



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

May 8, 2015

MEMORANDUM TO: Mr. Louis Mitchell, P.E.
Division 10 Engineer

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

SUBJECT: Union and Mecklenburg Counties; Monroe Bypass/Connector;
WBS 34533.1.TA1; **TIP R-2559 & R-3329.**

Attached are the US Army Corps of Engineers Section 404 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. Tim McFadden, Transportation Program Management
Mr. Malcom Watson, P.E., Transportation Program Management
Mr. Larry Thompson, Division Environmental Officer
Dr. Majed Al-Ghandour, P.E., Programming and TIP
Ms. Brenda Moore, P.E., Roadway Design
Mr. Robert Memory, Utilities Unit
Mr. Andrew Nottingham, 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. Eric Midkiff, P.E., PDEA Western Section
Ms. Beth Harmon, NCDMS
Mr. Philip Ayscue, Office of Inspector General

PROJECT COMMITMENTS

T.I.P Project No. R-2559 & R-3329
Monroe Bypass/ Connector
Union & Mecklenburg Counties

COMMITMENTS FROM PROJECT DEVELOPMENT AND DESIGN

The following commitments have been completed:

Final designs will incorporate hazardous spill basins along the project corridor within the designated hazardous spill basin area associated with Lake Twitty. These basins will be designed in accordance with NCDOT's *Best Management Practices for Protection of Surface Waters, Guidelines for the Location and Design of Hazardous Spill Basins*, and *Guidelines for Drainage Studies and Hydraulic Design*.

NCDOT and FHWA will coordinate with USFWS when the management plan and guidance become available for the northern long-eared bat (*Myotis septentrionalis*), which was proposed for listing as Endangered in October 2013.

NCTA is committed to incorporating community input into the aesthetic design process.

NCTA will coordinate with the NCDOT Rail Division and CSX during final design for the project's eastern terminus at US 74, which would affect the east-west rail mainline through Union County.

A Design Noise Study will be prepared to update the noise analysis based upon the most recent traffic forecasts and the final design.

When the final proposed alignment is established and right-of-way limits are determined, a hazardous materials site assessment will be performed to determine levels of contamination at any potential hazardous materials sites. The assessment will be made prior to right-of-way acquisition.

The cemetery delineation plan for the Hasty-Fowler-Secret Cemetery (Site 31UN351) as well as any plan detailing removal of the burials will be submitted and approved by the State Historic Preservation Office prior to any ground-disturbing activities in areas suspected to contain marked or unmarked graves. All possible burials identified in the survey will be treated as potential human graves and treated appropriately under North Carolina burial removal laws.

NCDOT Natural Environment Section

NCDOT and FHWA will coordinate with USFWS to monitor the status of the potential listing of Georgia Aster (*Symphyotrichum georgianum*) and Savannah Lilliput (*Toxolasma pullus*) throughout construction.

Division 10 Construction Unit

Dust suppression measures will be implemented to reduce dust generated by construction when the control of dust is necessary for the protection of motorists and residents.

NCTA will coordinate with Mecklenburg County and Union County schools to share information to minimize impacts to school bus routes.

NCTA will take the following actions to protect and preserve two known populations of Schweinitz's sunflower (EO#77 and EO#230):

- "Do Not Mow" signs have been posted by the NCDOT at both EOs
- The populations are being managed by the NCDOT in accordance with the *NCDOT Roadside Vegetation Management Guidelines in Marked Areas* plan
- The populations have been incorporated into the *Union Power Schweinitz's Sunflower Restricted Sites* plan as Site R and will be managed accordingly
- The Design-Build Team will clearly demark the two Schweinitz's sunflower populations with tree-protection fencing
- Prior to commencing construction, the Design-Build Team and the NCTA/NCDOT will meet with USFWS to discuss the protection and preservation of EO #77 and #230.

Division 10 Construction Unit & Roadside Environmental Unit

Seeding will be required within 14 calendar days of completing construction activities in an area.

NCTA will follow NCDOT's *Design Standards in Sensitive Watersheds* for implementing erosion and sediment control BMPs along the entire project.

For any construction staging, storage, refueling, borrow pit or spoil area that is considered within the Goose Creek or Sixmile Creek watersheds, the NCDOT will coordinate with the USFWS, NCDOT Division Environmental Officer, and the contractor to determine if BMPs can be implemented for each site that avoid/minimize the potential for adverse effects to listed species and critical habitat.

A turbidity water quality testing program for the main stem of Stewarts Creek will be implemented to evaluate the performance of BMPs. Testing will be completed upstream and downstream of the construction area, as well as before, during, and after storm events.

COMMITMENTS FROM PERMITTING

No additional commitments have been developed during project permitting.

DEPARTMENT OF THE ARMY PERMIT

Permittee: **NCDOT**
ATTN: MR. RICHARD HANCOCK, P.E., MANAGER

Permit No.: **SAW-2009-00876**

Issuing Office: **CESAW-RG-A**

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 that office acting under the authority of the commanding officer.

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

Project Description: The US-74 Monroe Connector/Bypass Project (STIP R-3329 and STIP R-2559) is an approximately 20 mile long four to six-lane controlled-access facility extending from US-74 near I-485 in Mecklenburg County to US-74 between Wingate and Marshville in Union County.

Project Location: Mecklenburg County to US-74 between Wingate and Marshville in Union County, North Carolina.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on **December 31, 2025.** 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 Condition 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 is 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.
4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

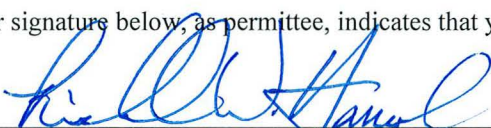
5. **Reevaluation of Permit Decision.** This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

- 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 33 CFR 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 measures 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.



(PERMITTEE) **NCDOT, Mr. Richard Hancock,**
P.E. Manager

5/5/2015

(DATE)

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



(DISTRICT ENGINEER) **Kevin P. Landers Sr.,**
Colonel, U.S. Army
District Commander

8 MAY 2015

(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)

SPECIAL CONDITIONS
Action ID#: SAW-2009-00876
The Monroe Bypass Project – STIP R-3329 and R-2559

Failure to institute and carry out the details of the following special conditions will result in a directive to cease all ongoing and permitted work within waters of the U.S. associated with the permitted project, or such other remedies and/or fine as the Wilmington District Engineer, or his authorized representatives, may seek.

- a. **Construction Plans:** All work authorized by this permit must be performed in strict compliance with the attached plans dated September 29, 2014 (date located on lower left side of cover sheet), 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.
- b. **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.
- c. **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.
- d. **Borrow and Waste:** To ensure that all borrow and waste activities occur on high ground and do not result in the degradation of adjacent waters and wetlands, 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 Corps of Engineers with appropriate maps indicating the locations of proposed borrow or waste sites as soon as such information is available. The permittee will coordinate with the Corps of Engineers before approving any borrow or waste sites that are within 400 feet of any stream or wetland. 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 (b) 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 (b). 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.

- e. The permittee shall install barrier fencing around all wetlands that are not to be disturbed to make them readily visible and prevent construction equipment from inadvertently entering or disturbing these areas.
- f. The Permittee shall provide the cemetery delineation plan for Fowler/Hasty/Secrest cemetery (Site 31UN351) as well as any plan detailing removal of the burials will be submitted to, and approved by, the State Historic Preservation Office prior to any ground disturbing activities in areas suspected to contain marked or unmarked graves.
- g. If any construction staging, storage, refueling, borrow pit, or spoil areas are chosen within the Goose Creek or Sixmile Creek watersheds, the permittee shall coordinate with NC DOT Division Environmental officer and a representative from the US Fish and Wildlife Service and the contractor to develop Best Management Practices for each site to avoid and or minimize the potential for adverse effects resulting from such activity.
- h. The permittee shall adhere to the NC Department of Transportation's Design Standards in Sensitive Watersheds for implementing erosion and sediment control BMPs along the entire project.
- i. Hazardous spill basins will be located along the project corridor within the designated hazardous spill basin area associated with Lake Twitty.
- j. **Culverts:**

1. Unless otherwise requested in the applicant's application and depicted on the approved work plans, culverts greater than 48 inches in diameter will be buried at least one foot below the bed of the stream. 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.
2. 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.

k. **NCDWR 401 Cert:** In accordance with 33 U.S.C. 1341(d), all conditions of the North Carolina Division of Water Quality 401 Water Quality Certification No. 3845, Dated March 6, 2015 are hereby incorporated as special conditions of this permit

l. **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.

m. 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.

n. Violations of these conditions or violations of Section 404 of the Clean Water must be reported in writing to the Wilmington District U.S. Army Corps of Engineers within 24 hours of the permittee's discovery of the violation.

o. **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.

p. **Pre Construction Meetings:** The permittee shall schedule and attend a preconstruction meeting between its representatives, the contractors representatives, and the Corps of Engineers, Asheville 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 schedule the preconstruction meeting for a time frame when the USACE, NCDCM, and NCDWQ Project Managers can attend. The permittee shall invite the Corps, NCDCM, and NCDWQ 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.

q. **Prohibitions on Concrete:** The permittee shall take measures to prevent live or fresh concrete, including bags of uncured concrete, from coming into contact with any water in or entering into waters of the United States. Water inside coffer dams or casings that has been in contact with concrete shall only be returned to waters of the United States when it no longer poses a threat to aquatic organisms (concrete is set and cured).

r. **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.

s. **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.

t. **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.

u. **Sediment Erosion Control**

1. 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.
2. 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.
3. The permittee shall remove all sediment and erosion control measures placed in wetlands or waters, and shall restore natural grades on those areas, prior to project completion
4. 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.

v. **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.

w. **Sediment sluicing:** The permittee shall take measures to control any bottom sediment that may be sluiced by draining the pond(s) on the project site. Sediment sluicing from ponds is not authorized by this permit.

x. **Threatened and endangered species:** All necessary precautions and measures will be implemented so that any activity will not kill, injure, capture, harass, or otherwise harm any protected federally listed species. While accomplishing the authorized work, if the permittee discovers or observes a damaged or hurt listed endangered or threatened species, the District Engineer will be immediately notified to initiate the required Federal coordination. The following additional conditions will be implemented regarding endangered species:

1. The permittee shall implement the following actions and commitments to protect and preserve Schweinitz's sunflower EO #s 77 and 230 with regard to the Monroe Connector/Bypass project :

- "No Mow" signs will be posted and maintained by the NCDOT at both EOs
- The populations will be managed by the NCDOT in accordance with the "NCDOT Roadside Vegetation Management Guidelines in Marked Areas" plan.
- The populations have been incorporated into the Union Power Schweinitz's Sunflower Restricted Sites plan as Site R and will be managed accordingly.
- The Design-Build Team will clearly demarcate the two Schweinitz's sunflower populations with tree-protection fencing
- Prior to commencing construction, the Design-Build Team and the NCTA/NCDOT will meet with the Service to discuss the protection and preservation of EO #s 77 and 230.
- If the placement of waste and borrow in sensitive watersheds or in locations that could impact the Schweinitz's sunflower cannot be avoided, further consultation with the Service may be required.



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart,
Secretary

March 6, 2015

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

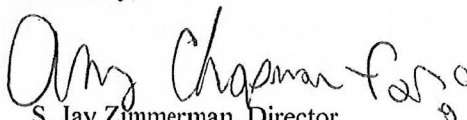
Subject: 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act and ISOLATED WETLANDS PERMIT Pursuant to IWGP100000 with ADDITIONAL CONDITIONS for Proposed Construction of the Monroe Connector/Bypass Toll Road from US 74 near I-485 in Southeastern Mecklenburg County to US 74 in the Area Between the Towns of Wingate and Marshville in Union County, STIP R-3329 and R-2559, Sections 1, 2A, 2B, 2C, 3A, & 3B, NCDWR Project No. 02-0672 V3

Dear Mr. Hancock:

Attached hereto is a copy of Certification No. WQC4015 issued to The North Carolina Department of Transportation (NCDOT) dated March 6, 2015.

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

Sincerely,


S. Jay Zimmerman, Director
Division of Water Resources

Attachments

Electronic copy only distribution:

Crystal Amschler, US Army Corps of Engineers, Asheville Field Office
Larry Thompson, Division 10 Environmental Officer
Dr. Cynthia Van Der Wiele, US Environmental Protection Agency
Marella Buncick, US Fish and Wildlife Service
Marla Chambers, NC Wildlife Resources Commission
NC Division of Water Resources, MRO
File Copy

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Resources (NCDWR) Regulations in 15 NCAC 2H .0500 and **ISOLATED WETLANDS PERMIT Pursuant to IWGP100000**. This Certification authorizes the NCDOT to impact 5.72 acres of jurisdictional wetlands, 0.92 acres of isolated wetlands, and 15,495 linear feet of jurisdictional streams in Union County. The project shall be constructed pursuant to the application received October 2, 2014. The authorized impacts are as described below:

Stream Impacts in the Yadkin River Basin

Site	Permanent Stream Impact (linear ft)	Temporary Stream Impact (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
Section 1	1,913	86	1,999	1,799
Section 2A	2,037	201	2,238	2,037
Section 2B	3,780	247	4,027	3,771
Section 2C	4,322	293	4,615	4,092
Section 3A	3,052	128	3,180	2,845
Section 3B	391	79	470	237
Total	15,495	1,034	16,529	14,781

Wetland Impacts in the Yadkin River Basin

Site	Fill (ac)	Fill (temporary) (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Area under Bridge (ac)	Total Wetland Impact (ac)	Total Mitigation Required (ac)
Section 1	1.12	0	0	0.17	0	0	1.27	1.27
Section 2A	0.24	0	0.02	0.05	0.03	0	0.34	0.31
Section 2B	0.19	0	0.01	0.02	0.04	0	0.26	0.22
Section 2C	2.78	0	0	0.31	0	0	3.09	3.09
Section 3A	0.17	0	0	0.03	1.31	0	1.51	0.20
Section 3B	1.17	0	0.11	0.23	0.04	0	1.55	1.51
Total	5.72		0.14	0.76	1.42	0	7.10	6.6

Isolated Wetland Impacts in the Yadkin River Basin

Site	Fill (ac)	Fill (temporary) (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Total Wetland Impact (ac)	Total Mitigation Required
Section 1	0.88	0	0	0.04	0	0.92	0.92
Total	0.88	0	0	0.04	0	0.92	0.92

The application provides adequate assurance that the discharge of fill material into the waters of the Yadkin River Basin in conjunction with the proposed project 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 received October 2, 2014. 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.

Conditions of Certification:

1. Hazardous spill basins shall be constructed along the project corridor at stream crossing located within the Lake Twitty watershed per the commitment in the Record of Decision (ROD) dated August 2010. It is recommended that hazardous spill basins be constructed at all stream crossings where practicable along the project corridor. [15A NCAC 02H.0506(b)(2)]
2. Work in the dry. All work in or adjacent to the streams/wetlands shall be conducted so that they do not come into contact with the disturbed areas. [15A NCAC 02H.0506(b)(3) and (c)(3)]
3. All portions of the proposed project draining to 303(d) listed watersheds that are impaired due to turbidity shall be designed, constructed, and operated with sediment and erosion control measures that meet Design Standards in Sensitive Watersheds (15A NCAC 4B .0124). However, due to the size of the project, NCDOT shall not be required to meet 15A NCAC 4B .0124(a) regarding the maximum amount of uncovered acres.

All portions of the proposed project draining to 303(d) listed watersheds that are impaired due to biological criteria exceedances shall not discharge stormwater directly to surface waters. Stormwater shall be treated using appropriate best management practices (e.g., vegetated conveyances, constructed wetlands, detention ponds, etc.) prior to discharging to surface waters. [15A NCAC 02B.0200]

4. If any construction staging, storage, refueling, borrow pit or spoil areas are chosen within the Goose Creek or Six Mile Creek watersheds, NCDOT will develop BMPs for each site to avoid and minimize potential adverse effects. In addition, NCDOT shall coordinate with NCDWR to ensure compliance with the Goose Creek Riparian Buffer Rules. [15A NCAC 02B.0607]
5. Diversion ditches and similar measures for the purpose of sediment and erosion control will be matted and maintained to ensure maximum efficiency for the reduction of sediment loss and turbidity. This includes interior and exterior slopes of sediment basins. [15A NCAC 02H.0506(b)(3) and (c)(3)]
6. The area immediately adjacent to the stream within the work zone shall be matted or covered (at minimum) prior to rain events. [15A NCAC 02H.0506(b)(2)]
7. Slopes in excess of 10 ft in height and located within 30 ft of waters of the state shall be matted, at minimum, upon completion and/or in accordance with the sediment/erosion control plan. It is strongly recommended to be matted at the earliest possible time. [15A NCAC 02B.0607]
8. 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. [15A NCAC 02H.0506(b)(2)]
9. If multiple pipes/culverts are proposed to pass stream flow, they shall be designed to mimic natural stream cross section as close as possible. Baffles and sills may be required to meet this requirement. The stream channel shall not be widened to the greatest extent practicable. [15A NCAC 02H.0506(b)(2)]
10. Unless otherwise approved by 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. 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)]
11. 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.0607]
12. 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)]

13. 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 02H.0506(b)(3)]
14. 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)]
15. In accordance with 15A NCAC 02H.0506(h), compensatory mitigation for the losses of $\geq$ 150 lf of stream and or $\geq$ 0.10 acre or wetlands is required. We understand that you have chosen to perform compensatory mitigation for impacts to streams through the North Carolina Ecosystem Enhancement Program (EEP), and that the EEP has agreed to implement the mitigation for the project. EEP has indicated in a letter dated November 4, 2014, that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the EEP Mitigation Banking Instrument signed July 28, 2010. Until the EEP receives and clears your payment, and proof of payment has been provided to this Office, no impacts specified in this Authorization Certificate shall occur. For accounting purposes, this Authorization Certificate authorizes payment to the EEP to meet the following compensatory mitigation requirement:

	Compensatory Mitigation Required	River and Sub-basin Number
Stream	14,781 linear ft.	Yadkin (03040105)
Wetlands (riparian)	5.68 acres	Yadkin (03040105)
Wetland (non-riparian)	0.92 acres	Yadkin (03040105)

16. 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.
17. 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)]
18. No staging, or use, of equipment of any kind is permitted in waters of the U.S., or protected riparian buffers unless approved by this Certification. [15A NCAC 02H.0506(b)(2)]

19. 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 in approved location/manner. [15A NCAC 02H.0506(b)(3)]
20. Where ponds are drained, proper measures shall be utilized to drain the pond with limited impact to upstream and downstream channel stability and water quality, as well as to native aquatic species. If typical pond draining techniques fail to work or create significant disturbance to aquatic species, additional measures may be required (such as relocation). 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 pond remains stable. [15A NCAC 02H.0506(b)(2)]
21. Tall fescue shall not be used in the establishment of temporary or permanent ground cover within riparian areas. For the establishment of permanent herbaceous cover, erosion control matting (biodegradable) shall be used in conjunction with appropriate seeding on disturbed soils within the riparian area and on disturbed steep slopes. [15A NCAC 02H.0506(b)(3) and (c)(3)]
22. 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)]
23. 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)]
24. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited. [15A NCAC 02H.0506(b)(3)]
25. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization 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]
26. Bridge bent construction shall use driven piles (hammer or vibratory) or drilled shaft construction methods. [15A NCAC 02H.0506(b)(2)]
27. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site appropriate (grass swales, pre-formed scour holes, vegetated buffers, etc.) means before entering the stream. [15A NCAC 02H.0506(b)(2)]
28. Upon completion of the project (including any impacts at associated borrow or waste sites), the NCDOT Division Engineer or authorized agent 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)]
29. 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)]
30. 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)]
31. 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.

32. 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]

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. This Certification shall expire upon the expiration of the 404.

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

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

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

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

Sam M. Hayes, General Counsel
Department of Environment and Natural Resources
1601 Mail Service Center

This the 6th day of March 2015



S. Jay Zimmerman, Director
Division of Water Resources

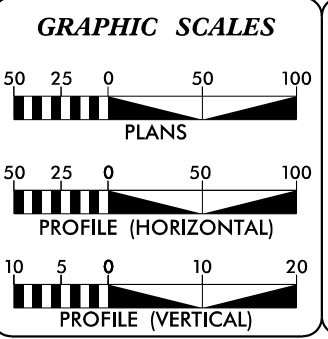
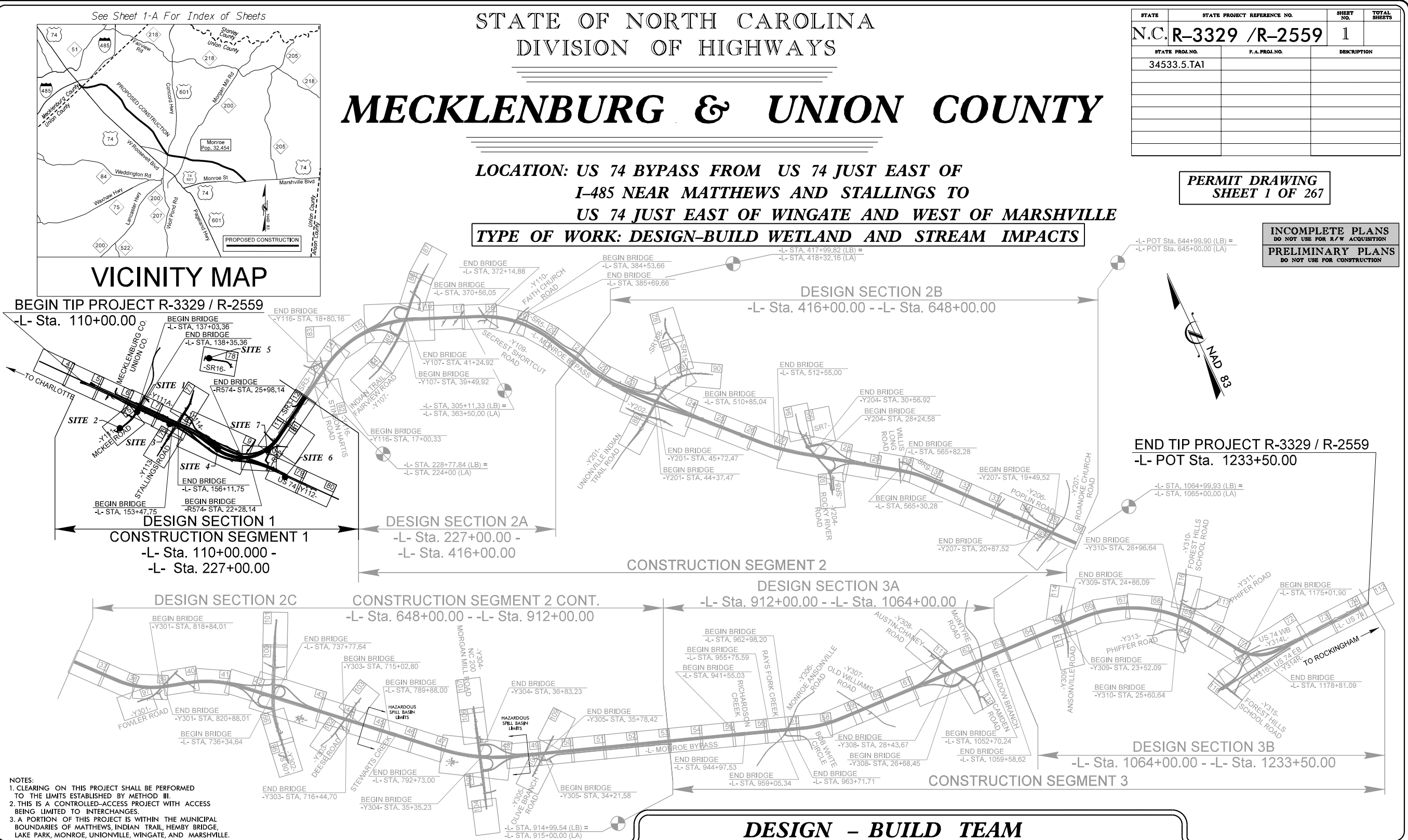
R-3329/R-2559

US 74 Monroe Bypass

Permit Impact Drawings

TIP PROJECT: R-3329 /R-2559

CONTRACT: C202587



DESIGN DATA

ADT 2013 =	64,100
ADT 2035 =	95,600
DHV =	8%
D =	55%
T =	18%*
V =	70 mph

*TTST 11% DUAL 7%
FUNCTIONAL CLASS.: FREEWAY

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-3329 /R-2559.....	18.1 mi
LENGTH STRUCTURE TIP PROJECT R-3329 /R-2559.....	*1.6 mi
TOTAL LENGTH TIP PROJECT R-3329 /R-2559.....	19.7 mi

* LENGTH OF STRUCTURES BASED ON WB LANES

DESIGN - BUILD TEAM

PLANS PREPARED BY :

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO. F-0112

2012 STANDARD SPECIFICATIONS

LETTING DATE:
OCTOBER 28, 2010

J.T. Peacock, Jr., P.E.
PROJECT ENGINEER

Stephen E. Roberts, P.E.
PROJECT DESIGN ENGINEER

CONTRACTOR :

MONROE
BYPASS CONSTRUCTORS

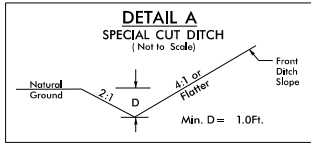
HYDRAULICS ENGINEER

SIGNATURE: P.E.
ROADWAY DESIGN ENGINEER

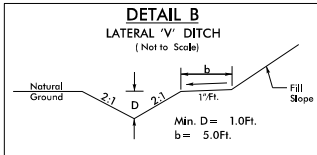
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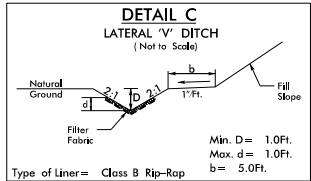
PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	1-2N
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 2 OF 267	



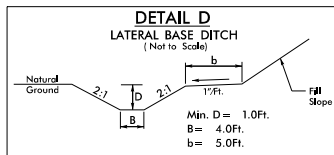
-R674- STA. 16+36.67 TO STA. 17+23.00 RT
-Y111- STA. 14+75 TO STA. 17+00 RT
-L- STA. 212+50 TO STA. 216+50 RT
-Y113- STA. 40+50 TO STA. 41+25 LT
-Y113- STA. 40+50 TO STA. 41+25 RT



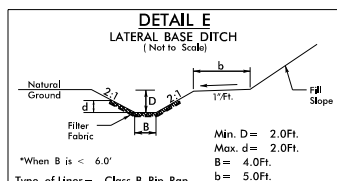
-Y114- STA. 38+15.73 TO STA. 40+52.00 LT
-SR2- STA. 18+53 TO STA. 22+50 RT



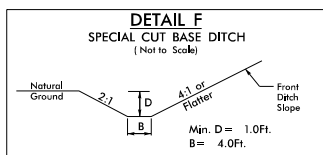
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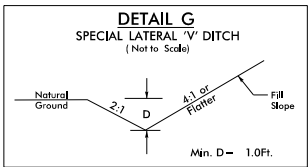
-L- STA. 207+50 TO STA. 212+25 RT
-Y113- STA. 13+00 TO STA. 17+00 RT



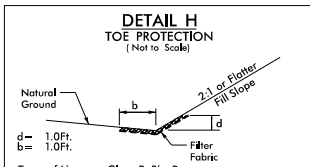
-L1- STA. 124+50 TO STA. 125+11 LT
-R174- STA. 29+65.00 TO STA. 33+19.10 RT
-R174- STA. 37+55.51 TO STA. 44+20.00 RT



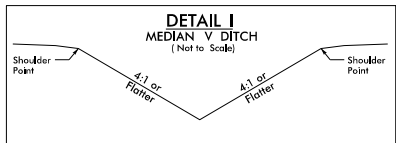
-L1- STA. 168+50 TO STA. 173+00 RT
-Y111- STA. 11+00 TO STA. 14+75 RT (D=1.5')



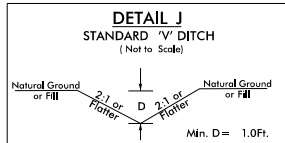
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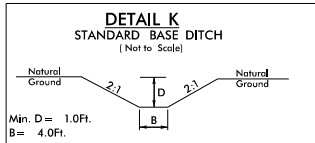
-Y113- STA. 21+00 TO STA. 23+00 LT



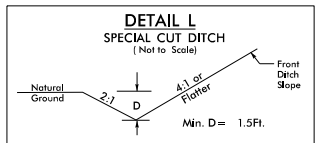
-L1- STA. 175+25 TO STA. 183+00 RT
-L1- STA. 189+50 TO STA. 191+50 CL



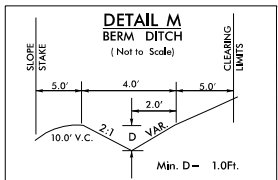
-L1- STA. 165+00 TO STA. 166+50 RT
-R174- STA. 27+36 RT; L=75', S=5.73%
BEG EL=694.86, END EL=690.56
-R674- STA. 10+94.87 TO STA. 15+00.75 RT



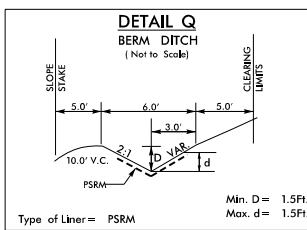
-L1- STA. 166+50 TO STA. 168+50 RT
-L1- STA. 173+00 TO STA. 175+25 RT
-L- STA. 213+85 LT; L=281', S=0.30%,
BEG EL=667.5, END EL=666.7



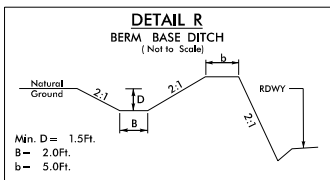
-R174- STA. 19+07.99 TO STA. 20+98.01 RT
-Y114- STA. 11+00 TO STA. 13+50 RT
-Y114- STA. 17+00.00 TO STA. 18+63.34 RT



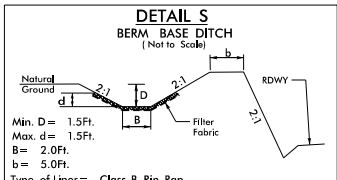
-L- STA. 213+50 TO STA. 227+00 RT



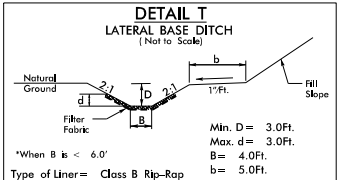
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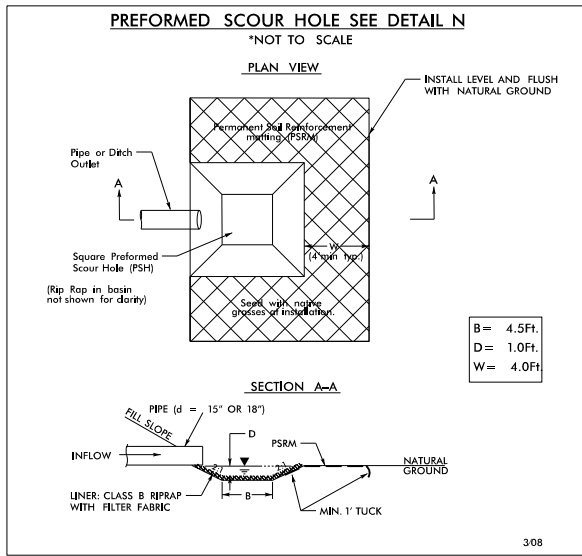
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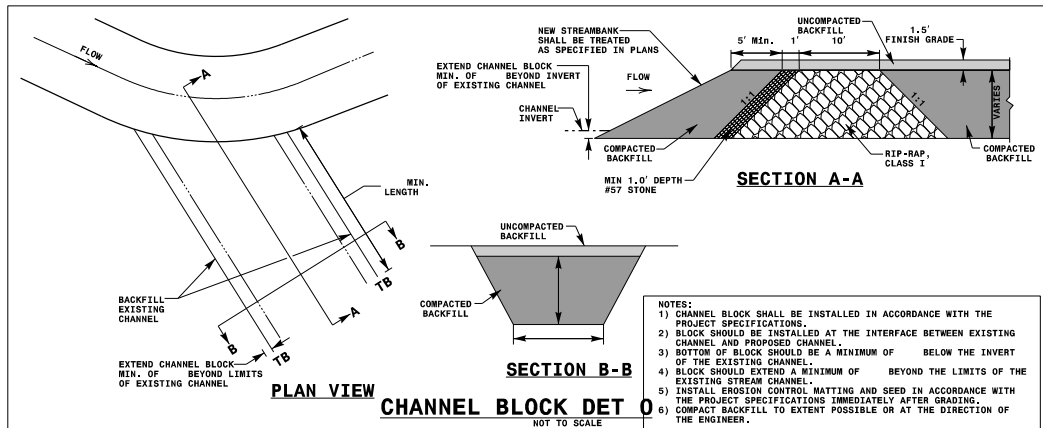
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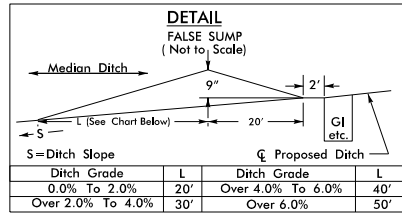
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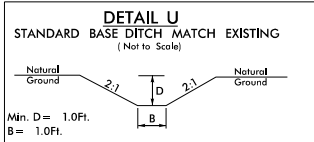
-DR1- STA. 10+92 RT



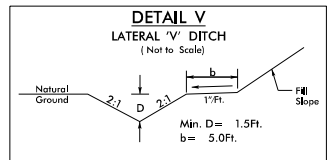
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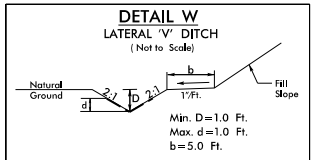
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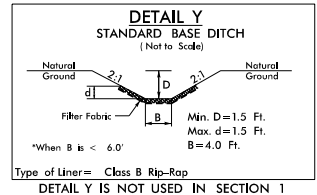
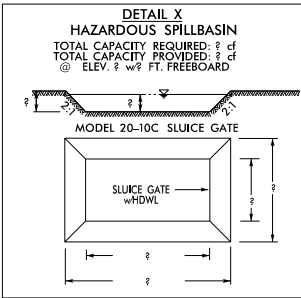
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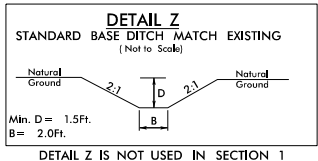
-R174- STA. 44+20.00 TO STA. 47+67.13 RT
-Y112- STA. 13+50.00 TO STA. 27+54.00 RT



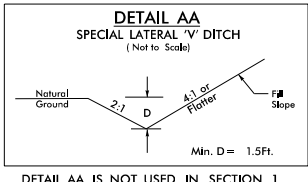
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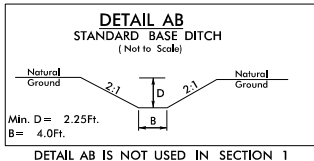
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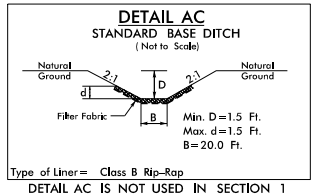
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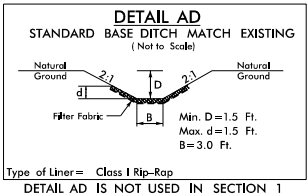
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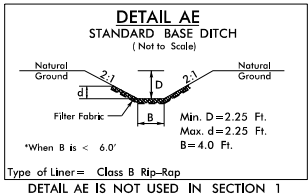
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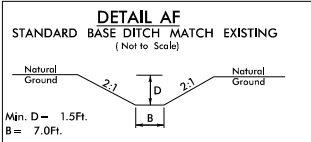
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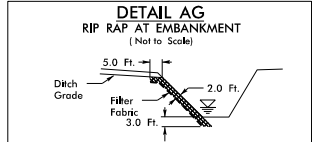
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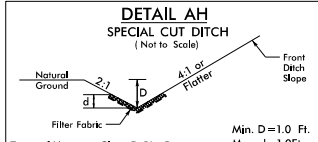
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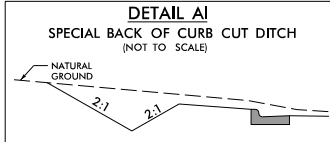
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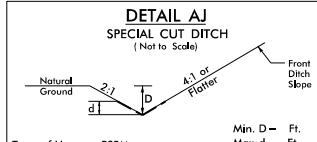
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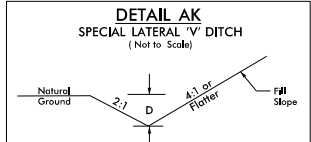
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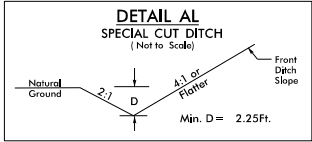
-R174- STA. 14+22.07 TO STA. 16+19.47 LT



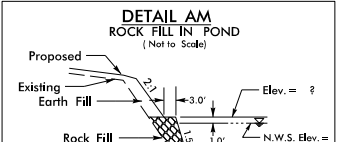
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DETAIL AK IS NOT USED IN SECTION 1



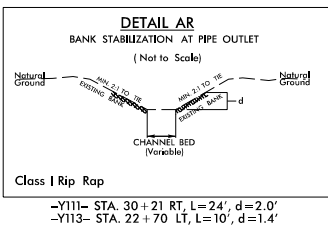
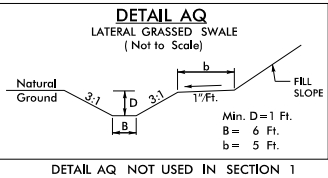
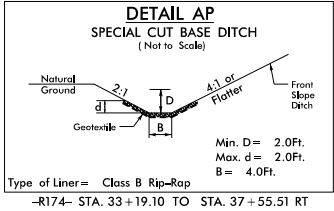
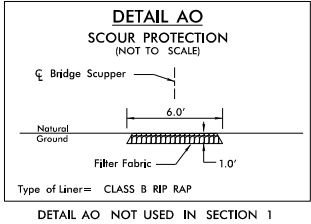
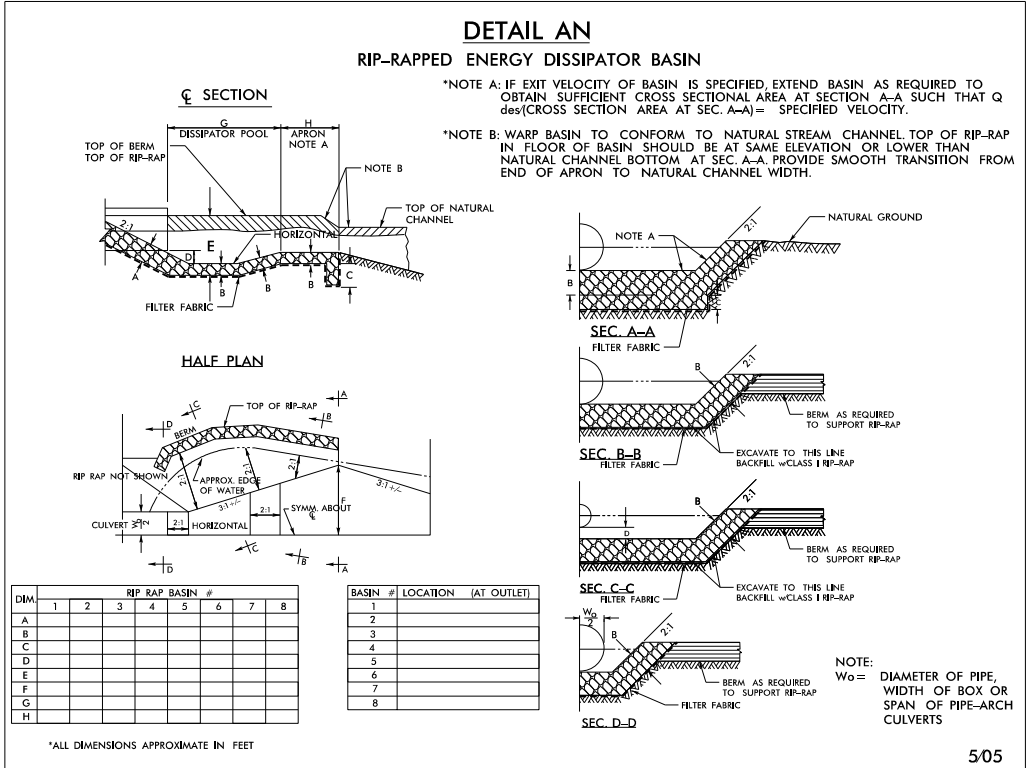
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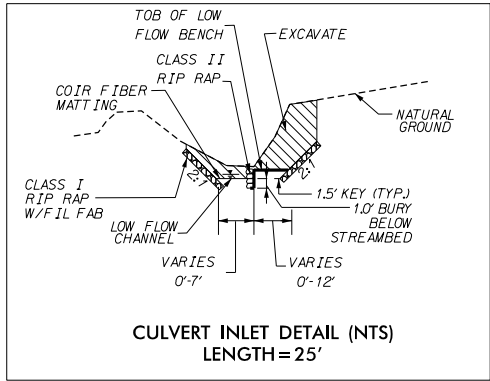
DETAIL AM IS NOT USED IN SECTION 1



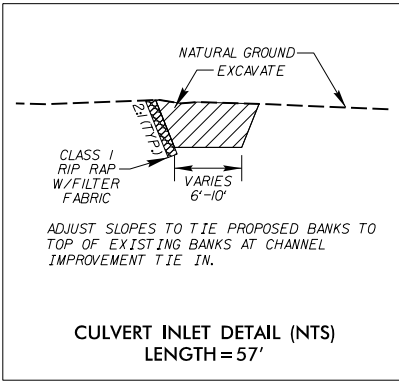
PROJECT REFERENCE NO. <i>R-3329 / R-2559</i>		SHEET NO. <i>1-20</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
<i>PERMIT SHEET</i>		<i>DRAWING 3 OF 267</i>	



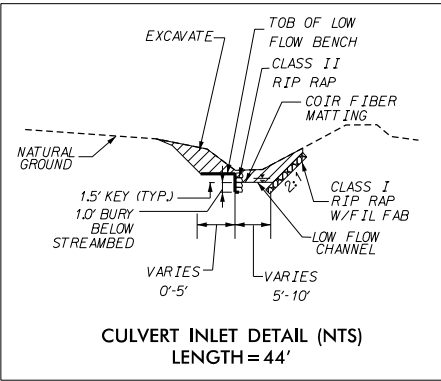
NORTH FORK
CROOKED CREEK TRIB. 5
-DR_1- STA. 11+55



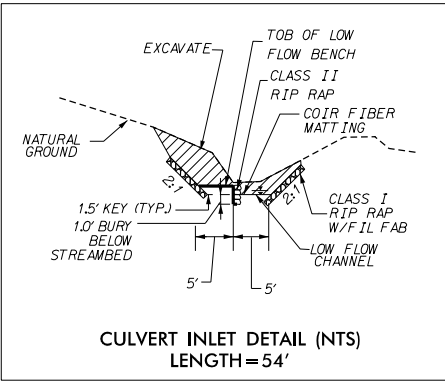
NORTH FORK
CROOKED CREEK TRIB. 5
-Y111- STA. 21+41



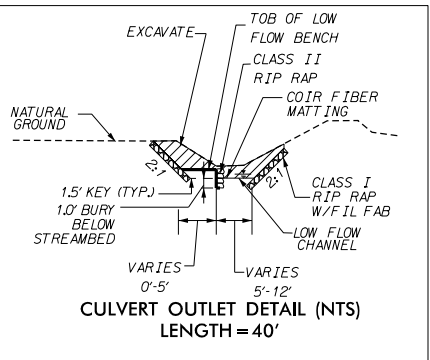
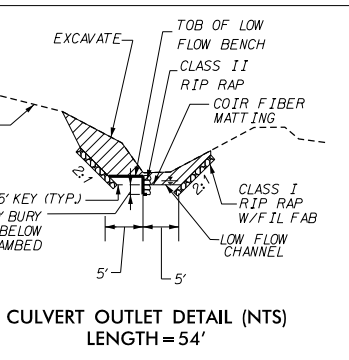
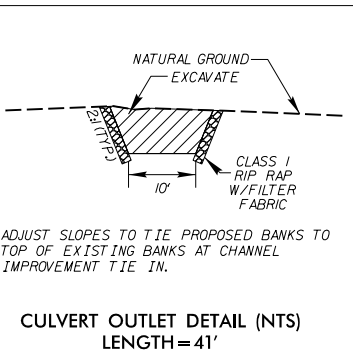
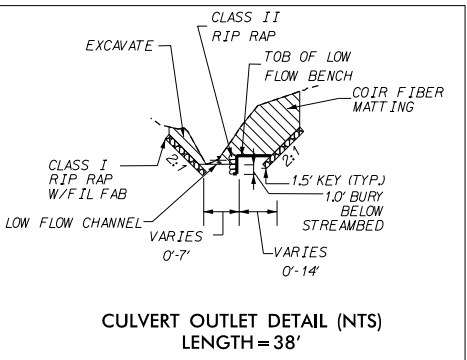
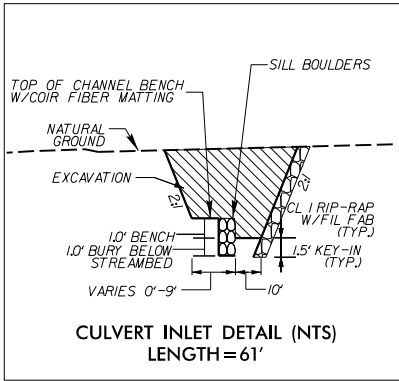
NORTH FORK
CROOKED CREEK TRIB. 4
-R174- STA. 29+69



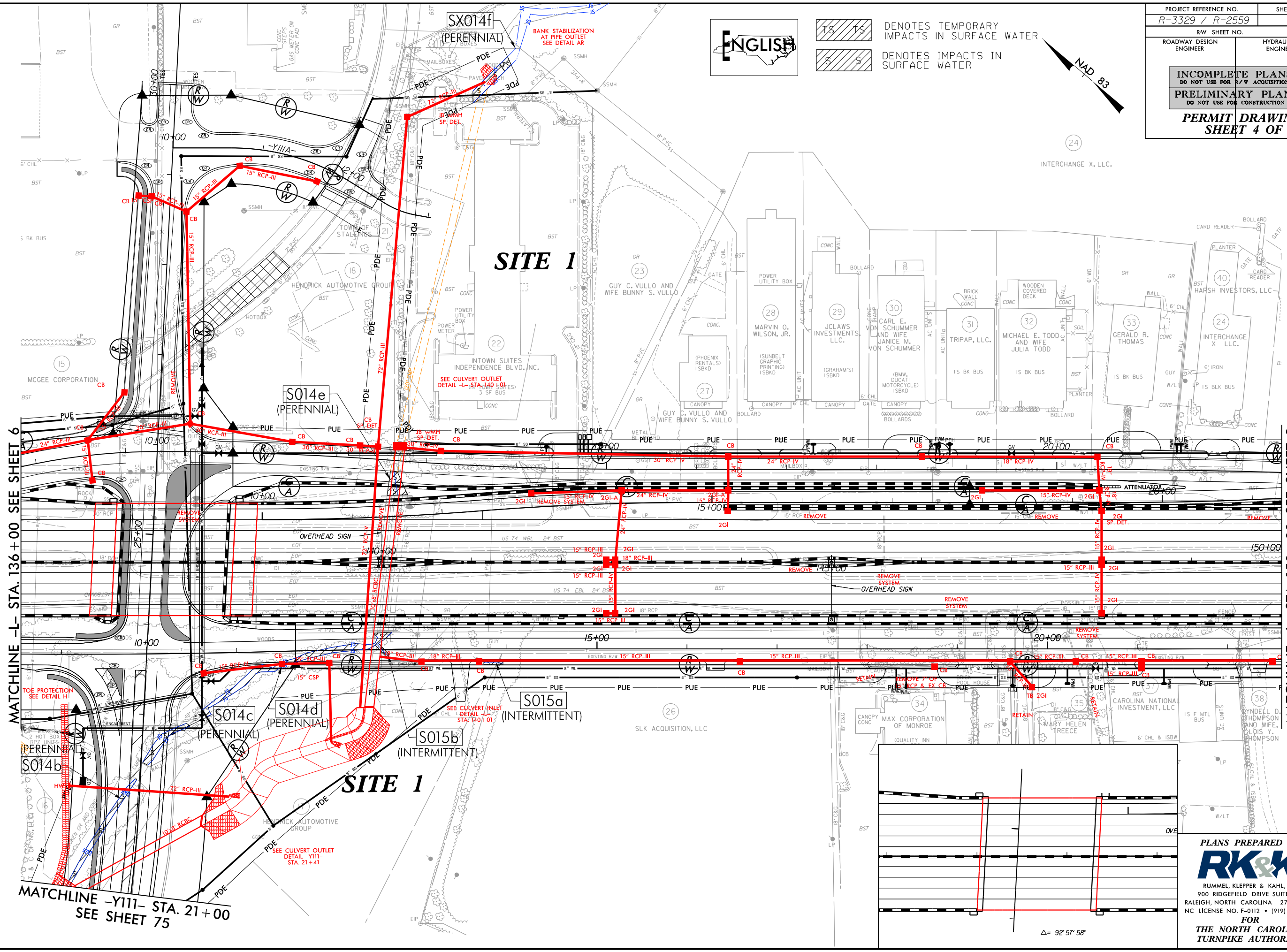
NORTH FORK
CROOKED CREEK TRIB. 4
-L- STA. 175+72



NORTH FORK
CROOKED CREEK TRIB. 5
-L- STA. 140+01



8/17/99
8/30/2004
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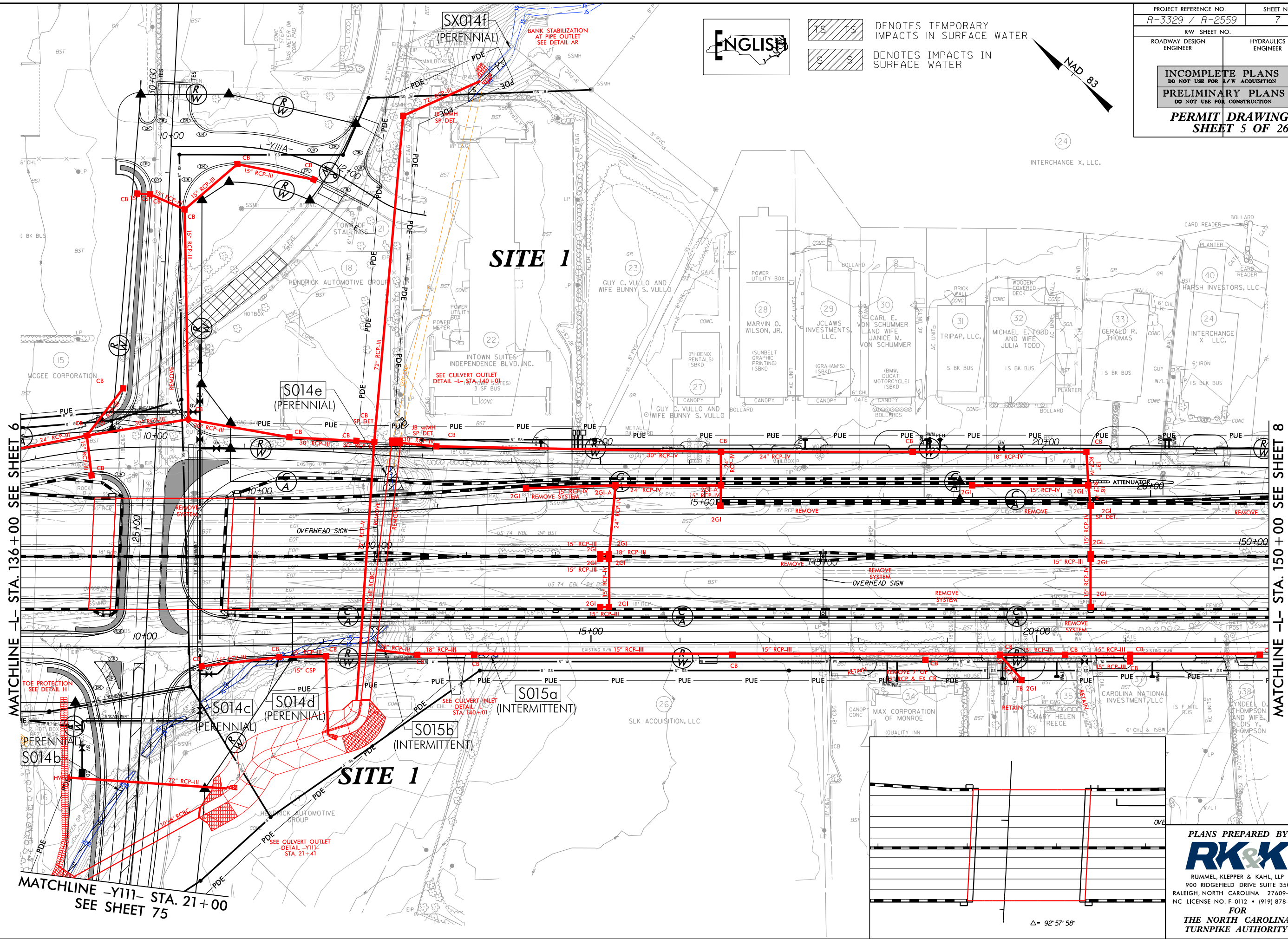


TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
S S DENOTES IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 4 OF 267	

PLANS PREPARED BY :
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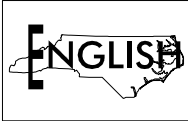
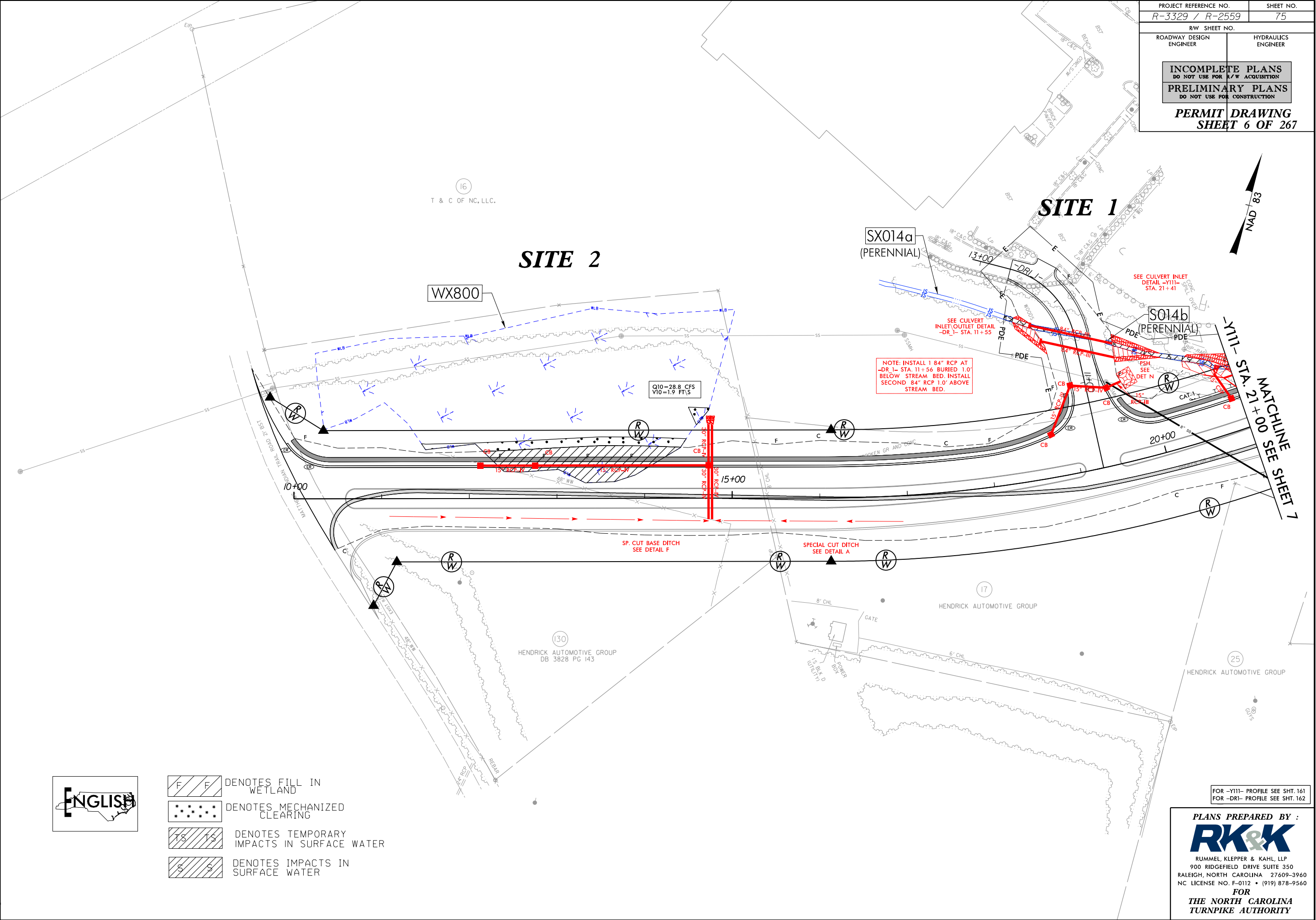
PLANS PREPARED BY :
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8/30/2014
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PROJECT REFERENCE NO.		SHEET NO.	
R-3329 / R-2559		75	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
PERMIT DRAWING SHEET 6 OF 267			



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

FOR -Y111- PROFILE SEE SHT. 161
FOR -DRI- PROFILE SEE SHT. 162

PLANS PREPARED BY :
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PERMIT | DRAWING
SHEET 7 OF 267

NAD 83

MATCHLINE SEE SHEET 7
1+00

FOR -Y111- PROFILE SEE SHT. 161
FOR -DR1- PROFILE SEE SHT. 162

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SITE 2

SITE 1

16
T & C OF NC, LLC.

WX800

SX014a
(PERENNIAL)

S014b
PERENNIAL)
PDE

**NOTE: INSTALL 1 84" RCP AT
-DR 1- STA. 11+56 BURIED 1.0'
BELOW STREAM BED. INSTALL
SECOND 84" RCP 1.0' ABOVE
STREAM BED.**

$$\begin{aligned} Q_{10} &= 28.8 \text{ CFS} \\ V_{10} &= 1.9 \text{ FT/S} \end{aligned}$$

SP. CUT BASE DITCH
SEE DETAIL F

SPECIAL CUT DITCH
SEE DETAIL A

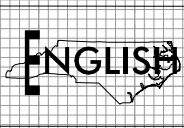


English

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

9/30/2014
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 8/17/99

5/28/99



-L-

PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		121
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 8 OF 267		

CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 1600	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= X	FT
BASE DISCHARGE	= 1700	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= X	FT
OVERTOPPING DISCHARGE	= X	CFS
OVERTOPPING FREQUENCY	= 10	YRS
OVERTOPPING ELEVATION	= X	FT

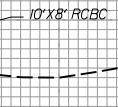
PI = 137+50.00
EL = 723.80'
VC = 590'
K = 151
DS = 60mph

-L- STA.137+44.91
-YIII- STA.24+69J6
ELEV. = 720.88'
MCKEE RD.

-L- STA.138+67.88 =
-SRLT 2- STA.10+00.00, 47.25' LT
ELEV. = 721.51'

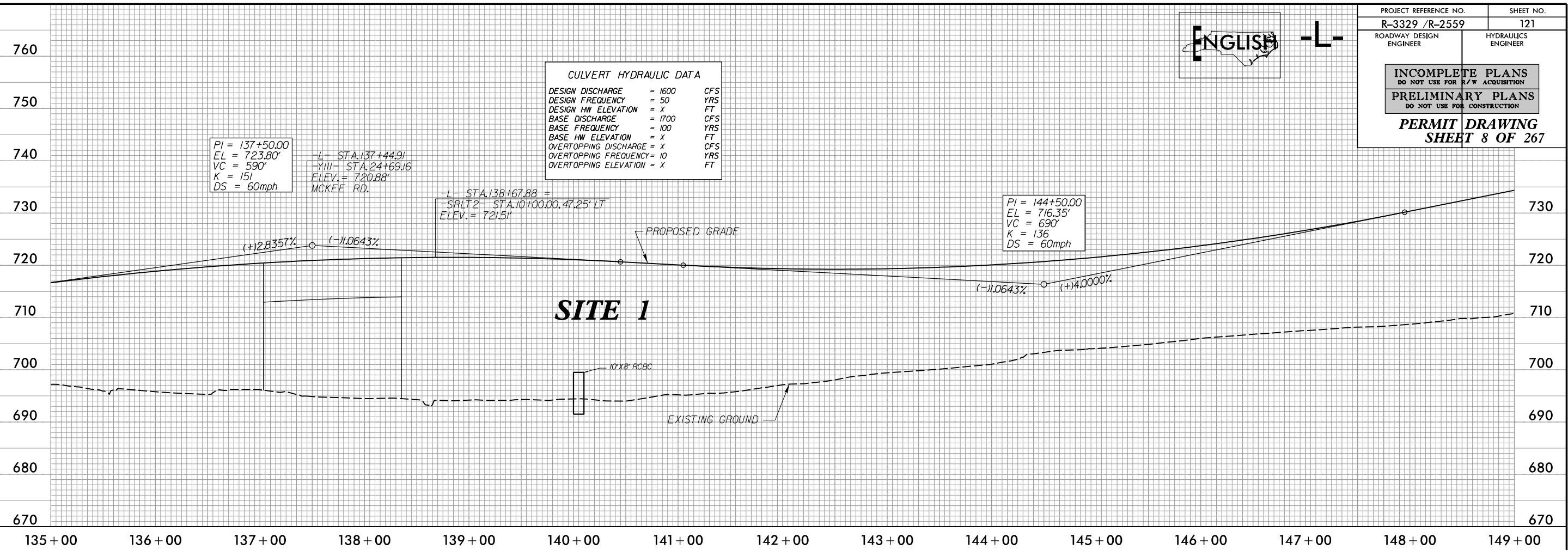
PI = 144+50.00
EL = 716.35'
VC = 690'
K = 136
DS = 60mph

SITE 1



EXISTING GROUND

PROPOSED GRADE



PI = 155+40.00
EL = 759.95'
VC = 1,210'
K = 151
DS = 60mph

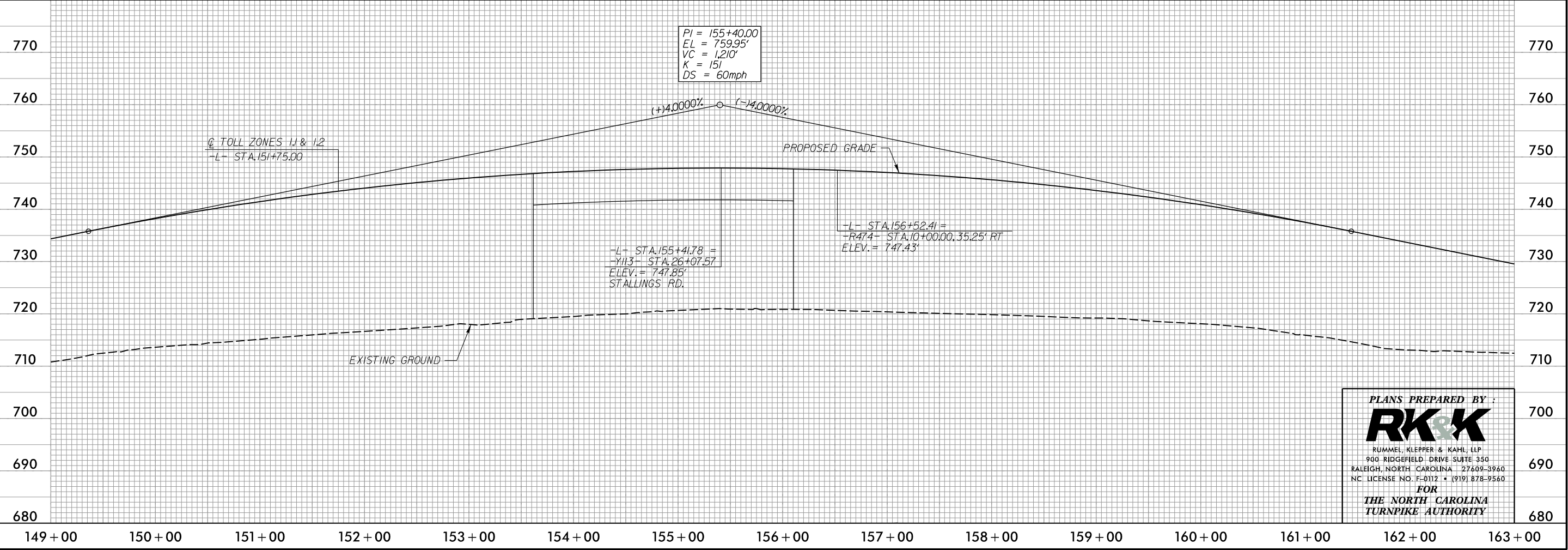
@ TOLL ZONES 1J & 12
-L- STA.151+75.00

-L- STA.155+41.78 =
-YIII3- STA.26+07.57
ELEV. = 747.85'
STALLINGS RD.

-L- STA.156+52.41 =
-R474- STA.10+00.00, 35.25' RT
ELEV. = 747.43'

PROPOSED GRADE

EXISTING GROUND



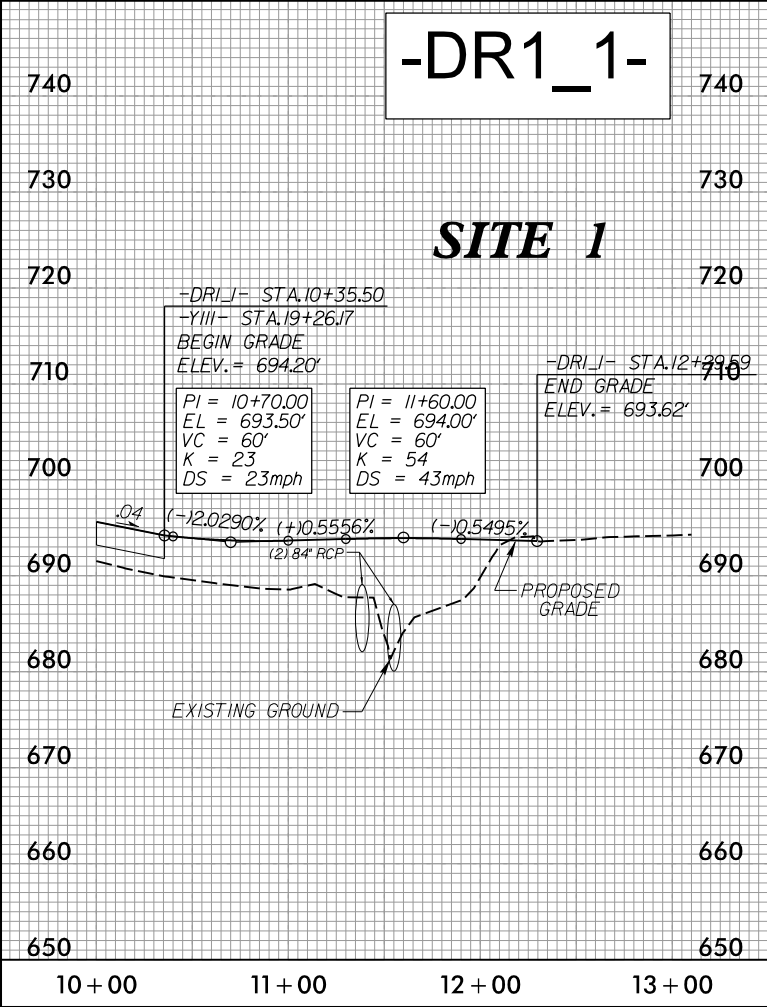
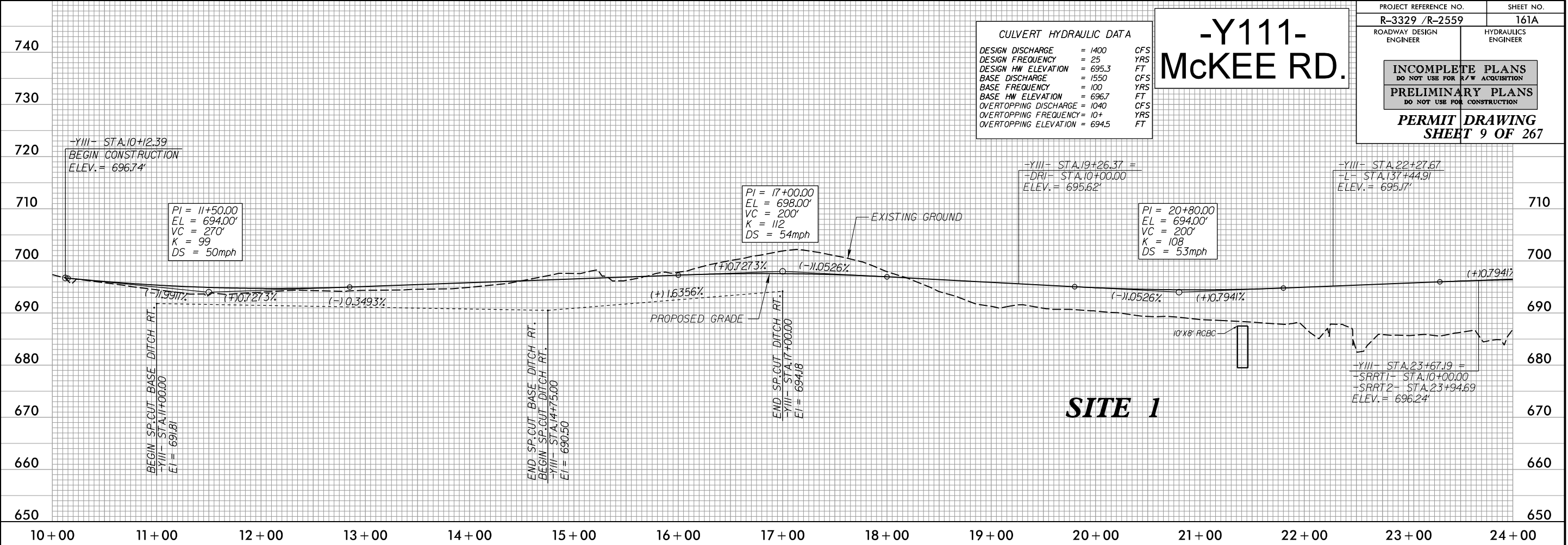
PLANS PREPARED BY :

RK&K

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900 RIDGEFIELD DRIVE SUITE 350
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NC LICENSE NO. F-0112 • (919) 878-9560

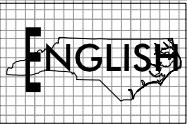
FOR
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Elevs



5/14/99

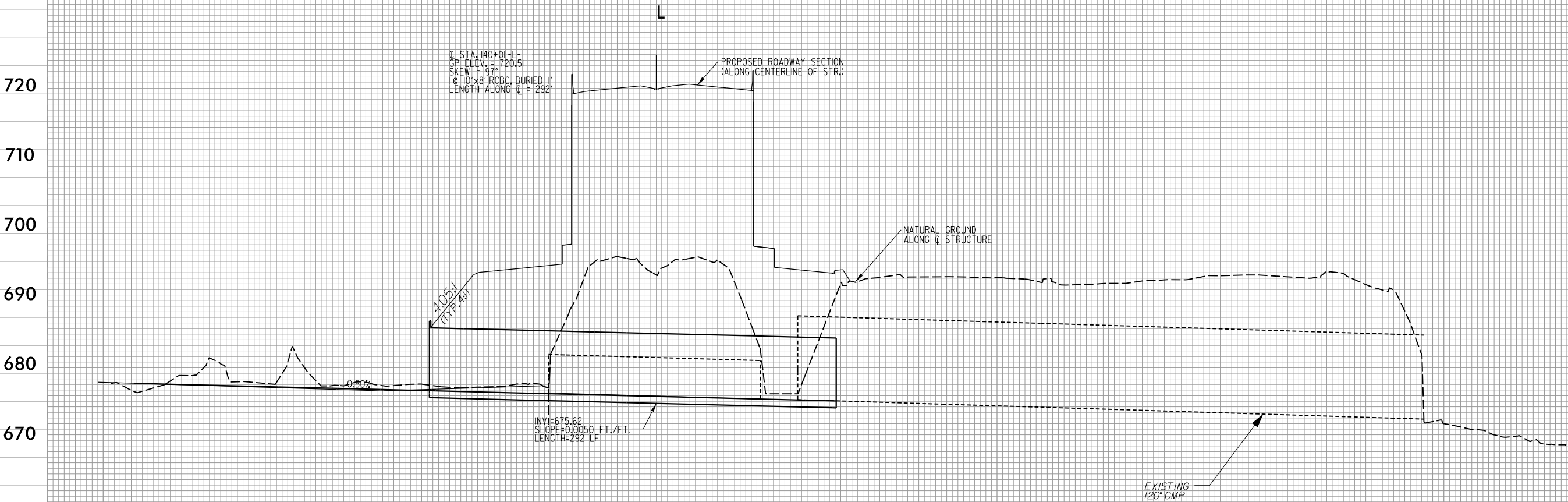
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Elev



PROJECT REFERENCE NO.		SHEET NO.	
R-3329 /R-2559			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
PERMIT SHEET		DRAWING 10 OF 267	

SITE 1

-L- 140+00



PROPOSED 10'X8' RCBC

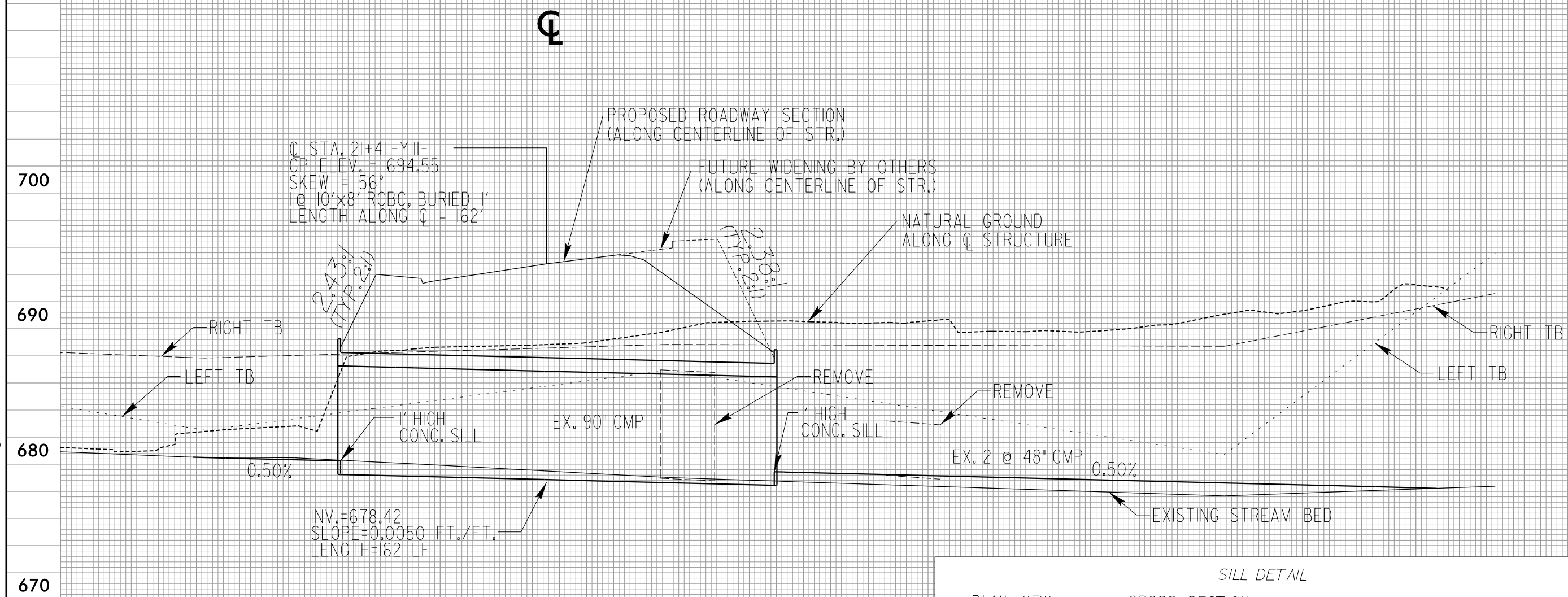
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9/30/2004
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Elevs

SITE 1

-YIII- 21+50

ENGLISH

PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT SHEET		DRAWING 11 OF 267



PROPOSED 10'X8' RCBC

SILL DETAIL

PLAN VIEW

CROSS SECTION

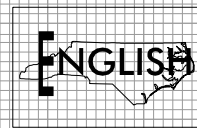
PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET.

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.

5/14/99
8/29/2004
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Elev

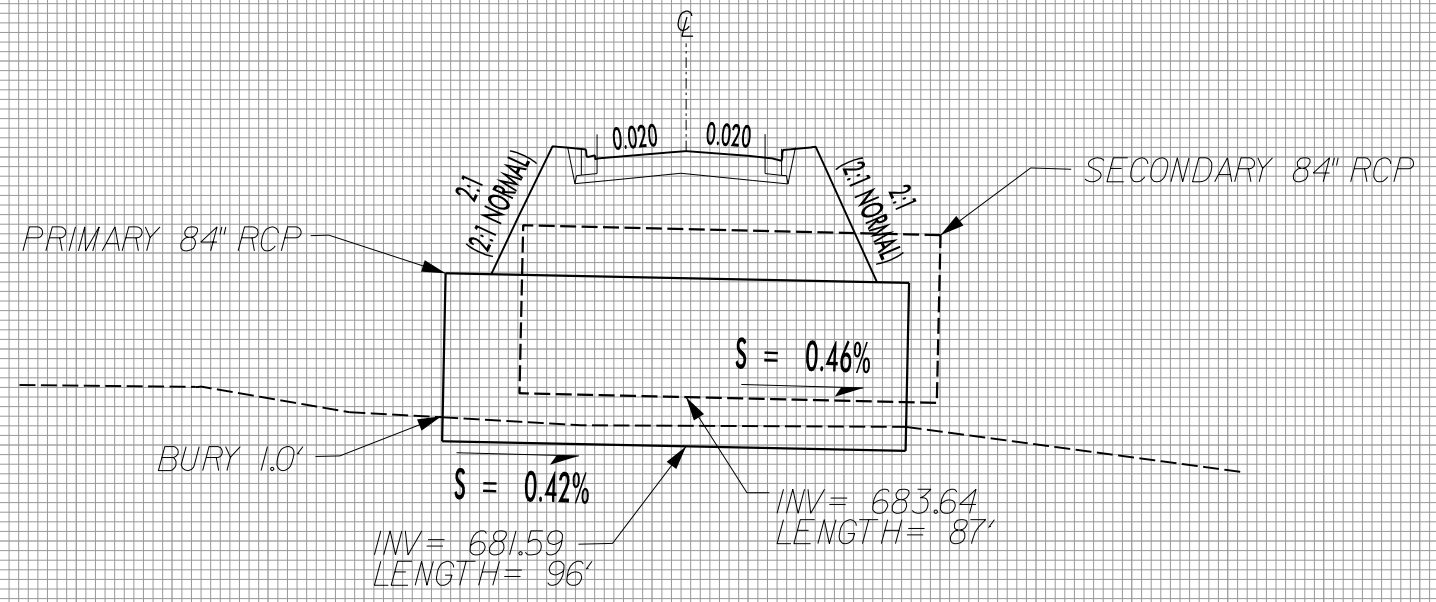
120 100 80 60 40 20 0 20 40 60 80 100 120 140

700
690
680
670



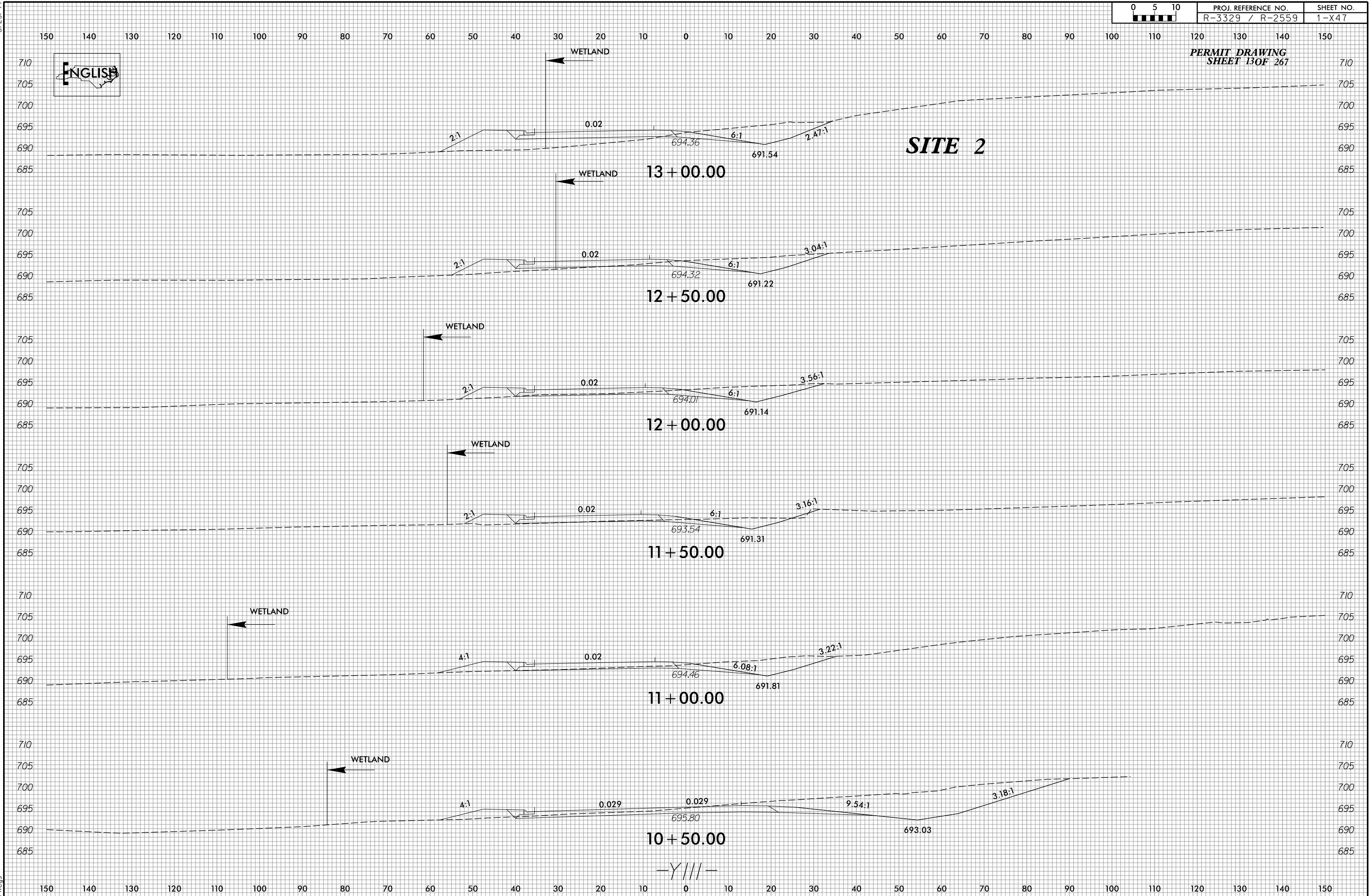
PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT SHEET		DRAWING 12 OF 267

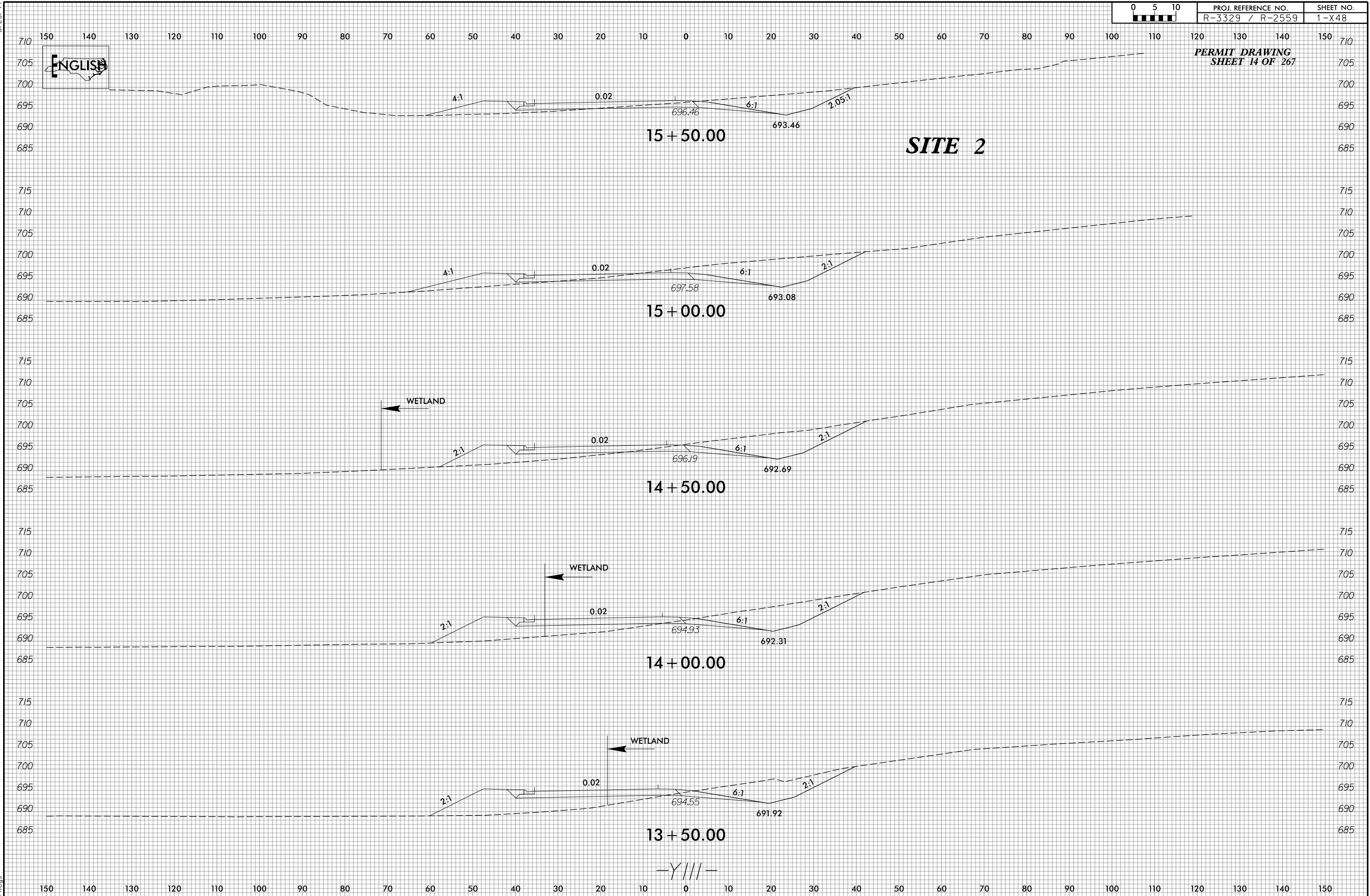
SITE 1 -DRI- 11+55



NOTE: BURY PRIMARY 84" RCP 1.0' BELOW STREAM BED.
INSTALL SECONDARY 84" RCP 1.0' ABOVE STREAM BED CHANNEL.

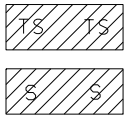
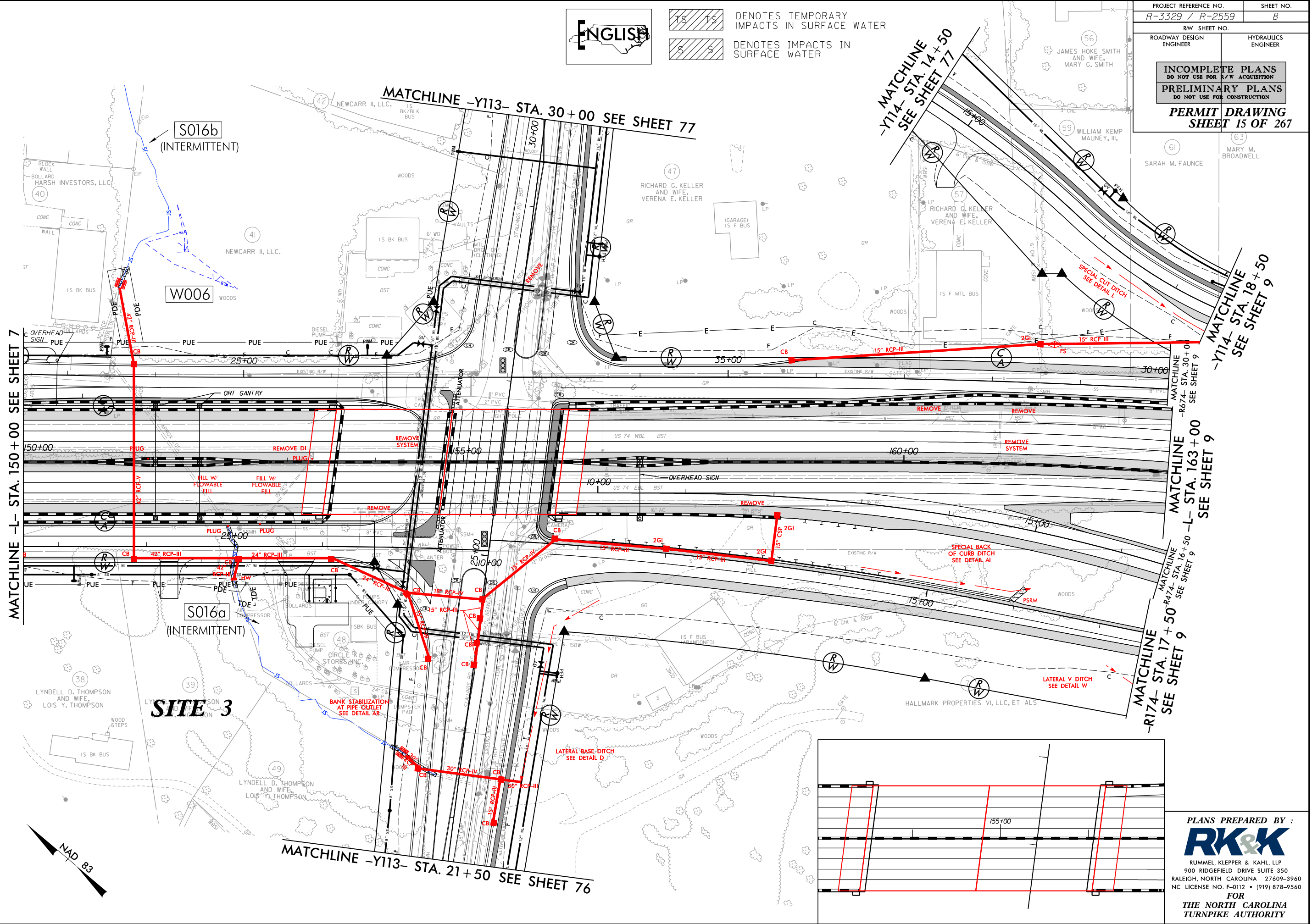
PROPOSED (2) 84" RCP





8/17/99

8/30/2004
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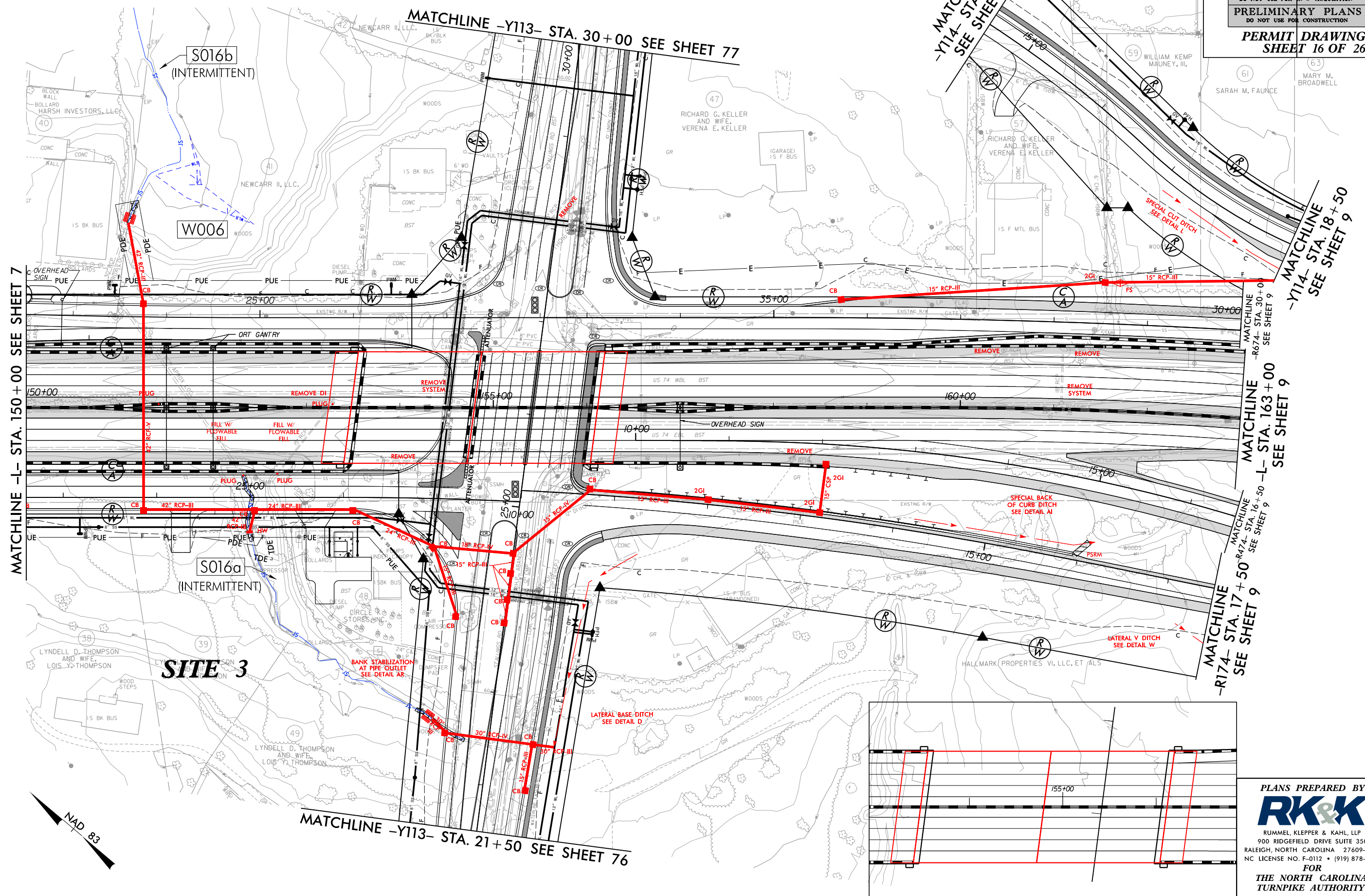


1S 1S DENOTES TEMPORARY IMPACTS IN SURFACE WATER
S S DENOTES IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 8
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 15 OF 267	

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ENGLISH

 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 DENOTES IMPACTS IN SURFACE WATER

MATCHLINE -L- STA. 150+00 SEE SHEET 7

MATCHLINE -Y113- STA. 21+50 SEE SHEET 76

ER

MATCHLINE
-Y114- STA. 14+50
SEE SHEET 77

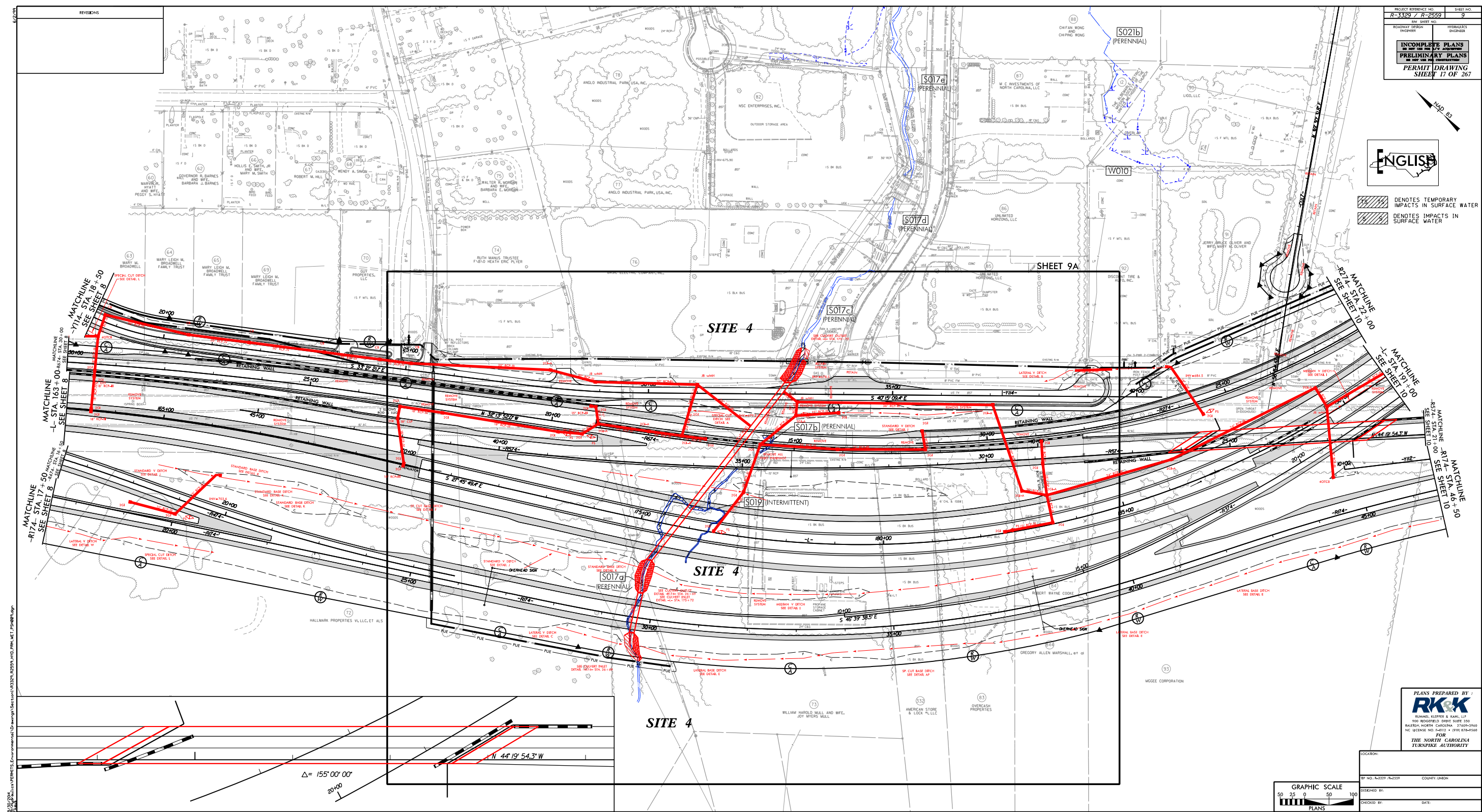
MATCHLINE
-Y114- STA. 18+50
SEE SHEET 9

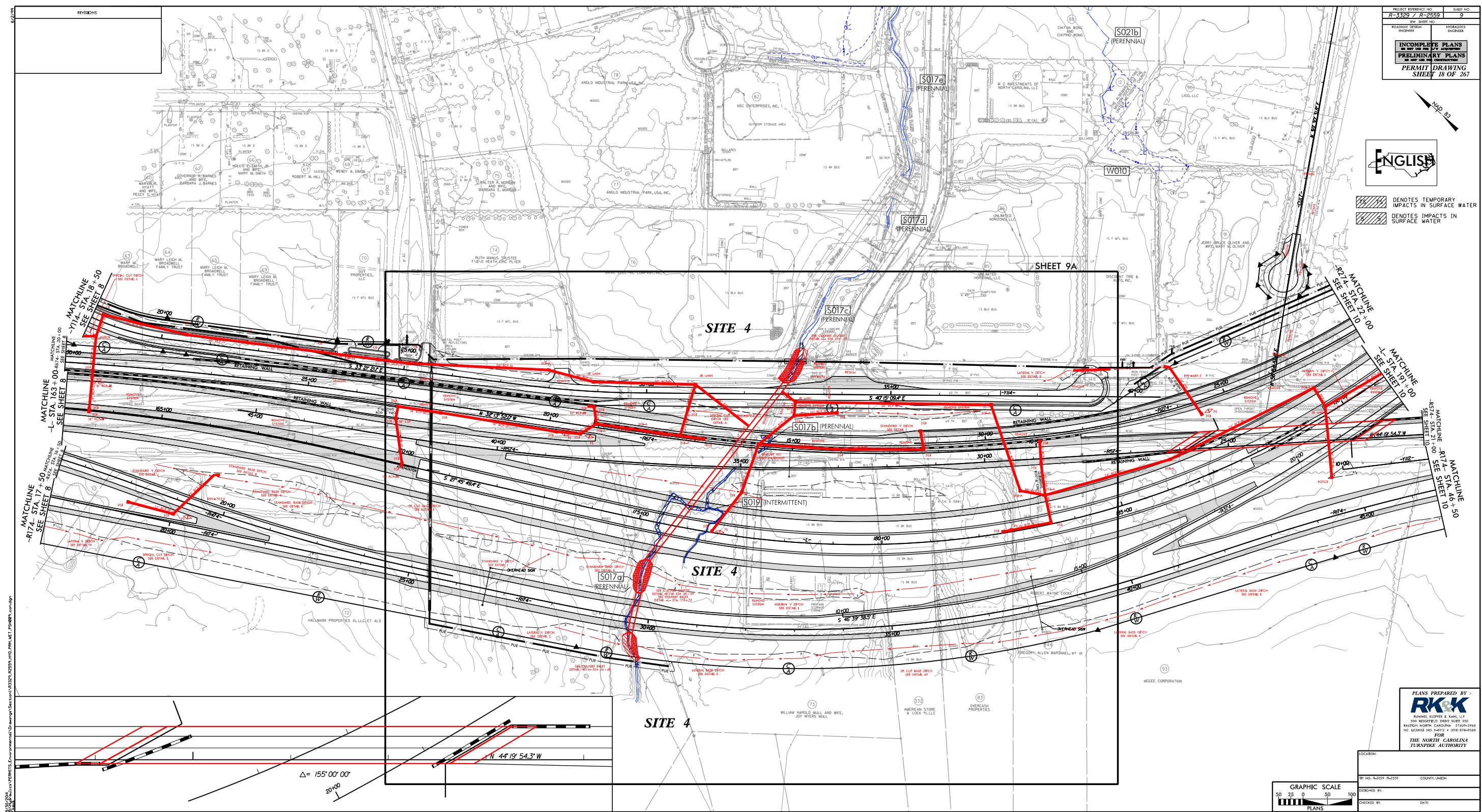
MATCHLINE
-R174- STA. 17 + 50
SEE SHEET 9

MATCHLINE
STA. 16 + 50
SEE SHEET 9

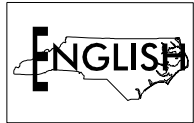
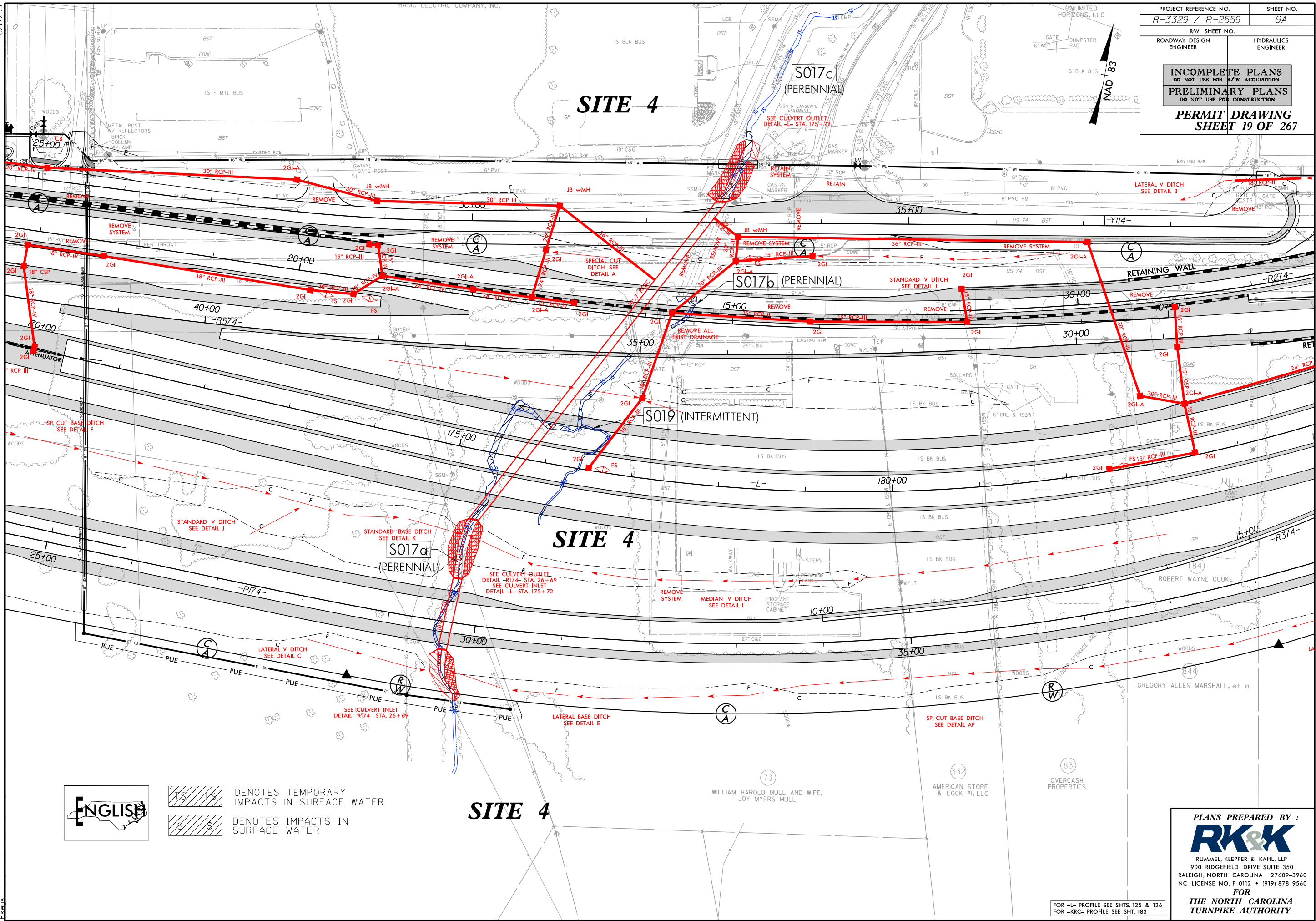
MATCHLINE
-L- STA. 163 + 00
SEE SHEET 9

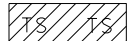
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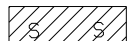




PROJECT REFERENCE NO. R-3329 / R-2559		SHEET NO. 9A	
RW SHEET NO. ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
PERMIT DRAWING SHEET 19 OF 267			



 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

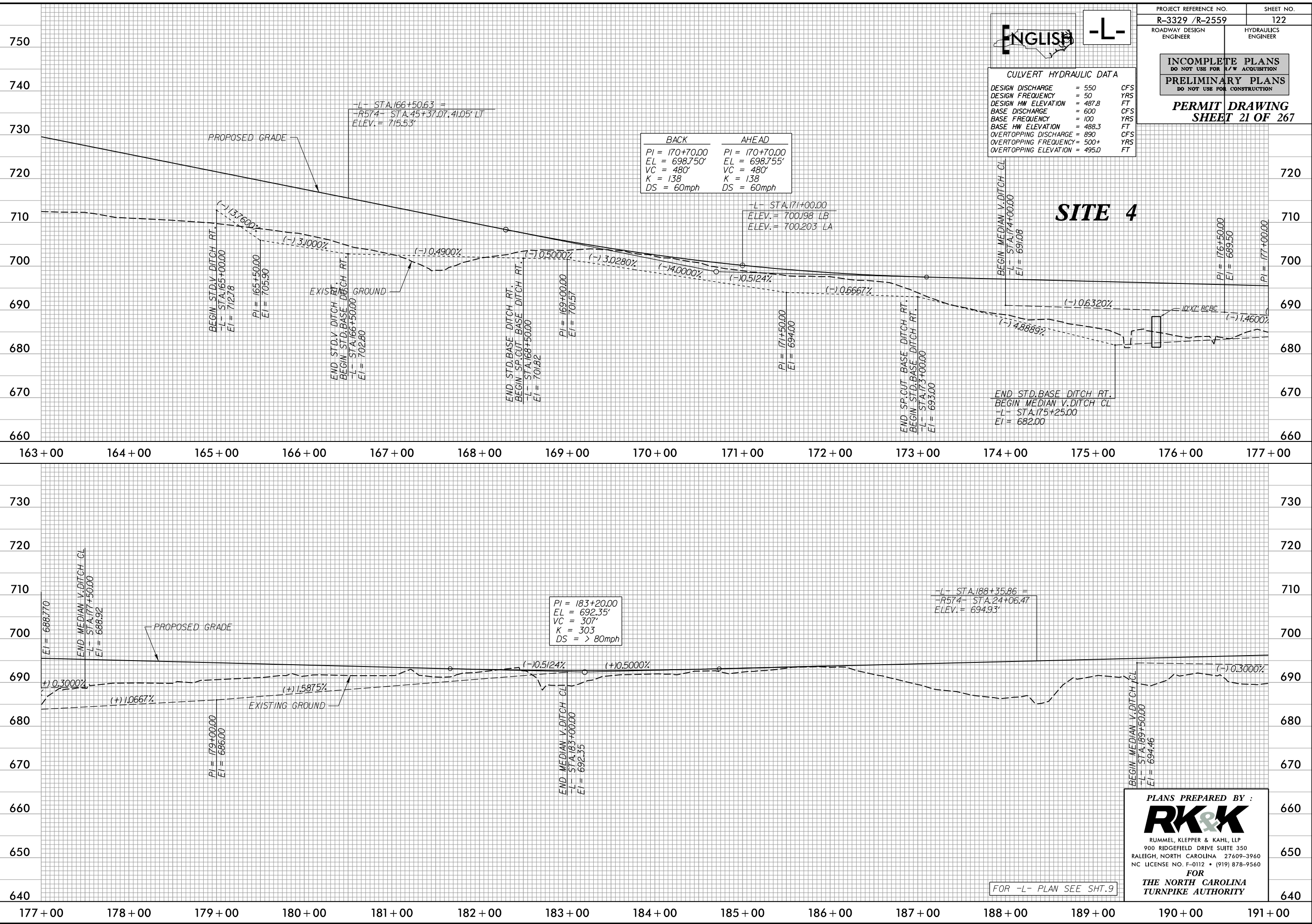
 DENOTES IMPACTS IN SURFACE WATER

SITE 4

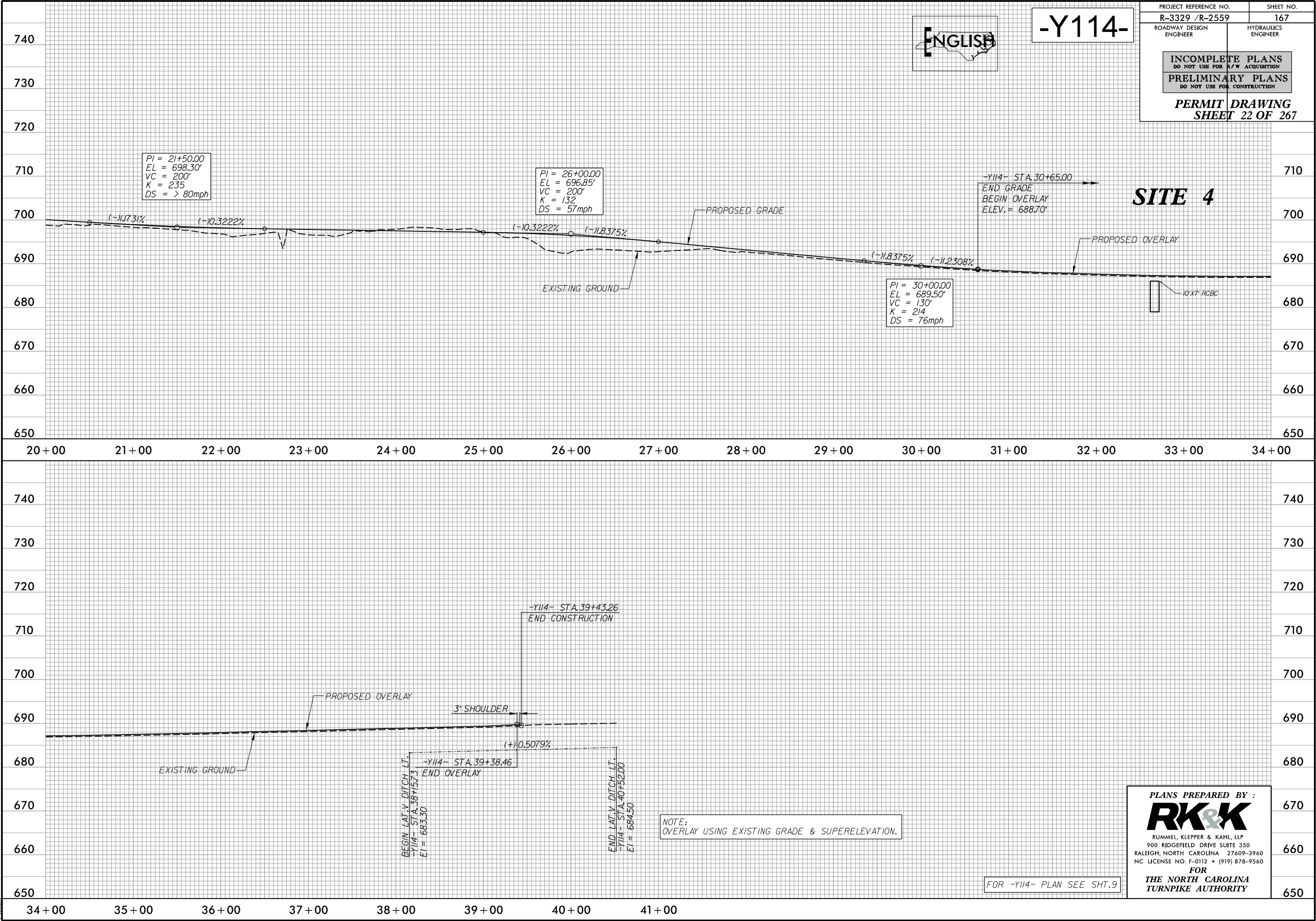
FOR -L- PROFILE SEE SHTS. 125 & 126
FOR -KRC- PROFILE SEE SHIT. 183

PLANS PREPARED BY :
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8/30/2004
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Elevs

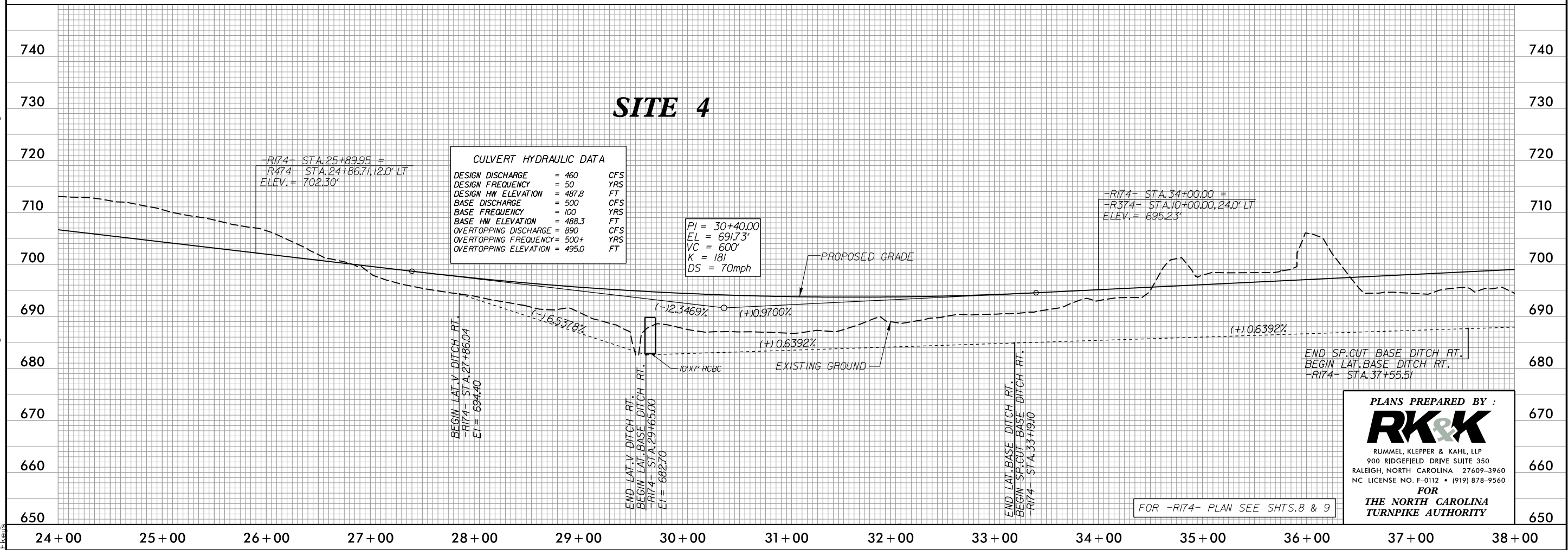
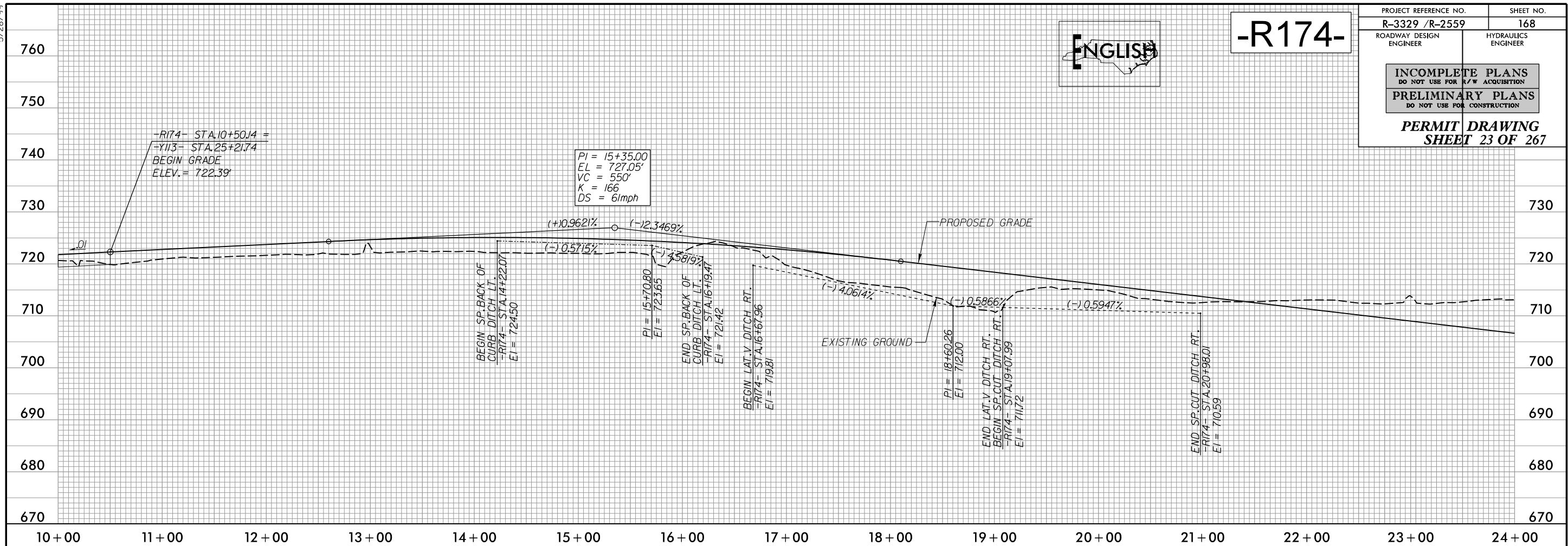


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Elevs



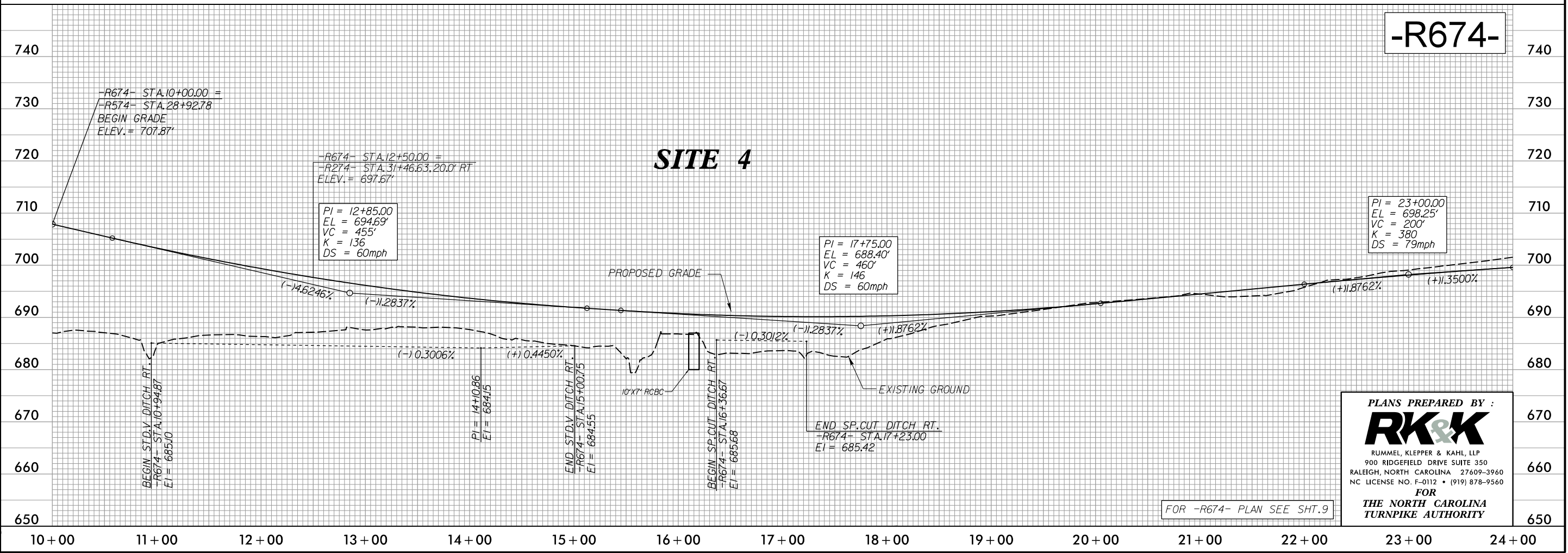
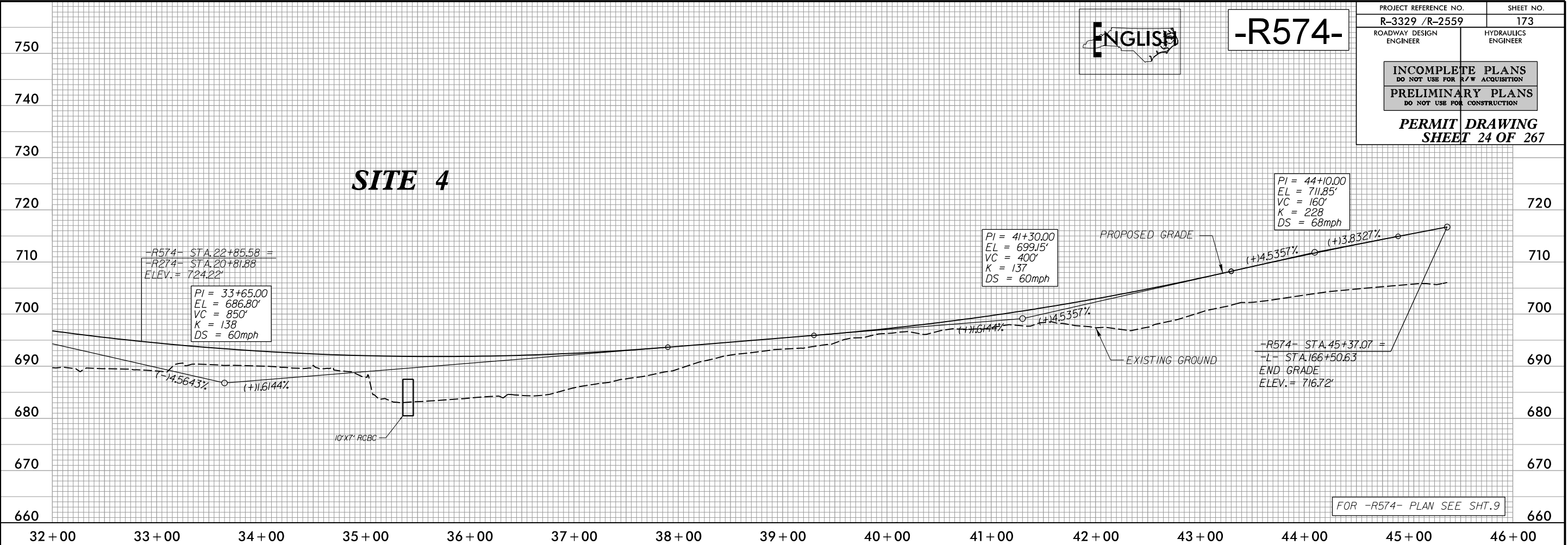


-R174-



5/28/99

8/29/2004
R:\Hydraulics\PERMITS_Environmental\Drawings\Section\ R3329_R2559_HYD_PRM_WET_PFL173.dgn
Elevs



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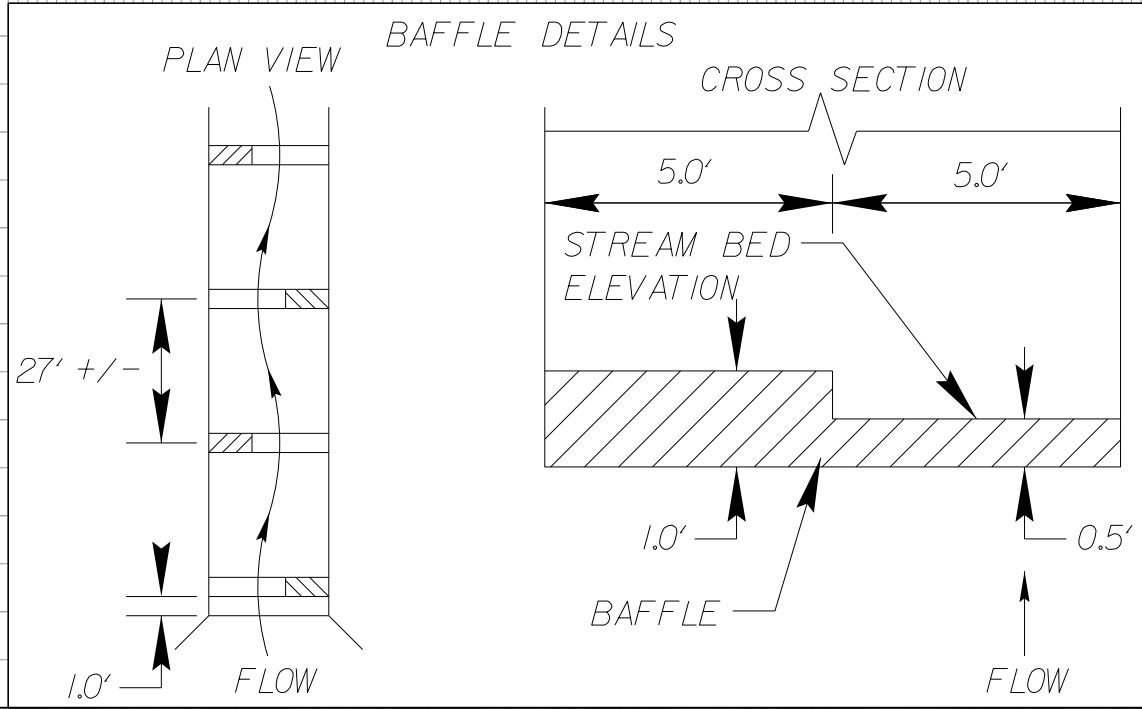
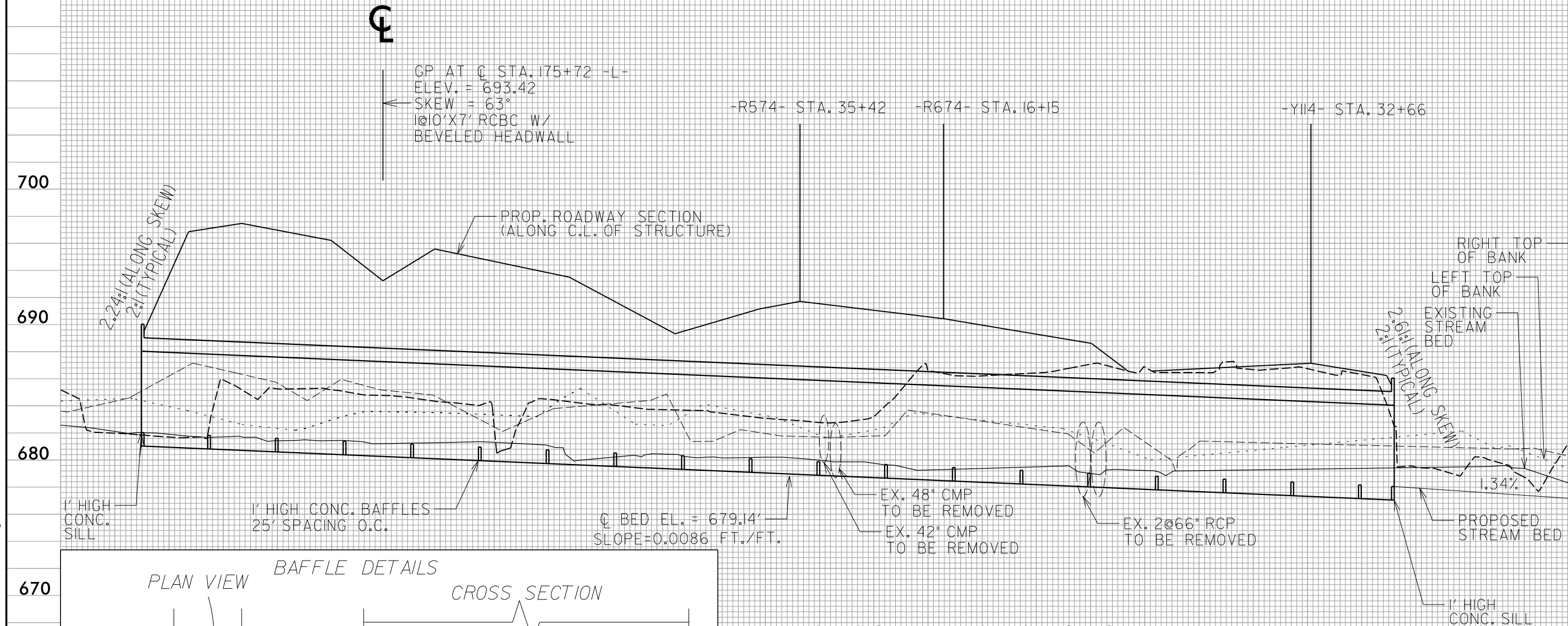
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TURNPIKE AUTHORITY

5/14/99
9/30/2004
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Elevs

SITE 4 -L- 175+72

ENGLISH

PROJECT REFERENCE NO. R-3329 /R-2559		SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT SHEET		DRAWING 25 OF 267



PROPOSED 10'X7' RCBC WITH BAFFLES

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 AT THE PROJECT SITE DURING
CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO
APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO
PERMIT CONDITIONS.

