



Pre-Construction Notification (PCN) Form

For Nationwide Permits and Regional General Permits
(along with corresponding Water Quality Certifications)

June 1, 2021 Ver 4.1

Please note: fields marked with a red asterisk * below are required. You will not be able to submit the form until all mandatory questions are answered.

Also, if at any point you wish to print a copy of the E-PCN, all you need to do is right-click on the document and you can print a copy of the form.

Below is a link to the online help file.

<https://edocs.deq.nc.gov/WaterResources/0/edoc/624704/PCN%20Help%20File%202018-1-30.pdf>

A. Processing Information

County (or Counties) where the project is located:*

Moore

Hoke

Is this a NCDMS Project?*

Yes No

Click Yes, only if NCDMS is the applicant or co-applicant.

Is this project a public transportation project?*

Yes No

This is any publicly funded by municipal, state or federal funds road, rail, airport transportation project.

Is this a NCDOT Project?*

Yes No

(NCDOT only) T.I.P. or state project number:

R-5709

WBS #*

50205.1.1

(for NCDOT use only)

1a. Type(s) of approval sought from the Corps:*

Section 404 Permit (wetlands, streams and waters, Clean Water Act)

Section 10 Permit (navigable waters, tidal waters, Rivers and Harbors Act)

Has this PCN previously been submitted?*

Yes

No

1b. What type(s) of permit(s) do you wish to seek authorization?*

Nationwide Permit (NWP)

Regional General Permit (RGP)

Standard (IP)

1c. Has the NWP or GP number been verified by the Corps?*

Yes No

Nationwide Permit (NWP) Number:

57 - Electric Utility Line and Telecommunications Activities – (frequently used)

NWP Numbers (for multiple NWPS):

List all NW numbers you are applying for not on the drop down list.

Regional General Permit (RGP) Number:

198200031 - NCDOT Bridges, Widening Projects 2015

RGP Numbers (for multiple RGPS):

List all RGP numbers you are applying for not on the drop down list.

1d. Type(s) of approval sought from the DWR:*

check all that apply

- 401 Water Quality Certification - Regular
 Non-404 Jurisdictional General Permit
 Individual 401 Water Quality Certification

- 401 Water Quality Certification - Express
 Riparian Buffer Authorization

Pre-Filing Meeting Information

Before submitting this form please ensure you have submitted the Pre-Filing Meeting Request Form as we will not be able to accept your application without this important first step. The Pre-Filing Meeting Request Form is used in accordance with 40 C.F.R. Section 121.4(a) "At least 30 days prior to submitting a certification request, the project proponent shall request a pre-filing meeting with the certifying agency" and in accordance with 40 C.F.R. Section 121.5(b)(7), and (c)(5) all certification requests shall include documentation that a pre-filing meeting request was submitted to the certifying authority at least 30 days prior to submitting the certification request. Click [here](#) to read more information on when this form is needed prior to application submission or [here](#) to view the form.

Is this a courtesy copy notification? *

Yes No

ID#

Version

Pre-filing Meeting or Request Date *

5/12/2021

Attach documentation of Pre-Filing Meeting Request here: *

Click the upload button or drag and drop files here to attach document

R-5709 4C Final Minutes 20210615.pdf

196.33KB

File type must be PDF

1e. Is this notification solely for the record because written approval is not required?

*

For the record only for DWR 401 Certification:

Yes No

For the record only for Corps Permit:

Yes No

1f. Is this an after-the-fact permit application? *

Yes No

1g. Is payment into a mitigation bank or in-lieu fee program proposed for mitigation of impacts?

If so, attach the acceptance letter from mitigation bank or in-lieu fee program

Yes No

Acceptance Letter Attachment

Click the upload button or drag and drop files here to attach document

Accept_R-5709.pdf

461.99KB

FILETYPE MUST BE PDF

1h. Is the project located in any of NC's twenty coastal counties? *

Yes No

1j. Is the project located in a designated trout watershed? *

Yes No

Link to trout information: <http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/Trout.aspx>

B. Applicant Information

1a. Who is the Primary Contact? *

Gordon Cashin

1b. Primary Contact Email: *

gcashin@ncdot.gov

1c. Primary Contact Phone: *

(xxx)xxx-xxxx

(919)749-0442

1d. Who is applying for the permit? *

Owner
(Check all that apply)

Applicant (other than owner)

1e. Is there an Agent/Consultant for this project? *

Yes No

2. Owner Information

2a. Name(s) on recorded deed: *

Multiple properties

2b. Deed book and page no.:

2c. Contact Person:

(for Corporations)

2d. Address *

Street Address

1000 Birch Ridge Drive

Address Line 2

City

Raleigh

Postal / Zip Code

27610

State / Province / Region

NC

Country

USA

2e. Telephone Number: *

(xxx)xxx-xxxx

(919)749-0442

2f. Fax Number:

(xxx)xxx-xxxx

2g. Email Address: *

pharris@ncdot.gov

C. Project Information and Prior Project History

1. Project Information

1a. Name of project: *

Widening and improvements of NC 211 from US 15-501 in Aberdeen to SR 1244 (West Palmer Street) / SR 1311 (Mockingbird Hill Road) in Raeford. (Central)

1b. Subdivision name:

(if appropriate)

1c. Nearest municipality / town: *

Aberdeen and Raeford

2. Project Identification

2a. Property Identification Number:

(tax PIN or parcel ID)

2b. Property size:

(in acres)

2c. Project Address

Street Address

Address Line 2

City

Postal / Zip Code

State / Province / Region

Country

2d. Site coordinates in decimal degrees

Please collect site coordinates in decimal degrees. Use between 4-6 digits (unless you are using a survey-grade GPS device) after the decimal place as appropriate, based on how the location was determined. (For example, most mobile phones with GPS provide locational precision in decimal degrees to map coordinates to 5 or 6 digits after the decimal place.)

Latitude: *

35.051455

ex: 34.208504

Longitude: *

-79.343141

-77.796371

3. Surface Waters

3a. Name of the nearest body of water to proposed project: *

Devil Gut Branch, Quewhiffle Creek, Mountain Creek, Buffalo Creek, Toney's Creek and Rockfish Creek.

3b. Water Resources Classification of nearest receiving water: *

C (multiple streams), B (Rockfish Creek), C:Sw (Toney's Creek)

[Surface Water Lookup](#)

3c. What river basin(s) is your project located in? *

Lumber

3d. Please provide the 12-digit HUC in which the project is located. *

03040203

[River Basin Lookup](#)

4. Project Description and History

4a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application: *

The project lies in the outer coastal plain physiographic region (Sandhills) of North Carolina. Topography in the project vicinity is characterized by broad, sandy ridges and long, less sandy slopes. Elevations in the study area range from 270 - 550 feet above sea level. Land use in the project vicinity consists of mixed forestland, agriculture, commercial, and residential.

4b. Have Corps permits or DWR certifications been obtained for this project (including all prior phases) in the past? *

Yes No Unknown

4f. List the total estimated acreage of all existing wetlands on the property:

14.79

4g. List the total estimated linear feet of all existing streams on the property:

(intermittent and perennial)

4,600

4h. Explain the purpose of the proposed project: *

The purpose of the proposed project is to reduce traffic congestion and travel delays, and correct roadway deficiencies along NC 211 within the project limits.

4i. Describe the overall project in detail, including indirect impacts and the type of equipment to be used: *

STIP Project No. R-5709 proposes to widen approximately 15.4 miles of NC 211 in Moore and Hoke Counties. The existing two-lane roadway is proposed to be widened to a four lane divided roadway with a grass median and reduced conflict intersections. A 30-foot wide raised median is proposed in Moore County (50 mph design speed) and a 46-foot wide depressed median is proposed in Hoke County (60 mph design speed). There will be curb and gutter with 5-foot sidewalks on both sides of NC 211 in Aberdeen and on the south side of NC 211 from Gable Drive to the project terminus in Raeford.

Widening is proposed primarily along the existing alignment. Hills/crests and valleys/sags will be flattened to correct problems with the existing alignment such as sight distance.

Dual bridges with 5.5-foot sidewalks will carry NC 211 over the Aberdeen & Rockfish Railroad just east of Central Drive in Aberdeen (Moore County), eliminating the at-grade railroad crossing. NC 211 will be realigned to eliminate the existing at-grade railroad crossing at Reservation Road (Hoke County). This new section of roadway will also include dual bridges over the railroad.

Standard roadbuilding equipment will be used. Utilities will be adjusted along the project as needed.

5. Jurisdictional Determinations

5a. Have the wetlands or streams been delineated on the property or proposed impact areas? *

Yes No Unknown

Comments:

PJD package submitted for review on 6/8/21

5b. If the Corps made a jurisdictional determination, what type of determination was made? *

Preliminary Approved Not Verified Unknown N/A

Corps AID Number:

Example: SAW-2017-99999

SAW-2018-02283

5c. If 5a is yes, who delineated the jurisdictional areas?

Name (if known): Pete Stafford, Hal Bain, John Merritt

Agency/Consultant Company: RK&K

Other:

6. Future Project Plans

6a. Is this a phased project? *

Yes No

Are any other NWP(s), regional general permit(s), or individual permits(s) used, or intended to be used, to authorize any part of the proposed project or related activity? This includes other separate and distant crossing for linear projects that require Department of the Army authorization but don't require pre-construction notification.

NA

D. Proposed Impacts Inventory

1. Impacts Summary

1a. Where are the impacts associated with your project? (check all that apply):

Wetlands Streams-tributaries Buffers
 Open Waters Pond Construction

2. Wetland Impacts

If there are wetland impacts proposed on the site, then complete this question for each wetland area impacted.

"W." will be used in the table below to represent the word "wetland".

S1	RCP installation	Permanent	Culvert	Site 3 (SA)	Perennial	Both	4 Average (feet)	183 (linear feet)
S2	RCP installation	Temporary	Culvert	Site 3 (SA)	Perennial	Both	4 Average (feet)	20 (linear feet)
S3	bank stabilization	Permanent	Bank Stabilization	Site 4 (SD)	Perennial	Both	6 Average (feet)	20 (linear feet)
S4	bank stabilization	Temporary	Bank Stabilization	Site 4 (SD)	Perennial	Both	6 Average (feet)	12 (linear feet)
S5	RCP installation	Permanent	Culvert	Site 8 (SC)	Perennial	Both	6 Average (feet)	85 (linear feet)
S6	RCP installation	Temporary	Culvert	Site 8 (SC)	Perennial	Both	6 Average (feet)	53 (linear feet)
S7	bank stabilization	Permanent	Bank Stabilization	Site 8 (SC)	Perennial	Both	6 Average (feet)	26 (linear feet)
S8	RCP installation	Permanent	Culvert	Site 10 (SE)	Perennial	Both	3 Average (feet)	70 (linear feet)
S9	RCP installation	Permanent	Culvert	Site 14 (SF)	Perennial	Both	5 Average (feet)	185 (linear feet)
S10	RCP installation	Permanent	Culvert	Site 15 (SJ)	Intermittent	Both	6 Average (feet)	140 (linear feet)
S11	RCP installation	Temporary	Culvert	Site 15 (SJ)	Intermittent	Both	6 Average (feet)	11 (linear feet)
S12	RCP installation	Permanent	Culvert	Site 16 (SG)	Perennial	Both	3 Average (feet)	116 (linear feet)
S13	bank stabilization	Permanent	Stabilization	Site 16 (SG)	Perennial	Both	3 Average (feet)	20 (linear feet)
S14	bank stabilization	Temporary	Stabilization	Site 16 (SG)	Perennial	Both	3 Average (feet)	11 (linear feet)
S15	RCP installation	Temporary	Culvert	Site 18 (SH)	Perennial	Both	3 Average (feet)	26 (linear feet)
S16	channel relocation	Permanent	Other	Site 18 (SH)	Perennial	Both	3 Average (feet)	213 (linear feet)
S17	bank stabilization	Permanent	Stabilization	Site 18 (SH)	Perennial	Both	3 Average (feet)	15 (linear feet)
S18	bank stabilization	Temporary	Stabilization	Site 18 (SH)	Perennial	Both	3 Average (feet)	12 (linear feet)
S19	roadway fill	Permanent	Fill	Site 22 (SM)	Intermittent	Both	4 Average (feet)	341 (linear feet)
S20	roadway fill	Temporary	Fill	Site 22 (SM)	Intermittent	Both	4 Average (feet)	12 (linear feet)
S21	RCP installation	Permanent	Culvert	Site 22A (SK)	Perennial	Both	9 Average (feet)	6 (linear feet)
S22	bank stabilization	Permanent	Stabilization	Site 22A (SK)	Perennial	Both	9 Average (feet)	23 (linear feet)
S23	bank stabilization	Temporary	Stabilization	Site 22A (SK)	Perennial	Both	9 Average (feet)	3 (linear feet)

** All Perennial or Intermittent streams must be verified by DWR or delegated local government.

3i. Total jurisdictional ditch impact in square feet:

0

3i. Total permanent stream impacts:

1,443

3i. Total temporary stream impacts:

160

3i. Total stream and ditch impacts:

1603

3j. Comments:

4. Open Water Impacts

If there are proposed impacts to lakes, ponds, estuaries, tributaries, sounds, the Atlantic Ocean, or any other open water of the U.S. then individually list all open water impacts below.

4a. Site # [*] (?)	4a1. Impact Reason	4b. Impact type [*] (?)	4c. Name of waterbody (?)	4d. Activity type [*]	4e. Waterbody type [*]	4f. Impact area [*]
3	RCP	P	SA	Culverts	Tributary	0.02 (acres)
3	RCP	T	SA	Culverts	Tributary	0.01 (acres)
4	bank stabilization	P	SD	Stabilization	Tributary	0.00 (acres)
4	bank stabilization	T	SD	Stabilization	Tributary	0.00 (acres)
8	RCP	P	SC	Culverts	Tributary	0.01 (acres)
8	RCP	T	SC	Culverts	Tributary	0.01 (acres)
8	bank stabilization	P	SC	Stabilization	Tributary	0.00 (acres)
10	RCP	P	SE	Culverts	Tributary	0.00 (acres)
14	RCP	P	SF	Culverts	Tributary	0.02 (acres)
15	RCP	P	SJ	Culverts	Tributary	0.01 (acres)
15	RCP	T	SJ	Culverts	Tributary	0.00 (acres)
16	RCP	P	SG	Culverts	Tributary	0.01 (acres)
16	bank stabilization	P	SG	Stabilization	Tributary	0.01 (acres)
16	bank stabilization	T	SG	Stabilization	Tributary	0.01 (acres)
18	RCP	T	SH	Culverts	Tributary	0.01 (acres)
18	channel relocation	P	SH	Fill	Tributary	0.02 (acres)
18	bank stabilization	P	SH	Stabilization	Tributary	0.01 (acres)
18	bank stabilization	T	SH	Stabilization	Tributary	0.01 (acres)
20	fill	P	PE ditch to pond	Fill	Ditch	0.01 (acres)
22	fill	P	SM	Fill	Tributary	0.02 (acres)
22	fill	T	SM	Fill	Tributary	0.01 (acres)
22A	RCP	P	SK	Culverts	Tributary	0.01 (acres)
22A	RCP	T	SK	Culverts	Tributary	0.01 (acres)
22A	bank stabilization	P	SK	Stabilization	Tributary	0.01 (acres)

4g. Total temporary open water Impacts:

0.07

4g. Total permanent open water impacts:

0.16

4g. Total open water impacts:

0.23

4h. Comments:

E. Impact Justification and Mitigation



1. Avoidance and Minimization

1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing the project:*

The project was developed via the NEPA/404 Merger process. As detailed in the Merger Handout dated June 3, 2020, avoidance and minimization of impacts were incorporated throughout the project development process. The choice of widening side on several project segments was driven by wetland and stream avoidance (see 4A signature form). After the widening side was selected (CP 2 and CP 2-Revisited), additional avoidance and minimization measures were incorporated through design refinements, such as shifting U-turn bulbs, minor adjustments to the alignment, revising intersection design, steepening slopes, and the addition of pipes for wildlife passage at the request of the NC Wildlife Resources Commission.

1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques:*

NCDOT will employ hand clearing where possible. Other minimization measures include:

1. Steepening of roadway fill slopes within jurisdictional areas.
2. Stormwater was designed to avoid direct discharge into jurisdictional features to the maximum extent practicable.
3. Stormwater design velocities entering jurisdictional features have been mitigated to be non-erosive (less than 2 fps).
4. Open shoulder sections were maximized to promote sheet flow from the roadway.
5. Diffuse flow provided at outlets that do not have a well defined outfall.

2. Compensatory Mitigation for Impacts to Waters of the U.S. or Waters of the State

2a. Does the project require Compensatory Mitigation for impacts to Waters of the U.S. or Waters of the State?

Yes No

2c. If yes, mitigation is required by (check all that apply):

DWR Corps

2d. If yes, which mitigation option(s) will be used for this project?

Mitigation bank Payment to in-lieu fee program Permittee Responsible Mitigation

4. Complete if Making a Payment to In-lieu Fee Program

4a. Approval letter from in-lieu fee program is attached.

Yes No

4b. Stream mitigation requested:

(linear feet)

1443

4c. If using stream mitigation, what is the stream temperature:

warm

NC Stream Temperature Classification Maps can be found under the Mitigation Concepts tab on the Wilmington District's RIBITS website.

4d. Buffer mitigation requested (DWR only):

(square feet)

4e. Riparian wetland mitigation requested:

(acres)

1.3

4f. Non-riparian wetland mitigation requested:

(acres)

1.0

4g. Coastal (tidal) wetland mitigation requested:

(acres)

4h. Comments

6. Buffer mitigation (State Regulated Riparian Buffer Rules) - required by DWR

6a. Will the project result in an impact within a protected riparian buffer that requires buffer mitigation? If yes, you must fill out this entire form - please contact DWR for more information.

Yes No

F. Stormwater Management and Diffuse Flow Plan (required by DWR)

*** Recent changes to the stormwater rules have required updates to this section. ***

1. Diffuse Flow Plan

1a. Does the project include or is it adjacent to protected riparian buffers identified within one of the NC Riparian Buffer Protection Rules?

Yes No

For a list of options to meet the diffuse flow requirements, click [here](#).

If no, explain why:

NC Riparian Buffer Rules do not apply to the Lumber Basin.

2. Stormwater Management Plan

2a. Is this a NCDOT project subject to compliance with NCDOT's Individual NPDES permit NCS000250?*

Yes No

Comments:

G. Supplementary Information



1. Environmental Documentation

1a. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land? *

Yes No

1b. If you answered "yes" to the above, does the project require preparation of an environmental document pursuant to the requirements of the National or State (North Carolina) Environmental Policy Act (NEPA/SEPA)? *

Yes No

1c. If you answered "yes" to the above, has the document review been finalized by the State Clearing House? (If so, attach a copy of the NEPA or SEPA final approval letter.) *

Yes No

Comments: *

A Minimum Criteria Determination Checklist was prepared for the project. This type of documentation does not require review by the State Clearing House.

2. Violations (DWR Requirement)

2a. Is the site in violation of DWR Water Quality Certification Rules (15A NCAC 2H .0500), Isolated Wetland Rules (15A NCAC 2H .1300), or DWR Surface Water or Wetland Standards or Riparian Buffer Rules (15A NCAC 2B .0200)? *

Yes No

3. Cumulative Impacts (DWR Requirement)

3a. Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? *

Yes No

3b. If you answered "no," provide a short narrative description.

NCDOT completed a Land Use Scenario Assessment Report in December 2019. This report concluded that, based upon the qualitative analysis, indirect land use impacts are not likely, and an Indirect and Cumulative Effects Assessment was not required for this project.

4. Sewage Disposal (DWR Requirement)

4a. Is sewage disposal required by DWR for this project? *

Yes No N/A

5. Endangered Species and Designated Critical Habitat (Corps Requirement)

5a. Will this project occur in or near an area with federally protected species or habitat? *

Yes No

5b. Have you checked with the USFWS concerning Endangered Species Act impacts? *

Yes No

5c. If yes, indicate the USFWS Field Office you have contacted.

Raleigh

5d. Is another Federal agency involved? *

Yes No Unknown

5e. Is this a DOT project located within Division's 1-8? *

Yes No

5j. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat? *

USFWS County List, IPaC, Coordination with USFWS. Updated surveys were conducted as needed in June 2021.

6. Essential Fish Habitat (Corps Requirement)

6a. Will this project occur in or near an area designated as an Essential Fish Habitat? *

Yes No

6b. What data sources did you use to determine whether your site would impact an Essential Fish Habitat? *

NMFS Essential Fish Habitat map data.

7. Historic or Prehistoric Cultural Resources (Corps Requirement)

Link to the State Historic Preservation Office Historic Properties Map (does not include archaeological data: <http://gis.ncdcr.gov/hpoweb/>)

7a. Will this project occur in or near an area that the state, federal or tribal governments have designated as having historic or cultural preservation status (e.g., National Historic Trust designation or properties significant in North Carolina history and archaeology)? *

Yes No

7b. What data sources did you use to determine whether your site would impact historic or archeological resources? *

Programmatic MCDC documentation

8. Flood Zone Designation (Corps Requirement)

Link to the FEMA Floodplain Maps: <https://msc.fema.gov/portal/search>

8a. Will this project occur in a FEMA-designated 100-year floodplain? *

Yes No

8c. What source(s) did you use to make the floodplain determination? *

Flood Risk Information System

Miscellaneous

Comments

NCDWR:

Written approval from DWR is required for the GP 31 however with the NW 57, it does not appear DWR's authorization will require an Individual 401 WQC as impacts due to utility relocations falling below requirements for written approval.

Please use the space below to attach all required documentation or any additional information you feel is helpful for application review. Documents should be combined into one file when possible, with a Cover Letter, Table of Contents, and a Cover Sheet for each Section preferred.

[Click the upload button or drag and drop files here to attach document](#)

EPCN attachments.pdf

29.28MB

[File must be PDF or KMZ](#)

Signature

*

By checking the box and signing below, I certify that:

- The project proponent hereby certifies that all information contained herein is true, accurate, and complete to the best of my knowledge and belief; and
- The project proponent hereby requests that the certifying authority review and take action on this CWA 401 certification request within the applicable reasonable period of time.
- I have given true, accurate, and complete information on this form;
- I agree that submission of this PCN form is a "transaction" subject to Chapter 66, Article 40 of the NC General Statutes (the "Uniform Electronic Transactions Act");
- I agree to conduct this transaction by electronic means pursuant to Chapter 66, Article 40 of the NC General Statutes (the "Uniform Electronic Transactions Act");
- I understand that an electronic signature has the same legal effect and can be enforced in the same way as a written signature; AND
- I intend to electronically sign and submit the PCN form.

Full Name: *

Mack Christopher Rivenbark III

Signature *

Mack C. Rivenbark, III

Date

6/24/2021

R-5709 Final 4B Interagency Concurrence Point Meeting Minutes



Date: October 21, 2020

Meeting Minutes: October 21, 2020

Location: Zoom Meeting

Time: 1:00 PM

Attendees: Paul Atkinson – NCDOT Hydraulics
Mike Sanderson – NCDOT EPU
Mary Mays Yahl – RK&K
Kevin Alford -Wetherill
Robert Patterson – NCDWR
Harminder Singh – Wetherill
Benjamin Williamson - NCDOT PMU
Gordon Cashin NCDOT - EPU
Elmo Vance – NCDOT PMU
Pam Williams – NCDOT PMU
Reuben Blakley – NCDOT Division 8
Rob Ridings - DWR

Chris Rivenbark – NCDOT EAU
Terry Farr – NCDOT PMU
Trent Cormier– RK&K
Jerry Lindsay -Wetherill
Matthew Harvey – Wetherill
William Akabi-Davis– NCDOT Roadway Design
Brian Robinson – NCDOT Roadway Design
Travis Wilson – NC Wildlife Commission
Mark Staley – NCDOT Roadside Env.
Ray Lovinggood – NCDOT Hydraulics
Rex Badgett – NCDOT Division 8

The 30% Hydraulic Review was held in order to reach agreement on concurrence point 4B for the R-5709 project in Moore and Hoke Counties. The following items were discussed and conclusions reached:

Trent Cormier introduced the design team for the project. The project is broken up in to two design segments. The project is approximately 15.65 miles from US 15-501 in Aberdeen to SR 1244(West Palmer Street)/SR 1311(Mockingbird Hill Road) in Raeford.

Kevin Alford began the discussion on the plan sheets.

Plan sheet 4

- Stream SA: Impacts due to proposed roadway fill. Outlet protection will be on banks only. We do not anticipate excessive storm outlet velocities.

Plan sheet 5

- Stream SD: Impacts due to proposed roadway fill. Outlet protection will be on banks only. We do not anticipate excessive storm outlet velocities.
- Stream SC: Retain existing pipes in place and no need for pipe extensions. There are potential impacts where ditch ties to the stream. Outlet protection will be on banks only. We do not anticipate excessive storm outlet velocities.

Plan sheet 6

- Stream SC: Impacts due to proposed roadway fill. Outlet protection will be on banks only. We do not anticipate excessive storm outlet velocities.

Plan sheets 7-12

- No Impacts

Plan sheet 13

- No Impacts on this sheet. The pipe at approximately -L- Station 128+00 +/- is showing up on the 4B plans as a 1@66" RCP, but this has been revised since the 4B plans were created. The current proposed crossing is 2@48" RCP. Also,

the ditch coming into the inlet on the left side of -L- does not have rip rap on the 4B plan set but has been updated to have rip rap on the current proposed plans.

Plan sheet 14

- No Impacts

Plan sheet 15

- Wetland WJ: Impacts due to roadway fill and outlet stabilization.

Plan sheet 15-16

- Wetland WJ impacts are due to roadway fill and outlet stabilization.
- Wetland WI and Stream SE: Stream SE impacts are due to roadway fill. Stream SE is just on the downstream of the existing crossing. Wetland WI impacts are due to roadway fill and outlet stabilization. It was planned to drain the pond upstream and maintain the wetlands by retaining a portion of the existing outlet control structure. There was concern that this property was owned by the "Nature Conservancy" and it was stated that no coordination had been done with the "Nature Conservancy" at this stage of project.

Plan sheet 17

- No Impacts

Plan sheet 18

- Wetland WM: Impacts due to outlet stabilization at the end of a roadway ditch.

Plan sheet 18-19

- Wetland WL, Wetland WM, Wetland WN, Pond PA and Stream SF: Pond PA and Wetland WN will be impacted due to the removal of the pond dam at Pond PA. Stream SF and Wetland WM will be impacted due to roadway fill. Wetland WL will be impacted due to roadway fill and outlet stabilization.

Plan sheets 20-23

- No Impacts

Plan sheet 24

- Stream SJ: Impacts due to roadway fill and outlet stabilization. A dissipator pad was used at the outlet of the proposed pipes due excessive storm outlet velocities. Chris Rivenbark is verifying that the stream SJ is a JS.
- Wetland WW will not be impacted.

Plan sheets 25-31, 66-69, 73

- No Impacts

From this point forward, Trent Cormier led the discussion on each plan sheet.

Plan sheet 31-34

- No Impacts

Plan sheet 35

- Stream SG: This channel is jurisdictional only on the outlet end of the existing pipe. Impacts due to proposed roadway fill. Outlet protection will be on banks only. We do not anticipate excessive storm outlet velocities.

Plan sheet 36-43

- No Impacts

Plan sheet 44

- Wetland WO: No Impacts or adverse effects.

Plan sheet 45

- Wetland WP: Impacts due to proposed roadway fill, toe protection and pipe outlet stabilization.

Plan sheet 45-46

- Wetland WQ: Impacts due to proposed roadway fill, toe protection and pipe outlet stabilization.
- Stream SH: Impacts due to proposed roadway fill and upstream pipe outlet. Outlet protection is on banks only. We do not anticipate excessive storm outlet velocities. There was discussion on whether to bury the pipe that crosses the match line. Based on our discussions we will bury the 42" pipe along stream SH and upsize to a 48"
- The stream SH and wetlands WQ and WP are all combined downstream outside of the project area.

Plan sheet 47-52

- No impacts.

Plan sheet 53

- Wetland WR: Impacts due to roadway fill.
- Gordon mentioned this site as a possible location where the wetlands may no longer be jurisdictional to USACE due to new rules. Will wait for further clarification on new rules.

Plan sheet 54

- Pond PE: Impacts due to ditch connection to the pond. Minimal open water impacts anticipated.

Plan sheet 55-61

- No impacts.

Plan sheet 62

- Wetland WI: No Impacts, Outside of project area.

Plan sheet 63

- Wetland WT: Impacts due to proposed roadway fill and headwall construction
- Stream SM: Impacts due to proposed roadway fill and tail ditch. The existing system is flat and poorly graded, so the tail ditch was required to maintain positive flow.

Plan sheet 64,65,70,71

- No impacts.

Plan sheet 72

- Wetland WY: No Impacts, Outside of project area.

After completing the review of the plans, Mr. Cormier asked if there were any additional comments and there were none.

The meeting adjourned.

R-5709 Final 4C Interagency Concurrence Point Meeting Minutes



Date: 6/15/2021

Meeting Date: May 12, 2021

Location: Virtual conference held via GoTo Meeting: <https://global.gotomeeting.com/join/202085069>

Time: 1:00 PM

Attendees:

James Lastinger – USACE	Amy Chapman – NCDWR
Robert Patterson – NCDWR	Seth Wilcher – FHWA
Paul Atkinson – NCDOT Hydraulics	Ray Lovinggood – NCDOT Hydraulics
Chris Rivenbark – NCDOT ECAP	Matt Wilkerson – NDOT EAU
Wes Cartner – NCDOT EAU	Jeff Walston – NCDOT REU
Jennifer Parrish – NCDOT REU	David Clodgo – NCDOT Roadway
Piotr Stojda – NCDOT Roadway	Tucker Martin – NCDOT Utilities
Jon Gaillard – NCDOT Utilities	Dayton Martin – NCDOT Utilities
Ali Kouchehi – NCDOT Utilities	Hoang Dieu – NCDOT SMU
David Stutts – NCDOT SMU	Rex Badgett – NCDOT Division 8
Art King - DEO	Kevin Alford – Wetherill
Elmo Vance – NCDOT PMU	Mike Sanderson – NCDOT EPU
Pam Williams – NCDOT PMU	Colin Mellor – NCDOT EPU
Pete Stafford – RK&K	Trent Cormier – RK&K
Rob Ridings – NCDWR	Gary Jordan – USFWS
Gordon Cashin – NCDOT ECAP	Hannah Headrick – NCDOT EPU
Amanetta Somerville - USEPA	Monte Matthews – USACE
Travis Wilson – NCWRC	Reuben Blakley – NCDOT Division 8
Terry Farr – NCDOT PMU	Brian Robinson – NCDOT Roadway

An interagency concurrence point meeting was held to reach agreement on concurrence point 4C for the R-5709 NC-211 project in Moore/Hoke Counties. The following items were discussed, and conclusions reached.

The group then began reviewing the permit drawings, led by Kevin Alford and Trent Cormier.

- **Site 13:** Pond PA. Impacts due to the pond being drained by the contractor.
 - **Discussed whether the wetlands around the pond being are impacted due to it being drained. After discussion, it was determined that the wetlands would not be impacted since the existing hydrology is being maintained. Rob Ridings noted that this pipe does not require burial if the pond is being drained and that leaving it buried in anticipation of a new channel forming within the pond is acceptable.**
- **Site 18:** Stream SH, Wetland WQ. Impacts due to roadway fill, 42" RCP at outlet.
 - **Need to Add 20% Bury Depth Note to plans. Note will read "Buried 0.7"**
- **Site 19:** Wetland WR. Impacts due to roadway fill. This is a proposed total take.
 - **Remove "Fill" hatch from the wetland area outside of the roadway fill slope. Add a Note on the Impact Summary that denoting the area outside the fill slope will be considered as impacted.**

We completed a sheet-by-sheet review of the drawings with the site-specific comments above noted during the meeting. As part of general discussion, Chris Rivenbark noted that the some of the wetland clearing method will be changing from mechanical to hand clearing. Additionally, the permitting agencies agreed that this permit could likely be filed as a general permit (GP) and not an Individual Permit (IP).



ROY COOPER
Governor

JOHN NICHOLSON
Interim Secretary

TIM BAUMGARTNER
Director



NORTH CAROLINA
Environmental Quality

June 22, 2021

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

Dear Mr. Harris:

Subject: Mitigation Acceptance Letter:

TIP Number R-5709, NC 211 Widening from US 15 / 501 in Aberdeen to East of SR 1244 (West Palmer Street) / SR 1311 (Mockingbird Hill Road) in Raeford, Hoke County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the stream and wetland mitigation for the subject project. Based on the information supplied by you on June 22, 2021, the impacts are located in CU 03040203 of the Lumber River basin in the Southern Inner Coastal Plain (SICP) Eco-Region, and are as follows:

Stream & Wetlands	River Basin	CU Location	Eco-Region	Stream			Wetlands		
				Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh
Impacts	Lumber	03040203	SICP	0	0	1,443.000	1.300	1.000	0

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

DMS commits to implementing sufficient compensatory stream and wetland mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies in accordance with the In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from DMS.

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

Sincerely,

Handwritten signature of Elizabeth Harmon in cursive.

James B. Stanfill
DMS Asset Management Supervisor

Cc: Mr. Monte Matthews, USACE – Raleigh Regulatory Field Office
Ms. Amy Chapman, NC Division of Water Resources – Raleigh
File: R-5709



North Carolina Department of Environmental Quality | Division of Mitigation Services
217 West Jones Street | 1652 Mail Service Center | Raleigh, North Carolina 27699-1652
919.707.8976



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh ES Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726



February 18, 2020

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

Dear Mr. Harris:

This letter is in response to your letter of February 13, 2020 and attached Biological Assessment (dated February 3, 2020) which provided the U.S. Fish and Wildlife Service (Service) with the biological conclusion of the North Carolina Department of Transportation that the proposed improvements to NC 211 from US 15-501 in Aberdeen to east of SR 1244/SR 1311 in Raeford, Hoke and Moore Counties (STIP No. R-5709) may affect, but are not likely to adversely affect the federally endangered red-cockaded woodpecker (RCW, *Picoides borealis*). The following response is provided in accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

No RCW cavity trees will be taken and the project does not come within 200 feet of any known RCW cavity trees. The project will remove approximately 17.92 acres of RCW foraging habitat and result in 18.90 acres of noncontiguous habitat collectively from within three affected RCW partitions. However, each partition will still meet the Standard for Managed Stability guidelines post-project when both suitable and potentially suitable habitat are considered. Therefore, the Service concurs with your conclusion that the action may affect, but is not likely to adversely affect the red-cockaded woodpecker.

We believe that the requirements of Section 7(a)(2) of the ESA have been satisfied. We remind you that obligations under Section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action. The Service appreciates the opportunity to review this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

Sincerely,




for Pete Benjamin
Field Supervisor



Electronic copy:



Andy Williams, USACE, Wake Forest, NC

Travis Wilson, NCWRC, Creedmoor, NC

Chris Rivenbark, NCDOT, Raleigh, NC

		North Carolina Department of Transportation Highway Stormwater Program STORMWATER MANAGEMENT PLAN FOR NCDOT PROJECTS					
(Version 2.08; Released April 2018)							
WBS Element: 50205.1.1		TIP No.: R-5709	County(ies): Hoke Moore		Page 1 of 3		
General Project Information							
WBS Element:		50205.1.1	TIP Number: R-5709		Project Type: Roadway Widening	Date: 6/18/2021	
NCDOT Contact:		Paul Atkinson, PE		Contractor / Designer:	Trent Cormier		
		Address: 1202 Birch Ridge Drive Raleigh, NC 27610			Address: 8601 Six Forks Road Forum 1, Suite 700 Raleigh, NC 27615		
		Phone: (919)707-6707			Phone: (919)878-9560		
		Email: patkinson@ncdot.gov			Email: tcormier@rkk.com		
City/Town:		Aberdeen, Raeford		County(ies):	Hoke	Moore	
River Basin(s):		Lumber		CAMA County?	No	No	
Wetlands within Project Limits?		Yes					
Project Description							
Project Length (lin. miles or feet):		15.648 MI.	Surrounding Land Use: Farmland, Woods, Residential				
Proposed Project			Existing Site				
Project Built-Upon Area (ac.)		222.7 ac.		63.3 ac.			
Typical Cross Section Description:		A typical cross-section - 178 foot-wide will be used; which will include four 12-foot travel lanes with varying grass medians (23 foot, 30 foot, or 46 foot). It also contains varying exterior shoulder sections where 10-feet is paved, curb and gutter, and open shoulder section.			The existing typical cross-section is 24-foot wide with two 12-foot travel lanes and varying 8 to 10-foot unpaved shoulders.		
Annual Avg Daily Traffic (veh/hr/day):		Design/Future: 16,100 / 22,300	Year: 2022 / 2040		Existing: 10,000	Year: 2001	
General Project Narrative: (Description of Minimization of Water Quality Impacts)		R-5709 is a roadway widening project of NC 211 from the existing two lanes to the proposed four lanes in Hoke and Moore Counties. The expansion is 15.648 miles long and begins from US 15-501 in Aberdeen to east of SR 1244 (West Palmer Street) – SR 1311 (Mockingbird Hill Road) in Raeford. Wetlands, perennial streams, and intermittent streams are found within the limits of the project area. The jurisdictional streams within the study area have no impairments and do not provide habitat for any threatened or endangered aquatic species. Design Mitigations for wetlands and streams include: 1. Steepening of roadway fill slopes within jurisdictional areas. 2. Stormwater was designed to avoid direct discharge into jurisdictional features to the maximum extent practicable. 3. Stormwater design velocities entering jurisdictional features have been mitigated to be non-erosive (less than 2 fps). 4. Open shoulder sections were maximized to promote sheet flow from the roadway. 5. Diffuse flow provided at outlets that do not have a well defined outfall.					
Waterbody Information							
Surface Water Body (1):		UT to Devil Gut Branch		NCDWR Stream Index No.:	14-2-11-7		
NCDWR Surface Water Classification for Water Body		Primary Classification:	Class C				
		Supplemental Classification:	None				
Other Stream Classification:		None					
Impairments:		None					
Aquatic T&E Species?		No Comments:					
NRTR Stream ID:		SA, SB, SD			Buffer Rules in Effect:	N/A	
Project Includes Bridge Spanning Water Body?		No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	N/A	
Deck Drains Discharge Over Water Body?		N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
		(If yes, provide justification in the General Project Narrative)					

	North Carolina Department of Transportation Highway Stormwater Program STORMWATER MANAGEMENT PLAN FOR NCDOT PROJECTS								
(Version 2.08; Released April 2018)									
WBS Element:	50205.1.1	TIP No.:	R-5709	County(ies):	Hoke Moore	Page	2	of	3
Additional Waterbody Information									
Surface Water Body (2):		Devil Gut Branch			NCDWR Stream Index No.:		14-2-11-7		
NCDWR Surface Water Classification for Water Body				Primary Classification:		Class C			
				Supplemental Classification:		None			
Other Stream Classification:		None							
Impairments:		None							
Aquatic T&E Species?		No			Comments:				
NRTR Stream ID:		SC			Buffer Rules in Effect:		N/A		
Project Includes Bridge Spanning Water Body?		No		Deck Drains Discharge Over Buffer?		N/A		Dissipator Pads Provided in Buffer?	
Deck Drains Discharge Over Water Body?		N/A		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)			
		(If yes, provide justification in the General Project Narrative)							
Surface Water Body (3):									
Surface Water Body (3):		Quewhiffle Creek			NCDWR Stream Index No.:		14-2-14		
NCDWR Surface Water Classification for Water Body				Primary Classification:		Class C			
				Supplemental Classification:		None			
Other Stream Classification:		None							
Impairments:		None							
Aquatic T&E Species?		No			Comments:				
NRTR Stream ID:		SE			Buffer Rules in Effect:		N/A		
Project Includes Bridge Spanning Water Body?		No		Deck Drains Discharge Over Buffer?		N/A		Dissipator Pads Provided in Buffer?	
Deck Drains Discharge Over Water Body?		N/A		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)			
		(If yes, provide justification in the General Project Narrative)							
Surface Water Body (4):									
Surface Water Body (4):		UT to Quewhiffle Creek			NCDWR Stream Index No.:		14-2-14		
NCDWR Surface Water Classification for Water Body				Primary Classification:		Class C			
				Supplemental Classification:		None			
Other Stream Classification:		None							
Impairments:		None							
Aquatic T&E Species?		No			Comments:				
NRTR Stream ID:		SF, SJ			Buffer Rules in Effect:		N/A		
Project Includes Bridge Spanning Water Body?		No		Deck Drains Discharge Over Buffer?		N/A		Dissipator Pads Provided in Buffer?	
Deck Drains Discharge Over Water Body?		N/A		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)			
		(If yes, provide justification in the General Project Narrative)							
Surface Water Body (5):									
Surface Water Body (5):		UT to Mountain Creek			NCDWR Stream Index No.:		14-2-16-(2)		
NCDWR Surface Water Classification for Water Body				Primary Classification:		Class C			
				Supplemental Classification:		None			
Other Stream Classification:		None							
Impairments:		None							
Aquatic T&E Species?		No			Comments:				
NRTR Stream ID:		SG			Buffer Rules in Effect:		N/A		
Project Includes Bridge Spanning Water Body?		No		Deck Drains Discharge Over Buffer?		N/A		Dissipator Pads Provided in Buffer?	
Deck Drains Discharge Over Water Body?		N/A		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)			
		(If yes, provide justification in the General Project Narrative)							

	North Carolina Department of Transportation Highway Stormwater Program STORMWATER MANAGEMENT PLAN FOR NCDOT PROJECTS				
(Version 2.08; Released April 2018)					
WBS Element: 50205.1.1	TIP No.: R-5709	County(ies): Hoke Moore		Page 3	of 3
Additional Waterbody Information					
Surface Water Body (6):	UT to Buffalo Creek		NCDWR Stream Index No.:	14-2.5	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Class C		
	Supplemental Classification:		None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SH		Buffer Rules in Effect:	N/A	
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
	(If yes, provide justification in the General Project Narrative)				
Surface Water Body (7):	UT to Toney's Creek		NCDWR Stream Index No.:	14-10-1.2	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Class C		
	Supplemental Classification:		Swamp Waters (Sw)		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SI, SM		Buffer Rules in Effect:	N/A	
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
	(If yes, provide justification in the General Project Narrative)				
Surface Water Body (8):	UT to Rockfish Creek		NCDWR Stream Index No.:	18-31-(12)	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Class B		
	Supplemental Classification:		None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SK, SL		Buffer Rules in Effect:	N/A	
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
	(If yes, provide justification in the General Project Narrative)				

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5709	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
50205.1.1		PE	
50205.2.1		ROW	
50205.2.2		UTILITIES	
50205.3.1		CONSTRUCTION	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

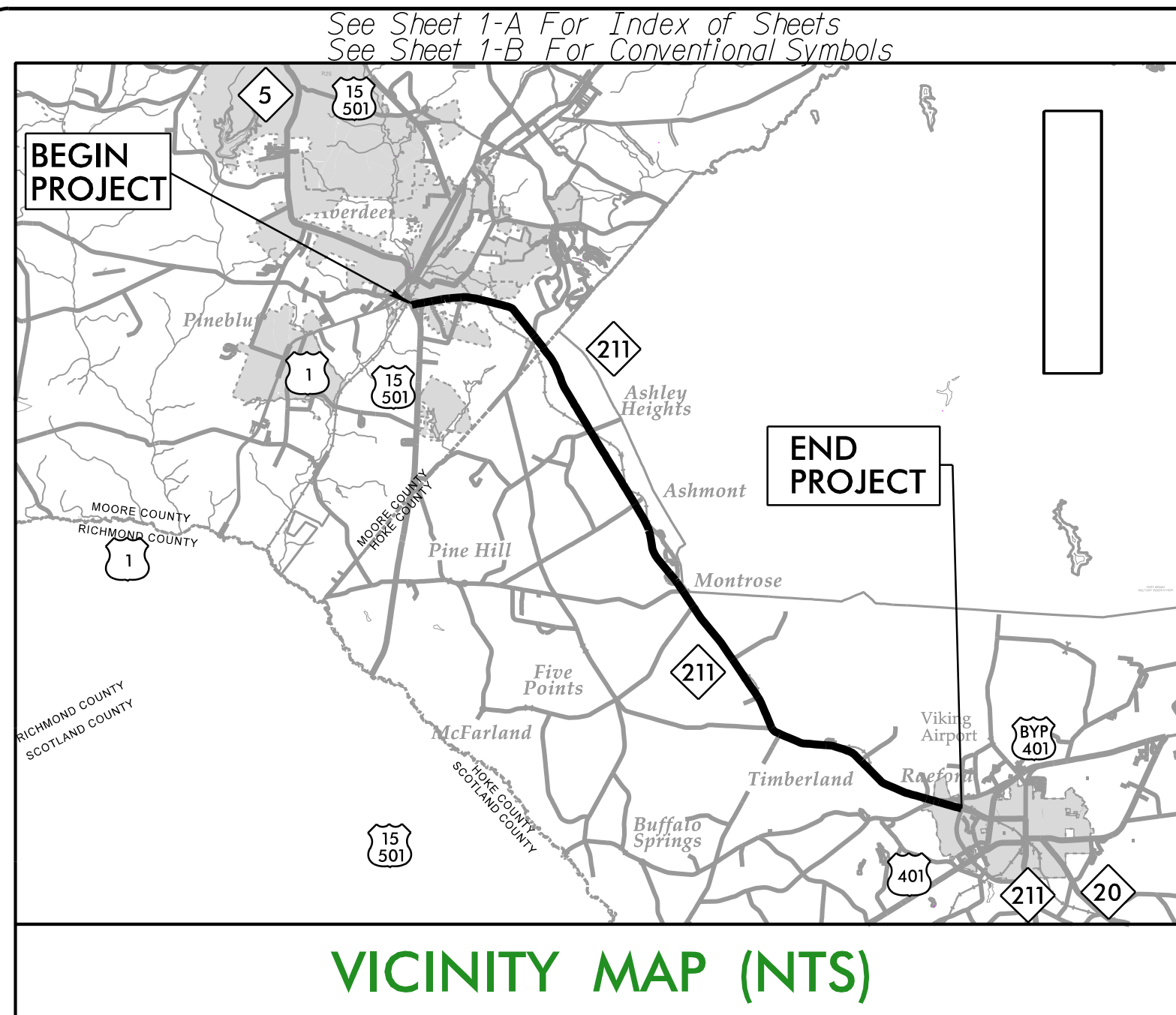
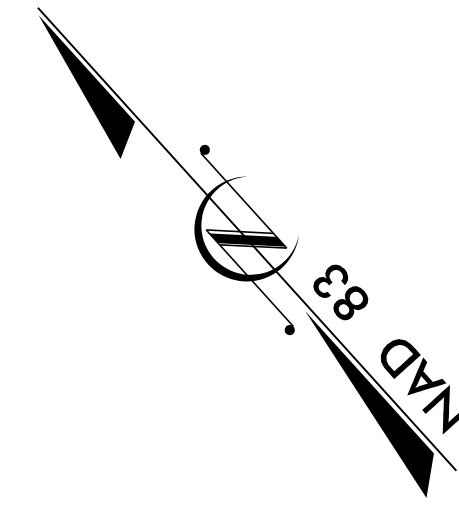
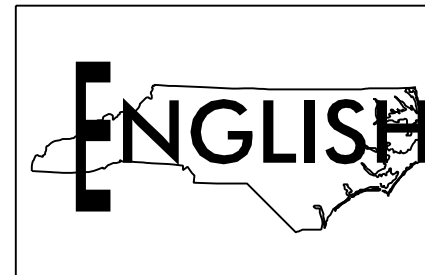
MOORE/HOKE COUNTIES

LOCATION: NC 211 FROM US 15/US 501 IN ABERDEEN TO SR 1244
(WEST PALMER ST) /SR 1311 (MOCKINGBIRD HILL RD) IN RAEFORD

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

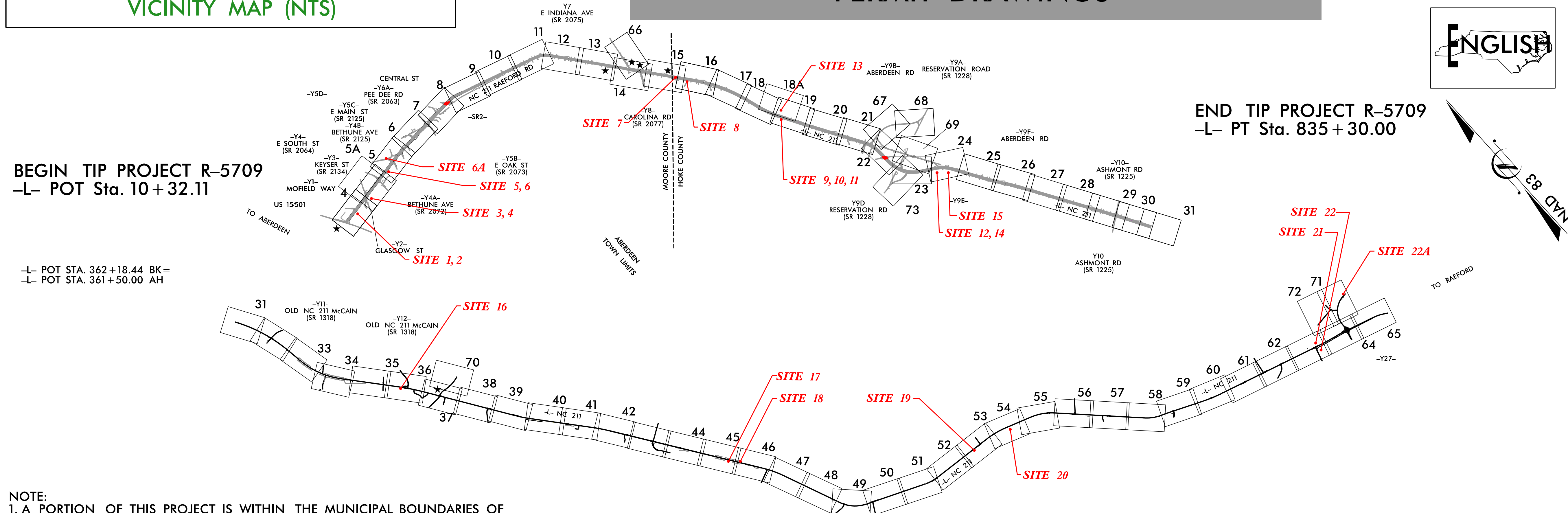
WETLAND AND SURFACE WATER IMPACTS PERMIT DRAWINGS

PERMIT DRAWING
SHEET 1 OF 60



TIP PROJECT: R-5709

VICINITY MAP (NTS)



