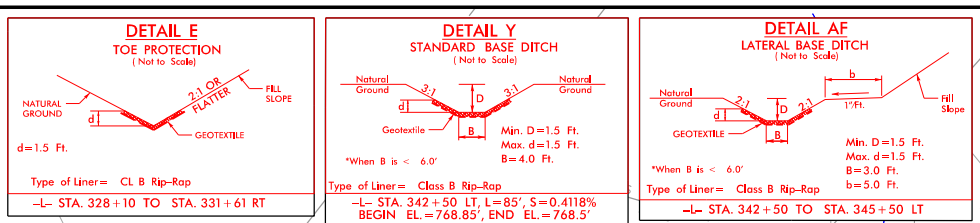
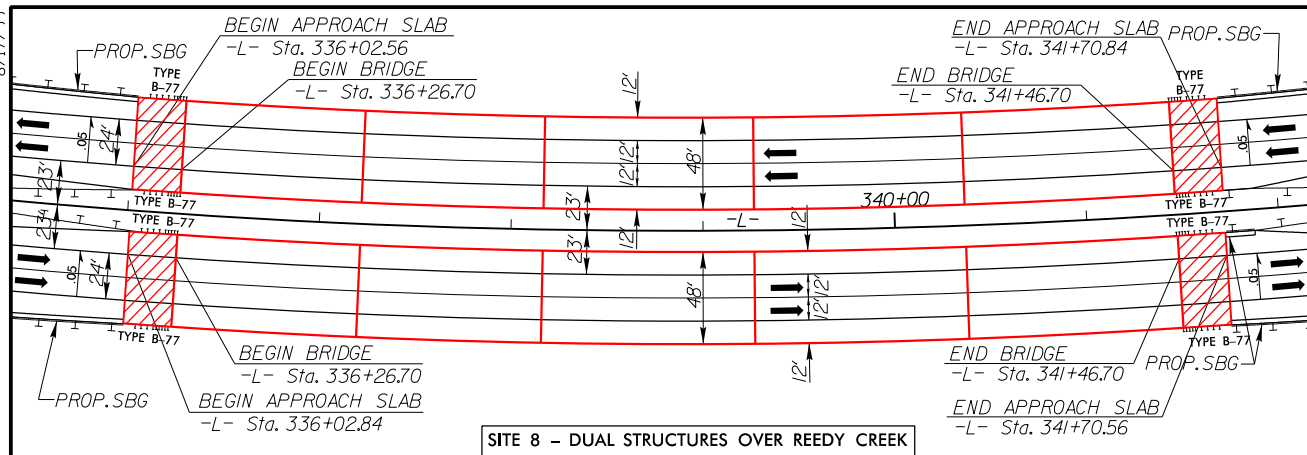
FOR -L- PROFILE SEE SHTS. 45 & 46
FOR STRUCTURE PLANS, SEE SHTS. S2-1
THRU. S2-54 & SHTS. S3-1 THRU. S3-54

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8/10/2014
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R:\Hydraulics\PERMITS\Environmental\Drawings\2413A\2413a_HYD_PRM_WET_psh22.con.dgn



CURB & GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	331+00.00	336+01.33	LT
SBG	-L-	341+72.07	344+00.00	LT
SBG	-L-	331+00.00	336+02.06	RT
SBG	-L-	341+71.34	344+00.00	RT
SBG	-L-	341+71.62	341+87.00	MED RT

PROJECT REFERENCE NO.
R-2413A

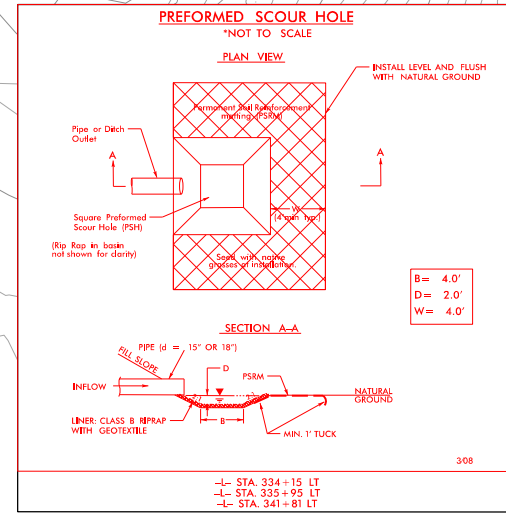
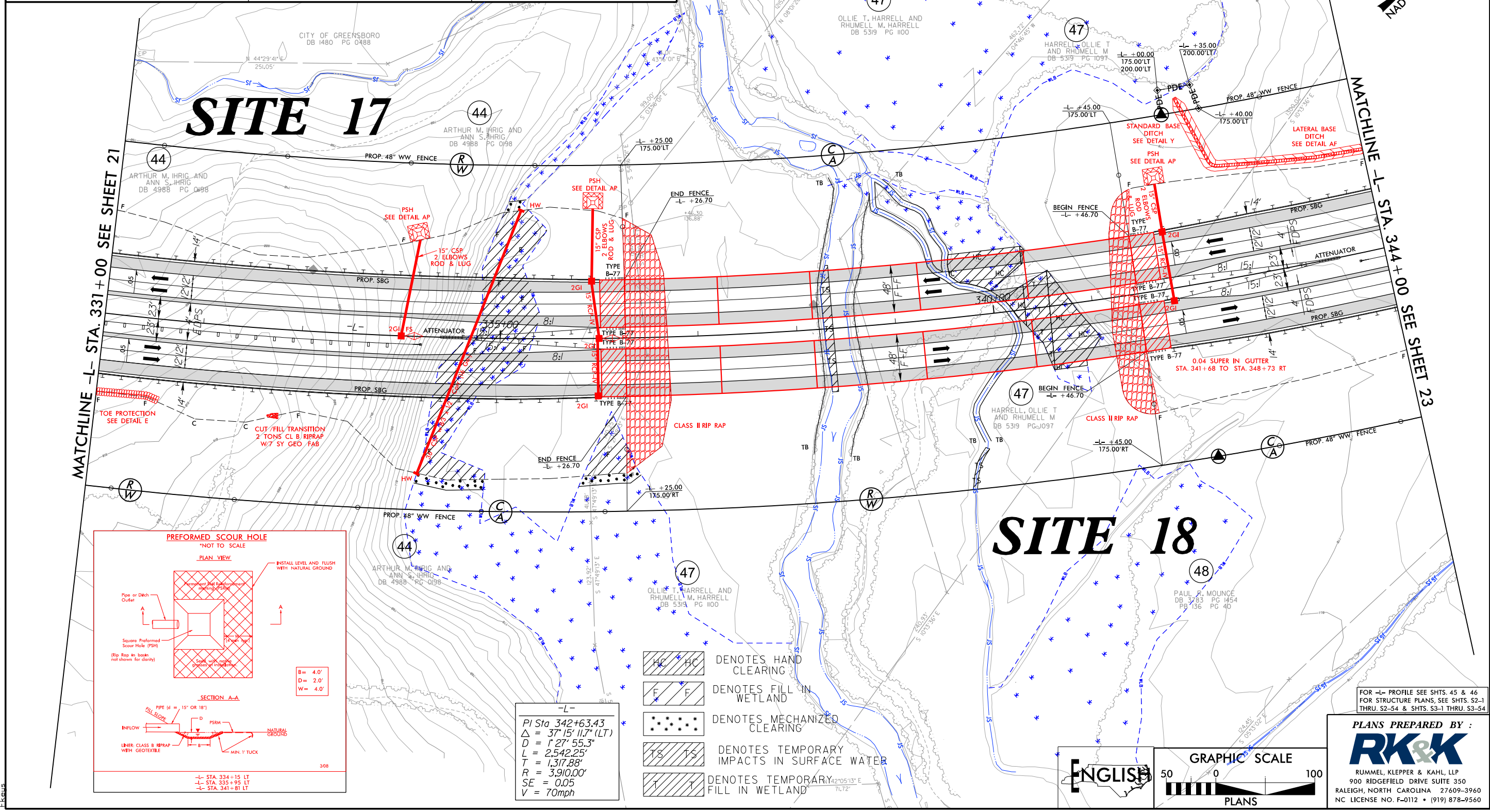
SHEET NO.
22

RW SHEET NO.

ROADWAY DESIGN ENGINEER

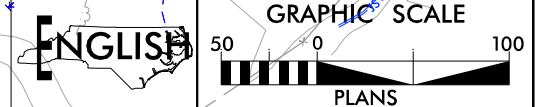
HYDRAULICS ENGINEER

REVISED 9/12/2014
PERMIT DRAWING
SHEET 54 OF 81



PI Sta 342+63.43
 $\Delta = 37^{\circ}15'11.7''$ (LT)
 $D = 1^{\circ}27'55.3''$
 $L = 2,542.25'$
 $T = 1,317.88'$
 $R = 3,910.00'$
 $SE = 0.05$
 $V = 70\text{mph}$

- HC HC DENOTES HAND CLEARING
- F F DENOTES FILL IN WETLAND
- *** DENOTES MECHANIZED CLEARING
- TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- 1 1 DENOTES TEMPORARY FILL IN WETLAND

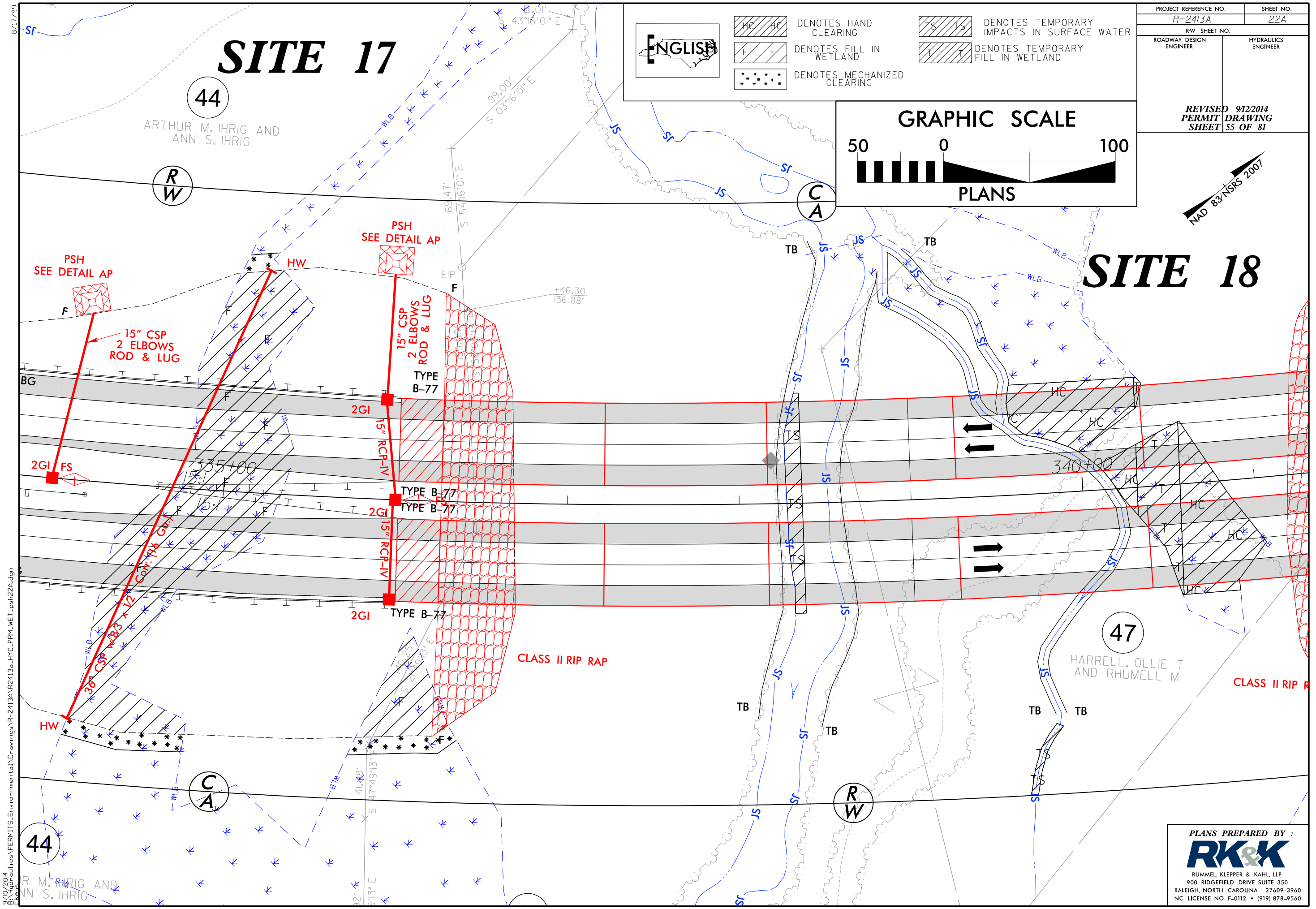


FOR -L- PROFILE SEE SHTS. 45 & 46
FOR STRUCTURE PLANS, SEE SHTS. S2-1
THRU. S2-54 & SHTS. S3-1 THRU. S3-54

PLANS PREPARED BY :

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R M. IHRIG AND
ANN S. IHRIG

HC HC DENOTES HAND CLEARING
F F DENOTES FILL IN WETLAND
••••• DENOTES MECHANIZED CLEARING
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
T T DENOTES TEMPORARY FILL IN WETLAND

GRAPHIC SCALE

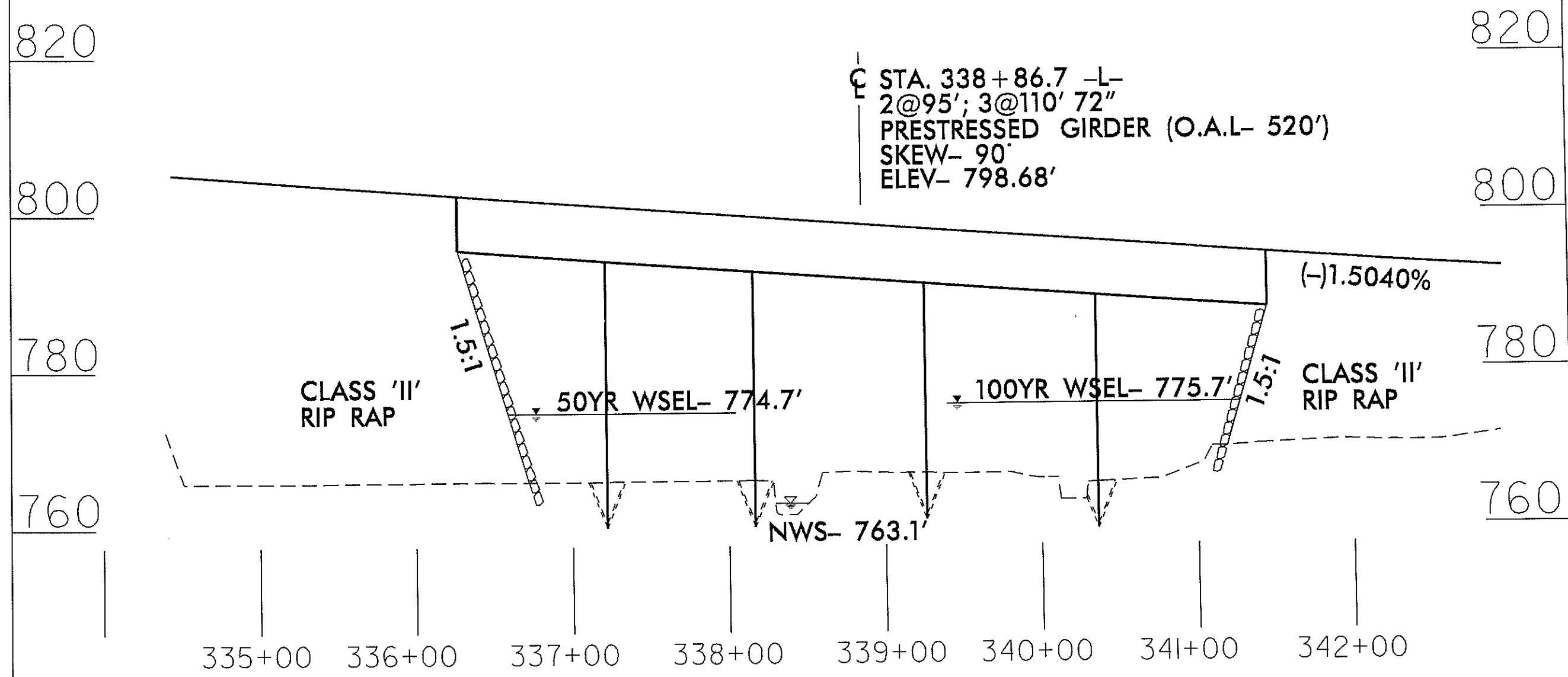
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PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-2413A	22A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
REVISED PERMIT SHEET	9/12/2014 DRAWING 55 OF 81