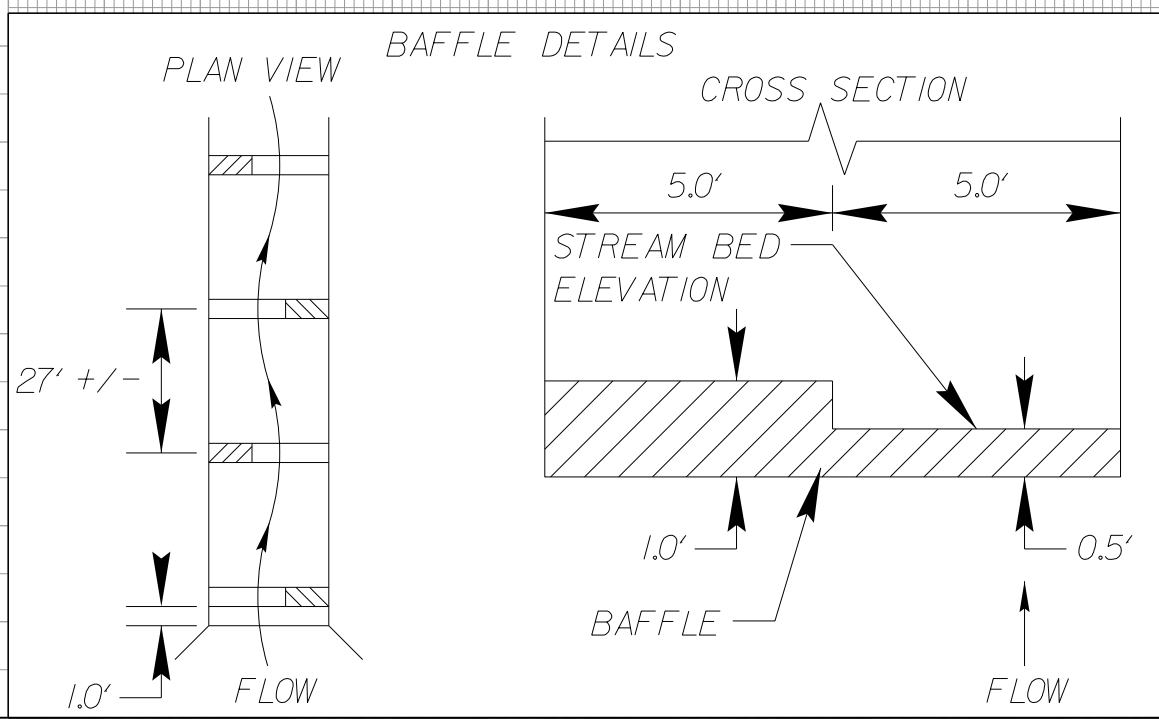
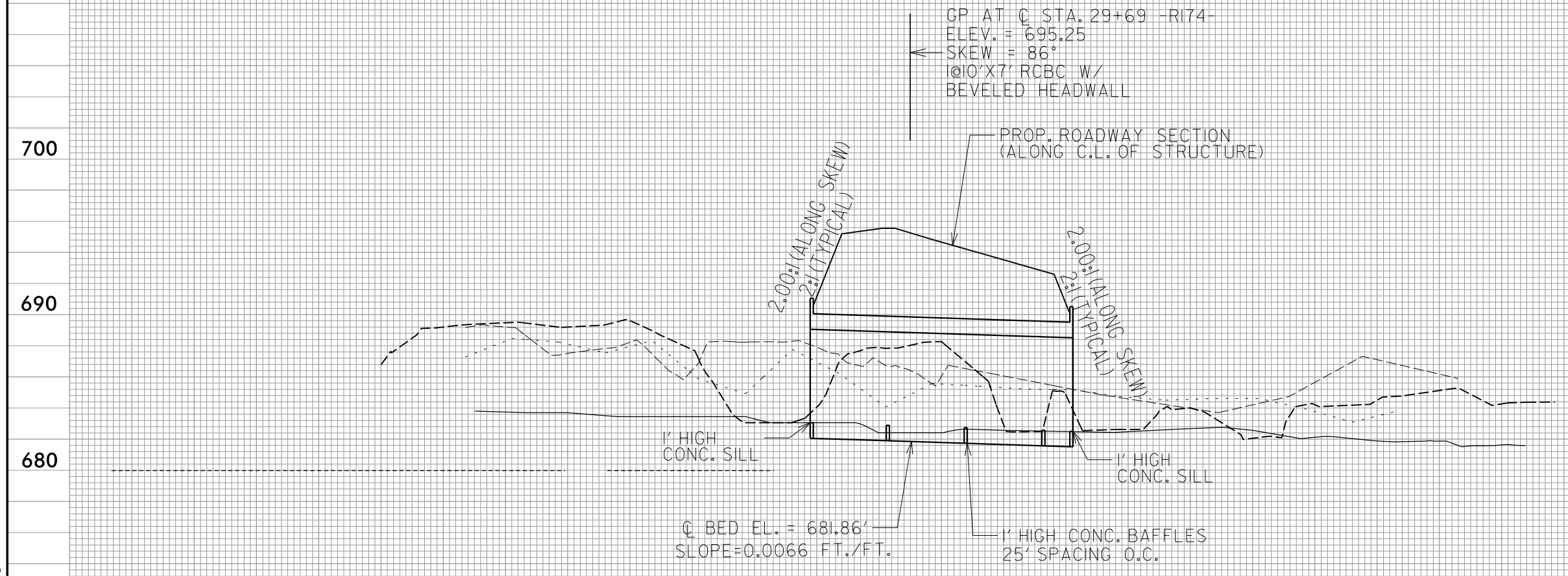
5/14/99
9/30/2004
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Elevs

SITE 4

-R174- STA. 29+69

ENGLISH

PROJECT REFERENCE NO.		SHEET NO.	
R-3329 /R-2559			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
PERMIT DRAWING		SHEET 26 OF 267	

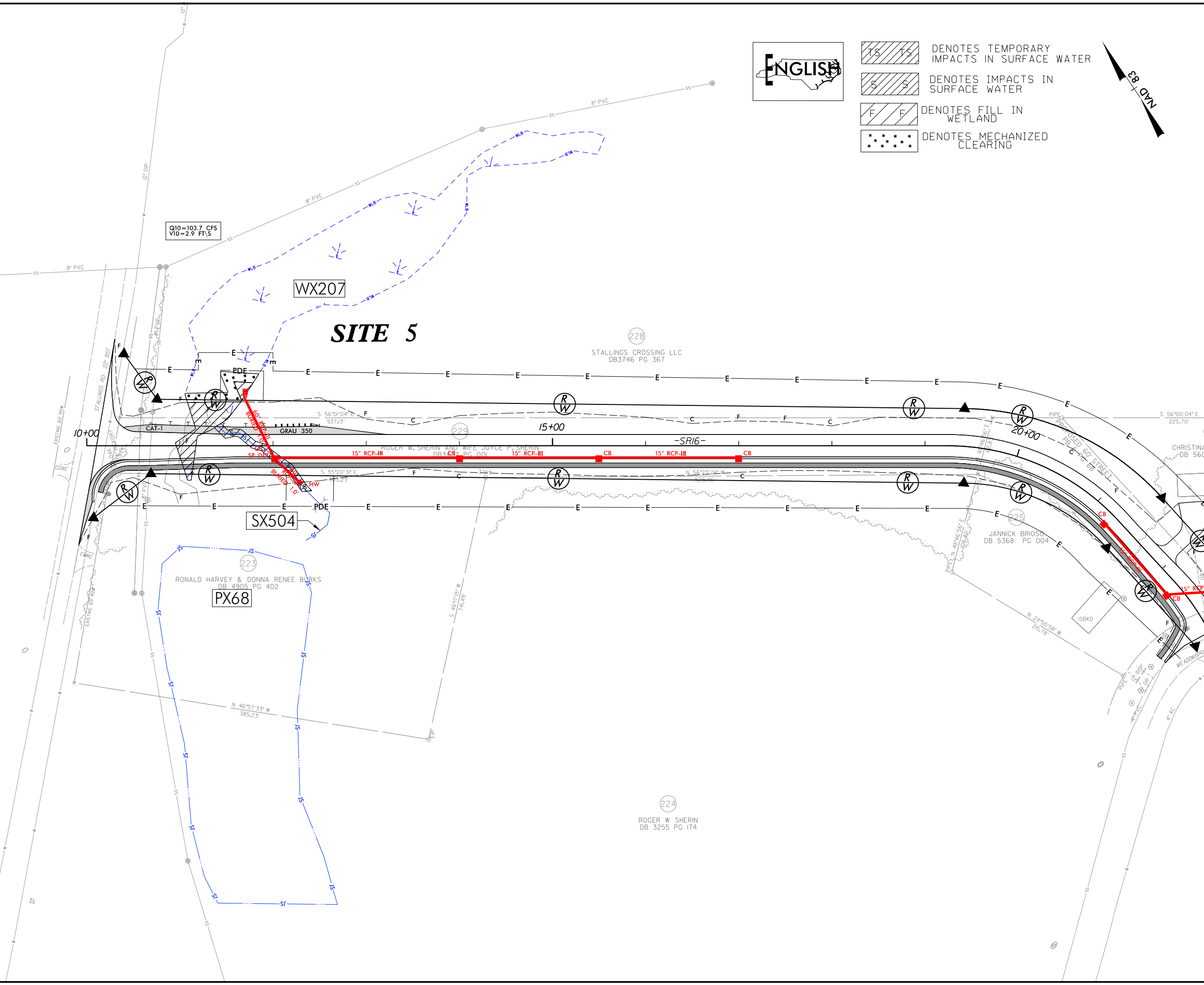


PROPOSED 10'X7' RCBC WITH BAFFLES

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 AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

8/17/99
8/29/2014
R:\Hydraulics\PERMITS\Environmental\Drawings\Section1\R3329_R2559_HYD_PRM_WET_PSH078.dgn
E:\



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

PROJECT REFERENCE NO. <i>R-3329 / R-2559</i>		SHEET NO. <i>78</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
<i>PERMIT</i>		<i>DRAWING</i>	
<i>SHEET</i>		<i>27 OF 267</i>	

FOR -SRI6- PROFILE SEE SHT. 175

PLANS PREPARED BY :

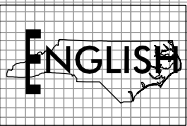
RK&K

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

FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

5/14/99

9/29/2014
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P:\kws



PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT SHEET		DRAWING 29 OF 267

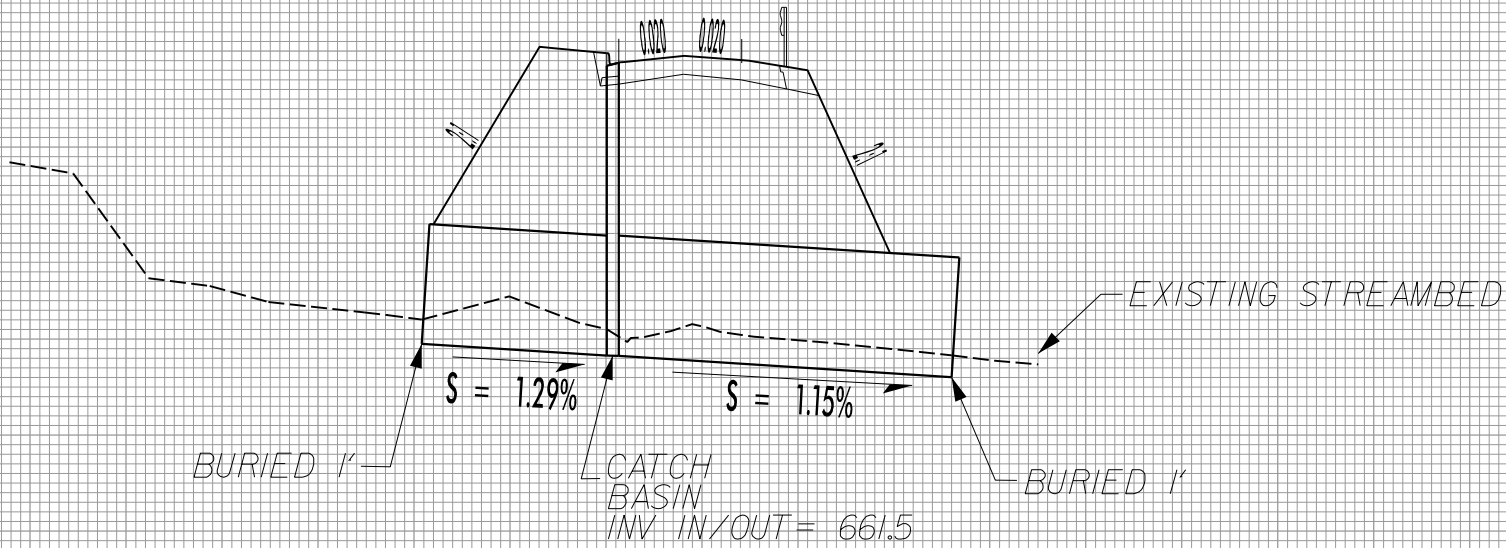
SITE 5
-SR16- 12+00

680

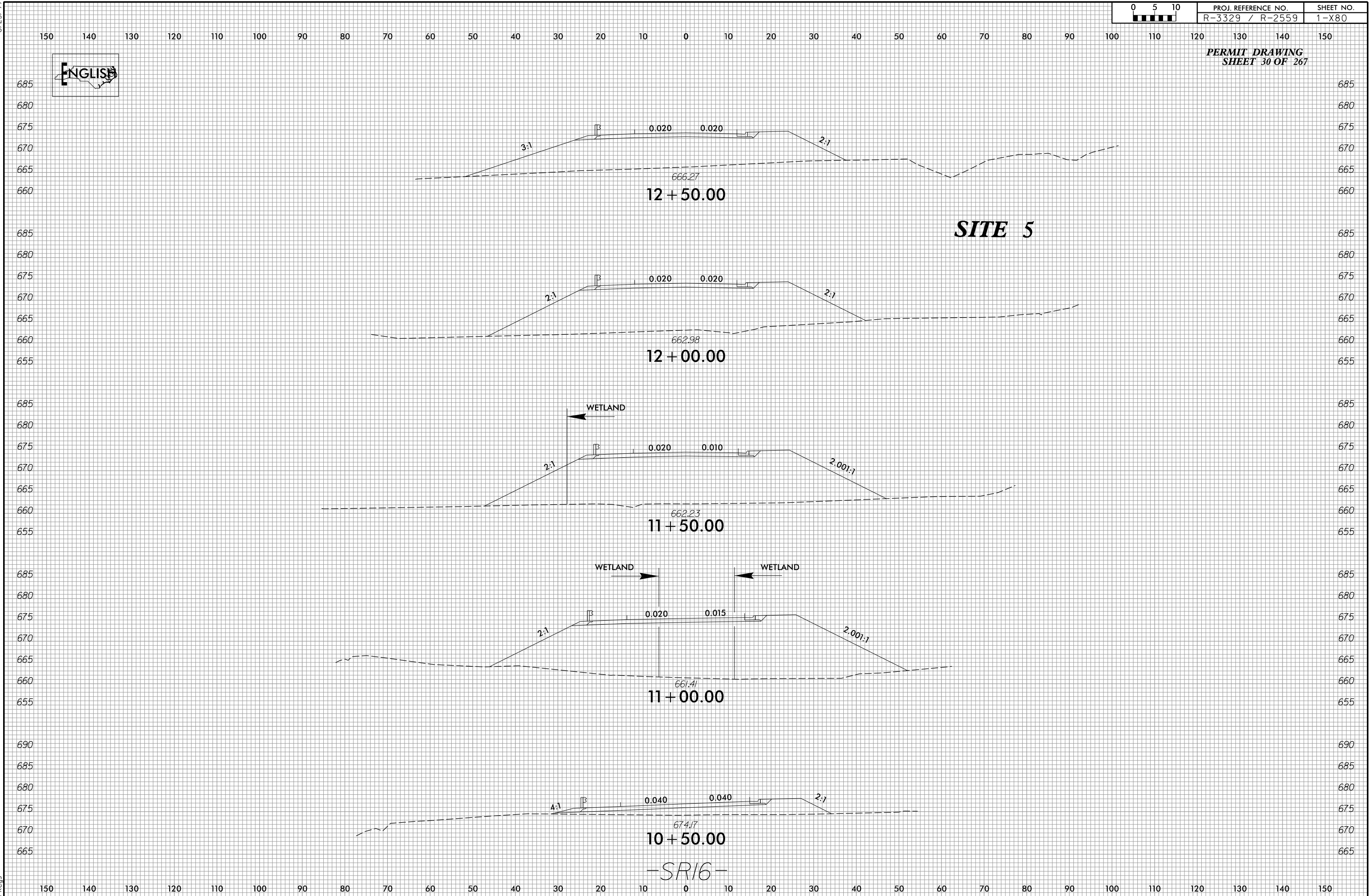
670

660

650



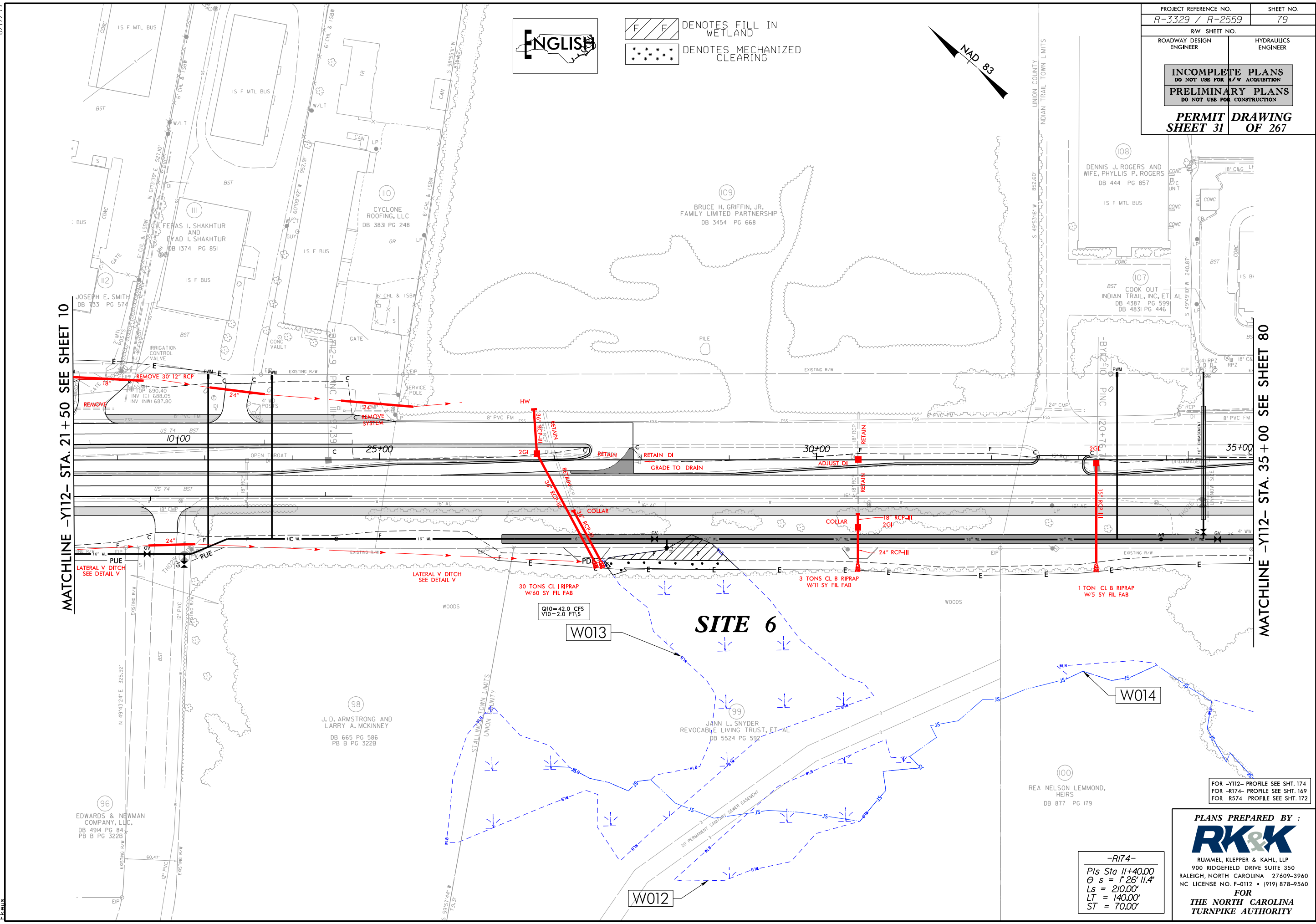
PROPOSED 60" RCP



8/17/99
8/29/2014
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E:\Users\jleu

MATCHLINE -Y112- STA. 21+50 SEE SHEET 10

MATCHLINE -Y112- STA. 35+00 SEE SHEET 80



ENGLISH

F F DENOTES FILL IN WETLAND

* * * * * DENOTES MECHANIZED CLEARING

PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	79
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT SHEET 31	DRAWING OF 267

FOR -Y112- PROFILE SEE SHT. 174
FOR -R174- PROFILE SEE SHT. 169
FOR -R574- PROFILE SEE SHT. 172

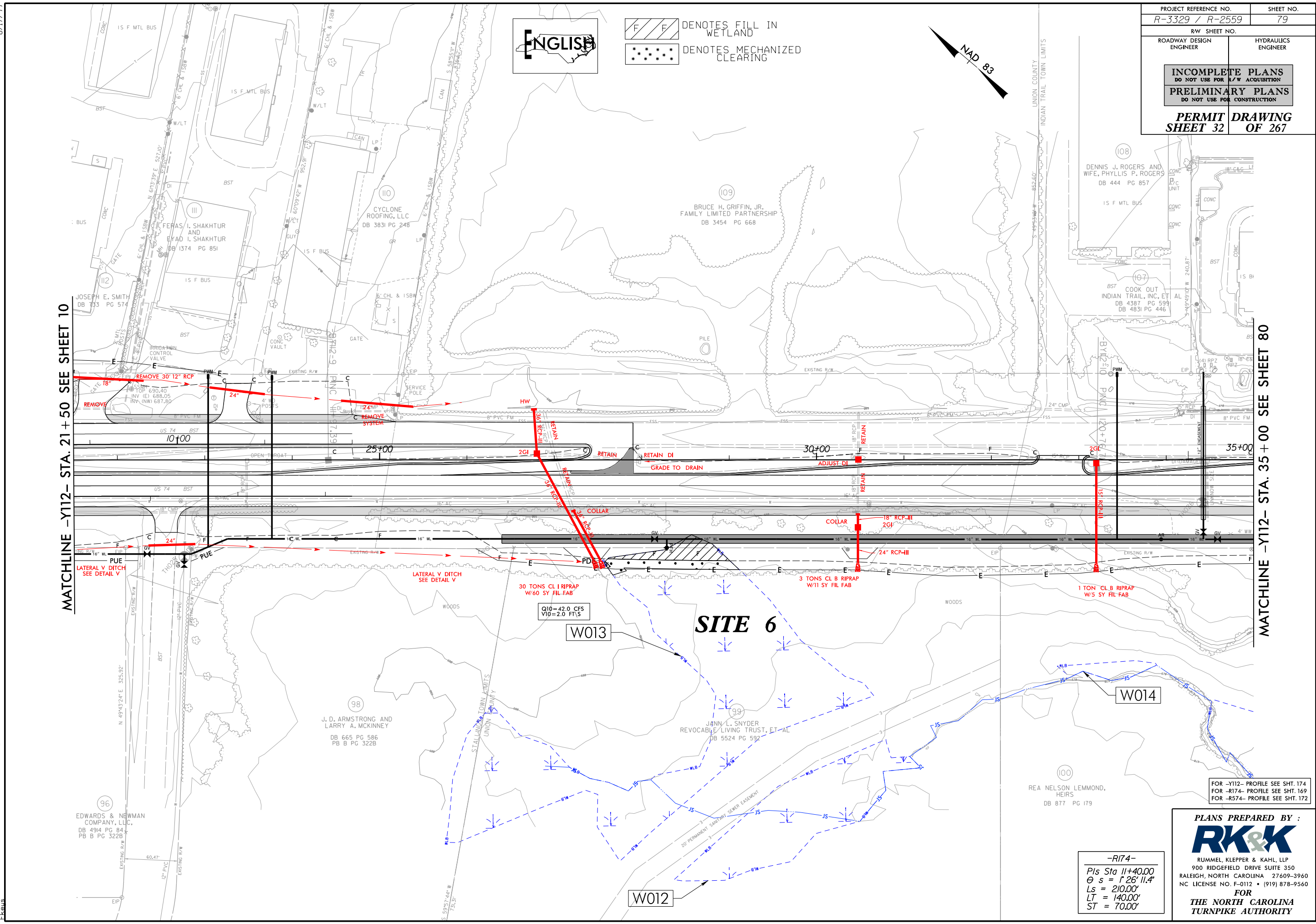
-R174-
Pls Sta 11+40.00
θ s = 1' 26" 11.4"
Ls = 210.00'
LT = 140.00'
ST = 70.00'

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
FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

8/17/99
8/29/2014
R:\Hydraulics\PERMITS\Environmental\Drawings\Section1\R3329_R2559_HYD_PRM_WET_PSH079_con.dgn

MATCHLINE -Y112- STA. 21+50 SEE SHEET 10

MATCHLINE -Y112- STA. 35+00 SEE SHEET 80



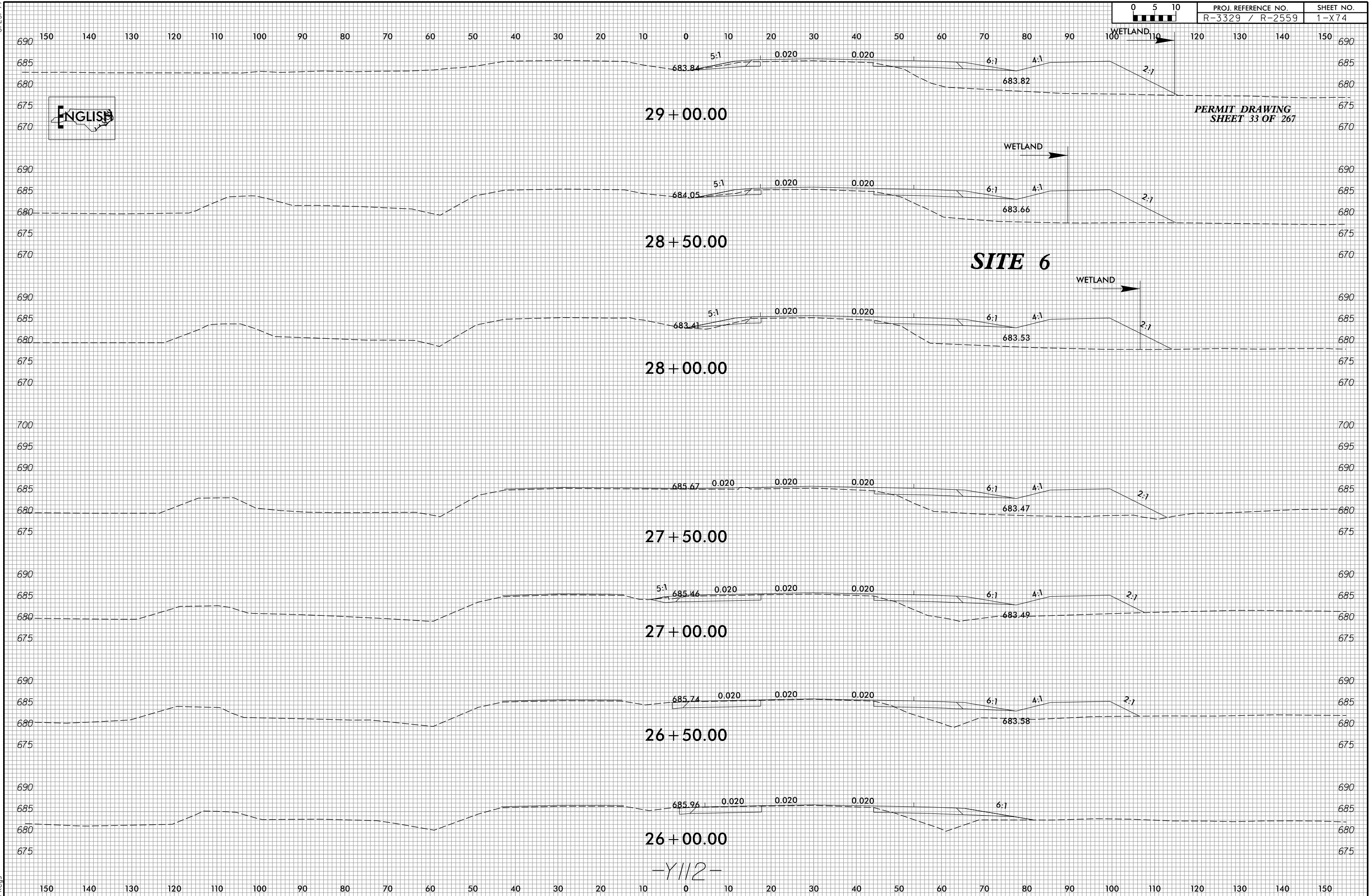
F F DENOTES FILL IN WETLAND
... DENOTES MECHANIZED CLEARING

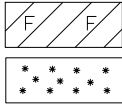
PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 79
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT SHEET 32	DRAWING OF 267

-R174-
Pis Sta 11+40.00
θ s = 1.26' 11.4"
Ls = 210.00'
LT = 140.00'
ST = 70.00'

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
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TURNPIKE AUTHORITY

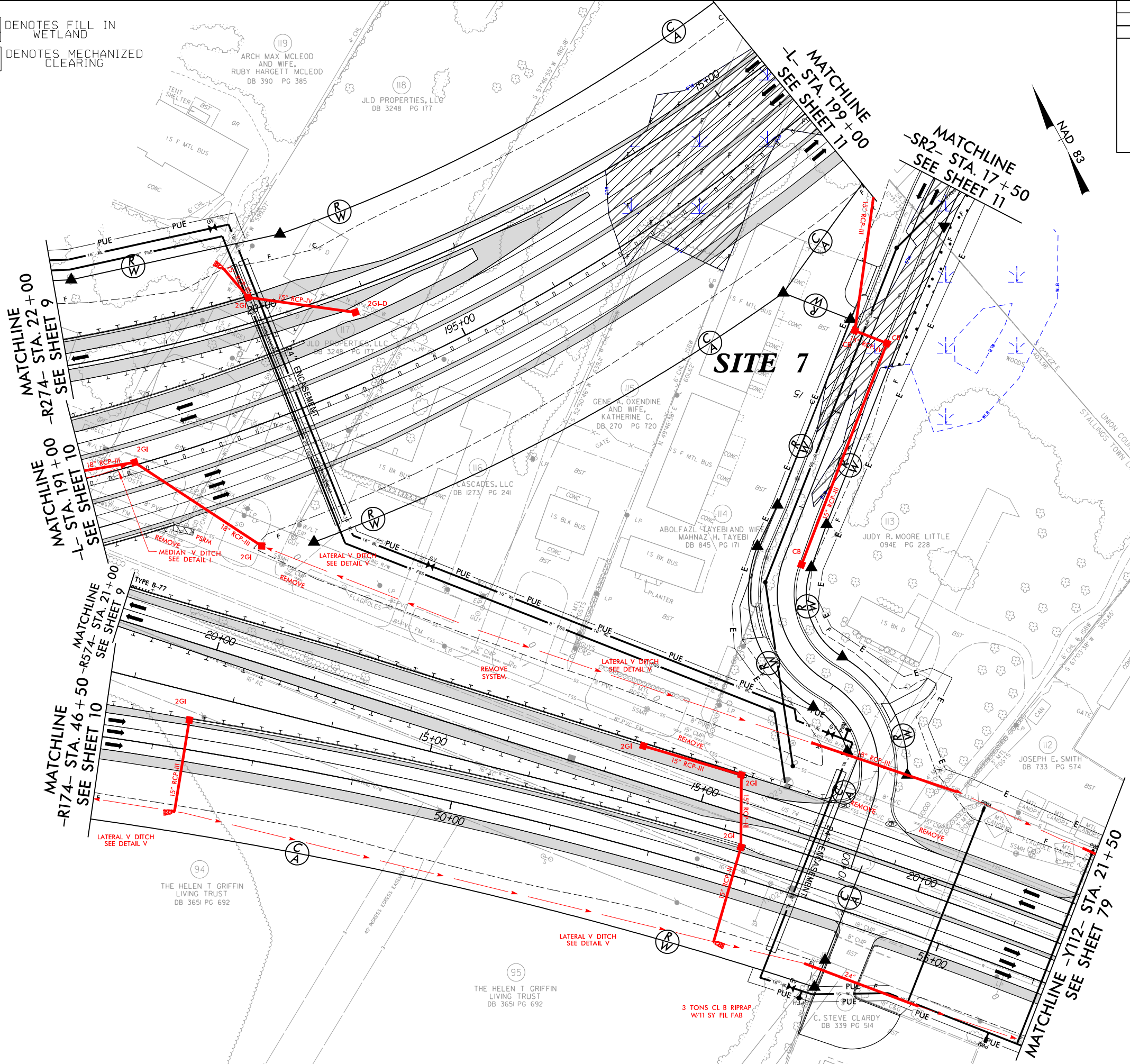
FOR -Y112- PROFILE SEE SHT. 174
FOR -R174- PROFILE SEE SHT. 169
FOR -R574- PROFILE SEE SHT. 172





DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING

PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 34 OF 267	

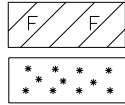


PLANS PREPARED BY :

RK&K

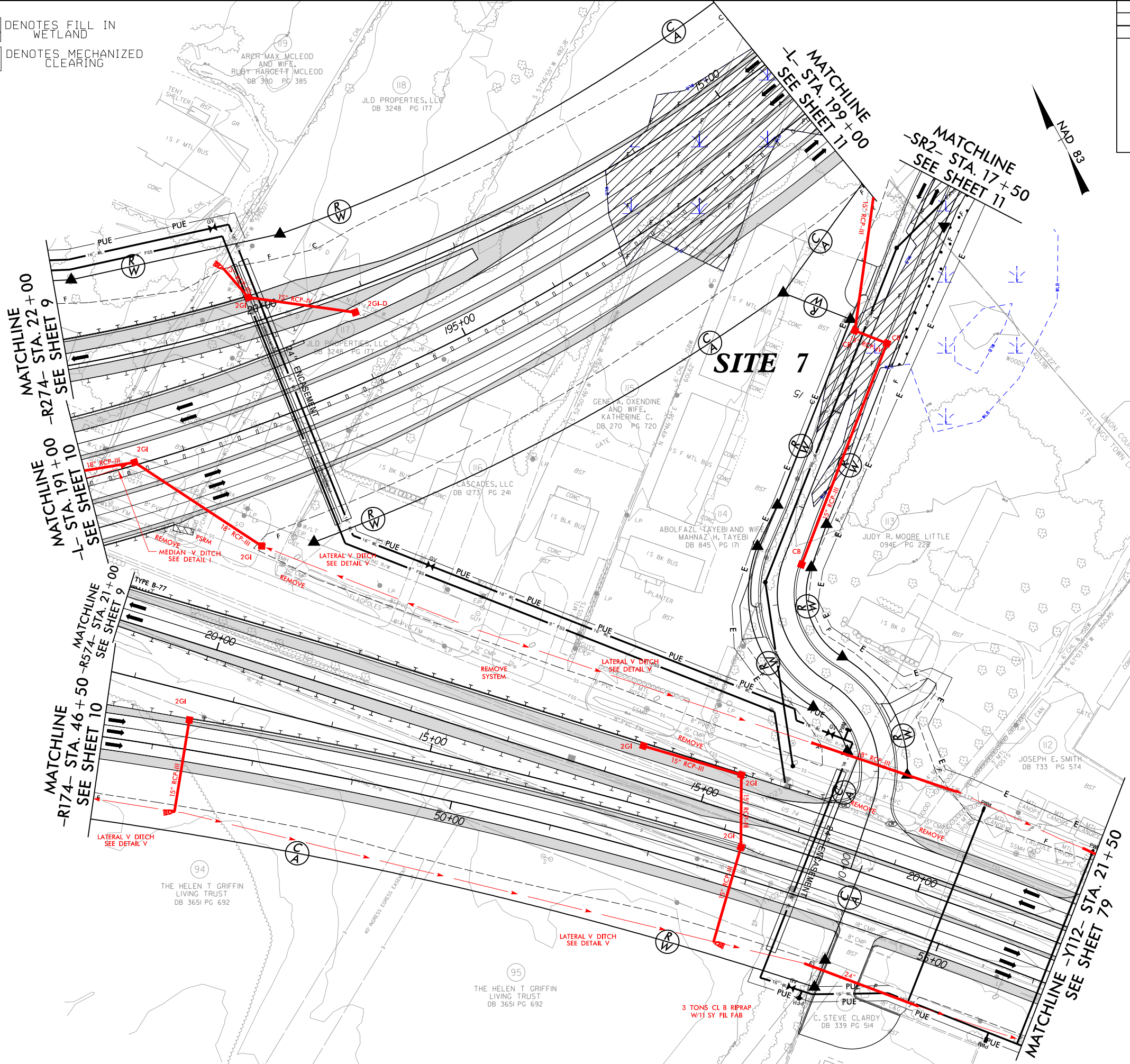
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY



DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING

PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 35 OF 267	



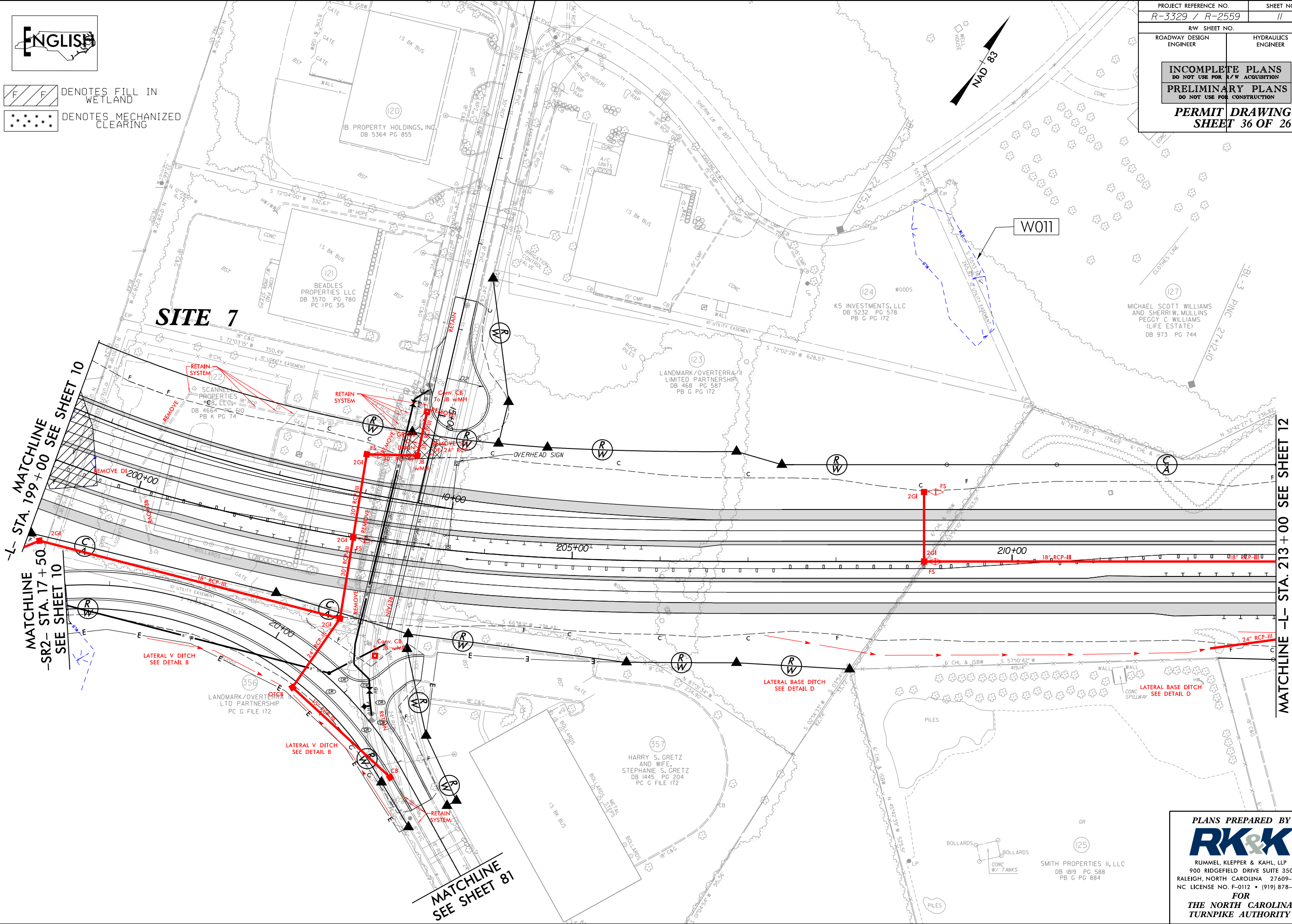
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560
FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

8/17/99



F F DENOTES FILL IN WETLAND
***** DENOTES MECHANIZED CLEARING

PROJECT REFERENCE NO. <i>R-3329 / R-2559</i>		SHEET NO. <i>11</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
<i>PERMIT DRAWING SHEET 36 OF 267</i>			



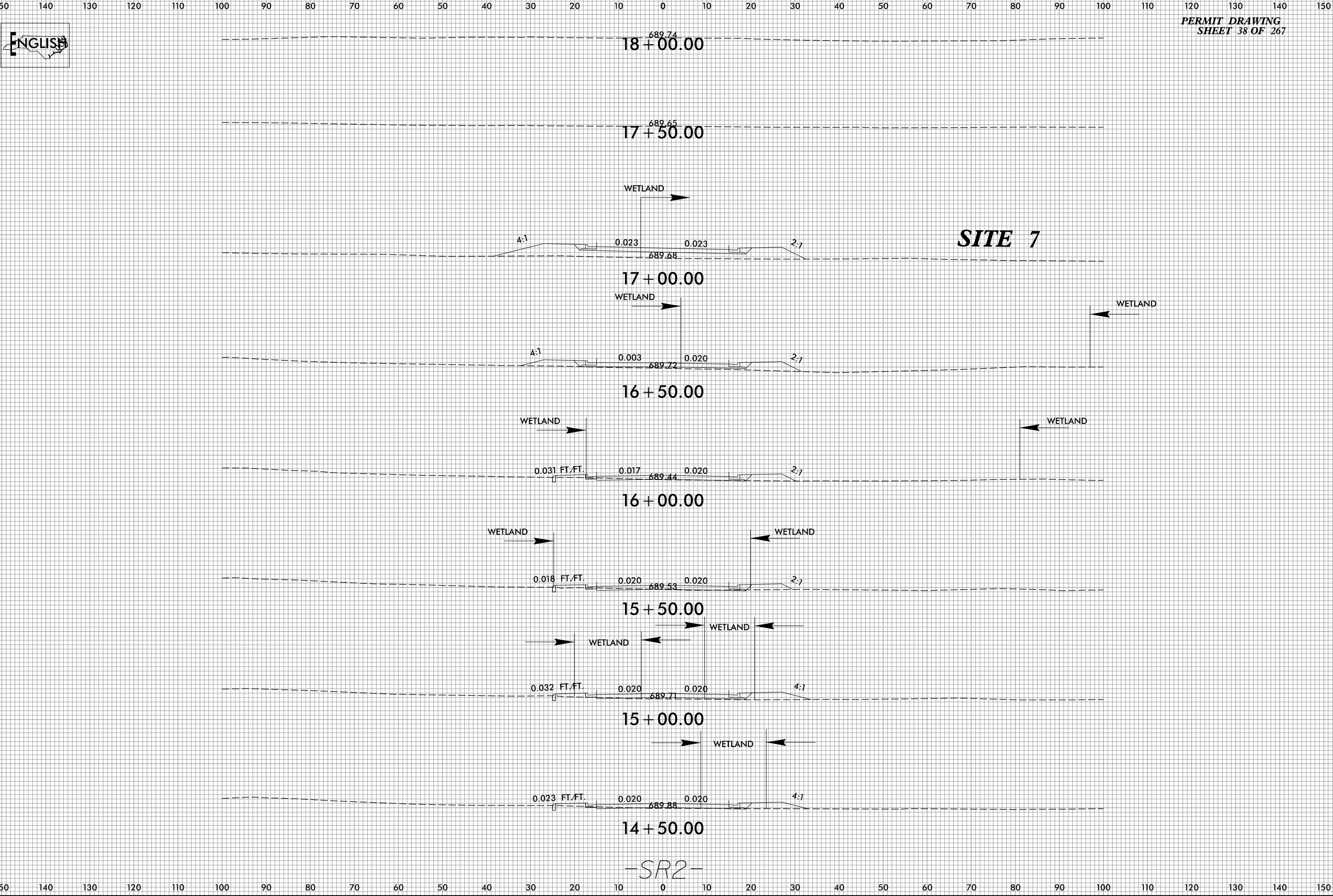
8/29/2014
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E:\Users\jlewis

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
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TURNPIKE AUTHORITY

9/29/2014
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8/23/99

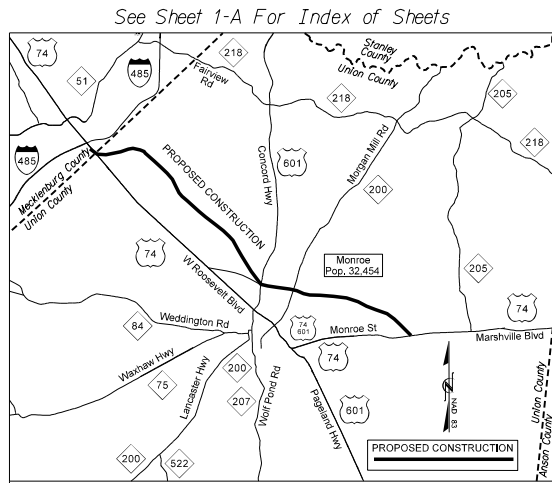
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keds



-SR2-

TIP PROJECT: R-3329 /R-2559

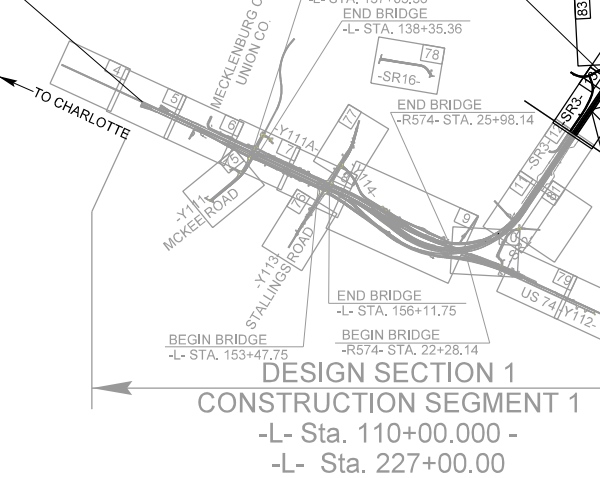
CONTRACT: C202587



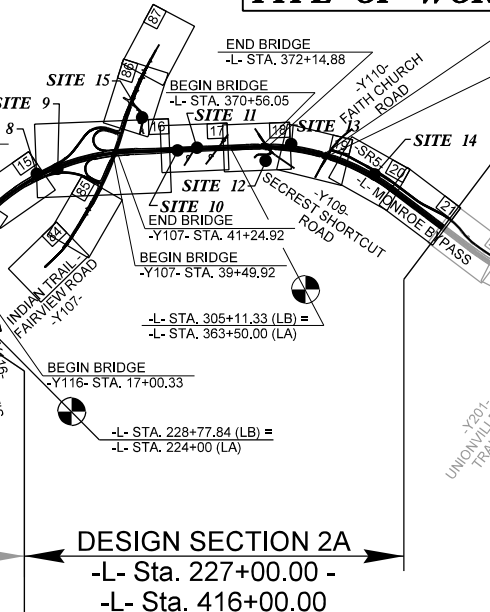
VICINITY MAP

BEGIN TIP PROJECT R-3329 / R-2559

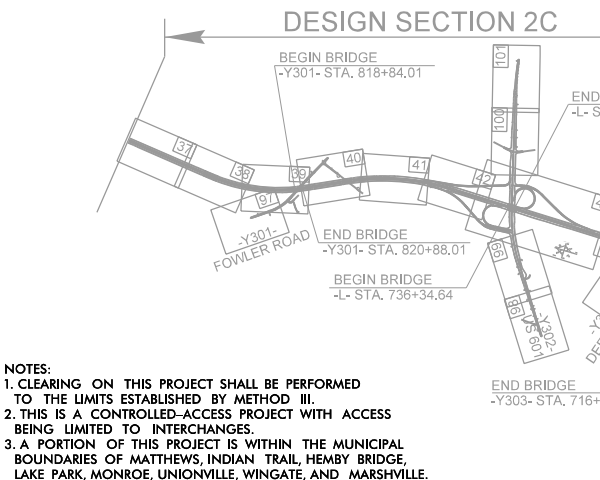
-L- Sta. 110+00.00



DESIGN SECTION 1
CONSTRUCTION SEGMENT 1
-L- Sta. 110+00.000 -
-L- Sta. 227+00.00

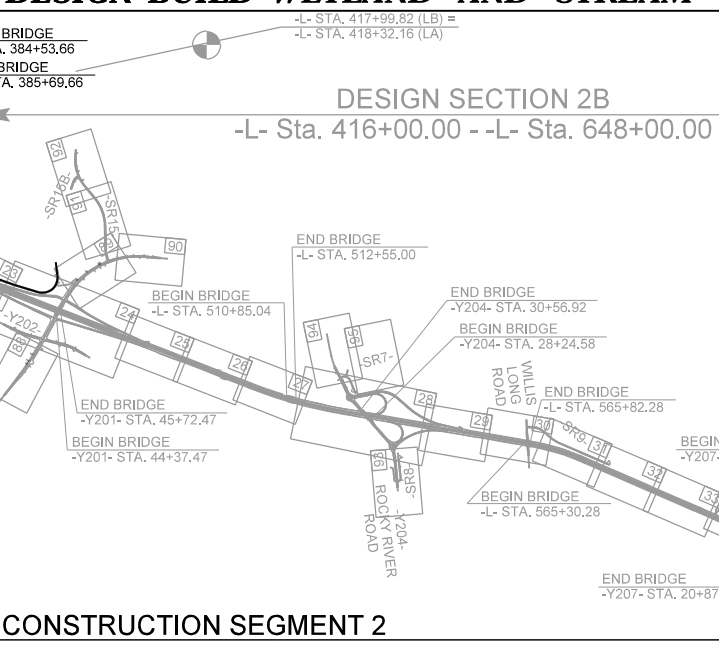


DESIGN SECTION 2A
CONSTRUCTION SEGMENT 2
-L- Sta. 227+00.00 -
-L- Sta. 416+00.00



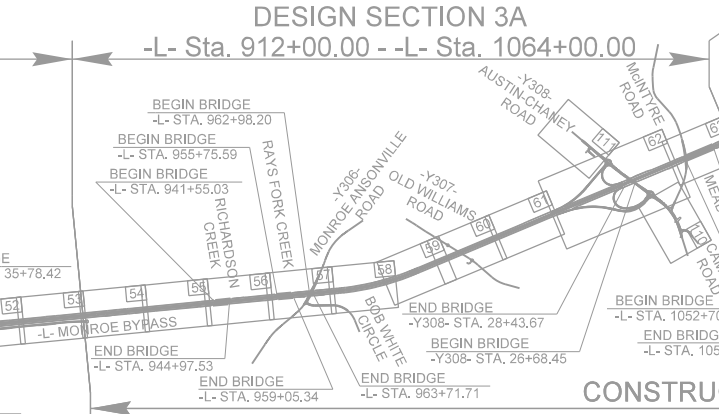
DESIGN SECTION 2C

CONSTRUCTION SEGMENT 2 CONT.
-L- Sta. 648+00.00 -L- Sta. 912+00.00



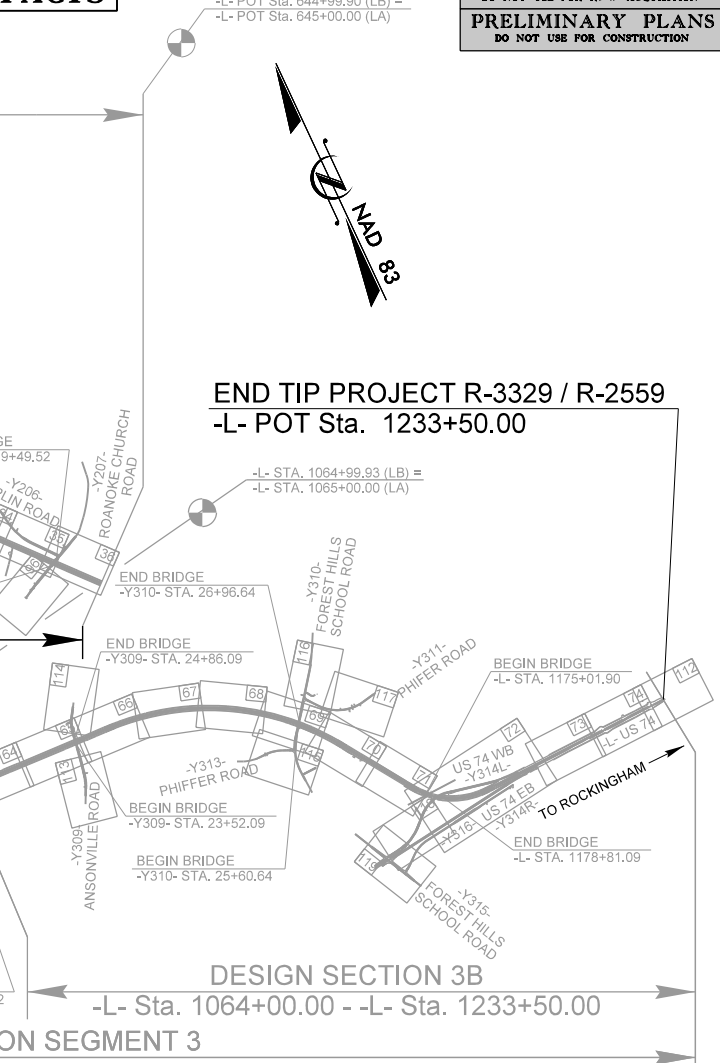
DESIGN SECTION 2B
-L- Sta. 416+00.00 -L- Sta. 648+00.00

CONSTRUCTION SEGMENT 2



DESIGN SECTION 3A
-L- Sta. 912+00.00 -L- Sta. 1064+00.00

CONSTRUCTION SEGMENT 3



DESIGN SECTION 3B
-L- Sta. 1064+00.00 -L- Sta. 1233+50.00

END TIP PROJECT R-3329 / R-2559

-L- POT Sta. 1233+50.00

-L- STA. 1064+99.93 (LB) =
-L- STA. 1065+00.00 (LA)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MECKLENBURG & UNION COUNTY

LOCATION: US 74 BYPASS FROM US 74 JUST EAST OF
I-485 NEAR MATTHEWS AND STALLINGS TO
US 74 JUST EAST OF WINGATE AND WEST OF MARSHVILLE

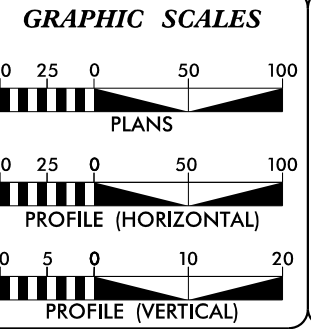
TYPE OF WORK: DESIGN-BUILD WETLAND AND STREAM IMPACTS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3329 /R-2559	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34533.5.TA1			

PERMIT DRAWING
SHEET 39 OF 267

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

- NOTES:
- 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.
 - A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF MATTHEWS, INDIAN TRAIL, HEMBY BRIDGE, LAKE PARK, MONROE, UNIONVILLE, WINGATE, AND MARSHVILLE.



DESIGN DATA

ADT 2013 =	64,100
ADT 2035 =	95,600
DHV =	8%
D =	55%
T =	18%*
V =	70 mph

*TTST 11% DUAL 7%
FUNCTIONAL CLASS.: FREEWAY

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-3329 /R-2559.....	18.1 mi
LENGTH STRUCTURE TIP PROJECT R-3329 /R-2559.....	*1.6 mi
TOTAL LENGTH TIP PROJECT R-3329 /R-2559.....	19.7 mi

* LENGTH OF STRUCTURES BASED ON WB LANES

DESIGN - BUILD TEAM

PLANS PREPARED BY :



RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO. F-0112

2012 STANDARD SPECIFICATIONS

LETTING DATE:
OCTOBER 28, 2010

J.T. Peacock, Jr., P.E.
PROJECT ENGINEER

Stephen E. Roberts, P.E.
PROJECT DESIGN ENGINEER

CONTRACTOR :



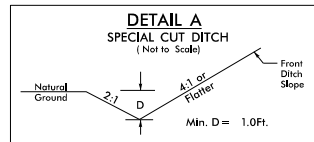
HYDRAULICS ENGINEER

SIGNATURE: P.E.
ROADWAY DESIGN ENGINEER

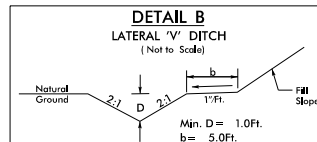
SIGNATURE: P.E.



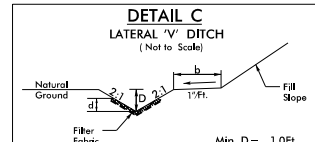
PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 2A-2F
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION PERMIT DRAWING SHEET 40 OF 267	



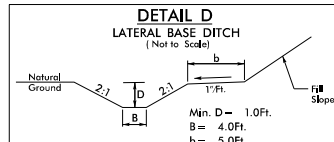
-L2A- STA. 226+50 TO STA. 229+00 LT
-L2A- STA. 281+00 TO STA. 282+50 RT
-L2A- STA. 285+00 TO STA. 287+00 LT
-L2A- STA. 289+00 TO STA. 289+50 RT
-L2A- STA. 295+00 TO STA. 297+00 RT
-L2A- STA. 413+00 TO STA. 414+00 RT
-KRC- STA. 18+70 TO STA. 20+50 RT
-SR3- STA. 29+00 TO STA. 29+81 RT
-SR3- STA. 29+00 TO STA. 29+85 RT
-Y115- STA. 13+50 TO STA. 16+00 RT
-SR4- STA. 12+50 TO STA. 14+00 RT
-Y107- STA. 15+90 TO STA. 16+50 LT & RT
-Y107- STA. 51+00 TO STA. 52+00 LT
-Y107- STA. 53+00 TO STA. 56+65 LT
-Y107- STA. 62+50 TO STA. 63+00 LT & RT
-Y109- STA. 18+00 TO STA. 21+00 LT
-Y116- STA. 22+50 TO STA. 23+50 LT & RT



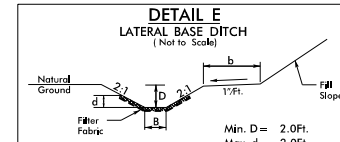
-Y107- STA. 17+35 TO STA. 18+70 LT
-Y107- STA. 56+65 TO STA. 58+00 LT



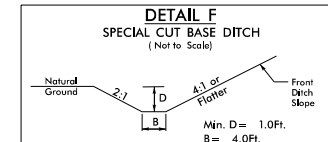
-X- STA. XX+XX TO STA. XX+XX XT



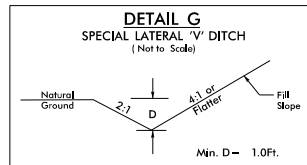
-L2A- STA. 263+00 TO STA. 264+90 RT
-L2A- STA. 289+50 TO STA. 295+00 RT
-L2A- STA. 291+50 TO STA. 293+70 LT
-L2A- STA. 364+00 TO STA. 370+55 LT
-L2A- STA. 371+20 TO STA. 373+55 LT
-L2A- STA. 373+50 TO STA. 375+24 RT
-L2A- STA. 375+50 TO STA. 379+50 RT
-L2A- STA. 397+00 TO STA. 409+50 RT
-KRC- STA. 16+25 TO STA. 18+70 RT
-SR107- STA. 11+50 TO STA. 17+50 LT
-SR5- STA. 34+35.74 TO STA. 38+92.70 RT
-Y107- STA. 18+00 TO STA. 21+91 LT
-Y107- STA. 21+91 TO STA. 24+50 RT
-Y109- STA. 15+50 TO STA. 15+93 LT



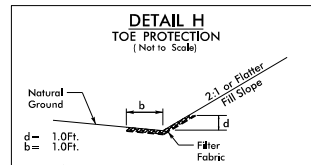
DETAIL E NOT USED IN SECTION 2A



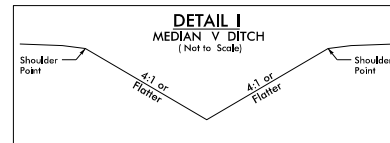
-SR4- STA. 10+50 TO STA. 14+22 LT
-Y107- STA. 17+50 TO STA. 21+91 RT



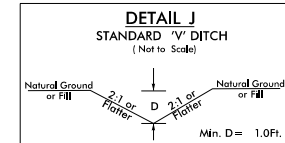
-Y107- STA. 55+00 TO STA. 59+50 RT



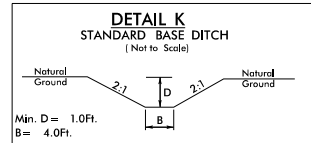
-KRB- STA. 27+00 TO STA. 30+00 LT



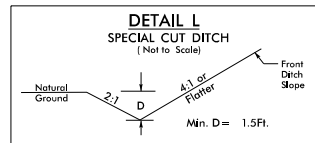
-L2A- STA. 256+00 TO STA. 260+50 CL
-L2A- STA. 408+00 TO STA. 411+00 CL
-L2A- STA. 372+50 TO STA. 375+50 CL



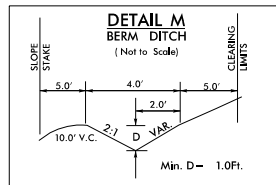
-L2A- STA. 386+50 TO STA. 393+50 LT
-L2A- STA. 396+00 TO STA. 401+00 LT
-L2A- STA. 401+50 TO STA. 409+50 LT



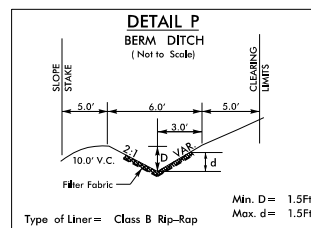
-SR3- STA. 21+60 LT; L=80', S=0.30%
BEG EL=680.2, END EL=680.0



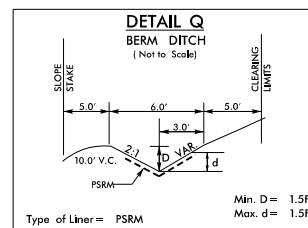
-L2A- STA. 259+00 TO STA. 263+00 RT



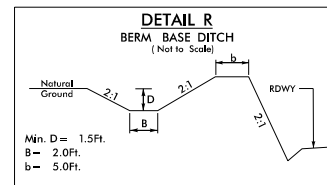
-L2A- STA. 227+00 TO STA. 225+50 RT (STA. EQUAL; L=328')
-L2A- STA. 227+25 TO STA. 231+00 RT
-L2A- STA. 238+00 TO STA. 244+00 LT
-L2A- STA. 246+50 TO STA. 250+75 RT
-L2A- STA. 244+00 TO STA. 246+50 LT
-L2A- STA. 255+00 TO STA. 257+00 RT



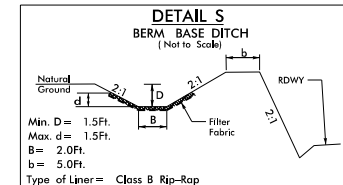
DETAIL P NOT USED IN SECTION 2A



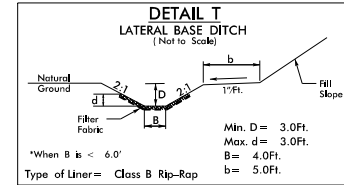
-L2A- STA. 225+50 TO STA. 227+25 RT
-L2A- STA. 245+50 TO STA. 246+50 RT
-L2A- STA. 246+50 TO STA. 250+50 LT



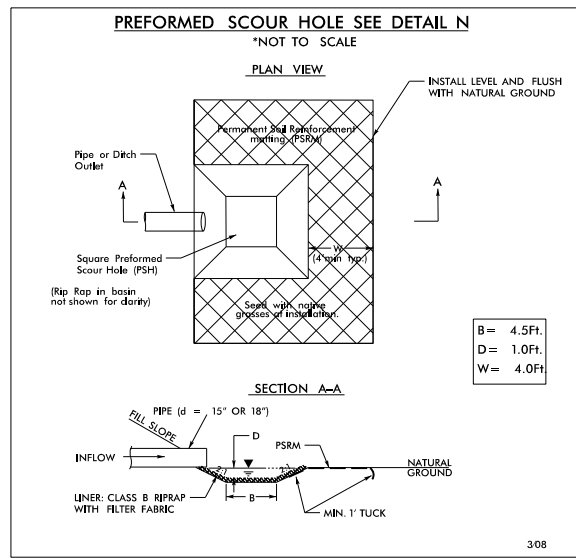
-L2A- STA. 250+50 TO 256+30 LT
-L2A- STA. 250+75 TO 255+00 RT
-L2A- STA. 257+00 TO 262+00 RT



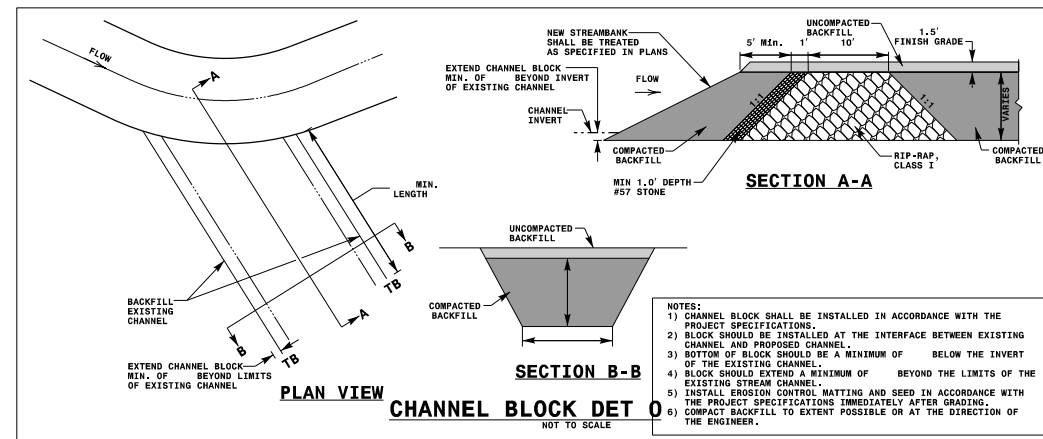
-L2A- STA. 262+00 TO 263+50 RT



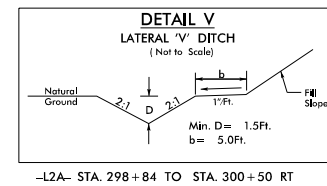
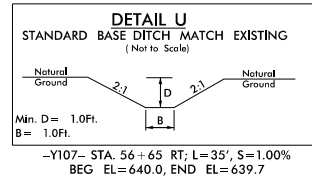
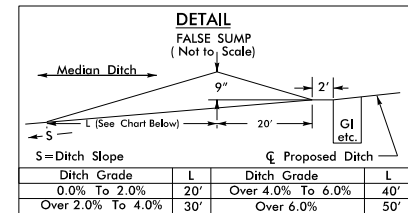
-L2A- STA. 261+50 TO STA. 265+60 LT



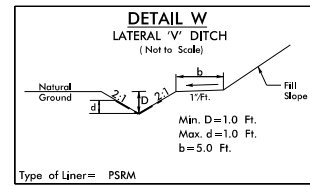
-L2A- STA. 294+25 LT



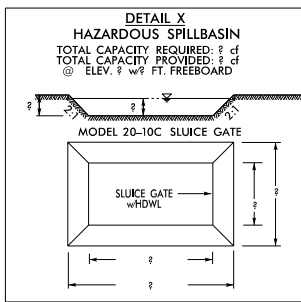
-L2A- STA. 370+98 RT
-SR4- STA. 12+20 RT



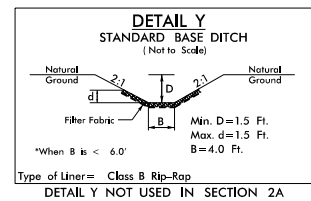
-L2A- STA. 298+84 TO STA. 300+50 RT



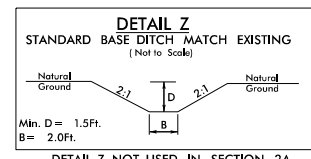
-L2A- STA. 298+05 TO STA. 300+50 LT



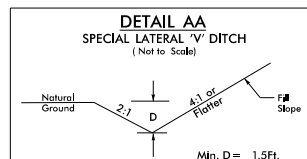
DETAIL X NOT USED IN SECTION 2A



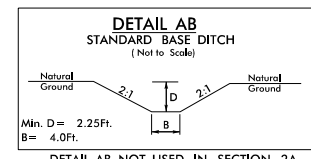
DETAIL Y NOT USED IN SECTION 2A



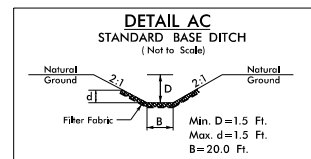
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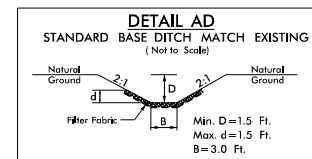
-Y107- STA. 21+91 TO STA. 26+00 LT



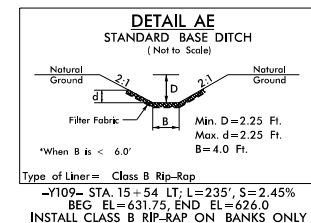
DETAIL AB NOT USED IN SECTION 2A



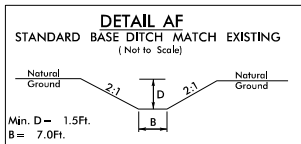
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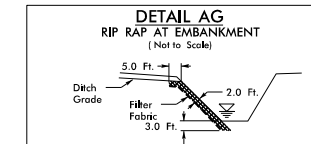
DETAIL AD NOT USED IN SECTION 2A



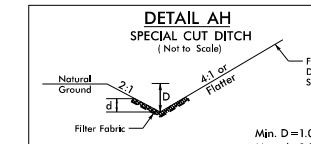
-Y109- STA. 15+54 LT; L=235', S=2.45%
BEG EL=631.75, END EL=626.0
INSTALL CLASS B RIP-RAP ON BANKS ONLY



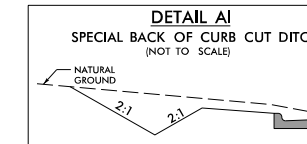
-L2A- STA. 298+15 LT; L=75', S=0.53%
BEG EL=636.0, END EL=635.6



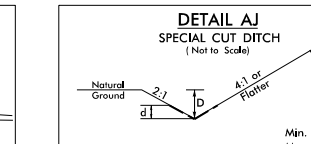
DETAIL AG NOT USED IN SECTION 2A



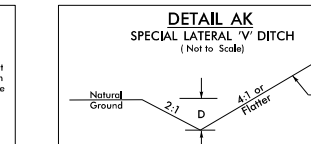
DETAIL AH NOT USED IN SECTION 2A



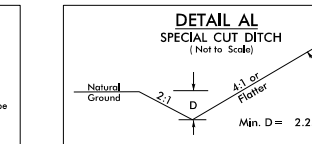
DETAIL AI NOT USED IN SECTION 2A



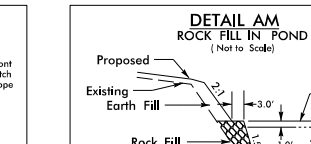
DETAIL AJ NOT USED IN SECTION 2A



-KRB- STA. 14+00 TO STA. 17+55 LT



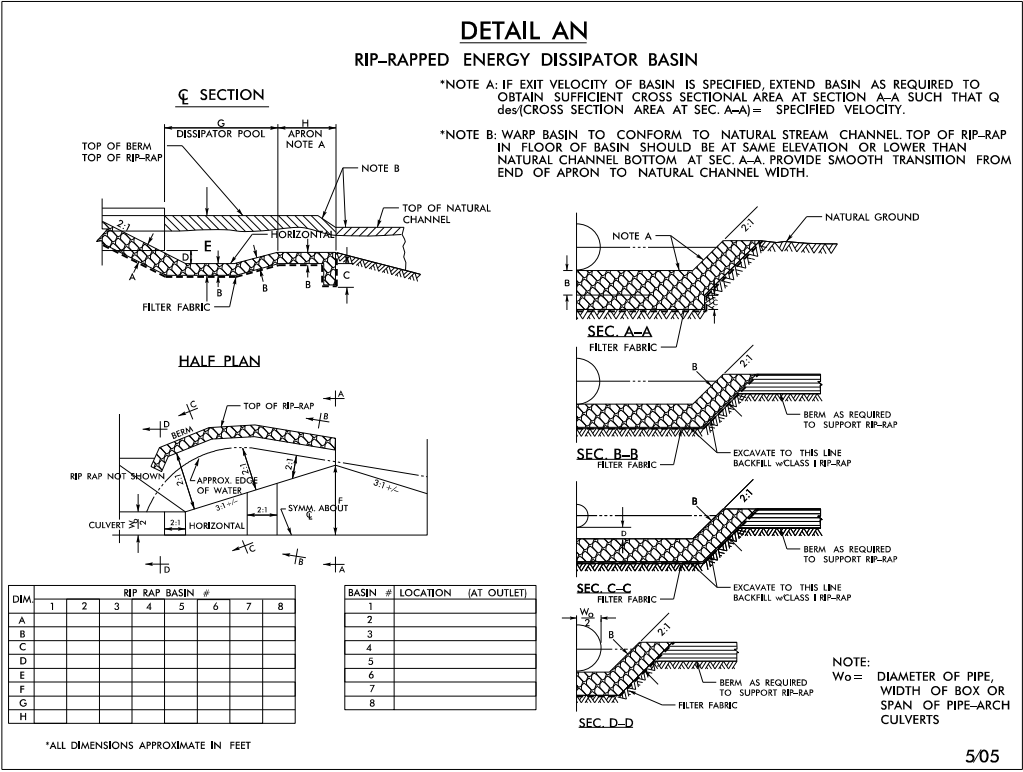
-KRB- STA. 16+60.72 TO STA. 17+55.00 RT
-KRB- STA. 17+55 TO STA. 20+00 LT



DETAIL AM NOT USED IN SECTION 2A

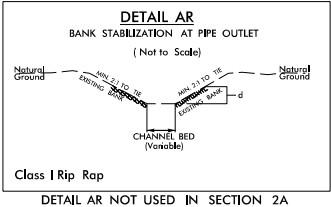
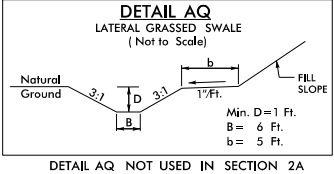
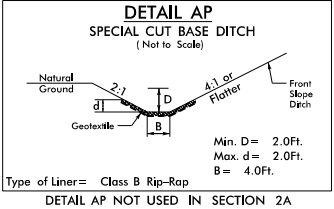
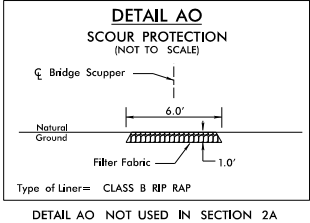


PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	2A-26
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT SHEET	DRAWING 41 OF 267

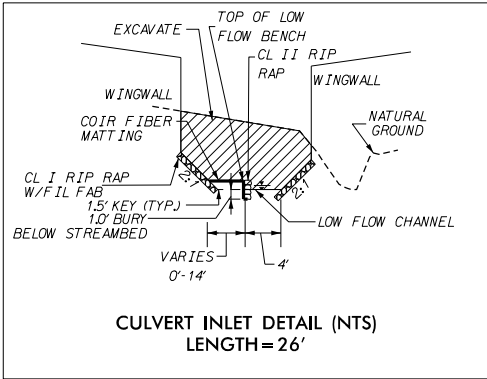


DETAIL AN NOT USED IN SECTION 2A

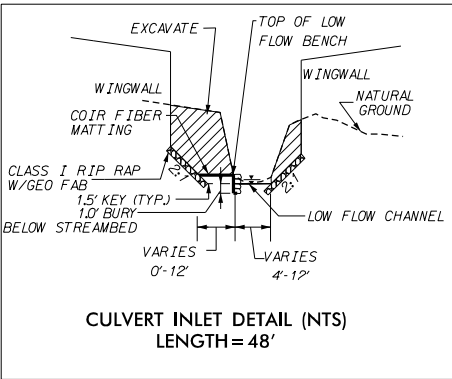
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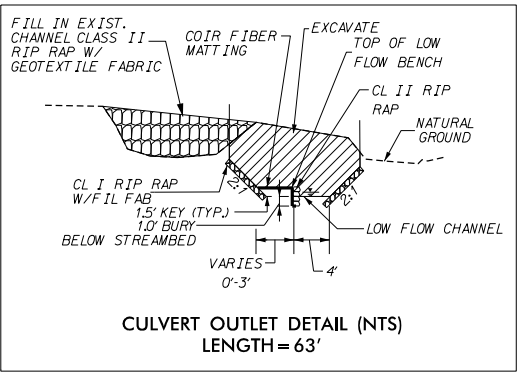
UT TO NORTH FORK
CROOKED CREEK
-L- STA. 265 + 40



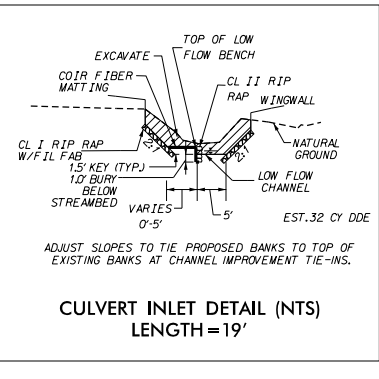
UT TO NORTH FORK
CROOKED CREEK
-L- STA. 293 + 48



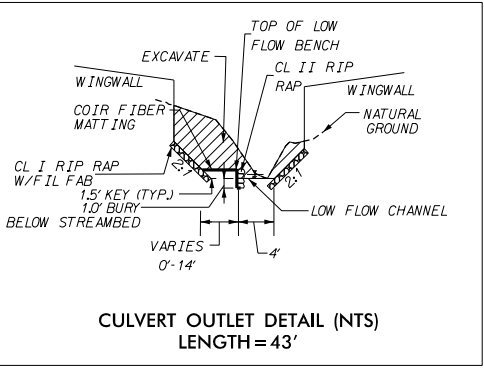
UT TO NORTH FORK
CROOKED CREEK
-L- STA. 373 + 54



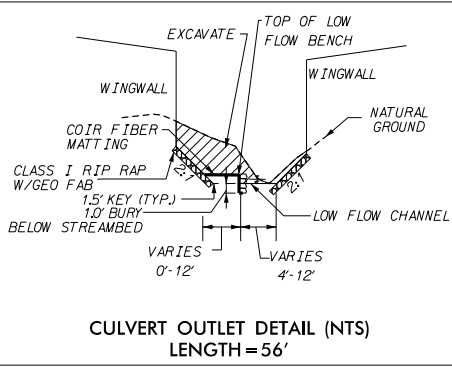
UT TO NORTH FORK
CROOKED CREEK
-L- STA. 396 + 14



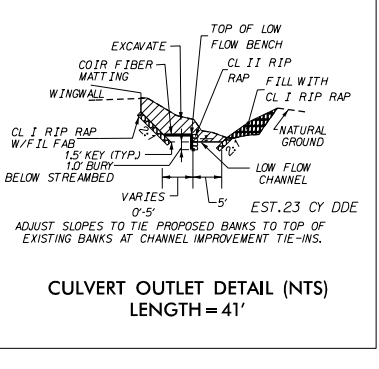
CULVERT OUTLET DETAIL (NTS)
LENGTH = 43'



CULVERT OUTLET DETAIL (NTS)
LENGTH = 56'



CULVERT OUTLET DETAIL (NTS)
LENGTH = 41'



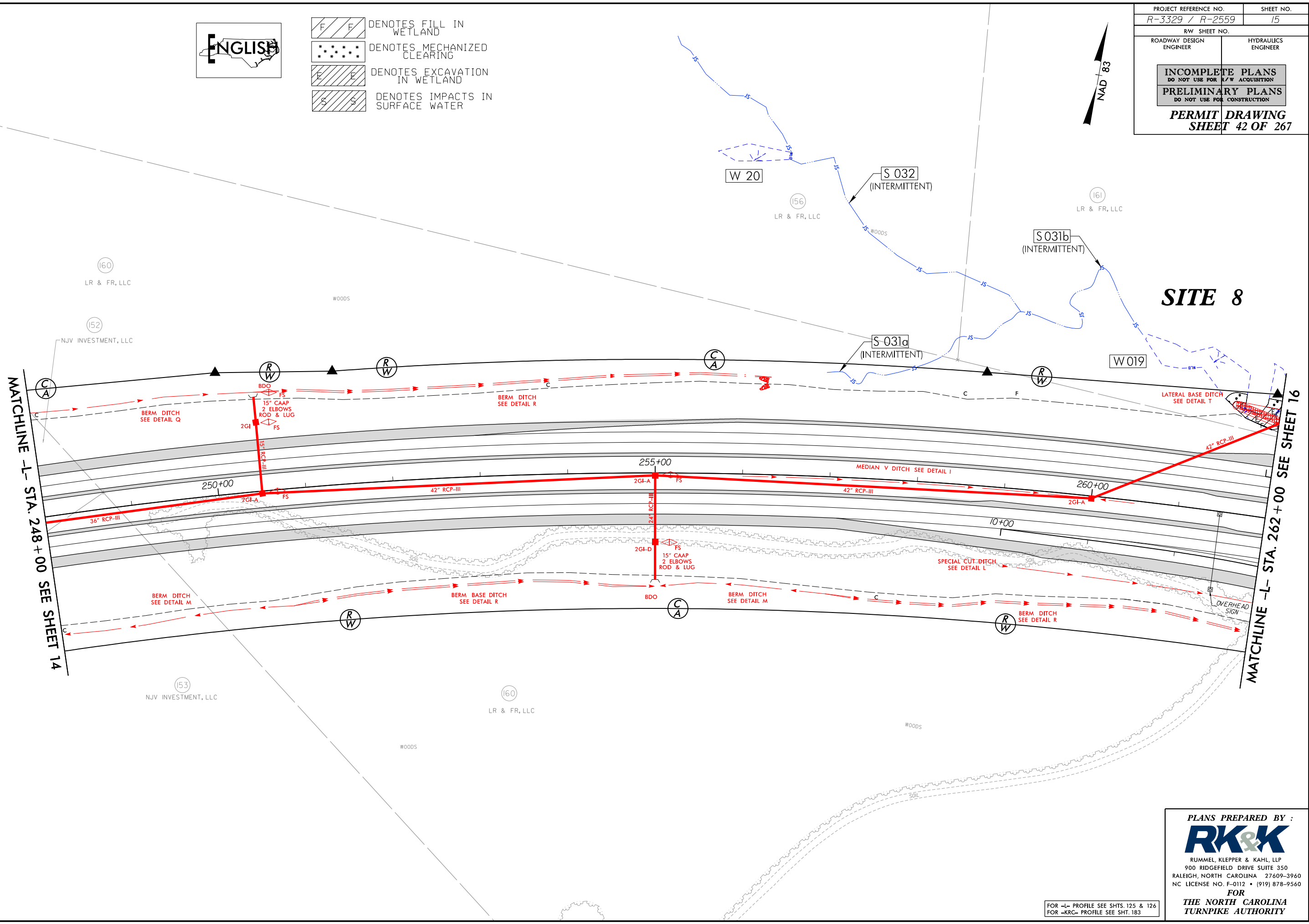
8/17/99
8/29/2014
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- F DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- E DENOTES EXCAVATION IN WETLAND
- S DENOTES IMPACTS IN SURFACE WATER



PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	15
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 42 OF 267	



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

FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

FOR -L- PROFILE SEE SHTS. 125 & 126
FOR -KRC- PROFILE SEE SHT. 183

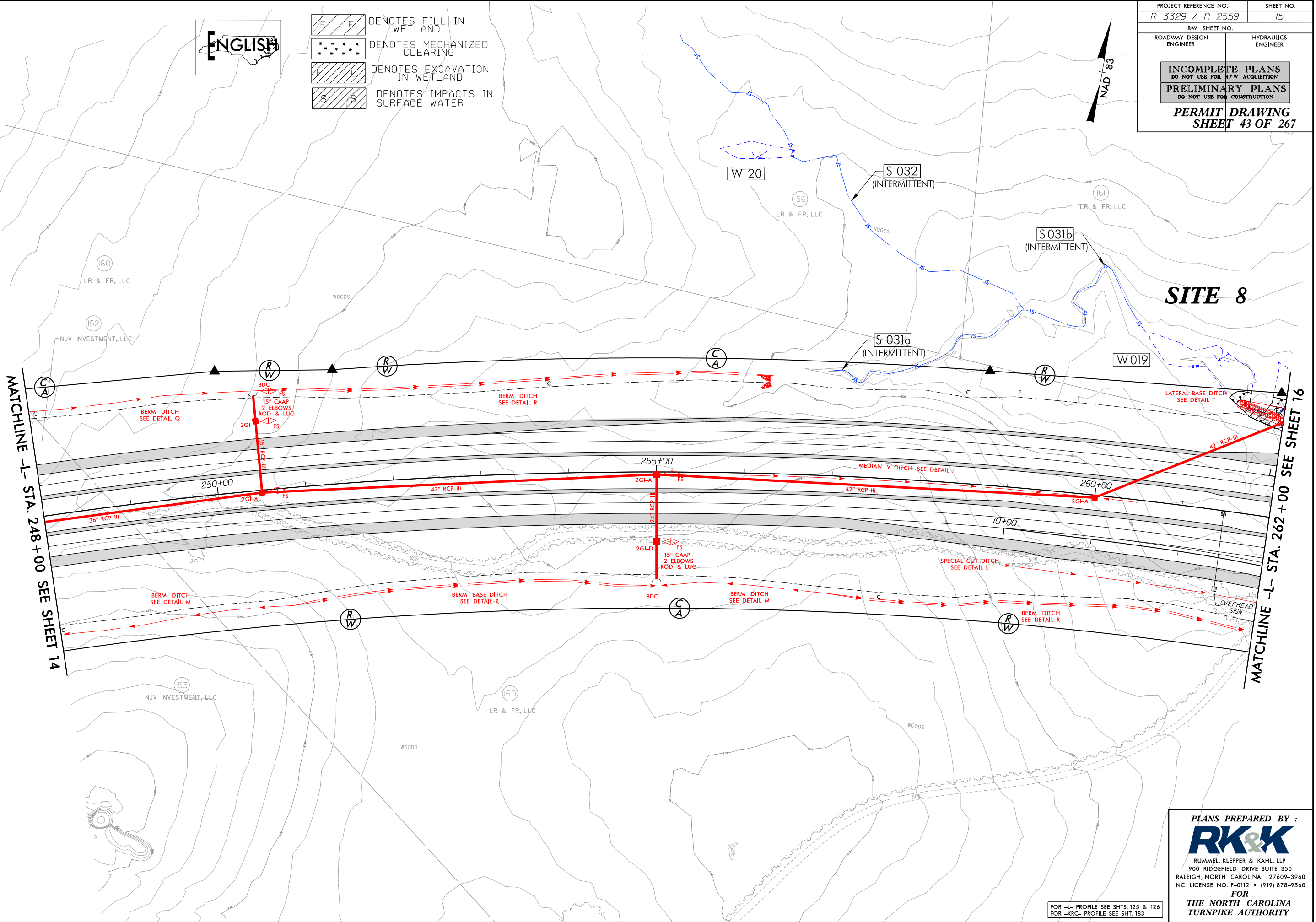
8/17/99

8/29/2014
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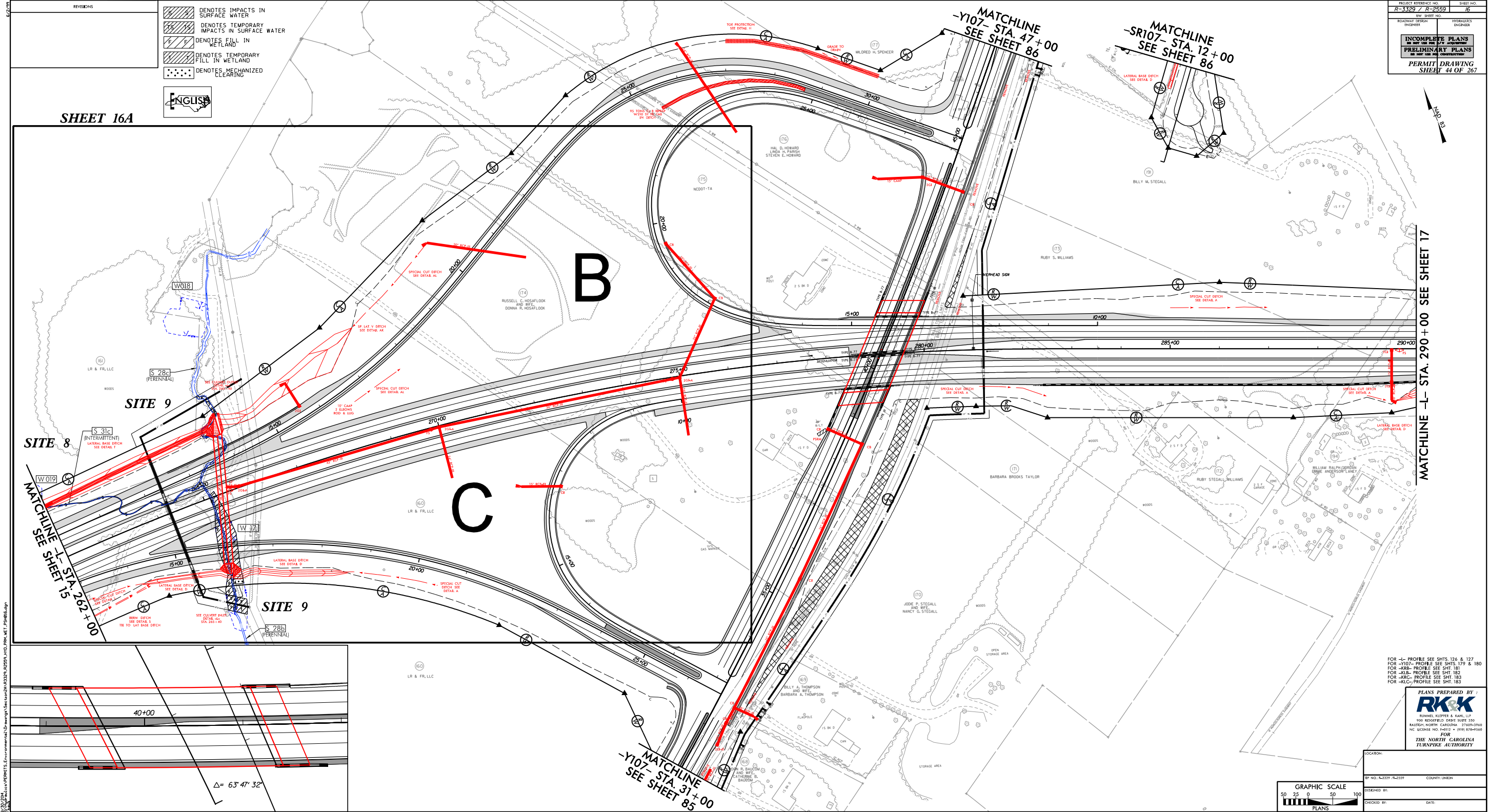
- | | | |
|-------|---|----------------------------------|
| F | F | DENOTES FILL IN WETLAND |
| ••••• | | DENOTES MECHANIZED CLEARING |
| E | E | DENOTES EXCAVATION IN WETLAND |
| S | S | DENOTES IMPACTS IN SURFACE WATER |

PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 15
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 43 OF 267	



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
FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

FOR -L- PROFILE SEE SHTS. 125 & 126
FOR -KRC- PROFILE SEE SHIT. 183



REVISIONS	

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



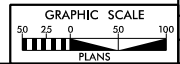
SHEET 16A

PROJECT REFERENCE NO.	R-3329 / R-2559	SHEET NO.	16
RDW SHEET NO.		HYDRAULICS	
INCOMPLETE PLANS			
PRELIMINARY PLANS			
PERMIT DRAWING			
SHEET 44 OF 267			

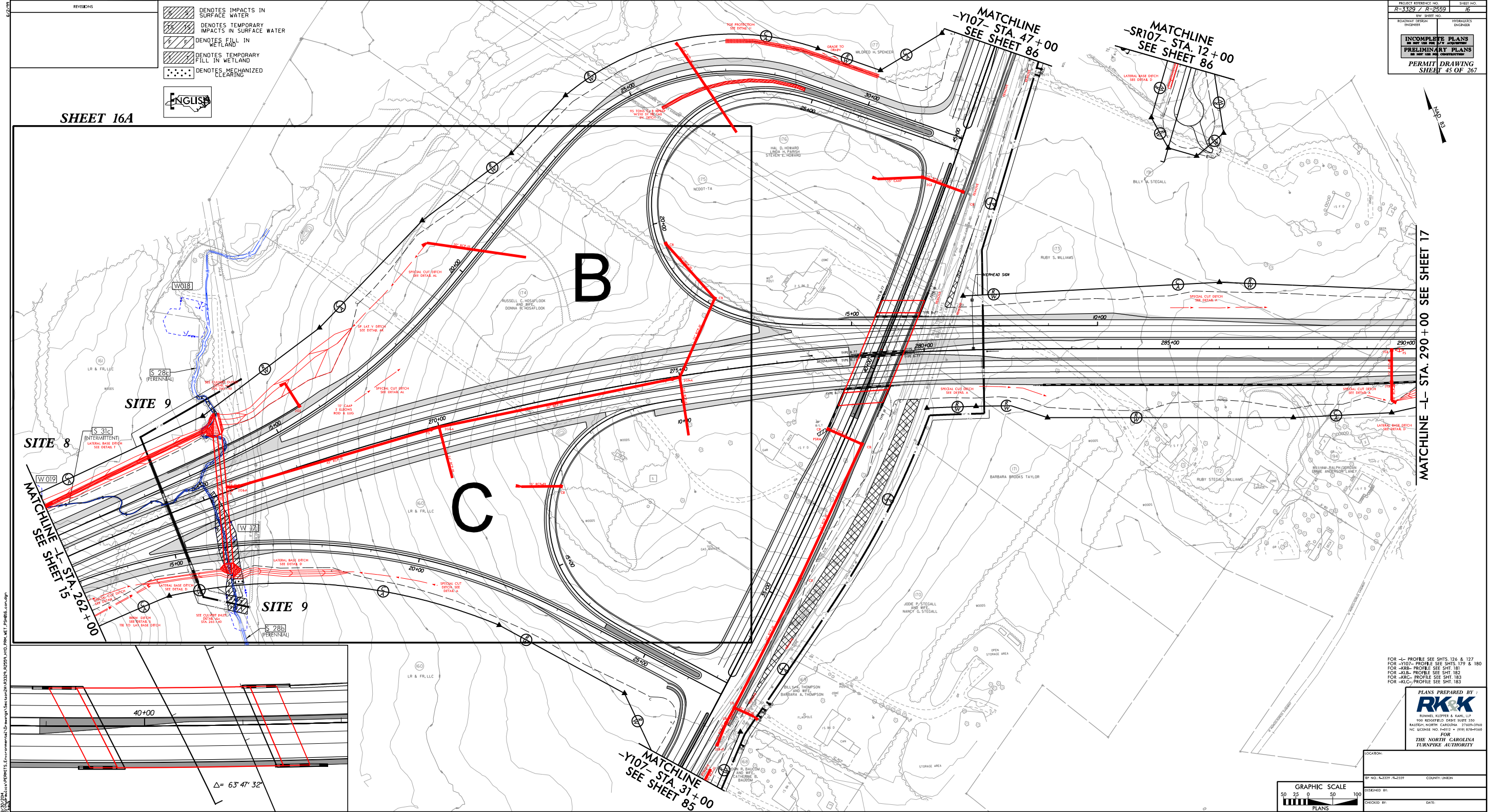
MATCHLINE -L- STA. 290 + 00 SEE SHEET 17

- FOR -L- PROFILE SEE SHTS. 126 & 127
- FOR -Y107- PROFILE SEE SHTS. 179 & 180
- FOR -ARB- PROFILE SEE SHT. 181
- FOR -JLS- PROFILE SEE SHT. 182
- FOR -KRC- PROFILE SEE SHT. 183
- FOR -RLC- PROFILE SEE SHT. 183

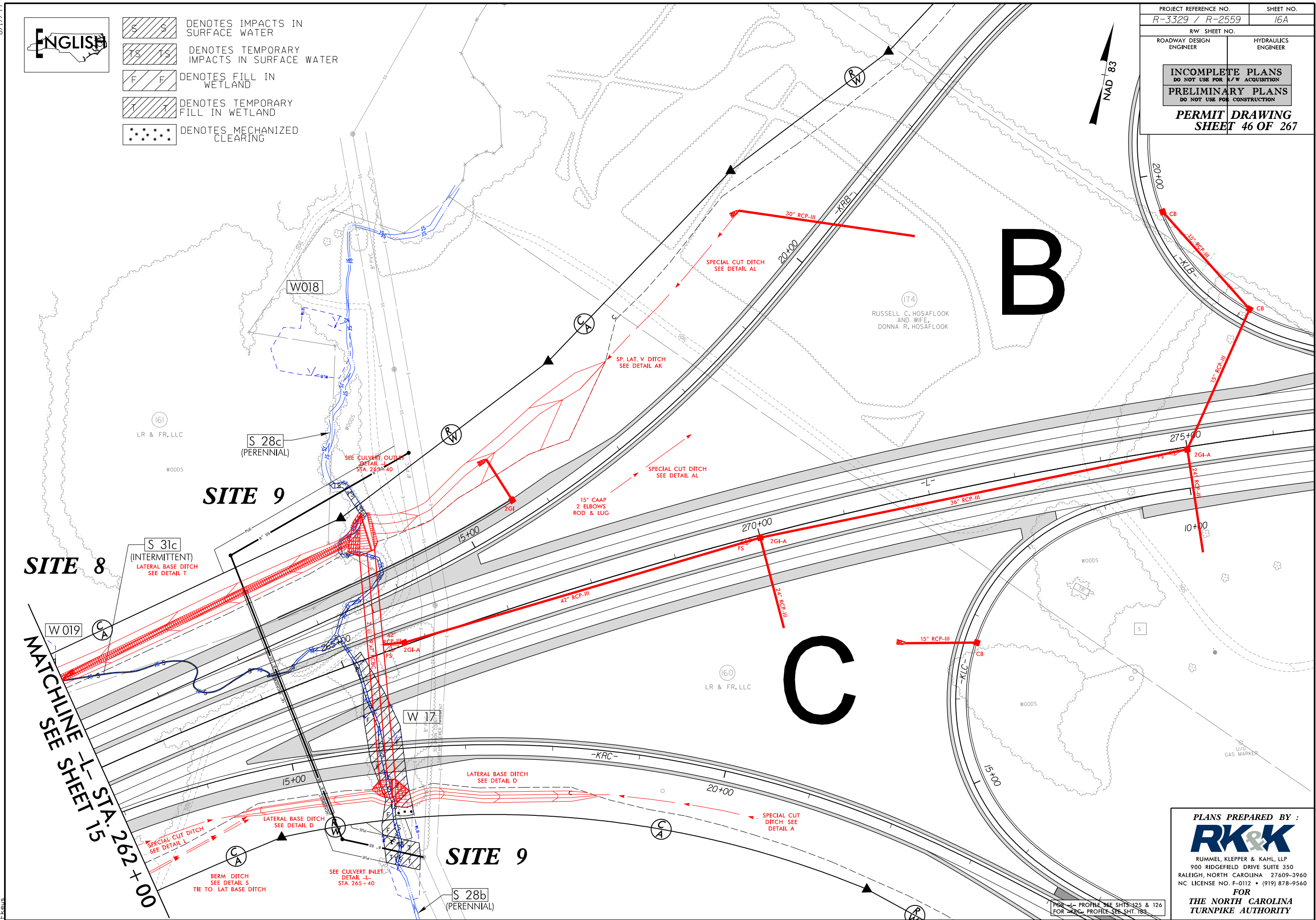
PLANS PREPARED BY :
RK&K
RICHARD K. KEEFER & KATHY L. KEEFER
100 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27605-3140
NC LICENSE NO. 4-019 / 4-019 878-9548
FOR THE NORTH CAROLINA TURNPIKE AUTHORITY



LOCATION:	
TP NO. R-3329 / R-2559	COUNTY/UNION
DESIGNED BY:	
CHECKED BY:	
DATE:	



PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
LEIGH, NORTH CAROLINA 27609-3960
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SITE 8

SITE 9

SITE 9

MATCHLINE SEE SHEET 15 STA. 262+00

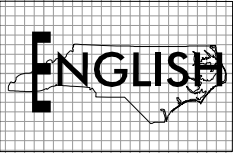
B

C

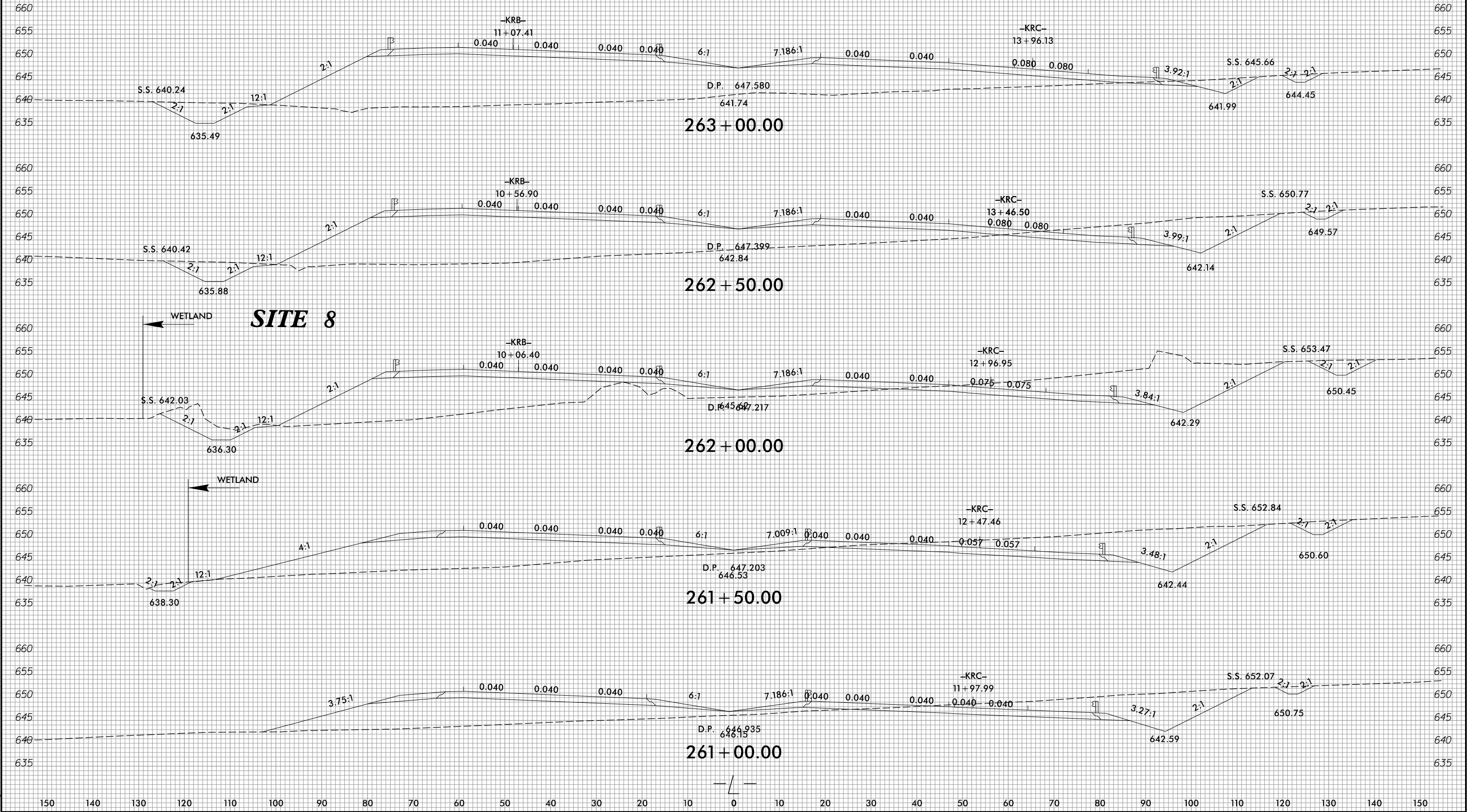
NAD 83

~~FOR -L- PROFILE SEE SHTS. 125 & 126~~
~~FOR -KRC- PROFILE SEE SHT. 183~~

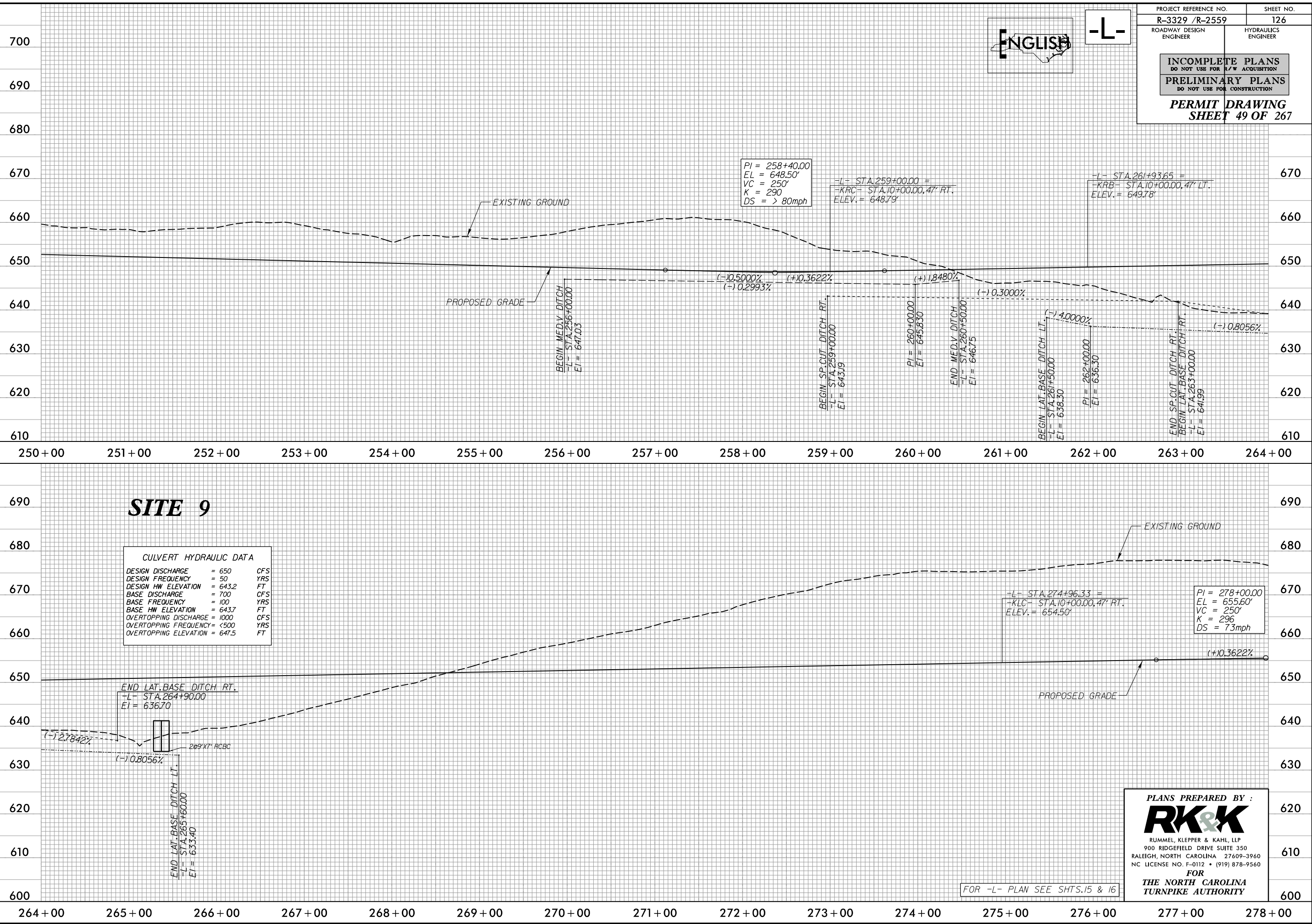
PLANS PREPARED BY :
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RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
ALEIGH, NORTH CAROLINA 27609-3960
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FOR
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PERMIT DRAWING
SHEET 48 OF 267



5/28/99
8/29/2004
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Elevs



5/14/99

9/29/2004
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Elev

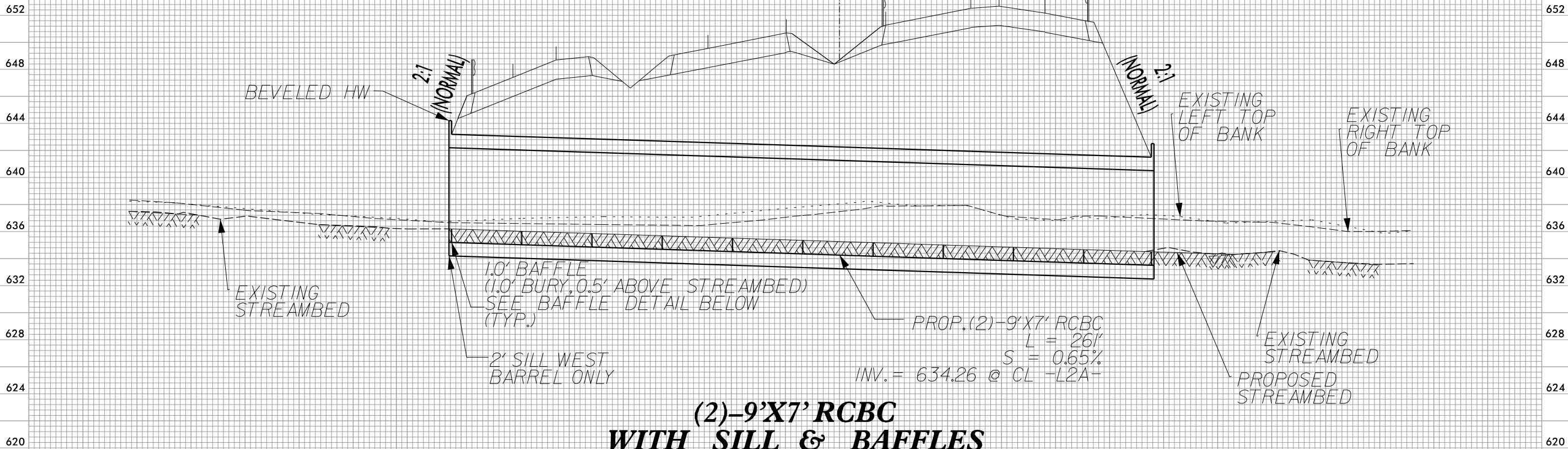
160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160

ENGLISH

SITE 9

-L- STA. 265+40

PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 50 OF 267		



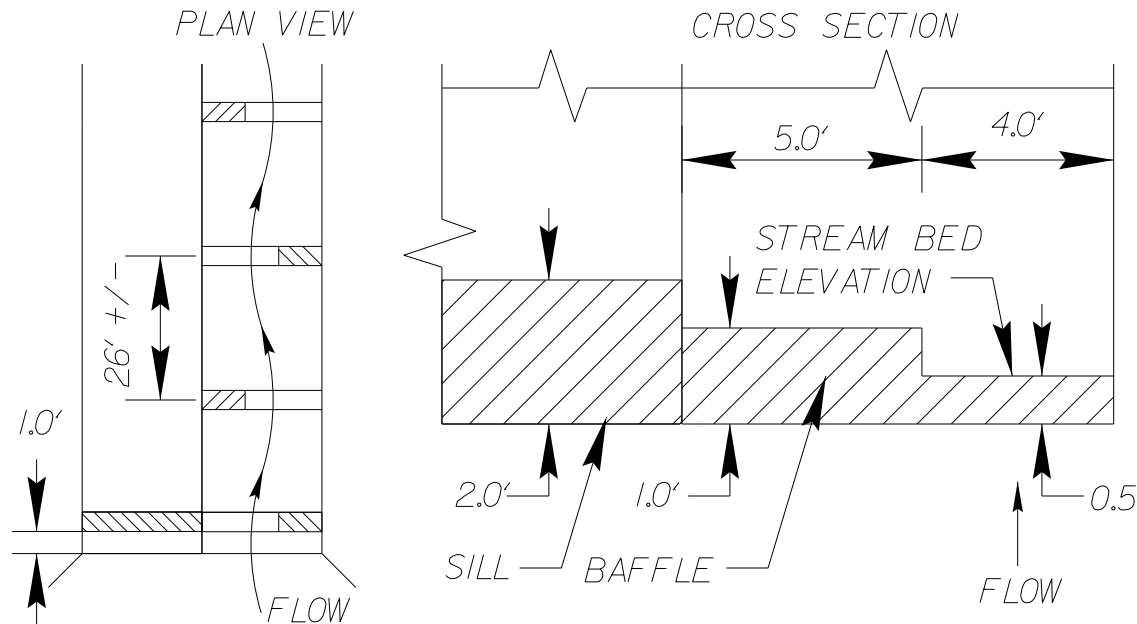
(2)-9'X7' RCBC WITH SILL & BAFFLES

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.

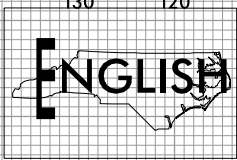
SILL/BAFFLE DETAILS



8/23/99

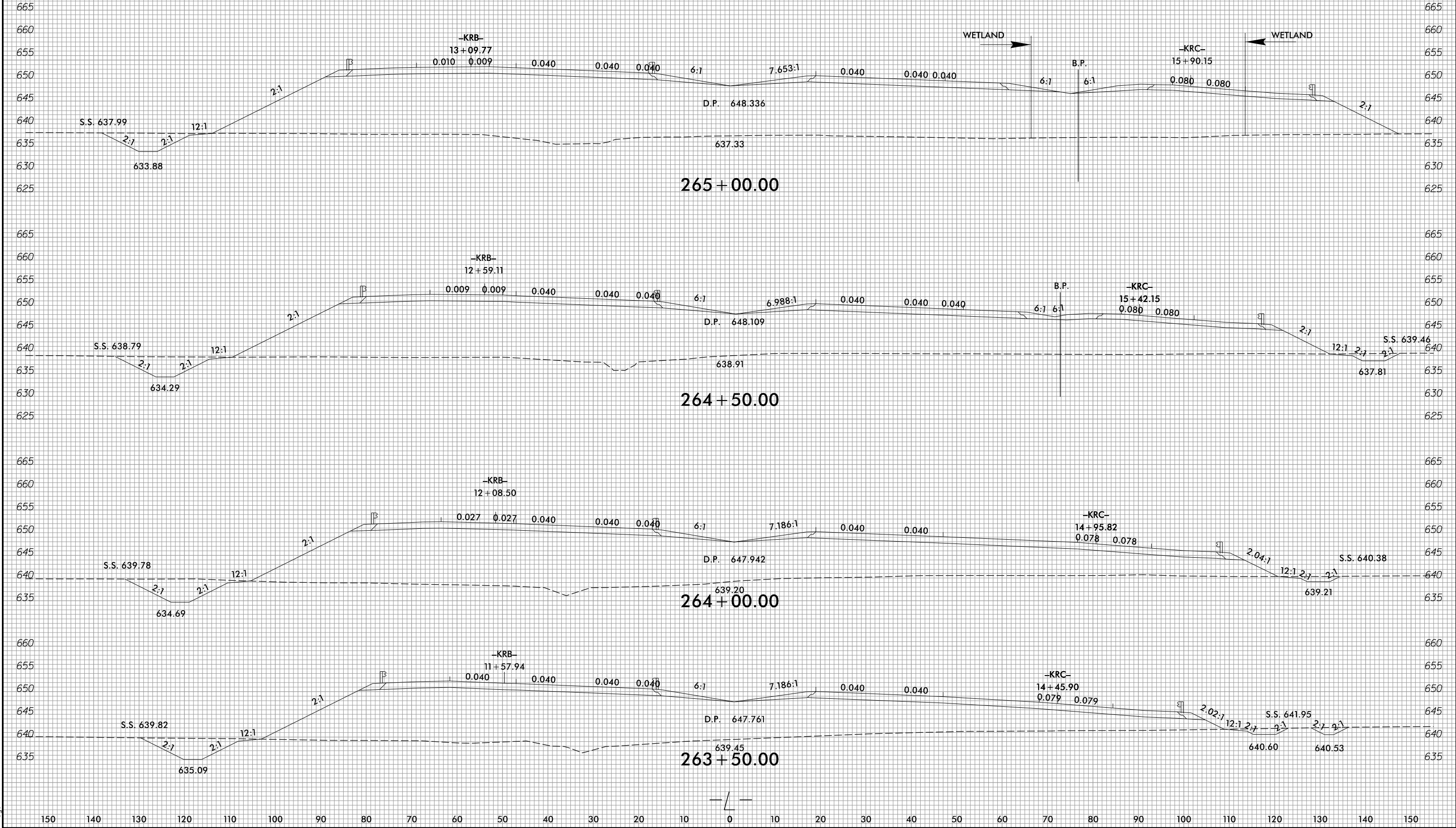
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0510	PROJ. REFERENCE NO.	SHEET NO.
	R-3329 / R-2559	2A-X23



PERMIT DRAWING
SHEET 51 OF 267

SITE 9

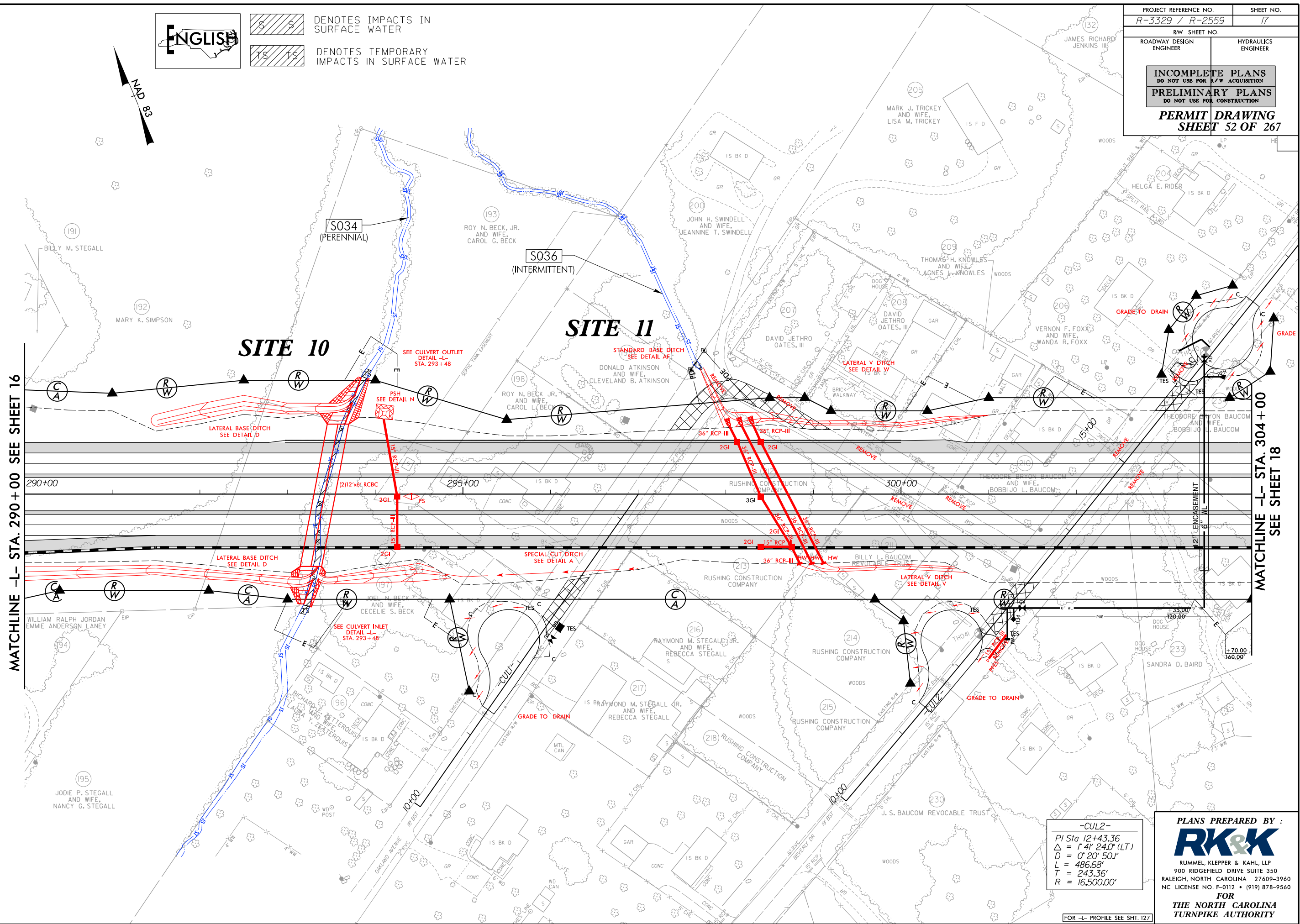




English

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

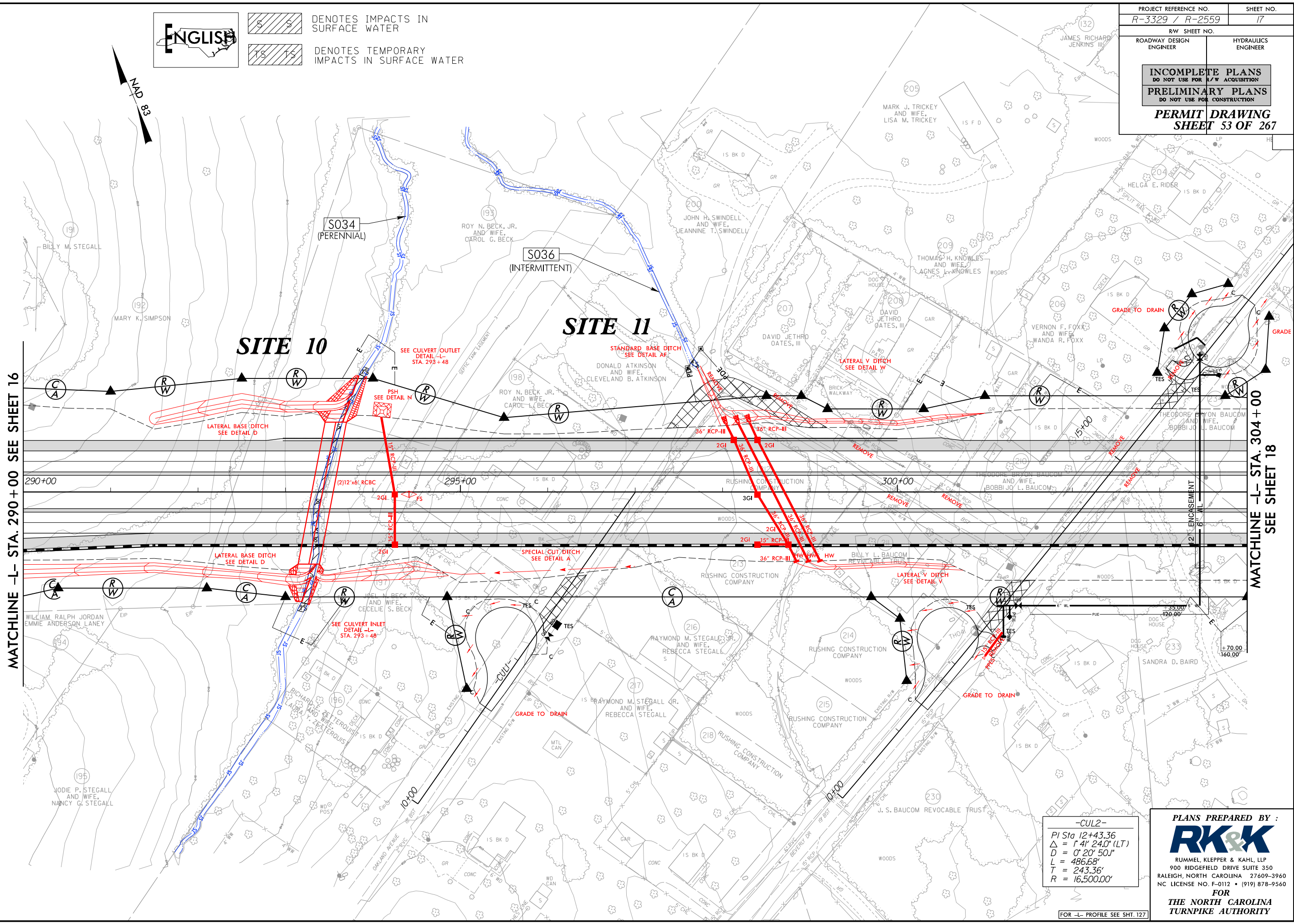


-CUL2-

PI Sta	12+43.36
Δ	= 1° 41' 24.0" (LT)
D	= 0° 20' 50.1"
L	= 486.68'
T	= 243.36'
R	= 16,500.00'

PLANS PREPARED BY :
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RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
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FOR
THE NORTH CAROLINA
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8/17/99
8/29/2014
R:\Hydro\Drawings\Section2A\R3329_R2559_HYD_PRM_WET_PSH017_con.dgn
R:\Hydro\Drawings\PERMITS\Environmental\Drawings\Section2A\R3329_R2559_HYD_PRM_WET_PSH017_con.dgn



ENGLISH

9 9 DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

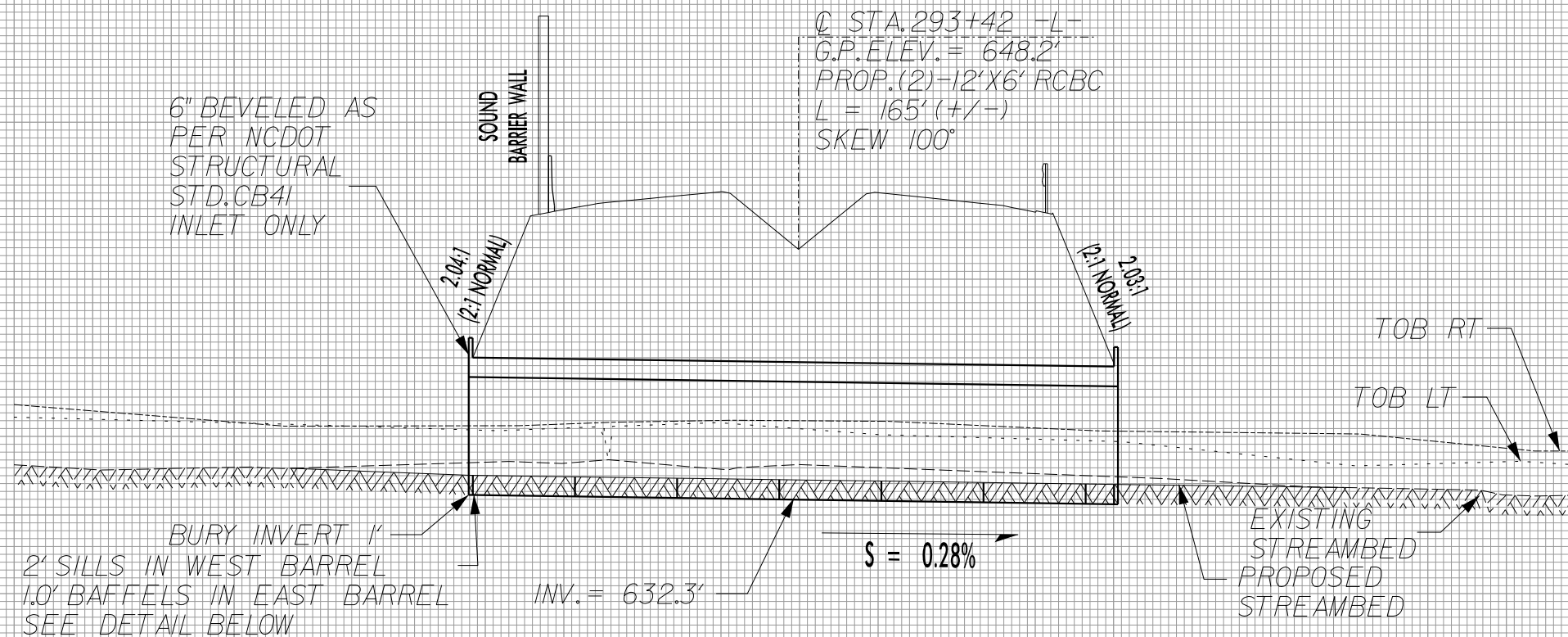
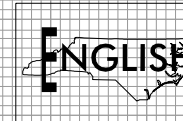
PROJECT REFERENCE NO. <i>R-3329 / R-2559</i>		SHEET NO. <i>17</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
PERMIT DRAWING SHEET 53 OF 267			

-CUL2-
PI Sta 12+43.36
 $\Delta = 1' 41'' 24.0''$ (LT)
 $D = 0' 20' 50.0''$
 $L = 486.68'$
 $T = 243.36'$
 $R = 16,500.00'$

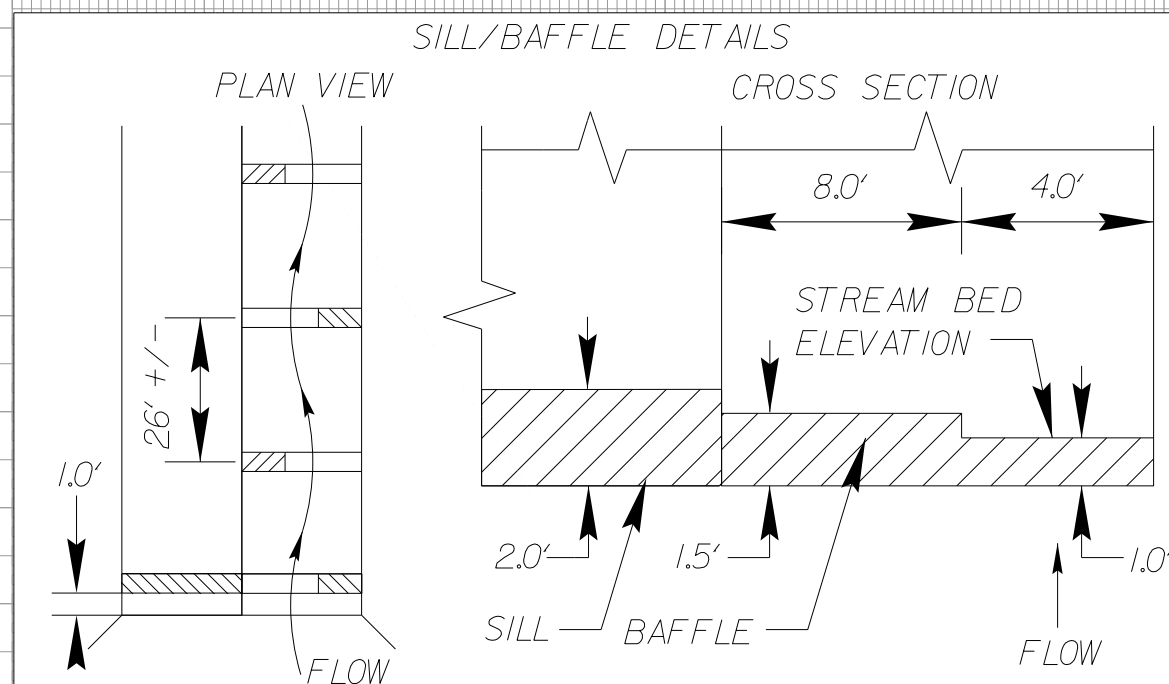
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
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TURNPIKE AUTHORITY

FOR -L- PROFILE SEE SHT. 127

SITE 10
-L- 293 + 48



**(2) 12' x 6' RCBC
WITH BAFFLES**



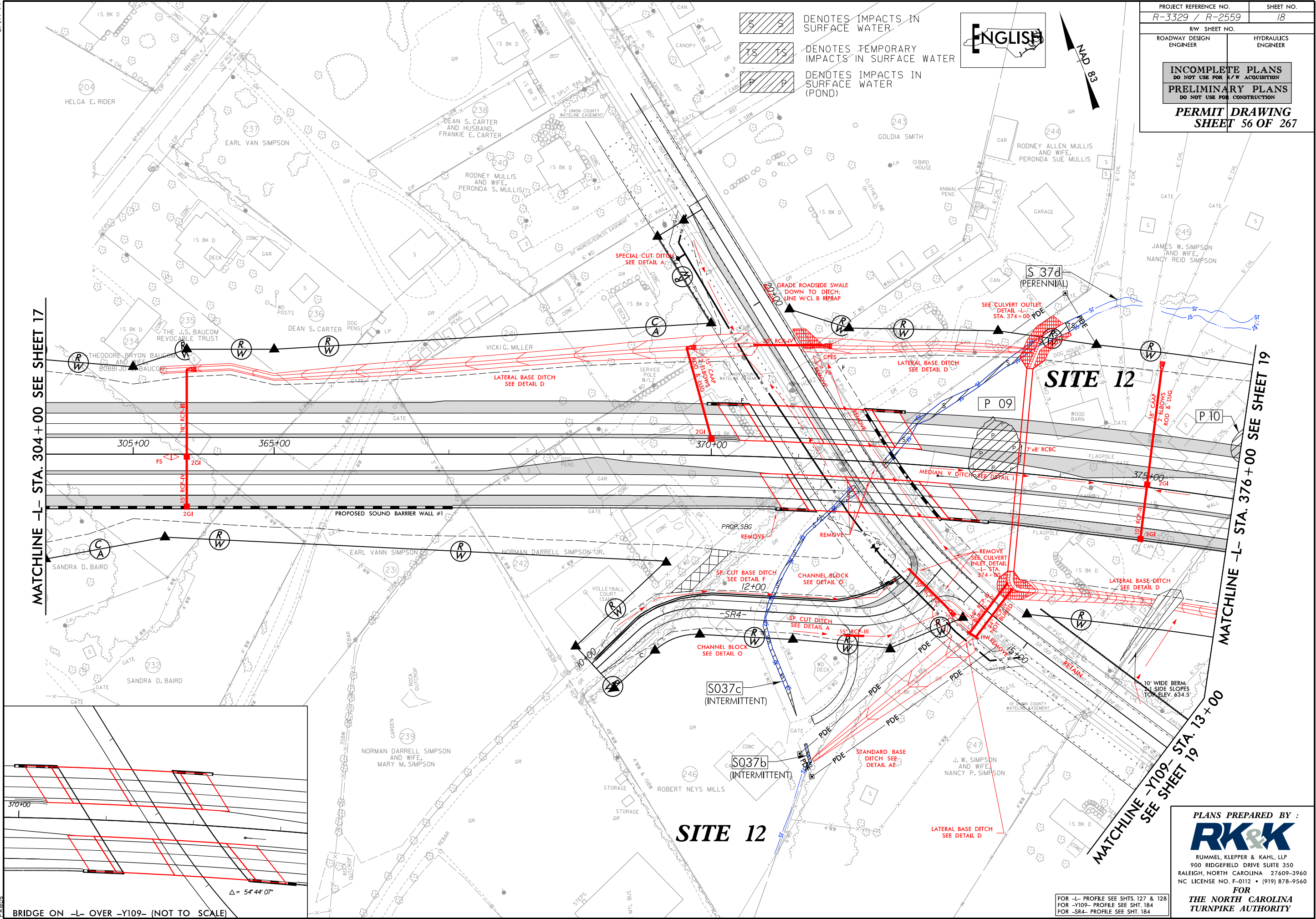
PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET.

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.

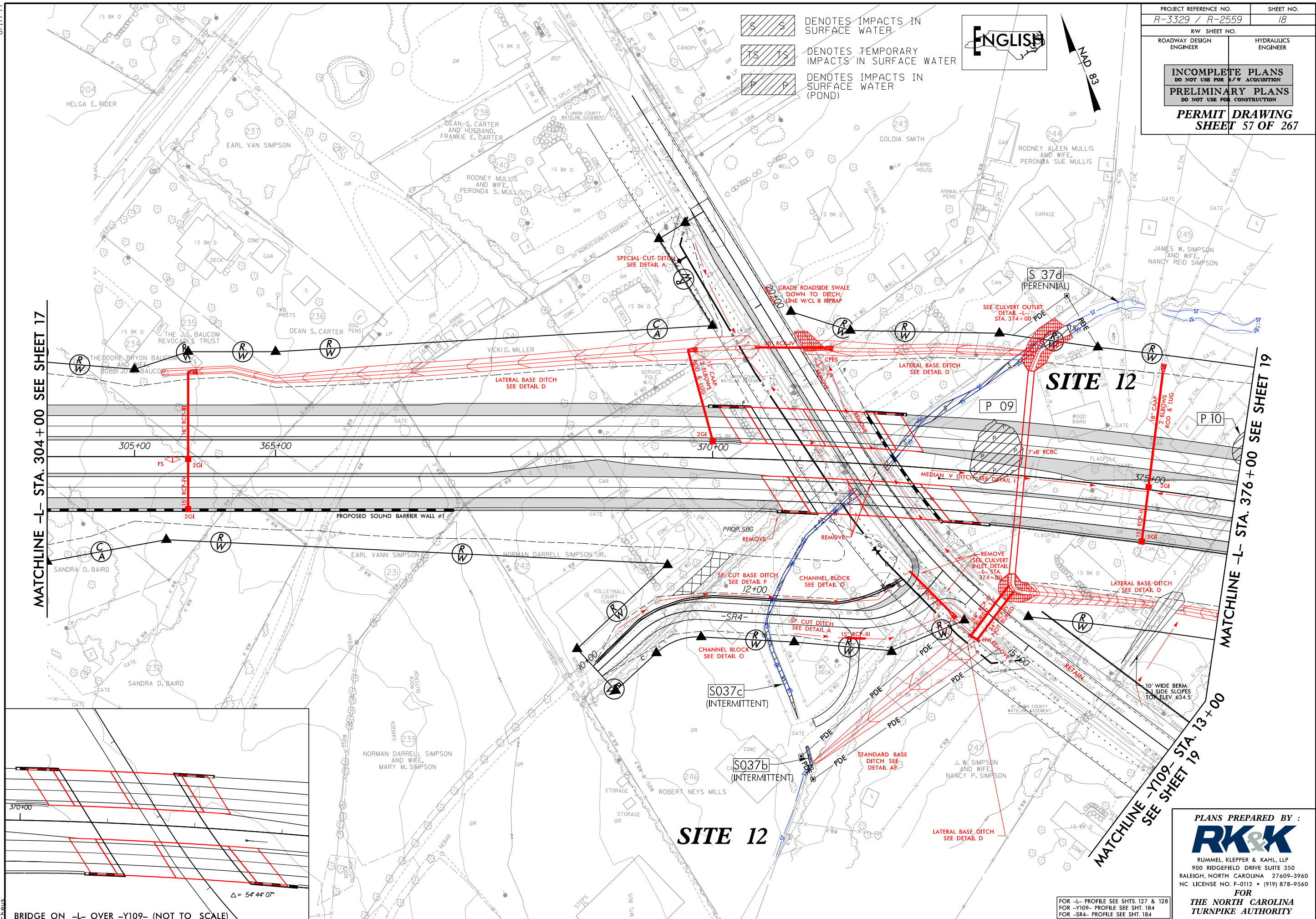
8/17/99

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8/17/99

8/29/2014 R:\Hydraulics\PERMITS_Environmental\Drawings\Section2A\R3329_R2559_HYD_PRM_WET_PSH018.con.dgn

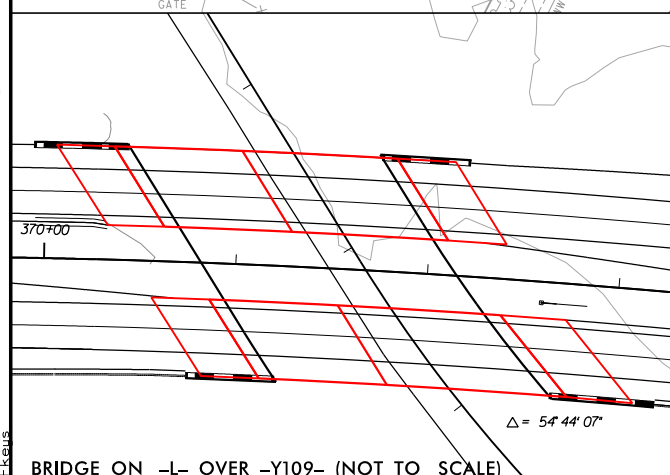


- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER (POND)

ENGLISH



PROJECT REFERENCE NO. <i>R-3329 / R-2559</i>		SHEET NO. <i>18</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
<i>PERMIT DRAWING SHEET 57 OF 267</i>			



SITE 12

FOR -L- PROFILE SEE SHTS. 127 & 128
FOR -Y109- PROFILE SEE SHT. 184
FOR -SR4- PROFILE SEE SHT. 184

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

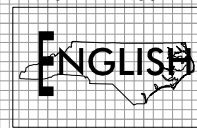
FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

5/14/99
9/30/2004
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Elev

160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160

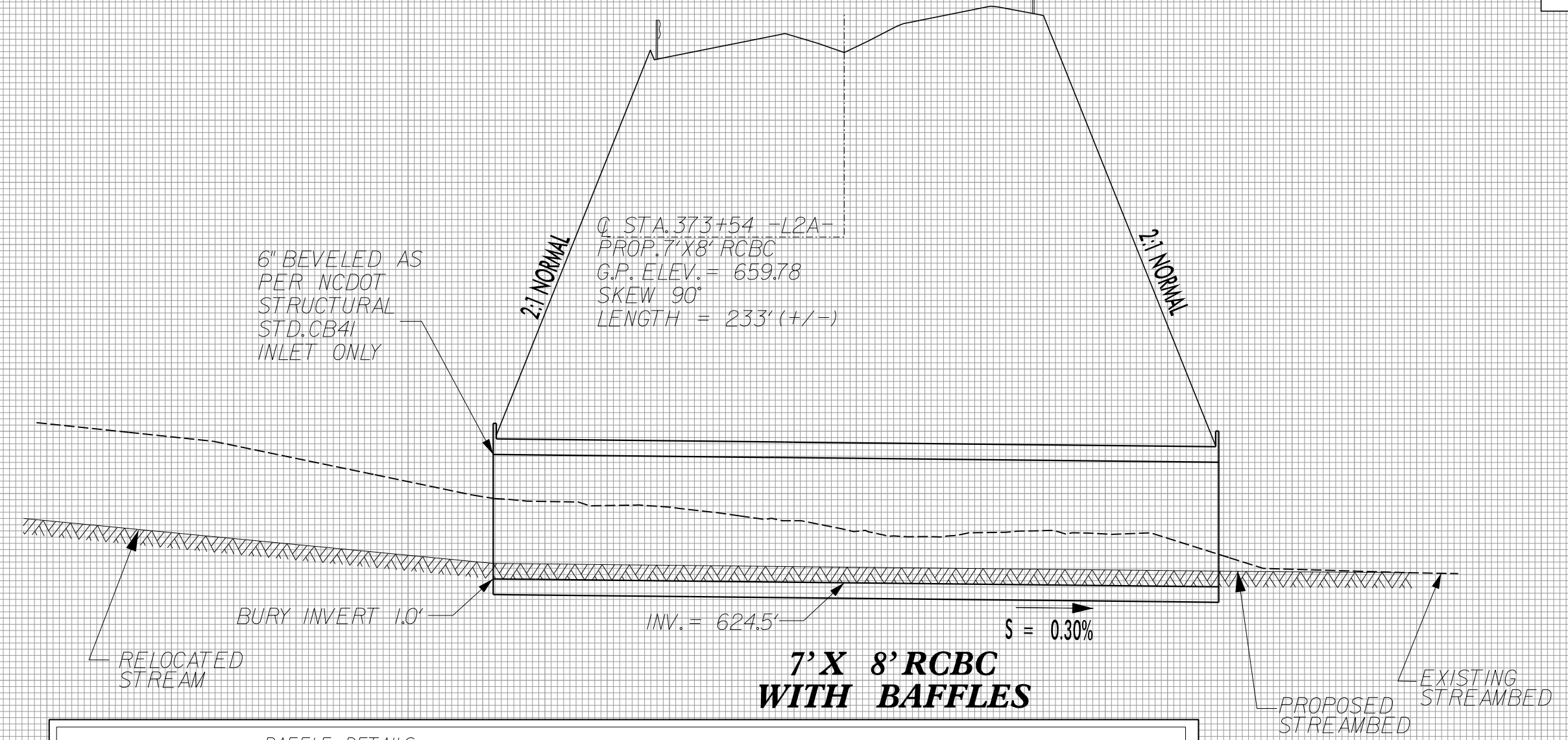
SITE 12

-L- STA. 373+41



PROJECT REFERENCE NO.		SHEET NO.	
R-3329 /R-2559			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
PERMIT DRAWING SHEET 59 OF 267			

660
650
640
630
620



BAFFLE DETAILS

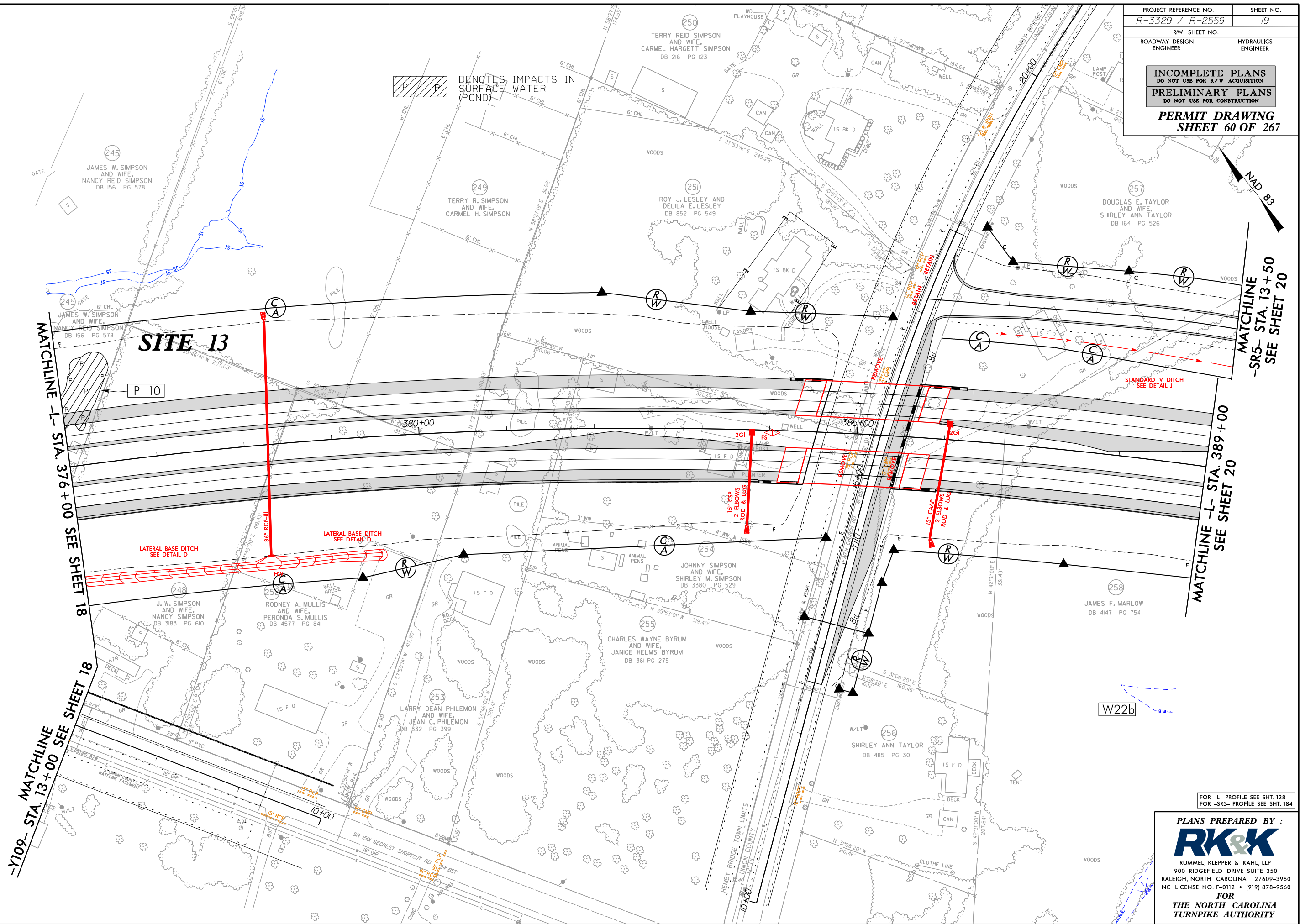
PLAN VIEW

CROSS SECTION

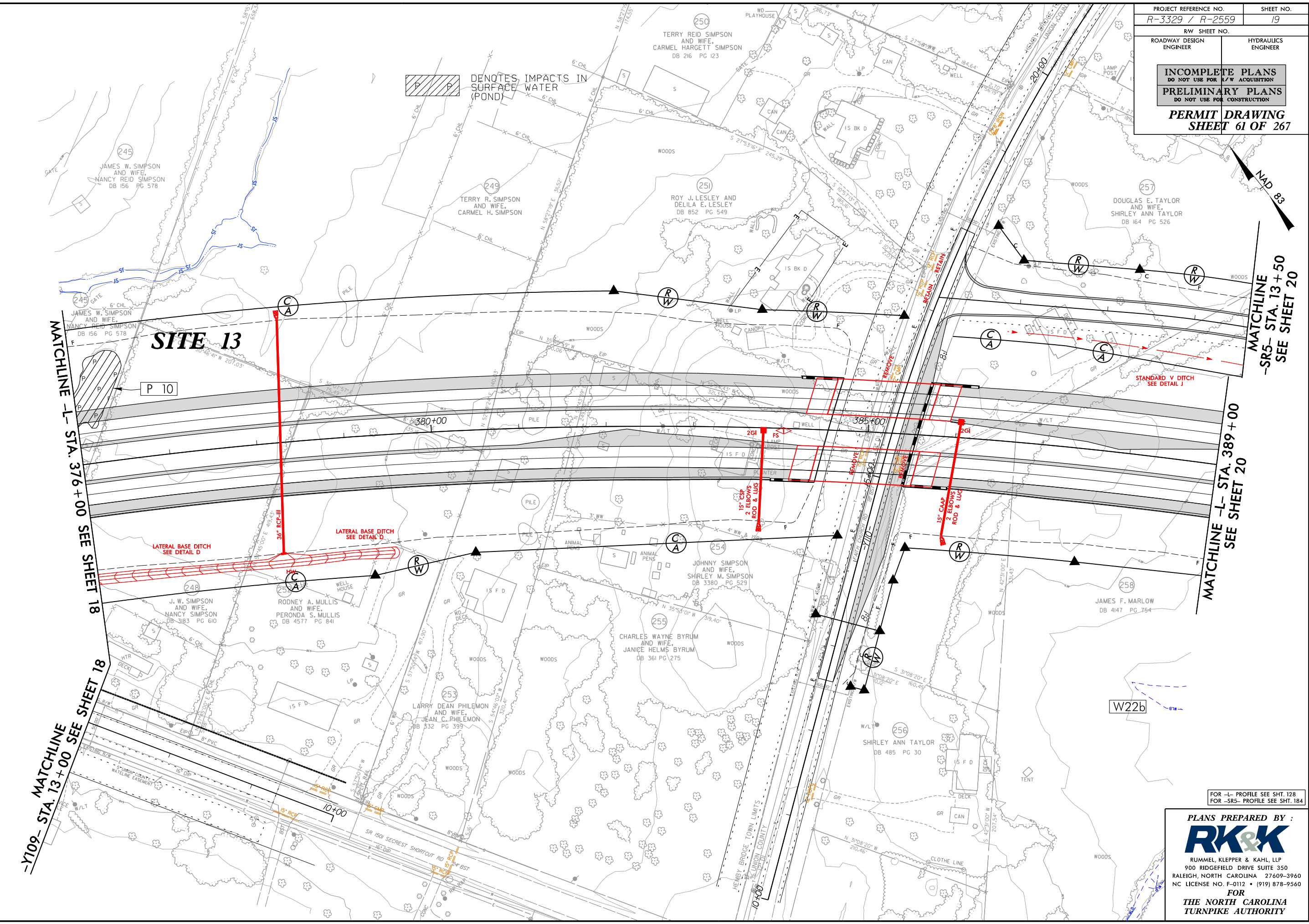
PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET.

