



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

April 11, 2018

MEMORANDUM TO: Mr. Mike Mills, P.E.
Division 7 Engineer

FROM: Philip S. Harris, III, P.E., Manager
Environmental Analysis Unit

SUBJECT: Guilford County; Continuation of Greensboro-High Point Road (SR 4121) on New Location; Federal Aid No. STP-4121(1); WBS 34802.1.1; **TIP U-2412A.**

DocuSigned by:

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Attached are the U.S. Army Corps of Engineers Individual Permit, N.C. Division of Water Resources Water Quality Certification, and Jordan Lake Watershed Buffer Authorization. All environmental permits have been received for the construction of this project.

A copy of this permit package will be posted on the NCDOT website at:

<https://connect.ncdot.gov/resources/Environmental/Pages/default.aspx>

Quick Links>Permit Documents> Issued Permits.

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

Mr. Ron Davenport, P.E. Contracts Management
Mr. Jerry Parker, Division 7 Environmental Officer
Dr. Majed Al-Ghandour, P.E., Programming and TIP
Mr. Carl Barclay, P.E., Utilities Unit
Mr. Stephen Morgan, P.E., Hydraulics
Mr. Brian Hanks, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. Lamar Sylvester, P.E., State Roadway Construction Engineer
Ms. Laura Sutton, P.E., Project Delivery
Ms. Beth Harmon, Division of Mitigation Services
Ms. Cheterra Sheff, Single Audit Compliance

PROJECT COMMITMENTS

T.I.P. Project No. U-2412/U-2524AE
Greensboro-High Point Road Improvements
Guilford County
Federal Aid Project No. STP-4121(1)
WBS Element 34802.1.1

COMMITMENTS FROM PROJECT DEVELOPMENT AND DESIGN

Project Development and Environmental Analysis (PDEA) Unit

A final design traffic noise study will be performed on the selected alternative (Alternative Corridor 2). The study will include, but will not be limited to, recommended noise wall locations at Loftyview Drive, Crestwood Circle, and Riverwalk Lane.

Noise wall locations were investigated during design.

Natural Environment Section, Hydraulics Unit

NCDOT will apply for the “general” major variance from the *Randleman Lake WaterSupply: Protection and Maintenance of Riparian Areas* with the Pre-Notification Application Form for the 401 Water Quality Certification. Written concurrence that the conditions of the “general” major variance must be obtained from the Division of Water Quality before any activities that impact buffers may begin.

Due to revisions of the Randleman Lake Water Supply Riparian Buffer rules, a major variance is no longer required for this project.

Hydraulics Unit, Roadside Environmental Unit

Since the alternative corridors cross the Deep River within a critical area, high quality water sedimentation controls in addition to NCDOT’s *Best Management Practices for Protection of Surface Waters* and *Design Standards in Sensitive Watersheds* will be implemented. Hazardous spill detention basins will be provided along the new location portion of the project between Enterprise Drive and Guilford College Road (SR 1546). If feasible from a topographical standpoint, combined spill and stormwater basins will be used. Stormwater regulations set forth by the Randleman Dam Watershed Nutrient Management Strategy (Randleman Rules) will be followed during the design and construction of the proposed project.

No Change.

Hydraulics Unit and Roadway Design Unit

The proposed Bull Run Creek Trail greenway is anticipated to follow Bull Run Creek. A bridge is proposed to carry the roadway over Bull Run Creek and its 50-foot buffers. The bridge will be designed to accommodate the proposed greenway on one side of the stream.

No Change.

The project will incorporate bridges to span the streams and buffers at an unnamed tributary to the Deep River (UT3), the Deep River itself, and Bull Run Creek, as discussed at Merger Meeting 2A.

No Change.

Wetlands associated with the Deep River will be spanned, as discussed at Merger Meeting 4A.

No Change.

PDEA Unit, Roadway Design Unit, and Structure Design Unit

In order to mitigate visual impacts to the Oakdale Cotton Mill Village Historic District, NCDOT will coordinate with the State Historic Preservation Office (SHPO) regarding the control of access fence to be located at the top of the cut slope adjacent to the district, the bridge rail, and guardrails on Oakdale Road (SR 1352).

The design of this section was coordinated with SHPO.

Roadway Design Unit, Structure Design Unit

NCDOT will coordinate with Norfolk Southern to ensure the bridge over the railroad is correctly located and is designed to span future freight, high speed rail, and potential transit tracks. This will ensure the expansion of the freight tracks and installation of the high speed rail corridor will remain compatible with the project.

The design was coordinated with Norfolk Southern Railroad.

Roadway Design Unit

During the preparation of right of way plans, NCDOT will prepare cost estimates for an alternative to eliminate the intersection of Forbes Drive and High Point Road and provide access to Forbes Drive properties via Hilltop Crest Road. This alternative will be presented at a public meeting subsequent to the publication of this FEIS. Unless proved not feasible, the Forbes Drive intersection will be eliminated to avoid impacts to a veterinarian business.

Impact to the veterinarian business has been minimized through the use of curb and gutter and slope adjustments. The Forbes Drive intersection will remain in the proposed project.

During the preparation of right of way plans, NCDOT will include bus pullovers at the project's intersections with Enterprise Drive, Manor Road, Mackay Road, and Hilltop Road, provided the pullovers do not increase the number of residential or business relocations.

Roadway Design investigated the inclusion of bus pullovers at these intersections.

In the vicinity of Guilford Memorial Park, NCDOT will hold the existing right of way line on the north side and widen the existing roadway to the south to avoid impacts to graves and trees associated with the cemetery.

Impacts to the cemetery have been avoided.

During final design, NCDOT will optimize placement of additional median openings between Guilford College Road and Mackay Road. Specific locations that NCDOT will consider for median openings include: Scotland Road (SR 1368) and Guilford Memorial Park, and a median opening that serves Alberdingk-Boley and Daimler Chrysler.

Roadway Design investigated placement of median openings between Guilford College Road and Mackay Road.

During final design, NCDOT will consider realigning Suttonwood Drive (SR 1370) Road to intersect existing High Point Road (SR 4121) across from Mackay Road (SR 1549).

A connection of Suttonwood Drive (SR 1370) to Mackay Road (SR 1549) to the south of existing High Point Road (SR 4121) is proposed to provide connectivity in this area.

Along curb and gutter portions of the project, 4.2 m (14-foot) outside through lanes will be provided to accommodate bicyclists.

Right of Way and PDEA Unit

Once the owners of the dam at Owen Lake between Ring Street and Manor Drive have been identified through the Right of Way Branch's deed research, NCDOT will provide contact information to the Division of Land Quality for their use in pursuing repair or removal of the dam.

No Change.

Project design plans will not maintain access to Oak Village Drive and Creekside Drive of the Bull Run subdivision. This decision is based on preliminary right of way damage estimates and public input.

No change.

Traffic Engineering Branch

In the vicinity of the Ragsdale High School, Jamestown Middle School, and Millis Road Elementary School, NCDOT will consider the installation of a traffic signal with pedestrian accommodations at Vickrey Chapel Road and pedestrian crossings across Vickrey Chapel and Millis Roads, in the vicinity of the schools.

NCDOT has proposed a traffic signal at the Vickrey Chapel Road intersection. Pedestrian accommodations were evaluated.

COMMITMENTS FROM PERMITTING

Division 7, Natural Environment Section, and Hydraulics Unit

Conditions from Original Permit issued July 18, 2012:

It is recognized that plans for Section U-2412A are still in the preliminary state and accordingly, U-2412A is not authorized for construction at this time. Construction may commence on Section U-2412A only after: 1) all appropriate and practicable avoidance and minimization measures have been approved through the remaining 4C Merger Meeting; 2) a final jurisdictional determination for Section U-2412A is complete, occurring prior to the permit modification for this section; 3) final plan design has been completed and approved by the District Commander; and 4) a modification request, including a final compensatory mitigation plan for this Section, is submitted by NCDOT and approved by the District Commander.

When final design plans are completed for U-2412A, a modification to the 401 Water Quality Certification and the Randleman Lake Riparian Buffer Certification shall be submitted with five copies and 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, and buffers. No construction activities that impact any wetlands, streams, surface waters, or buffers located in U-2412A shall begin until after the permittee applies for, and receives a written modification of the 401 Water Quality Certification and the Randleman Lake Riparian Buffer Authorization from the NC Division of Water Quality. This modification shall include compensatory mitigation for applicable impacts to streams, wetlands, or riparian buffers associated with U-2412A.

This commitment has been accomplished.

Division 7 and Hydraulics Unit

Any modifications to this 401 Water Quality Certification that propose additional stream impacts or increased impervious surface requiring additional stormwater management may be subject the Jordan Water Supply Nutrient Strategy [I5A NCAC02B .0267]. NCDOT shall coordinate with NCDWQ prior to submitting a modification request to determine the applicability of the Jordan Water Supply Nutrient Strategy. This condition does not apply to major modifications for additional sections of the project that were covered under the Finding of No Significant Impact or approved in the Avoidance and Minimization stage of the project.

This commitment has been accomplished.



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

April 05, 2018

Regulatory Division/1200A

Action ID: SAW-2000-21876

Mr. Philip S. Harris III, P.E., C.P.M.
Natural Environment Section Head
North Carolina Department of Transportation
Division of Highways
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Mr. Harris:

Reference the Department of the Army (DA) permit dated July 18, 2012, to Dr. Gregory J. Thorpe, of the North Carolina Department of Transportation (NCDOT) for impacts associated with the widening and new location project identified as U-2412A&B/U-2524AE. The 7.9 mile project includes a combination of widening improvements to existing High Point Road (SR 1486-SR 4121) and construction on new location, including an interchange with the US 311 Bypass in High Point and the Greensboro Western Urban Loop in Greensboro, Guilford County, North Carolina. The project area contains five (5) unnamed tributaries to Reddicks Creek, eight (8) unnamed tributaries to the Deep River, two (2) unnamed tributaries to Bull Run Creek, and several adjacent wetland areas in the Cape Fear River Basin (8-Digit Cataloging Unit 03030003).

Total impacts authorized by the permit, including: 1) the permanent placement of fill material into 4,817 linear feet of stream channel, 1.62 acres of wetlands, and 3.65 acres of open water ponds, and 2) the temporary placement of fill material into 776 linear feet of jurisdictional stream channel. Compensatory mitigation was implemented for the unavoidable impacts by payment into the North Carolina Ecosystem Enhancement Program, now known as the North Carolina Division of Mitigation Services. However, since U-2412A was unfunded and letting more than 5 years out from the DA permit date, NCDOT did not provide mitigation for that Section at that time. Per Special Condition c) of the DA permit, Construction may commence on U-2412A only after: 1) all appropriate and practicable avoidance and minimization measures have been approved through the remaining 4C Merger Meeting; 2) a final jurisdictional determination for U-2412A is complete, occurring prior to the permit modification for this section; 3) final plan design has been completed and approved by the District Commander; and 4) a modification request, including a final compensatory mitigation plan for this Section is submitted by NCDOT and approved by the District Commander.

Also reference your permit modification request letter and attachments dated and received February 27, 2018 via email, as well as your revised information received via email dated March 26, 2018 (herein referred to as the "Modification Request Letters"), proposing the following:

- 1) Release of U-2412A for construction per Special Condition c) of the DA permit dated July 18, 2012;
- 2) Authorization of permanent discharge of fill material into 3,317 linear feet of stream channel related to:
 - a. Placing 3,073 linear feet of stream channel in culverts, and;
 - b. Adding rip rap bank stabilization to 244 linear feet of stream channel;
- 3) Authorization of permanent discharge of fill material into 1.75 acres of wetlands related to:
 - a. Placing 1.30 acres of wetlands under fill slopes, and;
 - b. Mechanized clearing in 0.45 acre of wetlands.
 - i. Note that the project also proposes 0.09 acre of hand clearing in wetlands;
- 4) Authorization of permanent discharge of fill material into, or drainage of, 3.64 acres of open water ponds;
- 5) Authorization of temporary discharge of fill material in 203 linear feet of stream channel related to temporary construction access and dewatering for culvert installation;

Following evaluation of the information submitted in your modification request, the U.S. Army Corps of Engineers, Wilmington District (Corps) has determined that it is appropriate and reasonable, is not contrary to the public interest, and no public notice is required for this modification. Furthermore, the requirements of Special Condition c) of the DA permit dated July 18, 2012 have been completed as follows:

- All appropriate and practicable avoidance and minimization measures have been approved, as discussed during the 4C Merger Meeting for U-2412A dated September 21, 2017, and documented on page 8 of the Modification Request Letters (February 27, 2018 Letter);
- A Preliminary Jurisdictional Determination, based on a field delineation by AECOM and NCDO T, with changes made in the field by the Corps on November 9, 2017, was finalized for U-2412A on March 23, 2018;

- A permit modification request for U-2412A including final plan design was completed per submittal of the Modification Request Letters, and approved by the District Commander via this document.

Therefore, the permit is modified to release U-2412A for construction, including the requested additional stream and wetland impacts. For all U-2412A Permit Sites, this work must be constructed as shown on the Wetland & Stream Impacts Permit drawings for U-2412A submitted in the "Application for Modification of the Section 404 Individual Permit ...", dated February 27, 2018 (Permit Drawings Sheets 1-61), and your revised information received via email dated March 26, 2018 (Permit Drawings Sheet 62);

In addition, the following special conditions regarding additional compensatory mitigation and Section 7 of the Endangered Species Act have been incorporated:

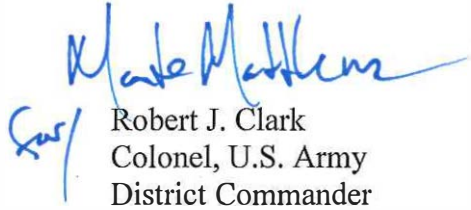
x) In order to compensate for impacts associated with this permit, mitigation shall be provided in accordance with the provisions outlined on the most recent version of the attached Compensatory Mitigation Responsibility Transfer Form. The requirements of this form, including any special conditions listed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

xx) This USACE permit does not authorize you to take a threatened or endangered species, in particular, the Northern Long-eared Bat (NLEB) (*Myotis septentrionalis*). In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (ESA) (e.g., a Biological Opinion (BO) under the ESA, Section 7, with "incidental take" provisions with which you must comply). The U.S. Fish and Wildlife Service's (USFWS's) Programmatic BO titled "Northern Long-eared Bat (NLEB) Programmatic Biological Opinion for North Carolina Department of Transportation (NCDOT) Activities in Eastern North Carolina (Divisions 1-8)," dated March 25, 2015, and adopted on May 4, 2015, contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that are specified in the BO. Your authorization under this USACE permit is conditioned upon your compliance with all the mandatory terms and conditions (incorporated by reference into this permit) associated with incidental take of the BO. Failure to comply with the terms and conditions associated with incidental take of the BO, where a take of the listed species occurs, would constitute an unauthorized take, and would also constitute non-compliance with your USACE permit. The USFWS is the appropriate authority to determine compliance with the terms and conditions of its BO and with the ESA.

All other conditions of the permit, including the permit expiration date of December 31, 2032, remain in effect as written. The U-2412A&B/U-2524AE project now totals 1) the permanent placement of fill material into 5,249 linear feet of stream channel, 2.38 acres of wetlands, and 3.64 acres of open water pond, and 2) the temporary placement of fill material into 343 linear feet of stream channel.

Should you have questions, please contact Mr. David E. Bailey, Raleigh Regulatory Field Office at telephone (919) 554-4884, Extension 30, or at David.E.Bailey2@usace.army.mil.

FOR THE COMMANDER


Robert J. Clark
Colonel, U.S. Army
District Commander

Copies Furnished with Attachment:

Ms. April Norton
Transportation Permitting Unit
Division of Water Resources
North Carolina Department of
Environment and Natural Resources
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

Mr. Michael A. Turchy
North Carolina Department of Transportation
Division of Highways
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

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

Copies Furnished without Attachment:

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

Christopher A. Militscher
Chief, NEPA Program Office
USEPA Region 4
61 Forsyth Street, SW
Atlanta, GA 30303

Mr. Travis Wilson
North Carolina Wildlife Resources Commission
1718 Hwy 56 West
Creedmoor, North Carolina 27522

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

Permittee: NCDOT

Project Name: NCDOT/SR4121 IMPROV./U-2412

Action ID: SAW-2000-21876

County: Guilford

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

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

Permitted Impacts and Compensatory Mitigation Requirements

Permitted Impacts Requiring Mitigation*:

8-digit HUC and Basin: 03030003, Cape Fear River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
5,005				2.38		

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

Compensatory Mitigation Requirements:

8-digit HUC and Basin: 03030003, Cape Fear River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
9,645				4.76		

Mitigation Site Debited: NCDMS

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

Section to be completed by the Mitigation Sponsor

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

Mitigation Sponsor Name: _____

Name of Sponsor's Authorized Representative: _____

Signature of Sponsor's Authorized Representative

Date of Signature

USACE Wilmington District
Compensatory Mitigation Responsibility Transfer Form, Page 2

Conditions for Transfer of Compensatory Mitigation Credit:

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

Comments/Additional Conditions:

- This Form supersedes the compensatory mitigation requirement per Special Condition g) of the DA permit issued on July 18, 2012;
- This form reflects additional stream credits required as part of the U-2412A&B/U-2524AE Permit Modification dated April 5, 2018, specifically for the construction release of U-2412A, including:
 - permanent stream impacts at Permit Sites 1A, 2 through 5, 7, 8, and 12 through 16 (total of 2,862 l.f.) at a 2:1 ratio;
 - permanent stream impacts at Permit Site 9 (total of 211 l.f.) at a 1:1 ratio, and;
 - permanent wetland impacts at Permit Sites 1A, 1, 2, 5A, 5B, 8, 9, 10, 12, 13, 13A, and 14 (total of 1.75 acres) at a 2:1 ratio;
- The Mitigation Requirements listed on Page 1 are for the total U-2412A&B/U-2524AE project and do not reflect any stream or riparian wetland credits already accepted by NCDMS/NCEEP for the U-2412B/U-2524AE phases of this project (3,710 SMUs and 1.26 WMUs).

This form is not valid unless signed below by the USACE Project Manager and by the Mitigation Sponsor on Page 1. *Once signed, the Sponsor should provide copies of this form along with an updated bank ledger to: 1) the Permittee, 2) the USACE Project Manager at the address below, and 3) the Wilmington District Mitigation Office, Attn: Todd Tugwell, 3331 Heritage Trade Drive, Suite 105, Wake Forest, NC 27587 (email: todd.tugwell@usace.army.mil).* Questions regarding this form or any of the permit conditions may be directed to the USACE Project Manager below.

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

 
USACE Project Manager Signature

April 5, 2018
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>.



ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

LINDA CULPEPPER
Interim Director

April 5, 2018

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

Subject: Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act Randleman Buffer Rules with Additional Conditions for the Continuation of Greensboro-High Point Road (SR 4121) from I-74/US 311 in High Point to Hilltop Road in Greensboro, Guilford County. Federal Aid Project No. STP-4121 (1), Division 7, TIP No. U-2412A, WBS 34802.1.1. NCDWR Project No. 20120211v.2

Dear Mr. Harris:

Attached hereto is a modification of Certification No. 003924 issued to The North Carolina Department of Transportation (NCDOT) dated June 4, 2012. This Certification replaces the modification dated March 19, 2018.

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

Sincerely,

A handwritten signature in blue ink, appearing to read 'Linda Culpepper', written over a horizontal line.

Linda Culpepper, Interim Director
Division of Water Resources

Attachments

Electronic copy only distribution:

David Bailey, US Army Corps of Engineers, Raleigh Field Office
Jerry Parker, Division 7 Environmental Officer
Michael Turchy, NC Department of Transportation
Carla Dagnino, NC Department of Transportation
Chris Militscher, US Environmental Protection Agency
Travis Wilson, US Fish and Wildlife Service
Gary Jordan, NC Wildlife Resources Commission
Beth Harmon, Division of Mitigation Services
File Copy

**MODIFICATION to the 401 WATER QUALITY CERTIFICATION PURSANT to SECTION 401 of the
FEDERAL CLEAN WATER ACT and RANDLEMAN BUFFER RULES with ADDITIONAL
CONDITIONS**

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Resources (NCDWR) Regulations in 15 NCAC 2H .0500 and 15A NCAC 2B.0250. This certification authorizes the NCDOT to impact 1.86 acres of jurisdictional wetlands, 3,520 linear feet of jurisdictional streams and 611,637 square feet of protected riparian buffers in Guilford County. The project shall be constructed pursuant to the modification dated and received February 27, 2018. The authorized impacts are as described below:

Stream Impacts in the Cape Fear River Basin

Site U-2412A	Permanent Fill in Perennial Stream (linear ft.)		Temporary Fill in Perennial Stream (linear ft.)	Total Stream Impact (linear ft.)	Stream Impacts Requiring Mitigation (linear ft.)
	Culvert	Bank Stabilization			
1	--	--	--	--	--
1A	--	--	--	--	--
2	316	0	10	326	316
3	110	0	0	110	--
4	279	28	20	327	--
5	431	35	20	486	431
5A	--	--	--	--	--
5B	--	--	--	--	--
6	--	--	--	--	--
7	283	0	21	304	--
8	445	0	55	500	445
9	211	0	0	211	--
10	0	171	20	191	--
11	--	--	--	--	--
12	99	0	10	109	--
13	494	0	27	521	494
13A	--	--	--	--	--
14	69	10	4	83	69
15	270	0	16	286	--
16	66	0	0	66	66
Total	3,073	244	203	3,520	1,821

Total Stream Impact for Modification: 3,520 linear feet

Wetland Impacts in the Cape Fear River Basin

Site	Fill (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Total Wetland Impact (ac)
1	0.02	--	--	--	0.02
1A	0.02	--	--	--	0.02
2	0.29	--	--	--	0.29
3	--	--	--	--	--
4	--	--	--	--	--
5	--	--	--	--	--
5A	0.03	--	--	--	0.03
5B	< 0.01	--	--	--	<0.01
6	--	--	--	--	--
7	--	--	--	--	--
8	0.51	--	0.04	--	0.55
9	0.02	--	0.02	--	0.04
10	0.02	--	0.19	0.09	0.21
11	--	--	--	--	--
12	0.05	--	--	--	0.05
13	0.32	--	0.08	--	0.11
13A	0.01	--	0.11	--	0.12
14	0.01	--	< 0.01	--	0.02
15	--	--	--	--	--
16	--	--	--	--	--
Total	1.32	0	0.45	0.09	1.86

Total Wetland Impact for Modification: 1.86 acres

Randleman Lake Watershed Riparian Buffer Impacts

Site	Zone 1 Impact (sqft.)	minus Wetlands in Zone 1 (sqft.)	= Zone 1 Buffers (not wetlands) (sqft.)	Zone 1 Buffer Mitigation Required (using 3:1 ratio)		Zone 2 Impact (sqft.)	minus Wetlands in Zone 2 (sqft.)	= Zone 2 Buffers (not wetlands) (sqft.)	Zone 2 Buffer Mitigation Required (using 1.5:1 ratio)
1	21,406	1,369	20,037	60,111		18,009	246	17,763	26,645
2	45,276	8,080	37,196	111,588		27,771	2,321	25,450	38,175
3	5,208*	0	5,208*	0		4,972*	0	4,972*	0
4	26,140	0	26,140	78,420		20,878	0	20,878	31,317
5	30,129	1,214	28,915	86,745		20,878	103	20,775	31,163
6	11,465*	0	11,465*	0		7,451*	0	7,451*	0
7	17,689	0	17,689	53,067		11,782	0	11,782	17,673
8	26,549	12,301	14,248	42,744		17,359	6,564	10,795	16,193
9	10,559	27	10,532	31,596		9,478	13	9,465	14,198
10	12,930*	6,844***	12,930***	0		4,784*	3,479***	4,784***	0
11	22,336*	0	22,336*	0		15,050*	0	15,050*	0
12	23,818	2,265	21,553	64,659		15,825	0	15,825	23,738
13	61,627	16,929	44,698	134,094		35,903	2,516	33,387	50,081
14	6,068	473	5,595	16,785		4,602	67	4,535	6,803
15	11,181	0	11,181	33,543		5,682	0	5,682	8,523
16**	35,727 (31,329*) (4,398)	0	35,727 (31,329*) (4,398)	(4,398*3) 13,194		21,065* (17,159*) (3,906)	0	21,065* (17,159*) (3,906)	(3,906*1.5) 5,859
17	1,320*	0	1,320*	0		720*	0	720*	0
Totals	369,428 84,588- allowable 284,840-mitigable	42,658	319,926 84,588 – allowable 242,182 - mitigable	726,546		242,209 50,136 - allowable 192,073 – mitigable	11,830	226,900 50,136 – allowable 180,243 - mitigable	270,365

Total Buffer Impact for Modification: 611,637 square feet.

* Allowable impacts

**Site 16, Zone 1 = 31,329 sqft (allowable) and 4,398 (mitigable). Zone 2 = 17,159 sqft (allowable) and 3,906 sqft (mitigable)

Total allowable impacts for Zone 1 – 84,588 sqft and 50,136 sqft for Zone 2.

Total mitigable impacts for Zone 1 – 284, 840 sqft. and 192,073 sqft. for Zone 2.

***Site 10 is not subject to mitigation; therefore, the wetland is not deducted from buffer mitigation requirements.

Pond Impacts in the Cape Fear River Basin

Site	Permanent Fill in Open Waters (ac)	Temporary Fill in Open Waters (ac)	Total Fill in Open Waters (ac)
2 (PA, Owen's Lake)	0.61	0	0.61
12 (PB)	0.13	0	0.13
13 (PC)	1.33	0	1.33
16 (PD)	1.57	0	1.57
Total	3.64	0	3.64

Total Pond Impacts for Modification: 3.64 acres.

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

This approval is only valid for the purpose and design that you submitted in your modified application dated and received February 27, 2018, with subsequent information on March 26, 2018. All the authorized activities and conditions of certification associated with the original Water Quality Certification dated June 4, 2012 still apply except where superseded by this certification. Should your project change, you are required to notify the NCDWR and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 300 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). Additional buffer impacts may require compensatory mitigation as described in 15A NCAC 2B .0250. 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 Army Corps of Engineers Permit.

Condition(s) of Certification:

1. Compensatory mitigation for 1,821 linear feet of impact to streams and 1.75 acres of riverine/riparian wetlands is required. We understand that you have chosen to perform compensatory mitigation for impacts to streams through the North Carolina Division of Mitigation Service (DMS) (formerly NCEEP), and that the DMS has agreed to implement the mitigation for the project. The DMS has indicated in a letter dated February 26, 2018 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the DMS Mitigation Banking Instrument signed July 28, 2010.
2. Compensatory mitigation for impacts to 242,182 (minus wetlands) square feet of protected riparian buffers in Zone 1, and 180,243 (minus wetlands) square feet of protected riparian buffers in Zone 2 shall be required. We understand that you have chosen to perform compensatory mitigation for impacts to protected buffers through use of the North Carolina Division of Mitigation Services (DMS) (formerly NCEEP). Mitigation for unavoidable impacts to Jordan Lake Watershed Riparian Buffers shall be provided in the Cape Fear River Basin and done in accordance with 15A NCAC .02B .0295. The DMS has indicated in a letter dated February 26, 2018 that they will assume responsibility for satisfying the compensatory mitigation requirements for the above-referenced project, in accordance with DMS's Mitigation Banking Instrument signed June 14, 2016.
3. This modification is applicable only to the additional proposed activities. All the authorized activities and conditions of certification associated with the original Water Quality Certification dated June 4, 2012 still apply except where superseded by this certification.
4. All stormwater runoff shall be directed as sheetflow through stream buffers at non-erosive velocities, unless

otherwise approved by this certification (15A NCAC 2B .0267).

5. All riparian buffers impacted by the placement of temporary fill or clearing activities shall be restored to the preconstruction contours and revegetated. Maintained buffers shall be permanently revegetated with non-woody species by the end of the growing season following completion of construction. For this condition, maintained buffer areas are defined as areas within the transportation corridor that will be subject to regular NCDOT maintenance activities including mowing. The area with non-maintained buffers shall be permanently revegetated with native woody species before the next growing season following completion of construction (15A NCAC 2B .0267).
6. Pursuant to 15A NCAC 2B .0250, sediment and erosion control devices shall not be placed in Zone 1 of any Randleman Lake Watershed Riparian Buffer without prior approval by the NCDWR. Currently, the NCDWR has approved no sediment and erosion control devices in Zone 1, outside of the approved project impacts, or anywhere on this project. Moreover, sediment and erosion control devices shall be allowed in Zone 2 of the buffers if Zone 1 is not compromised and that discharge is released as diffuse flow.
7. Any modifications to this 401 Water Quality Certification that propose additional stream impacts or increased impervious surface requiring additional stormwater management may be subject the Randleman Lake Water Supply Nutrient Strategy (15A NCAC02B .0250). The NCDOT shall coordinate with the NCDWR prior to submitting a modification request to determine the applicability of the Randleman Water Supply Nutrient Strategy. This condition does not apply to major modifications for additional sections of the project that were covered under the Finding of No Significant Impact or approved in the Avoidance and Minimization stage of the project.

General Conditions:

1. Unless otherwise approved in this certification, placement of culverts and other structures in open waters and streams shall be placed below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and downstream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by NCDWR. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact NCDWR for guidance on how to proceed and to determine whether a permit modification will be required. [15A NCAC 02H.0506(b)(2)]
2. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills. [15A NCAC 02B.0200]
3. During the construction of the project, no staging of equipment of any kind is permitted in waters of the U.S., or protected riparian buffers. [15A NCAC 02H.0506(b)(2)]
4. The dimension, pattern and profile of the stream above and below the crossing shall not be modified. Disturbed floodplains and streams shall be restored to natural geomorphic conditions. [15A NCAC 02H.0506(b)(2)]
5. The use of rip-rap above the Normal High-Water Mark shall be minimized. Any rip-rap placed for stream stabilization shall be placed in stream channels in such a manner that it does not impede aquatic life passage. [15A NCAC 02H.0506(b)(2)]
6. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval. [15A NCAC 02H .0507(c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]
7. All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water. [15A NCAC 02H.0506(b)(3) and (c)(3)]
8. Heavy equipment shall be operated from the banks rather than in the stream channel to minimize sedimentation and reduce the introduction of other pollutants into the stream. [15A NCAC 02H.0506(b)(3)]
9. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials.

[15A NCAC 02H.0506(b)(3)]

10. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification. [15A NCAC 02H.0506(b)(3)]
11. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited. [15A NCAC 02H.0506(b)(3)]
12. The Permittee and its authorized agents shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act) and any other appropriate requirements of State and Federal law. If the NCDWR determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, the NCDWR may reevaluate and modify this certification. [15A NCAC 02B.0200]
13. All fill slopes located in jurisdictional wetlands shall be placed at slopes no flatter than 3:1, unless otherwise authorized by this certification. [15A NCAC 02H.0506(b)(2)]
14. A copy of this Water Quality Certification shall be maintained on the construction site always. In addition, the Water Quality Certification and all subsequent modifications, if any, shall be maintained with the Division Engineer and the on-site project manager. [15A NCAC 02H .0507(c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]
15. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization shall be clearly marked by highly visible fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this certification. [15A NCAC 02H.0501 and .0502]
16. The issuance of this certification does not exempt the Permittee from complying with all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (i.e. local, state, and federal) having jurisdiction, including but not limited to applicable buffer rules, stormwater management rules, soil erosion and sedimentation control requirements, etc.
17. The Permittee shall report any violations of this certification to the Division of Water Resources within 24 hours of discovery. [15A NCAC 02B.0506(b)(2)]
18. Upon completion of the project, the NCDOT Division Engineer shall complete and return the enclosed "Certification of Completion Form" to notify the NCDWR when all work included in the 401 Certification has been completed. [15A NCAC 02H.0502(f)]
19. Native riparian vegetation must be reestablished in the riparian areas within the construction limits of the project by the end of the growing season following completion of construction. [15A NCAC 02B.0231(a)(6)]
20. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated with this permit without appropriate modification. Should waste or borrow sites, or access roads to waste or borrow sites, be located in wetlands or streams, compensatory mitigation will be required since that is a direct impact from road construction activities. [15A NCAC 02H.0506(b)(3) and (c)(3)]
21. All sediment and erosion control devices shall be removed and the natural grade restored within two (2) months of the date that the Division of Energy, Mining and Land Resources (DEMLR) or locally delegated program has released the specific area within the project. [15A NCAC 02H.0506(b)(3) and (c)(3)]
22. Sediment and erosion control measures shall not be placed in wetlands or surface waters, or within 5 feet of the top of bank, without prior approval from NCDWR. [15A NCAC 02H.0506(b)(3) and (c)(3)]
23. 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 to protect surface waters standards [15A NCAC 02H.0506(b)(3) and (c)(3)]:
 - a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*.
 - b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased

borrow pits associated with the project.

- c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.
 - d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.
24. Sediment and erosion control measures shall not be placed in wetlands or waters unless otherwise approved by this Certification. [15A NCAC 02H.0506(b)(3) and (c)(3)]

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

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

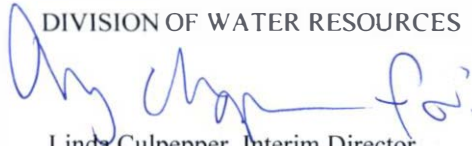
The petition may be faxed-provided the original and one copy of the document is received by the Office of Administrative Hearings within five (5) business days following the faxed transmission. The mailing address for the Office of Administrative Hearings is:

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

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

Mr. Bill F. Lane, General Counsel
Department of Environmental Quality
1601 Mail Service Center

This the 29th day of March 2018

DIVISION OF WATER RESOURCES

Linda Culpepper, Interim Director

WQC No. 003924



Environmental
Quality

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

LINDA CULPEPPER
Interim Director

NCDWR Project No.: _____ County: _____

Applicant: _____

Project Name: _____

Date of Issuance of 401 Water Quality Certification: _____

Certificate of Completion

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

Applicant's Certification

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

Signature: _____ Date: _____

Agent's Certification

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

Signature: _____ Date: _____

Engineer's Certification

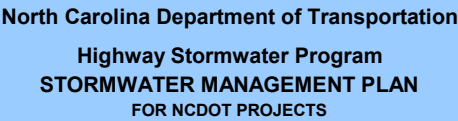
_____ Partial _____ Final

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

Signature _____ Registration No. _____ Date _____

		North Carolina Department of Transportation					
		Highway Stormwater Program					
		STORMWATER MANAGEMENT PLAN					
		FOR NCDOT PROJECTS					
(Version 2.07; Released October 2016)							
WBS Element: 34802.1.1		TIP No.: U-2412A		County(ies): Guilford		Page 1 of 8	
General Project Information							
WBS Element:		34802.1.1		TIP Number:		U-2412A	
NCDOT Contact:		Bill Elam, PE		Contractor / Designer:		Joshua G. Dalton, PE	
		Address: NCDOT Hydraulics Unit 1590 Mail Service Raleigh, NC 27699-1590				Address: Sungate Design Group, P.A. 905 Jones Franklin Road Raleigh, NC 27606	
		Phone: 919-707-6718				Phone: 919-859-2243 ext. 201	
		Email: belam@ncdot.gov				Email: jdalton@sungatedesign.com	
City/Town:		High Point and Jamestown		County(ies):		Guilford	
River Basin(s):		Cape Fear		CAMA County?		No	
Wetlands within Project Limits?		Yes					
Project Description							
Project Length (lin. miles or feet):		3.74 miles		Surrounding Land Use:		Commercial, Medium Density Residential	
		Proposed Project				Existing Site	
Project Built-Upon Area (ac.):		79.8 ac.				16.6 ac.	
Typical Cross Section Description:		Grassed ditch median with 6:1 side slopes. 4 paved lanes (total 48' wide). 14' shoulder on each side (17' with guardrail). 12' paved shoulder. Varying fill and cut slopes (see project XSC's for detailed information).				C.F. Felix Harvey Pkwy: open shoulder section, 4 paved lanes (total 48') with grassed ditch median, 4.5' paved shoulder on each side; NC HWY 11: open shoulder section, 4 paved lanes (total 48') with grassed ditch median, 3' paved shoulder on each side.	
Annual Avg Daily Traffic (veh/hr/day):		Design/Future: 45160		Year: 2039		Existing: 36,330	
General Project Narrative: (Description of Minimization of Water Quality Impacts)		The North Carolina Department of Transportation (NCDOT) proposes to construct an extension for Greensboro/High Point Road from US 311 Bypass to west of SR 1480 (Vickrey Chapel Road). There are three proposed major structures involved with the construction of the project which will all be constructed at new stream crossing locations. The proposed structure over Deep River Tributary 1 is a 667 feet-long multi-span dual bridge. The proposed structure over the Deep River is a 400 feet-long multi-span dual bridge. The proposed structure over Bull Run is a 305 feet-long multi-span dual bridge. The proposed bridges have been designed without deck drains or with closed deck drain systems where necessary. No direct discharge from bridge decks will occur to streams or buffers. Grassed swales were used for treatment when BMP design standards could be met. These grassed swales were used to reduce flow velocity, promote sedimentation, infiltration and runoff attenuation. Velocities at jurisdictional features are non-erosive. Hazardous spill/dry detention basins have been proposed at all locations feasible to provide pre/post peak discharge attenuation and stormwater quality treatment. 2:1 (horizontal to vertical) slopes have been specified at all jurisdictional stream/wetland crossings. A 1.5:1 slope (with slope protection armoring) has been specified left of station 104+00 to 105+00 -L- to reduce buffer impacts to UT Deep River. Pipe inverts will be buried below the stream bed when pipe slopes are less than 4%. The box culvert at station 173+50 -L- will be buried 1' with sills at the inlet and outlet.					
Waterbody Information							
Surface Water Body (1):		Deep River		NCDWR Stream Index No.:		17-(3.7)	
NCDWR Surface Water Classification for Water Body		Primary Classification:		Water Supply IV (WS-IV)		Critical Area	
		Supplemental Classification:		None			
Other Stream Classification:		None					
Impairments:		None					
Aquatic T&E Species?		No		Comments:			
NRTR Stream ID:		Deep River		Buffer Rules in Effect:		Randleman Lake	
Project Includes Bridge Spanning Water Body?		Yes		Deck Drains Discharge Over Buffer?		No	
Deck Drains Discharge Over Water Body?		No		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
		(If yes, provide justification in the General Project Narrative)					

		North Carolina Department of Transportation			
		Highway Stormwater Program			
		STORMWATER MANAGEMENT PLAN			
(Version 2.07; Released October 2016)		FOR NCDOT PROJECTS			
WBS Element:	34802.1.1	TIP No.:	U-2412A	County(ies):	Guilford
		Page	2	of	8
Additional Waterbody Information					
Surface Water Body (2):	Bull Run		NCDWR Stream Index No.:	17-5-(2)	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Water Supply IV (WS-IV)	Critical Area	
	Supplemental Classification:		None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No		Comments:		
NRTR Stream ID:	Bull Run			Buffer Rules in Effect:	Randleman Lake
Project Includes Bridge Spanning Water Body?	Yes	Deck Drains Discharge Over Buffer?	No	Dissipator Pads Provided in Buffer?	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					



(Version 2.07; Released October 2016)

WBS Element: 34802.1.1

TIP No.: U-2412A

County(ies): Guilford

Page

3

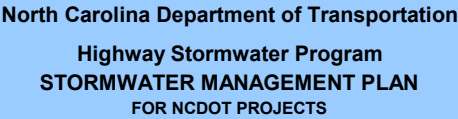
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Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
4	15+50 -L- RT	UT to	0.0	6.0	6.0	1.2	124	350	1.00%	4.0	1.9	5.3	2.0	No	Yes
	19+00 -L- RT	Triangle													
4/5	20+50 -L- LT	UT to	0.0	6.0	6.0	0.2	19	250	1.00%	0.3	1.0	0.4	1.1	No	Yes
	23+00 -L- LT	Triangle													
5	24+50 -L- RT	UT to	0.0	6.0	6.0	1.0	102	350	1.00%	3.0	1.7	3.9	1.9	No	Yes
	28+00 -L- RT	Triangle													
5	26+50 -L- M	UT to	0.0	6.0	6.0	0.3	29	150	2.40%	1.0	1.8	1.3	2.0	No	Yes
	28+00 -L- M	Triangle													
5	28+00 -L- RT	UT to	0.0	6.0	6.0	0.9	86	300	1.90%	1.8	2.0	2.4	2.1	No	Yes
	31+00 -L- RT	Triangle													
5	31+00 -L- M	UT to	0.0	6.0	6.0	0.5	53	325	2.60%	1.3	2.0	1.7	2.2	No	Yes
	34+25 -L- M	Triangle													
5/6	34+25 -L- M	UT to	0.0	6.0	6.0	0.3	32	308	2.20%	0.5	1.5	0.6	1.6	No	Yes
	37+33 -L- M	Triangle													
6	37+33 -L- M	UT to	0.0	6.0	6.0	0.4	42	367	0.60%	3.9	1.5	5.1	1.6	No	Yes
	41+00 -L- M	Triangle													
6	41+00 -L- M	UT to	0.0	5.7	5.7	0.6	63	400	0.80%	1.5	1.4	2.0	1.5	No	Yes
	45+00 -L- M	Triangle													
6/7	45+00 -L- M	UT to	0.0	5.5	5.5	0.7	73	450	0.70%	1.8	1.4	2.3	1.5	No	Yes
	49+50 -L- M	Triangle													
6/7	45+50 -L- LT	UT to	0.0	6.0	6.0	1.5	150	500	0.60%	3.9	1.5	5.1	1.6	No	Yes
	50+50 -L- LT	Triangle													
7	51+55 -L- M	UT to	0.0	5.5	5.5	0.6	57	395	0.50%	1.5	1.2	1.9	1.2	No	Yes
	55+50 -L- M	Triangle													
7	55+50 -L- RT	UT to	0.0	6.0	6.0	0.8	80	300	0.60%	2.2	1.3	3.0	1.4	No	Yes
	58+50-L- RT	Triangle													
7	55+50 -L- M	UT to	0.0	4.8	4.8	0.5	51	250	1.30%	1.6	1.7	2.1	1.9	No	Yes
	58+00 -L- M	Triangle													
7	55+50 -L- LT	UT to	0.0	6.0	6.0	0.4	40	300	0.80%	0.8	1.2	1.1	1.3	No	Yes
	58+50 -L- LT	Triangle													
7	59+47 -L- LT	UT to	0.0	6.0	6.0	1.7	170	170	0.80%	3.7	1.7	4.9	1.8	No	Yes
	61+16 -L- LT	Triangle													
7	60+17 -L- M	UT to	0.0	6.0	6.0	0.2	21	99	0.30%	0.7	0.8	0.9	0.8	No	Yes
	61+16 -L- M	Triangle													
7	61+16 -L- M	UT to	0.0	8.0	8.0	0.7	73	434	0.30%	2.0	0.9	2.6	1.0	No	No
	65+50 -L- M	Triangle													
7/8	61+16 -L- LT	UT to	0.0	6.0	6.0	1.5	150	284	1.00%	3.0	1.7	4.0	1.9	No	Yes
	64+00 -L- LT	Triangle													