NAD 83/USRS 2007

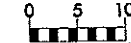
PLANS PREPARED BY :
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PROFILE

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34429.1.1 (R-2413A)
NC 68 CONNECTOR
FROM FOUR LANES AT
SR 2011 TO SR 2127
PERMIT DRAWING
SHEET 56 OF 81
2 / 13 / 13

8/23/99

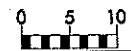


PROJ. REFERENCE NO. R-2413A SHEET NO. X-270

PERMIT DRAWING
SHEET 57 OF 81



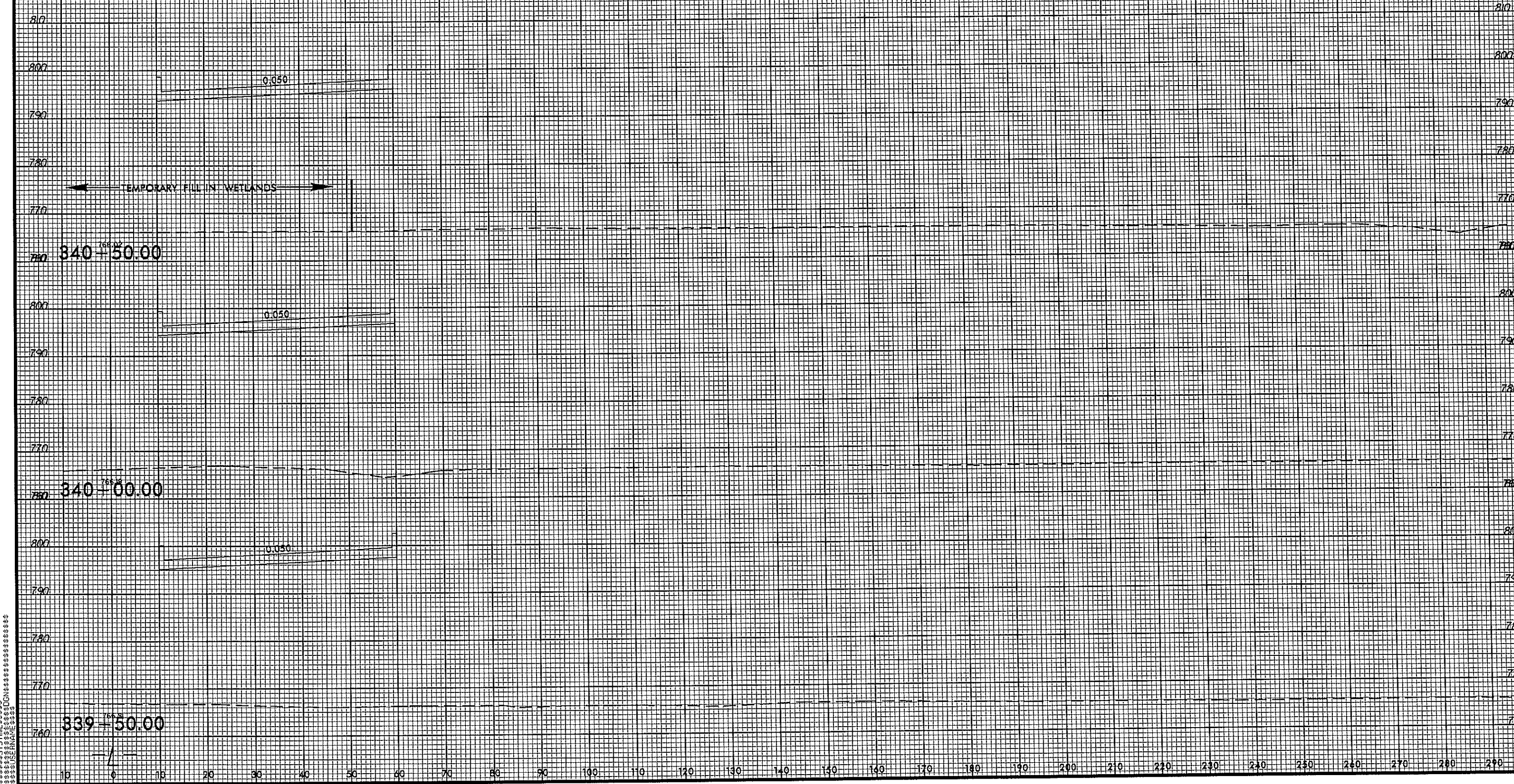
8/23/99



PROJ. REFERENCE NO.
R-2413A

SHEET NO.
X-274

PERMIT DRAWING
SHEET 58 OF 81



8/17/99



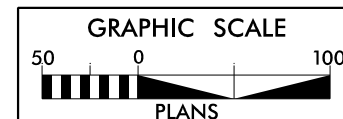
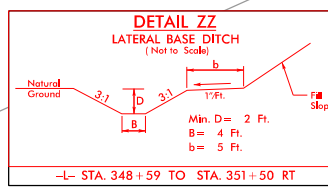
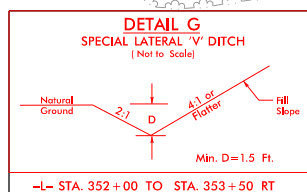
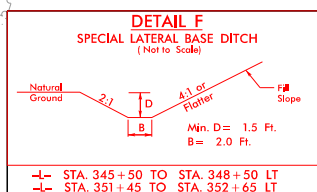
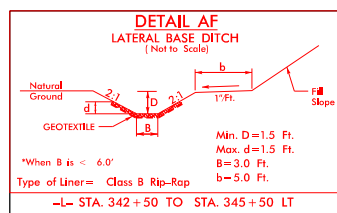
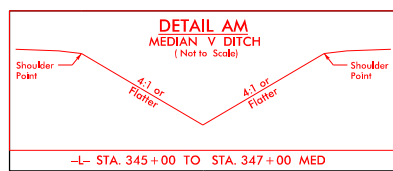
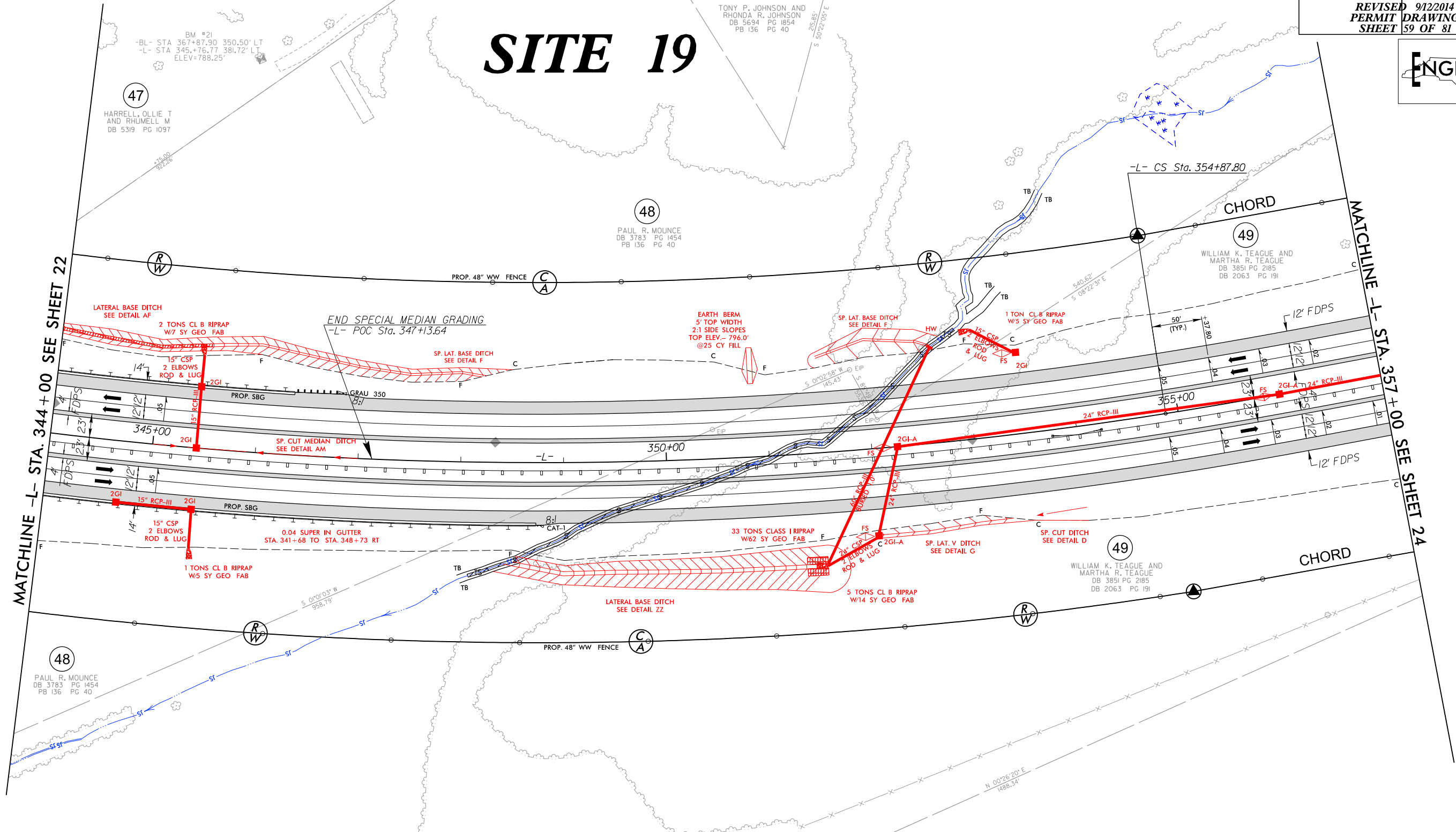
DENOTES IMPACTS IN SURFACE WATER



DENOTES TEMPORARY IMPACTS IN SURFACE WATER

CURB & GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	344+00.00	346+35.00	LT
SBG	-L-	344+00.00	348+73.00	RT

PROJECT REFERENCE NO. <i>R-2413A</i>		SHEET NO. <i>23</i>
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
REVISED PERMIT SHEET <i>9/12/2014</i> DRAWING <i>59 OF 81</i>		

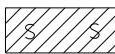
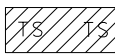


-L-
Pls Sta 355+71.14
Os = 1' 49' 54.1"
Ls = 250.00'
LT = 166.68'
ST = 83.34'

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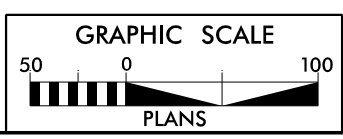
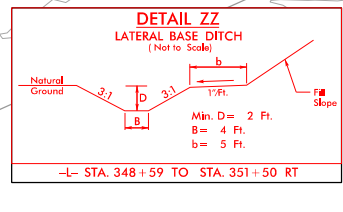
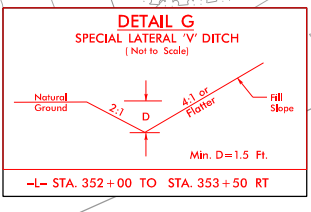
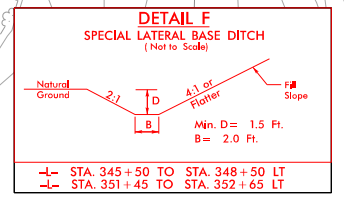
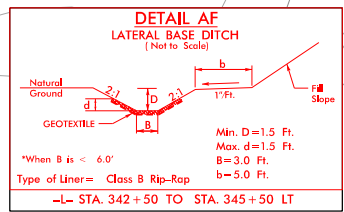
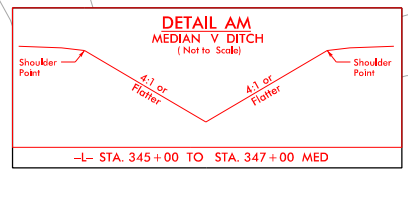
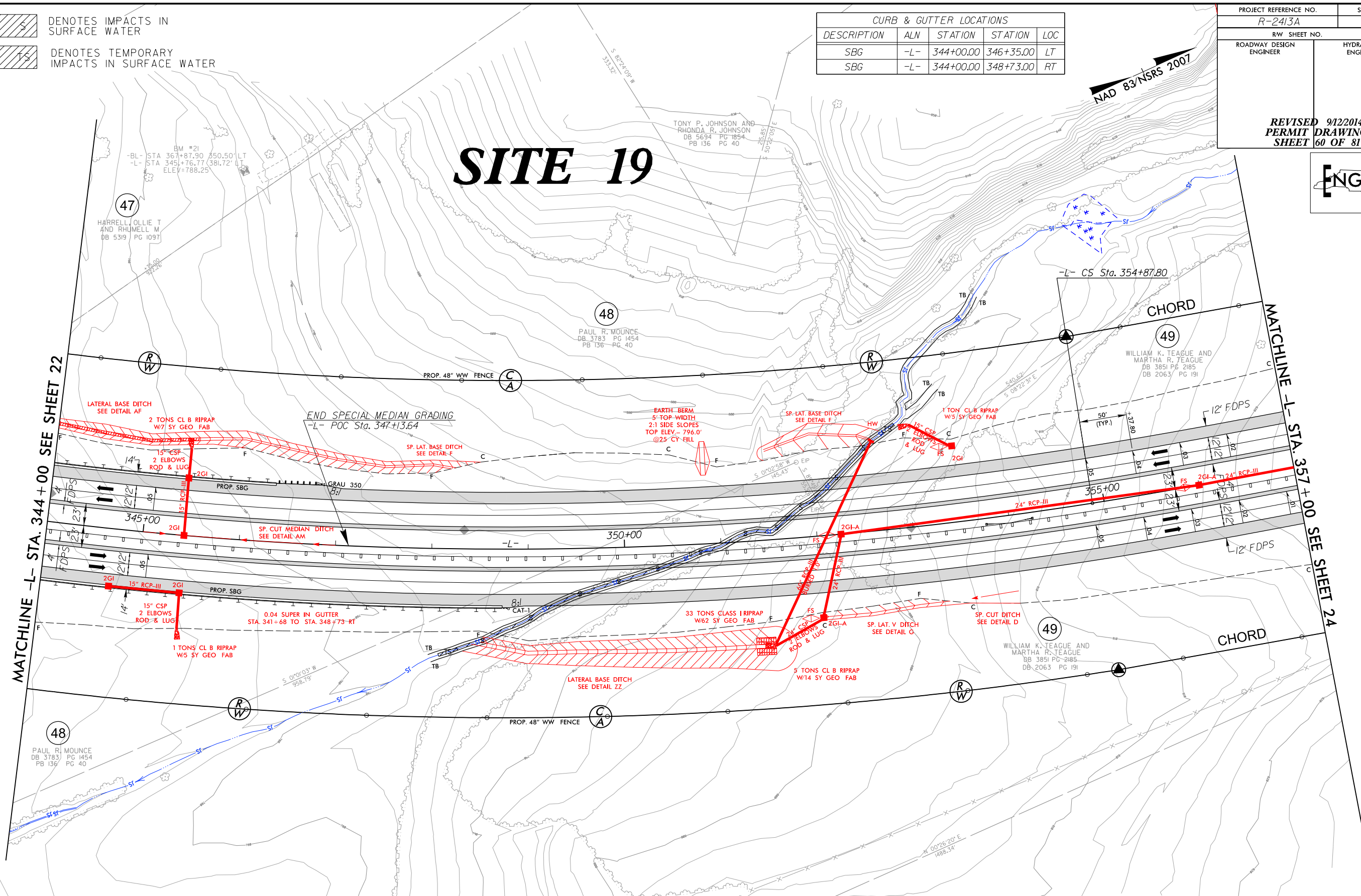
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8/17/99
8/10/2014
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 DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

