STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT L. MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

April 3, 2013

MEMORANDUM TO: Mr. Mike Holder, PE
Division 12 Engineer

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

SUBJECT: Cleveland County; US 74 Shelby Bypass from 0.6 miles west of SR 1162 to SR 1001; Federal Project No. NHF-74(14); WBS Element 34497.1.2; **TIP R-2707.**

Attached are the U.S. Army Corps of Engineers Section 404 Individual permit and the N.C. Division of Water Quality Section 401 Water Quality Certification for the above referenced project. 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:
http://www.ncdot.gov/doh/preconstruct/pe/neu/permit.html

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

Mr. Randy Garris, P.E. State Contract Officer
Ms. Trish Beam, Division Environmental Officer
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Jay Bennett, P.E., Roadway Design Unit
Mr. Dewayne Sykes, P.E. Utilities Unit
Mr. Art McMillan, P.E., Hydraulics Unit
Mr. Tom Koch, P.E., Structure Design Unit
Mr. Mark Staley, Roadside Environmental Unit
Mr. Ron Hancock, P.E., State Roadway Construction Engineer
Mr. Mike Robinson, P.E., State Bridge Construction Engineer
Mr. Bill Goodwin, P.E., PDEA Bridge Unit Head
Ms. Leilani Paugh, Natural Environment Section
Ms. Beth Harmon, EEP
Mr. Phillip Ayscue, Office of Inspector General
Mr. Clarence Coleman, P.E., FHWA

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

TELEPHONE: 919-707-6100
FAX: 919-212-5785

WEBSITE: WWW.NCDOT.ORG

LOCATION:
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610-4328

PROJECT COMMITMENTS

TIP Project No. R-2707A-E
US 74 Shelby Bypass
From 0.6 mile west of SR 1162 to SR 1001
Cleveland County, North Carolina
Federal-Aid No. NHF-74(14)
State Project No. 8.1801001
WBS Number 34497.1.2

COMMITMENTS FROM PROJECT DEVELOPMENT AND DESIGN

Project Development and Environmental Analysis Unit

Stream Relocations and Modifications. Stream relocations or modifications will be coordinated with the US Fish and Wildlife Service (USFWS), US Army Corps of Engineers (COE), the North Carolina Department of Environment and Natural Resources, Division of Water Quality (DWQ) and the North Carolina Wildlife Resources Commission (WRC) in accordance with the Fish and Wildlife Coordination Act [72 Stat. 563, as amended; 16 USC 661 et seq. (1976)]. An on-site stream mitigation review will be held with the COE, the USFWS, the WRC, and the DWQ. The assessment will determine where on-site stream mitigation is possible. Bioengineering techniques will be applied to relocated streams. These techniques will result in meandering streams with riffles and pools. Native vegetation will be used to stabilize banks and root wads will be used instead of rip-rap as appropriate. A 2:1 off-site compensatory mitigation ratio will be required unless an on-site stream is being relocated via natural stream design techniques; the latter will be at a 1:1 stream mitigation ratio. Stream mitigation (i.e., enhancement, preservation) adjacent to the project must still be completed at a 2:1 mitigation ratio if the mitigation is not an on-site natural stream design relocation. Based on the preliminary design for this project, two stream relocations will be required:

- A stream relocation will be required for the tributary of Buffalo Creek between SR 2063 and the Light Oak community. An approximately 950-foot segment of this stream will require relocation, most likely to the east of its existing location.
- A stream relocation will be required just to the west of Lithia Springs Road for a tributary of the First Broad River. This relocation is approximately 1,100 feet in length, and will be to the north of the existing stream bed.

Action: This commitment applies to Sections C and D and these locations will be addressed during the final design phase.

Stream and Wetland Mitigation Plans. A comprehensive mitigation plan will be coordinated with the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service,

North Carolina Department of Environment and Natural Resources, Division of Water Quality, and North Carolina Wildlife Resources Commission.

Future Air Quality. Any future air quality analysis for this project will include a review of vehicle-mix percentages, given the industrial nature of portions of the project area.

Action: An Addendum to the Air Quality Impacts can be found in the 2008 Record of Decision.

~~Transplant of Dwarf-Flowered Heartleaf Plants. The North Carolina Plant Conservation Program (NCPCP) will be notified if or when dwarf-flowered heartleaf (DFHL) plants will be lost to construction. A qualified botanist from that organization or a designated representative will be allowed to transplant, if desired, any of the plants that would be lost to a different area of protection.~~

Action: This commitment has been dropped as a Conservation Measure in the Amendment to the Biological Opinion (BO) issued November 9, 2012.

Dwarf-Flowered Heartleaf Monitoring. The dwarf-flowered heartleaf sites in the right-of-way will be monitored annually for five years to determine their stability and to detect any construction effects (positive or negative) which have not been anticipated (increased light, hydrology changes, etc.) and efforts will be made to control exotics.

Action: Conservation Measure 5 from the Amendment to the BO replaces this commitment. See Attachment.

Dwarf-Flowered Heartleaf Report. A written report on dwarf-flowered heartleaf monitoring and management efforts will be provided yearly until the project is completed

Action: Conservation Measure 5 from the Amendment to the BO replaces this commitment. See Attachment.

Dwarf-Flowered Heartleaf Conservation Easements. Written documentation will be provided to the US Fish and Wildlife Service and to the North Carolina Natural Heritage Program regarding any successful efforts to obtain conservation easements on dwarf-flowered heartleaf sites 8, 9, 12, 13, 24, 25, 26, 30, 32, 33, 34, 35, and 43.

Action: Conservation Measure 4 from the Amendment to the BO replaces this commitment. See Attachment.

Wetlands and Streams Re-Verification. Wetlands and stream information will be re-verified during the Section 404 permit application process.

Action: Wetlands and stream information was re-verified on November 30, 2009.

Indirect and Cumulative Effects Analysis. A supplemental Indirect and Cumulative Effects analysis will be performed prior to construction.

Action: An Indirect and Cumulative Effects and Land Use Scenario Assessment were completed on October 2, 2009.

Project Development and Environmental Analysis Unit, Structure Design Unit, Hydraulics Unit, Division 12

Brushy Creek. The following measures will be implemented at the Brushy Creek crossing to minimize both short-term construction impacts and long-term impacts:

- Trees will be cut at the base to create root wads to help stabilize the banks.
- During final design, the bridges will be designed with sufficient length to allow for wildlife passage. This will be coordinated with USFWS.
- Deck drainage will not be released directly into the waterway.

Action: Per January 2006 coordination with USFWS, the bridges provide sufficient length to allow for wildlife passage.

First Broad River. The following measures will be implemented at the First Broad River crossing to minimize both short-term construction impacts and long-term impacts:

- A temporary causeway or work bridge will be constructed.
- A drainage system will be utilized on the bridge for stormwater runoff.
- Coordination will be conducted with the local water supply administrator.
- Hazardous spill basins will be utilized.
- Vegetation will be left in place as much as is practicable.
- Deck drainage will not be released directly into the waterway.

Action: Hazardous spill basins will be installed on the both sides of the First Broad River and drainage will not directly flow into the river from the bridge. The First Broad River is located between Sections B & C and per current design will not have permitted impacts from this project.

Stream 4-13 and DFHL Sites 10, 11 and 12. During culvert design and construction, consideration will be given to minimizing disturbance of Stream 4-13 and dwarf-flowered heartleaf sites #10, 11, and 12 - including minimizing clearing, minimizing rip rap on the stream banks, and using native vegetation to revegetate the stream banks.

Action: DFHL Sites 10 and 11 will incur direct effects from project construction. Avoidance and minimization measures including reduced sloped stake limits and the use of native vegetation can be found in the October 2012 Amended Biological Assessment. NCDOT will attempt to enter into conservation easements with access points for all or portions of several DFHL Sites, including Site 12.

Cemeteries. Impacts to cemeteries will be avoided and/or minimized to the extent practicable during the final design phase of the project. If required, graves will be relocated according to state guidelines.

Action: Human remains have been identified, removed, and relocated for impacted grave sites within the Wright-Bostic cemetery. Efforts are being made to avoid impacts to the Eskridge Grove cemetery. The Poston Cemetery will incur impacts.

Hamilton-McBrayer Farm. Along the existing section of US 74 at the Hamilton-McBrayer Farm, widening will be to the north (away from the property). A service road will be added, extending from Broadway Road, all within existing right-of-way, to service the trailers in the mobile home park to the north and west of the Hamilton-McBrayer Farm. This will comply with the conditions set forth in the NC State Historic Preservation Office effects concurrence form for this historic property, and will ensure that the effect to the Hamilton-McBrayer Farm will not be adverse.

Action: A service road has been added extending from Broadway Road, within the existing right of way. A temporary easement is required on Broadway Road, resulting in No Adverse Effect on the property.

Wildlife Passage. During final design, the bridges over Brushy Creek will be designed with sufficient length to allow for wildlife passage. This will be coordinated with USFWS during design.

Action: Per January 2006 coordination with USFWS, the bridges provide sufficient length to allow for wildlife passage

Geodetic Markers. The North Carolina Geodetic Survey will be notified prior to construction to allow ample time for relocation of any affected geodetic markers.

Project Development and Environmental Analysis Unit, Division 12, Right-of-Way Branch

Dwarf-Flowered Heartleaf Mitigation Plan. A plan to mitigate impacts to the dwarf-flowered heartleaf will be developed in consultation with USFWS and WRC. Mitigation efforts will be performed by qualified persons and could include transplanting the vegetative portions of plants from existing sites to preselected, approved alternate sites, dispersing seed, and/or acquiring existing sites for preservation.

Action: Conservation Measures 3,4,5,6 and 8 from the Amendment to the BO replace this commitment. See Attachment.

Project Development and Environmental Analysis Unit, Division 12

Street Closings. Any street closings will be coordinated with fire, police, and EMS personnel.

Project Development and Environmental Analysis Branch, Roadway Design Unit, Hydraulics Unit

Noise Barriers. In areas of impacted noise receptors where abatement measures have been considered and found not to be reasonable, a vegetative barrier will be considered for psychological and aesthetic screening.

Farmland. Efforts will be made to minimize impacts to farmlands during final design, including crossing of farm fields along property boundaries wherever possible to avoid bisecting farm operations.

Lithia Springs. Impacts to Lithia Springs will be avoided and/or minimized to the extent practicable during the final design phase of the project. A study of the impacts to the underground water table due to road grading operations at Lithia Springs will be undertaken during final design.

Action: This commitment applies to Section C.

Project Development and Environmental Analysis Branch, Geotechnical Engineering Unit, Right-of-Way Branch

Hazardous Materials Sites. Should the Selected Alternative impact any hazardous material site or UST, a Preliminary Site Assessment will be performed prior to right-of-way acquisition to determine the existence and/or extent of any contamination. These assessments will also be used by NCDOT to estimate the associated clean-up costs.

Action: No hazardous materials sites exist within the project limits.

Project Development and Environmental Analysis Unit, Roadway Design Unit, Division 12, Right-of-Way Branch

Protection of Dwarf-Flowered Heartleaf Sites. Dwarf-flowered heartleaf sites outside of the construction limits of the project in areas where NCDOT owns the property or has a construction easement will be protected and will not be disturbed during construction. Those sites will be left forested and will be protected in perpetuity. The sites will remain on the design plans and will be labeled as sensitive areas.

Action: Conservation Measures 2,3,4,6 and 8 from the Amendment to the BO replace this commitment. **See Attachment.**

COMMITMENTS FROM PERMITTING

Natural Environment Section/Division 13

From the 404 Individual Permit, Special Condition *z*: NCDOT shall implement the 8 conservation measures listed in the US Fish and Wildlife Service November 9, 2012 Biological Opinion (attached) for this project and shall reinitiate consultation with USFWS under Section 7 of the Endangered Species Act for Sections C, D, and E when they are scheduled for construction.

From the 401 Water Quality Certification – the following Conditions of Certification:

1) When the final design plans are completed for R-2707 Sections C, D, and E, a modification to the 401 Water Quality Certification shall be submitted with fees to the NC Division of Water Quality. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams, and other surface waters. No construction activities that impact any wetlands, streams, or surface waters in R-2707 Sections C, D, or E shall begin until after the permittee applies for and receives a written modification of the 401 Water Quality Certification from the NC Division of Water Quality.

2) Compensatory mitigation for impacts to 4.05 acres of wetlands is required. We understand that you have chosen to perform compensatory mitigation for impacts to wetlands through the North Carolina Ecosystem Enhancement Program (EEP) and that EEP has agreed to implement the mitigation for this project. EEP has indicated in a letter dated July 3, 2012 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the Tri-Party MOA signed on July 22, 2003 and the Dual-Party MOA signed on April 12, 2004.

3) Compensatory mitigation for impacts for 4,976 linear feet of impact to streams is required. We understand that you have chosen to perform compensatory mitigation for impacts to streams through the North Carolina Ecosystem Enhancement Program (EEP) and that EEP has agreed to implement the mitigation for this project. EEP has indicated in a letter dated July 3, 2012 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 Banking Mitigation Instrument signed on July 28, 2010.

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

RECEIVED
APR 19 2013
DIVISION OF HIGHWAYS
PDEA-OFFICE OF NATURAL ENVIRONMENT

REPLY TO
ATTENTION OF:

April 12, 2013

Regulatory Division

Action ID: SAW-2009-1449
NC DOT TIP No. R-2707 (Sections A and B)

North Carolina Department of Transportation
Dr. Gregory J. Thorpe
1598 Mail Service Center
Raleigh, North Carolina 27699

Dear Dr. Thorpe:

In accordance with your written request of July 2, 2012 and the ensuing administrative record, enclosed is a copy of a department of the Army (DA) permit to discharge fill material into jurisdictional waters of the U.S. in association with the construction of a 19-mile new location, four lane divided highway with full control access, known as the Shelby Bypass, TIP no. R-2707, located north of the town of Shelby, in Cleveland County, North Carolina.

Sections R-2707 A and B are approximately 6.55 miles in length and will permanently impact 5,190 linear feet of jurisdictional stream channel and 4.5 acres of wetlands associated with the roadway construction. Temporary impacts associated with sections A and B total 0.06 acre of stream channel.

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

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

a. You must complete construction before December 31, 2020.

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

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

You should address all questions regarding this authorization to Ms. Liz Hair in the Asheville Regulatory Field Office, telephone number (828) 271-7980, extension 225.

Thank you in advance for completing our Customer Survey Form. This can be accomplished by visiting our website at http://per2.nwp.usace.army.mil/survey.html and completing the survey on-line. We value your comments and appreciate your taking the time to compete a survey each time you interact with our office.

Sincerely,

Steven A. Baker
Colonel, U. S. Army
District Commander

Enclosures

Copies Furnished (with enclosures):

Chief, Source Data Unit
NOAA/National Ocean Service
1315 East-west Hwy., Rm 7316
Silver Spring, MC 20910-3282

Copies Furnished with special conditions and plans:

U. S. Fish and Wildlife Service
Fish and Wildlife Enhancement
Post Office Box 33726
Raleigh, North Carolina 27636-3726

Mr. Fritz Rhodes
National Marine Fisheries Service
101 Pivers Island Road
Beaufort, North Carolina 28516

Ms. Jennifer Derby, Chief
Wetlands Protection Section – Region IV
Water Management Division
U. S. Environmental Protection Agency
61 Forsyth Street
Atlanta, Georgia 30303

Mr. Todd Bowers
Wetlands and Marine Regulatory Section
Water Protection Division - Region IV
U. S. Environmental Protection Agency
61 Forsyth St. SW
Atlanta, GA 30303-8931

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

Mr. Pace Wilber
National Marine Fisheries Service
219 Fort Johnson Road
Charleston, South Carolina 29412-9110

Mr. Mark LaRue
Wetlands and Marine Regulatory Section
Water Management Division - Region IV6
U. S. Environmental Protection Agency
61 Forsyth Street
Atlanta, Georgia 30303

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: North Carolina Department of Transportation	File Number: **SAW-2009-1449**	Date: March 29, 2013

Attached is:	See Section below
☒ **INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)**	**A**
☐ PROFFERED PERMIT (Standard Permit or Letter of permission)	B
☐ PERMIT DENIAL	C
☐ APPROVED JURISDICTIONAL DETERMINATION	D
☐ PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the district engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II: REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact: **District Engineer, Wilmington Regulatory Division,** **Attn:** Ms. Liz Hair Project Mgr USACE 151 Patton Avenue, Room 208 Asheville, NC 28801	If you only have questions regarding the appeal process you may also contact: Mr. Jason Steele, Administrative Appeal Review Officer CESAD-PDO U.S. Army Corps of Engineers, South Atlantic Division 60 Forsyth Street, Room 10M15 Atlanta, Georgia 30303-8801 Phone: (404) 562-5137

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:

For appeals on Initial Proffered Permits send this form to:

District Engineer, Wilmington Regulatory Division, Attn: Ms. Liz Hair Project Mgr, **69 Darlington Avenue, Wilmington, North Carolina 28403**

For Permit denials, Proffered Permits and approved Jurisdictional Determinations send this form to:

Division Engineer, Commander, U.S. Army Engineer Division, South Atlantic, Attn: Mr. Jason Steele, Administrative Appeal Officer, CESAD-PDO, 60 Forsyth Street, Room 10M15, Atlanta, Georgia 30303-8801 Phone: (404) 562-5137

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

Permittee: North Carolina Department of Transportation **Action ID:** SAW-2009-1449
Project Name: R-2707 A Shelby Bypass **County:** Cleveland

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

Instructions to Sponsor: The Sponsor must verify that the mitigation requirements shown below are available at the identified site. By signing below, the Sponsor is accepting full responsibility for the identified mitigation, regardless of whether or not they have received payment from the Permittee. Once the form is signed, the Sponsor must update the appropriate ledger and provide a copy of the signed form to the Permittee and to the USACE Bank/In-Lieu Fee Program Manager. The Sponsor must also comply with all reporting requirements established in their authorizing instrument.

Permitted Impacts and Compensatory Mitigation Requirements:

Permitted Impacts Requiring Mitigation* **8-digit HUC and Basin:** 03050105, Broad River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-riverine	Non-Riparian	Coastal
1,489				0.43		

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

Compensatory Mitigation Requirements: **8-digit HUC and Basin:** 03050105, Broad River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-riverine	Non-Riparian	Coastal
2,978				0.86		

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

Section to be completed by the Mitigation Sponsor

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

Mitigation Sponsor Name: _____

Name of Sponsor's Authorized Representative: _____

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

USACE Wilmington District
Compensatory Mitigation Responsibility Transfer Form, Page 2

Conditions for Transfer of Compensatory Mitigation Credit:

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

Comments/Additional Conditions:

This form is not valid unless signed by the mitigation Sponsor and USACE Project Manager. For questions regarding this form or any of the conditions of the permit authorization, contact the Project Manager at the address below.

USACE Project Manager: Liz Hair
USACE Field Office: Asheville Regulatory Field Office
US Army Corps of Engineers
151 Patton Avenue, Room 208
Asheville, North Carolina 28801-5006
Email:

USACE Project Manager Signature

February 26, 2013
Date of Signature

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

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

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

Permittee: North Carolina Department of Transportation **Action ID:** SAW-2009-1449
Project Name: R-2707 B Shelby Bypass **County:** Cleveland

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

Instructions to Sponsor: The Sponsor must verify that the mitigation requirements shown below are available at the identified site. By signing below, the Sponsor is accepting full responsibility for the identified mitigation, regardless of whether or not they have received payment from the Permittee. Once the form is signed, the Sponsor must update the appropriate ledger and provide a copy of the signed form to the Permittee and to the USACE Bank/In-Lieu Fee Program Manager. The Sponsor must also comply with all reporting requirements established in their authorizing instrument.

Permitted Impacts and Compensatory Mitigation Requirements:

Permitted Impacts Requiring Mitigation* **8-digit HUC and Basin:** 03050105, Broad River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-riverine	Non-Riparian	Coastal
3,535				3.37		

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

Compensatory Mitigation Requirements: **8-digit HUC and Basin:** 03050105, Broad River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-riverine	Non-Riparian	Coastal
7,070				6.74		

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

Section to be completed by the Mitigation Sponsor

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

Mitigation Sponsor Name: _____

Name of Sponsor's Authorized Representative: _____

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

USACE Wilmington District
Compensatory Mitigation Responsibility Transfer Form, Page 2

Conditions for Transfer of Compensatory Mitigation Credit:

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

Comments/Additional Conditions:

This form is not valid unless signed by the mitigation Sponsor and USACE Project Manager. For questions regarding this form or any of the conditions of the permit authorization, contact the Project Manager at the address below.

USACE Project Manager: Liz Hair
USACE Field Office: Asheville Regulatory Field Office
US Army Corps of Engineers
151 Patton Avenue, Room 208
Asheville, North Carolina 28801-5006
Email:

USACE Project Manager Signature

February 26, 2013
Date of Signature

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

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

DEPARTMENT OF THE ARMY PERMIT

Permittee **NC Department of Transportation – R-2707**

Permit No. **SAW-2009-01449**

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: **In order to facilitate construction of a 19-mile four lane divided highway with full control of access, known as the Shelby Bypass NC DOT TIP no. R-2707, located to the north of the town of Shelby, in Cleveland County, North Carolina.**

Sections A and B: Permanent impacts to jurisdictional streams, wetlands, and ponds will be the result of roadway fill, the installation and/or replacement of pipes and culverts, and the placement of rip rap for bank stabilization. Total permanent impacts to jurisdictional waters of the U.S. are 5,190 linear feet of stream channels and 4.05 acres of wetlands. Temporary impacts include 0.06 acre of stream channel.

Sections C, D, and E: NC DOT's current design stage is preliminary, based on 25-foot slope stake limits and shows permanent impacts to wetlands of approximately 2.04 acres. Permanent impacts to jurisdictional streams total 16,034 linear feet. Additional impacts to open waters (ponds) total 2.43 acres. The permittee shall not commence any activity, including but not limited to, clearing, grubbing, excavation, filling of any stream or wetland, or rerouting of any stream channel until such time that the District Engineer has been provided a copy of a final design for Sections C, D, and E of the Shelby Bypass and the permittee has received written approval from the District Engineer that such work may commence.

Project Location: **Located to the north of the town of Shelby, in Cleveland County, North Carolina.**

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on **December 31, 2020.** 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.

E. L. Lusk for Gregory J. Thorpe, PhD 4.3.13

(PERMITTEE) **NC DEPARTMENT OF TRANSPORTATION** *(DATE)*

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

12 April 2013

(DISTRICT COMMANDER) **STEVEN A. BAKER**
COLONEL

(DATE)

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

(TRANSFEREE) *(DATE)*

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

SPECIAL CONDITIONS
Action ID: SAW-2009-1449

Work Limits

a) All work authorized by this permit must be performed in strict compliance with the attached plans dated 09/08/1999 (R-2707A) and 2/24/2012 (R-2707B), 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) The permittee shall not commence any activity, including but not limited to, clearing, grubbing, excavation, filling of any stream or wetland, or rerouting of any stream channel until such time that the District Engineer has been provided a copy of a final design for Sections C, D, and E of the Shelby Bypass and the permittee has received written approval from the District Engineer that such work may commence.

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

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

e) The permittee shall ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Written verification shall be provided that the final construction drawings comply with the attached permit drawings prior to any active construction in waters of the United States, including wetlands. Any deviation in the construction design plans will be brought to the attention of the Corps of Engineers, Ms. Liz Hair, Asheville Regulatory Field Office prior to any active construction in waters or wetlands.

f) The permittee shall schedule a preconstruction meeting between its representatives, the contractor's representatives, and the Corps of Engineers, Asheville Regulatory 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 of the terms and conditions contained within this Department of the Army Permit. The permittee shall provide the USACE, Asheville Regulatory Field Office, NCDOT Regulatory Project Manager, with a copy of the final plans at least two weeks prior to the preconstruction meeting along with a description of any changes that have been made to the project's design, construction methodology or construction timeframe. The permittee shall schedule the preconstruction meeting for a time when the USACE and North Carolina Division of Water Quality (NCDWQ) Project Managers can attend. The permittee shall invite the Corps 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 schedule and participate in the required meeting.

Related Laws

g) 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) 733-3300or (800) 858-0368 and provisions of the North Carolina Oil Pollution and Hazardous Substances Control Act will be followed.

Project Maintenance

h) 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.

i) 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.

j) 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.

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

l) The permittee shall remove all sediment and erosion control measures placed in wetlands or waters, and shall restore natural grades in those areas, prior to project completion.

m) 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-erodable materials. Grubbing of riparian vegetation will not occur until immediately before construction begins on a given segment of stream channel.

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

o) 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.

Enforcement

p) All reports, documentation and correspondence required by the conditions of this permit shall be submitted to the following address: U.S. Army Corps of Engineers, Regulatory Division, Asheville Regulatory Field Office, c/o Ms. Liz Hair, Field office address, and by telephone at: 828-271-7980. The Permittee shall reference the following permit number, SAW-2009-01449, on all submittals.

q) Violations of these conditions or violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act must be reported in writing to the Wilmington District U.S. Army Corps of Engineers within 24 hours of the permittee's discovery of the violation.

r) The permittee will ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Written verification shall be provided that the final construction drawings comply with the attached permit drawings prior to any active construction in waters of the United States, including wetlands. Any deviation in the construction design plans will be brought to the attention of the Corps of Engineers, Asheville Regulatory Field Office prior to any active construction in waters or wetlands.

s) Prior to commencing construction within jurisdictional waters of the United States for any portion of the proposed project, the permittee shall forward the latest version of project construction drawings to the Corps of Engineers, Asheville Regulatory Field Office NCDOT Regulatory Project Manager. Half-size drawings will be acceptable.

t) 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.

u) 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.

v) 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 or 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 the 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. A waiver from the depth specifications in this condition may be requested in writing. The waiver will be issued if it can be demonstrated that the proposal would result in the least impacts to the aquatic environment.

w) To ensure that all borrow and waste activities occur on high ground and do not result in the degradation of adjacent wetlands and streams, except as authorized by this permit, the permittee shall require its contractors and/or agents to identify all areas to be used to borrow material, or to dispose of dredged, fill, or waste material. The permittee shall provide the USACE with appropriate maps indicating the locations of proposed borrow or waste sites as soon as the permittee has that information. The permittee will coordinate with the USACE before approving any borrow or waste sites that are within 400 feet of any streams or wetlands.

x) The permittee shall take measures to prevent live or fresh concrete from coming into contact with any surface waters until the concrete has hardened.

Mitigation

y) 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.

Threatened and Endangered Species

z) NCDOT shall implement the 8 conservation measures listed in US FWS November 9, 2012 Biological Opinion for this project , and shall reinitiate consultation with the US Fish and Wildlife Service under Section 7 of the Endangered Species Act for Sections C and D, and E when they are scheduled for construction.

R-2707 Project Commitments

aa) The following Project Commitments (Green Sheets) included in the R-2707 2008 FEIS and Record of Decision (Appendix C) are hereby incorporated as Special Conditions of this permit: PDEA, Highway Design Branch, Division 12: 1) Brushy Creek site: Trees will be cut at the base to create root wads to help stabilize the stream banks. During final design, the bridges will be designed with sufficient length to allow for wildlife passage and design will be coordinated with USFWS. Deck drainage will not be released directly into the waterway;

2) First Broad River site: A temporary work bridge/causeway will be constructed. A drainage system will be utilized on the bridge for stormwater runoff. Coordination will be conducted with the local water supply administrator. Hazardous spill basins will be utilized. Vegetation will be left intact/in place as much is practicable. Deck drainage will not be released into the waterway; 3) Stream 4-13 and DFHL sites 10, 11, and 12: During culvert design and construction, consideration will be given to minimizing disturbance at these sites including minimizing clearing, minimal rip rap on the stream banks, and using native vegetation to re-vegetate the stream banks; 4) Impacts to cemeteries will be avoided and/or minimized to the extent practicable during final design phase. If required, graves will be relocated according to state guidelines; 5) Hamilton-McBrayer Farm: Along the existing portion of US 74 at the Hamilton-McBrayer Farm, widening will be to the north (away from the property). A service road will be added, extending from Broadway Road, all within existing right-of-way, to service the trailers in the mobile home park to the north and west of the Hamilton-McBrayer Farm; 6) Wildlife passage: During final design, the bridges over Brushy Creek will be designed with sufficient length to allow for wildlife passage. This will be coordinated with the USFWS during design.

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Water Quality
Charles Wakild, P.E
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

RECEIVED
SEP 20 2012
DIVISION OF HIGHWAYS
PDEA-OFFICE OF NATURAL ENVIRONMENT

September 18, 2012

Dr. Greg Thorpe, PhD., Manager
Project Development and Environmental Analysis
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina, 27699-1548

Subject: 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS for Proposed construction of US 74 Shelby Bypass in Cleveland County, Federal Aid Project No. NHF-74(14), State Project No. 8.1801001, TIP # R-2707. NCDWQ Project No. 20120673 ver. 1.

Dear Dr. Thorpe:

Attached hereto is a copy of Certification No. 3941 issued to The North Carolina Department of Transportation (NCDOT) dated September 18, 2012.

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

Sincerely,

Robert Ridings

for Charles Wakild
Director

Attachments

cc: Liz Hair, US Army Corps of Engineers, Asheville Field Office
Trish Simon, Division 12 Environmental Officer
Travis Wilson, NC Wildlife Resources Commission
Beth Harmon, Ecosystem Enhancement Program (if applicable)
Alan Johnson, NCDWQ Mooresville Regional Office
Jeff Hemphill, NCDOT Natural Environment Unit
File Copy

Transportation and Permitting Unit
1650 Mail Service Center, Raleigh, North Carolina 27699-1617
Location: 512 N. Salisbury St. Raleigh, North Carolina 27604
Phone: 919-807-6300 \ FAX: 919-807-6492
Internet: www.ncwaterquality.org

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

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality (NCDWQ) Regulations in 15 NCAC 2H .0500 . This certification authorizes the NCDOT to impact 6.04 acres of jurisdictional wetlands, and 21653 linear feet of jurisdictional streams Cleveland County. The project shall be constructed pursuant to the application dated received July 11, 2012. The authorized impacts are as described below:

Section A Stream Impacts in the Broad River Basin

Site	Permanent Impact to Intermittent Stream (linear ft)	Temporary Impact to Intermittent Stream (linear ft)	Riprap Stabilization to Intermittent Stream (linear ft)	Permanent Impact to Perennial Stream (linear ft)	Temporary Impact to Perennial Stream (linear ft)	Riprap Stabilization to Perennial Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
1	0	0	0	185	20	20	225	205
2	57	16	0	0	0	0	73	0
3	64	6	12	0	0	0	82	0
4	0	0	0	290	37	12	339	302
5	0	0	0	0	0	17	17	0
6	290	28	12	0	0	0	330	302
7	318	20	0	0	0	0	338	318
8	19	19	0	0	0	0	38	0
9	0	0	0	266	28	0	294	266
10	0	0	0	0	0	8	8	0
Total	**748**	**89**	**24**	**741**	**85**	**57**	**1744**	**1393**

Total Stream Impact for Section A: 1744 linear feet

Section B Stream Impacts in the Broad River Basin

Site	Permanent Impact to Intermittent Stream (linear ft)	Temporary Impact to Intermittent Stream (linear ft)	Riprap Stabilization to Intermittent Stream (linear ft)	Permanent Impact to Perennial Stream (linear ft)	Temporary Impact to Perennial Stream (linear ft)	Riprap Stabilization to Perennial Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
1	0	0	0	397	61	11	469	408
2	15	0	0	0	0	0	15	0
3	386	18	15	0	0	0	419	401
4	0	0	0	330	20	15	365	345
5	0	0	0	585	31	18	634	603
6	0	0	0	245	21	15	281	260
7	5	10	0	0	0	0	15	0
8	0	0	0	17	0	0	17	0
9	0	0	0	568	23	11	602	579
11	0	0	0	440	10	0	450	440
12	547	61	0	0	0	0	608	547
Total	**953**	**89**	**15**	**2582**	**166**	**70**	**3875**	**3583**

Total Stream Impact for Section B: 3875 linear feet

Preliminary Stream Impacts for Project:
Section C: 7274 linear feet
Section D: 5916 linear feet
Section E: 2844 linear feet

Section A Wetland Impacts in the Broad River Basin

Site	Permanent Fill (ac)	Excavation (ac)	Mechanized Clearing (ac)	Total Wetland Impact (ac)	Wetland Impacts Requiring Mitigation (ac)
5	0.28	0.03	0.04	0.34	0.34
7	0.07	0	0.01	0.08	0.08
Total	**0.35**	**0.03**	**0.05**	**0.43**	**0.43**

Total Wetland Impact for Section A: 0.43 acres.

Section B Wetland Impacts in the Broad River Basin

Site	Permanent Fill (ac)	Excavation (ac)	Mechanized Clearing (ac)	Total Wetland Impact (ac)	Wetland Impacts Requiring Mitigation (ac)
6	0.01	0	<0.01	0.01	0.02
7	3.29	0	0.25	3.54	3.54
8	0.05	0	0	0.05	0.05
11	0.01	0	0	0.01	0.01
12	0.01	0	0	0.01	0.01
Total	**3.37**	**0**	**0.25**	**3.62**	**3.62**

Total Wetland Impact for Section B: 3.62 acres.

Preliminary Wetland Impacts for Project:
Section C: 0.92 acres
Section D: 0.4 acres
Section E: 0.67 acres

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

This approval is only valid for the purpose and design that you submitted in your application dated received July 11, 2012. Should your project change, you are required to notify the NCDWQ 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. When final design plans are completed for R-2707 Sections C, D, and E, a modification to the 401 Water Quality Certification shall be submitted with fees to the NC Division of Water Quality. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams, and other surface waters. No construction activities that impact any wetlands, streams, or surface waters in R-2707 Sections C, D, or E shall begin until after the permittee applies for, and receives a written modification of the 401 Water Quality Certification from the NC Division of Water Quality.

2. Compensatory mitigation for impacts to 4.05 acres of wetlands is required. We understand that you have chosen to perform compensatory mitigation for impacts to wetlands 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 July 3, 2012 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the Tri-Party MOA signed on July 22, 2003 and the Dual-Party MOA signed on April 12, 2004

3. Compensatory mitigation for 4976 linear feet of impact to streams is required. We understand that you have chosen to perform compensatory mitigation for impacts to streams through the North Carolina Ecosystem Enhancement Program (EEP), and that the EEP has agreed to implement the mitigation for the project. EEP has indicated in a letter dated July 3, 2012 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.

4. Two copies of the final construction drawings shall be furnished to NCDWQ (one to Central Office and another to the Mooresville Regional Office) prior to the pre-construction meeting. The permittee shall provide written verification that the final construction drawings comply with the permit drawings contained in the application dated received July 22, 2012. Any deviations from the approved drawings are not authorized unless approved by the NC Division of Water Quality.

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

6. The post-construction removal of any temporary bridge structures must return the project site to its preconstruction contours and elevations. The impacted areas shall be revegetated with appropriate native species.

7. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Please refer to the most current version of *Stormwater Best Management Practices.*

8. Bridge piles and bents shall be constructed using driven piles (hammer or vibratory) or drilled shaft construction methods. More specifically, jetting or other methods of pile driving are prohibited without prior written approval from NCDWQ first.

9. No drill slurry or water that has been in contact with uncured concrete shall be allowed to enter surface waters. This water shall be captured, treated, and disposed of properly.

10. All pile driving or drilling activities in surface waters shall be enclosed in turbidity curtains unless otherwise approved by NCDWQ in this certification.

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

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

13. Riprap shall not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be properly designed, sized and installed.

14. For all streams being impacted due to site dewatering activities, the site shall be graded to its preconstruction contours and revegetated with appropriate native species.

15. 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.

16. For any areas of the project draining to Water Supply Critical Area waters (WS CA), the permittee shall use "Design Standards in Sensitive Watersheds" [15A NCAC 4B.0124(a)-(e)]. However, due to the size of the project, NC DOT shall not be required to meet 15A NCAC 4B .0124(a) regarding the maximum amount of uncovered acres. Temporary cover (wheat, millet, or similar annual grain) or permanent herbaceous cover shall be planted on all bare soil within 15 business days of ground disturbing activities to provide erosion control.

17. 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.

18. During the construction of the project, no staging of equipment of any kind is permitted in waters of the U.S.

19. 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.

20. The use of rip-rap above the Normal High Water Mark shall be minimized. Any rip-rap placed for stream stabilization shall be placed in stream channels in such a manner that it does not impede aquatic life passage.

21. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval.

22. All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water.

23. 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.

24. 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.

25. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification.

26. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited.

27. 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 NCDWQ 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, NCDWQ may reevaluate and modify this certification.

28. All fill slopes located in jurisdictional wetlands shall be placed at slopes no flatter than 3:1, unless otherwise authorized by this certification..

29. 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.

30. The outside 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.

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 shall report any violations of this certification to the Division of Water Quality within 24 hours of discovery.

33. Upon completion of the project (including any impacts at associated borrow or waste sites), the NCDOT Division Engineer shall complete and return the enclosed "Certification of Completion Form" to notify NCDWQ when all work included in the 401 Certification has been completed.

34. Native riparian vegetation (i.e. trees and shrubs native to your geographic region) 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.

35. 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.

36. 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:

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.

37. Sediment and erosion control measures shall not be placed in wetlands or waters unless otherwise approved by this Certification.

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

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

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

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

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

Mr. William Cary, General Counsel
Department of Environment and Natural Resources
1601 Mail Service Center

This the 18th day of September 2012

DIVISION OF WATER QUALITY

Robert Ridings

for Charles Wakild
Director

WQC No. 3941

North Carolina Department of Environment and Natural Resources
Division of Water Quality
Charles Wakild, P.E
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

NCDWQ Project No.: _____ **County:** _____

Applicant: _____

Project Name: _____

Date of Issuance of 401 Water Quality Certification: _____

Certificate of Completion

Upon completion of all work approved within the 401 Water Quality Certification or applicable Buffer Rules, and any subsequent modifications, the applicant is required to return this certificate to the 401 Transportation Permitting Unit, North Carolina Division of Water Quality, 1650 Mail Service Center, Raleigh, NC, 27699-1650. This form may be returned to NCDWQ by the applicant, the applicant's authorized agent, **or** the project engineer. It is not necessary to send certificates from all of these.

Applicant's Certification

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

Signature: _____ Date: _____

Agent's Certification

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

Signature: _____ Date:_____

Engineer's Certification

_____ Partial _____ Final

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

Signature _____ Registration No. _____

Date _____

Transportation and Permitting Unit
1650 Mail Service Center, Raleigh, North Carolina 27699-1617
Location: 512 N. Salisbury St. Raleigh, North Carolina 27604
Phone: 919-807-6300 \ FAX: 919-807-6492
Internet: www.ncwaterquality.org

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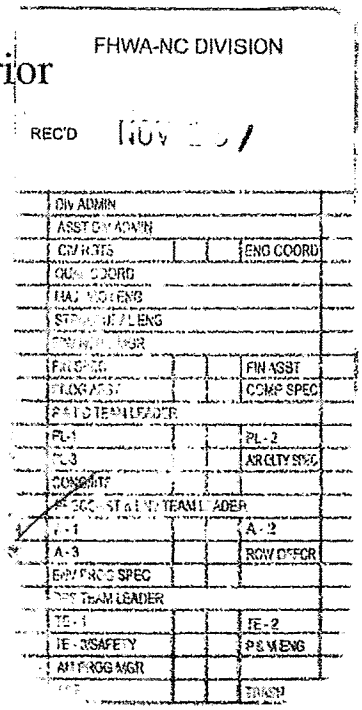
United States Department of the Interior

FISH AND WILDLIFE SERVICE
Asheville Field Office
160 Zillicoa Street
Asheville, North Carolina 28801

November 9, 2012



Mr. John F. Sullivan, III
Division Administrator
Federal Highway Administration
310 New Bern Avenue, Suite 410
Raleigh, North Carolina 27601

Dear Mr. Sullivan:

Subject: Amendment to the Biological Opinion for the Proposed US 74 Shelby Bypass in Cleveland County, North Carolina, Federal Aid No. NHF-74(14), State Project No. 8.1801001, TIP No. R-2707

This document transmits the U.S. Fish and Wildlife Service's (Service) amended biological opinion (Opinion) based on our review of updated information for the proposed US 74 Shelby Bypass in Cleveland County, North Carolina, and its effects on the federally threatened dwarf-flowered heartleaf (*Hexastylis naniflora*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act). We received your October 16, 2012, request for reinitiation of formal consultation on October 17, 2012. This amendment is based on information provided in the October 16, 2012, amendment package and addresses specific changes from the 2004 Opinion.

The reinitiation of consultation was requested for the following reasons: (1) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in the Opinion and (2) the agency action has been modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the Opinion. More than 8 years have elapsed since the original Opinion was rendered. Resurveys of plant populations, coupled with more refined project plans, have changed the impacts considered in the 2004 Opinion. In addition, conservation of plants and habitat pledged within the rights-of-way (ROW) was reexamined since the North Carolina Department of Transportation (NCDOT) has not purchased the ROW or begun construction activities on this project.

AMENDMENT TO THE 2004 BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The NCDOT proposes to construct the Shelby Bypass (Bypass) to bypass the Town of Shelby, in Cleveland County, North Carolina, from existing US 74 west of Shelby to existing US 74 east of Shelby. The Bypass is proposed to be a four-lane divided, full control of access facility, primarily on new location to the north and east of Shelby, for about 18 miles.

Although the Bypass was studied in total, the project has been divided into five sections (A-E) for the purposes of funding and construction. At the current time, sections A, B, and C are programmed, and sections D and E are post-year (Table 1). Project details are much more refined for sections A-C than they were in 2004.

Table 1. Shelby Bypass Sections and Dates.

Section of R-2707	Location of Section	Length (miles)	Right-of-Way Date	Let Date
A	Existing US 74 (West Dixon Blvd) from west of SR 1162 (Peachtree Rd) to west of SR 1314 (Hoyle Rd)	3.93	June 30, 2010	February 2013 (AA Section) and August 2013 (AB Section)
B	West of SR 1314 (Hoyle Rd) to west of NC 226 (Polkville Rd)	2.62	July 15, 2011	August 2013
C	West of NC 226 (Polkville Rd) to west of NC 150 (Cherryville Rd)	5.34	December 21, 2012	January 15, 2019
D	West of NC 150 (Cherryville Rd) to existing US 74 (East Dixon Blvd) west of SR 2238	4.09	Post-Year	Post-Year
E	Existing US 74 (East Dixon Blvd) from west of SR 2238 to west of SR 1001 (Stoney Point Rd)	2.64	Post-Year	Post-Year

Conservation Measures

The following list of conservation measures have been updated primarily to reflect changes in the plant sites receiving protection in the project ROW. Other minor changes also are included. This list supersedes the previous list of measures in the 2004 Opinion.

1. Pre-construction meeting - A Service biologist will attend the preconstruction meeting to discuss (a) the importance of avoiding dwarf-flowered heartleaf plants and (b) other environmental commitments that are a part of the project.

2. Dwarf-flowered heartleaf protective barriers - Before construction activities begin at dwarf-flowered heartleaf Sites 7, 10, 11, 15, 16, 20, 22, 24, 25, 28, 31, 32, and 49, the portion of occupied dwarf-flowered heartleaf habitat remaining intact from construction activities (i.e., adverse direct effects and indirect effects from drainage activities) will be protected by placing orange safety fencing or otherwise hardened barriers with

appropriate signage along the construction limits. The signed fencing or barriers will protect the remaining plants from accidental disturbance during construction. The portions of dwarf-flowered heartleaf sites that are protected will remain on the project's design plans throughout construction activities and will be labeled on the plans as "sensitive areas."

3. On-site protection - The portions of dwarf-flowered heartleaf Sites 7, 10, 11, 15, 16, 20, 22, 24, 25, 28, 31, 32, and 49 not lost from project construction will be protected in perpetuity. A protective buffer of up to 400 feet out from the limits of preserved occupied dwarf-flowered heartleaf habitat will be placed around these plant sites and also preserved in perpetuity. Final buffer widths will vary for each site. Design Plan Sheet Nos. 16 - 26 of 26 in the amended Biological Assessment (BA) depict the area of occupied dwarf-flowered heartleaf habitat to be protected and the approximate limits of the protective buffers. Final site configurations, including buffer limits, will be mapped and submitted to the Service when ROW acquisitions are complete.

4. Conservation easements - The NCDOT will attempt to enter into conservation easements with access points, where appropriate, for all or portions of dwarf-flowered heartleaf Sites 1, 8, 12, 13, 14, 26, 29, 33, 34, 35, 43, and 48. The portions of Sites 25 and 32 remaining intact upon project construction and not already protected by ROW extensions will also be pursued for potential conservation easements. Written documentation will be provided to the Service and North Carolina Natural Heritage Program once easements are successfully obtained at any of these sites.

5. On-site monitoring - For on-site conservation sites entered into a secured protective ownership, either though ROW extension via settlement/condemnation or through a conservation easement with a landowner, the NCDOT will quantitatively and qualitatively monitor occupied dwarf-flowered heartleaf habitat preserved in perpetuity. Monitoring efforts will begin with the acquisition of pre-construction/easement acquisition environmental baseline data. The preserved sites will then be monitored post-construction/easement acquisition once every 2 years over a 6-year period to ensure the protection, and detect trends in numbers, of dwarf-flowered heartleaf plants that may or may not be due to project construction. Monitoring reports detailing the monitoring results and any appropriate management activities undertaken will be submitted to the Service at the end of each monitoring period.

6. Management of nonnative, invasive species - For on-site conservation sites entered into a secured protective ownership, either though ROW extension via settlement/condemnation or through a conservation easement, adverse effects from biological pollution can be avoided and/or minimized on a case-by-case basis through effective efforts to manage the growth of nonnative, invasive species within the areas of occupied dwarf-flowered heartleaf habitat that is preserved.

7. Future anticipated adverse effects - The NCDOT has designated an expected 50-foot-wide greenway corridor through dwarf-flowered heartleaf Sites 12, 14, 22, 23, 25, and 26. Future anticipated adverse effects (not counting biological pollution)

associated with the planned greenway's footprint must remain excluded from the area of occupied dwarf-flowered heartleaf habitat that the NCDOT can protect at these sites.

8. Broad River Greenway Conservation Area - The NCDOT entered into a conservation easement on July 18, 2008, with the Broad River Greenway, Inc., of approximately 1,000 acres of land referred to as the Broad River Greenway Conservation Area (BRGCA). In accordance with the stated measures of the BRGCA's Conservation Plan as well as additional monitoring requirements and guidelines provided by the Service, the NCDOT will quantitatively and qualitatively monitor occupied dwarf-flowered heartleaf habitat within the BRGCA. Monitoring efforts began with the acquisition of environmental baseline data prior to obtaining the conservation easement. The BRGCA is then to be monitored once every 3 years over a 9-year period to ensure the protection, and detect trends in numbers, of dwarf-flowered heartleaf plants over time. Monitoring reports detailing the monitoring results and any appropriate management activities undertaken will be submitted to the Service at the end of each monitoring period.

EFFECTS OF THE ACTION

As depicted in Table 2, changes in the effects of the proposed action are relatively minor. The total number of plants has increased by 24 percent, mostly on the BRGCA. Acres of habitat have decreased only slightly.

Table 2. Impacts 2004 vs. 2012.

Action Area or Effects	As Noted in the 2004 BA and BO		As Noted in this 2012 Amended BA	
	Occupied DFHL Habitat (ac)*/ **	Number of DFHL Plants	Occupied DFHL Habitat (ac)*/ **	Number of DFHL Plants
Preferred Alternative Corridor and Adjoining Areas	27.41	16,405	34.00	18,177
Broad River Greenway Conservation Area	54.26***	10,796	54.13	15,750
Action Area (Total)	**81.67**	**27,201**	**88.13**	**33,927**
Direct Effects	4.1	3,337	4.13	3,060
Indirect Effects	7.2	5,524	3.65	2,267
Cumulative Effects	2.4	1,460	9.24	4,458
Adverse Effects (Total)	**13.6**	**10,321**	**17.03**	**9,785**
On-site Conservation	11.2	4,798	9.28	4,104
Off-site Conservation	54.26***	10,796	54.13	15,750
Beneficial Effects (Total)	**65.46**	**15,594**	**63.41**	**19,854**

*For conservation areas, excludes any protective buffer or conservation easement areas not containing dwarf-flowered heartleaf plants.

**Acreage totals rounded to nearest 0.01 acre and, consequently, may not equate because of rounding.

***The BA and Opinion of 2004 both incorrectly reported approximately 47 acres of occupied dwarf-flowered heartleaf habitat occurring within what is now referred to as the BRGCA.

The following specifics explain the changes in adverse and beneficial effects to occupied habitat and numbers of plants from the 2004 Opinion:

1. More refined preliminary roadway design plans are used to depict adverse and beneficial effects at a greater precision and accuracy;

2. The number of plants within the action area is greater because field surveys were updated;

3. More refined preliminary roadway design plans now account for adverse indirect effects caused by drainage impacts anticipated to occur within areas of occupied habitat situated outside of the project's proposed ROW but within areas designated in a drainage easement;

4. Indirect effects via biological pollution from the growth of nonnative, invasive species is modified to exclude those areas of occupied habitat situated in the 400-foot biological pollution zone with an existing low threat from such species;

5. Portions of occupied habitat where the area of indirect effects from biological pollution intersects the area proposed for on-site preservation through fee simple ROW extension are now depicted as actually incurring those adverse effects before any management activities on nonnative, invasive species are implemented;

6. Occupied habitat situated within assumed areas of a planned greenway are excluded from areas to be preserved on-site in perpetuity; and

7. Occupied habitat and associated protective buffer areas to be preserved on-site in perpetuity are analyzed down to a more detailed parcel level rather than at a less detailed occurrence level.

CONCLUSION

Total rangewide numbers of dwarf-flowered heartleaf plants and known occurrences have not changed significantly since the issuance of the 2004 Opinion. Given that the total negative impacts in the action area have remained virtually the same as in 2004, the overall impact to the dwarf-flowered heartleaf across its range has not changed. While the number of plants protected in ROW on the project has decreased slightly, numbers of plants on the conservation site have increased since 2004. The updated data provided has helped to refine the impacts analyzed in 2004 with the overall result being very little change.

After reviewing the current status of the dwarf-flowered heartleaf, the environmental baseline for the action area, the effects of the proposed highway project, the cumulative effects, and the proposed conservation measures, it is our biological opinion that the project as proposed is not likely to jeopardize the continued existence of the dwarf-flowered heartleaf. No critical habitat has been designated for this species; therefore, none will be affected.

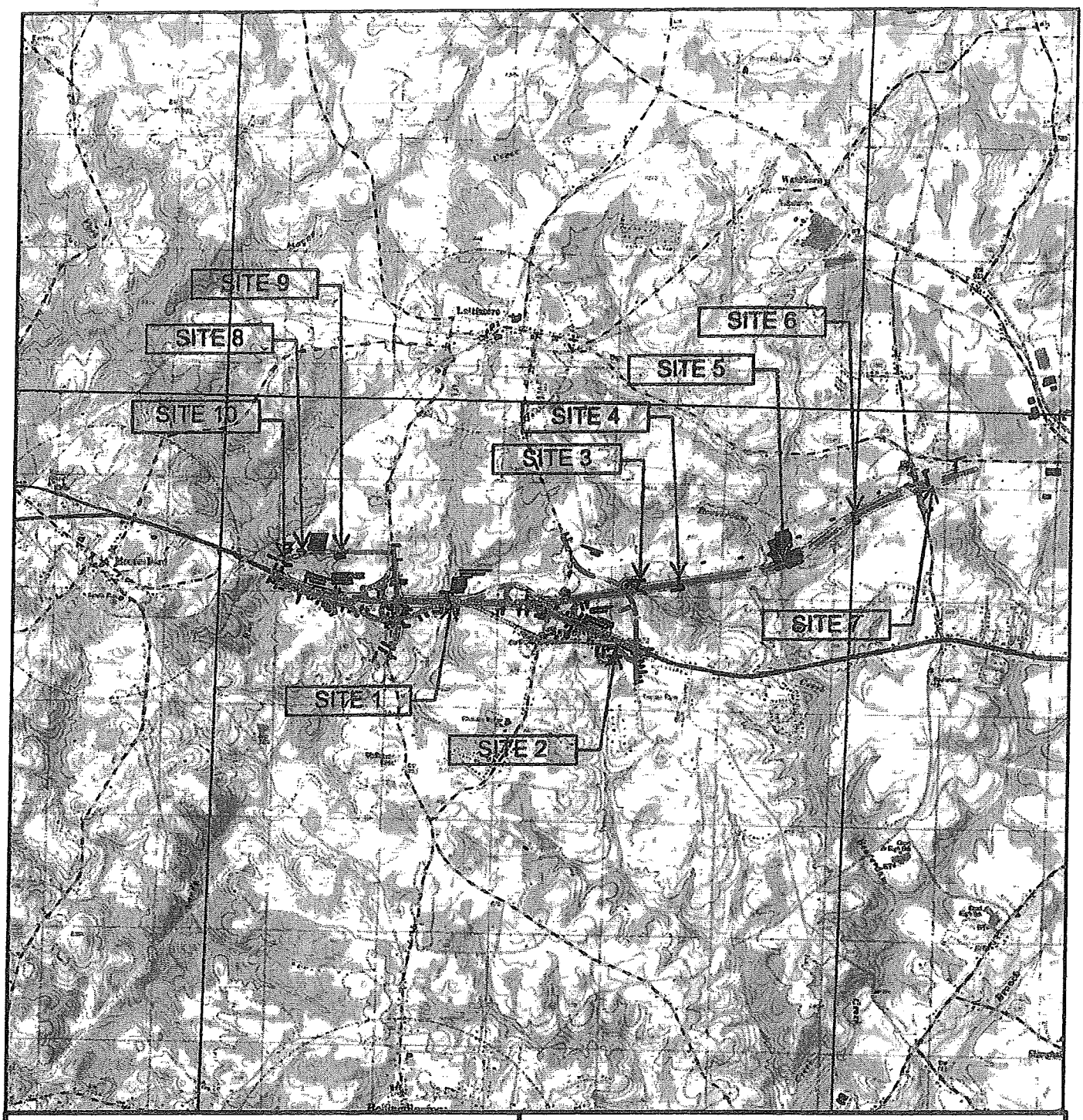
REINITIATION/CLOSING STATEMENT

This concludes formal consultation on the action outlined in your October 16, 2012, request for reinitiation of formal consultation. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over an action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion, (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this Opinion, or (4) a new species is listed or critical habitat is designated that may be affected by the action.

If you have any questions concerning this Opinion, please contact Ms. Marella Buncick of our staff at 828/258-3939, Ext. 237, or me, Ext. 223. We have assigned our Log No. 4-2-95-031 to this project; please refer to it in any future correspondence concerning this project.

Sincerely,

for Brian P. Cole
Field Supervisor



TOPO MAP

SCALE 1" = 4000'

NCDOT

DIVSION OF HIGHWAYS
CLEVELAND COUNTY
PROJECT: R-2707A

US 74 - SHELBY BYPASS
FROM WEST OF SR 1162
(PEACHTREE ROAD)
TO WEST OF SR 1313
(WASHBURN SWITCH ROAD)

SHEET OF 04/17/12

Permit Drawing
Sheet 1 of 35

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	58+07 TO 59+13LT	2 @ 8'X8' RCBC						0.05	<0.01	185	20	
	-L-58+34 LT	BANK STABILIZE								20		
2	-SRV2- 15+78 TO 15+83 RT	48" RCP						0.01	<0.01	57	16	
3	-L- 114+11 LT TO 116+70 RT	36" RCP IV						0.01	<0.01	64	6	
		BANK STABILIZE								12		
4	-L-127+10 LT TO 127+51 RT	36" RCP/36" CSP						0.05	<0.01	290	37	
		BANK STABILIZE								12		
5	-L-159+60LT TO 160+26 RT	ROADWAY FILL	0.28		0.02	0.02						
	-L-157+60LT	BANK STABILIZE								17		
	-L-156+55LT	LATERAL DITCH			0.01	0.01						
6	-L- 182+12 TO 183+34 LT	42" LRFD DESIGN						0.03	<0.01	290	28	
		BANK STABILIZE								12		
7	-L- 207+27LT TO 208+24RT	2 @ 36" RCP	0.07			0.01		0.03	<0.01	318	8	
	-L- 208+18 RT	BANK STABILIZE									12	
8	-SR6 18+36 TO 18+47 LT	30" RCP						<0.01	<0.01	19	19	
9	-SR6- 28+48 RT TO 31+00 LT	36" RCP						0.01		119		
		OPEN CHANNEL						0.02	0.01	147	28	
10	-SR6 11+52 RT	BANK STABILIZE								8		
TOTALS:			0.35	0.00	0.03	0.05	0.00	0.20	0.03	1570	173	0

ATN Revised 3/31/05

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

COUNTY
WBS - 34497.1.2 (R-2707A)

SHEET ##########

Permit Drawing
Sheet 2 of 35

PROPERTY OWNERS

PARCEL	OWNER NAME	ADDRESS
28	JAMES STEPHEN CORNWELL	117 WESTLEE LATTIMORE NC 28089-0127
91	CHURCH OF GOD-LOUIS GRADY DAVIS-TRUSTEE	PO BOX 1986 SHELBY NC 28151-1986
34	HAMRICK BROTHERS INC.	PO BOX 802 BOILING SPRINGS NC 28017-0802
37	MARY JONES PARNELL	1038 RACE PATH CHURCH ROAD ELLENBORO NC 28040
41	JAMES A. BLACK II	2670 TOWERY ROAD SHELBY NC 28150-9157
42	HOWARD VICTOR BOWEN	3760 ROBERT RIDINGS SHELBY NC 28150

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

CLEVELAND COUNTY
PROJECT: 34497.1.2 (R-2707A)

US 74 (SHELBY BYPASS) FROM WEST OF SR 1162 (PEACHTREE ROAD) TO WEST OF SR 1313 (WASHBURN SWITCH ROAD)

SHEET 1 OF 2 06/21/11

Permit Drawing
Sheet 3 of 35

PROPERTY OWNERS

PARCEL	OWNER NAME	ADDRESS
44	MARIE ELAINE CULBERSON	131 RODEO DRIVE DALLAS NC 28034
43	ROBERT PERRY MCSWAIN	3641 TOWERY ROAD SHELBY NC 28150
50	LETHA RAY BEAVER	304 PLATO LEE ROAD SHELBY NC 28150
49	JOHN ROBERT MCBRAYER	4 YATES MCBRAYER DRIVE SHELBY NC 28152-1045
48A	ROBERT FRANCIS BODWELL SR.	408 PLATO LEE ROAD SHELBY NC 28150
48	MALCOLM KEITH & MARIE BEAVER	330 PLATO LEE ROAD SHELBY NC 28450-7037
12	JOHN JASON HUNT	138 PEACHTREE ST. LATTIMORE NC 28089-0277

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

CLEVELAND COUNTY
PROJECT: 34497.1.2 (R-2707A)

US 74 (SHELBY BYPASS) FROM WEST OF SR 1162 (PEACHTREE ROAD) TO WEST OF SR 1313 (WASHBURN SWITCH ROAD)

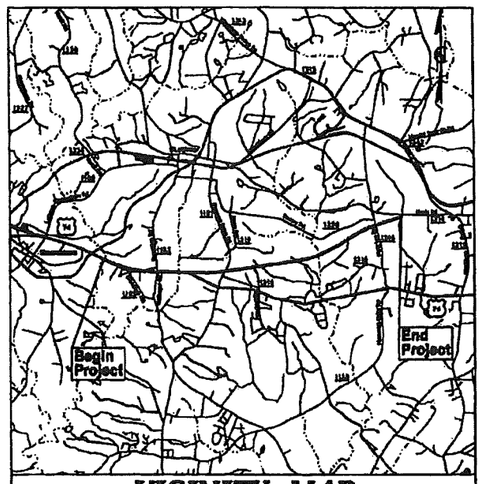
SHEET 2 OF 2 06/21/11

Permit Drawing
Sheet 4 of 25

09/08/99

TIP R-2707A

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CLEVELAND COUNTY

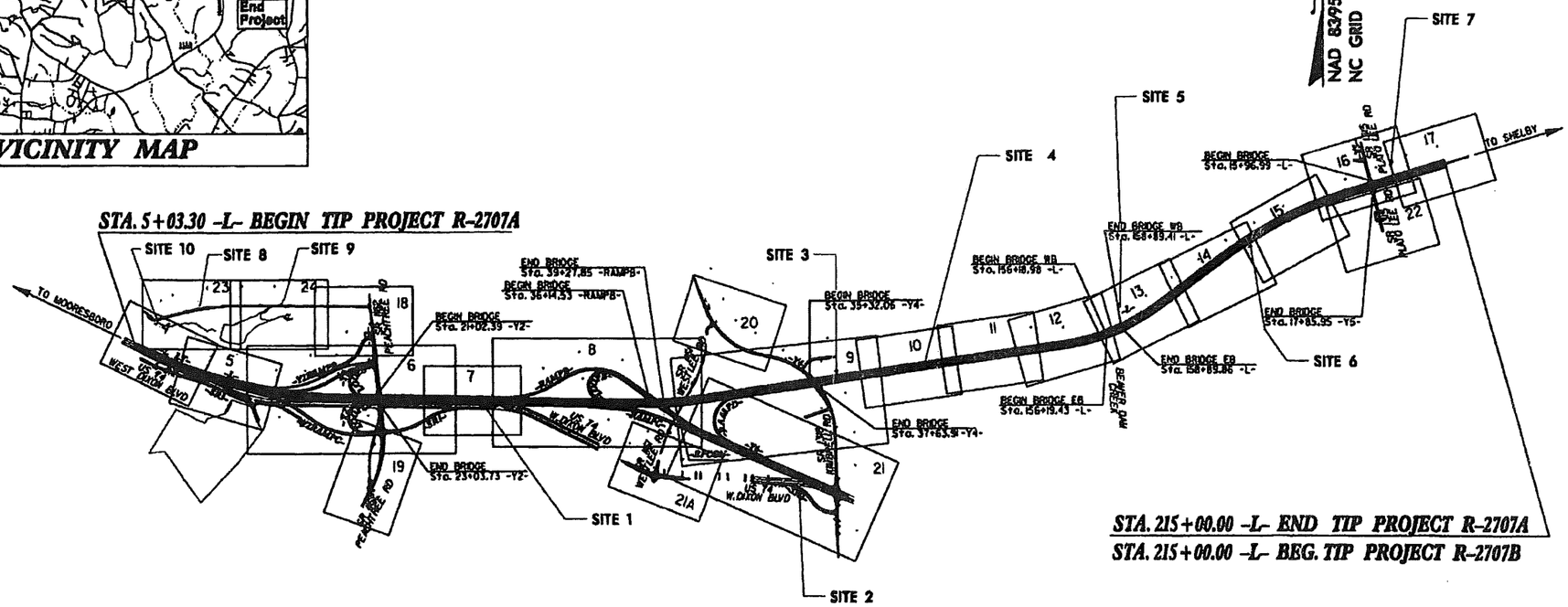
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2707A	1	

STATE PROJECT NO.	F.A. PROJECT NO.	DESCRIPTION
34497.1.2	NHF-74(14)	PE

PERMIT DRAWINGS
WETLAND AND
STREAM IMPACTS

LOCATION: US 74 (SHELBY BYPASS) FROM WEST OF SR 1162 (PEACHTREE ROAD) TO WEST OF SR 1313 (WASHBURN SWITCH ROAD)

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



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

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

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NCDOT CONTACT:
DOUG TAYLOR, P.E.
PROJECT ENGINEER - ROADWAY DESIGN

CONTRACT:

ARCADIS G&M
Drawn by: MCB
Checked by: MCB
Filename: RPLE5

Time: 9:17AM

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2002 = 24,800
ADT 2025 = 45,400
DHV = 12 %
D = 60 %
T = 14 % *
V = 70 MPH

* TTST 8% DUAL 6%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2707A = 3.977 miles
LENGTH OF STRUCTURE TIP PROJECT R-2707A = 0.048 miles
TOTAL LENGTH TIP PROJECT R-2707A = 3.929 miles

Prepared In The Office of:
ARCADIS
Global Infrastructure, Environment & Facilities
801 Corporate Center Drive, Suite 300
Raleigh, NC 27607-5477
Tel 919/854-1282 Fax 919/854-5448
www.arcadis-us.com
for the North Carolina Department of Transportation

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:

ARCADIS CONTACT
STEVE SMALLWOOD, P.E.
PROJECT ENGINEER

PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
SIGNATURE P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ADMINISTRATOR DATE

Permit Drawing
Sheet 5 of 35

ARCADIS
G & M of North Carolina, Inc.
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801 Corporate Center Drive, Suite 300
Raleigh, NC 27607-5073
Tel: 919/854-1282 Fax: 919/854-5448

PROJECT REFERENCE NO.	SHEET NO.
R-2707A	7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

RIGHT OF WAY REVISION: CHANGED STATION TO BE OFF CURVE PT STA 23+35.74 -SRI- 10' RT. TO 10 STS
RIGHT OF WAY REVISION: CHANGED 28 TO 17, REMOVED SHARED PROPERTY CONNECTOR, CHANGED PARCEL SOUTH OF -L- FROM 17 TO 28, ADDED 28A, 9/ /11 ST'S

ARCADIS G&M
Date: =DATE=
Filename: =FILE=
Time: =TIME=

DETAIL 7A
LATERAL BASE DITCH
(Not to Scale)

Min. b = 2.0 Ft.
Max. d = 2.0 Ft.
B = 6.0 Ft.
b = 5.0 Ft.

*When B Is ≥ 6.0' Std. No. 858.01

Type of Liner = CL. 'I' RIPRAP

-L- STA 58+34 TO 59+28 LT

DETAIL 7B
LINE EXISTING DITCH
(Not to Scale)

Max. d = 1.0 Ft.

Type of Liner = CL. 'B' RIP RAP

-SRI- STA 23+56 TO 25+43 RT

DETAIL 7C
LINE EXISTING DITCH
(Not to Scale)

Max. d = 2.0 Ft.

Type of Liner = CL. 'A' RIP RAP

-L- STA 59+21 TO 62+00 RT

DETAIL 7E
FALSE SUMP
(Not to Scale)

S = Ditch Slope

FROM STA. TO STA.

DETAIL 7G
RIP RAP AT EMBANKMENT
(Not to Scale)

Type of Liner = CL. 'I' RIP RAP

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 8395

JAMES STEPHEN CORNWELL
DB 17M PG 662

SITE 1

JAMES STEPHEN CORNWELL
DB 94E PG 665

BANK STABILIZATION
48+34 LT
SEE DETAIL 7G

BANK STABILIZATION
IMPACT

LATERAL "BASE" DITCH
W/CL 'I' RIP RAP
-L- STA. 58+34
TO STA. 59+28 LT
EST. 45 TONS
EST. 93 S.Y. FABRIC
SEE DETAIL 7A

-L- STA. 60+34 LT

LINE ROADWAY DITCH
W/PERMANENT SOIL
REINFORCEMENT MATTING
-L- STA. 53+00 LT
TO STA. 55+50 LT
EST. 340 S.Y. MATTING
SEE DETAIL 7D

2@8'X8' CULVERT EXTENSION

48" CSP WELDOWS, SLEEVE GASKET W/COD & LUG CONNECTORS.