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.



8/17/99
8/28/2014
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PROJECT REFERENCE NO. R-3329 / R-2559		SHEET NO. 19	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
PERMIT DRAWING SHEET 61 OF 267			

FOR -L- PROFILE SEE SHT. 128
FOR -SR5- PROFILE SEE SHT. 184

PLANS PREPARED BY :

RK&K

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

FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

NAD 83

SEE CULVERT OUTLET
DETAIL -L-
STA. 396+14

MATCHLINE -L- STA. 389 + 00
SEE SHEET 19

MATCHLINE
SR5- STA. 27+00
SEE SHEET 21

**MATCHLINE -L- STA. 402 + 00
SEE SHEET 21**

SITE 14

S038a
(INTERMITTENT)

FOR -L- PROFILE SEE SHTS. 128 & 129
FOR -SR5- PROFILE SEE SHT. 184

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
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FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

NAD 83

SEE CULVERT OUTLET
DETAIL -L-
STA. 396+14

S038a
(INTERMITTENT)

**MATCHLINE -L- STA. 402 + 00
SEE SHEET 21**

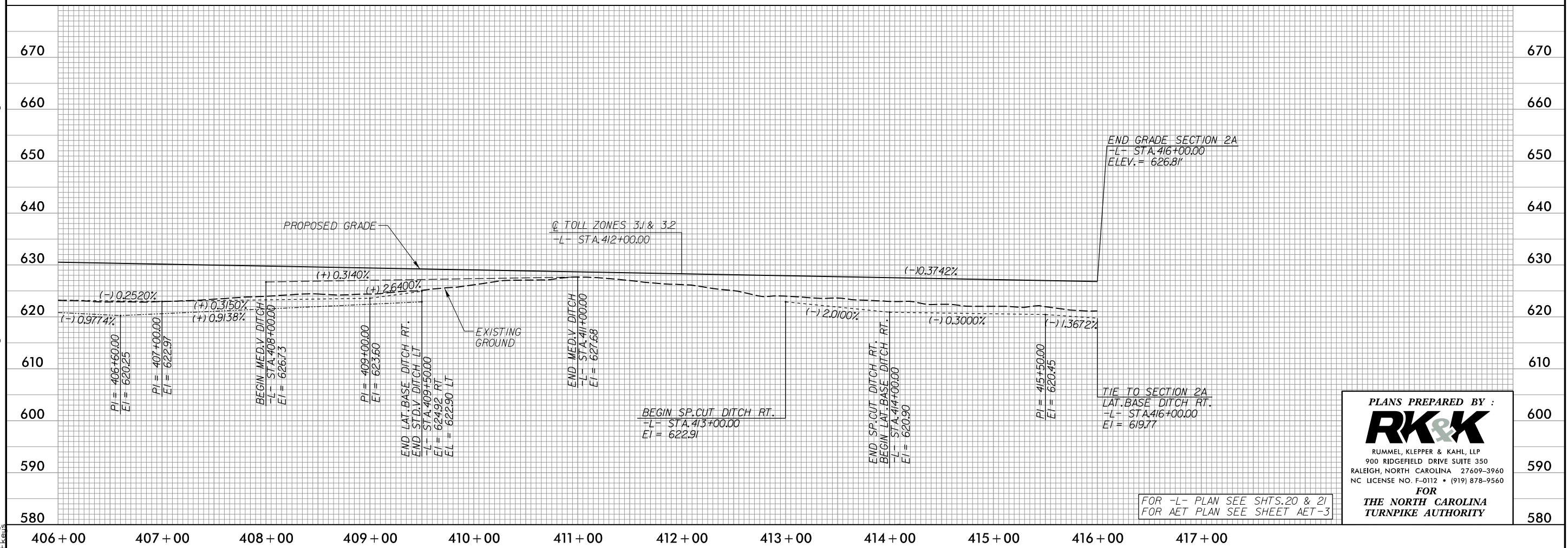
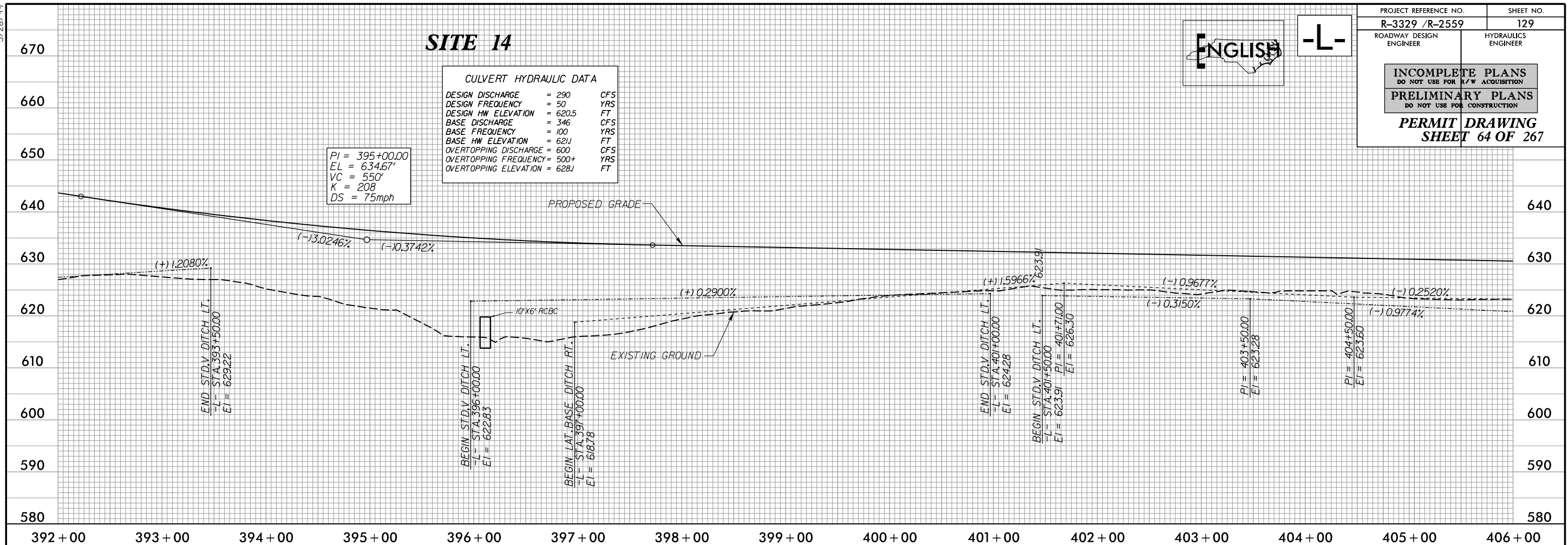
**MATCHLINE -L- STA. 389 + 00
SEE SHEET 19**

PLANS PREPARED BY :
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FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY



SITE 14

CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 290	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 620.5	FT
BASE DISCHARGE	= 346	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 621J	FT
OVERTOPPING DISCHARGE	= 600	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 628J	FT

$$\begin{aligned} PI &= 395+00.00 \\ EL &= 634.67' \\ VC &= 550' \\ K &= 208 \\ DS &= 75\text{mph} \end{aligned}$$


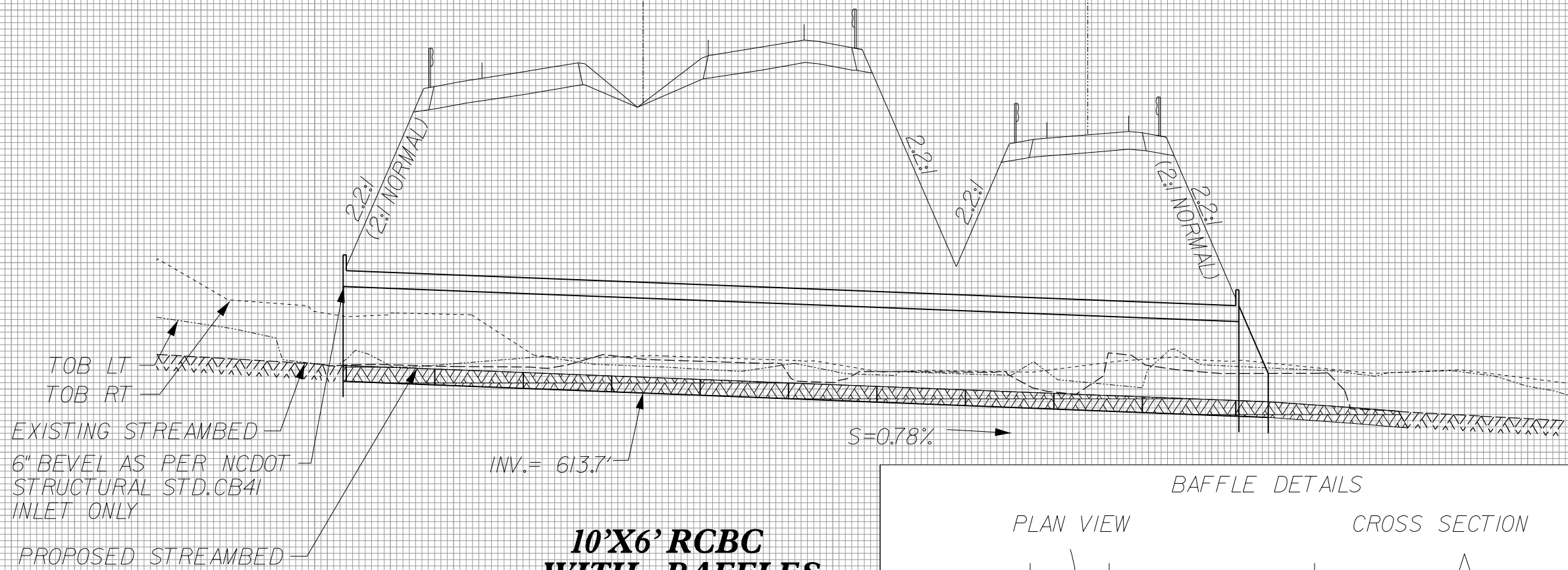
FOR -L- PLAN SEE SHTS.20 & 21
FOR AET PLAN SEE SHEET AET-3

PLANS PREPARED BY :

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
ALEIGH, NORTH CAROLINA 27609-3960
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FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

SITE 14
-L- STA. 396 + 14

PROP. 10' x 6' RCBC
STA. 396+14 -L-
G.P. EL. = 634.9'
SKEW = 112° LENGTH = 284' (+/-)

$$\text{STA. } 21+37.6 - \text{SR5} - \text{G.P. EL.} = 630.1'$$


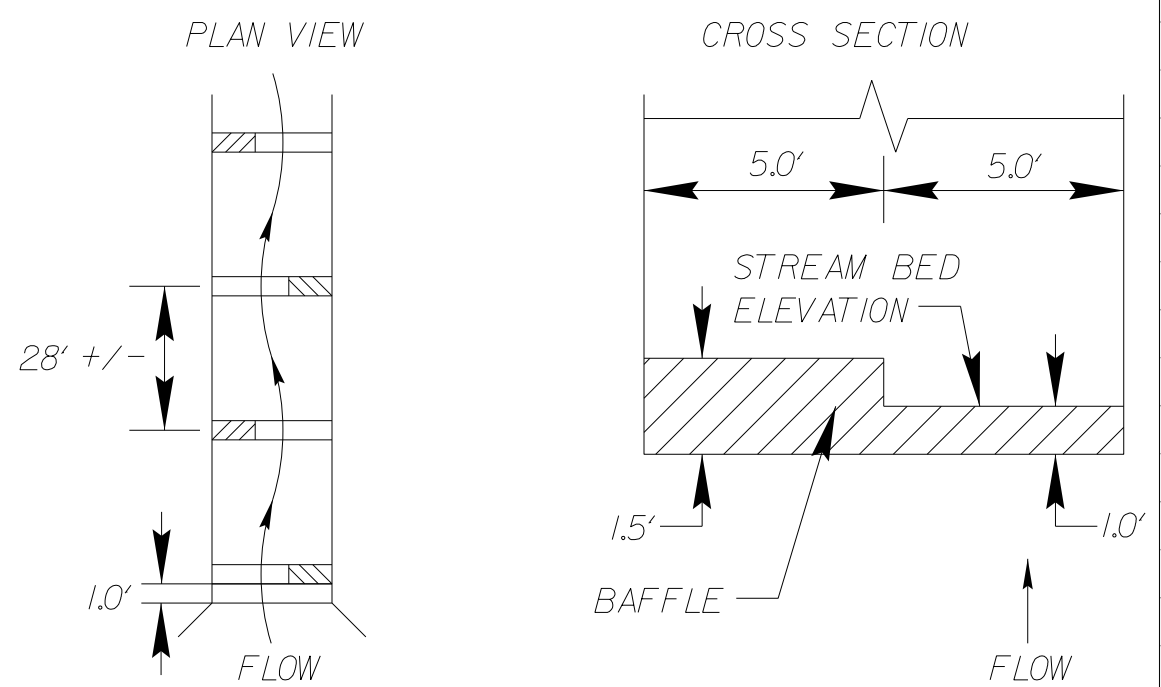
10'X6' RCBC WITH BAFFLES

PLACE BAFFLES 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 AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

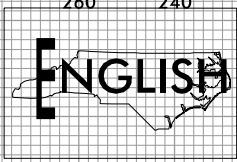
BAFFLE DETAILS



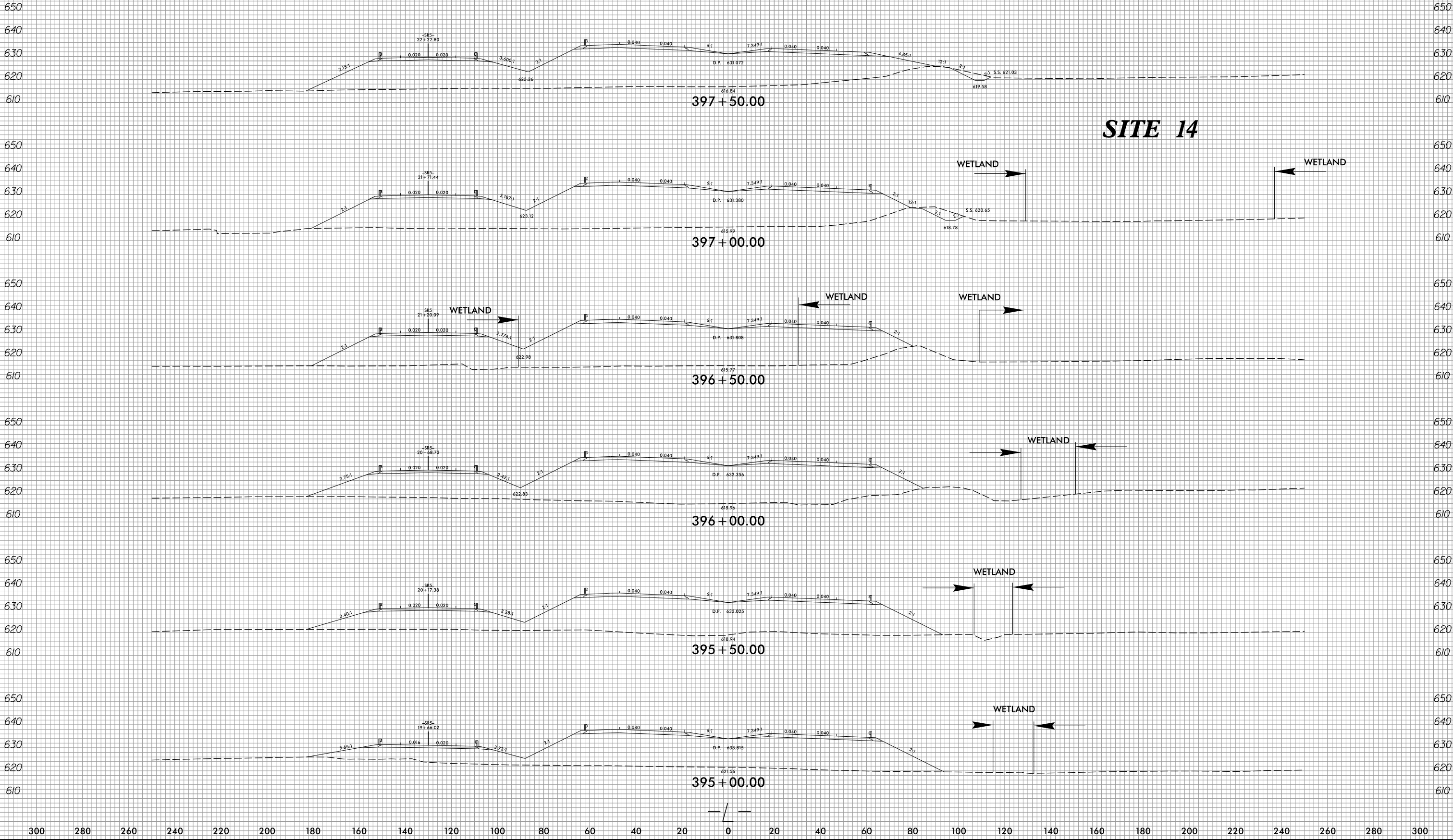
8/23/99

9/29/2014
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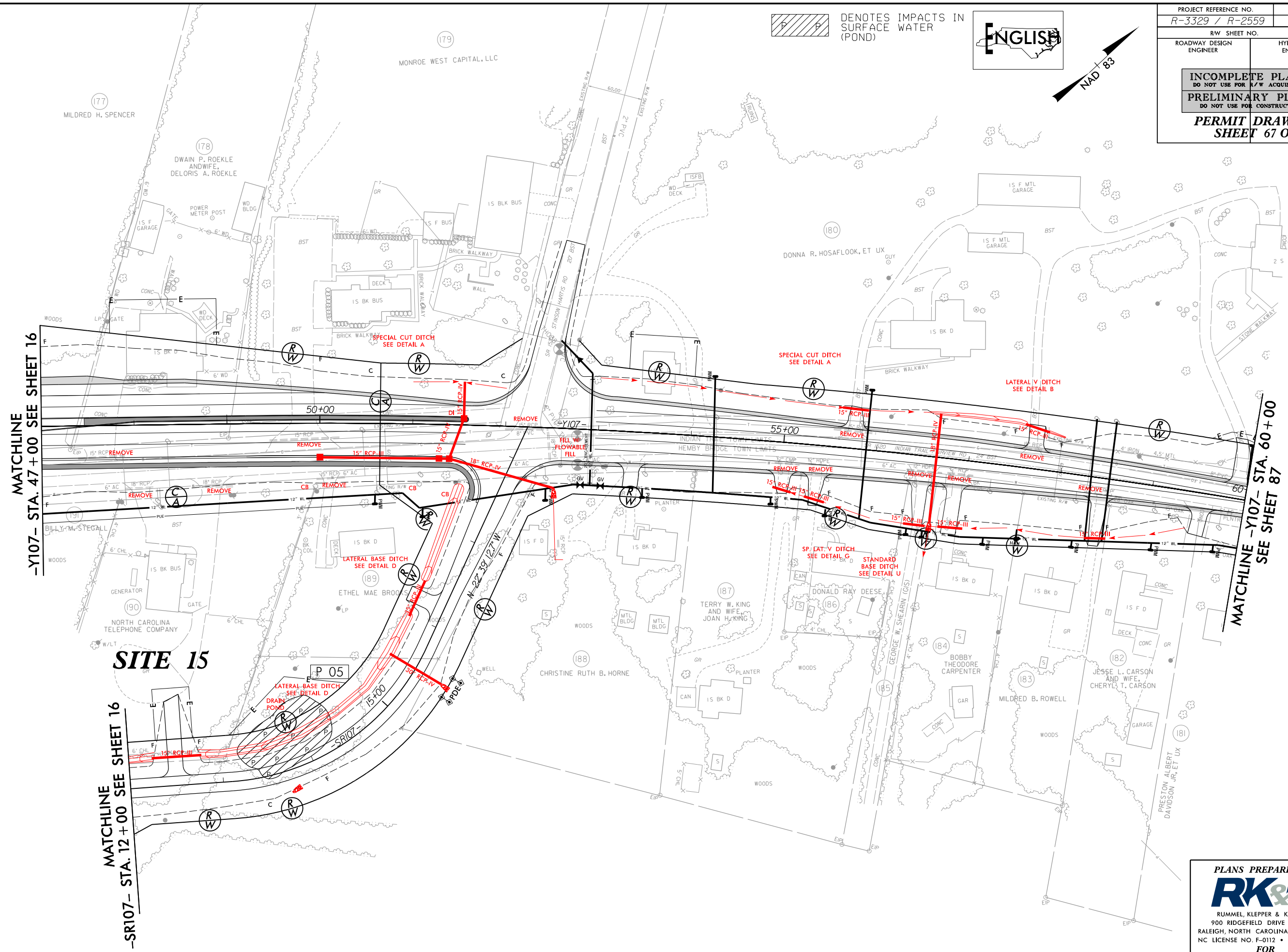
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PERMIT DRAWING
SHEET 66 OF 267

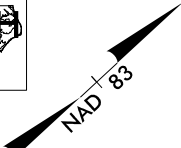


8/17/99
8/29/2014
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E:\




DENOTES IMPACTS IN SURFACE WATER (POND)





PROJECT REFERENCE NO. <i>R-3329 / R-2559</i>		SHEET NO. <i>86</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
<i>PERMIT DRAWING SHEET 67 OF 267</i>			

PLANS PREPARED BY :

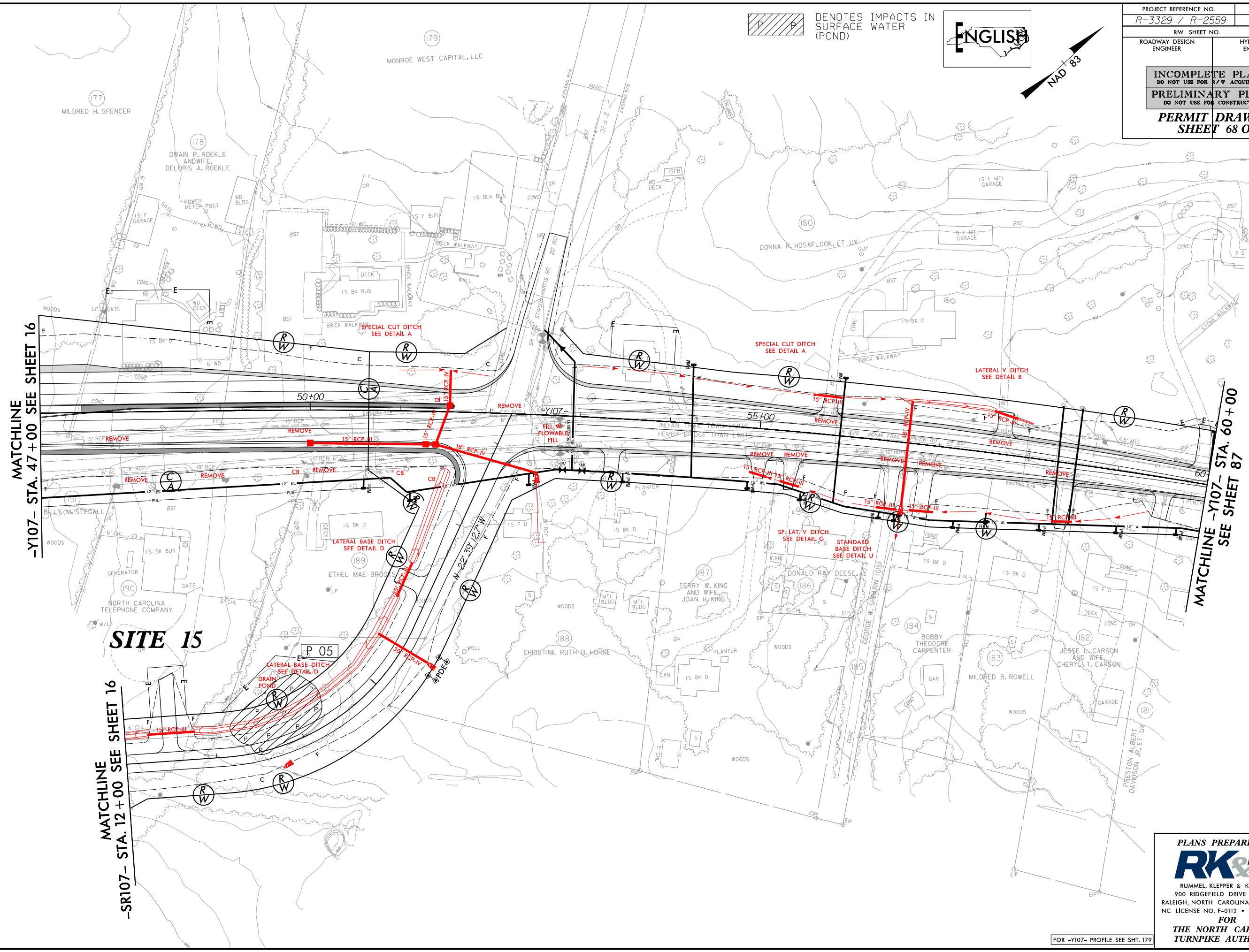
RK&K

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

FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

FOR -Y107- PROFILE SEE SHT. 179

8/17/99
8/29/2014
R:\Hidraulics\PERMITS_Environmental\Drawings\Section2A\R3329_R2559_HYD_PRM_WET_PSH086.com.dgn



179

MONROE WEST CAPITAL, LLC

177

MILDRED H. SPENCER

178

DWAIN P. ROEKE AND WIFE
DELORIS A. ROEKE

180

DONNA R. HOSAFLOOK, ET UX

181

PRESTON ALBERT DAVIDSON JR., ET UX

182

JESSE L. CARSON AND WIFE
CHERYL T. CARSON

183

MILDRED B. ROWELL

184

BOBBY THEODORE CARPENTER

185

GEORGE W. STEARN (GWS)

186

DONALD RAY DEESE

187

TERRY W. KING AND WIFE
JOAN H. KING

188

CHRISTINE RUTH B. HORNE

189

ETHEL MAE BROOKS

190

NORTH CAROLINA TELEPHONE COMPANY

191

BILLY W. STEGALL

192

WOODS

193

WOODS

194

WOODS

195

WOODS

196

WOODS

197

WOODS

198

WOODS

199

WOODS

200

WOODS

PROJECT REFERENCE NO. <i>R-3329 / R-2559</i>		SHEET NO. <i>86</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 68 OF 267			

PLANS PREPARED BY :

RK&K

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

FOR

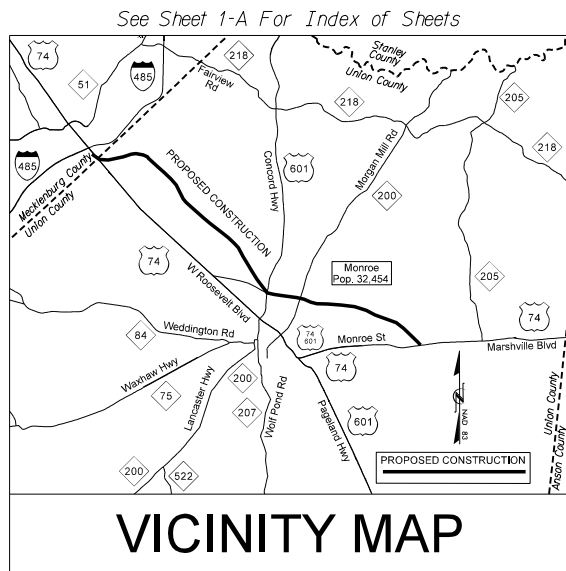
THE NORTH CAROLINA
TURNPIKE AUTHORITY

FOR -Y107- PROFILE SEE SHT. 179

09/08/99

TIP PROJECT: R-3329 / R-2559

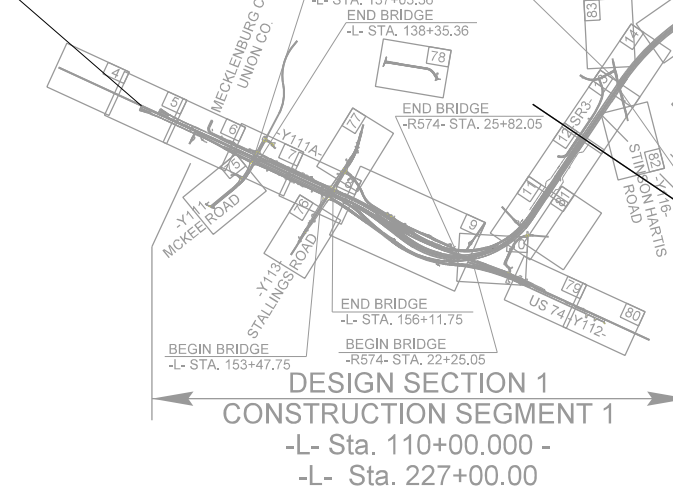
CONTRACT: C202587



VICINITY MAP

BEGIN TIP PROJECT R-3329 / R-2559

-L- Sta. 110+00.00

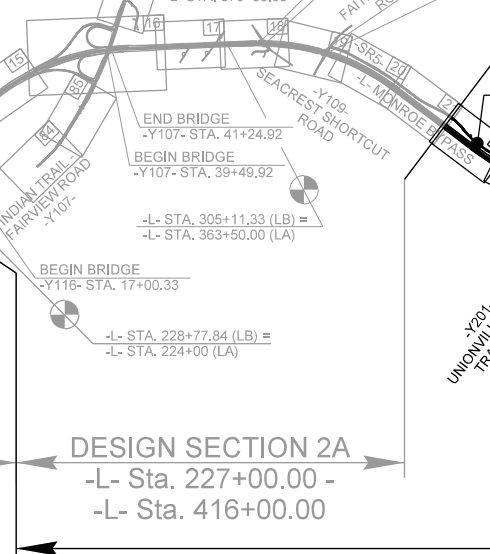


DESIGN SECTION 1

CONSTRUCTION SEGMENT 1

-L- Sta. 110+00.000 -

-L- Sta. 227+00.00



DESIGN SECTION 2A

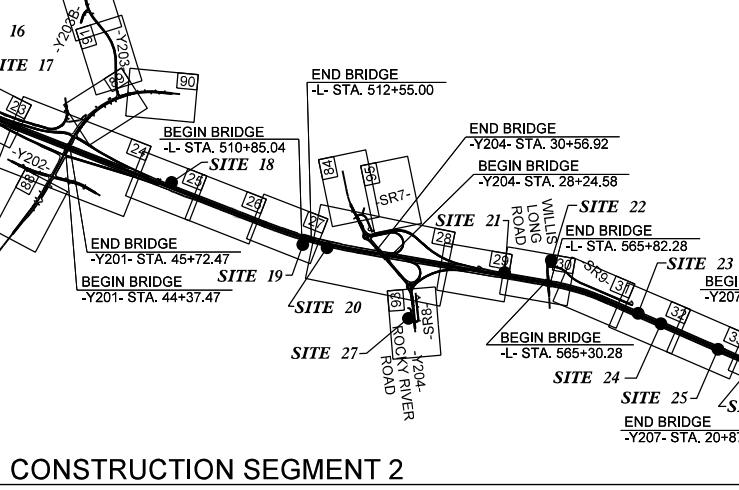
CONSTRUCTION SEGMENT 2

-L- Sta. 227+00.00 -

-L- Sta. 416+00.00

DESIGN SECTION 2B

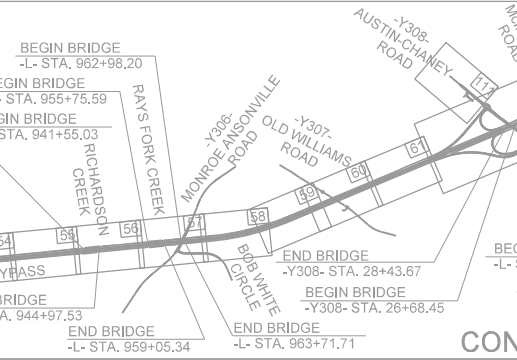
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CONSTRUCTION SEGMENT 2

DESIGN SECTION 3A

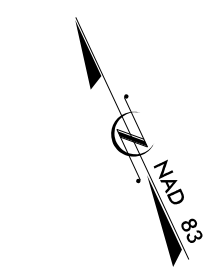
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CONSTRUCTION SEGMENT 3

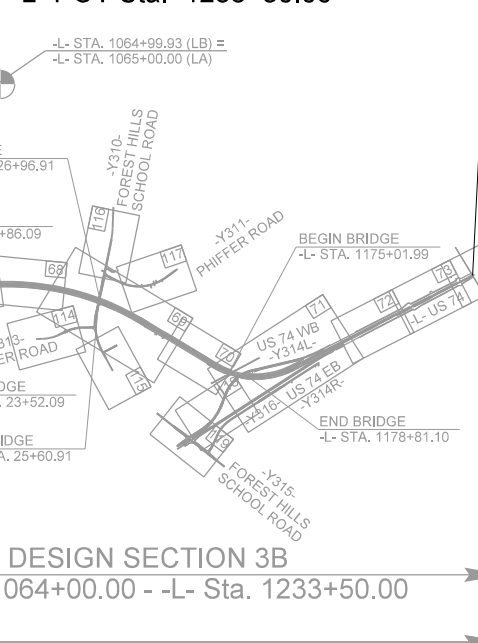
-L- POT Sta. 644+99.90 (LB) =

-L- POT Sta. 645+00.00 (LA)



END TIP PROJECT R-3329 / R-2559

-L- POT Sta. 1233+50.00



DESIGN SECTION 3B

-L- Sta. 1064+00.00 -L- Sta. 1233+50.00

- NOTES:
1. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.
 2. THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.
 3. A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF MATTHEWS, INDIAN TRAIL, HEMBY BRIDGE, LAKE PARK, MONROE, UNIONVILLE, WINGATE, AND MARSHVILLE.

GRAPHIC SCALES



PLANS



PROFILE (HORIZONTAL)



PROFILE (VERTICAL)

DESIGN DATA

ADT 2013 = 64,100
ADT 2035 = 95,600
DHV = 8%
D = 55%
T = 18%*
V = 70 mph

*(TTST 11% + DUAL 7%)
FUNCTIONAL CLASS.: FREEWAY

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-3329 / R-2559..... 18.1 mi
LENGTH STRUCTURE TIP PROJECT R-3329 / R-2559..... *1.6 mi
TOTAL LENGTH TIP PROJECT R-3329 / R-2559..... 19.7 mi

* LENGTH OF STRUCTURES BASED ON WB LANES

NCDOT CONTACT: K. ZAK HAMIDI, PE

DESIGN - BUILD TEAM

PLANS PREPARED BY :



RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO. F-0112

J.T. Peacock, Jr., P.E.
PROJECT ENGINEER

Stephen E. Roberts, P.E.
PROJECT DESIGN ENGINEER

2006 STANDARD SPECIFICATIONS

LETTING DATE:

OCTOBER 28, 2010

CONTRACTOR :

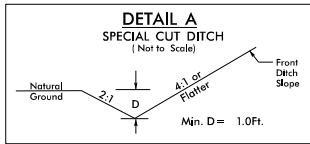


HYDRAULICS ENGINEER

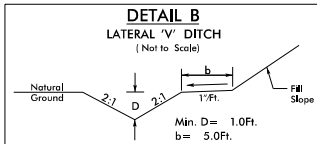
SIGNATURE: P.E.
ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

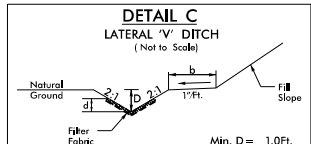
\$\$\$\$\$TIME\$\$\$\$\$
09/20/10
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J.L. keys



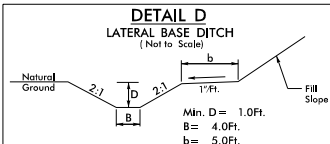
-L- STA. 424+50 TO STA. 426+00 LT
-L- STA. 441+00 TO STA. 454+00 RT
-L- STA. 442+50 TO STA. 444+50 LT
-L/-NRB- STA. 449+00 TO STA. 450+00 LT
-L- STA. 463+50 TO STA. 469+00 RT
-L- STA. 465+50 TO STA. 469+00 LT
-L- STA. 494+75 TO STA. 496+00 LT
-L- STA. 496+50 TO STA. 497+50 RT
-L- STA. 531+00 TO STA. 534+00 RT
-L- STA. 532+00 TO STA. 536+00 LT
-L- STA. 539+00 TO STA. 543+00 LT
-L- STA. 539+00 TO STA. 542+50 RT
-L- STA. 545+50 TO STA. 550+00 LT
-L- STA. 575+50 TO STA. 575+00 RT
-L- STA. 583+00 TO STA. 585+00 LT
-L- STA. 582+50 TO STA. 584+00 RT
-L- STA. 588+00 TO STA. 590+50 RT
-L- STA. 592+50 TO STA. 595+00 LT
-L- STA. 593+00 TO STA. 595+50 RT
-L- STA. 598+00 TO STA. 598+68 RT
-L- STA. 599+50 TO STA. 600+00 RT
-L- STA. 605+45 TO STA. 612+00 RT
-L- STA. 606+20 TO STA. 612+00 LT
-L- STA. 618+50 TO STA. 620+00 LT
-L- STA. 618+50 TO STA. 619+50 RT
-L- STA. 634+50 TO STA. 635+50 LT
-L- STA. 634+50 TO STA. 635+50 RT
-QRA- STA. 17+50 TO STA. 83+25 RT
-QRA- STA. 19+50 TO STA. 20+00 RT
-QRA- STA. 25+50 TO STA. 28+00 LT
-QLD- STA. 10+10 TO STA. 12+12 RT
-QLD- STA. 16+85 TO STA. 17+35 RT
-QRD- STA. 15+00 TO STA. 19+00 RT
-SR5- STA. 44+14 TO STA. 47+21 RT
-SR5- STA. 79+00 TO STA. 83+25 RT
-SR5- STA. 79+00 TO STA. 82+95 LT
-SR7- STA. 13+23 TO STA. 15+50 RT
-SR8- STA. 10+50 TO STA. 15+42 LT
-Y201- STA. 22+11 TO STA. 26+50 RT
-Y201- STA. 52+00 TO STA. 54+00 RT
-Y201- STA. 66+50 TO STA. 73+26 LT
-Y201- STA. 72+50 TO STA. 73+08 RT
-Y202- STA. 8+83 TO STA. 9+50 RT
-Y202- STA. 8+90 TO STA. 9+50 LT
-Y202- STA. 13+50 TO STA. 15+00 LT
-Y202- STA. 19+00 TO STA. 21+00 RT
-Y202- STA. 19+50 TO STA. 21+00 LT
-Y202- STA. 23+00 TO STA. 24+00 RT
-Y202- STA. 28+00 TO STA. 29+70 RT
-Y202- STA. 28+75 TO STA. 29+75 LT
-Y203- STA. 18+00 TO STA. 19+50 RT
-Y203- STA. 23+50 TO STA. 29+50 RT
-Y203- STA. 35+00 TO STA. 36+92 RT
-Y203- STA. 35+00 TO STA. 37+03 LT
-Y203B- STA. 12+50 TO STA. 13+64 LT
-Y203B- STA. 12+25 TO STA. 13+40 RT
-Y204- STA. 11+00 TO STA. 11+00 RT
-Y204- STA. 12+50 TO STA. 15+50 RT
-Y204- STA. 15+50 TO STA. 18+00 LT
-Y204- STA. 42+00 TO STA. 43+04 RT
-Y204- STA. 42+00 TO STA. 42+84 LT
-Y208- STA. 13+00 TO STA. 14+25 RT
-Y208- STA. 17+00 TO STA. 18+00 RT
-Y204_DET- STA. 20+34.66 TO STA. 21+84.66 RT



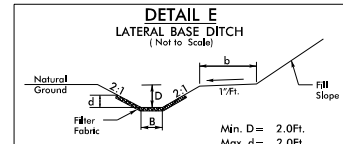
-L- STA. 431+50 TO STA. 433+62 RT
-L- STA. 513+00 TO STA. 515+00 RT
-L- STA. 558+00 TO STA. 559+10 RT
-L- STA. 566+50 TO STA. 569+50 RT
-L- STA. 566+50 TO STA. 572+00 LT
-L- STA. 573+00 TO STA. 575+00 RT
-L- STA. 584+50 TO STA. 586+00 RT
-L- STA. 590+50 TO STA. 593+00 RT
-L- STA. 591+18 TO STA. 591+70 LT
-L- STA. 604+25 TO STA. 605+45 RT
-L- STA. 605+00 TO STA. 606+20 LT
-L- STA. 612+00 TO STA. 614+00 RT
-L- STA. 614+03 TO STA. 615+00 RT
-L- STA. 638+37 TO STA. 639+50 RT
-QRA- STA. 20+50 TO STA. 25+50 LT
-QRA- STA. 28+00 TO STA. 28+76 LT
-QRD- STA. 19+00 TO STA. 19+71 LT
-QRD- STA. 19+00 TO STA. 19+41 RT
-SR5- STA. 78+25 TO STA. 79+00 LT
-SR9- STA. 15+00 TO STA. 19+10 RT
-SR9- STA. 15+66 TO STA. 18+59 LT
-Y201- STA. 26+75 TO STA. 27+50 RT
-Y201- STA. 48+50 TO STA. 48+87 LT
-Y202- STA. 17+00 TO STA. 17+85 LT
-Y203- STA. 15+67 TO STA. 18+00 RT
-Y204- STA. 36+00 TO STA. 39+00 RT
-Y207- STA. 14+00 TO STA. 15+00 LT



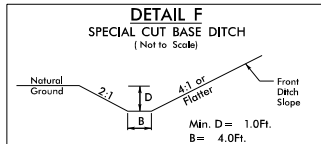
Type of Liner = Class B Rip-Rap
DETAIL C NOT USED IN SECTION 2B



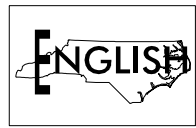
-L- STA. 414+00 TO STA. 431+50 RT
-L- STA. 437+00 TO STA. 444+00 RT
-L- STA. 473+50 TO STA. 474+62 LT
-L- STA. 476+00 TO STA. 488+00 LT
-L- STA. 515+00 TO STA. 516+12 RT
-L- STA. 519+25 TO STA. 524+00 RT
-L- STA. 524+50 TO STA. 525+00 LT
-L- STA. 536+00 TO STA. 539+00 LT
-L- STA. 537+86 TO STA. 539+00 RT
-L- STA. 553+93 TO STA. 554+50 RT
-L- STA. 554+50 TO STA. 556+00 LT
-L- STA. 555+50 TO STA. 558+00 RT
-L- STA. 559+10 TO STA. 562+32 RT
-L- STA. 560+00 TO STA. 561+61 LT
-L- STA. 584+00 TO STA. 586+00 RT
-L- STA. 598+00 TO STA. 600+20 LT
-L- STA. 613+05 TO STA. 614+03 LT
-L- STA. 619+50 TO STA. 621+50 RT
-L- STA. 620+50 TO STA. 624+50 LT
-L- STA. 628+00 TO STA. 632+50 RT
-L- STA. 631+50 TO STA. 633+50 LT
-L- STA. 637+70 TO STA. 640+00 LT
-NRD- STA. 29+50 TO STA. 30+90 RT
-QLA- STA. 12+05 TO STA. 16+50 LT
-QRA- STA. 20+00 TO STA. 24+46 RT
-QRD- STA. 19+71 TO STA. 20+50 LT
-SR5- STA. 76+85 TO STA. 78+50 RT
-Y201- STA. 28+50 TO STA. 34+75 LT
-Y201- STA. 48+50 TO STA. 52+00 RT
-Y201- STA. 48+87 TO STA. 50+00 LT
-Y203- STA. 10+70 TO STA. 18+00 LT
-Y204- STA. 23+50 TO STA. 25+99 RT
-Y206- STA. 15+50 TO STA. 17+50 LT
-Y207- STA. 15+00 TO STA. 18+84 LT
-Y207- STA. 17+00 TO STA. 19+50 RT



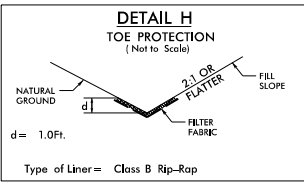
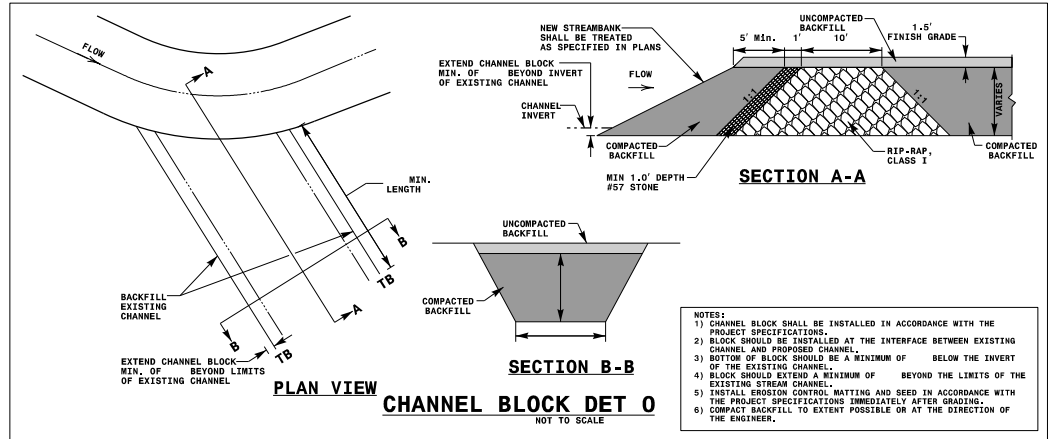
-L- STA. 433+62 TO STA. 435+50 RT
-L- STA. 444+00 TO STA. 445+50 RT
-L- STA. 474+62 TO STA. 476+00 LT
-L- STA. 477+00 TO STA. 484+00 RT
-L- STA. 524+00 TO STA. 525+50 RT
-L- STA. 585+50 TO STA. 587+75 LT
-L- STA. 637+00 TO STA. 638+37 RT
-SR5- STA. 55+75 TO STA. 57+06 LT
-Y206- STA. 24+67 TO STA. 25+50 LT



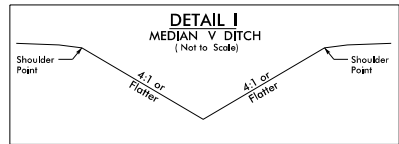
-L- STA. 435+50 TO STA. 437+00 RT
-L- STA. 470+50 TO STA. 473+50 LT
-L- STA. 472+50 TO STA. 477+00 RT
-L- STA. 554+50 TO STA. 555+50 RT
-SR5- STA. 78+50 TO STA. 79+00 RT
-Y201- STA. 21+90 TO STA. 28+50 LT
-Y203B- STA. 10+50 TO STA. 12+50 LT
-Y206- STA. 25+50 TO STA. 27+16 LT



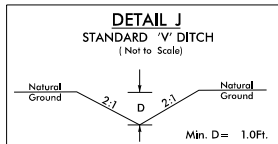
PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	2B-2H
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 70 OF 267	



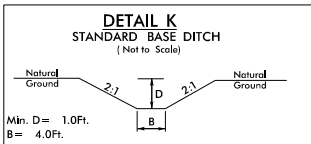
Type of Liner = Class B Rip-Rap
DETAIL H NOT USED IN SECTION 2B



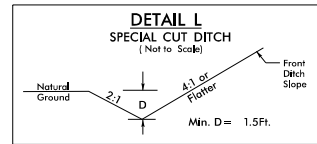
-L- STA. 453+50 TO STA. 455+00 MED
-L- STA. 490+00 TO STA. 491+00 MED
-L- STA. 530+00 TO STA. 532+50 MED
-L- STA. 583+00 TO STA. 585+00 MED
-L- STA. 588+00 TO STA. 592+50 MED
-L- STA. 608+50 TO STA. 610+50 MED
-L- STA. 618+50 TO STA. 622+50 MED
-L- STA. 634+50 TO STA. 635+50 MED



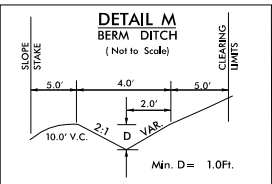
-Y204- STA. 13+50 RT; L=22', S=4.5%
BEG EL.=642.0, END EL.=641.0
-Y204- STA. 17+00 TO STA. 17+24 RT
L=38', S=2.1%, BEG EL.=643.8, END EL.=643.0
-SR5- STA. 64+88 LT; L=110', S=0.8%
BEG EL.=637.9, END EL.=637.0
-SR8- STA. 16+28 TO STA. 16+57 RT
L=54', S=2.4%, BEG EL.=645.3, END EL.=644.0



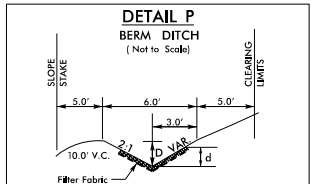
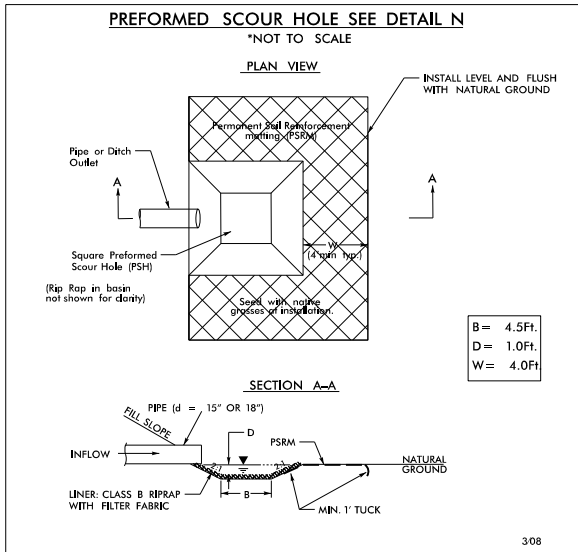
-Y202- STA. 14+15 LT; L=100', S=2.5%
BEG EL.=646.9, END EL.=644.4
-Y202- STA. 14+20 RT; L=273', S=0.3%
BEG EL.=644.0, END EL.=643.3
-Y202- STA. 28+75 LT; L=100', S=0.5%
BEG EL.=651.7, END EL.=651.2
-Y202- STA. 28+75 RT; L=100', S=6.1%
BEG EL.=658.1, END EL.=652.0
-L- STA. 629+50 LT; L=80', S=4.2%
BEG EL.=592.4, END EL.=589.0
-L- STA. 631+50 LT; L=55', S=2.9%
BEG EL.=590.8, END EL.=589.2
-Y201- 26+75 RT; L=115', S=0.3%
BEG EL.=634.4, END EL.=634.1
-L- STA. 556+00 LT; L=230', S=0.4%
BEG EL.=622.9, END EL.=622.0
-L- STA. 569+25 LT TO -SR9- 15+75 RT;
L=105', S=1.7%, BEG EL.=616.5, END EL.=614.5
-QRA- STA. 28+76 TO STA. 28+82 LT
L=18', S=0.6%, BEG EL.=621.0, END EL.=620.9
-SR5- STA. 78+25 LT; L=199', S=0.7%
BEG EL.=639.3, END EL.=638.0
-L- STA. 553+12 RT; L=112', S=6.6%
BEG EL.=631.7, END EL.=624.3



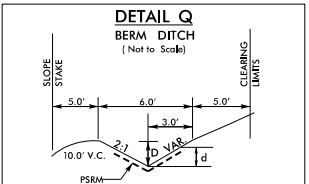
DETAIL L NOT USED IN SECTION 2B



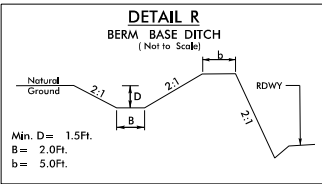
-L- STA. 615+00 TO STA. 618+00 RT
-L- STA. 532+00 TO STA. 534+40 RT



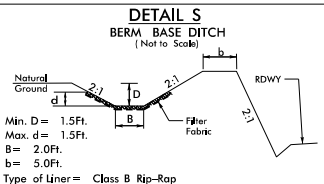
Type of Liner = Class B Rip-Rap
DETAIL P NOT USED IN SECTION 2B



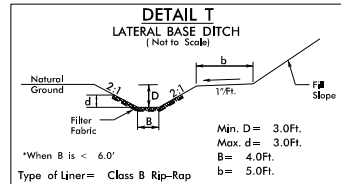
Type of Liner = PSRM
DETAIL Q NOT USED IN SECTION 2B



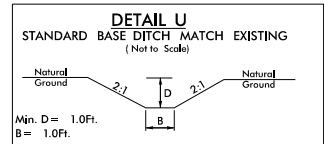
-NRA- STA. 11+00 TO STA. 22+50 LT
-QRA- STA. 10+00 TO STA. 16+50 RT
-L- STA. 550+50 TO STA. 551+25 LT
-L- STA. 547+00 TO STA. 553+93 RT



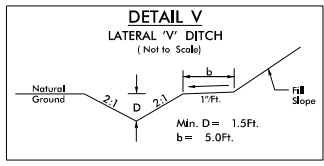
Type of Liner = Class B Rip-Rap
-NRD- STA. 13+16 TO STA. 27+00 RT



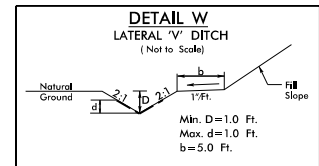
Type of Liner = Class B Rip-Rap
DETAIL T NOT USED IN SECTION 2B



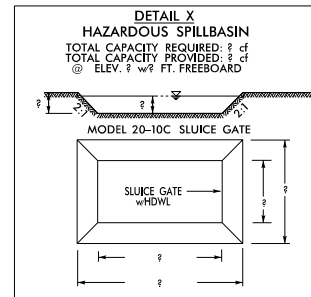
DETAIL U NOT USED IN SECTION 2B



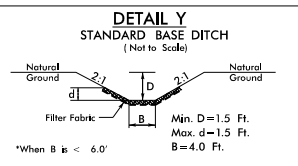
DETAIL V NOT USED IN SECTION 2B



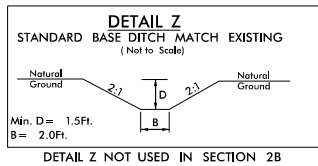
Type of Liner = PSRM
DETAIL W NOT USED IN SECTION 2B



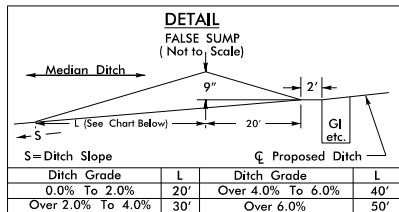
DETAIL X NOT USED IN SECTION 2B



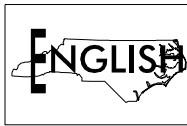
Type of Liner = Class B Rip-Rap
-L- STA. 474+62 RT; L=60', S=1.7%
BEG EL.=626.2, END EL.=625.2
-QRA- STA. 24+46 RT; L=218', S=2.3%
BEG EL.=620.9, END EL.=615.8
-Y201- STA. 28+15 LT; L=100', S=5.9%
BEG EL.=640.7, END EL.=634.8
-Y2G- STA. 48+25 LT; L=196', S=3.2%
BEG EL.=646.0, END EL.=639.8



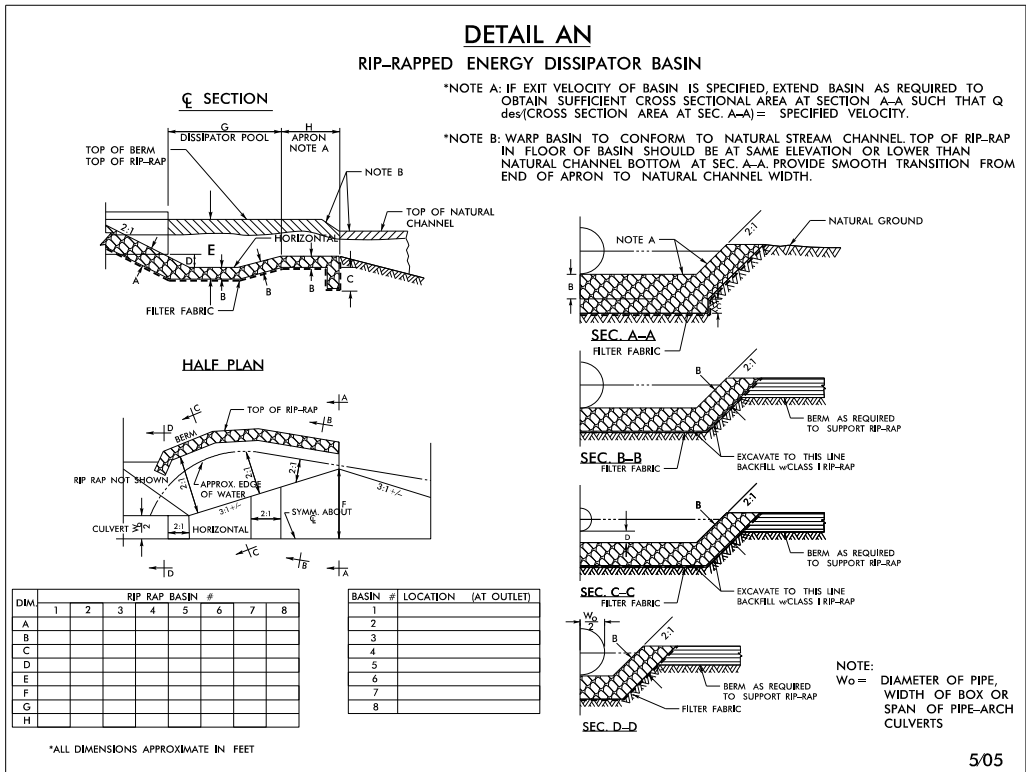
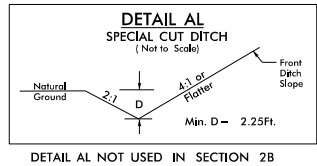
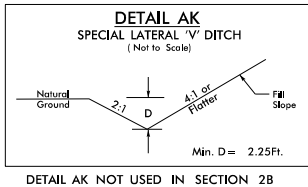
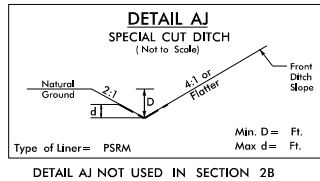
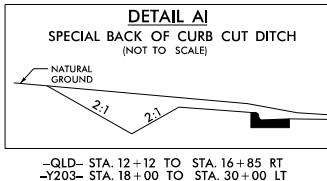
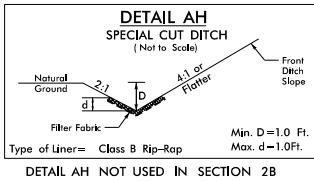
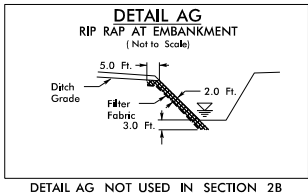
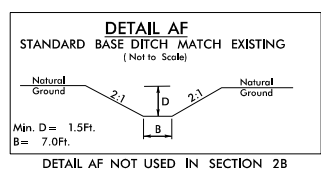
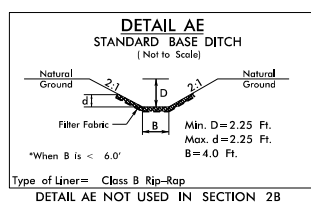
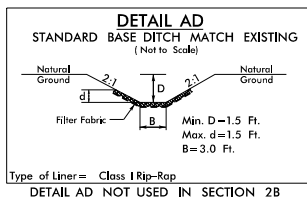
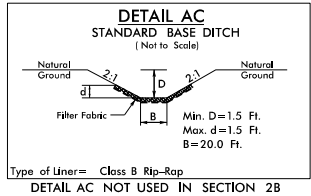
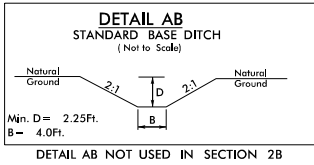
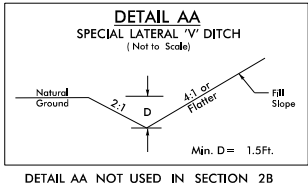
DETAIL Z NOT USED IN SECTION 2B



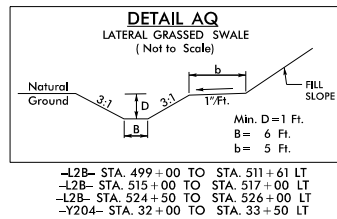
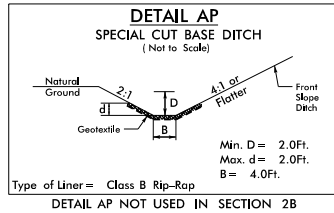
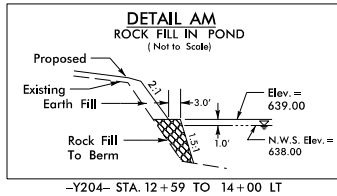
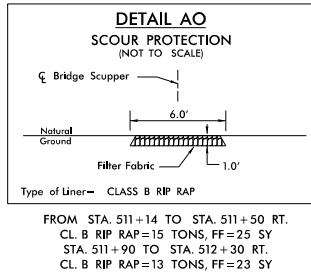
S=Ditch Slope	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'



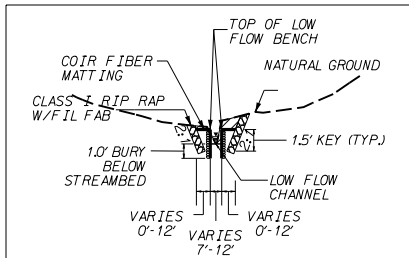
PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	2B-21
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 71 OF 267	



DETAIL AN NOT USED IN SECTION 2B

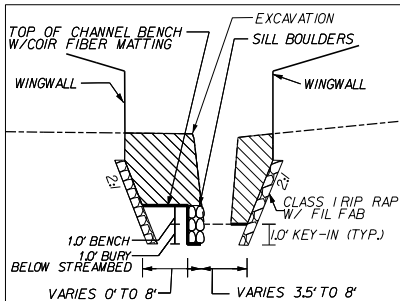


UT TO NORTH FORK
CROOKED CREEK
-L- STA. 424+11.5



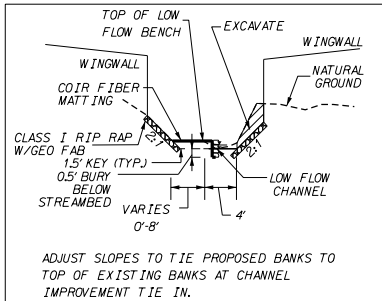
CULVERT INLET DETAIL (NTS)
LENGTH = 65'

UT TO SOUTH FORK
CROOKED CREEK
-L- STA. 515+45



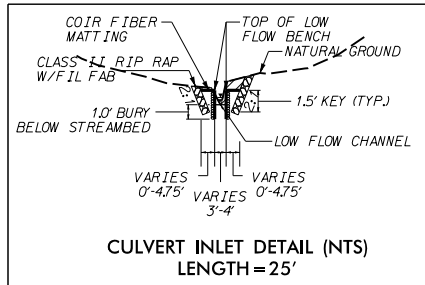
CULVERT INLET DETAIL (NTS)
LENGTH = 21'

UT TO EAST FORK
STEWARTS CREEK
-L- STA. 586+22

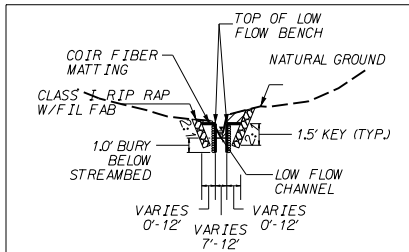
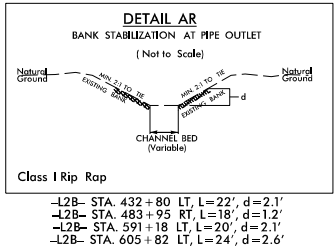


CULVERT INLET DETAIL (NTS)
LENGTH = 66'

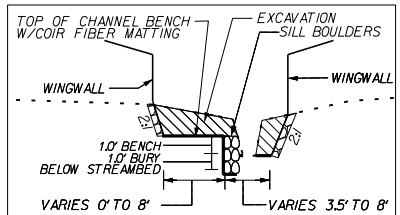
UT TO EAST FORK
STEWARTS CREEK
-L- STA. 613+68



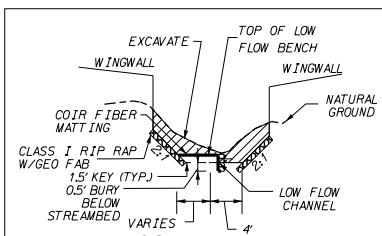
CULVERT INLET DETAIL (NTS)
LENGTH = 25'



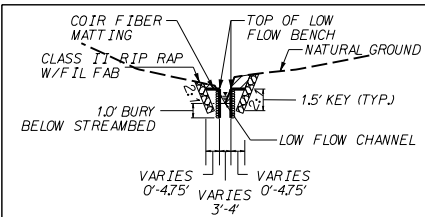
CULVERT OUTLET DETAIL (NTS)
LENGTH = 57'



CULVERT OUTLET DETAIL (NTS)
LENGTH = 26'

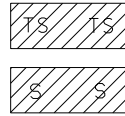


CULVERT OUTLET DETAIL (NTS)
LENGTH = 93'



CULVERT OUTLET DETAIL (NTS)
LENGTH = 23'

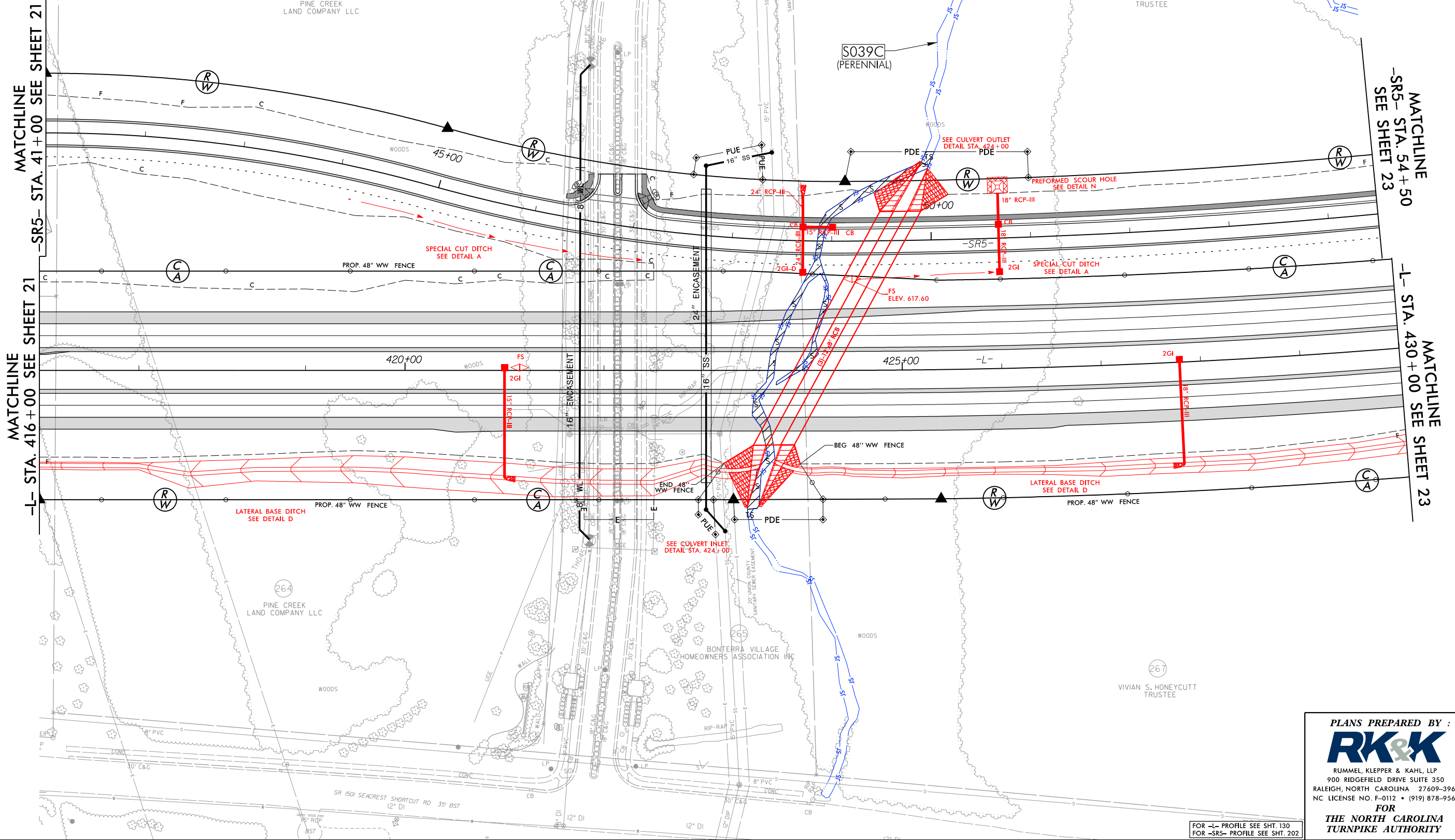
8/17/99



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN
SURFACE WATER

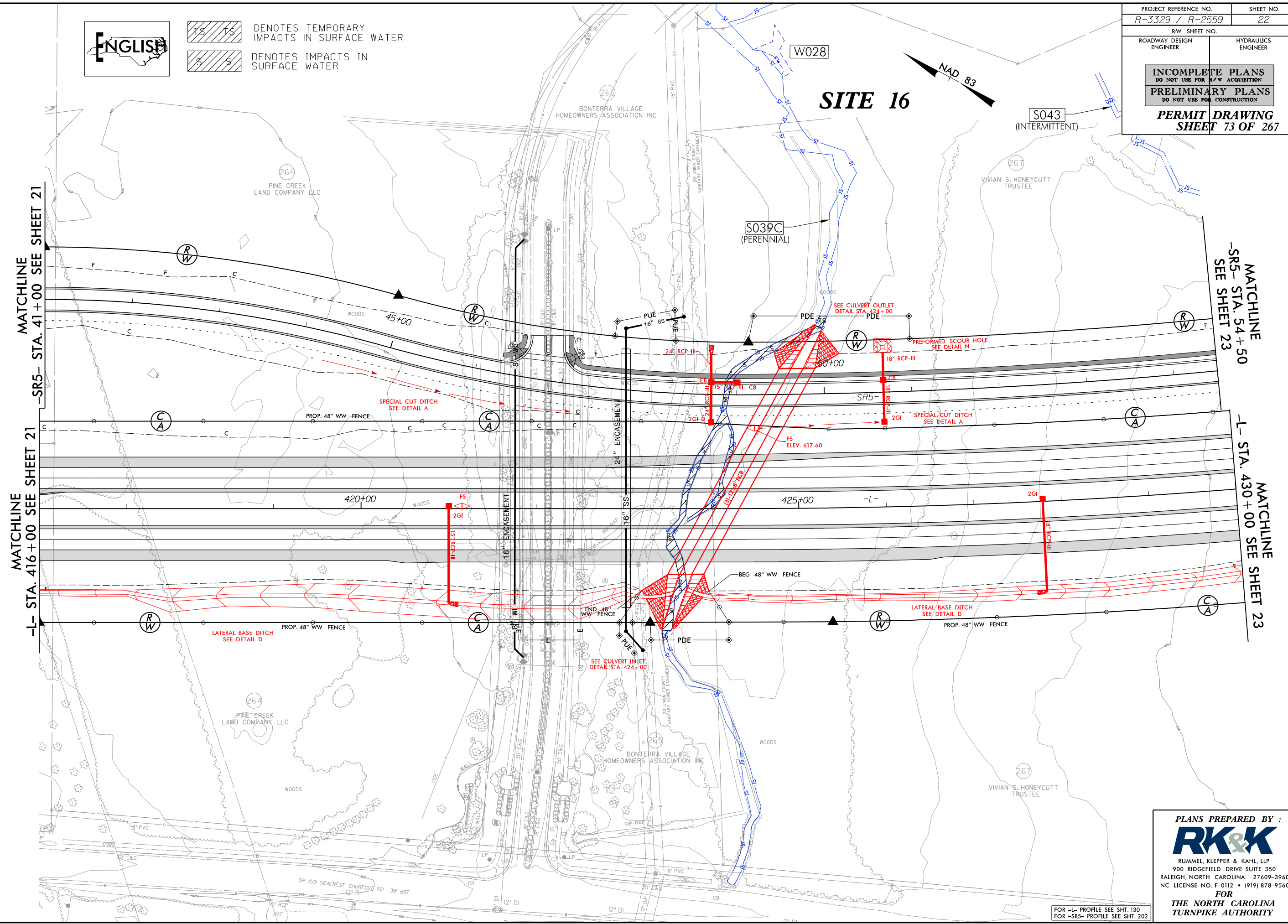
PROJECT REFERENCE NO. R-3329 / R-2559		SHEET NO. 22
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 72 OF 267		



FOR -L- PROFILE SEE SHT. 130
FOR -SR5- PROFILE SEE SHT. 202

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
FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

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



FOR -L- PROFILE SEE SHT. 130
FOR -SR5- PROFILE SEE SHT. 202

670

660

650

640

630

620

610

600

590

580

CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 1000	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 616.2	FT
BASE DISCHARGE	= 1100	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 616.9	FT
OVERTOPPING DISCHARGE	= 2250	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 623.8	FT

SITE 16

$PI = 429+00.00$
 $EL = 622.06'$
 $VC = 390'$
 $K = 197$
 $DS = 73\text{mph}$



PIPE HYDRAULIC DATA		
STR 2312 Sta.432+86		
DRAINAGE AREA	= 55.3	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 177.5	CFS
DESIGN HW ELEVATION	= 621.42	FT
100 YEAR DISCHARGE	= 206.4	CFS
100 YEAR HW ELEVATION	= 621.96	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 495.2	CFS
OVERTOPPING ELEVATION	= 628.47	FT

$$\begin{array}{r} -L-STA. 431+83.01 = \\ -NRB- STA. 10+00.00 \\ \hline ELEV. = 626.60' \end{array}$$
$$\begin{array}{r} -L-STA.435+97.79 = \\ -NRC- STA.10+00.00, 47' RT \\ ELEV. = 633.24' \end{array}$$

END LAT.BASE DITCH RT.
BEGIN LAT.V DITCH RT.
-L- STA.431+50.00
EI = 619.39

$$\begin{aligned} P1 &= 433 + 62.00 \\ EI &= 617.75 \end{aligned}$$

END LAT.V DITCH RT.
BEGIN SP.CUT DITCH RT.
-L- STA.435+50.00
E1 - 62601

END SP.CUT DITCH RT.
 BEGIN LAT.BASE DITCH RT.
 -L- STA.437+00.00
 E' = 630.15

BEGIN SP. CUT DITCH RT.
-L- STA. 441+00.00
EI = 641.29

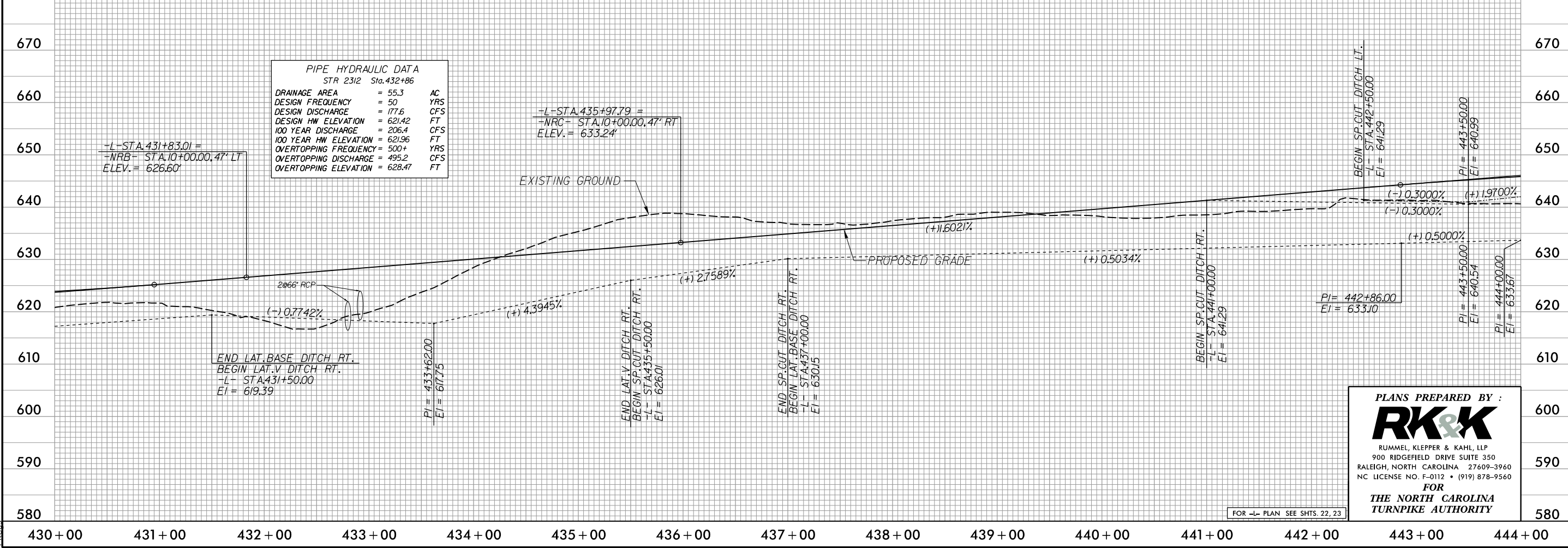
BEGIN SP. CUT DITCH LT.
-L- STA. 442+50.00
FI = 641.29

Y	(+)	
PI = 443+50.00	PI = 443+50.00	
FI = 640.54	FI = 640.99	

$$\frac{PI = 442 + 86.00}{EI = 633.10}$$

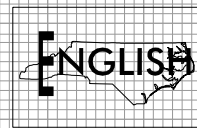
PLANS PREPARED BY :
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FOR -L- PLAN SEE SHTS. 22, 23



5/14/99
9/30/2004
B:\Hydraulics\PERMITS\Environmental\Drawings\Section2B\R3329_R2559_HDY_PRM_WET_PFL2B1.dgn
Elev

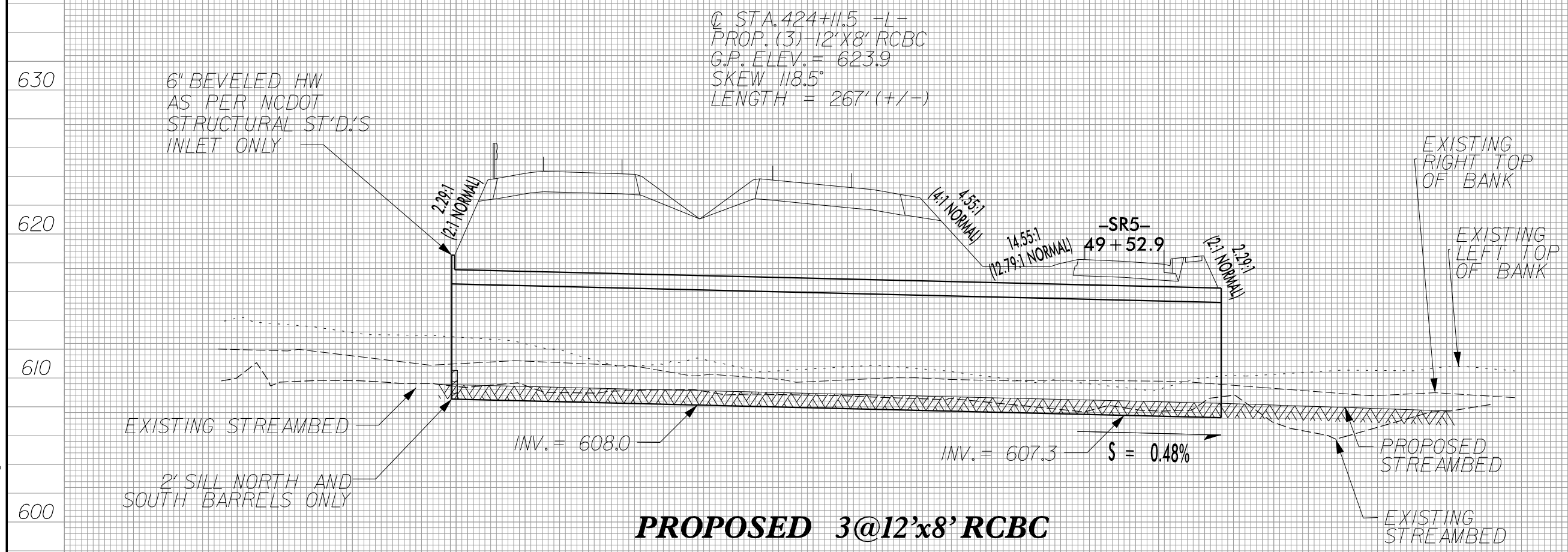
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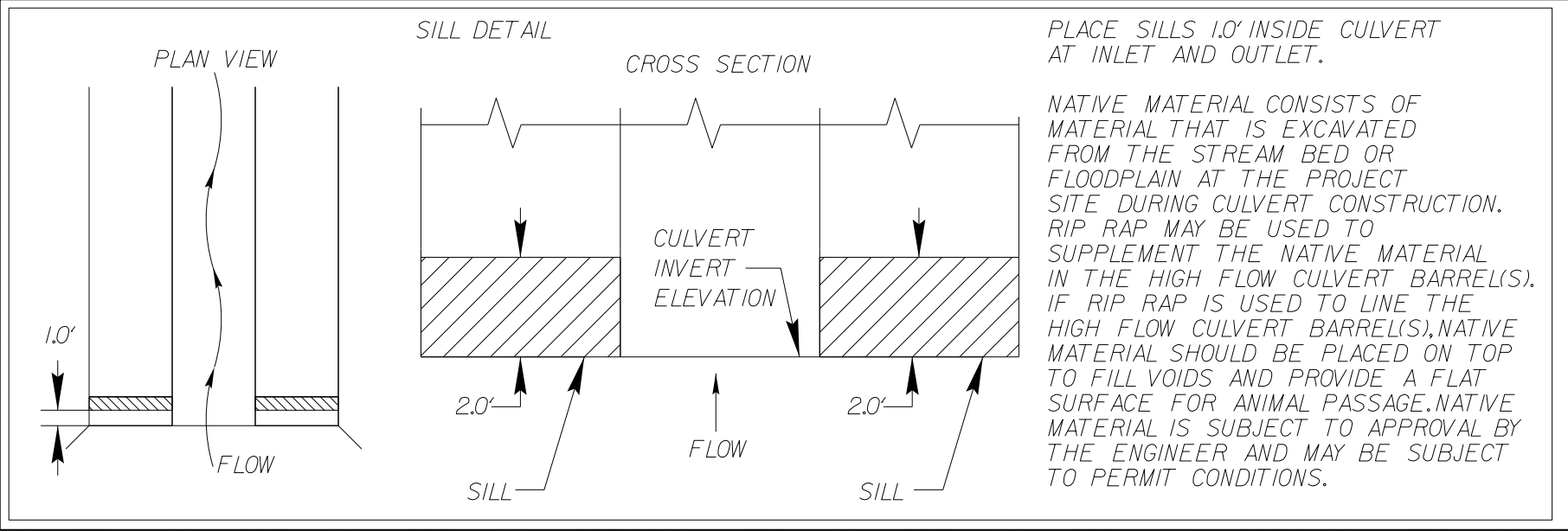
PROJECT REFERENCE NO. R-3329 /R-2559		SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 75 OF 267		

SITE 16

-L- STA. 424+00



PROPOSED 3@12'x8' RCBC





 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 DENOTES IMPACTS IN SURFACE WATER

S041b
(PERENNIAL)

SITE 17

MATCHLINE
-SR5- STA. 54+50
SEE SHEET 22

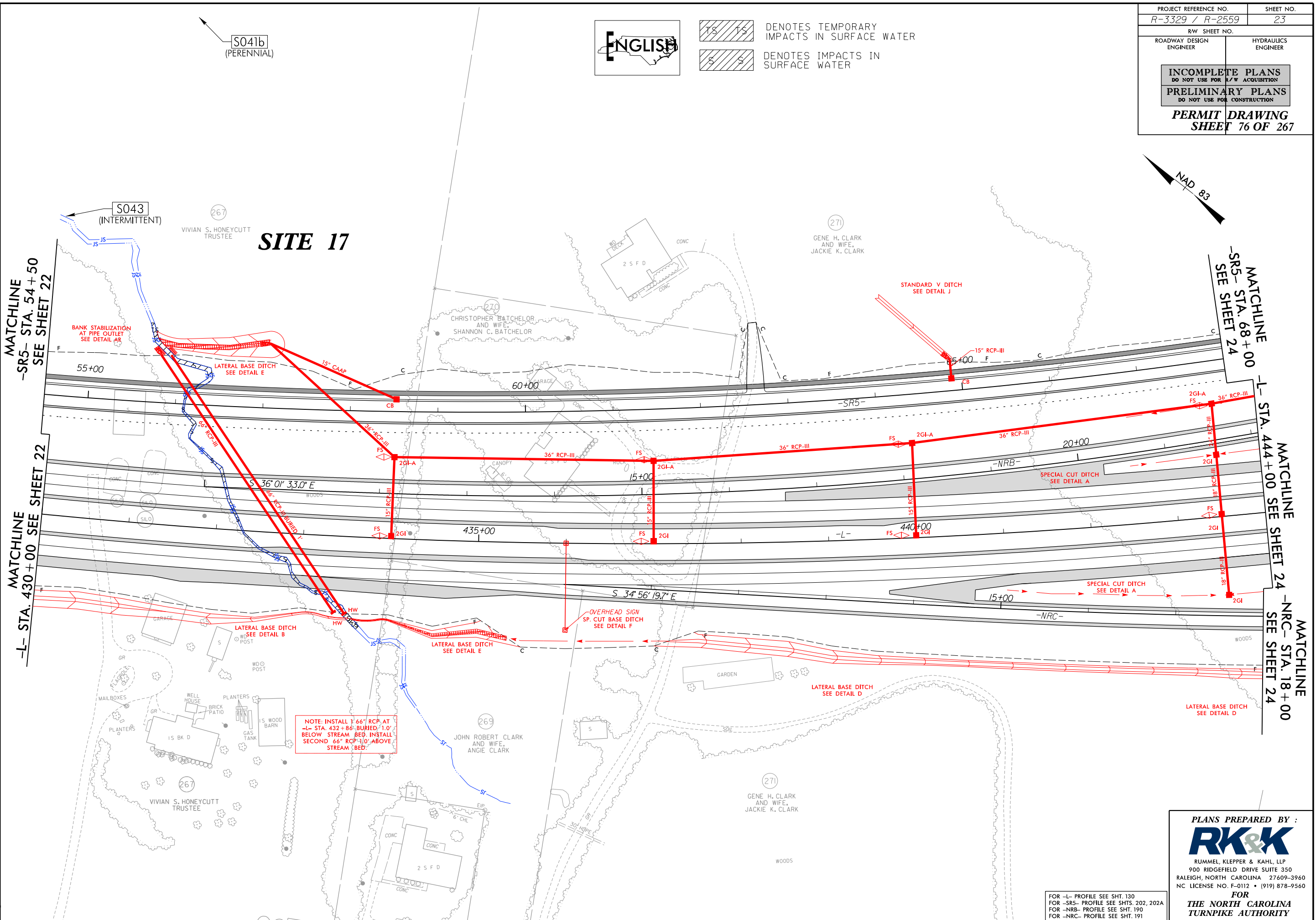
MATCHLINE
-L- STA. 430+00 SEE SHEET 22

MATCHLINE
-SR5- STA. 68+00
SEE SHEET 24

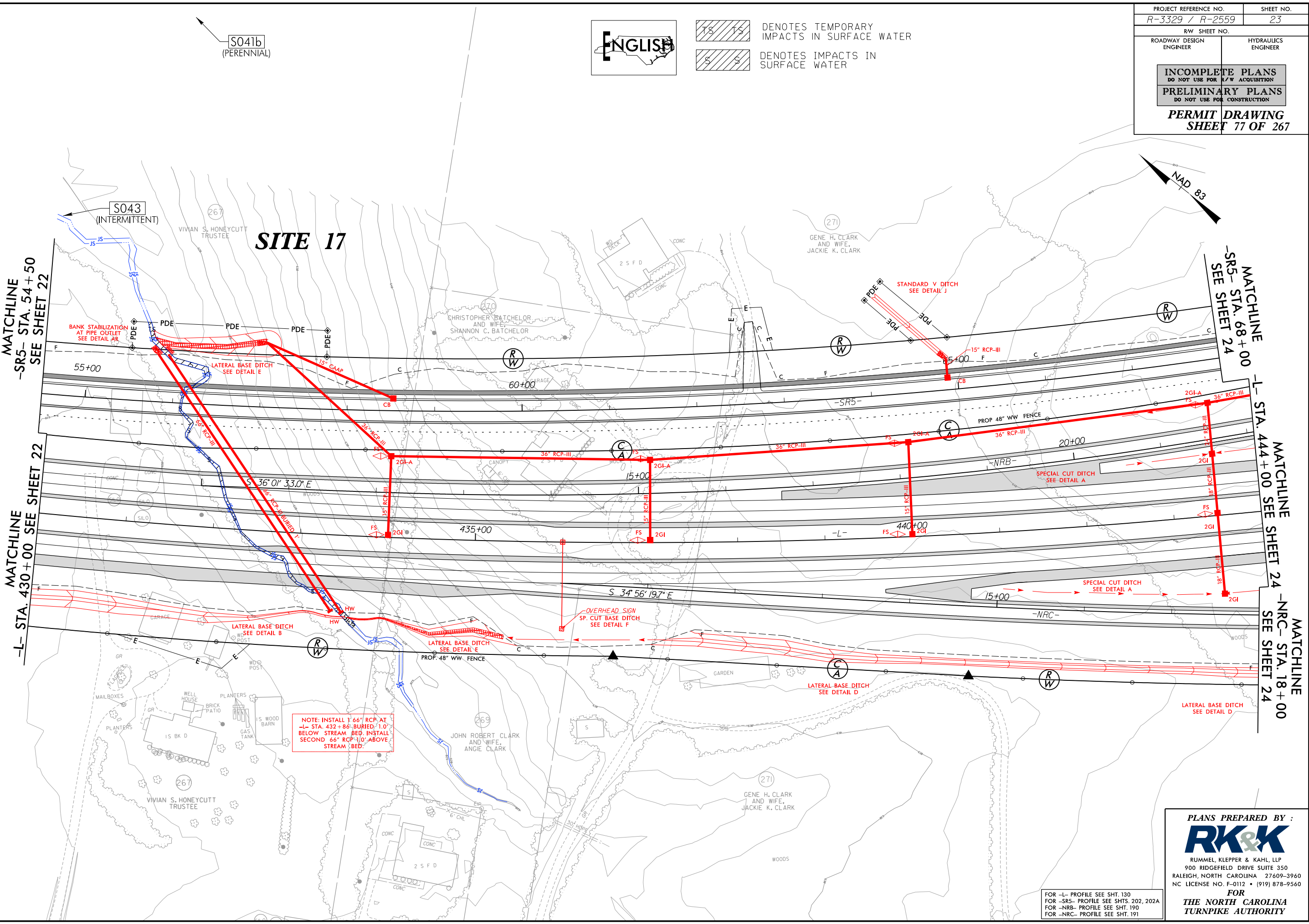
MATCHLINE
MATCHLINE
-NRC- STA. 18+00
SEE SHEET 24
SEE SHEET 24
11+00 SEE SHEET 24

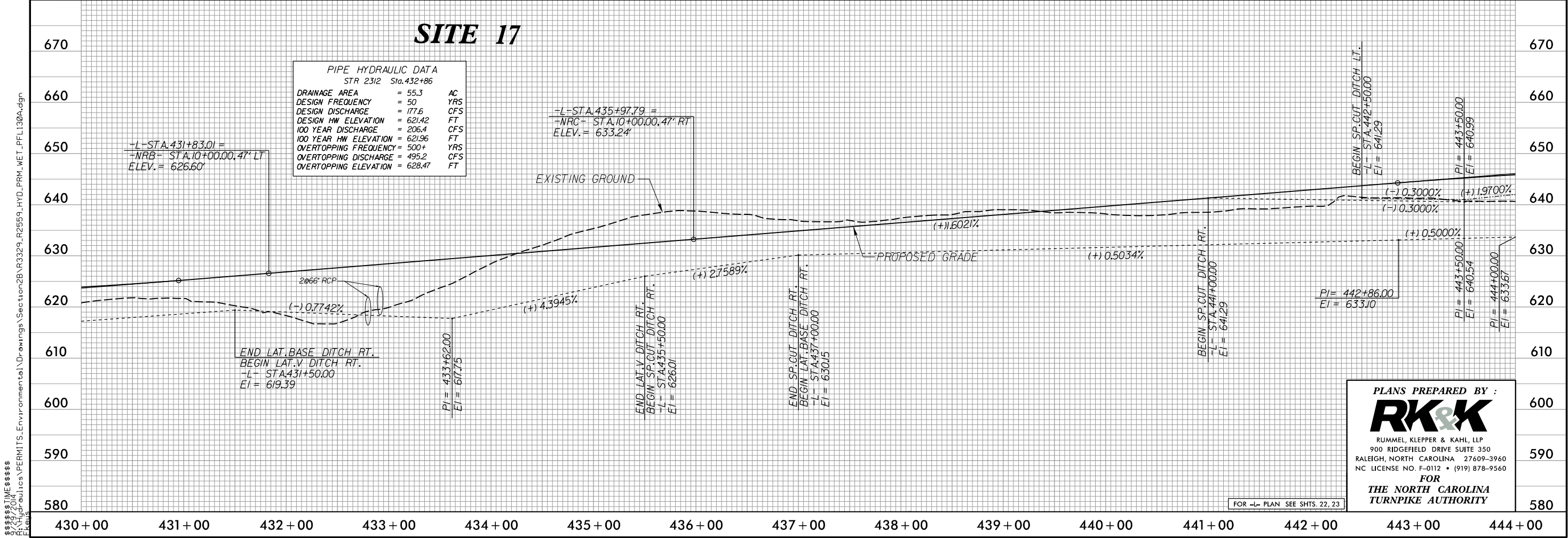
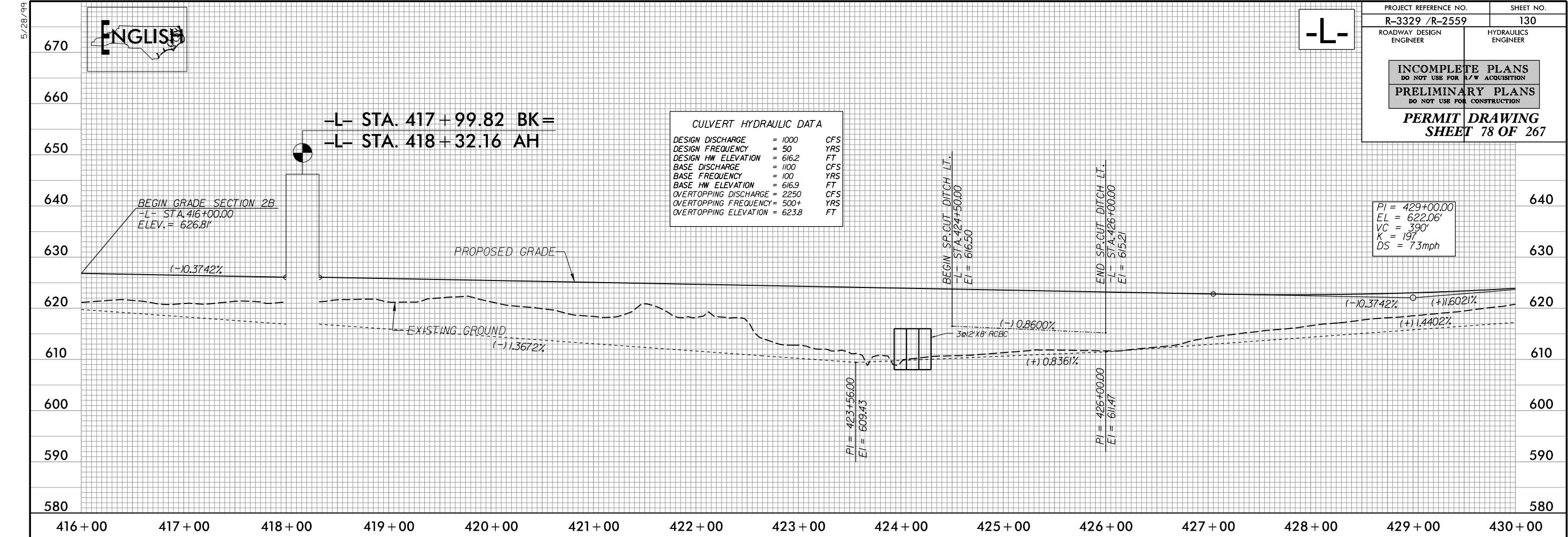
PLANS PREPARED BY :
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FOR -L- PROFILE SEE SHT. 130
FOR -SR5- PROFILE SEE SHTS. 202, 202A
FOR -NRB- PROFILE SEE SHT. 190
FOR -NRC- PROFILE SEE SHT. 191



8/17/99
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\$\$\$\$\$CMT\$\$\$\$\$
\$\$\$\$\$ELEM\$\$\$\$\$

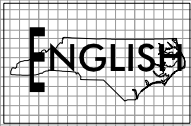




5/14/99

9/29/2004
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Elev

140 120 100 80 60 40 20 0 20 40 60 80 100 120 140



PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 79 OF 267		

SITE 17
-L- STA. 432+98

640

630

620

610

600

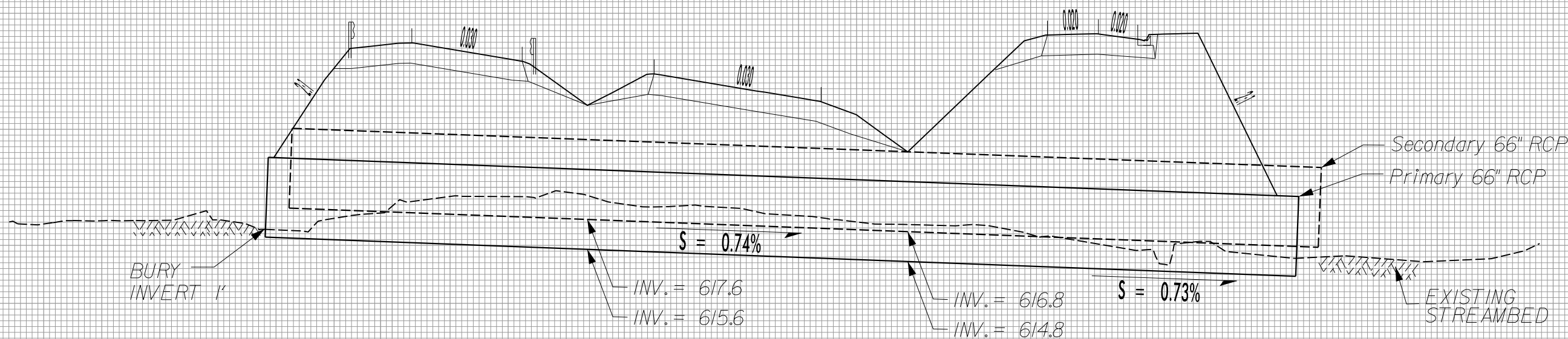
640

630

620

610

600

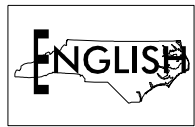


NOTE: BURY PRIMARY 66" RCP 1.0' BELOW STREAM BED.
INSTALL SECONDARY 66" RCP 1.0' ABOVE STREAM BED

2 @ 66" RCP

8/17/99

\\nc-tol\projects\PERMITS\Environmental\Drawings\Section2B\R3329_R2559_HYD_PRM_WET_PSH0255.con.dgn
\$\$\$\$\$TIME\$\$\$\$\$
\$\$\$\$\$DATE\$\$\$\$\$
\$\$\$\$\$CMT\$\$\$\$\$
\$\$\$\$\$FILE\$\$\$\$\$



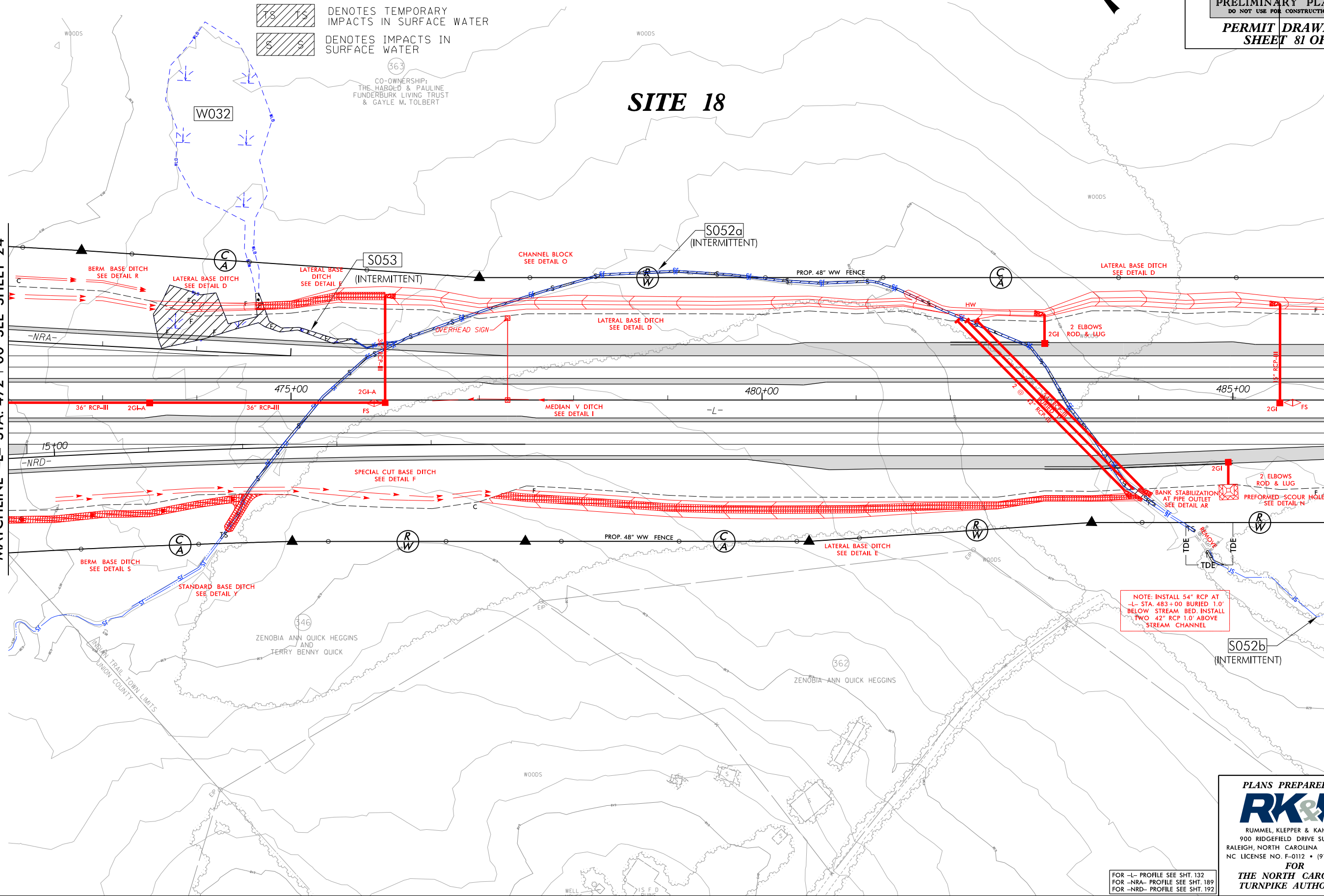
- ENGLISH
- DENOTES EXCAVATION IN WETLAND
 - DENOTES FILL IN WETLAND
 - DENOTES MECHANIZED CLEARING
 - DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 - DENOTES IMPACTS IN SURFACE WATER

CO-OWNERSHIP:
THE HARBOLD & PAULINE
FUNDERBURK LIVING TRUST
& GAYLE M. TOLBERT

SITE 18

MATCHLINE -L- STA. 472+00 SEE SHEET 24

MATCHLINE -L- STA. 486+00 SEE SHEET 26



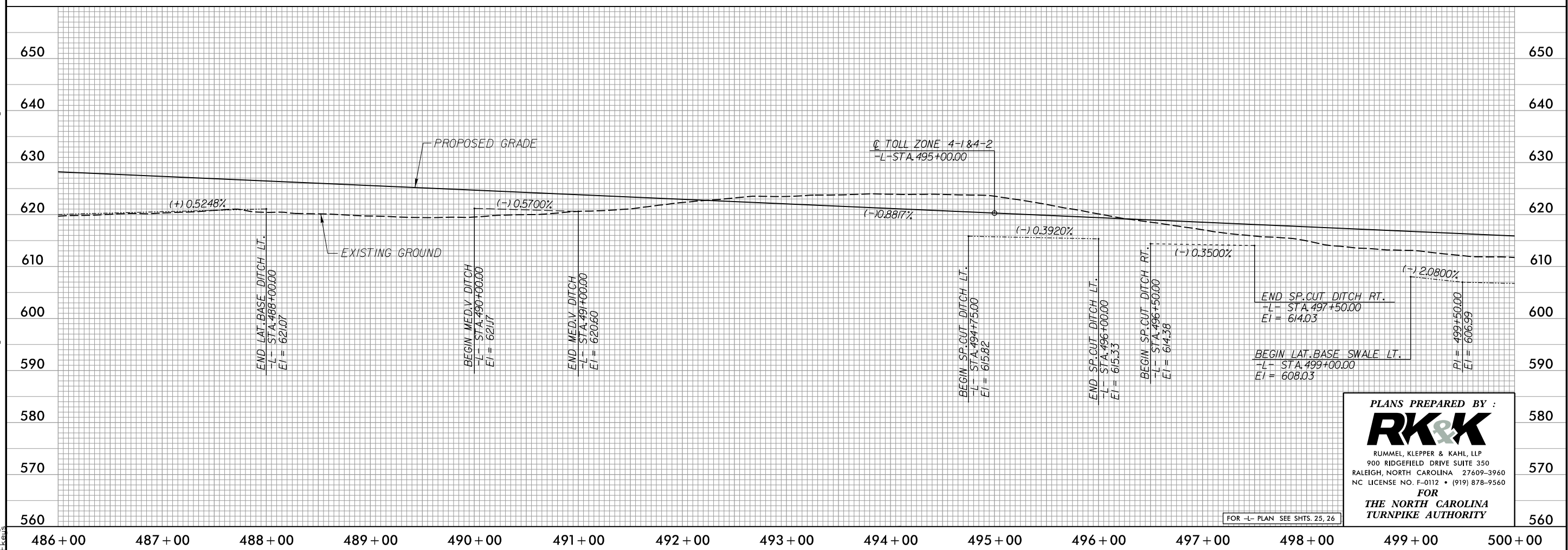
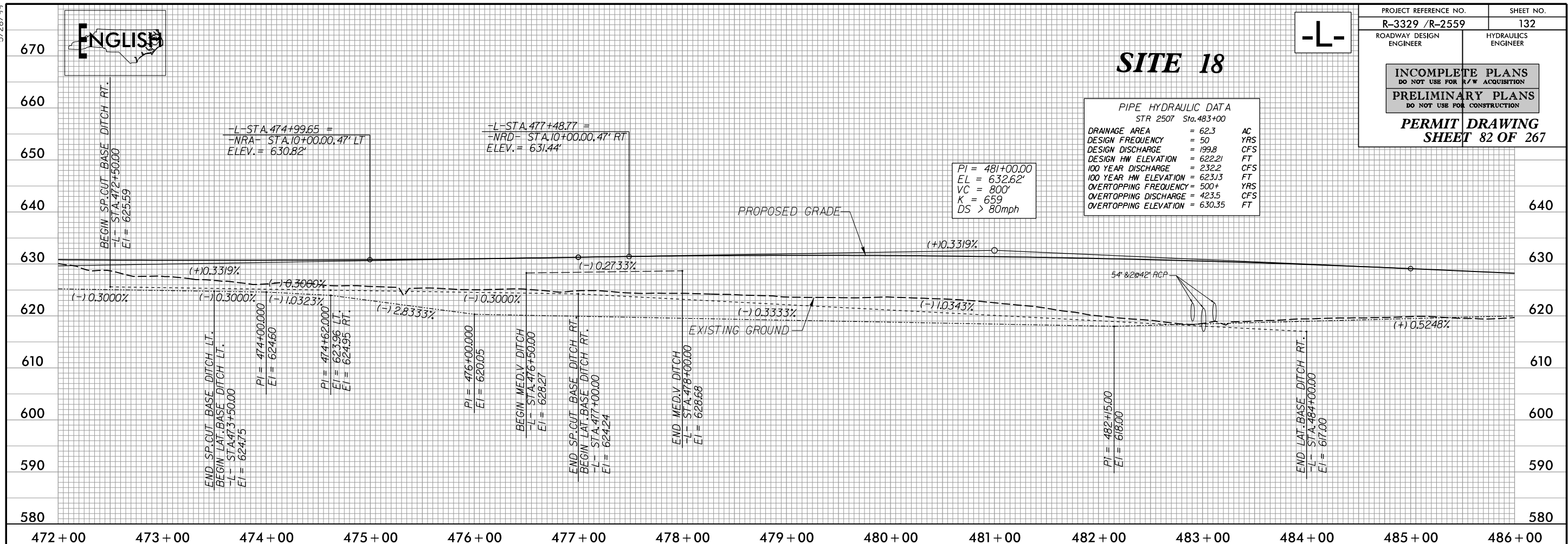
FOR -L- PROFILE SEE SHT. 132
FOR -NRA- PROFILE SEE SHT. 189
FOR -NRD- PROFILE SEE SHT. 192

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SITE 18

PIPE HYDRAULIC DATA			
STR 2507 Sta.483+00			
DRAINAGE AREA	=	62.3	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	199.8	CFS
DESIGN HW ELEVATION	=	622.21	FT
100 YEAR DISCHARGE	=	232.2	CFS
100 YEAR HW ELEVATION	=	623.13	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	423.5	CFS
OVERTOPPING ELEVATION	=	630.35	FT

$PI = 481+00.00$
 $EL = 632.62'$
 $VC = 800'$
 $K = 659$
 $DS > 80mph$



PLANS PREPARED BY :

RK&K

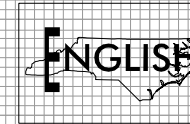
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FOR -L- PLAN SEE SHTS. 25, 26

5/14/99

140 120 100 80 60 40 20 0 20 40 60 80 100 120 140



PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 83 OF 267		

SITE 18 -L- STA. 483+00

636

632

628

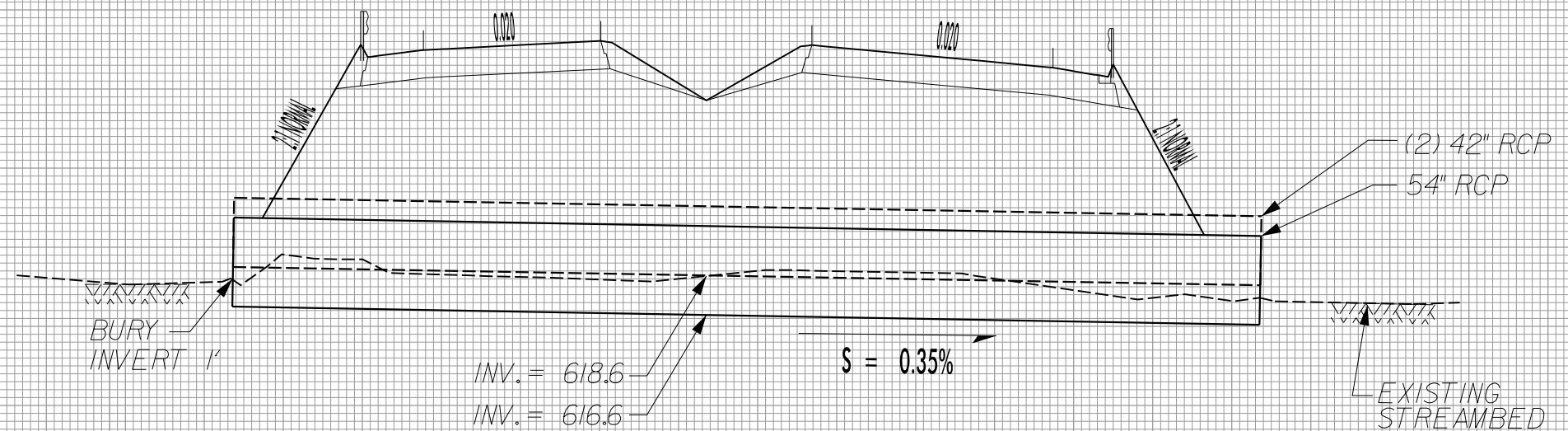
624

620

616

612

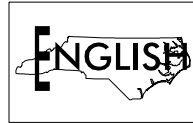
608



NOTE: BURY 54" RCP 1.0' BELOW STREAM BED.
INSTALL (2) 42" RCP 1.0' ABOVE STREAM CHANNEL.

(2) 42" RCP
54" RCP

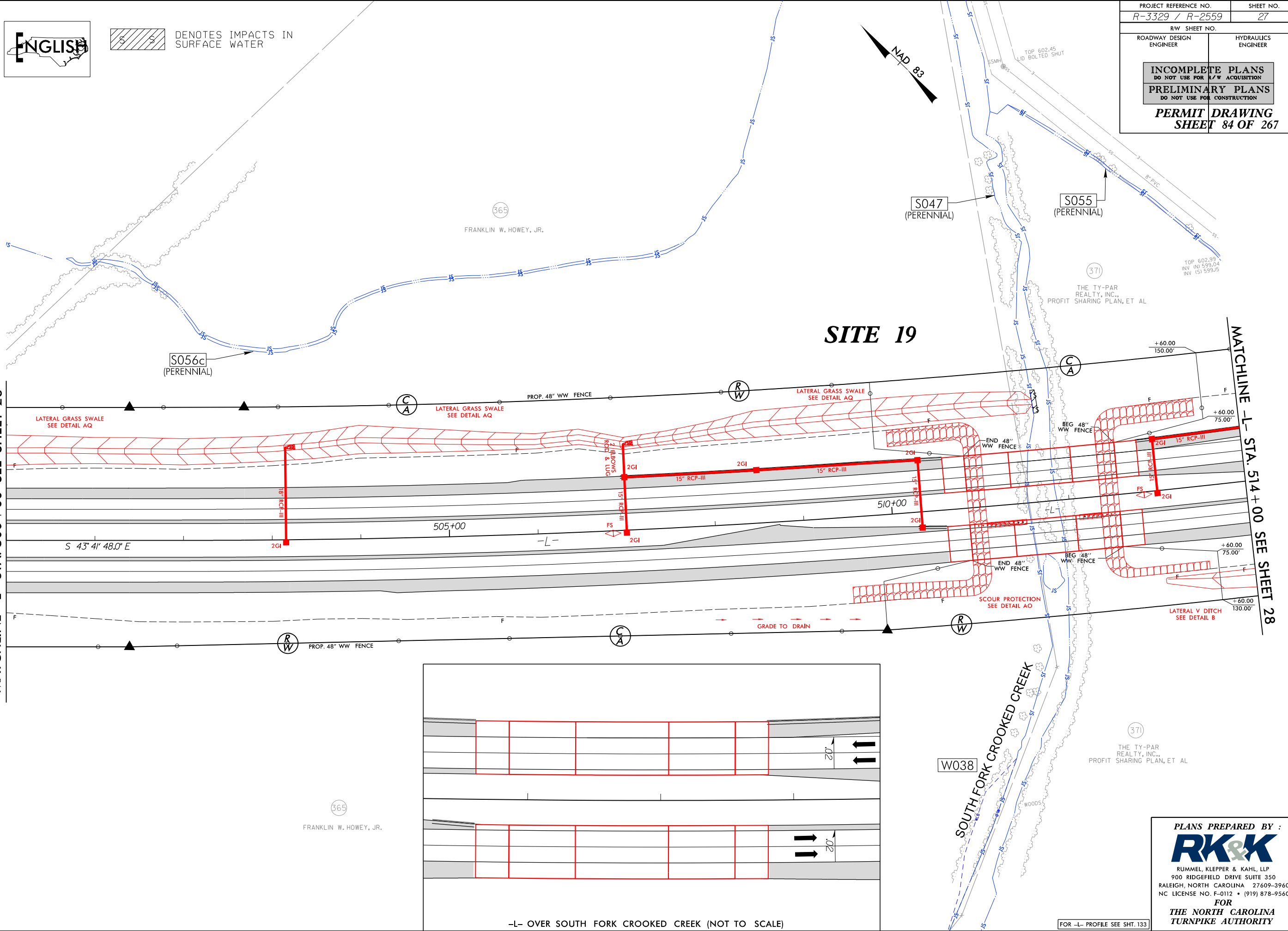
8/17/99



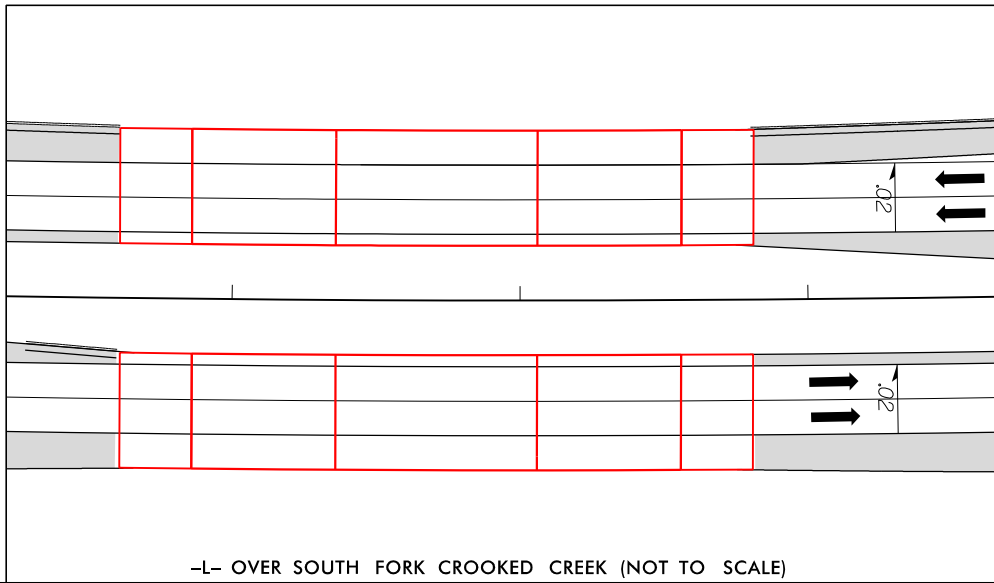
DENOTES IMPACTS IN
SURFACE WATER

PROJECT REFERENCE NO. R-3329 / R-2559		SHEET NO. 27
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION
PERMIT DRAWING SHEET 84 OF 267		

MATCHLINE -L- STA. 500+00 SEE SHEET 26



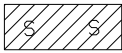
MATCHLINE -L- STA. 514+00 SEE SHEET 28



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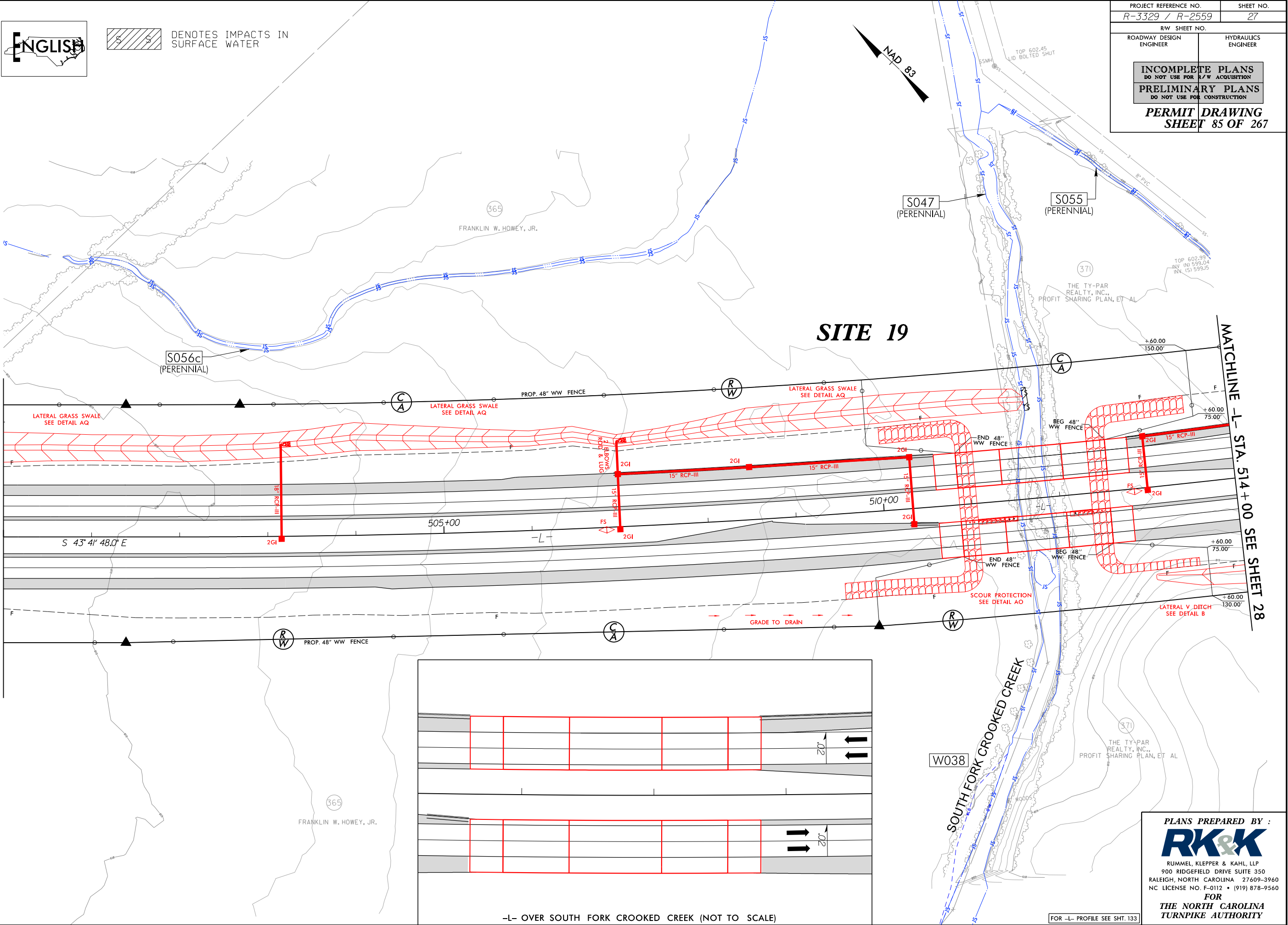
FOR -L- PROFILE SEE SHT. 133

\$\$\$\$\$TIME\$\$\$\$\$
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DENOTES IMPACTS IN
SURFACE WATER

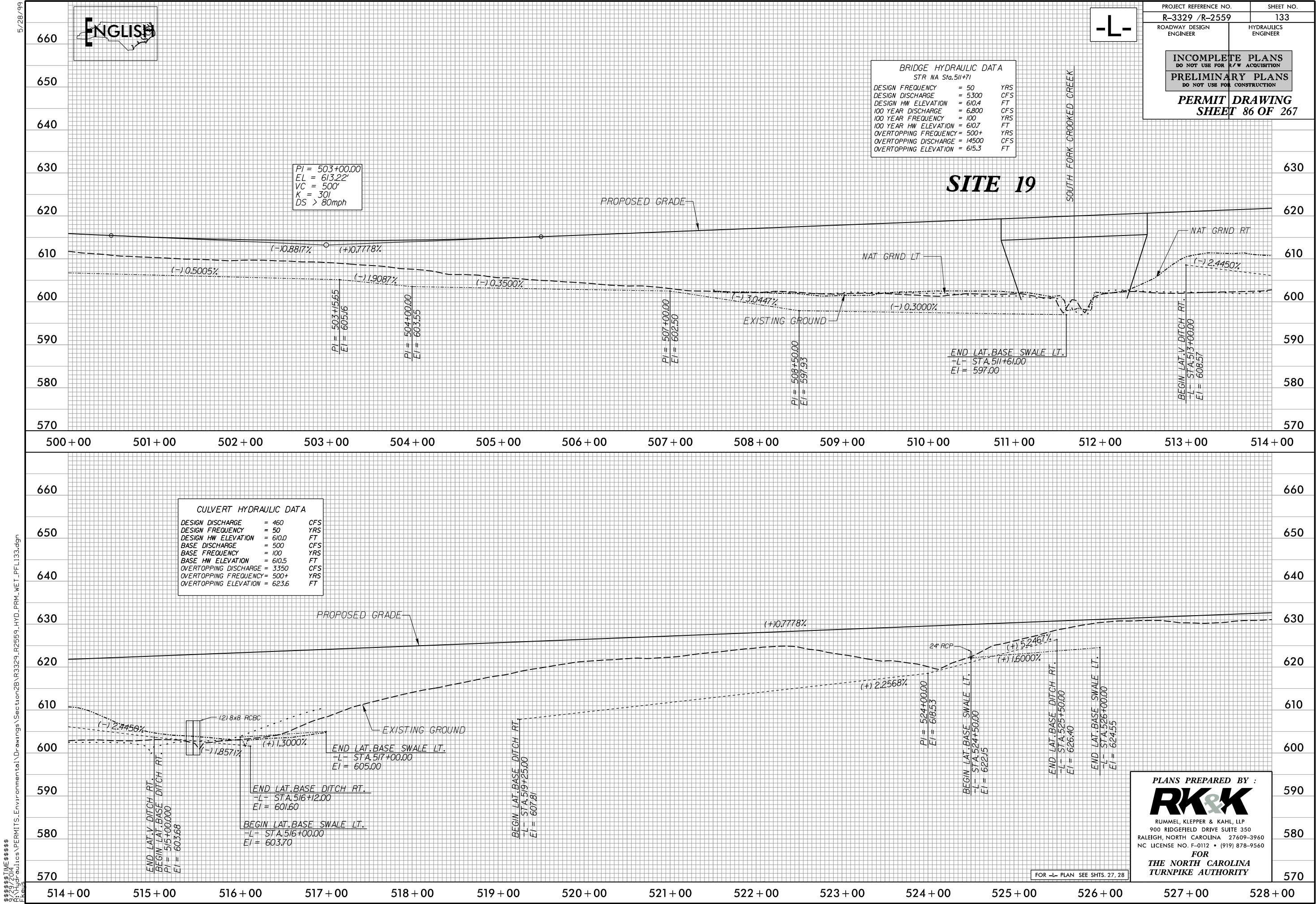
MATCHLINE -L- STA. 500+00 SEE SHEET 26

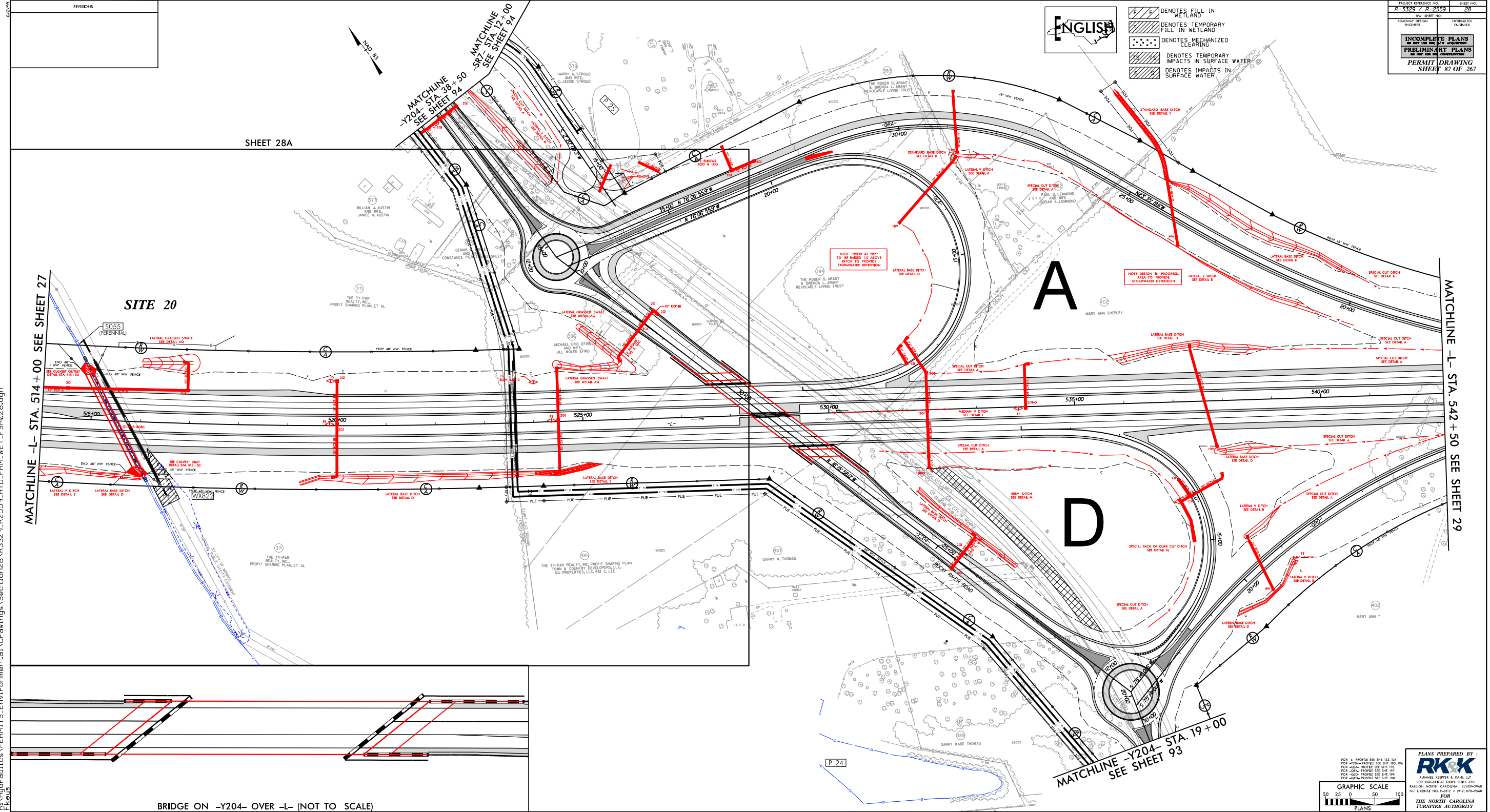


-L- OVER SOUTH FORK CROOKED CREEK (NOT TO SCALE)

FOR -L- PROFILE SEE SHT. 133

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REVISIONS

PROJECT REFERENCE NO. **R-3329 / R-2559** SHEET NO. **28**

RDW SHEET NO. **28**

ROADWAY DESIGN **INVOICES**

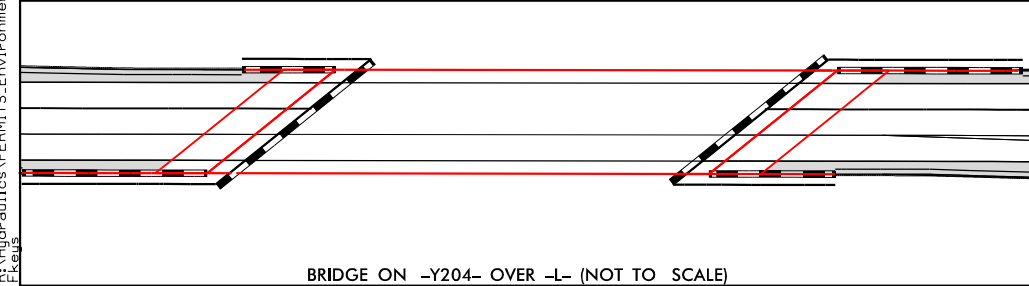
HYDRAULICS **BOOKLET**

INCOMPLETE PLANS
DO NOT USE FOR CONSTRUCTION

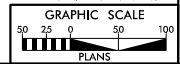
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING
SHEET 87 OF 267

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



BRIDGE ON -Y204- OVER -L- (NOT TO SCALE)



PLANS PREPARED BY :

RK&K

RUNNEL KLEPPER & KAHN, LLP

1000 WOODBRIDGE DRIVE SUITE 330

RALEIGH, NORTH CAROLINA 27605-2840

NC LICENSE NO. 4-0027 - 0799 878-0446

FOR

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TURNPIKE AUTHORITY

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9/30/2014
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Kreus

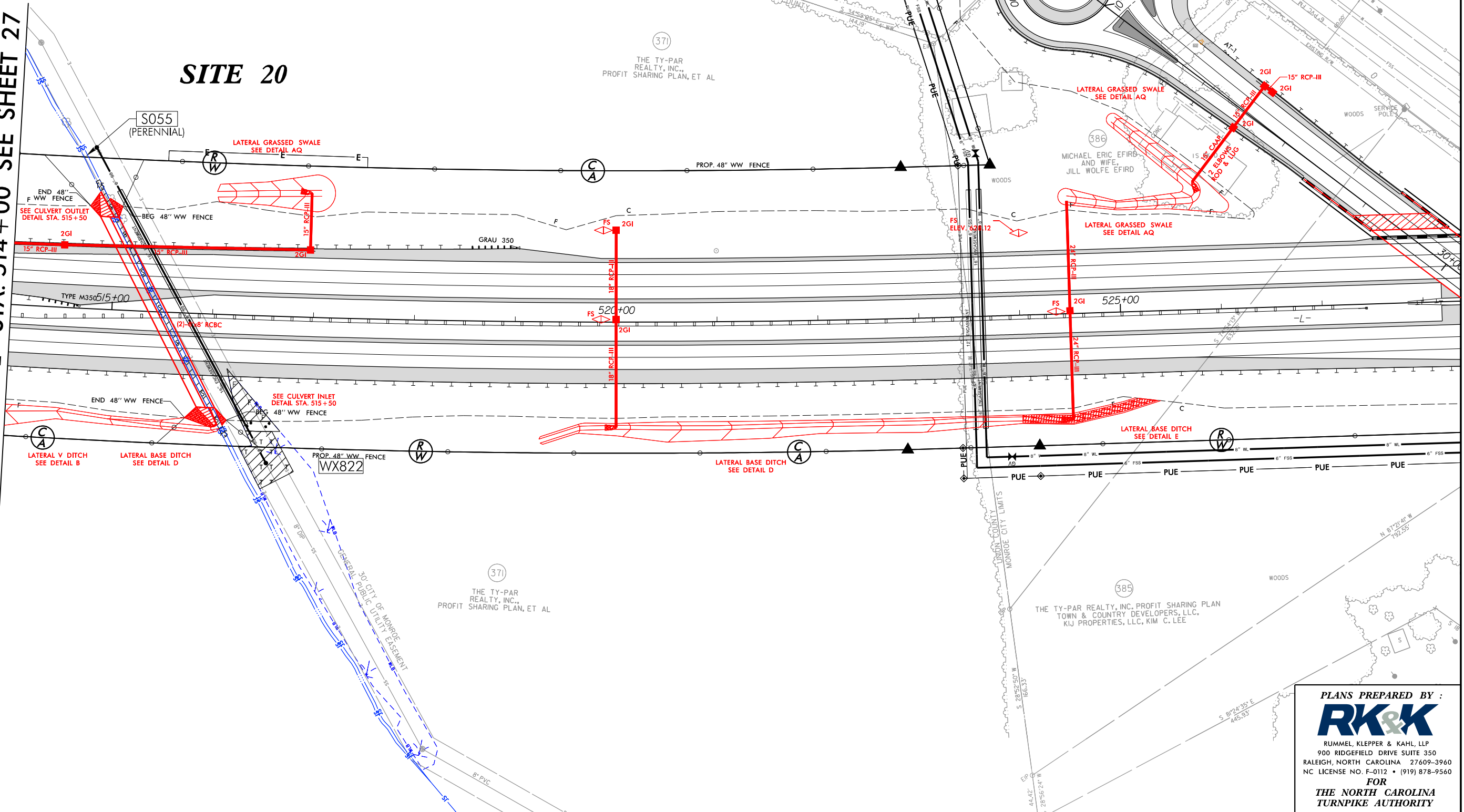


- DENOTES FILL IN WETLAND
- DENOTES TEMPORARY FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 28A
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 89 OF 267	

MATCHLINE -L- STA. 514+00 SEE SHEET 27

SITE 20



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PROJECT REFERENCE NO.		SHEET NO.	
R-3329 /R-2559		133	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	

INCOMPLETE PLANS

DO NOT USE FOR R/W ACQUISITION

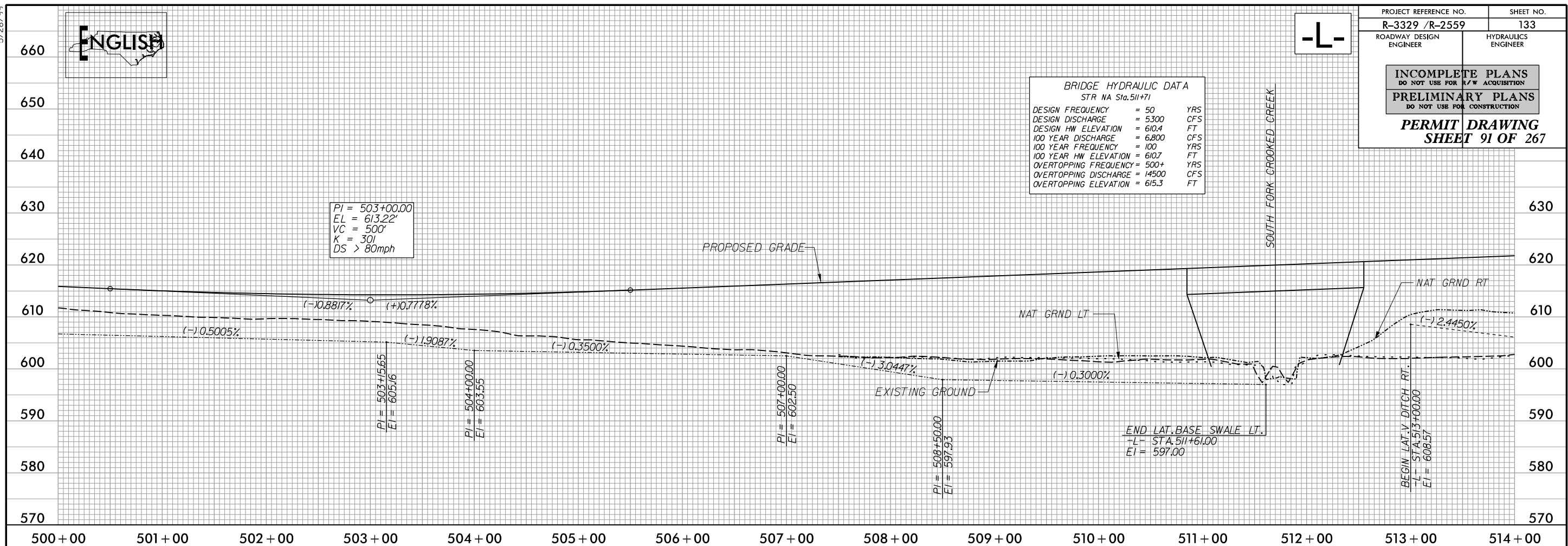
PRELIMINARY PLANS

DO NOT USE FOR CONSTRUCTION

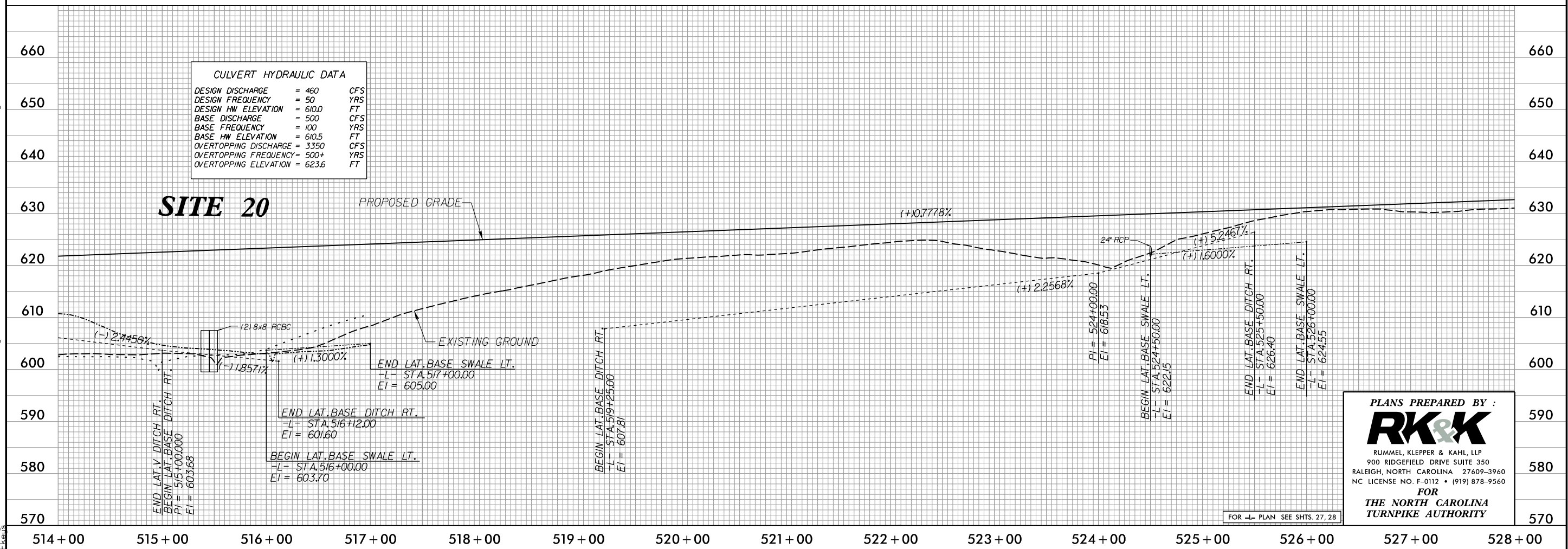
PERMIT DRAWING

SHEET 91 OF 267

BRIDGE HYDRAULIC DATA		
STR NA Sta.511+71		
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 5300	CFS
DESIGN HW ELEVATION	= 610.4	FT
100 YEAR DISCHARGE	= 6,800	CFS
100 YEAR FREQUENCY	= 100	YRS
100 YEAR HW ELEVATION	= 610.7	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 14500	CFS
OVERTOPPING ELEVATION	= 615.3	FT



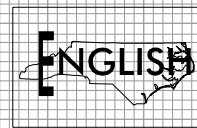
CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 460	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 610.0	FT
BASE DISCHARGE	= 500	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 610.5	FT
OVERTOPPING DISCHARGE	= 3350	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 623.6	FT



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5/14/99
9/29/2004
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Elev

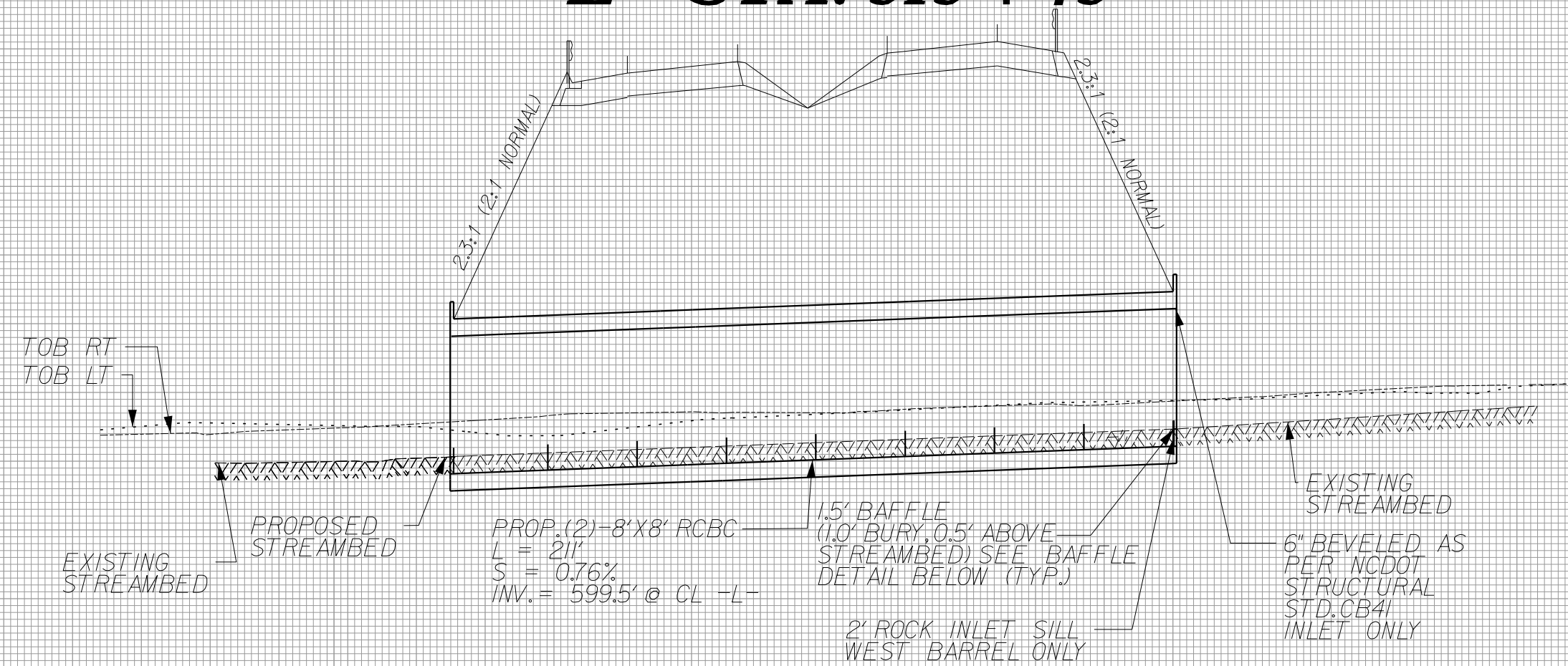
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PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 92 OF 267		

SITE 20

-L- STA. 515+45

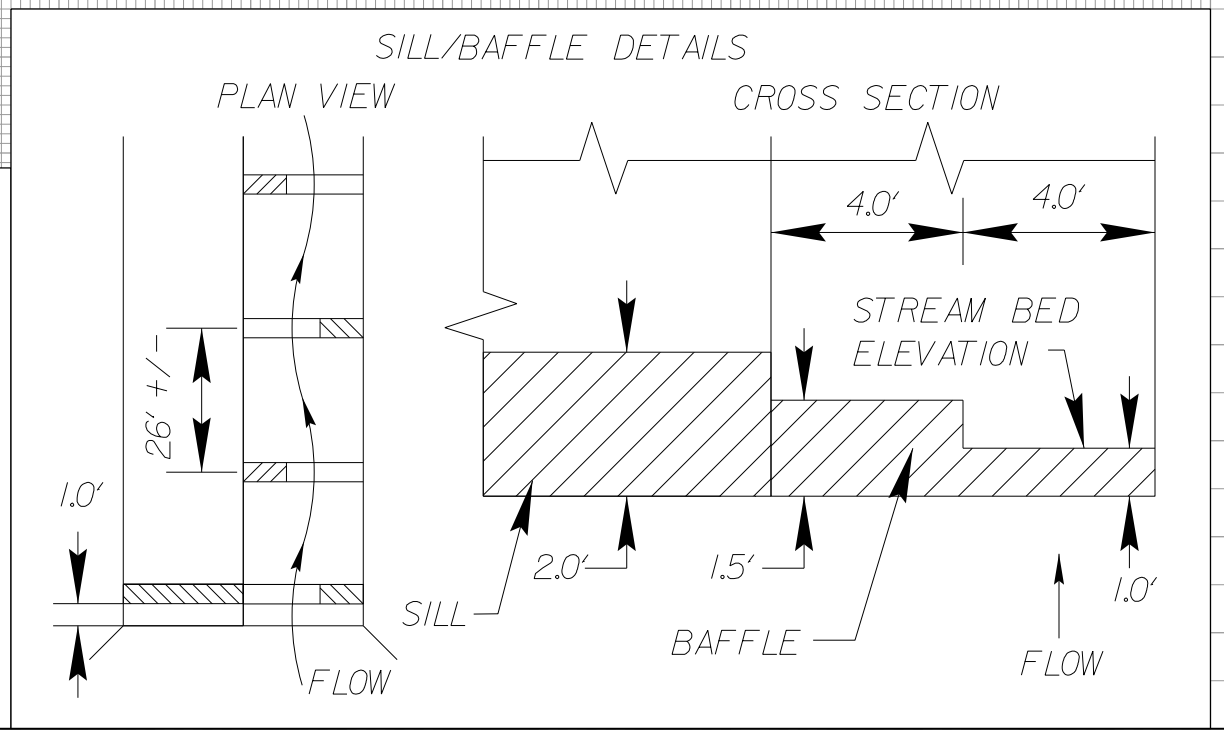


2@8'x8' RCBC WITH BAFFLES

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.



