Transportation

PAT McCRORY
Governor

NICHOLAS J. TENNYSON
Secretary

July 27, 2016

MEMORANDUM TO: Mr. Brandon Jones, P.E.
Division 8 Engineer

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

SUBJECT: Randolph County; US 64 Improvements;
Federal Aid No. NHF-64(19); WBS 34450.1.1; **TIP R-2536.**

Attached are the US Army Corps of Engineers Individual Permit and N.C. Division of Water Resources (NCDWR) Water Quality Certification. All environmental permits have been received for the construction of this project.

A copy of this permit package will be posted on the NCDOT website at:
https://connect.ncdot.gov/resources/Environmental/Pages/default.aspx
Quick Links>Permit Documents> Issued Permits.

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

Mr. Randy Garris, P.E. State Contract Officer
Mr. Clarence Coleman, P.E., FHWA
Mr. Michael Shumsky, P.E., Design Build
Mr. Art King, Division Environmental Officer
Dr. Majed Al-Ghandour, P.E., Programming and TIP
Ms. Roger Thomas, P.E., Roadway Design
Mr. Robert Memory, Utilities Unit
Mr. Jay Twisdale, P.E., Hydraulics
Mr. Tom Koch, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. Ron Hancock, P.E., State Roadway Construction Engineer
Mr. Rob Hanson, P.E., PDEA
Mr. Philip Ayscue, Office of Inspector General
Ms. Beth Harmon, Division of Mitigation Services
Ms. LeiLani Paugh, Natural Environment Section

PROJECT COMMITMENTS

T.I.P. Project No R-2536
US 64 Improvements
Randolph County
Federal Aid Project No. NHF-64(19)
W.B.S. No. 34450.1.1

COMMITMENTS FROM PROJECT DEVELOPMENT AND DESIGN

All commitments developed during the project development and design phase have been incorporated into the design. Current status, changes, or additions to the project commitments as shown in the environmental document for the project are listed below.

In addition to the Section 404 Individual Permit (IP) Special Conditions, State Stormwater Permit, Section 401 Water Quality Certification (WQC) Conditions, Regional Conditions, NCDOT's Guidelines for Best Management Practices for Protection of Surface Waters, NCDOT's Guidelines for Best Management Practices for Bridge Demolition and Removal, and General Certification Conditions, the following special commitments were agreed to by the NCDOT:

Drainage and hydrological studies will be conducted to identify and design major drainage structures.

Geotechnical investigations will be conducted to recommend techniques and materials to overcome any soil limitations along the selected alternative.

The provision of service roads to specific properties will be determined, as needed, during the property acquisition phase through contact and negotiations with property owners.

A search for geodetic control monuments will be conducted during development of the project's construction plans.

Preparation of an erosion control plan incorporating the NCDOT's Best Management Practices for Protection of Surface Waters.

Coordination with municipalities and public utilities for relocation and reconfiguration of utility systems will be conducted.

The Relocation Assistance Program will be implemented.

Approval of all required permits and certifications as outlined in Section 4.11, pages 4-70 and 4-71 of the DEIS will be obtained prior to construction.

Action: *All above are standard NCDOT Project Commitments.*

Project Development & Environmental Analysis Unit, Division 8

Follow-up surveys to determine suitable habitat for Schweinitz's suflower within the Preferred Alternative construction limits will be conducted during the appropriate flowering season within two (2) years prior to project construction. If a population of the species is found, the NCDOT will enter into Section 7 consultation with the US Fish and Wildlife Service.

Action: *Surveys for Schweinitz's sunflower were completed in the project study area on September 29, 2011, and on September 11, 13, and 23 in 2013 and September 17, 2014.* ***Surveys were updated on September 15, 2015. Surveys of additional service roads added during project development were surveyed, with USFWS consent, on March 5 and 7, 2016.*** *No populations of Schweinitz's sunflower were discovered in the project study area.*

The Mitigation Plan for jurisdictional impacts to streams and wetlands will be developed by the NCDOT during the Section 404/Section 401 permit application processes. As required by the NEPA process and the ACOE/EPA Section 404 B1 Guidelines, to offset potential wetland and stream impacts, NCDOT will investigate the potential for on-site mitigation. Once on-site opportunities are exhausted, compensatory mitigation will be provided by the NCDENR Ecosystem Enhancement Program pursuant to the tri-party Memorandum of Agreement between USACE, NCDENR, and NCDOT (July 2003).

Action: *NCDEQ Division of Mitigation Services has issued acceptance letters for providing compensatory mitigation.*

The NCDOT will coordinate with the City of Asheboro regarding the proposed greenway crossing at Vestal Creek which is part of the proposed Zoo Greenway from the Asheboro YMCA to the NC Zoological Park. Cooridination will be conducted to ensure that the design plans for the bypass will accommodate the greenway.

Action: *Based on the City of Asheboro's greenway plan, the proposed structures at both Little River and Vestal Creek will be designed to accommodate a future 15-foot greenway underneath the structure.*

The NCDOT committed to maintaining trees along the southeast edge of the historic Cox-Brown Farm property and extending a tree line along a new ramp and right-of-way line, to visually shield the historic property from the view of bypass Alternatives 1, 2, 13, and 14.

Action: *Alternative 29 was selected as the Preferred Alternative. It is located nearly one mile south of the Cox-Brown Farm. None of the trees on the farm or in the adjacent wooded tract will be affected by the project. Therefore, selection of Alternative 29 fulfills this project commitment.*

Anoise attenuation barrier was determined to be reasonable and feasible at the residential area along Twelve Tree Road adjacent to the US 220 Bypass. A final decision on the installation of noise abatement measures will be made upon completion of the final roadway design and design public hearing for the project.

Action: *Design noise report was completed April 29, 2014; a noise wall barrier along Twelve Tree Road adjacent to US 220 Bypass will be incorporated in the roadway design plans.*

As stipulated in a triparty Memorandum of Agreement (MOA) between the NCDOT, the FHWA, and the HPO, Data Recovery Plans will be prepared for archaeological sites 31RD1398, 31RD1399, and 31RD1426/1426** (** denotes historic component) and submitted to the State Historic Preservation Office for review. The NCDOT will ensure that each Data Recovery Plan is implemented after right-of-way is acquired or once right-of-entry is secured from property owners and prior to construction activities within the site locations. The NCDOT will abide by all other stipulations pertaining to the data recovery efforts listed in the MOA signed by the NCDOT on June 26, 2006.

Action: *Draft Data Recovery Plans are complete and ready for submittal to the State Historic Preservation Office (SHPO) for review and approval. NCDOT will ensure that each Data Recovery Plan is implemented after right-of-way is acquired or once right-of-entry is secured from property owners and prior to construction activities within the site locations. A new MOA was executed on January 20, 2012 containing the same seven stipulations of the original MOA from 2006, but removing the expiration date.*

The proposed crossing of North Prong of Richland Creek by the Zoo Connector (new location alignment) will use a double barrel 14’x10’ reinforced concrete box culvert (RCBC), which is equal in size to the adjacent downstream culverts conveyed under existing NC 159 for the North prong of Richland Creek. The box culvert will be used in lieu of the originally proposed bridge, as discussed at the February 18, 2015 Merger Meeting.

Action: *This commitment has been fulfilled and included in the current design.*

Roadway Design Unit, Division 8, and Roadside Environmental Unit, NES

To avoid downstream impacts to the Cape Fear Shiner due to sedimentation, in-stream construction in all tributaries of the Deep River, including Richland, Vestal, Squirrel, Gabriel's Creeks, Tantraugh Branch, and their tributaries should be avoided to the extent practicable. Where in-stream construction is unavoidable, the following measures will be implemented to ensure protection for all aquatic resources occurring downstream:

1. Installation of in-stream silt curtains weighted at the bottom, and stringent bank erosion control;
2. If tree removal is required, stumps and roots should remain intact for bank stabilization;
3. In-stream construction activities will be initiated only during low flow conditions that permit the effective deployment of the silt curtains; and,
4. In-stream construction activities will be avoided during the Cape Fear Shiner spawning period (between April 1 and June 30).

Action: *The U.S. Fish and Wildlife Service issued concurrence that this project will have No Effect on any Cape Fear Shiner populations in a letter dated October 22, 2013 based on a lack of suitable habitat. Additionally, the U.S. Fish and Wildlife Service in 2014 indicated that coordination with them on the Cape Fear Shiner is no longer required.*

Two wildlife crossings, 30-feet in width, will be constructed under each of the dual bridges proposed over Little River, Vestal Creek, and North Prong Richland Creek. Appropriate fencing will be constructed to direct wildlife to the crossings.

Action: *The bridges on the US 64 Bypass over Little River and Vestal Creek shall be of sufficient length and span arrangement to span the waterway and provide 60-feet on the west side of both waterways from the top of the bank to the toe of fill slope and provide 30-feet on the east side of both waterways from the top of the bank to the toe of fill slope. On each side of both waterways, 30-feet shall be provided for wildlife passage. The additional 30-feet on the west side of both waterways provide a 15-foot buffer between the 30-feet wildlife passage and a future 15-foot greenway. The minimum vertical clearance for both bridges shall be 10 feet above the existing natural ground surface. Fencing will not be required; however standard Right-of-Way fencing may be used per NCDOT policy. Wildlife crossing are no longer included at North Prong Richland Creek.*

Roadway Design Unit, Roadside Environmental Unit, and Structures Design Unit

The NCDOT will continue to work with the North Carolina Zoological Park to ensure the Zoo Connector and associated structures are designed to contribute aesthetically to the entrance to the North Carolina Zoological Park.

Action: *This coordination will be conducted during the final design and construction by the NCDOT.*

COMMITMENTS FROM PERMITTING

Division 8, Structures Design Unit, Hydraulics Unit

404 Condition #16:
A. Unless otherwise requested in the applicant's application and depicted on the approved work plans, for perennial streams, culverts greater than 48 inches in diameter will be buried at least one foot below the bed of the stream. For perennial streams, culverts 48 inches in diameter and less shall be buried or placed on the stream bed as practicable and appropriate to maintain aquatic passage, and every effort shall be made to maintain existing channel slope. The bottom of the culvert must be placed at a depth below the natural stream bottom to provide for passage during drought or low flow conditions. Destabilizing the channel and head cutting upstream should be considered in the placement of the culvert. Culverts do not need to be buried if they meet any of the following three (3) criteria:

1. The pipe or culvert is 250 feet in length or greater.
2. The pipe or culvert is installed on a greater than 3%.
3. If the stream is intermittent.

B. Measures will be included in the construction/installation that will promote the safe passage of fish and other aquatic organisms. The dimension, pattern, and profile of the stream above and below a pipe or culvert should not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed opening should be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. Spring flow should be determined from gauge data, if available. In the absence of such data, bankfull flow can be used as a comparable level.

Human Environment Unit

404 Condition #21:
The Permittee shall fully implement the Memorandum of Agreement between the Permittee, the North Carolina State Historic Preservation Officer and The Federal

Highway Administration, dated January 20, 2012, which is incorporated herein by reference. Additional archaeological surveys will be conducted at locations resulting from refinements in design that were not included in the original 2006 archaeological survey Area of Potential Effects (APE). The NCDOT Archaeology Group will work in consultation with HPO and OSA to identify any NRHP-eligible resources within the updated APE and document the potential for adverse effects. If any additional NRHP-eligible sites will be adversely effected and cannot be avoided, the NCDOT Archaeology Group will also develop a Data Recovery Plan to mitigate adverse effects due to the design modifications. If needed, the NCDOT Archaeology Group will coordinate with FHWA, HPO, and OSA to discuss a potential amendment to the January 20, 2012 Memorandum of Agreement (MOA) to address any newly-identified NRHP-eligible archaeological sites adversely effected by the design modifications. In addition, the Data Recovery Plan/or archaeological site 31RD1398 will be updated to reflect the design modification for Staleys Farm Road (Site 6), if needed The NCDOT will ensure that each Data Recovery Plan is implemented after right-of-way is acquired or once right-of-entry is secured from property owners and prior to construction activities within the site locations. The NCDOT will abide by all other stipulations pertaining to the data recovery efforts listed in the MOA signed by the NCDOT on January 20, 2012.

Division 8, Roadside Environmental Unit, Natural Environment Unit

401 Condition #17:
Due to the possibility that compaction and/or other site alterations might prevent the temporary wetland impact area from re-attaining jurisdictional wetland status; the permittee shall provide an update on the wetland areas temporarily impacted at Sites 25, 92, and 93. This update shall be conducted two growing seasons after completion of the work and shall consist of photographs and a brief report on the progress of the areas in re-attaining wetland jurisdictional status. Upon submission of this update to the NCDWR, the permittee shall schedule an agency field meeting with the NCDWR to determine if the wetland areas temporarily impacted by this project have re-attained jurisdictional wetland status. If the wetland areas temporarily impacted by this project have not re-attained jurisdictional wetland status, the NCDWR shall determine if compensatory wetland mitigation is required.

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

22 July 2016

Regulatory Division/1200A

Action ID: SAW-2002-01260

Mr. Philip S. Harris III
Natural Environment Section Head
NC Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Mr. Harris:

In accordance with the written request of May 24, 2016, and the ensuing administrative record, enclosed is a Department of the Army (DA) Permit to authorize the following: 1) Permanent placement of fill material into 31,992 linear feet of jurisdictional stream channel, 6.44 acres of adjacent riparian wetlands, 10.55 acres of jurisdictional open waters and, 2) Temporary placement of fill material into 2,841 linear feet of jurisdictional stream channel and 2.22 acres adjacent wetlands. These impacts are associated with the construction of a 16.4 mile, four-lane divided facility on new location, including improvements to the US 64 corridor and an upgraded, 1.8 mile, two-lane parkway access to the North Carolina Zoological Park (Zoo). The project is identified as R-2536. The project site begins immediately east of the Back Creek Road, US 64 intersection and extends to immediately west of the Loflin Pond Road, US 64 intersection. The proposed Zoo connector extends from east of Staley's Farm Road (SR 2839) to the existing NC 159/Zoo entrance, in Asheboro, Randolph County, North Carolina.

Any deviation in the authorized work will likely require modification of this permit. If a change in the authorized work is necessary, you should promptly submit revised plans to the Corps showing the proposed changes. You may not undertake the proposed changes until the Corps notified you that your permit has been modified.

Carefully read your permit. The general and special conditions are important. Your failure to comply with these conditions could result in a violation of Federal law. Certain significant general conditions require that:

a. You must complete construction before December 31, 2021.

b. You must notify this office in advance as to when you intend to commence and complete work.

c. You must allow representatives from this office to make periodic visits to your worksite as deemed necessary to assure compliance with permit plans and conditions.

You should address all questions regarding this authorization to Mr. Andrew Williams, in the Raleigh Regulatory Field Office, telephone number (919) 554-4884, extension 26.

Thank you in advance for completing our Customer Survey Form. This can be accomplished by visiting our web-site at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0 and completing the survey on-line. We value your comments and appreciate your taking the time to complete a survey each time you interact with our office.

Sincerely,

for / Kevin P. Landers Sr.
Colonel, U.S. Army
District Commander

Enclosures

Copy Furnished (with enclosures):

Chief, Source Data Unit
NOAA/National Ocean Service
Attn: Sharon Tear N/CS261
1315 East-West Hwy., Rm 7316
Silver Spring, Maryland 20910-3282

Copies Furnished with special conditions and plans:

Mr. Pete Benjamin
U.S. Fish and Wildlife Service
Raleigh Ecological Service Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

Mr. Fritz Rohde
Habitat Conservation Division – Atlantic Branch
101 Pivers Island Road
Beaufort, North Carolina 28516

Mr. Todd Bowers
Oceans, Wetlands and Streams Protection Branch
Wetlands and Streams Regulatory Section
U.S. Environmental Protection Agency – Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303-8931

Mr. Doug Huggett
Division Coastal Management
N.C. Department of Environment and Natural Resources
400Commerce Avenue
Morehead City, North Carolina 28557

Dr. Pace Wilber
Habitat Conservation Division – Atlantic Branch
NOAA Fisheries Service
219 Fort Johnston Road
Charleston, South Carolina 29412

DEPARTMENT OF THE ARMY PERMIT

Permittee: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION—ATTN: MR. PHILIP S. HARRIS, III

Permit No: SAW-2002-01260

Issuing Office: USAED, WILMINGTON

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of the office acting under the authority of the commanding officer.

You are authorized to perform work in the accordance with the terms and conditions specified below.

Project Description: The project, identified as R-2536, consists of the construction of a 16.4 mile, four-lane divided facility on new location and includes improvements to the US 64 corridor in Asheboro and upgraded, 1.8 mile, two-lane parkway access to the North Carolina Zoological Park (Zoo). R-2536 begins immediately east of the Back Creek Road, US 64 intersection and extends to immediately west of the Loflin Pond Road, US 64 intersection. The proposed Zoo connector extends from east of Staley's Farm Road (SR 2839) to the existing NC 159/Zoo entrance, in Asheboro, Randolph County, North Carolina. Total permanent impacts for the construction of this project are 31,992 linear feet of jurisdictional stream channel, 6.44 acres of adjacent wetlands and 10.55 acres of jurisdictional open waters. Total temporary impacts for the construction of this project are 2,841 linear feet of jurisdictional stream channel and 2.22 acres of adjacent wetlands. All impacts are located within three (3) different, 8-Digit Cataloging Units (Yadkin 03040103, Yadkin 03040104 and Cape Fear 03030003).

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

Project Location: The project, identified as R-2536 begins immediately east of the Back Creek Road, US 64 intersection and extends to immediately west of the Loflin Pond Road, US 64 intersection. The proposed Zoo connector extends from east of Staley's Farm Road (SR 2839) to the existing NC 159/Zoo entrance, in Asheboro, Randolph County, North Carolina. Coordinates (in decimal degrees) for the site are as follows: Begin Project- 35.7060N, -79.8849W; End Project- 35.7252N, -79.7361W; Southern Terminus, Zoo Connector- 35.6323N, -79.7793W (NAD83/WGS84).

Permit Conditions:

General Conditions:

1. The time Limit for completing the work authorized ends on December 31, 2021. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Conditions 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

*SEE ATTACHED SPECIAL CONDITIONS

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S. C. 403).

(X) Section 404 of the clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United states in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

 *U.S. GOVERNMENT PRINTING OFFICE: 1986 – 717-425

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was mad in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measure by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

07/22/2016

(PERMITTEE) NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
ATTN: PHILIP S. HARRIS, III

(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

for

22 July 2016

(DISTRICT COMMANDER) KEVIN P. LANDERS SR., COLONEL

(DATE)

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(Transferee) **(Date)**

 ***U.S. GOVERNMENT PRINTING OFFICE: 1986 – 717-425**

SPECIAL CONDITIONS
ACTION ID: SAW-2002-01260
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION R-2536

WORK LIMITS

1. **CONSTRUCTION PLANS:** All work authorized by this permit must be performed in strict compliance with the attached plans for R-2536 dated March 24, 2016 (Sheets 2,3,4,22,41,42,56,57,61,62,63,77,78,81, 82, 87,88,94,95, 96,118,121, 129,130,131,132,133, 134, 135,136,137,138,139 were revised on June 14, 2016), which are a part of this permit. Any modification to these plans must be approved by the US Army Corps of Engineers (USACE) prior to implementation.

2.UNAUTHORIZED DREDGE OR FILL: Except as authorized by this permit or any USACE approved modification to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, within waters or wetlands. This permit does not authorize temporary placement or double handling of excavated or fill material within waters or wetlands outside the permitted area. This prohibition applies to all borrow and fill activities connected with this project.

3. MAINTAIN CIRCULATION AND FLOW OF WATERS: Except as specified in the plans attached to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, in such a manner as to impair normal flows and circulation patterns within waters or wetlands or to reduce the reach of waters or wetlands.

4. DEVIATION FROM PERMITTED PLANS: Except as authorized by this permit or any USACE approved modification to this permit, no excavation, fill, or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, within waters or wetlands, or shall any activities take place that cause the degradation of waters or wetlands. There shall be no excavation from, waste disposal into, or degradation of, jurisdictional wetlands or waters associated with this permit without appropriate modification of this permit, including appropriate compensatory mitigation. This prohibition applies to all borrow and fill activities connected with this project. In addition, except as specified in the plans attached to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, in such a manner as to impair normal flows and circulation patterns within, into, or out of waters or wetlands or to reduce the reach of waters or wetlands.

5. PRECONSTRUCTION MEETING: The permittee shall schedule and attend a preconstruction meeting between its representatives, the contractors representatives, and the Corps of Engineers, Raleigh Field Office, NCDOT Regulatory Project Manager, prior to any work within jurisdictional waters and wetlands to ensure that there is a mutual understanding of all the terms and conditions contained with this Department of Army Permit. The permittee shall provide the USACE, Raleigh Field Office, NCDOT Project Manager, with a copy of the final permit plans at least two weeks prior to the preconstruction meeting along with a description of any changes that have been made to the project's design, construction methodology or construction timeframe. The permittee shall schedule the preconstruction meeting for a time frame when the USACE, North Carolina Division of Coastal Management (NCDCM), and NCDWR Project Managers can attend. The permittee shall invite the Corps, NCDCM, and NCDWR Project Managers a minimum of thirty (30) days in advance of the scheduled meeting in order to provide those individuals with ample opportunity to schedules and participate in the required meeting.

RELATED LAWS

6. WATER CONTAMINATION: All mechanized equipment will be regularly inspected and maintained to prevent contamination of waters and wetlands from fuels, lubricants, hydraulic fluids, or other toxic materials. In the event of a spill of petroleum products or any other hazardous waste, the permittee shall immediately report it to the N.C. Division of Water Quality at (919) 733-3300 or (800) 858-0368 and provisions of the North Carolina Oil Pollution and Hazardous Substances Control Act will be followed.

SPECIAL CONDITIONS
ACTION ID: SAW-2002-01260
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION R-2536

PROJECT MAINTENANCE

7. NOTIFICATION OF CONSTRUCTION COMMENCEMENT AND COMPLETION: The permittee shall advise the Corps in writing prior to beginning the work authorized by this permit and again upon completion of the work authorized by this permit.

8. CLEAN FILL: Unless otherwise authorized by this permit, all fill material placed in waters or wetlands shall be generated from an upland source and will be clean and free of any pollutants except in trace quantities. Metal products, organic materials (including debris from land clearing activities), or unsightly debris will not be used. Soils used for fill shall not be contaminated with any toxic substance in concentrations governed by Section 307 of the Clean Water Act.

9. PERMIT DISTRIBUTION: The permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit. A copy of this permit, including all conditions, shall be available at the project site during construction and maintenance of this project.

10. SILT-FENCING: The permittee shall employ all sedimentation and erosion control measures necessary to prevent an increase in sedimentation or turbidity within waters and wetlands outside the permit area. This shall include, but is not limited to, the immediate installation of silt fencing or similar appropriate devices around all areas subject to soil disturbance or the movement of earthen fill, and the immediate stabilization of all disturbed areas. Additionally, the project must remain in full compliance with all aspects of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statutes Chapter 113A Article 4).

11. PERMIT REVOCATION: The permittee, upon receipt of a notice of revocation of this permit or upon its expiration before completion of the work will, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the water or wetland to its pre-project condition.

12. EROSION CONTROL MEASURES IN WETLANDS: The permittee shall remove all sediment and erosion control measures placed in wetlands or waters, and shall restore natural grades in those areas, prior to project completion.

ENFORCEMENT

13. REPORTING ADDRESS: All reports, documentation and correspondence required by the conditions of this permit shall be submitted to the following address: U.S. Army Corps of Engineers, Regulatory Division, Raleigh Regulatory Field Office, c/o Mr. Andrew Williams, 3331 Heritage Trade Drive, Wake Forest, NC 27587, and by telephone at: 919-554-4884 extension 26. The Permittee shall reference the following permit number, SAW-2001-21125, on all submittals.

14. REPORTING VIOLATIONS OF THE CLEAN WATER ACT AND RIVERS AND HARBORS ACT: Violation of these conditions or violation of Section 404 of the Clean Water Act of Section 10 of the Rivers and Harbors Act must be reported in writing to the Wilmington District U.S. Army Corps of Engineers within 24 hours of the permitee's discovery of the violation.

15. COMPLIANCE INSPECTION: A representative of the Corps of Engineers will periodically and randomly inspect the work for compliance with these conditions. Deviations from these procedures may result in an administrative financial penalty and/or directive to cease work until the problem is resolved to the satisfaction of the Corps.

SPECIAL CONDITIONS
ACTION ID: SAW-2002-01260
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION R-2536

16. CULVERTS:

A. Unless otherwise requested in the applicant's application and depicted on the approved work plans, for perennial streams, culverts greater than 48 inches in diameter will be buried at least one foot below the bed of the stream. For perennial streams, culverts 48 inches in diameter and less shall be buried or placed on the stream bed as practicable and appropriate to maintain aquatic passage, and every effort shall be made to maintain existing channel slope. The bottom of the culvert must be placed at a depth below the natural stream bottom to provide for passage during drought or low flow conditions. Destabilizing the channel and head cutting upstream should be considered in the placement of the culvert. Culverts do not need to be buried if they meet any of the following three (3) criteria:

1. The pipe or culvert is 250 feet in length or greater.
2. The pipe or culvert is installed on a greater than 3%.
3. If the stream is intermittent.

B. Measures will be included in the construction/installation that will promote the safe passage of fish and other aquatic organisms. The dimension, pattern, and profile of the stream above and below a pipe or culvert should not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed opening should be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. Spring flow should be determined from gauge data, if available. In the absence of such data, bankfull flow can be used as a comparable level.

17. SEDIMENT EROSION CONTROL:

A. During the clearing phase of the project, heavy equipment must not be operated in surface waters or stream channels. Temporary stream crossings will be used to access the opposite sides of stream channels. All temporary diversion channels and stream crossings will be constructed of non-erodible materials. Grubbing of riparian vegetation will not occur until immediately before construction begins on a given segment of stream channel.

B. No fill or excavation impacts for the purposes of sedimentation and erosion control shall occur within jurisdictional waters, including wetlands, unless the impacts are included on the plan drawings and specifically authorized by this permit.

C. The permittee shall use appropriate sediment and erosion control practices which equal or exceed those outlined in the most recent version of the "North Carolina Sediment and Erosion Control Planning and Design Manual" to assure compliance with the appropriate turbidity water quality standard. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to assure compliance with the appropriate turbidity water quality standards. This shall include, but is not limited to, the immediate installation of silt fencing or similar appropriate devices around all areas subject to soil disturbance or the movement of earthen fill, and the immediate stabilization of all disturbed areas. Additionally, the project must remain in full compliance with all aspects of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statutes Chapter 113A Article 4). Adequate sedimentation and erosion control measures must be implemented prior to any ground disturbing activities to minimize impacts to downstream aquatic resources. These measures must be inspected and maintained regularly, especially following rainfall events. All fill material must be adequately stabilized at the earliest practicable date to prevent sediment from entering into adjacent waters or wetlands.

SPECIAL CONDITIONS
ACTION ID: SAW-2002-01260
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION R-2536

18. TEMPORARY FILLS: Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

19. BORROW AND WASTE: To ensure that all borrow and waste activities occur on high ground and do not result in the degradation of adjacent wetlands and streams, except as authorized by this permit, the permittee shall require its contractors and/or agents to identify all areas to be used to borrow material, or to dispose of dredged, fill, or waste material. The permittee shall provide the USACE with appropriate maps indicating the locations of proposed borrow or waste sites as soon as the permittee has that information. The permittee will coordinate with the USACE before approving any borrow or waste sites that are within 400 feet of any streams or wetlands. All jurisdictional wetland delineations on borrow and waste areas shall be verified by the Corps of Engineers and shown on the approved reclamation plans. The permittee shall ensure that all such areas comply with the Special Condition 4 of this permit and shall require and maintain documentation of the location and characteristics of all borrow and disposal sites associated with this project. This documentation will include data regarding soils, vegetation and hydrology sufficient to clearly demonstrate compliance with Special Condition 4. All information will be available to the Corps of Engineers upon request. The permittee shall require its contractors to complete and execute reclamation plans for each waste and borrow site and provide written documentation that the reclamation plans have been implemented and all work is completed. This documentation will be provided to the Corps of Engineers within 30 days of the completion of the reclamation work.

20. MITIGATION: In Lieu Fee: In order to compensate for impacts associated with this permit, mitigation shall be provided in accordance with the provisions outlined on the most recent version of the three (3) attached Compensatory Mitigation Responsibility Transfer Forms. The requirements of these forms, including any special conditions listed on this form, are hereby incorporated as special conditions of this permit authorization.

21. CULTURAL AND HISTORIC RESOURCES: The Permittee shall fully implement the Memorandum of Agreement between the Permittee, the North Carolina State Historic Preservation Officer and The Federal Highway Administration, dated January 20, 2012, which is incorporated herein by reference. Additional archaeological surveys will be conducted at locations resulting from refinements in design that were not included in the original 2006 archaeological survey Area of Potential Effects (APE). The NCDOT Archaeology Group will work in consultation with HPO and OSA to identify any NRHP-eligible resources within the updated APE and document the potential for adverse effects. If any additional NRHP-eligible sites will be adversely effected and cannot be avoided, the NCDOT Archaeology Group will also develop a Data Recovery Plan to mitigate adverse effects due to the design modifications. If needed, the NCDOT Archaeology Group will coordinate with FHWA, HPO, and OSA to discuss a potential amendment to the January 20, 2012 Memorandum of Agreement (MOA) to address any newly-identified NRHP-eligible archaeological sites adversely effected by the design modifications. In addition, the Data Recovery Plan/or archaeological site 31RD1398 will be updated to reflect the design modification for Staleys Farm Road (Site 6), if needed The NCDOT will ensure that each Data Recovery Plan is implemented after right-of-way is acquired or once right-of-entry is secured from property owners and prior to construction activities within the site locations. The NCDOT will abide by all other stipulations pertaining to the data recovery efforts listed in the MOA signed by the NCDOT on January 20, 2012.

22. THREATENED AND ENDANGERED SPECIES: The U.S. Fish and Wildlife Service's (USFWS's) Programmatic Biological Opinion (BO) titled "Northern Long-eared Bat (NLEB) Programmatic Biological Opinion for North Carolina Department of Transportation (NCDOT) Activities in Eastern North Carolina (Divisions 1-8)," dated March 25, 2015, and adopted on April 10, 2015, contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that are specified in the BO. As such, this permit verification contains a special condition requiring compliance with all the mandatory terms and conditions (incorporated by reference into this permit verification) associated with incidental take of the BO. Reasonable and prudent measures are actions necessary to minimize the impacts of incidental take that is anticipated to result from implementing the project that the Service regarded as not likely to jeopardize the species or adversely modify designated critical habitat.

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

Permittee: NCDOT/Mr. Philip Harris
Project Name: NCDOT/R-2536/US 64 Bypass/Division 8

Action ID: SAW-2002-01260
County: Randolph

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

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

Permitted Impacts and Compensatory Mitigation Requirements:

Permitted Impacts Requiring Mitigation* **8-digit HUC and Basin:** 03030003, Cape Fear River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
14,259			2.98			

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

Compensatory Mitigation Requirements: **8-digit HUC and Basin:** 03030003, Cape Fear River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
26,385			5.96			

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

Section to be completed by the Mitigation Sponsor

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

Mitigation Sponsor Name: NCDEQ DMS

Name of Sponsor's Authorized Representative: Beth Harmon

Beth Harmon
Signature of Sponsor's Authorized Representative

08/08/2016
Date of Signature

USACE Wilmington District
Compensatory Mitigation Responsibility Transfer Form, Page 2

Conditions for Transfer of Compensatory Mitigation Credit:

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

Comments/Additional Conditions:

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

USACE Project Manager: Andy Williams
USACE Field Office: Raleigh Regulatory Field Office
US Army Corps of Engineers
3331 Heritage Trade Drive, Suite 105
Wake Forest, North Carolina 27587
Email: andrew.e.williams2@usace.army.mil

Andrew Williams
USACE Project Manager Signature

July 20, 2016
Date of Signature

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

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the Customer Satisfaction Survey located at our website at http://regulatory.usacesurvey.com/ to complete the survey online.

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

Permittee: NCDOT/Mr. Philip Harris
Project Name: NCDOT/R-2536/US 64 Bypass/Division 8

Action ID: SAW-2002-01260
County: Randolph

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

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Permitted Impacts and Compensatory Mitigation Requirements:

Permitted Impacts Requiring Mitigation* **8-digit HUC and Basin:** 03040103, Yadkin River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
11,650			1.24			

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

Compensatory Mitigation Requirements: **8-digit HUC and Basin:** 03040103, Yadkin River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
23,042			2.48			

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

Section to be completed by the Mitigation Sponsor

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Mitigation Sponsor Name: NCDEQ DMS

Name of Sponsor's Authorized Representative: Beth Harmon

Beth Harmon — 08/03/2016

Signature of Sponsor's Authorized Representative — **Date of Signature**

USACE Wilmington District
Compensatory Mitigation Responsibility Transfer Form, Page 2

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US Army Corps of Engineers
3331 Heritage Trade Drive, Suite 105
Wake Forest, North Carolina 27587
Email: andrew.e.williams2@usace.army.mil

Andrew Williams
USACE Project Manager Signature

July 20, 2016
Date of Signature

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

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

Permittee: NCDOT/Mr. Philip Harris **Action ID:** SAW-2002-01260
Project Name: NCDOT/R-2536/US 64 Bypass/Division 8 **County:** Randolph

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

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Permitted Impacts and Compensatory Mitigation Requirements:

Permitted Impacts Requiring Mitigation* **8-digit HUC and Basin:** 03040104, Yadkin River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
6,083			2.21			

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

Compensatory Mitigation Requirements: **8-digit HUC and Basin:** 03040104, Yadkin River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
11,836			4.42			

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

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Mitigation Sponsor Name: NCDEQ DMS

Name of Sponsor's Authorized Representative: Beth Harmon

Beth Harmon — 08/03/2016
Signature of Sponsor's Authorized Representative — **Date of Signature**

USACE Wilmington District
Compensatory Mitigation Responsibility Transfer Form, Page 2

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Comments/Additional Conditions:

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USACE Project Manager: Andy Williams
USACE Field Office: Raleigh Regulatory Field Office
US Army Corps of Engineers
3331 Heritage Trade Drive, Suite 105
Wake Forest, North Carolina 27587
Email: andrew.e.williams2@usace.army.mil

Andrew Williams
USACE Project Manager Signature

July 20, 2016
Date of Signature

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

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the Customer Satisfaction Survey located at our website at http://regulatory.usacesurvey.com/ to complete the survey online.

Water Resources
ENVIRONMENTAL QUALITY

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

S. JAY ZIMMERMAN
Director

June 20, 2016

Mr. Philip S. Harris, III, P.E., CPM
Natural Environment Section Head
Project Development and Environmental Analysis
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina, 27699-1598

Subject: Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS for the proposed Asheboro Southern Bypass and Zoo Connector in Randolph County; TIP Project No. R-2536, WBS Element 34450.3.S1.
NCDWR Project No. 20160299

Dear Mr. Harris:

Attached hereto is a modification of Certification No. 4059 issued to The North Carolina Department of Transportation (NCDOT) dated May 20, 2016. This modification only addresses changes in the assignment of stream impacts at sites 44, 45A, 45B, 46, 47A, and 47B to the correct river basin (Yadkin River Basin). No changes in overall impact totals have occurred.

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

Sincerely,

S. Jay Zimmerman, Director
Division of Water Resources

Attachments

Electronic copy only distribution:
Andy Williams, US Army Corps of Engineers, Raleigh Field Office
Art King, Division 8 Environmental Officer
Rodger Rochelle, NC Department of Transportation
Chris Rivenbark, NC Department of Transportation
Dr. Cynthia Van Der Wiele, US Environmental Protection Agency
Gary Jordan, US Fish and Wildlife Service
Travis Wilson, NC Wildlife Resources Commission
Beth Harmon, Division of Mitigation Services
Brian Wrenn, NC Division of Water Resources
File Copy

401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Resources (NCDWR) Regulations in 15 NCAC 2H .0500. This certification authorizes the NCDOT to impact 8.66 acres of jurisdictional wetlands, 34,834 linear feet of jurisdictional streams and 10.69 acres of open water (ponds) in Randolph County. The project shall be constructed pursuant to the application dated received March 24, 2016 and additional information dated received May 19, 2016 and June 10, 2016. The authorized impacts are as described below:

Table 1. Stream Impacts.

Site Number	Permit Drawing Number	Surface Water Site Code	Permanent Fill in Surface Water (linear ft)	Temporary Fill in Surface Water (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
Yadkin River Basin						
1A, 1B	5	SB-AA	237	22	259	-
2	8	SD-AA	523	11	534	-
3	12	SAA-AA	205	14	219	-
5	12	SM-AA	258	25	283	-
4A	12	SE-AA	69	10	79	-
4B	12	SE-AA	563	-	563	-
4C	12	SE-AA*	795	20	815	795
4D	12	SE-AA*	11	21	32	11
4E	12	SE-AA*	753	10	763	753
6A, 6B, 6C	12	SZZ-AA	651	40	691	-
18A, 18B, 18C	23	SH-AA	419	32	451	-
19	25	SK-AA*	312	20	332	312
7	20	SG-AA*	1,354	20	1,375	1,354
8	31	SJ-AA	267	10	277	-
9	31	SO-AB/SI-AA*	1,091	21	1,112	1,091
21	53	SO-AB/SI-AA*	547	27	574	547
22	56	SM-AB*	585	33	618	585
10	37	SM-AB*	759	49	808	759
11	37	SL-AB	378	10	388	-
13	44	SK-AB*	782	22	804	782
14	44	SI-AB*	84	10	94	-
15	44	SJ-AB	322	36	358	-
16	49	SF-AB*	564	27	591	564
17	49	SH-AB	121	-	121	-
23A, 23B	64	SC-AB*	10	38	48	10
23D, 23E	66	SA-AB*	906	30	935	906
24	66	SB-AB*	86	-	86	-
26	70	Little River*	53	40	93	-
27	75	SR-B	982	11	993	-
29	77	SW-B	971	13	984	-
30	77	SZ-B*	1,161	26	1187	1,161
48	119	SAA-B*	334	21	355	334
49	119	SWW-B	100	10	110	-
28	77	SWW-B	520	10	530	-

Table 1. Stream Impacts.

Site Number	Permit Drawing Number	Surface Water Site Code	Permanent Fill in Surface Water (linear ft)	Temporary Fill in Surface Water (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
47B	116	SU-B*	163	14	177	163
46	116	SV-B*	23	11	34	-
47A	116	SU-B*	77	10	87	77
45A	114	ST-B	202	16	218	-
45B	114	ST-B	264	13	277	-
44	112	SS-B	231	26	257	-
Cape Fear River Basin						
31	83	SBB-B	330	13	343	-
32	83	SCC-B	148	10	158	-
33	87	SDD-B*	551	29	580	551
34	89	SEE-B*	535	29	564	535
35	89	SHH-B*	443	21	464	443
36	89	SGG-B*	581	-	581	581
37A, 37B	94	SQQ-B	101	70	171	-
104	94	SPP-B	345	49	394	-
38B	94	SII-B*	481	21	502	481
40	103	SKK-B*	534	22	556	534
39	103	SNN-B	3	11	14	-
41	103	SLL-B*	352	12	364	352
43A	108	SB-C*	4	15	19	4
43C	110	SC-C*	85	10	95	85
57/58A	110	SD-C*	888	12	900	888
50	123	SKK-D	36	20	56	-
52	127	SH-D	442	15	457	-
56A,56B,56C,56D	135	SC/SD-D	921	41	962	-
53	129	SG-D	327	21	348	-
55	132	SF-D	401	21	422	-
59	150	SG-C*	5	88	93	5
60	150	SF-C*	275	62	337	275
61	150	SE-C	274	10	284	-
62/63	156	SH-C*	290	163	453	290
64	160	SI-C	423	10	433	-
64	160	SYY-C	38	29	67	-
65	165	SJ-C*	339	86	425	339
66/67/68/69	169	SK-C*	297	143	440	297
70	176	SL-C*	360	24	384	360
71	179	SM-C*	402	35	437	402
72	179	SN-C*	716	66	782	716
73	186	SO-C	164	30	194	-
74	189	SQ-C*	306	130	436	306
75	189	SS-C*	277	48	325	277
76/76A/78/82	193	SV-C	649	20	669	-
85	206	SX-C*	318	101	419	318

Table 1. Stream Impacts.

Site Number	Permit Drawing Number	Surface Water Site Code	Permanent Fill in Surface Water (linear ft)	Temporary Fill in Surface Water (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
101/102/103	244	SBB-C/SAA-C*	153	77	230	153
86	221	SNN-C*	461	120	581	461
87	213	SCC/SEE-C*	146	66	212	-
97/98	235	SFF/SKK-C	240	92	332	-
96	235	SMM-C	124	18	142	-
100	239	SGG-C	227	11	238	-
94	221	SNN-C*	178	105	283	178
89	221	SNN-C*	57	31	88	57
90	221	SNN-C*	20	32	52	20
91	221	SNN-C*	13	23	36	13
Total	-	-	**31,993**	**2,841**	**34,834**	**19,125**

Notes: * indicates that stream is perennial.

Table 2. Wetland Impacts.

Site	Plan Sheet	Wetland Site Code	Permanent Fill (ac)	Temporary Fill (ac)	Mechanized Clearing (ac)	Excavation (ac)	Hand Clearing (ac)
Yadkin River Basin							
2	8	WYZ-AA	0.09	-	-	-	-
2	8	WXX-AA	0.03	-	-	-	-
3	14	WB-AA	-	-	<0.01	-	-
6A, 6B	12	WUU-AA	0.33	-	0.02	-	-
19	25	WD-AA	<0.01	-	-	-	-
20	28	WE-AA	0.07	-	-	-	-
8	31	WYY-AA	0.18	-	-	-	-
9	33	WZZ-AA	0.46	-	0.03	-	-
12	41	WH-AB	0.02	-	-	-	-
17	49	WG-AB	<0.01	-	-	-	-
23B	64	WF-AB	0.03	-	<0.01	-	-
23C	66	WE-AB	<0.01	-	-	-	-
23D	66	WA-AB	0.07	-	-	-	-
23D	66	WB-AB	0.04	-	-	-	-
23D	66	WC-AB	<0.01	-	-	-	-
24	66	WD-AB	0.01	-	-	-	-
25	70	WM-AB	0.47	0.18	0.30	-	-
26	70	WN-AB	0.05	-	-	-	-
48	119	WXX-B	0.96	-	0.17	0.09	-
Cape Fear River Basin							
31	83	WP-B	<0.01	-	<0.01	<0.01	-
37B	94	WTT-B	0.02	-	-	-	-
38A, 38C	94	WU-B	1.56	-	0.14	0.03	
38B	94	WU-B	-	-	0.02	<0.01	

Table 2. Wetland Impacts.

Site	Plan Sheet	Wetland Site Code	Permanent Fill (ac)	Temporary Fill (ac)	Mechanized Clearing (ac)	Excavation (ac)	Hand Clearing (ac)
41	103	WPP-B	0.02	-	-	-	-
41	103	WOO-B	0.03	-	-	-	-
52	127	WZZ-D	-	-	<0.01	-	-
54A	132	WD-D	0.02	-	-	-	-
54B	132	WE-D	0.02	-	-	-	-
64	160	WBA-C	0.17	-	-	-	-
71	179	WB-C	<0.01	-	-	-	-
78	193	WJ-C	0.14	-	-	-	-
79	197	WG-C	0.03	-	-	-	-
82	197	WH-C	0.03	-	-	-	-
82	197	WF-C	0.10	-	0.02	0.02	-
83	197	WE-C	0.10	-	-	-	-
81	197	WI-C	<0.01	-	-	0.03	-
85	206	WL-C	0.05	-	0.02	-	-
84	206	WK-C	<0.01	-	-	<0.01	
90	221	WV-C	<0.01	-	-	-	-
88	221	WAA-C	0.12	-	0.07	0.02	
93	221	WW-C	0.03	0.85	0.03	0.02	<0.01
95	221	WTA-C	<0.01	-	-	-	-
92	221	WTA-C	<0.01	0.03	-	0.03	0.02
92	221	WTA-C	-	1.13	-	-	-
86	213	WZ-C	0.03	-	-	-	-
99	239	WT-C	<0.01	-	<0.01	-	-
Total	-	-	**5.35**	**2.19**	**0.84**	**0.25**	**0.03**

Total Wetland Impact for Project: 8.66 acres.

Table 3. Open Water (Ponds) Impacts

Site	Permit Drawing No.	Surface Water Site Code	Permanent Fill in Open Waters (ac)	Temporary Fill in Open Waters (ac)	Total Fill in Open Waters (ac)
Yadkin River Basin					
2	8	PA-AA	1.11	-	1.11
12	41	PB-AB	<0.01	0.15	<0.01
23C	66	PA-AB	0.73	-	0.73
Cape Fear River Basin					
42	108	PG-B	0.21	-	0.21
43B	110	PH-B	0.78	-	0.78
43D	110	PA-C	1.19	-	1.19
58	147	PB-C	2.64	-	2.64
51	125	PA-D	1.18	-	1.18
77	193	PD-C	1.14	-	1.14
76	193	SV-C	1.01	-	1.01
80	193	PE-C	0.56	-	0.56

Table 3. Open Water (Ponds) Impacts

Site	Permit Drawing No.	Surface Water Site Code	Permanent Fill in Open Waters (ac)	Temporary Fill in Open Waters (ac)	Total Fill in Open Waters (ac)
Total	-	-	**10.54**	**0.15**	**10.69**

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

This approval is only valid for the purpose and design that you submitted in your application dated received March 24, 2016 and additional information dated received May 19, 2016 and June 10, 2016. All the authorized activities and conditions of certification associated with the original Water Quality Certification dated May 20, 2016 still apply except where superceded by this certification. Should your project change, you are required to notify the NCDWR and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 150 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Condition(s) of Certification:

Project Specific Conditions

1. This modification is applicable only to the corrections made in river basin assignments. All of the authorized activities and conditions of certification associated with the original Water Quality Certification dated May 20, 2016 still apply except where superseded by this certification.

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

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

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

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

Mr. Sam M. Hayes, General Counsel
Department of Environmental Quality
1601 Mail Service Center

This the 20th day of June 2016

DIVISION OF WATER RESOURCES

S. Jay Zimmerman, Director

WQC No. 4059

Water Resources
ENVIRONMENTAL QUALITY

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

S. JAY ZIMMERMAN
Director

NCDWR Project No.: _____ **County:** _____

Applicant: _____

Project Name: _____

Date of Issuance of 401 Water Quality Certification: _____

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

Applicant's Certification

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

Signature: _____ Date: _____

Agent's Certification

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

Signature: _____ Date:_____

Engineer's Certification

_____ Partial _____ Final

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

Signature _____ Registration No. _____ Date _____

Water Resources
ENVIRONMENTAL QUALITY

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

S. JAY ZIMMERMAN
Director

May 20, 2016

RECEIVED
MAY 25 2016
OFFICE OF NATURAL ENVIRONMENT

Mr. Philip S. Harris, III, P.E., CPM
Natural Environment Section Head
Project Development and Environmental Analysis
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina, 27699-1598

Subject: 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS for the proposed Asheboro Southern Bypass and Zoo Connector in Randolph County; TIP Project No. R-2536, WBS Element 34450.3.S1.
NCDWR Project No. 20160299

Dear Mr. Harris:

Attached hereto is a copy of Certification No. 4059 issued to The North Carolina Department of Transportation (NCDOT) dated May 20, 2016.

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

Sincerely,

Amy Chapman for:

S. Jay Zimmerman, Director
Division of Water Resources

Attachments

Electronic copy only distribution:
- Andy Williams, US Army Corps of Engineers, Raleigh Field Office
- Art King, Division 8 Environmental Officer
- Rodger Rochelle, NC Department of Transportation
- Chris Rivenbark, NC Department of Transportation
- Dr. Cynthia Van Der Wiele, US Environmental Protection Agency
- Gary Jordan, US Fish and Wildlife Service
- Travis Wilson, NC Wildlife Resources Commission
- Beth Harmon, Division of Mitigation Services
- Brian Wrenn, NC Division of Water Resources
- File Copy

401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Resources (NCDWR) Regulations in 15 NCAC 2H .0500. This certification authorizes the NCDOT to impact 8.66 acres of jurisdictional wetlands, 34,834 linear feet of jurisdictional streams and 10.69 acres of open water (ponds) in Randolph County. The project shall be constructed pursuant to the application dated received March 24, 2016 and additional information dated received May 19, 2016. The authorized impacts are as described below:

Table 1. Stream Impacts.

Site Number	Permit Drawing Number	Surface Water Site Code	Permanent Fill in Surface Water (linear ft)	Temporary Fill in Surface Water (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
Yadkin River Basin						
1A, 1B	5	SB-AA	237	22	259	-
2	8	SD-AA	523	11	534	-
3	12	SAA-AA	205	14	219	-
5	12	SM-AA	258	25	283	-
4A	12	SE-AA	69	10	79	-
4B	12	SE-AA	563	-	563	-
4C	12	SE-AA*	795	20	815	795
4D	12	SE-AA*	11	21	32	11
4E	12	SE-AA*	753	10	763	753
6A, 6B, 6C	12	SZZ-AA	651	40	691	-
18A, 18B, 18C	23	SH-AA	419	32	451	-
19	25	SK-AA*	312	20	332	312
7	20	SG-AA*	1,355	20	1,375	1,355
8	31	SJ-AA	267	10	277	-
9	31	SO-AB/SI-AA*	1,091	21	1,112	1,091
21	53	SO-AB/SI-AA*	547	27	574	547
22	56	SM-AB*	585	33	618	585
10	37	SM-AB*	759	49	808	759
11	37	SL-AB	378	10	388	-
13	44	SK-AB*	782	22	804	782
14	44	SI-AB*	84	10	94	-
15	44	SJ-AB	322	36	358	-
16	49	SF-AB*	564	27	591	564
17	49	SH-AB	121	-	121	-
23A	64	SC-AB*	10	38	48	10
23D, 23E	66	SA-AB*	905	30	935	905
24	66	SB-AB*	86	-	86	-
26	70	Little River*	53	40	93	-
27	75	SR-B	982	11	993	-
29	77	SW-B	971	13	984	-
30	77	SZ-B*	1,161	26	1187	1,161
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32	83	SCC-B	148	10	158	-
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38B	94	SII-B*	481	21	502	481
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41	103	SLL-B*	352	12	364	352
43A	108	SB-C*	4	15	19	4
43C	110	SC-C*	85	10	95	85
57/58A	110	SD-C*	888	12	900	888
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45A	114	ST-B	202	16	218	-
45B	114	ST-B	264	13	277	-
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52	127	SH-D	442	15	457	-
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53	129	SG-D	327	21	348	-
55	132	SF-D	401	21	422	-
59	150	SG-C*	5	88	93	5
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64	160	SYY-C	48	29	77	-
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86	221	SNN-C*	461	120	581	461
87	213	SCC/SEE-C*	146	66	212	-
97/98	235	SFF/SKK-C	240	92	332	-
96	235	SMM-C	124	18	142	-
100	239	SGG-C	227	11	238	-
94	221	SNN-C*	178	105	283	178
89	221	SNN-C*	57	31	88	57
90	221	SNN-C*	20	32	52	20
91	221	SNN-C*	13	23	36	13
Total	-	-	**31,993**	**2,841**	**34,834**	**19,125**

Notes: * indicates that stream is perennial.

Table 2. Wetland Impacts.

Site	Plan Sheet	Wetland Site Code	Permanent Fill (ac)	Temporary Fill (ac)	Mechanized Clearing (ac)	Excavation (ac)	Hand Clearing (ac)
Yadkin River Basin							
2	8	WYZ-AA	0.09	-	-	-	-
2	8	WXX-AA	0.03	-	-	-	-
3	14	WB-AA	-	-	<0.01	-	-
6A, 6B	12	WUU-AA	0.33	-	0.02	-	-
19	25	WD-AA	<0.01	-	-	-	-
20	28	WE-AA	0.07	-	-	-	-
8	31	WYY-AA	0.18	-	-	-	-
9	33	WZZ-AA	0.46	-	0.03	-	-
12	41	WH-AB	0.02	-	-	-	-
17	49	WG-AB	<0.01	-	-	-	-
23B	64	WF-AB	0.03	-	<0.01	-	-
23C	66	WE-AB	<0.01	-	-	-	-
23D	66	WA-AB	0.07	-	-	-	-
23D	66	WB-AB	0.04	-	-	-	-
23D	66	WC-AB	<0.01	-	-	-	-
24	66	WD-AB	0.01	-	-	-	-
25	70	WM-AB	0.47	0.18	0.30	-	-
26	70	WN-AB	0.05	-	-	-	-
48	119	WXX-B	0.96	-	0.17	0.09	-
31	83	WP-B	<0.01	-	<0.01	<0.01	-
Cape Fear River Basin							
37B	94	WTT-B	0.02	-	-	-	-
38A, 38C	94	WU-B	1.56	-	0.14	0.03	
38B	94	WU-B	-	-	0.02	<0.01	

Table 2. Wetland Impacts.

Site	Plan Sheet	Wetland Site Code	Permanent Fill (ac)	Temporary Fill (ac)	Mechanized Clearing (ac)	Excavation (ac)	Hand Clearing (ac)
41	103	WPP-B	0.02	-	-	-	-
41	103	WOO-B	0.03	-	-	-	-
52	127	WZZ-D	-	-	<0.01	-	-
54A	132	WD-D	0.02	-	-	-	-
54B	132	WE-D	0.02	-	-	-	-
64	160	WBA-C	0.17	-	-	-	-
71	179	WB-C	<0.01	-	-	-	-
78	193	WJ-C	0.14	-	-	-	-
79	197	WG-C	0.03	-	-	-	-
82	197	WH-C	0.03	-	-	-	-
82	197	WF-C	0.10	-	0.02	0.02	-
83	197	WE-C	0.10	-	-	-	-
81	197	WI-C	<0.01	-	-	0.03	-
85	206	WL-C	0.05	-	0.02	-	-
84	206	WK-C	<0.01	-	-	<0.01	
90	221	WV-C	<0.01	-	-	-	-
88	221	WAA-C	0.12	-	0.07	0.02	
93	221	WW-C	0.03	0.85	0.03	0.02	<0.01
95	221	WTA-C	<0.01	-	-	-	-
92	221	WTA-C	<0.01	0.03	-	0.03	0.02
92	221	WTA-C	-	1.13	-	-	-
86	213	WZ-C	0.03	-	-	-	-
99	239	WT-C	<0.01	-	<0.01	-	-
Total	-	-	**5.35**	**2.19**	**0.84**	**0.25**	**0.03**

Total Wetland Impact for Project: 8.66 acres.

Table 3. Open Water (Ponds) Impacts

Site	Permit Drawing No.	Surface Water Site Code	Permanent Fill in Open Waters (ac)	Temporary Fill in Open Waters (ac)	Total Fill in Open Waters (ac)
Yadkin River Basin					
2	8	PA-AA	1.11	-	1.11
12	41	PB-AB	<0.01	0.15	<0.01
23C	66	PA-AB	0.73	-	0.73
Cape Fear River Basin					
42	108	PG-B	0.21	-	0.21
43B	110	PH-B	0.78	-	0.78
43D	110	PA-C	1.19	-	1.19
58	147	PB-C	2.64	-	2.64
51	125	PA-D	1.18	-	1.18
77	193	PD-C	1.14	-	1.14
76	193	SV-C	1.01	-	1.01
80	193	PE-C	0.56	-	0.56

Table 3. Open Water (Ponds) Impacts

Site	Permit Drawing No.	Surface Water Site Code	Permanent Fill in Open Waters (ac)	Temporary Fill in Open Waters (ac)	Total Fill in Open Waters (ac)
Total	-	-	**10.54**	**0.15**	**10.69**

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

This approval is only valid for the purpose and design that you submitted in your application dated received March 24, 2016 and additional information dated received May 19, 2016. Should your project change, you are required to notify the NCDWR and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 150 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Condition(s) of Certification:

Project Specific Conditions

1. The NCDOT Division Environmental Officer or Environmental Assistant will conduct a pre-construction meeting with all appropriate staff to ensure that the project supervisor and essential staff understand the potential issues with stream and pipe alignment at the permitted site. NCDWR staff shall be invited to the pre-construction meeting. [15A NCAC 02H.0506(b)(2) and (b)(3)]

2. Two copies of the final construction drawings shall be furnished to the NCDWR Central Office prior to the pre-construction meeting. The permittee shall provide written verification that the final construction drawings comply with the permit drawings contained in the application dated March 24, 2016 and additional information dated received May 19, 2016. Any deviations from the approved drawings are not authorized unless approved by the NC Division of Water Resources.

3. Channel relocations shall be completed and stabilized, and approved on site by NCDWR staff, prior to diverting water into the new channel. Stream banks shall be matted with coir-fiber matting. Vegetation used for bank stabilization shall be limited to native riparian vegetation, and should include establishment of a vegetated buffer on both sides of the relocated channel to the maximum extent practical. Also, rip-rap may be allowed if it is necessary to maintain the physical integrity of the stream, but the applicant must provide written justification and any calculations used to determine the extent of rip-rap coverage requested. Once the stream has been turned into the new channel, it may be necessary to relocate stranded fish to the new channel to prevent fish kills. [15A NCAC 02H .0506(b)(3)]

4. At locations where ponds will be drained, proper measures will be taken to drain the pond with limited impact to upstream and downstream channel stability as well as to native aquatic species. Proper measures will be taken to avoid sediment release and/or sediment accumulation downstream as a result of pond draining. If typical pond draining techniques will create significant disturbance to native aquatic species, additional measures such as collection and relocation may be necessary to prevent a significant fish kill. NCDOT shall consult with NC Wildlife Resources staff to determine if there are any sensitive species, and the most appropriate measures to limit impacts to these species. The permittee shall observe any natural channel re-establishment, or utilize natural channel construction techniques, to ensure that the jurisdictional stream channel above and below the drained pond remain stable, and that no additional impacts occur within the natural stream channel as a result of draining the pond. [15A NCAC 2H.0506(b)(3)]

5. The post-construction removal of any temporary bridge structures must return the project site to its preconstruction contours and elevations. The impacted areas shall be revegetated with appropriate native species. [15A NCAC 02H .0506(b)(2)]

6. As a condition of this 401 Water Quality Certification, the bridge demolition and construction must be accomplished in strict compliance with the most recent version of NCDOT's Best Management Practices for Construction and Maintenance Activities. [15A NCAC 02H .0507(d)(2) and 15A NCAC 02H .0506(b)(5)]

7. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. To meet the requirements of NCDOT's NPDES permit NCS0000250, please refer to the most recent version of the *North Carolina Department of Transportation Stormwater Best Management Practices Toolbox* manual for approved measures. [15A NCAC 02H .0507(d)(2) and 15A NCAC 02H .0506(b)(5)]

8. Bridge piles and bents shall be constructed using driven piles (hammer or vibratory) or drilled shaft construction methods. More specifically, jetting or other methods of pile driving are prohibited without prior written approval from the NCDWR first. [15A NCAC 02H.0506(b)(2)]

9. No drill slurry or water that has been in contact with uncured concrete shall be allowed to enter surface waters. This water shall be captured, treated, and disposed of properly. [15A NCAC 02H .0506(b)(3)]

10. A turbidity curtain will be installed in the stream if driving or drilling activities occur within the stream channel, on the stream bank, or within 5 feet of the top of bank. This condition can be waived with prior approval from the NCDWR. [15A NCAC 02H .0506(b)(3)]

11. All bridge construction shall be performed from the existing bridge, temporary work bridges, temporary causeways, or floating or sunken barges. If work conditions require barges, they shall be floated into position and then sunk. The barges shall not be sunk and then dragged into position. Under no circumstances should barges be dragged along the bottom of the surface water. [15A NCAC 02H .0506(b)(3]

12. Unless otherwise approved in this certification, placement of culverts and other structures in open waters and streams, shall be placed below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and downstream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by the NCDWR. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact the NCDWR for guidance on how to proceed and to determine whether or not a permit modification will be required. [15A NCAC 02H.0506(b)(2)]

13. If multiple pipes or barrels are required, they shall be designed to mimic natural stream cross section as closely as possible including pipes or barrels at flood plain elevation and/or sills where appropriate. Widening the stream channel should be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage. [15A NCAC 02H.0506(b)(2)]

14. Riprap shall not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be properly designed, sized and installed. [15A NCAC 02H.0506(b)(2)]

15. The stream channel shall be excavated no deeper than the natural bed material of the stream, to the maximum extent practicable. Efforts must be made to minimize impacts to the stream banks, as well as to vegetation responsible for maintaining the stream bank stability. Any applicable riparian buffer impact for access to stream channel shall be temporary and be revegetated with native riparian species. [15A NCAC 02H.0506(b)(2)]

16. Pipes and culverts used exclusively to maintain equilibrium in wetlands, where aquatic life passage is not a concern, shall not be buried. These pipes shall be installed at natural ground elevation.

17. Due to the possibility that compaction and/or other site alterations might prevent the temporary wetland impact area from re-attaining jurisdictional wetland status; the permittee shall provide an update on the wetland areas temporarily impacted at Sites 25, 92, and 93. This update shall be conducted two growing seasons after completion of the work and shall consist of photographs and a brief report on the progress of the areas in re-attaining wetland jurisdictional status. Upon submission of this update to the NCDWR, the permittee shall schedule an agency field meeting with the NCDWR to determine if the wetland areas temporarily impacted by this project have re-attained jurisdictional wetland status. If the wetland areas

temporarily impacted by this project have not re-attained jurisdictional wetland status, the NCDWR shall determine if compensatory wetland mitigation is required.

18. Compensatory mitigation for 19,125 linear feet of impact to streams is required. We understand that you have chosen to perform compensatory mitigation for impacts to streams through the North Carolina Division of Mitigation Service (DMS) (formerly NCEEP), and that the DMS has agreed to implement the mitigation for the project. The DMS has indicated in a letter dated March 23, 2016 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the DMS Mitigation Banking Instrument signed July 28, 2010.
19. Compensatory mitigation for impacts to 6.23 acres of riverine wetlands is required at a 2:1 ratio. Compensatory mitigation for riverine wetland impacts detailed below is required at a 1:1 ratio.

Site	Wetland ID	Acres
8	WYY-AA	0.06
23D	WA-AB	0.02
38C	WU-B	0.11
81	WI-C	0.01
84	WK-C	0.01
Total		**0.21**

We understand that you have chosen to perform compensatory mitigation for impacts to wetlands through the North Carolina Division of Mitigation Services (DMS) (formerly NCEEP), and that the DMS has agreed to implement the mitigation for the project. DMS has indicated in a letter dated March 23, 2016 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with DMS's Mitigation Banking Instrument signed July 28, 2010.

20. In accordance with commitments made in your application, all clearing of vegetation for purpose of relocating overhead power lines within jurisdictional wetlands shall be performed without the use of mechanized equipment. [15A NCAC 02H.0506(b)(3)]

General Conditions

1. Unless otherwise approved in this certification, placement of culverts and other structures in open waters and streams shall be placed below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and downstream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by NCDWR. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact NCDWR for guidance on how to proceed and to determine whether or not a permit modification will be required. [15A NCAC 02H.0506(b)(2)]

2. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills. [15A NCAC 02B.0200]

3. During the construction of the project, no staging of equipment of any kind is permitted in waters of the U.S., or protected riparian buffers. [15A NCAC 02H.0506(b)(2)]

4. The dimension, pattern and profile of the stream above and below the crossing shall not be modified. Disturbed floodplains and streams shall be restored to natural geomorphic conditions. [15A NCAC 02H.0506(b)(2)]

5. The use of rip-rap above the Normal High Water Mark shall be minimized. Any rip-rap placed for stream stabilization shall be placed in stream channels in such a manner that it does not impede aquatic life passage. [15A NCAC 02H.0506(b)(2)]

6. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval. [15A NCAC 02H .0507 (c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]

7. All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water. [15A NCAC 02H.0506(b)(3) and (c)(3)]

8. Heavy equipment shall be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the introduction of other pollutants into the stream. [15A NCAC 02H.0506(b)(3)]

9. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials. [15A NCAC 02H.0506(b)(3)]

10. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification. [15A NCAC 02H.0506(b)(3)]

11. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited. [15A NCAC 02H.0506(b)(3)]

12. The permittee and its authorized agents shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act) and any other appropriate requirements of State and Federal law. If the NCDWR determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, the NCDWR may reevaluate and modify this certification. [15A NCAC 02B.0200]

13. All fill slopes located in jurisdictional wetlands shall be placed at slopes no flatter than 3:1, unless otherwise authorized by this certification. [15A NCAC 02H.0506(b)(2)]

14. A copy of this Water Quality Certification shall be maintained on the construction site at all times. In addition, the Water Quality Certification and all subsequent modifications, if any, shall be maintained with the Division Engineer and the on-site project manager. [15A NCAC 02H .0507(c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]

15. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization, including all non-commercial borrow and waste sites associated with the project, shall be clearly marked by highly visible fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this certification. [15A NCAC 02H.0501 and .0502]

16. The issuance of this certification does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (i.e. local, state, and federal) having jurisdiction, including but not limited to applicable buffer rules, stormwater management rules, soil erosion and sedimentation control requirements, etc.

17. The Permittee shall report any violations of this certification to the Division of Water Resources within 24 hours of discovery. [15A NCAC 02B.0506(b)(2)]

18. Upon completion of the project (including any impacts at associated borrow or waste sites), the NCDOT Division Engineer shall complete and return the enclosed "Certification of Completion Form" to notify the NCDWR when all work included in the 401 Certification has been completed. [15A NCAC 02H.0502(f)]

19. Native riparian vegetation must be reestablished in the riparian areas within the construction limits of the project by the end of the growing season following completion of construction. [15A NCAC 02B.0506(b)(2)]

20. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated with this permit without appropriate modification. Should waste or borrow sites, or access roads to waste or borrow sites, be located in wetlands or streams, compensatory mitigation will be required since that is a direct impact from road construction activities. [15A NCAC 02H.0506(b)(3) and (c)(3)]

21. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards [15A NCAC 02H.0506(b)(3) and (c)(3)]:

    a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*.
    b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North*

Carolina Sediment and Erosion Control Manual. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.

c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.

d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.

22. Sediment and erosion control measures shall not be placed in wetlands or waters unless otherwise approved by this Certification. [15A NCAC 02H.0506(b)(3) and (c)(3)]

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

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

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

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

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

Mr. Sam M. Hayes, General Counsel
Department of Environmental Quality
1601 Mail Service Center

This the 20th day of May 2016

DIVISION OF WATER RESOURCES

for:

S. Jay Zimmerman, Director

WQC No. 4059

MEMORANDUM OF AGREEMENT
BETWEEN
THE FEDERAL HIGHWAY ADMINISTRATION,
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION,
AND
NORTH CAROLINA STATE HISTORIC PRESERVATION OFFICER
FOR
TIP R-2536, Proposed Corridor for the Asheboro Southern Bypass
State Project No. 8.1571401Federal Aid Project No. NHF-64(19)
RANDOLPH COUNTY, NORTH CAROLINA

WHEREAS, the Federal Highway Administration (FHWA) has determined that the proposed corridor for the Asheboro Southern Bypass (the Undertaking) will affect archaeological sites 31RD1398, 31RD1399 and 31RD1426/1426**, properties determined eligible for listing in the National Register of Historic Places; and

WHEREAS, FHWA has consulted with the North Carolina State Historic Preservation Officer (SHPO) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f); and

Whereas, in accordance with 36 CFR Part 800, the North Carolina Department of Transportation (hereafter NCDOT) acknowledges and accepts the advice and conditions outlined in the Advisory Council on Historic Preservation's (hereafter Council) "Recommended Approach for Consultation on the Recovery of Significant Information from Archaeological Sites," published in the Federal Register (FR Doc. 99-12055) on May 17, 1999; and

Whereas, the consulting parties agree that the recovery of significant information from the archaeological sites listed above may be done in accordance with the published guidance; and

Whereas, the consulting parties agree that it is in the public interest to expend funds for the recovery of significant information from these archaeological sites to mitigate the adverse effects of the project; and

Whereas, the consulting parties concur, to the best of the their knowledge and belief, that no Native American Tribes or Native Hawaiian organizations attach religious or cultural importance to the affected property, and that no objections from such groups have been raised to the work proposed; and

Whereas, to the best of our knowledge and belief, no human remains, associated or unassociated funerary objects or sacred objects, or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001), are expected to be encountered in the archaeological work;

Now, therefore, FHWA and NCDOT shall ensure that the following terms and conditions will be implemented in a timely manner and with adequate resources in compliance with the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470).

STIPULATIONS

I. The NCDOT will develop Data Recovery Plans (hereafter DRPs) for Sites 31Rd1398, 31Rd1399, and 31Rd1426/1426**, all of which will be affected by the subject project, in consultation with the North Carolina State Historic Preservation Office (hereafter HPO).

II. The NCDOT will ensure that each DRP is implemented after Right-of-Way is acquired or once Right-of-Entry is secured from the property owners and prior to construction activities within the site location as shown in the DRP.

III. As they are developed, each individual DRP will be forwarded for review by the HPO.

IV. Upon completion of each Data Recovery effort, the NCDOT will prepare and forward a Management Summary to the HPO detailing the results of the Data Recovery field investigations. The Management Summary will contain sufficient information to demonstrate that the field investigation portion of the DRP has been implemented.

V. Upon receipt of the Management Summary, the HPO will respond within ten (10) days to the recommendations contained within the document.

VI. Upon acceptance of the recommendations contained in the Management Summary, the HPO will issue the NCDOT documentation that the Data Recovery field investigations have been completed.

VII. The analysis and report preparation, detailing Sites 31Rd1398, 31Rd1399, and 31Rd1426/1426** will be completed by the NCDOT, or their consultants, within twelve (12) months after completion of each site's fieldwork schedule.

VIII. Dispute Resolution

Should any of the Signatory or Concurring Party(ies) object within (30) days to any plans or documentation provided for review pursuant to this Agreement, the FHWA shall consult with the objecting party(ies) to resolve the objection. If the FHWA or the objecting party(ies) determines that the objection cannot be resolved, the FHWA will forward all documentation relevant to the dispute to the Council. Within thirty (30) days after receipt of all pertinent documentation, the Council will either:

1. Provide the FHWA with recommendations, which the FHWA will take into account in reaching a final decision regarding the dispute, or

2. Notify the FHWA that it will comment pursuant to 36 CFR Section 800.7(c) and proceed to comment. Any Council comment provided in response to such a request will be taken into account by the FHWA in accordance with 36 CFR Section 800.7 (c) (4) with reference to the subject of the dispute.

Any recommendation or comment provided by the Council will be understood to pertain only to the subject of the dispute; FHWA and NCDOT's responsibility to carry out all of the actions under this agreement that are not the subject of the dispute will remain unchanged.

IX. Amendments

If any Signatory to this MOA believes that its terms cannot be carried out or that an amendment to the terms must be made, that party(ies) shall immediately consult with the other party(ies) to develop amendments in accordance with 36 CFR 800.6(c)(7). If an amendment cannot be agree upon, the dispute resolution process set forth in Stipulation VII will be followed.

X. Termination

Any of the Signatory Party(ies) may terminate the agreement by providing notice to the other parties, provided that the signatories and concurring parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. Termination of this MOA will require compliance with 36 CFR 800.

This MOA may be terminated by the execution of a subsequent MOA that explicitly terminates or supersedes its terms.

XI. Duration

Unless terminated pursuant to Stipulation X above, this MOA will be in effect until FHWA, in consultation with the other Signatory and Concurring Party(ies), determines that all of its terms have satisfactorily been fulfilled or if NCDOT is unable or decides not to construct the Undertaking.

Execution of this Memorandum of Agreement by FHWA and the North Carolina SHPO, and implementation of its terms, evidence that FHWA has afforded the Council an opportunity to comment on the Undertaking, and that FHWA has taken into account the effects of the Undertaking on the historic properties.

Federal Highway Administration:

for _____ Date: 1/20/12

John F. Sullivan, III, P.E.
Division Administrator

State Historic Preservation Office:

_____ Date: 1/12/12

Jeffrey J. Crow
Director

North Carolina Department of Transportation:

_____ Date: 1/6/12

Robert Andrew Joyner, P.E.
Human Environment Section Head

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.03; Released October 2015)

WBS Element:	34450.3.S1	**TIP No.:**	R-2536 Section 1A	**County(ies):**	Randolph	**Page** 1	**of** 3

General Project Information

WBS Element:	34450.3.S1	**TIP Number:**	R-2536 Section 1A	**Project Type:**	New Location	**Date:**	12/15/2015
NCDOT Contact:	Matthew Lauffer, P.E.			**Contractor / Designer:**	Asheboro Bypass Constructors, LLC/ RK&K: Jeff Meador, PE		
Address:	NCDOT Hydraulics Unit 1590 Mail Service Center Raleigh, NC 27699-1590			**Address:**	900 Ridgefield Drive, Suite 350 Raleigh, NC 27609		
Phone:	919-707-6703			**Phone:**	919-878-9560		
Email:	mslauffer@ncdot.gov			**Email:**	jmeador@rkk.com		
City/Town:	Asheboro			**County(ies):**	Randolph		
River Basin(s):	Yadkin-Pee Dee	Cape Fear		**CAMA County?**	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	2.5 Miles	**Surrounding Land Use:**	Agriculture, Residential, Commercial				
	Proposed Project			**Existing Site**			
Project Built-Upon Area (ac.)	71.6	ac.		9.2	ac.		
Typical Cross Section Description:	Grassed ditch median with 6:1 side slopes. 4 paved lanes (total 48' wide) 12' shoulder on each side (15' with guardrail), 4' paved. Varying fill and cut slopes (see project XSC's for detailed information).			US 64 (beg. to end): 2 lanes (total 24' wide), 4-10' shoulders (13' with guardrail), (11' with guardrail), 2' paved.			
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 18,800	Year: 2040		Existing: 12,600	Year: 2015		

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

The North Carolina Department of Transportation (NCDOT) has proposed to construct a bypass for US 64 in Asheboro, NC. There is one proposed major structure involved with the construction of design section 1A. The proposed structure, on Cable Creek, is a 2@8'x8' Reinforced Concrete Box Culvert (RCBC). The culvert will be buried 1' below the channel to allow for aquatic passage. One of the two barrels has a high flow sill to restrict normal flow to just one barrel of the culvert. The width of the barrel carrying normal stream flow matches the existing channel width at this location. The structures has been designed to have as little environmental and surface water impacts as possible. Channel improvements were made for the proposed box culvert designs. Excavation was kept to a minimum and proposed stream channels were tied into the existing stream with as little impact as possible. Where excavation is necessary, coir fiber matting and rip-rap were utilized for bank stabilization in an attempt to reduce sediment transport and streambank erosion. Velocities at jurisdictional features are nonerosive. All of design section 1a is within the Yadkin River Basin.

Waterbody Information

Surface Water Body (1):	UT to Back Creek		**NCDWR Stream Index No.:**	13-2-3-3-3-(1.5)			
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C				
		Supplemental Classification:	None				
Other Stream Classification:							
Impairments:							
Aquatic T&E Species?	Yes	Comments:					
NRTR Stream ID:	SB-AA			**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)							

WBS Element: 34450.3.S1 **TIP No.:** R-2536 Section 1A **County(ies):** Randolph

Additional Waterbody Information

Surface Water Body (2):	UT to Cable Creek		**NCDWR Stream Index No.:**	13-2-3-3-3	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SD-AA			**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)					

Surface Water Body (3):	UT to Cable Creek		**NCDWR Stream Index No.:**	13-2-3-3-3	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SAA-AA			**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)					

Surface Water Body (4):	UT to Cable Creek		**NCDWR Stream Index No.:**	13-2-3-3-3	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	Yes	Comments:			
NRTR Stream ID:	SE-AA			**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)					

Surface Water Body (5):	UT to Cable Creek		**NCDWR Stream Index No.:**	13-2-3-3-3	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SM-AA			**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 2.03; Released October 2015)

WBS Element:	34450.3.S1	TIP No.:	R-2536 Section 1A	County(ies):	Randolph	Page	3	of	3

Additional Waterbody Information

Surface Water Body (6):	UT to Cable Creek		**NCDWR Stream Index No.:**	13-2-3-3-3	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SZZ-AA			**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)					

Surface Water Body (7):	Cable Creek		**NCDWR Stream Index No.:**	13-2-3-3-3	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SG-AA			**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)					

Surface Water Body (8):	UT to Cable Creek		**NCDWR Stream Index No.:**	13-2-3-3-3	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SH-AA			**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)					

Surface Water Body (9):	UT to Cable Creek		**NCDWR Stream Index No.:**	13-2-3-3-3	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SK-AA			**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 2.03; Released October 2015)

WBS Element:	34450.3.S1	**TIP No.:**	R-2536 Section 1B	**County(ies):**	Randolph	**Page**	1	**of**	3

General Project Information

WBS Element:	34450.3.S1	**TIP Number:**	R-2536 Section 1B	**Project Type:**	New Location	**Date:**	11/10/2015
NCDOT Contact:	Matthew Lauffer, P.E.			**Contractor / Designer:**	Asheboro Bypass Constructors, LLC/ RK&K: Jeff Meador, PE		
Address:	NCDOT Hydraulics Unit 1590 Mail Service Center Raleigh, NC 27699-1590			**Address:**	900 Ridgefield Drive, Suite 350 Raleigh, NC 27609		
Phone:	919-707-6703			**Phone:**	919-878-9560		
Email:	mslauffer@ncdot.gov			**Email:**	jmeador@rkk.com		
City/Town:	Asheboro			**County(ies):**	Randolph		
River Basin(s):	Yadkin-Pee Dee	Cape Fear		**CAMA County?**	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	2.5 Miles	**Surrounding Land Use:**	Agriculture, Residential, Commercial		
	Proposed Project			**Existing Site**	
Project Built-Upon Area (ac.)	42.5	ac.		6.5	ac.
Typical Cross Section Description:	Grassed ditch median with 6:1 side slopes. 4 paved lanes (total 48' wide) 12' shoulder on each side (15' with guardrail), 4' paved. Varying fill and cut slopes (see project XSC's for detailed information).			NC 49 (beg. to 64+55): shoulder section, 4 lanes (total 48' wide), 10' shoulders (13' with guardrail), 4' paved. NC 49 (64+55 to end): curb and gutter section, 4 lanes (total 48' wide), 10' grass berms. Old NC 49: shoulder section, 2 lanes (total 24' wide), 8' shoulders (11' with guardrail), 2' paved.	
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 18,800	Year: 2040		Existing: 12,600	Year: 2015

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

The North Carolina Department of Transportation (NCDOT) has proposed to construct a bypass for US 64 in Asheboro, NC. There are two proposed major structures involved with the construction of design section 1B. The first proposed structure, on Taylor's Creek, is a 2@8'x8' Reinforced Concrete Box Culvert (RCBC). The culvert will be buried 1' below the channel to allow for aquatic passage. One of the two barrels has a high flow sill to restrict normal flow to just one barrel of the culvert. The width of the barrel carrying normal stream flow matches the existing channel width at this location. The second structure is also on Taylor's Creek and is an extension of an existing 6'x5' RCBC on both the upstream and downstream side. The proposed culvert extensions will not be buried below the stream bed since the existing culvert is not burried. Taylor's Creek is not included in a FEMA study in the vicinity of the project. These structures have been designed to have as little environmental and surface water impacts as possible. Channel improvements were made for the proposed box culvert designs. Excavation was kept to a minimum and proposed stream channels were tied into the existing stream with as little impact as possible. Where excavation is necessary, coir fiber matting and rip-rap were utilized for bank stabilization in an attempt to reduce sediment transport and streambank erosion. Velocities at jurisdictional features are nonerosive. All of design section 1B is within the Yadkin River Basin.

Waterbody Information

Surface Water Body (1):	UT to Taylors Creek	**NCDWR Stream Index No.:**	13-2-3-5		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	Yes	Comments:			
NRTR Stream ID:	SJ-AA		**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)					

WBS Element: 34450.3.S1 **TIP No.:** R-2536 Section 1B **County(ies):** Randolph

Additional Waterbody Information

Surface Water Body (2):	UT to Taylors Creek		**NCDWR Stream Index No.:**	13-2-3-5	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Si-AA/SO-AB			**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)					

Surface Water Body (3):	Taylors Creek		**NCDWR Stream Index No.:**	13-2-3-5	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SM-AB			**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)					

Surface Water Body (4):	UT to Taylors Creek		**NCDWR Stream Index No.:**	13-2-3-5	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	Yes	Comments:			
NRTR Stream ID:	SL-AB			**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)					

Surface Water Body (5):	UT to Taylors Creek		**NCDWR Stream Index No.:**	13-2-3-5	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SK-AB			**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 2.03; Released October 2015)

WBS Element:	34450.3.S1	TIP No.:	R-2536 Section 1B	County(ies):	Randolph	Page	3	of	3

Additional Waterbody Information

Surface Water Body (6):	UT to Taylors Creek		**NCDWR Stream Index No.:**	13-2-3-5		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SI-AB			**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)						

Surface Water Body (7):	UT to Taylors Creek		**NCDWR Stream Index No.:**	13-2-3-5		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SJ-AB			**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)						

Surface Water Body (8):	UT to Taylors Creek		**NCDWR Stream Index No.:**	13-2-3-5		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SF-AB			**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)						

Surface Water Body (9):	UT to Taylors Creek		**NCDWR Stream Index No.:**	13-2-3-5		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SH-AB			**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 2.03; Released October 2015)

WBS Element:	34450.3.S2	**TIP No.:**	R-2536 Section 2	**County(ies):**	Randolph	**Page**	1 of 5

General Project Information

WBS Element:	34450.3.S2	**TIP Number:**	R-2536 Section 2	**Project Type:**	New Location	**Date:**	12/3/2015
NCDOT Contact:	Matthew Lauffer, P.E.			**Contractor / Designer:**	Asheboro Bypass Constructors, LLC/ RK&K: Matt Cook, PE		
Address:	NCDOT Hydraulics Unit 1590 Mail Service Center Raleigh, NC 27699-1590			**Address:**	900 Ridgefield Drive, Suite 350 Raleigh, NC 27609		
Phone:	919-707-6703			**Phone:**	919-878-9560		
Email:	mslauffer@ncdot.gov			**Email:**	mcook@rkk.com		
City/Town:	Asheboro			**County(ies):**	Randolph		
River Basin(s):	Yadkin-Pee Dee	Cape Fear		**CAMA County?**	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	4.8 Miles	**Surrounding Land Use:**	Agriculture, Residential, Commercial			
	Proposed Project			**Existing Site**		
Project Built-Upon Area (ac.)	110.2	ac.		19.3	ac.	
Typical Cross Section Description:	Grassed ditch median with 6:1 side slopes. 4 paved lanes (total 48' wide) 12' shoulder on each side (15' with guardrail), 4' paved. Varying fill and cut slopes (see project XSC's for detailed information).			Mack Rd: shoulder sec., (2)12' lanes. US HWY 220: 4-Lane div. (48' wide). Southmont Dr.: shoulder sec., (2)11' lanes. US 220 Bus.: shoulder sec., (2)12' lanes. Pastureview Rd: shoulder sec., (2)10' lanes. Old Cox Rd: shoulder sec., (2)12' lanes. Staley's Farm Rd.: shoulder sec., (2)12' lanes. NC 159 Zoo Parkway: shoulder sec., (2)12' lanes.		
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 18,800	Year: 2040		Existing: 12,600	Year: 2015	

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

The North Carolina Department of Transportation (NCDOT) has proposed to construct a bypass for US 64 in Asheboro, NC. There are 9 proposed major structures and two proposed stormwater ponds involved with the construction of design section 2. The first proposed structure (B6), over Little River, is a two span, dual bridge (1@85'-6", 1@112'-10") that minimizes impacts to Little River. The second proposed structure (C300), on UT to Big Branch, is a 2@ 7'x7' Reinforced Concrete Box Culvert buried 1'. Normal flow is restricted to one barrel with sills and alternating baffles are used in the low flow barrel to match the existing stream width. The third proposed structure (C250), on UT to Little River, is an extension of a 4'x5' Reinforced Concrete Box Culvert. The extension is angled to tie as close as possible to the existing stream location. The fourth proposed structure (C301), on UT to Big Branch, is a 3@ 10'x7' Reinforced Concrete Box Culvert buried 1'. Normal flow is restricted to one barrel with sills and alternating baffles are used in the low flow barrel to match the existing stream width. The fifth proposed structure (C350), on UT to North Prong Richland Creek is a 6'x7' Reinforced Concrete Box Culvert buried 1'. Sills will be used at the inlet and outlet to retain native material. The sixth proposed structure (C400), on North Prong Richland Creek, is a 2@ 14'x10' Reinforced Concrete Box Culvert buried 1'. Normal flow is restricted to one barrel with sills and alternating baffles are used in the low flow barrel to match the existing stream width. The seventh proposed structure (C440), on UT to South Prong Richland Creek, is a 6'x7' Reinforced Concrete Box Culvert buried 1'. The eighth proposed structure (C470), on UT to Tantraugh Branch, is a 6'x7' Reinforced Concrete Box Culvert buried 1'. The ninth proposed structure (C500), on Tantraugh Branch, is a 3@ 9'x7' Reinforced Concrete Box Culvert buried 1'. Normal flow is restricted to one barrel with sills and alternating baffles are used in the low flow barrel to match the existing stream width. There are two stormwater ponds proposed along the project, located at the interchange with -Y4- US 220 and the interchange with the (-Y9-) Zoo connector. All of the major structures have been designed to have as little environmental and surface water impacts as possible. Channel improvements were made for the proposed box culvert designs. Excavation was kept to a minimum and proposed stream channels were tied into the existing stream with as little impact as possible. Where excavation is necessary, coir fiber matting and rip-rap were utilized for bank stabilization in an attempt to reduce sediment transport and streambank erosion. Velocities at jurisdictional features are nonerosive and 2:1 fill slopes were used in jurisdictional area to minimize impacts. Design section 2 is within the Yadkin River Basin and the Cape Fear River Basin, separation is located near the proposed US 220 Business (-Y6-).

Waterbody Information

Surface Water Body (1):	UT to Little River		**NCDWR Stream Index No.:**	13-25-(1)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SU-B, SC-AB, SA-AB, SR-B, SWW-B, SS-B			**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)						

WBS Element: 34450.3.S2 **TIP No.:** R-2536 Section 2 **County(ies):** Randolph

Additional Waterbody Information

Surface Water Body (2):	Little River		**NCDWR Stream Index No.:**	13-25-(1)	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Little River			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (3):	UT to Big Branch		**NCDWR Stream Index No.:**	13-25-(1)	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SZ-B			**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)					

Surface Water Body (4):	UT to North Prong Richland Creek		**NCDWR Stream Index No.:**	17-22-1	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SHH-B, SGG-B, SBB-B, SCC-B, SDD-B, SEE-B, SH-D			**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)					

Surface Water Body (5):	North Prong Richland Creek		**NCDWR Stream Index No.:**	17-22-1	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SG-D			**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)					

WBS Element: 34450.3.S2 **TIP No.:** R-2536 Section 2 **County(ies):** Randolph

Additional Waterbody Information

Surface Water Body (6):	UT to South Prong Richland Creek		**NCDWR Stream Index No.:**	17-22-2	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SC-D/SD-D, SF-D			**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)					

Surface Water Body (7):	UT to Tantraugh Branch		**NCDWR Stream Index No.:**	17-22-3	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SII-B, SNN-B,SLL-B, SPP-B, SQQ-B			**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)					

Surface Water Body (8):	Tantraugh Branch		**NCDWR Stream Index No.:**	17-22-3	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SKK-B			**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)					

Surface Water Body (9):	UT to Vestal Creek		**NCDWR Stream Index No.:**	17-22-4	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SC-C			**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 2.03; Released October 2015)

WBS Element: **TIP No.:** R-2536 Section 2 **County(ies):** Randolph

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
21	-L- 250+20 LT	(2)Little River	PSH	Class 'B'	1.6	Pipe	18	6.8	1.2	No
31	-L- 408+00 LT	(7)UT to Tantraugh	PSH	Class 'B'	0.8	Pipe	15	2.9	0.9	No
75	-Y5- 42+23 RT	(1)UT to Little River	PSH	Class 'B'	0.3	Pipe	15	1.4	0.7	No

Additional Comments

* Refer to the NCDOT Best Management Practices Toolbox (2014), NCDOT Standards, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and criteria.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.03; Released October 2015)

WBS Element: 34450.3.S2 **TIP No.:** R-2536 Section 2 **County(ies):** Randolph

Other Best Management Practices

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	BMP Type	Drainage Area (ac)	New Built-Upon Area (ac)	Volume Treated (ac-ft)	Precipitation Depth Treated over NBUA (in)	BMP Associated w/ Buffer Rules?
70	-Y4- 60+40 LT (US 220 Interchange)	(1)UT to Little River	Dry Detention Basin	15.5	1.5	1.024	8.51	No
30	-Y9FLY- 21+50 LT (Zoo Connector Interchange)	(8)Tantraugh Branch	Dry Detention Basin	17.4	3.2	1.234	4.81	No

Additional Comments

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.02; Released April 2015)

General Project Information

WBS Element:	34450.3.S1	**TIP Number:**	R-2536 Section 3A	**Project Type:**	New Location	**Date:**	11/6/2015
NCDOT Contact:	Matthew Lauffer, PE			**Contractor / Designer:**	Trent Cormier, PE, CPESC, CPSWQ		
Address:	NCDOT Hydraulics Unit 1590 Mail Service Raleigh, NC 27699-1590			**Address:**	ICA Engineering 5121 Kingdom Way, Suite 100 Raleigh, NC 27607		
Phone:	(919) 707-6703			**Phone:**	(919) 900-1608		
Email:	mslauffer@ncdot.gov			**Email:**	trenton.cormier@hdrinc.com		
City/Town:	Asheboro			**County(ies):**	Randolph		
River Basin(s):	Cape Fear			**CAMA County?**	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	3.842 miles	**Surrounding Land Use:**	Agricultural, Low Residential and Commercial				
	Proposed Project			**Existing Site**			
Project Built-Upon Area (ac.)	48.0	ac.		4.9	ac.		
Typical Cross Section Description:	Grassed ditch median with 6:1 side slopes. 4 paved lanes (total 48' wide) 12' shoulder on each side (15' with guardrail), 4' paved. Varying fill and cut slopes (see project XSC's for detailed information).			NC HWY 42: open shoulder section, 2 paved lane (total 24' wide); Luck Road (SR 2604), Pine Hill Road (SR 2824) & Fleta Brown Road (SR 2827): open shoulder section, 2 paved lane (total 20' wide); Miles Moffit Road (SR 2828): open shoulder section, 2 paved lane (total 19' wide).			
Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	18,800	Year: 2040	Existing:	12,600	Year:	2015

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

The North Carolina Department of Transportation (NCDOT) has proposed to construct a bypass for US 64 in Asheboro, NC. There are five proposed major structures involved with the construction of the US 64 Bypass, all of which will be constructed at new stream crossing locations. The first proposed structure, over Vestal Creek, is a two span, dual bridge (1@81', 1@114'), 56" pre-stressed concrete MBT (modified bulb tee) girders with 4' end bent caps. This structure will utilize a 66" RCP as an overflow structure. The proposed bridge will have spill through abutments. In the project limits, Vestal Creek is a FEMA limited detailed studied stream with non-encroachment widths established. Regulatory floodways are not delineated on the FIRM and flood profiles have not been developed. The second proposed structure, on UT to Vestal Creek, is a 2@9'x6' Reinforced Concrete Box Culvert (RCBC) UT to Vestal Creek is not a FEMA detailed studied stream as listed in the effective Randolph County FIS. The third major structure, on Squirrel Creek, is a 3@10'x7' RCBC. Squirrel Creek is not a FEMA detailed studied stream as listed in the effective Randolph County FIS. The fourth major structure, on UT to Vestal Creek, is a 1@6'x7' RCBC. UT to Vestal Creek is not a FEMA detailed studied stream as listed in the effective Randolph County FIS. The fifth major structure, on UT to Vestal Creek, is a 1@6'x7' RCBC. UT to Vestal Creek is not a FEMA detailed studied stream as listed in the effective Randolph County FIS. These structures have been designed to have as little environmental and surface water impacts as possible. Channel improvements were made for the proposed box culvert designs. Excavation was kept to a minimum and proposed stream channels were tied into the existing stream with as little impact as possible. Where excavation is necessary, coir fiber matting and rip-rap were utilized for bank stabilization in an attempt to reduce sediment transport and streambank erosion. Throughout the project, multiple Preformed Scour Holes have been utilized for energy dissipation purposes. Grassed swales were used for treatment when BMP design standards could be met. Velocities at jurisdictional features are non-erosive. Raised OTCB's were placed along NC Highway 42 to reduce sediment transport. 20,460 LF of grassed swales were used to reduce flow velocity, promote sedimentation, infiltration and runoff attenuation.

Waterbody Information

Surface Water Body (1):	UT to Vestal Creek/SD-C		**NCDWR Stream Index No.:**	17-22-4		
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:	SD-C			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the		

(If yes, provide justification in the General Project Narrative)		General Project Narrative)

WBS Element: 34450.3.S1 **TIP No.:** R-2536 Section 3 **County(ies):** Randolph **Page** 2 **of** 7

Additional Waterbody Information

Surface Water Body (2):	UT to Vestal Creek/PB-C		**NCDWR Stream Index No.:**	17-22-4		
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:	PB-C			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	No	
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (3):	Vestal Creek		**NCDWR Stream Index No.:**	17-22-4		
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-C			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (4):	UT to Vestal Creek/SF-C		**NCDWR Stream Index No.:**	17-22-4		
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-C			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	No	
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):	UT to Vestal Creek/SE-C		**NCDWR Stream Index No.:**	17-22-4		
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-C			**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)						

WBS Element:	34450.3.S1	TIP No.:	R-2536 Section 3	County(ies):	Randolph	Page	3	of	7

Additional Waterbody Information

Surface Water Body (6):	UT to Vestal Creek/SH-C		**NCDWR Stream Index No.:**	17-22-4	
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-C			**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?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (7):	UT to Vestal Creek/SI-C/SYY-C		**NCDWR Stream Index No.:**	17-22-4	
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:	SI-C/SYY-C			**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)					

Surface Water Body (8):	UT to Vestal Creek/SJ-C		**NCDWR Stream Index No.:**	17-22-4	
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:	SJ-C			**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)					

Surface Water Body (9):	UT to Squirrel Creek/SK-C		**NCDWR Stream Index No.:**	17-22-6	
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:	SK-C			**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)					

WBS Element:	34450.3.S1	TIP No.:	R-2536 Section 3	County(ies):	Randolph	Page	4	of	7

Additional Waterbody Information

Surface Water Body (10):	UT to Squirrel Creek/SL-C		**NCDWR Stream Index No.:**	17-22-6	
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:	SL-C			**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)					

Surface Water Body (11):	UT to Squirrel Creek/SM-C		**NCDWR Stream Index No.:**	17-22-6	
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:	SM-C			**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)					

Surface Water Body (12):	UT to Squirrel Creek/SN-C		**NCDWR Stream Index No.:**	17-22-6	
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:	SN-C			**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)					

Surface Water Body (13):	UT to Squirrel Creek/SO-C		**NCDWR Stream Index No.:**	17-22-6	
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:	SO-C			**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)					

WBS Element:	34450.3.S1	TIP No.:	R-2536 Section 3	County(ies):	Randolph	Page	5	of	7

Additional Waterbody Information

Surface Water Body (14):	Squirrel Creek		**NCDWR Stream Index No.:**	17-22-6	
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:	SQ-C			**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)					

Surface Water Body (15):	UT to Squirrel Creek/SS-C		**NCDWR Stream Index No.:**	17-22-6	
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:	SS-C			**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)					

Surface Water Body (16):	UT to Squirrel Creek/SU-C		**NCDWR Stream Index No.:**	17-22-6	
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:	SU-C			**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)					

Surface Water Body (17):	UT to Squirrel Creek/SW-C		**NCDWR Stream Index No.:**	17-22-6	
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:	SW-C			**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)					

Additional Waterbody Information

Surface Water Body (18):	UT to Squirrel Creek/PD-C		**NCDWR Stream Index No.:**	17-22-6	
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:	PD-C			**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)					

Surface Water Body (19):	UT to Squirrel Creek/PE-C		**NCDWR Stream Index No.:**	17-22-6	
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:	PE-C			**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)					

Surface Water Body (20):	UT to Squirrel Creek/SV-C		**NCDWR Stream Index No.:**	17-22-6	
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:	SV-C			**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)					

Surface Water Body (21):	Gabriels Creek/SCC-C		**NCDWR Stream Index No.:**	17-14	
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:	SNN-C			**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 2.02; Released April 2015)

WBS Element: **TIP No.:** R-2536 Section 3 **County(ies):** Randolph

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
37	488+34 -L- RT	(4)UT to Vestal	PSH	Class 'B'	0.4	Pipe	15	2.1	0.5	No
39	505+73 -L- RT	(7)UT to Vestal	PSH	Class 'B'	1.2	Pipe	15	4.5	0.7	No
40	520+22 -L- RT	(8)UT to Vestal	PSH	Class 'B'	0.9	Pipe	15	3.2	0.6	No
41	548+28 -L- RT	(9)UT to Squirrel	PSH	Class 'B'	1.4	Pipe	18	6.0	0.7	No
46	609+74 -L- RT	(14)Squirrel Creek	PSH	Class 'B'	1.9	Pipe	18	6.3	0.8	No
48	642+54 -L- LT	(16)UT to Squirrel	PSH	Class 'B'	0.3	Pipe	15	1.7	0.4	No

Additional Comments

* Refer to the NCDOT Best Management Practices Toolbox (2014), NCDOT Standards, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and criteria.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.04; Released November 2015)

General Project Information

WBS Element:	34550.3.S1	**TIP Number:**	R-2536 Section 3B	**Project Type:** New Location	**Date:** 12/7/2015
NCDOT Contact:	Matthew Lauffer, PE	**Contractor / Designer:**	Trent Cormier, PE, CPESC, CPSWQ		
Address:	NCDOT Hydraulics Unit 1590 Mail Service Raleigh, NC 27699-1590	**Address:**	ICA Engineering 5121 Kingdom Way, Suite 100 Raleigh, NC 27607		
Phone:	(919) 707-6703	**Phone:**	(919) 900-1608		
Email:	mslauffer@ncdot.gov	**Email:**	trenton.cormier@hdrinc.com		
City/Town:	Asheboro	**County(ies):**	Randolph		
River Basin(s):	Cape Fear	**CAMA County?**	No		
Wetlands within Project Limits?	Yes				

Project Description

Project Length (lin. miles or feet):	14.74 mi.	**Surrounding Land Use:**	Agricultural, Low Residential and Commercial

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	32.2 ac.	14.9 ac.
Typical Cross Section Description:	Grassed ditch median with 6:1 side slopes. 4 paved lanes (total 48' wide) 12' shoulder on each side (15' with guardrail), 4' paved. Varying fill and cut slopes (see project XSC's for detailed information).	US Hwy 64: Grassed ditch median with 6:1 side slopes, 4 paved lanes (total 48' wide), 4' paved shoulder on each side. Trogdon Hill Road (SR2713): open shoulder section, 2 paved lane (total 24' wide)
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 18,800 Year: 2040	Existing: 12,600 Year: 2015

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

The North Carolina Department of Transportation (NCDOT) has proposed to construct a bypass for US 64 in Asheboro, NC. There are three proposed major structures involved with the construction of the US 64 Bypass, all of which will be constructed at new stream crossing locations. The first proposed structure, on UT to Gabriels Creek, is a 1@6'x7' Reinforced Concrete Box Culvert (RCBC). UT to Gabriels Creek is not a FEMA detailed studied stream as listed in the effective Randolph County FIS. The second proposed structure, on Gabriels Creek, is a 2@10'x8' RCBC. Gabriels Creek is a FEMA Limited Detailed studied stream with non-encroachment widths established. Regulatory floodways are not delineated on the FIRM and flood profiles have not been developed. The third proposed structure, on Gabriels Creek, is a 2@12'x8' RCBC. Gabriels Creek is a FEMA Limited Detailed Studied stream with non-encroachment widths established. Regulatory floodways are not delineated on the FIRM and flood profiles have not been developed. These structures have been designed to have as little environmental and surface water impacts as possible. Channel improvements were made for the proposed box culvert designs. Excavation was kept to a minimum and proposed stream channels were tied into the existing stream with as little impact as possible. Where excavation is necessary, coir fiber matting and rip-rap were utilized for bank stabilization in an attempt to reduce sediment transport and streambank erosion. Throughout the project, multiple Preformed Scour Holes have been utilized for enegy dissipation purpopses. Grassed swales were used for treatment when BMP design standards could be met. Velocities at jurisdictional features are non-erosive. 12,241 LF of grassed swales were used to reduce flow velocity, promote sedimentation, infiltration and runoff attenuation.

Waterbody Information

Surface Water Body (1):	UT to Gabriels Creek/SX-C	**NCDWR Stream Index No.:**	17-14
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:	SX-C	**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	**Dissipator Pads Provided in Buffer?**	N/A
(If yes, provide justification in the General Project Narrative)		(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)

WBS Element: 34550.3.S1 **TIP No.:** R-2536 Section 3 **County(ies):** Randolph

Additional Waterbody Information

Surface Water Body (2):	Gabriels Creek		**NCDWR Stream Index No.:**	17-14	
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:	SNN-C			**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)					

Surface Water Body (3):	UT to Gabriels Creek/SCC-C		**NCDWR Stream Index No.:**	17-14	
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:	SCC-C			**Buffer Rules in Effect:**	
Project Includes Bridge Spanning Water Body?		**Deck Drains Discharge Over Buffer?**		**Dissipator Pads Provided in Buffer?**	
Deck Drains Discharge Over Water Body?		(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):	UT to Gabriels Creek/SAA-C		**NCDWR Stream Index No.:**	17-14	
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:	SAA-C			**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)					

Surface Water Body (5):	UT to Gabriels Creek/SBB-C		**NCDWR Stream Index No.:**	17-14	
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:	SBB-C			**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)					

WBS Element: 34550.3.S1 **TIP No.:** R-2536 Section 3 **County(ies):** Randolph

Additional Waterbody Information

Surface Water Body (6):	UT to Gabriels Creek/SMM-C		**NCDWR Stream Index No.:**	17-14	
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:	SMM-C			**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)					

Surface Water Body (7):	UT to Gabriels Creek/SKK-C		**NCDWR Stream Index No.:**	17-14	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	None		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SKK-C			**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)					

Surface Water Body (8):	UT to Gabriels Creek/SFF-C		**NCDWR Stream Index No.:**	17-14	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	None		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SFF-C			**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)					

Surface Water Body (9):	UT to Mill Creek/SGG-C		**NCDWR Stream Index No.:**	17-18	
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:	SGG-C			**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 2.04; Released November 2015)

WBS Element: **TIP No.:** R-2536 Section 3 **County(ies):** Randolph

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
53	24+15 -Y17RPDA- RT		PSH	Class 'B'	1.0	Pipe	15	5.1	0.7	No
53	48+31 -Y17FLY- RT		PSH	Class 'B'	0.3	Pipe	15	1.5	0.4	No

Additional Comments

* Refer to the NCDOT Best Management Practices Toolbox (2014), NCDOT Standards, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and criteria.

09/08/99

TIP PROJECT: R-2536

CONTRACT: C203617

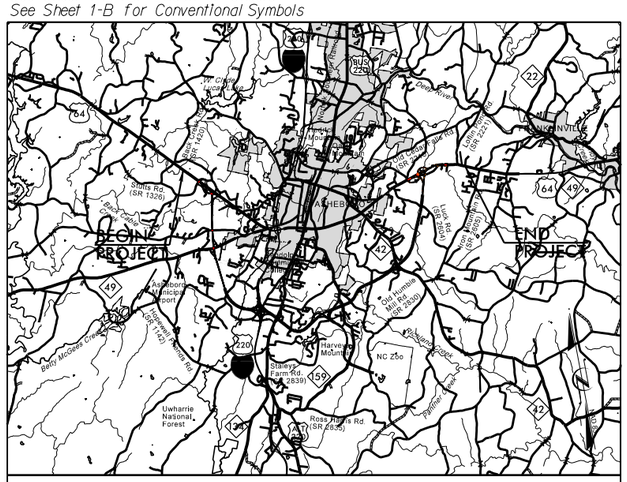
See Sheet 1-A for Index of Sheets
See Sheet 1-B for Conventional Symbols

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RANDOLPH COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2536	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34450.3.S1		PE



VICINITY MAP (NTS)

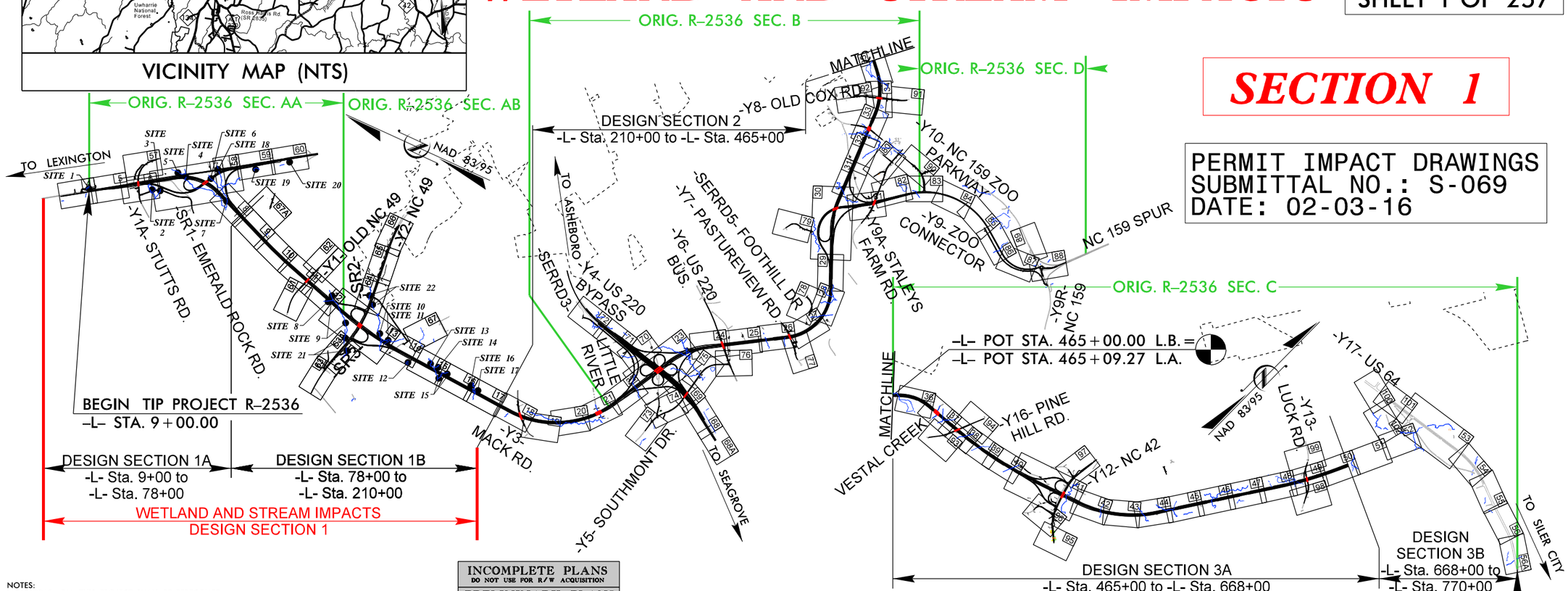
LOCATION: US 64 BYPASS FROM EXISTING US 64 WEST OF ASHEBORO TO EXISTING US 64 EAST OF ASHEBORO AND THE ZOO CONNECTOR FROM EAST OF STALEYS FARM RD. TO EXISTING NC 159/ZOO ENTRANCE

WETLAND AND STREAM IMPACTS

PERMIT DRAWING
SHEET 1 OF 257

SECTION 1

PERMIT IMPACT DRAWINGS
SUBMITTAL NO.: S-069
DATE: 02-03-16



NOTES:
1. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

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

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2015 = 12,600
ADT 2040 = 18,800
DHV = 11 %
D = 60 %
T = 13 % *
V = 70 MPH
(*TTST=8% + DUAL=5%)

FUNCTIONAL CLASSIFICATION
FREEWAY

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2536.....	14.619 mi
LENGTH STRUCTURE TIP PROJECT R-2536.....	0.121 mi
TOTAL LENGTH TIP PROJECT R-2536.....	14.740 mi

NCDOT CONTACT

K. Zak Hamidi, P.E.
PROJECT ENGINEER - DESIGN-BUILD UNIT

DESIGN - BUILD TEAM

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO. F-0112
1-888-521-4455 OR 919-878-9560

FOR
DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

LETTING DATE:
JUNE 29, 2015

B. Keith Skinner, P.E.
PROJECT ENGINEER

Michael T. Merritt, P.E.
PROJECT DESIGN ENGINEER

CONTRACTOR :

ASHEBORO 64 Bypass Constructors, LLC
WRIGHT BROTHERS RK&K

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

STATE OF NORTH CAROLINA

3/20/2016
R:\Hydraulics\PERMITS_Environmental\Drawings\4C\Section 1A\R2536_PRM_WET_tsh_secla.dgn
default

PROJECT REFERENCE NO.	SHEET NO.
R-2536	2D-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISED 6/14/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

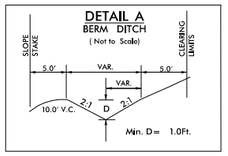
PERMIT DRAWING SHEET 2 OF 257

PLANS PREPARED BY :

RK&K

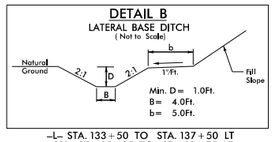
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

DETAIL A
BERM DITCH
(Not to Scale)



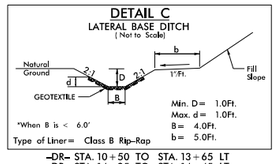
-L- STA. 25+50 TO STA. 28+50 RT
-L- STA. 27+00 TO STA. 28+00 LT
-L- STA. 71+00 TO STA. 72+00 LT
-L- STA. 89+00 TO STA. 90+00 RT
-L- STA. 106+50 TO STA. 110+50 RT
-L- STA. 166+00 TO STA. 169+00 LT
-L- STA. 207+00 TO STA. 210+00 LT
-Y- STA. 25+50 TO STA. 26+65 LT
-Y2- STA. 64+00 TO STA. 65+00 RT
-Y2- STA. 74+00 TO STA. 78+22 RT
-Y2- STA. 79+18 TO STA. 82+50 RT

DETAIL B
LATERAL BASE DITCH
(Not to Scale)



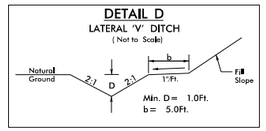
-L- STA. 133+50 TO STA. 137+50 LT
-SR1- STA. 15+25 TO STA. 15+75 LT
-SR1- STA. 18+69 TO STA. 19+50 RT, B=2'
-SR_E- STA. 11+00 TO STA. 13+00 LT
-Y1A- STA. 20+50 TO STA. 23+00 RT
-Y2- STA. 28+50 TO STA. 29+00 LT
-Y2RPD- STA. 22+50 TO STA. 23+50 RT
-Y2RPD- STA. 11+87.06 TO STA. 15+35 LT

DETAIL C
LATERAL BASE DITCH
(Not to Scale)



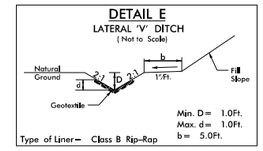
-DR- STA. 10+50 TO STA. 13+65 LT
-DR- STA. 14+25 TO STA. 14+45 LT
-FLY- STA. 19+25 TO STA. 21+25 LT
-FLY- STA. 36+80 TO STA. 37+50 RT
-L- STA. 90+50 TO STA. 92+50 RT
-L- STA. 137+05 TO STA. 138+50 RT
-L- STA. 178+50 TO STA. 181+50 RT
-L- STA. 199+00 TO STA. 200+15 RT
-RPA- STA. 20+50 TO STA. 23+39 RT
-SR1- STA. 19+50 TO STA. 20+97 RT, B=2'
-SR1- STA. 26+80 TO STA. 27+98 RT
-Y- STA. 30+00 TO STA. 34+50 LT
-Y- STA. 38+25 TO STA. 38+50 RT
-Y- STA. 44+75 TO STA. 45+00 LT
-Y- STA. 47+00 TO STA. 47+50 LT
-Y- STA. 58+00 TO STA. 60+30 RT
-Y2- STA. 35+00 TO STA. 36+92 RT
-Y2- STA. 52+00 TO STA. 56+00 LT
-Y2RPD- STA. 20+27 TO STA. 22+50 RT

DETAIL D
LATERAL 'V' DITCH
(Not to Scale)



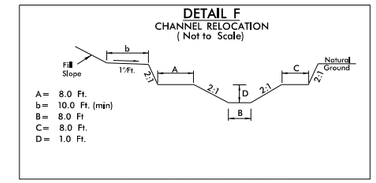
-DR6- STA. 11+50 TO STA. 12+30 RT
-FLY- STA. 13+66 TO STA. 14+63 RT
-FLY- STA. 41+50 TO STA. 41+66 LT
-FLY- STA. 43+50 TO STA. 44+85 LT
-L- STA. 31+56 TO STA. 32+50 LT
-L- STA. 33+84 TO STA. 34+00 LT
-L- STA. 168+18 TO STA. 168+50 RT
-L- STA. 182+00 TO STA. 183+57 LT
-L- STA. 182+85 TO STA. 183+00 RT
-RPA- STA. 23+39 TO STA. 24+50 RT
-SR1- STA. 15+75 TO STA. 17+00 LT
-SR1- STA. 18+69 TO STA. 19+50 RT
-SR_E- STA. 10+20 TO STA. 11+00 LT
-SR_F- STA. 31+00 TO STA. 33+10 LT
-Y- STA. 27+50 TO STA. 28+50 RT
-Y- STA. 37+25 TO STA. 38+25 RT
-Y1- STA. 20+62 TO STA. 22+00 LT
-Y1- STA. 20+63 TO STA. 22+00 RT
-Y1- STA. 31+50 TO STA. 33+00 RT
-Y1A- STA. 14+50 TO STA. 16+00 LT
-Y1A- STA. 26+30 TO STA. 27+00 RT
-Y2- STA. 39+07 TO STA. 40+00 RT
-Y2- STA. 52+50 TO STA. 53+60 RT
-Y2- STA. 52+00 TO STA. 56+00 LT
-Y2RPD- STA. 26+50 TO STA. 29+95 RT

DETAIL E
LATERAL 'V' DITCH
(Not to Scale)



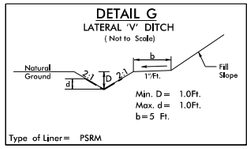
-FLY- STA. 14+63 TO STA. 15+11 RT
-L- STA. 90+57 TO STA. 90+80 LT
-L- STA. 152+25 TO STA. 152+63 LT, D=1.5', d=1.5'
-L1A- STA. 12+87 TO STA. 13+50 LT

DETAIL F
CHANNEL RELOCATION
(Not to Scale)



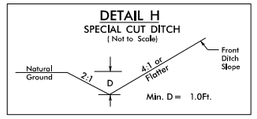
-L- STA. 66+18.43 TO STA. 70+95.02 RT

DETAIL G
LATERAL 'V' DITCH
(Not to Scale)



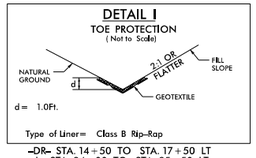
-DR6- STA. 10+37 TO STA. 11+59 LT
-DR6- STA. 10+50 TO STA. 11+50 RT
-FLY- STA. 12+85 TO STA. 13+66 RT
-FLY- STA. 18+00 TO STA. 19+25 LT
-FLY- STA. 31+50 TO STA. 36+80 RT
-FLY- STA. 39+88 TO STA. 41+50 LT
-FLY- STA. 41+66 TO STA. 43+50 LT
-L- STA. 25+78 TO STA. 26+20 LT
-L- STA. 32+50 TO STA. 33+84 LT
-L- STA. 50+64 TO STA. 50+80 RT
-L- STA. 89+50 TO STA. 90+57 LT
-L- STA. 125+00 TO STA. 128+16 LT
-L- STA. 176+50 TO STA. 176+80 LT
-L- STA. 179+45 TO STA. 181+50 LT
-L- STA. 183+00 TO STA. 184+00 RT
-L- STA. 196+50 TO STA. 197+50 LT, D=1.5', d=1.5'
-LPD- STA. 14+50 TO STA. 15+00 RT
-LPD- STA. 20+73 TO STA. 23+22 LT
-SR1- STA. 11+00 TO STA. 13+00 LT
-SR1- STA. 15+00 TO STA. 15+50 LT
-SR1- STA. 16+26 TO STA. 17+50 RT
-SR2- STA. 11+40 TO STA. 14+00 RT
-Y- STA. 15+99 TO STA. 16+40 LT
-Y- STA. 28+82 TO STA. 29+40 LT
-Y- STA. 62+00 TO STA. 63+50 RT
-Y- STA. 23+00 TO STA. 24+80 RT
-Y- STA. 24+55 TO STA. 25+50 LT
-Y- STA. 55+76 TO STA. 58+00 RT
-Y2A- STA. 11+15 TO STA. 11+50 LT

DETAIL H
SPECIAL CUT DITCH
(Not to Scale)



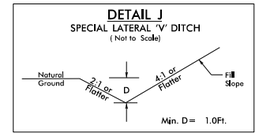
-L- STA. 71+00 TO STA. 72+63 LT
-L- STA. 192+50 TO STA. 195+50 LT
-L- STA. 192+50 TO STA. 196+00 RT
-L- STA. 202+00 TO STA. 203+00 LT
-SR1- STA. 20+97 TO STA. 21+97 RT
-SR1- STA. 33+50 TO STA. 34+50 RT
-SR_F- STA. 13+55 TO STA. 16+00 LT
-SR_F- STA. 14+00 TO STA. 16+00 RT
-Y- STA. 25+50 TO STA. 27+50 LT
-Y- STA. 63+50 TO STA. 64+33 RT
-Y1- STA. 22+00 TO STA. 24+50 LT
-Y1- STA. 22+00 TO STA. 24+50 RT
-Y1A- STA. 29+50 TO STA. 30+66 RT
-Y1A- STA. 11+66 TO STA. 12+50 LT
-Y1B- STA. 12+62 TO STA. 13+78 LT
-Y2- STA. 21+83 TO STA. 22+50 RT
-Y2- STA. 27+00 TO STA. 29+00 LT
-Y2- STA. 32+50 TO STA. 33+50 RT
-Y2A- STA. 15+50 TO STA. 16+14 LT
-Y2A- STA. 15+50 TO STA. 16+07 RT

DETAIL I
TOE PROTECTION
(Not to Scale)



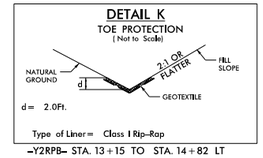
-DR- STA. 14+50 TO STA. 17+50 LT
-L- STA. 34+00 TO STA. 35+50 LT
-L- STA. 62+40 TO STA. 63+20 LT
-L- STA. 64+00 TO STA. 64+35 LT
-L- STA. 156+25 TO STA. 156+60 LT
-L- STA. 176+50 TO STA. 178+50 RT
-L- STA. 183+00 TO STA. 183+50 LT
-LPD- STA. 13+50 TO STA. 14+25 RT
-SR_E- STA. 12+50 TO STA. 14+00 RT
-SR_E- STA. 13+00 TO STA. 14+00 LT
-SR_F- STA. 11+00 TO STA. 13+50 LT
-Y- STA. 23+55 TO STA. 24+50 LT
-Y- STA. 54+50 TO STA. 55+30 LT

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



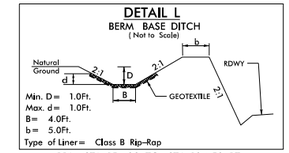
-Y1- STA. 29+50 TO STA. 33+00 LT
-Y1B- STA. 13+78 TO STA. 14+36 LT
-Y1DET- STA. 19+77 TO STA. 21+84 RT

DETAIL K
TOE PROTECTION
(Not to Scale)



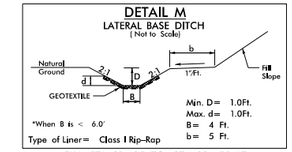
-Y2RPB- STA. 13+15 TO STA. 14+82 LT

DETAIL L
BERM BASE DITCH
(Not to Scale)



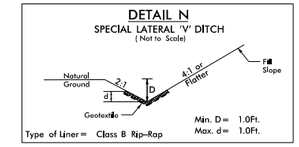
-RPA- STA. 15+20 TO STA. 19+50 RT
-SR_F- STA. 16+50 TO STA. 21+00 LT
-Y2RPB- STA. 18+50 TO STA. 20+50 LT
-Y- STA. 39+00 TO STA. 40+00 LT
-Y- STA. 47+50 TO STA. 50+25 LT
-Y- STA. 53+00 TO STA. 54+50 LT

DETAIL M
LATERAL BASE DITCH
(Not to Scale)



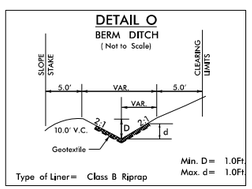
-FLY- STA. 21+25 TO STA. 22+50 LT
-L- STA. 15+96 TO STA. 17+00 RT
-L- STA. 126+50 TO STA. 127+16 RT
-L- STA. 197+50 TO STA. 199+00 LT
-RPA- STA. 19+00 TO STA. 20+50 RT
-SR1- STA. 14+90 TO STA. 15+25 LT
-Y- STA. 12+81 TO STA. 13+82 LT
-Y2- STA. 29+00 TO STA. 30+00 LT
-Y2- STA. 34+50 TO STA. 35+00 RT
-Y2RPB- STA. 18+25 TO STA. 19+00 RT

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



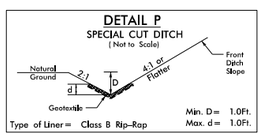
DETAIL NOT USED IN SECTION 1

DETAIL O
BERM DITCH
(Not to Scale)



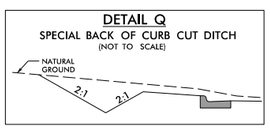
-L- STA. 86+17 TO STA. 89+00 RT
-L- STA. 161+00 TO STA. 166+00 LT
-Y2- STA. 64+00 TO STA. 68+00 RT
-Y2RPB- STA. 20+50 TO STA. 22+00 LT

DETAIL P
SPECIAL CUT DITCH
(Not to Scale)



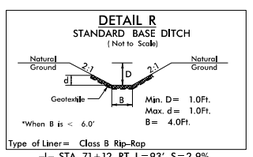
DETAIL NOT USED IN SECTION 1

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



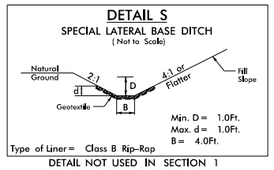
DETAIL NOT USED IN SECTION 1

DETAIL R
STANDARD BASE DITCH
(Not to Scale)



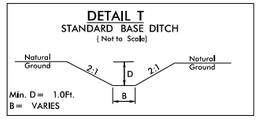
-L- STA. 71+12 RT, L=93', S=2.9%
BEG. ELEV=625.0, END ELEV=622.3
-L- STA. 71+20 RT, L=69', S=0.3%
BEG. ELEV=622.5, END ELEV=622.3
-L- STA. 181+50 RT, L=36', S=1.08%
BEG. ELEV=707.4, END ELEV=707.0
-LPD- STA. 20+73 LT, L=48', S=0.75%
BEG. ELEV=661.4, END ELEV=661.0
-Y2- STA. 63+50 LT, L=35', S=9.3%
BEG. ELEV=753.3, END ELEV=750.0

DETAIL S
SPECIAL LATERAL BASE DITCH
(Not to Scale)



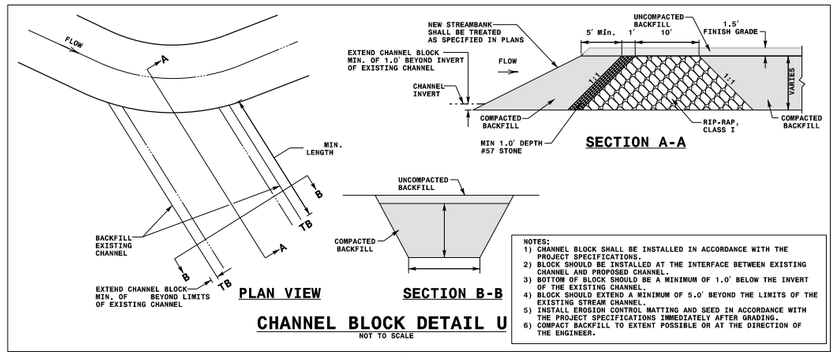
DETAIL NOT USED IN SECTION 1

DETAIL T
STANDARD BASE DITCH
(Not to Scale)



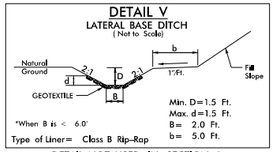
-L- STA. 81+43 RT, L=90', S=23.6%
BEG. ELEV=754.0, END ELEV=732.68
-Y- STA. 24+75 RT, B=2', L=34', S=0.76%
BEG. ELEV=664.5, END ELEV=664.2
-Y1A- STA. 20+50 RT, L=127', S=4.4%
BEG. ELEV=686.5, END ELEV=680.9

CHANNEL BLOCK DETAIL U
NOT TO SCALE



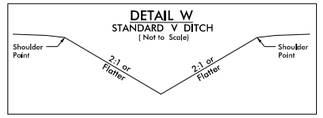
-RPA- STA. 22+76 LT
-L- STA. 62+75 LT
-L- STA. 70+65 RT
-L- STA. 127+21 RT
-L- STA. 176+90 LT
-L- STA. 179+23 LT
-L- STA. 200+15 LT
-Y- STA. 45+55 RT
-Y2- STA. 31+25 RT
-Y2- STA. 53+65 RT

DETAIL V
LATERAL BASE DITCH
(Not to Scale)



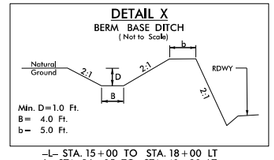
DETAIL NOT USED IN SECTION 1

DETAIL W
STANDARD V DITCH
(Not to Scale)



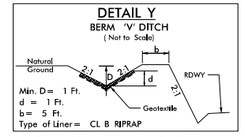
-FLY- STA. 16+99 TO STA. 18+00 LT, S=5.9%
BEG. ELEV=696.0, END ELEV=690.0
-L- STA. 63+00 RT, L=28', S=0.32%
BEG. ELEV=637.11, END ELEV=637.02
-L- STA. 168+20 RT, L=19', S=3.2%
BEG. ELEV=754.6, END ELEV=754.0
-Y- STA. 58+30 TO STA. 58+69 LT, S=4.46%
BEG. ELEV=755.00, END ELEV=753.28
-Y2- STA. 32+50 TO STA. 34+50 RT, S=0.3%
BEG. ELEV=691.74, END ELEV=691.14

DETAIL X
BERM BASE DITCH
(Not to Scale)



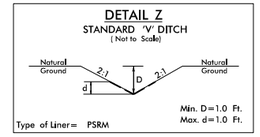
-L- STA. 15+00 TO STA. 18+00 LT
L- STA. 36+05 TO STA. 40+90 LT
-SR_F- STA. 14+25 TO STA. 16+50 LT S=0.3%
-SR_F- STA. 21+00 TO STA. 29+80 LT
-Y- STA. 21+50 TO STA. 23+50 LT
-Y- STA. 34+50 TO STA. 38+75 LT
-Y2- STA. 65+00 TO STA. 68+00 RT

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



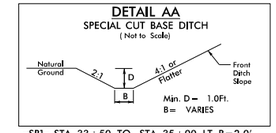
DETAIL NOT USED IN SECTION 1

DETAIL Z
STANDARD 'V' DITCH
(Not to Scale)



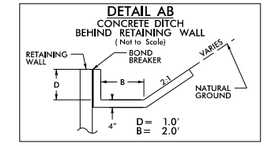
DETAIL NOT USED IN SECTION 1

DETAIL AA
SPECIAL CUT BASE DITCH
(Not to Scale)



-SR1- STA. 33+50 TO STA. 35+00 LT, B=2.0'
-Y- STA. 61+60 TO STA. 63+00 LT, B=4.0'

DETAIL AB
CONCRETE DITCH
BEHIND RETAINING WALL
(Not to Scale)



DETAIL NOT USED IN SECTION 1

8/17/99

6/14/2016
R:\Hydraulics\PERMITS\Environmental\Drawings\4C\Section 1A\R-2536_PRM_WET_DitchDet_SECI.dgn
dsrout

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	2D-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISED 6/14/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY :

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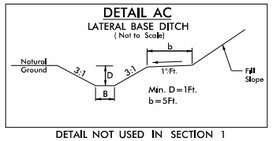
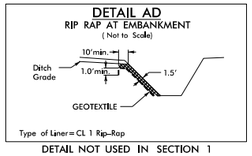
DETAIL AC
LATERAL BASE DITCH
(Not to Scale)



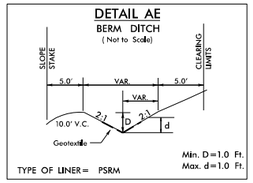
DETAIL NOT USED IN SECTION 1

DETAIL AD
RIP RAP AT EMBANKMENT
(Not to Scale)



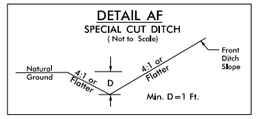
DETAIL NOT USED IN SECTION 1

DETAIL AE
BERM DITCH
(Not to Scale)



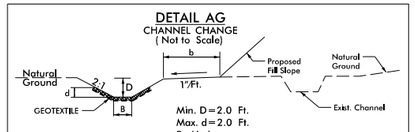
-L- STA. 82+00 TO STA. 89+00 RT

DETAIL AF
SPECIAL CUT DITCH
(Not to Scale)



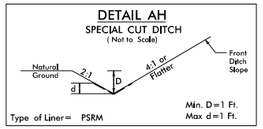
DETAIL NOT USED IN SECTION 1

DETAIL AG
CHANNEL CHANGE
(Not to Scale)



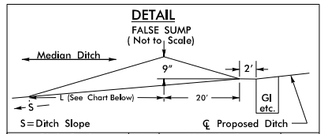
-L- STA. 62+40 TO STA. 63+11 LT, B=4', CL B
-L- STA. 63+95 TO STA. 64+35 LT, B=4', CL B
-L- STA. 64+90 TO STA. 66+24 RT, B=4', CL I
-L- STA. 127+16 TO STA. 133+50 RT, B=4', CL B
-L- STA. 133+50 TO STA. 135+00 RT, B=5', CL I
-L- STA. 135+00 TO STA. 137+05 RT, B=5', CL B
-L- STA. 152+63 TO STA. 156+43 LT, B=4', CL B
-L- STA. 176+80 TO STA. 178+30 LT, B=3', GRASS
-L- STA. 178+30 TO STA. 179+34 LT, B=3', CL B
-L- STA. 183+25 TO STA. 183+90 LT, B=2', CL B
-RPA- STA. 21+50 TO STA. 22+77 LT, B=4', CL B
-SR2- STA. 56+28 TO STA. 58+78 LT, B=6', CL B
-Y- STA. 13+82 TO STA. 15+99 LT, B=4', CL B
-Y- STA. 43+91 TO STA. 45+92 RT, B=9' CL I
-Y2- STA. 30+61 TO STA. 31+50 RT, B=6', CL B
-Y2- STA. 53+47 TO STA. 54+35 RT, B=6', CL II
-Y2- STA. 56+28 TO STA. 58+78 LT, B=6', CL B

DETAIL AH
SPECIAL CUT DITCH
(Not to Scale)



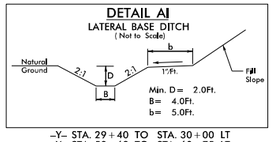
DETAIL NOT USED IN SECTION 1

DETAIL
FALSE SUMP
(Not to Scale)



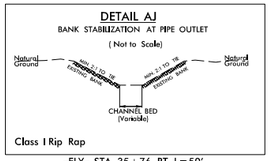
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

DETAIL AI
LATERAL BASE DITCH
(Not to Scale)



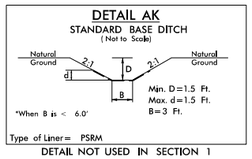
-Y- STA. 29+40 TO STA. 30+00 LT
-Y- STA. 58+69 TO STA. 60+75 LT
-Y2- STA. 30+00 TO STA. 35+04 LT

DETAIL AJ
BANK STABILIZATION AT PIPE OUTLET
(Not to Scale)



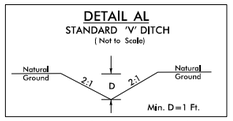
-FLY- STA. 35+76 RT, L=50'
-FLY- STA. 42+03 RT, L=35'
-FLY- STA. 45+52 RT, L=36'
-L- STA. 181+69 RT, L=50'
-L- STA. 198+57 RT, L=50'
-LPD- STA. 11+87 LT, L=42'
-SR1- STA. 16+30 RT, L=50'
-SR2- STA. 11+42 LT, L=50'
-SR3- STA. 13+50 RT, L=50'
-Y- STA. 45+00 RT, L=30'

DETAIL AK
STANDARD BASE DITCH
(Not to Scale)



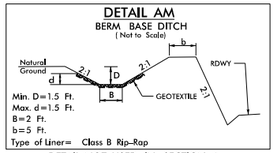
DETAIL NOT USED IN SECTION 1

DETAIL AL
STANDARD 'V' DITCH
(Not to Scale)



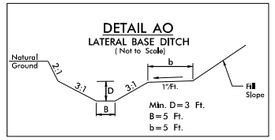
-Y1- STA. 27+25 TO STA. 27+60 RT, S=0.60%
BEG. ELEV=778.68, END ELEV=778.47
-Y- STA. 44+00 RT, L=30' S=2.6%
BEG. ELEV=666.2, END ELEV=665.5

DETAIL AM
BERM BASE DITCH
(Not to Scale)



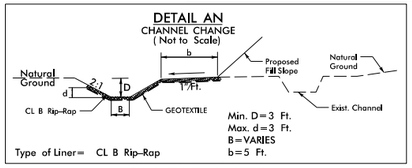
DETAIL NOT USED IN SECTION 1

DETAIL AO
LATERAL BASE DITCH
(Not to Scale)



DETAIL NOT USED IN SECTION 1

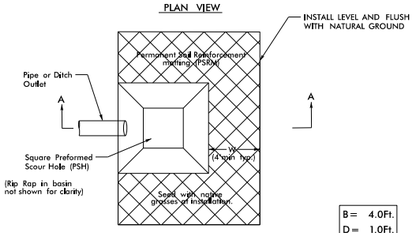
DETAIL AN
CHANNEL CHANGE
(Not to Scale)



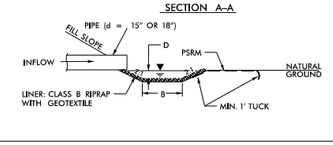
DETAIL NOT USED IN SECTION 1

PREFORMED SCOUR HOLE DETAIL AP
*NOT TO SCALE

PLAN VIEW

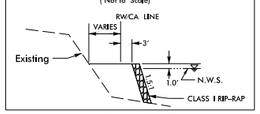


SECTION A-A



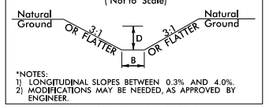
DETAIL NOT USE IN SECTION 1

DETAIL AQ
FILL IN POND W/ROCK PLATING
(Not to Scale)



-L- STA. 168+20 RT

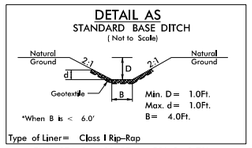
DETAIL AR
STANDARD BASE GRASSED SWALE
(Not to Scale)



*NOTES:
1) LONGITUDINAL SLOPES BETWEEN 0.3% AND 4.0%.
2) MODIFICATIONS MAY BE NEEDED, AS APPROVED BY ENGINEER.