CABLE GUIDERAIL

REMOVE

PROPOSED RW FENCE

FLAT GRATE 2GI

S 88°55'24"E

-SRI- STA 23+36 LT
BEGIN SHOULDER
BERM GUTTER

LINE EXISTING DITCH
W/CL "B" RIP RAP
-SRI- STA. 23+56 TO
STA. 25+43 RT
EST 65 TONS
EST 93 S.Y. FABRIC
SEE DETAIL 7B

PT Sta. 23+35.74 -SRI-

END PAVING
PT Sta. 24+48.74 -SRI-

JAMES STEPHEN CORNWELL
DB 17M PG 662

LINE EXISTING DITCH
W/CL "B" RIP RAP
-L- STA. 59+21 TO
STA. 62+00 RT
EST 410 TONS
EST 280 S.Y. FABRIC
SEE DETAIL 7C

-SRI- STA 28+06 LT
END SHOULDER
BERM GUTTER

TIE TO EXISTING CHANNEL

48" CSP WELDOWS, SLEEVE GASKET W/COD & LUG CONNECTORS

CHARLES CORNWELL
DB 94E PG 665

END CONSTRUCTION
PT Sta. 28+45.34 -SRI-

DETAIL 7D
LINE ROADWAY DITCH
(Not to Scale)

Max. d = 1.0 Ft.

Type of Liner = PSRM

-L- STA 45+00 TO 49+50 LT
-L- STA 53+00 TO 55+50 LT

MATCH LINE STA. 54+00.00 -L-
SEE SHEET 6

MATCH LINE STA. 62+00.00 -L-
SEE SHEET 8

SEE SHEET 26 FOR -L- PROFILE

Permit Drawing
Sheet 6 of 35

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PROJECT REFERENCE NO.	SHEET NO.
R-2707A	7
NW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 8395

REVISIONS

RIGHT OF WAY REVISION: CHANGED STATION TO BE OFF CURVE PT STA 23+3574 -SRI- 10' RT. /2/ /10 STS
RIGHT OF WAY REVISION: CHANGED 28 TO 1', REMOVED SHARED PROPERTY CONNECTOR, CHANGED PARCEL SOUTH OF -L- FROM 17 TO 28. ADDED 28A 9/ /11 STS

DETAIL 7A
LATERAL BASE DITCH
(Not to Scale)

Min. D = 2.0 Ft.
Max. d = 2.0 Ft.
B = 6.0 Ft.
b = 5.0 Ft.

*When B is ≥ 6.0' Std. No. 660.01

Type of Liner = CL 'I' RIPRAP

-L- STA 58+34 TO 59+38 LT

DETAIL 7B
LINE EXISTING DITCH
(Not to Scale)

Max. d = 1.0 Ft.

Type of Liner = CL 'B' RIP RAP

-SRI- STA 23+56 TO 25+43 RT

DETAIL 7C
LINE EXISTING DITCH
(Not to Scale)

Max. d = 2.0 Ft.

Type of Liner = CL 'B' RIP RAP

-L- STA 59+21 TO 62+00 RT

DETAIL 7E
FALSE SUMP
(Not to Scale)

S = Ditch Slope

FROM STA. TO STA.

DETAIL 7G
RIP RAP AT EMBANKMENT
(Not to Scale)

Type of Liner = CL 'I' RIP RAP

SITE 1

JAMES STEPHEN CORNWELL
DB 17M PG 662

JAMES STEPHEN CORNWELL
DB 94E PG 665

BANK STABILIZATION
-SRI- 24+34 LT
SEE DETAIL 7G

LINE ROADWAY DITCH
W/PERMANENT SOIL REINFORCEMENT MATTING
-L- STA. 65+90 LT
TO STA. 59+28 LT
EST. 340 S.Y. MATTING
SEE DETAIL 7D

LATERAL BASE DITCH
W/CL 'I' RIP RAP
-L- STA. 58+34
TO STA. 59+28 LT
EST. 45 TONS
EST. 93 S.Y. FABRIC
SEE DETAIL 7A

2@8'X8' CULVERT EXTENSION

48" CSP W/ BOWTIE SLEEVE GASKET W/ BOLT & LUG CONNECTORS

EAGLE GUIDERAIL

FLAT GRATE 2GI

S 88°55'24.01"E

-SRI- STA. 23+34 LT
BEGIN UNPROTECTED BERM GUTTER

LINE EXISTING DITCH
W/CL 'B' RIP RAP
-SRI- STA. 23+34 TO STA. 25+43 RT
EST. 65 TONS
EST. 93 S.Y. FABRIC
SEE DETAIL 7B

-SRI- STA. 25+43 RT

JAMES STEPHEN CORNWELL
DB 17M PG 662

24" RCP
-SRI- STA. 25+35.74

DETAIL 7D
LINE ROADWAY DITCH
(Not to Scale)

Type of Liner = PSRM
Max. d = 1.0 Ft.

-L- STA 45+00 TO 49+50 LT
-L- STA 53+00 TO 55+50 LT

LINE EXISTING DITCH
W/CL 'B' RIP RAP
-L- STA. 59+21 TO
STA. 62+00 RT
EST. 410 TONS
EST. 280 S.Y. FABRIC
SEE DETAIL 7C

TIE TO EXISTING CHANNEL

CHARLES CORNWELL
DB 94E PG 668

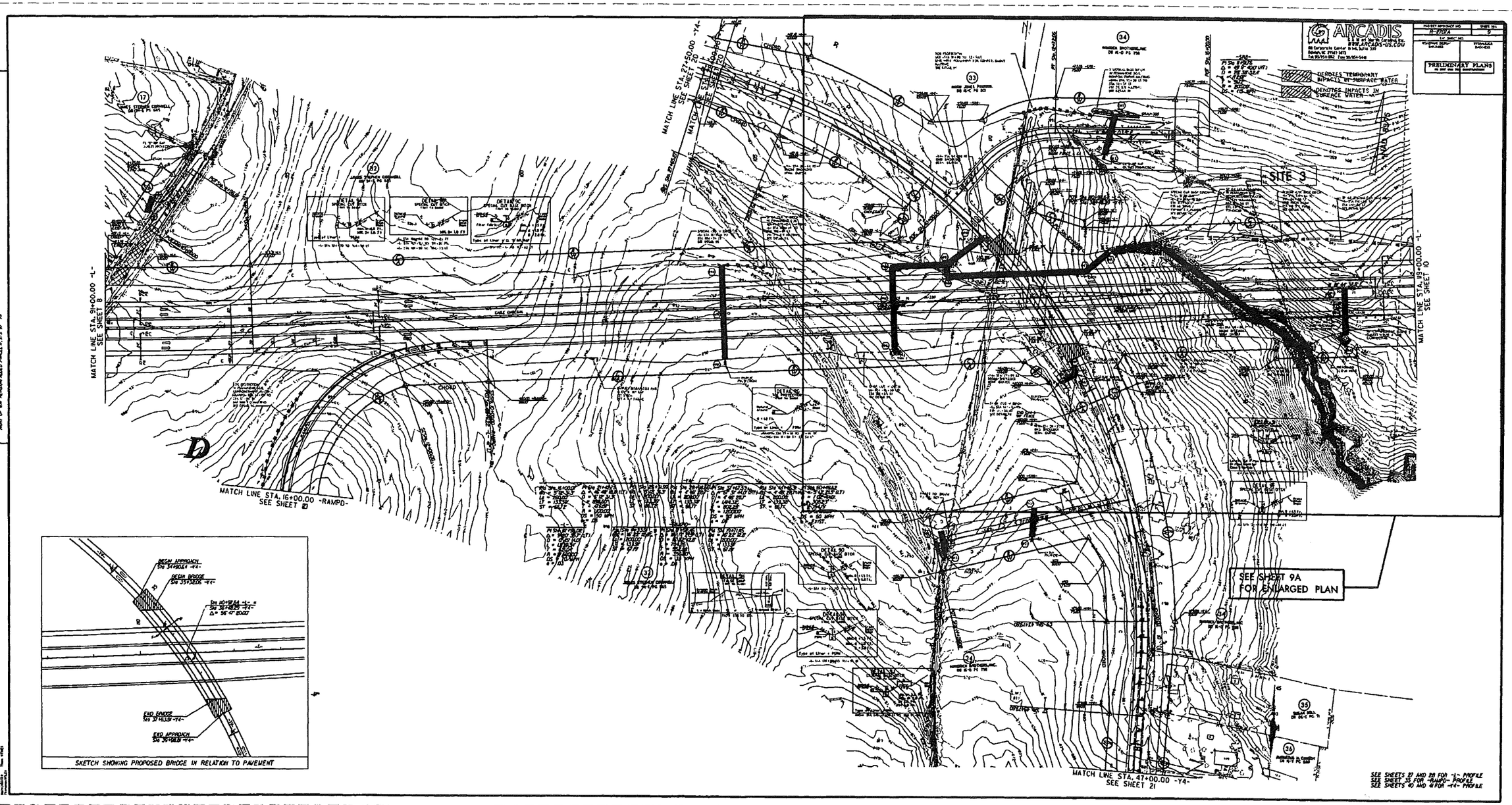
MATCH LINE STA. 54+00.00 -L-
SEE SHEET 6

MATCH LINE STA. 62+00.00 -L-
SEE SHEET 8

SEE SHEET 26 FOR -L- PROFILE

ARCADIS G&M
Date: <DATE>
Time: <TIME>
File: <Name of File>

Permit Drawing
Sheet 7 of 35



SKETCH SHOWING PROPOSED BRIDGE IN RELATION TO PAVEMENT

Permit Drawing
Sheet 8 of 35

SITE 3

NAD 83/95

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

PRELIMINARY PLANS

ARCADIS

MATCH LINE STA. 9+00.00 -L- SEE SHEET 8

MATCH LINE STA. 27+50.00 -Y4- SEE SHEET 20

MATCH LINE STA. 19+00.00 -L- SEE SHEET 10

MATCH LINE STA. 16+00.00 -RAMP0- SEE SHEET 10

MATCH LINE STA. 47+00.00 -Y4- SEE SHEET 21

SEE SHEET 9A FOR ENLARGED PLAN

SEE SHEETS 27 AND 28 FOR -L- PROFILE
SEE SHEET 35 FOR -RAMP0- PROFILE
SEE SHEETS 40 AND 41 FOR -Y4- PROFILE

SKETCH SHOWING PROPOSED BRIDGE IN RELATION TO PAVEMENT

Permit Drawing
Sheet 9 of 35

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PROJECT REFERENCE NO.	SHEET NO.
R-2707A	9A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS

ARCADIS G&M
Date/Time: #DATE#
Filename: #FILE#

TOE PROTECTION
SR8 -STA. 11+80 TO 13+50LT
LINE WITH PERMANENT SOIL REINFORCEMENT MATTING
SEE DETAIL 9G

MARY JONES PANNELL

HAMRICK BROTHERS, INC

PT Sta. 12+47

POT Sta. 16+00

2' LATERAL BASE DITCH W/ PERMANENT SOIL REINFORCEMENT MATTING -SR8- STA. 13+50 LT TO STA. 14+50 LT
EST. 23 S.Y. MATTING
SEE DETAIL 9J

GRAU-350

SR8 N 84° 03.5' E

GRADE TO DRAIN

CL. B RIP RAP OUTLET PROTECTION

-Y4- STA 104+90 RT
END SHOULDER
BERM GUTTER

N 75° 18' 23.5" E

POB Sta 110+97.64
POC Sta 36+48.29 -Y4-

POB Sta 10+10.00

POC Sta 10+89.99

SITE 3

SPECIAL CUT BASE DITCH W/CL 'B' RIP RAP
-L- STA. 112+58.89
STA. 113+63 LT
EST 46 TONS
EST 102 S.Y. FABRIC
SEE DETAIL 9C

SP. GR. LAT. BASE DITCH W/ PERMANENT SOIL REINFORCEMENT MATTING -SR8- STA. 113+63 TO STA. 115+50 LT
EST. 177 S.Y. MATTING
SEE DETAIL 9B

SPECIAL CUT BASE DITCH -L- STA. 115+50 TO STA. 116+50 LT
LINE WITH PBDM
EST 119 S.Y. PSDM
SEE DETAIL 9E

SP. GR. SPECIAL CUT BASE DITCH -L- STA. 116+50 TO STA. 119+00 LT
SEE DETAIL 9F

NAD 83'95

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

FLAT GRATE 2GI

TYPE A

18" RCP

2GI FS

1A-350

CABLE GUIDERAIL ANCHOR UNIT

2GI TYPE D

SP. GR. CUT 'V' DITCH
-L- STA. 106+50 TO STA. 107+84 RT
SEE DETAIL 9B

-Y4- STA 37+99 RT
BEGIN SHOULDER
BERM GUTTER

SP. GR. CUT 'V' DITCH
-L- STA. 107+84 TO STA. 111+50 RT
SEE DETAIL 9B

OUTLET PROTECTION

-Y4- STA 38+31 RT
END SHOULDER
BERM GUTTER

2GI FLAT GRATE W/ANGLED VANES

TYPE III

RUE

GRAU-350

-L- STA 115+01 RT
BEGIN SHOULDER
BERM GUTTER

ENERGY DISSIPATOR PAD W/ CL 'B' RIP RAP
EST 1 TON
ESR-4 S.Y. FABRIC

-L- STA 119+32 RT
END SHOULDER
BERM GUTTER

18" CSP ELBOWS, SLEEVE F GASKET W/COUPLING BAND & SUB CONNECTORS

PREFORMED SCOUR HOLE

MIN BANKS W/CL 'B' RIP RAP
SEE DETAIL 9B

OUTLET PROTECTION

Length 64 x Pipe Diameter
D= Pipe Diameter
Class A Rip-Rap

-L- STA 116+50 RT

DETAIL 9F
SPECIAL CUT BASE DITCH

Permit Drawing
Sheet 10 of 35

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PROJECT REFERENCE NO.	SHEET NO.
R-2707A	9A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S DENOTES IMPACTS IN SURFACE WATER

NAD 8395

SITE 3

TOE PROTECTION
SRB -STA. 11+80 TO 13+50LT
LINE WITH PERMANENT SOIL REINFORCEMENT MATTING
SEE DETAIL 9G

MARY JONES PANNELL

HAMRICK BROTHERS, INC

PT Sta. 124+

POT Sta. 116+0[illegible]

2' LATERAL BASE DITCH W/PERMANENT SOIL REINFORCEMENT MATTING -SRB- STA. 13+50 LT TO STA. 14+50 LT
EST. 23 S.Y. MATTING
SEE DETAIL 9J

GRAU-350

-SRB- N 84° 8' 03.5" E

GRADE TO DRAIN

-Y4- STA 34+90 RT
END SHOULDER BERM GUTTER

N 15° 14' 23.4" E

CL. B RIP RAP OUTLET PROTECTION

POT Sta 110+97.64 -L- =
POC Sta 36+48.29 -Y4-

SPECIAL CUT BASE DITCH W/CL 'B' RIP RAP
-L- STA. 112+50 TO STA. 113+63 LT
EST 46 TONS
EST 102 S.Y. FABRIC
SEE DETAIL 9C

SP. GR. LAT. BASE DITCH W/PERMANENT SOIL REINFORCEMENT MATTING
-L- STA. 113+63 TO STA. 115+50 LT
EST. [illegible] S.Y. MATTING
SEE DETAIL 9D

SPECIAL CUT BASE DITCH
-L- STA. 115+50 TO STA. 116+50 LT
LINE WITH PSRM
EST 110 S.Y. PSRM
SEE DETAIL 9E

SP. GR. SPECIAL CUT BASE DITCH
-L- STA. 116+50 TO STA. 119+00 LT
SEE DETAIL 9F

POT Sta 10+00.00

PUE

PT Sta. 10+99.59

FLAT GRATE 2GI

18" RCP-III

2GI TYPE 'A'

2GI FS

24" RCP-III

18" WMH

TYPE-III

12" RC

MES GATE

IA-350

CABLE GUIDERAIL ANCHOR UNIT

2GI TYPE 'D'

SP.GR. CUT 'V' DITCH
-L- STA. 106+50 TO STA. 107+84 RT
SEE DETAIL 9B

-Y4- STA 37+99 RT
BEGIN SHOULDER BERM GUTTER

SP.GR. CUT 'V' DITCH
-L- STA. 107+84 TO STA. 111+50 RT
SEE DETAIL 9B

OUTLET PROTECTION

2GI FLAT GRATE W/ANGLED VANES

-Y4- STA 38+31 RT
END SHOULDER BERM GUTTER

SR 1218 FARRELL RD (P 65')

ENERGY DISSAPATOR PAD
W/CL "B" RIP RAP
EST 1 TON
EST 4 S.Y. FABRIC

N 8° 44' 38.6" E

2GI FS

2GI FLAT GRATE

CAT-1

-L- STA 117+52 RT
END SHOULDER BERM GUTTER

GRAU-350
-L- STA 115+00 RT
BEGIN SHOULDER BERM GUTTER

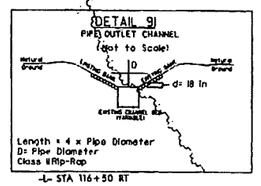
18" CSP W/ELBOWS, SLEEVE GASKET W/ROD & LUB CONNECTORS

LINE BANKS W/CL. II RIP RAP
SEE DETAIL 9I

TS

PREFORMED SCOUR HOLE

DETAIL 9I
PIPE OUTLET CHANNEL
(Not to Scale)



Length = 4 x Pipe Diameter
D= Pipe Diameter
Class II Rip-Rap

-L- STA 116+50 RT

DETAIL 9F
SPECIAL CUT BASE DITCH

REVISIONS

AFJOB: 7841
DGN: M610-TE8
FILENAME: #FILE8
Times: #TIMES

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WWW.ARCADIS-US.COM
801 Corporate Center Drive, Suite 300
Raleigh, NC 27607-5073
Tel: 919/854-1282 Fax: 919/854-5448

PROJECT REFERENCE NO.	SHEET NO.
R-2707A	10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

NAD 83/95

120 125 130

(34) HAMRICK BROTHERS, INC
DB 16-Q PG 798

(37) MARY JONES PARRELL
DB 1169 PG 143

SPECIAL CUT BASE DITCH
VWCL 'B' RIP RAP
-L- STA. 125+50 TO
STA. 127+18 LT
EST 87 TONS
EST 193 S.Y. FABRIC
SEE DETAIL 10A

SPECIAL CUT BASE DITCH
-L- STA. 127+22 TO
STA. 129+75 LT
SEE DETAIL 10B

PROPOSED WW FENCE

MATCH LINE STA. 119+00.00 -L-
SEE SHEET 9

MATCH LINE STA. 132+00.00 -L-
SEE SHEET 11

N 81°44' 38" E

PLAT GRATE 2GI

-L- STA 127+80 RT
BEGIN SHOULDER BERM GUTTER

-L- STA 129+00 RT
END SHOULDER BERM GUTTER

15" CSP WELDOWS, SLEEVE GASKET WRDD & LUB CONNECTORS

ENERGY DISSAPATOR PAD
W/CL 'B' RIP RAP
EST 1 TON
EST 4 S.Y. FABRIC

SITE 4

PERM BANK STABILIZATION ABOVE RIPRAP
SEE DETAIL 10E

LINE BANKS WITH CL. B RIP RAP
SEE DETAIL 10C

(34) HAMRICK BROTHERS, INC
DB 16-Q PG 798

(37) MARY JONES PARRELL
DB 1169 PG 143

DETAIL 10D
PIPE OUTLET CHANNEL
(Not to Scale)

Length = 4 x Pipe Diameter
D= Pipe Diameter
Class B Rip-Rap

-L- STA 127+50 RT

DETAIL 10A
SPECIAL CUT BASE DITCH
(Not to Scale)

Filter Fabric

Min. D = 1.5 Ft.
Max. d = 1.0 Ft.
B = 4.0 Ft.

Type of Liner = CL. 'B' RIP RAP

-L- STA 125+50 TO 127+18 LT

DETAIL 10B
SPECIAL CUT BASE DITCH
(Not to Scale)

Min. D = 1.5 Ft.
B = 4.0 Ft.

-L- STA 127+22 TO 129+75 LT

DETAIL 10C
FALSE SUMP
(Not to Scale)

S = Ditch Slope

FROM STA. TO STA.

DETAIL 10E
PERM RIP RAP ENERGY DISSIPATOR
(Not to Scale)

STA. 127+80 RT

SEE SHEETS 28 AND 29 FOR -L- PROFILE

ARCADIS C&M
Date:=DATE$
File name:=FILE$
Time: =TIME$

Permit Drawing
Sheet 12 of 35

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801 Corporate Center Drive, Suite 300
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Tel: 919/854-1282 Fax: 919/854-5448

PROJECT REFERENCE NO.	SHEET NO.
R-2707A	10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

MATCH LINE STA. 119+00.00 -L-
SEE SHEET 9

MATCH LINE STA. 132+00.00 -L-
SEE SHEET 11

NAD 83/95

SITE 4

HANNOCK BROTHERS, INC
DB 16-0 PG 758

HARRY JONES PARRELLI
DB 169 PG 143

PROPOSED WW FENCE

SPECIAL CUT BASE DITCH
WCL 'B' BIE BAP
-L- STA 125+50 TO
-L- STA 127+18 LT
EST 47 TONS
EST 193 S.Y. FABRIC
SEE DETAIL 10A

SPECIAL CUT BASE DITCH
-L- STA 127+22 TO
STA 129+75 LT
SEE DETAIL 10B

STA 127+00 RT
BROW SHOULDER
BERM GUTTER

STA 127+00 LT
END SHOULDER
BERM GUTTER

ENERGY DISSIPATOR PAD
WCL 'B' BIE BAP
EST 1 TON
EST 6 S.Y. FABRIC

FLAT GRATE

DETAIL 10D
FENCE AT EASEMENT
(Not to Scale)
STA 127+50 RT

DETAIL 10A
SPECIAL CUT BASE DITCH
(Not to Scale)
Min. D = 1.5 Ft.
Max. d = 1.0 Ft.
B = 4.0 Ft.
Type of Liner = CL 'B' BIE BAP
-L- STA 125+50 TO 127+18 LT

DETAIL 10B
SPECIAL CUT BASE DITCH
(Not to Scale)
Min. D = 1.5 Ft.
B = 4.0 Ft.
-L- STA 127+22 TO 129+75 LT

DETAIL 10C
FALSE SUMP
(Not to Scale)
FROM STA. TO STA.

DETAIL 10B
PIPE OUTLET CHANNEL
(Not to Scale)
D = 18 in
Length = 4 x Pipe Diameter
D= Pipe Diameter
Class I Rip-Rap
-L- STA 127+50 RT

SEE SHEETS 28 AND 29 FOR -L- PROFILE

ARCADIS G&M
Date=&DATE&
Time=&TIME&
Filename=&FILE&

Permit Drawing
Sheet 13 of 25

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PROJECT REFERENCE NO.	SHEET NO.
R-2707A	13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

F F DENOTES EXCAVATION IN WETLAND
F F DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING

REVISIONS

DEPT. OF WAY REVISION: NAME CHANGE ON PARCEL 42 & 41 /ILSTS

SITE 5

40 MICHAEL J. PREA DB 936 PG 1448

41 JAMES A. BLACK III DB 1250 PG 102

42 HORACE VICTOR BROWN DB 1507 PG 157

BEGIN APPROACH EB Sta 156+03.00 -L-
BEGIN BRIDGE EB Sta 156+28.00 -L-
END APPROACH EB Sta 159+08.00 -L-
END BRIDGE EB Sta 158+83.00 -L-
BEGIN BRIDGE WB Sta 156+28.00 -L-
BEGIN APPROACH WB Sta 156+03.00 -L-
END BRIDGE WB Sta 158+83.00 -L-
END APPROACH WB Sta 159+08.00 -L-
Sta 157+55.00 -L-
Δ = 88° 22' 38.9"

SKETCH SHOWING PROPOSED BRIDGE IN RELATION TO PAVEMENT

NAD 83/95

MATCH LINE STA. 156+00.00 -L- SEE SHEET 12

MATCH LINE STA. 169+50.00 -L- SEE SHEET 14

CS Sta. 164+59.59

ST Sta. 164+59.59

BANK STABILIZATION IMPACT SEE DETAIL 13B

WETLAND IMPACT

NOTE: 6" WEEP DRAINS TO BE LOCATED ON LEFT SIDE EACH BRIDGE AT 12' INTERVALS.DO NOT PLACE OVER CENTER SPAN

6' BASE DITCH WCL 'I' RIP RAP -L- STA. 157+91 TO STA. 159+04 LT EST 881 TONS EST 881 S.Y. FABRIC SEE DETAIL 13C

6' LATERAL BASE DITCH WCL 'I' RIP RAP -L- STA. 159+04 TO STA. 162+80 LT EST 249 TONS EST 274 S.Y. FABRIC SEE DETAIL 13A

-L- STA 161+50LT END SHOULDER BERM GUTTER

SHOULDER BERM GUTTER -L- STA. 159+25 TO 159+50 RT

15" CSP WELBOWS SLEEVE GASKET W/ BOD & LUG CONNECTORS.

1300 20 BOX GLAZE W/ WOOD VANES

1300 TONS CL. B RIP RAP W/1370 S.Y. FILTER FABRIC

CL. B RIP RAP OUTLET PROTECTION

TOTAL TABE

1300 TONS CL. N RIP RAP W/1370 S.Y. FILTER FABRIC

TOE PROTECTION -L- STA. 159+30 TO 161+55 RT LINE WITH PSRM SEE DETAIL 13E

CHORD

DETAIL 13D
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow
5 = Ditch Slope
℄ Proposed Ditch
FROM STA. TO STA.

DETAIL 13E
TOE PROTECTION
(Not to Scale)
PSRM
FROM -L- STA. 159+30 TO 161+55 RT

DETAIL 13A
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.5 Ft.
Max. d = 1.0 Ft.
B = 6.0 Ft.
b = 5.0 Ft.
*When B is ≥ 6.0' Std. No. 838.01
Type of Liner = CL. 'I' RIP. RAP
-L- STA 159+04 TO 162+80 LT

DETAIL 13B
RIP RAP AT EMBANKMENT
(Not to Scale)
Ditch Grade
Est. 10 Tons
Type of Liner = CL. 'I' RIP. RAP
-L- STA. 157+26 LT
-L- STA 157+91 LT

DETAIL 13C
STANDARD BASE DITCH
(Not to Scale)
Natural Ground
Filter Fabric
Min. D = 1.5 Ft.
Max. d = 1.0 Ft.
B = 6.0 Ft.
* When B is < 6.0'
Type of Liner = CL. 'I' RIP. RAP
-L- STA 157+91 TO 159+04 LT

SEE SHEETS 29 AND 30 FOR -L- PROFILE

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Time: 9:17:16
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Sheet 14 of 35

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PROJECT REFERENCE NO.	SHEET NO.
R-2707A	13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DENOTES EXCAVATION IN WETLAND
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING

REVISIONS

RIGHT OF WAY REVISION/NAME CHANGE ON PARCEL 40 BY ... /...

SITE 5

(40) MICHAEL J. RHEA DB 1136 PG 1448

(41) JAMES A. BLAKE JR. DB 1230 PG 1

(42) MARVIN W. BRITTEN DB 1247 PG 857

BANK STABILIZATION IMPACT SEE DETAIL 13B

WETLAND IMPACT

NOTE: 4" WEEP HOLES TO BE LOCATED ON LEFT SIDE EACH BRIDGE AT 12' INTERVALS. DO NOT PLACE OVER CENTER SPAN

6' BASE DITCH WCL 1' RIP RAP -L- STA. 157+91 TO STA. 159+04 LT EST. 911 TONS EST. 911 S.Y. FABRIC SEE DETAIL 13C

4' LATERAL DITCH WCL 1' RIP RAP -L- STA. 159+04 TO STA. 162+50 LT EST. 249 TONS EST. 274 S.Y. FABRIC SEE DETAIL 13C

SHOULDER BERM GUTTER -L- STA. 157+50 LT TO STA. 159+04 LT

SHOULDER BERM GUTTER -L- STA. 159+04 LT TO STA. 162+50 LT

TOE PROTECTION -L- STA. 158+39 TO 247+33 RT LIMIT RIPRAP SEE DETAIL 13B

1300 TONS CL. II RIP RAP W=137.0 FT. FILTER FABRIC

MATCH LINE STA. 156+00.00 -L- SEE SHEET 12

MATCH LINE STA. 169+50.00 -L- SEE SHEET 14

BEGIN APPROACH EB Sta 156+03.00 -L-
BEGIN BRIDGE EB Sta 156+28.00 -L-
END APPROACH EB Sta 159+08.00 -L-
END BRIDGE EB Sta 158+83.00 -L-
BEGIN BRIDGE WB Sta 156+28.00 -L-
BEGIN APPROACH WB Sta 156+03.00 -L-
END BRIDGE WB Sta 158+83.00 -L-
END APPROACH WB Sta 159+08.00 -L-
Sta 157+55.00 -L-
Δ = 88° 22' 38.97"

SKETCH SHOWING PROPOSED BRIDGE IN RELATION TO PAVEMENT

NAD 83/95

CHORD

DETAIL 13D
FALSE SUMP
(Not To Scale)
Outside Ditch Traffic Flow
2:1
20'
1.5'
6'
Ditch Slope
Proposed Ditch
FROM STA. TO STA.

DETAIL 13E
FOR PROTECTION OF SHOULDER BERM GUTTER
FROM STA. 158+39 TO 159+04 RT

DETAIL 13B
LATERAL BASE DITCH
(Not to Scale)
Filter Fabric Method
W = 18.0 Ft.
B = 8.0 Ft.
b = 5.0 Ft.
Type of Liner = CL. II RIP RAP
-L- STA 159+04 TO 162+50 LT

DETAIL 13B
RIP RAP (#2) EMBANKMENT PROTECTION
(Not to Scale)
Filter Fabric
Dist. to Toe
Type of Liner = CL. II RIP RAP
-L- STA. 157+26 LT
-L- STA. 157+91 LT

DETAIL 13C
STANDARD BASE DITCH
(Not to Scale)
Natural Ground
Filter Fabric
Min. D = 1.5 Ft.
Max. d = 1.0 Ft.
B = 6.0 Ft.
When B is < 6.0'
Type of Liner = CL. II RIP RAP
-L- STA 157+91 TO 159+04 LT

SEE SHEETS 29 AND 30 FOR -L- PROFILE

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Drawn by: KATES
Checked by: ES

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PROJECT REFERENCE NO.	SHEET NO.
R-2707A	15
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

REVISIONS

DETAIL 15B
BERM 'V' DITCH
(Not to Scale)

Min. D = 1.5 Ft.
b = 5.0 Ft.

-L- STA 191+50 TO 193+50 LT
-L- STA 193+50 TO 195+50 LT

DETAIL 15A
LATERAL BASE DITCH
(Not to Scale)

*When B is ≥ 6.0'
Std. No. 868.01

Min. D = 1.5 Ft.
Max. d = 1.0 Ft.
B = 6.0 Ft.
b = 5.0 Ft.

Type of Liner = CL "I" RIPRAP

-L- STA 181+90 TO 184+50 RT

DETAIL 14C
TAIL DITCH OUTLET CHANNEL
(Not to Scale)

d= 18 in

Class I Rip-Rap

-L- STA 182+13 RT

NAD 8395

BERM "V" DITCH
-L- STA. 191+50 TO
STA. 193+50 LT
SEE DETAIL 15B

BERM "V" DITCH
-L- STA. 193+50 TO
STA. 195+50 LT
SEE DETAIL 15B

ROBERT PERRY McSWAIN
DB 1173 PG 1763

MARIE ELAINE CULVERSON
DB 1071PG 527

DORIS W. McDANIEL
DB 18-J PG 197

JOHN LEON WORTMAN
DB 18-J PG 386

MARIE ELAINE CULVERSON
DB 1071PG 527

MATCH LINE STA. 182+00.00 -L-
SEE SHEET 14

MATCH LINE STA. 195+50.00 -L-
SEE SHEET 16

SITE 6

4' BASE TAIL DITCH
20' LONG TIE TO
EXISTING CHANNEL LINE
WITH CL II RIP RAP
SEE DETAIL 14C

TIE LATERAL BASE DITCH
TO EXISTING CHANNEL
WITH 40' RADIUS

6' LATERAL BASE DITCH
W/CL "I" RIP RAP
-L- STA. 181+90 RT
TO -L- STA 184+50 RT
EST 200 TONS
EST 207 S.Y. FABRIC
SEE DETAIL 15A

-L- STA 184+00 RT
END SHOULDER
BERM GUTTER

DETAIL 15C
FALSE SUMP
(Not to Scale)

Outside Ditch
Traffic Flow

0.5' Min.
1.0' Max.

2.0'

5'

2'

D
+1c

1 = Ditch Slope

℄ Proposed Ditch

FROM STA. TO STA.

SEE SHEETS 30 AND 31 FOR -L- PROFILE

ARCADIS G&M
Date: 6/15/2011
Time: 8:17:48 AM
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Sheet 16 of 35

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PROJECT REFERENCE NO.	SHEET NO.
R-2707A	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 15B
BERM "V" DITCH
(Not to Scale)

Min. D = 1.5 Ft.
b = 5.0 Ft.

-L- STA 191+50 TO 193+50 LT
-L- STA 193+50 TO 195+50 LT

DETAIL 15A
LATERAL BASE DITCH
(Not to Scale)

Min. D = 1.5 Ft.
Max. d = 1.0 Ft.
B = 6.0 Ft.
b = 5.0 Ft.

*When B is ≥ 6.0' Std. No. 868.01

Type of Liner = CL. "I" RIPRAP

-L- STA 181+90 TO 184+50 RT

DETAIL 14C
TAIL DITCH OUTLET CHANNEL
(Not to Scale)

Class II Rip-Rap

-L- STA 182+13 RT

NAD 83/95

BERM "V" DITCH
-L- STA. 191+50 TO
STA. 193+50 LT
SEE DETAIL 15B

BERM "V" DITCH
-L- STA. 193+50 TO
STA. 195+50 LT
SEE DETAIL 15B

ROBERT PERRY McSWAIN
DB 1173 PG 1763

MARIE ELAINE CULVERSON
DB 1071/PG 527

DORIS W. McDANIEL
DB 18-J PG 197

JOHN LEON WORTMAN
DB 18-J PG 386

MARIE ELAINE CULVERSON
DB 1071/PG 527

MATCH LINE STA. 182+00.00 -L-
SEE SHEET 14

MATCH LINE STA. 195+50.00 -L-
SEE SHEET 16

SITE 6

4' BASE TAIL DITCH
20' LONG TIE TO
CENTERLINE CHANNEL
WITH CL. 1 RIP RAP
SEE DETAIL 14C

6' LATERAL BASE DITCH
EXISTING CHANNEL
WITH 40' RADIUS

6' LATERAL BASE DITCH
W/CL "I" RIP RAP
-L- STA. 181+90 RT
TO -L- STA 184+50 RT
EST 200 TONS
EST 282 S.Y. FABRIC
SEE DETAIL 15A

STA. 184+00 RT
END SHOULDER
& BERM GUTTER

DETAIL 15C
FALSE SUMP
(Not to Scale)

S = Ditch Slope
℄ Proposed Ditch

FROM STA. TO STA.

SEE SHEETS 30 AND 31 FOR -L- PROFILE

REVISIONS

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Sheet 17 of 35

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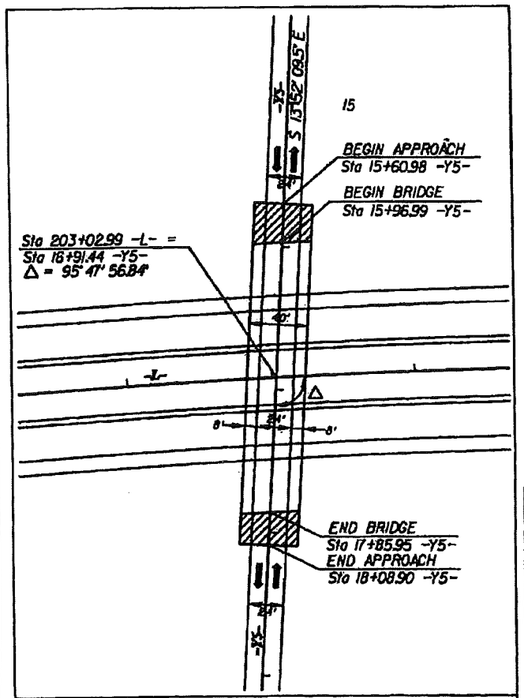
PROJECT REFERENCE NO.	SHEET NO.
R-2707A	16
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS
RIGHT OF WAY REVISION: CHANGED STA. OF SET TEXT TO INTERSECT EXISTING R/W STA. 204+26 -L- 48.84' RT. (2) ADD STA.
RIGHT OF WAY REVISION: ADDED EXISTING CURB & GUTTER ALONG -Y5- 10/30/07
RIGHT OF WAY REVISION: FINAL CHANGE ON PARCEL 60A 8/1/07

SKETCH SHOWING PROPOSED BRIDGE IN RELATION TO PAVEMENT



DETAIL 16D
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow
20'
0.5' min. 1.0' Max.
S = Ditch Slope
℄ Proposed Ditch
FROM STA. TO STA.

DETAIL 16E
PIPE OUTLET CHANNEL
(Not to Scale)
Length = 4 x Pipe Diameter
D= Pipe Diameter
Class B Rip-Rap

DETAIL 16A
BERM 'V' DITCH
(Not to Scale)
Natural Ground
Min. D = 1.5 Ft.
b = 5.0 Ft.
-L- STA 196+00 TO 198+50 LT
-L- STA 198+50 TO 200+50 LT
-L- STA 202+00 TO 202+50 LT
-L- STA 206+67 TO 213+00 LT

DETAIL 16C
BERM BASE DITCH
(Not to Scale)
Natural Ground
Min. D = 1.5 Ft.
b = 5.0 Ft.
Max. d = 1.0 Ft.
Type of Liner = PSBM
-L- STA 200+50 TO 202+50 LT

DETAIL 16B
HEAD DITCH CLEANOUT
(Not to Scale)
Natural Ground
Min. D = 1.5 Ft.
Min. Fabric Max. d = 1.5 Ft.
B = 2 Ft.
* When B is < 6.0'
Type of Liner = CL
-L- STA 204+78 TO STA 207+12 LT

POT Sta. 10+00.00
BEGIN CONSTRUCTION
POT Sta. 11+23.62 -Y5-

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

NAD 83/95

SITE 7

SEE SHEET 16A FOR ENLARGED PLAN

Permit Drawing
Sheet 18 of 35

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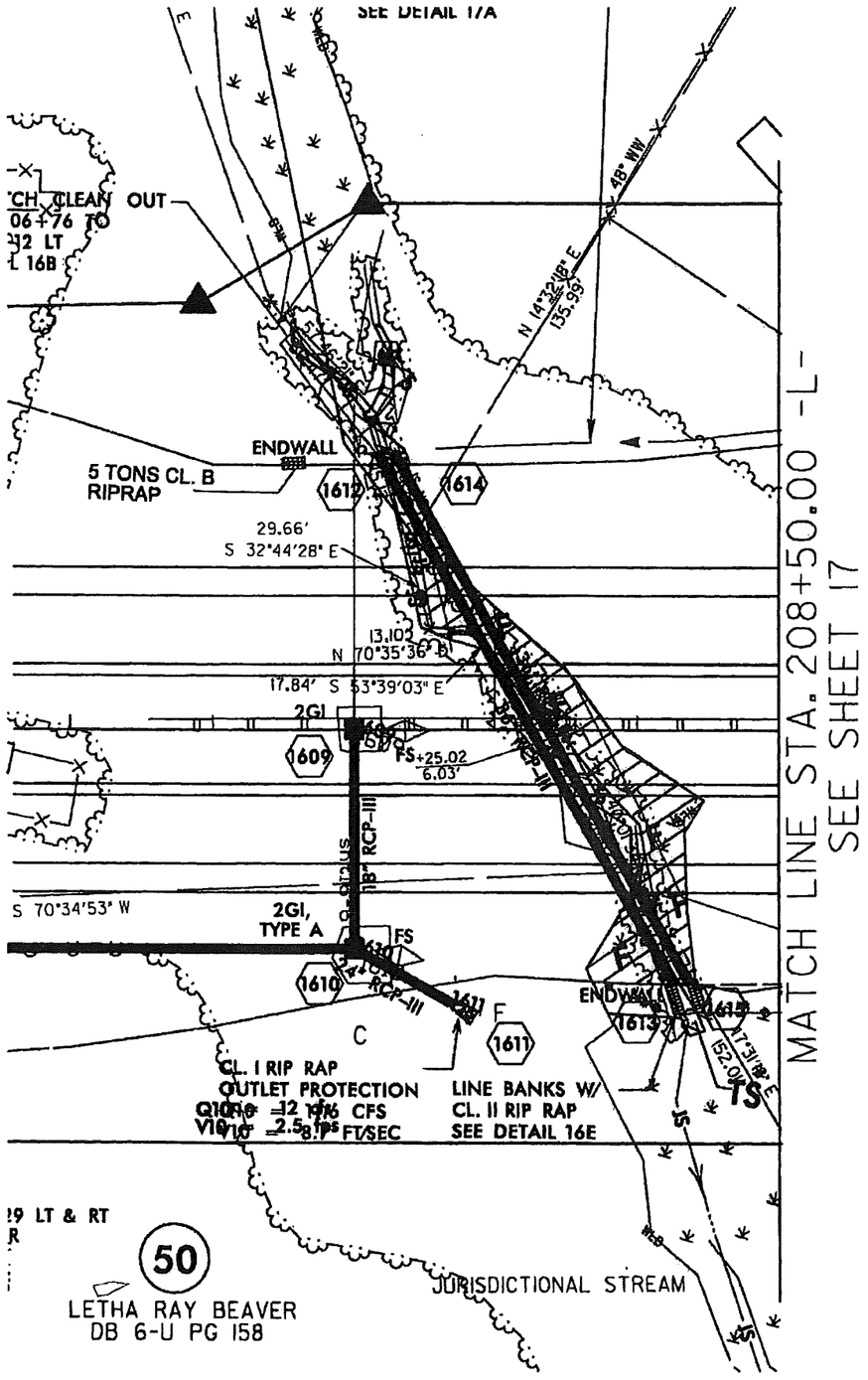
PROJECT REFERENCE NO.	SHEET NO.
R-2707A	16A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

REVISIONS

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Sheet 19 of 35

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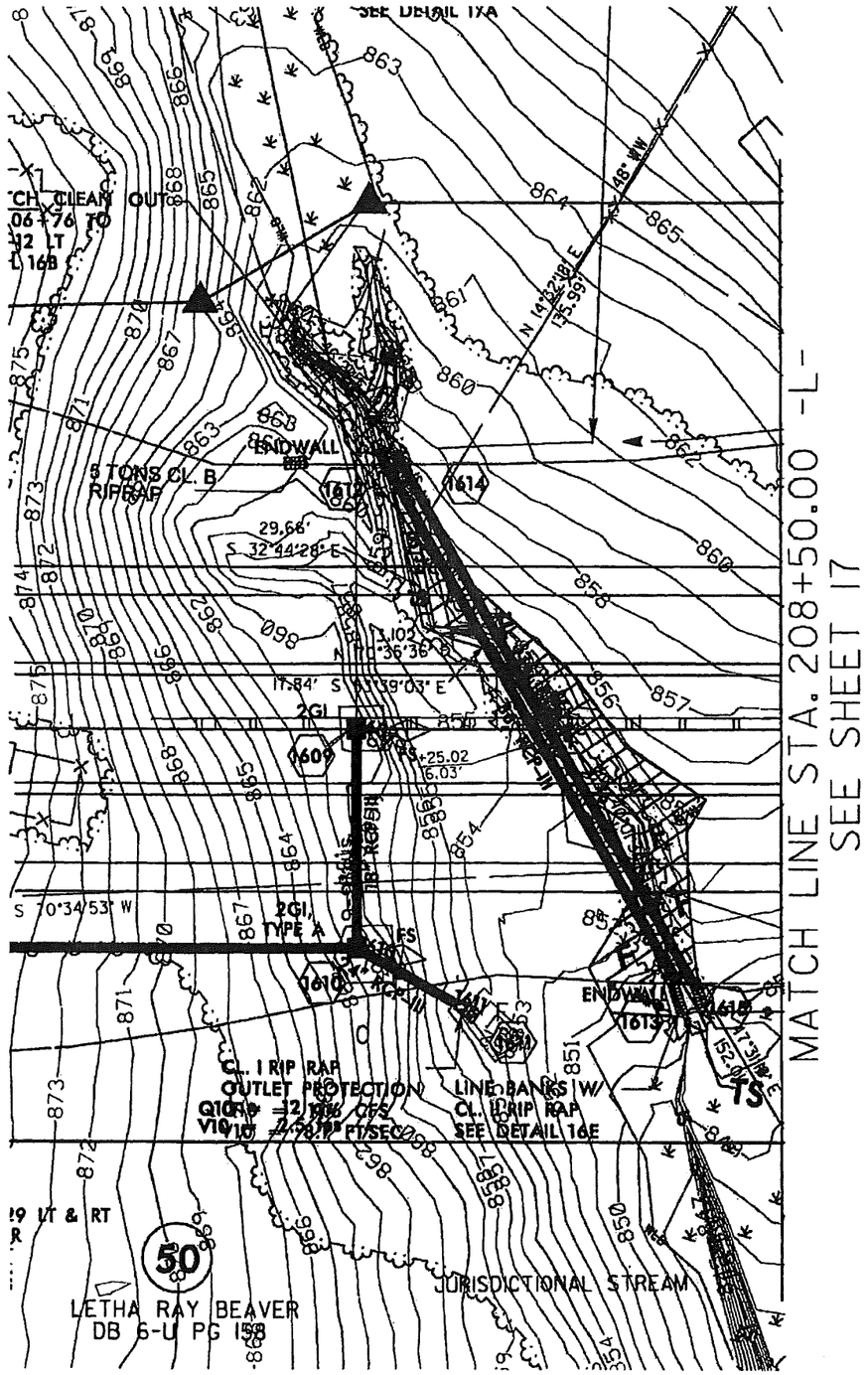
PROJECT REFERENCE NO.	SHEET NO.
R-2707A	16A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

REVISIONS

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Time: @TIME@

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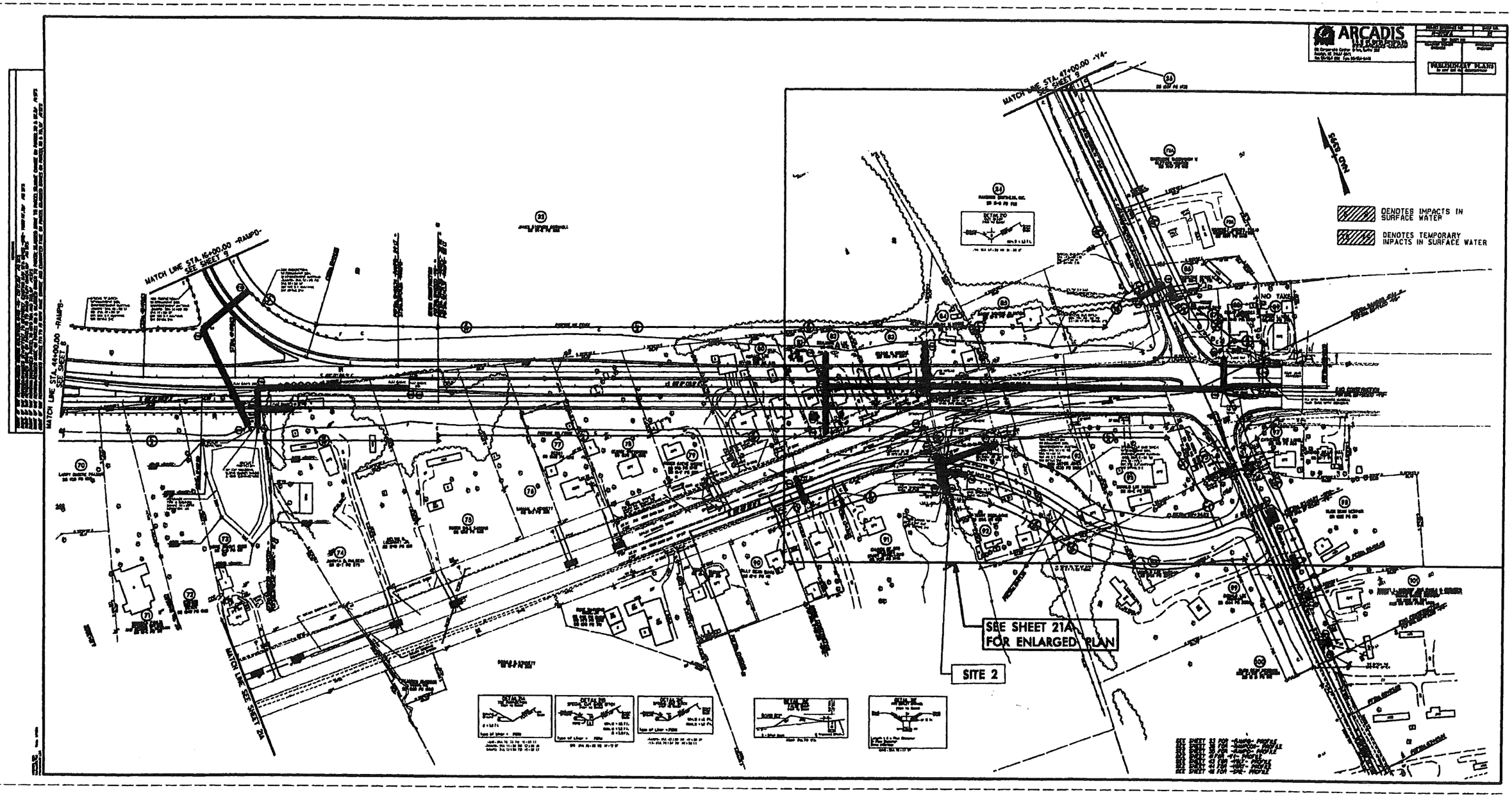
Sheet 20 of 35



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Sheet 21 of 35

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PRELIMINARY PLANS

MATCH LINE STA. 46+00.00 -RAMP0-
SEE SHEET 9

MATCH LINE STA. 47+00.00 -YA-
SHEET 9

MATCH LINE SEE SHEET 21A

SEE SHEET 21A1 FOR ENLARGED PLAN

SITE 2

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

Permit Drawing
Sheet 22 of 35

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PROJECT REFERENCE NO.	SHEET NO.
R-2707A	2JA
NW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/96

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

DETAIL 2S
RCP OUTLET CHANNEL
(Not to Scale)

Length = 4 x Pipe Diameter
D= Pipe Diameter
Class B Rip-Rap

-SKY2- STA 15+77 RT

DETAIL 21D
CUT DITCH
(Not to Scale)

Min. D = 1.5 Ft.

-Y4- STA 47+00 TO 51+50 RT

HAMRICK BROTHERS, INC.

CLIFFORD HAMRICK

CHRISTINE STREET

DANNY MONROE BLANTON

RUBY H. MOORE

BENJAMIN A. LEE

OSTINE W. GREENE

DON ASTOR JONES

DONALD LEE McSWAIN

CATHERINE L. STEIN

RUSH DEAN McSWAIN

CHURCH OF GOD TRUSTEES
GRADY DAVIS, LOUIS

CEDAR MENDOZA LOPEZ

NO TAKE

SPECIAL CUT DITCH
STA -Y4- 20+40 TO 23+50 LT SEE DETAIL 21C

SPECIAL CUT DITCH
STA -Y4- 47+00 TO 51+50 RT
SEE DETAIL 21D

TOE PROTECTION W/PERMANENT SOIL REINFORCEMENT MATTING -SR2- STA. 16+15 TO STA. 16+83 LT EST. 48 S.Y. MATTING SEE DETAIL 21A

SPECIAL CUT BASE DITCH W/TEMPORARY SOIL REINFORCEMENT MATTING -SR2- STA. 16+83 TO STA. 17+13 LT EST. 33 S.Y. MATTING SEE DETAIL 21B

POT Sta. 54+49.60 -Y4-
POT Sta. 25+76.00 -Y6-

END CONSTRUCTION
POT Sta. 28+50.00 -Y6-

FILL WITH FLOWABLE MATERIAL PLUG ENDS WITH CONCRETE

PLUG AND ABANDON

SITE 2

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
R-2707A	21A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

REVISIONS

SITE 2

Permit Drawing
Sheet 24 of 35

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PROJECT REFERENCE NO.	SHEET NO.
R-2707A	23
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ADDED SERVICE ROAD -SR6- ON PARCEL 1 & 12 - STS 12/ 12001
RIGHT OF WAY REVISION: RELOCATED SERVICE ROAD -SR6- AND REVISED -Y2RAMP8- - STS 6/ 12001

REVISIONS

-SR6-
PI Sta 11+25.97
Δ = 57° 36' 08.1" (LT)
D = 57° 17' 44.8"
L = 100.53'
T = 54.98'
R = 100.00'
DS = < 20 MPH

-SR6-
PI Sta 20+16.41
Δ = 15° 04' 26.3" (RT)
D = 1° 38' 13.3"
L = 920.82'
T = 463.08'
R = 3,500.00'
DS = 40 MPH
JOHN JACKSON HUNT

DETAIL 23B
LATERAL V-DITCH
(Not to Scale)
Min. D=1.0 Ft.
Max d=1.5 Ft.
Type of Liner= FSBM
-SR6- STA. 11+30 TO 13+00 LT

DETAIL 23A
LATERAL BASE DITCH
(Not to Scale)
Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=2.0Ft.
b= 8.0Ft.
Type of Liner= CL. B Rip-Rap
-SR6- STA. 16+00 TO 17+88 RT

DETAIL 23C
STANDARD BASE DITCH
(Not to Scale)
Min. D=1.5 Ft.
Max. d= 1.5 Ft.
B= 2.0 Ft.
Type of Liner= CL. B Rip-Rap
-SR6- STA. 11+48 TO 11+82 RT

DETAIL 23D
RIP RAP AT EMBANKMENT
(Not to Scale)
Type of Liner = CL. "B" RIP RAP
-SR6- STA. 11+40 RT

NAD 8395

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

(12) JOHN JACKSON HUNT
DB 17-E PG 170-172

SITE 8

SITE 10

BEGIN CONSTRUCTION
POT Sta. 10+15.00 -SR6-

POT Sta. 10+80.00

PC Sta. 10+70.59

PT Sta. 11+71.52

JURISDICTION STREAM BEGINS HERE

JURISDICTION STREAM ENDS HERE INTERMITTENT

LATERAL V-DITCH
-SR2- STA. 11+30 TO 13+00 LT
LINE WITH FSBM
SEE DETAIL 23B

2' LATERAL BASE DITCH
-SR6- STA. 16+00 TO 17+88 RT
LINE WITH CL B RIP RAP
SEE DETAIL 23A

TAIL DITCH
-SR6 STA-Y2-46 TO 11+82
LINE WITH CL B RIP RAP
SEE DETAIL 23C

BANK STABILIZATION
11+40 RT
SEE DETAIL 23D

MATCH LINE STA. 24+00.00 -SR6-
SEE SHEET 24

(1) WORD OF TRUTH FELLOWSHIP CHURCH
DB 1172 PG 2468

(1A) DALE LEE PARKER
DB 1259 PG 911

(3) BPB REALTY LLC
DB 1496 PG 893

NC GRID
NAD 83

PLANTED PINE SAPLINGS

POND OUTLET STRUCTURE
TOP=778.87'
INV=778.00'

POND
W.S. EL.=770.0'+/-

SEE SHEET 39 FOR -Y2- PROFILE

ARCADIS G&M
Date: 10/24/12
Filename: 6P1.E3D
Time: 8:17AM

Permit Drawing
Sheet 25 of 35

ARCADIS
C & M of North Carolina, Inc.
WWW.ARCADIS-US.COM
801 Corporate Center Drive, Suite 300
Raleigh, NC 27607-5073
Tel: 919/854-1282 Fax: 919/854-5448

PROJECT REFERENCE NO.	SHEET NO.
R-2707A	23
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NO RWT UNS FOR CONSTRUCTION

REVISIONS
ADDED SERVICE ROAD -SR6- ON PARCEL 1 & 12 - STS 12/2000
RIGHT OF WAY REVISION, RELOCATED SERVICE ROAD -SR6- AND REVISED -Y2 & MR6- - STS 6/ 2001

-SR6-
PI Sta 11+25.97
Δ = 57° 36' 08.1" (LT)
D = 57° 17' 44.8"
L = 100.53'
T = 54.98'
R = 100.00'
DS = < 20 MPH

-SR6-
PI Sta 20+16.41
Δ = 15° 04' 26.3" (RT)
D = 1° 38' 13.3"
L = 920.82'
T = 463.08'
R = 3,500.00'
DS = 40 MPH
JOHN JACKSON HUNT

DETAIL 23B
LATERAL V-DITCH
(Not to Scale)
Min. D = 1.0 Ft.
Max. d = 1.5 Ft.
Type of Liner = P30M
-SR6- STA. 11+50 TO 13+00 LT

DETAIL 23A
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
S = 5.0%
b = 5.0Ft.
*When S is < 4.0'
Type of Liner = CL. B Rip-Rap
-SR6- STA. 16+00 TO 17+80 RT

DETAIL 23C
STANDARD BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
S = 3.0 Ft.
*When S is < 4.0'
Type of Liner = CL. B Rip-Rap
-SR6- STA. 11+46 TO 11+82 RT

DETAIL 23D
RIP RAP AT EMBANKMENT
(Not to Scale)
Ditch D=0.6d
45°
Est. 10 Tons
LS1
Type of Liner = CL. B RIP RAP
-SR6- STA. 11+40 RT

NAD 83/95

18 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
5 DENOTES IMPACTS IN SURFACE WATER

(12) JOHN JACKSON HUNT
DB 17-E PG 170-172

SITE 8

SITE 10

BEGIN CONSTRUCTION
POT Sta. 10+15.00 -SR6-

POT Sta. 10+00.00

POT Sta. 10+70.59

PI -SR6- Sta. 11+71.52

JURISDICTION STREAM BEGINS HERE

JURISDICTION STREAM ENDS HERE SUBTERRANEAN

BANK STABILIZATION
11+70 RT
SEE DETAIL 23D

TAN DITCH
-SR6- STA. 11+46 TO 11+82
LINE WITH CL. B RIP RAP
SEE DETAIL 23C

-SR6- STA. 16+00 TO 17+80 RT
LINE WITH CL. B RIP RAP
SEE DETAIL 23A

N. GRID
NAD 83

MATCH LINE STA. 24+00.00 -SR6-
SEE SHEET 24

SEE SHEET 39 FOR -Y2- PROFILE

ARCADIS G&M
Date: 6DATE6
Filename: 6FILE6
Time: 6TIME6

Permit Drawing
Sheet 26 of 35

ARCADIS
G & M of North Carolina, Inc.
WWW.ARCADIS-US.COM
801 Corporate Center Drive, Suite 300
Raleigh, NC 27607-5073
Tel: 919/854-1282 Fax: 919/854-5449

PROJECT REFERENCE NO.	SHEET NO.
R-2707A	24
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

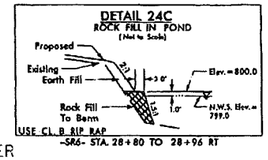
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

ADDED SERVICE ROAD -SR6- & -SR10- ON PARCEL 11 & 12, STS 12/10
RIGHT OF WAY REVISIONS, ADDED SERVICE ROAD -SR6- AND REVISED

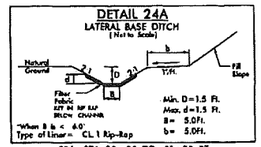
ARCADIS G&M
Date: 8/10/2016 Time: 9:17:16 AM
Filename: 8FR_E8

DETAIL 24C
ROCK FILL IN POND
(Not to Scale)



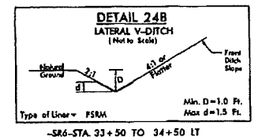
USE CL. B RIP RAP
-SR6- STA. 28+80 TO 28+96 RT

DETAIL 24A
LATERAL BASE DITCH
(Not to Scale)



Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 5.0 Ft.
b = 5.0 Ft.
When B is < 6.0'
Type of Liner = CL 1 Rip-Rap
-SR6- STA. 28+90 TO 31+00 RT

DETAIL 24B
LATERAL V-DITCH
(Not to Scale)



Min. D = 1.0 Ft.
Max d = 1.5 Ft.
Type of Liner = PSRM
-SR6- STA. 33+50 TO 34+50 LT

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

(12) JOHN JACKSON HUNT
DB 17-E PG 170-172

(12) JOHN JACKSON HUNT
DB 17-E PG 170-172

NAD 83/95

MATCH LINE STA. 24+00.00 -SR6-
SEE SHEET 23

MATCH LINE STA. 37+00.00 -SR6-
SEE SHEET 18

LATERAL V- DITCH
FROM SR6 33+50 TO 34+50 LT
LINE WITH PERMANENT SOIL REINFORCMENT MATTING
SEE DETAIL 24B

ROCK FILL IN POND
SR6- STA. 28+80 TO 28+96 RT
LINE WITH CL. B RIP RAP
SEE DETAIL 24C

5' LATERAL BASE DITCH
-SR6- STA. 28+90 TO 30+25 RT
LINE WITH CL. 1 RIP RAP
SEE DETAIL 24A

CL. B RIP RAP
OUTLET PROTECTION

SITE 9

S 89°32'56.9"E

N 89°56'59" W
621.00'

WOODS

PLANTED PINE SAPLINGS

SPRING

PUMP CONTROL BOX

GRAVEL

SLF WALL

CONC. WALL

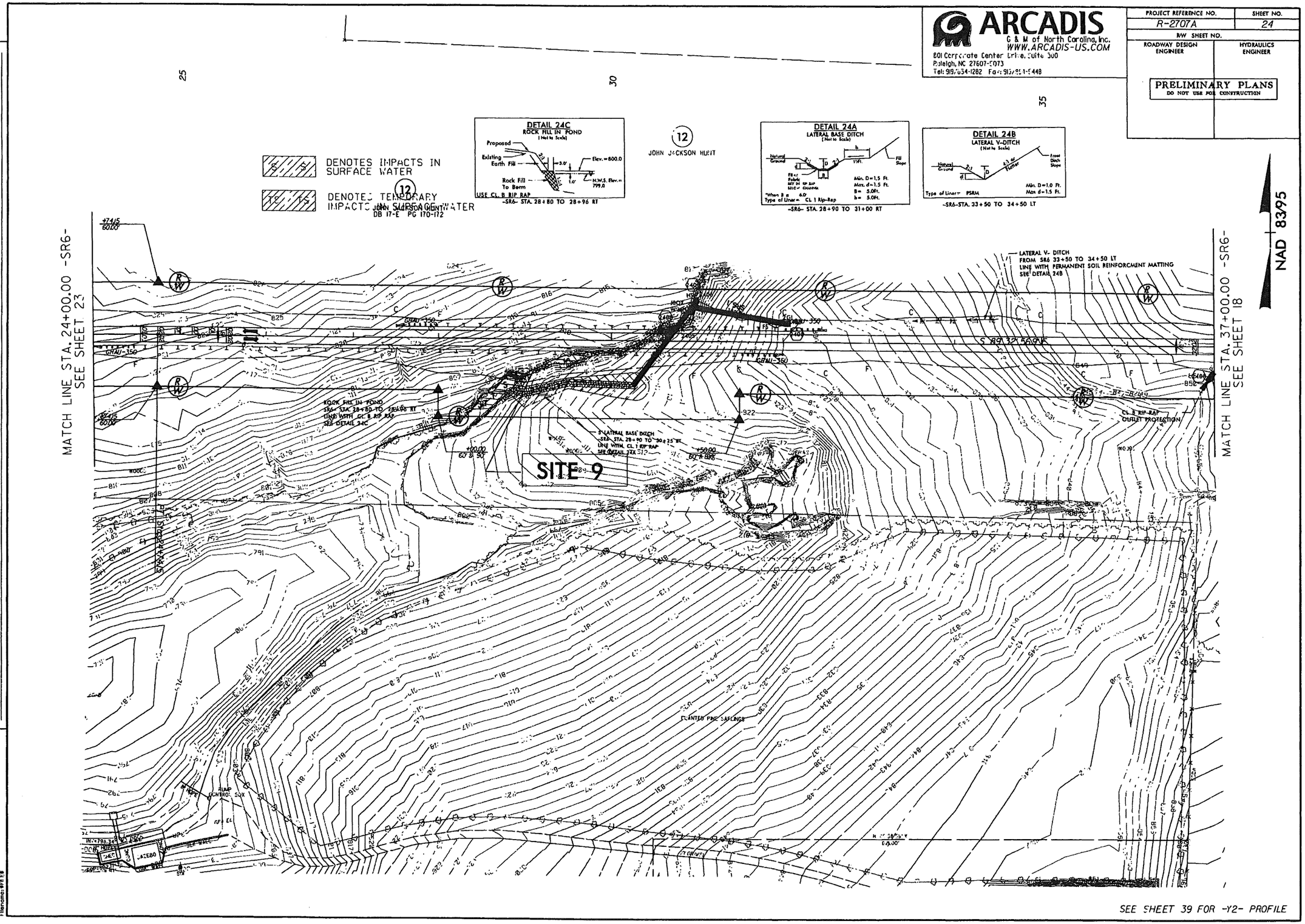
GAZEBO

WV=738.34'

TOP=744.45'