BEGIN TIP PROJECT R-5709
-L- POT Sta. 10+32.11

END TIP PROJECT R-5709
-L- PT Sta. 835+30.00

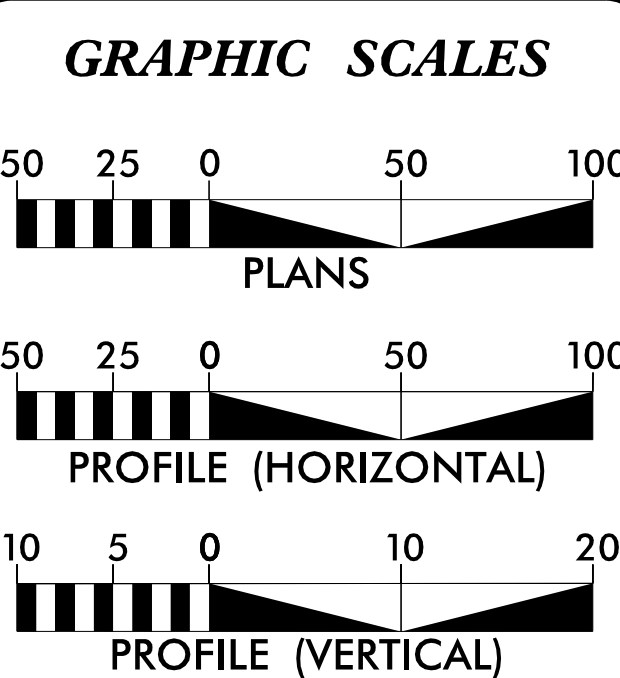
-L- POT STA. 362+18.44 BK =
-L- POT STA. 361+50.00 AH

- NOTE:
1. A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF ABERDEEN & THE CITY OF RAEFORD.
 2. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II & III AS DESCRIBED IN THE GENERAL NOTES.
 3. THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

★ PROPOSED SIGNAL

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

CONTRACT:



DESIGN DATA

ADT 2024 =	16,400
ADT 2044 =	23,400
K =	9%
D =	60%
T =	21% *
**V =	50 MPH/60 MPH
* TTST =	16% DUAL 5%
FUNC CLASS =	MINOR ARTERIAL
REGIONAL TIER	
**DESIGN SPEED CHANGES	AT COUNTY LINE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-5709.....	15.607 miles
LENGTH STRUCTURE TIP PROJECT R-5709.....	0.031 miles
TOTAL LENGTH OF PROJECT R-5709.....	15.638 miles

NCDOT CONTACT

Elmo E. Vance, Jr.
PROJECT MANAGER

PLANS PREPARED BY:

RK&K
8601 Six Forks Road, Forum 1 Suite 700
RALEIGH, NORTH CAROLINA 27615-3960
NC LICENSE NO. F-0112
1-888-521-4455 OR 919-878-9560

FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
APRIL 23, 2021

LETTING DATE:
MARCH 19, 2024

Brandon McInnis, PE
PROJECT ENGINEER

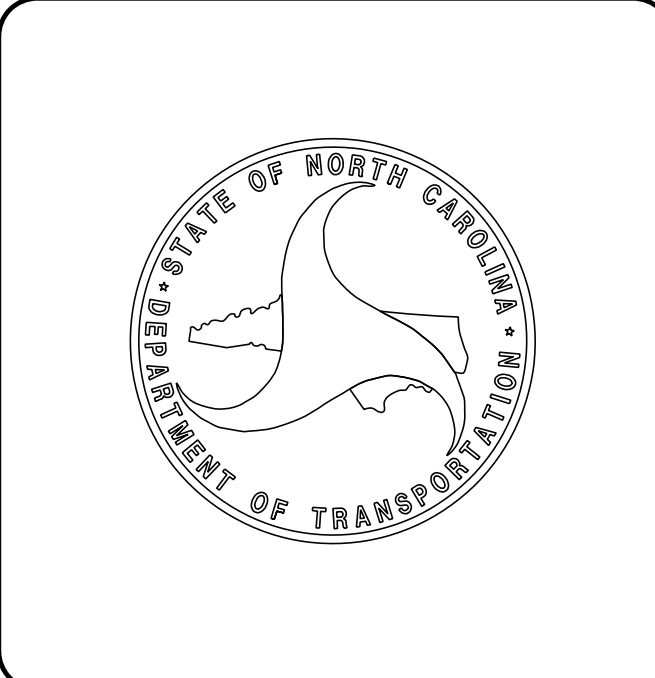
Mary Mays Yahl, PE
PROJECT DESIGN ENGINEER

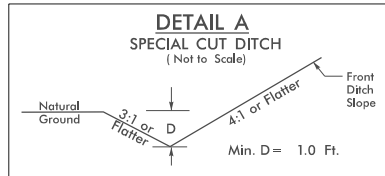
HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

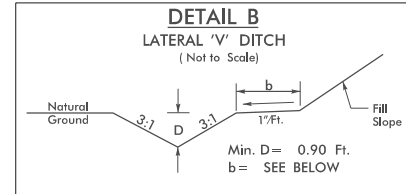
ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

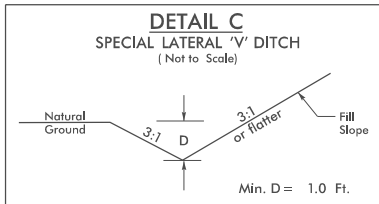




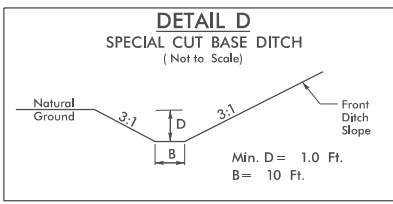
-L- FROM STA. 81+00 TO STA. 89+50 RT
-L- FROM STA. 94+50 TO STA. 97+50 RT
-L- FROM STA. 113+50 TO STA. 116+50 RT
-L- FROM STA. 134+00 TO STA. 135+75 RT
-L- FROM STA. 144+50 TO STA. 145+66 LT
-L- FROM STA. 156+00 TO STA. 157+00 LT
-L- FROM STA. 165+50 TO STA. 169+50 LT
-L- FROM STA. 174+00 TO STA. 175+00 LT
-L- FROM STA. 191+50 TO STA. 192+50 RT
-L- FROM STA. 194+50 TO STA. 195+00 RT
-L- FROM STA. 223+00 TO STA. 224+50 LT
-L- FROM STA. 227+00 TO STA. 227+50 LT
-L- FROM STA. 238+05 TO STA. 238+50 RT
-L- FROM STA. 266+00 TO STA. 268+00 LT
-L- FROM STA. 376+00 TO STA. 376+36 LT
-L- FROM STA. 398+50 TO STA. 400+50 LT
-L- FROM STA. 415+64 TO STA. 417+00 LT
-L- FROM STA. 424+00 TO STA. 424+82 LT
-L- FROM STA. 428+00 TO STA. 428+50 RT
-L- FROM STA. 435+44 TO STA. 438+50 LT
-L- FROM STA. 464+50 TO STA. 465+75 LT
-L- FROM STA. 472+00 TO STA. 477+75 LT
-L- FROM STA. 484+00 TO STA. 487+50 LT
-L- FROM STA. 520+00 TO STA. 532+00 LT
-L- FROM STA. 544+00 TO STA. 549+50 LT
-L- FROM STA. 551+50 TO STA. 552+00 LT
-L- FROM STA. 572+50 TO STA. 573+00 LT
-L- FROM STA. 578+00 TO STA. 580+29 LT
-L- FROM STA. 592+50 TO STA. 596+00 RT
-L- FROM STA. 623+50 TO STA. 643+00 RT
-L- FROM STA. 642+50 TO STA. 670+50 LT
-L- FROM STA. 656+00 TO STA. 665+15 RT
-L- FROM STA. 671+20 TO STA. 676+00 LT
-L- FROM STA. 676+50 TO STA. 678+50 LT
-L- FROM STA. 681+00 TO STA. 684+00 RT
-L- FROM STA. 685+50 TO STA. 690+00 LT
-L- FROM STA. 692+00 TO STA. 696+00 RT
-L- FROM STA. 699+00 TO STA. 700+00 RT
-L- FROM STA. 701+00 TO STA. 707+50 RT
-L- FROM STA. 708+66 TO STA. 710+03 LT
-L- FROM STA. 710+00 TO STA. 711+50 RT
-L- FROM STA. 715+00 TO STA. 715+50 LT
-L- FROM STA. 725+50 TO STA. 726+50 RT
-L- FROM STA. 726+50 TO STA. 731+50 LT
-L- FROM STA. 730+00 TO STA. 731+50 RT
-L- FROM STA. 733+50 TO STA. 736+00 LT
-L- FROM STA. 736+00 TO STA. 736+50 RT
-L- FROM STA. 743+00 TO STA. 745+00 LT
-L- FROM STA. 745+00 TO STA. 747+00 RT
-L- FROM STA. 746+50 TO STA. 751+00 LT
-L- FROM STA. 753+50 TO STA. 755+00 LT
-L- FROM STA. 756+50 TO STA. 757+00 RT
-L- FROM STA. 766+50 TO STA. 768+00 LT
-L- FROM STA. 769+50 TO STA. 772+50 RT
-L- FROM STA. 773+48 TO STA. 775+50 RT
-L- FROM STA. 778+50 TO STA. 782+50 LT
-L- FROM STA. 778+50 TO STA. 779+50 RT
-L- FROM STA. 786+00 TO STA. 786+97 LT
-L- FROM STA. 786+50 TO STA. 794+37 RT
-L- FROM STA. 795+28 TO STA. 795+65 RT
-L- FROM STA. 809+00 TO STA. 811+00 LT
-L- FROM STA. 812+30 TO STA. 812+33 RT
-L- FROM STA. 814+00 TO STA. 815+00 RT
-L- FROM STA. 815+00 TO STA. 816+50 LT
-L- FROM STA. 818+50 TO STA. 820+50 RT
-L- FROM STA. 821+50 TO STA. 822+96 LT
-L- FROM STA. 822+50 TO STA. 822+64 RT
-L- FROM STA. 826+50 TO STA. 827+50 RT
-L- FROM STA. 832+00 TO STA. 834+00 LT
-L- FROM STA. 26+00 TO STA. 27+00 LT
-L- FROM STA. 11+80 TO STA. 13+00 LT
-L- FROM STA. 15+00 TO STA. 15+50 LT
-L- FROM STA. 10+81 TO STA. 11+50 LT
-L- FROM STA. 10+71 TO STA. 12+00 RT
-L- FROM STA. 11+00 TO STA. 11+48 LT
-L- FROM STA. 14+00 TO STA. 14+50 RT
-L- FROM STA. 18+50 TO STA. 23+50 RT
-L- FROM STA. 13+00 TO STA. 15+10 LT
-L- FROM STA. 11+00 TO STA. 12+50 LT
-L- FROM STA. 11+00 TO STA. 12+00 RT



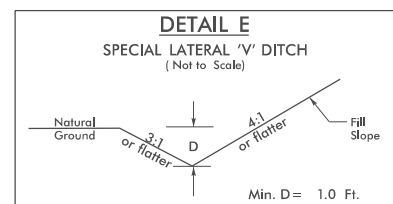
-L- FROM STA. 367+50 TO STA. 371+50 RT, b=5'
-L- FROM STA. 391+00 TO STA. 393+00 RT, b=2'
-L- FROM STA. 393+50 TO STA. 396+00 LT, b=2'
-L- FROM STA. 465+00 TO STA. 466+69 RT, b=2'
-L- FROM STA. 471+50 TO STA. 473+75 RT, b=5'
-L- FROM STA. 474+35 TO STA. 477+67 RT, b=5'
-L- FROM STA. 499+40 TO STA. 502+00 RT, b=2'
-L- FROM STA. 497+50 TO STA. 708+27 RT, b=5'
-L- FROM STA. 711+50 TO STA. 716+40 RT, b=5'
-L- FROM STA. 736+50 TO STA. 737+93 RT, b=2'
-L- FROM STA. 743+50 TO STA. 745+00 RT, b=5'
-L- FROM STA. 747+00 TO STA. 748+73 RT, b=5'
-L- FROM STA. 750+11 TO STA. 756+50 RT, b=5'
-L- FROM STA. 751+00 TO STA. 753+50 LT, b=5'
-L- FROM STA. 768+00 TO STA. 772+00 LT, b=4'
-L- FROM STA. 806+50 TO STA. 808+00 RT, b=5'
-L- FROM STA. 812+30 TO STA. 813+50 RT, b=5'
-L- FROM STA. 10+64 TO STA. 11+00, b=2'
-L- FROM STA. 11+00 TO STA. 11+50 LT, b=2'
-L- FROM STA. 11+00 TO STA. 11+50 RT, b=2'
-L- FROM STA. 11+00 TO STA. 11+50 LT, b=5'



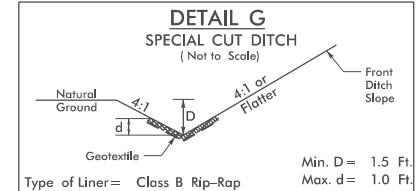
-L- FROM STA. 467+49 TO STA. 468+04 RT
-L- FROM STA. 479+00 TO STA. 480+50 RT
-L- FROM STA. 502+00 TO STA. 503+00 RT
-L- FROM STA. 505+35 TO STA. 506+00 RT
-L- FROM STA. 545+48 TO STA. 547+00 RT
-L- FROM STA. 568+50 TO STA. 569+00 LT
-L- FROM STA. 716+39 TO STA. 724+00 RT
-L- FROM STA. 825+00 TO STA. 826+50 RT
-L- FROM STA. 15+00 TO STA. 17+50 RT
-L- FROM STA. 11+00 TO STA. 14+50 LT
-L- FROM STA. 11+08 TO STA. 11+50 RT
-L- FROM STA. 10+25 TO STA. 11+50 LT
-L- FROM STA. 11+00 TO STA. 11+50 LT
-L- FROM STA. 10+50 TO STA. 14+50 RT
-L- FROM STA. 11+75 TO STA. 14+50 LT
-L- FROM STA. 12+50 TO STA. 14+50 RT
-L- FROM STA. 13+00 TO STA. 14+90 LT
-L- FROM STA. 13+00 TO STA. 15+10 RT
-L- FROM STA. 10+85 TO STA. 11+50 RT
-L- FROM STA. 10+96 TO STA. 12+00 LT
-L- FROM STA. 12+00 TO STA. 13+37 RT
-L- FROM STA. 10+45 TO STA. 14+00 RT
-L- FROM STA. 15+00 TO STA. 18+50 RT
-L- FROM STA. 19+50 TO STA. 25+00 LT
-L- FROM STA. 10+50 TO STA. 11+00 RT
-L- FROM STA. 10+50 TO STA. 12+50 LT
-L- FROM STA. 14+50 TO STA. 15+50 LT
-L- FROM STA. 11+12 TO STA. 13+00 RT



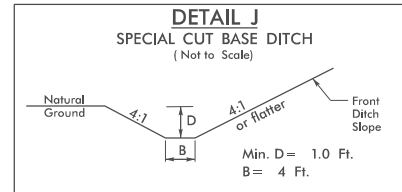
-Y14- FROM STA. 11+00 TO STA. 13+00 LT



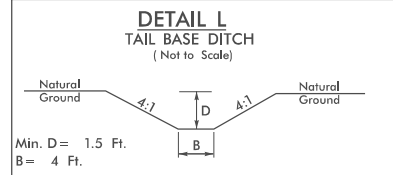
-L- FROM STA. 179+00 TO STA. 185+00 LT
-L- FROM STA. 189+00 TO STA. 194+00 LT
-L- FROM STA. 226+00 TO STA. 230+00 RT
-L- FROM STA. 368+00 TO STA. 371+00 LT
-L- FROM STA. 379+50 TO STA. 380+50 RT
-L- FROM STA. 387+50 TO STA. 389+50 LT
-L- FROM STA. 426+00 TO STA. 428+50 RT
-L- FROM STA. 430+50 TO STA. 432+50 LT
-L- FROM STA. 477+75 TO STA. 479+00 LT
-L- FROM STA. 480+50 TO STA. 483+00 LT
-L- FROM STA. 497+50 TO STA. 498+35 LT
-L- FROM STA. 498+00 TO STA. 499+37 RT
-L- FROM STA. 507+50 TO STA. 511+50 LT
-L- FROM STA. 524+50 TO STA. 526+91 RT
-L- FROM STA. 568+50 TO STA. 569+00 LT
-L- FROM STA. 573+50 TO STA. 576+83 LT
-L- FROM STA. 685+50 TO STA. 686+25 RT
-L- FROM STA. 698+00 TO STA. 700+50 LT
-L- FROM STA. 767+50 TO STA. 769+50 RT
-L- FROM STA. 820+50 TO STA. 822+49 RT
-L- FROM STA. 822+96 TO STA. 823+30 LT
-L- FROM STA. 832+50 TO STA. 834+00 LT
-L- FROM STA. 12+50 TO STA. 13+15 LT
-L- FROM STA. 11+00 TO STA. 12+50 RT
-L- FROM STA. 32+70 TO STA. 34+00 RT
-L- FROM STA. 14+00 TO STA. 15+30 LT
-L- FROM STA. 14+50 TO STA. 15+40 RT
-L- FROM STA. 11+41 TO STA. 12+48 LT



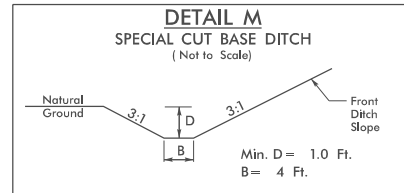
-L- FROM STA. 385+00 TO STA. 386+00 LT
-L- FROM STA. 471+00 TO STA. 471+50 LT
-L- FROM STA. 541+00 TO STA. 542+00 RT
-L- FROM STA. 772+00 TO STA. 774+00 LT
-L- FROM STA. 772+50 TO STA. 773+48 RT



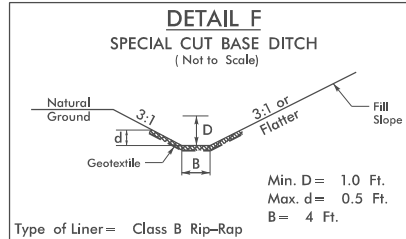
-L- FROM STA. 596+00 TO STA. 607+00 RT
-L- FROM STA. 718+50 TO STA. 719+00 LT



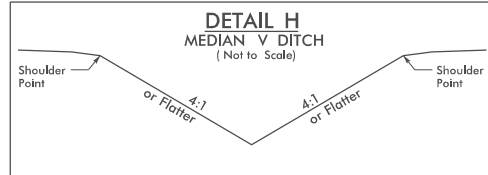
-L- STA. 665+15 RT; S=0.04%; L=60'; Beg. El.=358.94; End. El.=358.68; DDE=33 CY
-L- STA. 773+35 LT (RT OF RR); S=1.25%; L=40'; Beg. El.=297.00; End. El.=296.50; DDE=22 CY
-L- STA. 773+35 LT (LT OF RR); S=1.08%; L=28'; Beg. El.=296.19; End. El.=295.89; DDE=16 CY
-L- STA. 774+00 LT; S=5.24%; L=63'; Beg. El.=299.80; End. El.=296.50; DDE=35 CY
-L- STA. 812+30 RT; S=0.00%; L=68'; Beg. El.=280.58; End. El.=280.58; DDE=120 CY



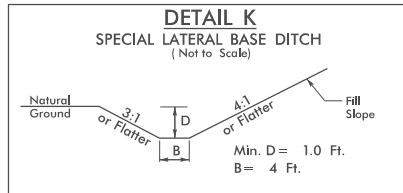
-L- FROM STA. 445+50 TO STA. 447+00 LT
-L- FROM STA. 592+00 TO STA. 593+50 LT
-Y24- FROM STA. 12+50 TO STA. 14+75 LT



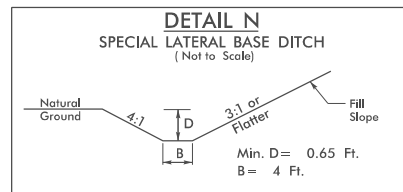
-L- FROM STA. 426+00 LT TO STA. 431+00 LT



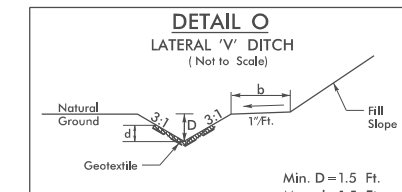
-L- FROM STA. 368+04 TO STA. 368+50 Median
-L- FROM STA. 389+50 TO STA. 390+50 Median
-L- FROM STA. 397+50 TO STA. 398+52 Median
-L- FROM STA. 398+52 TO STA. 399+00 Median
-L- FROM STA. 415+00 TO STA. 416+00 Median
-L- FROM STA. 437+50 TO STA. 438+28 Median
-L- FROM STA. 458+00 TO STA. 460+00 Median
-L- FROM STA. 465+00 TO STA. 466+50 Median
-L- FROM STA. 473+00 TO STA. 477+00 Median
-L- FROM STA. 478+00 TO STA. 483+94 Median
-L- FROM STA. 498+36 TO STA. 499+34 Median
-L- FROM STA. 513+00 TO STA. 515+00 Median
-L- FROM STA. 524+50 TO STA. 527+50 Median
-L- FROM STA. 547+50 TO STA. 549+33 Median
-L- FROM STA. 562+50 TO STA. 563+50 Median
-L- FROM STA. 572+00 TO STA. 575+50 Median
-L- FROM STA. 582+50 TO STA. 587+61 Median
-L- FROM STA. 594+00 TO STA. 605+56 Median
-L- FROM STA. 612+00 TO STA. 616+50 Median
-L- FROM STA. 629+00 TO STA. 633+50 Median
-L- FROM STA. 640+00 TO STA. 647+75 Median
-L- FROM STA. 654+00 TO STA. 659+00 Median
-L- FROM STA. 659+50 TO STA. 665+15 Median
-L- FROM STA. 696+00 TO STA. 697+50 Median
-L- FROM STA. 701+00 TO STA. 706+00 Median
-L- FROM STA. 716+39 TO STA. 717+50 Median
-L- FROM STA. 724+50 TO STA. 727+00 Median
-L- FROM STA. 752+00 TO STA. 753+00 Median
-L- FROM STA. 758+00 TO STA. 760+00 Median
-L- FROM STA. 763+50 TO STA. 764+50 Median
-L- FROM STA. 773+41 TO STA. 775+00 Median
-L- FROM STA. 778+50 TO STA. 779+00 Median
-L- FROM STA. 780+50 TO STA. 781+50 Median
-L- FROM STA. 788+50 TO STA. 790+50 Median
-L- FROM STA. 796+26 TO STA. 803+50 Median
-L- FROM STA. 810+67 TO STA. 815+00 Median
-L- FROM STA. 817+00 TO STA. 817+37 Median



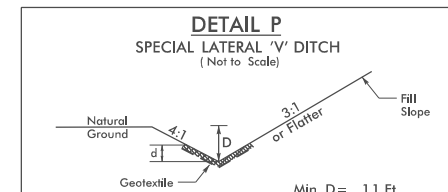
-L- FROM STA. 445+50 TO STA. 447+00 LT
-L- FROM STA. 499+34 TO STA. 501+00 LT
-L- FROM STA. 717+00 TO STA. 718+50 LT
-L- FROM STA. 810+49 TO STA. 812+30 RT



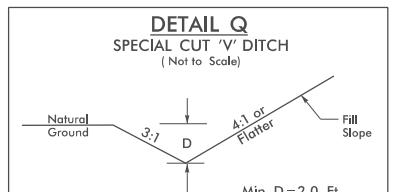
-L- FROM STA. 391+00 TO STA. 393+00 RT
-L- FROM STA. 505+50 TO STA. 506+00 RT



-L- FROM STA. 393+00 TO STA. 393+50 LT
-L- FROM STA. 407+50 TO STA. 415+64 LT
-L- FROM STA. 498+00 TO STA. 499+37 RT
-L- FROM STA. 731+50 TO STA. 733+27 RT



-L- FROM STA. 542+00 TO STA. 543+00 RT
-Y12- FROM STA. 11+07 TO STA. 12+00 RT



-L- FROM STA. 480+50 TO STA. 481+00 RT
-L- FROM STA. 489+50 TO STA. 498+00 RT
-L- FROM STA. 496+00 TO STA. 497+50 LT
-L- FROM STA. 506+00 TO STA. 507+50 RT
-L- FROM STA. 787+79 TO STA. 800+50 LT

PROJECT REFERENCE NO. R-5709
SHEET NO. 2D-1
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

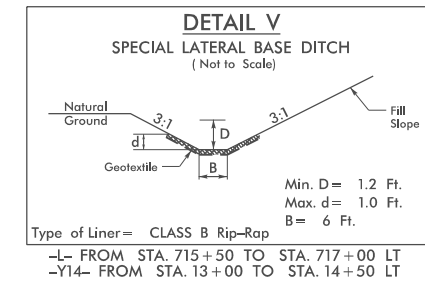
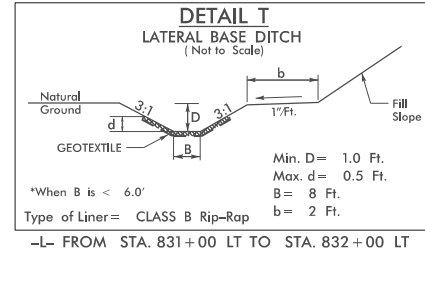
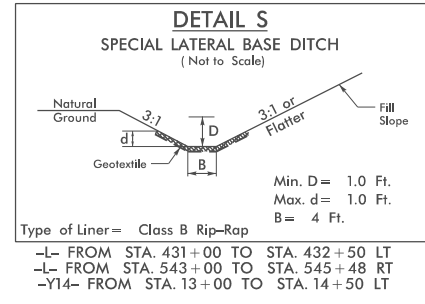
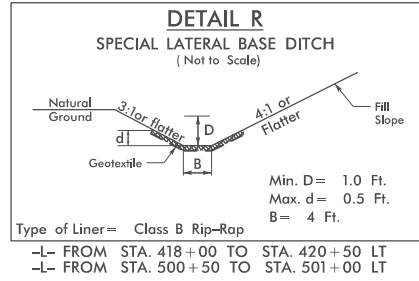
PERMIT DRAWING SHEET 2 OF 60



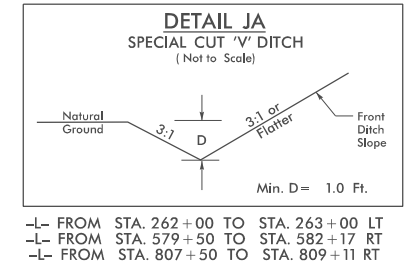
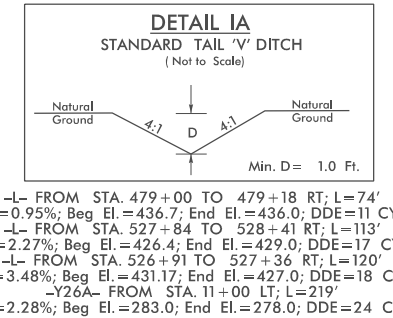
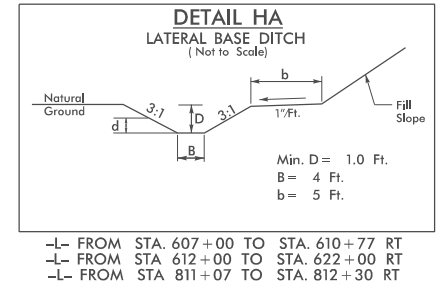
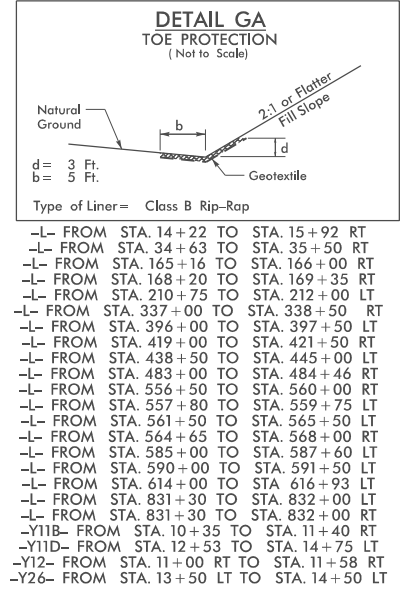
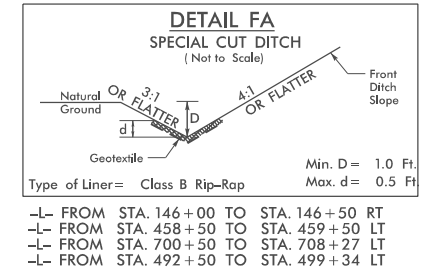
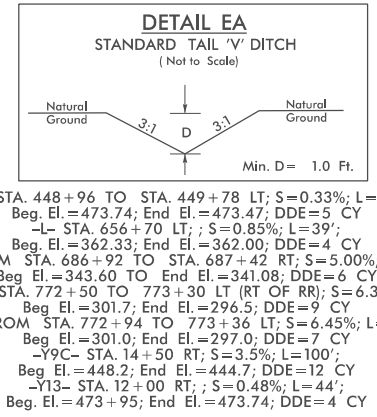
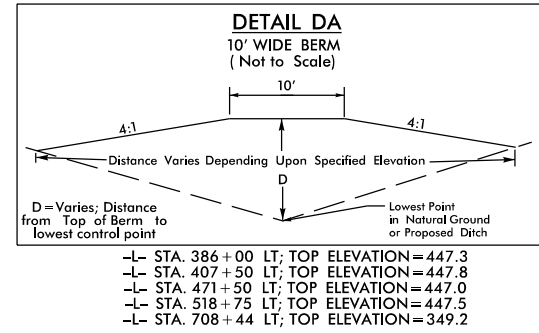
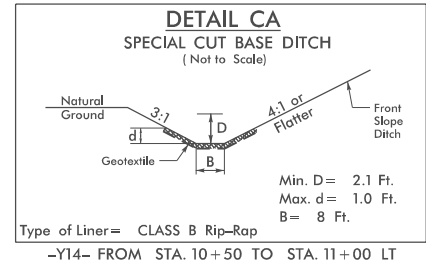
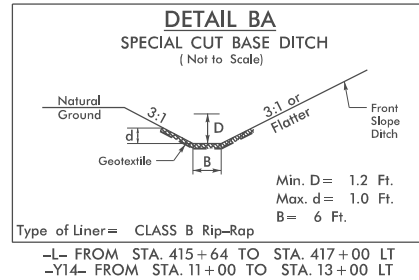
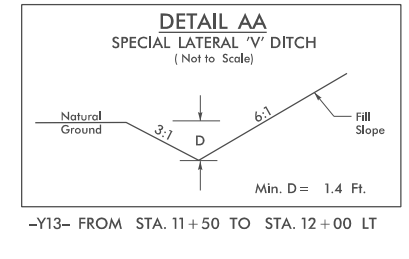
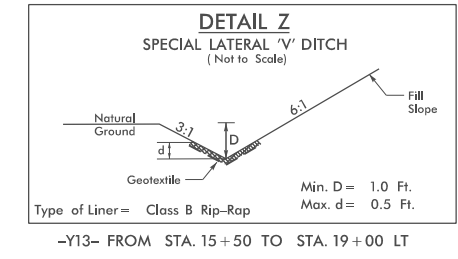
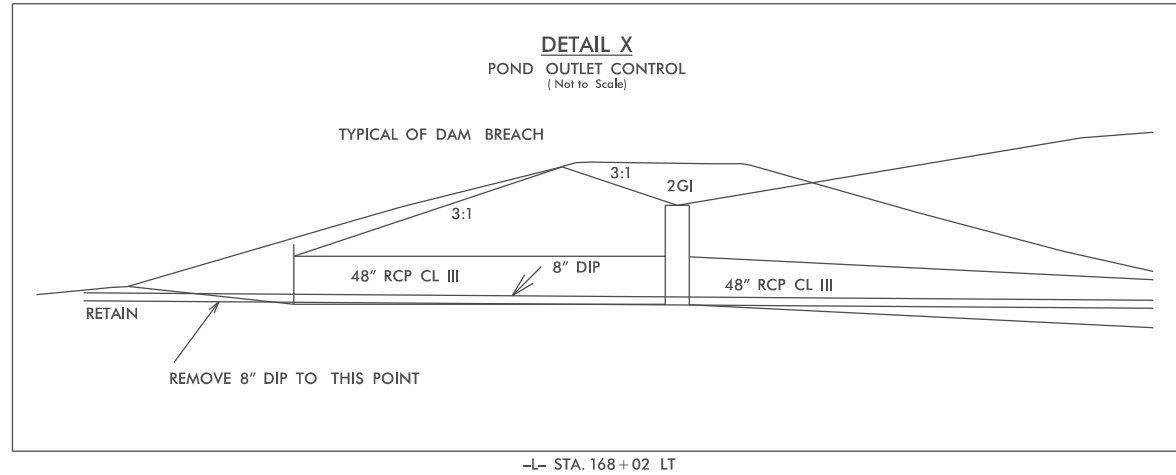
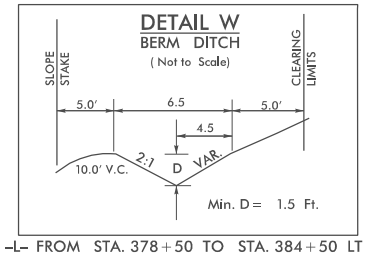
WETHERILL ENGINEERING logo and contact information: 1223 Jones Franklin Rd., Raleigh, N.C. 27606, License No. F-0377, Bus: 919 851 8077, Fax: 919 851 8107. TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION. RKK logo and address: 8601 Six Forks Road, Forum 1, Suite 700, Raleigh, North Carolina 27615-3960, License No. F-0112. Engineers | Construction Managers | Planners | Scientists www.rkk.com Responsive People | Creative Solutions

X:\8\2021\Permits\PERMITS_Environment\1\Drawings\PS\H-R-5709-1-HYD.Dwg Detail.dgn

PROJECT REFERENCE NO. R-5709	SHEET NO. 2D-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



PERMIT DRAWING SHEET 3 OF 60



R:\Hydraulics\PERMITS_Environmental\Drawings\PSH\R-5709_HYD.D\tech Detail.dgn

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

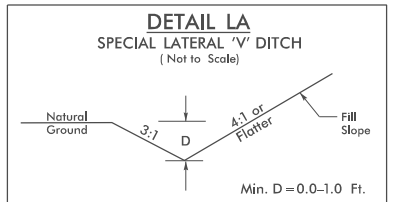
RK&K
P: (919) 978-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rk&k.com

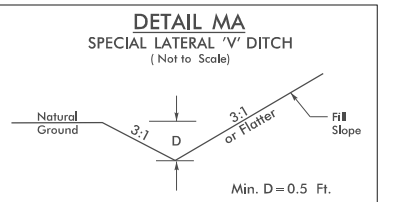
Responsive People | Creative Solutions

8/17/99

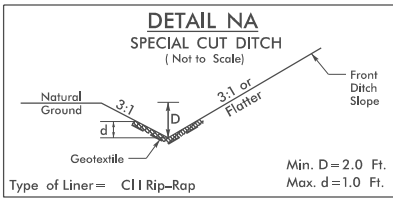
PROJECT REFERENCE NO. R-5709	SHEET NO. 2D-3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



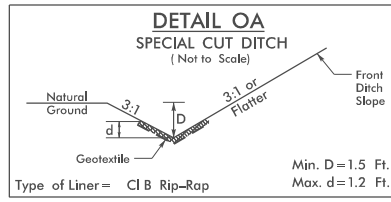
-L- FROM STA. 204+50 TO STA. 205+00 RT
-L- FROM STA. 274+50 TO STA. 275+50 RT



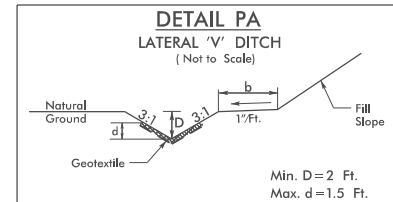
-L- FROM STA. 53+00 TO STA. 56+00 LT
-Y1- FROM STA. 11+00 TO STA. 12+50 RT
-Y2- FROM STA. 14+50 TO STA. 15+50 RT
-Y2- FROM STA. 19+25 TO STA. 20+50 RT
-Y3- FROM STA. 18+20 TO STA. 18+90 LT
-Y4- FROM STA. 12+00 TO STA. 14+50 RT
-Y4A- FROM STA. 11+00 TO STA. 11+85 RT
-Y4B- FROM STA. 10+50 TO STA. 12+50 LT
-Y5- FROM STA. 11+00 TO STA. 12+00 RT
-Y6- FROM STA. 13+00 TO STA. 14+50 LT
-Y6A- FROM STA. 11+22 TO STA. 11+75 LT
-Y9F- FROM STA. 20+50 TO STA. 21+00 LT



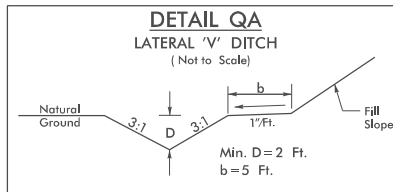
-L- FROM STA. 14+15 TO STA. 15+00 LT
-L- FROM STA. 22+00 TO STA. 24+50 RT
-L- FROM STA. 38+00 TO STA. 39+40 LT
-Y2- FROM STA. 15+50 TO STA. 16+38 RT
-Y5A- FROM STA. 10+66 TO STA. 12+00 RT



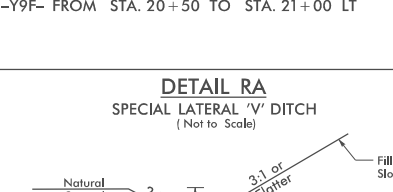
-L- FROM STA. 489+50 TO STA. 498+00 RT



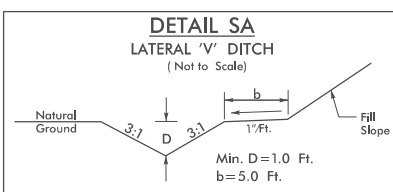
-Y9E- FROM STA. 11+00 TO STA. 12+00 RT



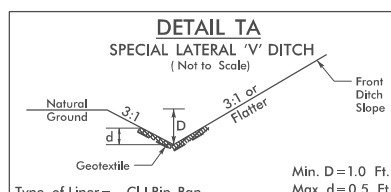
-Y9E- FROM STA. 12+00 TO STA. 13+00 RT
-L- FROM STA. 263+00 TO STA. 264+30 LT
-L- FROM STA. 264+50 TO STA. 266+00 LT



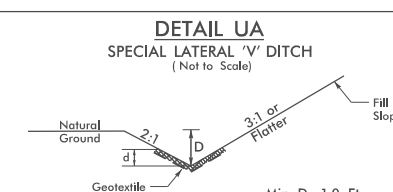
-L- FROM STA. 49+00 TO STA. 51+76.69 RT
-L- FROM STA. 60+32.75 TO STA. 60+75 RT
-Y6- FROM STA. 13+00 TO STA. 15+00 RT



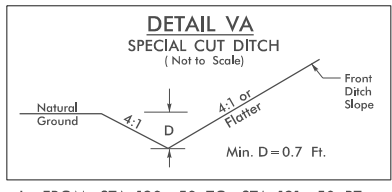
-L- FROM STA. 73+50 TO STA. 74+50 RT
-L- FROM STA. 243+70 TO STA. 244+80 LT
-L- FROM STA. 253+00 TO STA. 255+10 RT
-L- FROM STA. 254+85 TO STA. 260+30 LT
-Y9A- FROM STA. 11+71 TO STA. 12+85 RT



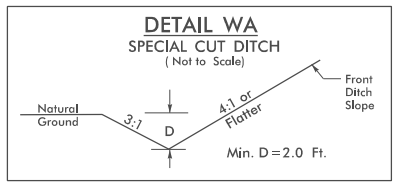
-L- FROM STA. 34+00 TO STA. 34+60 RT



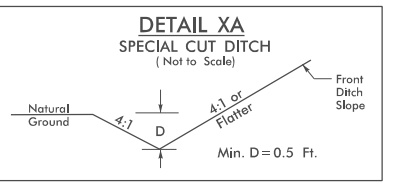
-L- FROM STA. 40+35 TO STA. 44+90 LT



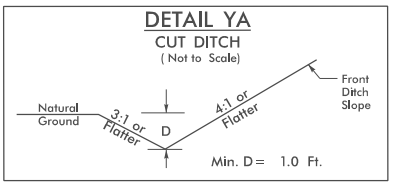
-L- FROM STA. 120+50 TO STA. 121+50 RT
-L- FROM STA. 127+50 TO STA. 128+25 RT



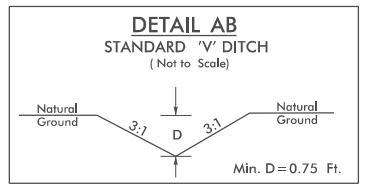
-L- FROM STA. 134+20 TO STA. 135+75 LT



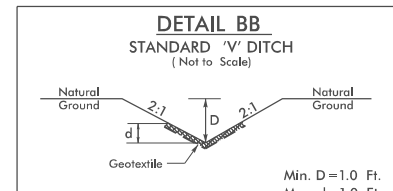
-L- FROM STA. 170+20 TO STA. 172+00 RT



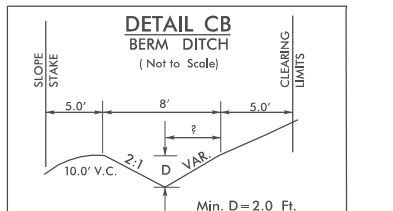
-L- FROM STA. 146+50 TO STA. 151+00 RT
-Y8- FROM STA. 10+39 TO STA. 11+00 RT



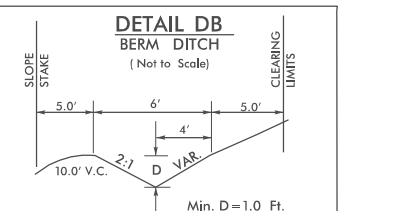
-Y9F- FROM STA. 20+00 TO STA. 20+50 LT; L=50'
S=1.75%; Beg El.=431.8; End El.=430.9; DDE=6 CY



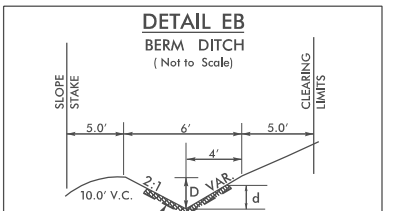
-L- FROM STA. 45+50 TO STA. 45+79 LT



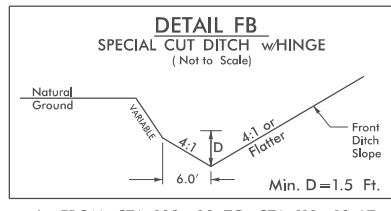
-L- FROM STA. 156+00 TO STA. 157+50 LT



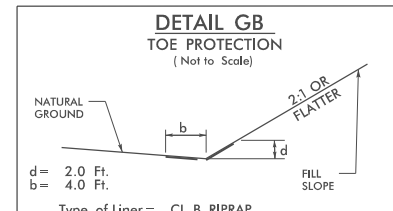
-L- FROM STA. 27+00 TO STA. 30+00 RT
-L- FROM STA. 32+00 TO STA. 33+00 RT
-L- FROM STA. 157+50 TO STA. 160+50 LT
-L- FROM STA. 161+25 TO STA. 163+50 LT



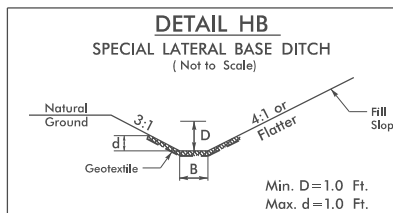
-L- FROM STA. 24+50 TO STA. 27+00 RT
-L- FROM STA. 33+00 TO STA. 34+00 RT



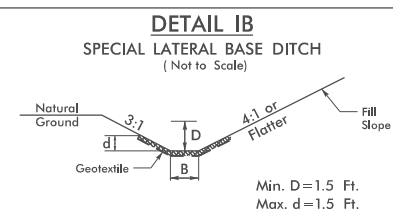
-L- FROM STA. 108+80 TO STA. 112+10 LT
-L- FROM STA. 128+18 TO STA. 131+50 LT
-L- FROM STA. 147+25 TO STA. 148+50 LT



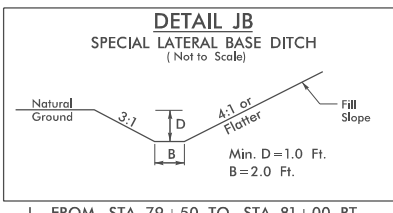
-L- FROM STA. 35+45 TO STA. 37+60 LT



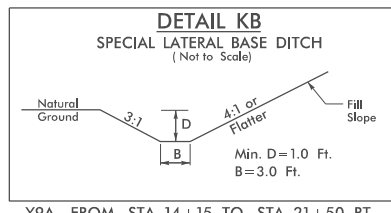
-L- FROM STA. 78+50 TO STA. 79+50 RT
-L- FROM STA. 201+00 TO STA. 201+80 LT



-L- FROM STA. 244+60 TO STA. 244+80 RT
-DR4- FROM STA. 12+50 TO STA. 13+00 RT



-L- FROM STA. 79+50 TO STA. 81+00 RT
-L- FROM STA. 199+50 TO STA. 201+00 LT
-L- FROM STA. 237+50 TO STA. 238+05 RT
-Y9B- FROM STA. 18+50 TO STA. 22+75 RT



-Y9A- FROM STA. 14+15 TO STA. 21+50 RT



**PERMIT DRAWING
SHEET 4 OF 60**

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

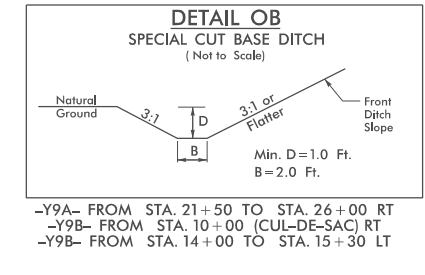
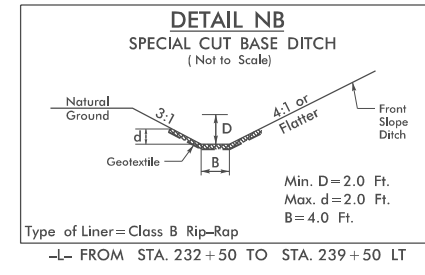
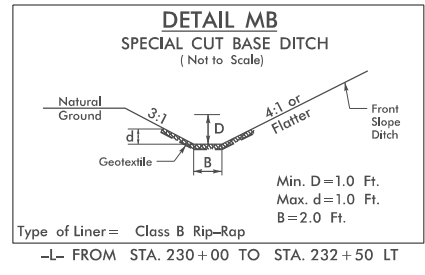
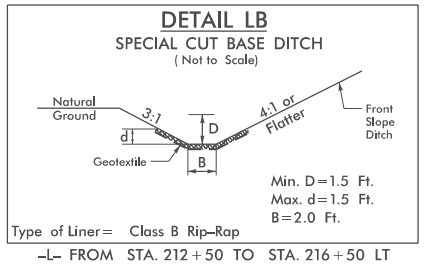
RK&K
P: (919) 878-8680
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkandk.com