CURB & GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	344+00.00	346+35.00	LT
SBG	-L-	344+00.00	348+73.00	RT

PROJECT REFERENCE NO. <i>R-2413A</i>		SHEET NO. <i>23</i>
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
REVISED 9/12/2014 PERMIT DRAWING SHEET 60 OF 81		

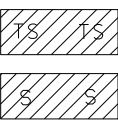


-L-
Pls Sta 355+71.14
Os = 1' 49' 54.1"
Ls = 250.00'
LT = 166.68'
ST = 83.34'

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DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN
SURFACE WATER

PROJECT REFERENCE NO. <i>R-2413A</i>		SHEET NO. <i>23A</i>
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	REVISED 9/12/2014 PERMIT DRAWING SHEET 61 OF 81	

NAD 83/NSRS 2007

GRAPHIC SCALE



PLANS

SITE 19

GRADING

LAT. BASE DITCH
SEE DETAIL F

EARTH BERM
5' TOP WIDTH
2:1 SIDE SLOPES
TOP ELEV.- 796.0'
@25 CY FILL

SP. LAT. BASE DITCH
SEE DETAIL F

1 TON CL B RIPRAP
W/5 SY GEO FAB

15" CSP
2 ELBOWS
ROD & LUG

2GI

350+00

355+00

24" RCP-III

33 TONS CLASS I RIPRAP
W/62 SY GEO FAB

24" CSP
2 ELBOWS
ROD & LUG

5 TONS CL B RIPRAP
W/14 SY GEO FAB

SP. LAT. V DITCH
SEE DETAIL G

SP. CUT DITCH
SEE DETAIL D

LATERAL BASE DITCH
SEE DETAIL ZZ

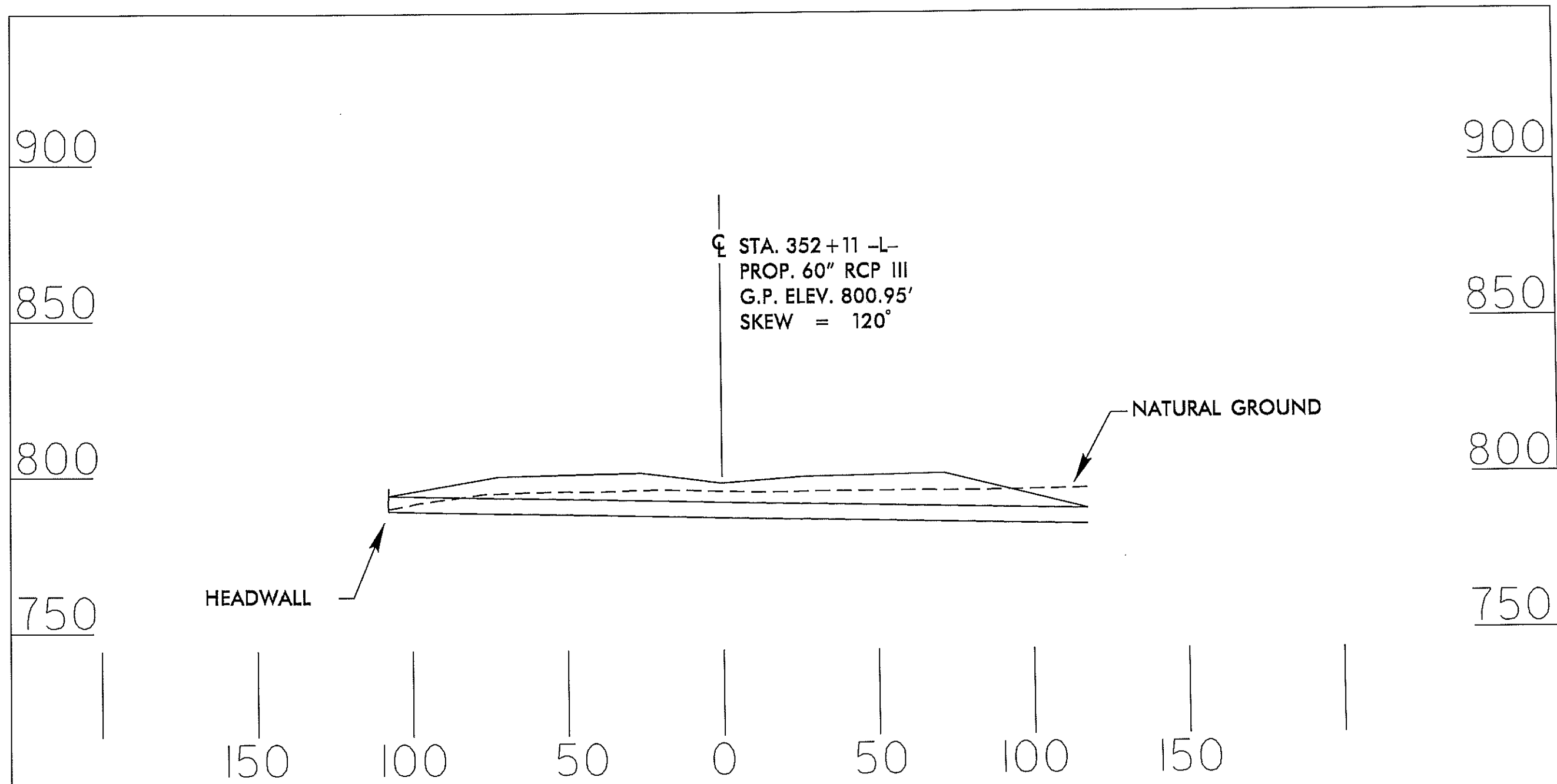
49

WILLIAM K. TEAGUE AND
MARTHA R. TEAGUE

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PROFILE

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34429.1.1 (R-2413A)
NC 68 CONNECTOR
FROM FOUR LANES AT
SR 2011 TO SR 2127
PERMIT DRAWING
SHEET 62 OF 81
2 / 13 / 13

8/17/99
8/10/2014
B:\Hydraulics\PERMITS\Environmental\Drawings\2413A\2413A_HYD_PRM_WET_psh31.dgn

DETAIL AG
LATERAL BASE DITCH
(Not to Scale)

Min. D=2.0 Ft.
B=4.0 Ft.
b=5.0 Ft.

-Y4- STA. 16+50 TO 18+50 RT

DETAIL E
TOE PROTECTION
(Not to Scale)

d=1.5 Ft.

Type of Liner= Class B Rip-Rap

-Y4- STA. 17+00 TO STA. 18+00 LT

DETAIL AG
LATERAL BASE DITCH
(Not to Scale)

Min. D=2.0 Ft.
B=4.0 Ft.
b=5.0 Ft.

-Y4- STA. 17+50 TO 22+00 RT

CURB & GUTTER LOCATIONS

DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-Y4-	13+40.00	18+25.00	LT

DETAIL AG
LATERAL BASE DITCH
(Not to Scale)

Min. D=2.0 Ft.
B=4.0 Ft.
b=5.0 Ft.

-Y4- STA. 17+50 TO 22+00 RT

DETAIL E
TOE PROTECTION
(Not to Scale)

d=1.5 Ft.

Type of Liner= Class B Rip-Rap

-Y4- STA. 17+00 TO STA. 18+00 LT

DETAIL AG
LATERAL BASE DITCH
(Not to Scale)

Min. D=2.0 Ft.
B=4.0 Ft.
b=5.0 Ft.

-Y4- STA. 17+50 TO 22+00 RT

PROJECT REFERENCE NO.
R-2413A

SHEET NO.
31

RW SHEET NO.

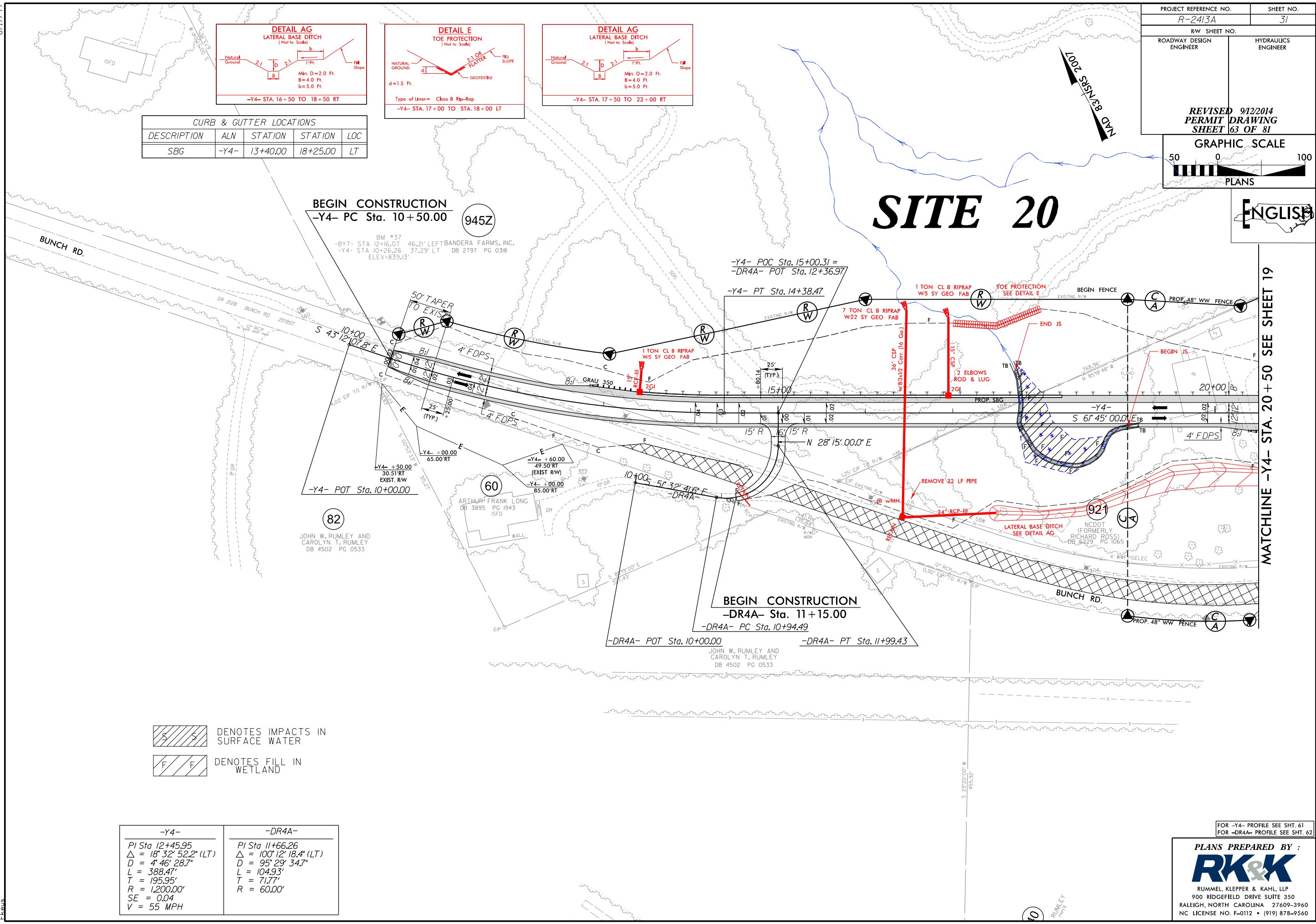
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