SEE SHEET 39 FOR -Y2- PROFILE

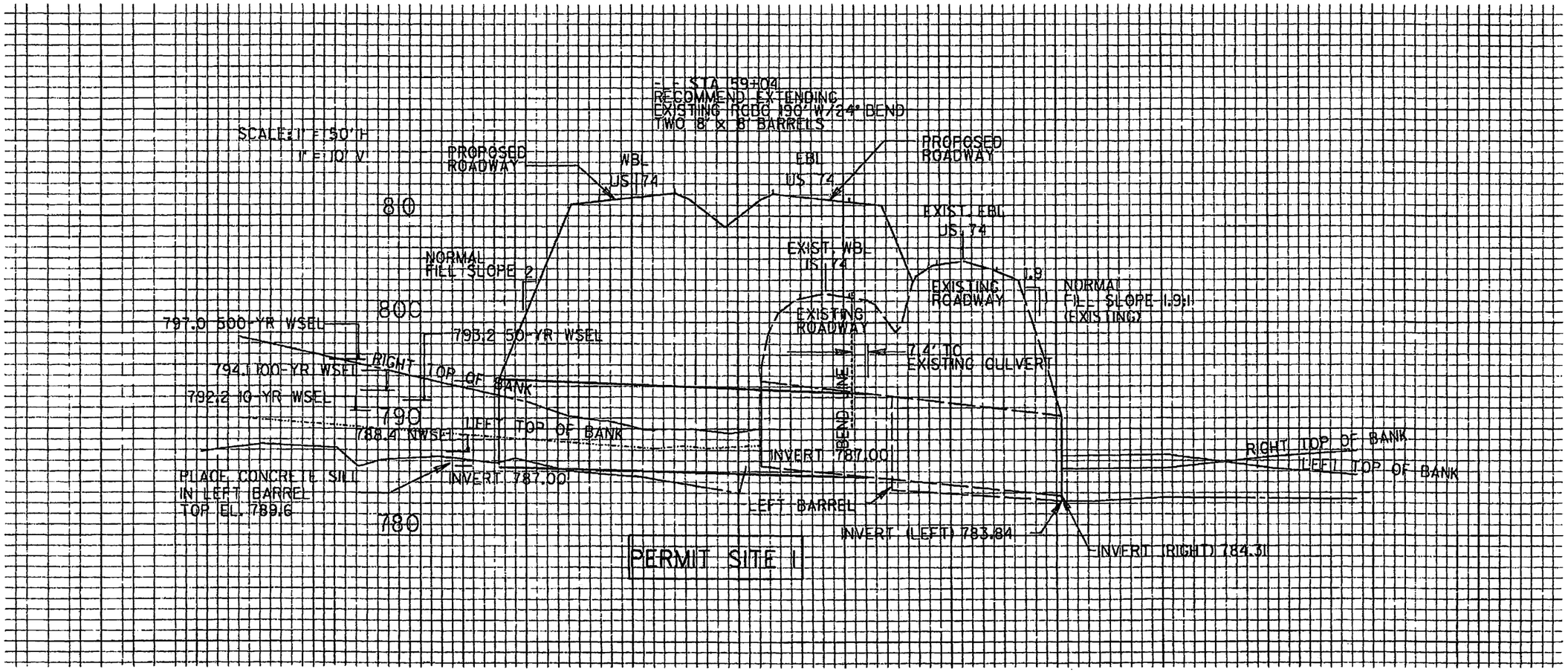
Permit Drawing
Sheet 27 of 35



REVISIONS

ADDED SERVICE ROAD -SR6- & -SR10- ON PARCEL 1 & 12, STS 12/ /10
RIGHT OF WAY REVISION RELOCATED SERVICE ROAD -SR6- AND REVISED -Y2RAMP8- STS 6/ /2011

Permit Drawing
Sheet 28 of 35


SCALE: 1" = 50' H
1" = 10' V
- - STA 59+04
RECOMMEND EXTENDING
EXISTING RCBC 190' W/24° BEND
TWO 8' x 8' BARRELS
PROPOSED ROADWAY
WBL US 74
EBL US 74
PROPOSED ROADWAY
EXIST. EBL US 74
EXIST. WBL US 74
NORMAL FILL SLOPE 2:1
EXISTING ROADWAY
1:9
NORMAL FILL SLOPE 1.9:1 (EXISTING)
EXISTING ROADWAY
7.4' TO EXISTING CULVERT
800
797.0 500-YR WSEL
793.2 50-YR WSEL
794.1 100-YR WSEL
RIGHT TOP OF BANK
792.2 10-YR WSEL
790
788.4 MWSEL
LEFT TOP OF BANK
BEND
INVERT 787.00
RIGHT TOP OF BANK
LEFT TOP OF BANK
PLACE CONCRETE SILL IN LEFT BARREL TOP EL. 789.6
INVERT 787.00
LEFT BARREL
INVERT (LEFT) 783.84
INVERT (RIGHT) 784.31
780
PERMIT SITE I

PROJECT REFERENCE NO.	SHEET NO.
R-2707A	28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 700 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 793.2 FT
BASE DISCHARGE	= 860 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 794.1 FT
OVERTOPPING DISCHARGE	= 3220 CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 812.6 FT

PI = 58+90.00
EL = 799.03'
K = 186
VC = 1,420'
DS = 70 MPH

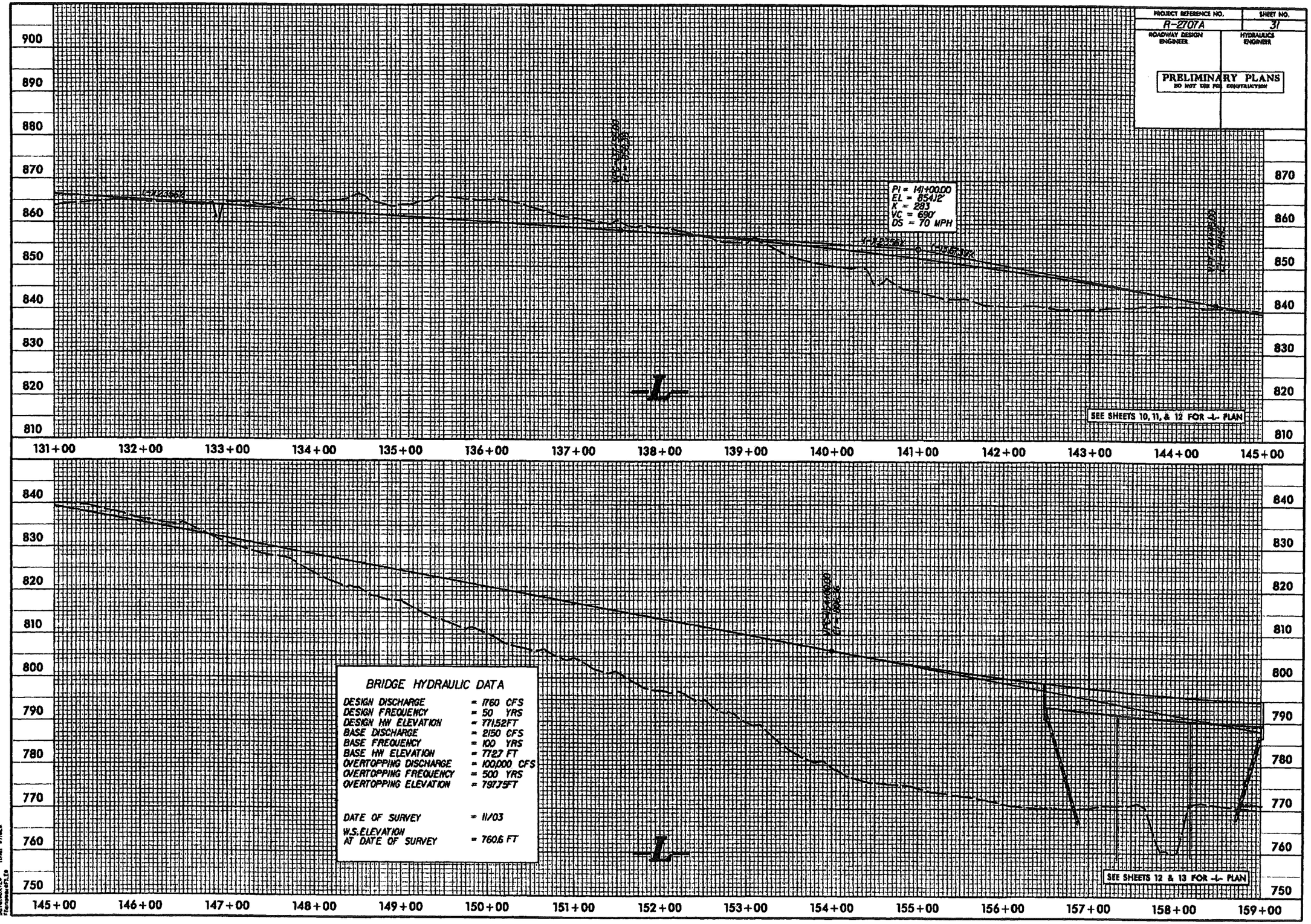
2x6'x6' BOX CULVERT

SEE SHEETS 6 & 7 FOR -L- PLAN

SEE SHEETS 7 & 8 FOR -L- PLAN

PROJECT REFERENCE NO.	SHEET NO.
R-2707A	31
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1760 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 771.52FT
BASE DISCHARGE	= 2150 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 772.7 FT
OVERTOPPING DISCHARGE	= 100,000 CFS
OVERTOPPING FREQUENCY	= 500 YRS
OVERTOPPING ELEVATION	= 797.5FT
DATE OF SURVEY	= 11/03
W.S.ELEVATION AT DATE OF SURVEY	= 760.6 FT

ARCADIS G&M
Three RIVERS
Pittsburgh, PA

WETLAND LIMIT

CLEARING LIMIT

769.04
160+00.00

769.51
159+50.00

770.00
159+00.00

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2707A	X-81

8/23/99

791.72
162+00.00

789.33
161+50.00

782.35
161+00.00

770.89
160+50.00

WETLAND LIMIT 257' FROM -L-

Permit Drawing
Sheet 32 of 35

PROJ. REFERENCE NO.	SHEET NO.
R-2707A	X-105

0 5 10

WETLAND LIMIT

854.25
207+50.00

860.98
207+00.00

865.30
206+50.00

873.07
206+00.00

878.30
205+50.00

Permit Drawing
Sheet 34 of 35

PROJ. REFERENCE NO.	SHEET NO.
R-2707A	X-106

859.70
209+50.00

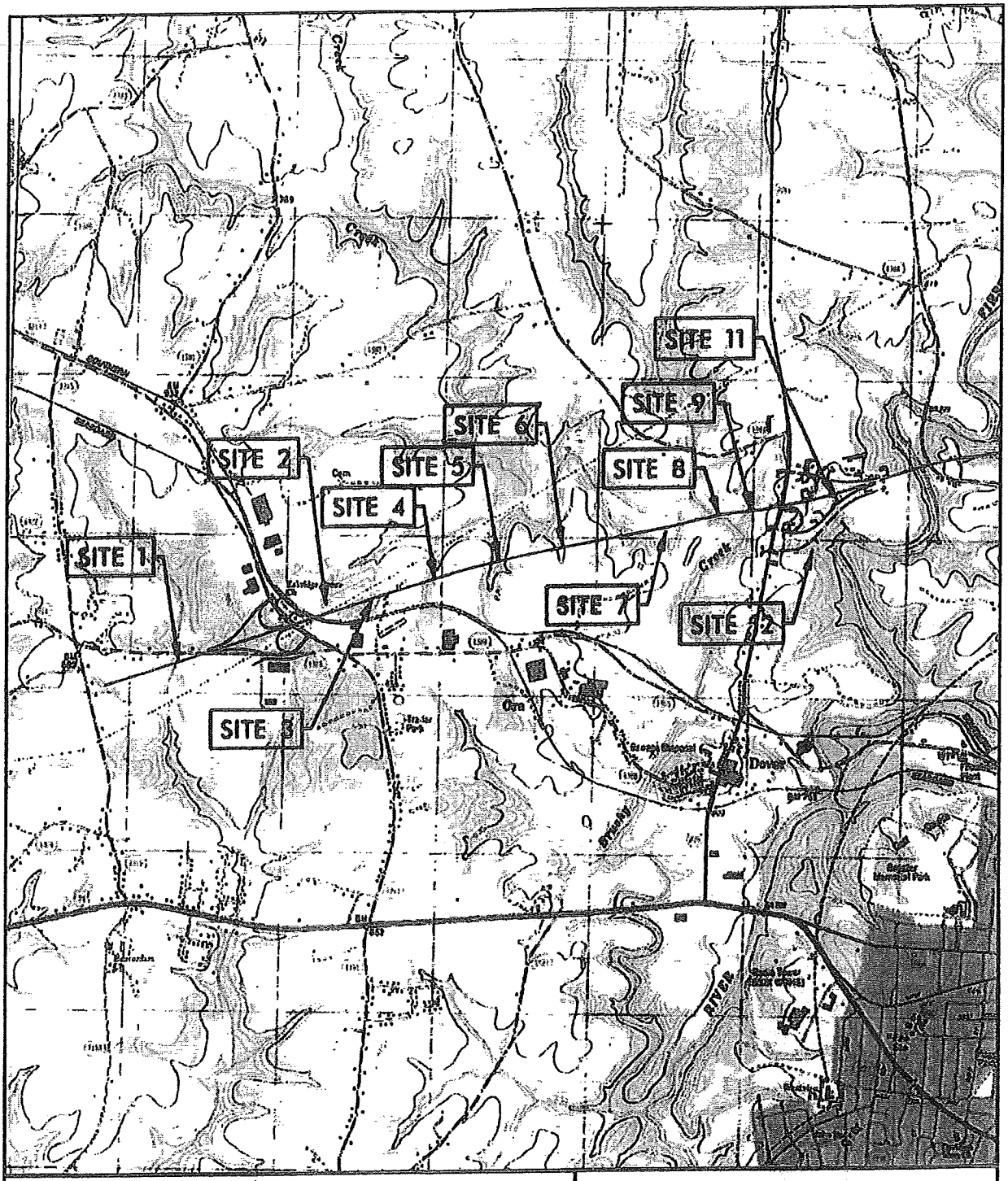
857.30
209+00.00

856.30
208+50.00

WETLAND LIMIT

855.97
208+00.00

Permit Drawing
Sheet 35 of 35



TOPO MAP

SCALE: 1" = 3000'

NCDOT

DIVISION OF HIGHWAYS
CLEVELAND COUNTY
PROJECT: R-2707B

US 74 - SHELBY BYPASS
FROM WEST OF ARTEE RD
TO WEST OF NC 226

SHEET OF 12/12/11

Permit Drawing
Sheet 1 of 30

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 220+98 - 223+67	2@10'X10' RCBC						0.10	0.01	397	20	
		Bank Stabilization						<0.01	<0.01	11	41	
2	-L- 255+64 - 255+79	Roadway Fill						<0.01		15		
3	-L- 265+48 - 266+92	66" RCP						0.03	<0.01	386	18	
		Bank Stabilization						<0.01		15		
4	-L- 278+37 - 280+52	60" RCP						0.04	<0.01	330	20	
		Bank Stabilization						<0.01		15		
5	-L- 292+39 - 294+80	66" RCP / 54" RCP						0.03	<0.01	585	31	
		Bank Stabilization						<0.01		18		
6	-L- 306+98 - 307+84	54" RCP	<0.01			<0.01		0.02	<0.01	245	21	
		Bank Stabilization						<0.01		15		
7	-L- 325+19 - 333+18	Roadway Fill	3.29			0.25		<0.01	<0.01	5	10	
8	-L- 340+33 - 341+49	Bridge	0.05					<0.01		17		
9	-L- 347+38 - 350+10	66" RCP						0.05	<0.01	568	23	
		Bank Stabilization						<0.01		11		
10	REMOVED											
11	-RPD1- 8+52		0.01					0.05	<0.01	440	10	
12	-Y17- 17+57 - 19+72	Roadway Fill	0.01					0.03	<0.01	547	61	
TOTALS:			3.37			0.25		0.37	0.03	3620	255	

Site 1 remove existing culvert L=50' and replace with open channel L=81'.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CLEVELAND COUNTY
(R-2707B)

SHEET

ATN Revised 3/31/05

Permit Drawing
Sheet 2 of 30

R-2707B

CONTRACT:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

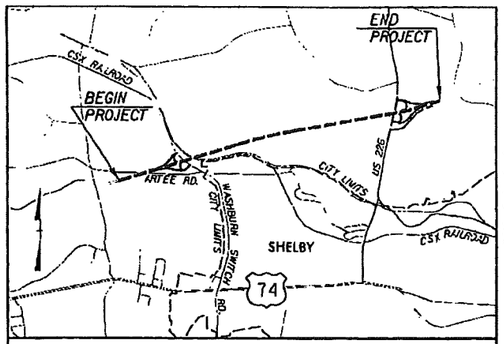
CLEVELAND COUNTY

STATE	STATE PROJECT REFERENCE NO	SHEET NO	TOTAL SHEETS
N.C.	R-2707B	1	

STATE FUNDING	F.A. PROJ NO	DESCRIPTION
34497.1.2	NHF-0074(14)	P.E.
34497.2.8	NHF-0074(107)	ROW

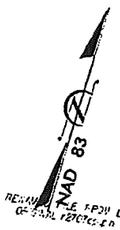
LOCATION: US 74 – Shelby Bypass from West of (SR 1314) Artee Rd. to West of NC 226

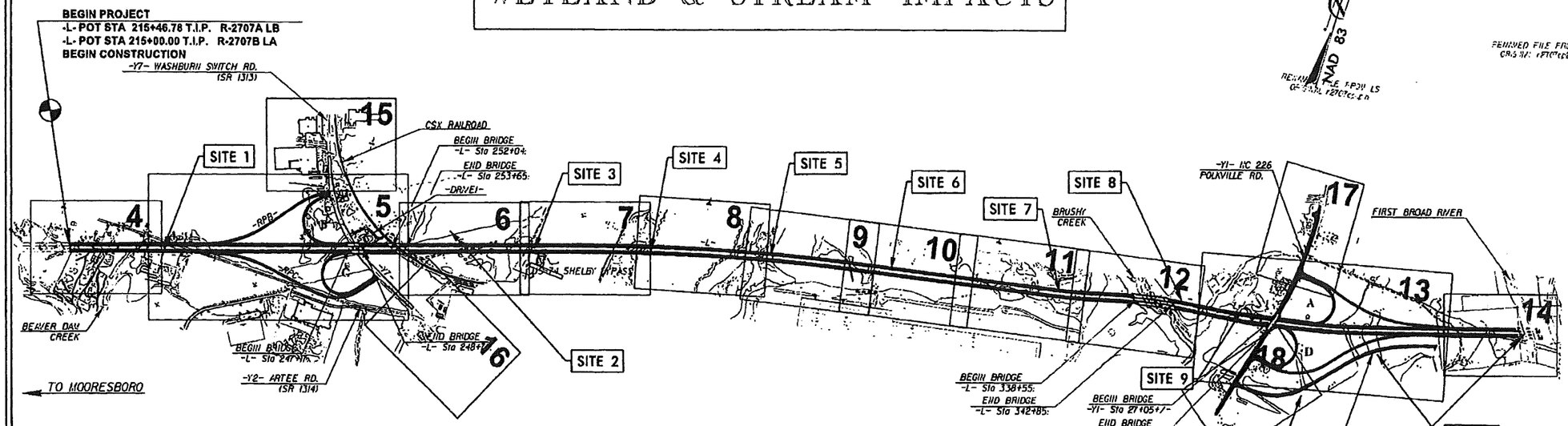
TYPE OF WORK: Grading, Drainage, -Y- Line Paving & Structures



VICINITY MAP

WETLAND & STREAM IMPACTS





THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGE.
PROJECT IS NOT WITHIN MUNICIPAL BOUNDARIES.

NCDOT Contact: K. Zak Hamidi, PE – Project Engineer – Roadway Design Unit

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE UNITS ESTABLISHED BY METHOD III.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2013 = 19,400
ADT 2033 = 31,100
DHV = 10%
D = 60%
T = 12%
V = 70 MPH
* (DUAL=5% + TTST=7%)

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2707B=	3.06 mi.
LENGTH OF STRUCTURES TIP PROJECT R-2707B=	0.14 mi.
TOTAL LENGTH OF TIP PROJECT R-2707B=	3.20 mi.

Prepared in the Office of:
HNTB
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JULY 15, 2011

LETTING DATE: JULY 16, 2013

ENRICO A. ROQUE, PE
PROJECT ENGINEER

ANTHONY THOMPSON, PE
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA
P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ADMINISTRATOR DATE

Permit Drawing
Sheet 3 of 30

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	4
R/W SHEET NO.	4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

OUTLET TYPICAL

INLET TYPICAL

DETAIL 27
FALSE SUMP
STA 218+45 MED
STA 223+50 MED

DETAIL 15
LATERAL BASE DITCH
STA 220+00 LT TO STA 223+25 LT

NAD 83

SITE 3

NOTE:
FOR -L- PROFILE SEE SHEET No. 16

BEGIN PROJECT
-L- POT STA 215+46.78 T.I.P. R-2707A LB
-L- POT STA 215+00.00 T.I.P. R-2707B LA
BEGIN CONSTRUCTION
BEGIN GRADING

RICHARD & MARCELLE HAWRICK
HERBERT RAY HAWKINS
ROGER W. McMAHAN
JOHN E. & GRACE F. WEAVER DB 849 PG 233
ROGER W. & DEBBIE McMAHAN
FRANKLIN NURSERY, INC.
ROBERT McBRAYER

REMOVE CAP
EST. DDE = 35 CY

LATERAL 3' BASE DITCH W/CL II RIP W/FF SEE DETAIL 15

300' TAPER

SPECIAL DITCH GRADE - SEE PROFILE

GRADING ONLY

N 73°00'27.7" E

FS - SEE DETAIL 27

LATERAL BASE DITCH SEE DETAIL 2

CL B RIPRAP OUTLET PROTECTION W/FF

LATERAL V-DITCH SEE DETAIL 13

LATERAL V-DITCH SEE DETAIL 9

BANK STABILIZATION

CL B RIPRAP
EST. 5 TON
EST. 14 SY FF

NON-EROSIVE DIFFUSED FLOW

DETAIL 13
LATERAL V-DITCH
STA 219+00 RT TO STA 220+50 RT

DETAIL 2
LATERAL BASE DITCH
STA 222+00 RT TO STA 223+60 RT

DETAIL 9
LATERAL V-DITCH
STA 223+50 RT TO STA 225+50 RT

MATCHLINE -L- STA 225+50 SEE SHEET 5

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

GRAPH SCALE 0 100 200

BANK STABILIZATION

Permit Drawing
Sheet 4 of 30

HNTB
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1654

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	4
RW SHEET NO.	4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

OUTLET TYPICAL

INLET TYPICAL

DETAIL 27
FALSE SLOPE
STA 218+45 MED
STA 223+50 MED

DETAIL 15
LATERAL BASE DITCH
STA 220+00 LT TO STA 223+25 LT

NAD 83

SITE 31

NOTE:
FOR -L- PROFILE SEE SHEET No. 16

BEGIN PROJECT
-L- POT STA 215+46.78 TVP: R-2707A LB
-L- POT STA 215+00.00 TVP: R-2707B LA
BEGIN CONSTRUCTION
BEGIN GRADING

GRADING ONLY

BANK STABILIZATION

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE -L- STA 225+50 SEE SHEET 5

REVISIONS

Permit Drawing
Sheet 5 of 30

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

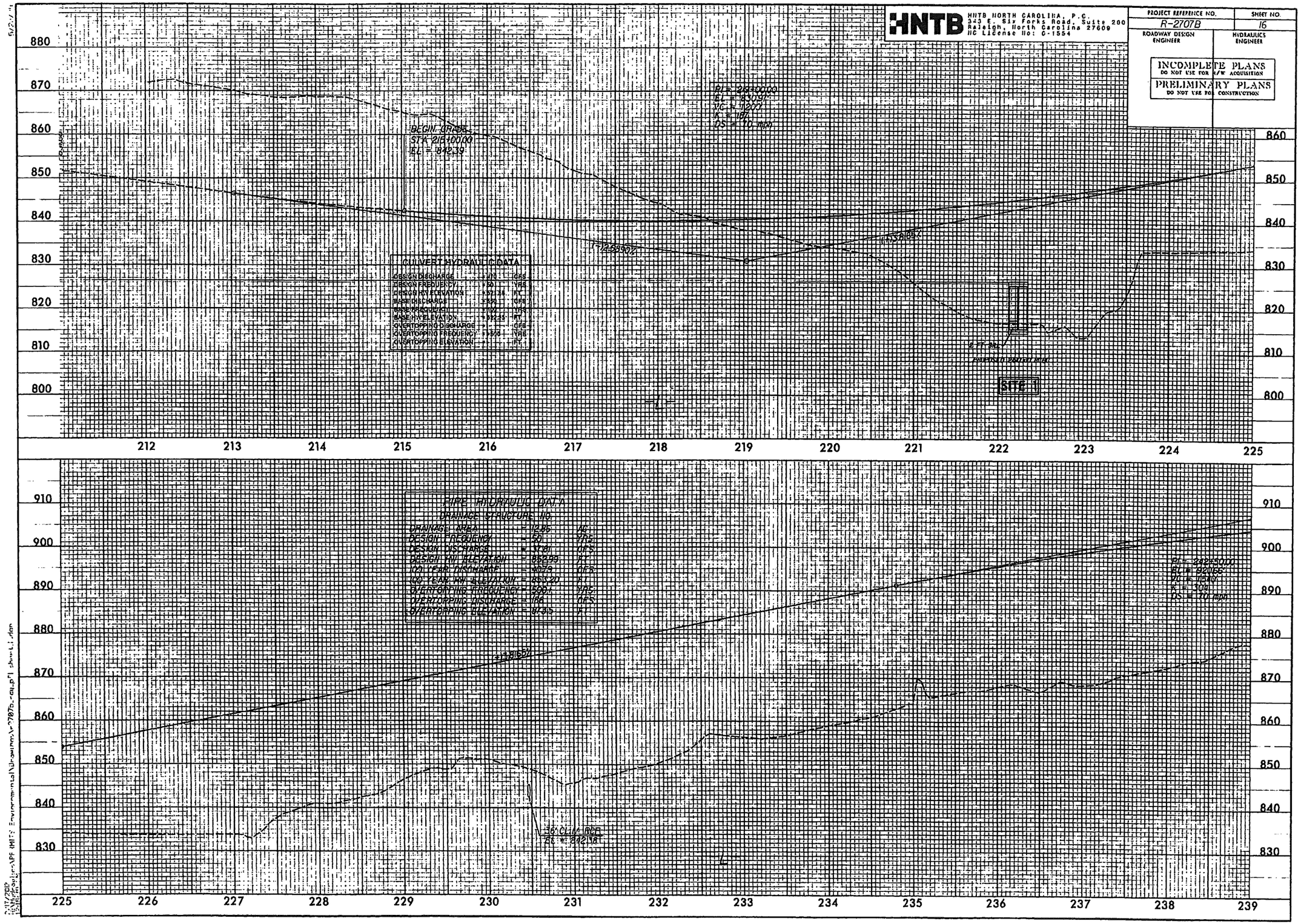
PROJECT REFERENCE NO.	SHEET NO.
R-2707B	16

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 30

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO
R-2707B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DETAIL 37 LATERAL BASE DITCH
STA 256+25 LT TO STA 258+00 LT

DETAIL 27 FALSE SLOPE
STA 253+65 AND +/- GRADE = 48% L = 35
STA 257+75 AND +/- GRADE = 48% L = 35

DETAIL 13 LATERAL 'V' DITCH
STA 257+00 RT TO STA 258+00 RT
STA 261+00 RT TO STA 261+12 RT
STA 262+50 LT TO STA 263+65 LT

DETAIL 17 LATERAL 'V' DITCH
STA 255+50 RT TO STA 257+00 RT
STA 262+12 RT TO STA 263+00 RT
STA 258+00 LT TO STA 262+50 LT

DETAIL 42 RIP-RAP AT EXIT OF PIPE
STA 255+83 LT, EST 37 TONS, EST 31 SY FF

DETAIL 39 LATERAL BASE DITCH
STA 252+70 LT TO STA 255+80 LT

DETAIL 2 LATERAL BASE DITCH
STA 256+10 LT TO STA 256+25 LT

DETAIL 34 TOE PROTECTION
STA 264+50 RT TO STA 265+50 RT
STA 265+70 RT TO STA 266+85 RT
STA 258+00 RT TO STA 259+00 RT

DETAIL 31 HEAD DITCH
STA 265+68 RT

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83

GRAPHIC SCALE 30 0 100 200 300

NON-ERODIBLE DIFFUSED FLOW

ESKRIDGE GROVE BAPTIST CHURCH

COLEMAN DOGGETT

-L- 253+50.00 198.00' LT.

LATERAL 4' BASE DITCH SEE DETAIL 39

-L- 255+90.00 800.00' LT.

LATERAL 2' BASE DITCH SEE DETAIL 2

LATERAL 2' BASE DITCH SEE DETAIL 37

-L- 258+33.00 160.00' LT.

BEGINNING OF JS

SITE 2

CL B RIPRAP EST 3 TONS EST 10 SY FF

LATERAL 'V' DITCH SEE DETAIL 17

LATERAL 'V' DITCH SEE DETAIL 13

CL B RIPRAP OUTLET PROTECTION WFF CL B=3 TONS FF=10 SY

CL B RIPRAP EST 3 TONS EST 10 SY FF

PROPOSED TOWER (BY OTHERS)

SITE 3

CL B RIPRAP EST. 1 TONS EST. 5 SY FF

CL B RIPRAP OUTLET PROTECTION WFF NO RR TO BE PLACED IN STREAM BED SEE DETAIL 42

BANK STABILIZATION

GRADING ONLY

GRADING ONLY

N 73° 00' 27.7" E

4' FDPS

FS - SEE DETAIL 27

TOE PROTECTION SEE DETAIL 34

HEADWALL 5' BASE HEAD DITCH - SEE DETAIL 31

100' TAPER

-L- 260+53.14 160.00' RT.

PROPOSED POWERLINE (BY OTHERS)

-L- 256+28.12 160.00' RT.

-L- 256+23.09 124.41' RT.

-L- 258+62.12 258.38' RT.

-L- 255+14.04 213.04' RT.

-L- 257+42.43 320.90' RT.

PROPOSED TOWER (BY OTHERS)

COLEMAN DOGGETT

JIMMY HAWKINS

UNKNOWN OWNER

FRED L. GLAIZE, II

MATCHLINE SEE SHEET 16

MATCHLINE -L- STA 254+50 SEE SHEET 5

MATCHLINE -L- STA 267+50 SEE SHEET 7

NOTE:
FOR -L- PROFILE SEE SHEET No. 20 & 21

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2/22/20"
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Permit Drawing
Sheet 7 of 30

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PROJECT REFERENCE NO.	SHEET NO
R-2707B	6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DETAIL 37 LATERAL BASE DITCH
STA 254+25 LT TO STA 255+00 LT

DETAIL 27 FALSE END DITCH

DETAIL 13 LATERAL 'V' DITCH
STA 257+00 RT TO STA 260+20 RT
STA 261+00 RT TO STA 262+12 RT
STA 262+50 LT TO STA 263+65 LT

DETAIL 17 LATERAL 'V' DITCH
STA 255+30 RT TO STA 257+00 RT
STA 262+12 RT TO STA 263+00 RT
STA 263+00 LT TO STA 262+50 LT

DETAIL 42

DETAIL 38 LATERAL BASE DITCH
STA 252+20 LT TO STA 255+80 LT

DETAIL 2 LATERAL BASE DITCH
STA 254+10 LT TO STA 256+25 LT

DETAIL 34 TOE PROTECTION

DETAIL 31 HEAD DITCH
STA 265+88 RT

STA 264+50 RT TO STA 265+30 RT
STA 265+70 RT TO STA 266+85 RT
STA 258+00 RT TO STA 259+00 RT

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83

NON-ERODIBLE DIFFUSED FLOW

ESKRIDGE GROVE BAPTIST CHURCH

COLEMAN DOGGETT

-L- 255+60.00 (-L-)
65.00 LT.

-L- 255+92.00
200.00 LT.

LATERAL 'V' DITCH SEE DETAIL 17

LATERAL 2 BASE DITCH SEE DETAIL 2

-L- 256+33.00
60.00 LT.

LATERAL 2 BASE DITCH SEE DETAIL 37

SITE #2

BEGINNING OF R

CL B RIPRAP EST 3 TONS EST 10 SY FF

255+00 (-L-)

HDWL

CL B RIPRAP EST 3 TONS EST 10 SY FF

LATERAL 'V' DITCH SEE DETAIL 17

LATERAL 'V' DITCH SEE DETAIL 13

CL B RIPRAP OUTLET PROTECTION VFF
CL B=3 TONS
FF=10 SY

SITE 3

PROPOSED TOWER (BY OTHERS)

CL B RIPRAP EST 1 TONS EST 5 SY FF

CL B RIPRAP OUTLET PROTECTION VFF
CL B=3 TONS
FF=10 SY
AT 10' RETURN
AT STREAM ARCH
SEE DETAIL 42

BANK STABILIZATION

GRADING ONLY

260+00

4' FDPS

SEE DETAIL 27

N 73° 00' 27.7" E

MATCHLINE -L- STA 254+50 SEE SHEET 5

MATCHLINE -L- STA 267+50 SEE SHEET 7

LATERAL 'V' DITCH SEE DETAIL 17

300' TAPER

TOE PROTECTION SEE DETAIL 34

-L- 260+53.14
160.00 RT.

LATERAL 'V' DITCH SEE DETAIL 13

LATERAL 'V' DITCH SEE DETAIL 12

TOE PROTECTION SEE DETAIL 34

HEADWALL & BASE DITCH SEE DETAIL 31

LATERAL 'V' DITCH SEE DETAIL 13

PROPOSED POWERLINE (BY OTHERS)

PUE

-L- 256+62.15
25.85 RT.

-L- 255+14.01
213.04 RT.

-L- 257+42.43
320.90 RT.

PROPOSED TOWER (BY OTHERS)

COLEMAN DOGGETT

MATCHLINE SEE SHEET 16

FRED L. GLAIZE, II

LYNN HAWKINS

NOTE:
FOR -L- PROFILE SEE SHEET No. 20 & 21

$$DATE$$
$$TIME$$
$$USER$$
$$DGN$$

Permit Drawing
Sheet 6 of 30

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NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

COLEMAN DOGGETT

DETAIL 27
FALSE SUVP
STA 270+55 RED
STA 278+05 RED

DETAIL 28
FALSE SUVP
STA 270+90 RT
STA 277+55 RT

DETAIL 29
FALSE SUVP
STA 278+55 LT

JIMMY HANKINS

SHELBY DEVELOPMENT PARTNERS, LLC

NAD 83

CL II RIPRAP OUTLET PROTECTION W/FF
NO RIPRAP TO BE PLACED IN STREAMBED
EST. 30 TONS
EST. 40 SY FF

CL B RIPRAP
EST. 3 TONS
EST. 10 SY FF

COLEMAN DOGGETT
OB 160 PG 593

GRADE TO DRAIN

BANK STABILIZATION

GRADING ONLY

SITE 4

N 73°00'27.7" E

FS - SEE DETAIL 27

FS - SEE DETAIL 28

FS - SEE DETAIL 29

STANDARD BERM DITCH
STA 270+90 TO STA 272+00
SEE DETAIL 30

STANDARD BERM DITCH
STA 270+00 TO STA 270+90
SEE DETAIL 30

LATERAL 2' BASE DITCH
SEE DETAIL 2

PREFORMED SCOUR HOLE
SEE DETAIL PSH3

DETAIL 30
BERM DITCH
STA 270+00 RT TO STA 272+00 RT

PREFORMED SCOUR HOLE 3
NOT TO SCALE
STA 278+43 RT

DETAIL 13
LATERAL 'V' DITCH
STA 278+43 RT TO STA 278+50 RT

DETAIL 2
LATERAL BASE DITCH
STA 278+43 RT TO STA 279+50 RT

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

GRAPHIC SCALE

MATCHLINE -L- STA 267+50 SEE SHEET 6

MATCHLINE -L- STA 281+00 SEE SHEET 8

-L- PC Sta. 275+55.52

NOTE:
FOR -L- PROFILE SEE SHEET No. 21

DATE: 2/17/2012
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PROJECT REFERENCE NO.	SHEET NO.
R-2707B	7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DETAIL 27
FALSE SUMP

STA 270+55 MED
STA-27R+05 MED

DETAIL 28
FALSE SUMP

STA 270+80 RT
STA-277+55 RT

DETAIL 29
FALSE SUMP

STA 278+55 LT

MATCHLINE -L- STA 267+50 SEE SHEET 6

MATCHLINE -L- STA 281+00 SEE SHEET 8

COLEMAN DOGGETT

COLEMAN DOGGETT DB 180, PG 693

JIMMY HANKINS

SHELBY DEVELOPMENT PARTNERS, LLC

C.B. RIPRAP EST. 8 TONS EST.10 SY RIP

GRADE TO DRAIN

270+00

275+00

GRADING ONLY

W 75°00'27.7"E

-L-

FS - SEE DETAIL 27

FS - SEE DETAIL 28

18" W/ 90° ELBOW

STANDARD BERM DITCH
STA 270+00 TO STA 272+60
SEE DETAIL 30

STANDARD BERM DITCH
STA 270+00 TO STA 270+80
SEE DETAIL 30

DETAIL 30
BERM DITCH

STA 270+00 RT TO STA 272+00 RT

PREFORMED SCOUR HOLE 3
NOT TO SCALE

PLAN VIEW

SECTION B-B

SECTION A-A

STA 278+55 RT

RIPRAP OUTLET PROTECTION VEL. NO. 1 (MOD.) PLACED IN ACCORDANCE WITH STD. NO. 876.01

RIPRAP OUTLET PROTECTION VEL. NO. 1 (MOD.) PLACED IN ACCORDANCE WITH STD. NO. 876.01

PREFORMED SCOUR HOLE
SEE DETAIL FSH3

DETAIL 13
FLUME

STA 278+43 RT TO STA 278+50 RT

DETAIL 2
LATERAL BERM DITCH

STA 278+43 RT TO STA 279+50 RT

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

GRAPHIC SCALE

NOTE:
FOR -L- PROFILE SEE SHEET No. 21

Permit Drawing
Sheet 10 of 30

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PROJECT REFERENCE NO.	SHEET NO
R-2707B	8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DETAIL 27
FALSE SUMP
STA 281+50 MED
STA 287+05 MED
STA 291+55 MED

DETAIL 28
FALSE SUMP
STA 281+90 LT
STA 291+10 RT

DETAIL 29
FALSE SUMP
STA 281+40 LT

DETAIL 33
BERM DITCH
STA 281-50 RT TO STA 285-50 RT

DETAIL 42
F.P. RIP RAP OUTLET PROTECTION

NAD 83

SHELBY DEVELOPMENT PARTNERS, LLC

22

PDE

PDE

BANK STABILIZATION

CL I RIPRAP OUTLET PROTECTION W FF NO RIP RAP TO BE PLACED IN STREAMBED SEE DETAIL 42

MATCHLINE -L- STA 281+00 SEE SHEET 7

MATCHLINE -L- STA 284+50 SEE SHEET 9

285+00

290+00

SPECIAL DITCH GRADE SEE PROFILE

FS - SEE DETAIL 28

FS - SEE DETAIL 27

FS - SEE DETAIL 29

SEE DETAIL 29

FUTURE CAT-1

SPECIAL BERM DITCH W CL B RR & FF SEE DETAIL 33

SITE 5

SHELBY DEVELOPMENT PARTNERS, LLC

22

23

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NOTE:
FOR -L- PROFILE SEE SHEET No. 18

NOTE:
FOR -L- PROFILE SEE SHEET No. 21

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Permit Drawing
Sheet 11 of 30

HNTB

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NC License No: C-1554

PROJECT REFERENCE NO	SHEET NO
R-2707B	8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DETAIL 27
FALSE SUMP
STA 281+30 RED
STA 287+65 RED
STA 291+35 RED

DETAIL 28
FALSE SUMP
STA 281+90 LT
STA 291+70 RT

DETAIL 29
FALSE SUMP
STA 281+40 LT

DETAIL 33
BERM DITCH
STA 281+50 RT TO STA 285+50 RT

DETAIL 42
STA 293+90 REF TO POINT REF. 31.59 RT

NAD 83

SHELBY DEVELOPMENT PARTNERS, LLC

22

PDES PDE

BACK OF ABUT AT PL

EL UNDER BRIDGE PROTECTION WILL BE RAISED AS NEEDED DURING CONSTRUCTION

MATCHLINE -L- STA 281+00 SEE SHEET 7

MATCHLINE -L- STA 294+50 SEE SHEET 9

285+00

290+00

SPECIAL DITCH GRADE SEE PROFILE

SPECIAL BERM DITCH W/CL & RR & EF SEE DETAIL 33

SHELBY DEVELOPMENT PARTNERS, LLC

22

SITE 37

23

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S-ALE

NOTE:
FOR -L- PROFILE SEE SHEET No. 18

NOTE:
FOR -L- PROFILE SEE SHEET No. 21

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7/17/2011
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Permit Drawing
Sheet 12 of 20

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NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	9
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DETAIL 27
FALSE SUMP
STA 300+05 RED

DETAIL 28
FALSE SUMP
STA 295+85 LT

DETAIL 2
LATERAL BASE DITCH
Min D=1.0 Ft
Max d=1.0 Ft
B=2.0 Ft
b=0.0 Ft
Type of Liner Class B Rip-Rap
FROM STA 294+63 TO STA 295+80

NAD 83

22 SHELBY DEVELOPMENT PARTNERS, LLC

WAL-MART STORES EAST, LP 23

-L- PT Sta. 303+96.22

PDE

RW

CA

295+00

300+00

305+00

SPECIAL DITCH GRADE - SEE PROFILE
STA 296+00 LT TO STA 300+00 LT

FS - SEE DETAIL 28

GRADING ONLY

FS - SEE DETAIL 27

N 80°06'34.0" E

4' FDPS

MATCHLINE -L- STA 294+50 SEE SHEET 8

MATCHLINE -L- STA 306+00 SEE SHEET 10

LATERAL 2' BASE DITCH SEE DETAIL 2'

SITE 5

23 DENOTES IMPACTS IN SURFACE WATER

DENOTES ~~TEMPORARY~~ IMPACTS IN SURFACE WATER

23 WAL-MART STORES EAST, LP

NOTE:
FOR -L- PROFILE SEE SHEET No. 21 & 22

Permit Drawing
Sheet 13 of 30

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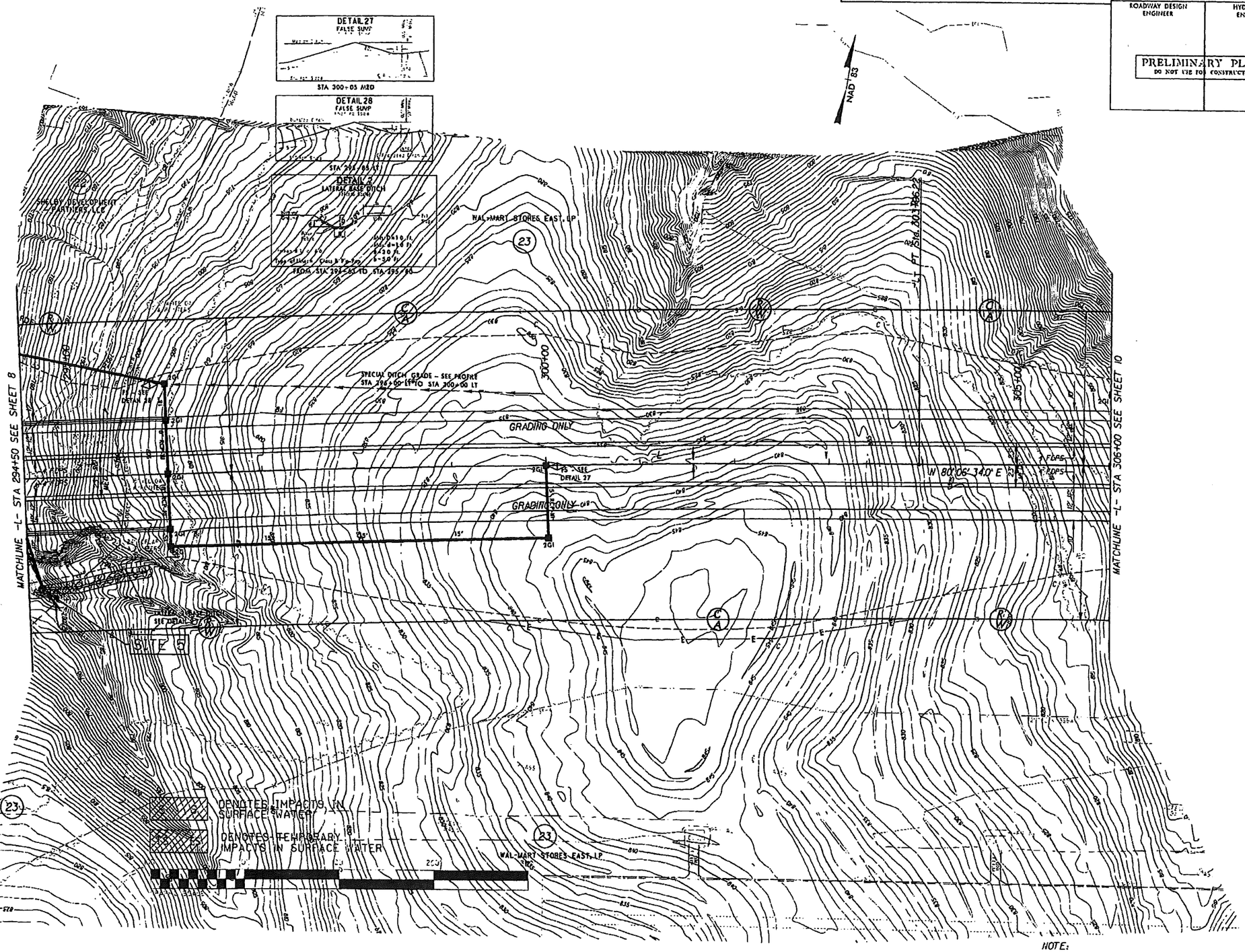
Raleigh, North Carolina 27609
NC License No: C-1664

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS



NOTE:
FOR -L- PROFILE SEE SHEET No. 21 & 22

Permit Drawing
14 of 30

HNTB NORTH CAROLINA, P.C.
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NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DETAIL 41
RIP RAP AT EMBANKMENT
STA. 307+59 RT CL I RR 16 TON; FF 23 SY

DETAIL 2
LATERAL BASE DITCH
STA 256+10 LT TO STA 256+25 LT

DETAIL 31
HEAD DITCH
Min D= 4.0 Ft
Max d 4.0 Ft.
B 8.0 Ft
DOE=250 CY
Type of Liners: FROM ONE BANKS ONLY
STA. 307+50 RT.

DETAIL 27
FALSE SUMP
STA 306+11 MED
STA 311+05 MED
STA 318+05 MED

DETAIL 28
FALSE SUMP
STA 306+55 RT -L-
STA 311+05 RT -L-
STA 318+05 RT -L-

DETAIL 29
FALSE SUMP
STA 306+11 LT -L-
STA 318+05 LT -L-

DETAIL 36
SPECIAL CUT DITCH
Min D=1.0 Ft.
FROM STA 307+66 TO STA 308+50 RT

DETAIL 42
RIP RAP AT EMBANKMENT
Type of Liners: CL B RR 2 TON
STA 323+90, EST 27 TONS EST 31 SY FF

NAD 83

SCALE
100 0 100 200

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

WAL-MART STORES EAST, LP
23

BANK STABILIZATION
SITE 6
CL II RIPRAP W FF NO RR TO BE PLACED IN STREAMBED SEE DETAIL 42
CL B RIPRAP EST 2 TON EST 7 SY FF
CL II RIPRAP EST 2 TON EST 7 SY FF
310+00
315+00
GRADING ONLY
GRADING ONLY
N 80° 06' 34.0" E
-L-
4' FDPS
4' FDPS
FS - SEE DETAIL 29
FS - SEE DETAIL 27
FS - SEE DETAIL 28
FS - SEE DETAIL 29
FS - SEE DETAIL 27
FS - SEE DETAIL 28
SEE DETAIL 40
HEAD DITCH DOE = 250 CY SEE DETAIL 31
CL B RIPRAP EST 2 TON EST 7 SY FF SEE DETAIL 31 SEE DETAIL 41
RDWL
MATCHLINE -L- STA 306+00 SEE SHEET 9
MATCHLINE -L- STA 318+50 SEE SHEET 11
WAL-MART STORES EAST, LP
23

NOTE:
FOR -L- PROFILE SEE SHEET No. 22

Permit Drawing
Sheet 15 of 30

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Raleigh, North Carolina 27609
NC License No: C-1552

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DETAIL 41
RIP RAP AT EMBANKMENT
STA. 307-59 RT CL I RR 16 TON; FF 23 SY

DETAIL 2
LATERAL BASE DITCH
STA 256+10 LT TO STA 256+25 LT

DETAIL 31
HEAD DITCH
Min D=1.0 Ft.
B=5.0 Ft
DDE=250 CY
STA. 307-50 RT.

DETAIL 27
FALSE SUMP
STA 306+31 MED
STA 311+05 MED
STA 318+05 MED

DETAIL 28
FALSE SUMP
STA 306+55 RT
STA 311+05 RT
STA 318+05 RT

DETAIL 29
FALSE SUMP
STA 308+31 LT
STA 318+05 LT

DETAIL 36
SPECIAL CUT DITCH
FROM STA 307+66 TO STA 308+50 RT

DETAIL 42
RIP RAP AT CROSS PIPE
STA 256+55 RT 27 TO 35 LT 31 SY FF

NAD 83

WAL-MART STORES EAST, LP

BANK STABILIZATION

SITE 6

CL B RIPRAP W FF; NO 23 TO BE PLACED IN STREAMBED SEE DETAIL 42

CL B RIPRAP EST 2 TON EST 2 SY FF

EST 10 SY SEE DETAIL 28

FS - SEE DETAIL 28

HEAD DITCH DDE = 250 CY SEE DETAIL 31

SEE DETAIL 40

CL I RIPRAP EST 11 TON EST 9 SY FF SEE DETAIL 31 SEE DETAIL 41

FS - SEE DETAIL 27

FS - SEE DETAIL 29

FS - SEE DETAIL 28

FS - SEE DETAIL 27

FS - SEE DETAIL 28

RDWL

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER-40

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

GRADING ONLY

N 80°06'340" E

MATCHLINE -L- STA 306+00 SEE SHEET 9

MATCHLINE -L- STA 318+50 SEE SHEET 11

NOTE:
FOR -L- PROFILE SEE SHEET No. 22

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3/24/2010
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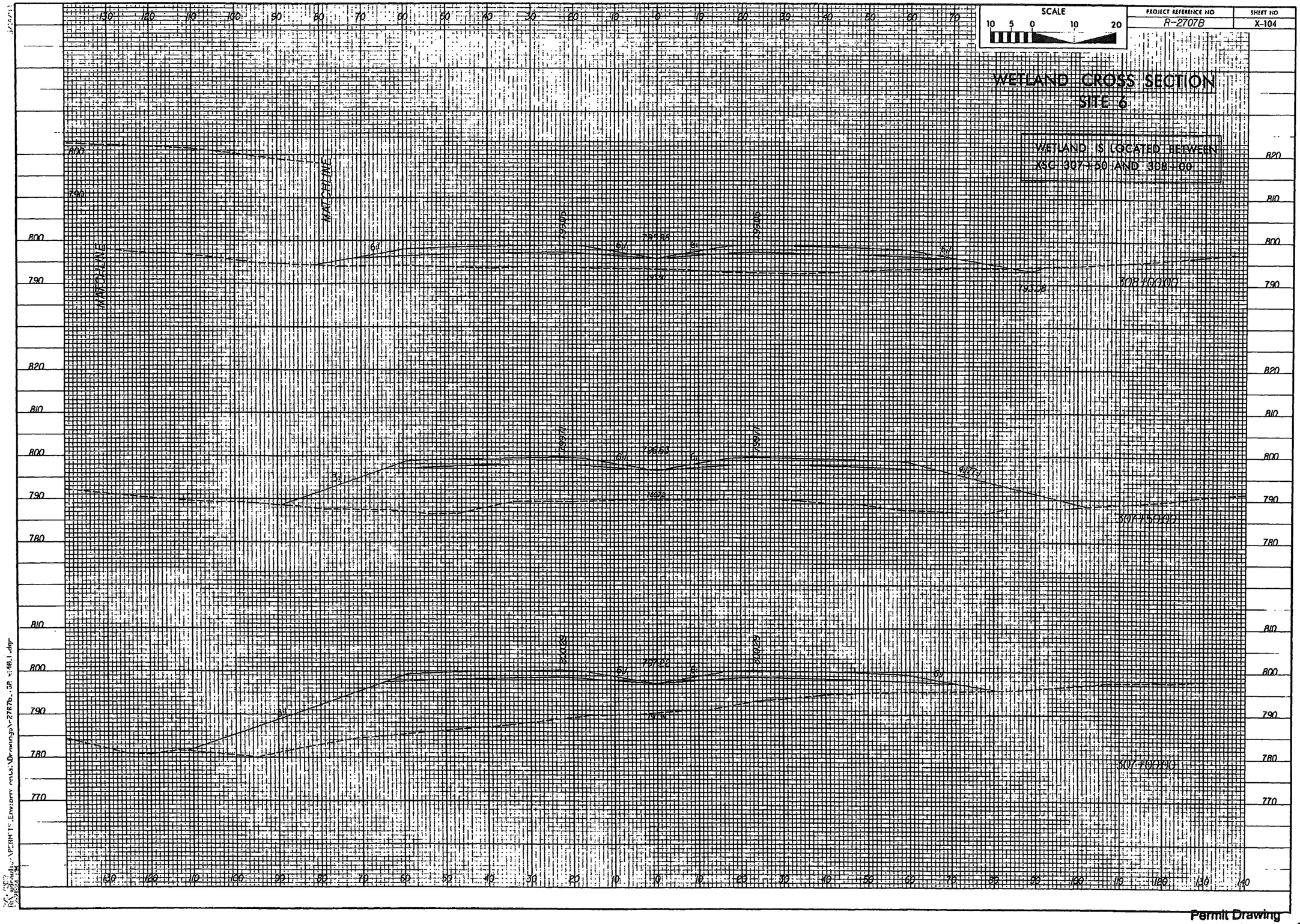
Permit Drawing
Sheet 16 of 30



Permit Drawing
Sheet 17 of 30

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PROJECT REFERENCE NO.	SHEET NO
R-2707B	11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DETAIL 34
TOE PROTECTION
STA 325+00 RT TO STA 331+25 RT
STA 321+50 LT TO STA 327+60 LT

DETAIL 21
SLOPE PROTECTION
STA 327+60 LT TO STA 331+50 LT

DETAIL 4
LATERAL BASE DITCH
STA 320+00 RT TO STA 322+65 RT

DETAIL 35
LATERAL "V" DITCH
STA 322+65 RT TO STA 325+00 RT

DETAIL 27
FALSE SUMP
STA. 319+35 -L- MED, GRADE=3%, L=30'
STA. 330+45 -L- MED, GRADE=0.3%, L=20'

Ditch Grade	L	Ditch/Grade	L
0.01 to 2.5%	15'	Over 4.0% to 7.0%	25'
Over 2.5% to 4.0%	20'	Over 7.0%	30'

DETAIL 28
FALSE SUMP
STA 319+55 -L- RT

DETAIL 29
FALSE SUMP
STA 319+55 -L- LT

NAD 83

WAL-MART STORES EAST, LP
(23)

320+00
325+00
-L- TS STA. 328+14.65
SC STA. 330+14.65
330+00

CL I RIPRAP W/FF
EST. 32 TON
EST. 54 SY FF

CL B RIPRAP
EST 2 TON
EST 7 SY FF

TOE PROTECTION
SEE DETAIL 34

SLOPE PROTECTION
STA 327+60 LT TO
STA. 331+50 LT
SEE DETAIL 21

FS - SEE DETAIL 29
FS - SEE DETAIL 27
FS - SEE DETAIL 28

GRADING LIMIT

N 80°06'34.0" E

-L-

LATERAL 3' BASE DITCH
SEE DETAIL 4

LATERAL "V" DITCH
SEE DETAIL 35

SITE 7

MATCHLINE -L- STA 318+50 SEE SHEET 10

MATCHLINE -L- STA 331+50 SEE SHEET 12

F/F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

GRAPHIC SCALE

NOTE:
FOR -L- PROFILE SEE SHEET No. 22 & 23

Permit Drawing
18 30

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5/7/2012

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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO
R-2707B	11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DETAIL 34
TOE PROTECTION
STA 325+00 RT TO STA 331+25 RT
STA 321+50 LT TO STA 327+60 LT

DETAIL 21
SLOPE PROTECTION
STA 327+60 LT TO STA 331+50 LT

DETAIL 4
LATERAL BASE DITCH
STA 320+00 RT TO STA 322+65 RT

DETAIL 35
LATERAL "V" DITCH
STA 322+65 RT TO STA 325+00 RT

DETAIL 27
FALSE SUMP
STA 319+55 -L- RT

DETAIL 28
FALSE SUMP
STA 319+55 -L- LT

DETAIL 29
FALSE SLOPE

NAD 83

WAL*MART STORES EAST LP

MATCHLINE -L- STA 318+50 SEE SHEET 10

MATCHLINE -L- STA 331+50 SEE SHEET 12

CL I RIPRAP W/FF
EST. 32 TON
EST. 54 SY FF

CL B RIPRAP
EST 2 TON
EST 7 SY FF

TOE PROTECTION
SEE DETAIL 34

SLOPE PROTECTION
STA 327+60 LT TO STA 331+50 LT
SEE DETAIL 21

GRADING LIMIT

-L-

N 80° 06' 34.0" E

SEE DETAIL 27

SEE DETAIL 28

LATERAL 3' BASE DITCH
SEE DETAIL 4

LATERAL "V" DITCH
SEE DETAIL 35

SITE

F DENOTES FILL IN WETLANDS

DENOTES MECHANIZED CLEARING

SCALE

FOR -L- PROFILE SEE SHEET 18, 22 & 23

Date Plotted: 2/11/20
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Permit Drawing
Sheet 19 of 30

Permit Drawing
Sheet 20 of 30

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NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

NAD 83

HW

DETAIL 21
SLOPE PROTECTION
STA 331-50 LT TO STA 333+25 LT

DETAIL 27
FALSE SUMP
STA 335+20 MED

DETAIL 29
FALSE SUMP
STA 339+60 RT

DETAIL 14
LATERAL BASE DITCH
STA 339+62 LT TO STA 343+50 LT

DETAIL 2
LATERAL BASE DITCH
STA 343+50 LT TO STA 345+50 LT
STA 337+50 RT TO STA 339+75 RT

WAL-MART STORES EAST, LP

23

24

NOTE:
6" DECK DRAINS TO BE PLACED ON 12' CENTERS ON SPANS 4 & 5 WBL BRIDGE. NO OTHER DECK DRAINS TO BE PLACED ON BRIDGE(S).

SITE 8

LATERAL 2' BASE DITCH
STA 339+62 LT TO STA 343+50 LT
SEE DETAIL 14

CL II RIPRAP TO ELEV. 742.6
STA 331+50 TO STA 333+25
SEE DETAIL 21

CL B RIPRAP
EST 2 TON
EST 7 SY FF

CL II RIPRAP
WFF

RIP RAP
AT EMBANKMENT
SEE DETAIL 41

END BRIDGE
-L- STA 342+85.00

LATERAL 2' BASE DITCH
STA 343+50 LT TO STA 345+50 LT
SEE DETAIL 2

GRADING ONLY

TB 2GI 36" RCP-III

FS - SEE DETAIL 27

2GI

84

84

GRADE TO DRAIN

4' FDPS

4' FDPS

GRADING ONLY

15" RCP-III

2GI

15" W/ ELBOWS

BEGIN BRIDGE
-L- STA 338+55.00

SPECIAL DITCH GRADE
STA 335+00 RT TO
STA 336+50 RT
SEE PROFILE

TOE PROTECTION
SEE DETAIL 34

TRANSITION STONE
CL B RIPRAP - 1 TON
FF - 5 SY

SITE 7

LATERAL 'V' DITCH
STA 336+50 RT TO STA 337+50 RT
SEE DETAIL 13

FS - SEE DETAIL 29

3GI

24"

24"

ENERGY DISSIPATOR
SEE DETAIL ED#3

PDE

PREFORMED SCOUR HOLE
SEE DETAIL #SH4

JB w/MH

15" W ELBOWS

EW

MATCHLINE -L- STA 331+50 SEE SHEET 11

MATCHLINE -L- STA 345+50 SEE SHEET 13

0 100 200 400
GRAPHIC SCALE

DETAIL 34
TOE PROTECTION
STA 332+25 RT TO STA 333+75 RT

DETAIL 13
LATERAL 'V' DITCH
STA 336+50 RT TO STA 337+50 RT

WAL-MART STORES EAST, LP

23

SKETCH SHOWING BRIDGE / ROADWAY RELATIONSHIP

340+00

4' P.S.

46' MED.

-L-

ENERGY DISSIPATOR ED #3
(NOT TO SCALE)

PLAN VIEW
(NOT TO SCALE)

PROFILE
(NOT TO SCALE)

STA 341+20 RT

PREFORMED SCOUR HOLE
(NOT TO SCALE)

PLAN VIEW

SECTION A-A

STA 343+50 RT

DETAIL 41
RIP RAP AT EMBANKMENT
(NOT TO SCALE)

STA 339+60 LT CL II RR 7 TON; FF 12 SY

DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

NOTE:
FOR -L- PROFILE SEE SHEET No. 23

24

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2/1/2007
Environ auto

Permit Drawing
Sheet 21 of 30

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NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	12
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

NAD 83

DETAIL 21
SLOPE PROTECTION

DETAIL 27
FALSE SUMP

DETAIL 29
FALSE SUMP

DETAIL 14
LATERAL BASE DITCH
STA 339+62 LT TO STA 343+50 LT

DETAIL 2
LATERAL BASE DITCH
STA 343+50 LT TO STA 345+50 LT;
STA 337+50 RT TO STA 339+75 RT

STA 331+50 LT TO STA 333+25 LT

STA 335+20 RT

STA 338+60 RT

WAL-MART STORES EAST, LP

NOTE:
6" DECK DRAINS TO BE PLACED ON 22' CENTERS ON SPANS 1 & 3 OF L BRIDGE. NO OTHER DECK DRAINS TO BE PLACED ON BRIDGE.

SITE 8

LATERAL 2 BASE DITCH
STA 339+62 LT TO STA 343+50 LT
SEE DETAIL 14

RIP RAP AT EMBANKMENT
SEE DETAIL 41

END BRIDGE
STA 342+85.00

LATERAL 3 BAST DITCH
STA 343+50 LT TO STA 345+50 LT
SEE DETAIL 2

CL B RIPRAP TO ELEV 742.6
STA 331+50 TO STA 333+25
SEE DETAIL 21

CL B RIPRAP
EST 2 TON
EST 7 SY FF

CL B RIPRAP
WFF

GRADING ONLY

FS - ISEE DETAIL 27

GRADING ONLY

GRADING ONLY

GRADE TO DRAIN

4 FOPS

4 FOPS

GRADING ONLY

CL B RIPRAP
WFF

15" W ELBOWS

15" W ELBOWS

MATCHLINE -L- STA 331+50 SEE SHEET 11

MATCHLINE -L- STA 345+50 SEE SHEET 13

SITE 7

TOE PROTECTION
SEE DETAIL 34

TRANSITION STONE
CL B RIPRAP - 1 TON
FF=3 SY

SPECIAL DITCH GRADE
STA 335+00 RT TO
STA 336+50 RT
SEE PROFILE

BEGIN BRIDGE
L STA 338+55.00

ENERGY DISSIPATOR ED #3

SEE DETAIL ED-3

PREFORMED SCOUR HOLE
SEE DETAIL PSH4

LATERAL 2 BASE DITCH
STA 337+50 RT TO
EXISTING DITCH
SEE DETAIL 2

LATERAL 'A' DITCH
STA 336+50 RT TO STA 337+55 RT
SEE DETAIL 19

REACH 2 - LEASE

DETAIL 34
CL PROTECTION

DETAIL 19
LATERAL 'A' DITCH

STA 335+75 RT

STA 337+50 RT TO STA 337+50 RT

WAL-MART STORES EAST, LP

SKETCH SHOWING BRIDGE / ROADWAY RELATIONSHIP

340'-0"

4' P.S.

24'

46' MED.

4' P.S.

-L-

4' P.S.

24'

4' P.S.

ENERGY DISSIPATOR ED #3

PLAN VIEW

PROFILE

CLASS B RIPRAP

STA 341+20 RT

PREFORMED SCOUR HOLE

STA 343+50 RT

DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DETAIL 41
RIP RAP AT EMBANKMENTS

STA 338+60 LT CL-TAX 2 TON; 19.33 SY

NOTE:
FOR -L- PROFILE SEE SHEET NO. 23

Permit Drawing
Sheet 22 of 30

HNTB

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO
R-2707B	20

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PI = 324+00.00
BL = 75326
VC = 1250'
K = 271
DS = 60+ mph

(EX.) 36"RCP

(EX.) 36"RCP

60" RCP EQUALIZER PIPE
EL = 73626

60" RCP EQUALIZER PIPE
PI = 335+00

60" RCP EQUALIZER
EL = 73930

SITE 8

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 30	AC	
DESIGN FREQUENCY	= 50	YRS	PI = 335+00.00
DESIGN DISCHARGE	= 1200	CFS	EL = 73600
DESIGN HW ELEVATION	= 74005	FT	VC = 1500'
100 YEAR DISCHARGE	= 1300	CFS	K = 568
100 YEAR HW ELEVATION	= 74038	FT	DS = 80+ mph
OVERTOPPING FREQUENCY	= 500+Y	YRS	
OVERTOPPING DISCHARGE	= 1750	CFS	
OVERTOPPING ELEVATION	= 74200	FT	

(EX.) 36"RCP

15"

66" RCP
PI = 339+30

Permit Drawing
Sheet 23 of 30

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NC License No: C-1554

PROJECT REFERENCE NO	SHEET NO
R-2707B	13A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

MATCHLINE -L- STA 355+00.00 SEE SHEET 12

CHARLES A. & JERI HORN
DB 1200 PG 2377

CHARLES A. HORN
DB 9X PG 433

LATERAL 4' BASE DITCH
STA 345+50 LT TO
STA 347+00 LT
SEE DETAIL 18

LATERAL 4' BASE DITCH
STA 347+00 LT TO
STA 349+35 LT
SEE DETAIL 19

CLASS I RIP RAP
EST. 17 TONS
28 SY FF

6' STANDARD
BASE DITCH
SEE DETAIL 20

15" W
ELBOWS

2GI

4' FDPS

FS SEE
DETAIL 27

300' TAPER

GRADING ONLY

SITE 9

BANK STABILIZATION

TOE PROTECTION
SEE DETAIL 34

TRANSITION STONE
CL B - 1 TON
FF - 5 SQ. YDS.

CL I RIPRAP W FF
NO BR TO BE PLACED
IN STREAMBED
SEE DETAIL 42

NOTE:
INFORMATION PROVIDED ON
THIS SHEET IS FROM
INTERCHANGE PLAN SHEET 13.

SCALE 1" = 200'

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 27
FALSE SUMP
STA 346+48 RED

DETAIL 34
TOE PROTECTION
STA 347+75 RT TO STA 350+25 RT

DETAIL 42
STA 347+53 LT

DETAIL 20
STANDARD BASE DITCH
STA 349+53 LT

-LPDI- POT 11+92.36
-YI- POT 33+08.75
-RPDI- POT 24+04.31
-YI- POT 33+28.75

-YI-

-LPDI- ST 10+57.36

-LPDI- CS 8+97.36

-LPDI- GRADING ONLY

FUTURE BEGIN
STA 12+31
LOOP -D- ST 0+00.00
-L- POT 355+00.51
47.00 (LT.)

LOOP -D- SC 1+60.00

T.P.-TCD
ELEV=802.15

T.P.-TCD
ELEV=787.