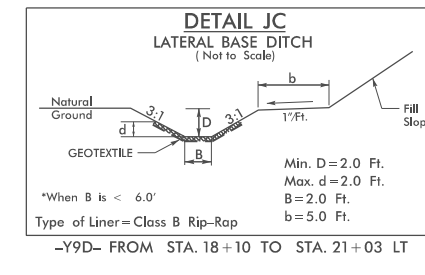
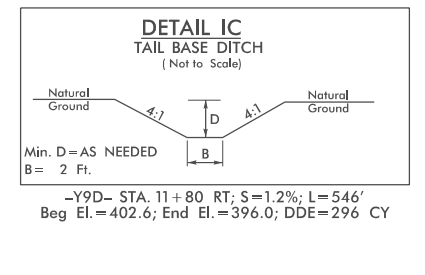
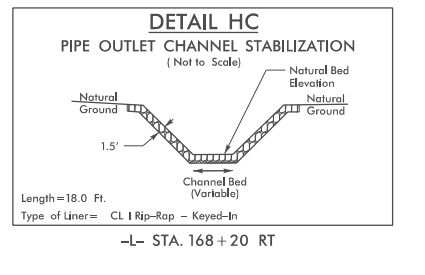
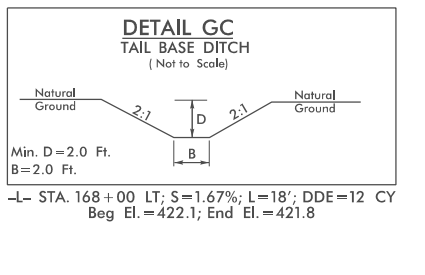
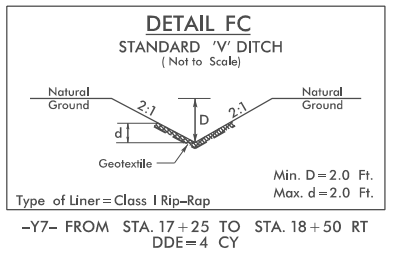
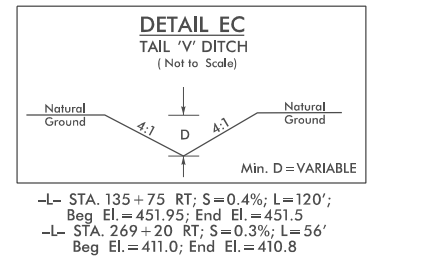
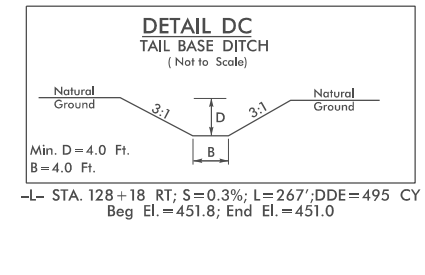
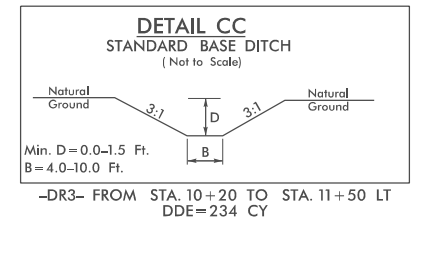
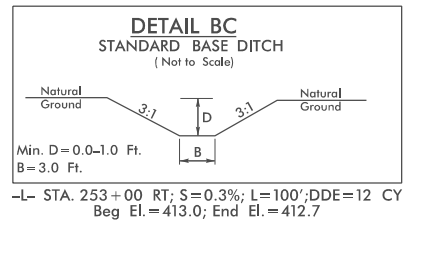
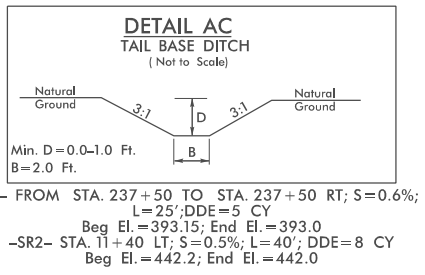
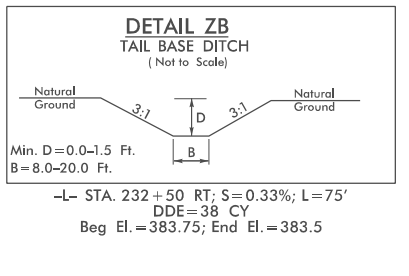
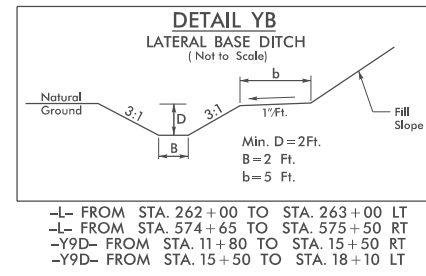
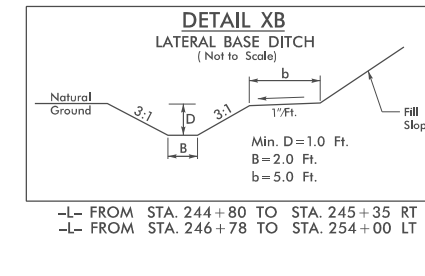
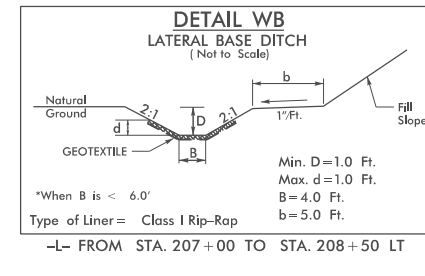
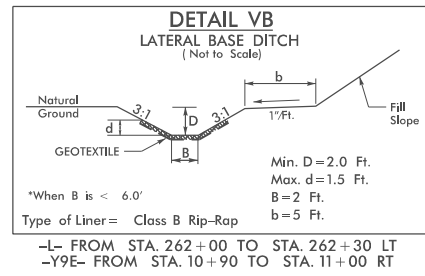
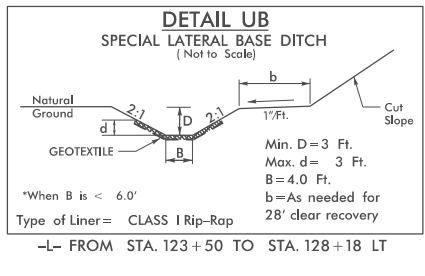
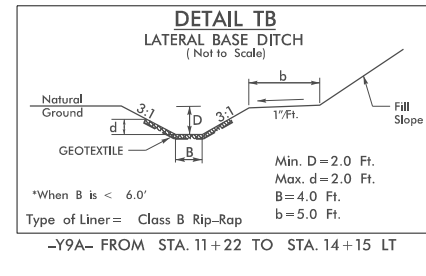
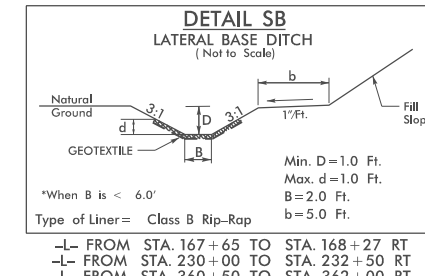
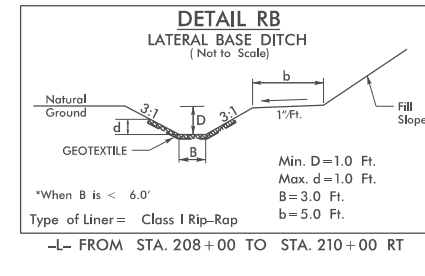
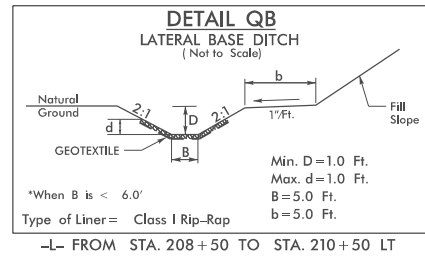
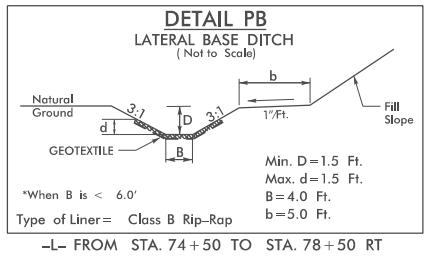
Responsive People | Creative Solutions

S:\8\2021\Permits\PERMITS_Environmental\Drawings\PSH\R-5709_HYD.D\tech Detail.dgn

PROJECT REFERENCE NO. R-5709	SHEET NO. 2D-4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



PERMIT DRAWING
SHEET 5 OF 60



S:\8\2021\Hydraulics\PERMITS_Environmental\Drawings\PSHR-5709_HYD.D\tech Detail.dgn

1223 Jones Franklin Rd.
Raleigh, NC 27615
919.854.8107

PERKINS ENGINEERING

TRANSPORTATION PLANNING/DESIGN - BRIDGE DESIGN
CIVIL/GEOTECHNICAL ENGINEERING - CONSTRUCTION OBSERVATION
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

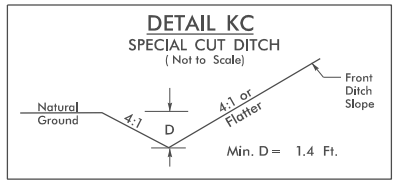
RK&K
P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rk&k.com

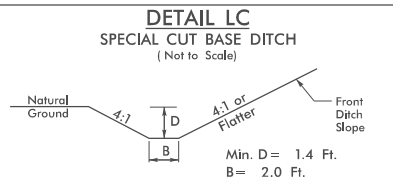
Responsive People | Creative Solutions

8/17/99

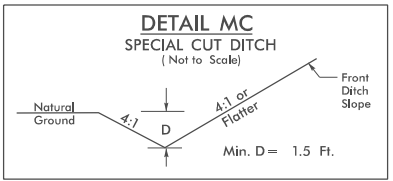
PROJECT REFERENCE NO. R-5709	SHEET NO. 2D-5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



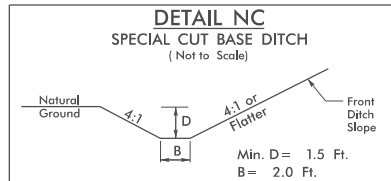
-L- FROM STA. 281+50 TO STA. 282+50 LT



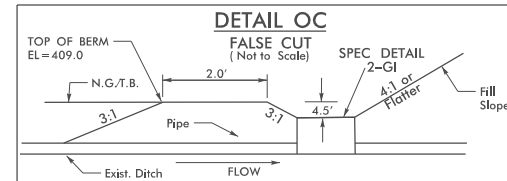
-L- FROM STA. 273+00 TO STA. 275+25 LT
-L- FROM STA. 276+10 TO STA. 281+50 LT



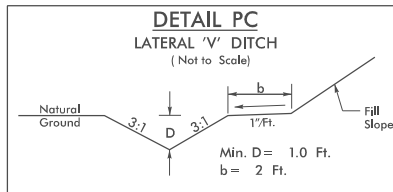
-L- FROM STA. 283+50 TO STA. 284+40 LT
-L- FROM STA. 286+60 TO STA. 295+00 LT
-L- FROM STA. 315+00 TO STA. 329+50 LT
-L- FROM STA. 336+00 TO STA. 339+00 LT
-L- FROM STA. 348+50 TO STA. 352+00 RT
-L- FROM STA. 358+00 TO STA. 358+88 RT
-L- FROM STA. 359+50 TO STA. 360+50 LT
-Y10- FROM STA. 15+00 TO STA. 15+85 RT
-Y10- FROM STA. 18+00 TO STA. 19+50 RT



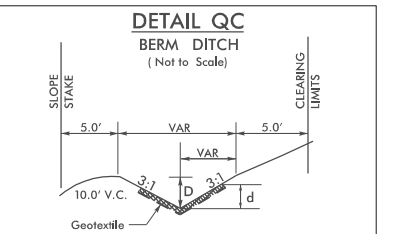
-L- FROM STA. 284+40 TO STA. 285+00 LT



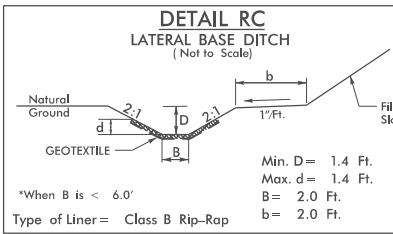
-L- STA. 302+59 TO STA. 303+86 LT



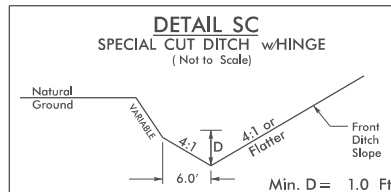
-L- FROM STA. 302+50 TO STA. 303+00 LT



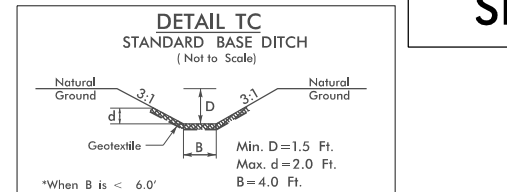
-L- FROM STA. 310+00 TO STA. 311+50 LT



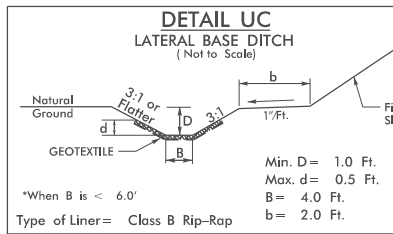
-L- FROM STA. 313+25 TO STA. 314+50 LT



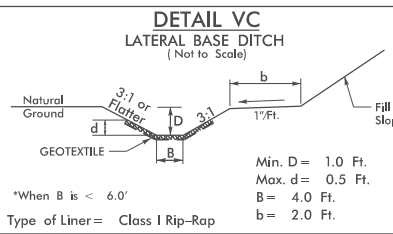
-L- FROM STA. 330+50 TO STA. 333+50 LT
-L- FROM STA. 352+50 TO STA. 359+50 LT



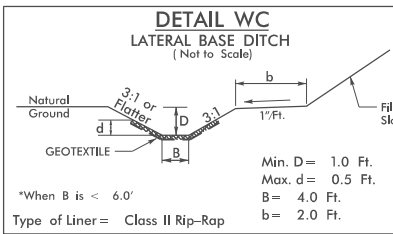
-L- STA. 208+50 LT; S=6.0%; L=25'; Beg. El.=373.4; End El.=371.9; DDE=13 CY
-L- STA. 644+46 LT; S=0.33%; L=60'; Beg. El.=364.00; End El.=362.00; DDE=62 CY



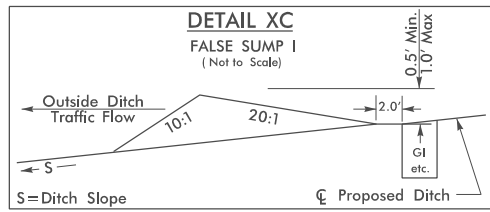
-L- FROM STA. 402+50 TO STA. 407+50 LT
-L- FROM STA. 557+00 TO STA. 557+75 LT
-L- FROM STA. 737+93 TO STA. 741+34 RT
-Y11E- FROM STA. 10+64 TO STA. 11+50 RT



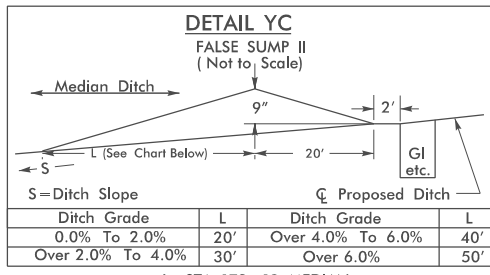
-L- FROM STA. 389+50 TO STA. 393+00 LT
-DR3- FROM STA. 11+50 TO STA. 12+50 LT



-Y11C- FROM STA. 10+67 TO STA. 11+28 RT

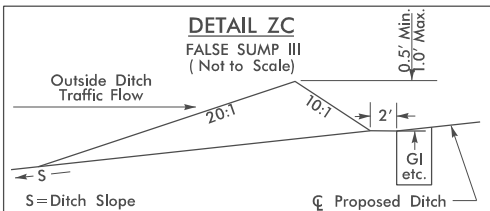


-L- STA. 113+00 TO STA. 120+00 LT
-L- STA. 135+89 LT
-L- STA. 201+20 RT
-L- STA. 299+30 RT
-L- STA. 311+30 LT
-L- STA. 314+80 LT
-L- STA. 320+80 LT
-L- STA. 339+30 LT
-L- STA. 361+05 LT
-L- STA. 378+00 LT
-L- STA. 390+00 RT
-L- STA. 397+31 LT
-L- STA. 402+00 LT
-L- STA. 421+88 LT
-L- STA. 529+00 LT
-L- STA. 555+80 LT
-Y9B- STA. 10+00 RT
-Y11A- STA. 11+39 LT

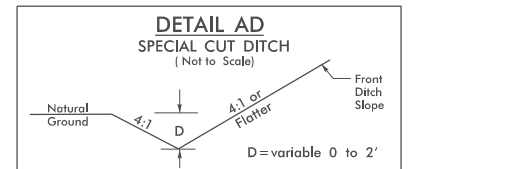


Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

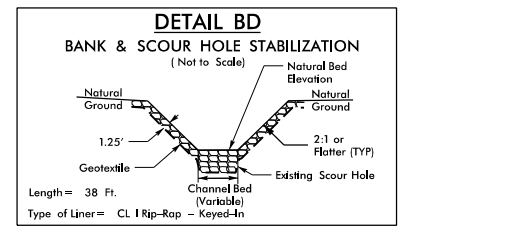
-L- STA. 173+19 MEDIAN
-L- STA. 264+30 TO 269+12 MEDIAN
-L- STA. 185+20 MEDIAN
-L- STA. 195+85 MEDIAN
-L- STA. 201+20 MEDIAN
-L- STA. 207+20 MEDIAN
-L- STA. 284+00 MEDIAN
-L- STA. 286+30 MEDIAN
-L- STA. 311+80 MEDIAN
-L- STA. 314+30 MEDIAN
-L- STA. 320+80 MEDIAN
-L- STA. 359+23 MEDIAN
-L- STA. 361+05 MEDIAN
-L- STA. 376+31 MEDIAN
-L- STA. 387+14 MEDIAN
-L- STA. 400+78 MEDIAN
-L- STA. 401+63 MEDIAN
-L- STA. 407+62 MEDIAN
-L- STA. 413+00 MEDIAN
-L- STA. 426+00 MEDIAN
-L- STA. 453+00 MEDIAN
-L- STA. 489+00 MEDIAN
-L- STA. 507+00 MEDIAN
-L- STA. 528+69 MEDIAN
-L- STA. 555+63 MEDIAN
-L- STA. 607+35 MEDIAN
-L- STA. 633+64 MEDIAN
-L- STA. 650+39 MEDIAN
-L- STA. 699+57 MEDIAN
-L- STA. 708+43 MEDIAN
-L- STA. 731+49 MEDIAN
-L- STA. 740+50 MEDIAN
-L- STA. 758+00 MEDIAN
-L- STA. 782+69 MEDIAN



-L- STA. 157+50 TO 165+10 LT
-L- STA. 97+40 LT
-L- STA. 195+75 LT
-L- STA. 303+50 LT
-L- STA. 314+30 RT
-L- STA. 385+12 RT
-L- STA. 422+00 RT
-L- STA. 555+63 RT
-L- STA. 569+00 RT
-L- STA. 644+63 LT



FROM STA. 172+75 TO STA. 173+17 -L- RT



-L- STA. 14+62 LT; Length=38 Ft.
-L- STA. 34+64 LT; Length=26 Ft.

PERMIT DRAWING SHEET 6 OF 60



S:\8\2021\Hydraulics\PERMITS_Environmental\Drawings\PSH\R-5709_HYD.Ditch_Detail.dgn

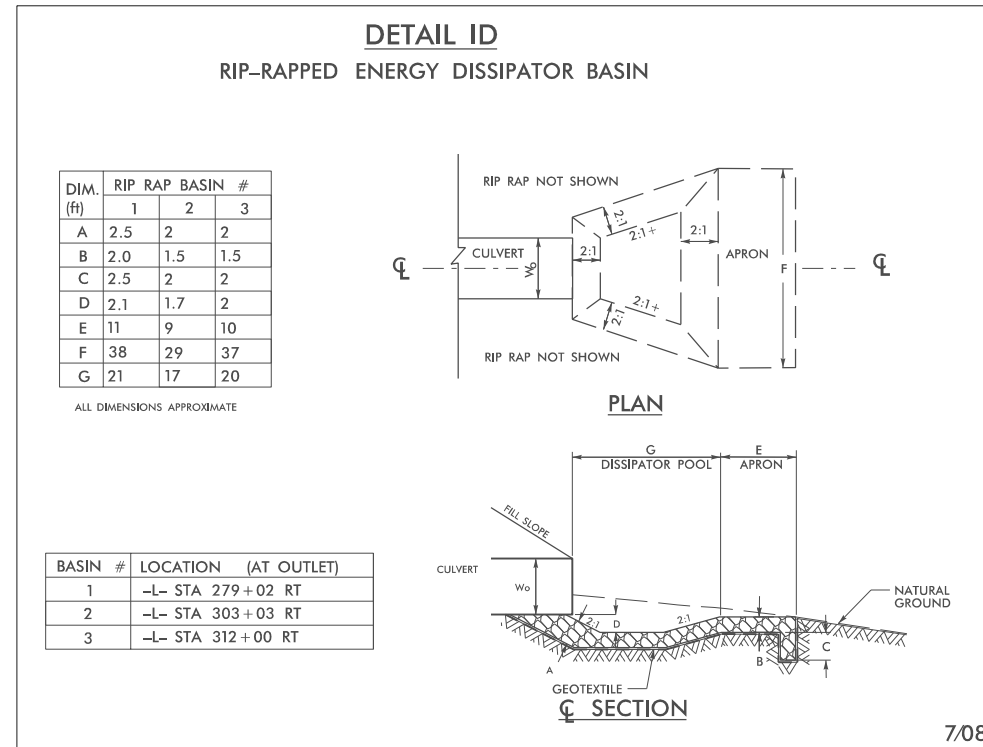
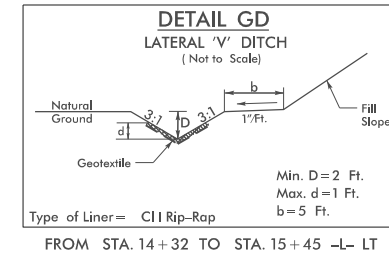
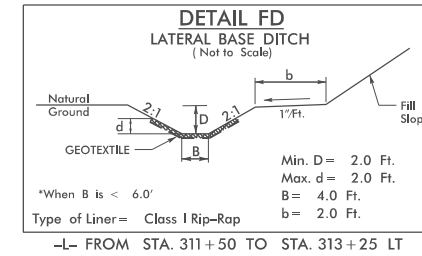
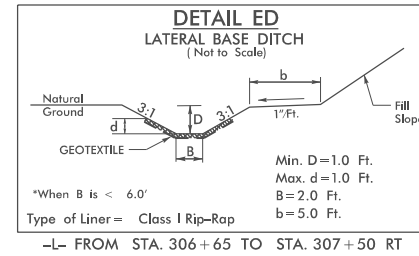
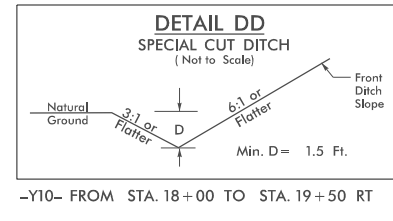
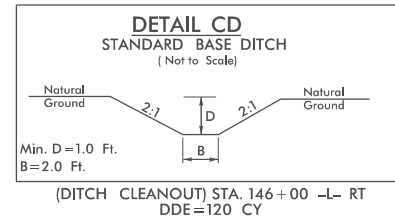
ETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CORPUS/SET/DESIGN - GIS/GIS - CONSTRUCTION OBSERVATION

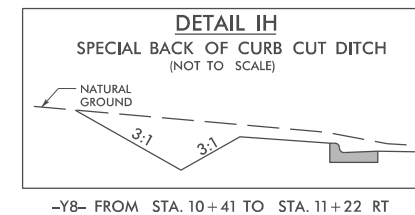
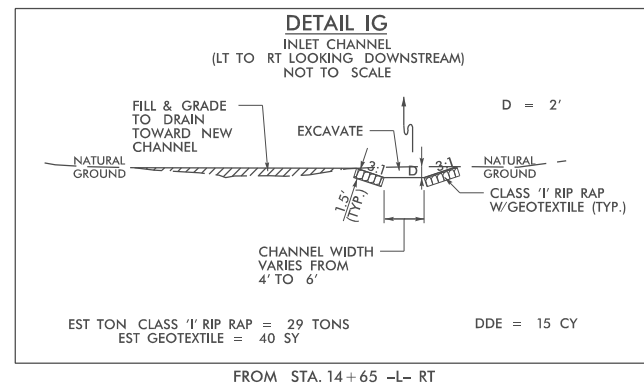
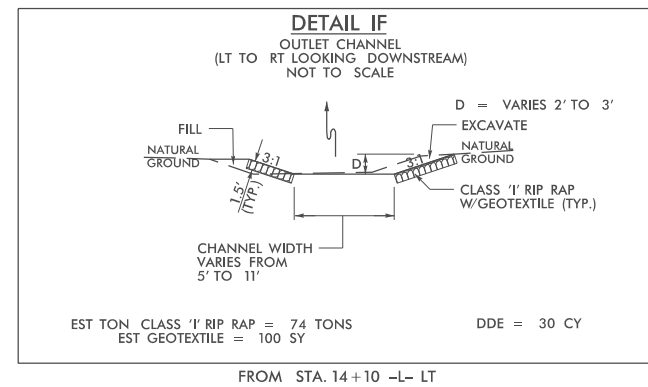
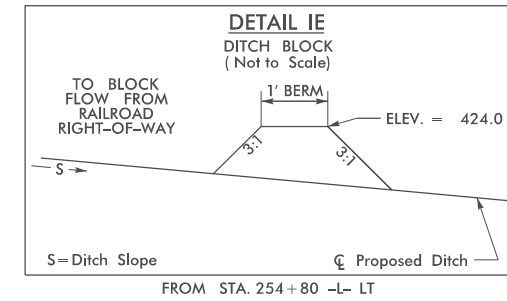
RK&K
P: (919) 978-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rk&k.com
Responsive People | Creative Solutions

PROJECT REFERENCE NO. R-5709	SHEET NO. 2D-6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-L- STA 279+02 RT
-L- STA 303+03 RT
-L- STA 312+00 RT



PERMIT DRAWING
SHEET 7 OF 60



S:\8\2021\Permits\Permits_Environmental\Drawings\PSH\R-5709_HYD.Ditch_Detail.dgn

ETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - SIGNS - CONSTRUCTION OBSERVATION

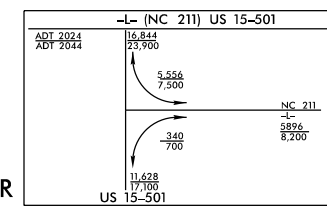
RK&K
P: (919) 878-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

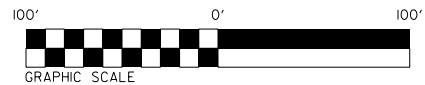
CURB + GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
2'-6"C+G	-L-	10+16.82	14+70.74	LT
2'-6"C+G	-Y1-	10+41.00	11+40.08	LT
2'-6"C+G	-Y1-	10+41.00	11+38.45	RT
2'-6"C+G	-L-	17+06.40	22+96.82	LT
1'-6"C+G	-L-	10+72.04	23+38.59	MEDIAN
2'-6"C+G	-L-	10+79.48	22+66.57	RT

F	F	DENOTES FILL IN WETLAND DENOTES HAND CLEARING DENOTES TEMPORARY IMPACTS IN SURFACE WATER DENOTES IMPACTS IN SURFACE WATER DENOTES EXCAVATION IN WETLAND
HC	HC	
TS	TS	
S	S	
E	E	

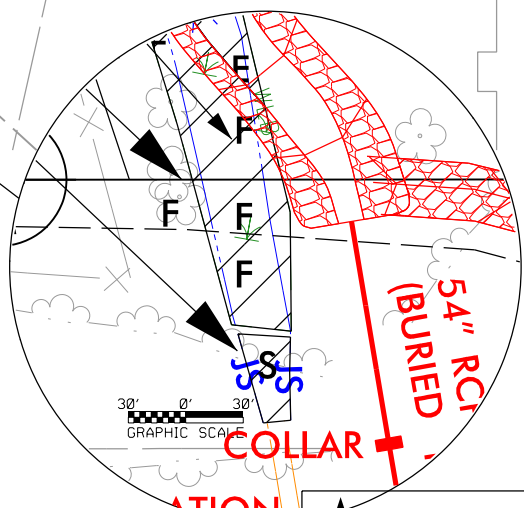
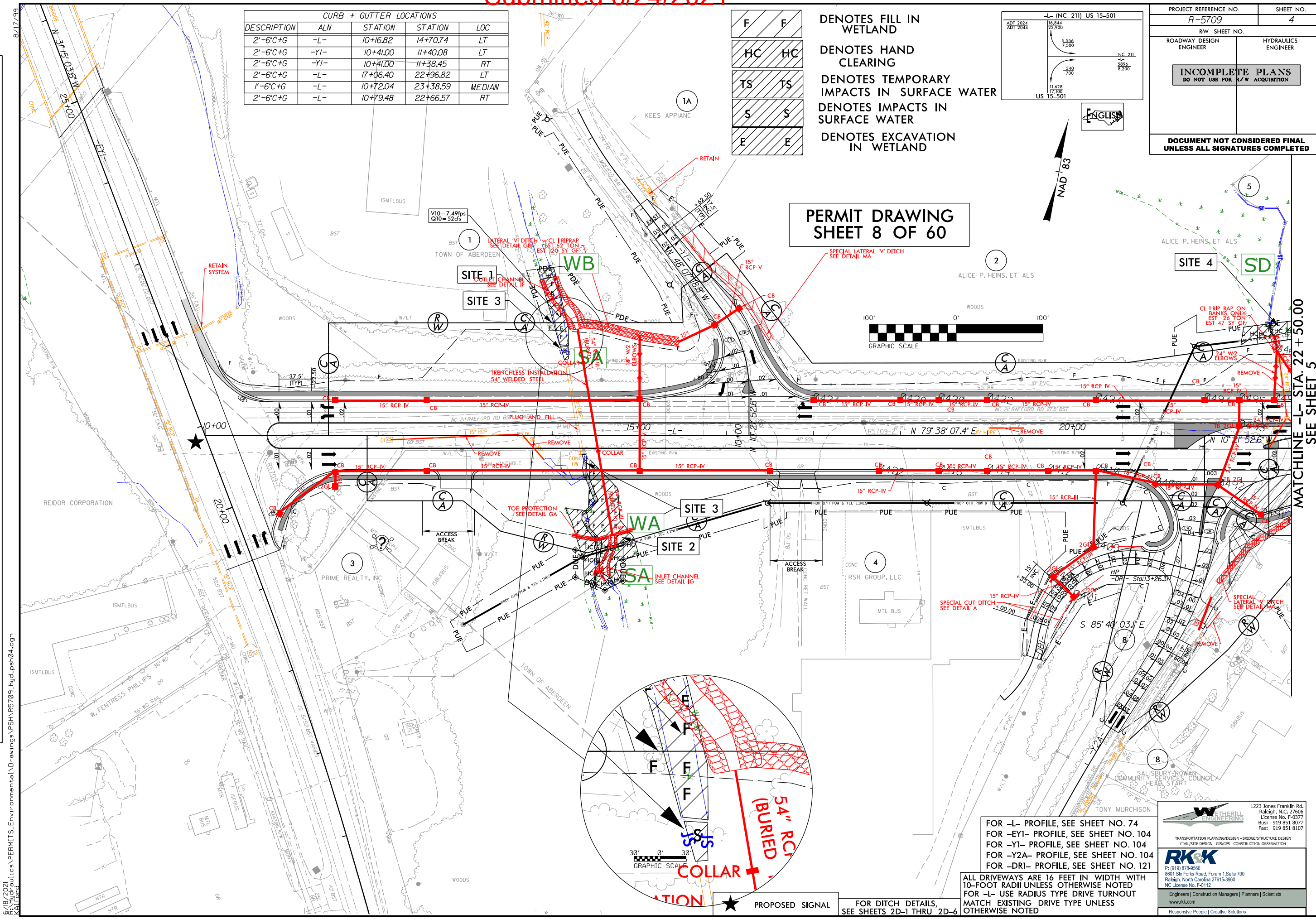


PROJECT REFERENCE NO. R-5709	SHEET NO. 4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PERMIT DRAWING SHEET 8 OF 60



REVISIONS



FOR -L- PROFILE, SEE SHEET NO. 74
 FOR -Y1- PROFILE, SEE SHEET NO. 104
 FOR -Y2A- PROFILE, SEE SHEET NO. 104
 FOR -DR1- PROFILE, SEE SHEET NO. 121

ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH 10-FOOT RADII UNLESS OTHERWISE NOTED
 FOR -L- USE RADIUS TYPE DRIVE TURNOUT MATCH EXISTING DRIVE TYPE UNLESS OTHERWISE NOTED

1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 License No. F-0377
 Bus: 919 851 8077
 Fax: 919 851 8107

WETHERILL ENGINEERING

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

RK&K
 P: (919) 878-8580
 8601 Six Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
 www.rkk.com
 Responsive People | Creative Solutions

B:\18\2021\Public\PERMITS_Environmental\Drawings\PSH\PSH5709_hyd_psh04.dgn
 8/17/2021

MATCHLINE -L- STA. 22 + 50.00
 SEE SHEET 5

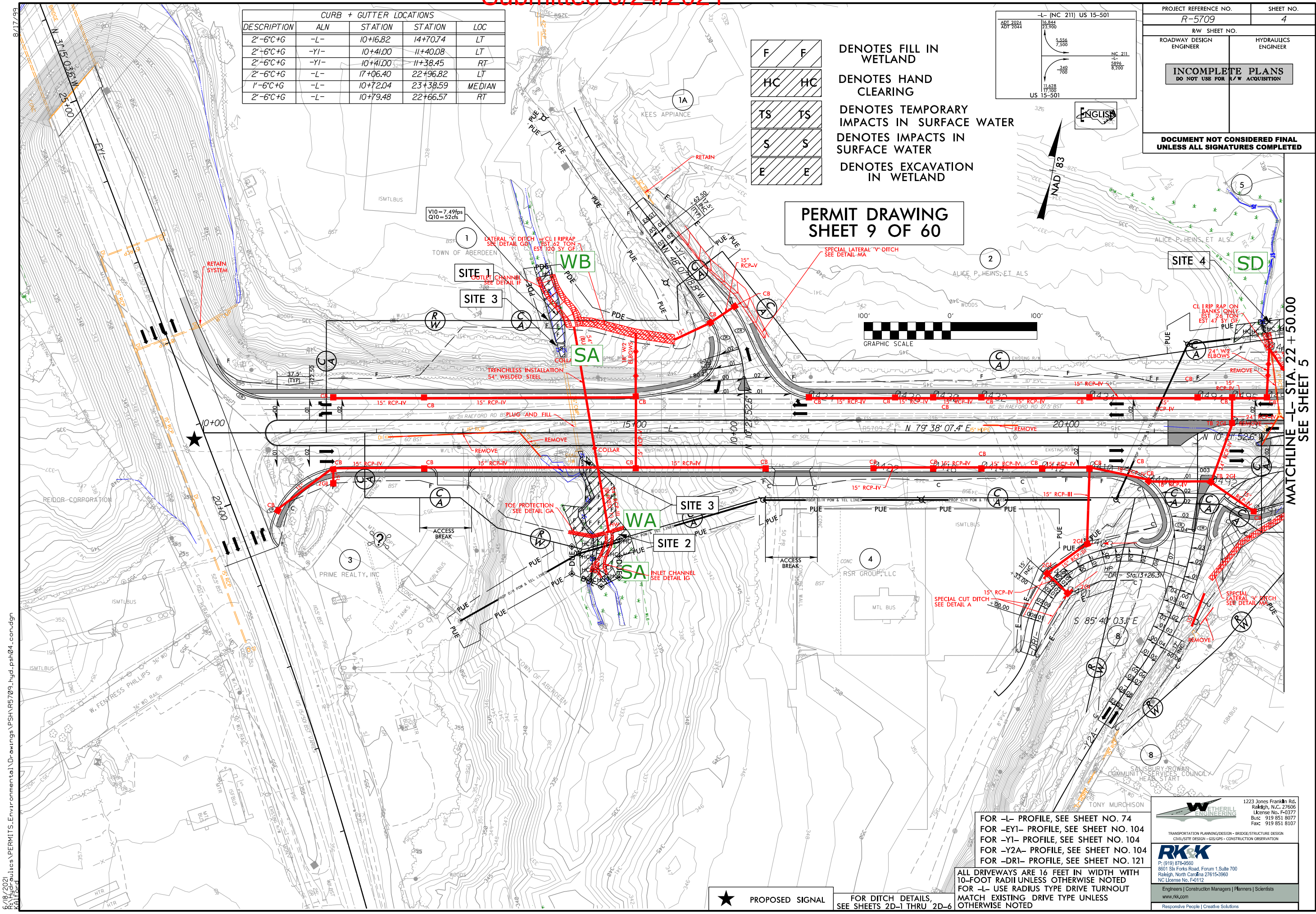
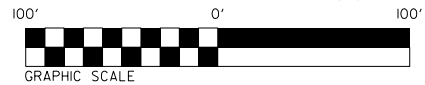
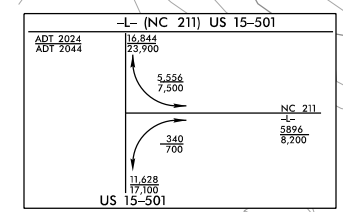
CURB + GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
2'-6"C+G	-L-	10+16.82	14+70.74	LT
2'-6"C+G	-Y1-	10+41.00	11+40.08	LT
2'-6"C+G	-Y1-	10+41.00	11+38.45	RT
2'-6"C+G	-L-	17+06.40	22+96.82	LT
1'-6"C+G	-L-	10+72.04	23+38.59	MEDIAN
2'-6"C+G	-L-	10+79.48	22+66.57	RT

F	F
HC	HC
TS	TS
S	S
E	E

F F DENOTES FILL IN WETLAND
HC HC DENOTES HAND CLEARING
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
S S DENOTES IMPACTS IN SURFACE WATER
E E DENOTES EXCAVATION IN WETLAND

PERMIT DRAWING SHEET 9 OF 60

PROJECT REFERENCE NO. R-5709	SHEET NO. 4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



6/18/2021
 C:\Users\paulcs\Documents\Drawings\PSH\5709\hyd_pah04_con.dgn

FOR -L- PROFILE, SEE SHEET NO. 74
 FOR -Y1- PROFILE, SEE SHEET NO. 104
 FOR -Y2- PROFILE, SEE SHEET NO. 104
 FOR -DR1- PROFILE, SEE SHEET NO. 121

ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH 10-FOOT RADII UNLESS OTHERWISE NOTED
 FOR -L- USE RADIUS TYPE DRIVE TURNOUT MATCH EXISTING DRIVE TYPE UNLESS OTHERWISE NOTED

WETHERILL ENGINEERING
 1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 License No. F-4377
 Bus: 919 851 8077
 Fax: 919 851 8107

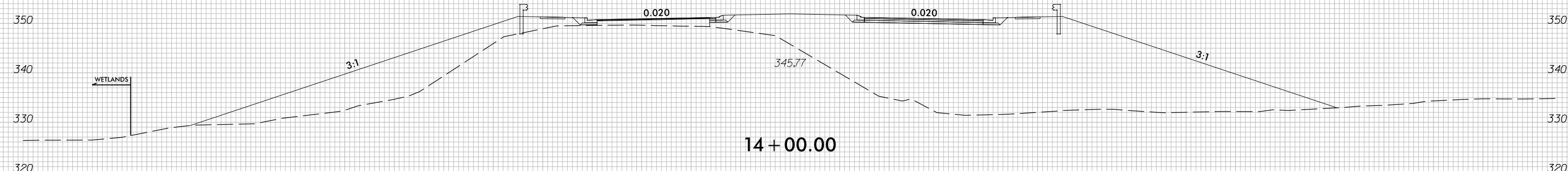
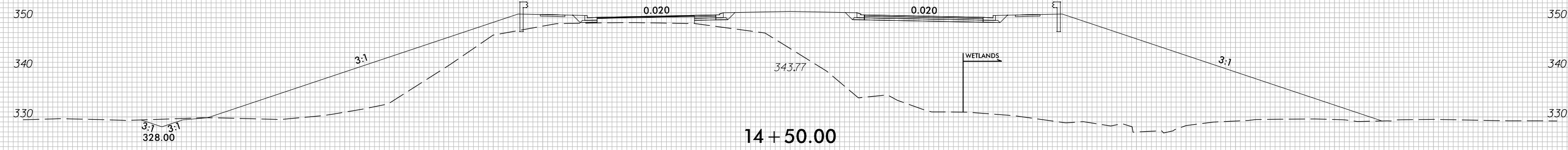
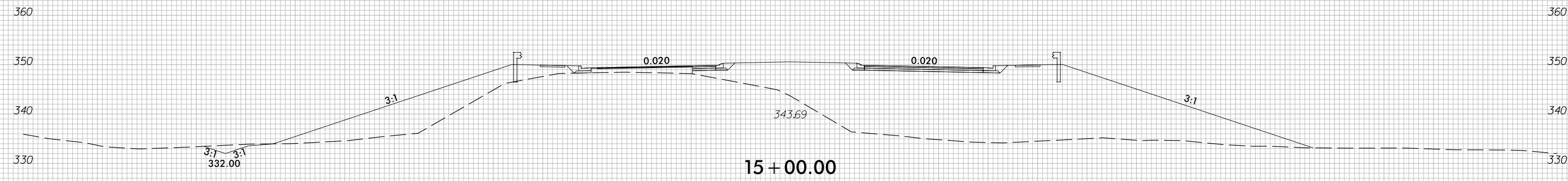
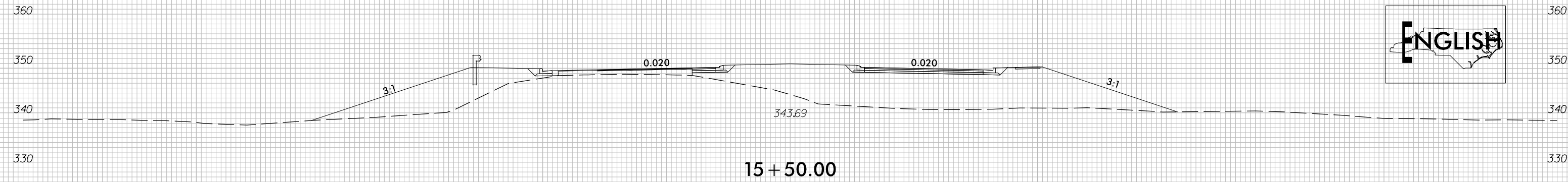
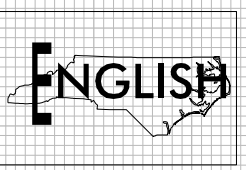
RK&K
 TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION
 P: (919) 878-9580
 8601 Six Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. F-0112
 Engineers | Construction Managers | Planners | Scientists
 www.rkk.com
 Responsive People | Creative Solutions

MATCHLINE -L- STA. 22 + 50.00
 SEE SHEET 5

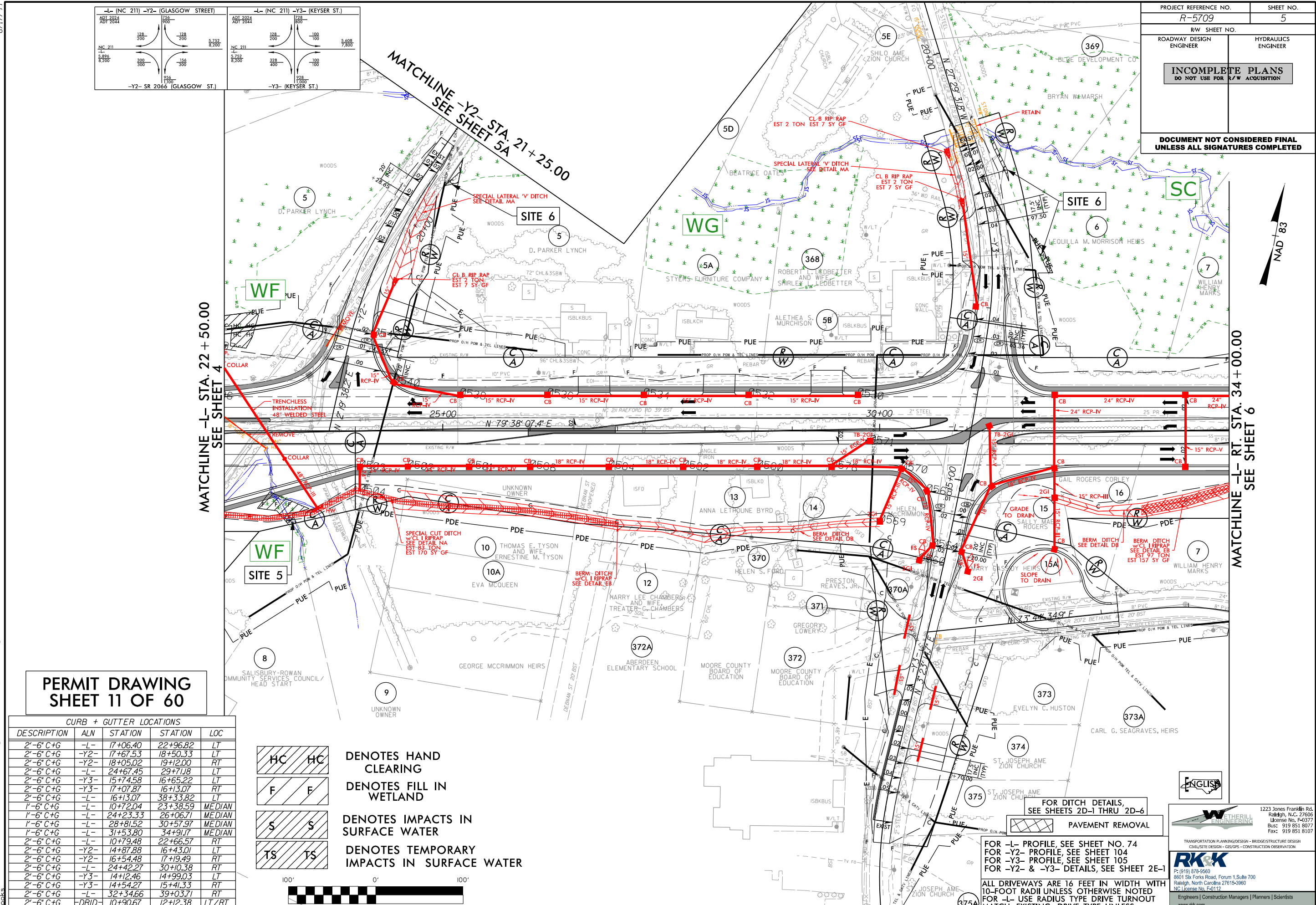
SITE 1

SITE 2

PERMIT DRAWING SHEET 10 OF 60



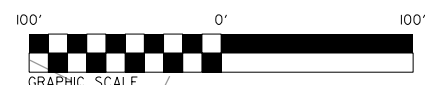
PROJECT REFERENCE NO. R-5709		SHEET NO. 5	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION </div>			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



**PERMIT DRAWING
SHEET 11 OF 60**

CURB + GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
2'-6" C+G	-L-	17+06.40	22+96.82	LT
2'-6" C+G	-Y2-	17+67.53	18+50.33	LT
2'-6" C+G	-Y2-	18+05.02	19+12.00	RT
2'-6" C+G	-L-	24+67.45	29+71.18	LT
2'-6" C+G	-Y3-	15+74.58	16+65.22	LT
2'-6" C+G	-Y3-	17+07.87	16+13.07	RT
2'-6" C+G	-L-	16+13.07	38+33.82	LT
1'-6" C+G	-L-	10+72.04	23+38.59	MEDIAN
1'-6" C+G	-L-	24+23.33	26+06.71	MEDIAN
1'-6" C+G	-L-	28+81.52	30+57.97	MEDIAN
1'-6" C+G	-L-	31+53.80	34+91.17	MEDIAN
2'-6" C+G	-L-	10+79.48	22+66.57	RT
2'-6" C+G	-Y2-	14+87.88	16+43.01	LT
2'-6" C+G	-Y2-	16+54.48	17+19.49	RT
2'-6" C+G	-L-	24+42.27	30+10.38	RT
2'-6" C+G	-Y3-	14+12.46	14+99.03	LT
2'-6" C+G	-Y3-	14+54.27	15+41.33	RT
2'-6" C+G	-L-	32+34.66	39+03.71	RT
2'-6" C+G	-DRID-	10+90.67	12+12.38	LT/RT
VALLEY GUTTER	-Y3-	11+00.00	12+50.00	LT

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



FOR DITCH DETAILS, SEE SHEETS 2D-1 THRU 2D-6

FOR DITCH DETAILS, SEE SHEETS 2D-1 THRU 2D-6

FOR DITCH DETAILS, SEE SHEETS 2D-1 THRU 2D-6

FOR -L- PROFILE, SEE SHEET NO. 74
 FOR -Y2- PROFILE, SEE SHEET 104
 FOR -Y3- PROFILE, SEE SHEET 105
 FOR -Y2- & -Y3- DETAILS, SEE SHEET 2E-1

ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH 10-FOOT RADII UNLESS OTHERWISE NOTED
 FOR -L- USE RADIUS TYPE DRIVE TURNOUT
 MATCH EXISTING DRIVE TYPE UNLESS OTHERWISE NOTED

WETHERILL ENGINEERING
 1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 License No. F-0377
 Bus: 919 851 8077
 Fax: 919 851 8107

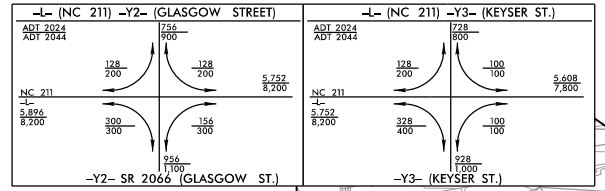
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN - GEOTECH - CONSTRUCTION OBSERVATION

RK&K
 P: (919) 978-9580
 8601 Six Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
 www.rk.com
 Responsive People | Creative Solutions

8/17/99
 R:\Projects\2021\PERMITS_Envr\Permits\Drawings\PSH\R5709_hyd_psh05.dgn
 18/18/2021
 R:\Projects\2021\PERMITS_Envr\Permits\Drawings\PSH\R5709_hyd_psh05.dgn

8/17/99



PROJECT REFERENCE NO. R-5709	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