Additional Comments



(Version 2.07; Released October 2016)

WBS Element: 34802.1.1

TIP No.: U-2412A

County(ies): Guilford

Page

4

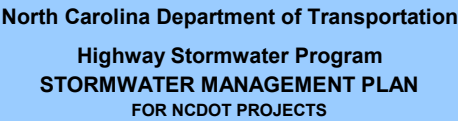
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8

Swales

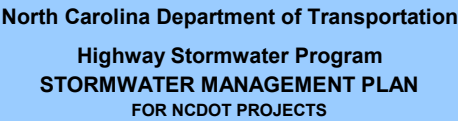
Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
7/8	61+20 -L- RT	UT to Triangle	0.0	6.0	6.0	1.3	130	430	0.40%	2.9	1.2	3.9	1.3	No	Yes
	65+50 -L- RT														
8	71+65 -L- M	UT to Deep River	0.0	4.6	4.6	0.5	52	335	1.60%	1.3	1.8	1.7	1.9	No	Yes
	75+00 -L- M														
8	72+00 -L- LT	UT to Deep River	0.0	6.0	6.0	0.3	30	300	2.70%	0.8	1.8	1.0	1.9	No	Yes
	75+00 -L LT														
8/9	75+00 -L- M	UT to Deep River	0.0	6.1	6.1	0.5	54	295	1.60%	1.7	1.8	2.2	1.9	No	Yes
	77+95 -L- M														
9	81+50 -L- M	UT to Deep River	0.0	5.9	5.9	0.4	36	225	2.00%	1.0	1.7	1.3	1.8	No	Yes
	83+75 -L- M														
9	83+75 -L- M	UT to Deep River	0.0	5.7	5.7	0.5	47	300	1.70%	1.1	1.7	1.5	1.8	No	Yes
	86+75 -L- M														
9/10	86+75 -L- M	UT to Deep River	0.0	5.6	5.6	0.4	40	252	2.70%	1.0	2.0	1.3	2.1	No	No
	89+27 -L- M														
10	97+10 -L- M	UT to Deep River	0.0	6.0	6.0	0.7	65	440	0.80%	1.4	1.3	1.9	1.4	No	Yes
	101+50 -L- M														
10/11	100+50 -L- RT	UT to Deep River	0.0	6.0	6.0	0.9	90	325	0.60%	2.0	1.3	2.6	1.4	No	Yes
	103+75 -L- RT														
11	101+50 -L- M	UT to Deep River	0.0	5.9	5.9	0.3	26	103	0.30%	0.5	0.7	0.6	0.7	No	Yes
	102+53 -L- M														
11	102+53 -L- M	UT to Deep River	0.0	5.6	5.6	0.5	54	122	1.50%	1.3	1.7	1.7	1.8	No	Yes
	103+75 -L- M														
11	104+24 -L- M	UT to Deep River	0.0	4.7	4.7	0.3	26	668	1.30%	1.0	1.6	1.3	1.7	No	Yes
	110+92 -L- M														
11	112+50 -L- RT	UT to Deep River	0.0	6.0	6.0	1.3	130	250	1.50%	2.7	2.0	3.6	2.1	No	Yes
	115+00 -L- RT														
12	119+00 -L- M	UT to Deep River	0.0	5.0	5.0	0.3	31	235	3.10%	0.8	2.0	1.0	2.1	No	Yes
	121+35 -L- M														
12	121+35 -L- M	UT to Deep River	0.0	5.5	5.5	0.4	37	240	2.60%	0.9	1.9	1.2	2.0	No	Yes
	123+75 -L- M														
12	123+75 -L- M	UT to Deep River	0.0	5.5	5.5	0.4	35	262	2.60%	0.8	1.8	1.1	2.0	No	Yes
	126+37 -L- M														
12/13	126+37 -L- M	Deep River	0.0	5.8	5.8	0.7	70	413	2.00%	1.7	2.0	2.2	2.1	No	Yes
	130+50 -L- M														
12/13	128+50 -L- LT	Bull Run	0.0	6.0	6.0	0.9	90	150	1.50%	2.4	1.9	3.1	2.1	No	Yes
	130+00 -L- LT														
13	130+50 -L- M	Deep River	0.0	5.8	5.8	0.5	48	300	1.10%	1.1	1.4	1.5	1.5	No	Yes
	133+50 -L- M														

Additional Comments



(Version 2.07; Released October 2016)

WBS Element: 34802.1.1							TIP No.: U-2412A	County(ies): Guilford				Page 5		of 8	
Swales															
Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
13	132+00 -L- RT	Bull Run	0.0	6.0	6.0	0.6	60	150	1.10%	1.4	1.5	1.9	1.6	No	Yes
	133+50 -L- RT														
14	148+50 -L- LT	Bull Run	0.0	6.0	6.0	0.3	32	172	1.50%	0.7	1.4	0.9	1.5	No	Yes
	150+22 -L- LT														
14	148+50 -L- RT	Bull Run	0.0	6.0	6.0	0.2	22	172	1.50%	0.6	1.4	0.8	1.5	No	Yes
	150+22 -L- RT														
14	148+50 -L- M	Deep River	0.0	5.8	5.8	0.9	86	172	2.00%	0.5	1.5	0.7	1.6	No	Yes
	150+22 -L- M														
14	150+22 -L- M	Deep River	0.0	5.8	5.8	0.5	46	273	1.30%	1.1	1.5	1.4	1.6	No	Yes
	152+95 -L- M														
15	157+00 -L- M	UT to Bull Run	0.0	5.8	5.8	0.5	47	300	0.30%	1.1	0.9	1.5	0.9	No	Yes
	160+00 -L- M														
15	160+00 -L- M	UT to Bull Run	0.0	5.8	5.8	0.2	16	100	0.30%	0.4	0.7	0.5	0.7	No	Yes
	161+00 -L- M														
15	161+00 -L- M	UT to Bull Run	0.0	5.8	5.8	0.7	67	458	0.30%	1.4	0.9	1.9	1.0	No	Yes
	165+58 -L- M														
15	161+00 -L- LT	UT to Bull Run	0.0	6.0	6.0	0.7	72	458	0.80%	1.5	1.4	2.0	1.5	No	Yes
	165+58 -L- LT														
15	161+50 -L- RT	UT to Bull Run	0.0	6.0	6.0	1.2	120	408	0.30%	2.7	1.1	3.6	1.2	No	Yes
	165+58 -L- RT														
15	165+58 -L- LT	UT to Bull Run	0.0	6.0	6.0	1.0	97	392	1.00%	2.3	1.6	3.0	1.7	No	Yes
	169+50 -L- LT														
15	165+58 -L- RT	UT to Bull Run	0.0	6.0	6.0	1.1	105	392	1.00%	2.4	1.7	3.2	1.8	No	Yes
	169+50 -L- RT														
15	165+58 -L- M	UT to Bull Run	0.0	6.0	6.0	0.4	41	392	1.00%	0.8	1.3	1.1	1.4	No	Yes
	169+50 -L- M														
16	169+50 -L- LT	UT to Bull Run	0.0	6.0	6.0	1.3	133	450	1.30%	3.0	1.9	3.9	2.1	No	Yes
	174+00 -L- LT														
16	169+50 -L- RT	UT to Bull Run	0.0	6.0	6.0	0.5	53	150	1.30%	1.3	1.6	1.8	1.7	No	Yes
	171+00 -L- RT														
15/16	169+50 -L- M	UT to Bull Run	0.0	6.0	6.0	0.5	48	450	1.30%	0.9	1.4	1.2	1.5	No	Yes
	174+00 -L- M														
16	174+00 -L- M	UT to Bull Run	0.0	6.0	6.0	0.2	16	150	1.30%	0.3	1.1	0.4	1.2	No	Yes
	175+50 -L- M														
16	175+50 -L- M	UT to Bull Run	0.0	6.0	6.0	0.2	24	267	1.40%	0.5	1.3	0.6	1.3	No	Yes
	178+17 -L- M														
16	176+35 -L- RT	UT to Bull Run	0.0	6.0	6.0	0.5	47	182	1.20%	1.4	1.5	1.9	1.7	No	Yes
	178+17 -L- RT														
Additional Comments															



Swales

[illegible]

Additional Comments



Level Spreaders, Hazardous Spill Basins, and Forebays

Additional Comments



Page 8 of 8

Additional Comments

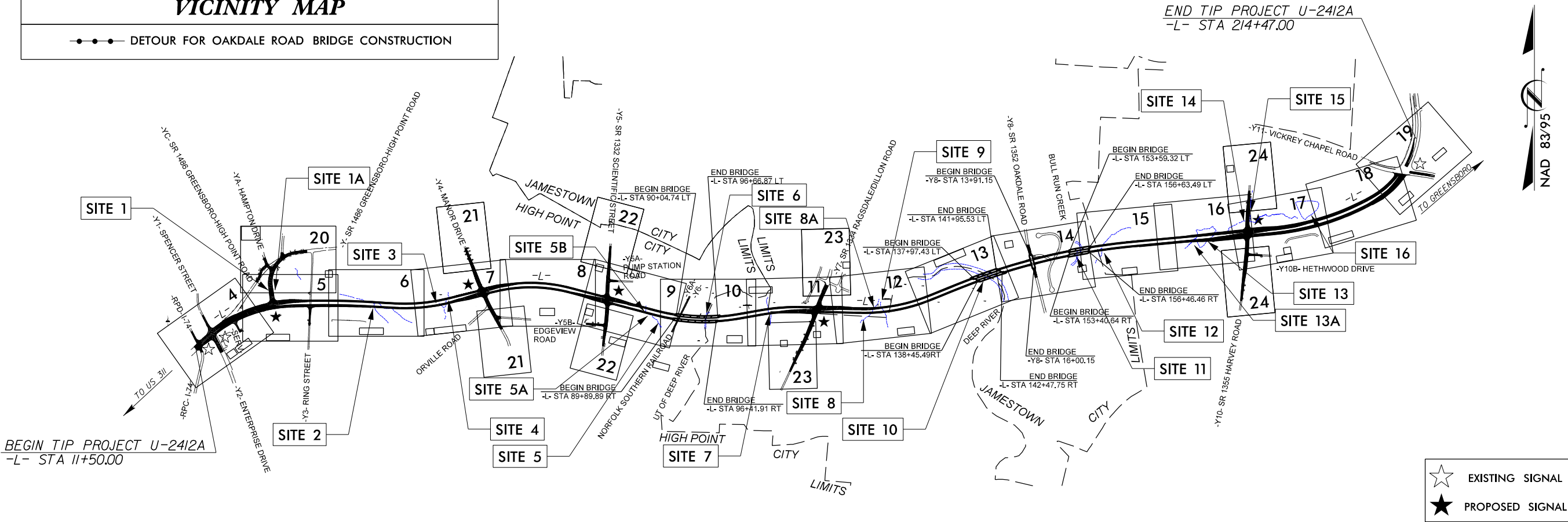
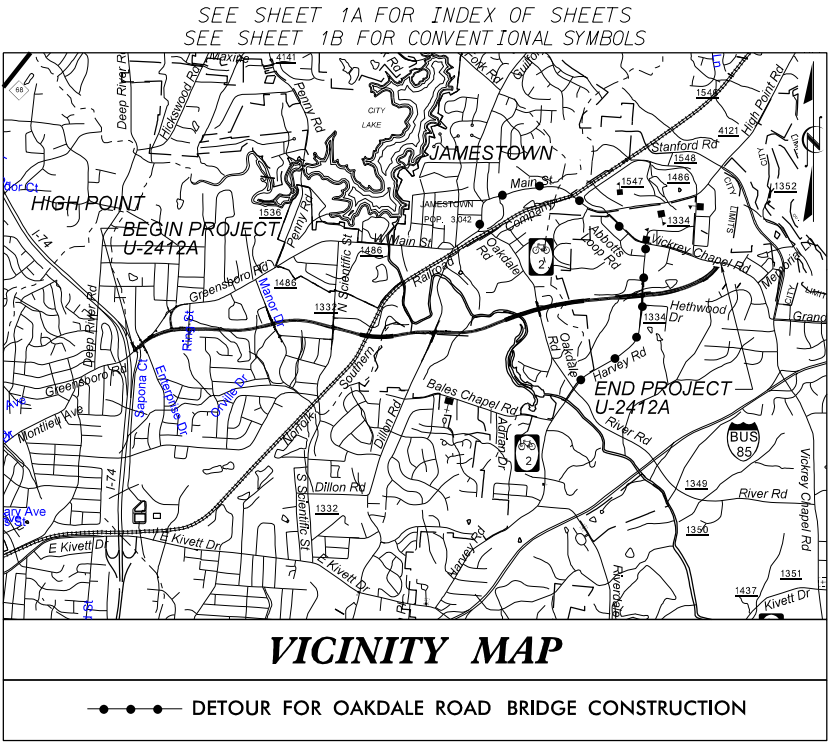
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N.C.	U-2412A	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34802.1.1	STP-4121(3)	PE	
34802.2.2	STP-4121(3)	RW & UTL.	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
GUILFORD COUNTY

LOCATION: SR-1486 /SR-4121 (JAMESTOWN PARKWAY) FROM I-74
TO WEST OF SR 1480 (VICKREY CHAPEL ROAD)

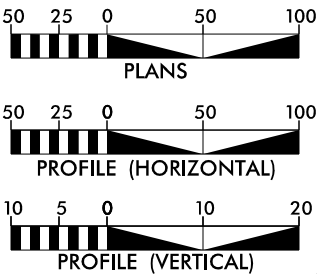
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERT, & SIGNALS

WETLAND AND SURFACE WATER IMPACTS PERMIT



THIS IS A CONTROLLED ACCESS FACILITY WITH ACCESS BEING LIMITED TO INTERSECTIONS.
NCDOT CONTACT: TATIA WHITE, PE, PLS

GRAPHIC SCALES



DESIGN DATA

ADT 2018 = 35,880
ADT 2038 = 44,720
K = 9 %
D = 55 %
T = 4 % *
V = 60 MPH
* TTST = 1% DUAL 3%
FUNC CLASS =
URBAN ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2412A = 3.586 MILES
LENGTH STRUCTURES TIP PROJECT U-2412A = .258 MILES
TOTAL LENGTH OF TIP PROJECT U-2412A = 3.844 MILES

PLANS PREPARED FOR THE NCDOT BY:
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2248
ENG FIRM LICENSE NO. C-890

M MOTT MACDONALD
2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 20, 2009

LETTING DATE:
JUNE 19, 2018

MICHAEL PEKAREK, PE
PROJECT ENGINEER

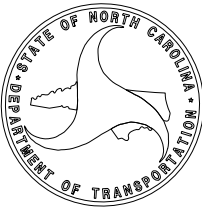
BRIAN PHILLIPS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



8/17/99

PROJECT REFERENCE NO.
U-2412A

SHEET NO.
2D-1

RW SHEET NO.

ROADWAY DESIGN ENGINEER

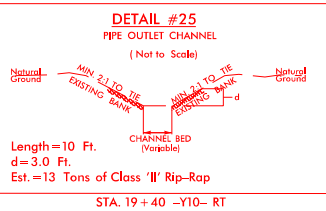
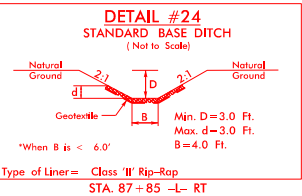
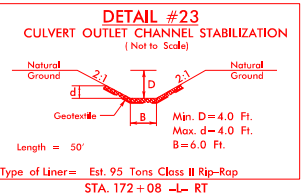
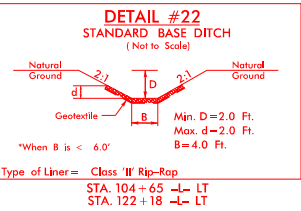
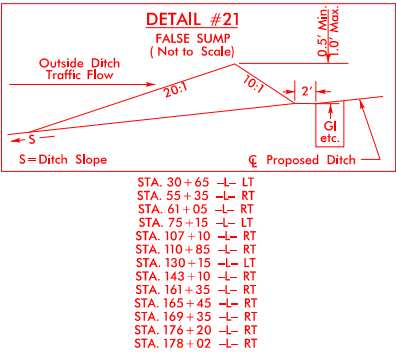
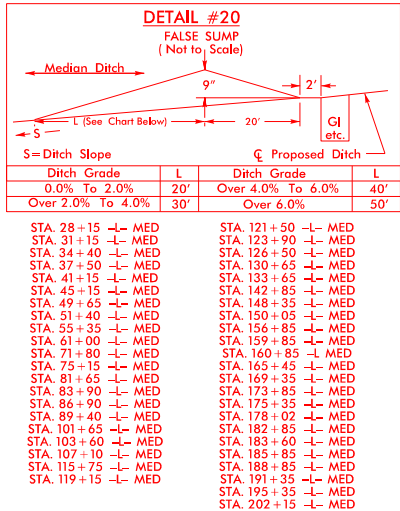
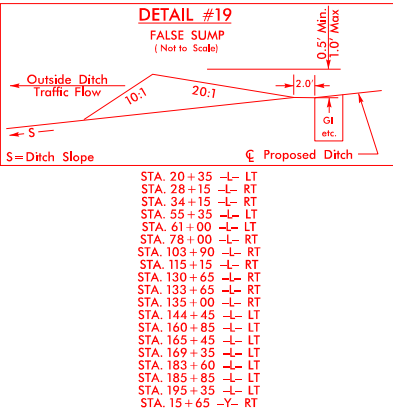
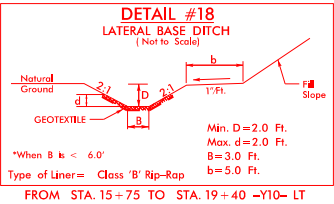
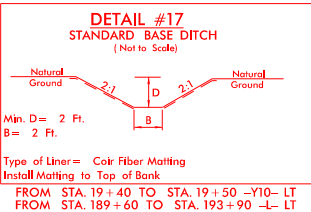
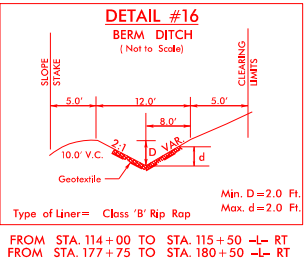
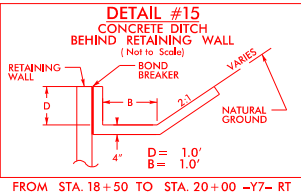
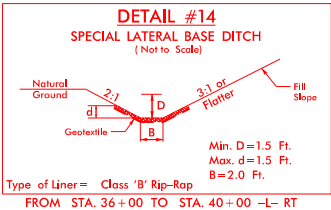
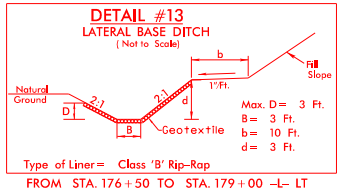
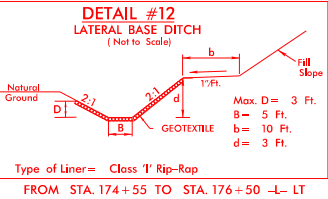
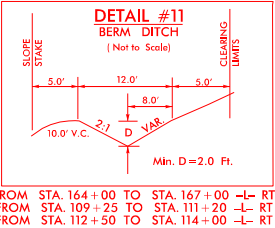
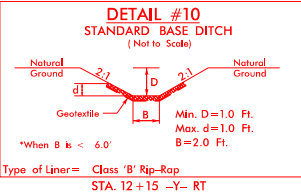
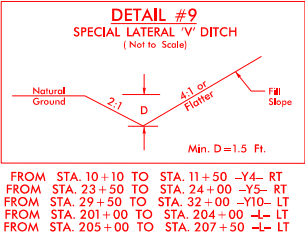
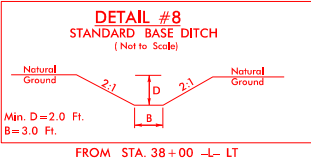
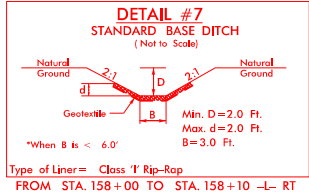
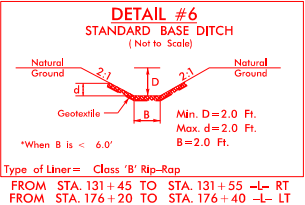
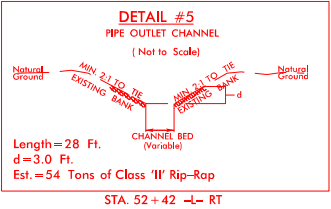
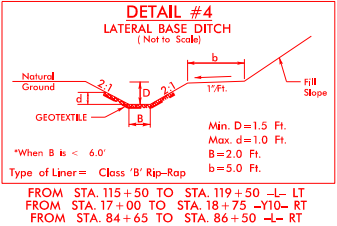
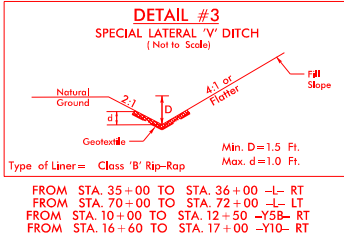
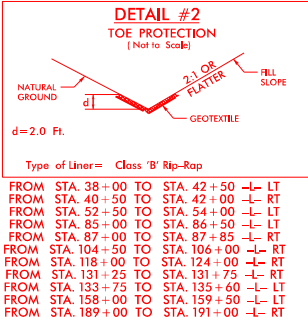
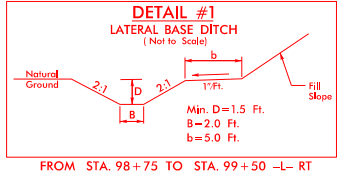
HYDRAULICS ENGINEER

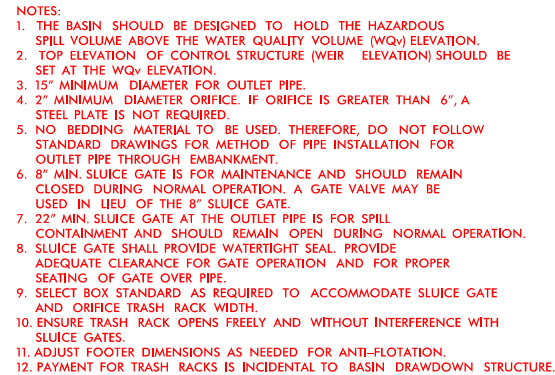
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of:
MOTT MACDONALD

PO Box 700
Fuquay-Varina, NC 27526
www.mottmac.com/mottmac
LICENSE NO. F-0669

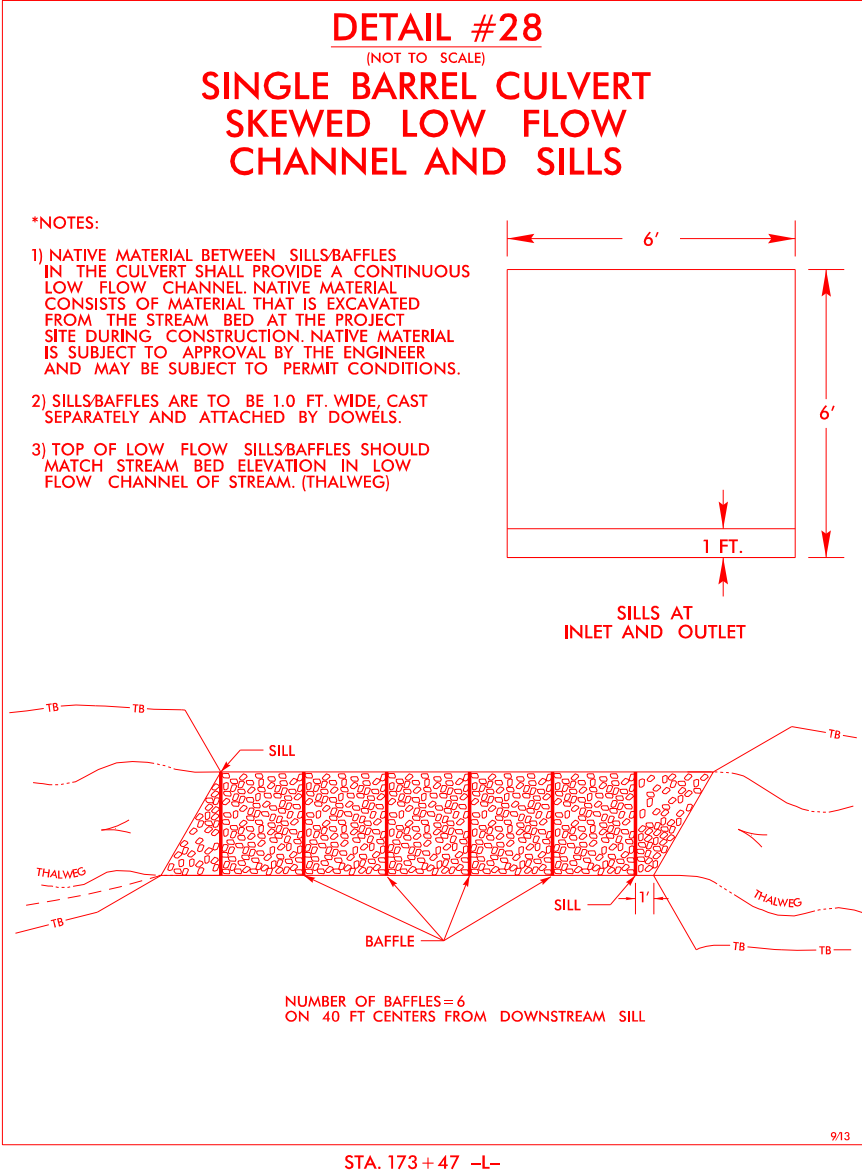
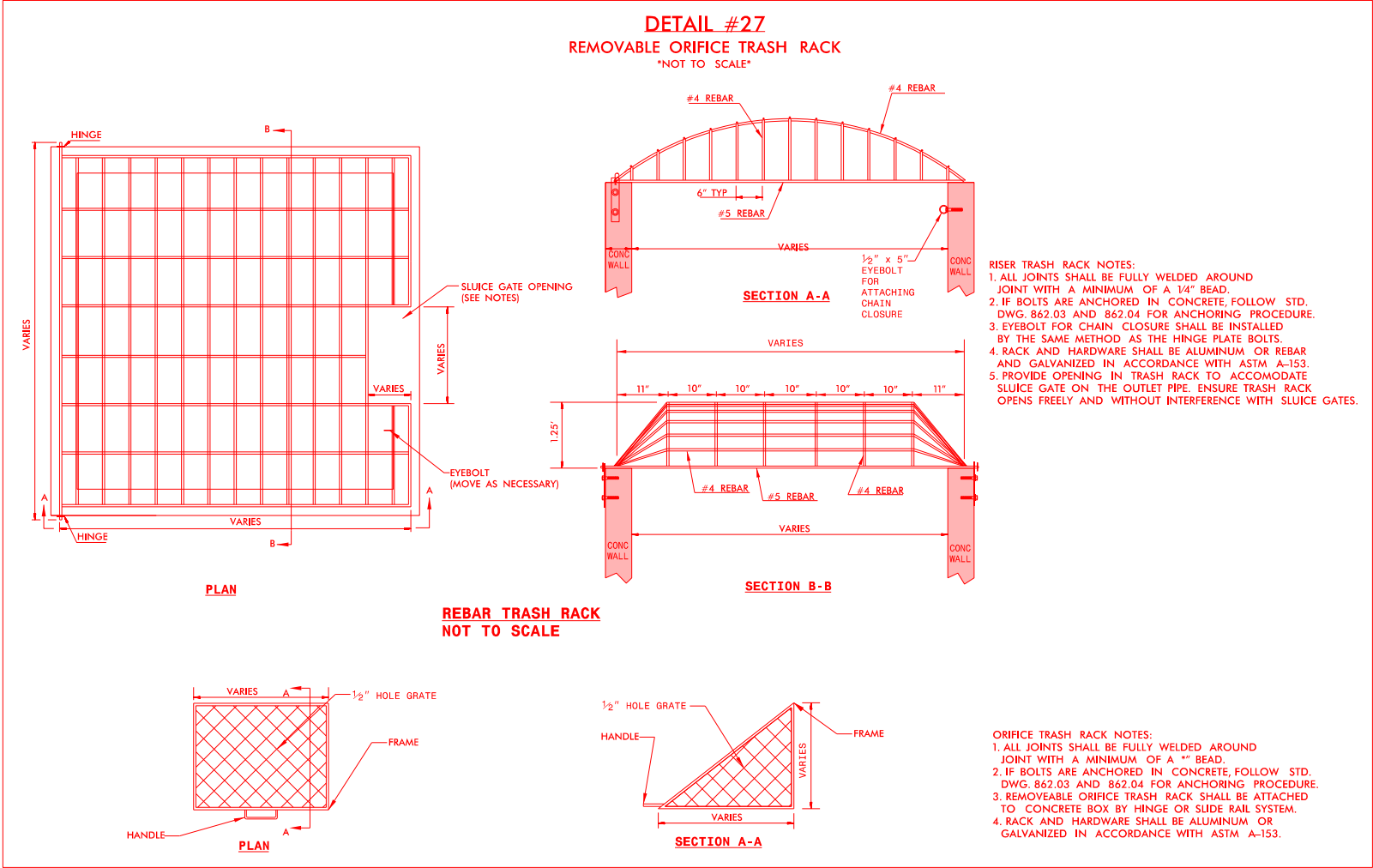
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL: (919) 850-2440
ENG. FIRM LICENSE NO. C-490





MINIMUM DIMENSIONS FOR DRY DETENTION/HAZARDOUS SPILL BASIN DRAWDOWN STRUCTURE											
STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	MAX. STORAGE DEPTH(D) FEET	INV. ELEV. CTL. STR.	CTL. STR. DIMENSIONS (W x L x H)	ORIFICE DIAMETER (O) INCHES	ORIFICE INV. ELEV.	OUTLET PIPE DIAMETER(P) INCHES
50+00 -L- RT	713	6	18	827.0	830.5	3.5	824.0	5 x 5 x 6.5	6	827.0	36
54+00 -L- RT	711	6	15	828.0	833.5	5.5	828.0	5 x 5 x 5.5	22	828.0	30
83+00 -L- LT	909	6	15	798.5	804.0	5.5	798.5	5 x 5 x 5.5	17	798.5	24
100+00 -L- LT	1015	6	18	728.0	732.0	4.0	725.0	5 x 5 x 7	2	728.0	30
143+00 -L- LT	1320	6	15	733.0	736.5	3.5	730.0	5 x 5 x 6.5	4.5	733.0	24
175+00 -L- RT	1613	6	18	768.0	772.5	4.5	765.0	5 x 5 x 7.5	8	768.0	30
192+00 -L- LT	1725	6	12	812.0	815.0	3.0	810.0	5 x 5 x 5	2	812.0	24

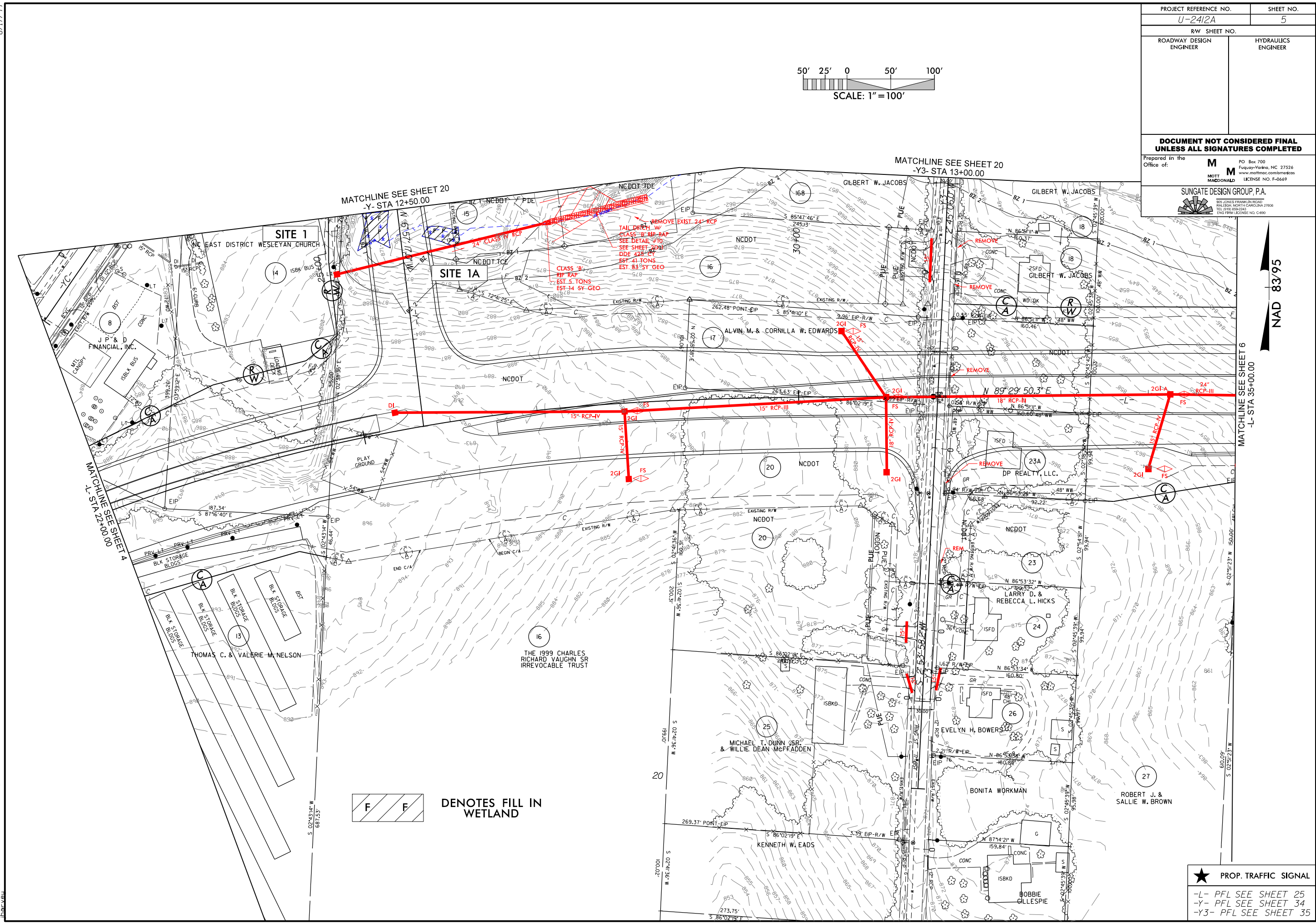
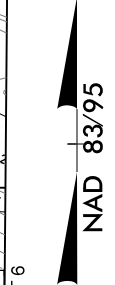
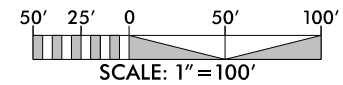
PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		2D-3	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared in the Office of:		MOTT MACDONALD	
		PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/mottmac LICENSE NO. F-0669	
SUNGATE DESIGN GROUP, P.A.			
905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL: (919) 855-2444 ENG FIRM LICENSE NO. C-490			



NAD 83/95



PROJECT REFERENCE NO.		SHEET NO.
U-2412A		5
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	



 DENOTES FILL IN WETLAND

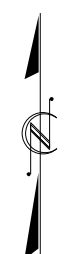
- ★ PROP. TRAFFIC SIGNAL
- L- PFL SEE SHEET 25
- Y- PFL SEE SHEET 34
- Y3- PFL SEE SHEET 35

8/17/99
2/23/2018
U-2412A.dwg
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8/17/99



DENOTES FILL IN
WETLAND



PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		5b	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

MATCHLINE SEE SHEET 20
-Y- STA 12+50.00

SITE 1
STRICT WESLEYAN CHURCH

14 ISBK BUS

R
W

BZ 1
BZ 2

N 6° 57' 17.0" W
17.0"

BZ 1

SITE 1A

24" CLASS IV RCP

NCDOT TCE

BZ 1

BZ 2

C
A

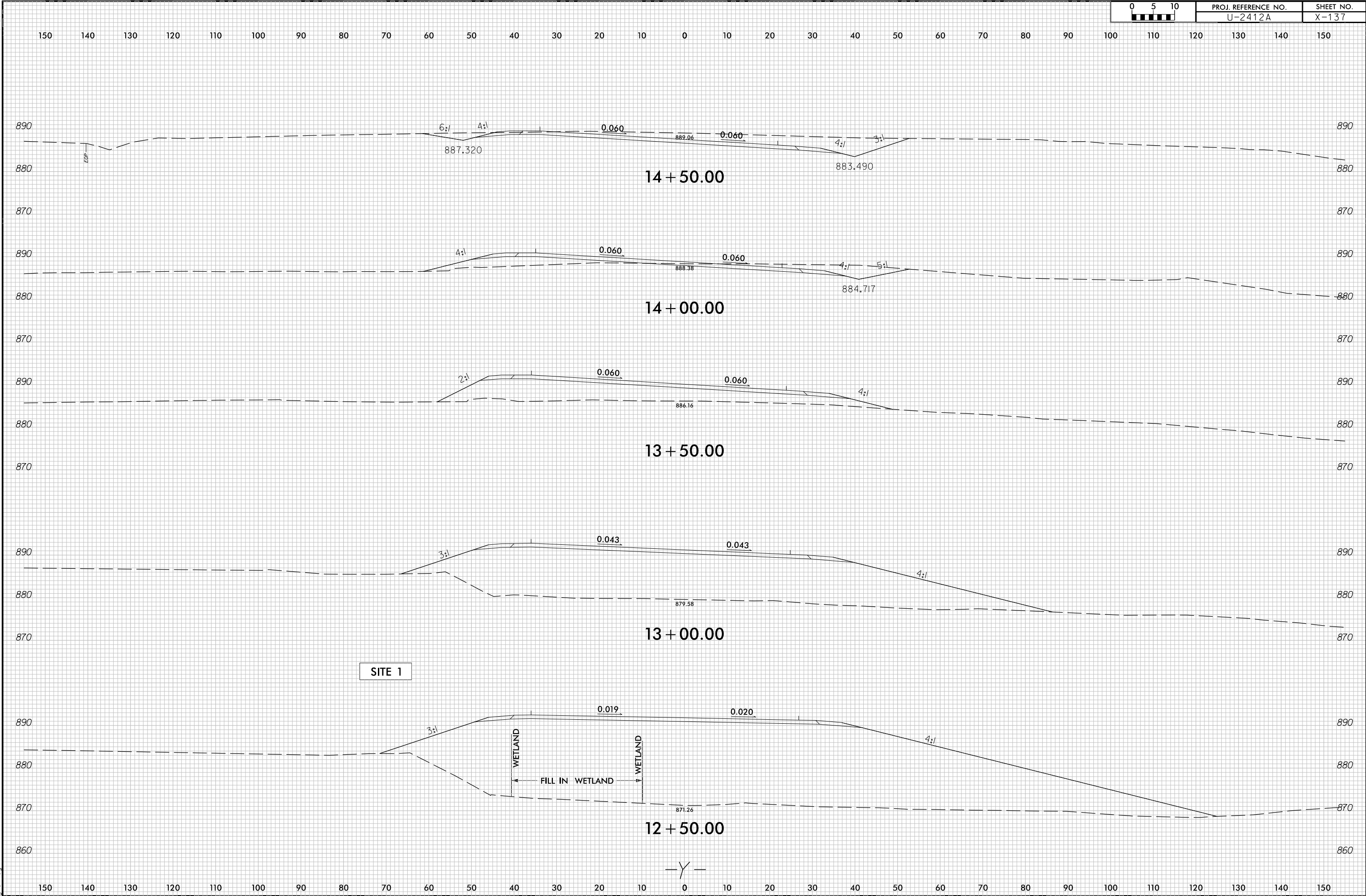
LOADING
DEC

2/23/2018
U-2412A.dwg
psh_05b.dgn
psh

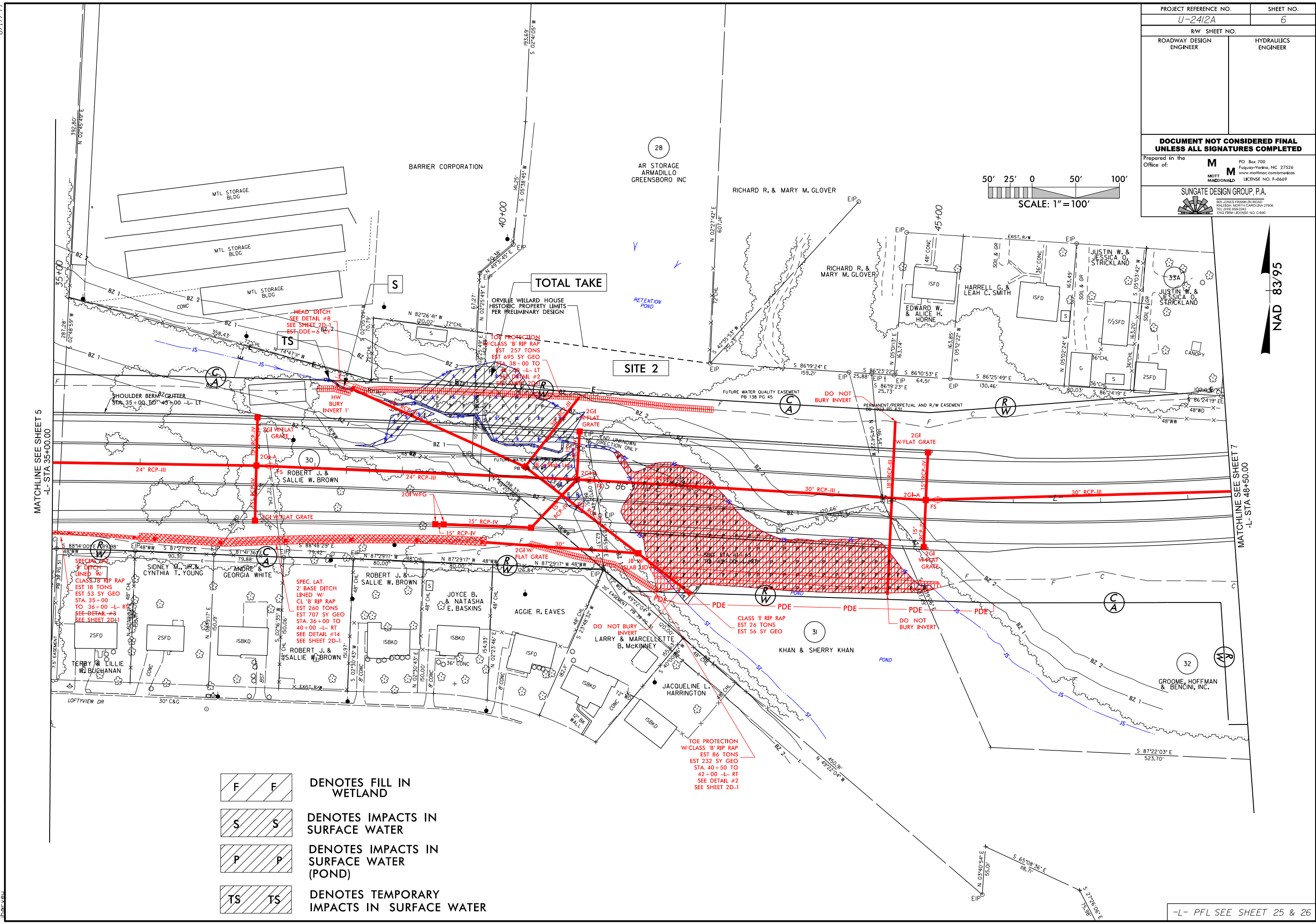
2/23/2018
U2412A_Hyd_prm_wet.psh_05c.dgn
Harvey