N 74°11'42" W
134.43'

S 15°46'05.2" W

MATCHLINE -L- SEE SHEET 18

S:\10ATF16\4
7/17/20E
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Permit Drawing
Sheet 24 of 30

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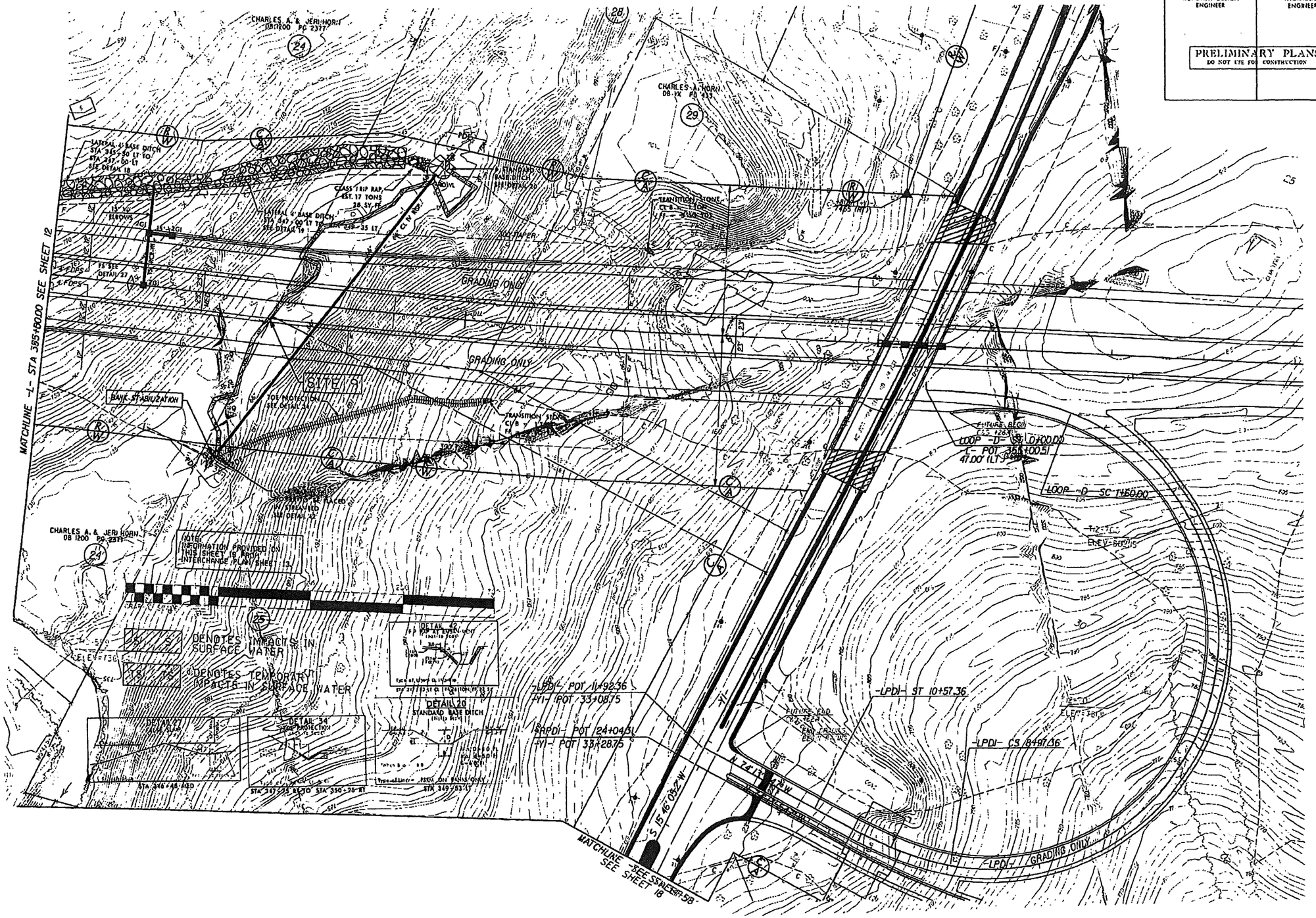
NC License No: C-1554

PROJECT REFERENCE NO	SHEET NO
R-2707B	13A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS



Permit Drawing
Sheet 25 of 30

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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	13B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

$$$DATE$$$
4/18/2012
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LOOP -A- SC 1+60.00
-LPAI-
GRADING ONLY
RAMP -A- SC 5+74.56
-RPAI-
GRADING ONLY
RAMP -D- SC 2+40.00
RAMP -D- CS 10+19.40
-RPDI-
-RPDI- SRS 12+59.40
-Y11-
SC 14+59.40
PT Sta. 366+39.53
PT Sta. 35+16.21
MATCHLINE -L- STA 374+00 SEE SHEET 14
STA 364+00 SEE SHEET 14
N 73°17'00.3" E
SITE 11
PROP. SLOPE STAKE LINE
PROP. R/W
EST 3 TONS CL B RIP RAP
EST _ SY FILTER FABRIC
EST _ TONS CL I RIP RAP
EST _ SY FILTER FABRIC
TOE PROTECTION
STA 365+00 TO 367+50 LT
SEE DETAIL 5
EST _ TON CL B RIP RAP
EST _ SY FILTER FABRIC
HW W/ SLUICE GATE
HDWL W/ SLUICE GATE
2GI-A W/ FLAT GRATE
2GI-B W/ FLAT GRATE
48" CLASS IV W/METHOD B INSTALLATION
HAZARDOUS SPILL BASIN - SEE LARGE DETAIL 26
TOTAL CAPACITY REQUIRED W/3.5' DEPTH = 1,780 CY
TOTAL CAPACITY W/0.5' FREEBOARD = 1,802 CY
SPECIAL 2' LATERAL BASE DITCH W/CL B RIP RAP
STA 8+25 TO 13+00 RT RAMP -D-
SEE DETAIL 9
EST _ TONS CL B RIP RAP
EST _ SY FILTER FABRIC
EST _ CY DDE
LATERAL 'A' DITCH LINED W/CL B RIP RAP
STA 32+39 TO 36+39 LT -Y17-
SEE DETAIL 2
EST _ TONS CL B RIP RAP
EST _ SY FILTER FABRIC
EST _ CY DDE
CHARLES A. HORN DB 862 PG 1893
WILLIAM JAMES HORN
PROP. C/A FENCE
DESIRE LN
15" CSP W/ ELBOWS
48"WWB25SW
24"
18"
15"
36"
48"
30"
24"
CB
FS
2GI-A
2GI-B
3GI-A
3GI-B
BDO
HW
40
41
39
35
30
1033
1024

NOTE:
INFORMATION PROVIDED ON THIS SHEET IS FROM INTERCHANGE PLAN SHEET 13.

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

180' 0' 100' 200' 300'
GRAPHIC SCALE

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
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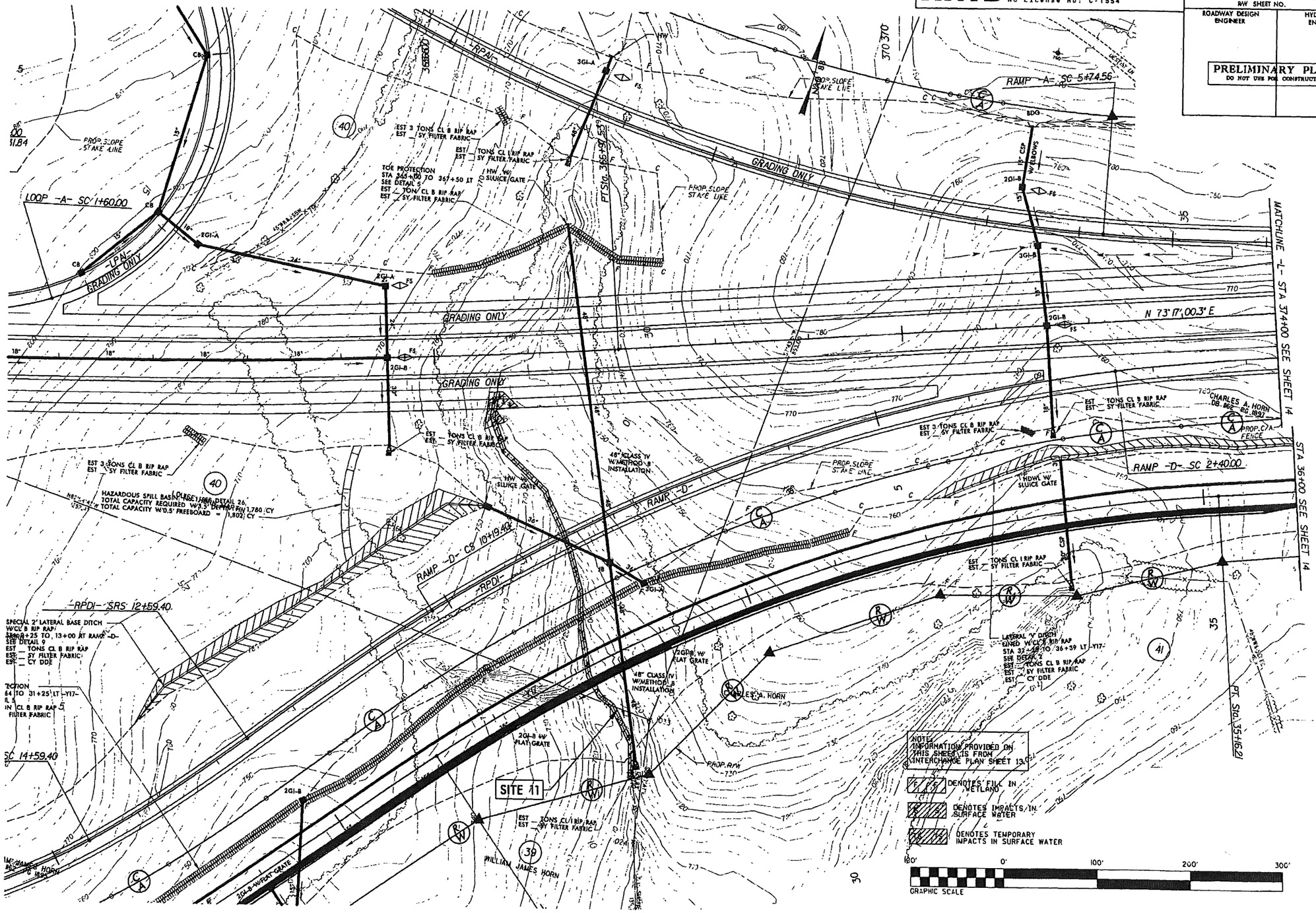
PROJECT REFERENCE NO.	SHEET NO.
R-2707B	13B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



REVISIONS

$$$$DATE$$$$
4/18/2012
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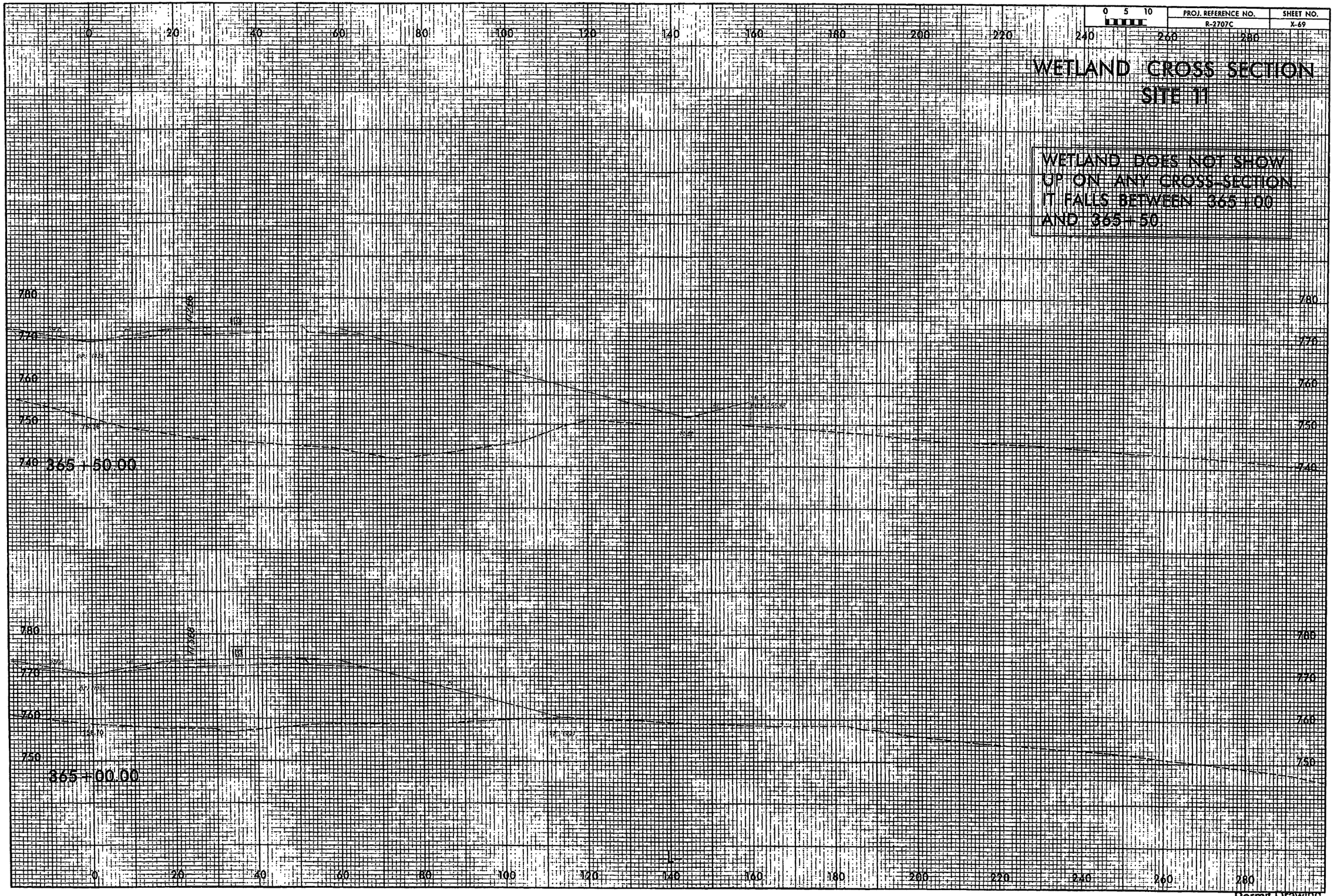
Permit Drawing
Sheet 27 of 30

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2707C	X-69

WETLAND CROSS SECTION
SITE 11

WETLAND DOES NOT SHOW UP ON ANY CROSS-SECTION. IT FALLS BETWEEN 365+00 AND 365+50



Permit Drawing
Sheet 28 of 30

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NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

REVISIONS

$$$$DATE$$$$
4/19/2012
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36

37

38

40

45

15

LATERAL V-DITCH LINED
W/CL B RIP RAP
STA 35+50 TO 37+00 -Y1- RT
SEE DETAIL 2
EST __ TONS CL B RIP RAP
EST __ SY FILTER FABRIC
EST __ CY DDE

SPECIAL DITCH GRADE
STA 37+00 TO 38+00 -Y1- RT
SEE PROFILE FOR GRADE

MATCHLINE SEE SHEET 14

REMOVE

S 18°57'59"W

S 81°14'48"E

EST 3 TONS CL B RIP RAP
EST __ SY FILTER FABRIC

2' LATERAL BASE DITCH LINED,
W/CL B RIP RAP
STA 17+00 TO 19+35 -Y17- LT
SEE DETAIL 21
EST __ TONS CL B RIP RAP
EST __ SY FILTER FABRIC
EST __ CY DDE

WILLIAM JAMES HORN

EST __ TONS CL B RIP RAP
EST __ SY FILTER FABRIC

PIPE GUARDRAIL

HW W/
SLUICE GATE
2GI-B W/
FLAT GRATE

-Y17-

SITE 12

2' LATERAL BASE DITCH LINED
W/CL B RIP RAP
STA 17+60 TO 19+20 -Y17- RT
SEE DETAIL 21
EST __ TONS CL B RIP RAP
EST __ SY FILTER FABRIC
EST __ CY DDE

MATCHLINE SEE SHEET 14

TIES TO EXISTING SWALE

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

100' 0' 100' 200' 300'
GRAPHIC SCALE

Permit Drawing
Sheet 29 of 30

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343 E. Six Forks Road, Suite 200
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PROJECT REFERENCE NO.	SHEET NO.
R-2707B	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

REVISIONS

$$$$DATE$$$$
4/19/20XX
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LATERAL V-DITCH LINED
W/CL B RIP RAP
STA 35+50 TO 37+00 -Y1- RT
SEE DETAIL 7
EST __ TONS CL B RIP RAP
EST __ SY FILTER FABRIC
EST __ CY DCE

SPECIAL DITCH GRADE
STA 37+00 TO 38+00 -Y12 RT
SEE PROFILE FOR GRADE

MATCHLINE SEE SHEET 14

S 16°24'59.3"W

S 67°14'48"E

2 LATERAL BASE DITCH LINED
W/CL B RIP RAP
STA 17+00 TO 19+35 -Y17-
SEE DETAIL 21
EST __ TONS CL B RIP RAP
EST __ SY FILTER FABRIC
EST __ CY DCE

EST 7 TONS CL B RIP RAP
EST __ SY FILTER FABRIC

WILLIAM JAMES KOPH

TONS CL B RIP RAP
SY FILTER FABRIC

24W-W SLUICE GATE
2GI-B W/ FLAT GRATE

SITE 12

TIES TO EXISTING SWALE

MATCHLINE SEE SHEET 14

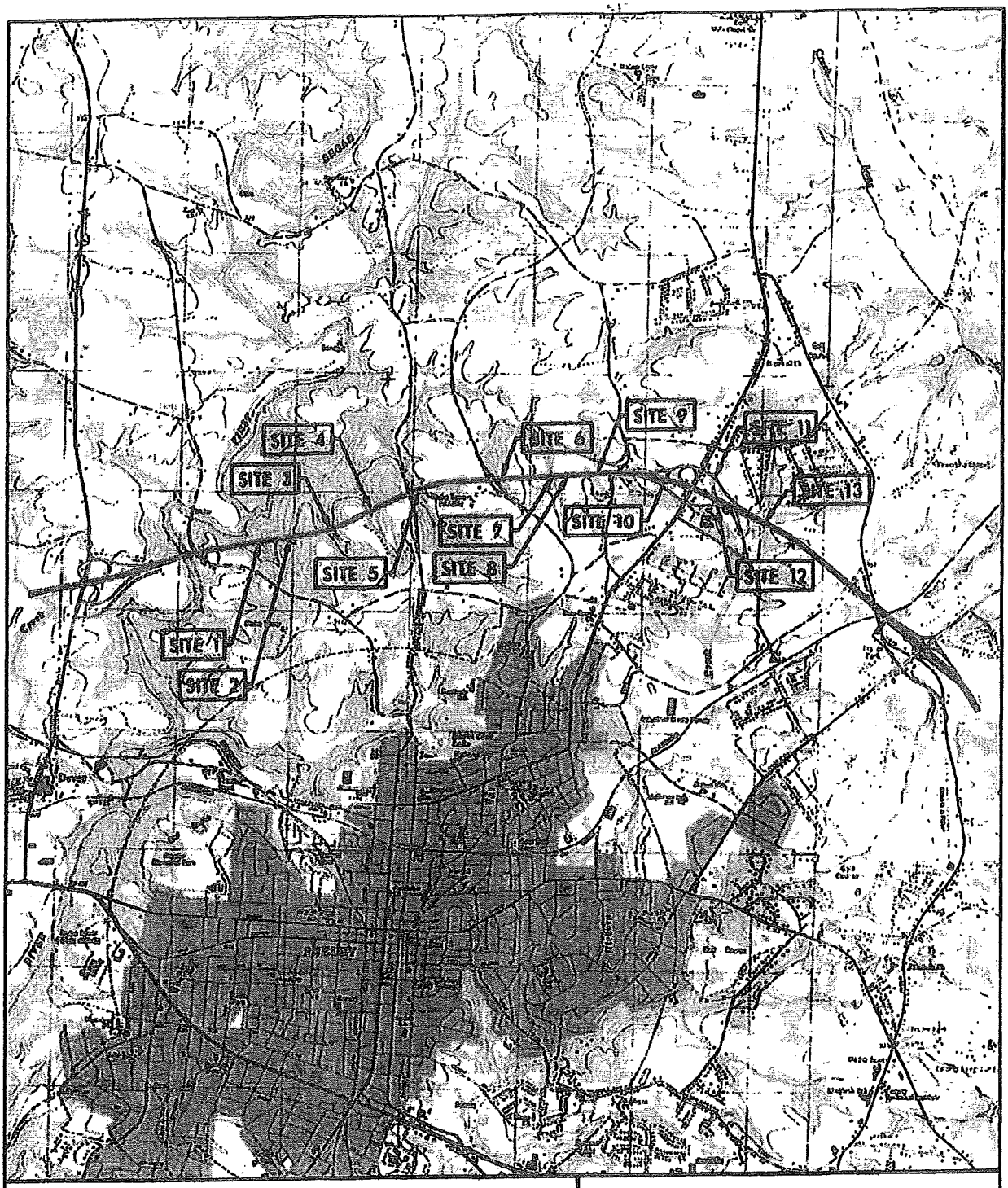
DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

100' 0' 100' 200' 300'
GRAPHIC SCALE

Permit Drawing
Sheet 30 of 30



TOPO MAP

SCALE: 1" = 4000'

NCDOT

DIVISION OF HIGHWAYS
CLEVELAND COUNTY
PROJECT: R-2707C

US 74 - SHELBY BYPASS
FROM WEST OF 226
TO EAST OF NC 150

SHEET OF 02/24/12

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 405+13 - 406+75							0.03	<0.01	374	28	
2	-L- 413+26 - 416+00							0.03	<0.01	397	20	
3	-L- 425+38 - 426+72							0.03	<0.01	323	21	
4	-L- 438+10 - 439+80 Rt	Pond						0.98				
			0.02					0.02	<0.01	182	10	
5	-L- 452+39 - 454+18							0.06	<0.01	683	57	
	Bank Stabilization							0.01		59		
6	-L- 475+63 - 477+10		0.01			<0.01		0.01	<0.01	273	21	
7	-L- 489+55 - 491+56							0.05	<0.01	496	22	
8	-L- 495+07 - 495+74							0.02	<0.01	330	17	
9	-L- 502+87 - 513+70		0.14					0.16	<0.01	1799	48	
10	-RPB2- 10+40 - 11+78							0.01	<0.01	183	20	
11	-RPA2- 14+87 - 18+11		0.49					0.06	<0.01	519	35	
12	-L- 536+91 - 541+08							0.03	<0.01	498	30	
	Bank Stabilization							<0.01		29		
13	-L- 552+30 - 554+65							0.11	<0.01	761	40	
	Bank Stabilization							<0.01		29		
14	-L- 563+56 - 568+17		0.01			0.01		<0.01	<0.01		10	
		Pond						1.33				
15	-Y11REV- 55+02 - 58+70		0.18			0.05		0.01	<0.01	172	17	
16	-Y16REV-14+16 - 14+71							0.02	<0.01	167	13	
TOTALS:			0.85			0.07		2.96	0.03	7274	409	

Note: No Impacts to First Broad River Spanning Structure.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CLEVELAND COUNTY
(R-2707C)

SHEET 2/24/2012

ATN Revised 3/31/05

TIP PROJECT: R-2707C

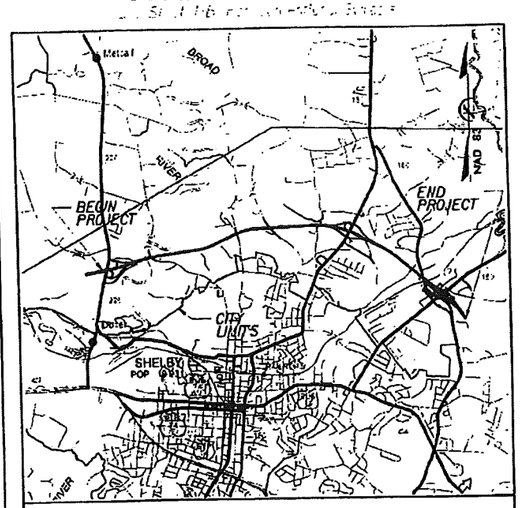
CONTRACT:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CLEVELAND COUNTY

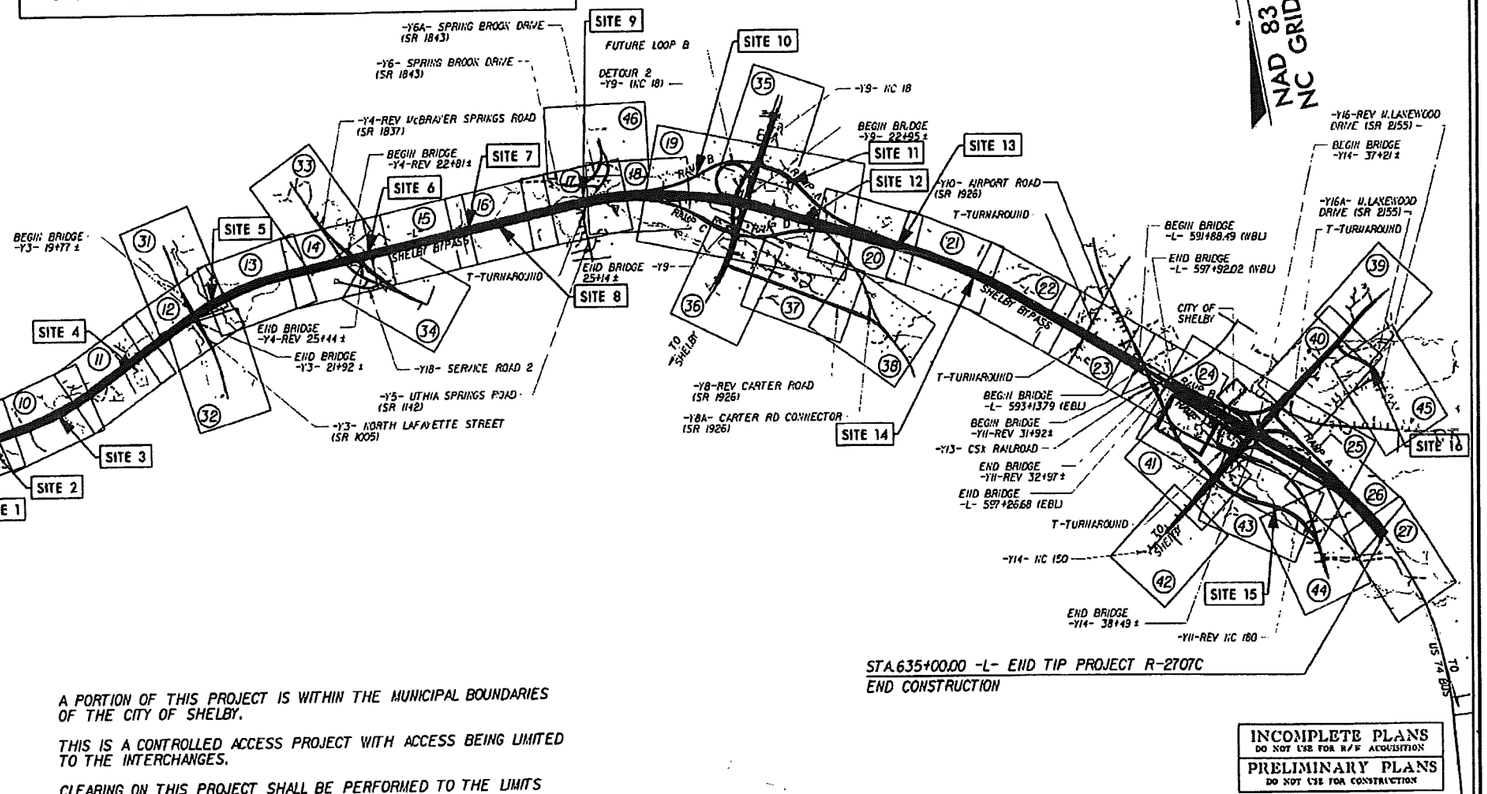
STATE	STATE PROJECT REFERENCE NO	SHEET NO	TOTAL SHEETS
N.C.	R-2707C	1	
STATE PROJECT NO	F.A. PROJECT NO	DESCRIPTION	
34497.1.4	NHF-74(14)	P.E.	

LOCATION: US 74 SHELBY BYPASS
FROM WEST OF NC 226
TO EAST OF NC 150
TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNING, SIGNALS AND STRUCTURES



VICINITY MAP SHOWING LOCATION OF STATE PROJECT 8.1801001

WETLAND AND STREAM IMPACTS



STA 353+22.84 -L- END TIP PROJECT R-2707B
STA 353+22.84 -L- BEGIN TIP PROJECT R-2707C

STA 635+00.00 -L- END TIP PROJECT R-2707C
END CONSTRUCTION

A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF SHELBY.

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

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

NCDOT CONTACT: DOUG TAYLOR, P.E.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS 50 25 0 50 100
PROFILE (HORIZONTAL) 50 25 0 50 100
PROFILE (VERTICAL) 10 5 0 10 20

DESIGN DATA

ADT 2005	=	20,300
ADT 2025	=	30,900
DHV	=	10 %
D	=	60 %
T	=	11 % *
V	=	70 MPH

* TTST 6% DUAL 5%

PROJECT LENGTH

LENGTH OF ROADWAY STATE PROJECT R-2707C	=	5.20 MILES
LENGTH OF STRUCTURES STATE PROJECT R-2707C	=	0.14 MILES
LENGTH OF STATE PROJECT R-2707C	=	5.34 MILES

Prepared for NCDOT in the Office of:
MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4688 FAX

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:

TIM R. REID, P.E.
PROJECT ENGINEER

TRENT E. HUFFMAN, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SDG
Sungate Design Group, P.A.
SIGNATURE: P.E.

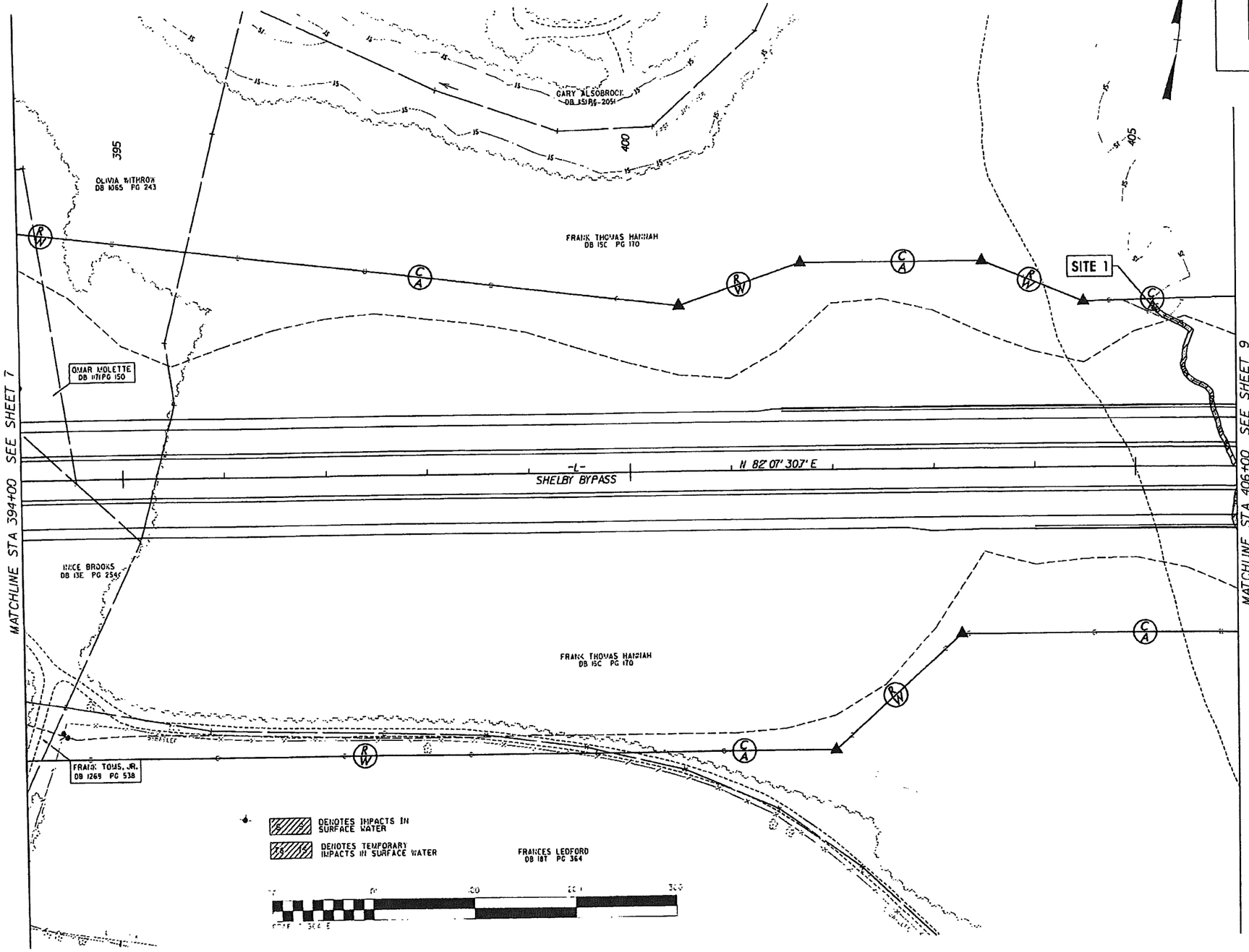
ROADWAY DESIGN ENGINEER
MOFFATT & NICHOL
SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA
P.E.
STATE HIGHWAY DESIGN ENGINEER

...\R2707C\Hydraulics\PERMITS\Environmental\Drawings\R2707C_hyd_prm_tsh.dgn
...2007 8:17:46 PM

PROJECT REFERENCE NO	SHEET NO.
R-2707C	8
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



FOR -L- PROFILE SEE SHEET 50

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	8
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

MATCHLINE STA 394+00 SEE SHEET 7

MATCHLINE STA 406+00 SEE SHEET 9

GARY ALSOBROOK
DB 1515 PG 2051

OLIVIA WITHROW
DB 1065 PG 243

FRANK THOMAS HANNAH
DB 15C PG 170

OMAR MOLETTE
DB 1719 PG 150

SITE 1

SHELBY BYPASS

N 82°07' 30" E

VICE BROOKS
DB 131 PG 254

FRANK THOMAS HANNAH
DB 15C PG 170

FRANK TOMS, JR.
DB. 1269 PG 538

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

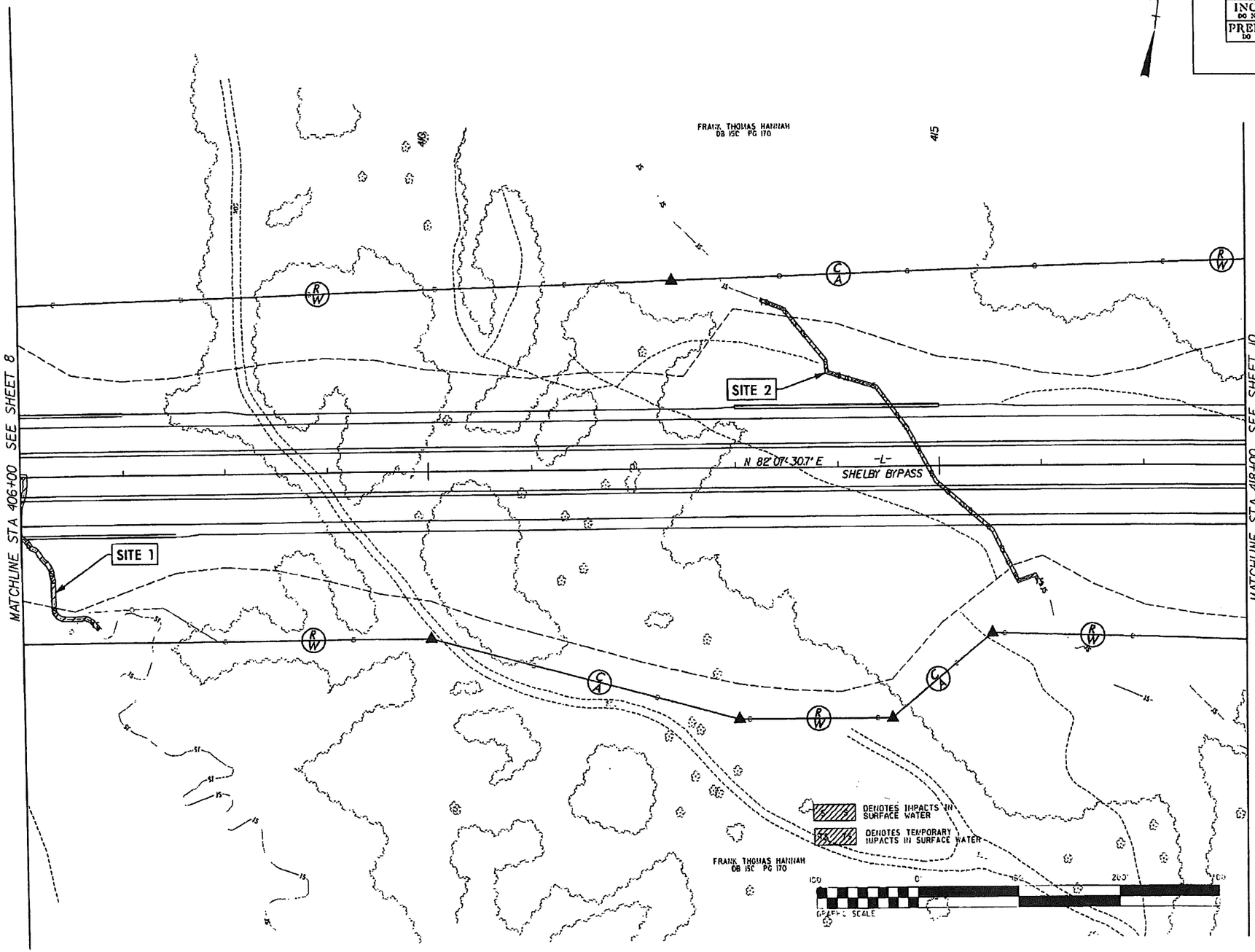
FRANCES LEDFORD
DB 187 PG 364

GRAPHIC SCALE

FOR -L- PROFILE SEE SHEET 50

PROJECT REFERENCE NO	SHEET NO.
R-2707C	9
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



FOR -L- PROFILE SEE SHEET 50

PROJECT REFERENCE NO	SHEET NO.
R-2707C	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

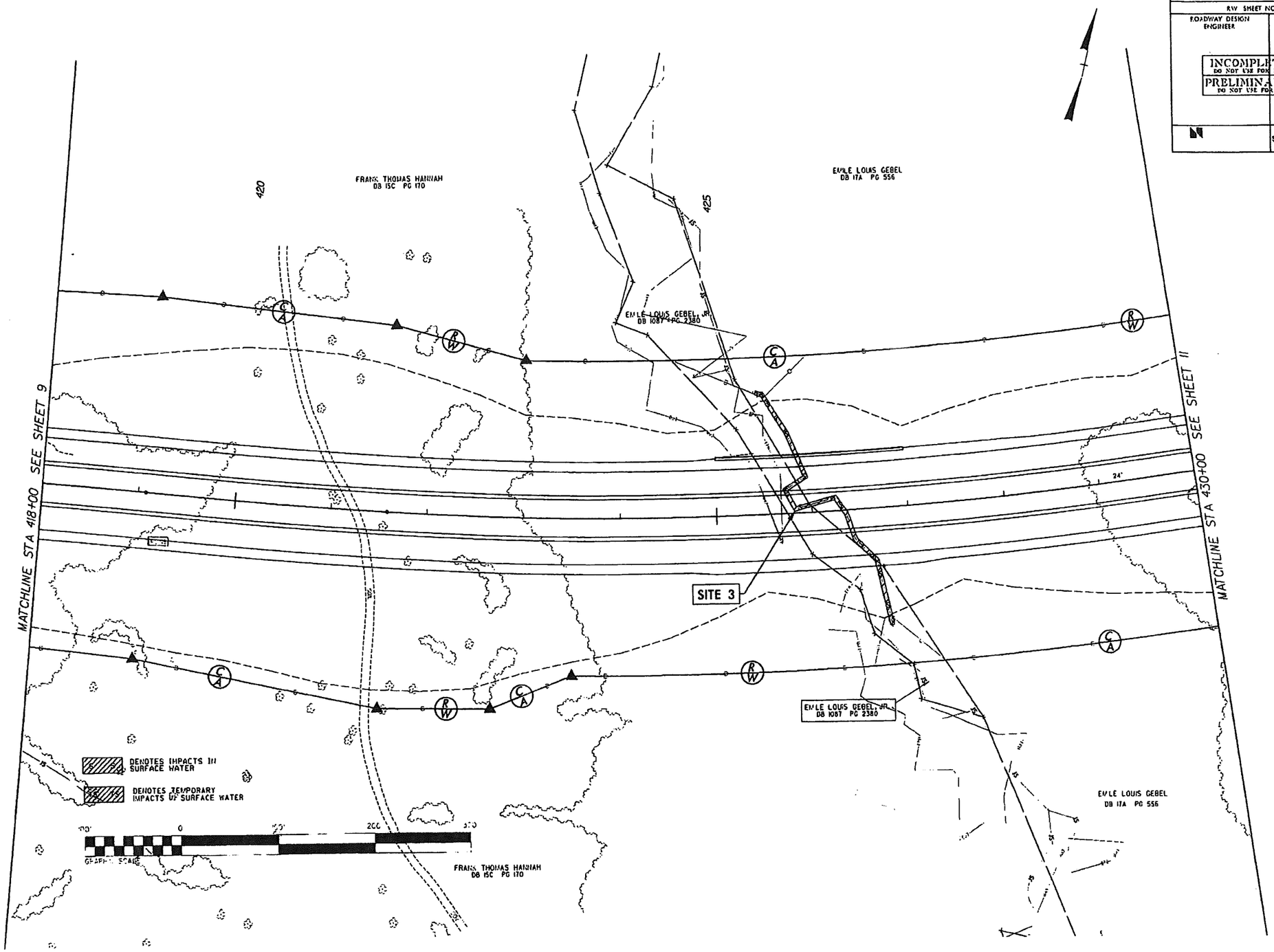
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FOR -L- PROFILE SEE SHEET 50

PROJECT REFERENCE NO	SHEET NO.
R-2707C	10
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

SDG

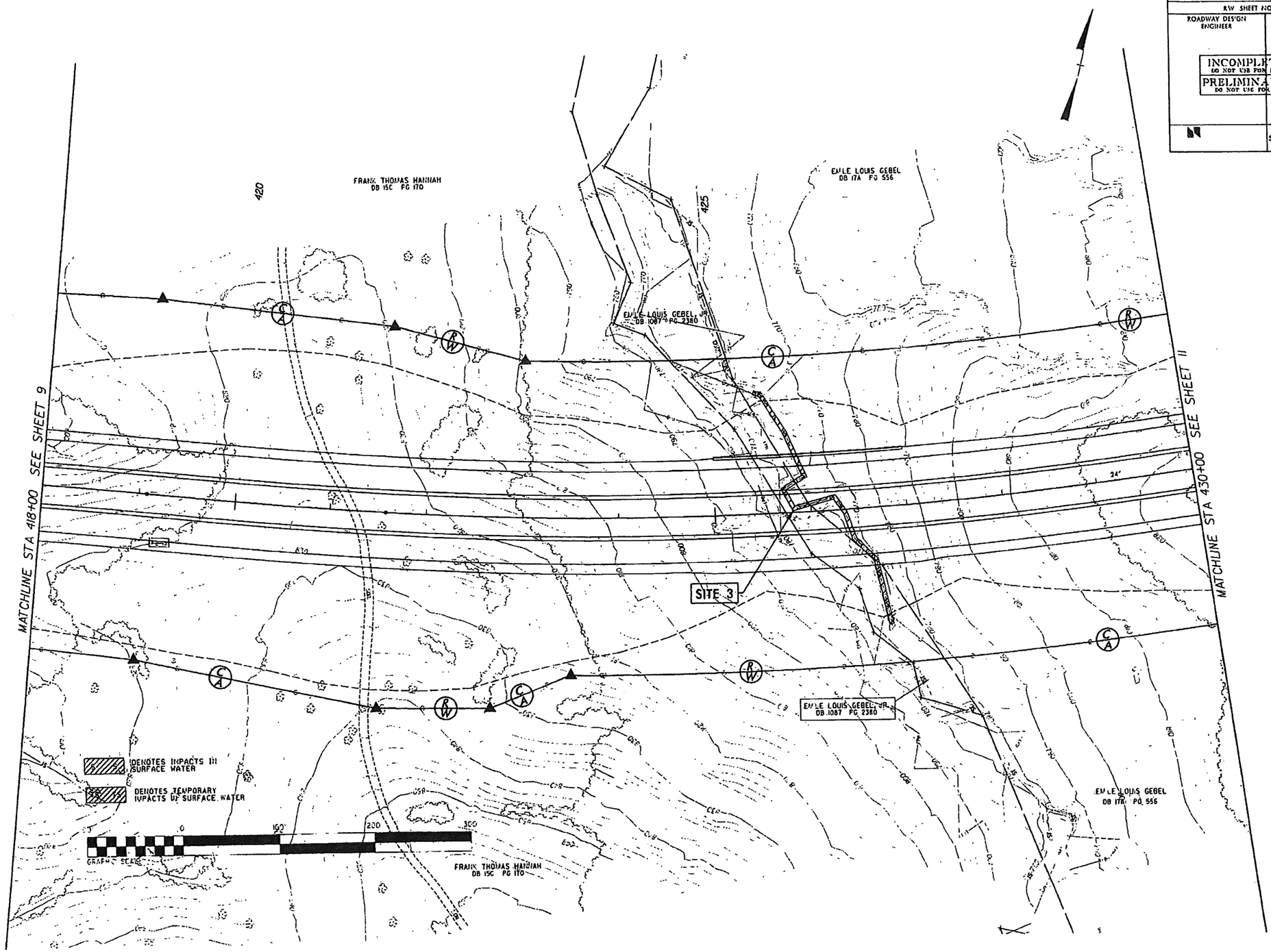


FOR -L- PROFILE SEE SHEET 51

PROJECT REFERENCE NO	SHEET NO.
R-2707C	10
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

SDG



FOR -L- PROFILE SEE SHEET 51

PROJECT REFERENCE NO.	SHEET NO
R-2707C	51

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19115 JOHN C. REID

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19115 HENRY WELLS JR.

CHARLOTTE, N.C.

APPROVED FOR RIGHT OF WAY ACQUISITION

APPROVED FOR CONSTRUCTION

MOFFATT & NICHOL

SDG

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.
DRAINAGE AREA = 7.1 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 194 CFS
DESIGN HW ELEVATION = 773.35 FT
100 YEAR DISCHARGE = 226 CFS
100 YEAR HW ELEVATION = 774.18 FT
OVERTOPPING FREQUENCY = 1100 YRS
OVERTOPPING DISCHARGE = 1226 CFS
OVERTOPPING ELEVATION = 779.24 FT

BH = 20
PC = 786.98
N = 5818932 E = 1240005
8 INCH WALL IN BASE OF 24 INCH WHITE OAK
-L- STA 427+00.27 160.18 LT

EXISTING GRADE

PROPOSED GRADE

BL = 418+00.00
EC = 787.00
R = 849
VA = 600
DS = 70 MPH

-L- @ 4.35%

-L- Base of W. Wall Detail 'B'

SITE 3

FOR -L- PLAN SEE SHEET 10

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.
DRAINAGE AREA = 9.7 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 257 CFS
DESIGN HW ELEVATION = 796.91 FT
100 YEAR DISCHARGE = 283 CFS
100 YEAR HW ELEVATION = 796.91 FT
OVERTOPPING FREQUENCY = 1100 YRS
OVERTOPPING DISCHARGE = 1189 CFS
OVERTOPPING ELEVATION = 804.90 FT

BH = 18
EC = 796.79
N = 5824854 E = 1241400
8 INCH WALL IN BASE OF 24 INCH RED OAK
-L- STA 439+36.38 76.35 LT

EXISTING GRADE

PROPOSED GRADE

-L- @ 4.35%

-L- Base of W. Wall Detail 'A'

FOR -L- PLAN SEE SHEET 11

PROJECT REFERENCE NO	SHEET NO.
R-2707C	11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

EMILE LOUIS GEBEL
DB 17A PG 556

435

440

DR. GARY L. MANGUM
DB 1240 PG 2358

SITE 4

CAT-1

GRAU-350

MATCHLINE STA 430+00 SEE SHEET 10

MATCHLINE STA 442+00 SEE SHEET 12

SITE 4

TOE

EMILE LOUIS GEBEL
DB 17A PG 556

DR. GARY L. MANGUM
DB 1240 PG 2358

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

0 50 100 300

GRAPHIC SCALE

FOR -L- PROFILE SEE SHEET 51

PROJECT REFERENCE NO	SHEET NO
R-2707C	11
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

MATCHLINE STA 430+00 SEE SHEET 10

MATCHLINE STA 442+00 SEE SHEET 12

EMILE LOUIS GEBEL
DB 11A PG 556

DR. GARY L. MANGUM
DB 1240 PG 2358

SITE 4

SITE 4

CAT-1

GRAU-350

TDE

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

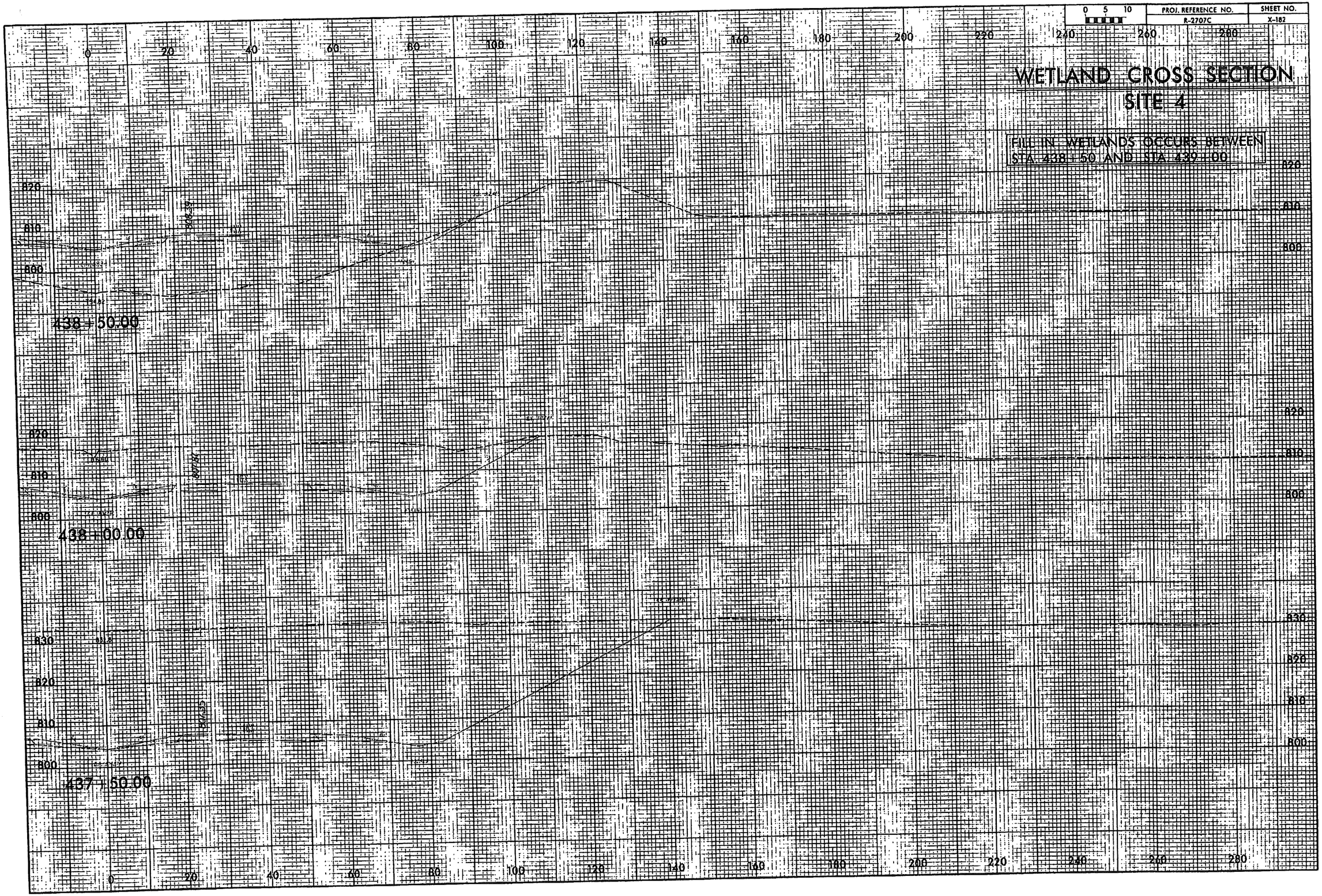
GRAPHIC SCALE

FOR -L- PROFILE SEE SHEET 51

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2707C	X-182

WETLAND CROSS SECTION
SITE 4

FILL IN WETLANDS OCCURS BETWEEN STA. 438+50 AND STA. 439+00



PROJECT REFERENCE NO.	SHEET NO.
R-2707C	12
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

MATCHLINE STA 17+00 -Y3- SEE SHEET 31

MATCHLINE STA 442+00 SEE SHEET 11

MATCHLINE STA 454+00 SEE SHEET 13

MATCHLINE STA 25+00 -Y3- SEE SHEET 32

EMILE LOUIS GEBEL
DB 174 PG 556

DR. GARY L. MANGUM
DB 1240 PG 2358

MINOR LEE MELTON
DB 1066 PG 294
PB 20 PG 87

DR. GARY L MANGUM
DB 165 PG 153

445

20

150'

BANK STABILIZATION

SITE 5

PDE

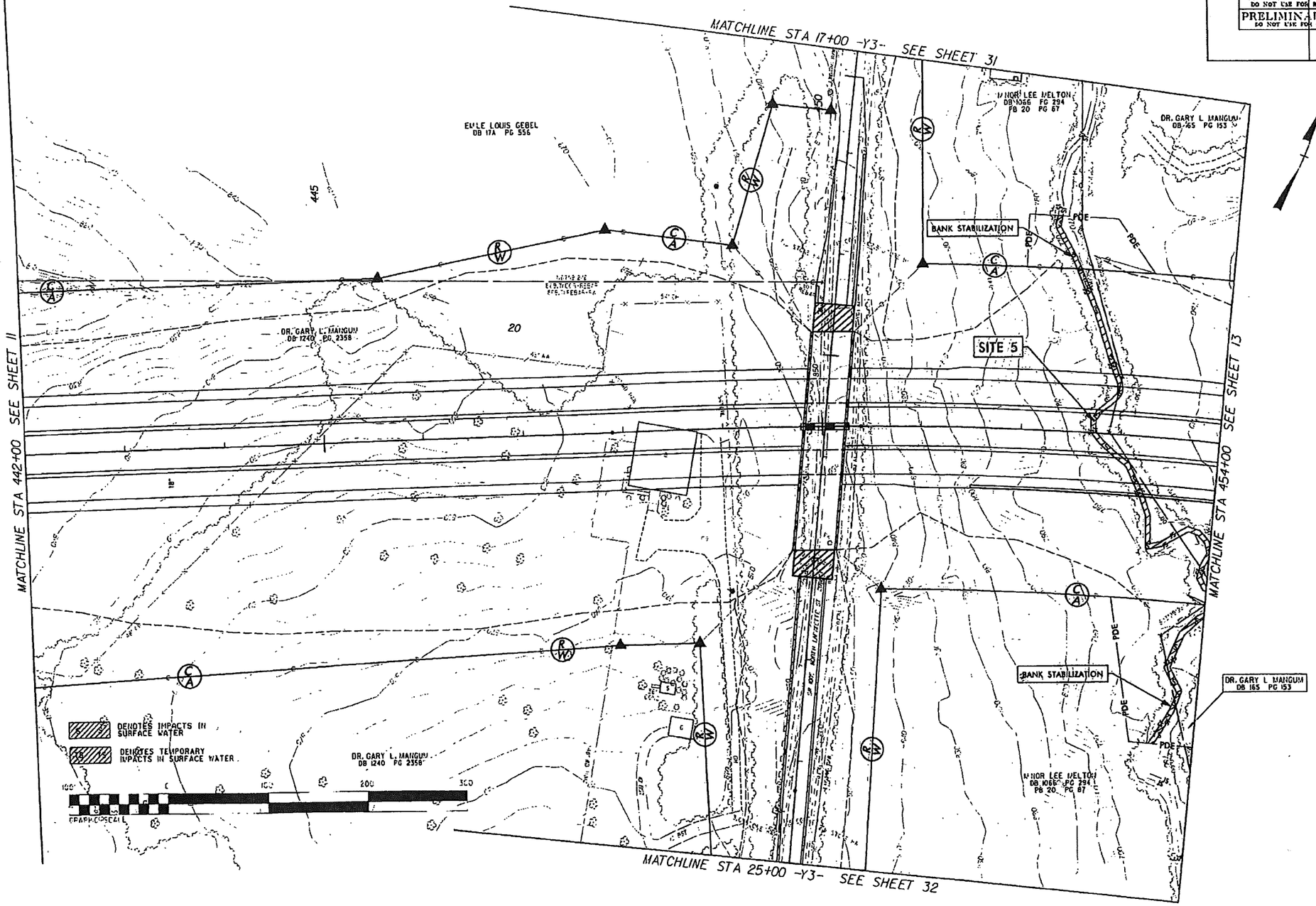
DENOTES IMPACTS IN SURFACE WATER

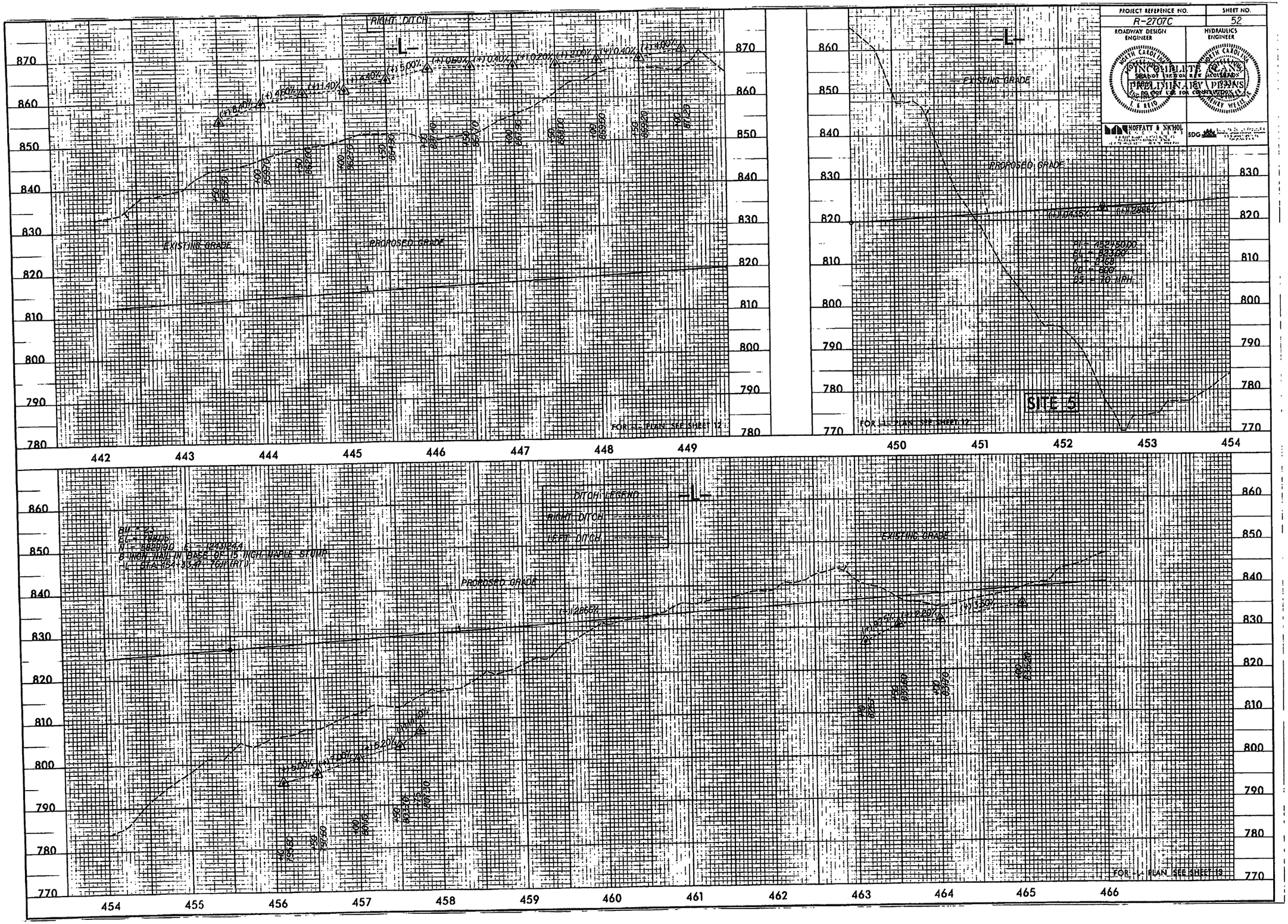
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

GRAPHIC SCALE
100' 0 100' 200' 300'

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	12
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




PROJECT REFERENCE NO.
R-2707C
SHEET NO.
52
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
PRELIMINARY PLANS
MOFFATT & NICHOL
SDG
RIGHT DITCH
-L-
EXISTING GRADE
PROPOSED GRADE
FOR -L- PLAN SEE SHEET 12
SITE 5
DITCH LEGEND
RIGHT DITCH
LEFT DITCH
FOR -L- PLAN SEE SHEET 13

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	13
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

DR. GARY L. MANGUM
DB 165 PG 153

460

455

465

CLEVELAND PROPERTIES
DB 16H PG 721

CHORD

SEE SHEET 12

MATCHLINE STA 454+00

MATCHLINE STA 466+00

SEE SHEET 14

TDE

SITE 5

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

150 0 100 200 300

GRAPHIC SCALE

DR. GARY L. MANGUM
DB 165 PG 153

CLEVELAND PROPERTIES
DB 16H PG 721

FOR -L- PROFILE SEE SHEET 52

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	13
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

DR. GARY L MANGUM
DB 165 PG 153

CLEVELAND PROPERTIES
DB 16H PG 721

MATCHLINE STA 454+00 SEE SHEET 12

MATCHLINE STA 466+00 SEE SHEET 14

TDE

SITE 5

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DR. GARY L MANGUM
DB 165 PG 153

CLEVELAND PROPERTIES
DB 6H PG 721

FOR -L- PROFILE SEE SHEET 52

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	14
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

MATCHLINE STA 19+00 -Y4-REV SEE SHEET 33

CLEVELAND PROPERTIES
DB 164 PG 721

JAMES RICHARD SPANGLER
DB 108 PG 2183

DR. GARY L MANGUM
DB 165 PG 153

S 23°49'00"E

SITE 6

CHESTER PEELER
DB 108 PG 2183

MATCHLINE STA 466+00 SEE SHEET 15

MATCHLINE STA 478+00 SEE SHEET 15

CLEVELAND PROPERTIES
DB 16H PG 721

CLEVELAND PROPERTIES
DB 16H PG 721

CHESTER PEELER
DB 108 PG 2183

MATCHLINE STA 28+00 -Y4-REV SEE SHEET 34

MATCHLINE STA 15+00 -Y18-

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

GRAPHIC SCALE

FOR -L- PROFILE SEE SHEET 53
FOR -Y4-REV PROFILE SEE SHEET 77
FOR -Y18- PROFILE SEE SHEET 88

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	14
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