MATCHLINE -L- STA. 22 + 50.00
SEE SHEET 4

MATCHLINE -L- RT. STA. 34 + 00.00
SEE SHEET 6

**PERMIT DRAWING
SHEET 12 OF 60**

CURB + GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
2'-6" C+G	-L-	17+06.40	22+96.82	LT
2'-6" C+G	-Y2-	17+67.53	18+50.33	LT
2'-6" C+G	-Y2-	18+05.02	19+12.00	RT
2'-6" C+G	-L-	24+67.45	29+71.18	LT
2'-6" C+G	-Y3-	15+74.58	16+65.22	LT
2'-6" C+G	-Y3-	17+07.87	16+13.07	RT
2'-6" C+G	-L-	16+13.07	38+33.82	LT
1'-6" C+G	-L-	10+72.04	23+38.59	MEDIAN
1'-6" C+G	-L-	24+23.33	26+06.71	MEDIAN
1'-6" C+G	-L-	28+81.52	30+57.97	MEDIAN
1'-6" C+G	-L-	31+53.80	34+91.7	MEDIAN
2'-6" C+G	-L-	10+79.48	22+66.57	RT
2'-6" C+G	-Y2-	14+87.88	16+43.01	LT
2'-6" C+G	-Y2-	16+54.48	17+19.49	RT
2'-6" C+G	-L-	24+42.27	30+10.38	RT
2'-6" C+G	-Y3-	14+12.46	14+99.03	LT
2'-6" C+G	-Y3-	14+54.27	15+41.33	RT
2'-6" C+G	-L-	32+34.66	39+03.71	RT
2'-6" C+G	-DRID-	10+90.67	12+12.38	LT/RT
VALLEY GUTTER	-Y3-	11+00.00	12+50.00	LT

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



FOR DITCH DETAILS, SEE SHEETS 2D-1 THRU 2D-6

FOR -L- PROFILE, SEE SHEET NO. 74
FOR -Y2- PROFILE, SEE SHEET 104
FOR -Y3- PROFILE, SEE SHEET 105
FOR -Y2- & -Y3- DETAILS, SEE SHEET 2E-1

ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH 10-FOOT RADII UNLESS OTHERWISE NOTED
FOR -L- USE RADIUS TYPE DRIVE TURNOUT
MATCH EXISTING DRIVE TYPE UNLESS OTHERWISE NOTED

WETHERILL ENGINEERING

1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GEOTECH - CONSTRUCTION OBSERVATION

RK&K

P: (919) 972-9590
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rk.com

Responsive People | Creative Solutions

8/18/2021 R:\Projects\Permits_Environmental\Drawings\PSH\R5709_hyd_psh05_con.dgn

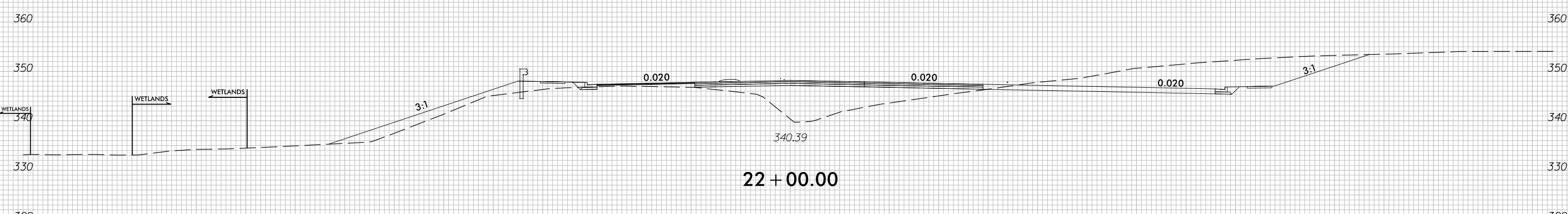
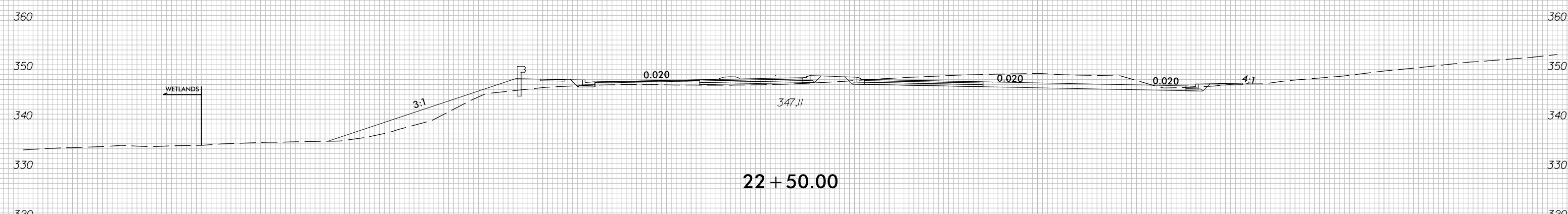
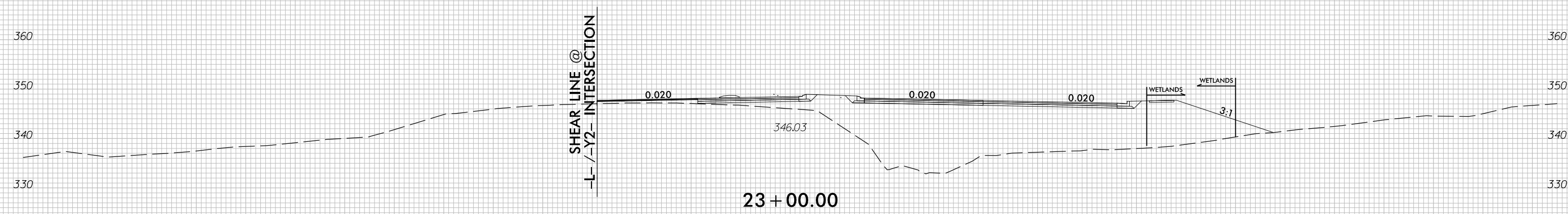
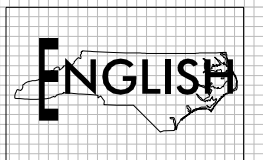
6/23/16

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

SITE 4

SITE 5

PERMIT DRAWING
SHEET 13 OF 60



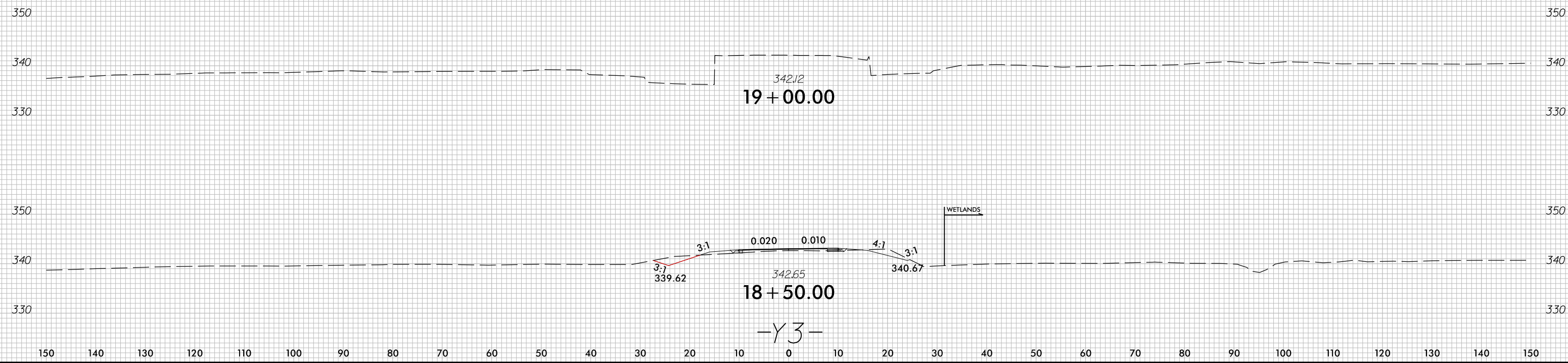
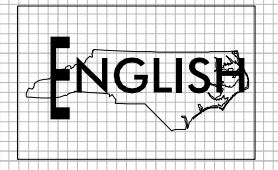
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

6/18/2021 11:51:05 AM C:\Users\jgiles\Documents\Drawings\5709\5709_Rdy_XPL.dgn

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

PERMIT DRAWING
SHEET 14 OF 60

SITE 6

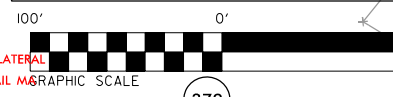


-Y3-

PROJECT REFERENCE NO.	SHEET NO.
R-5709	6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

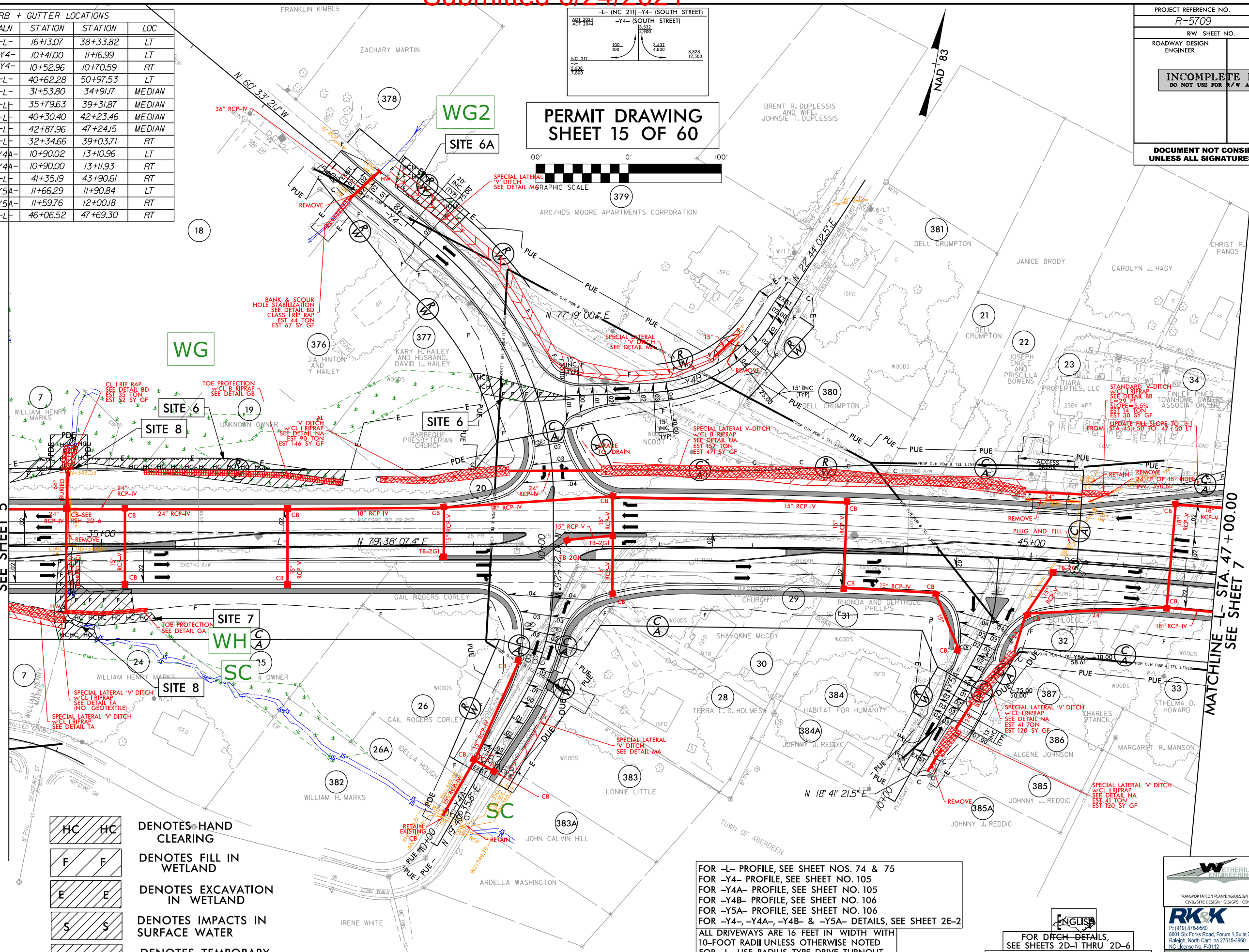
CURB + GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
2'-6" C+G	-L-	16+13.07	38+33.82	LT
2'-6" C+G	-Y4-	10+41.00	11+16.99	LT
2'-6" C+G	-Y4-	10+52.96	10+70.59	RT
2'-6" C+G	-L-	40+62.28	50+97.53	LT
1'-6" C+G	-L-	31+53.80	34+91.17	MEDIAN
1'-6" C+G	-L-	35+79.63	39+31.87	MEDIAN
1'-6" C+G	-L-	40+30.40	42+23.46	MEDIAN
1'-6" C+G	-L-	42+87.96	47+24.15	MEDIAN
2'-6" C+G	-L-	32+34.66	39+03.71	RT
2'-6" C+G	-Y4A-	10+90.02	13+10.96	LT
2'-6" C+G	-Y4A-	10+90.00	13+11.93	RT
2'-6" C+G	-L-	41+35.19	43+90.61	RT
2'-6" C+G	-Y5A-	11+66.29	11+90.84	LT
2'-6" C+G	-Y5A-	11+59.76	12+00.18	RT
2'-6" C+G	-L-	46+06.52	47+69.30	RT

PERMIT DRAWING SHEET 15 OF 60



MATCHLINE -L- STA. 34 + 00.00 SEE SHEET 5

MATCHLINE -L- STA. 47 + 00.00 SEE SHEET 7



- DENOTES HAND CLEARING
- DENOTES FILL IN WETLAND
- DENOTES EXCAVATION IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR -L- PROFILE, SEE SHEET NOS. 74 & 75
 FOR -Y4- PROFILE, SEE SHEET NO. 105
 FOR -Y4A- PROFILE, SEE SHEET NO. 105
 FOR -Y4B- PROFILE, SEE SHEET NO. 106
 FOR -Y5A- PROFILE, SEE SHEET NO. 106
 FOR -Y4-, -Y4A-, -Y4B- & -Y5A- DETAILS, SEE SHEET 2E-2
 ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH 10-FOOT RADII UNLESS OTHERWISE NOTED
 FOR -L- USE RADIUS TYPE DRIVE TURNOUT
 MATCH EXISTING DRIVE TYPE UNLESS OTHERWISE NOTED

FOR DITCH DETAILS, SEE SHEETS 2D-1 THRU 2D-6
 PAVEMENT REMOVAL

WETHERILL ENGINEERING
 1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 License No. F-0377
 Bus: 919 851 8077
 Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

RK&K
 P: (919) 978-9660
 8601 Six Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
 www.rk.com
 Responsive People | Creative Solutions

B:\17\99\PERMITS\Environmental\Drawings\PSH\PSH5709_hyd_pah06.dgn

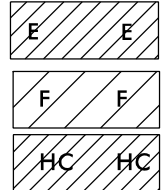
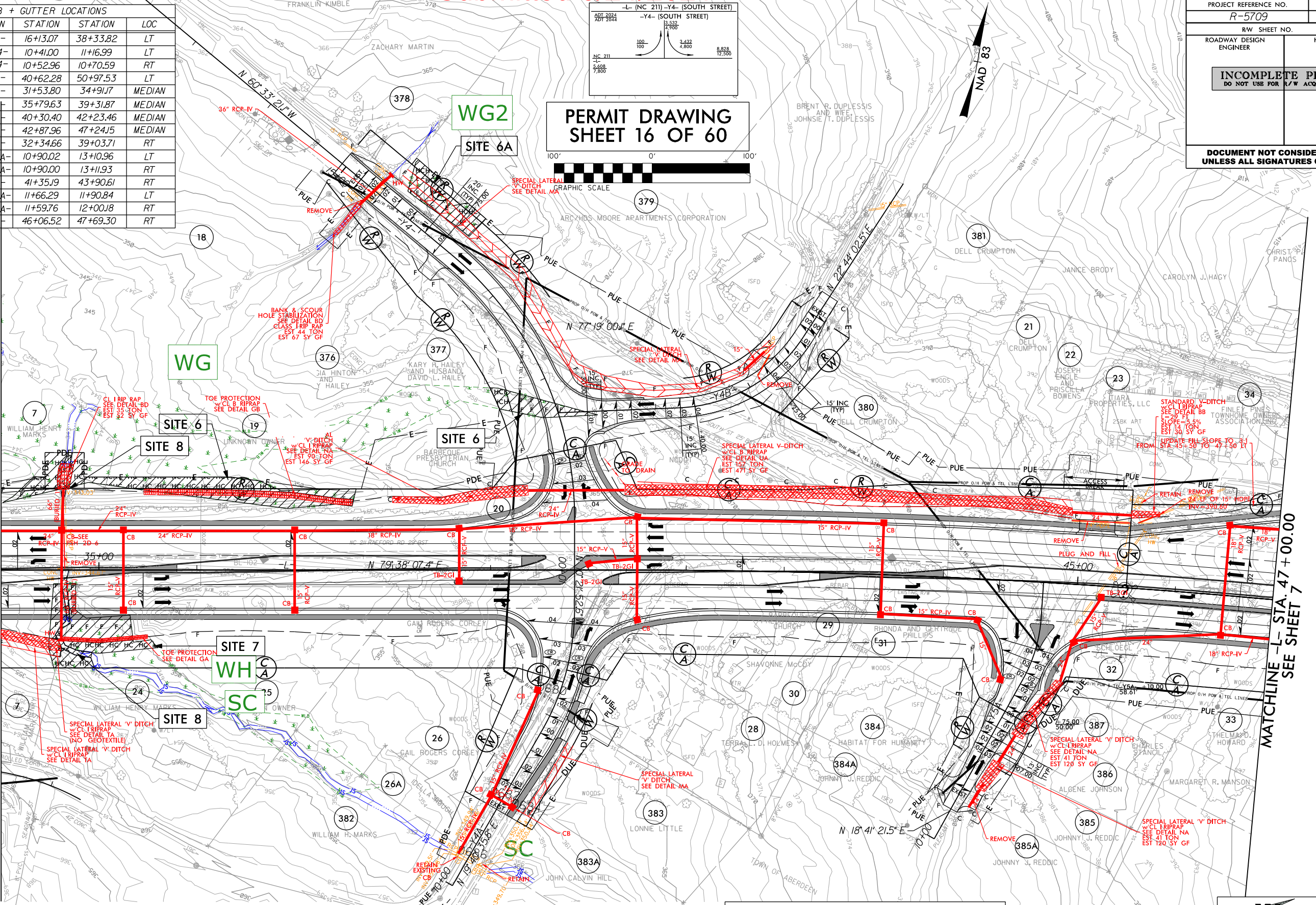
CURB + GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
2'-6" C+G	-L-	16+13.07	38+33.82	LT
2'-6" C+G	-Y4-	10+41.00	11+16.99	LT
2'-6" C+G	-Y4-	10+52.96	10+70.59	RT
2'-6" C+G	-L-	40+62.28	50+97.53	LT
1'-6" C+G	-L-	31+53.80	34+91.17	MEDIAN
1'-6" C+G	-L-	35+79.63	39+31.87	MEDIAN
1'-6" C+G	-L-	40+30.40	42+23.46	MEDIAN
1'-6" C+G	-L-	42+87.96	47+24.15	MEDIAN
2'-6" C+G	-L-	32+34.66	39+03.71	RT
2'-6" C+G	-Y4A-	10+90.02	13+10.96	LT
2'-6" C+G	-Y4A-	10+90.00	13+11.93	RT
2'-6" C+G	-L-	41+35.19	43+90.61	RT
2'-6" C+G	-Y5A-	11+66.29	11+90.84	LT
2'-6" C+G	-Y5A-	11+59.76	12+00.18	RT
2'-6" C+G	-L-	46+06.52	47+69.30	RT

PERMIT DRAWING
SHEET 16 OF 60

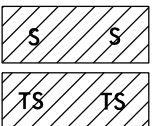
PROJECT REFERENCE NO. R-5709	SHEET NO. 6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

MATCHLINE -L- STA. 34 + 00.00
SEE SHEET 5

MATCHLINE -L- STA. 47 + 00.00
SEE SHEET 7



E DENOTES EXCAVATION IN WETLAND
F DENOTES FILL IN WETLAND
HC DENOTES HAND CLEARING



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

FOR -L- PROFILE, SEE SHEET NOS. 74 & 75
FOR -Y4- PROFILE, SEE SHEET NO. 105
FOR -Y4B- PROFILE, SEE SHEET NO. 106
FOR -Y5A- PROFILE, SEE SHEET NO. 106
FOR -Y4-, -Y4A-, -Y4B- & -Y5A- DETAILS, SEE SHEET 2E-2
ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH 10-FOOT RADII UNLESS OTHERWISE NOTED
FOR -L- USE RADIUS TYPE DRIVE TURNOUT
MATCH EXISTING DRIVE TYPE UNLESS OTHERWISE NOTED

FOR DITCH DETAILS, SEE SHEETS 2D-1 THRU 2D-6
PAVEMENT REMOVAL

1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

RK&K
ENGINEERS

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

P: (919) 876-9660
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

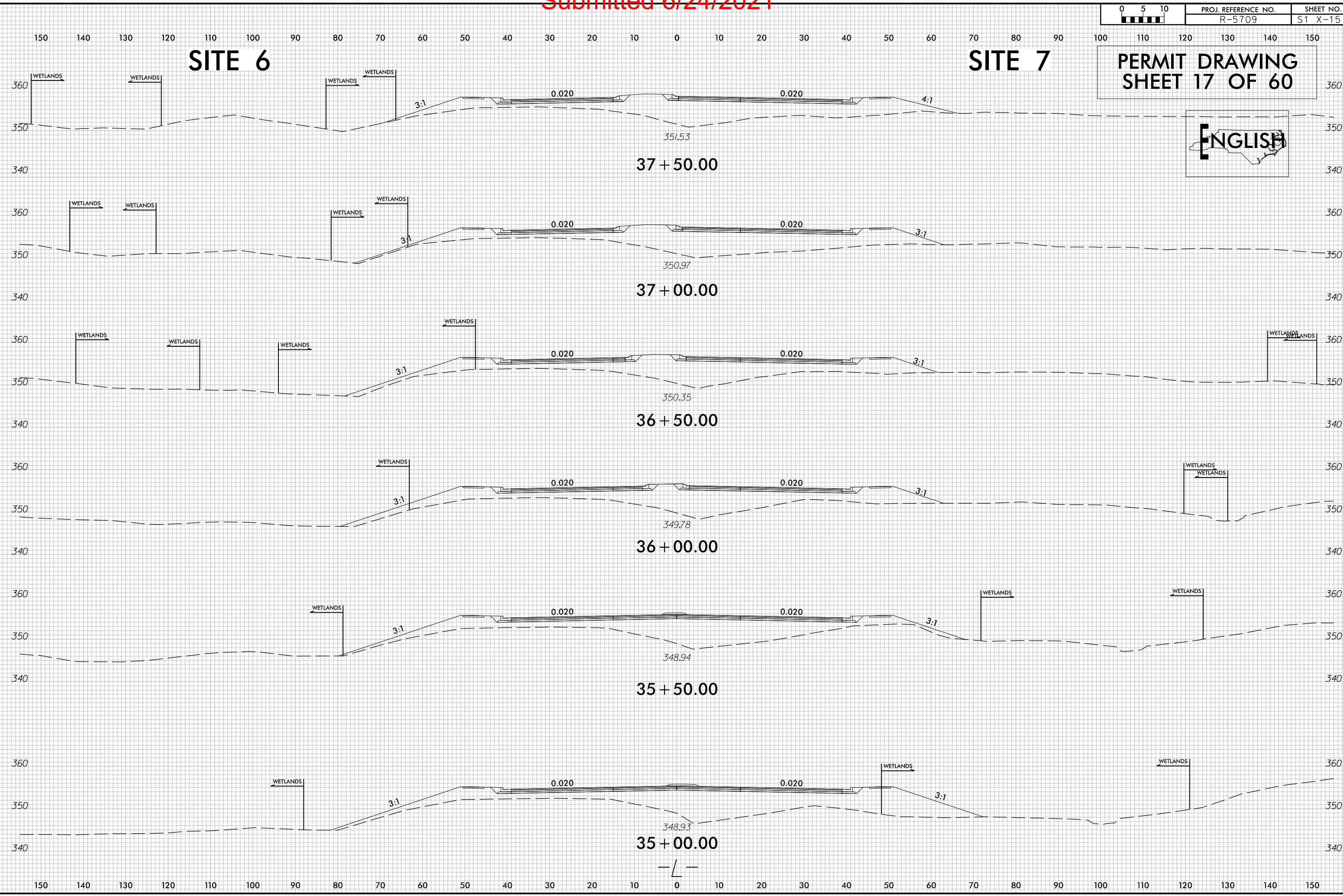
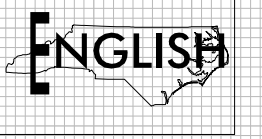
Engineers | Construction Managers | Planners | Scientists
www.rk.com
Responsive People | Creative Solutions

B:\17\99
B:\17\99\Drawings\Environmental\Drawings\PSH\PSH5709_hyd_pah06.com.dgn

SITE 6

SITE 7

PERMIT DRAWING SHEET 17 OF 60



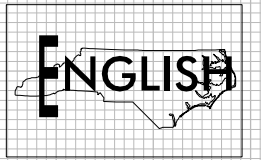
6/23/16
 6/18/2021
 I:\Projects\Permits_Environmental\Drawings\PSH\AR-5709_Rdy_XPL.dgn
 S1 X-15



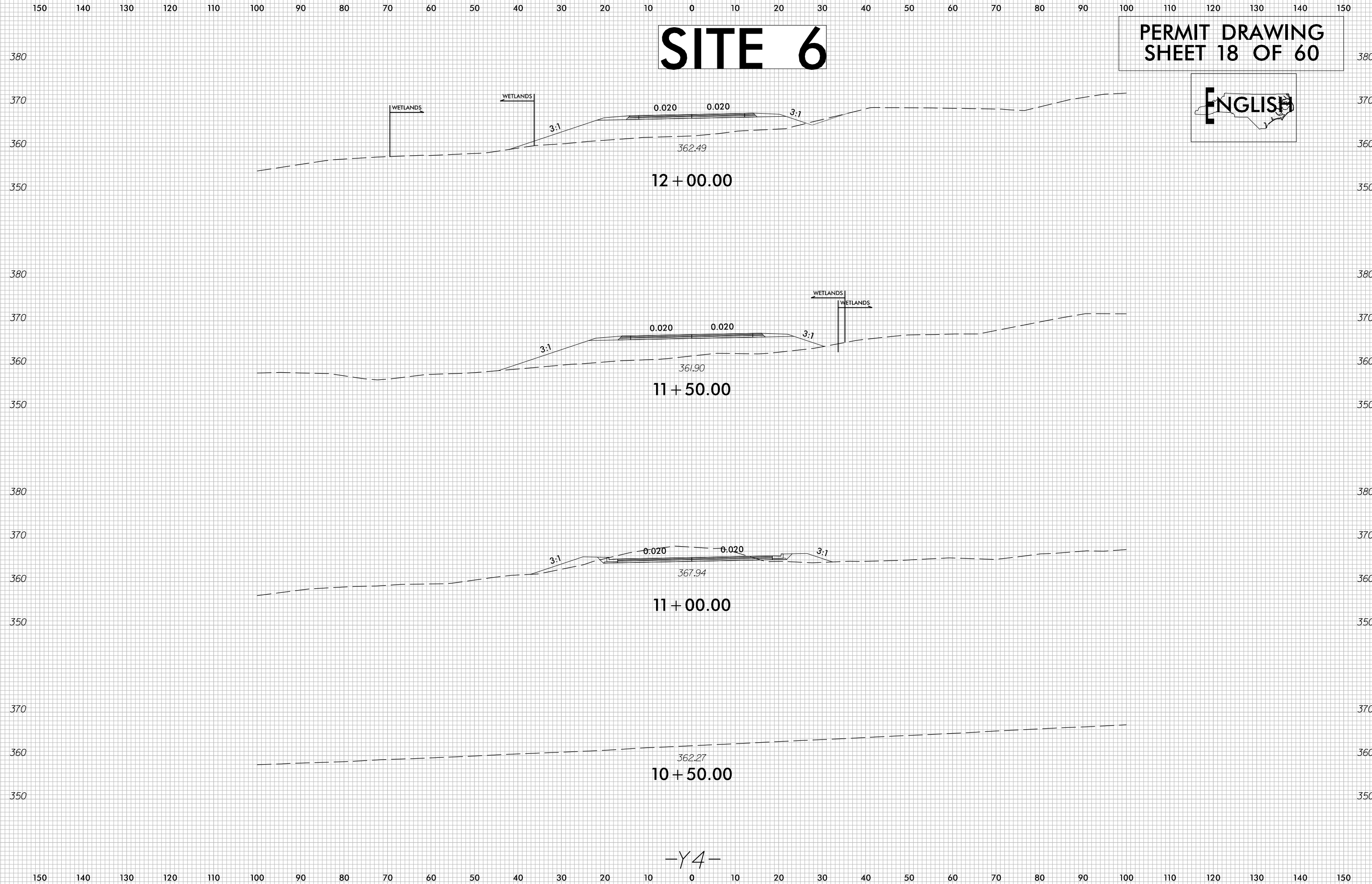
PROJ. REFERENCE NO.	SHEET NO.
R-5709	S1 X-167

SITE 6

PERMIT DRAWING
SHEET 18 OF 60



ENGLISH



10+50.00

11+00.00

11+50.00

12+00.00

-Y4-

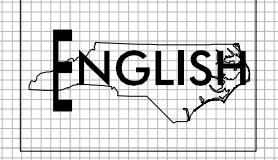
6/23/16
4/26/2021
R:\Projects\PERMITS_Environmental\Drawings\PSHR-5709_Rdy_XPL_Y4.dgn
USER:frbooks



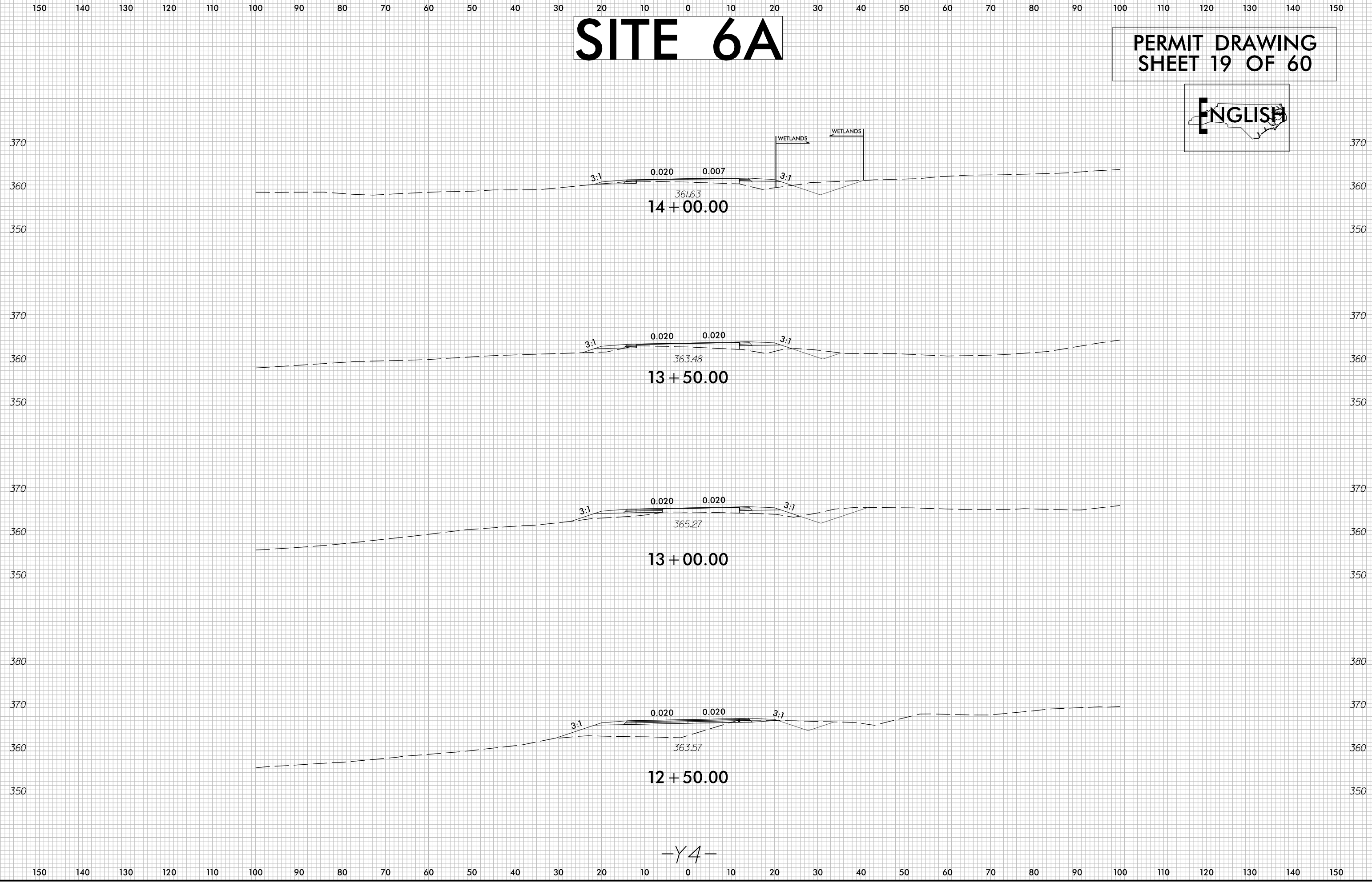
PROJ. REFERENCE NO.	SHEET NO.
R-5709	S1 X-168

SITE 6A

PERMIT DRAWING
SHEET 19 OF 60



6/23/16

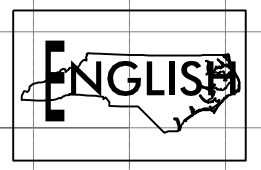


-Y4-

4/26/2021
R:\Users\james\PERMITS_Environmental\Drawings\PSHR-5709_Rdy_XPL_Y4.dgn
USER: jbr

SITE 8 -L- STA. 34 + 62

PERMIT DRAWING
SHEET 20 OF 60



355

3:1 (skewed 88.4*)

EXISTING ROADWAY

350

66" RCP-IV (BURIED 1')
(length = 152')

345

NWS = 344.9'

PROPOSED ELEVATION
= 345.20'

2.21%

NATURAL GROUND

PROPOSED ELEVATION
= 341.85'

340

-100

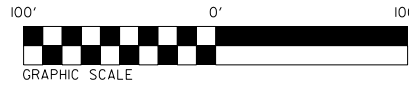
CL

100

6/23/16
4/26/2021
\\drainage\proj\15709_hyd_perm_wet.dgn
USER:KAT10r-d

CURB + GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
1'-6" C+G	-L-	155+04.61	160+29.61	MEDIAN
1'-6" C+G	-L-	161+18.55	163+93.98	MED.LT
1'-6" C+G	-L-	161+18.55	163+93.98	MED.RT
SBG	-L-	165+23.91	169+57.10	RT

PERMIT DRAWING
SHEET 21 OF 60



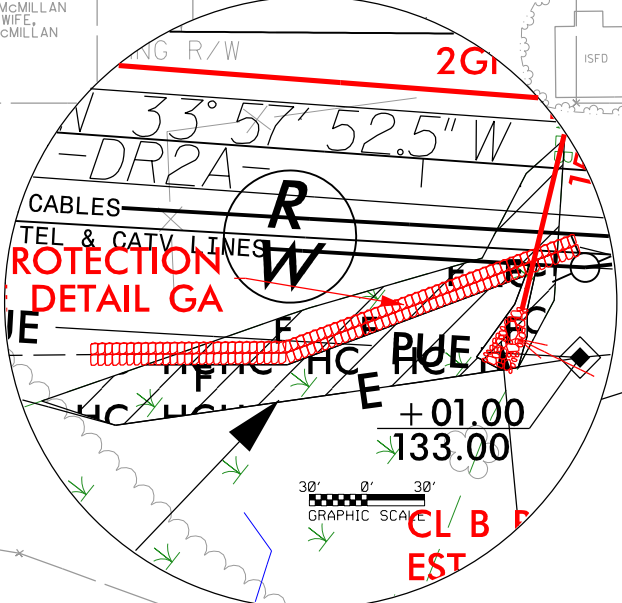
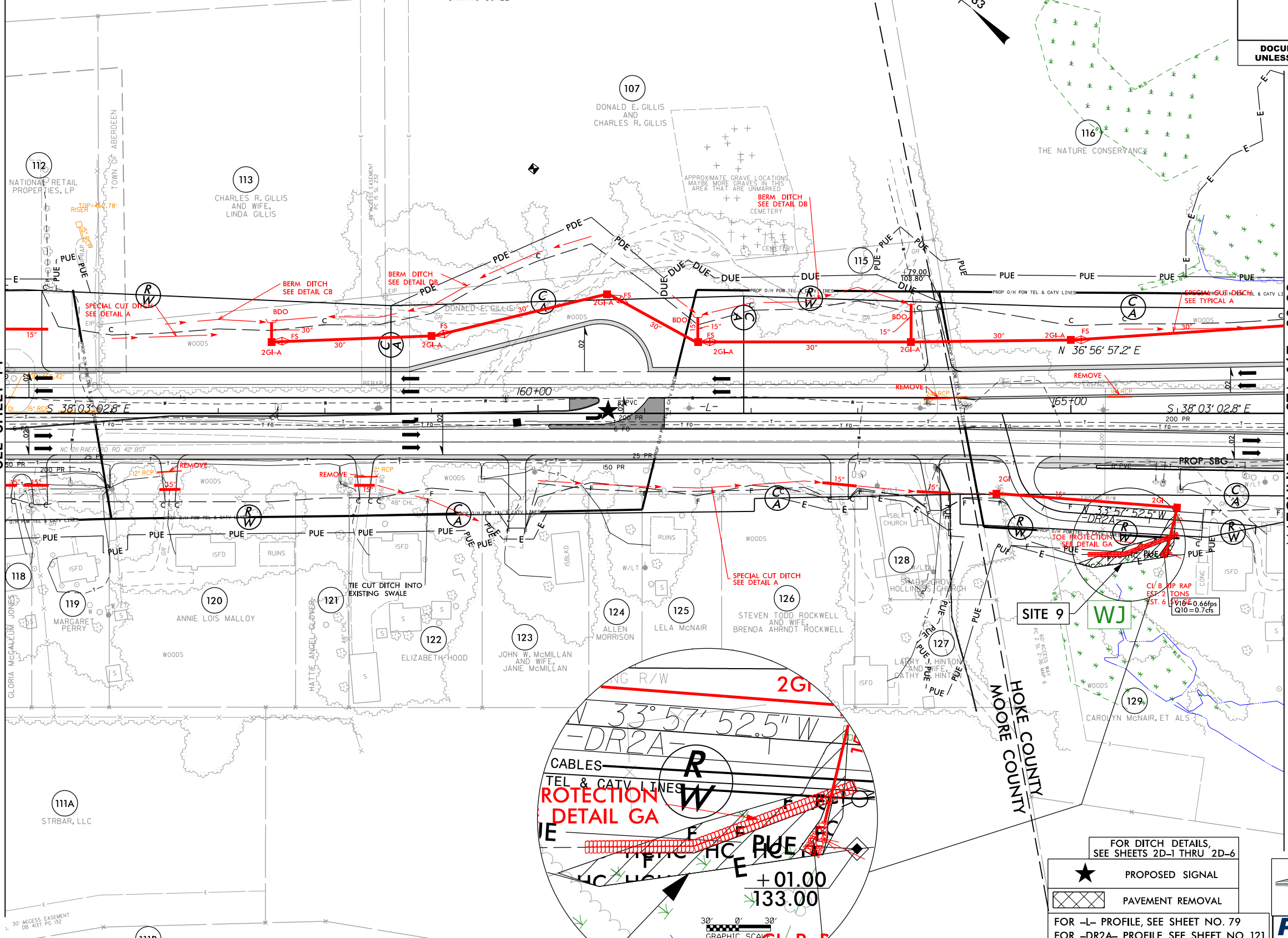
HC HC DENOTES HAND CLEARING

F F DENOTES FILL IN WETLAND

PROJECT REFERENCE NO. R-5709	SHEET NO. 15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

MATCHLINE -L- STA. 155 + 00.00
SEE SHEET 14

MATCHLINE -L- STA. 167 + 00.00
SEE SHEET 16



- ★ PROPOSED SIGNAL
- ☒ PAVEMENT REMOVAL
- FOR DITCH DETAILS, SEE SHEETS 2D-1 THRU 2D-6
- FOR -L- PROFILE, SEE SHEET NO. 79
- FOR -DR2A- PROFILE, SEE SHEET NO. 121
- ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH 10-FOOT RADII UNLESS OTHERWISE NOTED
- MATCH EXISTING DRIVE TYPE UNLESS OTHERWISE NOTED

1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

WETHERILL ENGINEERING

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

RK&K

P: (919) 876-9660
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rk.com

Responsive People | Creative Solutions

8/17/99
6/18/2021
B:\Hydro\Drawings\PERMITS_Environmental\Drawings\PSH\PSH5709_hyd_psh15.dgn

CURB + GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
1'-6" C+G	-L-	155+04.61	160+29.61	MEDIAN
1'-6" C+G	-L-	161+18.55	163+93.98	MED.LT
1'-6" C+G	-L-	161+18.55	163+93.98	MED.RT
SBG	-L-	165+23.91	169+57.10	RT

PERMIT DRAWING
SHEET 22 OF 60



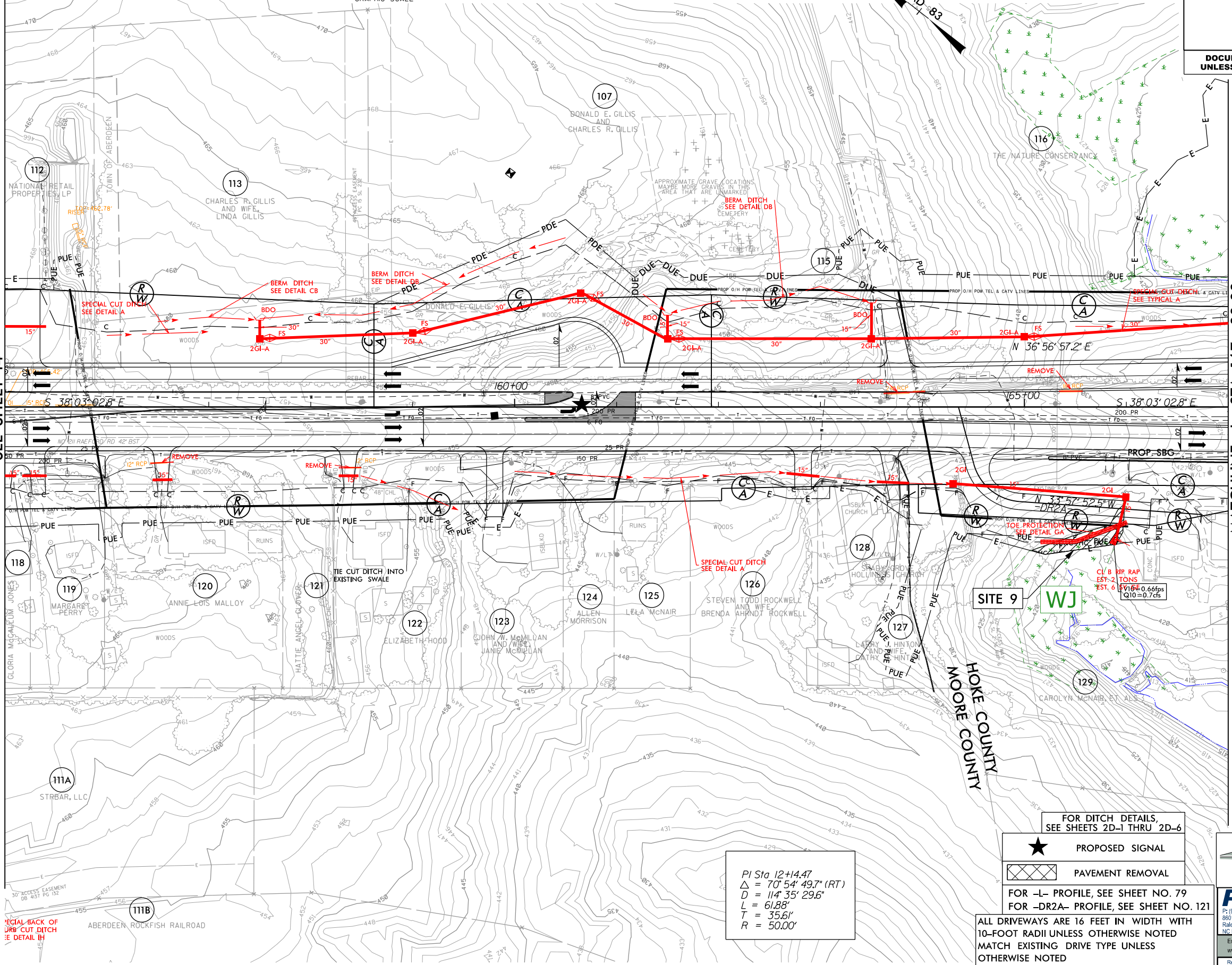
HC HC DENOTES HAND CLEARING

F F DENOTES FILL IN WETLAND

PROJECT REFERENCE NO. R-5709	SHEET NO. 15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

MATCHLINE -L- STA. 155 + 00.00
SEE SHEET 14

MATCHLINE -L- STA. 167 + 00.00
SEE SHEET 16



PI Sta 12+14.47
 $\Delta = 70^\circ 54' 49.7" (RT)$
 $D = 114' 35" 29.6"$
 $L = 61.88'$
 $T = 35.61'$
 $R = 500.0'$

FOR DITCH DETAILS, SEE SHEETS 2D-1 THRU 2D-6

★ PROPOSED SIGNAL

PAVEMENT REMOVAL

FOR -L- PROFILE, SEE SHEET NO. 79
 FOR -DR2A- PROFILE, SEE SHEET NO. 121

ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH 10-FOOT RADII UNLESS OTHERWISE NOTED
 MATCH EXISTING DRIVE TYPE UNLESS OTHERWISE NOTED

1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 License No. F-0377
 Bus: 919 851 8077
 Fax: 919 851 8107

WETHERILL ENGINEERING

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

RK&K

P: (919) 876-9660
 8601 Six Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
 www.rk.com

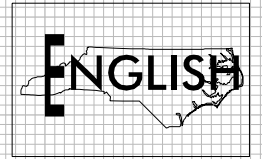
Responsive People | Creative Solutions

8/17/99
 B:\Hydro\Drawings\Permits\Environmental\Drawings\PSH\PSH5709_hyd_pah15_con.dgn
 6/18/2021
 B:\Hydro\Drawings\Permits\Environmental\Drawings\PSH\PSH5709_hyd_pah15_con.dgn

SITE 9

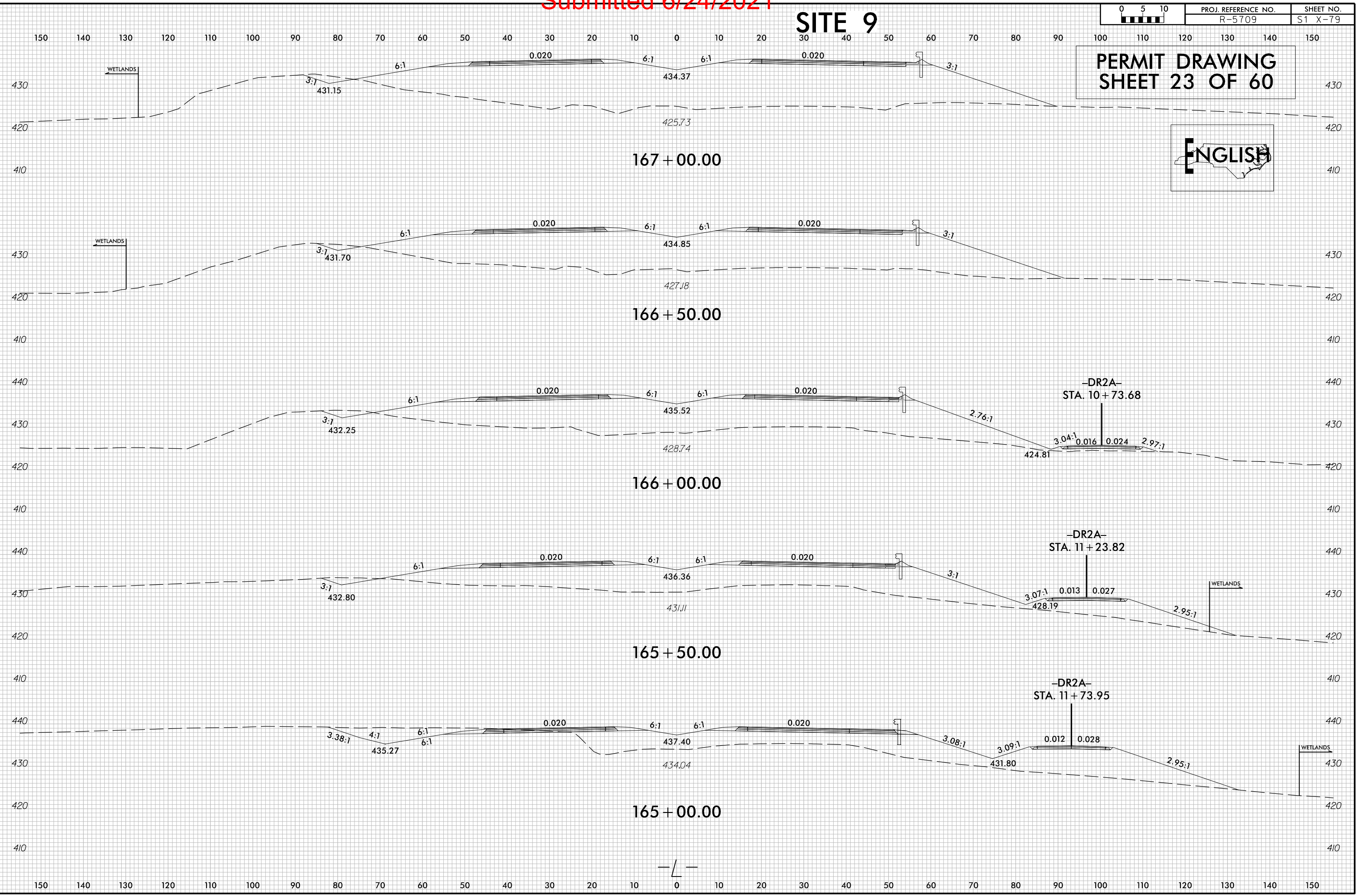
0 5 10	PROJ. REFERENCE NO. R-5709	SHEET NO. S1 X-79
--------	-------------------------------	----------------------