PROJ. REFERENCE NO.	SHEET NO.
U-2412A	X-137

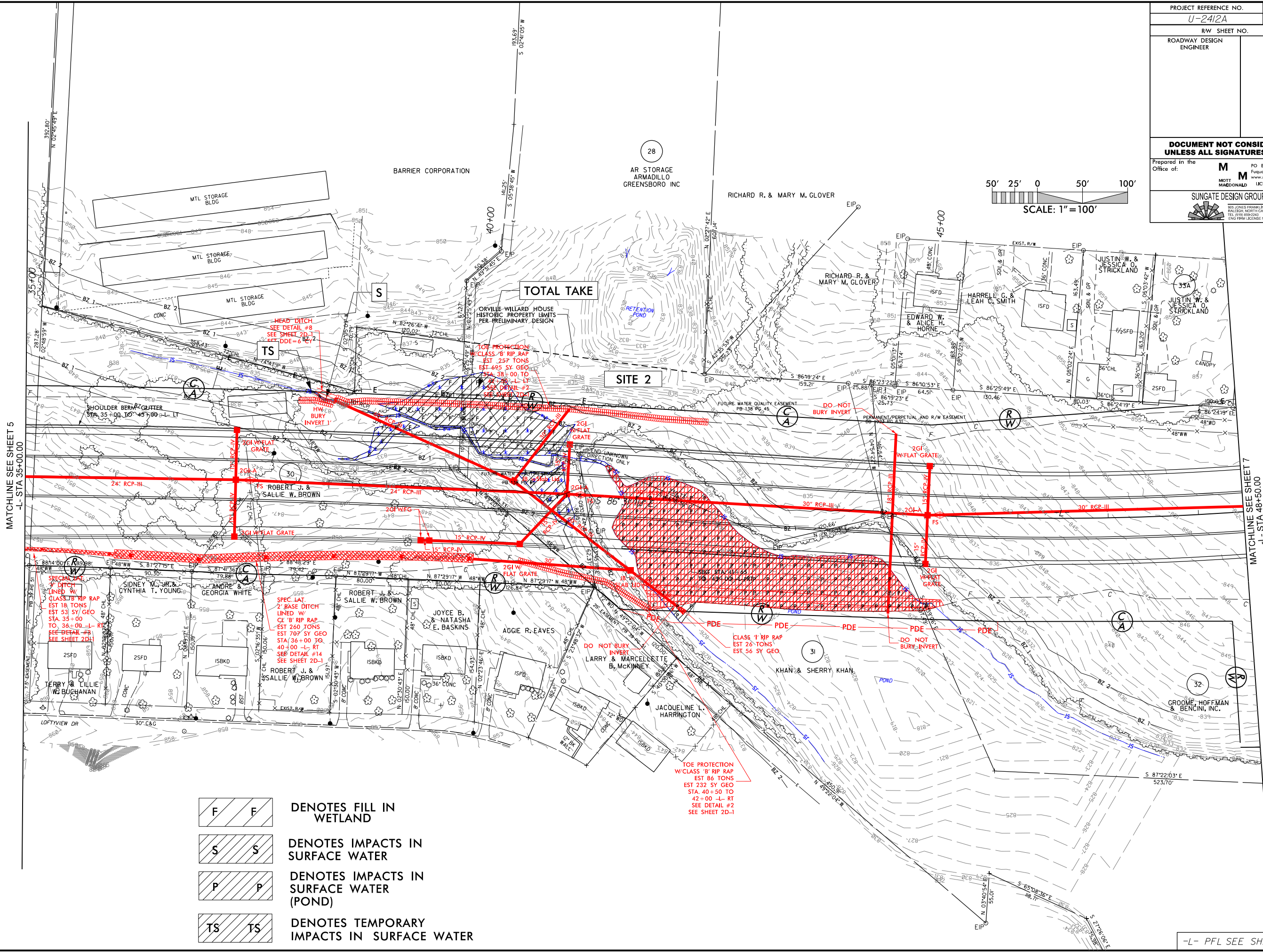


PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		6	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
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SUNGATE DESIGN GROUP, P.A. 905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL (919) 650-2442 ENG FIRM LICENSE NO. C-4890			

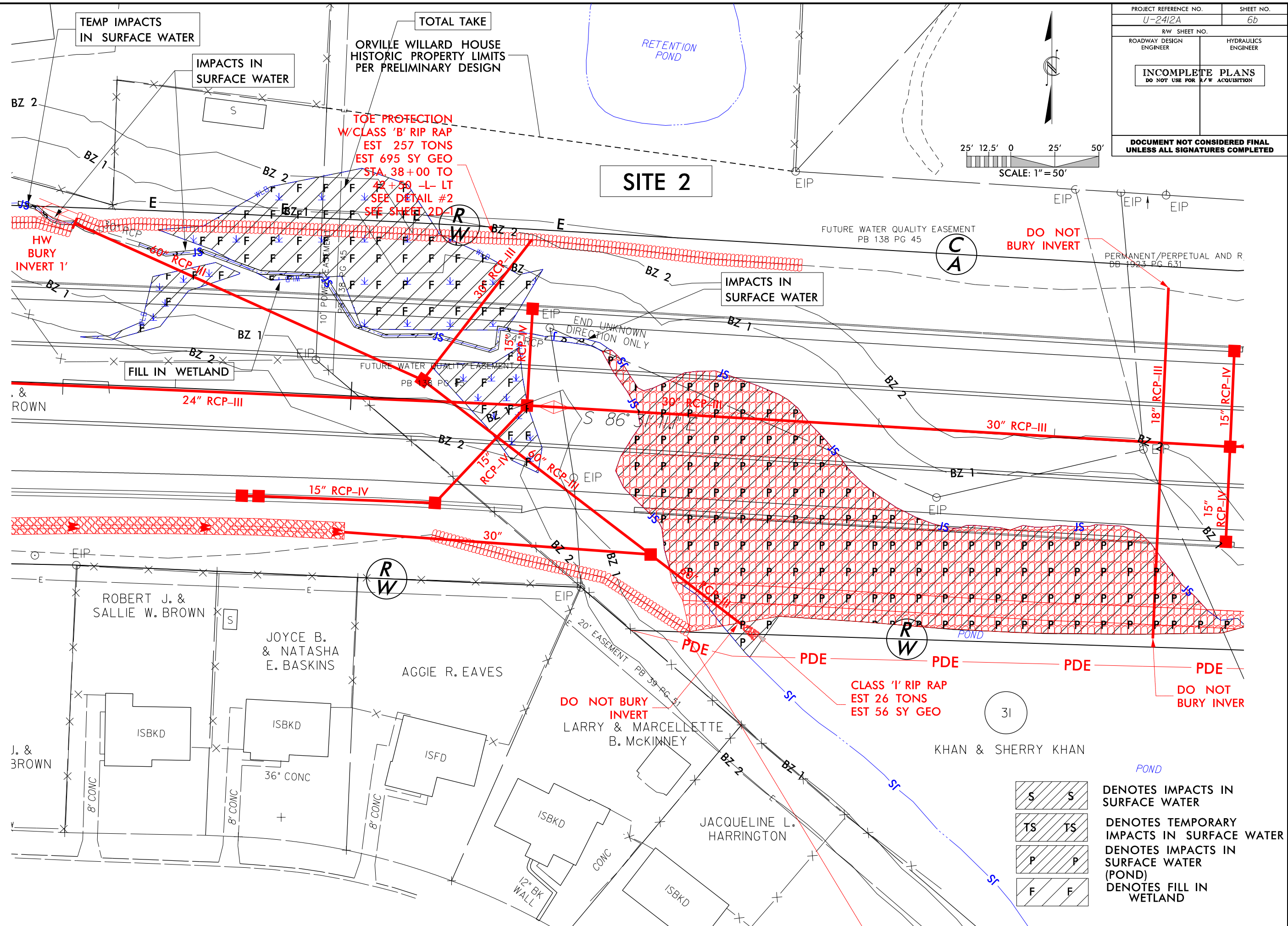


- DENOTES FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER (POND)
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO. U-2412A		SHEET NO. 6	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
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SUNGATE DESIGN GROUP, P.A. 800 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL (919) 850-2442 ENG FIRM LICENSE NO. C-490			



- | | |
|--|--|
| | DENOTES FILL IN WETLAND |
| | DENOTES IMPACTS IN SURFACE WATER |
| | DENOTES IMPACTS IN SURFACE WATER (POND) |
| | DENOTES TEMPORARY IMPACTS IN SURFACE WATER |

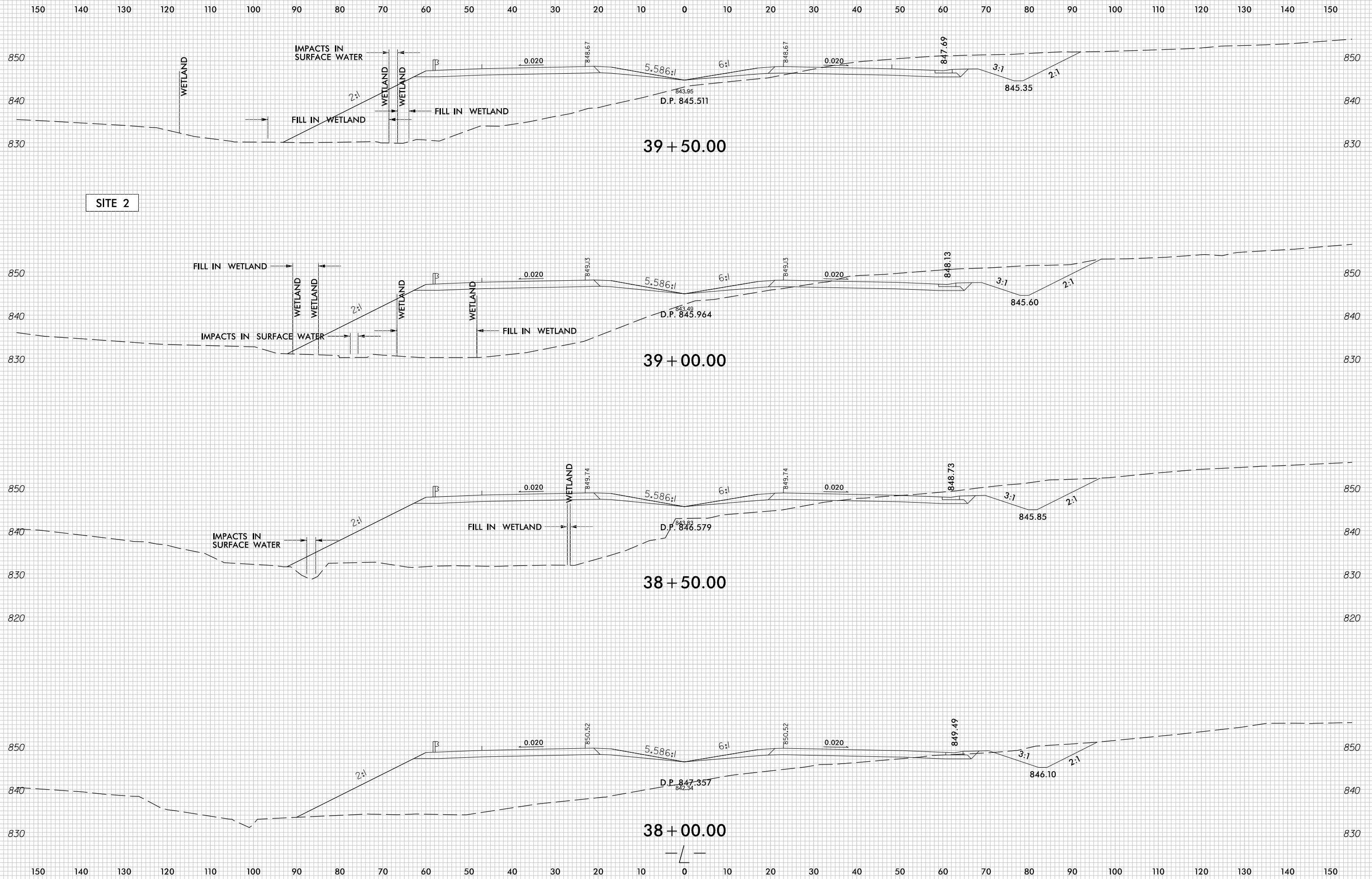
U2412A_HJ

8/23/99



PROJ. REFERENCE NO.	SHEET NO.
U-2412A	X-15

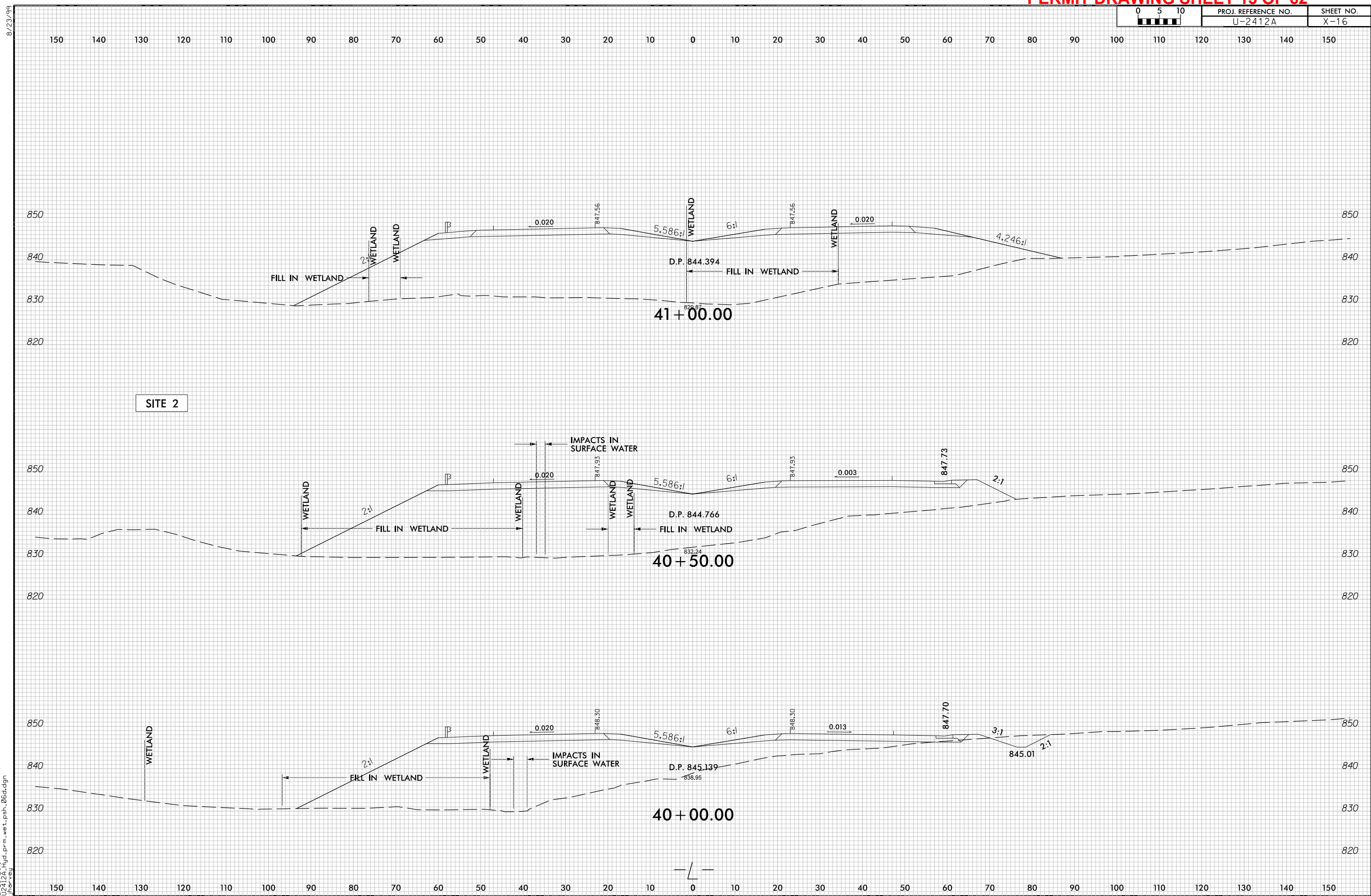
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2/23/2018
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Harvey

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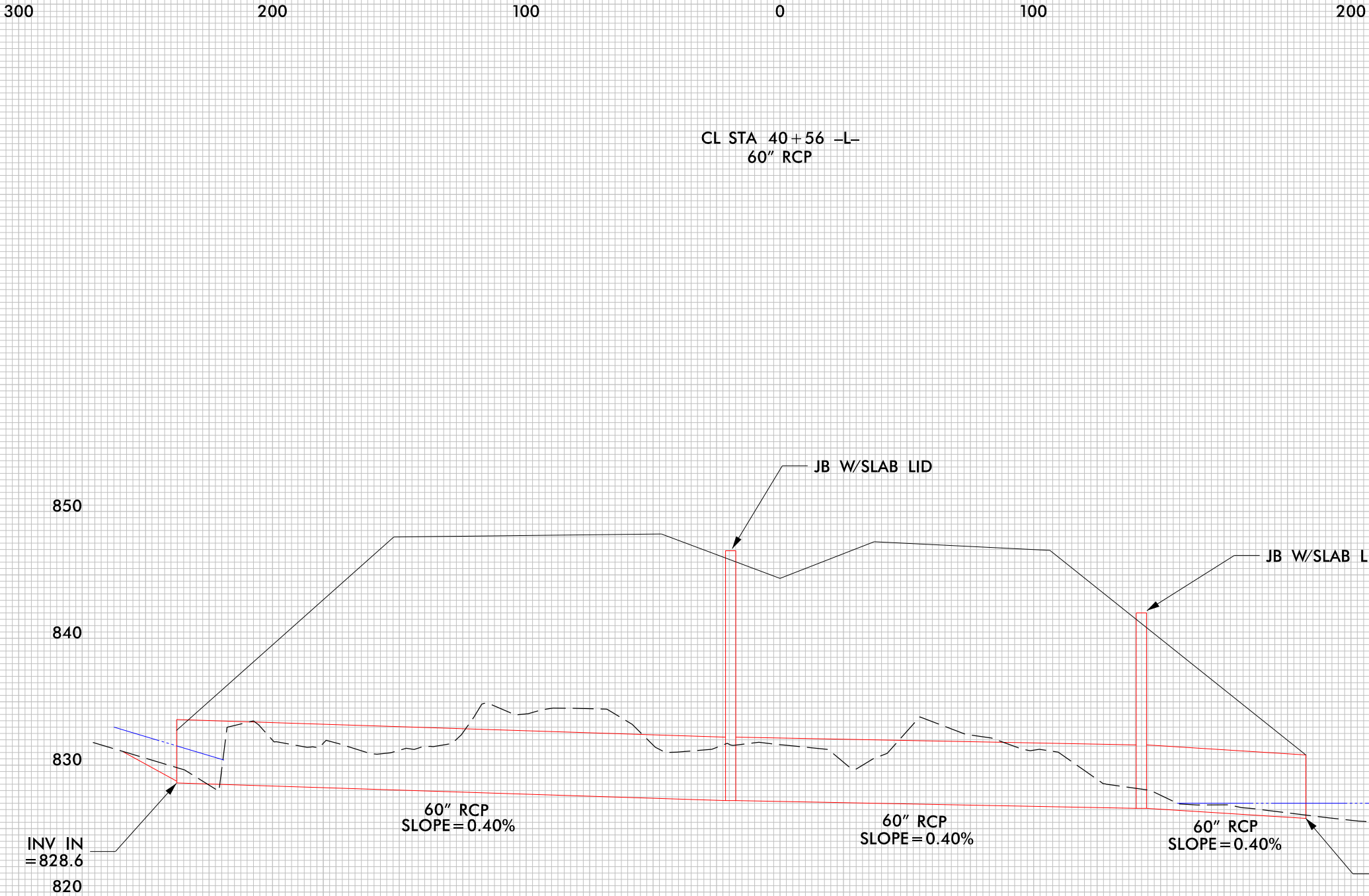
8/23/99



2/23/2018
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Harvey

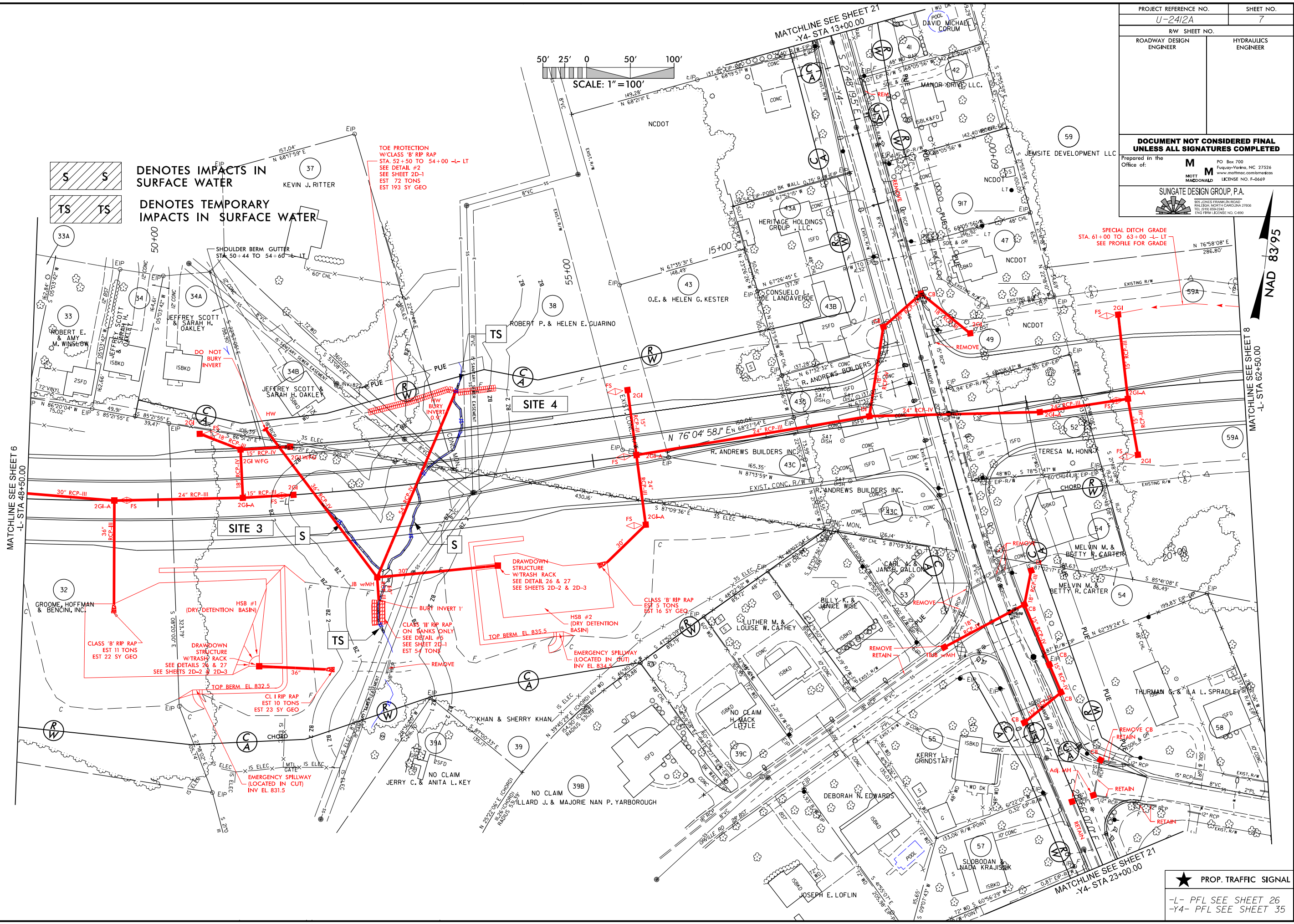
5/14/99

PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		6e	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



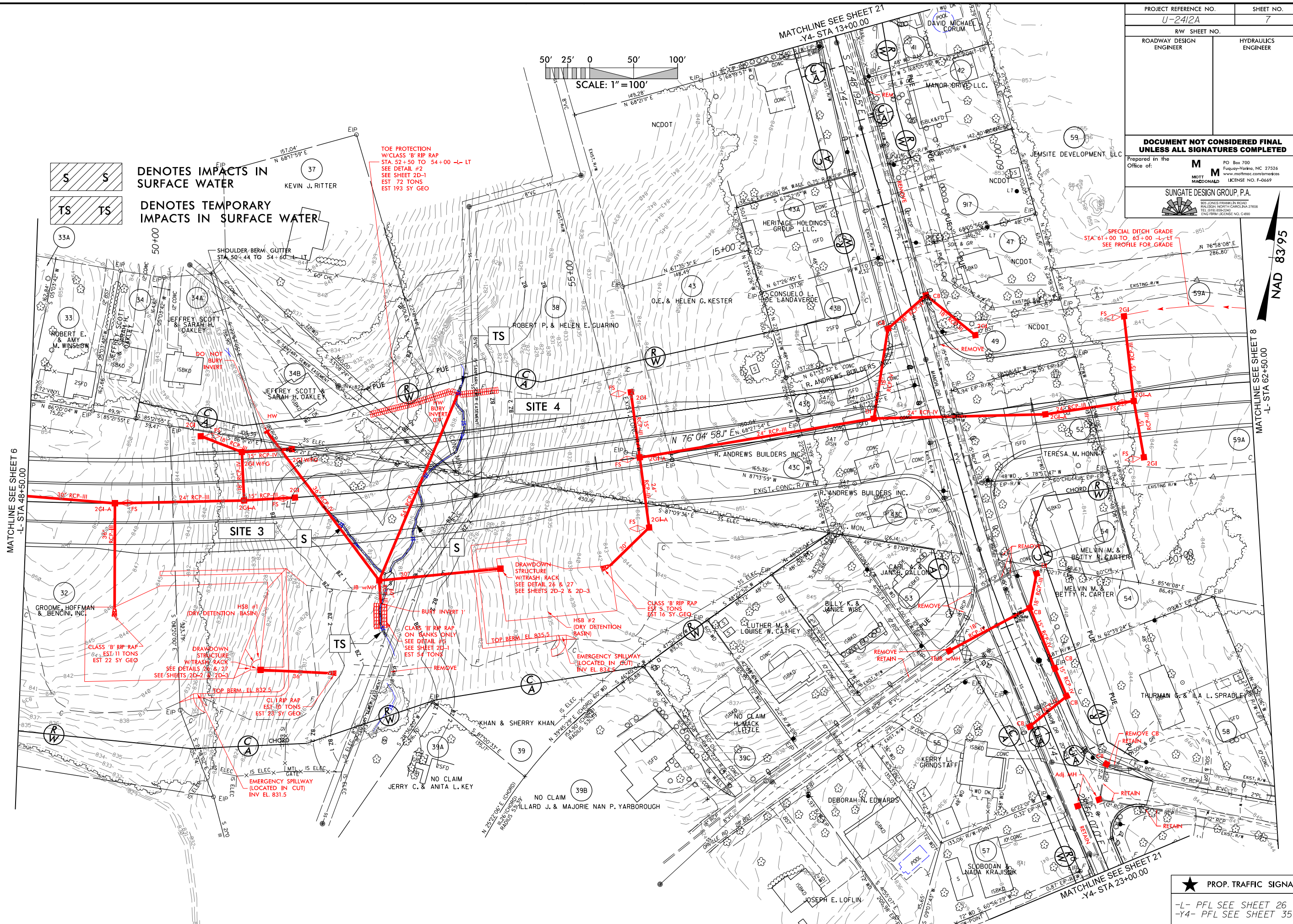
PROJECT REFERENCE NO. U-2412A		SHEET NO. 7	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER			
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2/23/2018
U-2412A.dwg, pr-m, wet, psh_07.dgn
10/2/2018



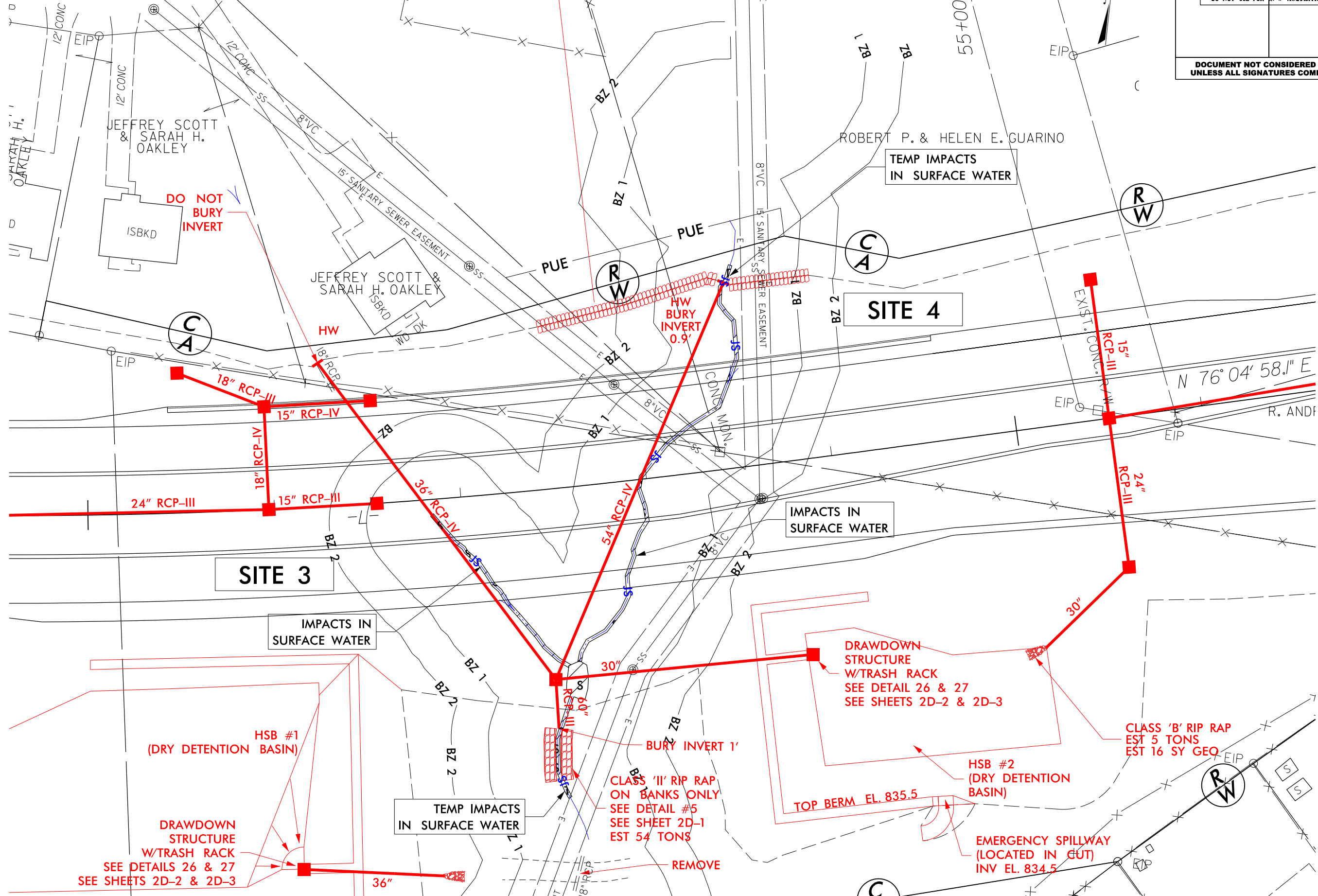
★ PROP. TRAFFIC SIGNAL
-L- PFL SEE SHEET 26
-Y4- PFL SEE SHEET 35

NAD 83/95



DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER





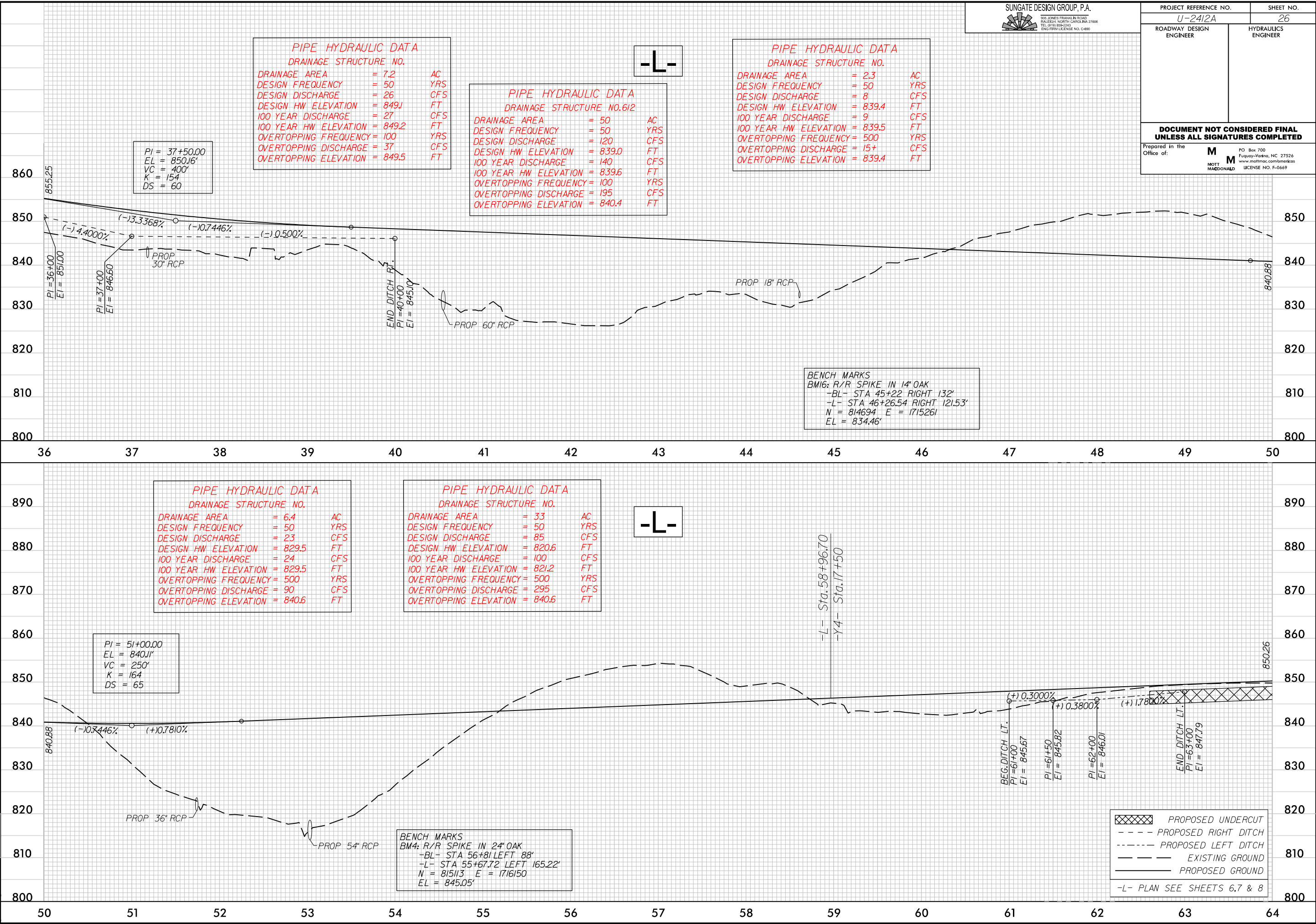
PROJECT REFERENCE NO. **U-2412A** SHEET NO. **26**

ROADWAY DESIGN ENGINEER

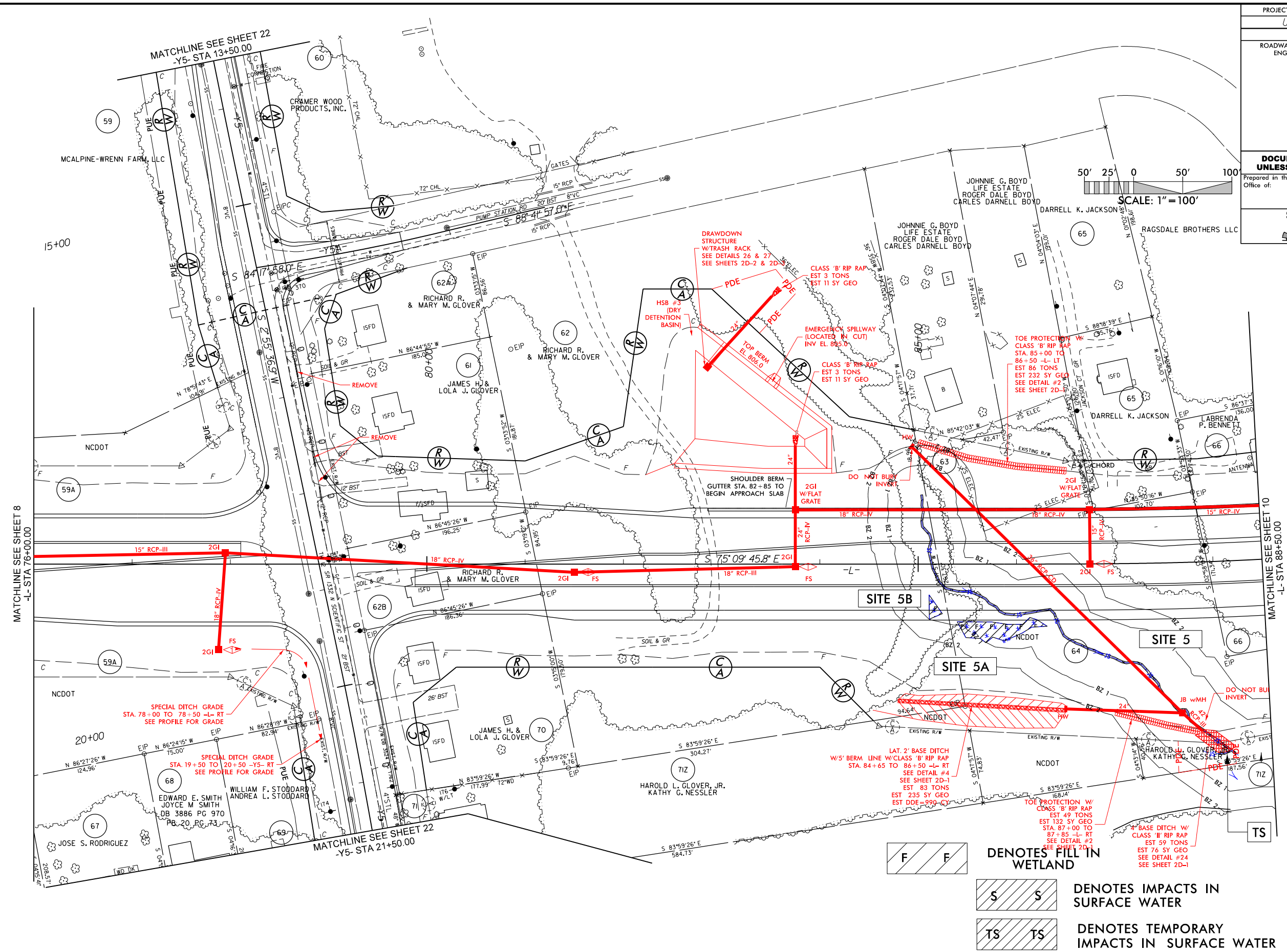
HYDRAULICS ENGINEER

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PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		9	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
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SUNGATE DESIGN GROUP, P.A.			
		100 JONES FRANKLIN ROAD	
		RALEIGH, NORTH CAROLINA 27608	
		TEL: (919) 606-2444 ENG FIRM LICENSE NO. C-4890	