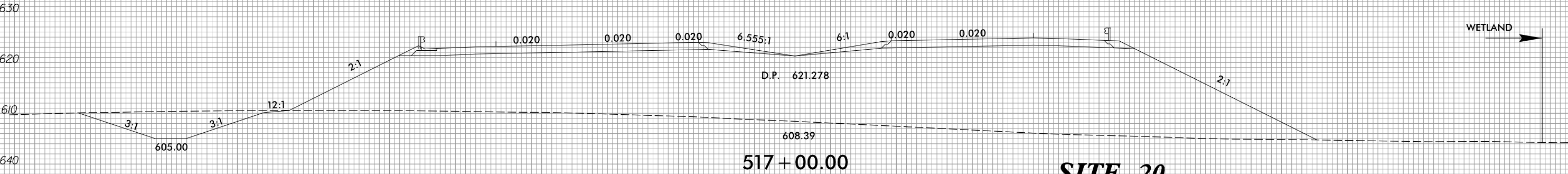
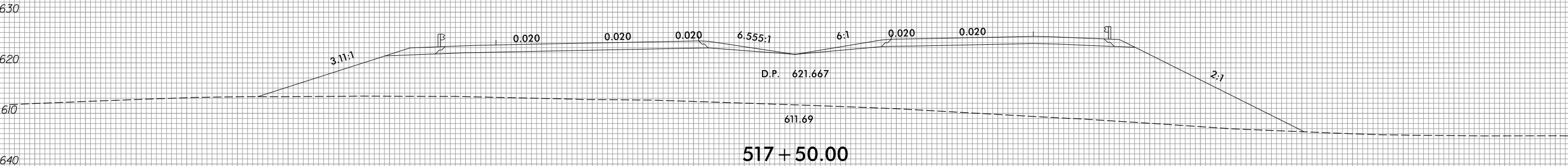
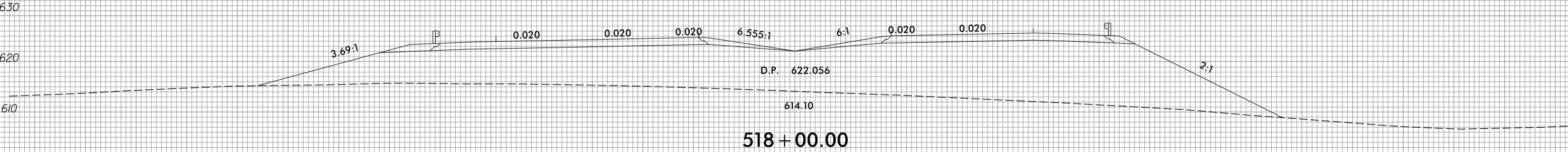
8/23/99

0510	PROJ. REFERENCE NO.	SHEET NO.
	R-3329 / R-2559	2B-X36

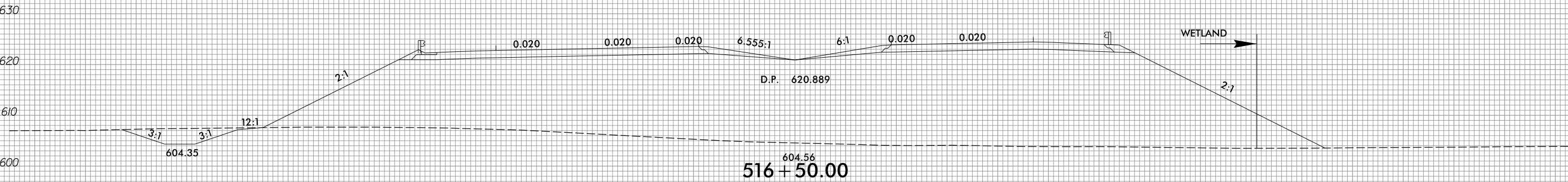
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PERMIT DRAWING
SHEET 93 OF 267



SITE 20



1501401301201101009080706050403020100102030405060708090100110120130140150

\\\\\\\$TIME\$\$\$\$\$
9/29/2014
R:\\Hydraulics\\PERMITS\\Environmental\\Drawings\\Section2B\\r-3329_r-2559_HYD_PRM_WET_XPL_2B1.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	29
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
<i>PERMIT DRAWING</i> <i>SHEET 94 OF 267</i>	

SITE 21

TIMOTHY MCDOW
AND WIFE
BRENDA TERRELL MCDOW

MATCHLINE -L- STA: 556+00 SEE SHEET 30

MATCHLINE -L- STA. 542+50 SEE SHEET 28

FOR -L- PROFILE SEE SHT. 134
FOR -QRA- PROFILE SEE SHT. 197
FOR -QRD- PROFILE SEE SHT. 198

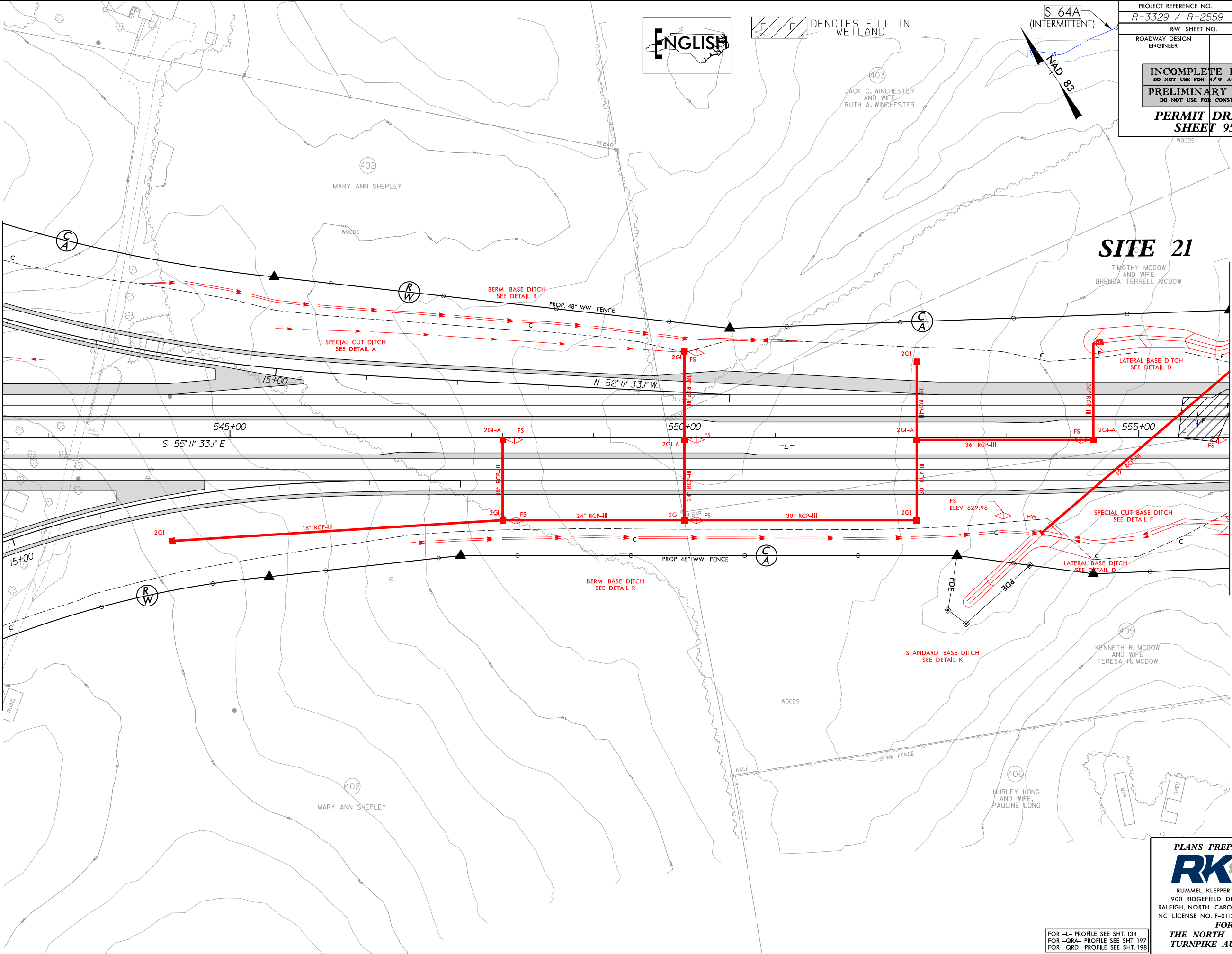
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
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FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

8/17/99

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MATCHLINE -L- STA. 542 + 50 SEE SHEET 28

MATCHLINE -L- STA. 556 + 00 SEE SHEET 30



ENGLISH

F F

DENOTES FILL IN WETLAND

S 64A
(INTERMITTENT)
NAD 83

PROJECT REFERENCE NO. R-3329 / R-2559		SHEET NO. 29	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION		PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING		SHEET 95 OF 267	

SITE 21

TIMOTHY MCDOW
AND WIFE
BRENDA TERRELL MCDOW

KENNETH R. MCDOW
AND WIFE
TERESA H. MCDOW

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FOR -L- PROFILE SEE SHT. 134
FOR -GRA- PROFILE SEE SHT. 197
FOR -QRD- PROFILE SEE SHT. 198

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

PERMIT | DRAWING
SHEET 96 OF 267

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**FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY**

FOR -L- PROFILE SEE SHT. 135
FOR -SR9- PROFILE SEE SHT. 199
FOR -Y208- PROFILE SEE SHT. 20

ENGLISH

A rectangular block with diagonal hatching from top-left to bottom-right. Inside the block, the letters 'TS' are written twice, separated by a space.

DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

~~DENOTES IMPACTS IN
SURFACE WATER~~

DENOTES MECHANIZED
 CLEARING

DENOTES FILL IN
 WETLAND

SITE 22

FOREST HILLS BAPTIST CHURCH

Q10=88.1 CFS
V10= 2.9 FT/S

S064c—
(INTERMITTENT)

~~NAID~~

BRIDGE ON -L- OVER WILLIS LONG RD. (NOT TO SCALE)

SITE
21

WATCHLINE -L- STA. 556+00 SEE SHEET 29

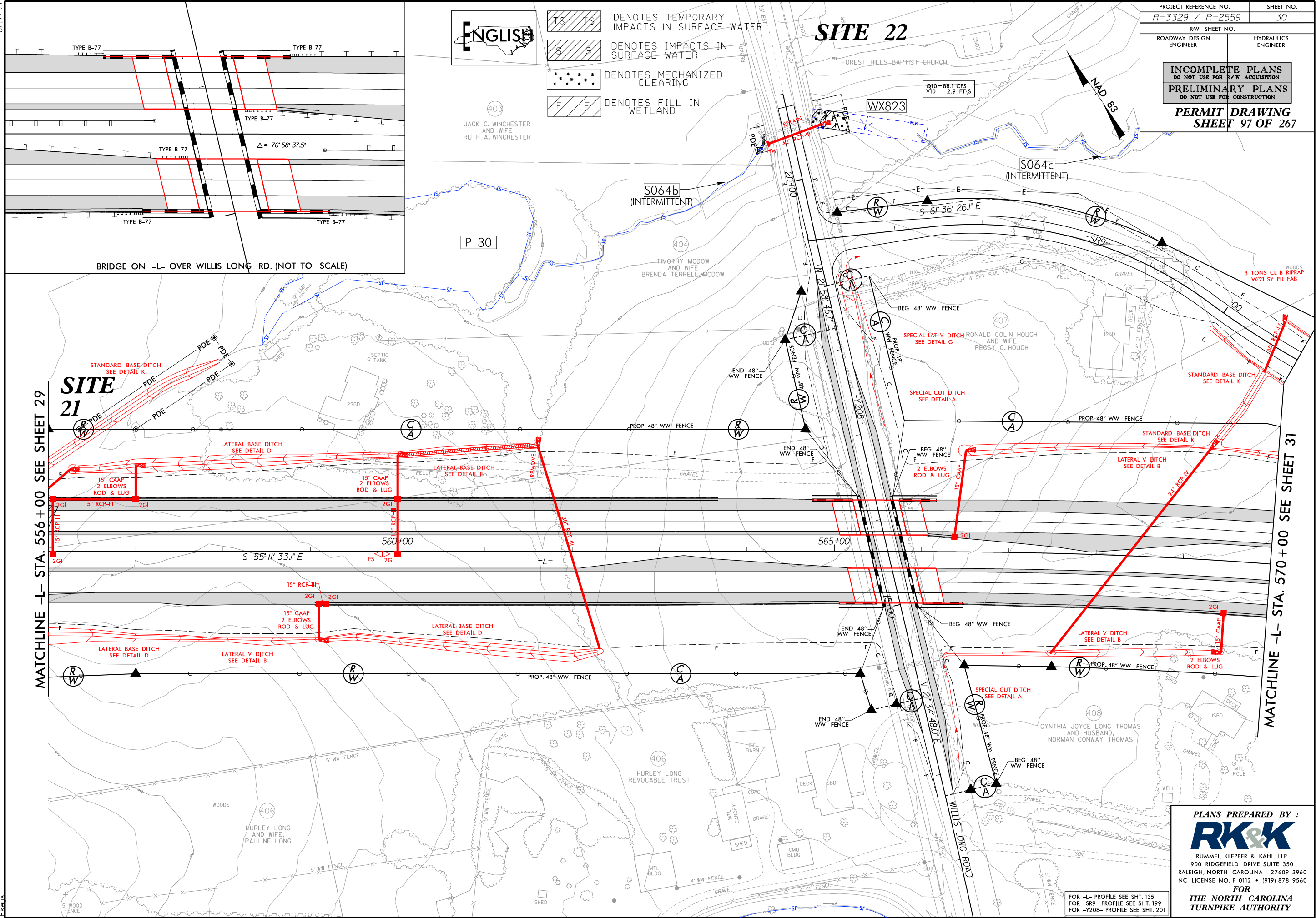
MATCHLINE -L- STA. 570 + 00 SEE SHEET 31

06-0331 WET
//29/2014
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8/17/99

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\$\$\$\$\$TIME\$\$\$\$\$



PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	30
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 97 OF 267	

PLANS PREPARED BY :

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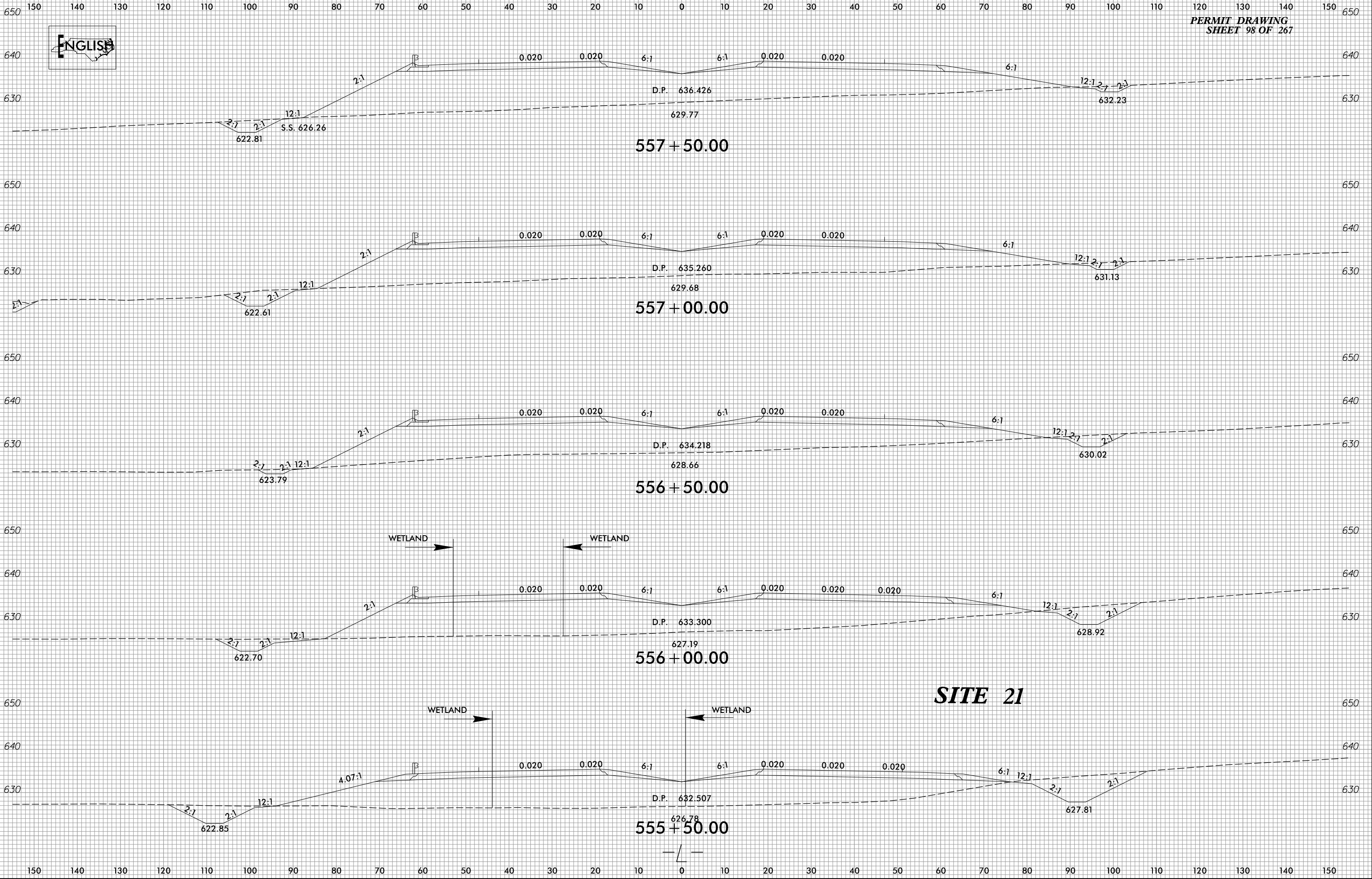
FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

FOR -L- PROFILE SEE SHT. 135
FOR -SR9- PROFILE SEE SHT. 199
FOR -Y208- PROFILE SEE SHT. 201

8/23/99

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	R-3329 / R-2559	2B-X51

PERMIT DRAWING
SHEET 98 OF 267



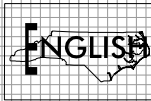
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9/29/2014
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8/23/99

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	R-3329 / R-2559	2B-X162

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PERMIT DRAWING
SHEET 99 OF 267

SITE 22

WETLAND

WETLAND

624.23

20 + 50.00

624.53

20 + 00.00

625.02

19 + 50.00

623.73

625.56

19 + 00.00

4:1 2:1 S.S. 624.60

622.53

623.93

626.47

18 + 50.00

4:1 2:1 S.S. 626.25

623.23

624.02

627.13

18 + 00.00

4:1 2:1

623.92

624.82

627.86

17 + 50.00

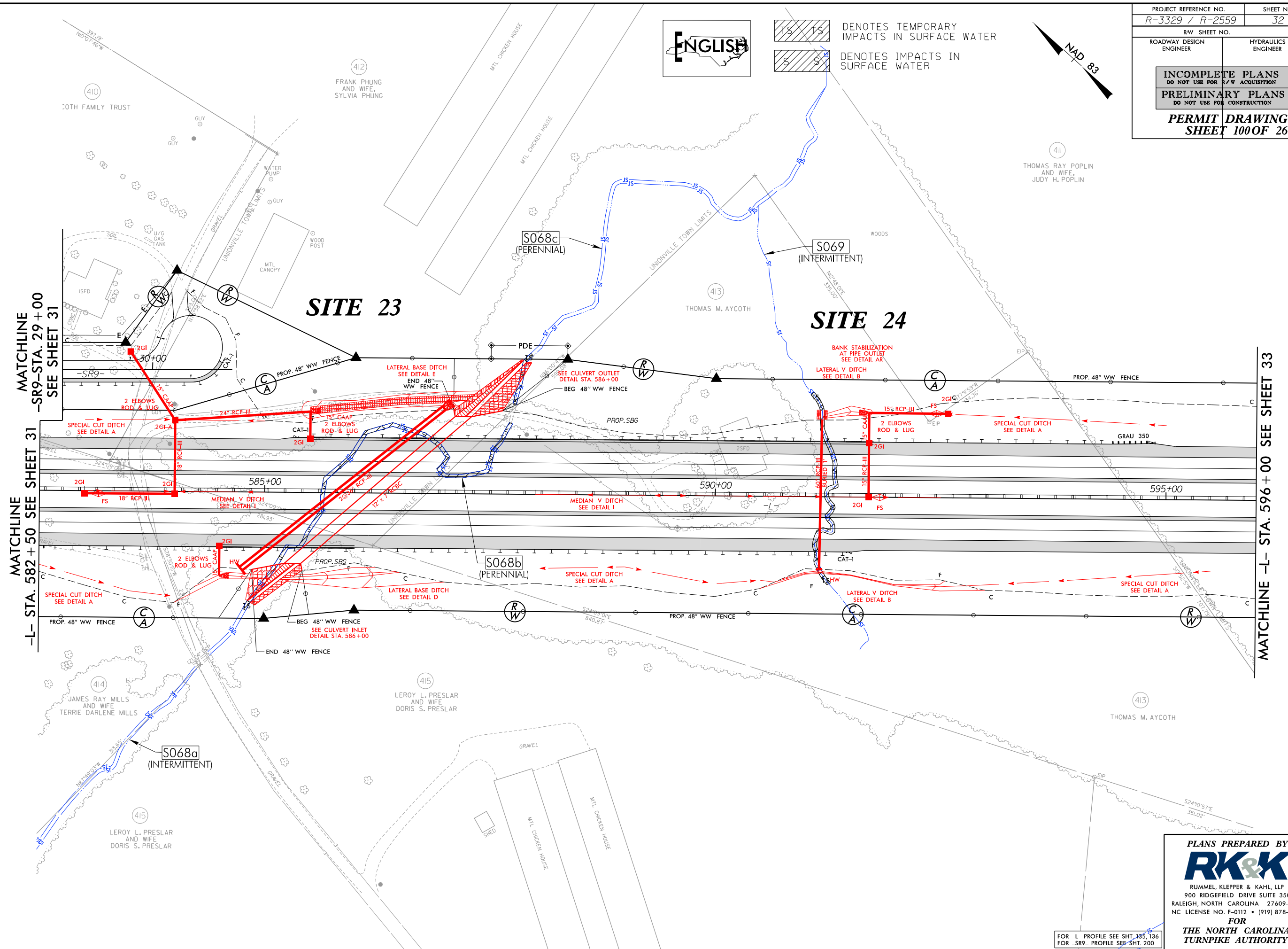
4:1 2:1

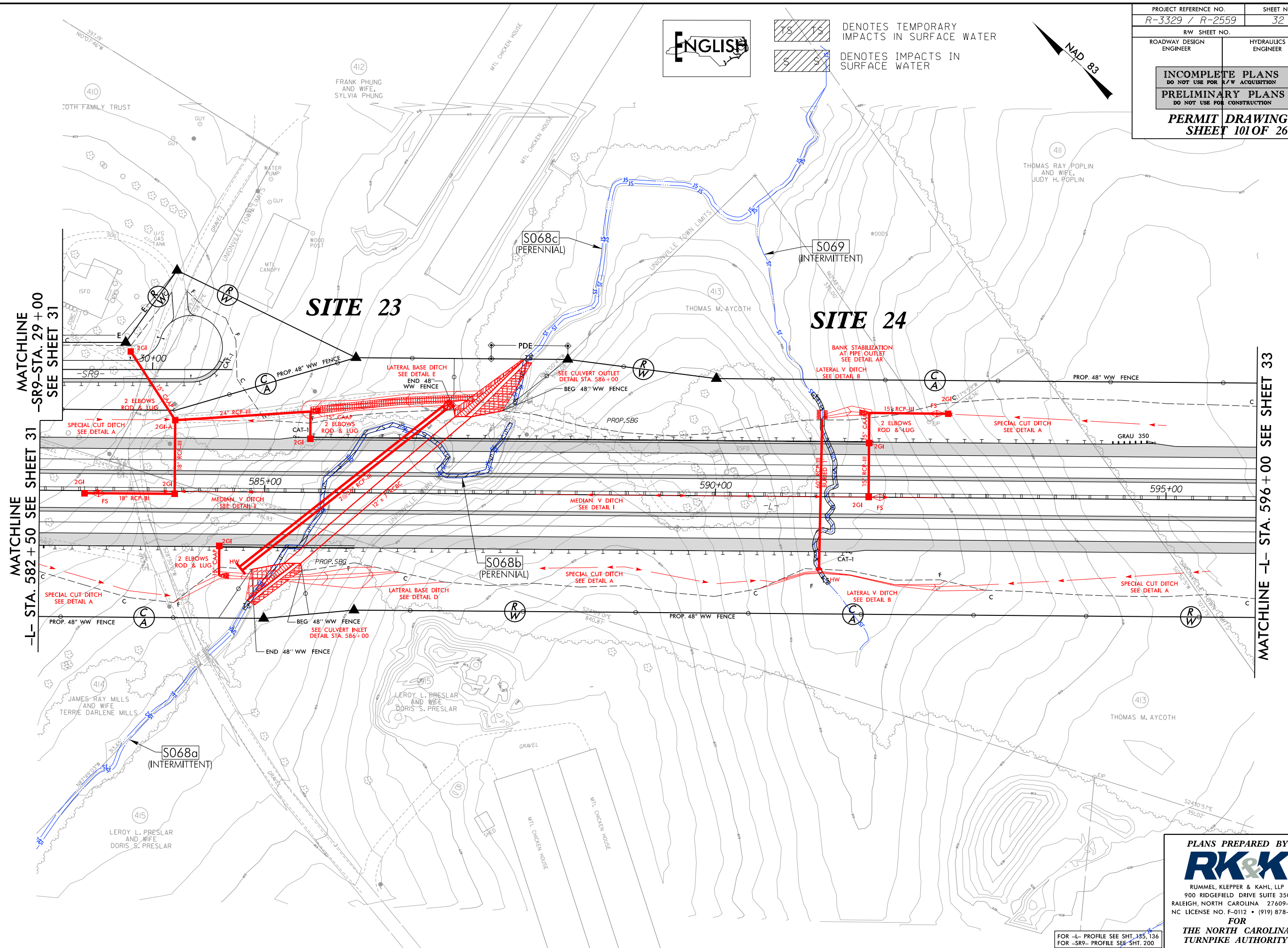
624.62

-Y208-

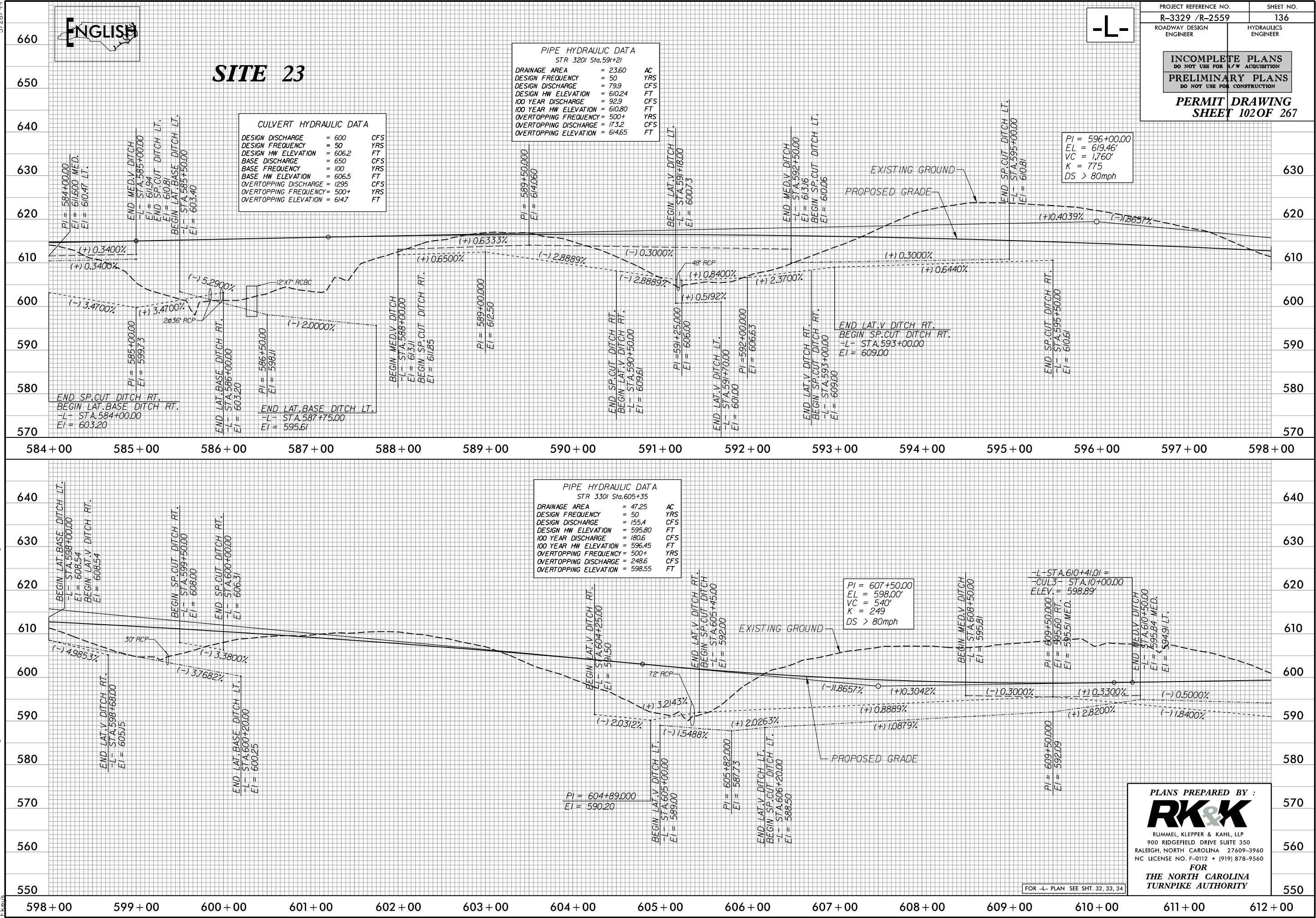
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9/29/2014
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kels





5/28/99
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—

630
620
610
600
590
580
570
640
630
620
610
600
590
580
570
560
550

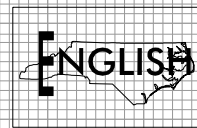
5/14/99

9/30/2004
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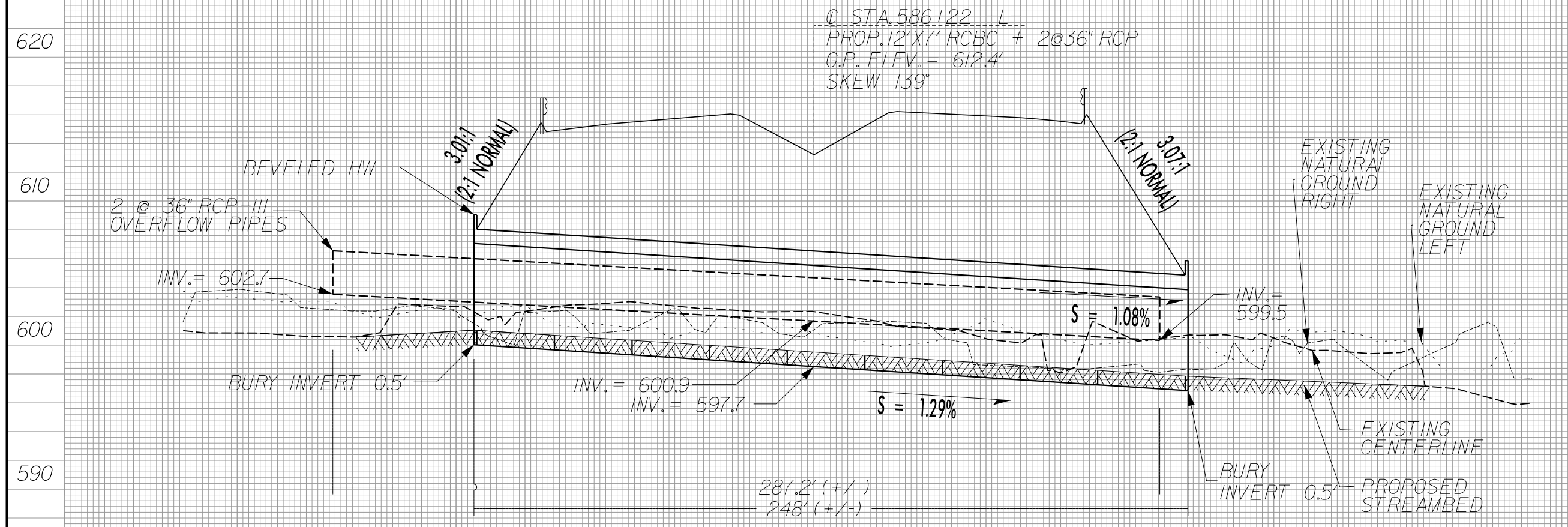
140 120 100 80 60 40 20 0 20 40 60 80 100 120 140

SITE 23

-L- STA. 586+33



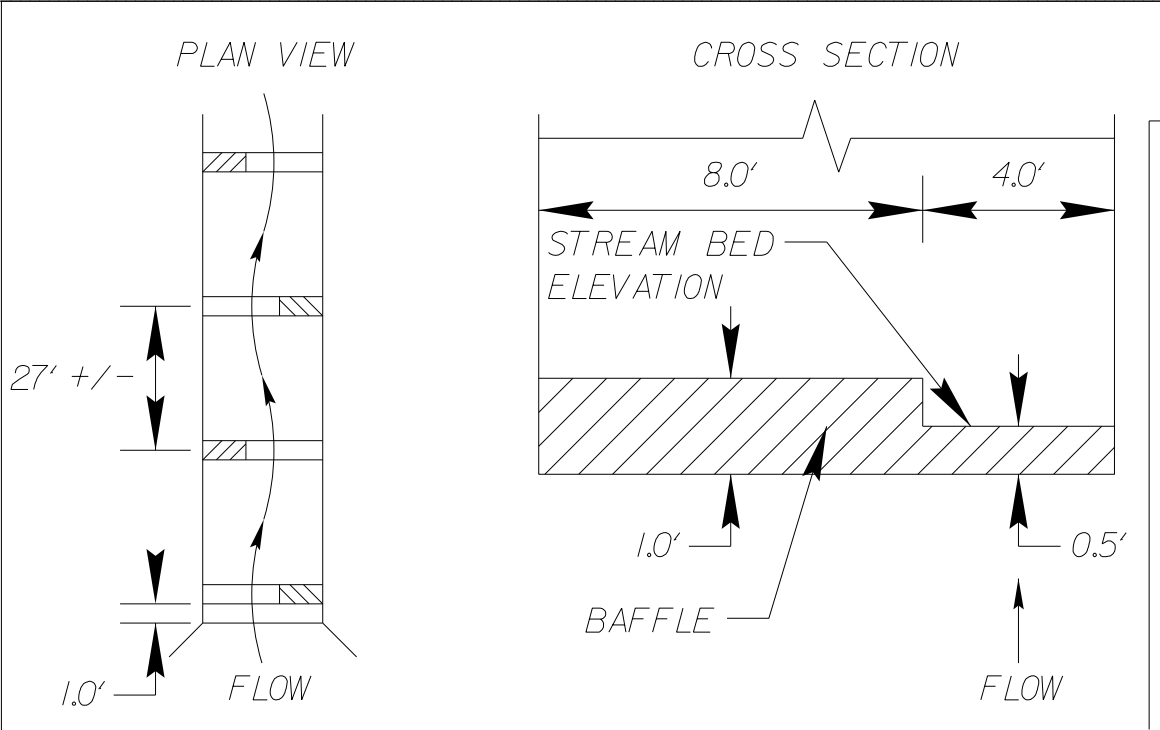
PROJECT REFERENCE NO. R-3329 /R-2559		SHEET NO.	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
PERMIT DRAWING SHEET 103 OF 267			



12' x 7' RCBC WITH BAFFLES

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

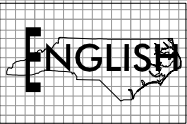
NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.



5/14/99

8/29/2004
B:\Hydraulics\PERMITS\Environmental\Drawings\Section2B\R3329_R2559_HDY_PRM_WET_PFL286.dgn
Elev

140 120 100 80 60 40 20 0 20 40 60 80 100 120 140



PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 104 OF 267		

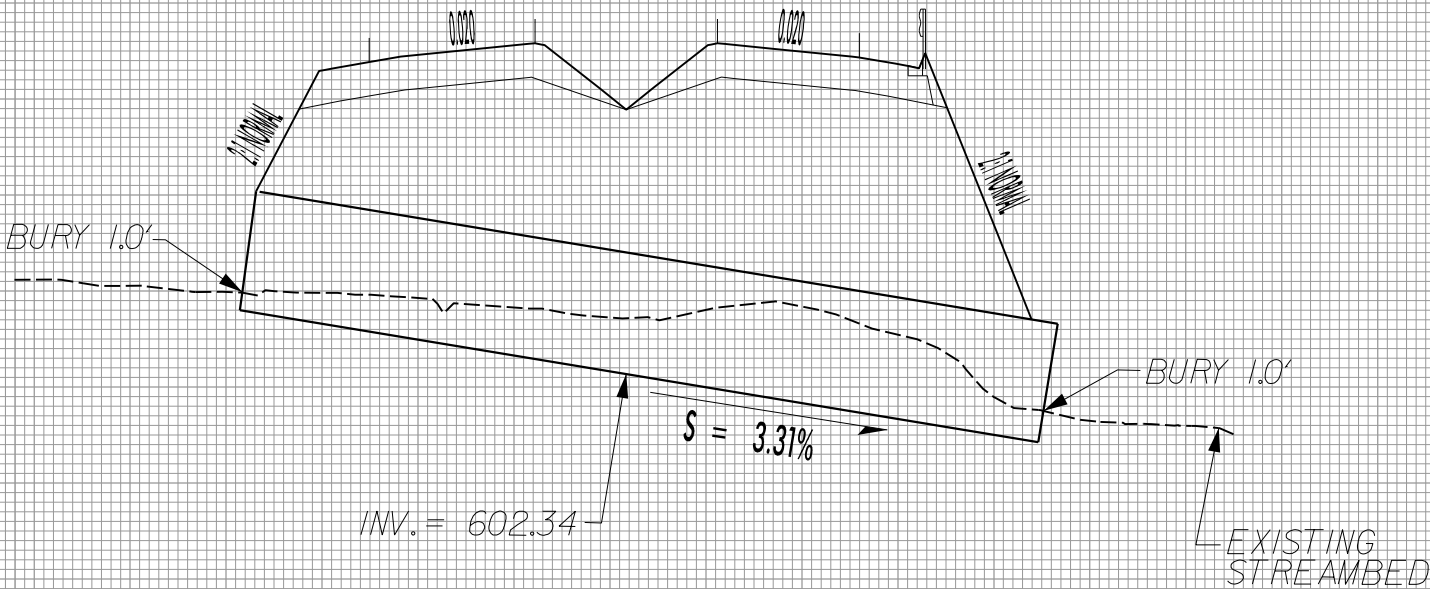
SITE 24
-L- STA. 591+00

620

610

600

590



60" RCP

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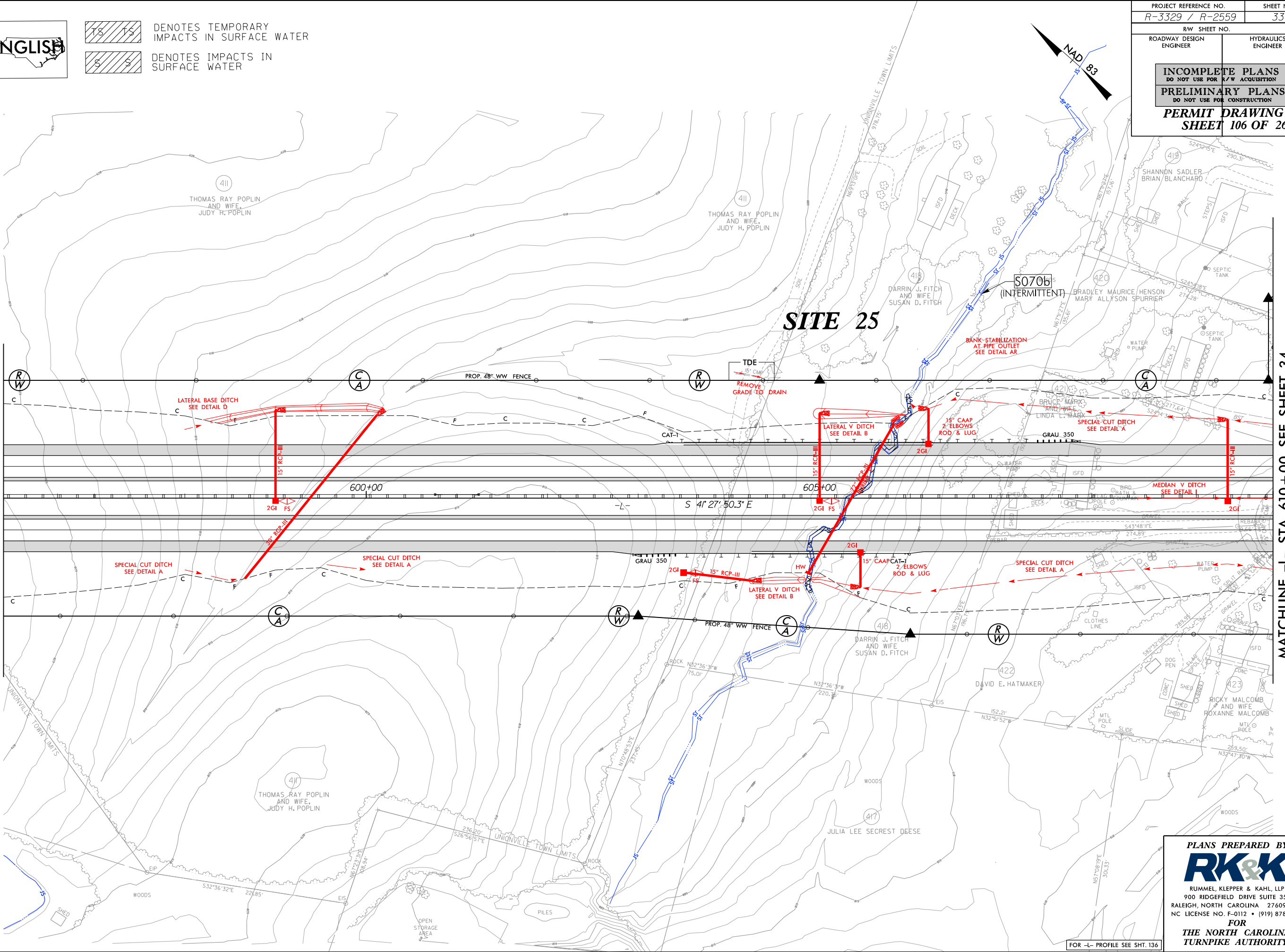
DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



DENOTES IMPACTS IN
SURFACE WATER

PROJECT REFERENCE NO. <i>R-3329 / R-2559</i>		SHEET NO. <i>33</i>
RW SHEET NO.		
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION PERMIT DRAWING SHEET 106 OF 267		

MATCHLINE -L- STA. 596+00 SEE SHEET 32



MATCHLINE -L- STA. 610+00 SEE SHEET 34

FOR -L- PROFILE SEE SHT. 136

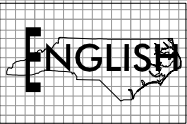
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R:\Hydraulics\PERMITS\Environmental\Drawings\Section2B\R3329_R2559_HYD_PRM_WET_PSH033.com.dgn

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5/14/99

9/30/2004
R:\Hydraulics\PERMITS\Environmental\Drawings\Section2B\R3329_R2559_HDY_PRM_WET_PFL2B7.dgn
Elev

140 120 100 80 60 40 20 0 20 40 60 80 100 120 140



PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 107 OF 267		

SITE 25
-L- STA. 605+35

605

605

595

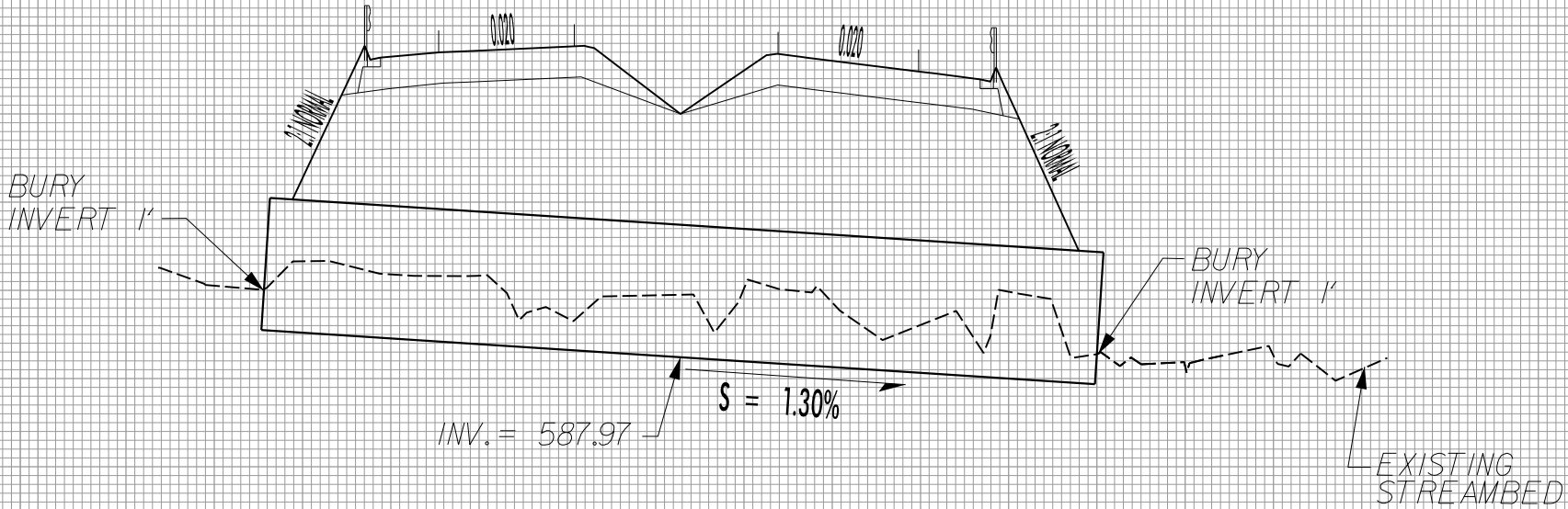
595

585

585

575

575

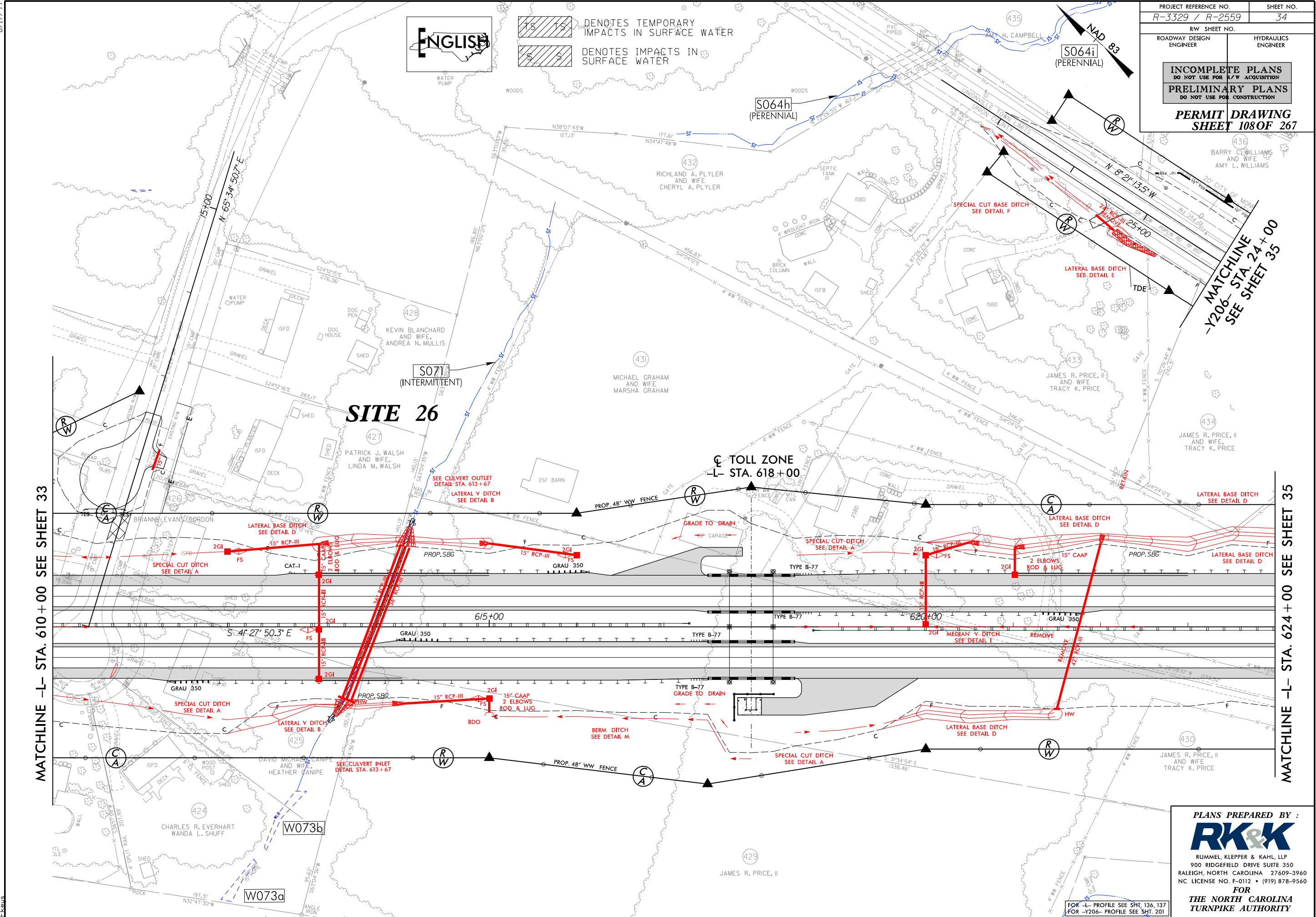


72" RCP

8/17/99

\\r1101\cmt\Drawings\Environmental\Drawings\Section2\B\3329_R2559_HYD_PRM_WET_PSH034.dgn

\$\$\$\$\$TIME\$\$\$\$\$



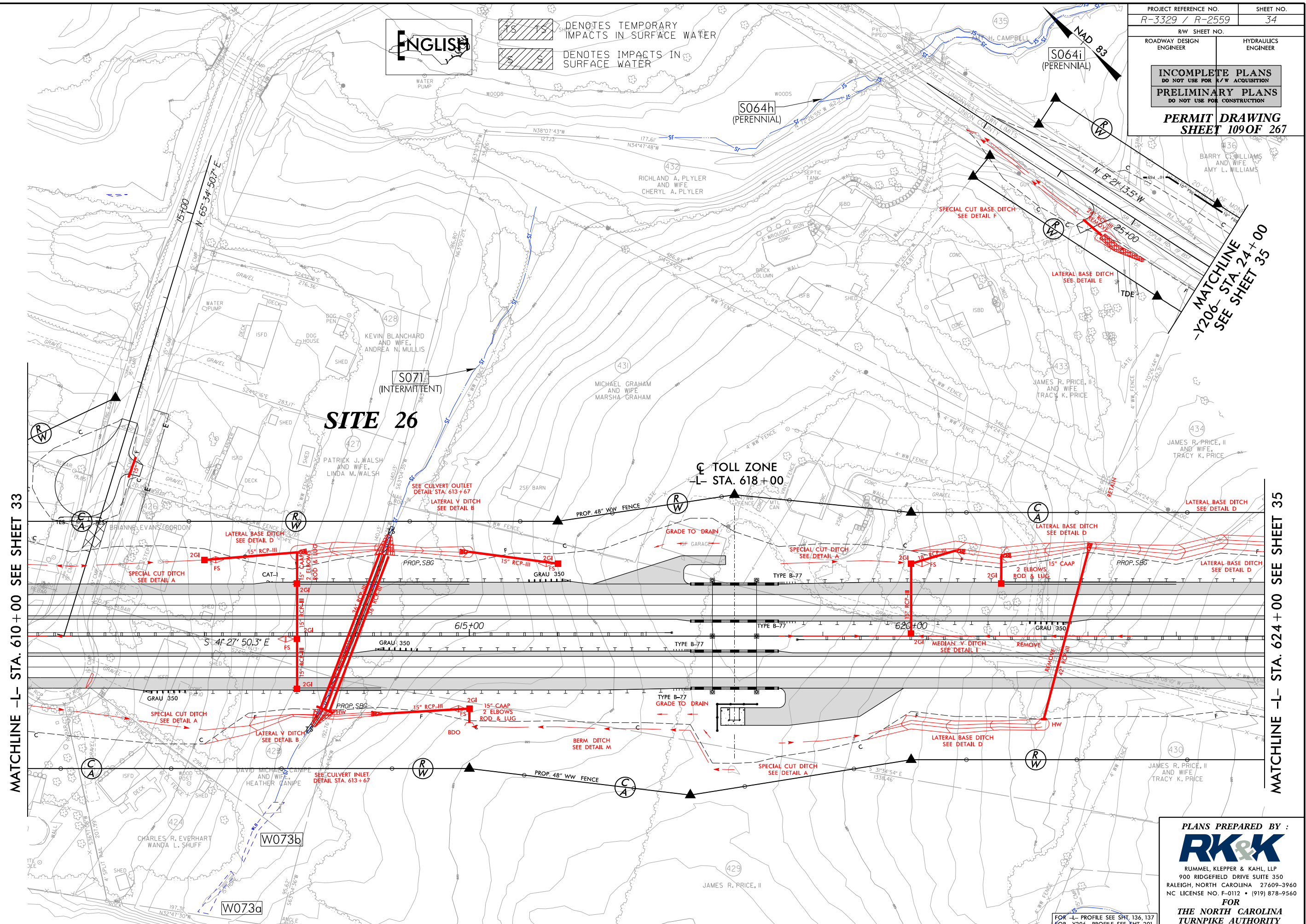
PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 34
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 108 OF 267	

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

PERMIT | DRAWING
SHEET 109 OF 26

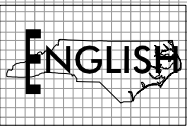
PLANS PREPARED BY :
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5/14/99

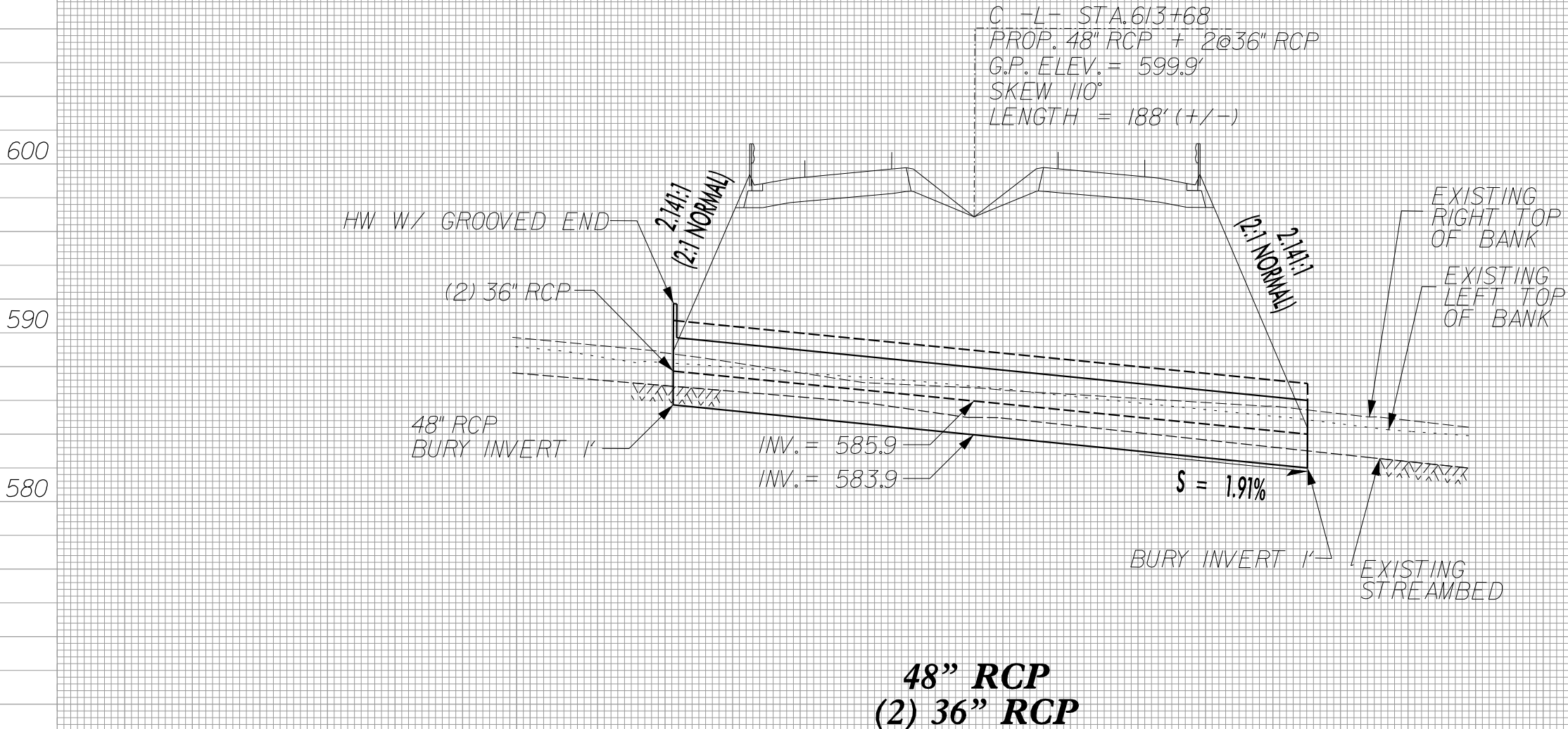
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Elevs

140 120 100 80 60 40 20 0 20 40 60 80 100 120 140



PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 110 OF 267		

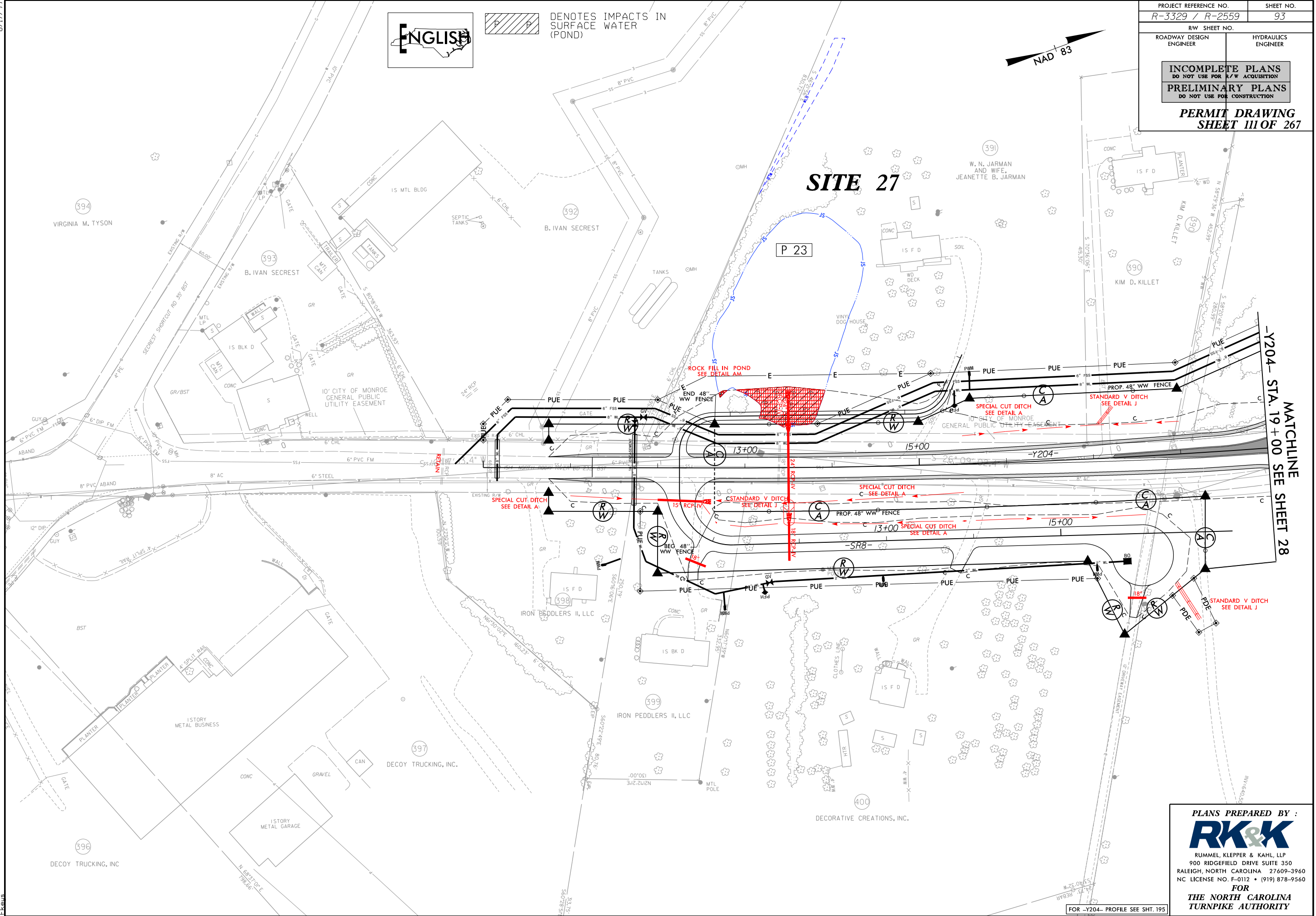
SITE 26
-L- STA. 613+68



8/17/99

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\$\$\$\$\$TIME\$\$\$\$\$



FOR -Y204- PROFILE SEE SHT. 195

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English

A rectangular block with diagonal hatching from the top-left to the bottom-right. Two capital letters 'P' are placed inside the block, one on the left and one on the right.

DENOTES IMPACTS IN
SURFACE WATER
(POND)

NAD 83

SITE 27

P 23

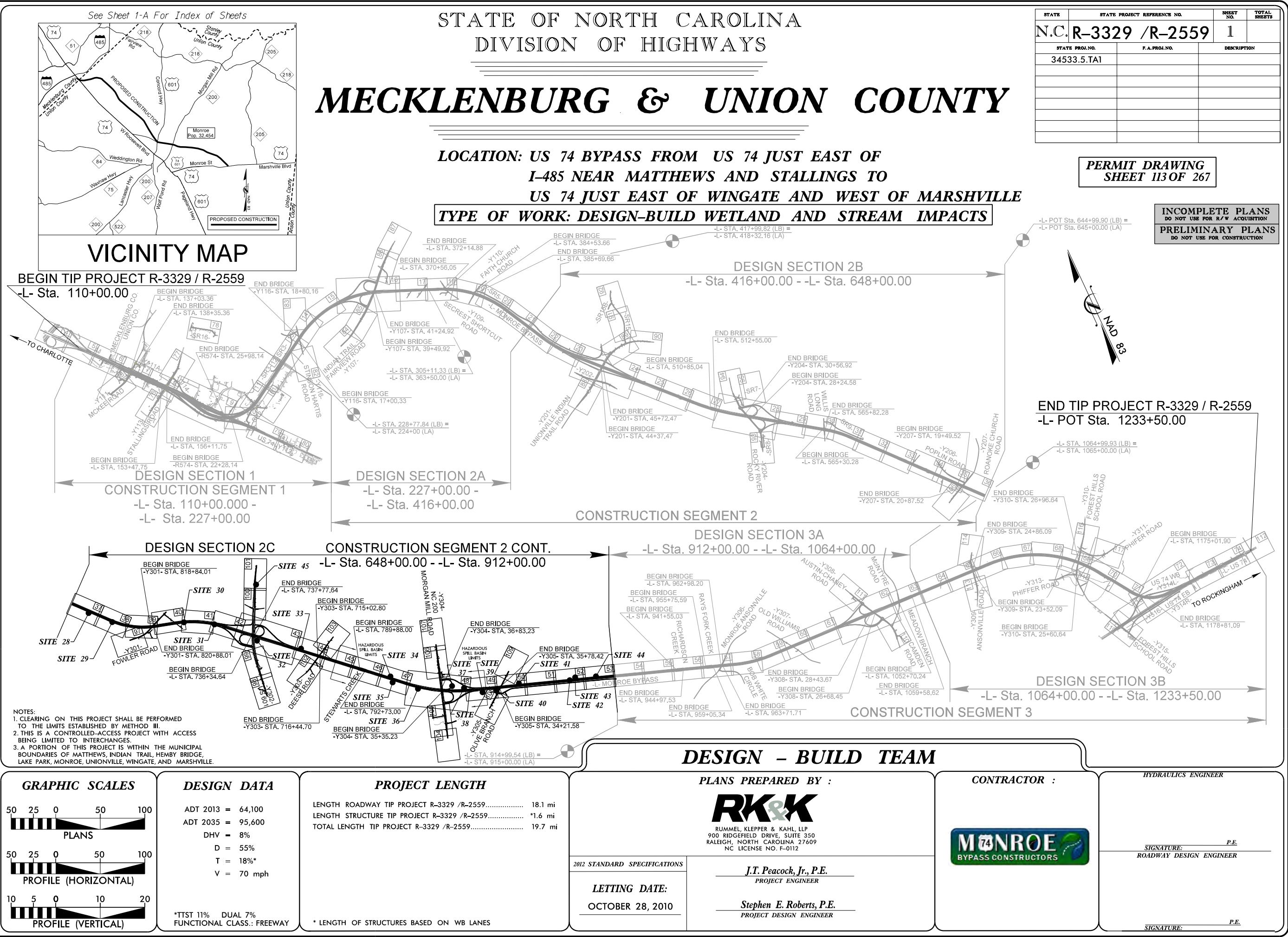
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-Y204- STA. 19+00 SEE SHEET 28

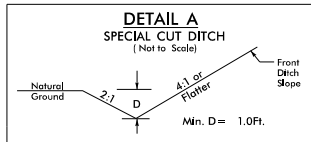
FOR -Y204- PROFILE SEE SHT. 195

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TURNPIKE AUTHORITY

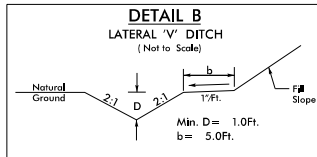
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TIP PROJECT: R-3329 / R-2559

CONTRACT: C202587
TIP PROJECT: R-3329 / R-2559

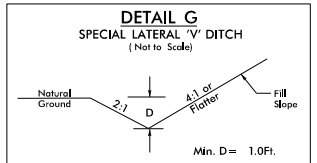




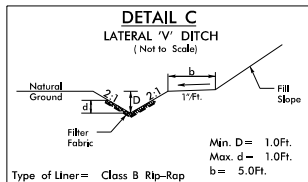
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-L2C- STA. 681+00 TO STA. 688+50 RT
-L2C- STA. 707+00 TO STA. 708+50 RT
-L2C- STA. 707+00 TO STA. 709+00 LT
-L2C- STA. 715+50 TO STA. 721+50 RT
-L2C- STA. 795+50 TO STA. 796+00 LT
-L2C- STA. 818+26 TO STA. 819+50 LT
-L2C- STA. 821+50 TO STA. 829+50 RT
-L2C- STA. 822+00 TO STA. 829+00 LT
-L2C- STA. 835+00 TO STA. 838+50 RT
-L2C- STA. 872+00 TO STA. 874+50 LT
-L2C- STA. 895+00 TO STA. 897+25 LT
-RRA- STA. 24+00 TO STA. 27+50 RT
-RRB- STA. 26+00 TO STA. 28+80 RT
-RRC- STA. 18+13.62 TO STA. 20+00 LT
-TRA- STA. 20+00 TO STA. 21+00 LT
-Y301- STA. 806+40 TO STA. 807+00 RT
-Y301- STA. 829+50 TO STA. 830+15 LT
-Y302- STA. 141+13 TO STA. 142+00 RT
-Y302- STA. 141+75 TO STA. 142+50 LT
-Y302- STA. 161+00 TO STA. 161+45 LT & RT
-Y302A- STA. 11+60 TO STA. 13+00 LT
-Y302A- STA. 11+60 TO STA. 12+75 RT
-Y302B- STA. 11+00 TO STA. 14+00 RT
-Y302B- STA. 12+00 TO STA. 14+20 LT
-Y302C- STA. 10+85 TO STA. 11+70 RT
-Y303- STA. 706+50 TO STA. 707+50 LT
-Y303- STA. 727+20 TO STA. 728+65 RT
-Y304- STA. 13+19.93 TO STA. 15+20 LT
-Y304- STA. 19+00 TO STA. 19+50 RT
-Y305- STA. 42+50 TO STA. 43+60 RT
-SR13- STA. 13+00 TO STA. 15+00 RT



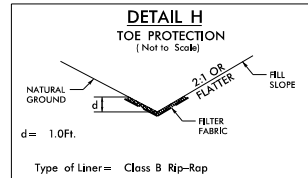
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-L2C- STA. 877+60 TO STA. 879+00 LT
-L2C- STA. 900+00 TO STA. 901+00 LT
-TRA- STA. 25+00 TO STA. 27+50 RT
-Y301- STA. 811+46 TO STA. 814+50 RT
-Y302- STA. 103+77.79 TO STA. 104+74.17 RT
-Y302- STA. 118+50 TO STA. 119+50 RT
-Y303- STA. 713+50 TO STA. 714+90 RT



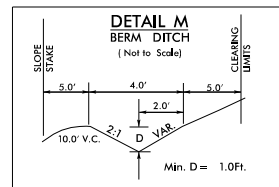
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-Y302- STA. 98+50 TO STA. 110+10 LT
-Y302- STA. 108+50 TO STA. 110+80 RT
-Y304- STA. 13+19.93 TO STA. 15+20 RT
-Y304- STA. 19+00 TO STA. 20+00 LT
-Y304- STA. 21+35 TO STA. 23+00 LT
-Y304- STA. 21+50 TO STA. 24+00 RT
-Y304- STA. 42+40 TO STA. 43+80 LT
-Y304- STA. 51+00 TO STA. 52+64 LT
-Y304- STA. 51+00 TO STA. 52+82 RT
-Y304- STA. 56+00 TO STA. 57+50 RT



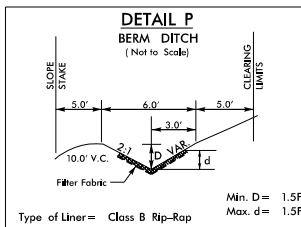
-Y303- STA. 710+00 TO STA. 711+05 LT
-Y303- STA. 711+18 TO STA. 713+50 RT



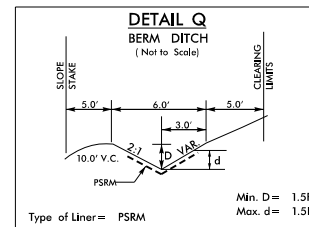
-L2C- STA. 866+00 TO STA. 867+00 LT
-TRA- STA. 15+30 TO STA. 16+55 RT
-Y302- STA. 126+50 TO STA. 127+30 LT
-Y302- STA. 133+95 TO STA. 136+55 LT
-Y301A- STA. 19+43 TO STA. 19+90 LT



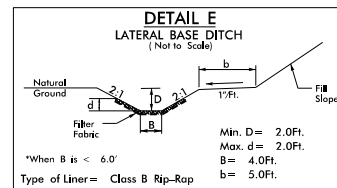
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-L2C- STA. 713+00 TO STA. 721+00 LT
-L2C- STA. 859+40 TO STA. 864+00 LT
-L2C- STA. 866+10 TO STA. 873+20 LT
-L2C- STA. 905+30 TO STA. 909+50 LT
-RRA- STA. 18+00 TO STA. 22+75 RT



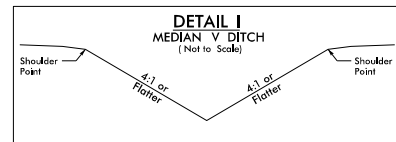
DETAIL P NOT USED IN SECTION 2C



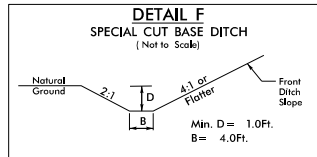
-RRB- STA. 15+00 TO STA. 20+45 LT



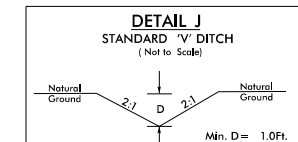
-L2C- STA. 654+50 TO STA. 656+00 LT
-L2C- STA. 670+00 TO STA. 672+00 LT
-L2C- STA. 692+50 TO STA. 694+00 LT
-L2C- STA. 698+00 TO STA. 705+20 LT
-L2C- STA. 701+00 TO STA. 703+00 RT
-L2C- STA. 741+69 TO STA. 744+00 RT
-L2C- STA. 758+55 TO STA. 763+00 LT
-L2C- STA. 782+50 TO STA. 785+50 RT
-L2C- STA. 784+50 TO STA. 785+50 LT
-L2C- STA. 793+30 TO STA. 797+00 RT
-L2C- STA. 807+12 TO STA. 811+00 LT
-L2C- STA. 853+00 TO STA. 855+40 RT
-L2C- STA. 853+00 TO STA. 857+50 LT
-L2C- STA. 867+18 TO STA. 870+18 RT
-L2C- STA. 896+40 TO STA. 898+50 RT
-L2C- STA. 898+00 TO STA. 900+00 LT
-RLA- STA. 10+00 TO STA. 13+48.04 LT
-TLA- STA. 15+00 TO STA. 17+50 LT
-TRD- STA. 17+64 TO STA. 20+00 RT
-TRD- STA. 20+77 TO STA. 23+00 RT
-Y301- STA. 810+50 TO STA. 813+00 LT
-Y301A- STA. 15+50 TO STA. 15+50 LT
-Y302- STA. 110+80 TO STA. 116+00 RT
-Y302- STA. 124+00 TO STA. 126+50 LT
-Y302- STA. 129+40 TO STA. 131+00 RT
-Y302- STA. 133+75 TO STA. 138+00 RT
-Y304- STA. 17+00 TO STA. 720+20 RT (b varies, see plans)
-Y305- STA. 29+00 TO STA. 31+70 LT



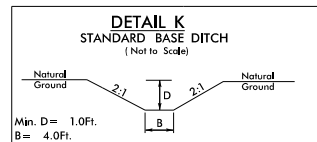
-L2C- STA. 675+00 TO STA. 677+00 CL
-L2C- STA. 690+50 TO STA. 693+00 CL
-L2C- STA. 707+00 TO STA. 708+50 CL
-L2C- STA. 782+50 TO STA. 783+50 CL
-L2C- STA. 795+00 TO STA. 799+00 CL
-L2C- STA. 827+00 TO STA. 829+00 CL
-L2C- STA. 831+00 TO STA. 835+00 CL
-L2C- STA. 872+50 TO STA. 874+00 RT
-L2C- STA. 893+00 TO STA. 897+50 CL
-L2C- STA. 892+50 TO STA. 896+70 RT
-L2C- STA. 899+50 TO STA. 902+50 RT



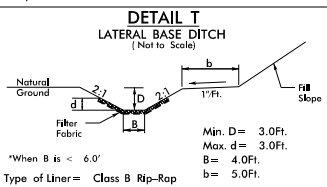
-L2C- STA. 690+50 TO STA. 692+50 LT
-L2C- STA. 897+25 TO STA. 898+00 LT
-RRA- STA. 30+00 TO STA. 31+00 RT
-Y301- STA. 806+40 TO STA. 810+50 LT



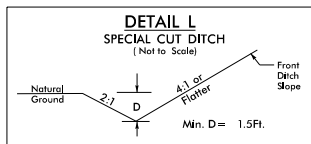
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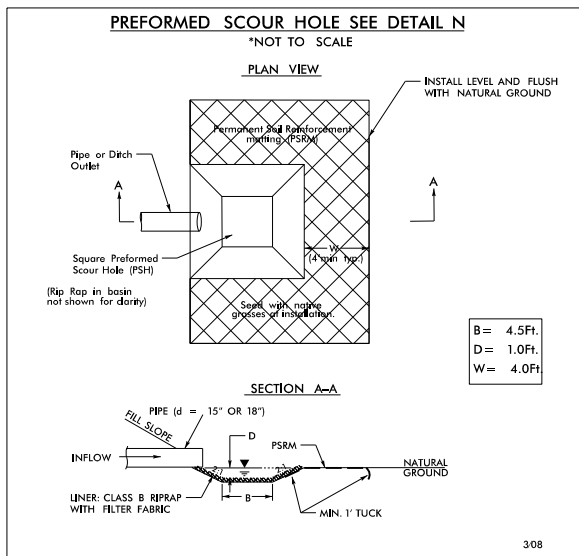
-L2C- STA. 665+00 LT; L=150', S=2.82%
BEG EL=558.26, END EL=554.03
-L2C- STA. 776+00 RT; L=115', S=0.35%
BEG EL=556.1, END EL=555.7
-L2C- STA. 817+00 LT; L=80', S=4.00%
BEG EL=549.5, END EL=546.3
-L2C- STA. 855+40 RT; L=150', S=0.65%
BEG EL=547.0, END EL=546.0
-RLC- STA. 17+00 TO 20+55 LT; L=340', S=0.44%
BEG EL=568.5, END EL=567.0
-Y304- STA. 15+20 RT; L=165', S=0.22%
BEG EL=580.0, END EL=579.6



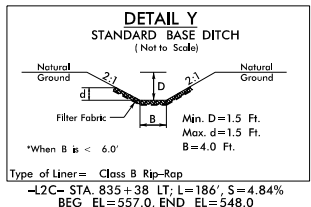
DETAIL T NOT USED IN SECTION 2C



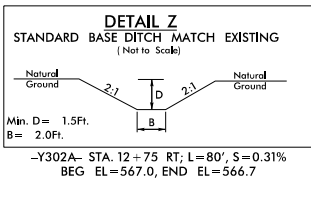
-L2C- STA. 767+50 TO STA. 768+00 RT
-Y302- STA. 138+00 TO STA. 140+00 RT



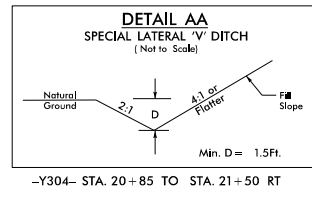
-L2C- STA. 659+50 RT
-L2C- STA. 671+00 RT
-Y317- STA. 57+00 RT



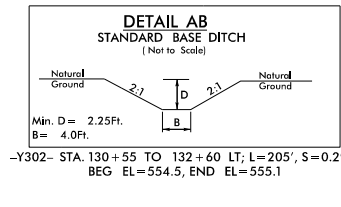
-L2C- STA. 835+38 LT; L=186', S=4.84%
BEG EL=557.0, END EL=548.0



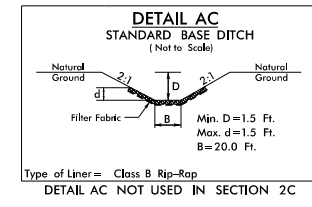
-Y302A- STA. 12+75 RT; L=80', S=0.31%
BEG EL=567.0, END EL=566.7



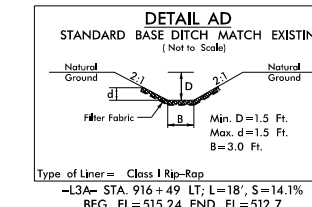
-Y304- STA. 20+85 TO STA. 21+50 RT



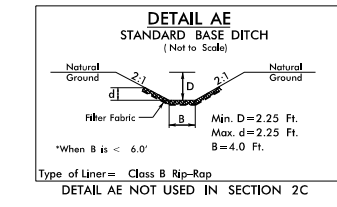
-Y302- STA. 130+55 TO 132+60 LT; L=205', S=0.29%
BEG EL=554.5, END EL=555.1



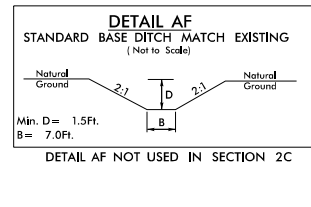
DETAIL AC NOT USED IN SECTION 2C



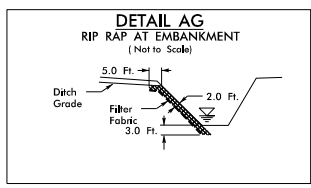
-L3A- STA. 916+49 LT; L=18', S=14.1%
BEG EL=515.24, END EL=512.7



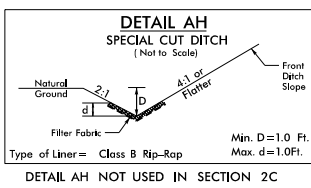
DETAIL AE NOT USED IN SECTION 2C



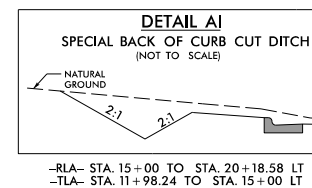
DETAIL AF NOT USED IN SECTION 2C



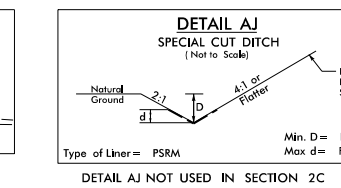
DETAIL AG NOT USED IN SECTION 2C



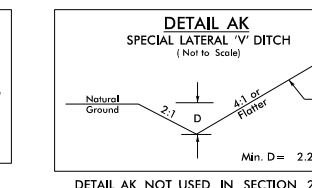
DETAIL AH NOT USED IN SECTION 2C



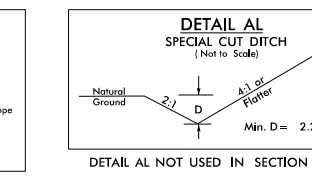
-RLA- STA. 15+00 TO STA. 20+18.58 LT
-TLA- STA. 11+98.24 TO STA. 15+00 LT
-TRD- STA. 12+27.70 TO STA. 15+50 RT



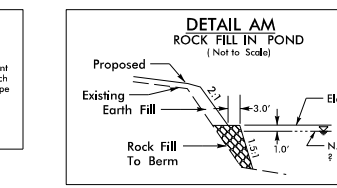
DETAIL AJ NOT USED IN SECTION 2C



DETAIL AK NOT USED IN SECTION 2C

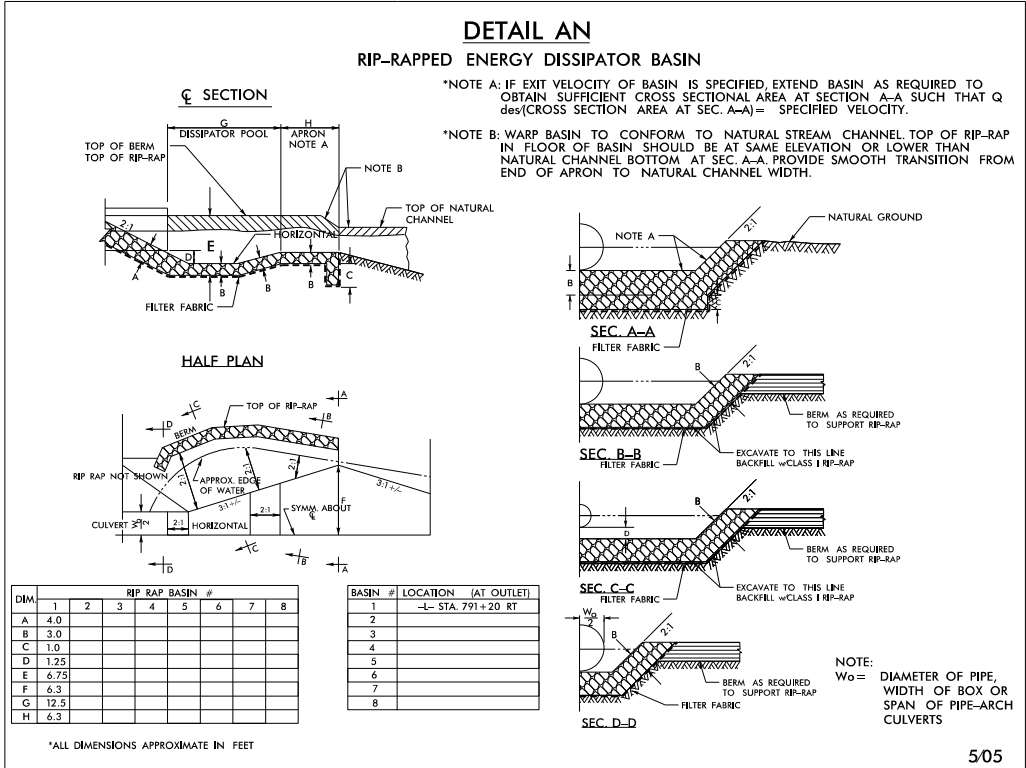


DETAIL AL NOT USED IN SECTION 2C

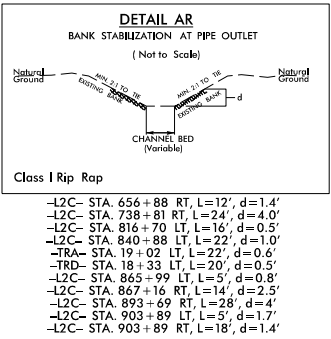
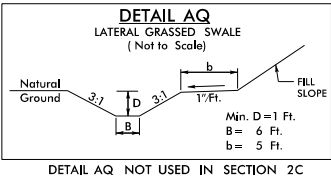
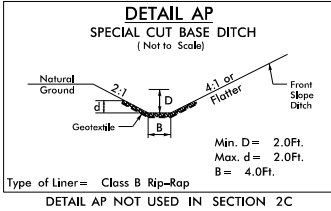
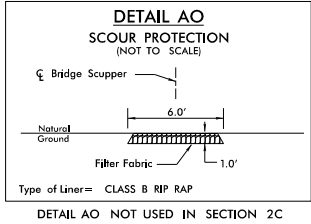


-L2C- STA. 848+25 TO 850+07 RT
-Y302- STA. 151+80 TO STA. 152+78 RT
-Y304- STA. 52+75 LT

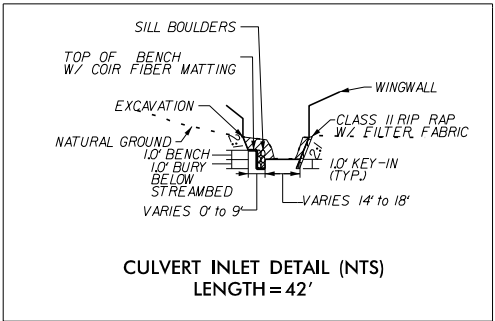
-L2C- 818+00 LT
C1=8996cf C2=9016cf EL1=552.9' EL2=558.0'
D1=4.0' L1=65.0' L2=81.0'
B1=22.0' B2=38.0' S=0.30%
-L2C- 807+00 LT
C1=11454cf C2=11952cf EL1=525.0' EL2=530.2'
D1=4.0' L1=60.0' L2=76.0'
B1=35.0' B2=51.0' S=0.30%
-L2C- 786+50 RT
C1=15074cf C2=16192cf EL1=532.0' EL2=537.2'
D1=4.0' L1=75.0' L2=91.0'
B1=40.0' B2=62.0' S=0.30%
-L2C- 793+00 RT
C1=11980cf C2=12015cf EL1=518.0' EL2=522.2'
D1=3.0' L1=75.0' L2=87.0'
B1=43.0' B2=55.0' S=0.30%
-TRD- 14+50 LT
C1=2760cf C2=3024cf EL1=555.8' EL2=559.0'
D1=2.0' L1=40.0' L2=48.0'
B1=30.0' B2=38.0' S=0.30%
-TRD- 20+25 RT
C1=2532cf C2=2916cf EL1=561.4' EL2=535.5'
D1=3.0' L1=30.0' L2=46.0'
B1=20.0' B2=36.0' S=0.30%
-TRA- 22+25 LT
C1=21602cf C2=36963cf EL1=547.5' EL2=552.0'
D1=4.0' L1=183.0' L2=199.0'
B1=59.0' B2=75.0' S=0.30%



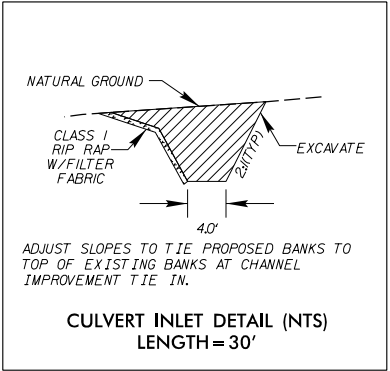
505



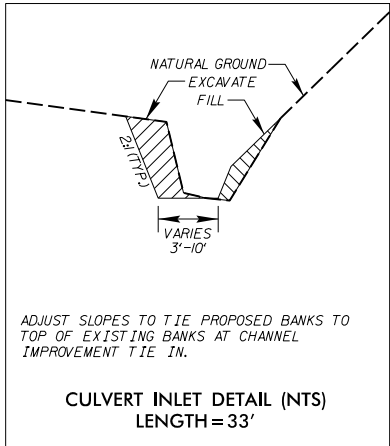
EAST FORK STEWARTS CREEK
-L- STA. 669+12



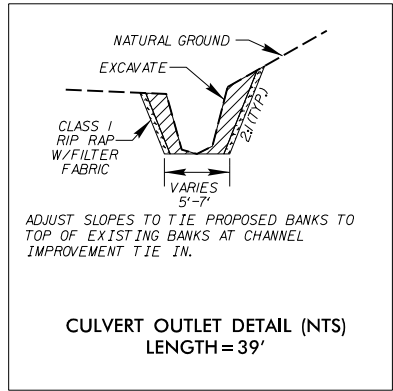
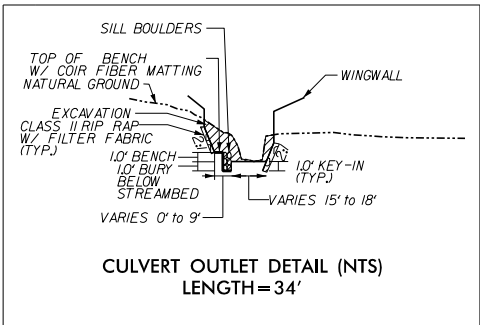
UT TO STEWARTS CREEK
-L- STA. 702+70



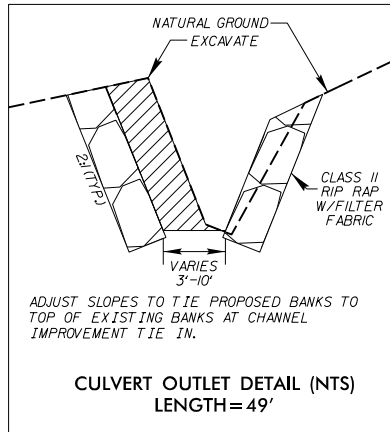
UT TO STEWARTS CREEK
-L- STA. 805+89



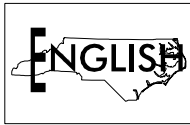
CULVERT OUTLET DETAIL (NTS)
LENGTH=34'



CULVERT OUTLET DETAIL (NTS)
LENGTH=49'



8/17/99



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



DENOTES IMPACTS IN
SURFACE WATER



PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 37
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 116 OF 267	

MATCHLINE -L- STA. 648+00 SEE SHEET 36

BEGIN SECTION 2C
-L- POT Sta. 648+00.00

444
LEROY J. HINSON
AND WIFE
MARY L. HINSON
DB 449 PG 170

448
DONALD WINCHESTER PRICE
DARLENE PRICE
DB 4099 PG 391
PB 1 PG 948

444
LEROY J. HINSON
AND WIFE
MARY L. HINSON
DB 449 PG 170

445
JAMES A. HANDY
AND WIFE
MARY ANN HANDY
DB 751 PG 74
PB D PG 729

W 75

446
CHERYL NAPIER
DB 4675 PG 673
PB 3 PG 80

447
ERIC PEREZ AND
DEBBIE DRAKE
DB 1888 PG 835
PB 3 PG 80

SITE 28

W 76

S 78b
(INTERMITTENT)

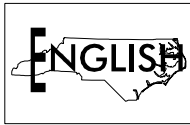
W 77

448
DONALD WINCHESTER PRICE
DARLENE PRICE
DB 4099 PG 391
PB 1 PG 948

MATCHLINE -L- STA. 662+00 SEE SHEET 38

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
FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

8/17/99



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

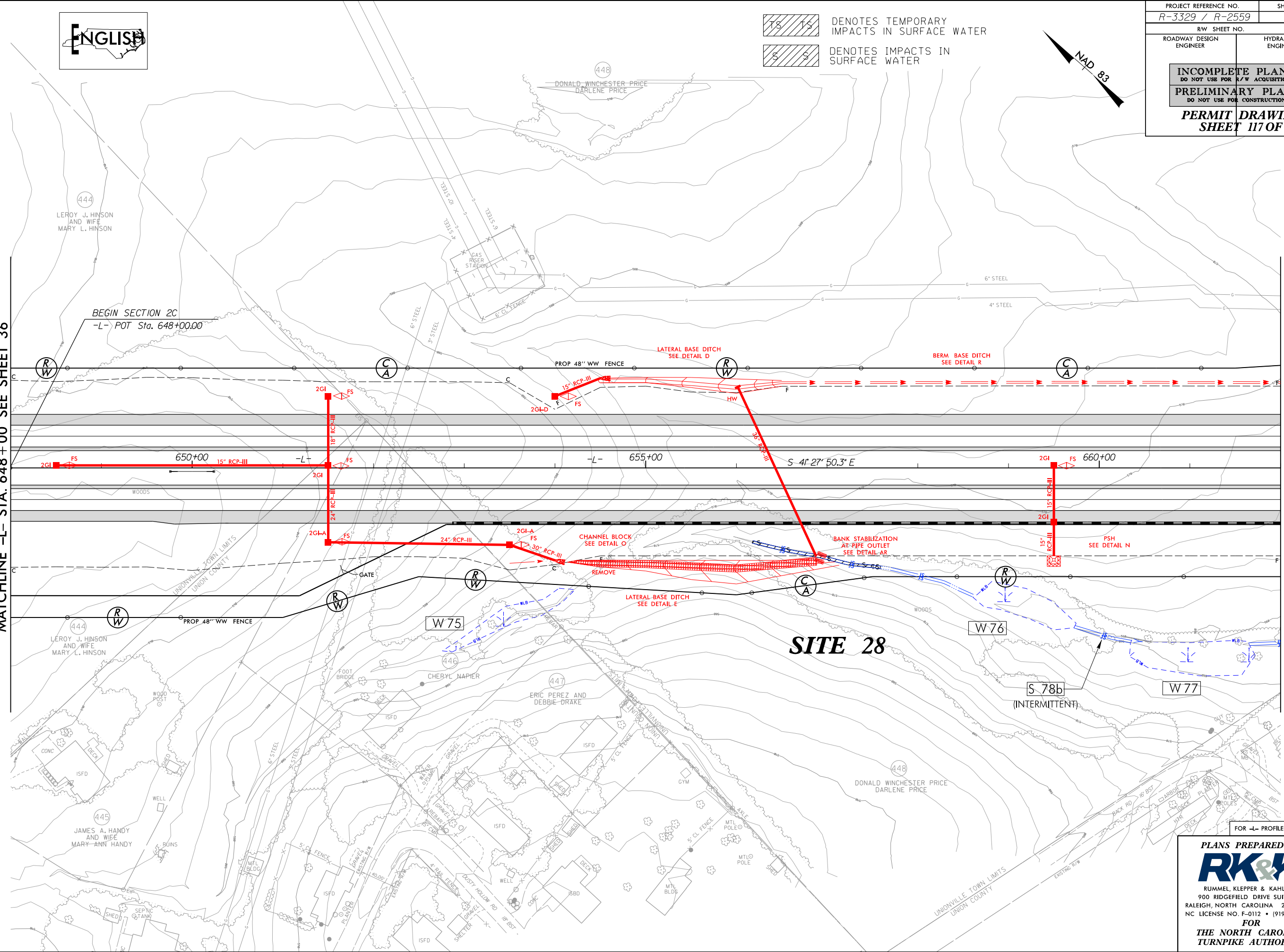


DENOTES IMPACTS IN
SURFACE WATER

PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 37
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 117 OF 267	

MATCHLINE -L- STA. 648+00 SEE SHEET 36

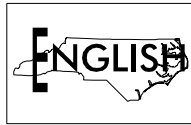
MATCHLINE -L- STA. 662+00 SEE SHEET 38



FOR -L- PROFILE SEE SHT. 139

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
FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

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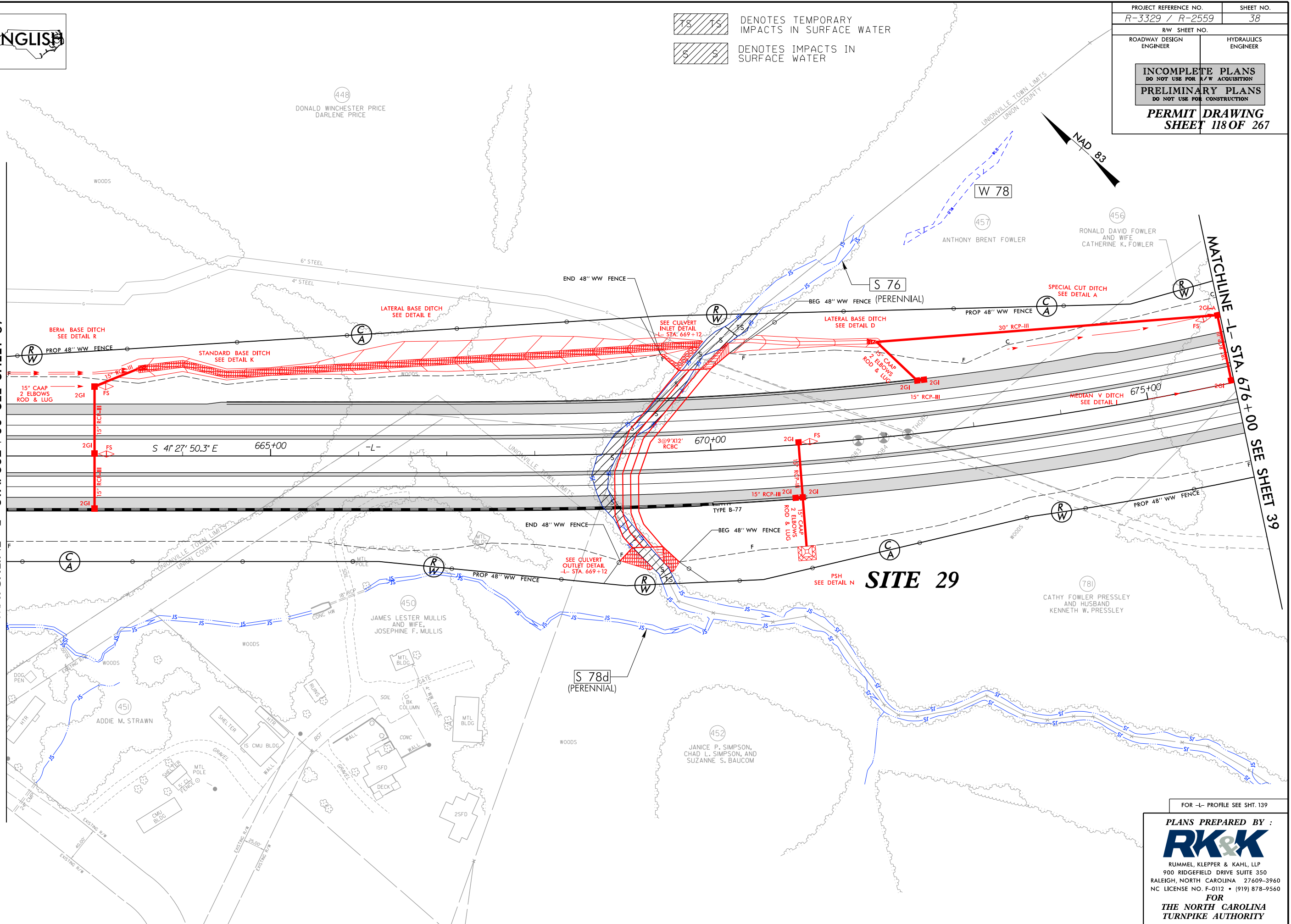


TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
S S DENOTES IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 38
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 118 OF 267	

MATCHLINE -L- STA. 662+00 SEE SHEET 37

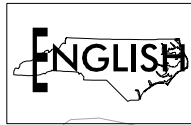
MATCHLINE -L- STA. 676+00 SEE SHEET 39



FOR -L- PROFILE SEE SHT. 139

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
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THE NORTH CAROLINA
TURNPIKE AUTHORITY

8/17/99

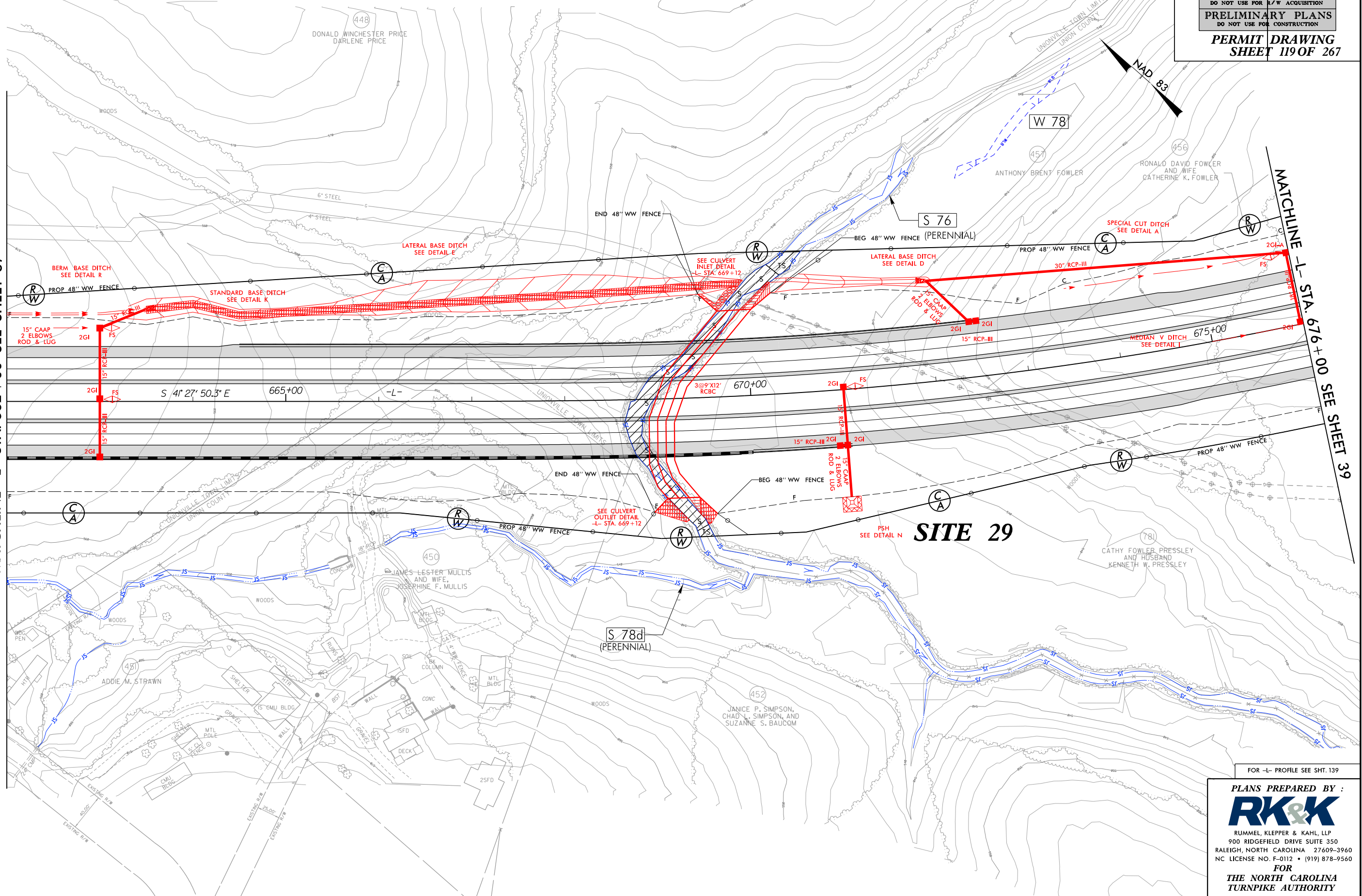


TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
S S DENOTES IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 38
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 119 OF 267	

MATCHLINE -L- STA. 662+00 SEE SHEET 37

MATCHLINE -L- STA. 676+00 SEE SHEET 39

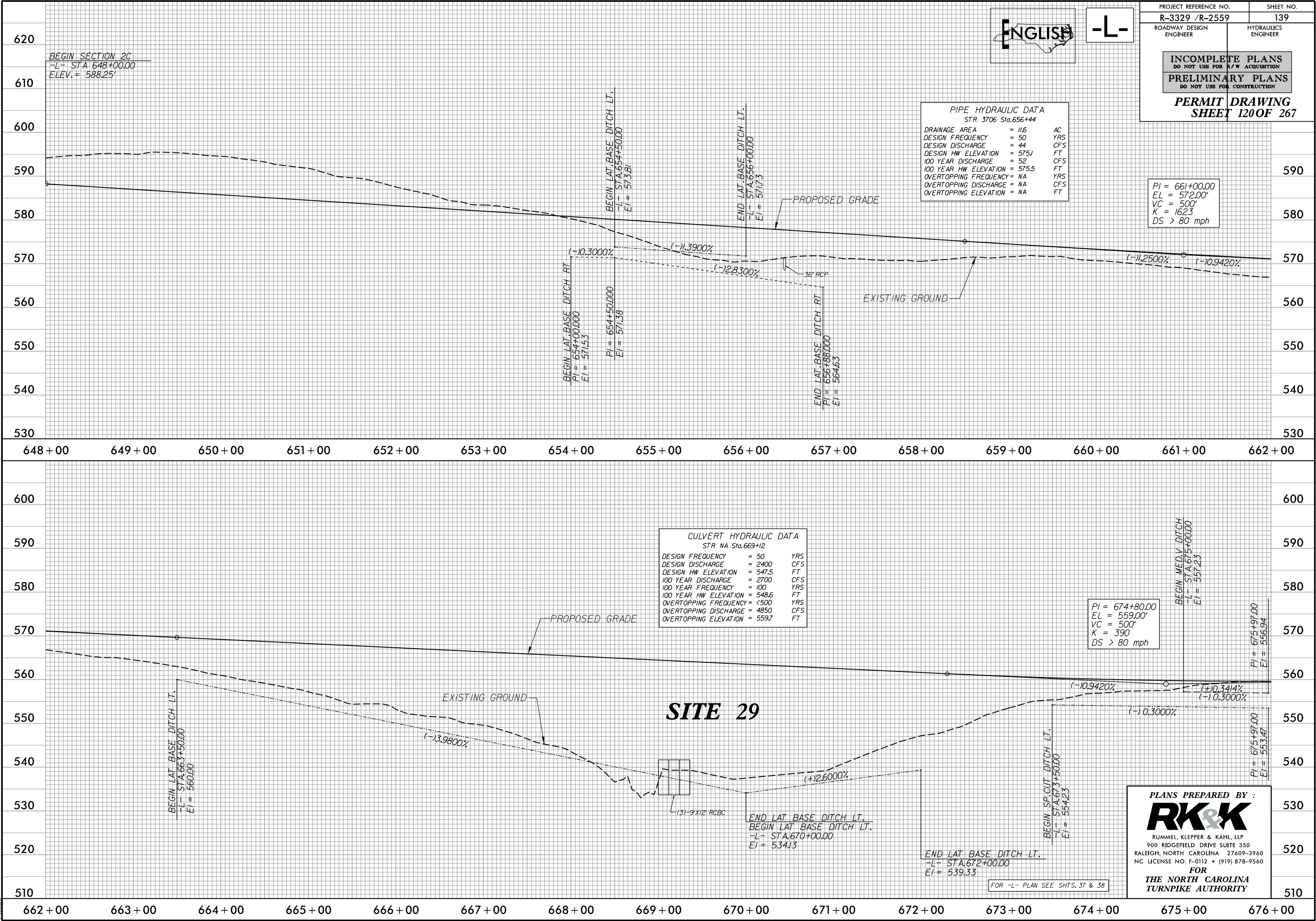


FOR -L- PROFILE SEE SHT. 139

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
FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

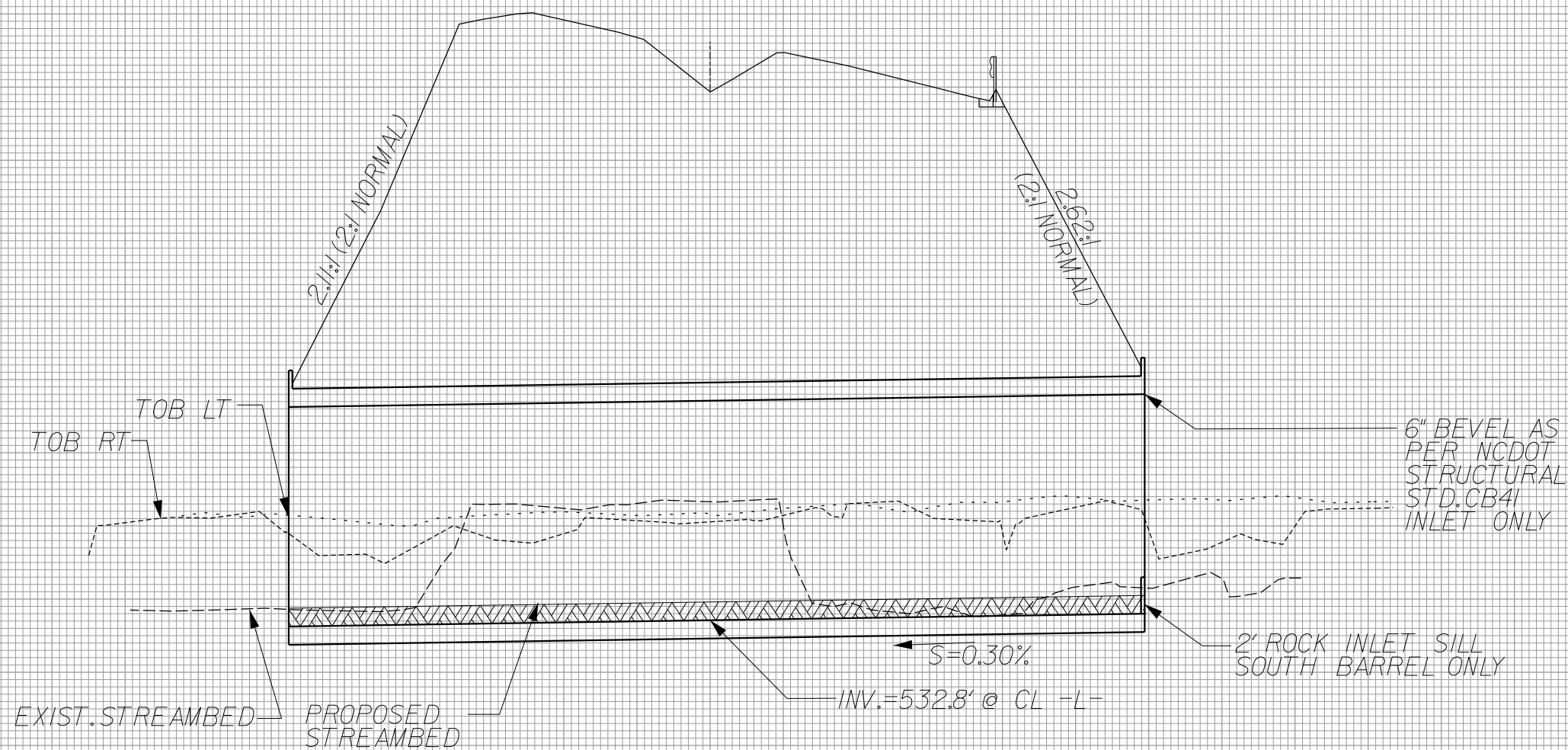
5/28/99

8/29/2004
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Elevs

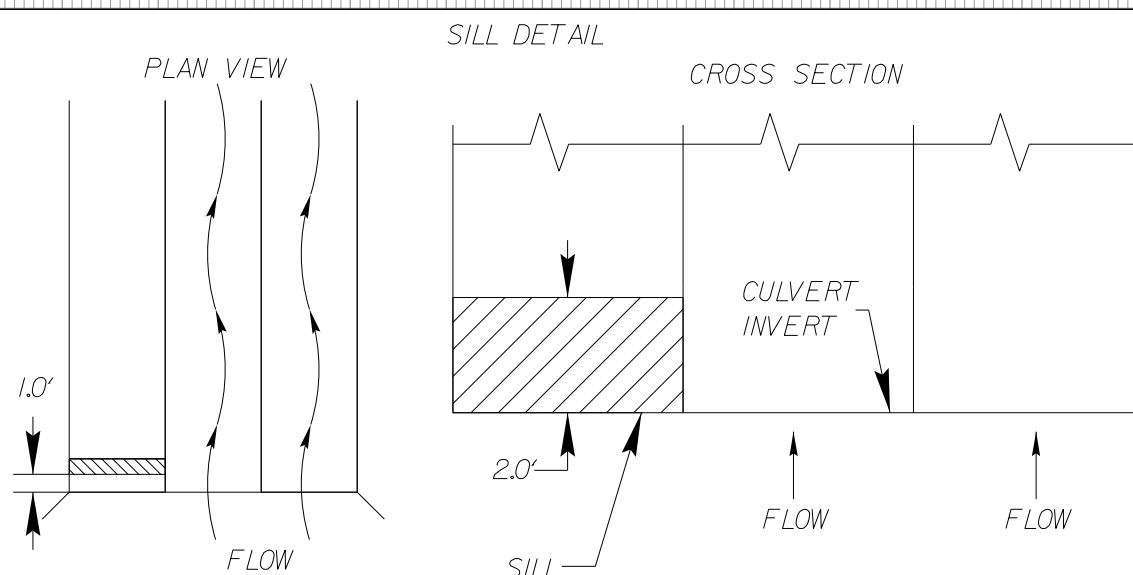




SITE 29
-L- STA. 669+18

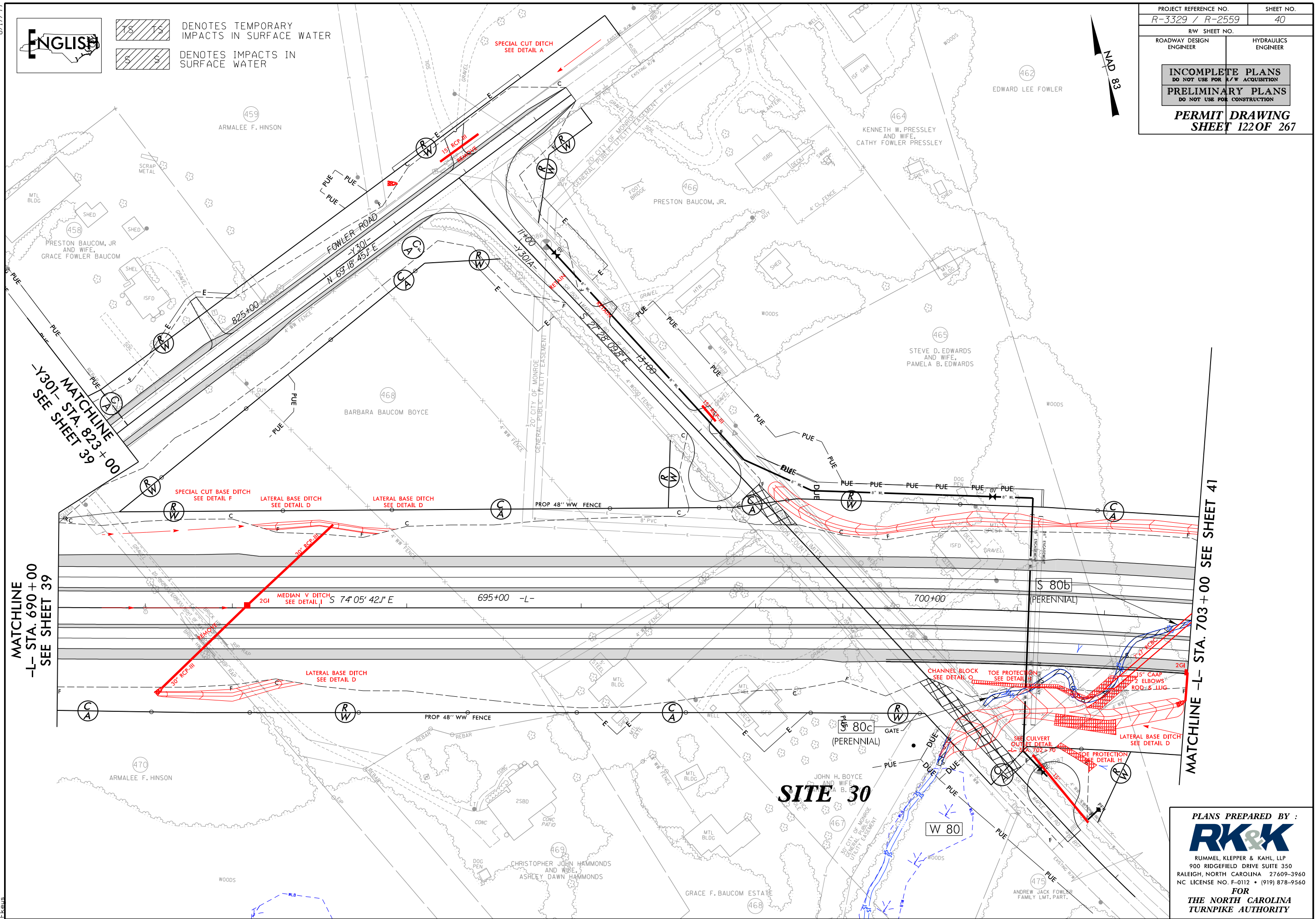


PROPOSED 3-9'X12' RCBC



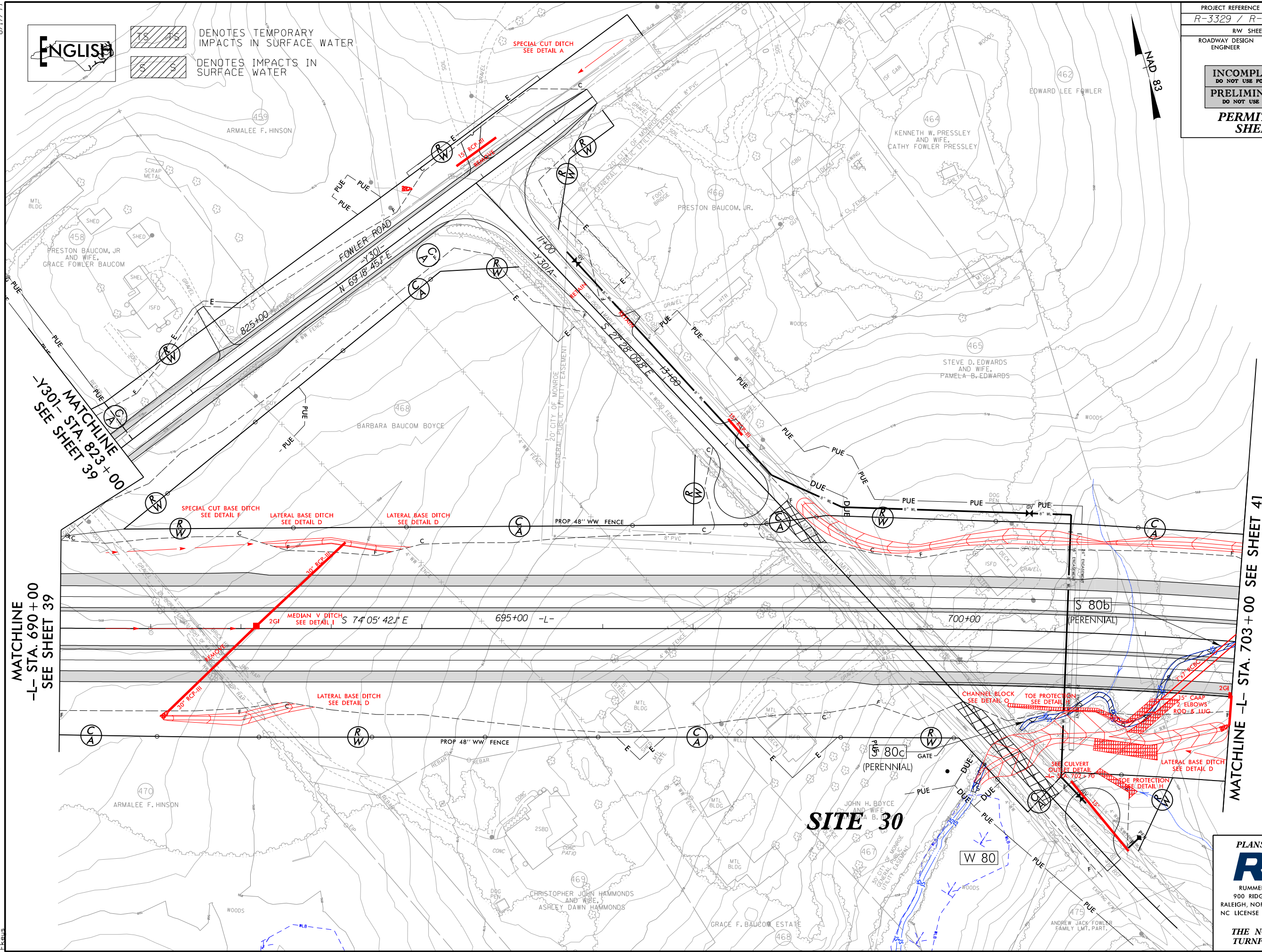
PLACE SILLS 1.0' INSIDE CULVERT
AT INLET AND OUTLET.

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. 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.