PERMIT DRAWING SHEET 23 OF 60



6/23/16

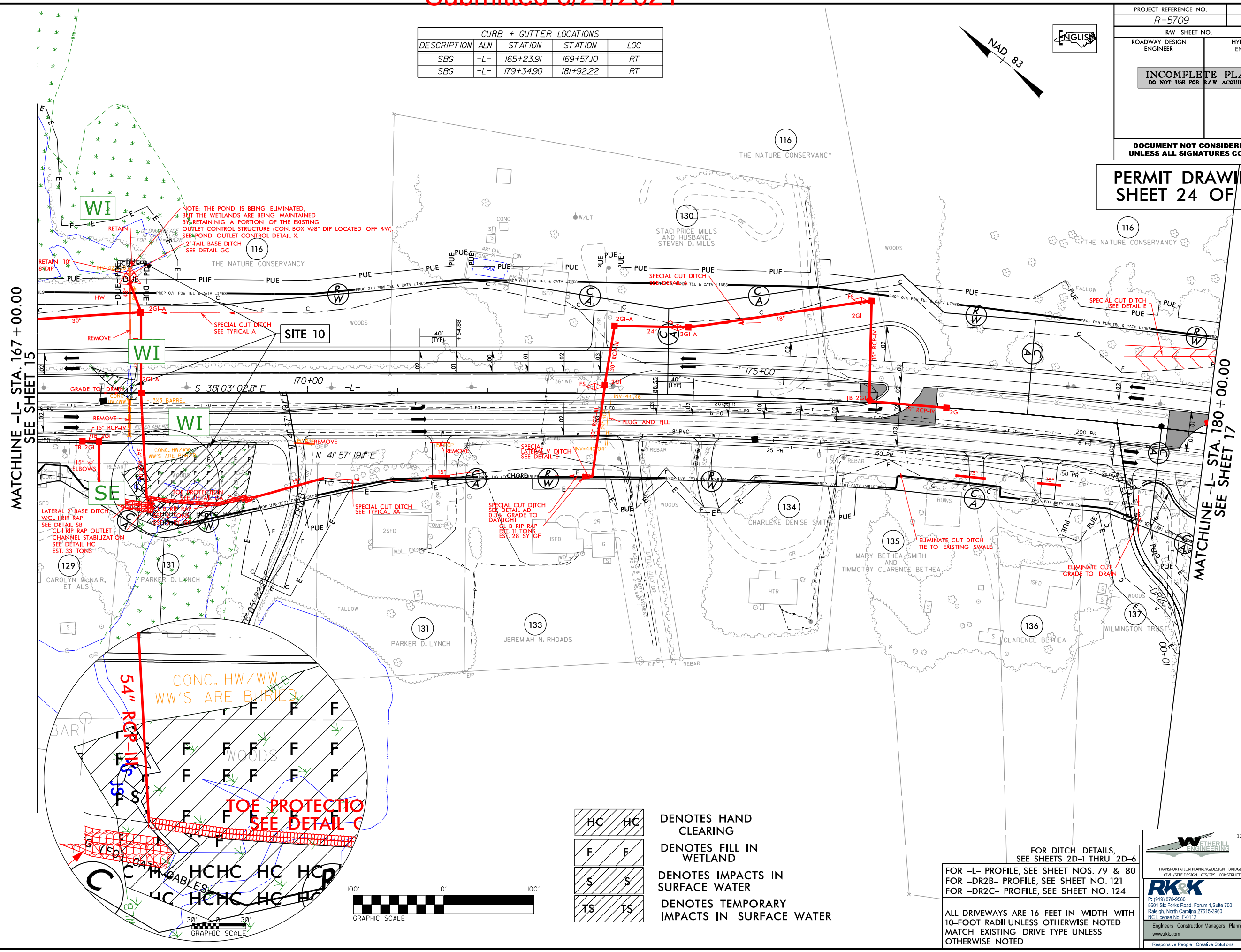
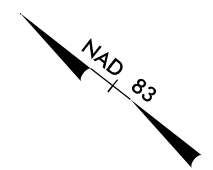
6/18/2021
C:\Users\james\Documents\Drawings\PSHAR-5709_Rdy_XPL.dgn
JAMES BROWN



PROJECT REFERENCE NO. R-5709	SHEET NO. 16
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

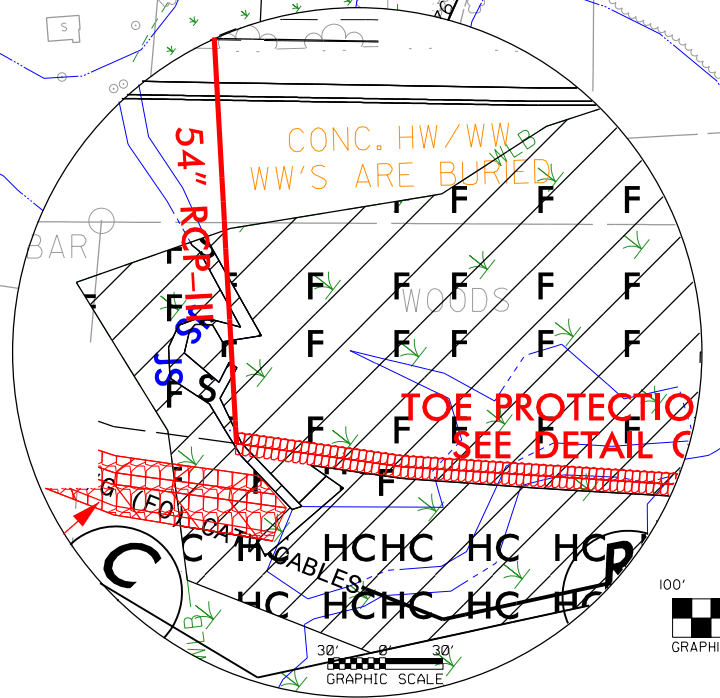
PERMIT DRAWING SHEET 24 OF 60

CURB + GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	165+23.91	169+57.10	RT
SBG	-L-	179+34.90	181+92.22	RT

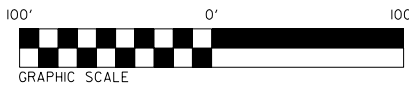


MATCHLINE -L- STA. 167 + 00.00
SEE SHEET 15

MATCHLINE -L- STA. 180 + 00.00
SEE SHEET 17



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



FOR DITCH DETAILS, SEE SHEETS 2D-1 THRU 2D-6
 FOR -L- PROFILE, SEE SHEET NOS. 79 & 80
 FOR -DR2B- PROFILE, SEE SHEET NO. 121
 FOR -DR2C- PROFILE, SEE SHEET NO. 124

ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH 10-FOOT RADII UNLESS OTHERWISE NOTED
 MATCH EXISTING DRIVE TYPE UNLESS OTHERWISE NOTED

WETHERILL ENGINEERING
 1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 License No. F-0377
 Bus: 919 851 8077
 Fax: 919 851 8107

RK&K
 P: (919) 978-9660
 8601 Six Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. F-0112

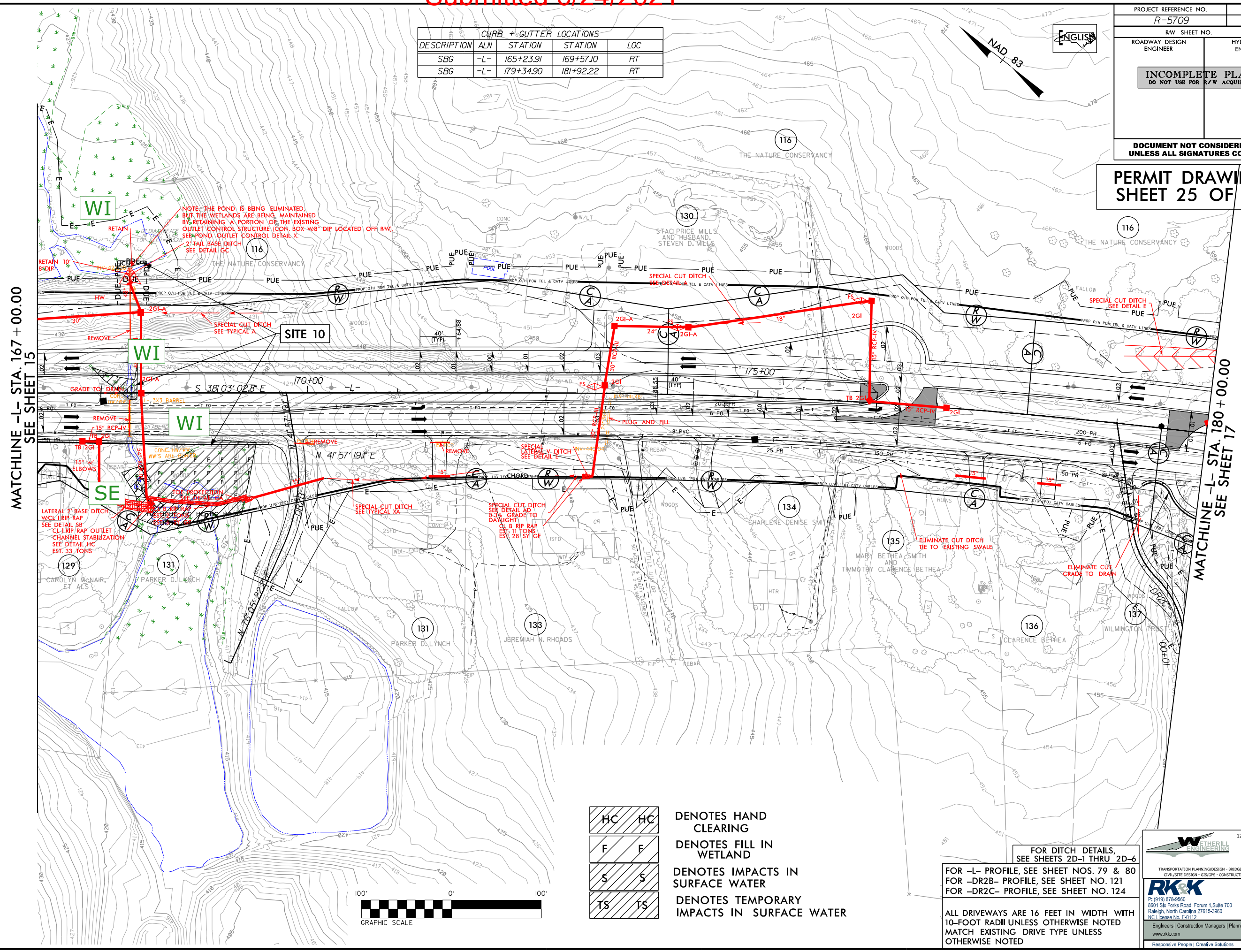
Engineers | Construction Managers | Planners | Scientists
 www.rk.com
 Responsive People | Creative Solutions

B:\17\99
 B:\18\2021
 B:\Hydro\Projects\PERMITS_Environmental\Drawings\PSH\PSH5709_hyd_pah16.dgn

PROJECT REFERENCE NO. R-5709	SHEET NO. 16
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PERMIT DRAWING
SHEET 25 OF 60

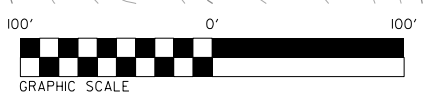
CURB + GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	165+23.91	169+57.10	RT
SBG	-L-	179+34.90	181+92.22	RT



MATCHLINE -L- STA. 167 + 00.00
SEE SHEET 15

MATCHLINE -L- STA. 180 + 00.00
SEE SHEET 17

HC	HC	DENOTES HAND CLEARING
F	F	DENOTES FILL IN WETLAND
S	S	DENOTES IMPACTS IN SURFACE WATER
TS	TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER



FOR DITCH DETAILS,
SEE SHEETS 2D-1 THRU 2D-6

FOR -L- PROFILE, SEE SHEET NOS. 79 & 80
FOR -DR2B- PROFILE, SEE SHEET NO. 121
FOR -DR2C- PROFILE, SEE SHEET NO. 124

ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH 10-FOOT RADII UNLESS OTHERWISE NOTED
MATCH EXISTING DRIVE TYPE UNLESS OTHERWISE NOTED

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

RK&K
P: (919) 876-9660
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

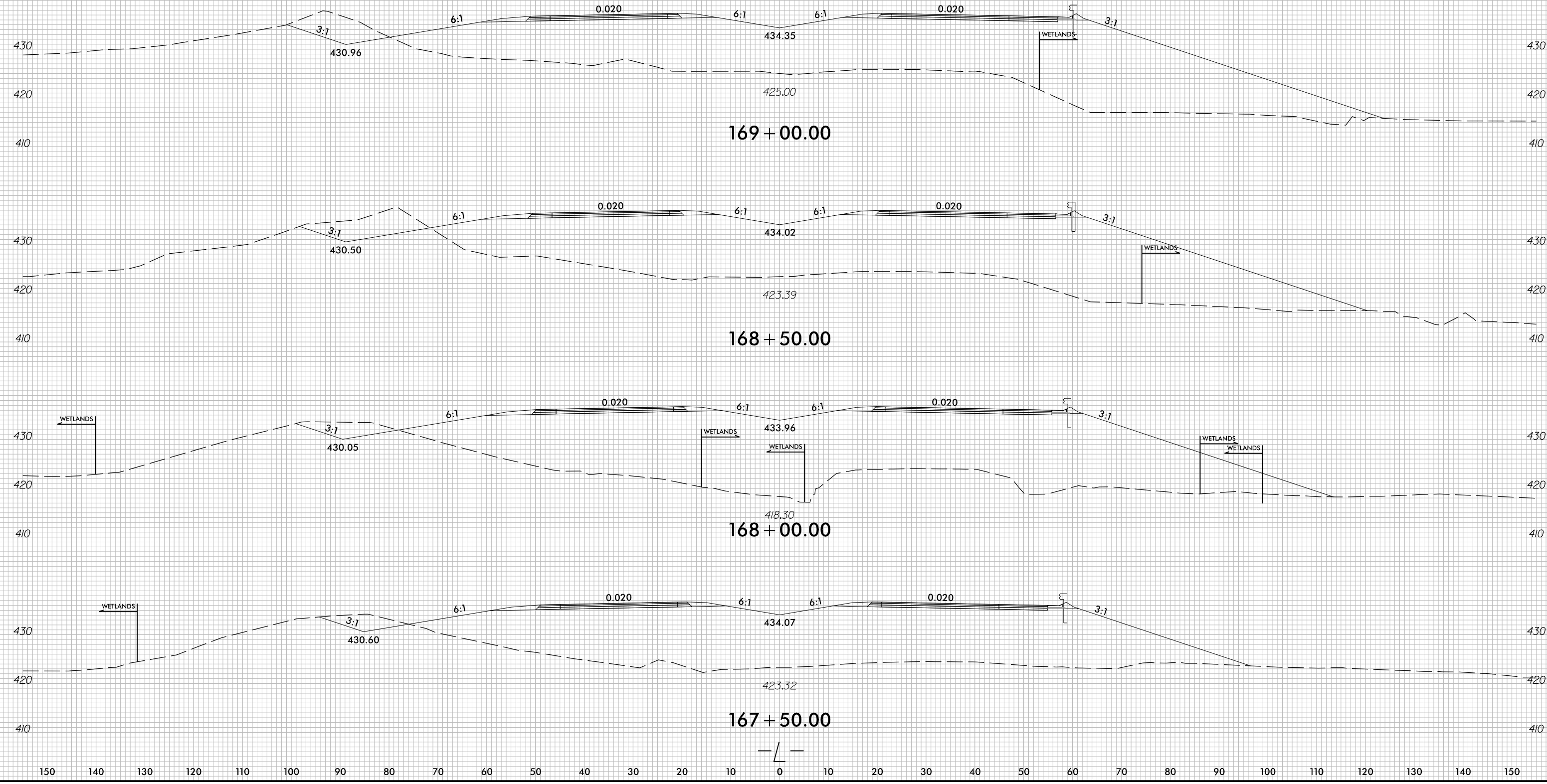
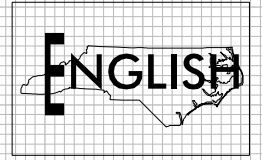
Engineers | Construction Managers | Planners | Scientists
www.rk.com
Responsive People | Creative Solutions

B:\17\99
6/18/2021
B:\Hydro\Projects\PERMITS_Environmental\Drawings\PSH\PSH5709_hyd_pah16_con.dgn

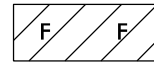
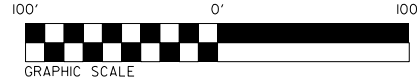
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

SITE 10

PERMIT DRAWING SHEET 26 OF 60



PERMIT DRAWING
SHEET 27 OF 60



DENOTES FILL IN
WETLAND

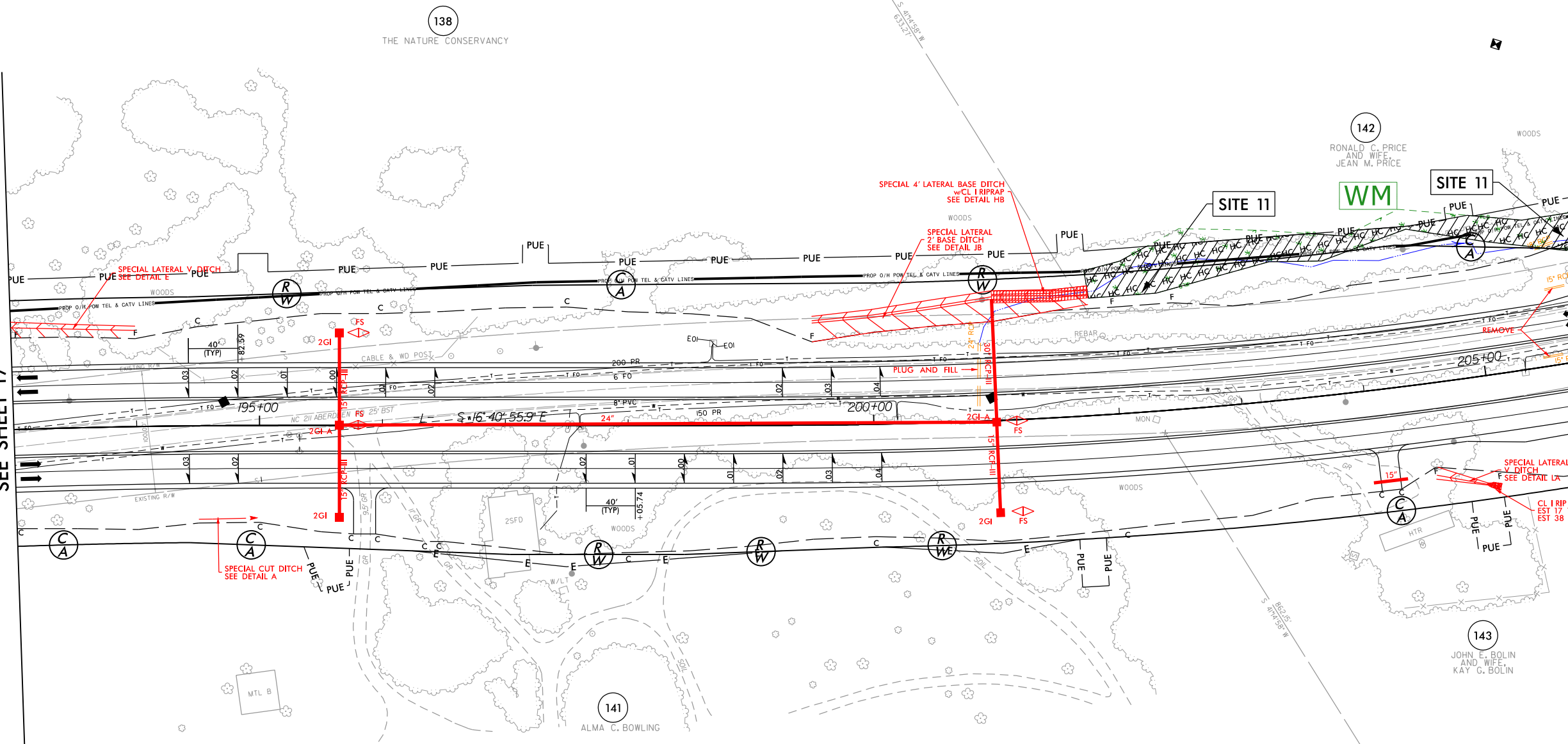


DENOTES HAND
CLEARING

PROJECT REFERENCE NO. R-5709	SHEET NO. 18
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

MATCHLINE -L- STA. 193 + 00.00
SEE SHEET 17

MATCHLINE -L- STA. 206 + 00.00
SEE SHEET 19



CURB + GUTTER LOCATION				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	205+73.14	206+00.00	RT

FOR DITCH DETAILS,
SEE SHEETS 2D-1 THRU 2D-6

FOR -L- PROFILE, SEE SHEET NOS. 80 & 81

ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH
10-FOOT RADII UNLESS OTHERWISE NOTED
MATCH EXISTING DRIVE TYPE UNLESS
OTHERWISE NOTED

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

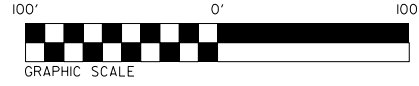
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

RK&K
P: (919) 878-9660
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rk.com
Responsive People | Creative Solutions

B:\17\99
B:\18\2021
B:\Hydro\Projects\PERMITS_Environmental\Drawings\PSH\PSH5709_hyd_psh18.dgn

PERMIT DRAWING
SHEET 28 OF 60



DENOTES FILL IN WETLAND

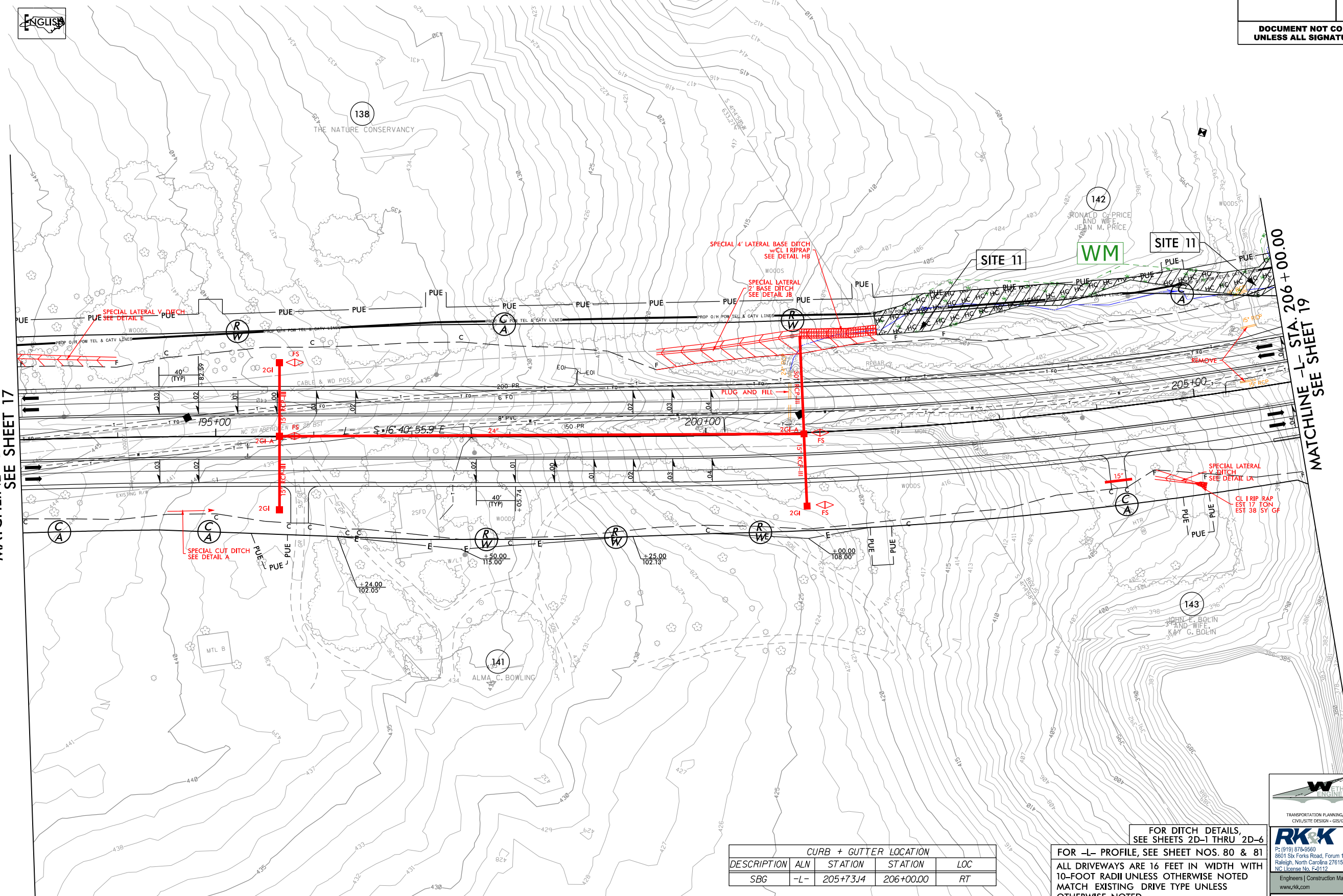


DENOTES HAND CLEARING

PROJECT REFERENCE NO. R-5709	SHEET NO. 18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

MATCHLINE -L- STA. 193 + 00.00
SEE SHEET 17

MATCHLINE -L- STA. 206 + 00.00
SEE SHEET 19



CURB + GUTTER LOCATION				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	205+73.14	206+00.00	RT

FOR DITCH DETAILS,
SEE SHEETS 2D-1 THRU 2D-6

FOR -L- PROFILE, SEE SHEET NOS. 80 & 81

ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH 10-FOOT RADII UNLESS OTHERWISE NOTED
MATCH EXISTING DRIVE TYPE UNLESS OTHERWISE NOTED

1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

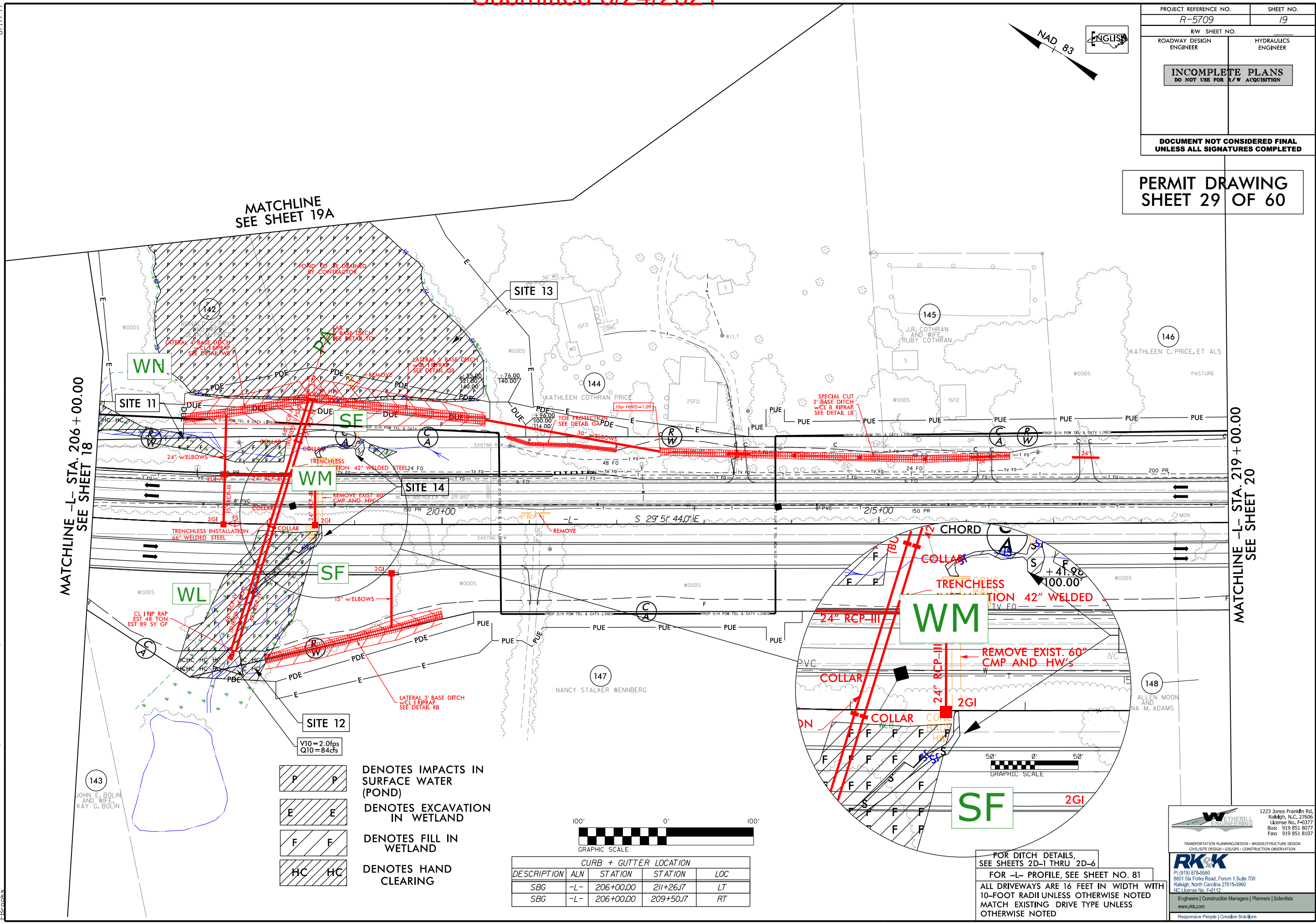
P: (919) 878-9660
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

B:\17\99
B:\18\2021
B:\18\2021\PERMITS\Environmental\Drawings\PSH\N5709_hyd_pah18_con.dgn

PROJECT REFERENCE NO. R-5709	SHEET NO. 19
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PERMIT DRAWING SHEET 29 OF 60

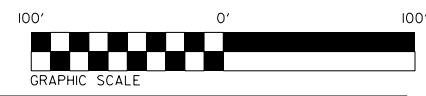


MATCHLINE -L- STA. 206 + 00.00
SEE SHEET 18

MATCHLINE -L- STA. 219 + 00.00
SEE SHEET 20

MATCHLINE
SEE SHEET 19A

- DENOTES IMPACTS IN SURFACE WATER (POND)
- DENOTES EXCAVATION IN WETLAND
- DENOTES FILL IN WETLAND
- DENOTES HAND CLEARING



CURB + GUTTER LOCATION				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	206+00.00	211+26.17	LT
SBG	-L-	206+00.00	209+50.17	RT

FOR DITCH DETAILS, SEE SHEETS 2D-1 THRU 2D-6
FOR -L- PROFILE, SEE SHEET NO. 81
ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH 10-FOOT RADII UNLESS OTHERWISE NOTED
MATCH EXISTING DRIVE TYPE UNLESS OTHERWISE NOTED

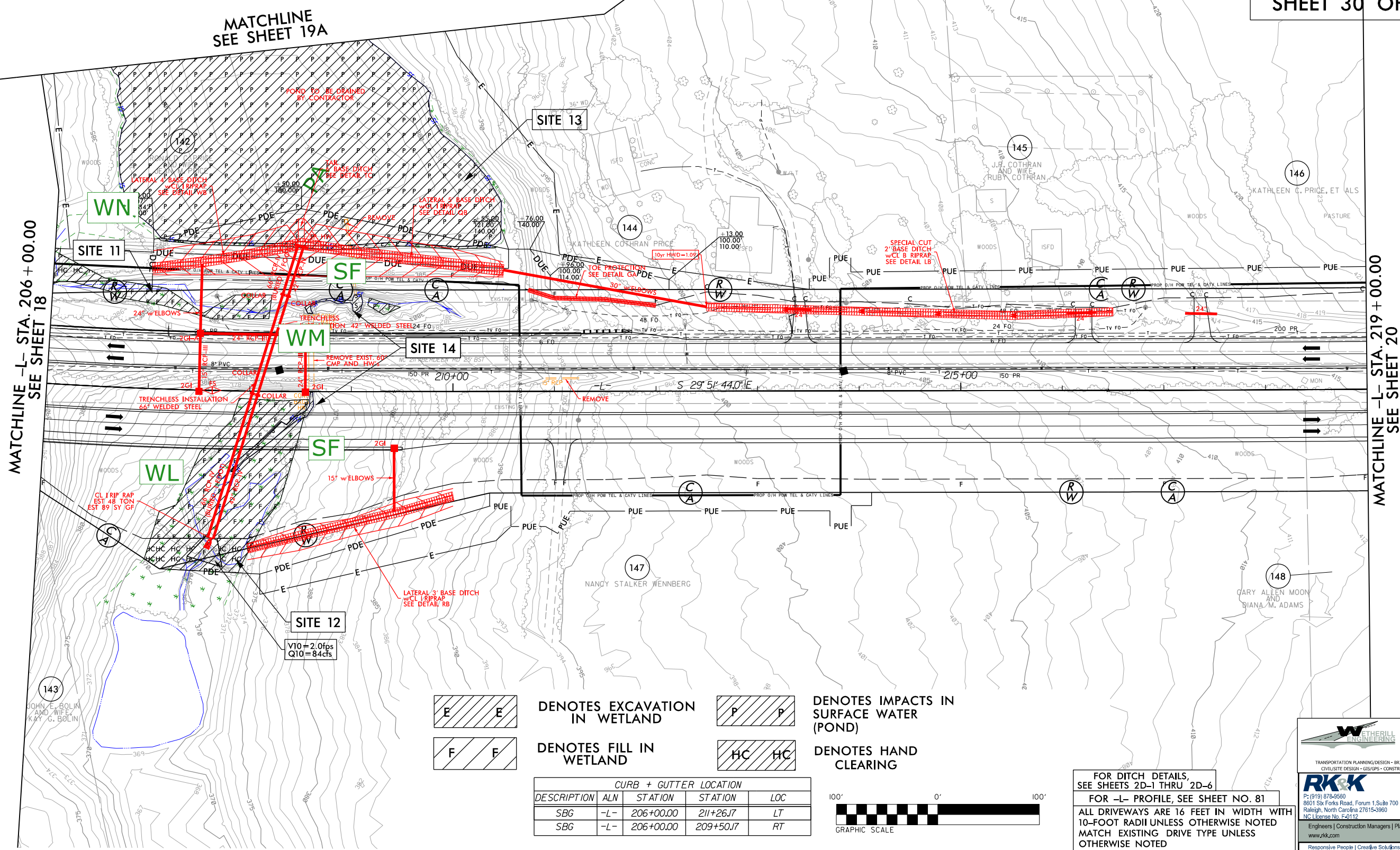
WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

RK&K
P: (919) 878-8660
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rk.com
Responsive People | Creative Solutions

B:\17\99
B:\18\2021
B:\Hydro\Utilities\PERMITS_Environmental\Drawings\PSH\PSH5709_hyd_pah19.dgn

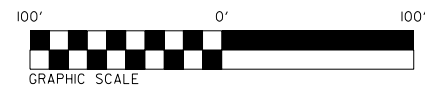
PROJECT REFERENCE NO. R-5709	SHEET NO. 19
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PERMIT DRAWING
SHEET 30 OF 60



- DENOTES EXCAVATION IN WETLAND
- DENOTES FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER (POND)
- DENOTES HAND CLEARING

	CURB + GUTTER LOCATION			
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-L-	206+00.00	211+26.17	LT
SBG	-L-	206+00.00	209+50.17	RT



FOR DITCH DETAILS, SEE SHEETS 2D-1 THRU 2D-6
FOR -L- PROFILE, SEE SHEET NO. 81
ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH 10-FOOT RADII UNLESS OTHERWISE NOTED
MATCH EXISTING DRIVE TYPE UNLESS OTHERWISE NOTED

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus. 919 851 8077
Fax: 919 851 8107

RK&K
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION
P: (919) 878-8660
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rk.com
Responsive People | Creative Solutions

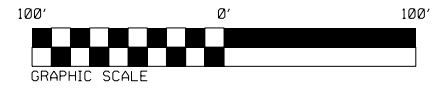
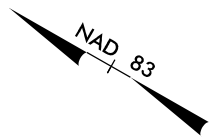
B:\17\99
B:\17\99\Drawings\Permits\Environmental\Drawings\PSH\PSH5709_hyd_pah19_con.dgn

B.17/99



DENOTES IMPACTS IN SURFACE WATER (POND)

PERMIT DRAWING SHEET 31 OF 60



PROJECT REFERENCE NO. R-5709	SHEET NO. 19A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

N 32°23'36" W
489.81'

N 32°23'36" W
976.83'

142
RONALD C. PRICE
AND WIFE
JEAN M. PRICE
DB 410 PG 776

144
KATHLEEN COTHRAN PRICE
DB 200 PG 65

MATCHLINE
SEE SHEET 18

MATCHLINE
SEE SHEET 19

MATCHLINE
SEE SHEET 18

MATCHLINE
SEE SHEET 19

PODS TO BE OBTAINED BY CONTRACTOR

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

RK&K
P: (919) 876-8660
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rk.com
Responsive People | Creative Solutions

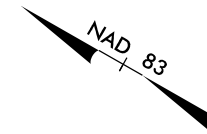
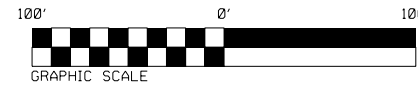
B:\18\2021\Hydro\Public\PERMITS_Environmental\Drawings\PSH\PSH5709_hyd_psh19A.dgn

B.17/99

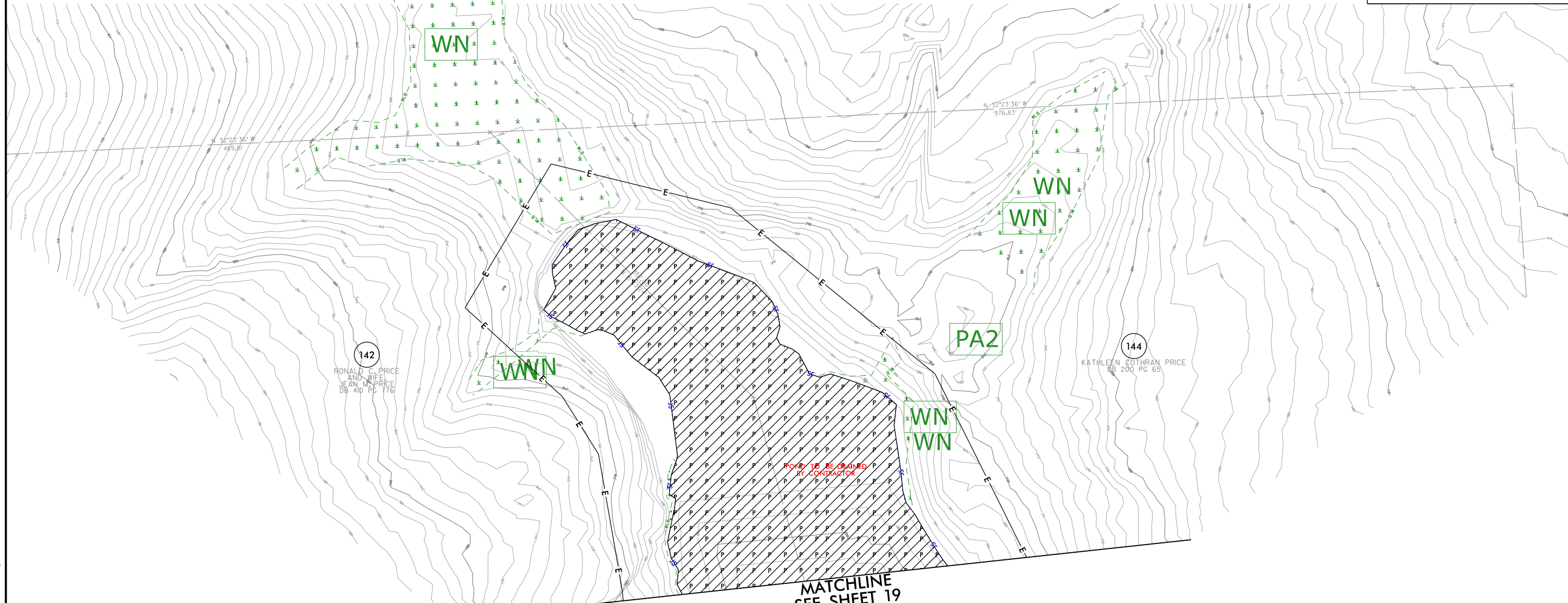


DENOTES IMPACTS IN SURFACE WATER (POND)

PERMIT DRAWING SHEET 32 OF 60



PROJECT REFERENCE NO. R-5709	SHEET NO. 19A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



142
RONALD C. PRICE AND WIFE
JEAN M. PRICE
DB 410 PG 176

144
KATHLEEN GOTHAN PRICE
DB 200 PG 65

MATCHLINE
SEE SHEET 18

MATCHLINE
SEE SHEET 19

MATCHLINE
SEE SHEET 18

MATCHLINE
SEE SHEET 19

B:\18\2021\Permits\Drawings\Environmental\Drawings\PSH\R5709_hyd_pah19A_con.dgn

WETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

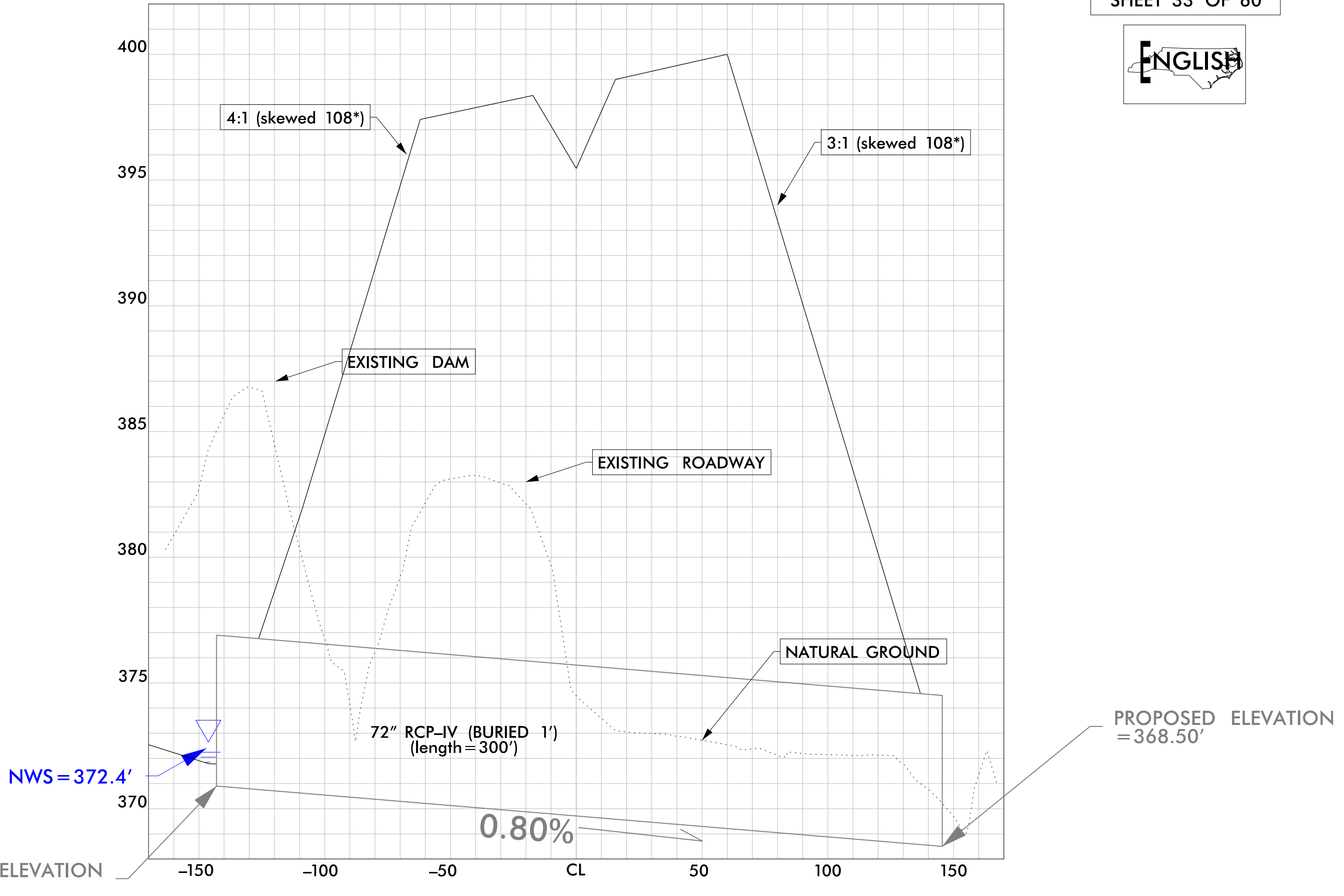
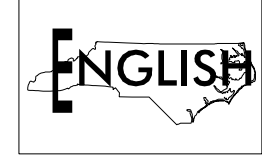
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

RK&K
P: (919) 876-8660
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rk.com
Responsive People | Creative Solutions

SITE 14
-L- STA. 208+07

PERMIT DRAWING
SHEET 33 OF 60



6/18/2021 8:41:43 AM C:\Users\jacob\Documents\Drawings\5709_hyd_prm_wet.dgn USER: jacob



PROJ. REFERENCE NO.
R-5709

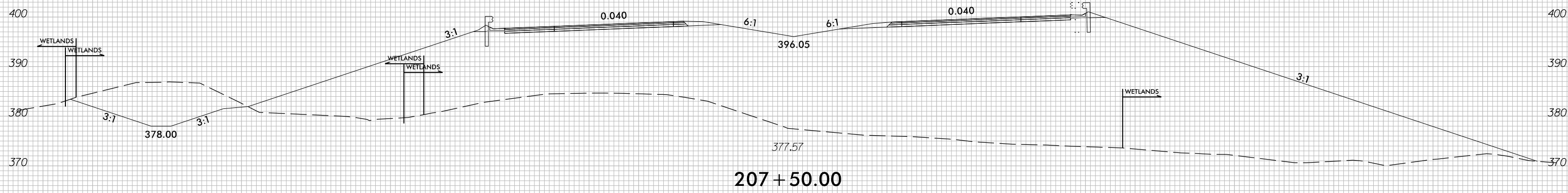
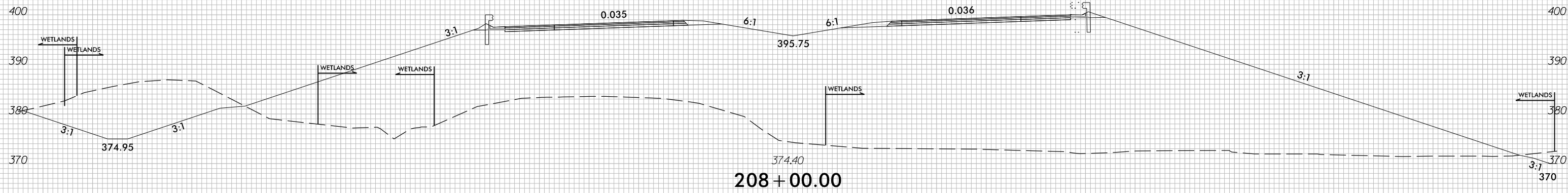
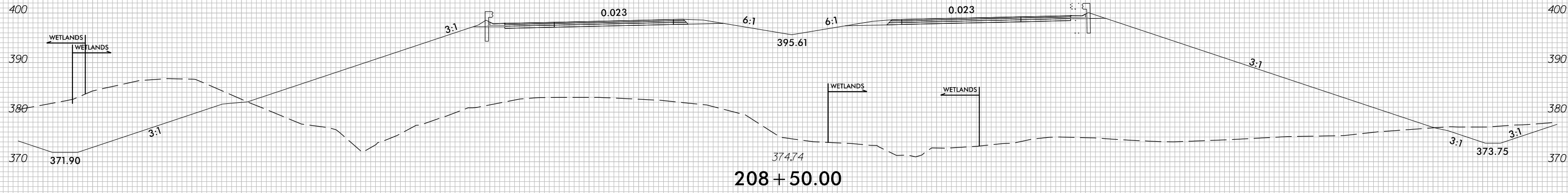
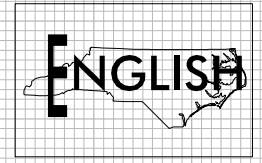
SHEET NO.
S1 X-95