LEGEND

DENOTES FILL IN WETLAND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

★ PROP. TRAFFIC SIGNAL

-L- PFL SEE SHEET 27

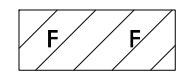
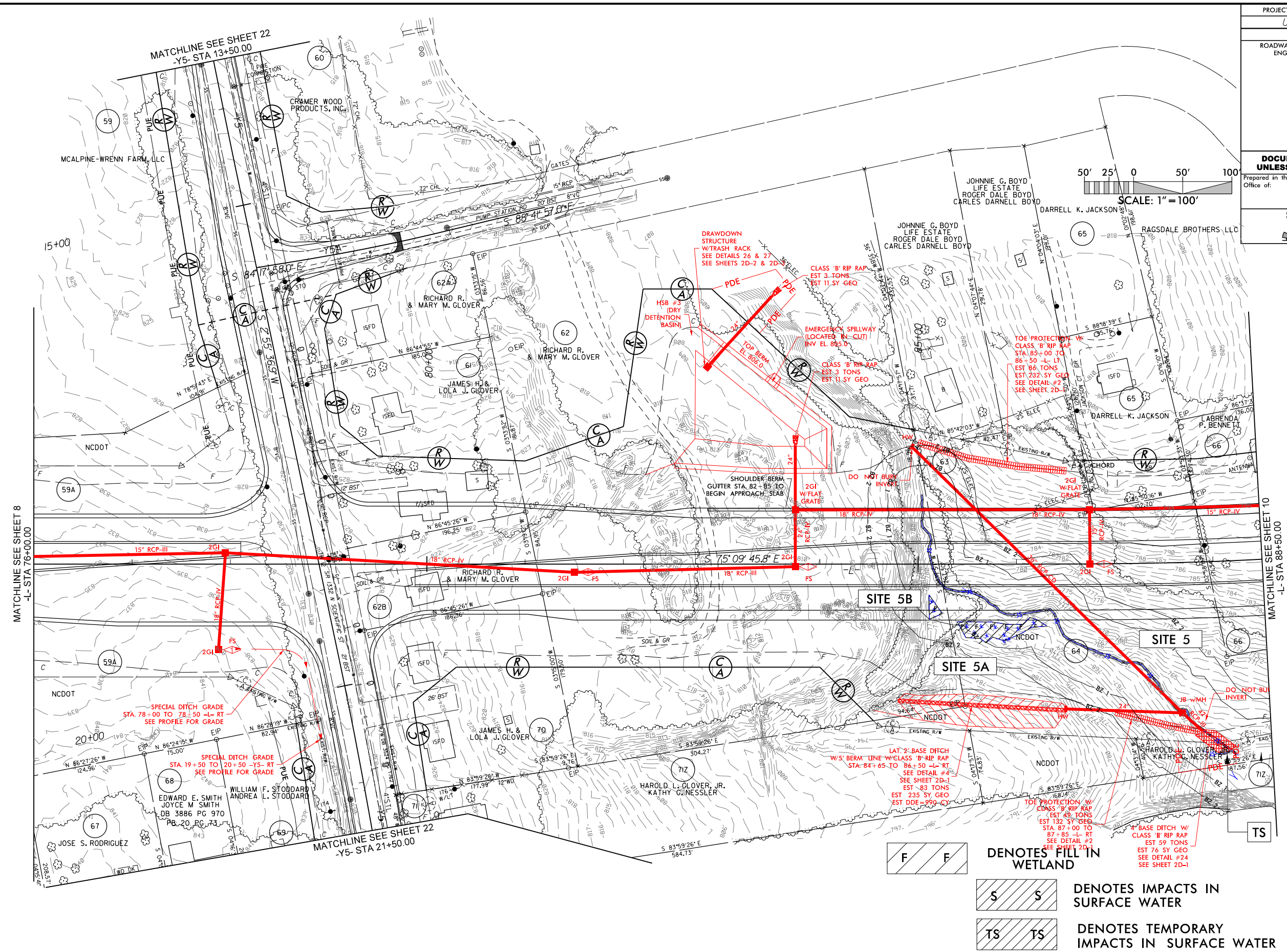
-Y5- PFL SEE SHEET 36

-Y5A- PFL SEE SHEET 37

8/17/99

2/23/2018 12:12 PM d:\proj\wet_psh_09.dgn

PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		9	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
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DENOTES FILL IN WETLAND



DENOTES IMPACTS IN SURFACE WATER

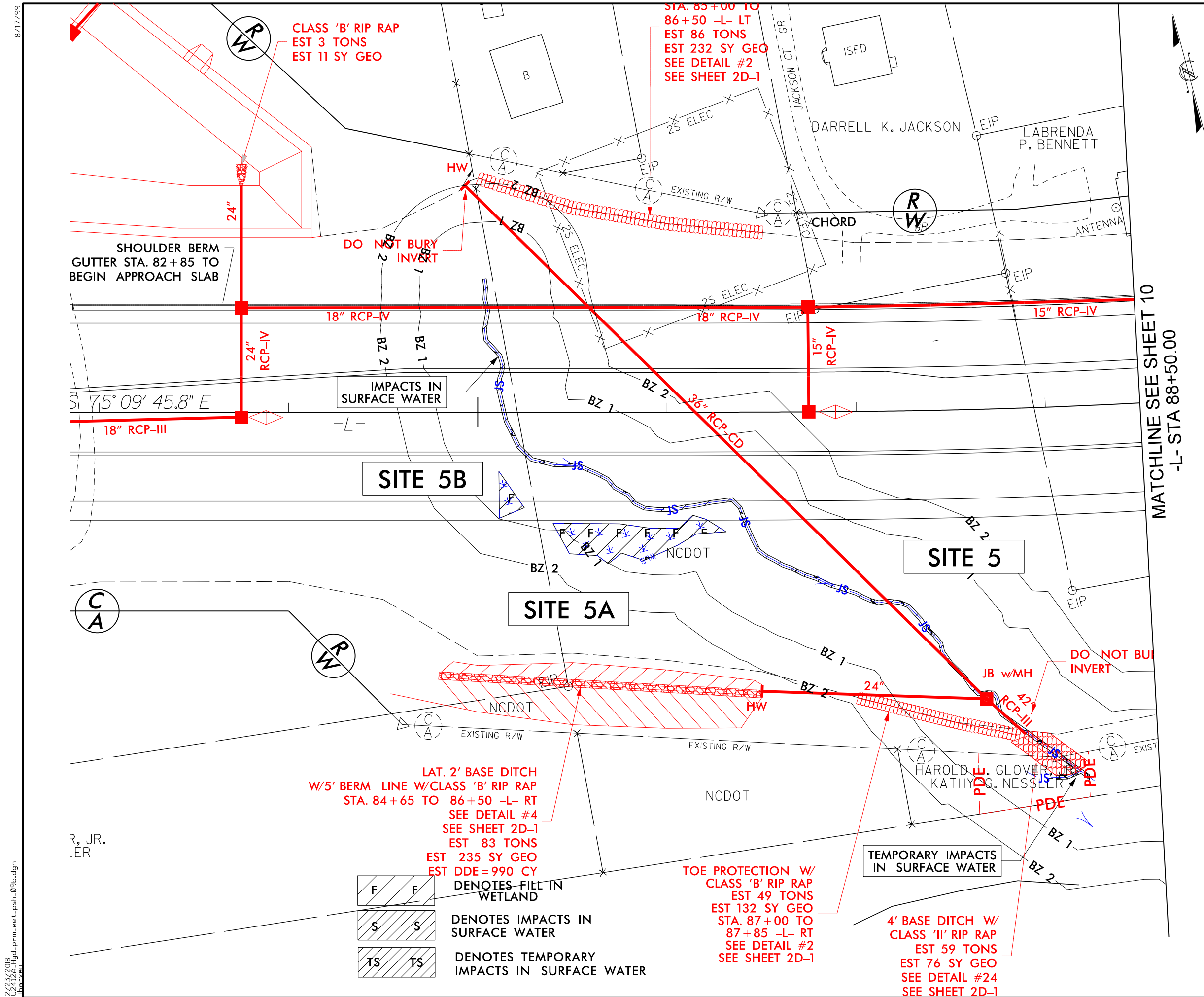
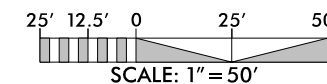


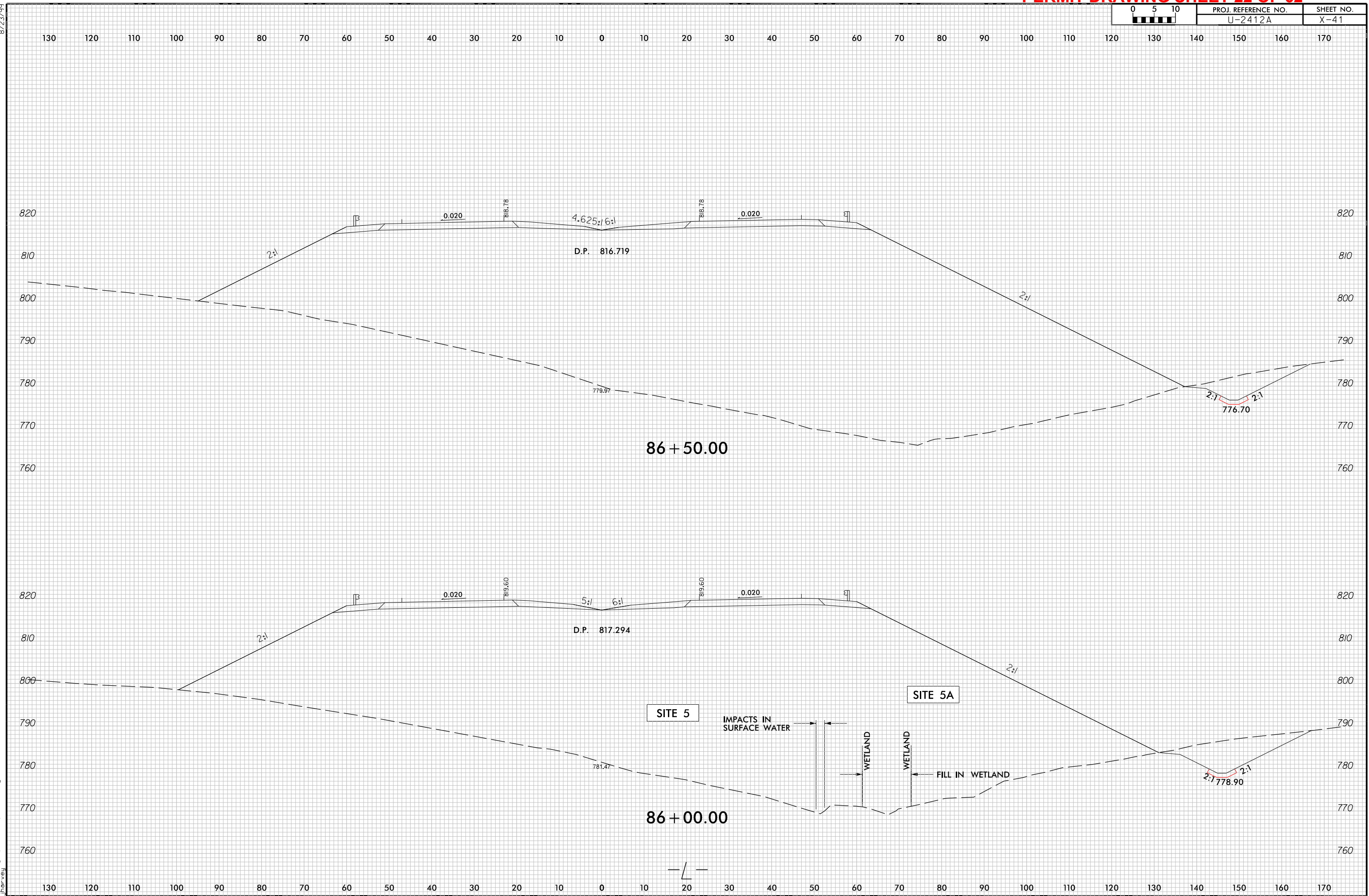
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

★ PROP. TRAFFIC SIGNAL
-L- PFL SEE SHEET 27
-Y5- PFL SEE SHEET 36
-Y5A- PFL SEE SHEET 37

8/17/99
2/23/2018
U-2412A.dwg
d:\prj\wet\psh_09a.con.dgn
10/2/2018

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	9b
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
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8/17/99

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 905 JONES FRANKLIN ROAD
 RALEIGH, NORTH CAROLINA 27606
 TEL (919) 859-2243
 ENG FIRM LICENSE NO. C-490

SITE 6

~~STRUCTURE
PAY ITEM~~

DRAWDOWN STRUCTURE
W/TRASH RACK
SEE DETAILS 26 & 27
SEE SHEETS 2D-2 & 2D-3

CLASS 'B'
RIP RAP
EST 5 TONS
EST 16 SY GEO

CLASS 'B'
RIP RAP
EST 3 TONS
EST 11 SY GEO

INV. 719.43 CALCULATED FROM UPSTREAM
DIRECT MEASUREMENT DEPTH 3
TOP OF SLOPE 728.0
INV. OUT 724.0

CLASS 'B' RIP RAP
EST 5 TONS
EST 15 SYNGEO

80° 03' 37.0" E

772 773 774
770

SEWER EASEMENT

Topographic map showing contour lines and elevation markers. The map includes labels for '20° SANTAR' and elevation points: 778, 779, 770, and 760.

75
NANCY T. GUITON

50' 25' 0

30 25 0
SCALE:

BRIDGE

-L- PFL SEE SHEET 27 &
FOR STRUCTURES SEE SHEET 28

-L- PFL SEE SHEET 27 & 28
FOR STRUCTURES SEE SHEET S-1 THRU S-?



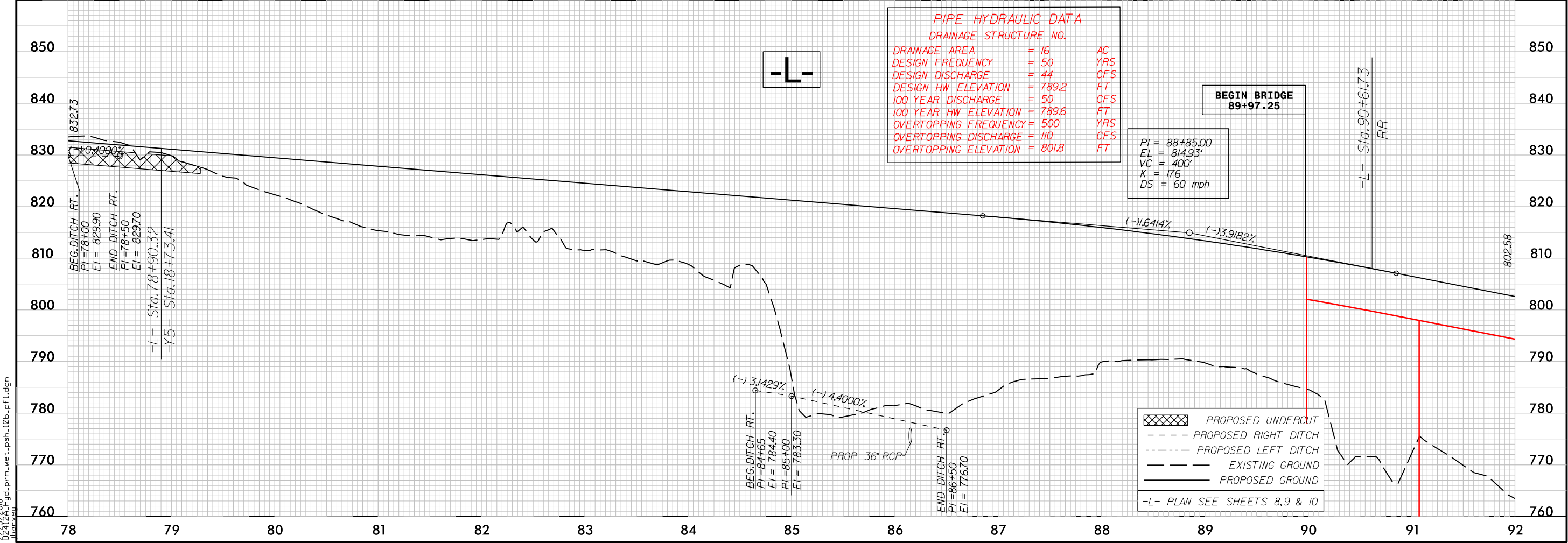
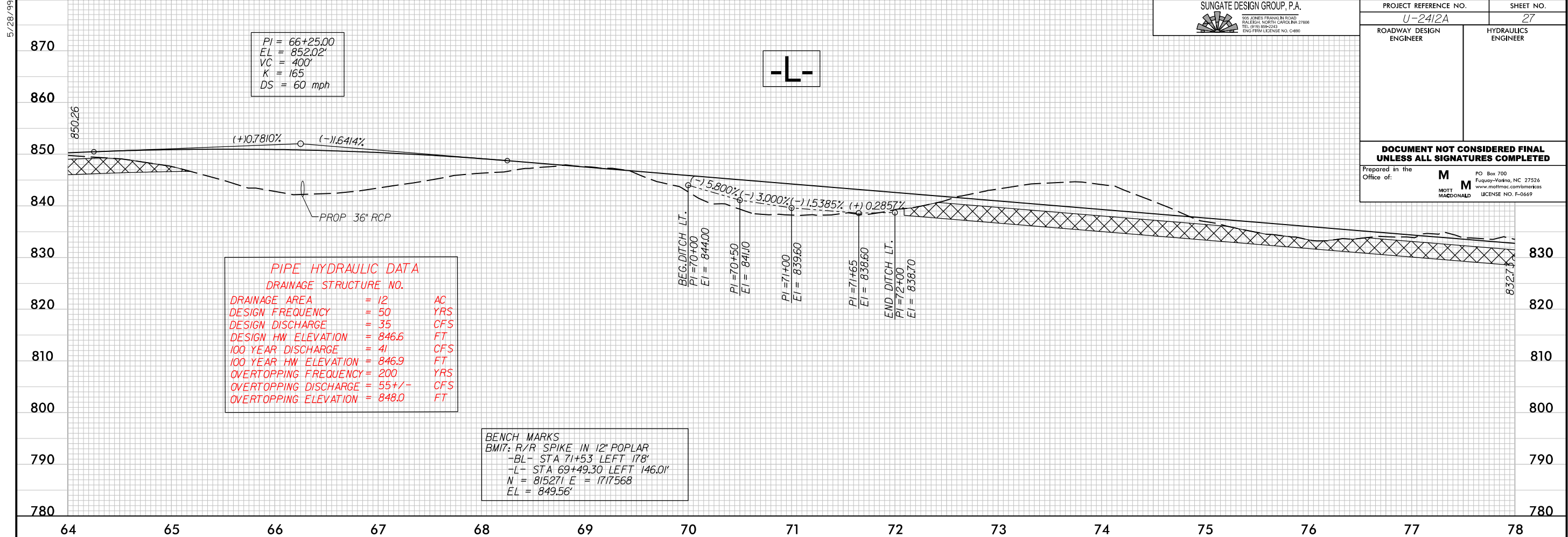
PROJECT REFERENCE NO. U-2412A SHEET NO. 27

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL
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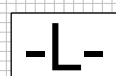
DESIGN DISCHARGE	= 2000	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 73.96	FT
BASE DISCHARGE	= 2200	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 73.9	FT
OVERTOPPING DISCHARGE	= 3500+	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 76.3+/-	FT
	=	FT
DATE OF SURVEY	= 8-10-06	
W.S.ELEVATION		
AT DATE OF SURVEY	= 72.94	FT

DRAINAGE AREA	= 4.6	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 13	CFS
DESIGN HW ELEVATION	= 749.9	FT
100 YEAR DISCHARGE	= 14	CFS
100 YEAR HW ELEVATION	= 750.0	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 23+	CFS
OVERTOPPING ELEVATION	= 768.0	FT

BENCH MARKS
BM18: R/R SPIKE IN 20" POPLAR
-BL- STA 92+28 RIGHT 279'
-L- STA 90+00.01 RIGHT 253.85'
N = 814388 E = 1719513
EL = 764.62'

BM7: R/R SPIKE IN 20" POPLAR
-BL- STA 97+14 RIGHT 290'
-L- STA 95+03.58 RIGHT 295.90'
N = 814309 E = 1720047
EL = 735.78'

DRAINAGE AREA	= 12	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 35	CFS
DESIGN HW ELEVATION	= 740.8	FT
100 YEAR DISCHARGE	= 41	CFS
100 YEAR HW ELEVATION	= 741.2	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 70+	CFS
OVERTOPPING ELEVATION	= 769.3	FT



BENCH MARKS
BM8: R/R SPIKE IN 18" HICKORY
-BL- STA 108+38 RIGHT 213'
-L- STA 106+28.38 RIGHT 224.83'
N = 814526 E = 1721178
EL = 776.23'

$PI = 112 + 40.00$
 $EL = 792.20'$
 $VC = 800'$
 $K = 157$
 $DS = 60 \text{ mph}$

BEG. DITCH LT.
PI = 115+50

$$PI = 116 + 50$$
$$P1 = 118 + 00$$
$$P1 = 118 + 50$$

END DITCH LT.
PI - 110+50

 PROPOSED UNDERCUT
 - - - - PROPOSED RIGHT DITCH
 - - - - - PROPOSED LEFT DITCH
 _ _ _ _ _ EXISTING GROUND
 _ _ _ _ _ PROPOSED GROUND

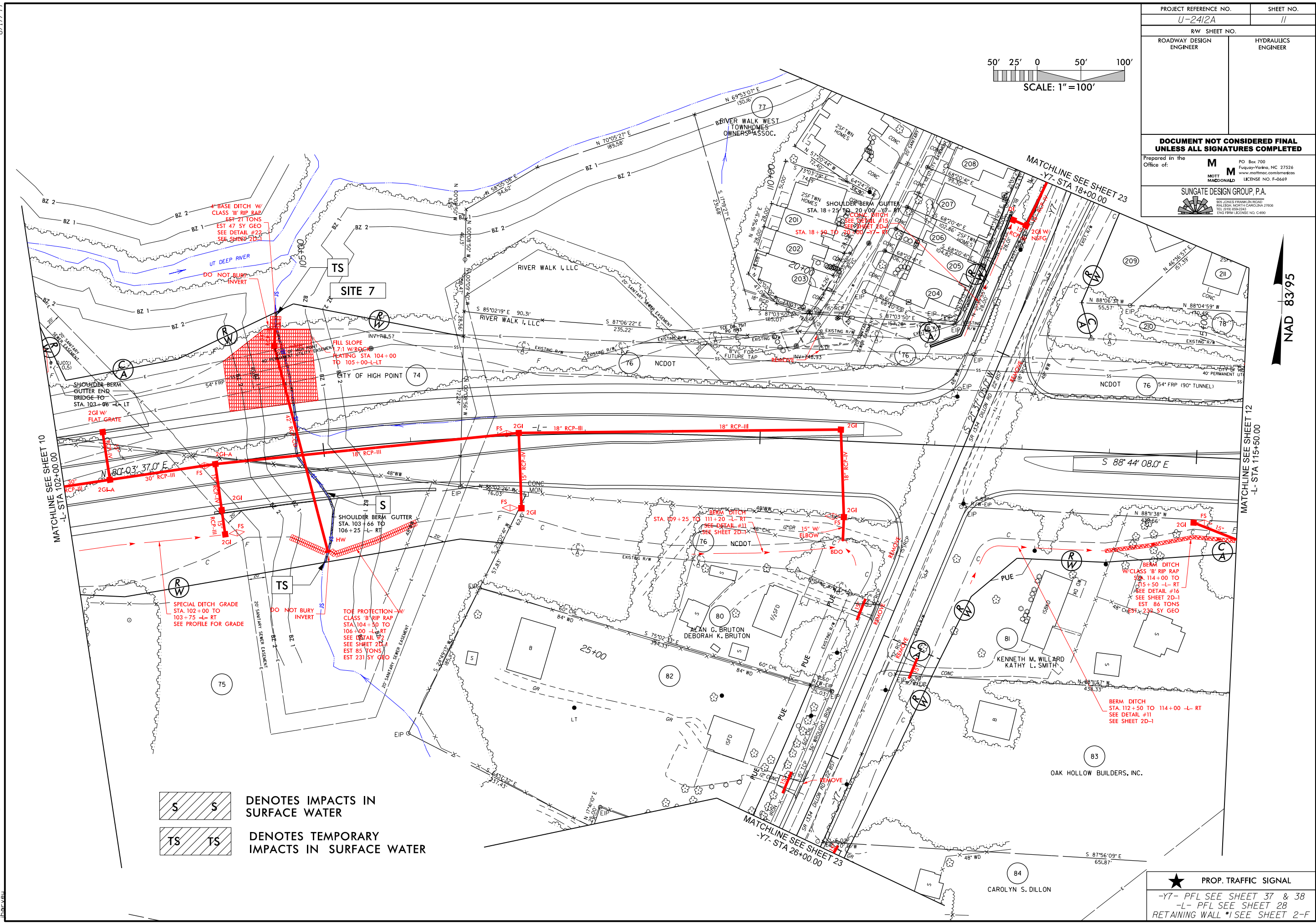
-L- PLAN SEE SHEETS 10,11 & 12

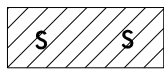
PERMIT DRAWING SHEET 27 OF 62

PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		11	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
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NAD 83/95



 DENOTES IMPACTS IN SURFACE WATER

 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

★ PROP. TRAFFIC SIGNAL

-Y7- PFL SEE SHEET 37 & 38

-L- PFL SEE SHEET 28

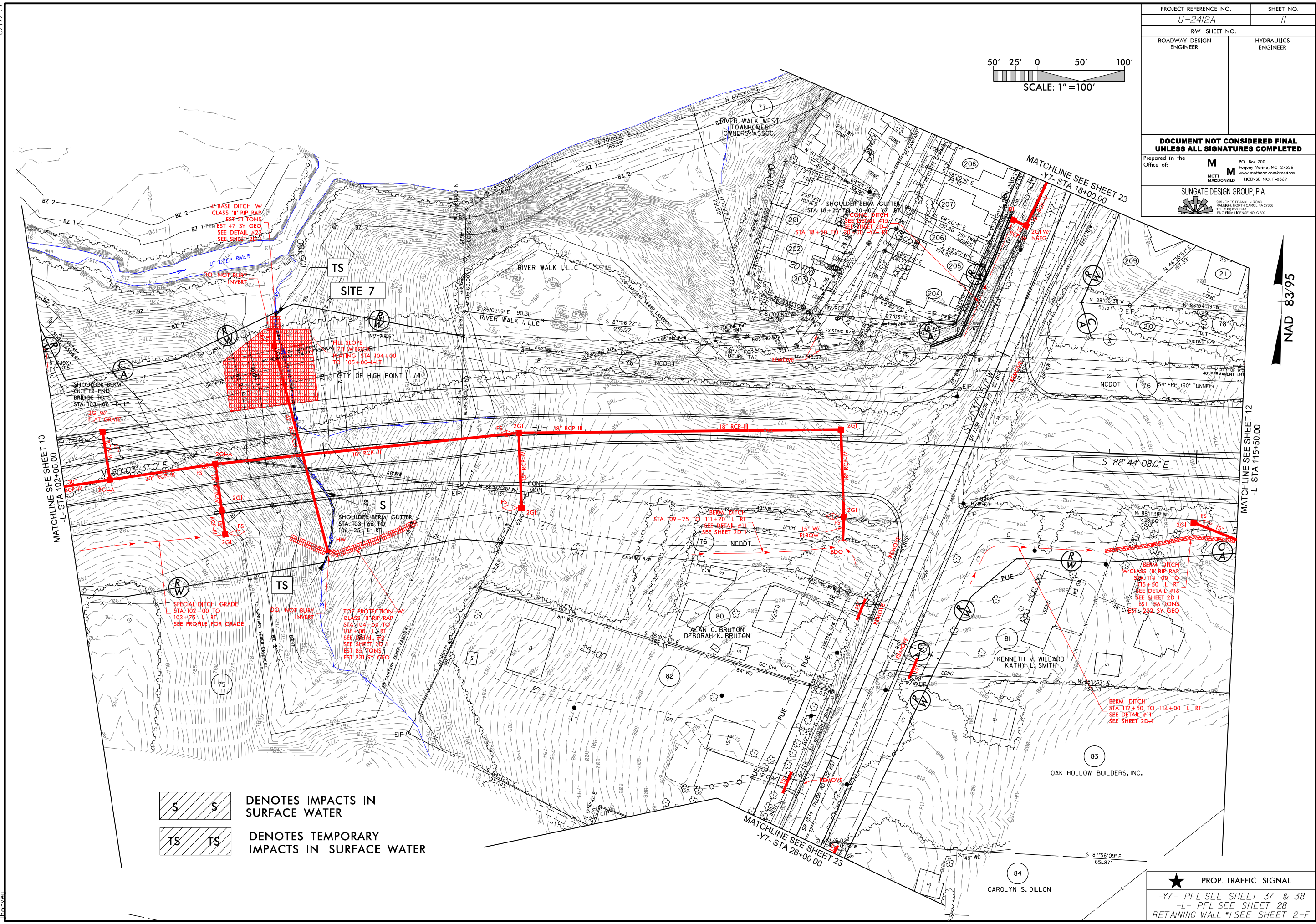
RETAINING WALL #1 SEE SHEET 2-F

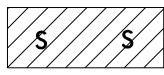
8/17/99

2/23/2018

U-2412A.dwg, d, pr, m, wet, psh, 11.dgn

PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		11	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
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SUNGATE DESIGN GROUP, P.A.			
		905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL (919) 865-2445 ENG FRM LICENSE NO. C-4890	



 DENOTES IMPACTS IN SURFACE WATER

 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

★ PROP. TRAFFIC SIGNAL

-Y7- PFL SEE SHEET 37 & 38

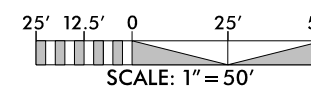
-L- PFL SEE SHEET 28

RETAINING WALL #1 SEE SHEET 2-F

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	11b
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



MATCHLINE SEE SHEET 10
-L- STA 102+00.00

4' BASE DITCH W/
CLASS 'II' RIP RAP
EST 21 TONS
EST 47 SY GEO
SEE DETAIL #22
SEE SHEET 2D-1

TEMPORARY IMPACTS
IN SURFACE WATER

SITE 7

FILL SLOPE
1.7:1 W/ROCK
PLATING STA 104+00
TO 105+00-L-LT

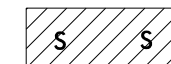
IMPACTS IN
SURFACE WATER

TEMPORARY IMPACTS
IN SURFACE WATER

SPECIAL DITCH GRADE
STA. 102+00 TO
103+75 -L- RT
SEE PROFILE FOR GRADE

DO NOT BURY
INVERT

TOE PROTECTION W/
CLASS 'B' RIP RAP
STA. 104+50 TO
106+00 -L- RT
SEE DETAIL #2
SEE SHEET 2D-1
EST 85 TONS
EST 231 SY GEO



DENOTES IMPACTS IN
SURFACE WATER

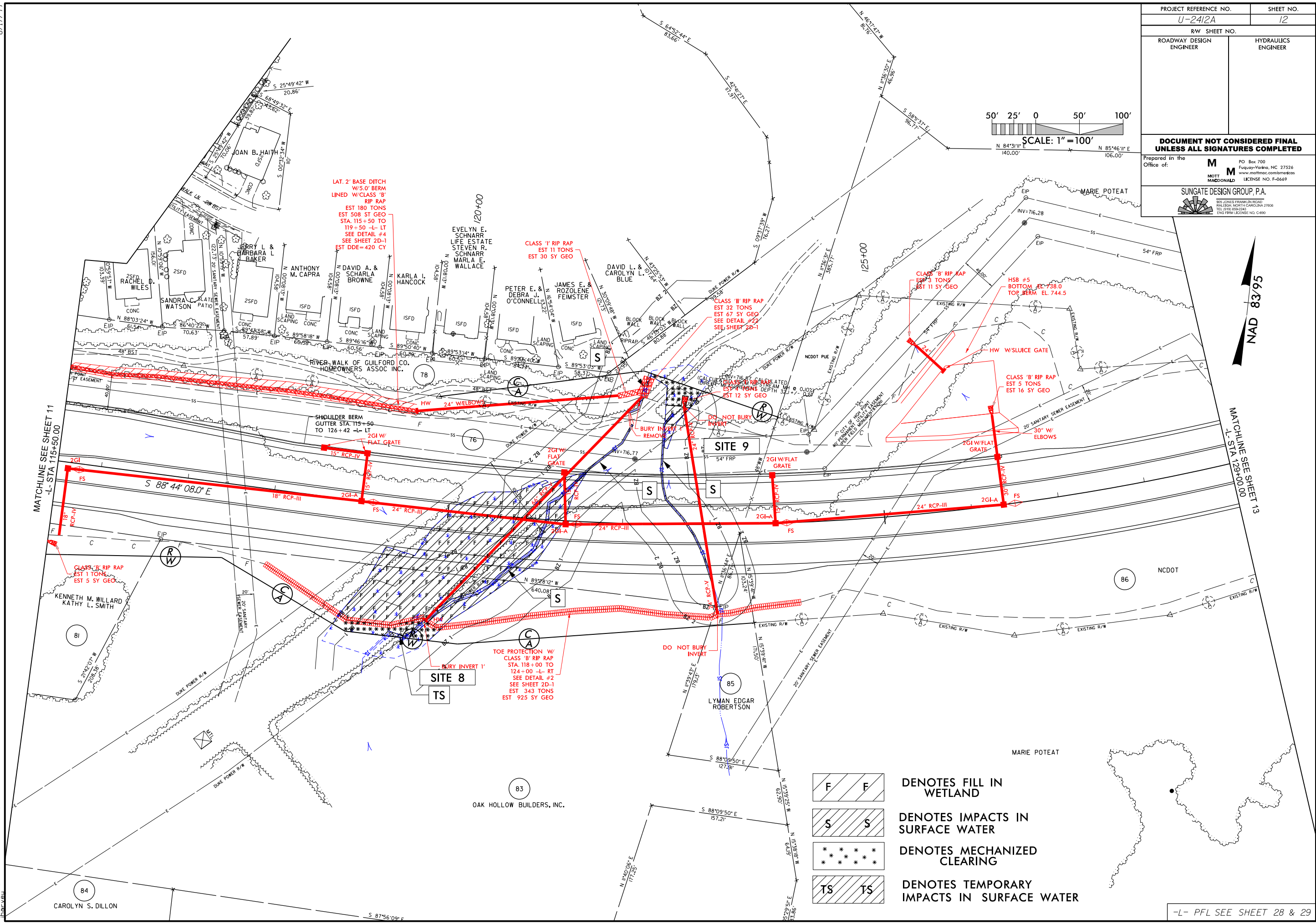
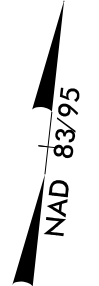
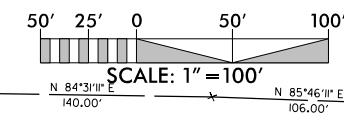


DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

8/17/99

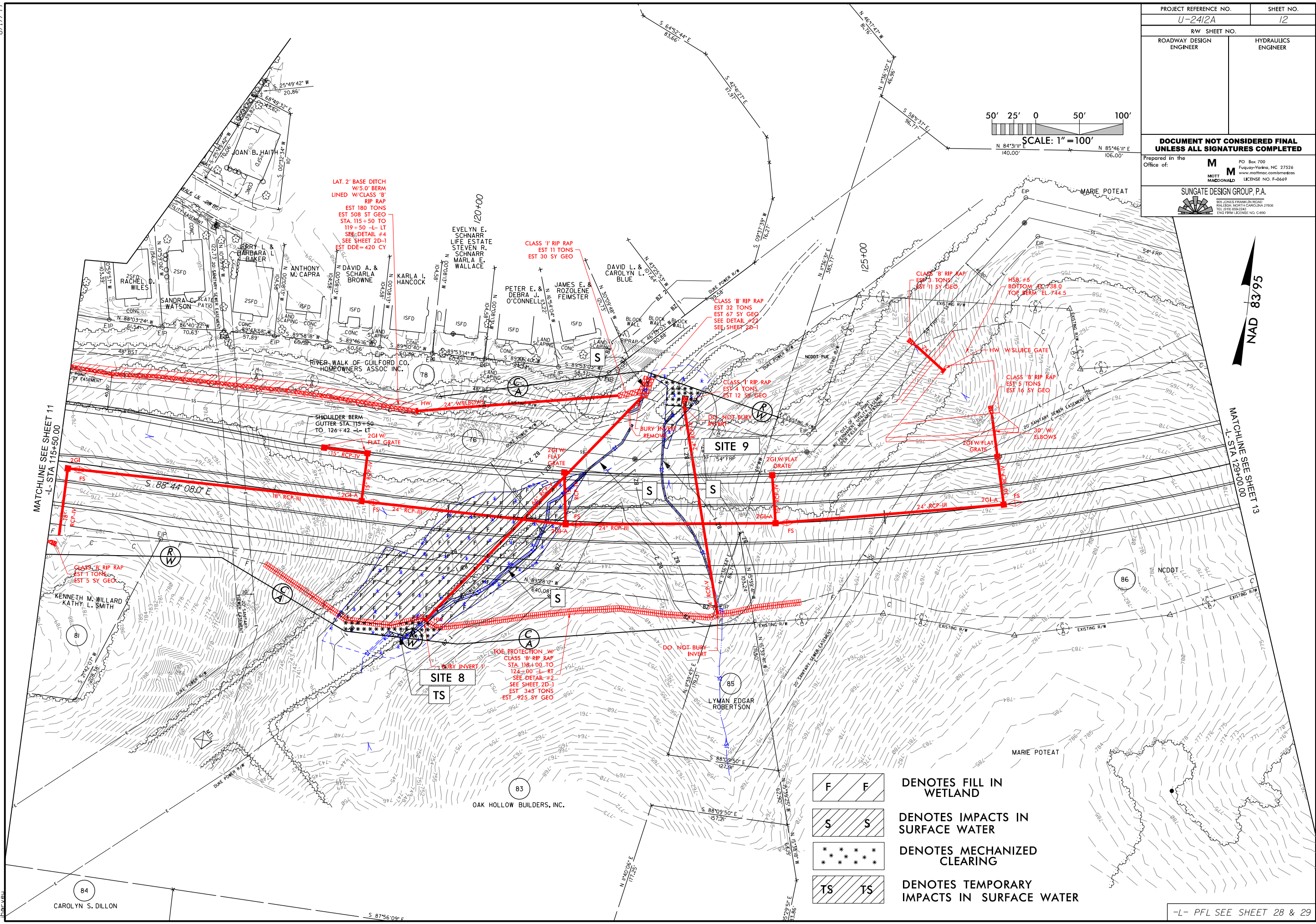
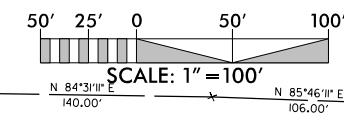
2/23/2018
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11b.dgn

PROJECT REFERENCE NO. U-2412A		SHEET NO. 12
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
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- DENOTES FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO. U-2412A		SHEET NO. 12
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
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PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/nc LICENSE NO. F-0669		
SUNGATE DESIGN GROUP, P.A. 905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL: (919) 883-8242 ENG FRM LICENSE NO. C-4900		

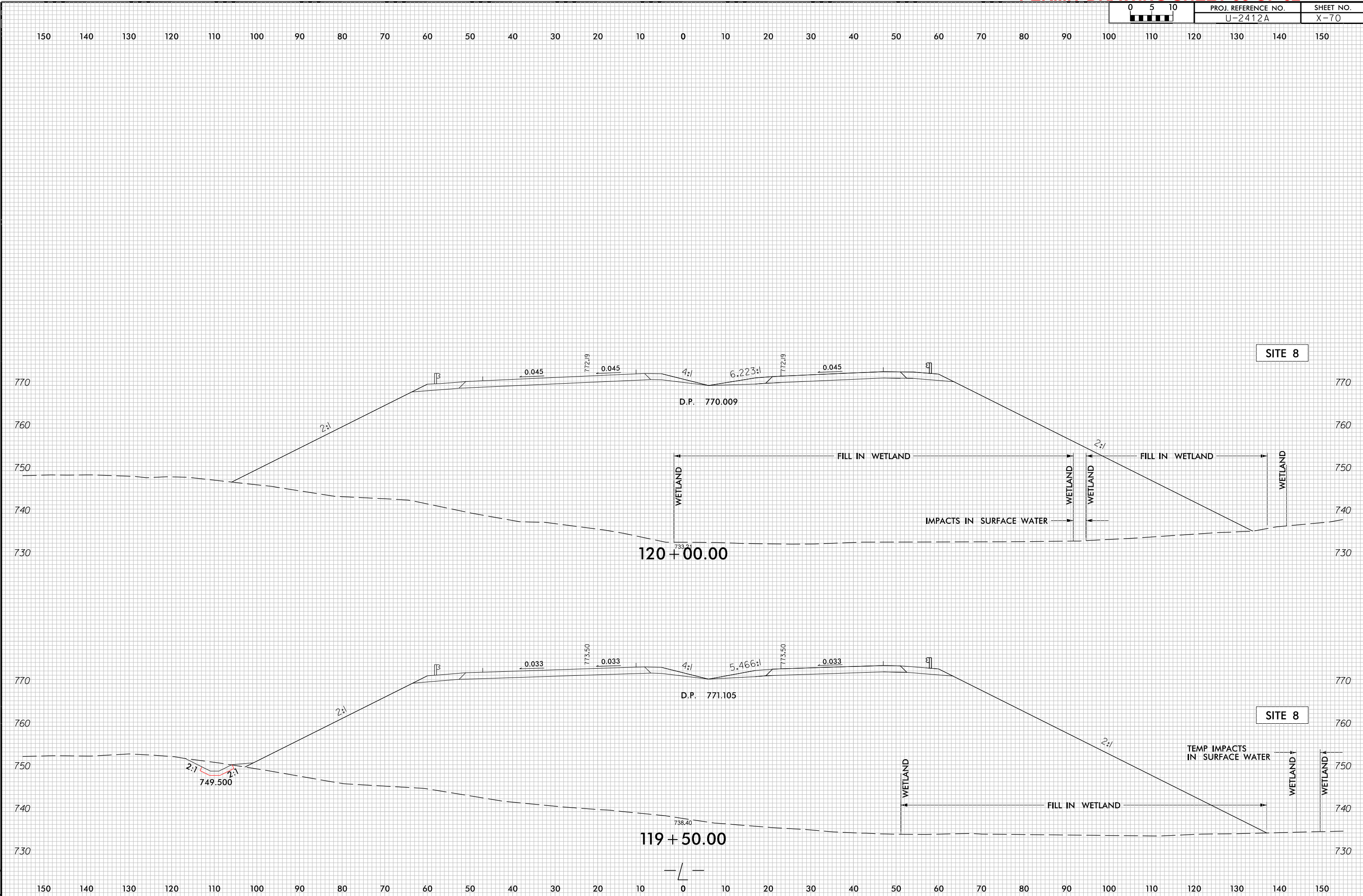


- DENOTES FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

8/23/99



PROJ. REFERENCE NO.	SHEET NO.
U-2412A	X-70



2/23/2018
U2412A_Hyd_prm_wet.psh_12.dgn
Harvey

5/14/99

PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		12c	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