REVISED 9/12/2014
PERMIT DRAWING
SHEET 63 OF 81

GRAPHIC SCALE

PLANS

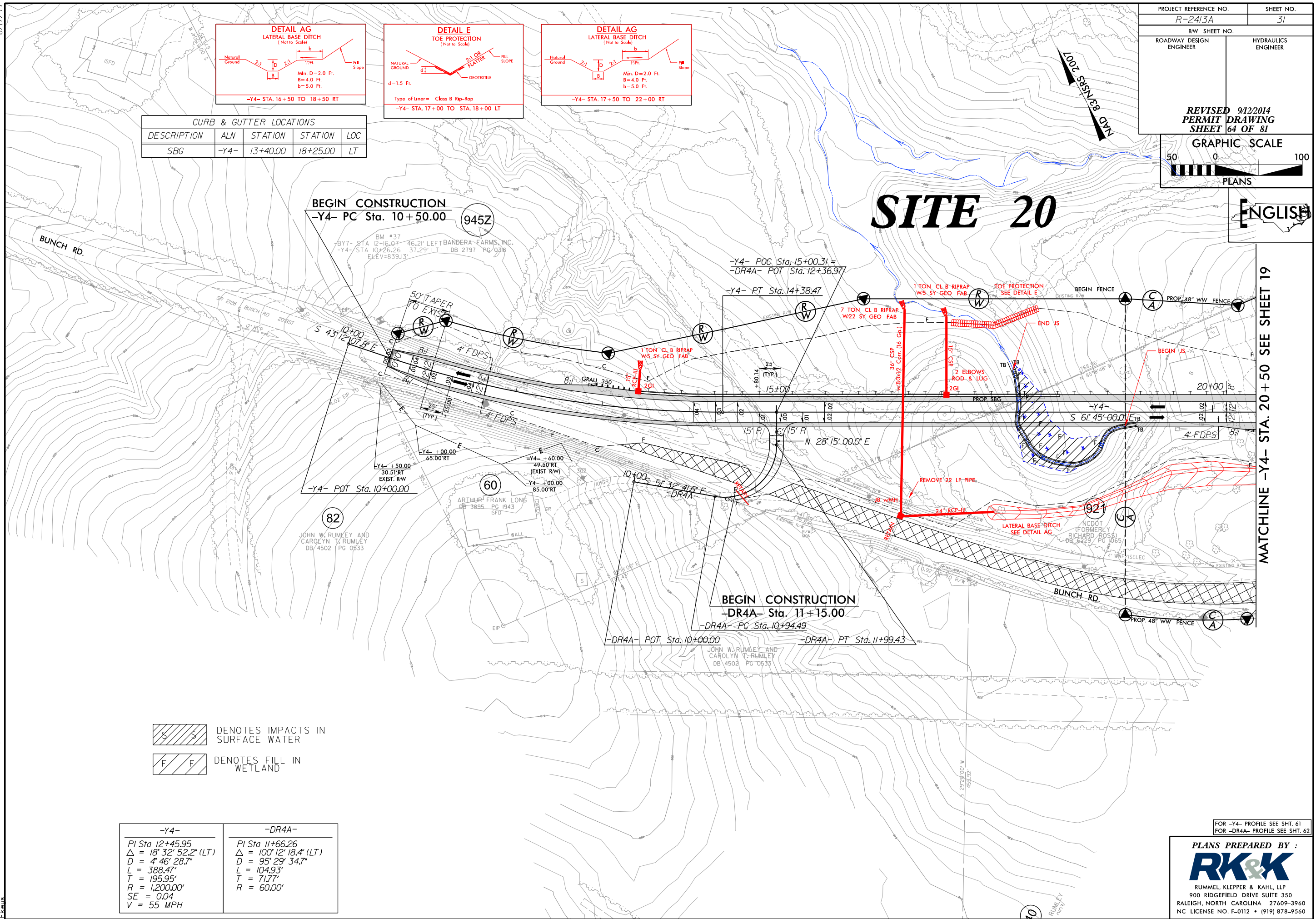
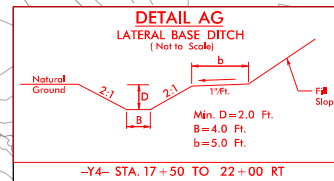
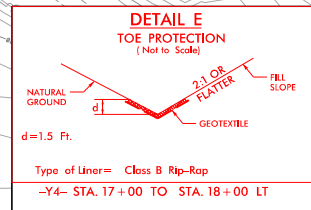
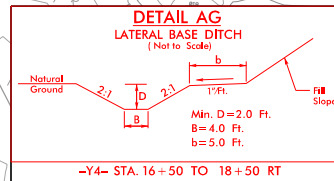


MATCHLINE -Y4- STA. 20+50 SEE SHEET 19

MATCHLINE -Y4- STA. 20+50 SEE SHEET 19

SITE 20

CURB & GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-Y4-	13+40.00	18+25.00	LT



 DENOTES IMPACTS IN SURFACE WATER

 DENOTES FILL IN WETLAND

-Y4-	-DR4A-
<i>PI Sta 12+45.95</i>	<i>PI Sta 11+66.26</i>
$\Delta = 18^{\circ} 32' 52.2''$ (LT)	$\Delta = 100^{\circ} 12' 18.4''$ (LT)
$D = 4' 46' 28.7''$	$D = 95' 29' 34.7''$
$L = 388.47'$	$L = 104.93'$
$T = 195.95'$	$T = 71.77'$
$R = 1,200.00'$	$R = 60.00'$
$SE = 0.04$	
$V = 55$ MPH	

FOR -Y4- PROFILE SEE SHT. 61
FOR -DR4A- PROFILE SEE SHT. 62

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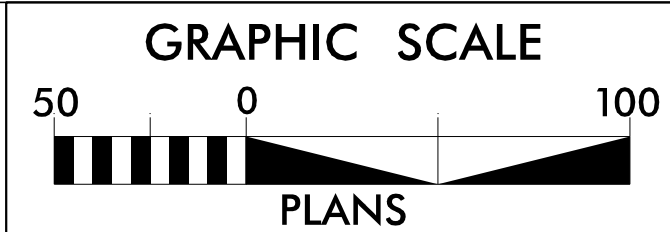
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8/10/2014
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E:\Users\jleu

SITE 20

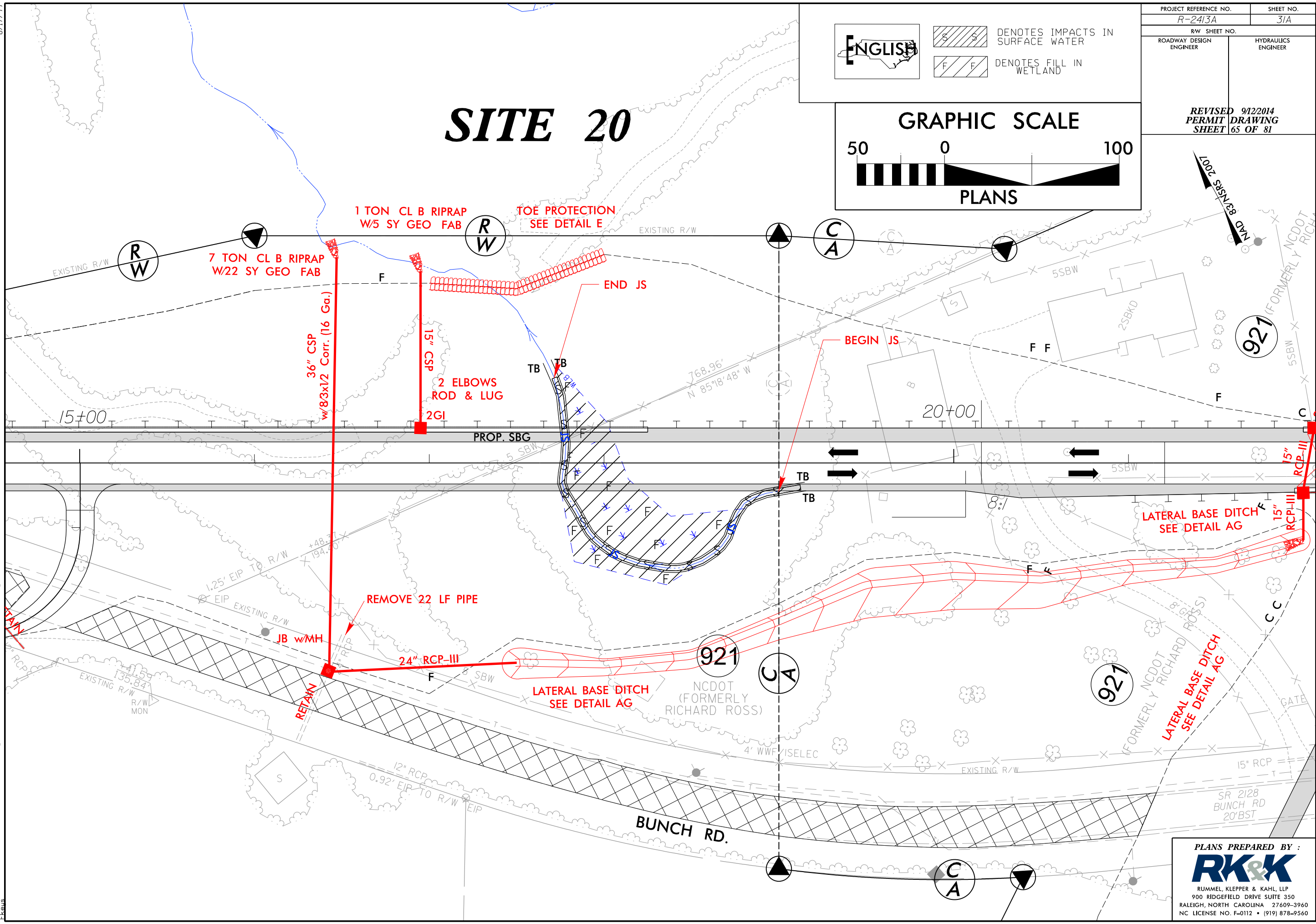


DENOTES IMPACTS IN
SURFACE WATER

DENOTES FILL IN
WETLAND



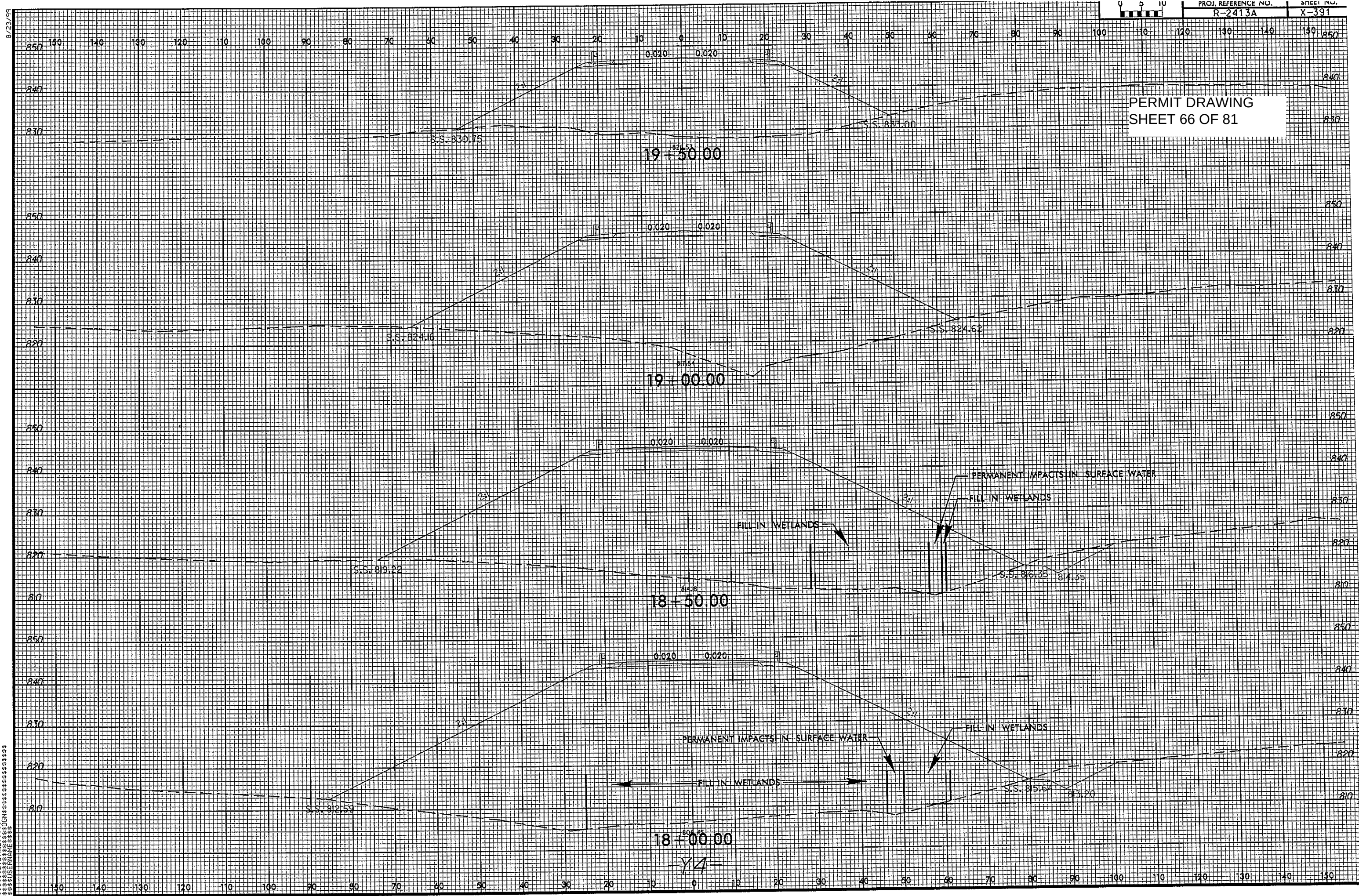
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RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		REVISED 9/12/2014 PERMIT DRAWING SHEET 65 OF 81	



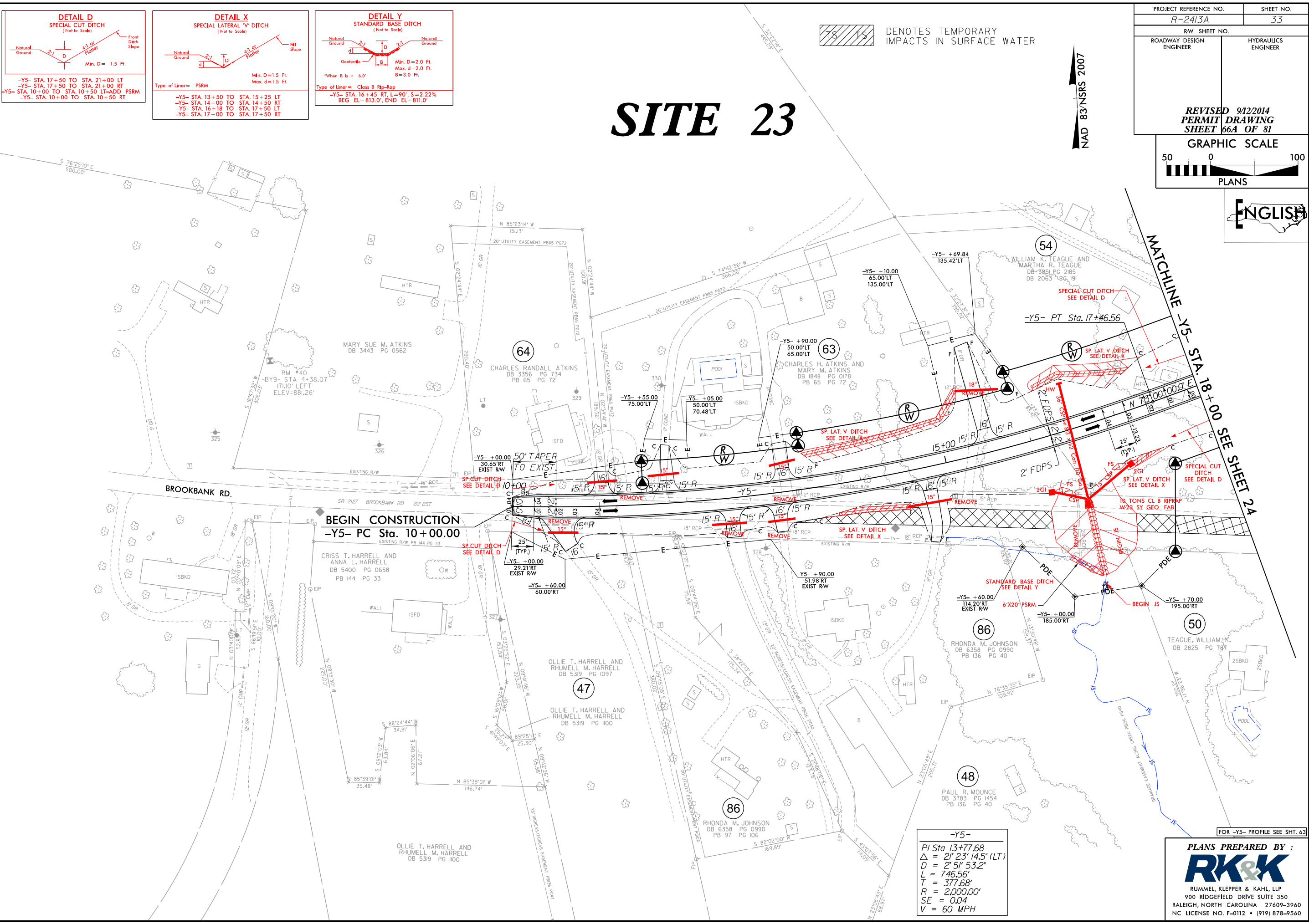
PLANS PREPARED BY :