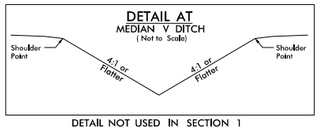
DETAIL NOT USED IN SECTION 1

DETAIL AS
STANDARD BASE DITCH
(Not to Scale)



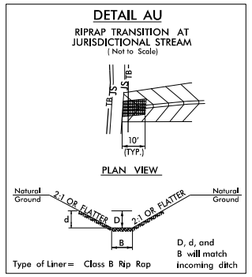
-FLY- STA. 14+63 RT, L=52', S=1.7%
BEG. ELEV=649.9, END ELEV=649.0
-FLY- STA. 18+90 LT, L=47', S=14.9%
BEG. ELEV=685.0, END ELEV=678.0
-L- STA. 8+95 TO 9+50 LT, S=11.4%
BEG. ELEV=564.0, END ELEV=570.5
-L- STA. 48+00 RT, L=47', S=12.3%
BEG. ELEV=690.5, END ELEV=684.7
-LPD- STA. 13+50 RT, L=36', S=11.9%
BEG. ELEV=689.0, END ELEV=684.7
-SR F- STA. 14+00 RT, L=315', S=5.7%
BEG. ELEV=739.4, END ELEV=721.0
-Y- STA. 45+00 LT, L=50', S=11.2%
BEG. ELEV=698.0, END ELEV=692.4
-Y- STA. 45+85 RT, L=40', S=12.6%
BEG. ELEV=674.5, END ELEV=669.5

DETAIL AT
MEDIAN V DITCH
(Not to Scale)



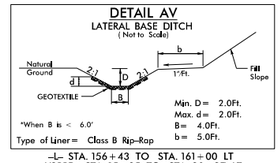
DETAIL NOT USED IN SECTION 1

DETAIL AU
RIPRAP TRANSITION AT JURISDICTIONAL STREAM
(Not to Scale)



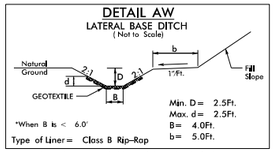
-L- STA. 8+85 LT
-L- STA. 128+05 LT
-L- STA. 197+46 LT
-Y2- STA. 35+15 LT

DETAIL AV
LATERAL BASE DITCH
(Not to Scale)



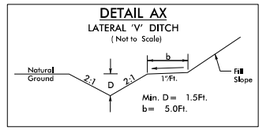
-L- STA. 156+43 TO STA. 161+00 LT
-Y2RPD- STA. 15+35 TO STA. 20+27 LT
-L- STA. 181+69 TO STA. 182+25 RT
-L- STA. 198+00 TO STA. 199+50 RT
-Y- STA. 45+00 TO STA. 45+20 LT
-Y2- STA. 35+04 TO STA. 40+50 LT
-Y2- STA. 57+90 TO STA. 62+00 RT

DETAIL AW
LATERAL BASE DITCH
(Not to Scale)



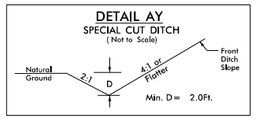
-Y2RPB- STA. 16+20 TO STA. 18+50 LT

DETAIL AX
LATERAL 'V' DITCH
(Not to Scale)



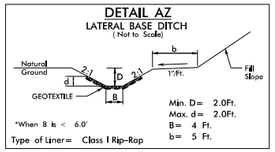
DETAIL NOT USED IN SECTION 1

DETAIL AY
SPECIAL CUT DITCH
(Not to Scale)



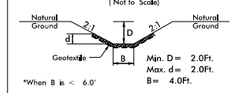
DETAIL NOT USED IN SECTION 1

DETAIL AZ
LATERAL BASE DITCH
(Not to Scale)



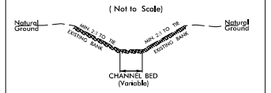
DETAIL NOT USED IN SECTION 1

DETAIL BA
STANDARD BASE DITCH
(Not to Scale)

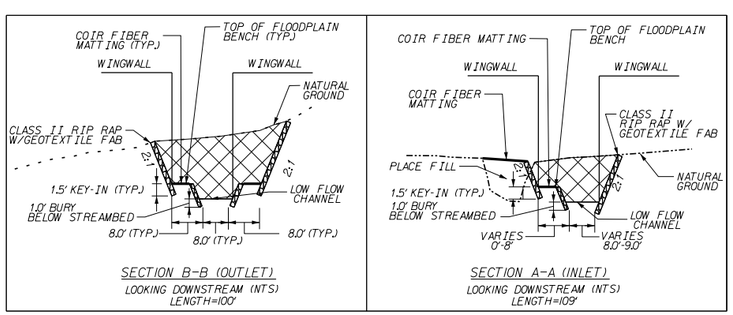


DETAIL NOT USED IN SECTION 1

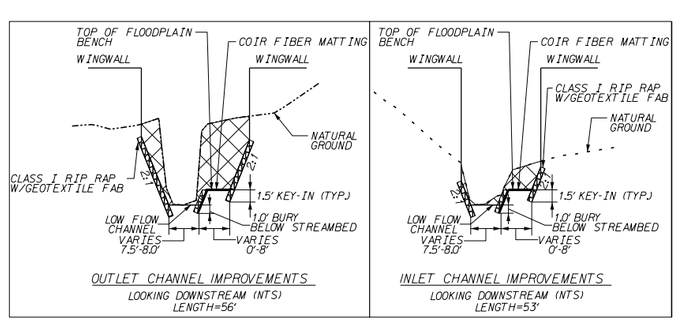
DETAIL BB
BANK STABILIZATION AT PIPE OUTLET
(Not to Scale)



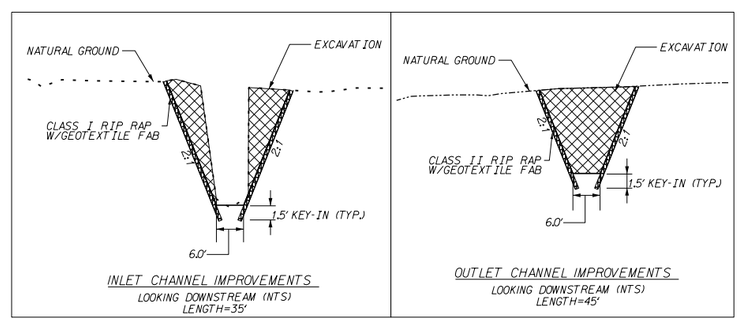
-L- STA. 90+55 LT, L=36'
-Y- STA. 58+00 RT, L=30'



CULVERT INLET/OUTLET DETAILS
-L- STA 65+84



CULVERT INLET/OUTLET DETAILS
-L- STA 153+70



CULVERT INLET/OUTLET DETAILS
-Y2- STA 55+28

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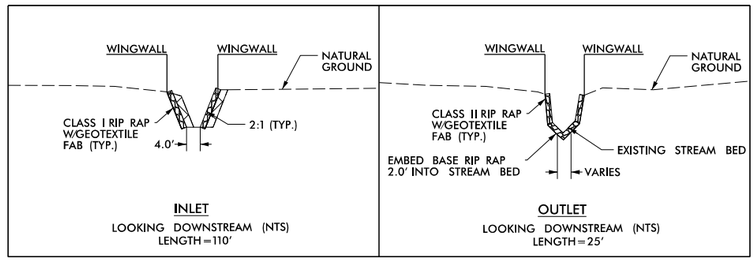
SHEET 3 OF 257



CULVERT INLET/OUTLET DETAIL
–DR– STA 13 + 42

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SHEET 4 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	2D-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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R-2536	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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SHEET 5 OF 257

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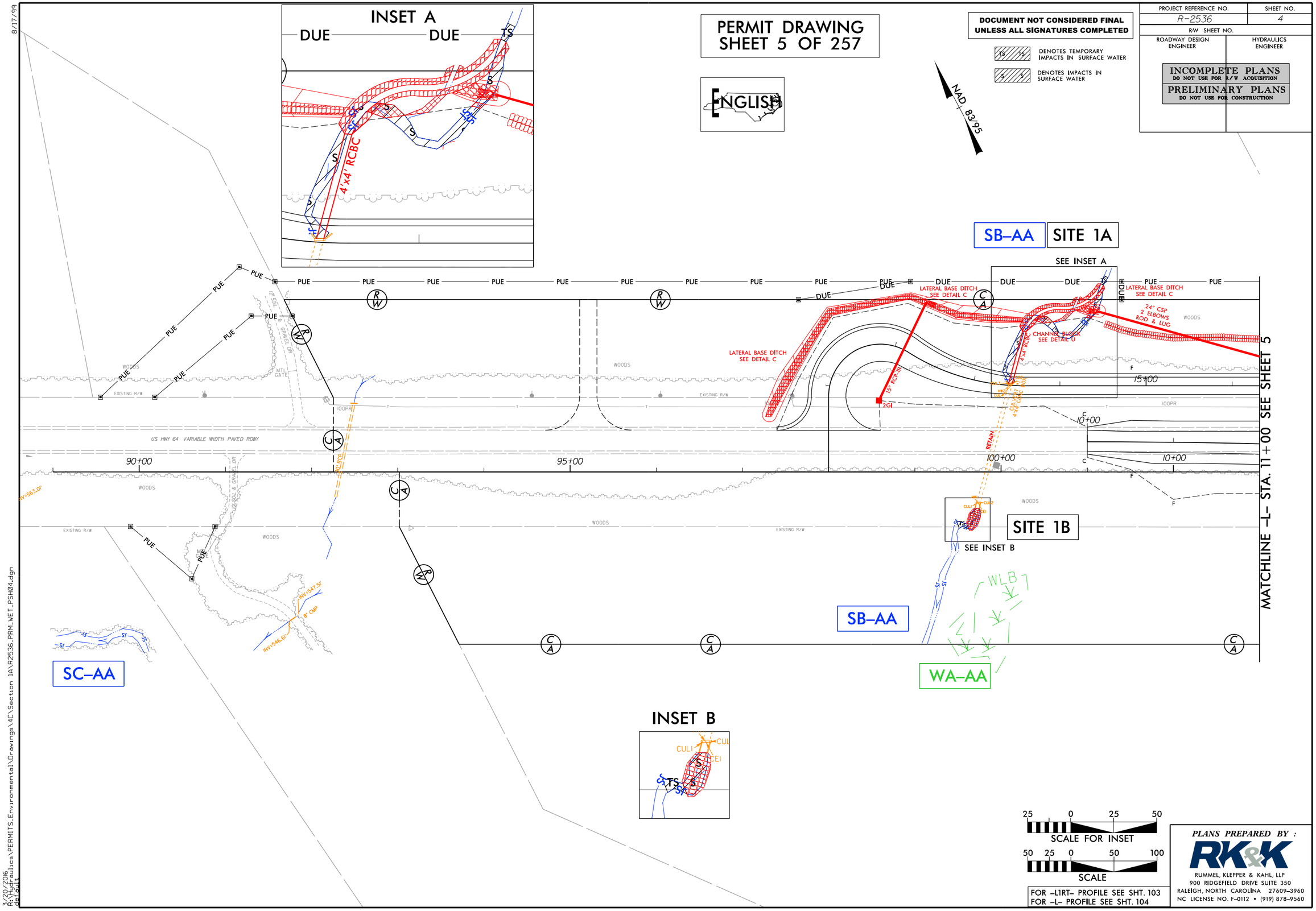
TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES IMPACTS IN SURFACE WATER

NAD 83/95



25 0 25 50
SCALE FOR INSET

50 25 0 50 100
SCALE

FOR -L1RT- PROFILE SEE SHT. 103
FOR -L- PROFILE SEE SHT. 104

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TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES IMPACTS IN SURFACE WATER

NAD 83/95

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R-2536	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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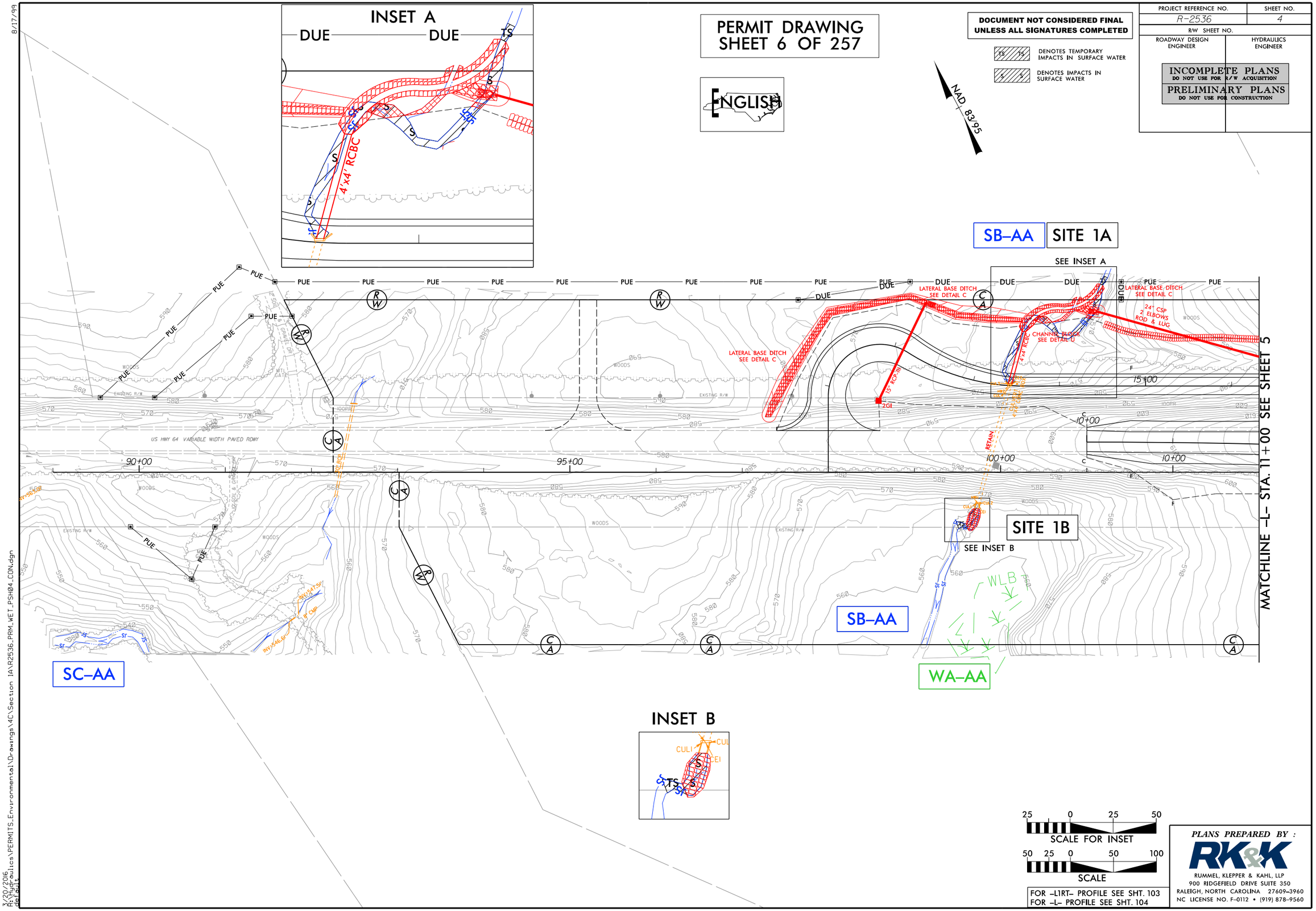

FOR -L1RT- PROFILE SEE SHT. 103
FOR -L- PROFILE SEE SHT. 104

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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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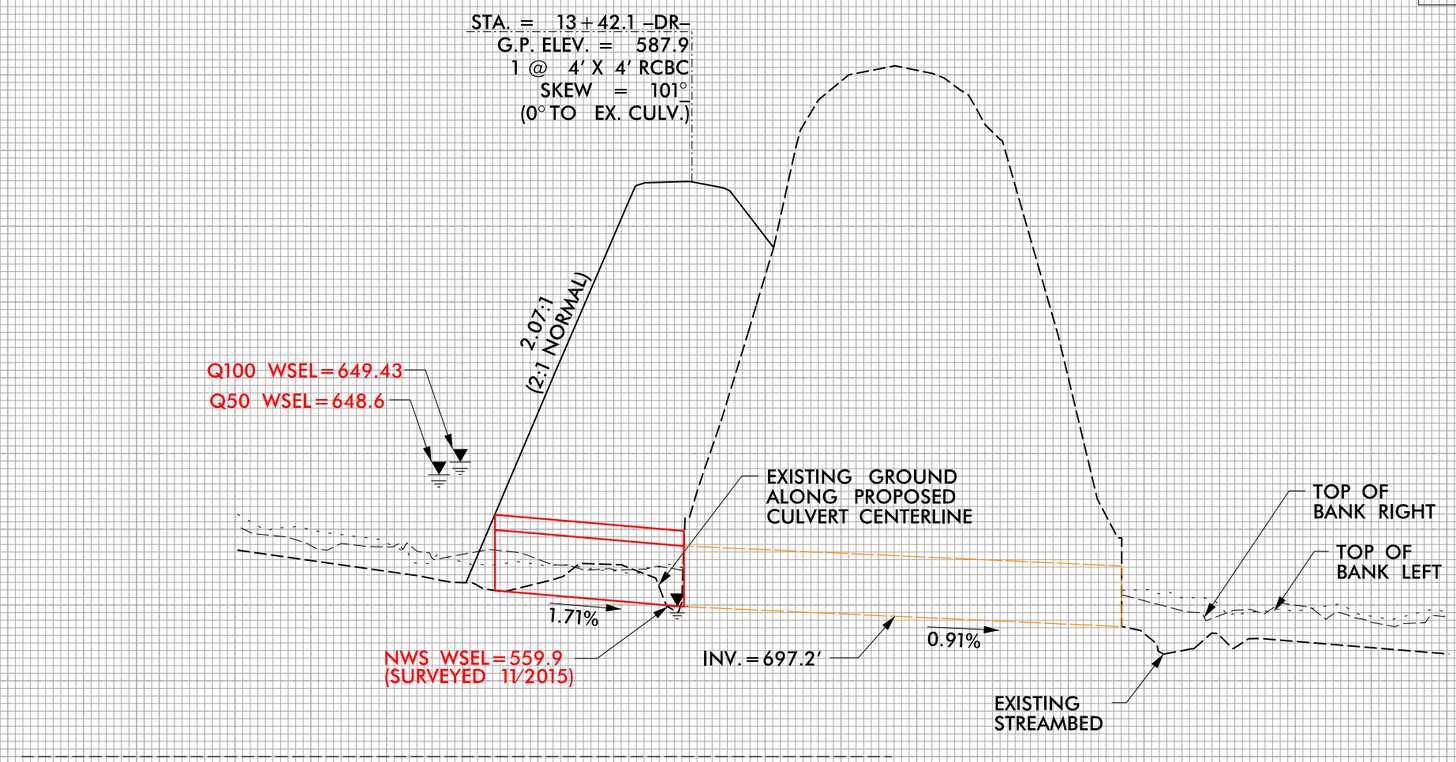
SHEET 7 OF 257

SITE 1
–DR– STA. 13+52



EXTEND EXISTING 4'x4' RCBC, NOT BURIED
(TOTAL LENGTH=205')

250 200 150 100 50 0 50 100 150 200 250

3/20/2016
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PROJECT REFERENCE NO.	SHEET NO.
R-2536	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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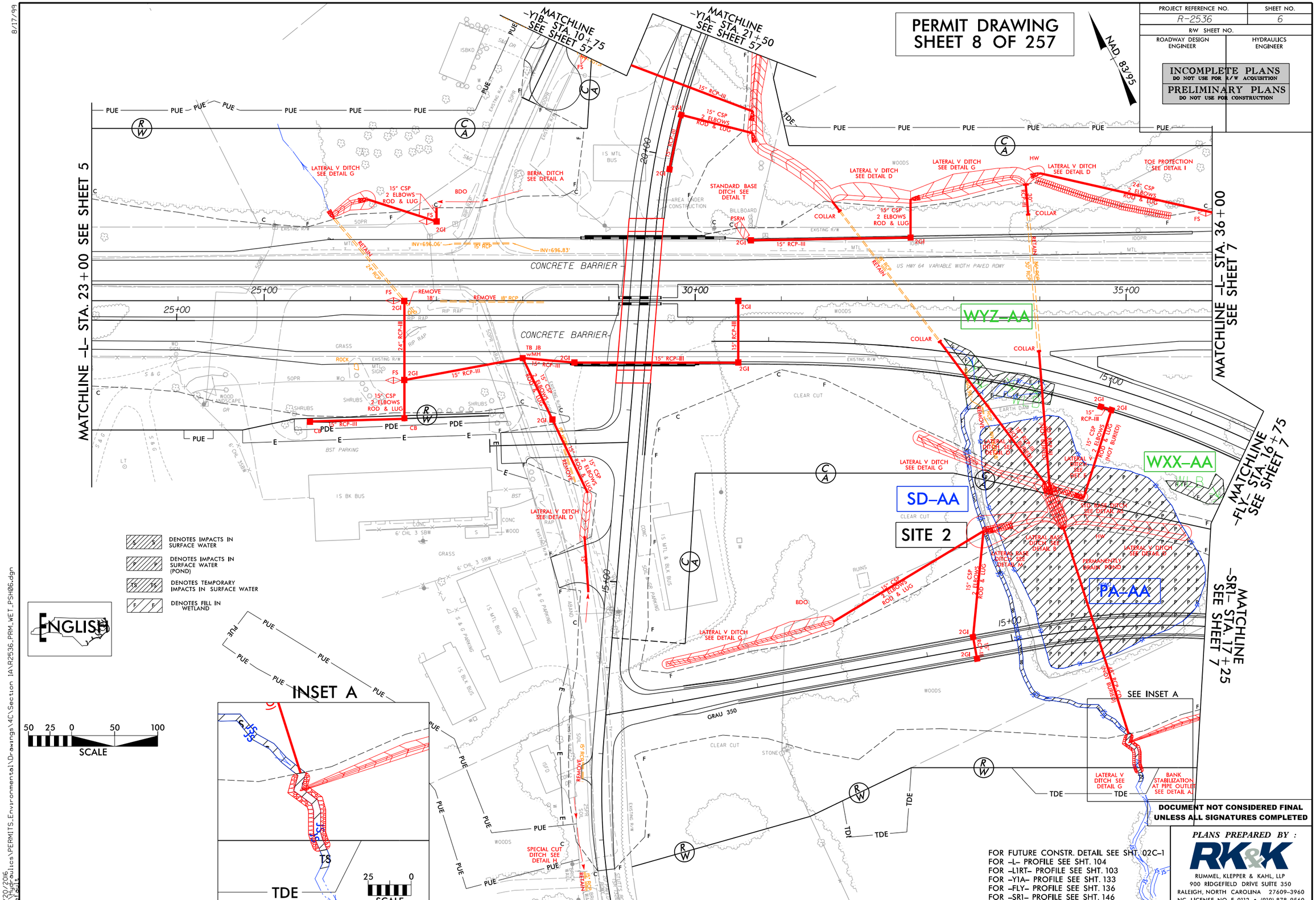
PERMIT DRAWING SHEET 8 OF 257

NAD 83/95



FOR FUTURE CONSTR. DETAIL SEE SHT. 02C-1
FOR -L- PROFILE SEE SHT. 104
FOR -L1RT- PROFILE SEE SHT. 103
FOR -Y1A- PROFILE SEE SHT. 133
FOR -FLY- PROFILE SEE SHT. 136
FOR -SR1- PROFILE SEE SHT. 146

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R-2536	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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SHEET 9 OF 257

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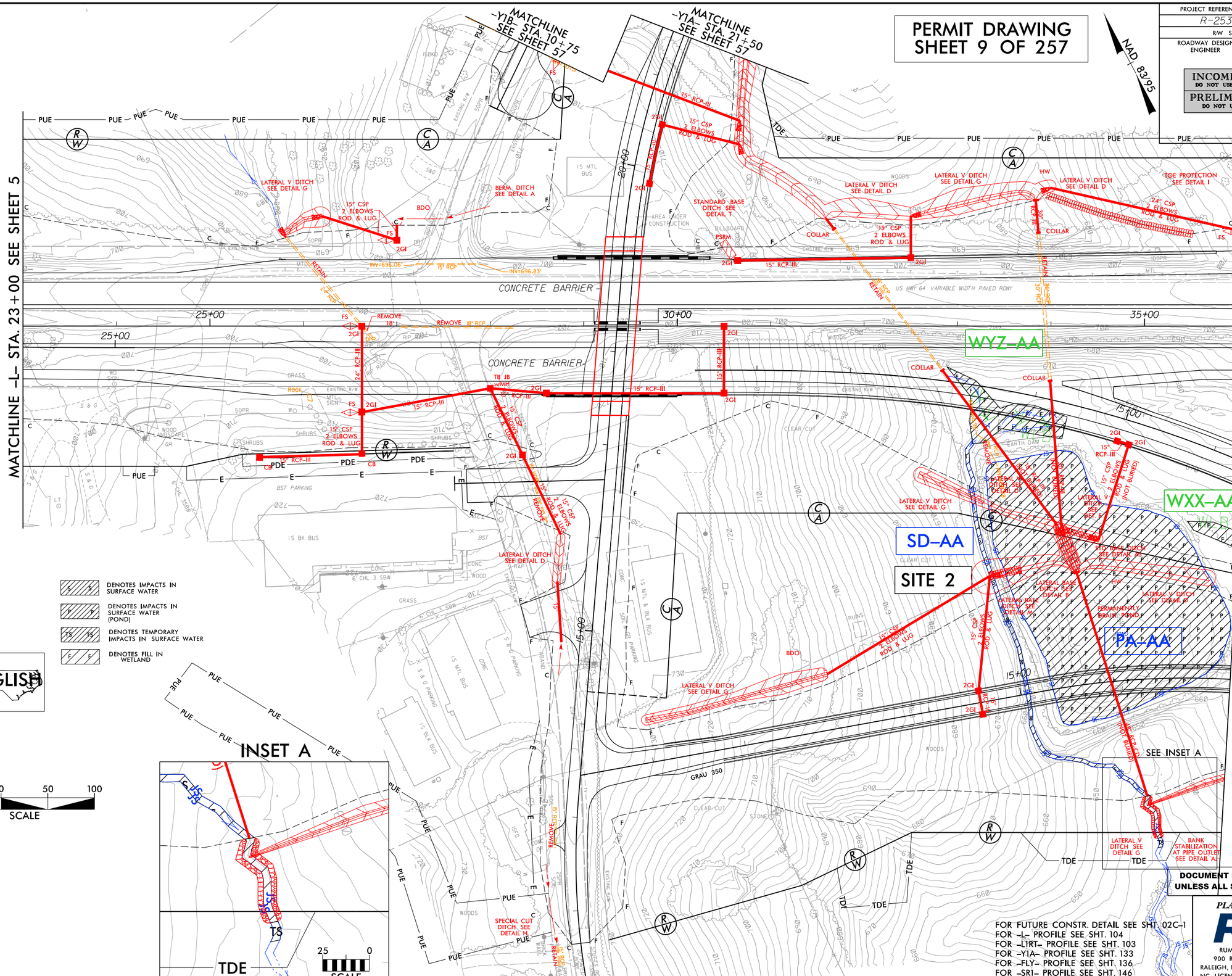

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0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-27

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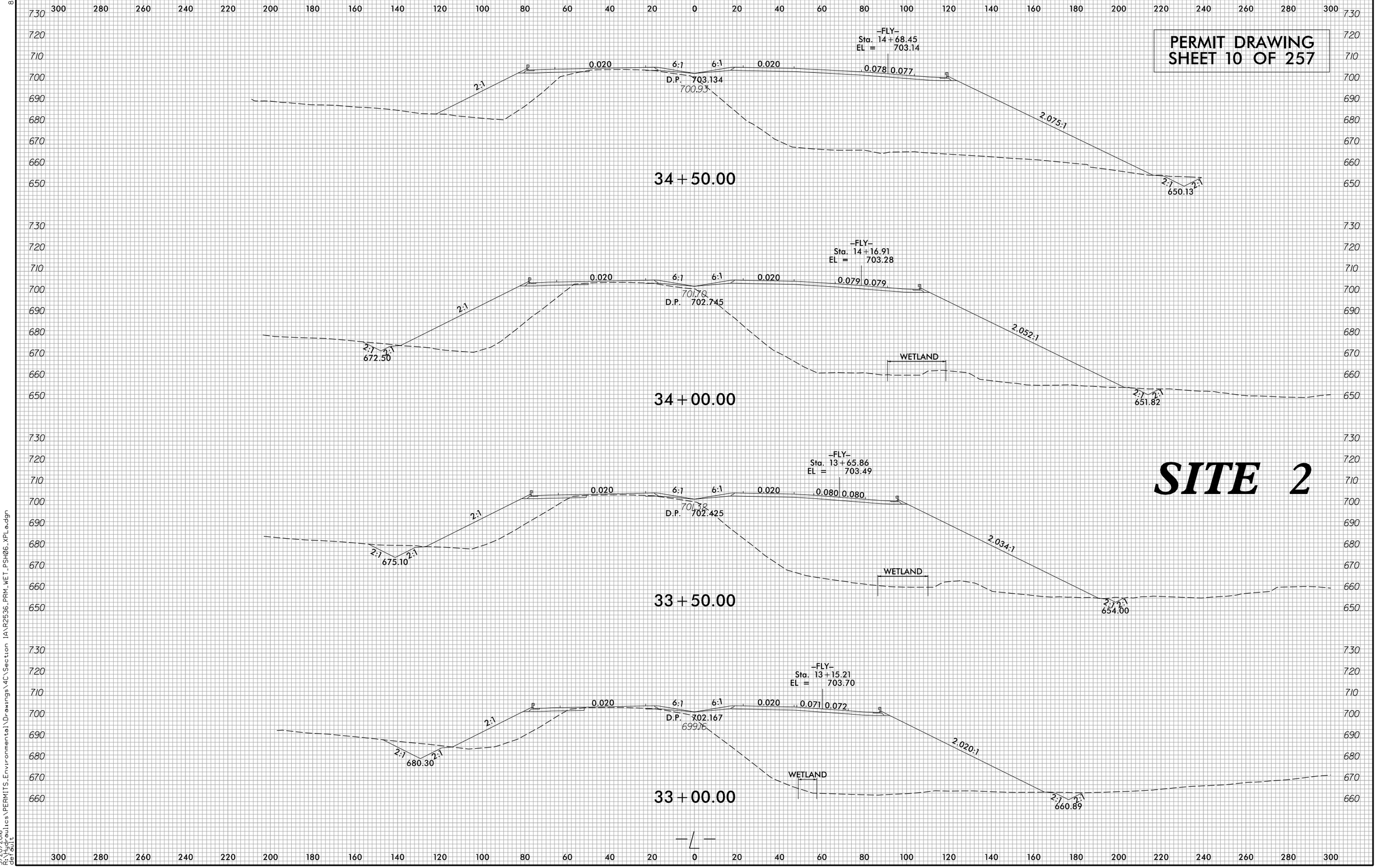
SHEET 10 OF 257

SITE 2



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	R-2536	X-29

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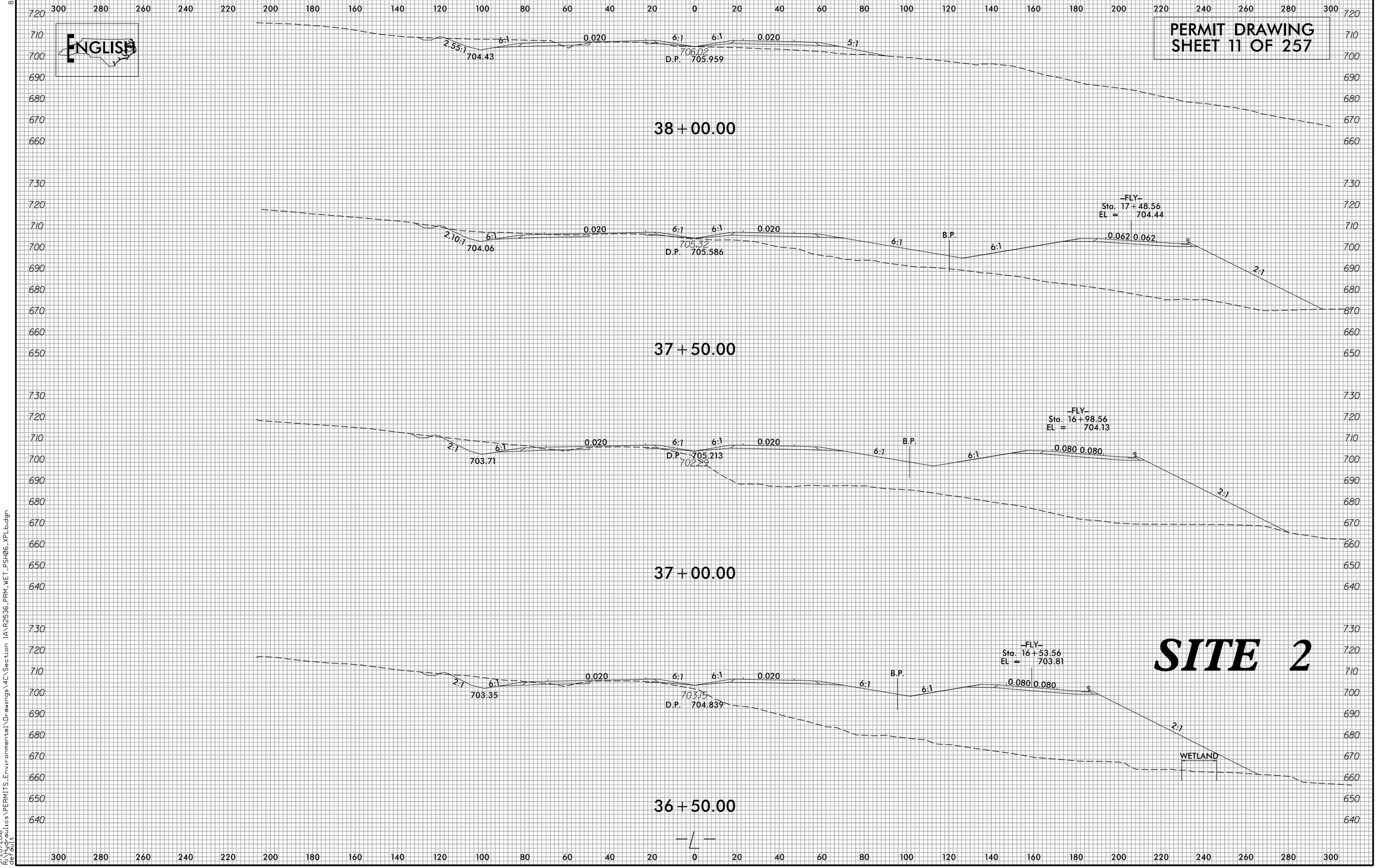
SHEET 11 OF 257



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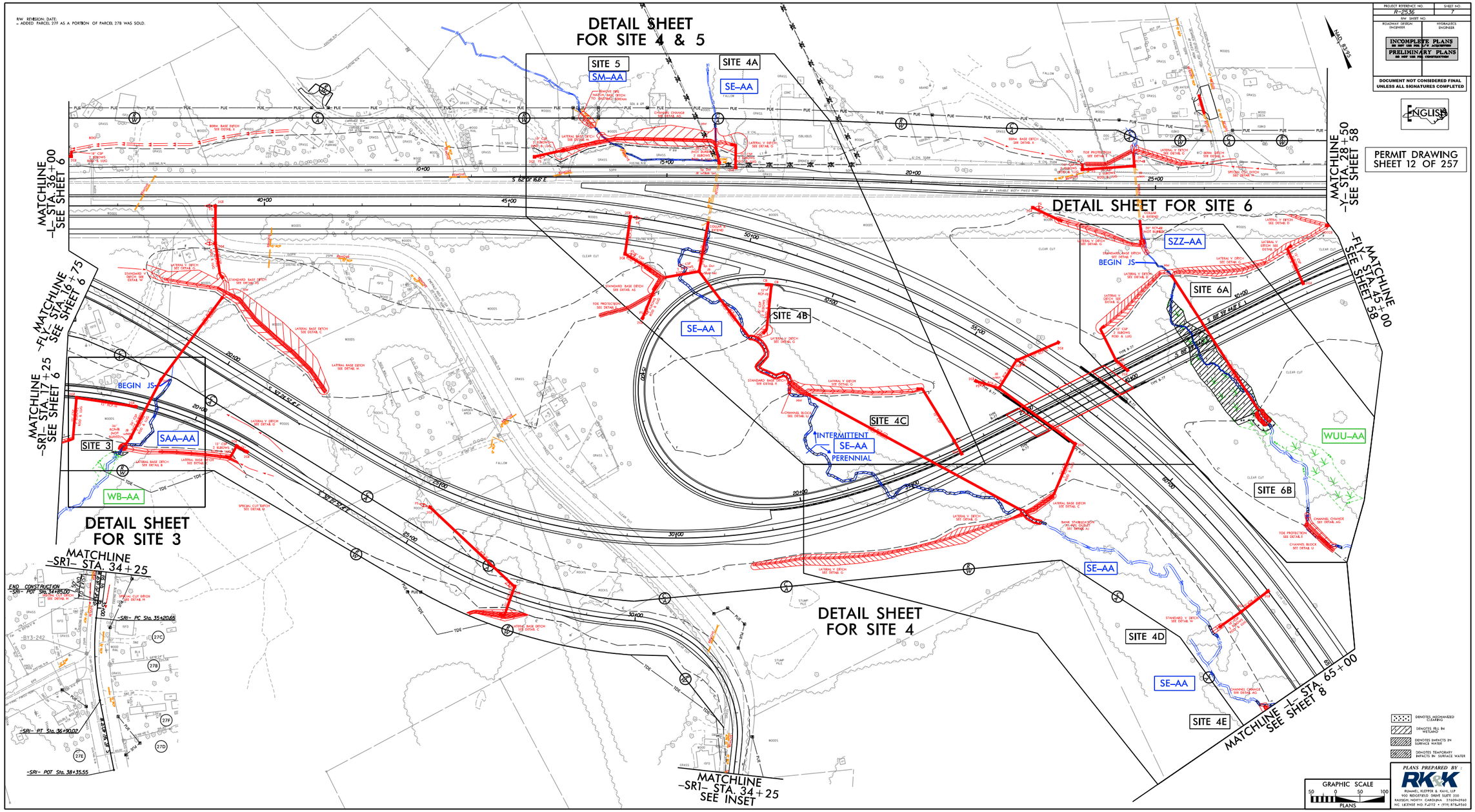
RW REVISION: DATE:
– ADDED PARCEL 277 AS A PORTION OF PARCEL 278 WAS SOLD.



PROJECT REFERENCE NO.	SHEET NO.
R-2536	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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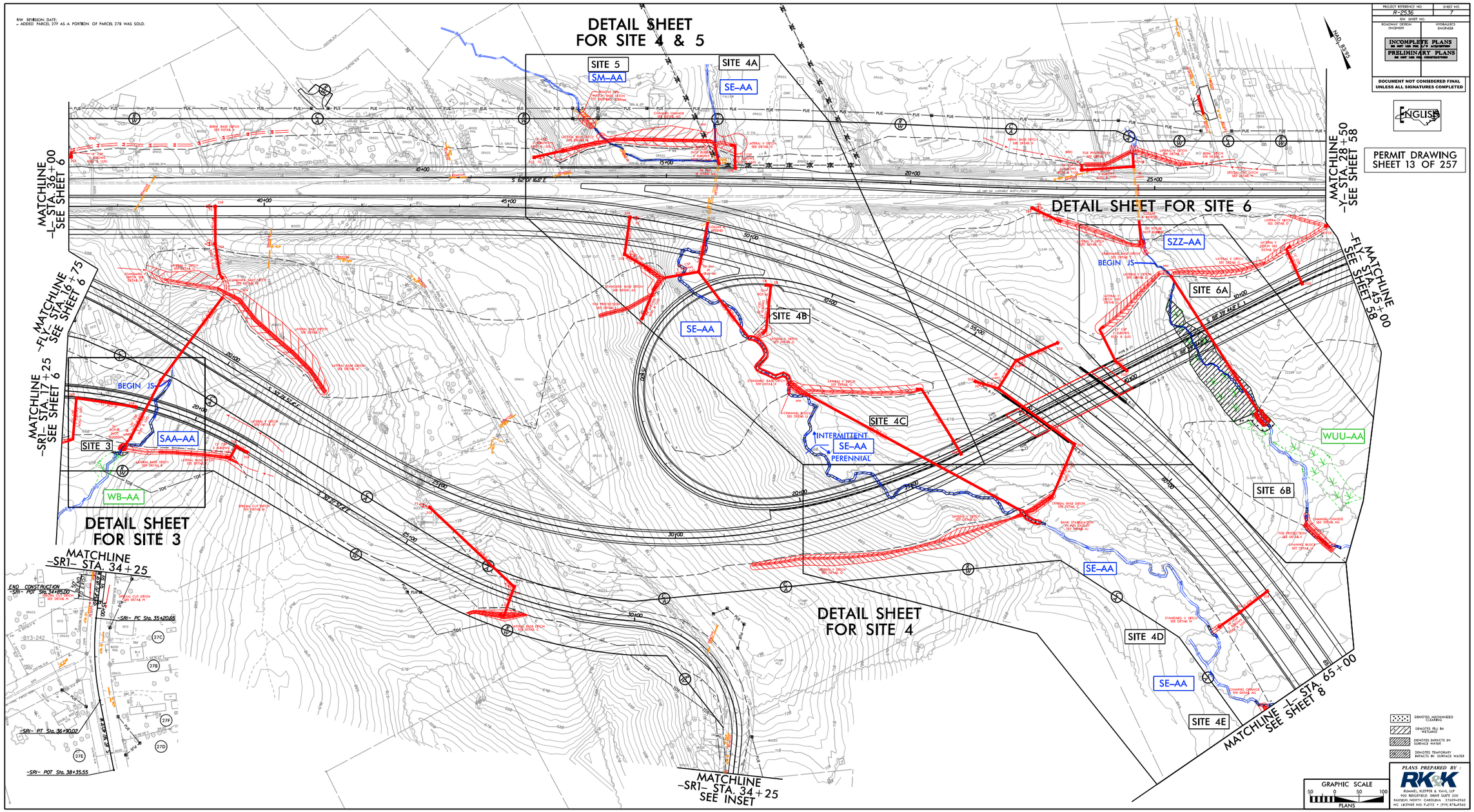
SHEET 12 OF 257

RW REVISION: DATE:
– ADDED PARCEL 27F AS A PORTION OF PARCEL 27B WAS SOLD.



PROJECT REFERENCE NO.	SHEET NO.
R-2536	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	7A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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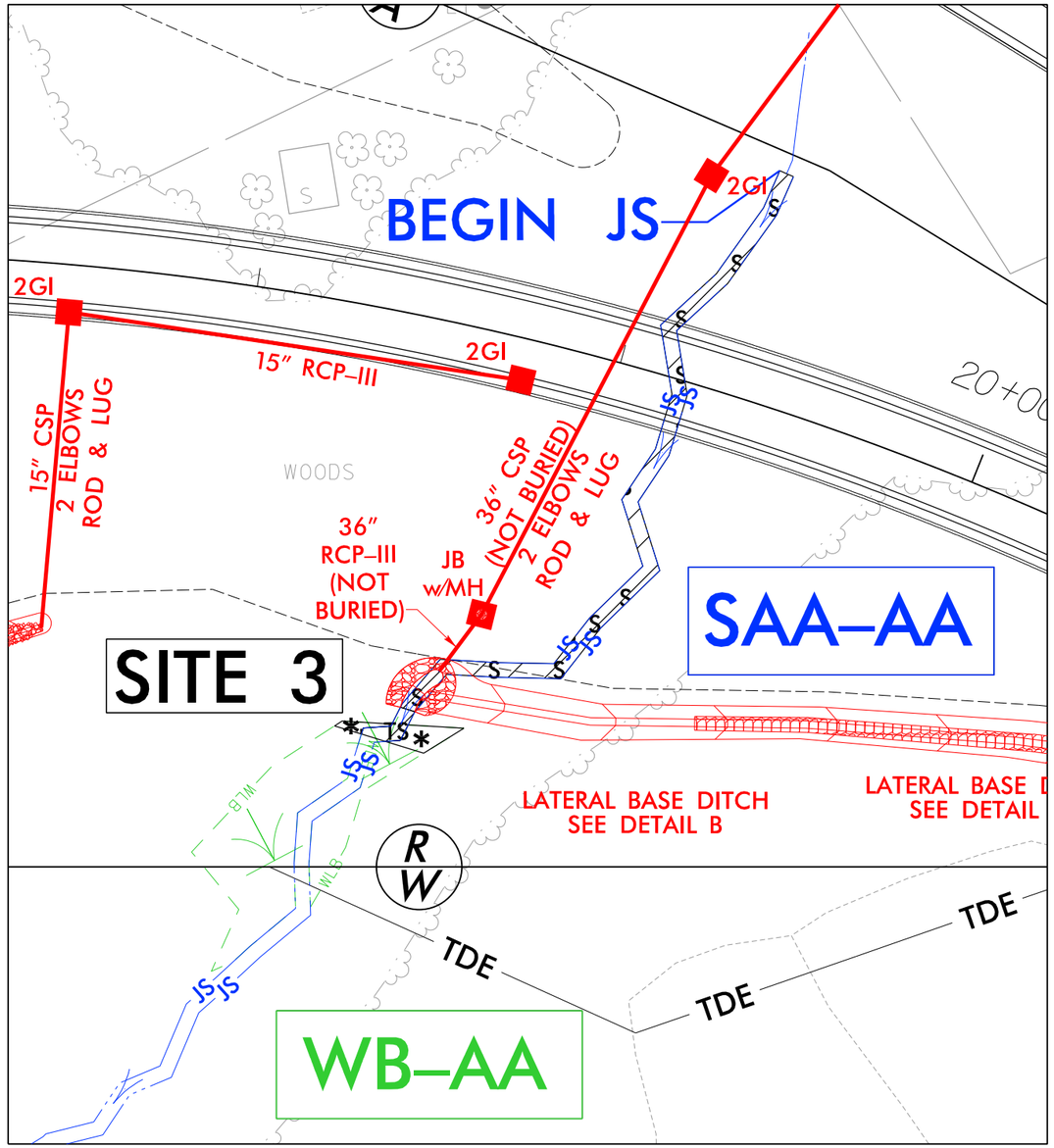
DETAIL SHEET FOR SITE 3



DENOTES MECHANIZED CLEARING

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

25 0 25 50
SCALE

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DETAIL SHEET FOR SITE 4 & 5

PROJECT REFERENCE NO.	SHEET NO.
R-2536	7B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PRELIMINARY PLANS
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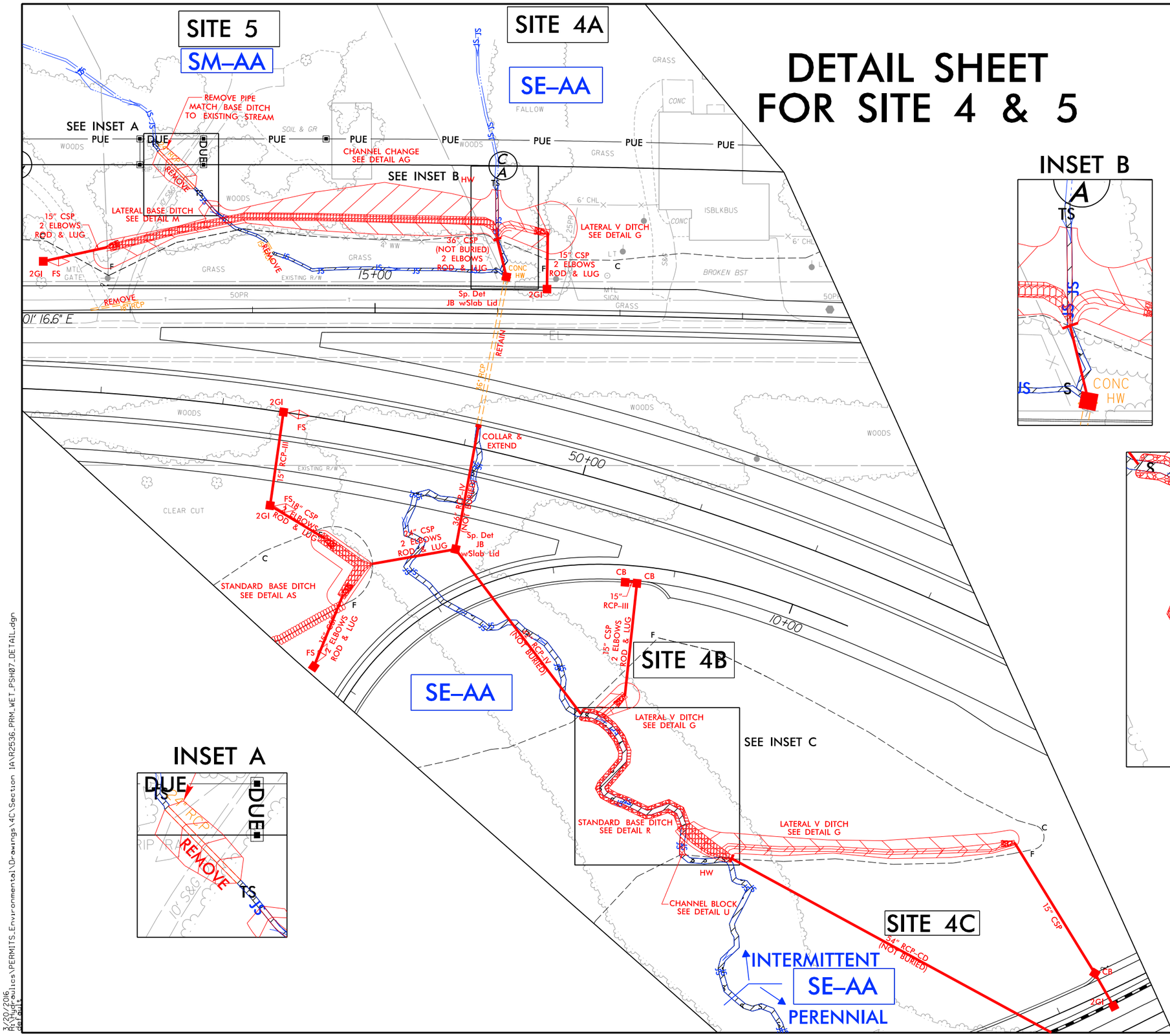
SHEET 15 OF 257

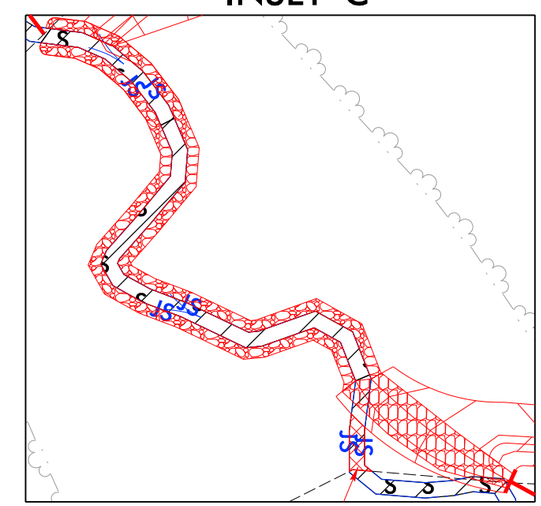
NAD 83/95



INSET A

INSET B

INSET C



DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50 25 0 50 100
SCALE
25 0 25 50
SCALE FOR INSETS

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	7C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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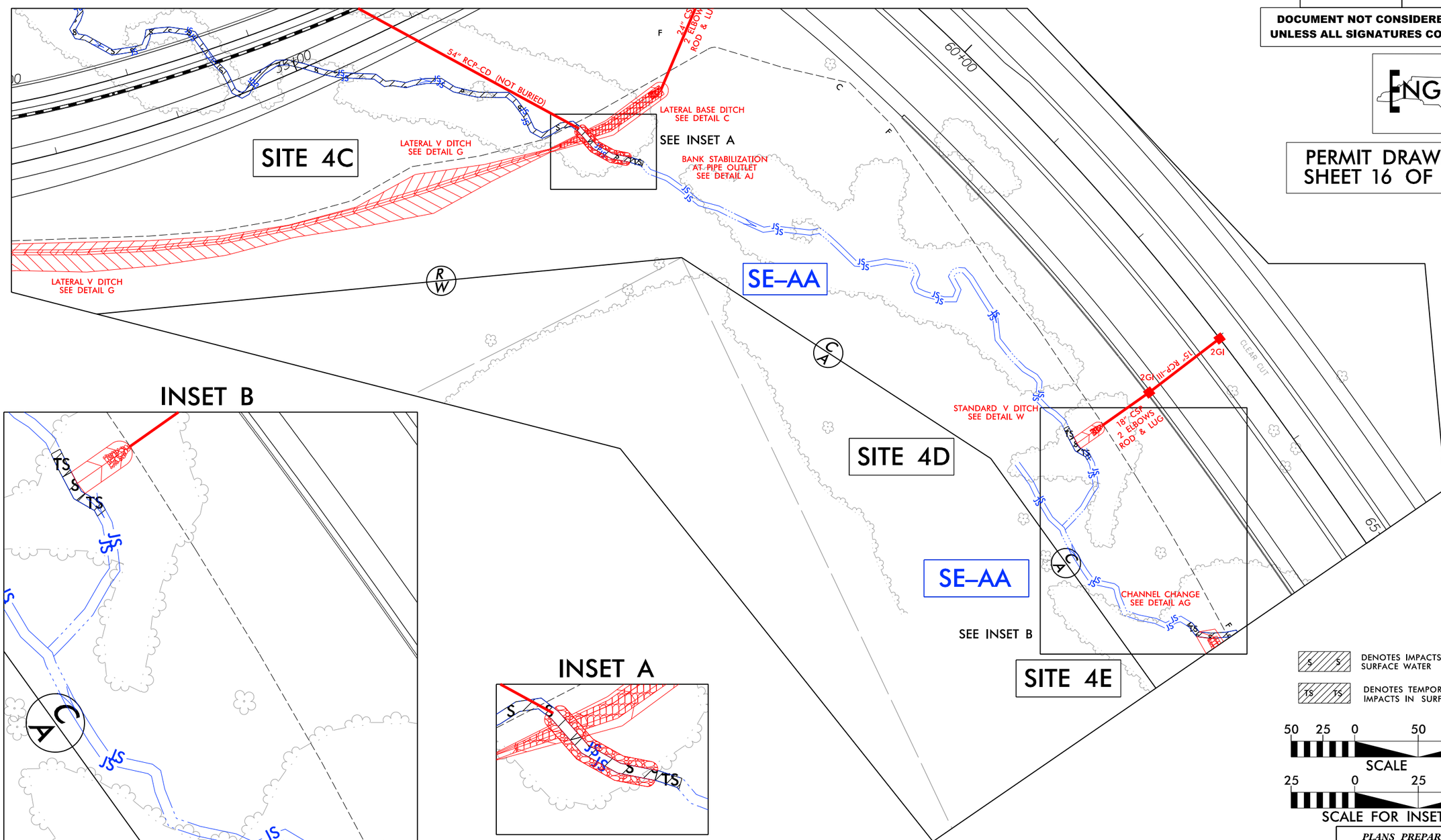
ENGLISH

PERMIT DRAWING
SHEET 16 OF 257

DETAIL SHEET FOR SITE 4



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PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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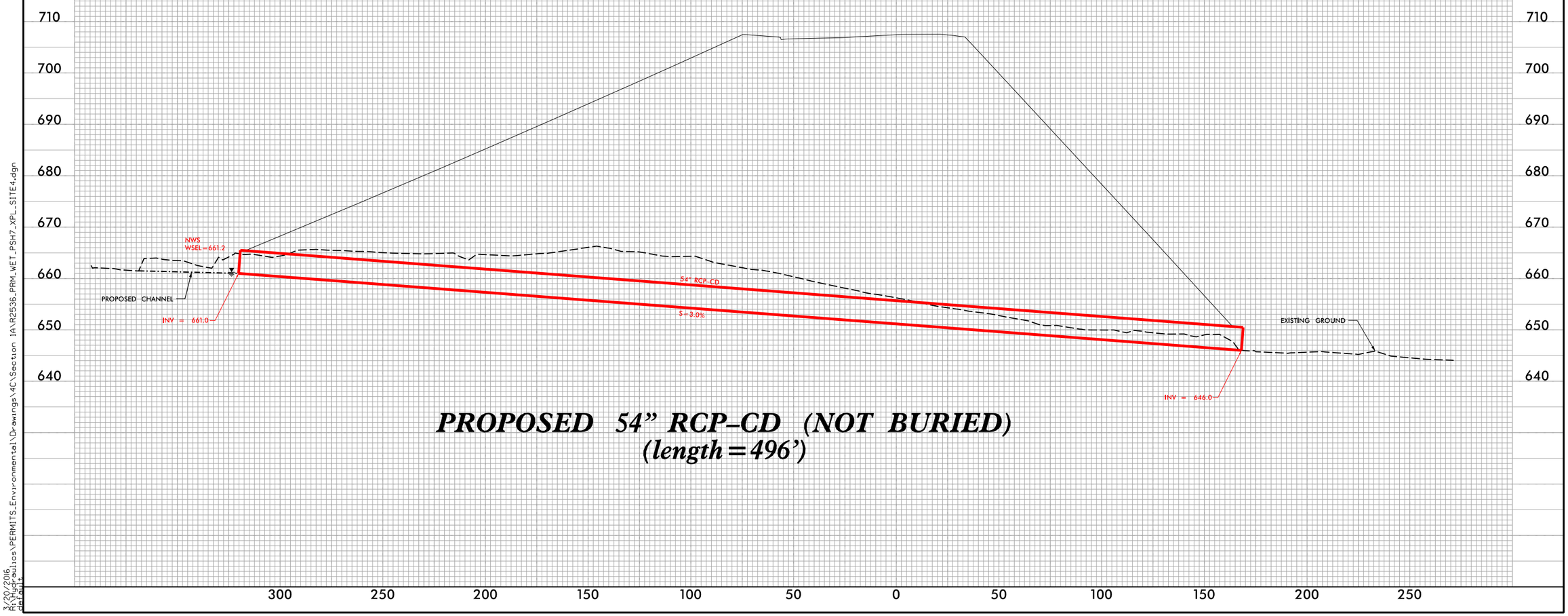
SHEET 17 OF 257

ENGLISH

SITE 4C
–FLY– 35+83



PROPOSED 54" RCP–CD (NOT BURIED)
(length = 496')

3/30/2016
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DETAIL SHEET FOR SITE 6

PROJECT REFERENCE NO.	SHEET NO.
R-2536	7D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PRELIMINARY PLANS
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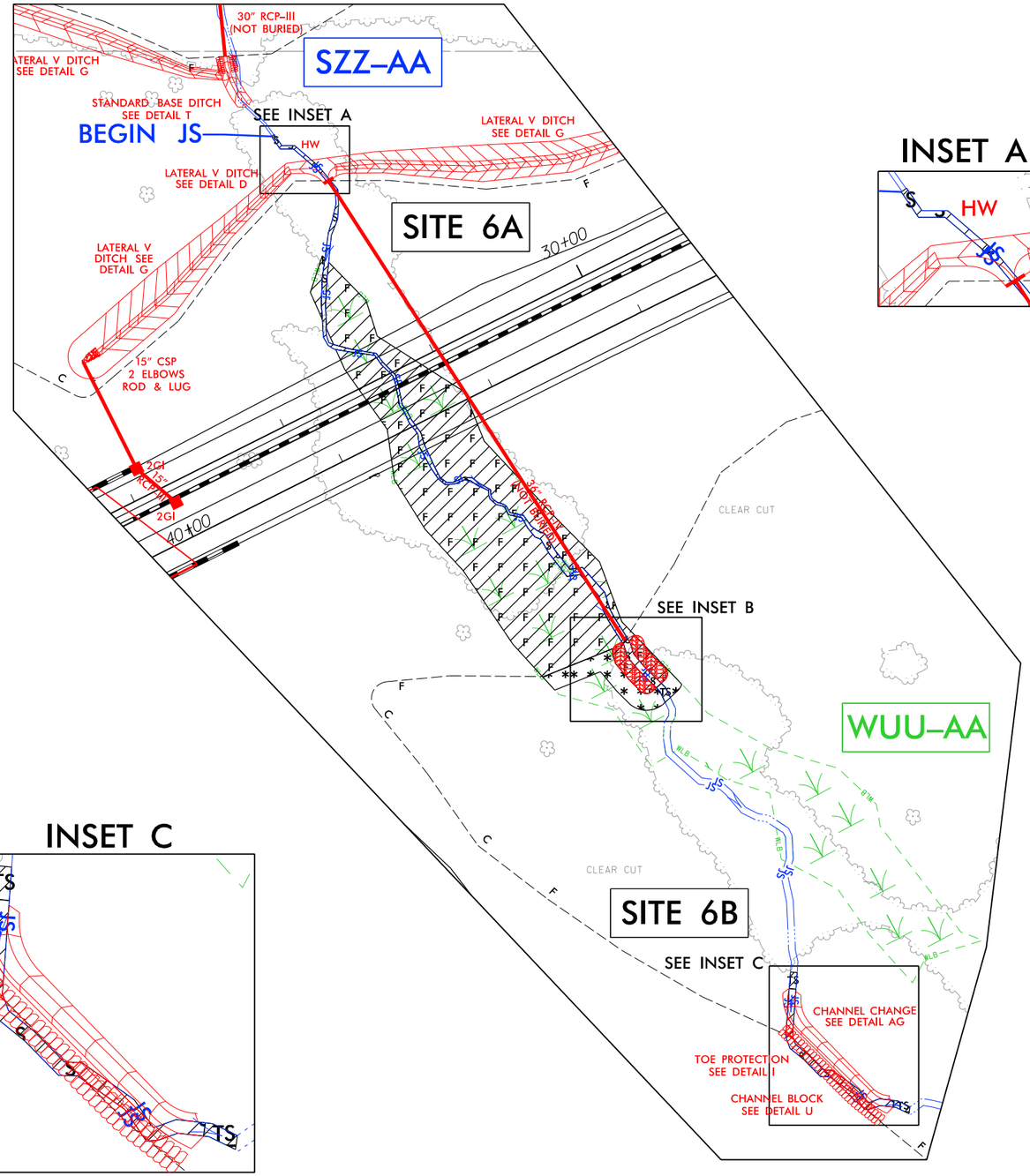
ENGLISH

PERMIT DRAWING
SHEET 18 OF 257

NAD 83/95



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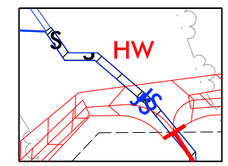

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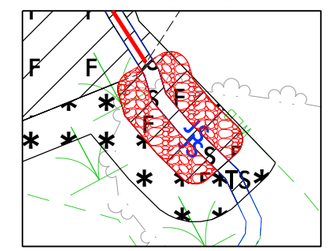
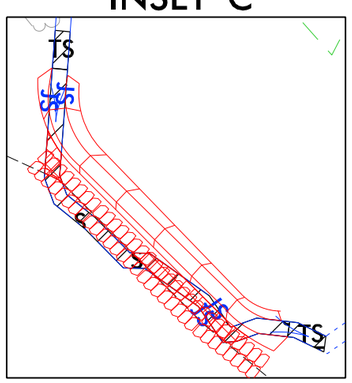


INSET C



DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50 25 0 50 100
SCALE

25 0 25 50
SCALE FOR INSETS

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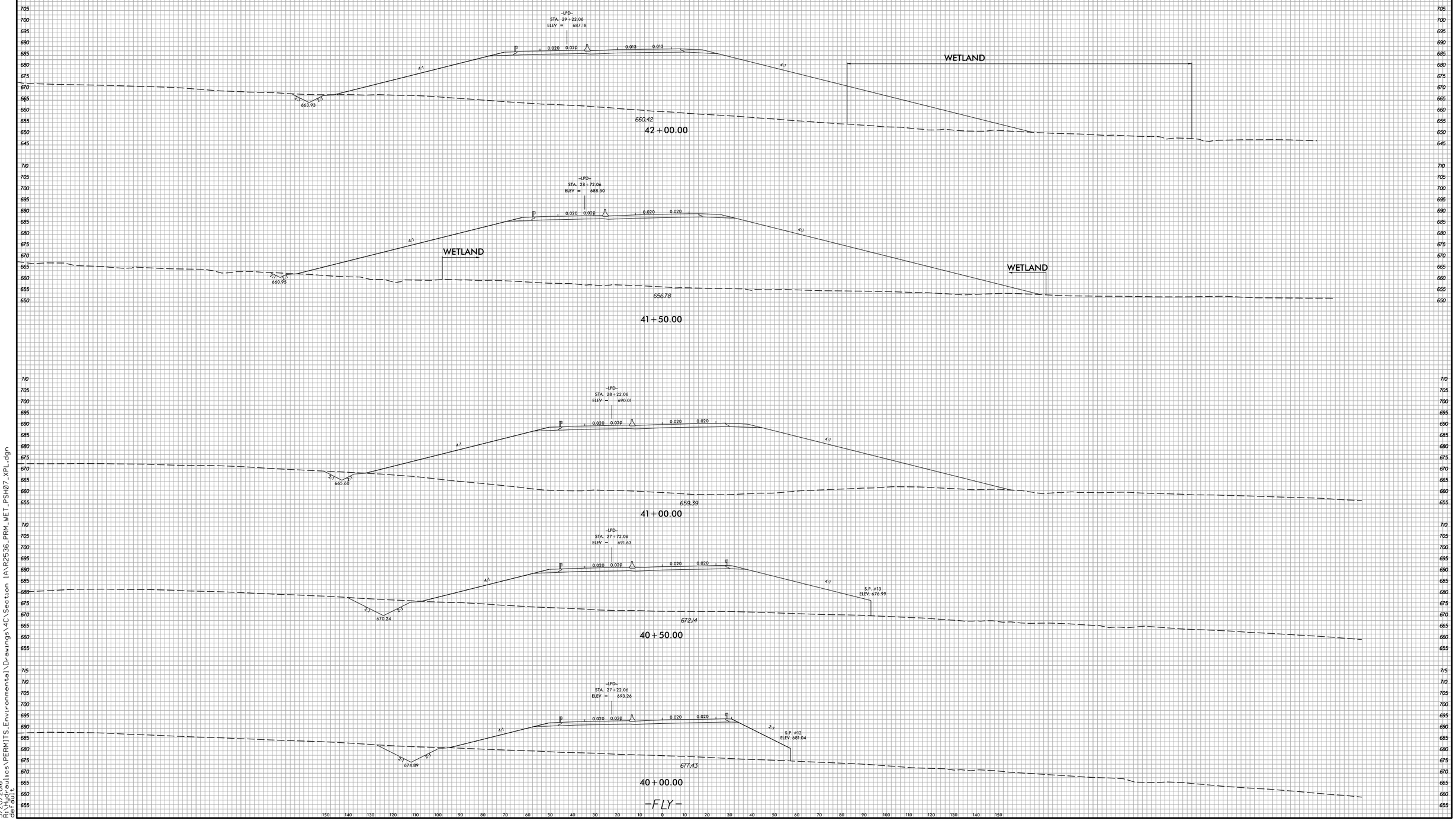
PROJ. REFERENCE NO.	SHEET NO.

PERMIT DRAWING
SHEET 19 OF 257

SITE 6



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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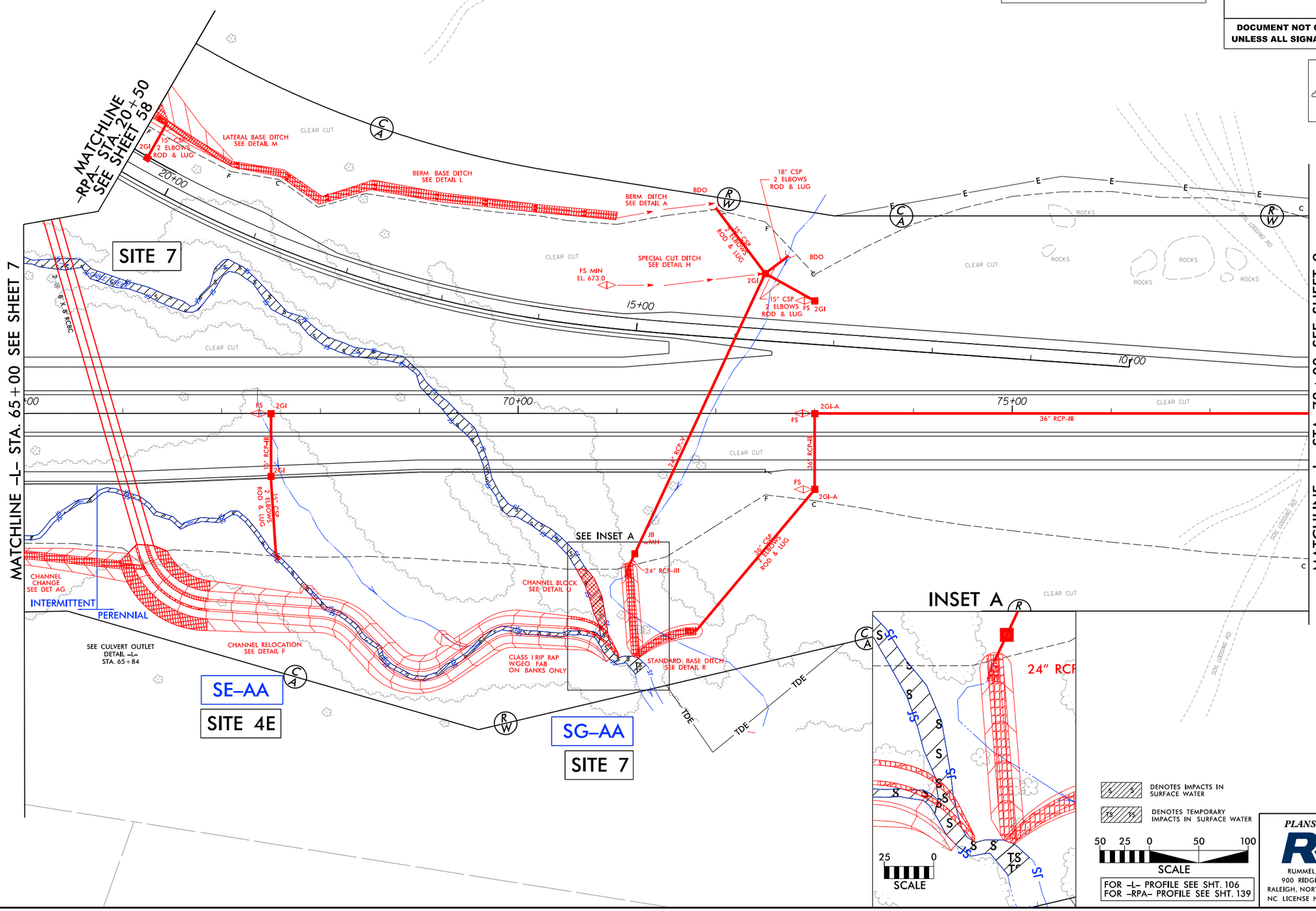
SHEET 20 OF 257

ENGLISH



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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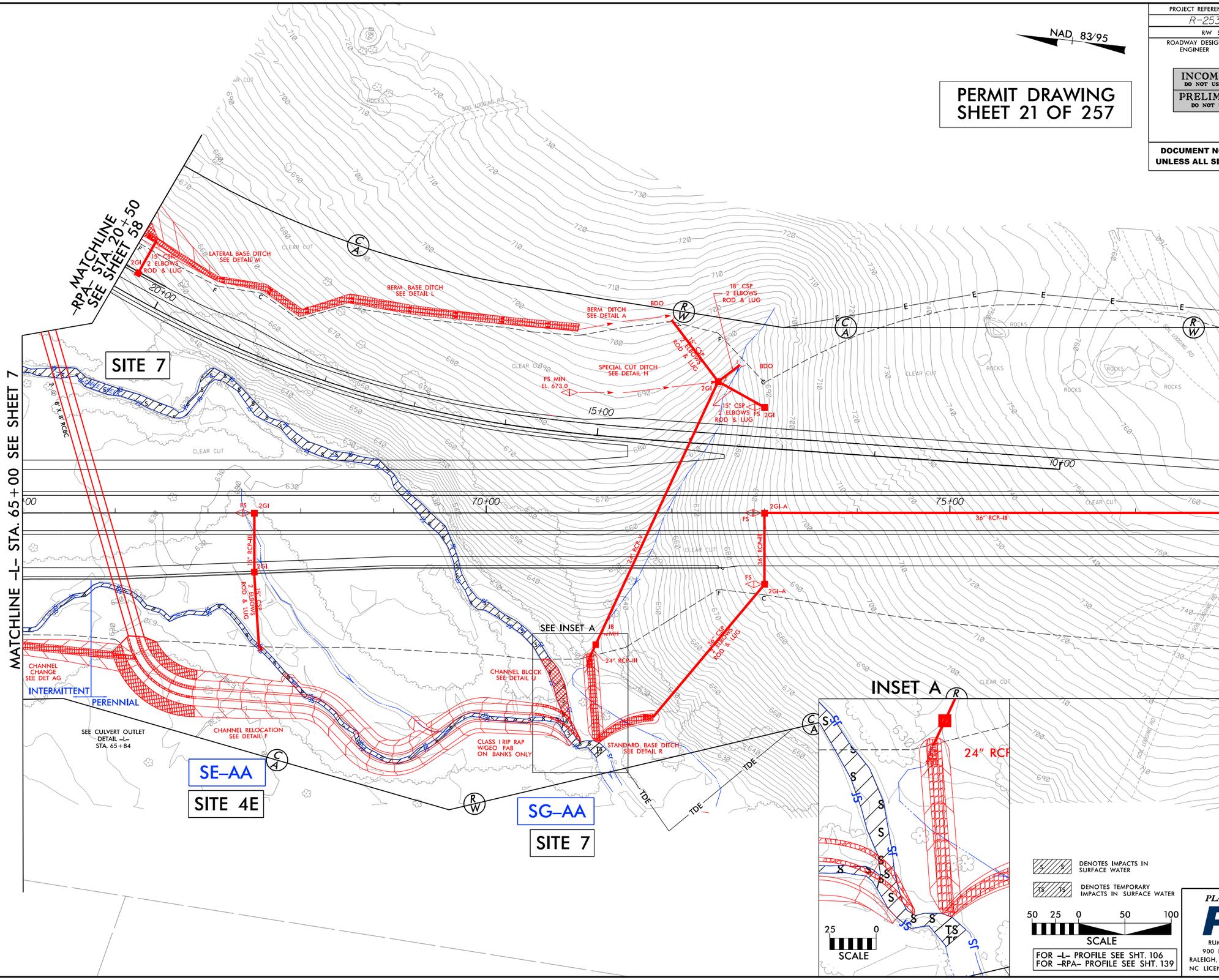
PERMIT DRAWING
SHEET 21 OF 257



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PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
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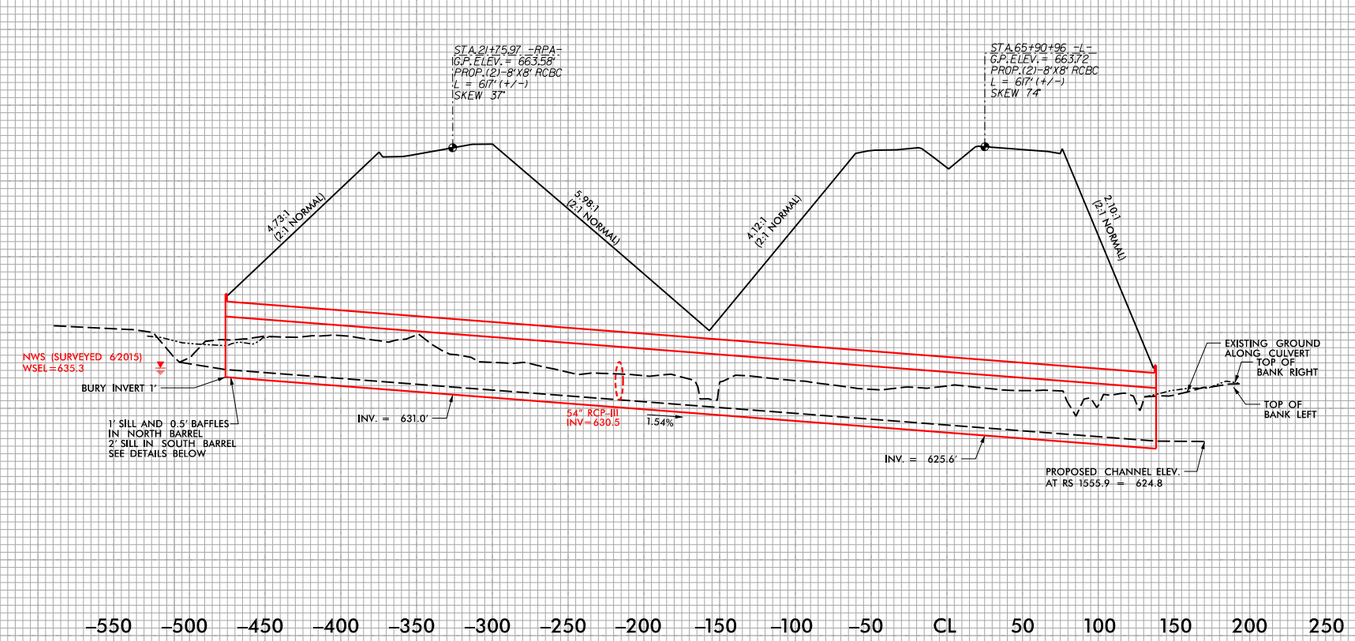
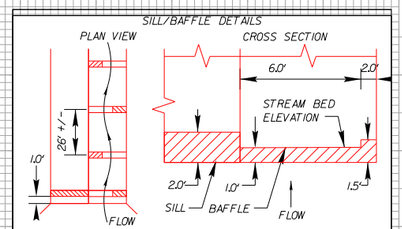
PERMIT DRAWING
SHEET 22 OF 257

SITE 7
–L– 65+84



PROPOSED 2 @ 8'X 8'RCBC
(length=602')



PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET.

ALTERNATE BAFFLE SECTIONS TO FORCE STREAM TO MEANDER LEFT TO RIGHT ALONG THE LENGTH OF THE CULVERT.

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION.ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL.RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARRELS.IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARRELS,NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE.NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

5/14/99

6/13/2016
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default

PROJECT REFERENCE NO.	SHEET NO.
R-2536	58
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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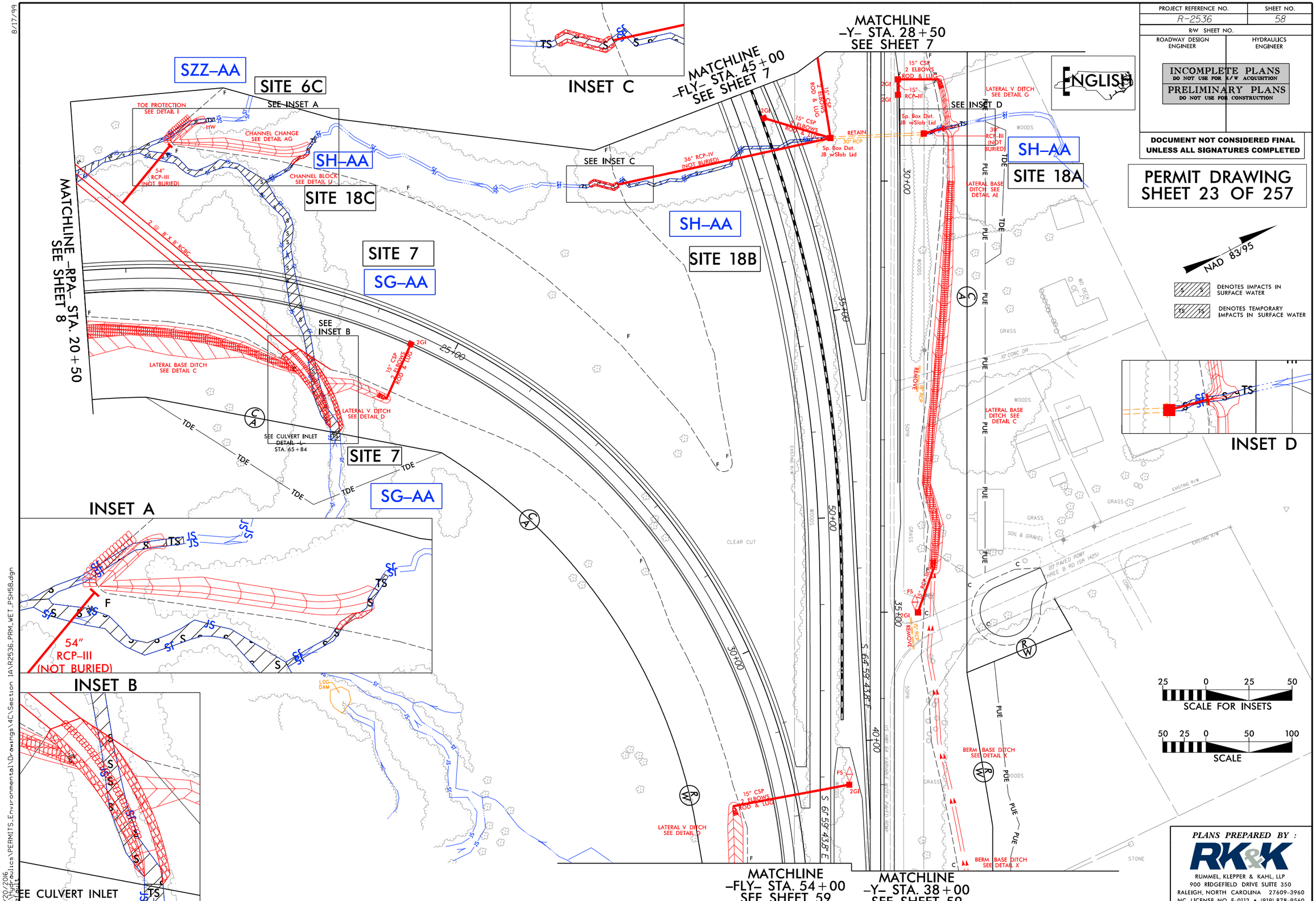
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 23 OF 257

ENGLISH



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defpilot

PROJECT REFERENCE NO.	SHEET NO.
R-2536	58
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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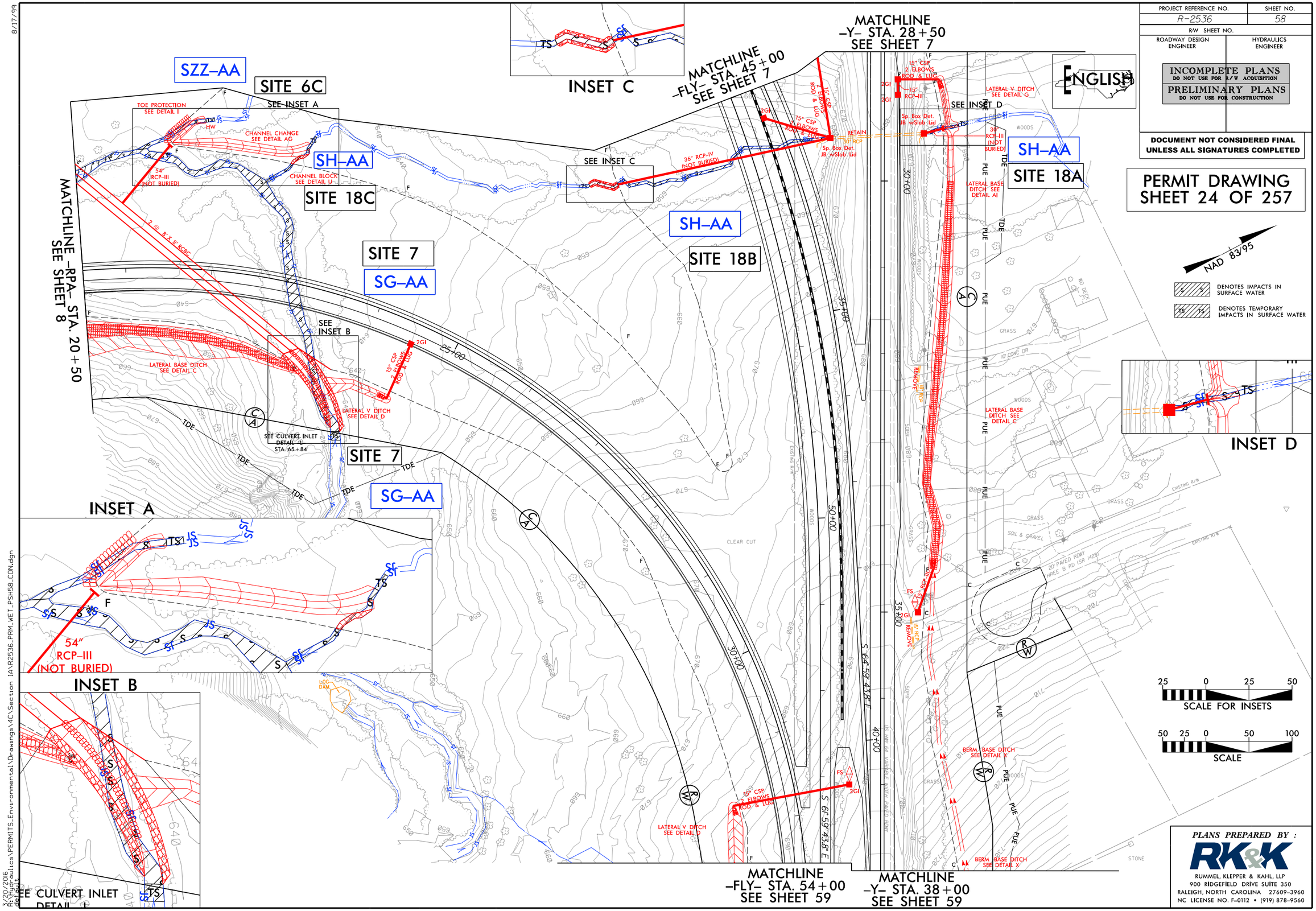
SHEET 24 OF 257

ENGLISH



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defarjat

8/17/99

ENGLISH

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 25 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	59
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
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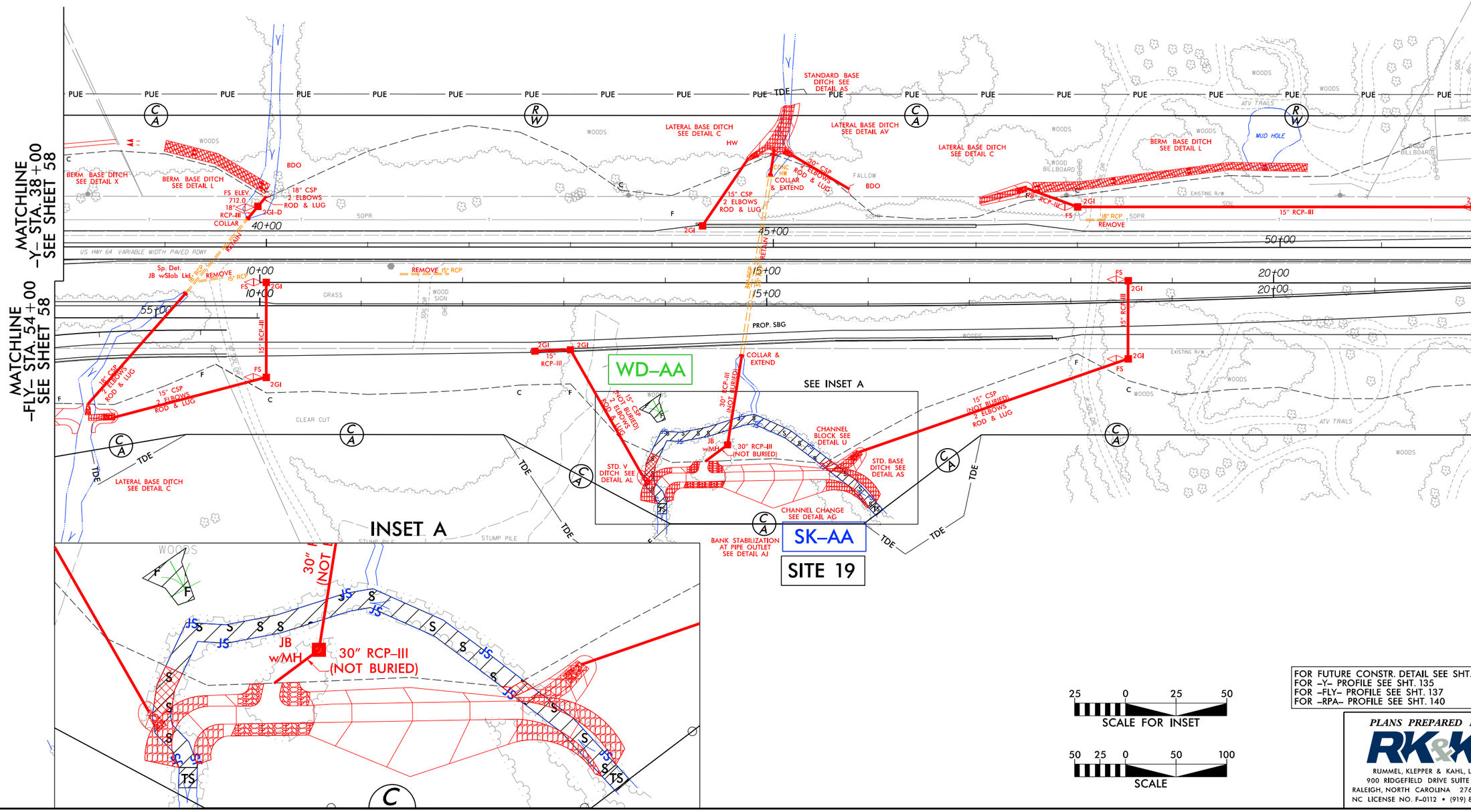

25 0 25 50
SCALE FOR INSET

50 25 0 50 100
SCALE

FOR FUTURE CONSTR. DETAIL SEE SHT. 02C-4
FOR -Y- PROFILE SEE SHT. 135
FOR -FLY- PROFILE SEE SHT. 137
FOR -RPA- PROFILE SEE SHT. 140

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8/17/99

ENGLISH

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

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PERMIT DRAWING SHEET 26 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	59
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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DO NOT USE FOR CONSTRUCTION

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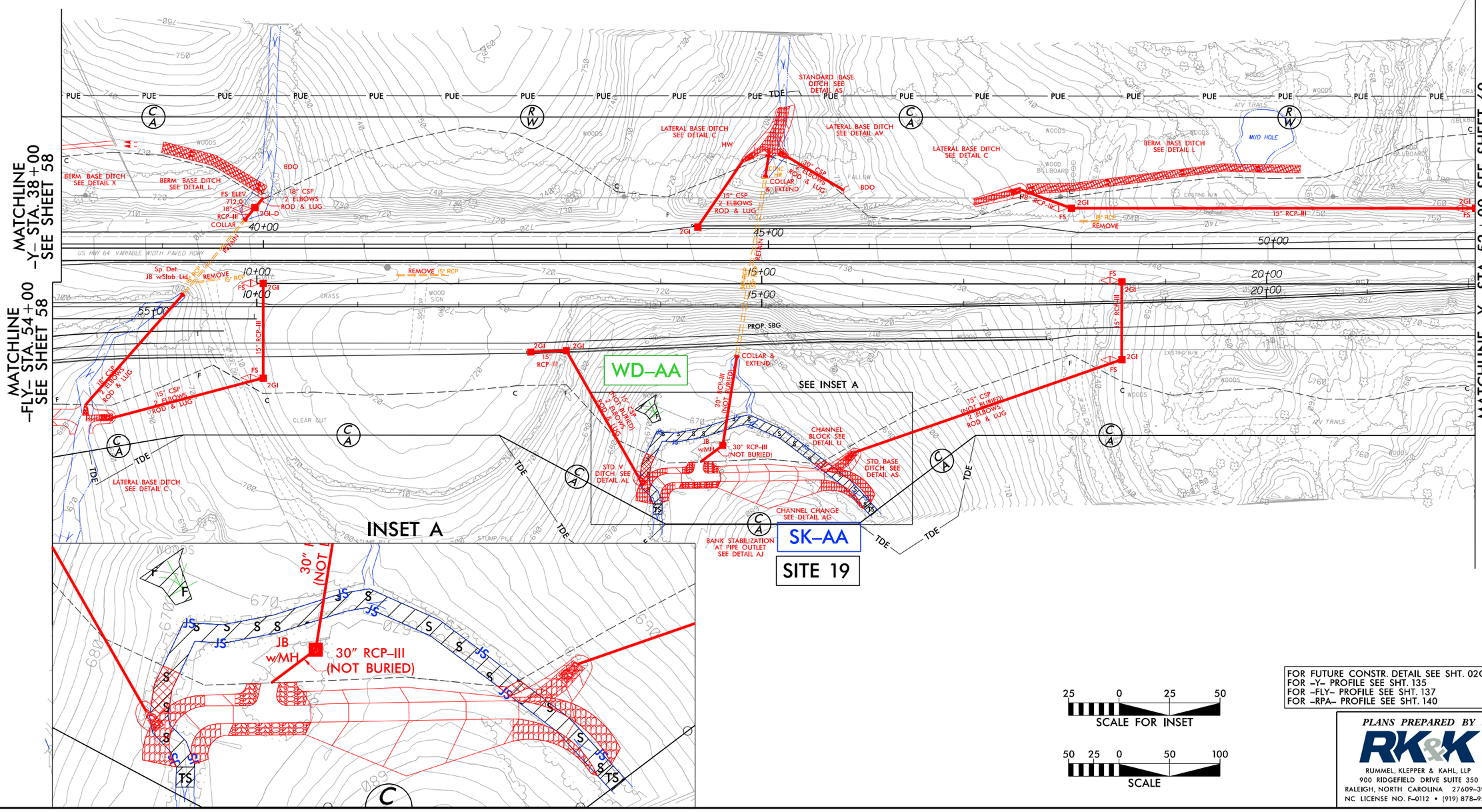

FOR FUTURE CONSTR. DETAIL SEE SHT. 02C-4
FOR -Y- PROFILE SEE SHT. 135
FOR -FLY- PROFILE SEE SHT. 137
FOR -RPA- PROFILE SEE SHT. 140

25 0 25 50
SCALE FOR INSET

50 25 0 50 100
SCALE

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PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-172

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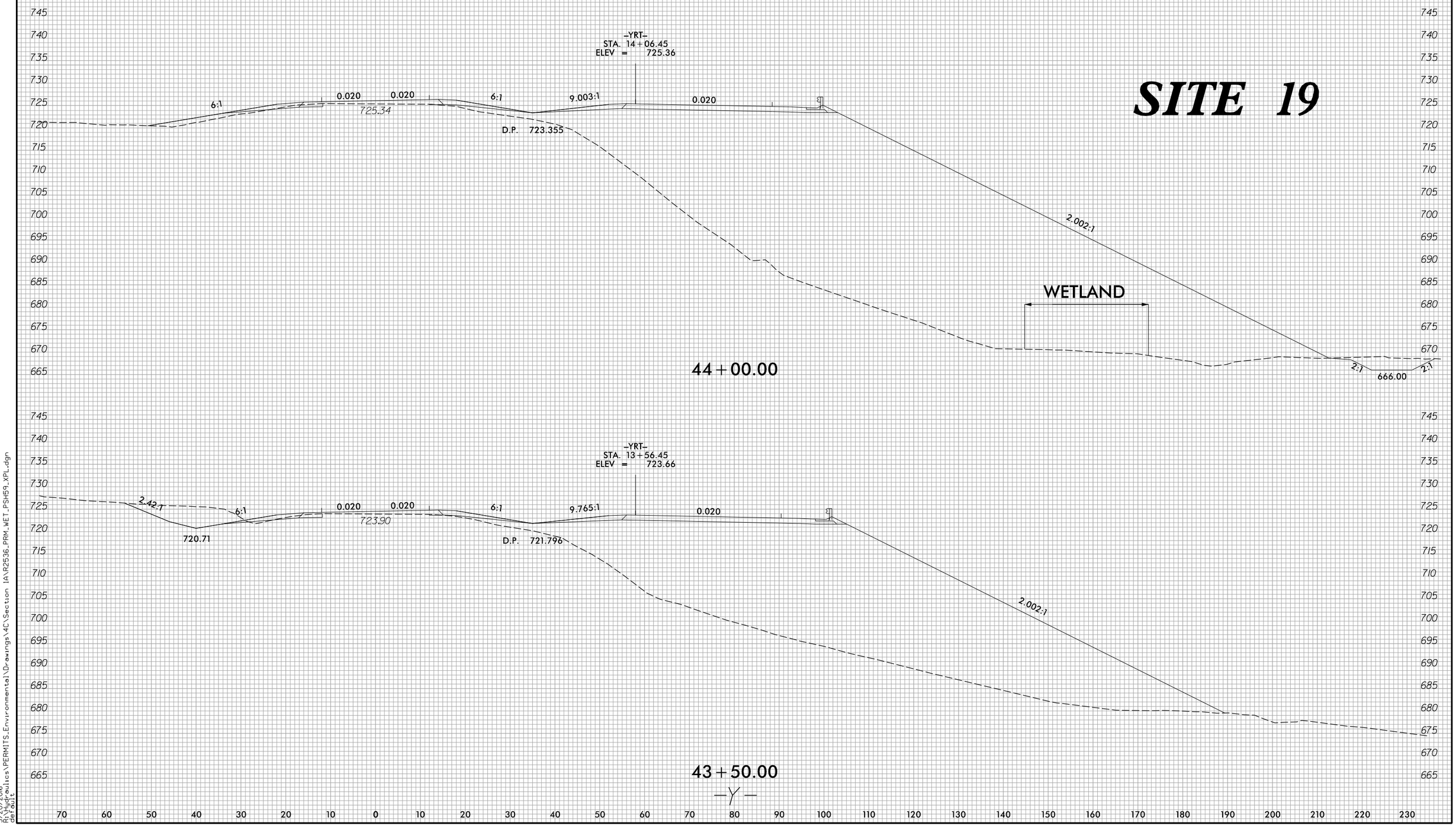
SHEET 27 OF 257



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	60
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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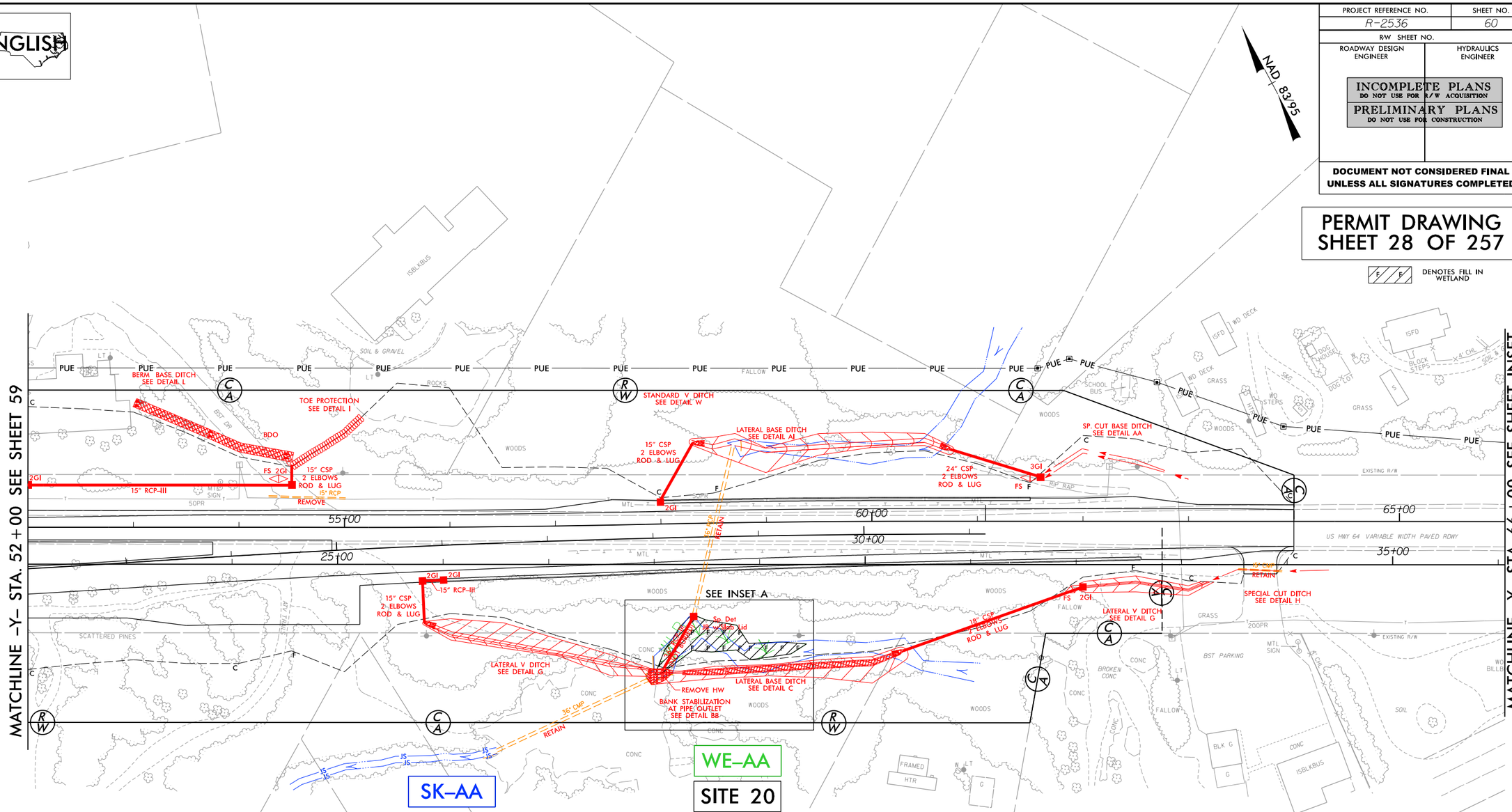
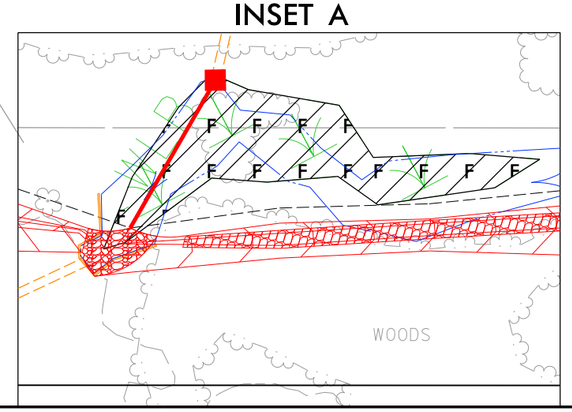
PERMIT DRAWING SHEET 28 OF 257

F F DENOTES FILL IN WETLAND



INSET A



25 0 25 50
SCALE FOR INSET

50 25 0 50 100
SCALE

FOR FUTURE CONSTR. DETAIL SEE SHT. 02C-5
FOR -Y- PROFILE SEE SHT. 135

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	60
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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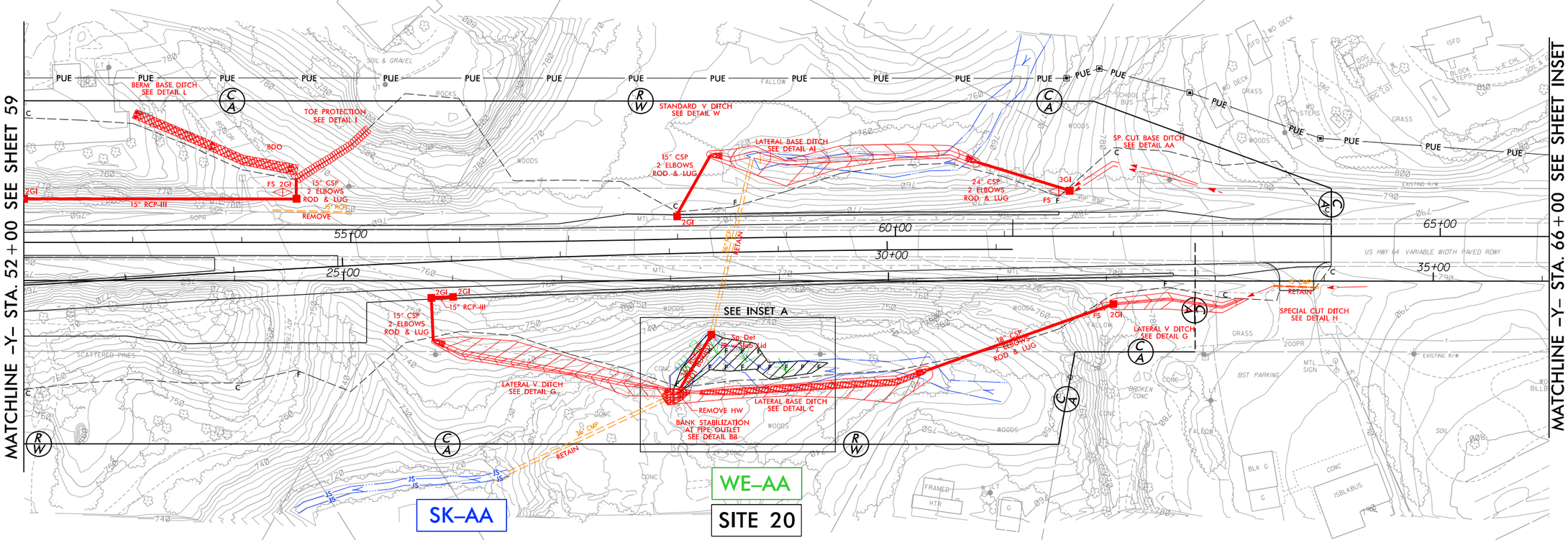
PERMIT DRAWING SHEET 29 OF 257

F/F DENOTES FILL IN WETLAND



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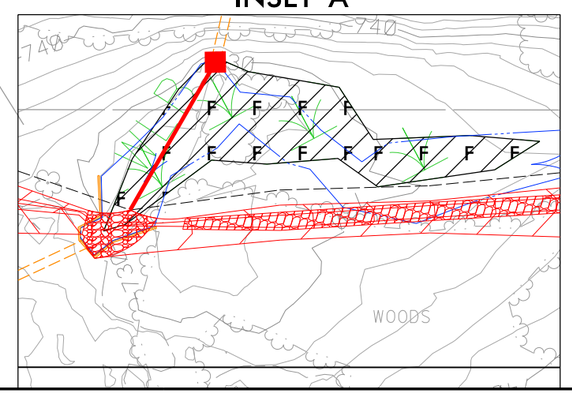

25 0 25 50
SCALE FOR INSET

50 25 0 50 100
SCALE

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FOR -Y- PROFILE SEE SHT. 135

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-185

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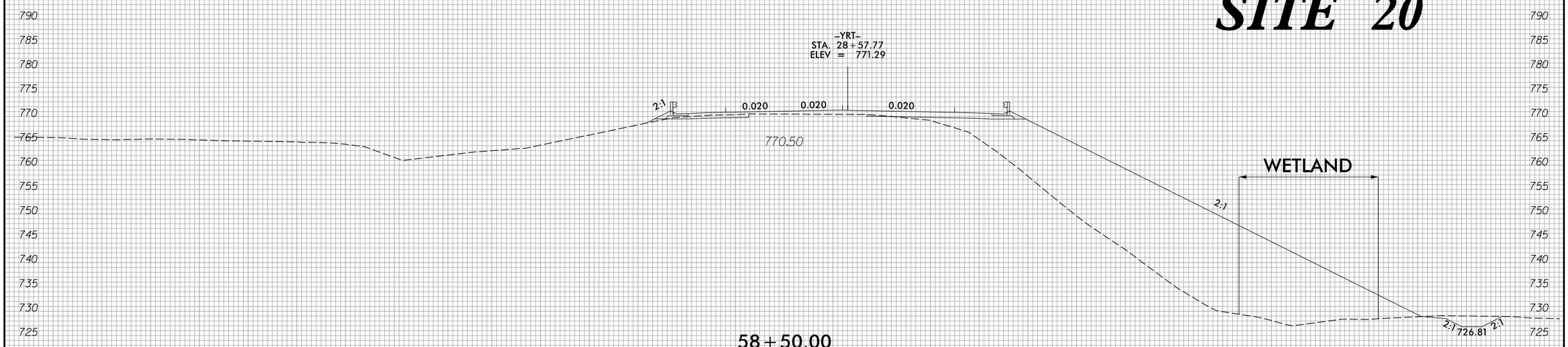
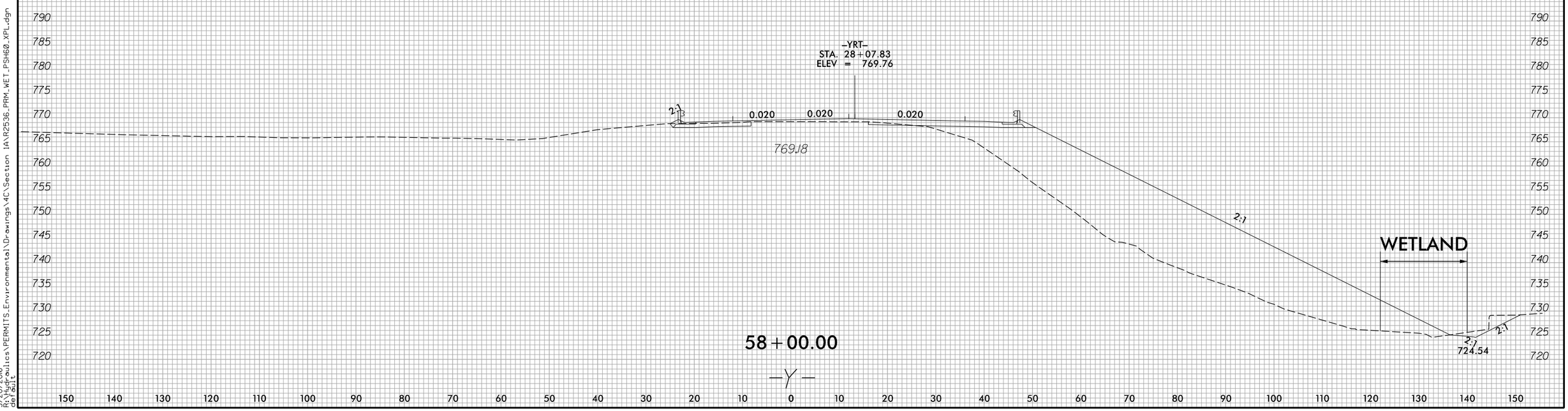
SHEET 30 OF 254

SITE 20





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PROJECT REFERENCE NO.	SHEET NO.
R-2536	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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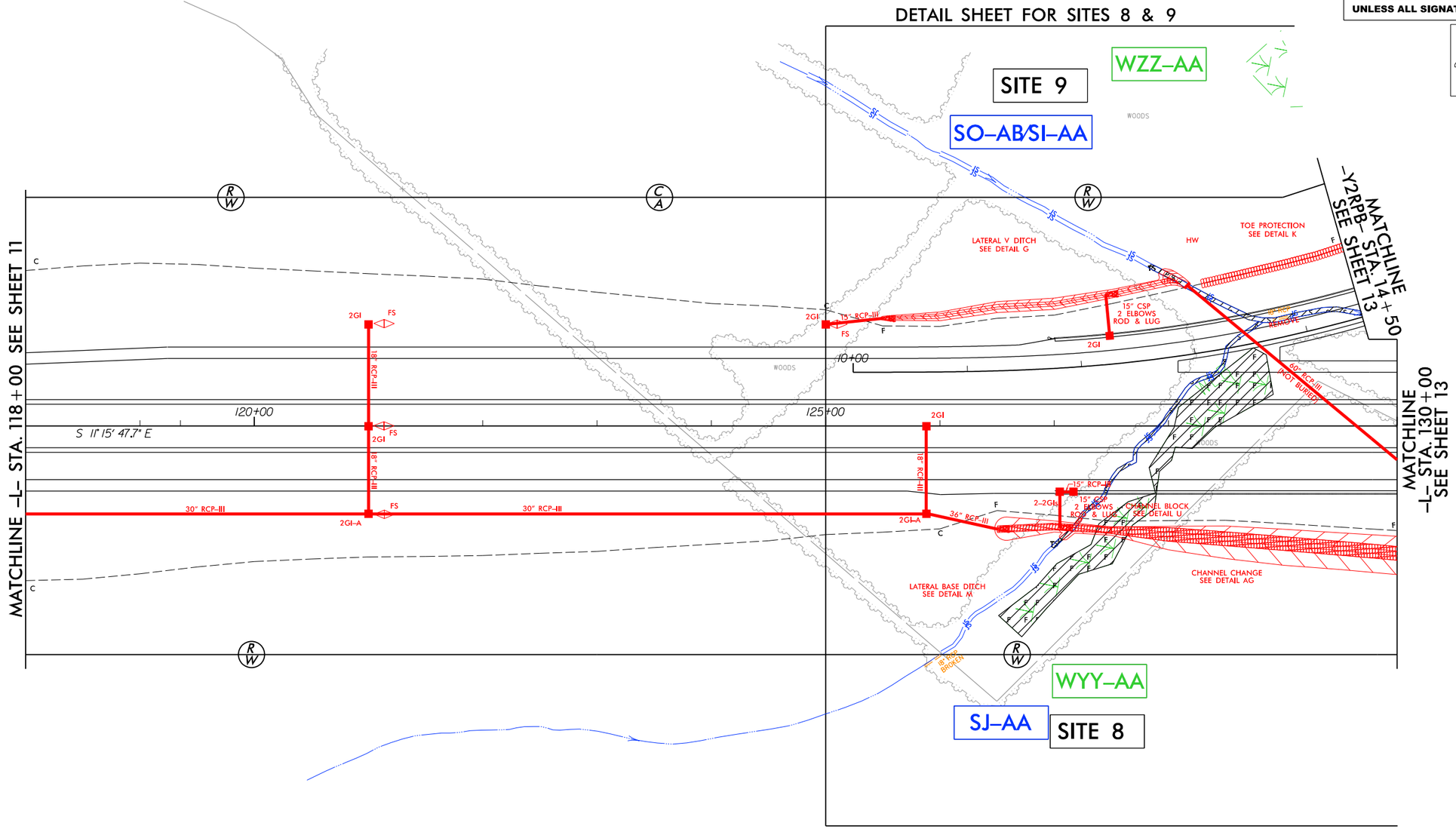
SHEET 31 OF 257

DETAIL SHEET FOR SITES 8 & 9



DENOTES FILL IN WETLAND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

50 25 0 50 100
SCALE

FOR -L- PROFILE SEE SHT. 108
FOR -Y2RPB- PROFILE SEE SHT. 144

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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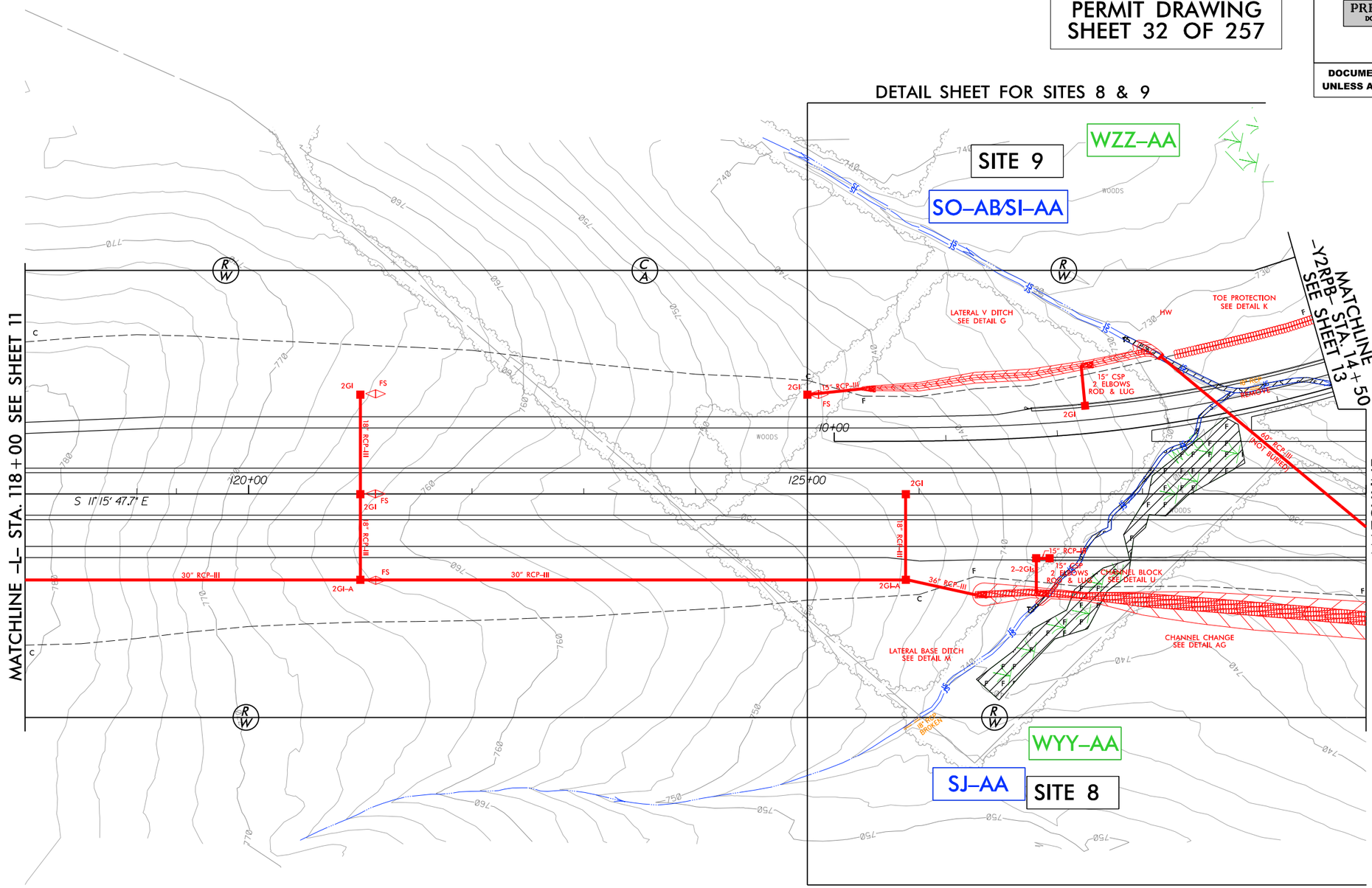
NAD 83/95

PERMIT DRAWING
SHEET 32 OF 257

DETAIL SHEET FOR SITES 8 & 9



DENOTES FILL IN WETLAND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

50 25 0 50 100
SCALE

FOR -L- PROFILE SEE SHT. 108
FOR -Y2RPB- PROFILE SEE SHT. 144

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	12-13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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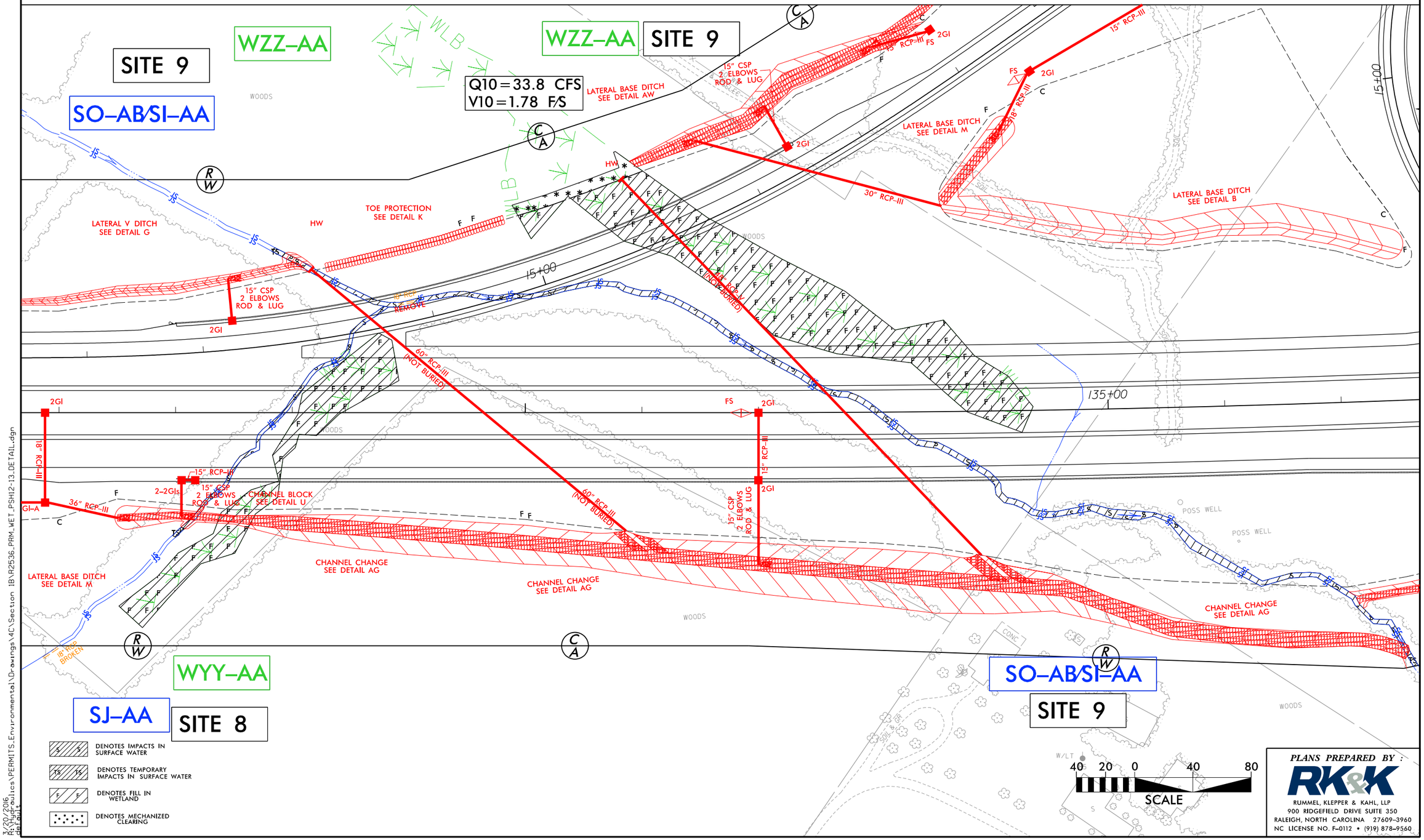
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING
SHEET 33 OF 257

DETAIL SHEET FOR SITES 8 & 9



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PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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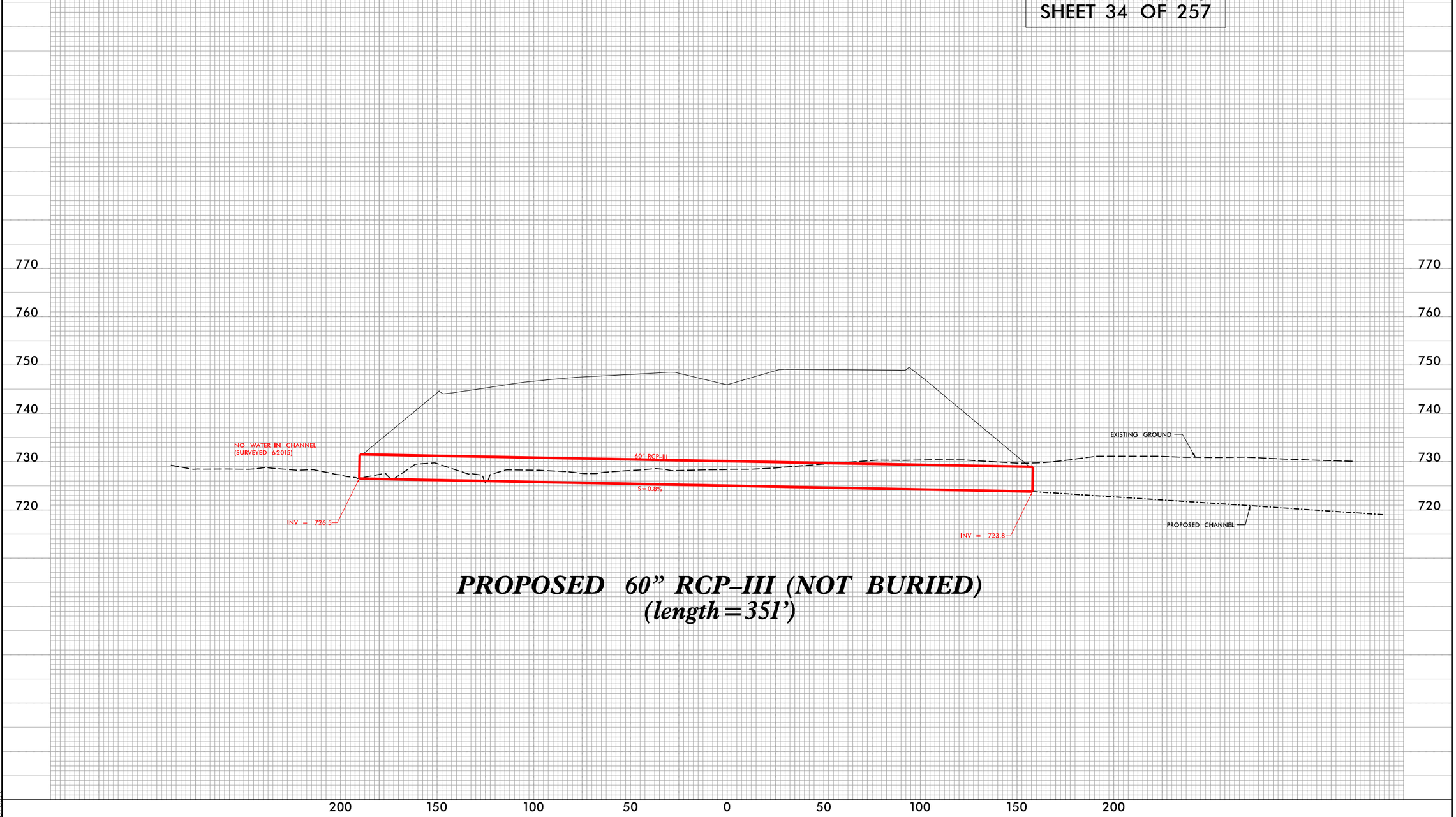
ENGLISH

PERMIT DRAWING
SHEET 34 OF 257

SITE 9
–L– 129+64



PROPOSED 60" RCP–III (NOT BURIED)
(length=351')

3/30/2016
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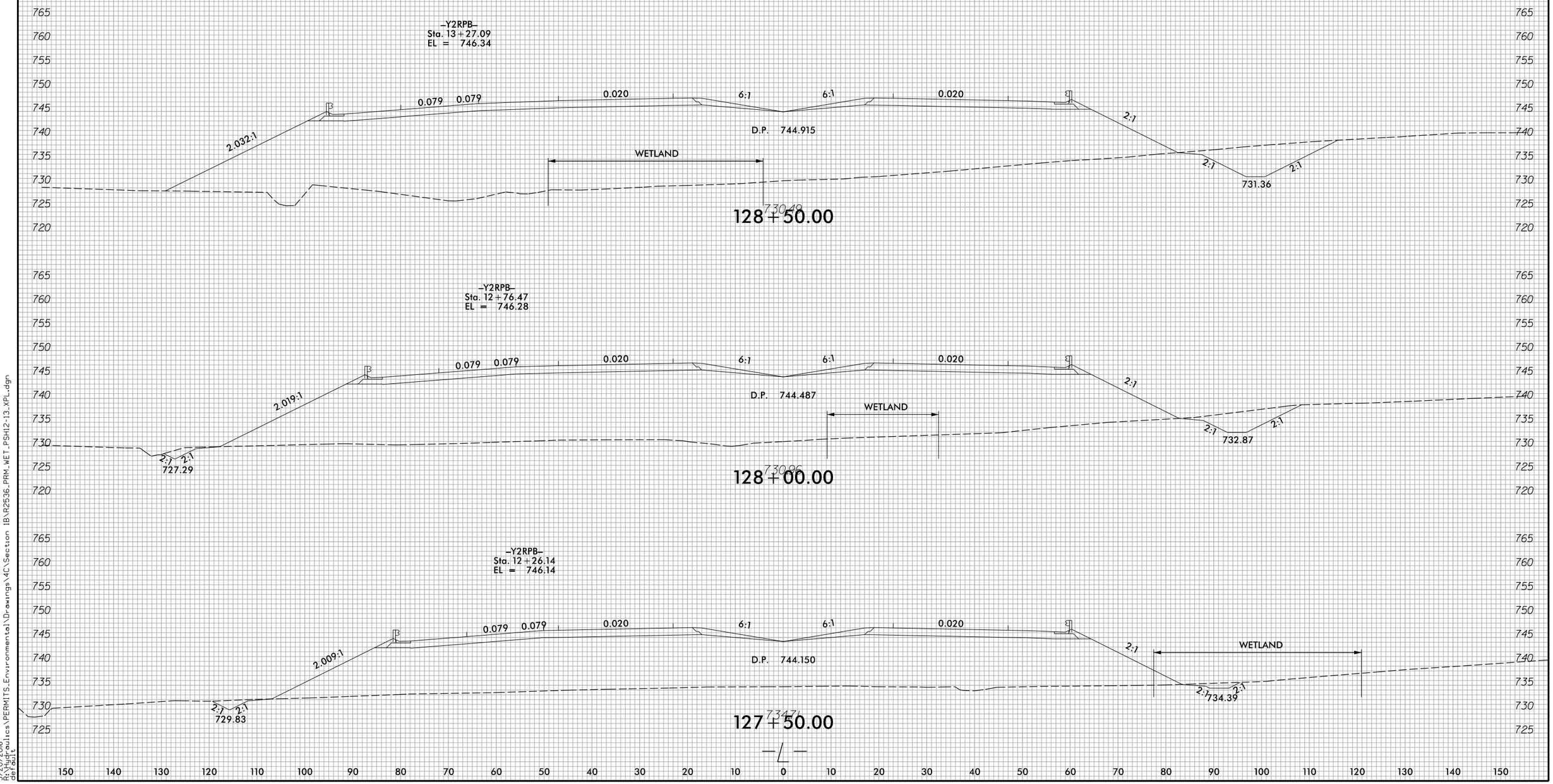
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-78

SITE 8

PERMIT DRAWING
SHEET 35 OF 257



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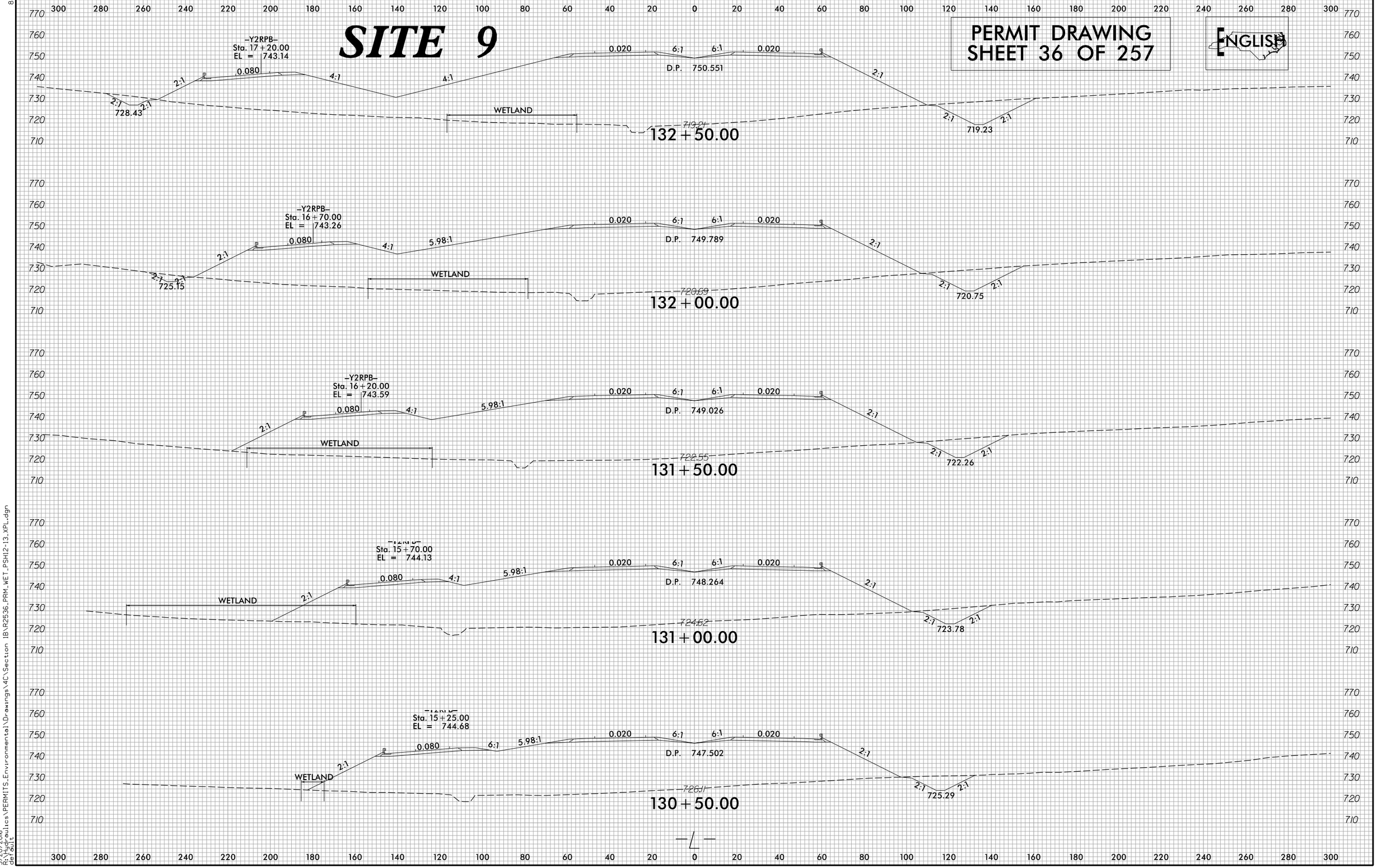
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-80

0 10 20

SITE 9

PERMIT DRAWING
SHEET 36 OF 257

ENGLISH



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3/20/2016
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R/W REVISION: DATE: 2/5/2016
- PARCELS 42 AND 43 COMBINED INTO ONE PARCEL, 42, JAMES AND JUDITH OWENS.
- PARCELS 37 AND 37A COMBINED INTO ONE PARCEL, 37, KENNETH STOUT.
- PARCEL 35 DIVIDED INTO PARCELS 35, BERNADETTE LAMBETH, AND 35D, CORBIN T. LAMBETH.
- ROW REVISED TO INCLUDE ALL OF PARCEL 36, GREGORY ALLEN PARK.

PROJECT REFERENCE NO.	SHEET NO.
R-2536	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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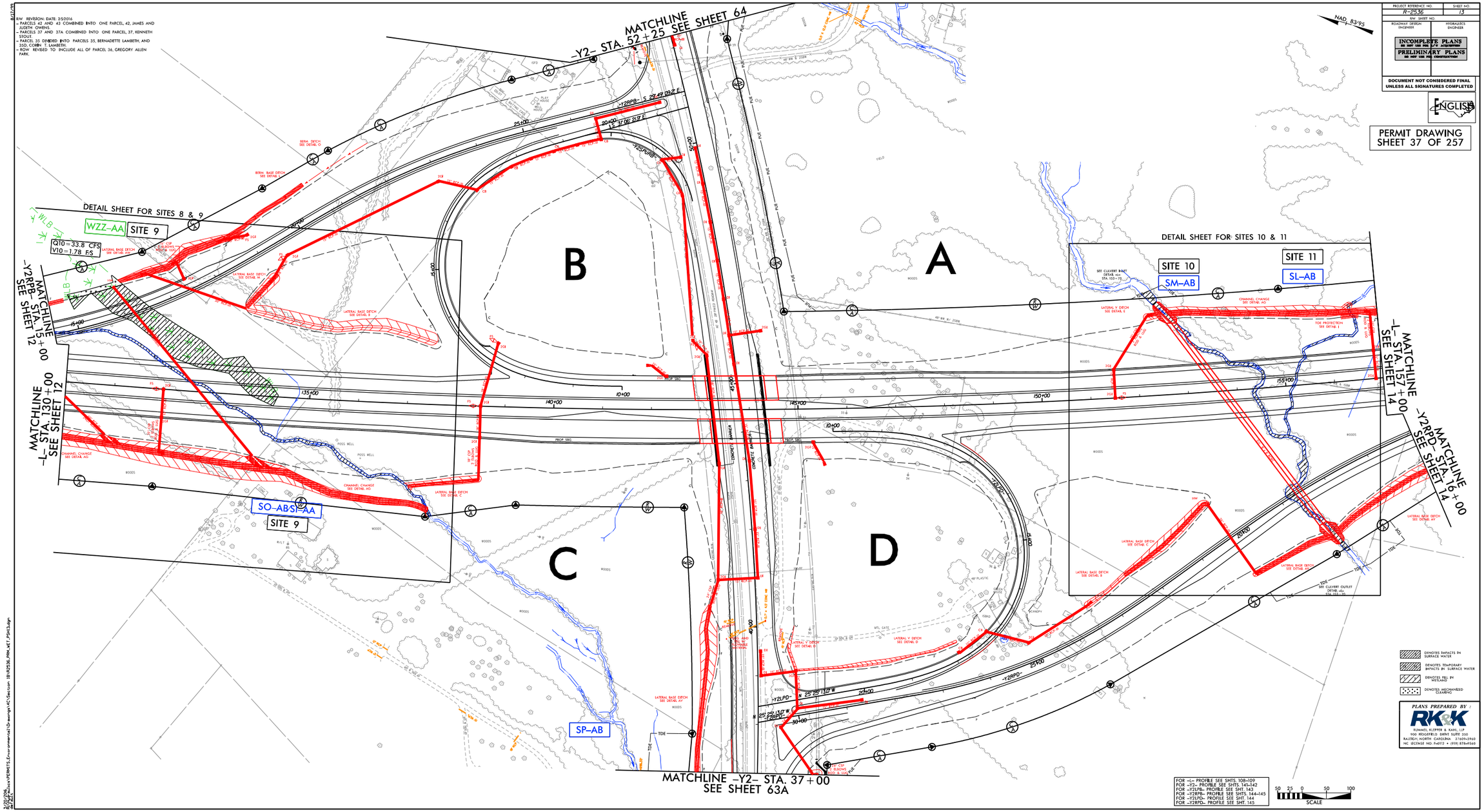
ENGLISH

PERMIT DRAWING
SHEET 37 OF 257



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8/17/2016
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R/W REVISION: DATE: 2/5/2016
- PARCELS 42 AND 43 COMBINED INTO ONE PARCEL, 42, JAMES AND JUDITH OWENS.
- PARCELS 37 AND 37A COMBINED INTO ONE PARCEL, 37, KENNETH STOUT.
- PARCEL 35 DIVIDED INTO PARCELS 35, BERNADETTE LAMBETH, AND 35D, CORBY T. LAMBETH.
- ROW REVISED TO INCLUDE ALL OF PARCEL 36, GREGORY ALLEN PARK.

PROJECT REFERENCE NO.	SHEET NO.
R-2536	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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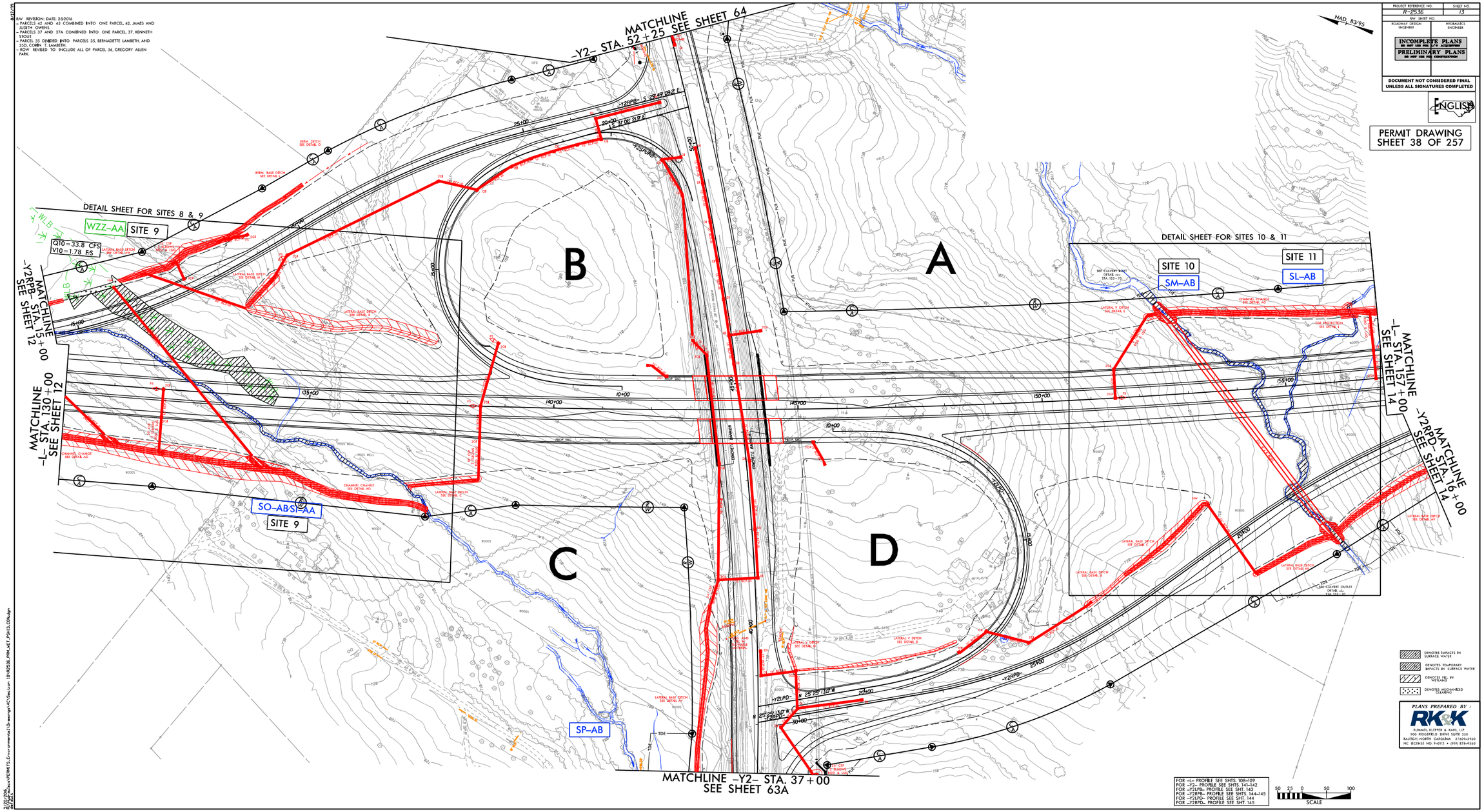
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

PERMIT DRAWING
SHEET 38 OF 257



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R-2536_PRM
PLOT DATE:
PLOT SCALE:

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	13A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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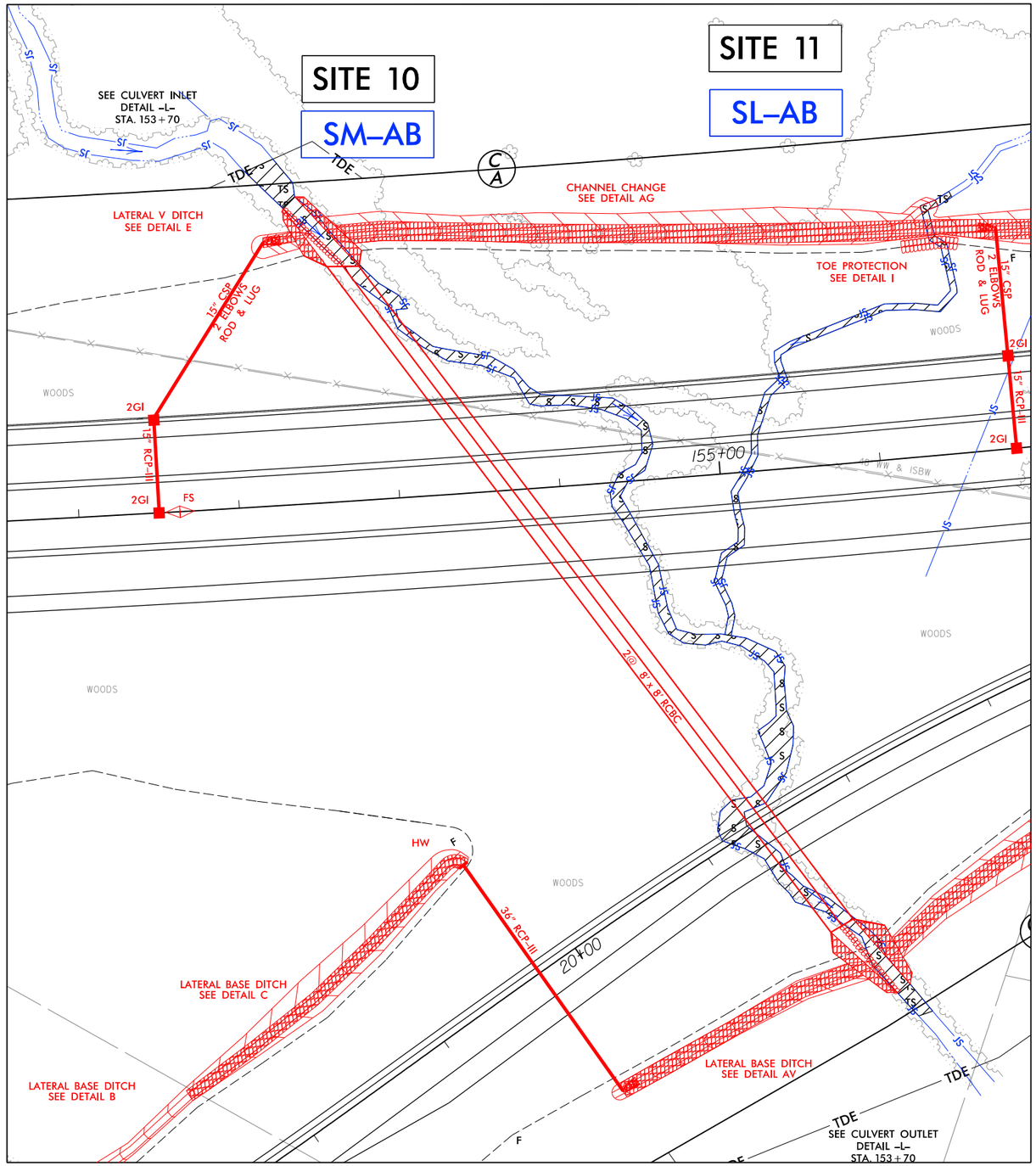
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95

ENGLISH

DETAIL SHEET FOR SITES 10 & 11



40 20 0 40 80

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 39 OF 257

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PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PRELIMINARY PLANS
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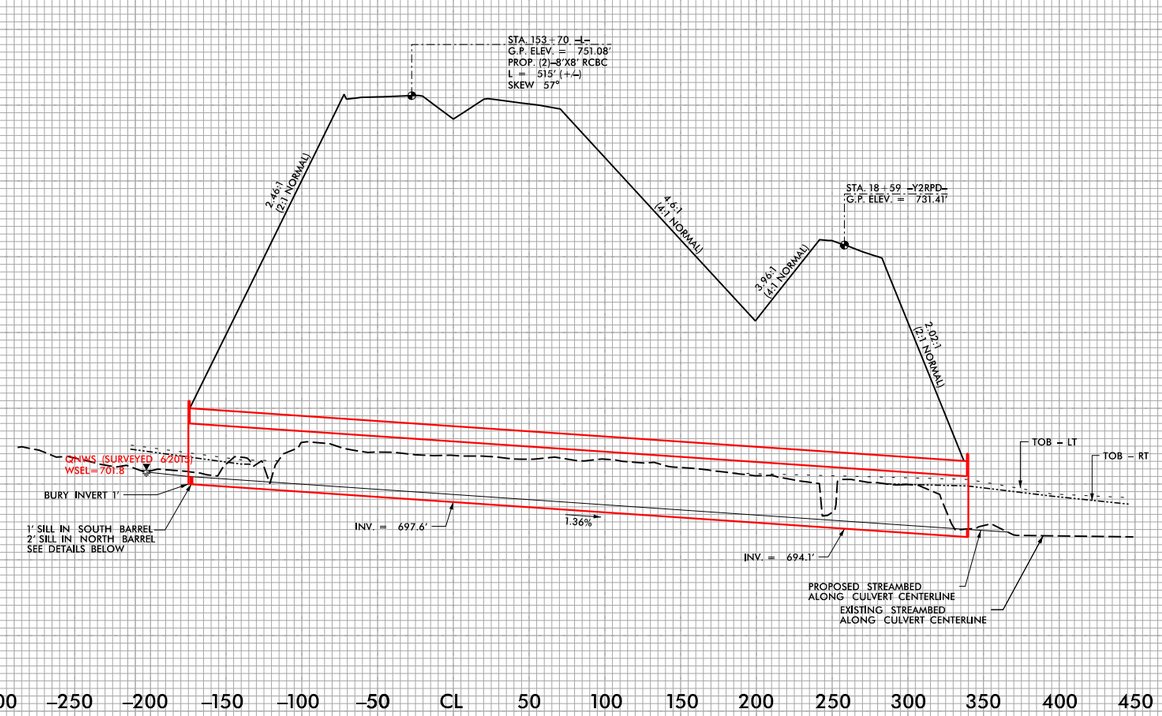
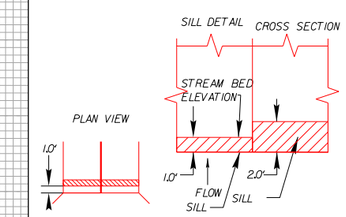
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 40 OF 257

SITE 10
–L– 153+70



PROPOSED 2 @ 8'X 8' RCBC
(length=515')



PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET.