3002001000600100200

CL STA 120+87 -L-
66" RCP

770

760

750

740

730

720

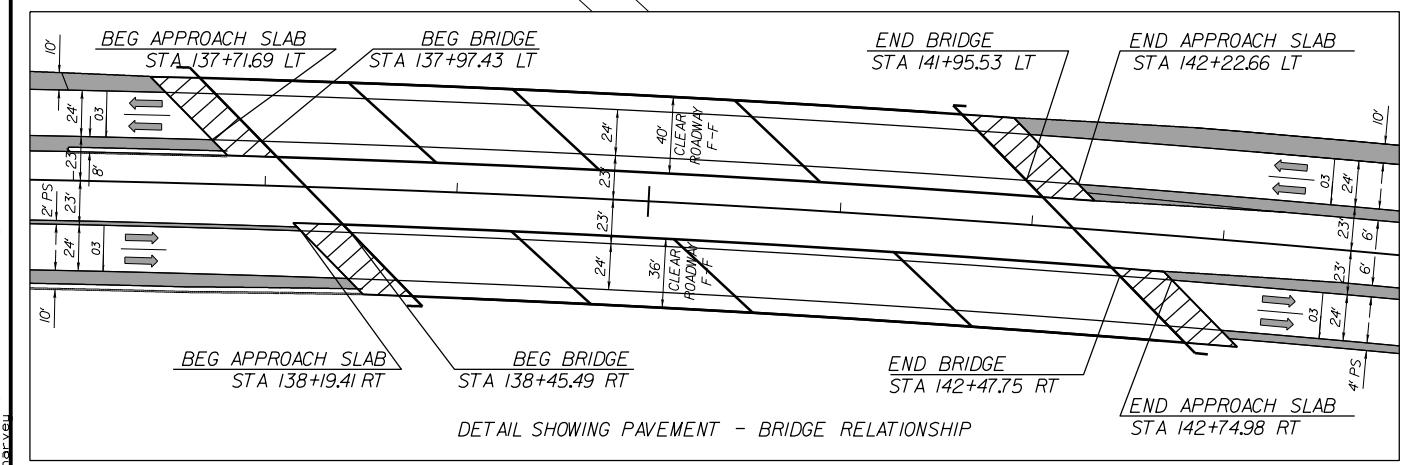
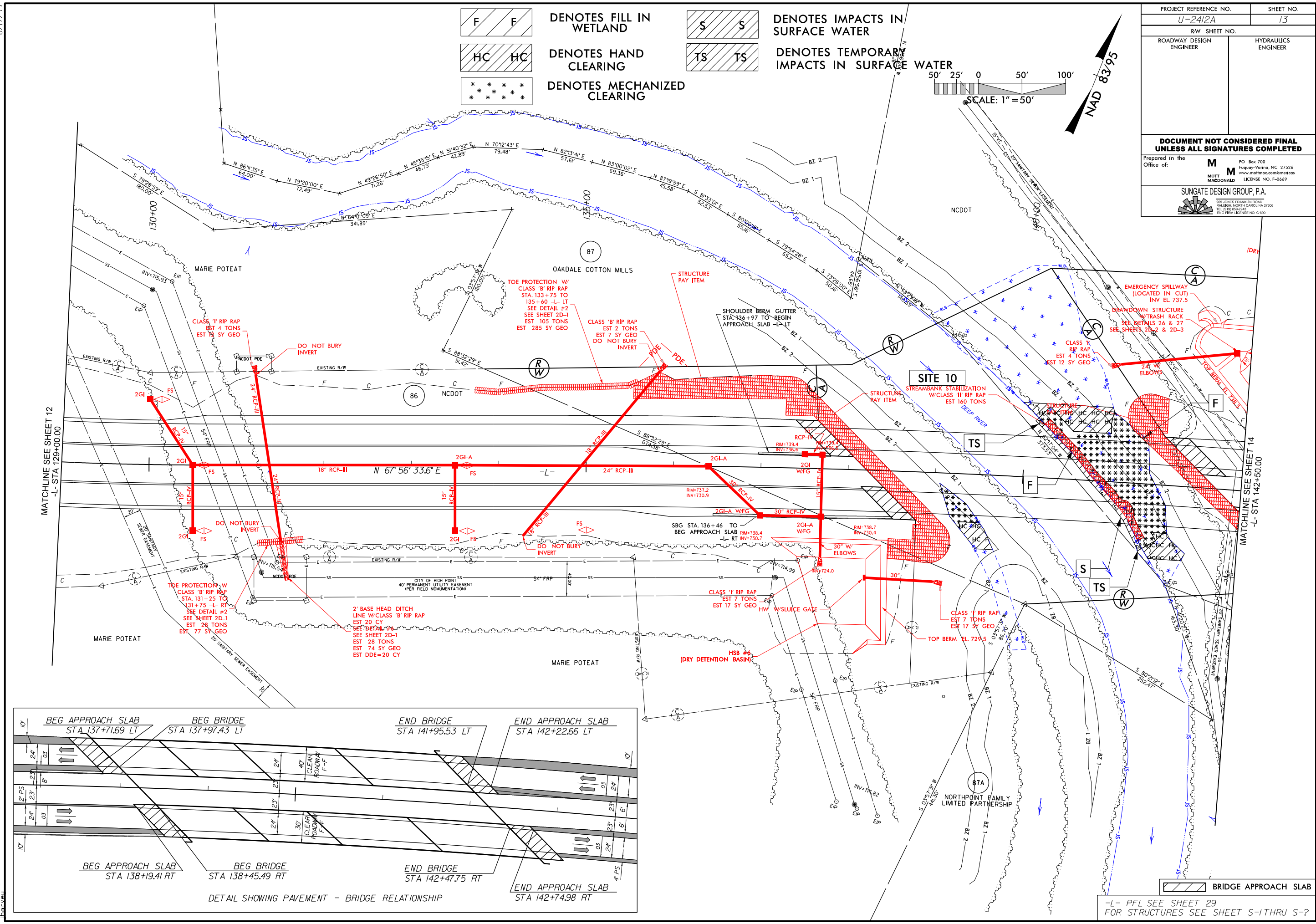
INV OUT
= 723.0

66" RCP
SLOPE = 3.34%

INV IN
= 734.9

2/27/2018
U-2412A.dwg
psh-12d-sec.dgn
jbo:van

PROJECT REFERENCE NO. U-2412A		SHEET NO. 13	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared in the Office of:		MOTT MACDONALD	
		PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/mottmac LICENSE NO. F-0669	
SUNGATE DESIGN GROUP, P.A.			
905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27605 TEL: (919) 602-2441 ENG. FIRM LICENSE NO. C-4890			

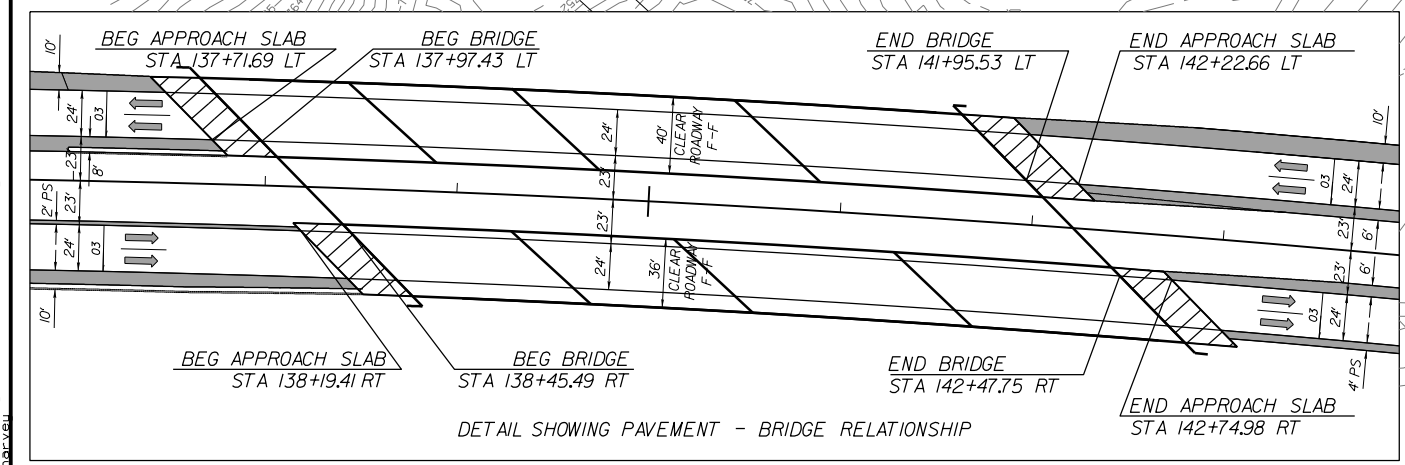
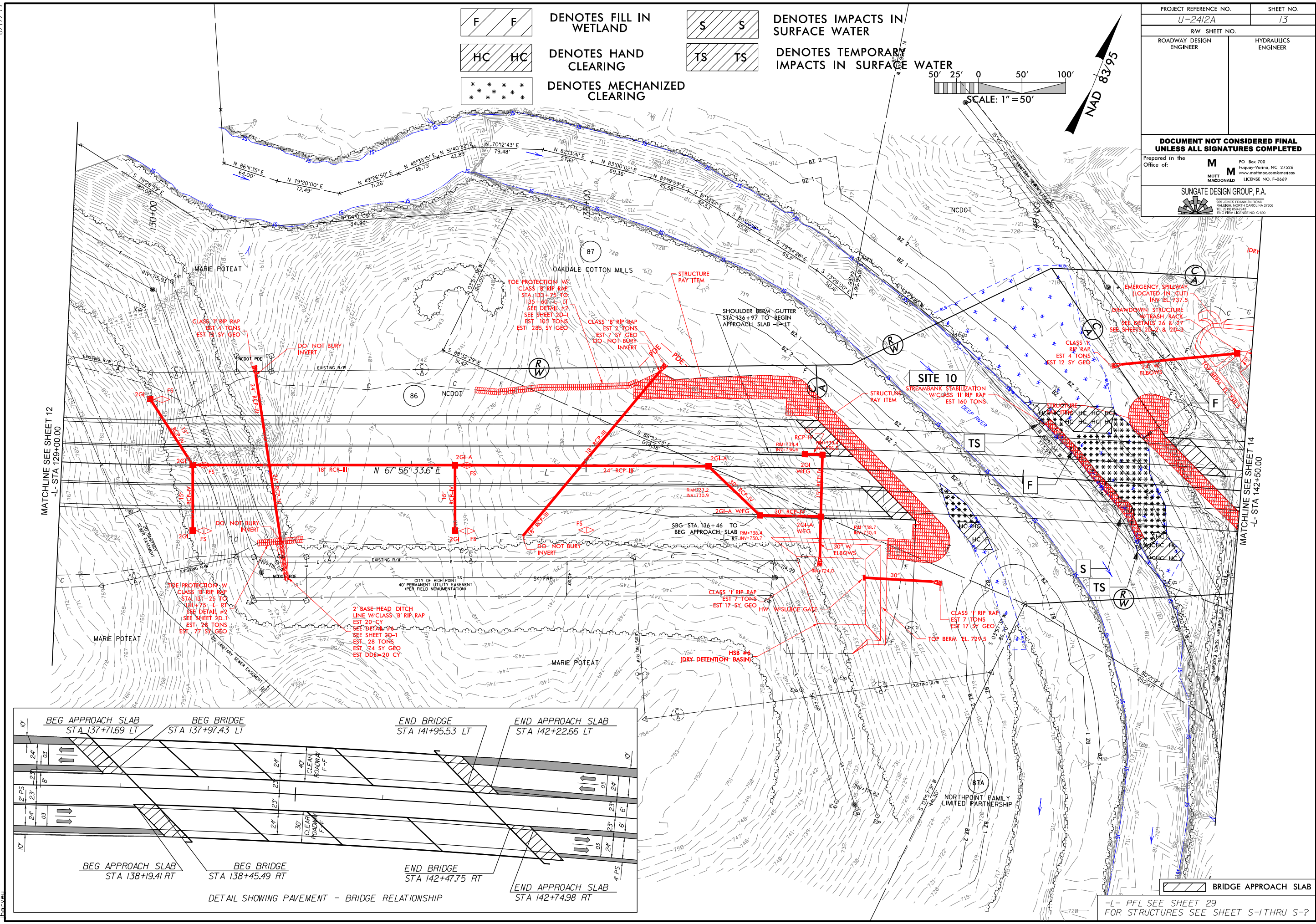


BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 29
FOR STRUCTURES SEE SHEET S-1 THRU S-?

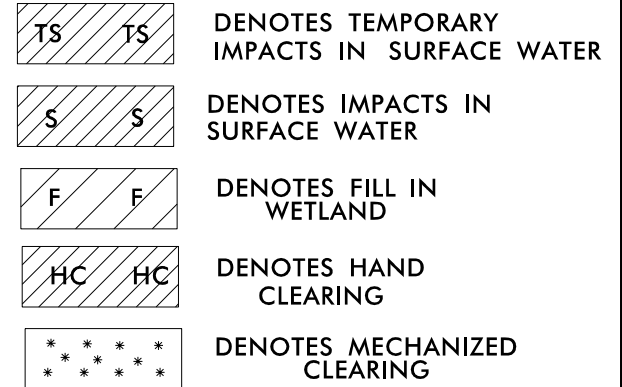
2/23/2018
U-2412A.dwg
psh-13.dgn

PROJECT REFERENCE NO. U-2412A		SHEET NO. 13	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared in the Office of:		MOTT MACDONALD	
		PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/mottmac LICENSE NO. F-0669	
SUNGATE DESIGN GROUP, P.A.			
905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL: (919) 600-2444 ENG. FIRM LICENSE NO. C-490			



8/17/99
2/23/2018
U:\2412A\hyd.prj\wet.psh_13a.con.dgn

Diagram illustrating the cross-section of a roadbed. The total width of the roadbed at its base is 50 feet, divided into two 25-foot sections. The left section shows a 25-foot embankment with vertical hatching, and the right section shows a 25-foot embankment with diagonal hatching. A scale bar below indicates 1 inch = 50 feet.





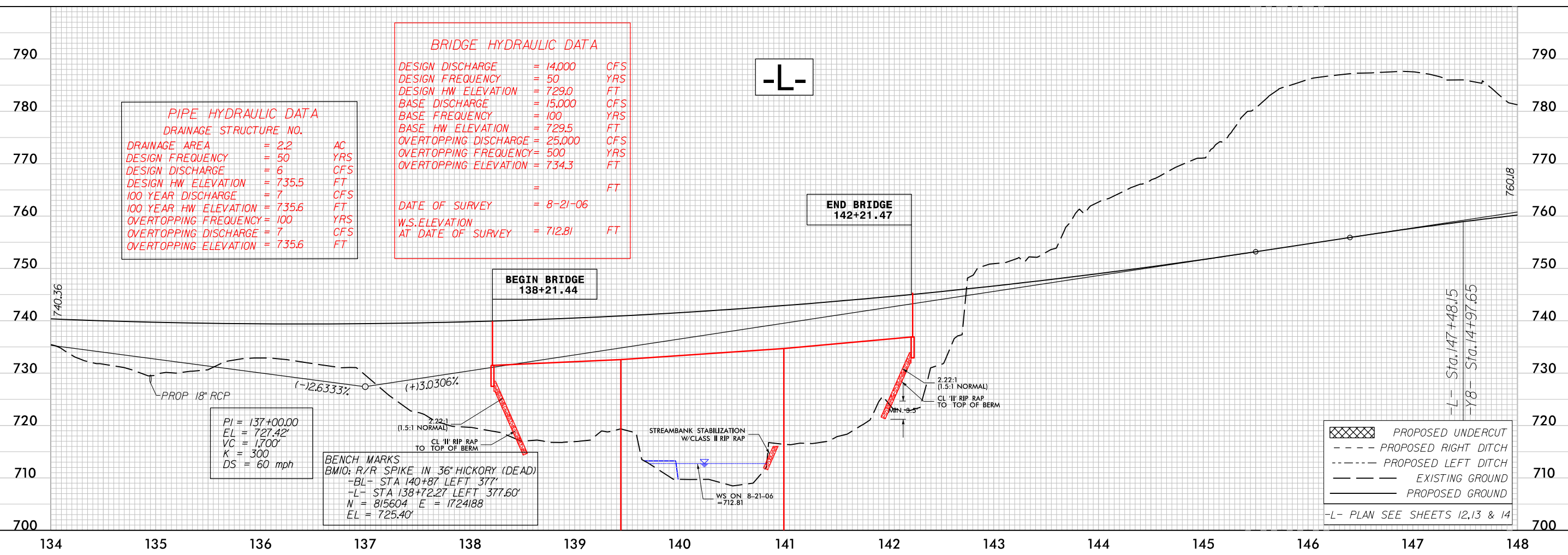
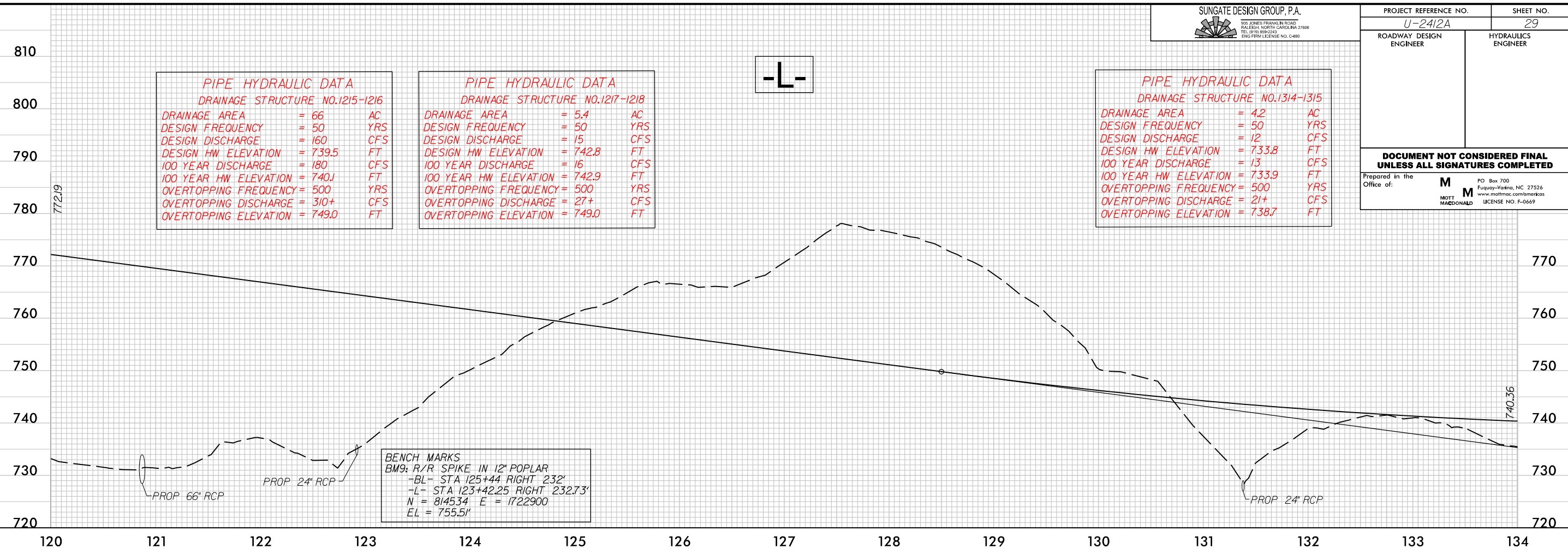
PROJECT REFERENCE NO. **U-2412A** SHEET NO. **29**

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

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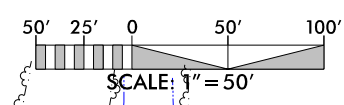
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2412A	X-85

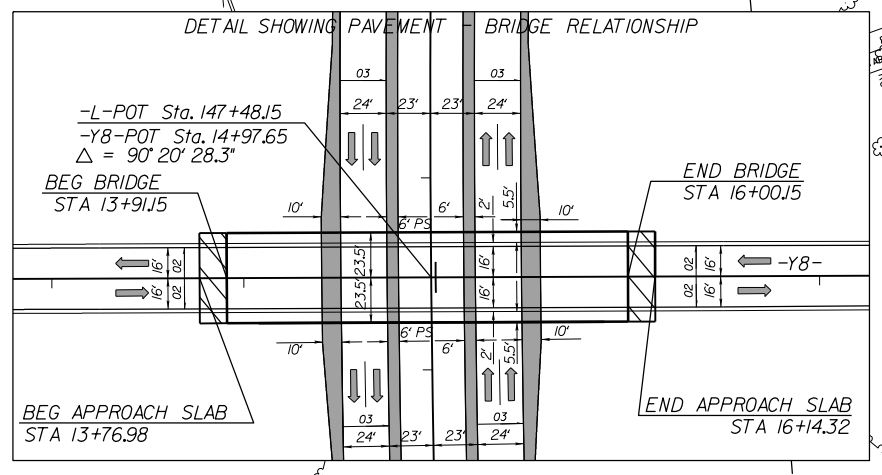
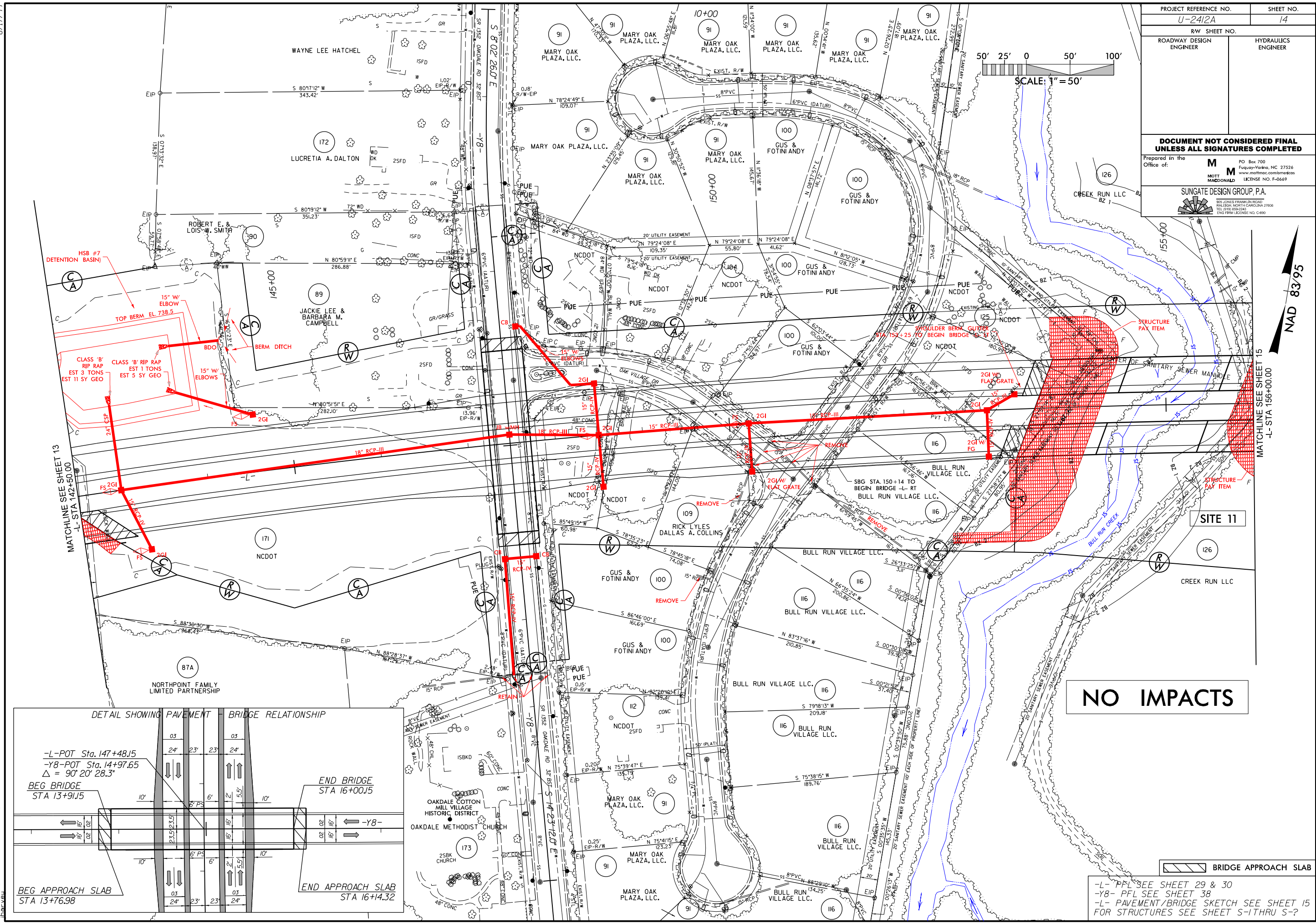


2/23/2018
U2412A_Hyd_prm_wet.psh_13d.dgn
Harvey

PROJECT REFERENCE NO. U-2412A		SHEET NO. 14
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
Prepared in the Office of:		M PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/mottmac TEL (919) 650-2444 FAX (919) 650-2444 ENG FRM LICENSE NO. C-4690
MOTT MACDONALD		
SUNGATE DESIGN GROUP, P.A.		
84  80-1 JONES FARMBLVD ROAD RALEIGH, NORTH CAROLINA 27605 ENG FRM LICENSE NO. C-4690		



NAD 83/95



BRIDGE APPROACH SLAB

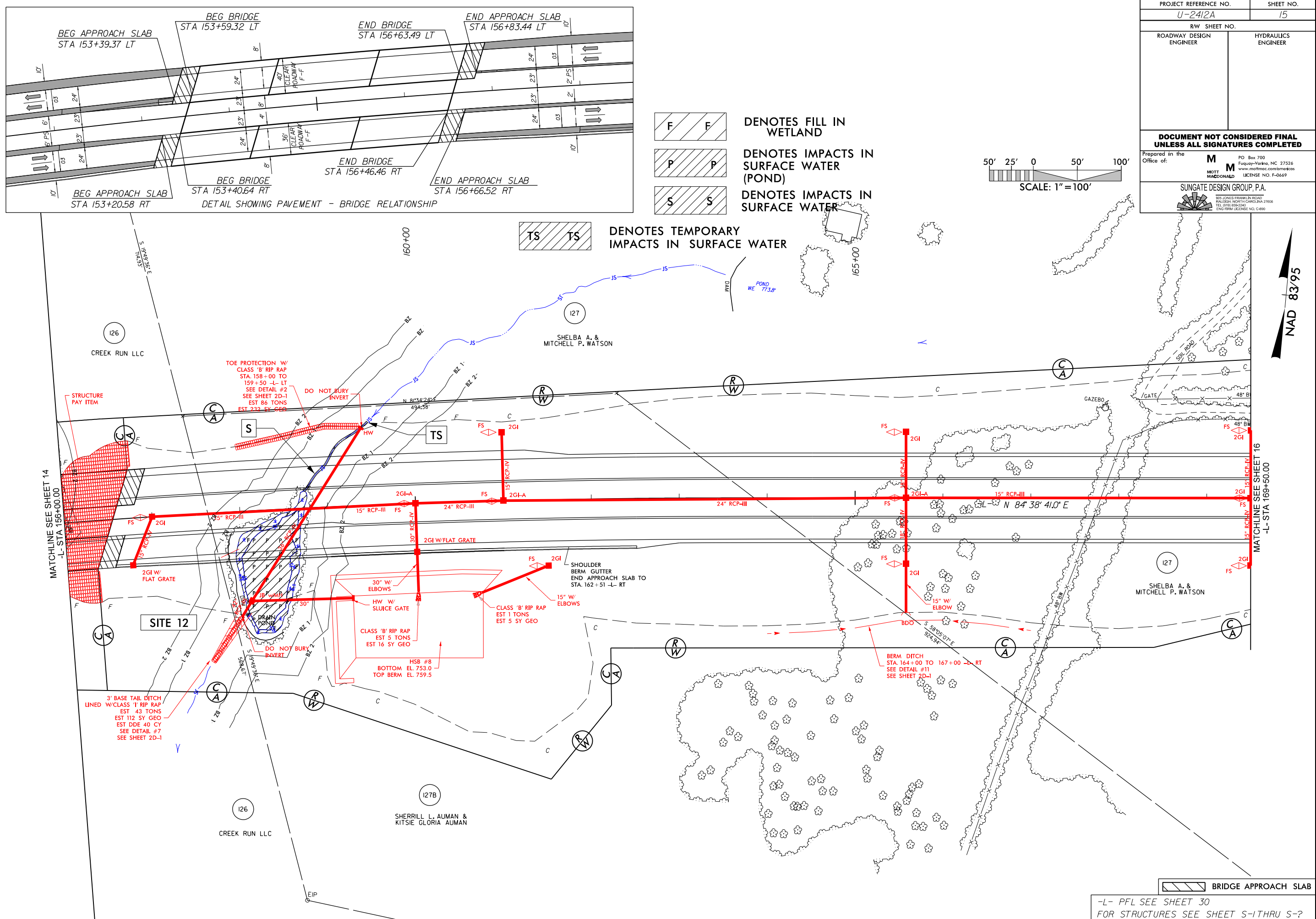
-L- PFL SEE SHEET 29 & 30
-Y8- PFL SEE SHEET 38
-L- PAVEMENT BRIDGE SKETCH SEE SHEET 15
FOR STRUCTURES SEE SHEET S-1 THRU S-7

MATCHLINE SEE SHEET 15
-I - STA 156+00.00

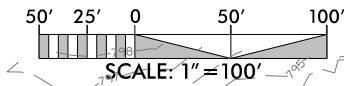
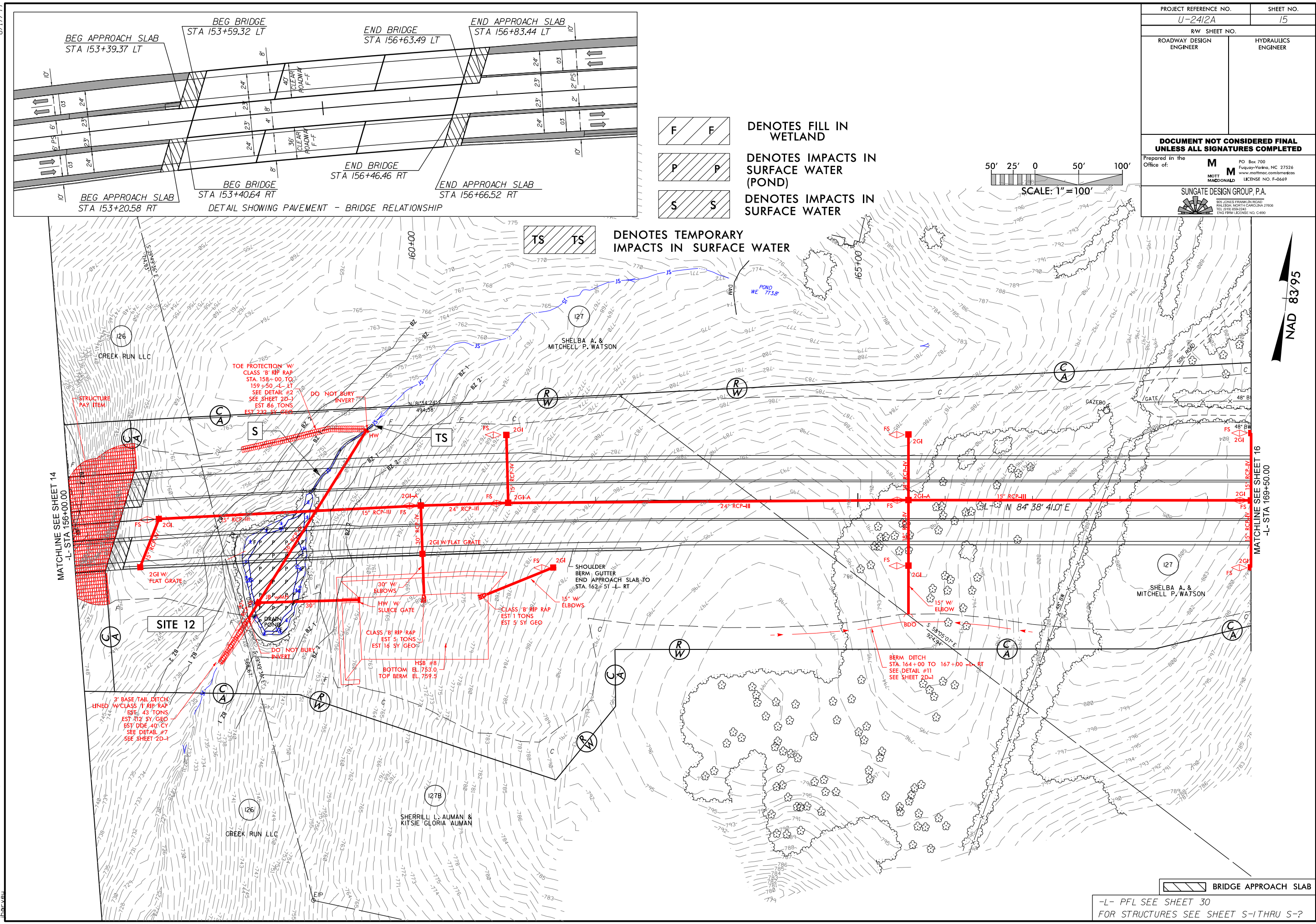
 BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 29 & 30
-Y8- PFL SEE SHEET 38
-L- PAVEMENT/BRIDGE SKETCH SEE SHEET 15
FOR STRUCTURES SEE SHEET S-1 THRU S-?

-L- PFL SEE SHEET 30
FOR STRUCTURES SEE SHEET S-1 THRU S-?



PROJECT REFERENCE NO.		SHEET NO.
U-2412A		15
RW SHEET NO.		
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
Prepared in the Office of:		M
		PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/mottmac MOTT MACDONALD LICENSE NO. F-0669
SUNGATE DESIGN GROUP, P.A.		
		
905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL: (919) 832-2441 ENG FIRM LICENSE NO. C-4890		



NAD 83/95

BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 30
FOR STRUCTURES SEE SHEET S-1 THRU S-?

8/17/99
2/23/2018
U-2412A.dwg
d:\p\m\wet\psh_15a.con.dgn

126

CREEK RUN LLC

TOE PROTECTION W/
CLASS 'B' RIP RAP
STA. 158+00 TO
159+50 -L- LT
SEE DETAIL #2
SEE SHEET 2D-1
EST 86 TONS
EST 232 SY GEO

TEMPORARY IMPACTS IN SURFACE WATER

SITE 12

3' BASE TAIL DITCH
LINED W/CLASS 'I' RIP RAP
EST 43 TONS
EST 112 SY GEO
EST DDE 40 CY
SEE DETAIL #7
SEE SHEET 2D-1

CLASS 'B' RIP RAP
EST 5 TONS
EST 16 SY GEO

HSB #8
BOTTOM EL. 753.0
TOP BERM EL. 759.5

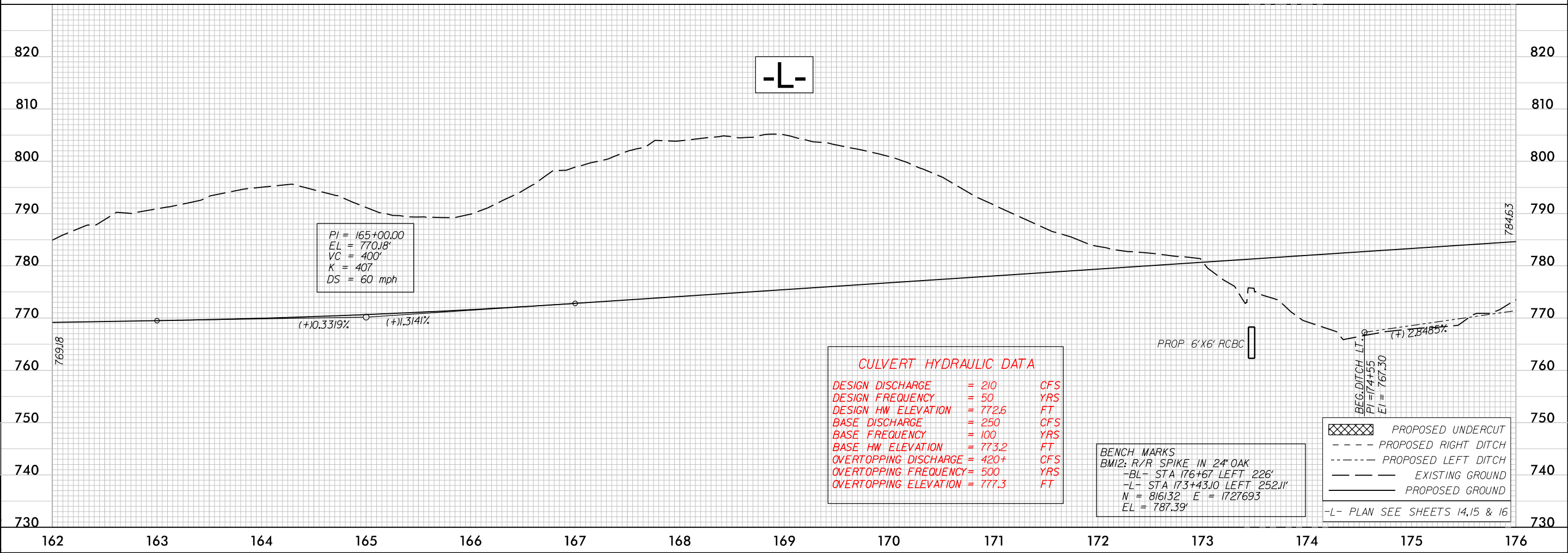
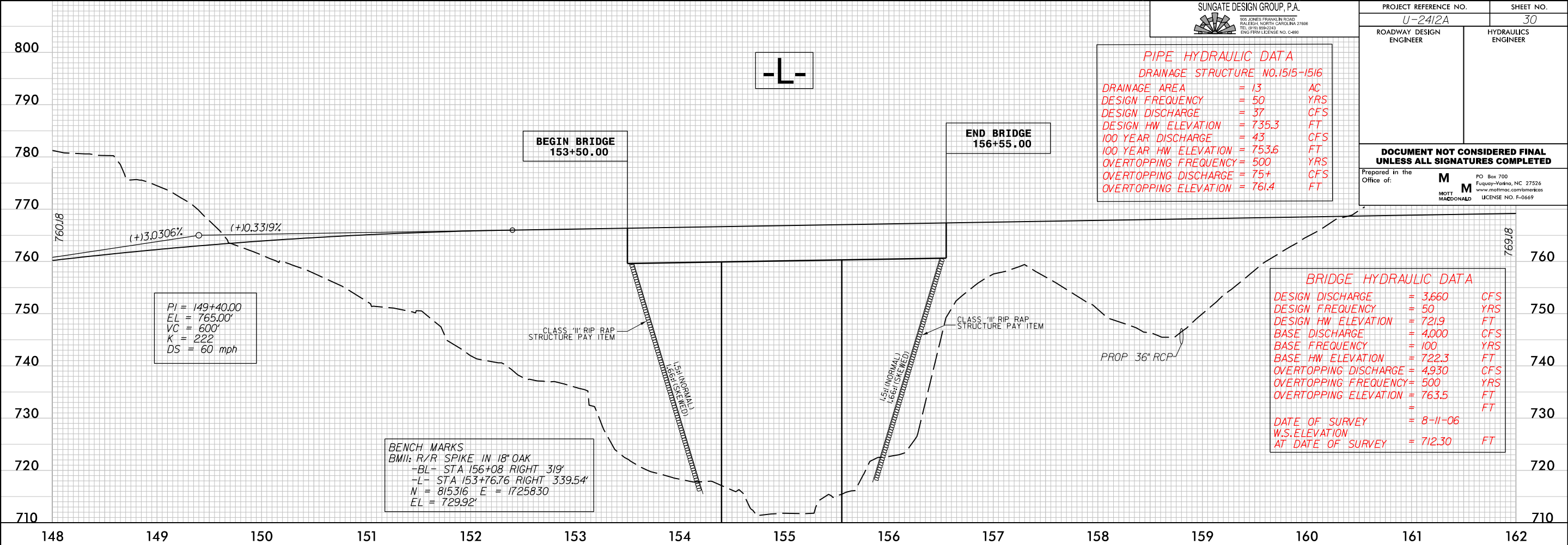
— CLASS 'B' RIP RAP
EST 1 TONS
EST 5 SY GEO

15" W/
ELBOWS

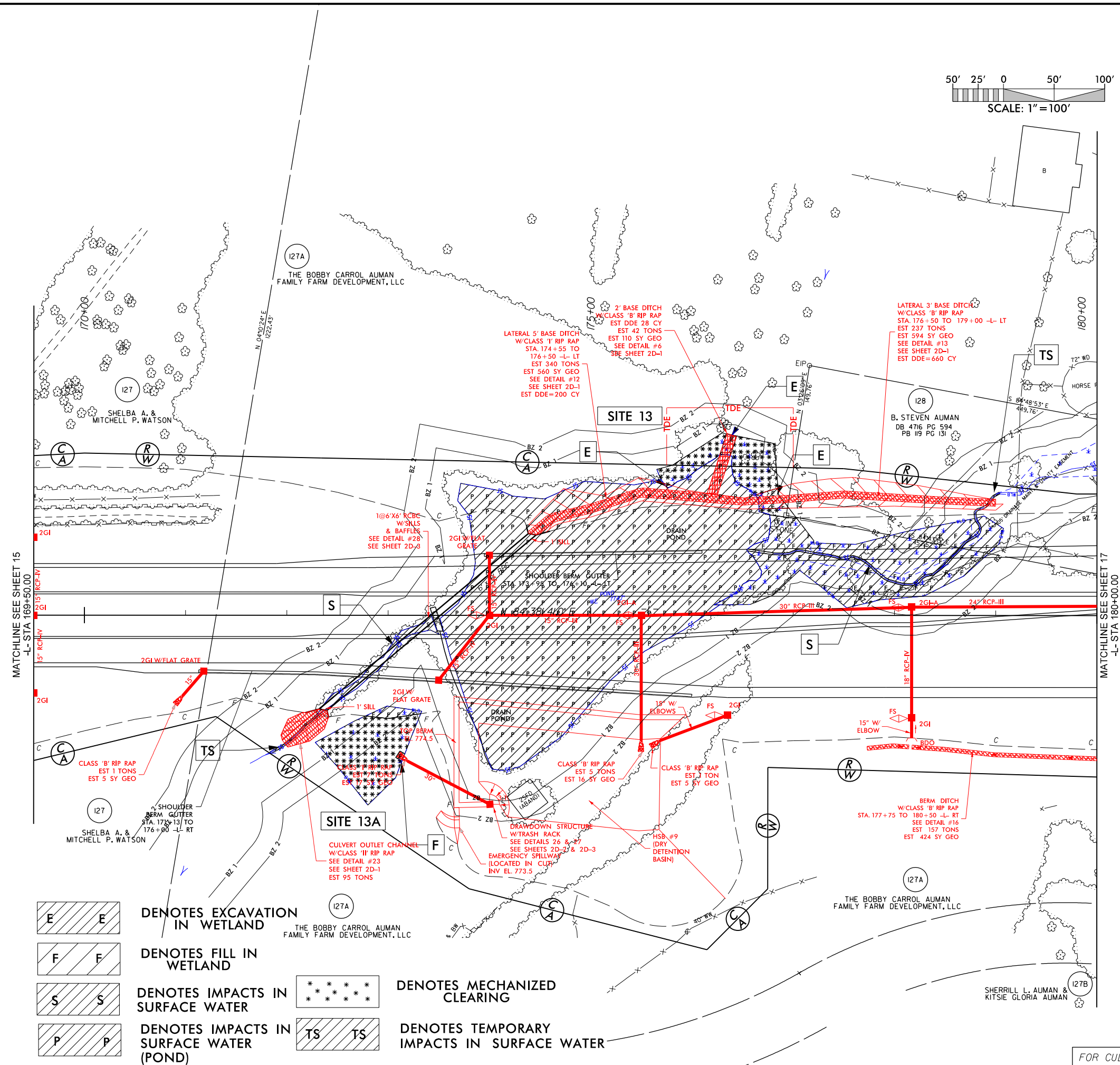
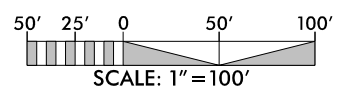