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

SITES 11, 13

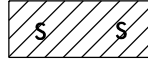


SITES 12

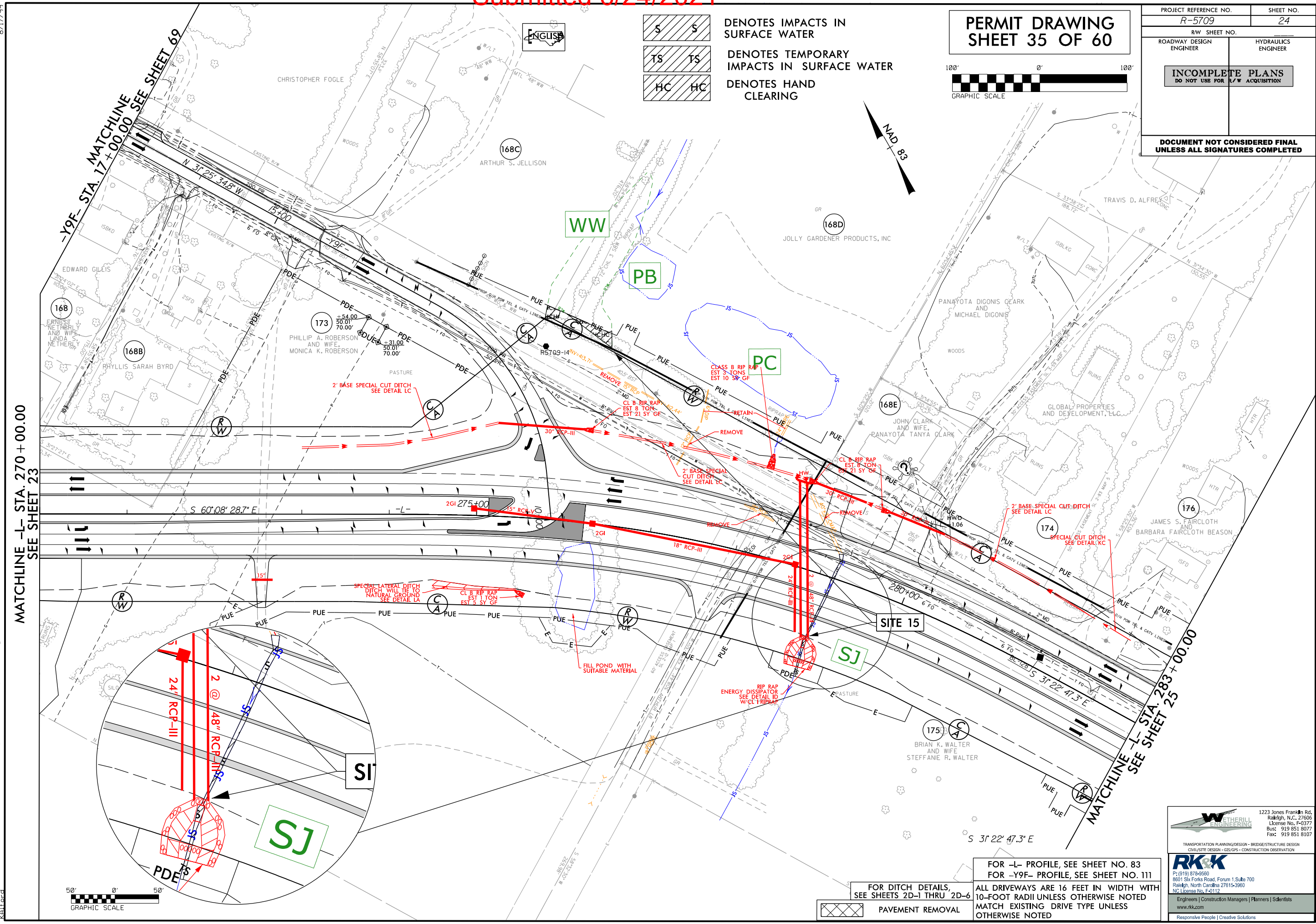
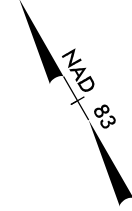
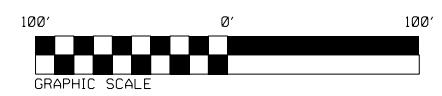
PERMIT DRAWING
SHEET 34 OF 60



PERMIT DRAWING SHEET 35 OF 60

PROJECT REFERENCE NO. R-5709	SHEET NO. 24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER
-  DENOTES HAND CLEARING



MATCHLINE -L- STA. 270 + 00.00
SEE SHEET 23

MATCHLINE -L- STA. 283 + 00.00
SEE SHEET 25



 PAVEMENT REMOVAL

FOR -L- PROFILE, SEE SHEET NO. 83
FOR -Y9F- PROFILE, SEE SHEET NO. 111
ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH 10-FOOT RADII UNLESS OTHERWISE NOTED
MATCH EXISTING DRIVE TYPE UNLESS OTHERWISE NOTED



1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GIS - CONSTRUCTION OBSERVATION



P: (919) 878-4560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

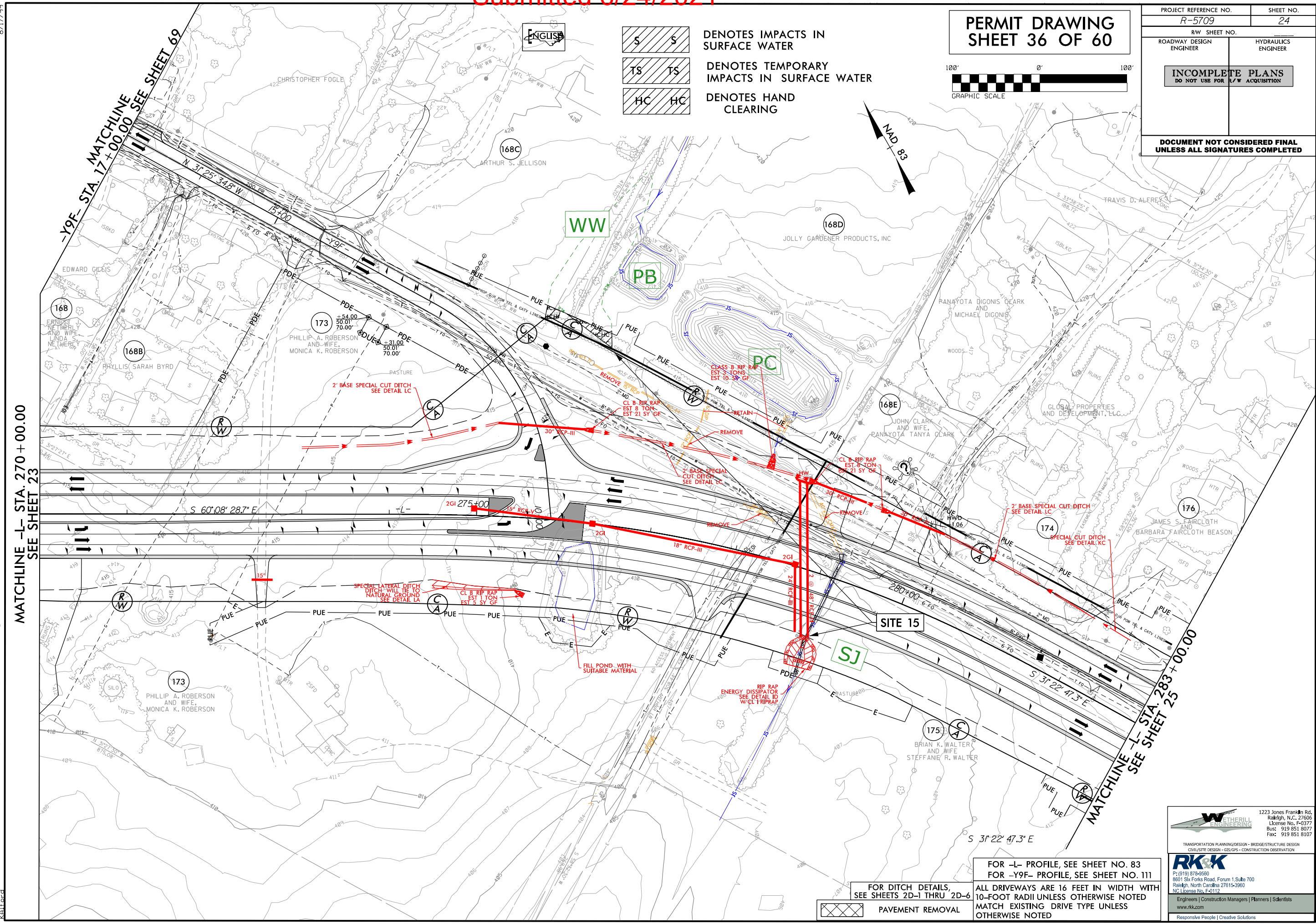
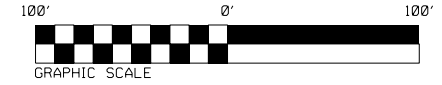
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99
6/18/2021
R:\Hydraulics\PERMITS_Environmental\Drawings\PSH\5709_hyd_psh24.dgn

PERMIT DRAWING SHEET 36 OF 60

PROJECT REFERENCE NO. R-5709	SHEET NO. 24
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES HAND CLEARING



MATCHLINE -L- STA. 270 + 00.00
SEE SHEET 23

MATCHLINE -L- STA. 283 + 00.00
SEE SHEET 25

PAVEMENT REMOVAL

FOR DITCH DETAILS,
SEE SHEETS 2D-1 THRU 2D-6

FOR -L- PROFILE, SEE SHEET NO. 83
FOR -Y9F- PROFILE, SEE SHEET NO. 111
ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH
10-FOOT RADII UNLESS OTHERWISE NOTED
MATCH EXISTING DRIVE TYPE UNLESS
OTHERWISE NOTED

1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

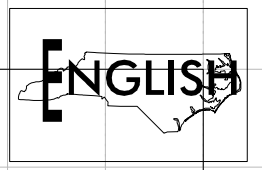
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

8/17/99
B:\Hydraulics\PERMITS\Environmental\Drawings\PSHV5709_hyd_psh24.com.dgn

PERMIT DRAWING
SHEET 37 OF 60

SITE 15
-L- STA. 278 + 80



420

4:1 (skewed 72.5*)

EXISTING ROADWAY

415

NATURAL GROUND

2@48" RCP-III
length = 174'

410

NWS = 410.2'

0.98%

PROPOSED ELEVATION
= 409.40'

PROPOSED ELEVATION
= 407.70'

405

-100

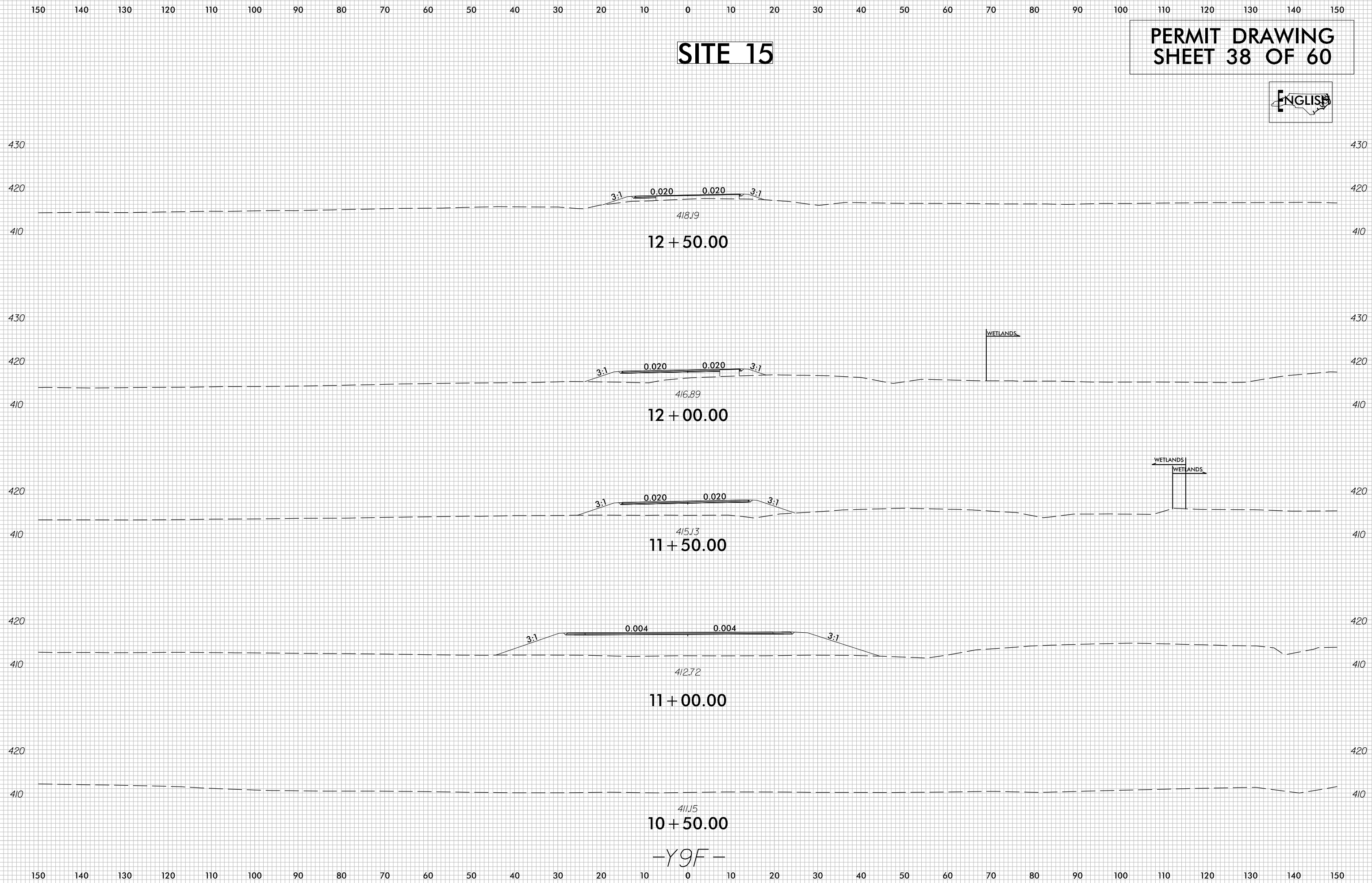
CL

100

6/18/2021 8:41:43 AM C:\Users\PERMITS\Environmental\Drawings\R5709_hyd_prm_wet.dgn USER: PERMITS

SITE 15

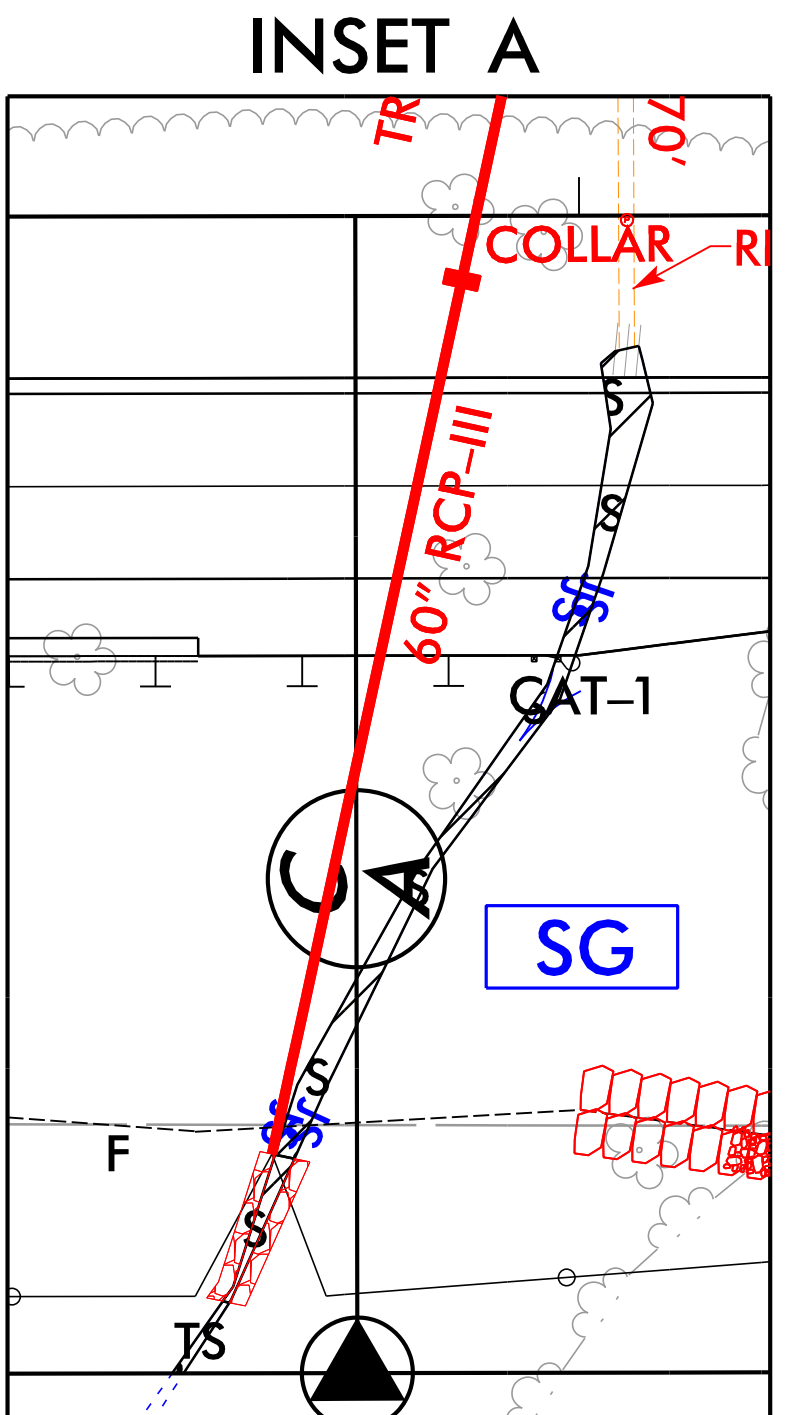
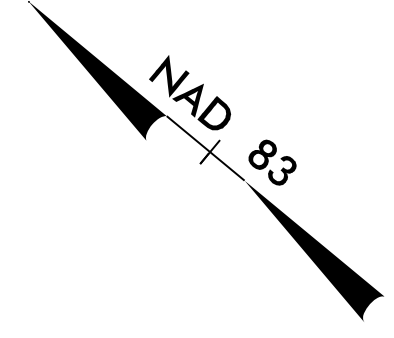
PERMIT DRAWING SHEET 38 OF 60



-Y9F-

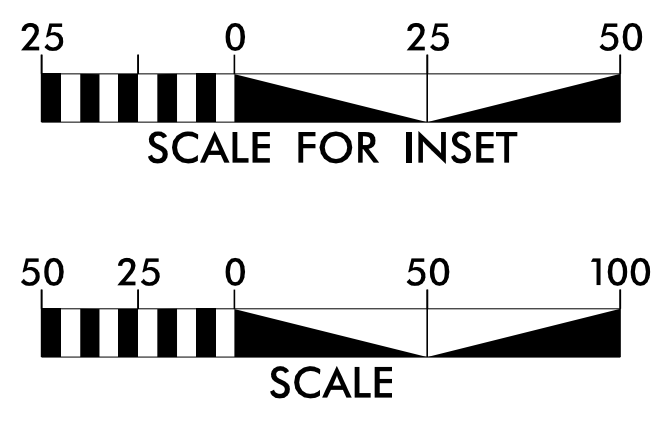
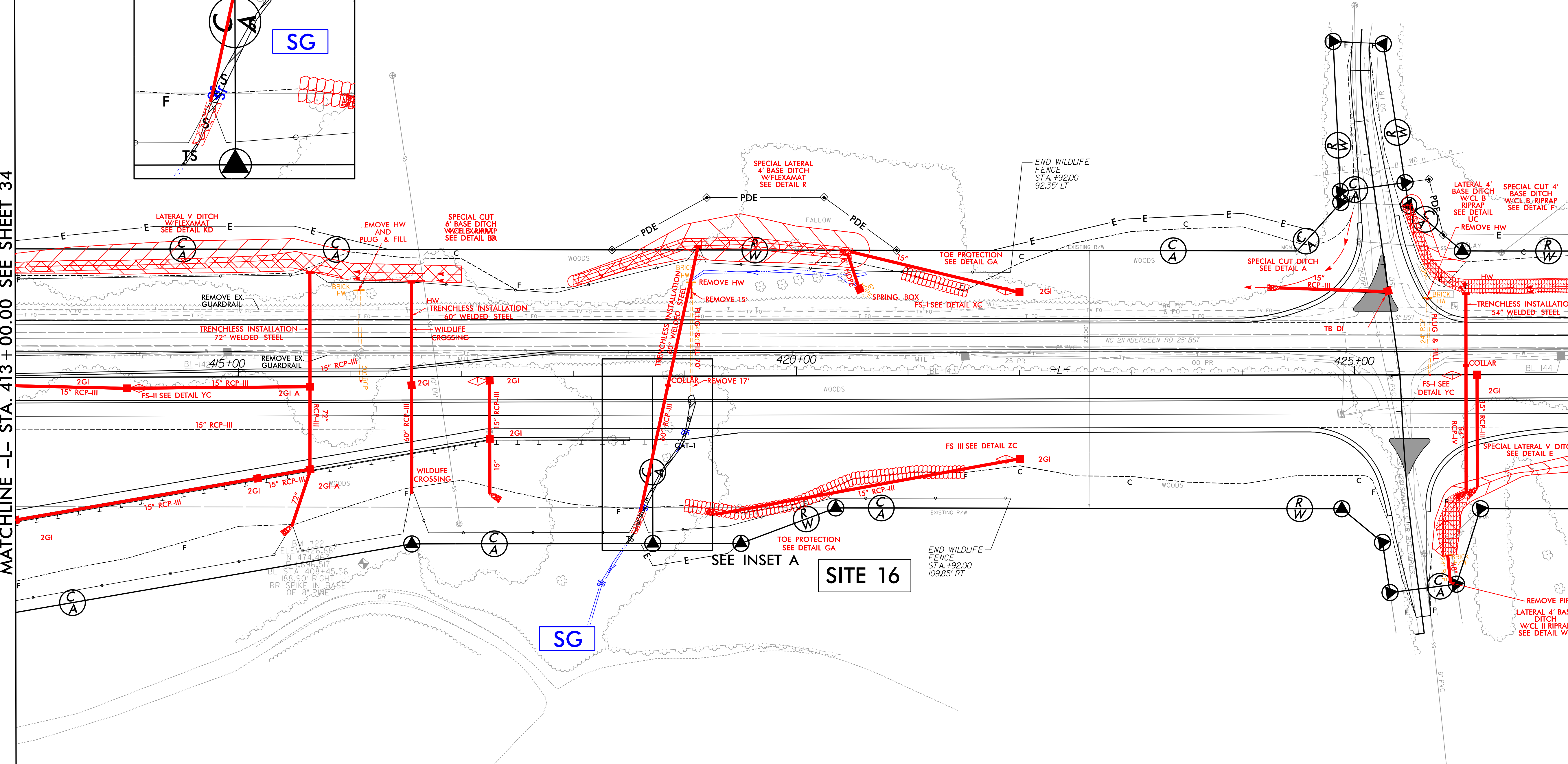
6/18/2021
R:\Hydro\Projects\Environmental\Drawings\PSH\1R-5709_Rdy_XPL_Y9F.dgn
USER: EB-cooks

PROJECT REFERENCE NO. R-5709	SHEET NO. 35
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



MATCHLINE -L- STA. 413 + 00.00 SEE SHEET 34

MATCHLINE -L- STA. 427 + 00.00 SEE SHEET 36



PERMIT DRAWING
SHEET 39 OF 60

ENGLISH

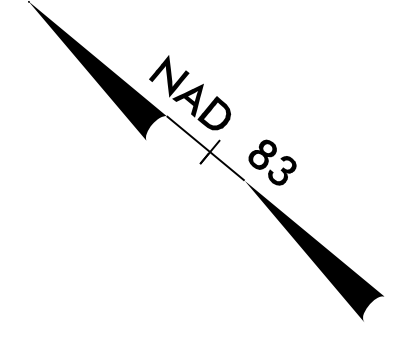
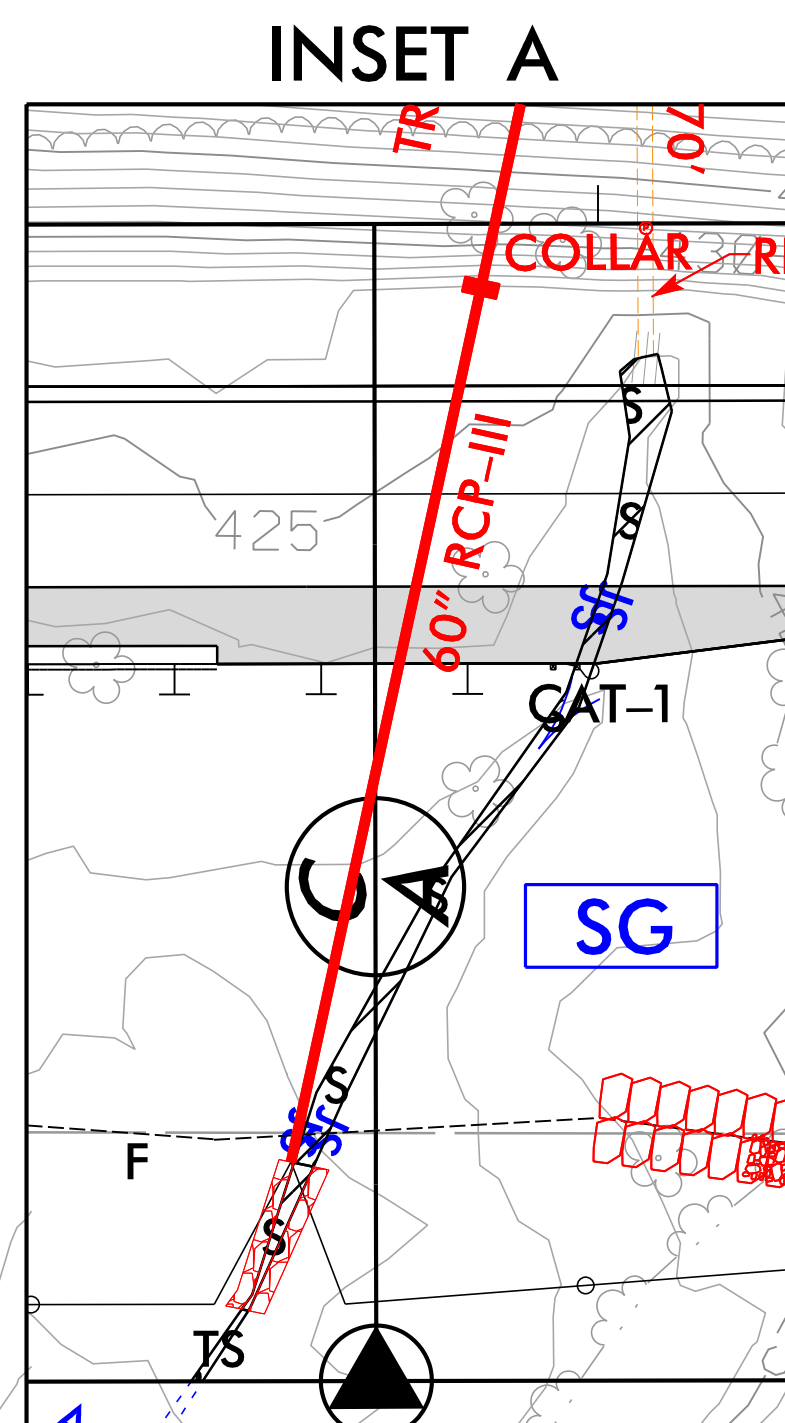
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

RK&K
 P: (919) 978-9560
 8601 Six Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
 www.rkk.com
 Responsive People | Creative Solutions

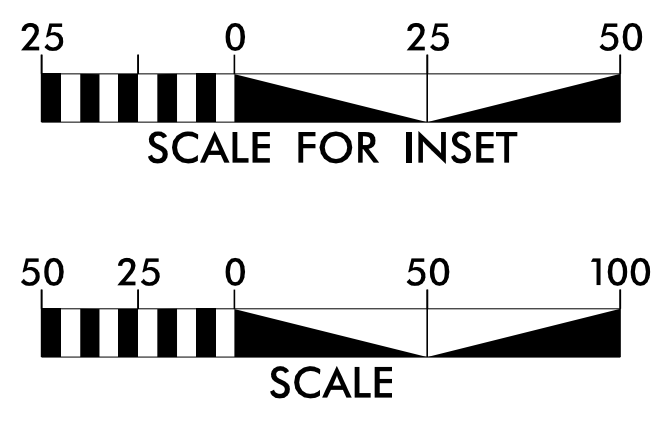
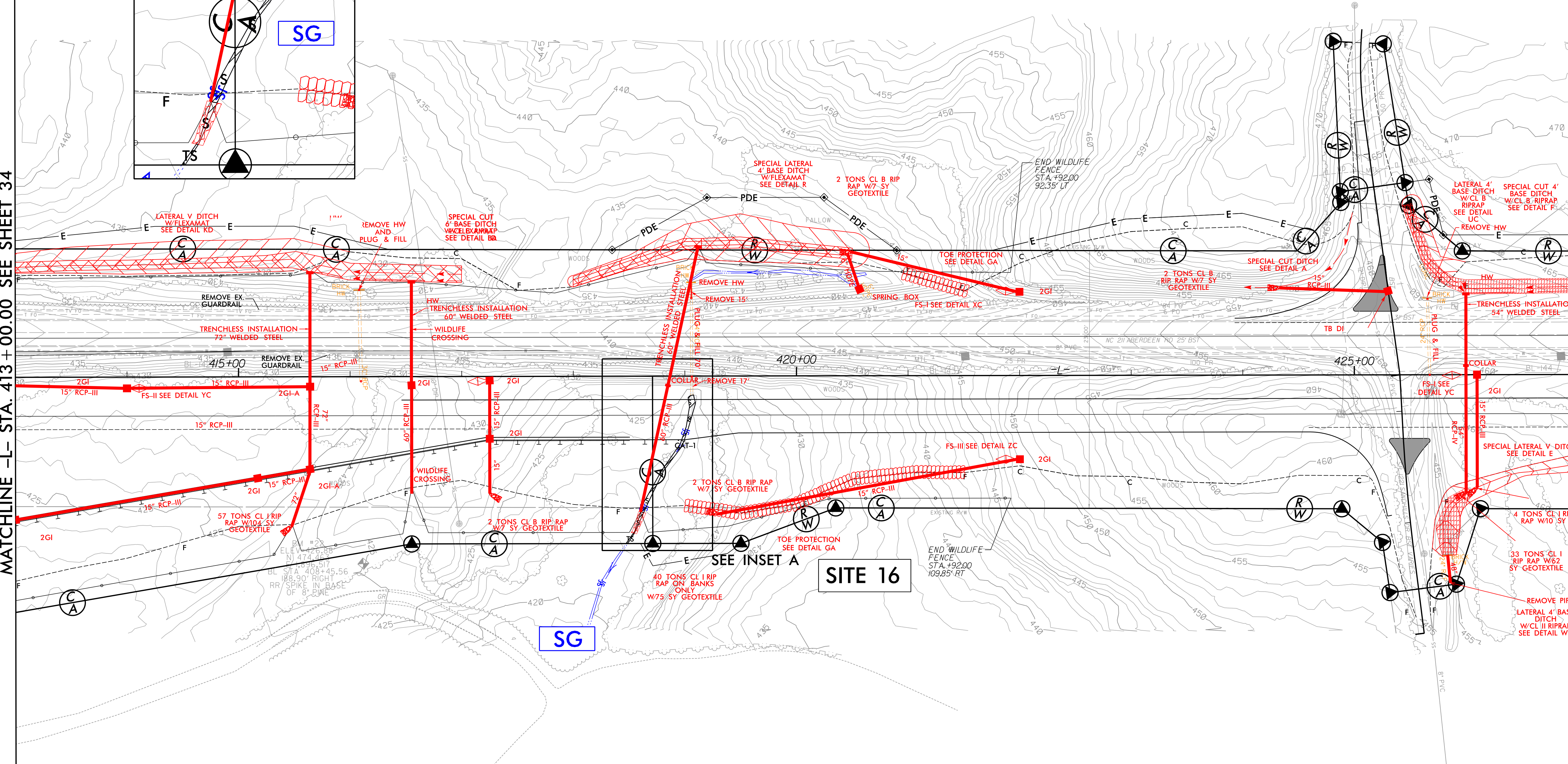
8/17/199
 R:\Projects\2021\Hydraulics\PERMITS_Environmental\Drawings\4C\Section 2\R5709_Hyd_4C_wet_psh35.dgn

PROJECT REFERENCE NO. R-5709	SHEET NO. 35
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



MATCHLINE -L- STA. 413 + 00.00 SEE SHEET 34

MATCHLINE -L- STA. 427 + 00.00 SEE SHEET 36



PERMIT DRAWING
SHEET 40 OF 60

ENGLISH

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

RK&K
 P: (919) 978-9560
 8601 Six Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
 www.rkk.com
 Responsive People | Creative Solutions

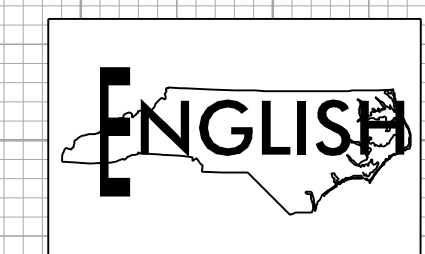
8/17/199
 R:\18\2021\Hydraulics\PERMITS_Environmental\Drawings\4C\Section 2\185709_Hyd_4C_wet_psh35_con.dgn

PROJECT REFERENCE NO. <i>R-5709</i>	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

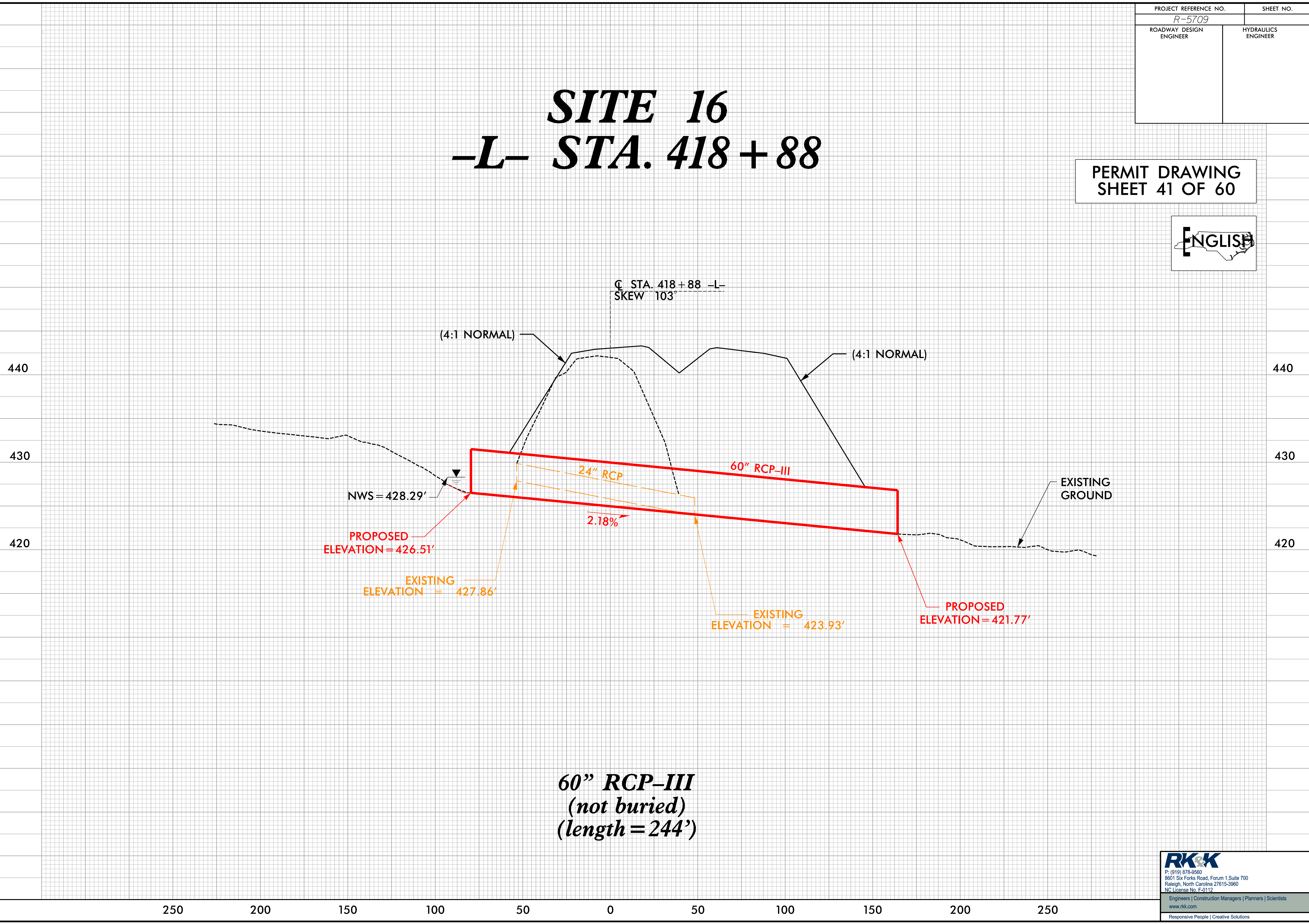
SITE 16

-L- STA. 418 + 88

PERMIT DRAWING
SHEET 41 OF 60



5/14/99
6/18/2021
B:\Projects\PERMITS_Environmental\Drawings\4C\Section 2\R-5709-Hyd-PFL-SITE16.dgn



60" RCP-III
(not buried)
(length = 244')

RK&K
P: (919) 878-8560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

PROJECT REFERENCE NO. R-5709	SHEET NO. 45
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

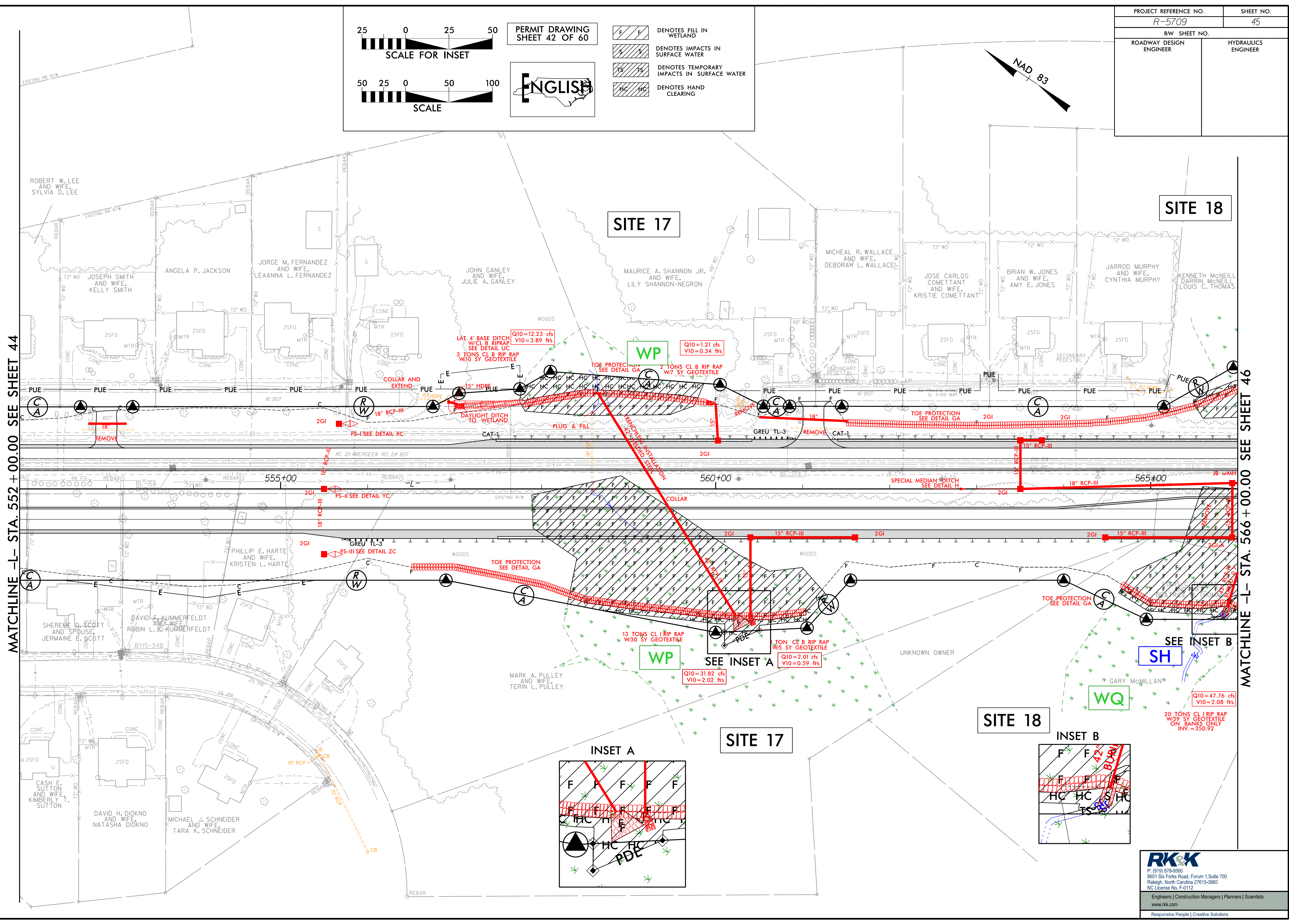
25 0 25 50
SCALE FOR INSET

50 25 0 50 100
SCALE

PERMIT DRAWING SHEET 42 OF 60

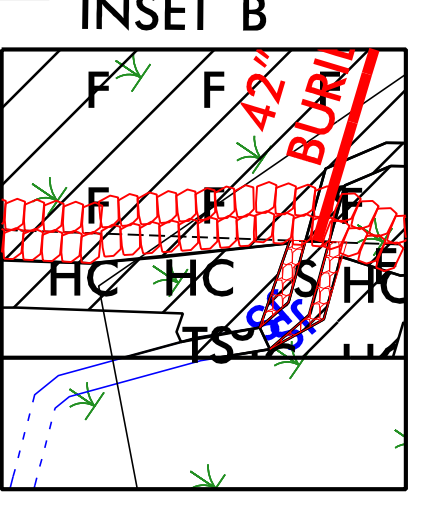
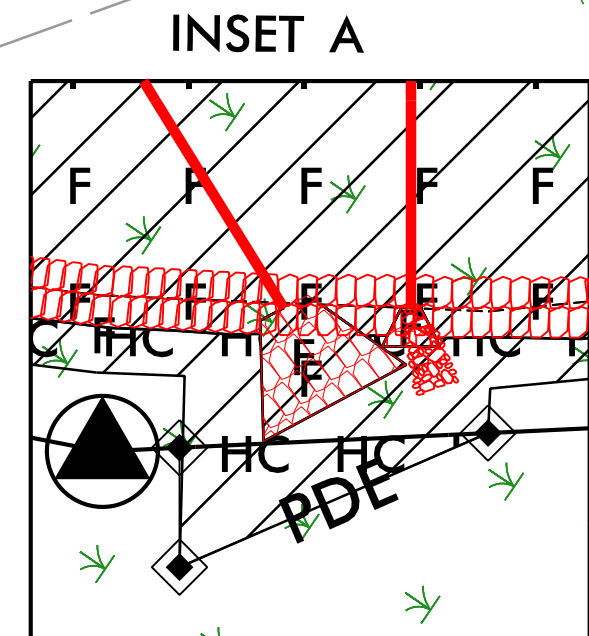
ENGLISH

- Denotes Fill in Wetland
- Denotes Impacts in Surface Water
- Denotes Temporary Impacts in Surface Water
- Denotes Hand Clearing



MATCHLINE -L- STA. 552 + 00.00 SEE SHEET 44

MATCHLINE -L- STA. 566 + 00.00 SEE SHEET 46



RK&K

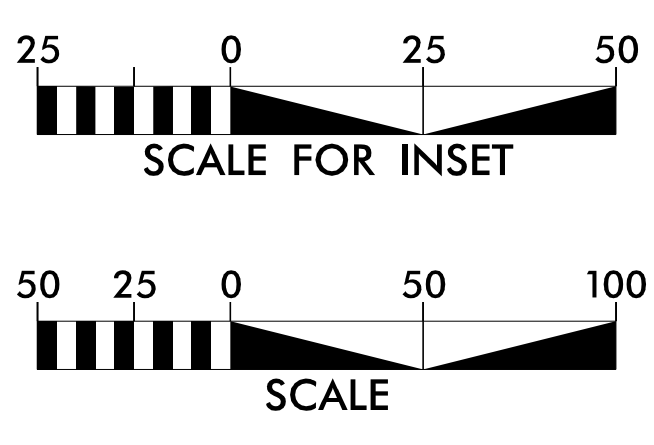
P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3660
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

8/17/199
S:\Projects\Hydraulics\PERMITS\Environmental\Drawings\4C\Section 2\RP5709_Hyd_4C_wet.psn\45.dgn

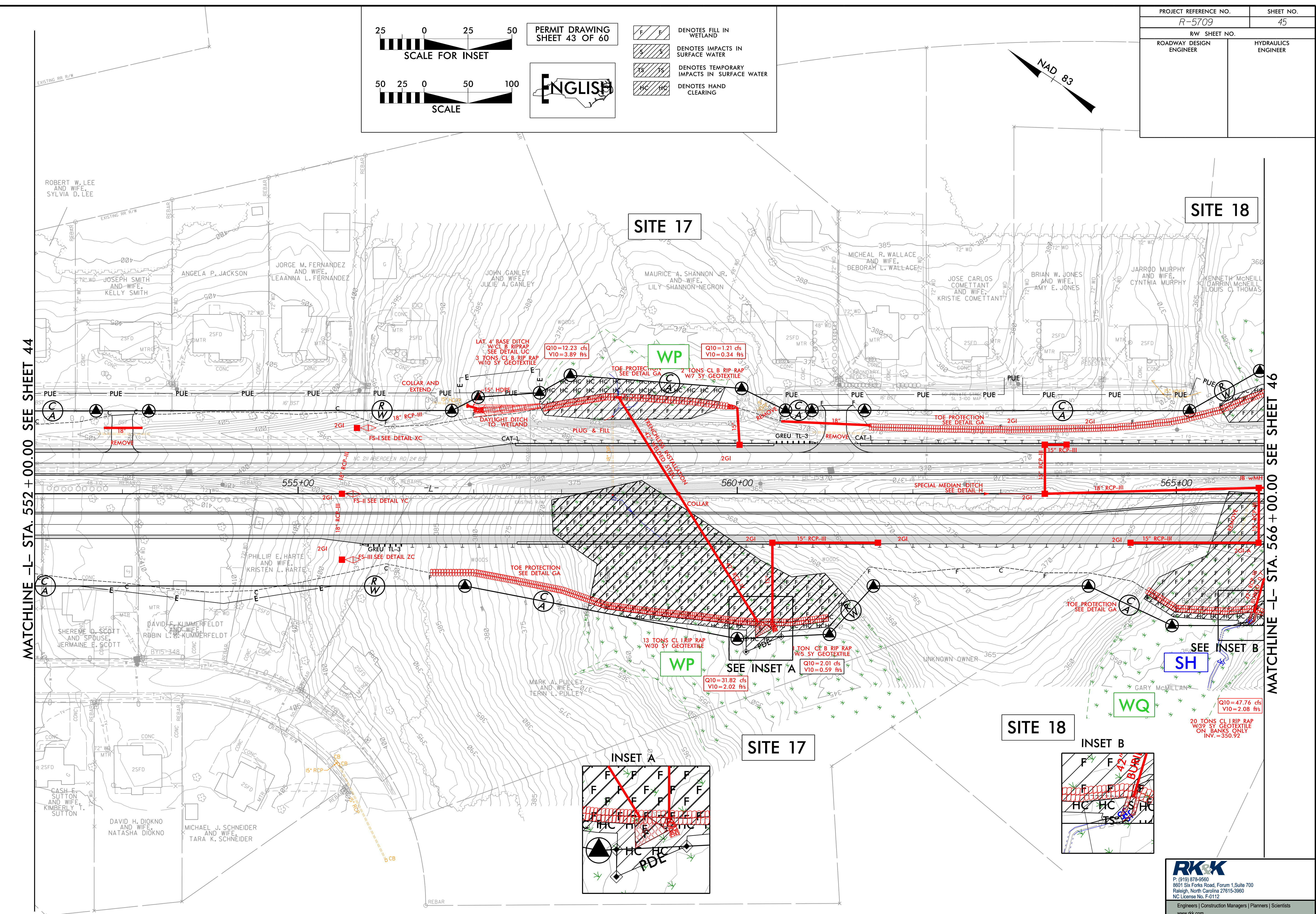
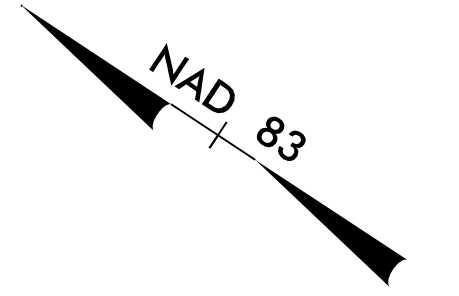
PROJECT REFERENCE NO. R-5709	SHEET NO. 45
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	



PERMIT DRAWING SHEET 43 OF 60

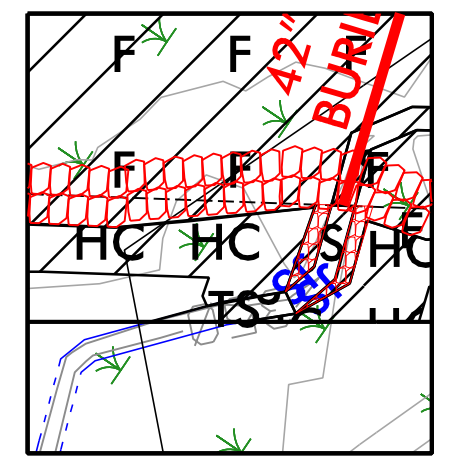
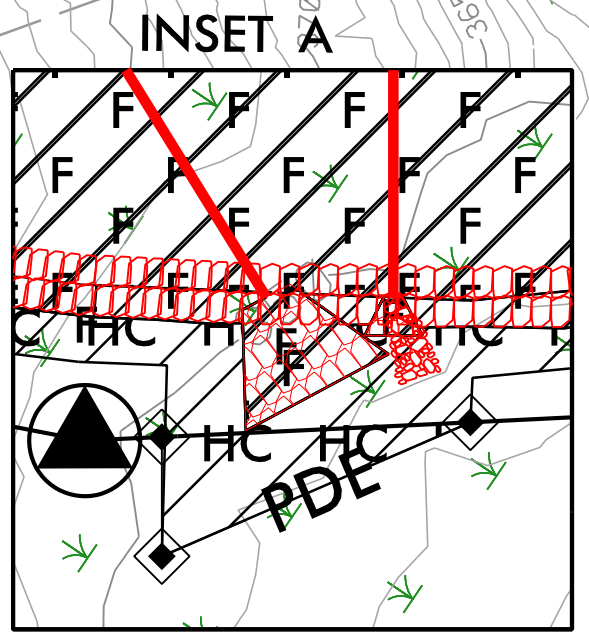