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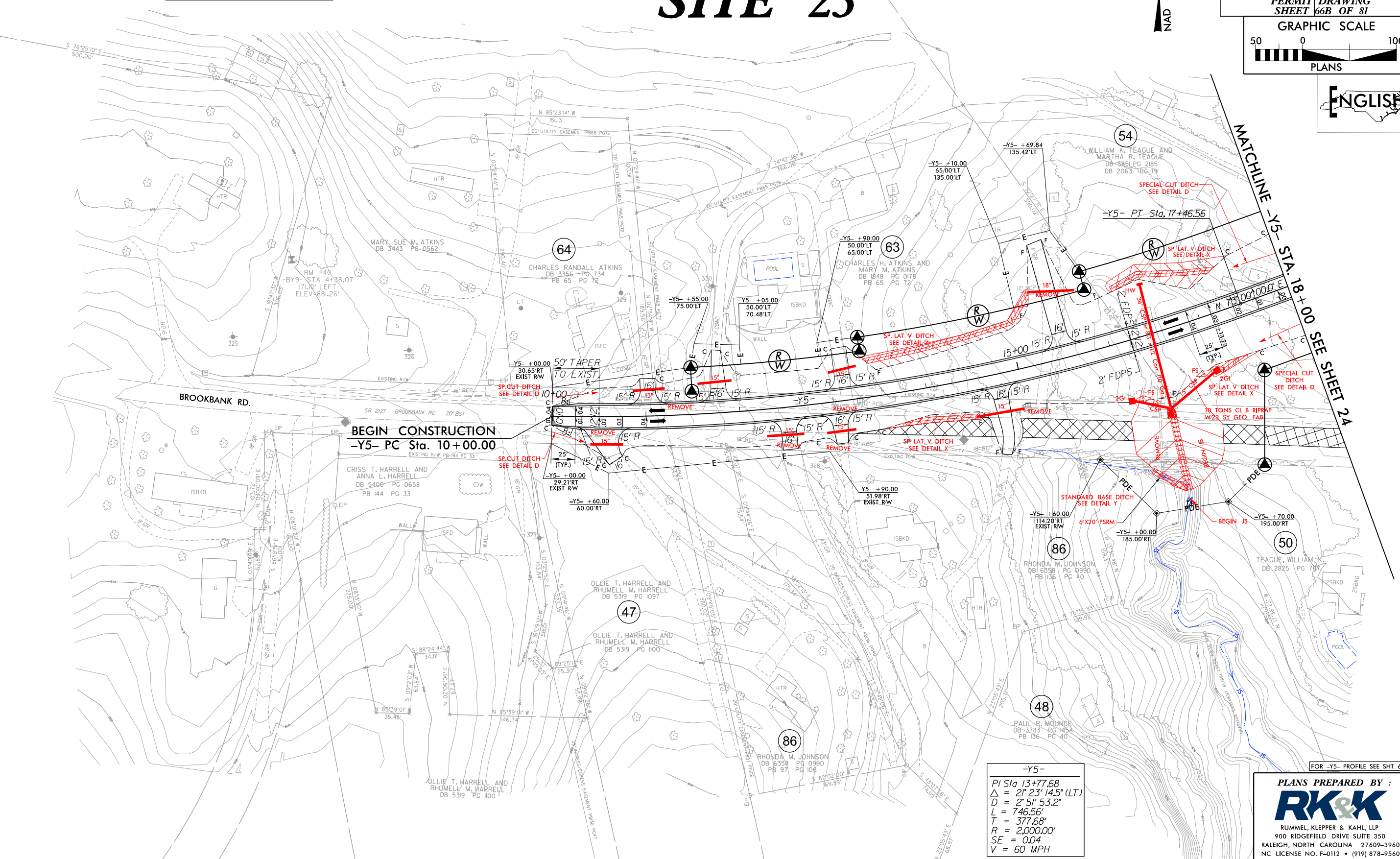
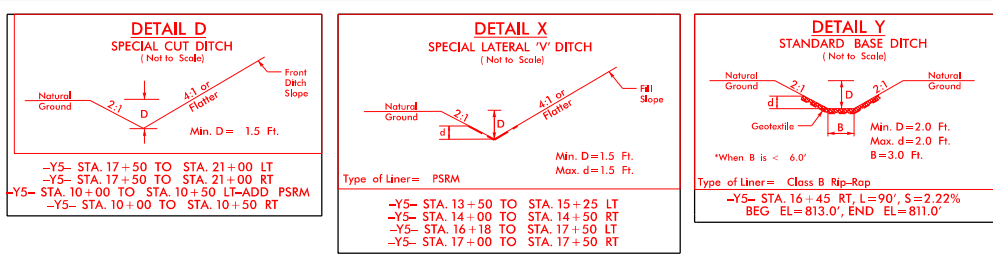
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8/10/2014
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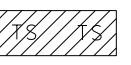
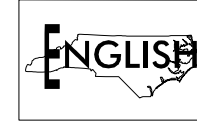
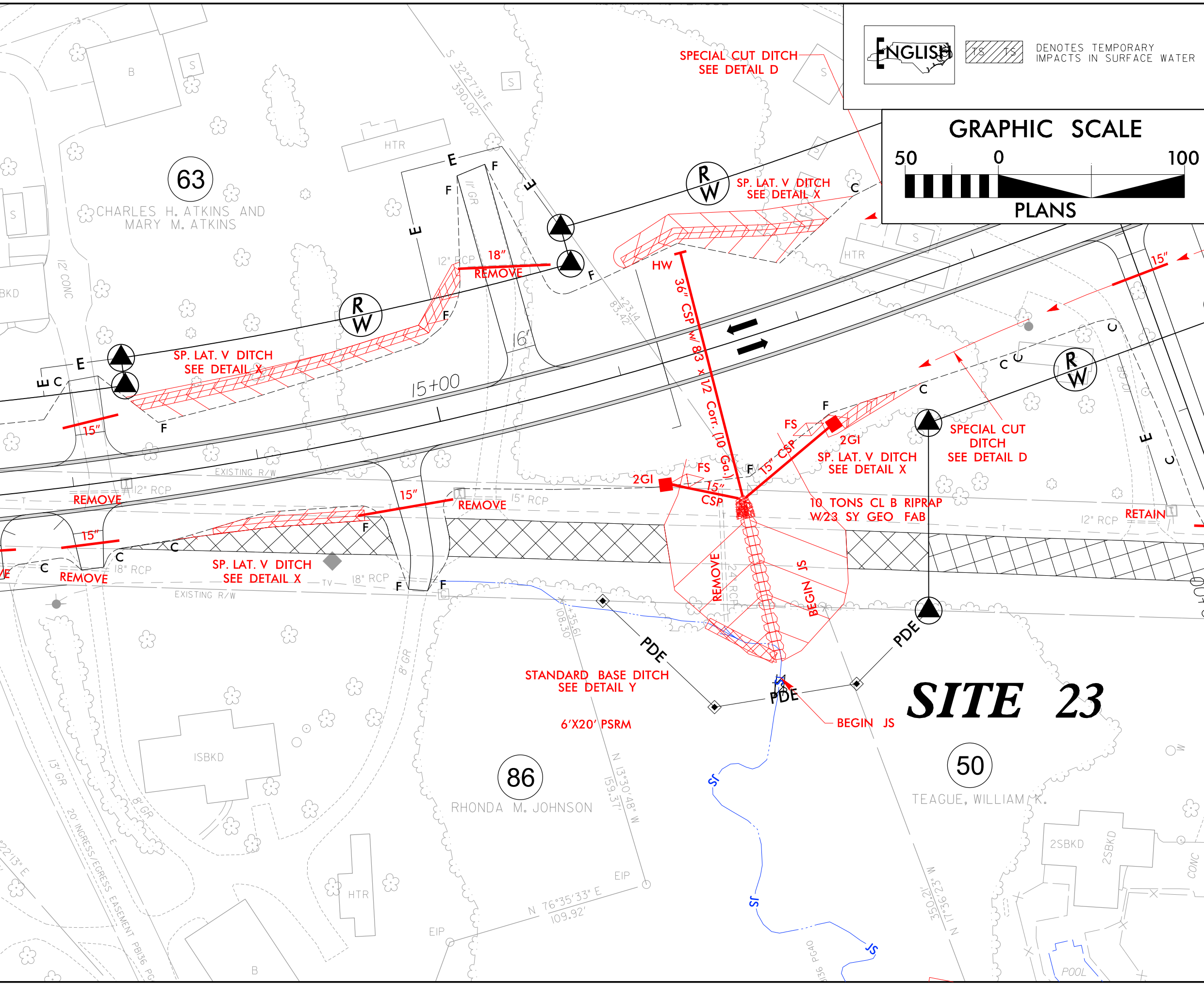
A rectangular block with diagonal hatching from the top-left to the bottom-right. The letters 'TS' are written in the upper-left and upper-right corners of the block.

SITE 23



R/10/2014
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8/10/2014
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DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

GRAPHIC SCALE



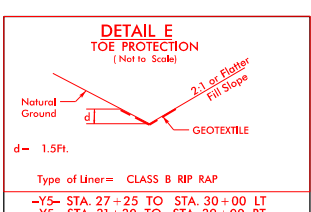
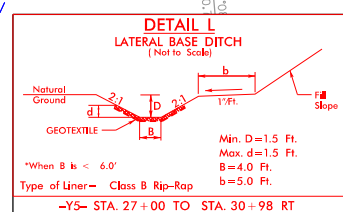
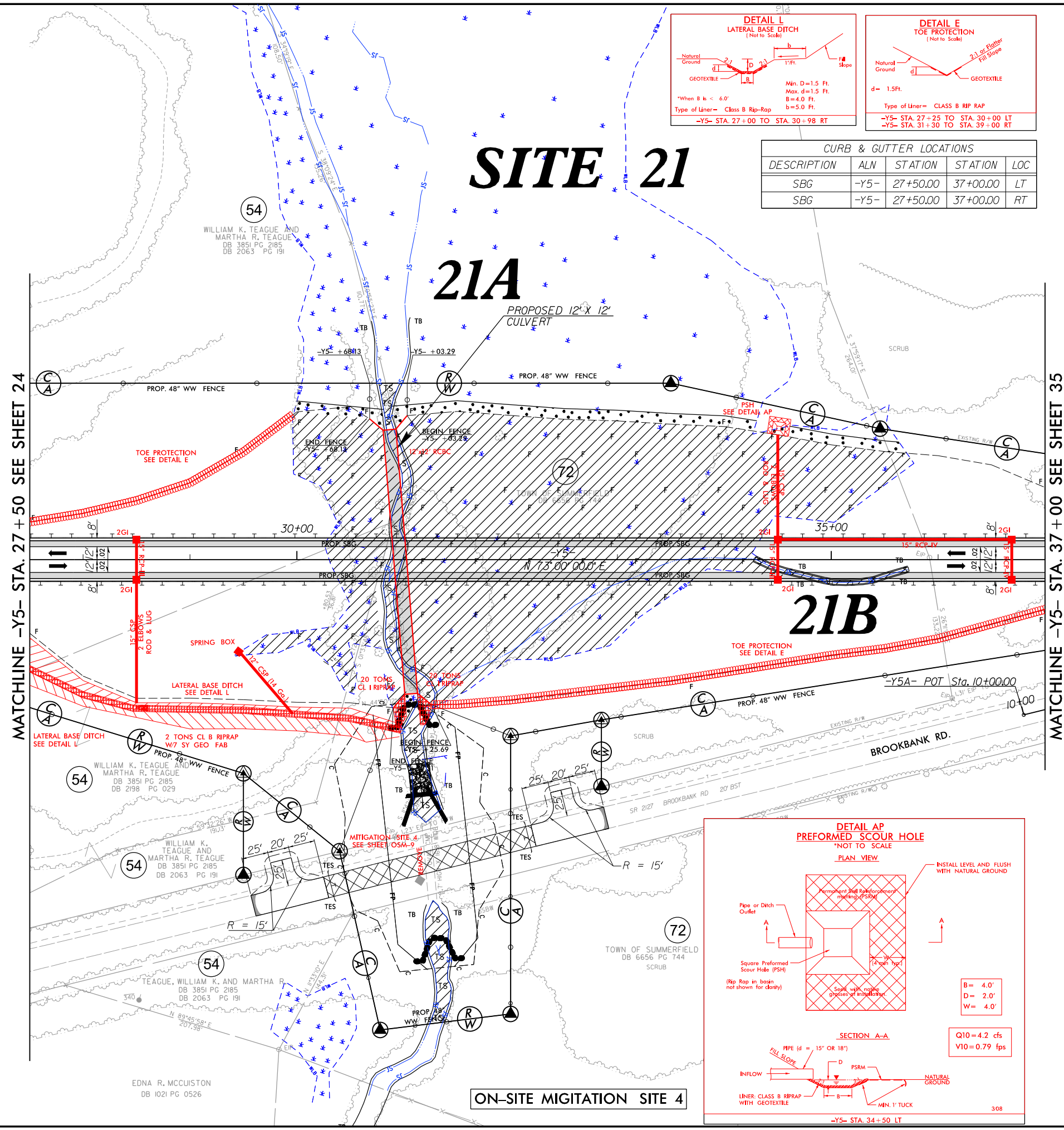
PLANS

PROJECT REFERENCE NO. R-2413A		SHEET NO. 33A	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		REVISED 9/12/2014 PERMIT DRAWING SHEET 66C OF 81	

SITE 23

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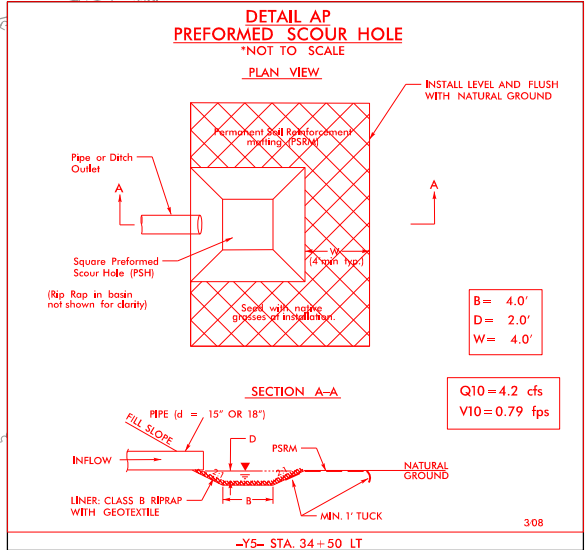
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8/10/2014
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CURB & GUTTER LOCATIONS

DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-Y5-	27+50.00	37+00.00	LT
SBG	-Y5-	27+50.00	37+00.00	RT

- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER



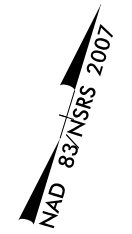
PROJECT REFERENCE NO. **R-2413A** SHEET NO. **34**