MATCHLINE STA 19+00 -Y4-REV SEE SHEET 33

MATCHLINE STA 466+00 SEE SHEET 13

MATCHLINE STA 478+00 SEE SHEET 15

MATCHLINE STA 28+00 -Y4-REV SEE SHEET 31

MATCHLINE STA 15+00 -Y18-

CLEVELAND PROPERTIES
DB 1614 PG 721

DR. GARY L. MANGUM
DB 1615 PG 153

JAMES RICHARD SPANGLER
DB 1108 PG 2183

CHESTER PEELER
DB 1108 PG 2183

SITE 6

S 23°44'00" E

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

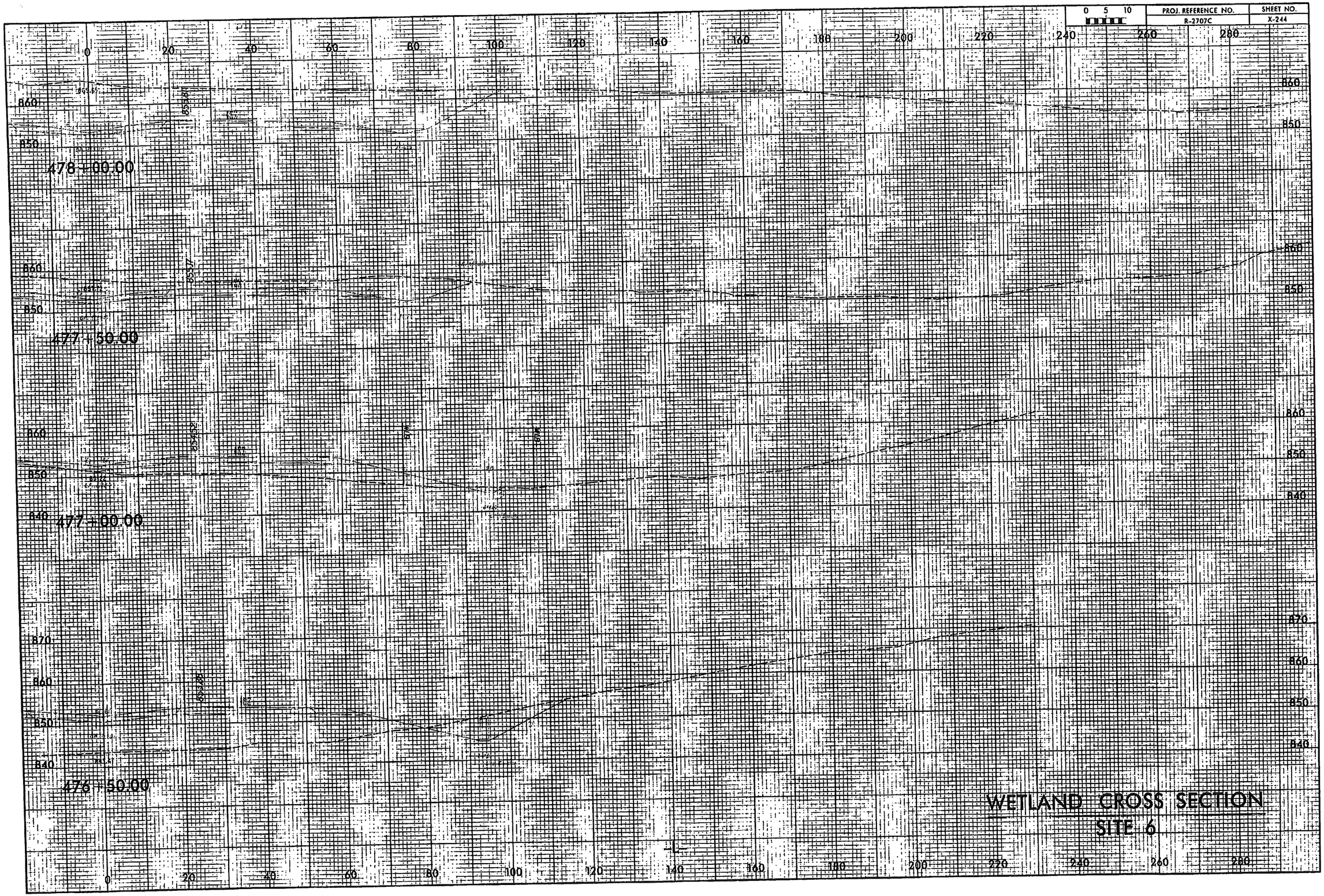
DENOTES MECHANIZED CLEARING

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

GRAPHIC SCALE

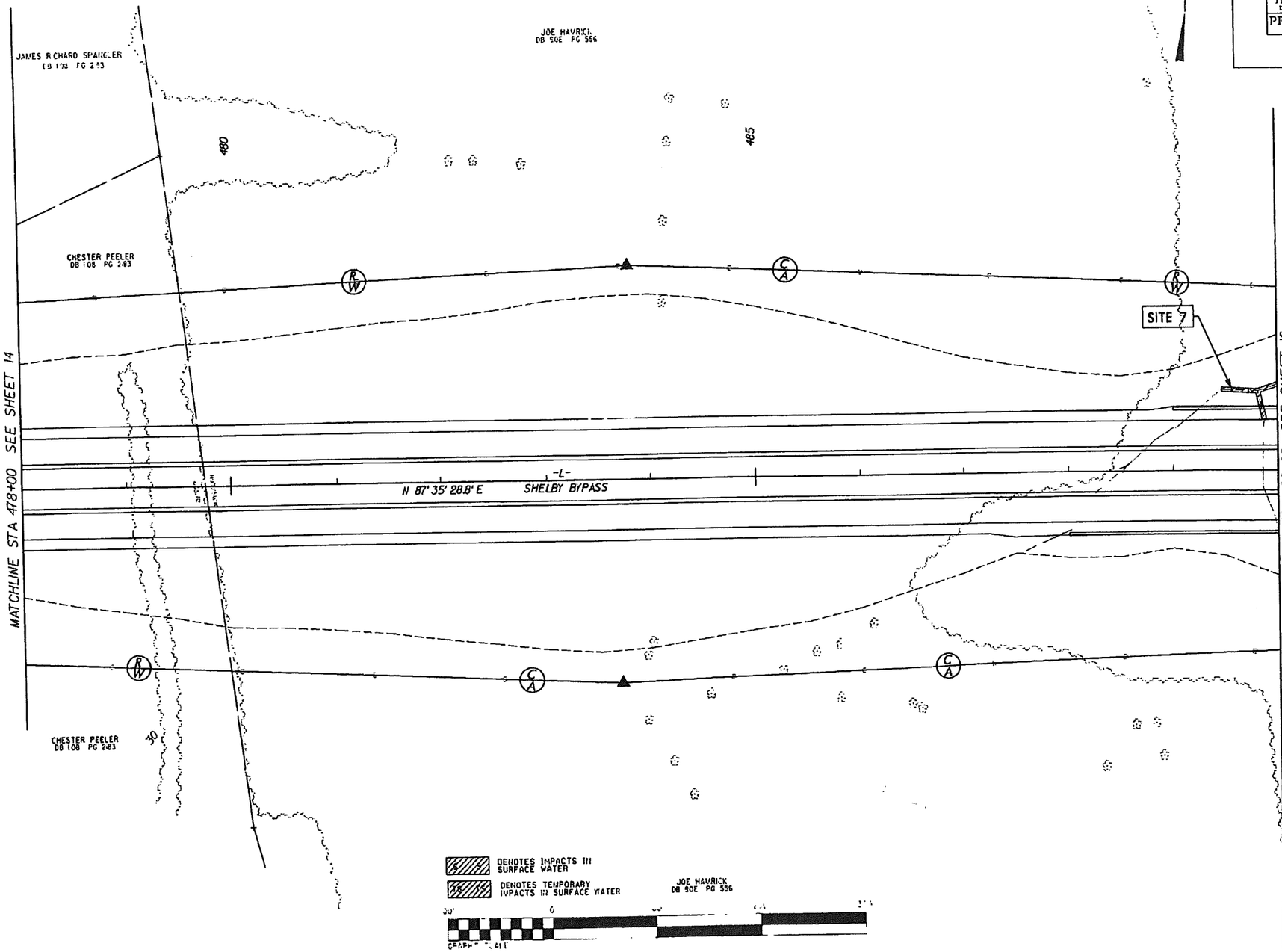
FOR -L- PROFILE SEE SHEET 53
FOR -Y4-REV PROFILE SEE SHEET 77
FOR -Y18- PROFILE SEE SHEET 88

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2707C	X-244



PROJECT REFERENCE NO.	SHEET NO.
R-2707C	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

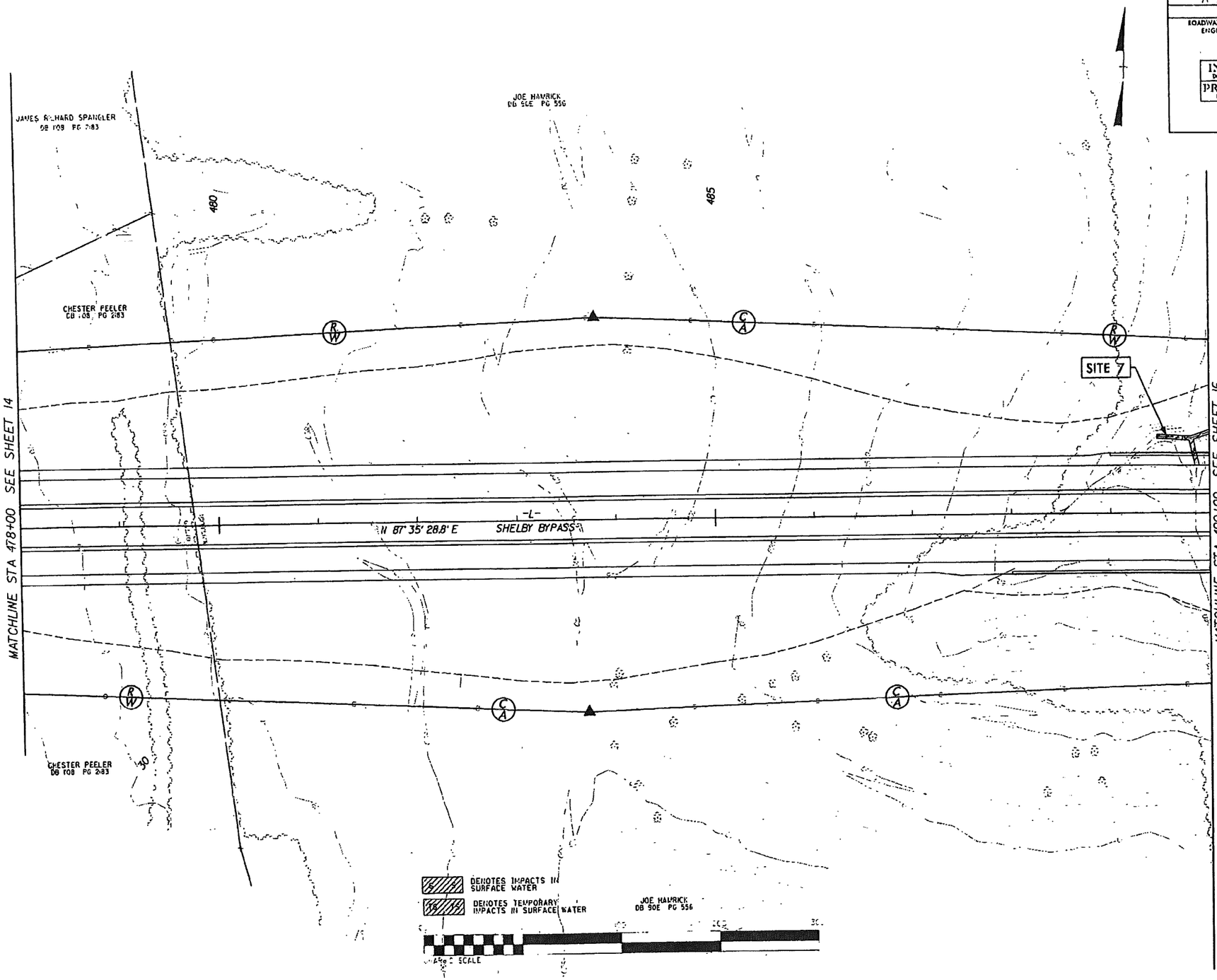
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



FOR -L- PROFILE SEE SHEET 53

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	15
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



FOR -L- PROFILE SEE SHEET 53

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	16
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

JOE HAVRICK
DB 90E PG 556

HAL DEDMON
DB 90E PG 556

CARRIE NORVILLE TESSNER
DB 17F PG 352

JOHN D. CROWDER, JR.
DB 15J PG 66

495

500

MATCHLINE STA 490+00 SEE SHEET 15

MATCHLINE STA 502+00 SEE SHEET 17

SITE 7

SITE 8

N 87° 35' 28.8" E

-L-
SHELBY BYPASS

CAT-1

GRAU-350

C/A

R/W

NELLIE MAE THRIFT
DB 16T PG 180

ROY FRANKLIN WRAY
DB 16R PG 600

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

0 100 200 300

GRAPHIC SCALE

FOR -L- PROFILE SEE SHEET 54

PROJECT REFERENCE NO.	SHEET NO.
R-2701C	16
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

JOE HAVRICK
DB 90E PG 556

HAL DEDMON
DB 90E PG 556

CARRIE NORVILLE TESSNER
DB 117 PG 382

JOHN D. CROWDER, JR.
DB 151 PG 66

MATCHLINE STA 490+00 SEE SHEET 15

SITE 7

SITE 8

N 87° 35' 28.8" E

-L-
SHELBY BYPASS

CAT-1

GRAU-350

MATCHLINE STA 502+00 SEE SHEET 17

NELLIE MAE THRIFT
DB 161 PG 180

ROY FRANKLIN WRAY
DB 161 PG 600

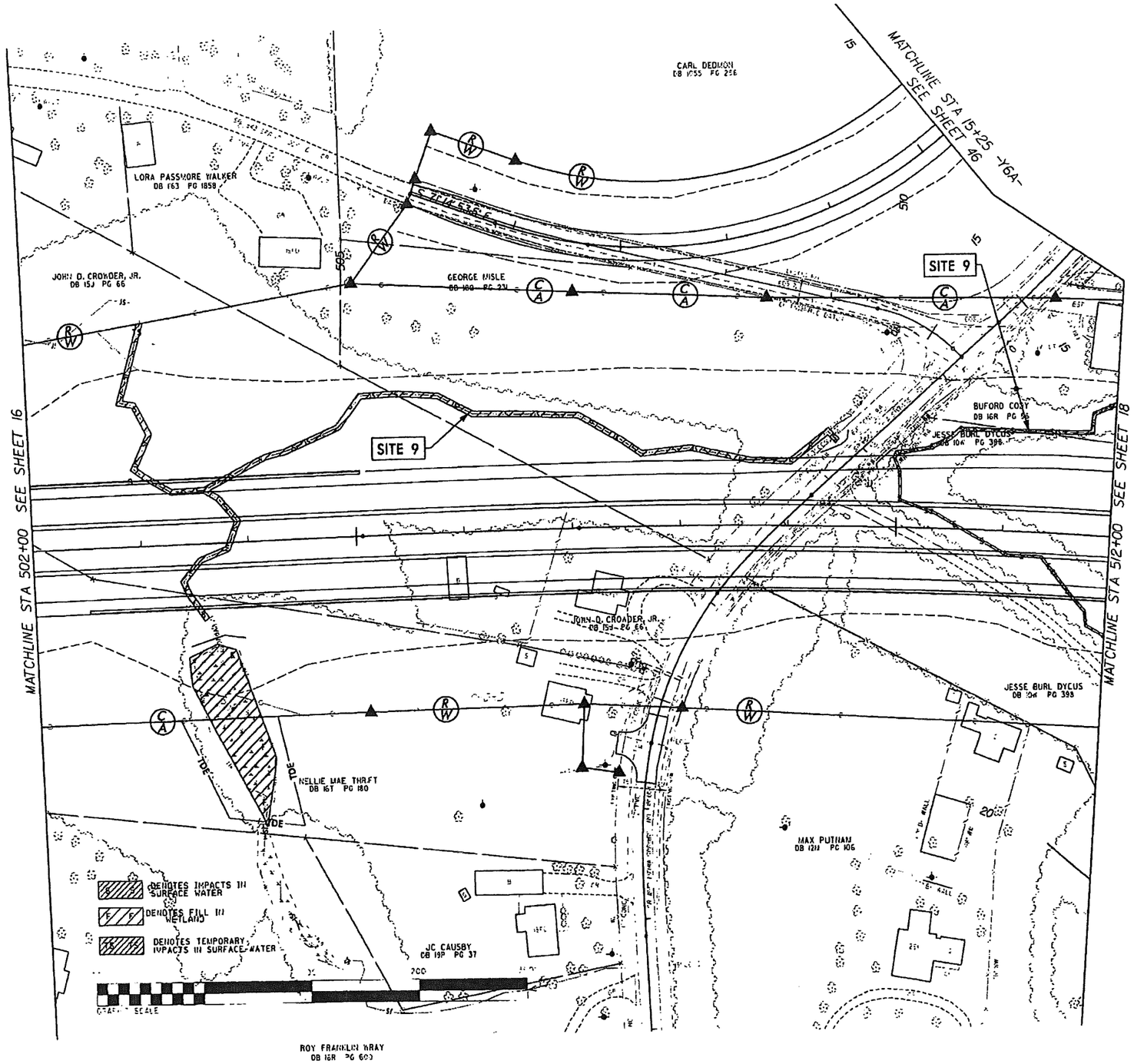
DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHEET 54

PROJECT REFERENCE NO	SHEET NO.
R-2707C	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

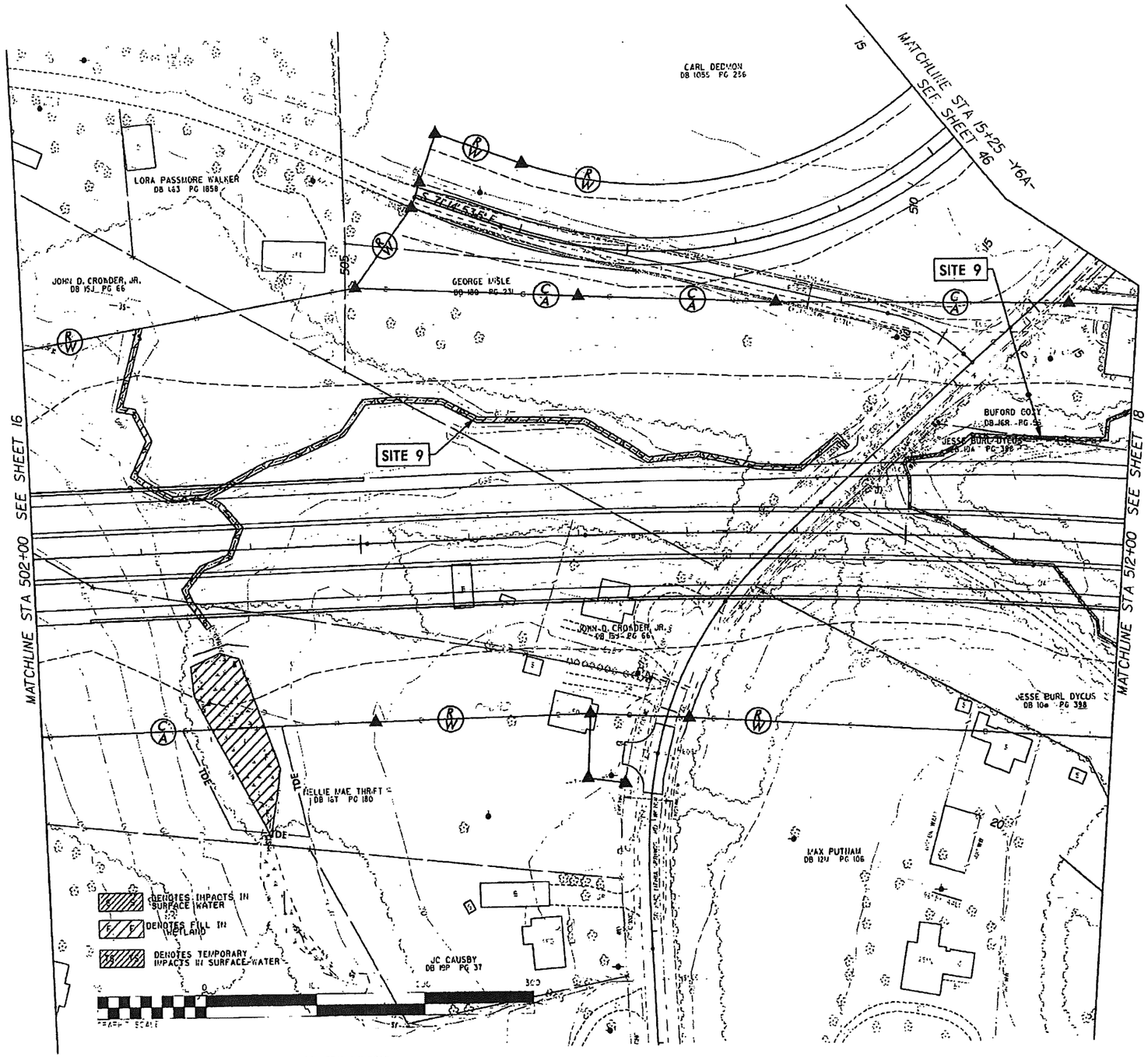
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



FOR -L- PROFILE SEE SHEET 54
FOR -Y6A- PROFILE SEE SHEET 78

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



FOR -L- PROFILE SEE SHEET 54
FOR -Y6A- PROFILE SEE SHEET 78

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	18
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

CARL DEDMON
DB 1055 PG 256

BUFORD CODY
DB 1611 PG 56

B BUSINESS CORPORATION
DB 1049 PG 404

SITE 9

SITE 9

B BUSINESS CORPORATION
DB 1049 PG 404

JESSE BURL DYCUS
DB 104 PG 398

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

MAX PUTNAM
DB 1214 PG 106

FRED FALLS HARRILL
DB 1202 PG 2467

MATCHLINE STA 5+00 SEE SHEET 17

STA 6+40 -RAMP B-

STA 5+60 -RAMP C-

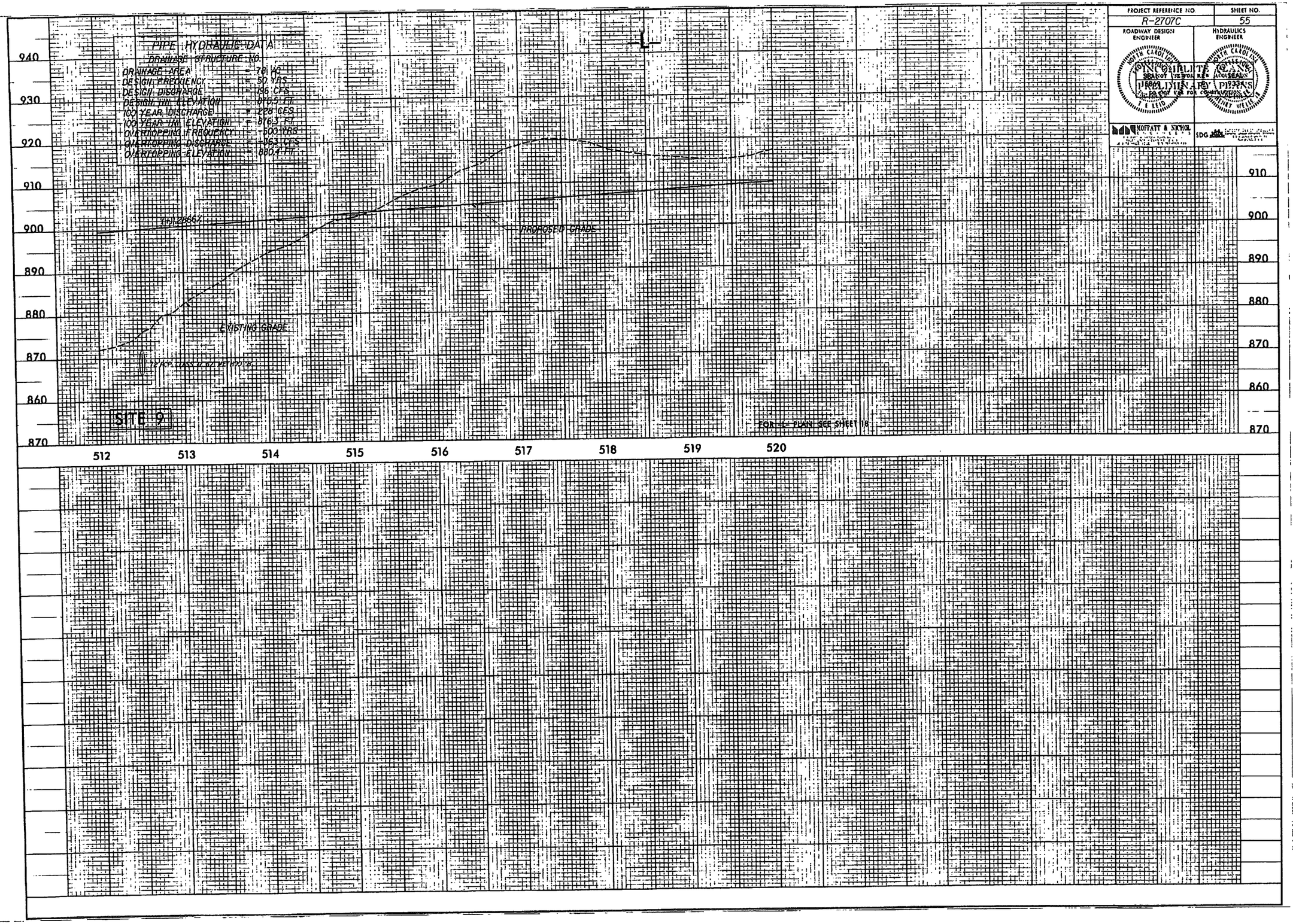
MATCHLINE STA 520+00 SEE SHEET 19

FOR -L- PROFILE SEE SHEET 55
FOR RAMP -B- PROFILE SEE SHEET 66
FOR RAMP -C- PROFILE SEE SHEET 67
FOR -Y6A- PROFILE SEE SHEET 78

PROJECT REFERENCE NO.	SHEET NO
R-2707C	18
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

FOR -L- PROFILE SEE SHEET 55
FOR RAMP -B- PROFILE SEE SHEET 66
FOR RAMP -C- PROFILE SEE SHEET 67
FOR -Y6A- PROFILE SEE SHEET 78



PROJECT REFERENCE NO.	SHEET NO.
R-2707C	55

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

MOFFATT & NICHOL ENGINEERS

SDG

PROJECT REFERENCE NO.	SHEET NO
R-2707C	19A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

B

C

SITE 10

CARL DEDMON DB 1055 PG 256

CARL DEDMON DB 140 PG 190

DIAN PENDLETON DB 1149 PG 350

VELMA PARKER OAKS DB 693 PG 613

MAXINE LAN. DANNEY DB 102 PG 74

ELIZABETH BULLMAN DB 426 PG 830

JERRY PENDLETON DB 1047 PG 653

DONALD TURNER DB BP PG 405

THURMAN TURNER DB 41 PG 558

RAYMOND FELTON DB 1251 PG 146

EARCIE CORNWELL DB 76 PG 309

B BUSINESS CORPORATION DB 1049 PG 404

STA 6+40 RAMP -B-

STA 5+60 RAMP -C-

MATCHLINE STA 520+00 SEE SHEET 18

REMOVE PIPE & CB'S

REMOVE

REMOVE PIPES & CB'S

STD BERM DITCH STA 9+50 TO 16+00 RAMP -C- LT

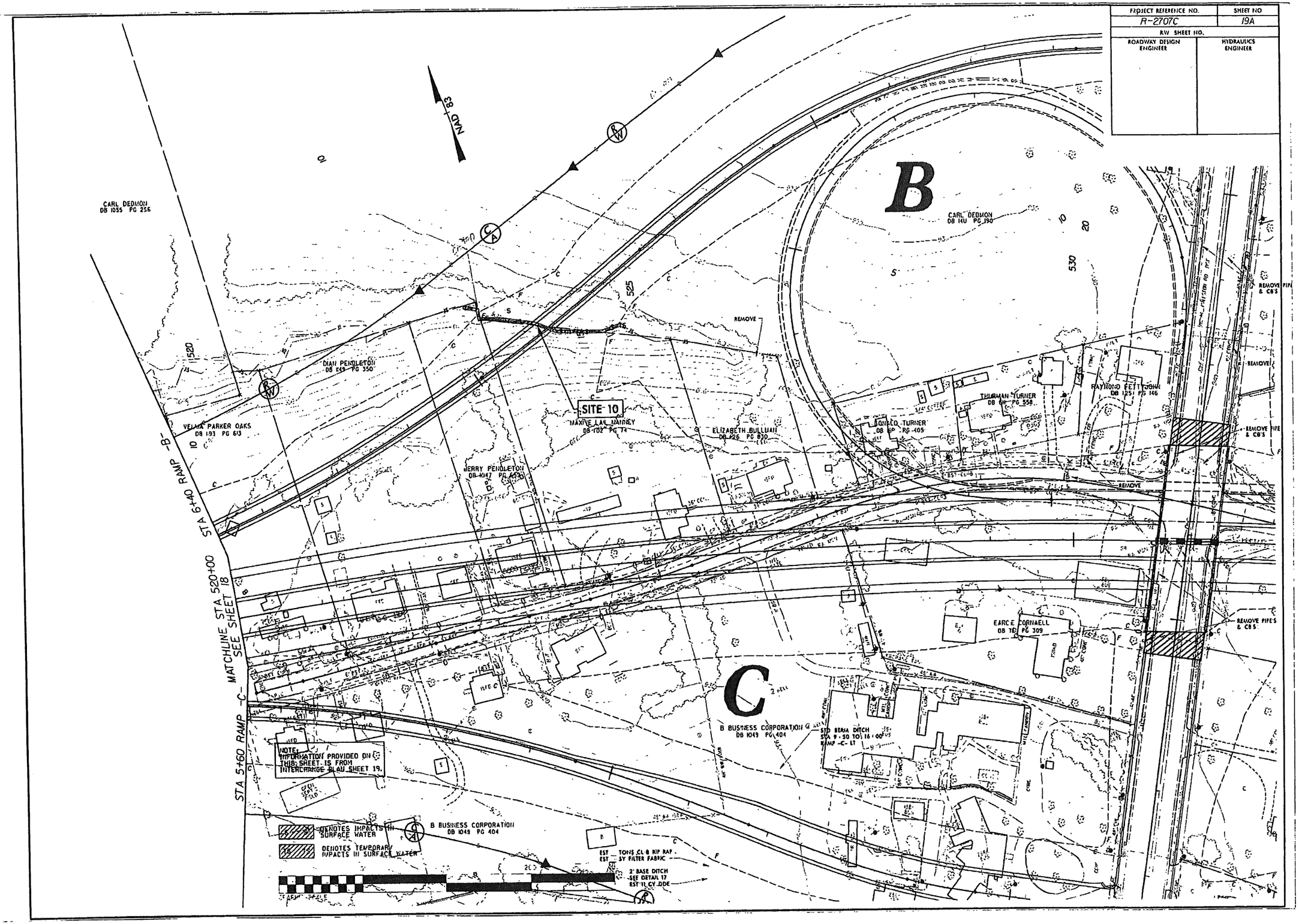
NOTE: INFORMATION PROVIDED ON THIS SHEET IS FROM INTERCHANGE PLAN SHEET 19.

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

EST ___ TONS CL B RIP RAP
EST ___ SY FILTER FABRIC

2' BASE DITCH SEE DETAIL 17
EST 11 CY DDE



PROJECT REFERENCE NO.
R-2707C
SHEET NO
19A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NAD 83
B
C
CARL DEDMON
DB 1055 PG 256
CARL DEDMON
DB 1410 PG 190
DIAN PENDLETON
DB 1549 PG 350
VELMA PARKER OAKS
DB 1193 PG 613
SITE 10
MAXINE LAY NANNEY
DB 1102 PG 74
ELIZABETH BULLMAN
DB 1126 PG 830
JERRY PENDLETON
DB 1047 PG 652
THURMAN TURNER
DB 611 PG 558
RAYMOND FETTYJOHN
DB 1251 PG 146
DONALD TURNER
DB 1 PG 405
EARCE CORNWELL
DB 1 PG 309
B BUSINESS CORPORATION
DB 1049 PG 404
STD BERM DITCH
STA 9+50 TO 16+00
RAMP -C- LT
STA 6+40 RAMP -B-
STA 5+60 RAMP -C-
MATCHLINE STA 520+00
SEE SHEET 18
REMOVE
REMOVE PIPE & CB'S
REMOVE PIPES & CB'S
NOTE:
INFORMATION PROVIDED ON THIS SHEET IS FROM INTERCHANGE PLAN SHEET 19.
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
B BUSINESS CORPORATION
DB 1049 PG 404
EST TONS CL B RIP RAP
EST SY FILTER FABRIC
2' BASE DITCH
SEE DETAIL 17
EST 11 CY DDE

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	19B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
HOFFMAN & NICHOL ENGINEERS	SDG

NOTE:
INFORMATION PROVIDED ON THIS SHEET IS FROM INTERCHANGE PLAN SHEET 19.

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

GRAPHIC SCALE

NAD 83

SITE 11

SITE 12

A

D

GEORGE V. BYRD
DB 5V PG 493

JAMES THEODORE DEDMON
DB 1080 PG 1396

SAMUEL MARK CHAMPION
DB 173 PG 2366

RAYMOND PETTIGREW
DB 1251 PG 146

DOROTHY HOYLE ELMORE
DB 179 PG 480

SUSAN AINSLEY TEDDY
DB 166 PG 397

ELIZABETH F. VINCENT
DB 184 PG 1245

GLADYS M. PENDLETON
DB 168 PG 242

CAT-1

GRAU-350

TYPE XI-MOD

IMPACT ATTENUATOR TYPE 350

CONCRETE BARRIER TYPE XI-MOD

MATCHLINE STA 543+00
SEE SHEET 20

STA 4+05 RAMP -D-

STA 8+85 RAMP -A-

PROJECT REFERENCE NO	SHEET NO.
R-2707C	19B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
MOFFATT & NICHOL ENGINEERS	SDG

NOTE:
INFORMATION PROVIDED ON THIS SHEET IS FROM INTERCHANGE PLAN SHEET 19.

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

GRAPHIC SCALE

NAD 83

SITE 11

SITE 12

GEORGE V. BYRD
DB 5V PG 493

JAMES THEODORE DEDMON
DB 1080 PG 1396

SAMUEL MARK CHAMPION
DB 473 PG 2366

RAYMOND CETTI JOHN
DB 1251 PG 146

WILLIAM [illegible]
DB 145 PG 6[illegible]

DOROTHY HOYLE ELMORE
DB 179 PG 480

SUSAN ANSLEY TEDDY
DB 766 PG 397

ELIZABETH P. VINCENT
DB 134 PG 1245

GLADYS M. PENDLETON
DB 168 PG 242

TYPE XI-MOD

IMPACT ATTENUATOR TYPE 350

CONCRETE BARRIER TYPE XI-MOD

GRAU-350

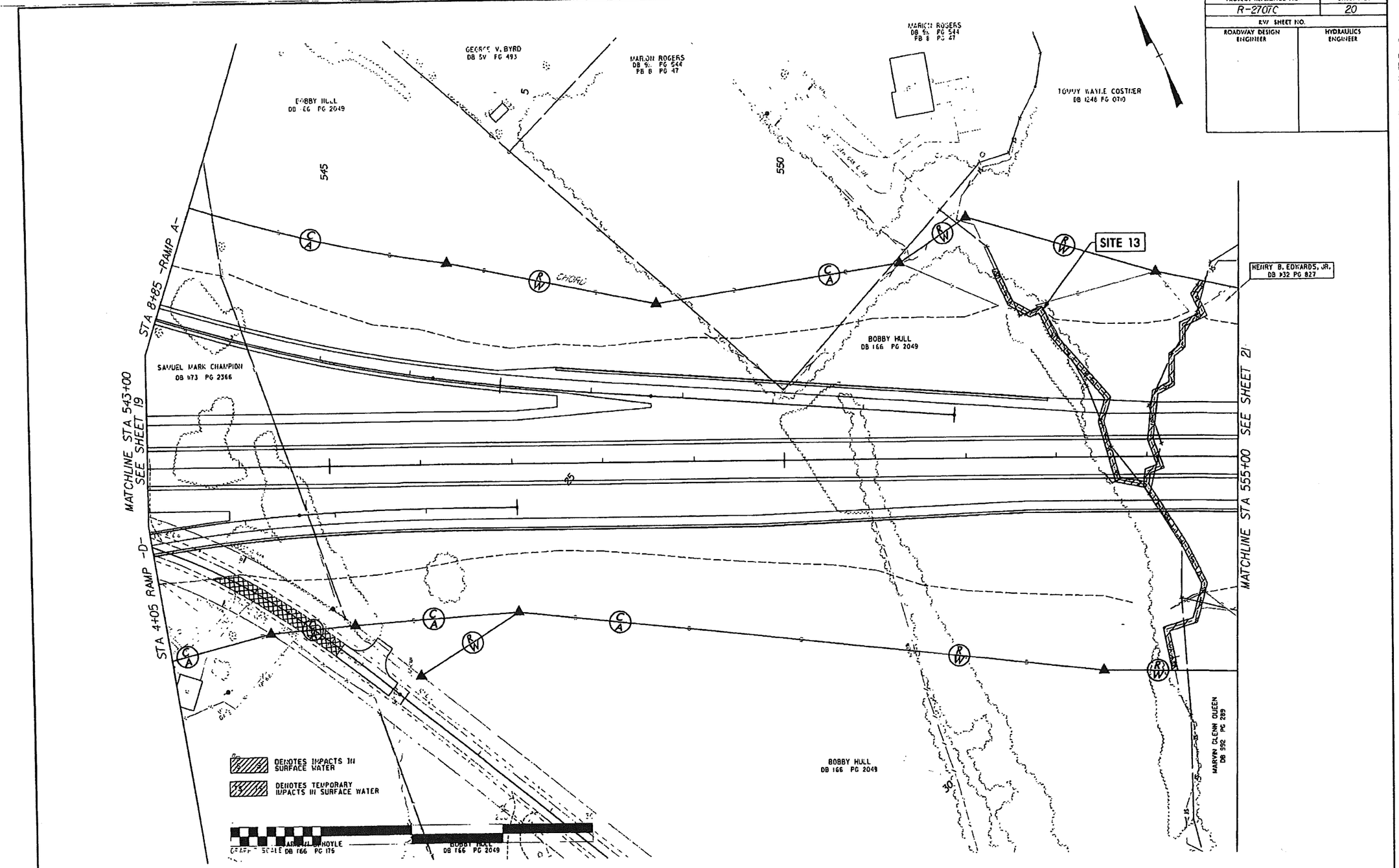
CAT-1

MATCHLINE STA 543+00
SEE SHEET 20

STA 8+85 RAMP -A-

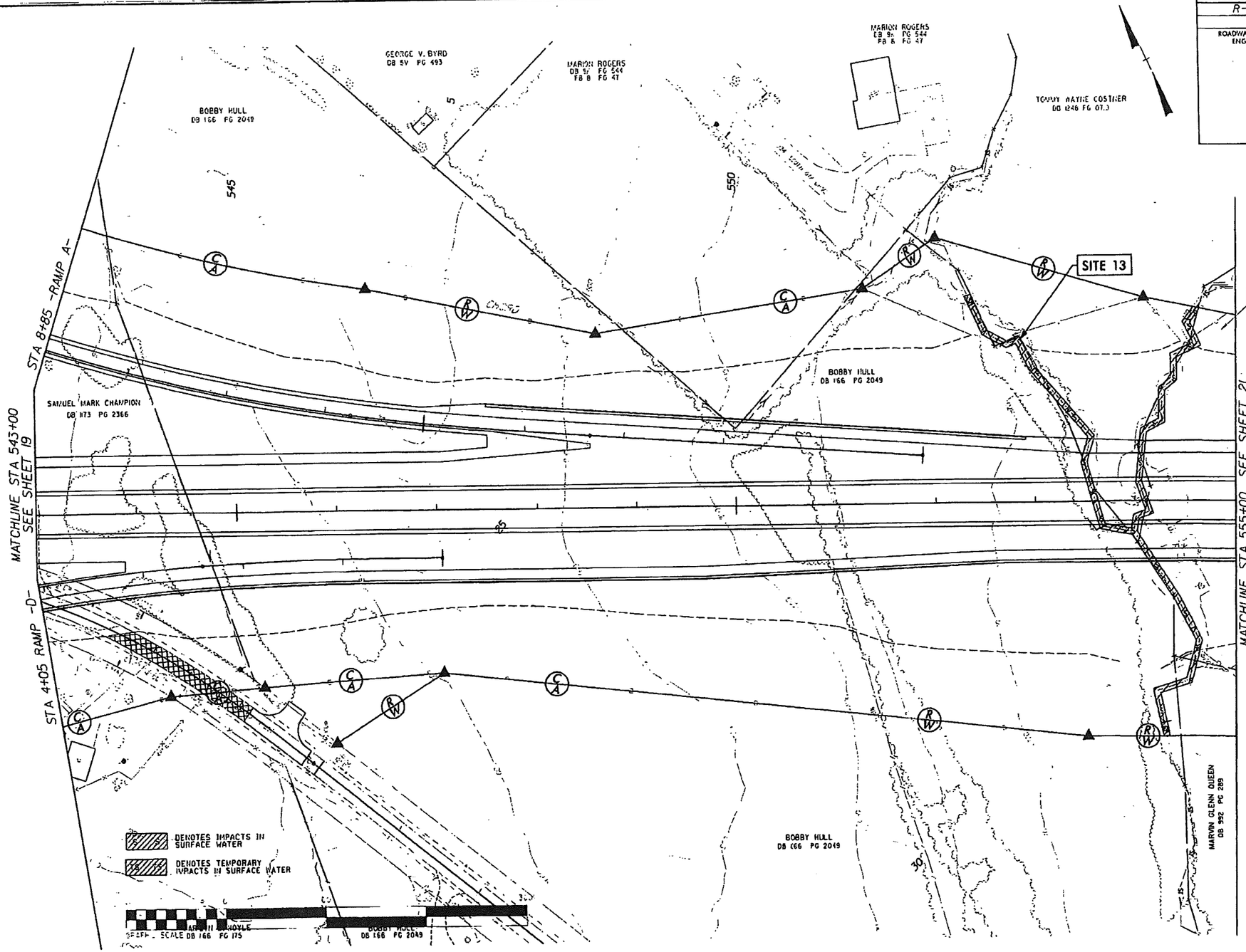
STA 4+05 RAMP -D-

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



FOR -L- PROFILE SEE SHEET 57
FOR RAMP -A- PROFILE SEE SHEET 65
FOR RAMP -D- PROFILE SEE SHEET 68

PROJECT REFERENCE NO	SHEET NO
R-2707C	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



FOR -L- PROFILE SEE SHEET 57
FOR RAMP -A- PROFILE SEE SHEET 65
FOR RAMP -D- PROFILE SEE SHEET 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	57

ROADWAY DESIGN ENGINEER

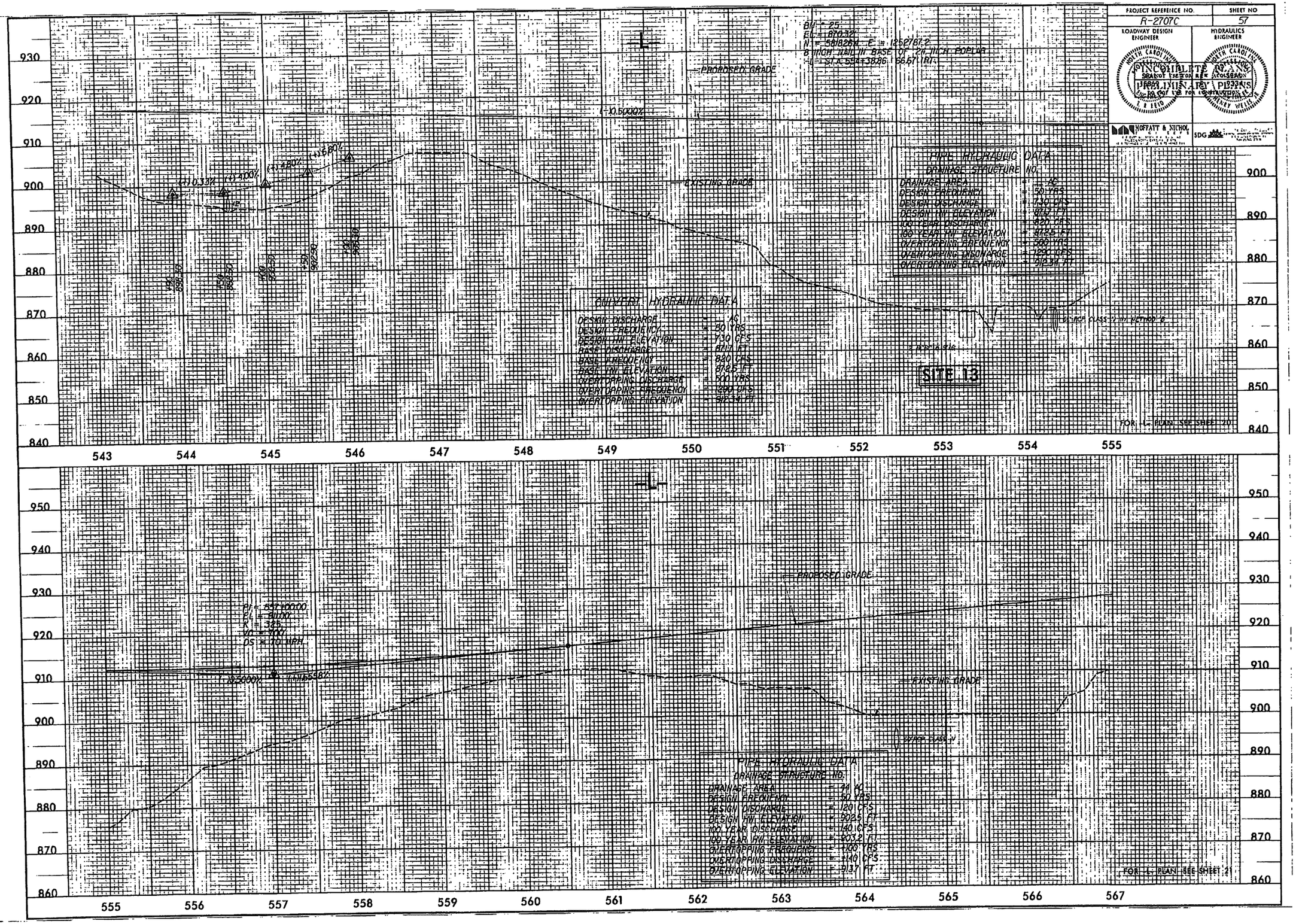
HYDRAULICS ENGINEER

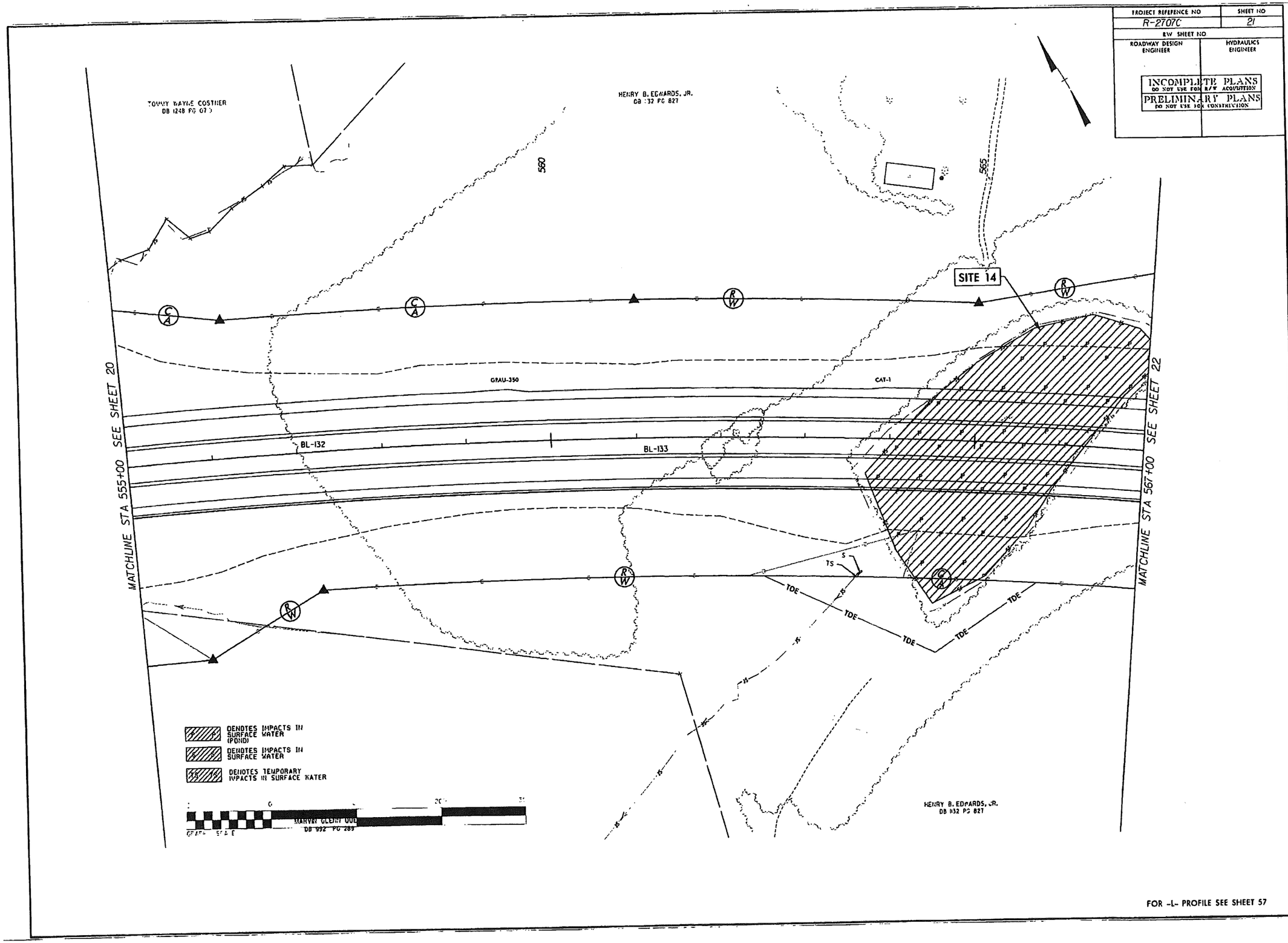
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 16002 REGISTERED ENGINEER T. R. FELD

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22336 REGISTERED ENGINEER STANLEY WELLS

HOFFATT & NICHOL

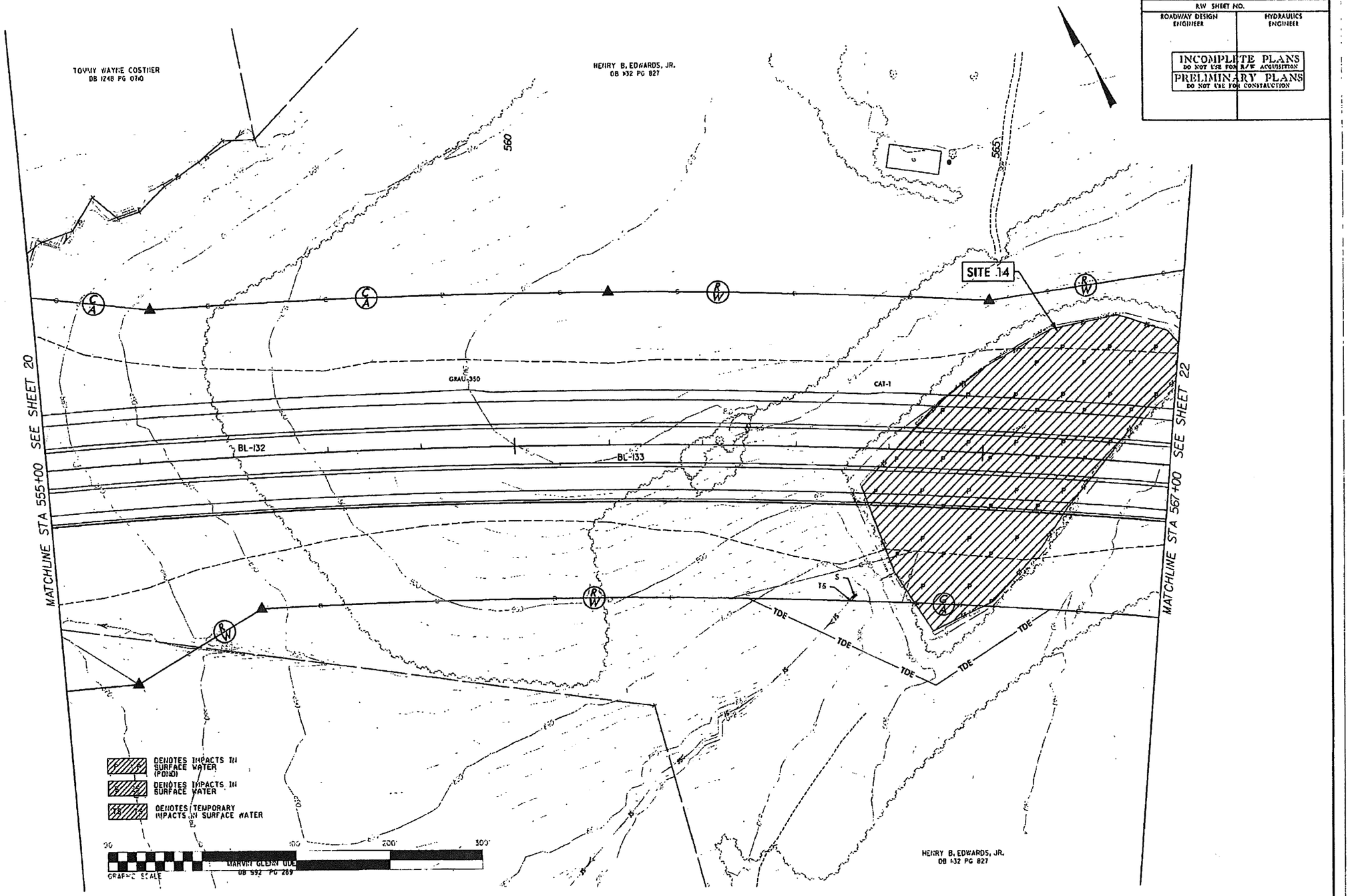
SDG




PROJECT REFERENCE NO
R-2707C
SHEET NO
21
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
TOMMY WAYNE COSTNER
DB 1248 PG 07
HENRY B. EDWARDS, JR.
DB 132 PG 827
560
565
SITE 14
GRAU-350
CAT-1
BL-132
BL-133
MATCHLINE STA 555+00 SEE SHEET 20
MATCHLINE STA 567+00 SEE SHEET 22
TDE
TS
DENOTES IMPACTS IN SURFACE WATER (POND)
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
MARVIN GLENN DUE
DB 992 PG 289
HENRY B. EDWARDS, JR.
DB 132 PG 827
FOR -L- PROFILE SEE SHEET 57

PROJECT REFERENCE NO	SHEET NO.
R-2707C	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

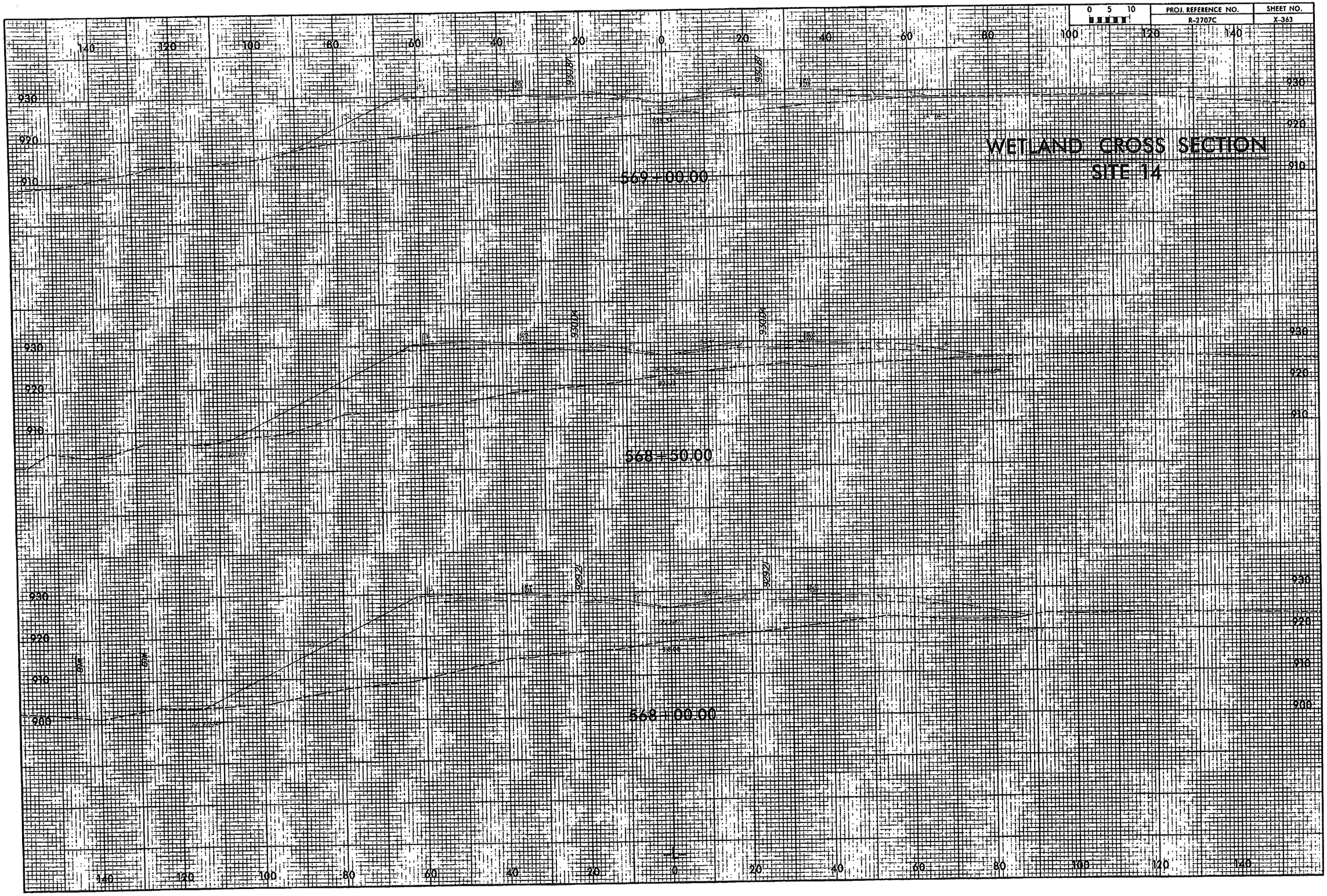
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



FOR -L- PROFILE SEE SHEET 57

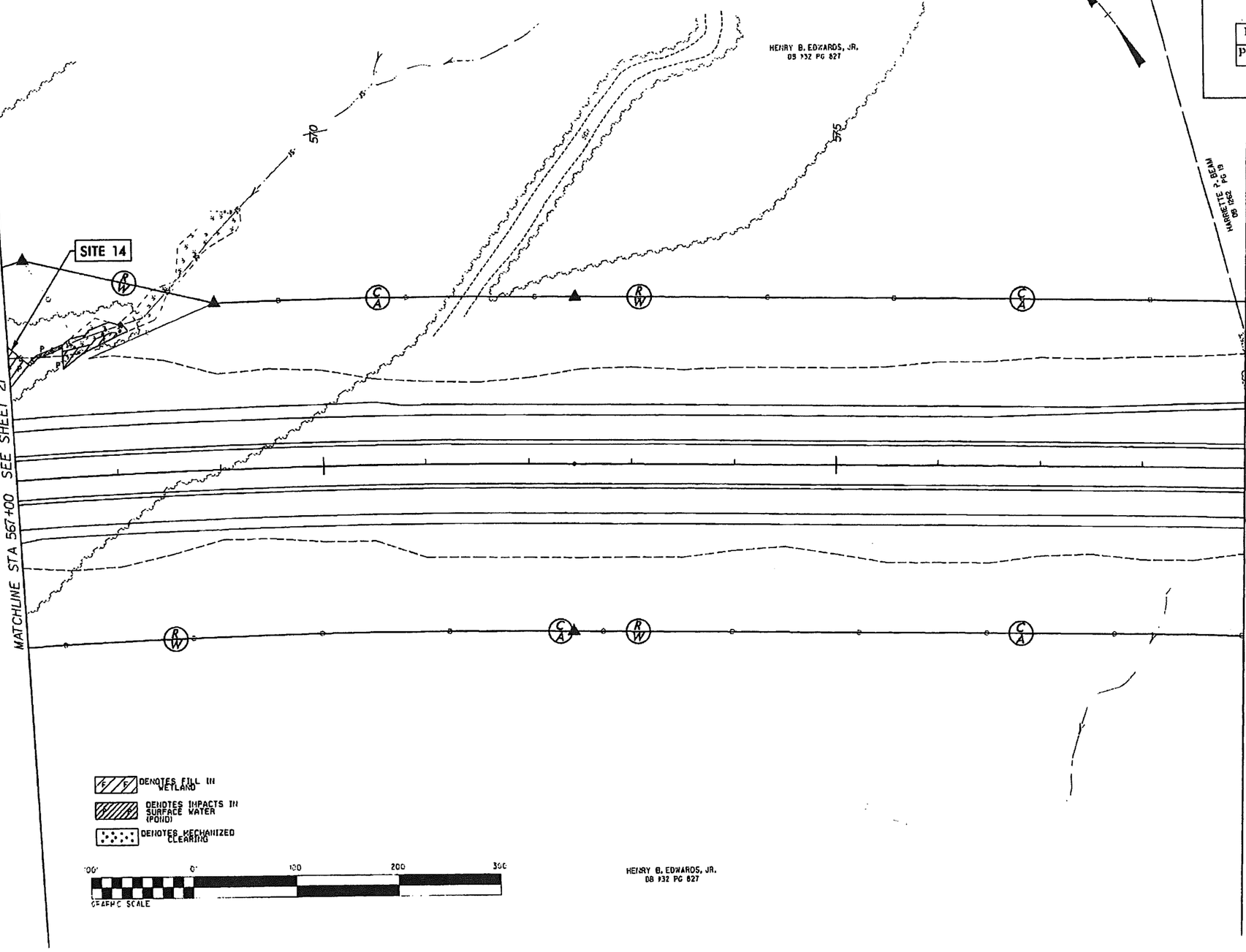
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2707C	X-363

WETLAND CROSS SECTION
SITE 14



PROJECT REFERENCE NO.	SHEET NO.
R-2707C	22
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



FOR -L- PROFILE SEE SHEET 58

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	22
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

HENRY B. EDWARDS, JR.
DB 932 PG 827

HARRIETTE P. BEAM
DB 1262 PG 19

SITE 14

MATCHLINE STA 567+00 SEE SHEET 21

MATCHLINE STA 579+00 SEE SHEET 23

DENOTES FILL-IN WETLAND

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES MECHANIZED CLEARING

100 0 100 200 300

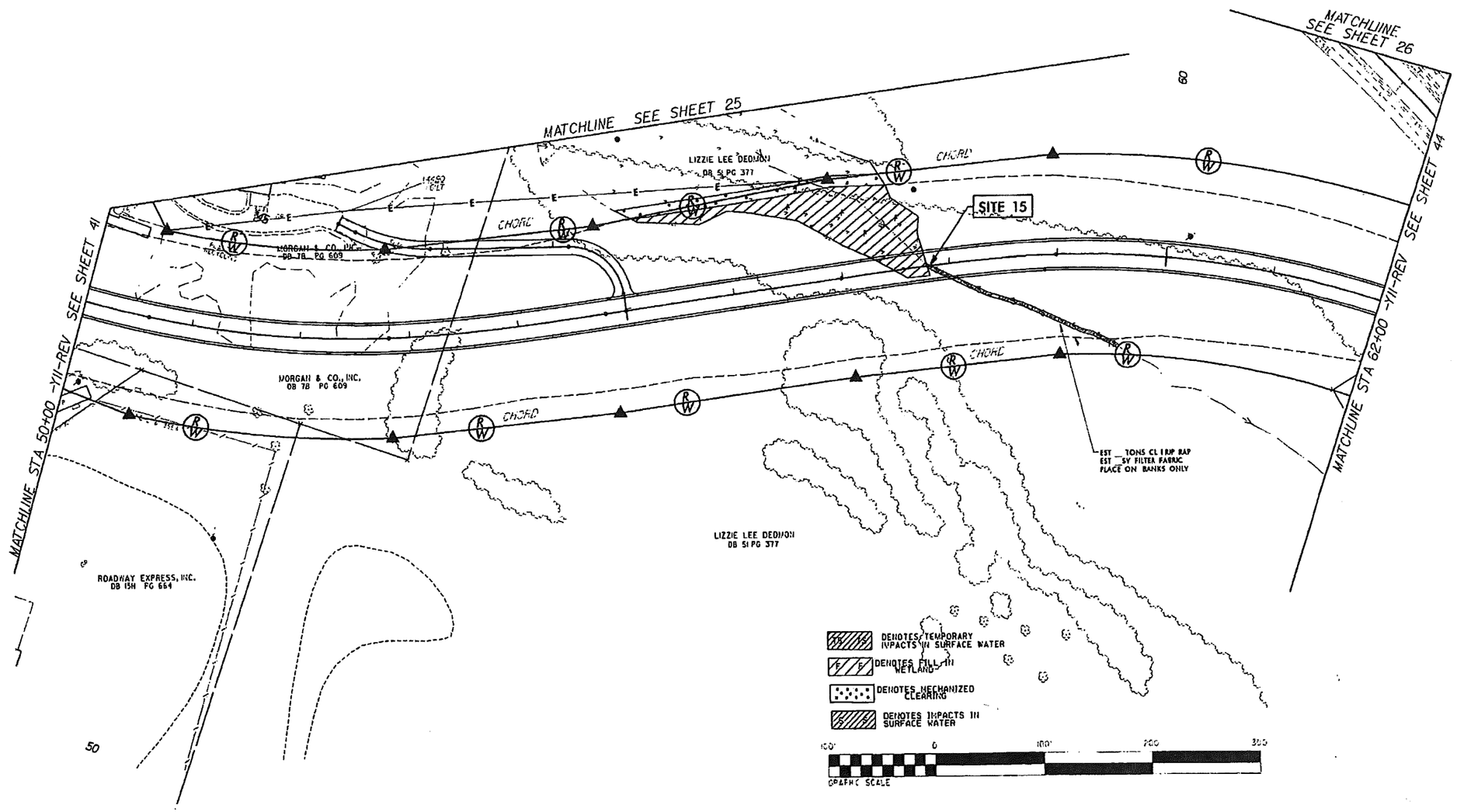
GRAPHIC SCALE

HENRY B. EDWARDS, JR.
DB 932 PG 827

FOR -L- PROFILE SEE SHEET 58

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	43
R/W SHEET NO	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

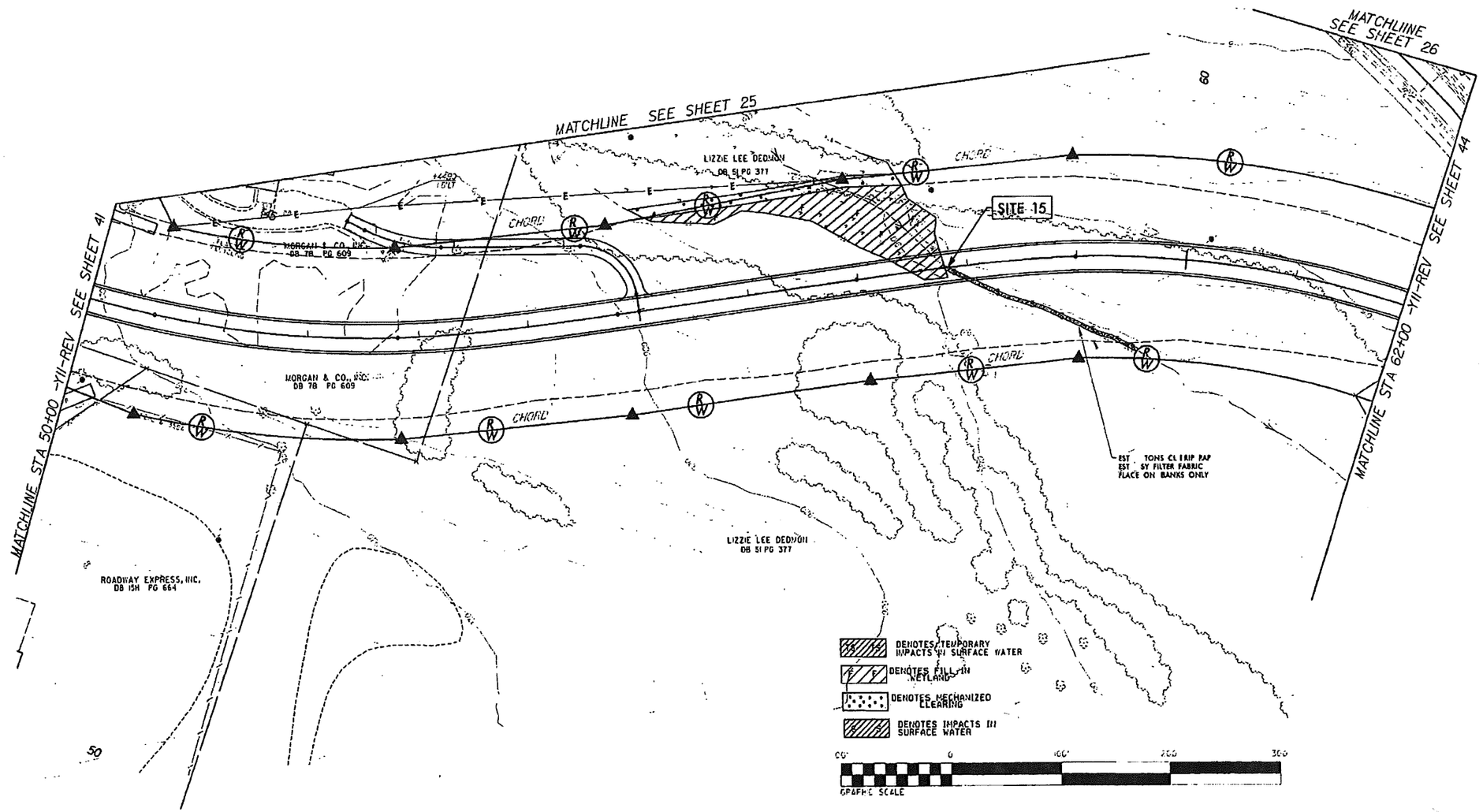
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



FOR -Y11-REV PROFILE SEE SHEETS 81 & 82

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	43
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



FOR -Y11-REV PROFILE SEE SHEETS 81 & 82

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	45
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

NAD 83

SITE 16

MATCHLINE STA 17+00 -Y16-REV SEE SHEET 40

POT Sta. 10+00.00

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR -Y16-REV PROFILE SEE SHEET 85
FOR -Y16A- PROFILE SEE SHEET 85

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	45
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

NAD 83

SITE 16

MATCHLINE STA 17+00 -Y16-REV SEE SHEET 40

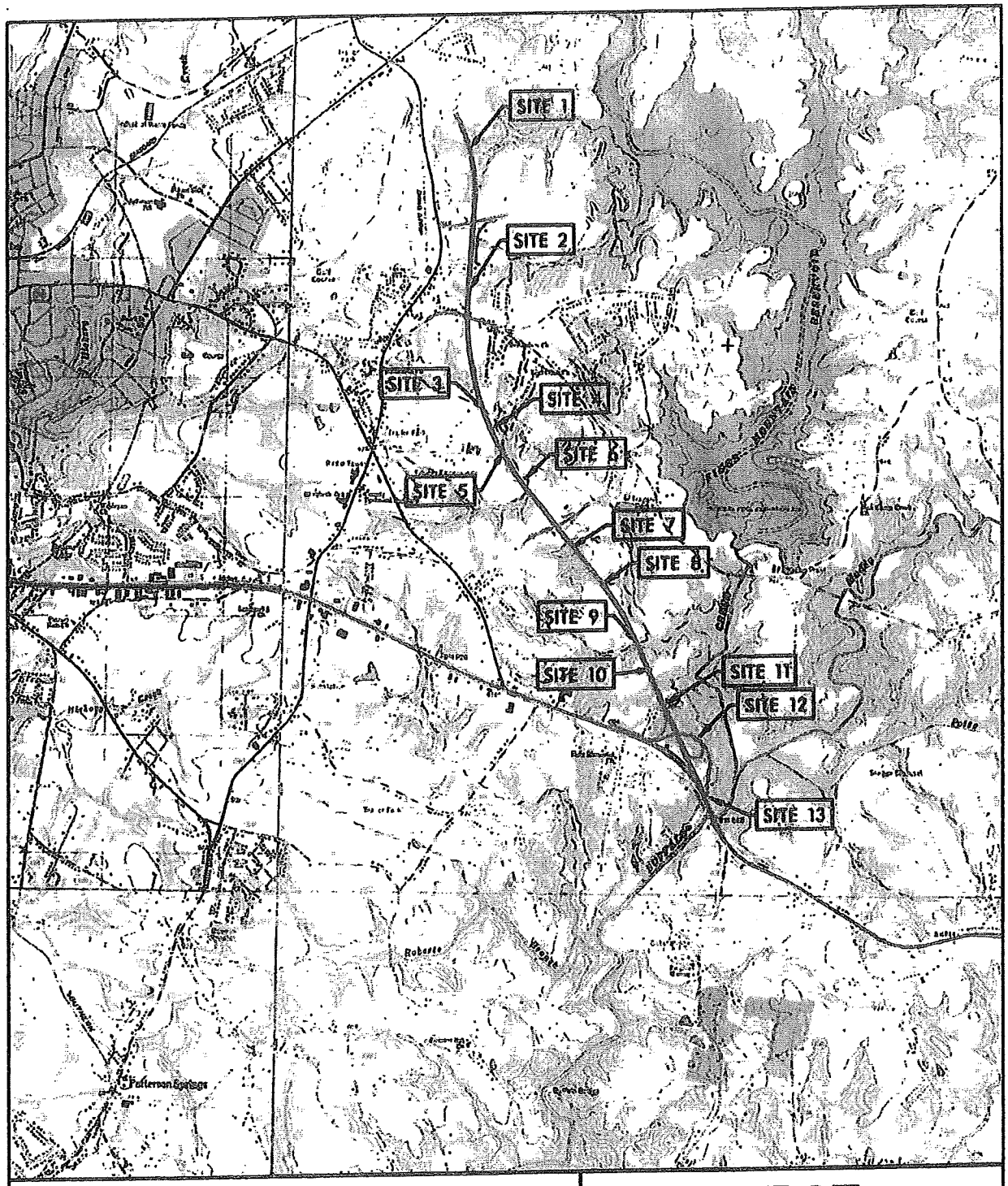
POT STA 10+00.00

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

200

FOR -Y16-REV PROFILE SEE SHEET 85
FOR -Y16A- PROFILE SEE SHEET 85



TOPO MAP

SCALE: 1" = 4000'

NCDOT

DIVISION OF HIGHWAYS
CLEVELAND COUNTY
PROJECT: R-2707D

US 74 - SHELBY BYPASS
FROM EAST OF NC 180
TO EXISTING US 74

SHEET OF 02/24/12

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	WETLAND IMPACTS: Temp. Fill In Wetlands (ac)	WETLAND IMPACTS: Excavation in Wetlands (ac)	WETLAND IMPACTS: Mechanized Clearing in Wetlands (ac)	WETLAND IMPACTS: Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	SURFACE WATER IMPACTS: Temp. SW impacts (ac)	SURFACE WATER IMPACTS: Existing Channel Impacts Permanent (ft)	SURFACE WATER IMPACTS: Existing Channel Impacts Temp. (ft)	SURFACE WATER IMPACTS: Natural Stream Design (ft)
1	-L- 643+78 - 647+11							0.05	<0.01	644	33	
2	-L- 683+32 - 685+10		0.05					0.02	<0.01	480	20	
3	-L- 714+91 - 720+51							0.08	<0.01	763	58	
4	-L- 723+42 - 724+12								0.02		97	
5	-L- 728+15 - 731+94							0.06	<0.01	435	36	
6	-L- 737+35 - 744+14							0.14	0.03	1130	260	
	Bank Stabilization							<0.01		28		
7	-L- 763+42 - 764+51		0.02			<0.01		0.02	<0.01	245	25	
8	-L- 776+62 - 778+43		<0.01					0.06	<0.01	449	21	
9	-L- 796+17 - 797+09							0.04	<0.01	419	54	
	Bank Stabilization							<0.01		48		
10	-L- 804+45 - 805+12		0.04			0.02		0.01		211		
11	-L- 814+25 - 815+87		0.24					0.01	<0.01	248	17	
	Pond							0.12				
12	-RPA- 30+25 - 33+55		0.04					0.01		126		
13	-L- 841+00 - 848+63							0.05	<0.01	690	22	
TOTALS:			0.38			0.02		0.67	0.07	5916	643	

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CLEVELAND COUNTY
(R-2707D)

SHEET 2/24/2012

ATN Revised 3/31/05

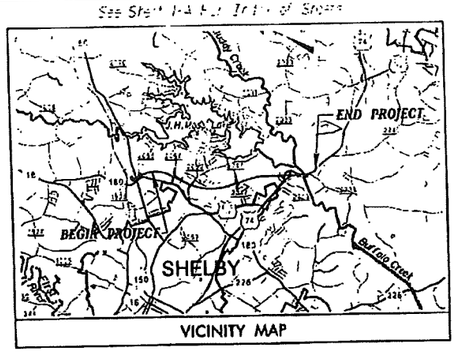
TIP PROJECT: R-2707D

CONTRACT:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CLEVELAND COUNTY

STATE	STATE PROJECT REFERENCE NO	SHEET NO.	TOTAL SHEETS
N.C.	R-2707D	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
34497.1.2	NHF-74 (14)	P.E.	
34497.2.7		R/W & UTIL.	