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION.ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL.RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL(S).IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL(S),NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE.NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

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default

PROJECT REFERENCE NO.	SHEET NO.
R-2536	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PRELIMINARY PLANS
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PERMIT DRAWING
SHEET 41 OF 257

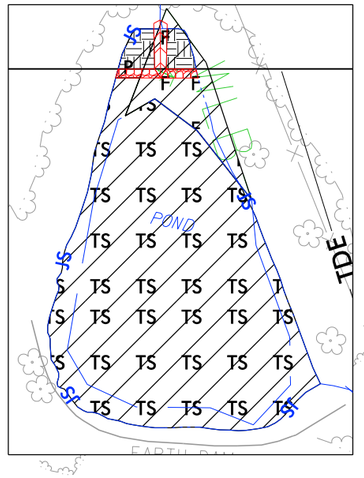
ENGLISH

NAD 83/95

TS/FS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

F/E DENOTES FILL IN WETLAND

INSET A



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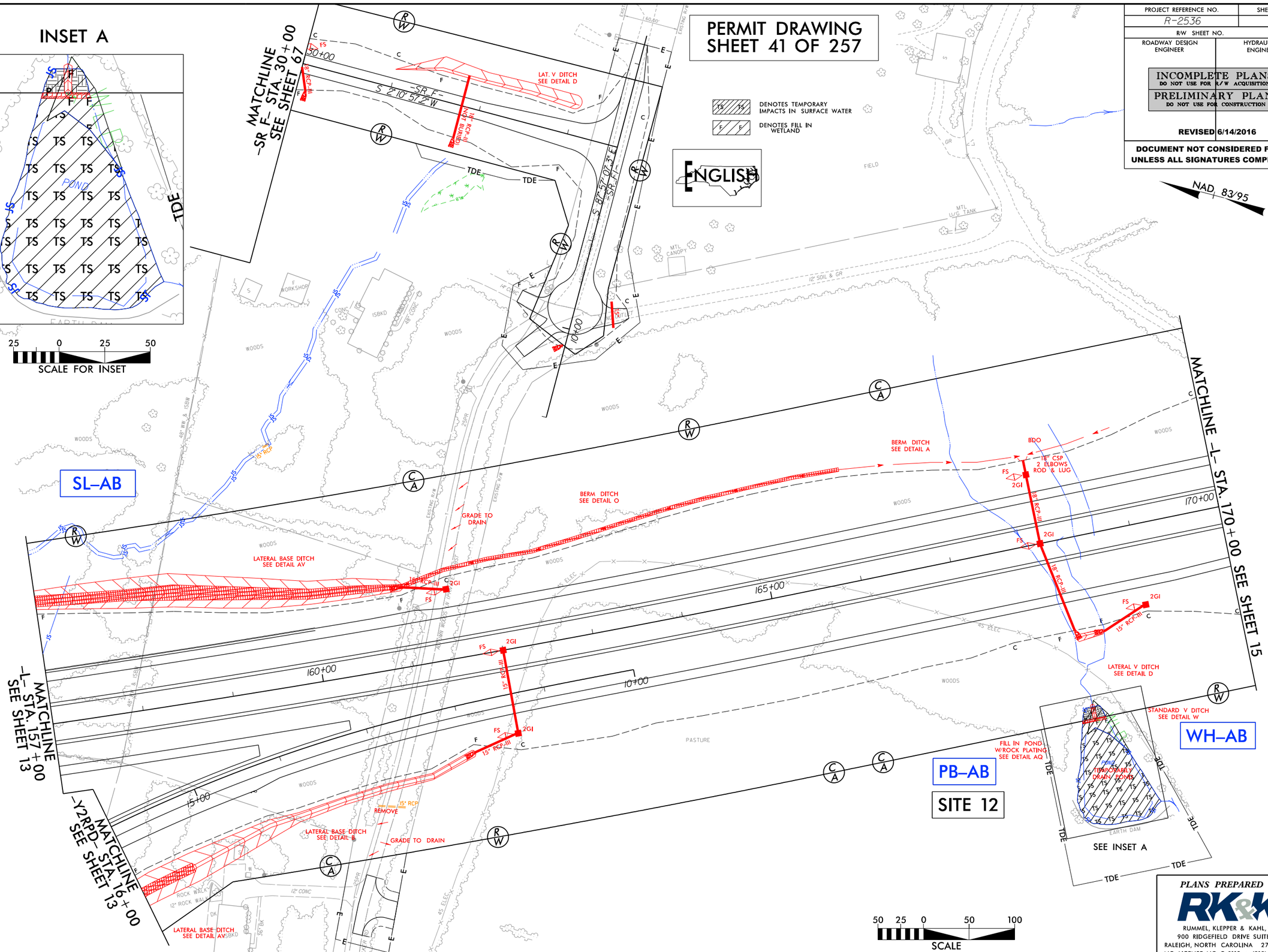

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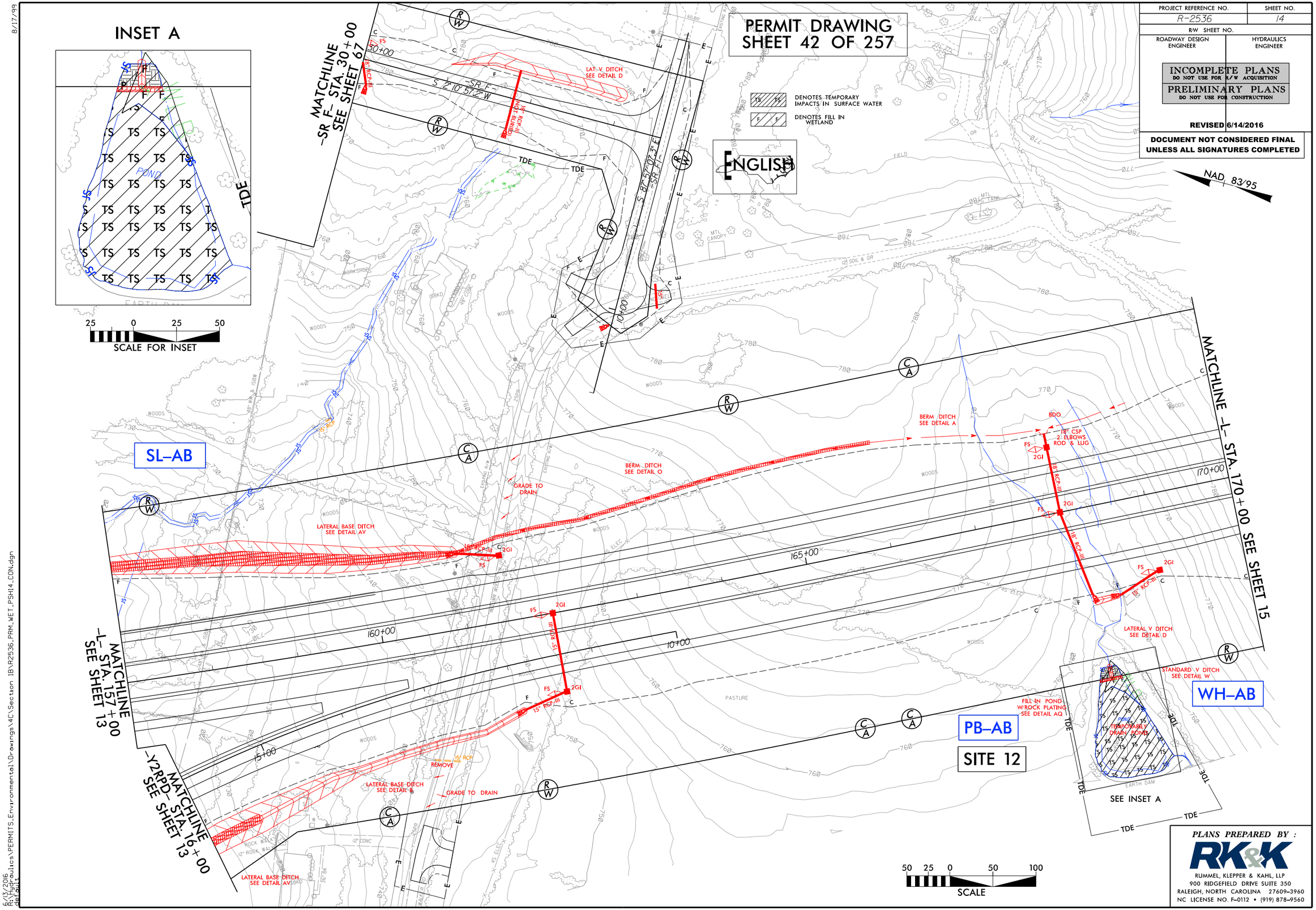

PROJECT REFERENCE NO.	SHEET NO.
R-2536	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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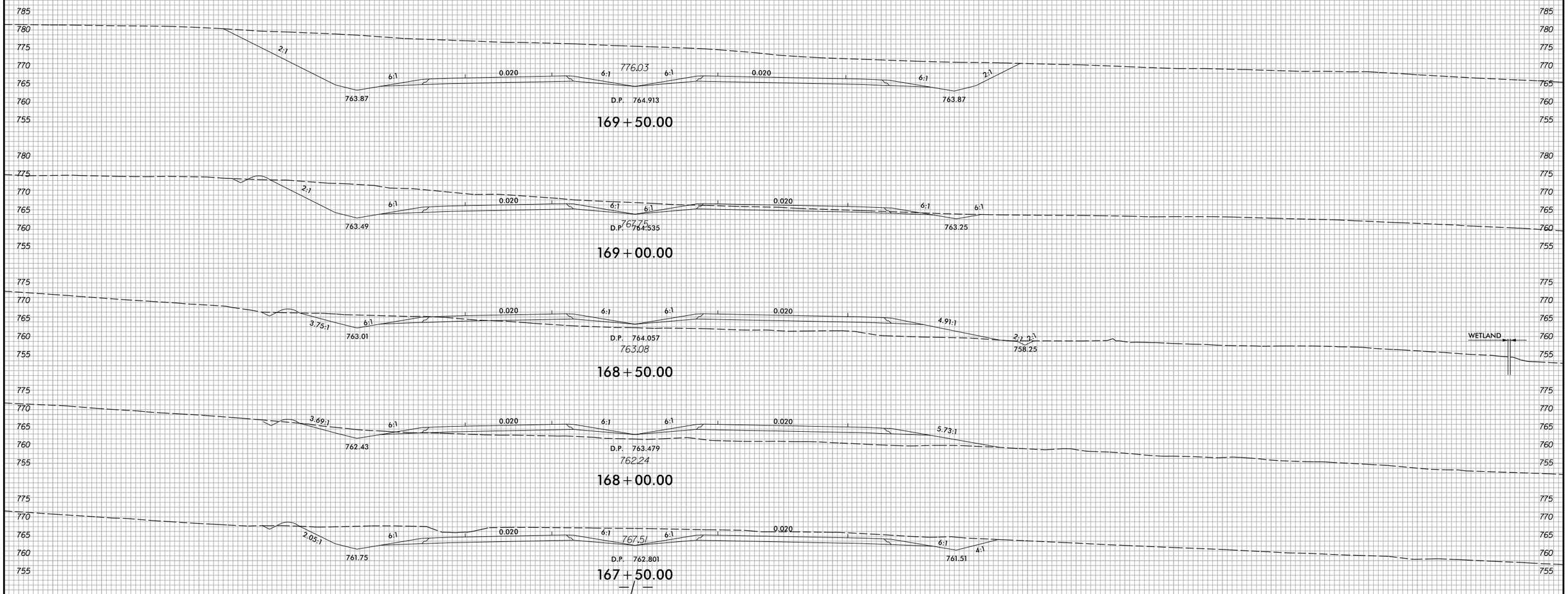
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-XX

PERMIT DRAWING
SHEET 43 OF 257

SITE 12

ENGLISH



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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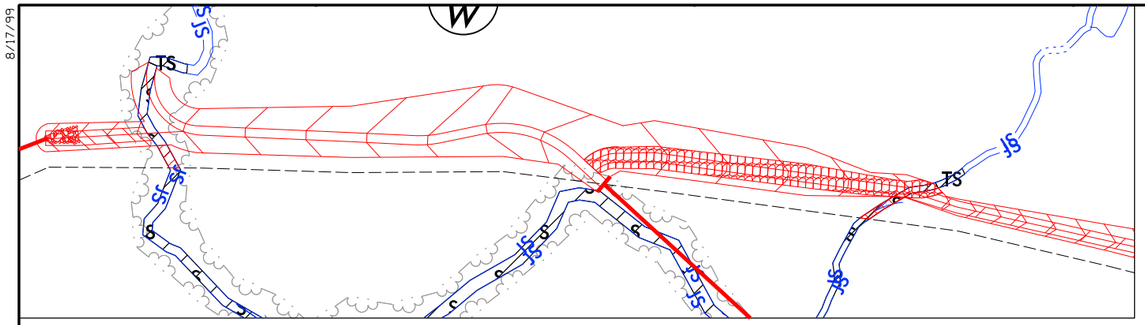
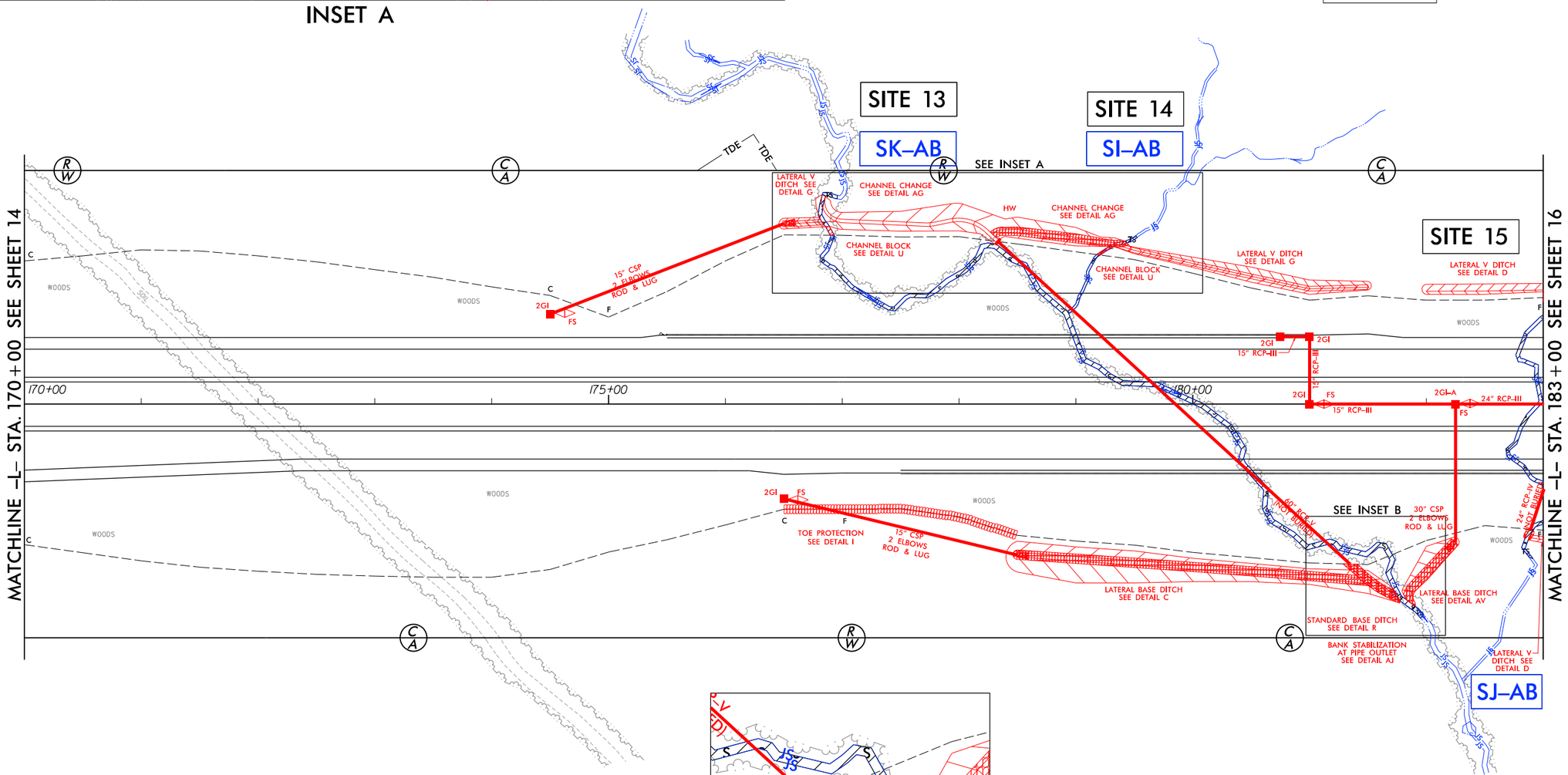
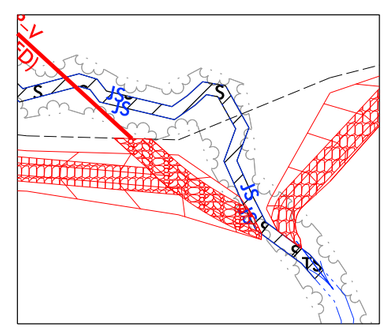
PERMIT DRAWING
SHEET 44 OF 257

ENGLISH



INSET A





INSET B

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

FOR –L– PROFILE SEE SHT. 110

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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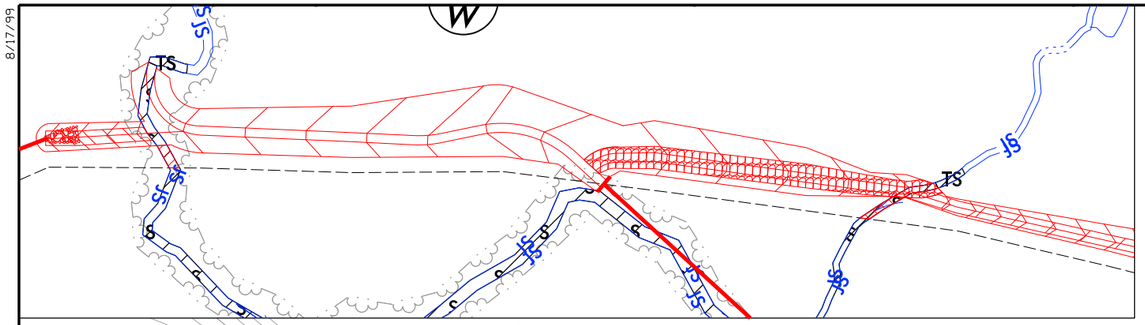
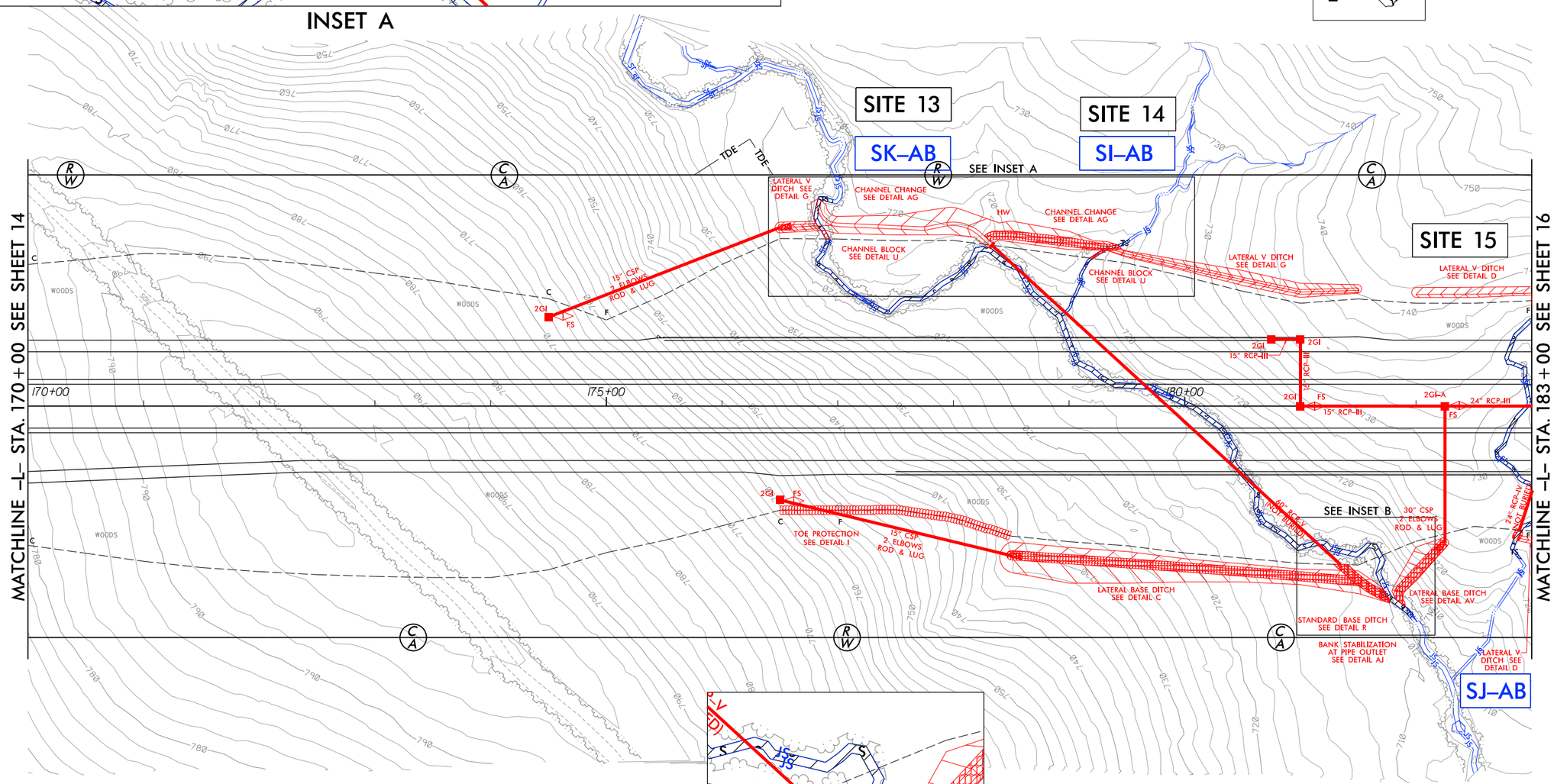
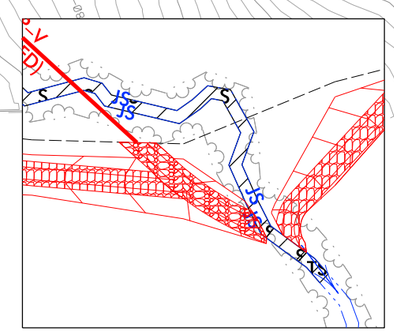
SHEET 45 OF 257

ENGLISH



INSET A





INSET B

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

FOR -L- PROFILE SEE SHT. 110

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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SHEET 46 OF 257

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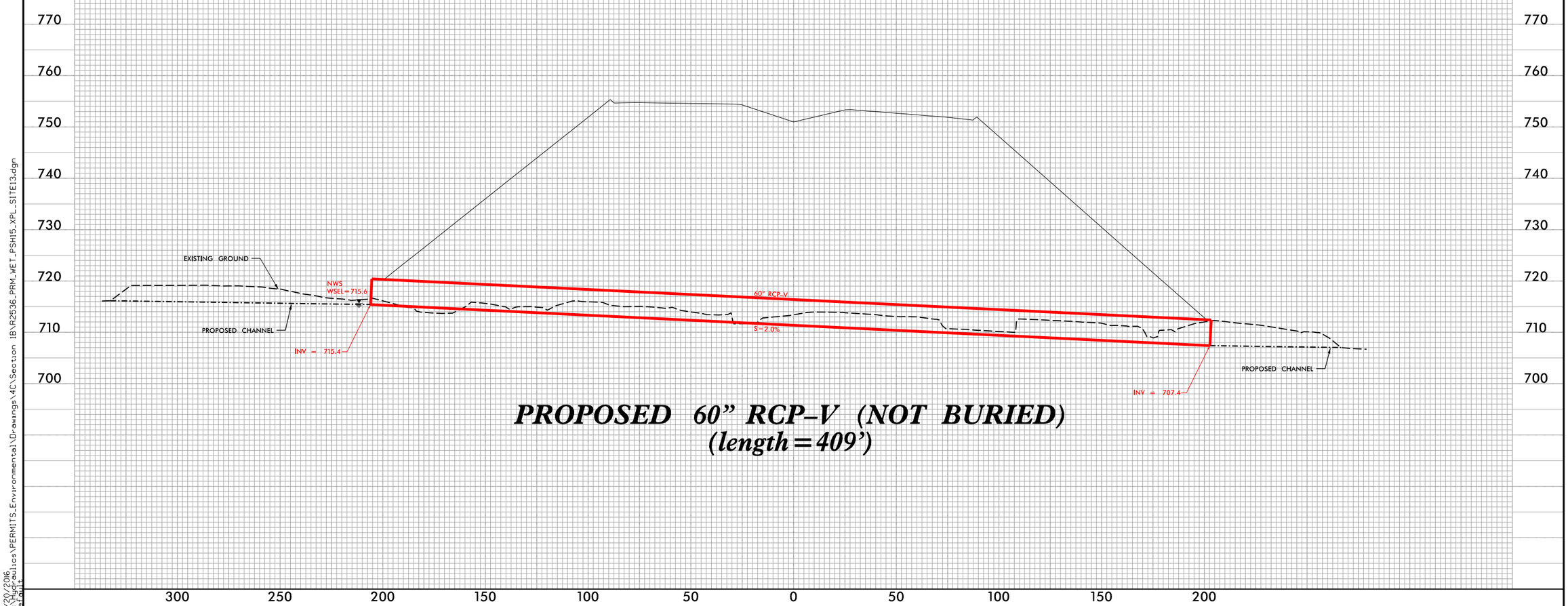
SITE 13
–L– 179+85



PROPOSED 60" RCP-V (NOT BURIED)
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PROJECT REFERENCE NO.	SHEET NO.
R-2536	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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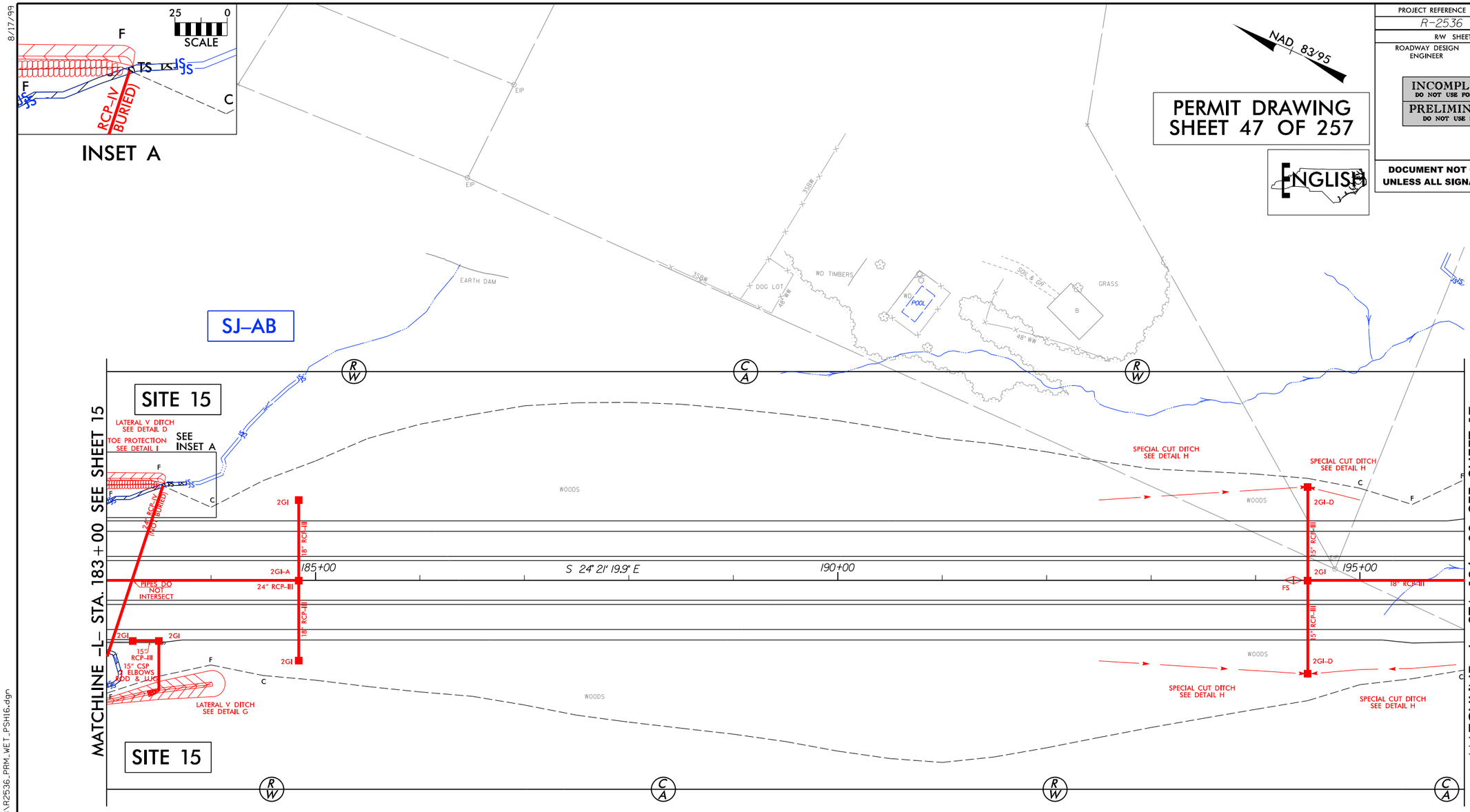
PERMIT DRAWING
SHEET 47 OF 257

ENGLISH

NAD 83/95



DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50 25 0 50 100
SCALE

FOR -L- PROFILE SEE SHTS. 110-111

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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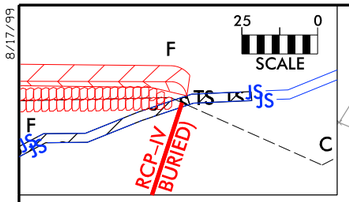
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

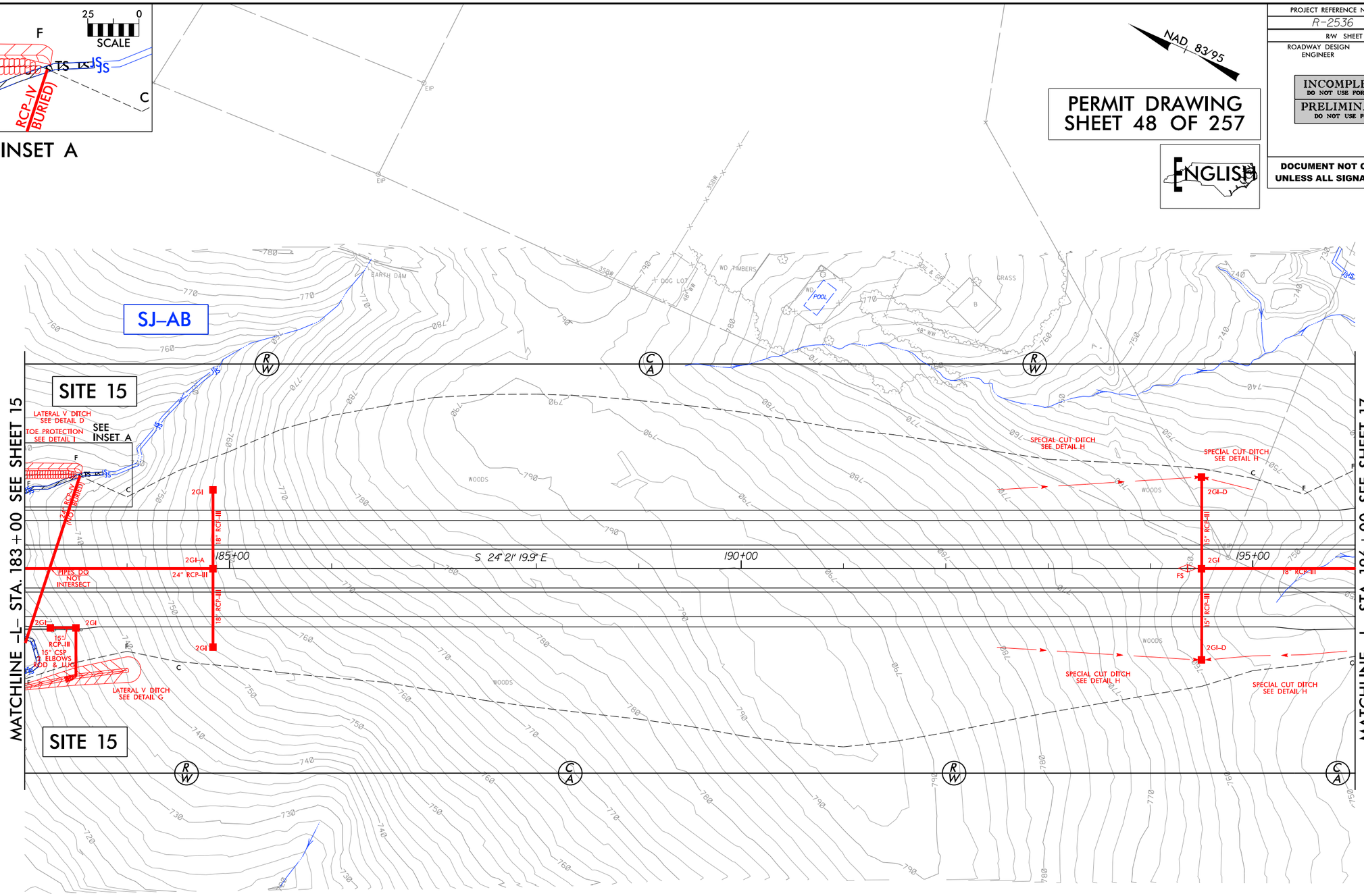
NAD 83/95

PERMIT DRAWING
SHEET 48 OF 257

ENGLISH



INSET A



SITE 15

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50 25 0 50 100
SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

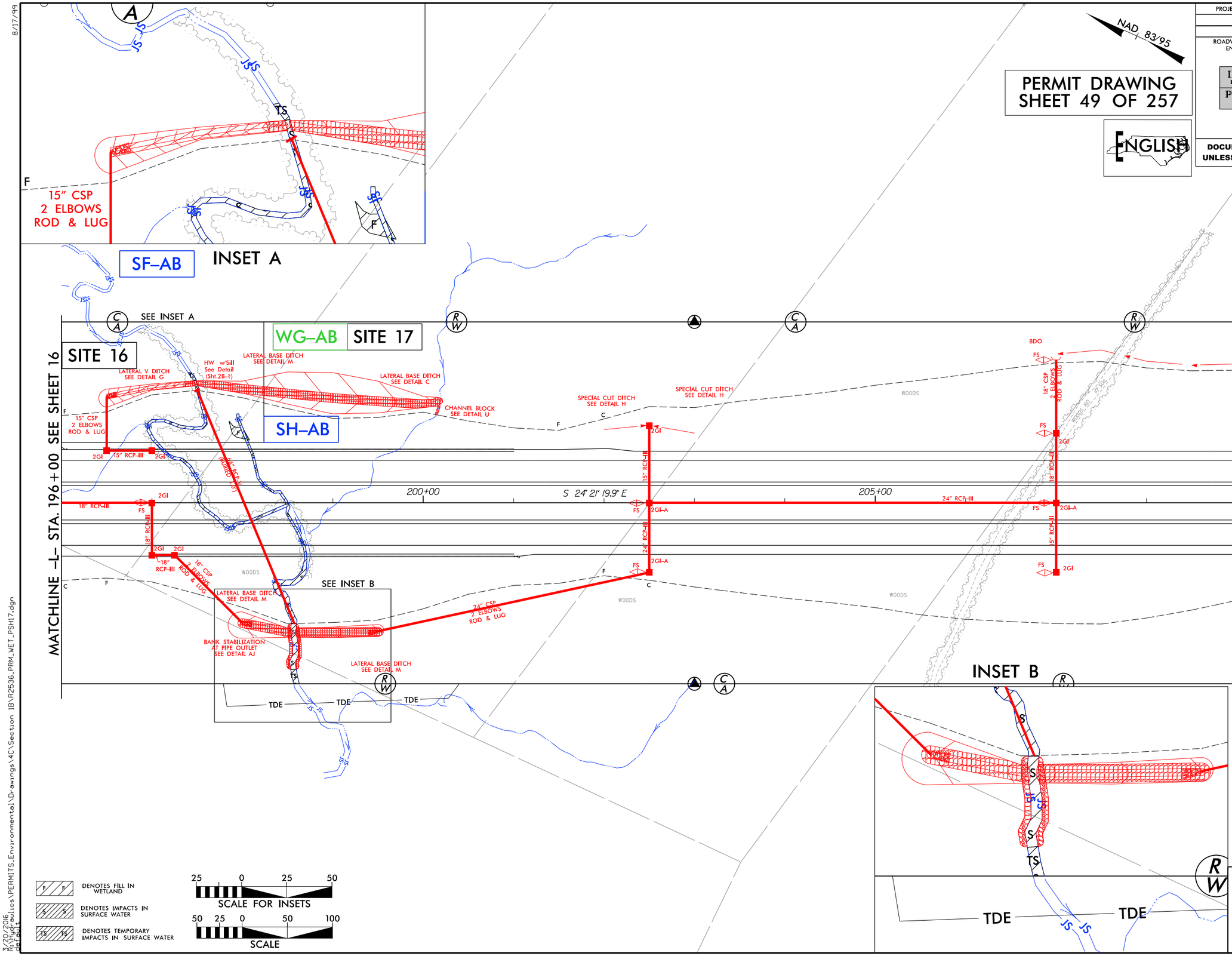
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 49 OF 257

ENGLISH

NAD 83/95



DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

PLANS PREPARED BY :

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3/30/2016
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default

PROJECT REFERENCE NO.	SHEET NO.
R-2536	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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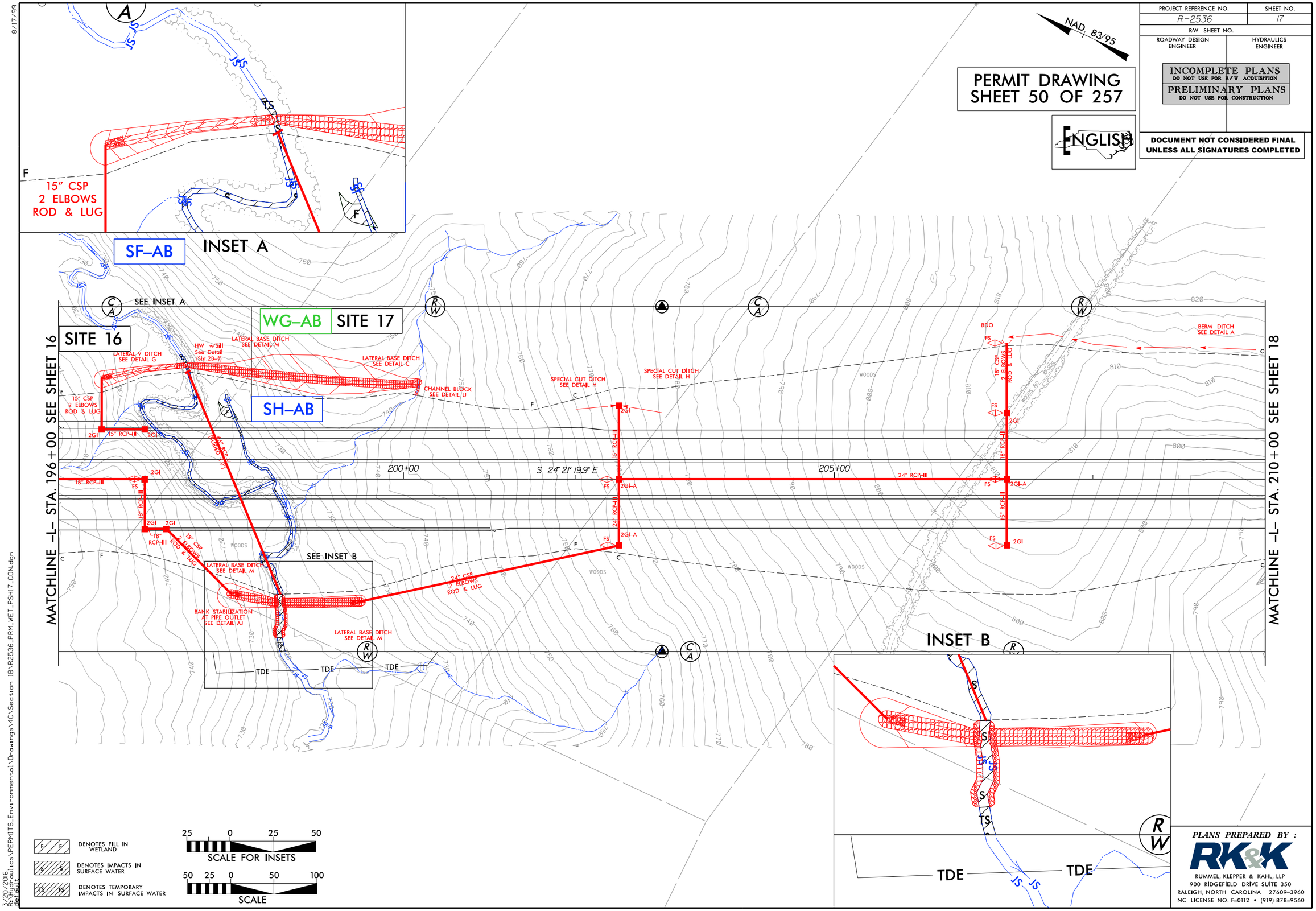
NAD 83/95

PERMIT DRAWING
SHEET 50 OF 257

ENGLISH



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PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL
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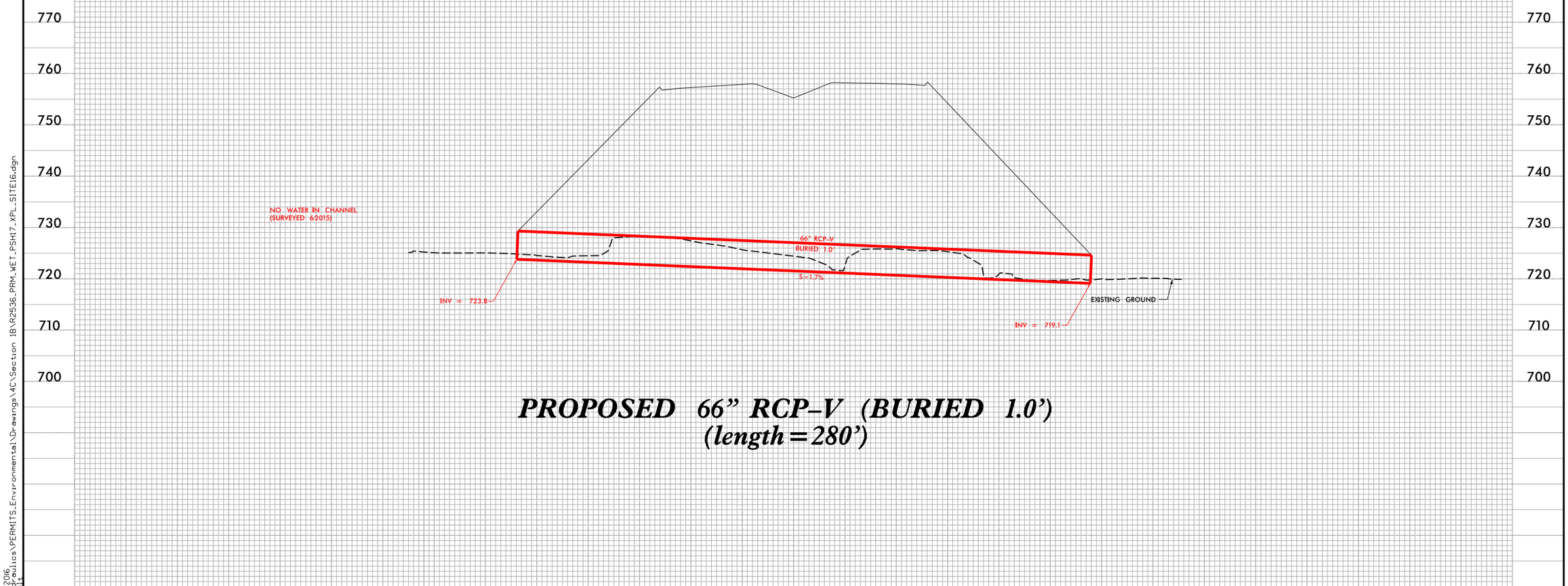
SHEET 51 OF 257

ENGLISH

SITE 16
–L– 198+02



PROPOSED 66" RCP–V (BURIED 1.0')
(length=280')

3/30/2016
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default

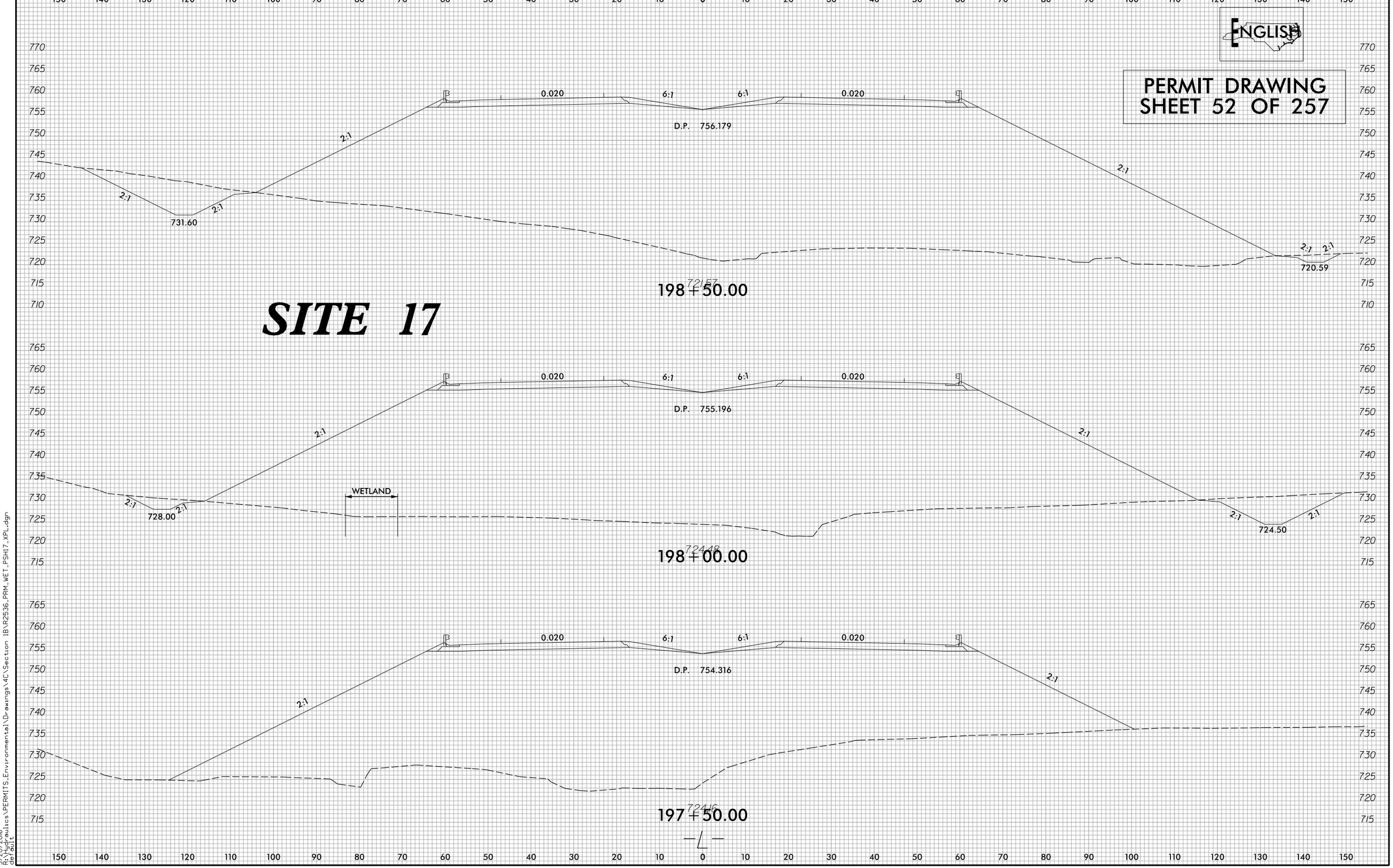
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-121

0 5 10

ENGLISH

PERMIT DRAWING
SHEET 52 OF 257

SITE 17



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default

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	63A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
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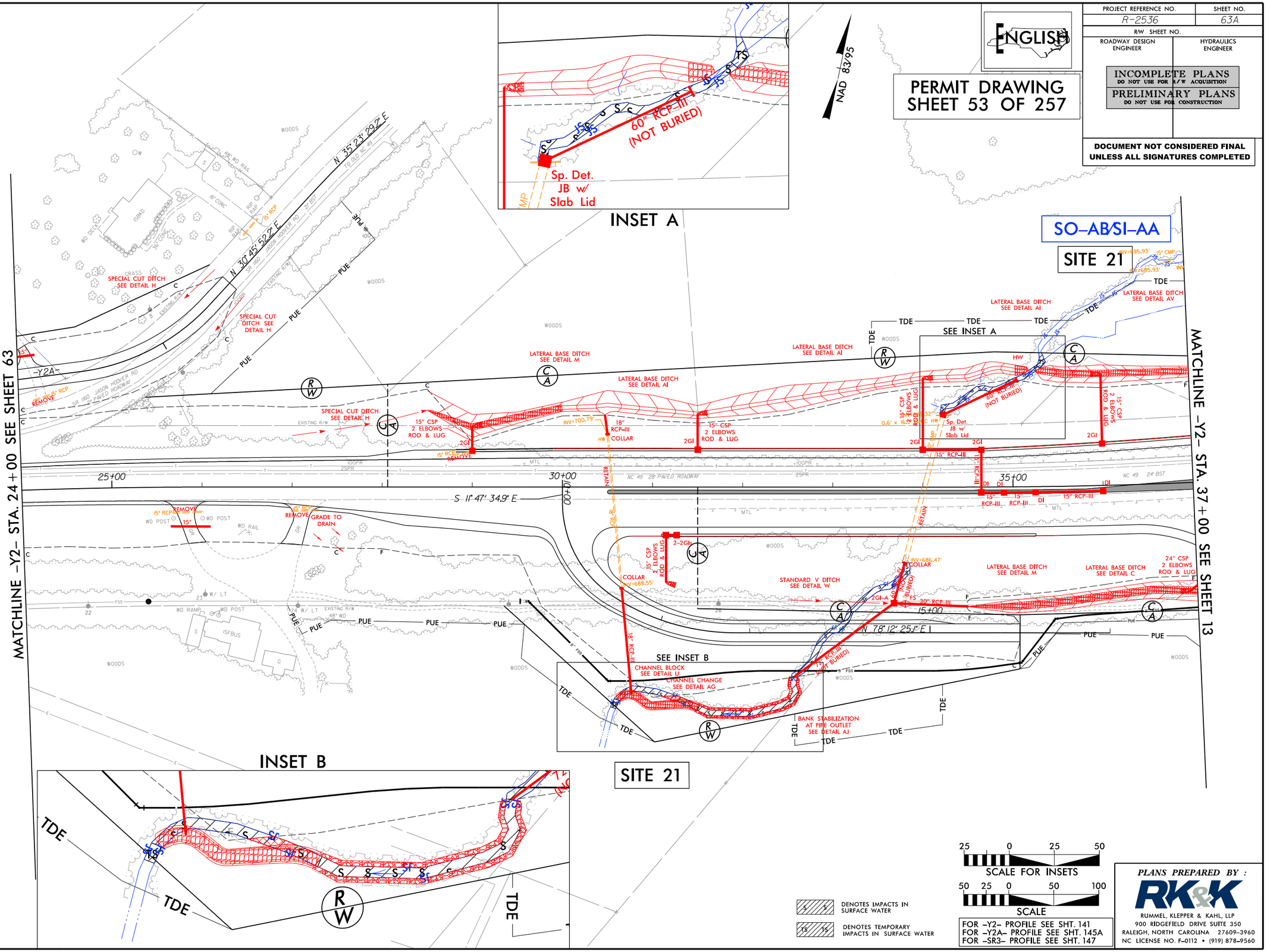
ENGLISH

PERMIT DRAWING SHEET 53 OF 257



FOR -Y2- PROFILE SEE SHT. 141
FOR -Y2A- PROFILE SEE SHT. 145A
FOR -SR3- PROFILE SEE SHT. 147

PLANS PREPARED BY :

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	63A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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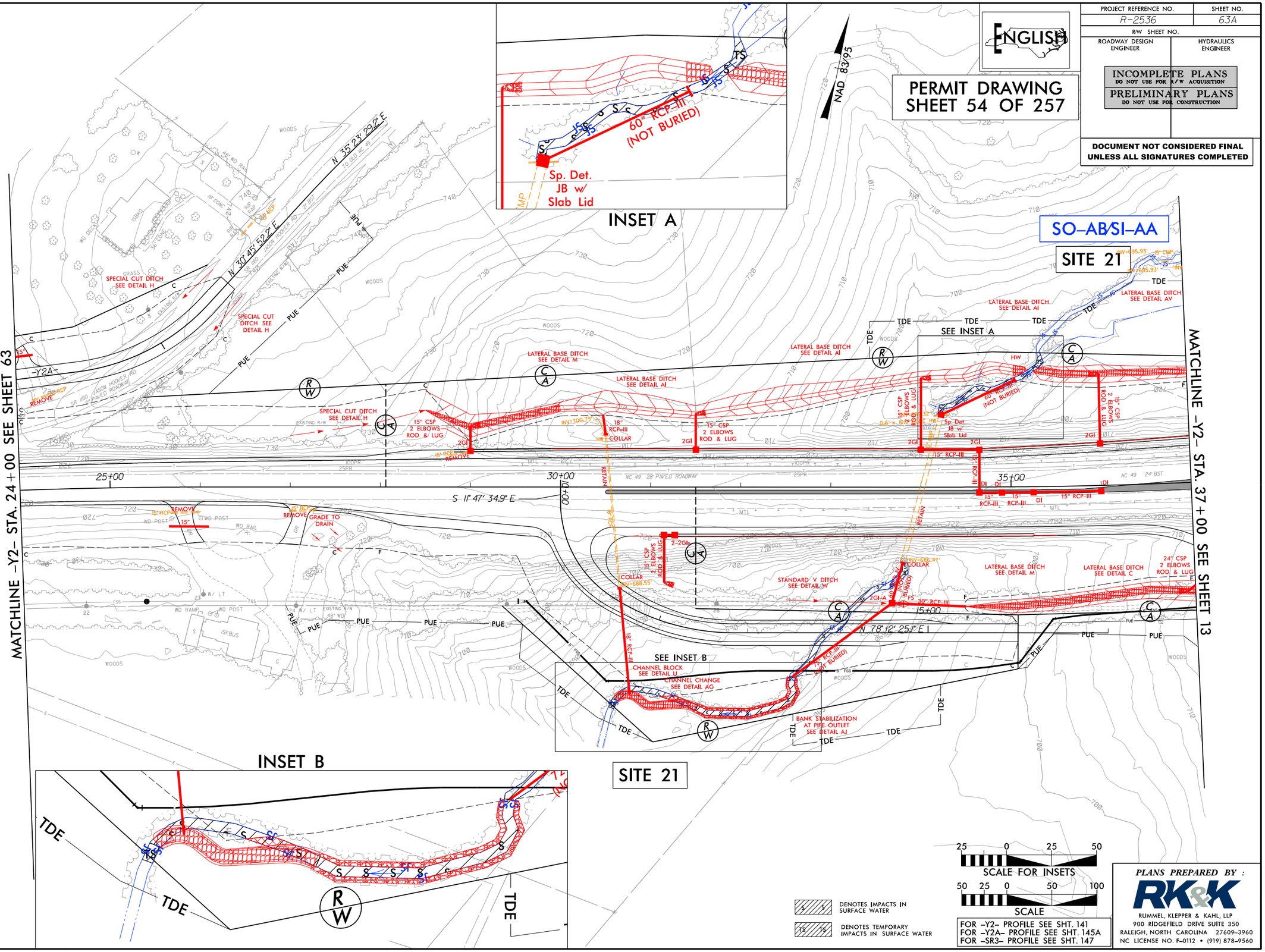
ENGLISH

PERMIT DRAWING
SHEET 54 OF 257



INSET B

SITE 21

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SCALE FOR INSETS: 25 0 25 50

SCALE: 50 25 0 50 100

FOR -Y2- PROFILE SEE SHT. 141
FOR -Y2A- PROFILE SEE SHT. 145A
FOR -SR3- PROFILE SEE SHT. 147

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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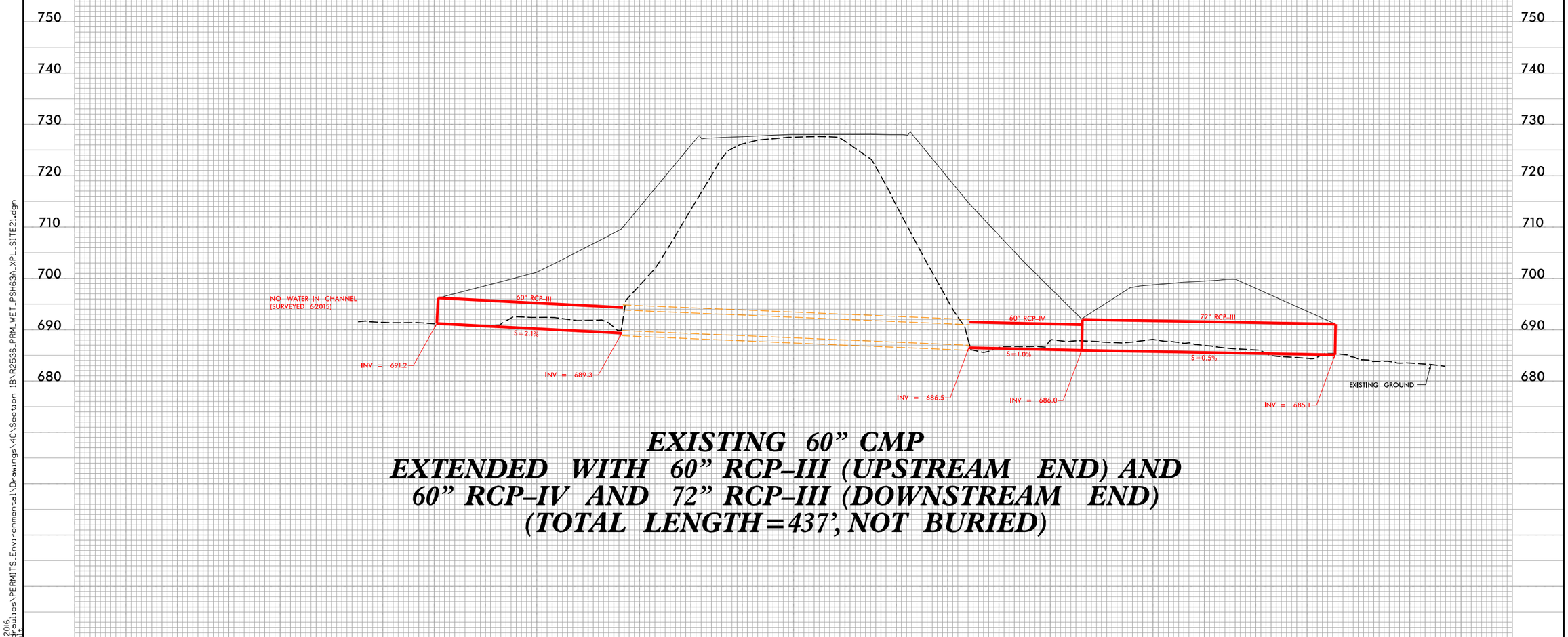
PERMIT DRAWING
SHEET 55 OF 257

SITE 21
–Y2– 34+02



EXISTING 60" CMP
EXTENDED WITH 60" RCP–III (UPSTREAM END) AND
60" RCP–IV AND 72" RCP–III (DOWNSTREAM END)
(TOTAL LENGTH=437', NOT BURIED)

3/30/2006
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PROJECT REFERENCE NO.	SHEET NO.
R-2536	64
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISED 6/14/2016

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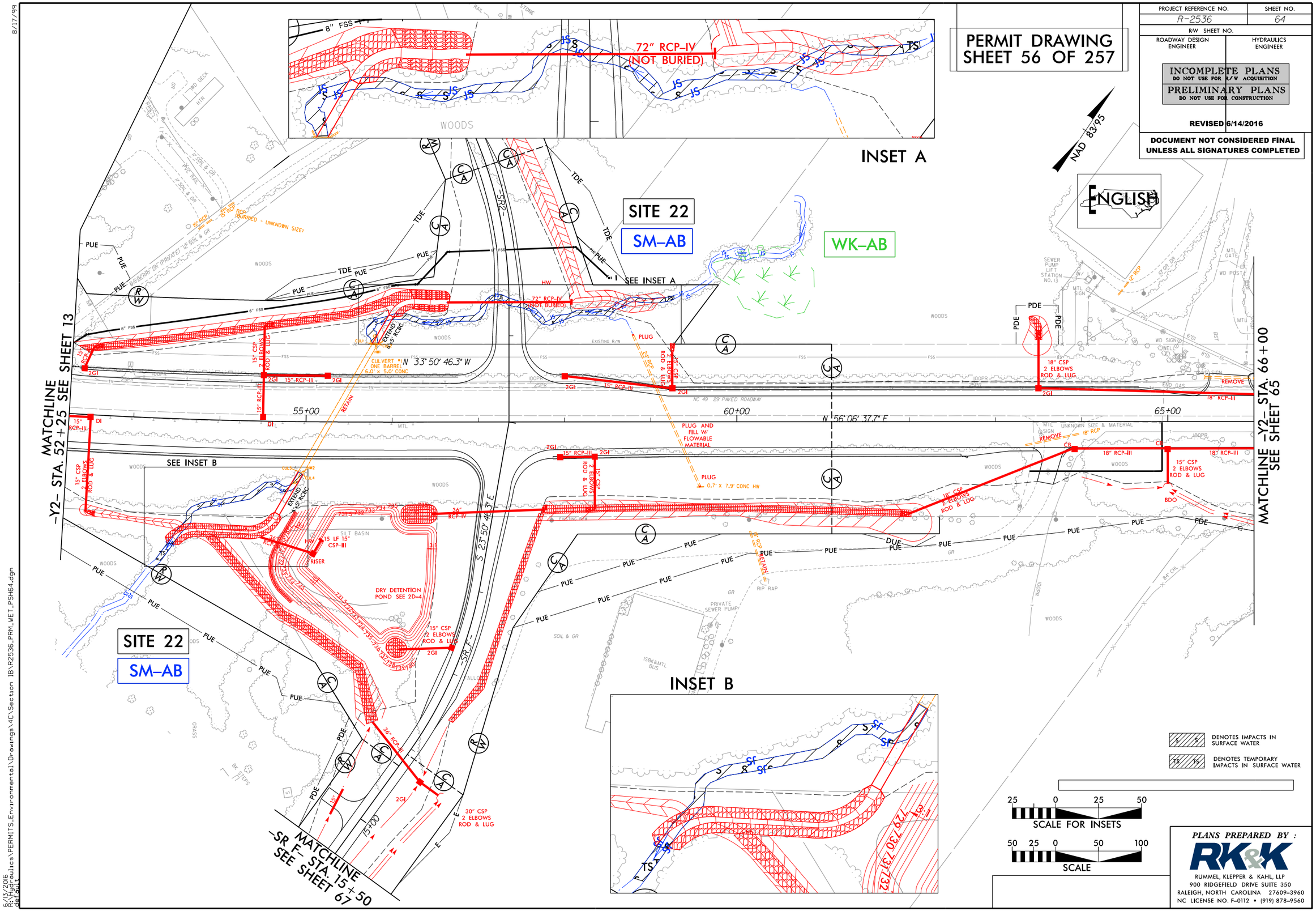
PERMIT DRAWING SHEET 56 OF 257



PLANS PREPARED BY :

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6/13/2016
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dsfoutz

PROJECT REFERENCE NO.	SHEET NO.
R-2536	64
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISED 6/14/2016

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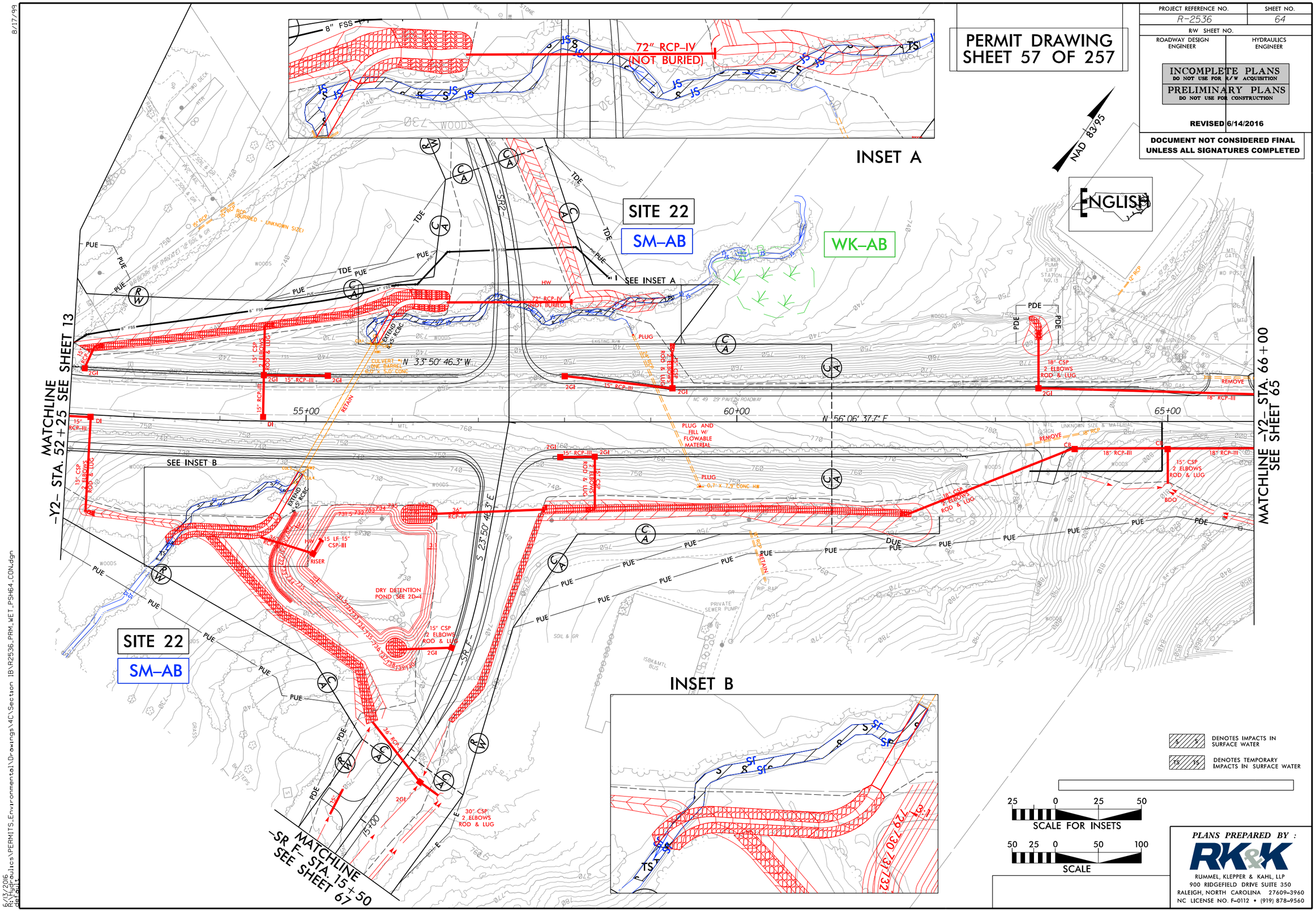
PERMIT DRAWING
SHEET 57 OF 257



PLANS PREPARED BY :

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6/13/2016
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PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL
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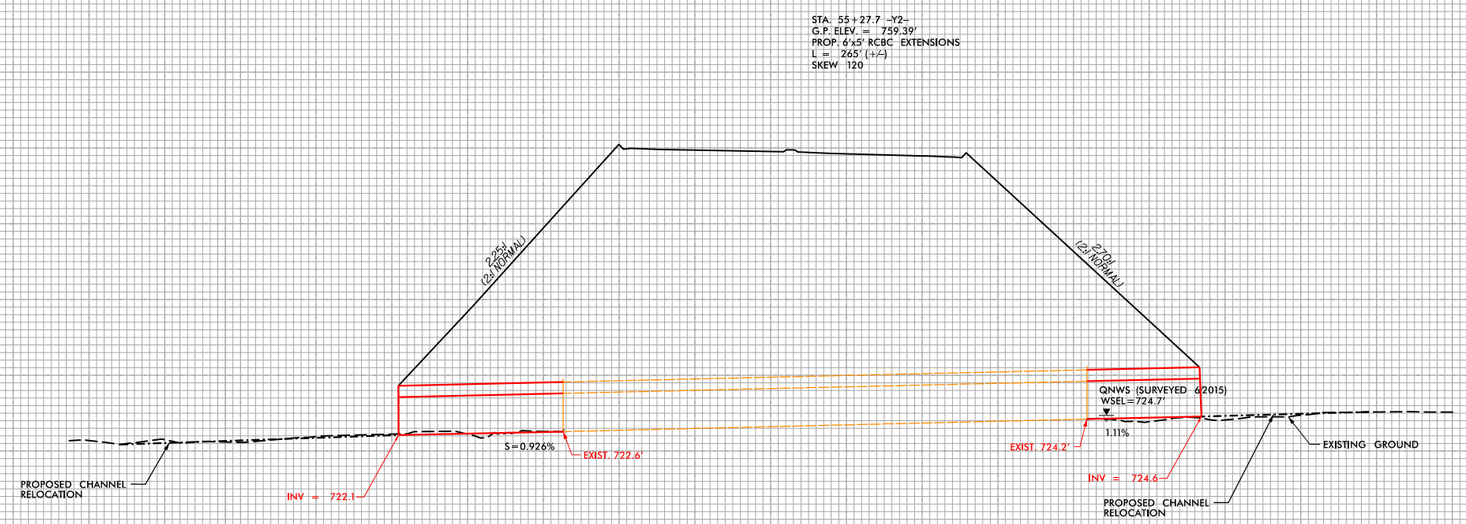
PERMIT DRAWING
SHEET 58 OF 257

ENGLISH

SITE 22
–Y2– 55+28



EXISTING 6'X 5' CONCRETE BOX CULVERT EXTENDED WITH 6'X 5' RCBC (BOTH ENDS) (TOTAL LENGTH=265', NOT BURIED)

5/14/99

3/30/2006
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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

DOCUMENT NOT CONSIDERED FINAL
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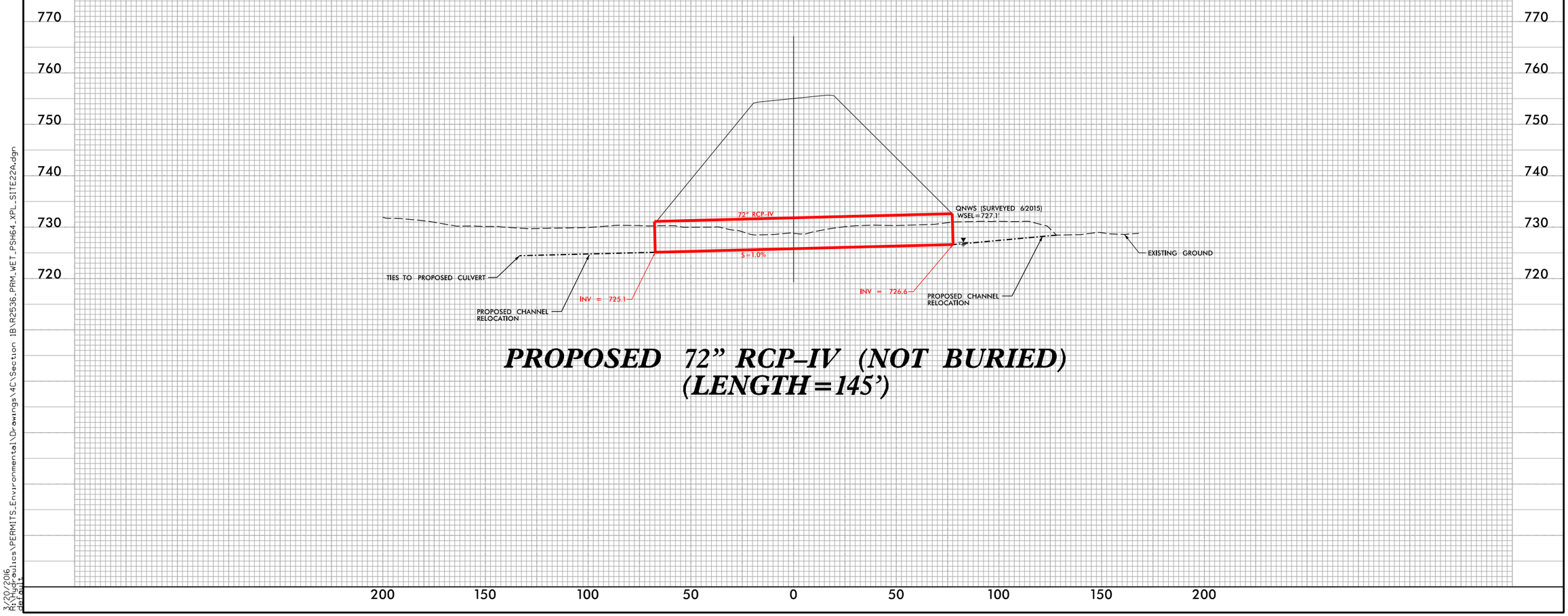
PERMIT DRAWING
SHEET 59 OF 257

SITE 22
–SR2– 11+39



PROPOSED 72" RCP–IV (NOT BURIED)
(LENGTH=145')

3/29/2016
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default

09/08/99

TIP PROJECT: R-2536

CONTRACT: C203617

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RANDOLPH COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2536	1	

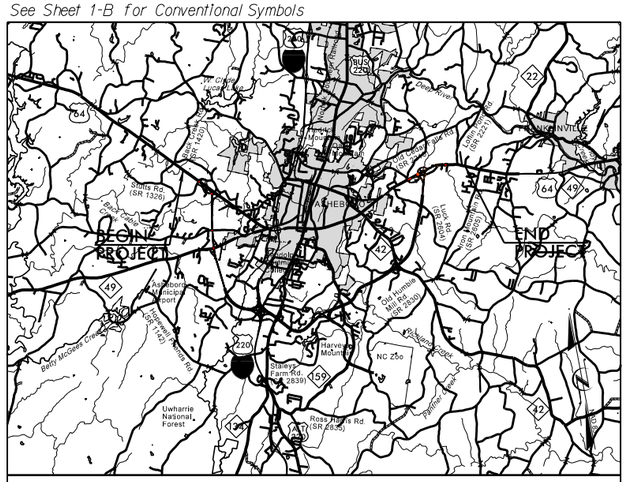
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34450.3.S1		PE

LOCATION: US 64 BYPASS FROM EXISTING US 64 WEST OF ASHEBORO TO EXISTING US 64 EAST OF ASHEBORO AND THE ZOO CONNECTOR FROM EAST OF STALEYS FARM RD. TO EXISTING NC 159/ZOO ENTRANCE

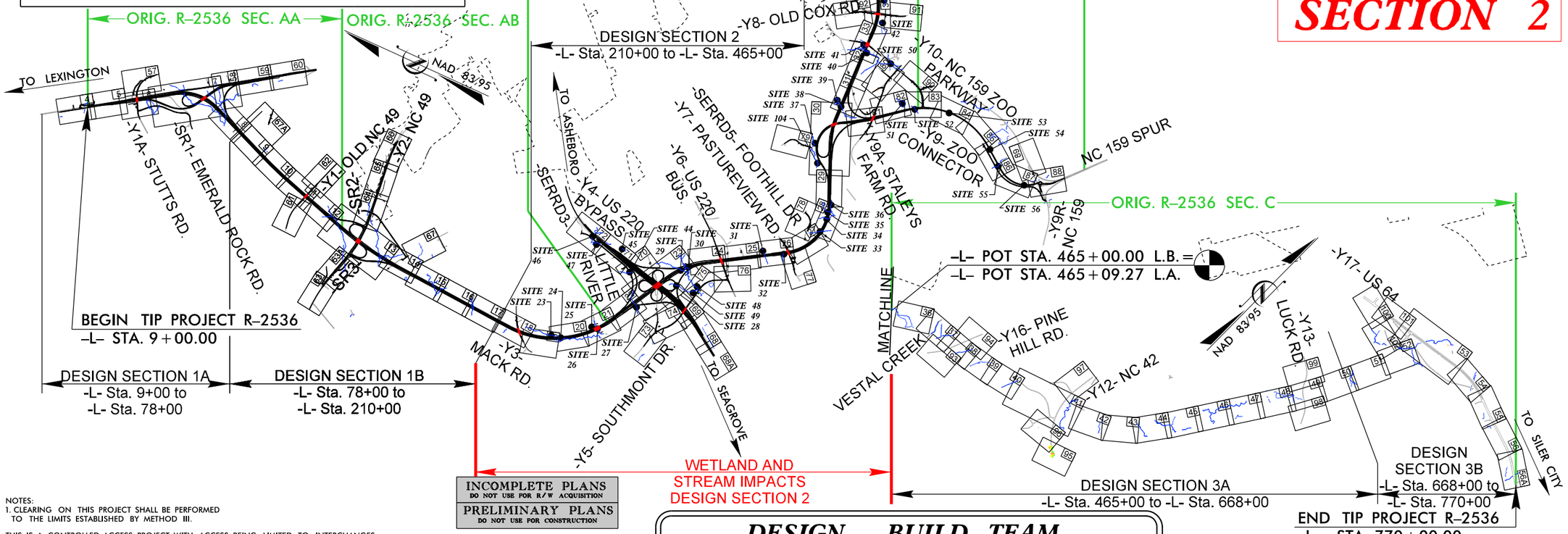
WETLAND AND STREAM IMPACTS

PERMIT DRAWING
SHEET 60 OF 257

SECTION 2



VICINITY MAP (NTS)



NOTES:
1. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

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

INCOMPLETE PLANS
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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DESIGN - BUILD TEAM

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2015 = 12,600
ADT 2040 = 18,800
DHV = 11 %
D = 60 %
T = 13 % *
V = 70 MPH
(*TTST = 8% + DUAL = 5%)

FUNCTIONAL CLASSIFICATION
FREEWAY

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2536.....	14.619 mi
LENGTH STRUCTURE TIP PROJECT R-2536.....	0.121 mi
TOTAL LENGTH TIP PROJECT R-2536.....	14.740 mi

NCDOT CONTACT

K. Zak Hamidi, P.E.
PROJECT ENGINEER - DESIGN-BUILD UNIT

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO. F-0112
1-888-521-4455 OR 919-878-9560

FOR
DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

LETTING DATE:
JUNE 29, 2015

B. Keith Skinner, P.E.
PROJECT ENGINEER

Michael T. Merritt, P.E.
PROJECT DESIGN ENGINEER

CONTRACTOR :
ASHEBORO 64 Bypass Constructors, LLC
WRIGHT BROTHERS RK&K

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

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATE OF NORTH CAROLINA

3/22/2016
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	2D-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PRELIMINARY PLANS
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REVISED 6/14/2016

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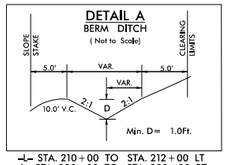
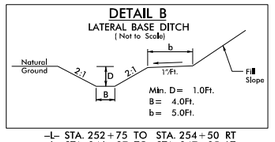
PERMIT DRAWING SHEET 61 OF 257

DETAIL A
BERM DITCH
(Not to Scale)



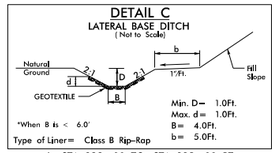
–L– STA. 210+00 TO STA. 212+00 LT
–L– STA. 229+00 TO STA. 230+00 RT
–L– STA. 301+50 TO STA. 303+50 LT
–L– STA. 339+12 TO STA. 340+50 LT
–L– STA. 449+70 TO STA. 451+50 LT
–SR_Q– STA. 17+48.76 TO STA. 20+48.76 RT
–SR_Q– STA. 22+48.77 TO STA. 26+81.87 RT
–Y4RPA– STA. 33+40 TO STA. 35+80 RT
–Y5– STA. 18+50 TO STA. 19+50 LT
–Y9FLY– STA. 39+25 TO STA. 44+00 RT
–Y9– STA. 37+75 TO STA. 41+50 LT
–Y9– STA. 48+58 TO STA. 50+00 RT
–Y9RPD– STA. 19+00 TO STA. 22+00 LT
–Y9RPD– STA. 23+00 TO STA. 27+50 LT

DETAIL B
LATERAL BASE DITCH
(Not to Scale)



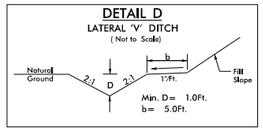
–L– STA. 252+75 TO STA. 254+50 RT
–L– STA. 346+37 TO STA. 347+25 LT
–L– STA. 357+00 TO STA. 359+50 LT
–L– STA. 392+00 TO STA. 393+00 LT
–L– STA. 455+37 TO STA. 455+75 RT
–L– STA. 457+50 TO STA. 460+00 RT
–SERRD1– STA. 14+00 TO STA. 18+00 LT
–SERRD3– STA. 23+00 to STA. 25+25 LT
–SERRD5– STA. 12+00 TO STA. 15+00 LT
–SR_Q– STA. 12+48.76 TO STA. 14+48.76 RT
–SR_Q– STA. 20+48.76 TO STA. 20+88 RT
–SR_Q– STA. 34+19 TO STA. 37+04 RT
–SR_Q– STA. 37+56.54 TO STA. 42+00 RT
–Y4– STA. 38+60 TO STA. 40+50 RT
–Y4LPB– STA. 11+45 TO STA. 20+50 RT
–Y4LPD– STA. 11+41 TO STA. 19+50 RT
–Y4RPD– STA. 21+50 TO STA. 23+23 LT
–Y7– STA. 20+85 TO STA. 23+00 LT
–Y9– STA. 28+53 TO STA. 29+25 RT
–Y9– STA. 30+20 TO STA. 31+50 RT
–Y9– STA. 70+00 TO STA. 73+50 LT
–Y9– STA. 78+50 TO STA. 80+00 RT
–Y9– STA. 78+50 TO STA. 79+00 LT
–Y9B– STA. 12+00 TO STA. 15+00 LT
–Y9C– STA. 11+50 TO STA. 13+55 RT
–Y9FLY– STA. 10+00 TO STA. 11+50 RT
–Y9FLY– STA. 16+50 TO STA. 19+50 LT
–Y9FLY– STA. 20+50 TO STA. 22+80 LT
–Y9FLY– STA. 26+50 TO STA. 28+00 LT
–Y9LPB– STA. 16+90 TO STA. 19+77 RT
–Y9RPB– STA. 18+90 TO STA. 23+15 RT
–Y9RPC– STA. 19+50 TO STA. 23+50 LT
–Y9RPC– STA. 20+50 TO STA. 23+50 RT

DETAIL C
LATERAL BASE DITCH
(Not to Scale)



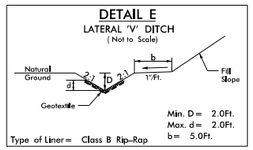
–L– STA. 228+00 TO STA. 229+00 RT
–L– STA. 234+25 TO STA. 241+50 LT
–L– STA. 234+50 TO STA. 235+00 RT
–L– STA. 254+50 TO STA. 261+50 RT
–L– STA. 274+47 TO STA. 277+65 RT
–L– STA. 274+50 TO STA. 275+00 LT
–L– STA. 346+00 TO STA. 346+37 LT
–L– STA. 355+00 TO STA. 357+00 LT
–L– STA. 363+73 TO STA. 364+50 RT
–L– STA. 365+50 TO STA. 368+00 RT
–L– STA. 393+00 TO STA. 396+65 LT
–L– STA. 433+06 TO STA. 435+00 RT
–L– STA. 455+75 TO STA. 457+50 RT
–SERRD1– STA. 18+00 TO STA. 21+67 LT
–SERRD3– STA. 37+26 TO STA. 38+85 LT
–SERRD5– STA. 13+85 TO STA. 14+50 RT
–Y4LPD– STA. 10+00 TO STA. 11+41 RT
–Y4RPC– STA. 12+50 TO STA. 16+40 RT
–Y4RPD– STA. 13+35 TO STA. 14+71 RT
–Y4RPD– STA. 24+20 TO STA. 25+44 RT
–Y5– STA. 12+21 TO STA. 14+50 LT
–Y5– STA. 12+21.67 TO STA. 15+00 RT
–Y5– STA. 46+50 TO STA. 50+50 LT
–Y9– STA. 14+50 TO STA. 15+75 RT
–Y9– STA. 11+50 TO STA. 15+00 LT
–Y9– STA. 16+50 TO STA. 18+20 LT
–Y9– STA. 22+00 TO STA. 24+00 LT
–Y9A– STA. 37+00 TO STA. 38+25 LT
–Y9C– STA. 11+00 TO STA. 13+00 LT
–Y9FLY– STA. 19+50 TO STA. 20+50 LT
–Y9FLY– STA 50+00 TO STA. 51+15 RT
–Y9RPC– STA. 23+50 TO STA. 29+38 RT

DETAIL D
LATERAL 'V' DITCH
(Not to Scale)



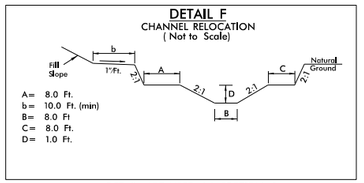
–L– STA. 244+00 TO STA. 245+23 LT
–L– STA. 252+50 TO STA. 253+75 LT
–L– STA. 249+00 TO STA. 249+65 LT
–L– STA. 299+36 TO STA. 301+50 LT
–L– STA. 455+00 TO STA. 455+37 RT
–SERRD3– STA. 40+82 TO STA. 41+87 LT
–SERRD5– STA. 10+00 TO STA. 11+00 LT
–SR_Q– STA. 46+50 TO STA. 47+50 LT
Y3_DET– STA. 15+91.75 TO STA. 18+20.50 LT
–Y4– STA. 74+54 TO STA. 80+35 RT
–Y4LPA– STA. 17+20 TO STA. 23+39 RT
–Y4LPB– STA. 18+30 TO STA. 20+00 LT
–Y4LPC– STA. 20+50 TO STA. 23+25 RT
–Y4RPA– STA. 23+50 TO STA. 24+00 RT
–Y4RPB– STA. 14+90 TO STA. 16+25 LT
–Y4RPB– STA. 18+75 TO STA. 20+25 LT
–Y4RPB– STA. 21+25 TO STA. 25+50 LT
–Y4RPB– STA. 30+65 TO STA. 31+60 LT
–Y4RPD– STA. 15+18 TO STA. 16+75 LT
–Y6– STA. 27+00 TO STA. 29+00 LT
–Y8– STA. 10+50 TO STA. 13+00 LT
–Y8– STA. 14+00 TO STA. 15+00 LT
–Y9– STA. 19+90 TO STA. 22+00 LT
–Y9– STA. 44+50 TO STA. 45+25 RT
–Y9– STA. 60+00 TO STA. 60+96 RT
–Y9– STA. 69+50 TO STA. 72+53 RT
–Y9– STA. 78+00 TO STA. 78+50 RT
–Y9A– STA. 33+50 TO STA. 35+00 RT
–Y10– STA. 11+00 TO STA. 13+50 RT

DETAIL E
LATERAL 'V' DITCH
(Not to Scale)



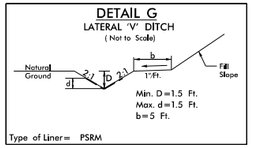
–L– STA. 336+77 TO STA. 337+50 RT
–SERRD1– STA. 20+35 TO STA. 21+67 LT, CL I
–Y5– STA. 23+00 TO STA. 24+81 LT
–Y5A– STA. 11+00 TO STA. 13+00 LT

DETAIL F
CHANNEL RELOCATION
(Not to Scale)



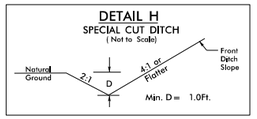
DETAIL NOT USED IN SECTION 2

DETAIL G
LATERAL 'V' DITCH
(Not to Scale)



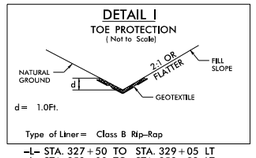
–L– STA. 329+06 TO STA. 333+00 LT
–L– STA. 329+82 TO STA. 333+00 RT
Y3_DET– STA. 15+21.14 TO STA. 15+91.75 LT
–Y9– STA. 16+63 TO STA. 20+00 RT
–Y9– STA. 48+00 TO STA. 48+58 RT
–Y9– STA. 48+00 TO STA. 49+29 LT
–Y9A– STA. 29+00 TO STA. 33+50 RT

DETAIL H
SPECIAL CUT DITCH
(Not to Scale)



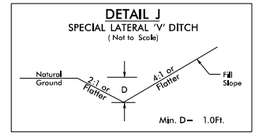
–L– STA. 219+50 TO STA. 227+50 LT
–L– STA. 220+75 TO STA. 226+00 RT
–L– STA. 247+50 TO STA. 249+00 LT
–L– STA. 301+50 TO STA. 307+50 LT
–L– STA. 302+00 TO STA. 303+50 RT
–L– STA. 336+50 TO STA. 339+00 LT
–L– STA. 337+50 TO STA. 339+00 RT
–L– STA. 451+50 TO STA. 455+00 LT
–L– STA. 449+50 TO STA. 453+00 RT
–SERRD1– STA. 21+00 TO STA. 21+41 RT
–SERRD3– STA. 10+00 TO STA. 11+50 LT
–SERRD3– STA. 43+99 TO STA. 45+85 RT
–SR_Q– STA. 11+50.47 TO STA. 12+48.76 RT
–SR_Q– STA. 14+48.76 TO STA. 15+98.76 RT
–Y3– STA. 10+50 TO STA. 11+50 RT
–Y3– STA. 20+50 TO STA. 20+87 RT
–Y4– STA. 49+00 TO STA. 50+00 RT
–Y4– STA. 50+50 TO STA. 54+50 RT
–Y4– STA. 86+00 TO STA. 86+42 RT
–Y4LPA– STA. 13+50 TO STA. 14+00 LT
–Y4LPC– STA. 23+25 TO STA. 23+85 RT
–Y4RPA– STA. 35+08 TO STA. 36+08 RT
–Y4RPC– STA. 21+00 TO STA. 22+50 LT
–Y4RPC– STA. 21+00 TO STA. 25+00 RT
–Y5– STA. 10+00 TO STA. 11+00 LT
–Y6– STA. 13+00 TO STA. 14+00 LT
–Y6– STA. 15+00 TO STA. 16+00 RT
–Y7– STA. 10+00 TO STA. 10+50 RT
–Y7– STA. 23+50 TO STA. 24+30 LT
–Y7– STA. 23+50 TO STA. 24+16 RT
–Y8– STA. 9+75 TO STA. 10+50 LT
–Y8– STA. 9+75 TO STA. 11+00 RT
–Y8– STA. 13+00 TO STA. 14+00 LT
–Y8– STA. 28+50 TO STA. 29+55 RT
–Y9– STA. 34+50 TO STA. 36+50 RT
–Y9– STA. 42+50 TO STA. 44+50 RT
–Y9– STA. 52+00 TO STA. 53+00 RT
–Y9– STA. 52+00 TO STA. 54+50 LT
–Y9– STA. 58+50 TO STA. 60+00 RT
–Y9A– STA. 12+40 TO STA. 14+00 RT
–Y9A– STA. 13+50 TO STA. 14+50 LT
–Y9A– STA. 37+50 TO STA. 39+00 RT
–Y9A– STA. 41+00 TO STA. 42+50 RT
–Y9B– STA. 16+50 TO STA. 18+00 RT
–Y9FLY– STA. 11+50 TO STA. 14+00 RT
–Y9FLY– STA. 40+00 TO STA. 43+00 RT
–Y9RPC– STA. 19+00 TO STA. 19+50 LT
–Y9RPC– STA. 20+00 TO STA. 20+50 RT
–Y9RPD– STA. 17+00 TO STA. 17+50 LT
–Y10– STA. 23+00 TO STA. 23+99 RT
–Y10A– STA. 15+00 TO STA. 15+74 RT
–Y10END– STA. 14+00 TO STA. 16+00 RT
–Y10END– STA. 18+00 TO STA. 19+50 RT

DETAIL I
TOE PROTECTION
(Not to Scale)



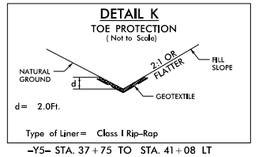
–L– STA. 327+50 TO STA. 329+05 LT
–L– STA. 352+00 TO STA. 353+82 LT
–L– STA. 354+90 TO STA. 357+50 RT
–L– STA. 360+00 TO STA. 364+50 LT
–L– STA. 360+00 TO STA. 363+25 RT
–L– STA. 364+50 TO STA. 365+50 RT
–L– STA. 405+25 TO STA. 414+30 LT
–L– STA. 406+85 TO STA. 412+00 RT
–L– STA. 431+50 TO STA. 433+00 LT
–L– STA. 455+00 TO STA. 458+10 LT
–L– STA. 462+50 TO STA. 465+00 RT
–SERRD3– STA. 41+35 TO STA. 42+39 LT
–SERRD3– STA. 20+70 TO STA. 23+75 LT
–SERRD3 DRT– STA. 11+58 TO STA. 12+68 LT
–SERRD5– STA. 12+50 TO STA. 13+80 RT
–SERRD5– STA. 15+00 TO STA. 17+00 LT
–Y4RPC– STA. 16+40 TO STA. 21+00 RT
–Y4RPC– STA. 19+78 TO STA. 21+50 LT
–Y5– STA. 21+00 TO STA. 23+00 LT
–Y5– STA. 45+50 TO STA. 46+50 LT
–Y9– STA. 15+75 TO STA. 16+50 RT
–Y9– STA. 23+50 TO STA. 25+00 RT
–Y9– STA. 27+00 TO STA. 29+40 LT
–Y9– STA. 31+25 TO STA. 32+50 LT
–Y9– STA. 36+35 TO STA. 37+50 LT
–Y9– STA. 45+45 TO STA. 46+00 RT
–Y9– STA. 61+00 TO STA. 61+50 RT
–Y9– STA. 62+60 TO STA. 63+05 RT
–Y9– STA. 67+45 TO STA. 67+90 RT
–Y9RAB– STA. 10+55 TO –NC159– STA. 12+00 LT
–Y9C– STA. 13+50 TO STA. 14+00 LT
–Y9FLY– STA. 10+75 TO STA. 11+80 LT
–Y9FLY– STA. 17+00 TO STA. 19+50 RT
–Y9FLY– STA. 24+30 TO STA. 27+25 RT

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



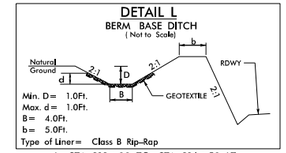
–Y4RPB– STA. 27+27 TO STA. 30+42 RT; 4:1
–Y9– STA. 36+50 TO STA. 37+00 RT
–Y9– STA. 53+00 TO STA. 54+00 RT

DETAIL K
TOE PROTECTION
(Not to Scale)



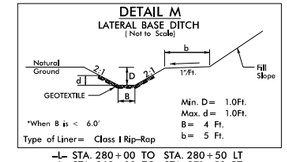
–Y5– STA. 37+75 TO STA. 41+08 LT

DETAIL L
BERM BASE DITCH
(Not to Scale)



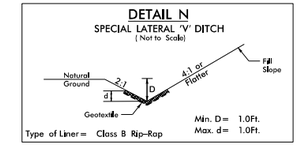
–L– STA. 212+00 TO STA. 216+50 LT
–L– STA. 222+00 TO STA. 228+00 RT
–L– STA. 230+00 TO STA. 234+50 RT
–L– STA. 317+20 TO STA. 318+20 LT
–Y5– STA. 16+69 TO STA. 18+50 LT
–Y5– STA. 19+50 TO STA. 21+00 LT
–Y9– STA. 31+50 TO STA. 42+00 RT

DETAIL M
LATERAL BASE DITCH
(Not to Scale)



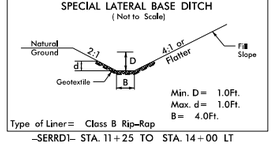
–L– STA. 280+00 TO STA. 280+50 LT
–L– STA. 368+00 TO STA. 371+50 RT
–SERRD5– STA. 14+50 TO STA. 17+17 RT
–SR_Q– STA. 46+00 TO STA. 47+60 RT
–Y4– STA. 71+00 TO STA. 72+50 RT
–Y4LPB– STA. 9+50 TO STA. 11+45 RT
–Y4RPD– STA. 23+23 TO STA. 24+20 RT
–Y9– STA. 10+00 TO STA. 14+50 RT
–Y9A– STA. 29+00 TO STA. 32+83 LT

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



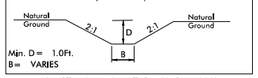
DETAIL NOT USE IN SECTION 2

DETAIL S
SPECIAL LATERAL BASE DITCH
(Not to Scale)



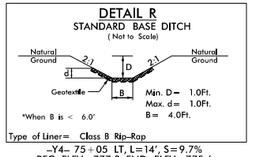
–SERRD1– STA. 11+25 TO STA. 14+00 LT

DETAIL T
STANDARD BASE DITCH
(Not to Scale)



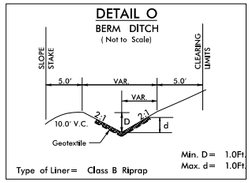
–L– STA. 314+35 LT, B=2', S=1.00%
L=50', BEG. ELEV=854.0, END ELEV=853.5
–L– STA. 445+54 RT, L=92', S=6.5%
BEG. ELEV=690.0, END ELEV=684.0
–NC159– STA. 12+00 LT, B=4' S=4.1%
BEG. ELEV=610.0, END ELEV=600.9
–SR_Q– STA. 40+00 LT, L=30', S=0.50%
BEG. ELEV= 617.2, END ELEV=617.1
–Y3– STA. 15+80 RT, L=44', S=0.68%
BEG. ELEV= 817.5, END ELEV=817.2
–Y4LPB– STA. 20+50 TO STA. 21+68 RT, B=4'
S=1.73%, L=118', BEG. ELEV=821.2, END ELEV=819.7
–Y6 DET– STA. 11+31.48 RT, B=4', S=0.96%
L=78', BEG. ELEV=846.8, END ELEV=846.0
–Y9B– STA. 15+00 LT, L=76', S=8.8%
BEG. ELEV=723.9, END ELEV=717.2

DETAIL R
STANDARD BASE DITCH
(Not to Scale)



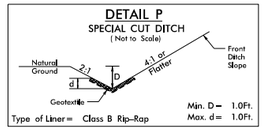
–Y4– 75+05 LT, L=14', S=9.7%
BEG. ELEV=777.0, END ELEV=775.6
–Y4LPA– 19+90 LT, L=82', S=7.3%
BEG. ELEV=829.0, END ELEV=823.0
–Y4LPD– 22+75 RT, L=89', S=8.0%
BEG. ELEV=825.0, END ELEV=817.7
–Y5– 46+00 RT, L=50', S=8.0%
BEG. ELEV=806.0, END ELEV=802.0
–Y9– STA. 53+33 LT, B=2', S=0.53%
L=68', BEG. ELEV=626.4, END ELEV=626.0
–Y9– STA. 79+00 LT, L=56', S=3.8%
BEG. ELEV=611.5, END ELEV=609.4

DETAIL O
BERM DITCH
(Not to Scale)



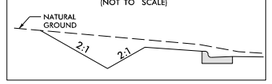
DETAIL NOT USED IN SECTION 2

DETAIL P
SPECIAL CUT DITCH
(Not to Scale)



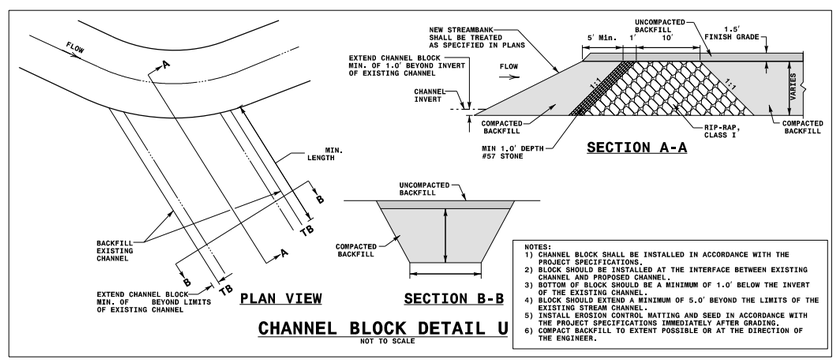
–Y5A– STA. 14+50 TO STA. 15+00 LT
–Y10END– STA. 21+50 TO STA. 22+34 RT

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



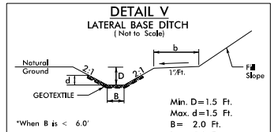
DETAIL NOT USE IN SECTION 2

DETAIL U
CHANNEL BLOCK DETAIL
NOT TO SCALE



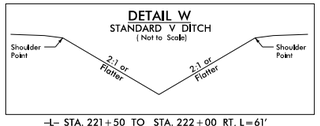
–L– STA. 433+50 RT
–Y9– STA. 74+60 LT
–Y9– STA. 75+72 LT
–Y9– STA. 76+20 LT
–Y9FLY– STA. 11+54 LT
–Y9RPB– STA. 21+90 LT
–Y9RPB– STA. 24+30 LT
–Y9RPB– STA. 25+25 LT

DETAIL V
LATERAL BASE DITCH
(Not to Scale)



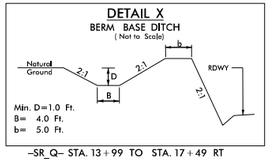
DETAIL NOT USED IN SECTION 2

DETAIL W
STANDARD V DITCH
(Not to Scale)



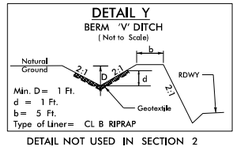
–L– STA. 221+50 TO STA. 222+00 RT, L=61'
S=0.31%, BEG. ELEV=833.1, END ELEV=832.9
–SERRD3– STA. 39+80 TO STA. 41+35 RT
–Y4RPA– STA. 26+00 RT, L=73', S=0.41%
BEG. ELEV=822.8, END ELEV=822.5
–Y4RPC– STA. 22+50 TO STA. 25+50 LT
–Y9A– STA. 42+50 RT, L=20', S=0.35%
BEG. ELEV= 630.1, END ELEV=630.0
–Y9LPB– STA. 16+00 LT, L=50', S=7.6%
BEG. ELEV= 643.8, END ELEV=640.0

DETAIL X
BERM BASE DITCH
(Not to Scale)



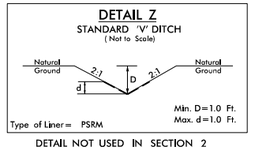
–SR_Q– STA. 13+99 TO STA. 17+49 RT

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



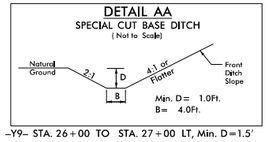
DETAIL NOT USED IN SECTION 2

DETAIL Z
STANDARD 'V' DITCH
(Not to Scale)



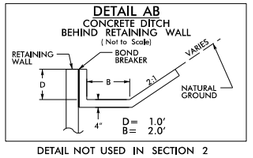
DETAIL NOT USED IN SECTION 2

DETAIL AA
SPECIAL CUT BASE DITCH
(Not to Scale)



–Y9– STA. 26+00 TO STA. 27+00 LT, Min. D=1.5'

DETAIL AB
CONCRETE DITCH
BEHIND RETAINING WALL
(Not to Scale)



DETAIL NOT USED IN SECTION 2

PLANS PREPARED BY :
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6/14/2016
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	2D-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISED 6/14/2016

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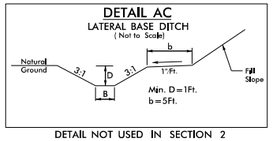
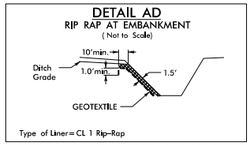
PERMIT DRAWING
SHEET 62 OF 257

DETAIL AC
LATERAL BASE DITCH
(Not to Scale)



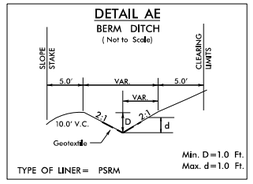
DETAIL NOT USED IN SECTION 2

DETAIL AD
RIP RAP AT EMBANKMENT
(Not to Scale)



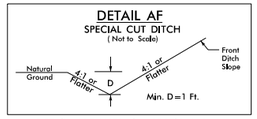
DETAIL NOT USED IN SECTION 2

DETAIL AE
BERM DITCH
(Not to Scale)



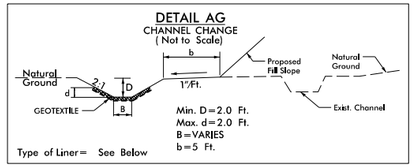
–L– STA. 451+50 TO STA. 455+00 LT
–Y4RPA– STA. 31+50 TO STA. 33+40 RT

DETAIL AF
SPECIAL CUT DITCH
(Not to Scale)



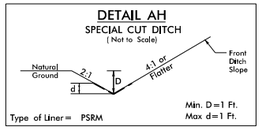
DETAIL NOT USED IN SECTION 2

DETAIL AG
CHANNEL CHANGE
(Not to Scale)



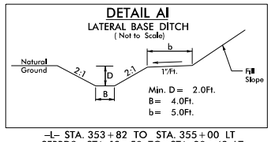
–L– STA. 237+00 TO STA. 243+00 RT, B=4', CL B
–SR Q– 34+19 RT, L=35', B=4', CL I
–Y4– STA. 80+35 TO 80+66 RT, B=3', CL B
–Y4RPD– STA. 25+44 TO 26+48 RT, B=5', GRASS
–Y5– STA. 40+28 TO 41+63 LT, B=4', GRASS
–Y9– STA. 73+50 TO STA. 76+31 LT, B=4', CL I
–Y9– STA. 79+06 TO STA. –NC159– 12+09 LT, B=4'–11', CL B

DETAIL AH
SPECIAL CUT DITCH
(Not to Scale)



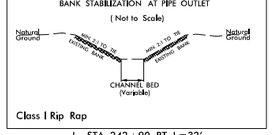
DETAIL NOT USED IN SECTION 2

DETAIL AI
LATERAL BASE DITCH
(Not to Scale)



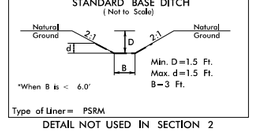
–L– STA. 353+82 TO STA. 355+00 LT
–SERRD3– STA. 19+50 TO STA. 20+49 LT
–Y5– STA. 24+81 TO STA. 29+46 LT
–Y9– STA. 15+00 TO STA. 16+50 LT
–Y9– STA. 24+00 TO STA. 26+00 LT

DETAIL AJ
BANK STABILIZATION AT PIPE OUTLET
(Not to Scale)



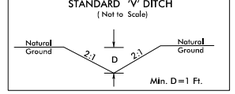
–L– STA. 242+90 RT, L=32'
–L– STA. 329+80 RT, L=50'
–L– STA. 356+89 RT, L=45'
–L– STA. 363+29 RT, L=45'
–L– STA. 458+10 LT, L=45'
–Y9A– STA. 43+05 RT, L=30'
–Y9– STA. 16+53 RT, L=48'
–Y9– STA. 60+40 LT, L=35'

DETAIL AK
STANDARD BASE DITCH
(Not to Scale)



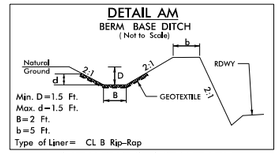
DETAIL NOT USED IN SECTION 2

DETAIL AL
STANDARD 'V' DITCH
(Not to Scale)



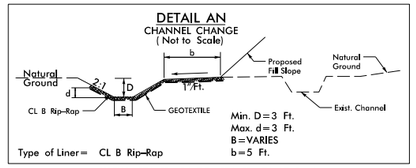
–L– STA. 247+56 RT, L=80', S=4.8%
BEG. ELEV=746.0, END ELEV=742.2
–SERRD3– STA. 45+85 RT, L=125', S=7.38%
BEG. ELEV=786.0, END ELEV=776.8
–SERRD3– STA. 45+85 LT, L=32', S=0.32%
BEG. ELEV=774.3, END ELEV=774.2

DETAIL AM
BERM BASE DITCH
(Not to Scale)



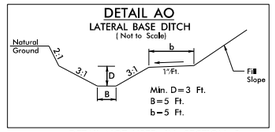
–L– STA. 335+00 TO STA. 338+35 LT
–Y9RPD– STA. 12+20 TO STA. 19+00 LT

DETAIL AN
CHANNEL CHANGE
(Not to Scale)



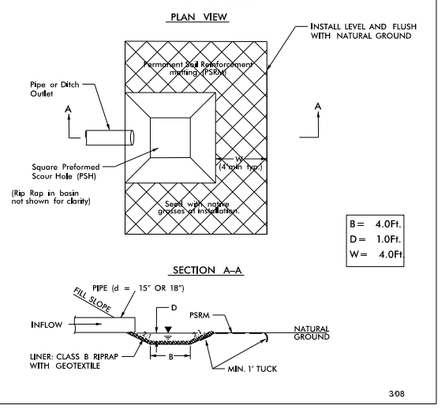
–Y9FLY– STA. 11+54 TO STA. 11+76 LT, B=4
–Y9RPB– STA. 21+89 TO STA. 22+45 LT, B=2'
–Y9RPB– STA. 24+31 TO STA. 25+83 LT, B=2'

DETAIL AO
LATERAL BASE DITCH
(Not to Scale)



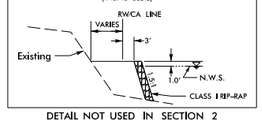
DETAIL NOT USED IN SECTION 2

PREFORMED SCOUR HOLE DETAIL AP
*NOT TO SCALE



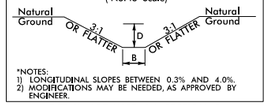
–L– STA. 250+20 LT
–L– STA. 408+00 LT

DETAIL AQ
FILL IN POND W/ROCK PLATING
(Not to Scale)



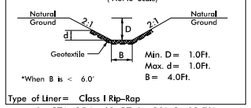
DETAIL NOT USED IN SECTION 2

DETAIL AR
STANDARD BASE GRASSED SWALE
(Not to Scale)



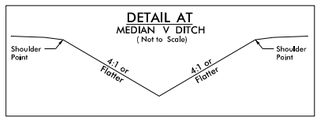
DETAIL NOT USED IN SECTION 2

DETAIL AS
STANDARD BASE DITCH
(Not to Scale)



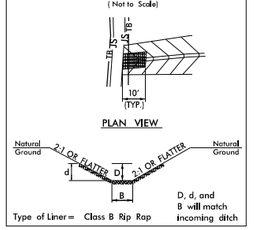
–L– STA. 354+62 RT, L=80', S=13.7%
BEG. ELEV=735.3, END ELEV=724.3
–L– STA. 455+37 RT, L=78', S=3.8%
BEG. ELEV=658.5, END ELEV=655.5
–SERRD1– STA. 10+00, B=4', S=0.3%
L=70', BEG. ELEV=709.4, END ELEV=709.1
–SERRD1– STA. 11+00, B=4', S=9.0%
L=70', BEG. ELEV=715.7, END ELEV=709.4
–SR Q– STA. 13+48.57 LT, L=45', S=6.0%
BEG. ELEV=632.4, END ELEV=629.7
–Y9B– STA. 17+20 RT, L=137', S=9.5%
BEG. ELEV=722.0, END ELEV=709.0
–Y9FLY– 12+00 LT, L=60', S=9.6%
BEG. ELEV=712.5, END ELEV=706.7

DETAIL AT
MEDIAN V DITCH
(Not to Scale)



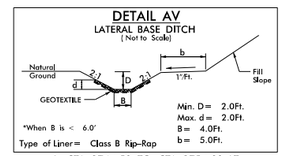
–L– STA. 220+00 TO STA. 226+00 CL
–Y9FLY– STA. 40+00 TO 43+00 CL

DETAIL AU
RIPRAP TRANSITION AT JURISDICTIONAL STREAM
(Not to Scale)



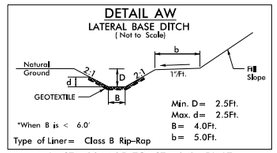
–L– STA. 252+60 LT & RT
–L– STA. 247+56 RT
–Y4– STA. 80+33 RT
–Y9– STA. 16+65 RT
–Y9– STA. 60+94 RT
–Y9– STA. 74+58 LT
–SERRD3– STA. 40+88 LT

DETAIL AV
LATERAL BASE DITCH
(Not to Scale)



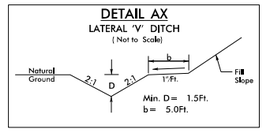
–L– STA. 274+50 TO STA. 275+00 LT
–L– STA. 353+82 TO STA. 359+50 LT
–L– STA. 363+73 TO STA. 364+50 RT
–L– STA. 365+50 TO STA. 368+00 RT
–SERRD3– STA. 37+26 TO STA. 38+85 LT
–Y4– STA. 72+50 TO STA. 74+54 RT
–Y4RPA– STA. 10+00 TO STA. 21+50 RT
–Y9– STA. 14+50 TO STA. 15+75 RT
–Y9RPC– STA. 23+50 TO STA. 29+38 RT

DETAIL AW
LATERAL BASE DITCH
(Not to Scale)



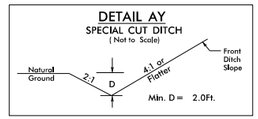
–L– STA. 234+25 TO STA. 241+50 LT
–L– STA. 433+37 TO STA. 435+00 RT, Min. D=3.5'
–Y9– STA. 11+50 TO STA. 15+00 LT

DETAIL AX
LATERAL 'V' DITCH
(Not to Scale)



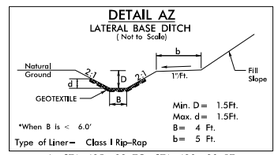
–L– STA. 227+50 TO STA. 229+74 LT

DETAIL AY
SPECIAL CUT DITCH
(Not to Scale)



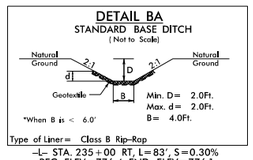
–Y9FLY– STA. 33+00 TO STA. 37+95 RT
–Y10END– STA. 21+50 TO STA. 22+05 LT

DETAIL AZ
LATERAL BASE DITCH
(Not to Scale)



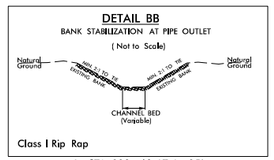
–L– STA. 435+93 TO STA. 439+00 RT
–Y4RPD– STA. 26+48 TO STA. 31+30 RT

DETAIL BA
STANDARD BASE DITCH
(Not to Scale)

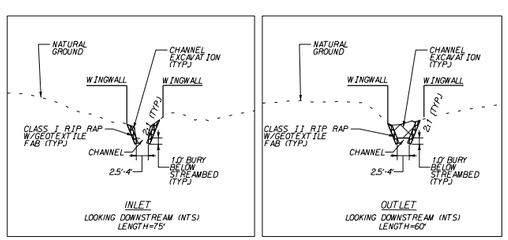


–L– STA. 235+00 RT, L=83', S=0.30%
BEG. ELEV=776.4, END ELEV=776.1
–Y10END– 19+00 LT, L=41', S=1.1%
BEG. ELEV=641.5, END ELEV=641.0
–Y4– STA. 23+47 RT, B=4', S=1.25%
L=72', BEG. ELEV=782.9, END ELEV=782.0

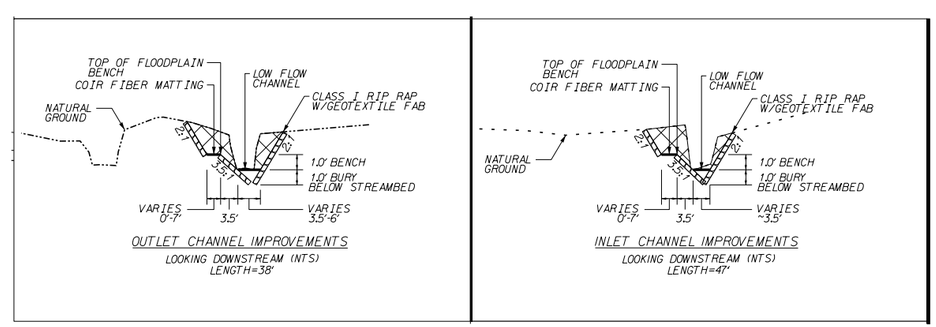
DETAIL BB
BANK STABILIZATION AT PIPE OUTLET
(Not to Scale)



–L– STA. 229+60 LT, L=25'
–L– STA. 346+96 RT, L=25'
–L– STA. 410+75 LT, L=30'
–L– STA. 414+35 LT, L=10'
–SERRD3– STA. 20+29 LT, L=24'
–SERRD5– STA. 13+85 RT, L=35'
–Y4– STA. 58+92 LT, L=20'
–Y5– STA. 12+32 RT, L=16'
–Y5– STA. 21+95 RT, L=25'
–Y9– STA. 36+00 LT, L=25'
–Y9– STA. 45+52 LT, L=35'
–Y9– STA. 49+12 RT, L=16'
–Y9RPC– STA. 25+21 LT, L=45'
–Y9RPD– STA. 16+91 RT, L=30'

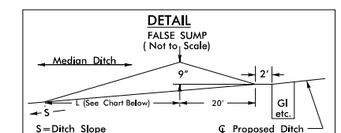


CULVERT INLET/OUTLET DETAILS
–Y4– STA 80+35



CULVERT INLET/OUTLET DETAILS
–L– STA 296+26

DETAIL
FALSE SUMP
(Not to Scale)



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

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	2D-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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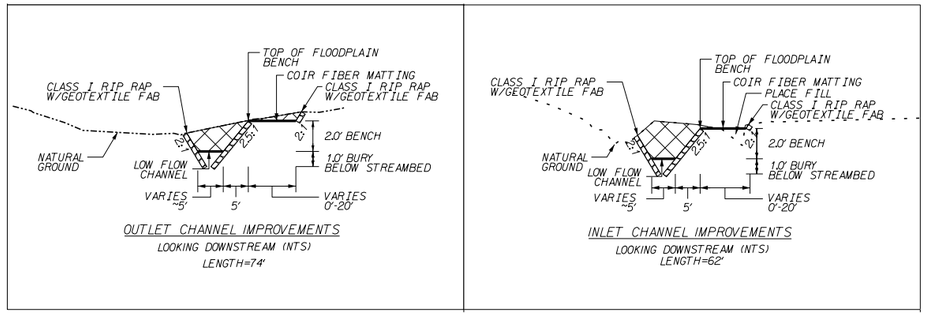
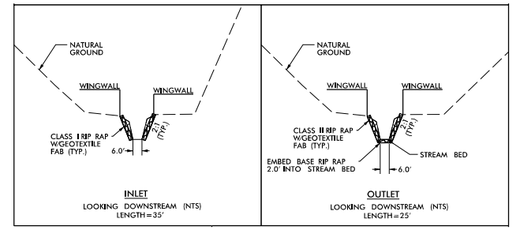
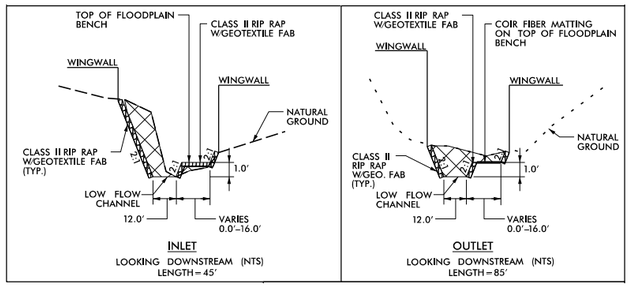
PERMIT DRAWING SHEET 63 OF 257



CULVERT INLET/OUTLET DETAILS
-Y5- STA 41+00



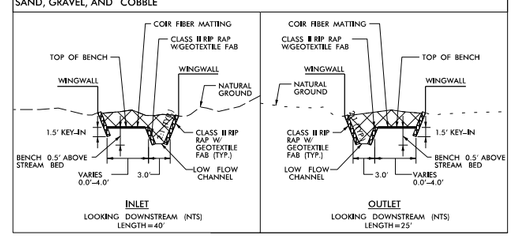
CULVERT INLET/OUTLET DETAILS
-L- STA 364+22



CULVERT INLET/OUTLET DETAILS
-Y9- STA 29+09

NO UPSTREAM OR DOWNSTREAM STRUCTURES THAT WERE IN PLACE AT THE TIME THAT THIS PROJECT WAS DESIGNED WILL BE ADVERSELY IMPACTED BY THIS PROJECT.

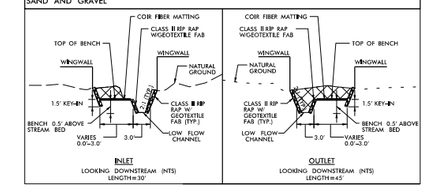
BED MATERIAL:
SAND, GRAVEL, AND COBBLE



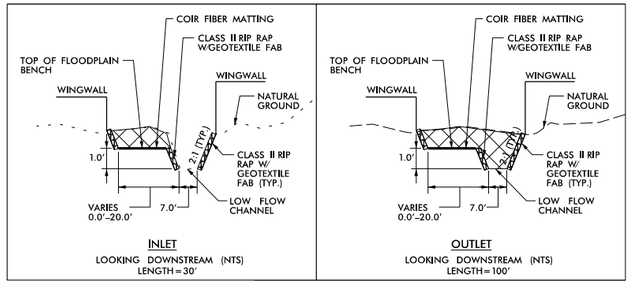
CULVERT INLET/OUTLET DETAILS
-Y9- STA 75+04

NO UPSTREAM OR DOWNSTREAM STRUCTURES THAT WERE IN PLACE AT THE TIME THAT THIS PROJECT WAS DESIGNED WILL BE ADVERSELY IMPACTED BY THIS PROJECT.

BED MATERIAL:
SAND AND GRAVEL



CULVERT INLET/OUTLET DETAILS
-L- STA 408+00



CULVERT INLET/OUTLET DETAILS
-L- STA 433+26

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PERMIT DRAWING
SHEET 64 OF 257

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

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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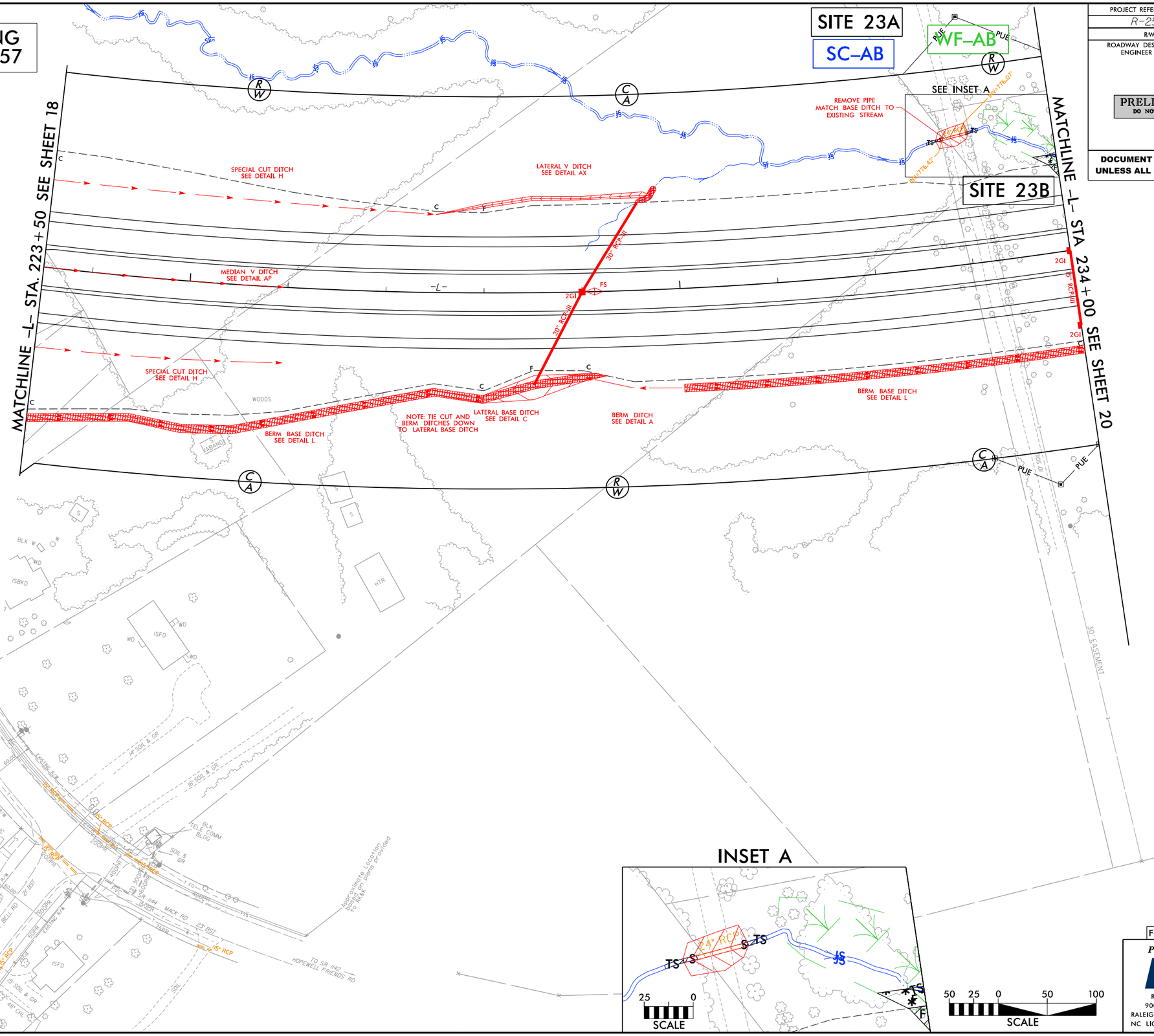

FOR -L- PROFILE SEE SHT. 23

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PERMIT DRAWING SHEET 65 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

F F DENOTES FILL IN WETLAND

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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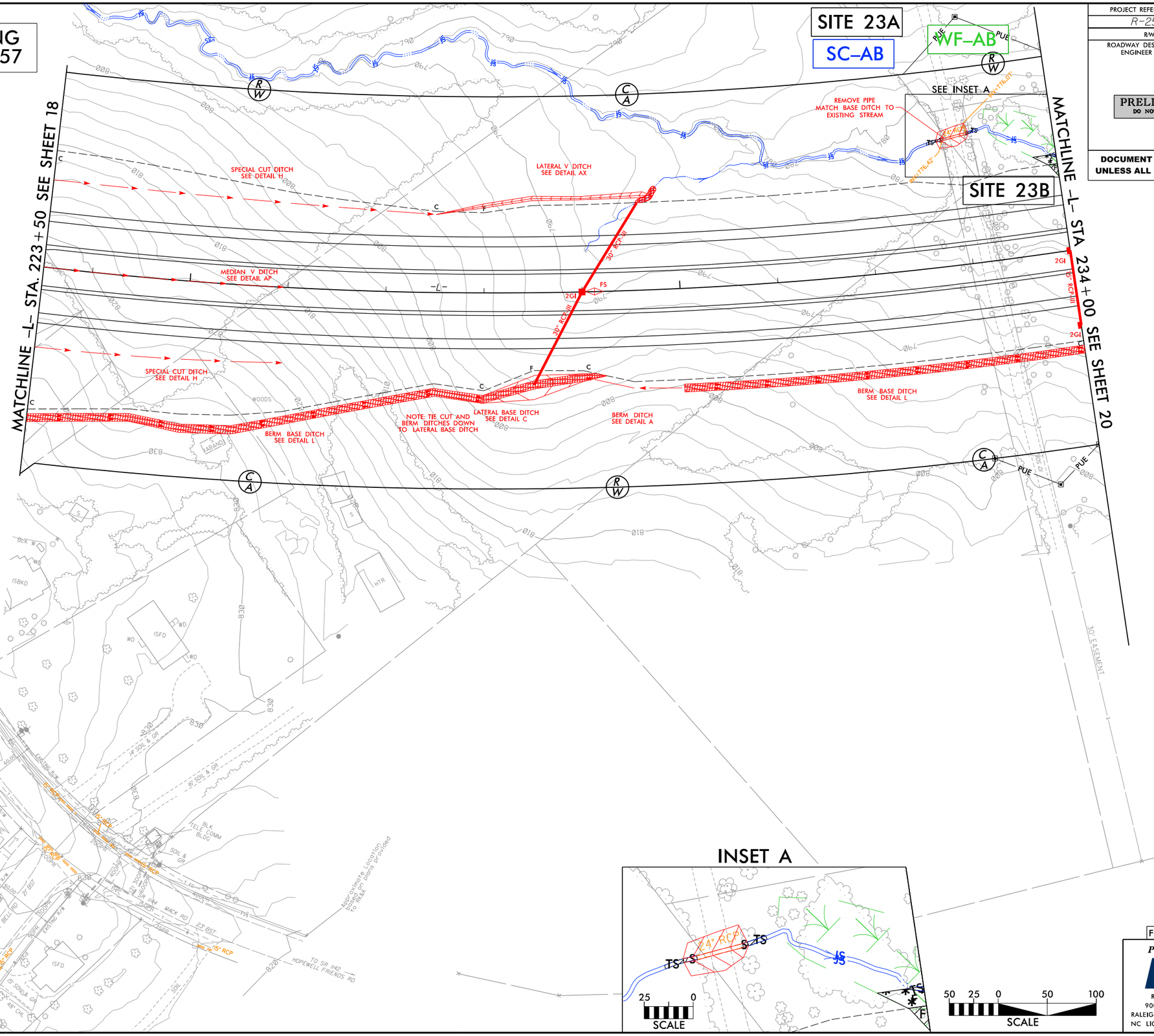

FOR -L- PROFILE SEE SHT. 23

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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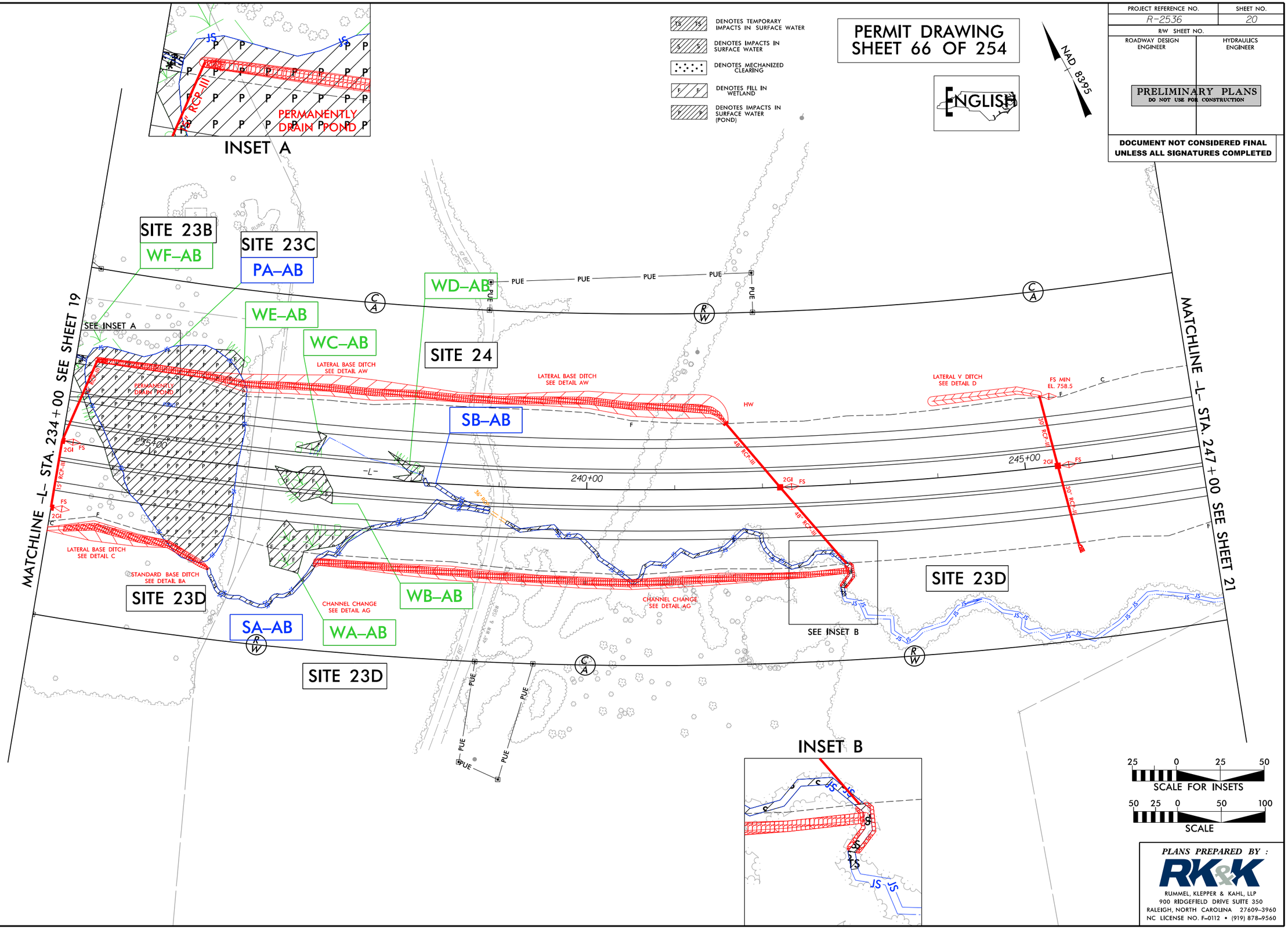
PERMIT DRAWING SHEET 66 OF 254

ENGLISH

NAD 83/95

TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
S DENOTES IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
F DENOTES FILL IN WETLAND
P DENOTES IMPACTS IN SURFACE WATER (POND)



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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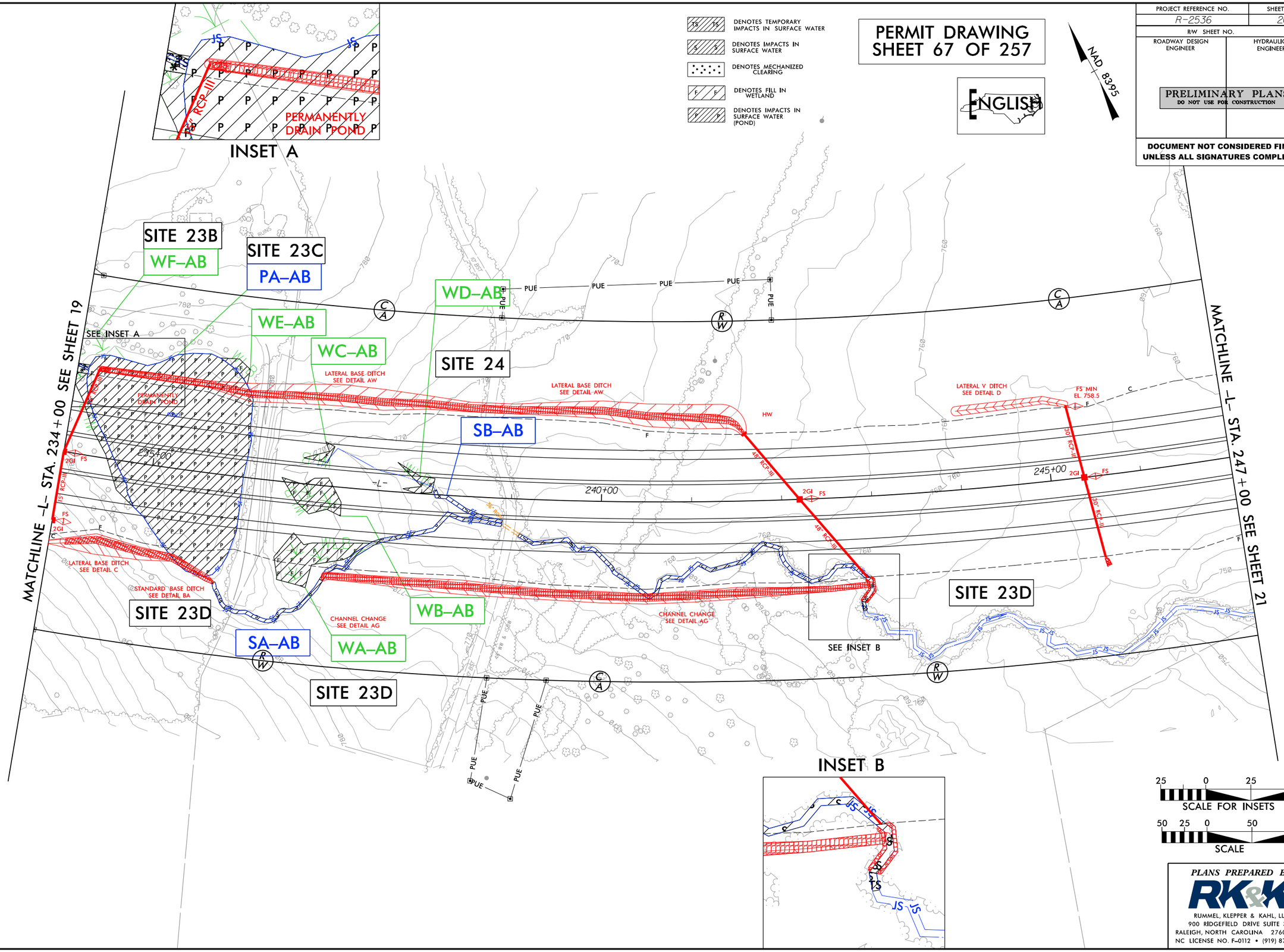
PERMIT DRAWING SHEET 67 OF 257

ENGLISH

NAD 83/95

- TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S — DENOTES IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- F — DENOTES FILL IN WETLAND
- P — DENOTES IMPACTS IN SURFACE WATER (POND)



INSET B

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

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PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-XX

SITE 23

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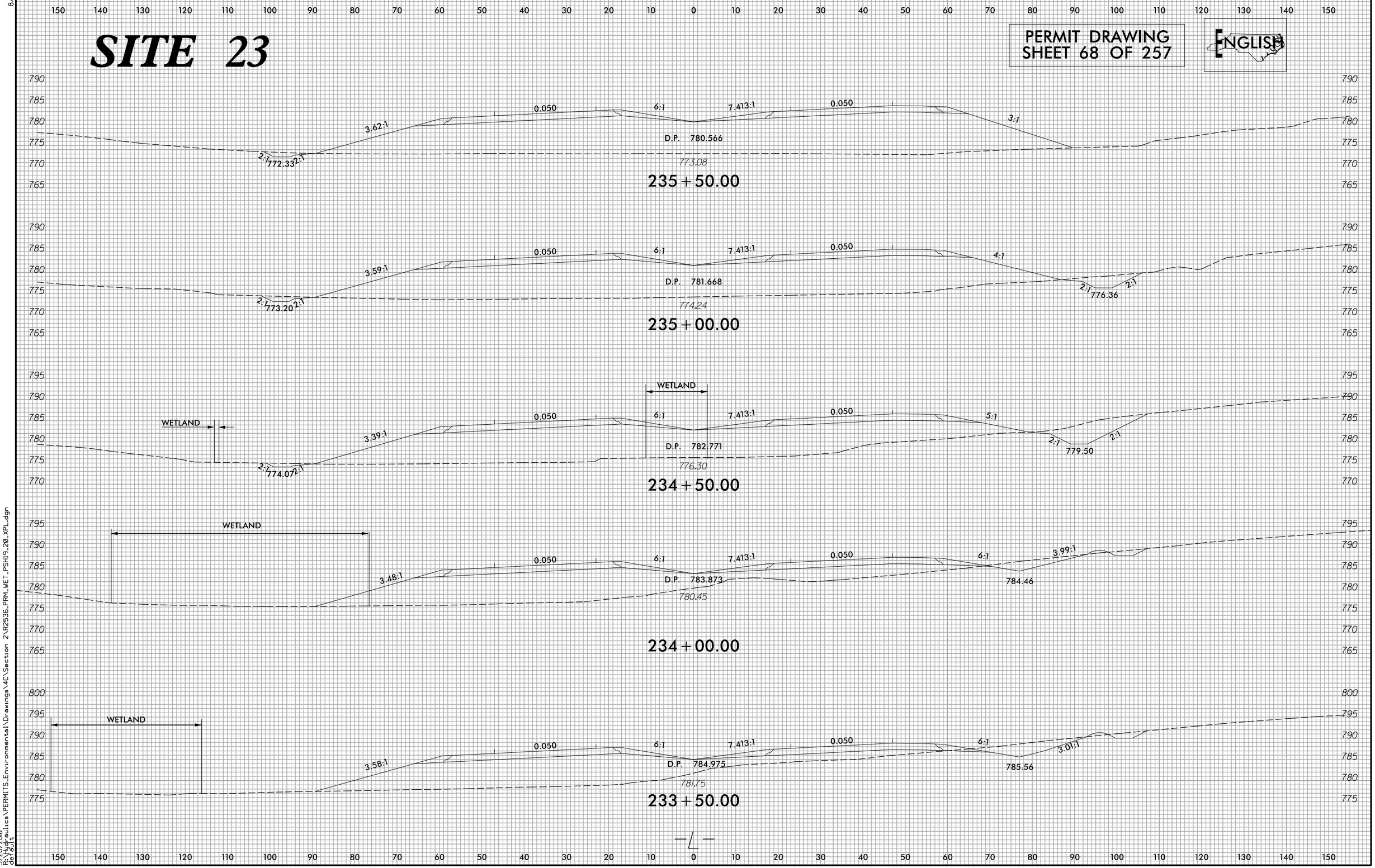
SHEET 68 OF 257

ENGLISH



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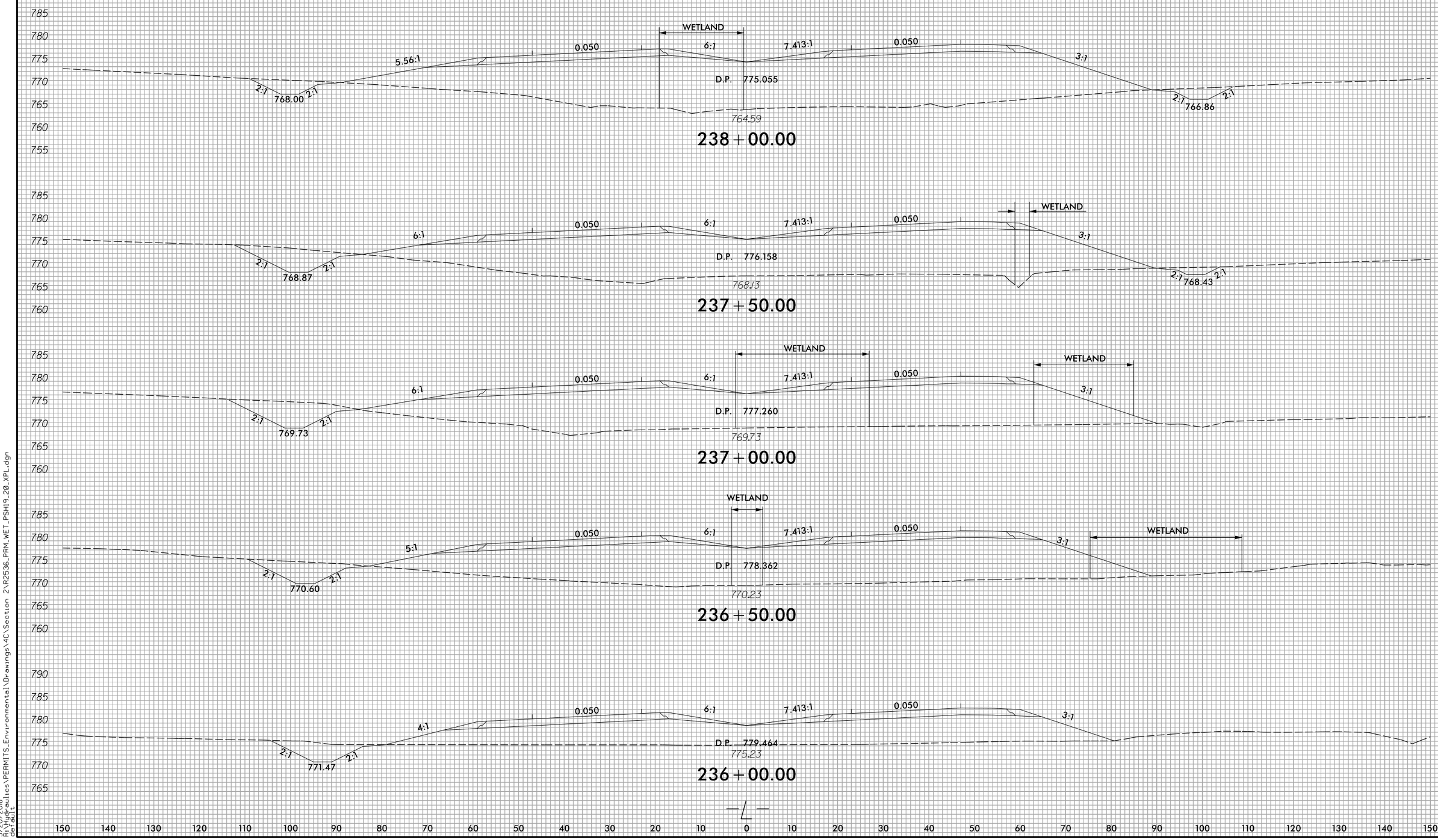
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-XX

SITE 23

PERMIT DRAWING
SHEET 69 OF 257

ENGLISH



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8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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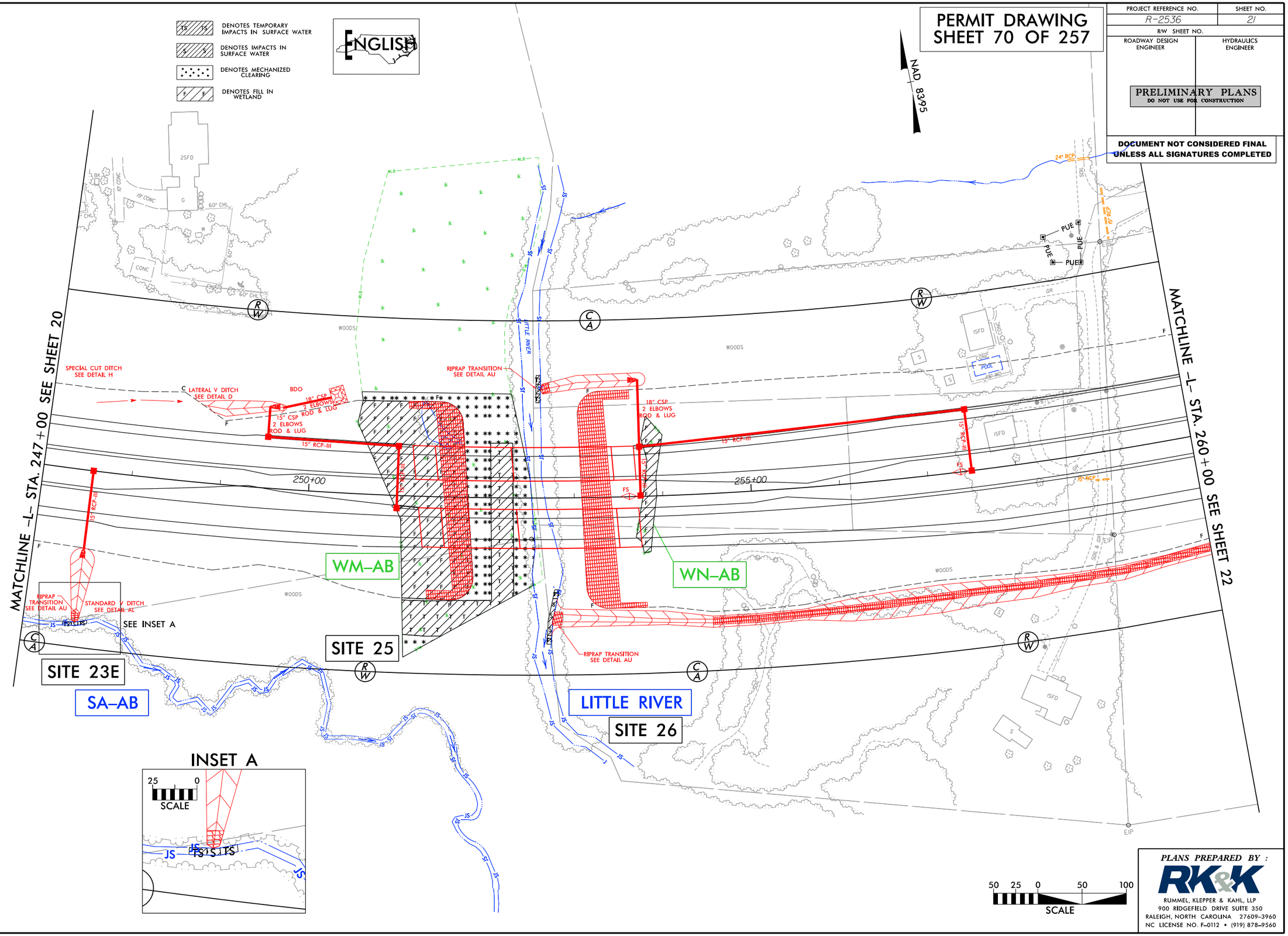

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 71 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

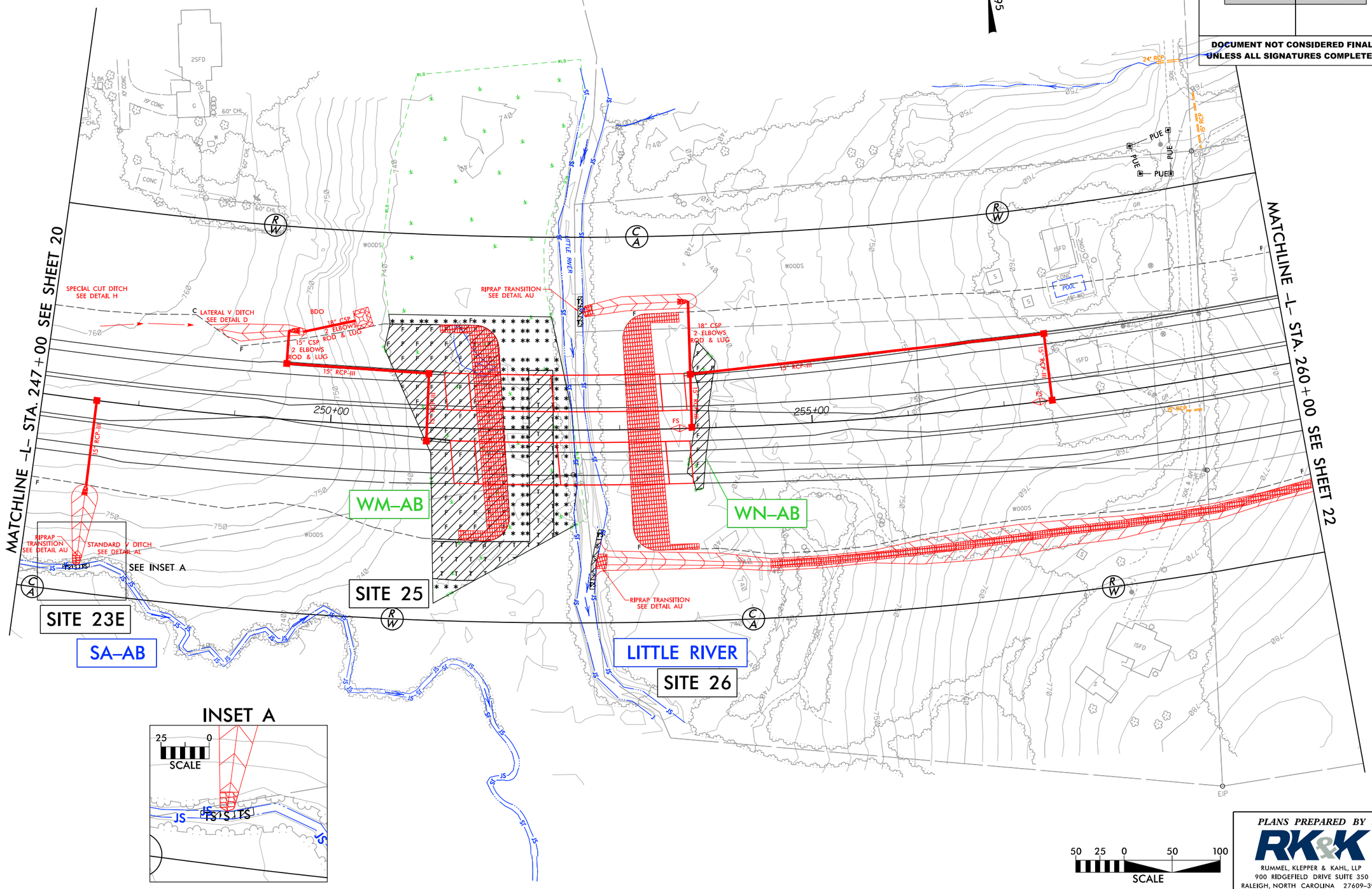
S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

F F DENOTES FILL IN WETLAND

ENGLISH

NAD 83/95



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	113
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 72 OF 257

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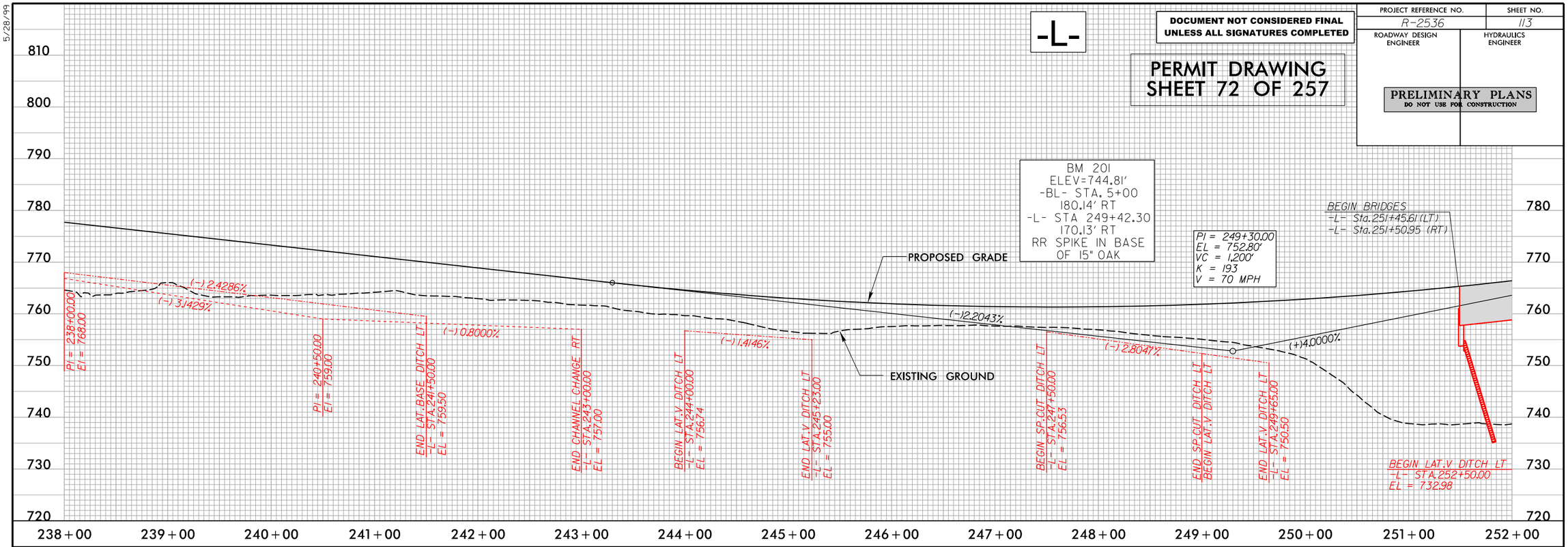

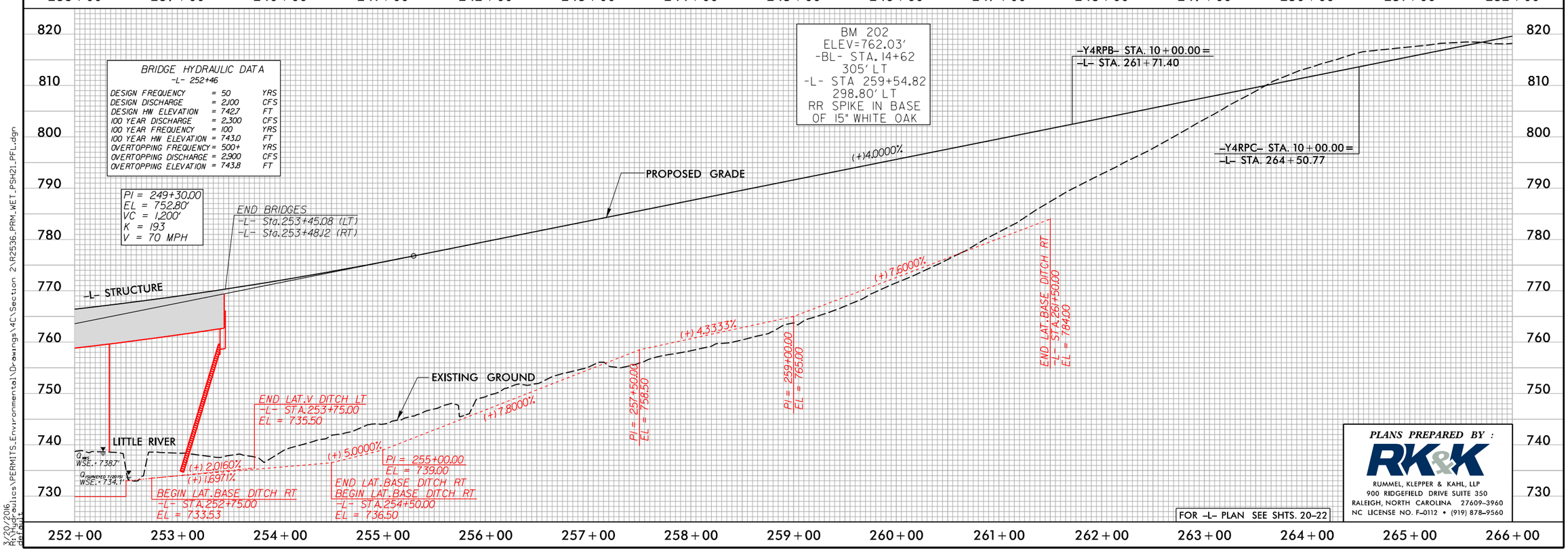

FOR -L- PLAN SEE SHTS. 20-22

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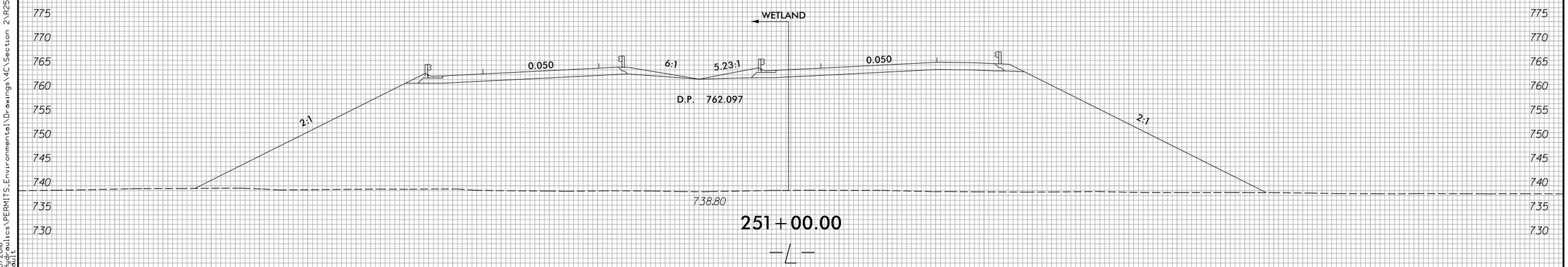
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-21

PERMIT DRAWING
SHEET 73 OF 257

ENGLISH

SITE 25



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3/20/2006
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PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-24