- DENOTES FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES HAND CLEARING



MATCHLINE -L- STA. 552 + 00.00 SEE SHEET 44

MATCHLINE -L- STA. 566 + 00.00 SEE SHEET 46

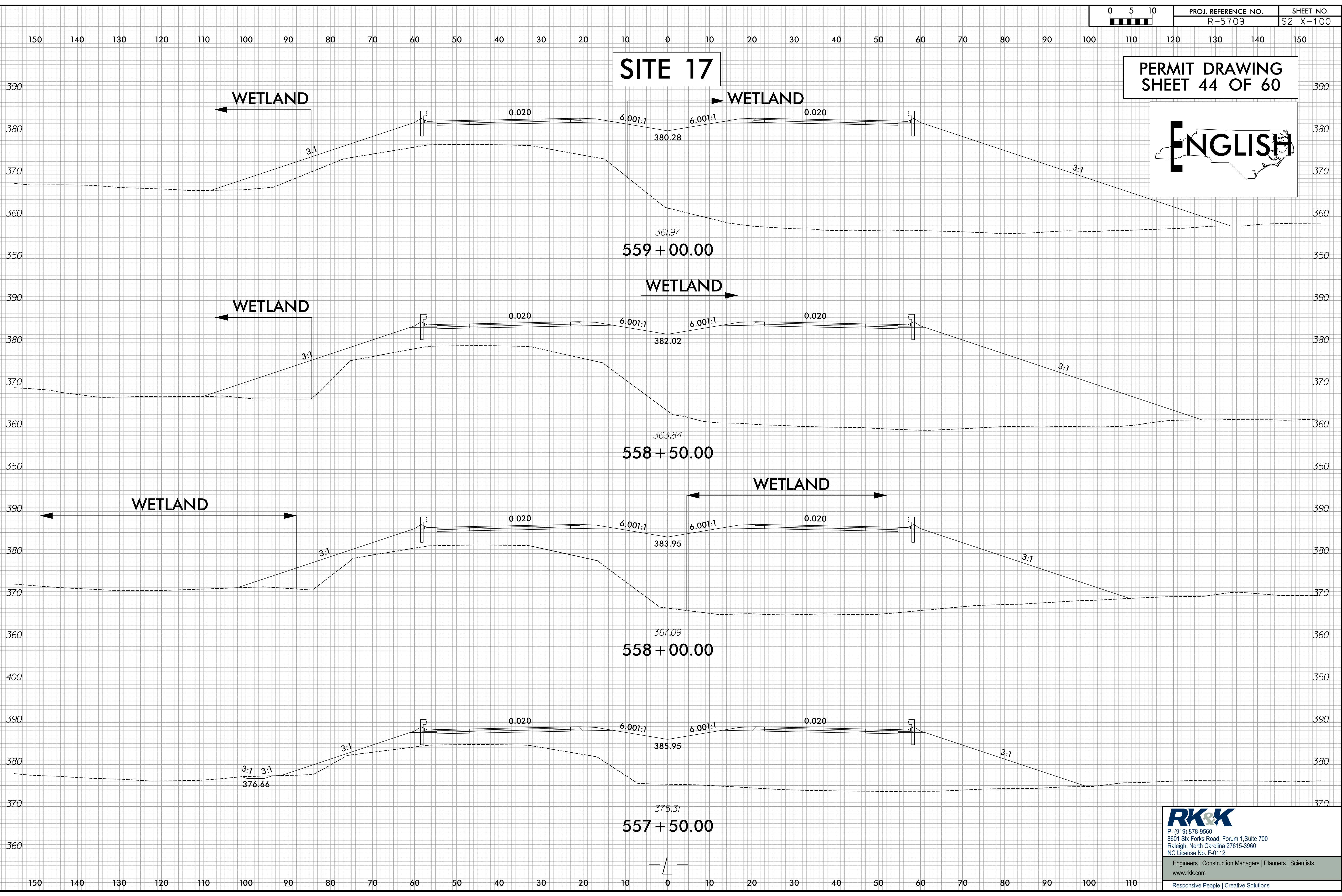
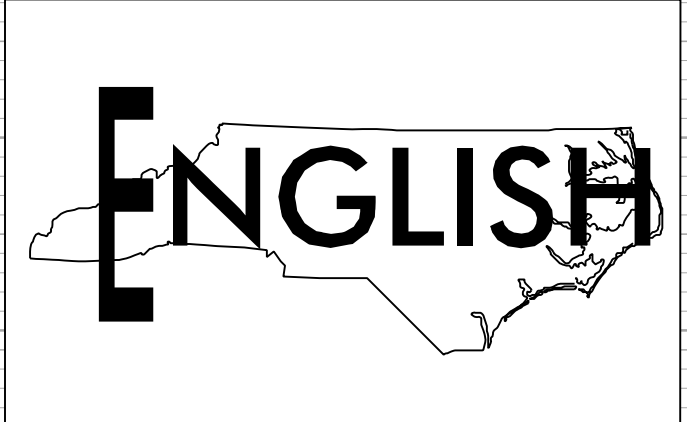


RK&K
 P. (919) 878-8680
 8601 Six Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3660
 NC License No. F-0112
 Engineers | Construction Managers | Planners | Scientists
 www.rkk.com
 Responsive People | Creative Solutions

8/17/199
C:\Users\Hydraulics\PERMITS_Environmental\Drawings\4C\Section 2\R5709_Hyd_4C_wet_psn45_con.dgn

SITE 17

PERMIT DRAWING SHEET 44 OF 60

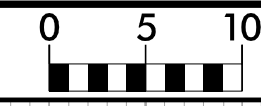


6/23/16
6/18/2021
P:\Hydro\Projects\PERMITS_Environmental\Drawings\4C\Section 2\AR-5709_Rdy_XPL_L2_SIT17.dgn

RK&K
 P: (919) 878-9660
 8601 Six Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. F-0112
 Engineers | Construction Managers | Planners | Scientists
 www.rkk.com
 Responsive People | Creative Solutions

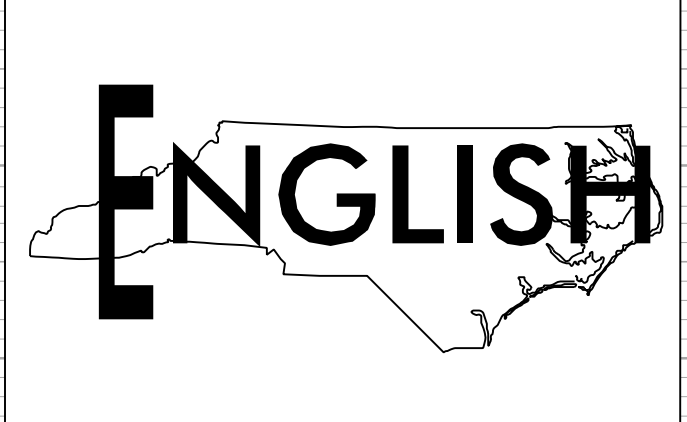
SITE 18

WETLAND



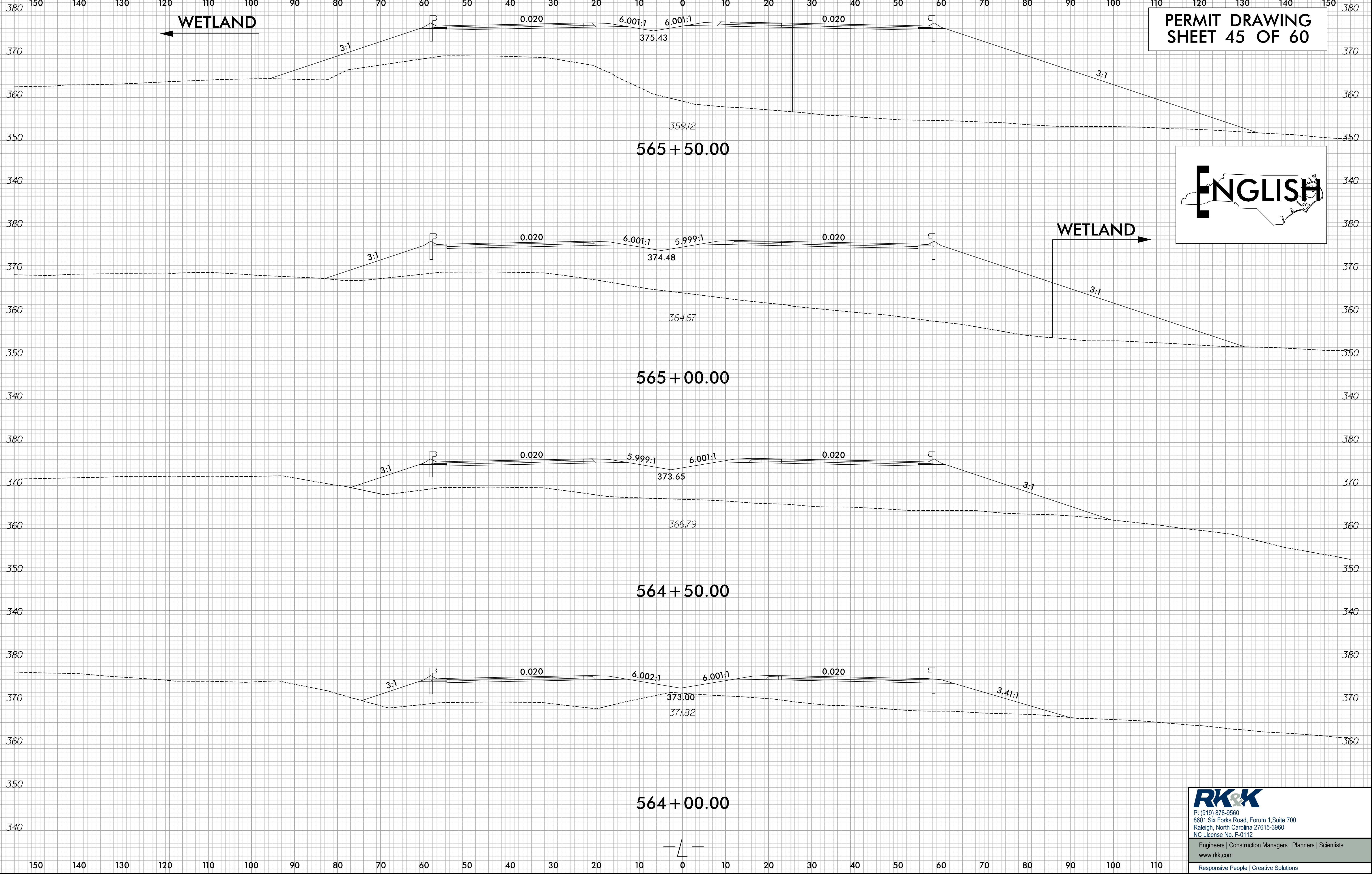
PROJ. REFERENCE NO.	SHEET NO.
R-5709	S2 X-104

PERMIT DRAWING SHEET 45 OF 60



6/23/16

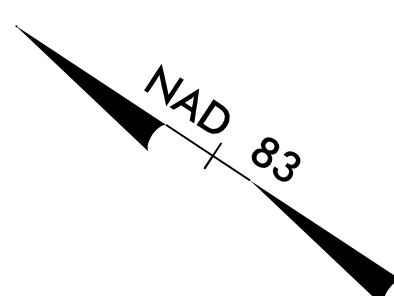
6/18/2021
R:\Hydro\Projects\PERMITS_Environmental\Drawings\4\Section 2\AR-5709_Rdu_XPL_L2-SITE18.dgn



RK&K
 P: (919) 878-9560
 8601 Six Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
 www.rkk.com
 Responsive People | Creative Solutions

PROJECT REFERENCE NO. R-5709	SHEET NO. 46
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



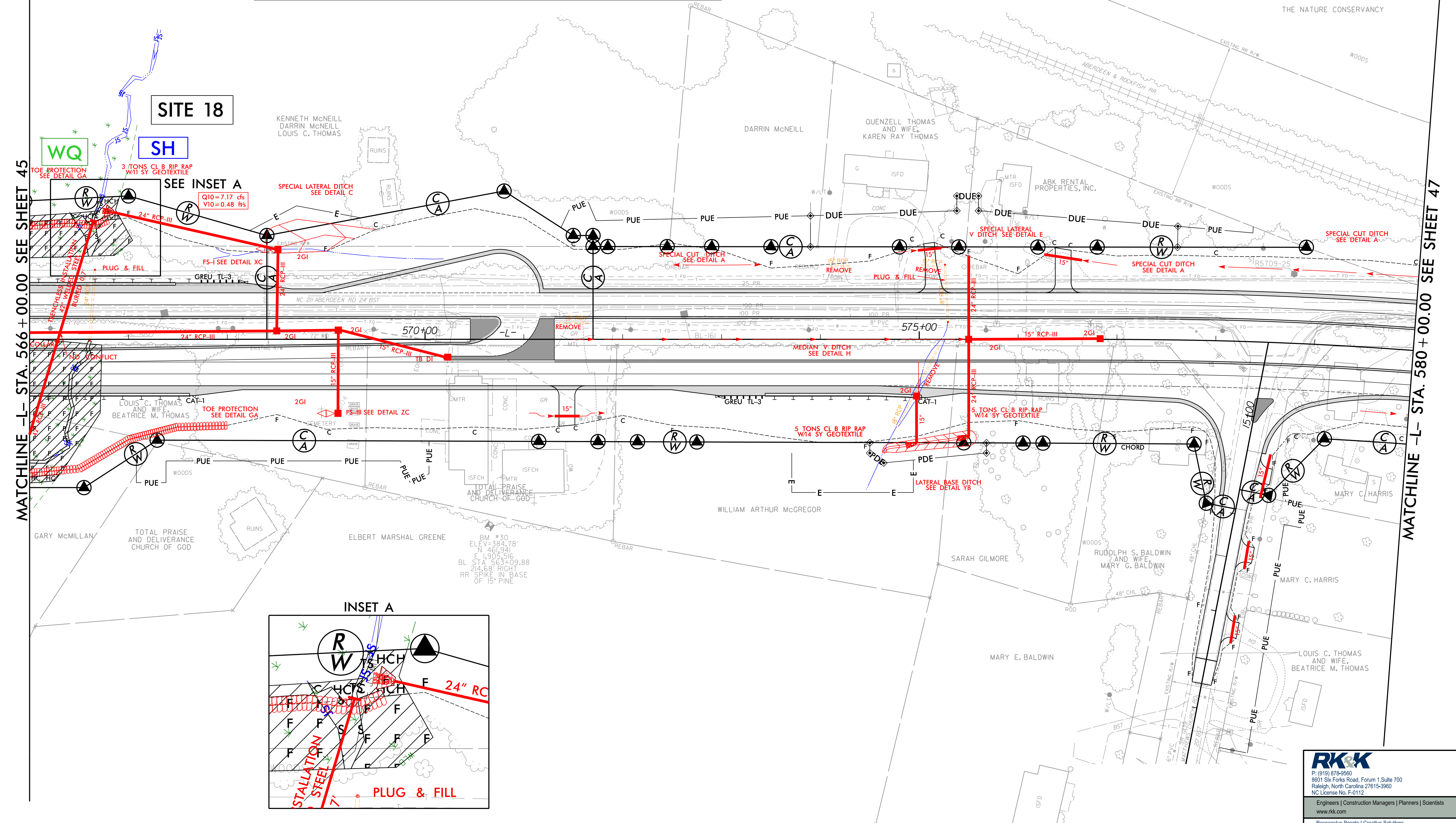
PERMIT DRAWING SHEET 46 OF 60

SCALE FOR INSET: 25 0 25 50

SCALE: 50 25 0 50 100

ENGLISH

- Denotes FILL IN WETLAND
- Denotes IMPACTS IN SURFACE WATER
- Denotes TEMPORARY IMPACTS IN SURFACE WATER
- Denotes HAND CLEARING



SITE 18

WQ

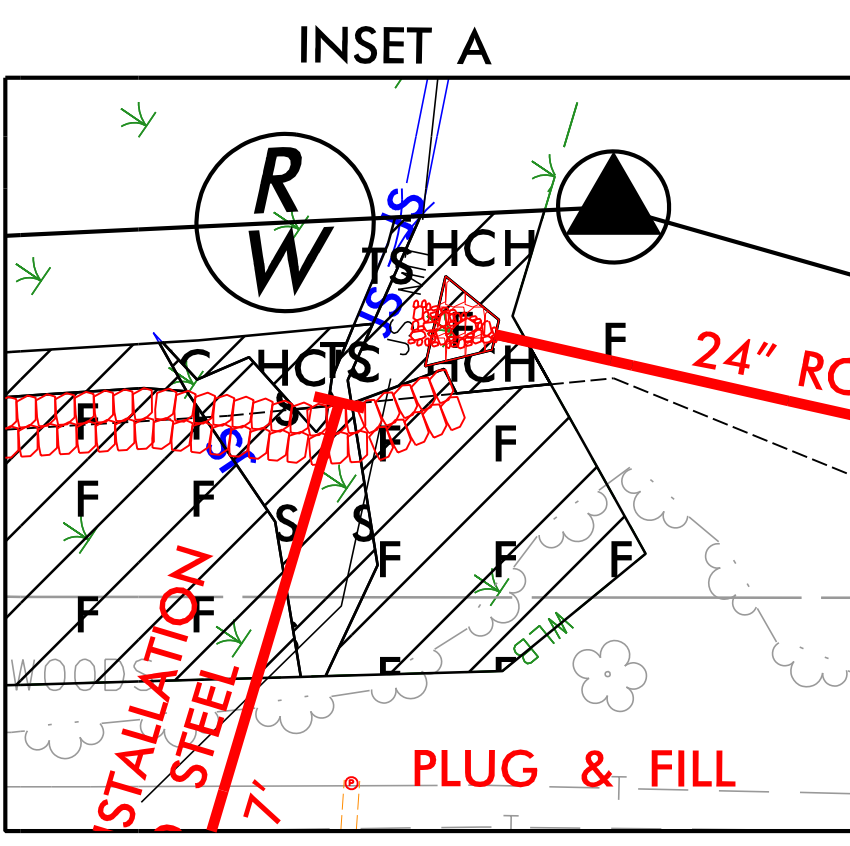
SH

SEE INSET A

Q10=7.17 cfs
V10=0.48 f/s

MATCHLINE -L- STA. 566+00.00 SEE SHEET 45

MATCHLINE -L- STA. 580+00.00 SEE SHEET 47



8/17/199
8/18/2021
C:\Users\jgibson\Documents\Environmental\Drawings\4C\Section 2\195709_Hyd_4C_wet.psn-46.dgn

RK&K

P: (919) 978-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

PROJECT REFERENCE NO. R-5709	SHEET NO. 46
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

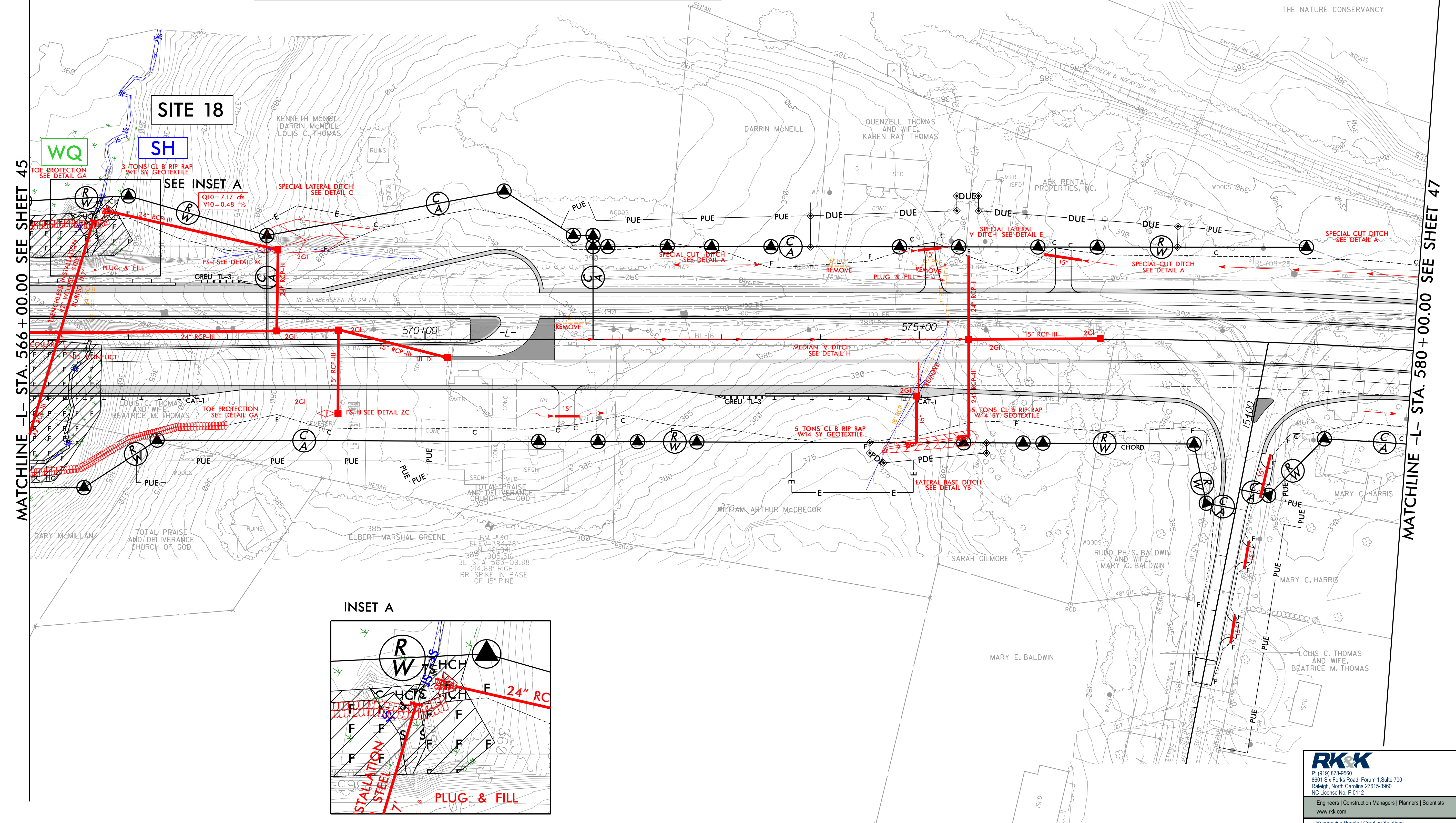
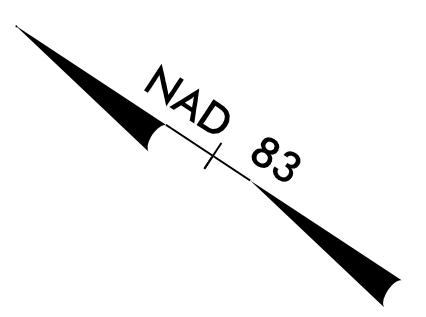
SCALE FOR INSET: 25 0 25 50

SCALE: 50 25 0 50 100

PERMIT DRAWING SHEET 47 OF 60

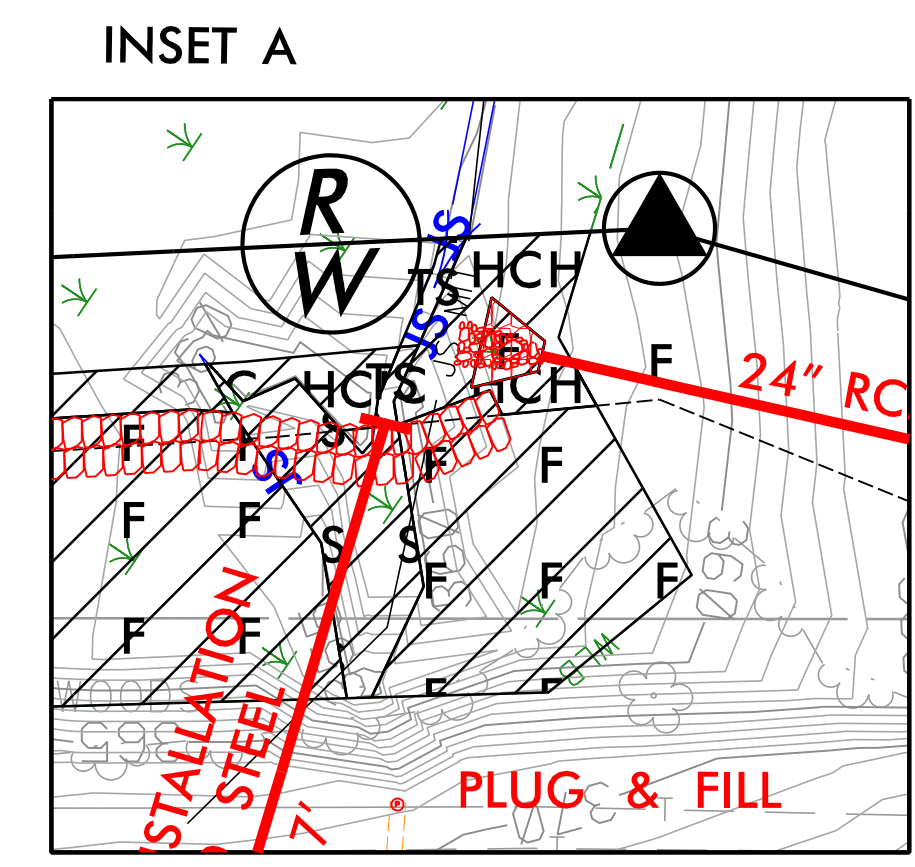
ENGLISH

- Denotes Fill in Wetland
- Denotes Impacts in Surface Water
- Denotes Temporary Impacts in Surface Water
- Denotes Hand Clearing



MATCHLINE -L- STA. 566+00.00 SEE SHEET 45

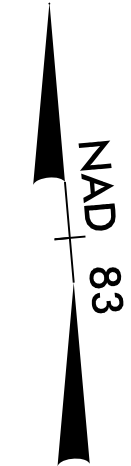
MATCHLINE -L- STA. 580+00.00 SEE SHEET 47



8/17/199
8/18/2021
S:\Geomatics\PERMITS\Environmental\Drawings\4C\Section 2\R5709_Hyd_4C_wet.psn\46_con.dgn

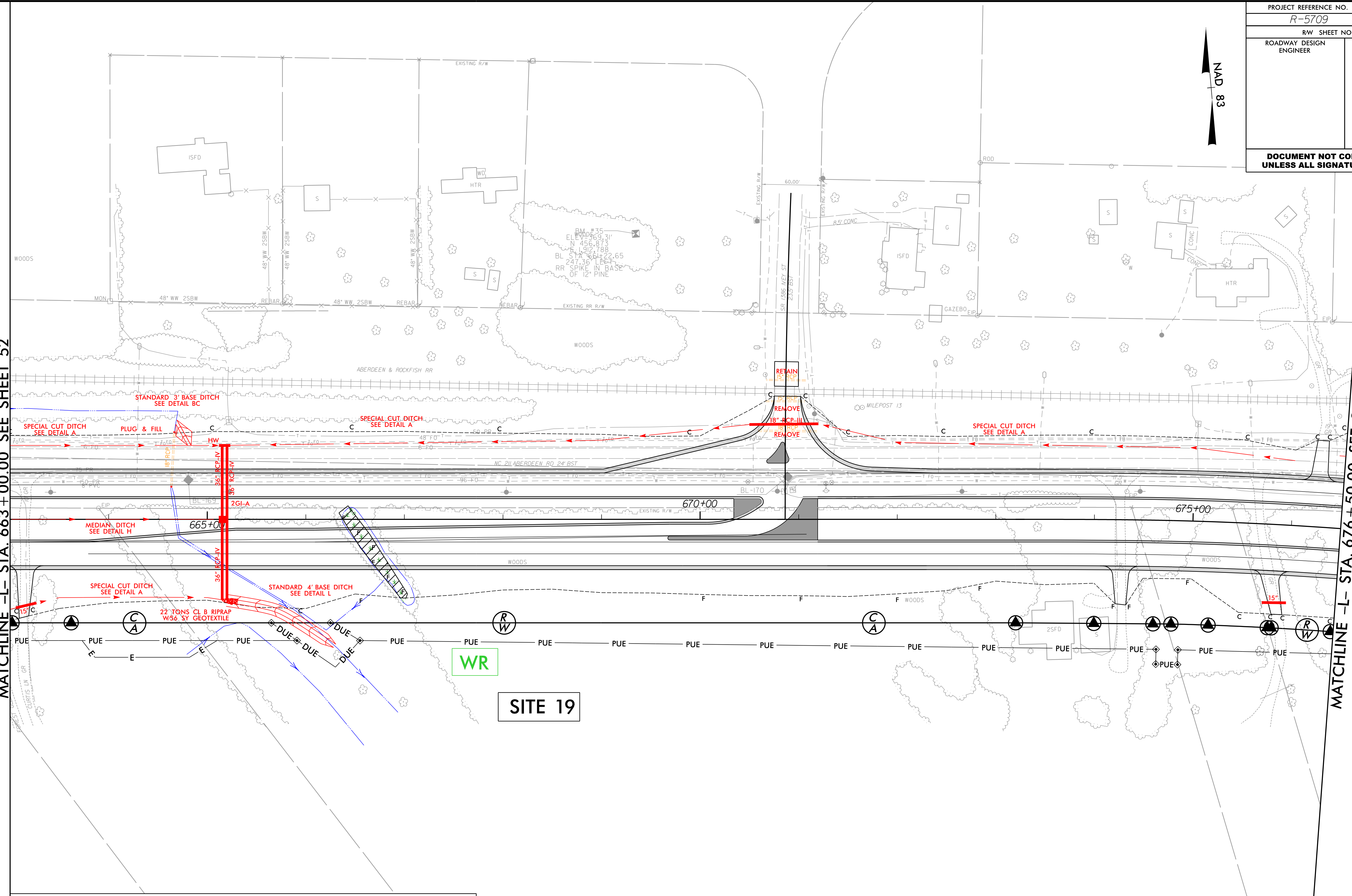
RK&K
 P: (919) 978-9560
 8601 Six Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. F-0112
 Engineers | Construction Managers | Planners | Scientists
 www.rkk.com
 Responsive People | Creative Solutions

PROJECT REFERENCE NO. R-5709	SHEET NO. 53
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



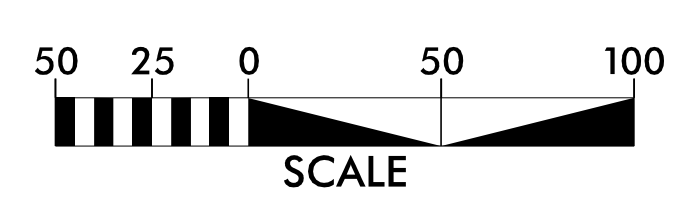
MATCHLINE -L- STA. 663 + 00.00 SEE SHEET 52

MATCHLINE -L- STA. 676 + 50.00 SEE SHEET 54

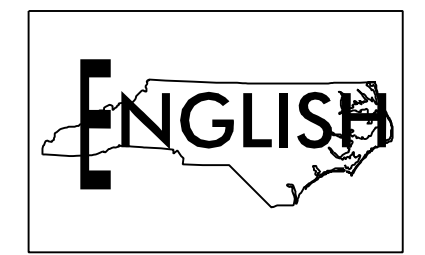


SITE 19

WR



PERMIT DRAWING
SHEET 48 OF 60



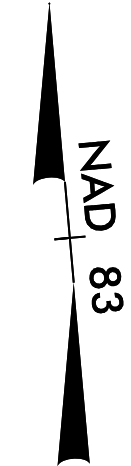
DENOTES FILL IN WETLAND



Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

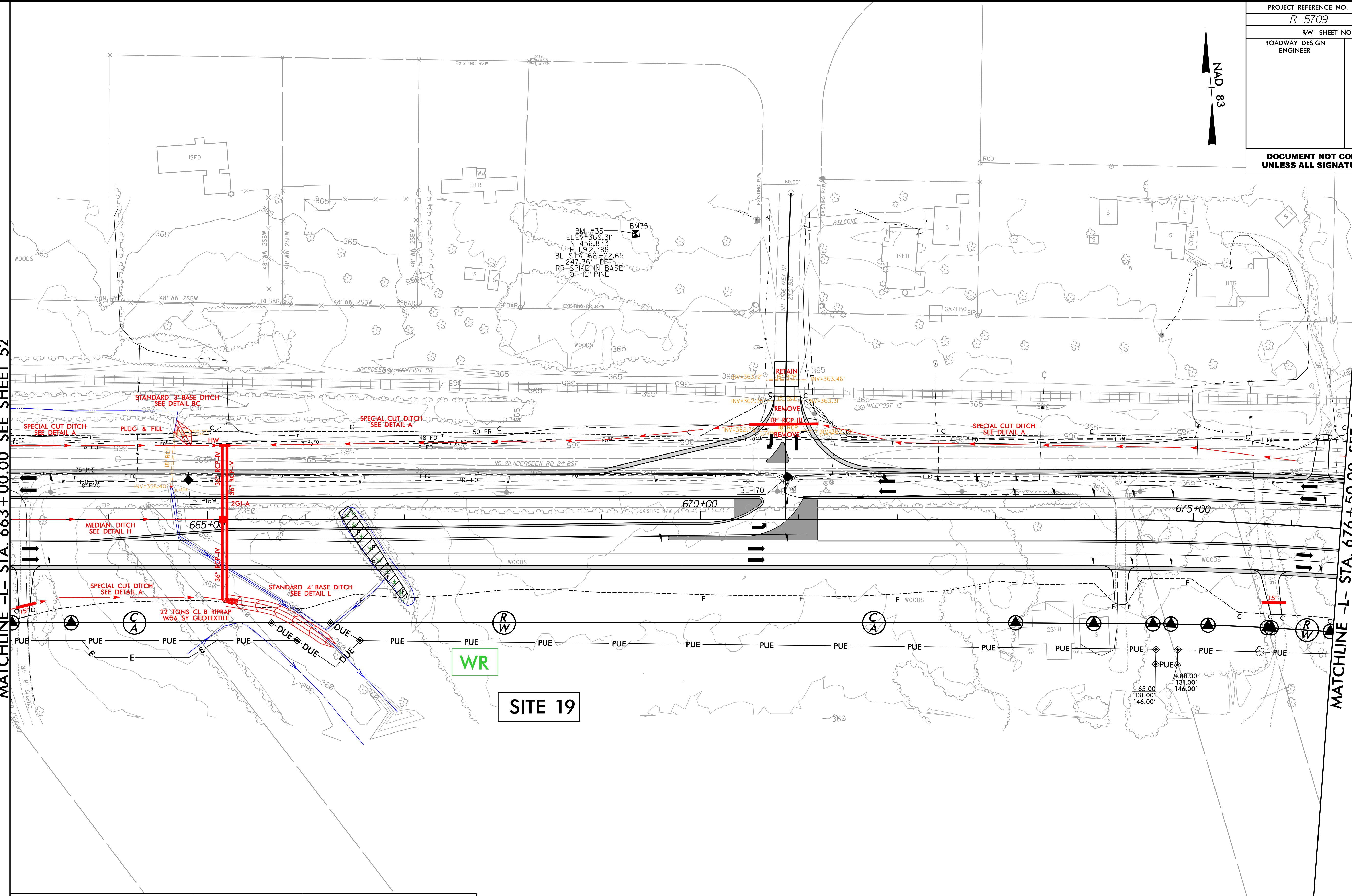
8/17/199
8/18/2021
C:\Users\jgibson\Documents\Drawings\4C\Section 2\15709_Hyd_4C_wet.psh53.dgn

PROJECT REFERENCE NO. R-5709	SHEET NO. 53
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

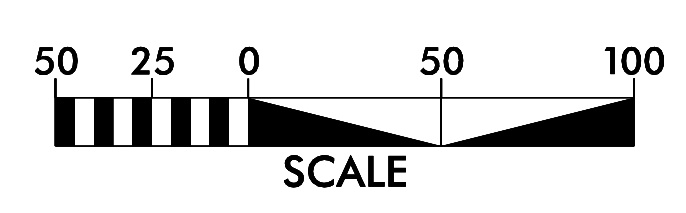


MATCHLINE -L- STA. 663 + 00.00 SEE SHEET 52

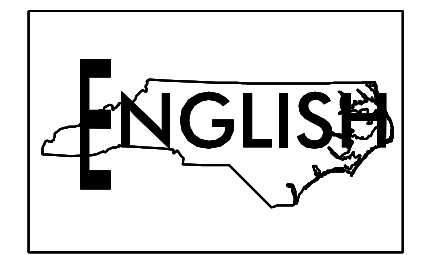
MATCHLINE -L- STA. 676 + 50.00 SEE SHEET 54



SITE 19



PERMIT DRAWING
SHEET 49 OF 60



DENOTES FILL IN WETLAND

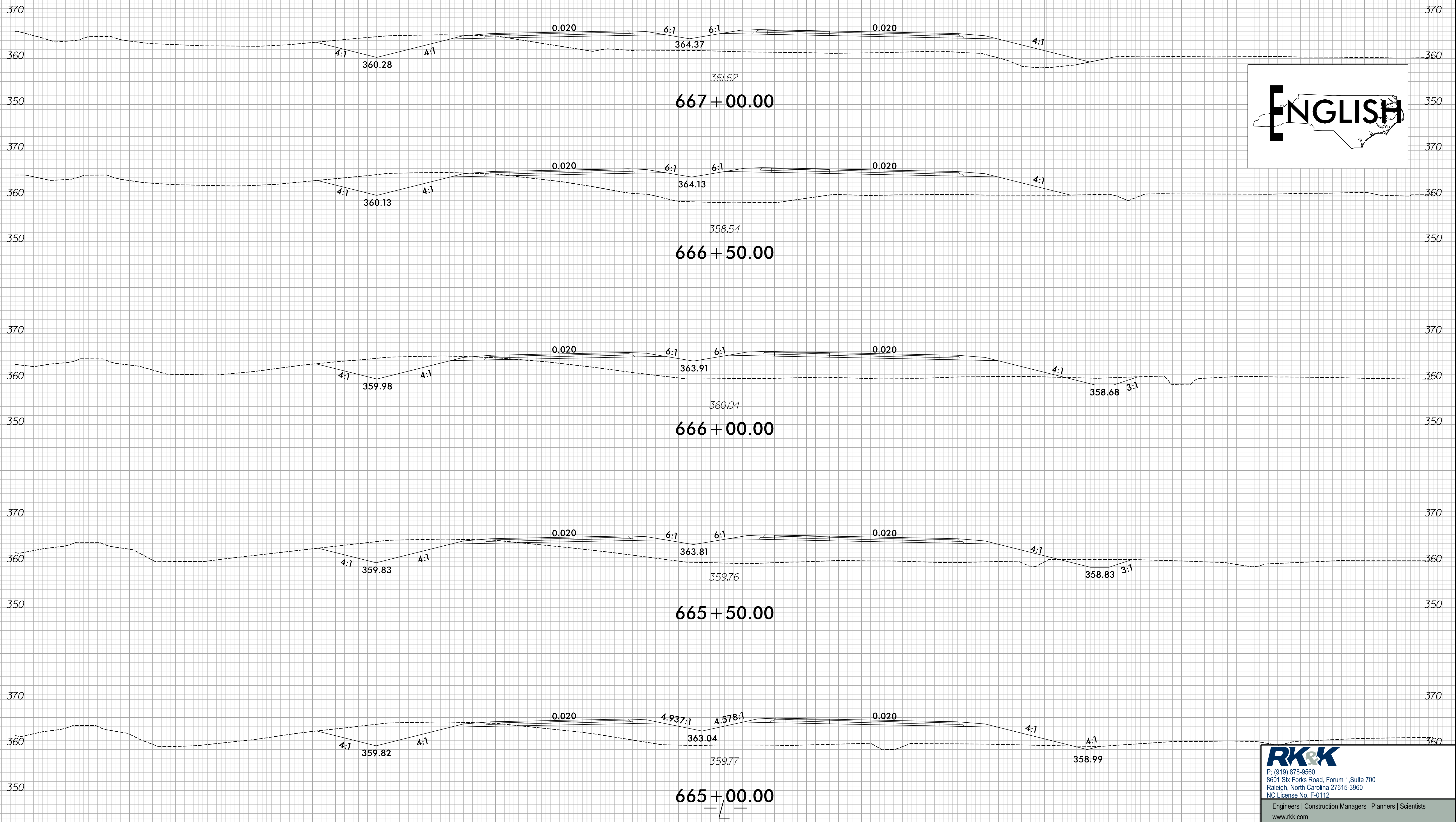
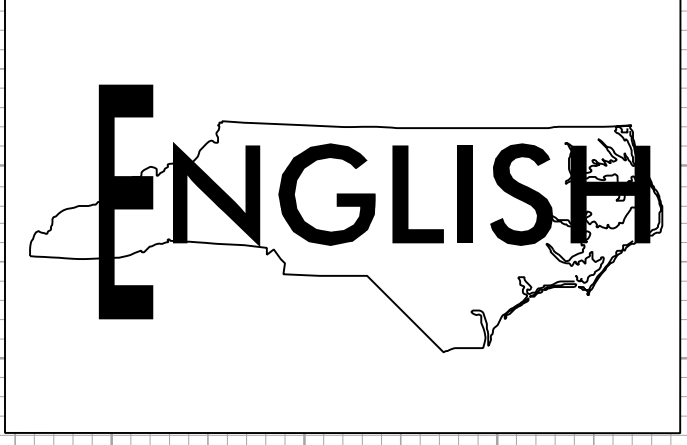
RK&K
 P: (919) 978-9560
 8601 Six Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. F-0112
 Engineers | Construction Managers | Planners | Scientists
 www.rkk.com
 Responsive People | Creative Solutions

8/17/199
 8/18/2021
 C:\Users\jgibson\Documents\Drawings\4C\Section 2\15709_Hyd_4C_wet_psh53_con.dgn

SITE 19

PERMIT DRAWING SHEET 50 OF 60

WETLAND

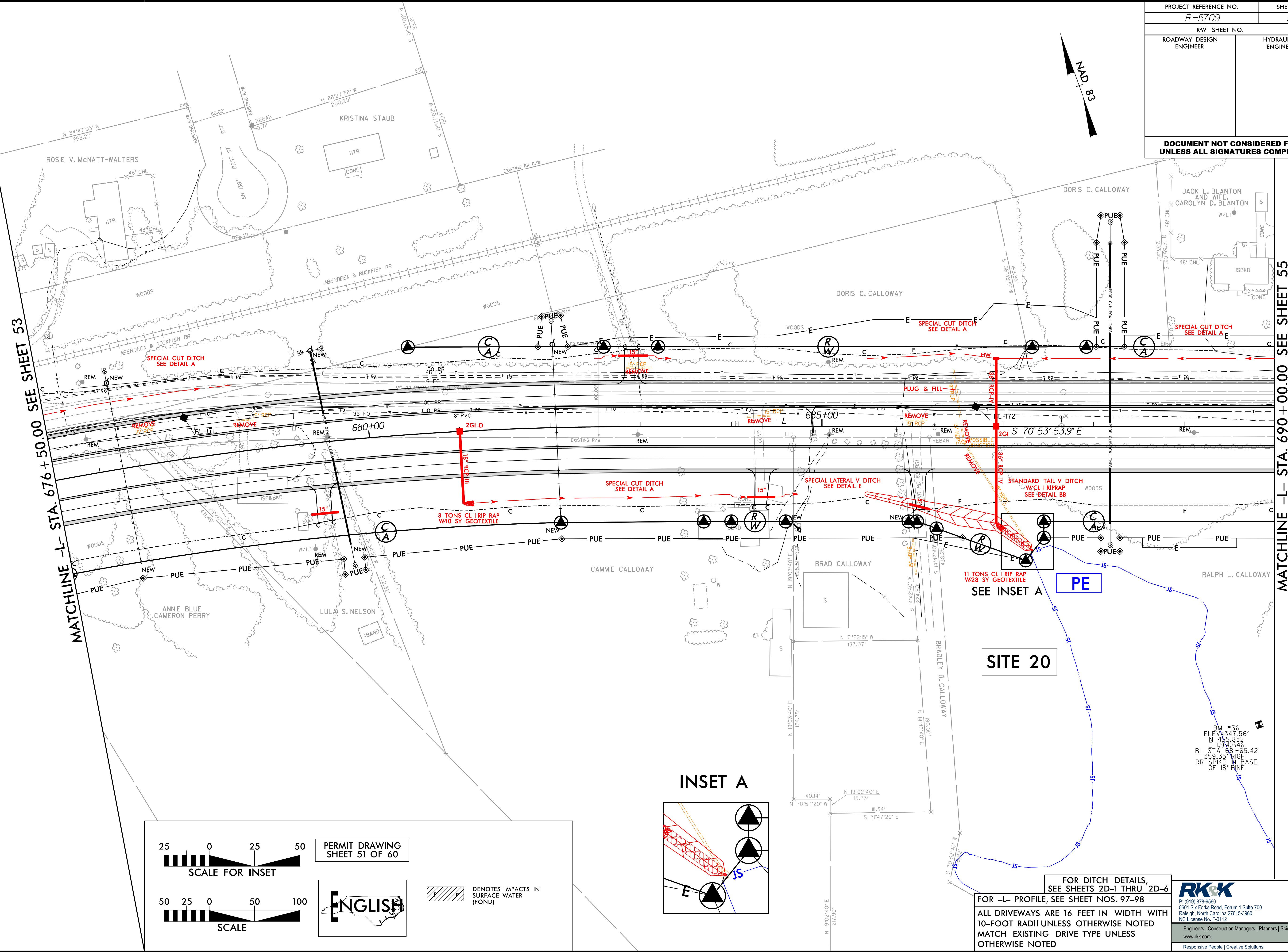
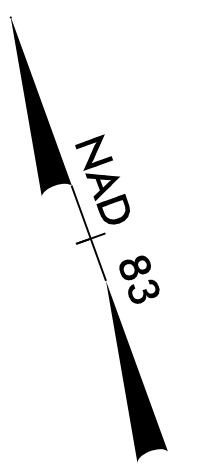


RK&K
 P: (919) 878-9660
 8601 Six Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
 www.rkk.com
 Responsive People | Creative Solutions

6/23/16
6/18/2021
R:\Hydro\Projects\PERMITS_Environmental\Drawings\4C\Section 2\AR-5709_Rdu_XPL_L2-SITE19.dgn

PROJECT REFERENCE NO. R-5709	SHEET NO. 54
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



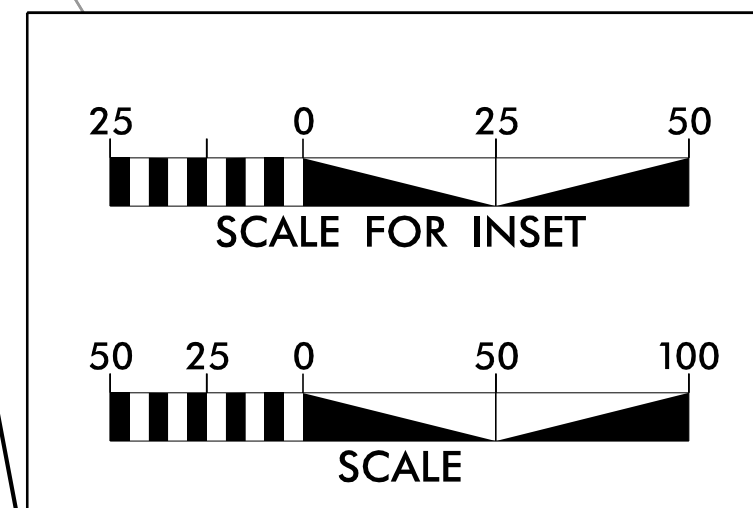
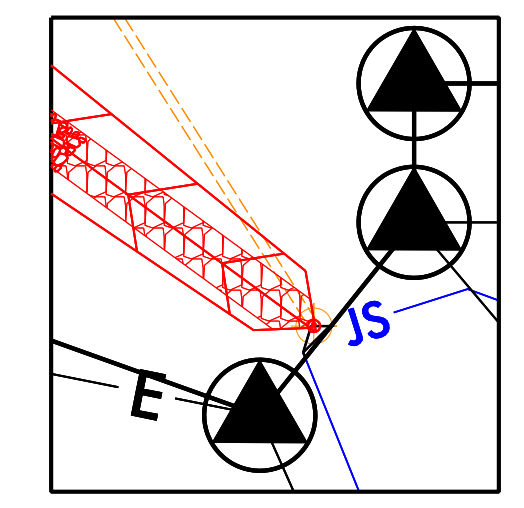
MATCHLINE -L- STA. 676 + 50.00 SEE SHEET 53

MATCHLINE -L- STA. 690 + 00.00 SEE SHEET 55

PE

SITE 20

INSET A



PERMIT DRAWING
SHEET 51 OF 60

ENGLISH

DENOTES IMPACTS IN SURFACE WATER (POND)

FOR DITCH DETAILS,
SEE SHEETS 2D-1 THRU 2D-6

FOR -L- PROFILE, SEE SHEET NOS. 97-98

ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH
10-FOOT RADII UNLESS OTHERWISE NOTED
MATCH EXISTING DRIVE TYPE UNLESS
OTHERWISE NOTED