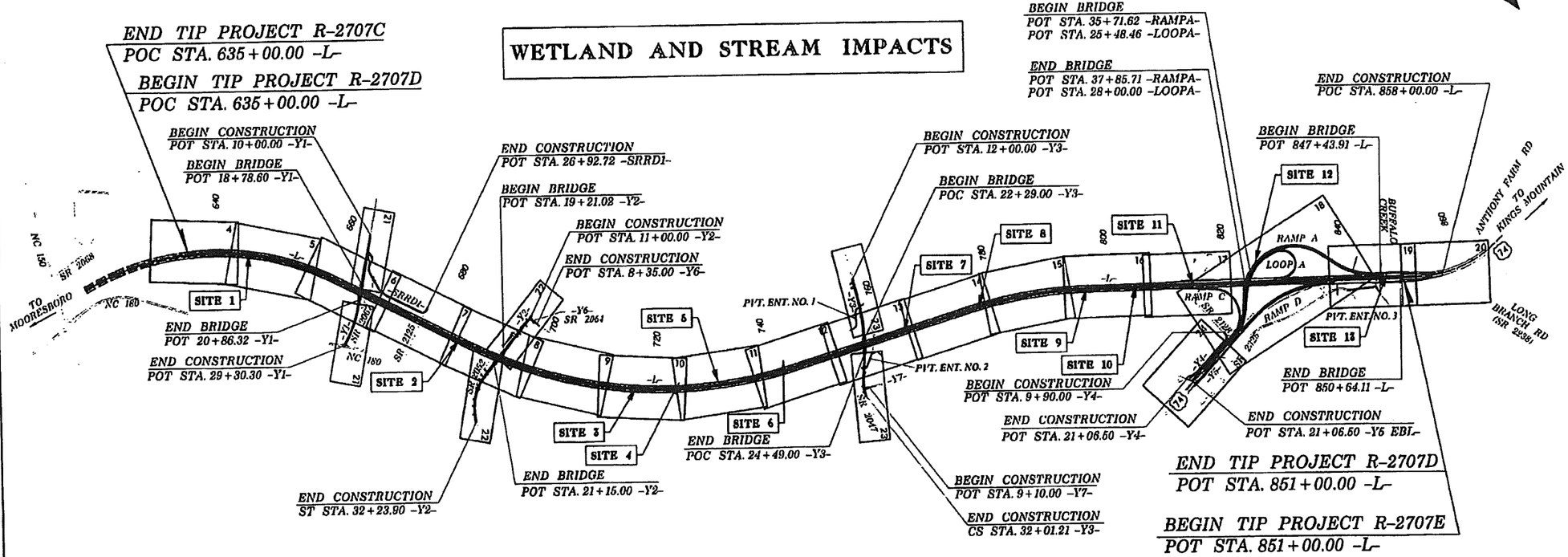


LOCATION: US 74, SHELBY BYPASS FROM EAST OF NC 180 TO EXISTING US 74, WEST OF SR 2238 (LONG BRANCH ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERTS & STRUCTURES

NC GRID NAD 83

WETLAND AND STREAM IMPACTS



THIS PROJECT IS NOT WITHIN ANY CITY LIMITS

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

CLEARING FOR THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ____.

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

GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2005 = 40,200
ADT 2025 = 65,800
DHV = 10 %
D = 60 %
T = 14 % *
V = 70 MPH

* TTST 8 % DUAL 6 %

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2707D	= 4.030 MI.
LENGTH OF STRUCTURE TIP PROJECT R-2707D	= 0.061 MI.
TOTAL LENGTH OF TIP PROJECT R-2707D	= 4.091 MI.

Prepared in the Office of:
Stantec
Stantec Consulting Inc.
Suite 300, 801 Jones Franklin Road
Raleigh, NC USA
27606
Tel. 919.851.6666
Fax. 919.851.7001
www.stantec.com

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:

G. SCOTT BOYLES, PE
PROJECT ENGINEER

KEITH F. HUDSON
PROJECT DESIGN ENGINEER

NCDOT CONTACT: DOUG TAYLOR, PE
PROJECT ENGINEER - ROADWAY DESIGN

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

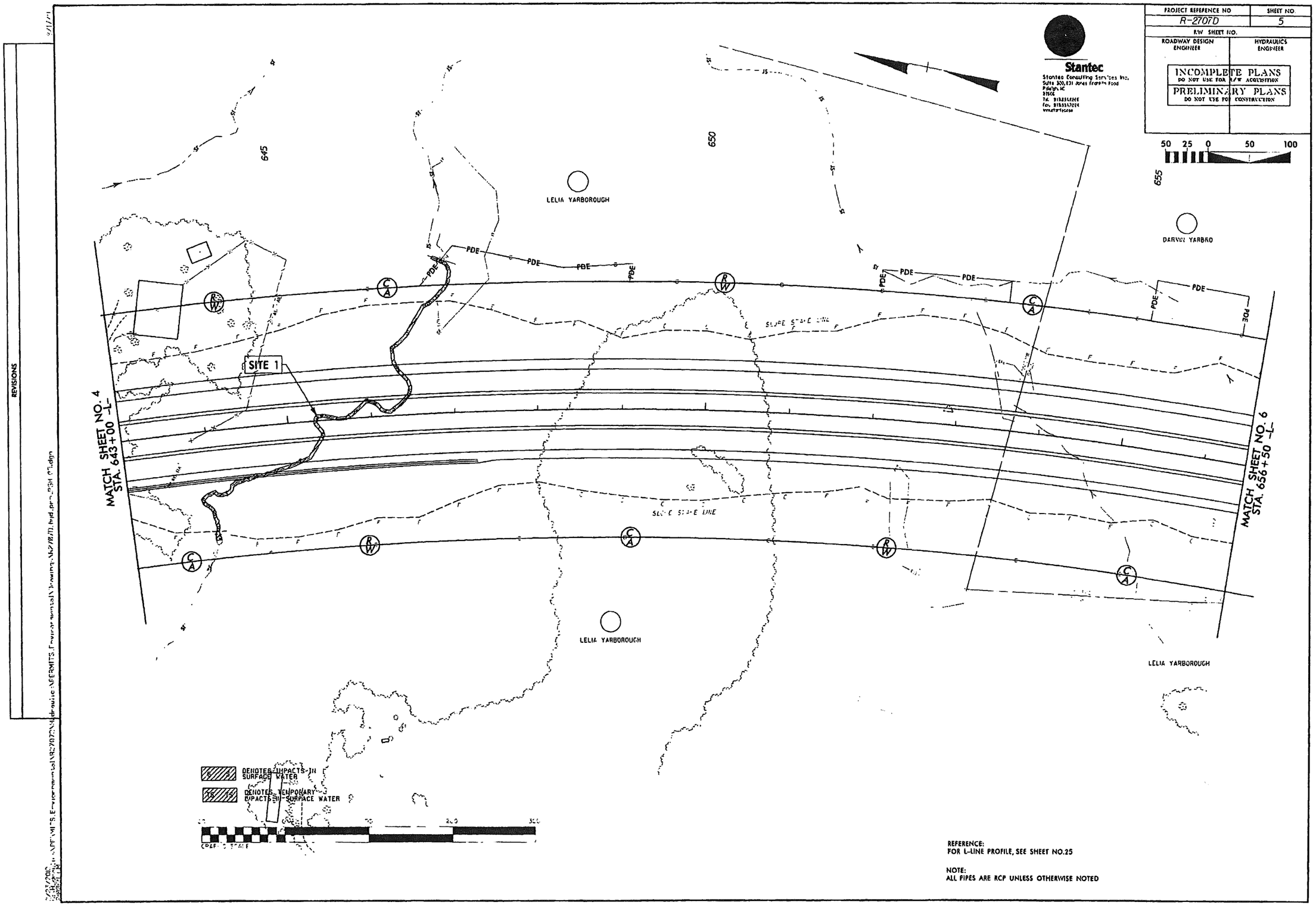
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

3/2/2011
R:\Highway offices\PERMITS\Environmental\NR270 (DENR-Hydraulics)\PERMITS_Environmental\Drawings\R-2707d_hyd_prm_tsh.dgn
3:0053 PM



PROJECT REFERENCE NO.
R-2707D
SHEET NO.
5
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
Stantec
50 25 0 50 100
645
650
655
LELIA YARBOROUGH
DARVIN YARBRO
PDE
SITE 1
MATCH SHEET NO. 4
STA. 643+00 -L-
MATCH SHEET NO. 6
STA. 656+50 -L-
SLOPE STAKE LINE
LELIA YARBOROUGH
LELIA YARBOROUGH
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
REFERENCE:
FOR L-LINE PROFILE, SEE SHEET NO.25
NOTE:
ALL PIPES ARE RCP UNLESS OTHERWISE NOTED

REVISIONS

PROJECT REFERENCE NO	SHEET NO.
R-2707D	5
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

Stantec
Stantec Consulting Services Inc.
Suite 300, 801 Jones Franklin Road
Raleigh, NC
27606
Tel. 919.851.6000
Fax. 919.851.6001
www.stantec.com

REVISIONS

MATCH SHEET NO. 4
STA. 643+00 -L-

MATCH SHEET NO. 6
STA. 656+50 -L-

SITE 1

LELIA YARBOROUGH

DARVIN YARBRO

PDE

645

650

655

660

665

670

675

680

685

690

695

700

705

710

715

720

725

730

735

740

745

750

755

760

765

770

775

780

785

790

795

800

805

810

815

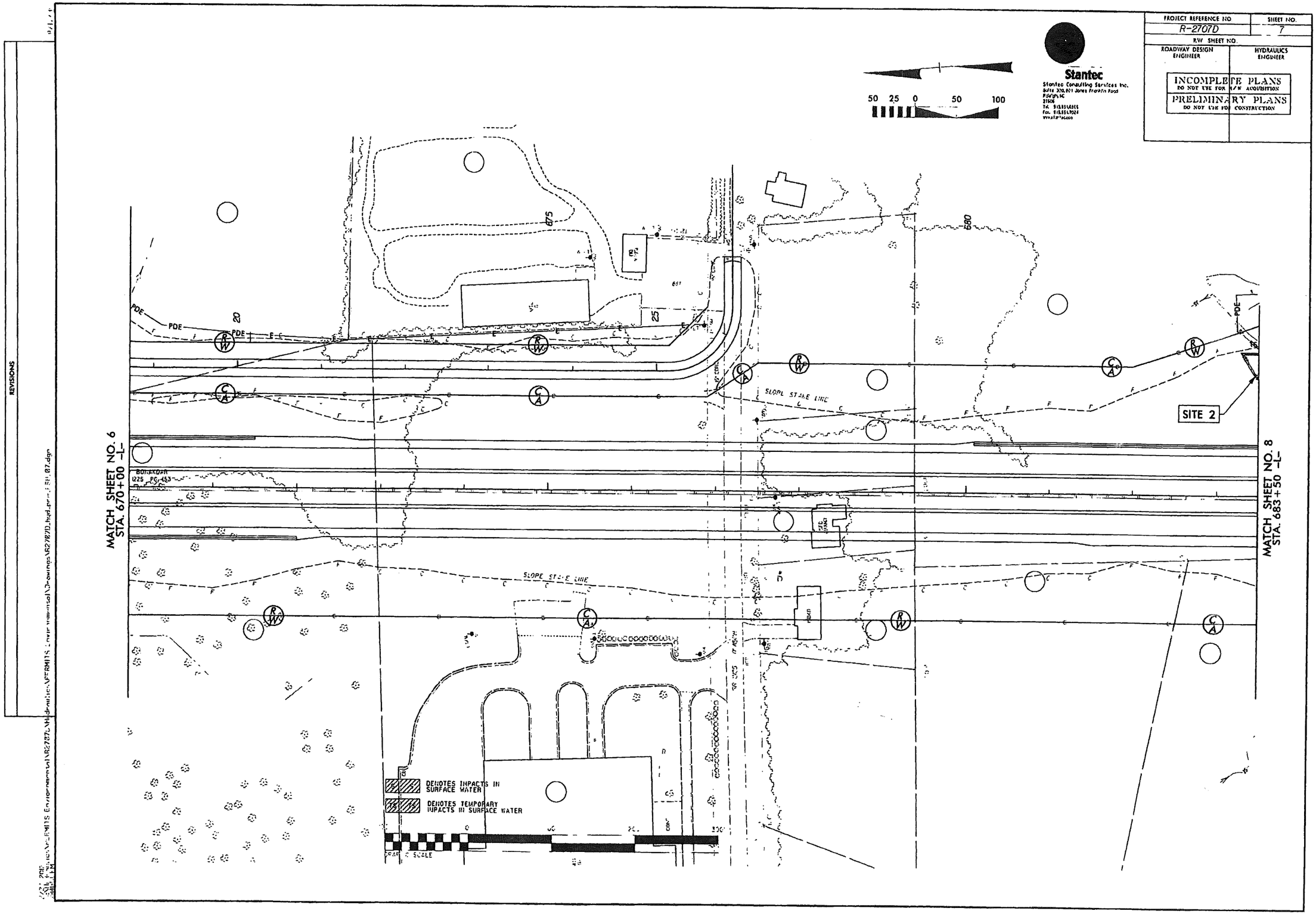
820

825

830

835

840



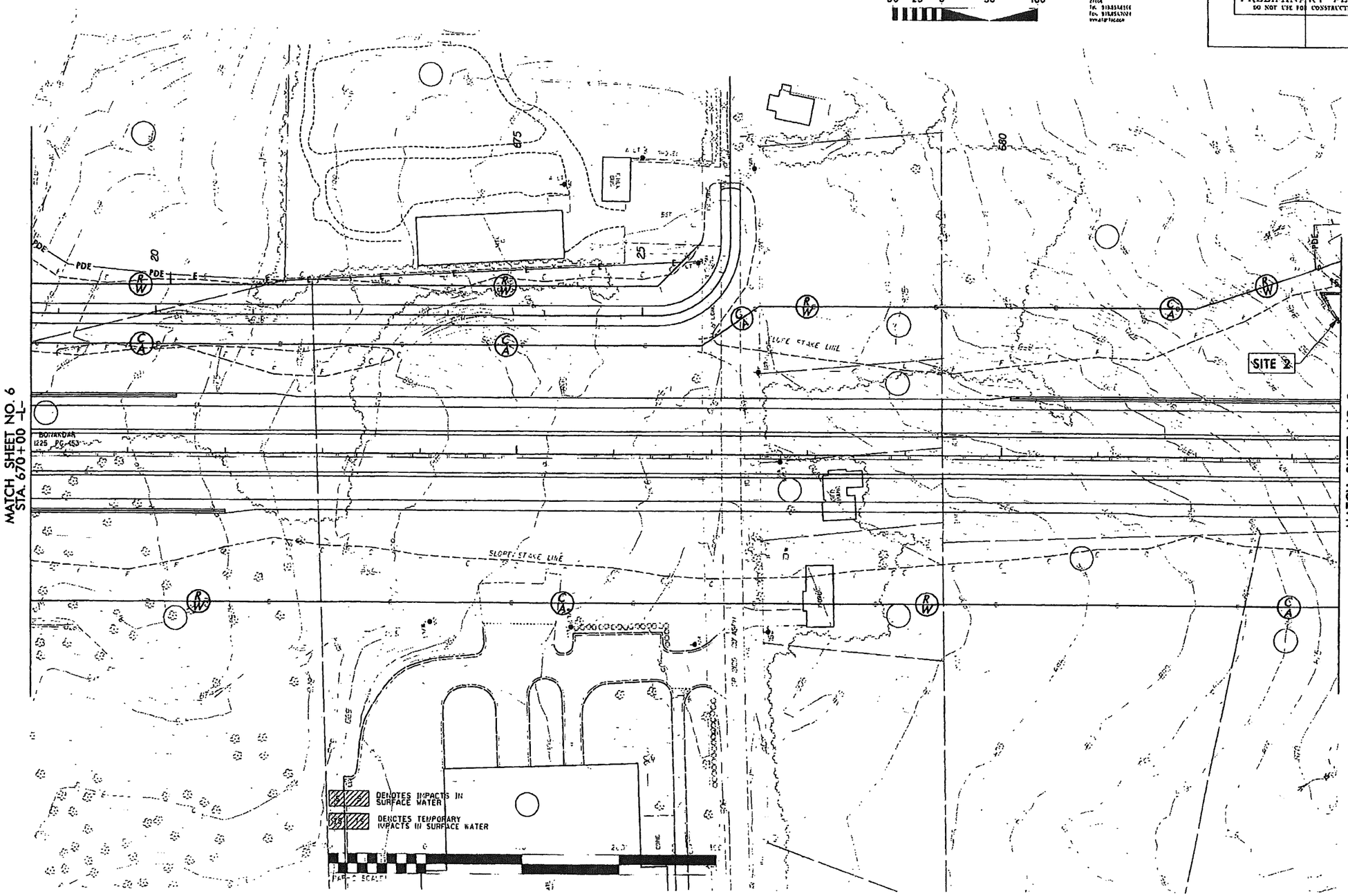
PROJECT REFERENCE NO.
R-2707D
SHEET NO.
7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Stantec
Stantec Consulting Services Inc.
50 25 0 50 100
MATCH SHEET NO. 6
STA. 670+00 -L-
MATCH SHEET NO. 8
STA. 683+50 -L-
SITE 2
SLOPE STAKE LINE
BONAKDAR
1225 PG 453
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
GRAPHIC SCALE
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	7
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

Stantec
Stantec Consulting Services Inc.
Suite 300, 801 Jones Franklin Road
Raleigh, NC
27606
Tel. 919.854.6200
Fax. 919.854.7024
www.stantec.com



REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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Raleigh NC
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FAX 919.851.7024
www.stantec.com

REVISIONS

LEGEND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

50 25 0 50 100

MATCH SHEET NO. 22
STA. 15+00 -Y2-

FRANCES BRENDA MOSES MATZ

HUBERT WALL, SR.

UNITED COMPANIES LENDING CORPORATION

690

695

JAMES A. NORMAN & WF. LOUISE S. NORMAN

N 12°58'07"W

PDE

665

EDWIN JOE HARRELSON

MICHAEL J. NORMAN & WF. CONNIE H. NORMAN

MATCH SHEET NO. 7
STA. 683+50 -L-

S 09°24'33"W

SITE 2

TREE LINE

CYLDE ODELL WEBBER

JAMES BORDERS, JR.

MAX HUGH CAMP

GERALD B. NORMAN

MATCH SHEET NO. 9
STA. 697+00 -L-

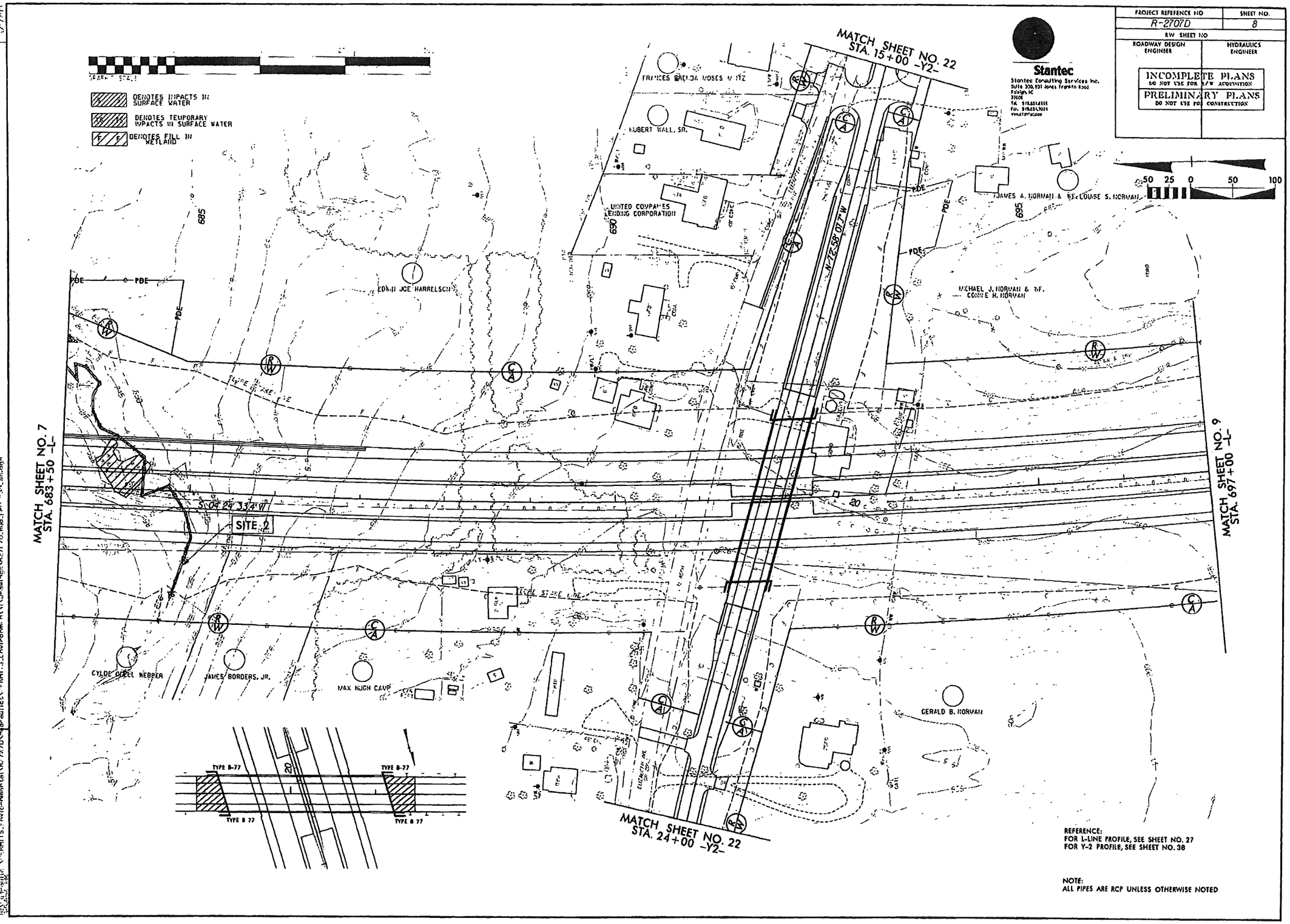
MATCH SHEET NO. 22
STA. 24+00 -Y2-

TYPE B-77

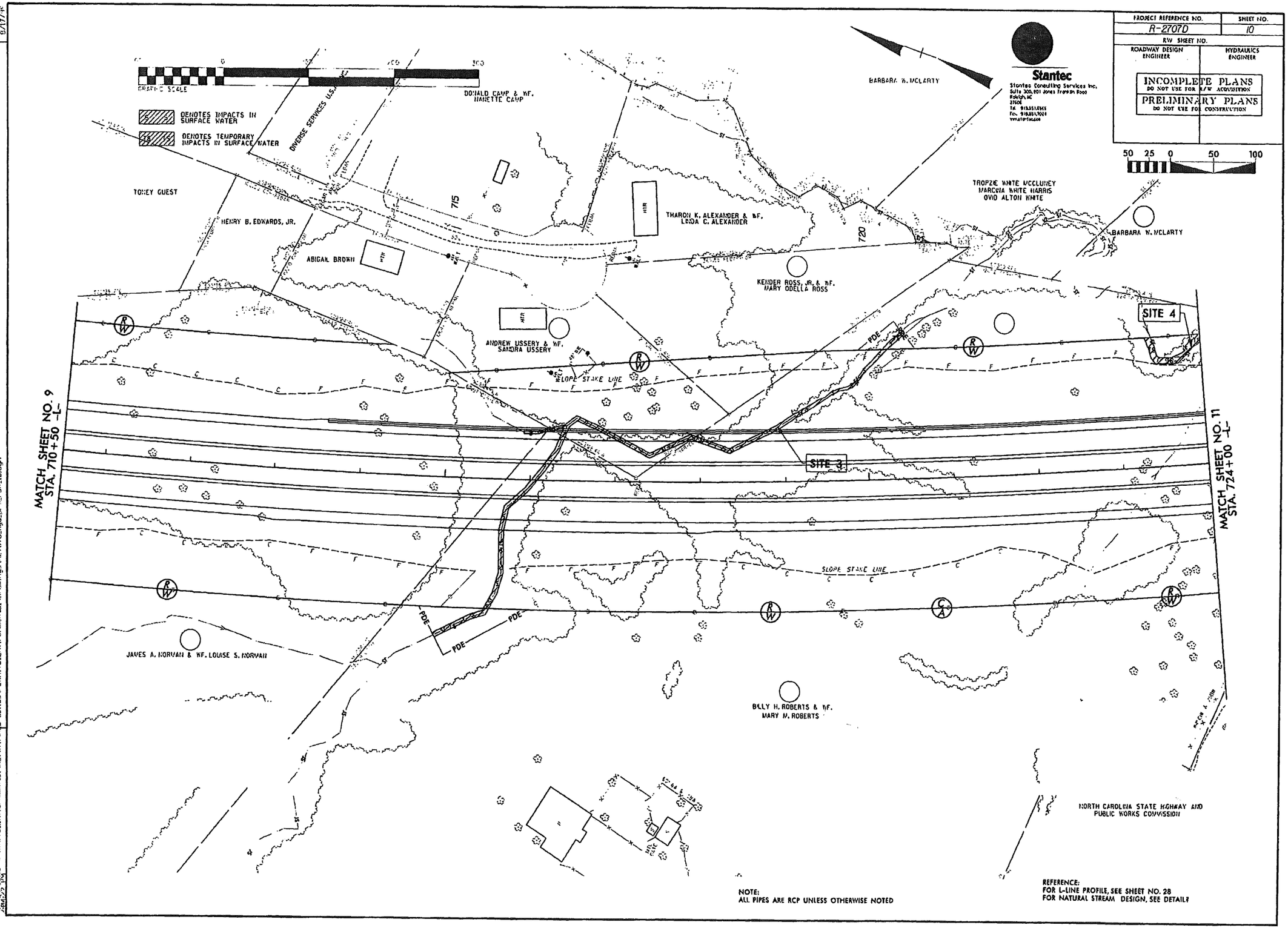
TYPE B 77

REFERENCE:
FOR L-LINE PROFILE, SEE SHEET NO. 27
FOR Y-2 PROFILE, SEE SHEET NO. 38

NOTE:
ALL PIPES ARE RCP UNLESS OTHERWISE NOTED

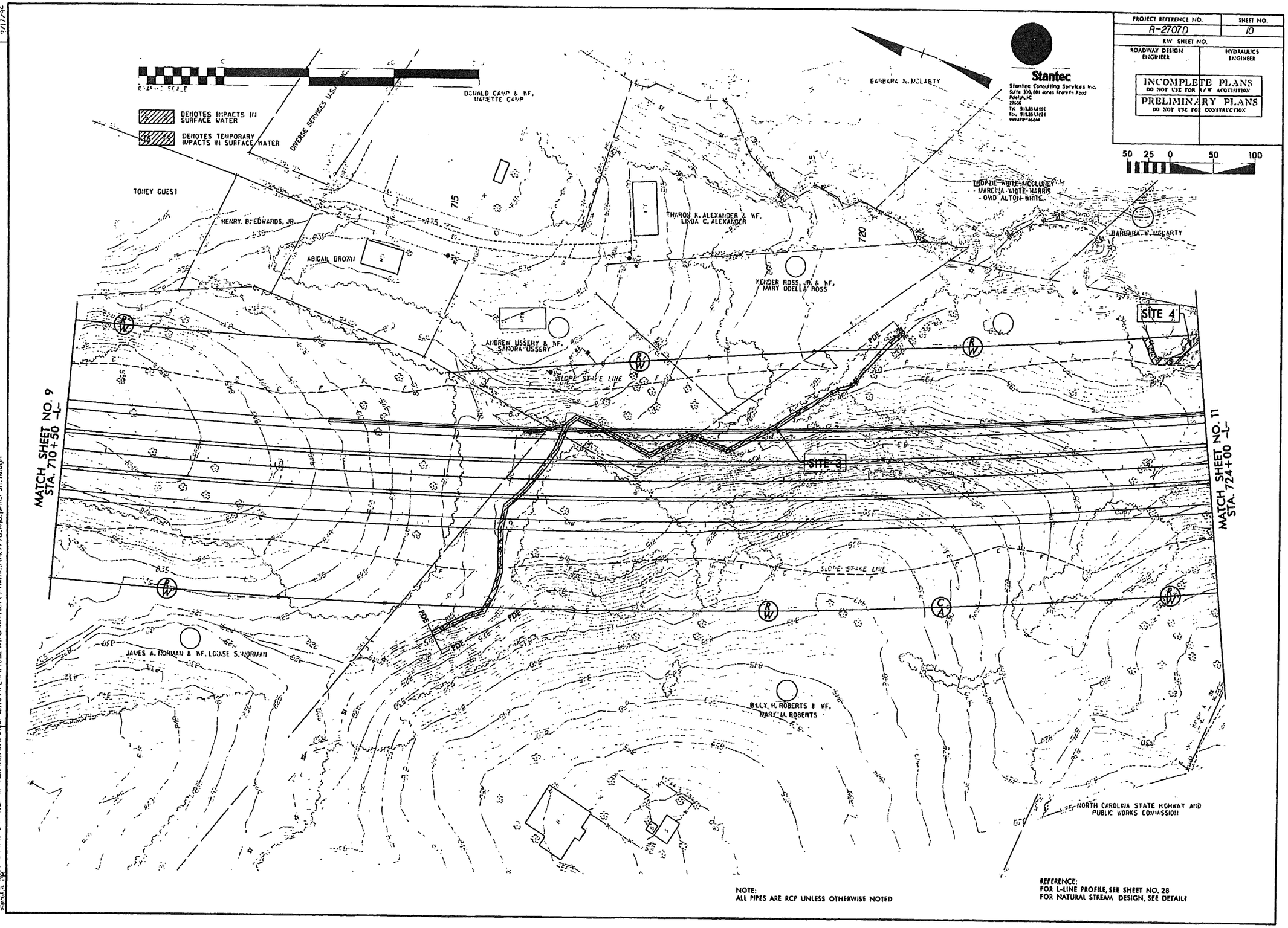


PROJECT REFERENCE NO
R-2707D
SHEET NO.
8
R/W SHEET NO
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Stantec
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
MATCH SHEET NO. 22
STA. 15+00 -Y2-
MATCH SHEET NO. 7
STA. 683+50 -L-
MATCH SHEET NO. 9
STA. 697+00 -L-
MATCH SHEET NO. 22
STA. 24+00 -Y2-
FRANCES BRENDA MOSES MITZ
HUBERT WALL, SR.
UNITED COMPANIES LENDING CORPORATION
EDWIN JOE HARRELSON
JAMES A. NORMAN & WF. LOUISE S. NORMAN
MICHAEL J. NORMAN & WF. CONNIE H. NORMAN
CYLDE OFFELL WEBBER
JAMES BORDERS, JR.
MAX HUGH CAMP
GERALD B. NORMAN
SITE 2
S 04°24'33.4"W
N 72°58'07.7"W
685
690
695
PDE
TYPE B-77
REFERENCE:
FOR L-LINE PROFILE, SEE SHEET NO. 27
FOR Y-2 PROFILE, SEE SHEET NO. 38
NOTE:
ALL PIPES ARE RCP UNLESS OTHERWISE NOTED
REVISIONS



NOTE:
ALL PIPES ARE RCP UNLESS OTHERWISE NOTED

REFERENCE:
FOR L-LINE PROFILE, SEE SHEET NO. 28
FOR NATURAL STREAM DESIGN, SEE DETAIL 7

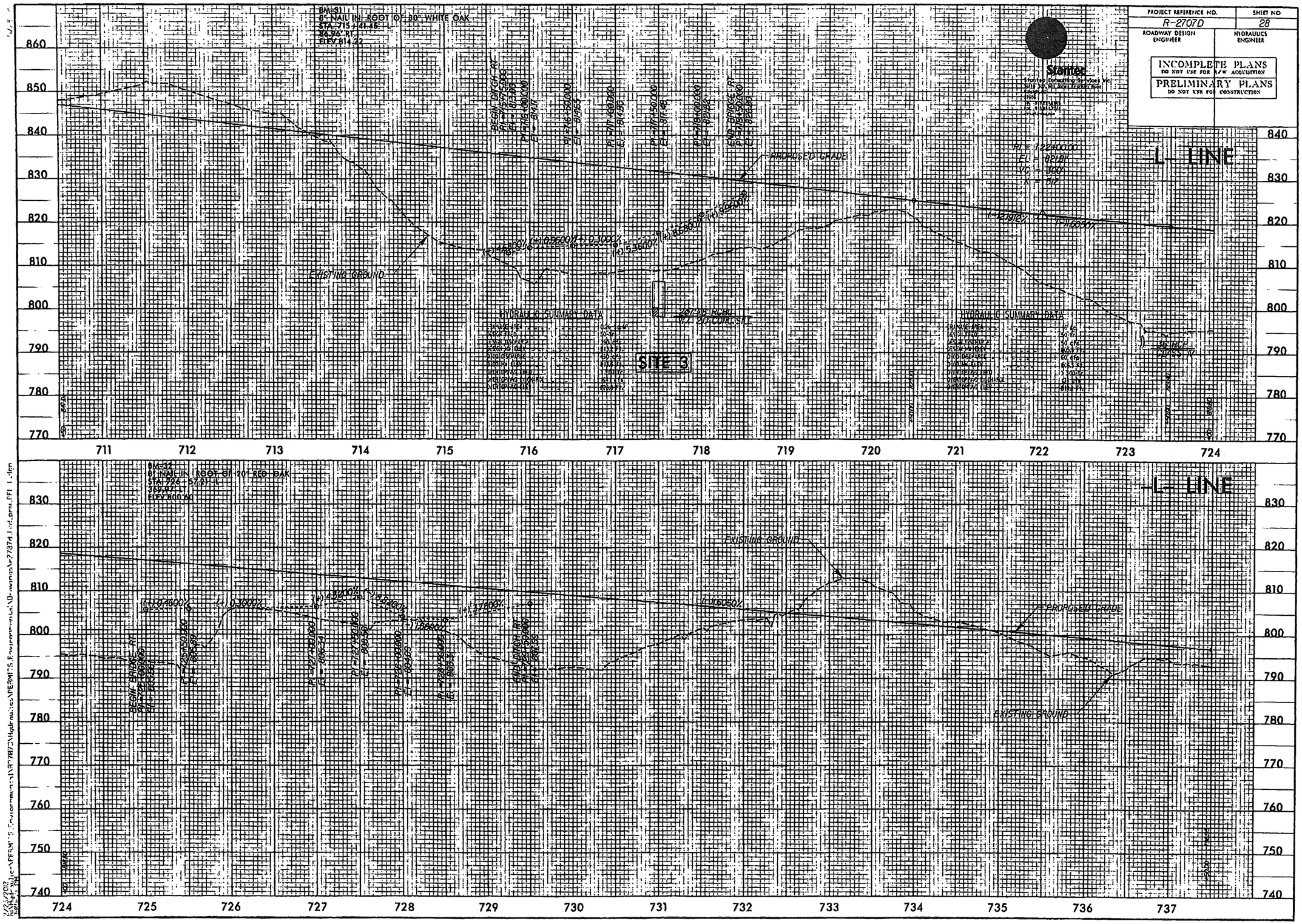


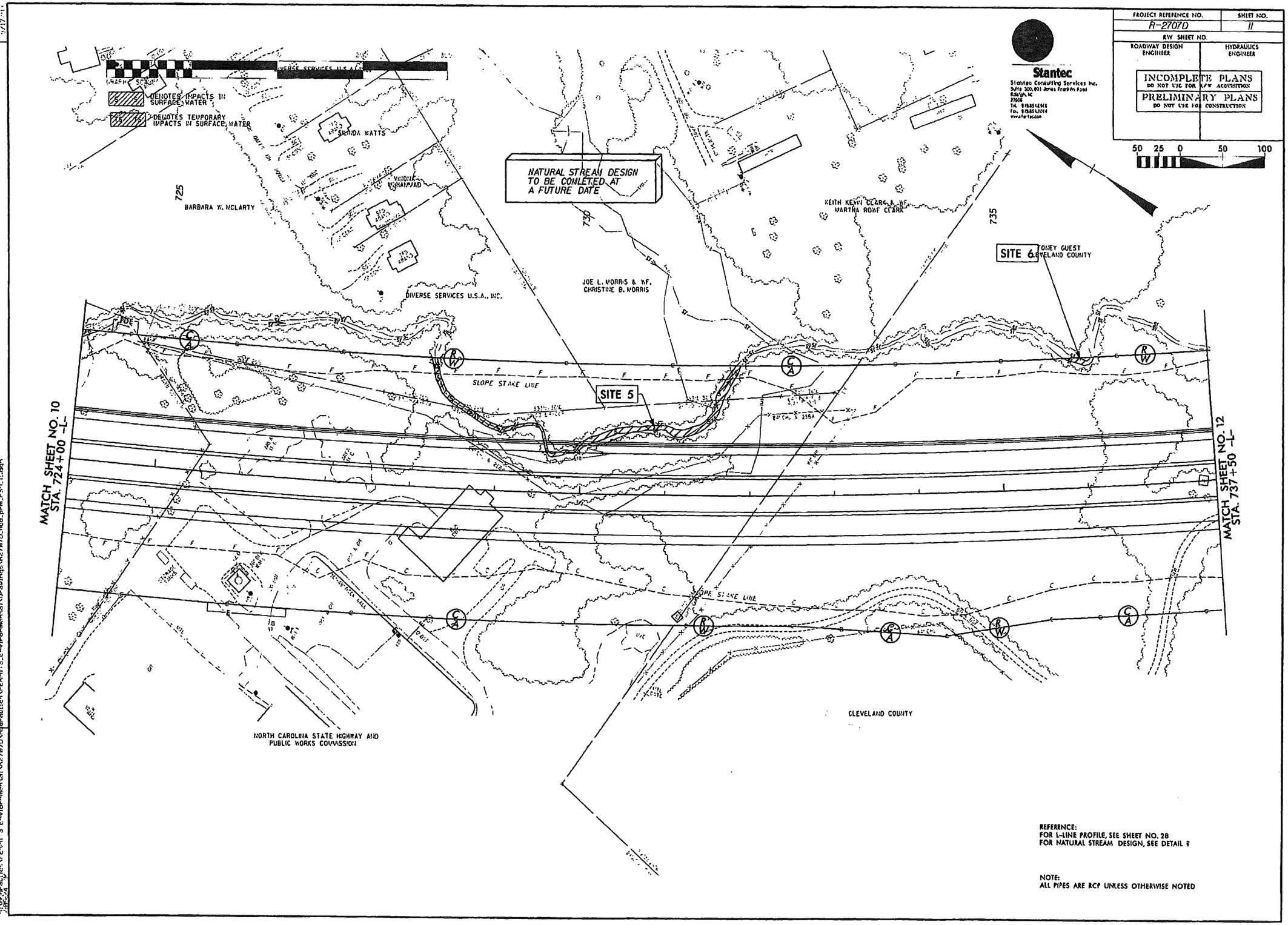
PROJECT REFERENCE NO.
R-2707D
SHEET NO.
10
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Stantec
Stantec Consulting Services Inc.
50 25 0 50 100
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DIVERSE SERVICES U.S.A. INC.
DONALD CAMP & WF. NANETTE CAMP
BARBARA W. MCLARTY
TONEY GUEST
HENRY B. EDWARDS, JR.
ABIGAIL BROWN
THARON K. ALEXANDER & WF. LINDA C. ALEXANDER
KENDER ROSS, JR. & WF. MARY ODELLA ROSS
TROPZIE WHITE MCCLURNEY MARCINA WHITE HARRIS OVID ALTON WHITE
BARBARA W. MCLARTY
ANDREW USSERY & WF. SANDRA USSERY
SLOPE STAKE LINE
SITE 4
SITE 3
MATCH SHEET NO. 9 STA. 710+50 -L-
MATCH SHEET NO. 11 STA. 724+00 -L-
JAMES A. NORMAN & WF. LOUISE S. NORMAN
BILLY H. ROBERTS & WF. MARY M. ROBERTS
NORTH CAROLINA STATE HIGHWAY AND PUBLIC WORKS COMMISSION
NOTE:
ALL PIPES ARE RCP UNLESS OTHERWISE NOTED
REFERENCE:
FOR L-LINE PROFILE, SEE SHEET NO. 28
FOR NATURAL STREAM DESIGN, SEE DETAIL
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION





REFERENCE:
FOR L-LINE PROFILE, SEE SHEET NO. 28
FOR NATURAL STREAM DESIGN, SEE DETAIL 7

NOTE:
ALL PIPES ARE RCP UNLESS OTHERWISE NOTED

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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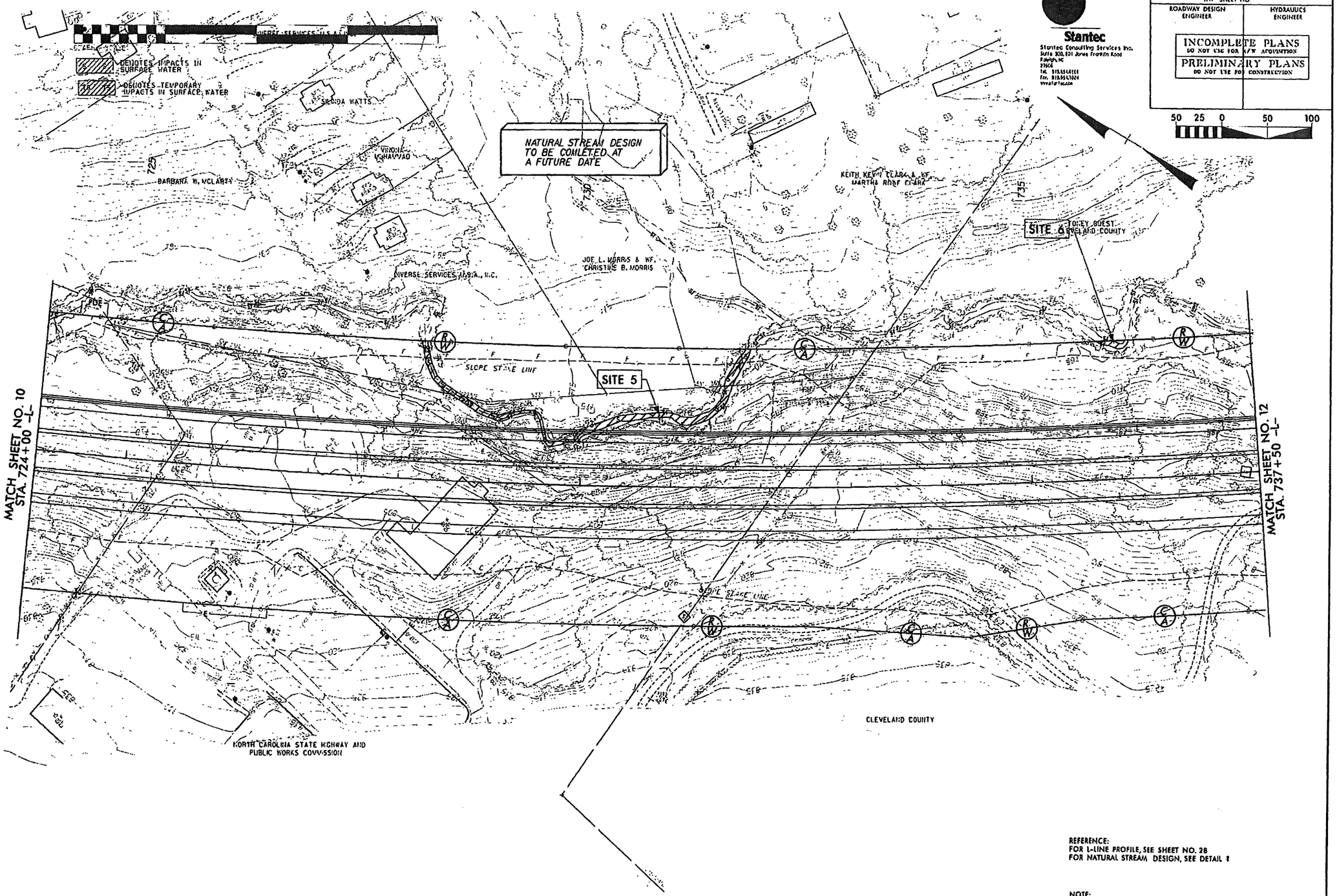
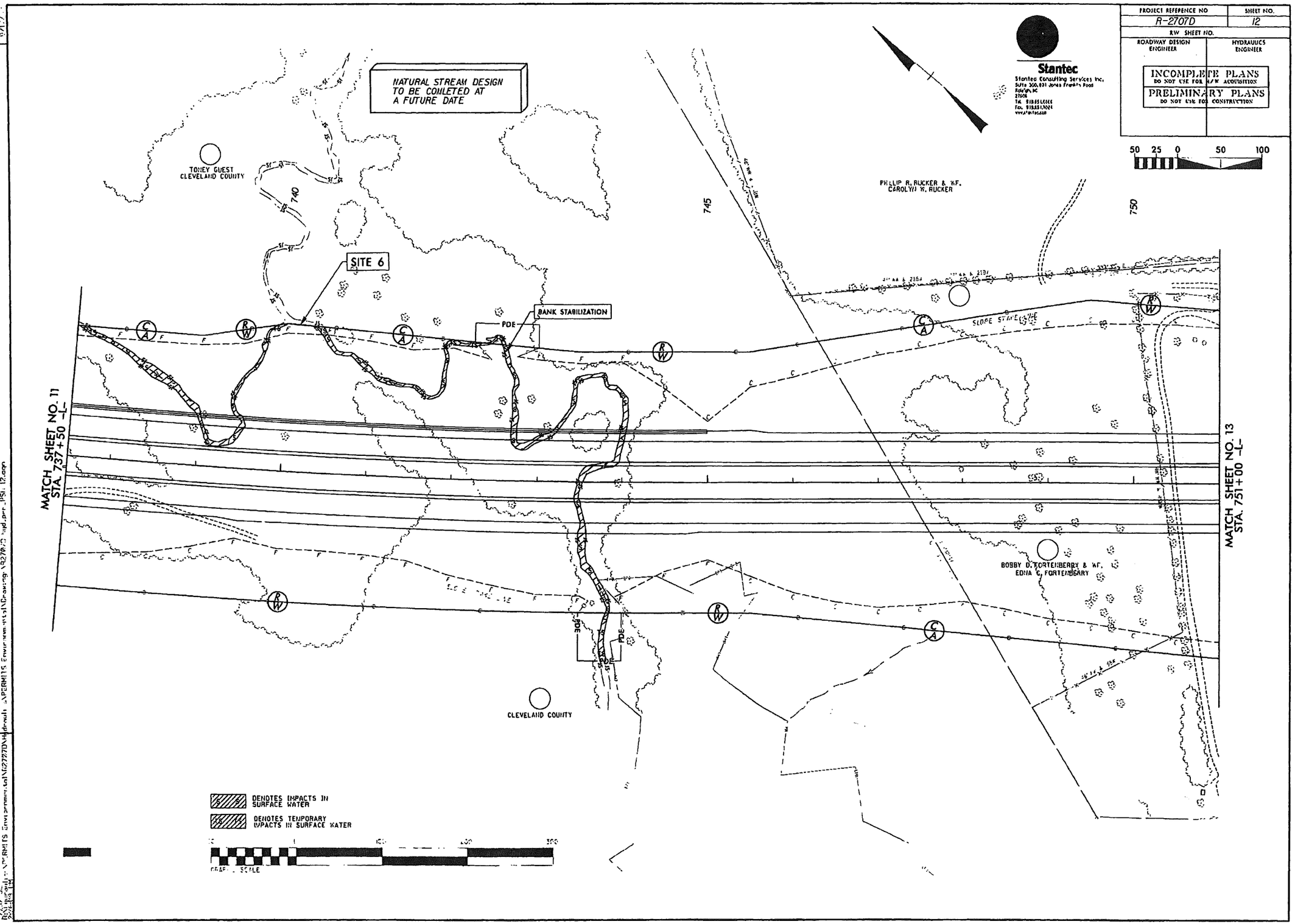


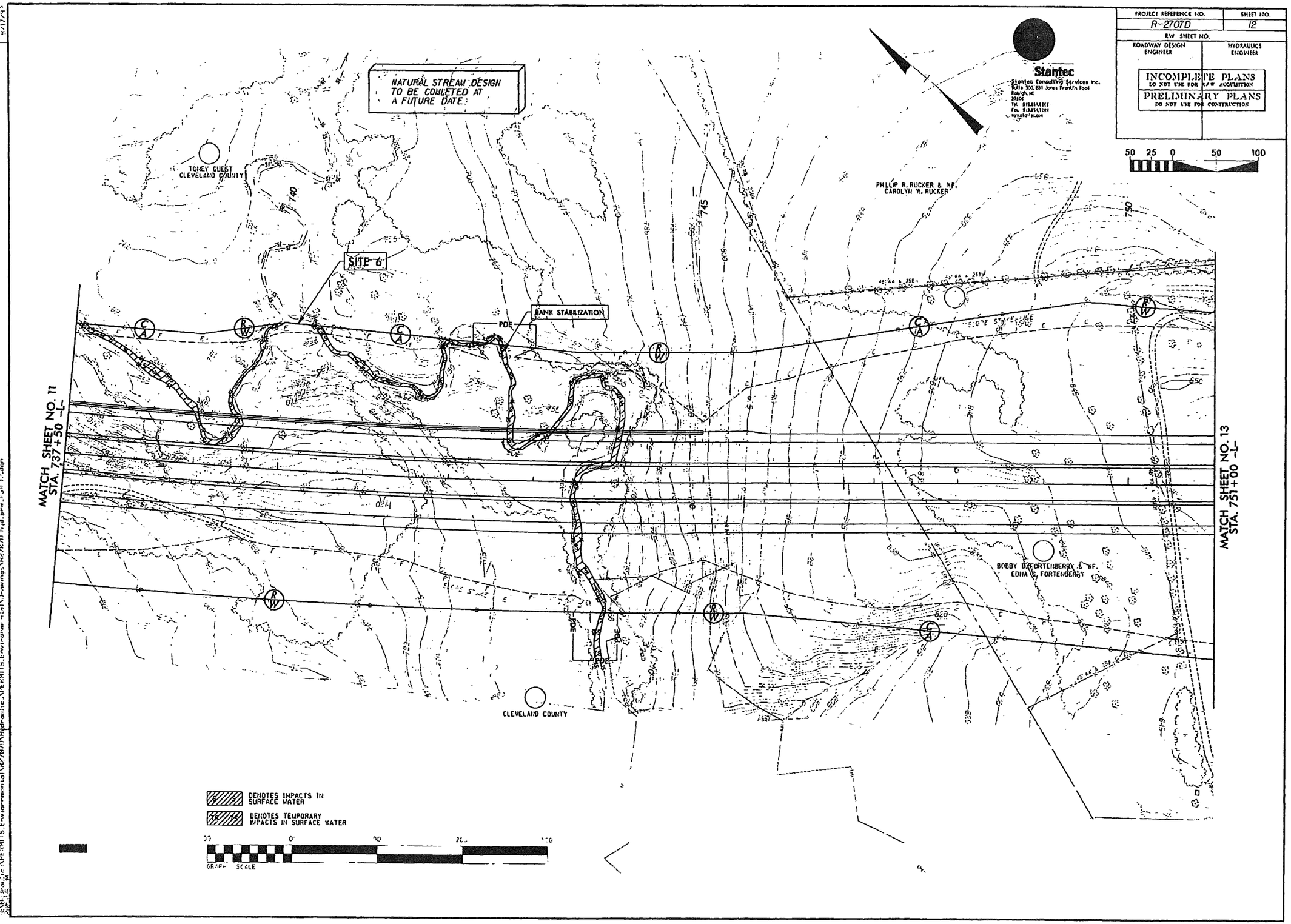
REFERENCE:
FOR L-LINE PROFILE, SEE SHEET NO. 28
FOR NATURAL STREAM DESIGN, SEE DETAIL 8

NOTE:
ALL PIPES ARE RCP UNLESS OTHERWISE NOTED

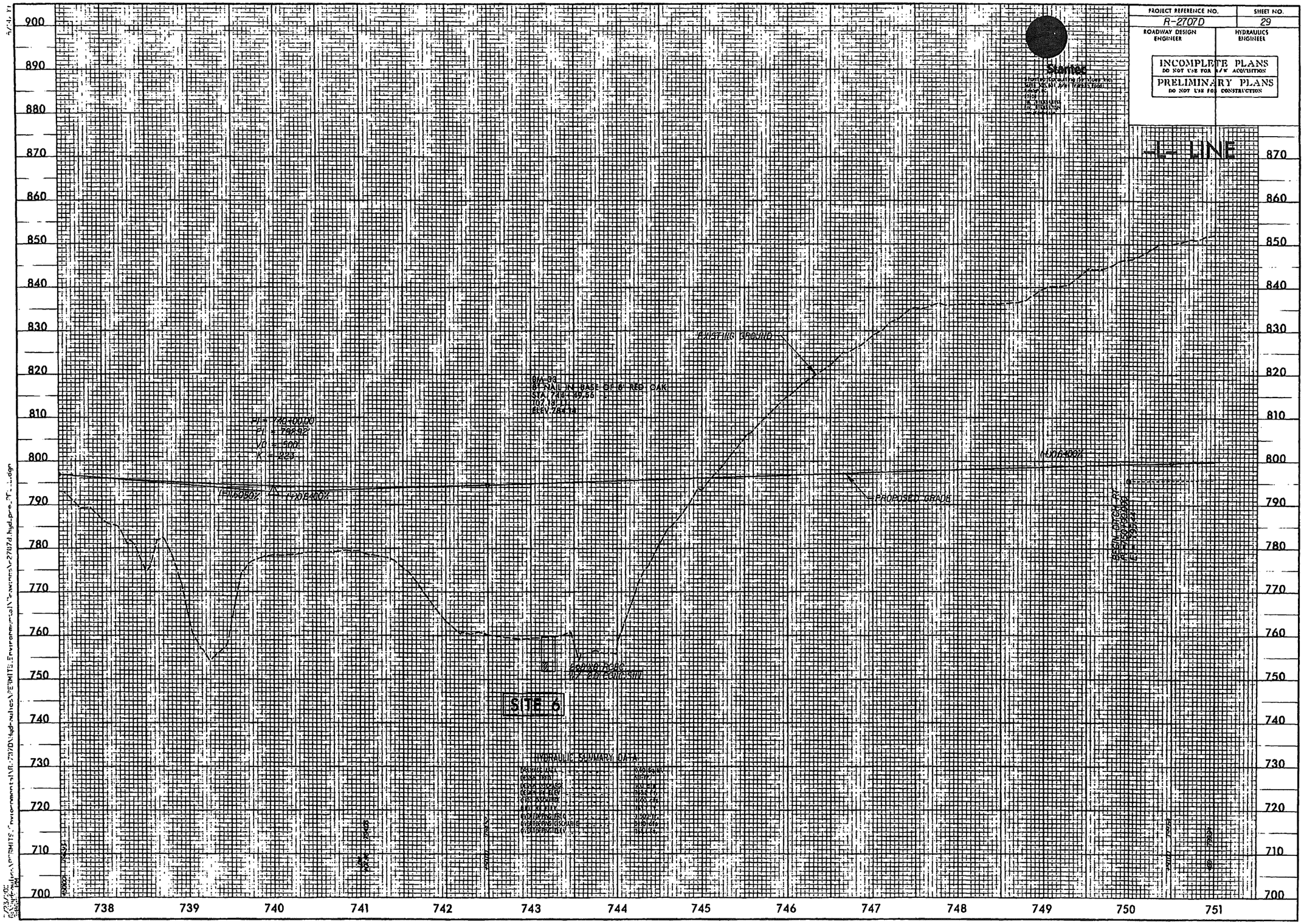
REVISIONS



PROJECT REFERENCE NO
R-2707D
SHEET NO.
12
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
Stantec
Stantec Consulting Services Inc.
50 25 0 50 100
NATURAL STREAM DESIGN TO BE COMLETED AT A FUTURE DATE
TONEY GUEST CLEVELAND COUNTY
740
745
750
PHILLIP R. RUCKER & WF. CAROLYN W. RUCKER
SITE 6
BANK STABILIZATION
PDE
SLOPE STAKE LINE
MATCH SHEET NO. 11 STA. 737+50 -L-
MATCH SHEET NO. 13 STA. 751+00 -L-
BOBBY D. FORTENBERRY & WF. EDNA C. FORTENBERRY
CLEVELAND COUNTY
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
GRAPHIC SCALE
REVISIONS



PROJECT REFERENCE NO.
R-2707D
SHEET NO.
12
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
Stantec
Stantec Consulting Services Inc.
50 25 0 50 100
NATURAL STREAM DESIGN TO BE COMPLETED AT A FUTURE DATE.
TONEY GUEST
CLEVELAND COUNTY
SITE 6
BANK STABILIZATION
PDE
PHILLIP R. RUCKER & WF.
CAROLYN W. RUCKER
BOBBY D. FORTENBERRY & WF.
EDNA C. FORTENBERRY
CLEVELAND COUNTY
MATCH SHEET NO. 11
STA. 737+50 -L-
MATCH SHEET NO. 13
STA. 751+00 -L-
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
GRAPH SCALE
REVISIONS



PROJECT REFERENCE NO.
R-2707D
SHEET NO.
29
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-L- LINE
EXISTING GROUND
PROPOSED GRADE
SITE 6
HYDRAULIC SUMMARY DATA
900
890
880
870
860
850
840
830
820
810
800
790
780
770
760
750
740
730
720
710
700
738
739
740
741
742
743
744
745
746
747
748
749
750
751

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	13
RW SHEET NO	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

50 25 0 50 100

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REVISIONS

GRAPHIC SCALE

DENOTES IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

MATCH SHEET NO. 23
STA. 19+00 -Y3-

-L- LINE
22900
39200
2005
2025
TRAFFIC COUNTS

LARRY E. WILEY & WF.
KAREN P. WILEY

BOBBY D. FORTENBERRY & WF.
EDNA C. FORTENBERRY

BILLY S. HOWELL & WF.
WILHELMINA J. HOWELL

THOMAS BAYNE RANDALL & WF.
BETTY W. RANDALL

755

760

765

SLOPE STAKE LINE

MATCH SHEET NO. 12
STA. 751+00 -L-

DONALD F. BELL

MECHANIZED CLEARING

SITE 7

MATCH SHEET NO. 14
STA. 765+00 -L-

BOBBY D. FORTENBERRY & WF.
EDNA C. FORTENBERRY

JAMES GUY SPANGLER & WF.
DIANNE ROLLINS SPANGLER

MATCH SHEET NO. 23
STA. 27+50 -Y3-

ROT Sta. 756+67.45 -L- =
POC Sta. 23+21.80 -Y3-

SHLD
TYPE-B-77
SHLD
56°21'53.5"
TYPE-B-77
SHLD
TYPE-B-77
TYPE-B-77
SHLD

RDWY/BRIDGE SKETCH

REFERENCE:
FOR L-LINE PROFILE, SEE SHEET NO. 30
FOR Y-3 PROFILE, SEE SHEET NO. 39

NOTE:
ALL PIPES ARE RCP UNLESS OTHERWISE NOTED

2/23/09
15:46:57 P:\Projects\PEDI Projects for Planning\NCDOT\Roadway\PERMITS\ Environmental\ND-sheets\R2707D.bid.dgn PDH,Jason

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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50 25 0 50 100