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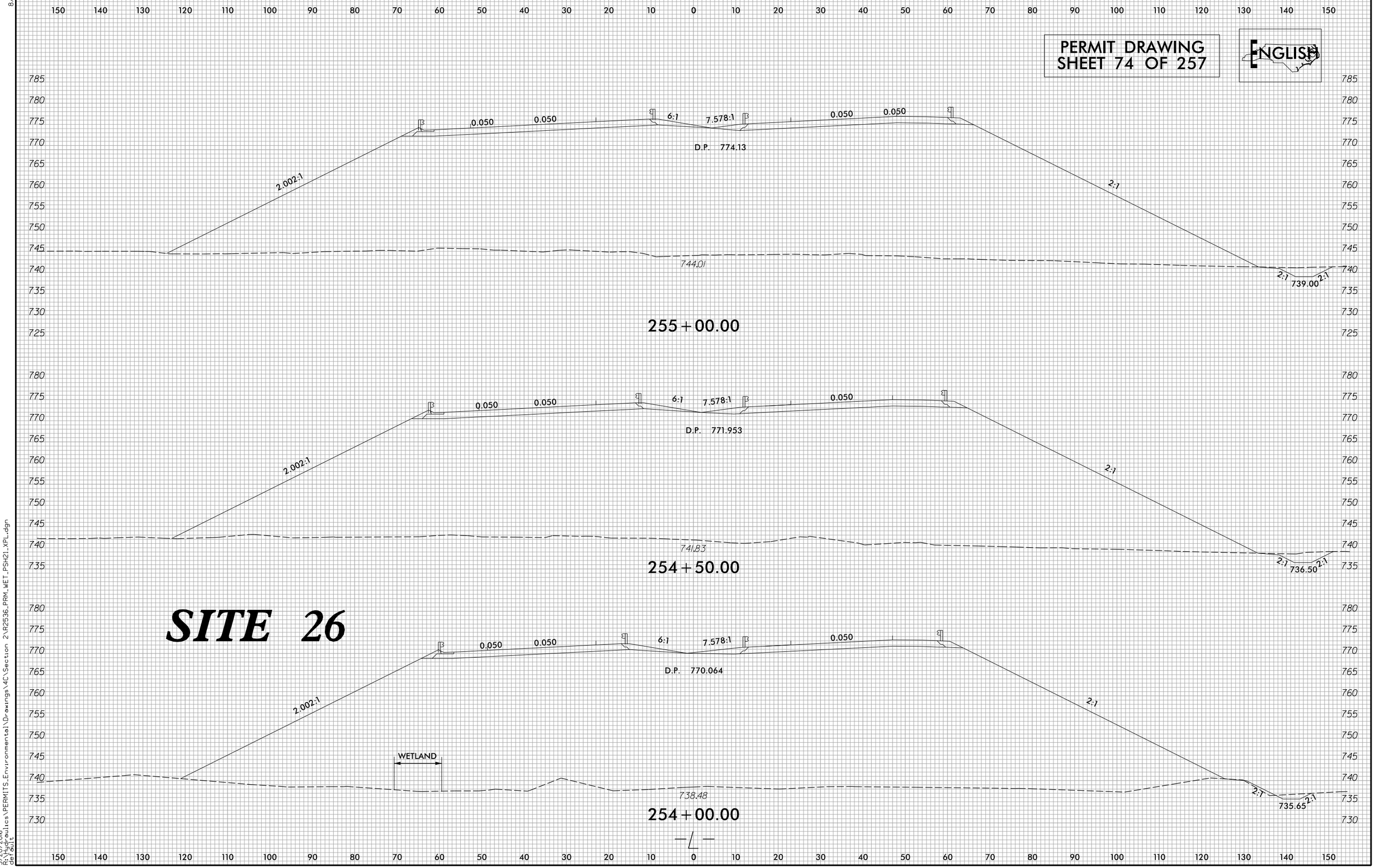
PERMIT DRAWING
SHEET 74 OF 257

ENGLISH



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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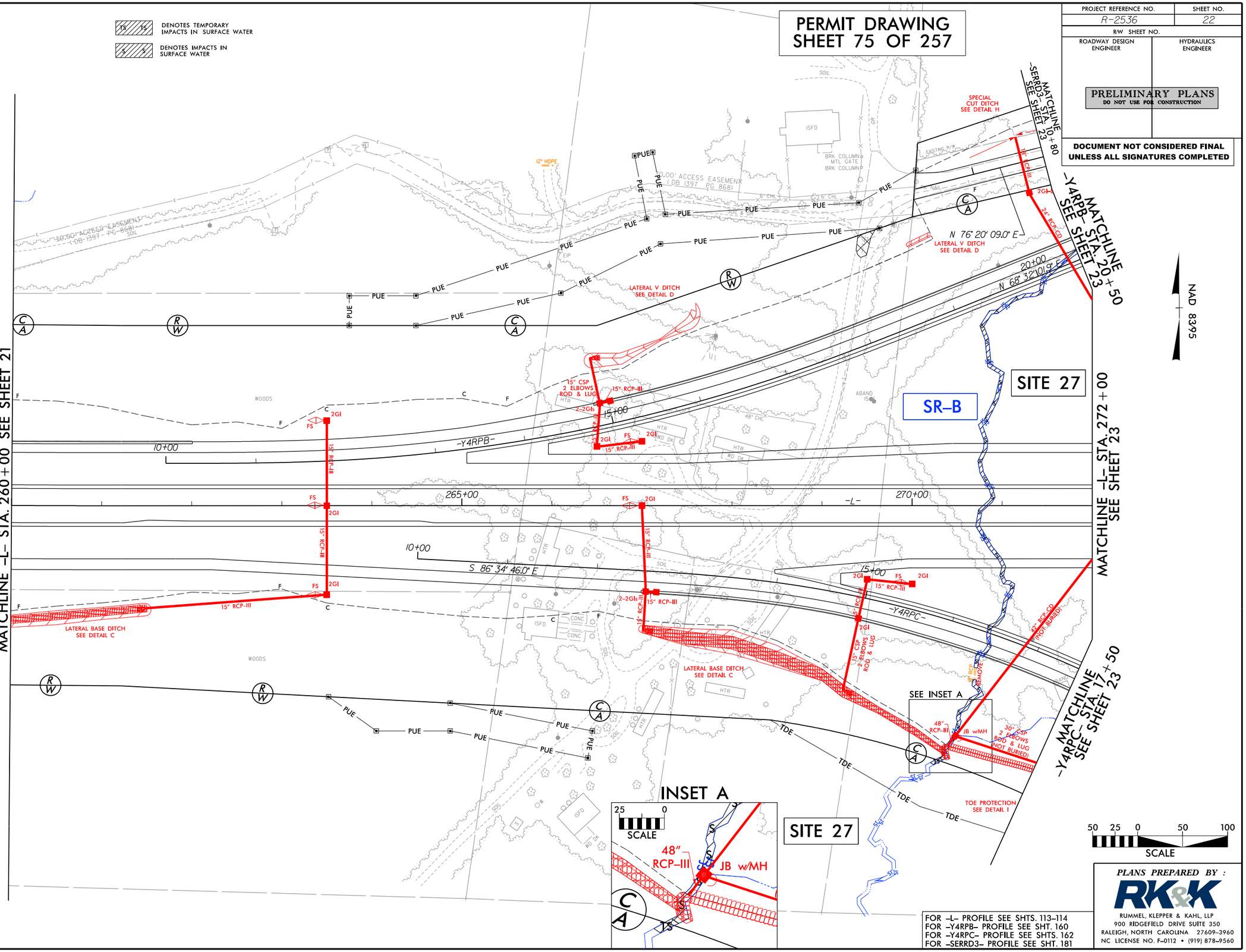
PERMIT DRAWING SHEET 75 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

ENGLISH



FOR -L- PROFILE SEE SHTS. 113-114
FOR -Y4RPB- PROFILE SEE SHT. 160
FOR -Y4RPC- PROFILE SEE SHTS. 162
FOR -SERRD3- PROFILE SEE SHT. 181

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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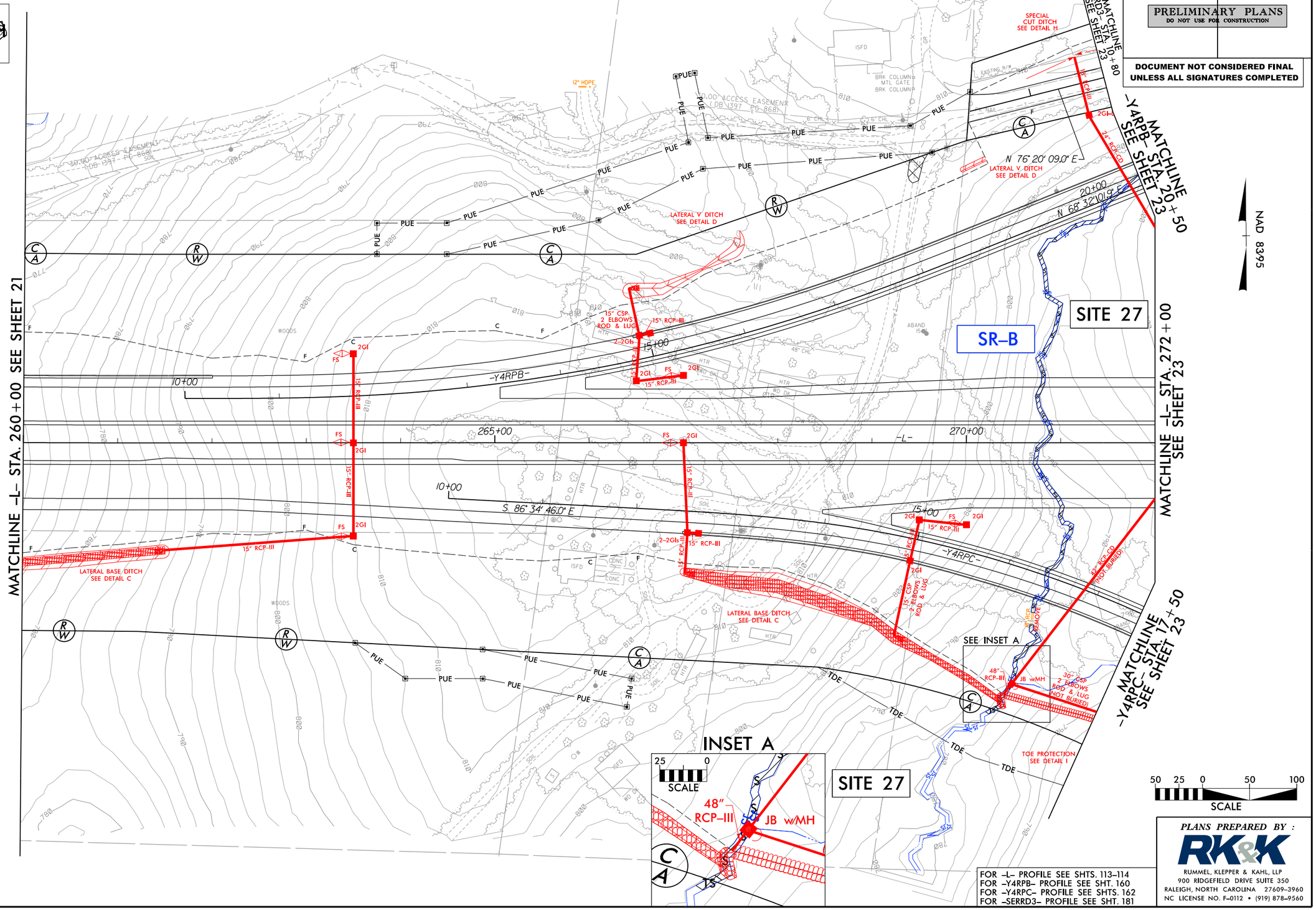
PERMIT DRAWING SHEET 76 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

ENGLISH



FOR -L- PROFILE SEE SHTS. 113-114
FOR -Y4RPB- PROFILE SEE SHT. 160
FOR -Y4RPC- PROFILE SEE SHTS. 162
FOR -SERRD3- PROFILE SEE SHT. 181

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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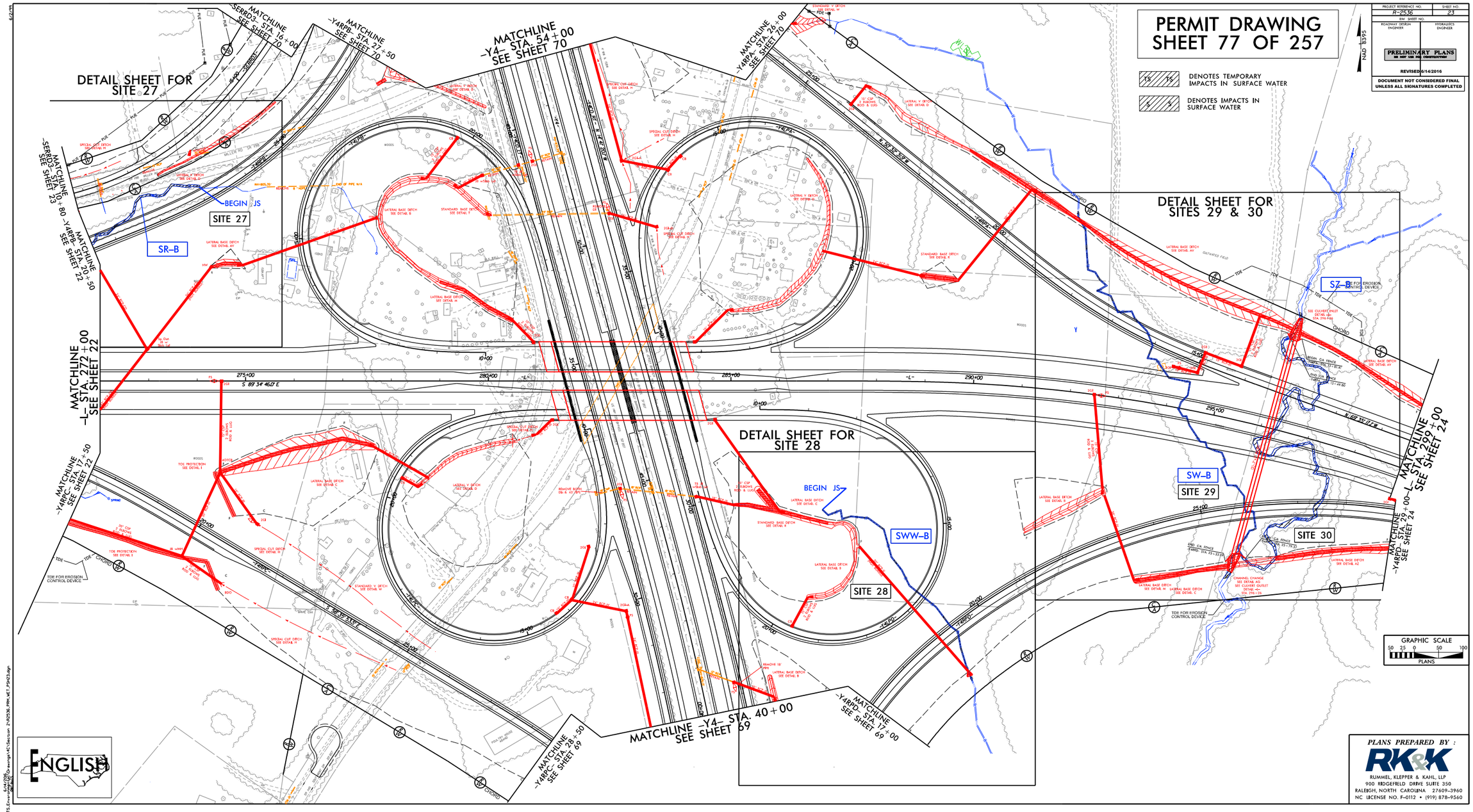
NAD 83/95

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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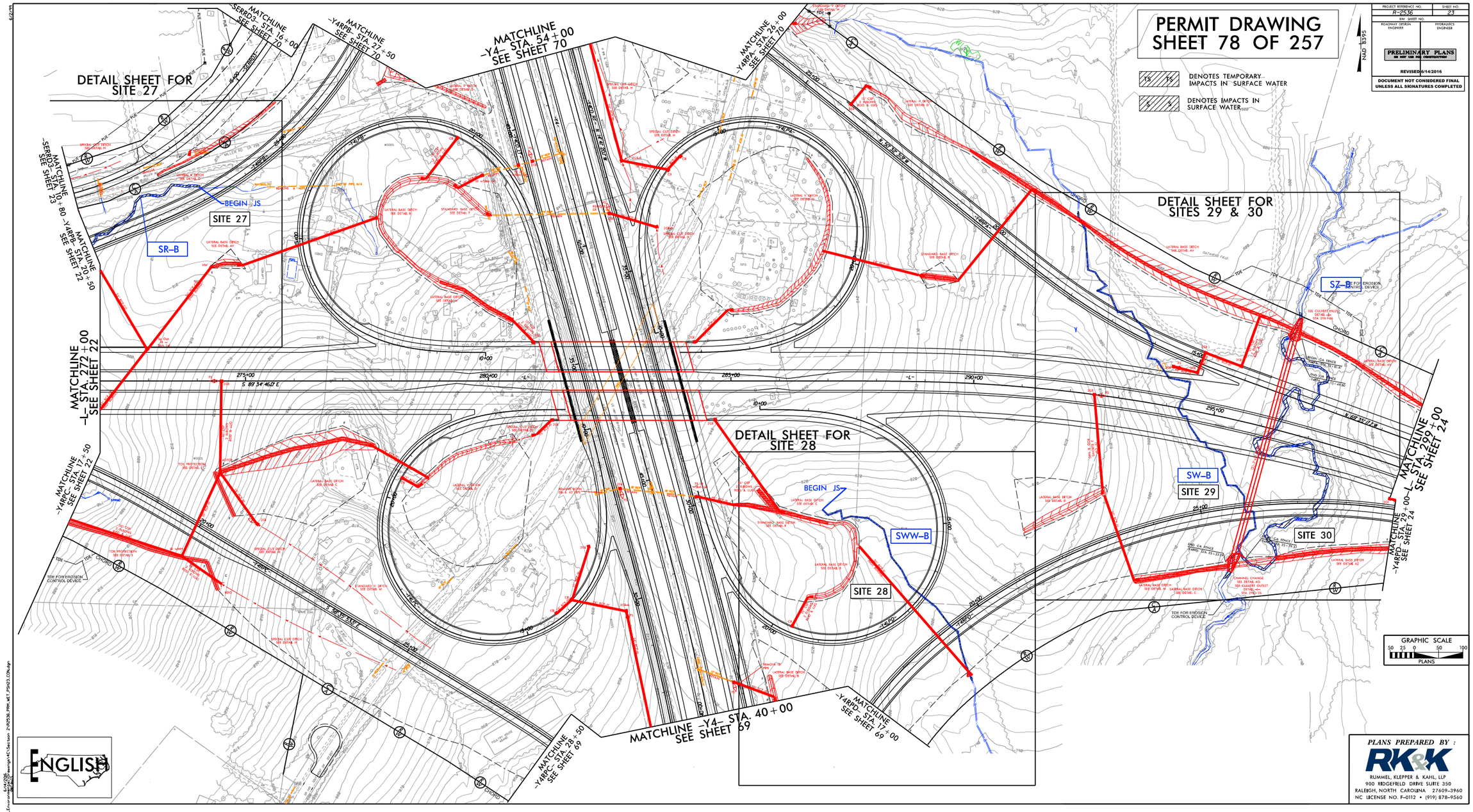
TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S DENOTES IMPACTS IN SURFACE WATER



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	23A
R/W SHEET NO.	
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ENGLISH

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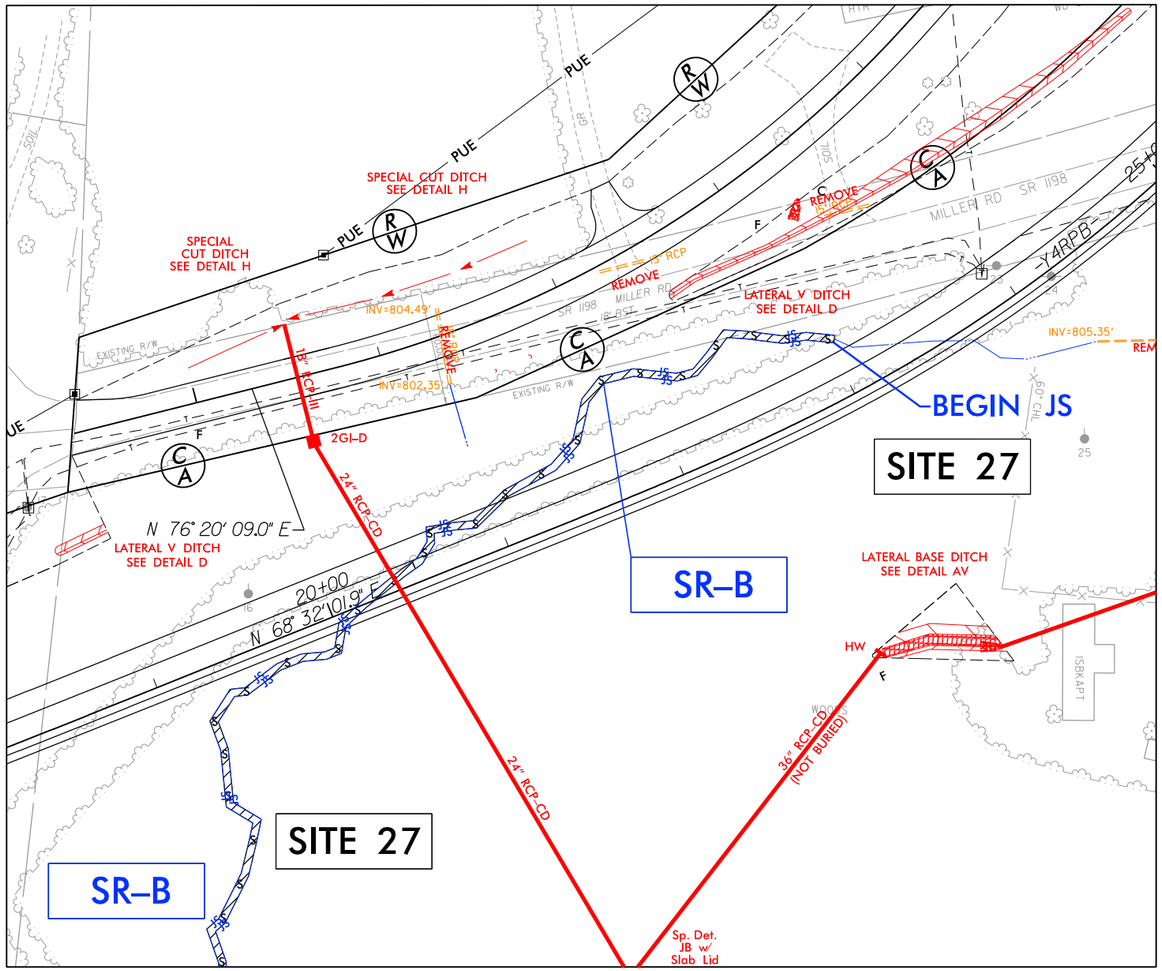
DENOTES IMPACTS IN SURFACE WATER

DETAIL SHEET FOR SITE 27



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SHEET 79 OF 257

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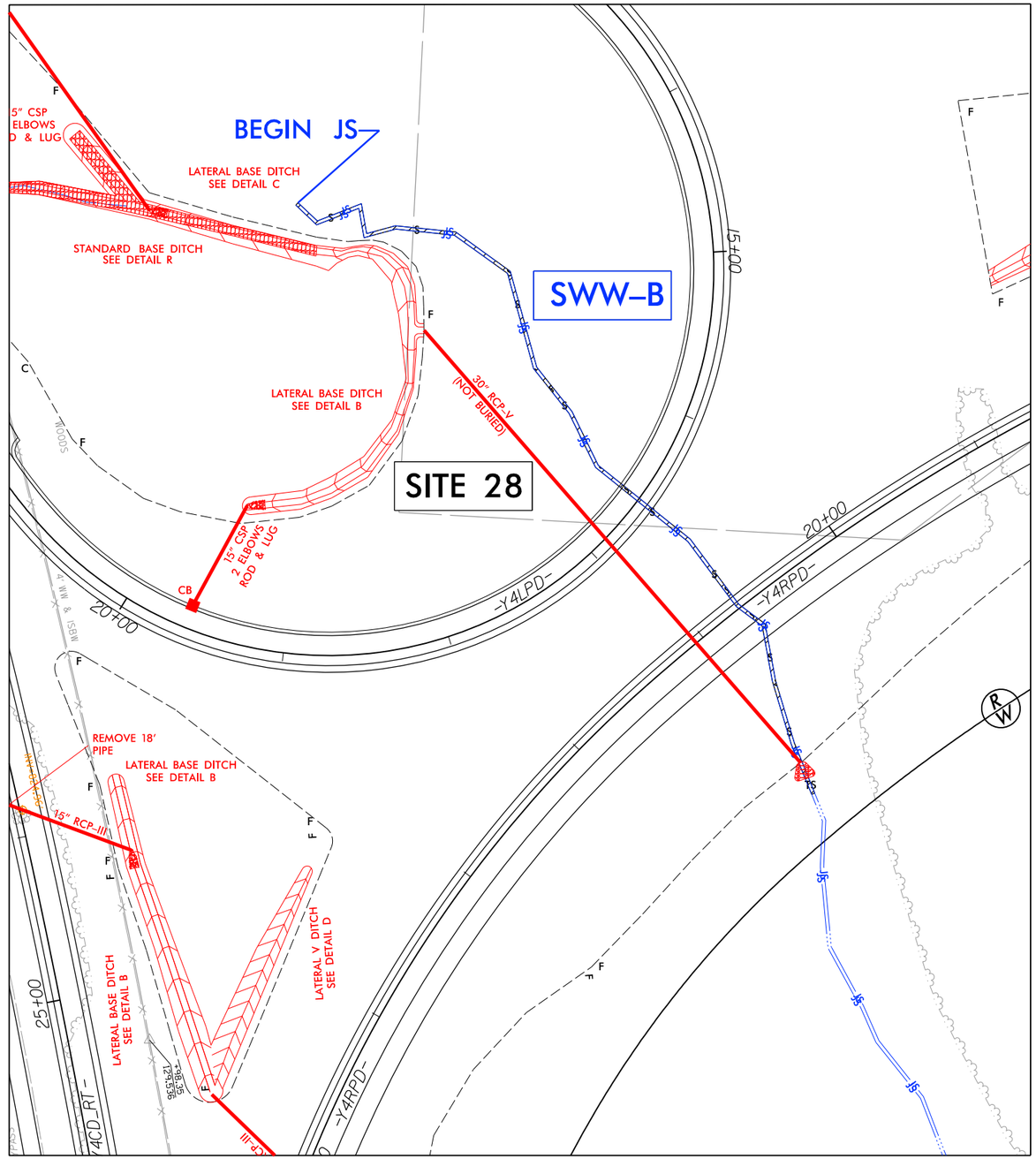
DETAIL SHEET FOR SITE 28



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ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	23B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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40 20 0 40 80

S DENOTES IMPACTS IN SURFACE WATER

TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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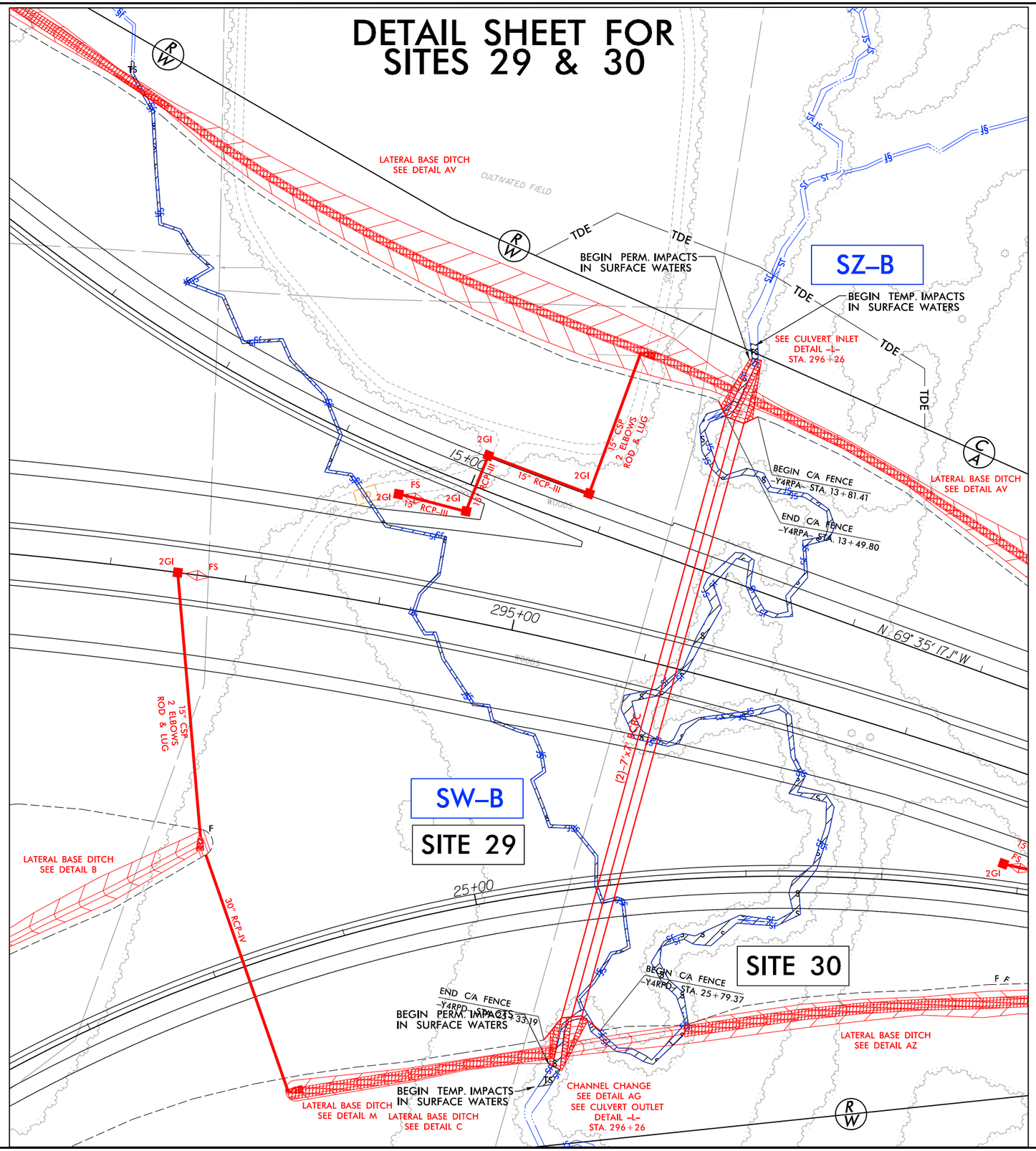
DETAIL SHEET FOR SITES 29 & 30



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	23C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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40 20 0 40 80

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 81 OF 257

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PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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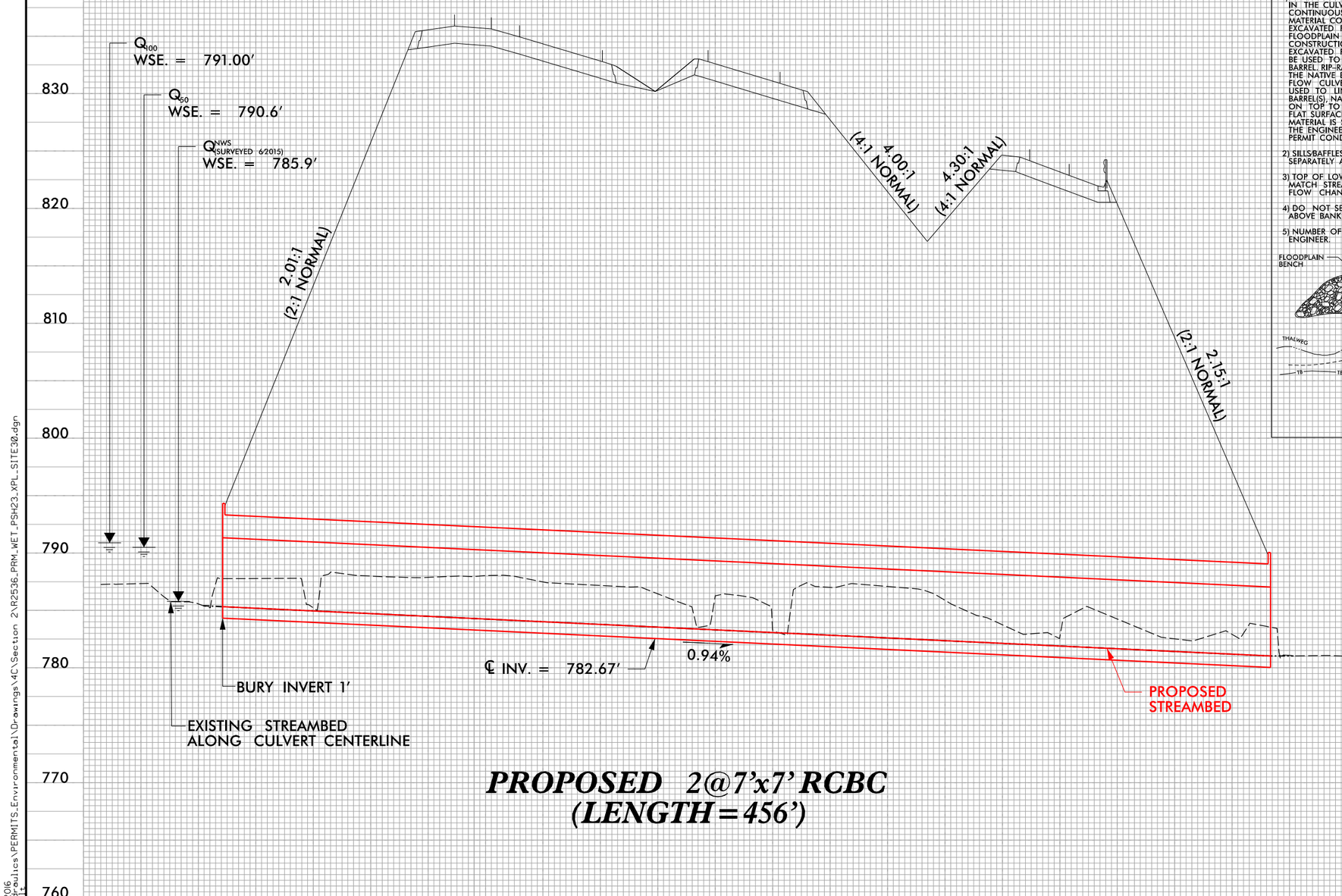
PERMIT DRAWING
SHEET 82 OF 257

ENGLISH

SITE 30
-L- 296+26



PROPOSED 2@7'x7' RCBC
(LENGTH=456')

SILL/BAFFLE DETAILS

(NOT TO SCALE)

MULTI- BARREL CULVERT LOW FLOW CHANNEL,SILLS AND FLOOD PLAIN BENCH

*NOTES:

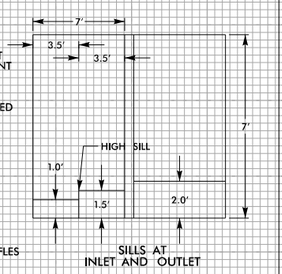
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP-RAP MAY BE USED TO SUPPLEMENT THE NATIVE BED MATERIAL IN THE HIGH FLOW CULVERT BARREL(S). IF RIP-RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL(S), NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

2) SILLS/BAFFLES ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

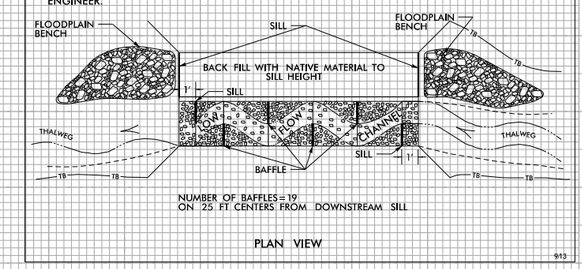
3) TOP OF LOW FLOW SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) DO NOT SET ELEVATION OF HIGH SILL/BAFFLES ABOVE BANK FULL.

5) NUMBER OF SILL/BAFFLES DETERMINED BY THE ENGINEER.



SILLS AT INLET AND OUTLET



NUMBER OF BAFFLES=19
ON 25 FT CENTERS FROM DOWNSTREAM SILL

PLAN VIEW

913

5/14/99

6/14/2016
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PROJECT REFERENCE NO.	SHEET NO.
R-2536	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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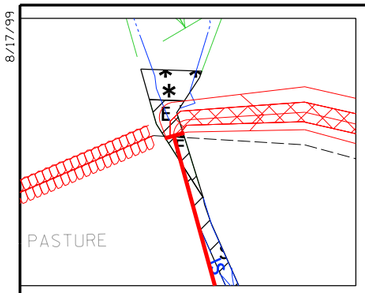
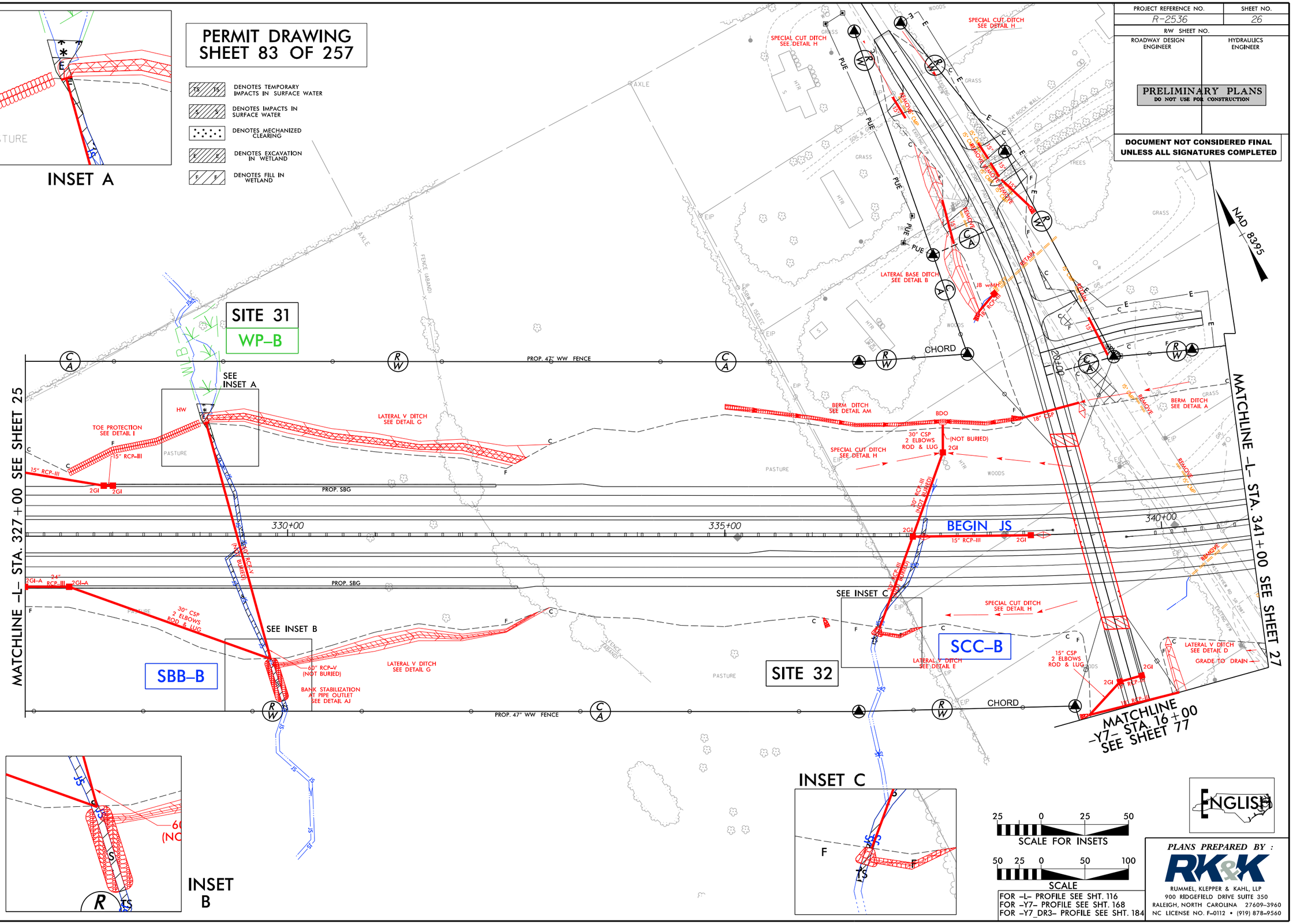
- TS / TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S / S — DENOTES IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- E / E — DENOTES EXCAVATION IN WETLAND
- F / F — DENOTES FILL IN WETLAND



INSET A



INSET B

INSET C

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

FOR –L– PROFILE SEE SHT. 116
FOR –Y7– PROFILE SEE SHT. 168
FOR –Y7_DR3– PROFILE SEE SHT. 184

ENGLISH

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PERMIT DRAWING SHEET 84 OF 257

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

PROJECT REFERENCE NO.	SHEET NO.
R-2536	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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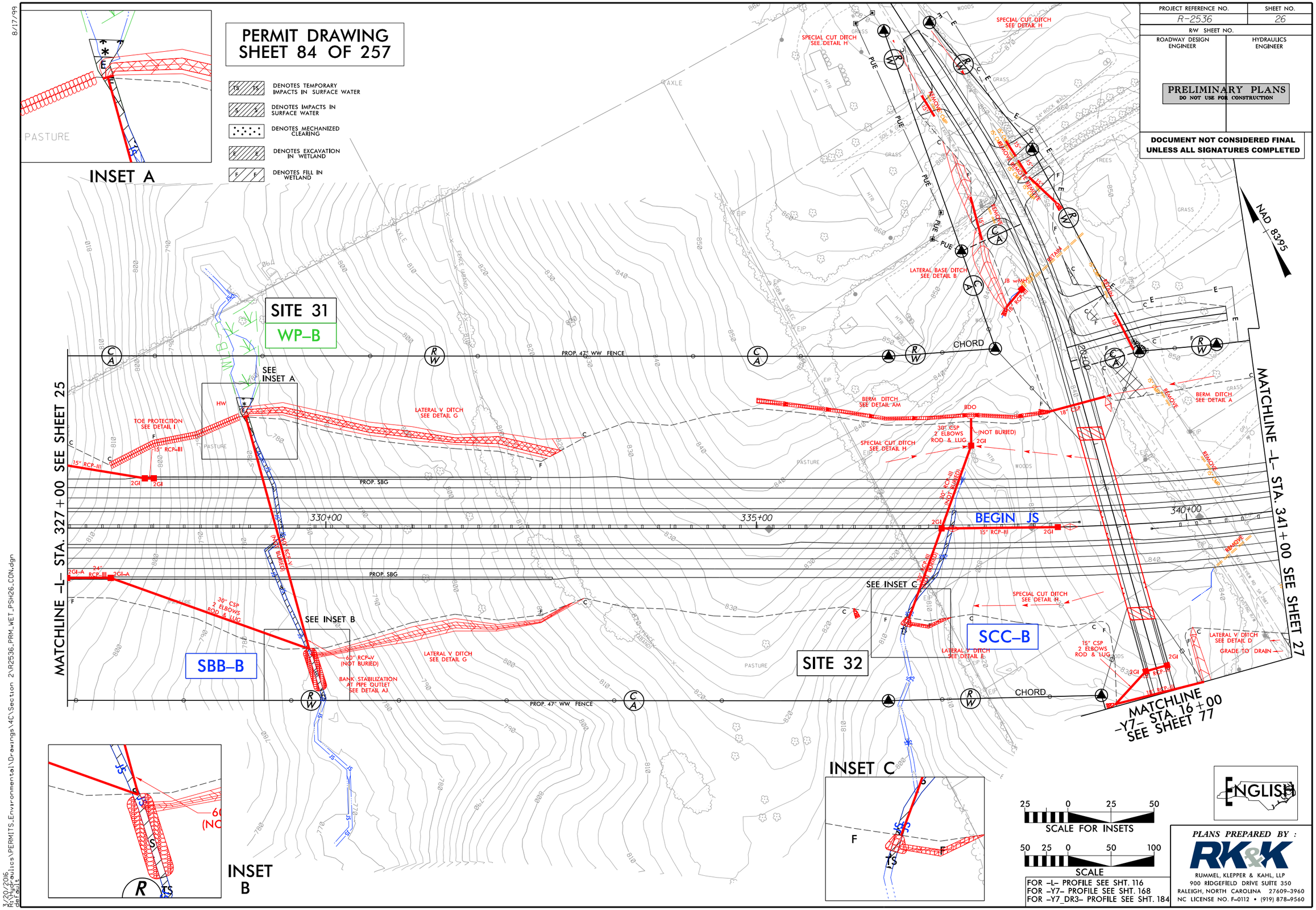

FOR –L– PROFILE SEE SHT. 116
FOR –Y7– PROFILE SEE SHT. 168
FOR –Y7_DR3– PROFILE SEE SHT. 184

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PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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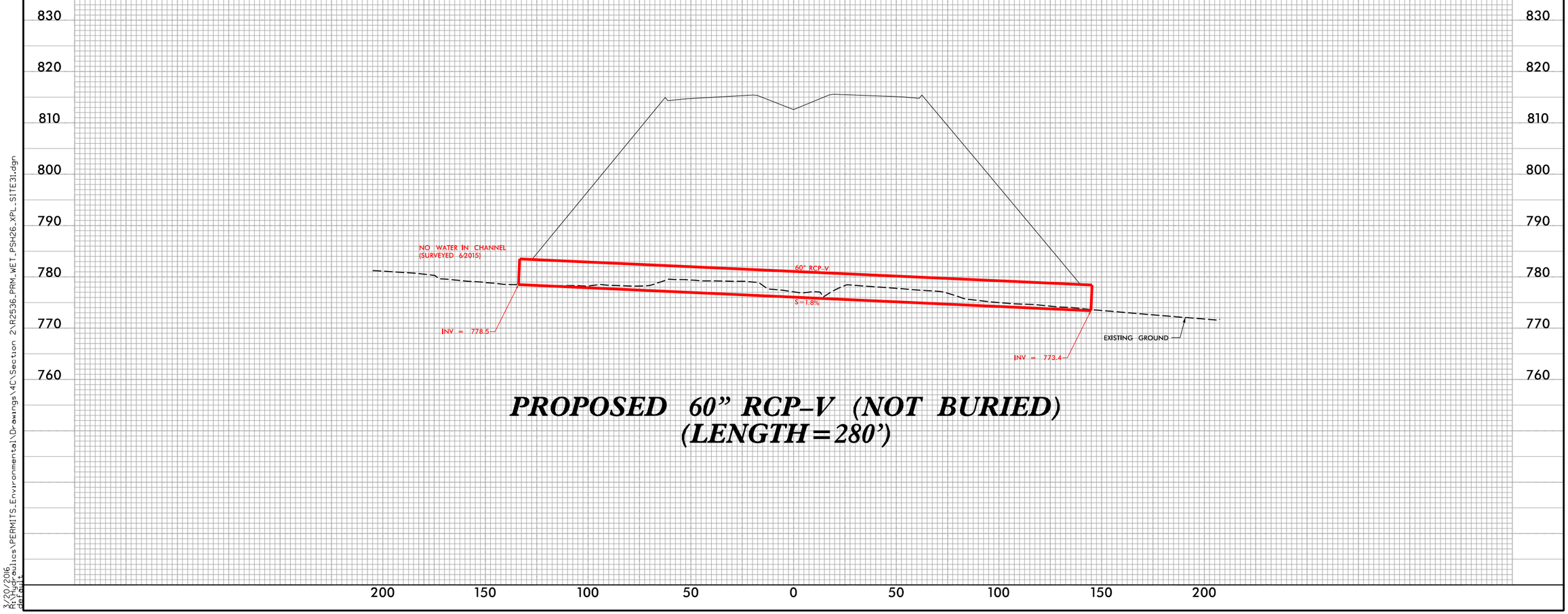
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

SITE 31
–L– 329+42

PERMIT DRAWING
SHEET 85 OF 257



PROPOSED 60" RCP–V (NOT BURIED)
(LENGTH=280')

3/30/2016
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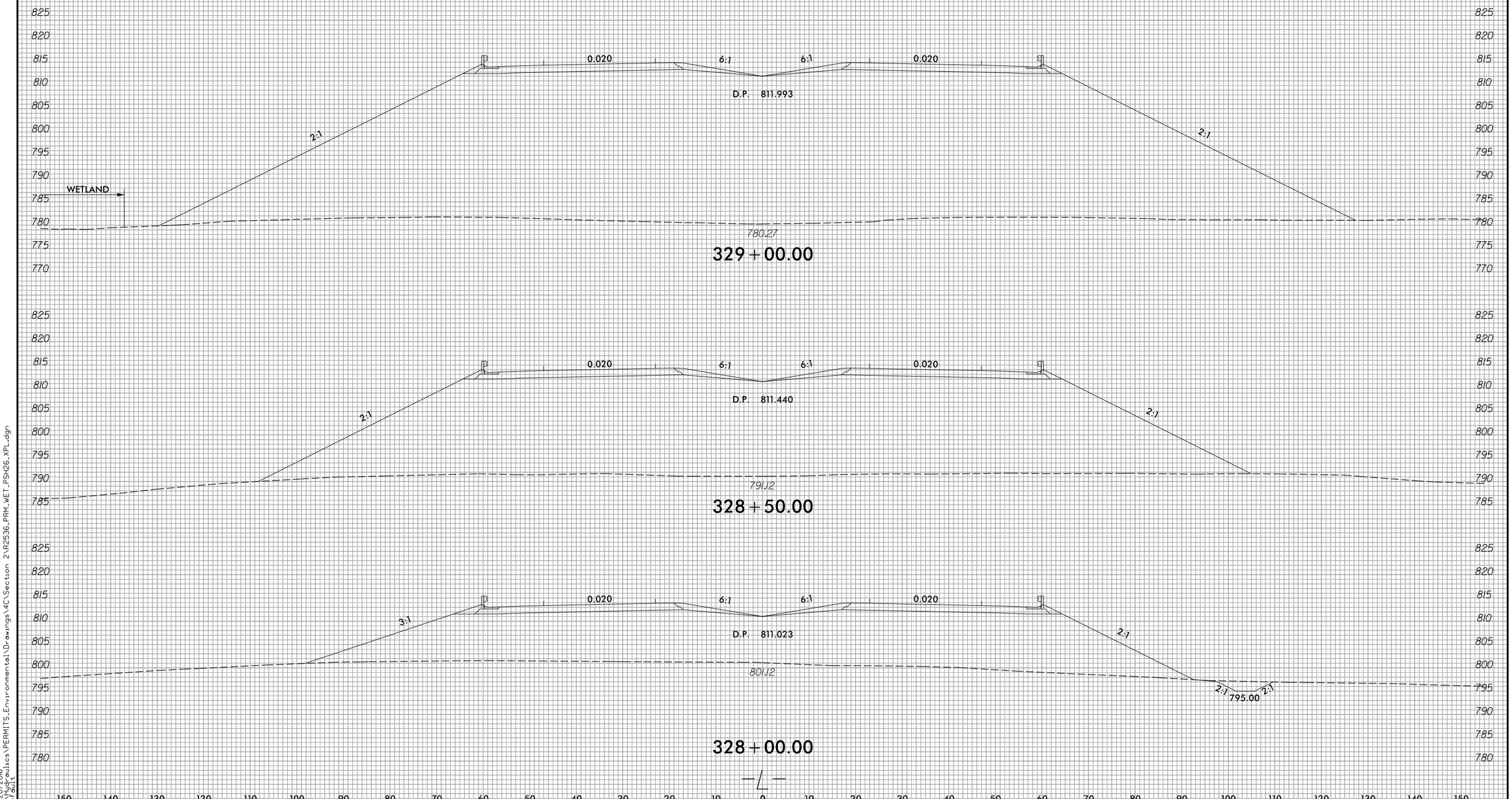
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-XX

SITE 31

PERMIT DRAWING
SHEET 86 OF 257

ENGLISH



8/23/99

3/20/2016
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PERMIT DRAWING
SHEET 87 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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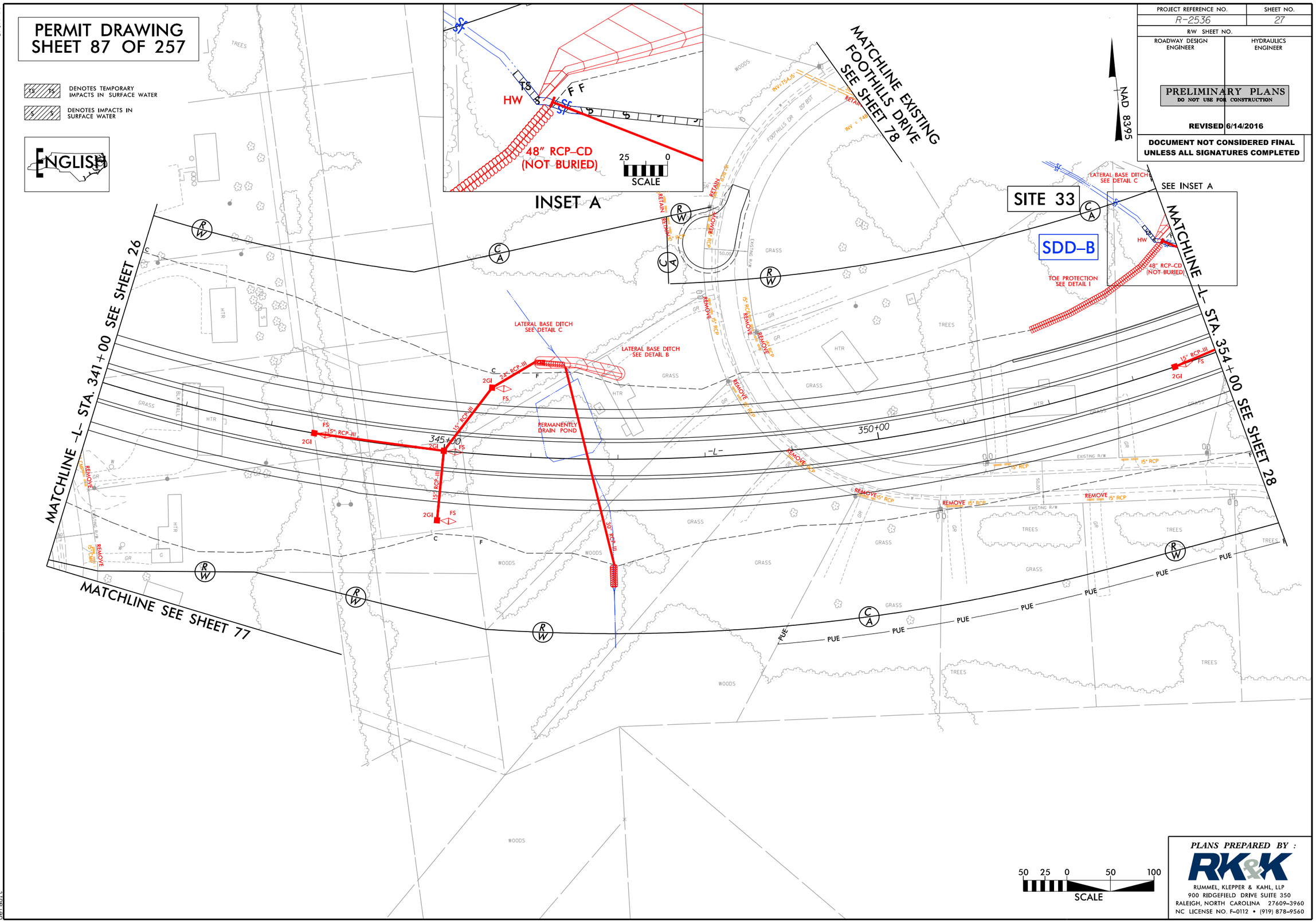

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PERMIT DRAWING
SHEET 88 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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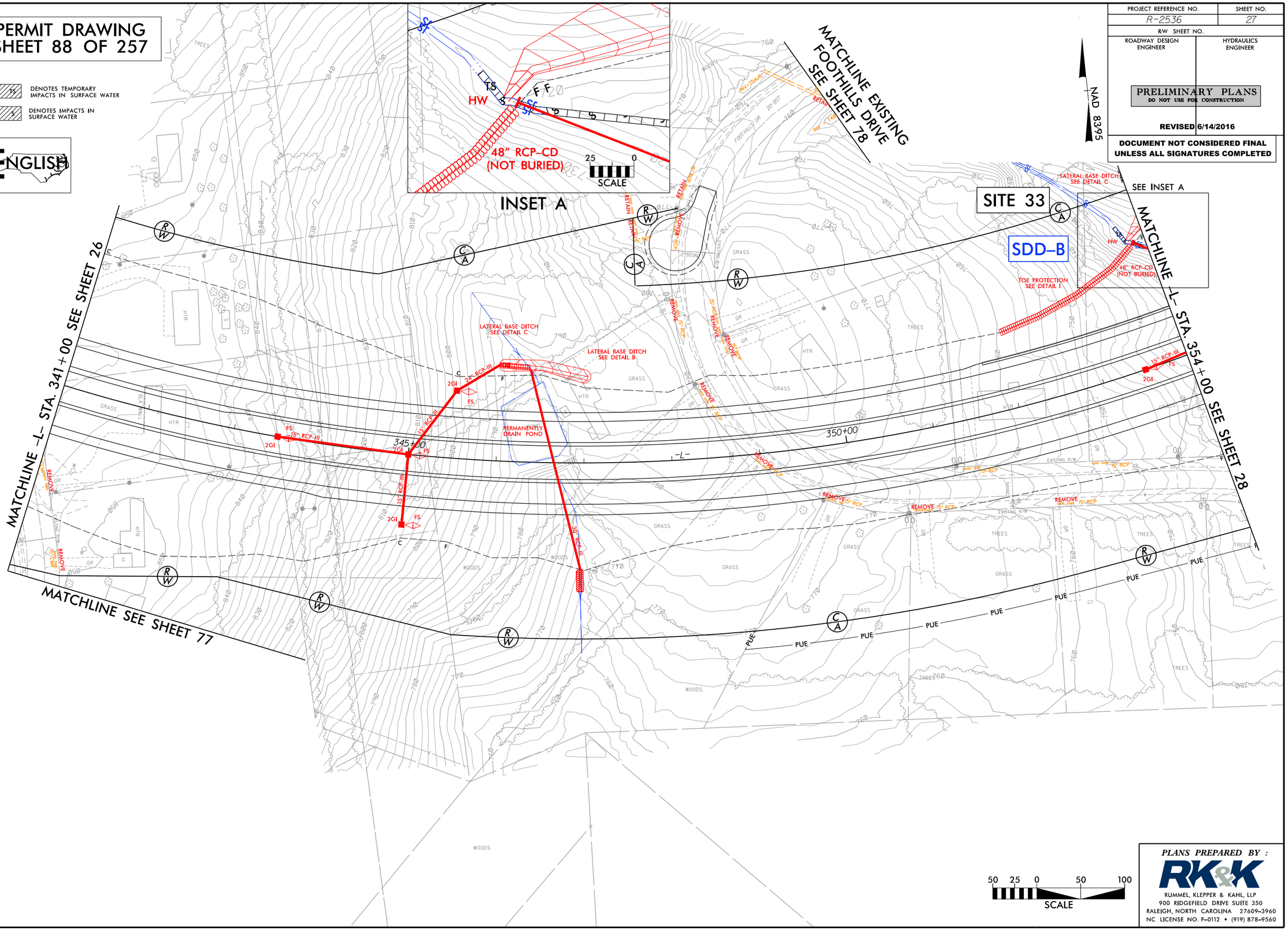
NAD 83/95



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PERMIT DRAWING SHEET 89 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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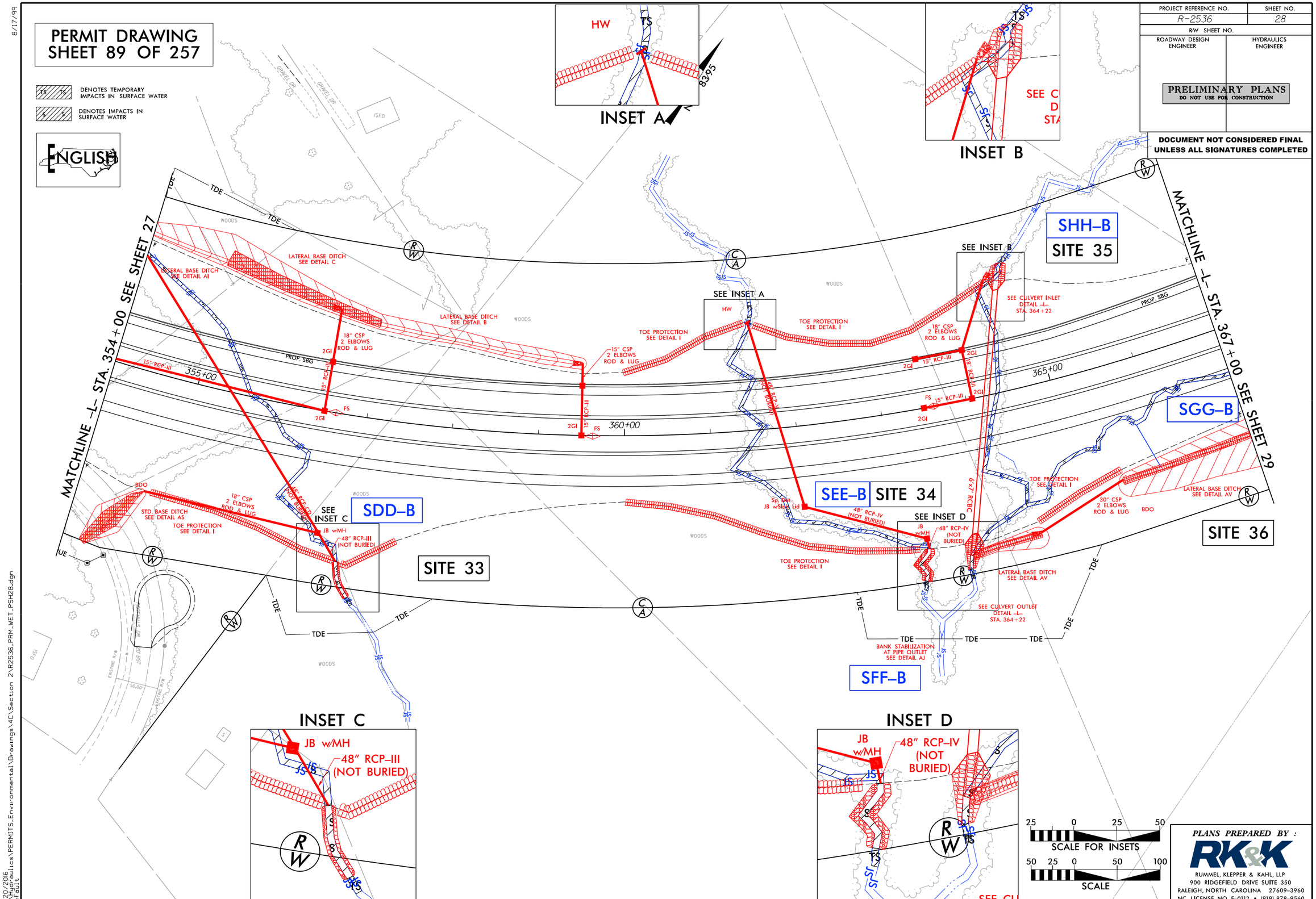

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PERMIT DRAWING
SHEET 90 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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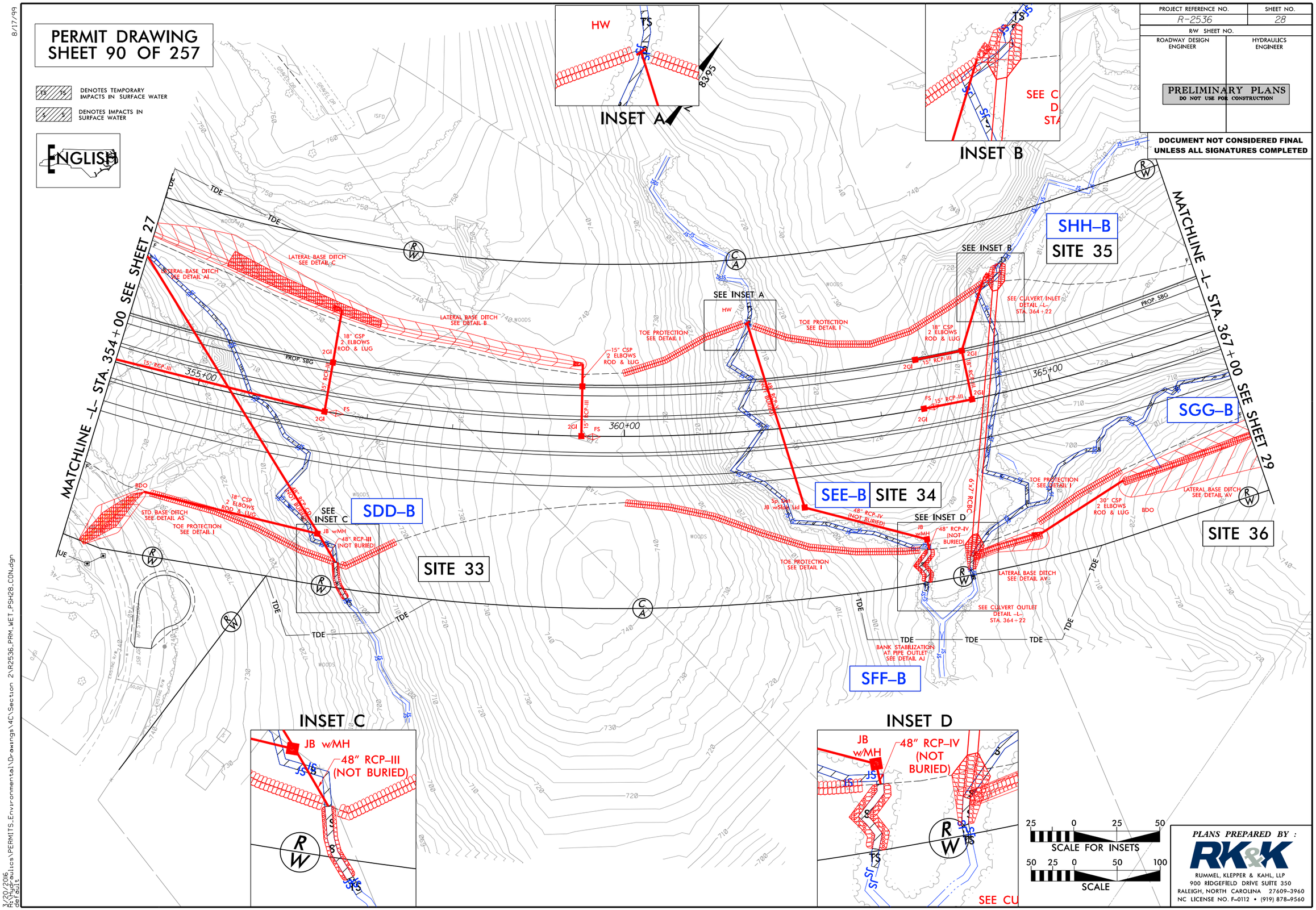
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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SITE 35
-L- 364+22

PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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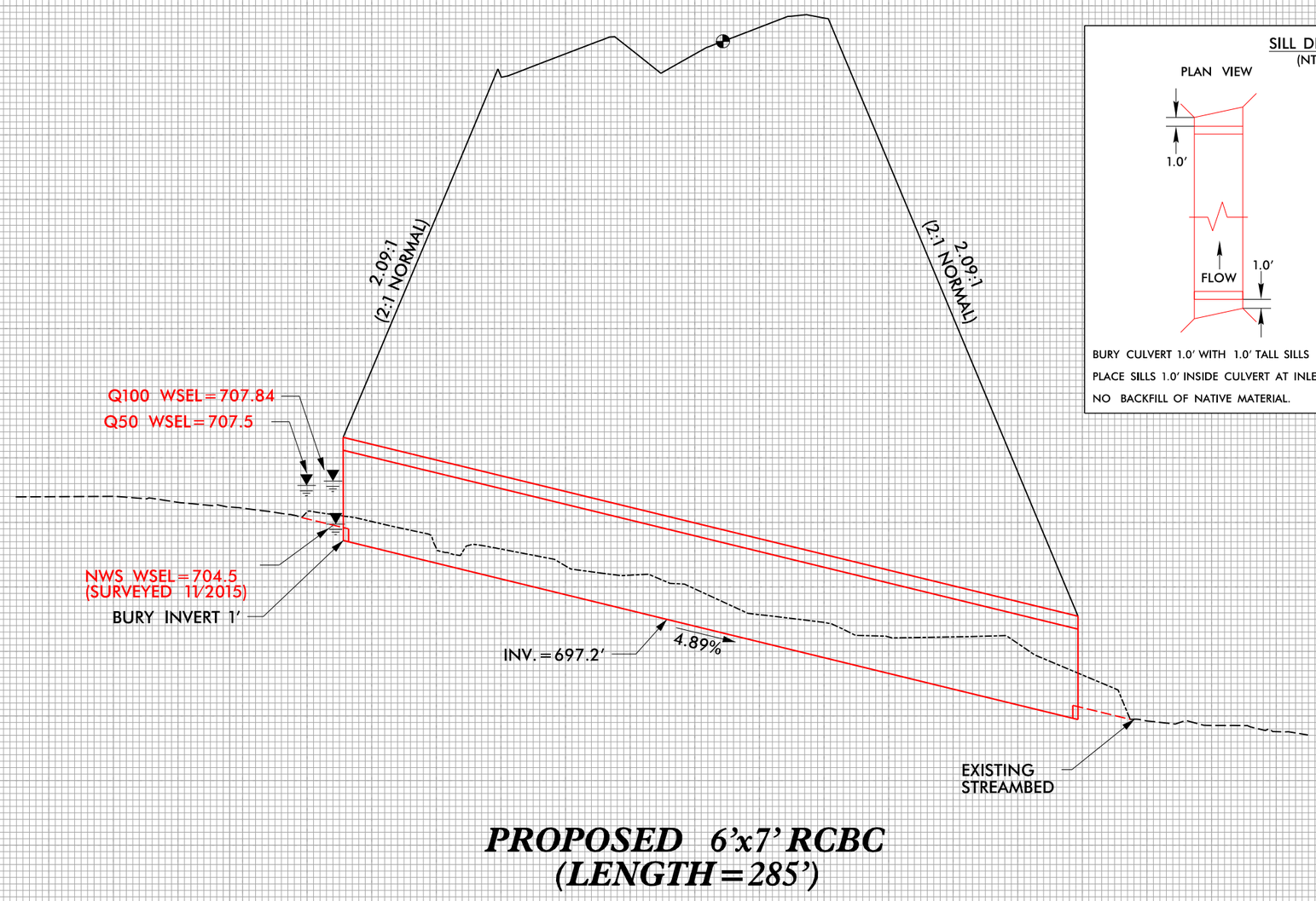
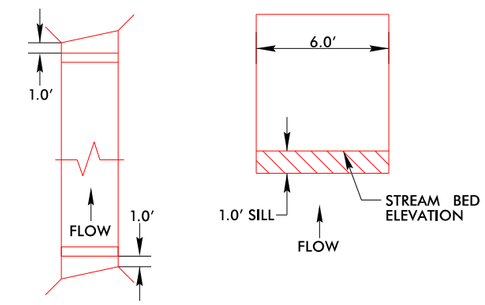
PERMIT DRAWING
SHEET 91 OF 257

ENGLISH

HORIZ. SCALE: 1=50'
VERT. SCALE: 1=10'



SILL DETAILS
(NTS)



BURY CULVERT 1.0' WITH 1.0' TALL SILLS
PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET PERPENDICULAR TO SIDEWALL.
NO BACKFILL OF NATIVE MATERIAL.

5/14/99

3/29/2016
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default

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PERMIT DRAWING
SHEET 92 OF 257

DENOTES IMPACTS IN SURFACE WATER

ENGLISH

NAD 83/95

PROJECT REFERENCE NO.	SHEET NO.
R-2536	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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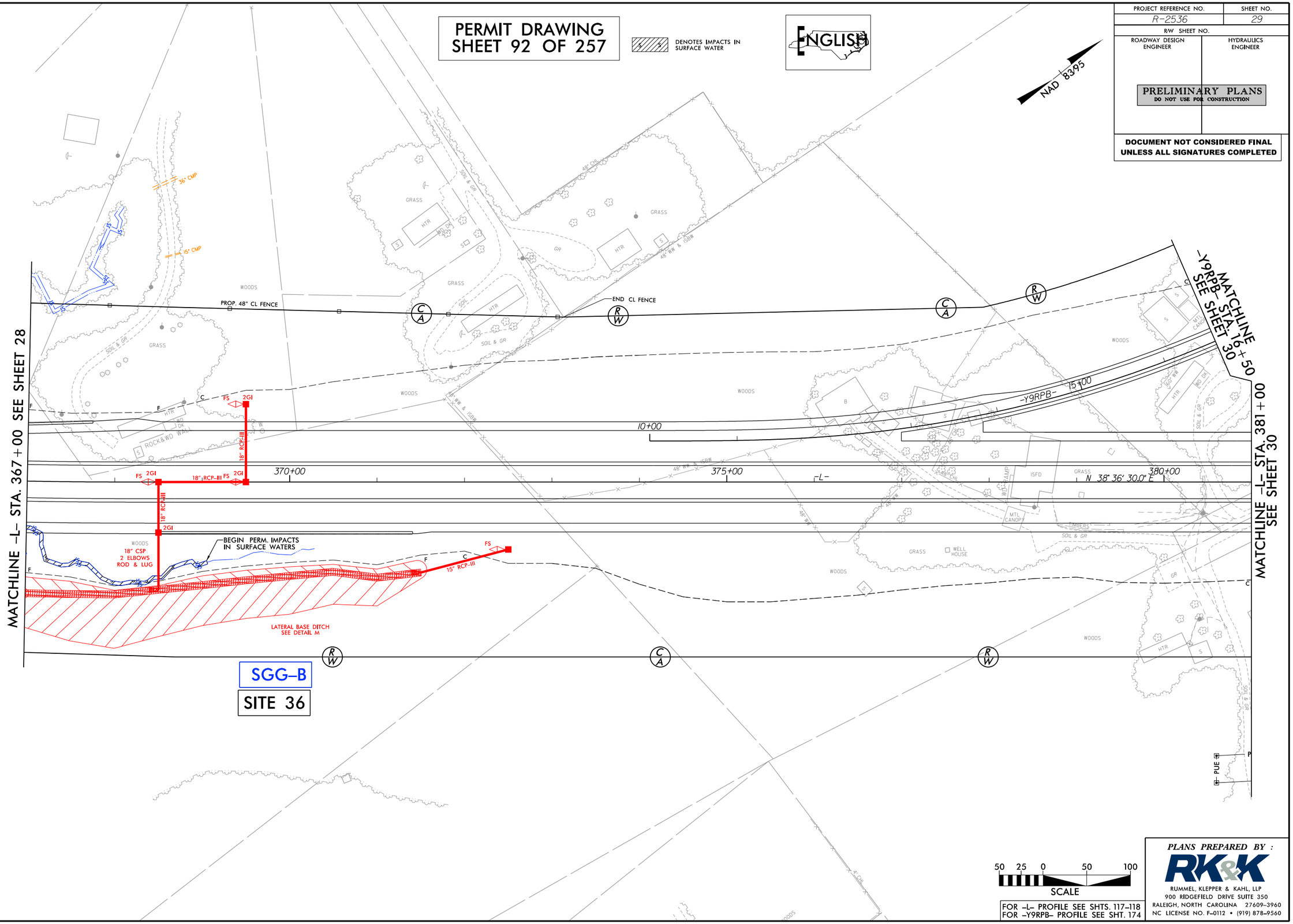

50 25 0 50 100
SCALE

FOR -L- PROFILE SEE SHTS. 117-118
FOR -Y9RPB- PROFILE SEE SHT. 174

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PERMIT DRAWING
SHEET 93 OF 257

DENOTES IMPACTS IN SURFACE WATER

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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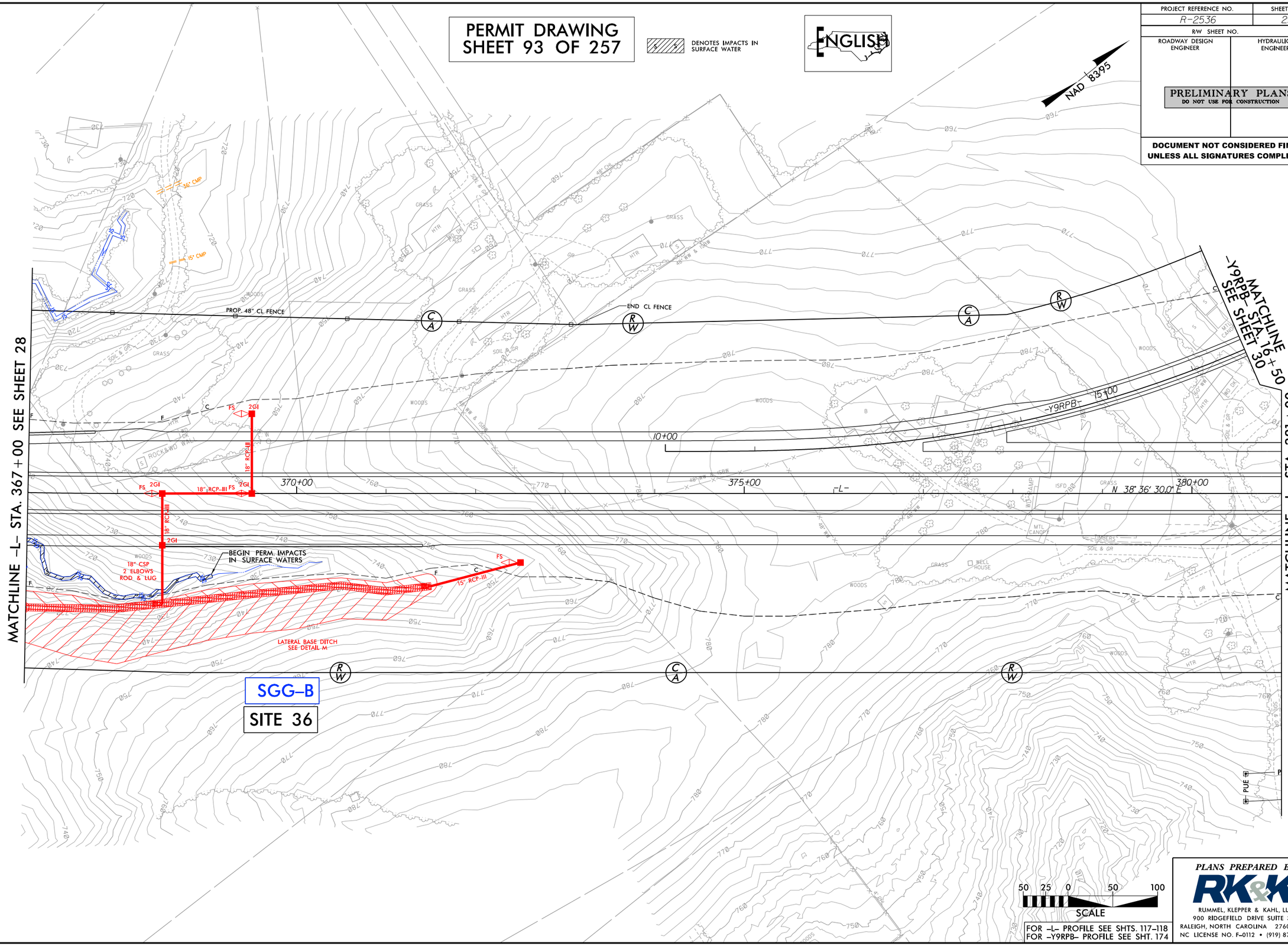
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



FOR -L- PROFILE SEE SHTS. 117-118
FOR -Y9RPB- PROFILE SEE SHT. 174

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ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2526C	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR BID OR CONSTRUCTION

REVISED 6/14/2016

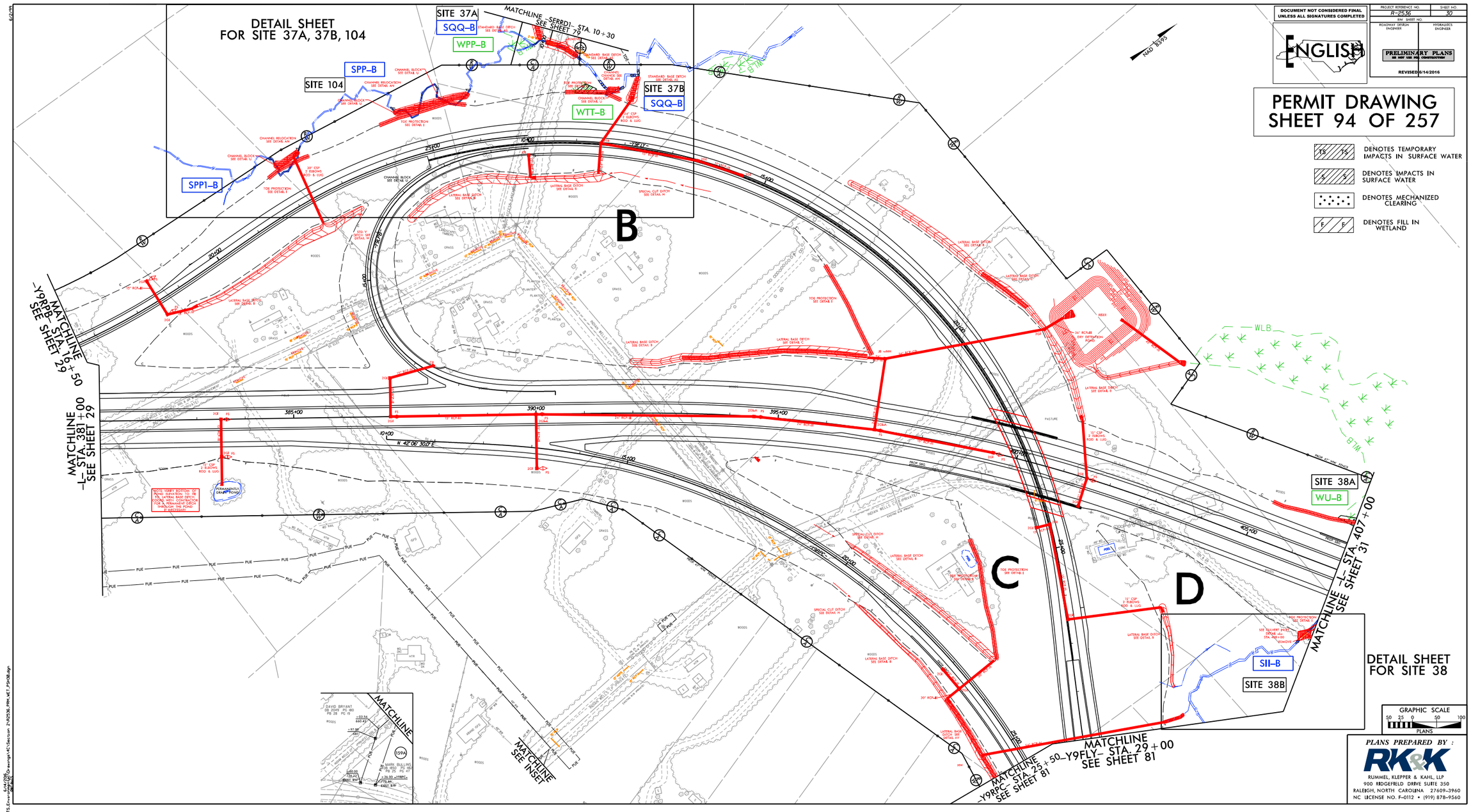
PERMIT DRAWING SHEET 94 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

F F DENOTES FILL IN WETLAND



GRAPHIC SCALE
50 25 0 50 100
PLANS

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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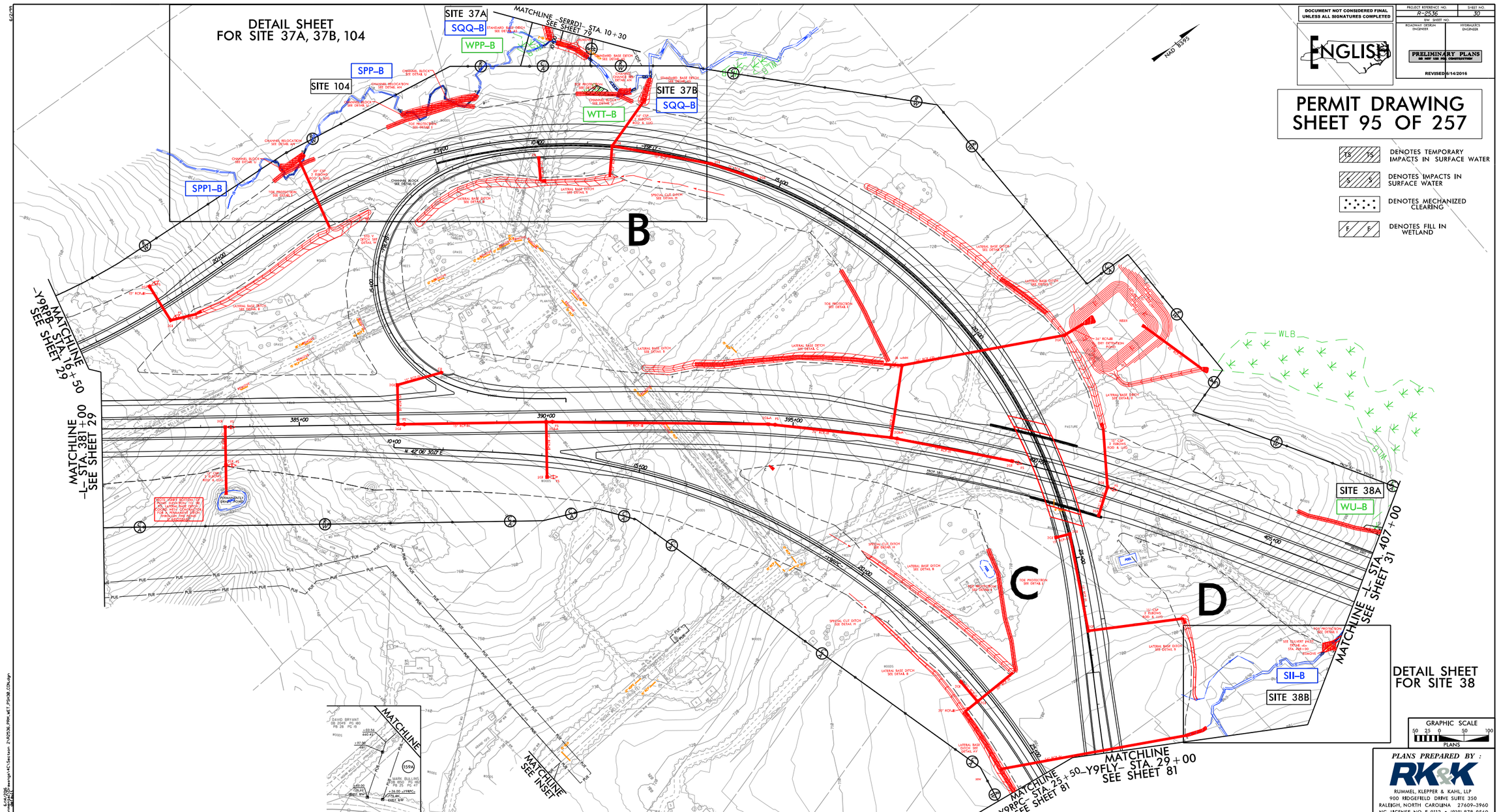
PERMIT DRAWING SHEET 95 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

F F DENOTES FILL IN WETLAND



GRAPHIC SCALE
50 25 0 50 100
PLANS

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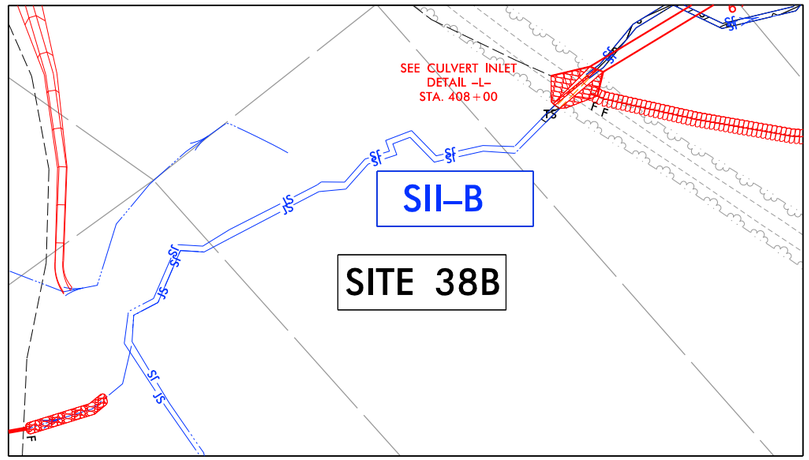
DETAIL SHEET FOR SITE 38



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ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	30A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PRELIMINARY PLANS
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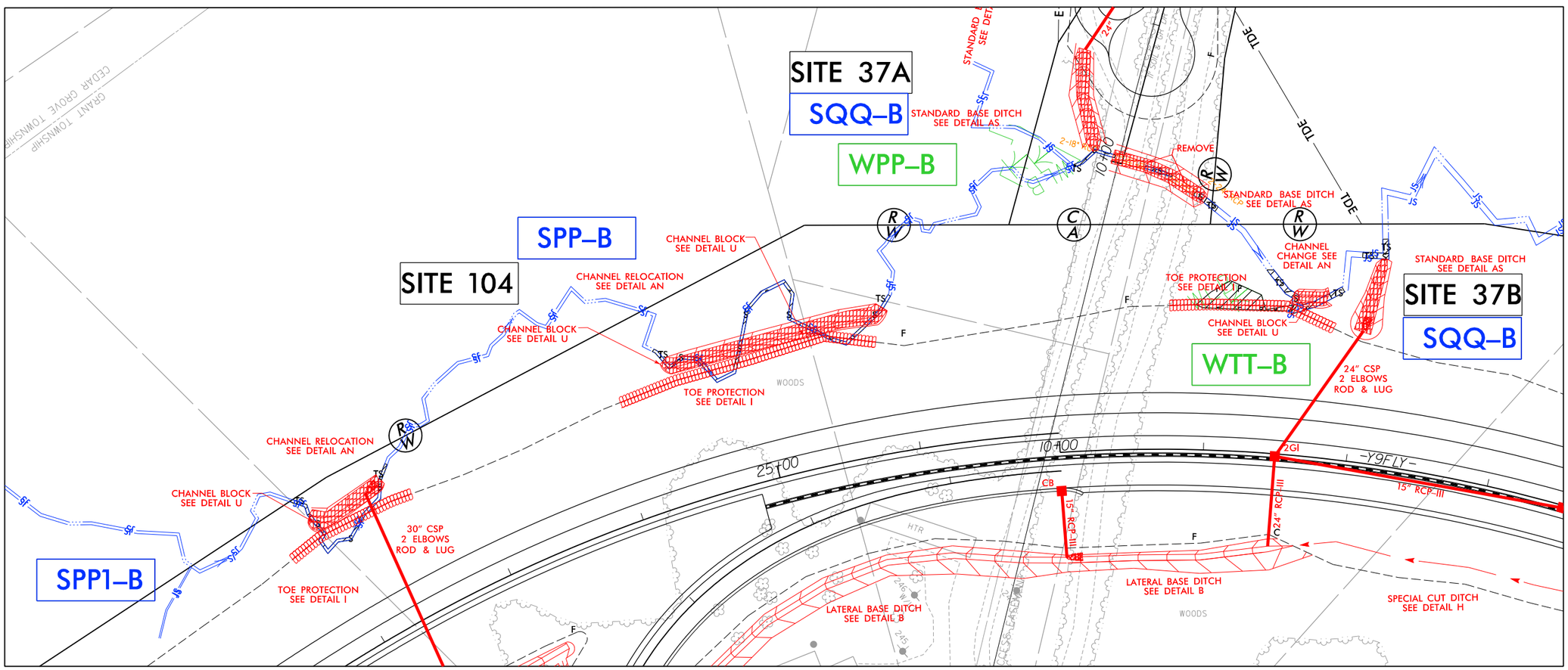
PERMIT DRAWING
SHEET 96 OF 257

40 20 0 40 80

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND



DETAIL SHEET FOR SITE 37A, 37B, 104

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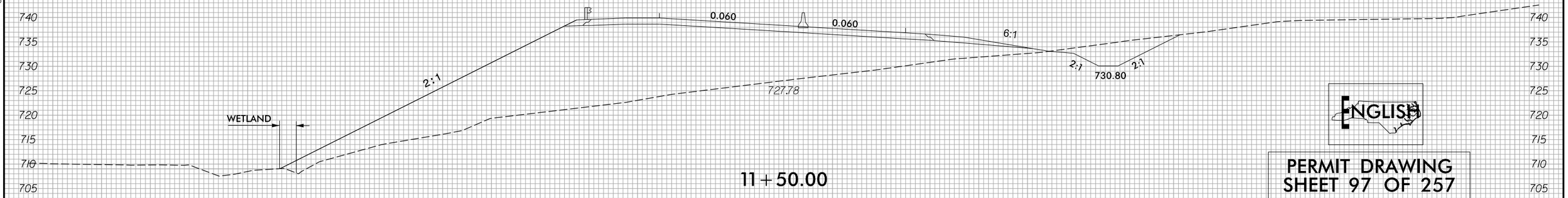
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-XX



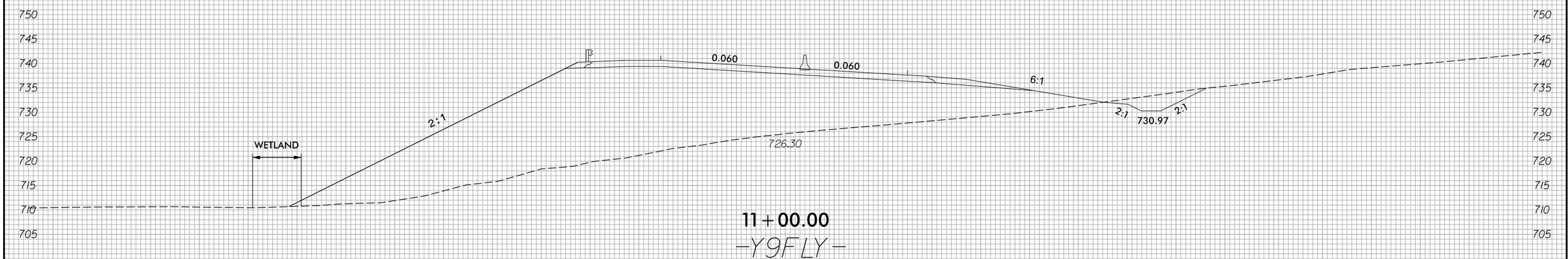
11+50.00

-Y9FLY-

ENGLISH

PERMIT DRAWING
SHEET 97 OF 257

SITE 37



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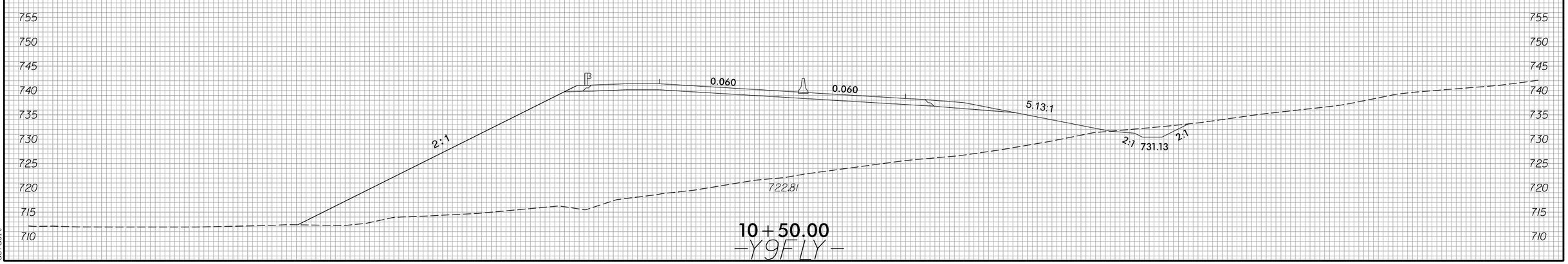

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-Y9FLY-

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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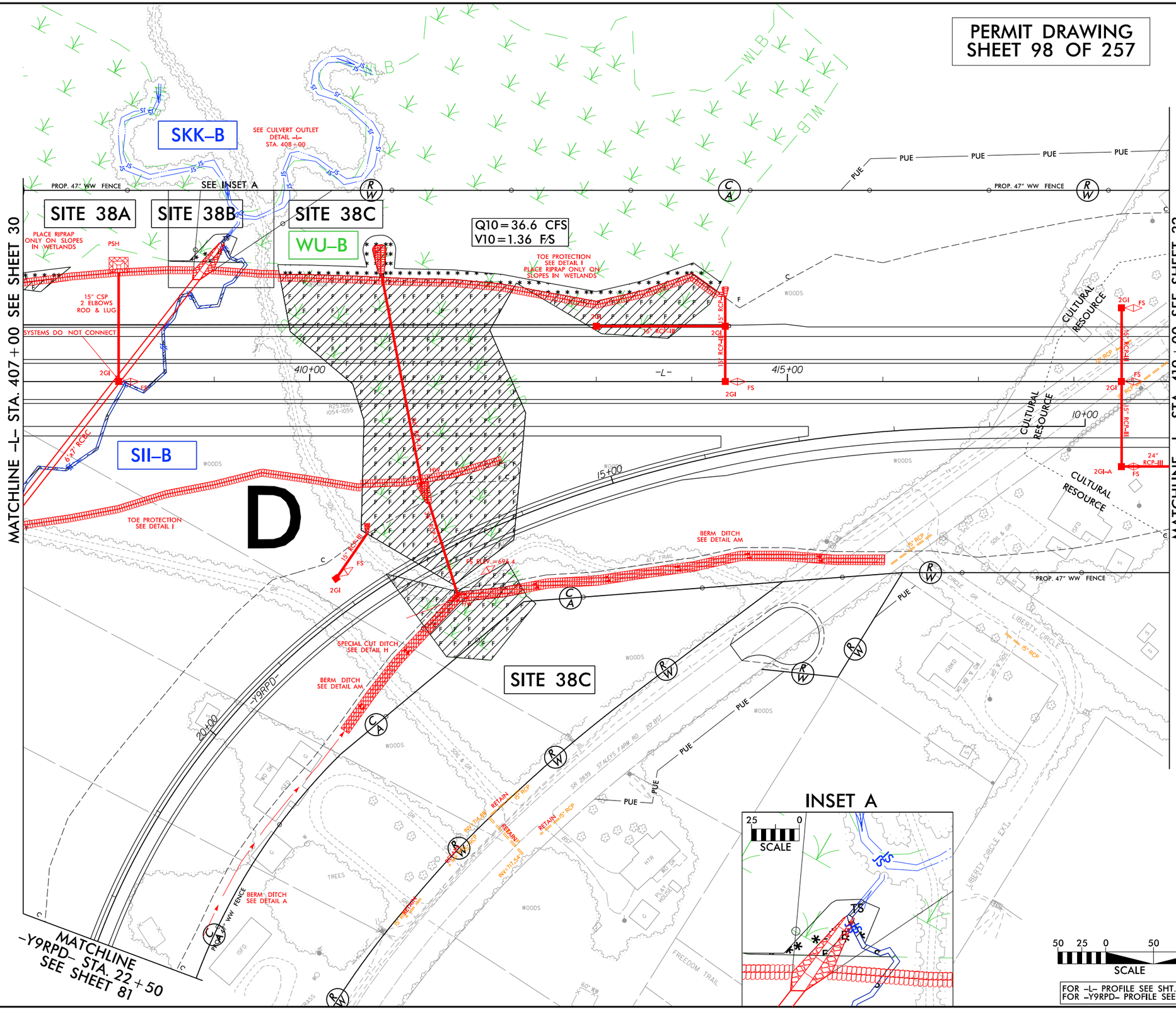
PERMIT DRAWING SHEET 98 OF 257



FOR -L- PROFILE SEE SHT. 119
FOR -Y9RPD- PROFILE SEE SHT. 176

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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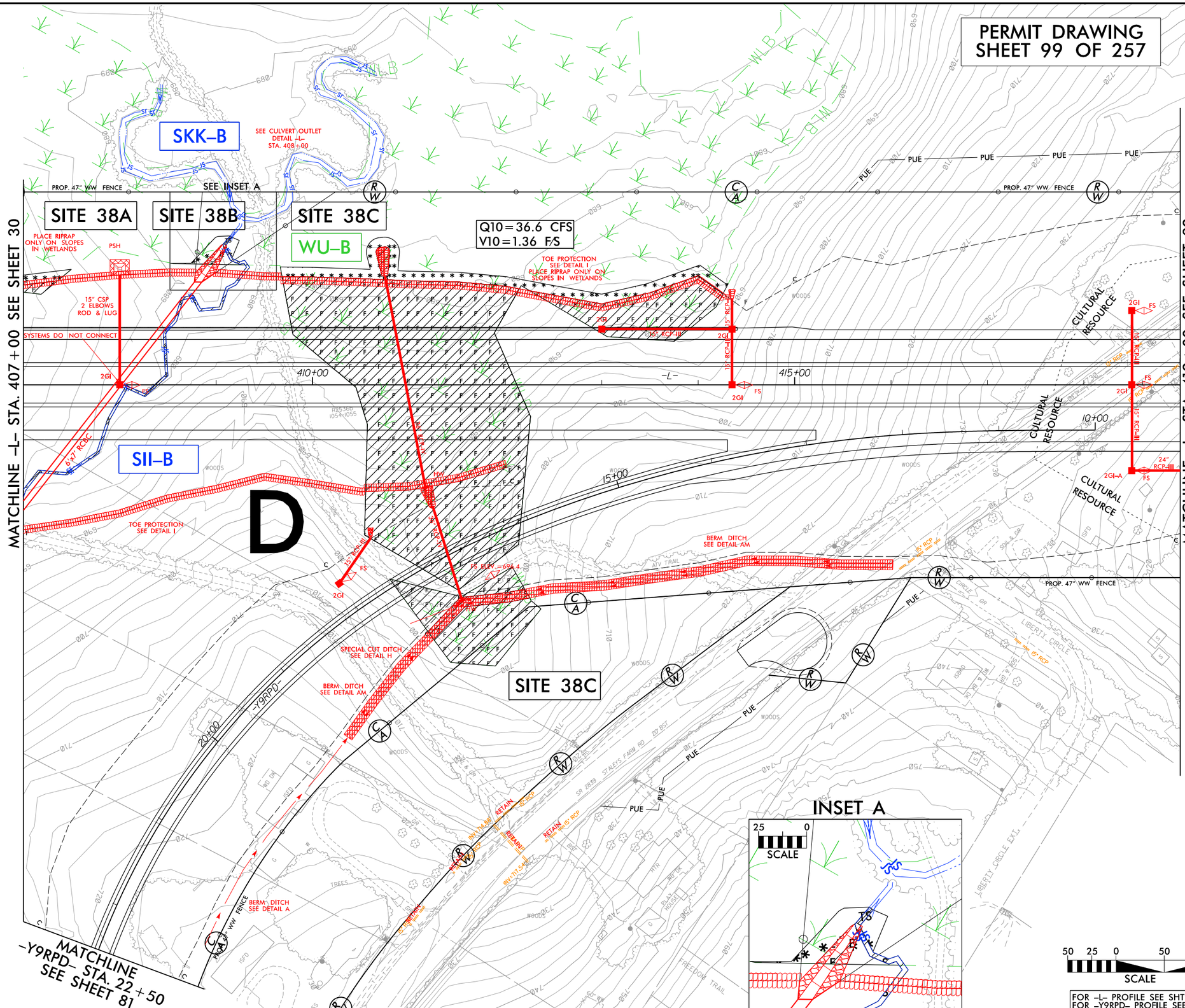
PERMIT DRAWING SHEET 99 OF 257



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default

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PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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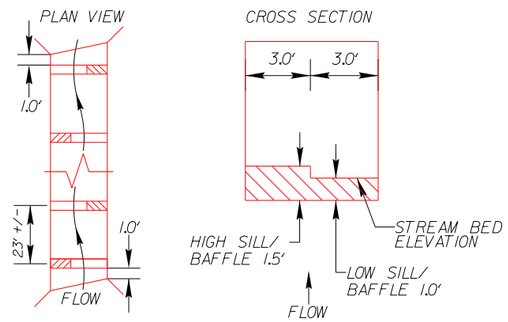
PERMIT DRAWING
SHEET 100 OF 257

ENGLISH

SITE 38
-L- 408+00

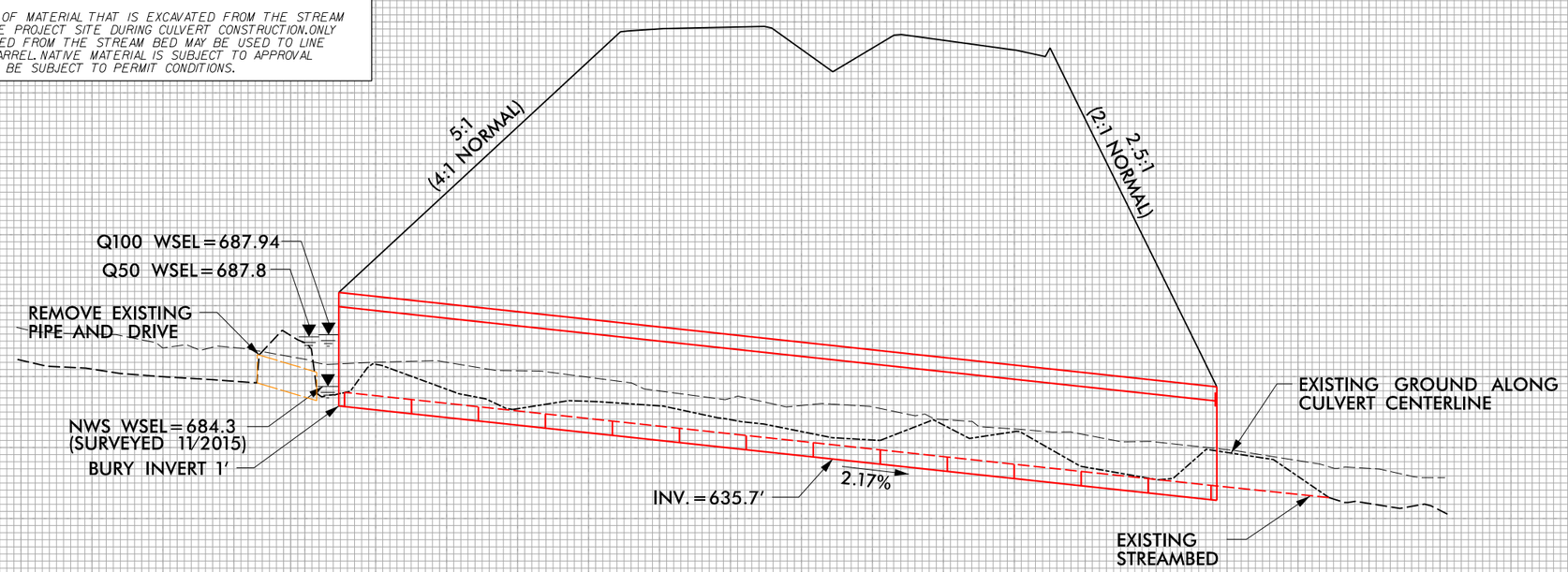
SILL/BAFFLE DETAILS (NTS)



PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET PERPENDICULAR TO SIDEWALL.

ALTERNATE 1.5' TALL HIGH SILL/BAFFLES LEFT AND RIGHT TO FORCE STREAM TO MEANDER ALONG THE LENGTH OF THE CULVERT.

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.



PROPOSED 6'x7' RCBC
(length=310')

710 700 690 680 670 660 650 640

200 150 100 50 0 50 100 150 200

3/30/2016
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PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-115

0 5 10

ENGLISH

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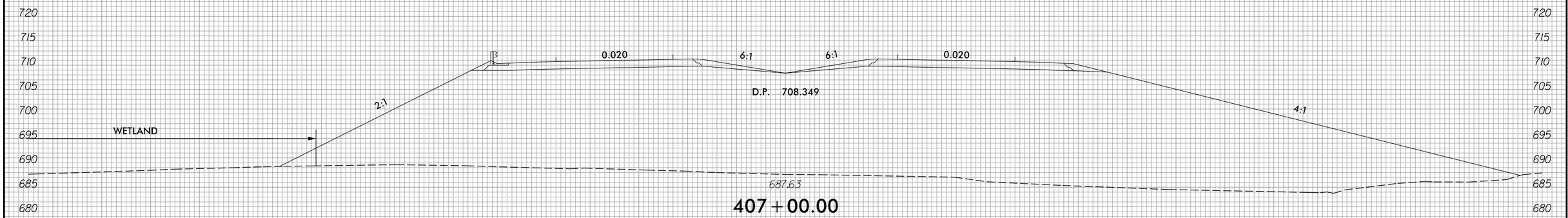
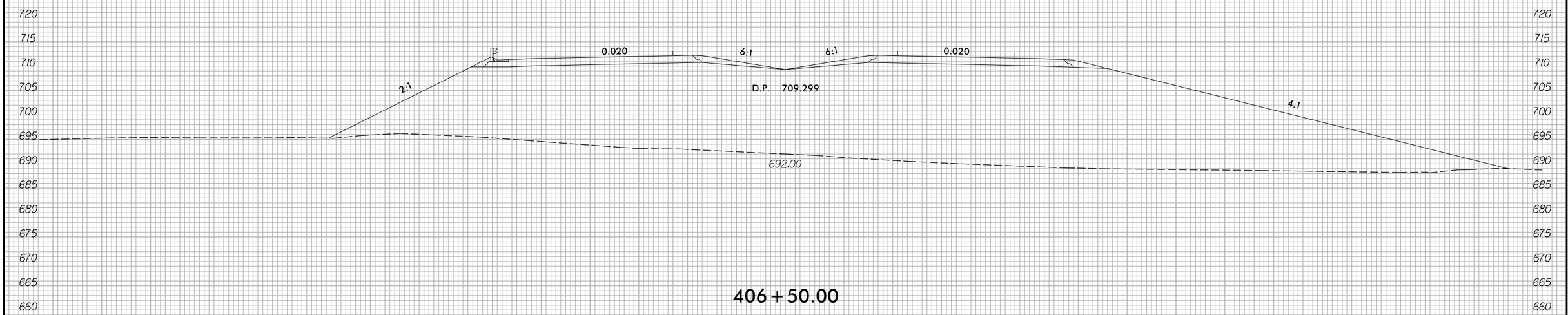
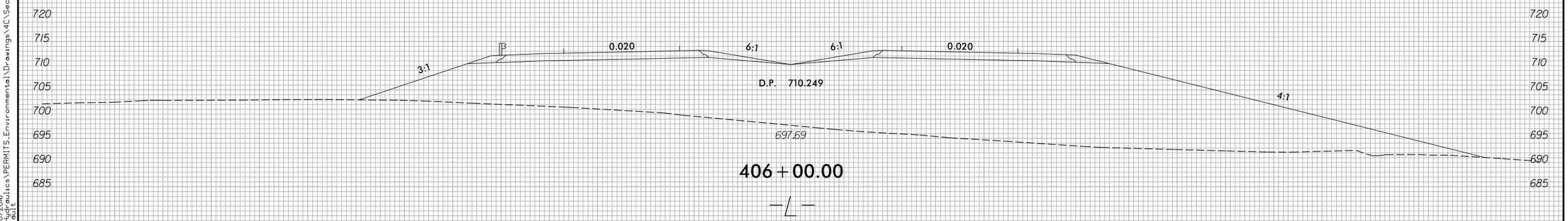
SHEET 101 OF 257

SITE 38







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PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-118

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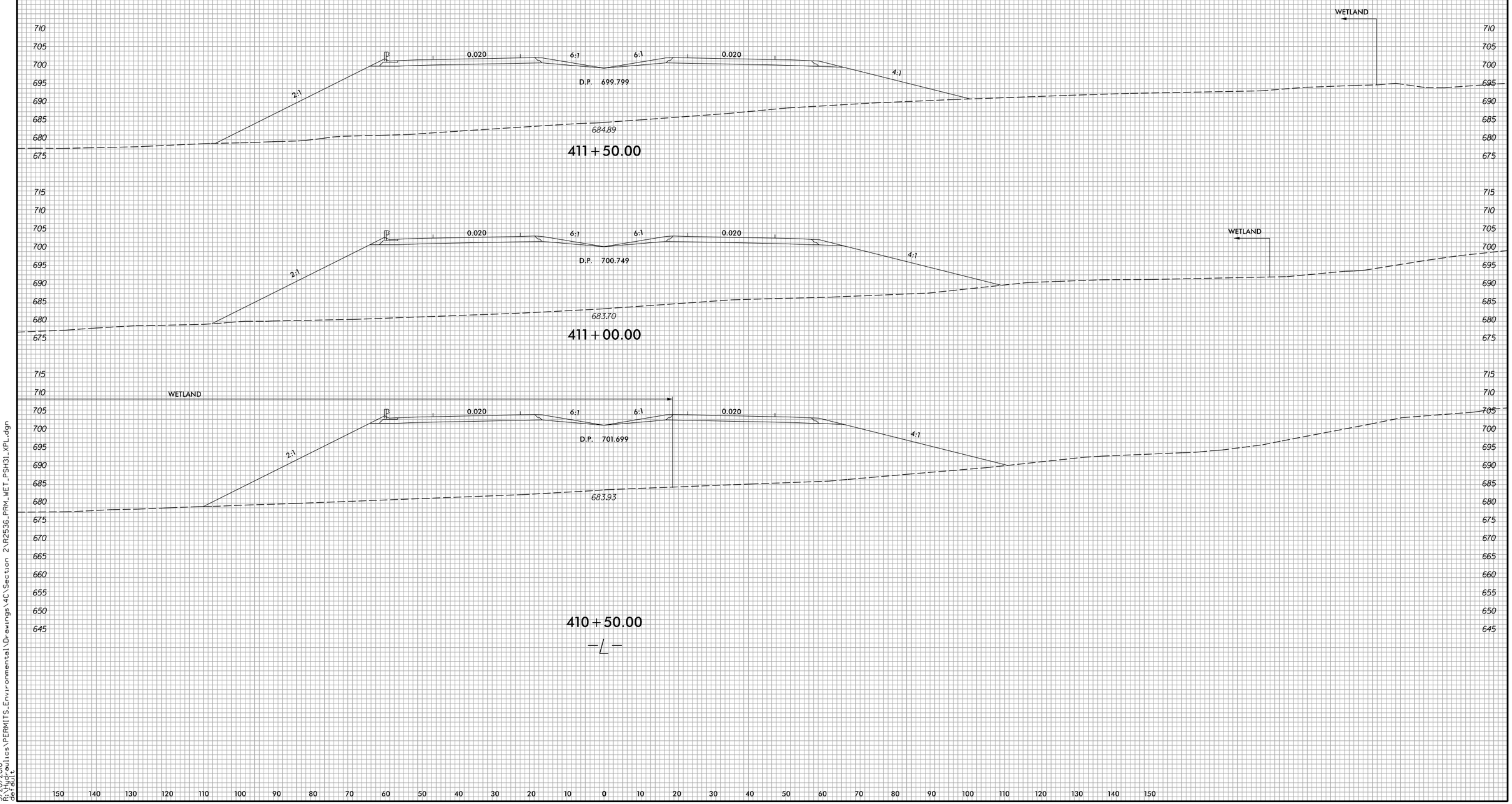
SHEET 102 OF 257

SITE 38



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	33
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 103 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

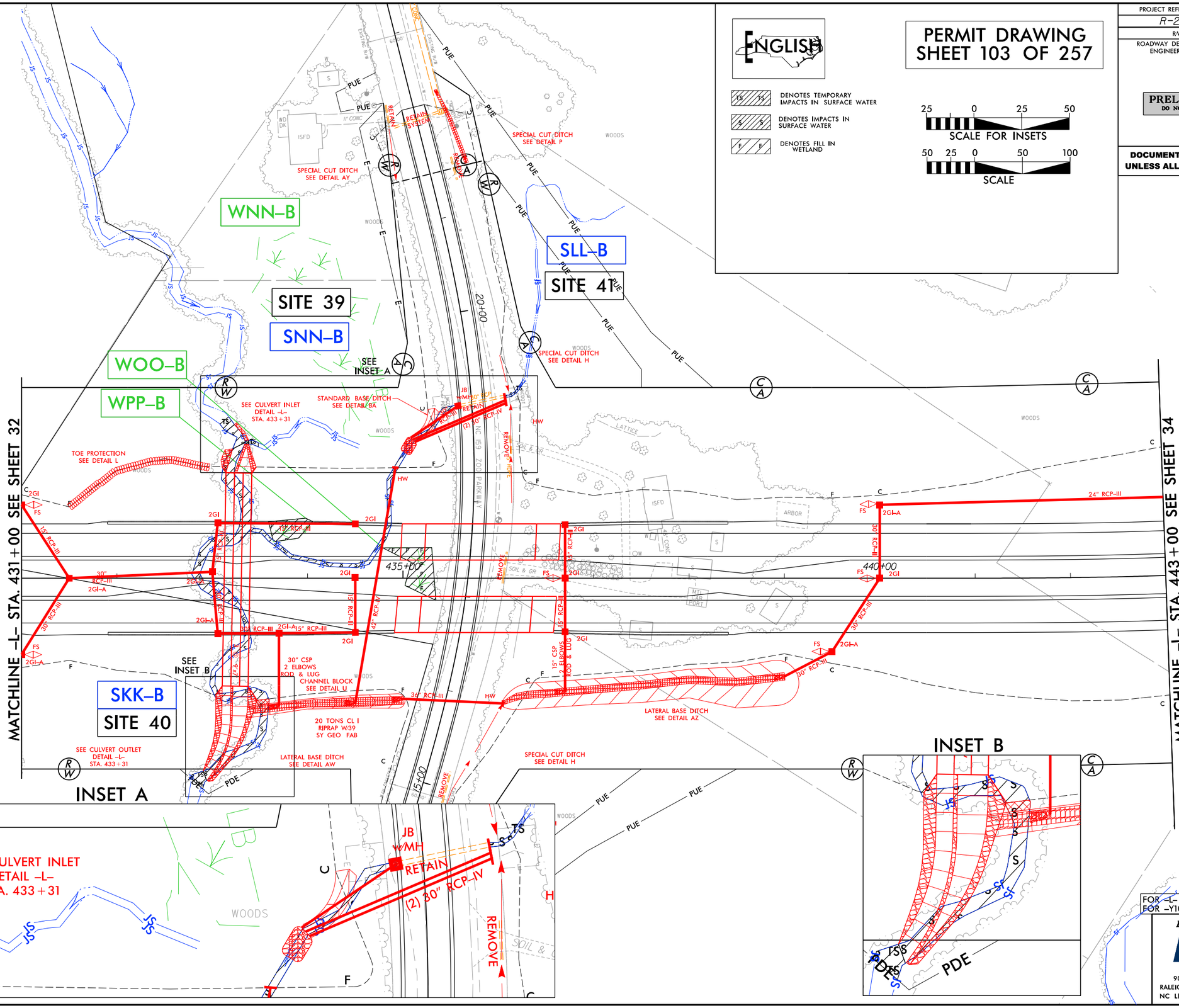
S S DENOTES IMPACTS IN SURFACE WATER

F F DENOTES FILL IN WETLAND

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

NAD 83/95



FOR –L– PROFILE SEE SHTS. 119–120
FOR –Y10_END– PROFILE SEE SHT. 180

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	33
R/W SHEET NO.	
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ENGLISH

PERMIT DRAWING SHEET 104 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

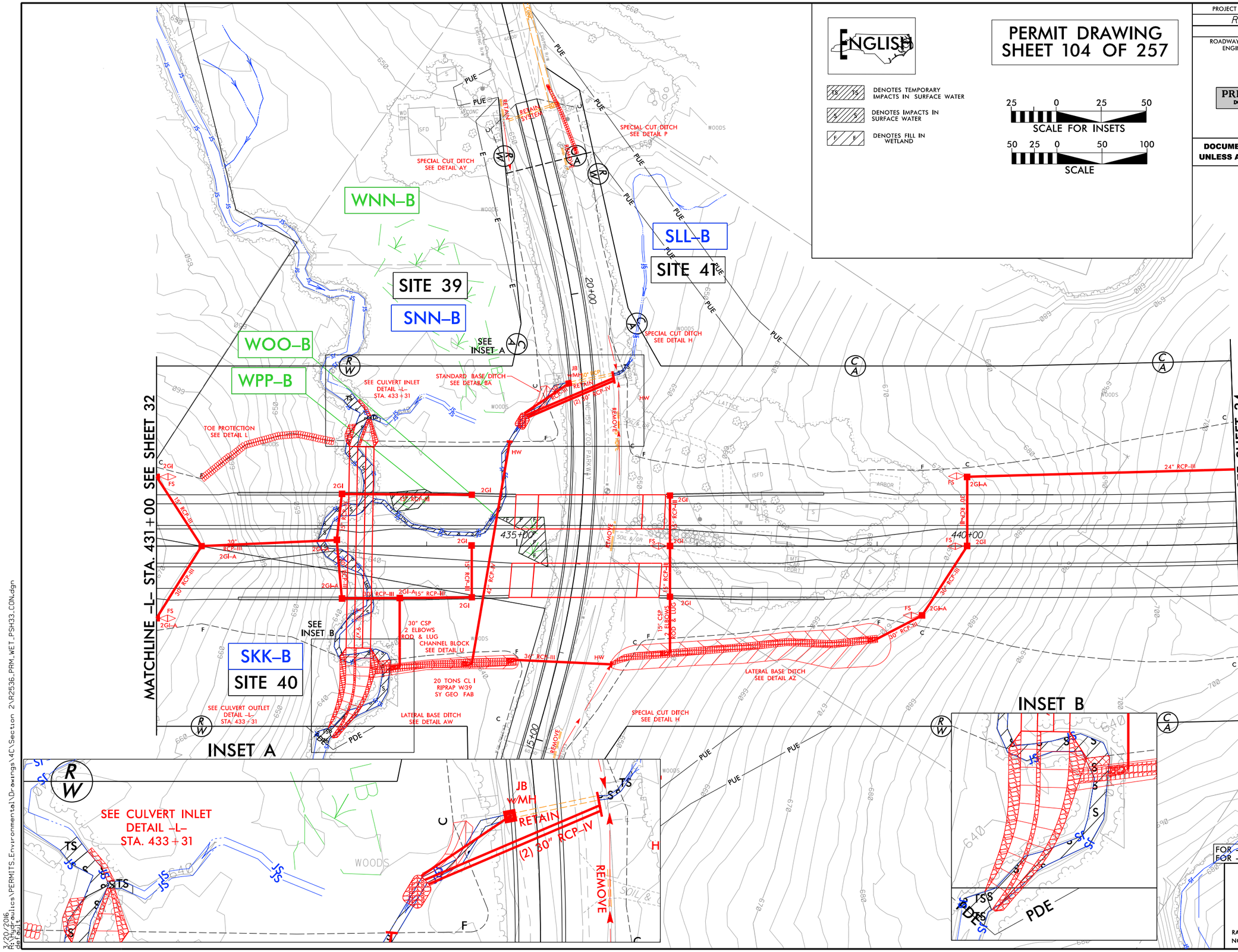
S S DENOTES IMPACTS IN SURFACE WATER

F F DENOTES FILL IN WETLAND

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

NAD 83/95



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FOR –Y10_END– PROFILE SEE SHT. 180

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PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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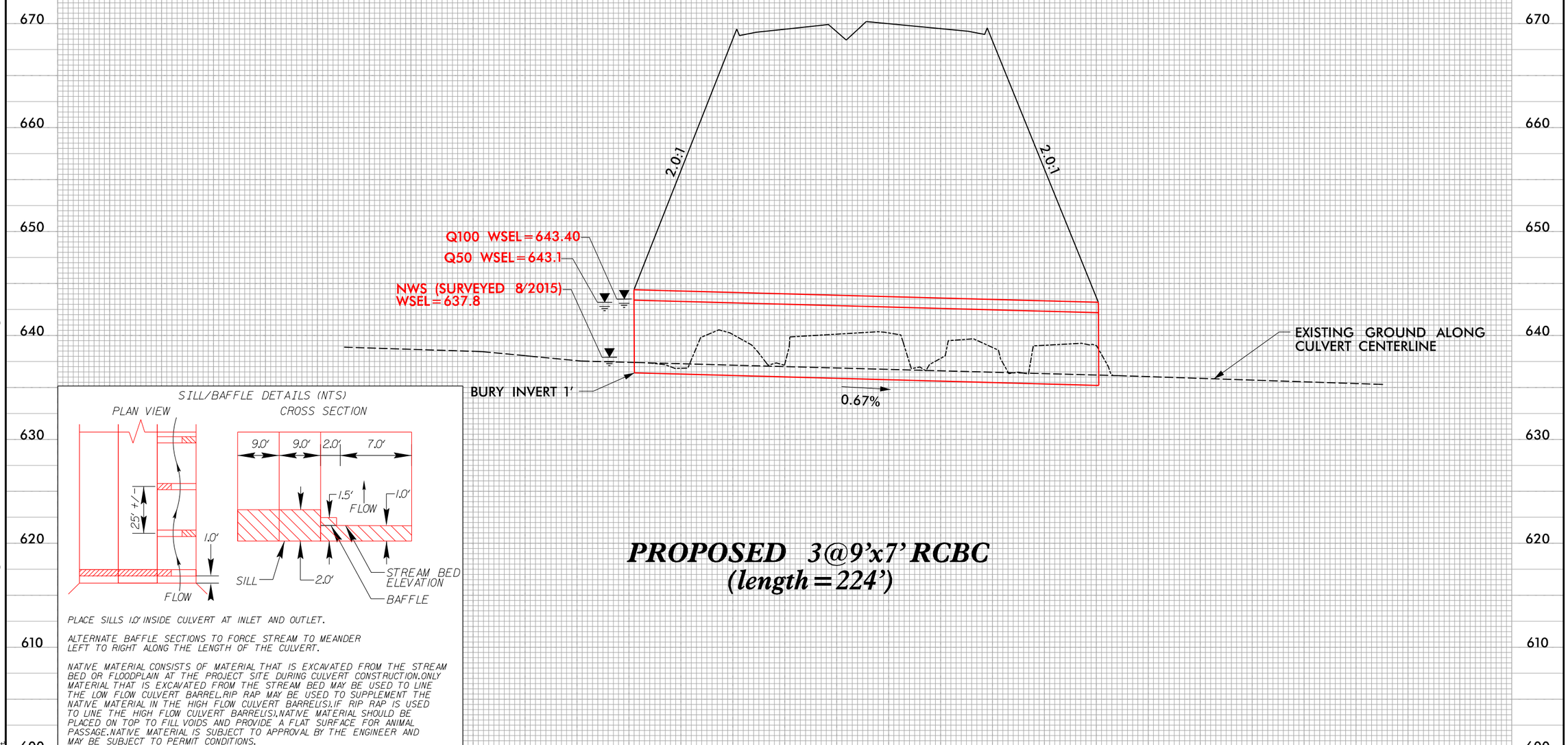
SHEET 105 OF 257

ENGLISH

SITE 40
–L– 433+32



SILL/BAFFLE DETAILS (NTS)

PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET.

ALTERNATE BAFFLE SECTIONS TO FORCE STREAM TO MEANDER LEFT TO RIGHT ALONG THE LENGTH OF THE CULVERT.