PIPE HYDRAULIC DATA	
DRAINAGE STRUCTURE NO.1515-1516	
DRAINAGE AREA	= 13 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 37 CFS
DESIGN HW ELEVATION	= 735.3 FT
100 YEAR DISCHARGE	= 43 CFS
100 YEAR HW ELEVATION	= 753.6 FT
OVERTOPPING FREQUENCY	= 500 YRS
OVERTOPPING DISCHARGE	= 75+ CFS
OVERTOPPING ELEVATION	= 761.4 FT

PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		30	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
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		PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/america LICENSE NO. F-0669	



PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		16	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared in the Office of:		M PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/america LICENSE NO. F-0669	
		M MOTT MACDONALD	
SUNGATE DESIGN GROUP, P.A.			
		800 JONES FARMBURN ROAD RALEIGH, NORTH CAROLINA 27605 TEL. (919) 459-2241 ENR FIRM LICENSE NO. C-490	



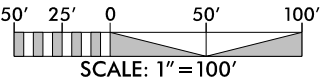
- DENOTES EXCAVATION IN WETLAND
- DENOTES FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER (POND)
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING

-L- PFL SEE SHEET 30 & 31

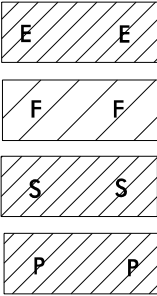
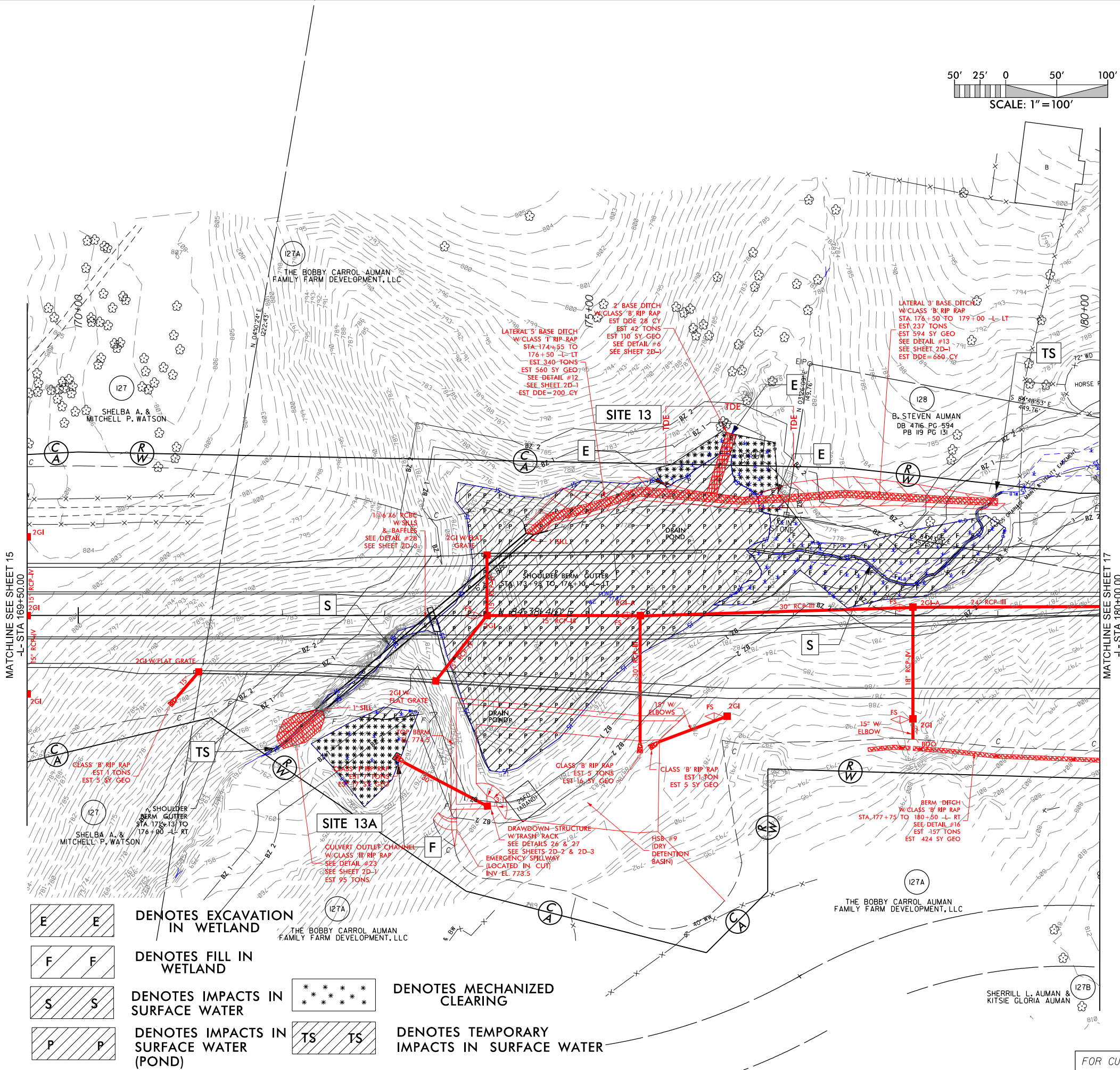
FOR CULVERT PLANS SEE SHEETS C-1 THRU C-?

8/17/99
2/23/2018
U-2412A.dgn
d:\p\m\wet_psh_16.dgn

PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		16	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
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MOTT MACDONALD			
SUNGATE DESIGN GROUP, P.A.			
905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL: (919) 855-2444 ENG. FIRM LICENSE NO. C-490			



NAD 83/95

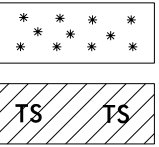


EXCAVATION IN WETLAND

FILL IN WETLAND

IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (POND)



MECHANIZED CLEARING

TEMPORARY IMPACTS IN SURFACE WATER

-L- PFL SEE SHEET 30 & 31

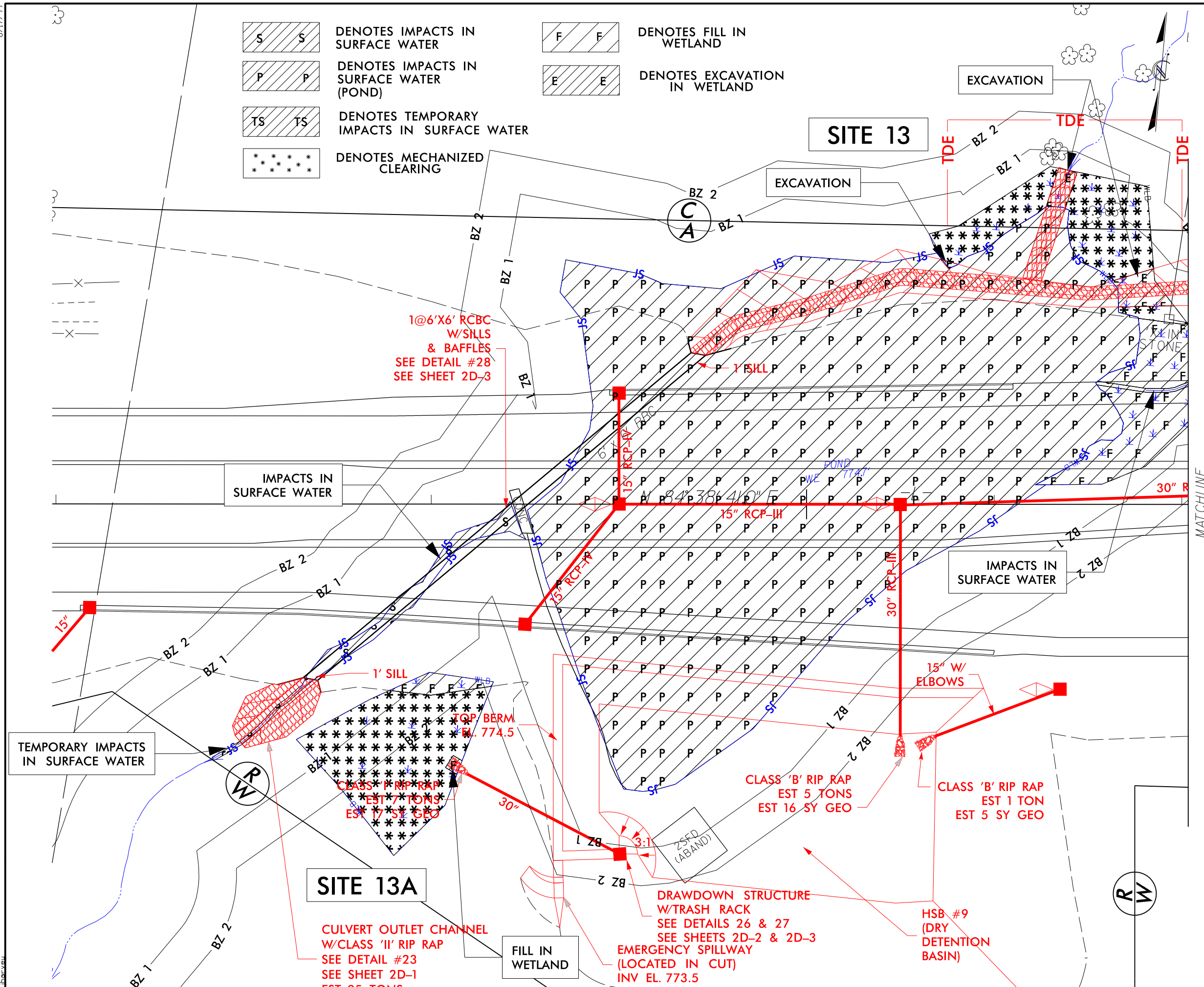
FOR CULVERT PLANS SEE SHEETS C-1 THRU C-?

8/17/99

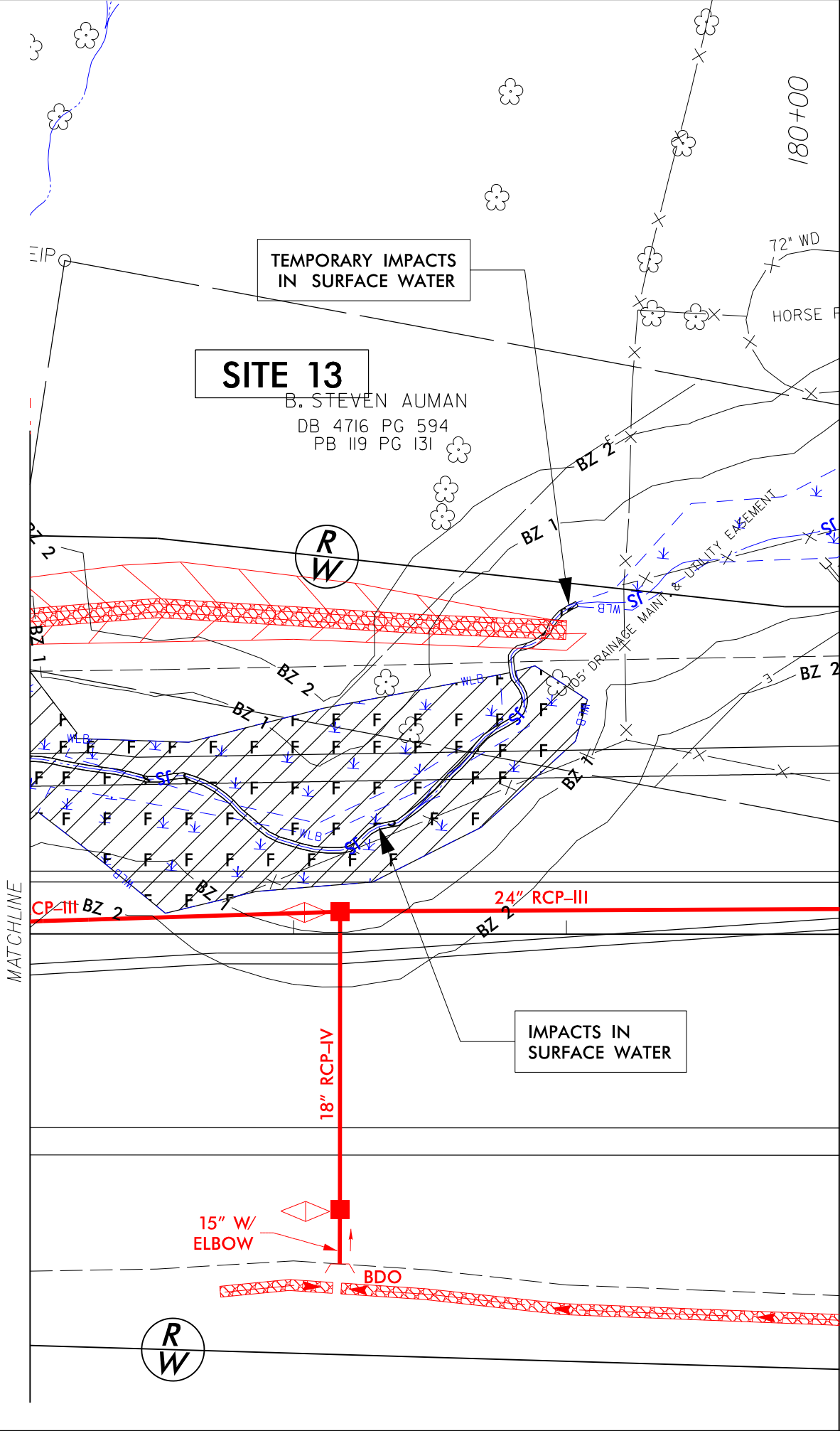
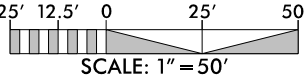
2/23/2018
U:\2412A\hyd.prm.wet.psh_16a.con.dgn
16a.con

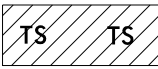
25' 12.5' 0 25' 50'

SCALE: 1" = 50'



PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		16c	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



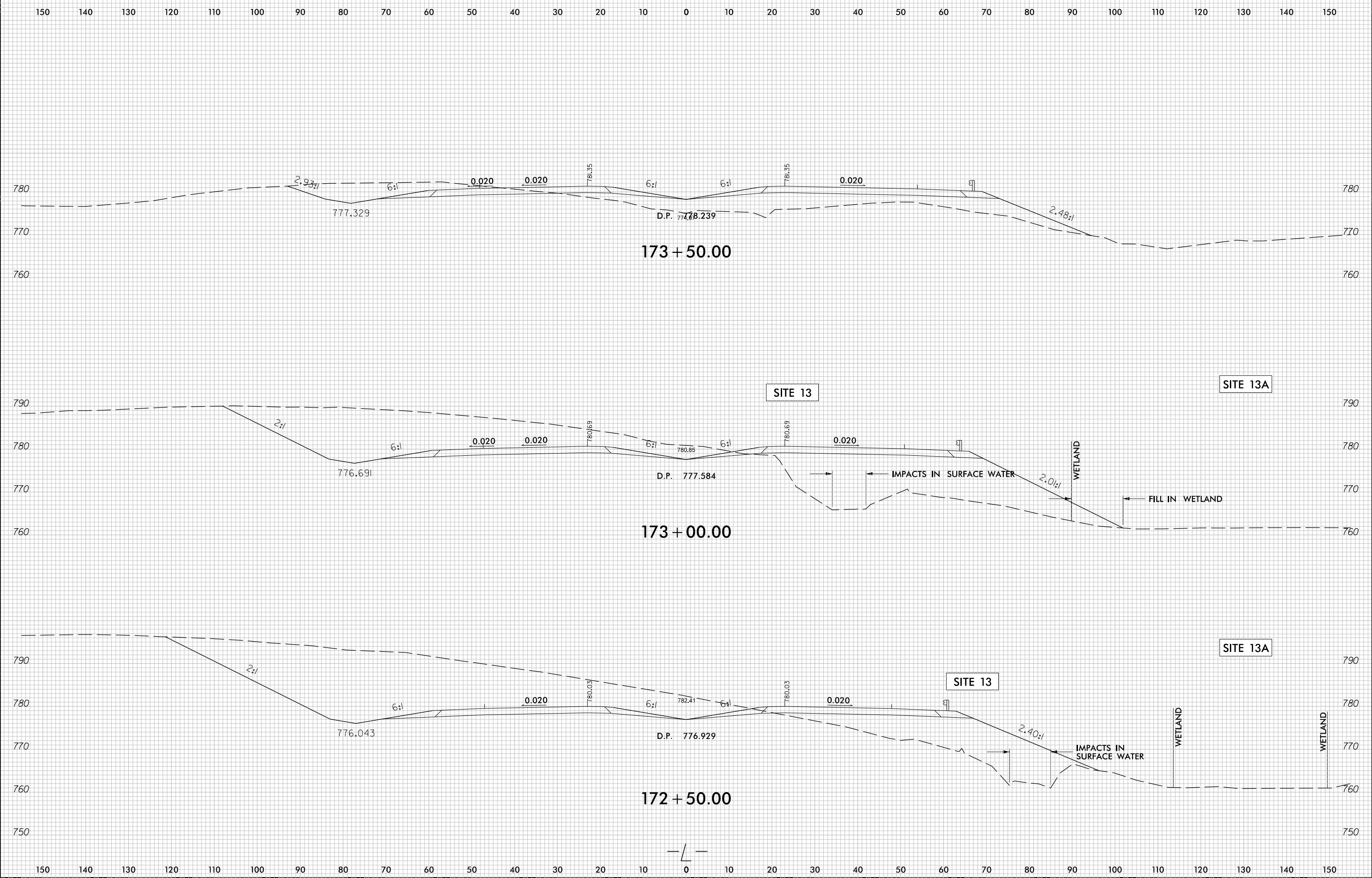
-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES FILL IN WETLAND
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER

8/17/99

2/23/2018
U-2412A.dwg
psh-16c.dgn
horvath

8/23/99

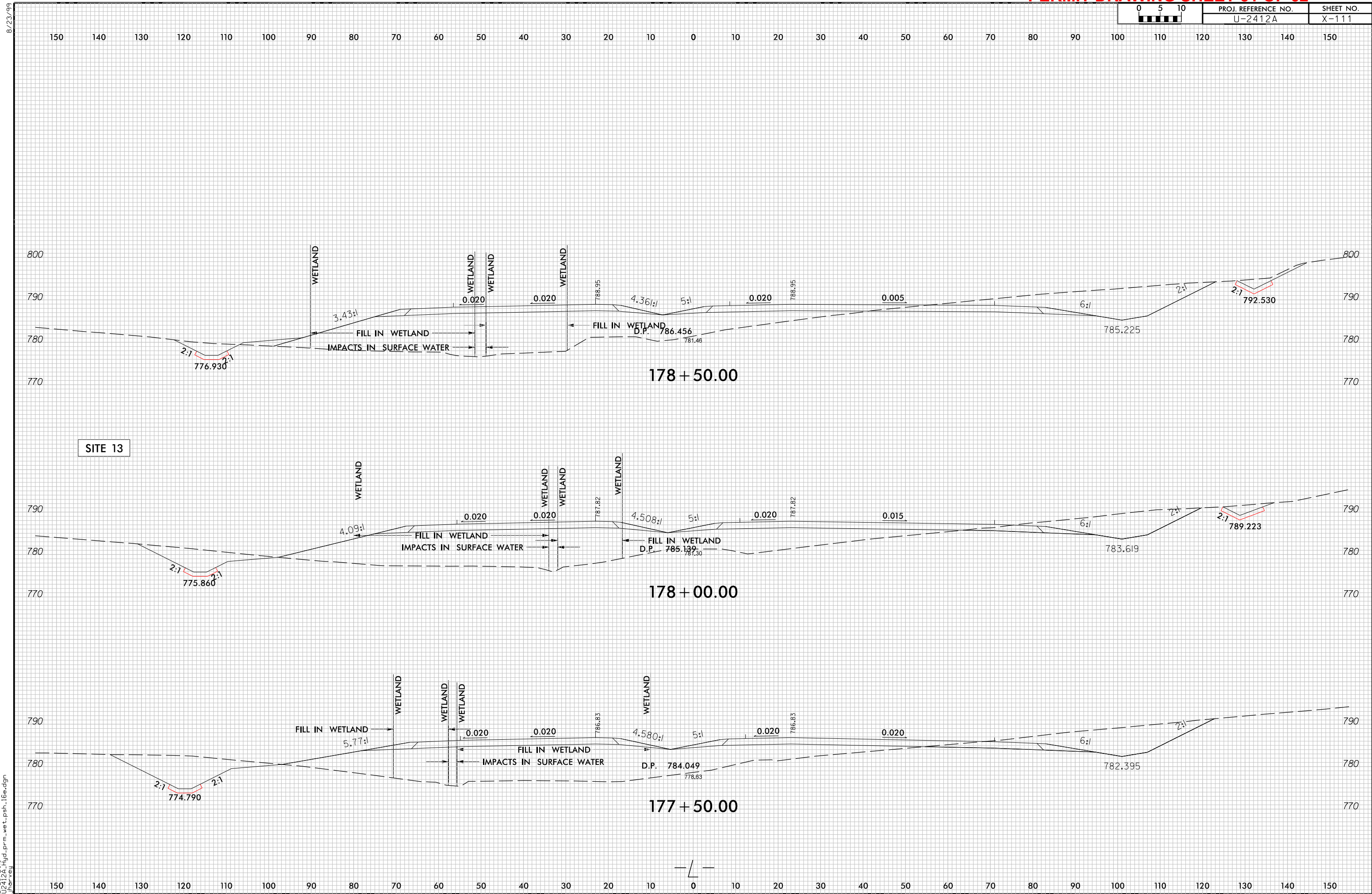
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2412A	X-108



2/23/2018
U2412A_Hyd_prm_wet.psh_16.dgn
Harvey

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2412A	X-111

8/23/99



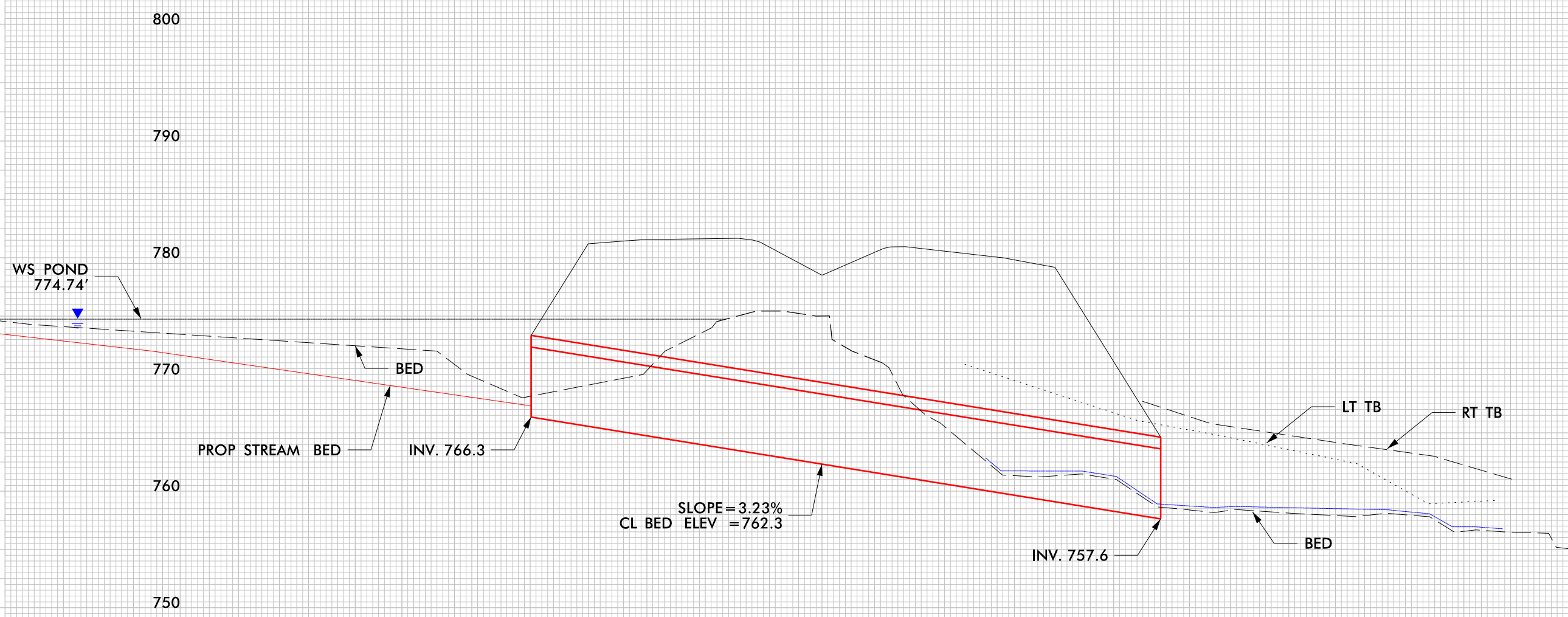
2/23/2018
U2412A_Hyd_prm_wet.psh_16.dgn
Harvey

PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		16f	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

5/14/99

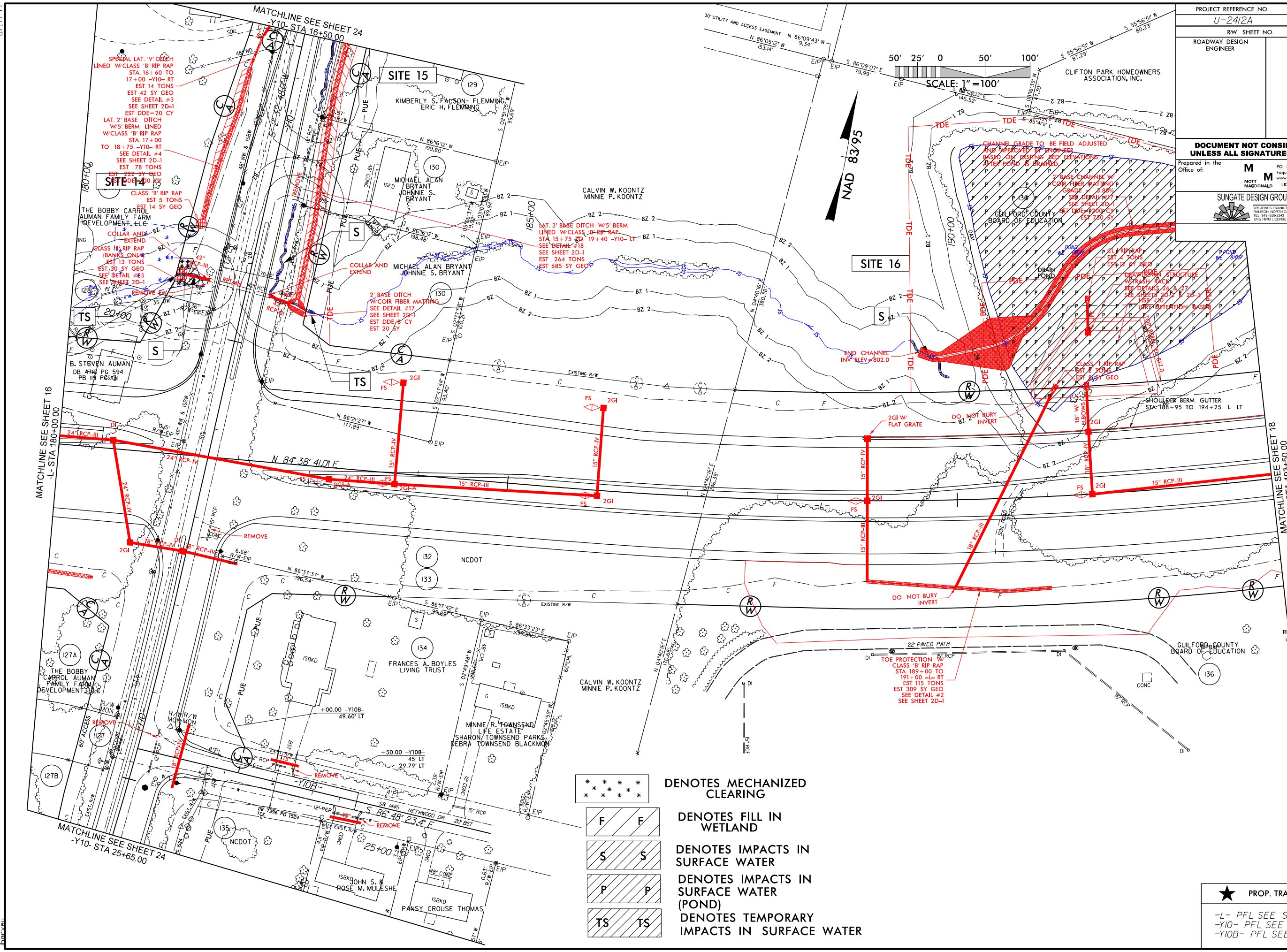
300 200 100 0 100 200

CL STA 173+47 -L-
SKEW=140°
GP EL=781.26
1 @ 6' X 6' RCBC



2/27/2018
U-2412A.dwg
psh-16f-sec.dgn
jbo

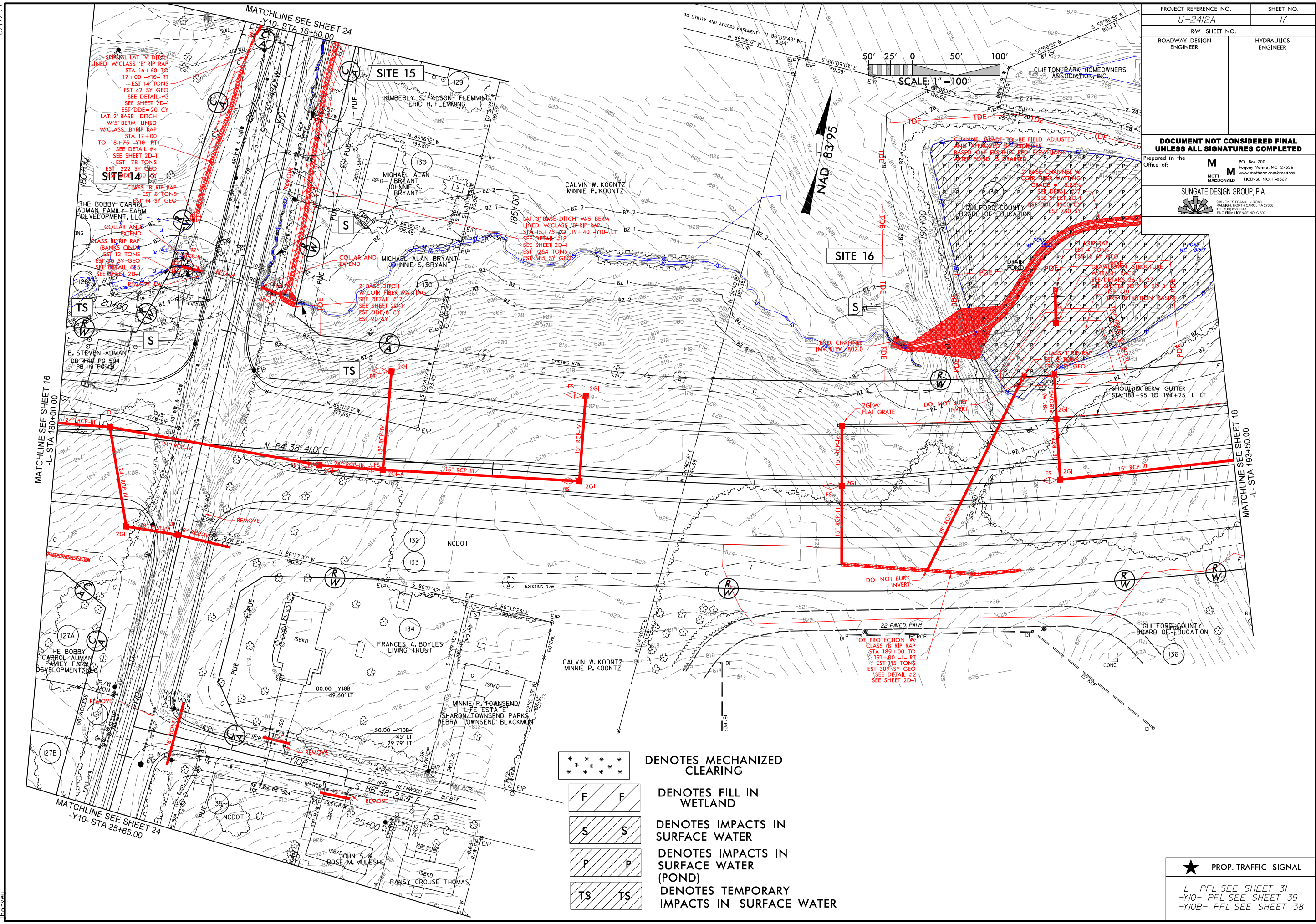
PROJECT REFERENCE NO. U-2412A		SHEET NO. 17	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared in the Office of:		MOTT MACDONALD	
		PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/mottmac LICENSE NO. F-0669	
		SUNGATE DESIGN GROUP, P.A.	
		905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL (919) 850-2441 ENG FIRM LICENSE NO. C-4890	



★ PROP. TRAFFIC SIGNAL

-L- PFL SEE SHEET 31
-Y10- PFL SEE SHEET 39
-Y10B- PFL SEE SHEET 38

PROJECT REFERENCE NO. U-2412A		SHEET NO. 17
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
Prepared in the Office of: M MOTT MACDONALD		
SUNGATE DESIGN GROUP, P.A. 905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL: (919) 605-2444 ENG. FIRM LICENSE NO. C-4860		



- DENOTES MECHANIZED CLEARING
- DENOTES FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER (POND)
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

★ PROP. TRAFFIC SIGNAL

-L- PFL SEE SHEET 31
-Y10- PFL SEE SHEET 39
-Y10B- PFL SEE SHEET 38

8/17/99

2/23/2018

U-2412A.dwg, d.pr, wet, psh, l7a, con.dgn



MATCHLINE SEE SHEET 24
-Y10- STA 16+50.00

SITE 15
KIMBERLY S. FALSON- FLEMMING
ERIC H. FLEMMING
IMPACTS IN SURFACE WATER

SITE 14
MECHANIZED CLEARING
FILL IN WETLAND
CLASS 'B' RIP RAP
EST 5 TONS
EST 14 SY GEO
THE BOBBY CARROLL AUMAN FAMILY FARM DEVELOPMENT, LLC
CLASS III RIP RAP (BANKS ONLY)
EST 13 TONS
EST 30 SY GEO
SEE DETAIL #25
SEE SHEET 2D-1
IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER
MICHAEL ALAN BRYANT
JOHNNIE S. BRYANT
TEMPORARY IMPACTS IN SURFACE WATER

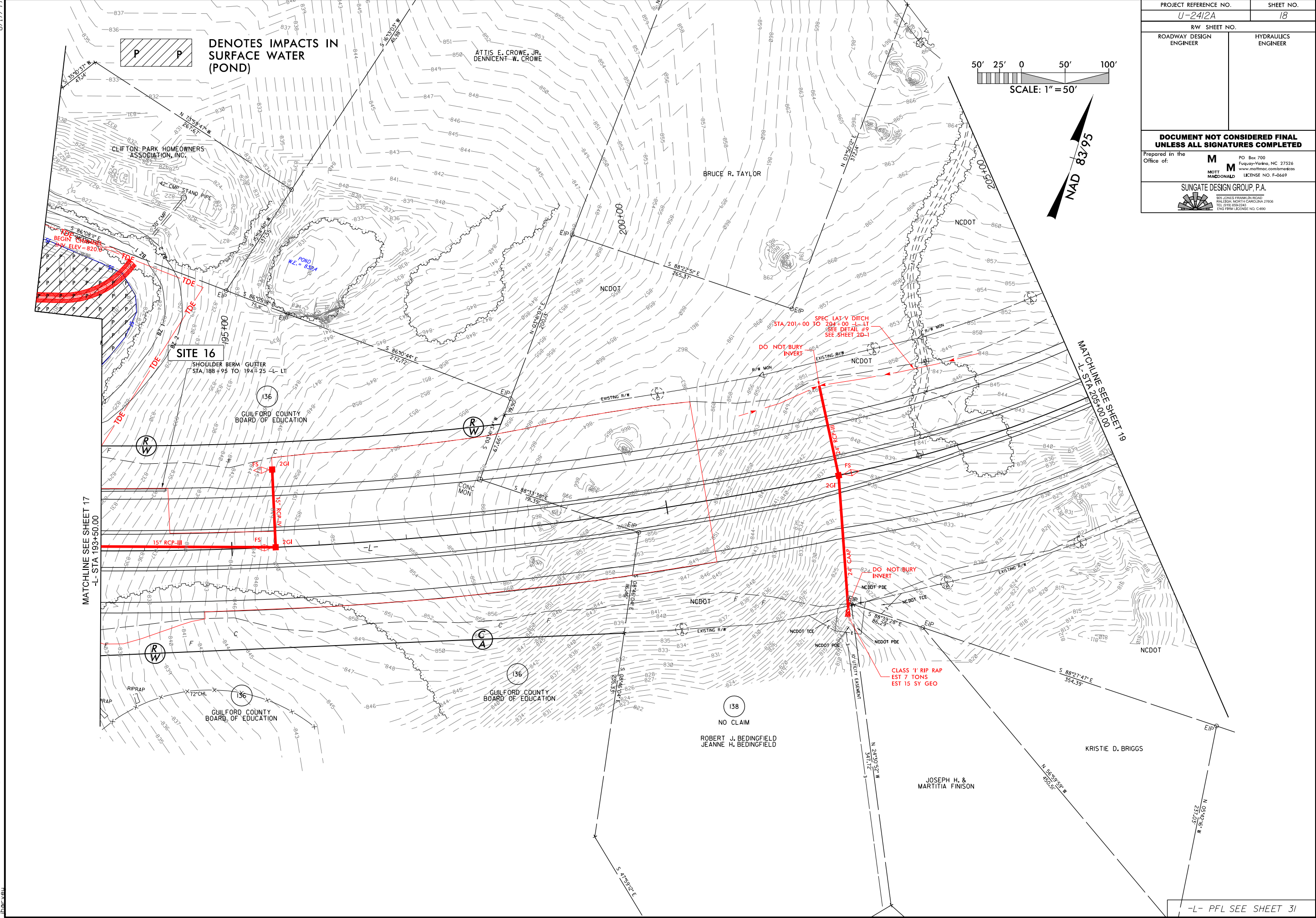
LEGEND:
DENOTES MECHANIZED CLEARING
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE SEE SHEET 16
-L- STA 180+00.00