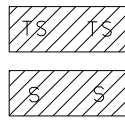
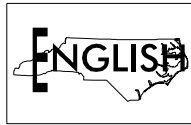
9/29/2014
\$\$\$\$\$\$ IIME\$\$\$\$\$
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R:\Hydraulics\PEF



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FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

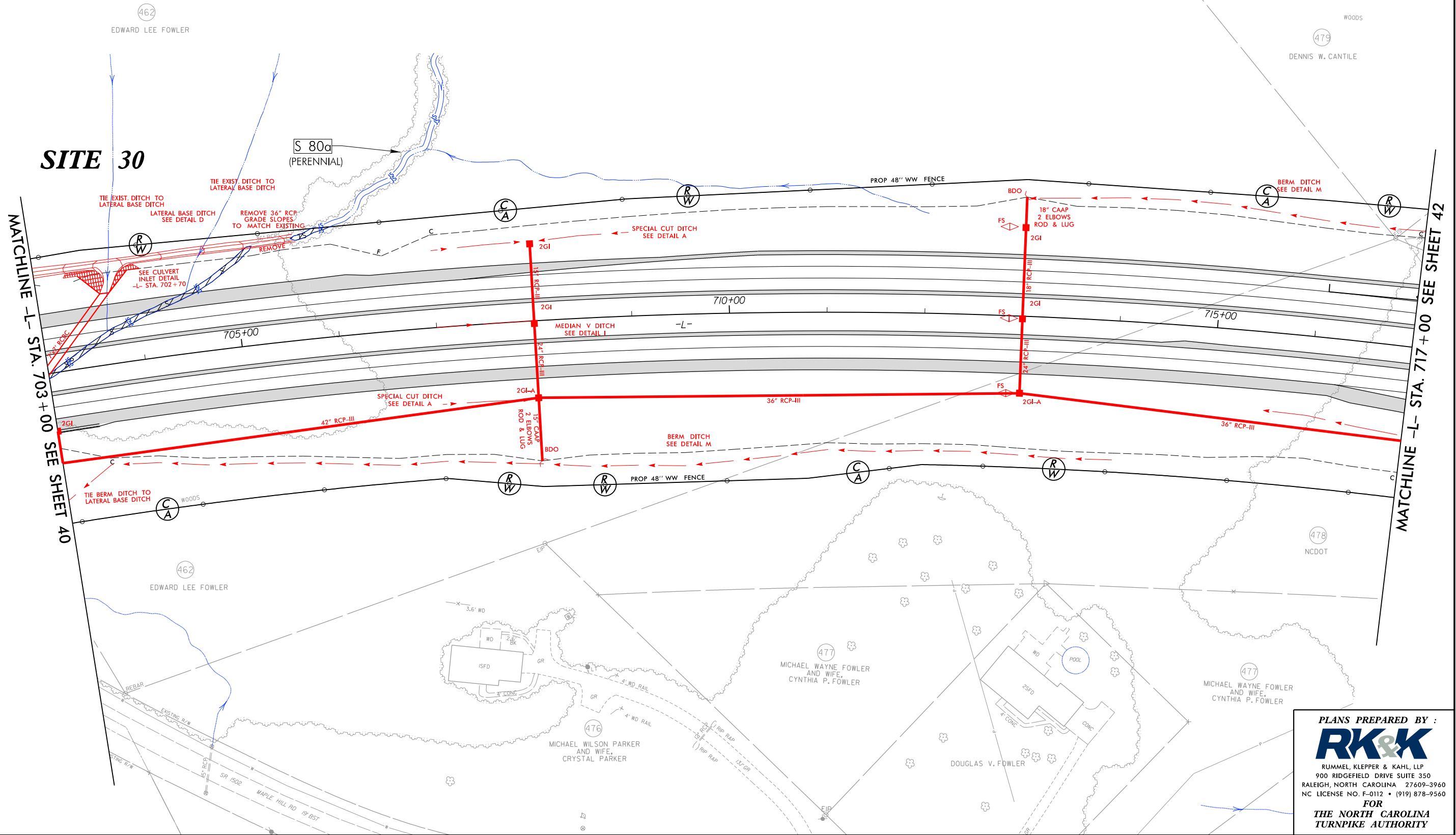
8/17/99



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN
SURFACE WATER

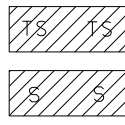
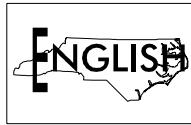
PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	41
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 124 OF 267	



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B:\Hydraulics\PERMITS_Environmental\Drawings\Section2C\R3329_R2559_HYD_PRM_WET_PSH041.dgn
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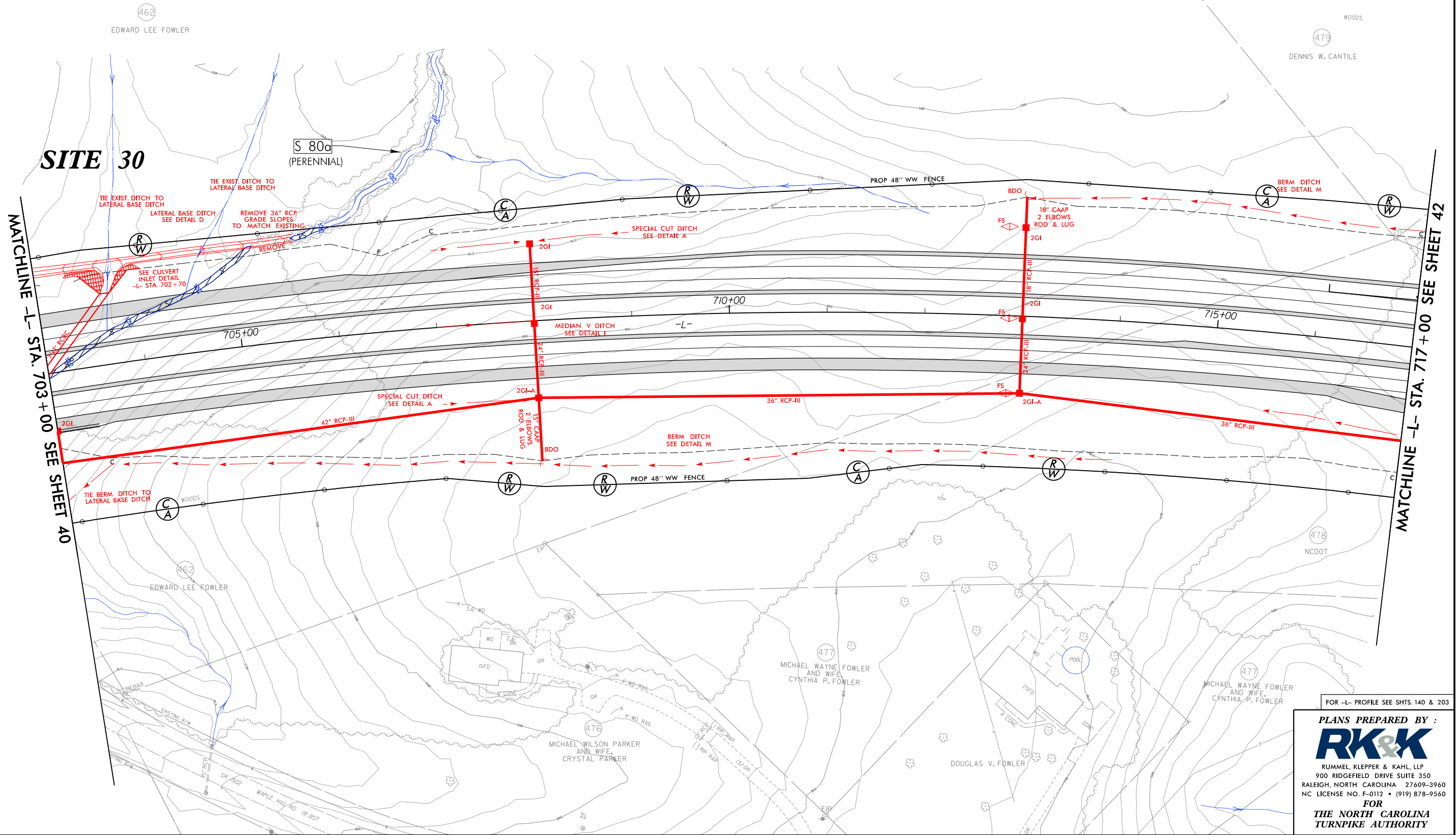
8/17/99



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN
SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	41
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 125 OF 267	

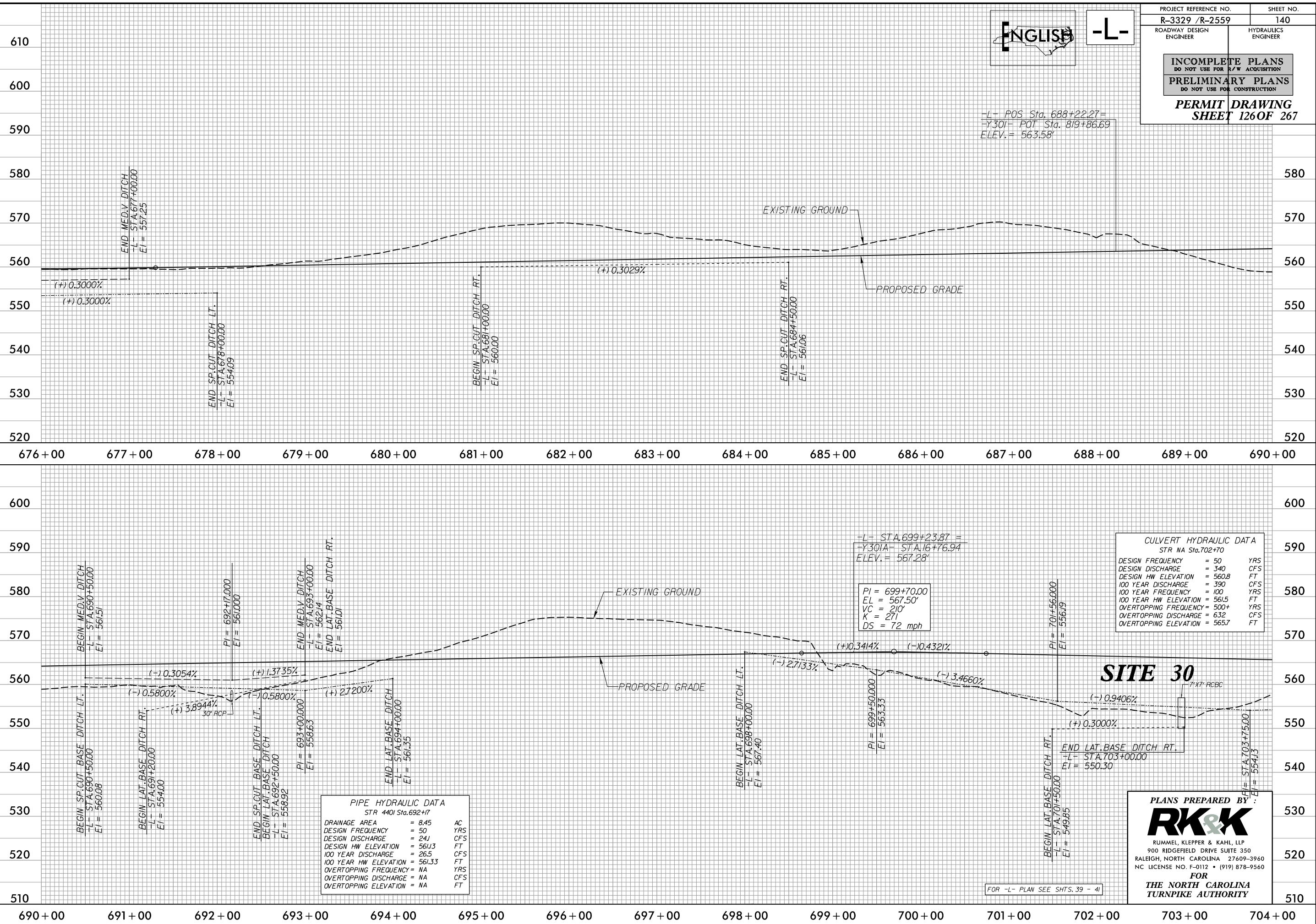


FOR -L- PROFILE SEE SHTS. 140 & 203

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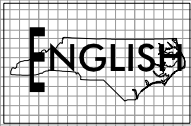
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5/14/99

8/29/2004
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PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 127 OF 267		

SITE 30

-L- STA. 702+97

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566

562

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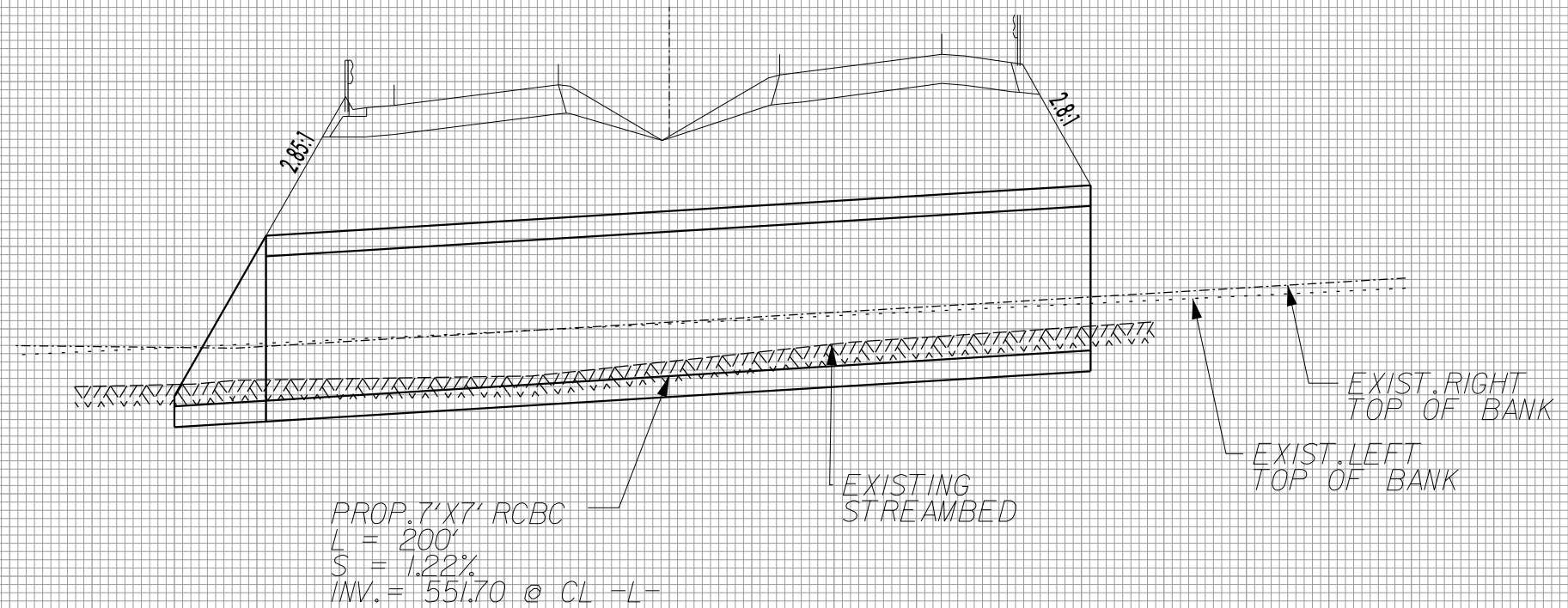
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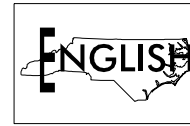
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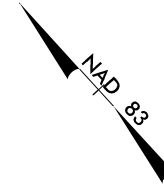


PROPOSED 7'X7' RCBC
BURIED 1.0'

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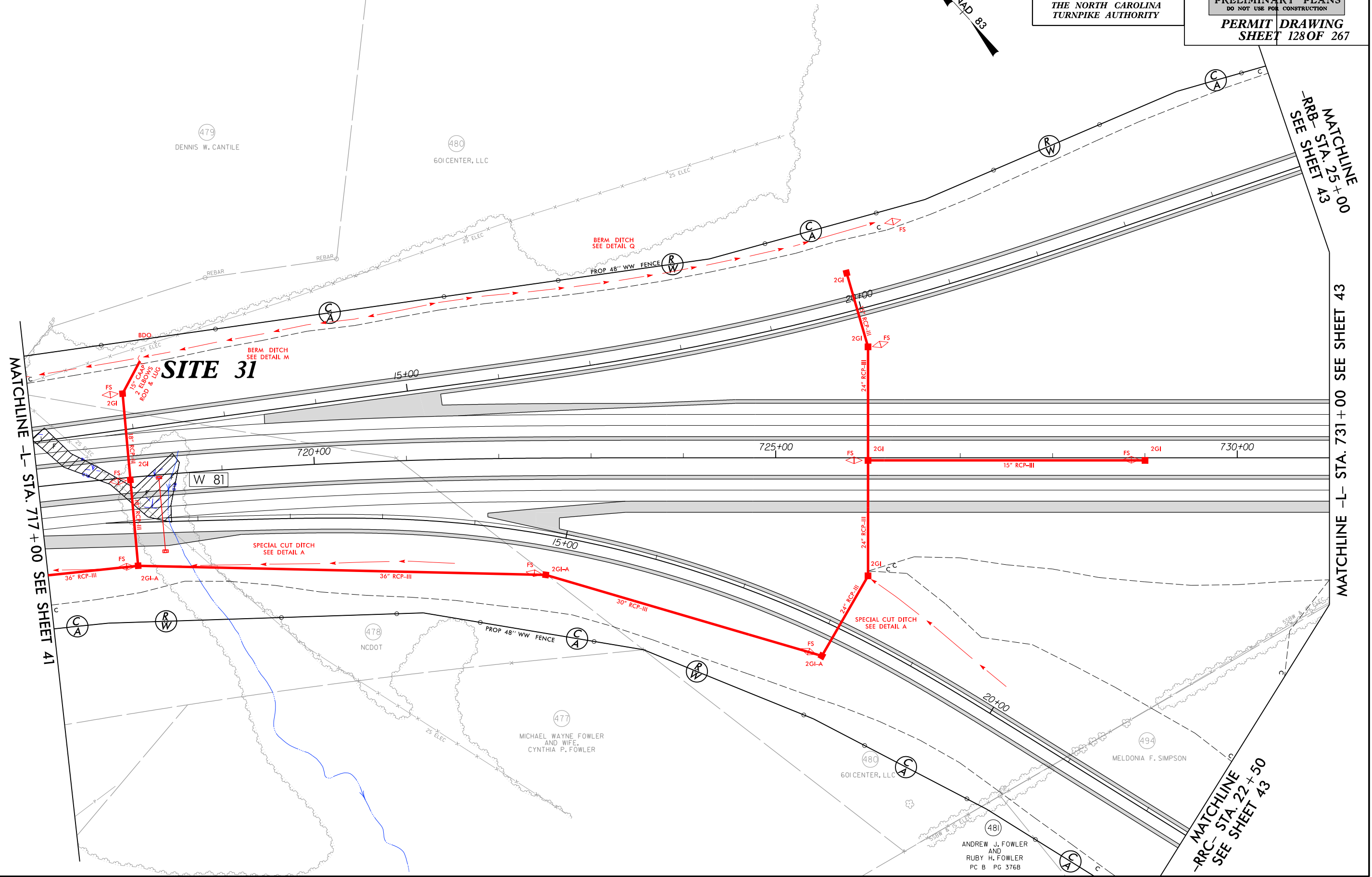


 DENOTES FILL IN WETLAND



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PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	42
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 128 OF 267	



8/17/99

8/29/2014
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DENOTES FILL IN
WETLAND

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PROJECT REFERENCE NO.

R-3329 / R-2559

SHEET NO.

42

RW SHEET NO.

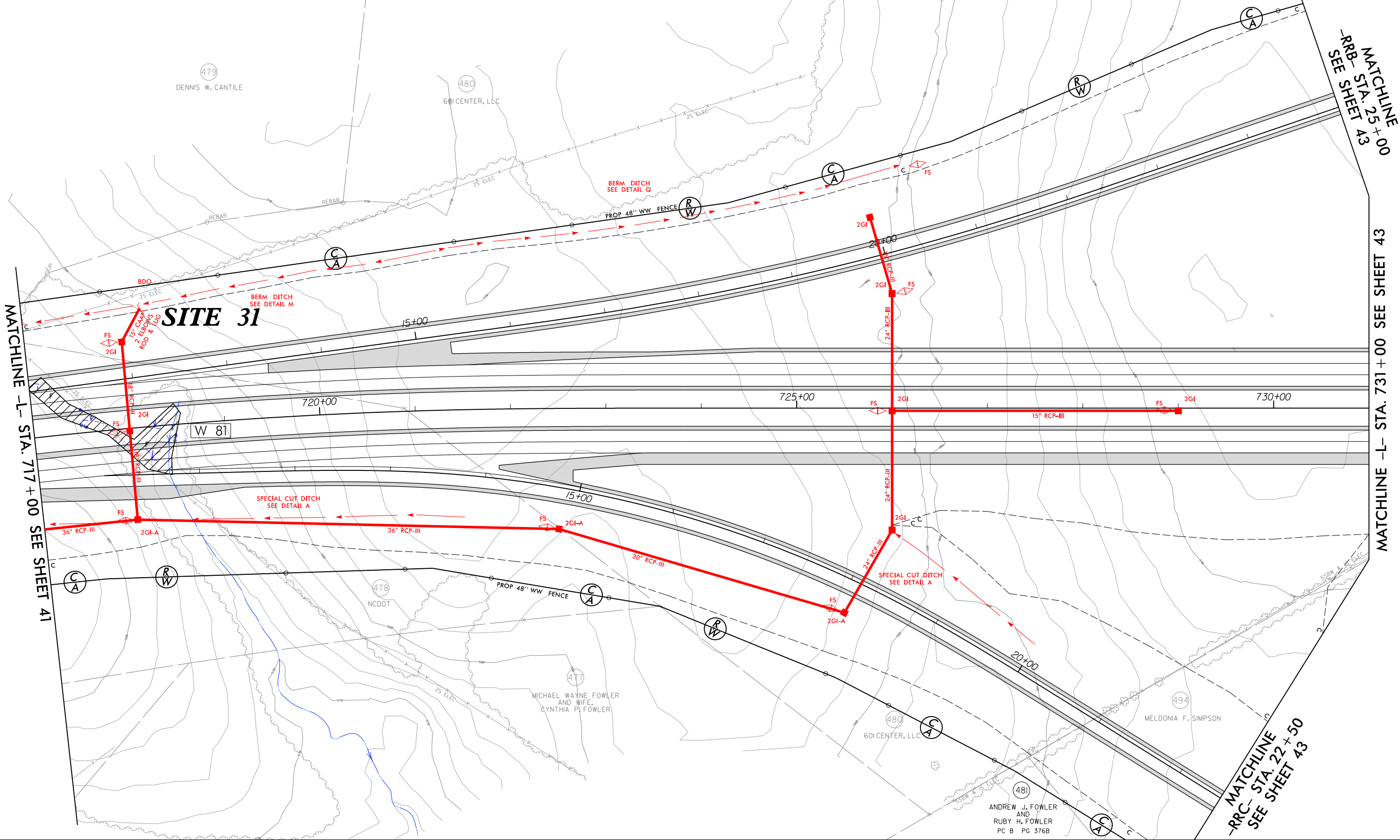
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ENGINEER

HYDRAULICS
ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR A/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING
SHEET 129 OF 267

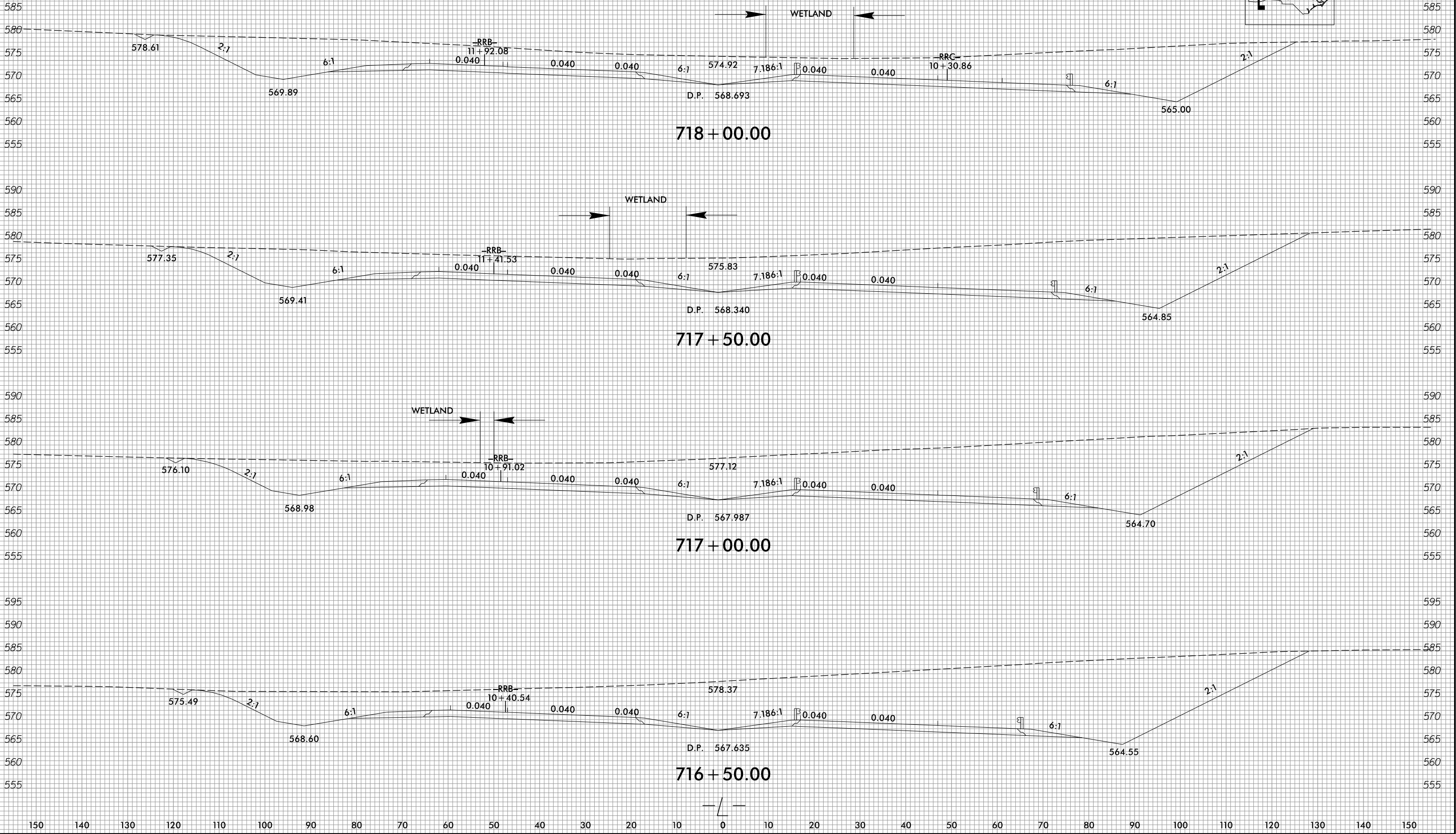
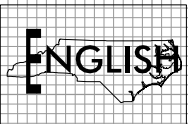


8/23/99

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	R-3329 / R-2559	2C-X33

PERMIT DRAWING
SHEET 130 OF 267

SITE 31

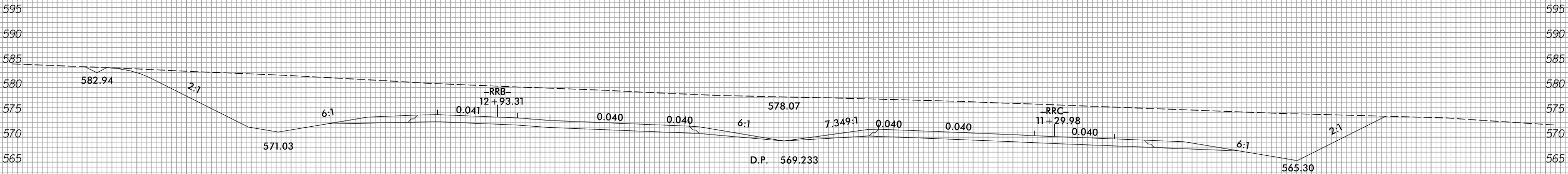
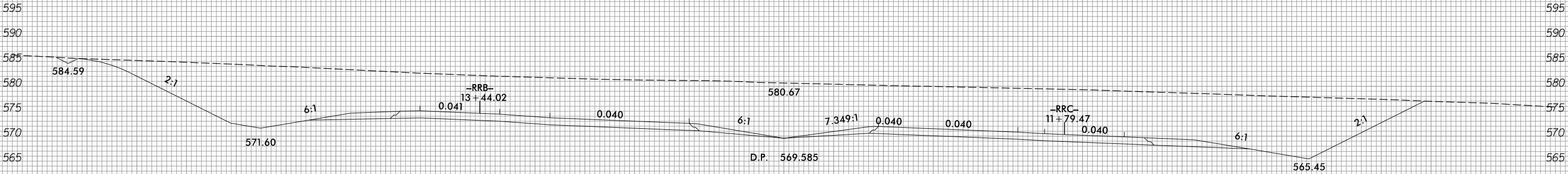
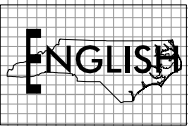


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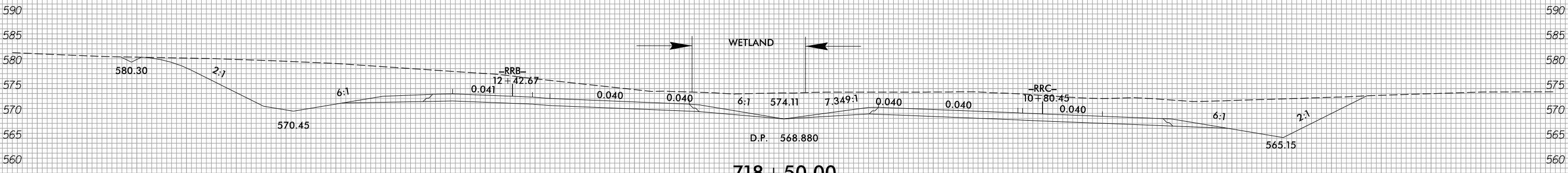
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	R-3329 / R-2559	2C-X34

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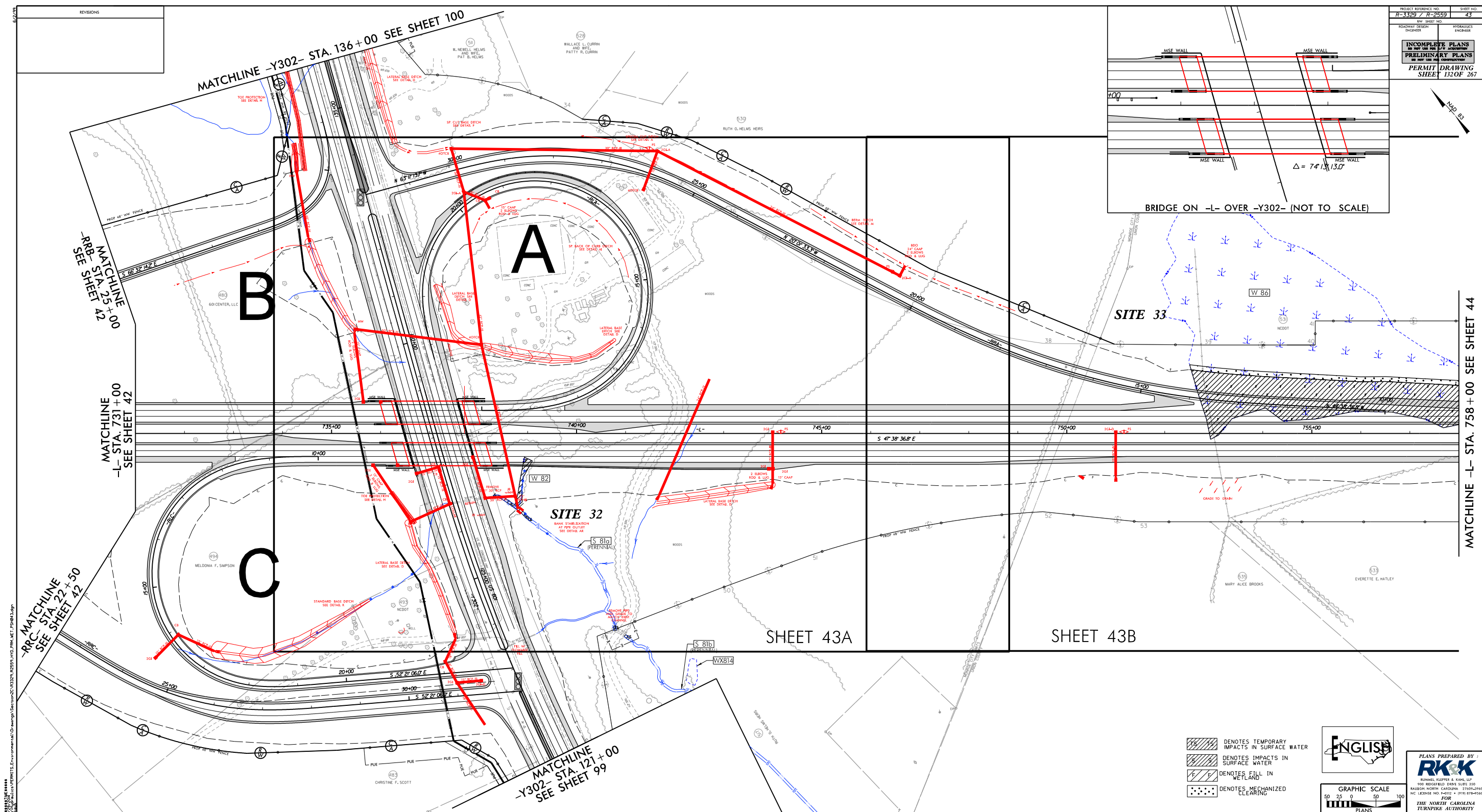
PERMIT DRAWING
SHEET 131 OF 267



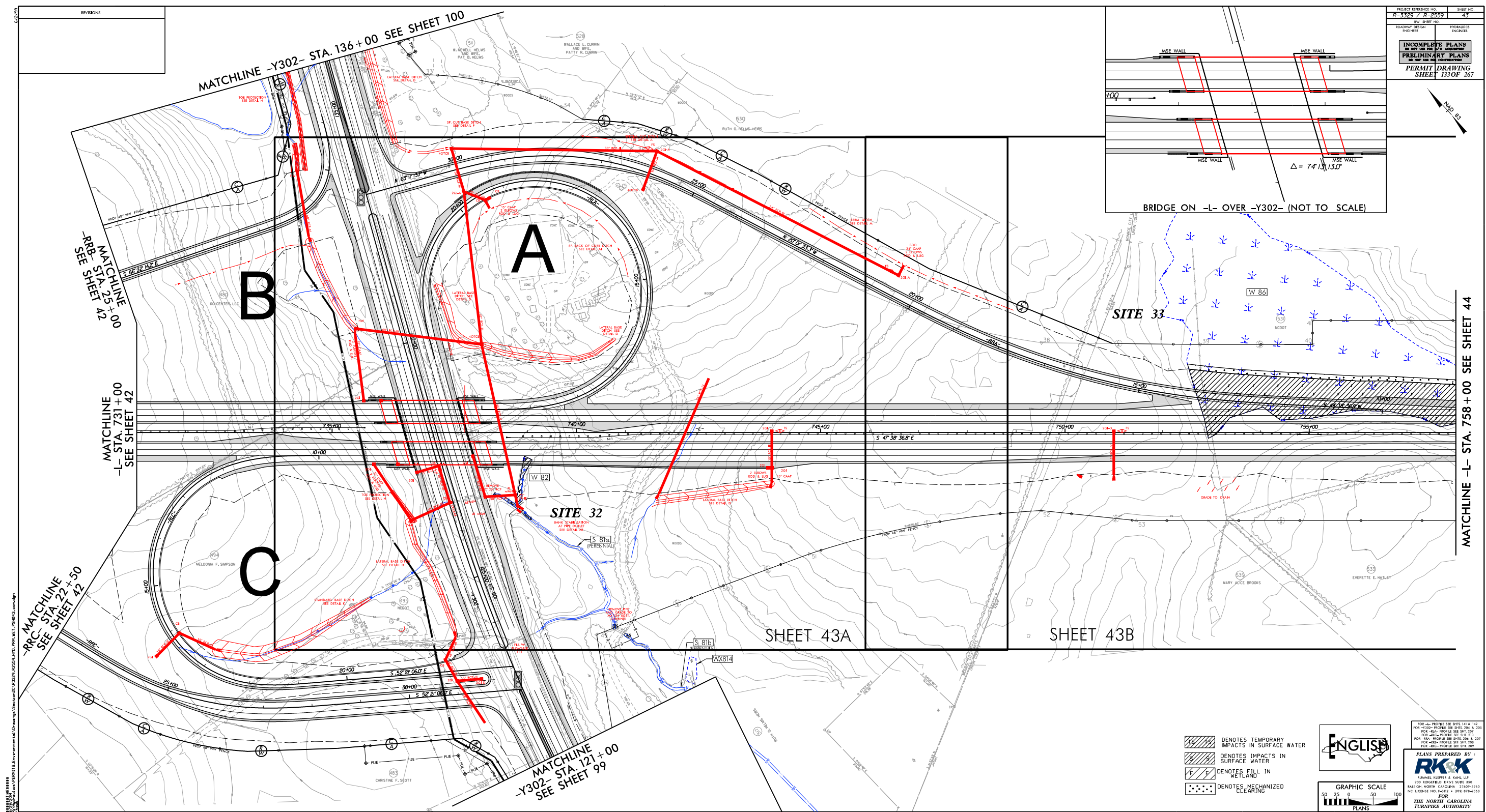
SITE 31



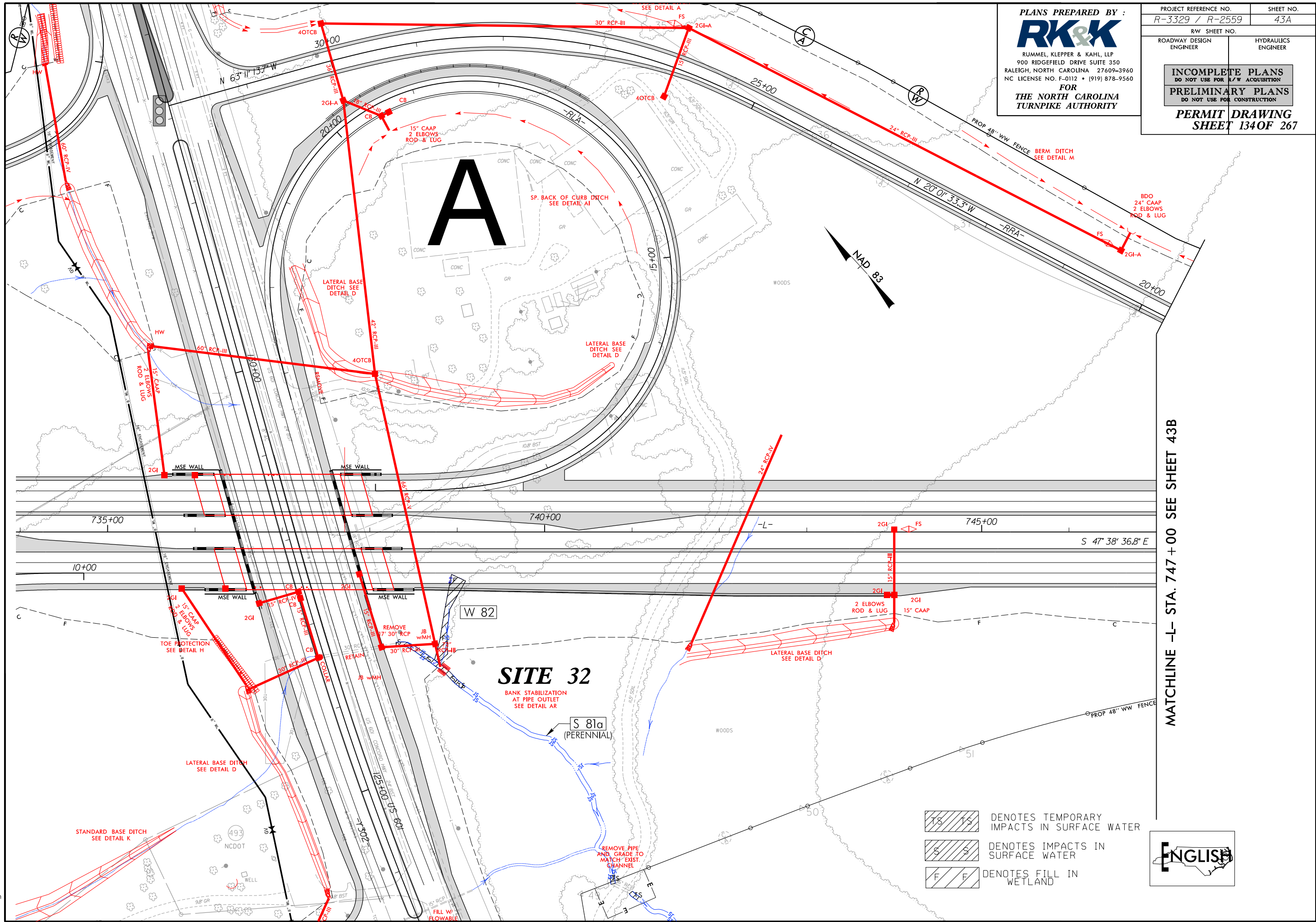
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12/2/2004
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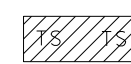


9/29/2014
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Fkejs



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PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	43A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 134 OF 267	

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

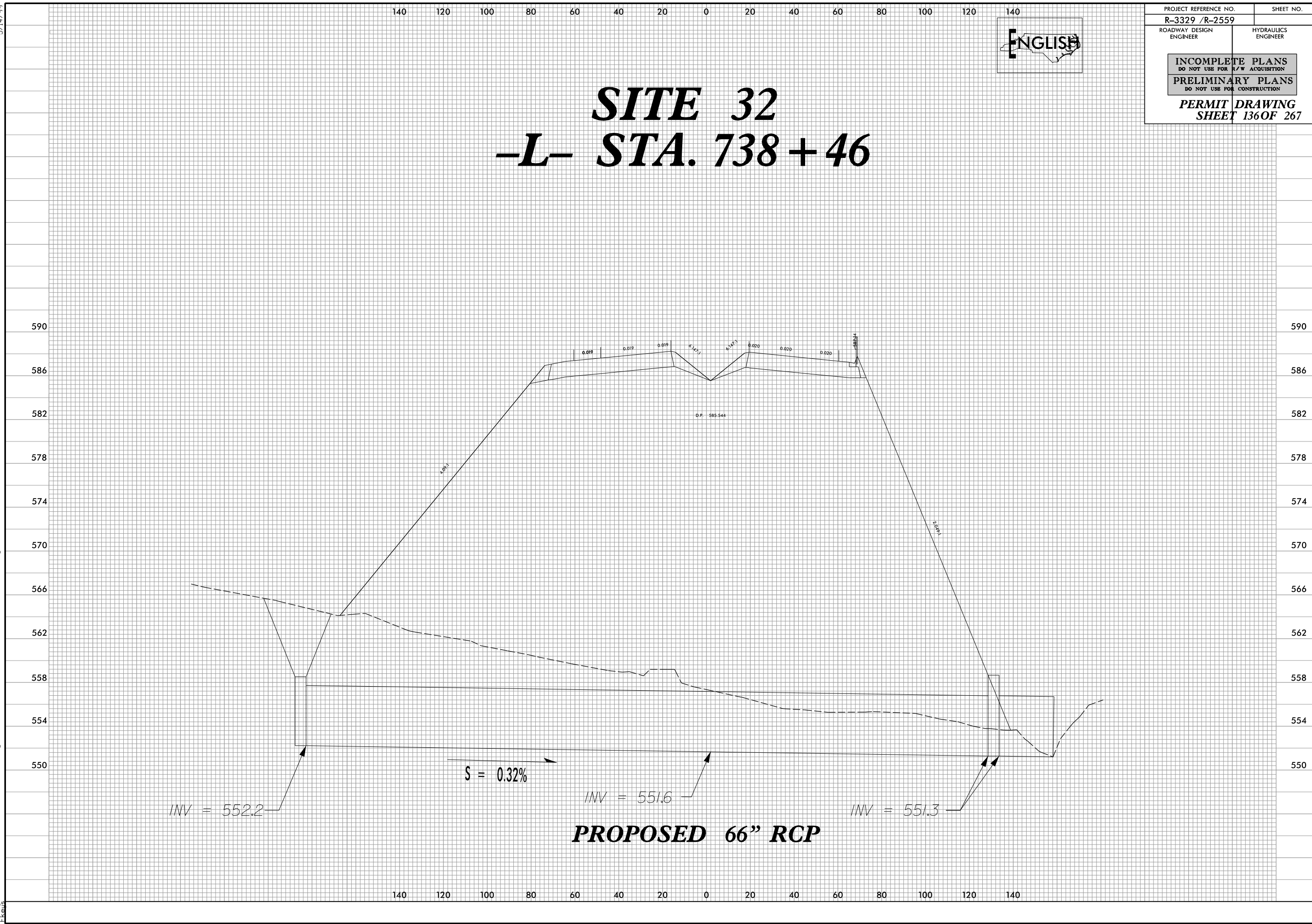
MATCHLINE -L- STA. 747 + 00 SEE SHEET 43B





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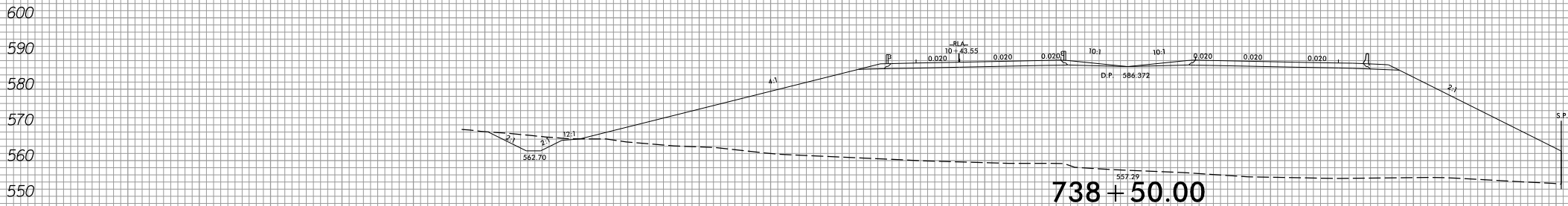
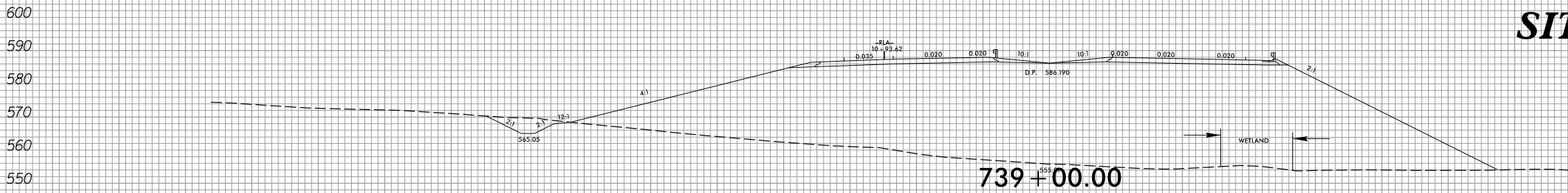
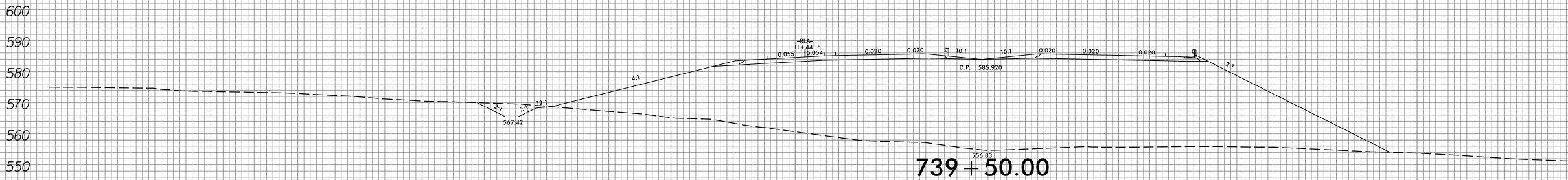
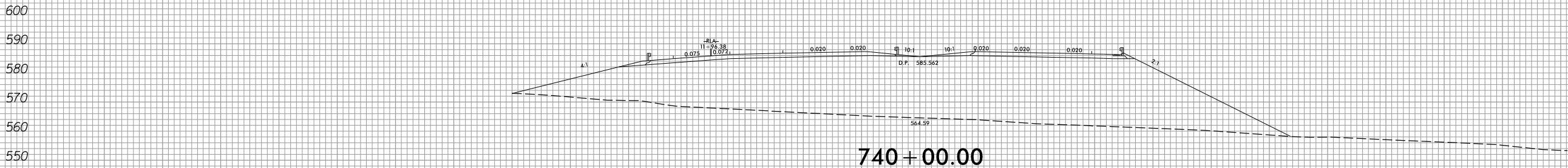
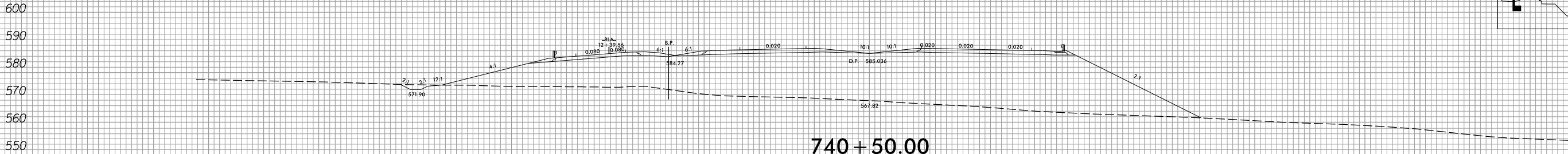
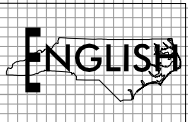
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5/29/2014
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8/23/99

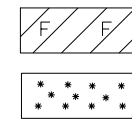
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	R-3329 / R-2559	2C-X44

PERMIT DRAWING
SHEET 137 OF 267



SITE 32





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PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	43B

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

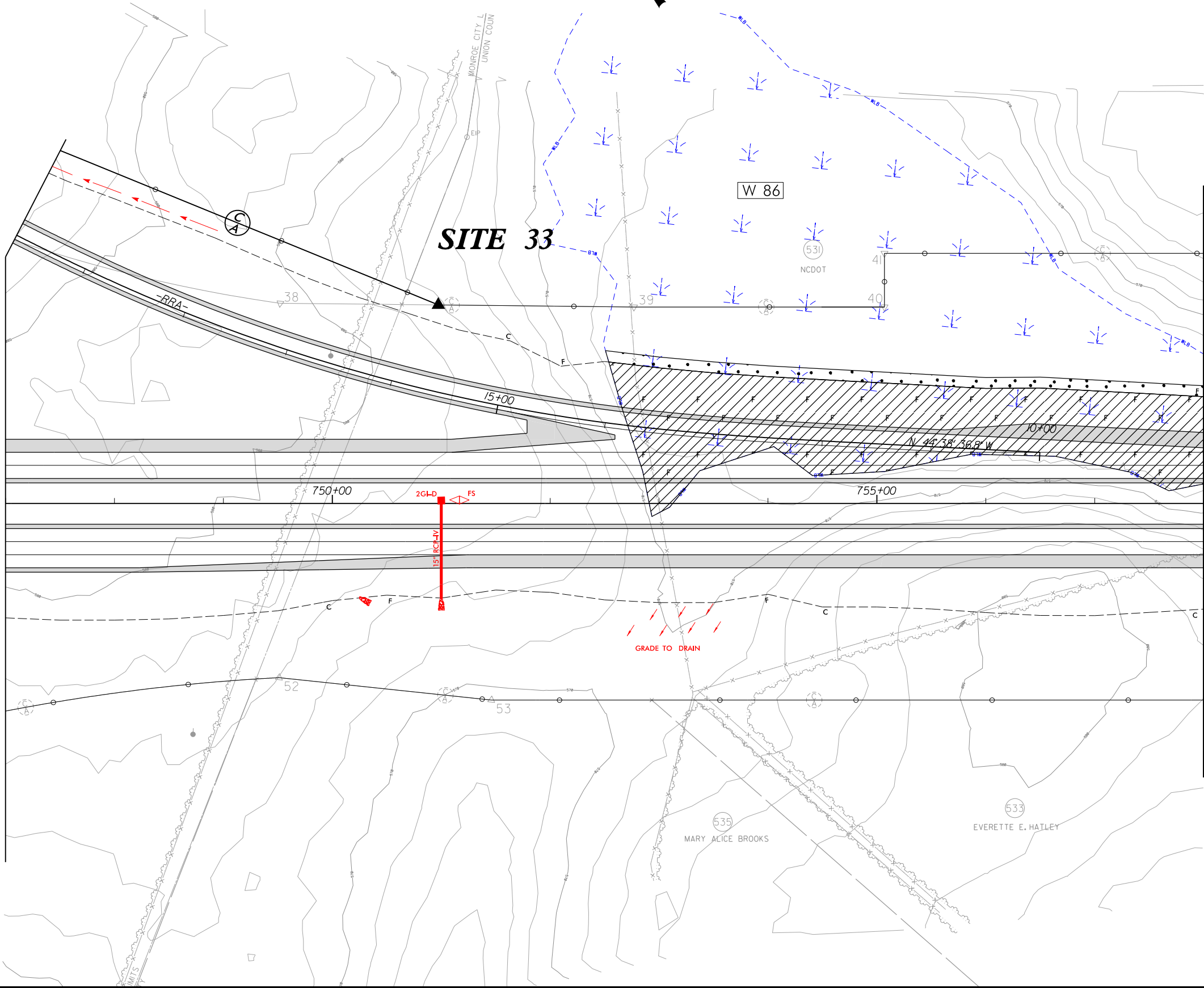
PERMIT DRAWING
SHEET 138 OF 267



MATCHLINE -L- STA. 758+00 SEE SHEET 44

9/29/2014
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MATCHLINE -L- STA. 747 + 00 SEE SHEET 43A



MATCHLINE -L- STA. 758 + 00 SEE SHEET 44



DENOTES FILL IN WETLAND



DENOTES MECHANIZED CLEARING

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PROJECT REFERENCE NO.

R-3329 / R-2559

SHEET NO.

43B

RW SHEET NO.

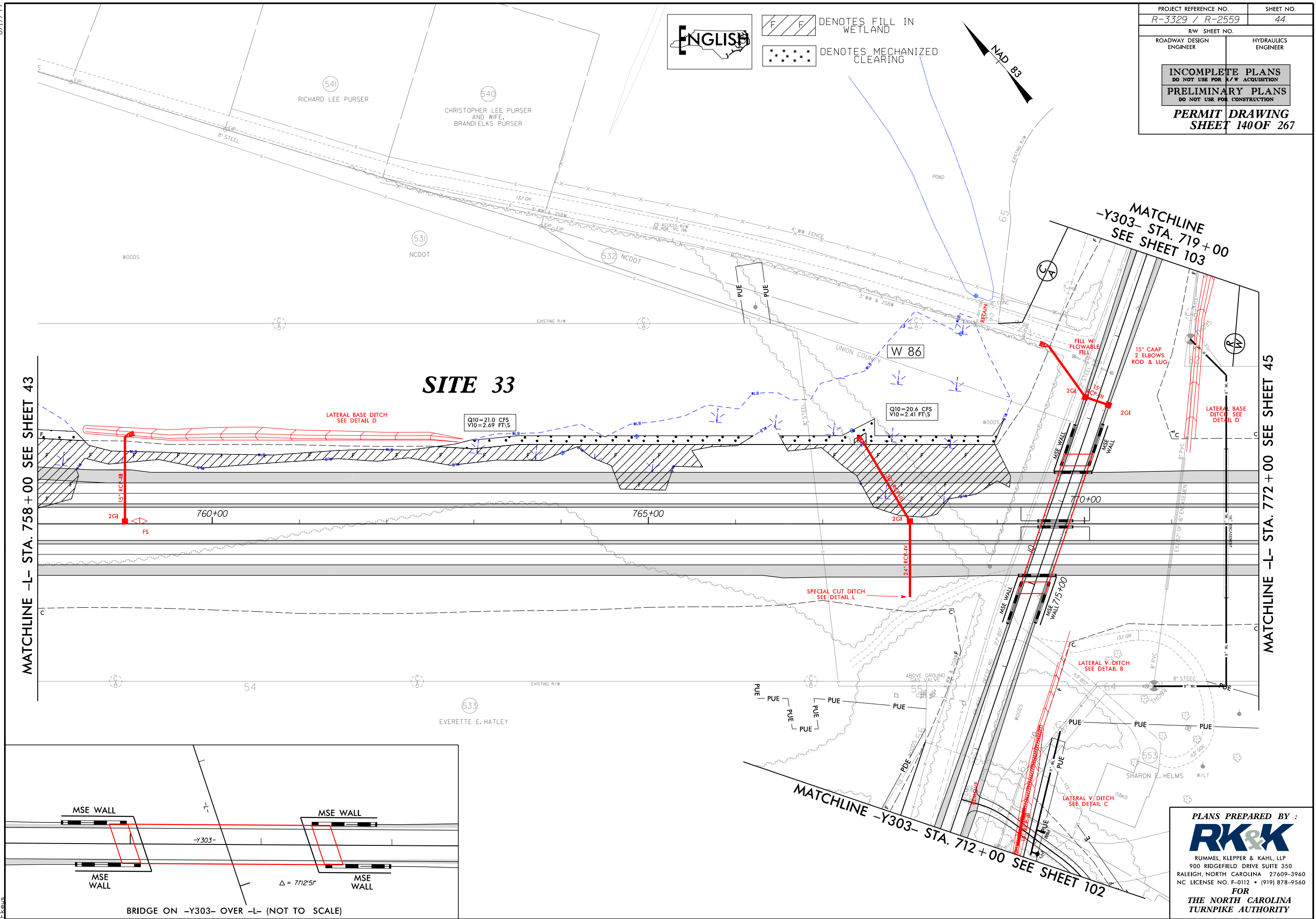
ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

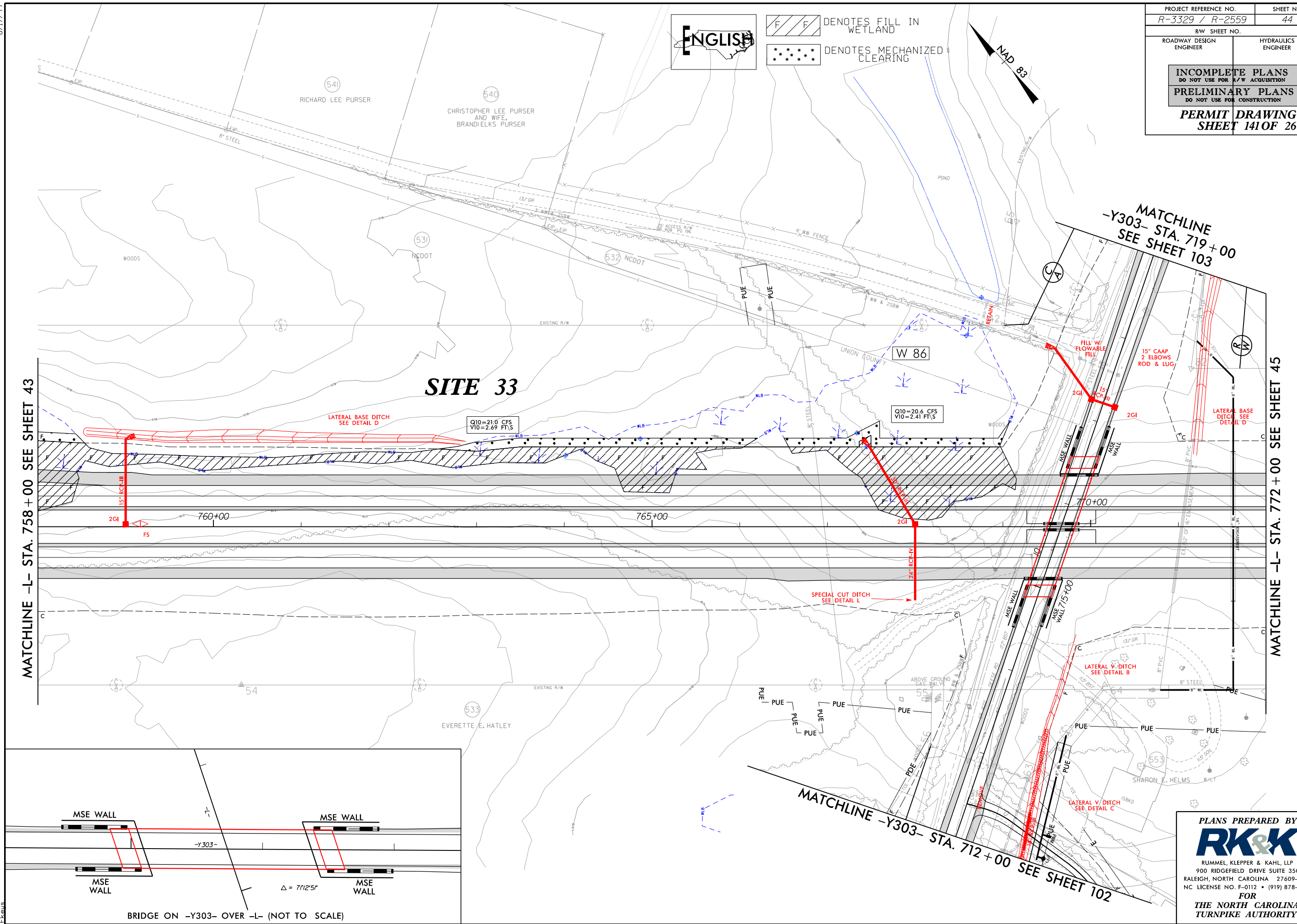
INCOMPLETE PLANS
DO NOT USE FOR A/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING
SHEET 139 OF 267



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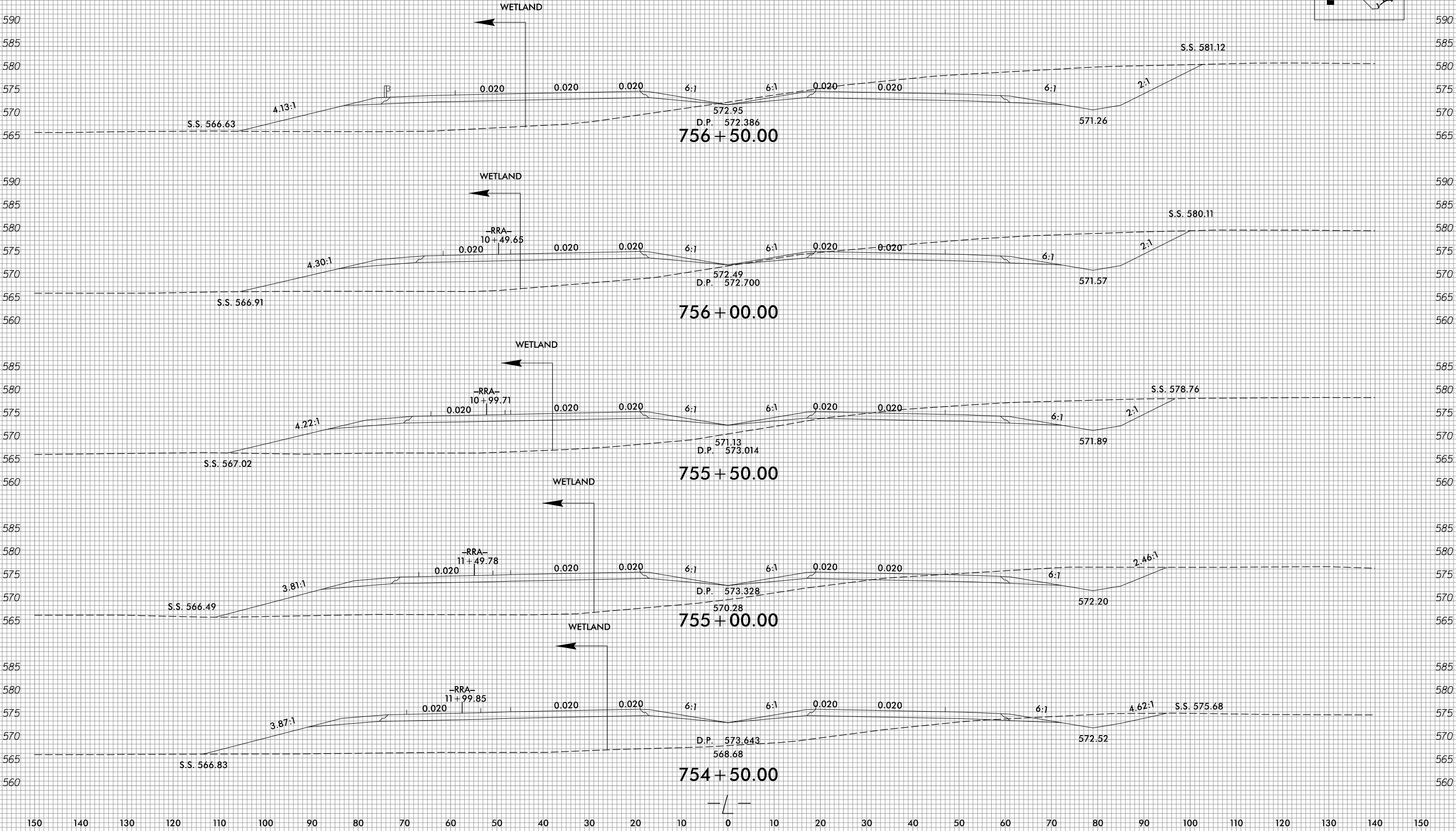
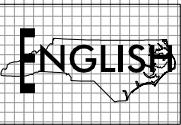
8/23/99

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	R-3329 / R-2559	2C-X50

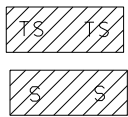
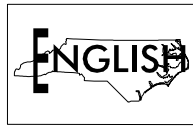
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PERMIT DRAWING
SHEET 142 OF 267

SITE 33



8/17/99



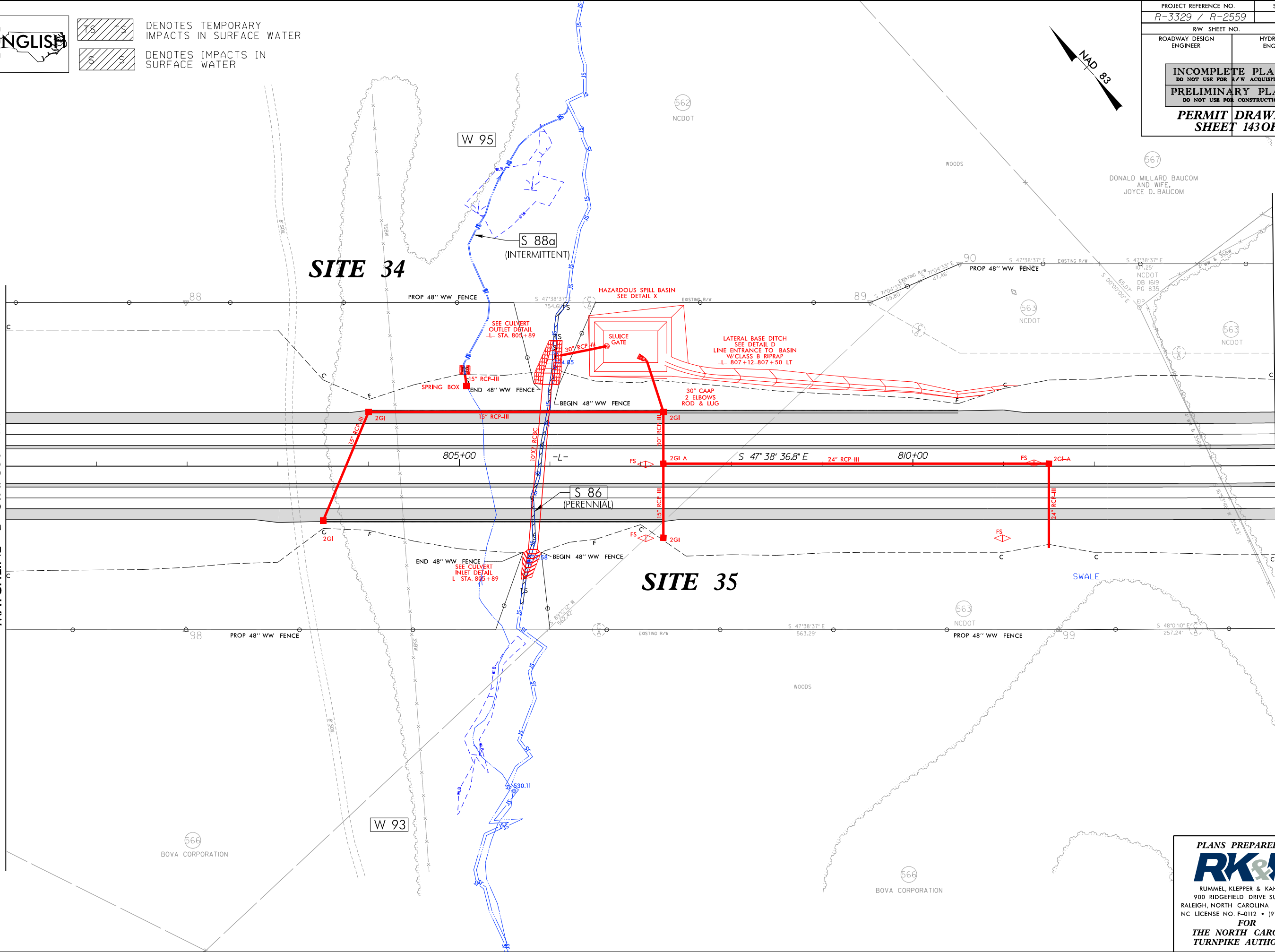
DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN
SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	47
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 143 OF 267	

MATCHLINE -L- STA. 800 + 00 SEE SHEET 46

MATCHLINE -L- STA. 814 + 00 SEE SHEET 48



PLANS PREPARED BY :

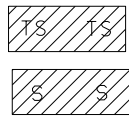
RK&K

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8/17/99



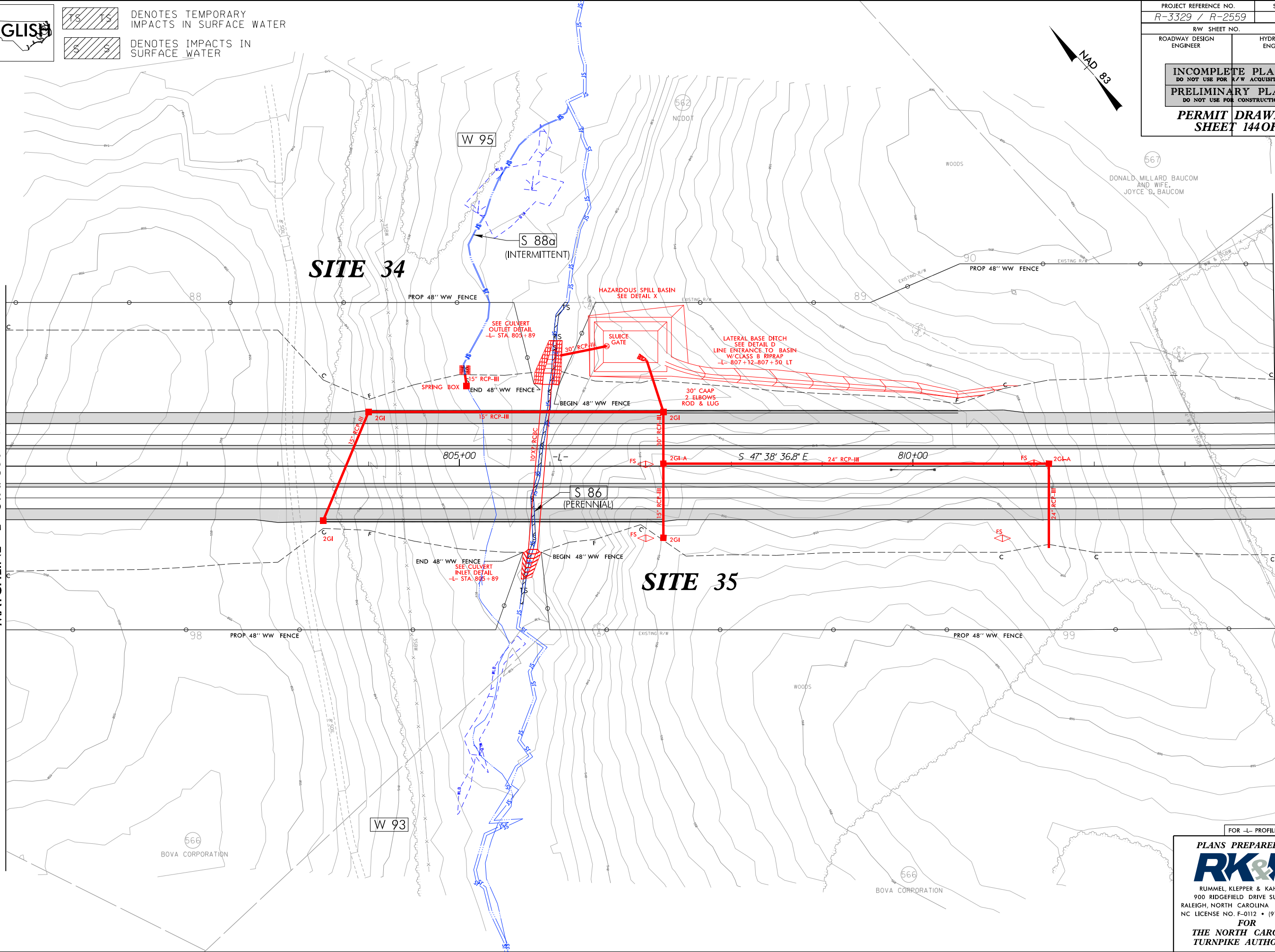
DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN
SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	47
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 144 OF 267	

MATCHLINE -L- STA. 800 + 00 SEE SHEET 46

MATCHLINE -L- STA. 814 + 00 SEE SHEET 48

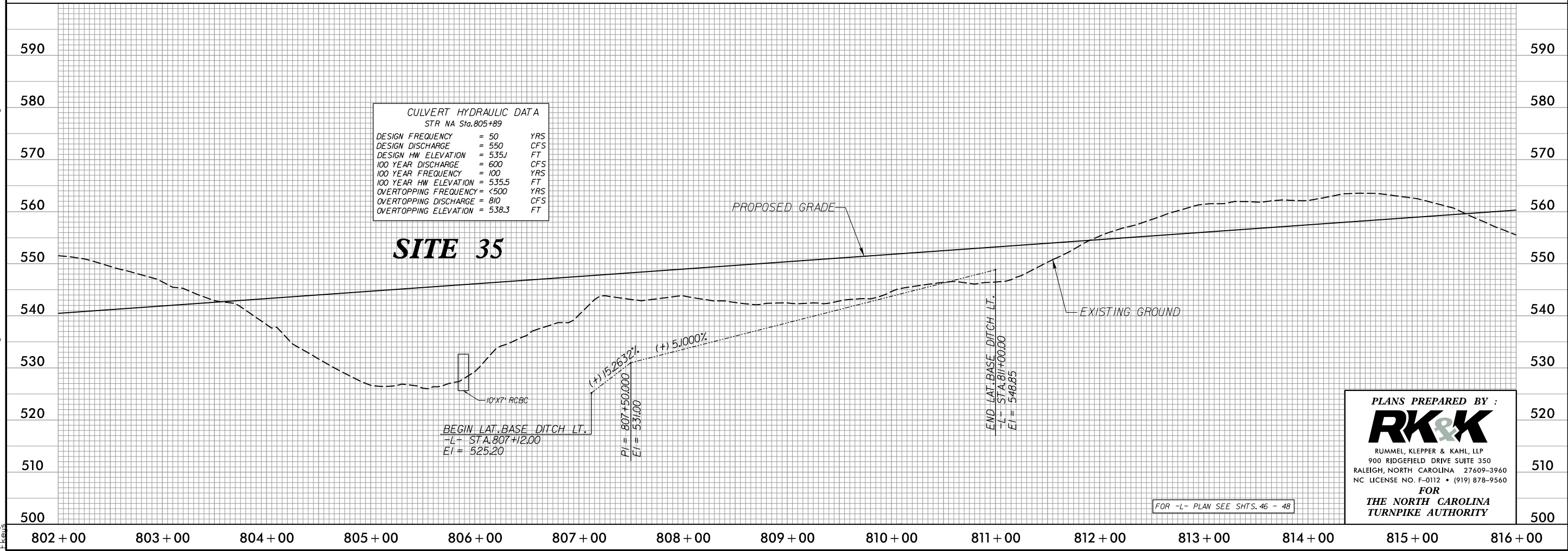
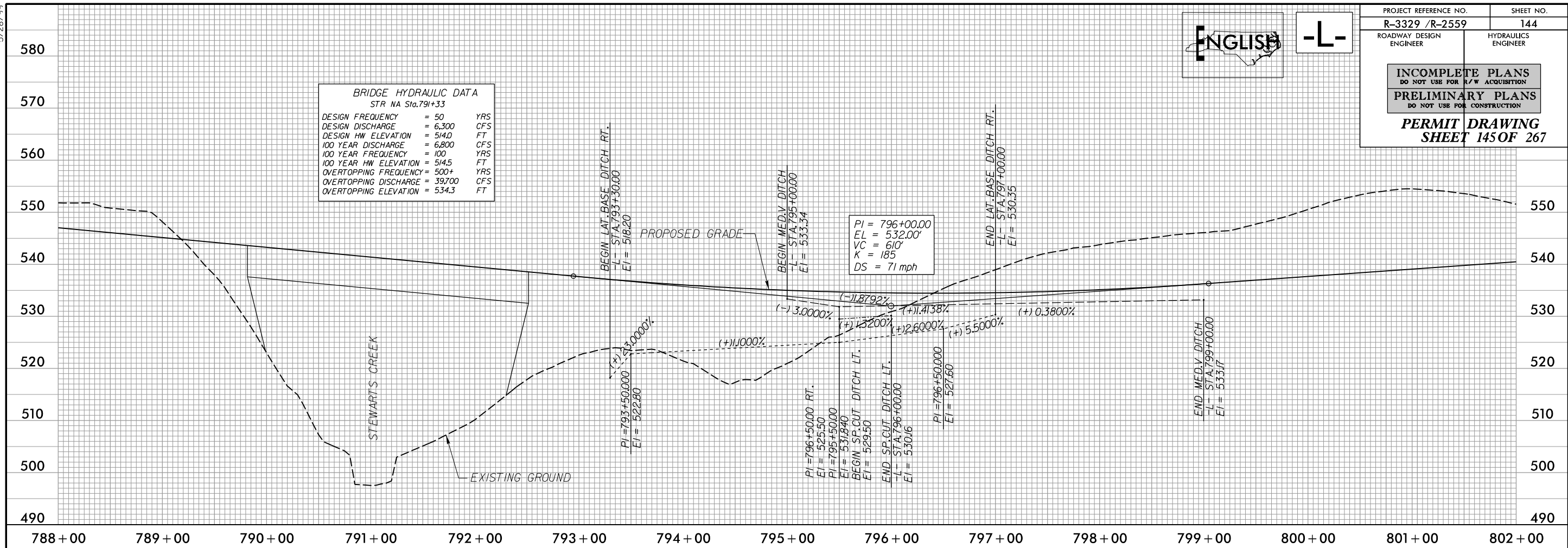


FOR -L- PROFILE SEE SHT. 144

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ENGLISH -L-

PROJECT REFERENCE NO. R-3329 /R-2559	SHEET NO. 144
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 145 OF 267	

PLANS PREPARED BY :

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

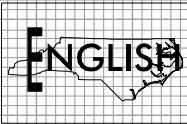
FOR
THE NORTH CAROLINA
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FOR -L- PLAN SEE SHTS. 46 - 48

5/14/99

9/29/2014
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PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 146 OF 267		

SITE 35

-L- STA. 805 + 89

550

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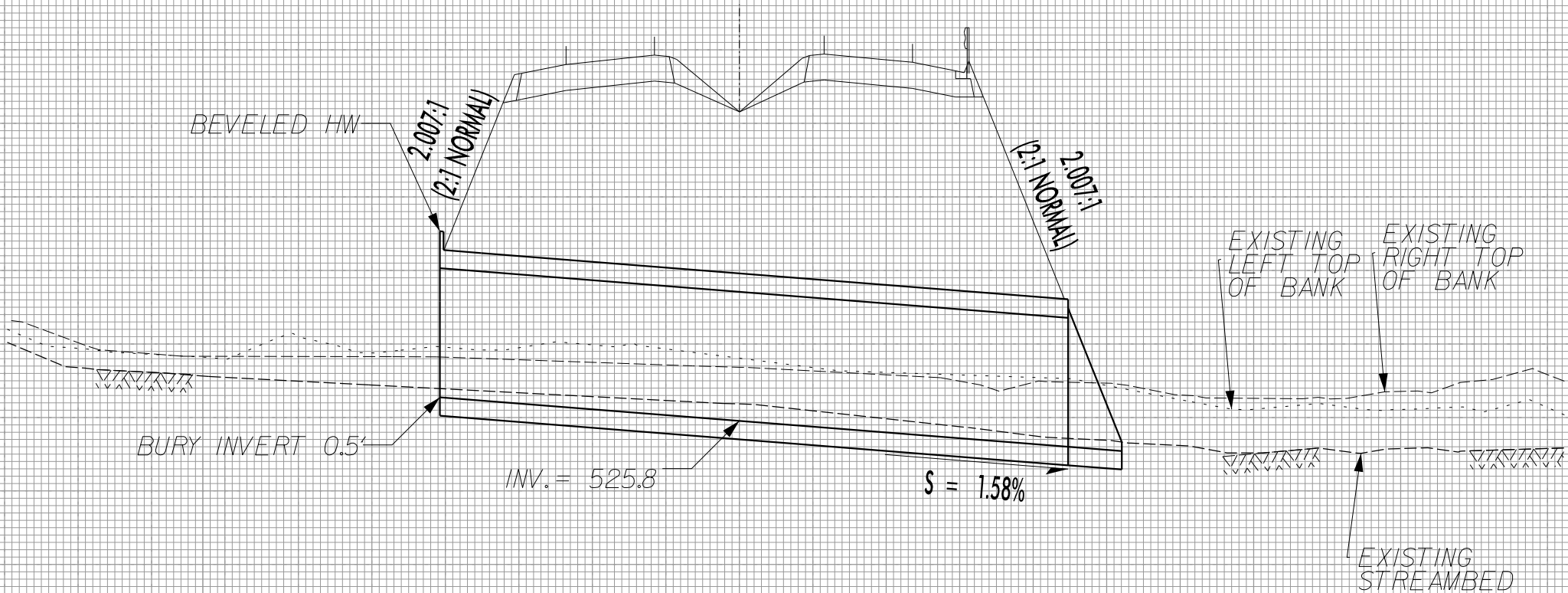
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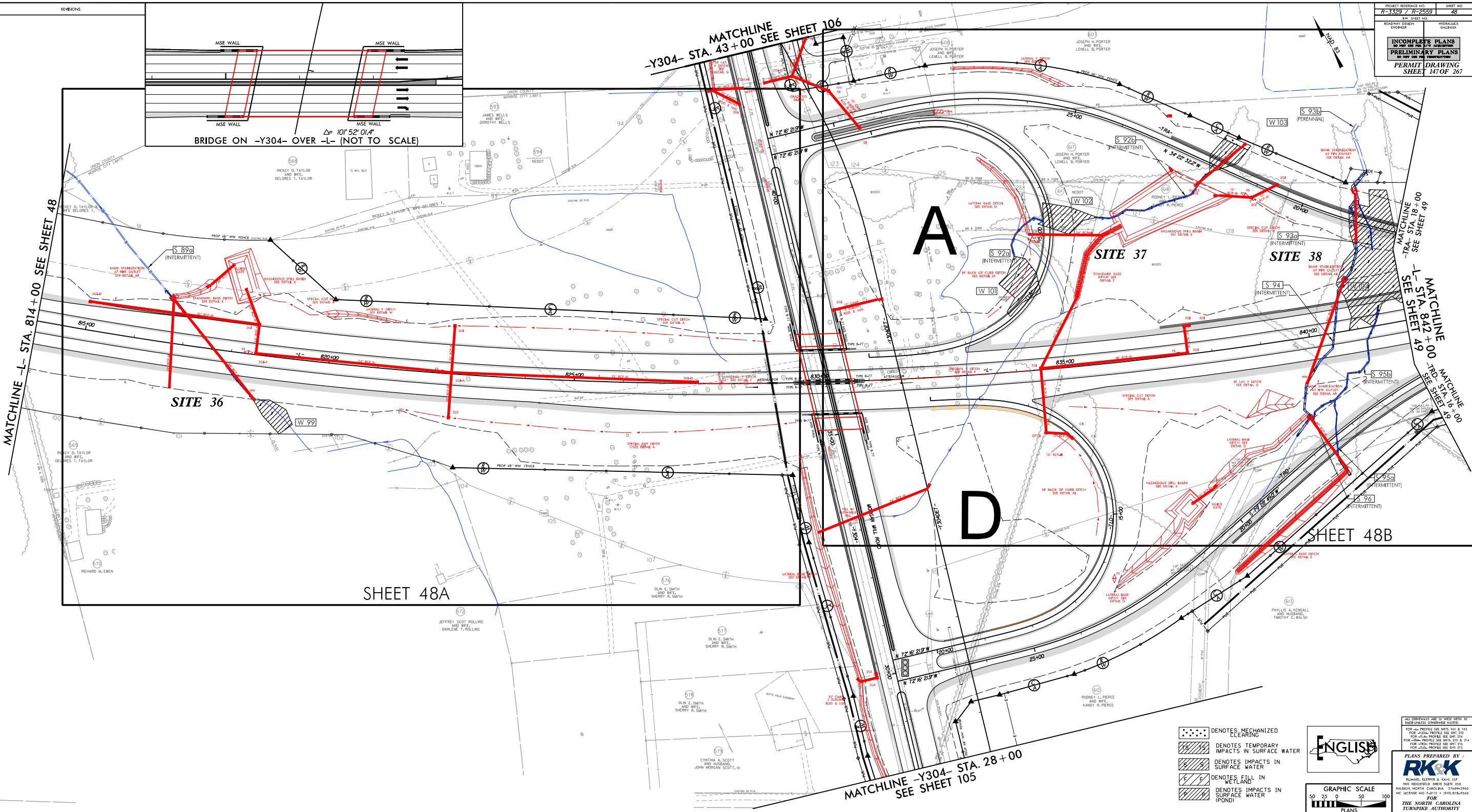
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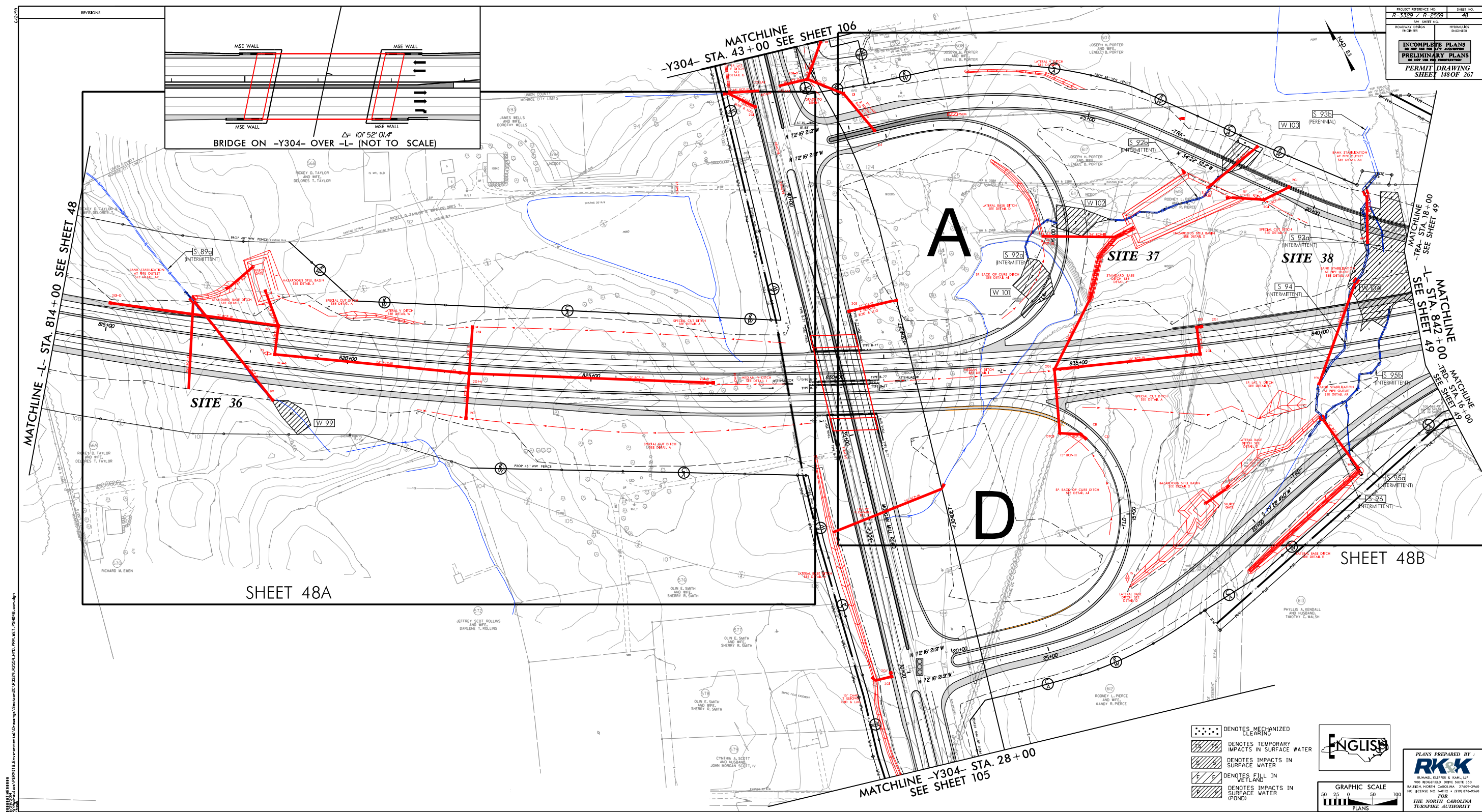
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PROPOSED 10'X7' RCBC

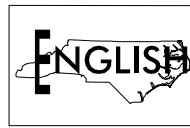
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8/17/99

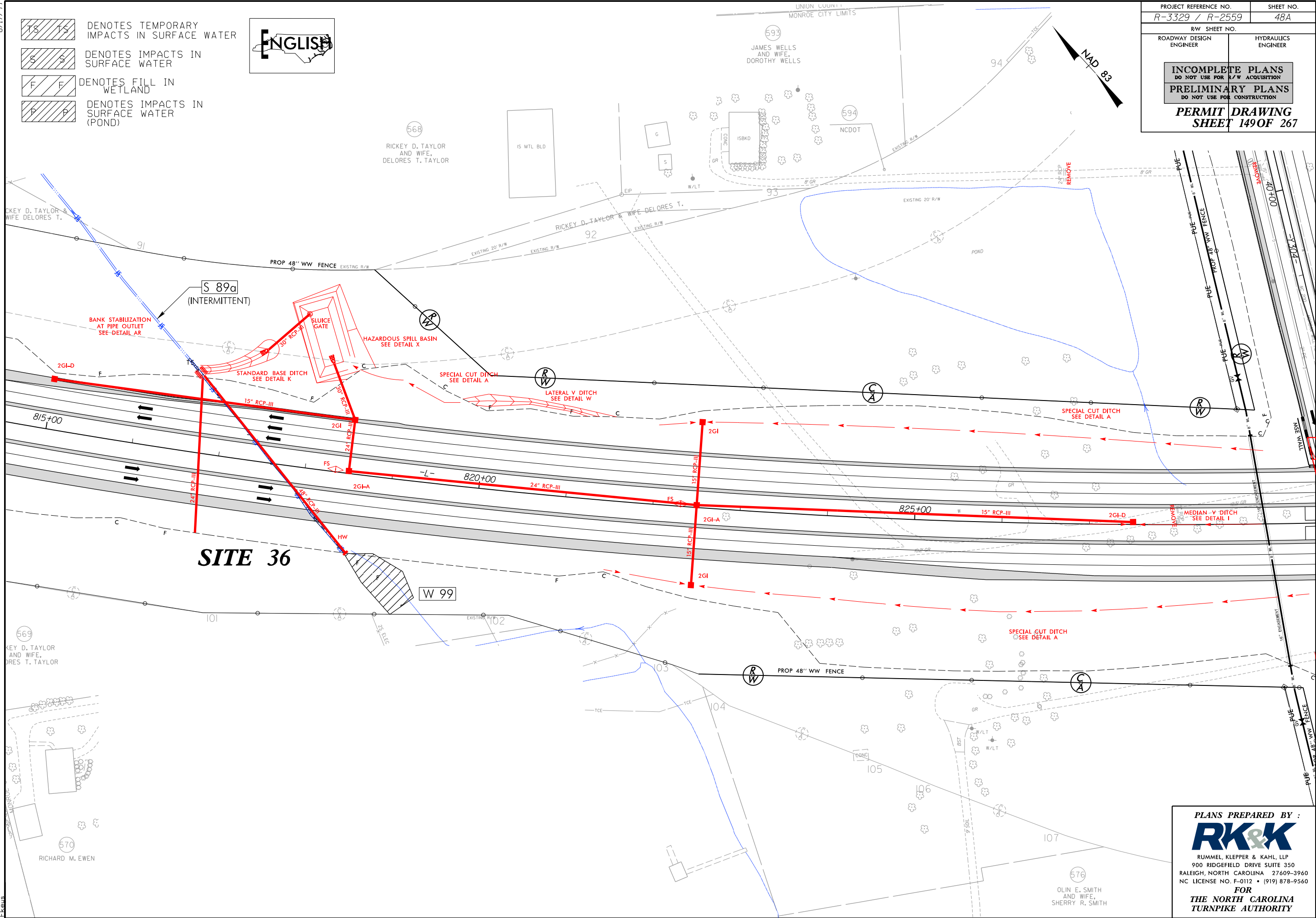
- 1S 1S DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S DENOTES IMPACTS IN SURFACE WATER
- F F DENOTES FILL IN WETLAND
- P P DENOTES IMPACTS IN SURFACE WATER (POND)



PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 48A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 149 OF 267	

NAD 83

8/29/2014
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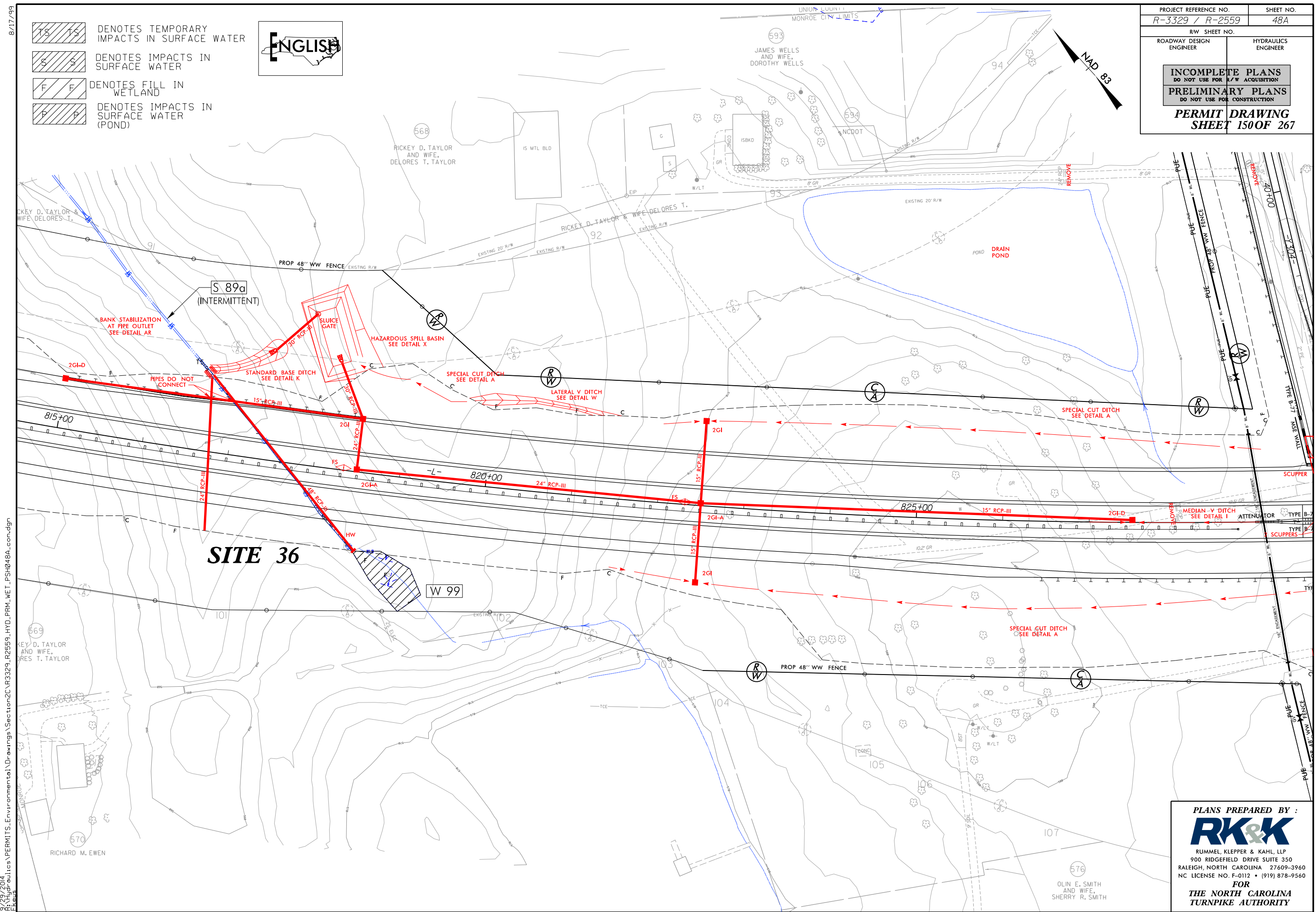
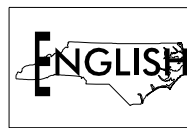


SITE 36

W 99

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THE NORTH CAROLINA
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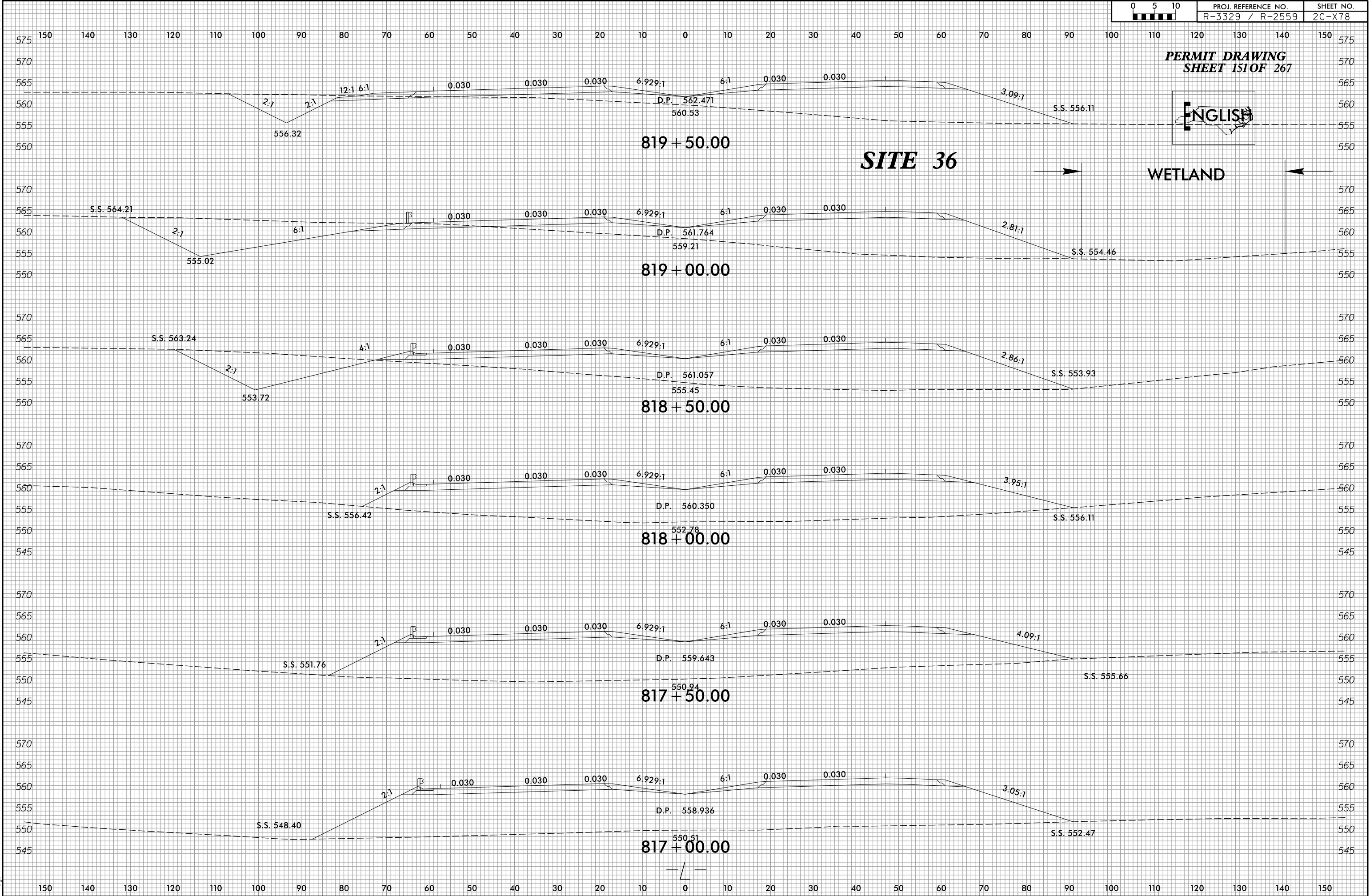
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
	DENOTES IMPACTS IN SURFACE WATER
	DENOTES FILL IN WETLAND
	DENOTES IMPACTS IN SURFACE WATER (POND)



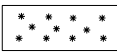
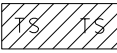
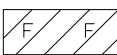
PLANS PREPARED BY :
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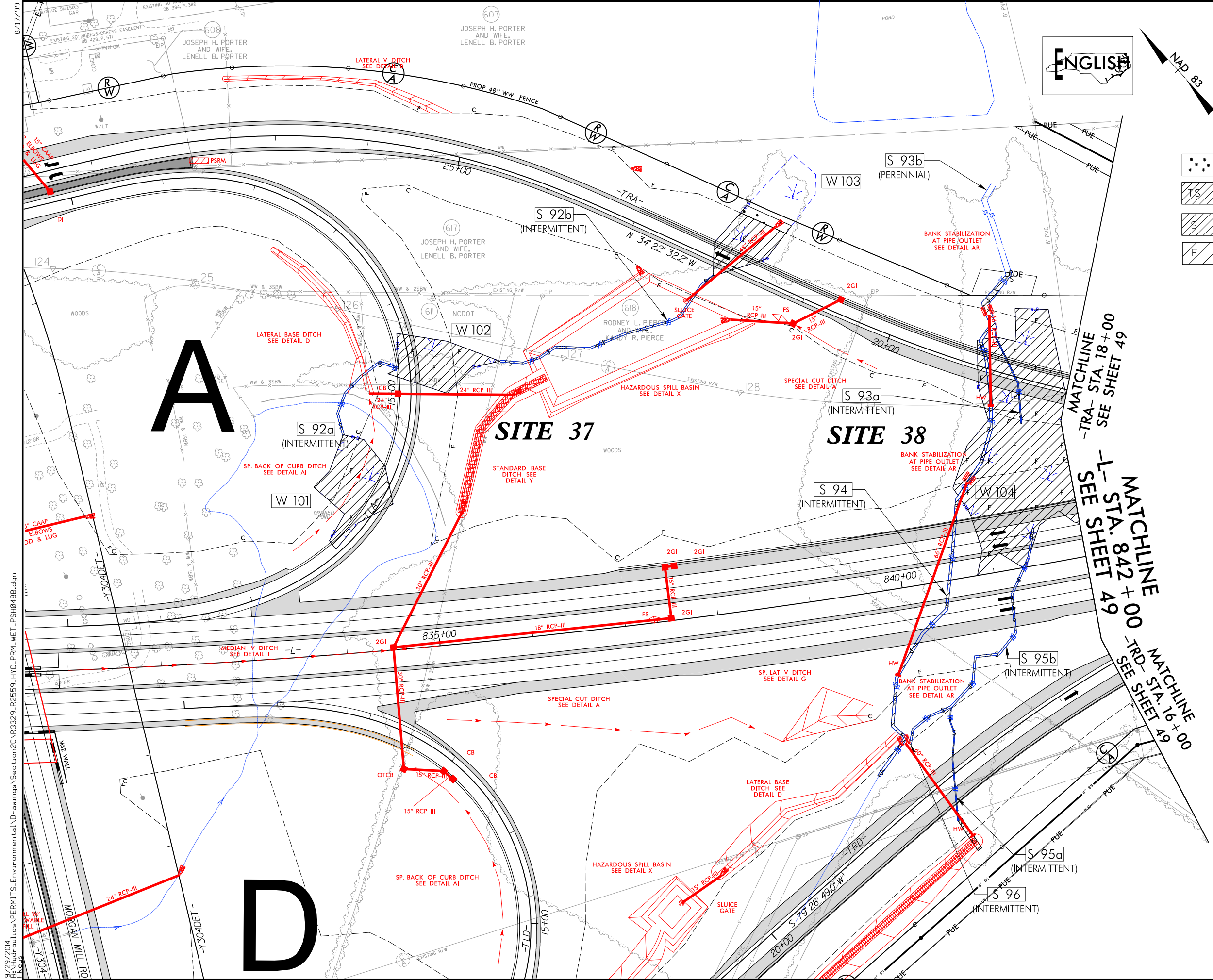
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9/29/2014
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PROJECT REFERENCE NO. R-3329 / R-2559		SHEET NO. 48B
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 152 OF 267		

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



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PLANS PREPARED BY :

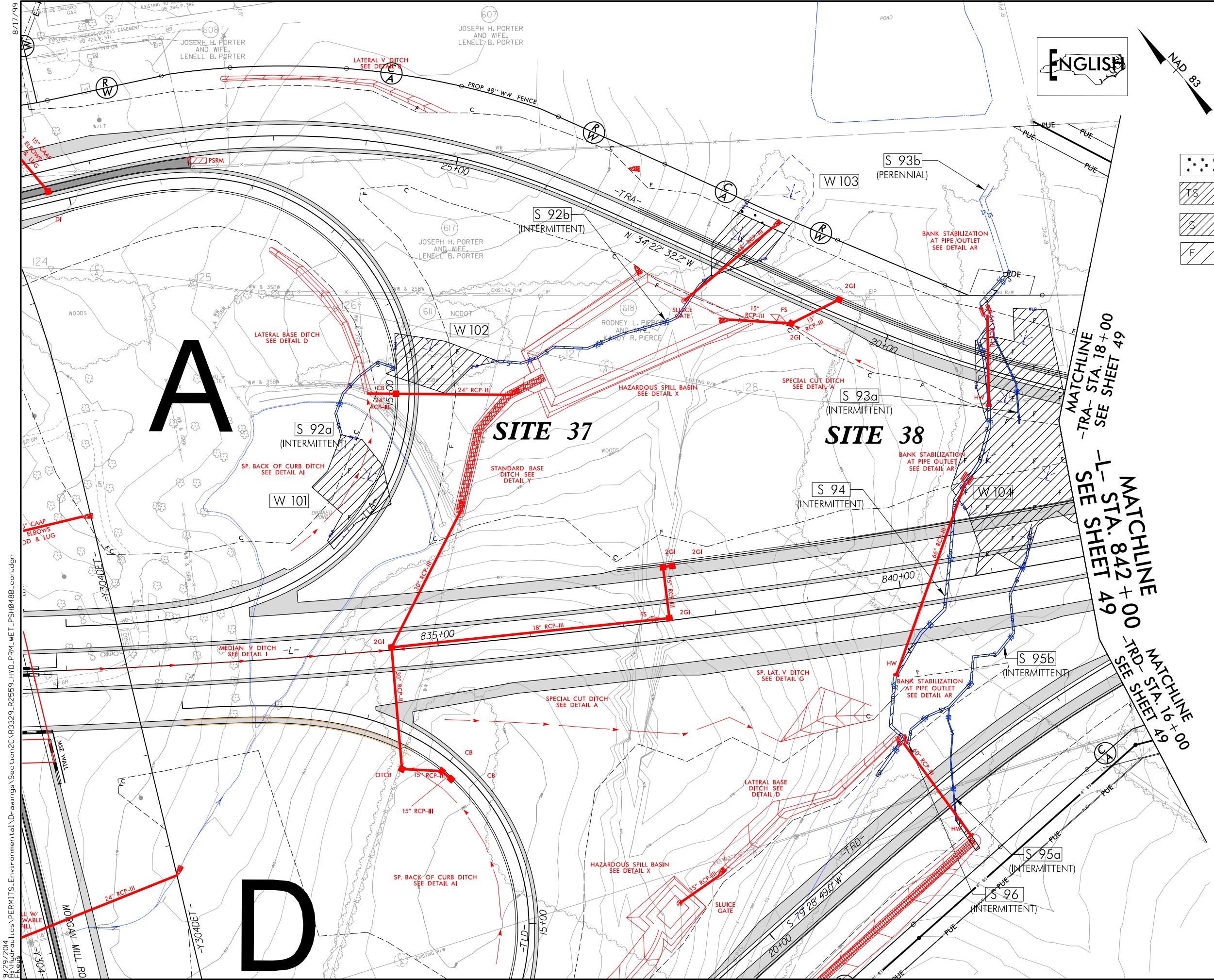
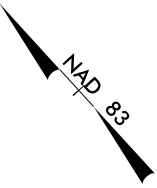
RK&K

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PROJECT REFERENCE NO. R-3329 / R-2559		SHEET NO. 48B	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
PERMIT DRAWING SHEET 153 OF 267			

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



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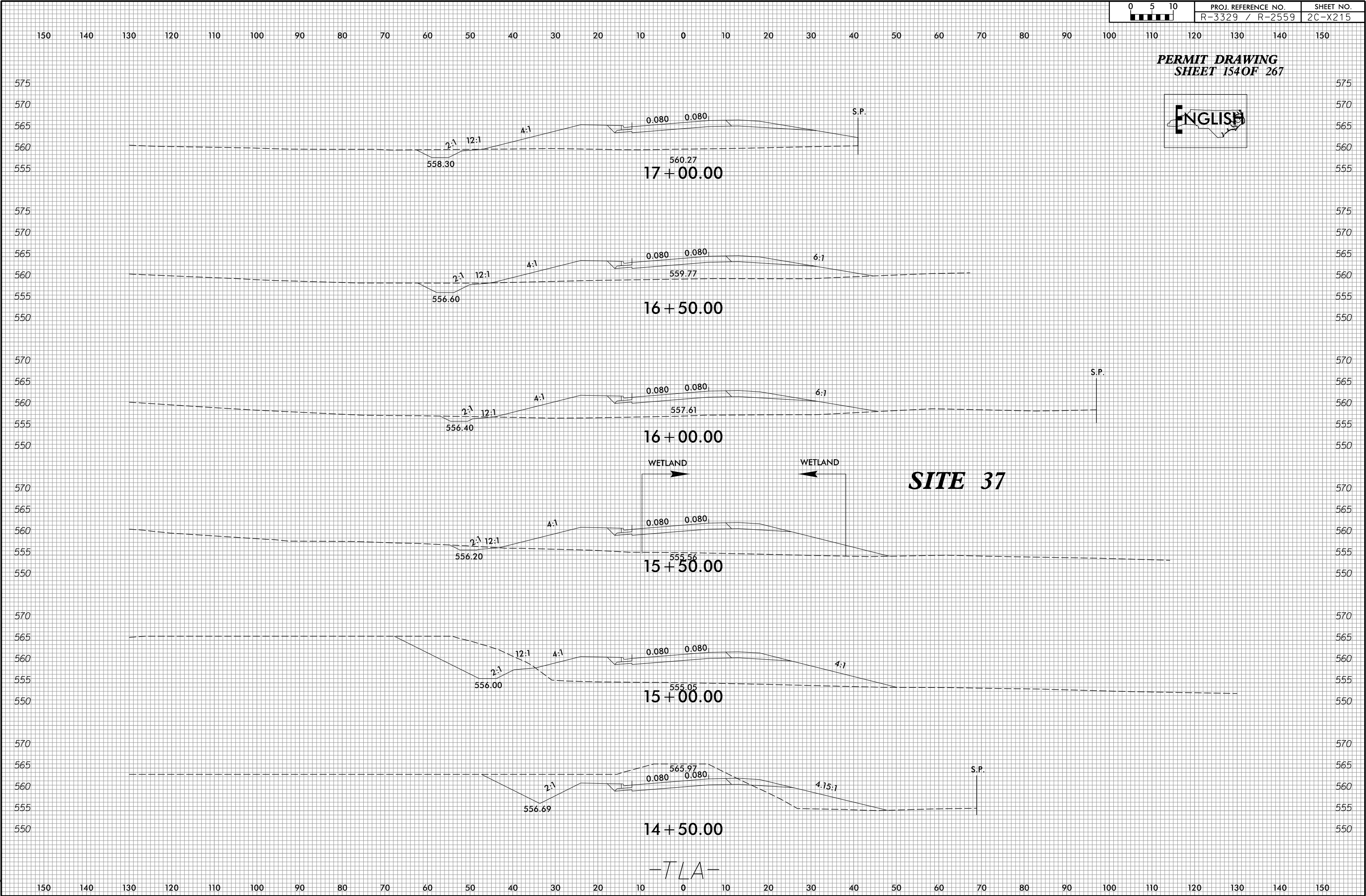
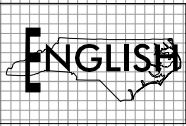
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9/29/2014
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	R-3329 / R-2559	2C-X215

PERMIT DRAWING
SHEET 154 OF 267

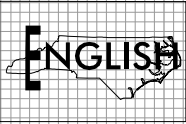


8/23/99

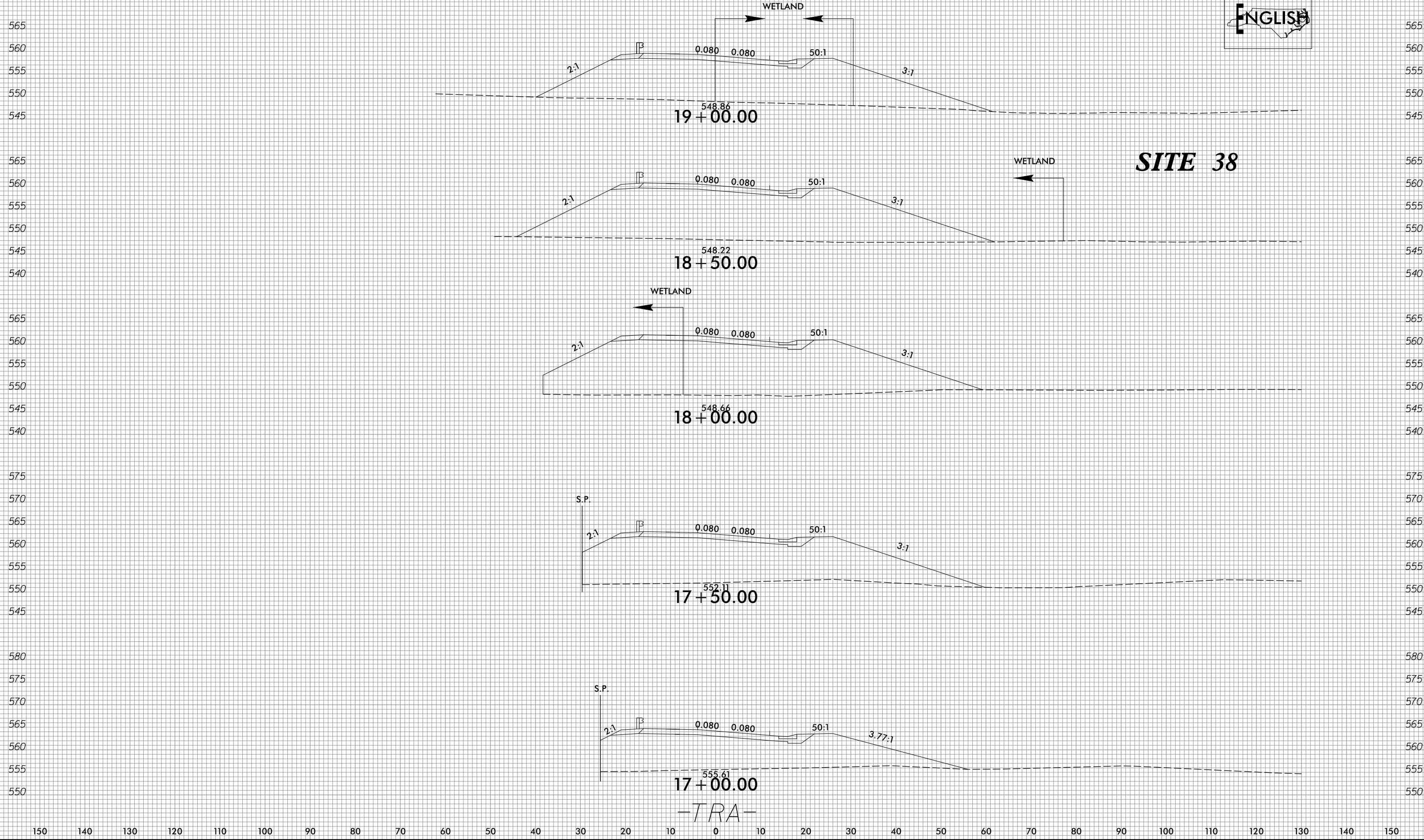
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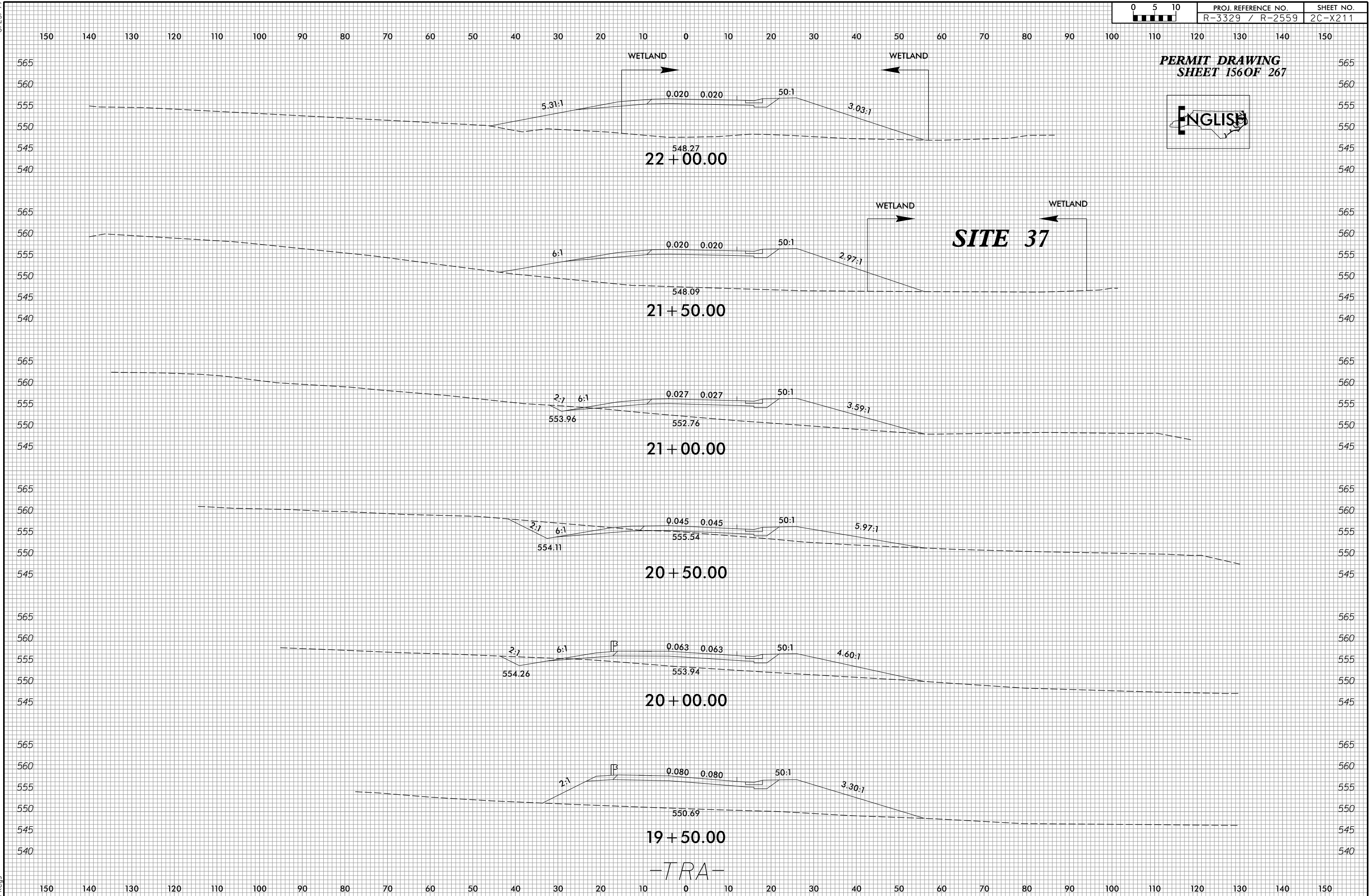
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	R-3329 / R-2559	2C-X210

PERMIT DRAWING
SHEET 155 OF 267

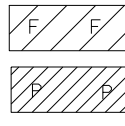
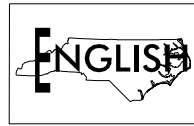


SITE 38





8/17/99



DENOTES FILL IN
WETLAND

DENOTES IMPACTS IN
SURFACE WATER
(POND)

607
JOSEPH H. PORTER
AND WIFE,
LENELL B. PORTER
DB 923 PG 308

617
JOSEPH H. PORTER
AND WIFE,
LENELL B. PORTER
DB 1466 PG 54
SITE 38

627
JAMES C. MCCOLLUM
AND WIFE,
ELIZABETH C. MCCOLLUM
DB 354 PG 540
DB 3807 PG 214

SITE 40

SITE 39

MATCHLINE -TRA- STA. 18+00
SEE SHEET 48

MATCHLINE -L- STA. 842+00
SEE SHEET 48

MATCHLINE -TRD- STA. 16+00
SEE SHEET 48

MATCHLINE -L- STA. 856+00
SEE SHEET 50

SEE SHEET 108

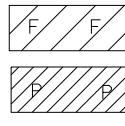
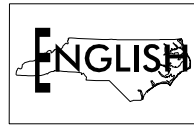
MATCHLINE -Y305-

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PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 49
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 157 OF 267	

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DENOTES FILL IN
WETLAND

DENOTES IMPACTS IN
SURFACE WATER
(POND)

607
JOSEPH H. PORTER
AND WIFE,
LENELL B. PORTER

83
DAN

PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 49
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 158 OF 267	

627
JAMES C. MCCOLLUM
AND WIFE,
ELIZABETH C. MCCOLLUM

MATCHLINE -L- STA. 842+00 SEE SHEET 48
MATCHLINE -TRA- STA. 18+00 SEE SHEET 48
MATCHLINE -TRD- STA. 16+00 SEE SHEET 48

SITE 38

SITE 40

SITE 39

MATCHLINE -L- STA. 856+00 SEE SHEET 50

MATCHLINE -Y305-

SEE SHEET 108

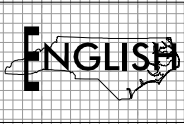
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\$\$\$\$\$TIME\$\$\$\$\$
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5/14/99

8/29/2004
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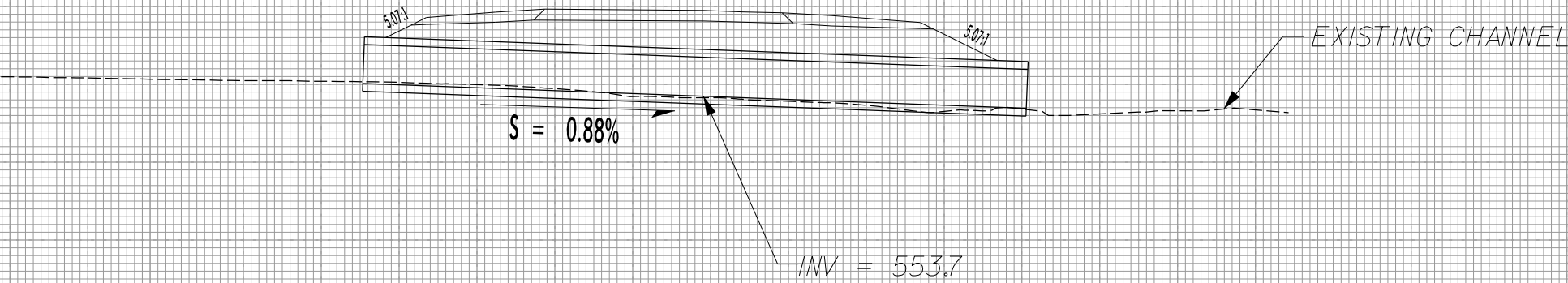


PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 159 OF 267		

SITE 38
-TRD- STA. 17+63

600
590
580
570
560
550
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530
520

600
590
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530
520



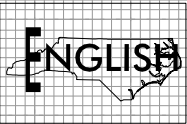
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5/14/99

8/29/2004
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Elevs

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PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 160 OF 267		

SITE 38

-L- STA. 840+31

570

576

572

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564

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570

576

572

568

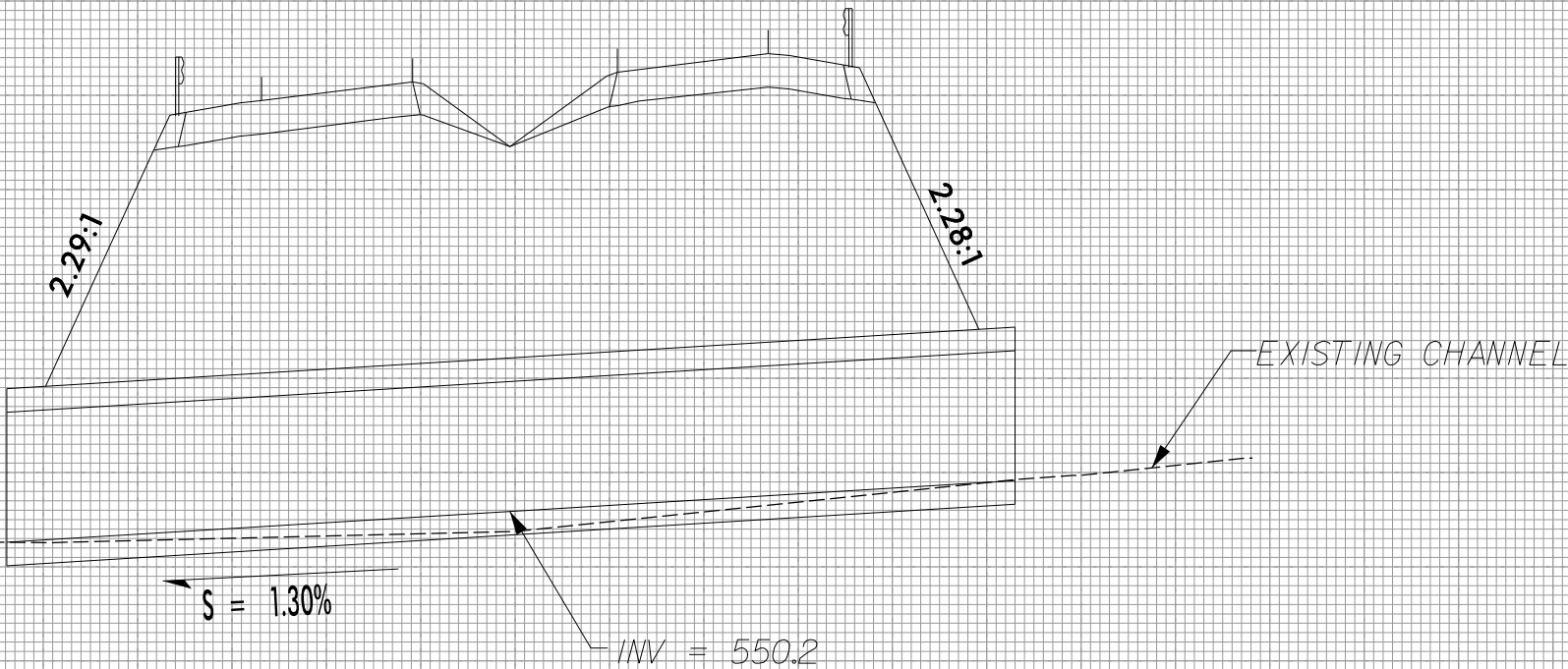
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556

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548



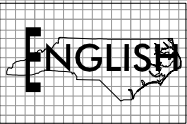
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5/14/99

8/29/2004
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PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 161 OF 267		

SITE 38 -TRA- STA. 18+86

576

566

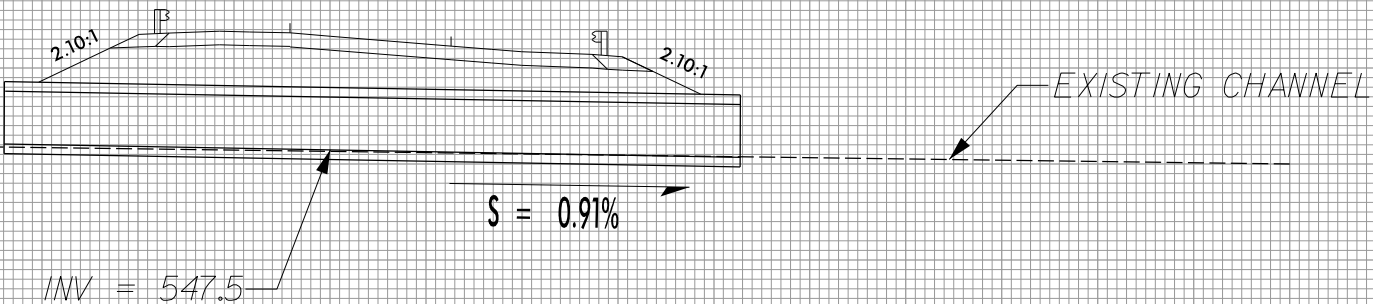
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516

PROPOSED 66" RCP III

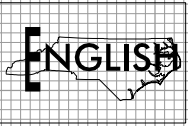
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8/23/99

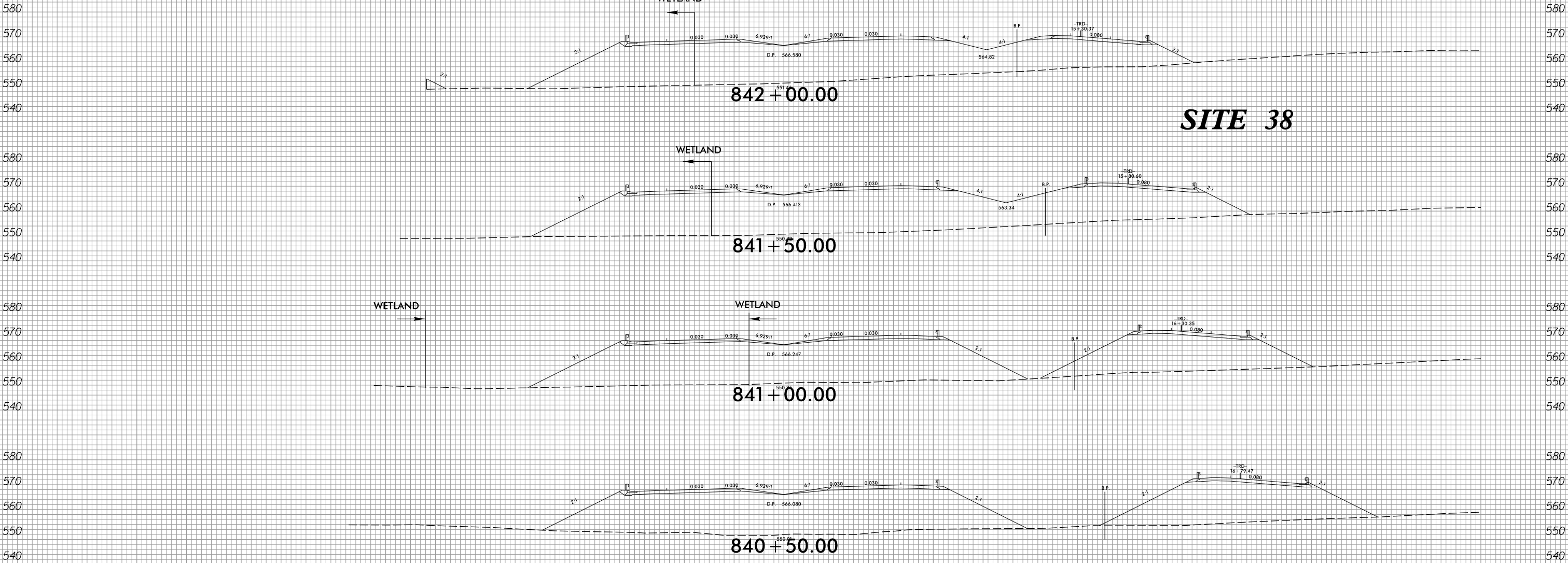
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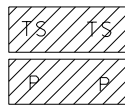


PERMIT DRAWING
SHEET 162 OF 267



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8/17/99

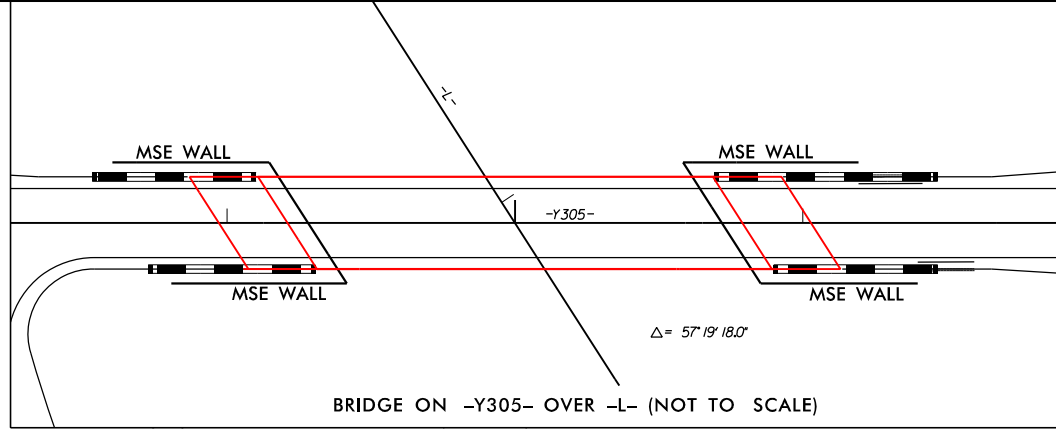
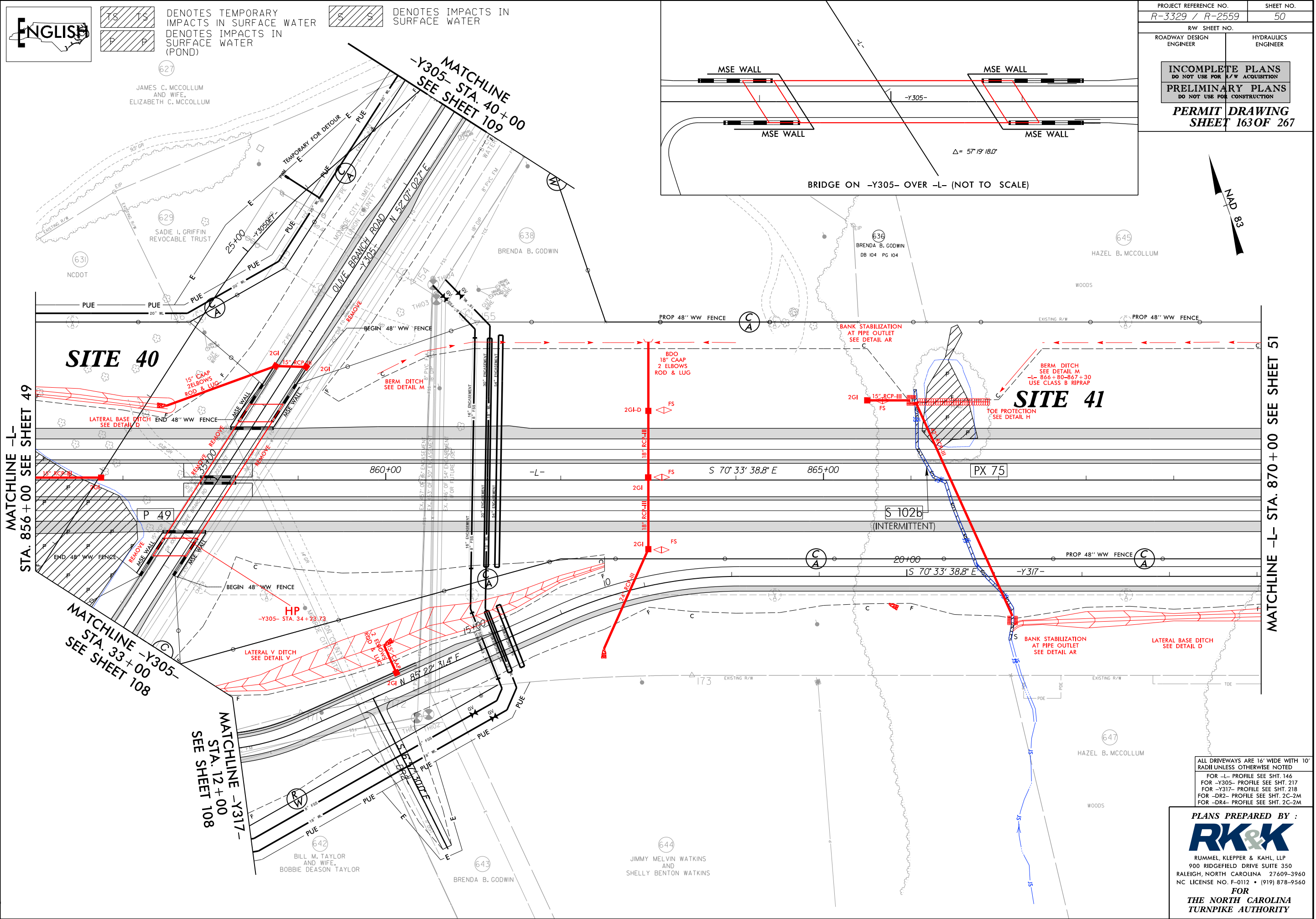


TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
P P DENOTES IMPACTS IN SURFACE WATER (POND)



S S DENOTES IMPACTS IN SURFACE WATER

JAMES C. MCCOLLUM
AND WIFE,
ELIZABETH C. MCCOLLUM

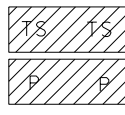


PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 50
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 163 OF 267	

ALL DRIVEWAYS ARE 16' WIDE WITH 10' RADIUS UNLESS OTHERWISE NOTED
FOR -L- PROFILE SEE SHT. 146
FOR -Y305- PROFILE SEE SHT. 217
FOR -Y317- PROFILE SEE SHT. 218
FOR -DR2- PROFILE SEE SHT. 2C-2M
FOR -DR4- PROFILE SEE SHT. 2C-2M

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DENOTES TEMPORARY
IMPACTS IN SURFACE WATER
DENOTES IMPACTS IN
SURFACE WATER
(POND)