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION.ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL.RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL(S).IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL(S).NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE.NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

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	R-2536	X-XX

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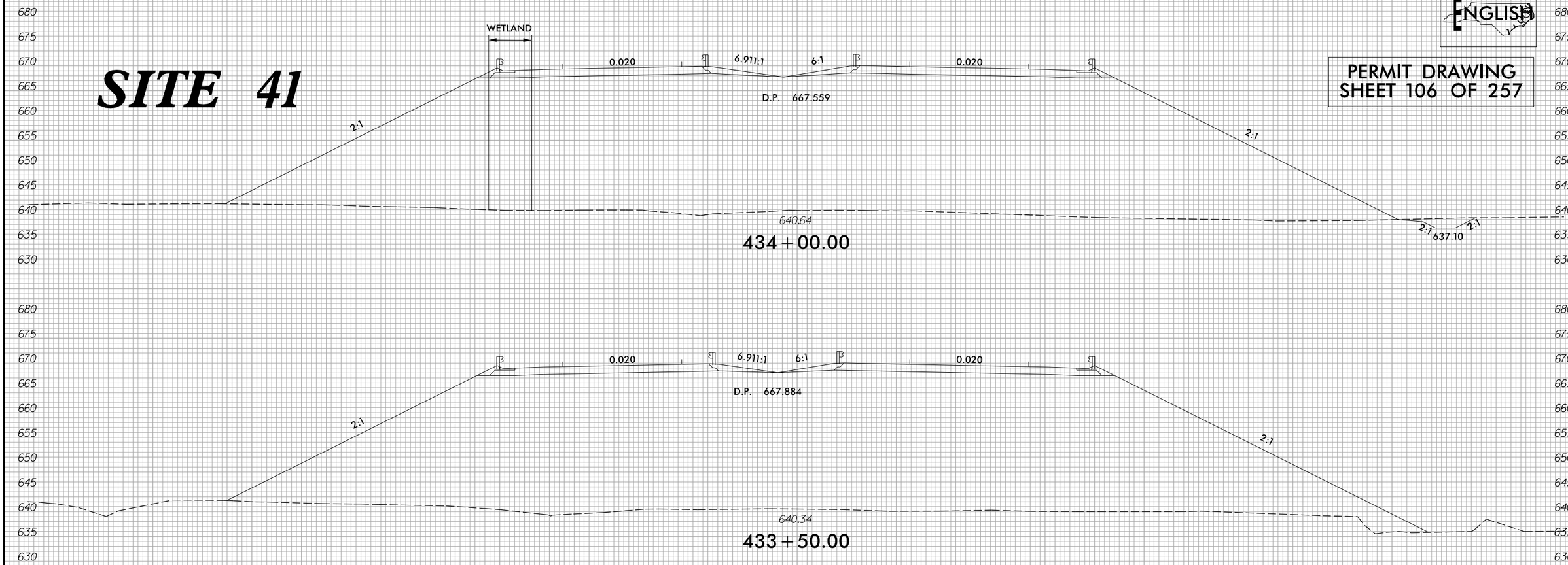
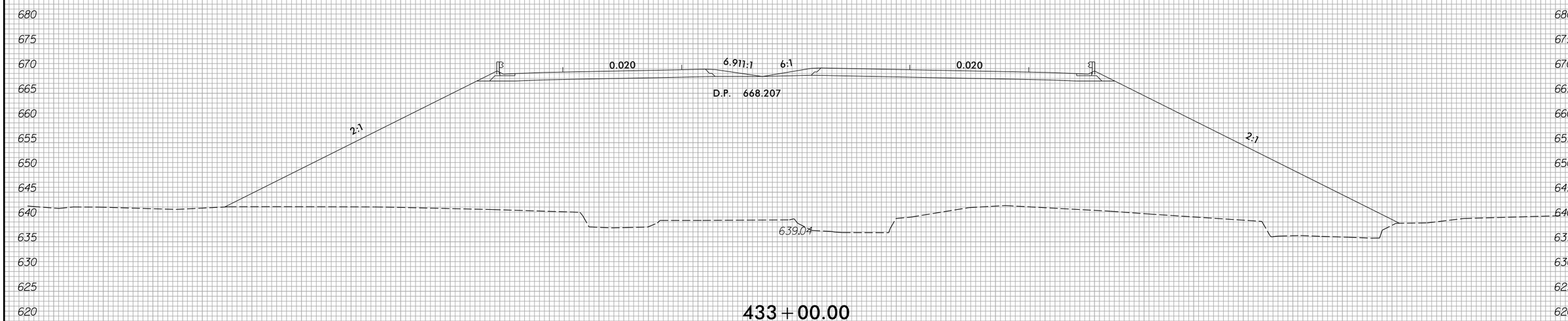
SHEET 106 OF 257

SITE 41





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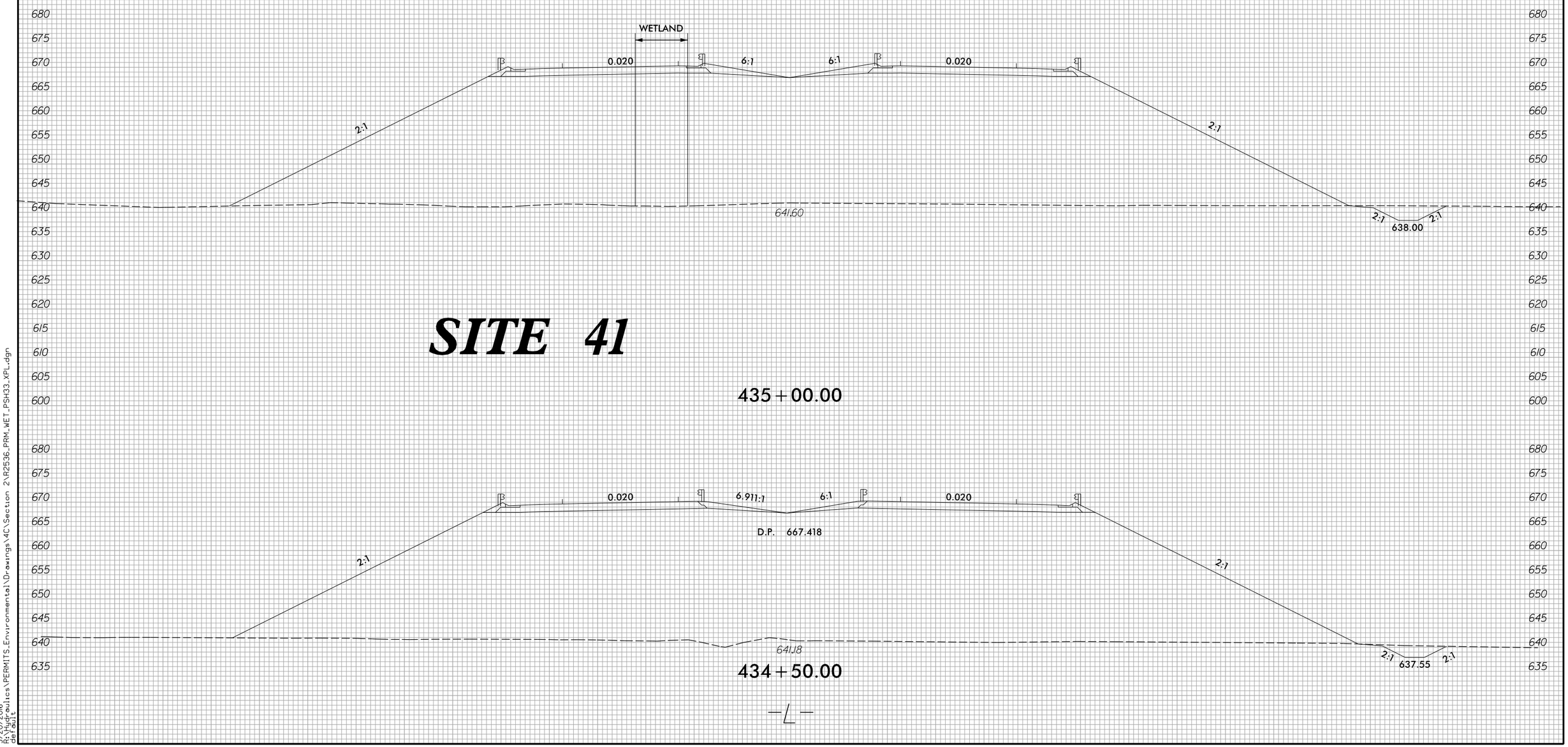
	R-2536	X-XX

ENGLISH

PERMIT DRAWING
SHEET 107 OF 257



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PERMIT DRAWING
SHEET 108 OF 257

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

PROJECT REFERENCE NO.	SHEET NO.
R-2536	34
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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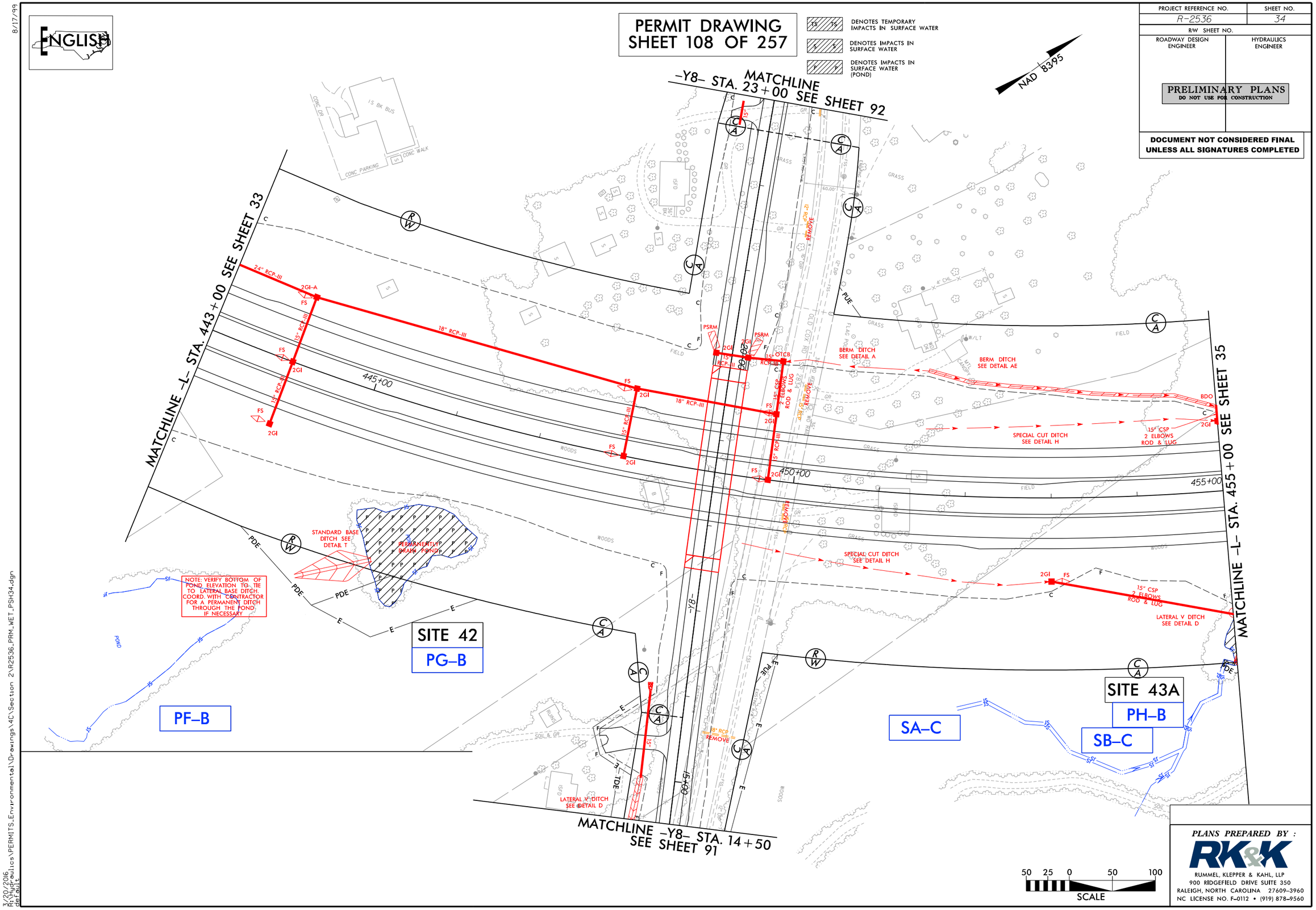

50 25 0 50 100
SCALE

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SHEET 109 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

P P DENOTES IMPACTS IN SURFACE WATER (POND)

PROJECT REFERENCE NO.	SHEET NO.
R-2536	34
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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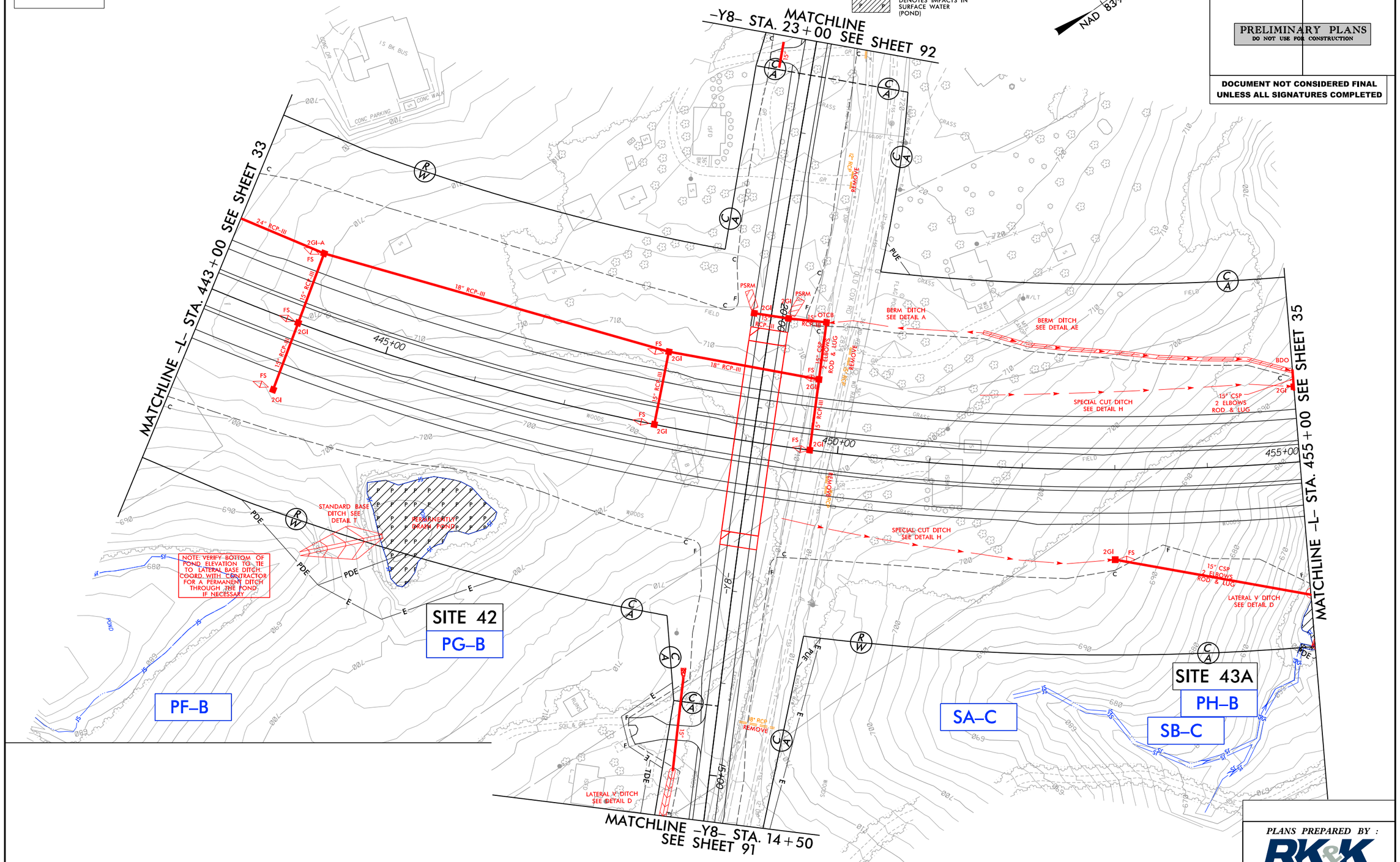

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	35
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING
SHEET 110 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

P P DENOTES IMPACTS IN SURFACE WATER (POND)

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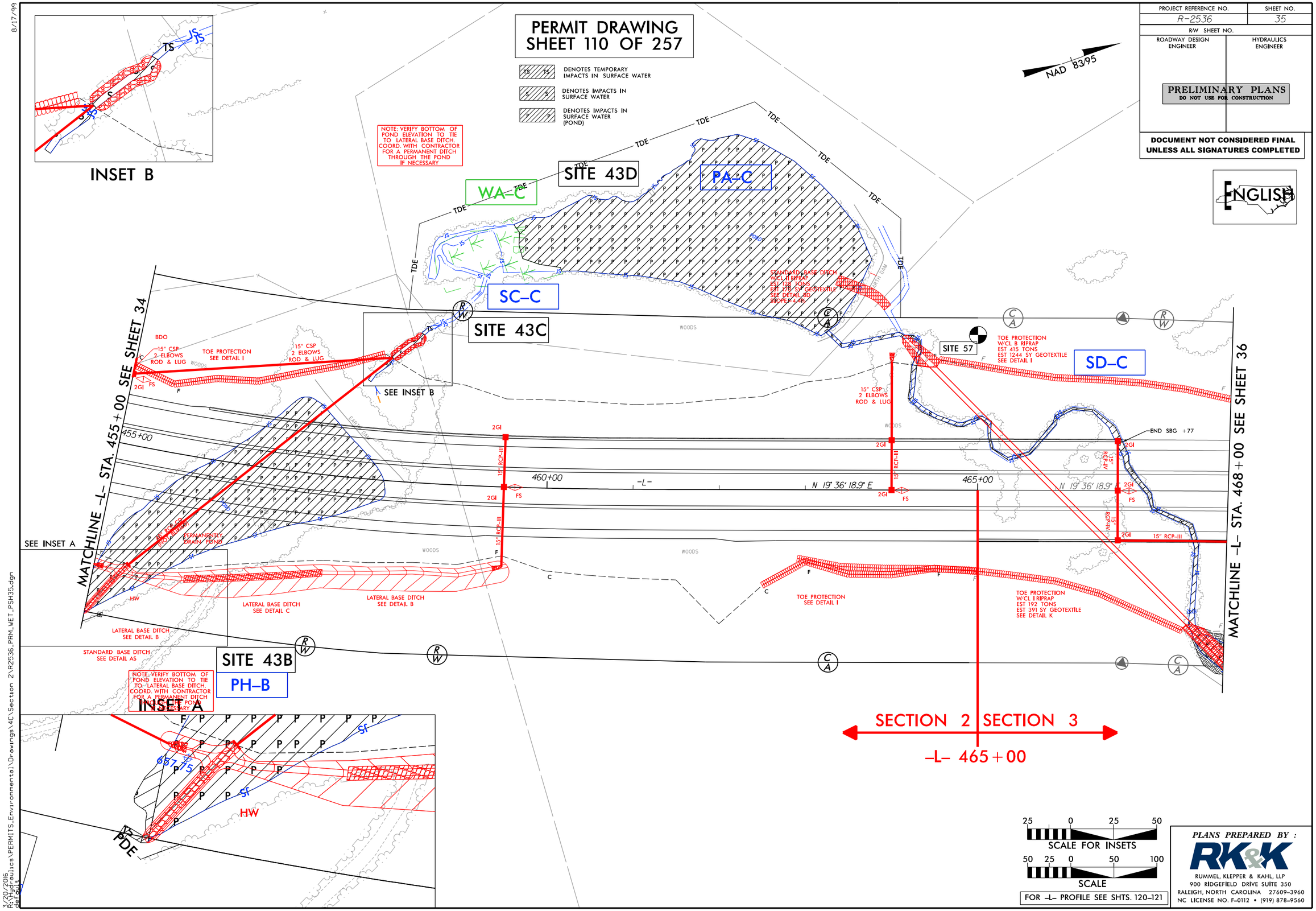

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

FOR -L- PROFILE SEE SHTS. 120-121

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	35
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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ENGLISH

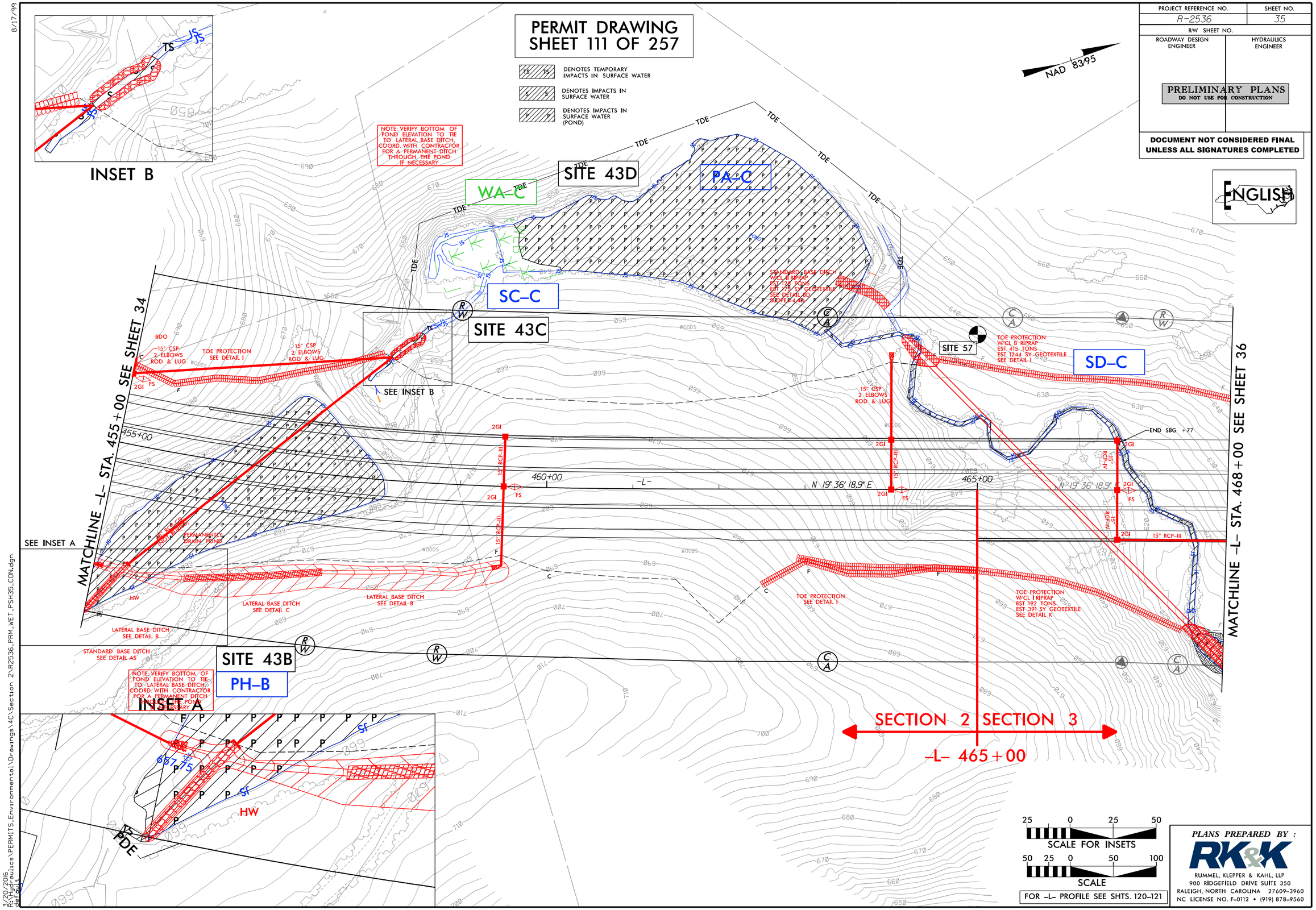
PERMIT DRAWING SHEET 111 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

P P DENOTES IMPACTS IN SURFACE WATER (POND)

NAD 83/95



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SHEET 112 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	70
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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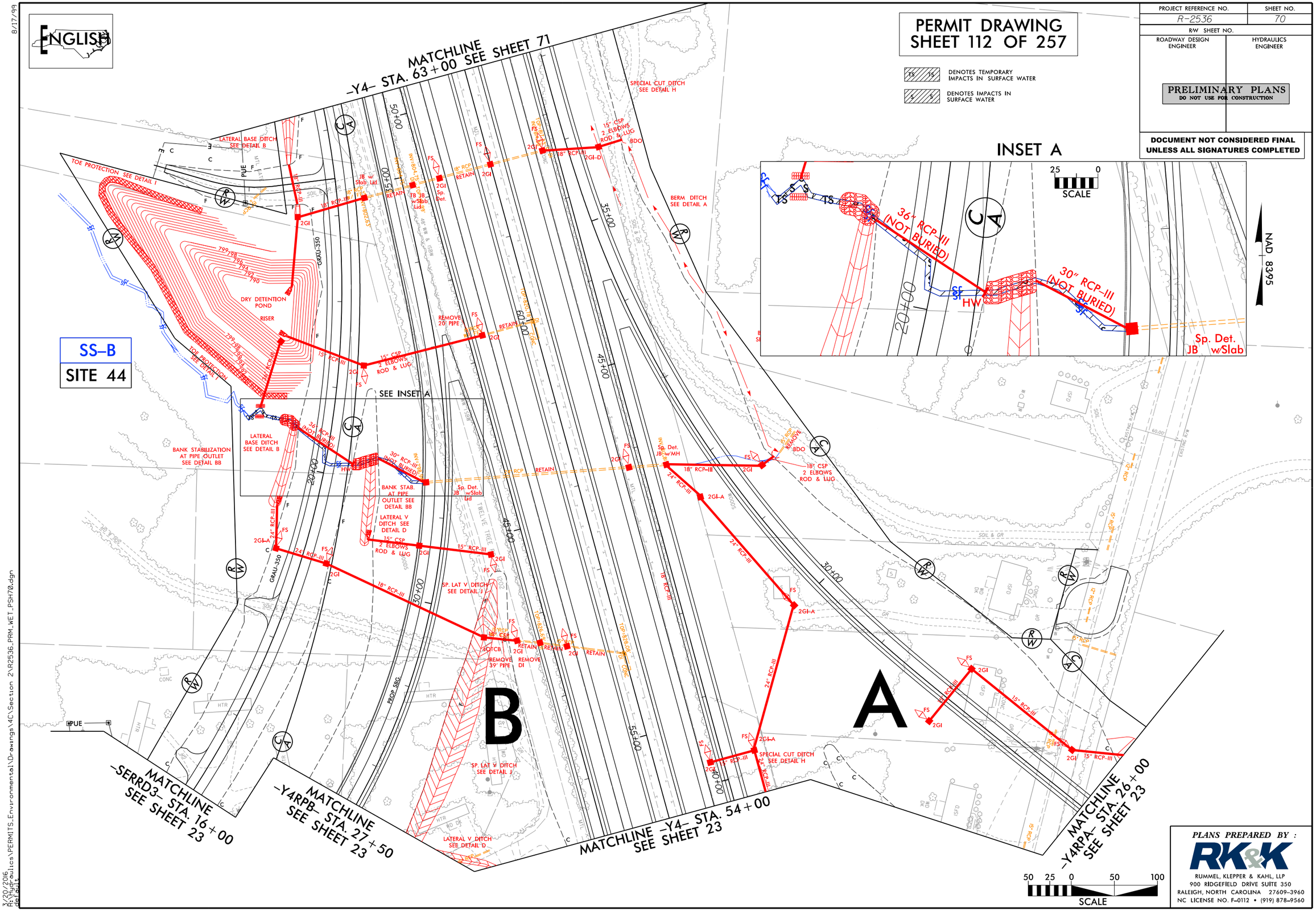
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER



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SHEET 113 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	70
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

SS-B
SITE 44

MATCHLINE -Y4- STA. 63+00 SEE SHEET 71

MATCHLINE -SERRD3- STA. 16+00 SEE SHEET 23

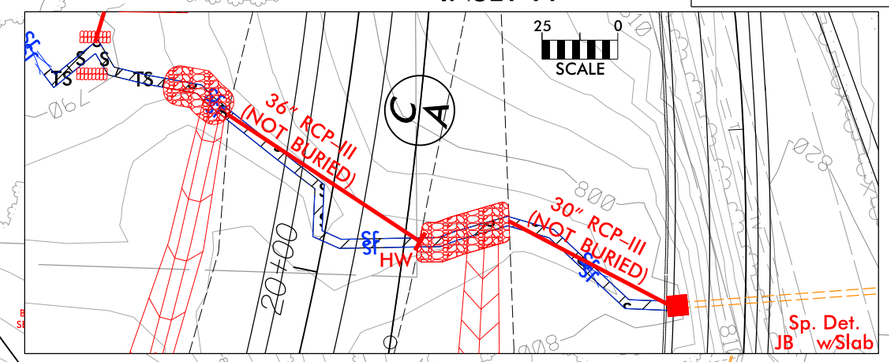
MATCHLINE -Y4RPB- STA. 27+50 SEE SHEET 23

MATCHLINE -Y4- STA. 54+00 SEE SHEET 23

MATCHLINE -Y4RPA- STA. 26+00 SEE SHEET 23

SEE INSET A

INSET A



NAD 83/95

TOE PROTECTION SEE DETAIL I

LATERAL BASE DITCH SEE DETAIL B

DRY DETENTION POND

RISER

BANK STABILIZATION AT PIPE OUTLET SEE DETAIL BB

LATERAL V DITCH SEE DETAIL D

SP. LAT. V DITCH SEE DETAIL J

SPECIAL CUT DITCH SEE DETAIL H

BERM DITCH SEE DETAIL A

REMOVE 39" PIPE

REMOVE DI

REMOVE 20" PIPE

15" CSP 2 ELBOWS ROD & LUG

18" CSP 2 ELBOWS ROD & LUG

Sp. Det. JB w/MH

Sp. Det. JB w/Slab Lid

B

A

50 25 0 50 100
SCALE

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R-2536	71
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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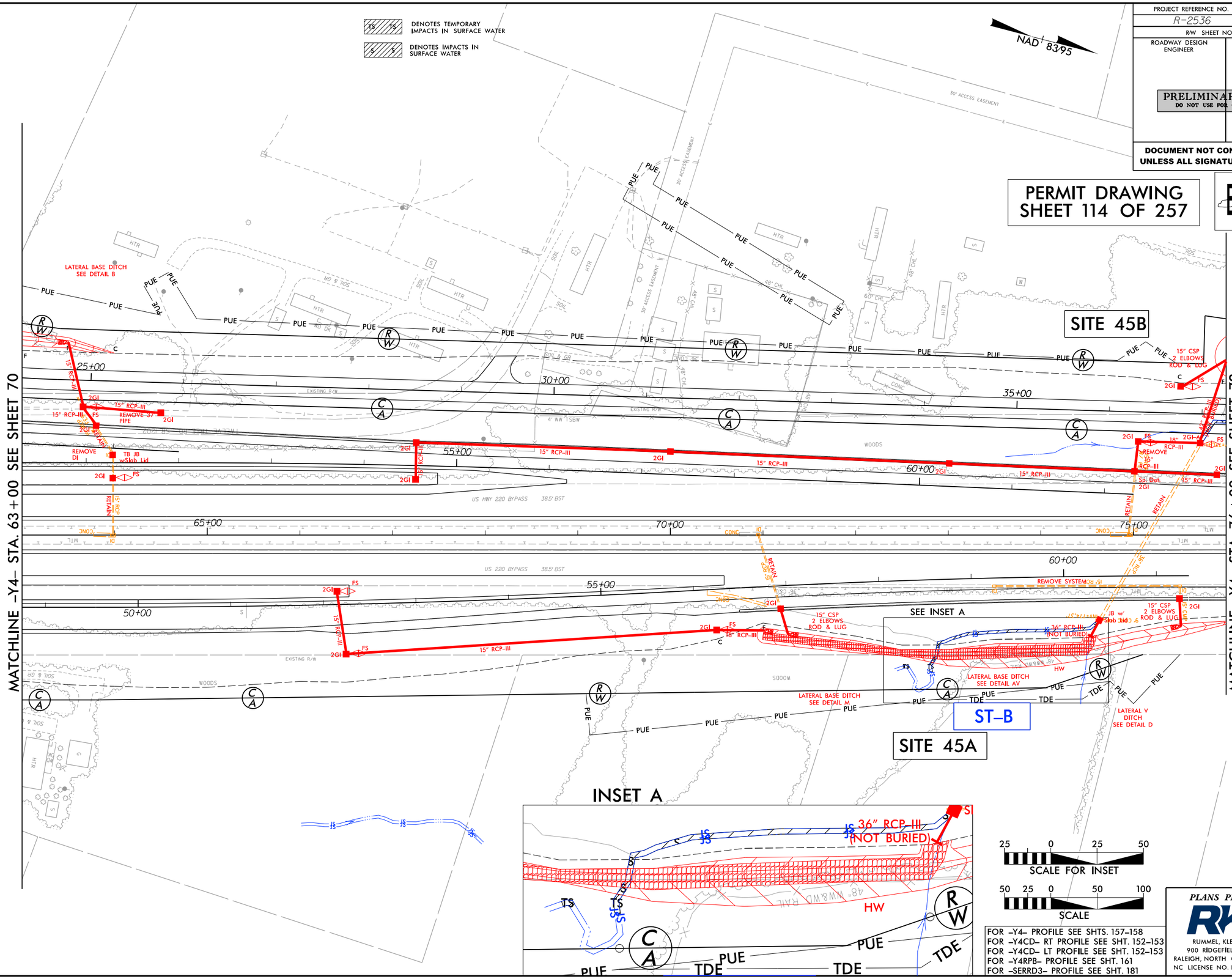
PERMIT DRAWING
SHEET 114 OF 257

ENGLISH



FOR -Y4- PROFILE SEE SHTS. 157-158
FOR -Y4CD- RT PROFILE SEE SHT. 152-153
FOR -Y4CD- LT PROFILE SEE SHT. 152-153
FOR -Y4RPB- PROFILE SEE SHT. 161
FOR -SERRD3- PROFILE SEE SHT. 181

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R-2536	71
R/W SHEET NO.	
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SHEET 115 OF 257

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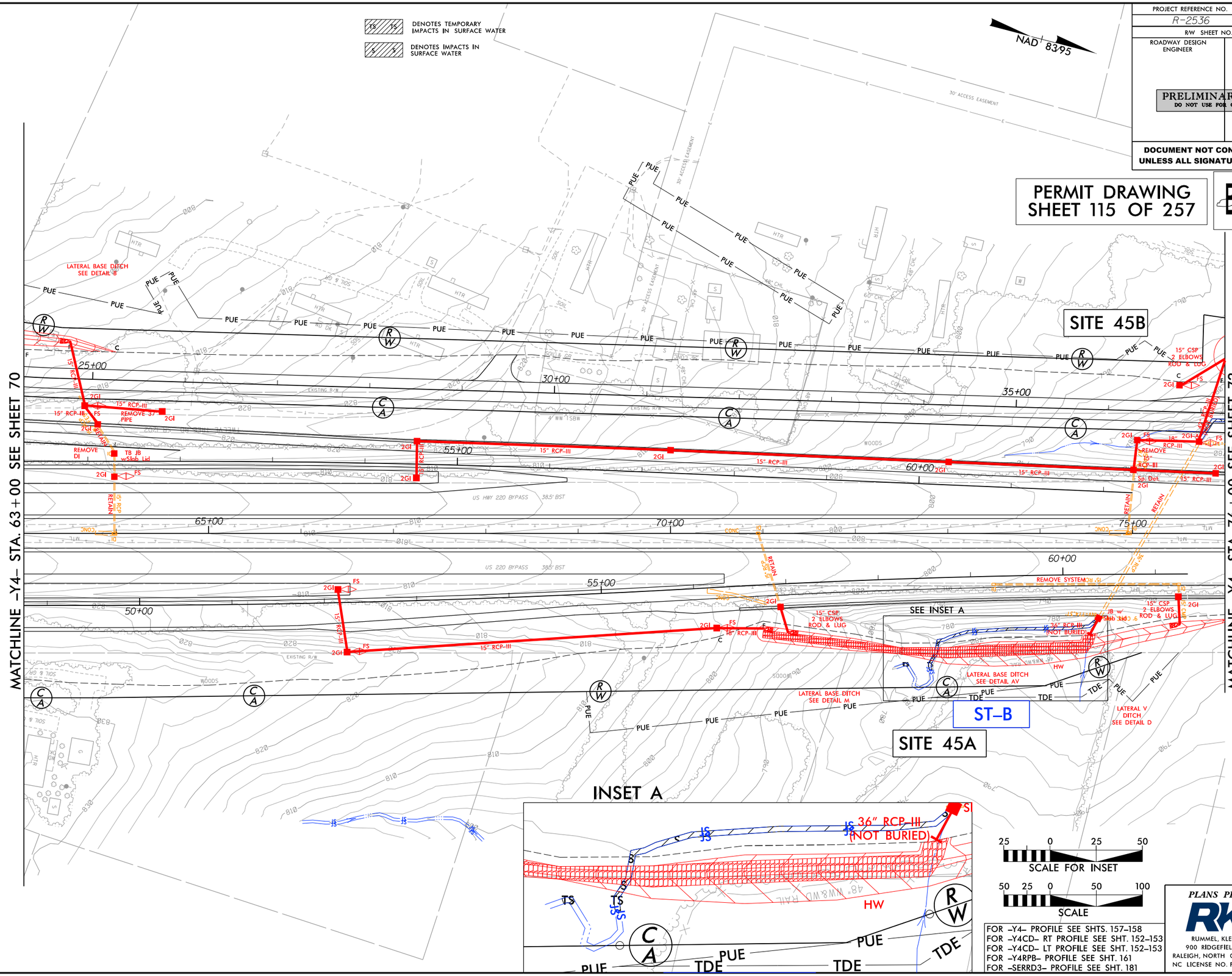

FOR -Y4- PROFILE SEE SHTS. 157-158
FOR -Y4CD- RT PROFILE SEE SHT. 152-153
FOR -Y4CD- LT PROFILE SEE SHT. 152-153
FOR -Y4RPB- PROFILE SEE SHT. 161
FOR -SERRD3- PROFILE SEE SHT. 181

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SHEET 116 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	72
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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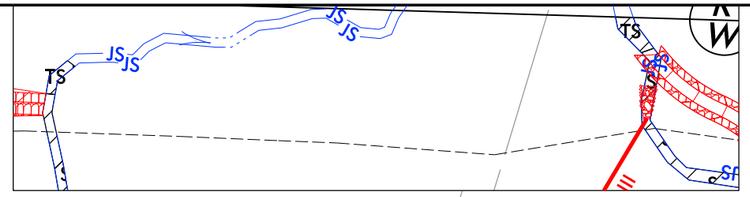

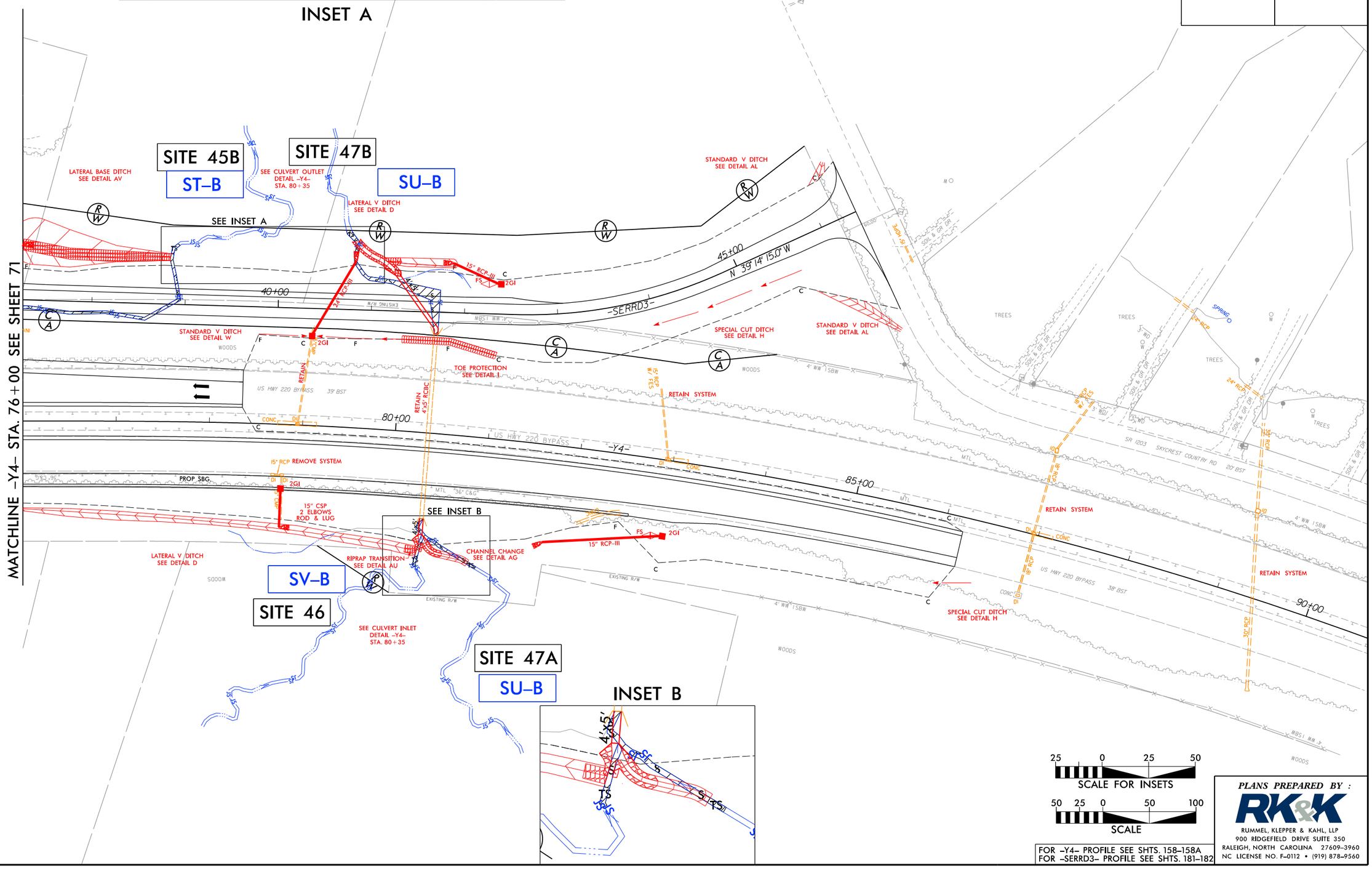

25 0 25 50
SCALE FOR INSETS

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SCALE

FOR –Y4– PROFILE SEE SHTS. 158–158A
FOR –SERRD3– PROFILE SEE SHTS. 181–182

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PERMIT DRAWING SHEET 117 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
R-2536	72
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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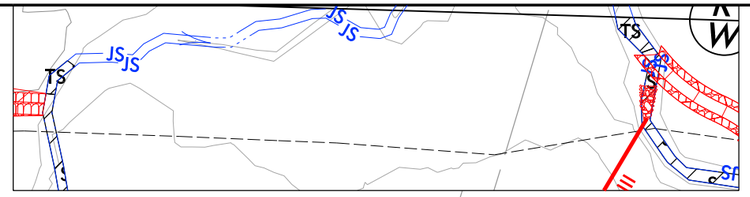

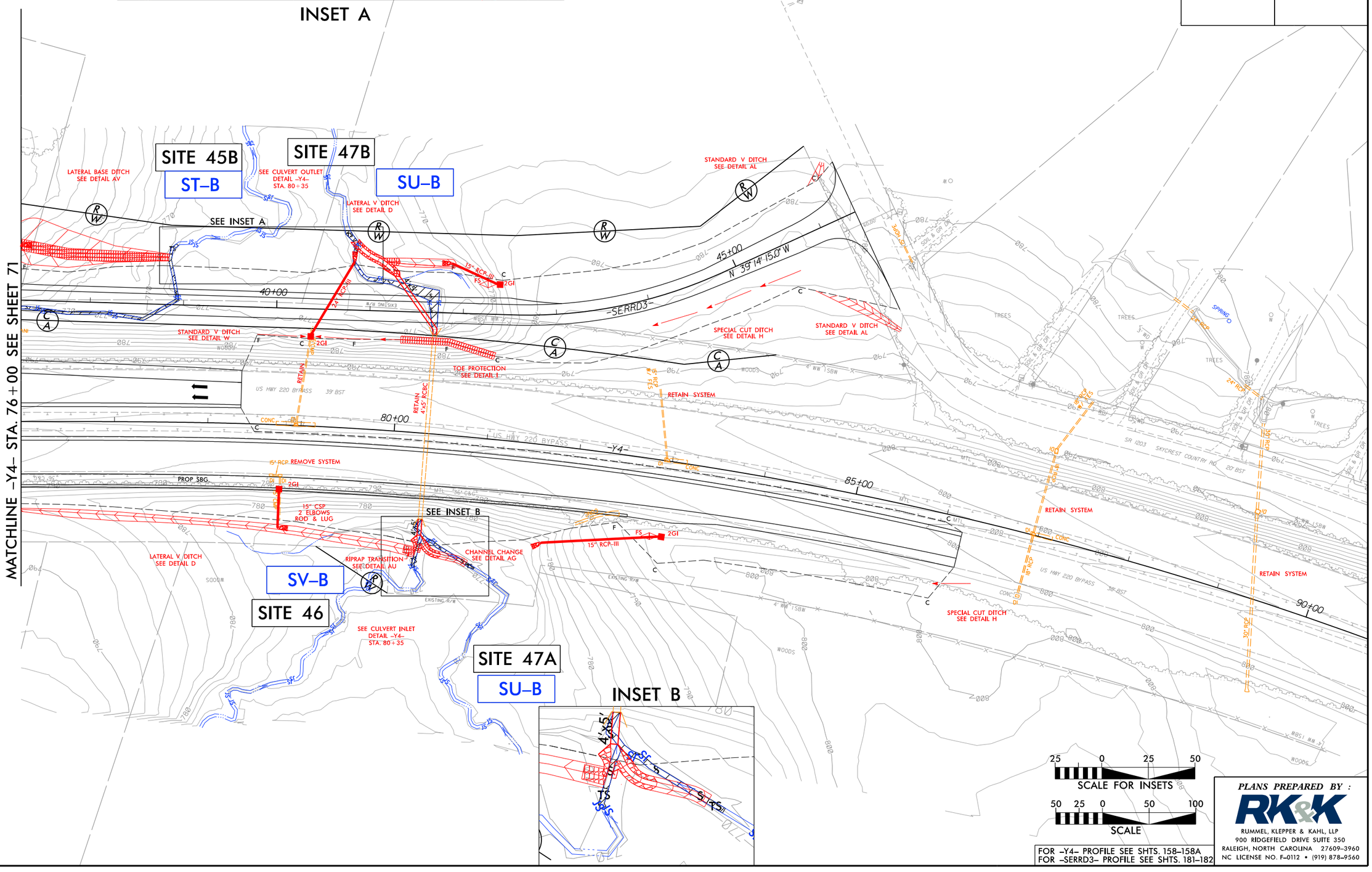

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SCALE FOR INSETS

50 25 0 50 100
SCALE

FOR -Y4- PROFILE SEE SHTS. 158-158A
FOR -SERRD3- PROFILE SEE SHTS. 181-182

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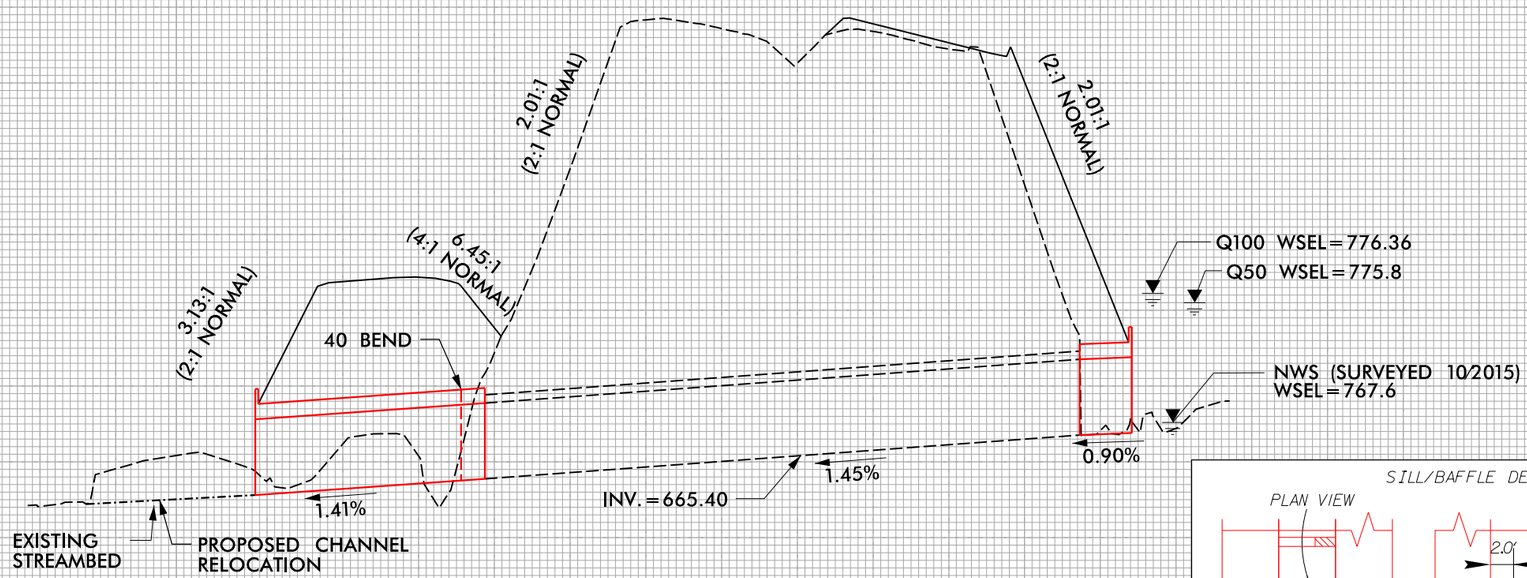
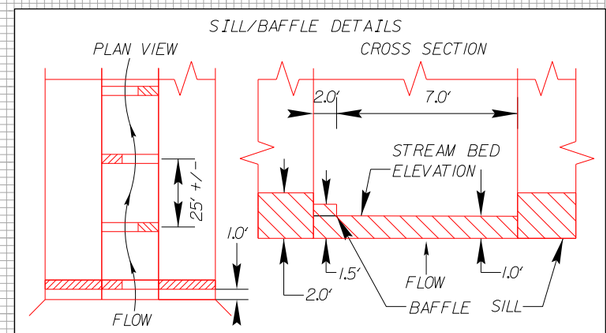
SHEET 118 OF 257

ENGLISH

SITE 47
–Y4– 80+35





PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET.

ALTERNATE BAFFLE SECTIONS TO FORCE STREAM TO MEANDER LEFT TO RIGHT ALONG THE LENGTH OF THE CULVERT.

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION.ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL.RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL(S).IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL(S),NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE.NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

EXTEND EXISTING 4'x5' RCBC
(total length=291')

5/14/99
6/14/2016
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	75
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 119 OF 257

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

INSET A

SITE 49
SWW–B
SEE INSET A
WYY–B
SITE 48
SEE CULVERT INLET DETAIL –Y5– STA. 41+00
PLACE RIPRAP ONLY ON SLOPES IN WETLANDS
TDE FOR EROSION CONTROL DEVICE
TDE
TOE PROTECTION SEE DETAIL K
CHANNEL RELOCATION SEE DETAIL AG
REMOVE
MATCHLINE –Y5– STA. 36+00 SEE SHEET 69
–Y5–
N 72° 35' 33.2" E
40+00
45+00
2GI
15" CSP 2 ELBOWS ROD & LUG
SEE CULVERT OUTLET DETAIL –Y5– STA. 41+00
WXX–B
SAA–B
SITE 48
SEE INSET B
TDE FOR EROSION CONTROL DEVICE
PDE
TOE PROTECTION SEE DETAIL I FS ELEV=814.3
24" RCP W/
LATERAL BASE DITCH SEE DETAIL C
STANDARD BASE DITCH SEE DETAIL R
POND WE 806
PC–B
MATCHLINE –Y5– STA. 50+00 SEE SHEET 76
NAD 83/95

INSET B

ENGLISH

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

FOR –Y5– PROFILE SEE SHTS. 165–166

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	75
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 120 OF 257

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

INSET A

NAD 83/95

SITE 49
SWW-B
SEE INSET A
WYY-B
SITE 48
WXX-B
SEE INSET B
SAA-B
SITE 48
PC-B

MATCHLINE -Y5- STA. 36+00 SEE SHEET 69

MATCHLINE -Y5- STA. 50+00 SEE SHEET 76

-Y5-
N 72° 35' 33.2" E
40+00
45+00

TDE FOR EROSION CONTROL DEVICE
TDE
TOE PROTECTION SEE DETAIL
PLACE RIPRAP ONLY ON SLOPES IN WETLANDS
CHANNEL RELOCATION SEE DETAIL AG
SEE CULVERT INLET DETAIL -Y5- STA. 41+00
REMOVE
2GI
15" CSP 2 ELBOWS ROD & LUG
SEE CULVERT OUTLET DETAIL -Y5- STA. 41+00
TOE PROTECTION SEE DETAIL I FS ELEV=814.3
24" RCP
STANDARD BASE DITCH SEE DETAIL R
LATERAL BASE DITCH SEE DETAIL C
PDE
POND WL 806

INSET B

ENGLISH

SCALE FOR INSETS: 25 0 25 50

SCALE: 50 25 0 50 100

FOR -Y5- PROFILE SEE SHTS. 165-166

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PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISED 6/14/2016

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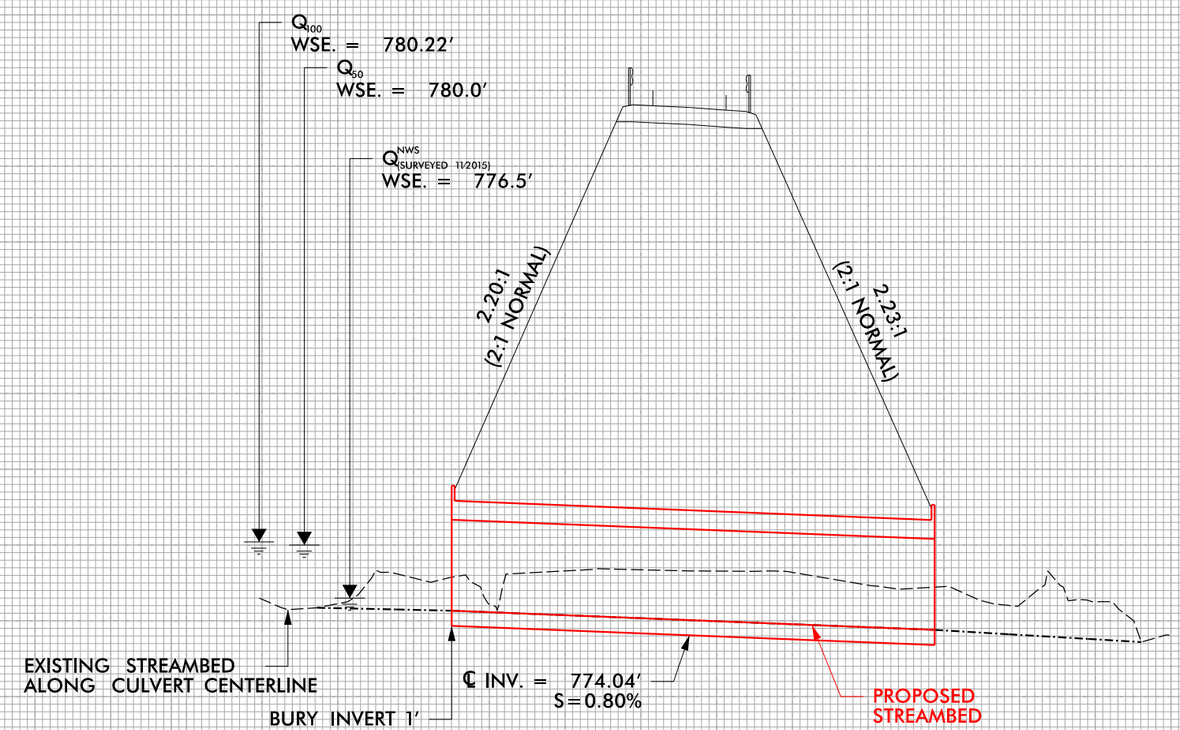
PERMIT DRAWING
SHEET 121 OF 257

ENGLISH

SITE 48
–Y5– 41+00



PROPOSED 3@10′x7′ RCBC
(length=160′)

SILL/BAFFLE DETAILS

(NOT TO SCALE)

MULTI– BARREL CULVERT LOW FLOW CHANNEL, SILLS AND FLOOD PLAIN BENCH

*NOTES:

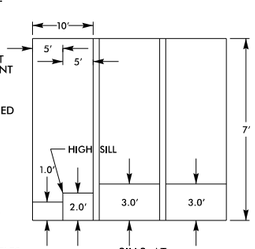
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP–RAP MAY BE USED TO SUPPLEMENT THE NATIVE BED MATERIAL IN THE HIGH FLOW CULVERT BARREL(S). IF RIP–RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL(S), NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

2) SILLS/BAFFLES ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

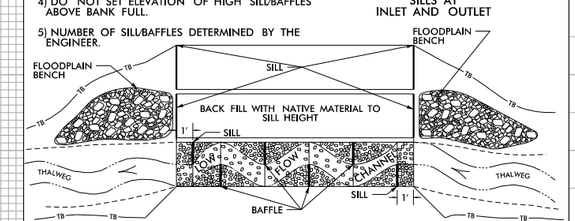
3) TOP OF LOW FLOW SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) DO NOT SET ELEVATION OF HIGH SILL/BAFFLES ABOVE BANK FULL.

5) NUMBER OF SILL/BAFFLES DETERMINED BY THE ENGINEER.



SILLS AT INLET AND OUTLET



NUMBER OF BAFFLES=9
ON 20 FT CENTERS FROM DOWNSTREAM SILL

PLAN VIEW

913

5/14/99

6/14/2016
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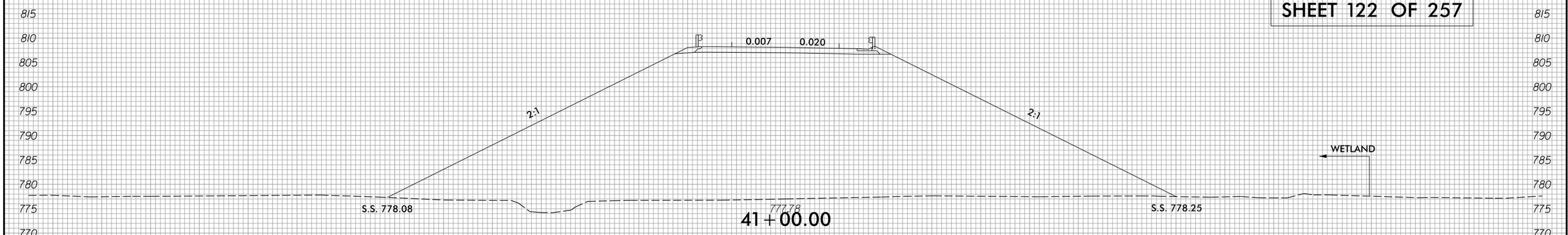
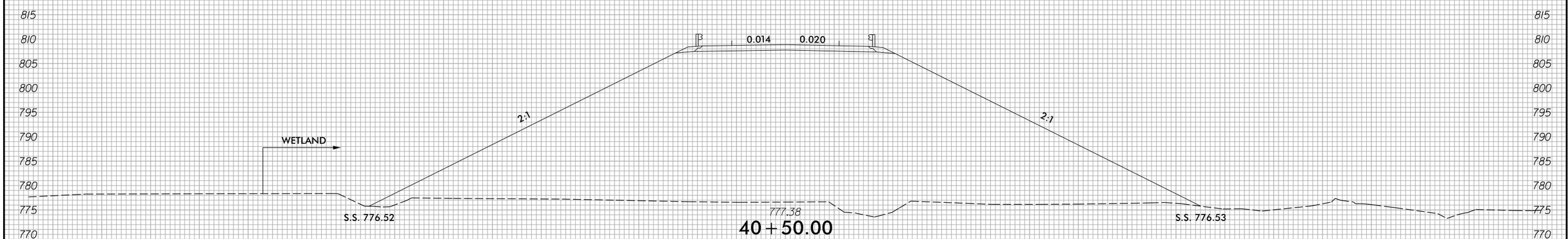
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-XX

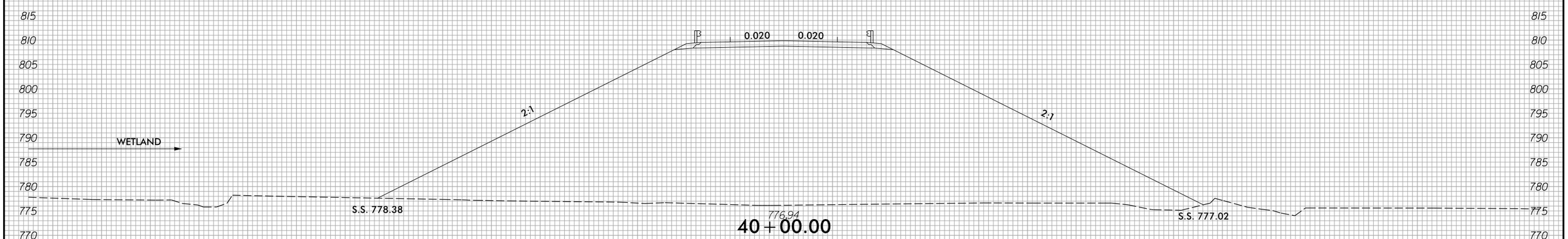
SITE 48

ENGLISH

PERMIT DRAWING
SHEET 122 OF 257







-Y5-

8/23/99

3/20/2016
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PROJECT REFERENCE NO.	SHEET NO.
R-2536	80
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 123 OF 257

ENGLISH

TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S DENOTES IMPACTS IN SURFACE WATER

NAD 83/95

R/W REVISION: DATE: 3/4/2016 - COMBINED PARCELS 35I AND 35J INTO ONE PARCEL NO. 35I

INSET A

PLUG & FILL W/ FLOWABLE FILL

36" RCP-III

24" RCP REMOVE

TBJB w/MH

RETAIN

RIP RAP

WOODS

PUE

TS

SCALE 25 0

LIBERTY CIRCLE

INDEPENDENCE AVE. (SR 2593)

WMM-B

SMM-B

SKK-D

SITE 50

SEE INSET A

S 84° 02' 47.5" E

N 13° 24' 02.2" W

N 78° 52' 44.7" E

S 35° 45' 22.1" E

10+00

35+00

30+00

40+00

+79.00 30.31' EXIST. R/W

+48.00 55'

+65.00 62'

+27.00 61.45' EXIST. R/W

FREEDOM TRAIL (SR 2994) 22' PAVED RDWY

INDEPENDENCE AVE. (SR 2593) 21' PAVED ROADWAY

LATERAL BASE DITCH SEE DETAIL C

LATERAL BASE DITCH SEE DETAIL B

LATERAL BASE DITCH SEE DETAIL M

LATERAL V DITCH SEE DETAIL D

LATERAL V DITCH SEE DETAIL G

REMOVE PIPE MATCH BASE DITCH TO EXISTING STREAM

PLUG & FILL W/ FLOWABLE FILL

SPECIAL CUT DITCH SEE DETAIL H

STANDARD V DITCH SEE DETAIL W

15" CSP 2 ELBOWS ROD & LUG

18" RCP-III

24" RCP

15" RCP

8" RCP

2GI

2GI FS

ISFD

2SFD

TANK

4" CHL

WD PORCH W/STEPS

WD PORCH W/STEPS PLASTIC SHED

MATCHLINE -Y9A- STA. 29+00 SEE SHEET 82

SCALE 50 25 0 50 100

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	80
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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PERMIT DRAWING SHEET 124 OF 257

ENGLISH

TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S DENOTES IMPACTS IN SURFACE WATER

NAD 83/95

R/W REVISION: DATE: 3/4/2016 - COMBINED PARCELS 35I AND 35IJ INTO ONE PARCEL NO. 35I

INSET A

PLUG & FILL W/ FLOWABLE FILL

36" RCP-III

24" RCP REMOVE

TBJB w/MH

RETAIN

SCALE 25 0

LIBERTY CIRCLE

INDEPENDENCE AVE. (SR 2593)

WMM-B

SMM-B

SKK-D

S 84° 02' 47.5" E

N 13° 24' 02.2" W

N 78° 52' 44.7" E

S 35° 45' 22.1" E

LATERAL BASE DITCH SEE DETAIL C

LATERAL BASE DITCH SEE DETAIL B

LATERAL BASE DITCH SEE DETAIL M

LATERAL V DITCH SEE DETAIL D

LATERAL V DITCH SEE DETAIL G

REMOVE PIPE MATCH BASE DITCH TO EXISTING STREAM

SPECIAL CUT DITCH SEE DETAIL H

STANDARD V DITCH SEE DETAIL W

SITE 50

SEE INSET A

MATCHLINE -Y9A- STA. 29+00 SEE SHEET 82

SCALE 50 25 0 50 100

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	82
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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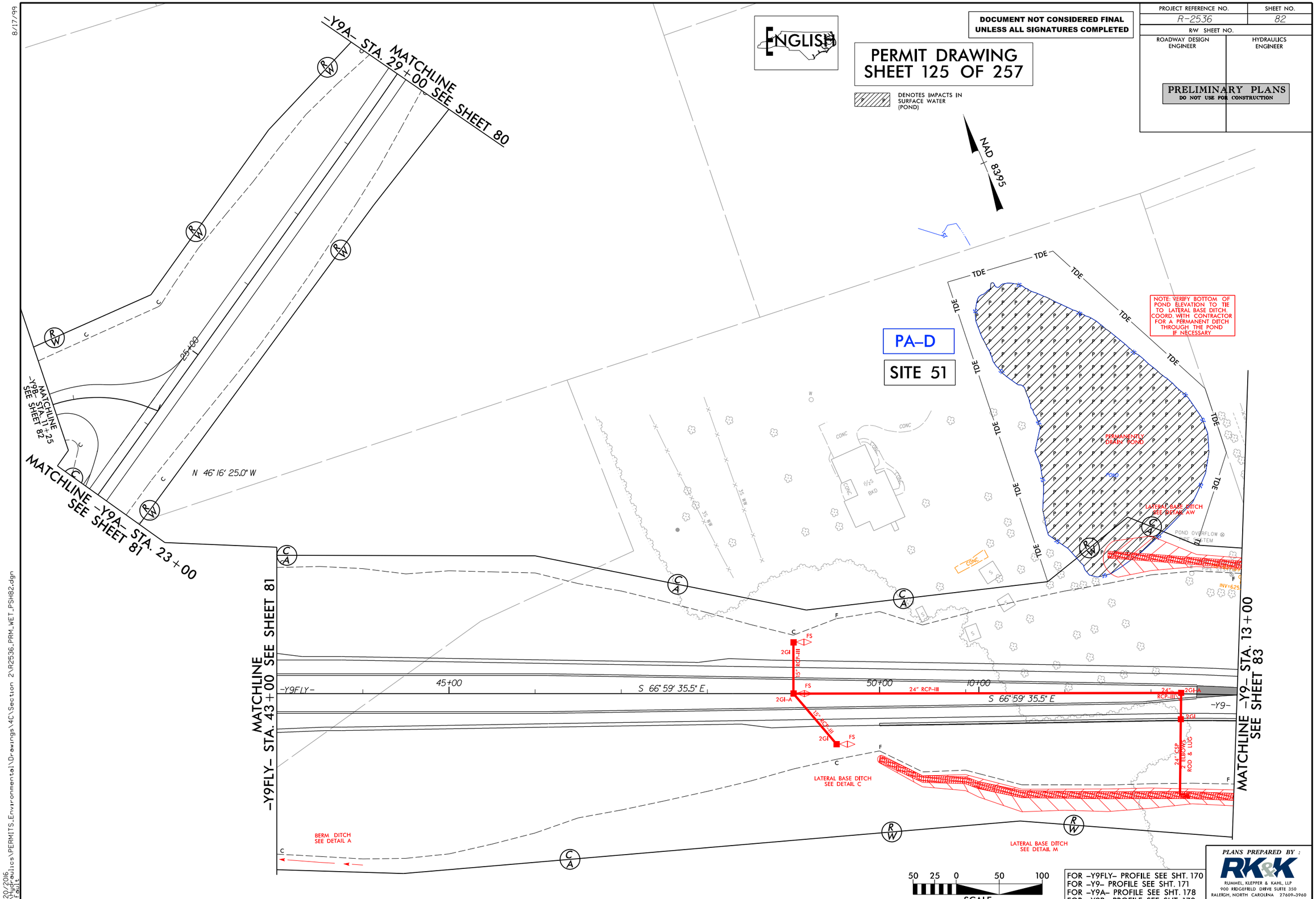
ENGLISH

PERMIT DRAWING SHEET 125 OF 257

DENOTES IMPACTS IN SURFACE WATER (POND)

NAD 83/95



50 25 0 50 100
SCALE

FOR -Y9FLY- PROFILE SEE SHT. 170
FOR -Y9- PROFILE SEE SHT. 171
FOR -Y9A- PROFILE SEE SHT. 178
FOR -Y9B- PROFILE SEE SHT. 178

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	82
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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PERMIT DRAWING SHEET 126 OF 257

ENGLISH

50 25 0 50 100
SCALE

DENOTES IMPACTS IN SURFACE WATER (POND)

NAD 83/95

PA-D

SITE 51

NOTE: VERIFY BOTTOM OF POND ELEVATION TO TIE TO LATERAL BASE DITCH. COORD. WITH CONTRACTOR FOR A PERMANENT DITCH THROUGH THE POND IF NECESSARY

MATCHLINE -Y9A- STA. 29+00 SEE SHEET 80

MATCHLINE -Y9A- STA. 11+25 SEE SHEET 82

MATCHLINE -Y9A- STA. 23+00 SEE SHEET 81

MATCHLINE -Y9FLY- STA. 43+00 SEE SHEET 81

MATCHLINE -Y9- STA. 13+00 SEE SHEET 83

N 46° 16' 25.0" W

S 66° 59' 35.5" E

-Y9FLY-

-Y9-

45+00

50+00

10+00

TDE

PERMANENTLY DRAIN POND

LATERAL BASE DITCH SEE DETAIL AW

POND OVERFLOW @ TOP OF DAM EL. 630

INV=625

2GI

FS

15" RCP-III

24" RCP-III

2GI-A

24" CSP ROD & LUG

LATERAL BASE DITCH SEE DETAIL C

BERM DITCH SEE DETAIL A

LATERAL BASE DITCH SEE DETAIL M

FOR -Y9FLY- PROFILE SEE SHT. 170
FOR -Y9- PROFILE SEE SHT. 171
FOR -Y9A- PROFILE SEE SHT. 178
FOR -Y9B- PROFILE SEE SHT. 178

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	83
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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ENGLISH

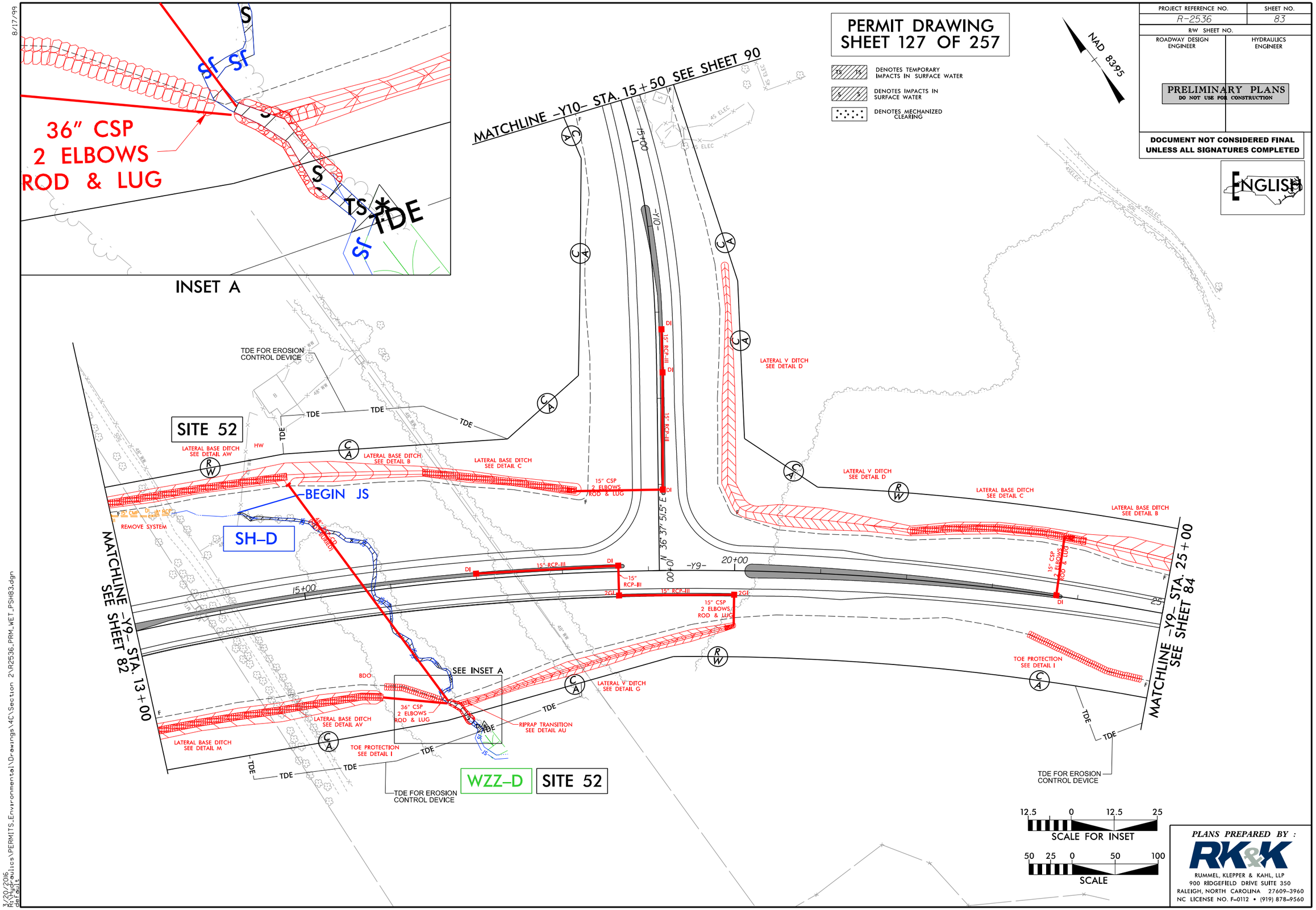
PERMIT DRAWING
SHEET 127 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

NAD 83/95



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default

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	83
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

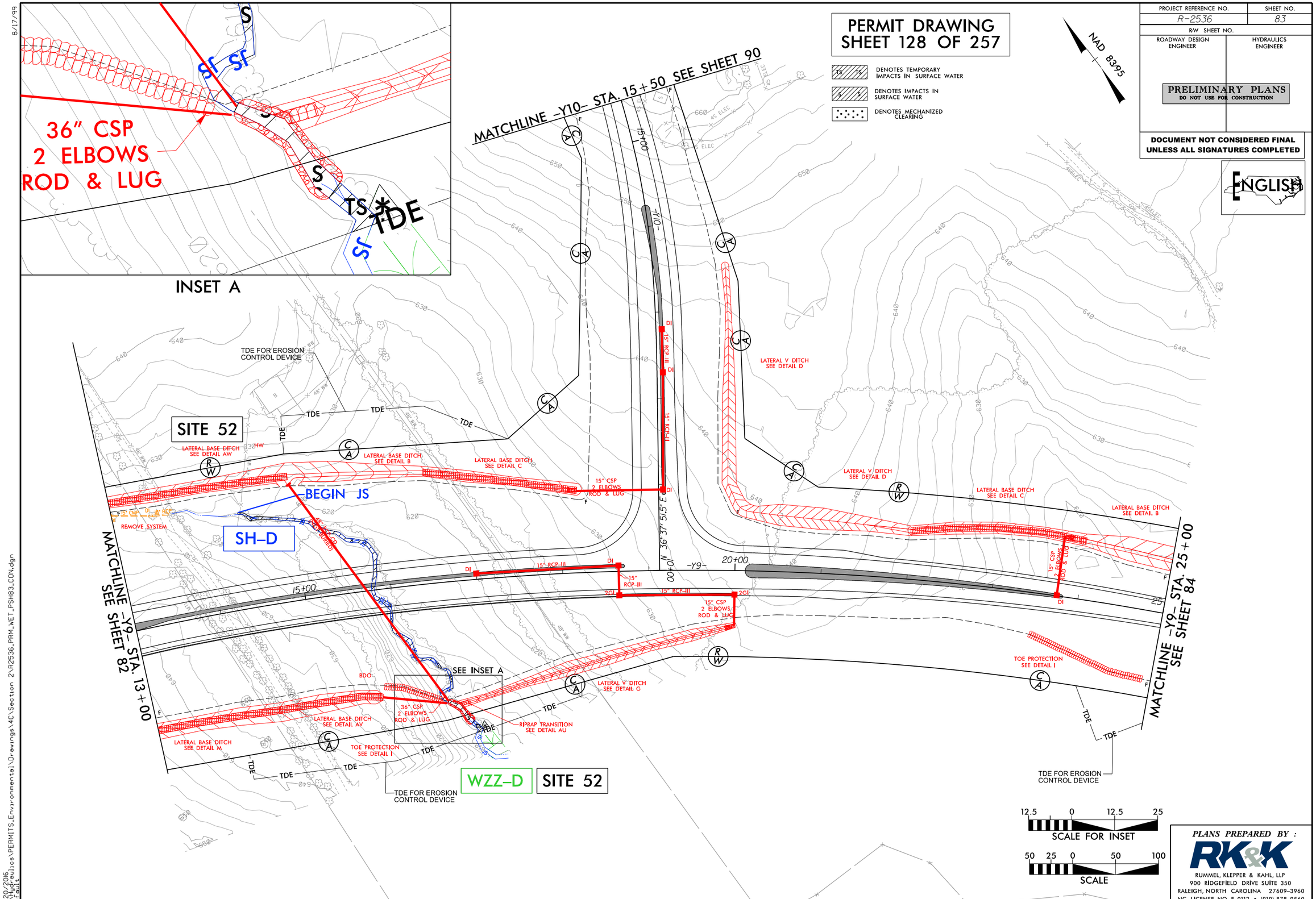
PERMIT DRAWING
SHEET 128 OF 257

TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

NAD 83/95



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default

8/17/99

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CURB & GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-Y9-	28+00.00	30+50.00	RT

PROJECT REFERENCE NO.	SHEET NO.
R-2536	84
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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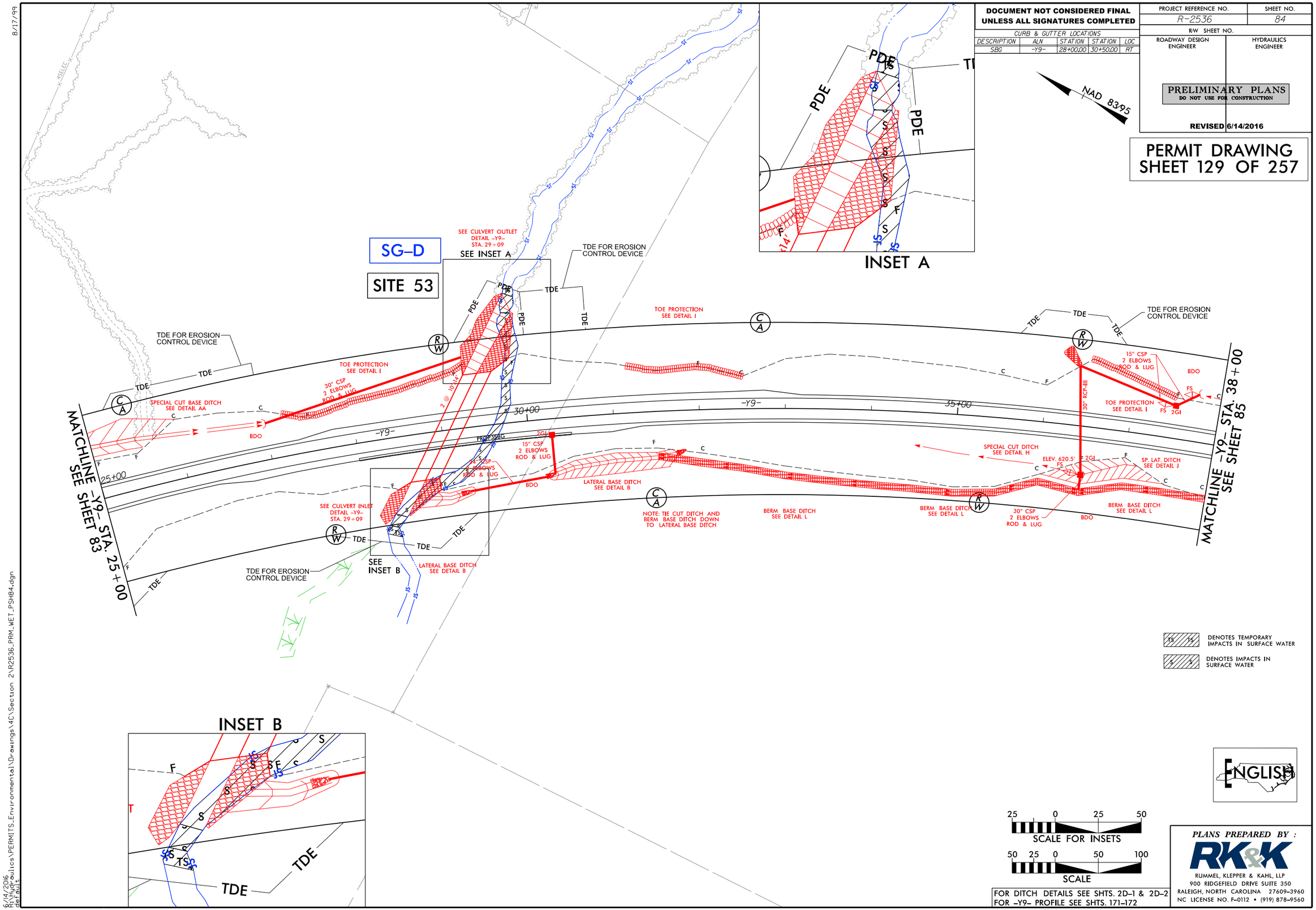
REVISED 6/14/2016

PERMIT DRAWING
SHEET 129 OF 257

NAD 83/95



ENGLISH

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

FOR DITCH DETAILS SEE SHTS. 2D-1 & 2D-2
FOR -Y9- PROFILE SEE SHTS. 171-172

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default

8/17/99

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CURB & GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-Y9-	28+00.00	30+50.00	RT

PROJECT REFERENCE NO.	SHEET NO.
R-2536	84
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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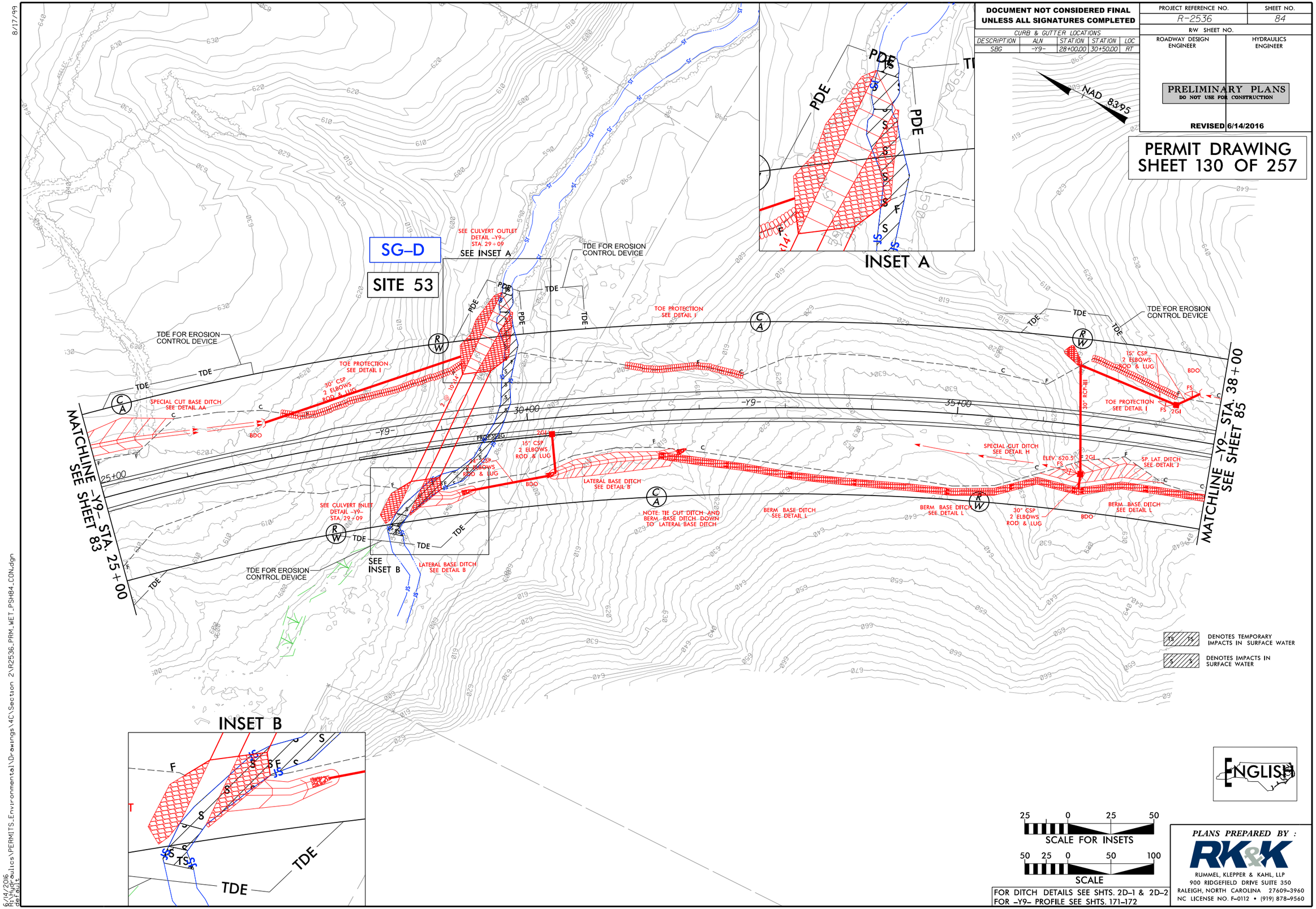
PERMIT DRAWING SHEET 130 OF 257



FOR DITCH DETAILS SEE SHTS. 2D-1 & 2D-2
FOR -Y9- PROFILE SEE SHTS. 171-172

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PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

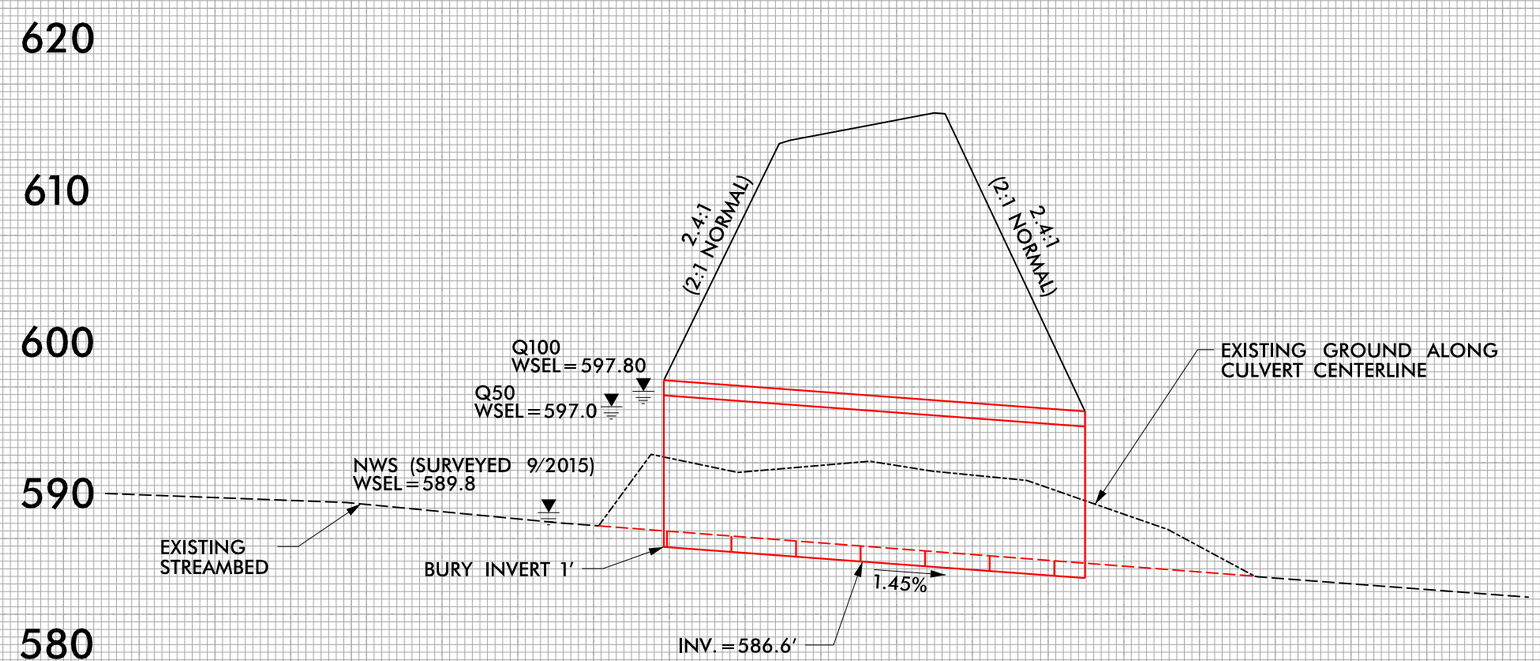
REVISED 6/14/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

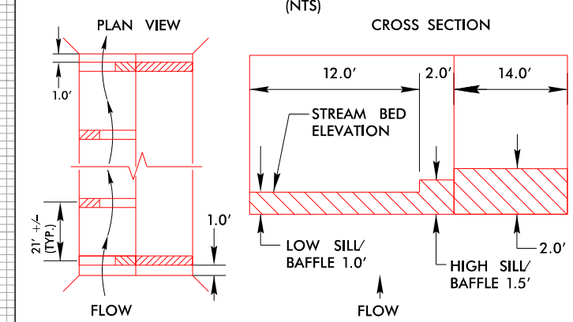
PERMIT DRAWING
SHEET 131 OF 257

SITE 53
–Y9– 29+09



PROPOSED 2@14'x10' RCBC
(length=138')

SILL/BAFFLE DETAILS
(NTS)



PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET.

ALTERNATE 1.5' TALL HIGH SILL/BAFFLES LEFT AND RIGHT TO FORCE STREAM TO MEANDER ALONG THE LENGTH OF THE CULVERT.

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL. IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

5/14/99
6/14/2016
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default

8/17/99

PERMIT DRAWING
SHEET 132 OF 257

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

CURB & GUTTER LOCATIONS

DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-SR_Q-	23+90.00	28+10.00	LT

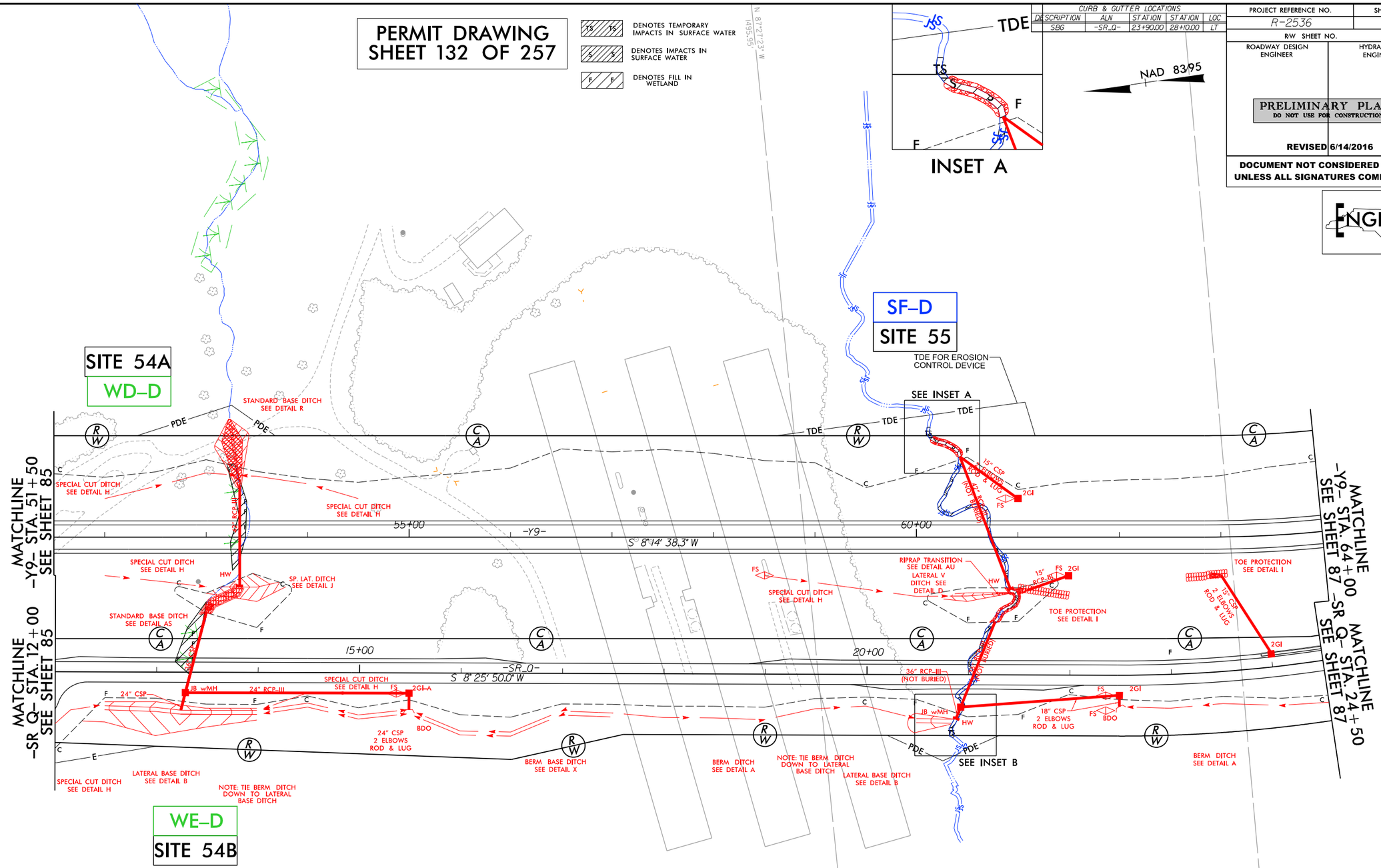
PROJECT REFERENCE NO.	SHEET NO.
R-2536	86
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

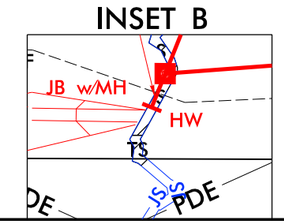
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISED 6/14/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH





25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

FOR DITCH DETAILS SEE SHTS. 2D-1 & 2D-2
FOR -Y9- PROFILE SEE SHT. 172
FOR -SR Q- PROFILE SEE SHT. 180A

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Default

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PERMIT DRAWING
SHEET 133 OF 257

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

CURB & GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-SR_Q-	23+90.00	28+10.00	LT

PROJECT REFERENCE NO.	SHEET NO.
R-2536	86
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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ENGLISH

NAD 83/95

INSET A

SF-D
SITE 55

SITE 54A
WD-D

WE-D
SITE 54B

MATCHLINE -Y9- STA. 51+50 SEE SHEET 85

MATCHLINE -SR Q- STA. 12+00 SEE SHEET 85

MATCHLINE -Y9- STA. 64+00 SEE SHEET 87

MATCHLINE -SR Q- STA. 24+50 SEE SHEET 87

TDE FOR EROSION CONTROL DEVICE

SEE INSET A

SEE INSET B

STANDARD BASE DITCH SEE DETAIL R

SPECIAL CUT DITCH SEE DETAIL H

SP. LAT. DITCH SEE DETAIL J

STANDARD BASE DITCH SEE DETAIL AS

24" CSP

JB w/MH

24" RCP-III

2GI-A

BDO

24" CSP 2 ELBOWS ROD & LUG

LATERAL BASE DITCH SEE DETAIL B

NOTE: TIE BERM DITCH DOWN TO LATERAL BASE DITCH

BERM BASE DITCH SEE DETAIL X

BERM DITCH SEE DETAIL A

RIPRAP TRANSITION SEE DETAIL AU

LATERAL V DITCH SEE DETAIL D

15" RCP-III

36" RCP-III (NOT BURIED)

18" CSP 2 ELBOWS ROD & LUG

TOE PROTECTION SEE DETAIL I

15" CSP 2 ELBOWS ROD & LUG

2GI

FS

HW

TS

PDE

TDE

55+00

60+00

15+00

20+00

-Y9-

S 8°14' 38.3" W

-SR Q-

S 8°25' 50.0" W

INSET B

JB w/MH

HW

TS

PDE

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

FOR DITCH DETAILS SEE SHTS. 2D-1 & 2D-2
FOR -Y9- PROFILE SEE SHT. 172
FOR -SR Q- PROFILE SEE SHT. 180A

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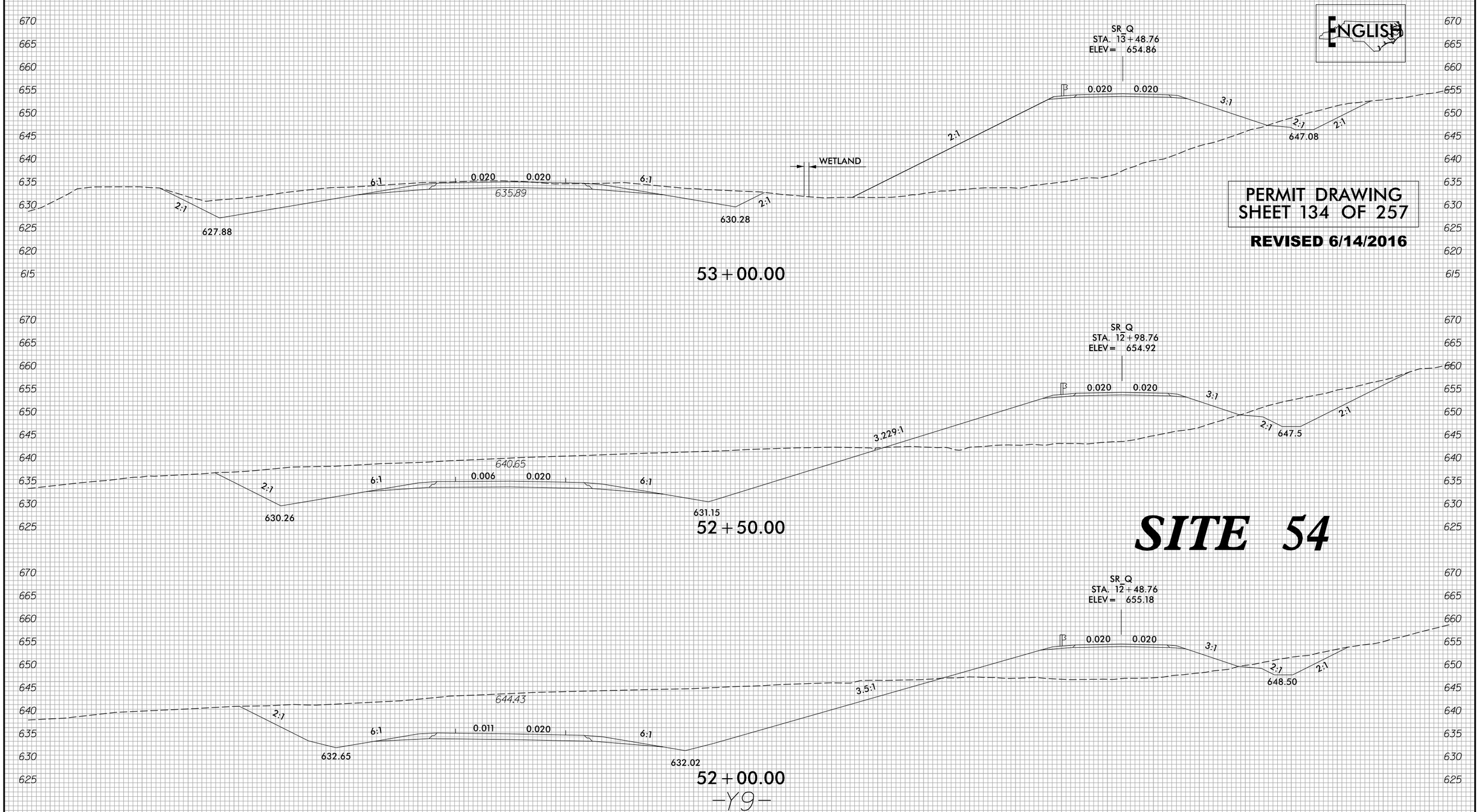
default

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-XX



PERMIT DRAWING
SHEET 134 OF 257

REVISED 6/14/2016

-Y9-

8/23/99

6/14/2016
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default

8/17/99

PERMIT DRAWING
SHEET 135 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

NOTE: ALL DRIVEWAY RADII 15' UNLESS OTHERWISE NOTED.

CURB & GUTTER LOCATIONS				
DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-SR_Q-	23+90.00	28+10.00	LT

PROJECT REFERENCE NO.	SHEET NO.
R-2536	87
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

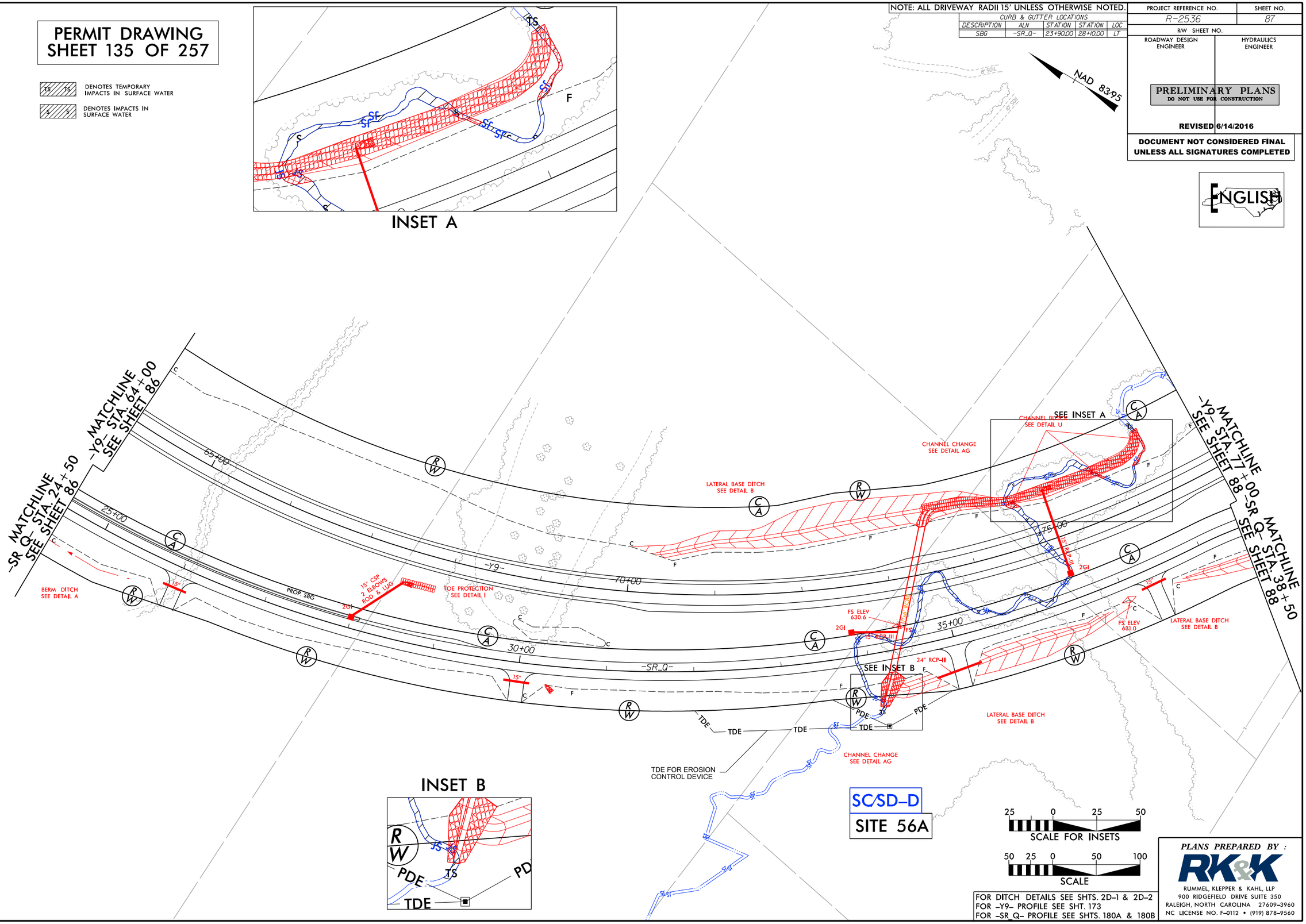
REVISED 6/14/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

INSET A



INSET B

SC/SD-D

SITE 56A

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

FOR DITCH DETAILS SEE SHTS. 2D-1 & 2D-2
FOR -Y9- PROFILE SEE SHT. 173
FOR -SR_Q- PROFILE SEE SHTS. 180A & 180B

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default

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PERMIT DRAWING
SHEET 136 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

NOTE: ALL DRIVEWAY RADII 15' UNLESS OTHERWISE NOTED.

CURB & GUTTER LOCATIONS

DESCRIPTION	ALN	STATION	STATION	LOC
SBG	-SR_Q-	23+90.00	28+10.00	LT

PROJECT REFERENCE NO.	SHEET NO.
R-2536	87
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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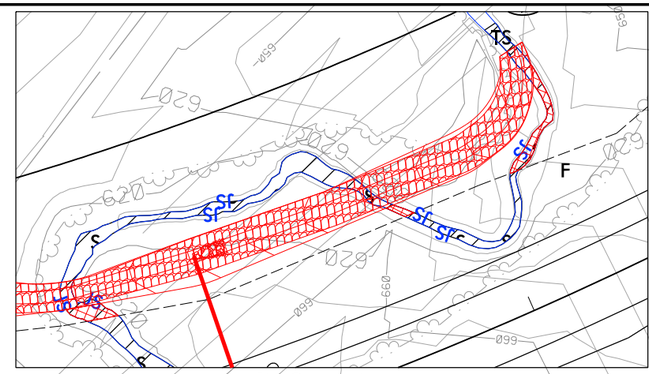
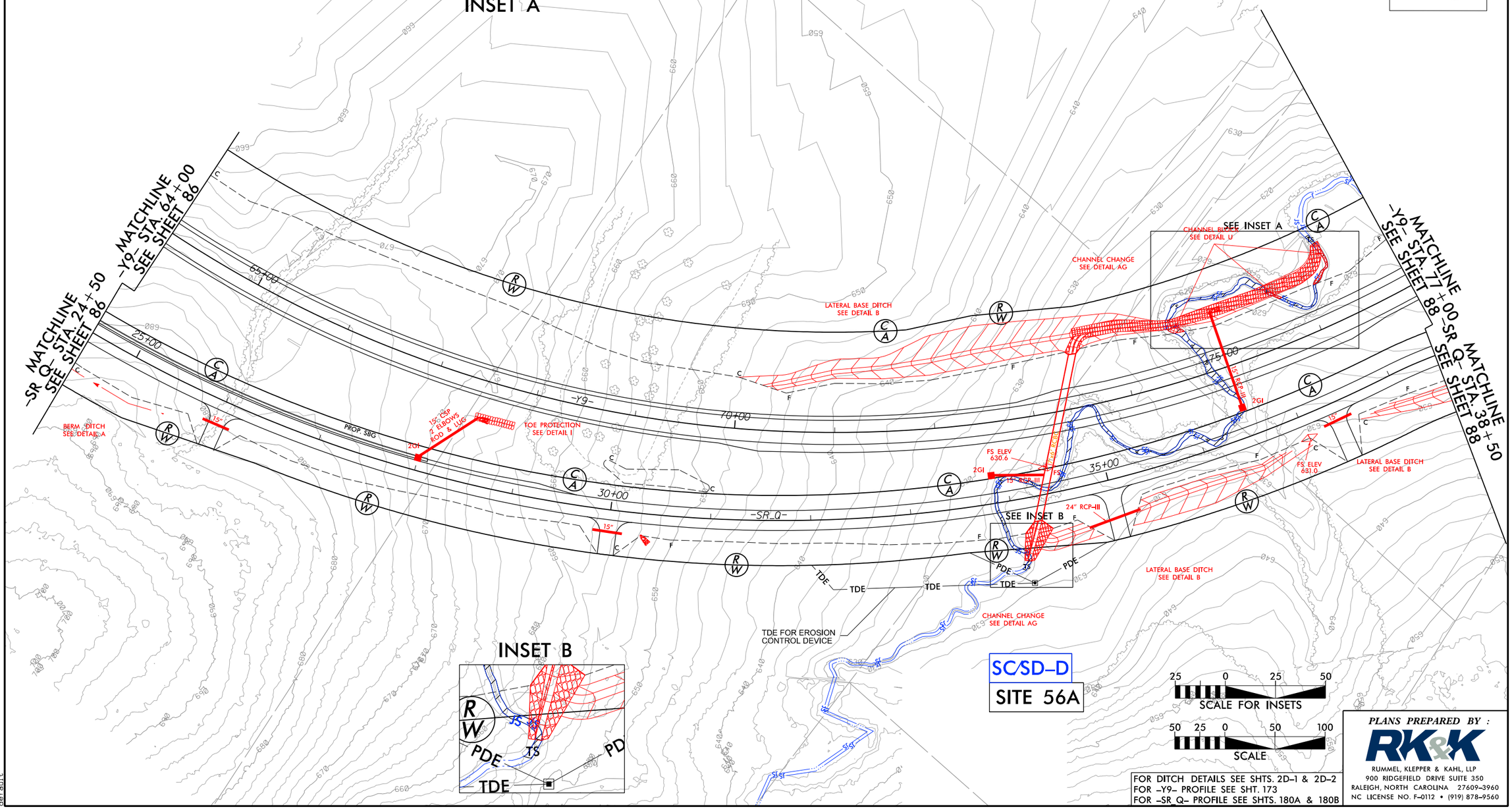
ENGLISH

NAD 83/95





FOR DITCH DETAILS SEE SHTS. 2D-1 & 2D-2
FOR -Y9- PROFILE SEE SHT. 173
FOR -SR_Q- PROFILE SEE SHTS. 180A & 180B

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details

PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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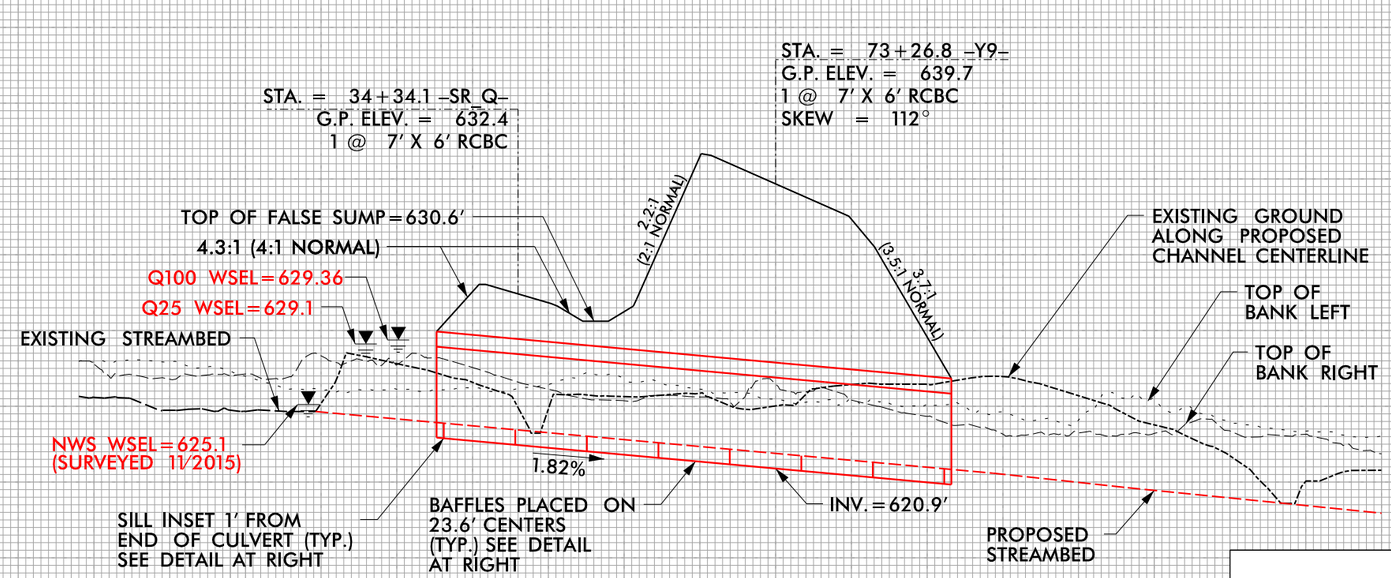
PERMIT DRAWING
SHEET 137 OF 257

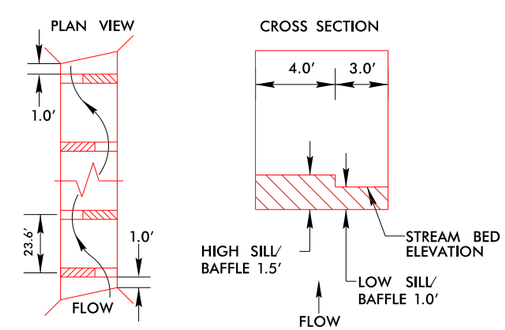
ENGLISH

SITE 56
–Y9– 73+27



PROPOSED 7'x6' RCBC
(length=170')

SILL/BAFFLE DETAILS (NTS)



PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET PERPENDICULAR TO SIDEWALL.

ALTERNATE 1.5' TALL HIGH SILL/BAFFLES LEFT AND RIGHT TO FORCE STREAM TO MEANDER ALONG THE LENGTH OF THE CULVERT.

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO BACKFILL THE CULVERT BARREL. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

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default

PERMIT DRAWING
SHEET 138 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2536	88
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISED 6/14/2016

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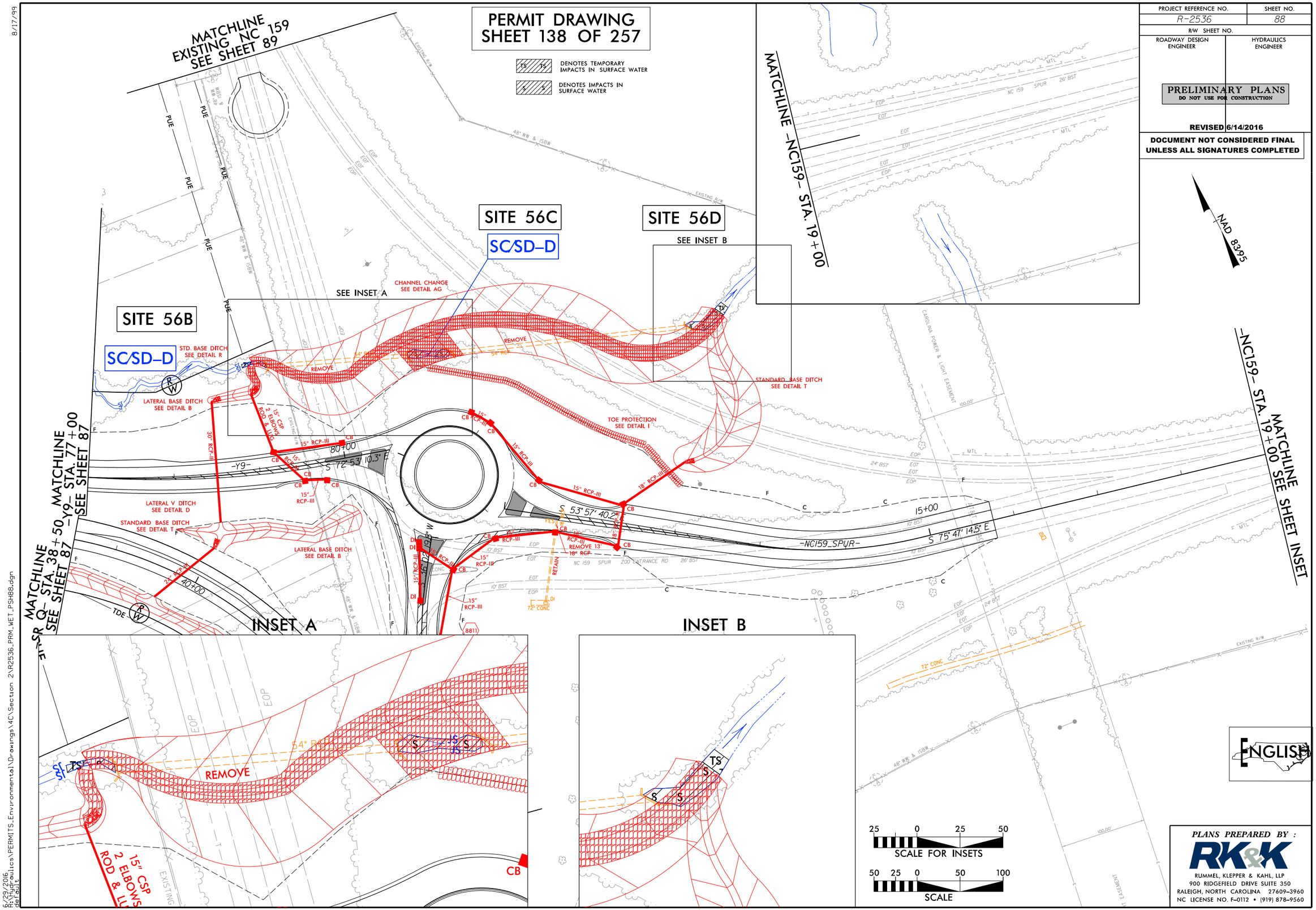

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8/17/99

PERMIT DRAWING
SHEET 139 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2536	88
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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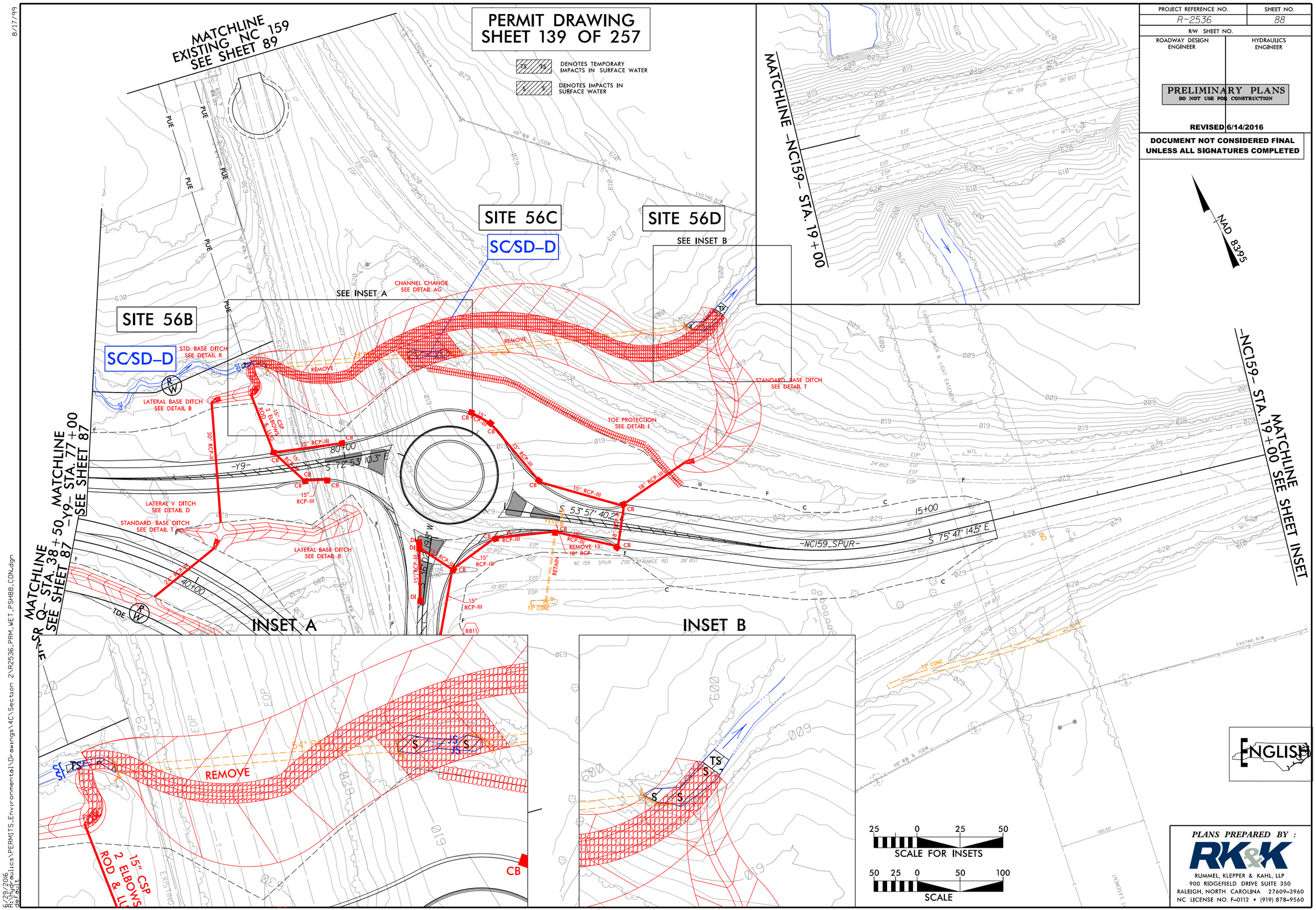
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PLANS PREPARED BY :

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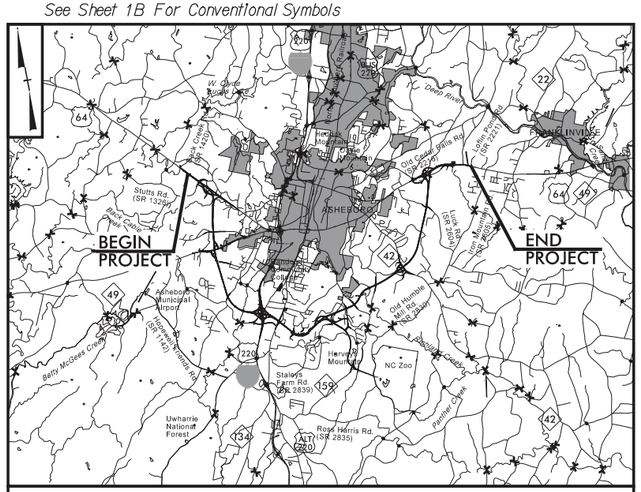
default

TIP PROJECT: R-2536

CONTRACT: C203617

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



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RANDOLPH COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2536	1	

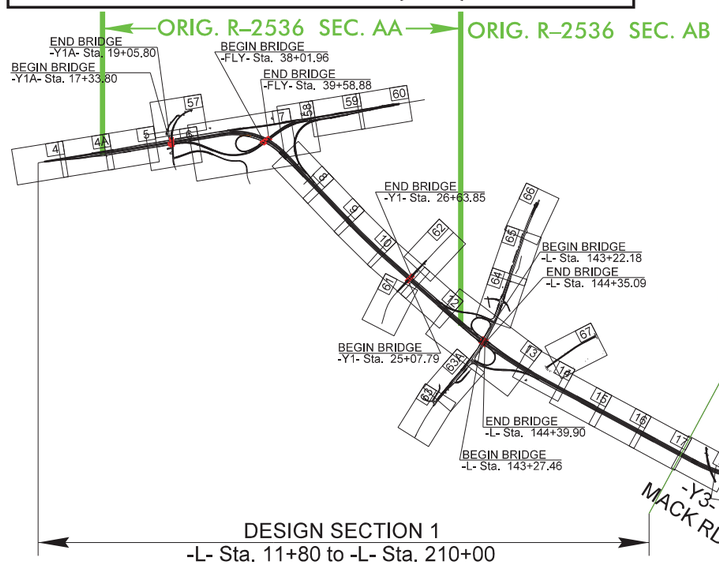
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34450.3.S1		PE

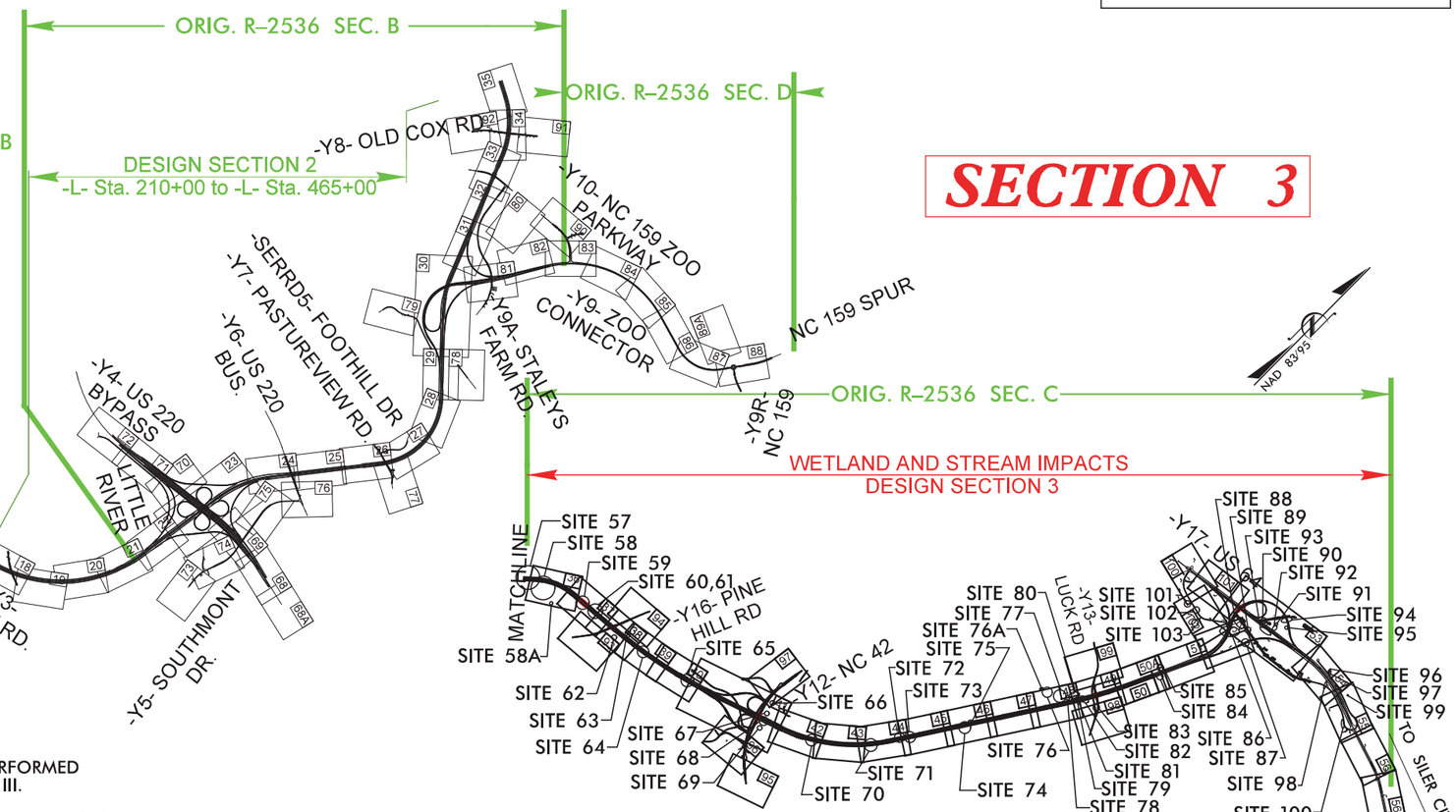
LOCATION: US 64 BYPASS FROM EXISTING US 64 WEST OF ASHEBORO TO EXISTING US 64 EAST OF ASHEBORO AND THE ZOO CONNECTOR FROM EAST OF STALEYS FARM ROAD TO EXISTING NC 159/ZOO ENTRANCE

WETLAND AND STREAM IMPACTS

PERMIT DRAWING
SHEET 140 OF 257

SECTION 3





NOTES:

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

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

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN - BUILD TEAM

GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2015 = 12,600
ADT 2040 = 18,800
DHV = 11 %
D = 60 %
T = 13 % *
V = 70 MPH
*(TTST=8% + DUAL=5%)

FUNCTIONAL CLASSIFICATION
FREEWAY

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2536.....	14.619 mi
LENGTH STRUCTURE TIP PROJECT R-2536.....	0.121 mi
TOTAL LENGTH TIP PROJECT R-2536.....	14.740 mi

NCDOT CONTACT

K. Zak Hamidi, P.E.
PROJECT ENGINEER - DESIGN-BUILD UNIT

ICA Engineering
ICA ENGINEERING
5121 KINGDOM WAY, SUITE 100
RALEIGH, NC 27607
NC LICENSE NO: F-0258
(919) 851-6066

FOR
DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

LETTING DATE:
JUNE 29, 2015

David C. Waller, P.E.
PROJECT ENGINEER

Henry W. Bare
PROJECT DESIGN ENGINEER

CONTRACTOR

ASHEBORO 64 Bypass Constructors, LLC
Wright Brothers RK&K

HYDRAULICS ENGINEER

TRENTON J. CORMIER, P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

DAVID C. WALLER, P.E.
SIGNATURE:

DIVISION OF HIGHWAYS

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

STATE OF NORTH CAROLINA

2/2/2016
ICA ENGINEERING, INC.
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	2D-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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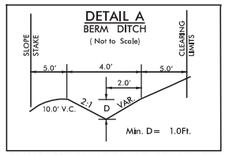
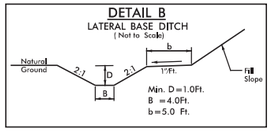
DETAIL A
BERM DITCH
(Not to Scale)



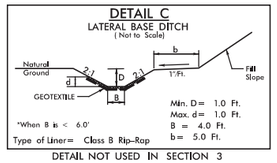
–Y12LPB– STA. 13+15 TO STA. 17+24 RT

DETAIL B
LATERAL BASE DITCH
(Not to Scale)



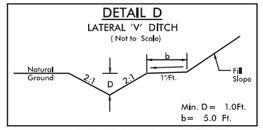
DETAIL NOT USED IN SECTION 3

DETAIL C
LATERAL BASE DITCH
(Not to Scale)



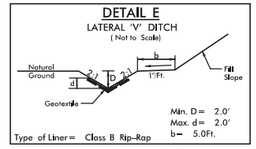
DETAIL NOT USED IN SECTION 3

DETAIL D
LATERAL 'V' DITCH
(Not to Scale)



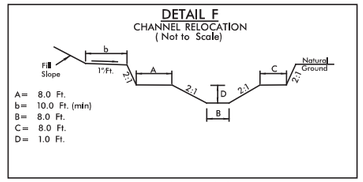
–L– STA. 589+55 TO STA. 592+00 LT
–L– STA. 645+70 TO STA. 646+50 LT
–L– STA. 650+70 TO STA. 651+09 RT
–Y13– STA. 16+50 TO STA. 19+10 RT
–Y13– STA. 21+30 TO STA. 21+68 LT
–Y16DET– STA. 19+00 TO STA. 19+90 RT
–SR5– STA. 27+25 TO STA. 29+23 LT

DETAIL E
LATERAL 'V' DITCH
(Not to Scale)



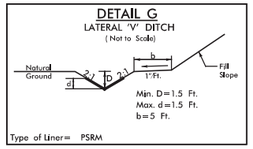
DETAIL NOT USED IN SECTION 3

DETAIL F
CHANNEL RELOCATION
(Not to Scale)



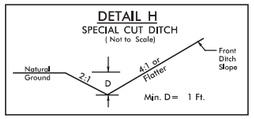
DETAIL NOT USED IN SECTION 3

DETAIL G
LATERAL 'V' DITCH
(Not to Scale)



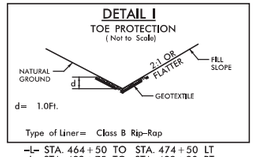
DETAIL NOT USED IN SECTION 3

DETAIL H
SPECIAL CUT DITCH
(Not to Scale)



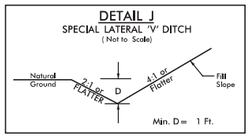
–L– STA. 475+50 TO STA. 478+00 LT
–L– STA. 491+25 TO STA. 493+00 RT
–L– STA. 496+15 TO STA. 498+00 RT
–L– STA. 501+25 TO STA. 502+00 RT
–L– STA. 502+00 TO STA. 504+00 LT
–L– STA. 502+75 TO STA. 504+50 RT
–L– STA. 515+00 TO STA. 519+00 RT
–L– STA. 538+00 TO STA. 542+50 RT
–L– STA. 538+25 TO STA. 542+50 LT
–L– STA. 557+50 TO STA. 562+50 LT
–L– STA. 583+00 TO STA. 585+50 LT
–L– STA. 605+00 TO STA. 605+75 LT
–L– STA. 646+50 TO STA. 647+00 LT
–Y12LPB– STA. 10+00 TO STA. 11+60 RT
–Y12LPC– STA. 10+00 TO STA. 12+10 LT
–Y16– STA. 15+58 TO STA. 16+94 RT
–Y16– STA. 17+30 TO STA. 19+84 RT
–Y16– STA. 16+00 TO STA. 18+30 LT
–Y16– STA. 19+00 TO STA. 20+00 LT
–Y16– STA. 24+00 TO STA. 24+40 LT
–Y16– STA. 24+00 TO STA. 26+00 RT
–Y12– STA. 18+00 TO STA. 22+90 RT
–Y12– STA. 25+70 TO STA. 27+00 LT
–Y12– STA. 43+00 TO STA. 45+60 LT
–Y12– STA. 45+00 TO STA. 50+00 RT
–Y16DET– STA. 15+58 TO STA. 16+94 RT
–Y16DET– STA. 27+50 TO STA. 29+00 RT
–Y17FLY– STA. 50+95 TO STA. 52+77 LT
–Y17– STA. 58+00 TO STA. 58+50 LT
–SR5– STA. 12+50 TO STA. 15+21 LT
–Y17ADRLT– STA. 10+45 TO STA. 11+25 LT
–Y17A– STA. 23+15 TO STA. 23+75 LT
–Y17A– STA. 25+00 TO STA. 28+00 LT

DETAIL I
TOE PROTECTION
(Not to Scale)



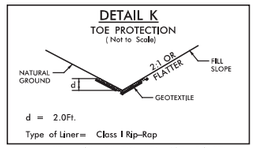
–L– STA. 464+50 TO STA. 474+50 LT
–L– STA. 482+75 TO STA. 483+90 RT
–L– STA. 487+52 TO STA. 488+57 LT
–L– STA. 505+24 TO STA. 507+65 LT
–L– STA. 506+76 TO STA. 509+45 RT
–L– STA. 519+50 TO STA. 520+00 RT
–L– STA. 521+75 TO STA. 524+00 LT
–L– STA. 562+75 TO STA. 563+65 LT
–L– STA. 563+73 TO STA. 565+75 LT
–L– STA. 577+75 TO STA. 580+50 LT
–L– STA. 593+85 TO STA. 594+50 LT
–L– STA. 594+59 TO STA. 596+00 LT
–L– STA. 607+70 TO STA. 609+65 RT
–L– STA. 666+00 TO STA. 668+75 LT
–L– STA. 666+20 TO STA. 669+35 RT
–Y13– STA. 15+27 TO STA. 16+71 LT
–Y17– STA. 65+00 TO STA. 67+00 RT
–Y17FLY– STA. 20+00 TO STA. 21+53 LT
–SR5– STA. 14+87 TO STA. 15+68 RT

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



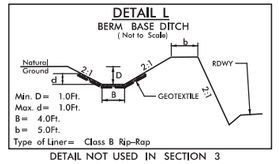
–L– STA. 474+70 TO STA. 475+50 LT
–L– STA. 492+00 TO STA. 493+00 LT
–L– STA. 489+75 TO STA. 491+25 RT
–L– STA. 536+00 TO STA. 538+00 RT
–L– STA. 536+00 TO STA. 538+25 LT
–L– STA. 635+08 TO STA. 636+00 LT
–Y16– STA. 26+00 TO STA. 28+49 RT
–Y12– STA. 28+50 TO STA. 31+75 LT
–Y12– STA. 34+88 TO STA. 37+50 LT
–Y12– STA. 42+28 TO STA. 43+00 LT
–Y12A– STA. 11+17 TO STA. 12+00 RT
–Y16DET– STA. 18+50 TO STA. 19+00 RT
–SRV– STA. 13+00 TO STA. 15+50 RT
–Y17RPC– STA. 18+70 TO STA. 21+04 LT
–Y17– STA. 58+50 TO STA. 60+50 LT

DETAIL K
TOE PROTECTION
(Not to Scale)



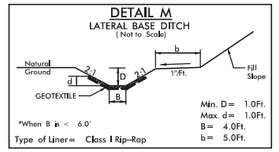
–L– STA. 463+00 TO STA. 467+56 RT

DETAIL L
BERM BASE DITCH
(Not to Scale)



DETAIL NOT USED IN SECTION 3

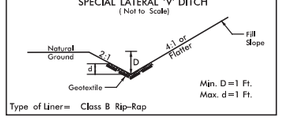
DETAIL M
LATERAL BASE DITCH
(Not to Scale)



–L– STA. 664+00 TO STA. 665+68 LT

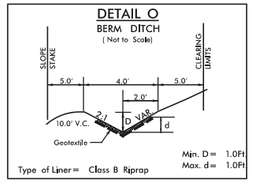
PERMIT DRAWING
SHEET 141 OF 257

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



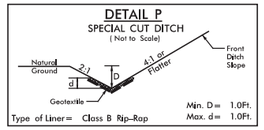
–Y17RPC– STA. 18+70 TO STA. 21+04 LT

DETAIL O
BERM DITCH
(Not to Scale)



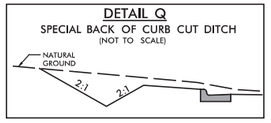
DETAIL NOT USED IN SECTION 3

DETAIL P
SPECIAL CUT DITCH
(Not to Scale)



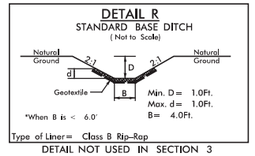
DETAIL NOT USED IN SECTION 3

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



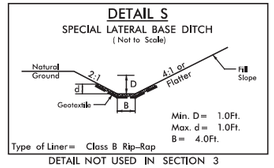
–SR6– STA. 33+89 TO STA. 34+85 LT

DETAIL R
STANDARD BASE DITCH
(Not to Scale)



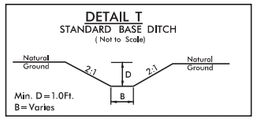
DETAIL NOT USED IN SECTION 3

DETAIL S
SPECIAL LATERAL BASE DITCH
(Not to Scale)



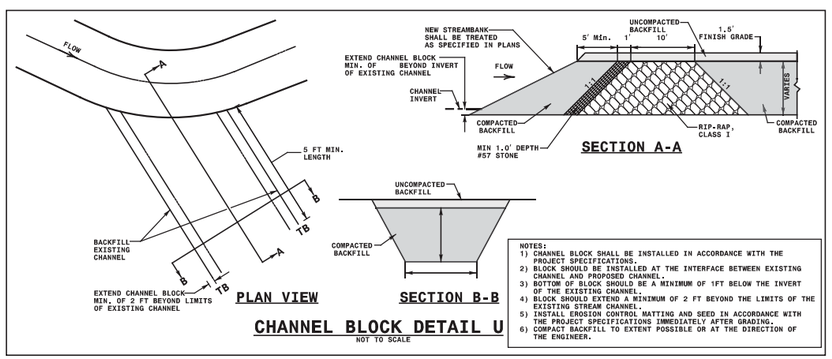
DETAIL NOT USED IN SECTION 3

DETAIL T
STANDARD BASE DITCH
(Not to Scale)



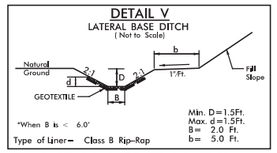
–L– STA. 471+22 TO STA. 471+50 RT, B=3'
–Y12– STA. 24+68 TO STA. 25+00 RT, B=4'
–Y12– STA. 25+02 TO STA. 25+47 RT, B=2
–Y13– STA. 17+25 TO STA. 18+07 LT, B=3'
–Y17– STA. 44+53 TO STA. 44+57 LT, B=3'
–Y17A– STA. 25+75 TO STA. 26+31 RT, B=2'
–Y17RPC– STA. 17+30 TO STA. 18+27 LT, B=2'
SR6DR1– STA. 10+20 TO STA. 10+40 LT, B=2'

CHANNEL BLOCK DETAIL U
NOT TO SCALE



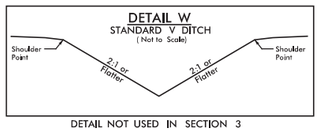
–L– STA. 611+40 –L– LT
–L– STA. 612+65 –L– LT
–Y17– STA. 15+35– LT
–SR5– STA. 26+25– LT

DETAIL V
LATERAL BASE DITCH
(Not to Scale)



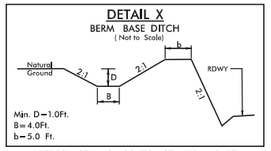
–L– STA. 549+08 TO STA. 550+00 RT
–L– STA. 594+02 TO STA. 596+10 RT

DETAIL W
STANDARD V DITCH
(Not to Scale)



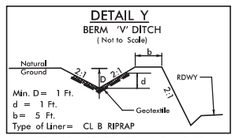
DETAIL NOT USED IN SECTION 3

DETAIL X
BERM BASE DITCH
(Not to Scale)



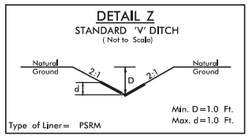
–Y17RPD– STA. 42+80 TO STA. 43+40 RT

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



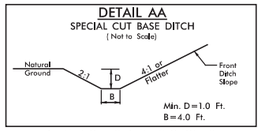
–L– STA. 556+17 TO STA. 560+60 LT
–L– STA. 596+50 TO STA. 602+70 LT
–L– STA. 630+75 TO STA. 645+55 RT
–Y12RPC– STA. 23+50 TO STA. 27+08 RT

DETAIL Z
STANDARD 'V' DITCH
(Not to Scale)



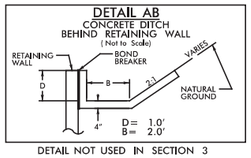
DETAIL NOT USED IN SECTION 3

DETAIL AA
SPECIAL CUT BASE DITCH
(Not to Scale)



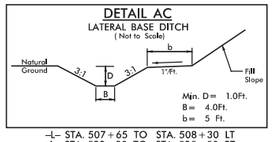
DETAIL NOT USED IN SECTION 3

DETAIL AB
CONCRETE DITCH
BEHIND RETAINING WALL
(Not to Scale)



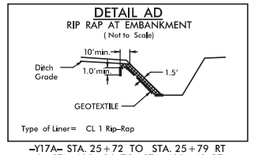
DETAIL NOT USED IN SECTION 3

DETAIL AC
LATERAL BASE DITCH
(Not to Scale)



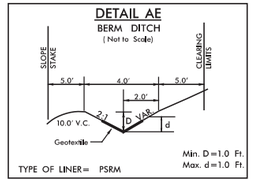
–L– STA. 507+65 TO STA. 508+30 LT
–L– STA. 522+30 TO STA. 525+50 RT
–SR5– STA. 26+04 TO STA. 28+40 LT

DETAIL AD
RIP RAP AT EMBANKMENT
(Not to Scale)



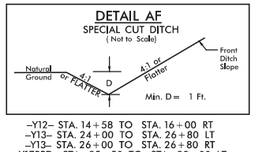
–Y17A– STA. 25+72 TO STA. 25+79 RT
–L– STA. 485+36 TO STA. 485+43 RT
–L– STA. 488+97 TO STA. 489+02 RT

DETAIL AE
BERM DITCH
(Not to Scale)



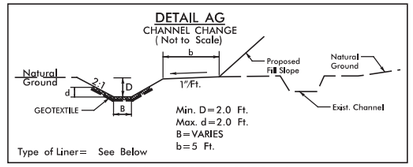
DETAIL NOT USED IN SECTION 3

DETAIL AF
SPECIAL CUT DITCH
(Not to Scale)



–Y12– STA. 14+58 TO STA. 16+00 RT
–Y13– STA. 24+00 TO STA. 26+80 LT
–Y13– STA. 26+00 TO STA. 26+80 RT
–Y17RPD– STA. 35+50 TO STA. 39+00 LT
–SR5– STA. 26+44 TO STA. 27+25 LT

DETAIL AG
CHANNEL CHANGE
(Not to Scale)



DETAIL NOT USED IN SECTION 3

$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$FILENAME$$$$

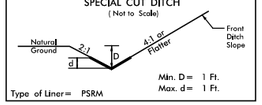
PROJECT REFERENCE NO.	SHEET NO.
R-2536	2D-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

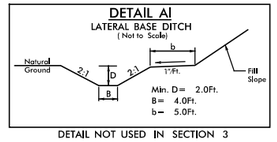
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL AH
SPECIAL CUT DITCH
(Not to Scale)



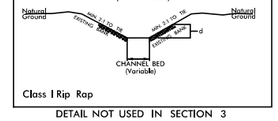
–L– STA. 512+00 TO STA. 512+50 LT
–L– STA. 588+00 TO STA. 591+00 RT
–L– STA. 663+00 TO STA. 664+00 RT
–Y12RPB– STA. 17+14 TO STA. 19+10 RT
–Y12RPC– STA. 15+85 TO STA. 17+80 LT
–Y12A– STA. 17+00 TO STA. 19+00 LT
–Y12A– STA. 18+00 TO STA. 19+60 RT
–Y12– STA. 24+80 TO STA. 25+70 LT
–Y12RPB– STA. 27+29 TO STA. 28+33 LT
–Y12– STA. 39+00 TO STA. 41+27 LT
–Y12B– STA. 11+50 TO STA. 13+12 LT
–SR5– STA. 12+78 TO STA. 14+04 RT
–Y17A– STA. 12+00 TO STA. 13+25 LT
–Y17A– STA. 14+35 TO STA. 16+00 LT
–Y17A– STA. 18+50 TO STA. 20+75 LT
–Y17A– STA. 22+50 TO STA. 23+15 LT

DETAIL AI
LATERAL BASE DITCH
(Not to Scale)



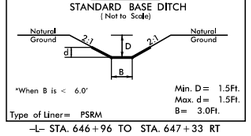
DETAIL NOT USED IN SECTION 3

DETAIL AJ
BANK STABILIZATION AT PIPE OUTLET
(Not to Scale)



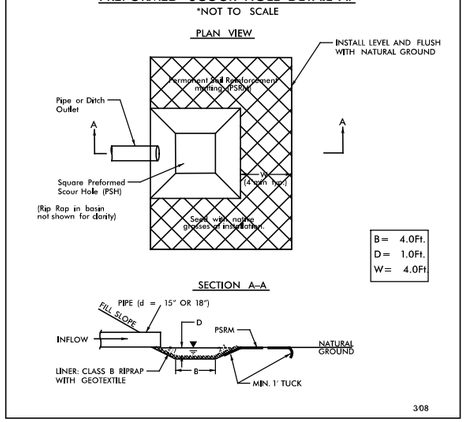
DETAIL NOT USED IN SECTION 3

DETAIL AK
STANDARD BASE DITCH
(Not to Scale)



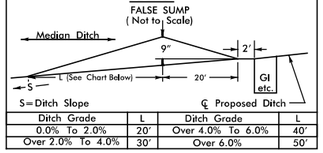
–L– STA. 646+96 TO STA. 647+33 RT

PREFORMED SCOUR HOLE DETAIL AP
*NOT TO SCALE



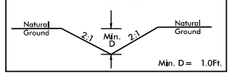
–L– STA. 488+33 RT
–L– STA. 488+67 LT
–L– STA. 505+70 RT
–L– STA. 520+20 RT
–L– STA. 548+28 RT
–L– STA. 609+74 RT
–L– STA. 642+54 LT
–Y17RPDA– STA. 24+15 RT
–Y17FLY– STA. 48+28 RT

DETAIL
FALSE SUMP
(Not to Scale)



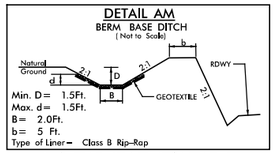
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

DETAIL AL
STANDARD 'V' DITCH
(Not to Scale)



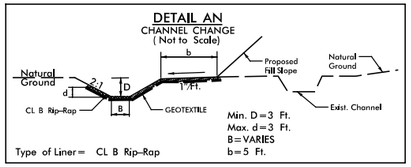
–L– STA. 526+50 TO STA. 527+37 RT
–Y12– STA. 14+80 LT

DETAIL AM
BERM BASE DITCH
(Not to Scale)



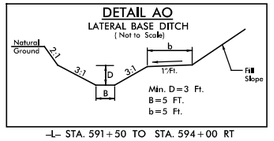
–L– 651+09 STA. TO STA. 657+50 RT

DETAIL AN
CHANNEL CHANGE
(Not to Scale)



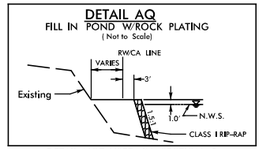
DETAIL NOT USED IN SECTION 3

DETAIL AO
LATERAL BASE DITCH
(Not to Scale)



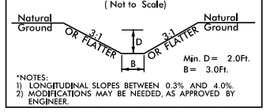
–L– STA. 591+50 TO STA. 594+00 RT

DETAIL AQ
FILL IN POND W/ROCK PLATING
(Not to Scale)



DETAIL NOT USED IN SECTION 3

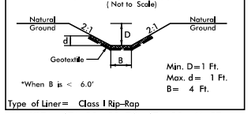
DETAIL AR
STANDARD BASE GRASSED SWALE
(Not to Scale)



*NOTES:
1) LONGITUDINAL SLOPES BETWEEN 0.3% AND 4.0%.
2) MODIFICATIONS MAY BE NEEDED, AS APPROVED BY ENGINEER.

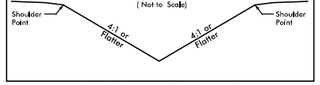
–L– STA. 498+27 TO STA. 498+44 RT
–Y12– STA. 39+13 TO STA. 39+65 RT
–Y17LPDA– STA. 17+33 TO STA. 17+50 LT

DETAIL AS
STANDARD BASE DITCH
(Not to Scale)



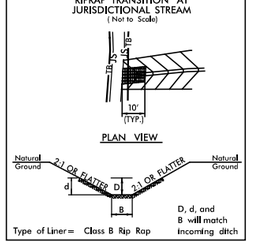
–Y17A– STA. 20+39 TO STA. 20+46 RT

DETAIL AT
MEDIAN 'V' DITCH
(Not to Scale)



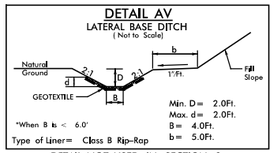
–Y17FLY– STA. 15+50 TO 17+00
–Y17– STA. 23+00 TO 24+00
–Y17– STA. 31+00 TO 32+00

DETAIL AU
RIPRAP TRANSITION AT JURISDICTIONAL STREAM
(Not to Scale)



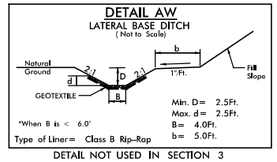
–L– STA. 490+65 LT
–L– STA. 498+44 RT
–L– STA. 508+30 LT
–L– STA. 589+55 LT
–L– STA. 594+00 RT
–L– STA. 610+17 RT
–Y12– STA. 30+44 RT
–Y12– STA. 35+15 RT
–Y12– STA. 39+13 RT
–L– STA. 671+16 LT
–Y17– STA. 44+53 LT
–Y17FLY– STA. 46+77 LT
–Y17LPDA– STA. 17+33 LT

DETAIL AV
LATERAL BASE DITCH
(Not to Scale)



DETAIL NOT USED IN SECTION 3

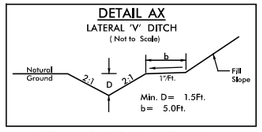
DETAIL AW
LATERAL BASE DITCH
(Not to Scale)



DETAIL NOT USED IN SECTION 3

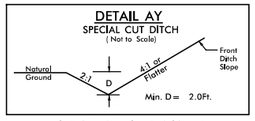
PERMIT DRAWING
SHEET 142 OF 257

DETAIL AX
LATERAL 'V' DITCH
(Not to Scale)



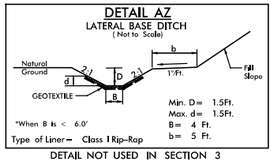
DETAIL NOT USED IN SECTION 3

DETAIL AY
SPECIAL CUT DITCH
(Not to Scale)



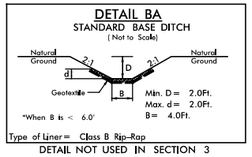
DETAIL NOT USED IN SECTION 3

DETAIL AZ
LATERAL BASE DITCH
(Not to Scale)



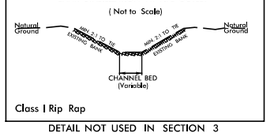
DETAIL NOT USED IN SECTION 3

DETAIL BA
STANDARD BASE DITCH
(Not to Scale)



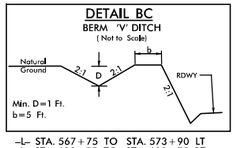
DETAIL NOT USED IN SECTION 3

DETAIL BB
BANK STABILIZATION AT PIPE OUTLET
(Not to Scale)



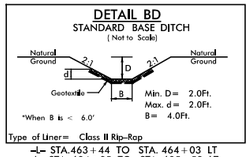
DETAIL NOT USED IN SECTION 3

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



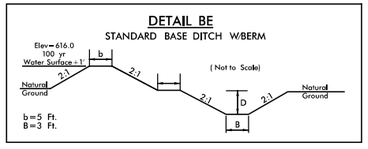
–L– STA. 567+75 TO STA. 573+90 LT
–L– STA. 629+75 TO STA. 630+75 RT
–L– STA. 648+00 TO STA. 649+44 RT
–L– STA. 647+43 TO STA. 649+47 LT
–L– STA. 674+00 TO STA. 677+00 RT
–Y12– STA. 45+00 TO STA. 50+00 LT
–Y17RPD– STA. 43+40 TO STA. 44+67 RT
–Y17– STA. 19+30 TO STA. 20+33 LT
–Y17– STA. 21+10 TO STA. 28+08 LT
–Y17– STA. 61+15 TO STA. 64+00 RT
–SR5– STA. 18+95 TO STA. 21+20 RT

DETAIL BD
STANDARD BASE DITCH
(Not to Scale)



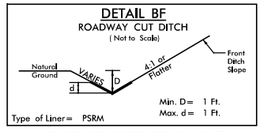
–L– STA. 463+44 TO STA. 464+03 LT
–L– STA. 634+85 TO STA. 635+59 LT
–L– STA. 637+43 TO STA. 638+92 LT
–L– STA. 640+75 TO STA. 643+05 LT

DETAIL BE
STANDARD BASE DITCH W/BERM
(Not to Scale)



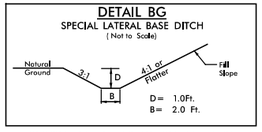
–Y17RPD– STA. 36+88 LT

DETAIL BF
ROADWAY CUT DITCH
(Not to Scale)



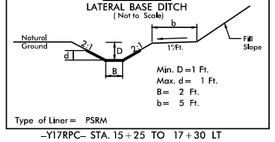
–Y17– STA. 27+50 TO STA. 31+00 RT
–Y17RPC– STA. 15+24 TO STA. 17+37 RT
–Y17LPDA– STA. 12+74 TO STA. 15+22 LT
–Y17A– STA. 11+40 TO STA. 12+00 LT
–Y17A– STA. 16+00 TO STA. 18+50 LT
–Y17A– STA. 17+00 TO STA. 19+50 RT
–Y17A– STA. 20+50 TO STA. 23+00 RT
–Y17A– STA. 20+75 TO STA. 22+50 LT
–Y17B– STA. 10+50 TO STA. 10+85 LT
–Y17B– STA. 11+12 TO STA. 12+00 LT
–Y17B– STA. 10+50 TO STA. 12+00 RT

DETAIL BG
SPECIAL LATERAL BASE DITCH
(Not to Scale)



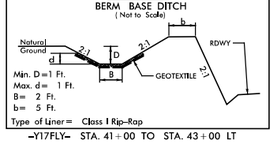
–Y17LPDA– STA. 16+50 TO STA. 17+65 RT

DETAIL BH
LATERAL BASE DITCH
(Not to Scale)



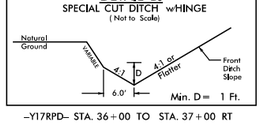
–Y17RPC– STA. 15+25 TO 17+30 LT

DETAIL BI
BERM BASE DITCH
(Not to Scale)



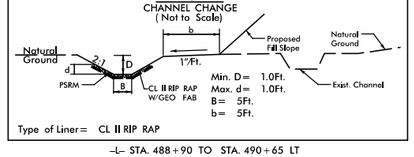
–Y17FLY– STA. 41+00 TO STA. 43+00 LT

DETAIL BJ
SPECIAL CUT DITCH w/HINGE
(Not to Scale)



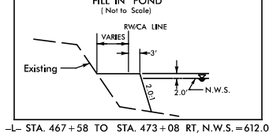
–Y17RPD– STA. 36+00 TO STA. 37+00 RT

DETAIL BK
CHANNEL CHANGE
(Not to Scale)



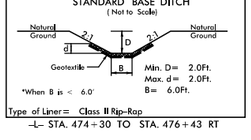
–L– STA. 488+90 TO STA. 490+65 LT

DETAIL BL
FILL IN POND
(Not to Scale)



–L– STA. 467+58 TO STA. 473+08 RT, N.W.S.=612.0

DETAIL BM
STANDARD BASE DITCH
(Not to Scale)



–L– STA. 474+30 TO STA. 476+43 RT

3/23/2016
R:\Roadway\R-2536_Hyd_DitchDet_SEC3.dgn
FGA ENGINEERING, INC.

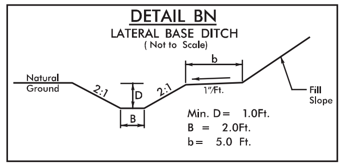
PROJECT REFERENCE NO.	SHEET NO.
R-2536	2D-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

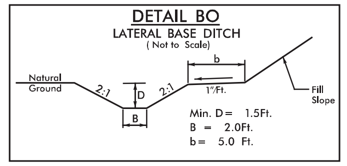
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

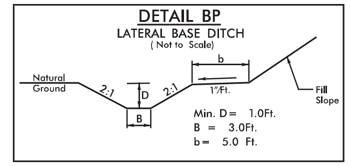
PERMIT DRAWING
SHEET 143 OF 257



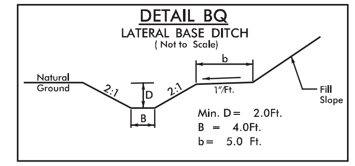
-L- STA. 473+24 TO STA. 476+00 RT
-L- STA. 483+72 TO STA. 485+42 RT
-L- STA. 500+80 TO STA. 502+00 LT
-L- STA. 673+00 TO STA. 674+12 LT



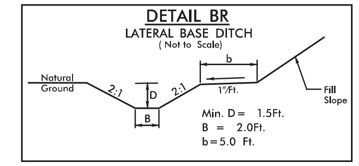
-L- STA. 610+17 TO STA. 611+50 RT



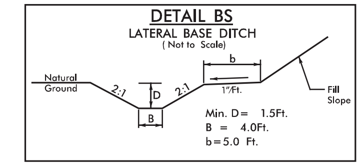
-L- STA. 669+34 TO STA. 669+83 RT



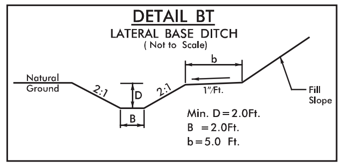
-Y17RPD- STA. 30+10 TO STA. 30+75 RT



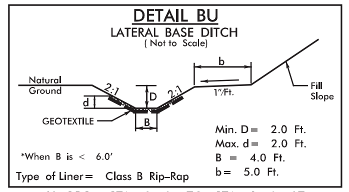
-SR5- STA. 14+25 TO STA. 14+80 RT



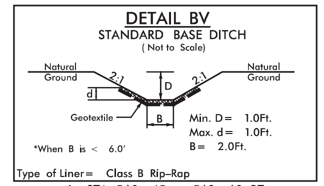
-Y12- STA. 23+77 TO STA. 24+68 RT



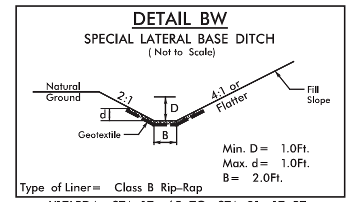
-Y13- STA. 15+65 TO STA. 16+50 RT



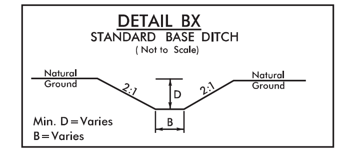
-Y17RPC- STA. 10+95 TO STA. 13+95 LT



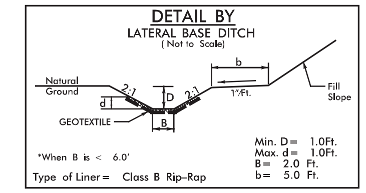
-L- STA. 560+45 to 560+60 RT
-L- STA. 622+73 to 623+50 RT
-L- STA. 630+21 to 630+41 LT
-Y12- STA. 46+55 to 46+69 RT



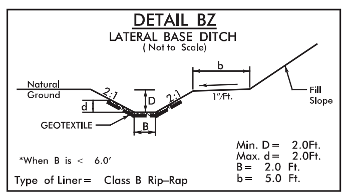
-Y17LPDA- STA. 17+65 TO STA. 21+17 RT



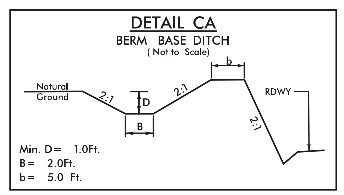
SR6- STA. 15+10 TO STA. 15+35 LT, B=2' D=1.5'



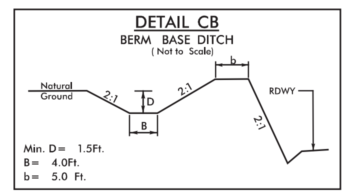
-L- STA. 499+03 TO STA. 501+25 RT
-L- STA. 579+02 TO STA. 580+95 RT
-L- STA. 580+87 TO STA. 583+00 LT
-L- STA. 581+28 TO STA. 582+34 RT
-L- STA. 592+00 TO STA. 593+85 LT
-L- STA. 605+75 TO STA. 609+00 LT
-L- STA. 623+50 TO STA. 626+05 RT
-L- STA. 668+75 TO STA. 670+37 LT
-Y17RPC- STA. 13+95 TO STA. 15+25 LT



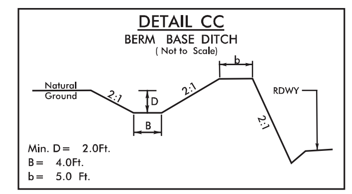
-L- STA. 609+00 TO STA. 610+50 LT
-Y17RPD- STA. 27+50 TO STA. 29+93 RT



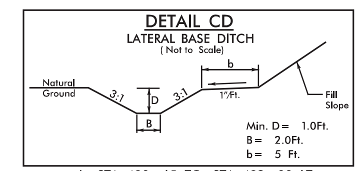
-Y17RPD- STA. 10+11 TO STA. 25+50 RT
-Y17FLY- STA. 36+50 TO STA. 37+50 RT
-Y17- STA. 56+00 TO STA. 57+07 RT



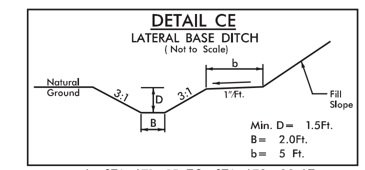
-Y17RPD- STA. 32+50 TO STA. 42+80 RT



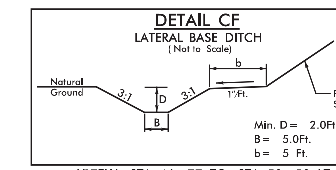
-Y17RPD- STA. 30+75 TO STA. 32+50 RT



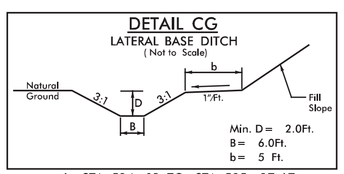
-L- STA. 490+65 TO STA. 492+00 LT
-L- STA. 489+01 TO STA. 489+75 RT
-L- STA. 499+90 TO STA. 500+72 LT
-L- STA. 524+18 TO STA. 535+27 LT
-L- STA. 580+50 TO STA. 580+85 LT
-L- STA. 670+64 TO STA. 671+50 RT
-L- STA. 673+00 TO STA. 674+12 LT



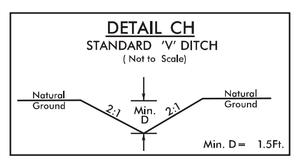
-L- STA. 671+15 TO STA. 673+00 LT



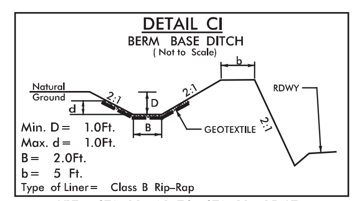
-Y17FLY- STA. 46+77 TO STA. 50+50 LT



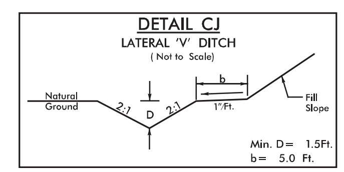
-L- STA. 524+18 TO STA. 535+27 LT



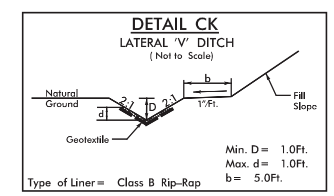
-L- STA. 570+32 TO STA. 570+50 RT



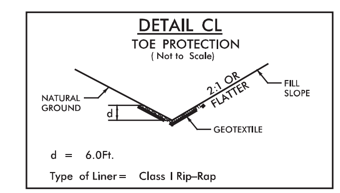
-Y17- STA. 28+08 TO STA. 32+85 LT
-Y17- STA. 52+27 TO STA. 56+00 RT
-Y17- STA. 57+07 TO STA. 61+15 RT
-Y17FLY- STA. 31+00 TO STA. 36+50 LT
-Y17FLY- STA. 37+50 TO STA. 41+00 LT
-SR5- STA. 16+26 TO STA. 18+95 RT



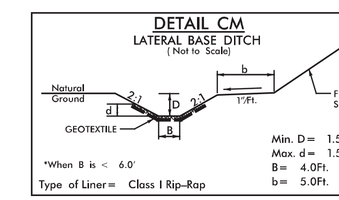
-L- STA. 570+50 TO STA. 571+50 RT



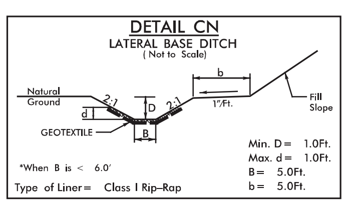
-Y17FLY- STA. 28+05 TO STA. 29+00 LT



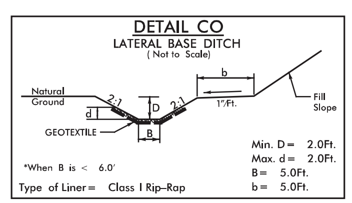
-L- STA. 508+32 TO STA. 510+00 LT



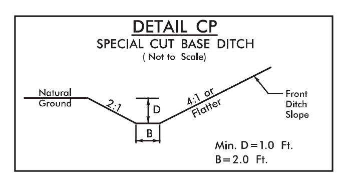
-Y17FLY- STA. 43+50 TO STA. 46+68 LT



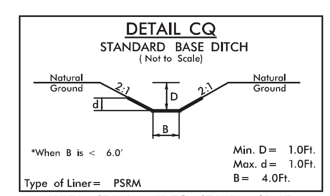
-Y17RPDA- STA. 16+68 TO STA. 22+48 LT



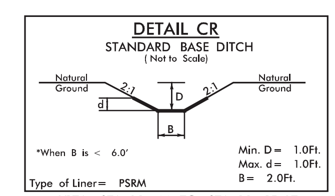
-Y17RPDA- STA. 22+48 TO STA. 23+10 LT



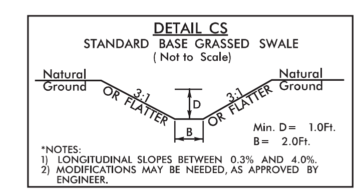
-Y16- STA. 24+40 TO STA. 27+50 LT
-Y17- STA. 36+00 TO STA. 36+49 LT



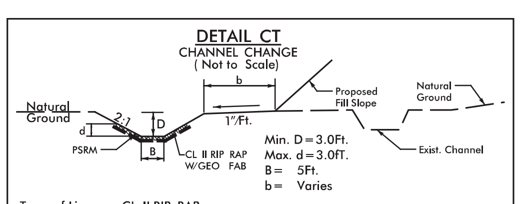
-Y17A- STA. 20+41 TO STA. 20+62 LT



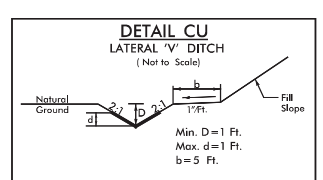
-Y17A- STA. 23+00 TO STA. 23+15 LT



-Y12- STA. 30+44 TO STA. 30+97 RT
-Y12- STA. 35+00 TO STA. 35+15 RT



-L- STA. 611+08 TO STA. 612+58 LT



-Y17RPC- STA. 17+39 TO STA. 17+83 RT

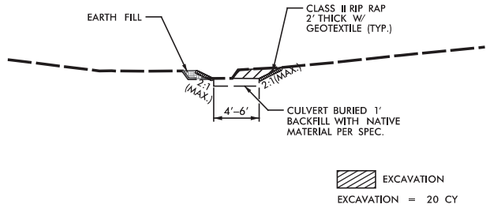
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	2D-4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

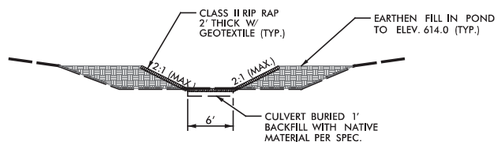
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



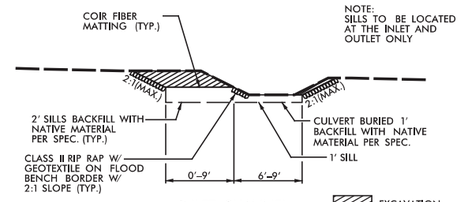
INLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.