RK&K

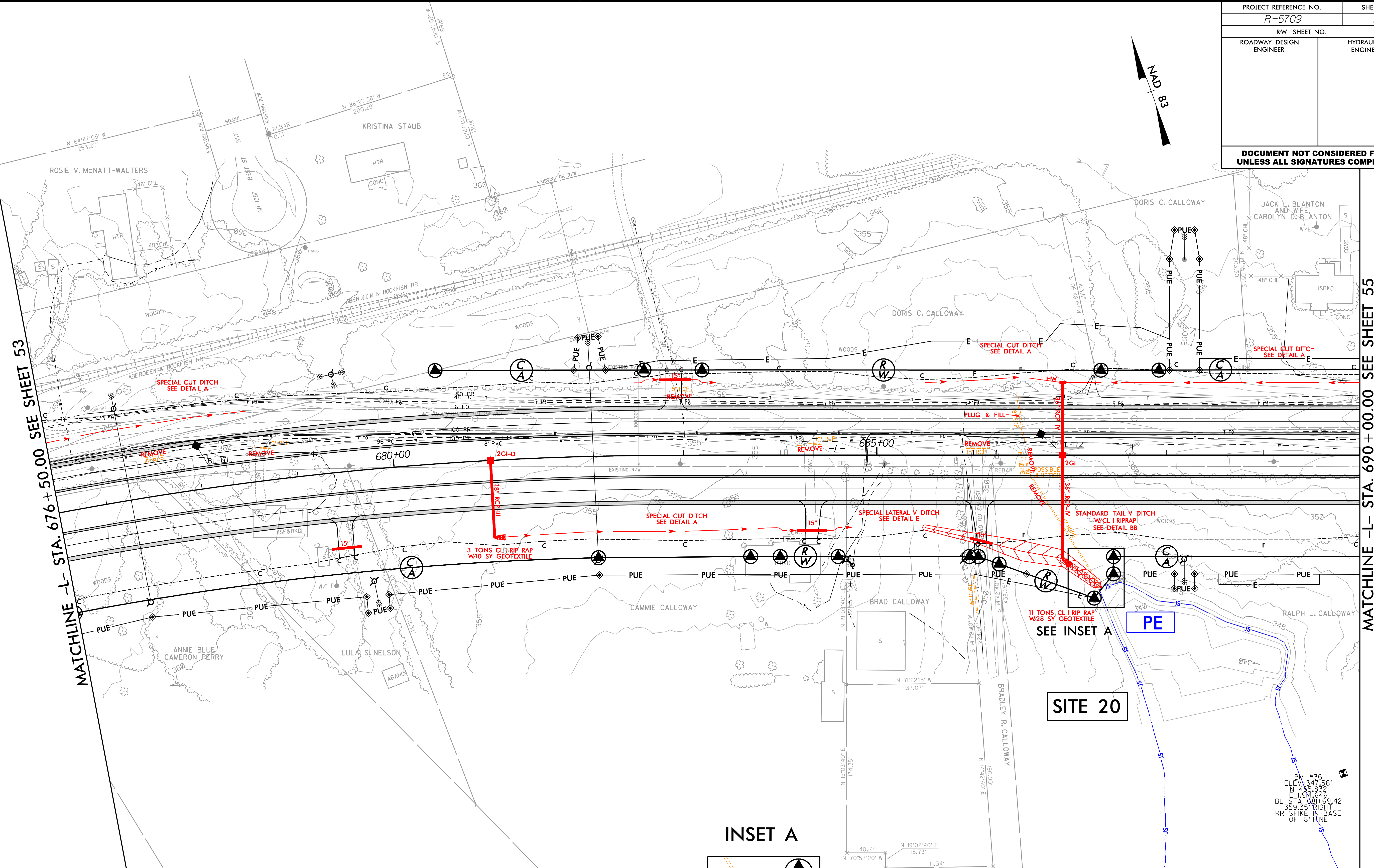
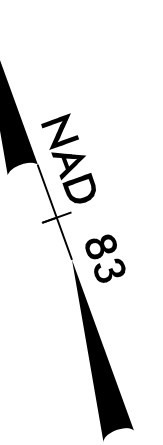
P: (919) 978-8660
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

8/17/199
8/18/2021
C:\Users\jgibson\Documents\Drawings\4C\Section 2\R5709_Hyd_4C_wet.psh54.dgn

PROJECT REFERENCE NO. R-5709	SHEET NO. 54
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



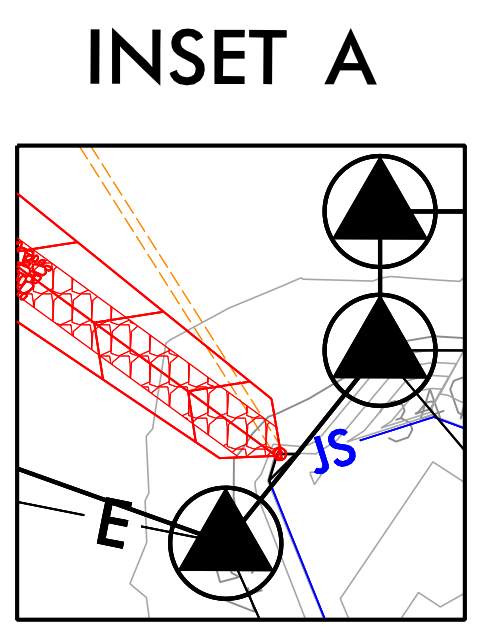
PERMIT DRAWING SHEET 52 OF 60

SCALE FOR INSET: 0, 25, 50

SCALE: 0, 25, 50, 100

ENGLISH

■ DENOTES IMPACTS IN SURFACE WATER (POND)



FOR DITCH DETAILS, SEE SHEETS 2D-1 THRU 2D-6

FOR -L- PROFILE, SEE SHEET NOS. 97-98

ALL DRIVEWAYS ARE 16 FEET IN WIDTH WITH 10-FOOT RADII UNLESS OTHERWISE NOTED

MATCH EXISTING DRIVE TYPE UNLESS OTHERWISE NOTED

RK&K

P: (919) 978-8560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

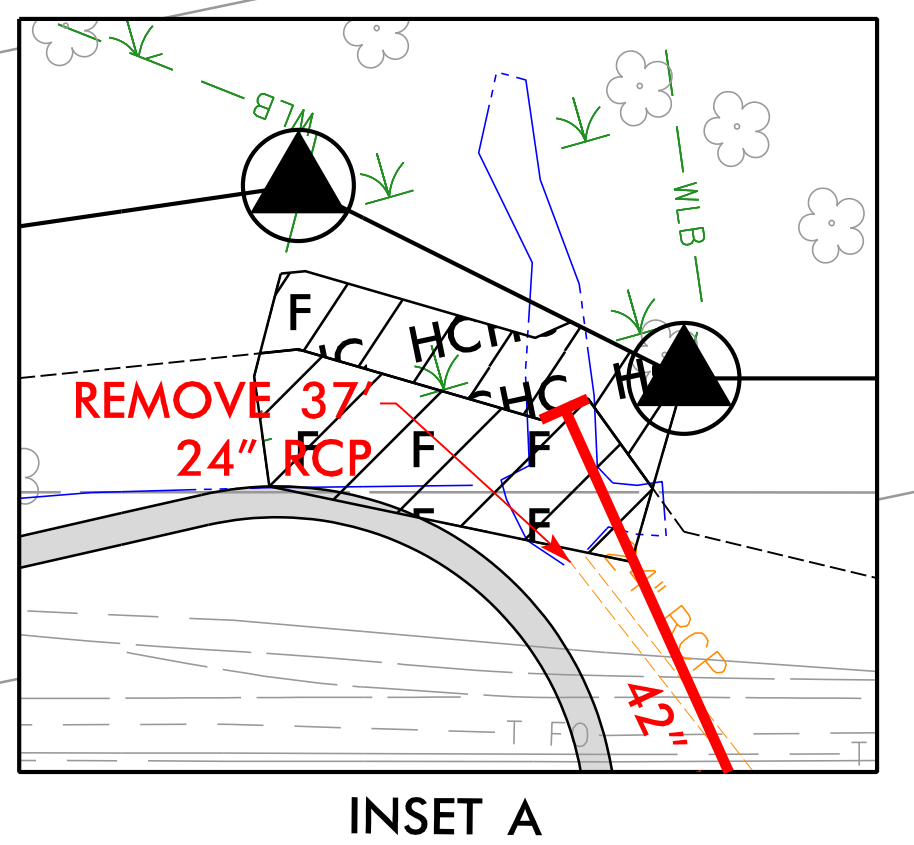
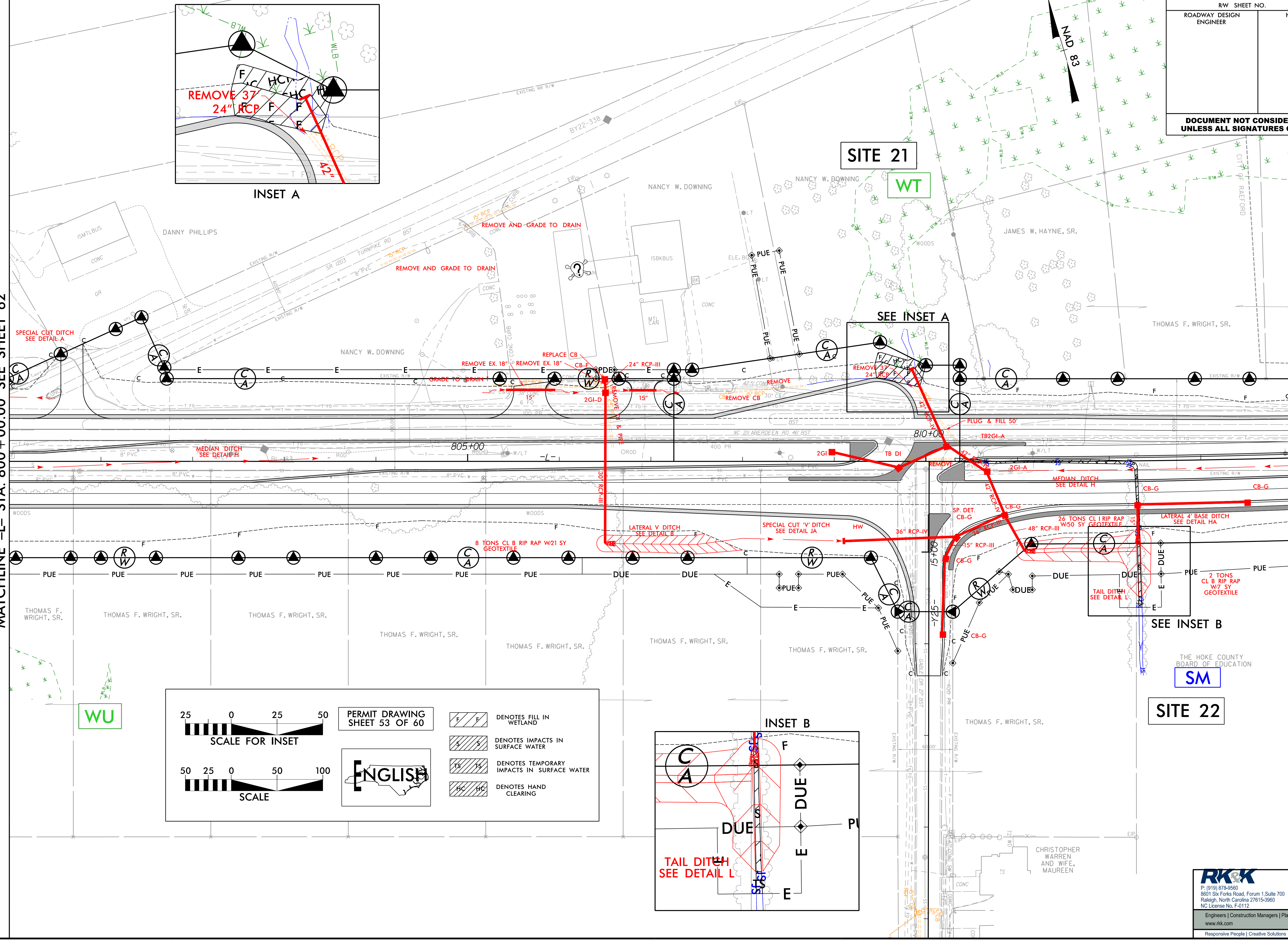
Responsive People | Creative Solutions

8/17/199
8/18/2021
C:\Users\jgibson\Documents\Drawings\4C\Section 2\R5709_Hyd_4C_wet_psh54_con.dgn

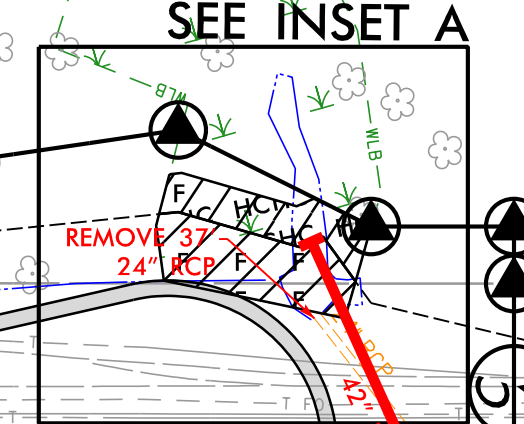
PROJECT REFERENCE NO. R-5709	SHEET NO. 63
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

MATCHLINE -L- STA. 800+00.00 SEE SHEET 62

MATCHLINE -L- STA. 814+00.00 SEE SHEET 64



SITE 21
WT



SITE 22
SM

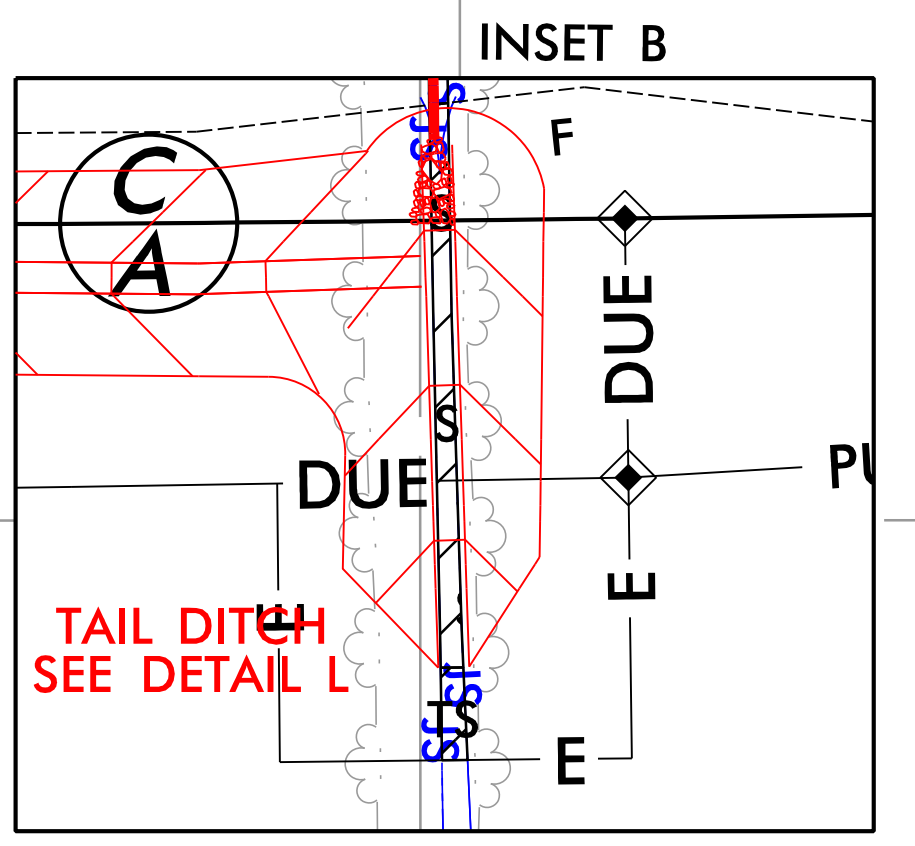
PERMIT DRAWING SHEET 53 OF 60

ENGLISH

	DENOTES FILL IN WETLAND
	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
	DENOTES HAND CLEARING

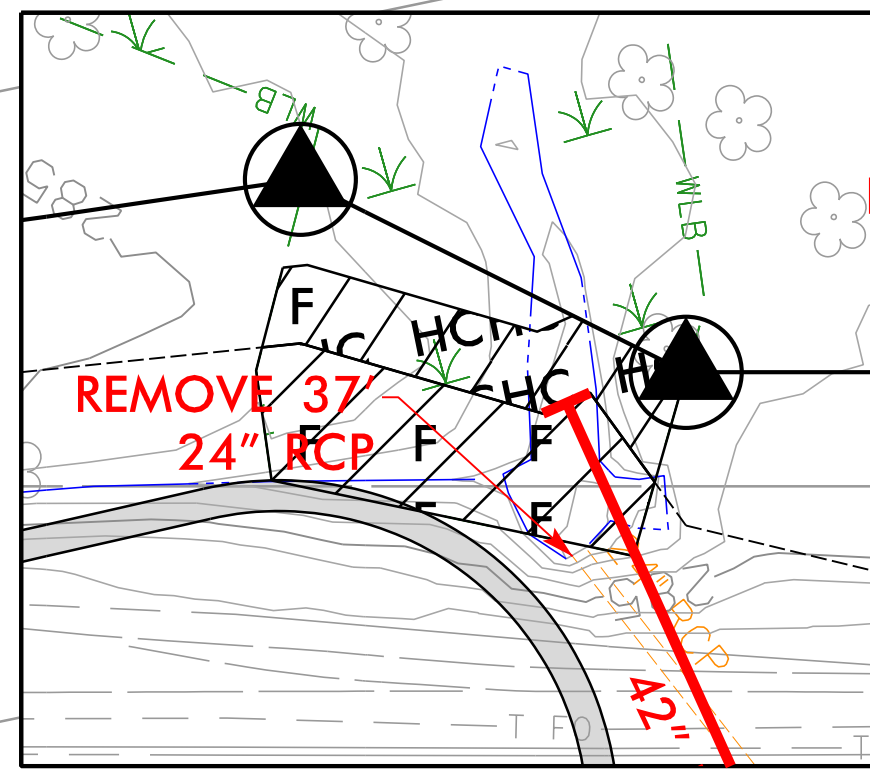
SCALE FOR INSET: 0, 25, 50

SCALE: 0, 25, 50, 100



8/17/199
8/18/2021
C:\Users\psh63\Documents\Drawings\4C\Section 2\195709_Hyd_4C_wet_psh63.dgn

PROJECT REFERENCE NO. R-5709	SHEET NO. 63
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



INSET A

SITE 21

WT

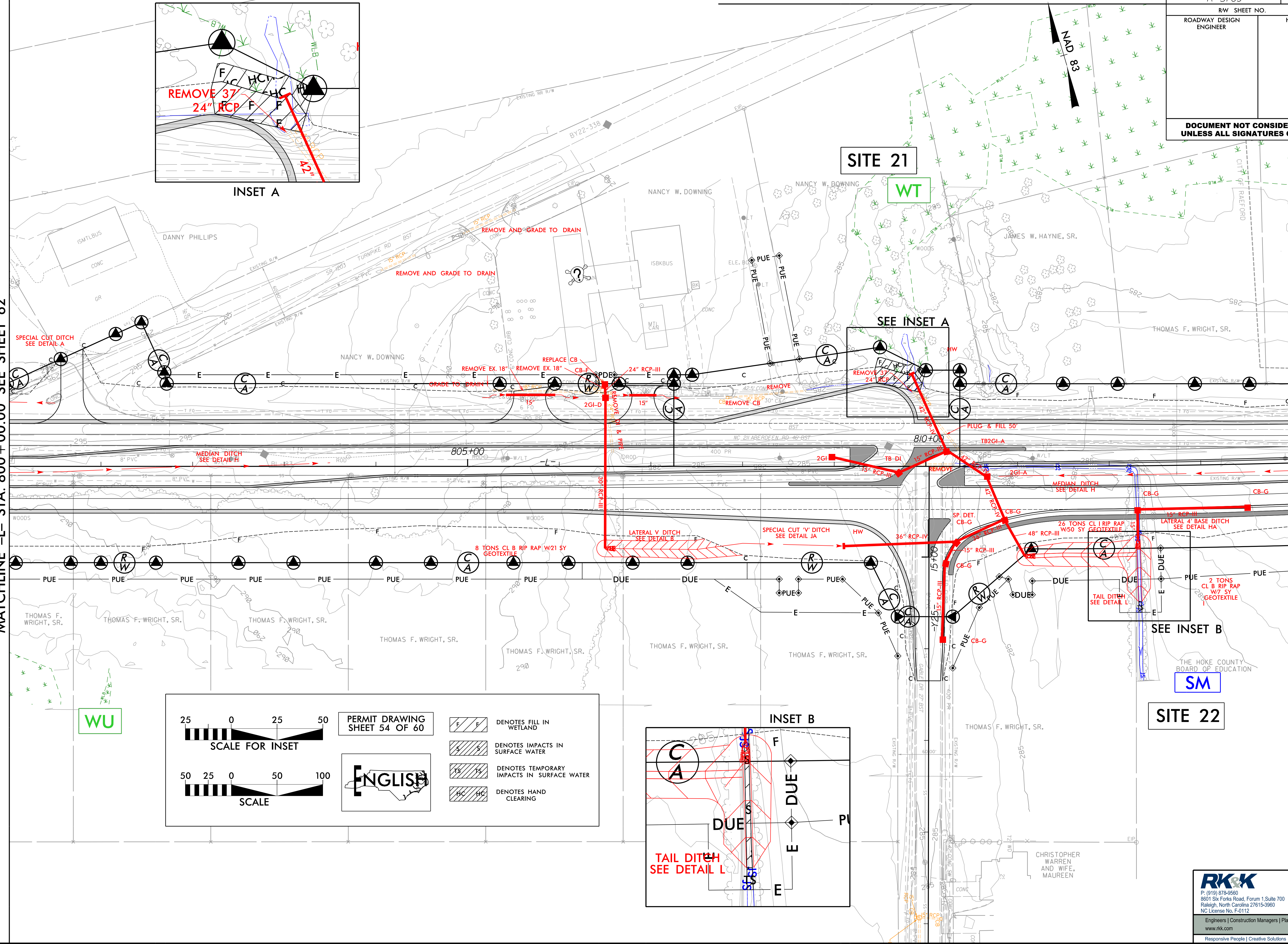
SEE INSET A

SITE 22

SM

MATCHLINE -L- STA. 800 + 00.00 SEE SHEET 62

MATCHLINE -L- STA. 814 + 00.00 SEE SHEET 64



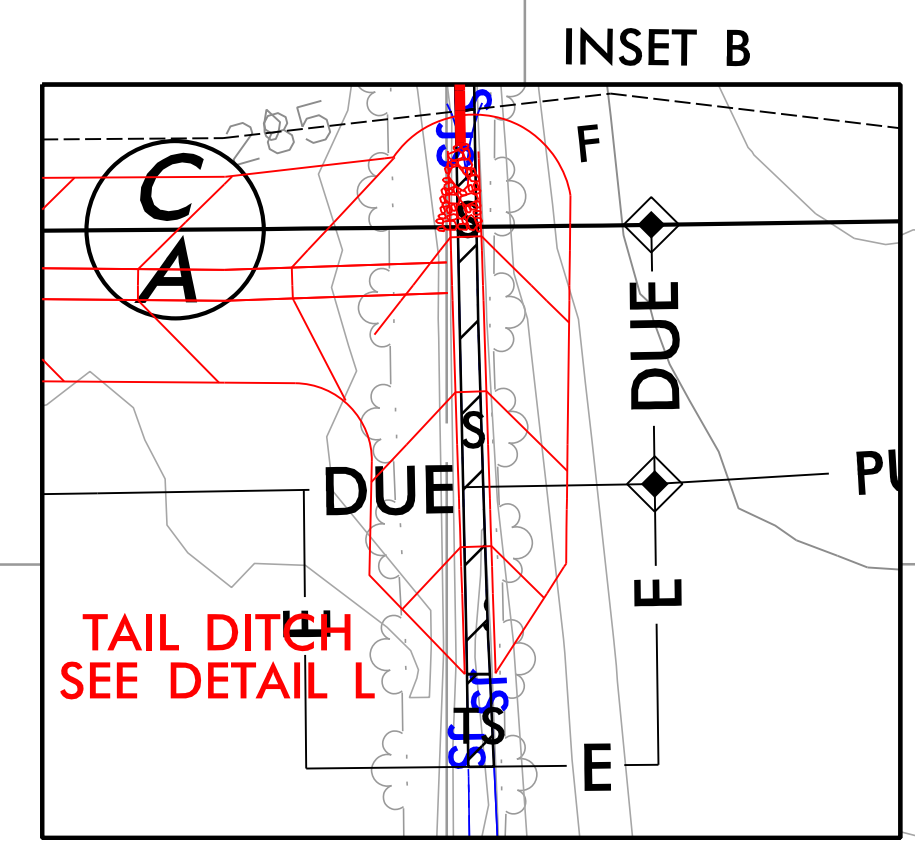
PERMIT DRAWING SHEET 54 OF 60

ENGLISH

	DENOTES FILL IN WETLAND
	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
	DENOTES HAND CLEARING

SCALE FOR INSET: 0, 25, 50

SCALE: 0, 25, 50, 100



TAIL DITCH SEE DETAIL L

8/17/199
8/18/2021
C:\Users\jperkins\Documents\Drawings\4C\Section 2\5709_Hyd_4C_wet_psh63.con.dgn

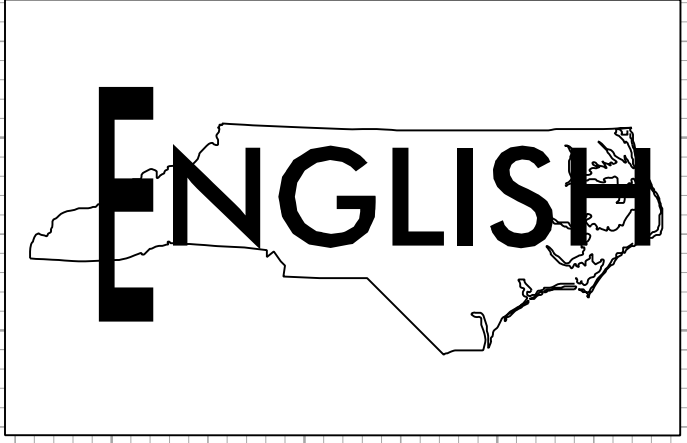
RK&K

P: (919) 978-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

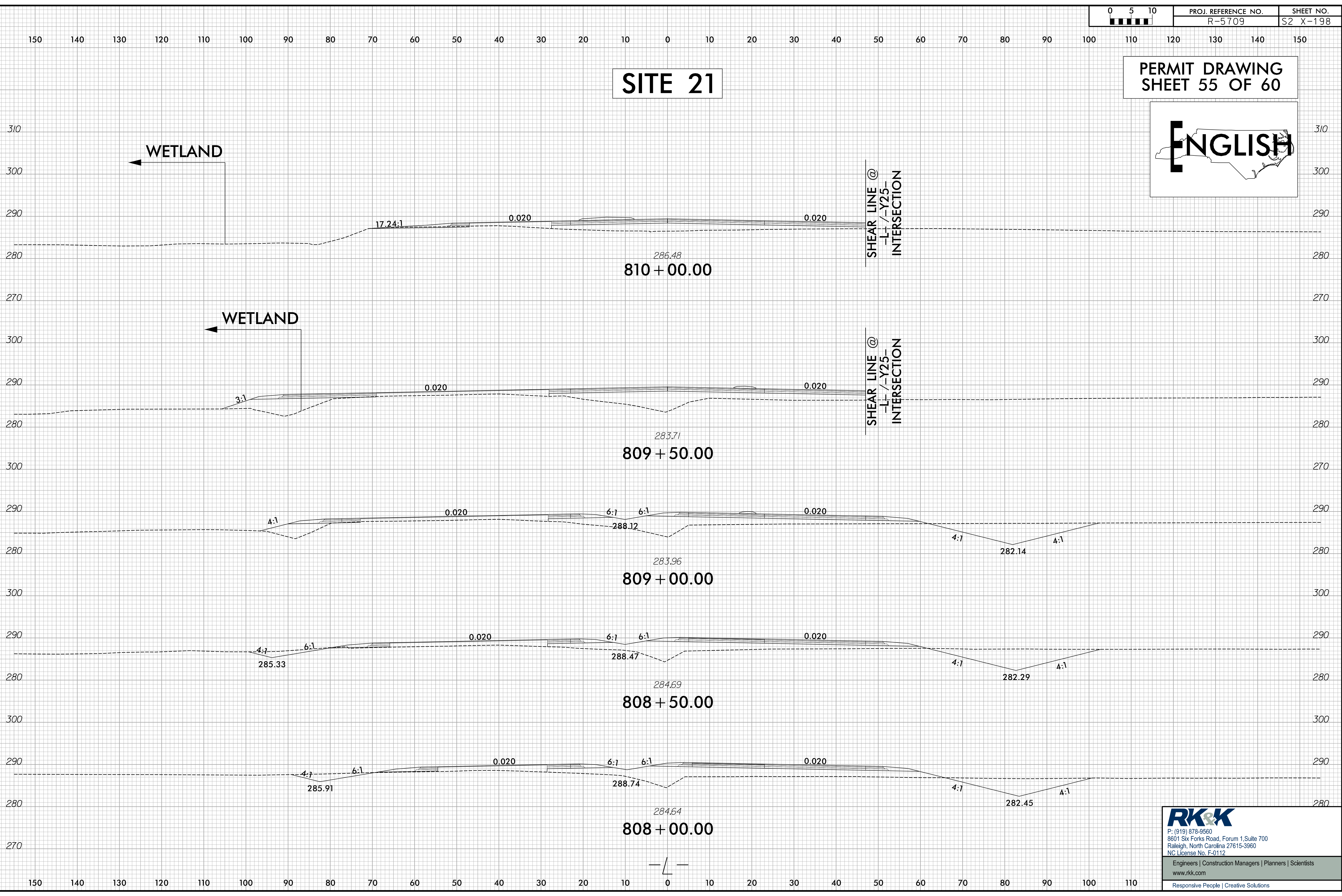
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

SITE 21

PERMIT DRAWING SHEET 55 OF 60



6/23/16
6/18/2021
R:\Hydro\Projects\PERMITS_Environmental\Drawings\4C\Section 2\NR5709_Rdy_XPL_L2_SITE21.dgn
kyle

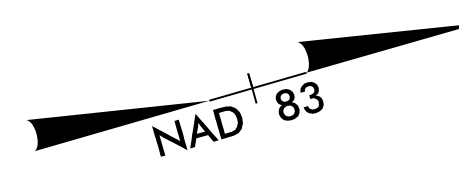
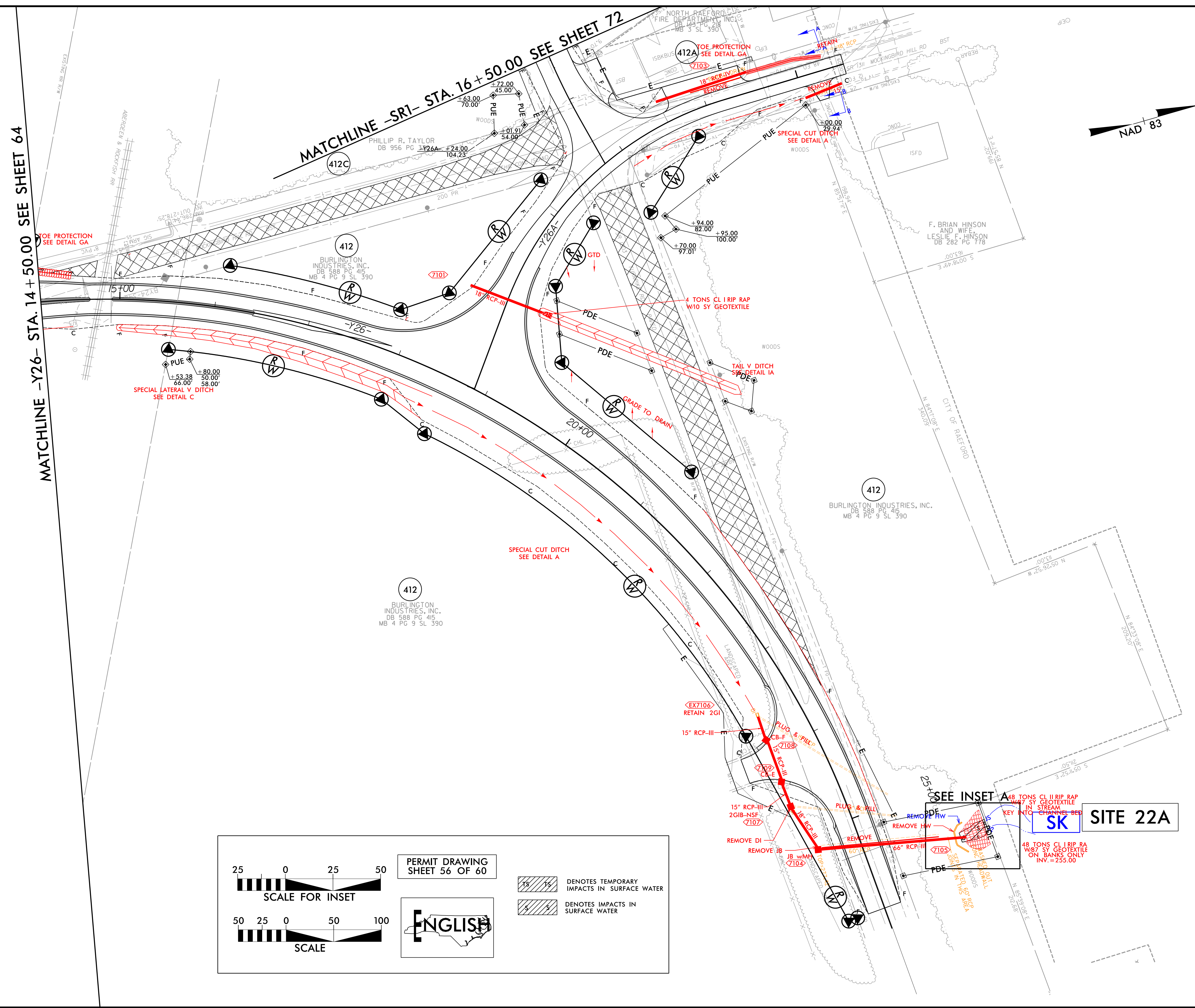


RK&K
 P: (919) 878-9560
 8601 Six Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
 www.rkk.com
 Responsive People | Creative Solutions

PROJECT REFERENCE NO. R-5709	SHEET NO. 71
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

8/17/199
S:\Projects\Hydraulics\PERMITS\Environmental\Drawings\4C\Section 2\R5709_Hyd_4C_wet_psh71.dgn



25 0 25 50

SCALE FOR INSET

50 25 0 50 100

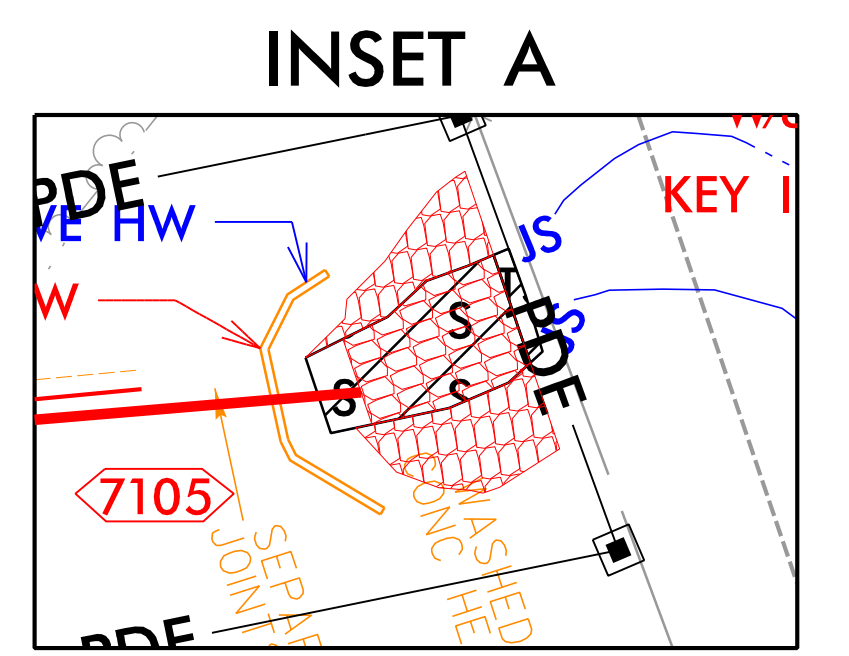
SCALE

PERMIT DRAWING SHEET 56 OF 60

ENGLISH

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER



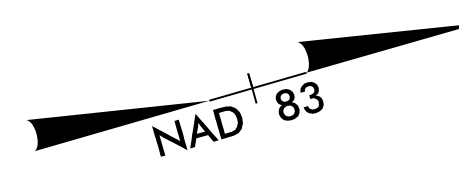
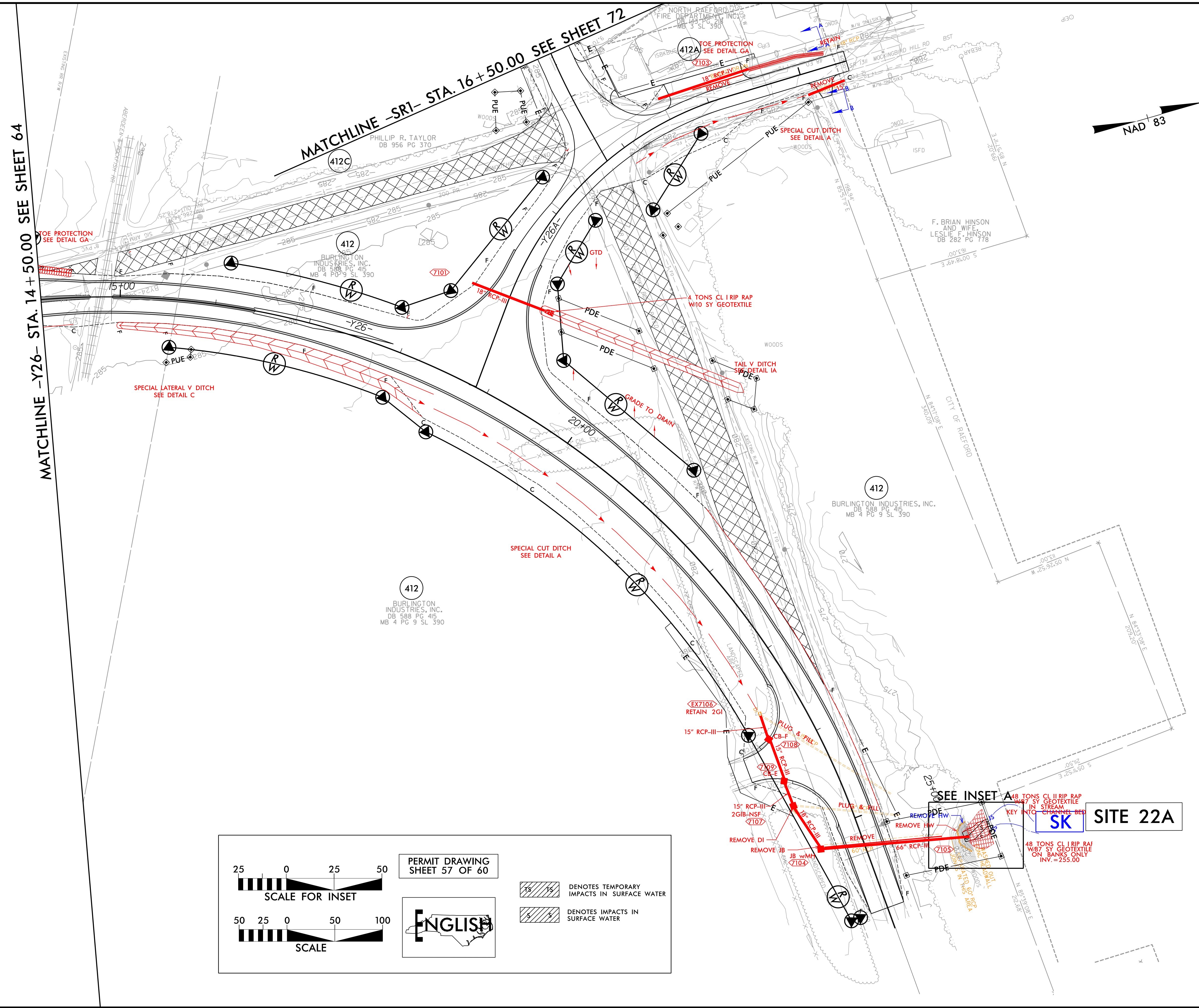
RK&K

P: (919) 978-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

PROJECT REFERENCE NO. R-5709	SHEET NO. 71
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

8/17/199
S:\Projects\2021\Hydraulics\PERMITS\Environmental\Drawings\4C\Section 2\R5709_Hyd_4C_wet_psh71.con.dgn



25 0 25 50

SCALE FOR INSET

50 25 0 50 100

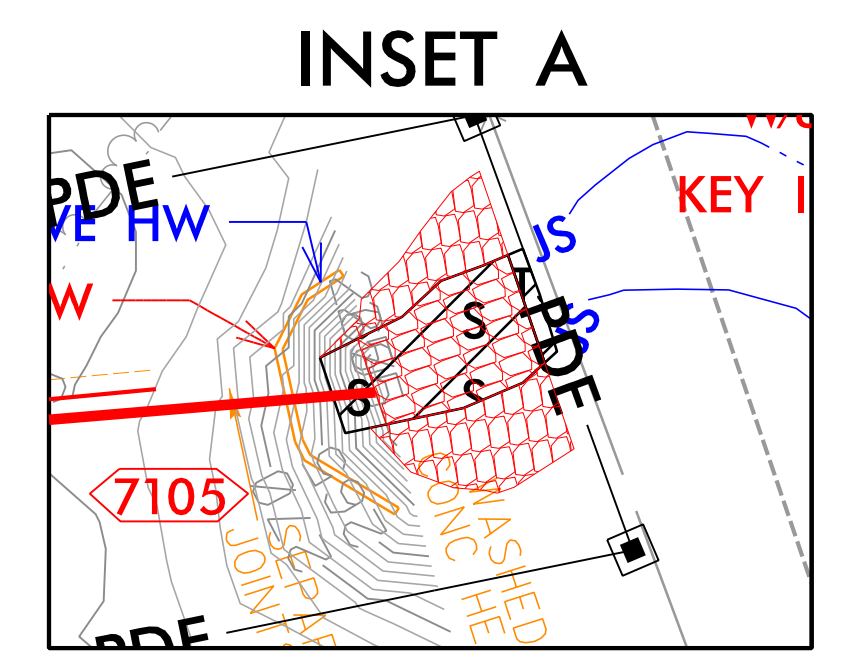
SCALE

PERMIT DRAWING SHEET 57 OF 60

ENGLISH

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER



R&K

P: (919) 978-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

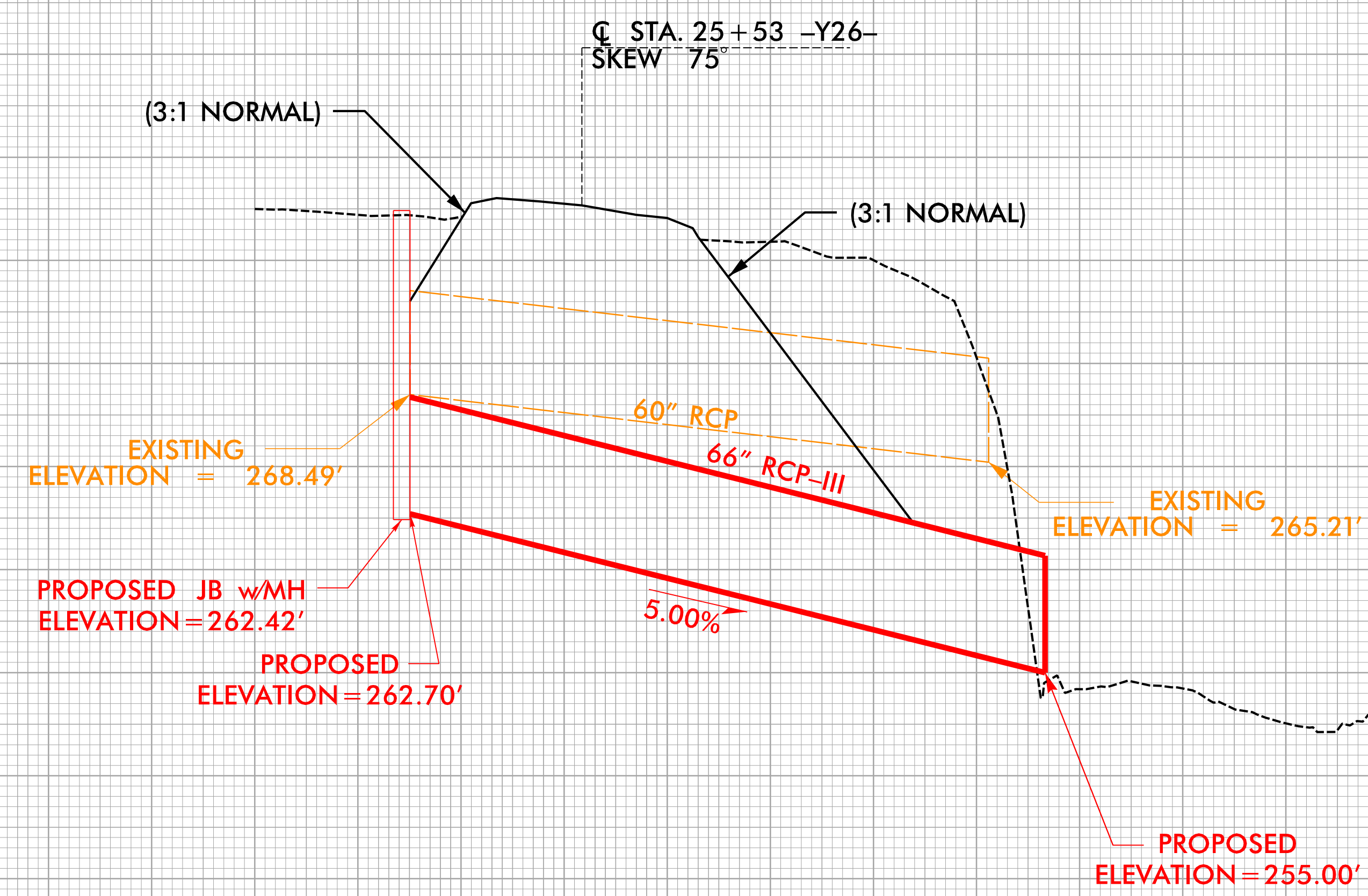
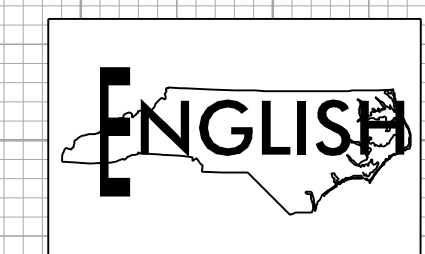
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

PROJECT REFERENCE NO. <i>R-5709</i>	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 22A

-Y26- STA. 25+53

PERMIT DRAWING
SHEET 58 OF 60



66" RCP-III
(length = 154')

5/14/99
6/18/2021
B:\Projects\PERMITS_Environmental\Drawings\4C\Section 2\R-5709-Hyd-PFL-SITE22A.dgn

WETLAND AND SURFACE WATER IMPACTS 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)
1	14+10 -L- LT	ROADWAY FILL -WB	0.02		< 0.01		< 0.01					
2	14+50 -L- RT	ROADWAY FILL -WA	0.07		< 0.01		0.03					
3	14+30 -L-	54" RCP-III (BURIED 1') -SA						0.02	< 0.01	183	20	
4	22+30 -L- LT	BANK STABILIZATION -SD					0.01	< 0.01	< 0.01	20	12	
		ROADWAY FILL -WF					< 0.01					
		UTILITY IMPACTS					0.02					
5	23+25 -L- RT	-Y2- WF	0.02				< 0.01					
6	20+60 -Y2- RT	UTILITY IMPACTS -WG					< 0.01					
6	18+50 -Y3- RT	ROADWAY FILL -WG					< 0.01					
6	36+00 -L- LT	ROADWAY FILL -WG	0.06				0.09					
6	39+50 -L- LT	-Y4- WG	0.03				< 0.01					
6A	14+00 -Y4- RT	ROADWAY FILL -WG2	< 0.01		0.03		0.02					
7	35+00 -L- RT	ROADWAY FILL -WH	0.06		< 0.01		0.03					
8	34+65 -L-	66" RCP IV (BURIED 1') -SC						< 0.01	< 0.01	85	53	
		BANK STABILIZATION						< 0.01		26		
9	165+50 -L- RT	ROADWAY FILL -WJ	0.01				0.02					
10	168+00 -L-	ROADWAY FILL -WI	0.19				0.05					
		54" RCP-III -SE						< 0.01		70		
		UTILITY IMPACTS -WI					< 0.01					
11	203+50 -L- LT	ROADWAY FILL -WM	0.07				0.07					
		UTILITY IMPACTS					0.15					
12	207+80 -L- RT	ROADWAY FILL -WL	0.29				0.06					
13	208+50 -L- LT	POND DRAINAGE -WN			0.02		< 0.01					3
14	208+61 -L-	72" RCP IV (BURIED 1') -SF						0.02		185		
15	279+00 -L-	2@48" RCP III -SJ						< 0.01	< 0.01	140	11	
		UTILITY IMPACTS -WW					0.01					
TOTALS*:			0.83		0.06		0.62	0.06	< 0.01	709	96	3

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 6/16/2021
 HOKE & MOORE COUNTIES
 R-5709

SHEET 59 OF 60