DENOTES IMPACTS IN
SURFACE WATER

JAMES C. MCCOLLUM
AND WIFE,
ELIZABETH C. MCCOLLUM

SITE 40

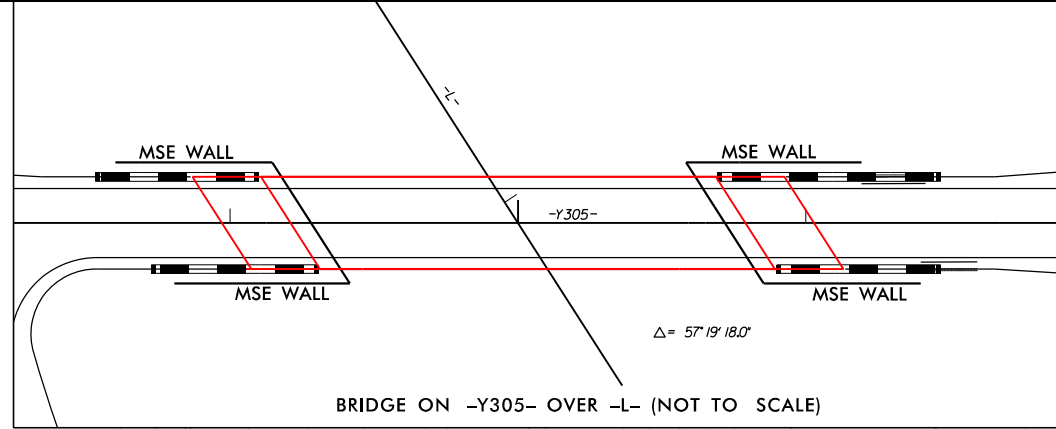
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MATCHLINE -L-
STA. 856+00 SEE SHEET 49

MATCHLINE -Y305-
STA. 33+00
SEE SHEET 108

MATCHLINE -Y317-
STA. 12+00
SEE SHEET 108

MATCHLINE
-Y305- STA. 40+00
SEE SHEET 109

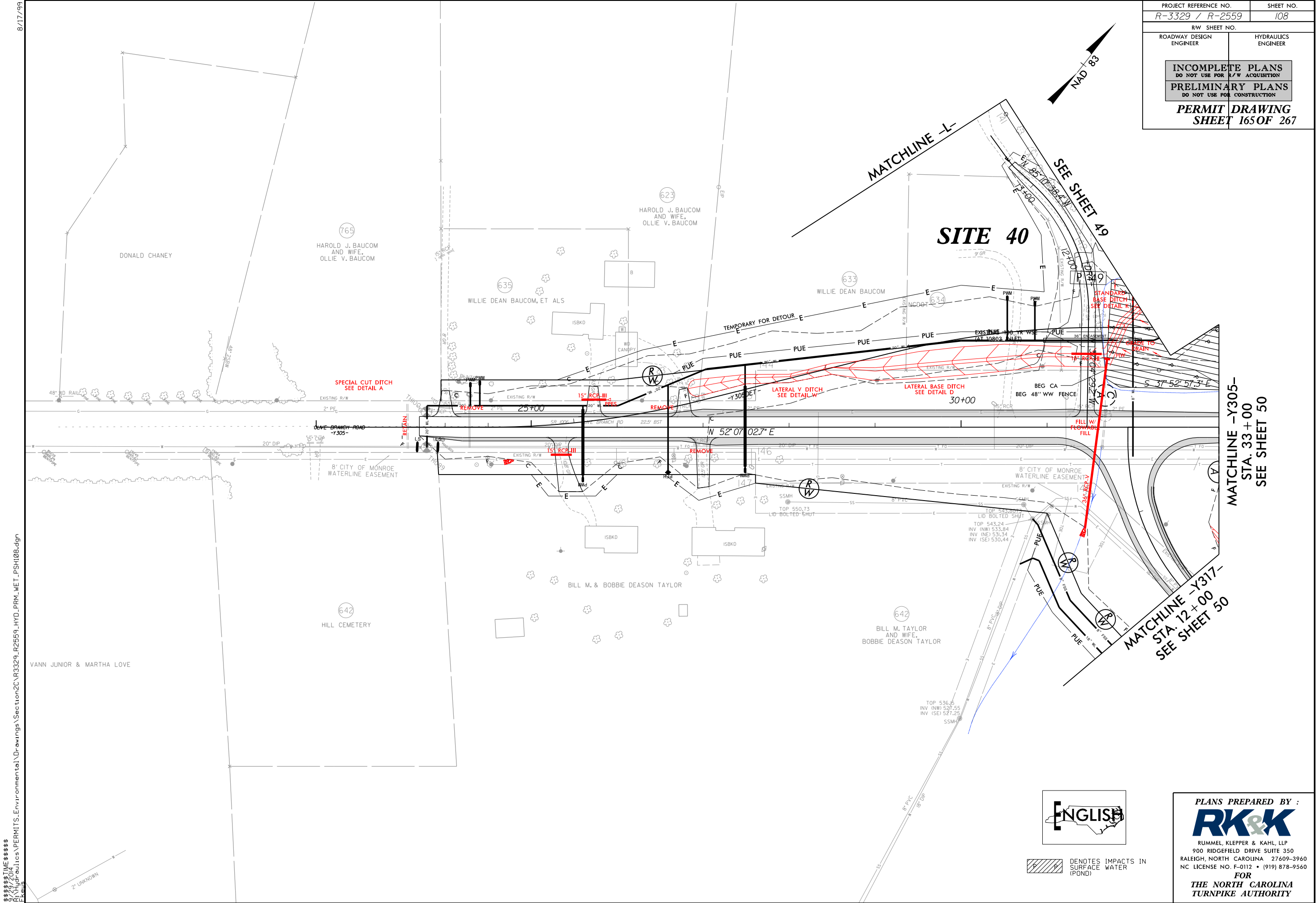


PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 50
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 164 OF 267	

ALL DRIVEWAYS ARE 16' WIDE WITH 10'
RADIUS UNLESS OTHERWISE NOTED

FOR -L- PROFILE SEE SHT. 146
FOR -Y305- PROFILE SEE SHT. 217
FOR -Y317- PROFILE SEE SHT. 218
FOR -DR2- PROFILE SEE SHT. 2C-2M
FOR -DR4- PROFILE SEE SHT. 2C-2M

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TURNPIKE AUTHORITY

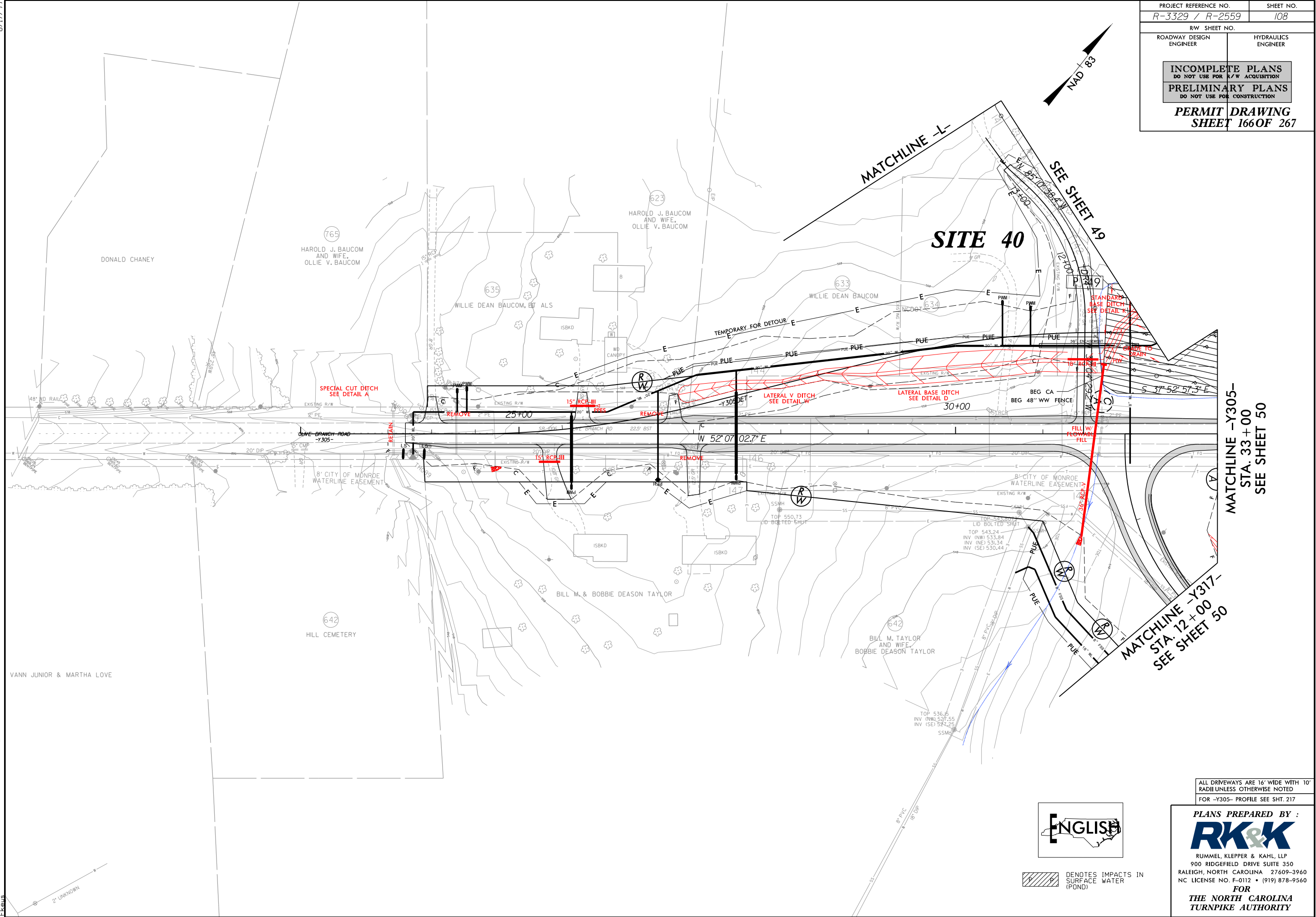


8/17/99

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8/17/99

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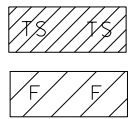


PROJECT REFERENCE NO. <i>R-3329 / R-2559</i>		SHEET NO. <i>108</i>				
RW SHEET NO.						
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER				
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INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION						
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION						
<i>PERMIT DRAWING SHEET 166 OF 267</i>						

ALL DRIVEWAYS ARE 16' WIDE WITH 10' RADIUS UNLESS OTHERWISE NOTED
FOR -Y305- PROFILE SEE SHT. 217

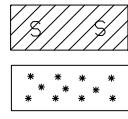
PLANS PREPARED BY :
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8/17/99



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

DENOTES FILL IN
WETLAND



DENOTES IMPACTS IN
SURFACE WATER

DENOTES MECHANIZED
CLEARING

645
HAZEL B. MCCOLLUM

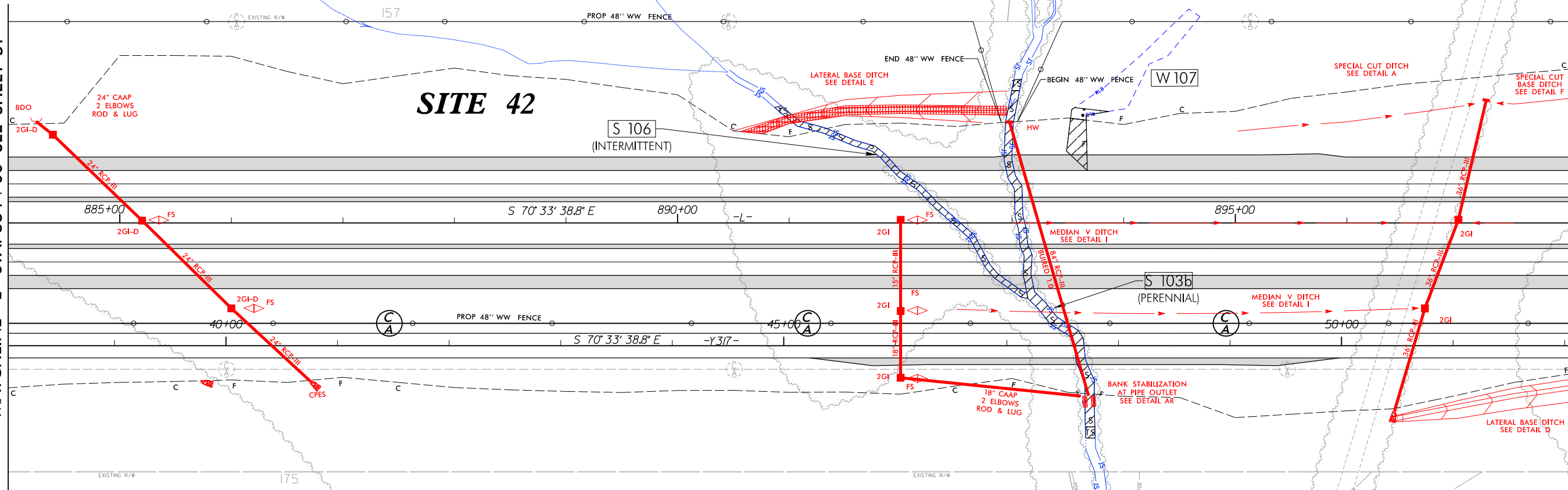
648
ROBERT H. MORRISON



PROJECT REFERENCE NO. <i>R-3329 / R-2559</i>		SHEET NO. <i>52</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
<i>PERMIT DRAWING SHEET 167 OF 267</i>			

MATCHLINE -L- STA. 884 + 00 SEE SHEET 51

MATCHLINE -L- STA. 898 + 00 SEE SHEET 53



\$\$\$\$\$TIME\$\$\$\$\$
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RUMMEL, KLEPPER & KAHL, LLP
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RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560
FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY



English

 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 DENOTES FILL IN WETLAND

 DENOTES IMPACTS IN SURFACE WATER

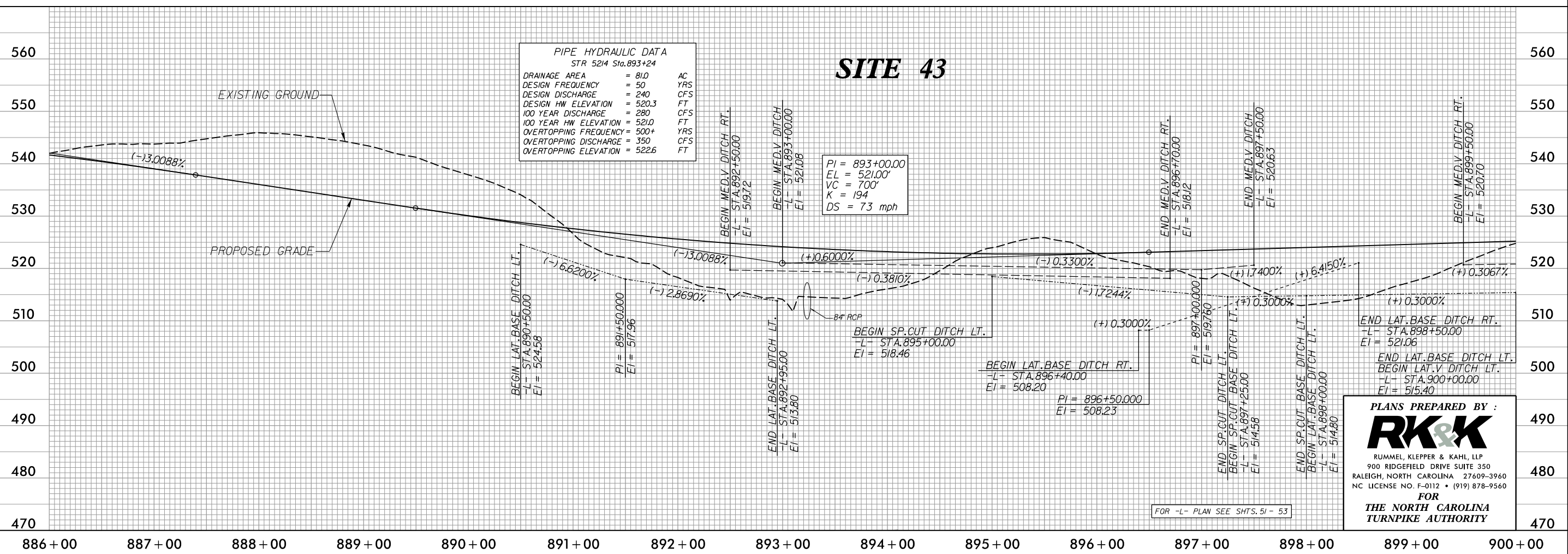
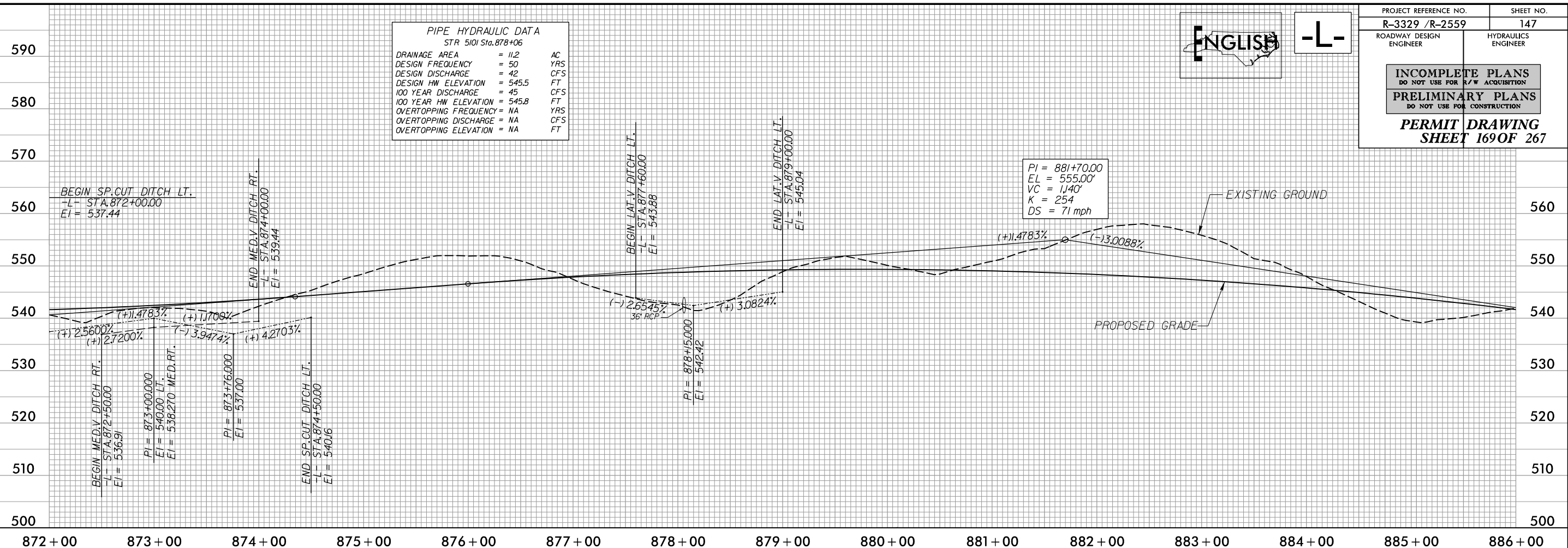
 DENOTES MECHANIZED CLEARING

MATCHLINE -L- STA. 884+00 SEE SHEET 51


 MATCHLINE -|- STA. 898+00 SEE SHEET 53

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
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5/28/99
8/29/2004
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Elev



ENGLISH
-L-

PROJECT REFERENCE NO. R-3329 /R-2559		SHEET NO. 147	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
PERMIT DRAWING SHEET 169 OF 267			

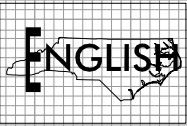
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560
FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

5/14/99

8/29/2004
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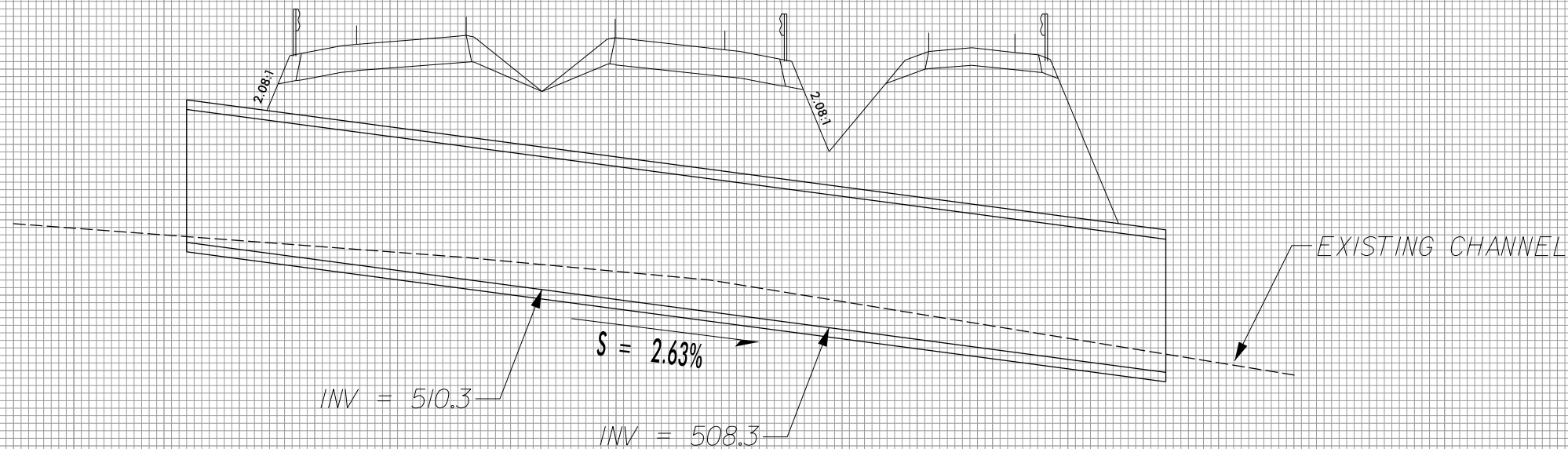
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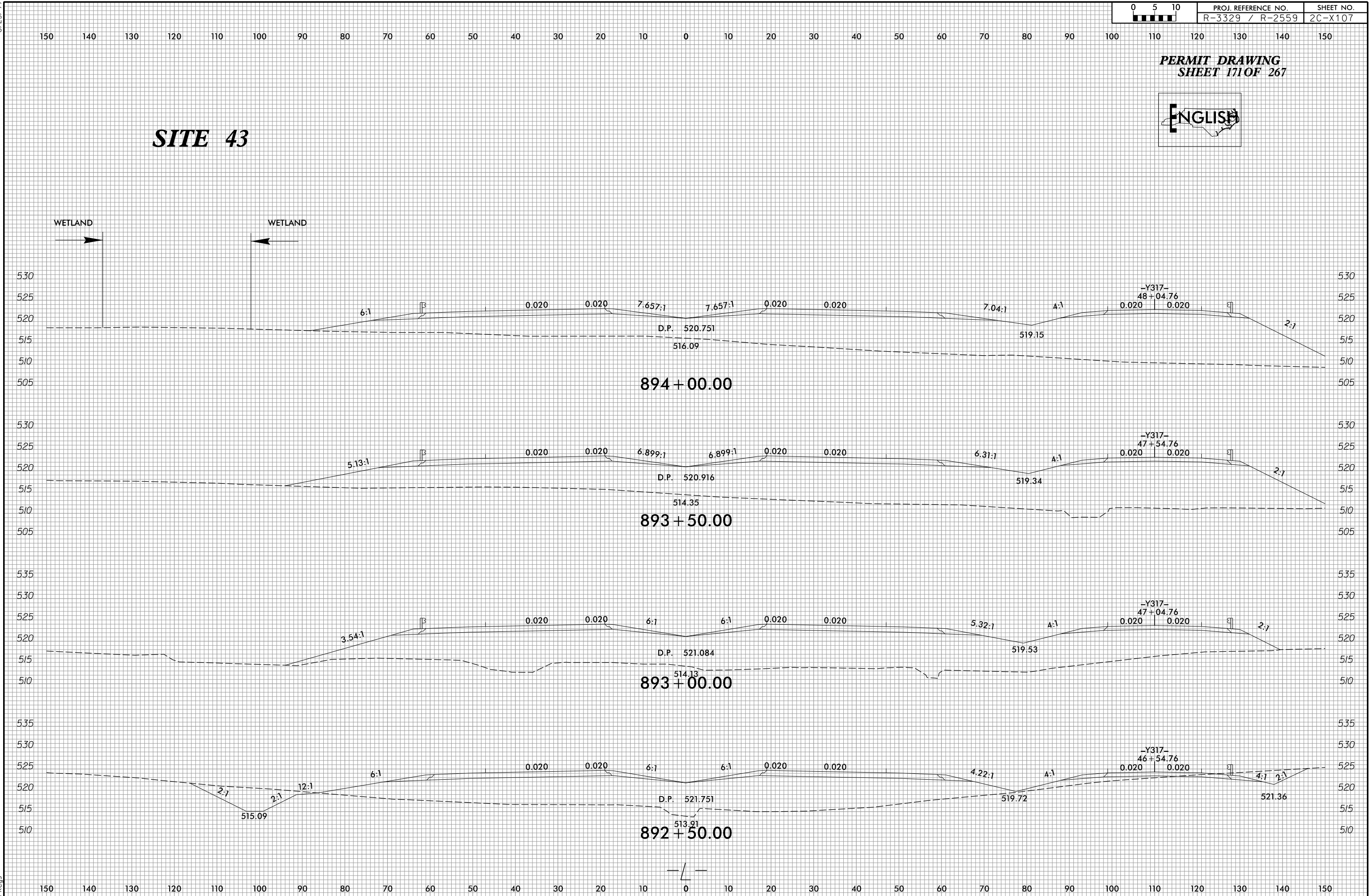


PROJECT REFERENCE NO.		SHEET NO.	
R-3329 /R-2559			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
PERMIT DRAWING SHEET 170 OF 267			

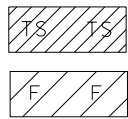
SITE 43 ***-L- STA. 893 + 24***



PROPOSED 84" RCP III
BURIED 1.0'

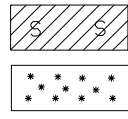


8/17/99



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

DENOTES FILL IN
WETLAND

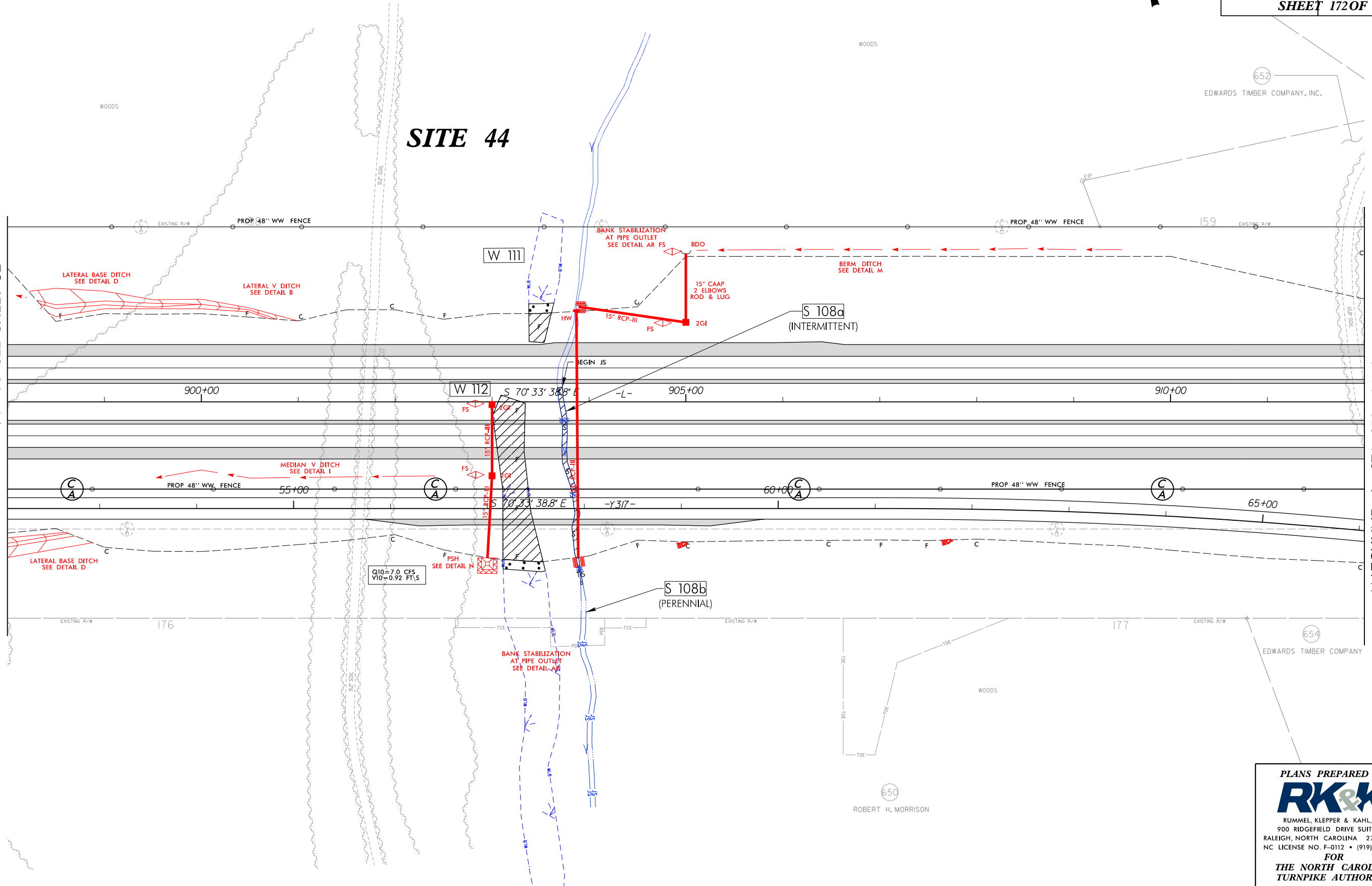


DENOTES IMPACTS IN
SURFACE WATER

DENOTES MECHANIZED
CLEARING

PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	53
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 172 OF 267	

MATCHLINE -L- STA. 898+00 SEE SHEET 52

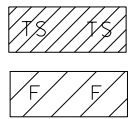


MATCHLINE -L- STA. 912+00 SEE SHEET 54

\$\$\$\$\$TIME\$\$\$\$\$
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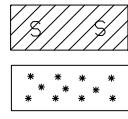
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
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8/17/99



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

DENOTES FILL IN
WETLAND

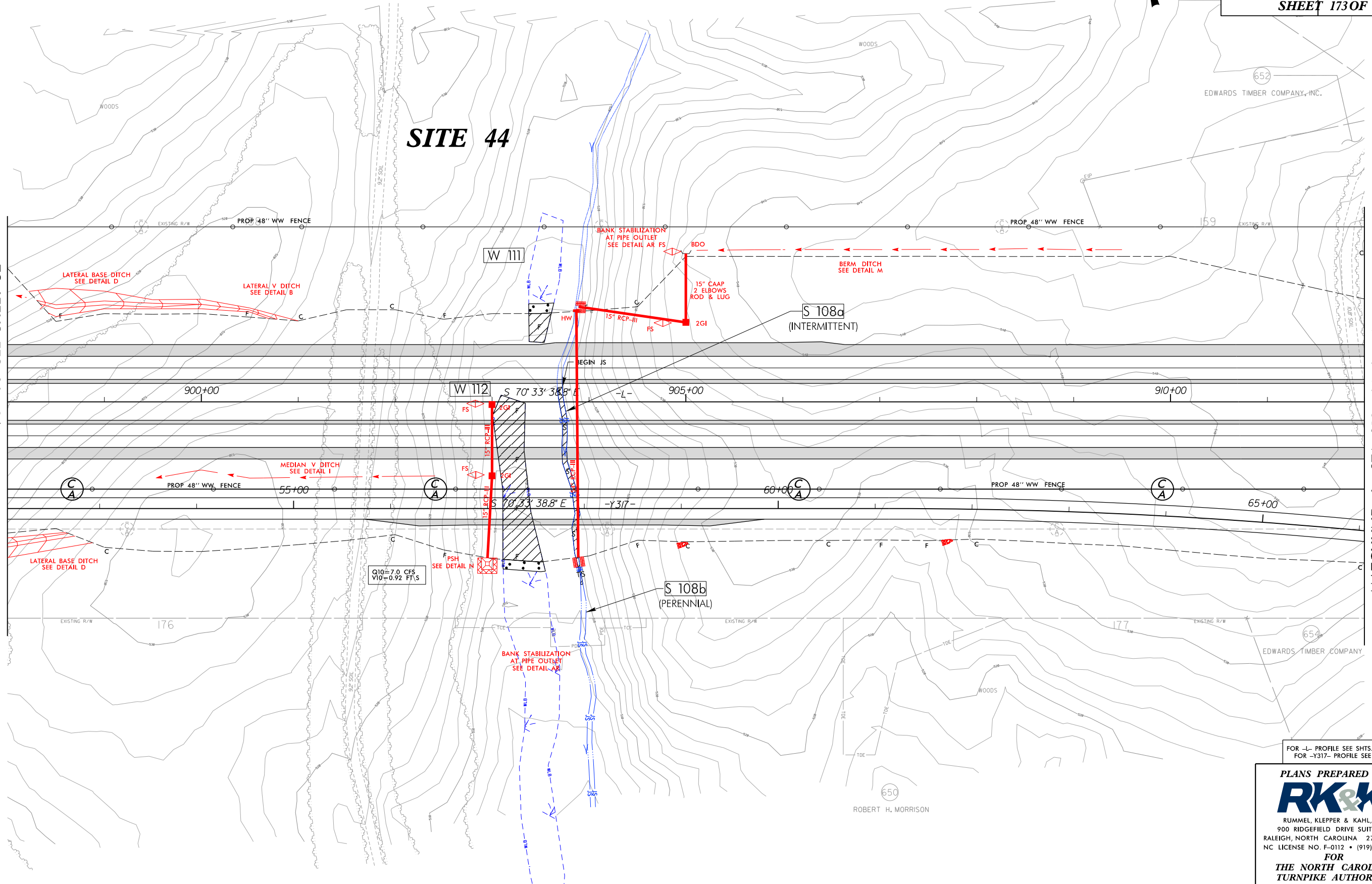


DENOTES IMPACTS IN
SURFACE WATER

DENOTES MECHANIZED
CLEARING

PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	53
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 173 OF 267	

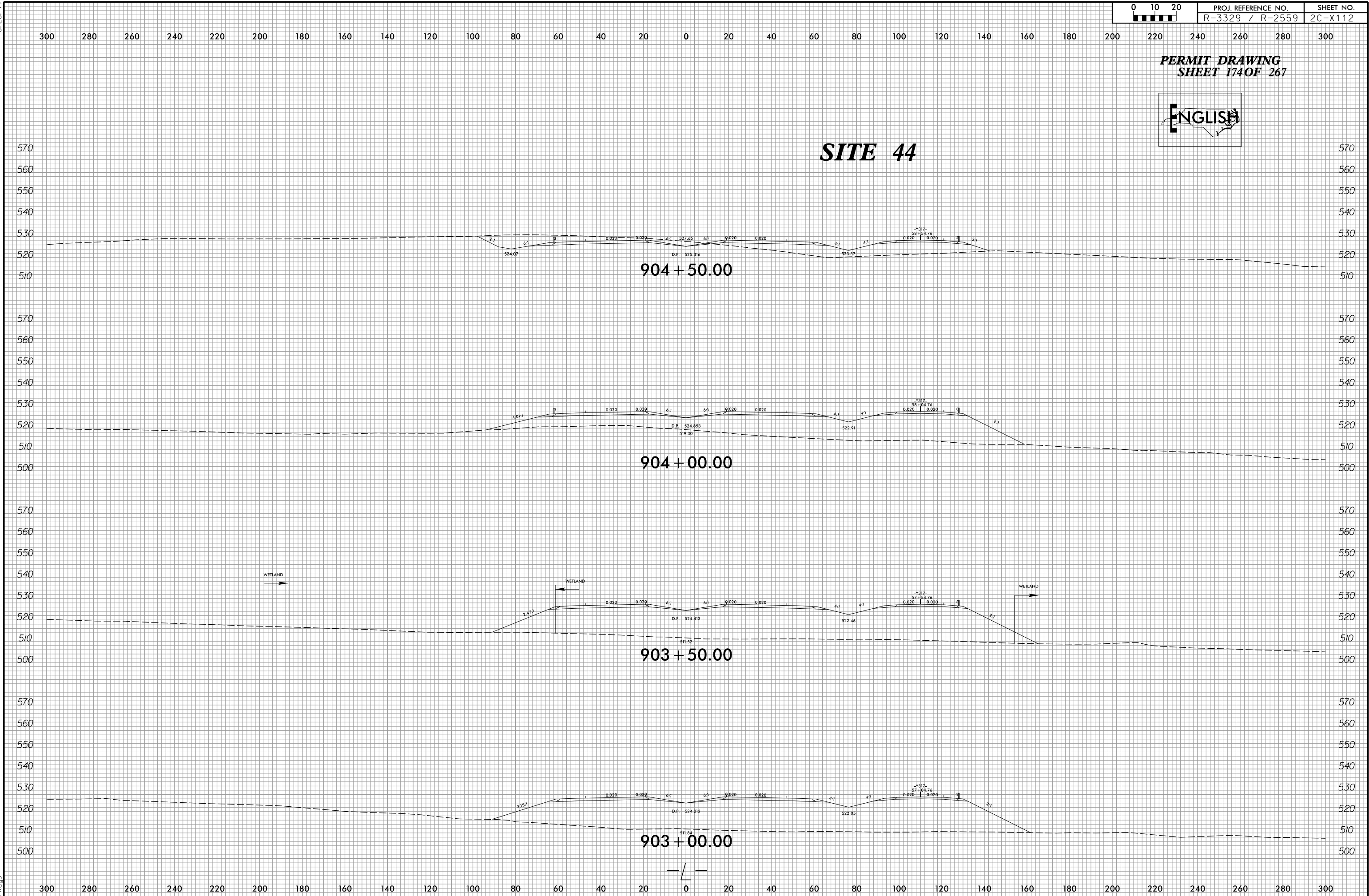
MATCHLINE -L- STA. 898+00 SEE SHEET 52



MATCHLINE -L- STA. 912+00 SEE SHEET 54

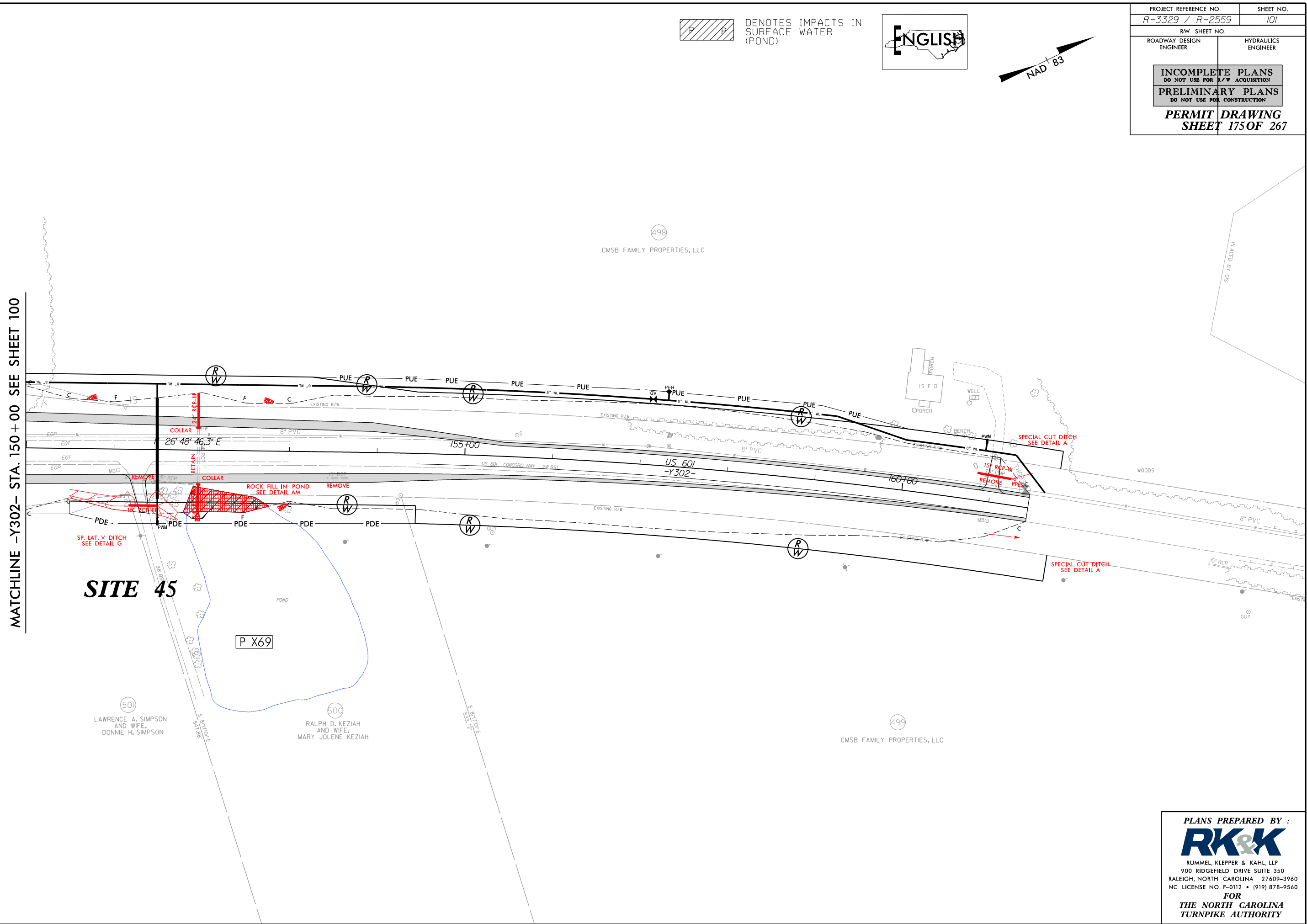
FOR -L- PROFILE SEE SHTS. 147 & 148
FOR -Y317- PROFILE SEE SHT. 219

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
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PROJECT REFERENCE NO.	SHEET NO.
<i>R-3329 / R-2559</i>	<i>101</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
<i>PERMIT DRAWING</i> <i>SHEET 175 OF 267</i>	

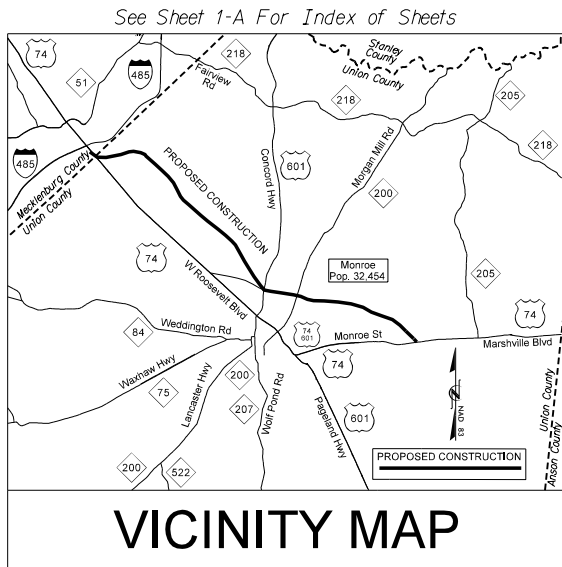
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
ALEIGH, NORTH CAROLINA 27609-3960
IC LICENSE NO. F-0112 • (919) 878-9560
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9/22/2014
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9/28/09

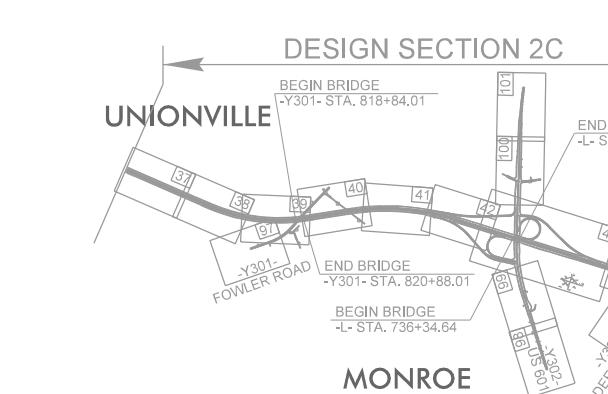
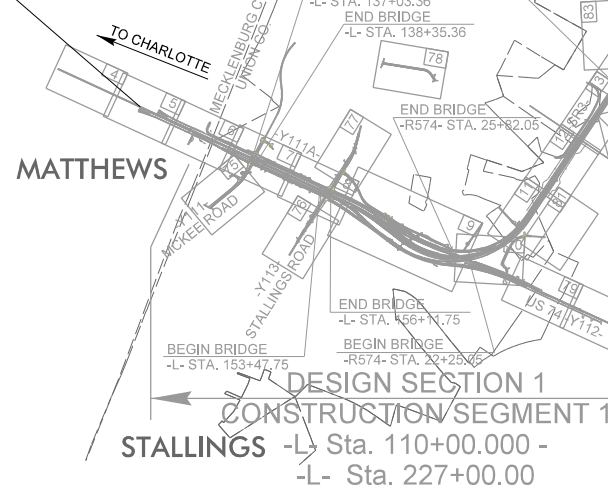
TIP PROJECT: R-3329 / R-2559

CONTRACT: C202587

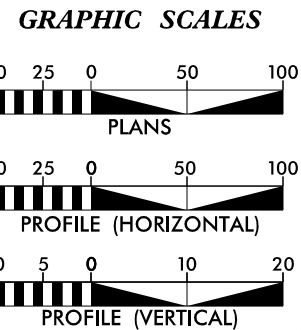


BEGIN TIP PROJECT R-3329 / R-2559

-L- Sta. 110+00.00



NOTES:
1. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.
2. THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.
3. A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF MATTHEWS, INDIAN TRAIL, HEMBY BRIDGE, LAKE PARK, MONROE, UNIONVILLE, WINGATE, AND MARSHVILLE.



DESIGN DATA

ADT 2013 = 64,100
ADT 2035 = 95,600
DHV = 8%
D = 55%
T = 18%*
V = 70 mph

*TTST 11% DUAL 7%
FUNCTIONAL CLASS.: FREEWAY

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-3329 / R-2559..... 18.1 mi
LENGTH STRUCTURE TIP PROJECT R-3329 / R-2559..... *1.6 mi
TOTAL LENGTH TIP PROJECT R-3329 / R-2559..... 19.7 mi

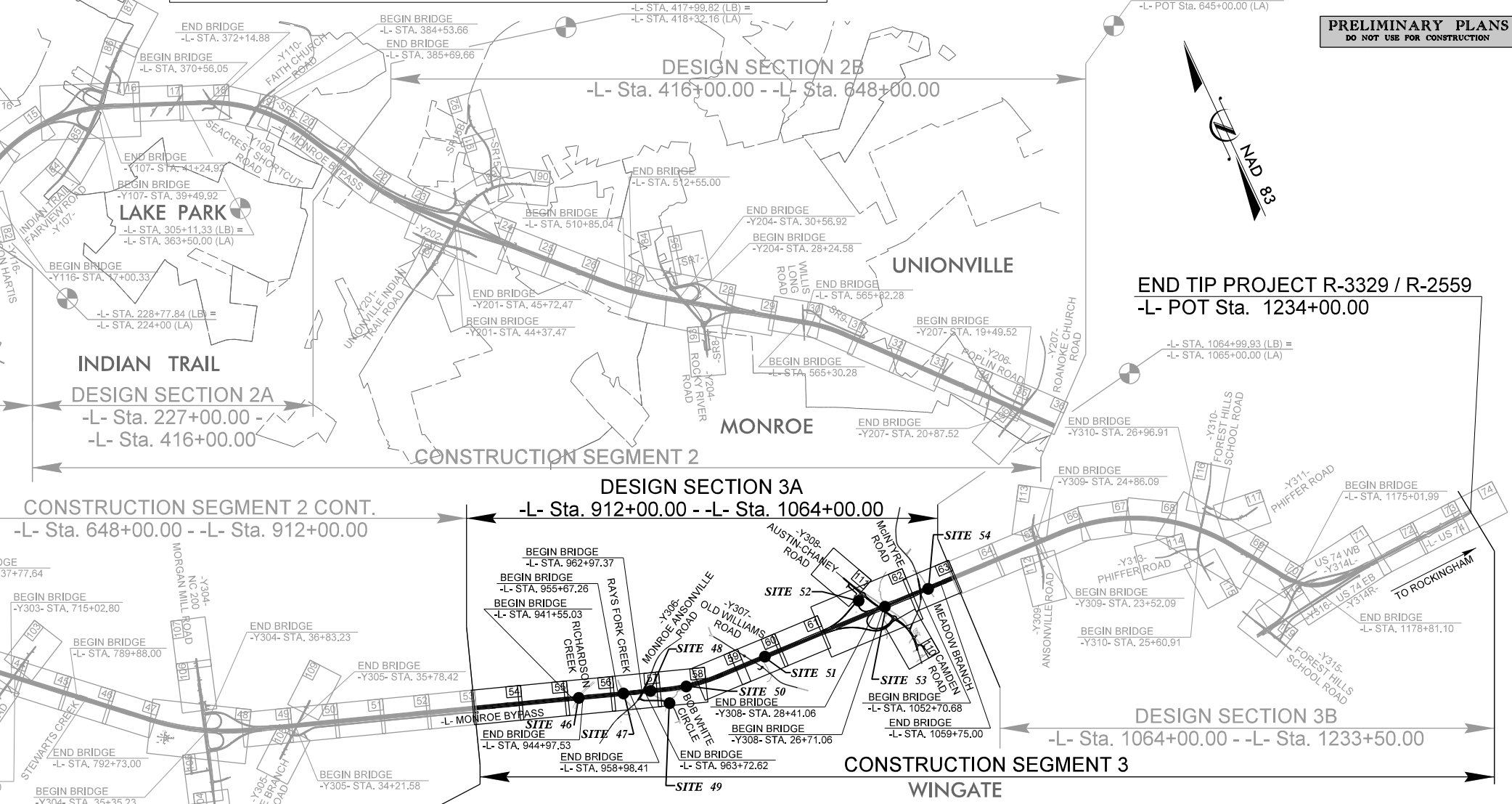
* LENGTH OF STRUCTURES BASED ON WB LANES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MECKLENBURG & UNION COUNTY

LOCATION: US 74 BYPASS FROM US 74 JUST EAST OF I-485 NEAR MATTHEWS AND STALLINGS TO US 74 JUST EAST OF WINGATE AND WEST OF MARSHVILLE

**TYPE OF WORK: DESIGN-BUILD
WETLAND & STREAM IMPACTS**



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3329 / R-2559	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34533.5.TA1			

PERMIT DRAWINGS
SHEET 177 OF 267

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DESIGN - BUILD TEAM

PLANS PREPARED BY :
MULKEY
ENGINEERS & CONSULTANTS
PO BOX 33127
RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM
NC LICENSE NO. C-1021

2006 STANDARD SPECIFICATIONS

LETTING DATE:
OCTOBER 28, 2010

Steve A. Drum, P.E.
PROJECT ENGINEER

Michael A. Holt, P.E.
PROJECT DESIGN ENGINEER

CONTRACTOR :

MONROE
BYPASS CONSTRUCTORS

HYDRAULICS ENGINEER

SIGNATURE: _____
ROADWAY DESIGN ENGINEER

SIGNATURE: _____
P.E.

-L- STA. 973+75 TO STA. 974+50 LT
-L- STA. 986+50 TO STA. 987+50 RT
-L- STA. 1063+50 TO STA. 1064+00 LT
-Y320- STA. 13+50 TO STA. 14+60 RT
-DR2- STA. 8+70 TO STA. 9+00 LT

```

-L- STA. 965+00 TO STA. 965+39 LT
-Y306- STA. 29+50 TO STA. 30+00 RT
-Y318- STA. 16+00 TO STA. 16+50 LT
-Y318- STA. 24+17 TO STA. 24+75 RT
-L- STA. 977+75 TO STA. 978+20 LT
-L- STA. 1001+00 TO STA. 1001+75 LT
-Y308- STA. 30+25 TO STA. 31+75 LT
-L- STA. 1049+50 TO STA. 1052+00 LT
-L- STA. 1062+00 TO STA. 1063+73 RT

```

Type of Liner=	Class B Rip-Rap	b=	5.0ft.
-L-	STA. 924+82 TO STA. 925+00	RT	
-L-	STA. 928+58 TO STA. 928+88	LT	

—L	STA. 923+41 TO	STA. 924+82 RT
—L	STA. 955+00 TO	STA. 955+50 LT
—L	STA. 959+50 TO	STA. 961+50 RT
—L	STA. 985+00 TO	STA. 986+35 LT
—L	STA. 992+50 TO	STA. 993+97 LT
—L	STA. 1001+75 TO	STA. 1002+60 LT
—VLC	STA. 20+75 TO	STA. 22+40 LT
—L	STA. 1041+65 TO	STA. 1043+00 LT

Type of Liner=	Class B Rip=	b=	5.0FI.
-L-	STA. 915 +00 TO	STA. 916 +43 RT	
-L-	STA. 916 +43 TO	STA. 917 +00 RT	
-L-	STA. 923 +40 TO	STA. 923 +85 LT	
-L-	STA. 929 +58 TO	STA. 930 +59 RT	
-L-	STA. 937 +15 TO	STA. 939 +50 LT	
-L-	STA. 939 +50 TO	STA. 942 +10 LT	
-L-	STA. 939 +15 TO	STA. 941 +05 RT	
-L-	STA. 946 +35 TO	STA. 947 +00 LT	
-L-	STA. 954 +70 TO	STA. 955 +00 LT	
-L-	STA. 958 +80 TO	STA. 962 +20 LT	
-Y306-	STA. 28 +80 RT TO	-L- STA. 966 +25 RT	
-L-	STA. 975 +54 TO	STA. 977 +30 LT	
-L-	STA. 976 +20 TO	STA. 979 +00 RT	
-L-	STA. 981 +44 TO	STA. 982 +50 LT	
-L-	STA. 993 +55 TO	STA. 994 +00 LT	
-L-	STA. 993 +97 TO	STA. 998 +50 LT	
-L-	STA. 1001 +16 TO	STA. 1003 +00 RT	
-L-	STA. 1002 +60 TO	STA. 1003 +15 LT	
-Y308-	STA. 21 +50 TO	STA. 25 +35 RT	
-Y308-	STA. 20 +50 LT TO	-Y308- STA. 28 +34 RT	
-L-	STA. 1059 +00 RT TO	STA. 1061 +45 LT	
-L-	STA. 1041 +00 TO	STA. 1044 +00 LT	
-L-	STA. 1059 +30 TO	STA. 1063 +00 LT	
-L-	STA. 1060 +00 TO	STA. 1060 +50 RT	

~~-VRB-~~ STA. 17+00 TO STA. 26+30 LT
~~-Y308-~~ STA. 35+00 TO STA. 36+50 LT
~~-VRB-~~ STA. 18+50 TO STA. 23+50 RT

DETAIL G NOT USED IN SECTION 3A

Type of Liner =	Class B	Kip-kap
—L—	STA. 928 + 97 TO	STA. 929 + 50 LT
—L—	STA. 964 + 50 TO	STA. 965 + 00 LT
—Y308—	STA. 31 + 75 TO	STA. 32 + 50 LT
—L—	STA. 1050 + 50 TO	STA. 1051 + 50 RT
—L—	STA. 1052 + 00 TO	STA. 1052 + 68 LT

- L- STA. 1020+00 TO STA. 1023+50 CL

-Y318- STA. 23+70 TO STA. 24+00 LT
 L=35', S=1.50%
 BEG EL=455.50, END EL=456.03
 -Y308- STA. 37+35 LT; L=35', S=2.77%
 BEG EL=549.74, END EL=548.77
 -Y308- STA. 28+91 RT; L=55', S=3.18%
 BEG EL=520.75, END EL=519.00
 -Y308- STA. 28+91 RT; L=110', S=7.27%
 BEG EL=519.00, END EL=511.00

- STA. 942.10 TO STA. 943.50 LT; L=140'; S=4.6%
 BEG EL=456.4, END EL=450.0
- STA. 943.50 TO STA. 944.0+04 LT; L=54'; S=1.9%,
 BEG EL=450.0, END EL=449.0
- STA. 955+50 TO STA. 956+82 LT; L=132'; S=2.0%
 BEG EL=452.0, END EL=449.36
- STA. 957+13 TO STA. 958+80 LT; L=167'; S=2.65%
 BEG EL=449.55, END EL=453.98
- STA. 957+80 TO STA. 958+00 RT; L=80'; S=1.00%
 BEG EL=449.50, END EL=450.00
- STA. 958+00 TO STA. 958+50 RT; L=50'; S=0.50%
 BEG EL=450.00, END EL=451.50
- STA. 958+50 TO STA. 959+50 RT; L=100'; S=0.00%
 BEG EL=451.50, END EL=452.00
- 3308- STA. 35+75 LT; L=45'; S=2.4%
 BEG EL=542.0, END EL=543.50
- 3319- STA. 23+88 LT; L=55'; S=2.00%
 BEG EL=515.5, END EL=508.7
- 3319- STA. 23+55 RT; L=100'; S=0.50%
 BEG EL=508.7, END EL=508.2

DETAIL L NOT USED IN SECTION 3A

-L- STA. 913+25 TO STA. 913+75 LT
-L- STA. 919+25 TO STA. 921+00 LT
-L- STA. 1019+00 TO STA. 1020+00 LT
-VRC- STA. 14+50 TO STA. 15+60 RT
-VRC- STA. 20+40 TO STA. 21+00 RT

-L- STA. 945+65 LT
-L- STA. 979+00 LT
-L- STA. 1041+00 LT
-Y319- STA. 23+60 +/- RT

DETAIL O NOT USED IN SECTION 3A

Type of Liner = Class B Rip-Rap

Type of Liner= PSRM

-L- STA. 1009+50 TO STA. 1013+00 LT
-L- STA. 1013+00 TO STA. 1014+00 LT
-L- STA. 1023+50 TO STA. 1027+00 LT
-VRB- STA. 16+70 TO STA. 17+00 LT

-L- STA. 909+50 TO -L- STA. 913+25 LT

DETAIL T NOT USED IN SECTION 3A

-L3A- STA. 997+60 LT; L=60', S=4.8%
BEG EL=529.89, END EL=527.01

DETAIL V NOT USED IN SECTION 3A

Type of Liner— PSRM

DETAIL X NOT USED IN SECTION 3A

PROJECT REFERENCE NO.
R-3329 / R-2559

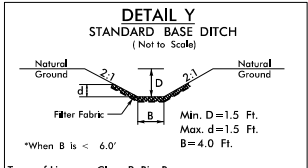
SHEET NO.
3A-2H

ROADWAY DESIGN ENGINEER

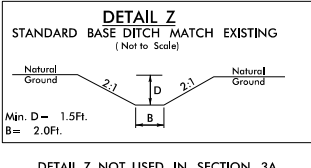
HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

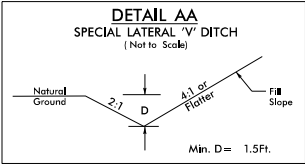
PERMIT DRAWINGS
SHEET 179 OF 267



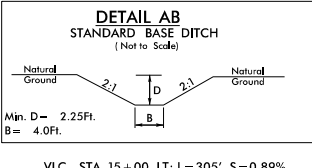
Type of Liner = Class B Rip-Rap
-L- STA. 941+05 TO STA. 941+50 RT; L=45', S=10.5%
BEG EL=456.7, END EL=452.0
-L- STA. 941+50 TO STA. 942+38 RT; L=88', S=4.6%
BEG EL=452.0, END EL=448.0
-L- STA. 1059+50 TO STA. 1060+00 RT
L=50', S=0.50%
BEG EL=509.00, END EL=509.25
-Y319- STA. 21+35 RT
L=52', S=0.40%
BEG EL=510.20, END EL=510.00



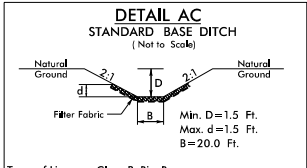
DETAIL Z NOT USED IN SECTION 3A



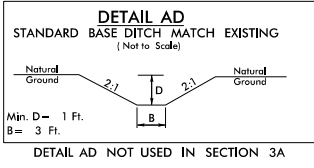
DETAIL AA NOT USED IN SECTION 3A



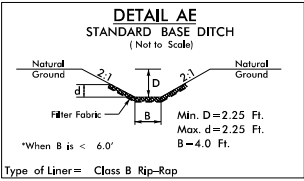
-VLC- STA. 15+00 LT; L=305', S=0.89%
BEG EL=522.71, END EL=522.00



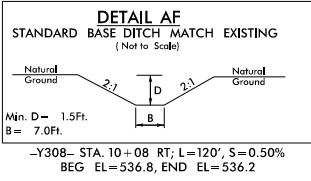
Type of Liner = Class B Rip-Rap
-L- STA. 1058+60 TO STA. 1059+30 LT
L=70', S=0.20%
BEG EL=508.50, END EL=508.58



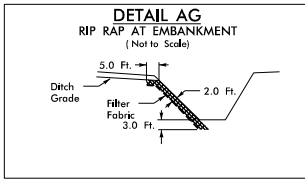
DETAIL AD NOT USED IN SECTION 3A



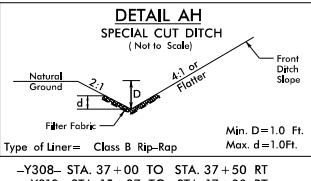
Type of Liner = Class B Rip-Rap
-L- STA. 1002+60 LT; L=54', S=3.43%
BEG EL=530.35, END EL=528.50
-L- STA. 1002+60 LT; L=27', S=1.00%
BEG EL=528.50, END EL=528.23
-Y308- STA. 30+00 RT; L=214', S=1.55%
BEG EL=514.31, END EL=511.00
-Y308- STA. 32+85 LT; L=23', S=0.30%
BEG EL=518.04, END EL=517.97



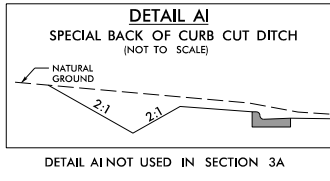
-Y308- STA. 10+08 RT; L=120', S=0.50%
BEG EL=536.8, END EL=536.2



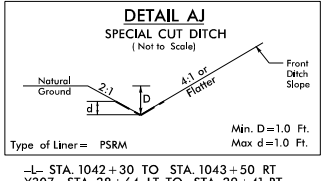
-L- STA. 942+35 RT 6 TONS CL I; 7 SY FF
-L- STA. 944+07 LT 5 TONS CL I; 7 SY FF
-L- STA. 956+80 LT 6 TONS CL I; 7 SY FF
-L- STA. 957+13 LT 7 TONS CL I; 7 SY FF
-L- STA. 957+50 RT 18 TONS CL I; 18 SY FF
-Y308- STA. 29+51 RT 5 TONS CL I; 7 SY FF
-Y308- STA. 28+43 RT 5 TONS CL I; 7 SY FF
-Y308- STA. 25+45 LT 10 TONS CL I; 14 SY FF
-VRC- STA. 28+34 RT 10 TONS CL I; 14 SY FF



Type of Liner = Class B Rip-Rap
-Y308- STA. 37+00 TO STA. 37+50 RT
-Y318- STA. 15+87 TO STA. 17+00 RT
-Y318- STA. 16+50 TO STA. 17+50 LT



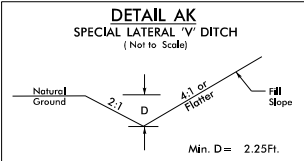
DETAIL AI NOT USED IN SECTION 3A



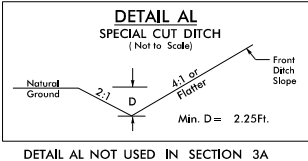
Type of Liner = PSRM
-L- STA. 1042+30 TO STA. 1043+50 RT
-Y307- STA. 28+64 LT TO STA. 29+41 RT
-Y307- STA. 28+64 TO STA. 29+39 LT
-Y308- STA. 13+50 TO STA. 14+60 LT
-Y308- STA. 14+50 TO STA. 16+49 LT
-Y308- STA. 20+50 TO STA. 21+50 RT
-Y308- STA. 33+50 TO STA. 35+00 RT
-VLC- STA. 18+00 TO STA. 20+35 LT

DETAIL
FALSE SUMP
(Not to Scale)

S = Ditch Slope		Proposed Ditch	
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'



DETAIL AK NOT USED IN SECTION 3A



DETAIL AL NOT USED IN SECTION 3A

DETAIL AO
SCOUR PROTECTION
(NOT TO SCALE)

DETAIL AN
RIP-RAPPED ENERGY DISSIPATOR BASIN

*NOTE A: IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS SECTIONAL AREA AT SECTION A-A SUCH THAT Q DES(CROSS SECTION AREA AT SEC. A-A) = SPECIFIED VELOCITY.

*NOTE B: WARP BASIN TO CONFORM TO NATURAL STREAM. CHANNEL TOP OF RIP-RAP IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM. AT SEC. A-A, PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.

HALF PLAN

SEC. A-A

SEC. B-B

SEC. C-C

SEC. D-D

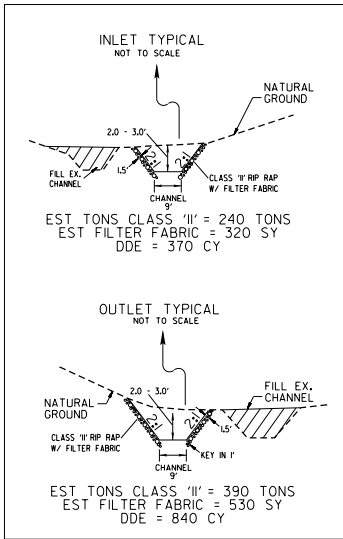
NOTE:
W₀ = DIAMETER OF PIPE,
WIDTH OF BOX OR
SPAN OF PIPE-ARCH
CULVERTS

RIP RAP BASIN #								
DIM.	1	2	3	4	5	6	7	8
A								
B								
C								
D								
E								
F								
G								
H								

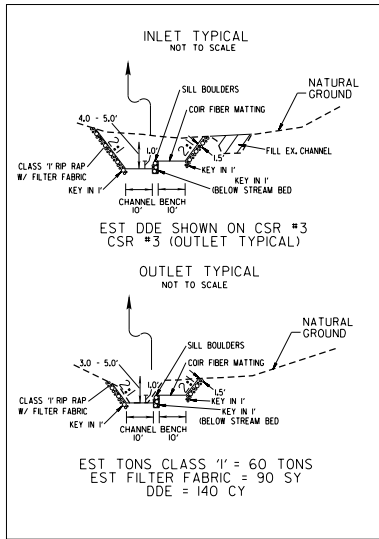
*ALL DIMENSIONS APPROXIMATE IN FEET

DETAIL AN NOT USED IN SECTION 3A

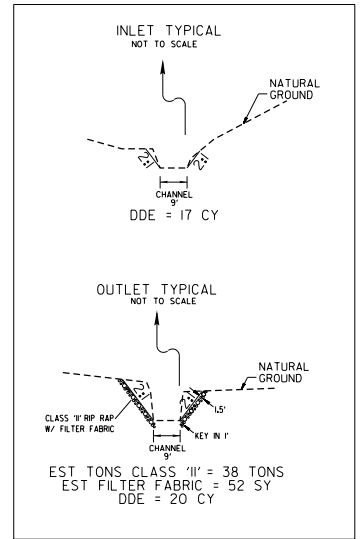
CORRESPONDS TO -L- 975+83 9'X7' RCBC



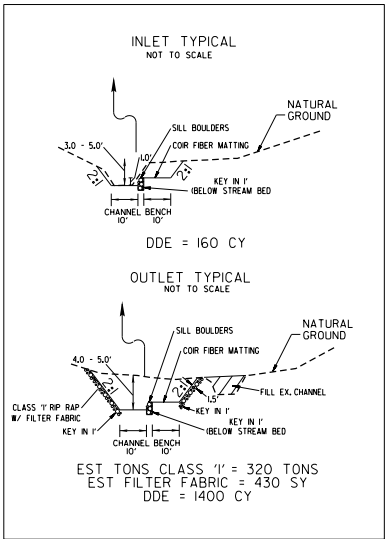
CORRESPONDS TO -L- 1041+25 2@10'X6' RCBC



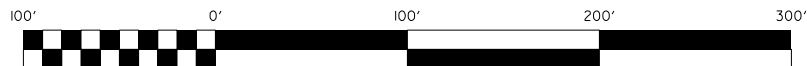
CORRESPONDS TO -Y318- 15+85 9'X7' RCBC



CORRESPONDS TO -VRC- 28+46 2@10'X6' RCBC



8/17/99



GRAPHIC SCALE



DENOTES IMPACTS IN
SURFACE WATER

655

ROBERT GILES, ET ALS



PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	56
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PERMIT DRAWINGS
SHEET 180 OF 267



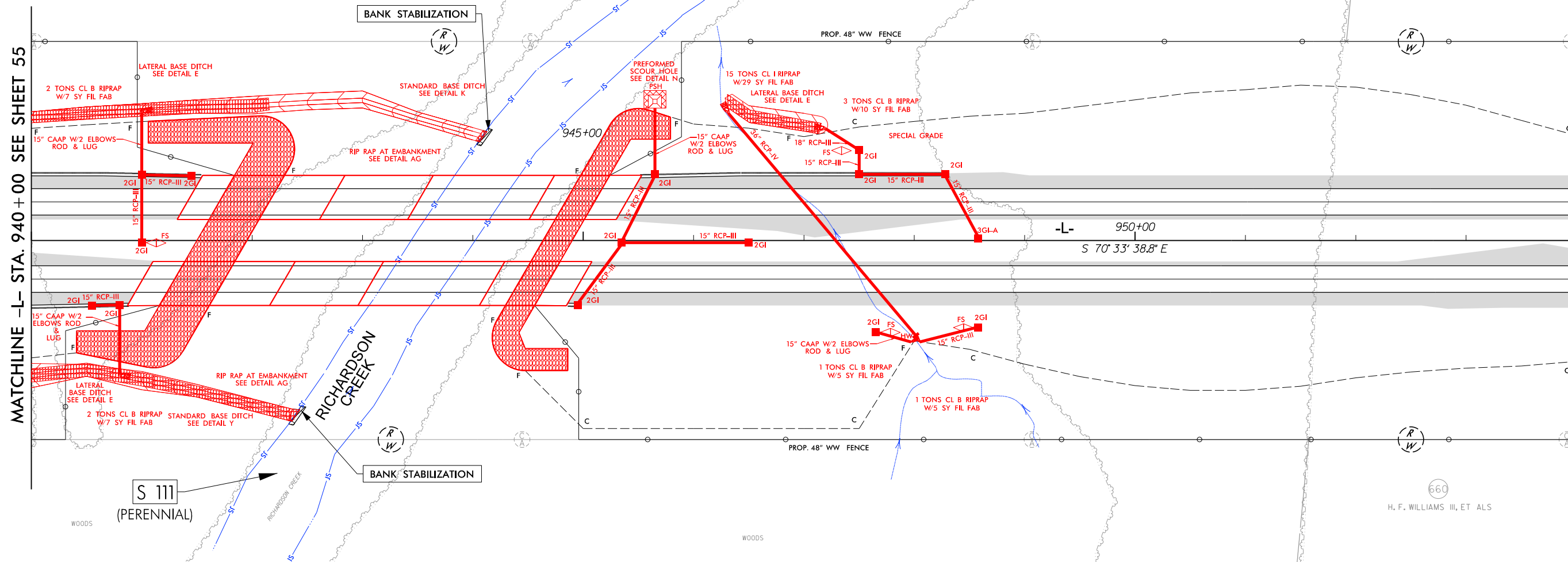
658

NCDOT

SITE 46

MATCHLINE -L- STA. 940+00 SEE SHEET 55

MATCHLINE -L- STA. 954+00 SEE SHEET 57

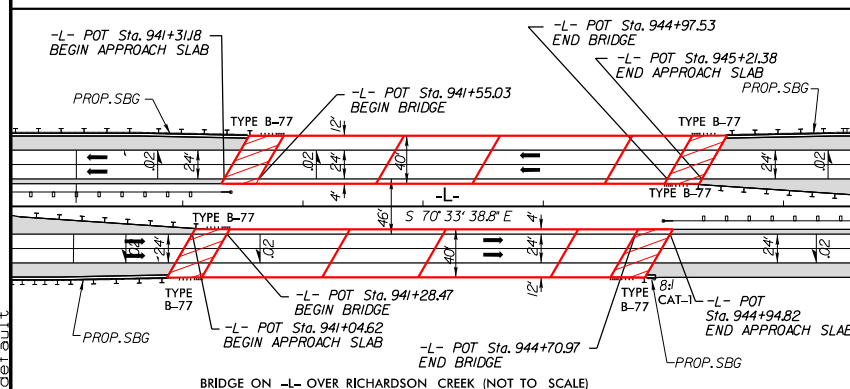


S 111
(PERENNIAL)

BANK STABILIZATION

660

H. F. WILLIAMS III, ET ALS



FOR -L- PROFILE SEE SHT.150

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FOR
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TURNPIKE AUTHORITY

657

ROBERT GILES, ET ALS

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8/17/99



DENOTES IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	56
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

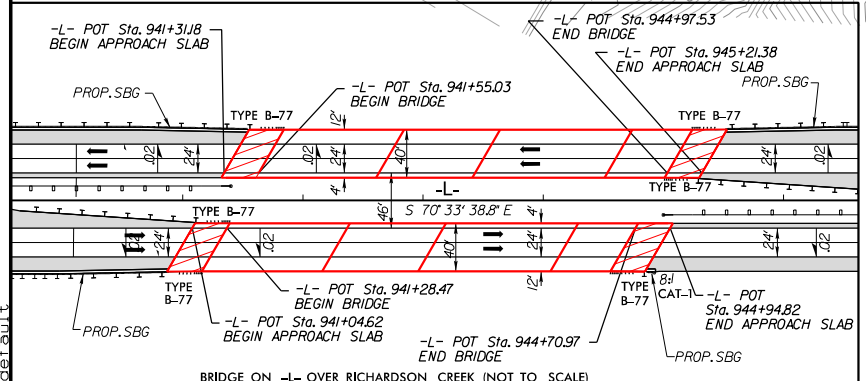
PERMIT DRAWINGS
SHEET 181 OF 267



SITE 46

MATCHLINE -L- STA. 940+00 SEE SHEET 55

MATCHLINE -L- STA. 954+00 SEE SHEET 57



BRIDGE ON -L- OVER RICHARDSON CREEK (NOT TO SCALE)

ROBERT GILES, ET ALS

ROBERT GILES, ET ALS

H. F. WILSON, III, ET ALS

FOR -L- PROFILE SEE SHT.150

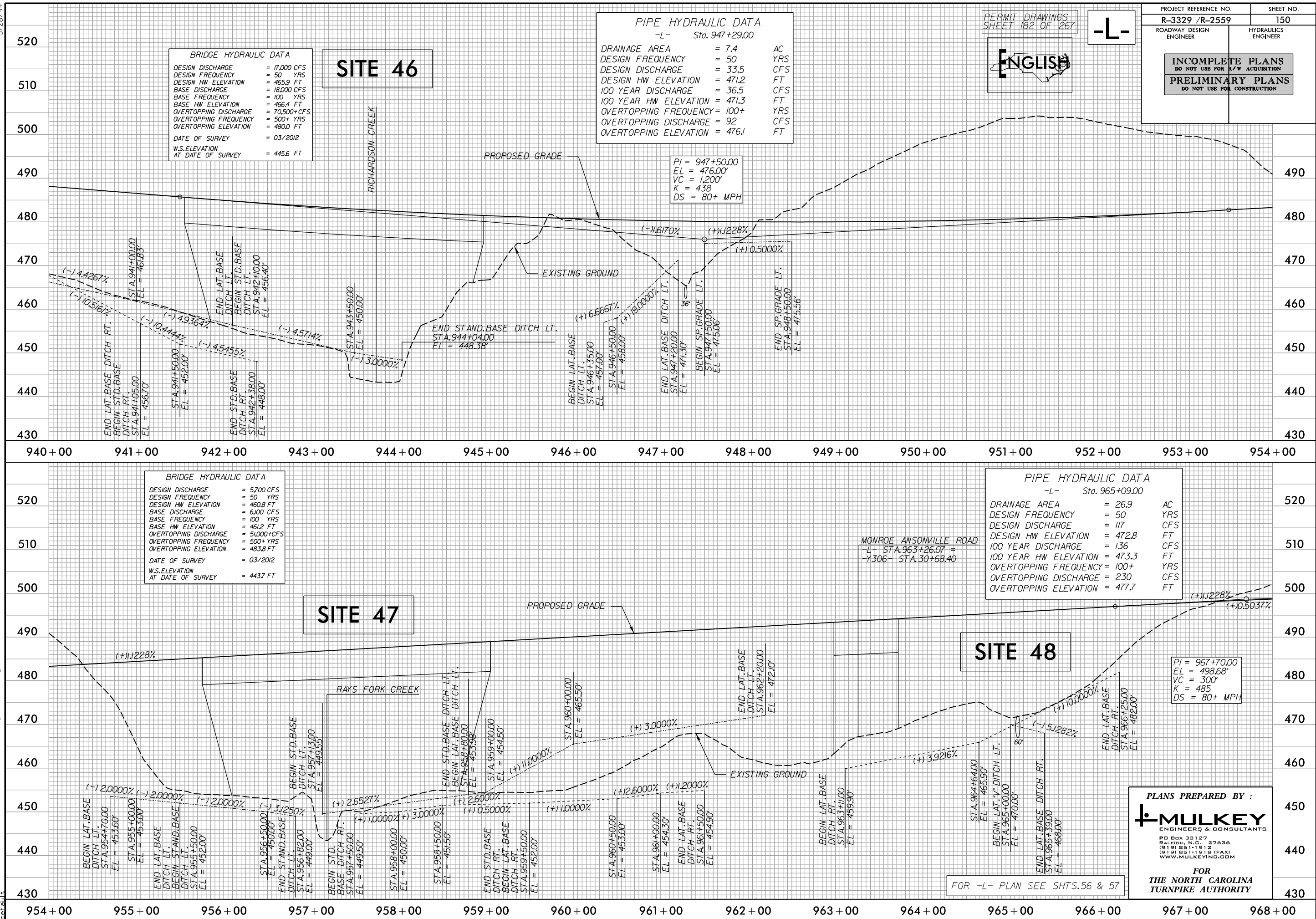
PLANS PREPARED BY :

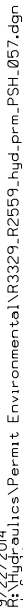
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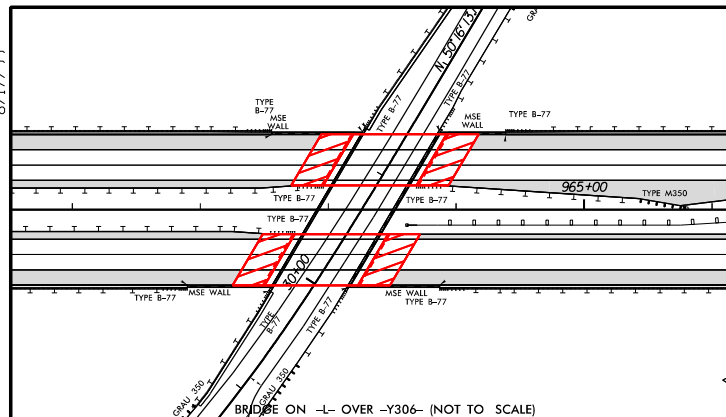
5/28/99
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default



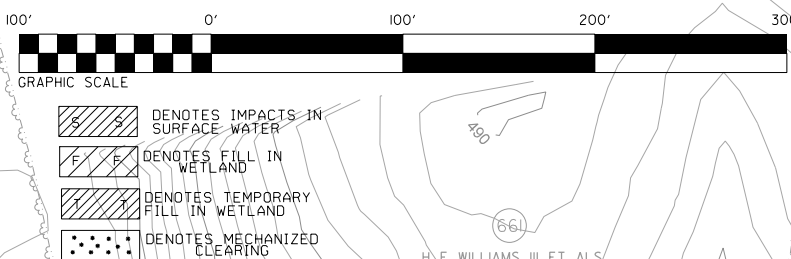
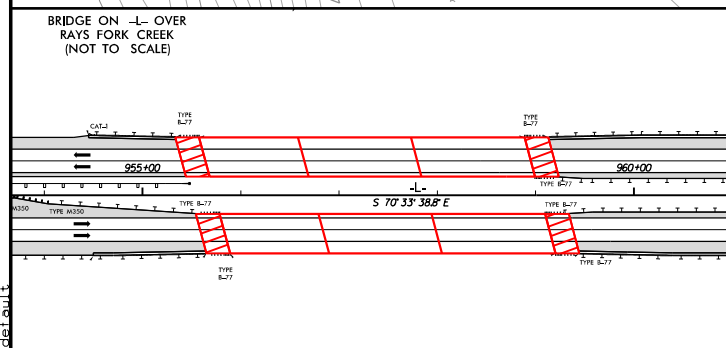


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8/22/2014
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MATCHLINE -L- STA. 954+00 SEE SHEET 56



PERMIT DRAWINGS
SHEET 184 OF 267

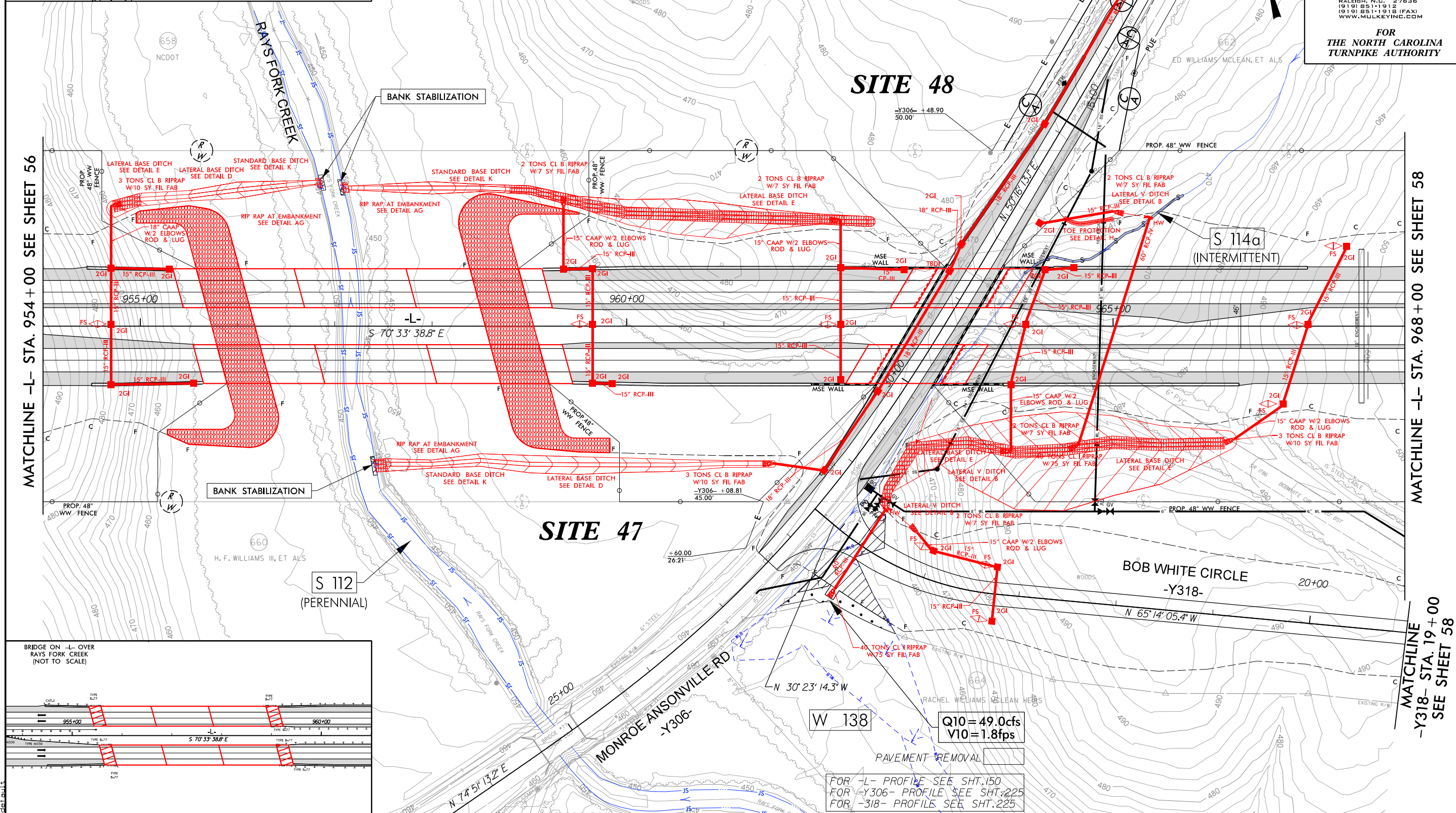
ENGLISH

PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 57
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PLANS PREPARED BY :

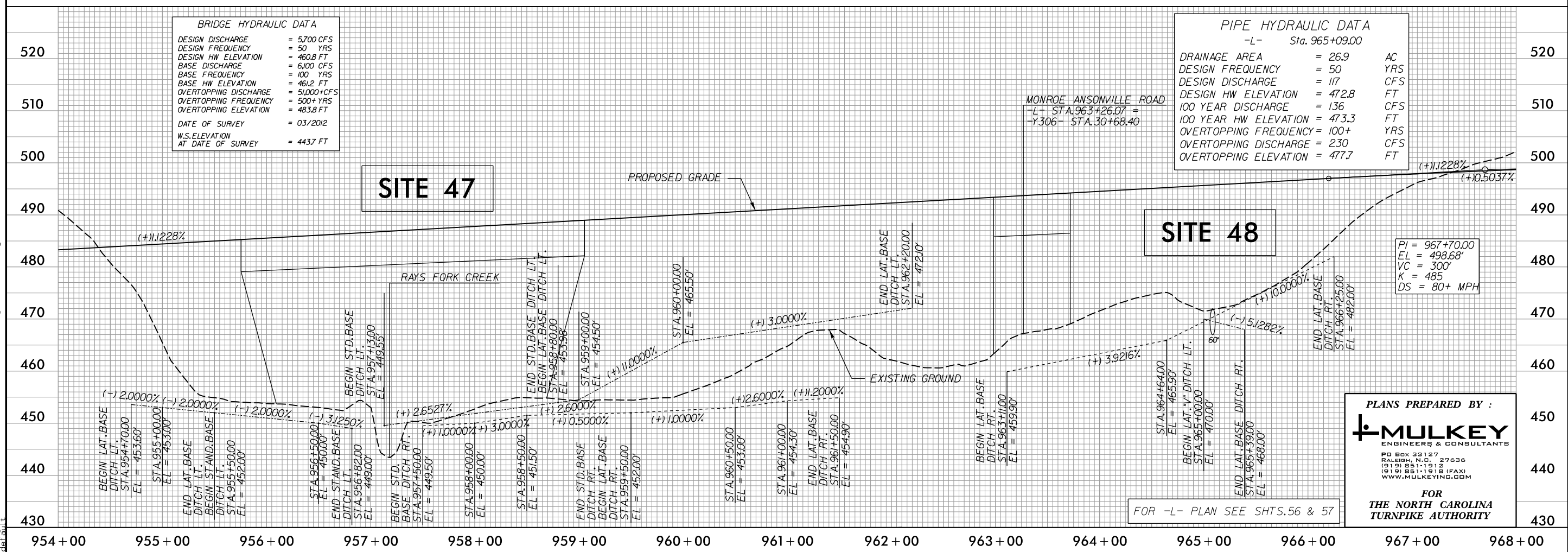
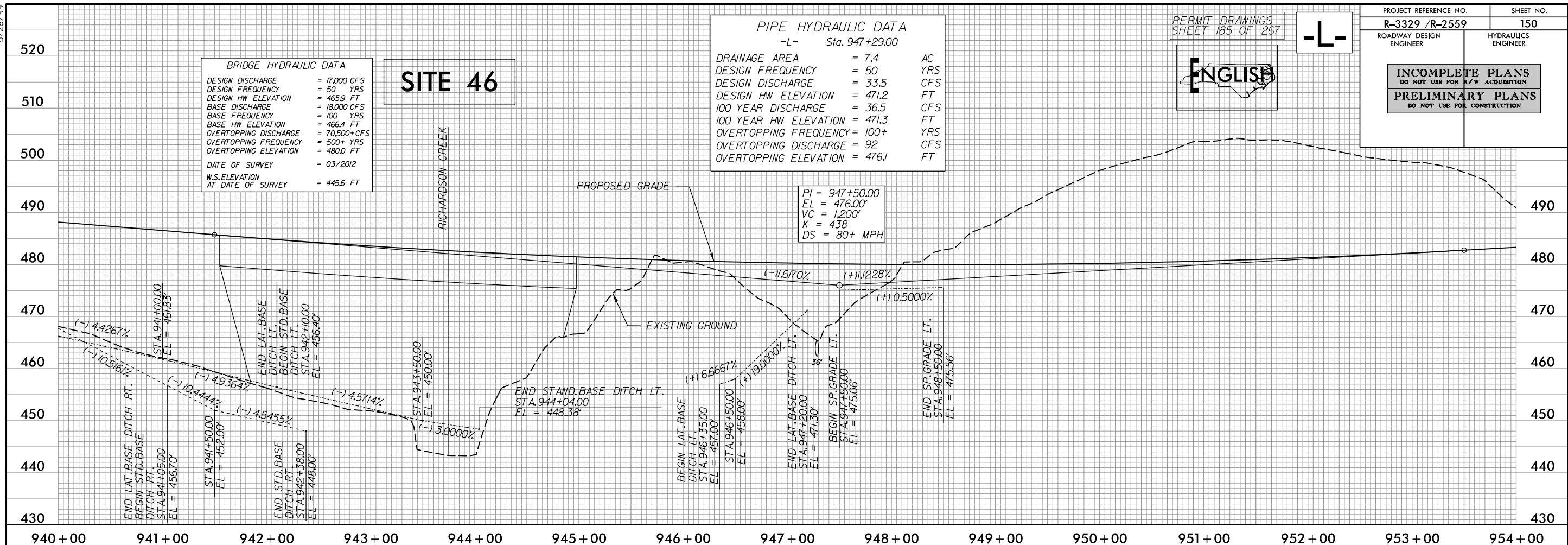
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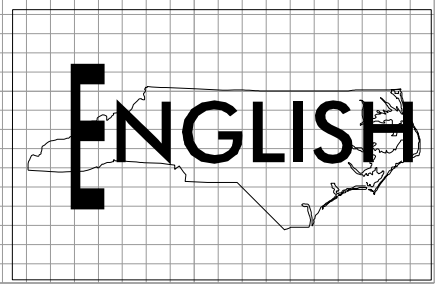
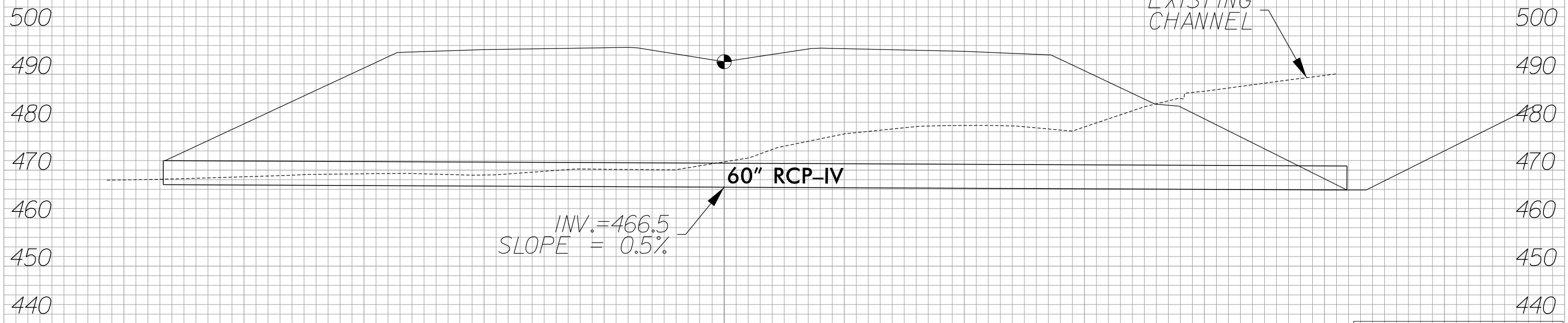
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SITE 48
-L-
965+08.50

PERMIT DRAWINGS
SHEET 186 OF 267

100' 50' C 50' 100' 150'



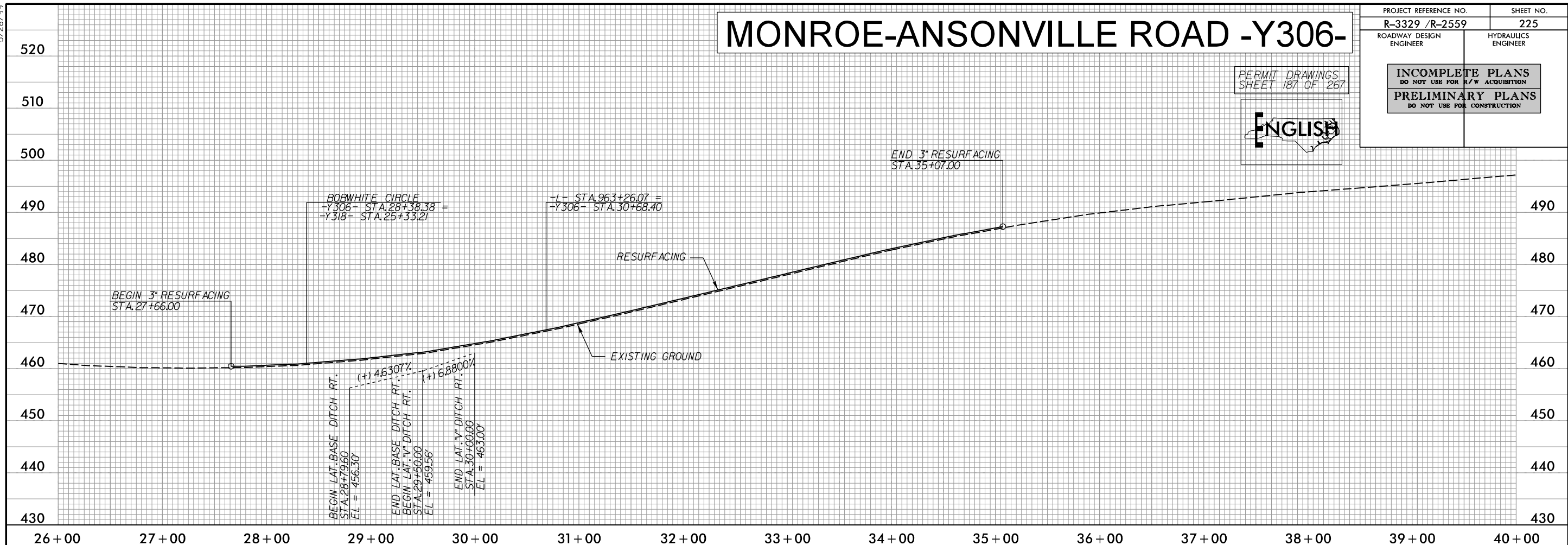
5/28/99

MONROE-ANSONVILLE ROAD -Y306-

PERMIT DRAWINGS
SHEET 187 OF 267

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-3329 /R-2559	225
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



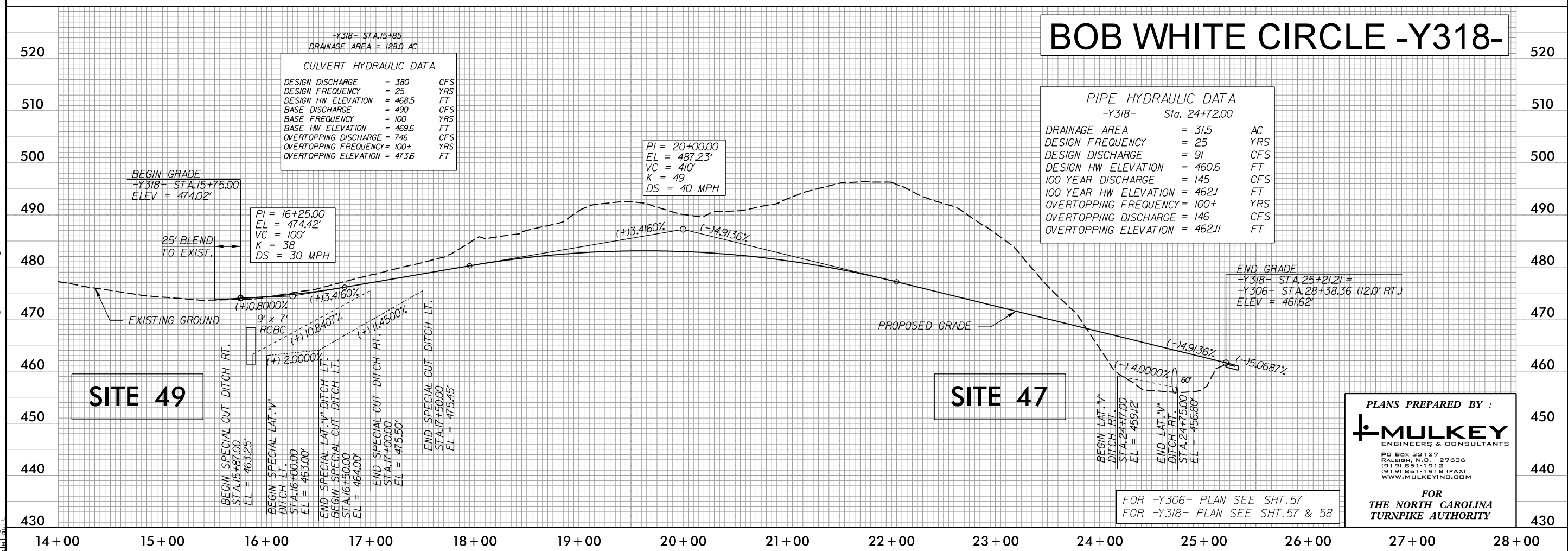
BOB WHITE CIRCLE -Y318-

-Y318- STA.15+85
DRAINAGE AREA = 128.0 AC

CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 380	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 468.5	FT
BASE DISCHARGE	= 490	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 469.6	FT
OVERTOPPING DISCHARGE	= 746	CFS
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING ELEVATION	= 473.6	FT

-Y318- Sta. 24+72.00

PIPE HYDRAULIC DATA		
DRAINAGE AREA	= 31.5	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 91	CFS
DESIGN HW ELEVATION	= 460.6	FT
100 YEAR DISCHARGE	= 145	CFS
100 YEAR HW ELEVATION	= 462.1	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 146	CFS
OVERTOPPING ELEVATION	= 462.11	FT



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FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

FOR -Y306- PLAN SEE SHT.57
FOR -Y318- PLAN SEE SHT.57 & 58

9/22/2004
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default

SITE 47
-Y318-
24+71.56

PERMIT DRAWINGS
SHEET 188 OF 267

100' Lt.

50'

℄

50'

100' Rt.

500

490

480

470

460

450

500

490

480

470

460

450

EXISTING
CHANNEL

EXISTING
CHANNEL

60" RCP-III

INV. = 455.06
SLOPE = 0.5%

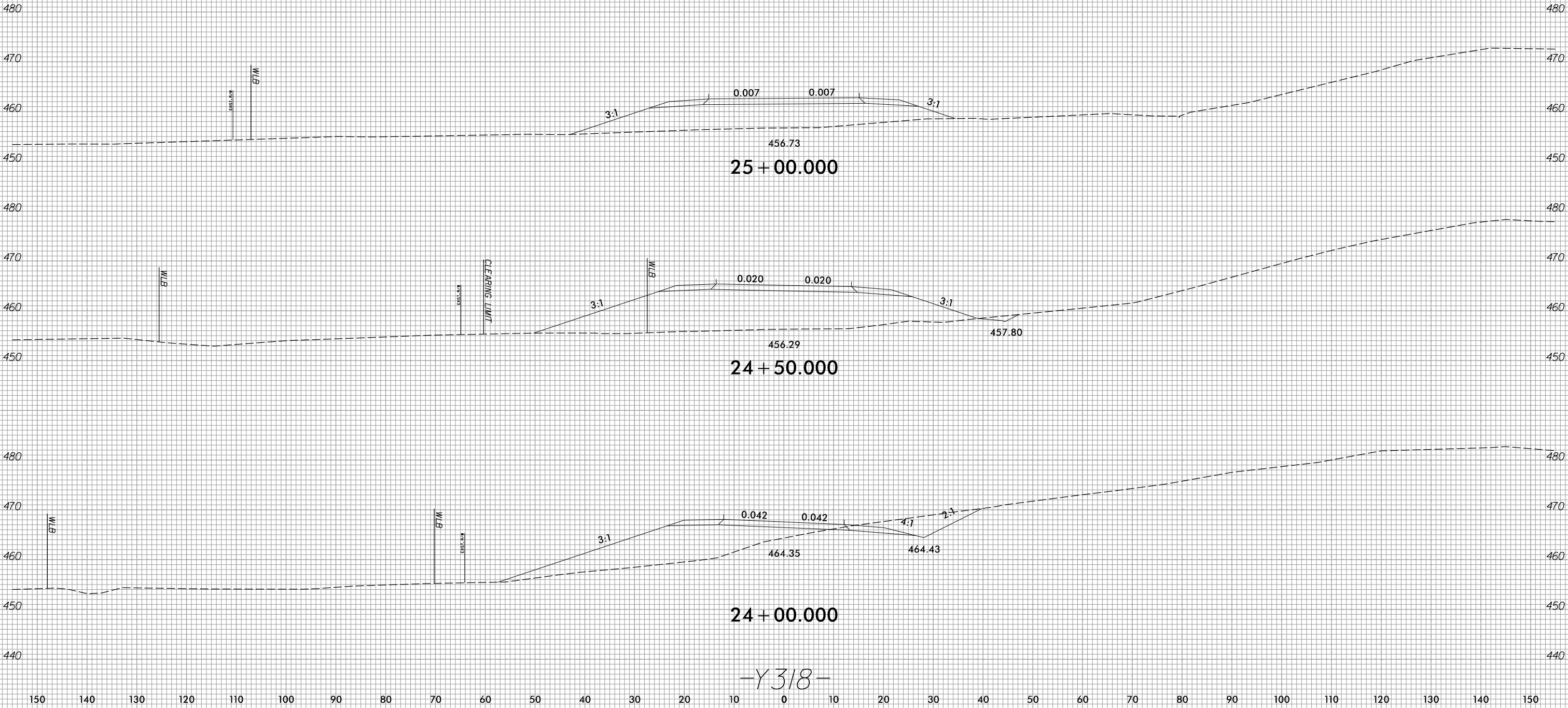
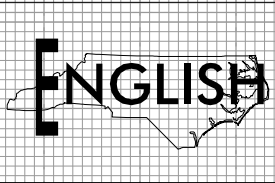
ENGLISH

8/23/99

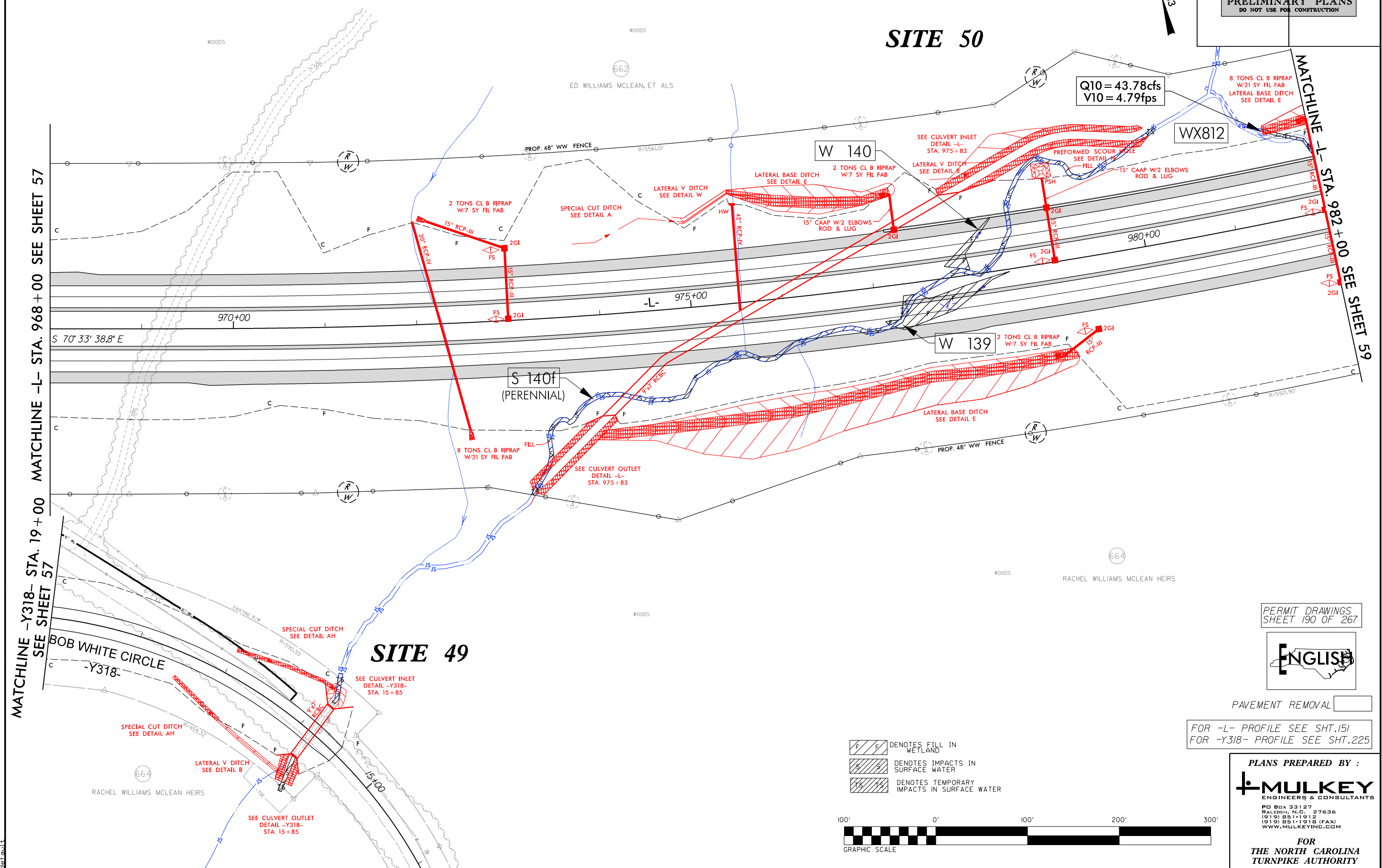
WETLAND CROSS SECTION

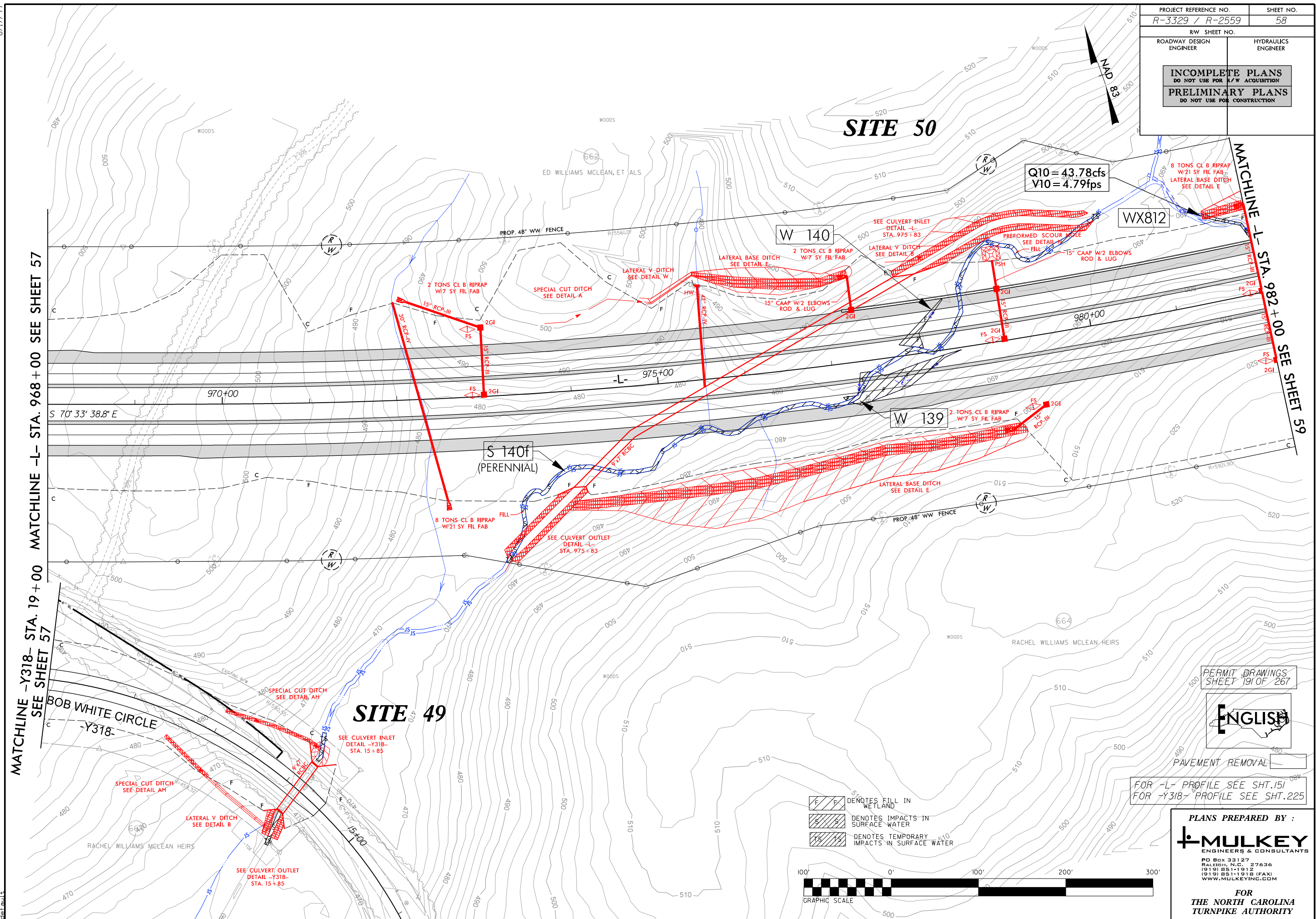
SITE 47

PERMIT DRAWINGS
SHEET 189 OF 267



-Y318-







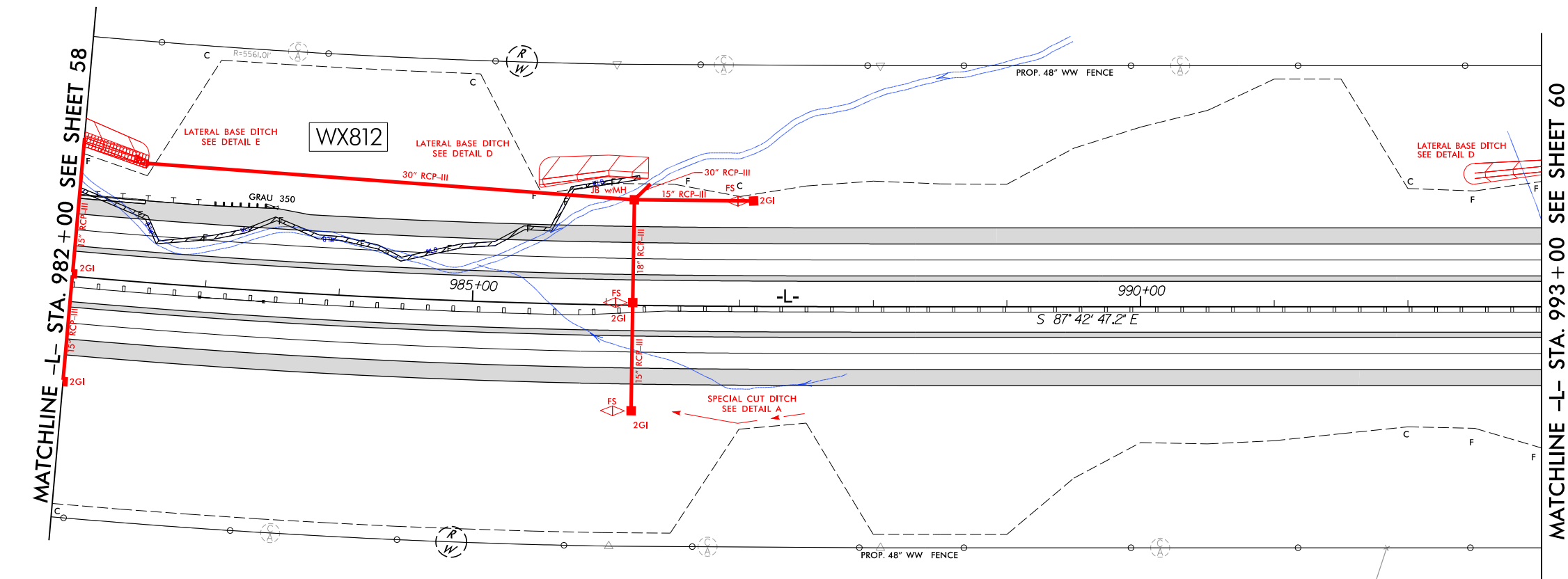
FOR -L- PROFILE SEE SHT.151

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TURNPIKE AUTHORITY



English

PLANS PREPARED BY :

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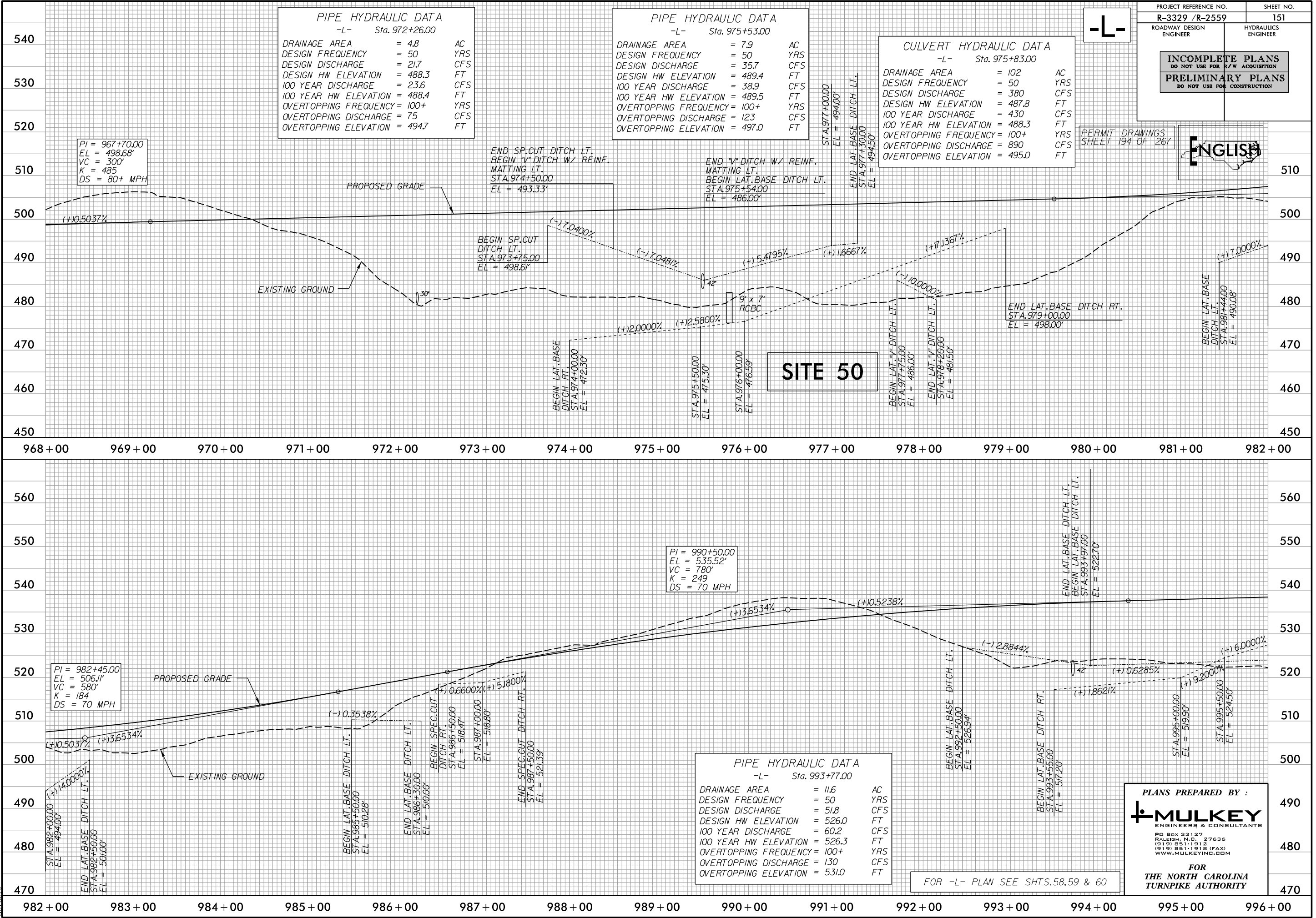
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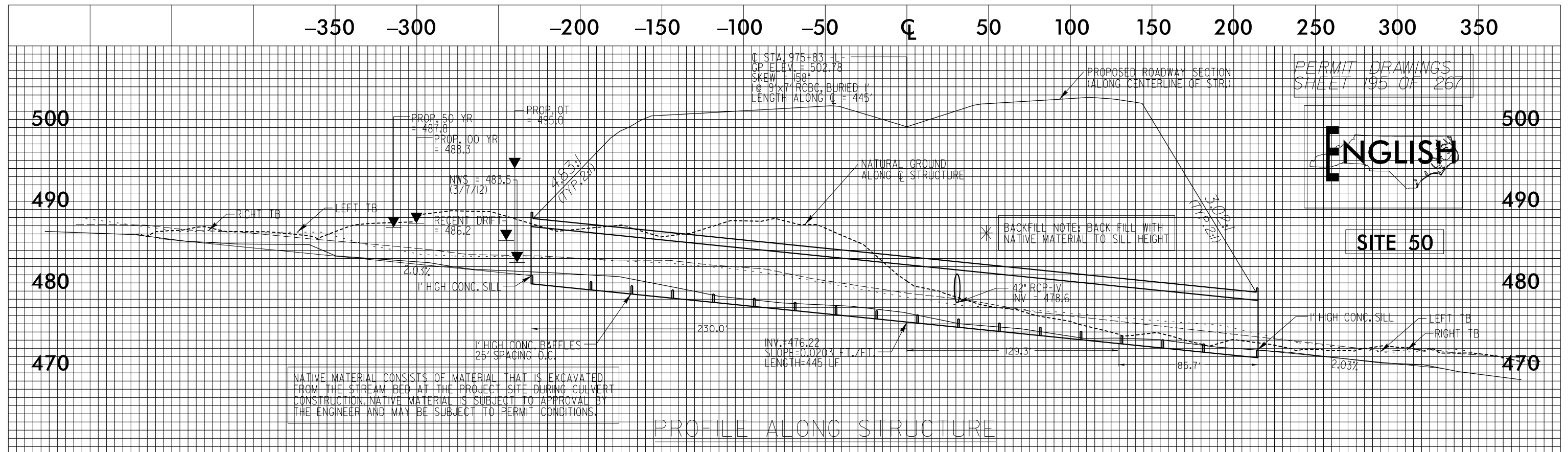
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THE NORTH CAROLINA
TURNPIKE AUTHORITY



5/28/99

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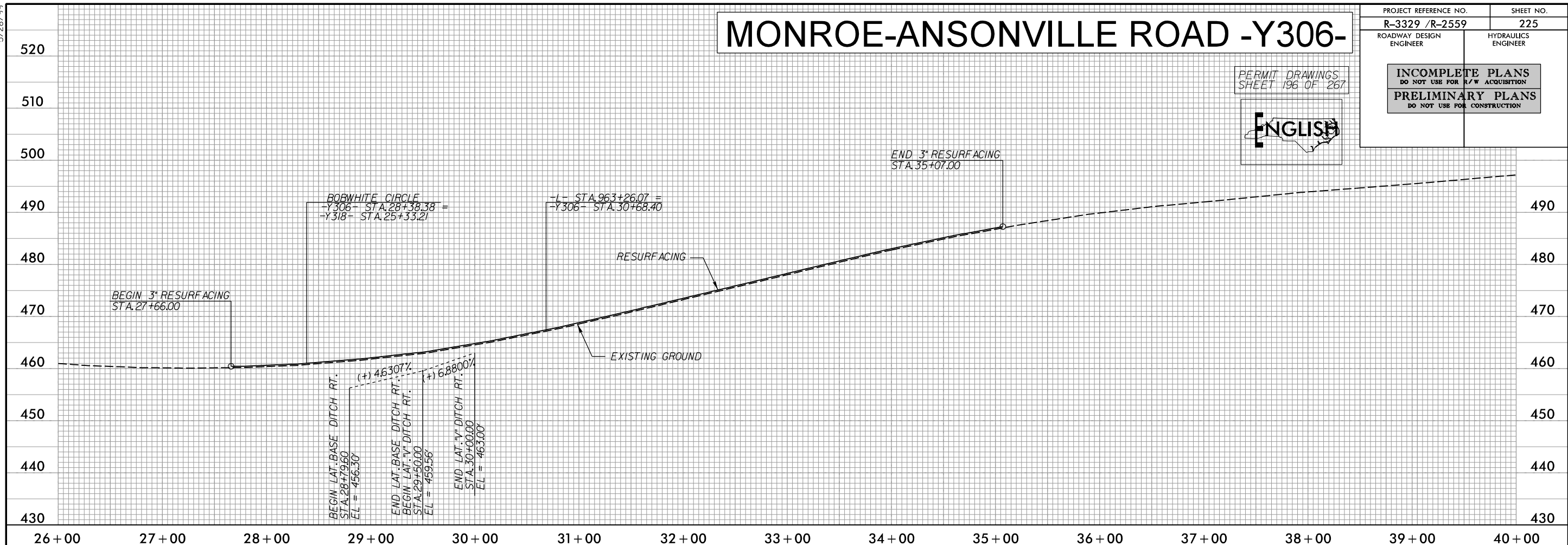
5/28/99

MONROE-ANSONVILLE ROAD -Y306-

PERMIT DRAWINGS
SHEET 196 OF 267

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-3329 /R-2559	225
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



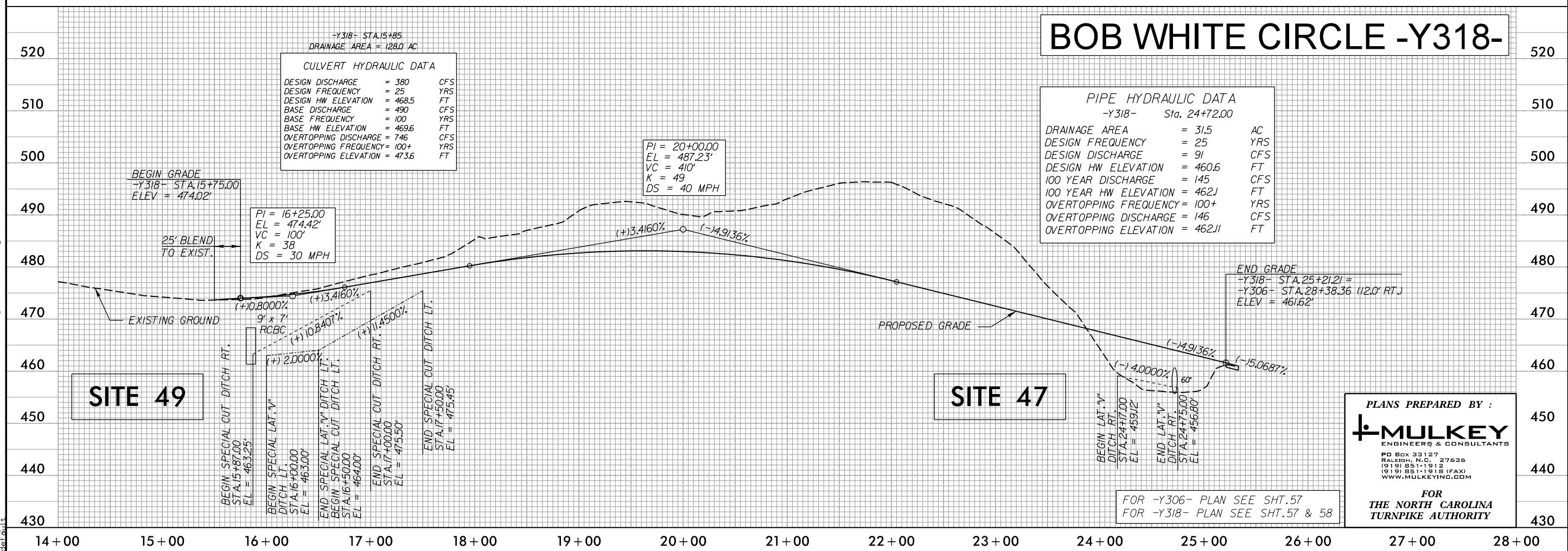
BOB WHITE CIRCLE -Y318-

-Y318- STA.15+85
DRAINAGE AREA = 128.0 AC

CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 380	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 468.5	FT
BASE DISCHARGE	= 490	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 469.6	FT
OVERTOPPING DISCHARGE	= 746	CFS
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING ELEVATION	= 473.6	FT

-Y318- Sta. 24+72.00

PIPE HYDRAULIC DATA		
DRAINAGE AREA	= 31.5	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 91	CFS
DESIGN HW ELEVATION	= 460.6	FT
100 YEAR DISCHARGE	= 145	CFS
100 YEAR HW ELEVATION	= 462.1	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 146	CFS
OVERTOPPING ELEVATION	= 462.11	FT



PLANS PREPARED BY :

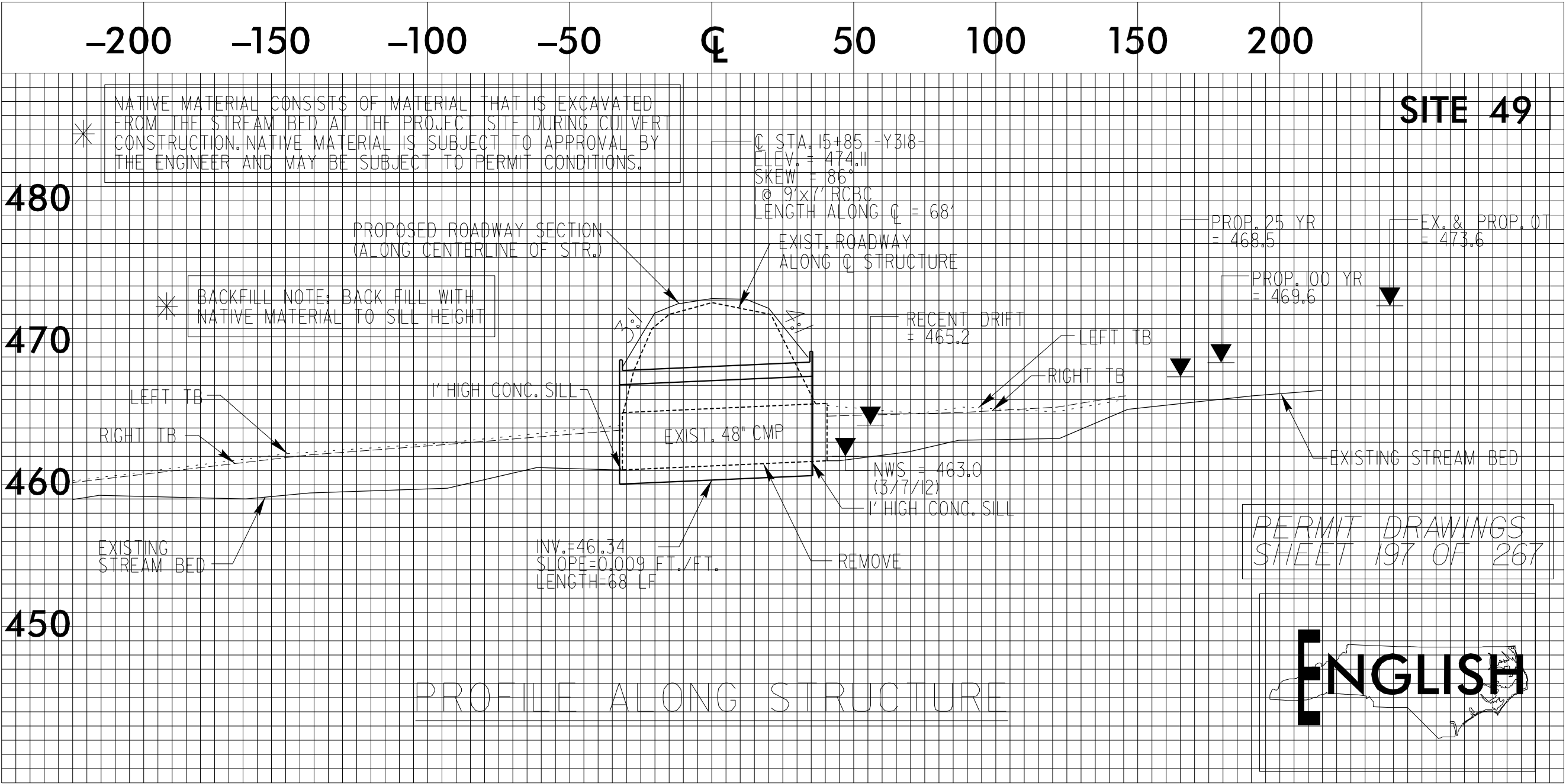
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FOR -Y306- PLAN SEE SHT.57
FOR -Y318- PLAN SEE SHT.57 & 58

8/22/2004
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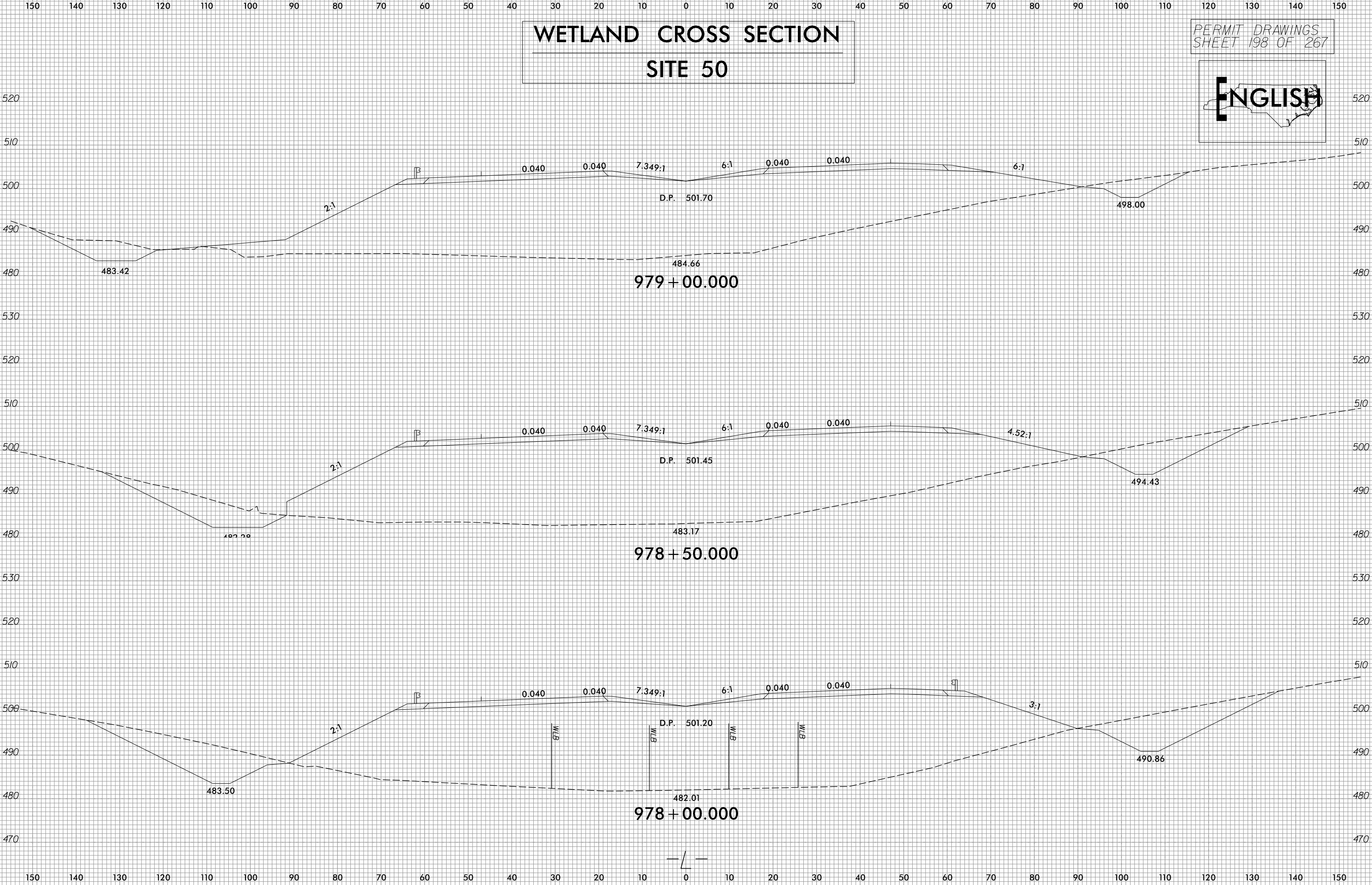
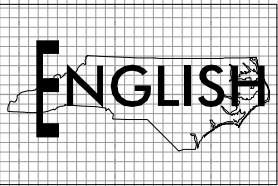


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WETLAND CROSS SECTION

SITE 50

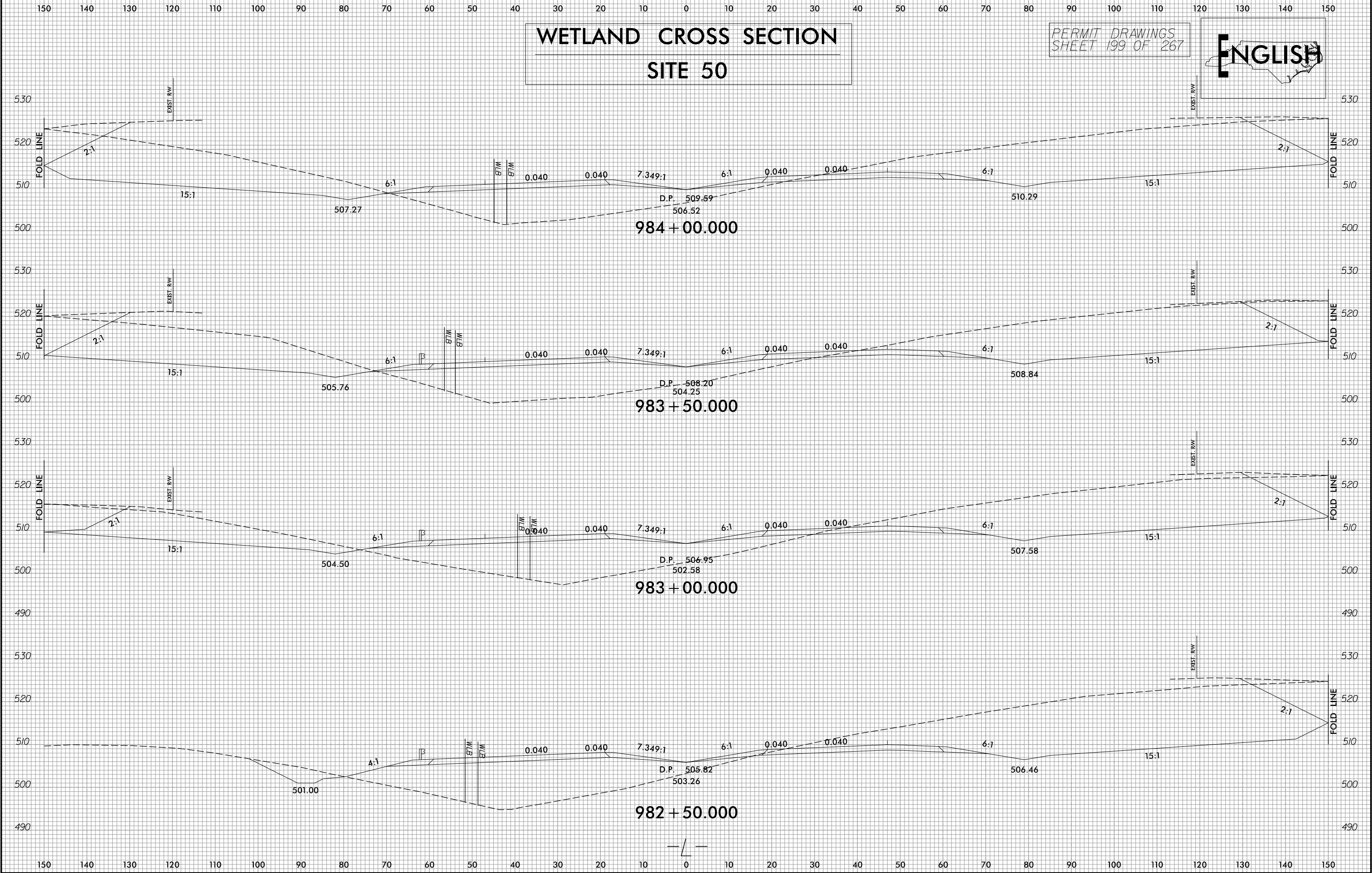
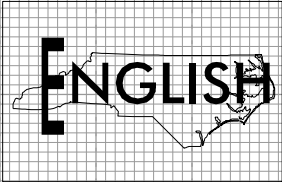
PERMIT DRAWINGS
SHEET 198 OF 267