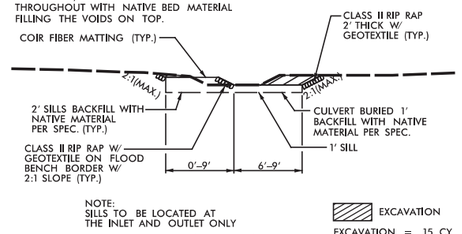
OUTLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

C550
1 @ 6' x 7' RCBC
STA. 466+00 –L–



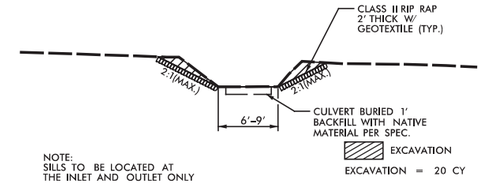
INLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

NOTE:
FOR CUT CONDITION, USE CLASS II RIP RAP FLOOD BENCH BORDER WITH NATURAL GROUND COVERED WITH COIR FIBER MAT INSIDE BORDER. IN FILL CONDITION, USE CLASS II RIP RAP FILL THROUGHOUT WITH NATIVE BED MATERIAL FILLING THE VOIDS ON TOP.



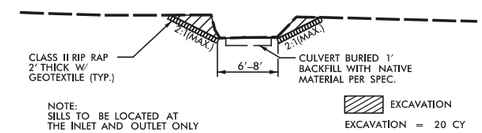
OUTLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

C600
2 @ 9' x 6' RCBC
STA. 500+00 –L–



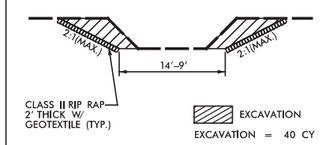
INLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.



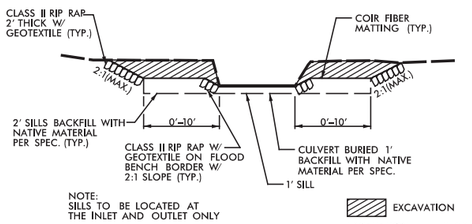
OUTLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

C650
1 @ 6' x 7' RCBC
STA. 523+16 –L–



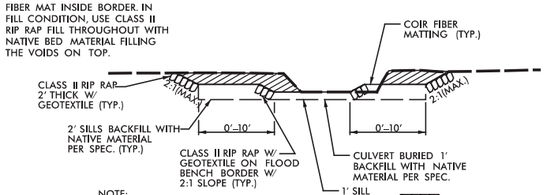
OUTLET CHANNEL IMPROVEMENT
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

66" RCP–III OVERFLOW
STA. 488+14.55 –L–



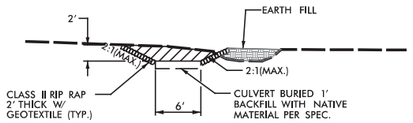
INLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

NOTE:
FOR CUT CONDITION, USE CLASS II RIP RAP FLOOD BENCH BORDER WITH NATURAL GROUND COVERED WITH COIR FIBER MAT INSIDE BORDER. IN FILL CONDITION, USE CLASS II RIP RAP FILL THROUGHOUT WITH NATIVE BED MATERIAL FILLING THE VOIDS ON TOP.



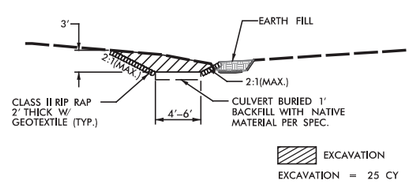
OUTLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

C700
3 @ 10' x 7' RCBC
STA. 610+42 –L–



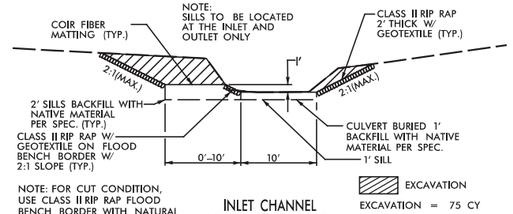
INLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAMBED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.



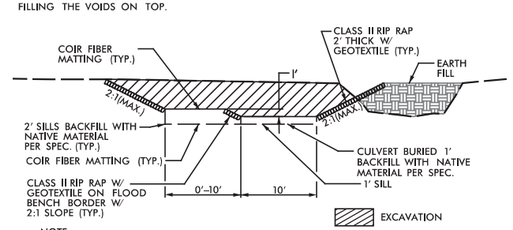
OUTLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

C750
1 @ 6' x 7' RCBC
STA. 30+09 –Y17RPD–



NOTE: FOR CUT CONDITION, USE CLASS II RIP RAP FLOOD BENCH BORDER WITH NATURAL GROUND COVERED WITH COIR FIBER MAT INSIDE BORDER. IN FILL CONDITION, USE CLASS II RIP RAP FILL THROUGHOUT WITH NATIVE BED MATERIAL FILLING THE VOIDS ON TOP.

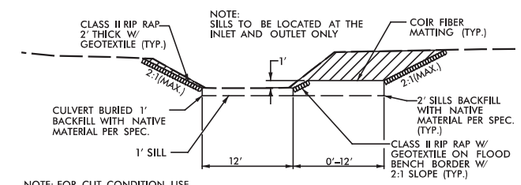
INLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')



NOTE: SILLS TO BE LOCATED AT THE INLET AND OUTLET ONLY

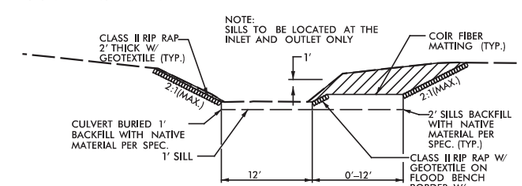
OUTLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

C800
2 @ 10' x 8' RCBC
STA. 22+13 –Y17FLY–



NOTE: FOR CUT CONDITION, USE CLASS II RIP RAP FLOOD BENCH BORDER WITH NATURAL GROUND COVERED WITH COIR FIBER MAT INSIDE BORDER. IN FILL CONDITION, USE CLASS II RIP RAP FILL THROUGHOUT WITH NATIVE BED MATERIAL FILLING THE VOIDS ON TOP.

INLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')



OUTLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

C801
2 @ 12' x 8' RCBC
STA. 46+76 –Y17FLY–

PERMIT DRAWING
SHEET 144 OF 257

2/2/2016
R:\Roadway\R-2536_Hyd_DitchDet_SEC3.dgn
T.A. ENGINEERING, INC.

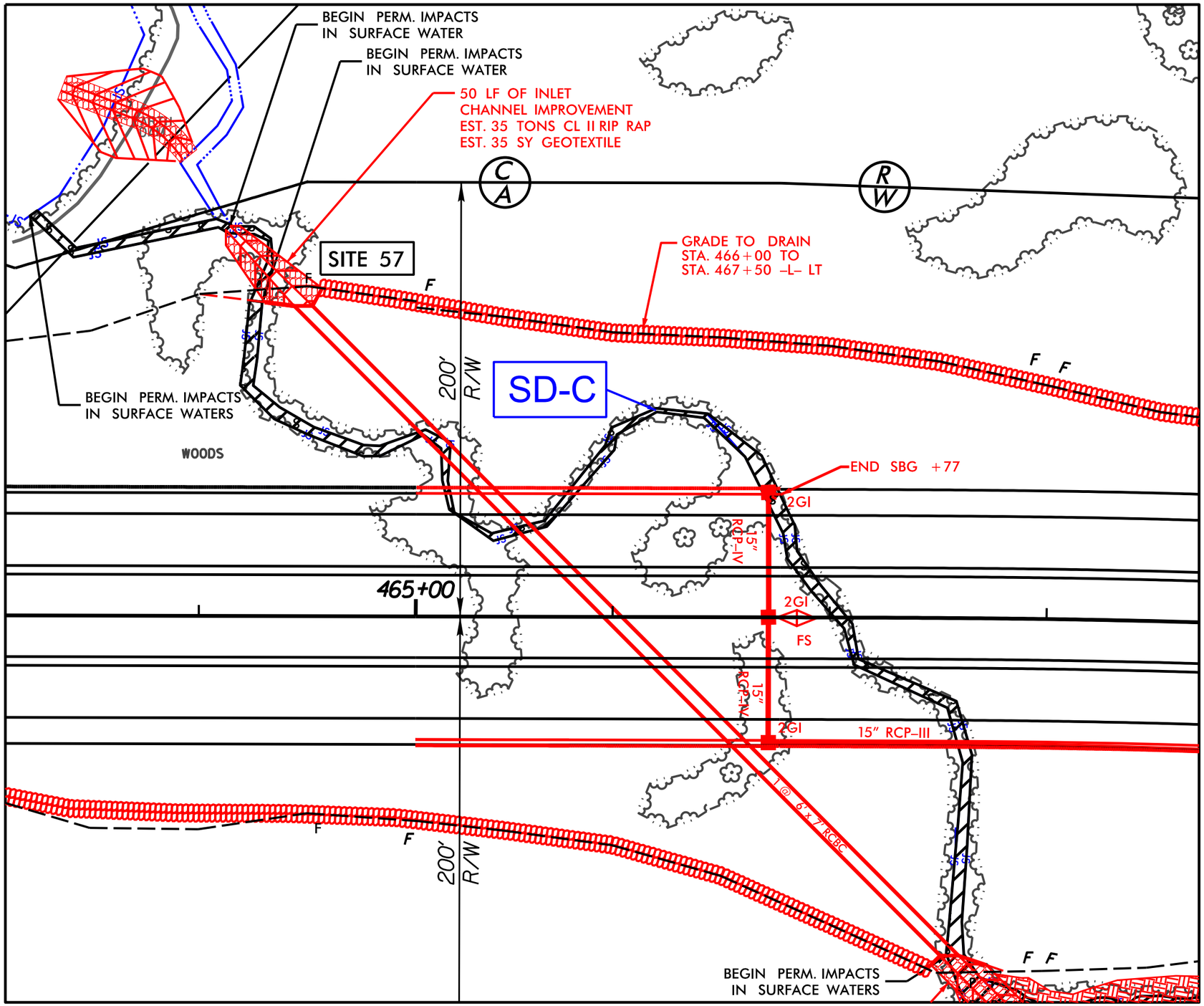
PROJECT REFERENCE NO.	SHEET NO.
R-2536	35A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 145 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



NAD 83/95

LEGEND

- — WLB — · DENOTES WETLAND BOUNDARY
- DENOTES PERMANENT IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER (POND)

DETAIL SHEET FOR SITE 57

50' 25' 0' 50' 100'
GRAPHIC SCALE

$DATE$
$(USERNAME)$
$FILEL$

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

SITE 57
–L– 466+00

PROJECT REFERENCE NO.	SHEET NO.
R-2536	
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

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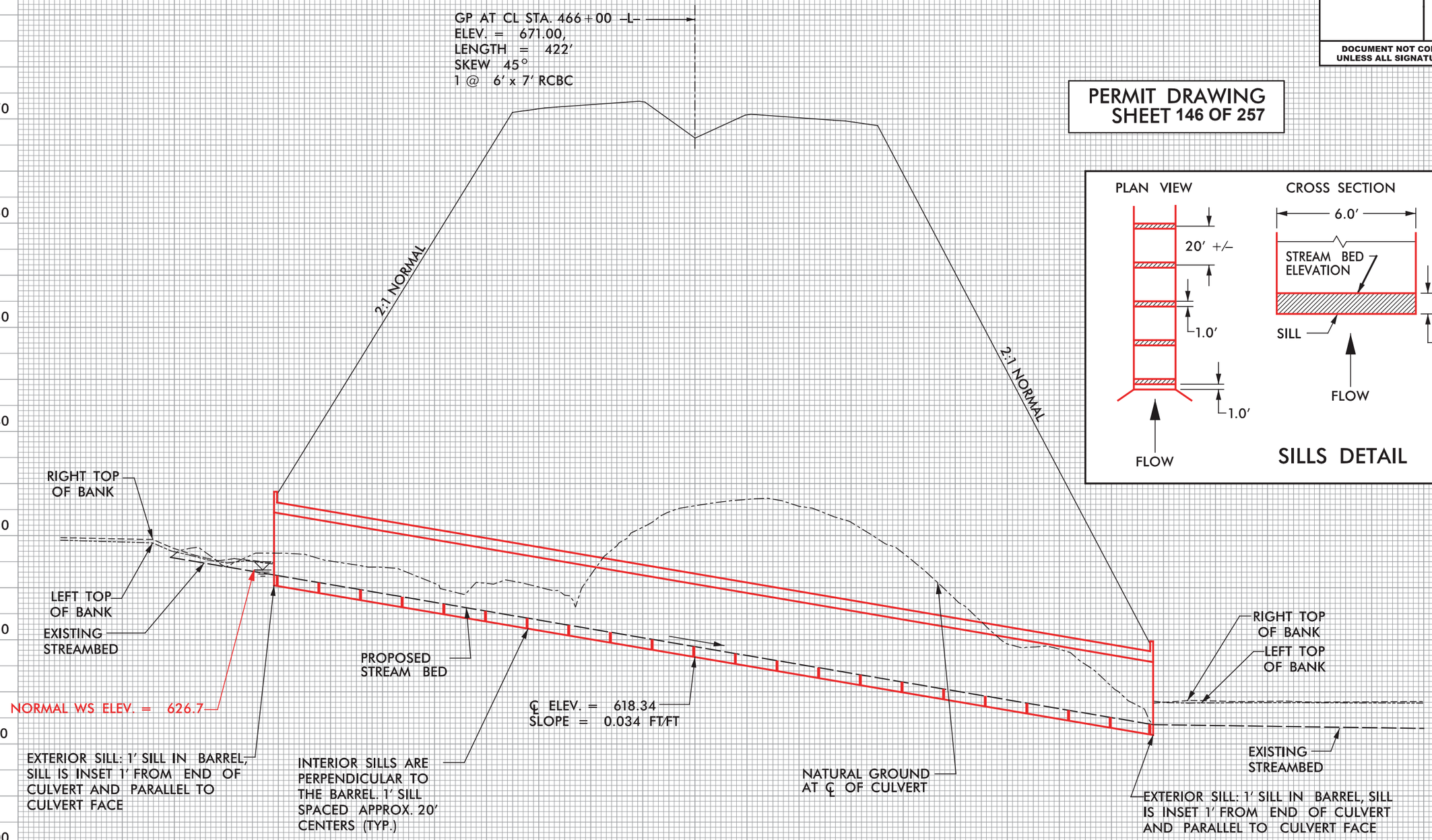
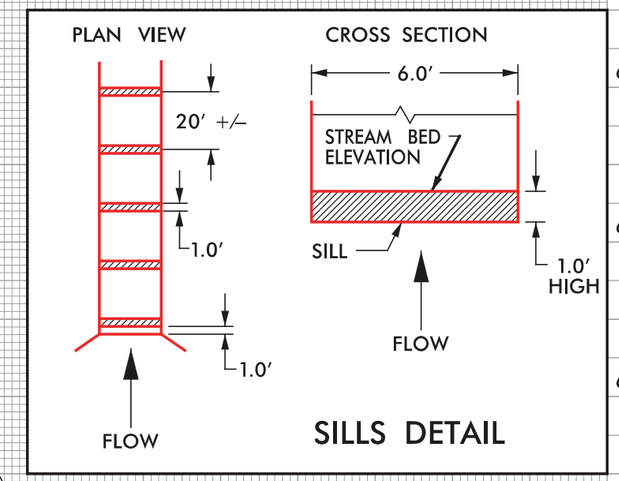
PERMIT DRAWING
SHEET 146 OF 257





NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

PROPOSED 1 @ 6' x 7' RCBC WITH SILLS

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NC License No: F-0258

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R:\Hydraulics\PERMITS Environmental\Drawings\R2536_hyd_prm_wet_pfl_along_c550.dgn

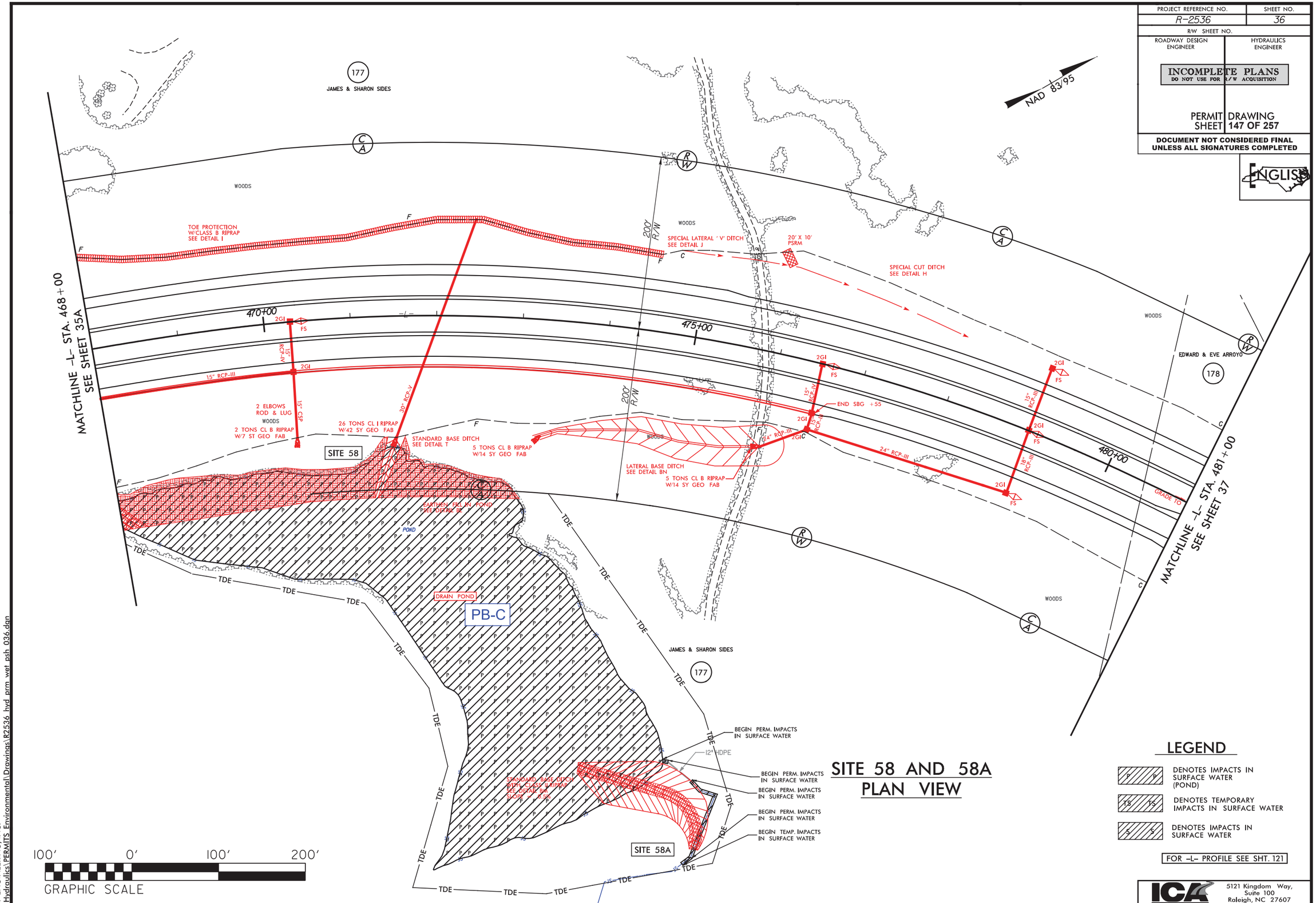
PROJECT REFERENCE NO.	SHEET NO.
R-2536	36
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 147 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 58 AND 58A PLAN VIEW

LEGEND

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

FOR -L- PROFILE SEE SHT. 121

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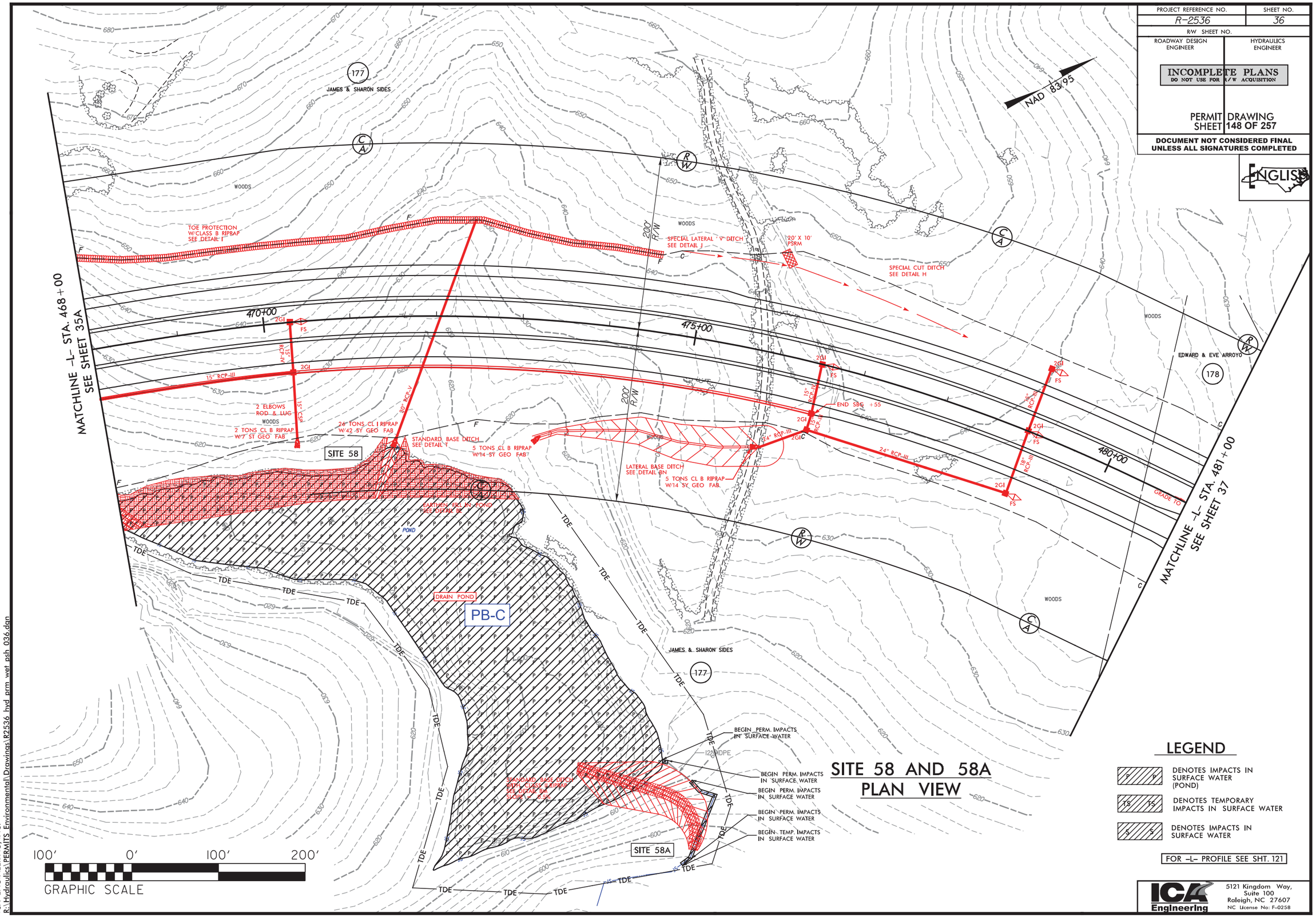
R:\Hydraulics\PERMITS Environmental\Drawings\R2536_hyd_prm_wet_psh_036.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2536	36
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 148 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SITE 58 AND 58A PLAN VIEW

LEGEND

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

FOR -L- PROFILE SEE SHT. 121

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NC License No: F-0258

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ICA ENGINEERING, INC.
R:\Hydraulics\PERMITS Environmental\Drawings\R2536 hyd prm wet psh 036.dgn

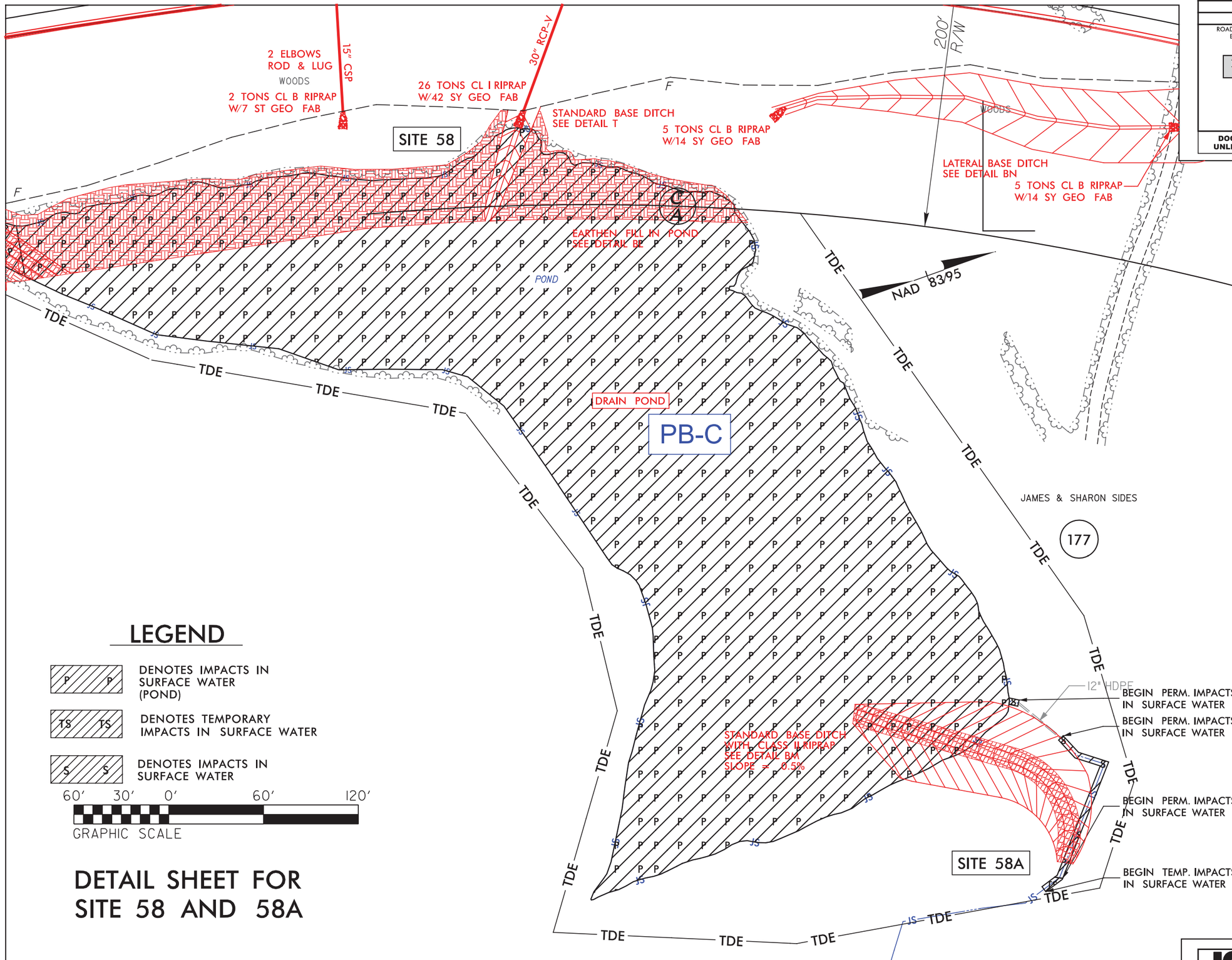
PROJECT REFERENCE NO.	SHEET NO.
R-2536	36A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 149 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



LEGEND

P P — DENOTES IMPACTS IN SURFACE WATER (POND)

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES IMPACTS IN SURFACE WATER

60' 30' 0' 60' 120'
GRAPHIC SCALE

DETAIL SHEET FOR SITE 58 AND 58A

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Raleigh, NC 27607
NC License No: F-0258

2/17/2016
ICA ENGINEERING, INC.
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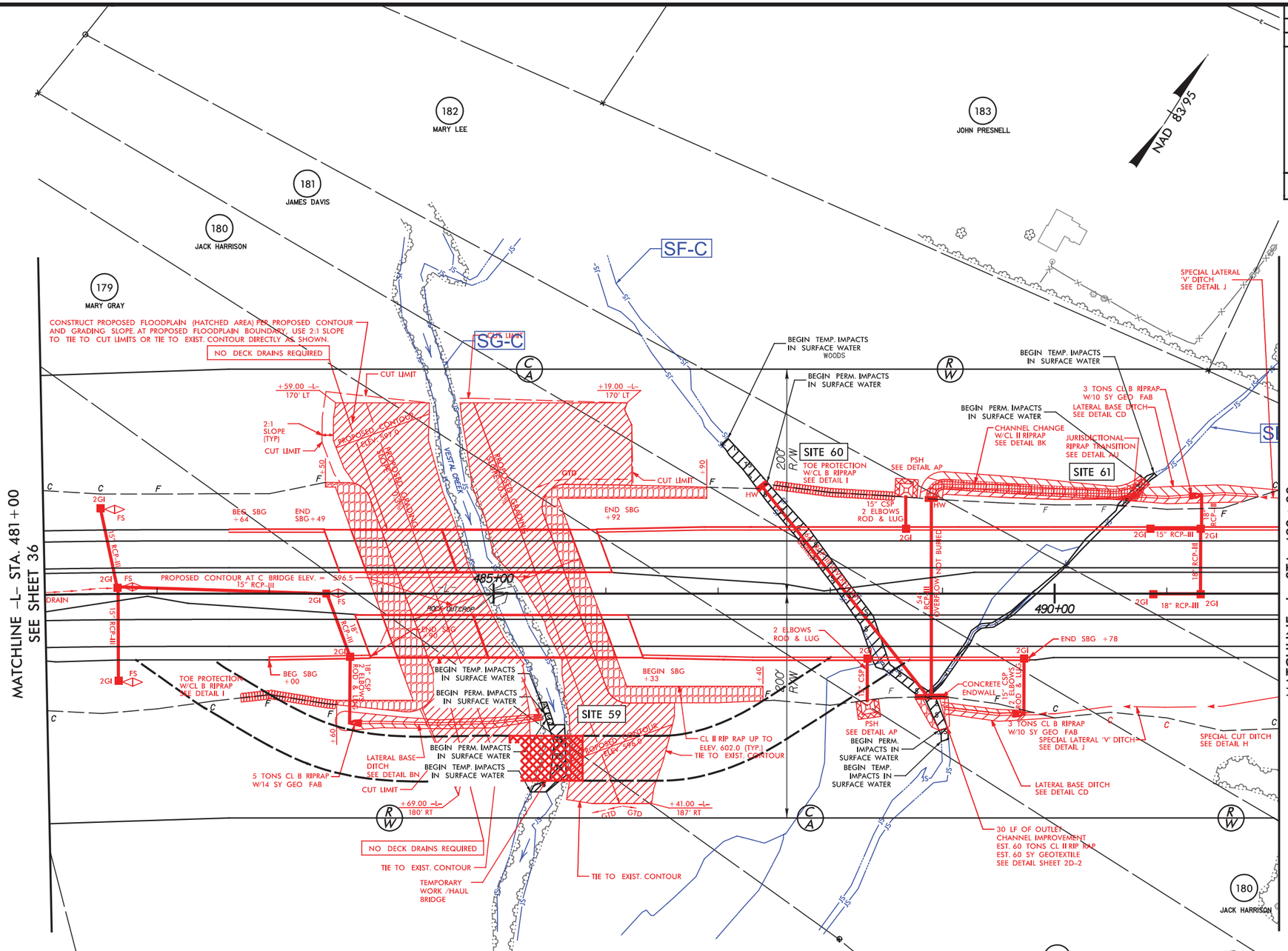
PROJECT REFERENCE NO.	SHEET NO.
R-2536	37
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 150 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SITE 59, 60 AND 61 PLAN VIEW

LEGEND

- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

100' 0' 100' 200'
GRAPHIC SCALE

2/23/2016
ICA ENGINEERING, INC.
R:\Hydraulics\PERMITS Environmental\Drawings\R2536 hyd prm wet psh 037.dgn

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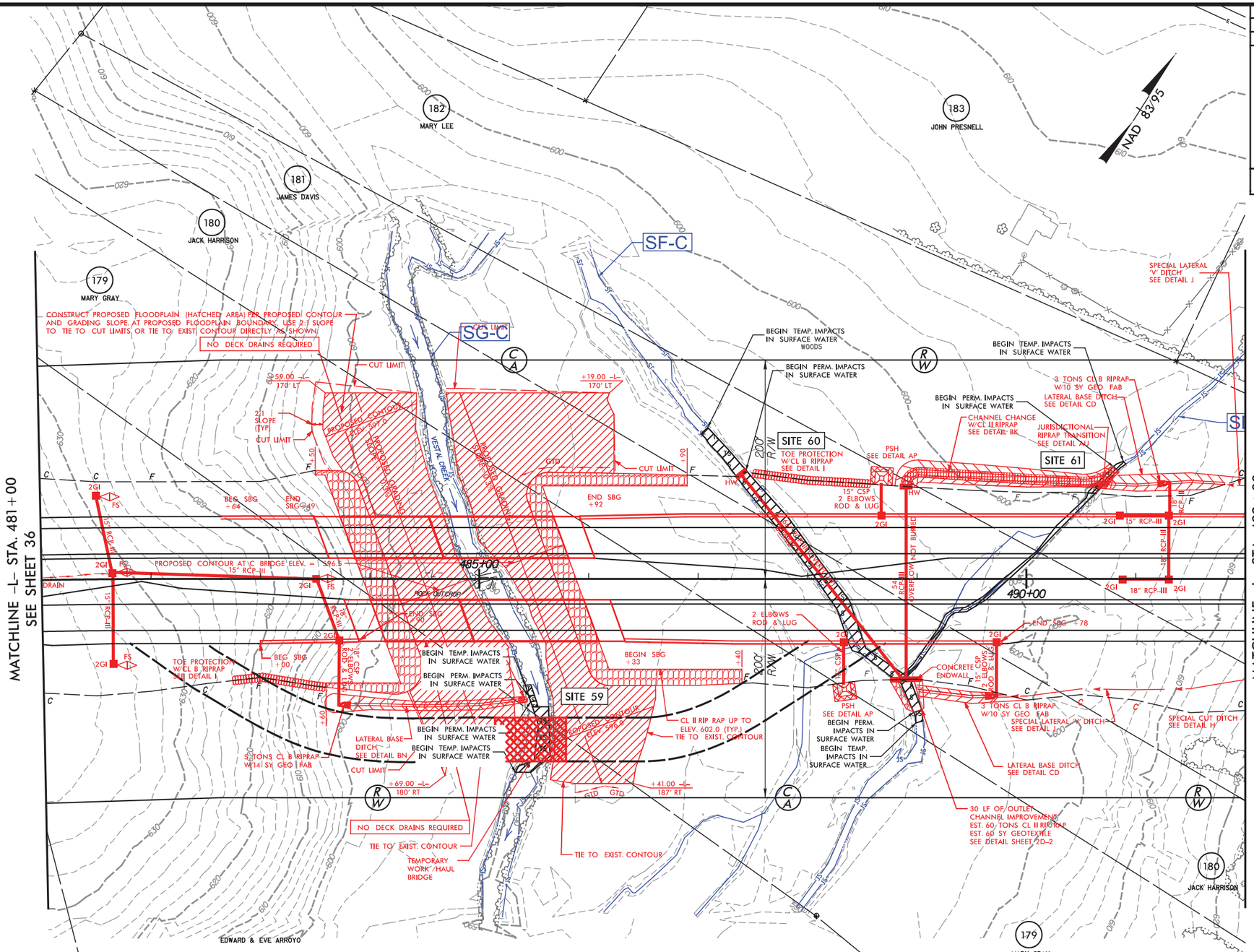
PROJECT REFERENCE NO.	SHEET NO.
R-2536	37
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 151 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 59, 60 AND 61
PLAN VIEW

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

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5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

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ICA ENGINEERING INC.
R:\Hydraulics\PERMITS Environmental\Drawings\R2536 hyd prm wet psh 037.dgn

DETAIL SHEET FOR SITE 59, 60, AND 61

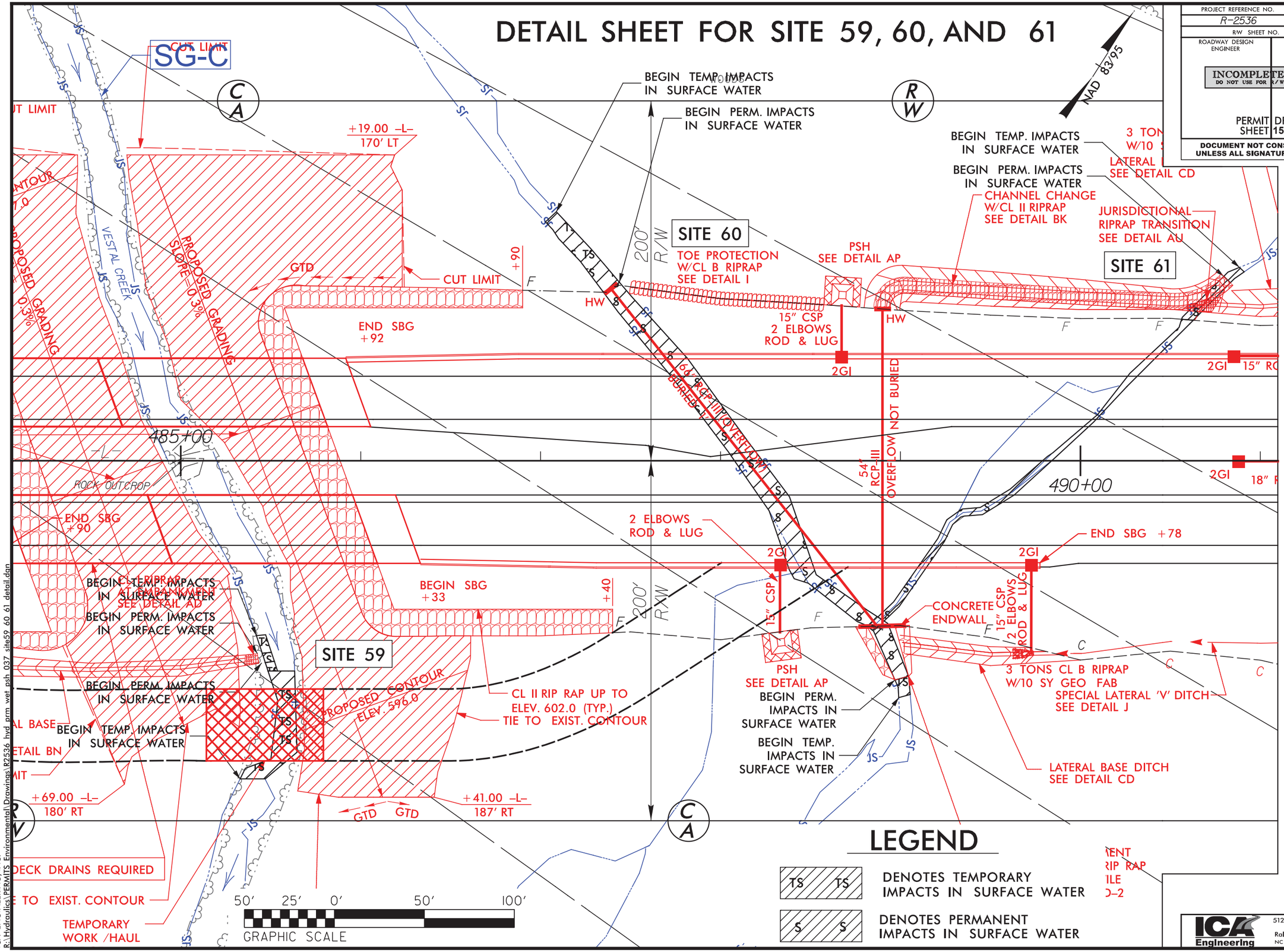
PROJECT REFERENCE NO.	SHEET NO.
R-2536	37A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 152 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



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ICA ENGINEERING, INC.
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PROJECT REFERENCE NO.	SHEET NO.
R-2536	121
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

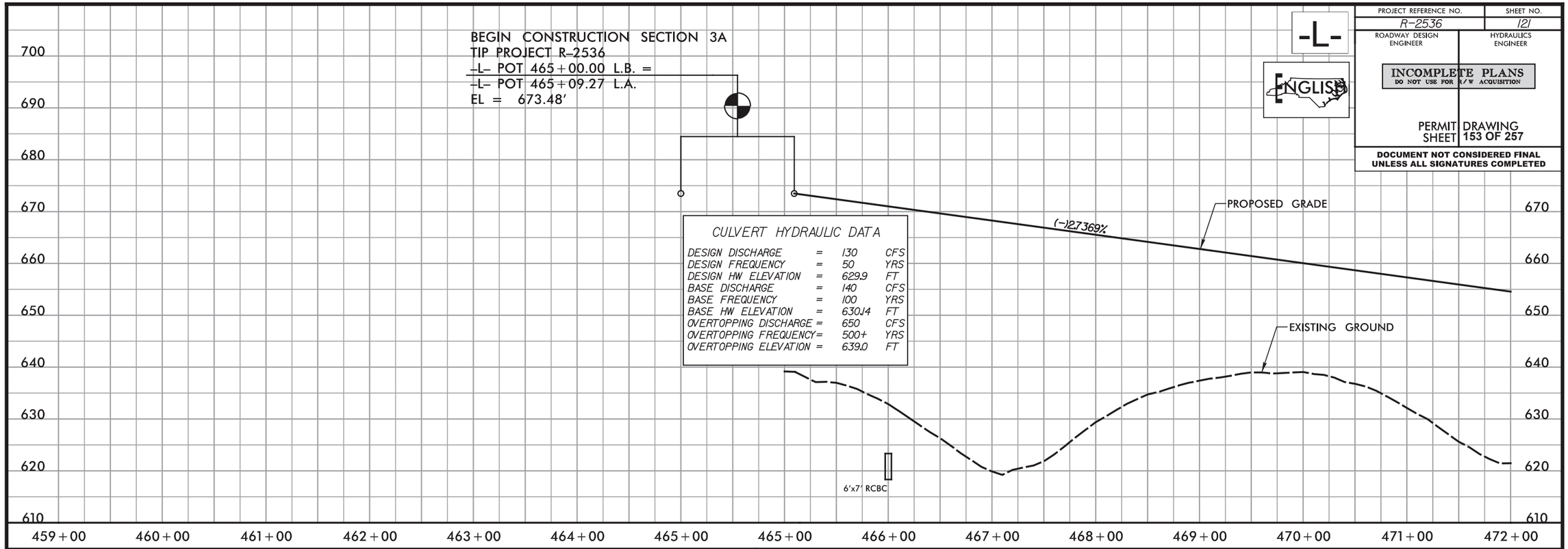
PERMIT DRAWING SHEET 153 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-

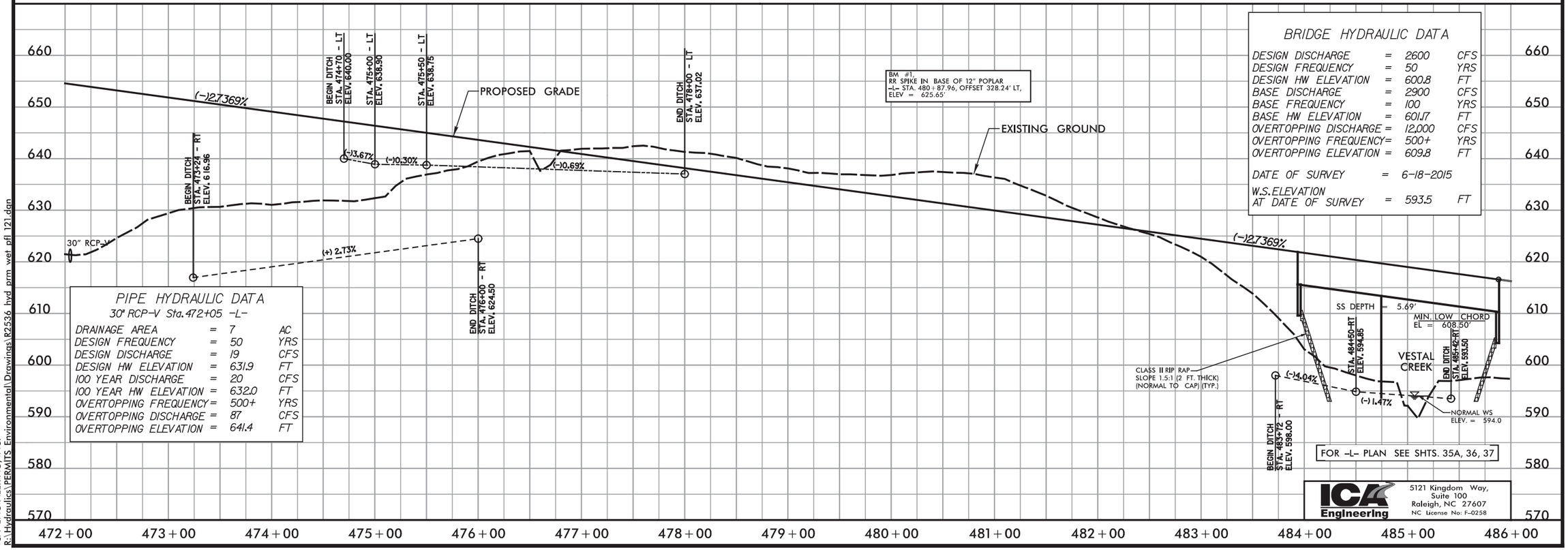
ENGLISH

BEGIN CONSTRUCTION SECTION 3A
TIP PROJECT R-2536
-L- POT 465+00.00 L.B. =
-L- POT 465+09.27 L.A.
EL = 673.48'



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	130	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	629.9	FT
BASE DISCHARGE	=	140	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	630.14	FT
OVERTOPPING DISCHARGE	=	650	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	639.0	FT



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	2600	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	600.8	FT
BASE DISCHARGE	=	2900	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	601.17	FT
OVERTOPPING DISCHARGE	=	12,000	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	609.8	FT
DATE OF SURVEY	=	6-18-2015	
W.S. ELEVATION AT DATE OF SURVEY	=	593.5	FT

PIPE HYDRAULIC DATA
30" RCP-V Sta. 472+05 -L-

DRAINAGE AREA	=	7	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	19	CFS
DESIGN HW ELEVATION	=	631.9	FT
100 YEAR DISCHARGE	=	20	CFS
100 YEAR HW ELEVATION	=	632.0	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	87	CFS
OVERTOPPING ELEVATION	=	641.4	FT

FOR -L- PLAN SEE SHTS. 35A, 36, 37

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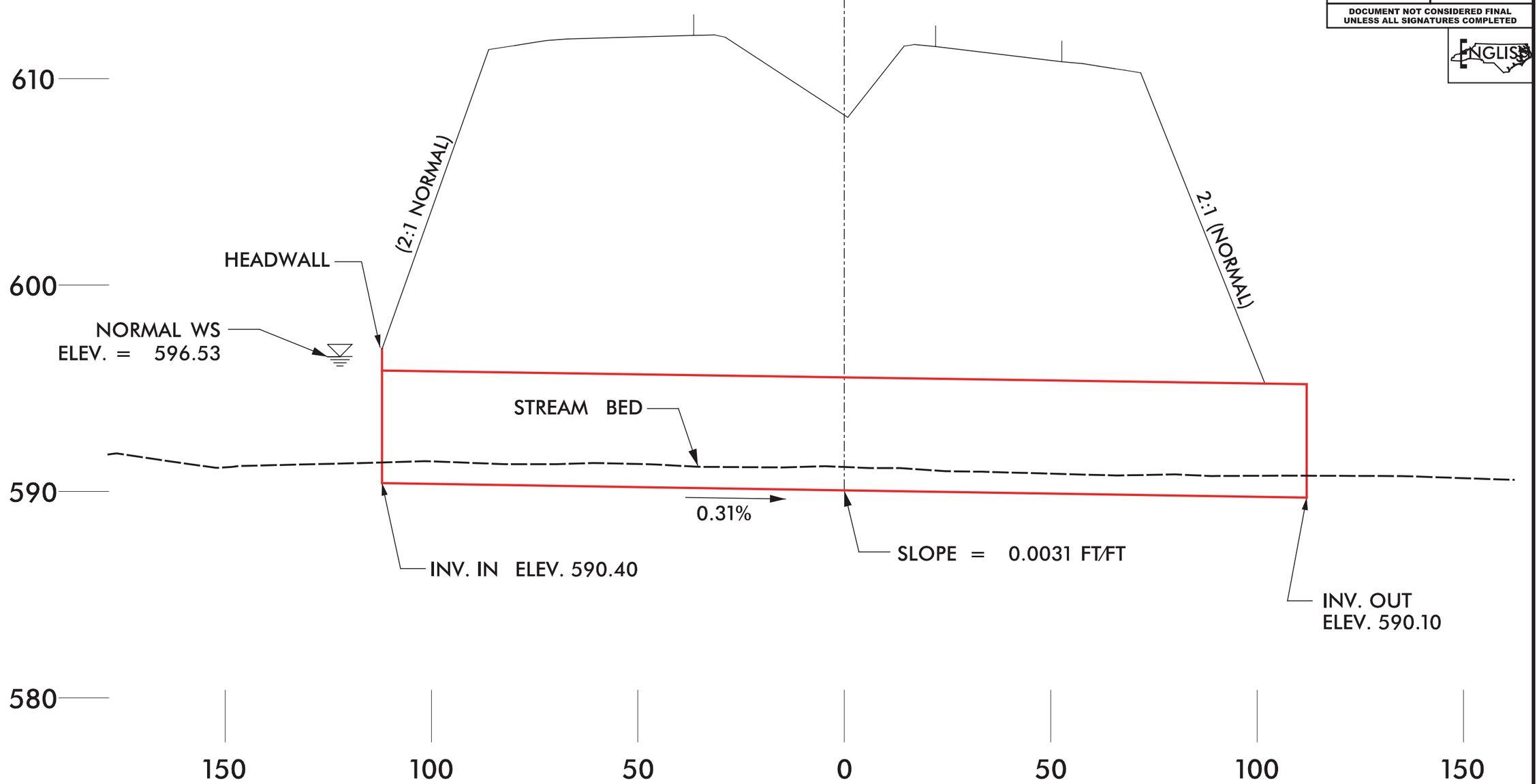
R:\Hydraulics\PERMITS Environmental\Drawings\R2536 hyd prm wet pfl 121.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 154 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SITE 60
PROFILE ALONG STRUCTURE
STA. 488+15 –L–

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R:\Hydraulics\PERMITS Environmental\Drawings\R2536 hyd prm wet pfl along 66in psh37.dgn

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 155 OF 257

DOCUMENT NOT CONSIDERED FINAL
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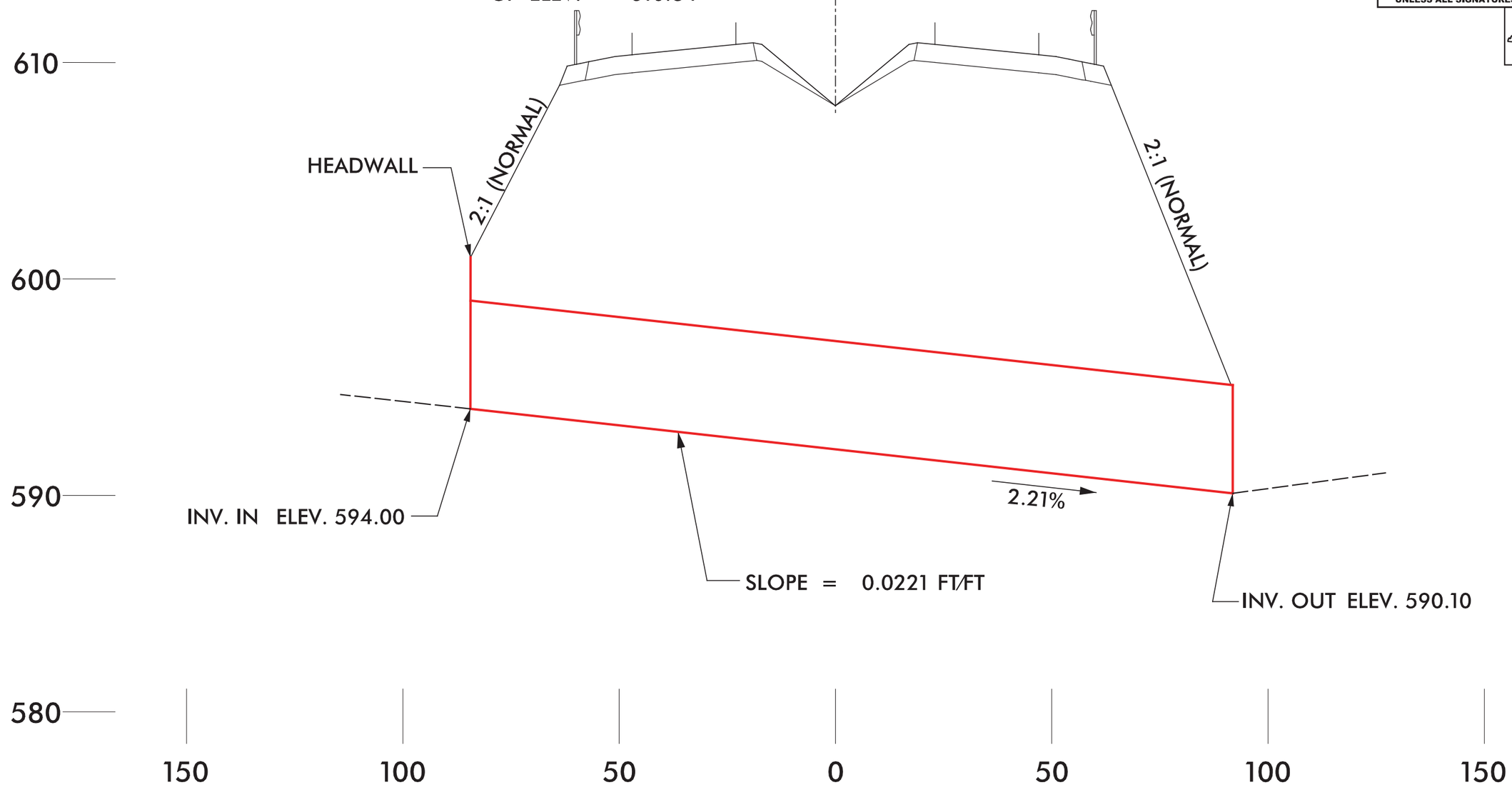

SITE 61
PROFILE ALONG STRUCTURE
STA. 488+90 –L–

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	38
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 156 OF 257

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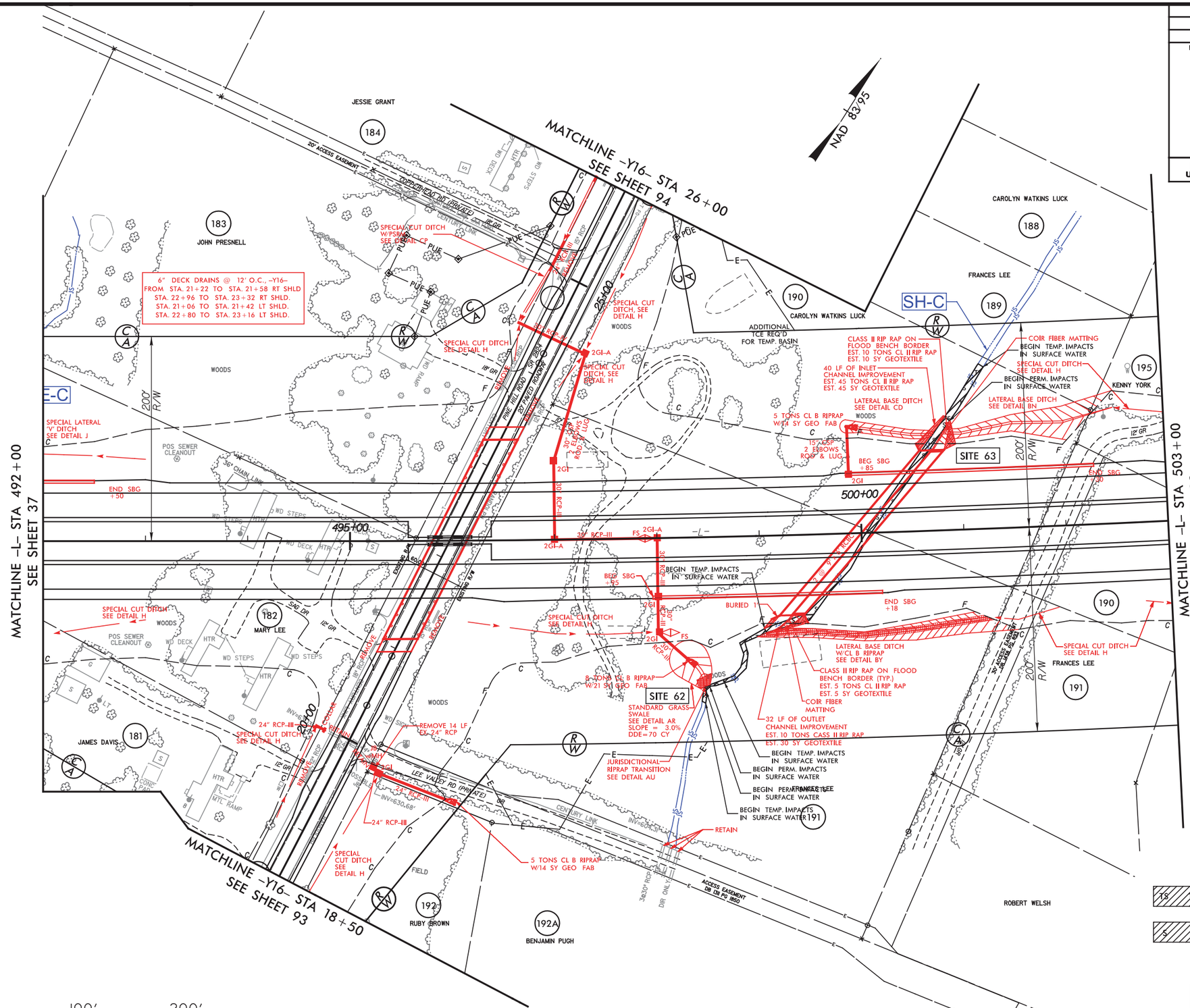

SITE 62 AND 63
PLAN VIEW

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NC License No: F-0258

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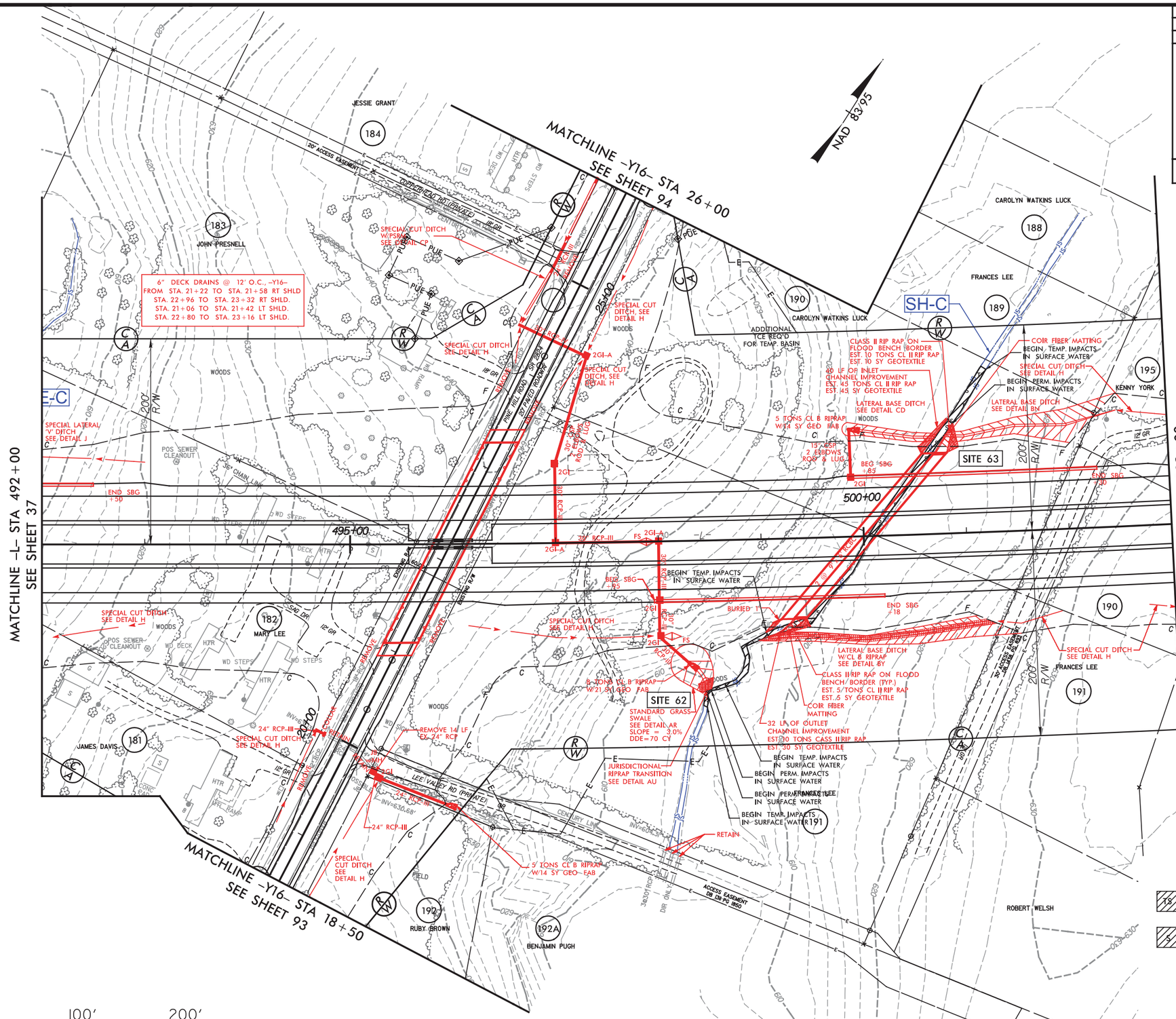
PROJECT REFERENCE NO.	SHEET NO.
R-2536	38
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 157 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



LEGEND

TS FS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHT. 122
FOR -Y16- PROFILE SEE SHT. 195
FOR -Y16DET- SEE SHT. 2B-5

100' 0' 100' 200'
GRAPHIC SCALE

SITE 62 AND 63
PLAN VIEW

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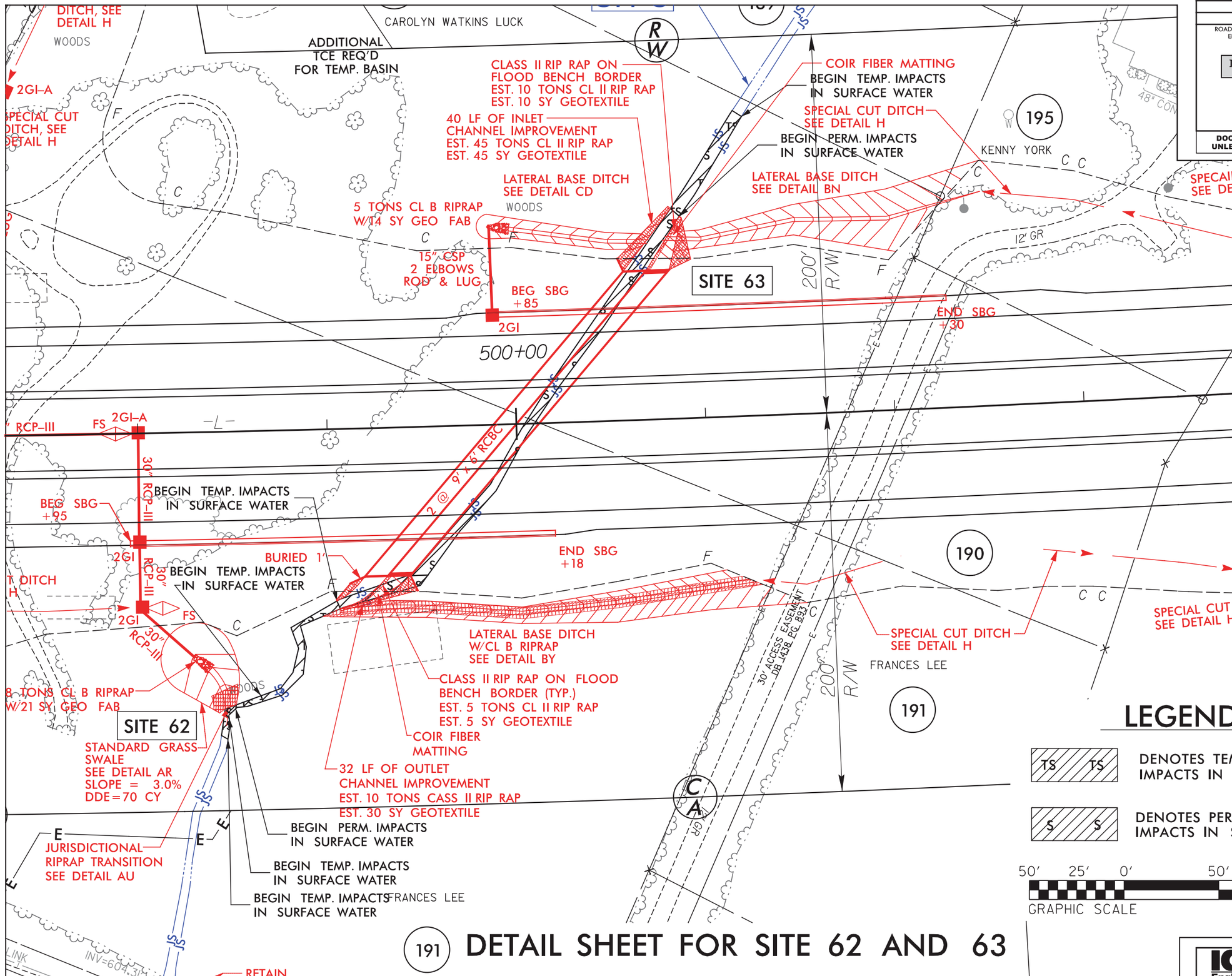
PROJECT REFERENCE NO.	SHEET NO.
R-2536	38A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 158 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



191 DETAIL SHEET FOR SITE 62 AND 63

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5/24/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

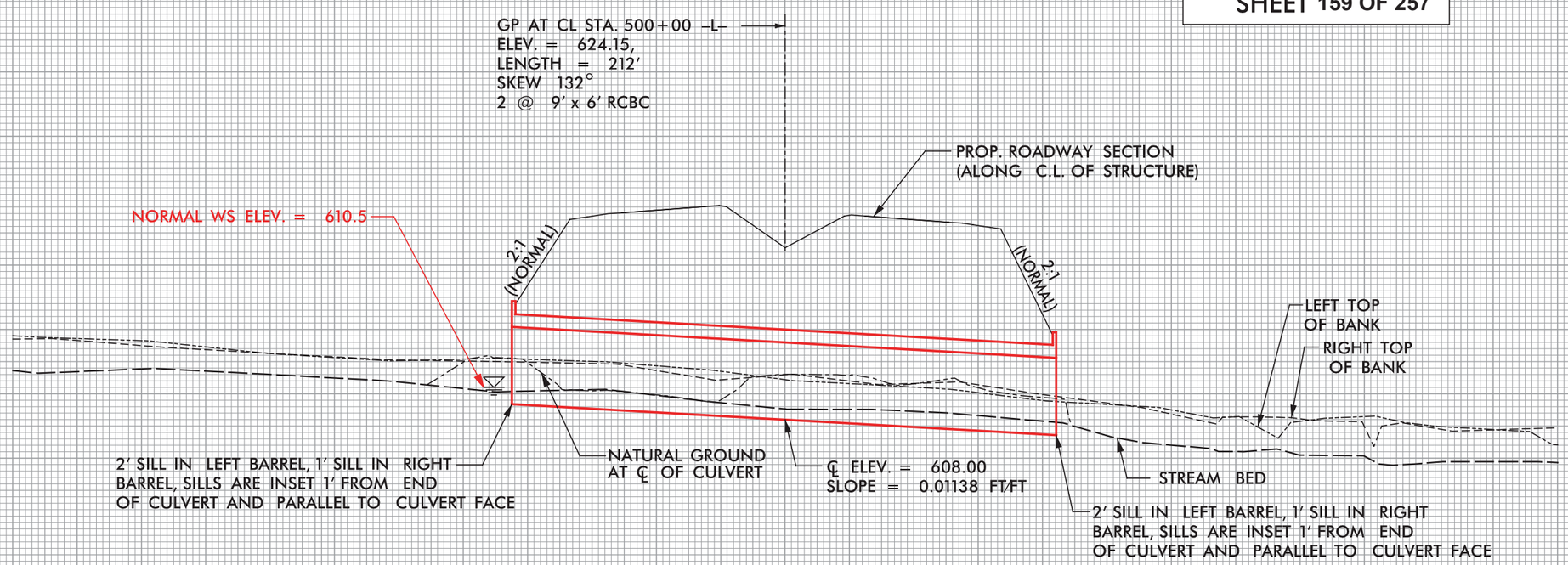
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

SITE 63
-L- 500+00

PERMIT DRAWING
SHEET 159 OF 257



PROPOSED 2 @ 9'X6' RCBC

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP RAP MAY BE USED TO SUPPLEMENT NATIVE MATERIAL IN THE HIGH FLOW BARREL(S). IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL(S), NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

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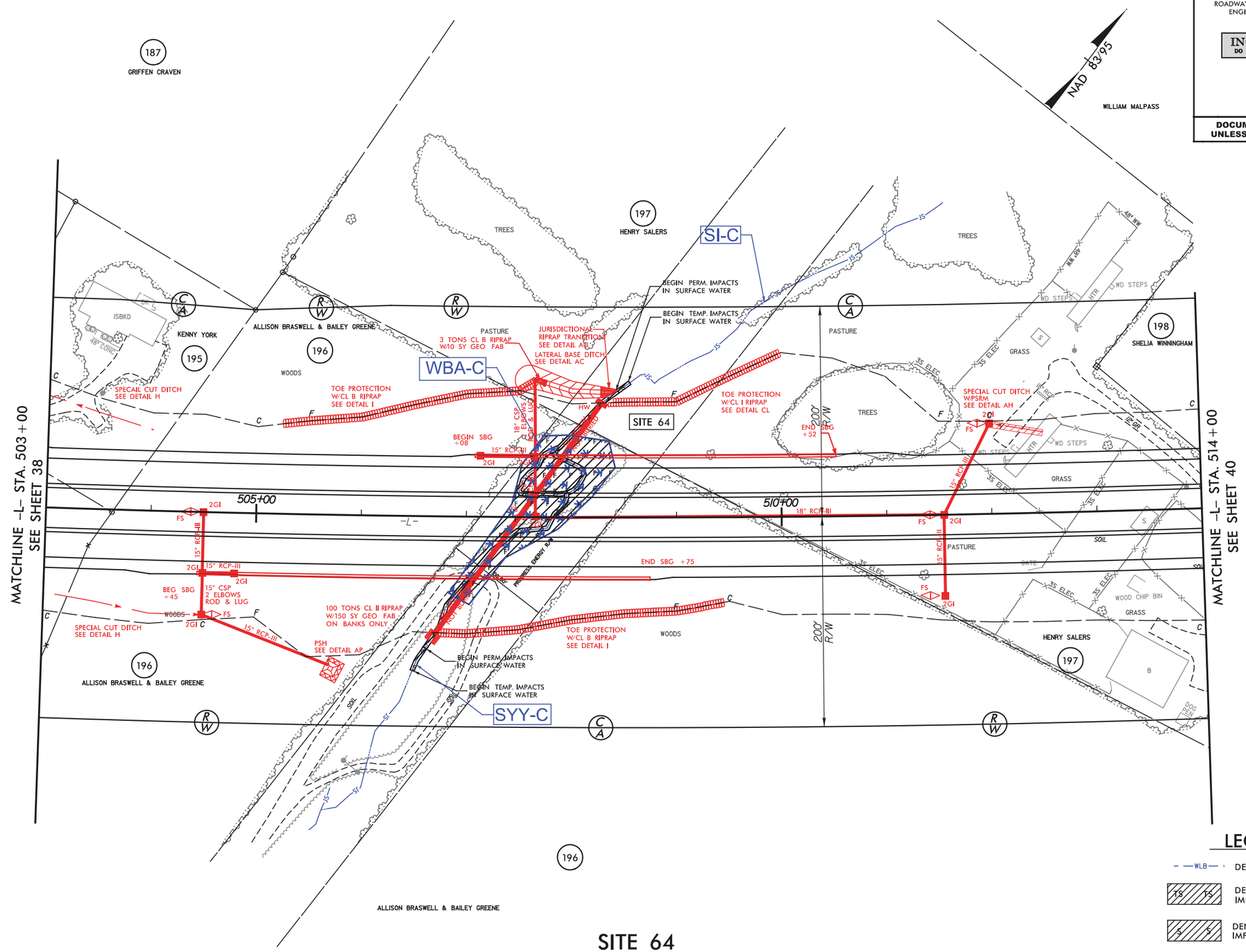
PROJECT REFERENCE NO.	SHEET NO.
R-2536	39
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 160 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 64
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S DENOTES PERMANENT IMPACTS IN SURFACE WATER
- F F DENOTES FILL IN WETLAND

FOR -L- PROFILE SEE SHT. 122

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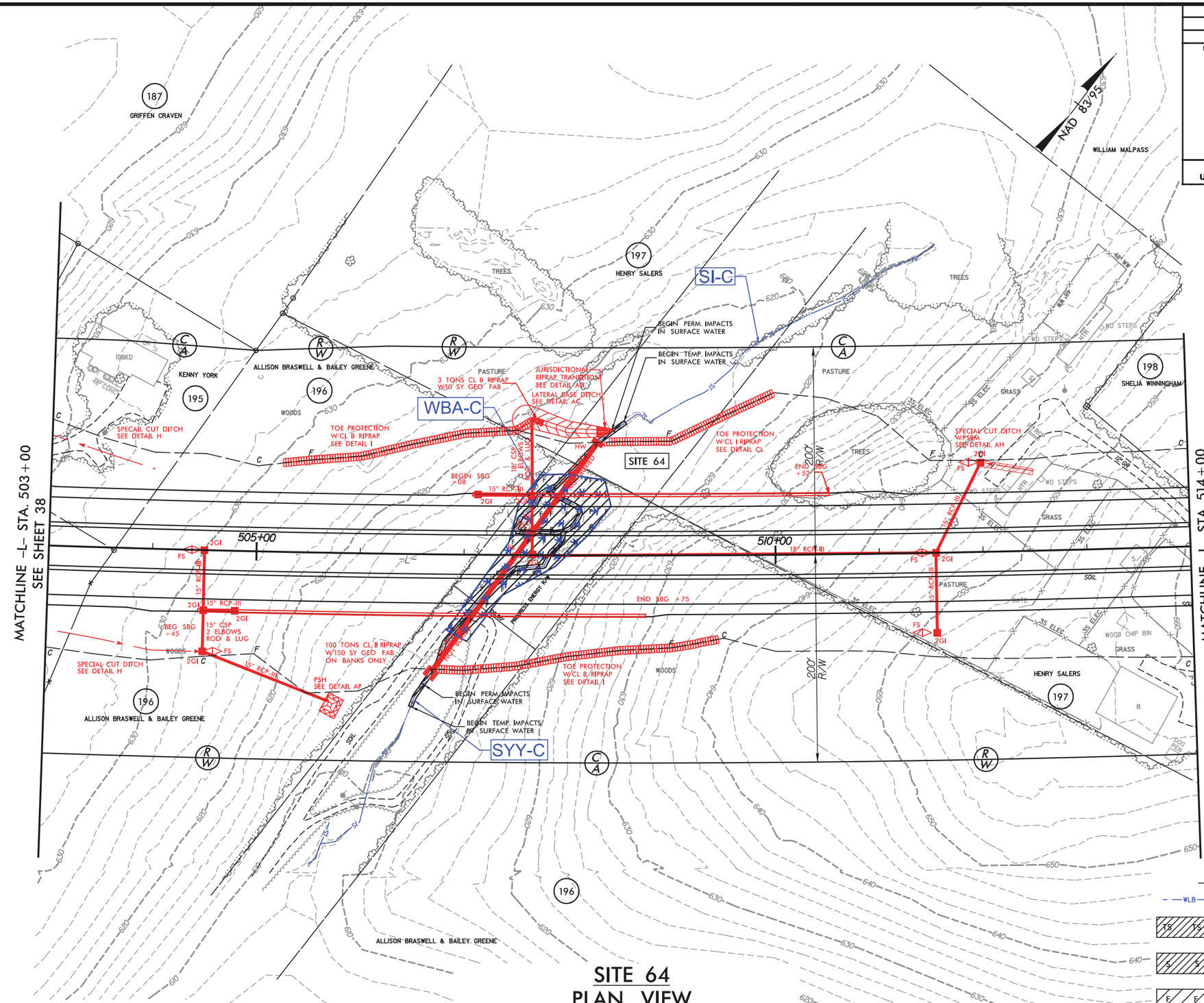
PROJECT REFERENCE NO.	SHEET NO.
R-2536	39
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 161 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 64
PLAN VIEW

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS / TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S / S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- F / F — DENOTES FILL IN WETLAND

FOR -L- PROFILE SEE SHT. 122

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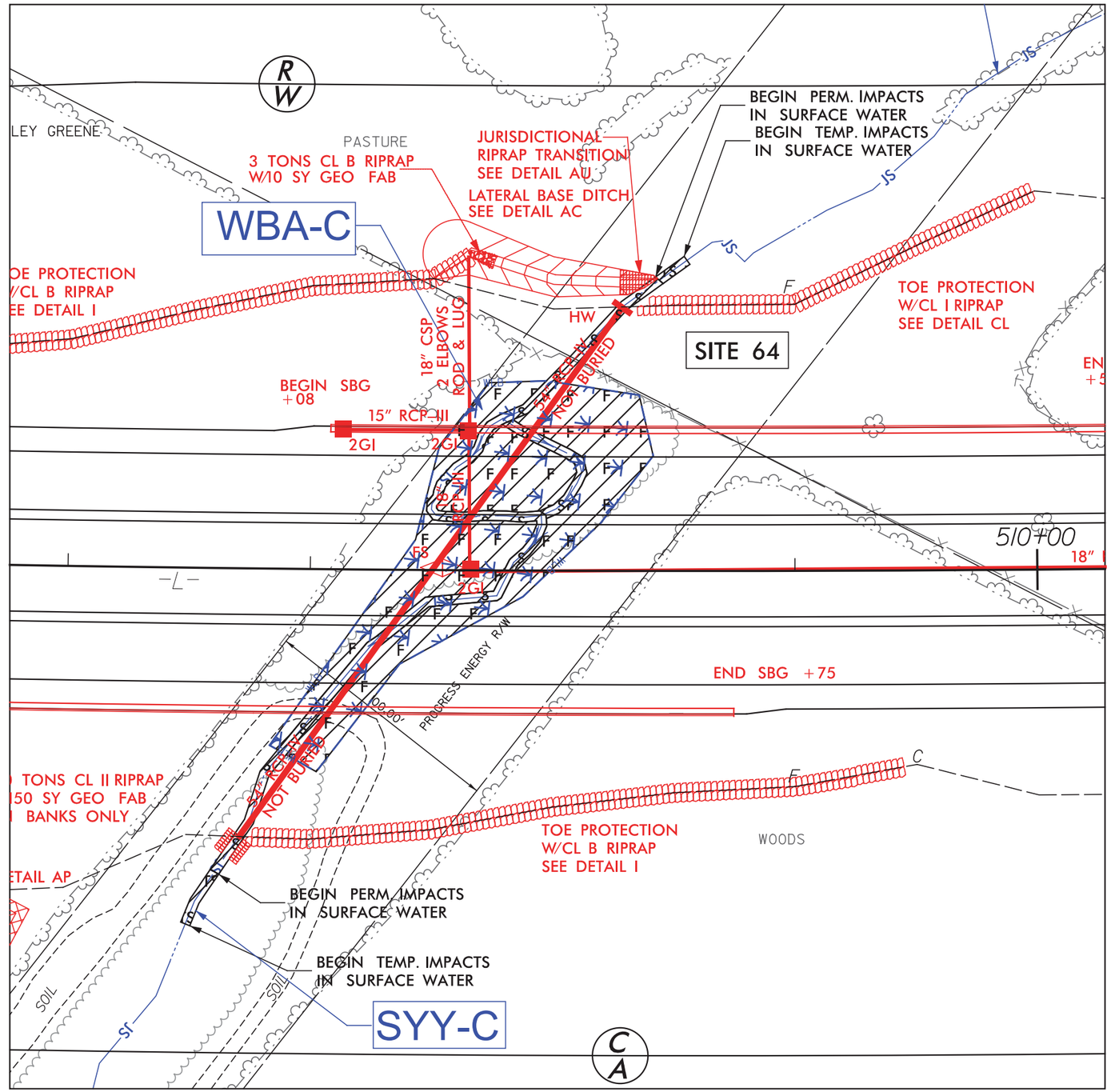
PROJECT REFERENCE NO.	SHEET NO.
R-2536	39A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 162 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL SHEET FOR SITE 64



50′ 25′ 0′ 50′ 100′
GRAPHIC SCALE

NAD 83/95

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS / TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S / S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- F / F — DENOTES FILL IN WETLAND

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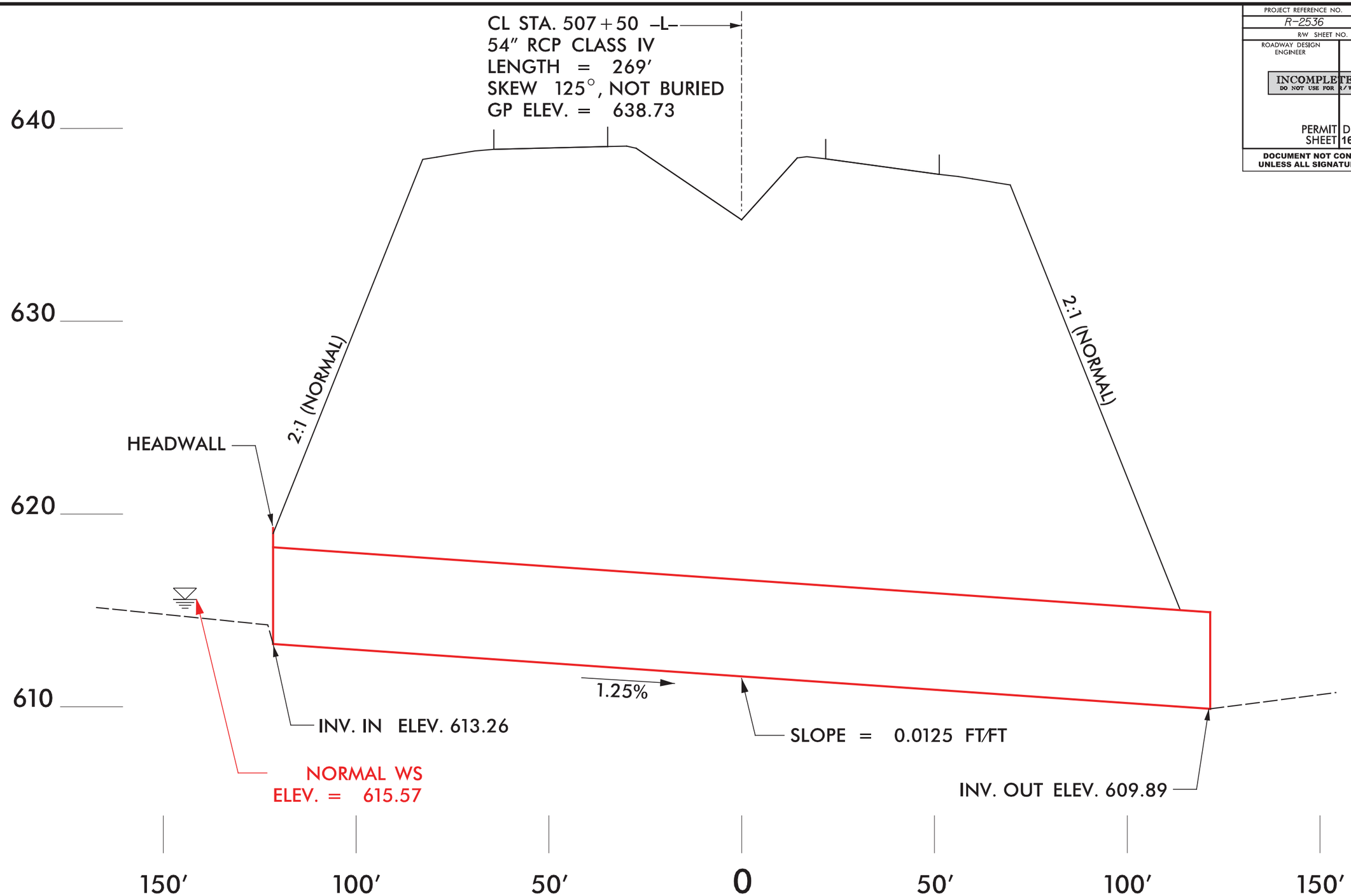
R:\Hydraulics\PERMITS Environmental\Drawings\R2536 hyd prm wet psh 039 site 64 Detail.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 163 OF 257

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



SITE 64
PROFILE ALONG STRUCTURE
STA. 507+50 –L–

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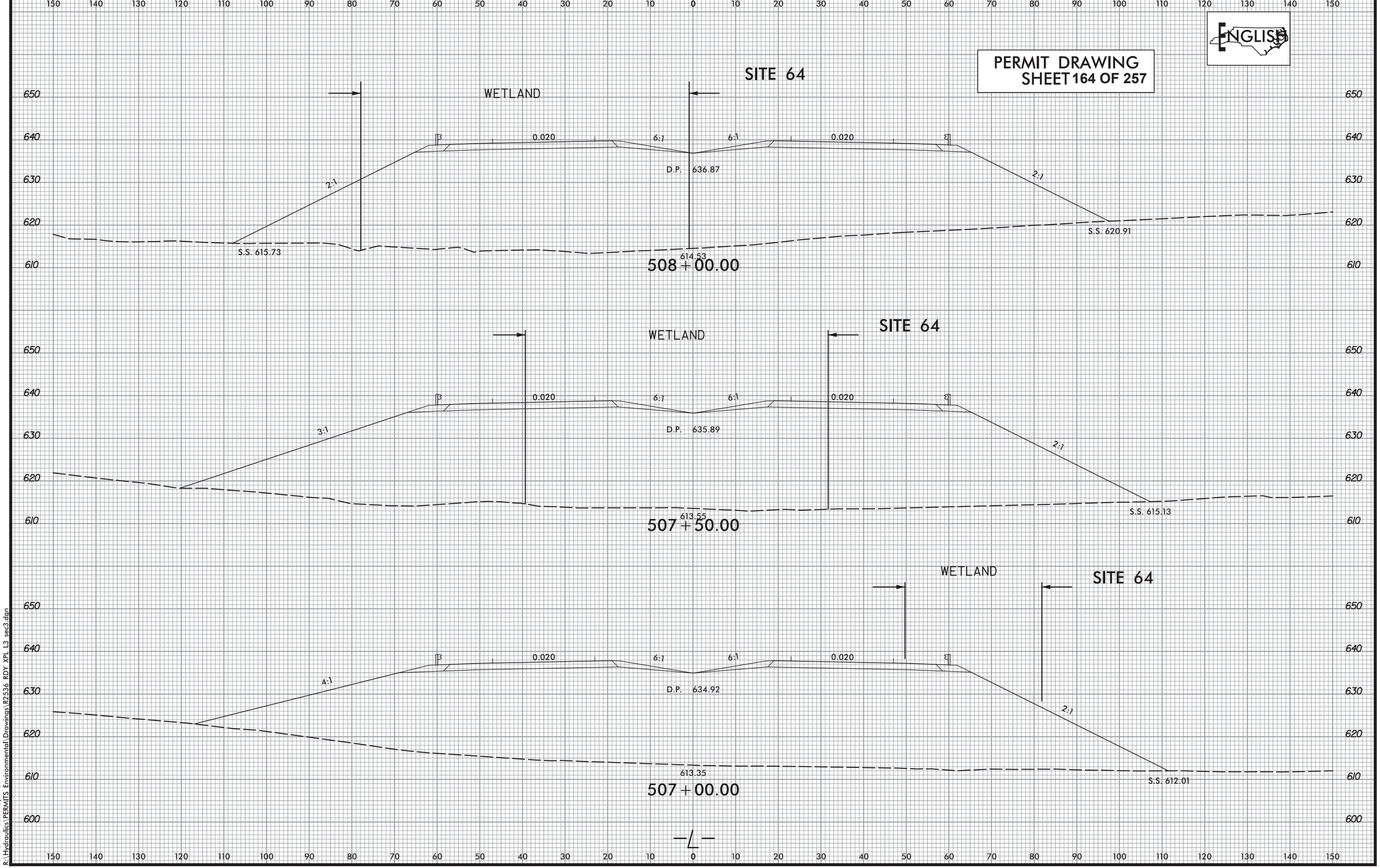
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-31

0 5 10

ENGLISH

PERMIT DRAWING
SHEET 164 OF 257



8/23/99

2/2/2016
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R:\Hydraulics\PERMITS Environmental\Drawings\R2536 RDY XPL L3 sec3.dgn

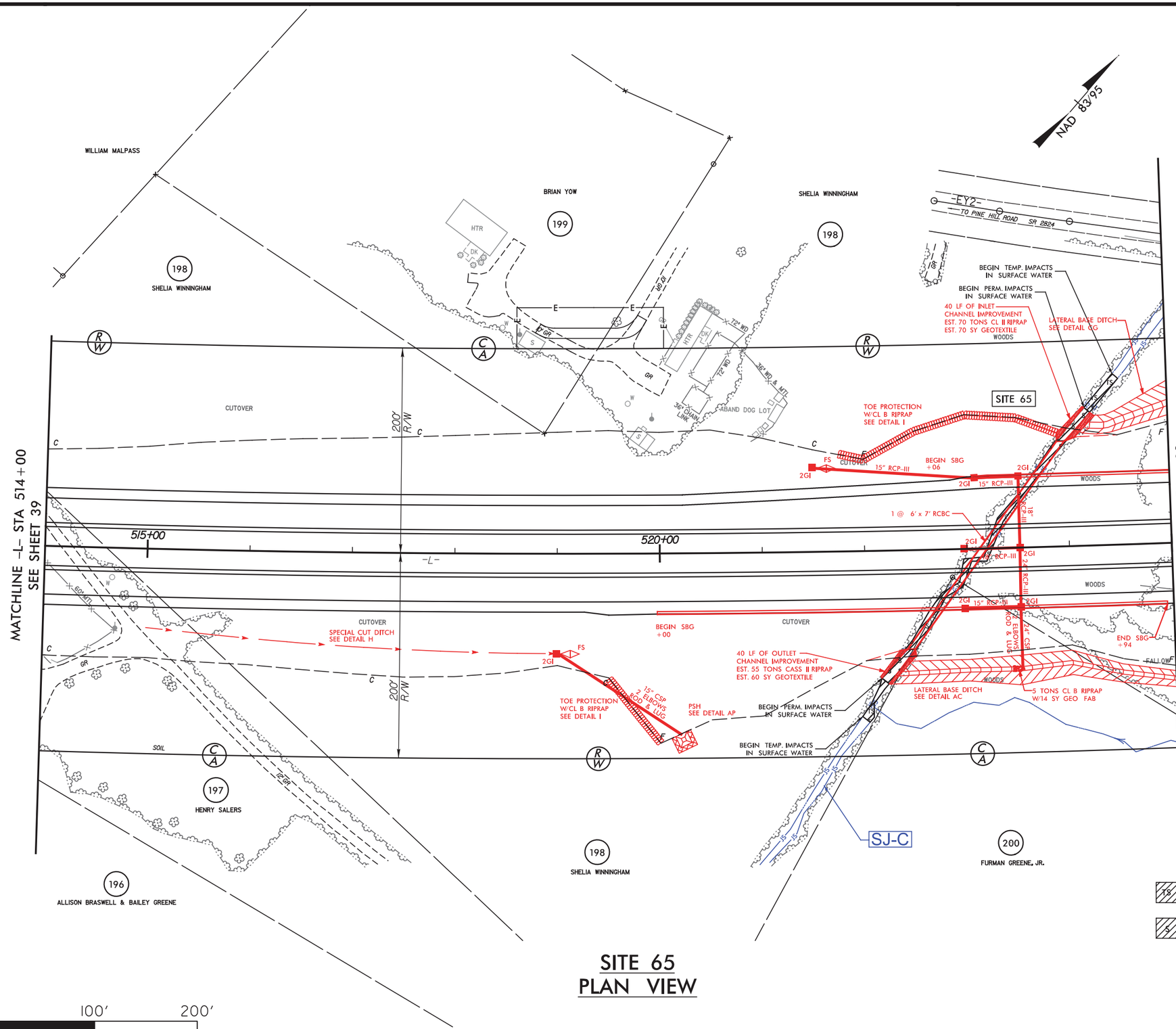
PROJECT REFERENCE NO.	SHEET NO.
R-2536	40
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 165 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 65
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHT. 123

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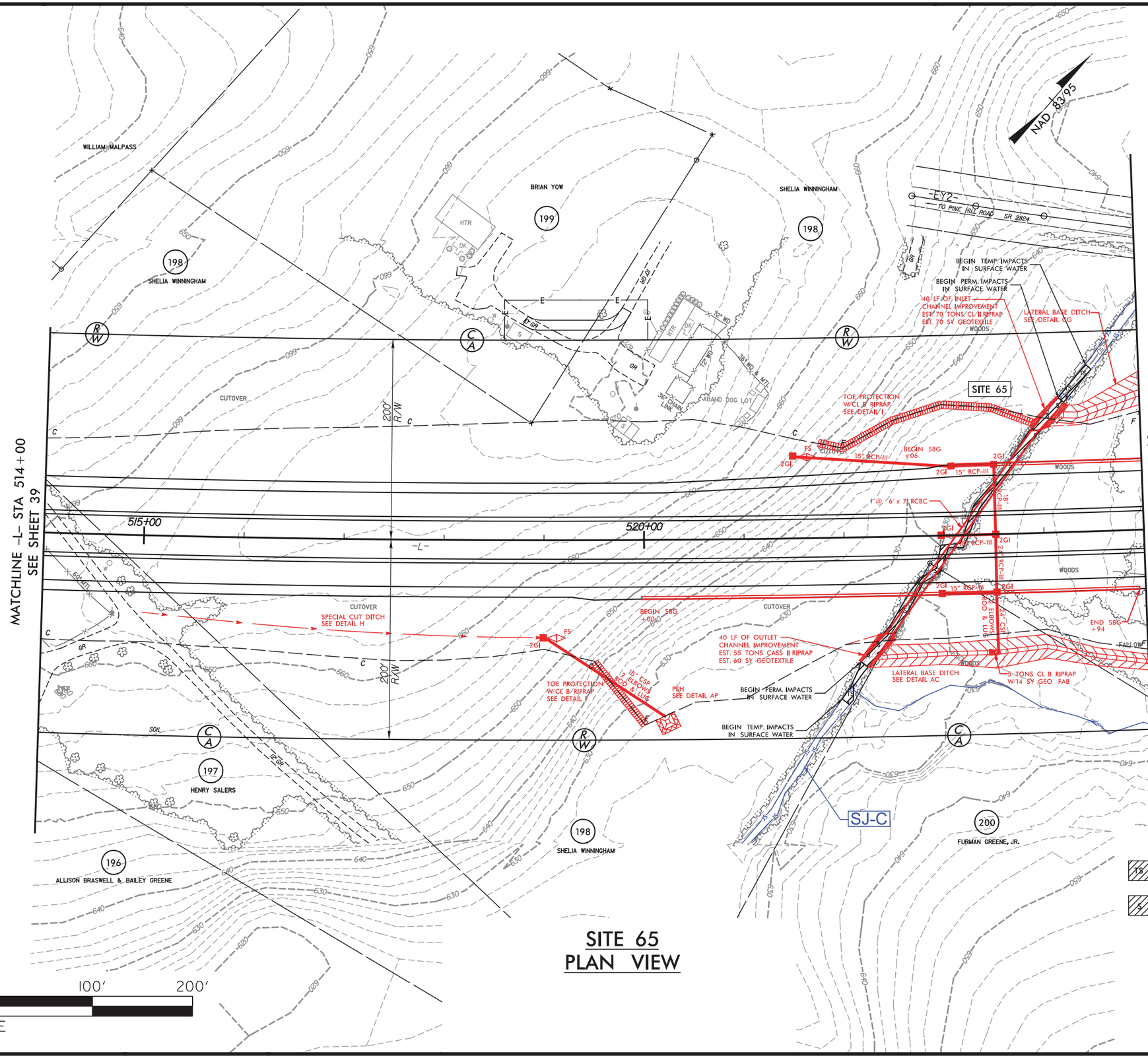
PROJECT REFERENCE NO.	SHEET NO.
R-2536	40
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 166 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 65
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHT. 123

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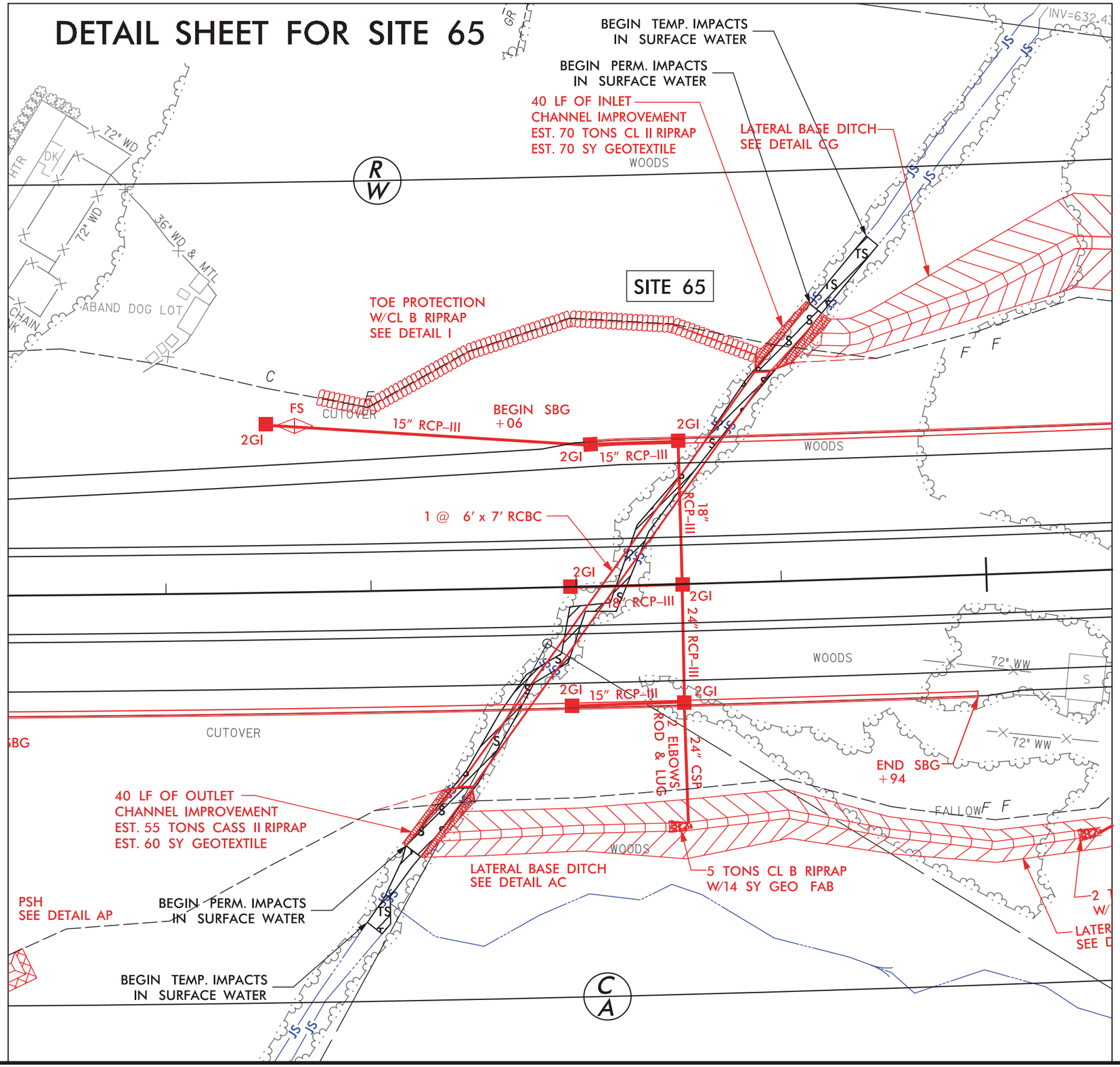
DETAIL SHEET FOR SITE 65



PROJECT REFERENCE NO.	SHEET NO.
R-2536	40A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 167 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'
GRAPHIC SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

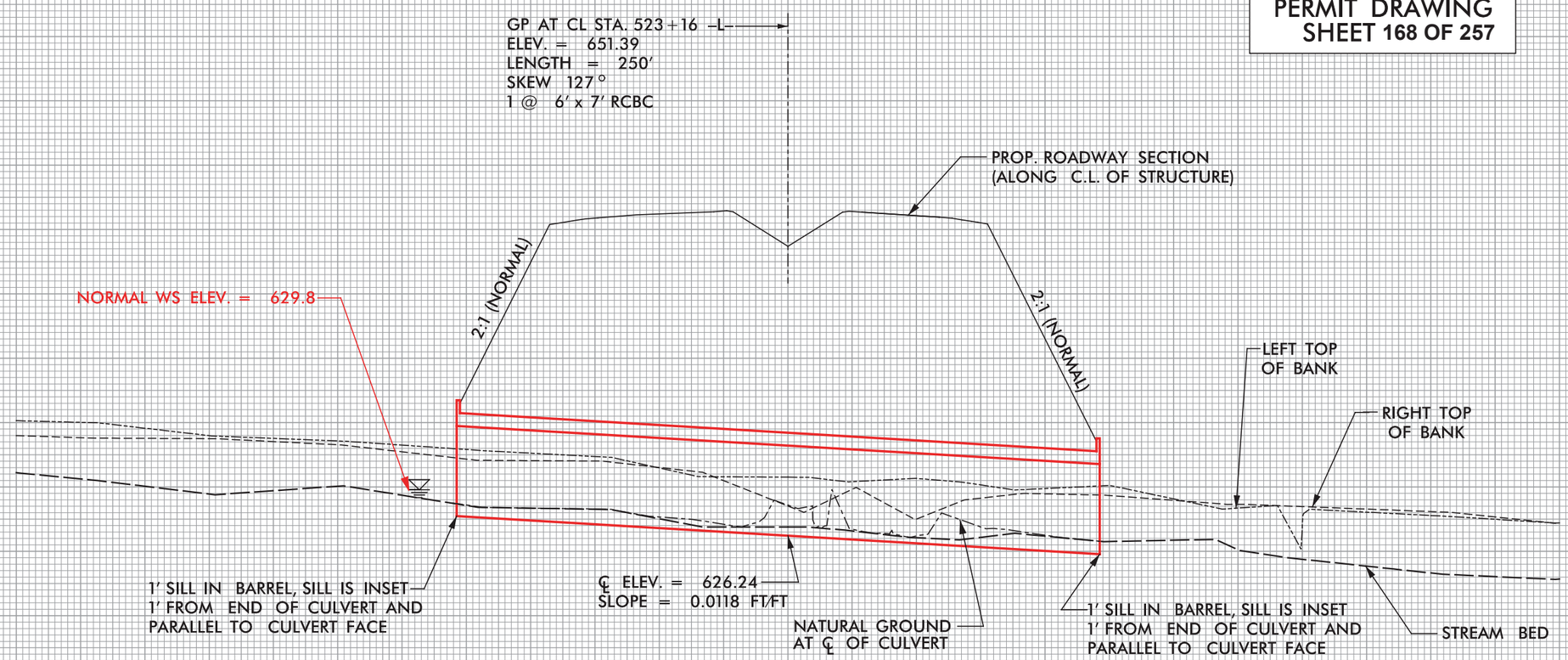
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

PERMIT DRAWING
SHEET 168 OF 257

SITE 65
-L- 523+16



PROPOSED 1 @ 6'x 7'RCBC

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

250 200 150 100 50 0 50 100 150 200 250

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REVISIONS

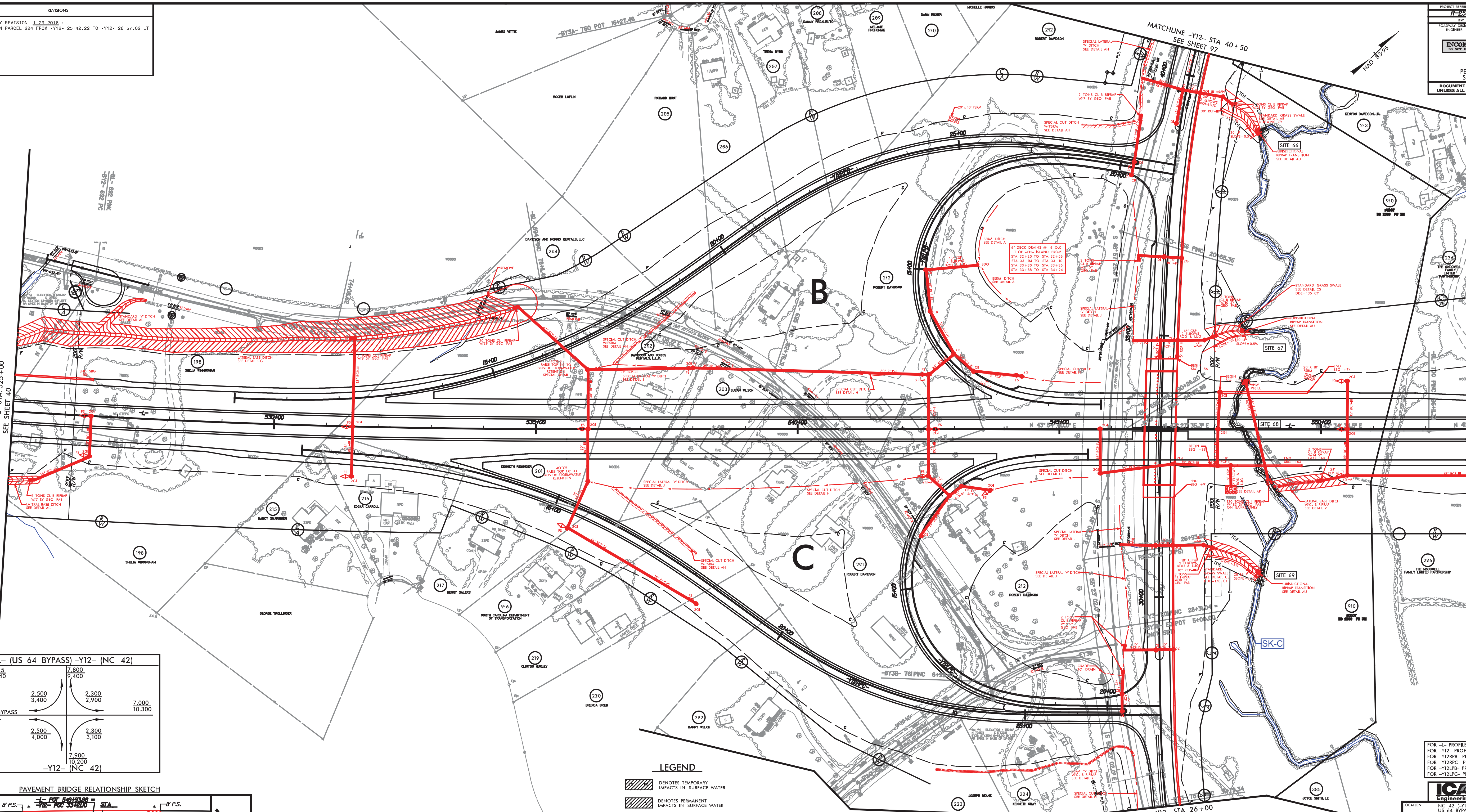
RIGHT-OF-WAY REVISION 1-29-2016 :
ADDED PUE ON PARCEL 224 FROM -Y12- 25+42.22 TO -Y12- 26+57.02 LT

PROJECT REFERENCE NO.	SHEET NO.
R-2536	41
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

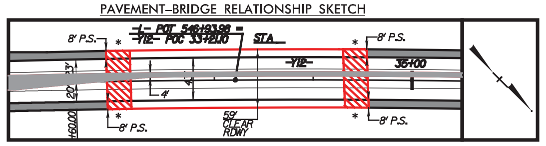
PERMIT DRAWING
SHEET 169 OF 257

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



-L- (US 64 BYPASS) -Y12- (NC 42)			
ADT 2015 / ADT 2040	7,800 / 9,400 (-Y12- north)		
2,500 / 3,400		2,300 / 2,900	7,000 / 10,300
US 64 BYPASS -L- 7,400 / 11,700			
2,500 / 4,000		2,300 / 3,100	
	7,900 / 10,200 -Y12- (NC 42)		

PAVEMENT-BRIDGE RELATIONSHIP SKETCH



* GUARDRAIL ANCHOR UNIT REQUIRED

BRIDGE APPROACH SLAB

PAVEMENT REMOVAL

LEGEND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES PERMANENT IMPACTS IN SURFACE WATER

SITE 66, 67, 68, AND, 69,
PLAN VIEW

FOR -L- PROFILE SEE SHTS. 123 - 124
FOR -Y12- PROFILE SEE SHT. 185
FOR -Y12RPB- PROFILE SEE SHTS. 186 - 187
FOR -Y12RPC- PROFILE SEE SHT. 188
FOR -Y12LPB- PROFILE SEE SHT. 187
FOR -Y12LPC- PROFILE SEE SHT. 189

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Raleigh, NC 27607
NC License No: F-0258

LOCATION: NC 42 (-Y12-) AT US 64 BYPASS (-L-)

TIP NO.: R-2536 COUNTY: RANDOLPH

DESIGNED BY: HWB

CHECKED BY: DCW DATE: 7-23-15

GRAPHIC SCALE
50 25 0 50 100
PLANS

2/23/2016
$FILE$
$$$$USERNAME$$$$

REVISIONS

RIGHT-OF-WAY REVISION 1-29-2016 :
ADDED PUE ON PARCEL 224 FROM -Y12- 25+42.22 TO -Y12- 26+57.02 LT

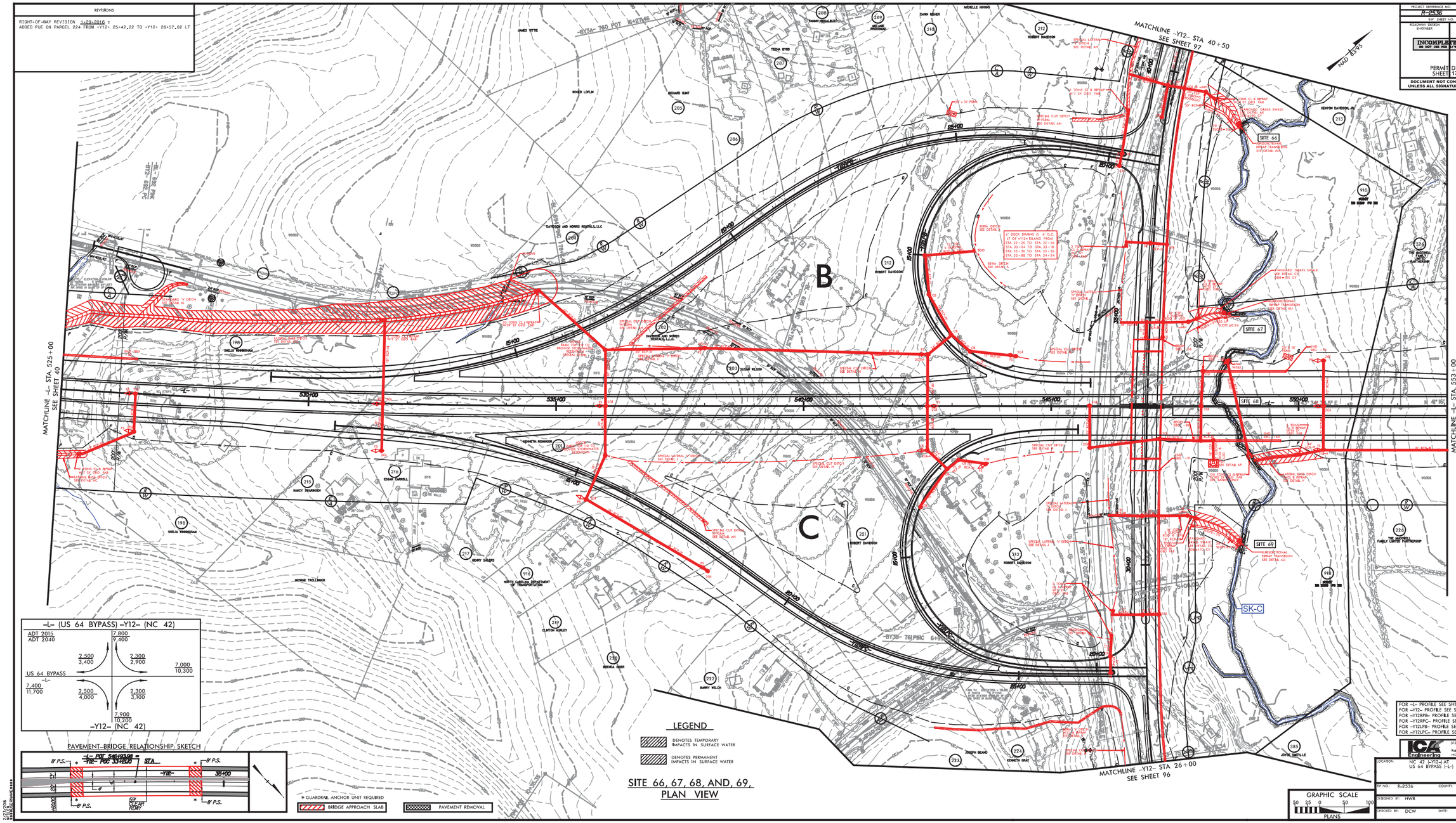
PROJECT REFERENCE NO.	SHEET NO.
R-2536	41
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 170 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



FOR -L- PROFILE SEE SHTS. 123 – 124
FOR -Y12- PROFILE SEE SHT. 185
FOR -Y12RPB- PROFILE SEE SHTS. 186 – 187
FOR -Y12RPC- PROFILE SEE SHT. 188
FOR -Y12LPB- PROFILE SEE SHT. 187
FOR -Y12LPC- PROFILE SEE SHT. 189

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Suite 100
Raleigh, NC 27607
NC License No: F-0258

LOCATION:
NC 42 -Y12-J AT
US 64 BYPASS (-L-)

TIP NO.: R-2536 COUNTY: RANDOLPH

DESIGNED BY: HWB

CHECKED BY: DCW DATE: 7-23-15

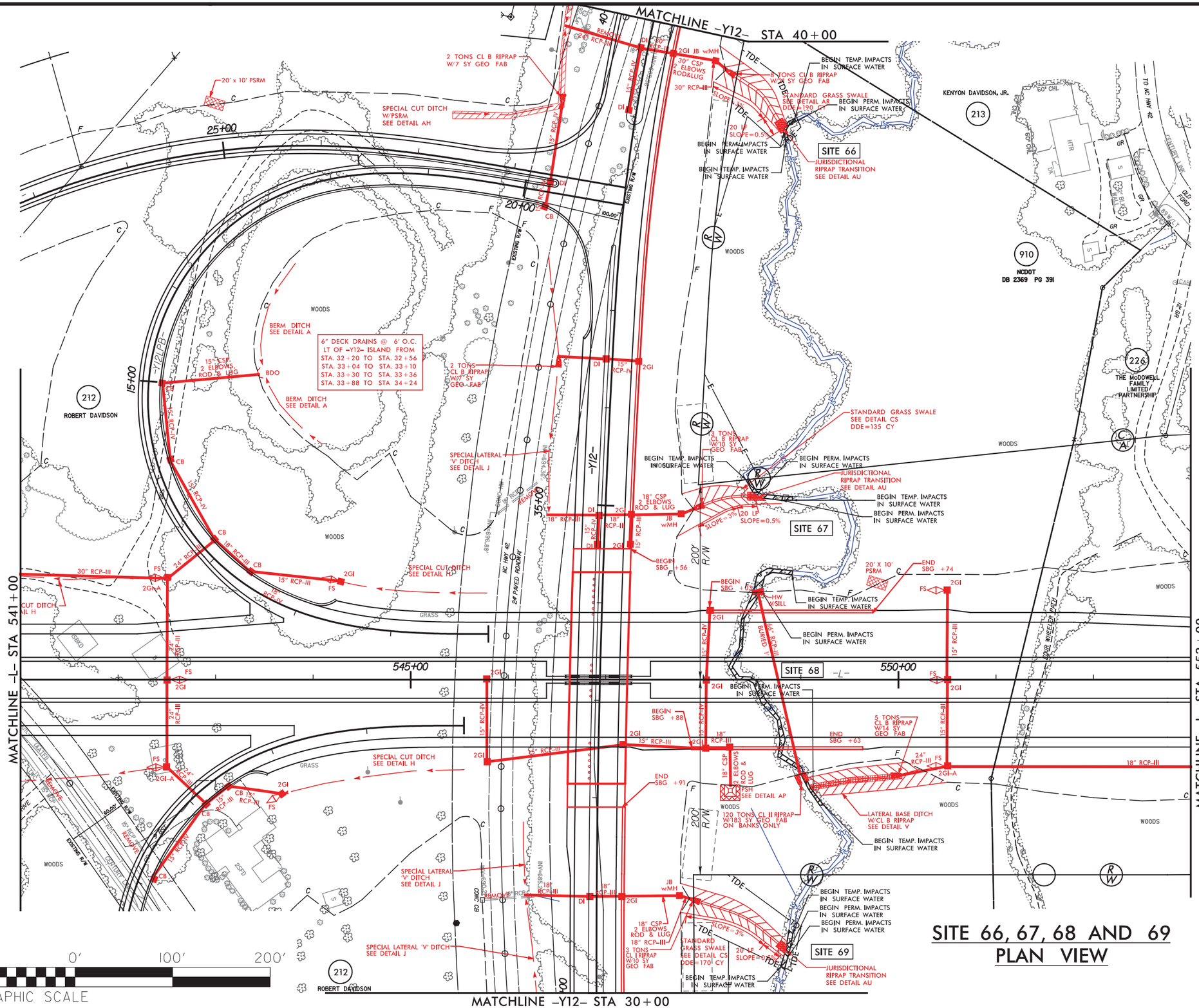
PROJECT REFERENCE NO.	SHEET NO.
R-2536	41
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 171 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



LEGEND

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

SITE 66, 67, 68 AND 69 PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	41
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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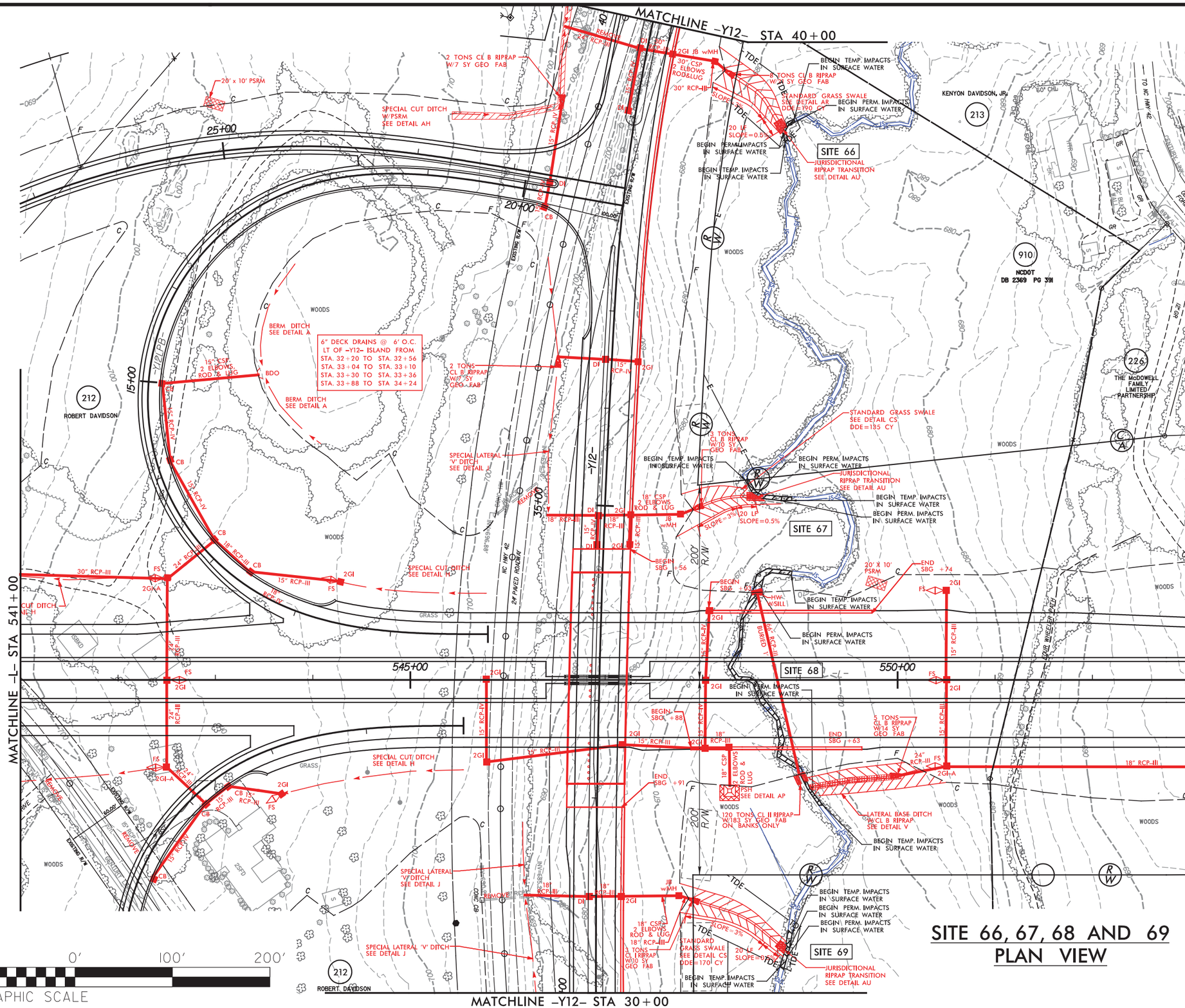
ENGLISH



SITE 66, 67, 68 AND 69 PLAN VIEW

LEGEND

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

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	4/A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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SHEET 173 OF 257

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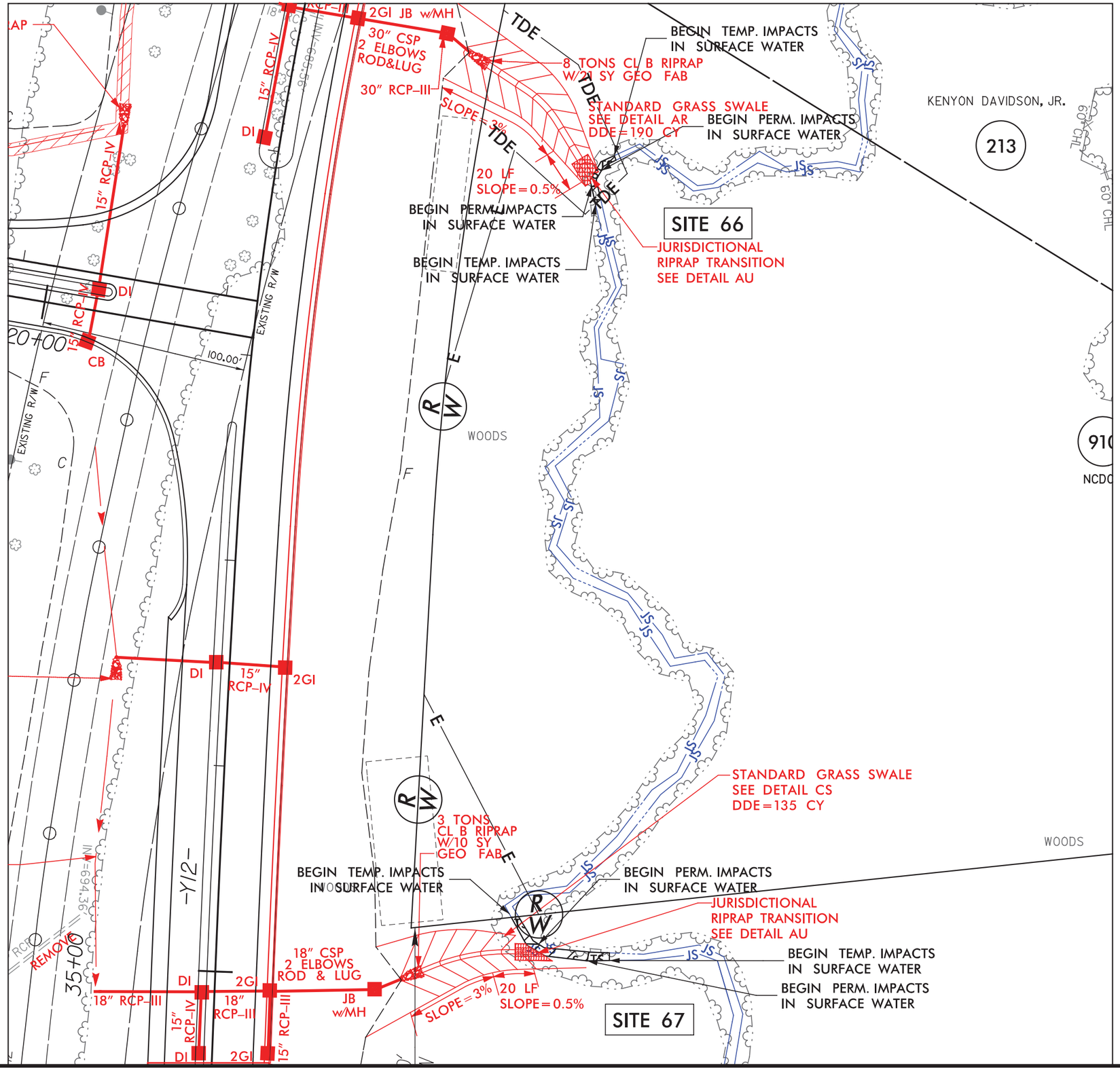
ENGLISH



DETAIL SHEET FOR SITE 66, 67

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'
GRAPHIC SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	41B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 174 OF 257

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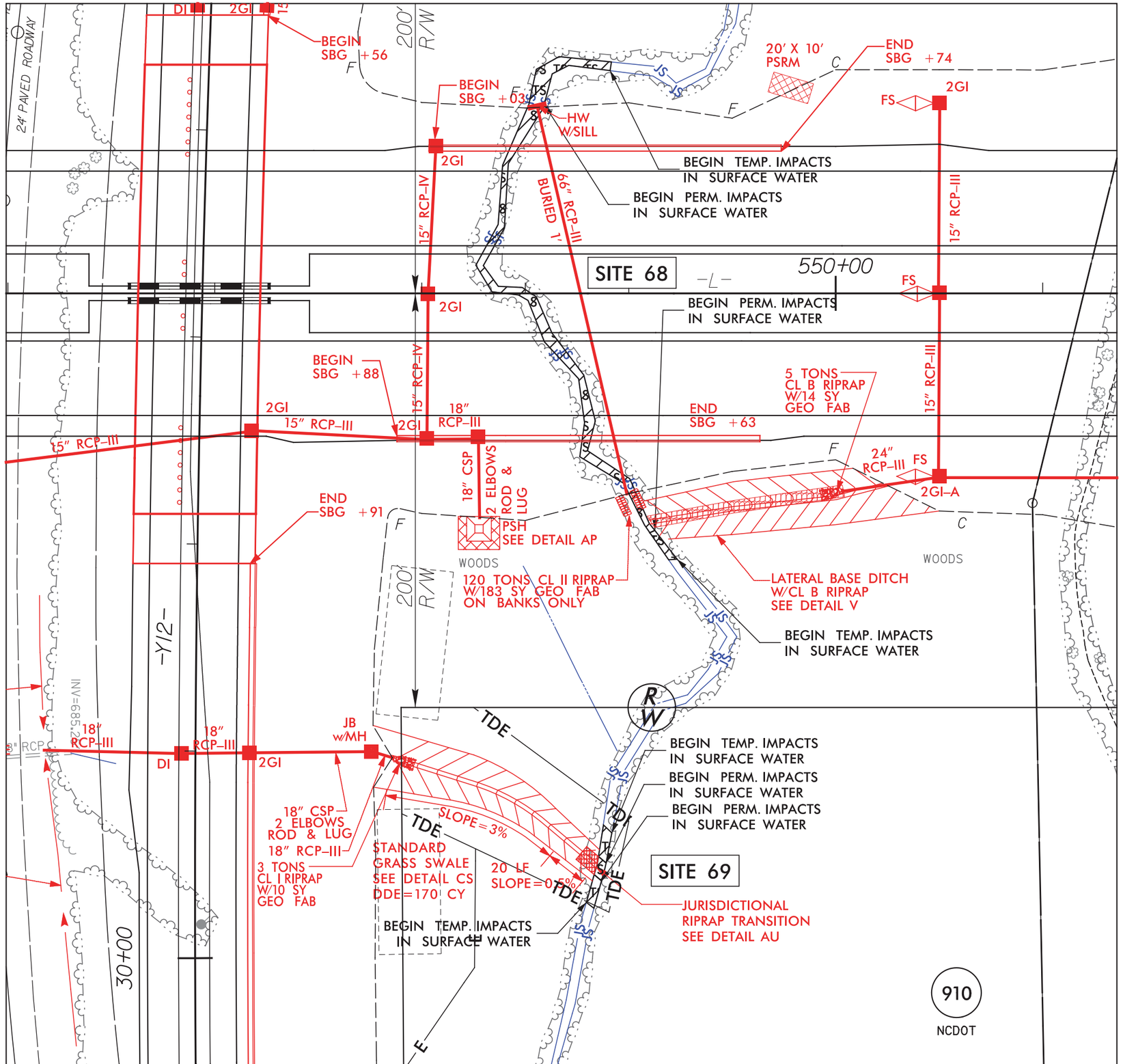
ENGLISH



DETAIL SHEET FOR SITE 68, 69

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'
GRAPHIC SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 175 OF 257

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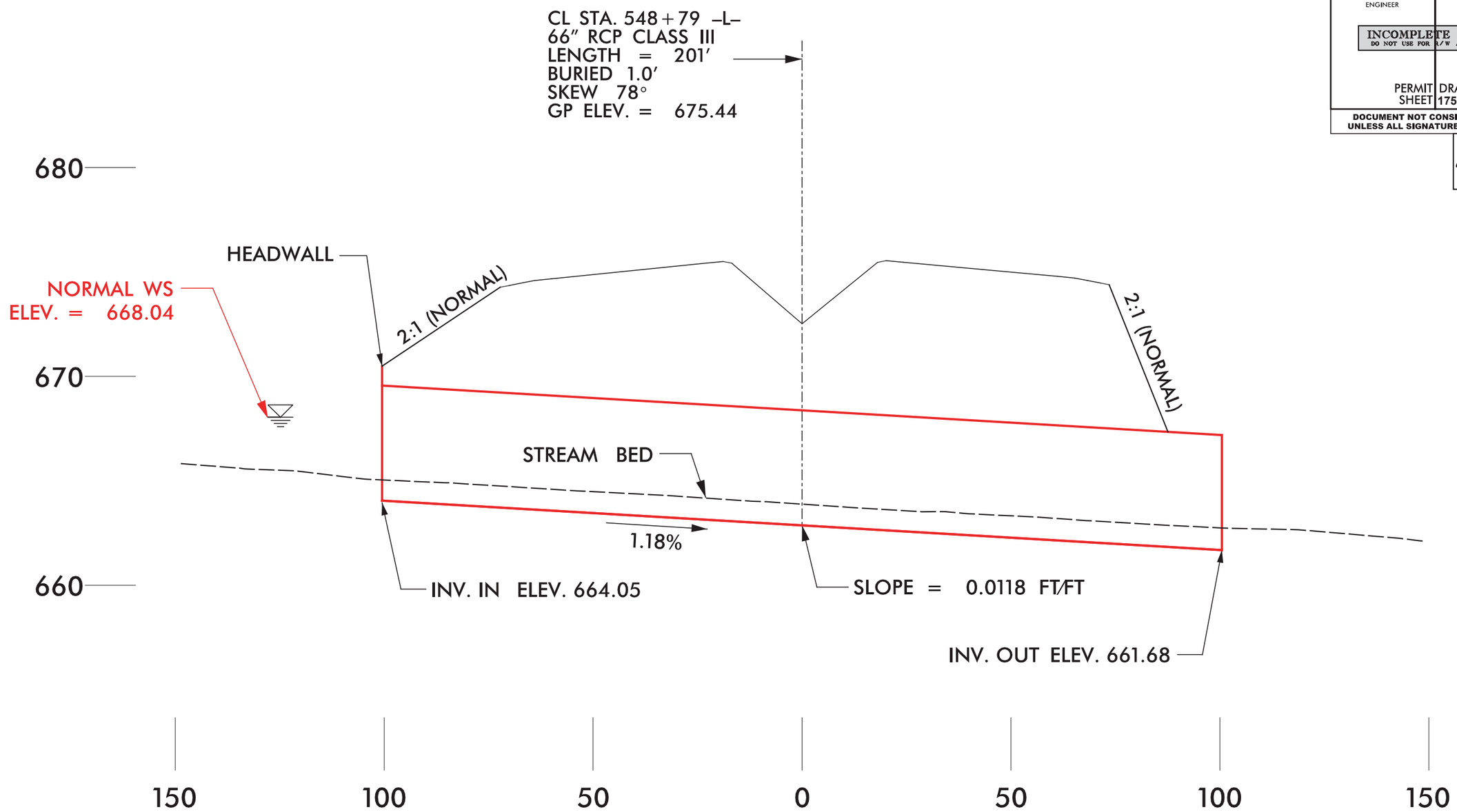
ENGLISH



SITE 68
PROFILE ALONG STRUCTURE
STA. 548+79 –L–

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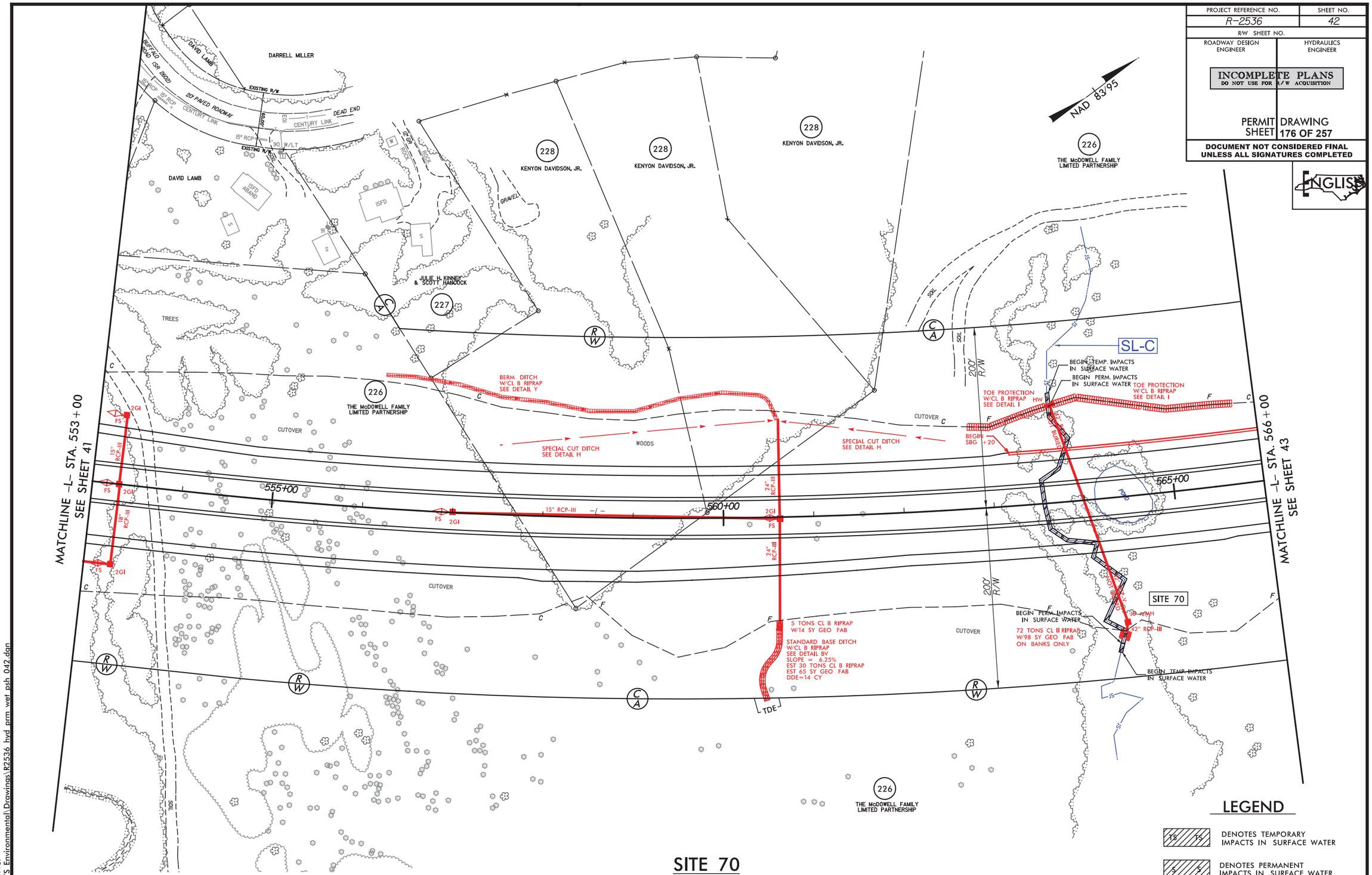
PROJECT REFERENCE NO.	SHEET NO.
R-2536	42
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 176 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 70
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHT. 124

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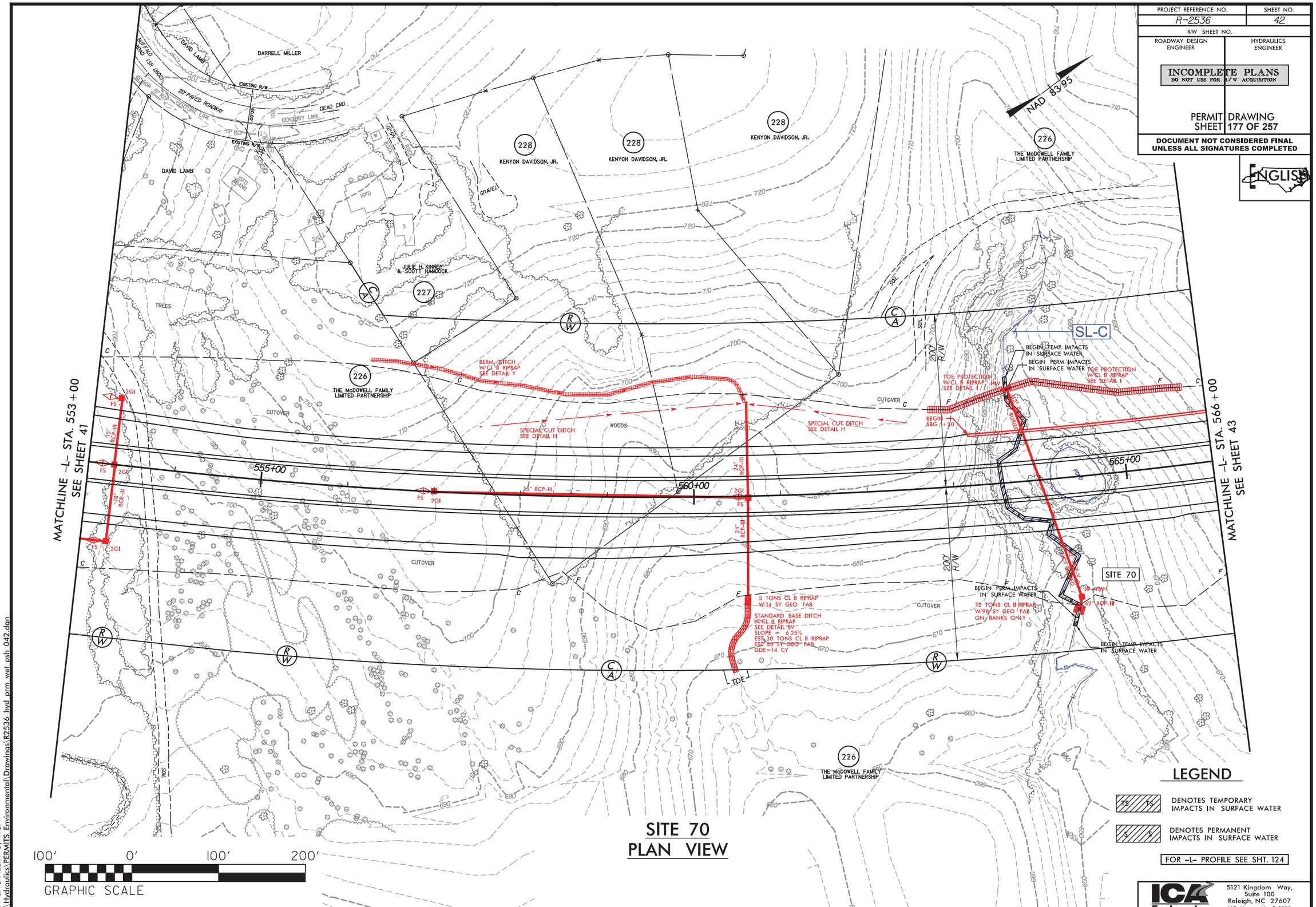
PROJECT REFERENCE NO.	SHEET NO.
R-2536	42
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 177 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 70
PLAN VIEW

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	42A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 178 OF 257

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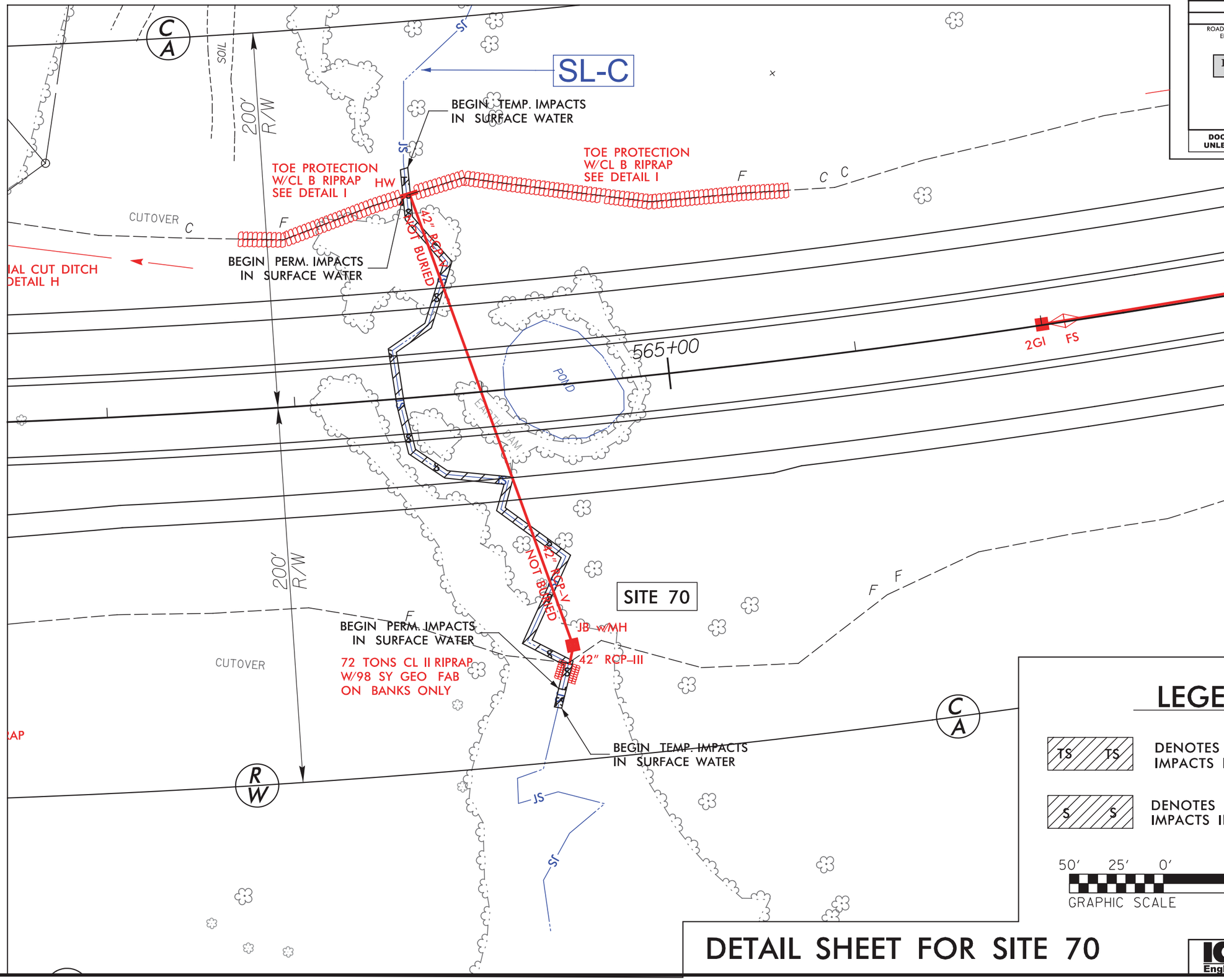
ENGLISH



LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'
GRAPHIC SCALE

DETAIL SHEET FOR SITE 70

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	44
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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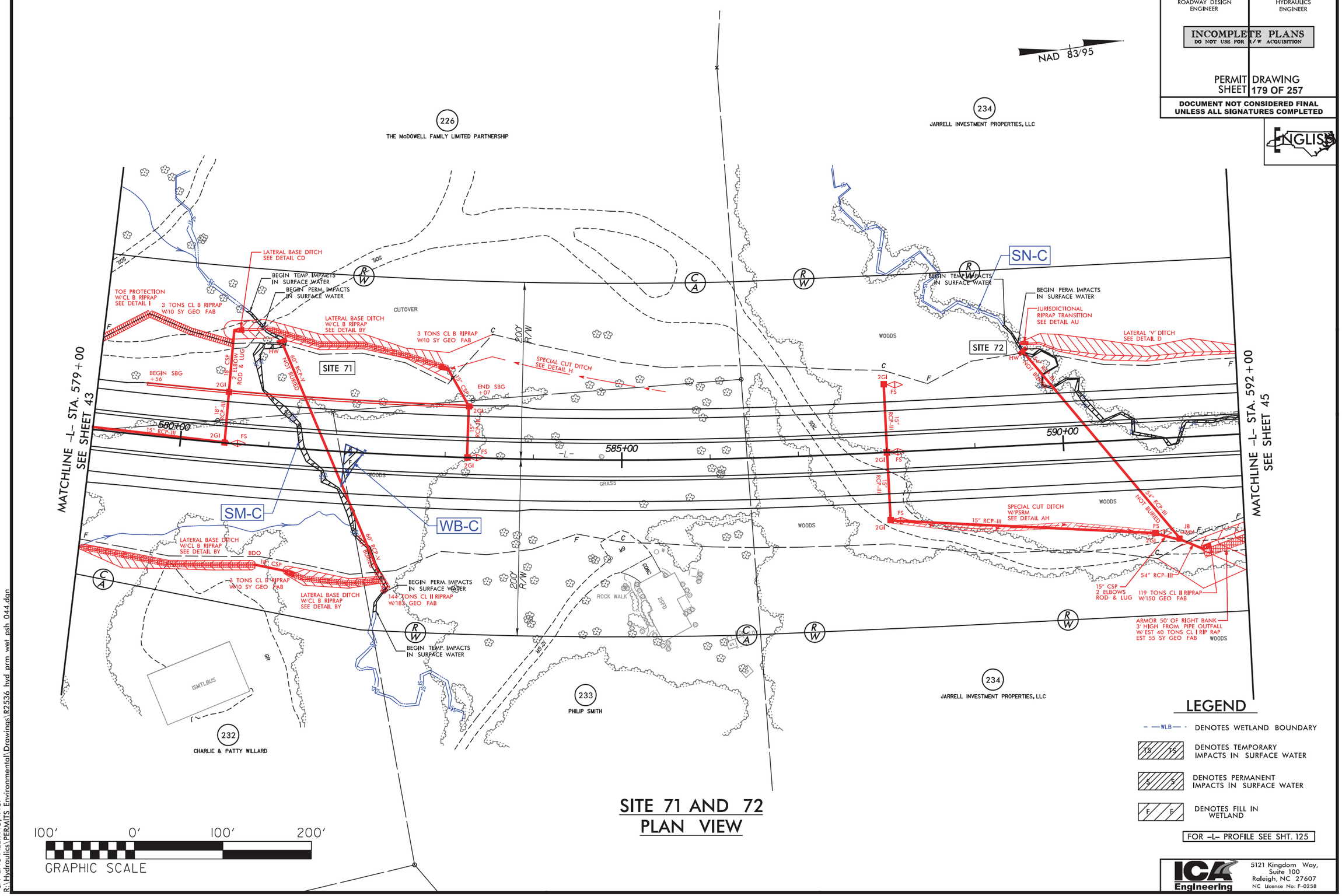
PERMIT DRAWING SHEET 179 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 71 AND 72 PLAN VIEW