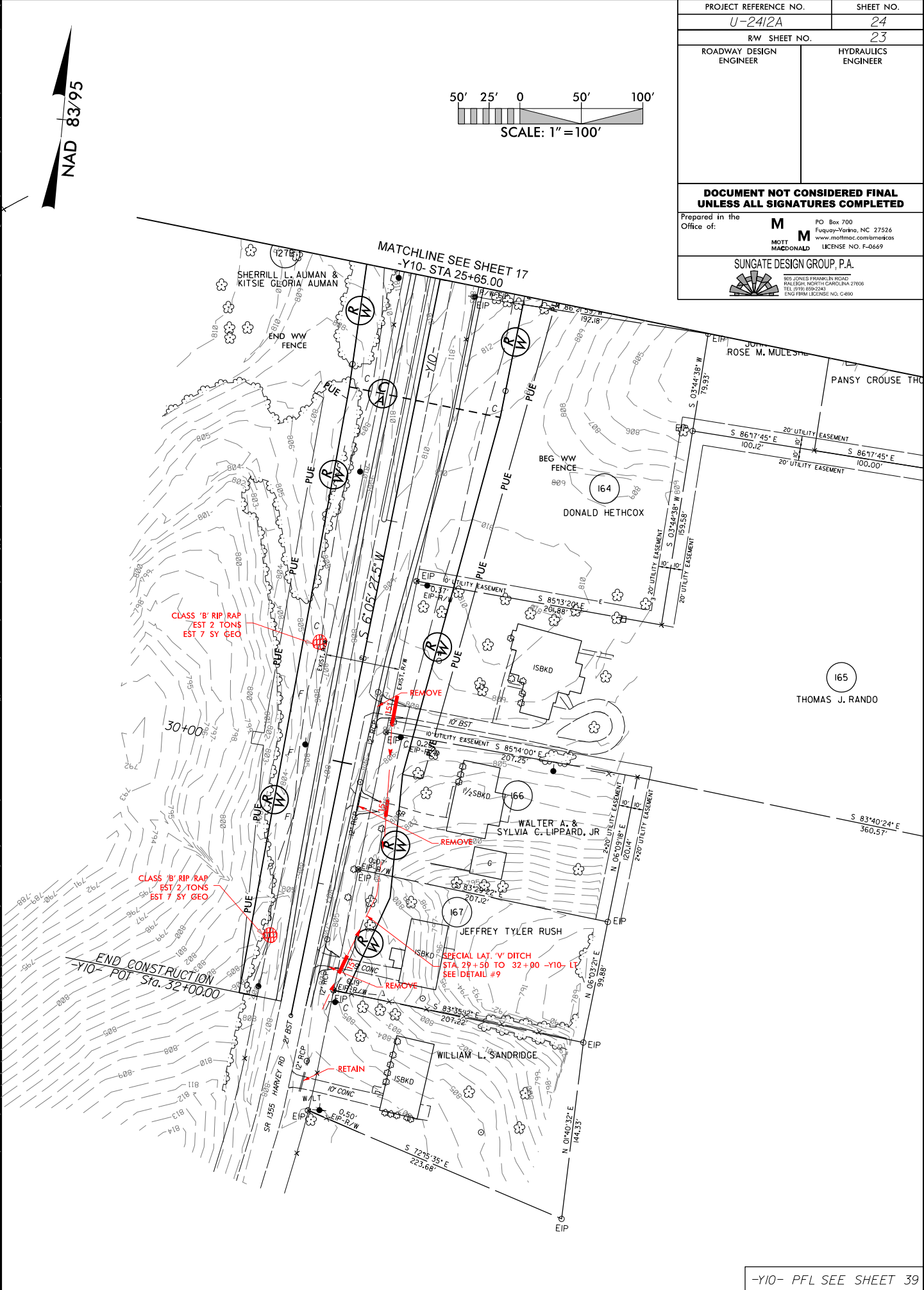
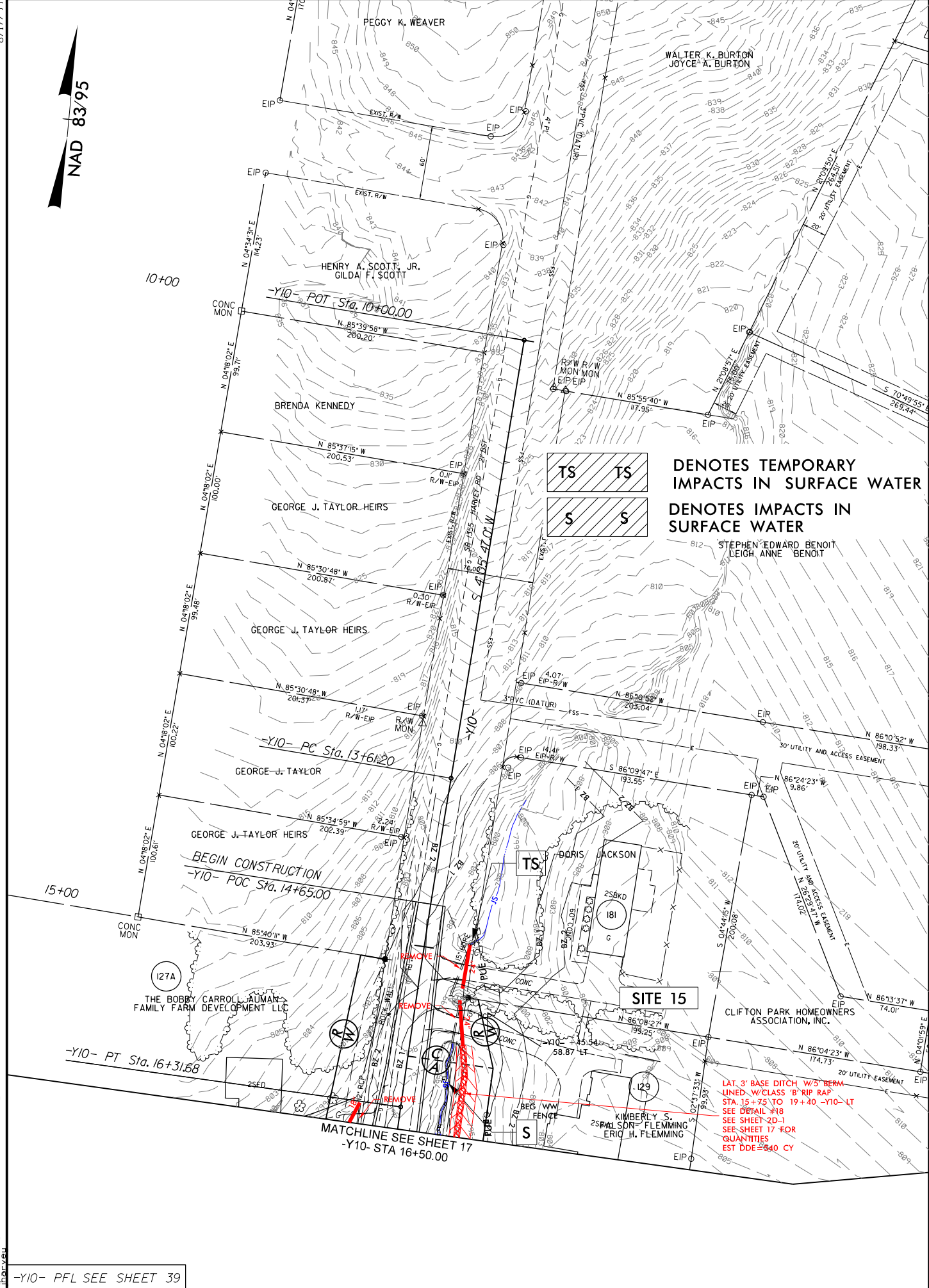
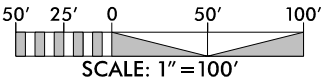
B. STEVEN AUMAN
DB 4716 PG 594
PB 119 PGS#73
TEMPORARY IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		18	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared in the Office of:		M PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/motmac LICENSE NO. F-0669	
		M MOTT MACDONALD	
SUNGATE DESIGN GROUP, P.A. 905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL: (919) 850-2441 ENG FIRM LICENSE NO. C-490			



PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		24	
RW SHEET NO.		23	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared in the Office of:		MOTT MACDONALD	
		PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/mottmac LICENSE NO. F-3669	
SUNGATE DESIGN GROUP, P.A.			
302 J. JONES BRANLEN ROAD RALEIGH, NORTH CAROLINA 27606 TEL (919) 655-2444 ENG FIRM LICENSE NO. C-4900			



8/17/99

2/23/2018
U-2412A.dwg
d:\p\m\wet_psh_24a.con.dgn

[illegible]

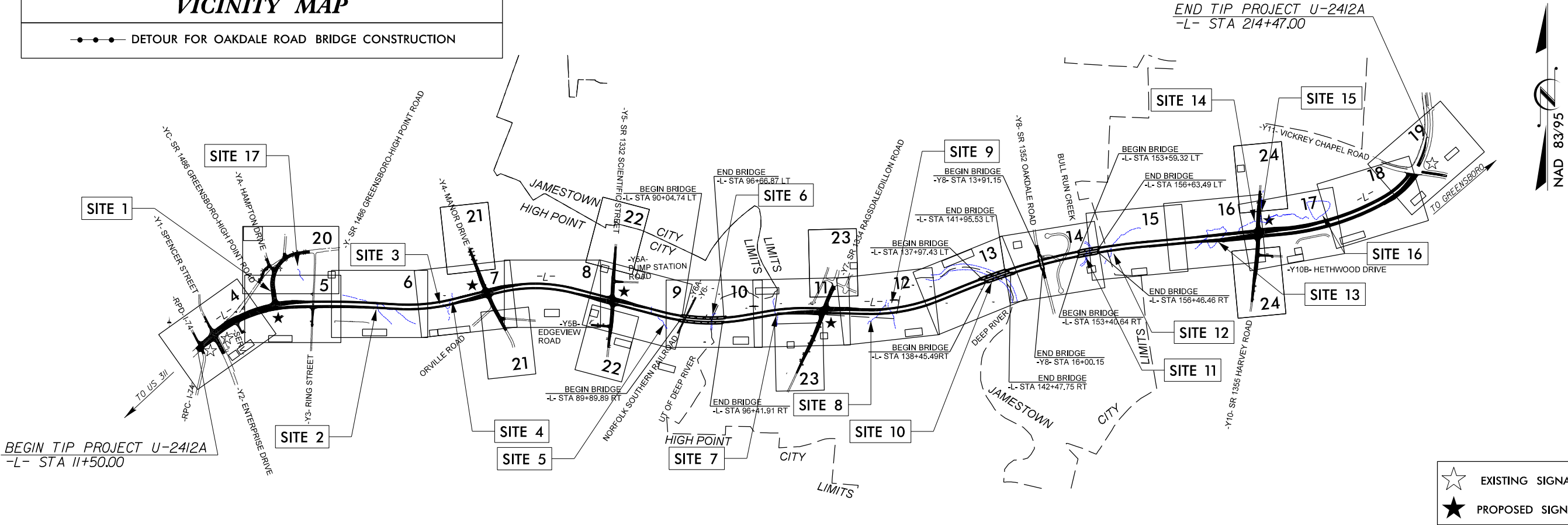
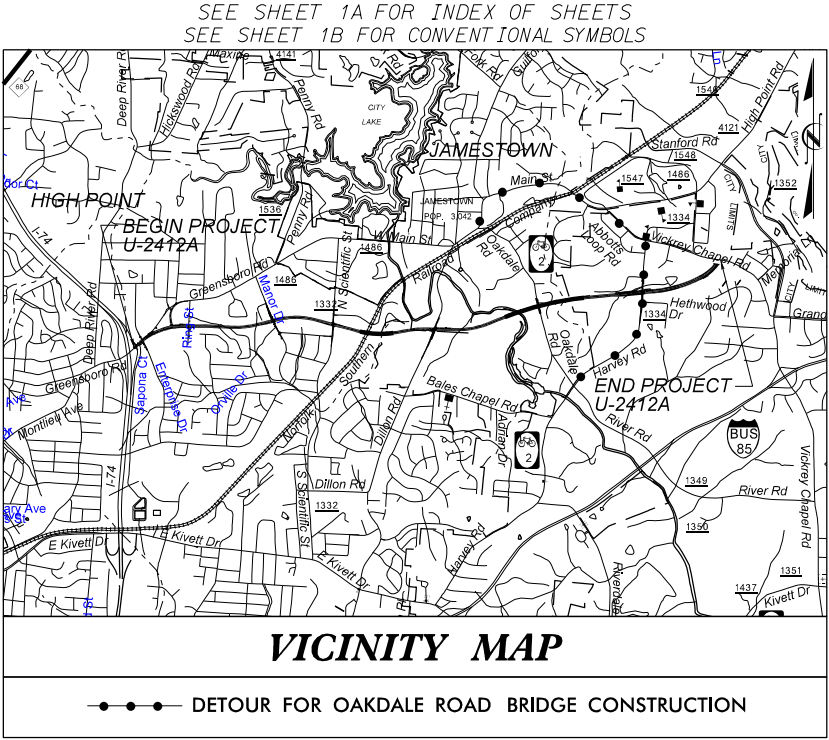
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2412A	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34802.1.1	STP-4121(3)	PE	
34802.2.2	STP-4121(3)	RW & UTL.	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
GUILFORD COUNTY

LOCATION: SR-1486 /SR-4121 (JAMESTOWN PARKWAY) FROM I-74
TO WEST OF SR 1480 (VICKREY CHAPEL ROAD)

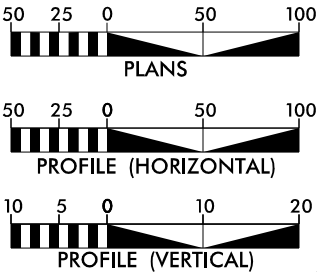
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERT, & SIGNALS

BUFFER IMPACTS PERMIT



THIS IS A CONTROLLED ACCESS FACILITY WITH ACCESS BEING LIMITED TO INTERSECTIONS.
NCDOT CONTACT: TATIA WHITE, PE, PLS

GRAPHIC SCALES



DESIGN DATA

ADT 2018 = 35,880
ADT 2038 = 44,720
K = 9 %
D = 55 %
T = 4 % *
V = 60 MPH
* TTST = 1% DUAL 3%
FUNC CLASS =
URBAN ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2412A = 3.586 MILES
LENGTH STRUCTURES TIP PROJECT U-2412A = .258 MILES
TOTAL LENGTH OF TIP PROJECT U-2412A = 3.844 MILES

PLANS PREPARED FOR THE NCDOT BY:
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2248
ENG FIRM LICENSE NO. C-890

M MOTT MACDONALD
2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 20, 2009

LETTING DATE:
JUNE 19, 2018

MICHAEL PEKAREK, PE
PROJECT ENGINEER

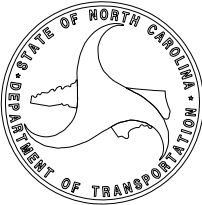
BRIAN PHILLIPS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



PROJECT REFERENCE NO.
U-2412A

SHEET NO.
2D-1

RW SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

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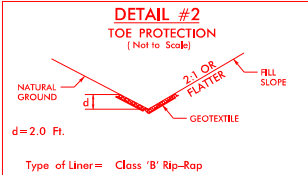
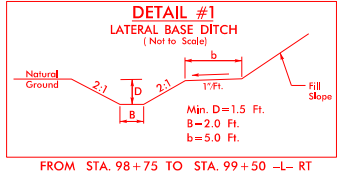
M

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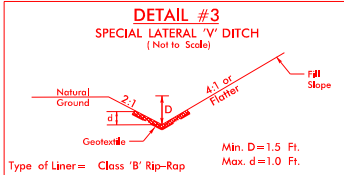
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Fuquay-Varina, NC 27526
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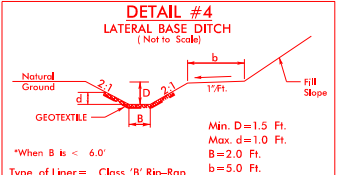
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL: (919) 850-2440
ENG. FIRM LICENSE NO. C-490



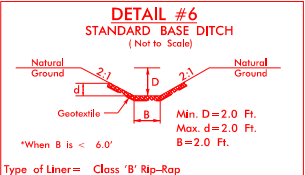
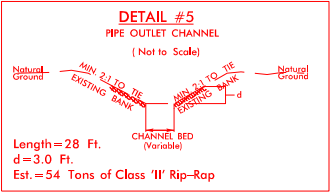
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FROM STA. 40+50 TO STA. 42+00 -L- RT
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FROM STA. 85+00 TO STA. 86+50 -L- LT
FROM STA. 87+00 TO STA. 87+85 -L- RT
FROM STA. 104+50 TO STA. 104+00 -L- RT
FROM STA. 118+00 TO STA. 124+00 -L- RT
FROM STA. 131+25 TO STA. 131+75 -L- RT
FROM STA. 133+75 TO STA. 135+60 -L- LT
FROM STA. 158+00 TO STA. 159+50 -L- LT
FROM STA. 189+00 TO STA. 191+00 -L- RT



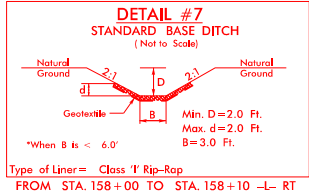
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FROM STA. 16+60 TO STA. 17+00 -Y10- RT



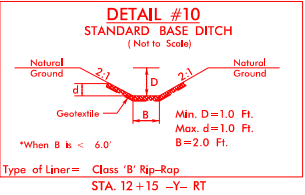
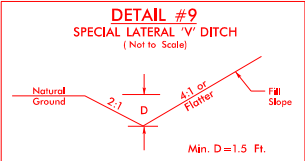
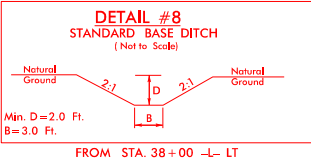
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FROM STA. 17+00 TO STA. 18+75 -Y10- RT
FROM STA. 84+65 TO STA. 86+50 -L- RT



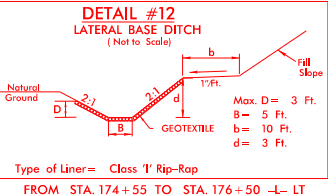
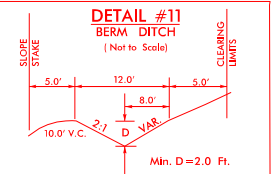
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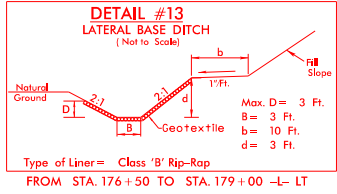
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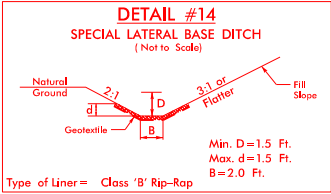
STA. 12+15 -Y- RT



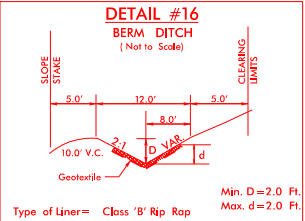
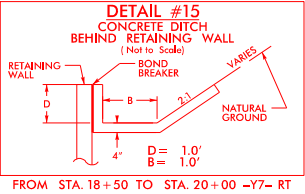
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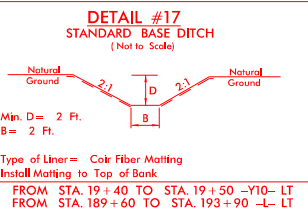
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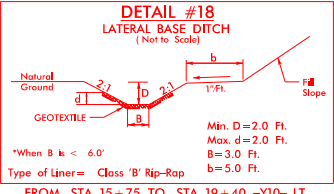
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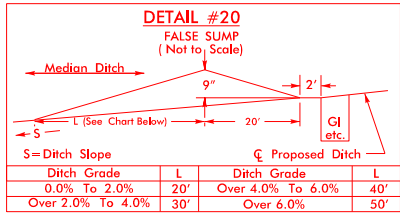
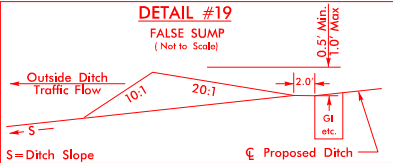
FROM STA. 114+00 TO STA. 115+50 -L- RT
FROM STA. 177+75 TO STA. 180+50 -L- RT



FROM STA. 19+40 TO STA. 19+50 -Y10- LT
FROM STA. 189+60 TO STA. 193+90 -L- LT

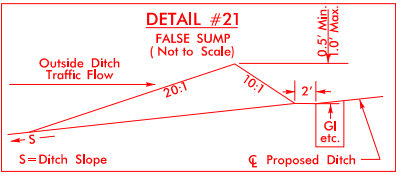


FROM STA. 15+75 TO STA. 19+40 -Y10- LT

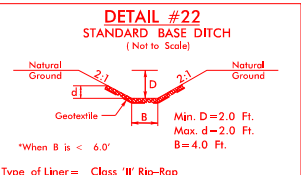


STA. 28+15 -L- MED
STA. 31+15 -L- MED
STA. 34+40 -L- MED
STA. 37+50 -L- MED
STA. 41+15 -L- MED
STA. 45+15 -L- MED
STA. 49+65 -L- MED
STA. 51+40 -L- MED
STA. 55+35 -L- MED
STA. 61+00 -L- MED
STA. 71+80 -L- MED
STA. 75+15 -L- MED
STA. 81+65 -L- MED
STA. 83+90 -L- MED
STA. 86+90 -L- MED
STA. 89+40 -L- MED
STA. 101+65 -L- MED
STA. 103+60 -L- MED
STA. 107+10 -L- MED
STA. 115+75 -L- MED
STA. 119+15 -L- MED

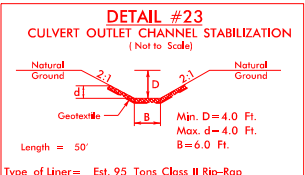
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STA. 126+50 -L- MED
STA. 130+65 -L- MED
STA. 133+65 -L- MED
STA. 142+85 -L- MED
STA. 148+35 -L- MED
STA. 150+05 -L- MED
STA. 156+85 -L- MED
STA. 159+85 -L- MED
STA. 160+85 -L- MED
STA. 165+45 -L- MED
STA. 169+35 -L- MED
STA. 173+85 -L- MED
STA. 175+35 -L- MED
STA. 178+02 -L- MED
STA. 182+85 -L- MED
STA. 183+60 -L- MED
STA. 185+85 -L- MED
STA. 188+85 -L- MED
STA. 191+35 -L- MED
STA. 195+35 -L- MED
STA. 202+15 -L- MED



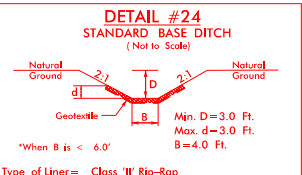
STA. 30+65 -L- LT
STA. 55+35 -L- RT
STA. 61+05 -L- RT
STA. 75+15 -L- LT
STA. 107+10 -L- RT
STA. 110+85 -L- RT
STA. 130+15 -L- LT
STA. 143+10 -L- LT
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STA. 165+45 -L- RT
STA. 169+35 -L- RT
STA. 176+20 -L- RT
STA. 178+02 -L- RT



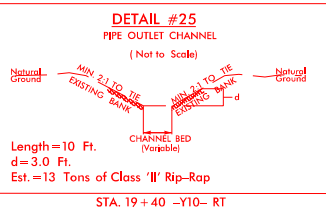
STA. 104+65 -L- LT
STA. 122+18 -L- LT



STA. 172+08 -L- RT



STA. 87+85 -L- RT



PROJECT REFERENCE NO.
U-2412A

SHEET NO.
2D-2

RW SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

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Prepared in the Office of:

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MOTT MACDONALD

PO Box 700
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LICENSE NO. F-0669

SUNGATE DESIGN GROUP, P.A.

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RALEIGH, NORTH CAROLINA 27606
TEL: 919.855.2441
ENG. FIRM LICENSE NO. C-490

DETAIL #26
DRY DETENTION/HAZARDOUS SPILL BASIN
DRAWDOWN STRUCTURE
NOT TO SCALE

Diagram showing Side 1 view of the structure. Labels include: TRASH RACK (SEE SPECIAL DETAIL), SLUICE GATE, TRASH RACK HINGES (THIS SIDE), TOP ELEV. CTL. STR., BASIN BOTTOM MIN. ELEV., OUTLET PIPE (P), and STEPS @ 12" O.C. (STD. DRWG. 840.66).

Diagram showing Side 2 view of the structure. Labels include: TRASH RACK (SEE SPECIAL DETAIL), SLUICE GATE, TOP ELEV. CTL. STR., BASIN BOTTOM MIN. ELEV., 4" CONCRETE PAD (2' x 2' MIN.), 6" MIN., VARIES SEE TABLE, OUTLET PIPE (P), and OUTFLOW.

Diagram showing Side 3 view of the structure. Labels include: SLUICE GATE, TRASH RACK (SEE SPECIAL DETAIL), TRASH RACK HINGES (THIS SIDE), TOP ELEV. CTL. STR., BASIN BOTTOM MIN. ELEV., OUTLET PIPE (P), and STEPS @ 12" O.C. (STD. DRWG. 840.66).

Inset A detail showing the orifice trash rack and steel orifice plate. Labels include: ORIFICE TRASH RACK (SEE SPECIAL DETAIL), 4" CONCRETE PAD (2' x 2' MIN.), ORIFICE (O), 4" STEEL ORIFICE PLATE 8"x8" MIN., and BORED HOLE 6" DIA. MIN.

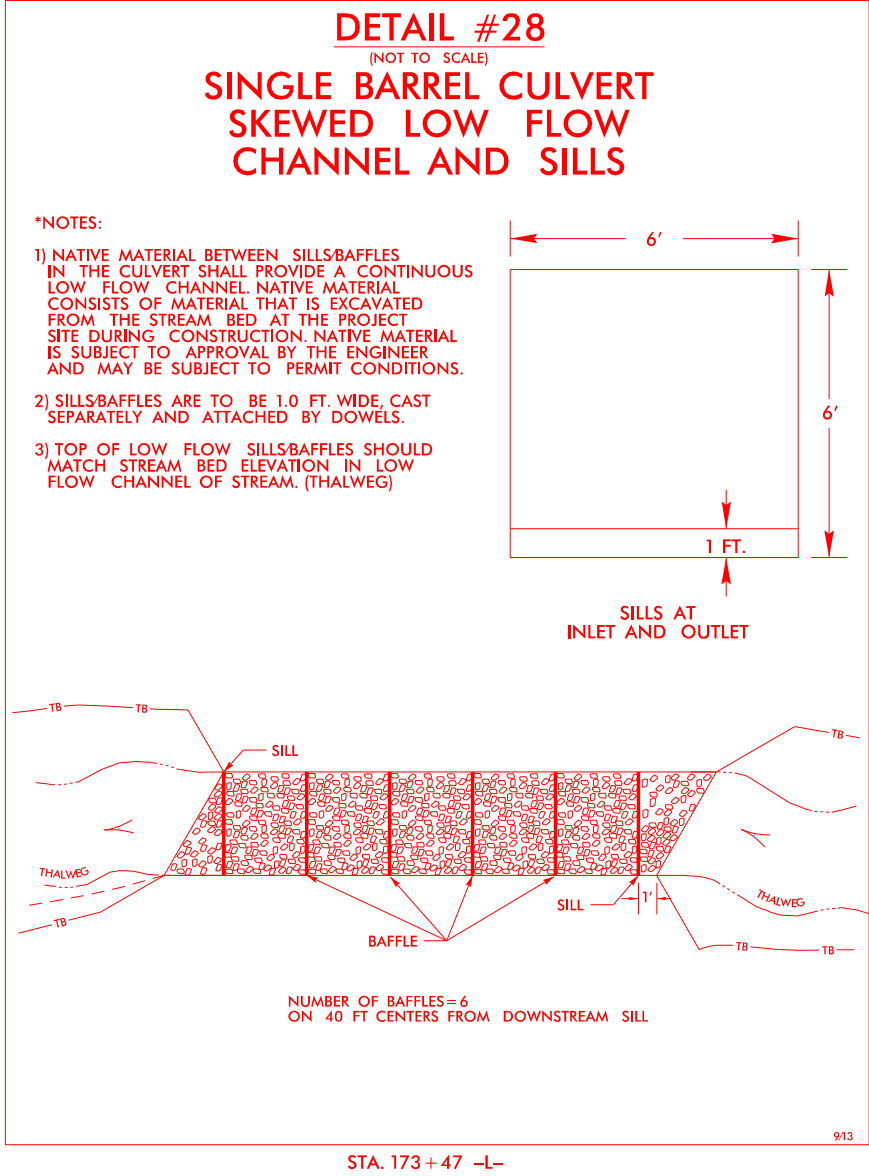
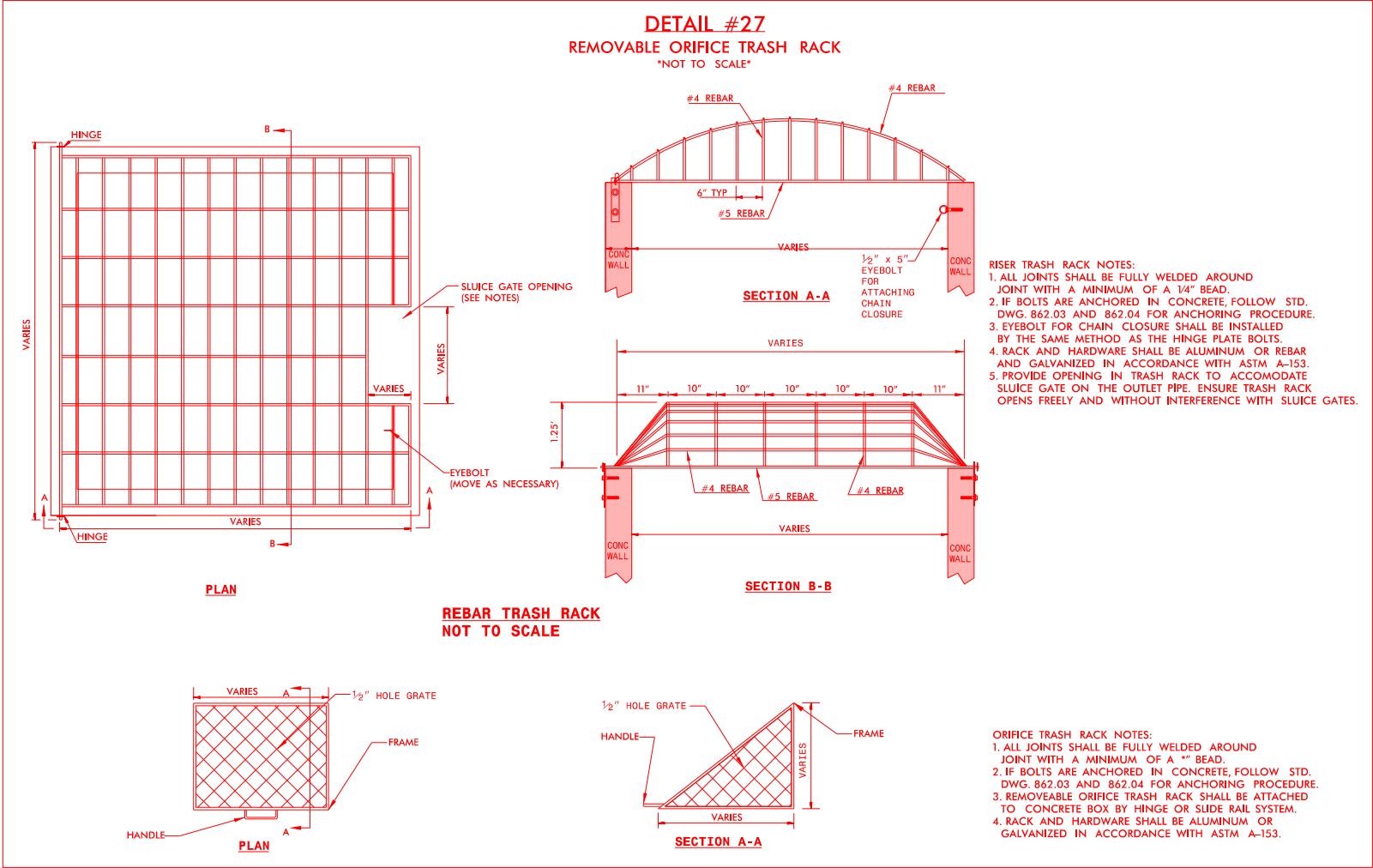
Diagram showing Plan View of the structure. Labels include: TRASH RACK HINGE, TRASH RACK HINGE, ORIFICE TRASH RACK (SEE SPECIAL DETAIL), VARIES SEE TABLE, 22" MIN., 6" MIN., STEPS @ 12" O.C. (STD. DRWG. 840.66), 8" MIN., SLUICE GATE, OUTLET PIPE (P), and SIDE 3.

NOTES:

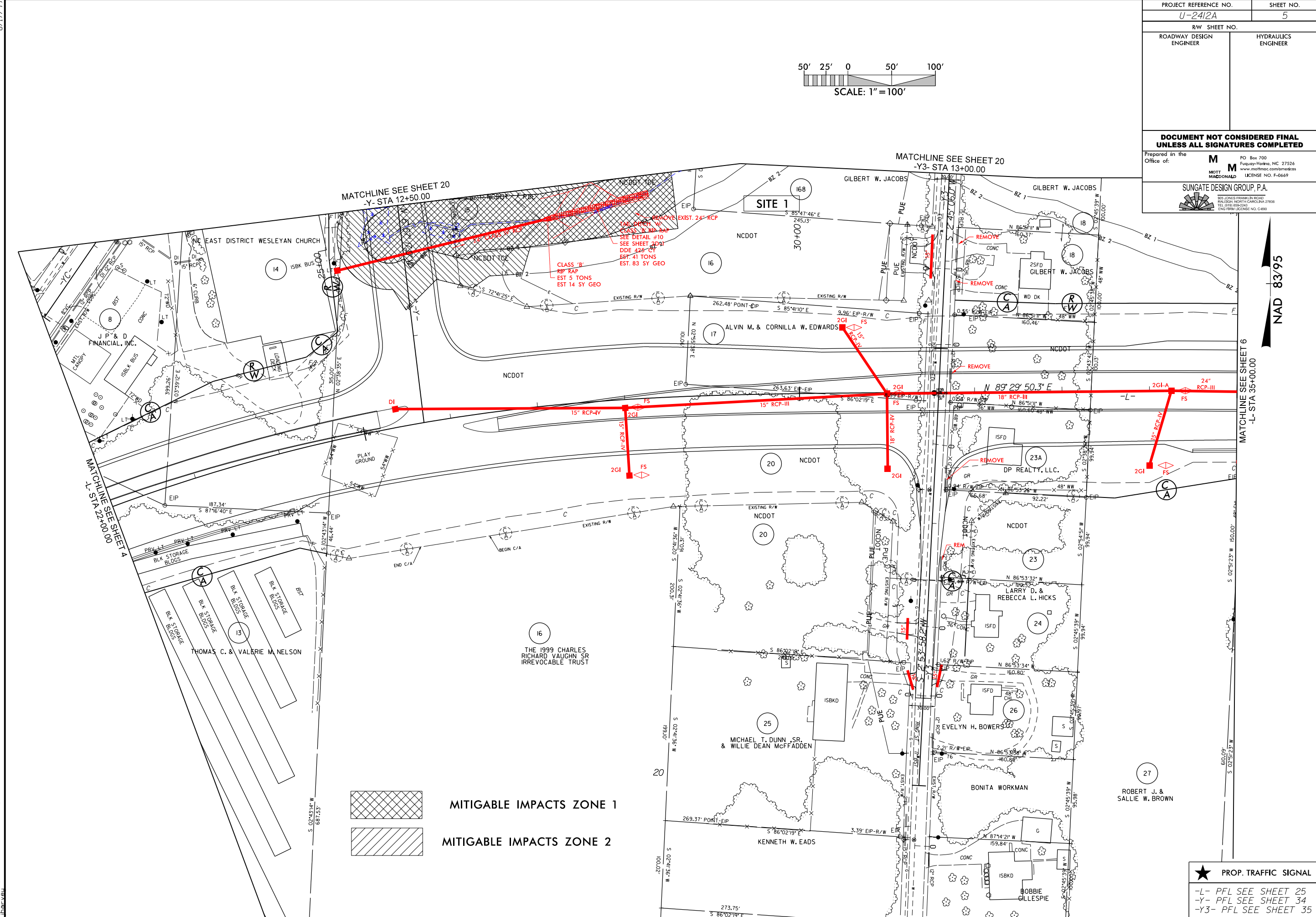
1. THE BASIN SHOULD BE DESIGNED TO HOLD THE HAZARDOUS SPILL VOLUME ABOVE THE WATER QUALITY VOLUME (WQV) ELEVATION.
2. TOP ELEVATION OF CONTROL STRUCTURE (WEIR ELEVATION) SHOULD BE SET AT THE WQV ELEVATION.
3. 15" MINIMUM DIAMETER FOR OUTLET PIPE.
4. 2" MINIMUM DIAMETER ORIFICE. IF ORIFICE IS GREATER THAN 6", A STEEL PLATE IS NOT REQUIRED.
5. NO BEDDING MATERIAL TO BE USED. THEREFORE, DO NOT FOLLOW STANDARD DRAWINGS FOR METHOD OF PIPE INSTALLATION FOR OUTLET PIPE THROUGH EMBANKMENT.
6. 8" MIN. SLUICE GATE IS FOR MAINTENANCE AND SHOULD REMAIN CLOSED DURING NORMAL OPERATION. A GATE VALVE MAY BE USED IN LIEU OF THE 8" SLUICE GATE.
7. 22" MIN. SLUICE GATE AT THE OUTLET PIPE IS FOR SPILL CONTAINMENT AND SHOULD REMAIN OPEN DURING NORMAL OPERATION.
8. SLUICE GATE SHALL PROVIDE WATERTIGHT SEAL. PROVIDE ADEQUATE CLEARANCE FOR GATE OPERATION AND FOR PROPER SEATING OF GATE OVER PIPE.
9. SELECT BOX STANDARD AS REQUIRED TO ACCOMMODATE SLUICE GATE AND ORIFICE TRASH RACK WIDTH.
10. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATES.
11. ADJUST FOOTER DIMENSIONS AS NEEDED FOR ANTI-FLOTATION.
12. PAYMENT FOR TRASH RACKS IS INCIDENTAL TO BASIN DRAWDOWN STRUCTURE.

MINIMUM DIMENSIONS FOR DRY DETENTION/HAZARDOUS SPILL BASIN DRAWDOWN STRUCTURE											
STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	MAX. STORAGE DEPTH(D) FEET	INV. ELEV. CTL. STR.	CTL. STR. DIMENSIONS (W x L x H)	ORIFICE DIAMETER (O) INCHES	ORIFICE INV. ELEV.	OUTLET PIPE DIAMETER(P) INCHES
50+00 -L- RT	713	6	18	827.0	830.5	3.5	824.0	5 x 5 x 6.5	6	827.0	36
54+00 -L- RT	711	6	15	828.0	833.5	5.5	828.0	5 x 5 x 5.5	22	828.0	30
83+00 -L- LT	909	6	15	798.5	804.0	5.5	798.5	5 x 5 x 5.5	17	798.5	24
100+00 -L- LT	1015	6	18	728.0	732.0	4.0	725.0	5 x 5 x 7	2	728.0	30
143+00 -L- LT	1320	6	15	733.0	736.5	3.5	730.0	5 x 5 x 6.5	4.5	733.0	24
175+00 -L- RT	1613	6	18	768.0	772.5	4.5	765.0	5 x 5 x 7.5	8	768.0	30
192+00 -L- LT	1725	6	12	812.0	815.0	3.0	810.0	5 x 5 x 5	2	812.0	24

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U-2412A		2D-3	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
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905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL: (919) 855-2441 ENG FIRM LICENSE NO. C-490			



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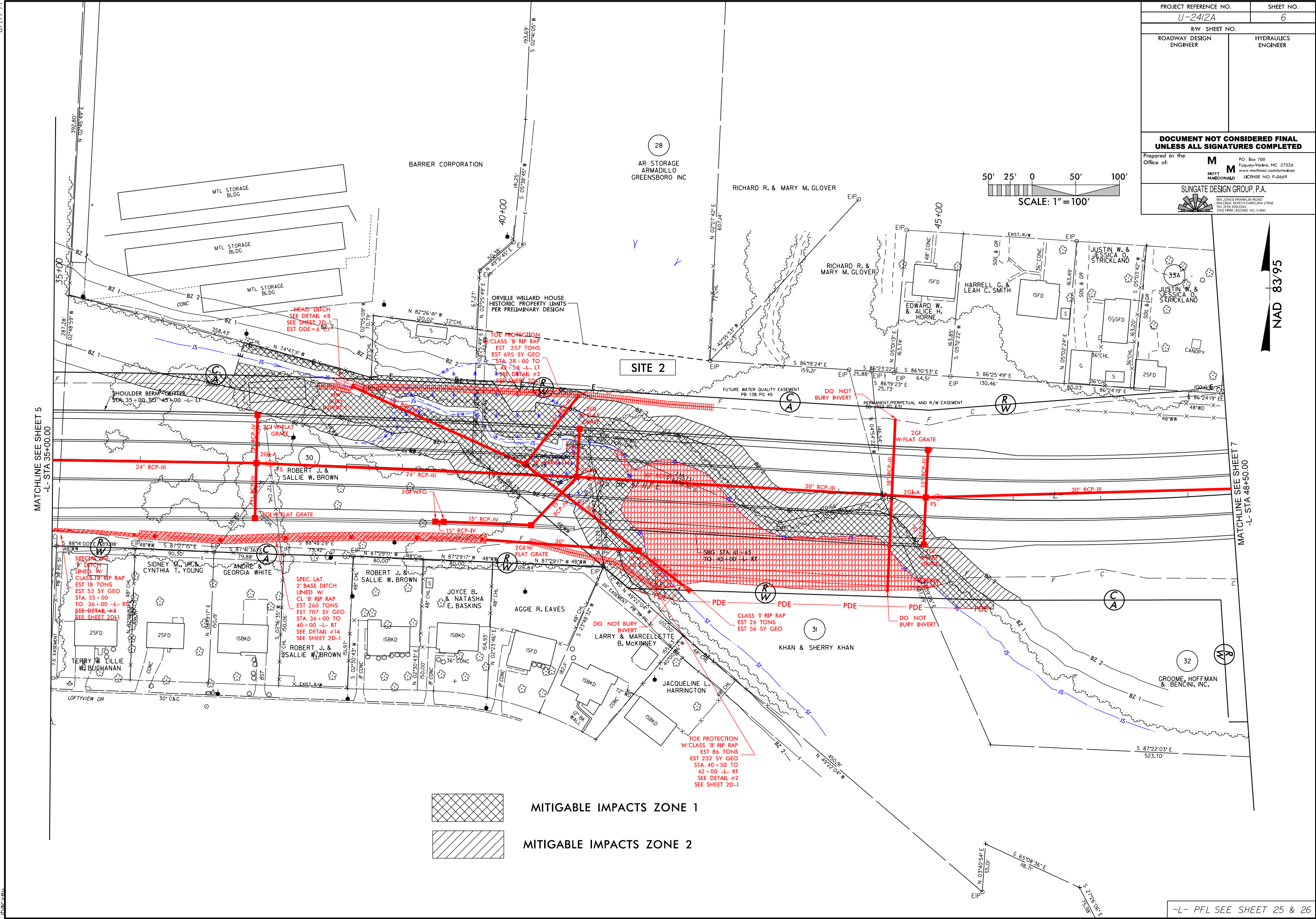
8/17/99