RW SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

REVISED 9/12/2014
PERMIT DRAWING
SHEET 67 OF 81



ENGLISH

GRAPHIC SCALE

50 0 100

FOR -Y5- PROJECT SHEET 63
FOR OSM PLANS SEE SHTS. OSM-4 & OSM-6
FOR STRUCTURE PLANS SEE -Y5- CULVERT SHTS. C-1 & C-5

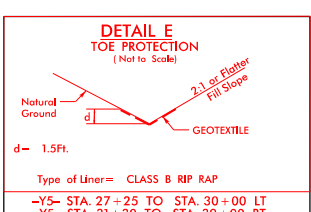
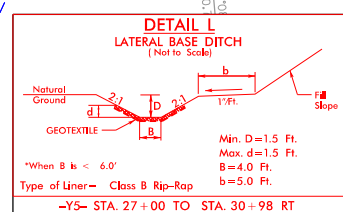
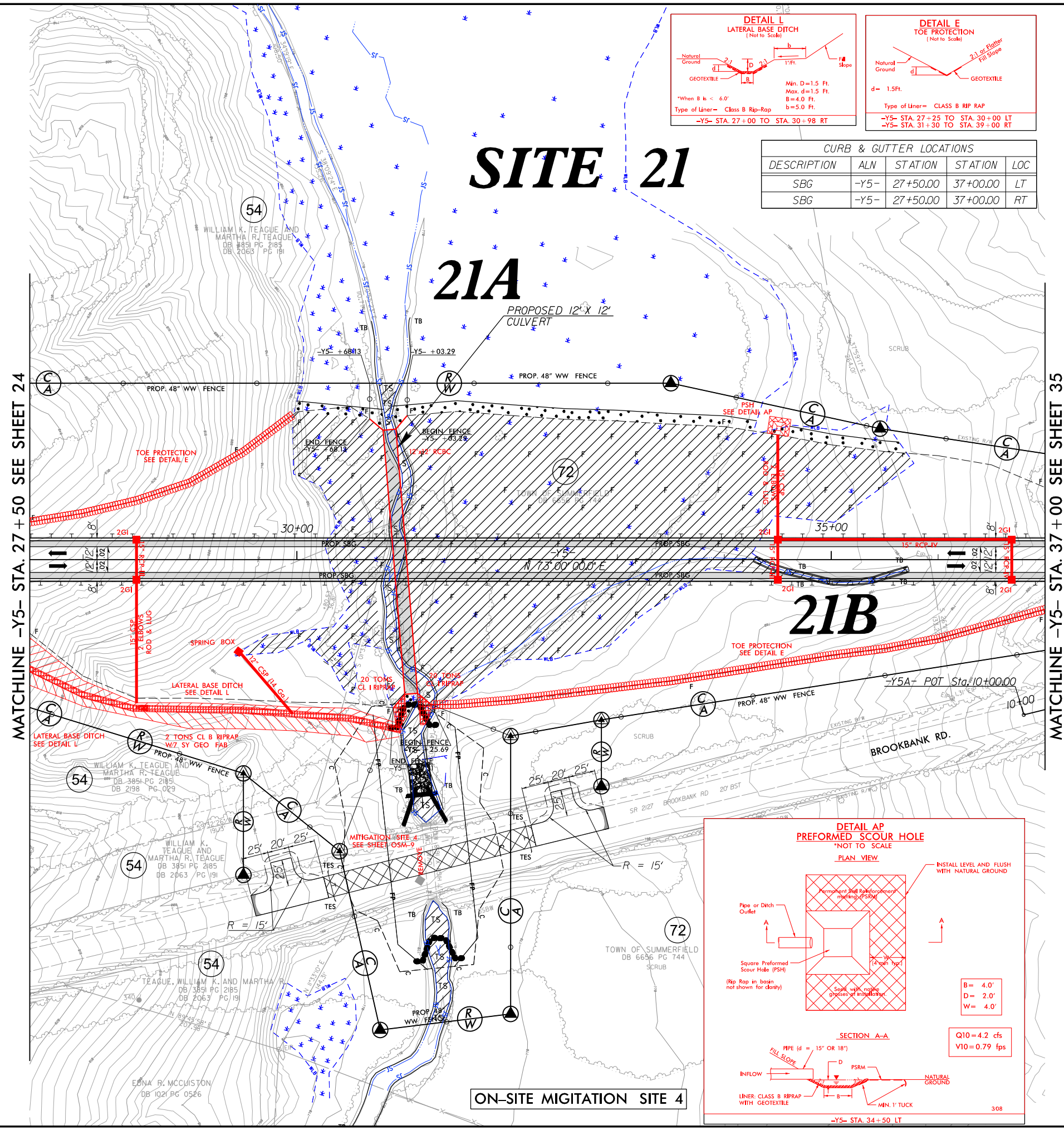
PLANS PREPARED BY :

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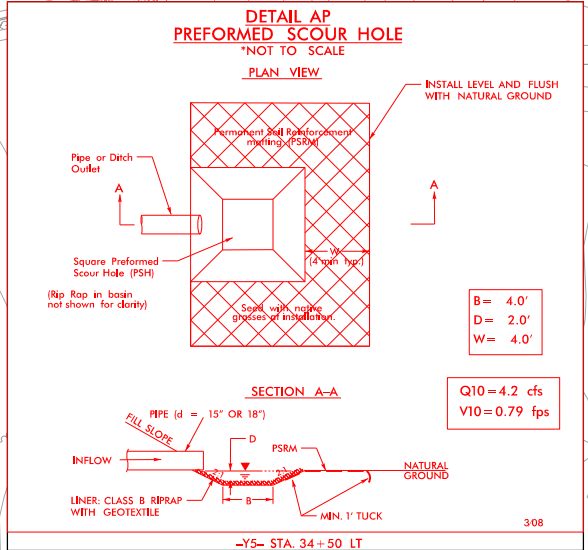
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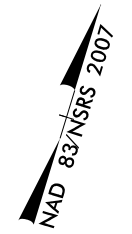
CURB & GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-Y5-	27+50.00	37+00.00	LT
SBG	-Y5-	27+50.00	37+00.00	RT

- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER



PROJECT REFERENCE NO. <i>R-2413A</i>		SHEET NO. <i>34</i>
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

REVISED 9/12/2014
PERMIT DRAWING
SHEET 68 OF 81



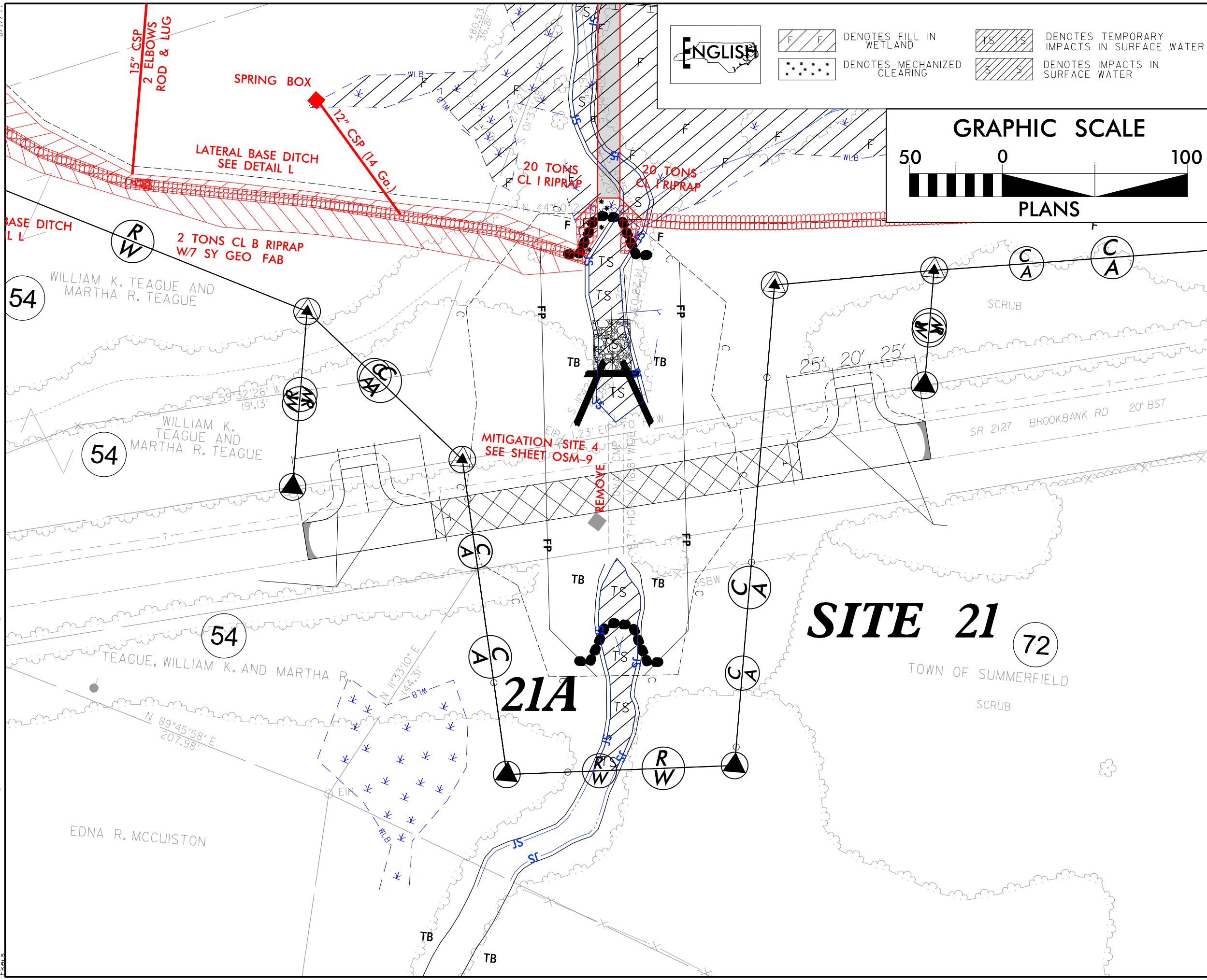
ENGLISH

GRAPHIC SCALE

FOR -Y5- PLANS SEE SHT. 63
FOR OSM PLANS SEE SHTS. OSM-4 & OSM-6
FOR STRUCTURE PLANS SEE -Y5- CULVERT SHTS. C-1 & C-5

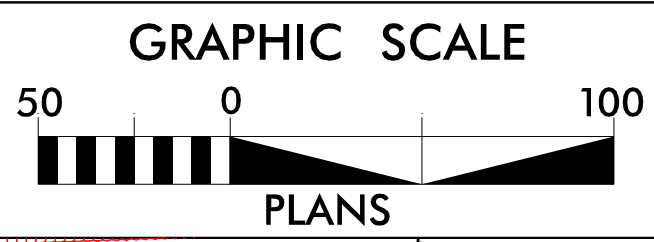
PLANS PREPARED BY :
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8/10/2014
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F F DENOTES FILL IN WETLAND
S S DENOTES MECHANIZED CLEARING

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
S S DENOTES IMPACTS IN SURFACE WATER



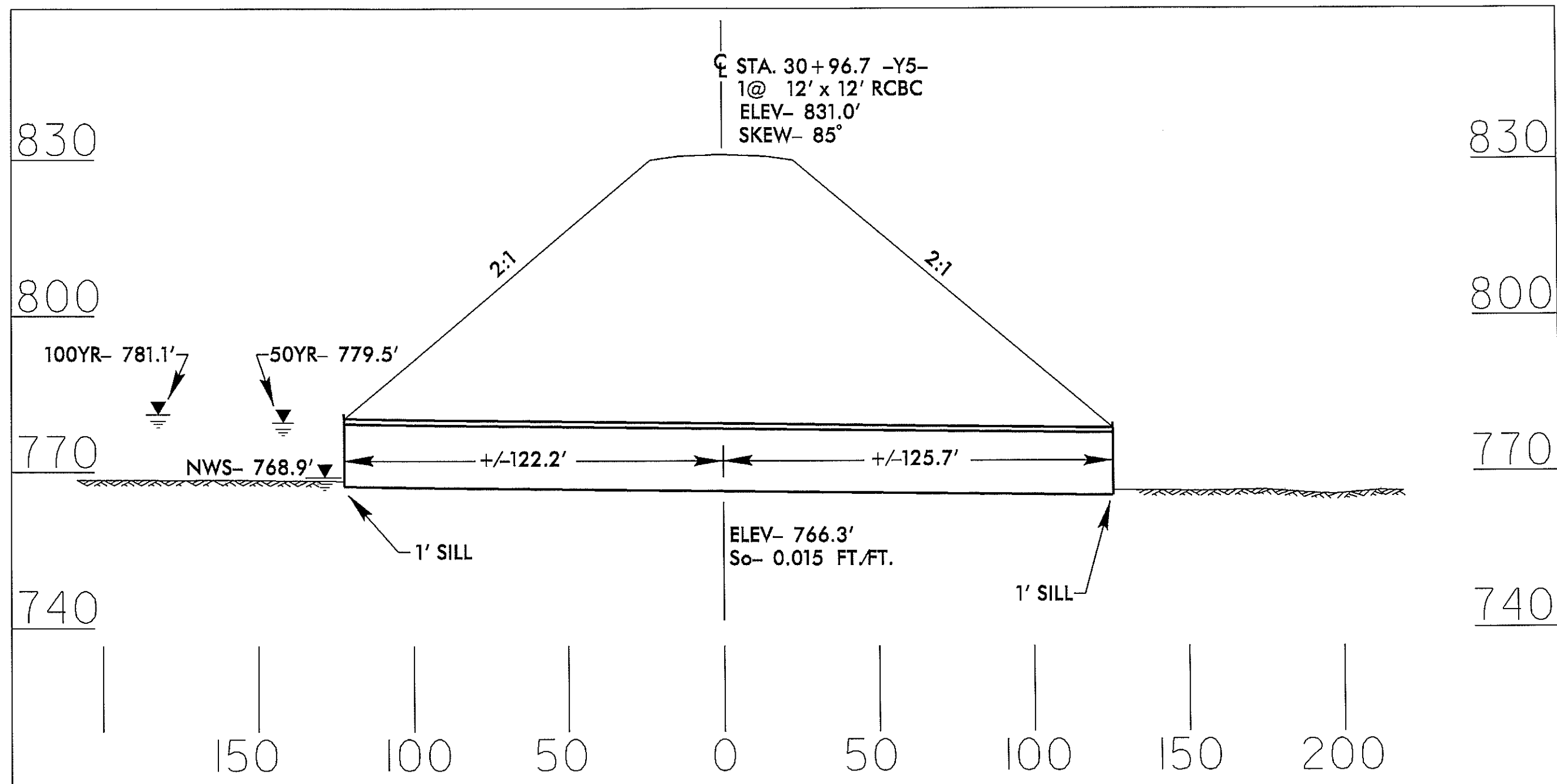
PROJECT REFERENCE NO. R-2413A		SHEET NO. 34A	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		REVISED 9/12/2014 PERMIT DRAWING SHEET 69 OF 81	

NAD 83 NRS 2007

SITE 21
TOWN OF SUMMERFIELD
SCRUB

21A

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PROFILE

NCDOT
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34429.1.1 (R-2413A)
NC 68 CONNECTOR
FROM FOUR LANES AT
SR 2011 TO SR 2127
PERMIT DRAWING
SHEET 70 OF 81
2 / 13 / 13