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- F F — DENOTES FILL IN WETLAND

FOR -L- PROFILE SEE SHT. 125

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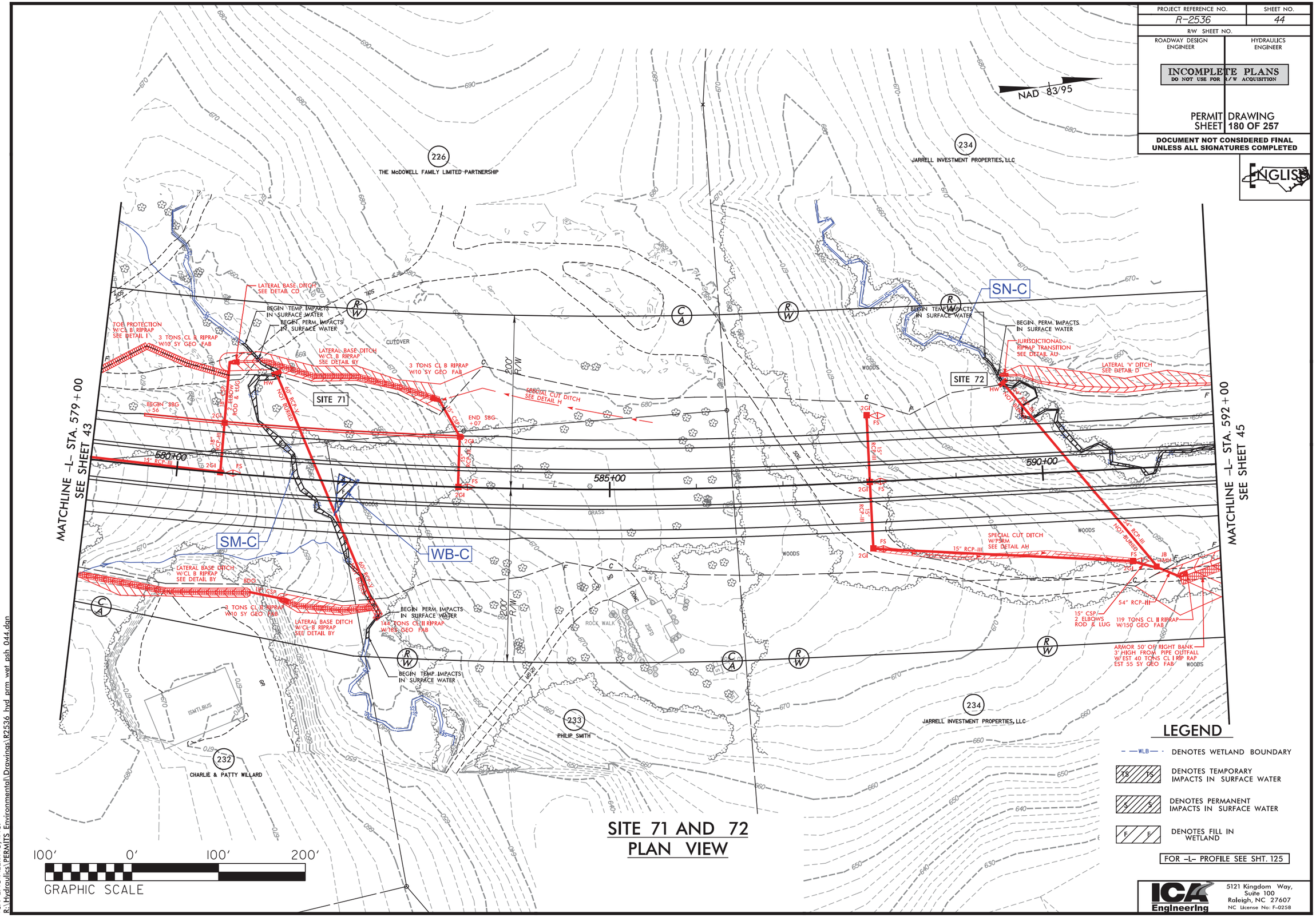
PROJECT REFERENCE NO.	SHEET NO.
R-2536	44
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 180 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 71 AND 72
PLAN VIEW

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- F — DENOTES FILL IN WETLAND

FOR -L- PROFILE SEE SHT. 125

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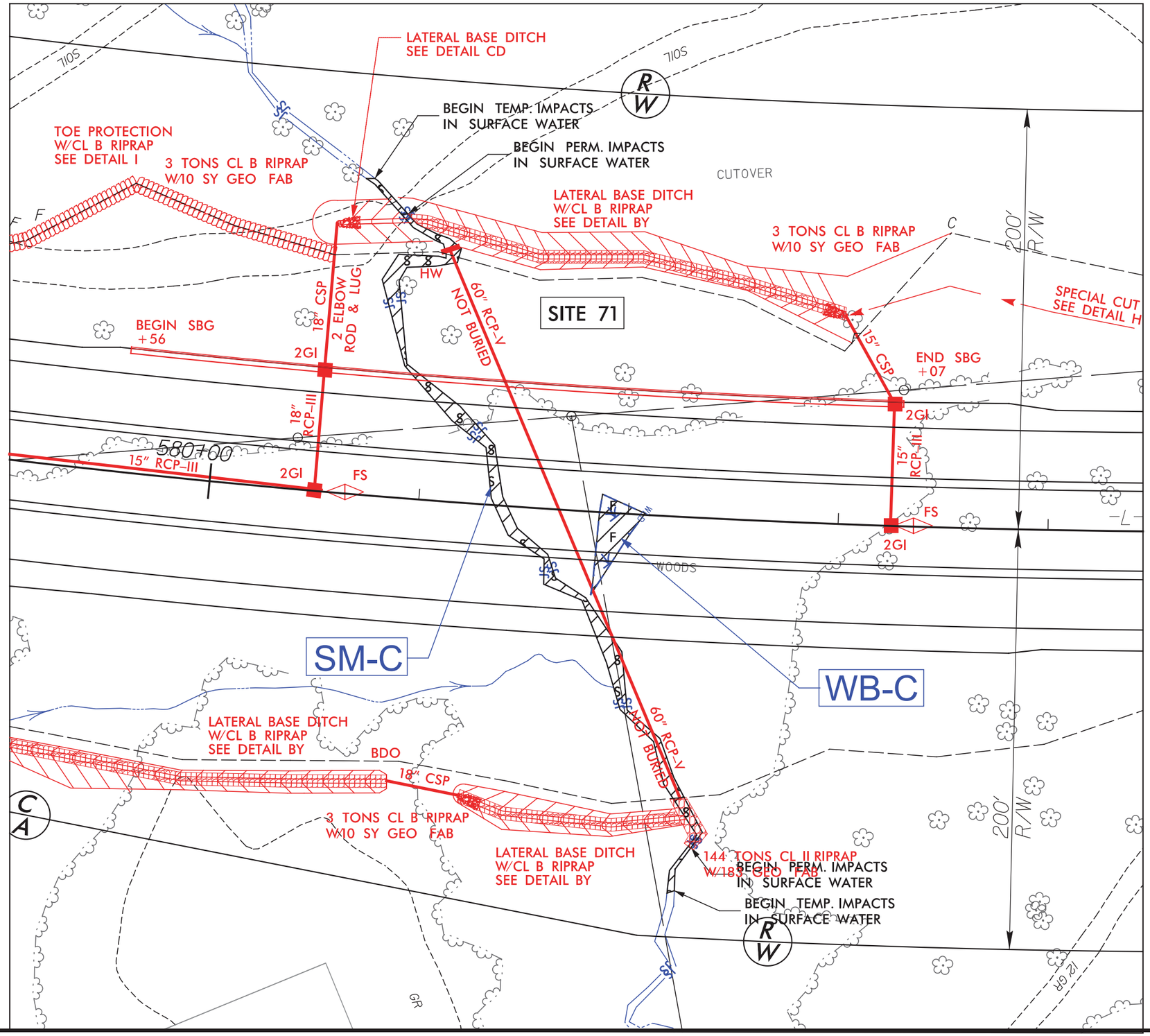
DETAIL SHEET FOR SITE 71



PROJECT REFERENCE NO.	SHEET NO.
R-2536	44A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 181 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- F F — DENOTES FILL IN WETLAND

50' 25' 0' 50' 100'
GRAPHIC SCALE

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DETAIL SHEET FOR SITE 72

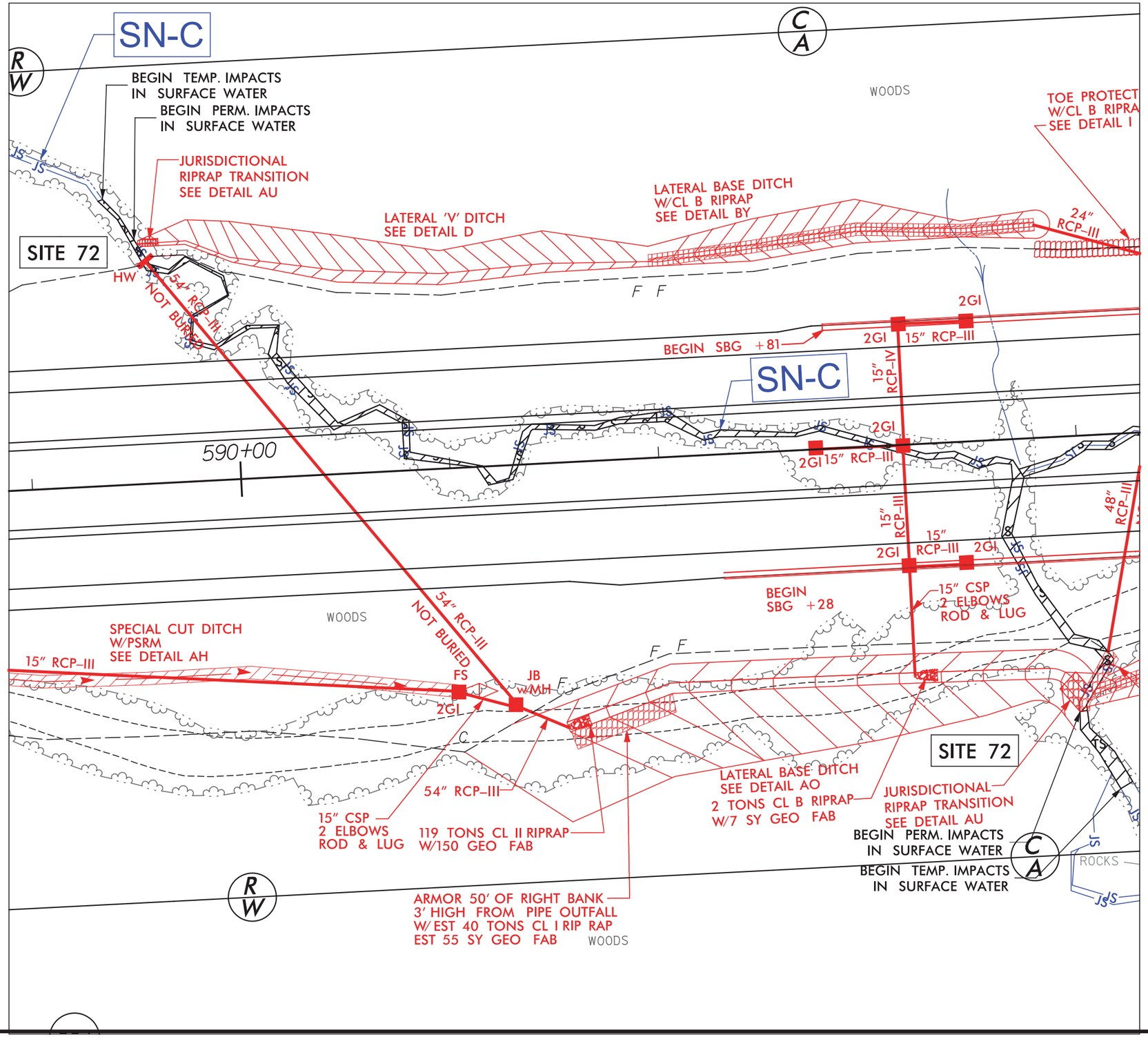
PROJECT REFERENCE NO.	SHEET NO.
R-2536	44B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 182 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



NAD 83/95

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'
GRAPHIC SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

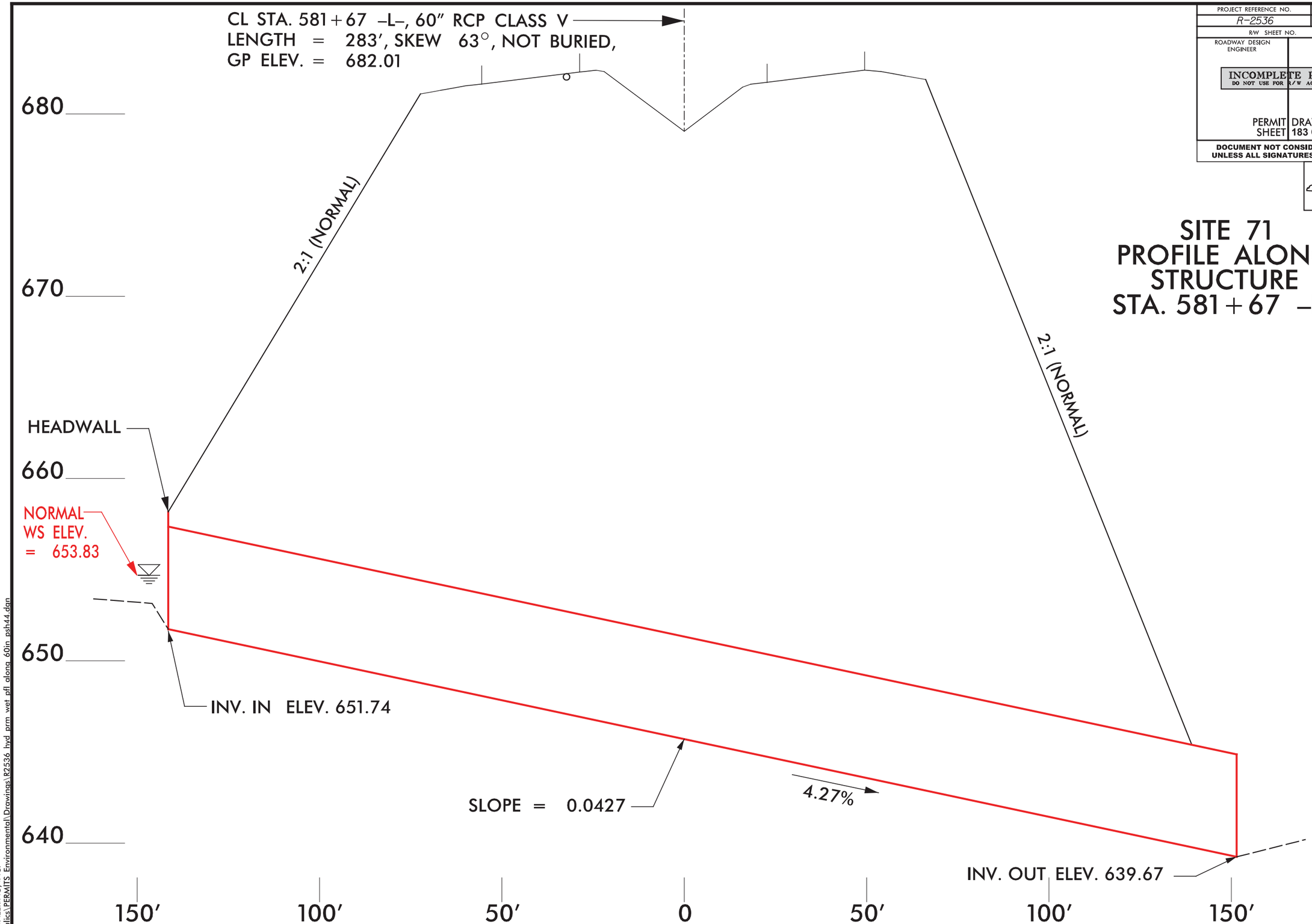
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 183 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

SITE 71 PROFILE ALONG STRUCTURE STA. 581+67 –L–



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	44
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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SHEET 184 OF 257

DOCUMENT NOT CONSIDERED FINAL
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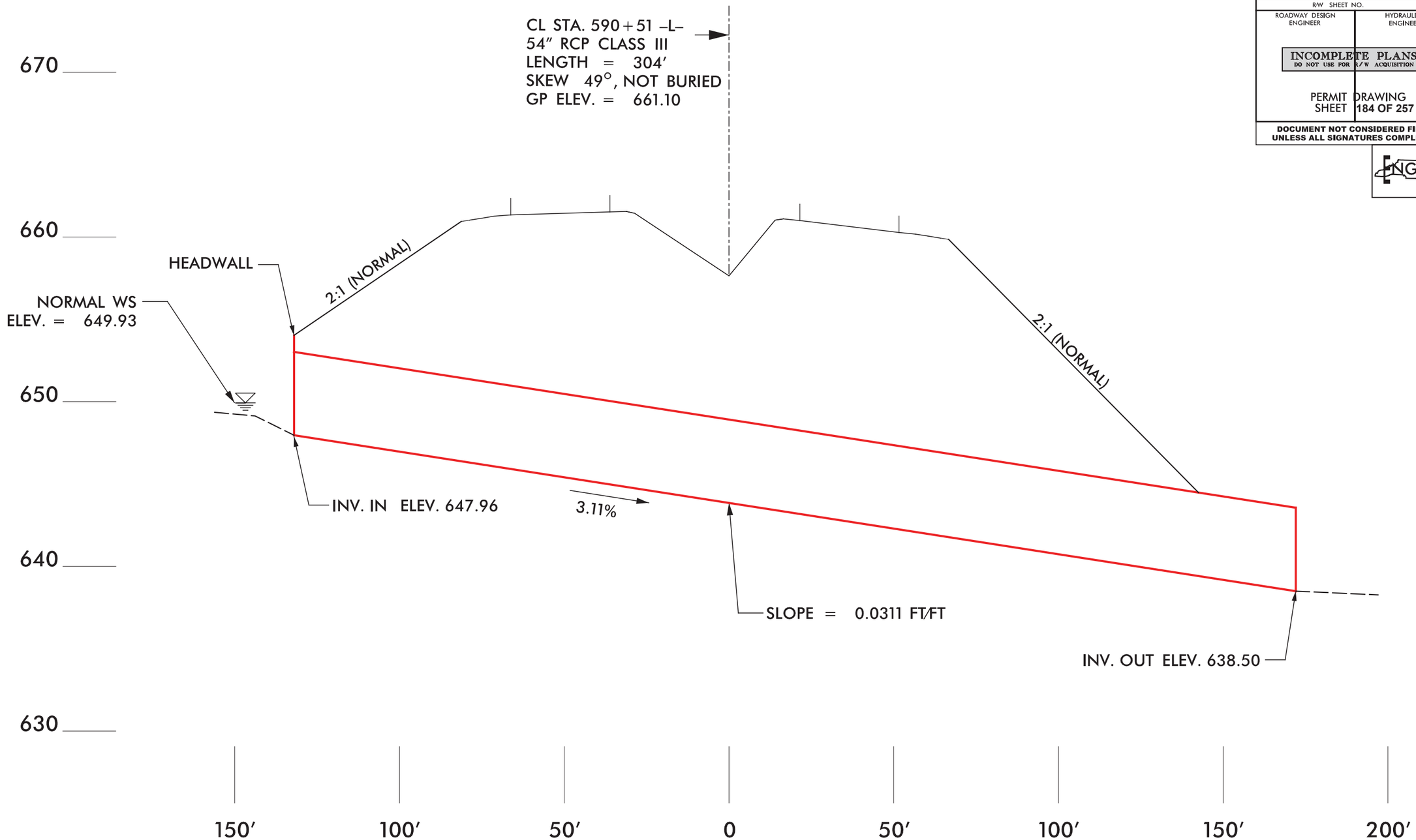
ENGLISH



SITE 72
PROFILE ALONG STRUCTURE
STA. 590+51 –L–

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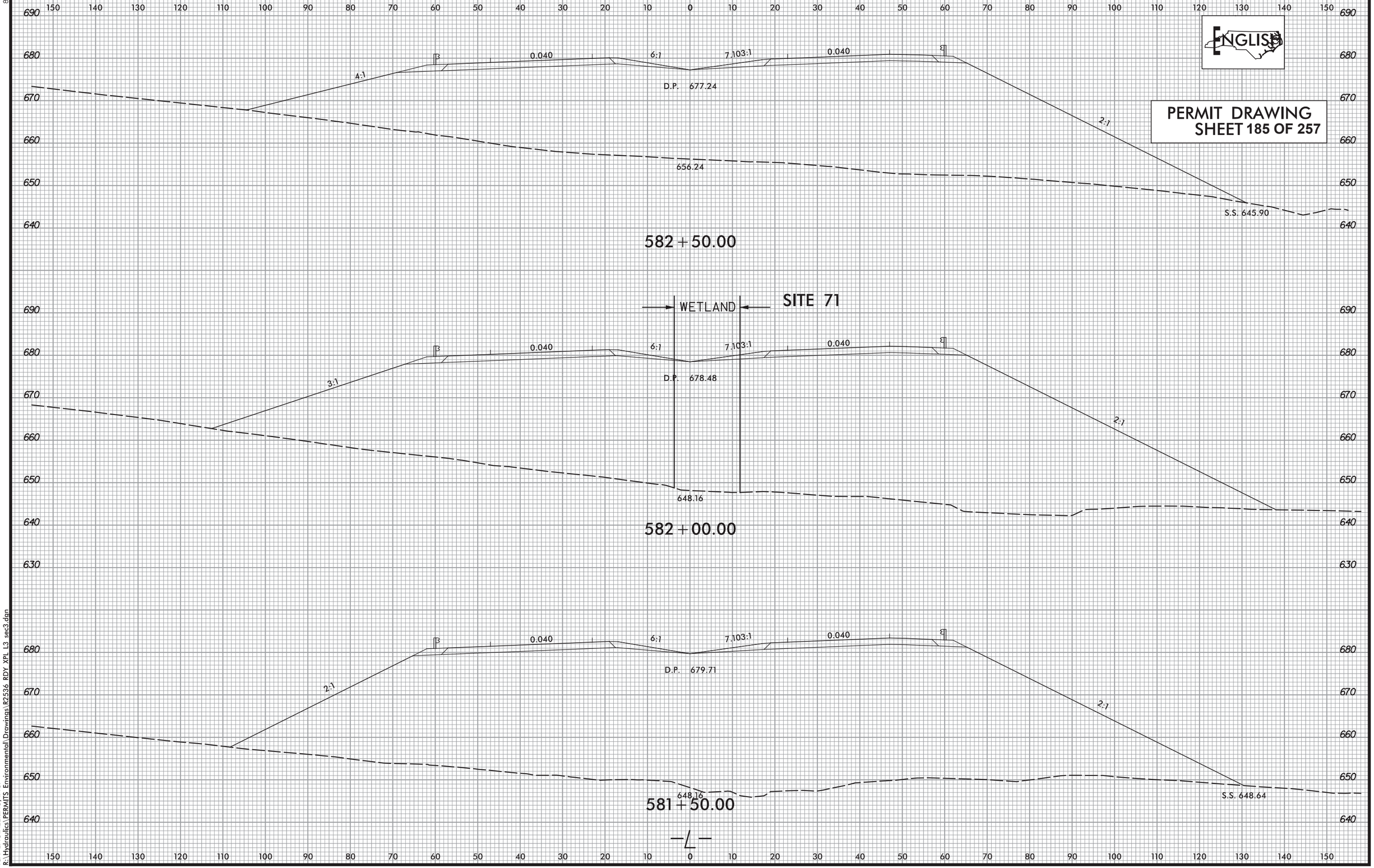
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-86

0 5 10

ENGLISH

PERMIT DRAWING
SHEET 185 OF 257



8/23/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	45
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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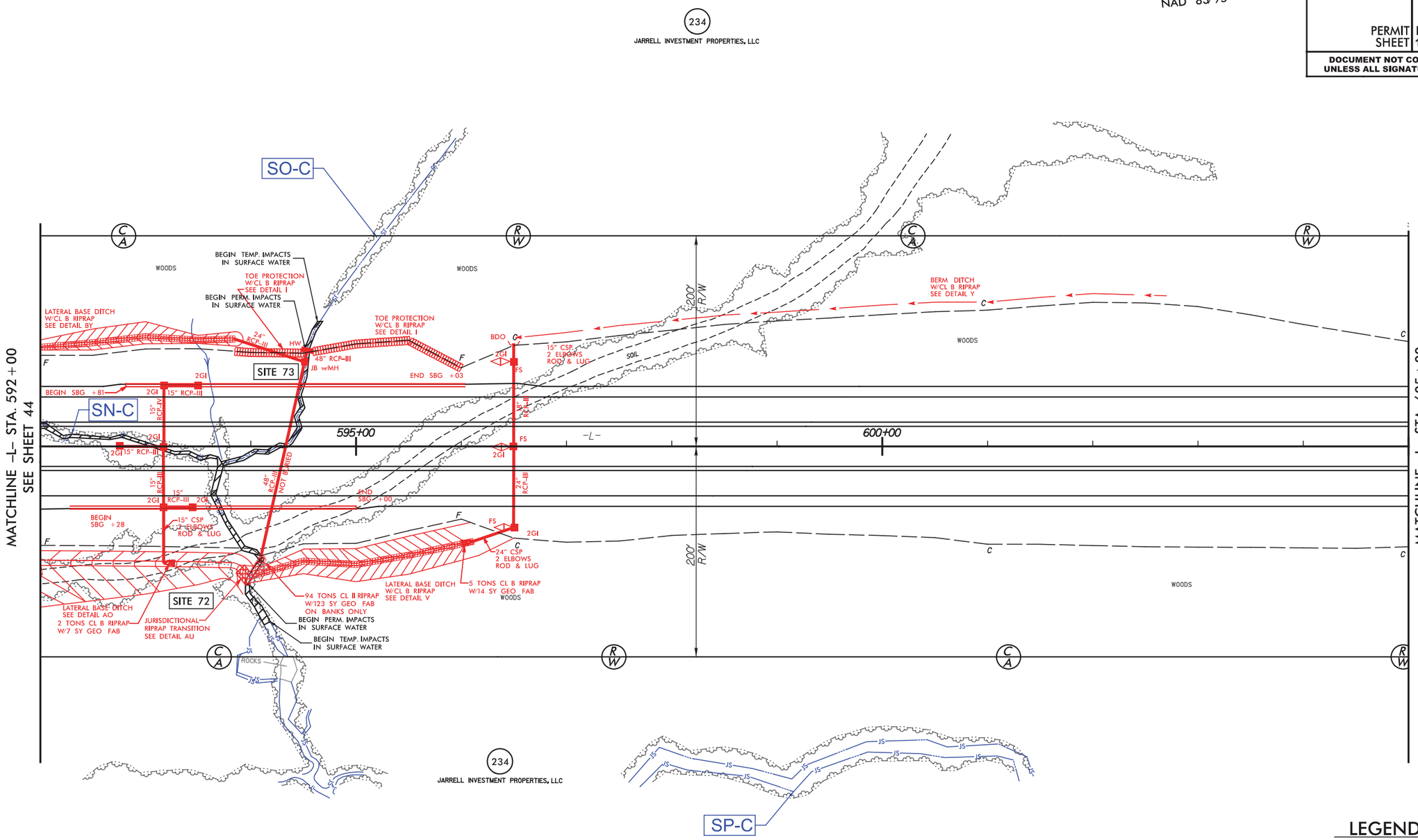
PERMIT DRAWING SHEET 186 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95



SITE 72 AND 73
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHTS. 125 – 126

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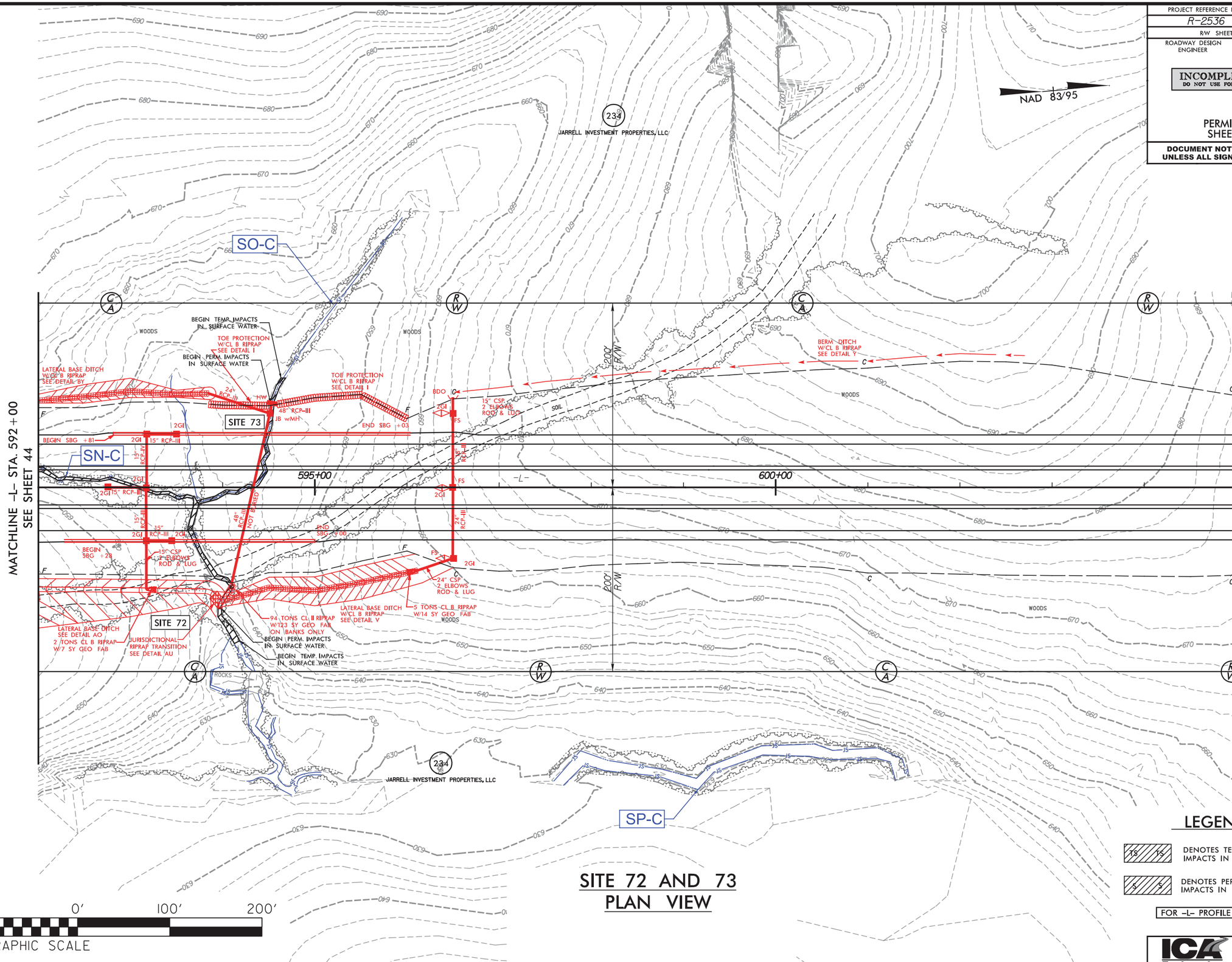
PROJECT REFERENCE NO.	SHEET NO.
R-2536	45
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 187 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 72 AND 73
PLAN VIEW

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHTS. 125 – 126

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	45A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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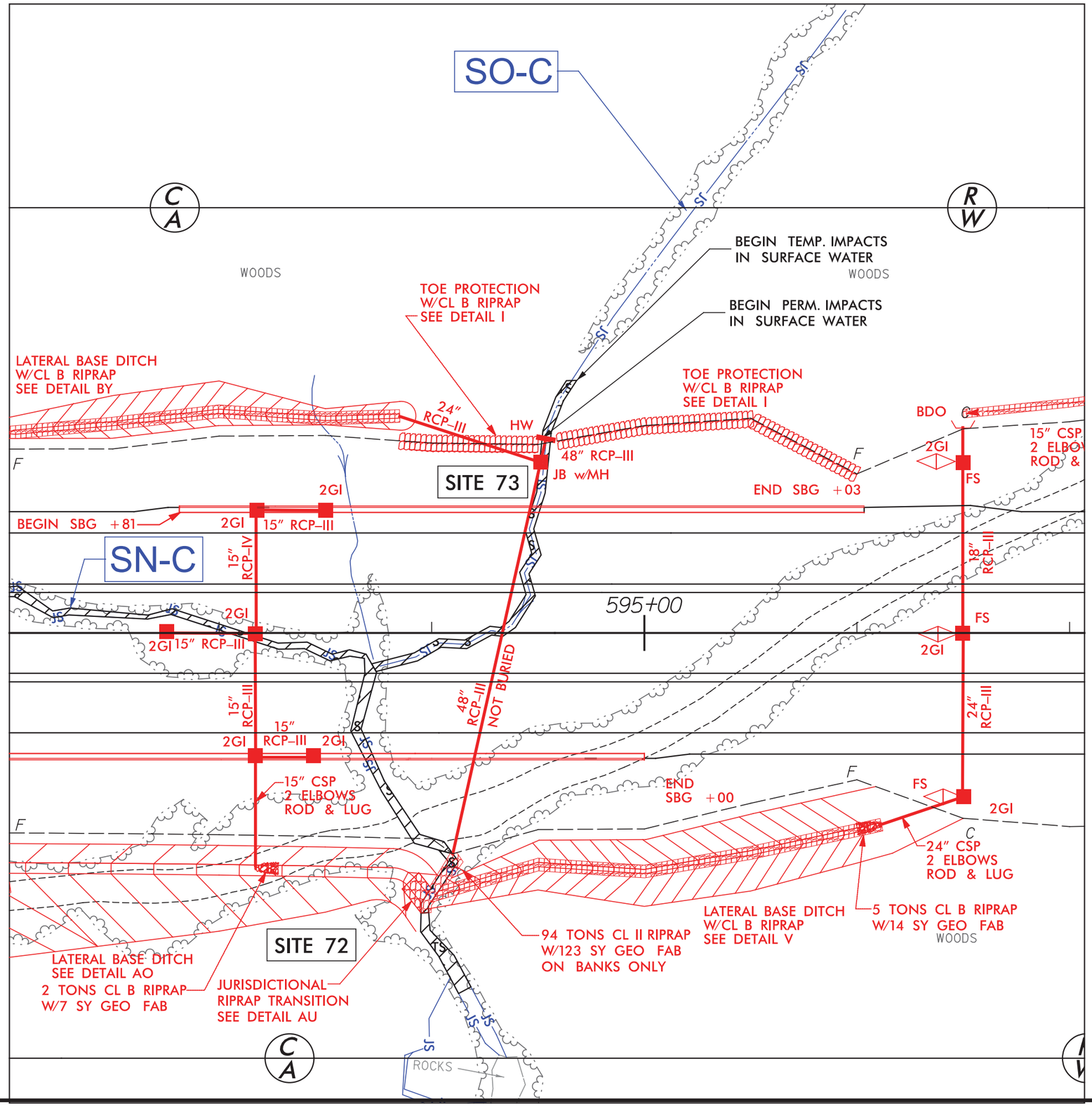
SHEET 188 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95



LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'
GRAPHIC SCALE

DETAIL SHEET FOR SITE 73

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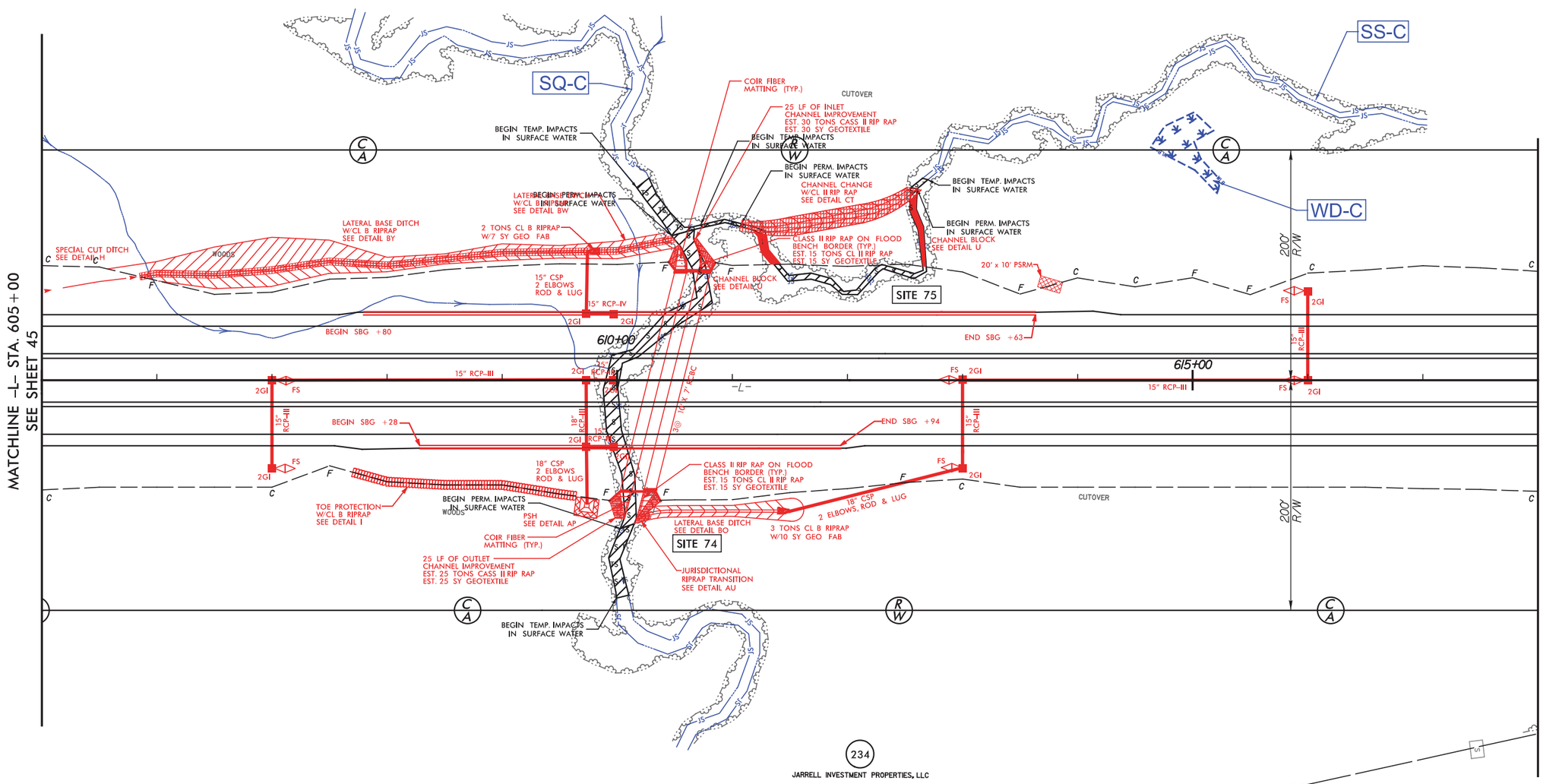
PROJECT REFERENCE NO.	SHEET NO.
R-2536	46
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 189 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 74, AND 75
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHT. 126

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ICA ENGINEERING, INC.
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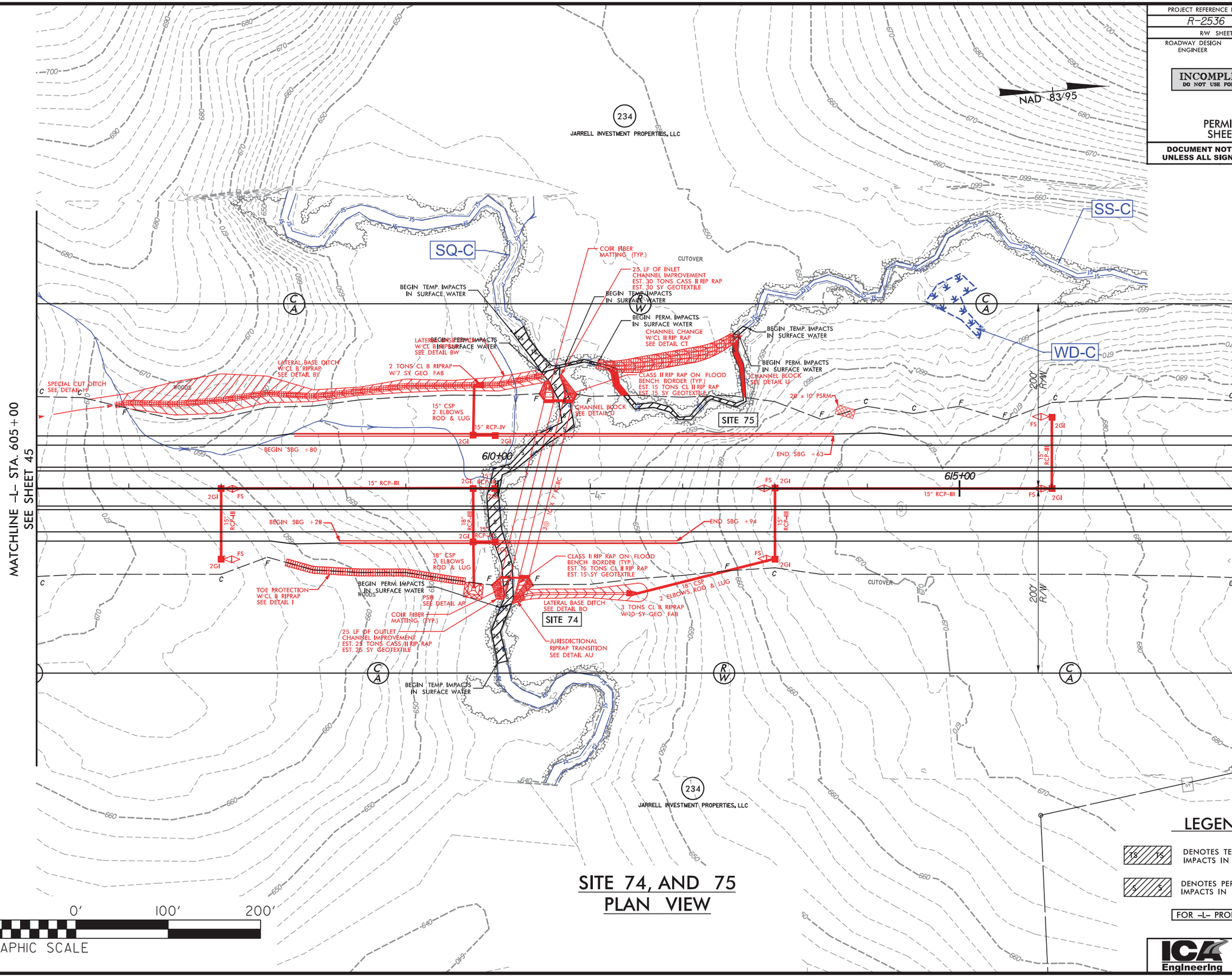
PROJECT REFERENCE NO.	SHEET NO.
R-2536	46
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 190 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 74, AND 75 PLAN VIEW

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHT. 126

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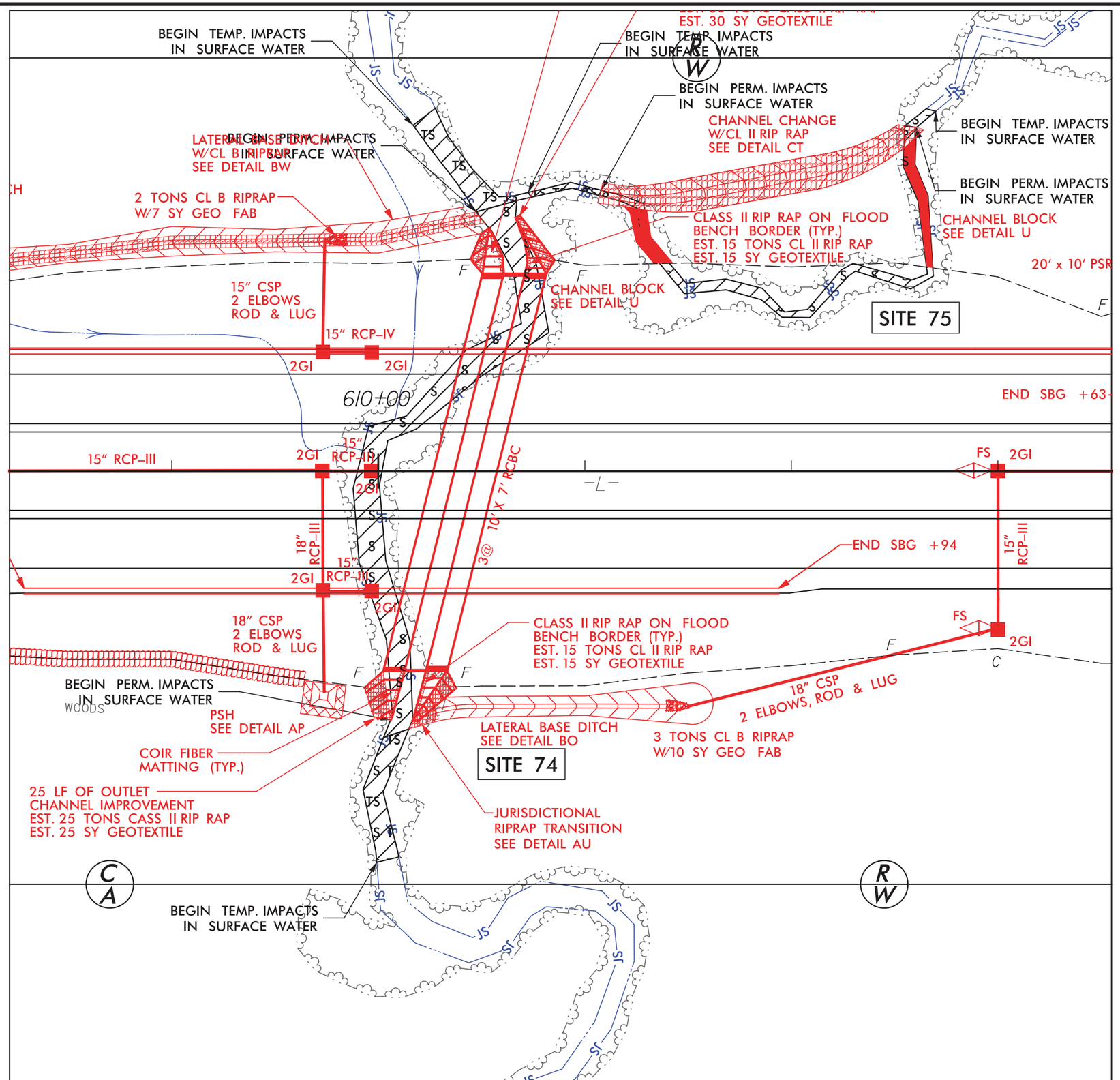
PROJECT REFERENCE NO.	SHEET NO.
R-2536	46A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 191 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



NAD 83/95

DETAIL SHEET FOR SITE 74, AND 75

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'
GRAPHIC SCALE

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R:\Hydraulics\PERMITS Environmental\Drawings\R2536 hyd prm wet psh 046 site 74 75.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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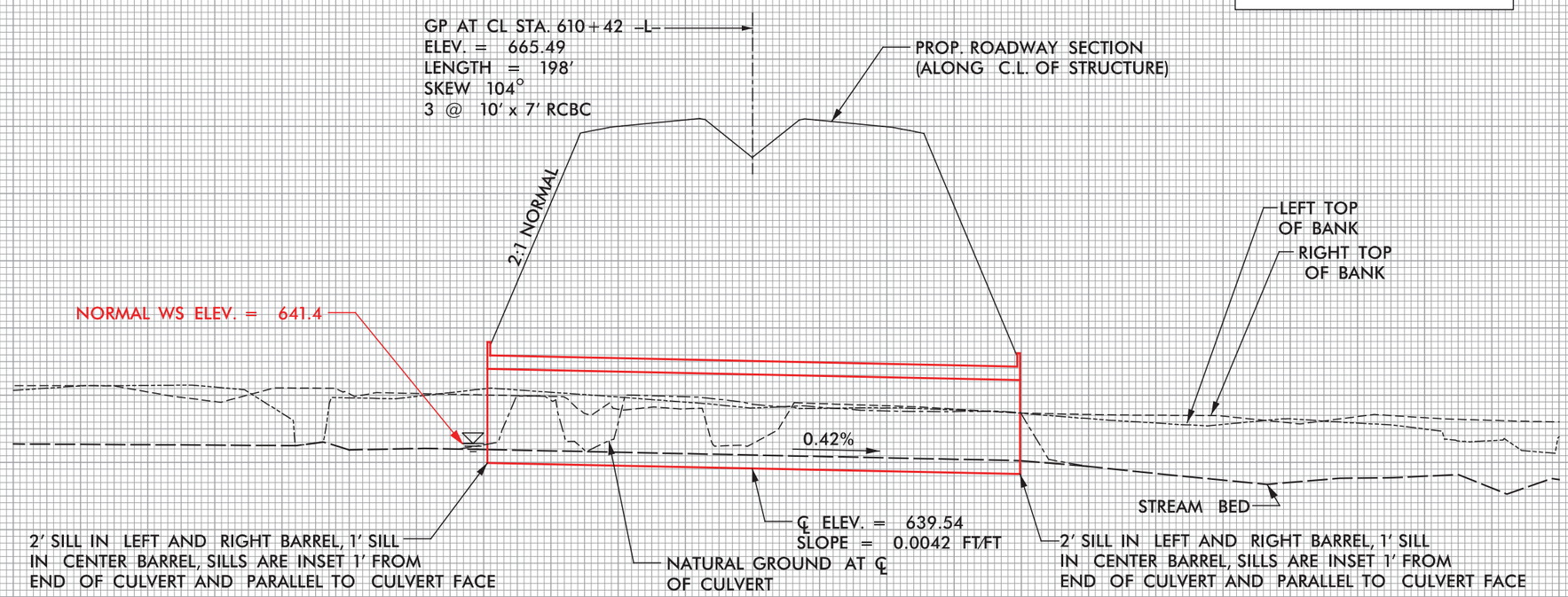
ENGLISH

PERMIT DRAWING
SHEET 192 OF 257

SITE 74
-L- 610+42



PROPOSED 3 @ 10' x 7' RCBC

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP RAP MAY BE USED TO SUPPLEMENT NATIVE MATERIAL IN THE HIGH FLOW BARREL(S). IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL(S), NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

250 200 150 100 50 0 50 100 150 200 250

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	48
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PERMIT DRAWING
SHEET 193 OF 257

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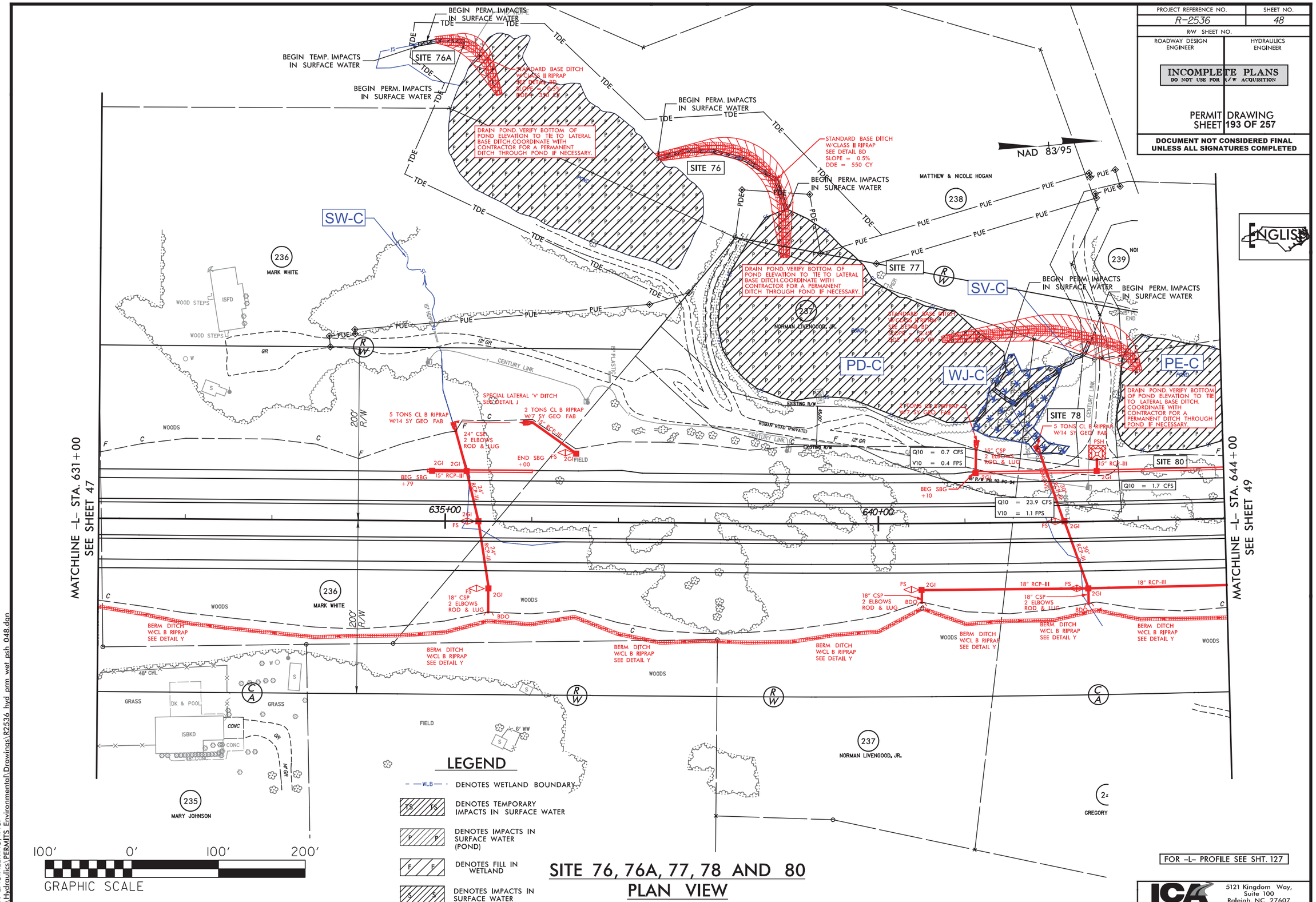

SITE 76, 76A, 77, 78 AND 80
PLAN VIEW

FOR -L- PROFILE SEE SHT. 127

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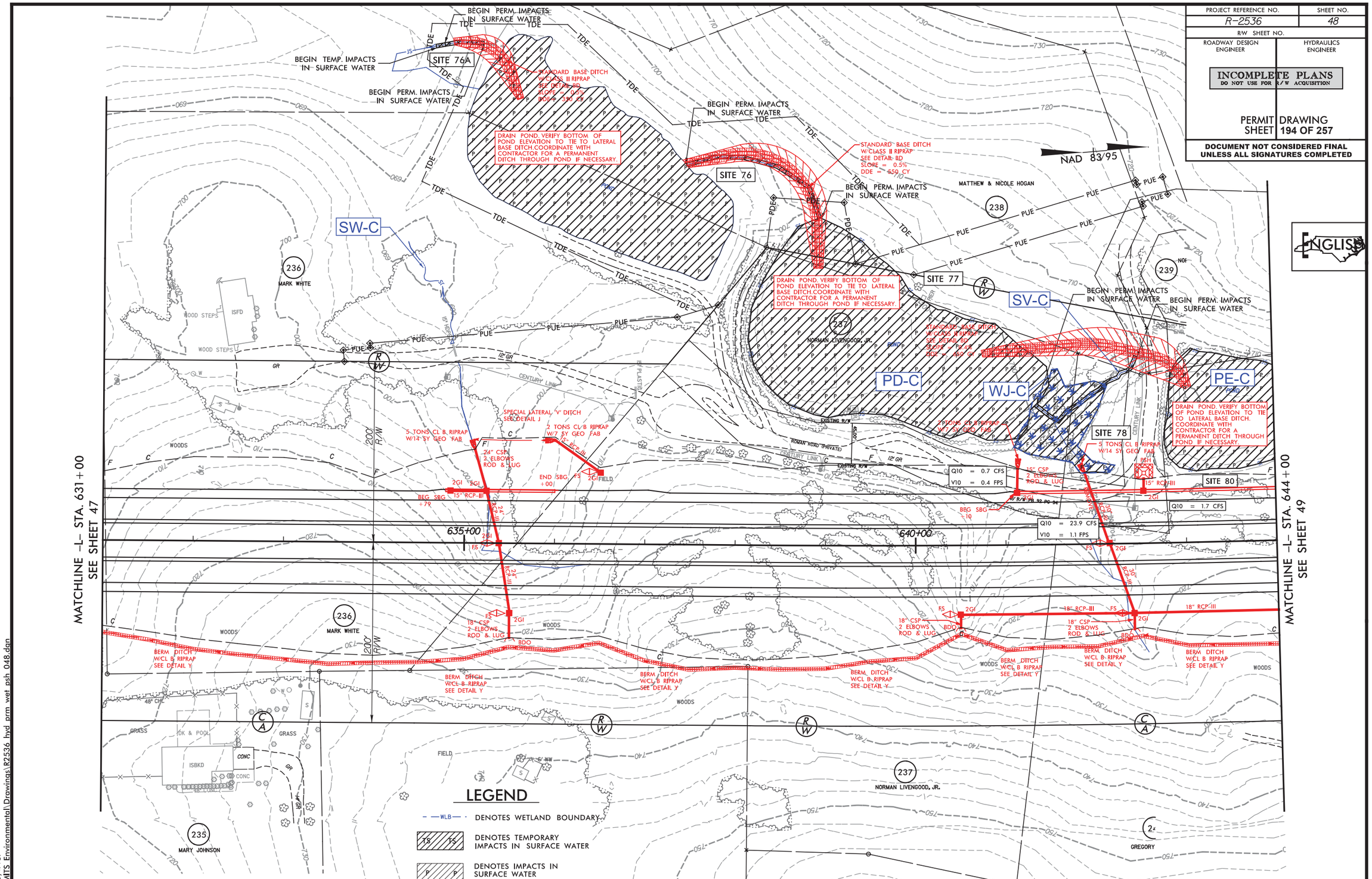
PROJECT REFERENCE NO.	SHEET NO.
R-2536	48
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 194 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS / TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- P / P — DENOTES IMPACTS IN SURFACE WATER (POND)
- F / F — DENOTES FILL IN WETLAND
- S / S — DENOTES IMPACTS IN SURFACE WATER

100' 0' 100' 200'
GRAPHIC SCALE

SITE 76, 76A, 77, 78 AND 80 PLAN VIEW

FOR -L- PROFILE SEE SHT. 127

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	48A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

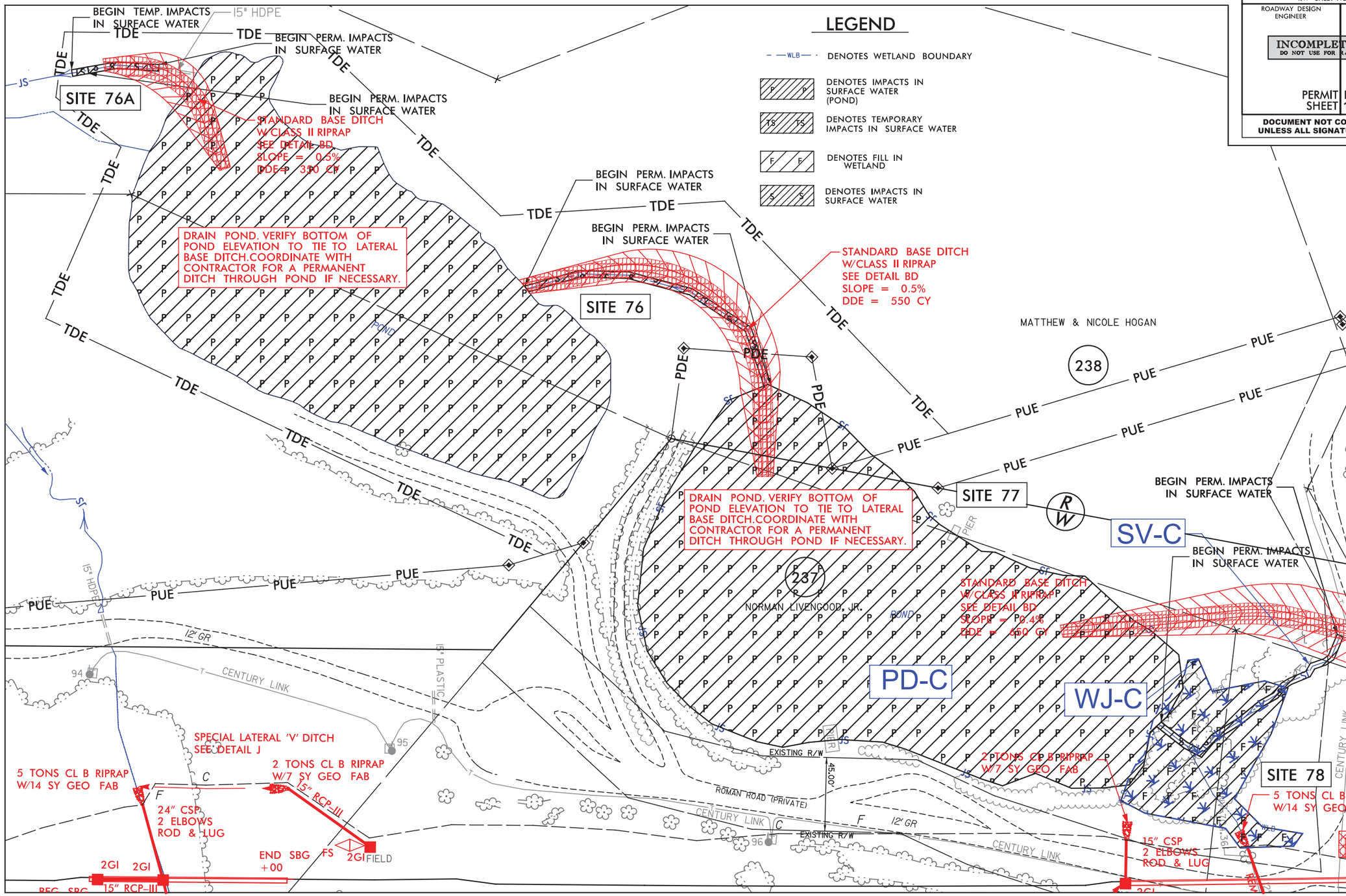
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 195 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95



60' 30' 0' 60' 120'
GRAPHIC SCALE

DETAIL SHEET FOR SITE 76, 76A, 77, AND 78

FOR -L- PROFILE SEE SHT. 122

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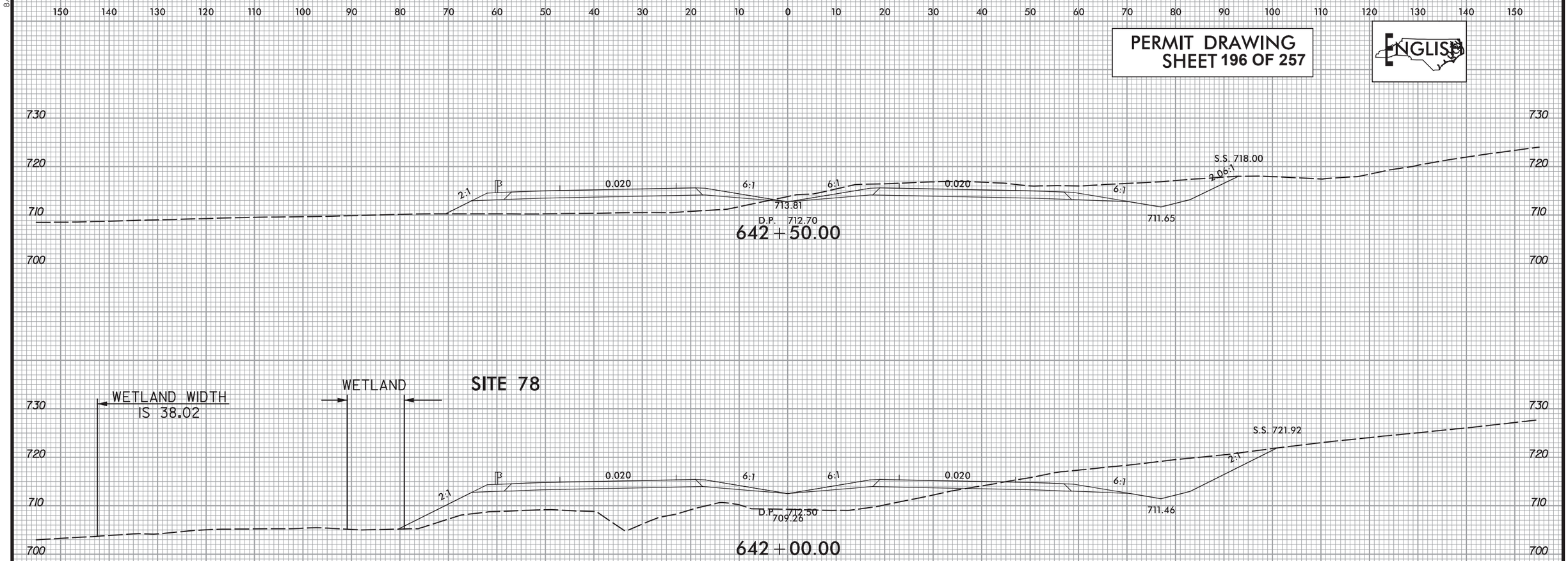
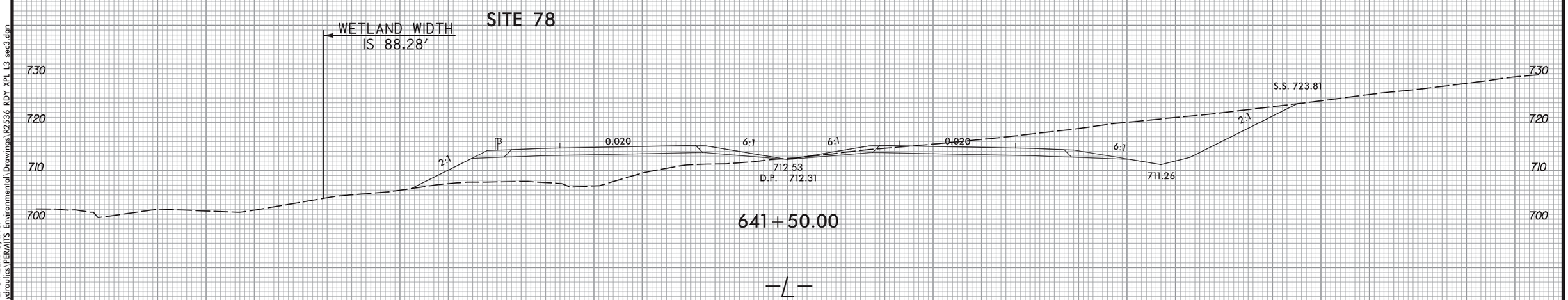
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-129

0 5 10

PERMIT DRAWING
SHEET 196 OF 257

ENGLISH





-L-

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ICA ENGINEERING, INC.
R:\Hydraulics\PERMITS Environmental\Drawings\R2536 RDY XPL L3 sec3.dgn

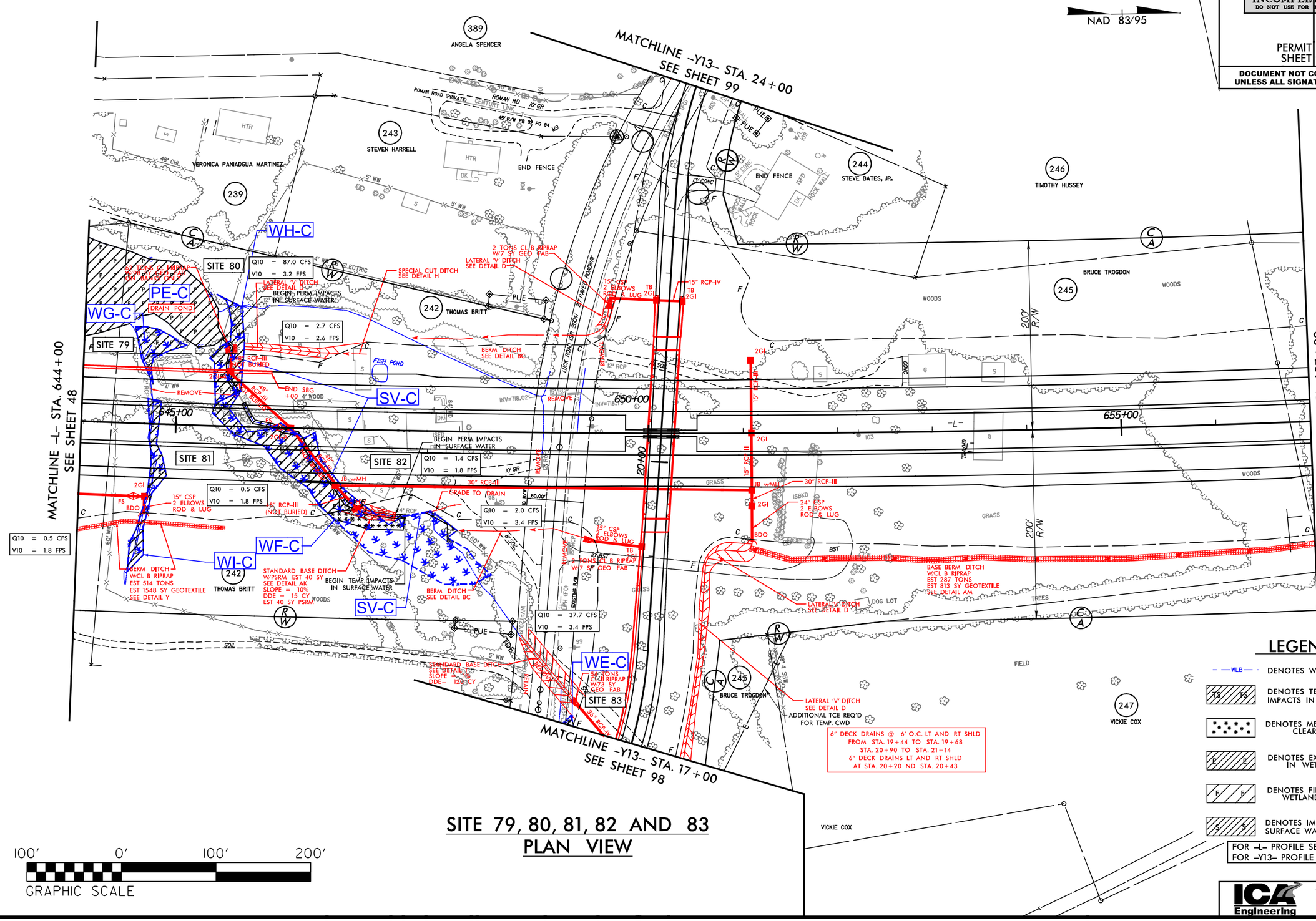
PROJECT REFERENCE NO.	SHEET NO.
R-2536	49
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 197 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 79, 80, 81, 82 AND 83
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

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

FOR -L- PROFILE SEE SHTS. 127 – 128
FOR -Y13- PROFILE SEE SHT. 196

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	49
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 198 OF 257

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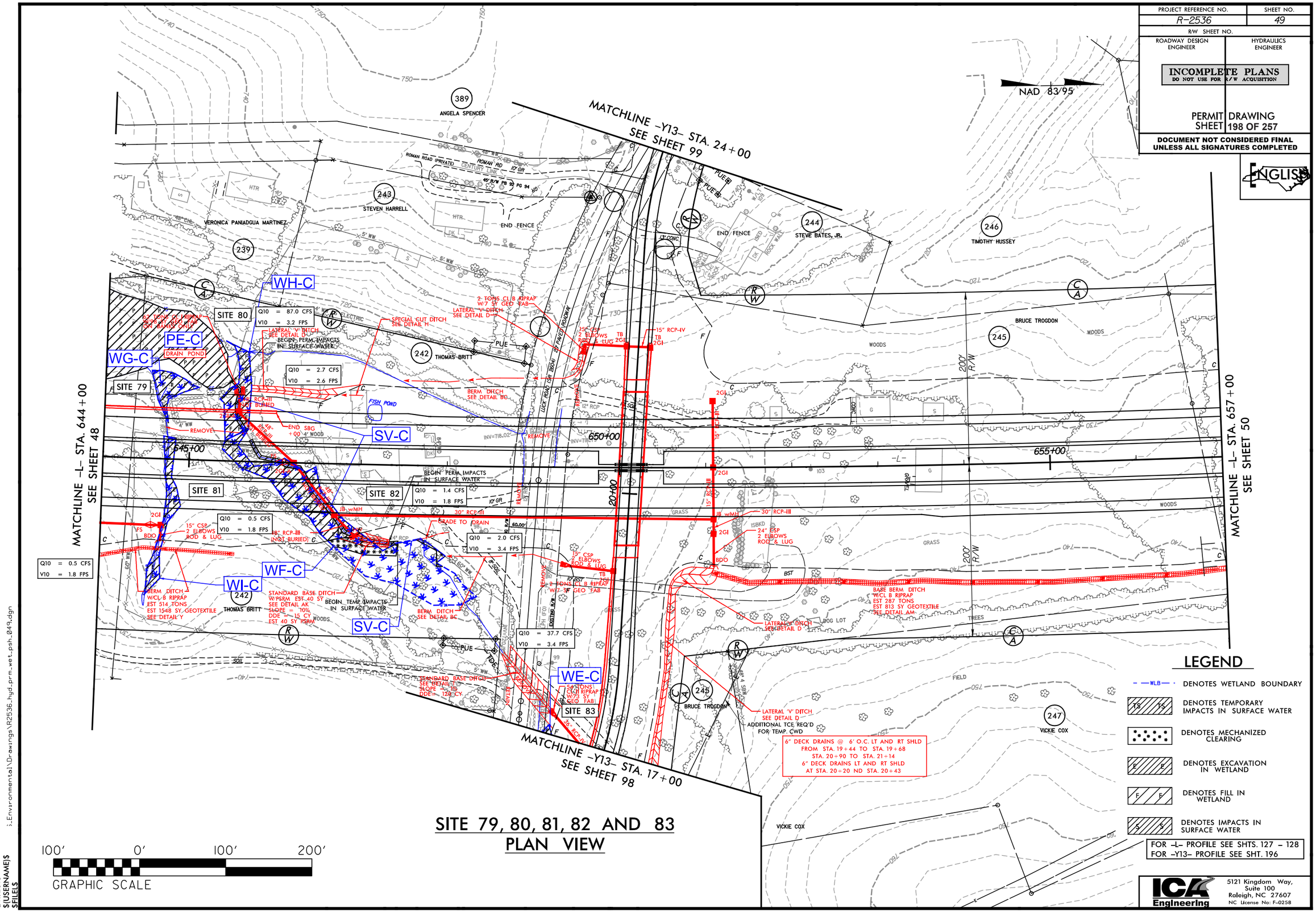
ENGLISH



SITE 79, 80, 81, 82 AND 83
PLAN VIEW

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DETAIL SHEET FOR SITE 79, 80, 81, AND 82

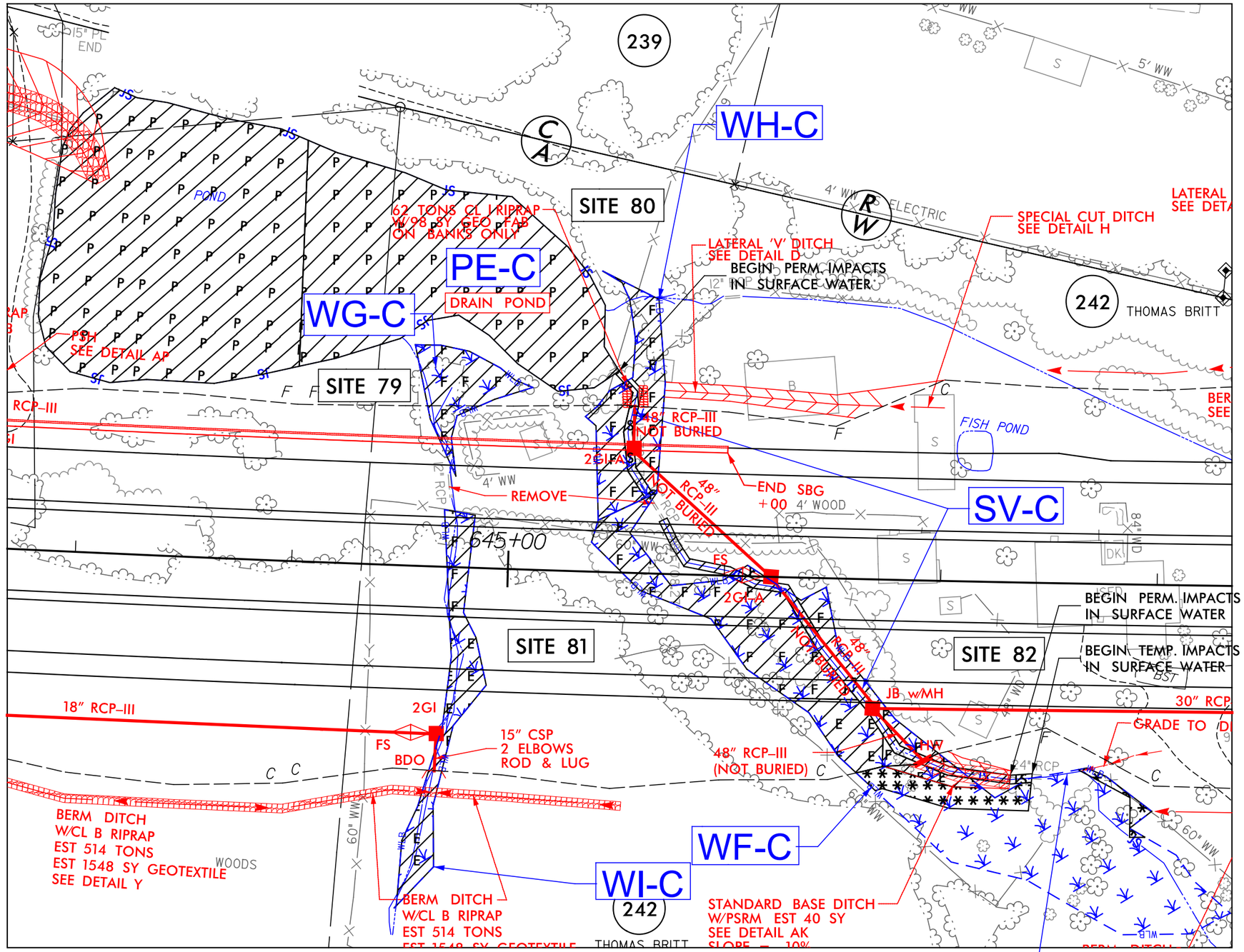
PROJECT REFERENCE NO.	SHEET NO.
R-2536	49A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 199 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- DENOTES MECHANIZED CLEARING
- P P — DENOTES IMPACTS IN SURFACE WATER (POND)
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES IMPACTS IN SURFACE WATER
- E E — DENOTES EXCAVATION IN WETLAND
- F F — DENOTES FILL IN WETLAND

50' 25' 0' 50' 100'
GRAPHIC SCALE

FOR -L- PROFILE SEE SHT. 122

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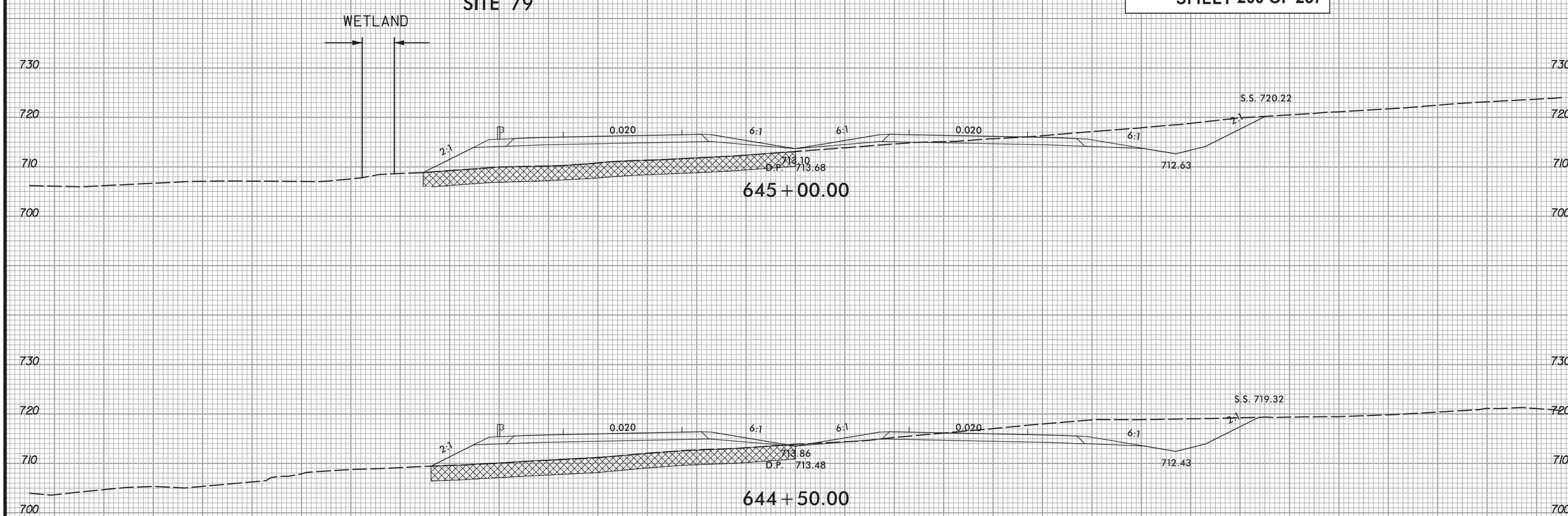
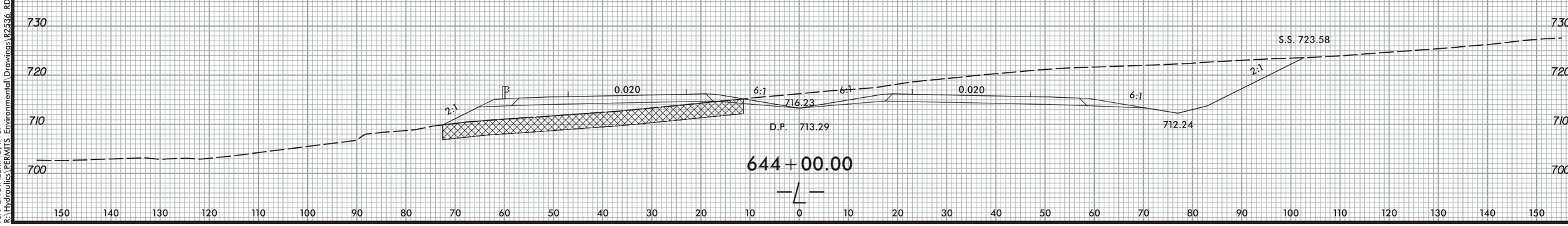
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-131

PERMIT DRAWING
SHEET 200 OF 257

SITE 79





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PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-132

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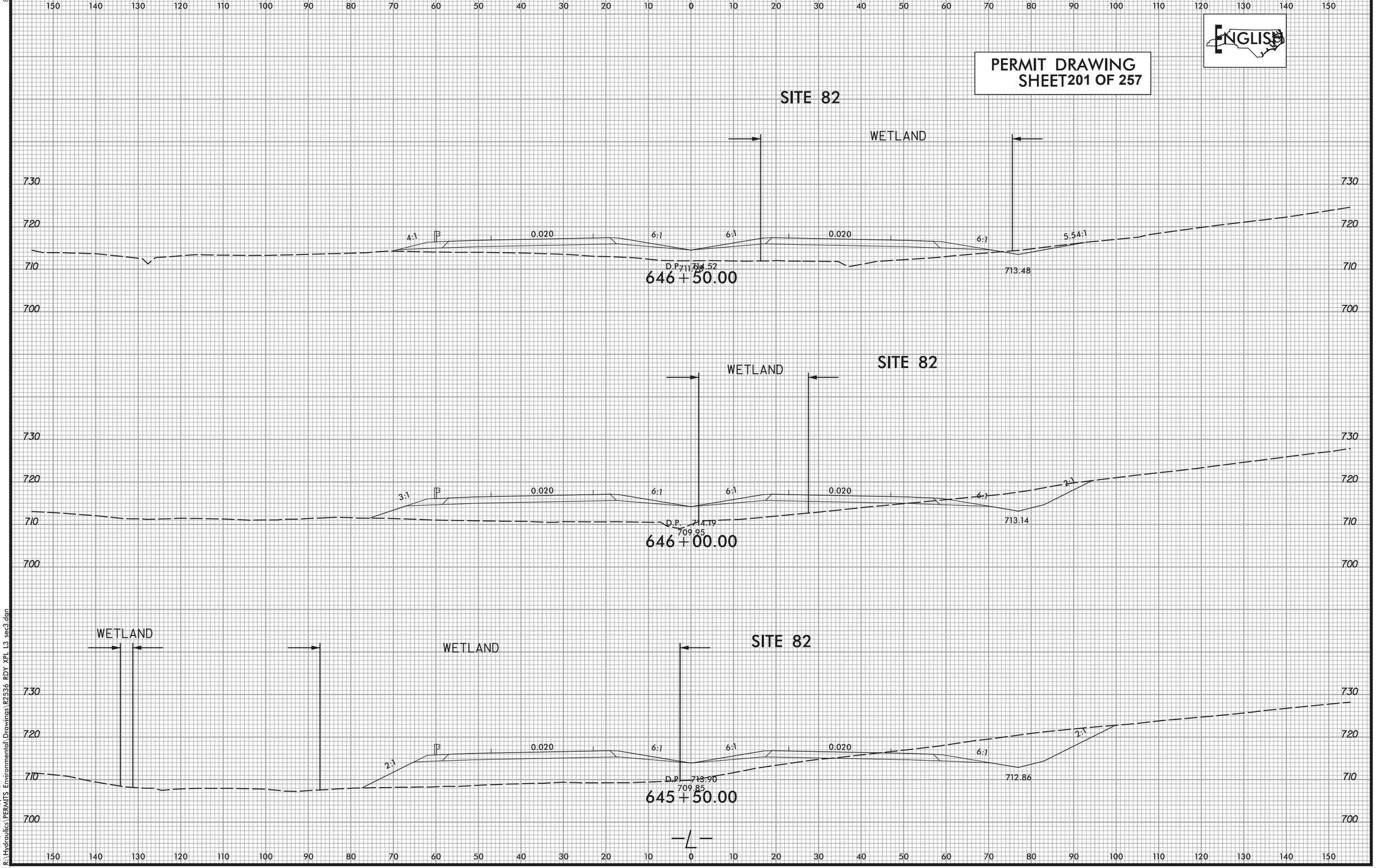
PERMIT DRAWING
SHEET 201 OF 257

ENGLISH



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	98
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PERMIT DRAWING
SHEET 202 OF 257

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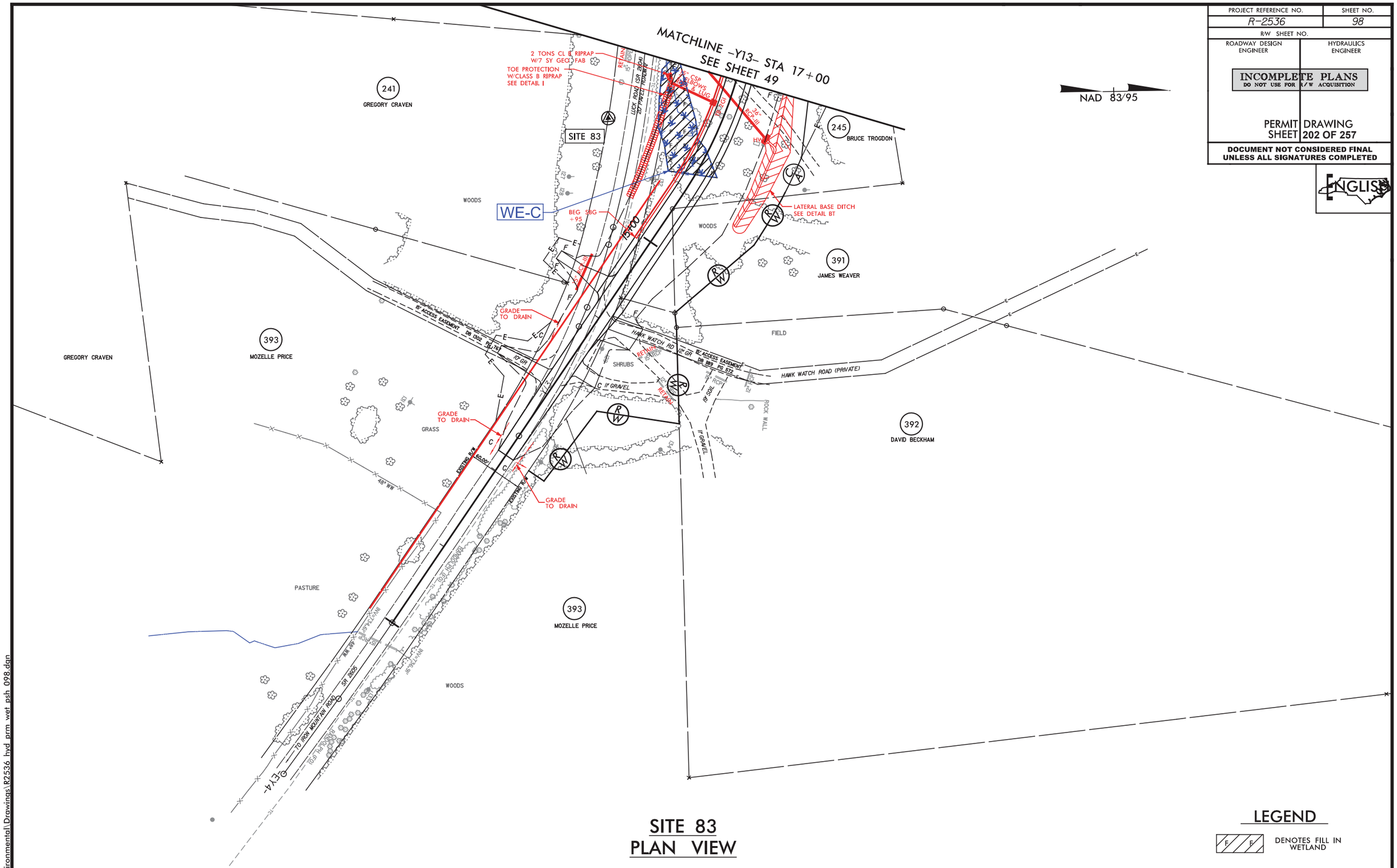

SITE 83
PLAN VIEW

LEGEND

F F DENOTES FILL IN WETLAND

FOR -Y13- PROFILE SEE SHT. 196

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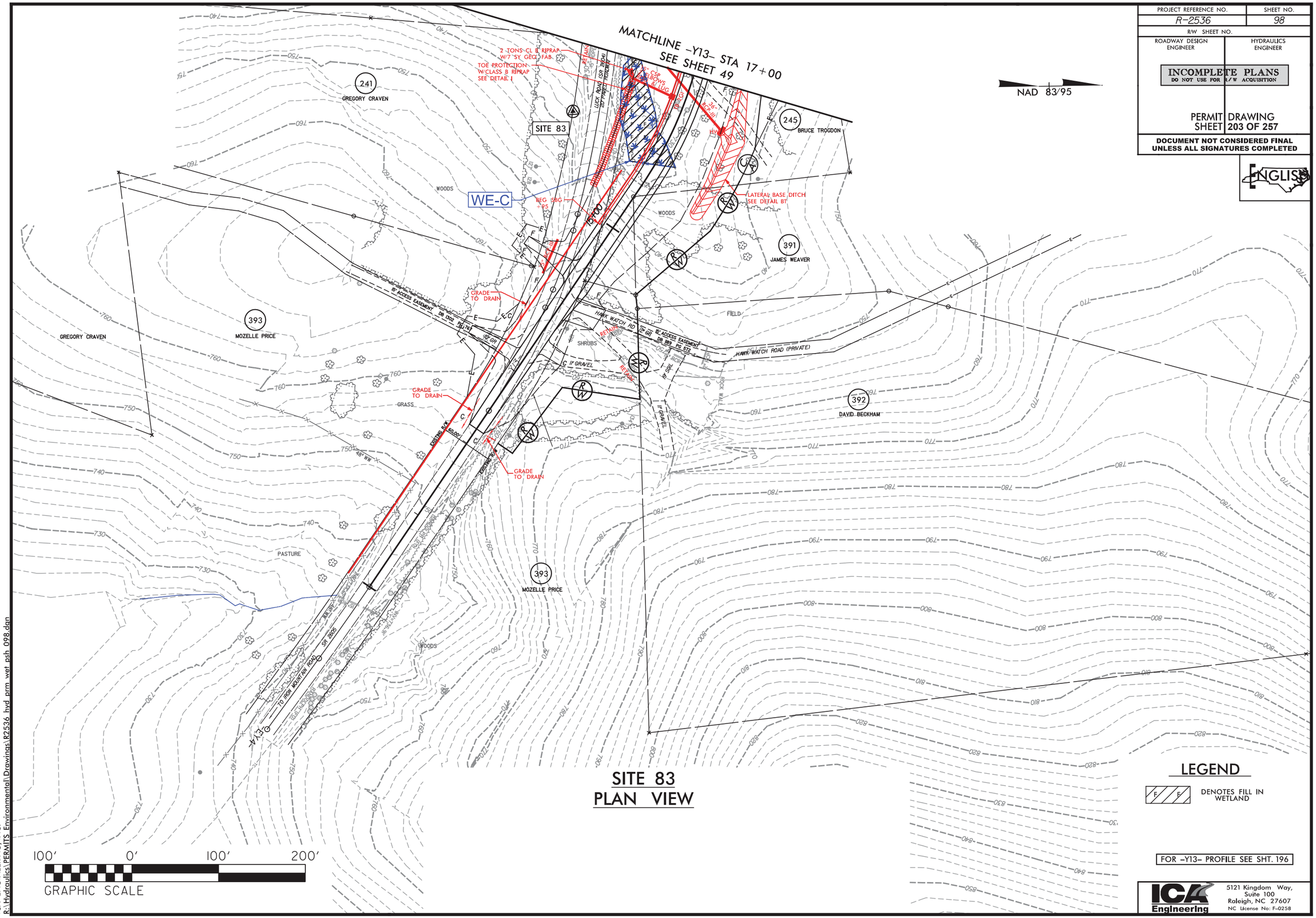
PROJECT REFERENCE NO.	SHEET NO.
R-2536	98
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 203 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 83
PLAN VIEW

LEGEND

F F — DENOTES FILL IN WETLAND

FOR -Y13- PROFILE SEE SHT. 196

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	98A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 204 OF 257

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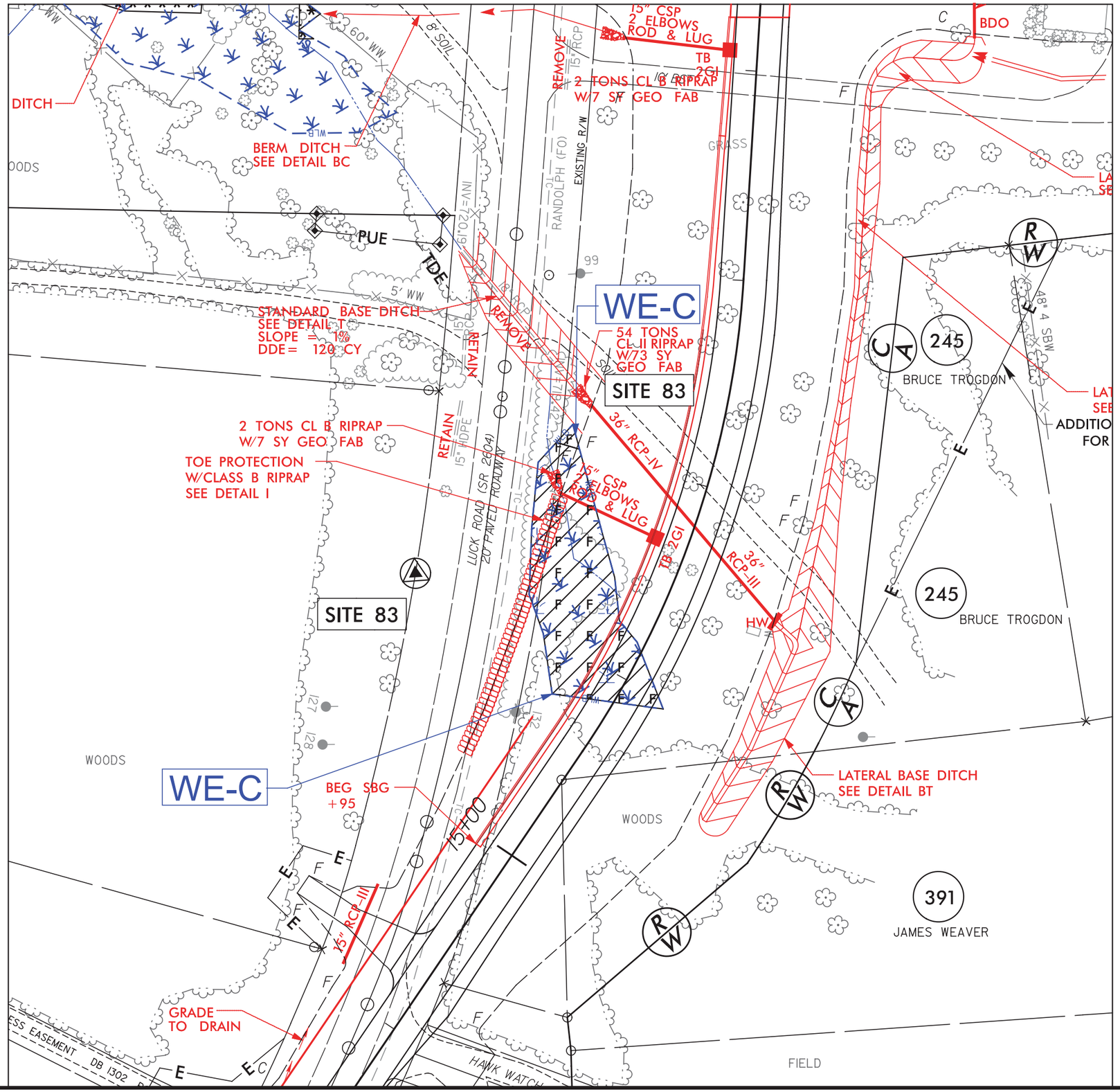
ENGLISH



DETAIL SHEET FOR SITE 83

LEGEND

F F — DENOTES FILL IN WETLAND

50' 25' 0' 50' 100'
GRAPHIC SCALE

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PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-223

0 5 10

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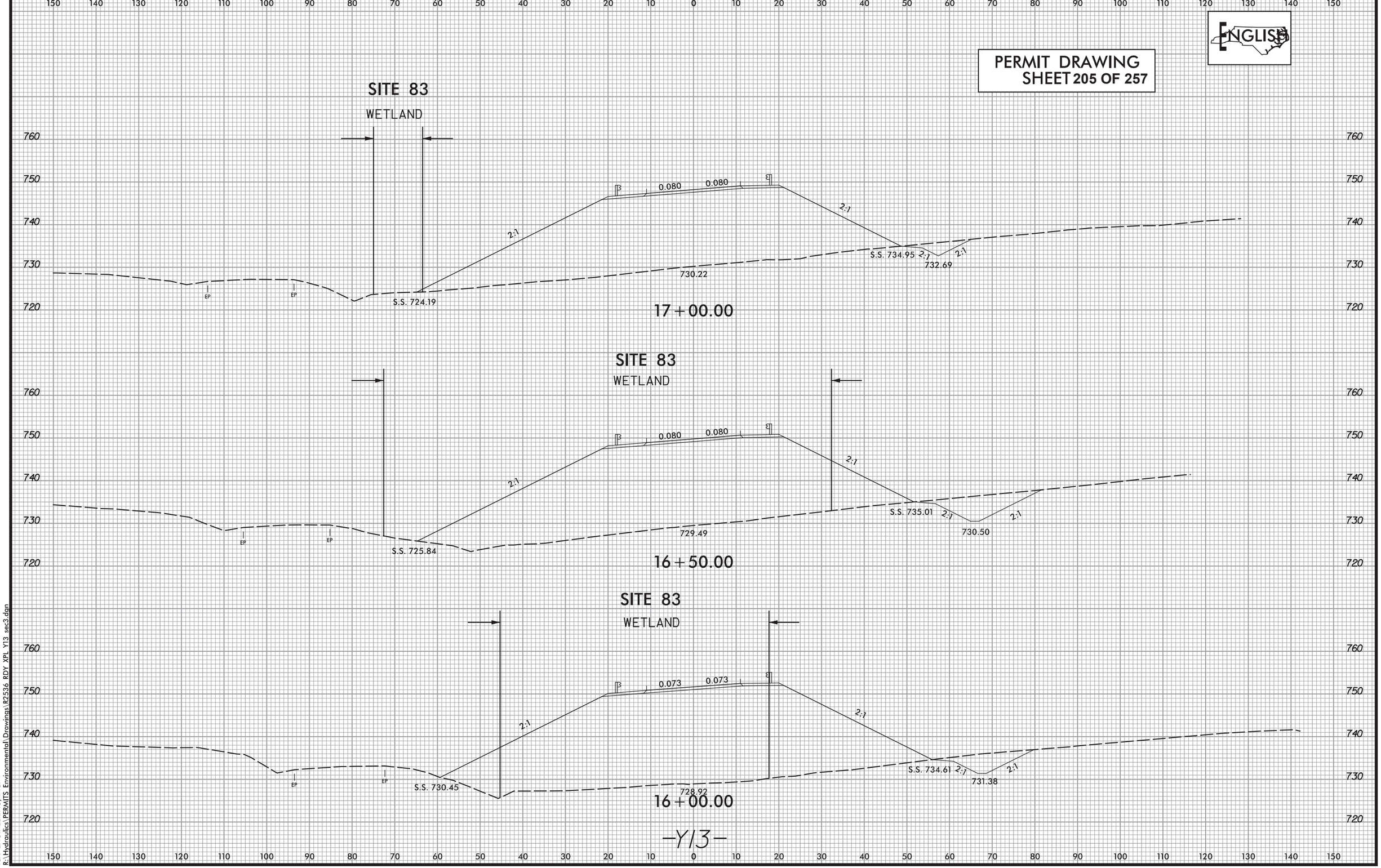
SHEET 205 OF 257



-Y13-

8/23/99

2/2/2016
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PROJECT REFERENCE NO.	SHEET NO.
R-2536	50
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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SHEET 206 OF 257

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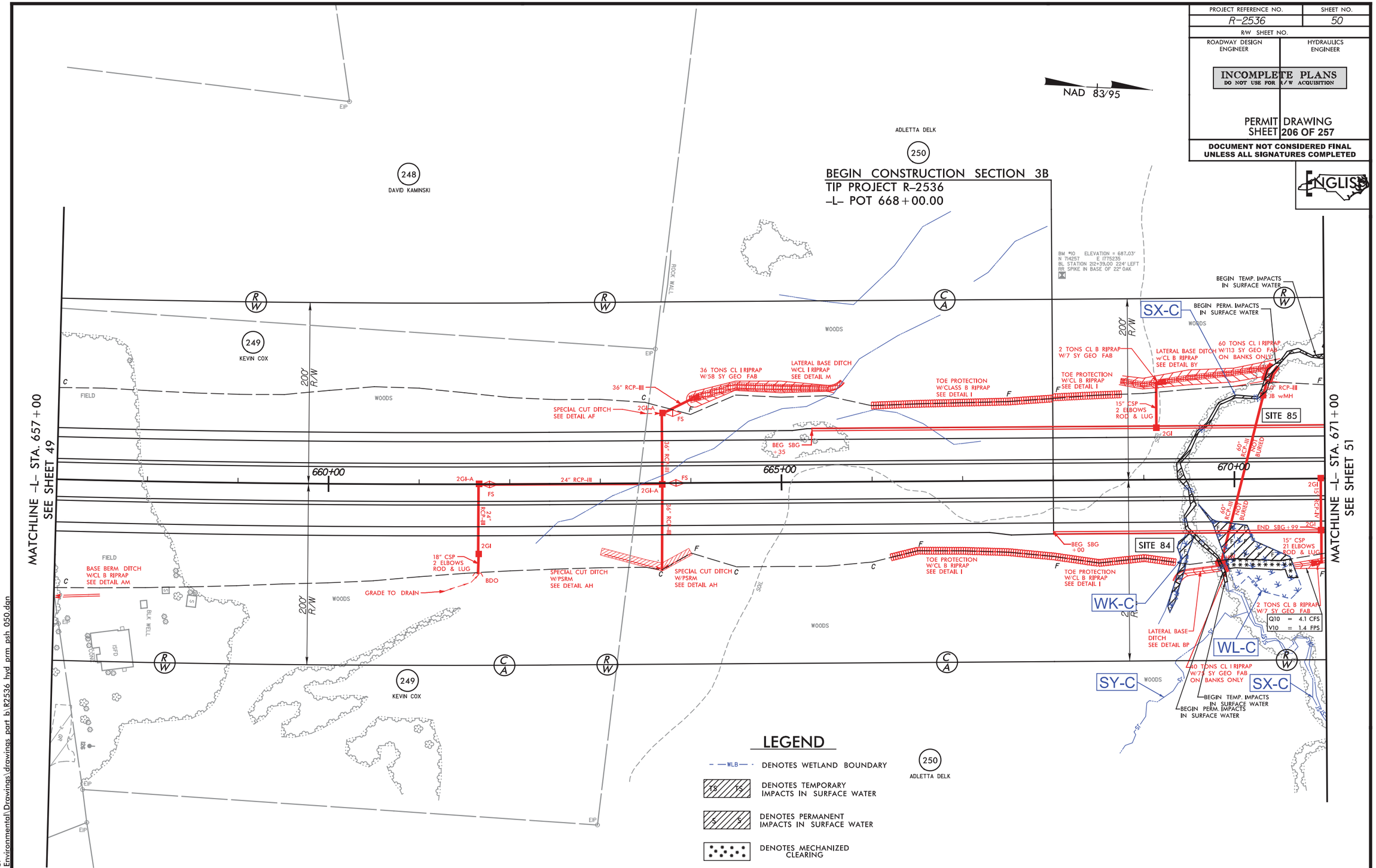

SITE 84 AND 85
PLAN VIEW

FOR -L- PROFILE SEE SHT. 128

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	50
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 207 OF 257

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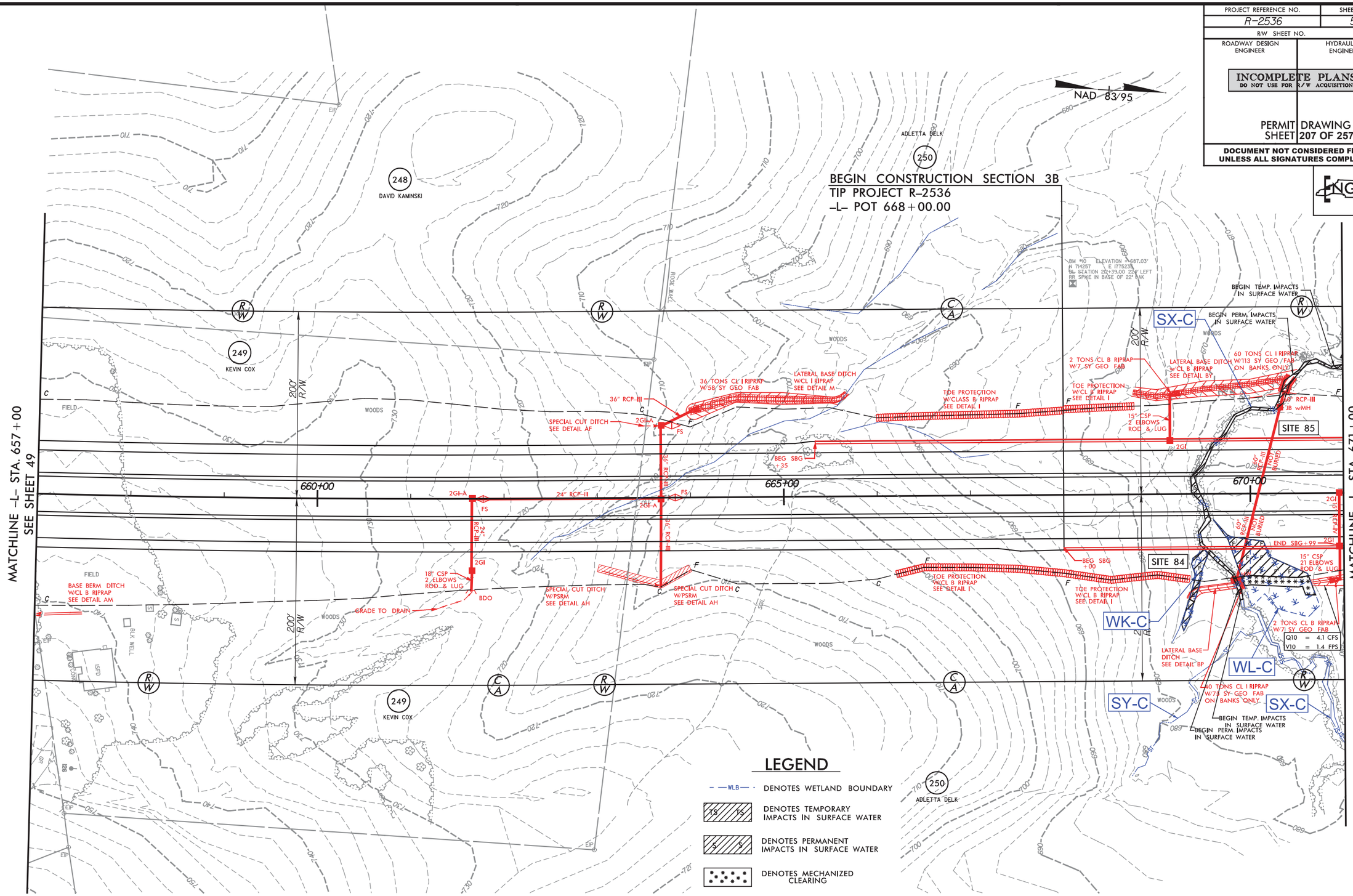
ENGLISH



LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- E — DENOTES EXCAVATION IN WETLAND
- F — DENOTES FILL IN WETLAND

100' 0' 100' 200'
GRAPHIC SCALE

SITE 84 AND 85
PLAN VIEW

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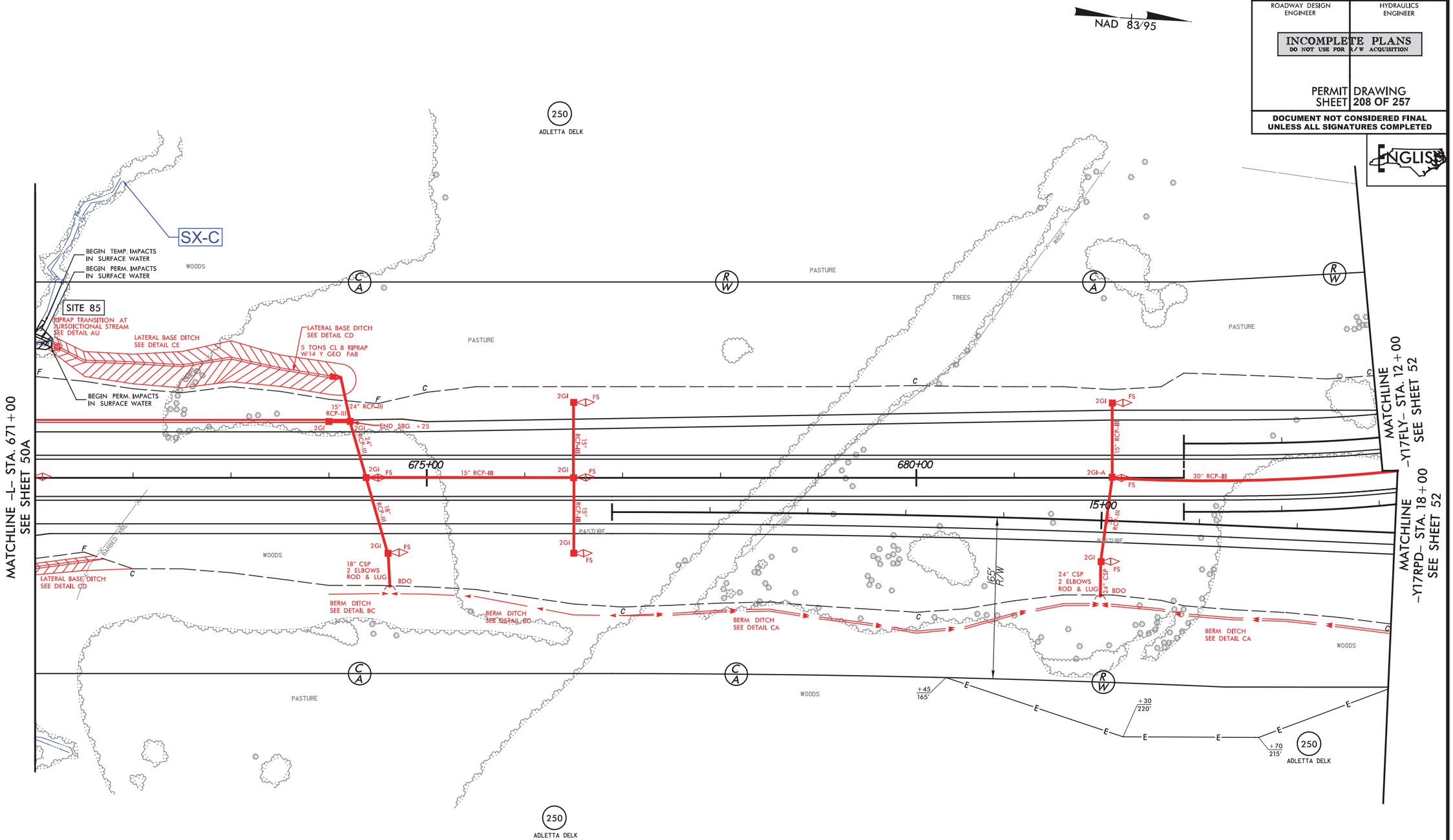
PROJECT REFERENCE NO.	SHEET NO.
R-2536	51
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 208 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 85
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHT. 129
FOR -Y17FLY- PROFILE SEE SHT. 129
FOR -Y17RPD- PROFILE SEE SHT. 209
FOR -Y17RPDA- PROFILE SEE SHT. 211

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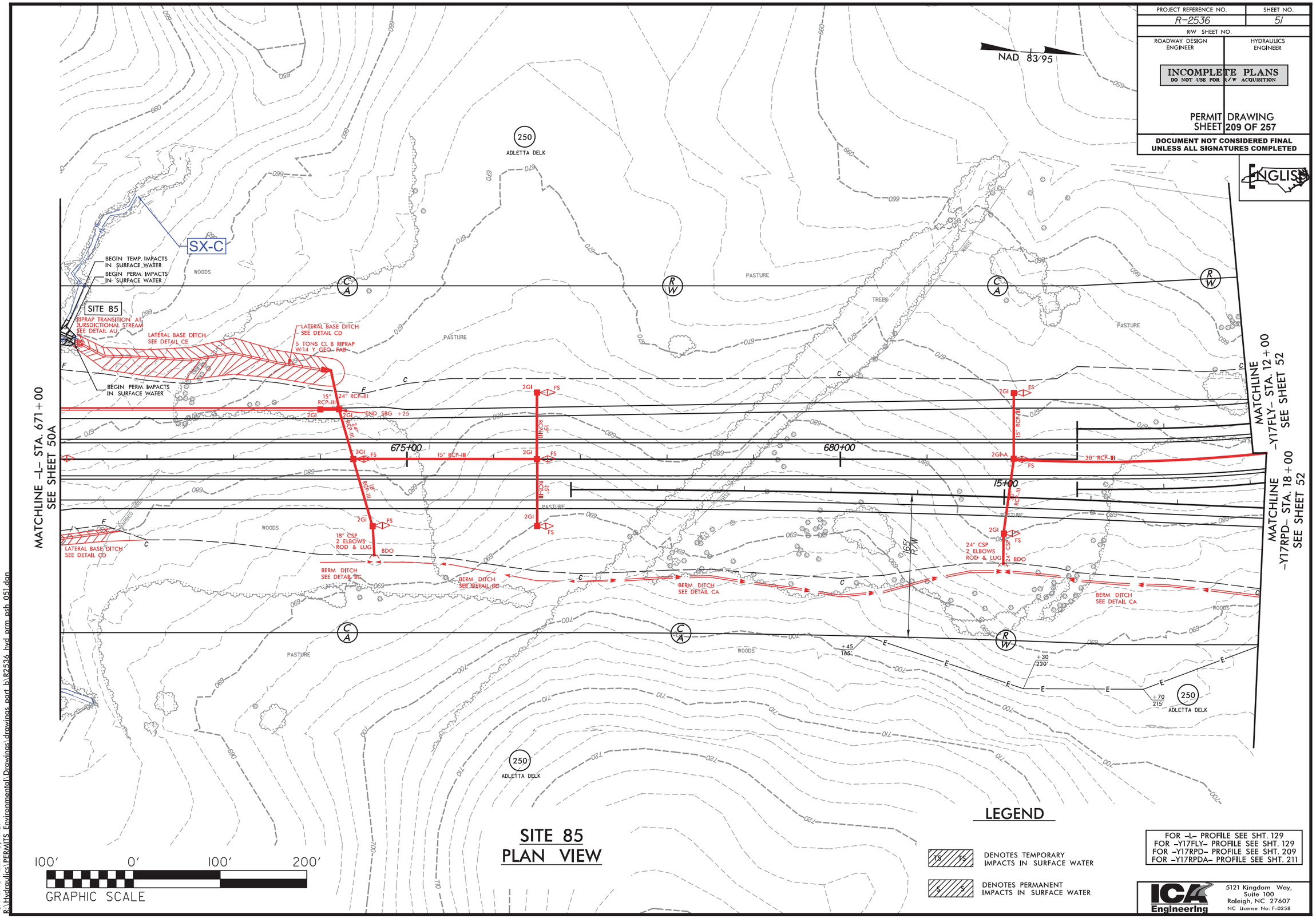
PROJECT REFERENCE NO.	SHEET NO.
R-2536	51
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 209 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SITE 85
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHT. 129
FOR -Y17FLY- PROFILE SEE SHT. 129
FOR -Y17RPD- PROFILE SEE SHT. 209
FOR -Y17RPDA- PROFILE SEE SHT. 211

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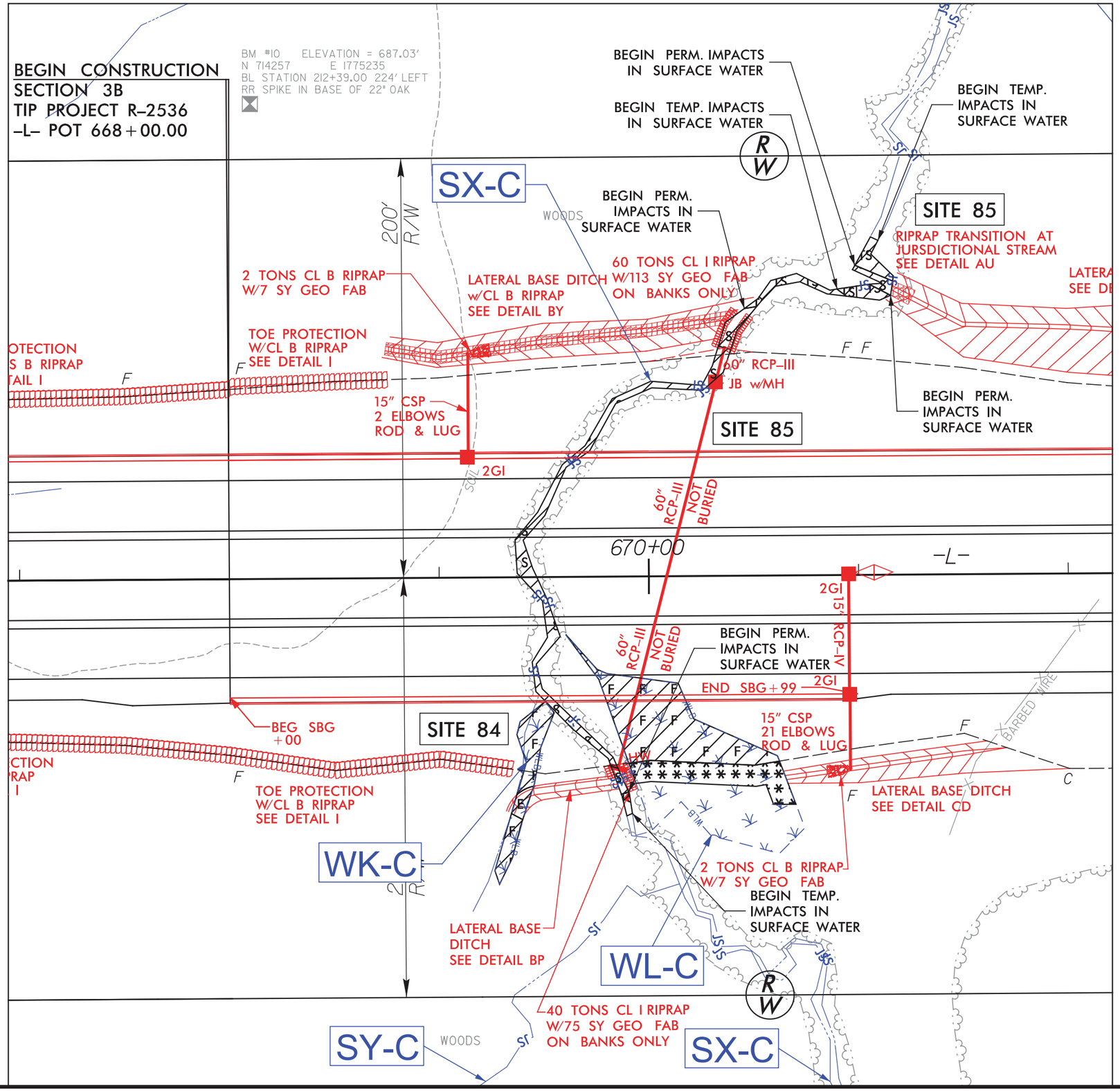
PROJECT REFERENCE NO.	SHEET NO.
R-2536	50A-51
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 210 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



NAD 83/95

DETAIL SHEET FOR SITE 84 AND 85

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- E E — DENOTES EXCAVATION IN WETLAND
- F F — DENOTES FILL IN WETLAND

50' 25' 0' 50' 100'
GRAPHIC SCALE

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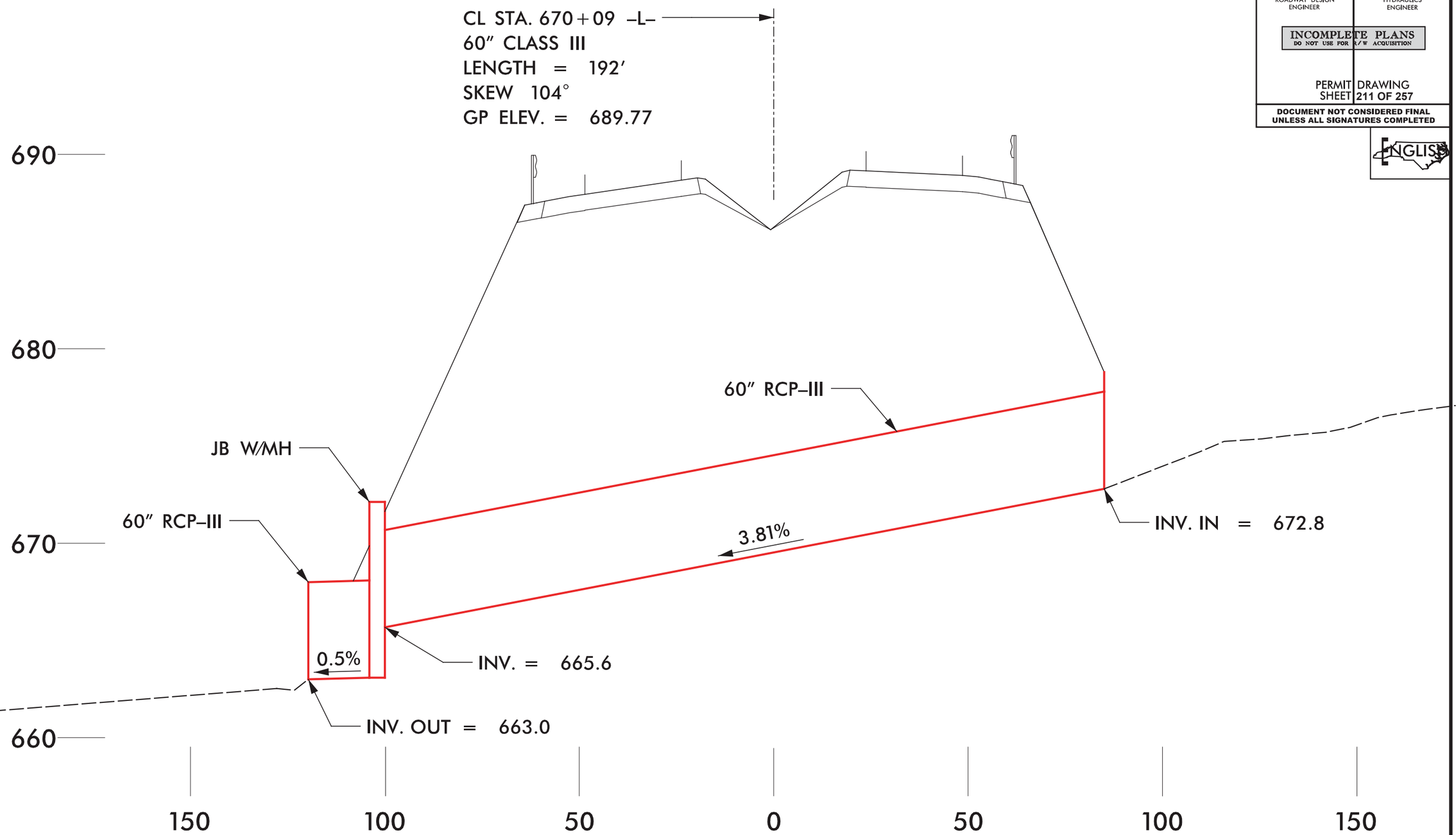
R:\Hydraulics\PERMITS Environmental\Drawings\drawings part b\R2536 hyd prm psh 050 51 site 84 85 detail.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 211 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SITE 85
PROFILE ALONG STRUCTURE
STA. 670+09 –L–

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2/2/2016
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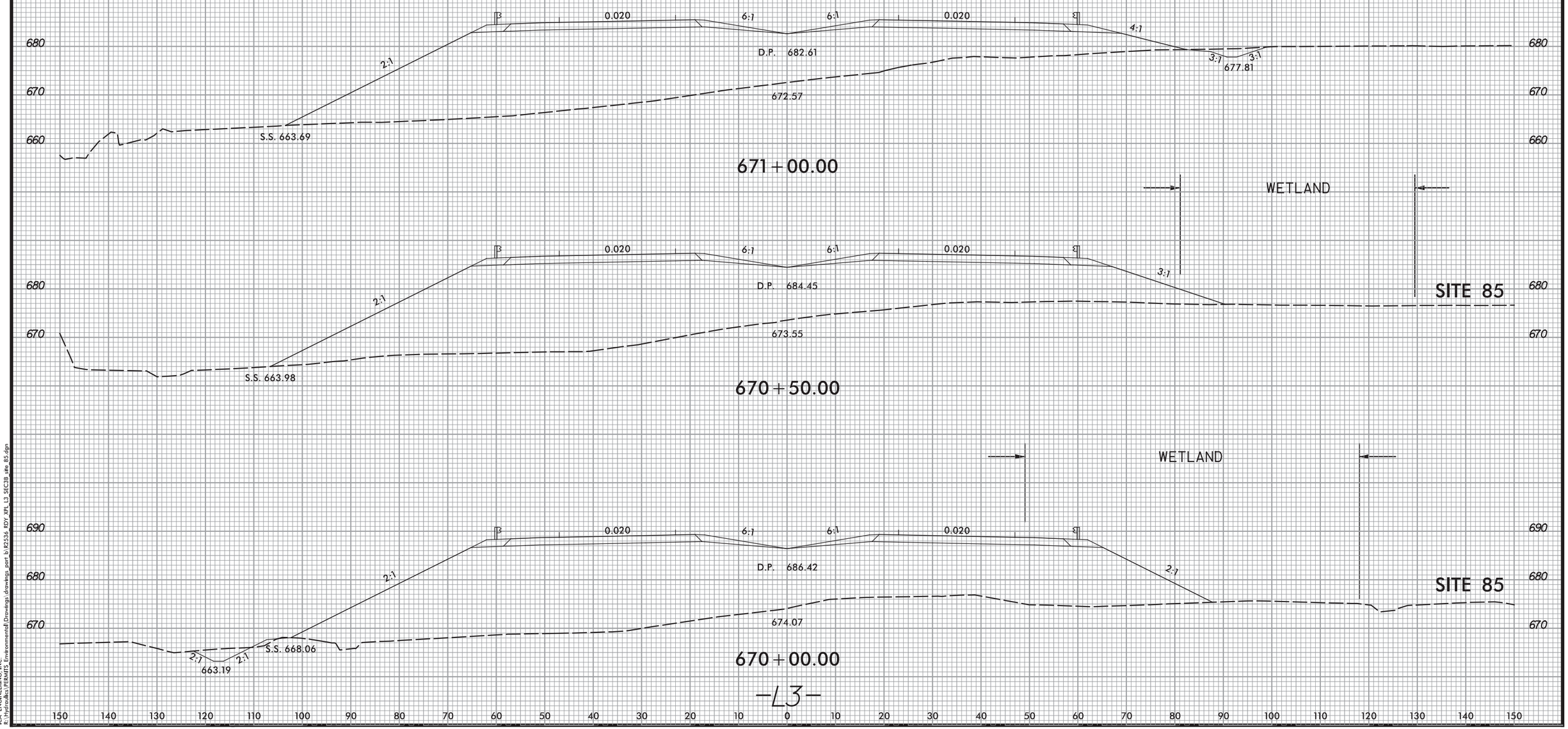
R:\Hydraulics\PERMITS Environmental\Drawings\drawings part b\R2536 hyd prm wet pfl along 60in psh50A.dgn

PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-3

0 5 10

ENGLISH

PERMIT DRAWING
SHEET 212 OF 257



-L3-

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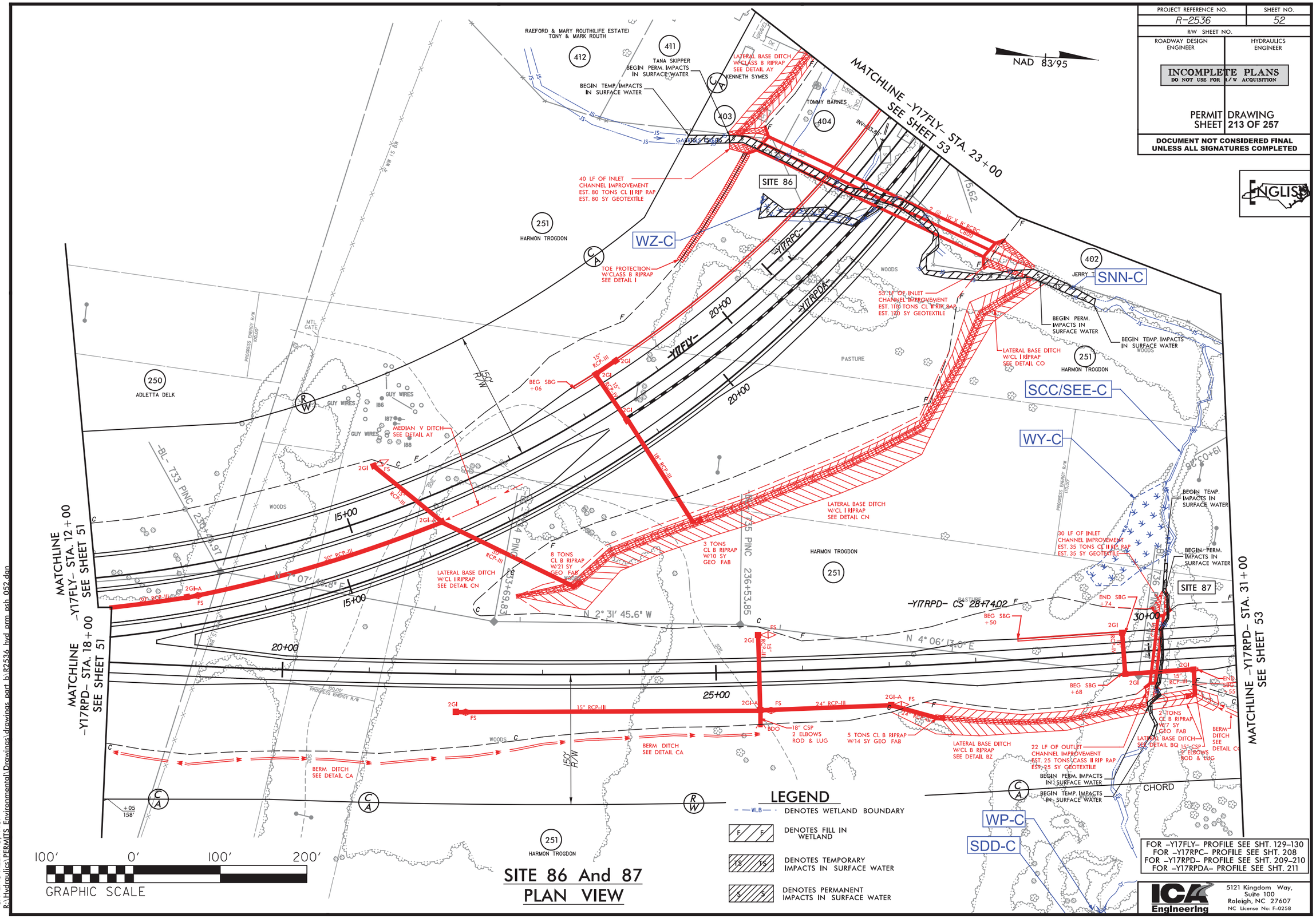
PROJECT REFERENCE NO.	SHEET NO.
R-2536	52
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 213 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SITE 86 And 87
PLAN VIEW

FOR -Y17FLY- PROFILE SEE SHT. 129-130
FOR -Y17RPC- PROFILE SEE SHT. 208
FOR -Y17RPD- PROFILE SEE SHT. 209-210
FOR -Y17RPDA- PROFILE SEE SHT. 211

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	52
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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SHEET 214 OF 257

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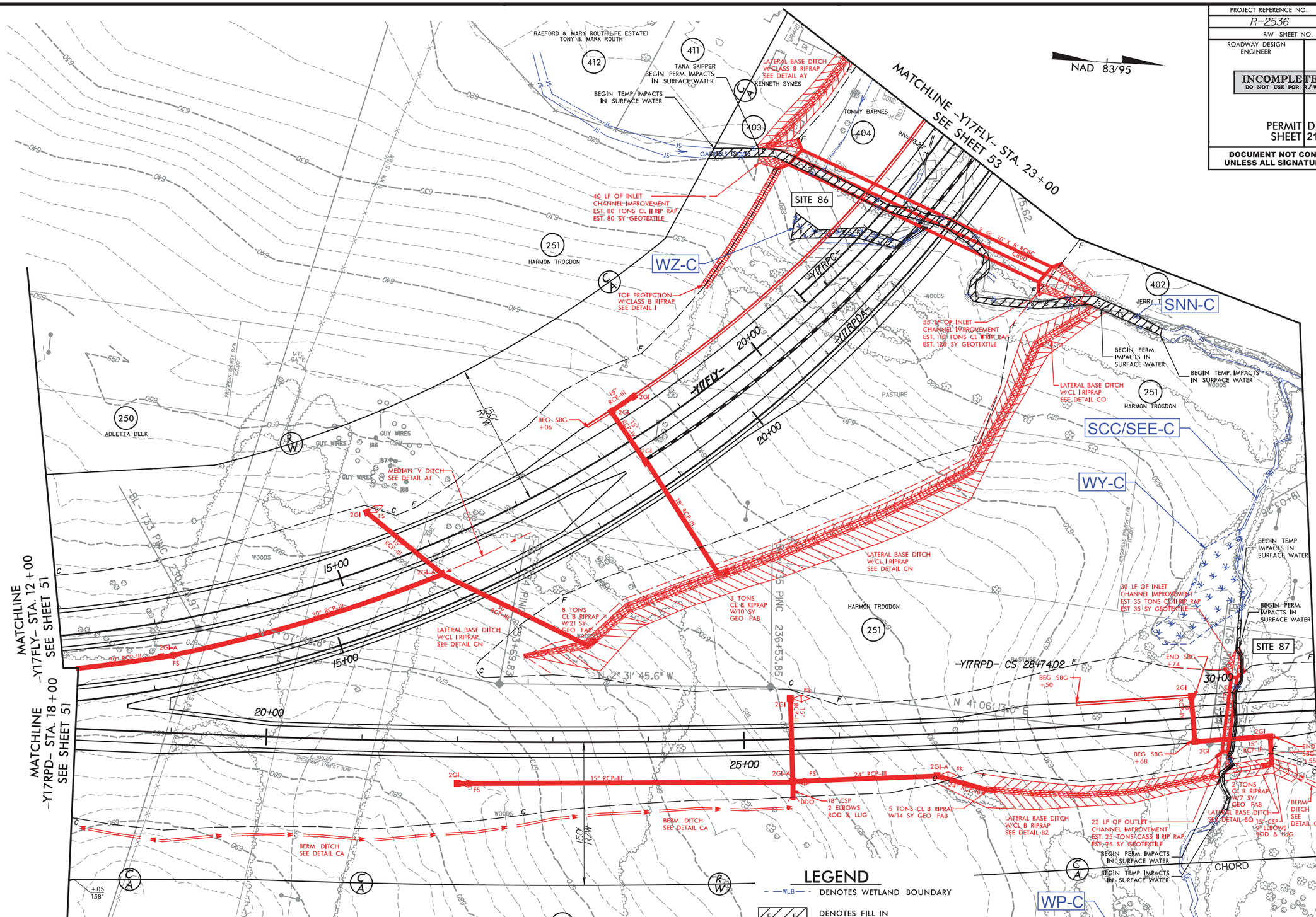
ENGLISH



LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- F F — DENOTES FILL IN WETLAND
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

SITE 86 And 87 PLAN VIEW

FOR -Y17FLY- PROFILE SEE SHT. 129-130
FOR -Y17RPC- PROFILE SEE SHT. 208
FOR -Y17RPD- PROFILE SEE SHT. 209-210
FOR -Y17RPDA- PROFILE SEE SHT. 211

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	52A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 215 OF 257

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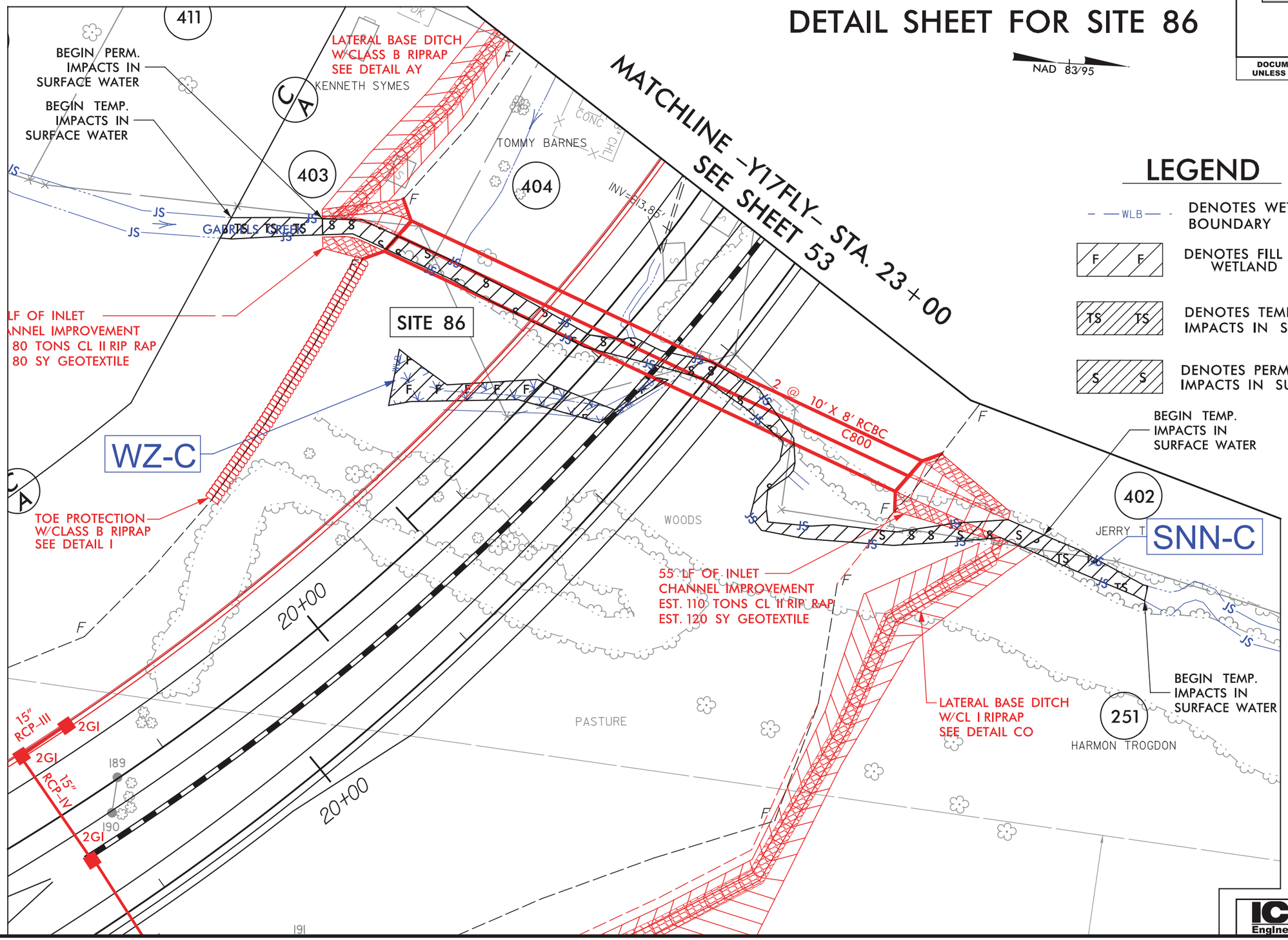
ENGLISH

50' 25' 0' 50' 100'
GRAPHIC SCALE

DETAIL SHEET FOR SITE 86

NAD 83/95



LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- F F — DENOTES FILL IN WETLAND
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	52B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 216 OF 257

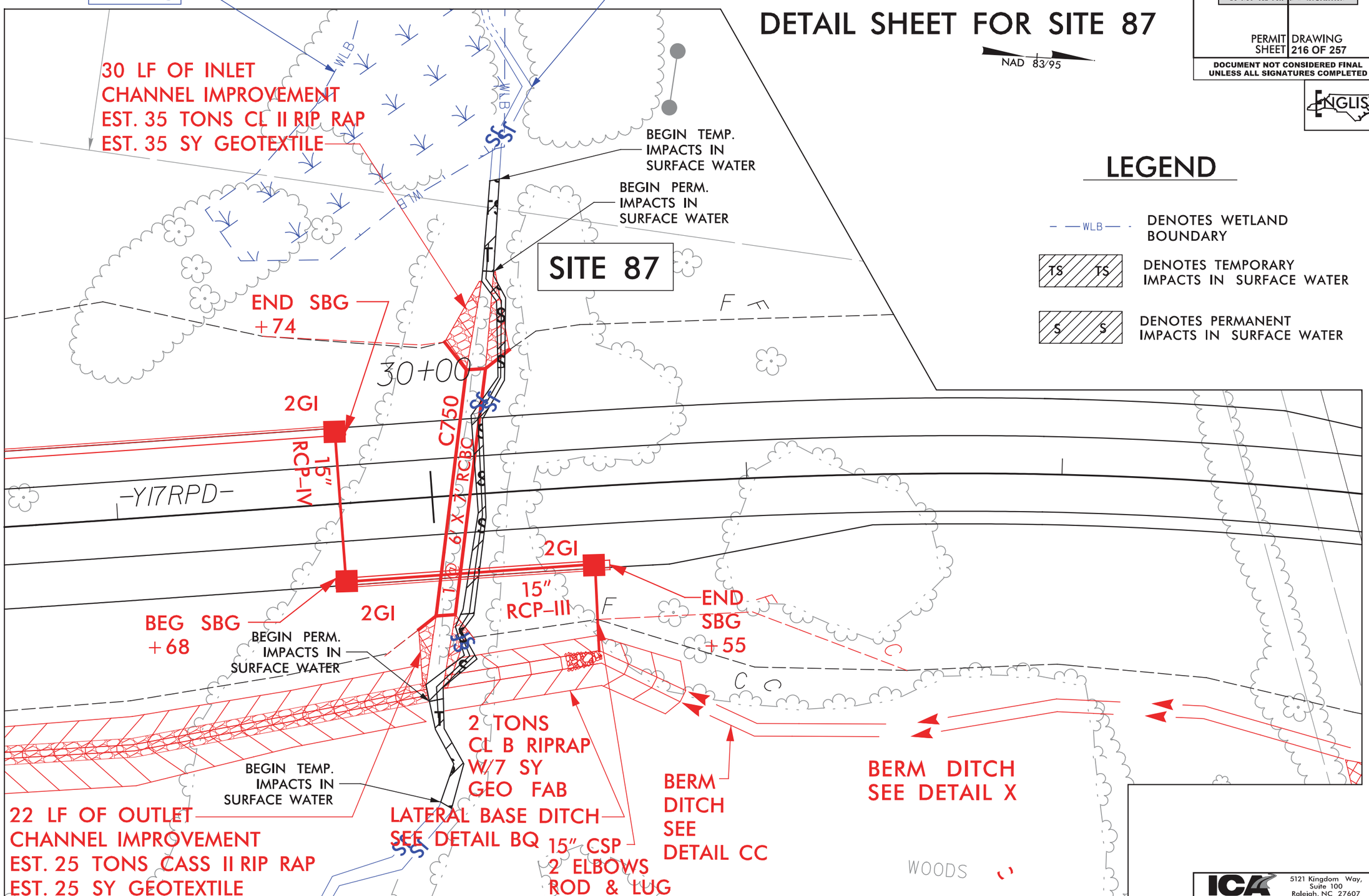
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

30' 15' 0' 30' 60'
GRAPHIC SCALE

DETAIL SHEET FOR SITE 87

NAD 83/95



LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

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SITE 86
–Y17FLY– 22+13

PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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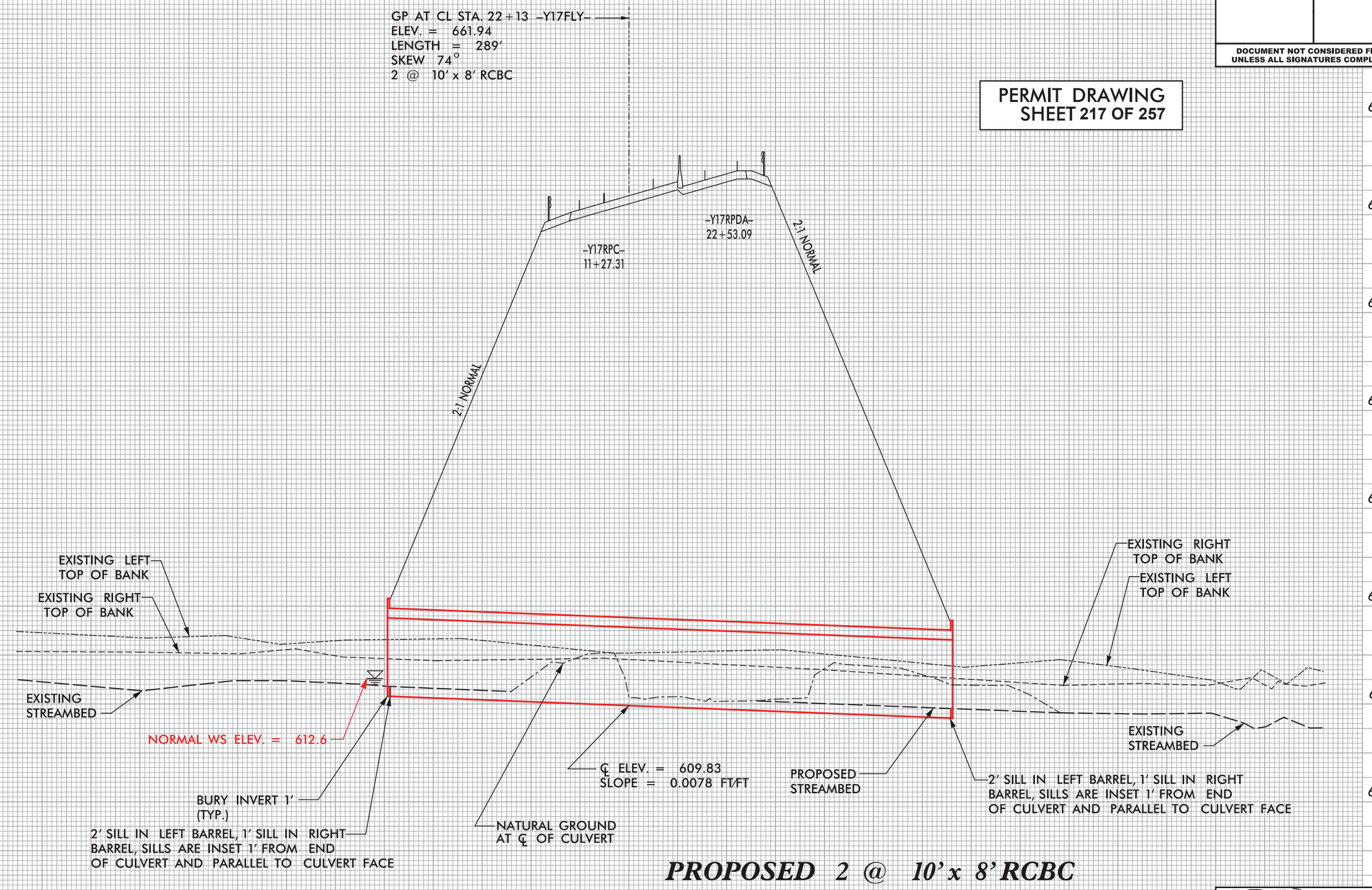
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 217 OF 257



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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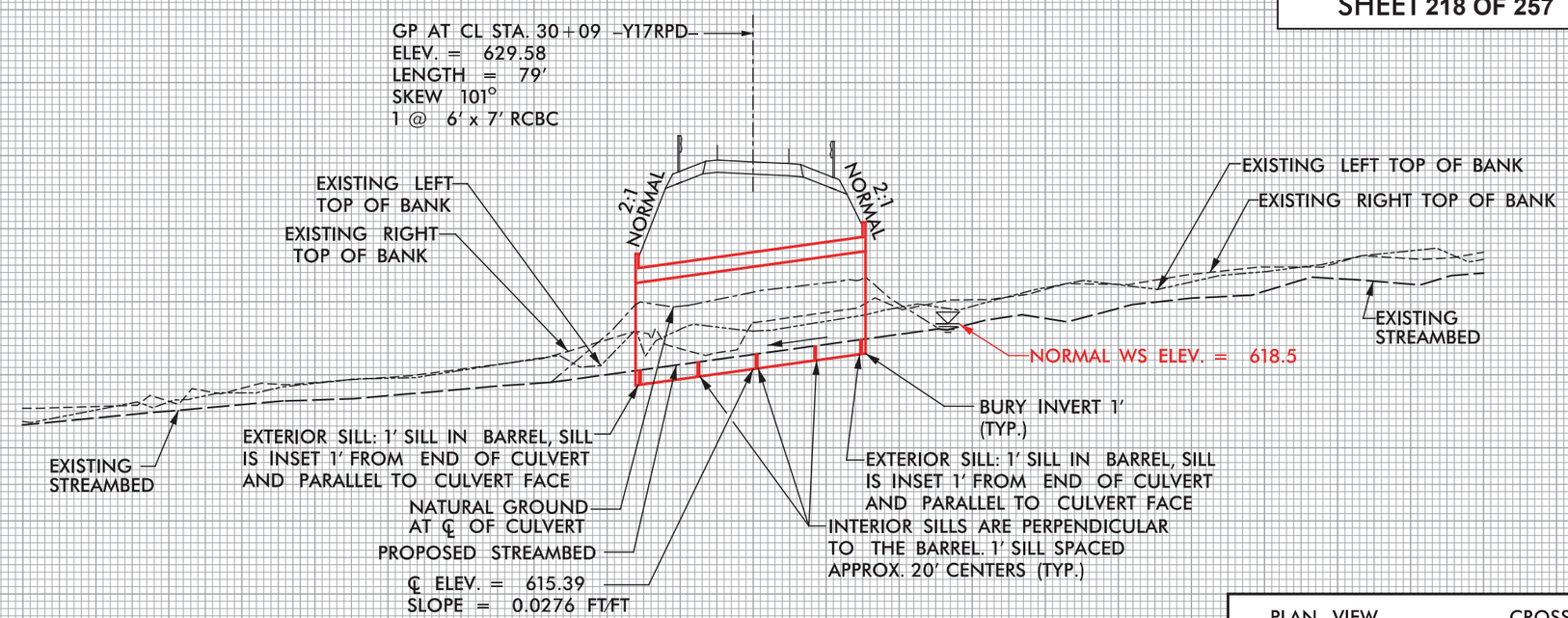
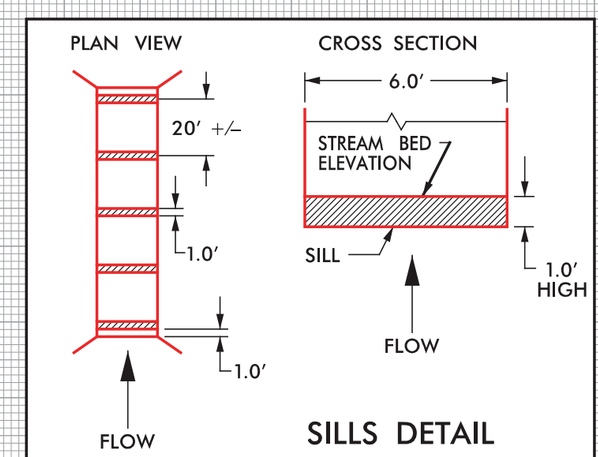
ENGLISH

SITE 87
-Y17RPD- 30+09

PERMIT DRAWING
SHEET 218 OF 257





NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

PROPOSED 1 @ 6'x 7' RCBC

250 200 150 100 50 0 50 100 150 200 250

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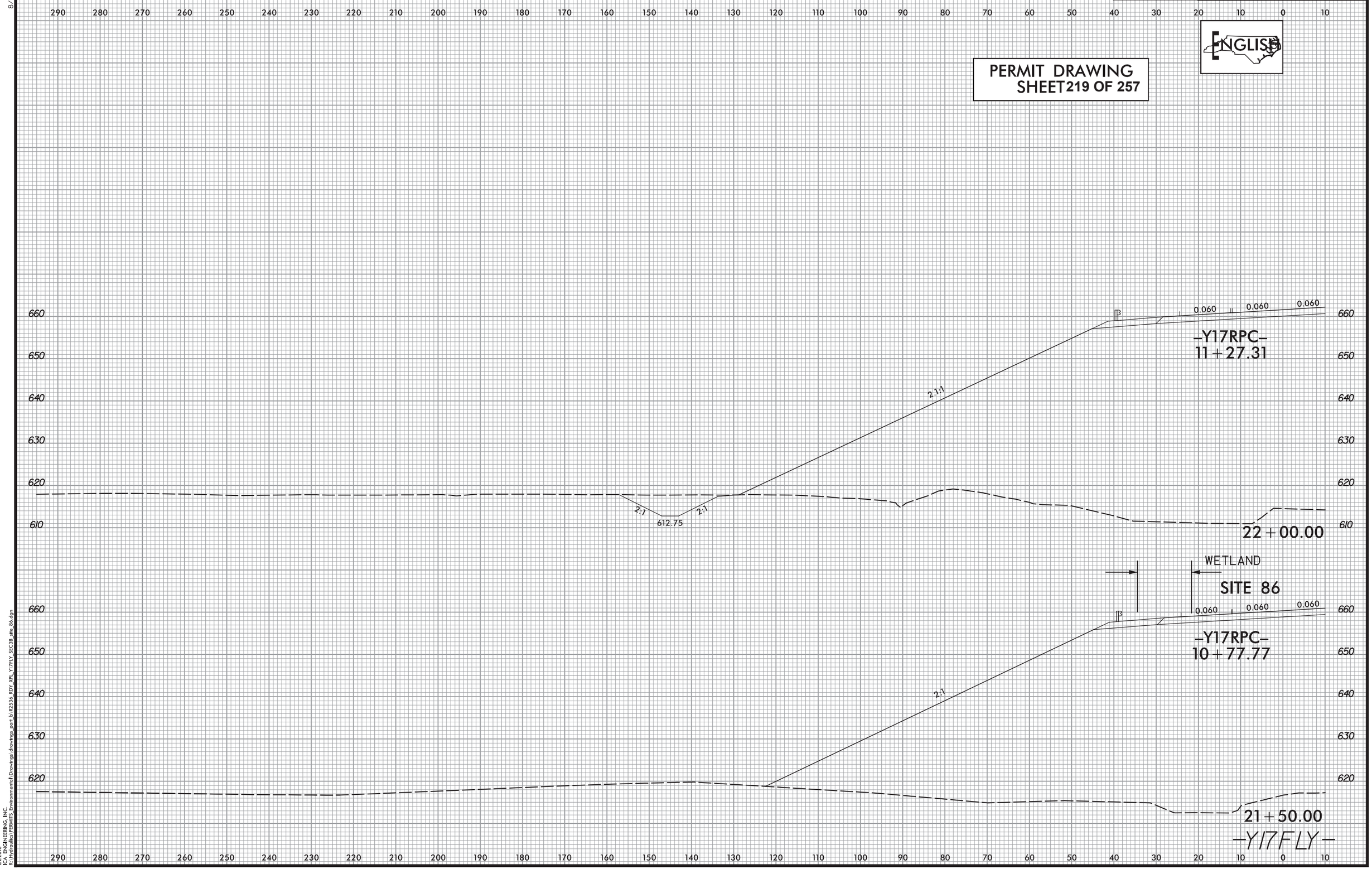
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-20

0 5 10

PERMIT DRAWING
SHEET 219 OF 257



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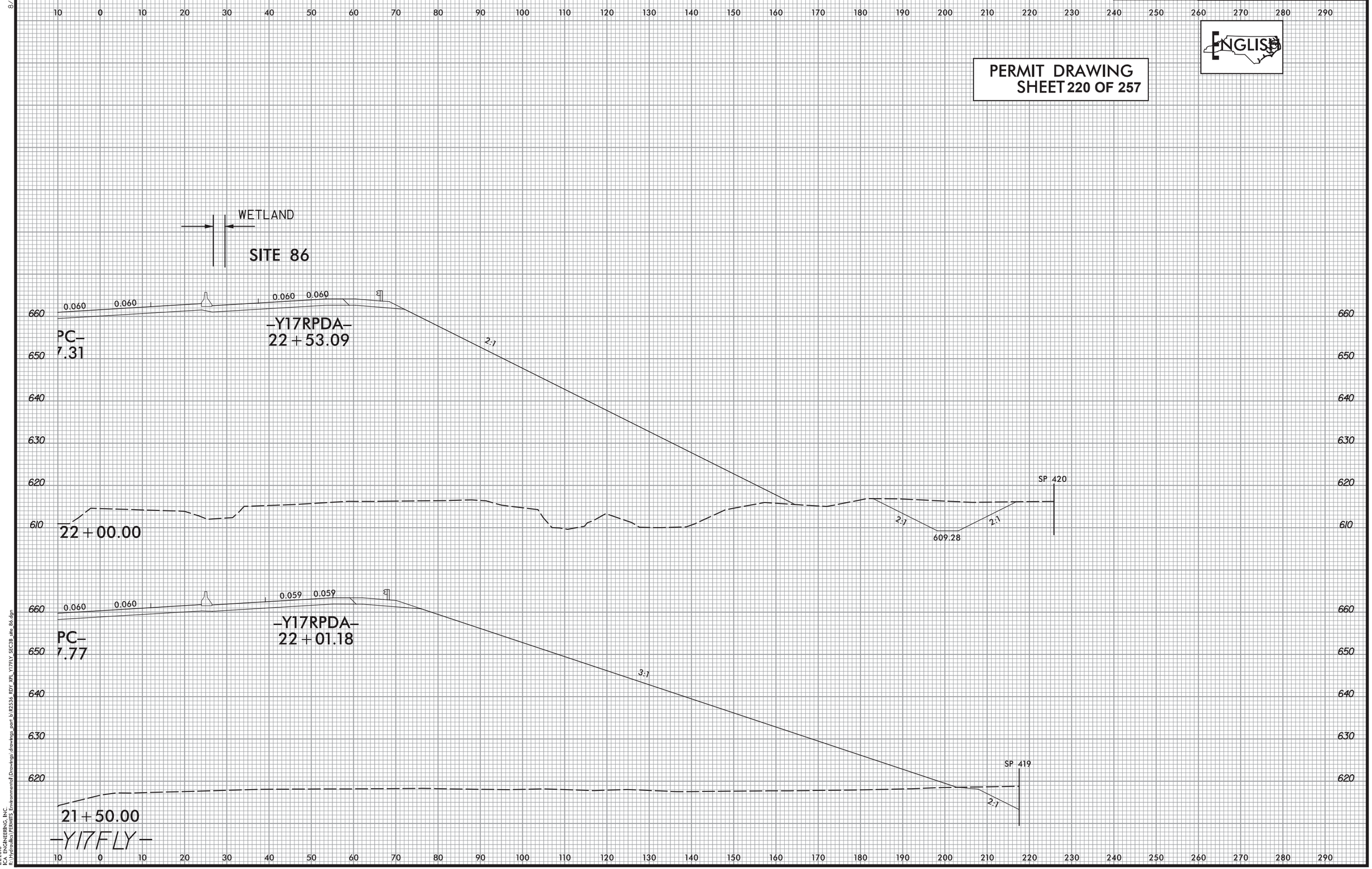
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-31

0 5 10

PERMIT DRAWING
SHEET 220 OF 257



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2/2/2016
ICA ENGINEERING, INC.
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REVISIONS

FOR -Y17- PROFILE SEE SHT. 203-208
FOR -Y17FLY- PROFILE SEE SHT. 129-131
FOR -Y17RPC- PROFILE SEE SHT. 208
FOR -Y17RPD- PROFILE SEE SHT. 209-210
FOR -Y17LPD- PROFILE SEE SHT. 210
FOR -Y17RPDA- PROFILE SEE SHT. 211
FOR -Y17A PROFILE SEE SHT. 212
FOR -SR6DR1- PROFILE SEE SHT. 215

PROJECT REFERENCE NO.	SHEET NO.
R-2536	53
R.W. SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 221 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

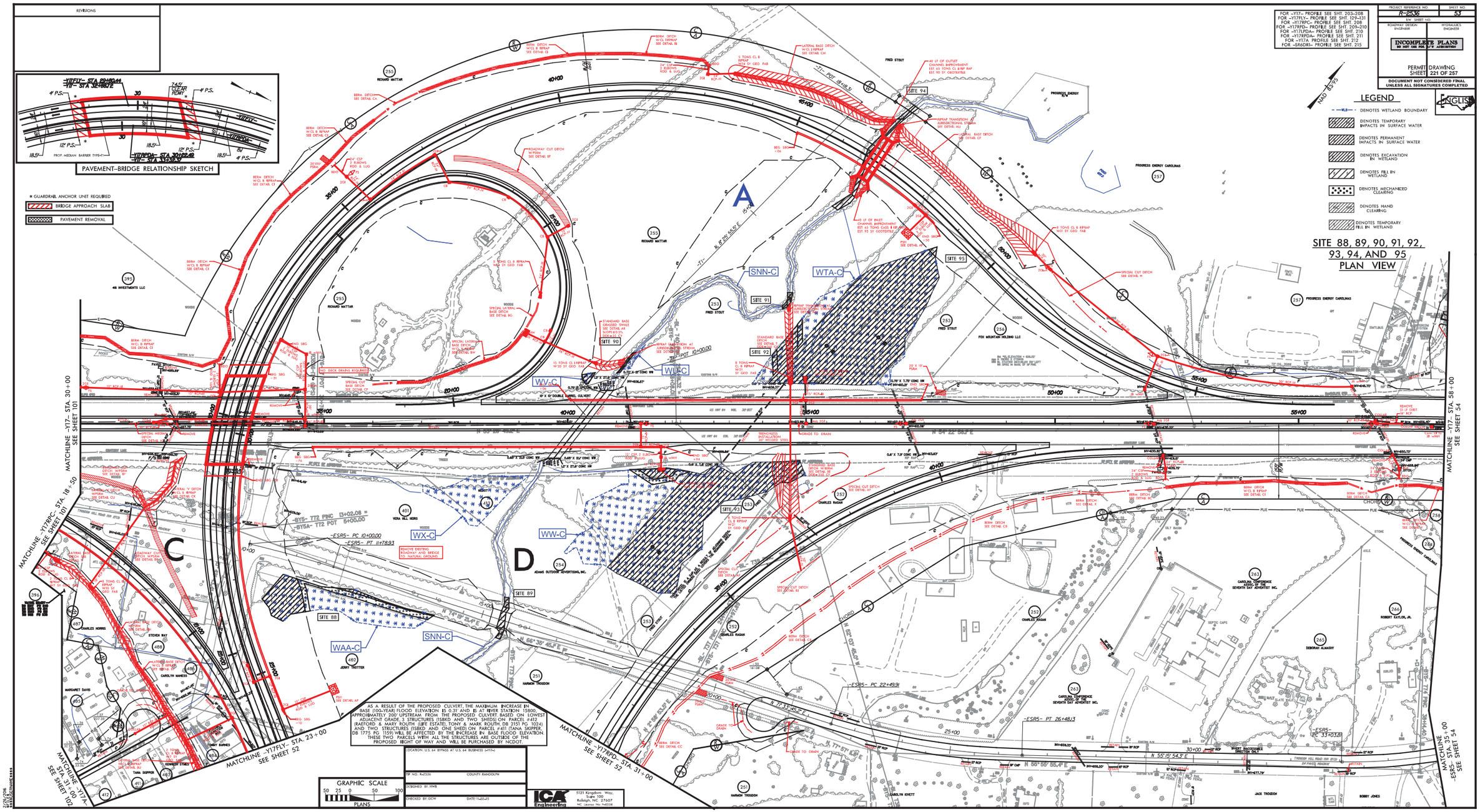
ENGLISH

NAD 83/95

LEGEND

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

SITE 88, 89, 90, 91, 92, 93, 94, AND 95 PLAN VIEW



AS A RESULT OF THE PROPOSED CULVERT, THE MAXIMUM INCREASE IN BASE (100-YEAR) FLOOD ELEVATION IS 0.31' AND IS AT RIVER STATION 15800, APPROXIMATELY 200' UPSTREAM FROM THE PROPOSED CULVERT BASED ON: LOWEST ADJACENT GRADE, 3 STRUCTURES (15BKD AND TWO SHEDS) ON PARCEL #412 (RAEFORD & MARY ROUTH (LIFE ESTATE), TONY & MARK ROUTH DB 2151 PG 1024) AND TWO STRUCTURES (15BKD AND ONE SHED) ON PARCEL #411 (TANA SKIPPER, DB 1775 PG. 1159) WILL BE AFFECTED BY THE INCREASE IN BASE FLOOD ELEVATION. THESE TWO PARCELS WITH ALL THE STRUCTURES ARE OUTSIDE OF THE PROPOSED RIGHT OF WAY AND WILL BE PURCHASED BY NCDOT.