REVISIONS

MATCH SHEET NO. 23
STA. 19+00 -Y3-

TRAFFIC COUNTS
-L- LINE
2022
39200
2005
2025

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

LARRY G. WILEY & WF.
KAREN R. WILEY

BOBBY D. FORTENBERRY & WF.
EDNA C. FORTENBERRY

BILLY S. HOWELL & WF.
HELENA J. HOWELL

THOMAS BATTIE RANDALL & WF.
BETTY R. RANDALL

SITE 7

SLOPE STAKE LINE

DONALD F. BELL

MECHANIZED CLEARING

JAMES GUY SPANGLER & WF.
DIANNE ROLLINS SPANGLER

RCB/BRIDGE SKETCH
PBOT Sta. 756+67.45 -L-
PEOT Sta. 23+21.80 -Y3-
SHLD
TYPE B-77

MATCH SHEET NO. 12
STA. 751+00 -L-

MATCH SHEET NO. 14
STA. 765+00 -L-

MATCH SHEET NO. 23
STA. 27+50 -Y3-

REFERENCE:
FOR L-LINE PROFILE, SEE SHEET NO. 30
FOR Y-3 PROFILE, SEE SHEET NO. 39

NOTE:
ALL PIPES ARE RCP UNLESS OTHERWISE NOTED

2/2/2017
12:49:22 PM
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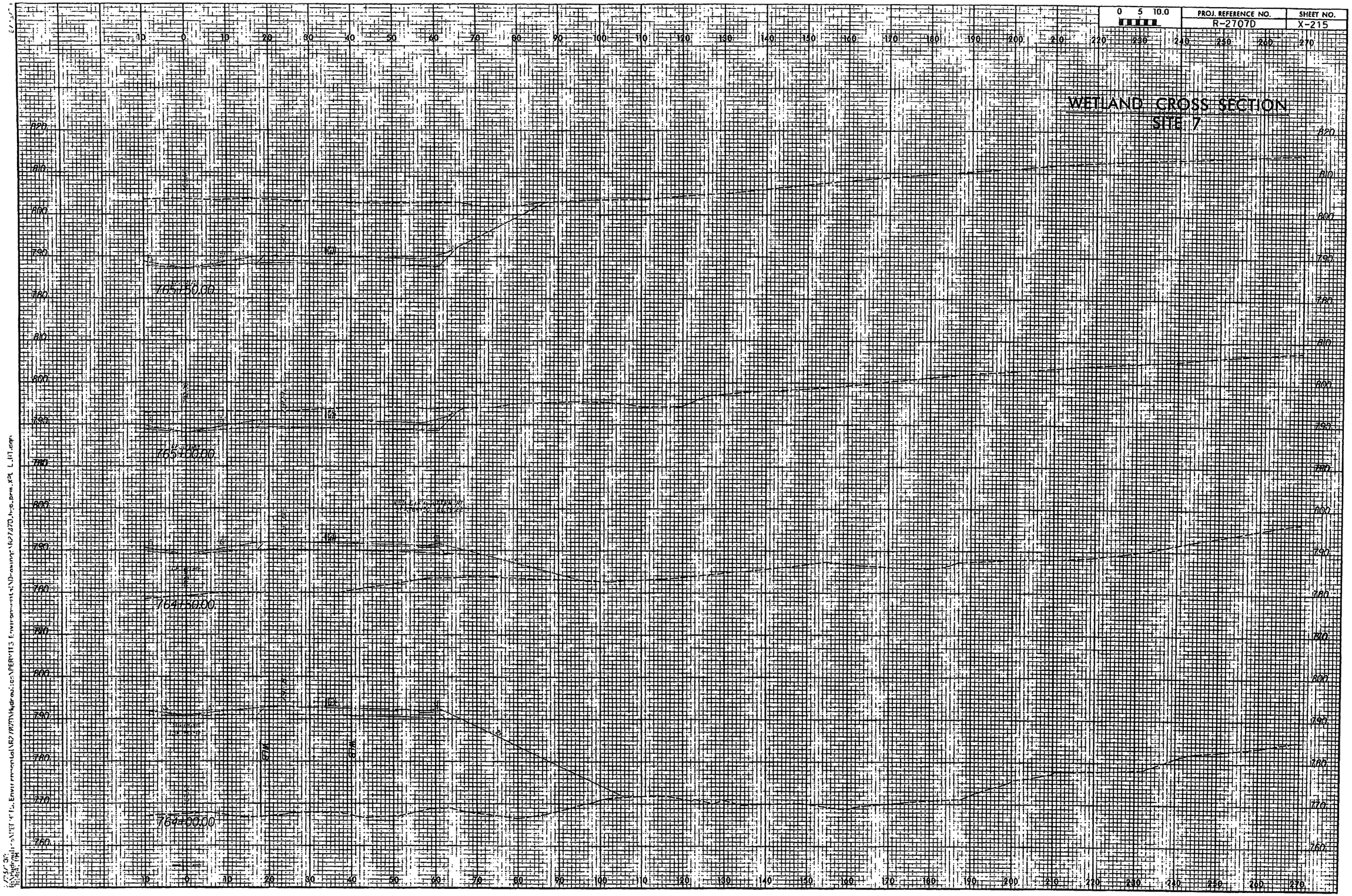
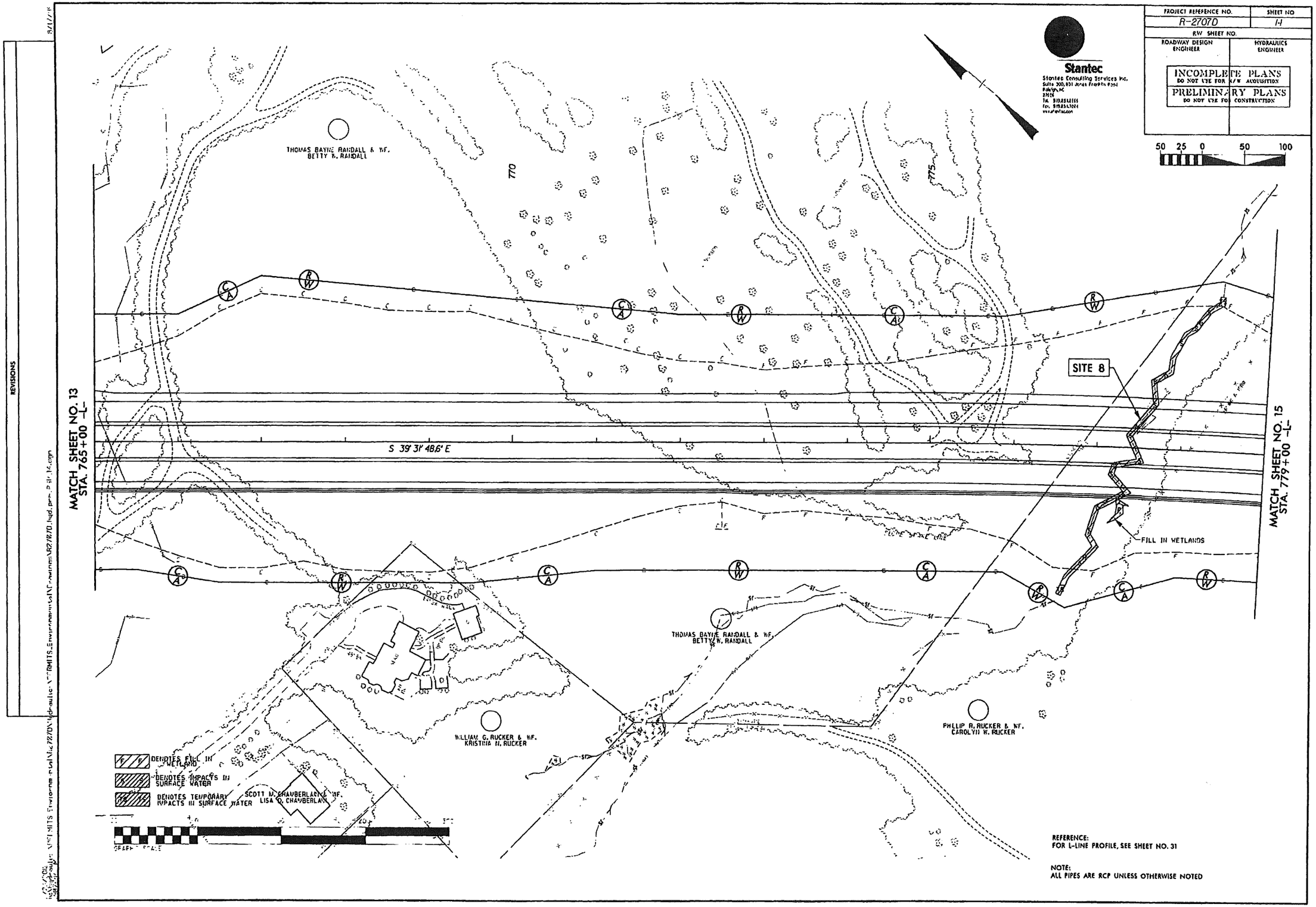
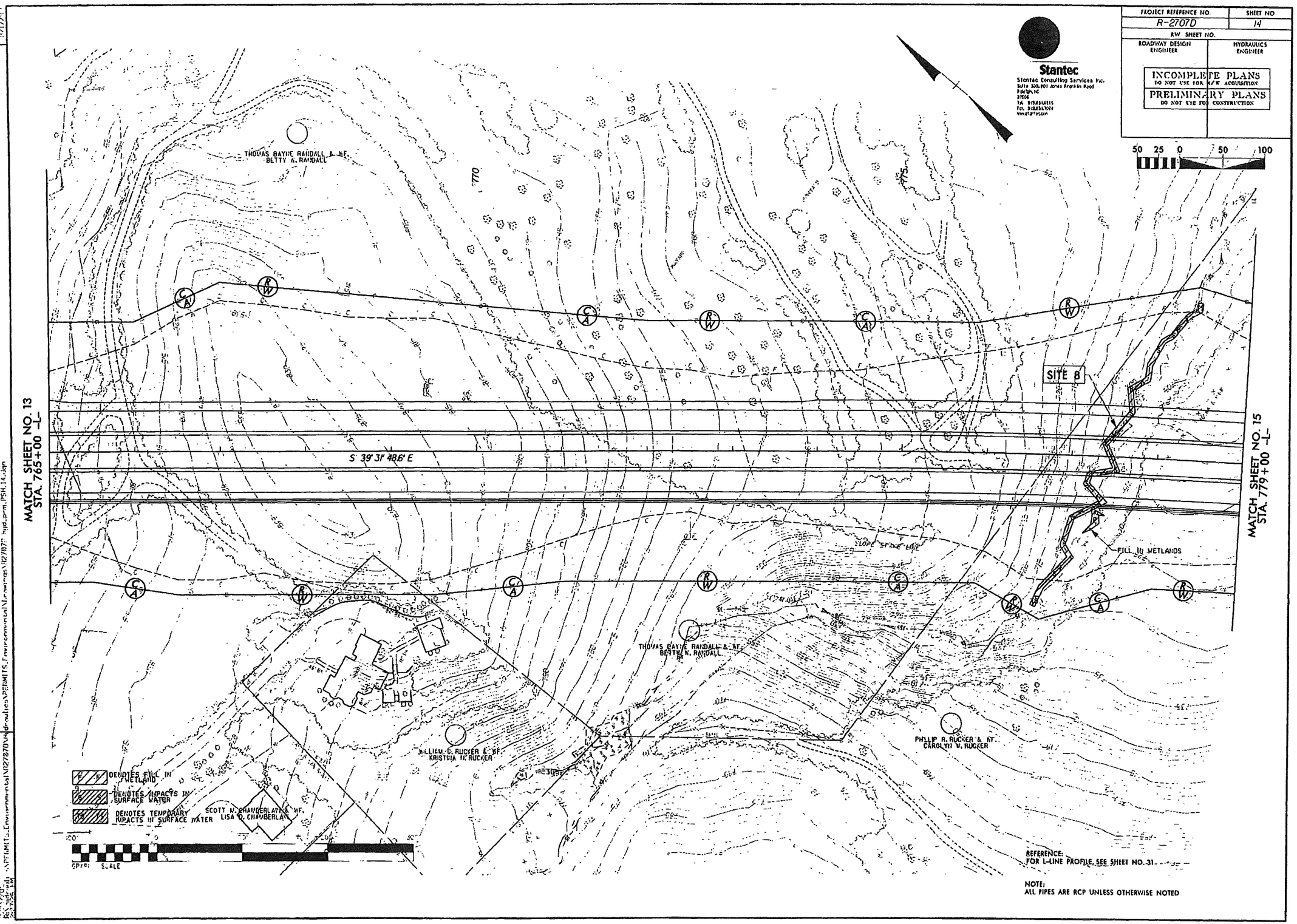


0 5 10.0
PROJ. REFERENCE NO.
R-2707D
SHEET NO.
X-215
WETLAND CROSS SECTION
SITE 7
765+50.00
765+00.00
764+50.00
764+00.00


PROJECT REFERENCE NO.
R-2707D
SHEET NO
14
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
Stantec
Stantec Consulting Services Inc.
50 25 0 50 100
THOMAS BAYNE RANDALL & WF.
BETTY W. RANDALL
770
775
SITE 8
S 39° 31' 48.6" E
MATCH SHEET NO. 13
STA. 765+00 -L-
MATCH SHEET NO. 15
STA. 779+00 -L-
FILL IN WETLANDS
THOMAS BAYNE RANDALL & WF.
BETTY W. RANDALL
WILLIAM G. RUCKER & WF.
KRISTINA N. RUCKER
PHILLIP R. RUCKER & WF.
CAROLYN W. RUCKER
SCOTT M. CHAMBERLAIN & WF.
LISA D. CHAMBERLAIN
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
GRAPHIC SCALE
REFERENCE:
FOR L-LINE PROFILE, SEE SHEET NO. 31
NOTE:
ALL PIPES ARE RCP UNLESS OTHERWISE NOTED
REVISIONS

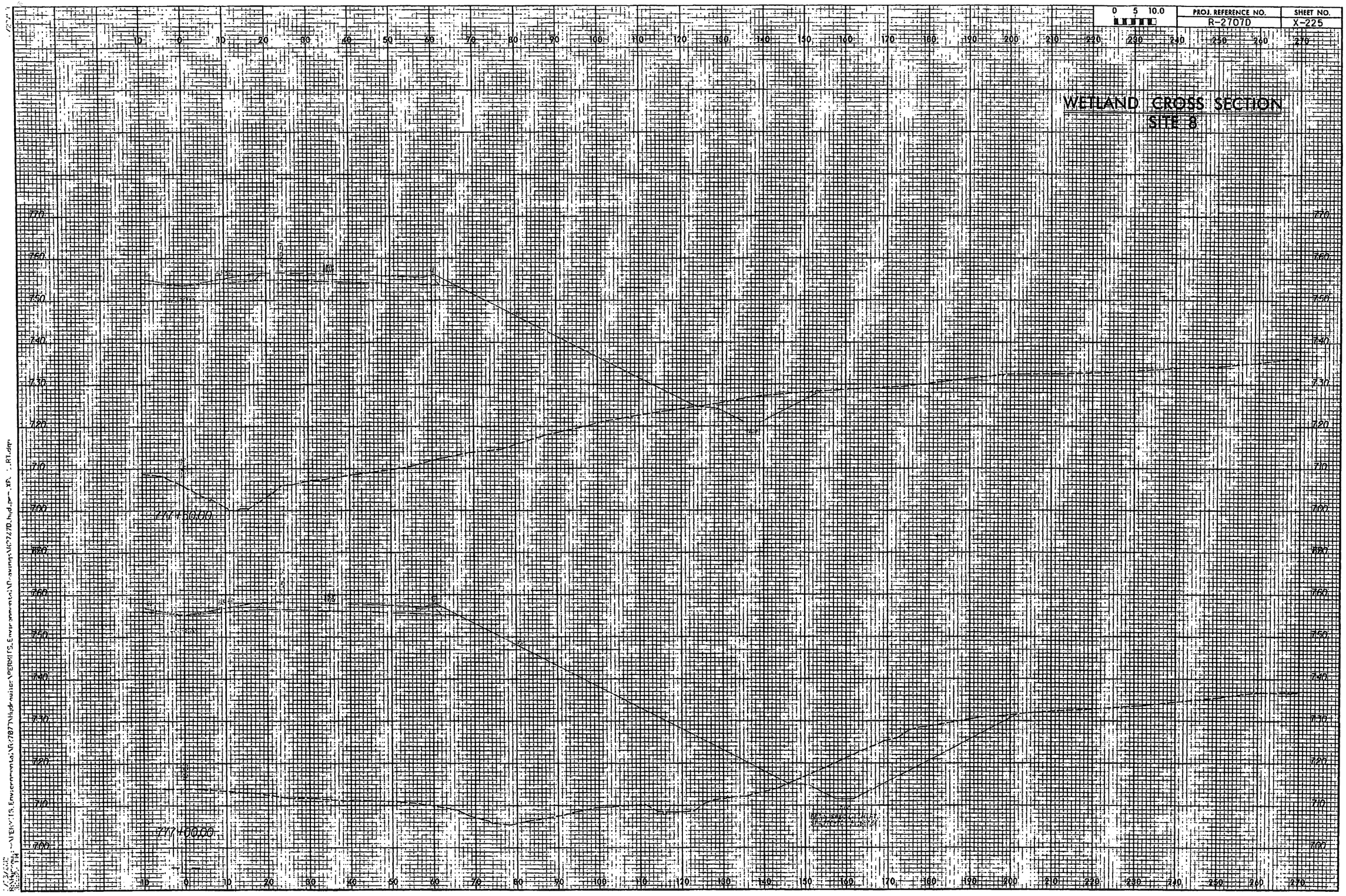


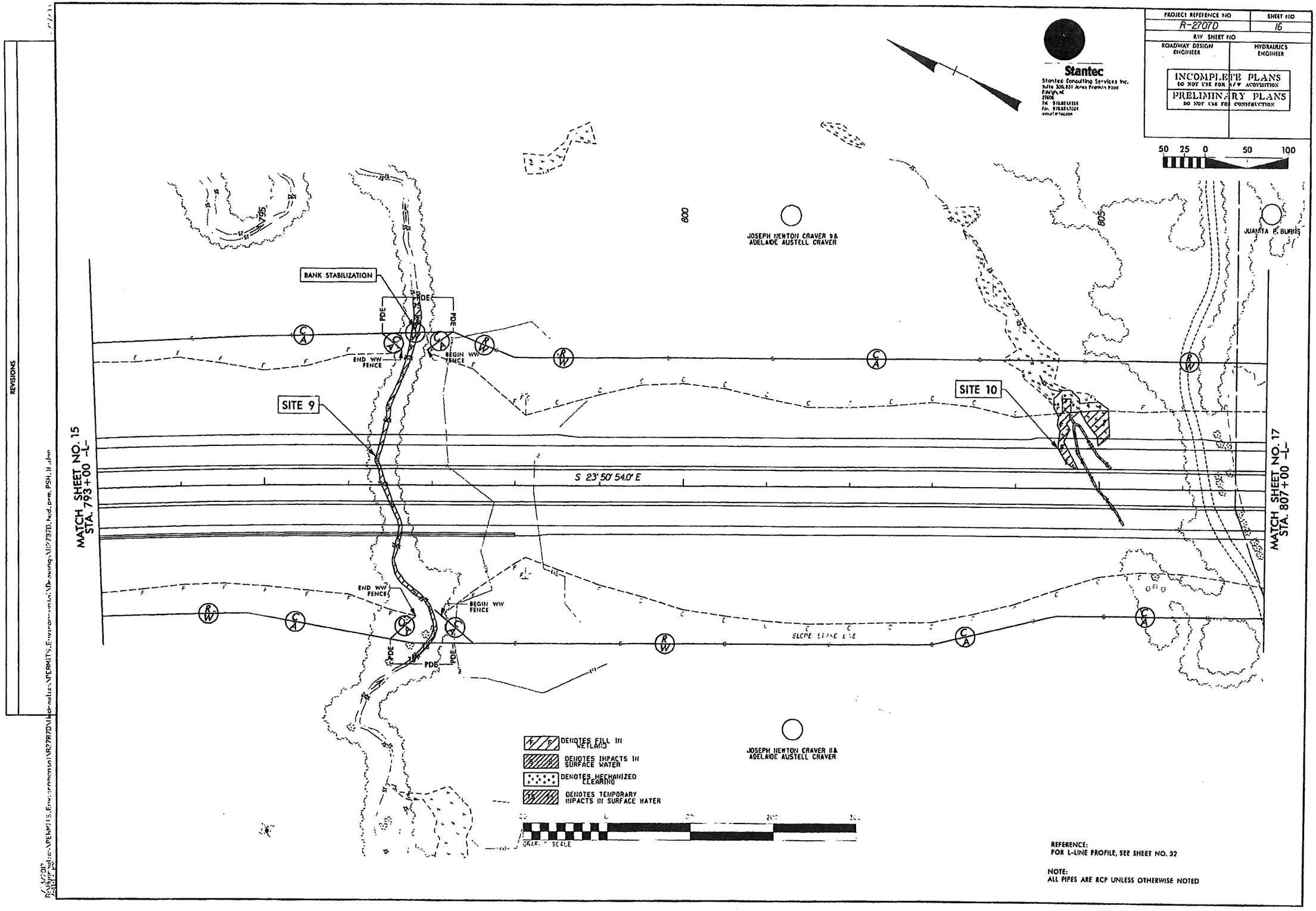
PROJECT REFERENCE NO.
R-2707D
SHEET NO
14
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Stantec
Stantec Consulting Services Inc.
50 25 0 50 100
THOMAS BAYNE RANDALL & WF.
BETTY W. RANDALL
770
775
SITE 8
S 39° 31' 48.6" E
MATCH SHEET NO. 13
STA. 765+00 -L-
MATCH SHEET NO. 15
STA. 779+00 -L-
FILL IN WETLANDS
SLOPE STAKE LINE
THOMAS BAYNE RANDALL & WF.
BETTY W. RANDALL
WILLIAM D. RUCKER & WF.
KRISTINA M. RUCKER
PHILLIP R. RUCKER & WF.
CAROLYN W. RUCKER
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
SCOTT M. CHAMBERLAIN & WF.
LISA D. CHAMBERLAIN
GRAPH SCALE
REFERENCE:
FOR L-LINE PROFILE, SEE SHEET NO. 31
NOTE:
ALL PIPES ARE RCP UNLESS OTHERWISE NOTED

REVISIONS

0 5 10.0	PROJ. REFERENCE NO.	SHEET NO.
	R-2707D	X-225

WETLAND CROSS SECTION
SITE 8




PROJECT REFERENCE NO
R-2707D
SHEET NO.
16
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
Stantec
Stantec Consulting Services Inc.
50 25 0 50 100
JOSEPH NEWTON CRAVER II & ADELAIDE AUSTELL CRAVER
JUANITA P. BURNS
BANK STABILIZATION
PDE
END WW FENCE
BEGIN WW FENCE
SITE 9
SITE 10
S 23° 50' 54.0" E
MATCH SHEET NO. 15
STA. 793+00 -L-
MATCH SHEET NO. 17
STA. 807+00 -L-
SLOPE STAKE LINE
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
GRAPHIC SCALE
REFERENCE:
FOR L-LINE PROFILE, SEE SHEET NO. 32
NOTE:
ALL PIPES ARE RCP UNLESS OTHERWISE NOTED
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	16
R/W SHEET NO	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
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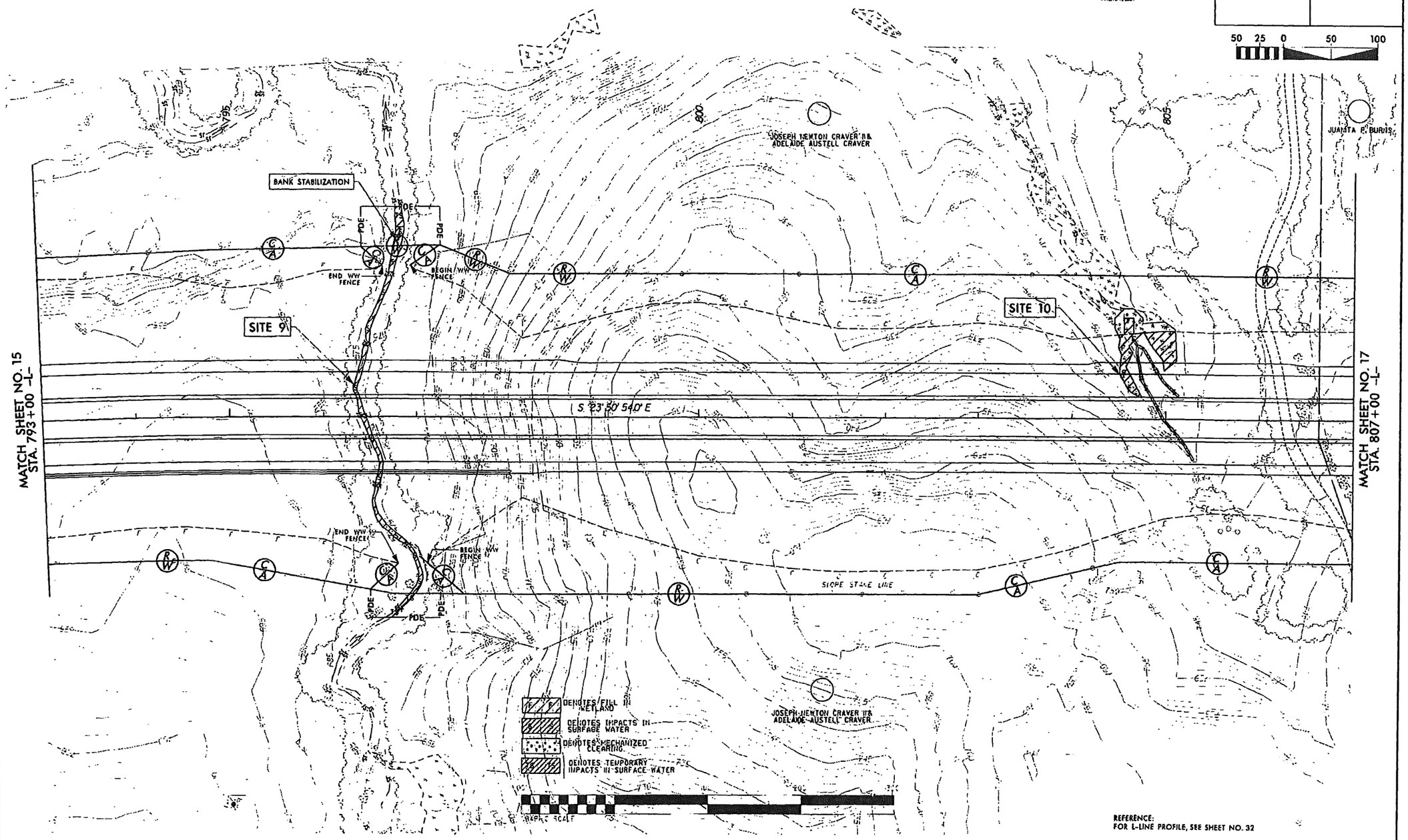
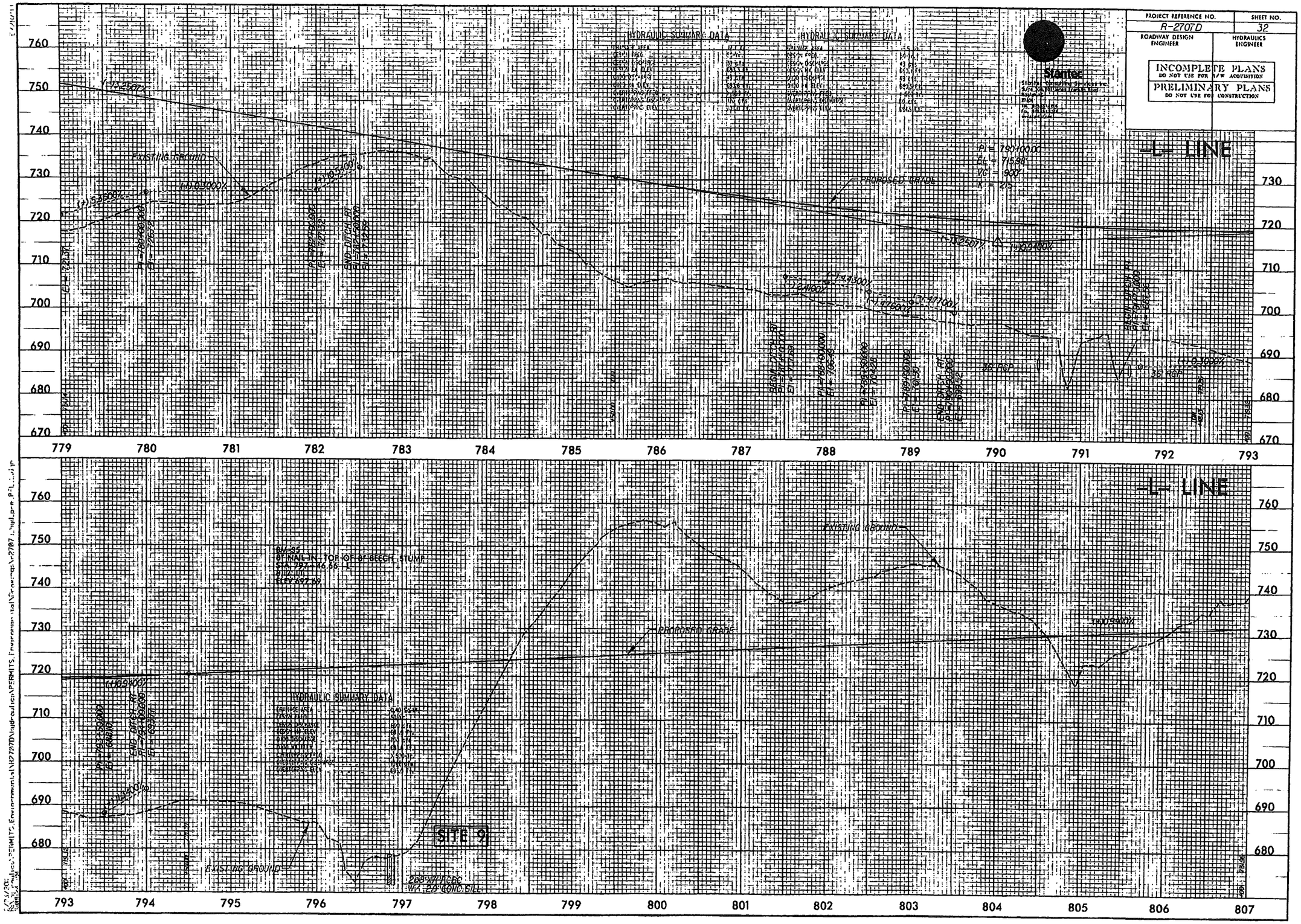


REFERENCE:
FOR L-LINE PROFILE, SEE SHEET NO. 32

NOTE:
ALL PIPES ARE RCP UNLESS OTHERWISE NOTED

REVISIONS


PROJECT REFERENCE NO.
R-2707D
SHEET NO.
32
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Stantec
HYDRAULIC SUMMARY DATA
-L- LINE
EXISTING GROUND
PROPOSED GRADE
PI = 790+00.00
EL = 715.98'
VC = 900'
K = 215
36" RCP
BM-35
8" NAIL IN TOP OF 8" BEECH STUMP
STA. 797+46.66 -L-
ELEV. 697.69
SITE 9
760
750
740
730
720
710
700
690
680
670
779
780
781
782
783
784
785
786
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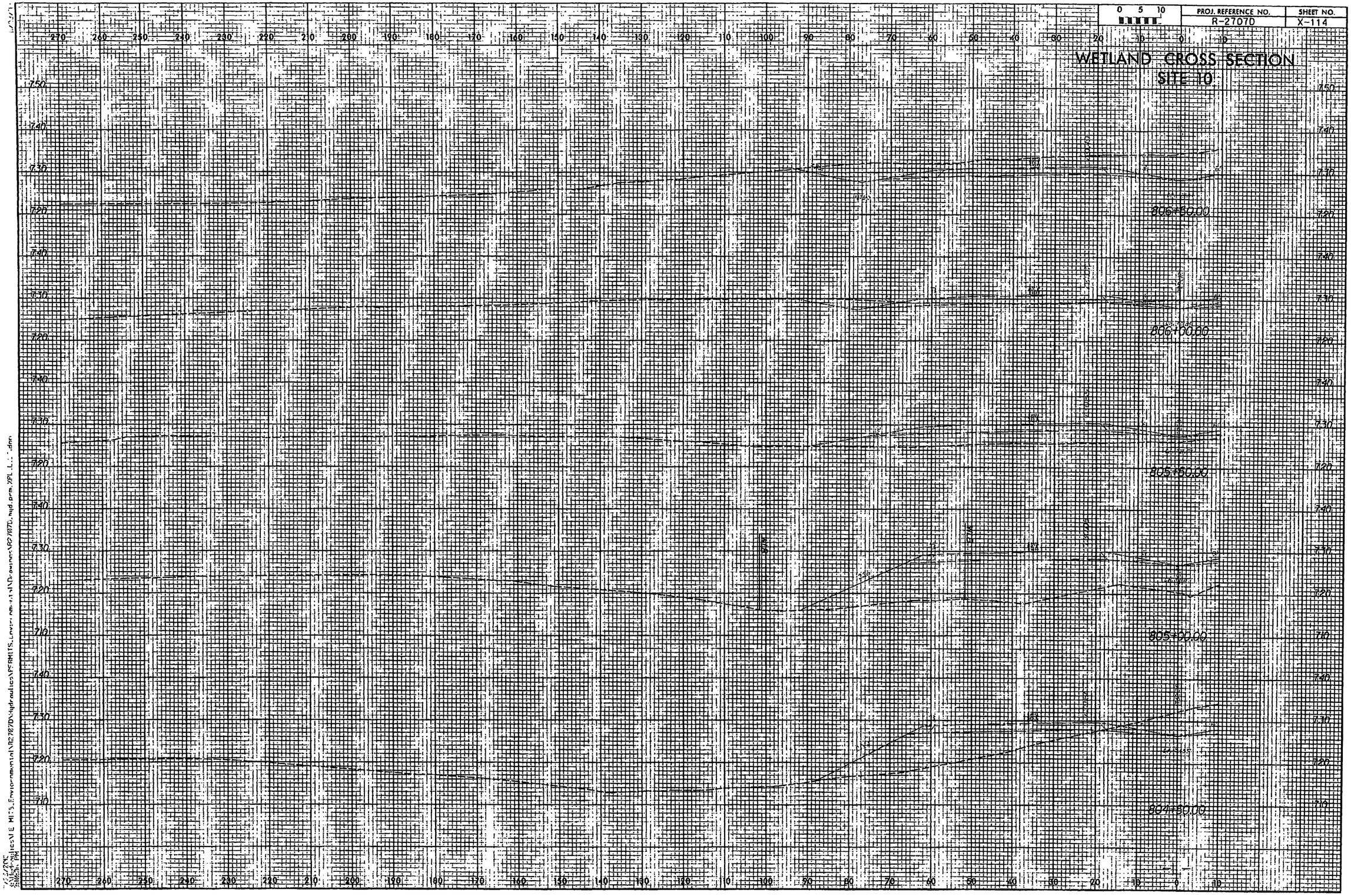
807

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2707D	X-114

WETLAND CROSS SECTION
SITE 10



PROJECT REFERENCE NO.	SHEET NO.
R-2707D	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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Fax. 919.851.7866
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REVISIONS

50 25 0 50 100

MATCH SHEET NO. 16
STA. 807+00 -L-

MATCH SHEET NO. 18
STA. 820+50 -L-

F. DON MELTON & WF.
VICKY C. MELTON

JUANITA P. BURNS

BETTY J. MAYES

JULES D. JOHNSON & WF.
LINDA JOHNSON

JAMES E. HEAFNER

SITE 11

END WW FENCE

BEGIN WW FENCE

LAVENDER, INC.

J. HAROLD PARKER & WF.
HELEN PARKER

DONNA D. PAINTER

DENNIS L. HAVRICK

MICHAEL H. FRADY & WF.
NORMA J. FRADY

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

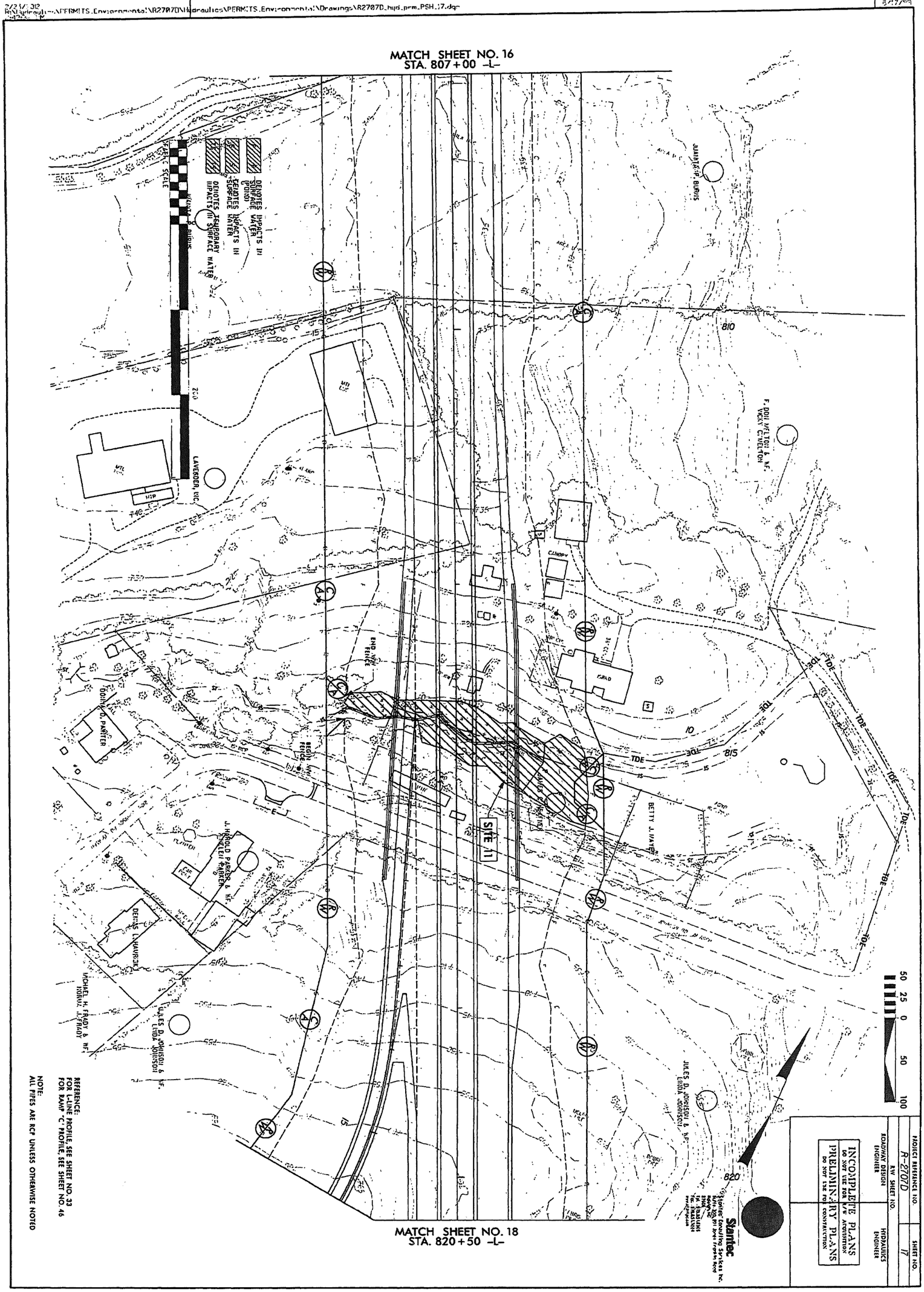
GRAPHIC SCALE

REFERENCE:
FOR L-LINE PROFILE, SEE SHEET NO. 33
FOR RAMP "C" PROFILE, SEE SHEET NO. 46

NOTE:
ALL PIPES ARE RCP UNLESS OTHERWISE NOTED

5/23/2012
DGN: mmillis
V:\RMITS_Environmental\R2707D\Hydraulics\V: RMITS_Environmental\Projects\R2707D_hyd.prn - PSI-17.dgn

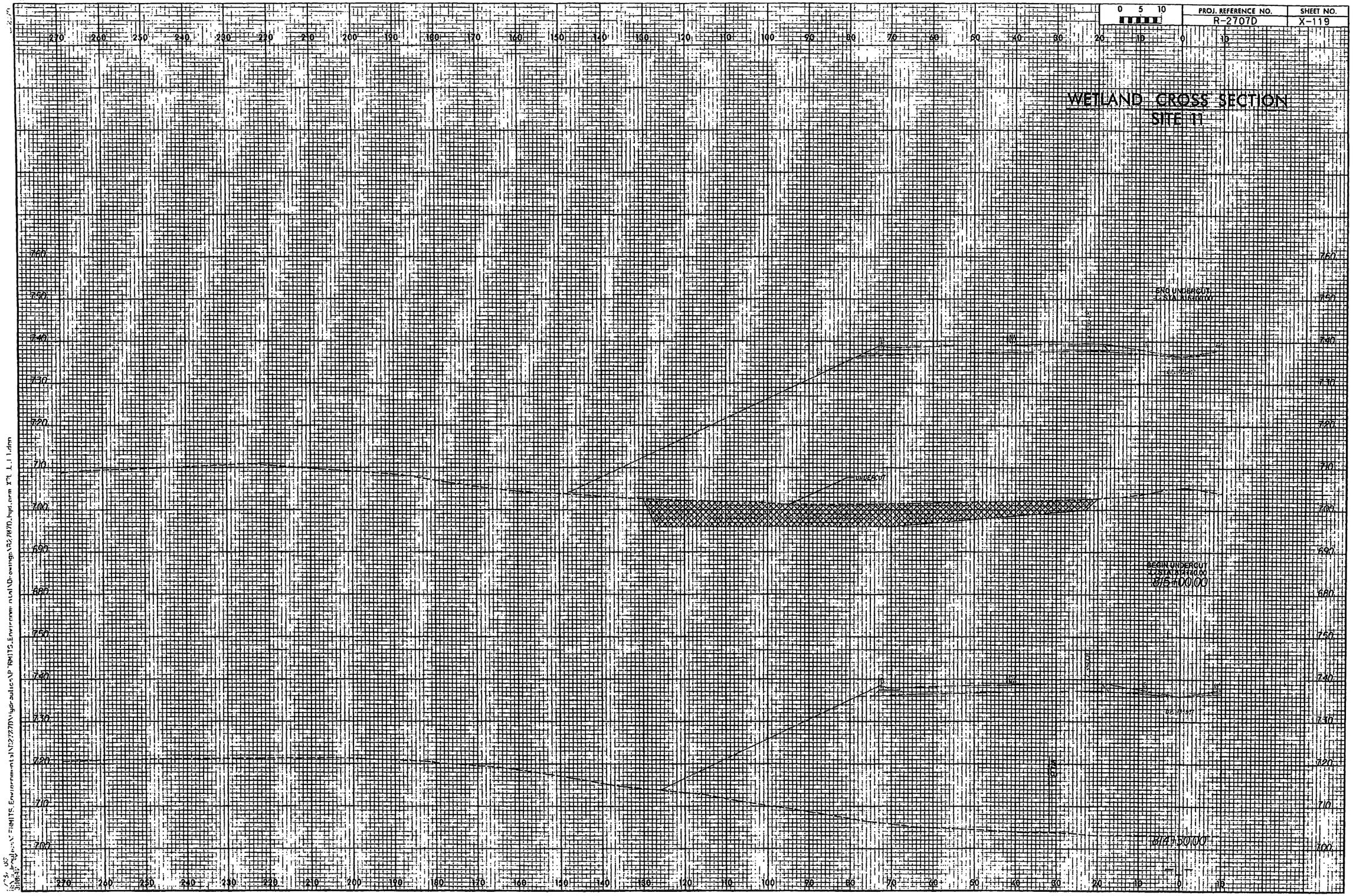
REVISIONS

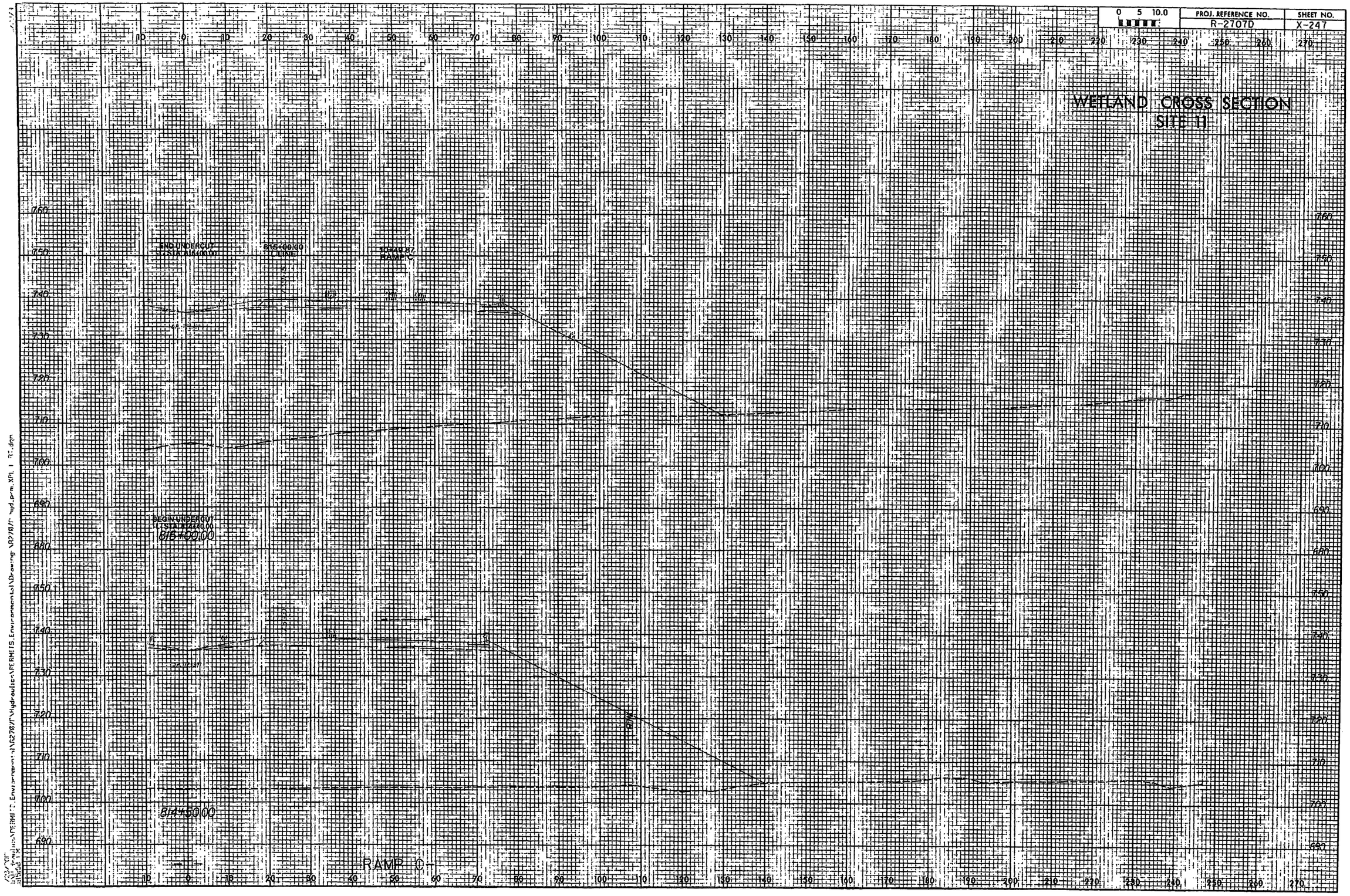


MATCH SHEET NO. 16
STA. 807+00 -L-
DENOTES IMPACTS IN SURFACE WATER (POND)
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
LAVERDER, INC.
JUANITA P. BURNS
F. DON MELTON & WF. VICKY C. MELTON
BETTY J. MAYER
JULES D. JOHNSON & WF. LINDA JOHNSON
MICHAEL H. FRADY & WF. NORMA J. FRADY
J. HAROLD PARKER & WF. HELEN PARKER
DENNIS L. HAMBRICK
SITE 11
MATCH SHEET NO. 18
STA. 820+50 -L-
REFERENCE:
FOR L-LINE PROFILE, SEE SHEET NO. 33
FOR RAMP "C" PROFILE, SEE SHEET NO. 46
NOTE:
ALL PIPES ARE RCP UNLESS OTHERWISE NOTED
PROJECT REFERENCE NO.
R-2707D
SHEET NO.
17
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Stantec

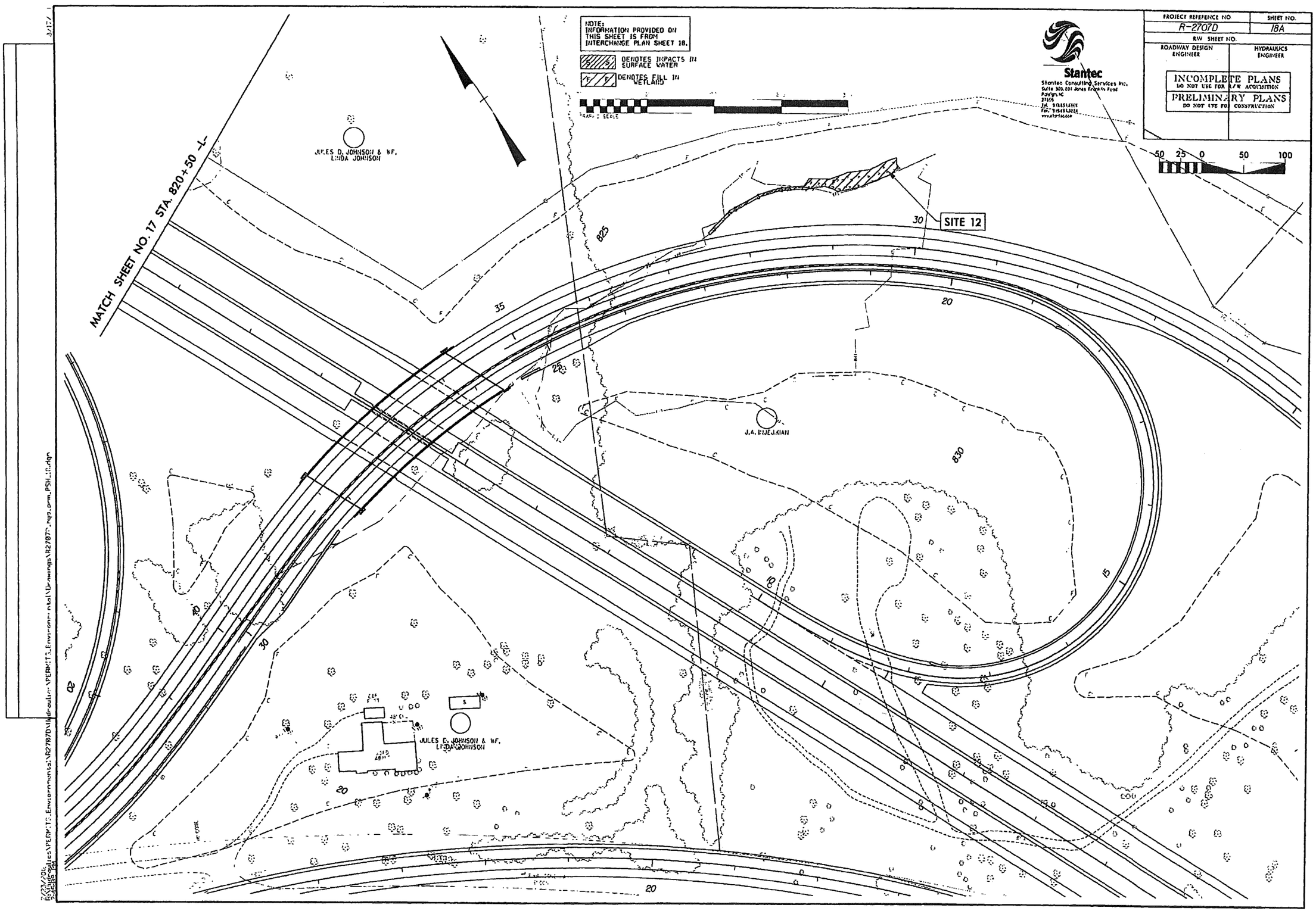
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2707D	X-119

WETLAND CROSS SECTION
SITE 11

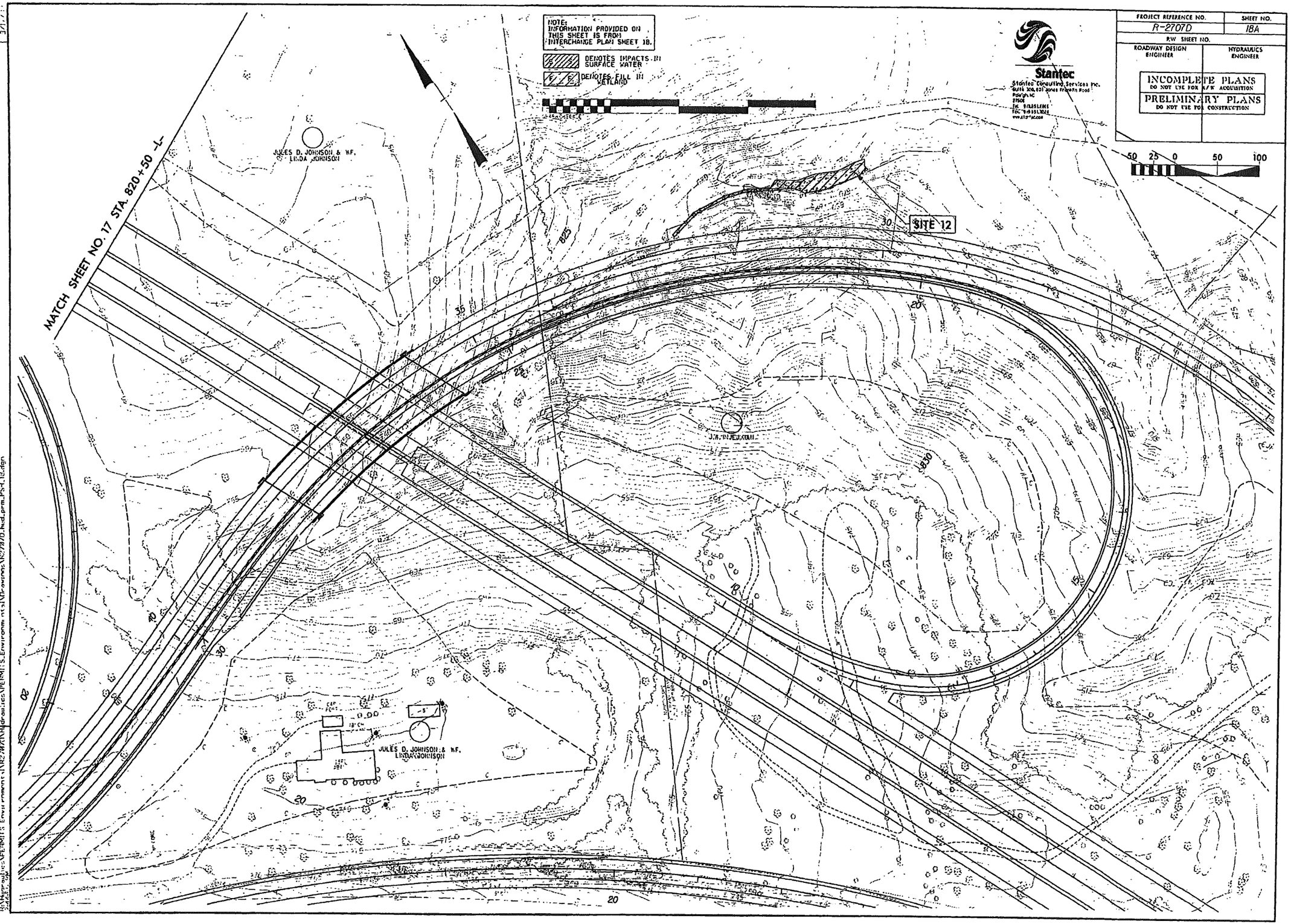




0 5 10.0
PROJ. REFERENCE NO.
R-2707D
SHEET NO.
X-247
WETLAND CROSS SECTION
SITE 11
END UNDERCUT
815+00.00
L LINE
10+49.87
RAMP C
BEGIN UNDERCUT
815+00.00
814+50.00
RAMP C



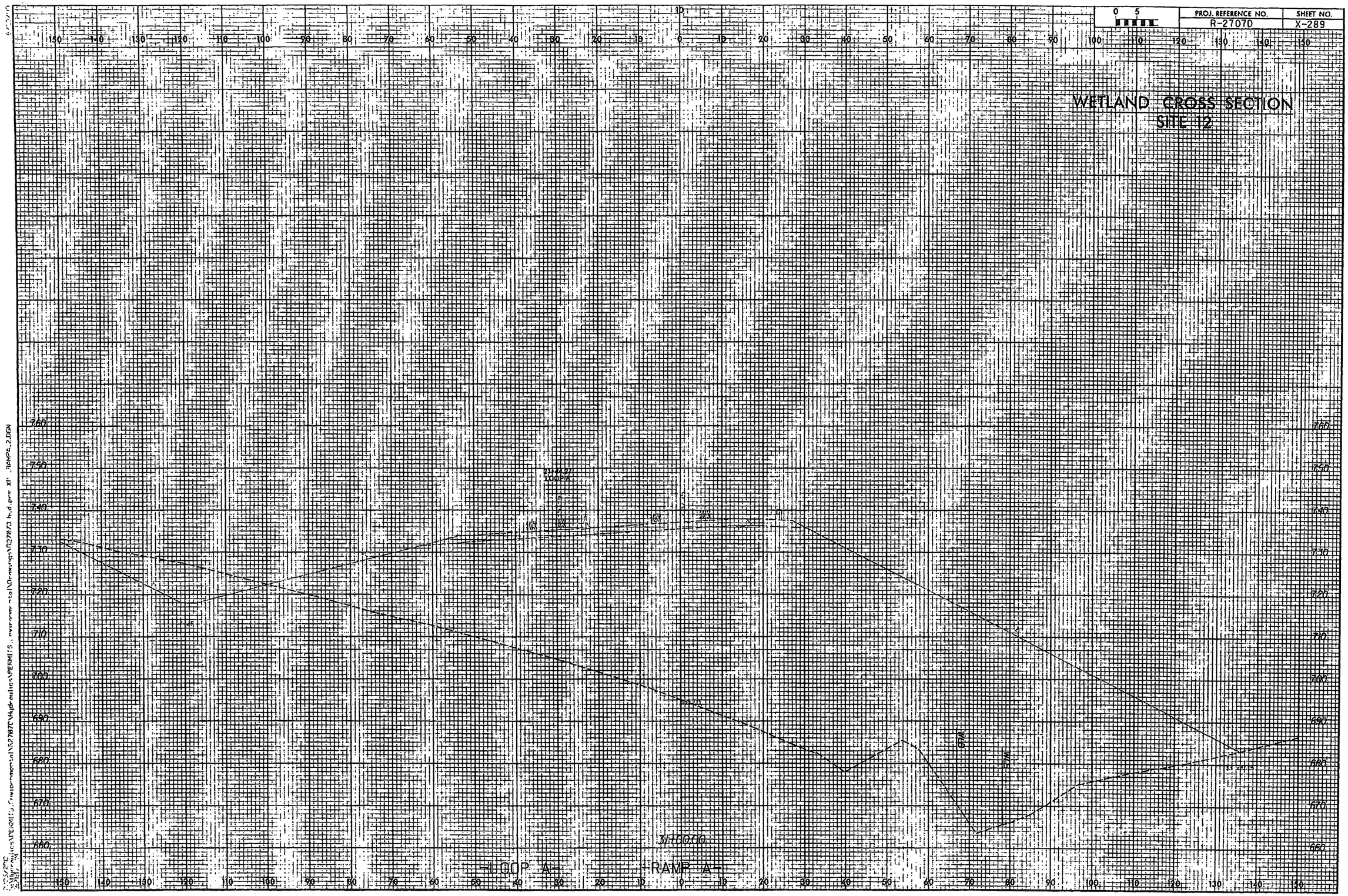
NOTE:
INFORMATION PROVIDED ON THIS SHEET IS FROM INTERCHANGE PLAN SHEET 18.
DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
Stantec
PROJECT REFERENCE NO
R-2707D
SHEET NO.
18A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
50 25 0 50 100
MATCH SHEET NO. 17 STA. 820+50 -L-
JULES D. JOHNSON & WF.
LINDA JOHNSON
SITE 12
J.A. INJEJKIAN
825
830
35
30
25
20
15
10
40

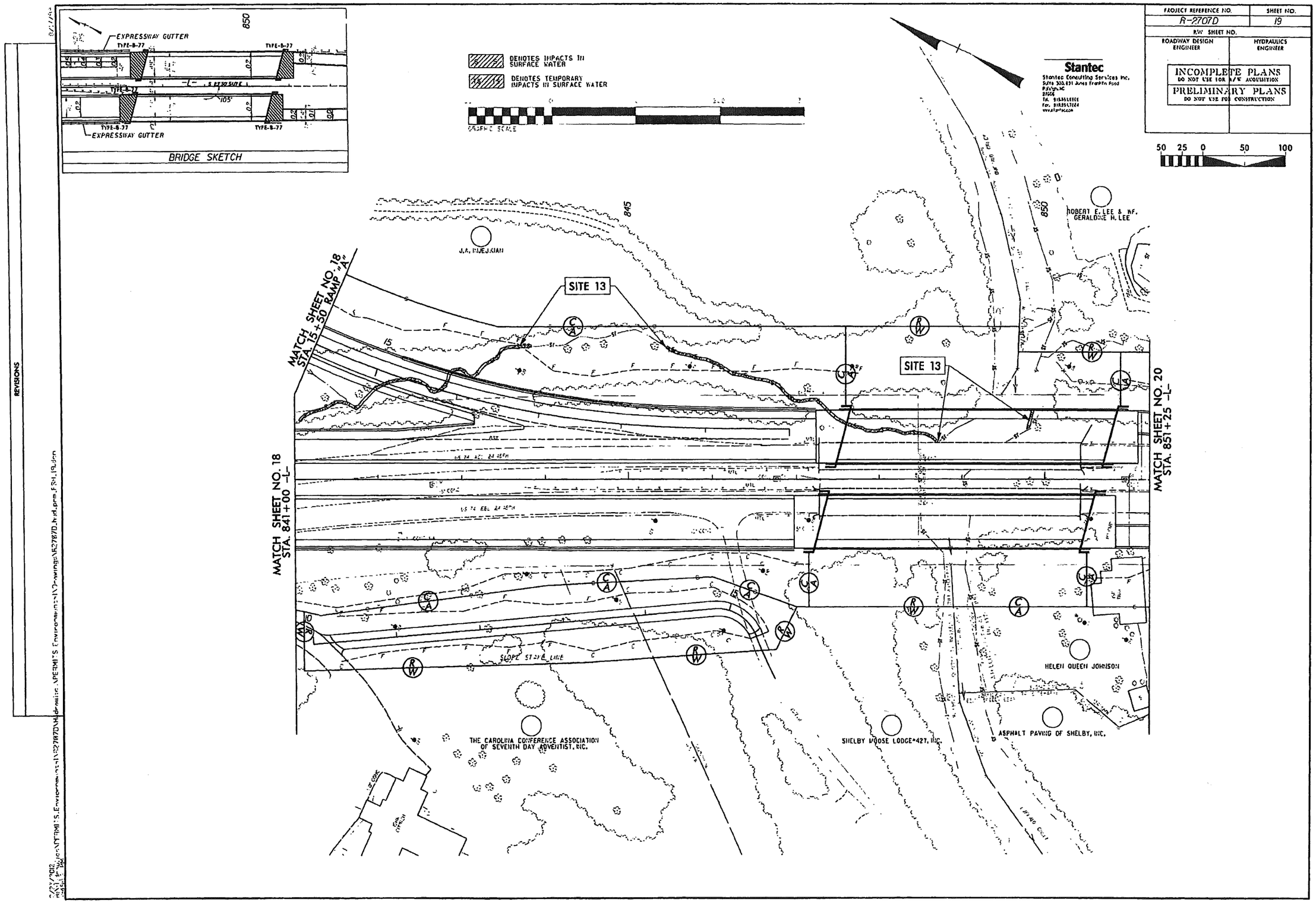


NOTE:
INFORMATION PROVIDED ON THIS SHEET IS FROM INTERCHANGE PLAN SHEET 1B.
DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
Stantec
Stantec Consulting Services Inc.
PROJECT REFERENCE NO.
R-2707D
SHEET NO.
1BA
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
50 25 0 50 100
MATCH SHEET NO. 17 STA. 820+50 -L-
JULES D. JOHNSON & WF.
LINDA JOHNSON
SITE 12
J.A. INJEKIAN
JULES D. JOHNSON & WF.
LINDA JOHNSON

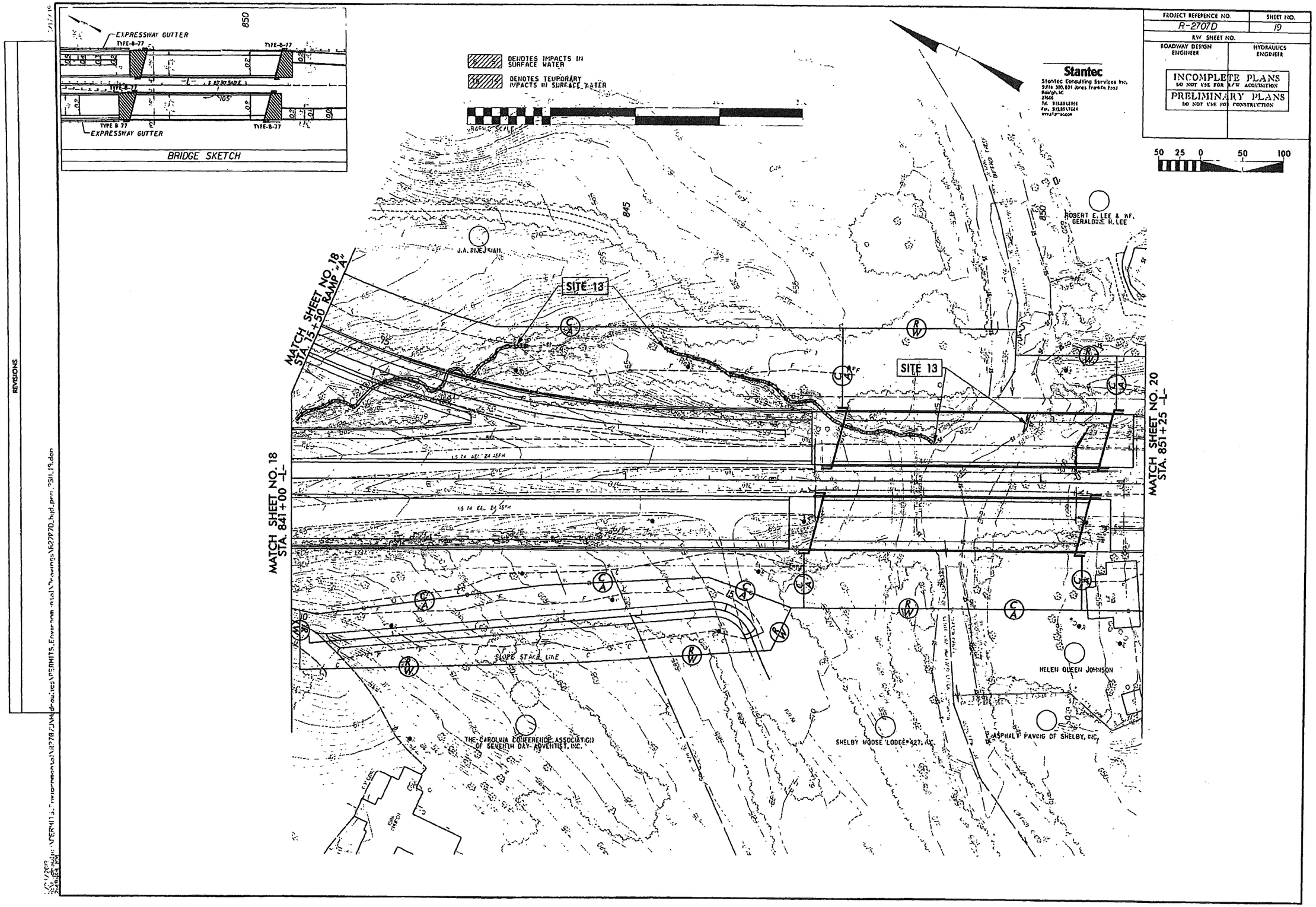
PROJ. REFERENCE NO.	SHEET NO.
R-27070	X-289