8/23/99

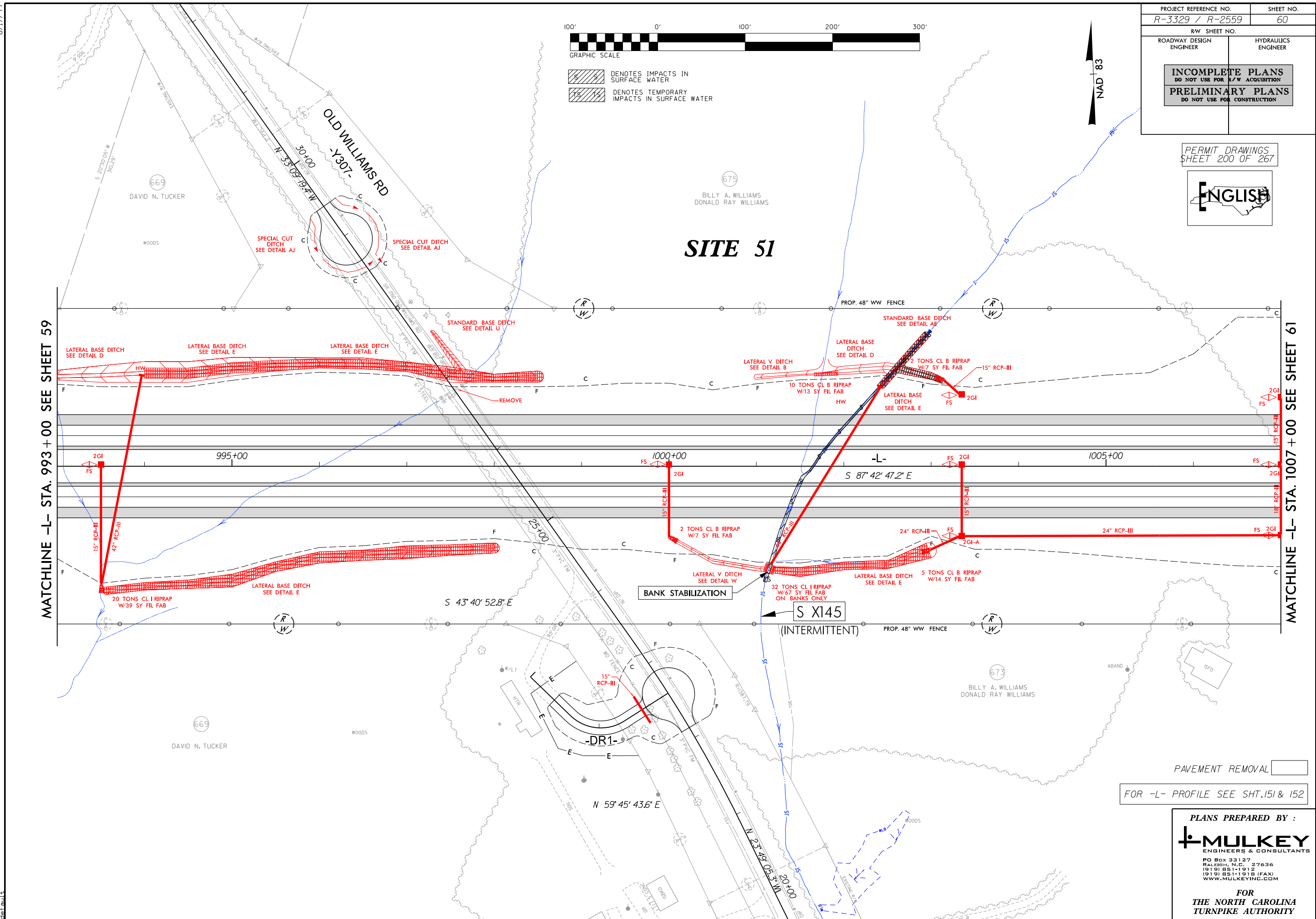
WETLAND CROSS SECTION SITE 50

PERMIT DRAWINGS
SHEET 199 OF 267



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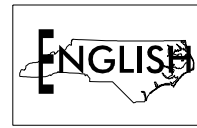


PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	60
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR A/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 200 OF 267

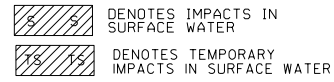


PAVEMENT REMOVAL

FOR -L- PROFILE SEE SHT. 151 & 152

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NAD 83

SITE 51

MATCHLINE -L- STA. 993+00 SEE SHEET 59

WATCHLINE -L- STA. 1007+00 SEE SHEET 61

PAVEMENT REMOVAL

FOR -L- PROFILE SEE SHT.151 & 152

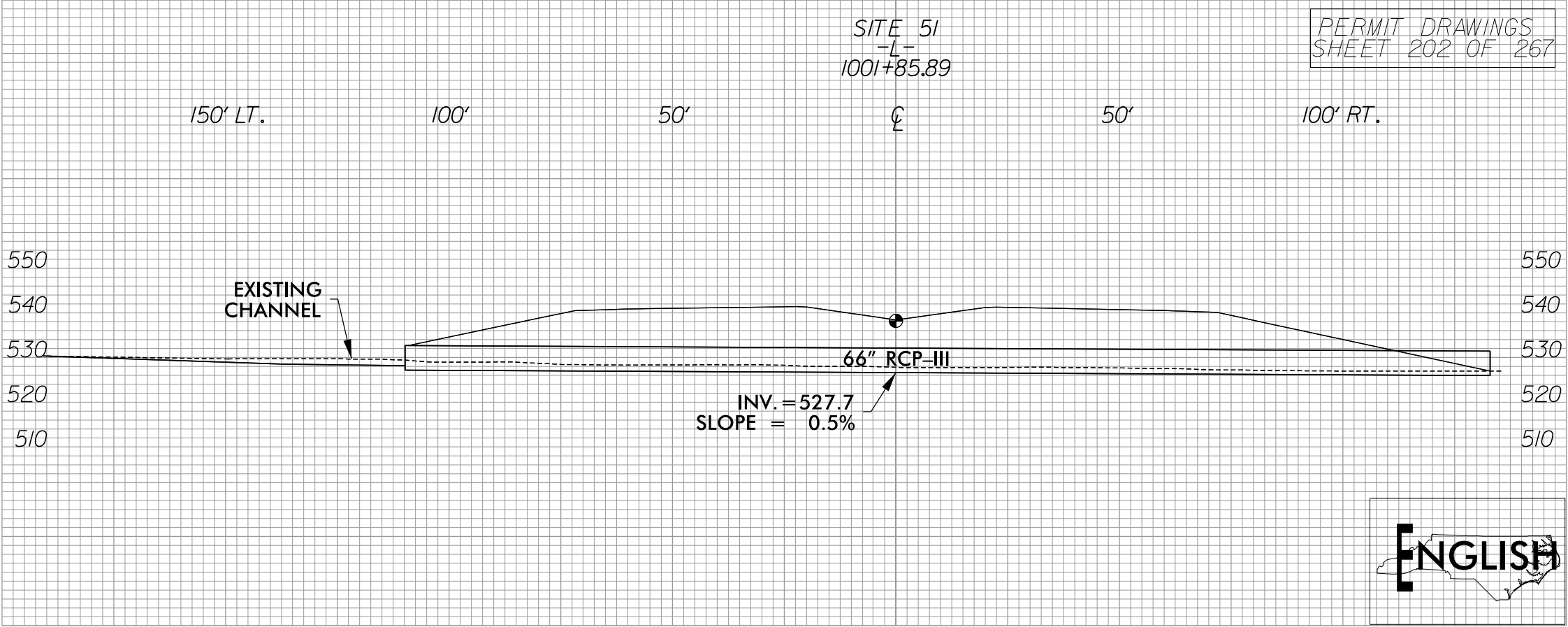
PLANS PREPARED BY :



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WATCHLINE -L- STA. 1007+00 SEE SHEET 61

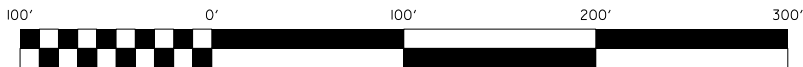
PLANS PREPARED BY :

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- DENOTES IMPACTS IN SURFACE WATER (POND)
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NOTE:
INFORMATION PROVIDED ON
THIS SHEET IS FROM
INTERCHANGE PLAN SHEET 62
SEE PERMIT SHEET 150

NAD 83

MATCHLINE -L- STA. 993+00 SEE SHEET 59

SITE 52

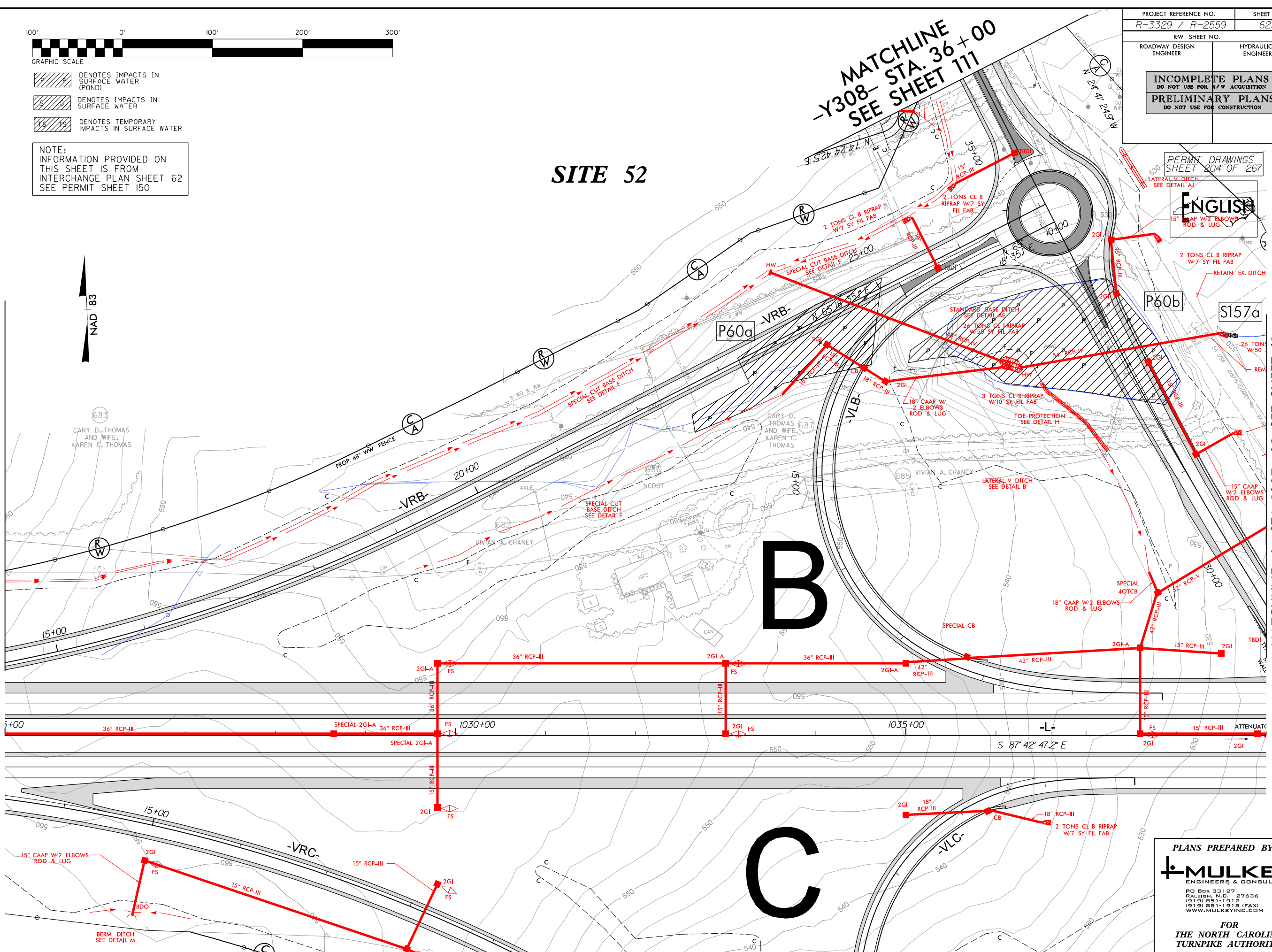
MATCHLINE
-Y308- STA. 36+00
SEE SHEET 111

PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 62A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PERMIT DRAWINGS
SHEET 204 OF 267

ENGLISH

MATCHLINE -L- STA. 1007+00 SEE SHEET 61



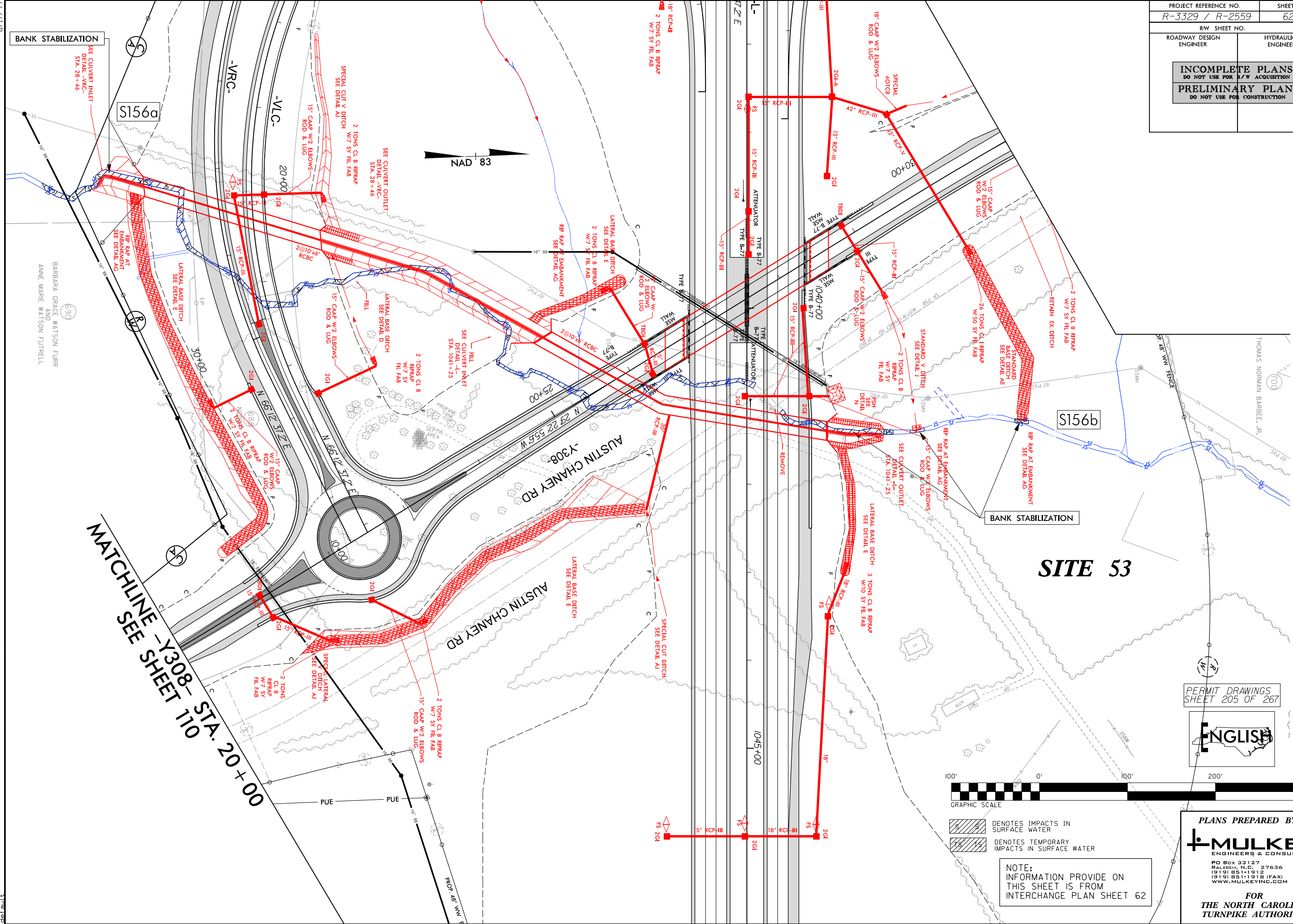
PLANS PREPARED BY :

MULKEY
ENGINEERS & CONSULTANTS

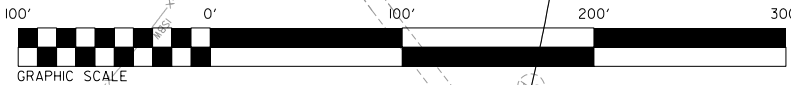
PO BOX 33127
RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

8/22/2014 R:\Hydraulics\Permit Environmental\3329_R2559_hyd.prm_PSH_062A.con.dgn



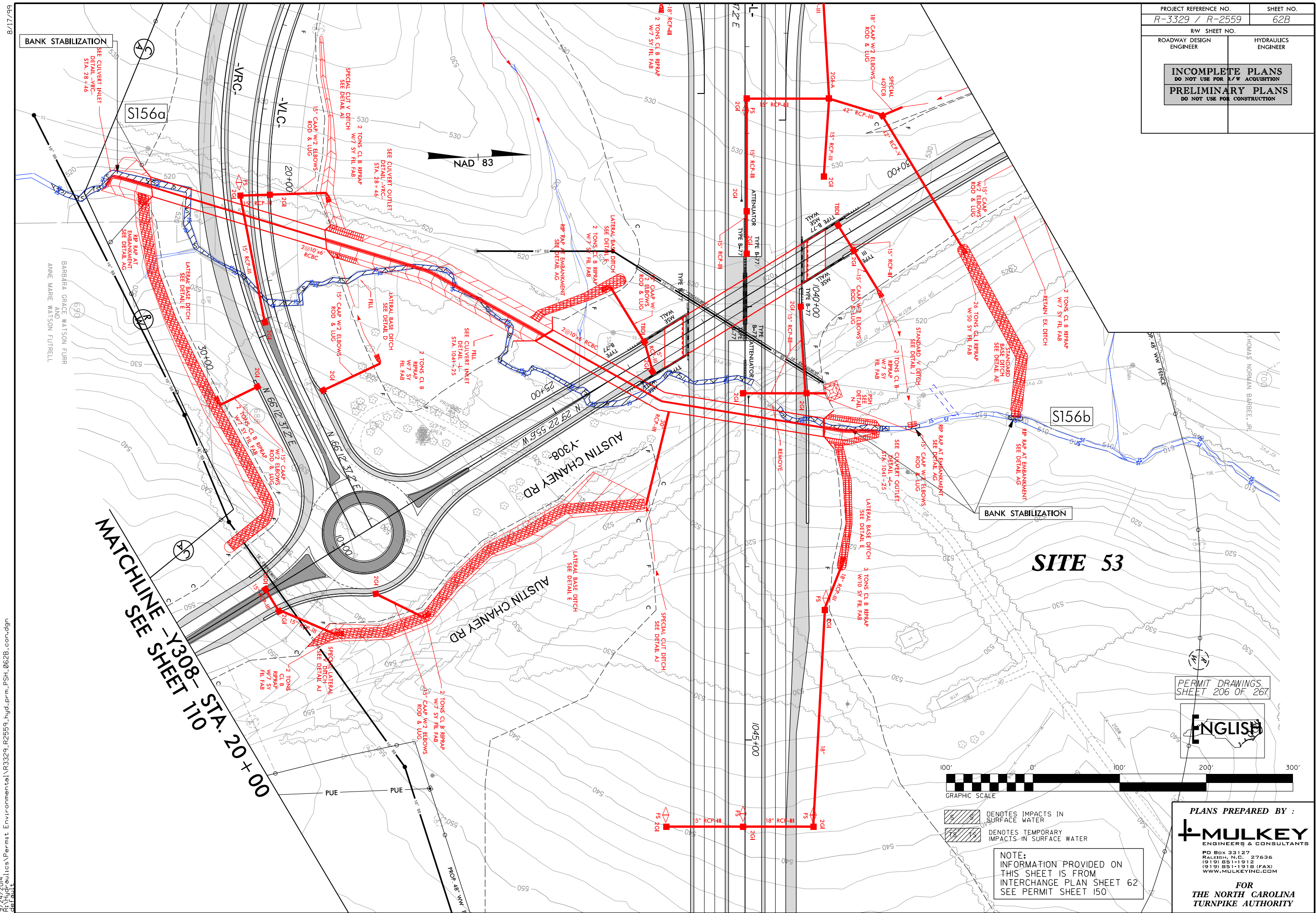
PERMIT DRAWINGS
SHEET 205 OF 267

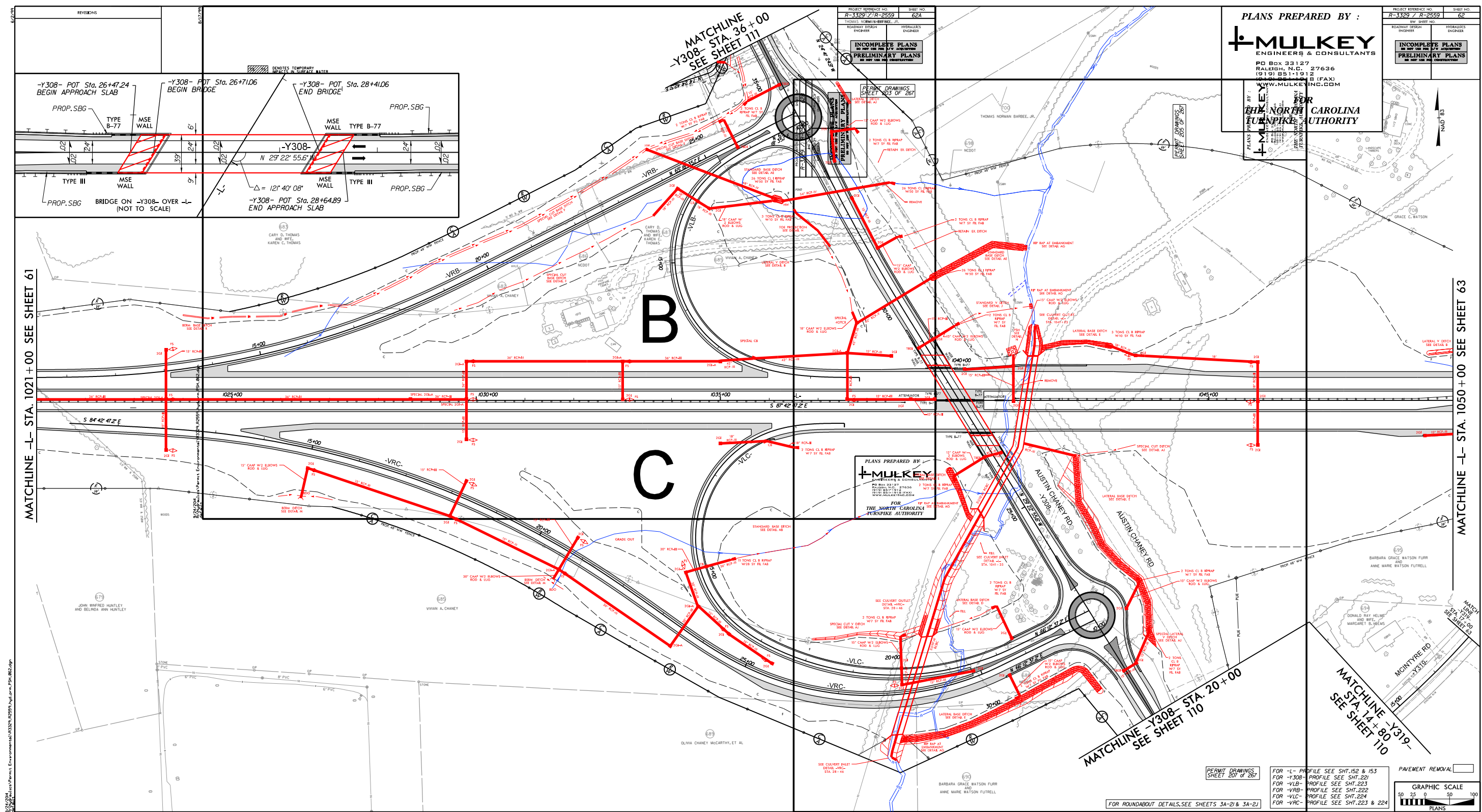


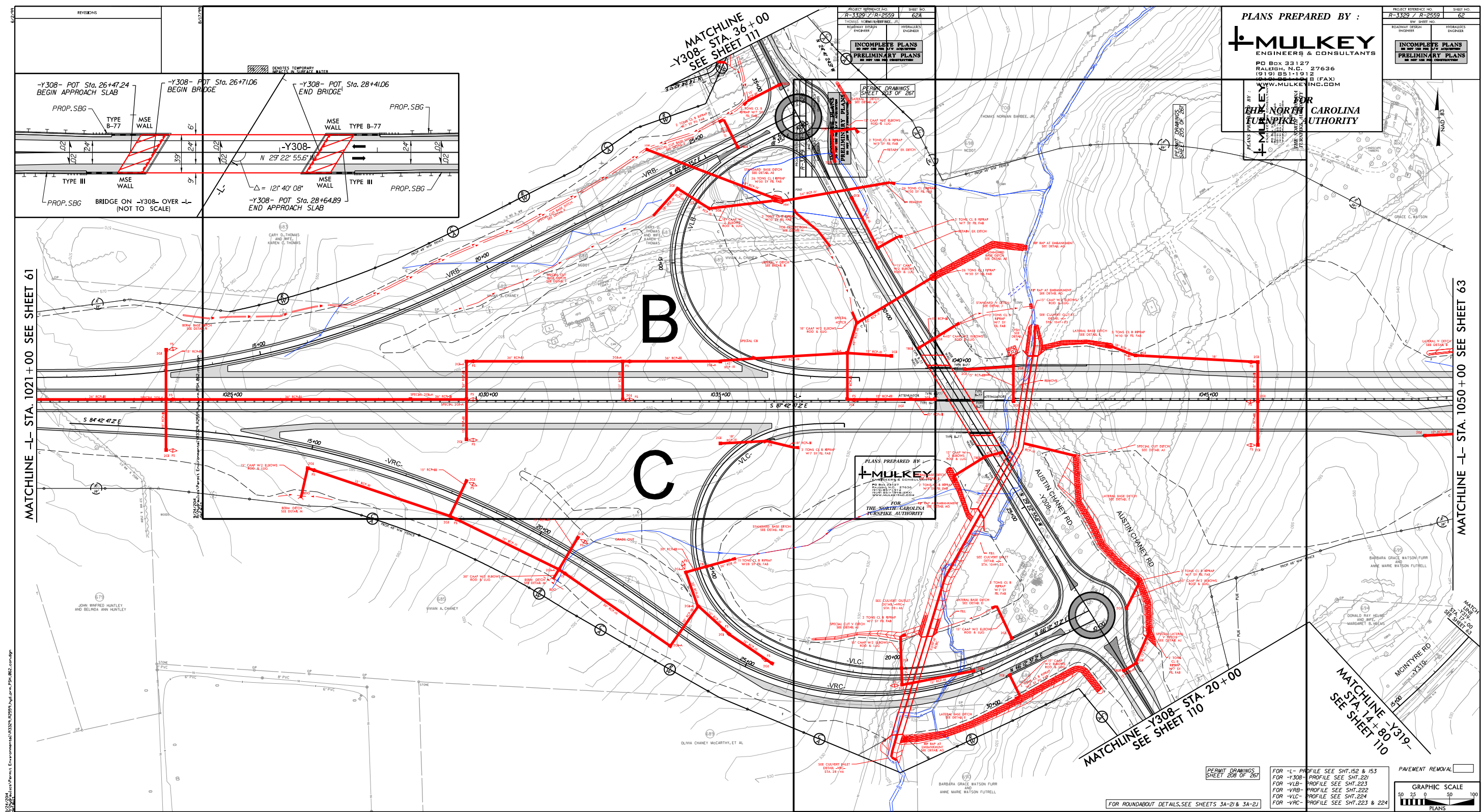
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NOTE:
INFORMATION PROVIDE ON
THIS SHEET IS FROM
INTERCHANGE PLAN SHEET 62

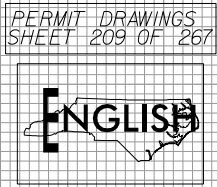
PLANS PREPARED BY :
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R:\Hydraulics\Permit Environmental\R3329_R2559_hyd_PFL-153.dgn



PROJECT REFERENCE NO.		SHEET NO.	
R-3329 /R-2559		153	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

PLANS PREPARED BY :

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ENGINEERS & CONSULTANTS

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RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
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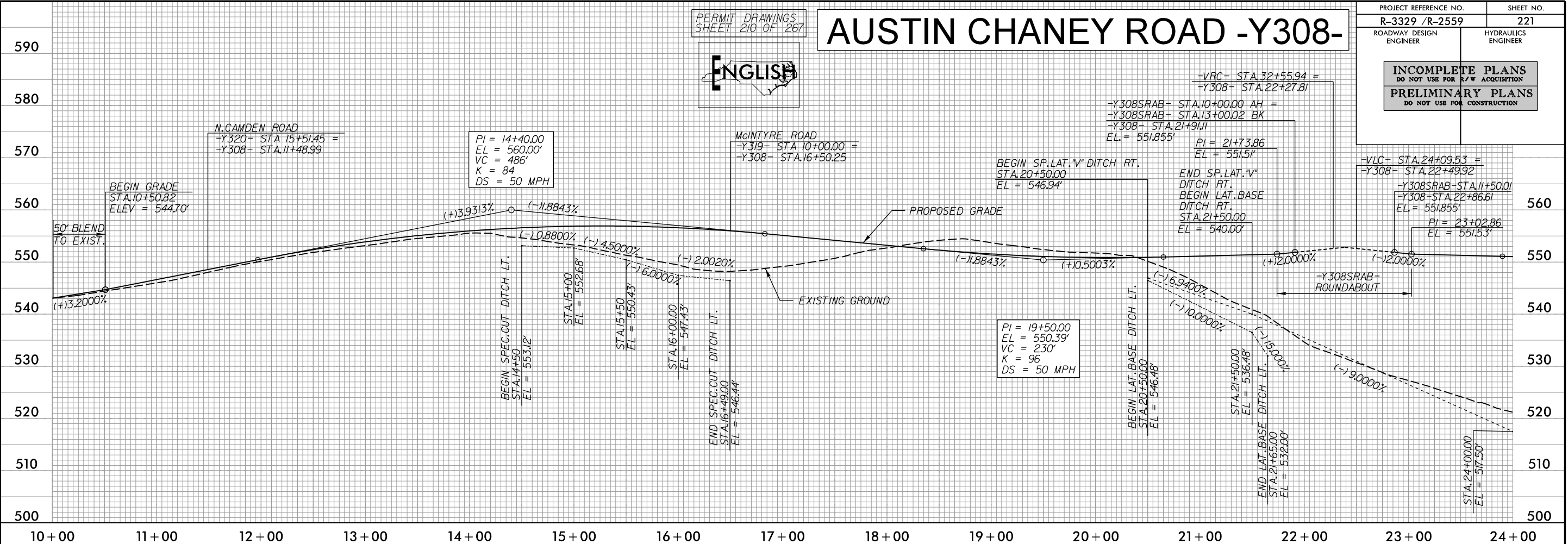
FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

5/28/99

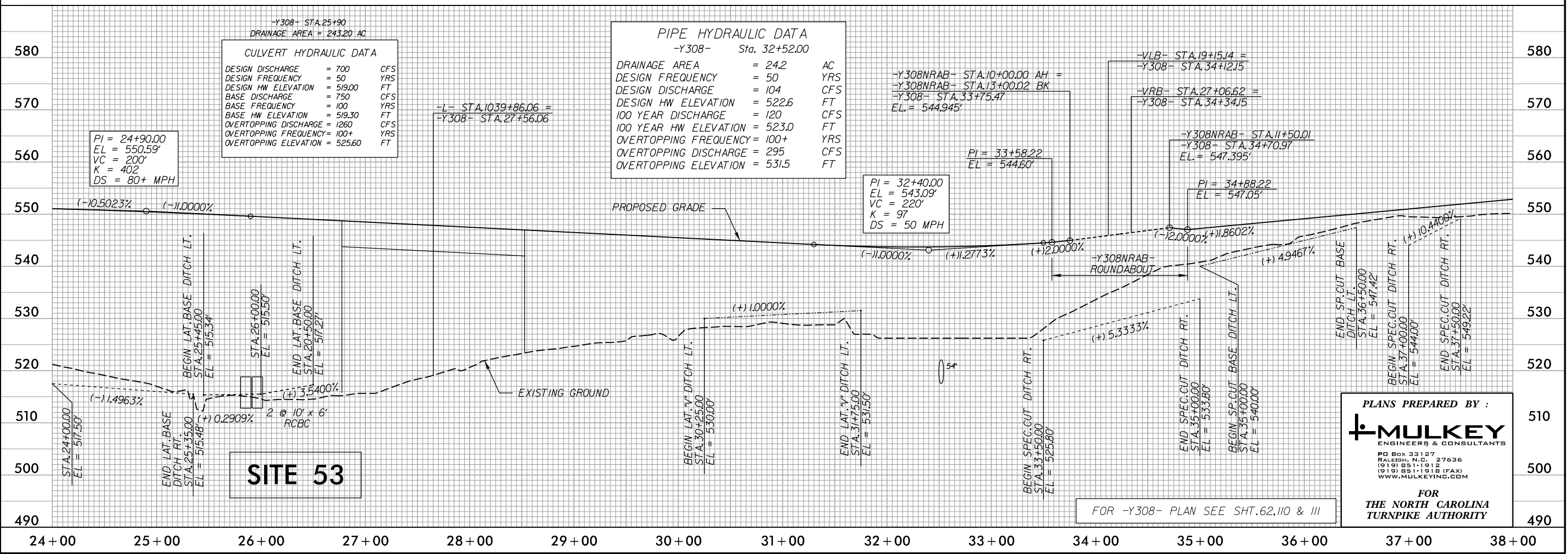
PERMIT DRAWINGS
SHEET 210 OF 267

AUSTIN CHANEY ROAD -Y308-

PROJECT REFERENCE NO.	SHEET NO.
R-3329 /R-2559	221
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



8/22/2004 R:\mulkey\Permit Environmental\R3329_R2559_hyd_PFL_221.dgn



PLANS PREPARED BY :

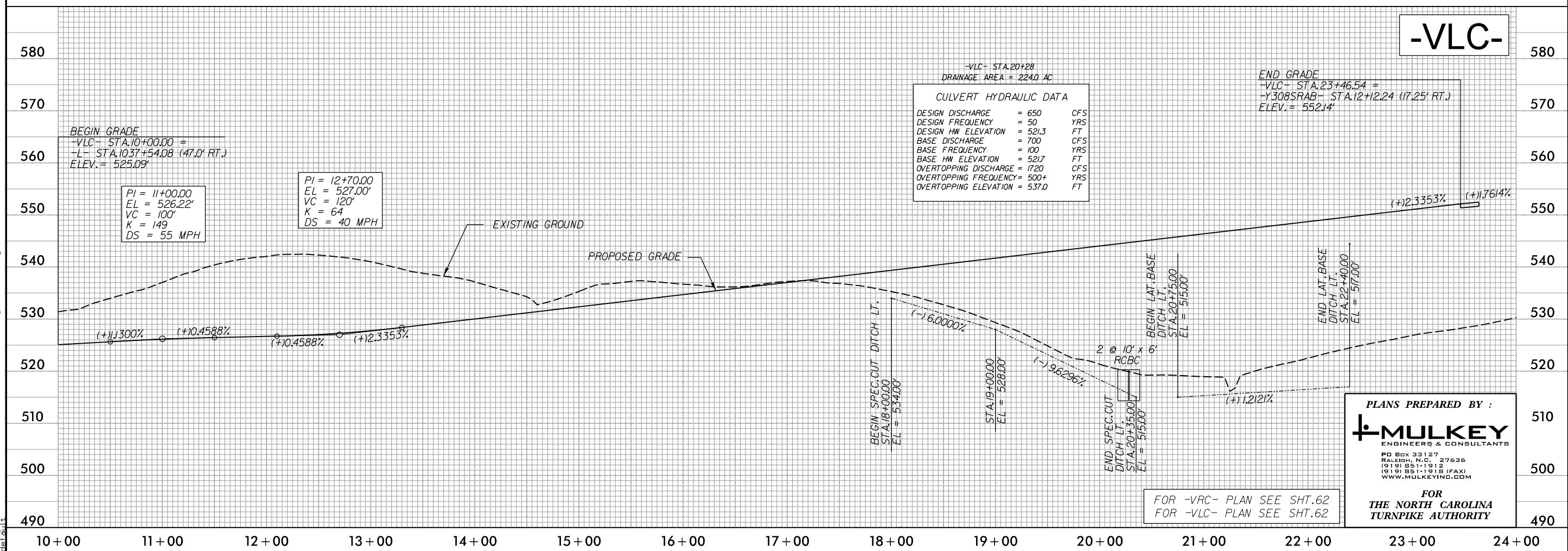
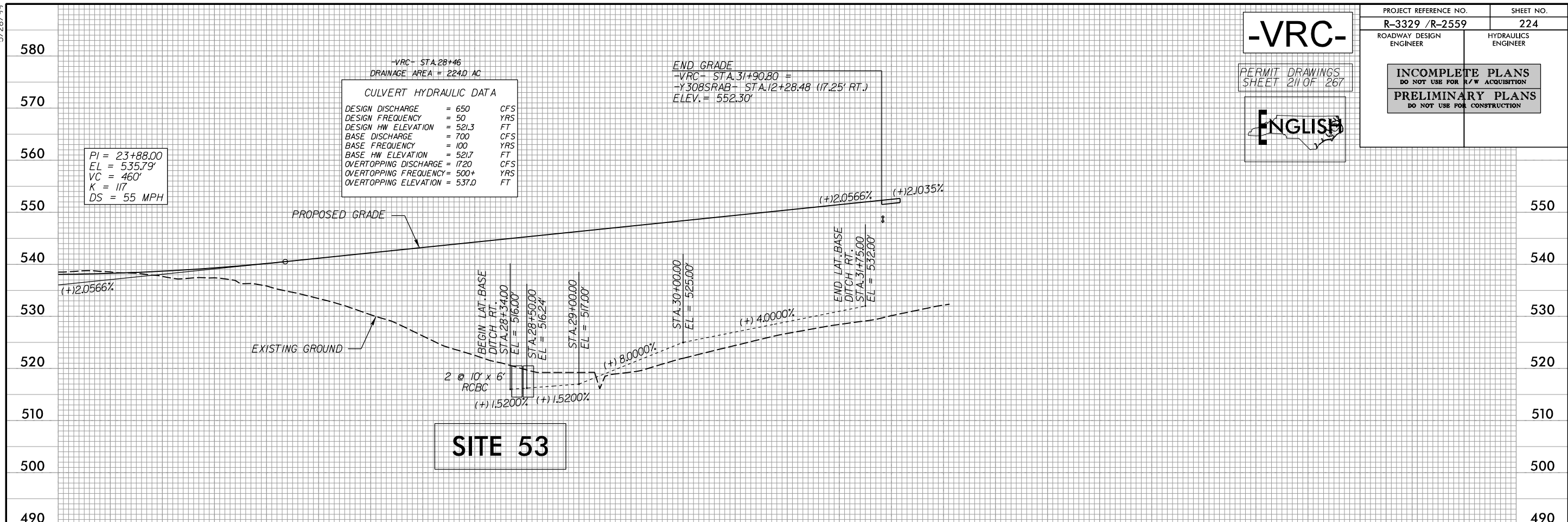
MULKEY
ENGINEERS & CONSULTANTS

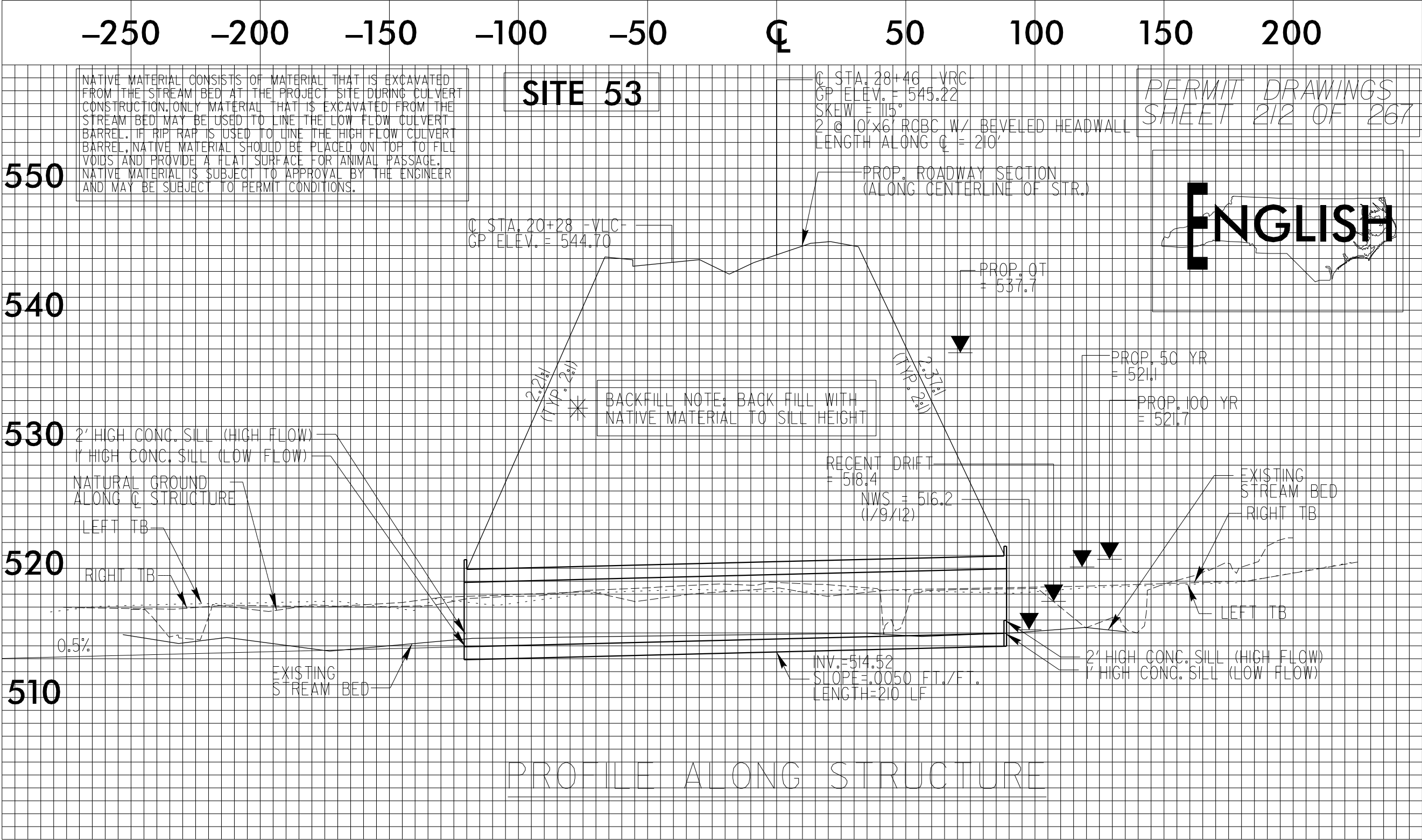
PO Box 33127
RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

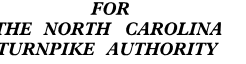
FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

5/28/99

8/22/2004
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default

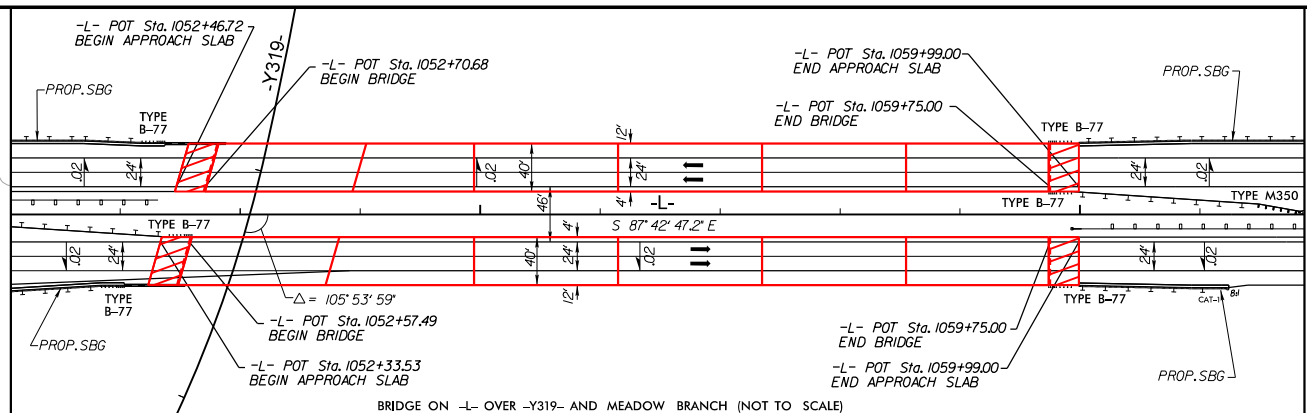
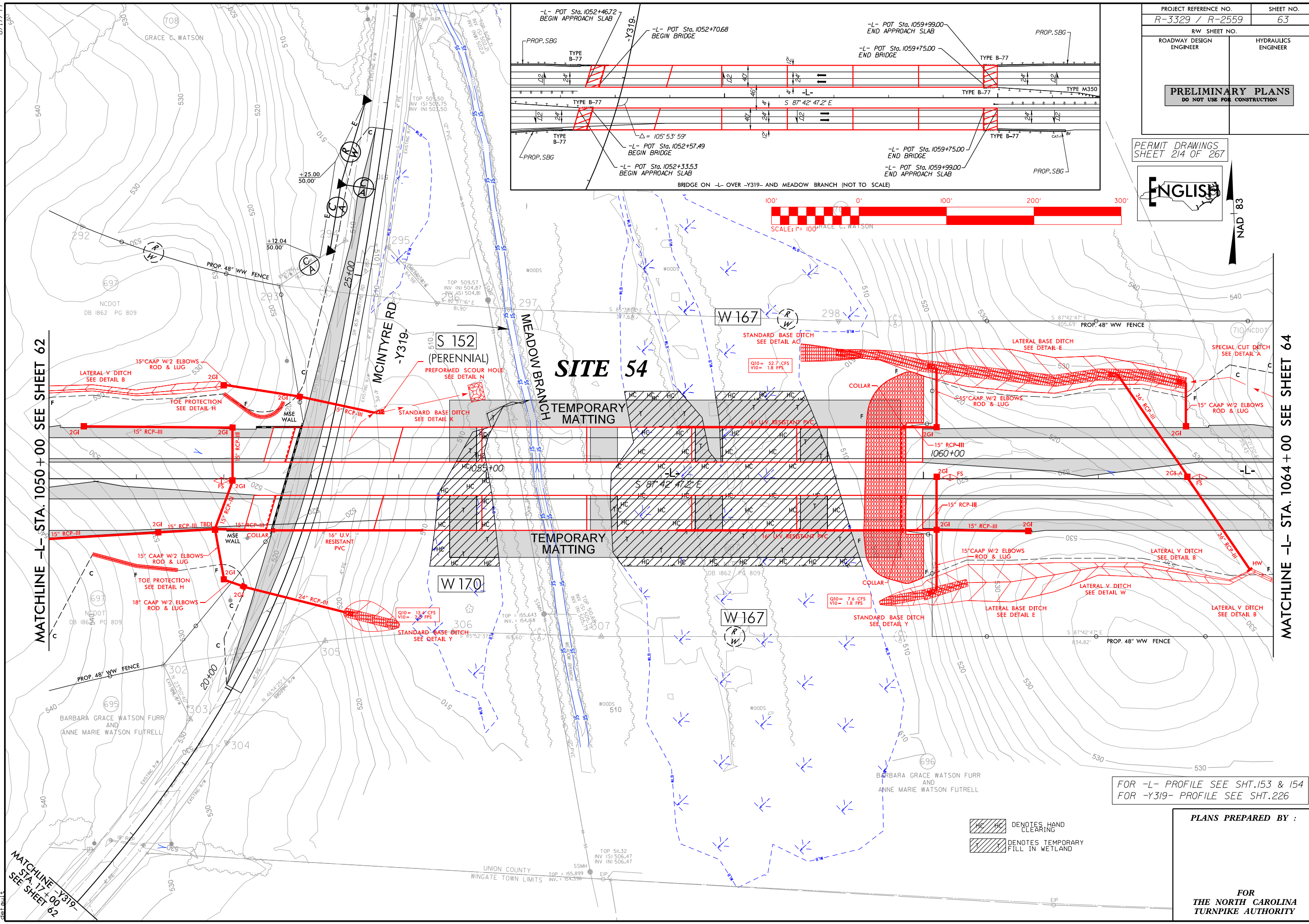






9/24/2014
P:\Hydraulics\Permit Environmental\R3329_R2559_Hyd_Wet_PSH_063.dgn

8/17/99
8/24/2014
R:\Hydraulics\Permit Environmental\R3329_R2559_Hyd.Wet.PSH.063.Contours.dgn



PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	63
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 214 OF 267



FOR -L- PROFILE SEE SHT.153 & 154
FOR -Y319- PROFILE SEE SHT.226

PLANS PREPARED BY :

HC HC DENOTES HAND
CLEARING
HC HC DENOTES TEMPORARY
FILL IN WETLAND

FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY



PLANS PREPARED BY :

MULKEY
ENGINEERS & CONSULTANTS

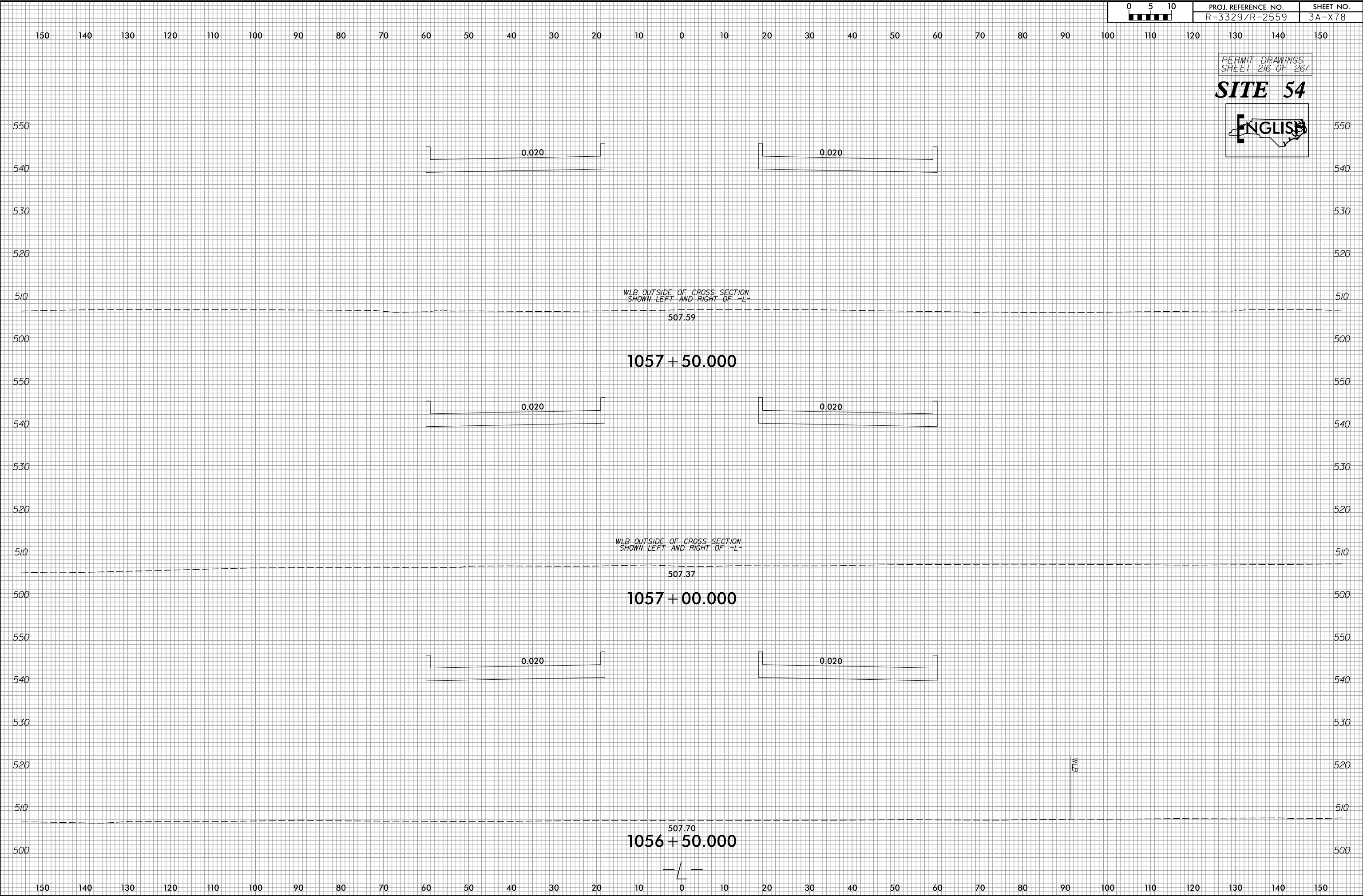
PO Box 33127
RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

8/23/99

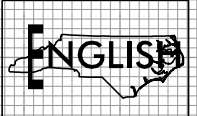
9/22/2014
R:\Hydraulics\Permit Environmental\R3329_R2559_Hyd_Wet.xpl.L3A.dgn
Default

0510	PROJ. REFERENCE NO. R-3329/R-2559	SHEET NO. 3A-X78
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PERMIT DRAWINGS
SHEET 216 OF 267

SITE 54



CONTRACT: C202587



MATTHEWS

NOTES:

1. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.
2. THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.
3. A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF MATTHEWS, INDIAN TRAIL, HEMBY BRIDGE, LAKE PARK, MONROE, UNIONVILLE, WINGATE, AND MARSHVILLE.



*TTST 11% DUAL 7%
FUNCTIONAL CLASS.: FREEWAY

**LOCATION: US 74 BYPASS FROM US 74 JUST EAST OF
I-485 NEAR MATTHEWS AND STALLINGS TO
US 74 JUST EAST OF WINGATE AND WEST OF MARSHVILLE**

TYPE OF WORK: DESIGN-BUILD WETLAND AND STREAM IMPACTS

PERMIT DRAWING
SHEET 217 OF 267

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

**RK&K**

Stephen E. Roberts, P.E.
PROJECT DESIGN ENGINEER

OCTOBER 28, 2010



MONROE
BYPASS CONSTRUCTORS

P.E.

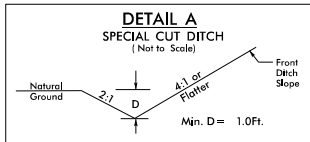
SIGNATURE:

ROADWAY DESIGN ENGINEER

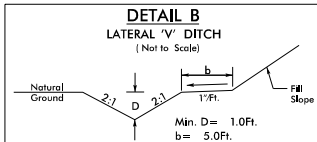
SIGNATURE: _____ *P.E.*



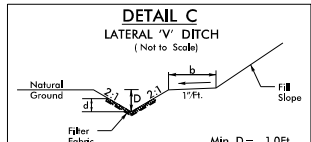
PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	3B-2E
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 218 OF 267	



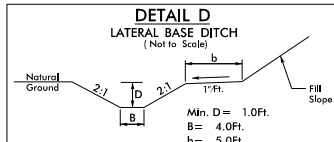
—L— STA. 1064+00 TO STA. 1071+50 LT
—L— STA. 1065+00 TO STA. 1066+50 RT
—L— STA. 1091+50 TO STA. 1095+00 LT
—L— STA. 1102+50 TO STA. 1106+50 RT
—L— STA. 1104+00 TO STA. 1107+00 LT
—L— STA. 1128+00 TO STA. 1134+50 RT
—L— STA. 1156+50 TO STA. 1158+50 LT
—Y309— STA. 12+50 TO STA. 13+50 RT
—Y309— STA. 28+00 TO STA. 29+50 RT
—Y309— STA. 30+50 TO STA. 32+00 RT
—Y310— STA. 13+18 TO STA. 14+50 LT
—Y310— STA. 33+00 TO STA. 35+00 LT
—Y310— STA. 39+50 TO STA. 39+92 LT
—Y310— STA. 38+50 TO STA. 40+50 RT
—Y313— STA. 14+74 TO STA. 15+50 LT
—Y313— STA. 14+91 TO STA. 15+50 RT
—Y314L— STA. 29+50 TO STA. 38+00 RT
—Y314L— STA. 30+50 TO STA. 31+00 LT
—Y314L— STA. 37+50 TO STA. 41+00 LT
—Y314R— STA. 16+50 TO STA. 18+00 LT
—Y315— STA. 11+92 TO STA. 14+50 RT
—Y314R— STA. 18+50 TO STA. 27+00 RT
—Y314R— STA. 23+50 TO STA. 25+85 LT
—Y314R— STA. 29+50 TO STA. 32+60 RT
—Y314R— STA. 33+00 TO STA. 37+50 RT
—Y316— STA. 17+00 TO STA. 20+50 RT
—Y316— STA. 13+00 TO STA. 15+00 RT
—Y316— STA. 24+20 TO STA. 25+50 RT
—DR2— STA. 10+25 TO STA. 10+50 RT
—DR2— STA. 10+25 TO STA. 10+50 LT



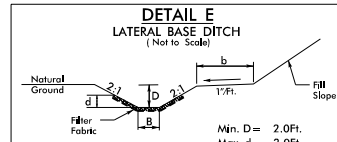
—L— STA. 1064+00 TO STA. 1065+00 RT
—L— STA. 1072+50 TO STA. 1073+50 LT
—L— STA. 1110+30 TO STA. 1112+00 LT
—L— STA. 1158+00 TO STA. 1159+51 RT
—Y309— STA. 15+82 TO STA. 16+70 RT
—Y309— STA. 16+63 TO STA. 17+19 LT
—Y309— STA. 25+35 TO STA. 28+00 RT
—Y310— STA. 22+80 TO STA. 24+50 RT
—Y310— STA. 29+00 TO STA. 33+00 LT
—Y311— STA. 21+00 TO STA. 26+82 RT
—Y314R— STA. 15+50 TO STA. 16+50 LT
—Y315— STA. 15+01 TO STA. 16+50 LT
—Y316— STA. 11+50 TO STA. 13+00 RT
—Y316— STA. 20+50 TO STA. 21+20 RT
—Y316— STA. 25+50 TO STA. 29+00 RT



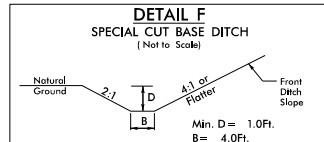
—L— STA. 1137+00 TO STA. 1137+50 LT
Type of Liner = Class B Rip-Rap
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
b = 5.0 Ft.



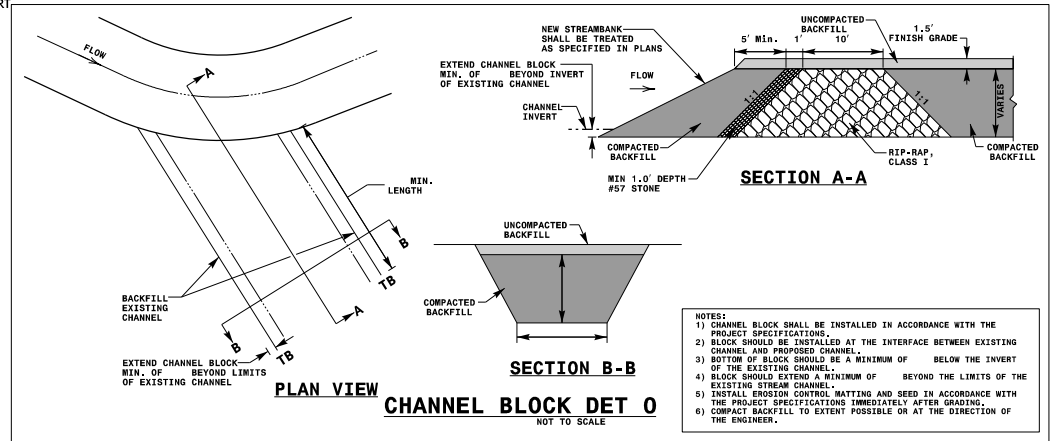
—L— STA. 1071+50 TO STA. 1072+50 LT
—L— STA. 1072+50 TO STA. 1073+95 RT
—L— STA. 1074+00 TO STA. 1076+00 RT
—L— STA. 1095+30 TO STA. 1096+50 RT
—L— STA. 1097+00 TO STA. 1097+94 LT
—L— STA. 1106+50 TO STA. 1111+50 RT
—L— STA. 1108+00 TO STA. 1110+30 LT
—L— STA. 1140+00 TO STA. 1141+50 RT
—L— STA. 1159+00 TO STA. 1162+70 LT
—L— STA. 1161+80 TO STA. 1164+00 RT
—L— STA. 1198+50 TO STA. 1200+00 RT
—L— STA. 1201+41 TO STA. 1205+50 LT
—Y309— STA. 17+00 TO STA. 18+50 RT
—Y309— STA. 20+00 TO STA. 21+00 RT
—Y309— STA. 22+00 TO STA. 23+49 RT
—Y310— STA. 16+50 TO STA. 19+68 LT
—Y310— STA. 21+00 TO STA. 25+60 LT
—Y310— STA. 27+30 TO STA. 29+00 LT
—Y310— STA. 27+50 TO STA. 31+25 RT
—Y311— STA. 10+50 TO STA. 18+50 LT
—Y311— STA. 23+00 TO STA. 24+38 LT
—Y311— STA. 11+00 TO STA. 17+65 RT
—Y313— STA. 17+00 TO STA. 22+50 LT
—Y313— STA. 18+50 TO STA. 22+77 RT
—Y315— STA. 16+50 TO STA. 18+66 LT
—Y316— STA. 29+00 TO STA. 29+72 RT



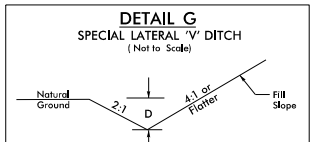
—L— STA. 1076+00 TO STA. 1076+50 RT
—L— STA. 1159+51 TO STA. 1161+80 RT
—L— STA. 1164+00 TO STA. 1165+00 RT
—L— STA. 1201+93 TO STA. 1206+00 RT
—Y309— STA. 18+50 TO STA. 20+00 RT
—Y309— STA. 21+00 TO STA. 22+00 RT
Type of Liner = Class B Rip-Rap
Min. D = 2.0 Ft.
Max. d = 2.0 Ft.
B = 4.0 Ft.
b = 5.0 Ft.
*When B is < 6.0'



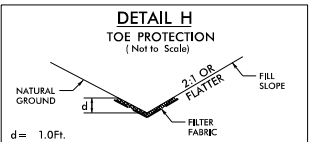
—L— STA. 1140+00 TO STA. 1141+20 LT
—L— STA. 1194+50 TO STA. 1198+50 RT
—Y311— STA. 24+38 TO STA. 27+00 LT



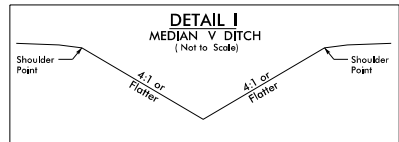
DETAIL O NOT USED IN SECTION 3B



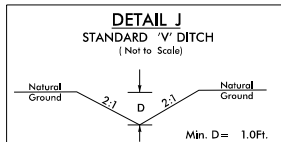
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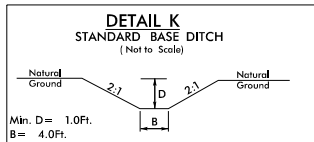
—L— STA. 1096+50 TO STA. 1098+50 LT
—L— STA. 1201+00 TO STA. 1201+78 RT
—L— STA. 1166+00 TO STA. 1167+65 RT
—Y314L— STA. 24+85 TO STA. 28+00 RT
—Y31R— STA. 11+00 TO STA. 12+50 LT
Type of Liner = Class B Rip-Rap



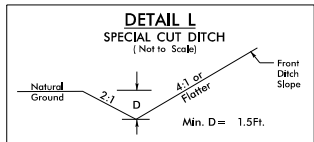
—L— STA. 1091+50 TO STA. 1094+00 MED
—L— STA. 1104+50 TO STA. 1106+50 MED
—L— STA. 1130+00 TO STA. 1135+50 MED
—L— STA. 1157+50 TO STA. 1159+50 MED
—L— STA. 1201+50 TO STA. 1203+00 MED
—L— STA. 1219+50 TO STA. 1223+00 MED



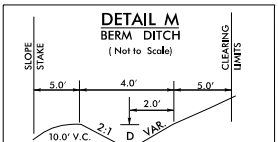
—L— STA. 1092+50 TO STA. 1094+50 LT
—L— STA. 1127+50 LT; L=85', S=0.47%
BEG EL=590.40, END EL. 590.0
—L— STA. 1149+50 LT; L=120', S=0.79%
BEG EL=579.65, END EL. 578.7
—L— STA. 1186+11 TO STA. 1188+00 RT



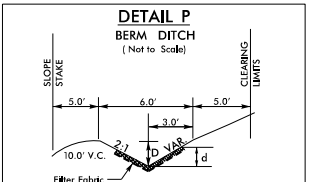
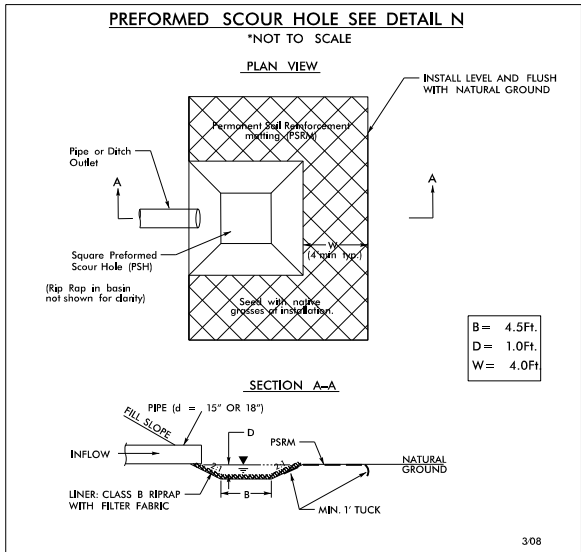
—L— STA. 1067+50 RT; L=182', S=0.55%
BEG EL=531.0, END EL. 530.0
—L— STA. 1068+00 LT; L=101', S=9.85%
BEG EL=543.2, END EL. 532.6
—L— STA. 1071+23 RT; L=89', S=0.90%
BEG EL=533.8, END EL. 533.0
—L— STA. 1072+50 LT; L=82', S=10.00%
BEG EL=543.2, END EL. 535.0
—L— STA. 1094+50 TO STA. 1096+50 LT
—L— STA. 1094+50 RT; L=20', S=0.55%
BEG EL=555.4, END EL. 555.3
—L— STA. 1095+30 RT; L=24', S=0.50%
BEG EL=554.9, END EL. 554.8
—L— STA. 1103+35 TO STA. 1108+00 LT
—L— STA. 1131+00 LT; L=150', S=1.09%
BEG EL=584.4, END EL. 582.8
—L— STA. 1137+50 LT; L=320', S=0.60%
BEG EL=585.4, END EL. 583.5
—L— STA. 1147+54 TO STA. 1148+57 RT
—L— STA. 1194+50 TO STA. 1197+00 RT
—L— STA. 1198+42 LT; L=41', S=4.63%
BEG EL=519.5, END EL. 517.6
—L— STA. 1211+80 LT; L=40', S=1.03%
BEG EL=537.1, END EL. 536.7
—L— STA. 1216+57 LT; L=40', S=0.30%
BEG EL= 541.1, END EL. 540.9
—Y310— STA. 19+56 TO STA. 19+68 LT
—Y310— STA. 24+30 LT; L=150', S=3.03%
BEG EL=585.95, END EL. 581.4
—Y311— STA. 18+75 TO STA. 19+00 RT
—Y314L— STA. 31+00 LT; L=305', S=0.75%
BEG EL=563.5, END EL. 561.2
—Y314R— STA. 25+85 LT; L=279', S=0.36%
BEG EL=565.1, END EL. 564.1
—Y314R— STA. 30+00 TO STA. 31+31 LT
—Y314R— STA. 33+00 TO STA. 34+35 LT



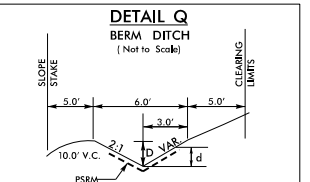
DETAIL L NOT USED IN SECTION 3B



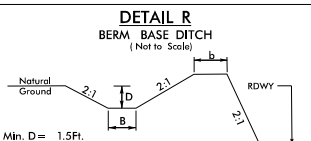
—L— STA. 1120+50 TO STA. 1124+50 RT



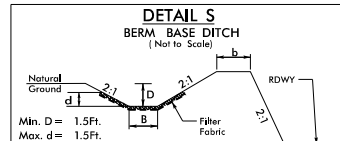
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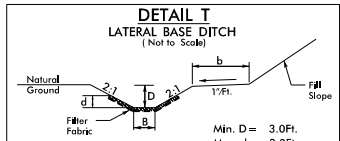
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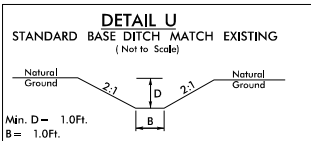
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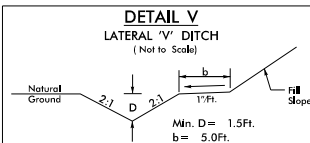
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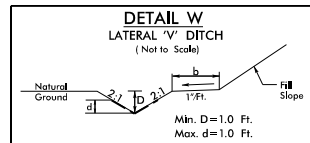
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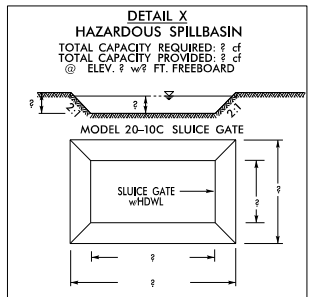
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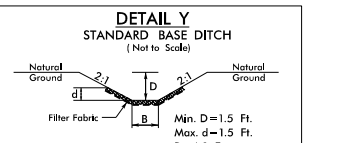
DETAIL V NOT USED IN SECTION 3B



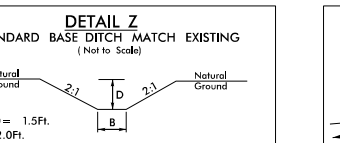
—Y309— STA. 13+50 TO STA. 15+82 RT
Type of Liner = PSRM



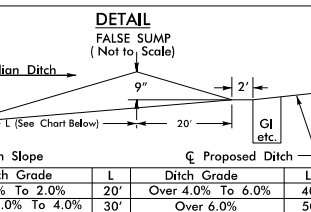
DETAIL X NOT USED IN SECTION 3B



—L— STA. 1110+30 LT; L=122', S=1.95%
BEG EL=572.0, END EL. 569.6
—Y314R— STA. 30+50 LT; L=40', S=3.13%
BEG EL=561.00, END EL. 559.75



DETAIL Z NOT USED IN SECTION 3B



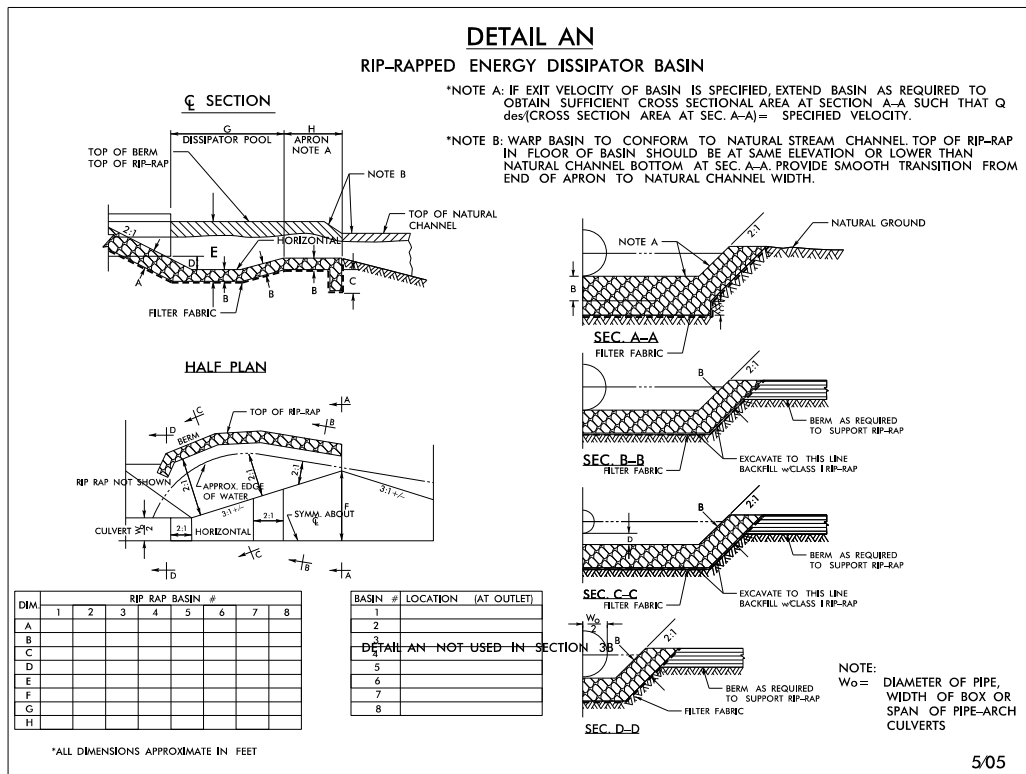
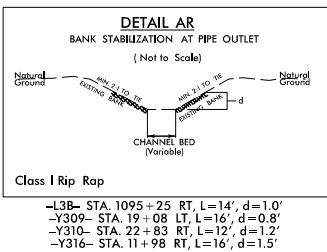
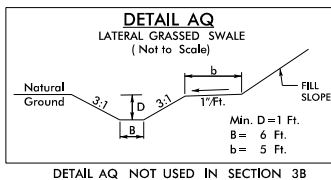
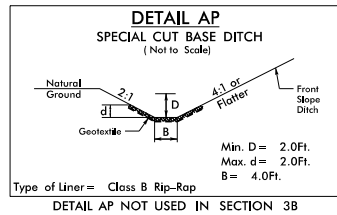
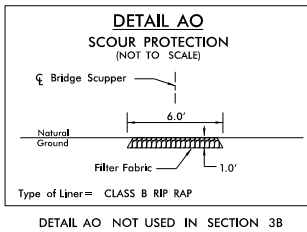
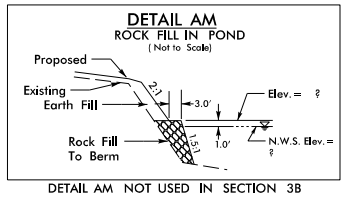
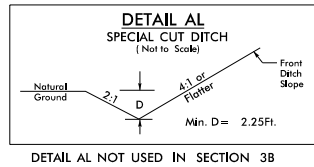
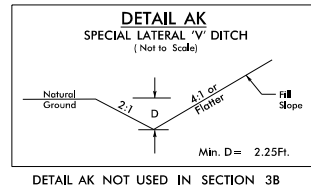
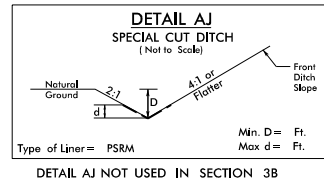
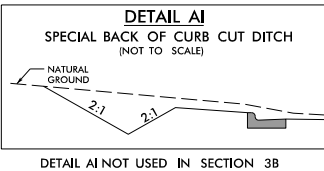
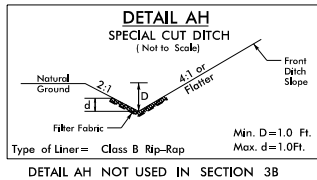
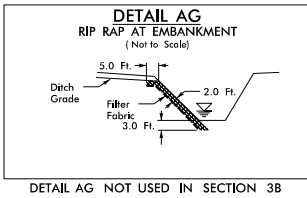
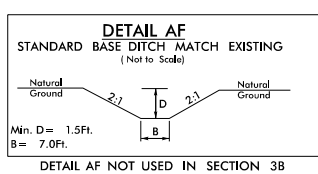
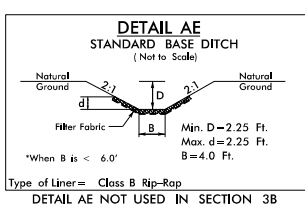
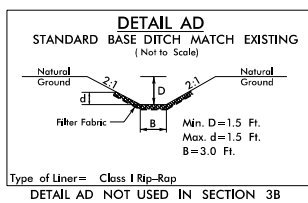
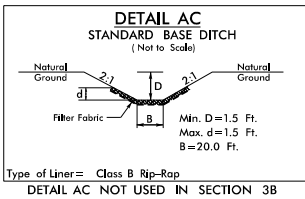
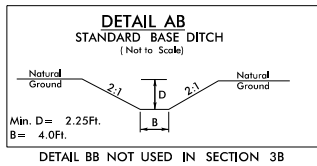
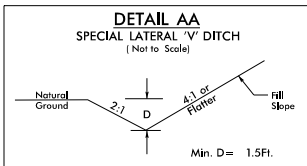
S=Ditch Slope	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'



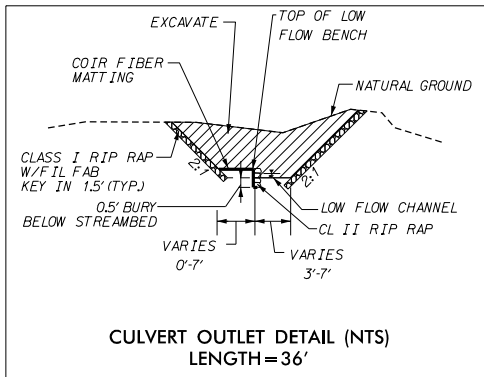
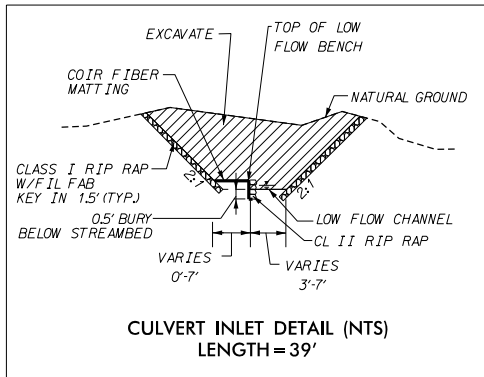
INCOMPLETE PLANS
DO NOT USE FOR A/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

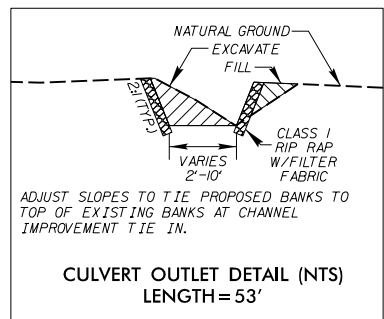
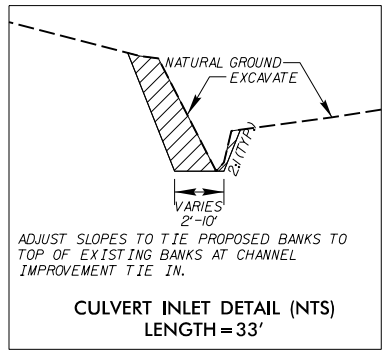
PERMIT DRAWING
SHEET 219 OF 267



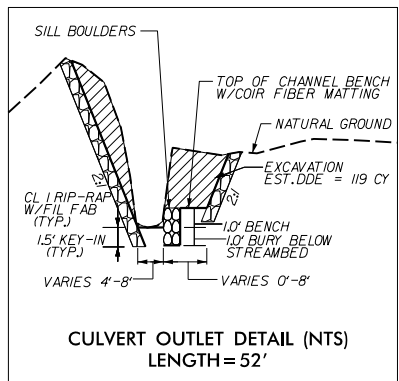
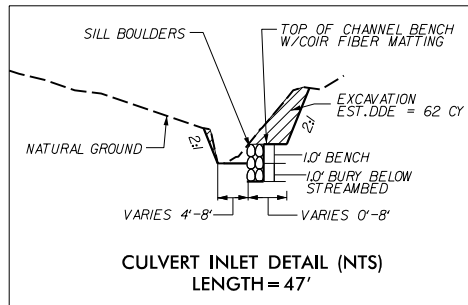
UT TO MEADOW BRANCH
-L- STA. 1074 + 23



UT TO SALEM CREEK
-L- STA. 1162 + 27



SALEM CREEK
-L- STA. 1201 + 62

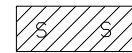


8/17/99

8/29/2014
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Elev



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



DENOTES IMPACTS IN
SURFACE WATER

709

NCDOT

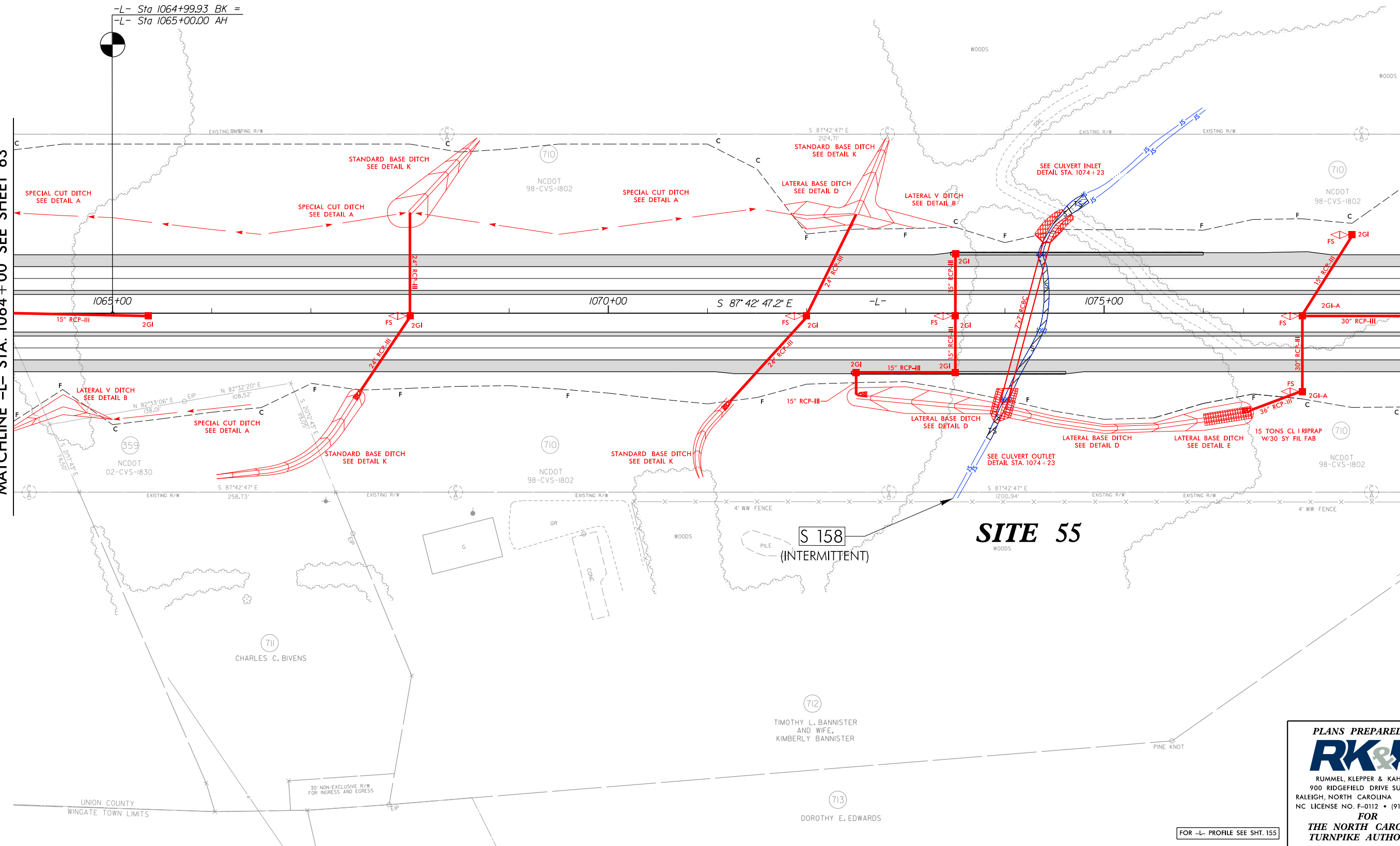


NAD 83

PROJECT REFERENCE NO. <i>R-3329 / R-2559</i>		SHEET NO. <i>64</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
PERMIT		DRAWING	
SHEET		220 OF 267	

MATCHLINE -L- STA. 1064 + 00 SEE SHEET 63

MATCHLINE -L- STA. 1078 + 00 SEE SHEET 65



FOR -L- PROFILE SEE SHT. 155

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DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



DENOTES IMPACTS IN
SURFACE WATER

709

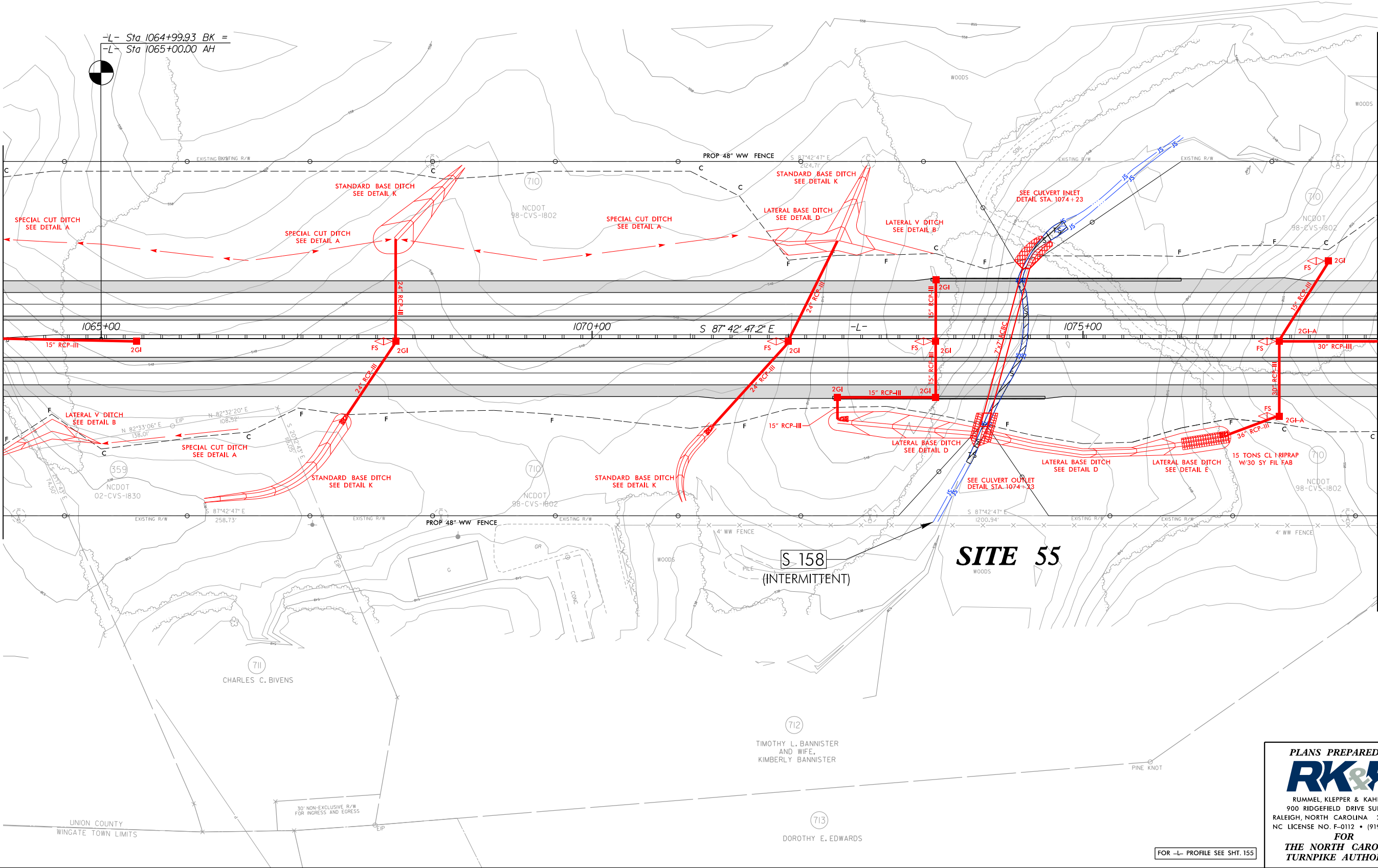
NCDOT



NAD 83

PROJECT REFERENCE NO. <i>R-3329 / R-2559</i>		SHEET NO. <i>64</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
<i>PERMIT DRAWING SHEET 221 OF 267</i>			

MATCHLINE -L- STA. 1064 + 00 SEE SHEET 63



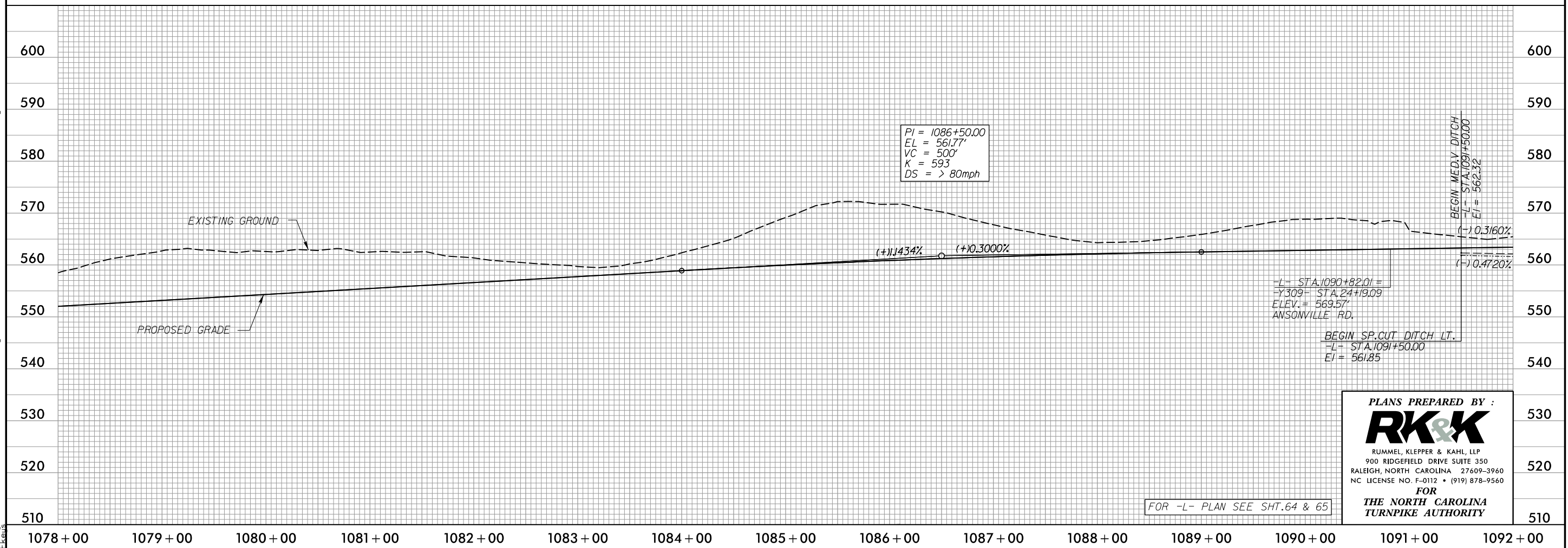
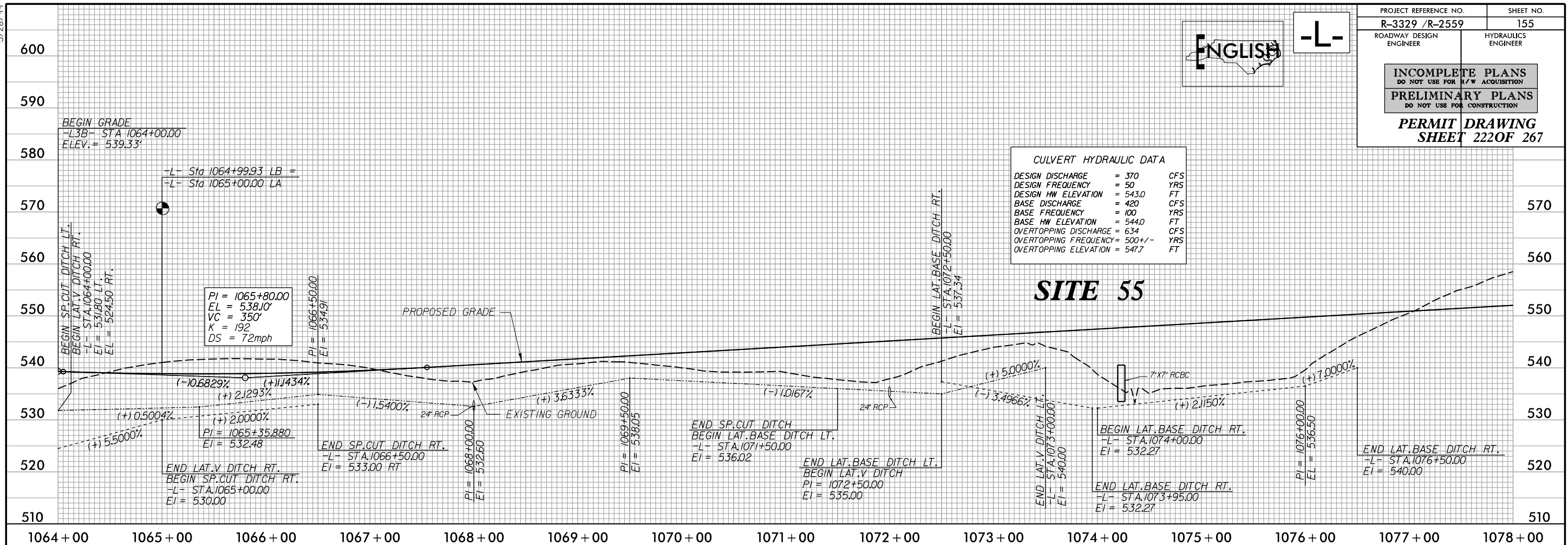
MATCHLINE -L- STA. 1078 + 00 SEE SHEET 65

FOR -L- PROFILE SEE SHT. 155

PLANS PREPARED BY :
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CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	370	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	543.0	FT
BASE DISCHARGE	=	420	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	544.0	FT
OVERTOPPING DISCHARGE	=	634	CFS
OVERTOPPING FREQUENCY	=	500+/-	YRS
OVERTOPPING ELEVATION	=	547.7	FT

SITE 55

FOR -L- PLAN SEE SHT.64 & 65

PLANS PREPARED BY :

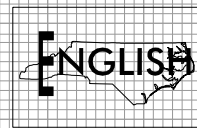
RK&K

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9/29/2004
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Elev

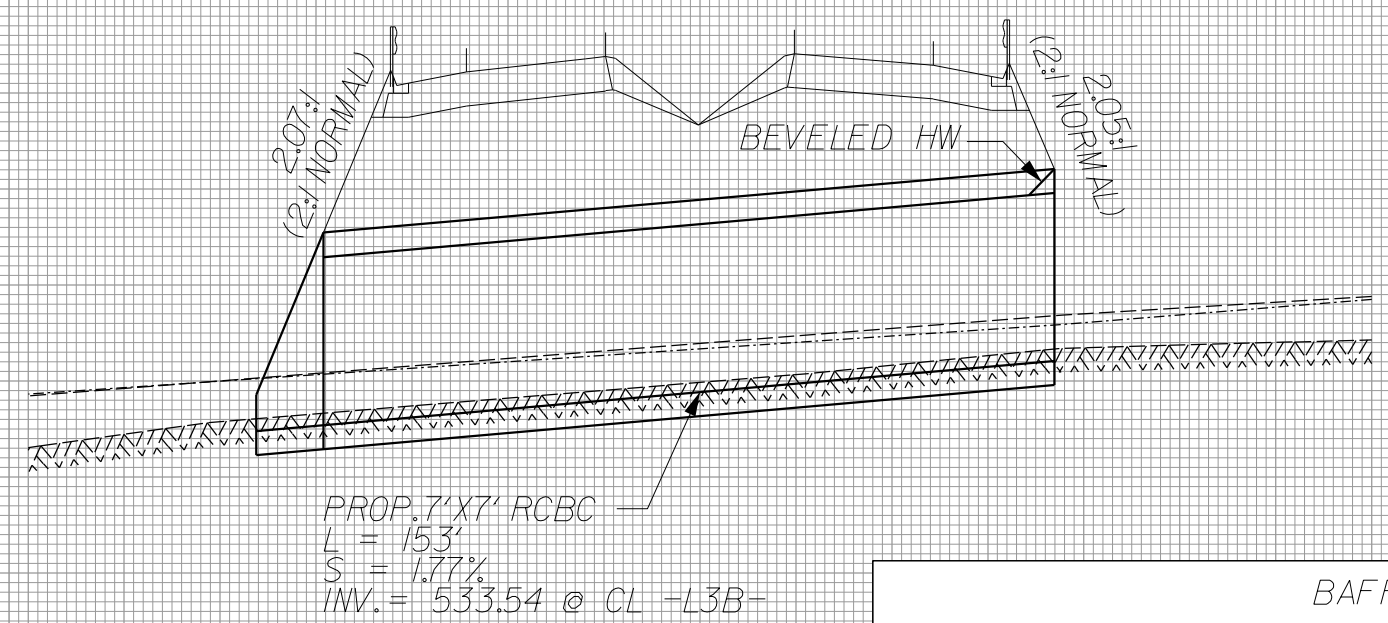
140 120 100 80 60 40 20 0 20 40 60 80 100 120 140



PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 223 OF 267		

SITE 55

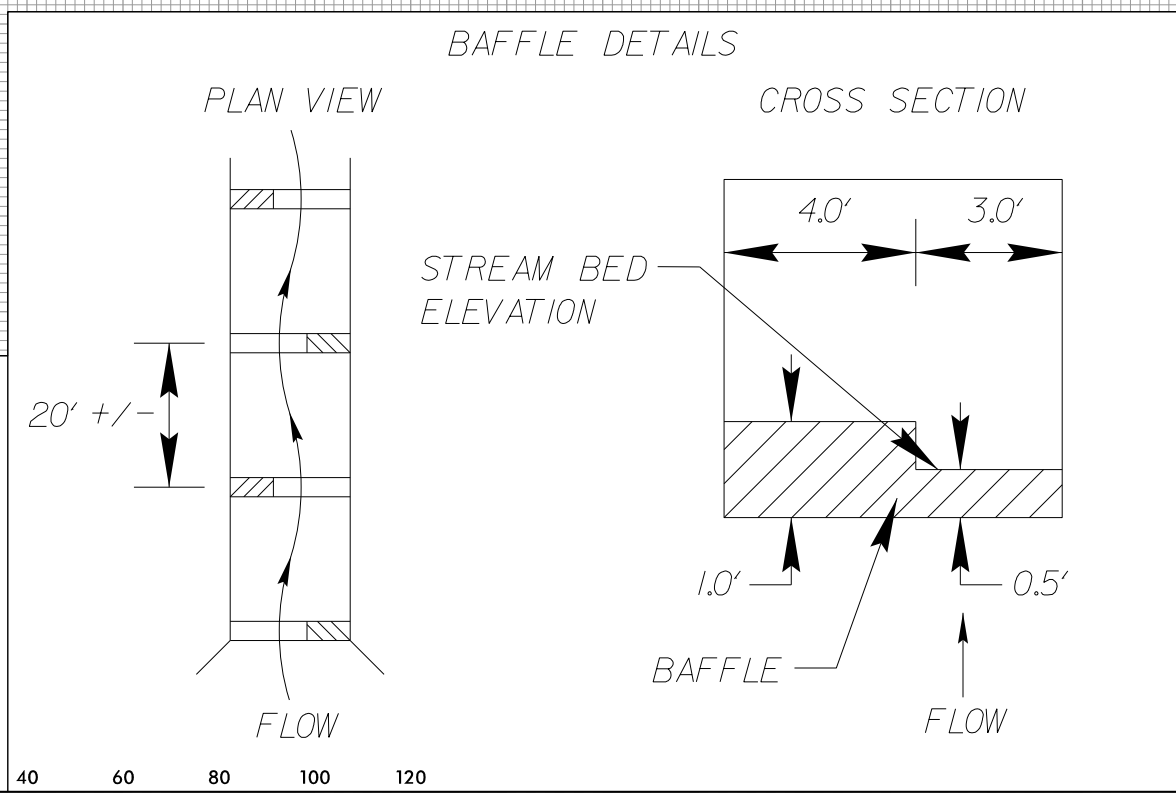
-L- STA. 1074+23



PROPOSED 7'X7' RCBC WITH BAFFLES

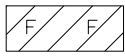
ALTERNATE BAFFLE SECTIONS TO FORCE STREAM TO MEANDER LEFT TO RIGHT ALONG THE LENGTH OF THE CULVERT.

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



8/17/99

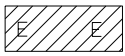
8/29/2014
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DENOTES FILL IN WETLAND



DENOTES MECHANIZED CLEARING



DENOTES EXCAVATION IN WETLAND

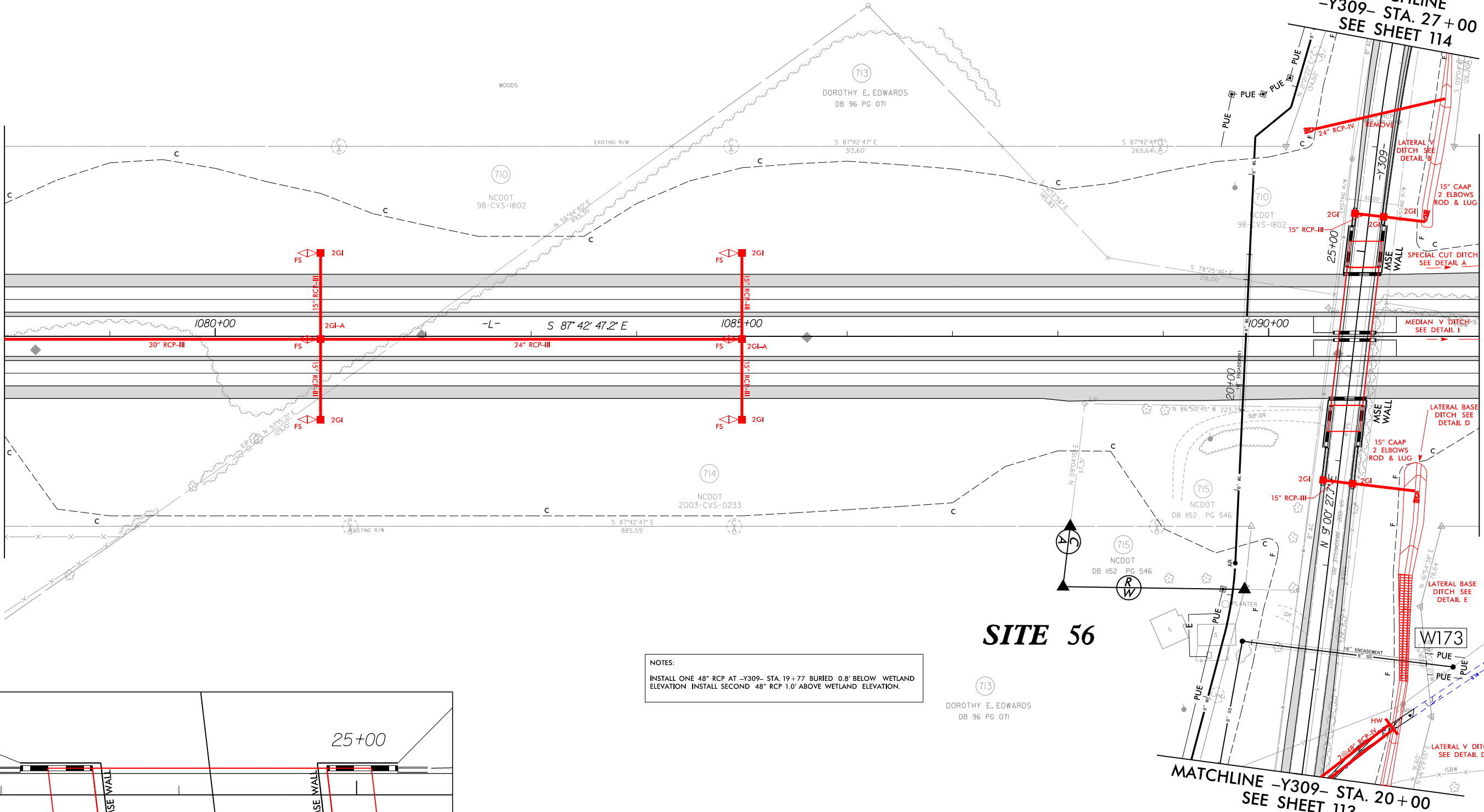


NAD 83

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PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	65
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 224 OF 267	

MATCHLINE -L- STA. 1078+00 SEE SHEET 64



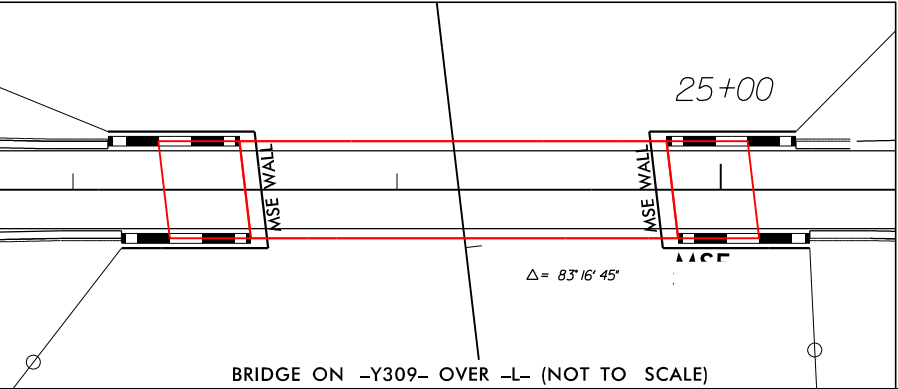
MATCHLINE -L- STA. 1092+00 SEE SHEET 66

NOTES:

INSTALL ONE 48" RCP AT -Y309- STA. 19+77 BURIED 0.8' BELOW WETLAND ELEVATION. INSTALL SECOND 48" RCP 1.0' ABOVE WETLAND ELEVATION.

SITE 56

(713)
DOROTHY E. EDWARDS
DB 96 PG 071



BRIDGE ON -Y309- OVER -L- (NOT TO SCALE)

FOR -L- PROFILE SEE SHT. 155
FOR -Y309- PROFILE SEE SHT. 227

8/17/99

8/29/2014
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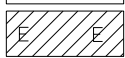
709
NCDOT



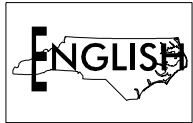
DENOTES FILL IN
WETLAND



DENOTES MECHANIZED
CLEARING



DENOTES EXCAVATION
IN WETLAND

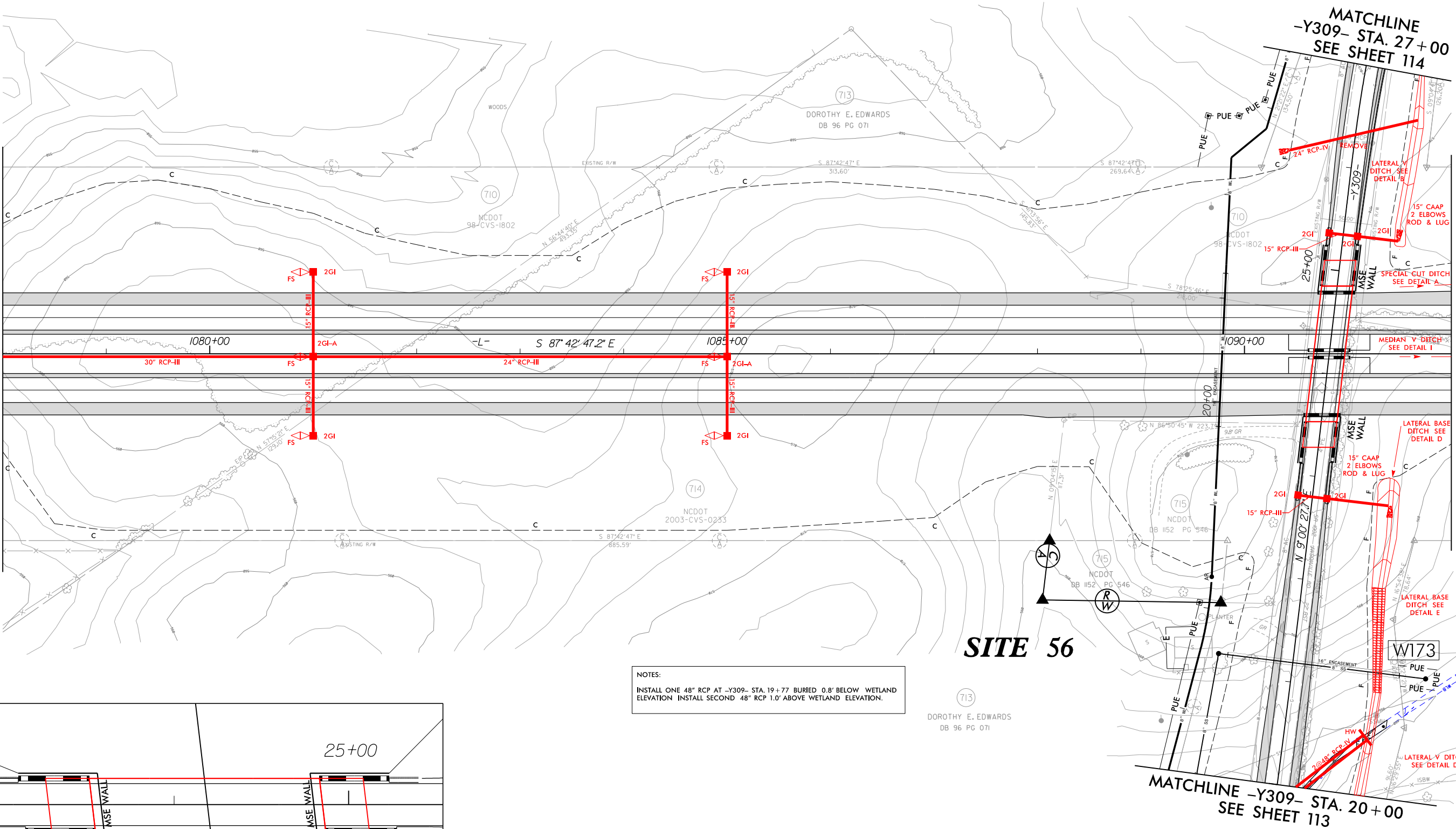


NAD 83

PLANS PREPARED BY :
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RALEIGH, NORTH CAROLINA 27609-3960
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PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 65
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 225 OF 267	

MATCHLINE -L- STA. 1078+00 SEE SHEET 64



MATCHLINE -L- STA. 1092+00 SEE SHEET 66

NOTES:
INSTALL ONE 48\"/>

SITE 56

713
DOROTHY E. EDWARDS
DB 96 PG 071

FOR -L- PROFILE SEE SHT. 155
FOR -Y309- PROFILE SEE SHT. 227

BRIDGE ON -Y309- OVER -L- (NOT TO SCALE)

SITE 56

**MATCHLINE -Y309- STA. 20+00
SEE SHEET 65**

**BANK STABILIZATION
AT PIPE OUTLET
SEE DETAIL AR**

Q10=80.0 CFS
V10= 1.7 FT/S

W172b

NOTES:

INSTALL ONE 48" RCP AT -Y309- STA. 19+77 BURIED 0.8' BELOW WETLAND
ELEVATION INSTALL SECOND 48" RCP 1.0' ABOVE WETLAND ELEVATION.

PX 74

ALL DRIVES ARE 16' WIDE WITH 10' RADII UNLESS OTHERWISE NOTED

FOR -Y309- PROFILE SEE SHT. 227

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TURNPIKE AUTHORITY

8/17/99

9/29/2014
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9/29/2014
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Fkeus

SITE 56

SEE SHEET 65

ALL DRIVES ARE 16' WIDE WITH 10'
RADI II UNLESS OTHERWISE NOTED

FOR -Y309- PROFILE SEE SHT. 227

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

INSTALL ONE 48" RCP AT -Y309- STA. 19+77 BURIED 0.8' BELOW WETLAND
ELEVATION INSTALL SECOND 48" RCP 1.0' ABOVE WETLAND ELEVATION.


 DENOTES FILL IN WETLAND
 DENOTES MECHANIZED CLEARING
 DENOTES TEMPORARY FILL IN WETLAND

ENGLISH

NAD 83

PX 74

W172b

W172a

Q10=80.0 CFS
V10= 1.7 FT/S

LATERAL V DITCH
SEE DETAIL B

CAAP
ELBOWS

2GI

LATERAL BASE DITCH
SEE DETAIL D

LATERAL BASE DITCH
SEE DETAIL E

ALLEN SCOTT EDWARDS
DB 5466 PG 405

OMMY N. EDWARDS
AND WIFE,
LINDA EDWARDS
DB 472 PG 122
DB 1253 PG 028

DOROTHY E. EDWARDS
DB 96 PG 071

POND

PERMANENT SEPTIC RAINFIELD EASEMENT

8/17/99

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Ekeus

720
RUTH B. TRULL
DB 200 PG 303

720A
TOMMY N. EDWARDS
AND WIFE,
LINDA A. EDWARDS
DB 5509 PG 514

719
JAVADI ENTERPRISES, INC.
DB 3053 PG 63

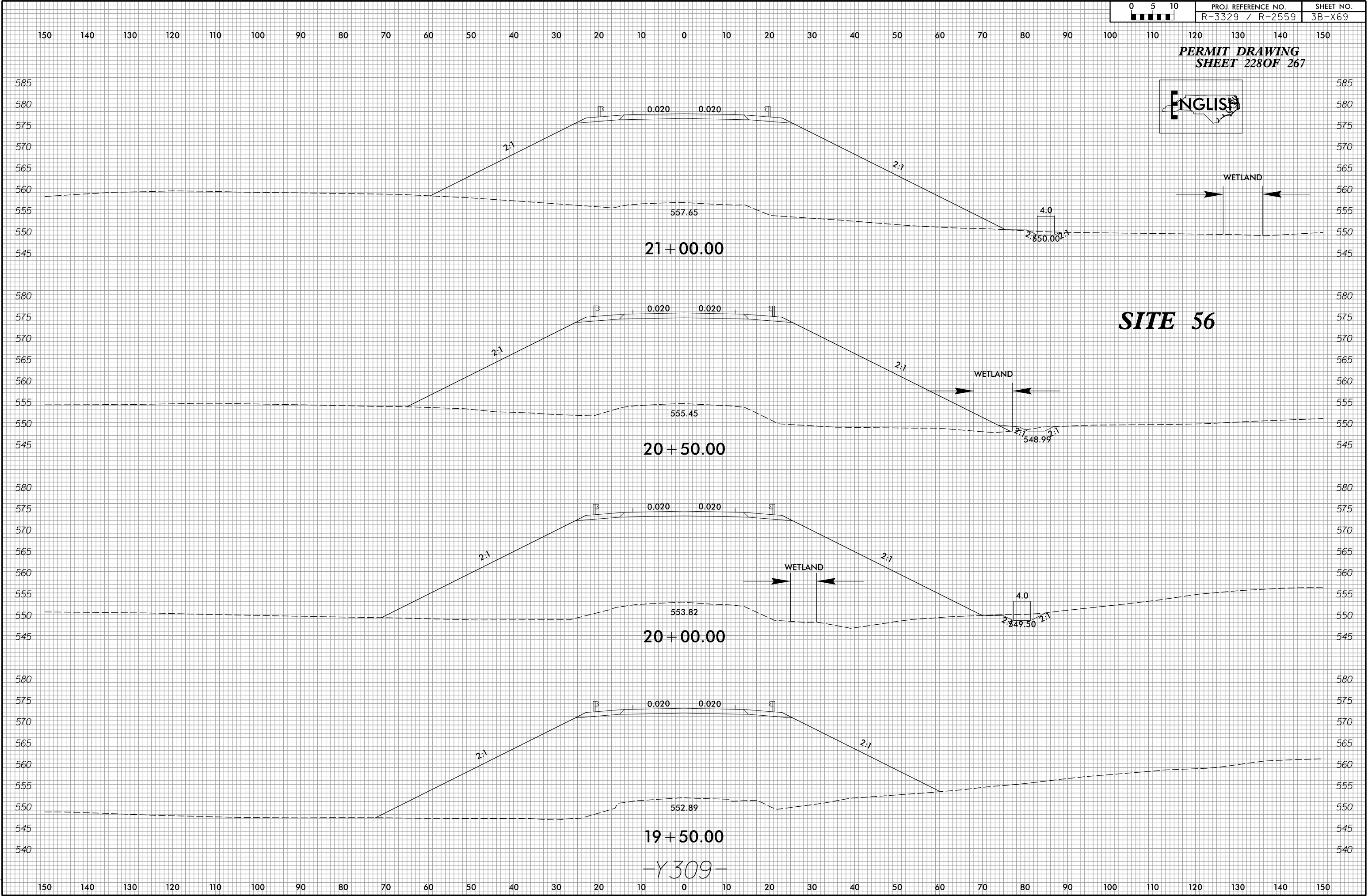
713
DOROTHY E. EDWARDS
DB 96 PG 071

722

723

8/23/99

9/29/2014
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Pkeys



NAD 83



	DENOTES FILL IN WETLAND
	DENOTES EXCAVATION IN WETLAND
	DENOTES MECHANIZED CLEARING

NOTES:

INSTALL BOTH 42" RCPS AT -L- STA. 1096+08 AT EXIST. WETLAND ELEVATION
DO NOT BURY

726
MARTHA G. COLEY
DB 1088 PG 495

3

W 173

714
NCDOT
2003-CVS-0233

(721)
DOROTHY E. EDWARDS
DB 96 PG 071

MATCHLINE -L- STA. 1092+00 SEE SHEET 65

MATCHLINE -L- STA. 1106 + 00 SEE SHEET 67

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TURNPIKE AUTHORITY

FOR -L- PROFILE SEE SHT. 156

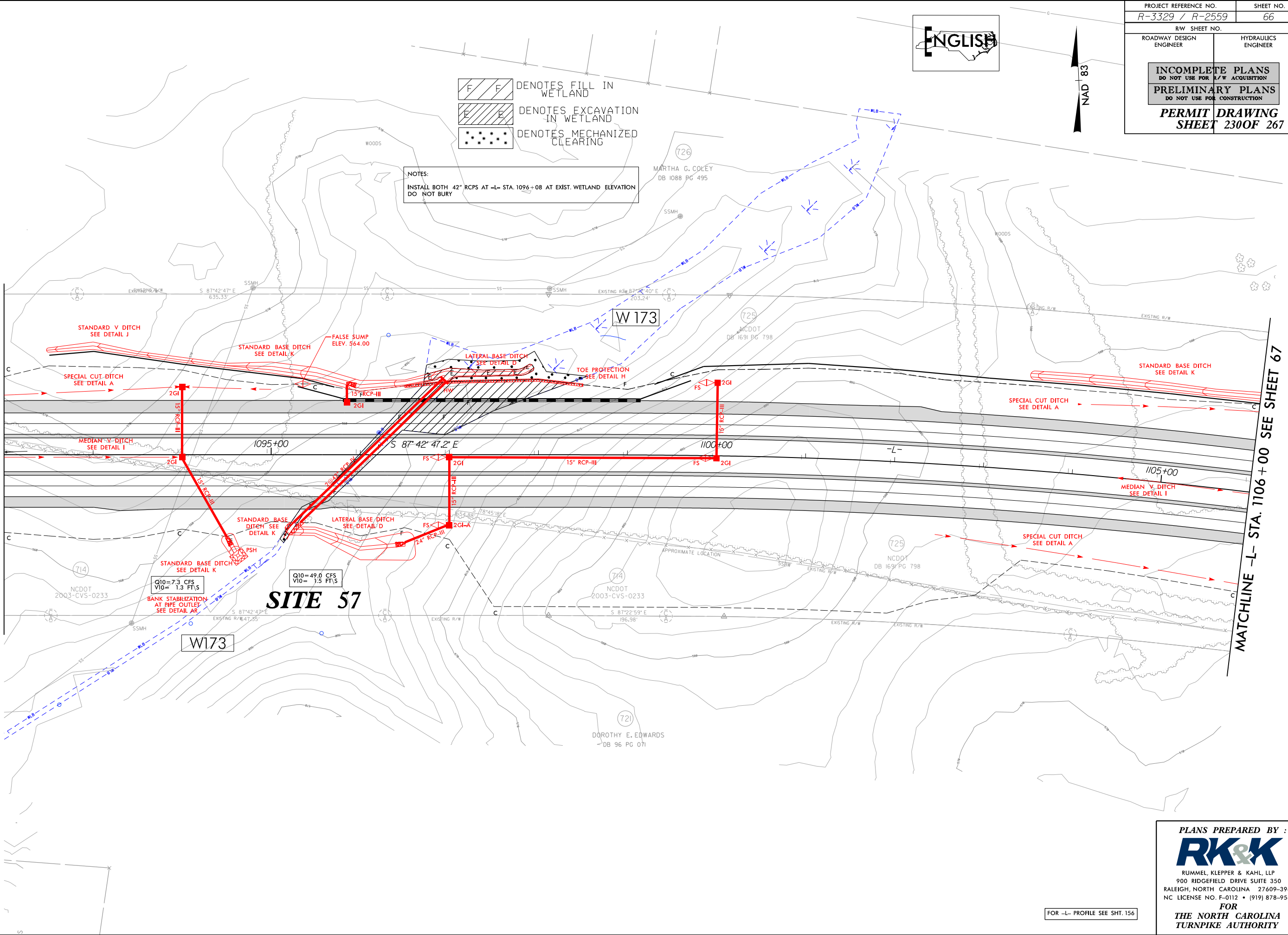
8/17/99

9/29/2014
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E:\keys

8/17/99

8/29/2014
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Elev

MATCHLINE -L- STA. 1092 + 00 SEE SHEET 65



- DENOTES FILL IN WETLAND
- DENOTES EXCAVATION IN WETLAND
- DENOTES MECHANIZED CLEARING

NOTES:
INSTALL BOTH 42" RCPS AT -L- STA. 1096+08 AT EXIST. WETLAND ELEVATION
DO NOT BURY

ENGLISH

NAD 83

PROJECT REFERENCE NO. <i>R-3329 / R-2559</i>		SHEET NO. <i>66</i>
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
<i>PERMIT DRAWING SHEET 2300F 267</i>		

MATCHLINE -L- STA. 1106 + 00 SEE SHEET 67

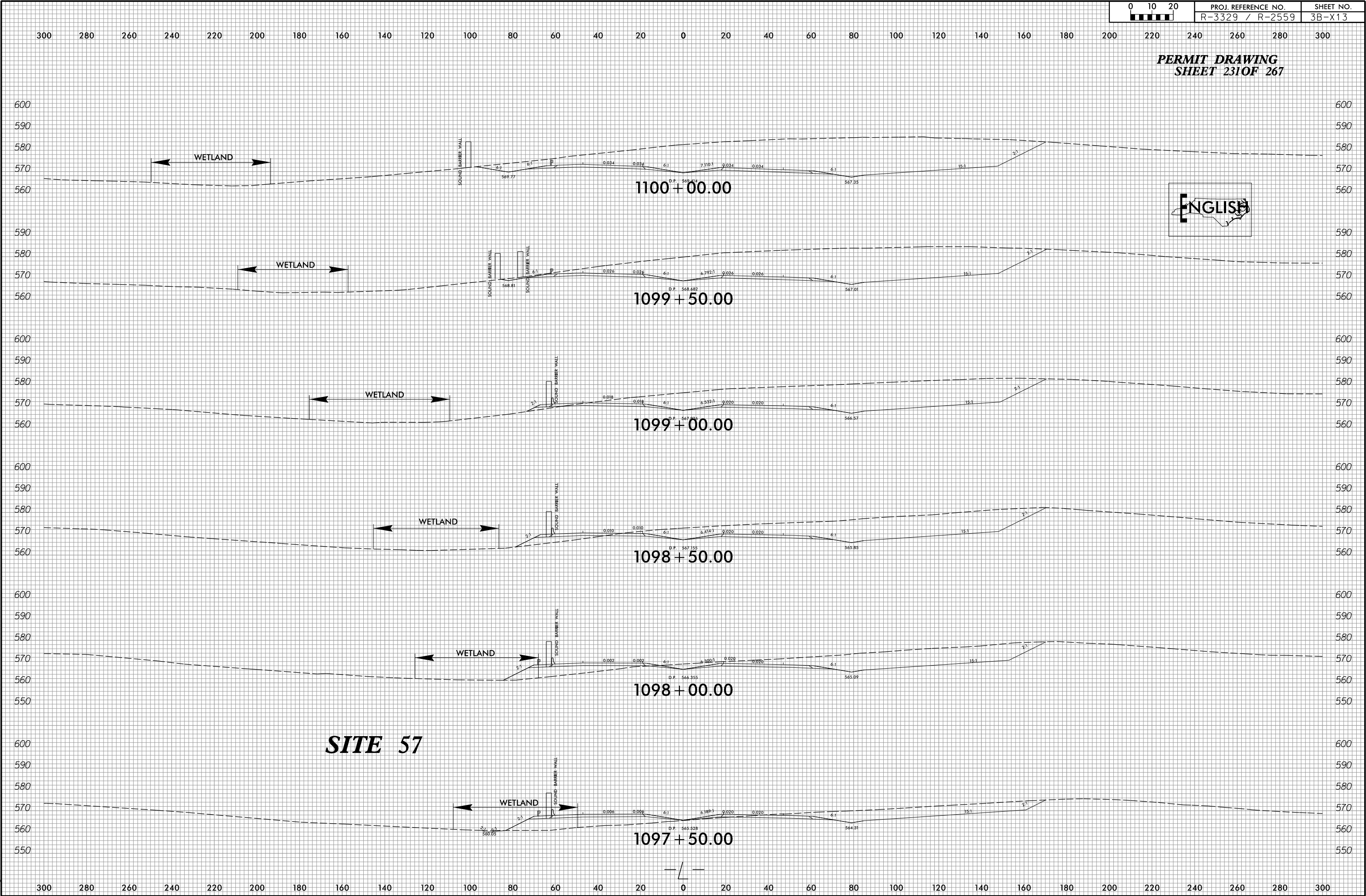
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560
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TURNPIKE AUTHORITY

FOR -L- PROFILE SEE SHT. 156

8/23/99

9/29/2014
R:\Hydraulics\PERMITS\Environmental\Drawings\Section3B\R3329_R2559_HDY_PRW_WET_XPL_L_3B1.dgn

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	R-3329 / R-2559	3B-X13

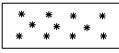


8/17/99

8/29/2014
R:\Hydraulics\PERMITS\Environmental\Drawings\Section38\38329_R2559_HDY_PRM_WET_PSH068.dgn
E:\



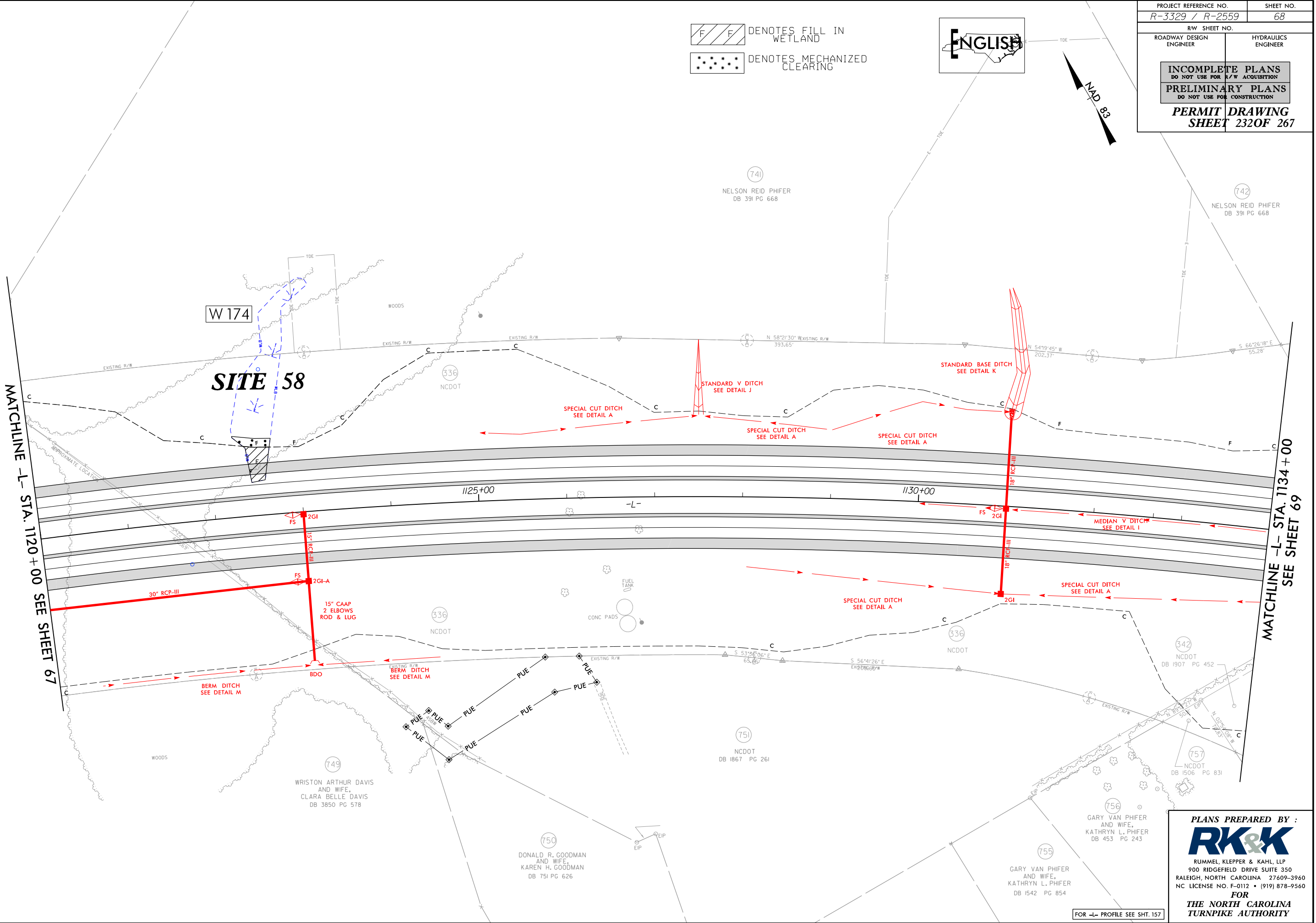
DENOTES FILL IN
WETLAND



DENOTES MECHANIZED
CLEARING



PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 68
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 232 OF 267	

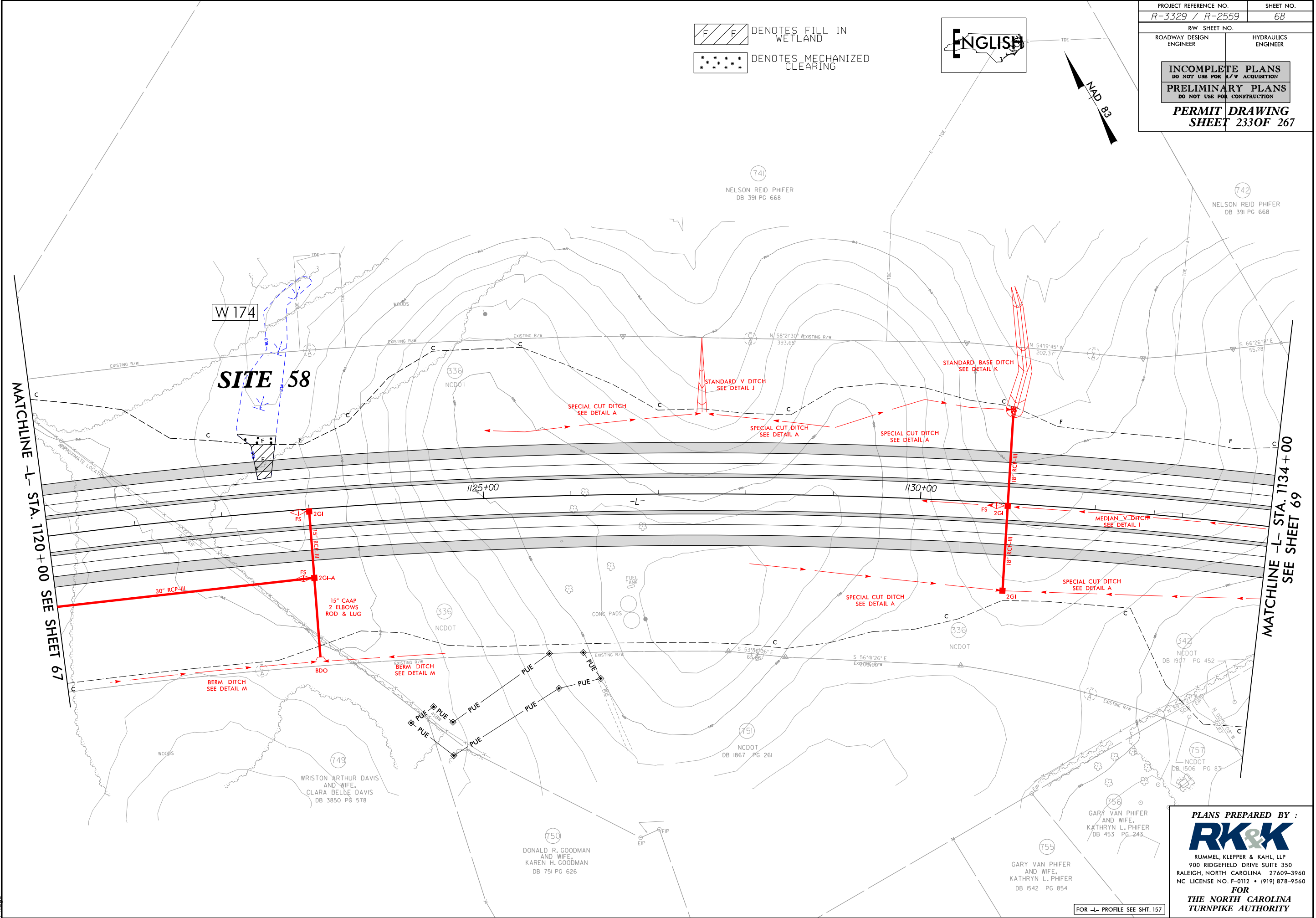


FOR -L- PROFILE SEE SHT. 157

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
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TURNPIKE AUTHORITY

8/17/99

8/29/2014
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E:\



PROJECT REFERENCE NO. <i>R-3329 / R-2559</i>		SHEET NO. <i>68</i>
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		
<i>PERMIT DRAWING SHEET 233 OF 267</i>		

NAD 83

FOR -L- PROFILE SEE SHT. 157

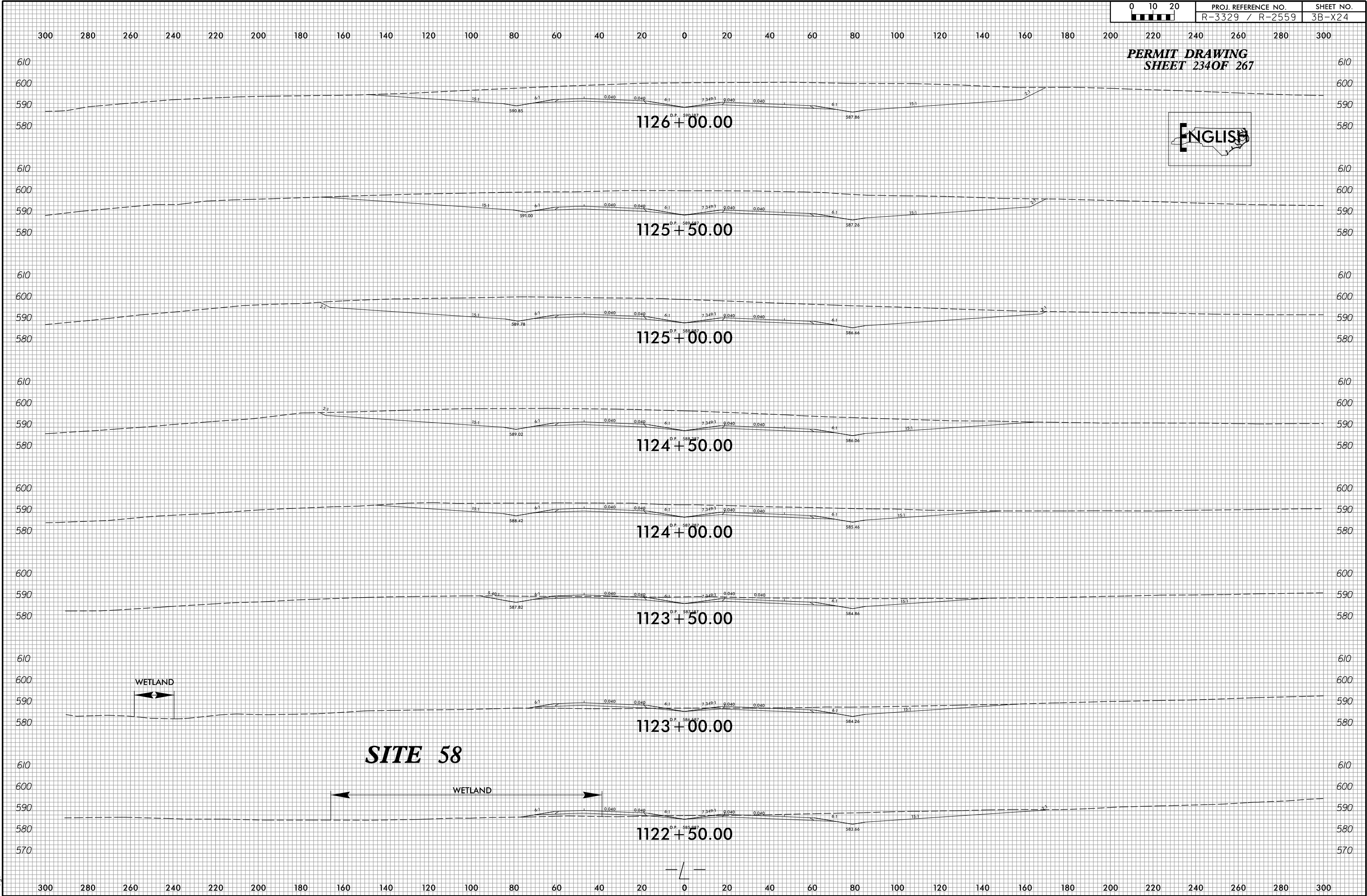
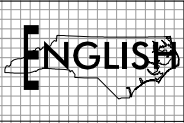
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
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9/29/2014
R:\Hydraulics\PERMITS\Environmental\Drawings\Section3B\R3329_R2559_HDY_PRM_WET_XPL_L_3B2.dgn

0 10 20 [Scale Bar]	PROJ. REFERENCE NO. R-3329 / R-2559	SHEET NO. 3B-X24
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PERMIT DRAWING
SHEET 234 OF 267



8/17/99
8/29/2014
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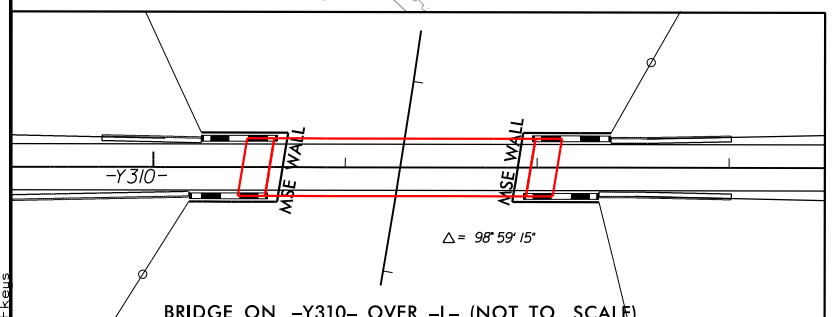
1S 1S
DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

1S 1S
DENOTES IMPACTS IN
SURFACE WATER

PROJECT REFERENCE NO. R-3329 / R-2559		SHEET NO. 69	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
PERMIT DRAWING SHEET 235 OF 267			

MATCHLINE -L- STA. 1134+00
SEE SHEET 68

MATCHLINE -L- STA. 1148+00
SEE SHEET 70



MATCHLINE -Y310- STA. 30+50 SEE SHEET 116

MATCHLINE -Y310- STA. 21+50
SEE SHEET 115

SITE 59

S 161a

(INTERMITTENT)

OBLITERATE

FOR -L- PROFILE SEE SHT. 157
FOR -Y310- PROFILE SEE SHT. 228

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8/17/99



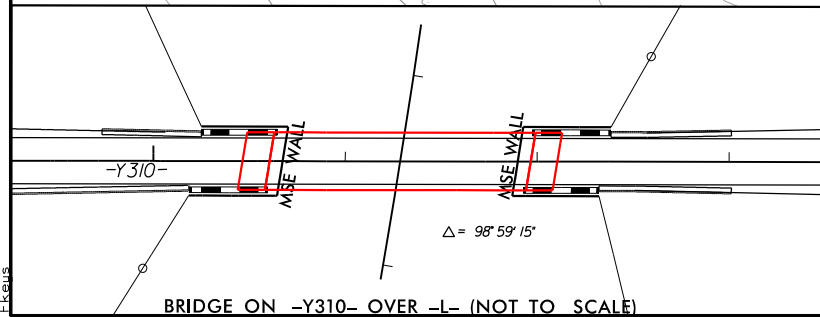
1S 1S
DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

1S 1S
DENOTES IMPACTS IN
SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	69
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 236 OF 267	

MATCHLINE -L- STA. 1134+00
SEE SHEET 68

MATCHLINE -L- STA. 1148+00
SEE SHEET 70



BRIDGE ON -Y310- OVER -L- (NOT TO SCALE)

MATCHLINE -Y310- STA. 30+50 SEE SHEET 116

MATCHLINE -Y310- STA. 21+50
SEE SHEET 115

SITE 59

S 161a

(INTERMITTENT)

THOMAS E. TRAYWICK, JR.
DB 138 PG 478

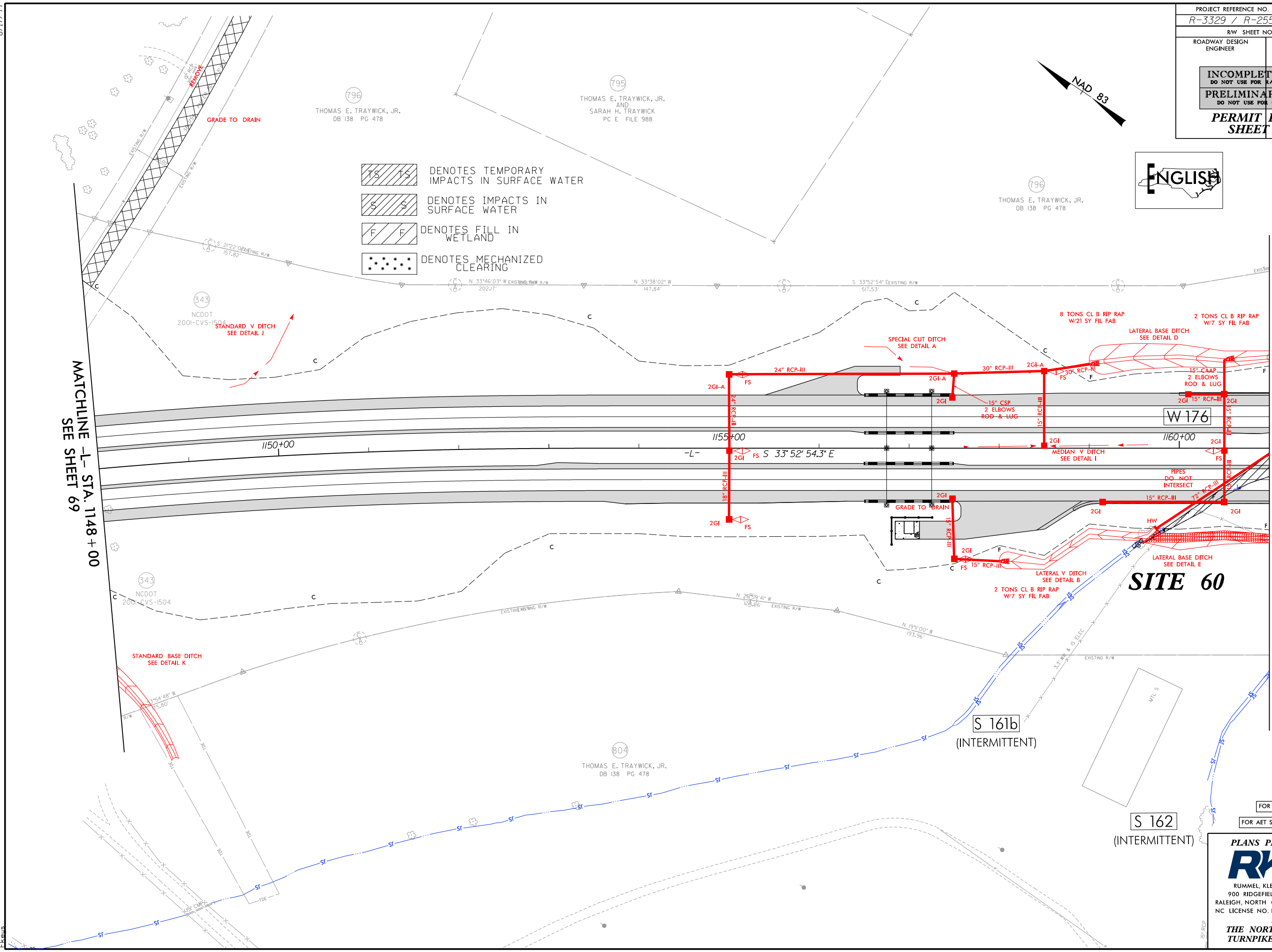
OBLITERATE

FOR -L- PROFILE SEE SHT. 157
FOR -Y310- PROFILE SEE SHT. 228

PLANS PREPARED BY :
RK&K
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8/28/2014
B:\Hydraulics\PERMITS_Environmental\Drawings\Section38\38R3329_R2559_HDY_PRM_WET_PSH070.dgn
Elev

PROJECT REFERENCE NO. <i>R-3329 / R-2559</i>		SHEET NO. <i>70</i>
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
<i>PERMIT DRAWING SHEET 237 OF 267</i>		



MATCHLINE -L- STA. 1148+00
SEE SHEET 69

MATCHLINE -L- STA. 1161+00
SEE SHEET 71

SITE 60

S 161b
(INTERMITTENT)

S 162
(INTERMITTENT)

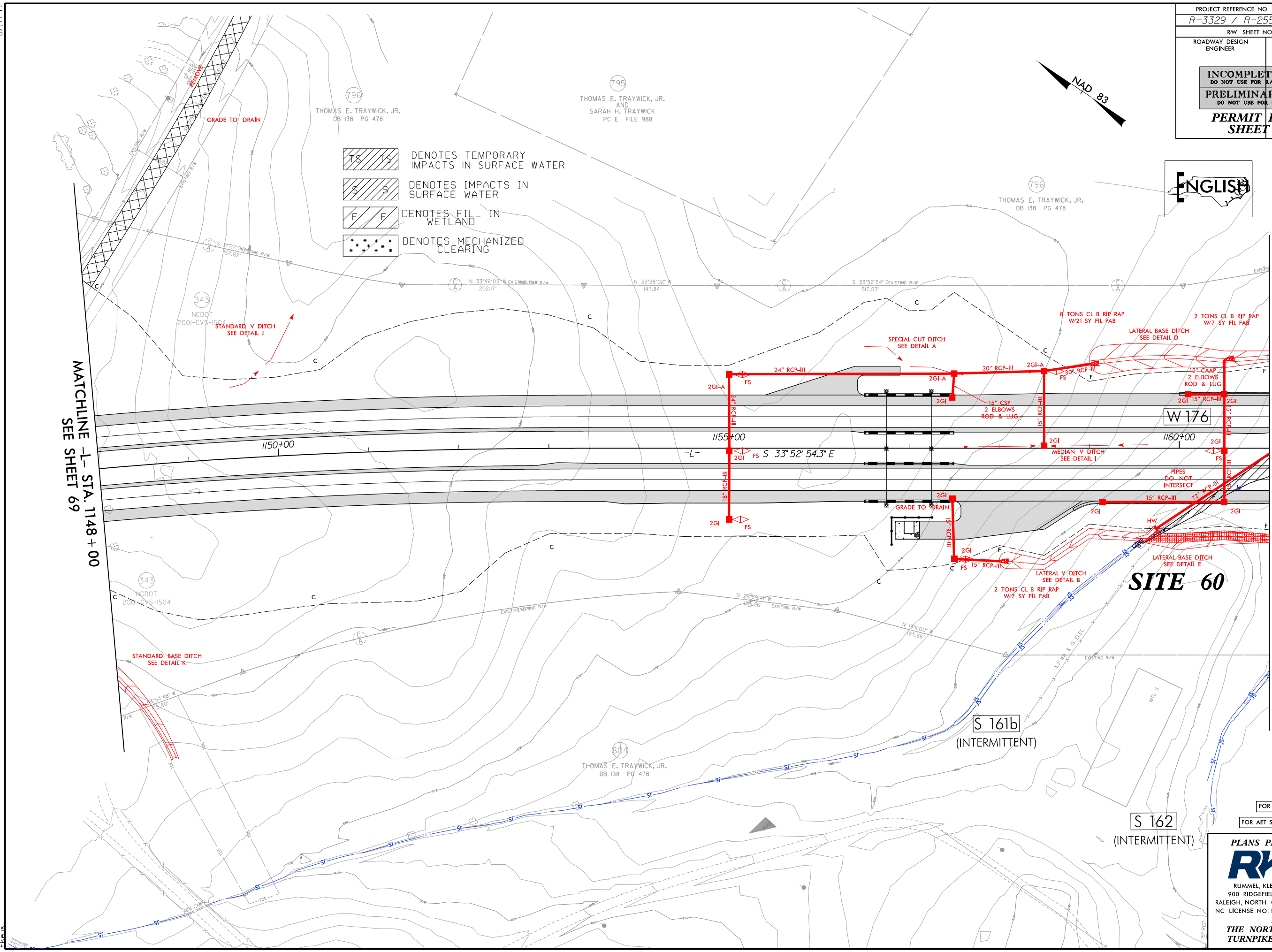
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING

- OBLITERATE
- FOR -L- PROFILE SEE SHT. 158
- FOR AET SITE DETAIL SEE SHT. AET-8

PLANS PREPARED BY :
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8/29/2014
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PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	70
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 238 OF 267	



MATCHLINE -L- STA. 1161+00
SEE SHEET 71

MATCHLINE -L- STA. 1148+00
SEE SHEET 69

SITE 60

OBLITERATE
FOR -L- PROFILE SEE SHT. 158
FOR AET SITE DETAIL SEE SHT. AET-8

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NAD 83

796
THOMAS E. TRAYWICK, JR.
DB 138 PG 478

NOTES:

INSTALL 72" RCP AND 10'X6' RCBC AT -L- STA. 1162+00 BURIED 1.0' BELOW WETLAND ELEVATION. DO NOT BURY 42" RCP PIPE.