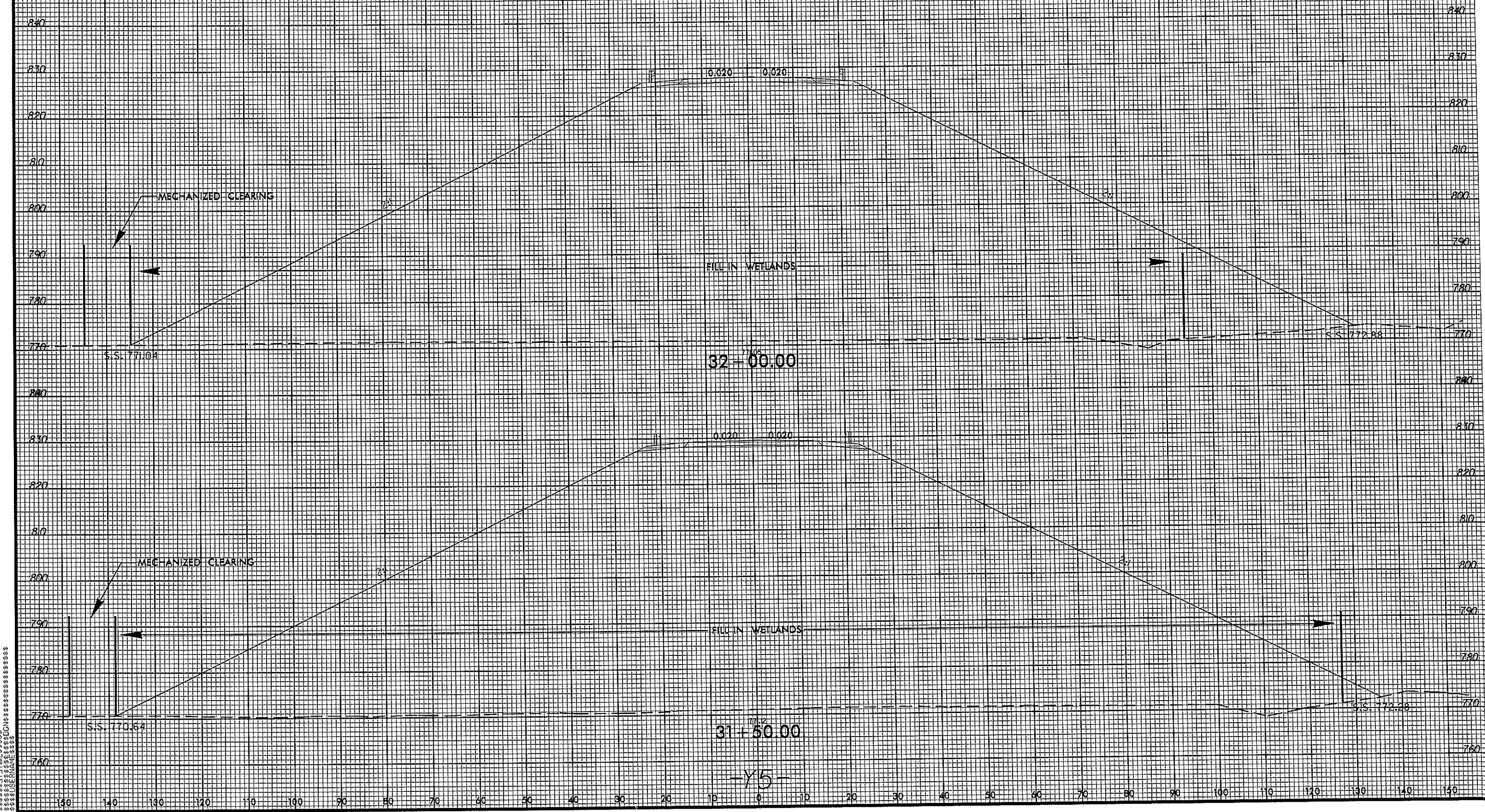
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PROJ. REFERENCE NO.
R-2413A

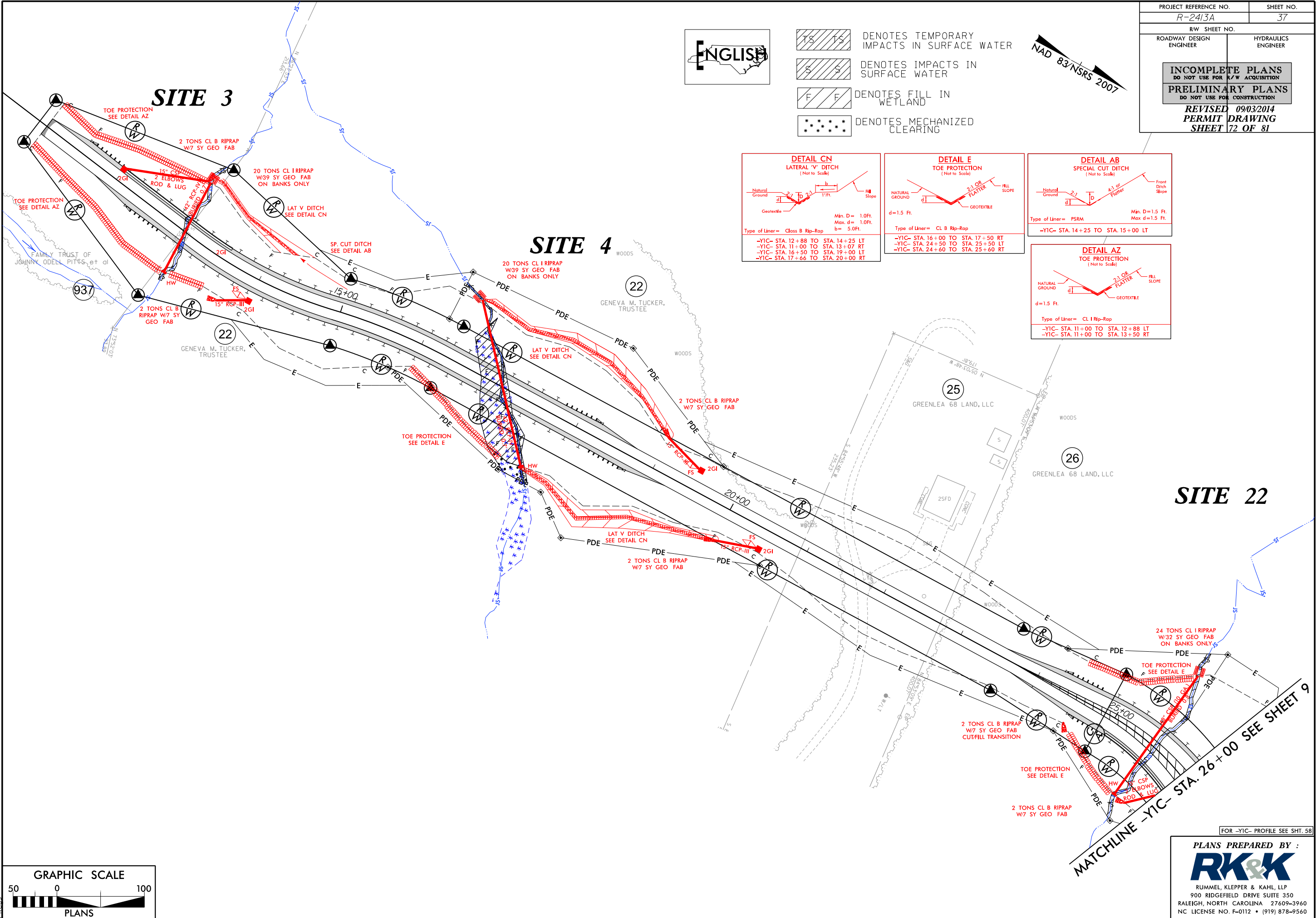
SHEET NO.
X-413

PERMIT DRAWING
SHEET 71 OF 81



8/17/99

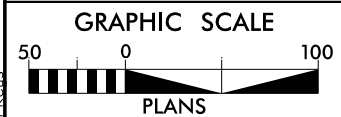
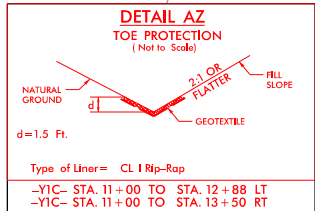
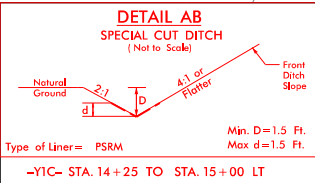
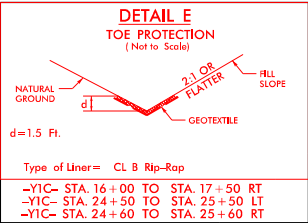
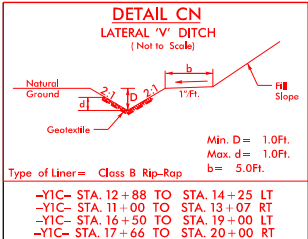
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- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING

NAD 83 NSRS 2007

PROJECT REFERENCE NO. <i>R-2413A</i>		SHEET NO. <i>37</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
REVISED PERMIT SHEET		<i>09/03/2014</i> <i>DRAWING</i> <i>72 OF 81</i>	



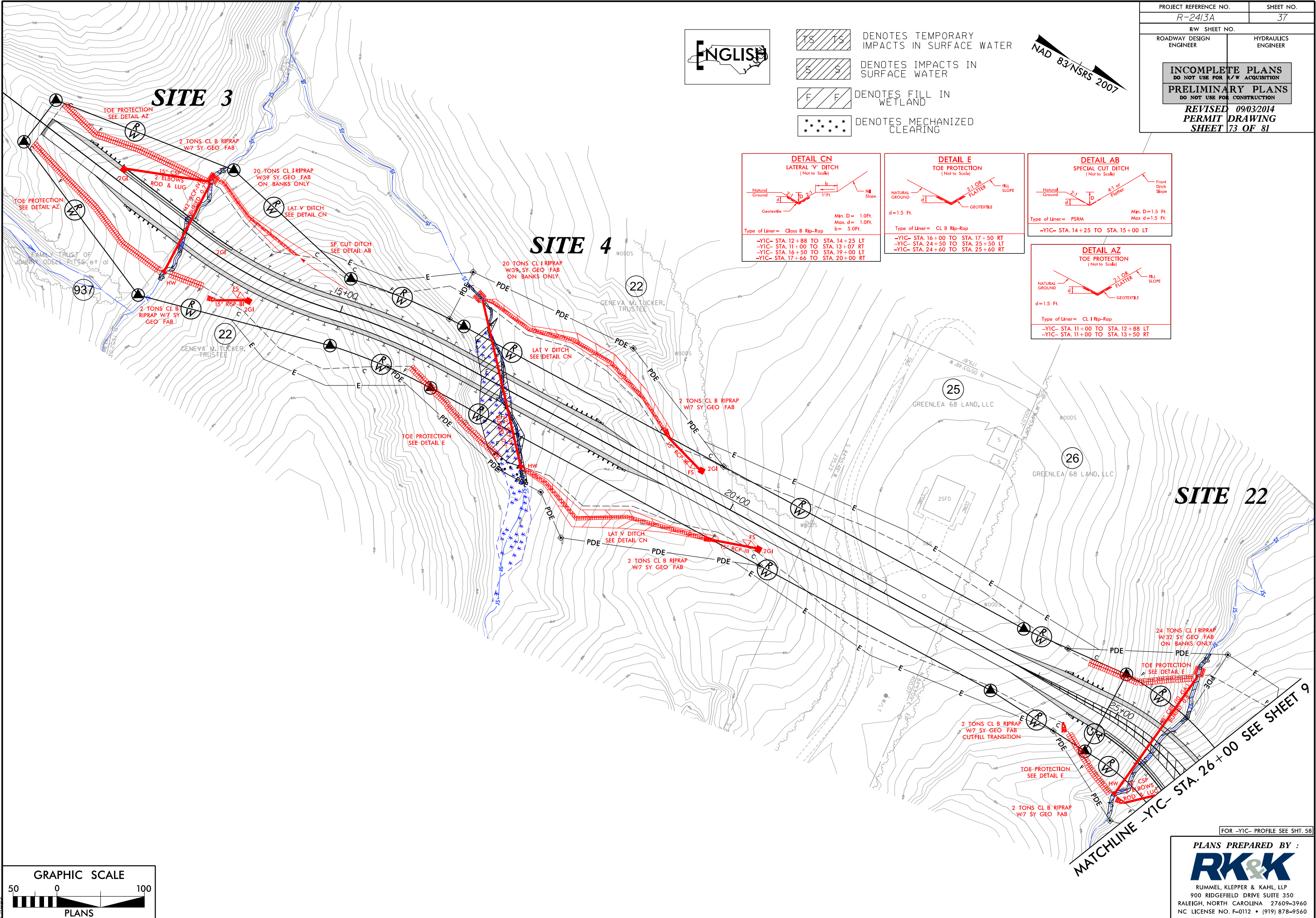
PLANS PREPARED BY :

RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

8/17/99

9/3/2014
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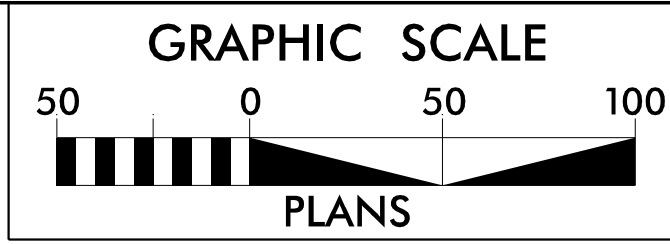
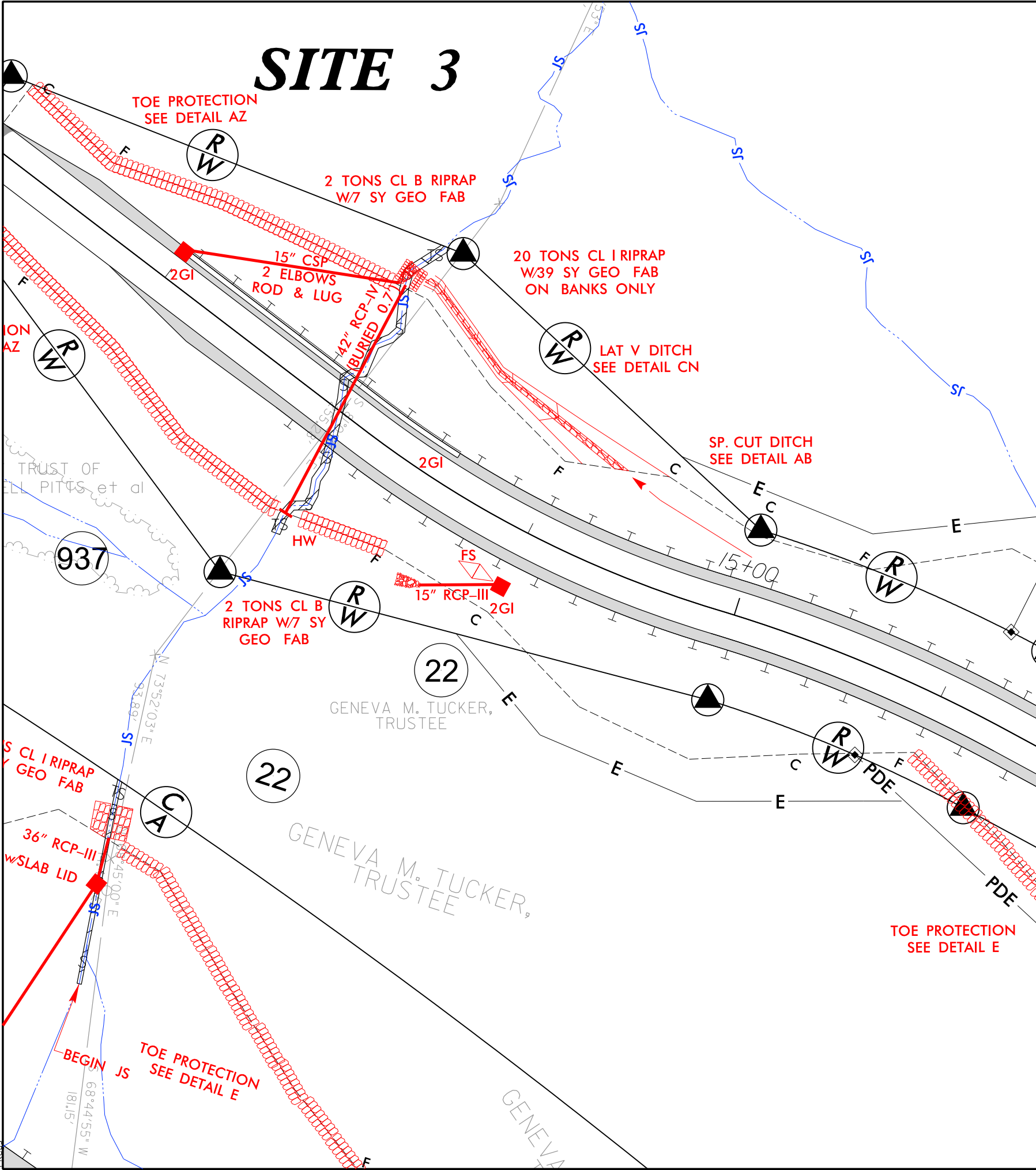
PROJECT REFERENCE NO. <i>R-2413A</i>		SHEET NO. <i>37</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION <i>REVISED 09/03/2014</i> <i>PERMIT DRAWING</i> <i>SHEET 73 OF 81</i>			

FOR -YIC- PROFILE SEE SHT. 58

8/17/99

9/3/2014
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SITE 3



PROJECT REFERENCE NO. R-2413A	SHEET NO. 37B
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
REVISED 09/03/2014 PERMIT DRAWING SHEET 74 OF 81	



- TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S DENOTES IMPACTS IN SURFACE WATER
- F F DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING

NAD 83/NSRS 2007
WOODS

SITE 4

22

GENEVA M. TUCKER, TRUSTEE

PDE

WOODS

2 TONS CL I RIPRAP W/7 SY GEO FAB

PDE

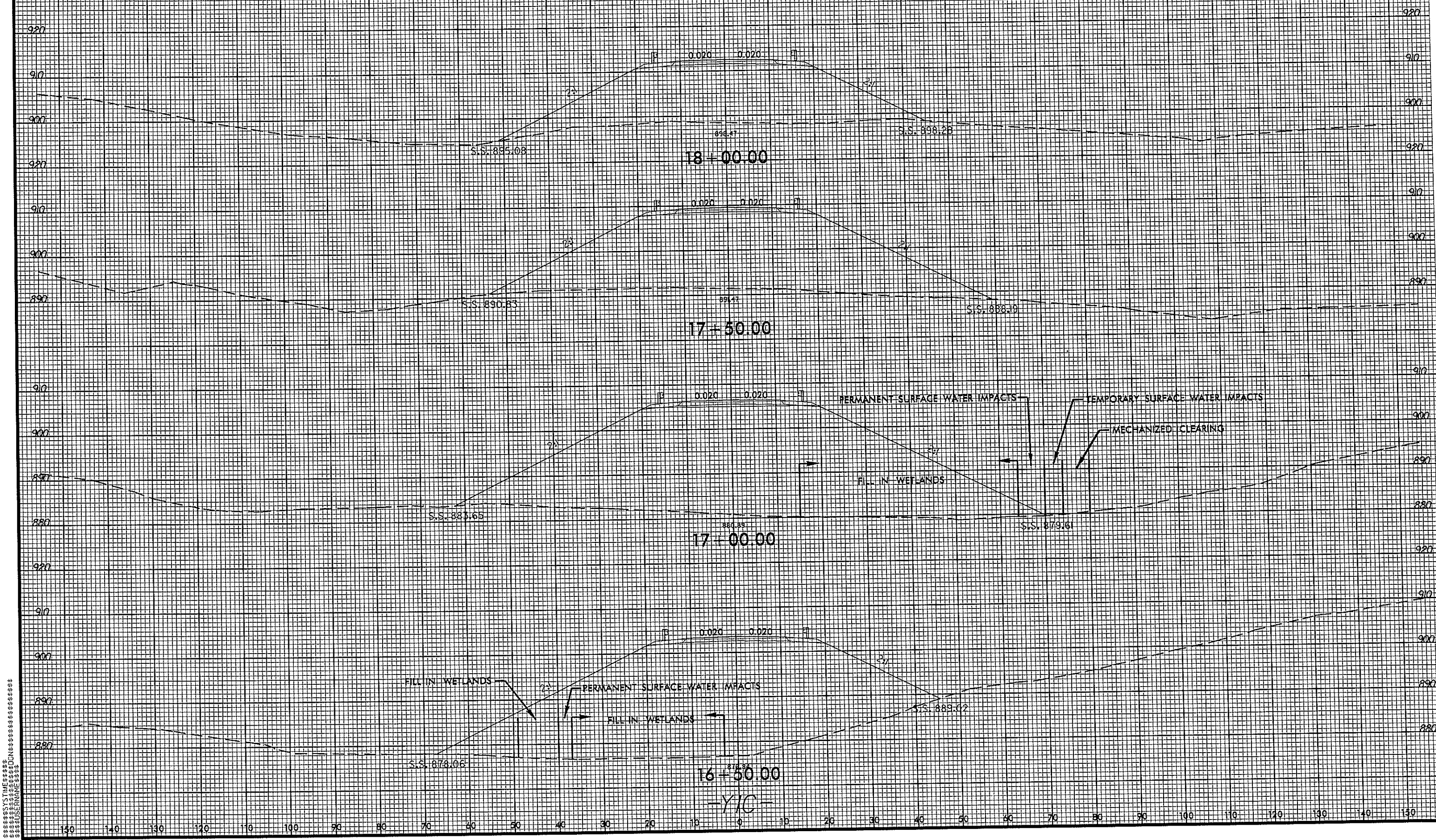
15" RCP-III

PLANS PREPARED BY :
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R-2413A X-433

PERMIT DRAWING
SHEET 75 OF 81



8/23/99

SITE 22



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN
SURFACE WATER

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GRAPHIC SCALE



PLANS

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26

GREENLEA 68 LAND, LLC

2 TONS CL B RIPRAP
W/7 SY GEO FAB
CUT/FILL TRANSITION

TOE PROTECTION
SEE DETAIL E

2 TONS CL B RIPRAP
W/7 SY GEO FAB

24 TONS CL I RIPRAP
W/32 SY GEO FAB
ON BANKS ONLY

TOE PROTECTION
SEE DETAIL E

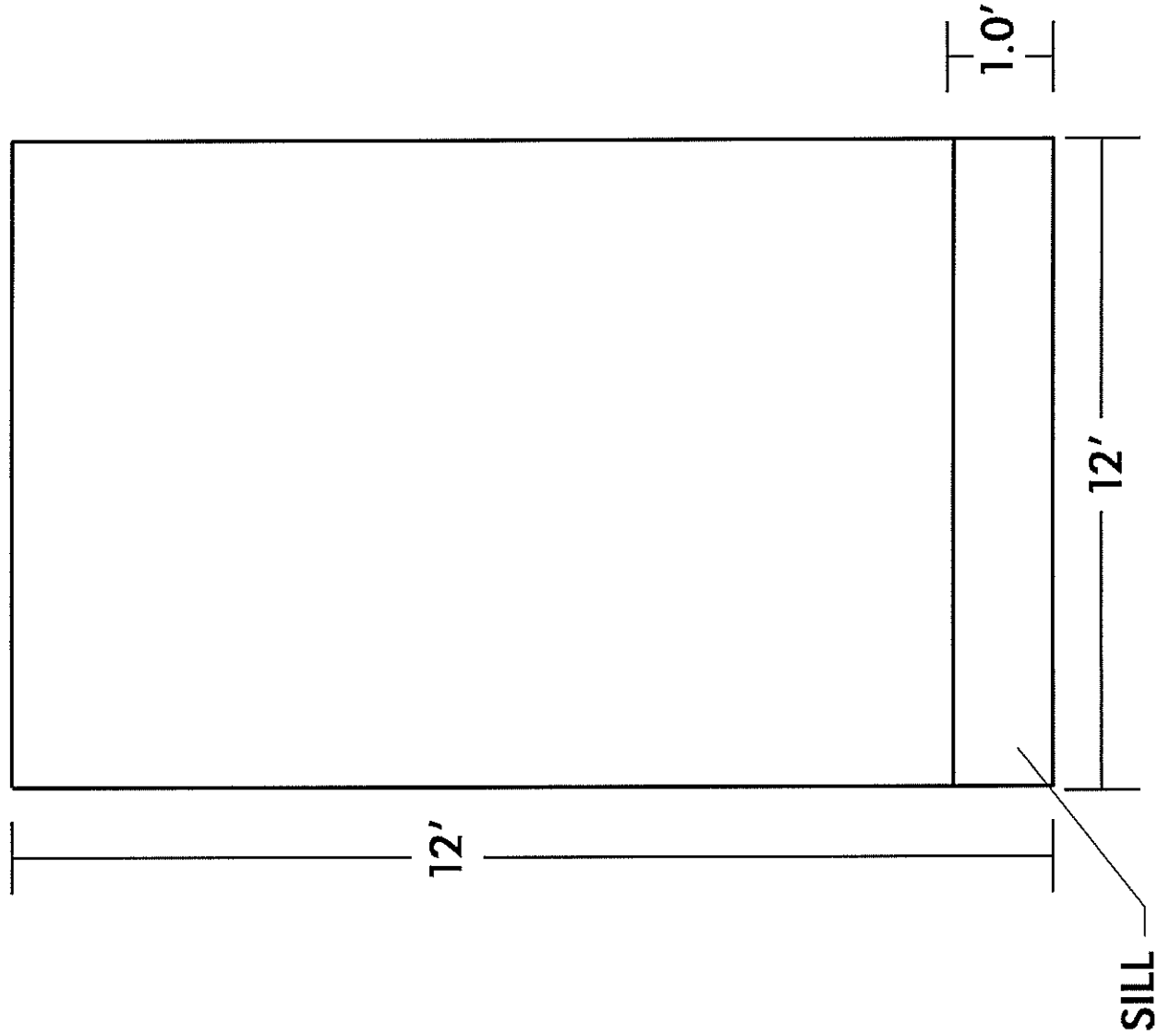
2 TONS
W7 SY
CUTFILL

2 TONS CL B RIPRAP
W/7 SY GEO FAB
CUT/FILL

8/17/99

3/3/2014
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SILL DETAIL



(PLACE SILL AT INLET AND OUTLET)

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
7	206+50 to 208+50 -L-	60" CSP & 54" CSP										
7a.								0.03	<0.01	379	21	
7b.								<0.01	<0.01	26	10	
7c.								<0.01		31		
		Bank Stabilization								45		
8	228+00 to 233+50 -L-	66" CSP										
8a.								0.06	<0.01	654	50	
8b.								<0.01		50		
8c.								<0.01		34		
		Bank Stabilization								21		
9	232+50 to 235+50 -L-	42" CSP						0.60 (pond)				
10	247+50 -L-	72" CSP										
10a.			0.01		<0.01			0.05	<0.01	426	41	
10b.								<0.01		49		
10c.			<0.01			0.01		0.01		116		
		Bank Stabilization								20		
11	249+50 to 251+50 -L-	48" CSP	0.12					<0.01	<0.01	47	17	
TOTALS:								0.15				

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD
COUNTY
WBS - 34429.1.1 (R-2413A)

PERMIT DRAWING
SHEET 79 OF 81

4/17/2013

WETLAND PERMIT IMPACT SUMMARY												
Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
12	269+50 -L-	72" CSP										
12a.								0.03		299		1163*
12b.								0.01		131		
13	277+00 to 281+00 -L-	54" RCP										
13a.								0.04	<0.01	525	10	977*
13b.								0.01		106		
14	307+00 -L-	78" CSP										
14a.								0.07		551	20	
14b.								0.02		258	10	
		Bank Stabilization								25		
15	322+50 to 326+00 -L-	54" CSP										
15a.			0.01					0.04	<0.01	513	41	
		Bank Stabilization								20		
15b.								<0.01		46		
16	327+50 to 329+50 -L-	72" CSP										
16a.			0.15					0.02	<0.01	342	29	
		Bank Stabilization								20		
16b.								<0.01		33		
SUBTOTALS:			0.16					0.21	0.03	2,869	110	2,140

* See Plan for On-Site Mitigation

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DIVISION OF HIGHWAYS
GUILFORD
COUNTY
WBS - 34429.1.1 (R-2413A)

PERMIT DRAWING
SHEET 80 OF 81

7/1/2013

WETLAND PERMIT IMPACT 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)
17	-L- 334+00-336+50	36" CSP	0.35			0.03						
18	-L- 338+00-340+50	Bridge		0.04			0.13		0.03		172	
19	-L- 348+00-353+00	60" RCP						0.03	<0.01	507	34	
20	-Y4- 17+50-19+00	36" CSP	0.11					0.02		240		
21	-Y5- 29+00-36+00	1@12'x12' RCBC										
21A			2.11			0.13		0.06	0.09	288	262	250*
21B		Road Fill						0.01		149		
22	Y1C- 25+50	48" CSP						0.02	<0.01	177	40	
		Bank Stabilization								16		
23	-Y5- 16+50	30" CSP/PDE							<0.01		12	
SUBTOTALS:			2.57	0.04		0.16	0.13	0.14	0.15	1377	520	250
TOTALS:			3.11 **	0.04	<0.01	0.19	0.13	1.42	0.30	8937	977 ***	2390

* SEE PLAN FOR ON-SITE MITIGATION

** DUE TO SITE 1 WETLAND IMPACTS ERROR, PERMANENT FILL IN WETLAND IN ORIGINAL PERMIT WAS SUMMED WRONG. IT WAS LISTED AS 3.13ac; IT SHOULD HAVE BEEN 3.14ac

*** TEMP CHANNEL IMPACT IN ORIGINAL PERMIT WAS SUMMED WRONG. IT WAS LISTED AS 942 FT; IT SHOULD HAVE BEEN 952 FT.

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UNION COUNTY
WBS - 34533.5.TA1 (R-3329/2559)
PERMIT DRAWING
SHEET 81 OF 81

REVISED
9/3/2014