WETLAND CROSS SECTION
SITE 12

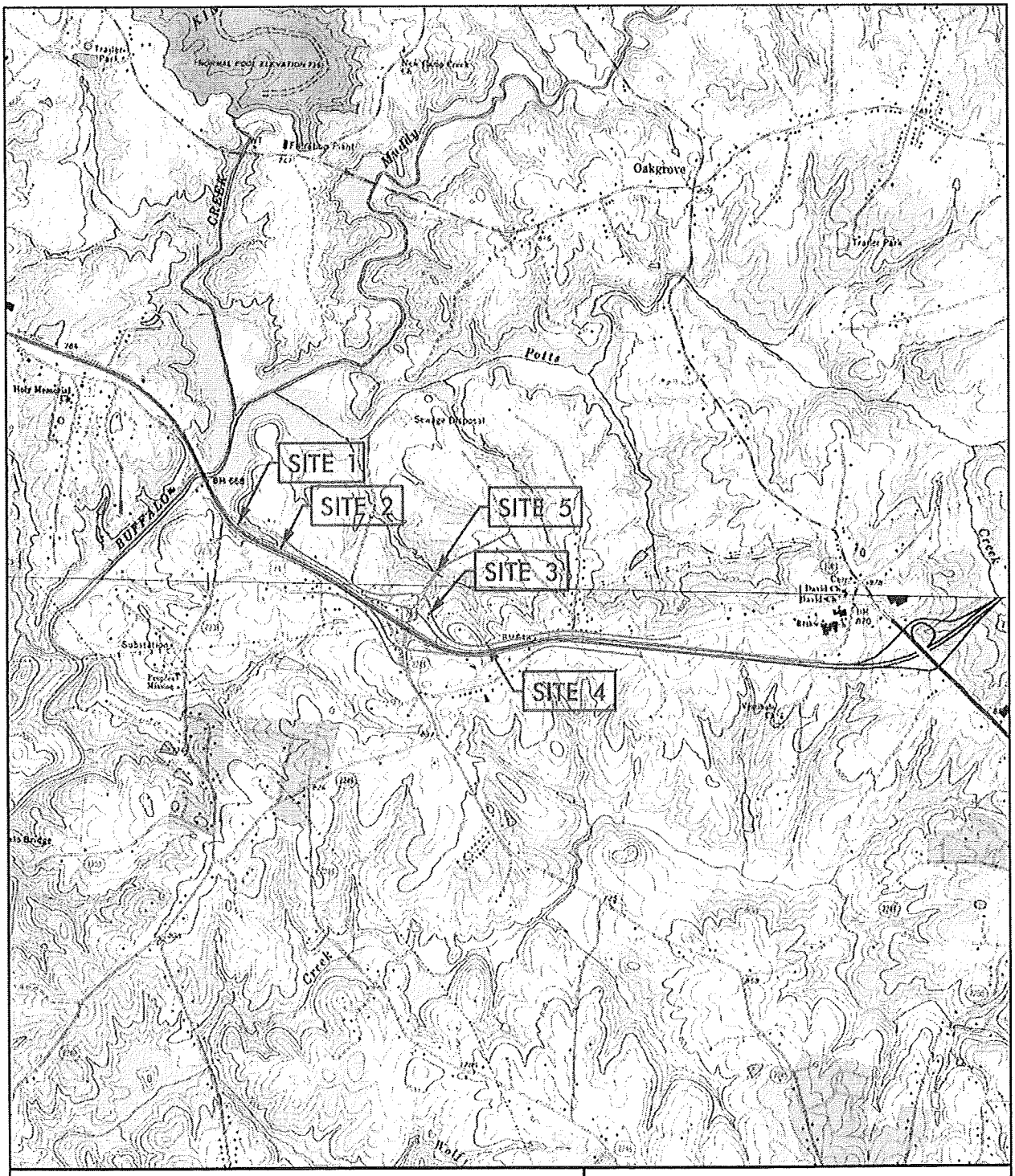




PROJECT REFERENCE NO.
R-2707D
SHEET NO.
19
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Stantec
Stantec Consulting Services Inc.
50 25 0 50 100
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
GRAPHIC SCALE
EXPRESSWAY GUTTER
TYPE-B-77
BRIDGE SKETCH
850
845
MATCH SHEET NO. 18
STA. 15+50 RAMP "A"
MATCH SHEET NO. 18
STA. 841+00 -L-
MATCH SHEET NO. 20
STA. 851+25 -L-
SITE 13
SITE 13
J.A. INJEJKIAN
ROBERT E. LEE & WF.
GERALDINE H. LEE
HELEN QUEEN JOHNSON
THE CAROLINA CONFERENCE ASSOCIATION OF SEVENTH DAY ADVENTIST, INC.
SHELBY MOOSE LODGE #427, INC.
ASPHALT PAVING OF SHELBY, INC.
SLOPE STAKE LINE
REVISIONS



PROJECT REFERENCE NO.
R-2707D
SHEET NO.
19
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
Stantec
Stantec Consulting Services Inc.
50 25 0 50 100
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
GRAPHIC SCALE
EXPRESSWAY GUTTER
TYPE-B-77
TYPE B 77
BRIDGE SKETCH
850
845
MATCH SHEET NO. 18
STA. 15+50 RAMP "A"
MATCH SHEET NO. 18
STA. 841+00 -L-
MATCH SHEET NO. 20
STA. 851+25 -L-
SITE 13
SITE 13
J.A. RIJEJKIAN
ROBERT E. LEE & WF. GERALDINE H. LEE
HELEN QUEEN JOHNSON
THE CAROLINA CONFERENCE ASSOCIATION OF SEVENTH DAY ADVENTIST, INC.
SHELBY MOOSE LODGE #427, INC.
ASPHALT PAVING OF SHELBY, INC.
SLOPE STAKE LINE
REVISIONS



TOPO MAP

SCALE: 1" = 3000'

NCDOT

DIVISION OF HIGHWAYS
CLEVELAND COUNTY
PROJECT: R-2707E

US 74 - SHELBY BYPASS
FROM EXISTING US 74 WEST OF
SR 2238 TO WEST OF SR 1001

SHEET OF 02/24/12

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L-860+55 - 873+50	Roadway Fill				<0.01		0.03	<0.01	318	10	
2	-L-870+93 - 873+51	Roadway Fill	0.01					0.05	<0.01	513	12	
	Bank Stabilization							<0.01		19		
3	-L-903+90 - 909+43		0.63					0.14	<0.01	1565	11	
	Bank Stabilization							<0.01		20		
4	-SR7- 28+50 - 29+42		0.02			<0.01		0.03		194		
5	-Y42- 39+27 - 39+86							0.14	0.01	215	31	
TOTALS:			0.66			<0.01		0.38	0.01	2844	64	

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

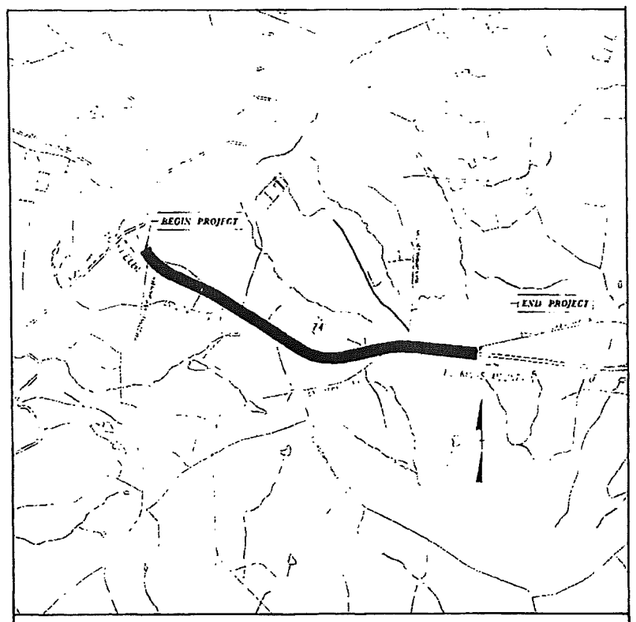
CLEVELAND COUNTY
(R-2707E)

SHEET 2/24/2012

ATN Revised 3/31/05

R-2707E

PROJECT: 34497.1.2



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

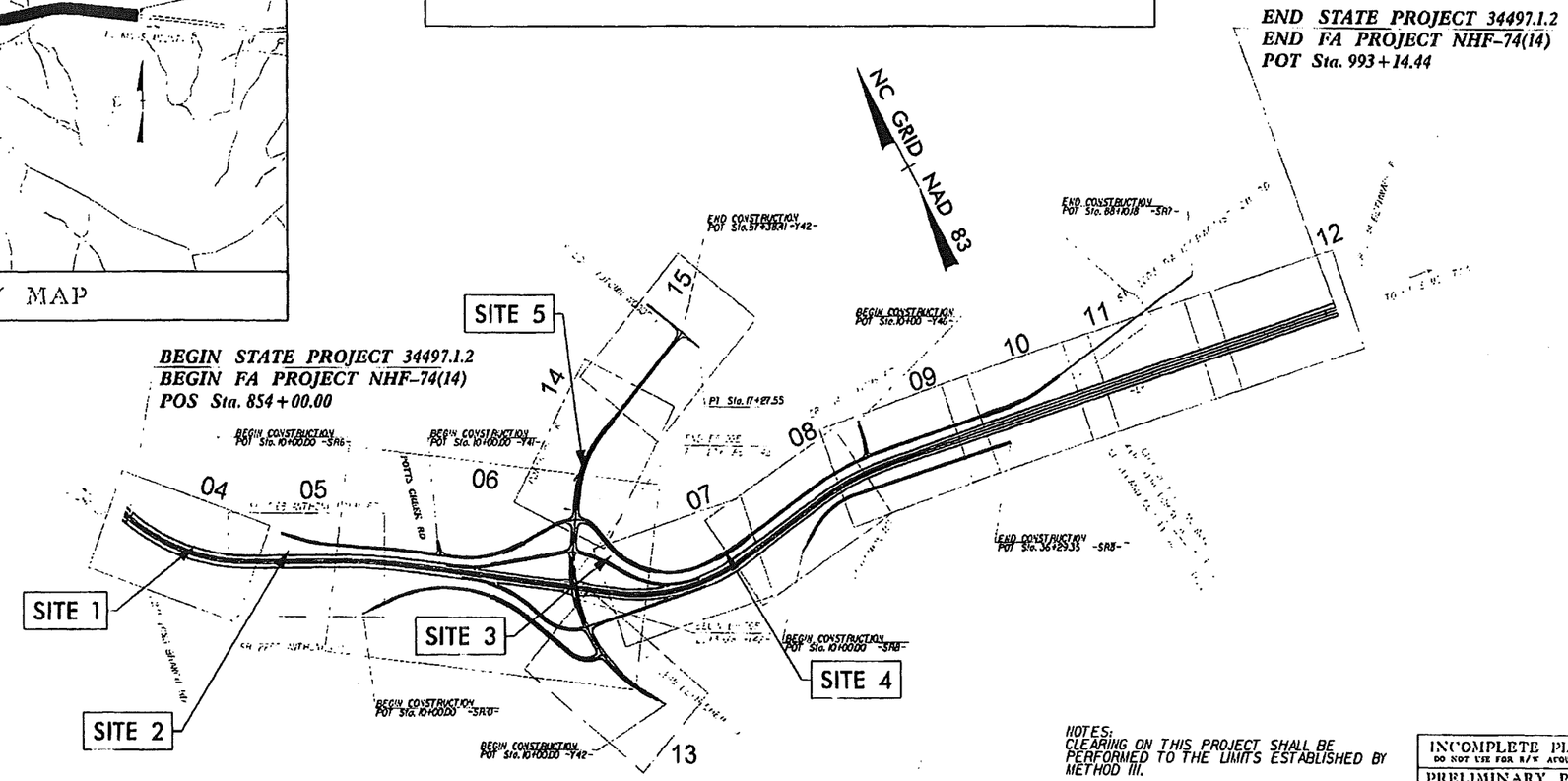
CLEVELAND COUNTY

STATE	STATE PROJECT REFERENCE NO	SHEET NO	TOTAL SHEETS
N.C.	R-2707E	1	
STATE FED NO	F.A. PROJ NO	DESCRIPTION	
34497.1.2	NHF-74(14)	P.E.	

LOCATION: US 74 FROM EXISTING US 74 WEST OF SR 2238 TO WEST OF SR 1001

TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE

WETLAND AND STREAM IMPACTS



NCDOT CONTACT: TERESA BRUTON, P.E.- PROJECT ENGINEER

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

THIS PROJECT IS NOT LOCATED WITHIN THE BOUNDARIES OF ANY MUNICIPALITY.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 5 2.5 0 5 10

DESIGN DATA

ADT 2005 = 21,100
ADT 2025 = 32,900
DHV = 10 %
D = 60 %
T = 5 % *
V = 70 MPH
* TTST 8% DUAL 6%

PROJECT LENGTH

LENGTH ROADWAY
F.A. PROJECT NHF-74(14 = 2.635 MILES

LENGTH STRUCTURE
F.A. PROJECT NHF-74(14) = —

TOTAL ROADWAY LENGTH
STATE PROJECT 34497.1.2 = 2.635 MILES

Prepared in the Office of:
WILBUR SMITH ASSOCIATES
P.O. BOX 1476 RALEIGH, NC 27602-1476 PHONE (919) 755-0563

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 21, 2005

LETTING DATE:

DAVID L. WILTER, P.E.
PROJECT ENGINEER

DAVID L. WILTER, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

DATE: 9/4/2007
TIME: 11:31:35 AM
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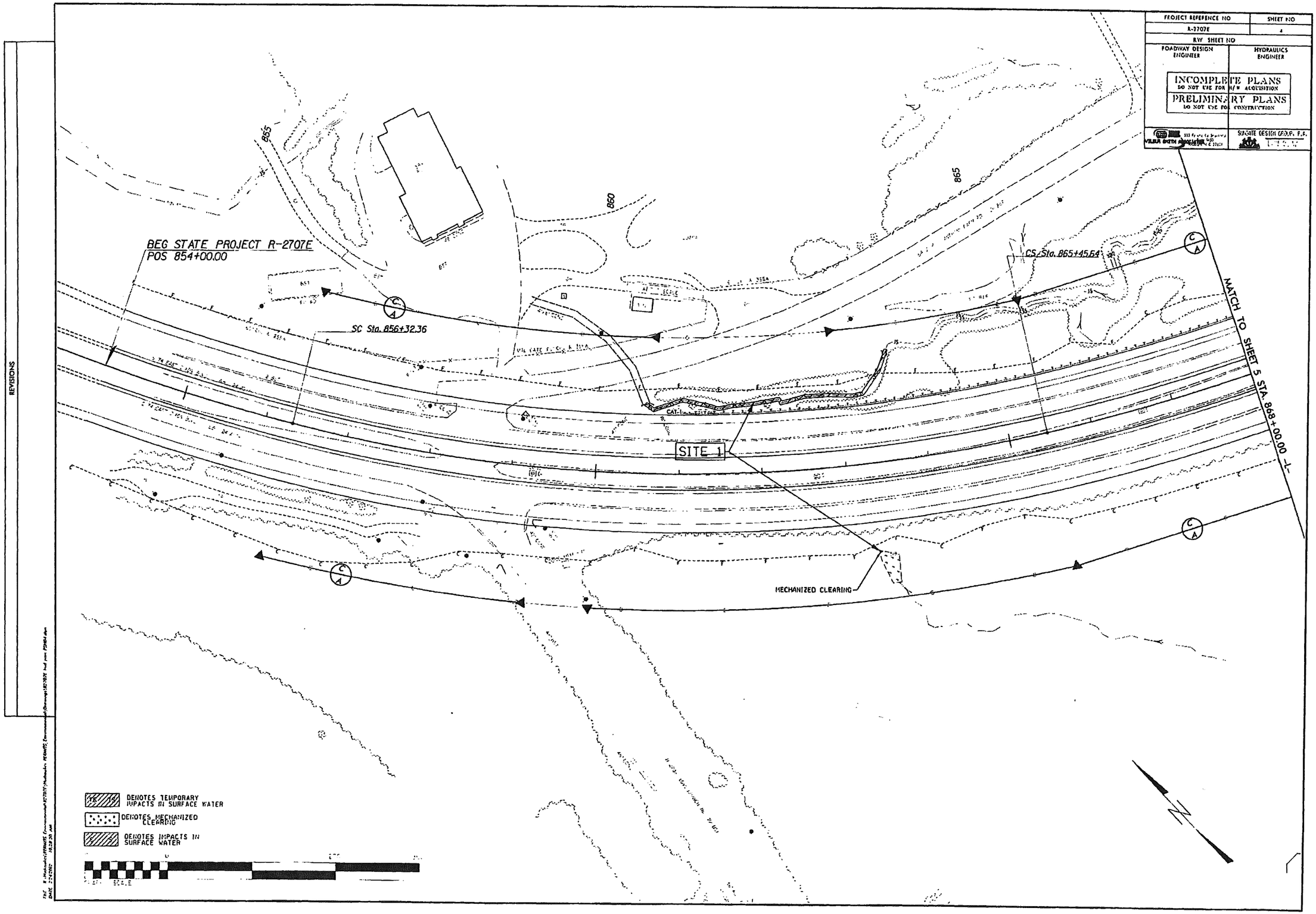
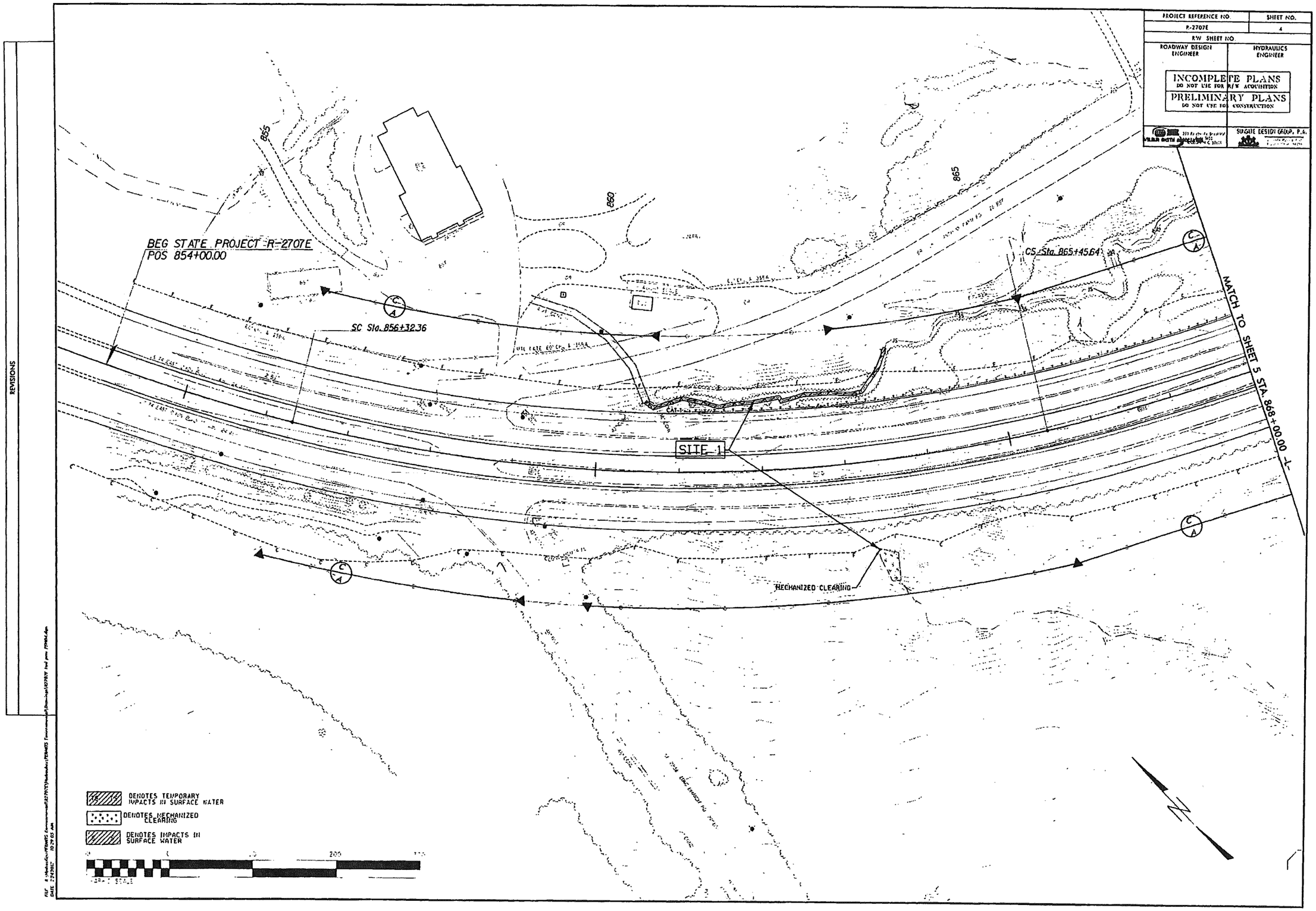
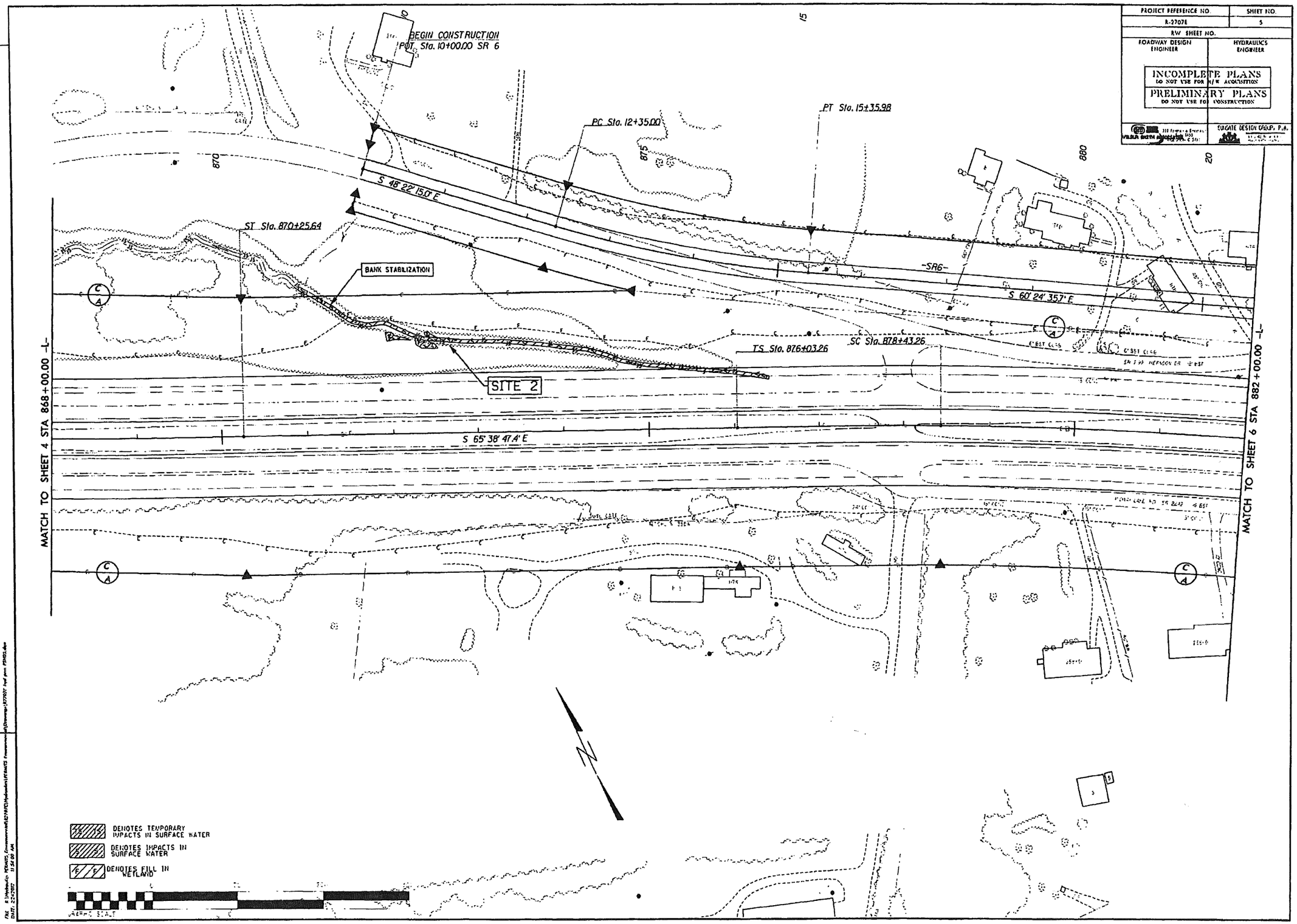
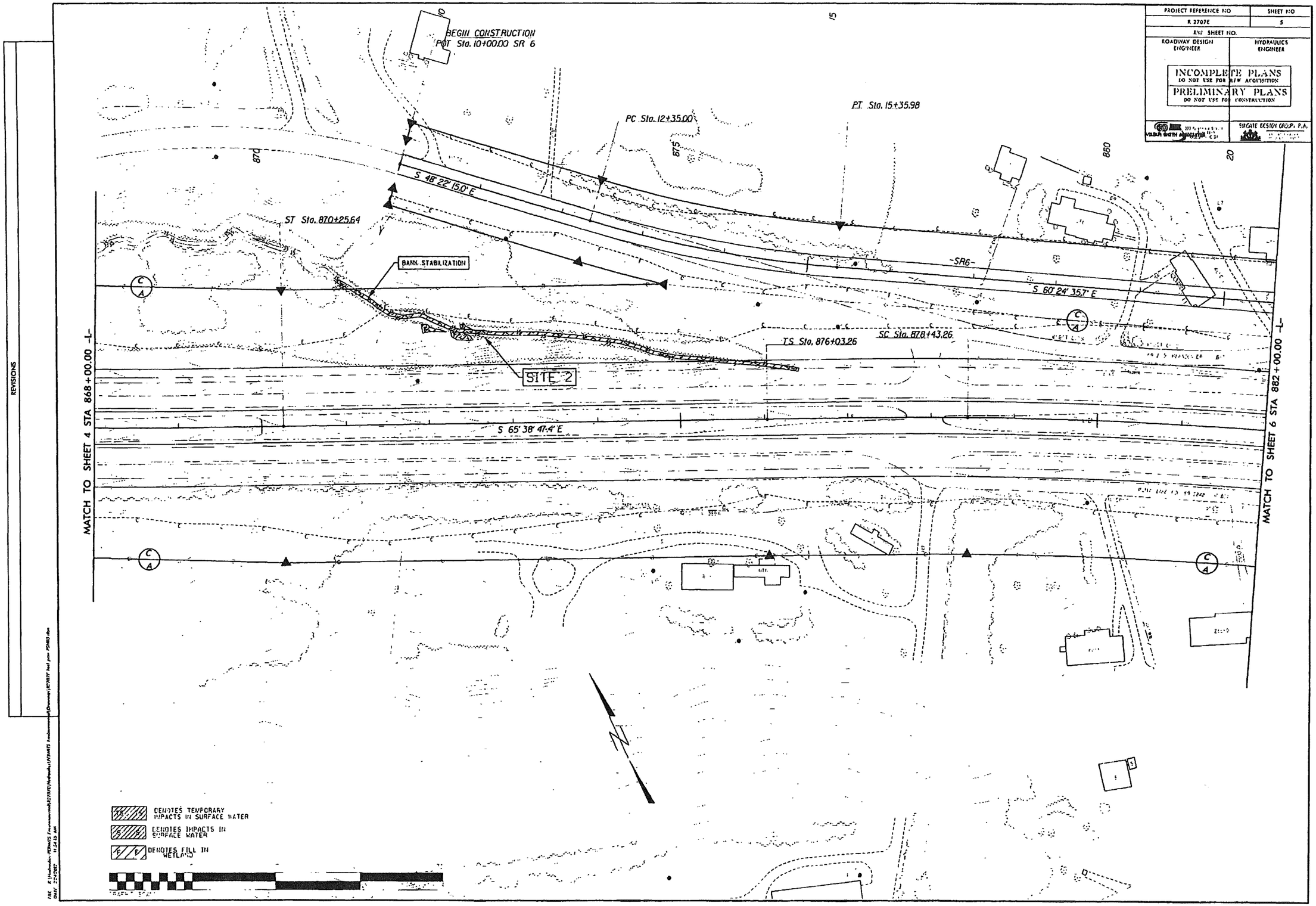


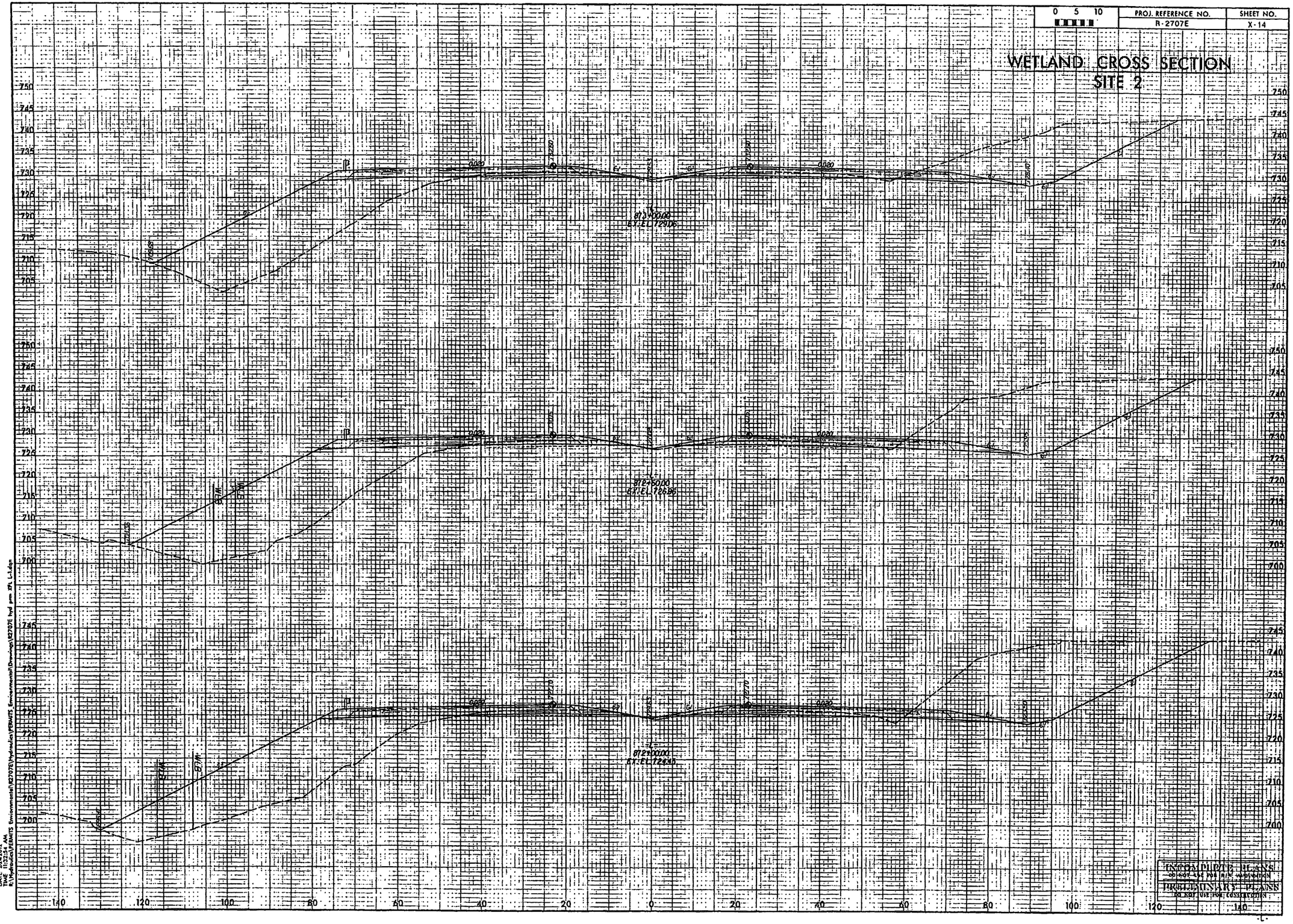
PROJECT REFERENCE NO
R-2707E
SHEET NO
4
R/W SHEET NO
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SUGATE DESIGN GROUP, P.A.
BEG STATE PROJECT R-2707E
POS 854+00.00
SC Sta. 856+32.36
CS Sta. 865+45.64
855
860
865
SITE 1
MECHANIZED CLEARING
MATCH TO SHEET 5 STA. 868+00.00 -L-
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
DENOTES IMPACTS IN SURFACE WATER
REVISIONS


PROJECT REFERENCE NO.
R-2707E
SHEET NO.
4
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
SUNGATE DESIGN GROUP, P.A.
BEG STATE PROJECT R-2707E
POS 854+00.00
SC Sta. 856+32.36
CS Sta. 865+45.64
MATCH TO SHEET 5 STA. 868+00.00 -L-
SITE 1
MECHANIZED CLEARING
855
860
865
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
DENOTES IMPACTS IN SURFACE WATER
200
REVISIONS



PROJECT REFERENCE NO.
R-2707E
SHEET NO.
5
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SUNGATE DESIGN GROUP, P.A.
BEGIN CONSTRUCTION
POT Sta. 10+00.00 SR 6
PC Sta. 12+35.00
PT Sta. 15+35.98
S 48° 22' 15.0" E
ST Sta. 870+25.64
BANK STABILIZATION
-SR6-
S 60° 24' 35.7" E
TS Sta. 876+03.26
SC Sta. 878+43.26
SITE 2
S 65° 38' 47.4" E
MATCH TO SHEET 4 STA 868+00.00 -L-
MATCH TO SHEET 6 STA 882+00.00 -L-
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
GRAPHIC SCALE
REVISIONS


PROJECT REFERENCE NO
R 2707E
SHEET NO
5
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
SUGGATE DESIGN GROUP, P.A.
BEGIN CONSTRUCTION
POT Sta. 10+00.00 SR 6
PC Sta. 12+35.00
PT Sta. 15+35.98
S 48° 22' 15.0" E
ST Sta. 870+25.64
BANK STABILIZATION
-SR6-
S 60° 24' 35.7" E
TS Sta. 876+03.26
SC Sta. 878+43.26
SITE 2
S 65° 38' 47.4" E
MATCH TO SHEET 4 STA 868+00.00 -L-
MATCH TO SHEET 6 STA 882+00.00 -L-
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
REVISIONS



0 5 10
PROJ. REFERENCE NO.
R-2707E
SHEET NO.
X-14
WETLAND CROSS SECTION
SITE 2
INCOMPLETE PLANS
DO NOT USE FOR RIGHT-OF-WAY DEVELOPMENT
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJECT REFERENCE NO	SHEET NO
R-2707E	6A
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

WILBUR SMITH ASSOCIATES

DENNIS DESIGN GROUP, P.A.

SITE 3

SITE 3

MATCH TO SHEET 14 STA 35+00.00 -Y42-

MATCH TO SHEET 7 STA 18+40.00 -RPD-

MATCH TO SHEET 7 STA 910+00.00 -L-

MATCH TO SHEET 7 STA 17+25.00 -RPA-

NOTE:
INFORMATION PROVIDED ON THIS SHEET IS FROM INTERCHANGE PLAN SHEET 6.

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

PROJECT REFERENCE NO	SHEET NO
R 2707E	6A
RW SHEET NO	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

KIMLEY-HORN AND ASSOCIATES, INC.

SUGATE DESIGN GROUP, P.A.

SITE 3

SITE 3

MATCH TO SHEET 14 STA 35+00.00 -Y42-

MATCH TO SHEET 7 STA 18+40.00 -RPD-

MATCH TO SHEET 7 STA 910+00.00 -L-

MATCH TO SHEET 7 STA 17+25.00 -RPA-

NOTE:
INFORMATION PROVIDED ON THIS SHEET IS FROM INTERCHANGE PLAN SHEET 6.

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

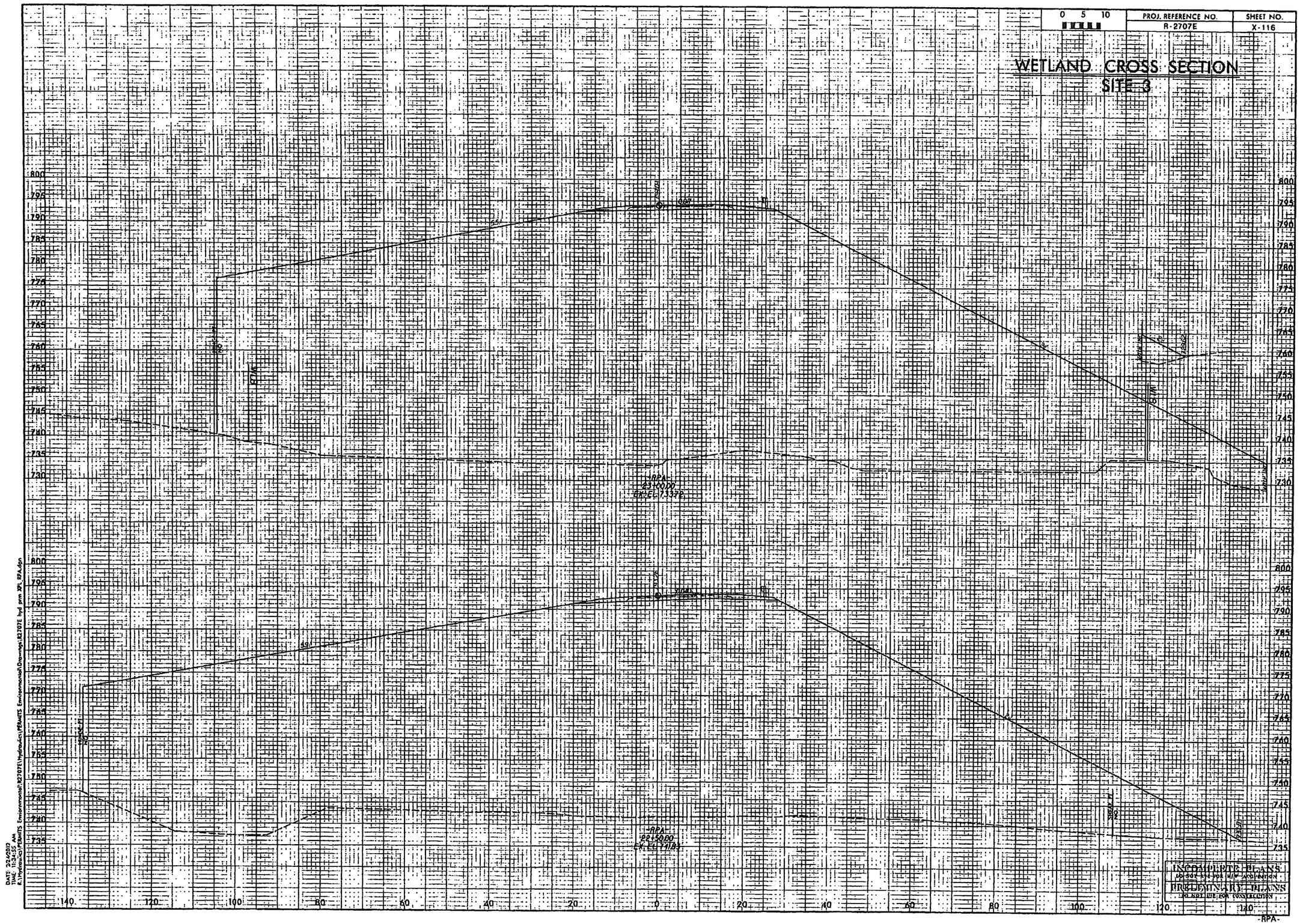
DENOTES IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

GRAPHIC SCALE

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
TAU	R-2707E	X-116

WETLAND CROSS SECTION
SITE 3



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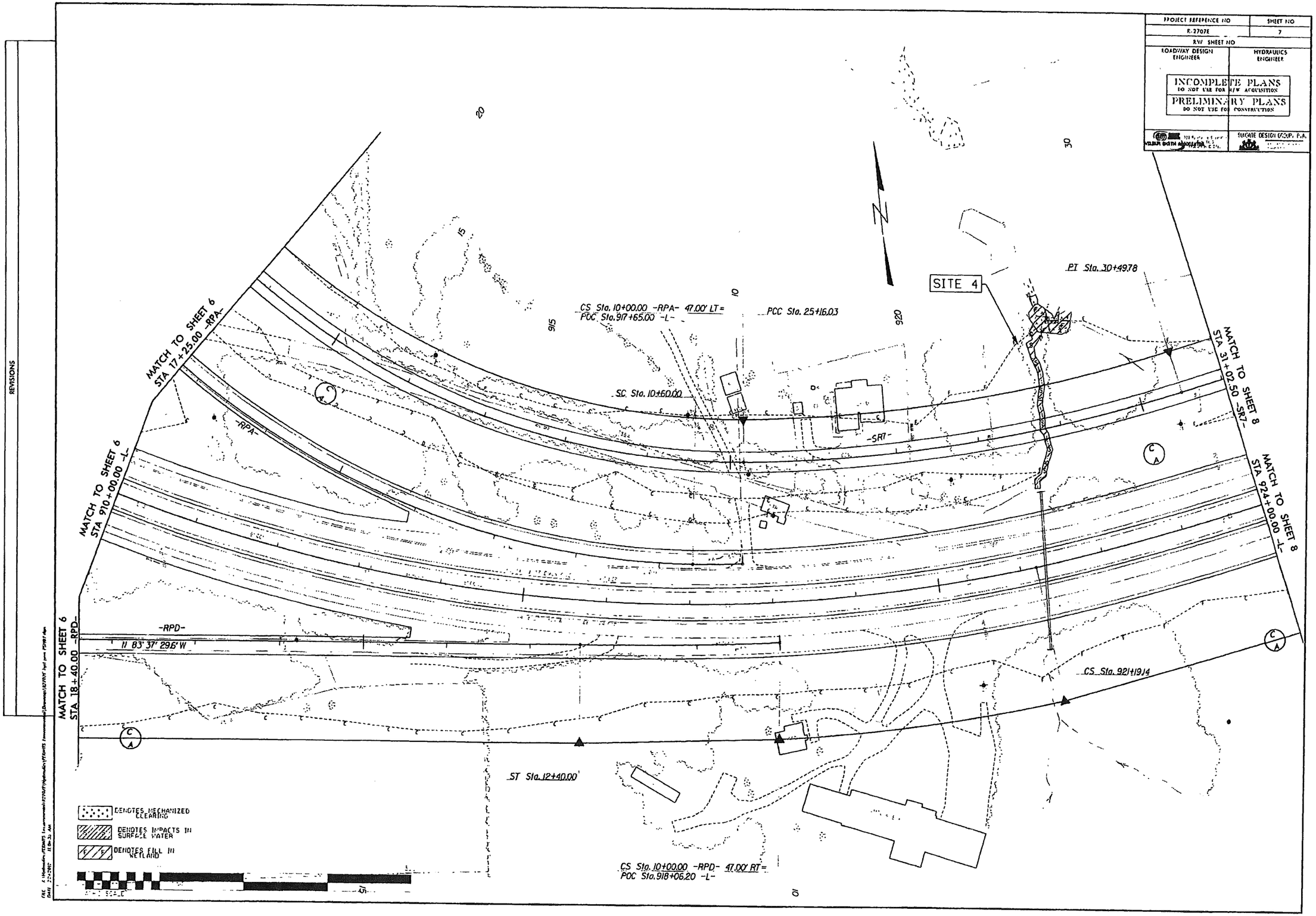
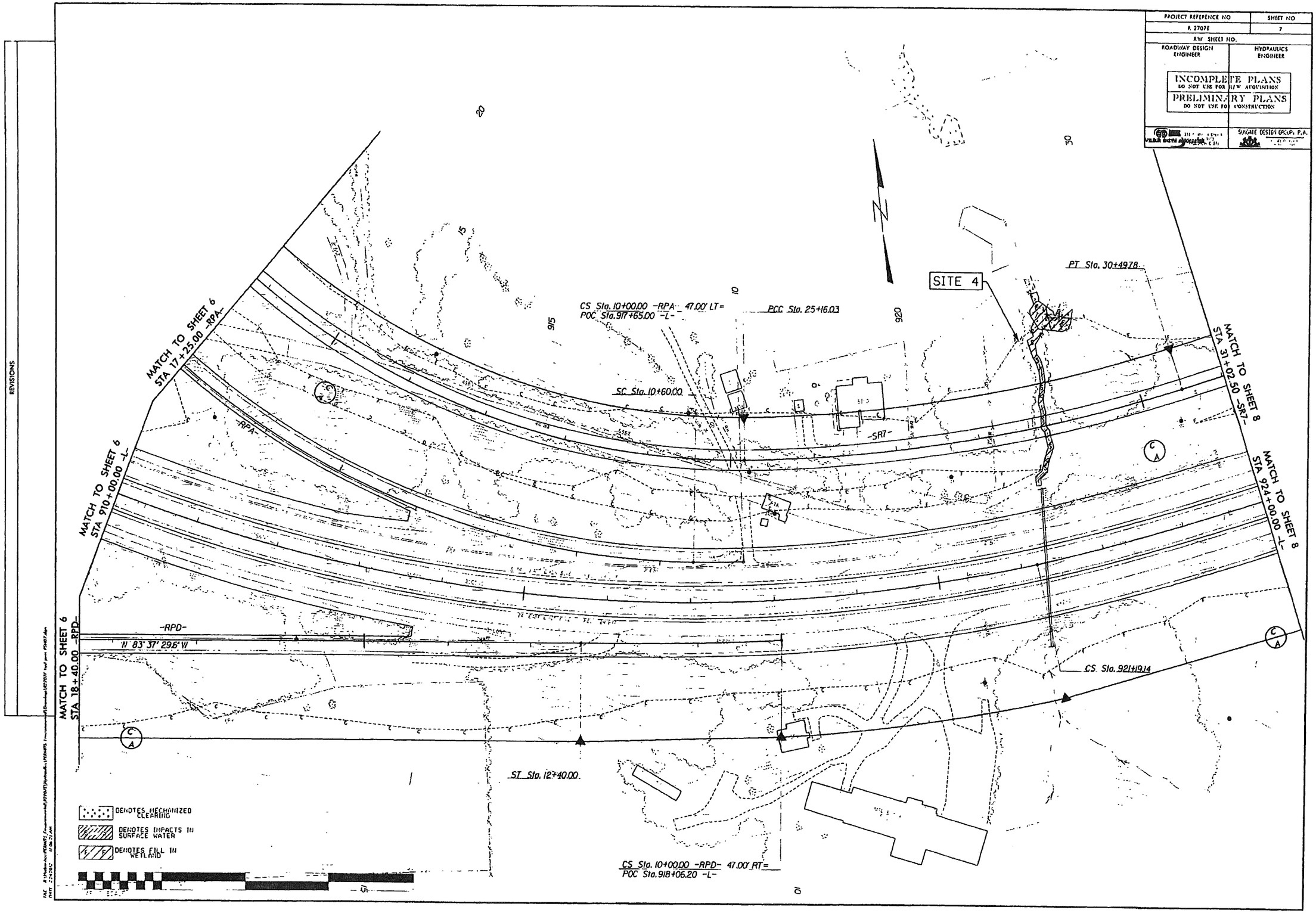
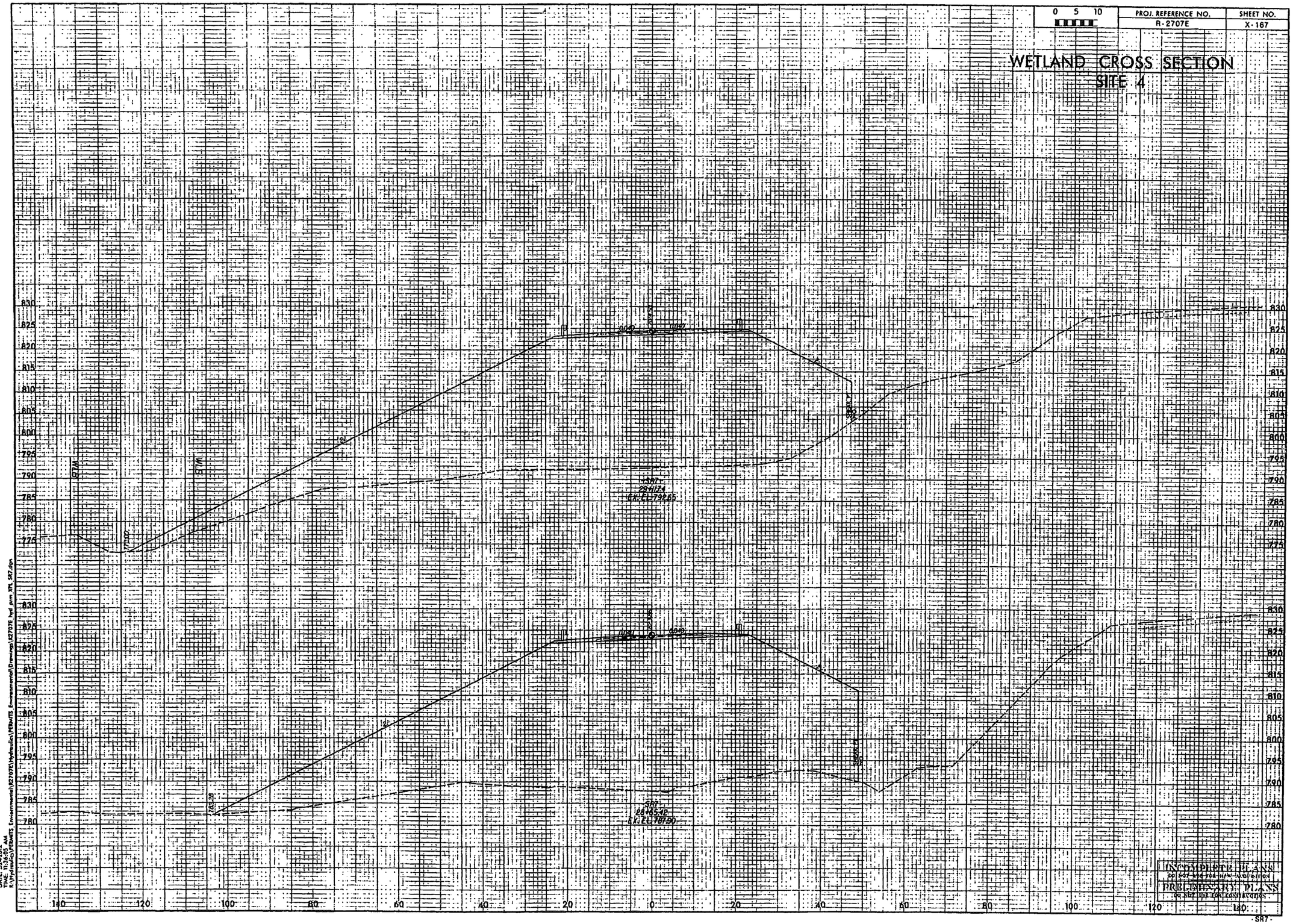
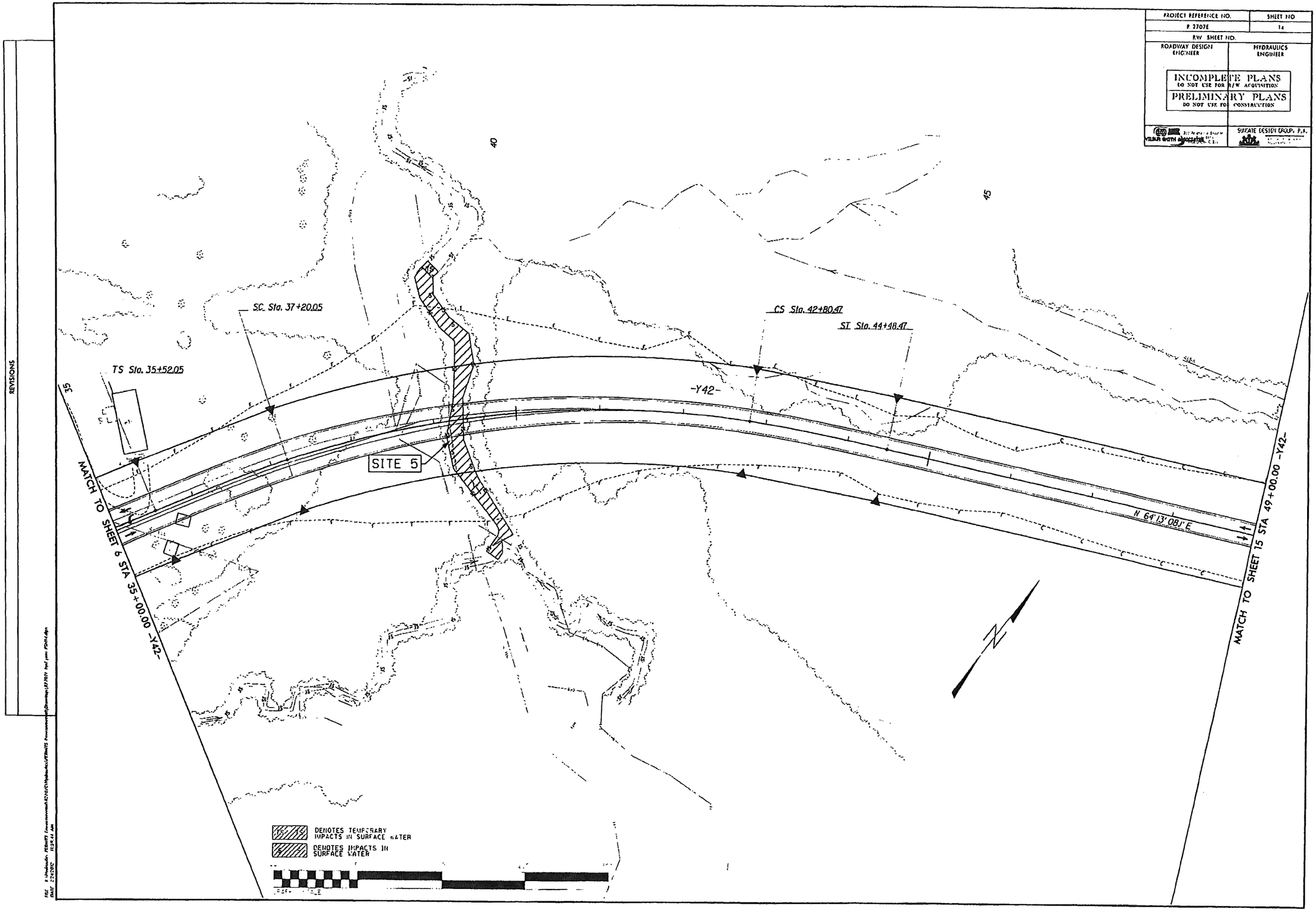
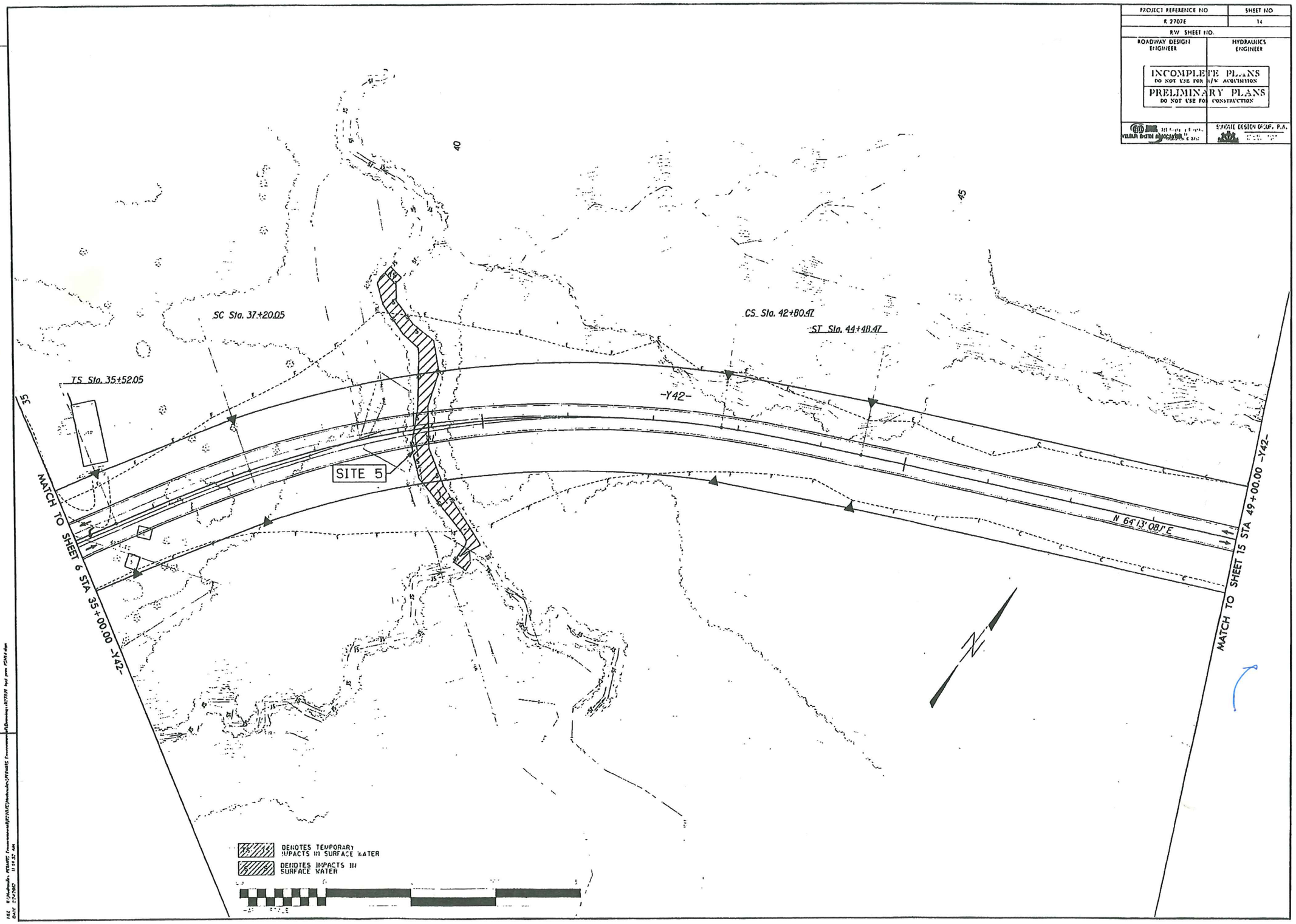

PROJECT REFERENCE NO
R-2707E
SHEET NO
7
RW SHEET NO
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SUGATE DESIGN GROUP, P.A.
REVISIONS
MATCH TO SHEET 6
STA 17+25.00 -RPA-
MATCH TO SHEET 6
STA 910+00.00 -L-
MATCH TO SHEET 6
STA 18+40.00 -RPD-
MATCH TO SHEET 8
STA 31+02.50 -SR7-
MATCH TO SHEET 8
STA 924+00.00 -L-
SITE 4
PT Sta. 30+49.78
CS Sta. 10+00.00 -RPA- 47.00' LT=
POC Sta. 917+65.00 -L-
PCC Sta. 25+16.03
SC Sta. 10+60.00
-SR7-
-RPA-
-RPD-
N 83° 37' 29.6" W
CS Sta. 921+19.14
ST Sta. 12+40.00
CS Sta. 10+00.00 -RPD- 47.00' RT=
POC Sta. 918+06.20 -L-
DENOTES MECHANIZED CLEARING
DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
20
15
10
915
920
30


PROJECT REFERENCE NO
R 2707E
SHEET NO
7
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
SUNGATE DESIGN GROUP, P.A.
REVISIONS
MATCH TO SHEET 6
STA 17+25.00 -RPA-
MATCH TO SHEET 6
STA 910+00.00 -L-
MATCH TO SHEET 6
STA 18+40.00 -RPD-
MATCH TO SHEET 8
STA 31+02.50 -SR7-
MATCH TO SHEET 8
STA 924+00.00 -L-
SITE 4
PT Sta. 30+49.78
CS Sta. 10+00.00 -RPA- 47.00' LT=
POC Sta. 917+65.00 -L-
PCC Sta. 25+16.03
SC Sta. 10+60.00
-RPA-
-SR7-
-RPD-
N 83° 37' 29.6" W
CS Sta. 921+19.14
ST Sta. 12+40.00
CS Sta. 10+00.00 -RPD- 47.00' RT=
POC Sta. 918+06.20 -L-
DENOTES MECHANIZED CLEARING
DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND



0 5 10
PROJ. REFERENCE NO.
R-2707E
SHEET NO.
X-167
WETLAND CROSS SECTION
SITE 4
SR7
29+11.74
EX. EL 792.65
SR7
28+65.42
EX. EL 787.90
INCOMPLETE PLANS
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SR7

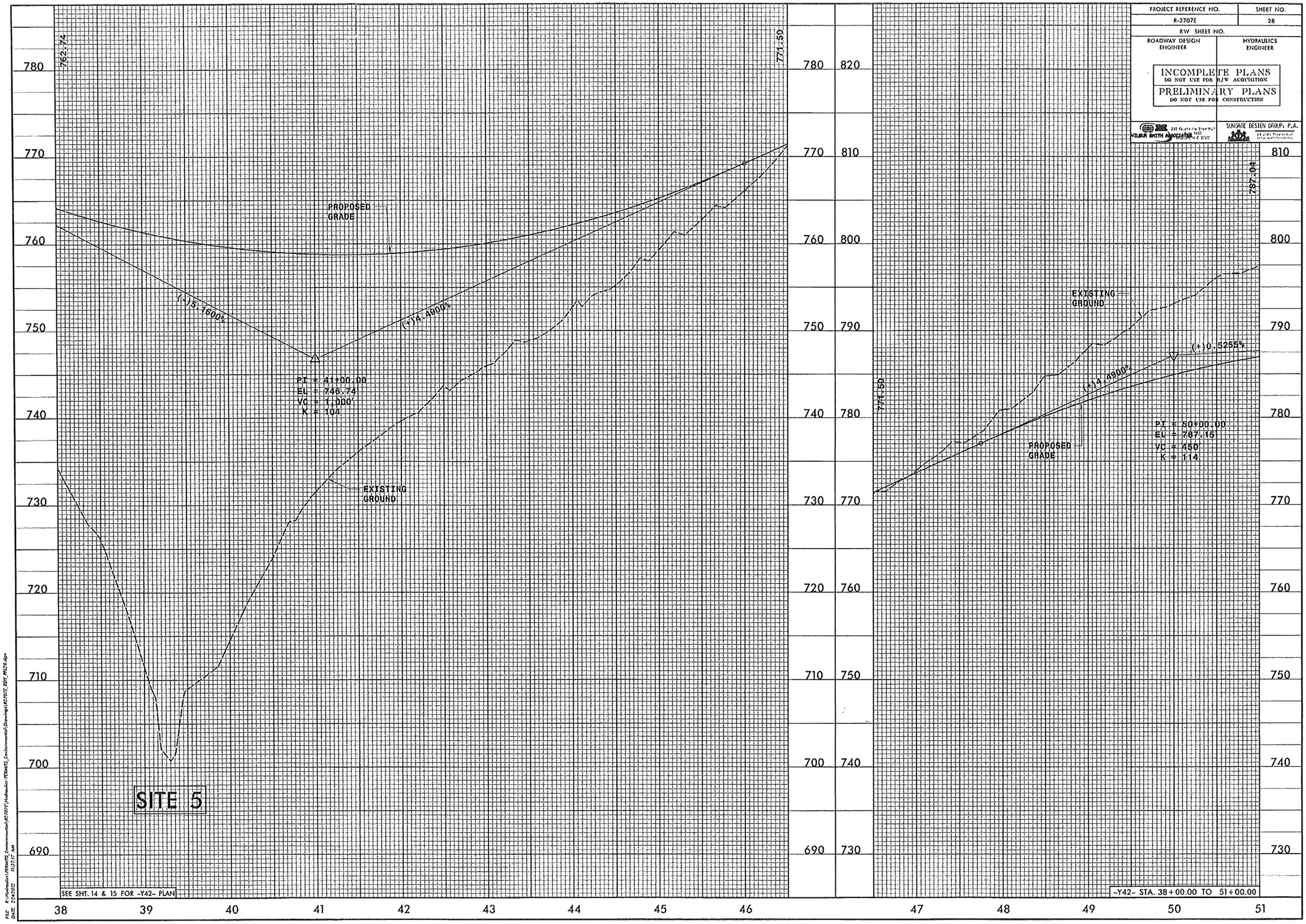

PROJECT REFERENCE NO.
P 2707E
SHEET NO
14
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SUNGATE DESIGN GROUP, P.A.
REVISIONS
SC Sta. 37+20.05
TS Sta. 35+52.05
CS Sta. 42+80.47
ST Sta. 44+48.47
-Y42-
SITE 5
N 64°13'08.1" E
MATCH TO SHEET 6 STA 35+00.00 -Y42-
MATCH TO SHEET 15 STA 49+00.00 -Y42-
35
40
45
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES IMPACTS IN SURFACE WATER


PROJECT REFERENCE NO
R 2707E
SHEET NO
14
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
SUMMIT DESIGN GROUP, P.A.
SC Sta. 37+20.05
CS Sta. 42+80.47
ST Sta. 44+48.47
TS Sta. 35+52.05
-Y42-
SITE 5
N 64°13'08.1" E
MATCH TO SHEET 6 STA 35+00.00 -Y42-
MATCH TO SHEET 15 STA 49+00.00 -Y42-
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES IMPACTS IN SURFACE WATER
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2707E	28
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

VILBUR SMITH ASSOCIATES

SUNGATE DESIGN GROUP, P.A.