SITE 60

W176

SEE CULVERT OUTLET
DETAIL STA. 1162+27

CLASS 'II' RIP RA

CLASS 'II' RIP RA
EST. 20 TONS

LATERAL BASE DITCH
SEE DETAIL D

LATERAL BASE DITCH
SEE DETAIL D

W 176

SITE 61

$$\begin{aligned} Q_{10} &= 44.4 \text{ CFS} \\ V_{10} &= 1.4 \text{ FT}^3/\text{S} \end{aligned}$$

26 TONS CL I RIP RAP
W/50 SY FIL FAB

W 176

W 177

797
NCDOT
DB 1840 PG 68

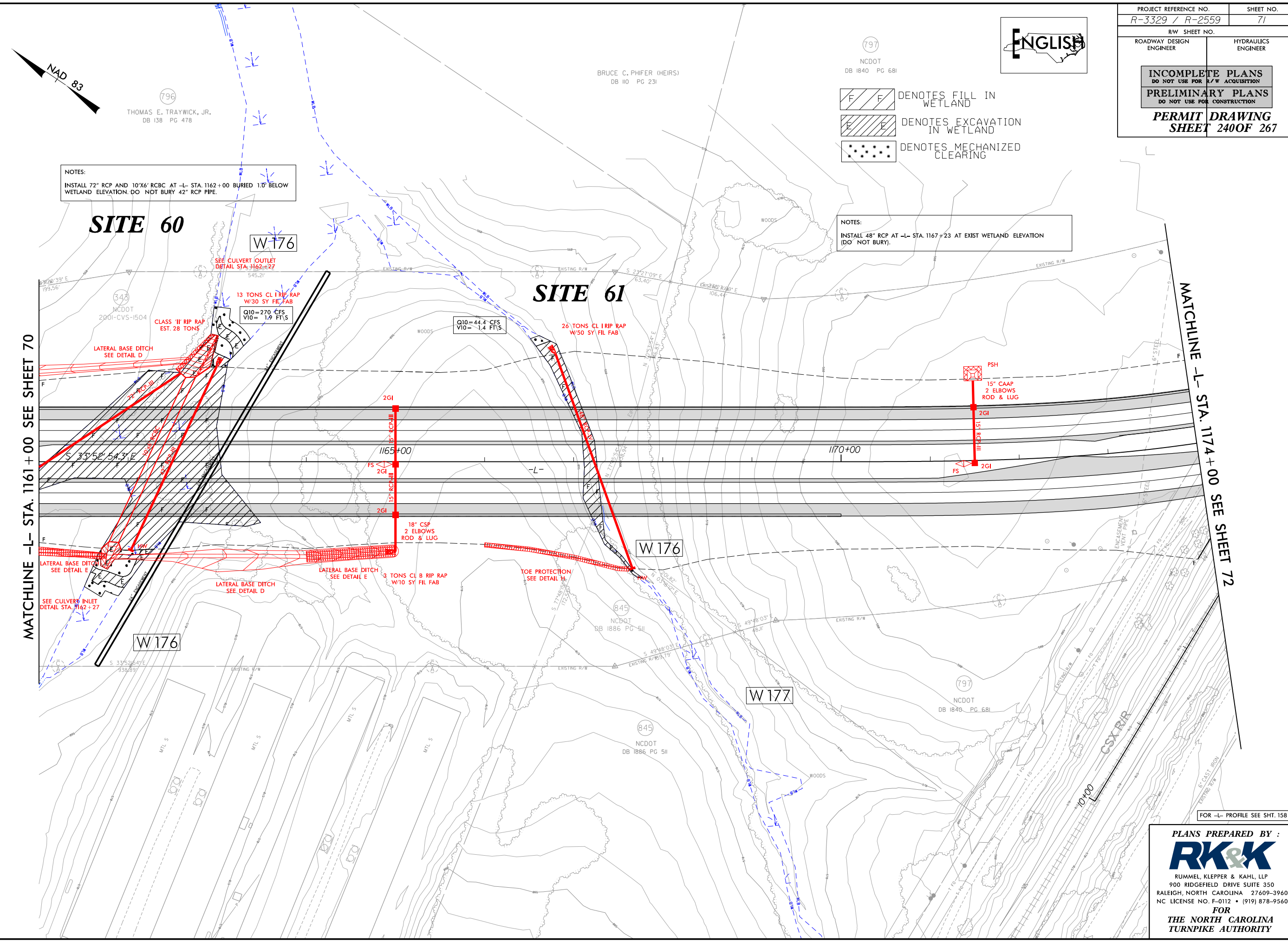
FOR -L- PROFILE SEE SHT. 158

PLANS PREPARED BY :

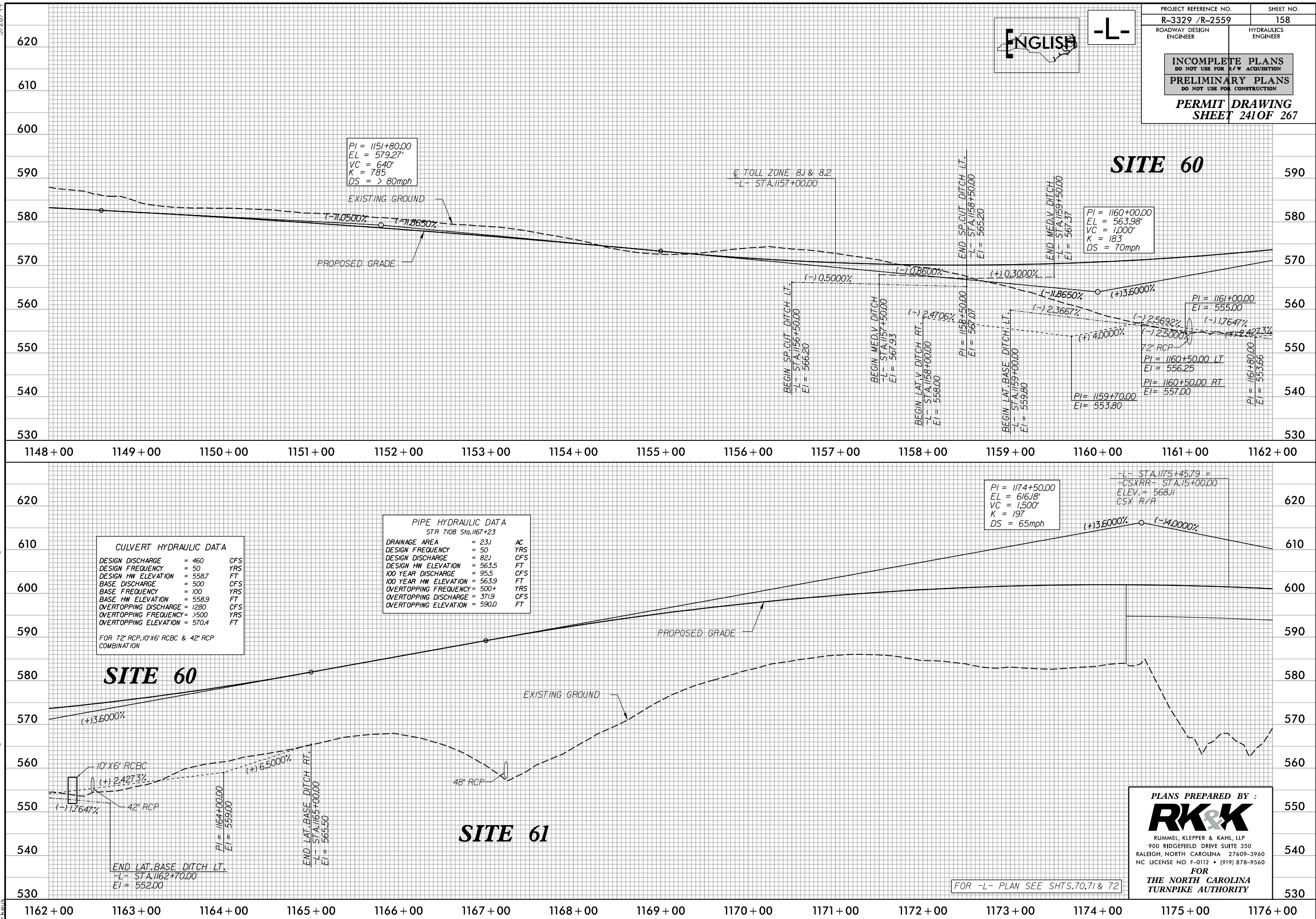
RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560
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8/17/99
8/29/2014
B:\Hydraulics\PERMITS\Environmental\Drawings\Section3B\R3329_R2559_HDY_PRM_WET_PSH071_con.dgn
E:\



5/28/99
8/29/2004
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Elev

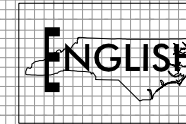


5/14/99

9/29/2004
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Elevs

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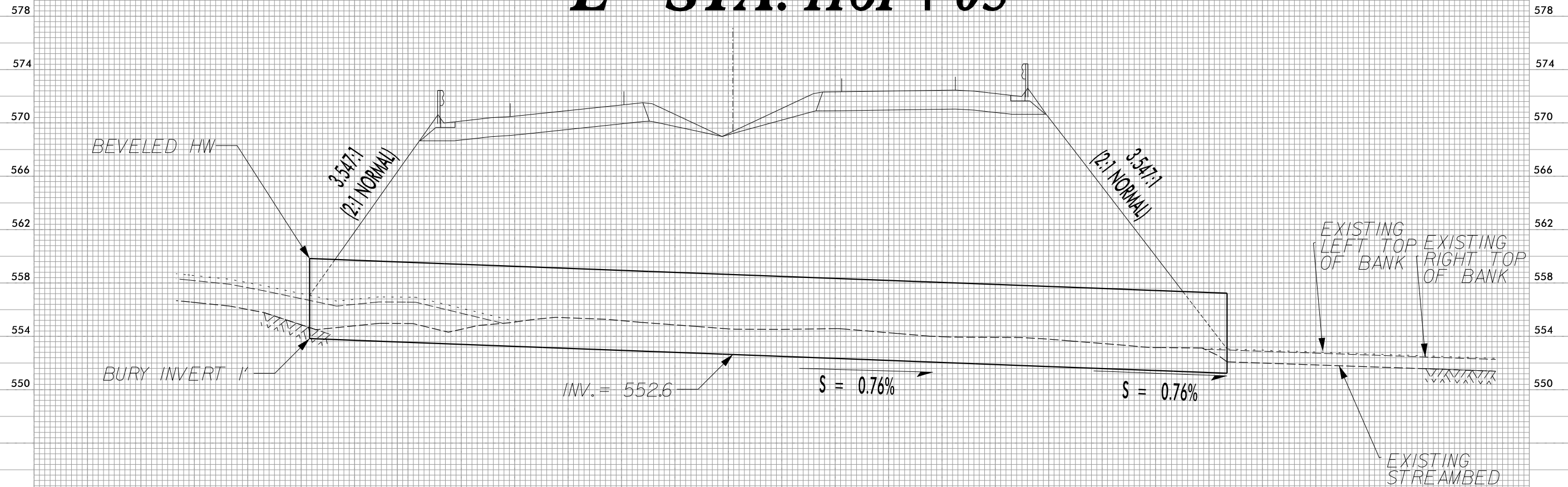
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PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 242 OF 267		

SITE 60

-L- STA. 1161+05

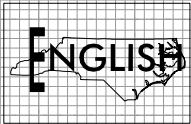


**PROPOSED 72" RCP
BURIED 1.0'**

5/14/99

8/29/2004
R:\Hydraulics\PERMITS\Environmental\Drawings\Section3B\R3329_R2559_HDY_PRM_WET_PFL3B4.dgn
Elevs

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PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 243 OF 267		

SITE 60

-L- STA. 1162 + 27

578

574

570

566

562

558

554

550

578

574

570

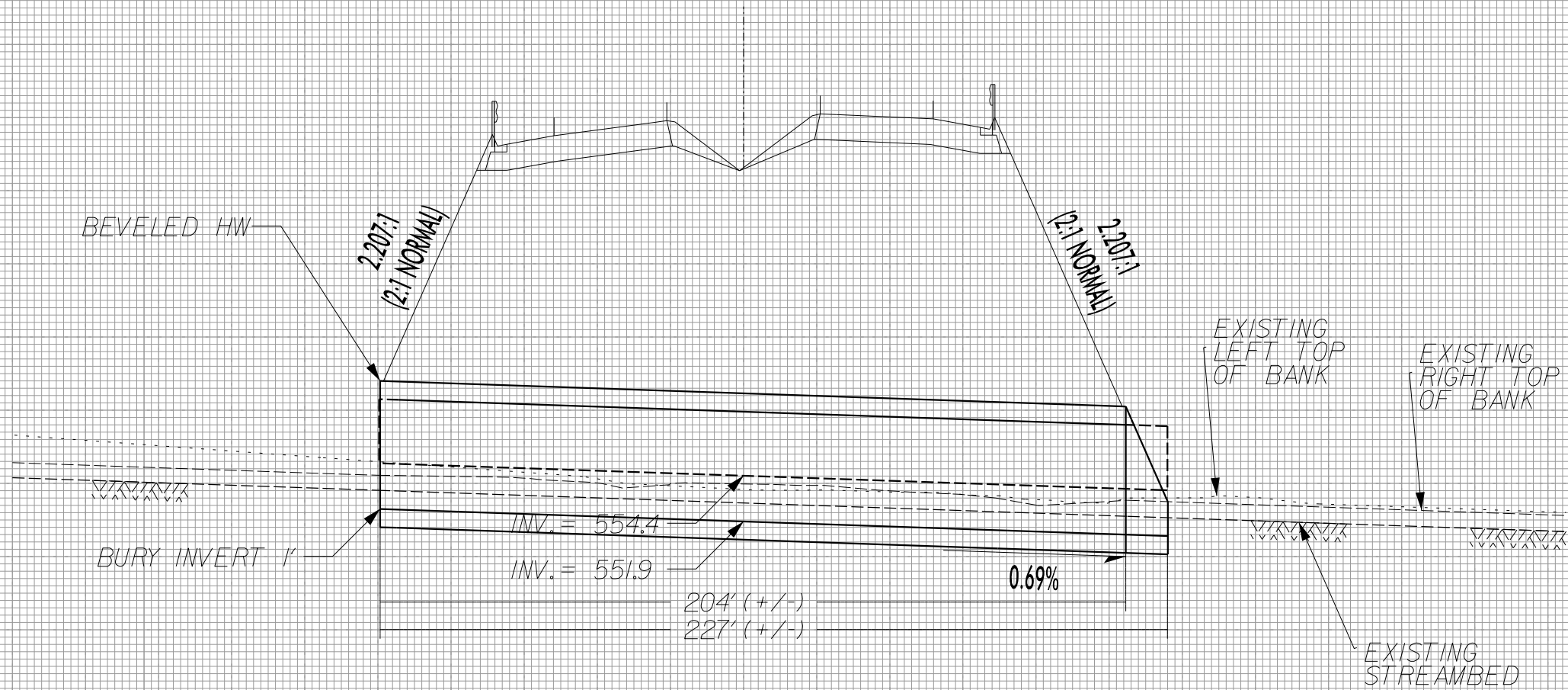
566

562

558

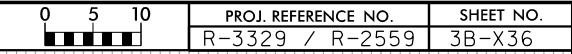
554

550



**PROPOSED 10'X6' RCBC
BURIED 1.0'
AND
FLOOD PLAIN PIPE**

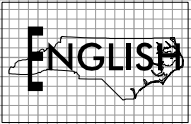
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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3329 / R-2559	3B-X38

PERMIT DRAWING
SHEET 245 OF 267



SITE 61

1167 + 50.00

D.P. 585.966

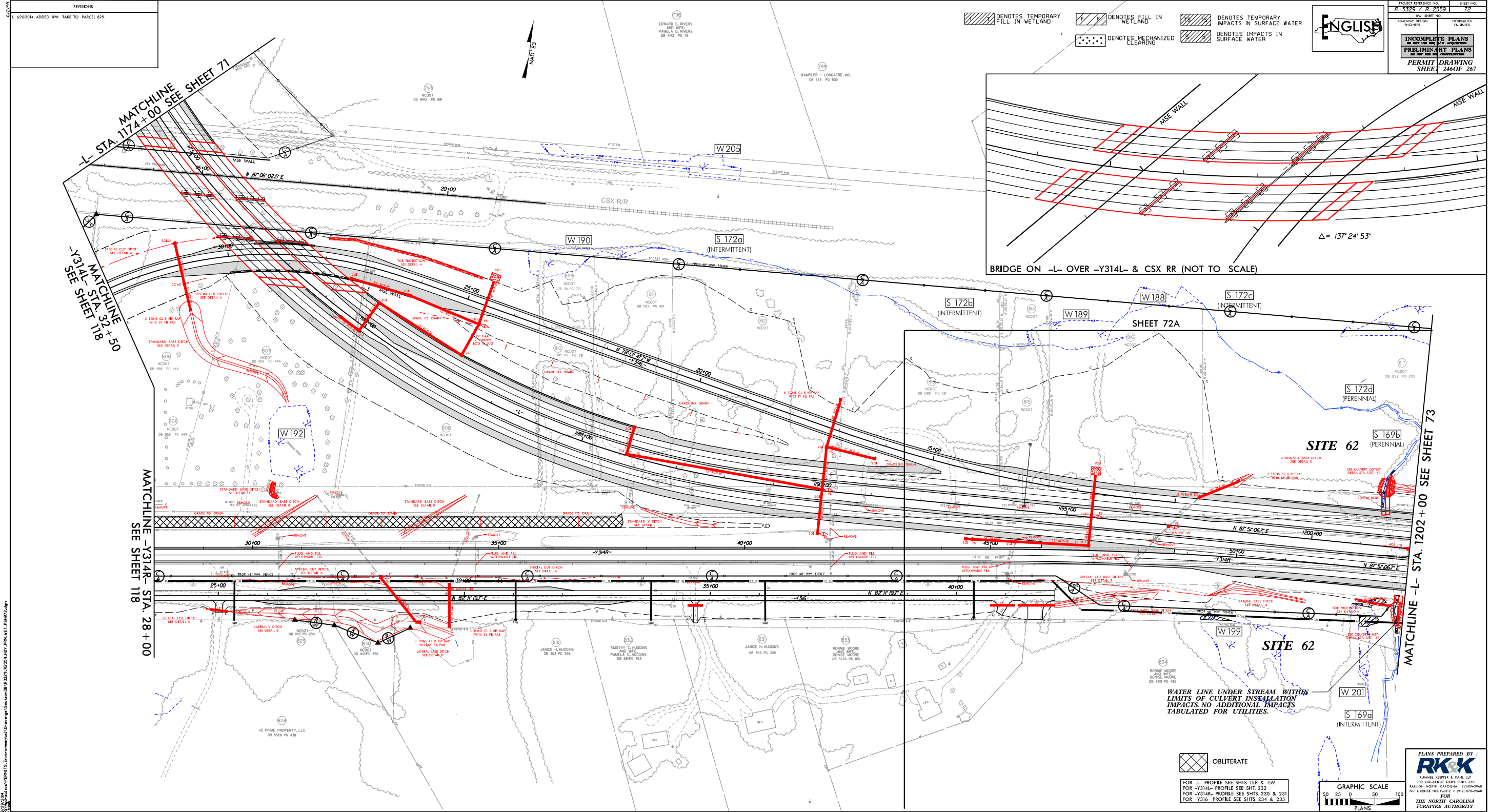
1167 + 00.00

1166 + 50.00

WETLAND

WETLAND

9/29/2014
R:\Hydraulics\PERMITS\Environmental\Drawings\Section3B\R3329_R2559_HDY_PRW_WET_XPL_L_3B4.dgn



REVISIONS	
6/26/2014	ADDED RW TAKE TO PARCEL 829.

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



PROJECT REFERENCE NO.
R-3329 / R-2559

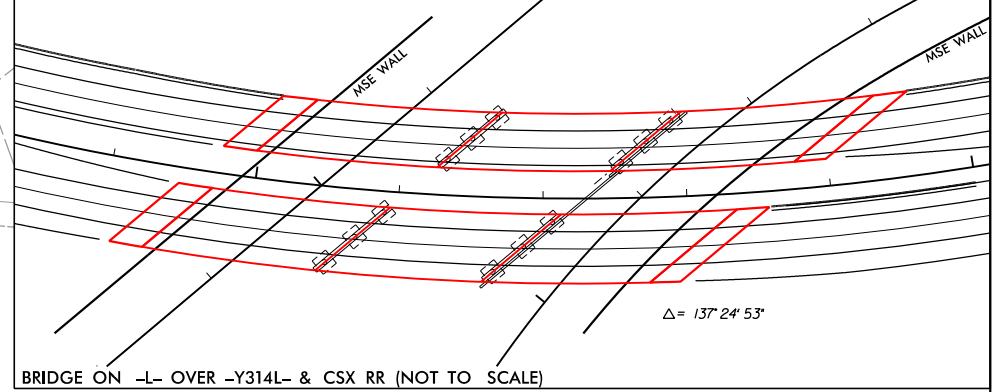
SHEET NO.
72

REV. SHEET NO.

ROADWAY DESIGN
INCHES

HYDRAULICS
INCHES

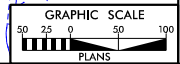
INCOMPLETE PLANS
NO IMP. OR L.P. JOINTING
PRELIMINARY PLANS
NO IMP. OR L.P. JOINTING
PERMIT DRAWING
SHEET 246 OF 267



\\032224\Users\K\Projects\15-Environmental\Drawings\Structure\032224-022509-RTD-RW-ME-Final\72.dgn

OBLITERATE

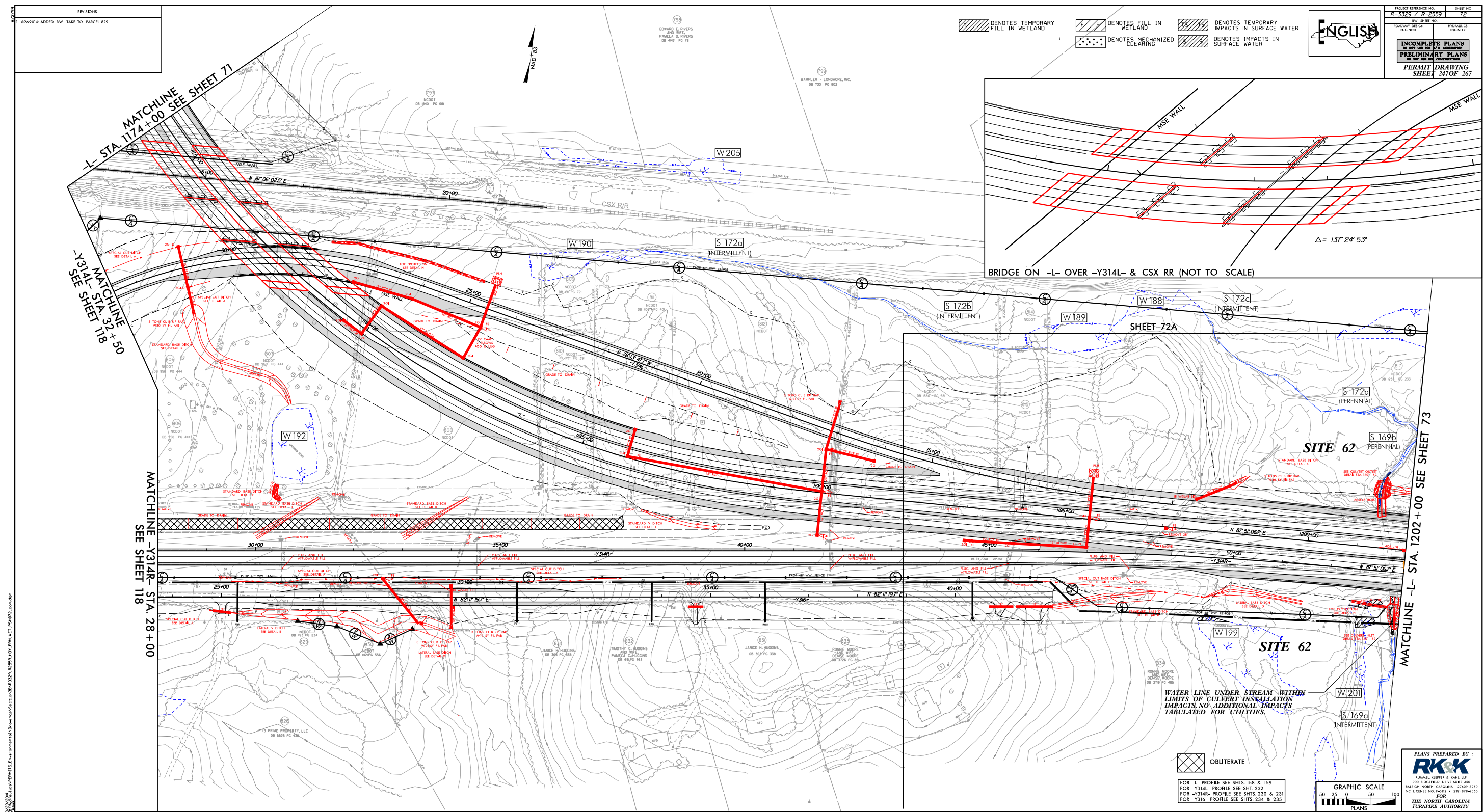
FOR -L- PROFILE SEE SHTS. 158 & 159
FOR -Y314L- PROFILE SEE SHT. 232
FOR -Y314L- PROFILE SEE SHTS. 230 & 231
FOR -Y314L- PROFILE SEE SHTS. 234 & 235



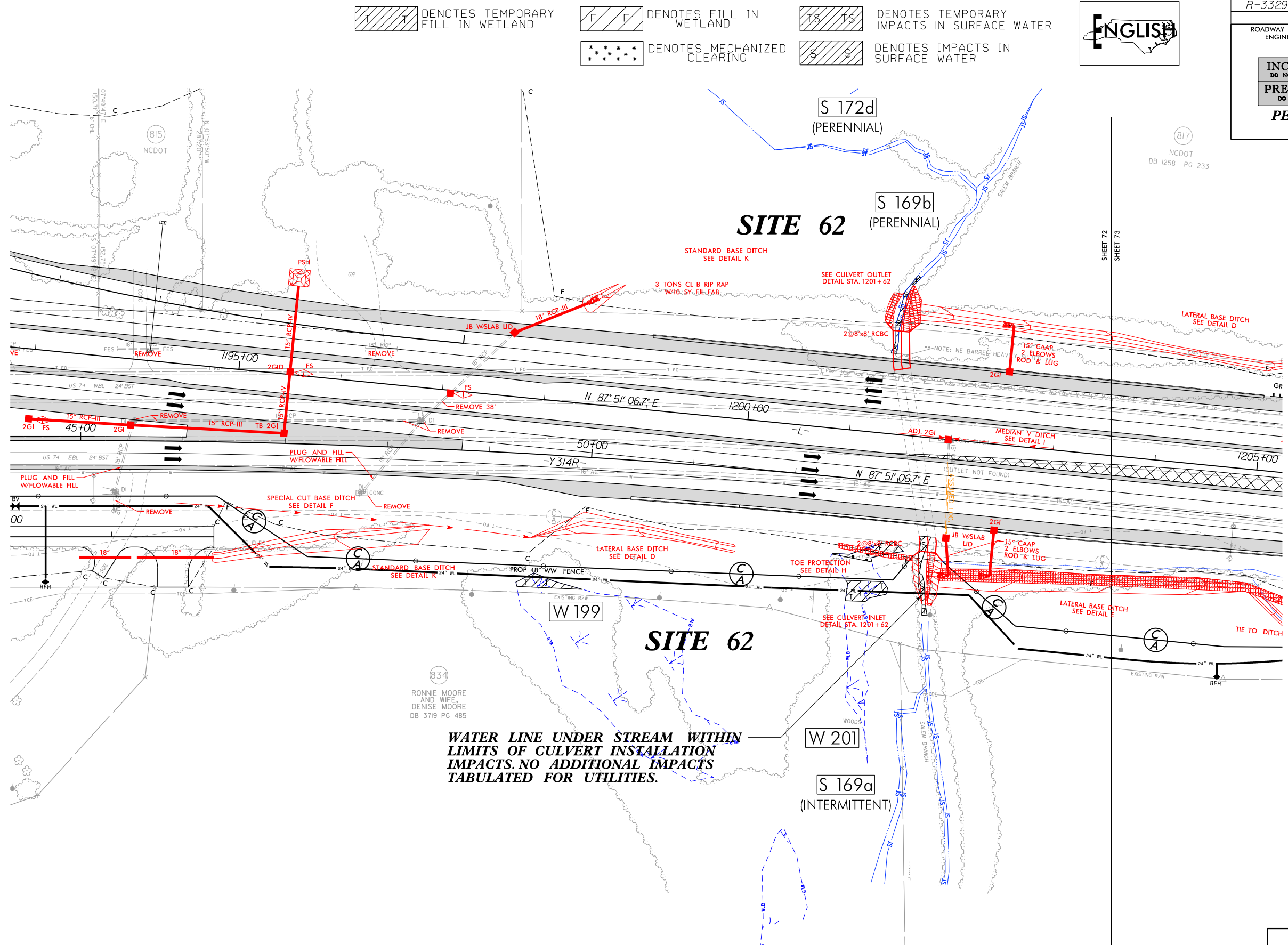
PLANS PREPARED BY :

RK&K

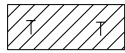
RUNNEL KLEPPER & KAHL, LLP
100 WOODFIELD DRIVE SUITE 330
RALEIGH, NORTH CAROLINA 27605-2640
NC LICENSE NO. 4-0717 - 07018749-0446
FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY



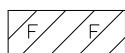
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
LEIGH, NORTH CAROLINA 27609-3960
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FOR -L- PROFILE SEE SHT. 158



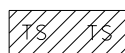
DENOTES TEMPORARY
FILL IN WETLAND



DENOTES FILL IN
WETLAND



DENOTES MECHANIZED
CLEARING



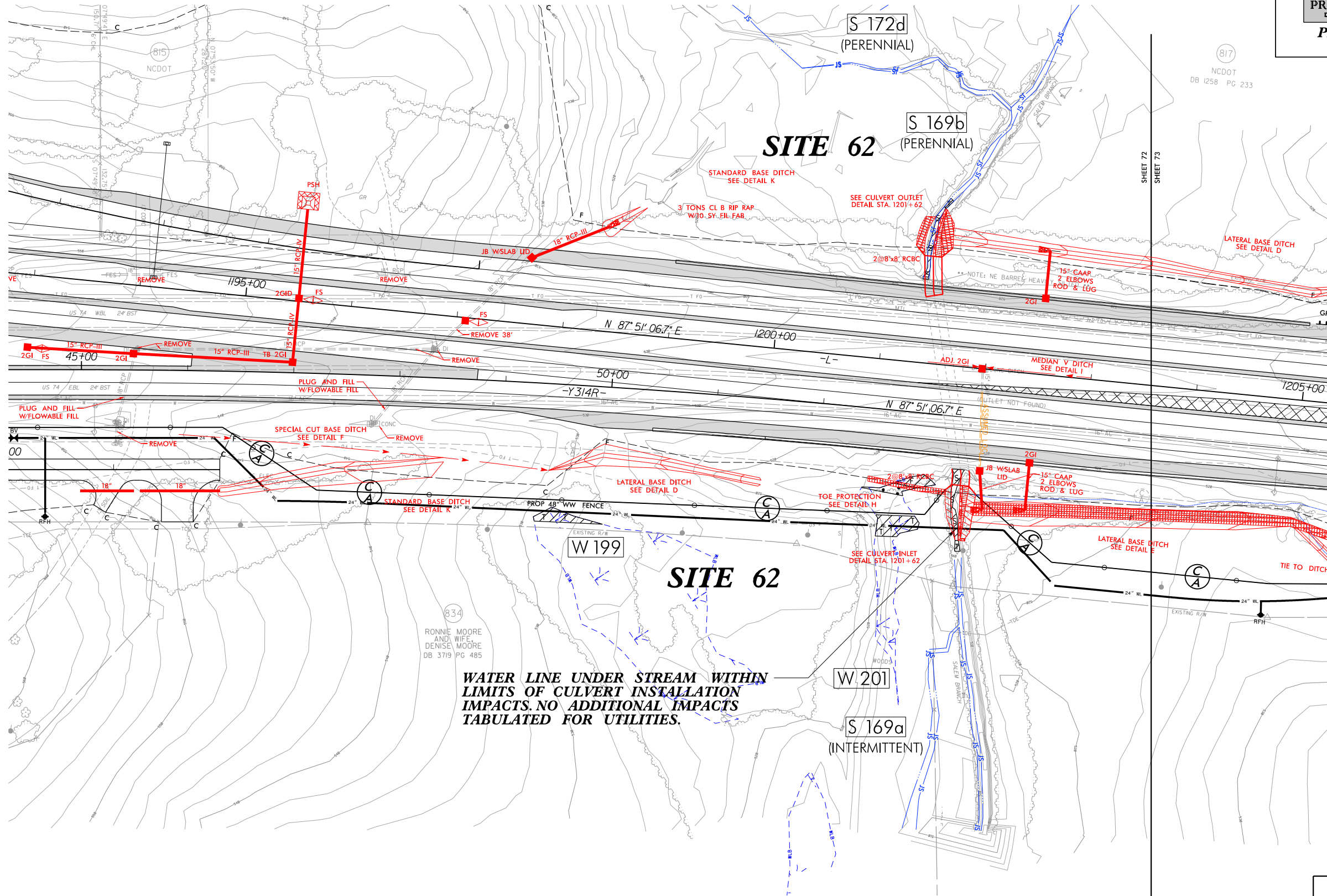
DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



DENOTES IMPACTS IN
SURFACE WATER



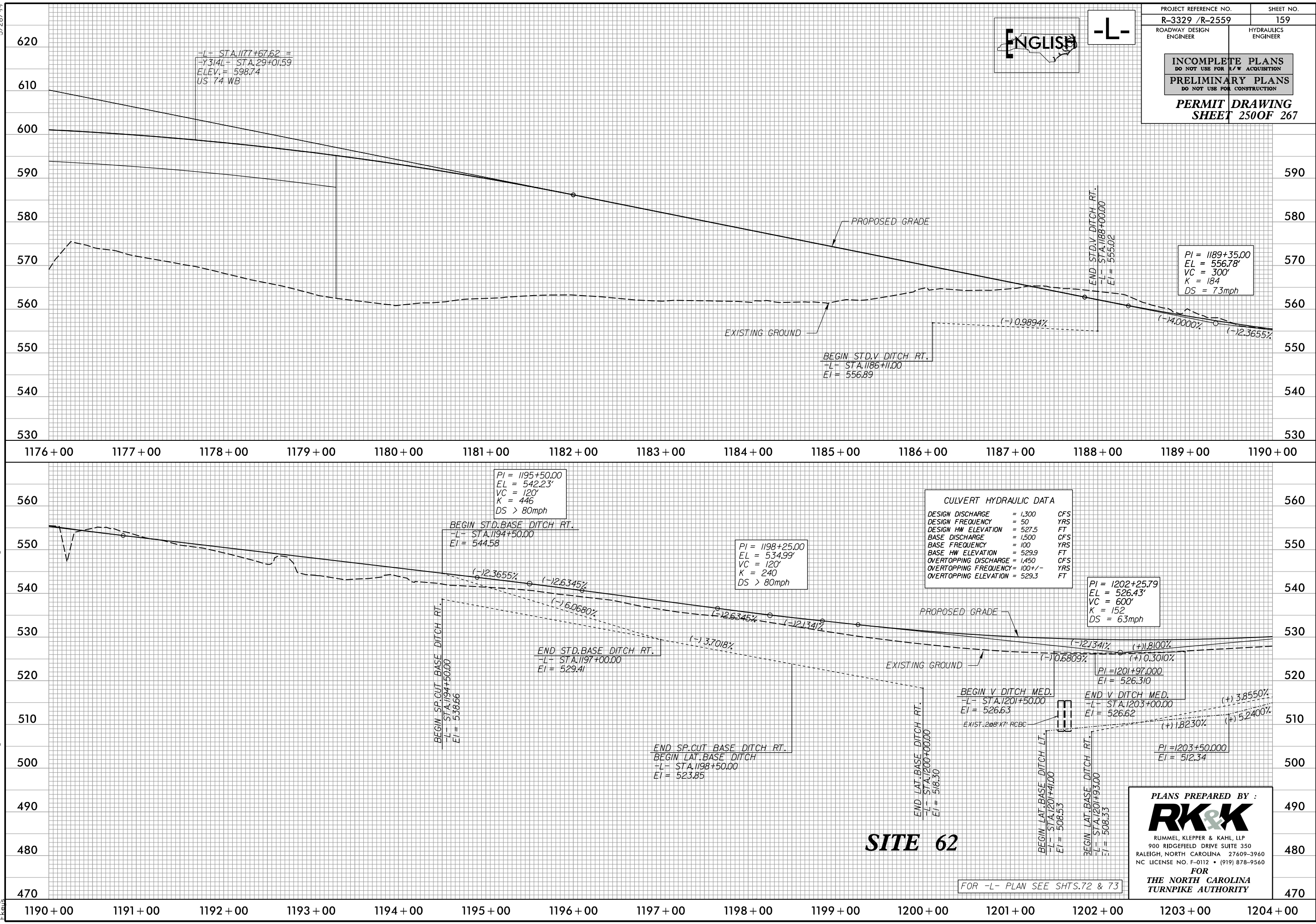
PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	72A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 249 OF 267	



FOR -L- PROFILE SEE SHT. 158

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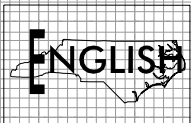
5/28/99
8/29/2004
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Elev



5/14/99

9/29/2004
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Elevs

140 120 100 80 60 40 20 0 20 40 60 80 100 120 140



PROJECT REFERENCE NO.		SHEET NO.
R-3329 /R-2559		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
PERMIT DRAWING SHEET 251 OF 267		

SITE 62

-L- STA. 1201+62

540

536

532

528

524

520

516

512

508

504

500

540

536

532

528

524

520

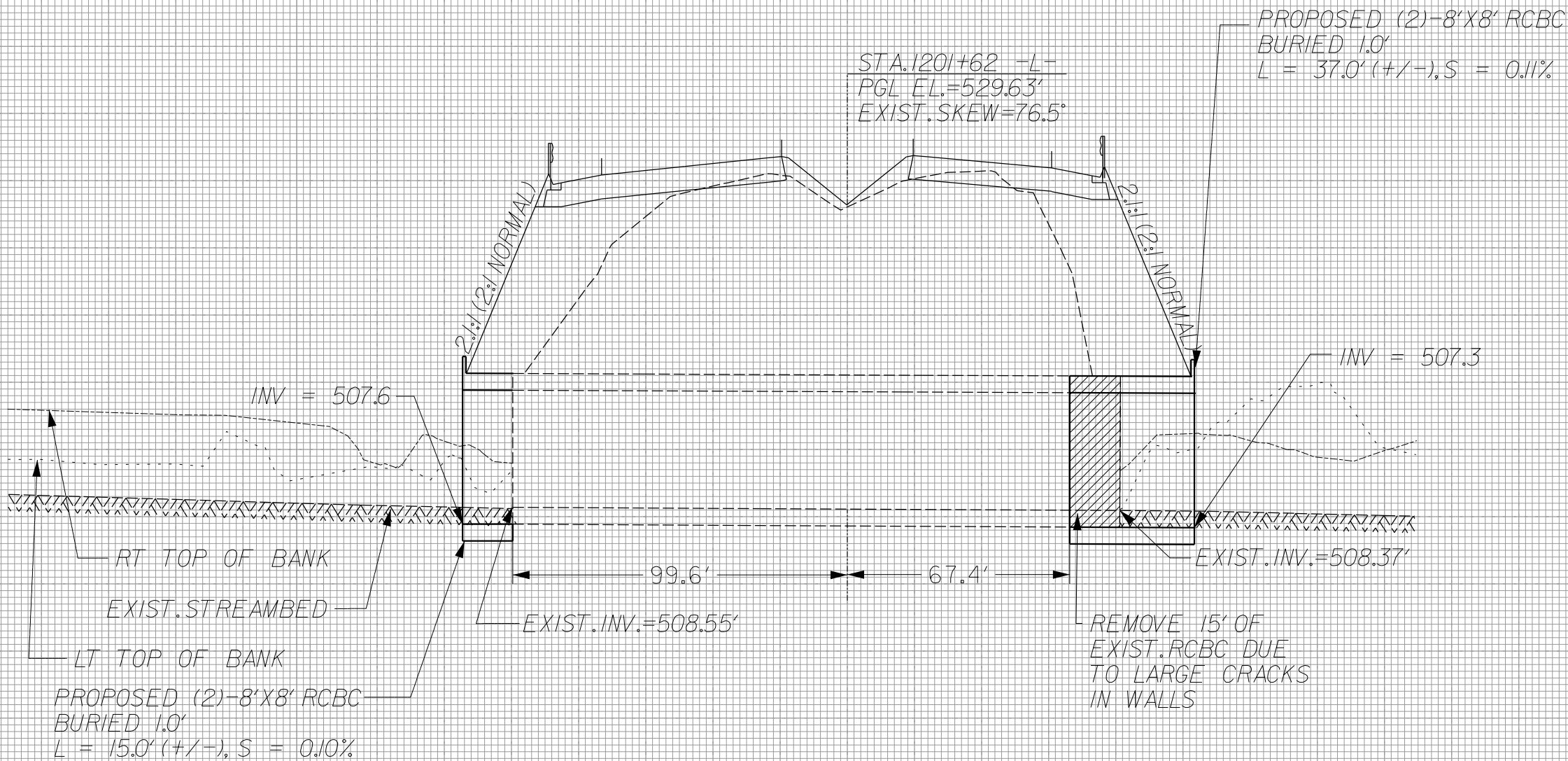
516

512

508

504

500



PROPOSED: EXTEND EXIST 2@8'X7'
(EXT 2@8'X8')
BURIED 1.0'

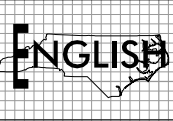
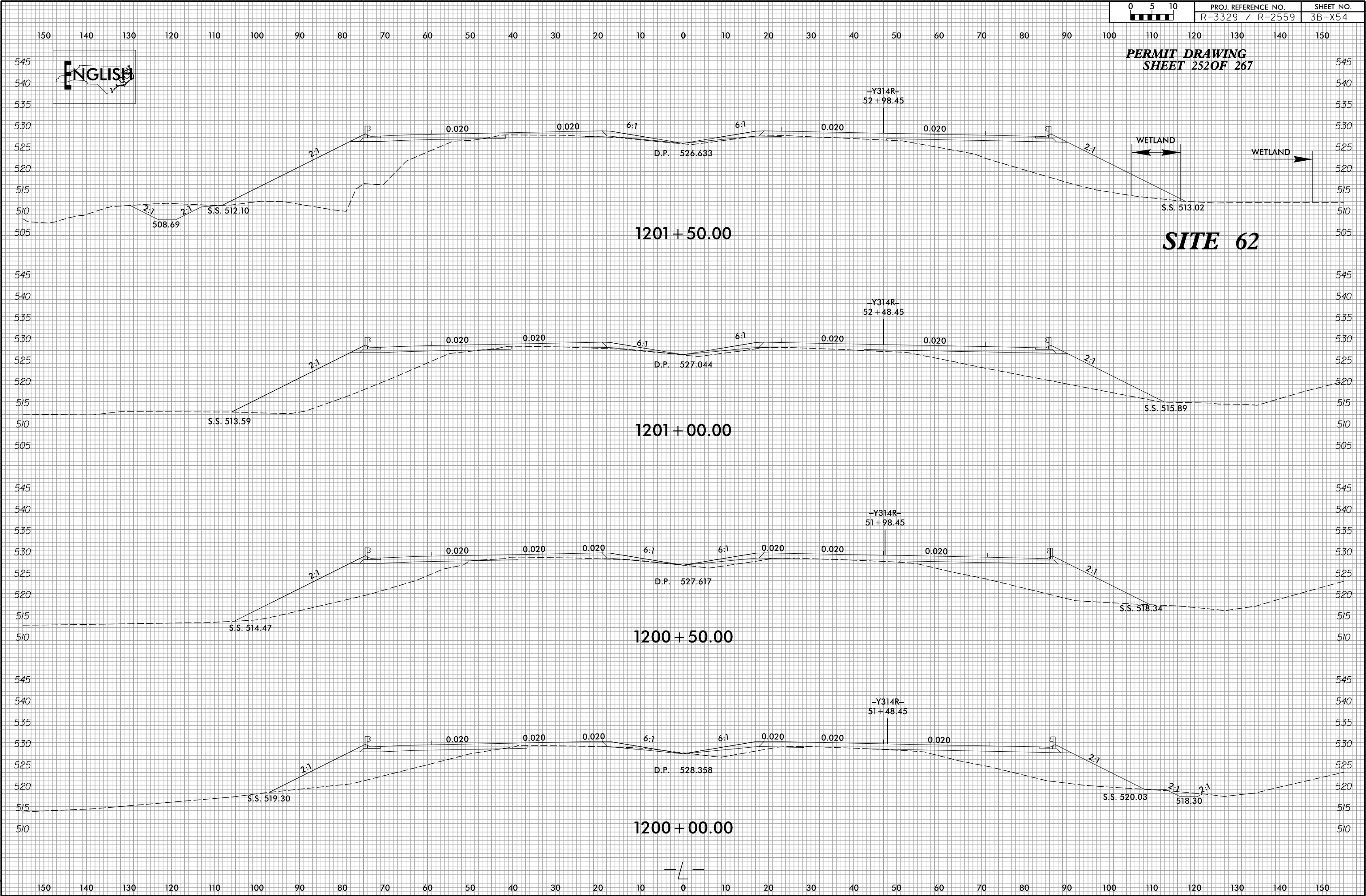
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8/23/99

9/29/2014
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0 5 10 [Scale Bar]	PROJ. REFERENCE NO. R-3329 / R-2559	SHEET NO. 3B-X54
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PERMIT DRAWING
SHEET 252 OF 267



8/17/99
8/29/2014
R:\Hydraulics\PERMITS\Environmental\Drawings\Section3B\R3329_R2559_HDY_PRM_WET_PSH118.dgn

F F DENOTES FILL IN WETLAND
* * * * * DENOTES MECHANIZED CLEARING

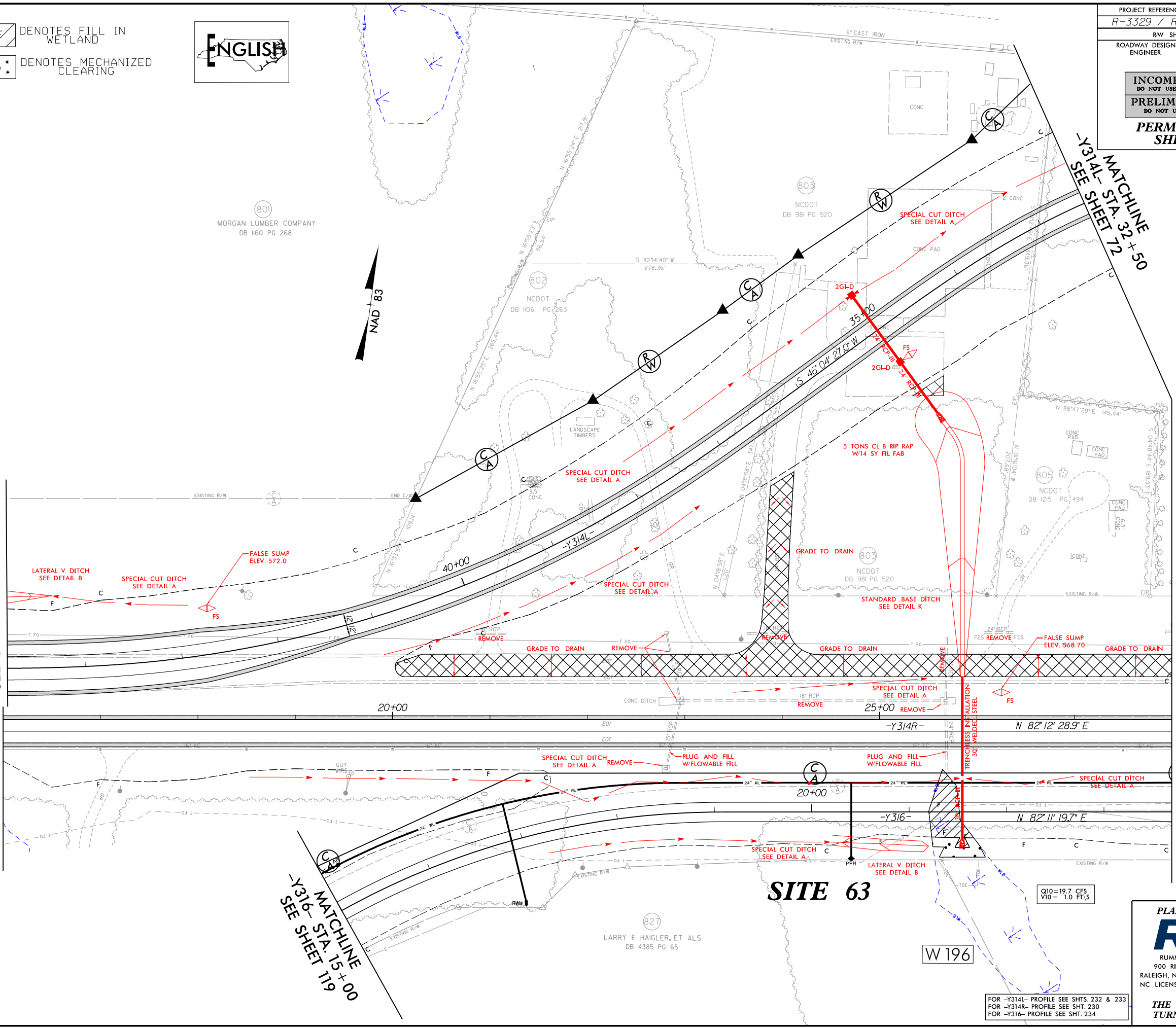


PROJECT REFERENCE NO. <i>R-3329 / R-2559</i>		SHEET NO. <i>118</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
PERMIT DRAWING SHEET 253 OF 267			

MATCHLINE
-Y314R- STA. 16 + 00
SEE SHEET 119

MATCHLINE
-Y314L- STA. 44 + 80
SEE SHEET 119

MATCHLINE -Y314R- STA. 28 + 00
SEE SHEET 72



SITE 63

Q10=19.7 CFS
V10= 1.0 FT/S

W 196

FOR -Y314L- PROFILE SEE SHTS. 232 & 233
FOR -Y314R- PROFILE SEE SHT. 230
FOR -Y316- PROFILE SEE SHT. 234

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
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8/17/99

8/29/2014
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DENOTES FILL IN WETLAND
 DENOTES MECHANIZED CLEARING

ENGLISH

PROJECT REFERENCE NO. R-3329 / R-2559	SHEET NO. 118
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
PERMIT DRAWING SHEET 254 OF 267	

MATCHLINE
 -Y314R- STA. 16 + 00
 SEE SHEET 119

MATCHLINE
 -Y314L- STA. 44 + 80
 SEE SHEET 119

MATCHLINE
 -Y316- STA. 15 + 00
 SEE SHEET 119

MATCHLINE -Y314R- STA. 28 + 00
 SEE SHEET 72

SITE 63

FOR -Y314L- PROFILE SEE SHTS. 232 & 233
 FOR -Y314R- PROFILE SEE SHT. 230
 FOR -Y316- PROFILE SEE SHT. 234

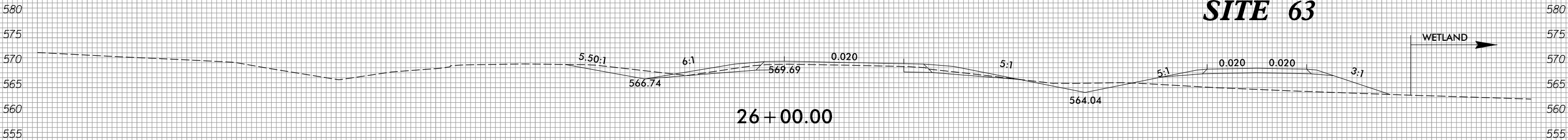
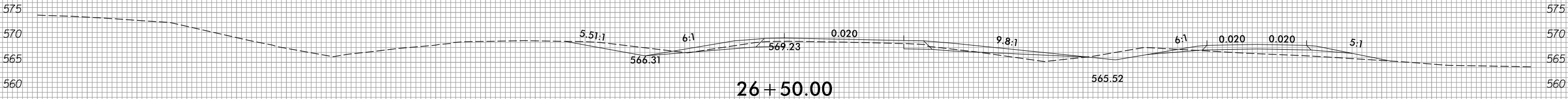
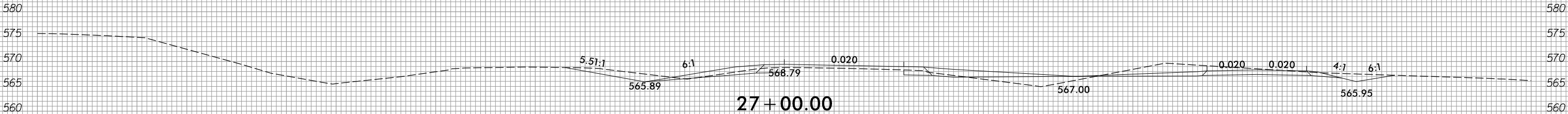
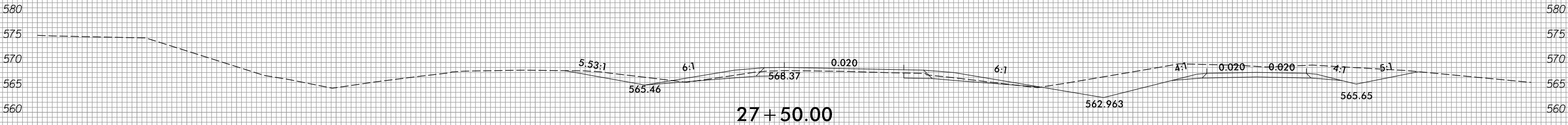
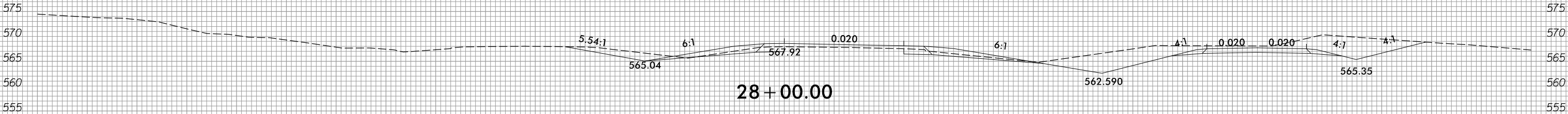
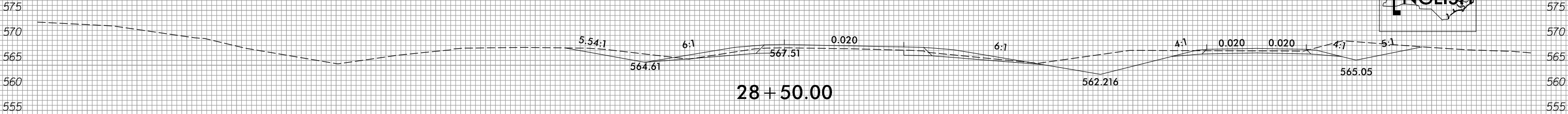
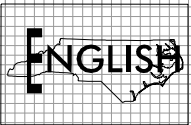
PLANS PREPARED BY :
RK&K
 RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NO. F-0112 • (919) 878-9560
 FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3329 / R-2559	3B-X99

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PERMIT DRAWING
SHEET 255 OF 267



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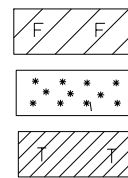
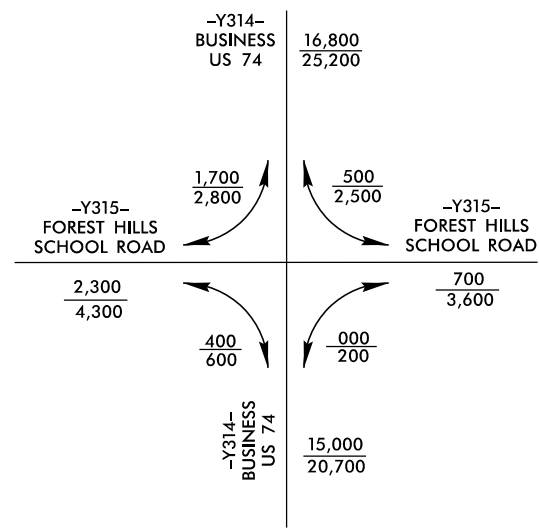
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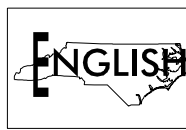
8/17/99

ADT 2013
ADT 2035

TRAFFIC DIAGRAM



F F DENOTES FILL IN WETLAND
* * * * * DENOTES MECHANIZED CLEARING
T T DENOTES TEMPORARY FILL IN WETLAND



NOTES:

INSTALL ONE 48" RCP AT -Y316- STA. 11+76 BURIED 0.8' BELOW EXIST. WETLAND ELEVATION. INSTALL SECOND 48" RCP 1.0' ABOVE BURIED PIPE.

778

UNION COUNTY
BOARD OF EDUCATION
DB 5305 PG 13

SITE 64

WX805

PROJECT REFERENCE NO.	SHEET NO.
R-3329 / R-2559	119
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION
PERMIT DRAWING SHEET 256 OF 267	

771

COMMERCIAL PIPING & FABRICATING, INC.
DB 329 PG 604

801
MORGAN LUMBER COMPANY
DB 1160 PG 268

SITE 64

WX811

MATCHLINE
-Y314R- STA. 16+00
SEE SHEET 118

MATCHLINE
-Y314L- STA. 44+80
SEE SHEET 118

MATCHLINE
-Y316- STA. 15+00
SEE SHEET 118

FOR -Y314R- PROFILE SEE SHT. 230
FOR -Y314L- PROFILE SEE SHT. 233
FOR -Y315- PROFILE SEE SHT. 233
FOR -Y316- PROFILE SEE SHT. 234

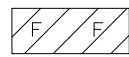
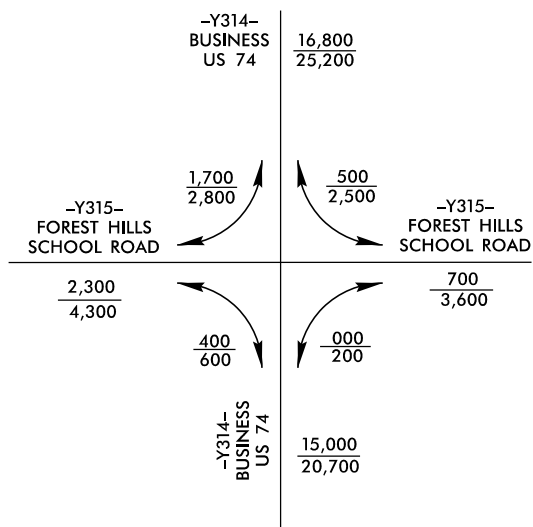
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
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8/29/2014
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ADT 2013
ADT 2035

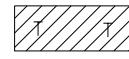
TRAFFIC DIAGRAM



DENOTES FILL IN
WETLAND



DENOTES MECHANIZED
CLEARING



DENOTES TEMPORARY
FILL IN WETLAND

NOTES:

INSTALL ONE 48" RCP AT -Y316- STA. 11+76 BURIED 0.8' BELOW
EXIST. WETLAND ELEVATION. INSTALL SECOND 48" RCP 1.0' ABOVE
BURIED PIPE.



PROJECT REFERENCE NO. R-3329 / R-2559		SHEET NO. 119	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
PERMIT DRAWING SHEET 257 OF 267			

778
UNION COUNTY
BOARD OF EDUCATION
DB 5305 PG 13

771
COMMERCIAL PIPING & FABRICATING, INC.
DB 329 PG 604

801
MORGAN LUMBER COMPANY
DB 1160 PG 268

SITE 64

WX805

WX811

SITE 64

MATCHLINE
-Y314R- STA. 16+00
SEE SHEET 118

MATCHLINE
-Y314L- STA. 44+80
SEE SHEET 118

MATCHLINE
-Y316- STA. 15+00 SEE SHEET 118

FOR -Y314R- PROFILE SEE SHT. 230
FOR -Y314L- PROFILE SEE SHT. 233
FOR -Y315- PROFILE SEE SHT. 233
FOR -Y316- PROFILE SEE SHT. 234

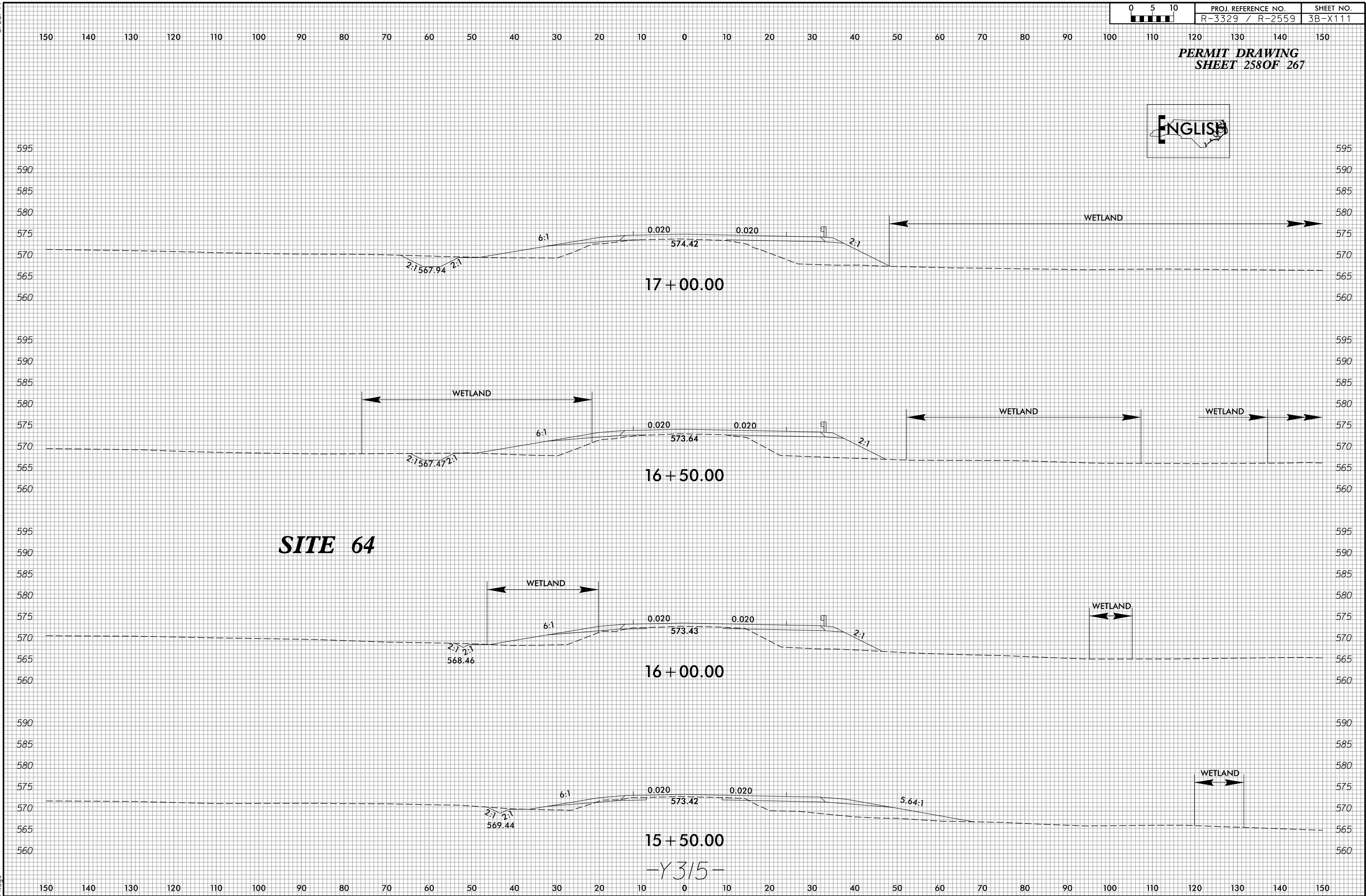
PLANS PREPARED BY :

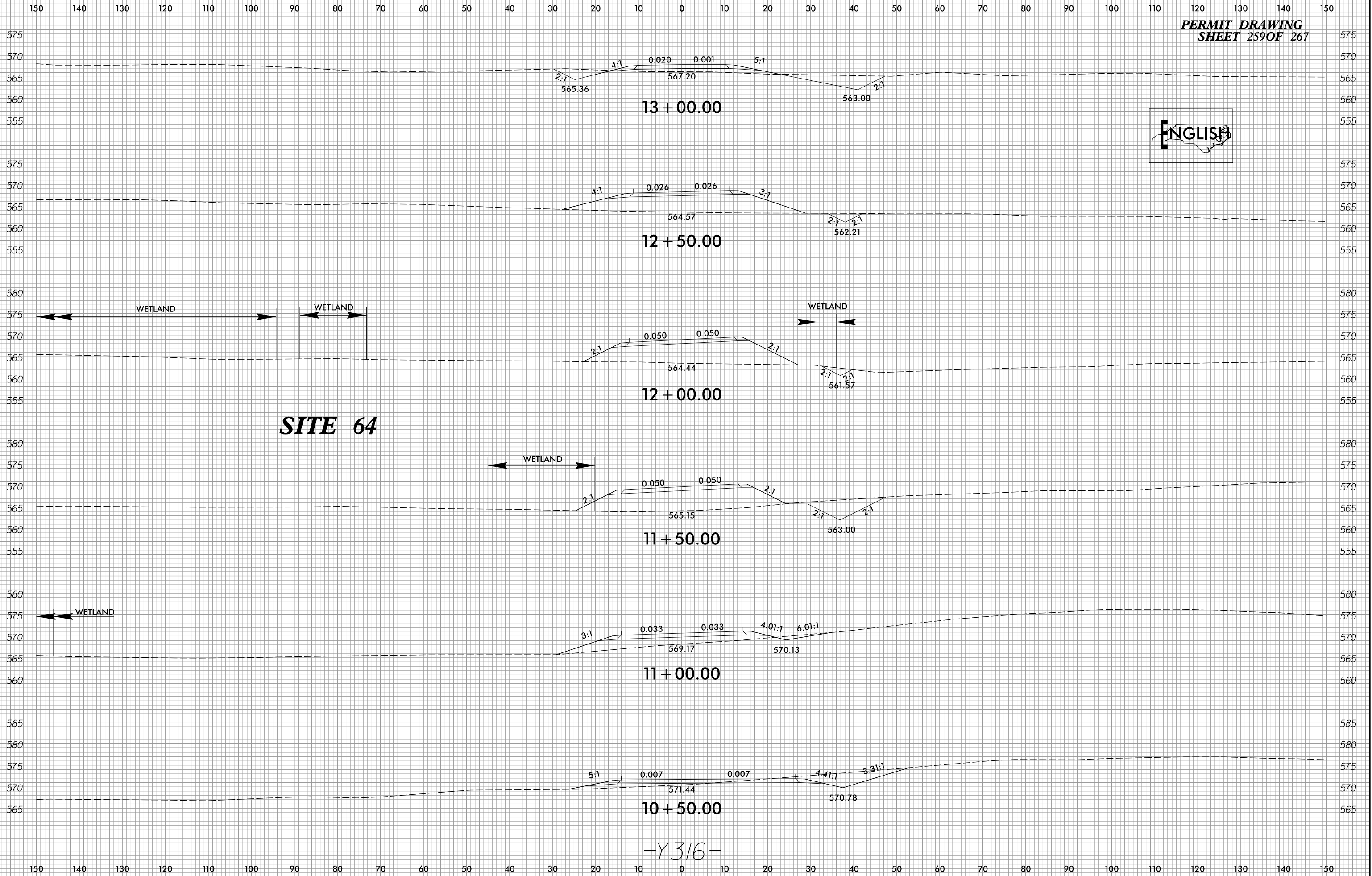
RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
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TURNPIKE AUTHORITY

8/29/2014
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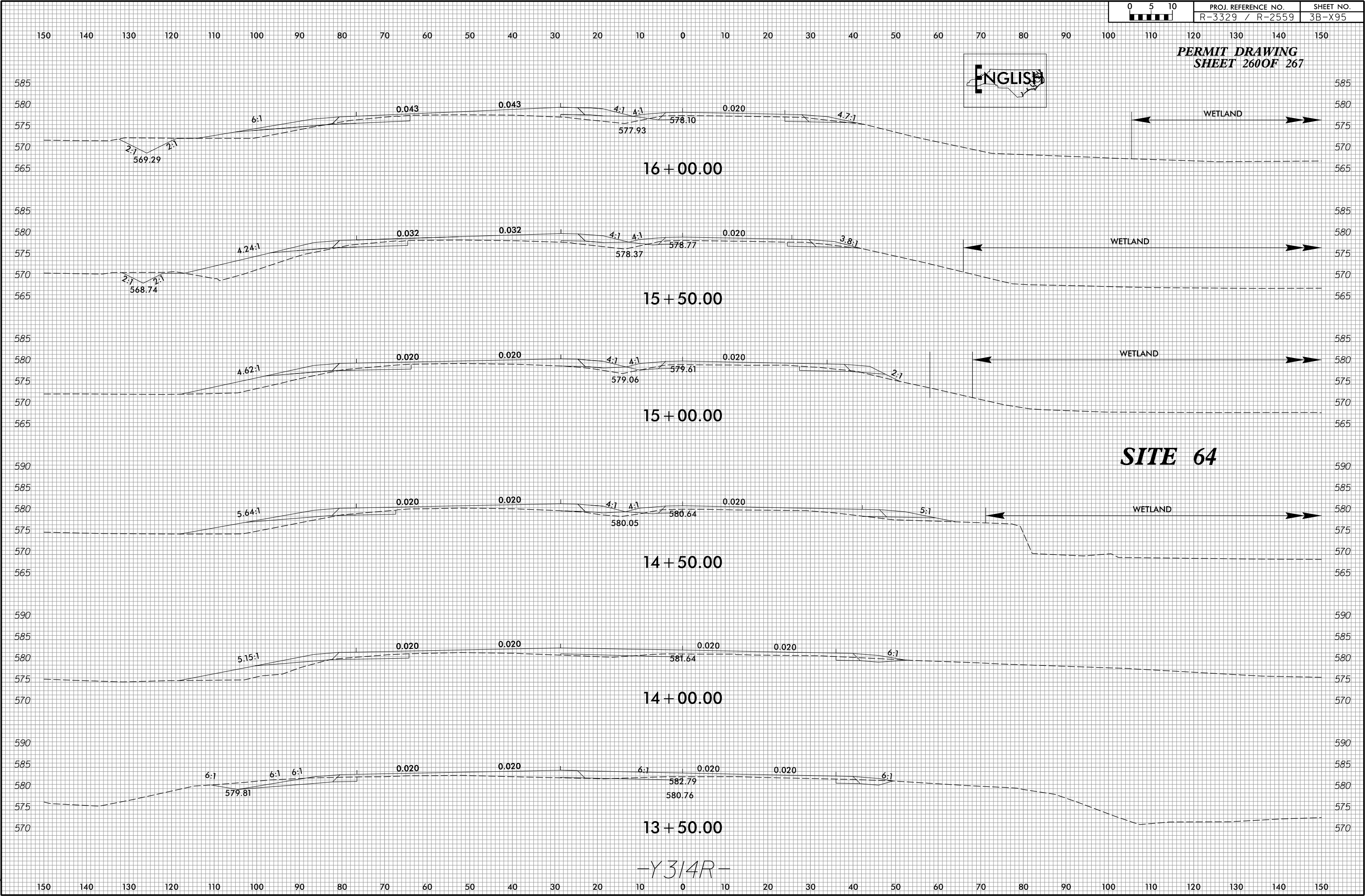
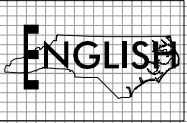




8/23/99

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	R-3329 / R-2559	3B-X95

PERMIT DRAWING
SHEET 260 OF 267



-Y314R-

WETLAND PERMIT IMPACT SUMMARY - DESIGN SECTION 2B												
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)
16	-L- 424+00	(3) 12'X8' RCBC								513		
		BANK STABILIZATION						0.01	<0.01	62	24	
17	-L- 432+98	(2) 66" RCP						0.03		429		
		BANK STABILIZATION						<0.01	<0.01	39	27	
18	-L- 479+00	(2) 42" RCP & 54" RCP	0.10		<0.01	<0.01		0.06		1163		
		BANK STABILIZATION						<0.01	<0.01	18	52	
19	-L- 511+70 LT	BRIDGE										
		BANK STABILIZATION							<0.01		26	
20	-L- 515+45	(2) 8'X8' RCBC						0.02		214		
		BANK STABILIZATION						<0.01	<0.01	51	20	
		UTLITY IMPACTS	0.02	0.04		0.01						
21	-L- 555+50	42" RCP	0.06									
22	-Y208- 20+65	42" RCP & RETAIN 24" RCP	0.01			0.01						
		BANK STABILIZATION						<0.01	<0.01	9	17	
23	-L- 586+33	12'X7' RCBC						0.04		408		
		BANK STABILIZATION						0.01	<0.01	122	20	
24	-L- 591+00	60" RCP						0.02		201		
		BANK STABILIZATION						<0.01	<0.01	32	20	
25	-L- 605+35	72" RCP						0.02		245		
		BANK STABILIZATION						<0.01	<0.01	40	21	
26	-L- 613+68	1@48", 2@36" RCP						0.02		189		
		BANK STABILIZATION						<0.01	<0.01	45	20	
27 ¹	-Y204- 13+50 LT	FILL IN POND						0.07				
SUBTOTAL DESIGN SECTION 2B:			0.19	0.04	0.00	0.02	0.00	0.39	0.02	3780	247	

*Rounded totals are the sum of actual impacts
¹ Surface Water Impact due to Rock Fill in Pond

WETLAND PERMIT IMPACT SUMMARY - DESIGN SECTION 2C												
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)
28	-L- 656+17 TO - 657+71 RT	36" RCP						<0.01		72		
		BANK STABILIZATION						<0.01	<0.01	62	10	
29	-L- 669+50	3@9'X12' RCBC						0.09		241		
		BANK STABILIZATION						0.04	0.01	123	38	
30	-L- 700+11 TO - 705+91	7'X7' RCBC						0.04	<0.01	375	33	
		BANK STABILIZATION						0.02	<0.01	206	10	
31	-L- 718+00	FILL IN WETLANDS	0.09									
32	-L- 738+80 RT	72" RCP & PIPE REMOVAL	0.02					0.01	<0.01	59	20	
		BANK STABILIZATION						<0.01	<0.01	24	10	
33	-L- 752+51 TO - 769+15 LT	FILL IN WETLANDS 30" RCP	1.61			0.28						
34	-L- 805+06 LT	15" RCP						<0.01	<0.01	13	10	
35	-L- 805+89	10'X7' RCBC						0.01		185		
		BANK STABILIZATION						0.01	0.01	82	74	
36	-L- 817+63	48" RCP	0.07					0.01		260		
		BANK STABILIZATION						<0.01	<0.01	16	10	
37	-TLA- 13+07 - 15+68; -TRA- 22+00 LT	FILL IN WETLANDS 24" & 48" RCP	0.28			0.01		0.02		380		
38	-L- 841+00 LT & RT	60" RCP & 2 66" RCPs	0.57					0.06		1016		
		BANK STABILIZATION						0.01	<0.01	95	24	
39 ¹	-L- 849+00 RT	FILL IN POND						0.22				
40 ¹	-L- 856+00 RT	FILL IN POND						0.90				
41 ²	-L- 866+50	42" RCP						0.12		279		
		BANK STABILIZATION						<0.01	<0.01	34	10	
42	-L- 890+87 TO -L- 893+14	FILL IN STREAM						0.03	<0.01	276	13	
43	-L- 893+00	84" RCP	0.01			<0.01		0.05		299	11	
		BANK STABILIZATION						0.01	<0.01	28	10	
44	-L- 903+70	54" RCP	0.13			0.02		0.02		179		
		BANK STABILIZATION						<0.01	<0.01	18	10	
45 ¹	-Y302- 152+00 RT	24" RCP						0.05				
SUBTOTAL DESIGN SECTION 2C:			2.78	0.00	0.00	0.31	0.00	1.73	0.04	4322	293	

*Rounded totals are the sum of actual impacts
¹ Fill in surface water due to draining pond
² 0.10ac of fill in surface water due to draining pond

Stormwater Management Plan



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: R3329\R2559 - Sct1 - 110+00 to 227- County(ies): Union

Page 1 of 4

General Project Information

Project No.:	R3329\R2559 - Sct1 - 110+00 to 227+00		Project Type:	New Location	Date:	10/1/2014
NCDOT Contact:	William Zerman, Jr, PE		Contractor / Designer:	Monroe Bypass Constructors - 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: 919-707-6755			Phone: 919-847-0166		
	Email: bzerman@ncdot.gov			Email: mcook@rkk.com		
City/Town:	Monroe		County(ies):	Union		
River Basin(s):	Yadkin-Pee Dee		CAMA County?	No		
Primary Receiving Water:	See Environmental Summary		NCDWQ Stream Index No.:	See Environmental Summary		
NCDWQ Surface Water Classification for Primary Receiving Water	Primary:		See Environmental Summary			
	Supplemental:					
Other Stream Classification:						
303(d) Impairments:	See Environmental Summary					
Buffer Rules in Effect	N/A					

Project Description

Project Length (lin. Miles or feet):	19.70 Mi.	Surrounding Land Use:	Rural with some urbanization		
	Proposed Project		Existing Site		
Project Built-Upon Area (ac.)	62.47	ac.	34.48	ac.	
Typical Cross Section Description:	4 lane divided roadway with 46' grass median				
Average Daily Traffic (veh/hr/day):	Design/Future: 95,600 (2035)		Existing: N/A - New Location		

General Project Narrative: The project is being constructed as a four lane divided highway from the Town of Stallings (bypassing Monroe) to just east of Wingate. The project includes major interchanges and improvements to existing US74 at both ends.

References



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS



(Version 1.2; Released September 2011)

Project/TIP No.: R3329/R2559 - Sct1 - 110+00 to County(ies): Union Page 2 of 4

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
7/75	135+61 137+29	Stream	Perennial	UT to North Fork Crooked Creek	S014B	13-17-20-1	C	biological impairment	Culvert	N/A	None
7	137+35 137+88	Stream	Perennial	UT to North Fork Crooked Creek	S014C	13-17-20-1	C	biological impairment	Culvert	N/A	None
7	138+01 140+12	Stream	Perennial	UT to North Fork Crooked Creek	S014D	13-17-20-1	C	biological impairment	Culvert	N/A	None
7	139+95 140+07	Stream	Intermittent	UT to North Fork Crooked Creek	S015B	13-17-20-1	C	biological impairment	Fill	N/A	None
7	141+14 141+35	Stream	Intermittent	UT to North Fork Crooked Creek	S015A	13-17-20-1	C	biological impairment	Fill	N/A	None
7	140+14 140+18	Stream	Perennial	UT to North Fork Crooked Creek	S014E	13-17-20-1	C	biological impairment	Culvert	N/A	None
7	141+02 141+44	Stream	Perennial	UT to North Fork Crooked Creek	SX014F	13-17-20-1	C	biological impairment	Culvert	N/A	None
8	152+36 154+77	Stream	Intermittent	UT to North Fork Crooked Creek	S016A	13-17-20-1	C	biological impairment	Culvert	N/A	None
9	175+13 176+81	Stream	Perennial	UT to North Fork Crooked Creek	S017A	13-17-20-1	C	biological impairment	Culvert	N/A	None
9	176+04 176+69	Stream	Intermittent	UT to North Fork Crooked Creek	S019	13-17-20-1	C	biological impairment	Fill	N/A	None
9	177+29 177+52	Stream	Perennial	UT to North Fork Crooked Creek	S017B	13-17-20-1	C	biological impairment	Culvert	N/A	None
9	177+63 178+08	Stream	Perennial	UT to North Fork Crooked Creek	S017C	13-17-20-1	C	biological impairment	Culvert	N/A	None
10/11	196+70 199+54	Wetland	Unknown	UT to North Fork Crooked Creek	N/A	N/A	N/A	N/A	Fill	N/A	None
10/11	SR2 14+05-17+61	Wetland	Unknown	UT to North Fork Crooked Creek	N/A	N/A	N/A	N/A	Fill	N/A	None
75	Y111 11+42 - 14+52	Wetland	Unknown	UT to North Fork Crooked Creek	WX800	N/A	N/A	N/A	Fill	N/A	None
75	Y111 18+47 - 19+46	Stream	Perennial	UT to North Fork Crooked Creek	SX014A	13-17-20-1	C	biological impairment	Culvert	N/A	None

* List all stream and surface water impact locations regardless of jurisdiction or size.

Equalizer Pipes to be noted as a minimization of impacts.

All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

References



(Version 1.2; Released September 2011)

Page 3 of 4

Surface Water Impacts

* List all stream and surface water impact locations regardless of jurisdiction or size.
Equalizer Pipes to be noted as a minimization of impacts.
All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

References



Project/TIP No.: R3329\R2559 - Sct1 - 11 County(ies): Union Page 4 of 4

☒ YES ☐ NO Have minimum design criteria, as presented in the NCDOT Best Management Practices Toolbox (2008), NCDOT Standard Details, or FHWA HEC-14 (July 2006), been met and verified, as applicable? If No, provide further explanation of why design criteria was not met.

* Refer to the NCDOT Best Management Practices Toolbox, Version 1 (March 2008), NCDOT Standard Details, 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 LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: R3329\R2559 - Sct2A - 227+00 to 41+00 County(ies): Union

Page 1 of 3

General Project Information

Project No.:	R3329\R2559 - Sct2A - 227+00 to 416+00		Project Type:	New Location		Date:	10/1/2014	
NCDOT Contact:	William Zerman, Jr, PE		Contractor / Designer:	Monroe Bypass Constructors - 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: 919-707-6755			Phone: 919-847-0166				
	Email: bzerman@ncdot.gov			Email: mcook@rkk.com				
City/Town:	Monroe		County(ies):	Union				
River Basin(s):	Yadkin-Pee Dee		CAMA County?	No				
Primary Receiving Water:	See Environmental Summary		NCDWQ Stream Index No.:	See Environmental Summary				
NCDWQ Surface Water Classification for Primary Receiving Water	Primary:		See Environmental Summary					
	Supplemental:							
Other Stream Classification:								
303(d) Impairments:	See Environmental Summary							
Buffer Rules in Effect	N/A							

Project Description

Project Length (lin. Miles or feet):	19.70 Mi.	Surrounding Land Use:	Rural with some urbanization		
	Proposed Project		Existing Site		
Project Built-Upon Area (ac.)	37.74 ac.		9.76 ac.		
Typical Cross Section Description:	4 lane divided roadway with 46' grass median				
Average Daily Traffic (veh/hr/day):	Design/Future:	95,600 (2035)	Existing:	N/A - New Location	

General Project Narrative: The project is being constructed as a four lane divided highway from the Town of Stallings (bypassing Monroe) to just east of Wingate. The project includes major interchanges and improvements to existing US74 at both ends.

References



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS



(Version 1.2; Released September 2011)

Project/TIP No.: R3329/R2559 - Sct2A - 227+00 to 227+00 County(ies): Union Page 2 of 3

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
15/16	261+36 262+03	Wetland	Unknown	UT to North Fork Crooked Creek	W019	N/A	N/A	N/A	Fill	N/A	None
15/16	261+98 265+05	Stream	Intermittent	UT to North Fork Crooked Creek	S031C	13-17-20-1	C	biological impairment	Fill	N/A	None
16	264+94 265+81	Stream	Perennial	UT to North Fork Crooked Creek	S028C	13-17-20-1	C	biological impairment	Culvert	N/A	None
16	264+84 265+38	Wetland	Unknown	UT to North Fork Crooked Creek	W017	N/A	N/A	N/A	Fill	N/A	None
17	293+22 293+85	Stream	Perennial	UT to North Fork Crooked Creek	S034	13-17-20-1	C	biological impairment	Culvert	N/A	None
17	297+63 297+73	Stream	Intermittent	UT to North Fork Crooked Creek	S036	13-17-20-1	C	biological impairment	Stabilization	N/A	None
18	370+66 371+71	Stream	Intermittent	UT to North Fork Crooked Creek	S037C	13-17-20-1	C	biological impairment	Culvert	N/A	None
18	372+00 374+08	Stream	Intermittent	UT to North Fork Crooked Creek	S037D	13-17-20-1	C	biological impairment	Culvert	N/A	None
18	372+95 373+53	Open Water	Pond	UT to North Fork Crooked Creek	P09	13-17-20-1	C	biological impairment	Fill	N/A	None
18/19	375+89 376+57	Open Water	Pond	UT to North Fork Crooked Creek	P10	13-17-20-1	C	biological impairment	Fill	N/A	None
20	395+63 395+74	Wetland	Unknown	UT to North Fork Crooked Creek	W22B	N/A	N/A	N/A	Fill	N/A	None
20	395+74 397+08	Stream	Perennial	UT to North Fork Crooked Creek	S038B	13-17-20-1	C	biological impairment	Culvert	N/A	None
20	396+23 397+01	Wetland	Unknown	UT to North Fork Crooked Creek	W025	N/A	N/A	N/A	Fill	N/A	None
86	-SR107- 13+18 -14+43	Open Water	Pond	UT to North Fork Crooked Creek	P05	13-17-20-1	C	biological impairment	Fill	N/A	None
18	-SR4- 12+25	Stream	Intermittent	UT to North Fork Crooked Creek	S037B	13-17-20-1	C	biological impairment	Excavation	N/A	None

* List all stream and surface water impact locations regardless of jurisdiction or size.

Equalizer Pipes to be noted as a minimization of impacts.

All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

References



* Refer to the NCDOT Best Management Practices Toolbox, Version 1 (March 2008), NCDOT Standard Details, 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 LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: R3329\R2559 - Sct2B - 416+00 to 64+ County(ies): Union

Page 1 of 4

General Project Information

Project No.:	R3329\R2559 - Sct2B - 416+00 to 648+00		Project Type:	New Location		Date:	10/1/2014	
NCDOT Contact:	William Zerman, Jr, PE		Contractor / Designer:	Monroe Bypass Constructors - 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: 919-707-6755			Phone: 919-847-0166				
	Email: bzerman@ncdot.gov			Email: jmeador@rkk.com				
City/Town:	Monroe		County(ies):	Union				
River Basin(s):	Yadkin-Pee Dee		CAMA County?	No				
Primary Receiving Water:	See Environmental Summary		NCDWQ Stream Index No.:	See Environmental Summary				
NCDWQ Surface Water Classification for Primary Receiving Water	Primary:		See Environmental Summary					
	Supplemental:							
Other Stream Classification:								
303(d) Impairments:	See Environmental Summary							
Buffer Rules in Effect	N/A							

Project Description

Project Length (lin. Miles or feet):	19.70 Mi.	Surrounding Land Use:	Rural with some urbanization		
	Proposed Project		Existing Site		
Project Built-Upon Area (ac.)	77.29 ac.		11.89 ac.		
Typical Cross Section Description:	4 lane divided roadway with 46' grass median				
Average Daily Traffic (veh/hr/day):	Design/Future:	95,600 (2035)	Existing:	N/A - New Location	

General Project Narrative: The project is being constructed as a four lane divided highway from the Town of Stallings (bypassing Monroe) to just east of Wingate. The project includes major interchanges and improvements to existing US74 at both ends.

References



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS



(Version 1.2; Released September 2011)

Project/TIP No.: R3329/R2559 - Sct2B - 416+00 to 416+00 County(ies): Union Page 2 of 4

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
22	423+44 425+32	Stream	Perennial	UT to North Fork Crooked Creek	S039C	13-17-20-1	C	biological impairment	Culvert	N/A	None
23	431+01 433+79	Stream	Intermittent	UT to North Fork Crooked Creek	S043	13-17-20-1	C	biological impairment	Culvert	N/A	None
25	474+25 484+24	Stream	Intermittent	UT to South Fork Crooked Creek	S052A	13-17-20-2	C	biological impairment	Fill	N/A	None
27	511+71	Stream	Perennial	South Fork Crooked Creek	S047	13-17-20-2	C	biological impairment	Stabilization	N/A	None
28	514+79 516+22	Stream	Perennial	UT to South Fork Crooked Creek	S055	13-17-20-2	C	biological impairment	Culvert	N/A	None
28	516+16 516+70	Wetland	Unknown	UT to South Fork Crooked Creek	WX822	N/A	N/A	N/A	Fill	N/A	None
29/30	555+44 556+11	Wetland	Unknown	UT to East Fork Stewarts Creek	N/A	N/A	N/A	N/A	Fill	N/A	None
30	-Y208- 20+67	Wetland	Unknown	UT to East Fork Stewarts Creek	WX823	N/A	N/A	N/A	Culvert	N/A	None
32	584+77 588+02	Stream	Perennial	UT to East Fork Stewarts Creek	S068B\ S068C	13-17-36-9-2	WSIII	None	Culvert	N/A	None
32	590+96 591+40	Stream	Intermittent	UT to East Fork Stewarts Creek	S069	13-17-36-9-2	WSIII	None	Culvert	N/A	None
33	604+84 606+07	Stream	Intermittent	UT to East Fork Stewarts Creek	S070B	13-17-36-9-2	WSIII	None	Culvert	N/A	None
34	613+21 614+15	Stream	Intermittent	UT to East Fork Stewarts Creek	S071	13-17-36-9-2	WSIII	None	Culvert	N/A	None
93	-Y204- 12+70-14+00	Open Water	Pond	UT to South Fork Crooked Creek	P23	N/A	C	biological impairment	Fill	N/A	None

* List all stream and surface water impact locations regardless of jurisdiction or size.

Equalizer Pipes to be noted as a minimization of impacts.

All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

References



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: R3329\R2559 - Sct2B - 41 County(ies): Union

Page 3 of 4

Swales

Sheet No.	Station (From / To)	Stream Crossing Station	Base Width (ft)	Front Slope (H:V)	Back Slope (H:V)	Drainage Area (ac)	Recommended Treatment Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used
26	-L- 49950 50316 LT	-L- 511+61 LT	6.0	3:1	3:1	5.45	545	366	0.50%	15.4	1.8	19.7	1.8	No
27	-L- 50400 50700 LT	-L- 511+61 LT	6.0	3:1	3:1	7.60	760	300	0.40%	21.5	1.8	27.5	1.9	No
27	-L- 50850 51168 LT	-L- 511+61 LT	6.0	3:1	3:1	9.82	982	318	0.30%	27.8	1.8	35.5	2.0	No
28	-L- 51600 51700 LT	-L- 514+89 LT	6.0	3:1	3:1	2.62	262	100	1.30%	8.6	1.8	11.0	1.9	No
28	-L- 52450 52600 LT	-L- 516+33 RT	6.0	3:1	3:1	1.74	174	150	1.60%	5.7	1.9	7.3	2.0	No
28	-Y204- 3200 3350 LT	-L- 516+33 RT	6.0	3:1	3:1	1.26	126	150	0.91%	4.2	1.4	5.3	1.5	No
28	-L- 52000 52450 CL	-L- 516+33 RT	0.0	6:1	6:1	0.69	69	450	0.80%	2.3	1.4	2.9	1.4	No
28	-L- 52450 52942 CL	-L- 516+33 RT	0.0	6:1	6:1	0.52	52	492	0.80%	1.2	1.1	1.6	1.1	No
28	-L- 52000 52400 LT	-L- 516+33 RT	0.0	6:1	6:1	1.16	116	400	0.80%	3.5	1.5	4.5	1.6	No
28	-L- 52550 52900 RT	-L- 516+33 RT	0.0	6:1	6:1	0.62	62	350	0.80%	2.0	1.3	2.6	1.4	No
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☒ YES ☐ NO Have minimum design criteria, as presented in the NCDOT Best Management Practices Toolbox, Version 1 (March 2008), been met and verified? If No, provide further explanation of why design criteria was not met.

Additional Comments

SWALE AT -L- 511+61 LT BROKEN INTO 3 SECTIONS TO SHOW SEPARATE SLOPES AND VELOCITIES. TOTAL DA TO SWALE IS 9.82 ACRES AND 984 LF OF TREATMENT LENGTH IS PROVIDED BETWEEN THE THREE SECTIONS



Preformed Scour Holes and Energy Dissipators

Additional Comments

* Refer to the NCDOT Best Management Practices Toolbox, Version 1 (March 2008), NCDOT Standard Details, 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 LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: R3329\R2559 - Sec2C - 648+00 to 91 County(ies): Union

Page 1 of 4

General Project Information

Project No.:	R3329\R2559 - Sec2C - 648+00 to 912+00		Project Type:	New Location		Date:	10/1/2014	
NCDOT Contact:	Marshall Clawson, PE		Contractor / Designer:	Monroe Bypass Constructors - Matthew L. Cook, PE				
Address:	NCDOT Hydraulics Unit 1590 Mail Service Center Raleigh, NC 27699-1590		Address:	900 Ridgefield Drive Suite 350 Raleigh, NC 27609				
	Phone: 919-707-6713			Phone: 919-878-9560				
	Email: mclawson@ncdot.gov			Email: mcook@rkk.com				
City/Town:	Monroe		County(ies):	Union				
River Basin(s):	Yadkin-Pee Dee		CAMA County?	No				
Primary Receiving Water:	See Environmental Summary		NCDWQ Stream Index No.:	See Environmental Summary				
NCDWQ Surface Water Classification for Primary Receiving Water	Primary:		See Environmental Summary					
	Supplemental:							
Other Stream Classification:								
303(d) Impairments:	See Environmental Summary							
Buffer Rules in Effect	N/A							

Project Description

Project Length (lin. Miles or feet):	Total 19.7	Surrounding Land Use:	Rural with some urbanization	
	Proposed Project		Existing Site	
Project Built-Upon Area (ac.)	129.20 ac.		16.11 ac.	
Typical Cross Section Description:	4 lane divided roadway with 46' grass median			
Average Daily Traffic (veh/hr/day):	Design/Future: 95,600 (2035)	Existing:	N/A - New Location	

General Project Narrative: The project is being constructed as a four lane divided highway from the Town of Stallings (bypassing Monroe) to just east of Wingate. The project includes major interchanges and improvements to existing US74 at both ends.

References



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS



(Version 1.2; Released September 2011)

Project/TIP No.: R3329/R2559 - Sec2C - 648+00 County(ies): Union Page 2 of 4

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
37	656+17 657+71	Stream	Intermittent	East Fork Stewarts Creek	S78b	13-17-36-9-2	WSIII		Culvert	N/A	None
38	669+50	Stream	Perennial	East Fork Stewarts Creek	S76	13-17-36-9-2	WSIII		Culvert	N/A	None
40-41	700+11 705+91	Stream	Perennial	East Fork Stewarts Creek	S80a, S80b, S80c	13-17-36-9-(1)	WSIII		Culvert	N/A	None
42	718+00	Wetland	Riverine	N/A, Isolated	W81				Fill	N/A	None
43	738+80	Stream	Perennial	Stewarts Creek	S81a	13-17-36-9-(1)	WSIII		Culvert	N/A	None
43	738+80	Wetland	Riverine	Stewarts Creek	W82	13-17-36-9-(1)	WSIII		Culvert	N/A	None
43-44	752+51 769+15	Wetland	Riverine	Stewarts Creek	W86				Fill	N/A	None
47	805+06	Stream	Intermittent	Stewarts Creek	S88a	13-17-36-9-(1)	WSIII		Fill	N/A	None
47	805+89	Stream	Perennial	Stewarts Creek	S86	13-17-36-9-(1)	WSIII		Culvert	N/A	None
48	817+63	Stream	Intermittent	Stewarts Creek	S89a	13-17-36-9-(1)	WSIII		Culvert	N/A	None
48	817+63	Wetland	Riverine	Stewarts Creek	W99				Fill	N/A	None
48	823+48 827+50	Open Water	Pond	Stewarts Creek	P44				Fill	N/A	None
48	13+07 15+68	Stream	Intermittent	Stewarts Creek	S92a, S92b	13-17-36-9-(1)	WSIII		Fill	N/A	Mod. Ret. Basin
48	13+07 15+68	Wetland	Riverine	Stewarts Creek	W101, W102, W103				Fill	N/A	Mod. Ret. Basin
48	841+00	Stream	Intermittent	Stewarts Creek	S93a, S94	13-17-36-9-(1)	WSIII		Culvert	N/A	None
48	841+00	Stream	Intermittent	Stewarts Creek	S95a, S95b, S96	13-17-36-9-(1)	WSIII		Culvert	N/A	None
48	841+00	Stream	Perennial	Stewarts Creek	S96b	13-17-36-9-(1)	WSIII		Culvert	N/A	None

* List all stream and surface water impact locations regardless of jurisdiction or size.

Equalizer Pipes to be noted as a minimization of impacts.

All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

References



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR LINEAR ROADWAY PROJECTS



(Version 1.2; Released September 2011)

Project/TIP No.: R3329|R2559 - Sec2C - 648+00 County(ies): Union Page 3 of 4

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
48-49	841+00	Wetland	Riverine	Stewarts Creek	W104				Culvert	N/A	None
49	849+00	Open Water	Pond	N/A, Isolated	P48				Fill	N/A	None
49, 50, 108	856+00	Open Water	Pond	Richardson Creek	P49				Fill	N/A	None
50	866+50	Stream	Intermittent	Richardson Creek	S102b	13-17-36-5	C		Culvert	N/A	None
50	866+50	Open Water	Pond	Richardson Creek	PX75				Culvert	N/A	None
52	890+87 893+14	Stream	Intermittent	Richardson Creek	S106	13-17-36-5	C		Fill	N/A	None
52	893+00	Stream	Perennial	Richardson Creek	S103b	13-17-36-5	C		Culvert	N/A	None
52	893+00	Wetland	Riverine	Richardson Creek	W107				Fill	N/A	None
53	903+70	Wetland	Riverine	Richardson Creek	W112				Fill	N/A	None
53	903+70	Stream	Intermittent	Richardson Creek	S108a	13-17-36-5	C		Culvert	N/A	None
53	903+70	Stream	Perennial	Richardson Creek	S108b	13-17-36-5	C		Culvert	N/A	None
101	152+00	Open Water	Pond	Stumplick Branch	PX69				Fill	N/A	None

* List all stream and surface water impact locations regardless of jurisdiction or size.

Equalizer Pipes to be noted as a minimization of impacts.

All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

References



North Carolina Department of Transportation
Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR LINEAR ROADWAY PROJECTS



(Version 1.2; Released September 2011)

Project/TIP No.: R3329/R2559 - Sec2C - County(ies): Union Page 4 of 4

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)
37	L 656+88 RT	Riprap Apron / Pad	Class I	11.55	Pipe	36" RCP	32.0	2.4
38	L 669+12 RT	Riprap Apron / Pad	Class I	2360.00	Culvert	3@9'x12' RCBC	1600.0	6.4
40	L 702+97 RT	Riprap Apron / Pad	Class I	103.00	Culvert	7'X7' RCBC	190.0	4.5
43	L 738+81 RT	Riprap Apron / Pad	Class I	97.66	Culvert	72" RCP	186.7	2.6
44	L 767+48 LT	Riprap Apron / Pad	Class 'B'	5.70	Culvert	30" RCP	20.6	1.5
47	L 805+89 LT	Riprap Apron / Pad	Class I	173.00	Culvert	10'X7' RCBC	310.0	9.5
48	L 816+70 LT	Riprap Apron / Pad	Class I	40.03	Pipe	24" RCP, 48" RCP, DITCH	81.2	4.2
48	TRA 21+61 RT	Riprap Apron / Pad	Class I	23.90	Pipe	48" RCP	40.8	1.5
48	TRA 19+05 RT	Riprap Apron / Pad	Class I	70.10	Pipe	66" RCP	120.0	2.3
50	L 867+16 RT	Riprap Apron / Pad	Class I	29.06	Pipe	42" RCP, DITCH	76.3	3.5
52	L 893+68 RT	Riprap Apron / Pad	Class I	83.30	Pipe	18" RCP, 84" RCP	132.0	5.4
53	L 903+89	Riprap Apron / Pad	Class I	42.50	Pipe	54" RCP	76.0	5.2

☐ YES

☐ NO

Have minimum design criteria, as presented in the NCDOT Best Management Practices Toolbox (2008), NCDOT Standard Details, or FHWA HEC-14 (July 2006), been met and verified, as applicable? If No, provide further explanation of why design criteria was not met.

Additional Comments

* Refer to the NCDOT Best Management Practices Toolbox, Version 1 (March 2008), NCDOT Standard Details, 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 LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: R3329\R2559 - Sct3A - 912+00 to 1064+00 County(ies): Union

Page 1 of 3

General Project Information

Project No.:	R3329\R2559 - Sct3A - 912+00 to 1064+00		Project Type:	New Location		Date:	10/1/2014	
NCDOT Contact:	Marshall Clawson, PE		Contractor / Designer:	Monroe Bypass Constructors - Kevin Alford, PE				
Address:	NCDOT Hydraulics Unit 1590 Mail Service Center Raleigh, NC 27699-1590		Address:	6750 Tryon Road Cary, NC 27518				
	Phone: 919-707-6713			Phone: 919-858-1878				
	Email: mclawson@ncdot.gov			Email: kalford@mulkeyinc.com				
City/Town:	Monroe		County(ies):	Union				
River Basin(s):	Yadkin-Pee Dee		CAMA County?	No				
Primary Receiving Water:	See Environmental Summary		NCDWQ Stream Index No.:	See Environmental Summary				
NCDWQ Surface Water Classification for Primary Receiving Water	Primary:		See Environmental Summary					
	Supplemental:							
Other Stream Classification:								
303(d) Impairments:	See Environmental Summary							
Buffer Rules in Effect	N/A							

Project Description

Project Length (lin. Miles or feet):	19.70	Surrounding Land Use:	Rural with some urbanization		
	Proposed Project		Existing Site		
Project Built-Upon Area (ac.)	49.37	ac.	9.79	ac.	
Typical Cross Section Description:	4 lane divided roadway with 46' grass median				
Average Daily Traffic (veh/hr/day):	Design/Future: 95,600 (2035)		Existing: N/A - New Location		

General Project Narrative: The project is being constructed as a four lane divided highway from the Town of Stallings (bypassing Monroe) to just east of Wingate. The project includes major interchanges and improvements to existing US74 at both ends.

References



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: R3329/R2559 - Sct3A - 912+00 to 912+00 County(ies): Union Page 2 of 3

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
56	942+33 -L- 944+18 -L-	Stream	Perennial	Richardson Creek	S111	13-17-36-(5)	C	biological impairment	Stabilization	N/A	None
57	956+83 -L- 957+44 -L-	Stream	Perennial	Ray's Fork	S112	13-17-36-8	C	None	Stabilization	N/A	None
57	964+10 -L- LT 965+73 -L- LT	Stream	Intermittent	Ray's Fork	S114A	13-17-36-8	C	None	Culvert	N/A	None
57	24+04 -Y318- 24+98 -Y318-	Wetland	Unknown	Ray's Fork	W138	N/A	N/A	N/A	Culvert	N/A	None
58	15+65 -Y318- 16+03 -Y318-	Stream	Perennial	Ray's Fork	S140F	13-17-36-8	C	None	Culvert	N/A	None
58	973+15 -L- 980+33 -L-	Stream	Perennial	Ray's Fork	S140F	13-17-36-8	C	None	Culvert	N/A	None
58/59	977+09 -L- 986+24 -L-	Wetland	Unknown	Ray's Fork	W139/W140/ WX812	N/A	N/A	N/A	Fill	N/A	None
60	1001+08 -L- 1003+00 -L-	Stream	Intermittent	Ray's Fork	SX145	13-17-36-8	C	None	Culvert	N/A	None
62	1032+66 -L- 1038+05 -L-	Open Water	Pond	Halfway Branch	P60A/P60B	13-17-36-11-1	C	None	Fill	N/A	None
62	32+08 -Y308- RT	Stream	Intermittent	Halfway Branch	S157A	13-17-36-11-1	C	None	Culvert	N/A	None
62	28+06 RT -VRC- 1041+43 LT -L-	Stream	Perennial	Halfway Branch	S156A/ S156B	13-17-36-11-1	C	None	Culvert	N/A	None

* List all stream and surface water impact locations regardless of jurisdiction or size.

Equalizer Pipes to be noted as a minimization of impacts.

All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

References



North Carolina Department of Transportation
Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR LINEAR ROADWAY PROJECTS



(Version 1.2; Released September 2011)

Project/TIP No.: R3329/R2559 - Sct3A - 9 County(ies): Union Page 3 of 3

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)
54	916+43 -L- RT	Riprap Apron / Pad	Class I	16.50	Pipe	48	37.8	2.0
54	924+49 -L- RT	Riprap Apron / Pad	Class I	14.10	Pipe	42	35.0	2.0
55	930+57 -L- RT	Riprap Apron / Pad	Class I	12.10	Pipe	42	28.0	1.9
55	932+00 -L- RT	Riprap Apron / Pad	Class 'B'	1.51	Pipe	18	5.1	1.9
56	945+65 -L- LT	PFSH	N/A	0.39	Pipe	15	2.1	1.2
56	946+32 -L- LT	Riprap Apron / Pad	Class I	7.40	Pipe	36	26.7	1.9
57	24+66 -Y318- LT	Riprap Apron / Pad	Class I	31.50	Pipe	60	49.0	1.8
58	15+80 -Y318- LT	Riprap Apron / Pad	Class II	128.00	Culvert	2-9x7 RCBC	250.0	4.4
58	973+25 -L- RT	Riprap Apron / Pad	Class II	102.40	Culvert	2-9x7 RCBC	210.0	4.2
58	981+50 -L- LT	Riprap Apron / Pad	Class 'B'	11.58	Ditch	N/A	40.3	3.1
60	993+50 -L- RT	Riprap Apron / Pad	Class I	11.60	Pipe	42	28.0	1.9
62	1041+00 -L- LT	PFSH	N/A	0.86	Pipe	15	4.3	1.6
62	1041+40 -L- LT	Riprap Apron / Pad	Class II	243.20	Culvert	2-10x6 RCBC	400.0	4.8
62	20+73 -VLC- LT	Riprap Apron / Pad	Class II	224.00	Culvert	2-10x6 RCBC	380.0	4.7
62	30+00 -Y308- RT	Riprap Apron / Pad	Class I	21.23	Pipe	42	62.3	3.4
62	32+11 -Y308- RT	Riprap Apron / Pad	Class I	24.20	Pipe	54	56.0	2.0

☒ YES ☐ NO Have minimum design criteria, as presented in the NCDOT Best Management Practices Toolbox (2008), NCDOT Standard Details, or FHWA HEC-14 (July 2006), been met and verified, as applicable? If No, provide further explanation of why design criteria was not met.

Additional Comments

* Refer to the NCDOT Best Management Practices Toolbox, Version 1 (March 2008), NCDOT Standard Details, 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 LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: R3329\R2559 - Sct3B - 1064+00 to 1: County(ies): Union

Page 1 of 3

General Project Information

Project No.:	R3329\R2559 - Sct3B - 1064+00 to 1233+50		Project Type:	New Location	Date:	10/1/2014
NCDOT Contact:	Marshall Clawson, PE		Contractor / Designer:	Monroe Bypass Constructors - 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: 919-707-6713			Phone: 919-847-0166		
	Email: mclawson@ncdot.gov			Email: jmeador@rkk.com		
City/Town:	Monroe		County(ies):	Union		
River Basin(s):	Yadkin-Pee Dee		CAMA County?	No		
Primary Receiving Water:	See Environmental Summary		NCDWQ Stream Index No.:	See Environmental Summary		
NCDWQ Surface Water Classification for Primary Receiving Water	Primary:		See Environmental Summary			
	Supplemental:					
Other Stream Classification:						
303(d) Impairments:	See Environmental Summary					
Buffer Rules in Effect	N/A					

Project Description

Project Length (lin. Miles or feet):	19.70	Surrounding Land Use:	Rural with some urbanization		
	Proposed Project		Existing Site		
Project Built-Upon Area (ac.)	49.37	ac.	9.79	ac.	
Typical Cross Section Description:	4 lane divided roadway with 46' grass median				
Average Daily Traffic (veh/hr/day):	Design/Future: 95,600 (2035)		Existing: N/A - New Location		

General Project Narrative: The project is being constructed as a four lane divided highway from the Town of Stallings (bypassing Monroe) to just east of Wingate. The project includes major interchanges and improvements to existing US74 at both ends.

References



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR LINEAR ROADWAY PROJECTS



(Version 1.2; Released September 2011)

Project/TIP No.: R3329/R2559 - Sct3B - 1064+00 County(ies): Union Page 2 of 3

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
64	1073+84 1074+67	Stream	Perennial	Meadow Branch	S158	13-17-36-11	C	None	Culvert	N/A	None
66	1094+50 1094+50	Wetland	Unknown	Meadow Branch	W173	N/A	N/A	N/A	Fill	N/A	None
68	1122+38 1122+67	Wetland	Unknown	Austin Branch	W174	N/A	N/A	N/A	Fill	N/A	None
69	22+83 RT	Stream	Perennial	Negro Head Creek	S161A	13-17-36-15	C	None	Culvert	N/A	None
70	1159+60 RT	Stream	Perennial	Negro Head Creek	S161B	13-17-36-15	C	None	Culvert	N/A	None
70/71	1159+60 1163+49	Wetland	Unknown	Negro Head Creek	W176	N/A	N/A	N/A	Culvert	N/A	None
71	1166+79 1167+65	Wetland	Unknown	Negro Head Creek	W176	N/A	N/A	N/A	Culvert	N/A	None
72	1201+40 1201+90	Stream	Perennial	Negro Head Creek	S169A/S169B	13-17-36-15	C	None	Culvert	N/A	None
113	18+83 2076	Wetland	Unknown	Meadow Branch	W173	N/A	N/A	N/A	Culvert	N/A	None
118	25+53 25+97	Wetland	Unknown	Negro Head Creek	W196	N/A	N/A	N/A	Culvert	N/A	None
119	15+73 16+73	Wetland	Unknown	Negro Head Creek	W197	N/A	N/A	N/A	Culvert	N/A	None
119	11+50 12+04	Wetland	Unknown	Negro Head Creek	W197	N/A	N/A	N/A	Culvert	N/A	None

* List all stream and surface water impact locations regardless of jurisdiction or size.

Equalizer Pipes to be noted as a minimization of impacts.

All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

References



* Refer to the NCDOT Best Management Practices Toolbox, Version 1 (March 2008), NCDOT Standard Details, 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 LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: R3329\R2559 - Sec2C - 648+00 to 91 County(ies): Union

Page 1 of 4

General Project Information

Project No.:	R3329\R2559 - Sec2C - 648+00 to 912+00		Project Type:	New Location	Date:	10/1/2014
NCDOT Contact:	Marshall Clawson, PE		Contractor / Designer:	Monroe Bypass Constructors - Matthew L. Cook, PE		
Address:	NCDOT Hydraulics Unit 1590 Mail Service Center Raleigh, NC 27699-1590		Address:	900 Ridgefield Drive Suite 350 Raleigh, NC 27609		
	Phone: 919-707-6713			Phone: 919-878-9560		
	Email: mclawson@ncdot.gov			Email: mcook@rkk.com		
City/Town:	Monroe		County(ies):	Union		
River Basin(s):	Yadkin-Pee Dee		CAMA County?	No		
Primary Receiving Water:	See Environmental Summary		NCDWQ Stream Index No.:	See Environmental Summary		
NCDWQ Surface Water Classification for Primary Receiving Water	Primary:		See Environmental Summary			
	Supplemental:					
Other Stream Classification:						
303(d) Impairments:	See Environmental Summary					
Buffer Rules in Effect	N/A					

Project Description

Project Length (lin. Miles or feet):	Total 19.7	Surrounding Land Use:	Rural with some urbanization		
	Proposed Project		Existing Site		
Project Built-Upon Area (ac.)	129.20	ac.	16.11	ac.	
Typical Cross Section Description:	4 lane divided roadway with 46' grass median				
Average Daily Traffic (veh/hr/day):	Design/Future:	95,600 (2035)	Existing:	N/A - New Location	

General Project Narrative: The project is being constructed as a four lane divided highway from the Town of Stallings (bypassing Monroe) to just east of Wingate. The project includes major interchanges and improvements to existing US74 at both ends.

References



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS



(Version 1.2; Released September 2011)

Project/TIP No.: R3329/R2559 - Sec2C - 648+00 County(ies): Union Page 2 of 4

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
37	656+17 657+71	Stream	Intermittent	East Fork Stewarts Creek	S78b	13-17-36-9-2	WSIII		Culvert	N/A	None
38	669+50	Stream	Perennial	East Fork Stewarts Creek	S76	13-17-36-9-2	WSIII		Culvert	N/A	None
40-41	700+11 705+91	Stream	Perennial	East Fork Stewarts Creek	S80a, S80b, S80c	13-17-36-9-(1)	WSIII		Culvert	N/A	None
42	718+00	Wetland	Riverine	N/A, Isolated	W81				Fill	N/A	None
43	738+80	Stream	Perennial	Stewarts Creek	S81a	13-17-36-9-(1)	WSIII		Culvert	N/A	None
43	738+80	Wetland	Riverine	Stewarts Creek	W82	13-17-36-9-(1)	WSIII		Culvert	N/A	None
43-44	752+51 769+15	Wetland	Riverine	Stewarts Creek	W86				Fill	N/A	None
47	805+06	Stream	Intermittent	Stewarts Creek	S88a	13-17-36-9-(1)	WSIII		Fill	N/A	None
47	805+89	Stream	Perennial	Stewarts Creek	S86	13-17-36-9-(1)	WSIII		Culvert	N/A	None
48	817+63	Stream	Intermittent	Stewarts Creek	S89a	13-17-36-9-(1)	WSIII		Culvert	N/A	None
48	817+63	Wetland	Riverine	Stewarts Creek	W99				Fill	N/A	None
48	823+48 827+50	Open Water	Pond	Stewarts Creek	P44				Fill	N/A	None
48	13+07 15+68	Stream	Intermittent	Stewarts Creek	S92a, S92b	13-17-36-9-(1)	WSIII		Fill	N/A	Mod. Ret. Basin
48	13+07 15+68	Wetland	Riverine	Stewarts Creek	W101, W102, W103				Fill	N/A	Mod. Ret. Basin
48	841+00	Stream	Intermittent	Stewarts Creek	S93a, S94	13-17-36-9-(1)	WSIII		Culvert	N/A	None
48	841+00	Stream	Intermittent	Stewarts Creek	S95a, S95b, S96	13-17-36-9-(1)	WSIII		Culvert	N/A	None
48	841+00	Stream	Perennial	Stewarts Creek	S96b	13-17-36-9-(1)	WSIII		Culvert	N/A	None

* List all stream and surface water impact locations regardless of jurisdiction or size.

Equalizer Pipes to be noted as a minimization of impacts.

All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

References



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR LINEAR ROADWAY PROJECTS



(Version 1.2; Released September 2011)

Project/TIP No.: R3329|R2559 - Sec2C - 648+00 County(ies): Union Page 3 of 4

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
48-49	841+00	Wetland	Riverine	Stewarts Creek	W104				Culvert	N/A	None
49	849+00	Open Water	Pond	N/A, Isolated	P48				Fill	N/A	None
49, 50, 108	856+00	Open Water	Pond	Richardson Creek	P49				Fill	N/A	None
50	866+50	Stream	Intermittent	Richardson Creek	S102b	13-17-36-5	C		Culvert	N/A	None
50	866+50	Open Water	Pond	Richardson Creek	PX75				Culvert	N/A	None
52	890+87 893+14	Stream	Intermittent	Richardson Creek	S106	13-17-36-5	C		Fill	N/A	None
52	893+00	Stream	Perennial	Richardson Creek	S103b	13-17-36-5	C		Culvert	N/A	None
52	893+00	Wetland	Riverine	Richardson Creek	W107				Fill	N/A	None
53	903+70	Wetland	Riverine	Richardson Creek	W112				Fill	N/A	None
53	903+70	Stream	Intermittent	Richardson Creek	S108a	13-17-36-5	C		Culvert	N/A	None
53	903+70	Stream	Perennial	Richardson Creek	S108b	13-17-36-5	C		Culvert	N/A	None
101	152+00	Open Water	Pond	Stumplick Branch	PX69				Fill	N/A	None

* List all stream and surface water impact locations regardless of jurisdiction or size.

Equalizer Pipes to be noted as a minimization of impacts.

All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

References



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Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR LINEAR ROADWAY PROJECTS



(Version 1.2; Released September 2011)

Project/TIP No.: R3329/R2559 - Sec2C - County(ies): Union Page 4 of 4

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)
37	L 656+88 RT	Riprap Apron / Pad	Class I	11.55	Pipe	36" RCP	32.0	2.4
38	L 669+12 RT	Riprap Apron / Pad	Class I	2360.00	Culvert	3@9'x12' RCBC	1600.0	6.4
40	L 702+97 RT	Riprap Apron / Pad	Class I	103.00	Culvert	7'X7' RCBC	190.0	4.5
43	L 738+81 RT	Riprap Apron / Pad	Class I	97.66	Culvert	72" RCP	186.7	2.6
44	L 767+48 LT	Riprap Apron / Pad	Class 'B'	5.70	Culvert	30" RCP	20.6	1.5
47	L 805+89 LT	Riprap Apron / Pad	Class I	173.00	Culvert	10'X7' RCBC	310.0	9.5
48	L 816+70 LT	Riprap Apron / Pad	Class I	40.03	Pipe	24" RCP, 48" RCP, DITCH	81.2	4.2
48	TRA 21+61 RT	Riprap Apron / Pad	Class I	23.90	Pipe	48" RCP	40.8	1.5
48	TRA 19+05 RT	Riprap Apron / Pad	Class I	70.10	Pipe	66" RCP	120.0	2.3
50	L 867+16 RT	Riprap Apron / Pad	Class I	29.06	Pipe	42" RCP, DITCH	76.3	3.5
52	L 893+68 RT	Riprap Apron / Pad	Class I	83.30	Pipe	18" RCP, 84" RCP	132.0	5.4
53	L 903+89	Riprap Apron / Pad	Class I	42.50	Pipe	54" RCP	76.0	5.2

☐ YES

☐ NO

Have minimum design criteria, as presented in the NCDOT Best Management Practices Toolbox (2008), NCDOT Standard Details, or FHWA HEC-14 (July 2006), been met and verified, as applicable? If No, provide further explanation of why design criteria was not met.

Additional Comments

* Refer to the NCDOT Best Management Practices Toolbox, Version 1 (March 2008), NCDOT Standard Details, 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 LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: R3329\R2559 - Sct3A - 912+00 to 1064+00 County(ies): Union

Page 1 of 3

General Project Information

Project No.:	R3329\R2559 - Sct3A - 912+00 to 1064+00		Project Type:	New Location		Date:	10/1/2014	
NCDOT Contact:	Marshall Clawson, PE		Contractor / Designer:	Monroe Bypass Constructors - Kevin Alford, PE				
Address:	NCDOT Hydraulics Unit 1590 Mail Service Center Raleigh, NC 27699-1590		Address:	6750 Tryon Road Cary, NC 27518				
	Phone: 919-707-6713			Phone: 919-858-1878				
	Email: mclawson@ncdot.gov			Email: kalford@mulkeyinc.com				
City/Town:	Monroe		County(ies):	Union				
River Basin(s):	Yadkin-Pee Dee		CAMA County?	No				
Primary Receiving Water:	See Environmental Summary		NCDWQ Stream Index No.:	See Environmental Summary				
NCDWQ Surface Water Classification for Primary Receiving Water	Primary:		See Environmental Summary					
	Supplemental:							
Other Stream Classification:								
303(d) Impairments:	See Environmental Summary							
Buffer Rules in Effect	N/A							

Project Description

Project Length (lin. Miles or feet):	19.70	Surrounding Land Use:	Rural with some urbanization		
	Proposed Project		Existing Site		
Project Built-Upon Area (ac.)	49.37	ac.	9.79	ac.	
Typical Cross Section Description:	4 lane divided roadway with 46' grass median				
Average Daily Traffic (veh/hr/day):	Design/Future: 95,600 (2035)		Existing: N/A - New Location		

General Project Narrative: The project is being constructed as a four lane divided highway from the Town of Stallings (bypassing Monroe) to just east of Wingate. The project includes major interchanges and improvements to existing US74 at both ends.

References



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: R3329/R2559 - Sct3A - 912+00 to 912+00 County(ies): Union Page 2 of 3

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
56	942+33 -L- 944+18 -L-	Stream	Perennial	Richardson Creek	S111	13-17-36-(5)	C	biological impairment	Stabilization	N/A	None
57	956+83 -L- 957+44 -L-	Stream	Perennial	Ray's Fork	S112	13-17-36-8	C	None	Stabilization	N/A	None
57	964+10 -L- LT 965+73 -L- LT	Stream	Intermittent	Ray's Fork	S114A	13-17-36-8	C	None	Culvert	N/A	None
57	24+04 -Y318- 24+98 -Y318-	Wetland	Unknown	Ray's Fork	W138	N/A	N/A	N/A	Culvert	N/A	None
58	15+65 -Y318- 16+03 -Y318-	Stream	Perennial	Ray's Fork	S140F	13-17-36-8	C	None	Culvert	N/A	None
58	973+15 -L- 980+33 -L-	Stream	Perennial	Ray's Fork	S140F	13-17-36-8	C	None	Culvert	N/A	None
58/59	977+09 -L- 986+24 -L-	Wetland	Unknown	Ray's Fork	W139/W140/ WX812	N/A	N/A	N/A	Fill	N/A	None
60	1001+08 -L- 1003+00 -L-	Stream	Intermittent	Ray's Fork	SX145	13-17-36-8	C	None	Culvert	N/A	None
62	1032+66 -L- 1038+05 -L-	Open Water	Pond	Halfway Branch	P60A/P60B	13-17-36-11-1	C	None	Fill	N/A	None
62	32+08 -Y308- RT	Stream	Intermittent	Halfway Branch	S157A	13-17-36-11-1	C	None	Culvert	N/A	None
62	28+06 RT -VRC- 1041+43 LT -L-	Stream	Perennial	Halfway Branch	S156A/ S156B	13-17-36-11-1	C	None	Culvert	N/A	None

* List all stream and surface water impact locations regardless of jurisdiction or size.

Equalizer Pipes to be noted as a minimization of impacts.

All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

References



North Carolina Department of Transportation
Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR LINEAR ROADWAY PROJECTS



(Version 1.2; Released September 2011)

Project/TIP No.: R3329/R2559 - Sct3A - 9 County(ies): Union Page 3 of 3

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)
54	916+43 -L- RT	Riprap Apron / Pad	Class I	16.50	Pipe	48	37.8	2.0
54	924+49 -L- RT	Riprap Apron / Pad	Class I	14.10	Pipe	42	35.0	2.0
55	930+57 -L- RT	Riprap Apron / Pad	Class I	12.10	Pipe	42	28.0	1.9
55	932+00 -L- RT	Riprap Apron / Pad	Class 'B'	1.51	Pipe	18	5.1	1.9
56	945+65 -L- LT	PFSH	N/A	0.39	Pipe	15	2.1	1.2
56	946+32 -L- LT	Riprap Apron / Pad	Class I	7.40	Pipe	36	26.7	1.9
57	24+66 -Y318- LT	Riprap Apron / Pad	Class I	31.50	Pipe	60	49.0	1.8
58	15+80 -Y318- LT	Riprap Apron / Pad	Class II	128.00	Culvert	2-9x7 RCBC	250.0	4.4
58	973+25 -L- RT	Riprap Apron / Pad	Class II	102.40	Culvert	2-9x7 RCBC	210.0	4.2
58	981+50 -L- LT	Riprap Apron / Pad	Class 'B'	11.58	Ditch	N/A	40.3	3.1
60	993+50 -L- RT	Riprap Apron / Pad	Class I	11.60	Pipe	42	28.0	1.9
62	1041+00 -L- LT	PFSH	N/A	0.86	Pipe	15	4.3	1.6
62	1041+40 -L- LT	Riprap Apron / Pad	Class II	243.20	Culvert	2-10x6 RCBC	400.0	4.8
62	20+73 -VLC- LT	Riprap Apron / Pad	Class II	224.00	Culvert	2-10x6 RCBC	380.0	4.7
62	30+00 -Y308- RT	Riprap Apron / Pad	Class I	21.23	Pipe	42	62.3	3.4
62	32+11 -Y308- RT	Riprap Apron / Pad	Class I	24.20	Pipe	54	56.0	2.0

☒ YES ☐ NO Have minimum design criteria, as presented in the NCDOT Best Management Practices Toolbox (2008), NCDOT Standard Details, or FHWA HEC-14 (July 2006), been met and verified, as applicable? If No, provide further explanation of why design criteria was not met.

Additional Comments

* Refer to the NCDOT Best Management Practices Toolbox, Version 1 (March 2008), NCDOT Standard Details, 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 LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: R3329\R2559 - Sct3B - 1064+00 to 1: County(ies): Union

Page 1 of 3

General Project Information

Project No.:	R3329\R2559 - Sct3B - 1064+00 to 1233+50		Project Type:	New Location	Date:	10/1/2014
NCDOT Contact:	Marshall Clawson, PE		Contractor / Designer:	Monroe Bypass Constructors - 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: 919-707-6713			Phone: 919-847-0166		
	Email: mclawson@ncdot.gov			Email: jmeador@rkk.com		
City/Town:	Monroe		County(ies):	Union		
River Basin(s):	Yadkin-Pee Dee		CAMA County?	No		
Primary Receiving Water:	See Environmental Summary		NCDWQ Stream Index No.:	See Environmental Summary		
NCDWQ Surface Water Classification for Primary Receiving Water	Primary:		See Environmental Summary			
	Supplemental:					
Other Stream Classification:						
303(d) Impairments:	See Environmental Summary					
Buffer Rules in Effect	N/A					

Project Description

Project Length (lin. Miles or feet):	19.70	Surrounding Land Use:	Rural with some urbanization		
	Proposed Project		Existing Site		
Project Built-Upon Area (ac.)	49.37	ac.	9.79	ac.	
Typical Cross Section Description:	4 lane divided roadway with 46' grass median				
Average Daily Traffic (veh/hr/day):	Design/Future: 95,600 (2035)		Existing: N/A - New Location		

General Project Narrative: The project is being constructed as a four lane divided highway from the Town of Stallings (bypassing Monroe) to just east of Wingate. The project includes major interchanges and improvements to existing US74 at both ends.

References



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS



(Version 1.2; Released September 2011)

Project/TIP No.: R3329/R2559 - Sct3B - 1064+00 County(ies): Union Page 2 of 3

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
64	1073+84 1074+67	Stream	Perennial	Meadow Branch	S158	13-17-36-11	C	None	Culvert	N/A	None
66	1094+50 1094+50	Wetland	Unknown	Meadow Branch	W173	N/A	N/A	N/A	Fill	N/A	None
68	1122+38 1122+67	Wetland	Unknown	Austin Branch	W174	N/A	N/A	N/A	Fill	N/A	None
69	22+83 RT	Stream	Perennial	Negro Head Creek	S161A	13-17-36-15	C	None	Culvert	N/A	None
70	1159+60 RT	Stream	Perennial	Negro Head Creek	S161B	13-17-36-15	C	None	Culvert	N/A	None
70/71	1159+60 1163+49	Wetland	Unknown	Negro Head Creek	W176	N/A	N/A	N/A	Culvert	N/A	None
71	1166+79 1167+65	Wetland	Unknown	Negro Head Creek	W176	N/A	N/A	N/A	Culvert	N/A	None
72	1201+40 1201+90	Stream	Perennial	Negro Head Creek	S169A/S169B	13-17-36-15	C	None	Culvert	N/A	None
113	18+83 2076	Wetland	Unknown	Meadow Branch	W173	N/A	N/A	N/A	Culvert	N/A	None
118	25+53 25+97	Wetland	Unknown	Negro Head Creek	W196	N/A	N/A	N/A	Culvert	N/A	None
119	15+73 16+73	Wetland	Unknown	Negro Head Creek	W197	N/A	N/A	N/A	Culvert	N/A	None
119	11+50 12+04	Wetland	Unknown	Negro Head Creek	W197	N/A	N/A	N/A	Culvert	N/A	None

* List all stream and surface water impact locations regardless of jurisdiction or size.

Equalizer Pipes to be noted as a minimization of impacts.

All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

References



Preformed Scour Holes and Energy Dissipators

Additional Comments

* Refer to the NCDOT Best Management Practices Toolbox, Version 1 (March 2008), NCDOT Standard Details, 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.

Separate cover required due to file size limitations.

Roadway Drawings located on
NES Permits Website at
R-2559 - R-3329 Union &
Mecklenburg Counties May 8,
2015 (Roadway Dwgs Only)