LOCATION: U.S. 64 BYPASS AT U.S. 64 BUSINESS (-Y17A-)

TIP NO.: R-2536 COUNTY: RANDOLPH

DESIGNED BY: HWB

CHECKED BY: GCW DATE: 11-02-15

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NC License No: F-0218

REVISIONS

FOR -Y17- PROFILE SEE SHT. 203-208
FOR -Y17FLY- PROFILE SEE SHT. 129-131
FOR -Y17RPC- PROFILE SEE SHT. 208
FOR -Y17RPD- PROFILE SEE SHT. 209-210
FOR -Y17LPD A- PROFILE SEE SHT. 210
FOR -Y17RPD A- PROFILE SEE SHT. 211
FOR -Y17A PROFILE SEE SHT. 212
FOR -SR60R1- PROFILE SEE SHT. 215

PROJECT REFERENCE NO.	SHEET NO.
R-2536	53
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 222 OF 257

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ENGLISH

PAVEMENT-BRIDGE RELATIONSHIP SKETCH

* GUARDRAIL ANCHOR UNIT REQUIRED
BRIDGE APPROACH SLAB
PAVEMENT REMOVAL

LEGEND

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

SITE 88, 89, 90, 91, 92, 93, 94, AND 95 PLAN VIEW

MATCHLINE -Y17- STA. 30+00 SEE SHEET 101

MATCHLINE -Y17- STA. 58+00 SEE SHEET 54

MATCHLINE -Y17RPC- STA. 18+50 SEE SHEET 101

MATCHLINE -Y17FLY- STA. 23+00 SEE SHEET 52

MATCHLINE -Y17RPD- STA. 31+00 SEE SHEET 52

MATCHLINE -Y17A- STA. 37+00 SEE SHEET 102

MATCHLINE -ESR5- STA. 35+00 SEE SHEET 54

AS A RESULT OF THE PROPOSED CULVERT, THE MAXIMUM INCREASE IN BASE (100-YEAR) FLOOD ELEVATION IS 0.31' AND IS AT RIVER STATION 15800, APPROXIMATELY 200' UPSTREAM FROM THE PROPOSED CULVERT. BASED ON LOWEST ADJACENT GRADE, 3 STRUCTURES (15BKD AND TWO SHEDS) ON PARCEL #412 (BAEFORD & MARY ROUTH (LIFE ESTATE), TONY & MARK ROUTH DB 2151 PG 1024) AND TWO STRUCTURES (15BKD AND ONE SHED) ON PARCEL #411 (TANA SKIPPER, DB 1775 PG. 1159) WILL BE AFFECTED BY THE INCREASE IN BASE FLOOD ELEVATION. THESE TWO PARCELS WITH ALL THE STRUCTURES ARE OUTSIDE OF THE PROPOSED RIGHT OF WAY AND WILL BE PURCHASED BY NCDOT.

LOCATION: U.S. 64 BYPASS AT U.S. 64 BUSINESS (-Y17-)

TIP NO.: R-2536 COUNTY: RANDOLPH

DESIGNED BY: HWB

CHECKED BY: GCW DATE: 11-02-15

GRAPHIC SCALE
50 25 0 50 100
PLANS

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2/26/2016
8:33:30 AM
R2536_SHEET_0053

PROJECT REFERENCE NO.	SHEET NO.
R-2536	53-lb
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 223 OF 257

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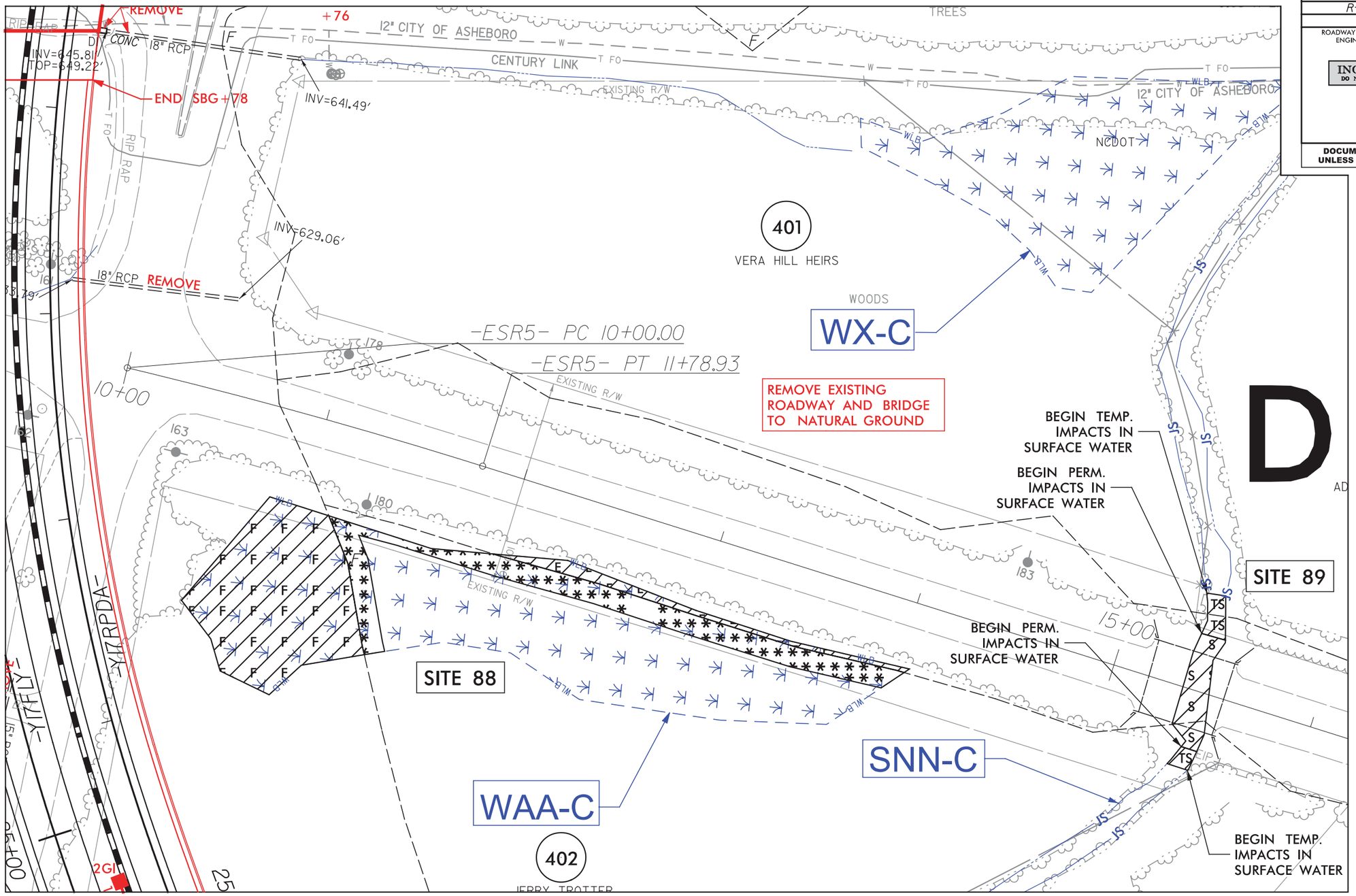
ENGLISH



LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- F F — DENOTES FILL IN WETLAND
- E E — DENOTES EXCAVATION IN WETLAND

50' 25' 0' 50' 100'
GRAPHIC SCALE

DETAIL SHEET FOR SITE 88 AND 89

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Raleigh, NC 27607
NC License No: F-0258

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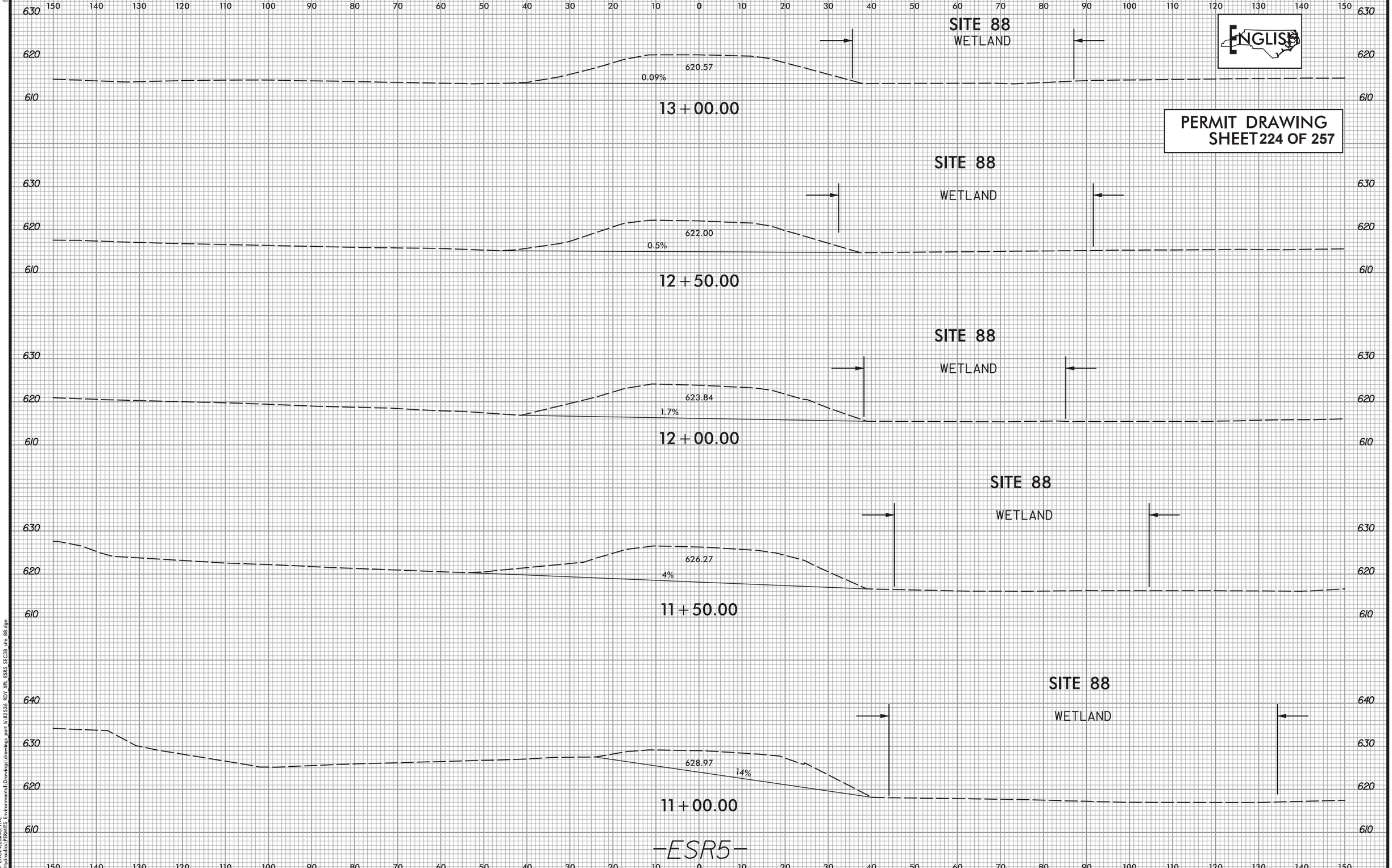
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-149

0 5 10

PERMIT DRAWING
SHEET 224 OF 257



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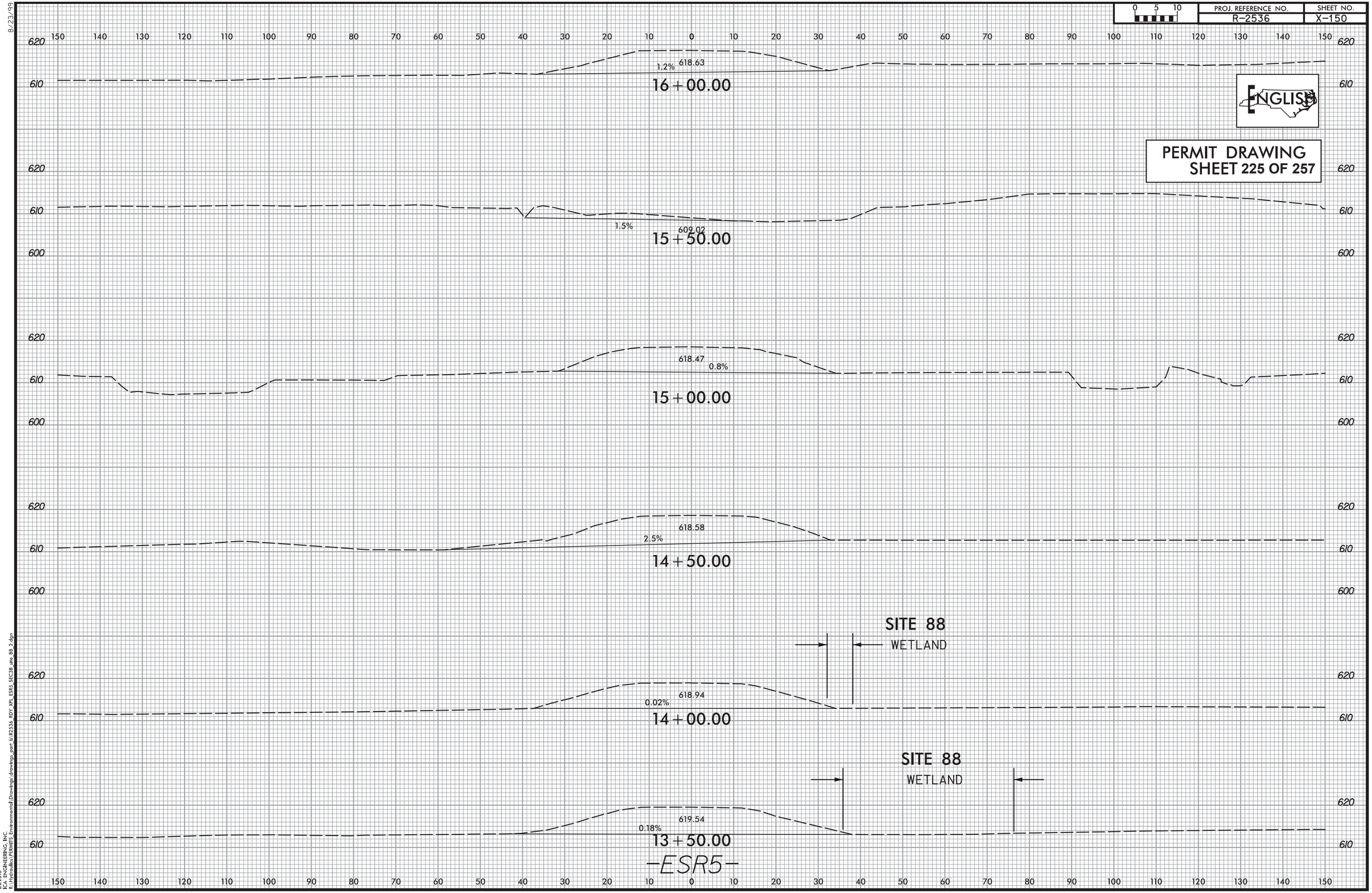
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-150

0 5 10



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	53-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET **226 OF 257**

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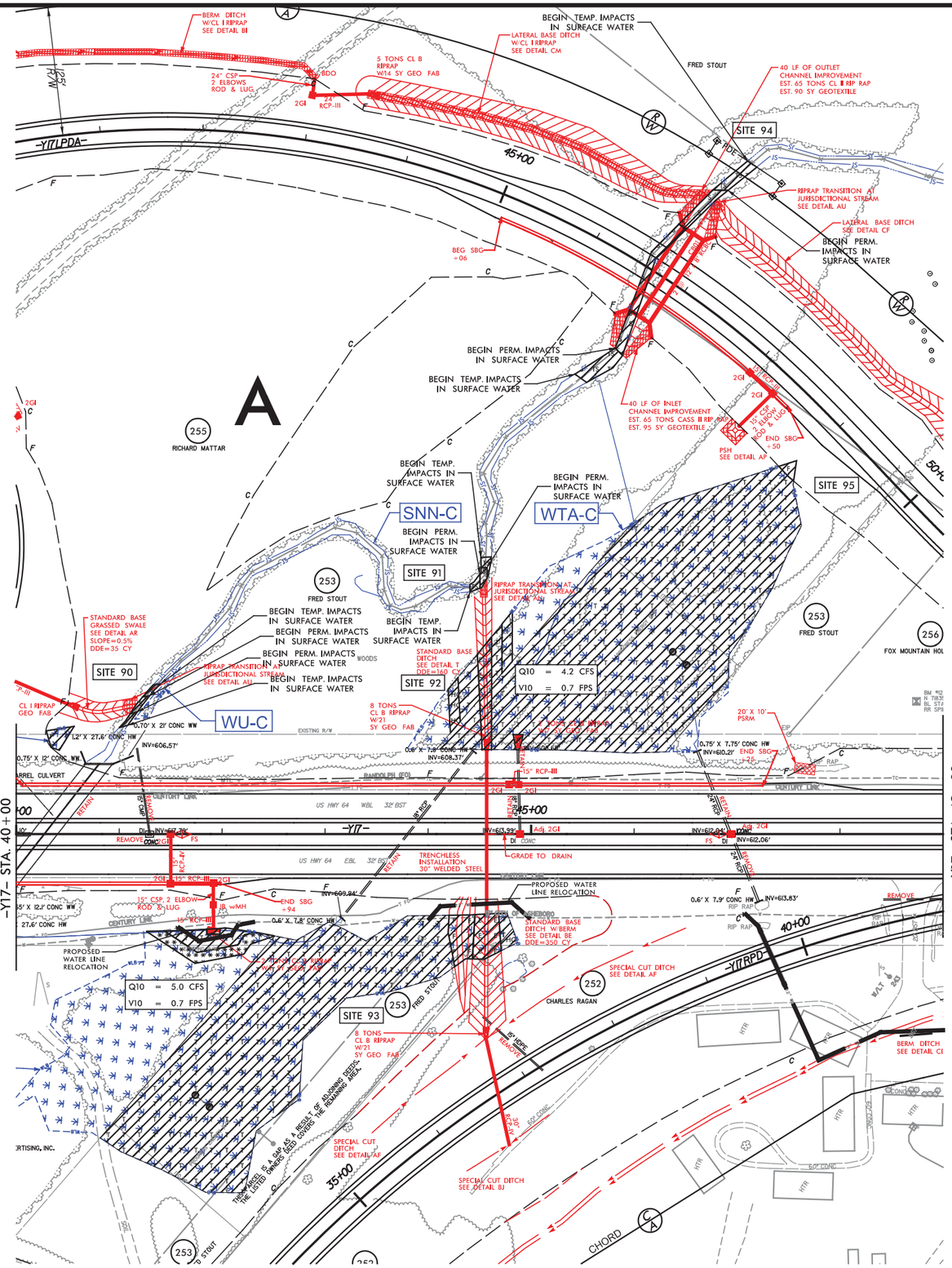

LEGEND

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

SITE 90, 91, 92, 93, 94, AND 95 PLAN VIEW

120' 0' 120' 240'
GRAPHIC SCALE

FOR -Y17A- PROFILE SEE SHT. 212

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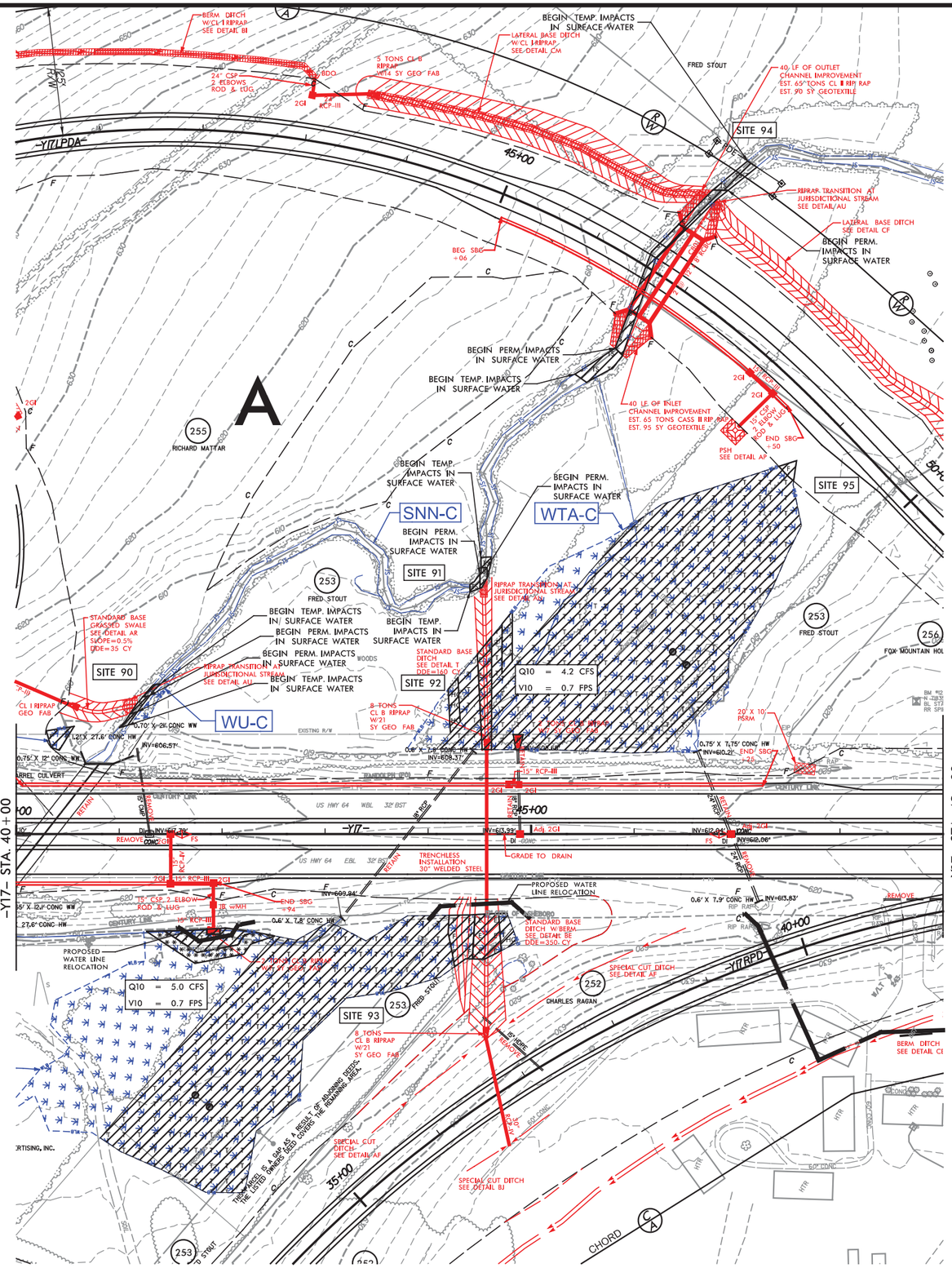
PROJECT REFERENCE NO.	SHEET NO.
R-2536	53-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 227 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- T/P — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S/P — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- E/E — DENOTES EXCAVATION IN WETLAND
- F/F — DENOTES FILL IN WETLAND
- T/T — DENOTES TEMPORARY FILL IN WETLAND
- MC — DENOTES MECHANIZED CLEARING
- HC — DENOTES HAND CLEARING

SITE 90, 91, 92, 93, 94, AND 95 PLAN VIEW

120' 0' 120' 240'
GRAPHIC SCALE

FOR -Y17A- PROFILE SEE SHT. 212

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	53_2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 228 OF 257

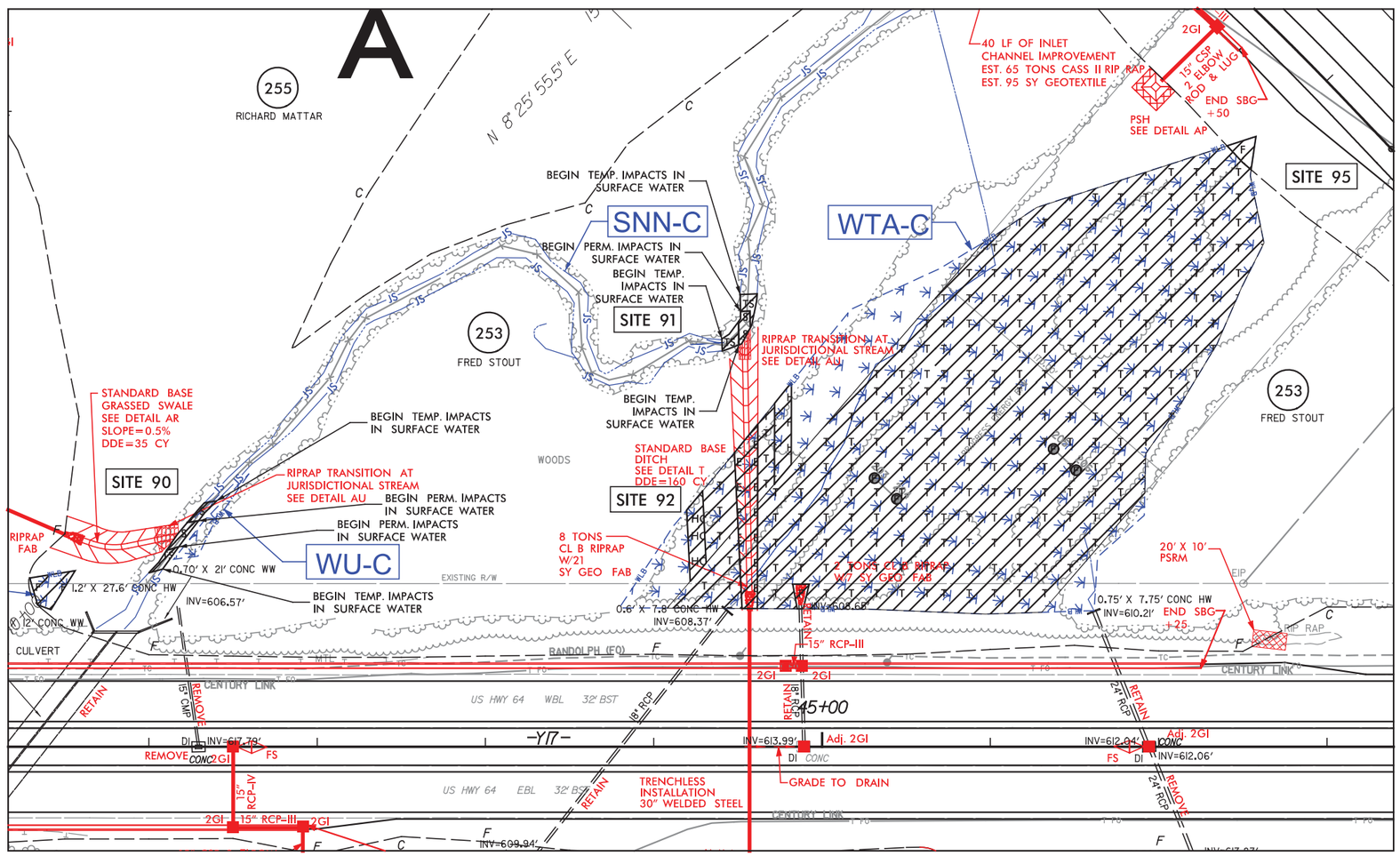
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- E E — DENOTES EXCAVATION IN WETLAND
- F F — DENOTES FILL IN WETLAND
- T T — DENOTES TEMPORARY FILL IN WETLAND
- HC HC — DENOTES HAND CLEARING

NAD 83/95



80' 40' 0' 80' 160'
GRAPHIC SCALE

DETAIL SHEET FOR SITE 90, 91, 92 AND 95

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Raleigh, NC 27607
NC License No: F-0258

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ICA ENGINEERING, INC.
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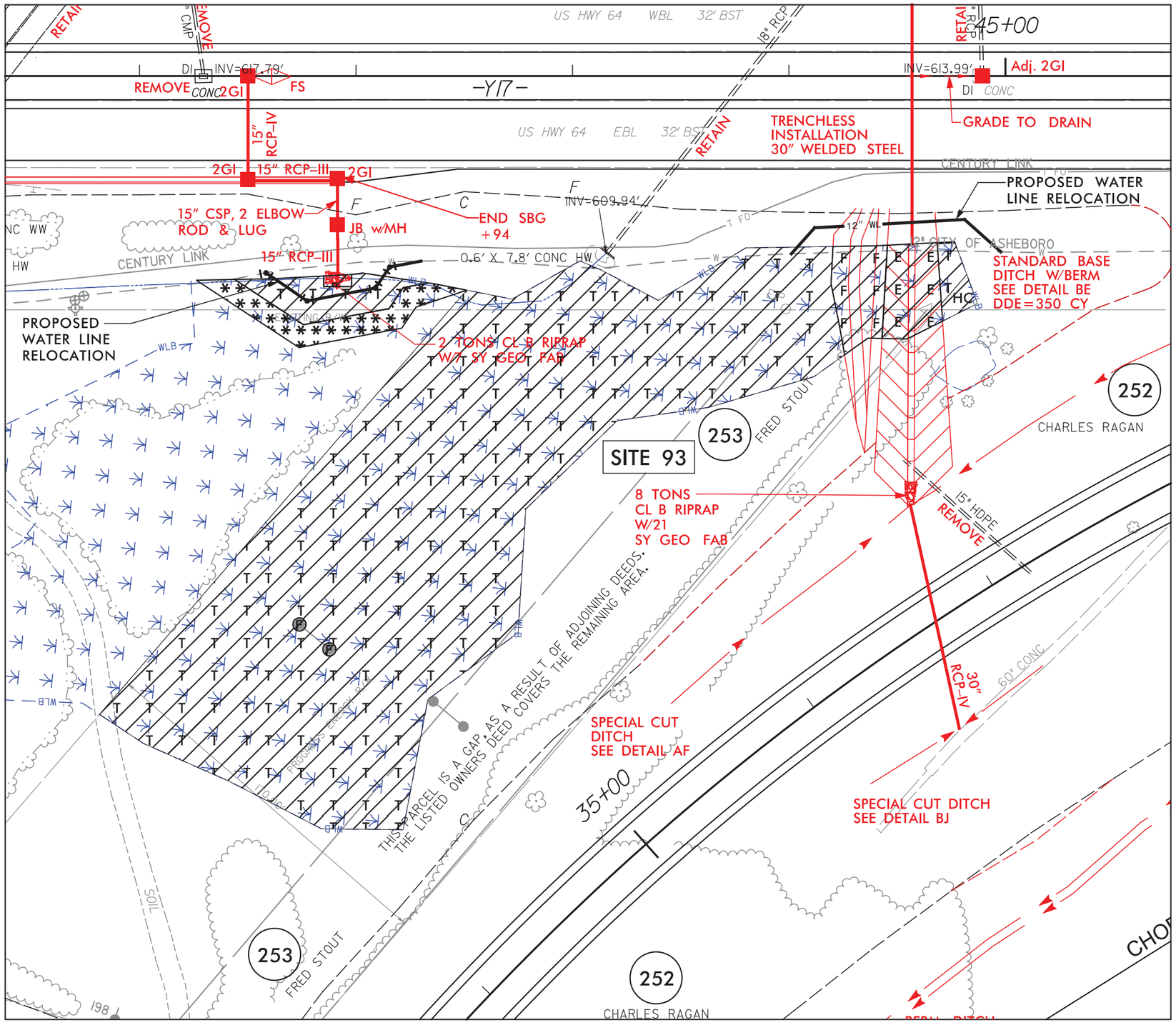
PROJECT REFERENCE NO.	SHEET NO.
R-2536	53_2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 229 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



NAD 83/95

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- F F — DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- E E — DENOTES EXCAVATION IN WETLAND
- T T — DENOTES TEMPORARY FILL IN WETLAND
- HC HC — DENOTES HAND CLEARING

DETAIL SHEET FOR SITE 93

50' 25' 0' 50' 100'
GRAPHIC SCALE

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Raleigh, NC 27607
NC License No: F-0258

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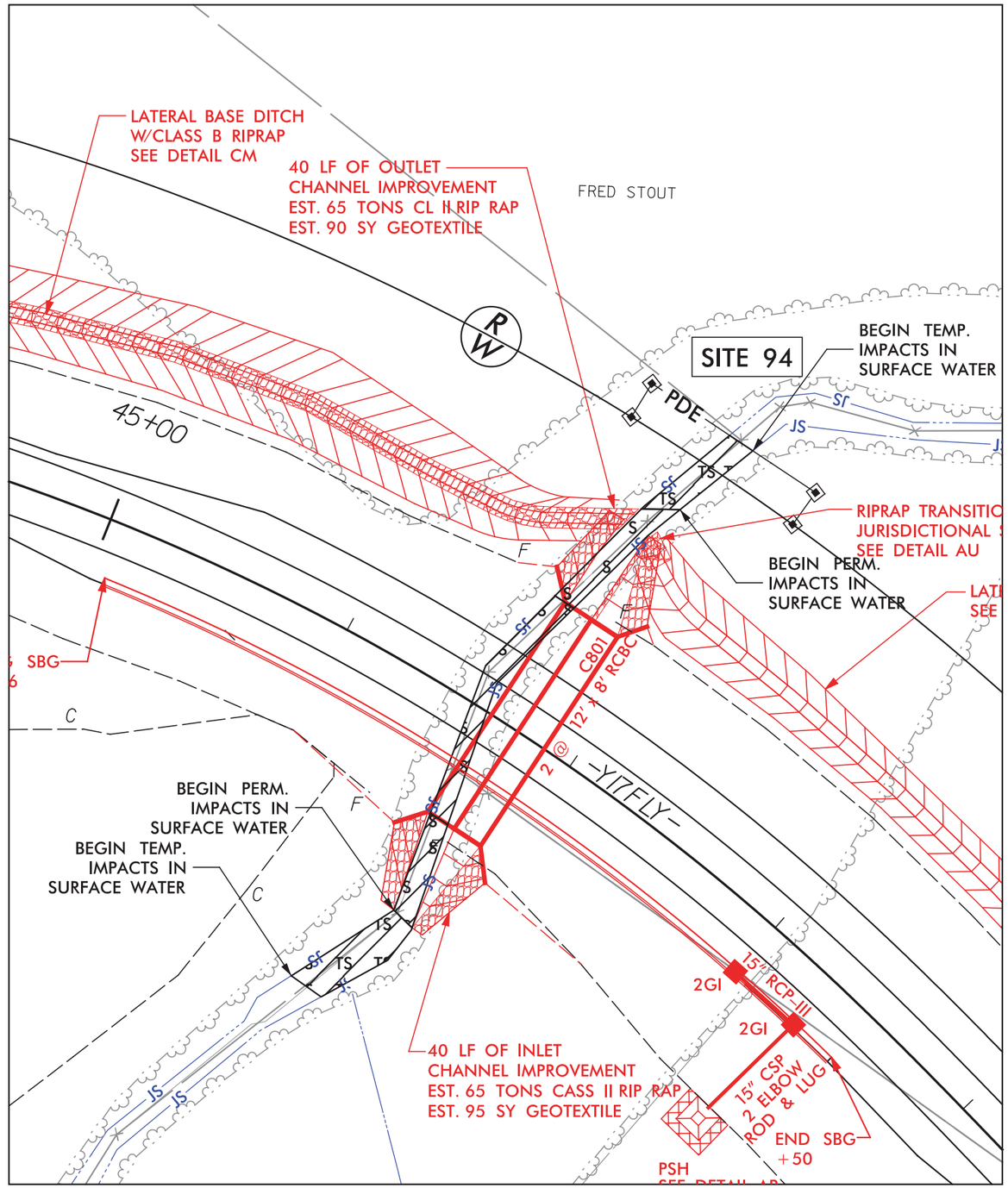
PROJECT REFERENCE NO.	53_2B
R-2536	53_2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 230 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



NAD 83/95

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

DETAIL SHEET FOR SITE 94

50' 25' 0' 50' 100'
GRAPHIC SCALE

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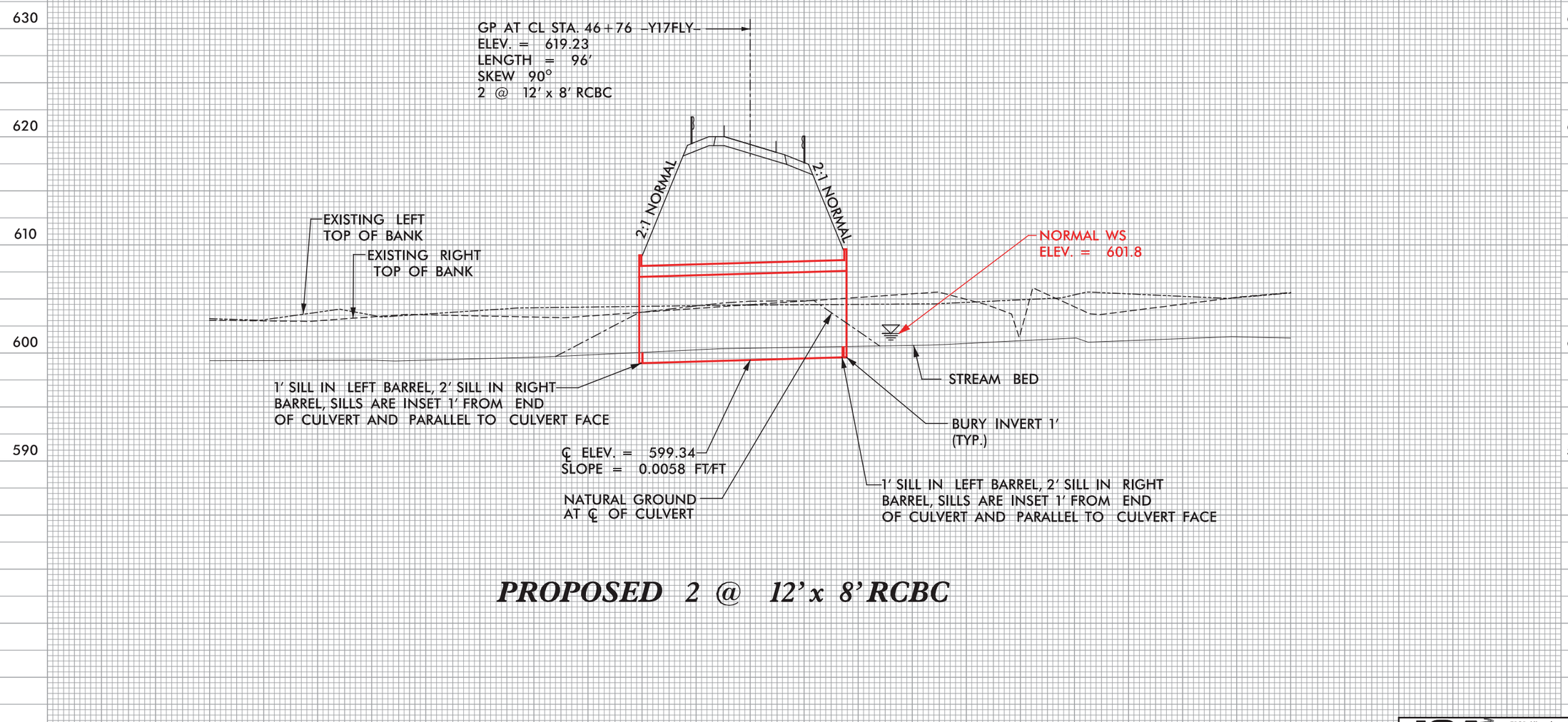
SITE 94
–Y17FLY– 46+76

PROJECT REFERENCE NO.	SHEET NO.
R-2536	
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 231 OF 257



PROPOSED 2 @ 12' x 8' RCBC

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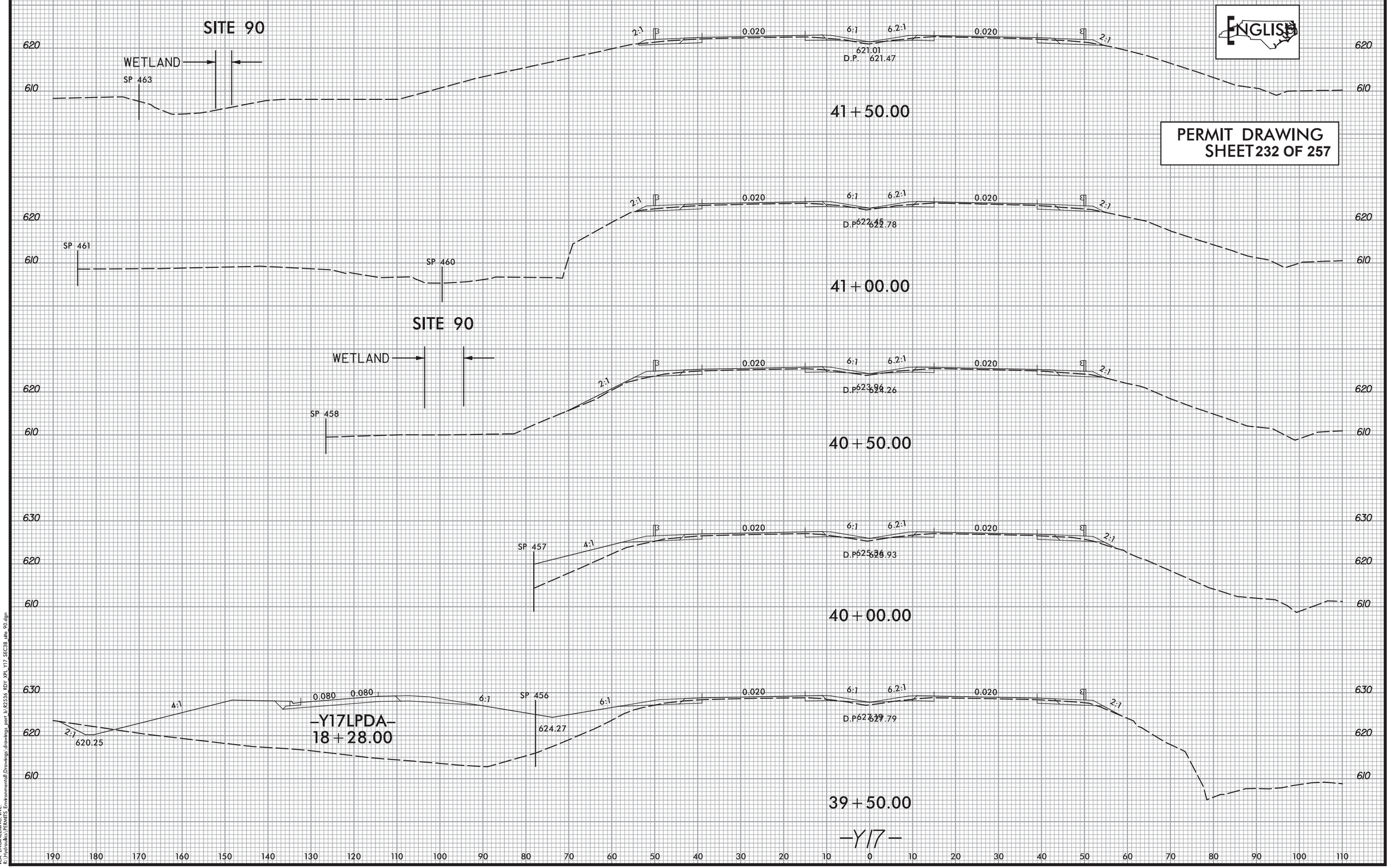
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-69

0 5 10

ENGLISH

PERMIT DRAWING
SHEET 232 OF 257



8/23/99

2/2/016
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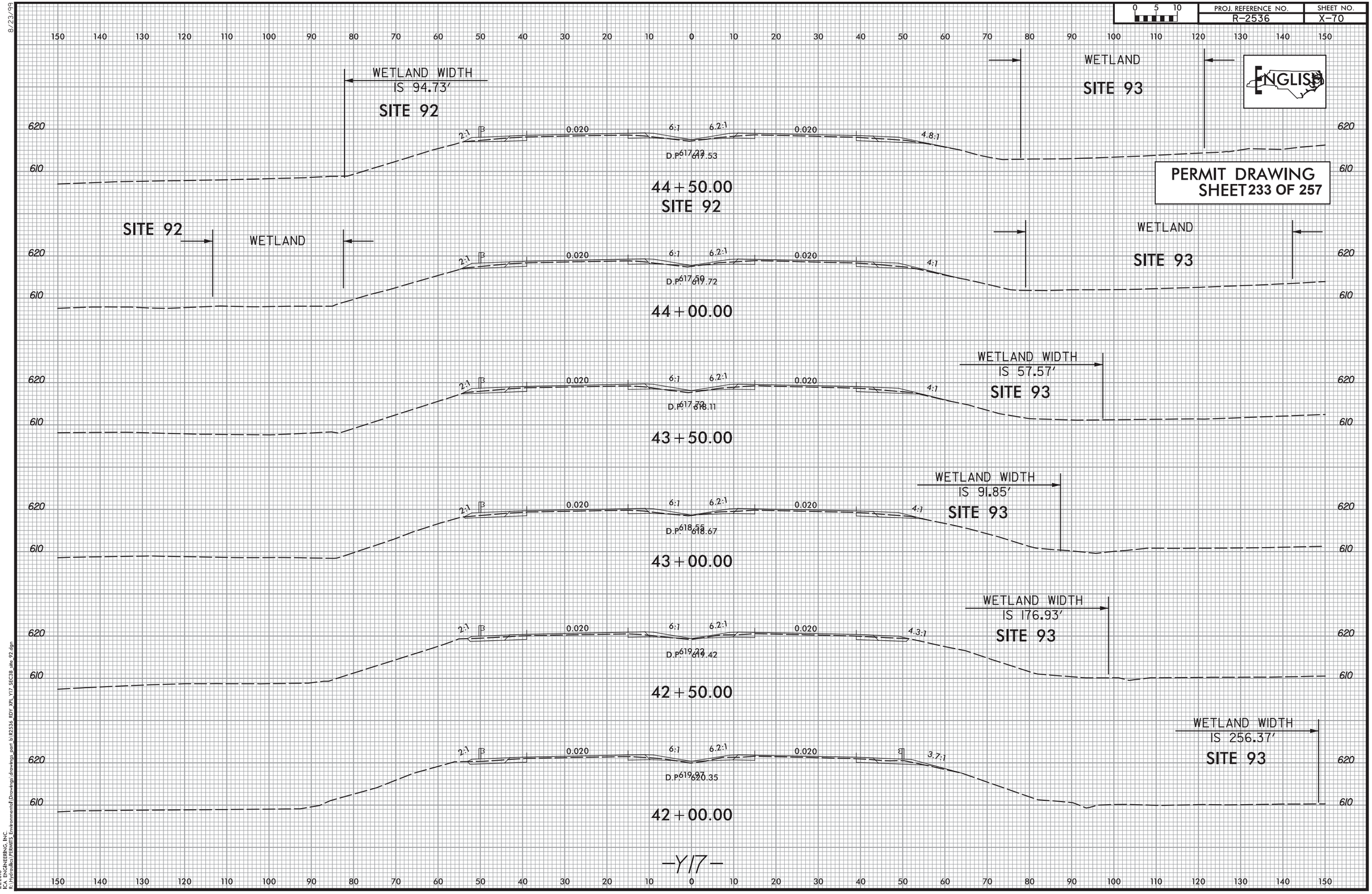
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-70

0 5 10



8/23/99

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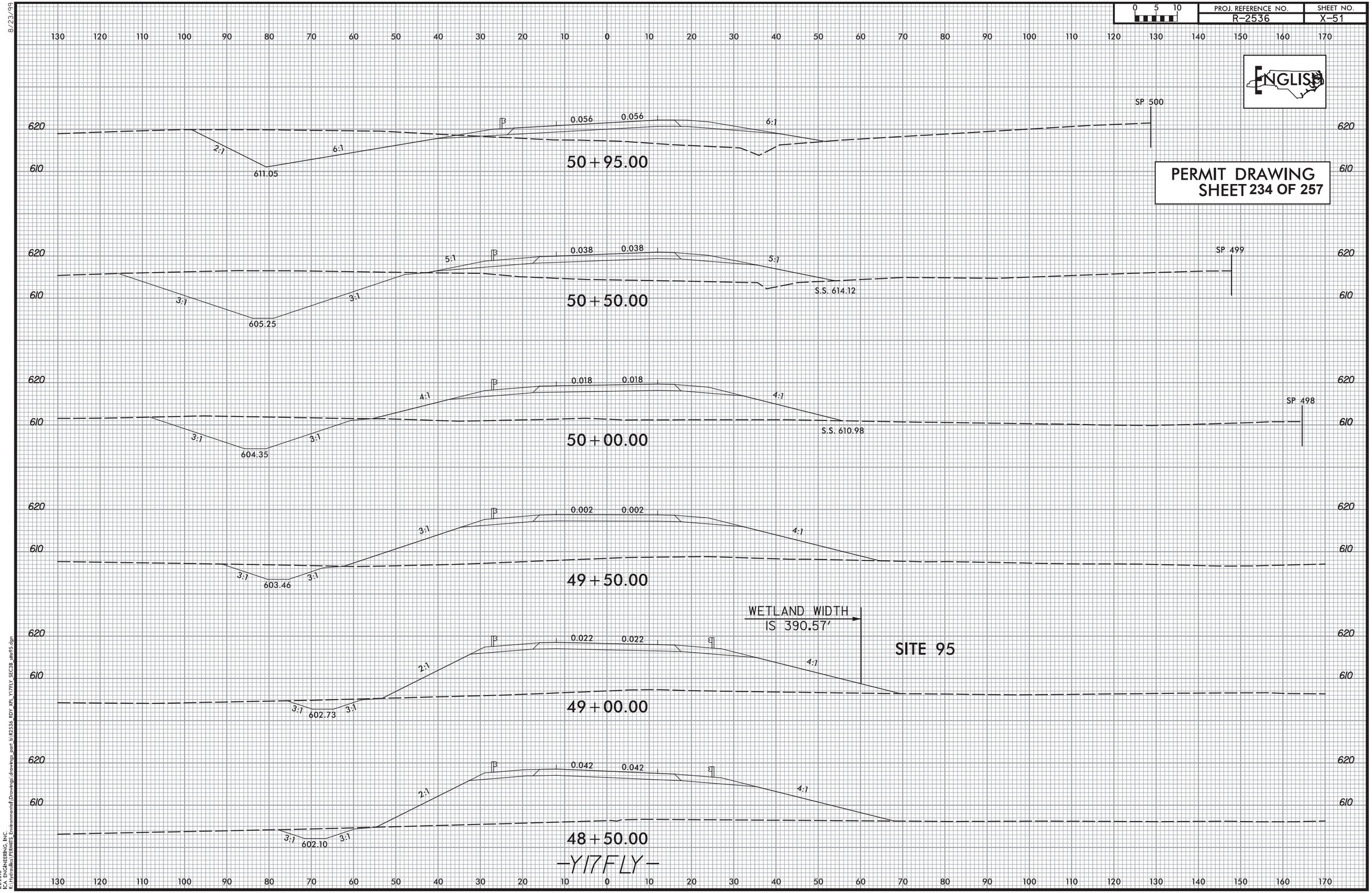
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-51

0 5 10



8/23/99

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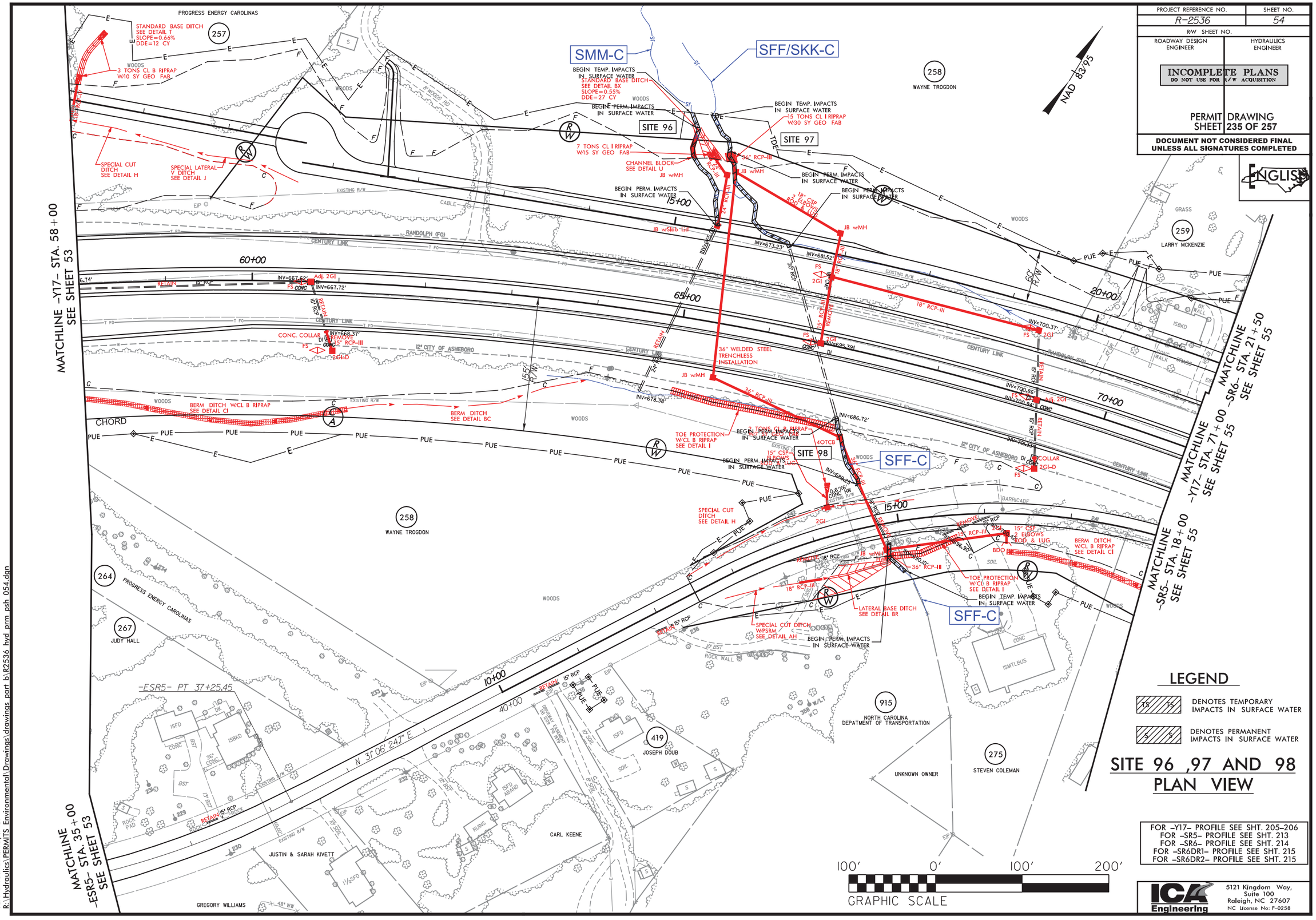
PROJECT REFERENCE NO.	SHEET NO.
R-2536	54
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 235 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



LEGEND

- 18 15 — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

SITE 96 ,97 AND 98 PLAN VIEW

FOR -Y17- PROFILE SEE SHT. 205-206
FOR -SR5- PROFILE SEE SHT. 213
FOR -SR6- PROFILE SEE SHT. 214
FOR -SR6DR1- PROFILE SEE SHT. 215
FOR -SR6DR2- PROFILE SEE SHT. 215

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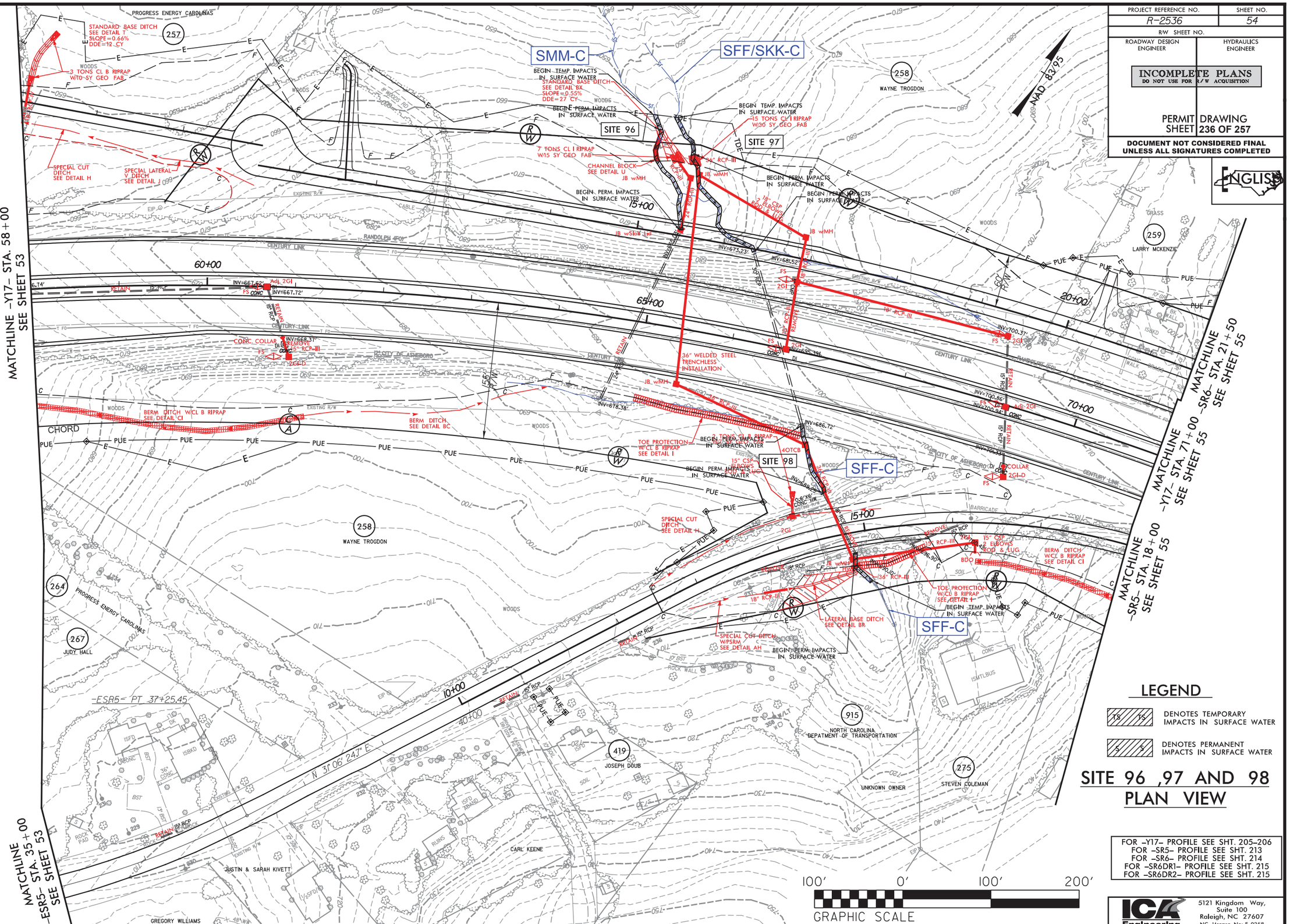
PROJECT REFERENCE NO.	SHEET NO.
R-2536	54
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 236 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

SITE 96 ,97 AND 98 PLAN VIEW

FOR -Y17- PROFILE SEE SHT. 205-206
FOR -SR5- PROFILE SEE SHT. 213
FOR -SR6- PROFILE SEE SHT. 214
FOR -SR6DR1- PROFILE SEE SHT. 215
FOR -SR6DR2- PROFILE SEE SHT. 215

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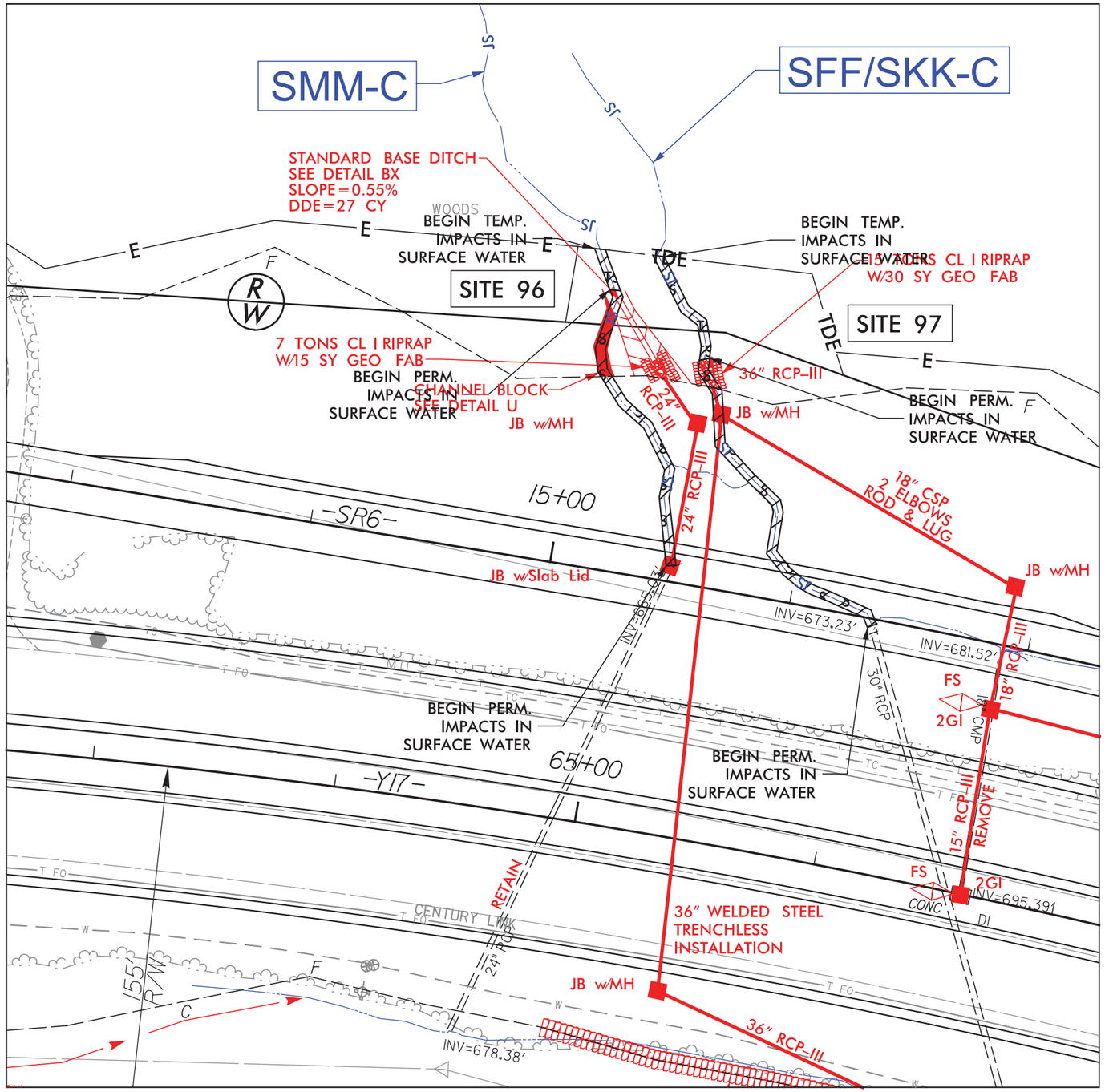
PROJECT REFERENCE NO.	SHEET NO.
R-2536	54
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 237 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



NAD 83/95

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

DETAIL SHEET FOR SITE 96 AND 97

50' 25' 0' 50' 100'
GRAPHIC SCALE

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NC License No: F-0258

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	54
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 238 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

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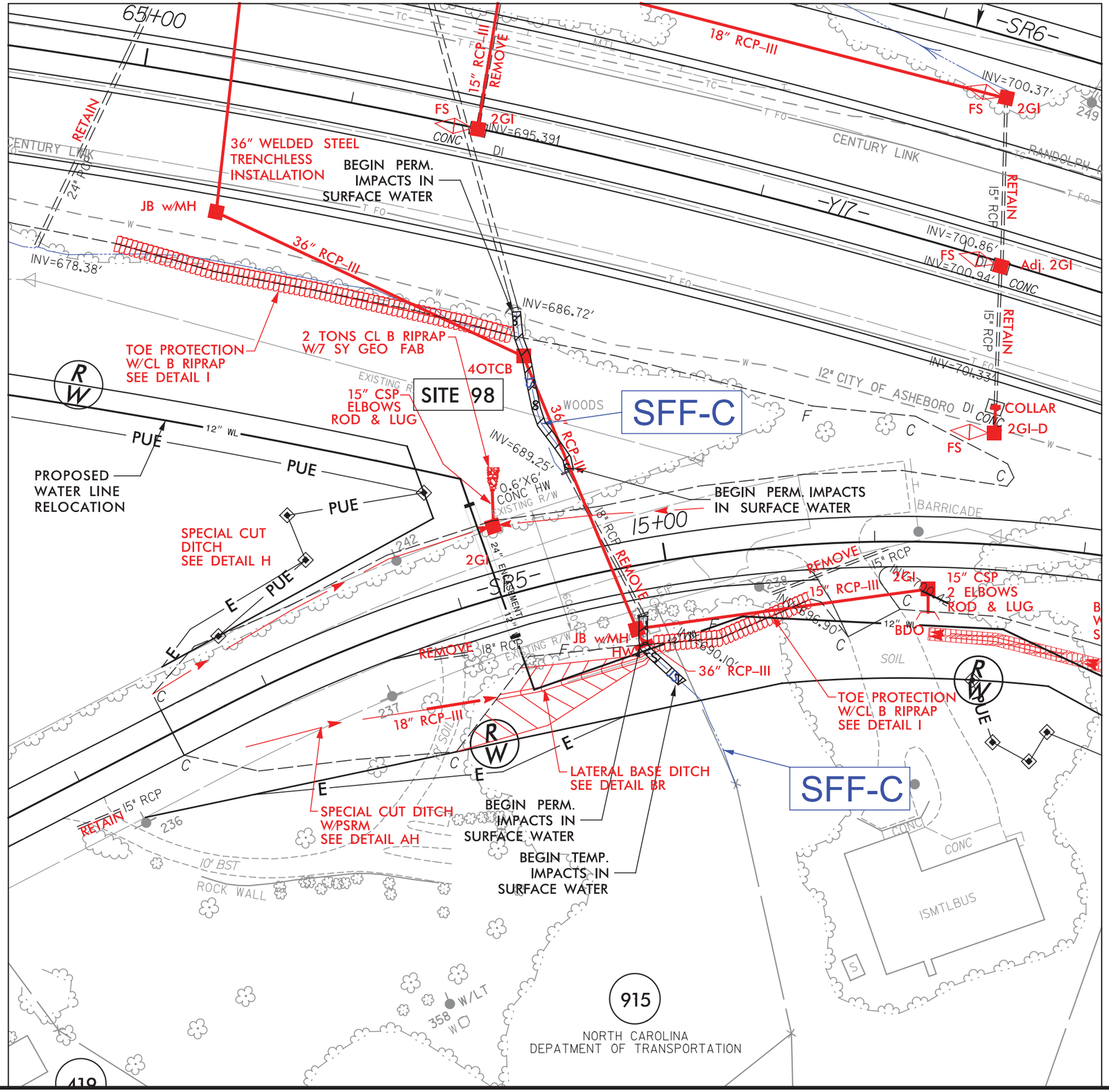

DETAIL SHEET FOR SITE 98

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'
GRAPHIC SCALE

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R:\Hydraulics\PERMITS Environmental\Drawings\drawings part b\R2536 hyd prm psh 054 site 98 detail.dgn

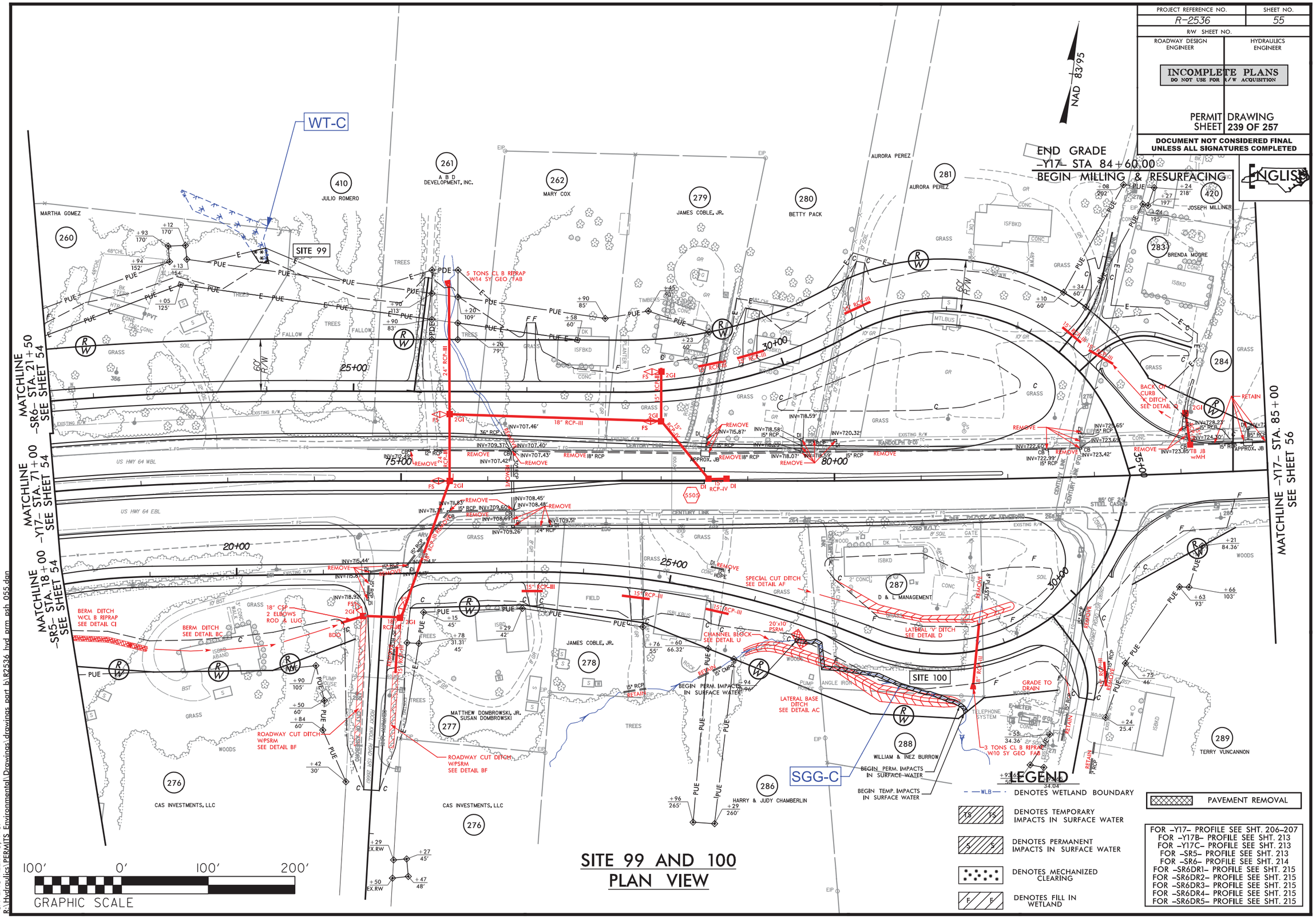
PROJECT REFERENCE NO.	SHEET NO.
R-2536	55
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 239 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 99 AND 100
PLAN VIEW

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- F — DENOTES FILL IN WETLAND
- PAVEMENT REMOVAL

FOR -Y17- PROFILE SEE SHT. 206-207
FOR -Y17B- PROFILE SEE SHT. 213
FOR -Y17C- PROFILE SEE SHT. 213
FOR -SR5- PROFILE SEE SHT. 213
FOR -SR6- PROFILE SEE SHT. 214
FOR -SR6DR1- PROFILE SEE SHT. 215
FOR -SR6DR2- PROFILE SEE SHT. 215
FOR -SR6DR3- PROFILE SEE SHT. 215
FOR -SR6DR4- PROFILE SEE SHT. 215
FOR -SR6DR5- PROFILE SEE SHT. 215

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ICA ENGINEERING, INC.
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PROJECT REFERENCE NO.	SHEET NO.
R-2536	55
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 240 OF 257

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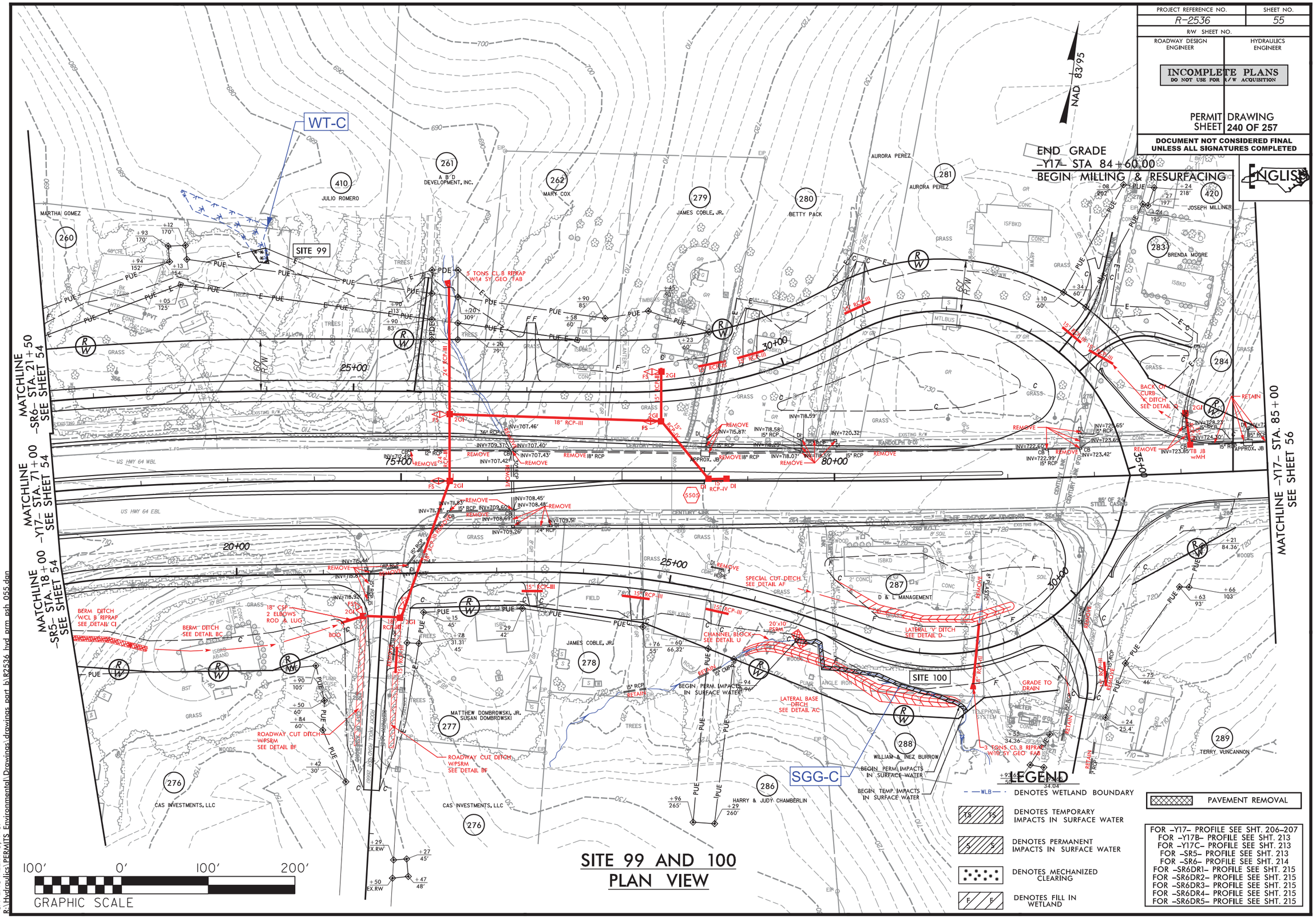
ENGLISH



SITE 99 AND 100
PLAN VIEW

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R:\Hydraulics\PERMITS\Environmental\Drawings\drawings port b\R2536 hyd prm psh 055.dgn

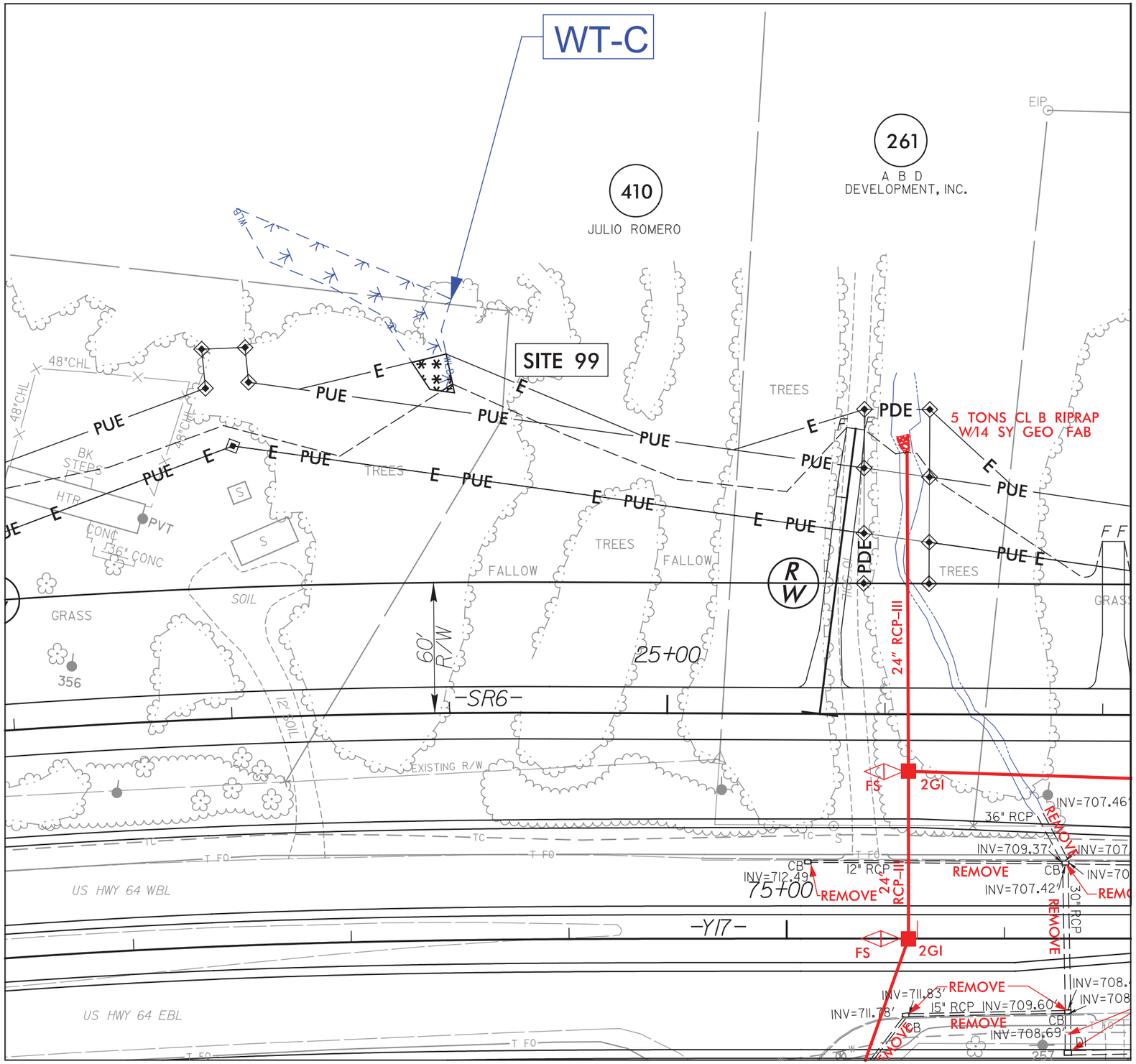
PROJECT REFERENCE NO.	SHEET NO.
R-2536	55
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT SHEET | DRAWING 241 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



NAD 83/95

DETAIL SHEET FOR SITE 99

LEGEND

WLB — DENOTES WETLAND BOUNDARY

DENOTES MECHANIZED CLEARING

F F DENOTES FILL IN WETLAND

50' 25' 0' 50' 100'
GRAPHIC SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	55
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

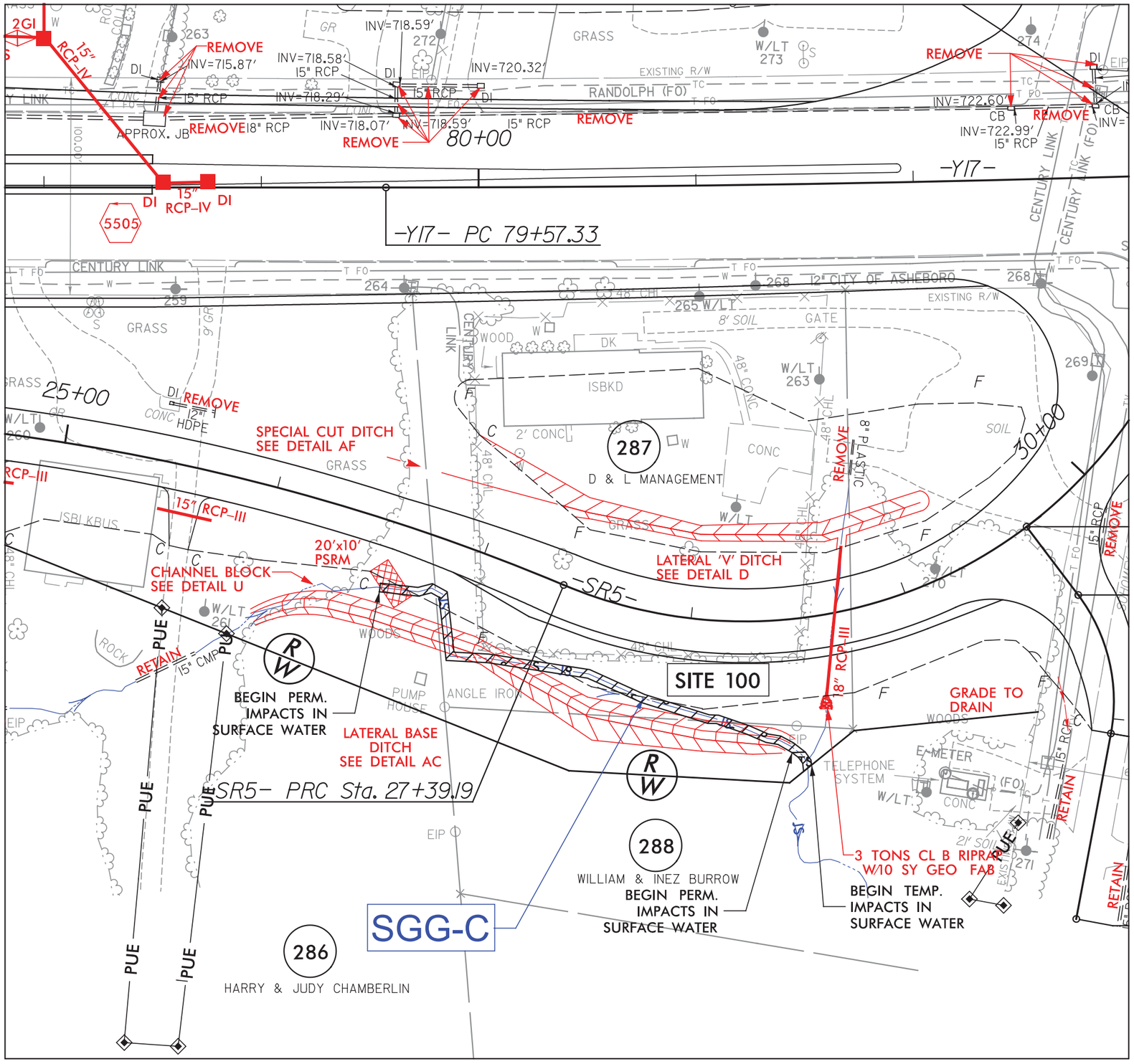
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 242 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95



DETAIL SHEET FOR SITE 100

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'
GRAPHIC SCALE

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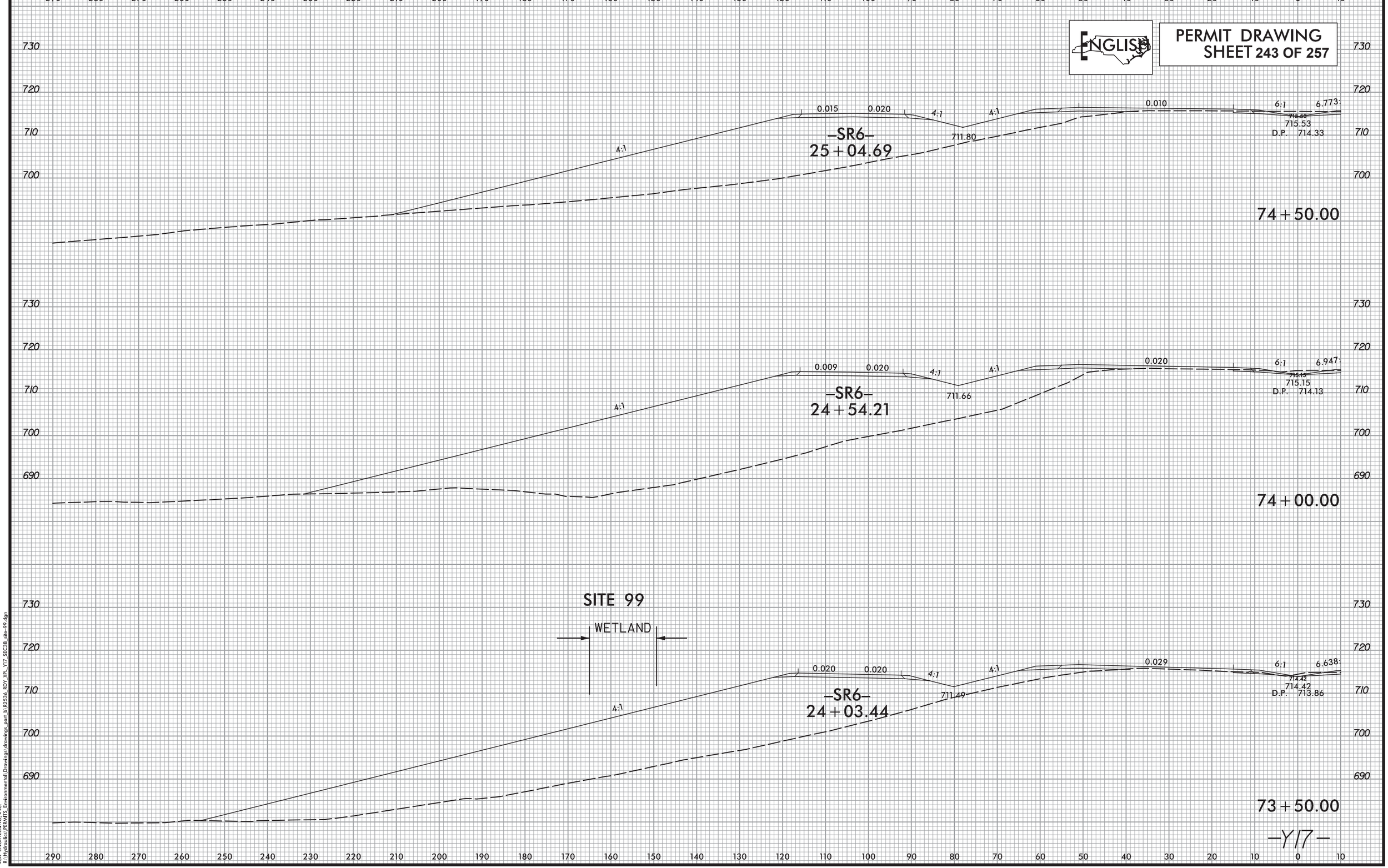
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-337

ENGLISH

PERMIT DRAWING
SHEET 243 OF 257



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R:\Hydraulics\PERMITS\Environmental\Drawings\drawings_part_b\R2536_RDY_XPL_V17_SEC3B_site-99.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2536	102
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 244 OF 257

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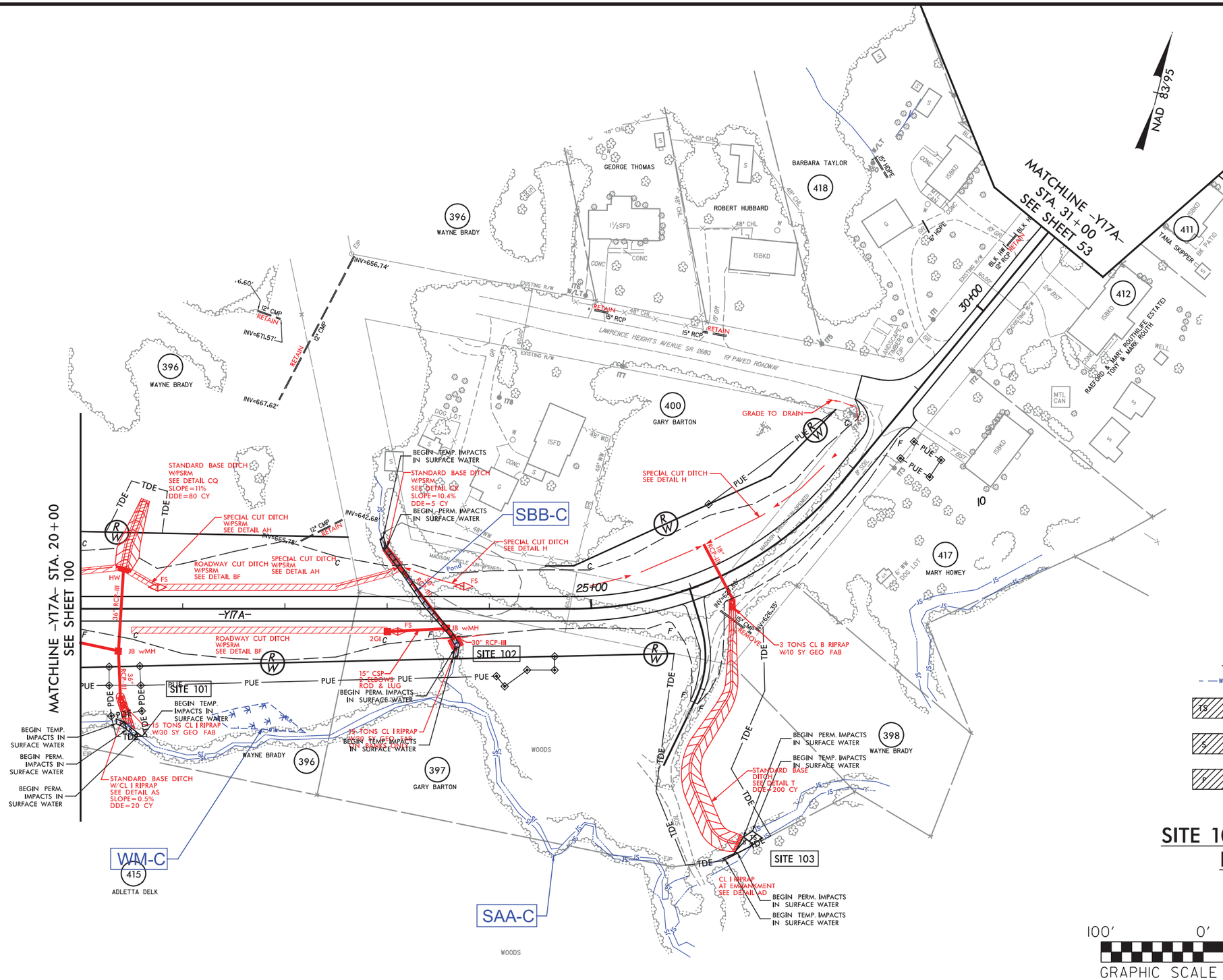
ENGLISH



LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- P — DENOTES IMPACTS IN SURFACE WATER (POND)

SITE 101, 102 AND 103 PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

AS A RESULT OF THE PROPOSED CULVERT, THE MAXIMUM INCREASE IN BASE (100-YEAR) FLOOD ELEVATION IS 0.31' AND IS AT RIVER STATION 15800, APPROXIMATELY 200' UPSTREAM FROM THE PROPOSED CULVERT. BASED ON LOWEST ADJACENT GRADE, 3 STRUCTURES (1SBKD AND TWO SHEDS) ON PARCEL #412 (RAEFORD & MARY ROUTH (LIFE ESTATE), TONY & MARK ROUTH, DB 2151 PG 1024) AND TWO STRUCTURES (1SBKD AND ONE SHED) ON PARCEL #411 (TANA SKIPPER, DB 1775 PG 1159) WILL BE AFFECTED BY THE INCREASE IN BASE FLOOD ELEVATION. THESE TWO PARCELS WITH ALL THE STRUCTURES ARE OUTSIDE OF THE PROPOSED RIGHT OF WAY AND WILL BE PURCHASED BY NCDOT.

FOR -Y17A- PROFILE SEE SHT. 212
FOR -Y17ADRRT- PROFILE SEE SHT. 215

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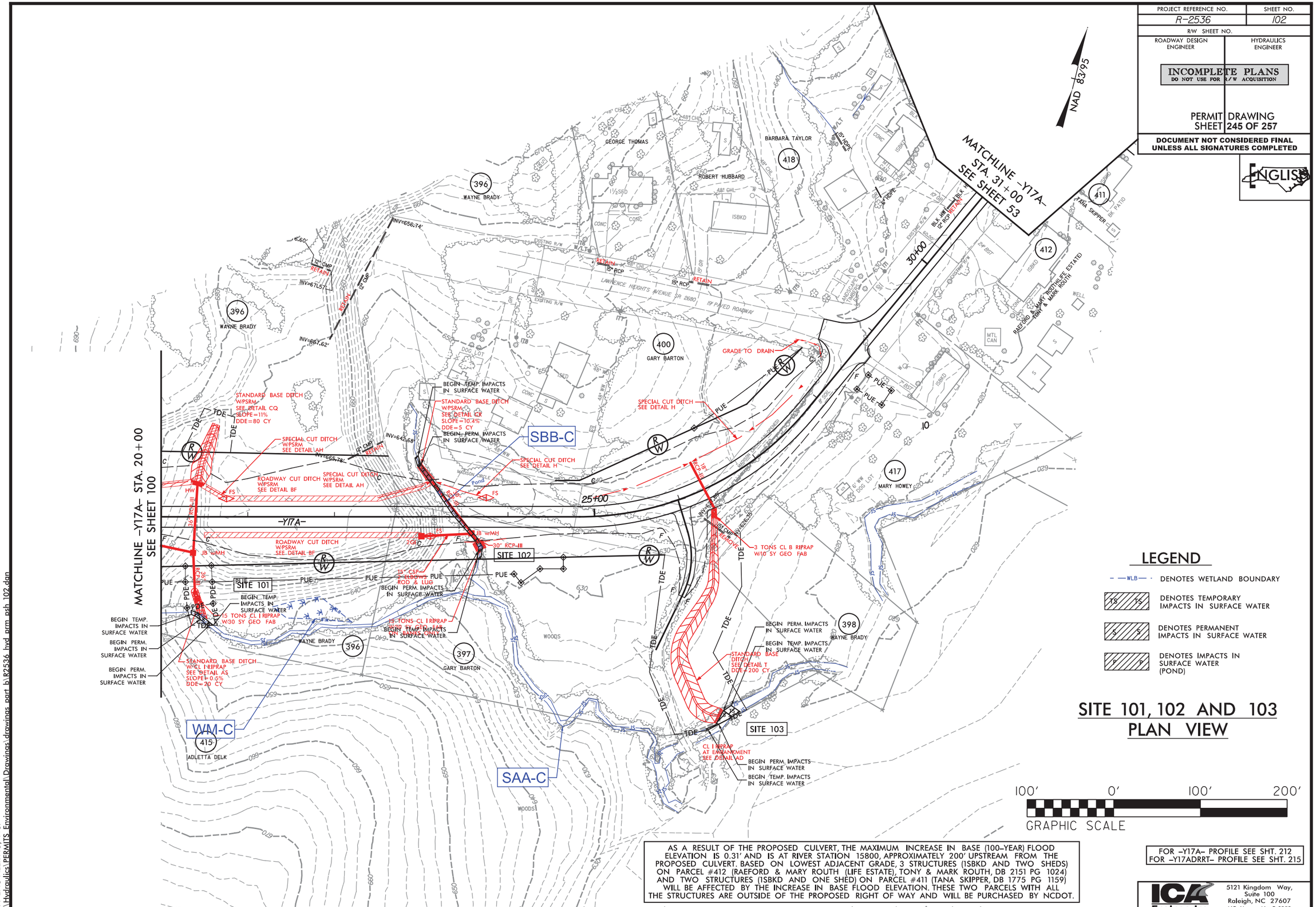
PROJECT REFERENCE NO.	SHEET NO.
R-2536	102
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 245 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- P — DENOTES IMPACTS IN SURFACE WATER (POND)

SITE 101, 102 AND 103 PLAN VIEW

AS A RESULT OF THE PROPOSED CULVERT, THE MAXIMUM INCREASE IN BASE (100-YEAR) FLOOD ELEVATION IS 0.31' AND IS AT RIVER STATION 15800, APPROXIMATELY 200' UPSTREAM FROM THE PROPOSED CULVERT. BASED ON LOWEST ADJACENT GRADE, 3 STRUCTURES (1SBKD AND TWO SHEDS) ON PARCEL #412 (RAEFORD & MARY ROUTH (LIFE ESTATE), TONY & MARK ROUTH, DB 2151 PG 1024) AND TWO STRUCTURES (1SBKD AND ONE SHED) ON PARCEL #411 (TANA SKIPPER, DB 1775 PG 1159) WILL BE AFFECTED BY THE INCREASE IN BASE FLOOD ELEVATION. THESE TWO PARCELS WITH ALL THE STRUCTURES ARE OUTSIDE OF THE PROPOSED RIGHT OF WAY AND WILL BE PURCHASED BY NCDOT.

FOR -Y17A- PROFILE SEE SHT. 212
FOR -Y17ADRRT- PROFILE SEE SHT. 215

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Raleigh, NC 27607
NC License No: F-0258

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	102
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

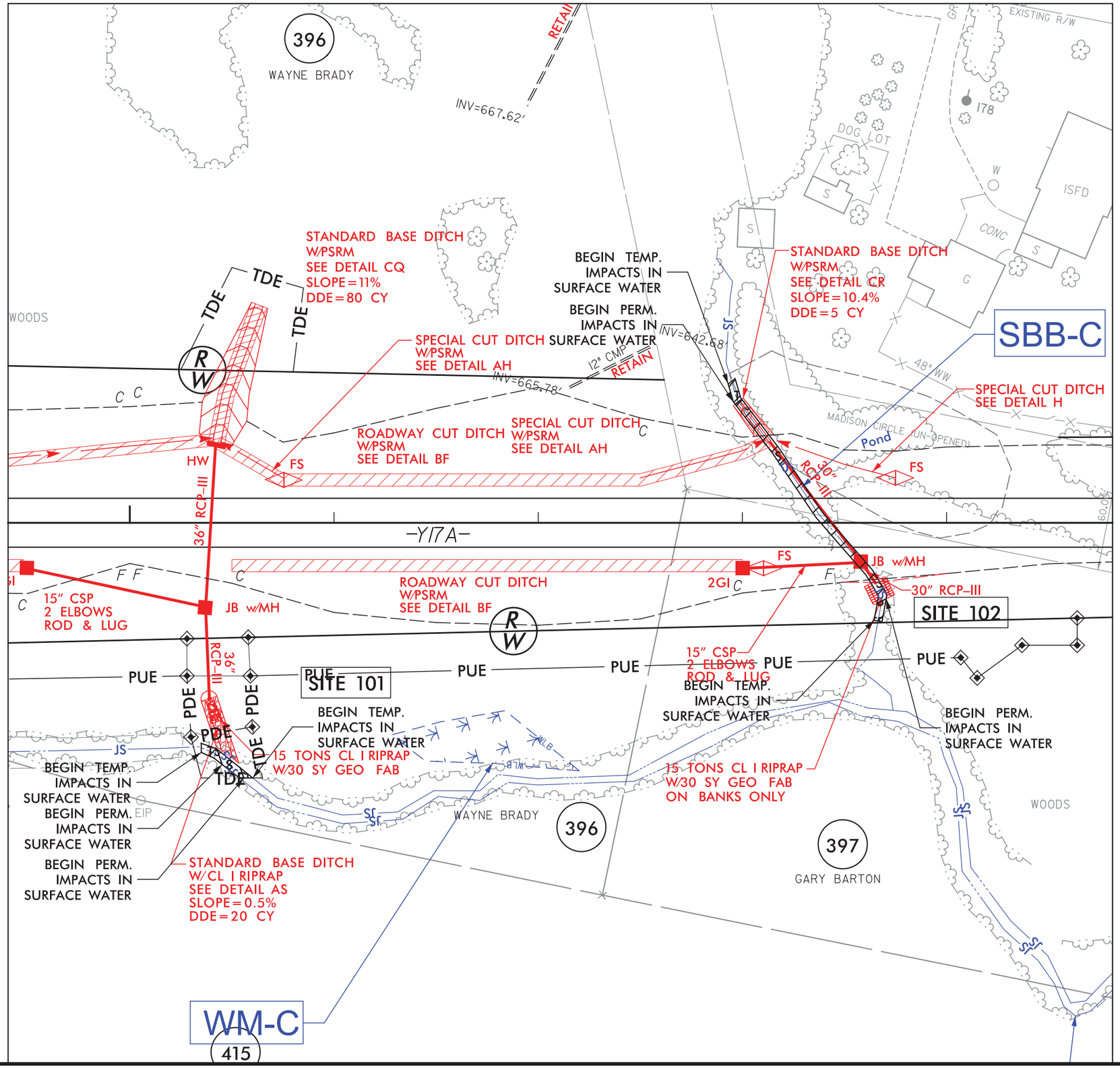
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 246 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95



DETAIL SHEET FOR SITE 101 AND 102

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- P P — DENOTES IMPACTS IN SURFACE WATER (POND)

50' 25' 0' 50' 100'
GRAPHIC SCALE

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

2232016
$(USERNAME)$
$FILEL$

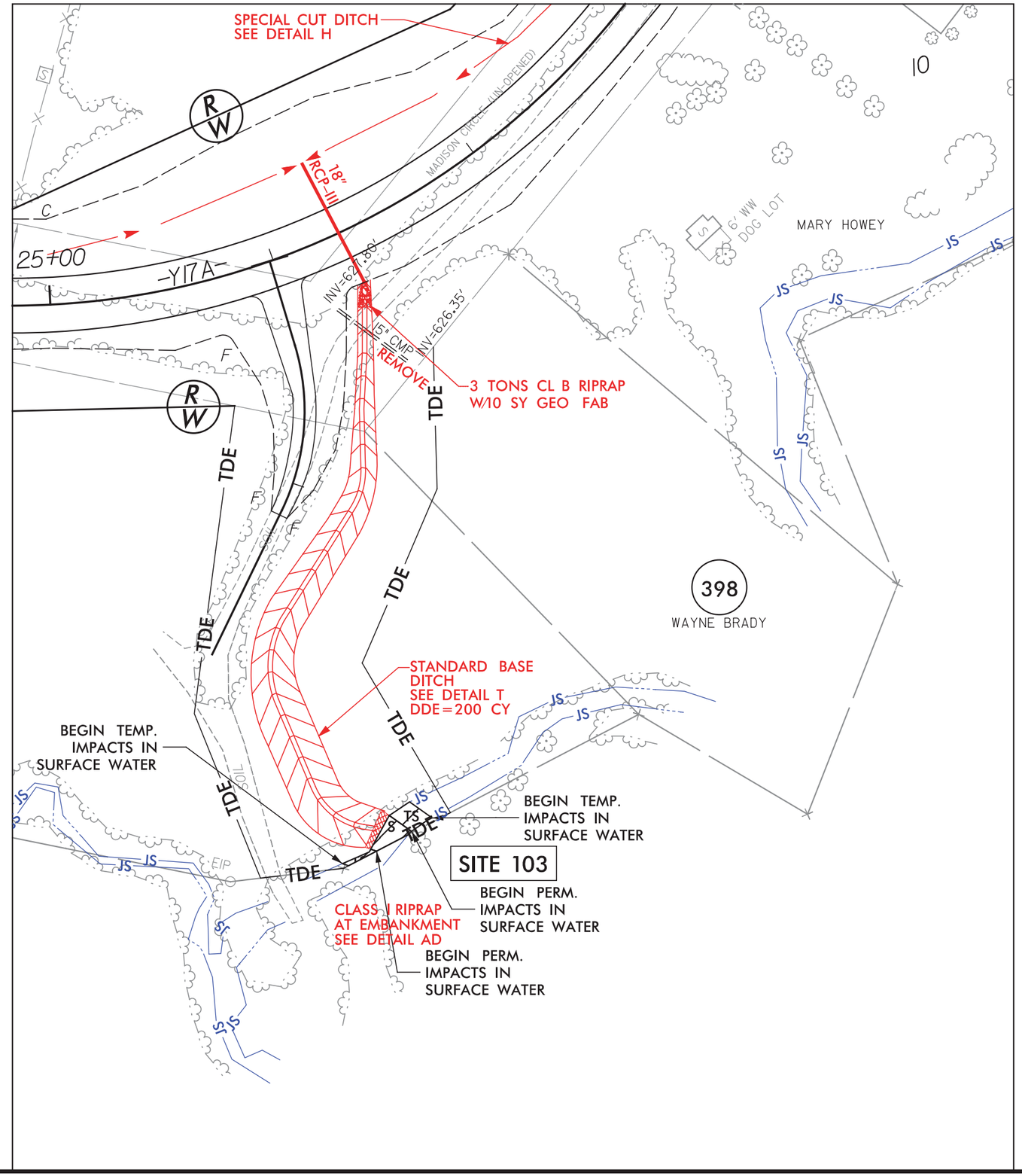
PROJECT REFERENCE NO.	SHEET NO.
R-2536	102
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 247 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



NAD 83/95

DETAIL SHEET FOR SITE 103

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'
GRAPHIC SCALE

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Raleigh, NC 27607
NC License No: F-0258

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WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1A	-DR- 13+32 - 14+56	4' X 4' RCBC, L=70', SB-AA						0.03	< 0.01	211	10	
1B	-L- 7+80	SCOUR STABILIZATION, SB-AA						< 0.01	< 0.01	26	12	
2	-FLY- 13+02 -	48" RCP, L=251', SD-AA; TOTAL: PA-AA, WYZ-AA, WXX-AA	0.12					1.15	< 0.01	472	11	
	-SR1- 16+47	BANK STABILIZATION, SD-AA						< 0.01		51		
3	-SR1- 18+44 - 19+30	36" CSP, L=153', SAA-AA, WB-AA				< 0.01		0.02	< 0.01	205	14	
4A	-Y- 15+96 - 16+08	36" CSP, L=32', SE-AA						< 0.01	< 0.01	69	10	
4B	-LPD- 11+21 - 13+06	42" RCP, L=169', SE-AA						0.04		394		
		BANK STABILIZATION, SE-AA						0.02		169		
4C	-FLY- 32+99 - 37+12	54" RCP, L=496', SE-AA						0.07	< 0.01	759	20	
		BANK STABILIZATION, SE-AA						< 0.01		36		
4D	-L- 62+82 - 63+15	BANK STABILIZATION, SE-AA						< 0.01	< 0.01	11	21	
4E	-L- 64+72 - 70+83	FILL, SE-AA						0.07	< 0.01	753	10	
5	-Y- 13+18 - 16+08	FILL, SM-AA						0.01	< 0.01	258	25	
6A	-LPD- 28+45 -	36" RCP L=328', SZZ-AA, WUU-AA	0.33			0.02		0.02	< 0.01	424	10	
	-FLY- 42+22	BANK STABILIZATION, SZZ-AA						< 0.01		34		
6B	-L- 62+21 - 63+23	FILL, SZZ-AA						0.01	< 0.01	111	20	
6C	-L- 63+77 - 64+68	FILL, SZZ-AA						< 0.01	< 0.01	82	10	
7	-RPA- 24+13 -L- 71+29	2 @ 8' X 8' RCBC L=601', SG-AA						0.26	< 0.01	1330	20	
		BANK STABILIZATION, SG-AA						< 0.01		24		
18A	-Y- 29+31 - 29+45	FILL, SH-AA						< 0.01	< 0.01	42	10	
18B	-FLY- 45+56 - 45+81	36" RCP L=253, SH-AA						0.02	< 0.01	270	12	
		BANK STABILIZATION, SH-AA						< 0.01		36		
18C	-RPA- 22+46 - 22+81	FILL, SH-AA						< 0.01	< 0.01	71	10	
19	-YRT- 13+79 - 16+14	FILL, SK-AA; TOTAL: WD-AA	< 0.01					0.06	< 0.01	312	20	
20	-Y- 57+91 - 59+37	FILL, TOTAL: WE-AA	0.07									
TOTALS*:			0.51			0.02		1.82	0.03	6148	244	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
JANUARY 2016
RANDOLPH
R-2536
34450.3.S1

Revised 2013 10 24

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
8	-L- 126+51 - 128+92	FILL, SJ-AA; TOTAL: WYY-AA	0.18					0.02	< 0.01	267	10	
9	-L- 127+82 - 137+43	48" RCP L=447', WZZ-AA	0.46			0.03						
		60" RCP L=351', SO-AB/SI-AA						0.12	< 0.01	1064	21	
		BANK STABILIZATION, SO-AB/SI-AA						< 0.01		27		
10	-L- 152+24 - 156+02	2 @ 8' X 8' RCBC L=515', SM-AB						0.11	0.02	647	49	
		BANK STABILIZATION, SM-AB						0.02		112		
11	-L- 154+91 - 156+59	FILL, SL-AB						0.03	< 0.01	378	10	
12	-L- 168+03 - 168+40	FILL, PB-AB; TOTAL: WH-AB	0.02					< 0.01	0.15			
13	-L- 176+81 - 181+98	60" RCP L=409' , SK-AB						0.07	< 0.01	769	22	
		BANK STABILIZATION, SK-AB						< 0.01		13		
14	-L- 178+93 - 179+44	FILL, SI-AB						< 0.01	< 0.01	84	10	
15	-L- 182+68 - 183+77	24" RCP L=209', SJ-AB						0.02	< 0.01	310	36	
		BANK STABILIZATION, SJ-AB						< 0.01		12		
16	-L- 196+94 - 198+72	66" RCP L=280', SF-AB						0.04	< 0.01	503	27	
		BANK STABILIZATION, SF-AB						< 0.01		61		
17	-L- 197+85 - 198+51	FILL; TOTAL: SH-AB, WG-AB	< 0.01					< 0.01		121		
21	-Y2- 30+53 - 35+52	60" & 72" RCP L=444', SO-AB/SI-AA						0.05	< 0.01	384	27	
		BANK STABILIZATION, SO-AB/SI-AA						0.02		163		
22	-Y2- 53+36 - 59+27	6' X 5' RCBC L=92', SM-AB						0.08	< 0.01	585	33	
TOTALS*:			0.66			0.03		0.62	0.19	5500	247	0

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NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
OCTOBER 2015
RANDOLPH
R-2536
34450.3.S1

Revised 2013 10 24

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
23A	-L- 232+67 - 232+84	DITCH, SC-AB						< 0.01	< 0.01	10	20	
23B	-L- 233+75 - 234+85	FILL, SC-AB, WF-AB	0.03			< 0.01			< 0.01		18	
23C	-L- 234+12 - 236+05	FILL IN POND; TOTAL: PA-AB, WE-AB	< 0.01					0.73				
23D	-L- 235+81 - 242+97	FILL, SA-AB; TOTAL: WA-AB, WB-AB, WC-AB	0.11					0.06		704		
		BANK STABILIZATION, SA-AB						0.02	< 0.01	194	10	
23E	-L- 247+43 - 247+70	BANK STABILIZATION, SA-AB						< 0.01	< 0.01	8	20	
24	-L- 236+44 - 238+91	FILL, TOTAL: SB-AB, WD-AB	0.01					< 0.01		86		
25	-L- 250+52 - 251+97	FILL, WM-AB	0.47	0.18		0.30						
26	-L- 252+55 - 254+02	FILL; TOTAL: WN-AB	0.05									
		BANK STABILIZATION, LITTLE RIVER						< 0.01	< 0.01	53	40	
27	-Y4RPC- 16+26 - Y4RPB- 23+05	FILL, SR-B						0.09	< 0.01	982	11	
28	-Y4RPD- 19+34 18+81	FILL, SWW-B						0.02	< 0.01	520	10	
29	Y4RPD- 26+10	FILL, SW-B						0.04	< 0.01	971	13	
30	-Y4RPA- 13+56 -	2 @ 7' X 7' RCBC L=456', SZ-B						0.10	< 0.01	1018	26	
	-Y4RPD- 25+21	BANK STABILIZATION, SZ-B						0.01		143		
31	-L- 328+96 - 330+00	60" RCP L=280', WP-B, SBB-B	< 0.01		< 0.01	< 0.01		0.03	< 0.01	279	13	
		BANK STABILIZATION SBB-B						< 0.01		51		
32	-L- 336+68 - 337+32	30" RCP L=244', SCC-B						0.01	< 0.01	148	10	
33	-L- 353+54 - 357+22	48" RCP L=440', SDD-B						0.05		496		
		BANK STABILIZATION, SDD-B						< 0.01	< 0.01	55	29	
34	-L- 361+20 - 363+31	48" RCP L=383', SEE-B						0.05	< 0.01	490	18	
		BANK STABILIZATION, SEE-B						< 0.01	< 0.01	45	11	
35	-L- 363+54 - 364+49	6' X 7' RCBC L=284', SHH-B						0.04	< 0.01	427	11	
		BANK STABILIZATION						< 0.01	< 0.01	16	10	
TOTALS*:			0.68	0.18	< 0.01	0.31		1.28	0.02	6694	270	0

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NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
JANUARY 2016
RANDOLPH
R-2536
34450.3.S2

Revised 2013 10 24

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
36	-L- 364+40 - 369+06	FILL; TOTAL: SGG-B						0.02		581		
37A	-SERRD1- 10+00	PIPE REMOVAL, SQQ-B						< 0.01	< 0.01	51	20	
37B	-Y9FLY- 11+37 - 12+09	DITCH, SQQ-B; TOTAL: WTT-B	0.02					< 0.01	< 0.01	50	50	
38A	-L- 406+64 - 407+50	FILL, WU-B	0.01			0.02						
38B	-L- 406+73 - 409+35	6' X 7' RCBC L=310', SII-B, WU-B			< 0.01	0.02		0.03	< 0.01	481	21	
38C	-L- 409+66 - 414+31	36" RCP L=224', WU-B	1.55		0.03	0.12						
39	-L- 433+34 - 433+46	BANK STABILIZATION, SNN-B						< 0.01	< 0.01	3	11	
40	-L- 432+76 - 433+64	3 @ 9' X 7' RCBC L=224', SKK-B						0.11	< 0.01	510	22	
		BANK STABILIZATION, SKK-B						< 0.01		24		
41	-L- 433+38 - -Y10END- 19+37	FILL, SLL-B; TOTAL: WPP-B, WOO-B	0.05					0.03	< 0.01	352	12	
42	-L- 445+23 - 446+59	DRAIN POND, TOTAL: PG-B						0.21				
43A	-L- 454+84 - 455+02	DITCH TIE IN, SB-C						< 0.01	< 0.01	4	15	
43B	-L- 454+88 - 458+13	48" RCP L=390', FILL IN POND, TOTAL: PH-B						0.78				
43C	-L- 457+82 - 458+59	48" RCP L=390', SC-C						< 0.01		39		
		BANK STABILIZATION, SC-C						< 0.01	< 0.01	46	10	
43D	-L- 457+82 - 458+59	DRAIN POND, WA-C; TOTAL: PA-C						1.19				
44	-SERRD3- 20+08 - 20+56	30" RCP L=60', 36" RCP L=76', SS-B						0.02	< 0.01	231	26	
45A	-Y4CD_RT- 58+23 - 60+40	DITCH/FILL, 36"/42" RCP L=334', ST-B						0.01	< 0.01	202	16	
45B	-SERRD3- 36+98 - 38+93	DITCH/FILL, 36"/42" RCP L=334', ST-B						0.02	< 0.01	264	13	
46	-Y4- 80+29 - 80+42	DITCH, SV-B						< 0.01	< 0.01	23	11	
47A	-Y4- 80+30 - 81+24	4' X 5' RCBC L=291', SU-B						< 0.01	< 0.01	77	10	
47B	-Y4- 79+43 - 80+42	4' X 5' RCBC L=291', SU-B						0.02	< 0.01	163	14	
TOTALS*:			1.63		0.03	0.16		2.47	0.02	3102	250	0

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NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
JANUARY 2016
RANDOLPH
R-2536
34450.3.S2

Revised 2013 10 24

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
48	-Y5- 38+67 - 41+84	3 @ 10' X 7' RCBC L=160', WXX-B, SAA-B	0.96		0.09	0.17		0.05	< 0.01	334	21	
49	-Y5- 40+06 - 40+85	FILL, SWW-B						0.01	< 0.01	100	10	
50	-Y9A- 43+05	BANK STABILIZATION, SKK-D						< 0.01	< 0.01	36	20	
51	-Y9- 10+00 - 12+61	DRAIN POND; TOTAL: PA-D						1.18				
52	-Y9- 14+39 - 17+02	48" RCP L=313', SH-D						0.03		404		
		BANK STABILIZATION, SH-D, WZZ-D				< 0.01		< 0.01	< 0.01	38	15	
53	-Y9- 28+19 - 29+83	2 @ 10' X 14' RCBC L=138', SG-D						0.09	< 0.01	291	21	
		BANK STABILIZATION, SG-D						0.01		36		
54A	-Y9- 53+24 - 53+40	FILL; TOTAL: WD-D	0.02									
54B	-Y9- 53+24 - 53+40	ROW; TOTAL: WE-D	0.02									
55	-Y9- 60+09 - 61+01	36" RCP L=104', 42" RCP L=140', SF-D						0.02		319		
		BANK STABILIZATION, SF-D						< 0.01	< 0.01	82	21	
56A	-Y9- 72+52 - 76+35	6' X 7' RCBC L=170', SC/SD-D						0.06	< 0.01	810	21	
56B	-Y9- 78+92 - 79+23	DITCH, SC/SD-D						< 0.01	< 0.01	20	10	
56C	-Y9RAB- 80+53 - 81+03	PIPE REMOVAL, SC/SD-D						< 0.01		49		
56D	-NC159- 11+77 - 12+24	DITCH, SC/SD-D						< 0.01	< 0.01	42	10	
104	-Y9RPB- 22+00 - 26+00	FILL, SPP-B						0.02	< 0.01	345	49	
TOTALS*:			1.00		0.09	0.17		1.51	0.02	2906	198	0

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NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
JANUARY 2016
RANDOLPH
R-2536
34450.3.S2

Revised 2013 10 24

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
57	-L- 465+95	1 @ 6' X 7' RCBC L=422', SD-C						0.07		721		
		BANK STABILIZATION, SD-C						< 0.01		51		
58	-L- 470+00 RT	DRAIN POND; TOTAL: PB-C						2.64				
58A	-L- 476+43 RT	TAIL DITCH, BANK STABILIZATION, SD-C						0.02	< 0.01	116	12	
59	-L- 495+00 RT	HAUL ROAD CROSSING, SG-C							0.02		72	
		BANK STABILIZATION, SG-C						< 0.01	< 0.01	5	16	
60	-L- 488+15	66" RCP (OVERFLOW) L=239', SF-C						0.07	0.01	243	52	
		BANK STABILIZATION, SF-C						< 0.01	< 0.01	32	10	
61	-L- 489+70	54" RCP (OVERFLOW) L=176', SE-C						0.02		242		
		CHANNEL RELOCATION, SE-C						< 0.01	< 0.01	32	10	
62	-L- 498+26 RT	TAIL DITCH BANK STABILIZATION, SH-C						< 0.01	< 0.01	9	26	
63	-L- 500+00	2 @ 9' X 6' RCBC L=211', SH-C						0.02	0.02	197	137	
		BANK STABILIZATION, SH-C						< 0.01		84		
64	-L- 507+50	54" RCP L=269', FILL, SYY-C, SI-C; TOTAL: WBA-C	0.17					0.04		423		
		BANK STABILIZATION, SYY-C, SI-C						< 0.01	< 0.01	38	39	
65	-L- 523+20	1 @ 6' X 7' RCBC L=250', SJ-C						0.04	< 0.01	260		
		BANK STABILIZATION, SJ-C						0.02	< 0.01	79	86	
66	-Y12- 39+00 RT	TAIL DITCH BANK STABILIZATION, SK-C						< 0.01	< 0.01	9	18	
67	-Y12- 35+00 RT	TAIL DITCH BANK STABILIZATION, SK-C						< 0.01	< 0.01	29	28	
68	-L- 548+79	66" RCP L=192', SK-C						0.02	< 0.01	229	50	
		BANK STABILIZATION, SK-C						< 0.01	< 0.01	21	18	
69	-Y12- 30+60 RT	TAIL DITCH BANK STABILIZATION, SK-C						< 0.01	< 0.01	9	29	
70	-L- 563+93	42" RCP L=255', SL-C						0.03	< 0.01	346	14	
		BANK STABILIZATION, SL-C						< 0.01	< 0.01	14	10	
TOTALS*:			0.17					3.11	0.20	3189	627	0

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NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
FEBRUARY 22, 2016
RANDOLPH COUNTY
R-2536
34450.3.S1

Revised 2013 10 24

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND 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)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
71	-L- 581+67	60" RCP L=283', SM-C; TOTAL: WB-C	< 0.01					0.04		336		
		BANK STABILIZATION, SM-C						< 0.01	< 0.01	66	35	
72	-L- 590+51	54" RCP L=276', SN-C						0.02		670		
		BANK STABILIZATION, SN-C						< 0.01	< 0.01	46	66	
73	-L- 594+33	48" RCP L=200', SO-C						0.02	< 0.01	164	30	
74	-L- 610+42	3 @ 10' X 7' RCBC L=198', SQ-C						0.06		238		
		BANK STABILIZATION, SQ-C						0.02	0.03	68	130	
75	-L- 611+00 - 612+68 LT	FILL & CHANNEL CHANGE, SS-C						0.03	< 0.01	277	48	
76	-L- 638+00 LT	TAIL DITCH, DRAIN POND, SV-C						1.01		180		
76A	-L- 634+83 LT	TAIL DITCH, BANK STABILIZATION, SV-C						< 0.01	< 0.01	43	10	
77	-L- 640+00 LT	DRAIN POND; TOTAL: PD-C						1.14				
78	-L- 641+67-642+24 LT	30" RCP L=165', SV-C, FILL; TOTAL: PE-C, WJ-C	0.14					< 0.01		146		
79	-L- 644+67 LT	FILL; TOTAL: WG-C	0.03									
80	-L- 644+00 LT	DRAIN POND; TOTAL: PE-C						0.56				
81	-L- 644+67 - 645+00 RT	FILL, CUT; TOTAL: WI-C	< 0.01		0.03							
82	-L- 646+22	48" RCP L=217', FILL & CUT, SV-C, WF-C; TOTAL: WG-C, WH-C	0.13		0.02	0.02		0.06	< 0.01	260	10	
		BANK STABILIZATION; TOTAL:WG-C, WH-C						< 0.01		20		
83	-Y13- 15+75 - 16+13 LT	FILL; TOTAL: WE-C	0.10									
TOTALS*:			0.42		0.05	0.02		3.01	0.09	2514	329	0

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NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
FEBRUARY 22, 2016
RANDOLPH COUNTY
R-2536
34450.3.S1

Revised 2013 10 24

WETLAND PERMIT IMPACT SUMMARY

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			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)
84	-L- 669+26 RT	FILL, DIVERSION DITCH; TOTAL: WK-C	< 0.01		< 0.01							
85	-L- 670+00	60" RCP L=207', FILL, SX-C, WL-C	0.05			0.02		0.02	< 0.01	278	44	
		BANK STABILIZATION, SX-C						< 0.01	< 0.01	40	57	
86	-Y17FLY- 22+13	2 @ 10' X 8' RCBC L=289', SNN-C; TOTAL: WZ-C	0.03					0.06	0.03	341	120	
		BANK STABILIZATION, SNN-C						0.02		120		
87	-Y17RPD- 30+09	1 @ 6' X 7' RCBC L=79', SCC-C						< 0.01	< 0.01	81	66	
		BANK STABILIZATION, SCC-C						< 0.01		65		
88	-Y17RPDA- 25+91 - 26+95 RT	FILL & CUT, WAA-C	0.12		0.02	0.07						
89	-ESR5- 15+50	BRIDGE REMOVAL, SNN-C							< 0.01		31	
		BANK STABILIZATION, SNN-C						0.02		57		
90	-Y17- 41+00 LT	TAIL DITCH BANK STABILIZATION, SNN-C; TOTAL: WV-C	< 0.01						0.02	20	32	
91	-Y17- 44+57 LT	TAIL DITCH BANK STABILIZATION, SNN-C						< 0.01	< 0.01	13	23	
92	-Y17- 44+57 LT	TAIL DITCH & BORE HOLE, WTA-C		0.03	0.03		0.02					
	-Y17- 44+90 LT	RIP-RAP PAD, WTA-C	< 0.01									
	-Y17- 44+08 - 47+64 LT	UTILITY INSTALLATION, WTA-C		1.13								
93	-Y17- 42+00 RT	RIP-RAP PAD, WW-C	< 0.01									
	-Y17- 40+81 - 44+82 RT	UTILITY INSTALLATION, WW-C		0.85		0.03						
	-Y17- 44+57 RT	TAIL DITCH AND BERM, WW-C	0.02		0.02		< 0.01					
94	-Y17FLY- 46+76	2 @ 12' X 8' RCBC L=96', SNN-C						0.02	0.03	98	105	
		BANK STABILIZATION, SNN-C						0.02		80		
95	-Y17FLY- 49+00 RT	FILL, WTA-C	< 0.01									
96	-SR6- 15+40 LT	24" RCP L=83', TAIL DITCH, SMM-C						< 0.01	< 0.01	124	18	
97	-SR6- 15+63 LT	36" RCP L=250', SFF/SKK-C						< 0.01	< 0.01	133	49	
		BANK STABILIZATION, SFF/SKK-C						< 0.01		13		
TOTALS*:			0.27	2.01	0.08	0.12	0.03	0.23	0.15	1463	545	0

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NOTES:
SITE 95 ONLY INCLUDES PERMANENT FILL AT STA. 49+00 -Y17FLY- RT

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
FEBRUARY 22, 2016
RANDOLPH COUNTY
R-2536
34450.3.S1

Revised 2013 10 24

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
98	-SR5- 17+45	36" RCP L=150', SFF/SKK-C						< 0.01	< 0.01	94	17	
		UTILITY INSTALLATION, SFF/SKK-C							< 0.01		26	
99	-SR6- 24+00 LT	FILL, WT-C	< 0.01			< 0.01						
100	-SR5- 26+57 - 28+48 RT	FILL & DITCH, SGG-C						0.02	< 0.01	227	11	
101	-Y17A- 19+54 RT	TAIL DITCH BANK STABILIZATION, SAA-C						< 0.01	< 0.01	15	32	
102	-Y17A- 23+44	30" RCP L=86', TAIL DITCH, SBB-C						< 0.01	< 0.01	112	11	
		BANK STABILIZATION, SBB-C						< 0.01	< 0.01	10	10	
103	-Y17A- 26+00	TAIL DITCH BANK STABILIZATION, SNN-C						< 0.01	< 0.01	16	24	
TOTALS*:			0.01			0.01		0.07	0.07	474	131	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
FEBRUARY 22, 2016
RANDOLPH COUNTY
R-2536
34450.3.S1

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WETLAND PERMIT IMPACT SUMMARY - PROJECT TOTALS

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
SUBTOTAL SECTION 1 PERMIT SHEET 248			0.51			0.02		1.82	0.03	6148	244	
SUBTOTAL SECTION 1 PERMIT SHEET 249			0.66			0.03		0.62	0.19	5500	247	
SUBTOTAL SECTION 2 PERMIT SHEET 250			0.68	0.18	< 0.01	0.31		1.28	0.02	6694	270	
SUBTOTAL SECTION 2 PERMIT SHEET 251			1.63		0.03	0.16		2.47	0.02	3102	250	
SUBTOTAL SECTION 2 PERMIT SHEET 252			1.00		0.09	0.17		1.51	0.02	2906	198	
SUBTOTAL SECTION 3 PERMIT SHEET 253			0.17					3.11	0.20	3189	627	
SUBTOTAL SECTION 3 PERMIT SHEET 254			0.42		0.05	0.02		3.01	0.09	2514	329	
SUBTOTAL SECTION 3 PERMIT SHEET 255			0.27	2.01	0.08	0.12	0.03	0.23	0.15	1463	545	
SUBTOTAL SECTION 3 PERMIT SHEET 256			0.01			0.01		0.07	0.07	474	131	
PROJECT TOTAL:			5.35	2.19	0.25	0.84	0.03	14.12	0.79	31990	2841	

*Rounded totals are the sum of actual impacts

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