2/23/2018
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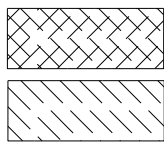
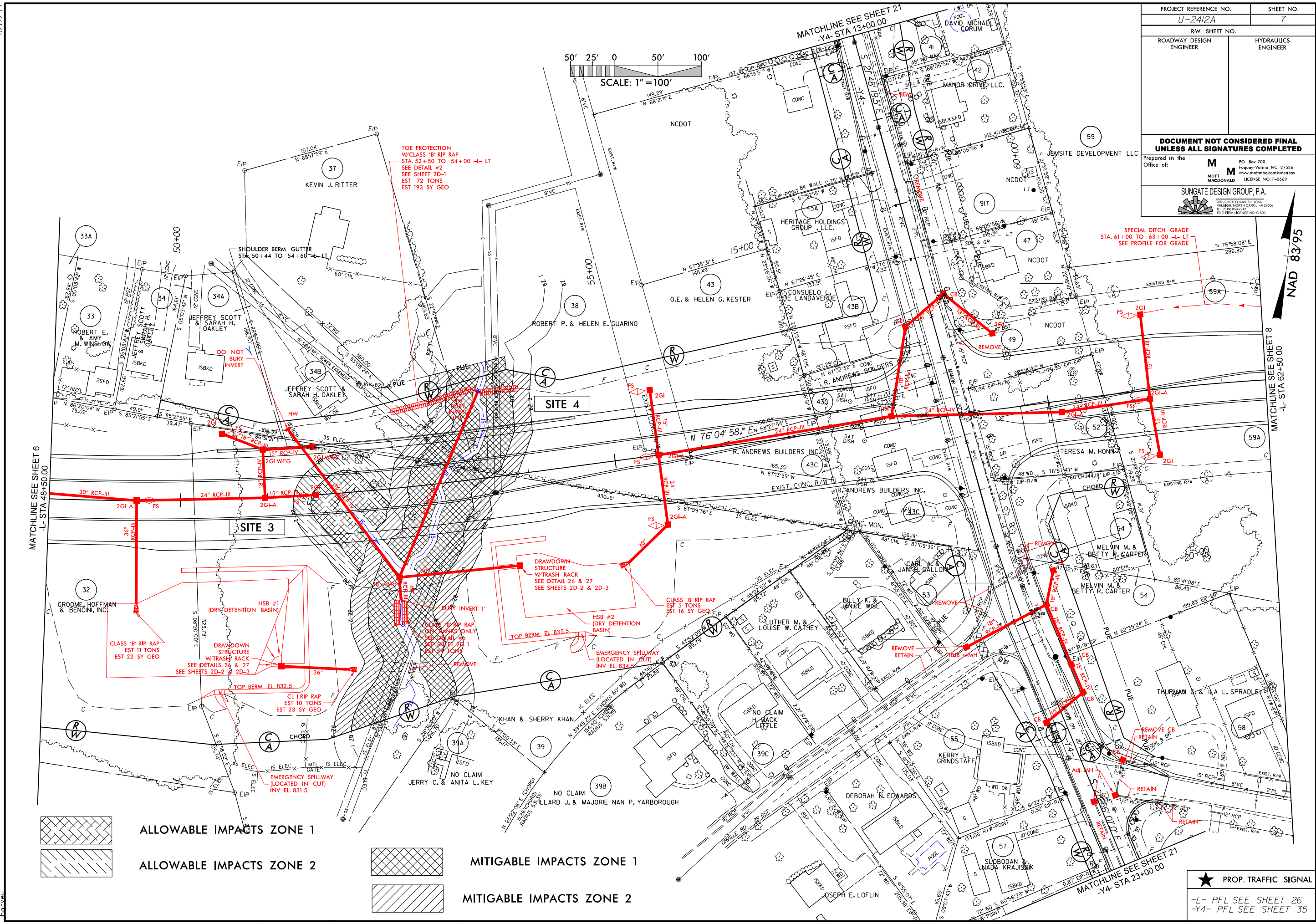
★ PROP. TRAFFIC SIGNAL

-L- PFL SEE SHEET 25
-Y- PFL SEE SHEET 34
-Y3- PFL SEE SHEET 35

PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		6	
RW SHEET NO.			
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905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL: (919) 650-2445 ENG FIRM LICENSE NO. C-4890			

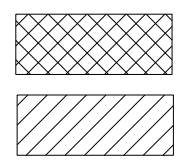


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ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2



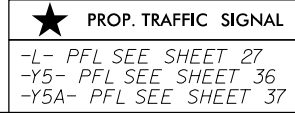
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MITIGABLE IMPACTS ZONE 2

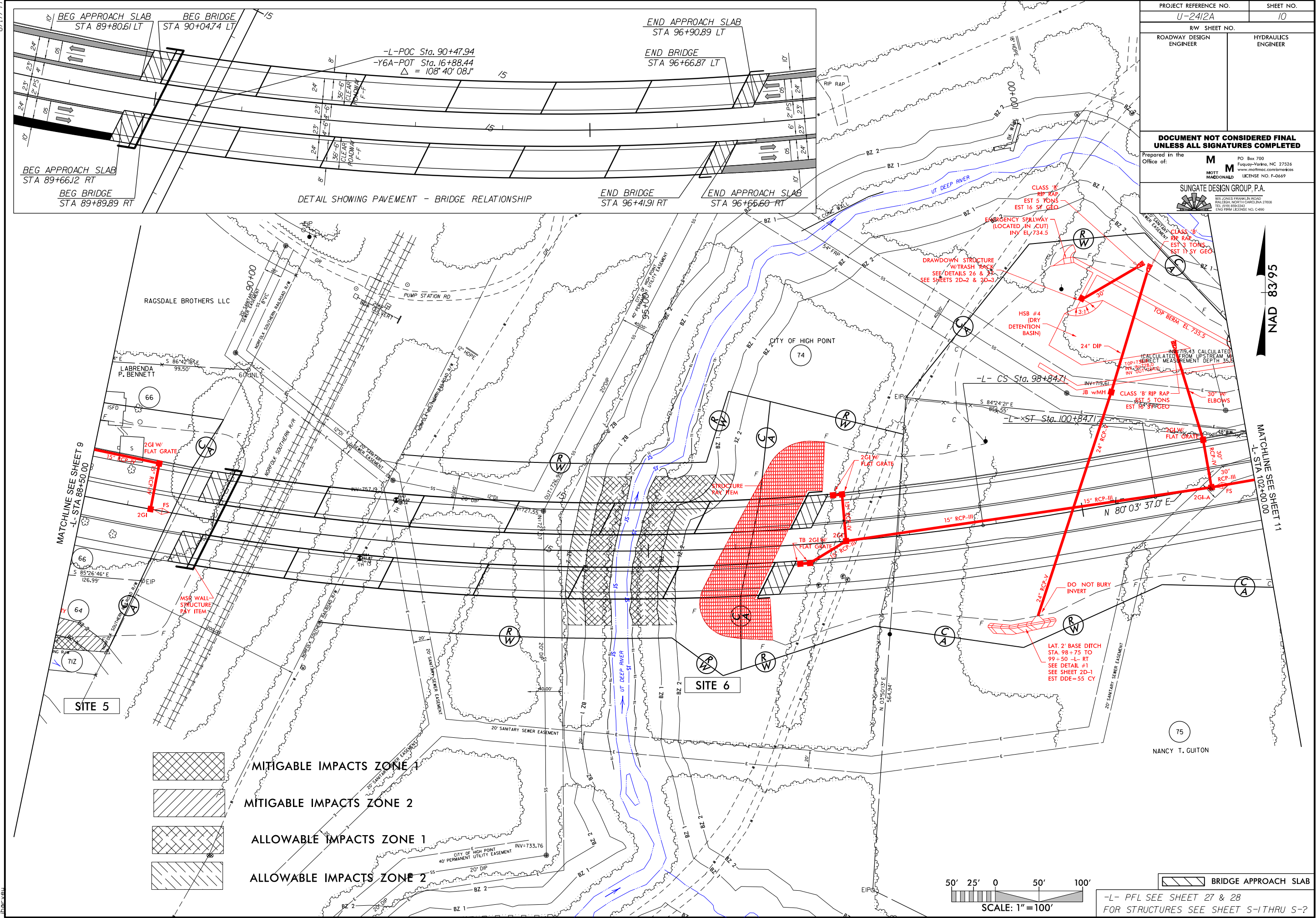
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-L- PFL SEE SHEET 26
-Y4- PFL SEE SHEET 35

8/17/99
2/23/2018
U-2412A.dwg, pr-m, buf, psh, 07.dgn
10/2/2018

NAD 83/95

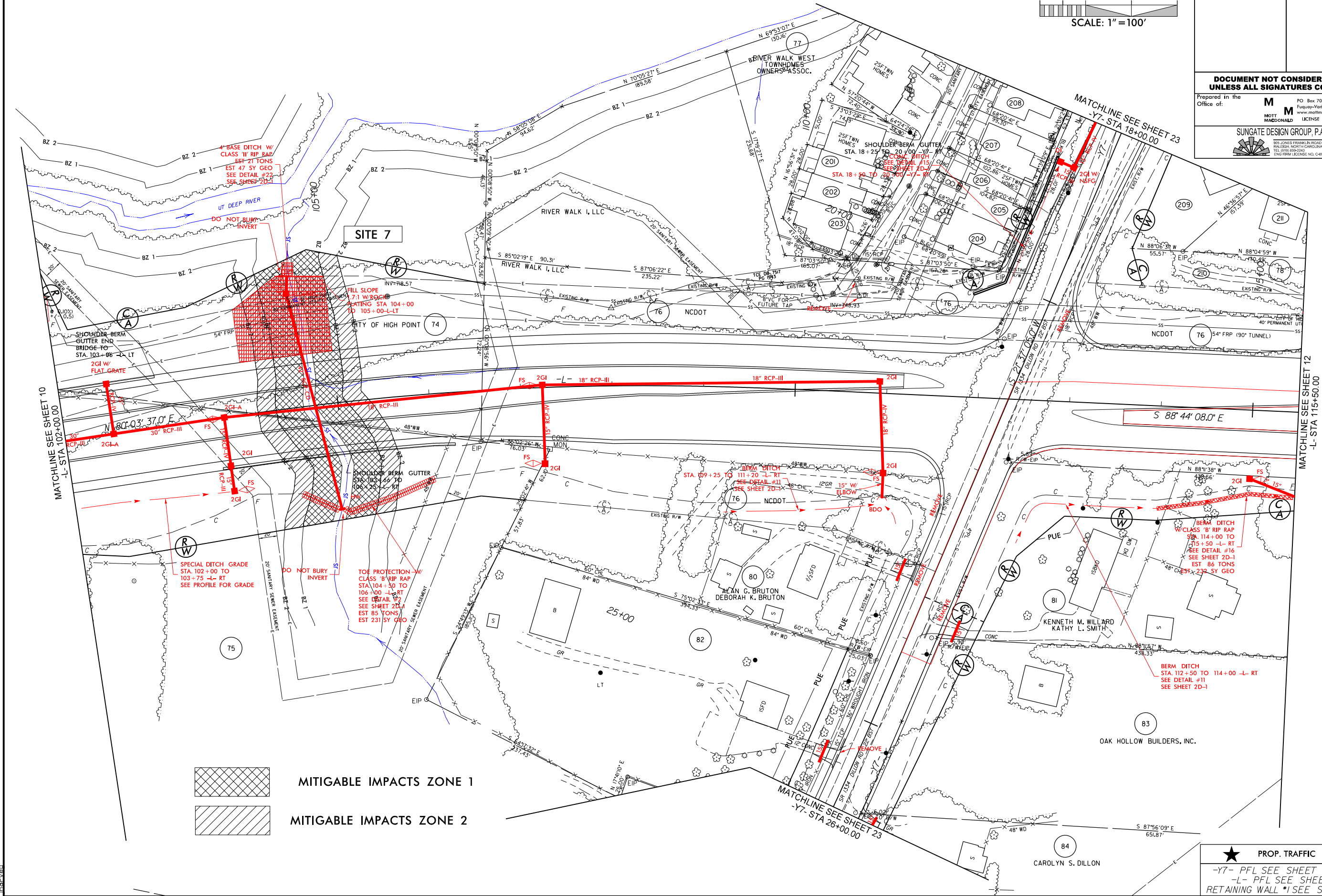


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SUNGATE DESIGN GROUP, P.A.			
		800 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27606 TEL: (919) 600-2442 ENG FIRM LICENSE NO. C-4860	

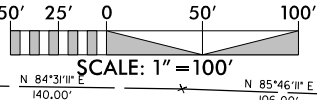


8/17/99
2/23/2018
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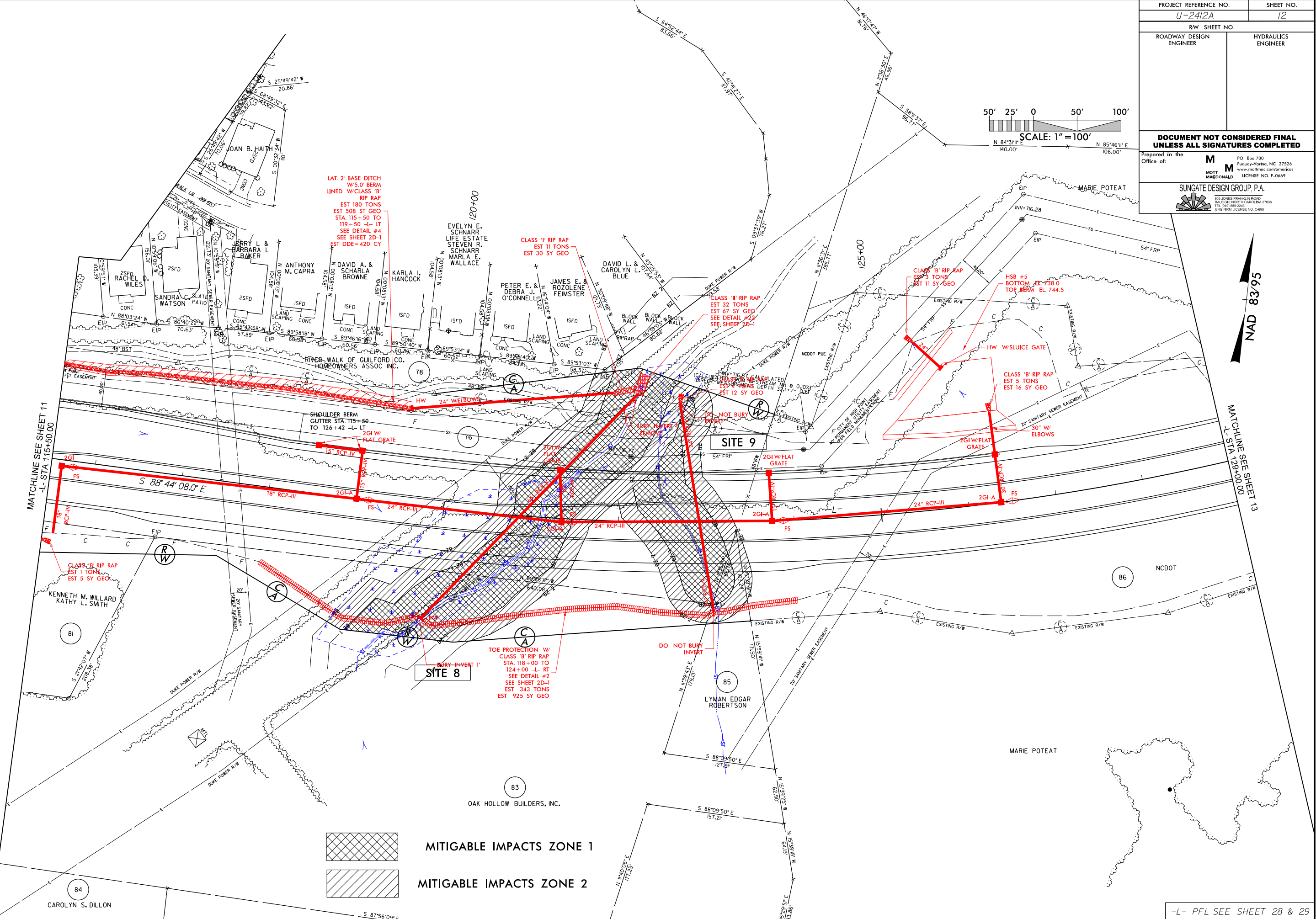
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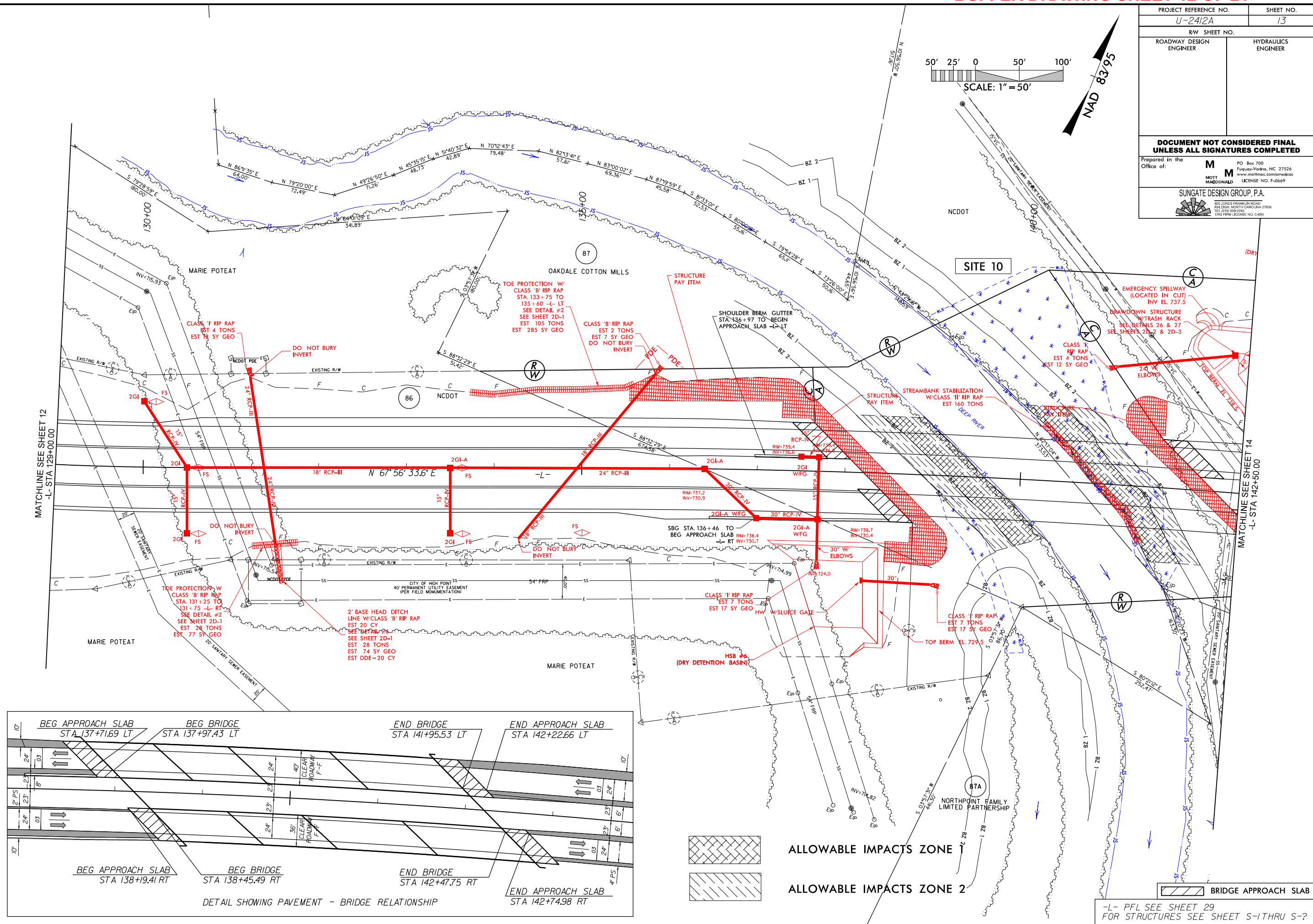
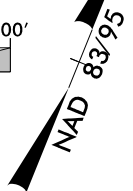


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U-2412A		12	
RW SHEET NO.			
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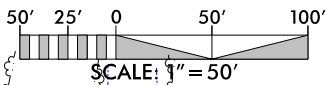


NAD 83/95

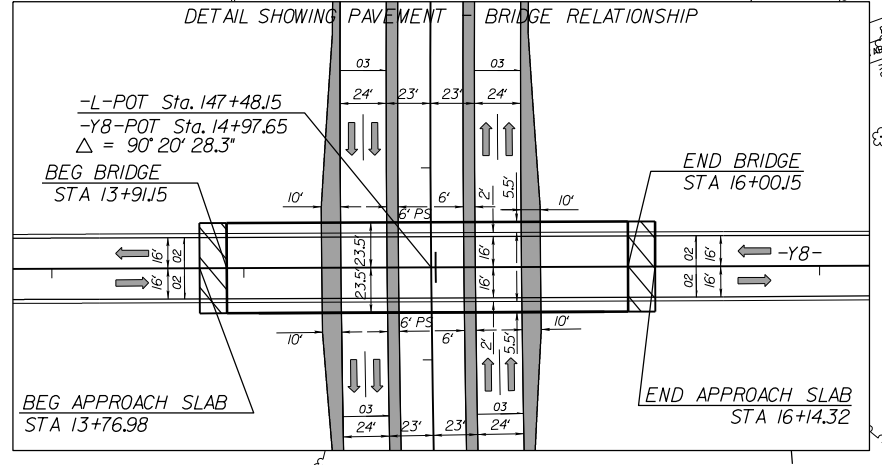
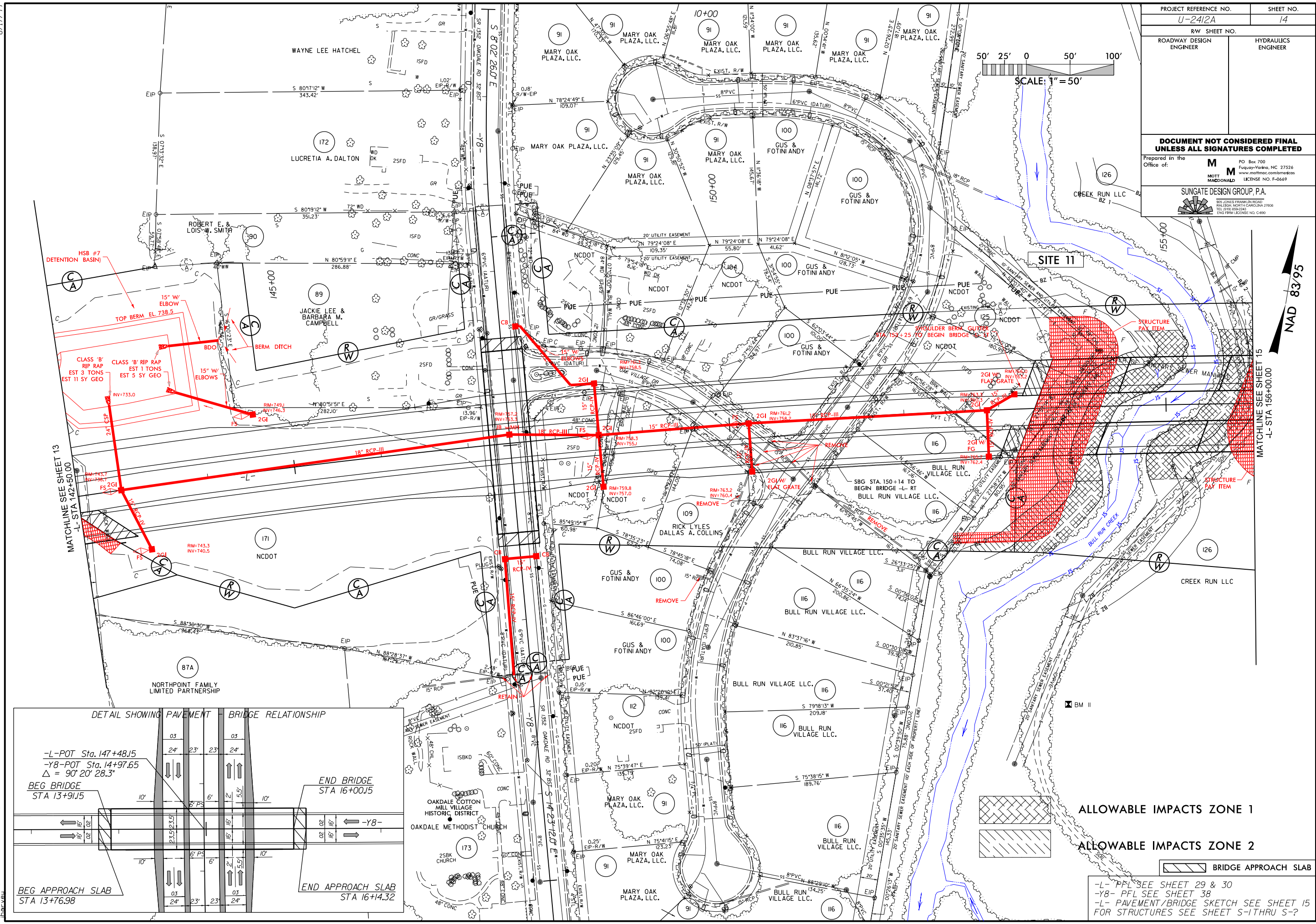




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RW SHEET NO.			
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER		
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SUNGATE DESIGN GROUP, P.A. 905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL (919) 660-2441 ENG FRM LICENSE NO. C-4900			



NAD 83/95



ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

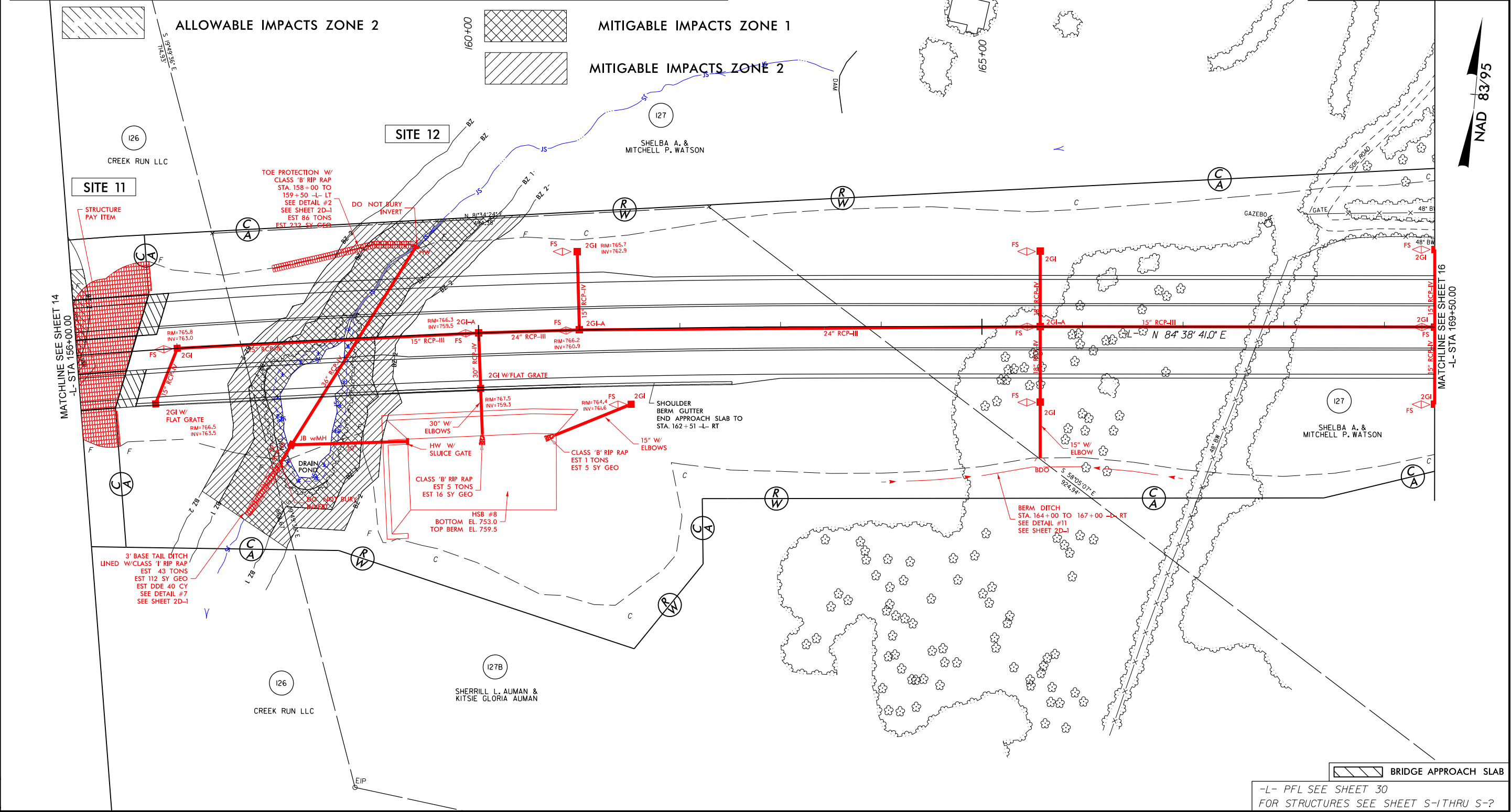
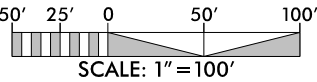
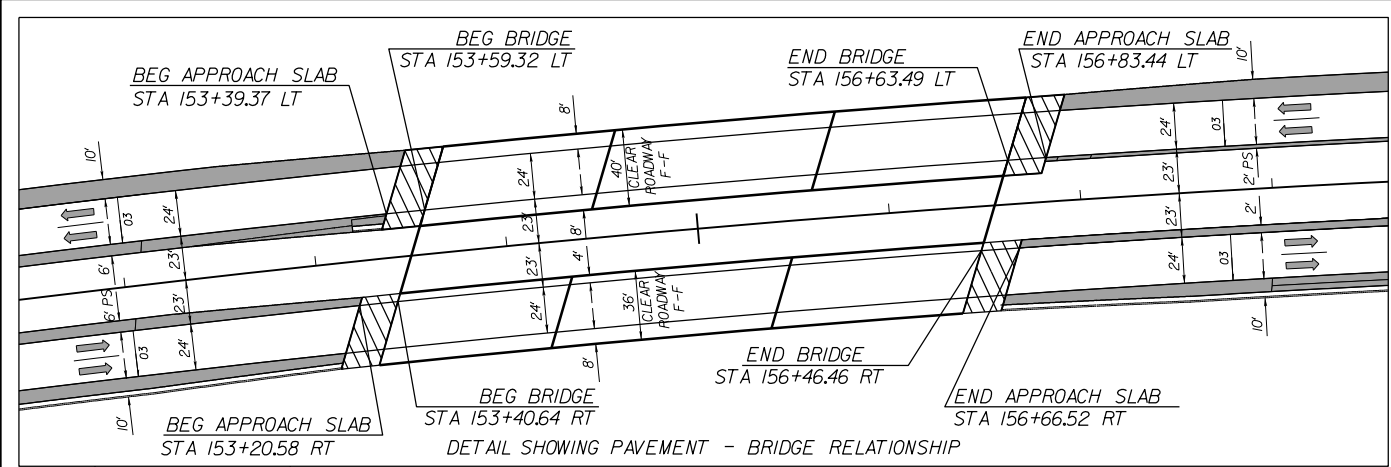
BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 29 & 30
-Y8- PFL SEE SHEET 38
-L- PAVEMENT/BRIDGE SKETCH SEE SHEET 15
FOR STRUCTURES SEE SHEET S-1 THRU S-?

8/17/99

2/23/2018 10:21:26 AM d:\p\m\buf_psh_14.dgn

PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		15	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
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SUNGATE DESIGN GROUP, P.A.  300 S. JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL: (919) 859-2444 ENG. FIRM LICENSE NO. C-4890			



BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 30
 FOR STRUCTURES SEE SHEET S-1THRU S-?

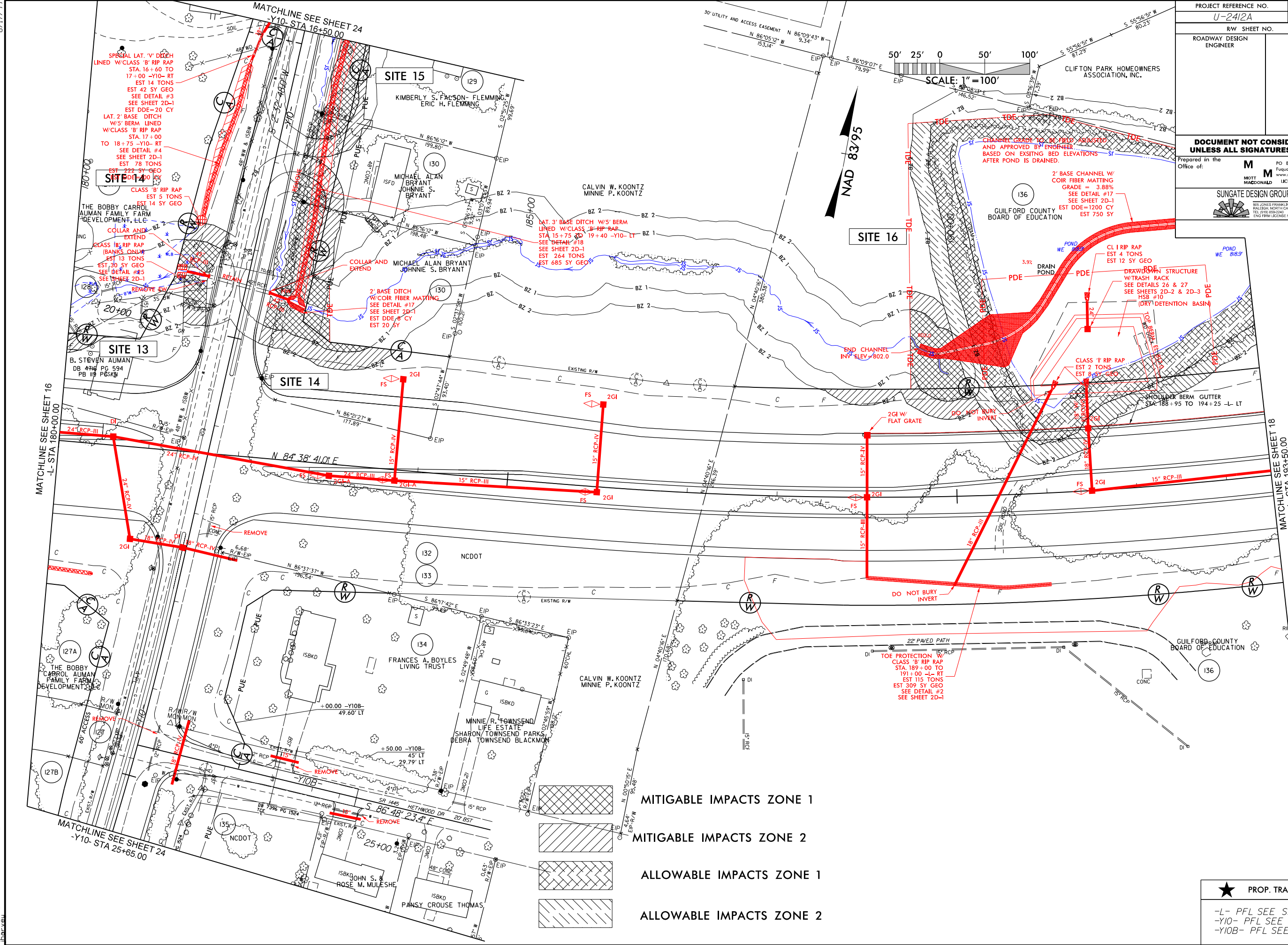
8/17/99

2/23/2018
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NAD 83/95



PROJECT REFERENCE NO. U-2412A		SHEET NO. 17
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
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MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

ALLOWABLE IMPACTS ZONE 1

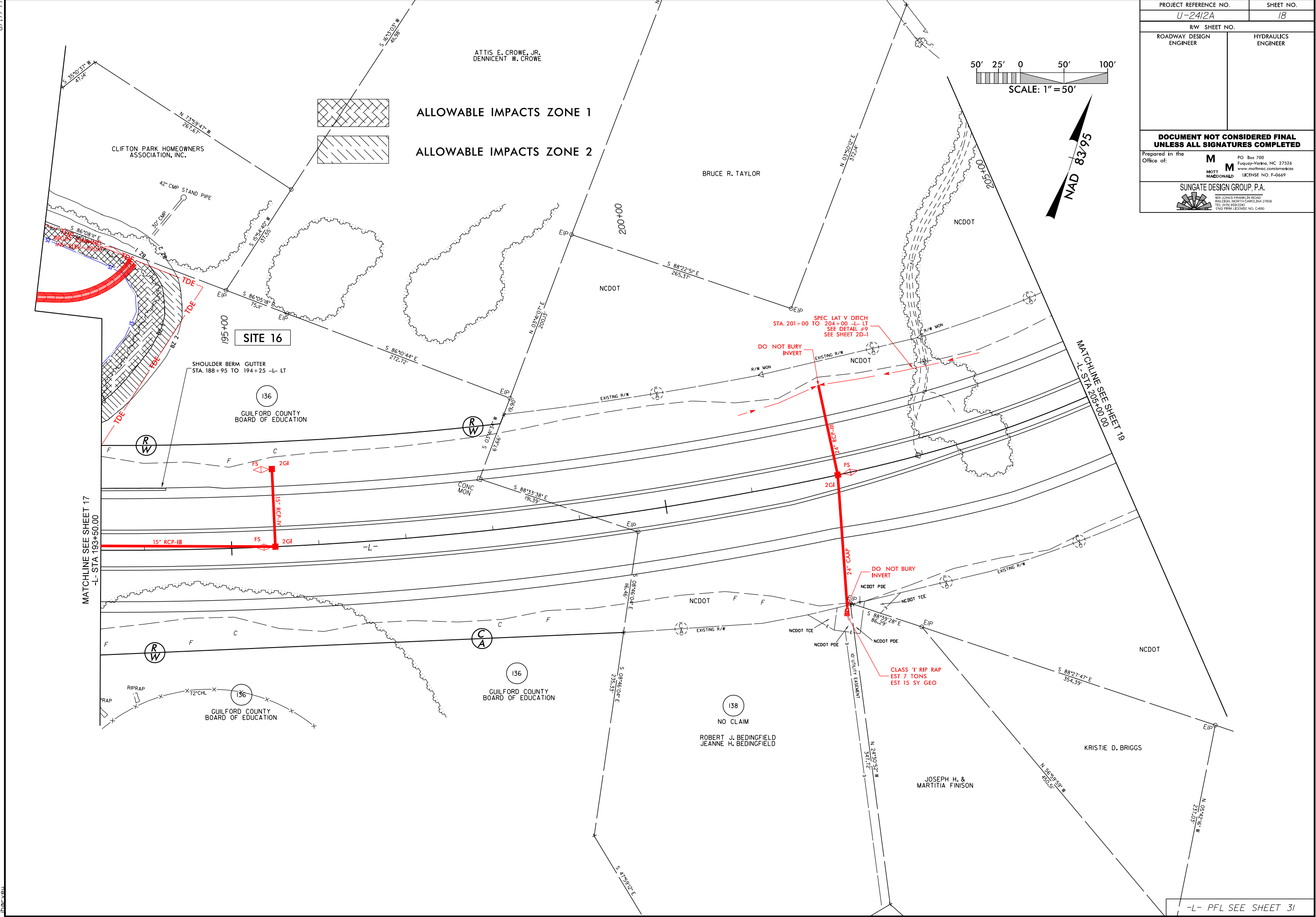
ALLOWABLE IMPACTS ZONE 2

★ PROP. TRAFFIC SIGNAL

-L- PFL SEE SHEET 31
-Y10- PFL SEE SHEET 39
-Y10B- PFL SEE SHEET 38

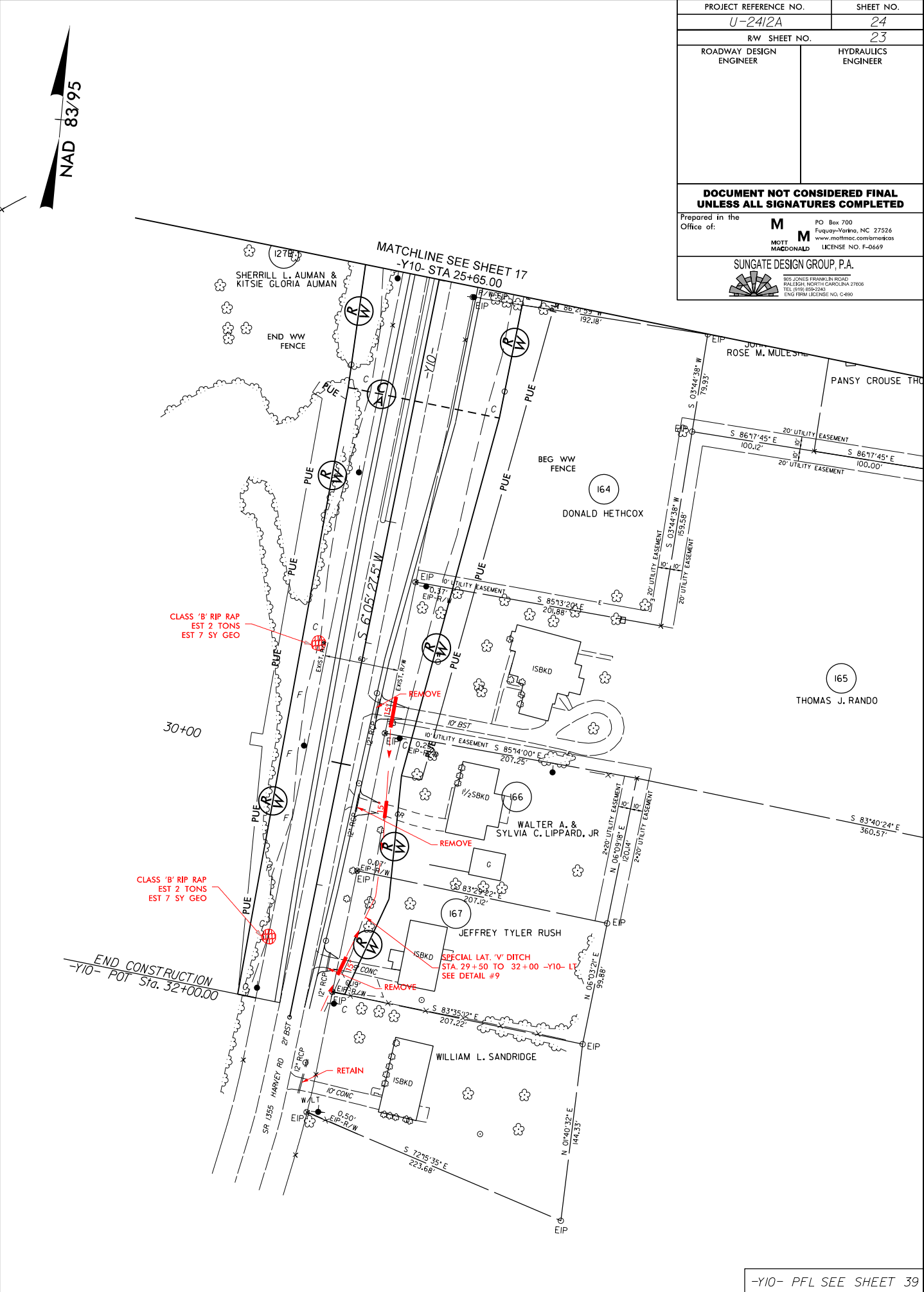
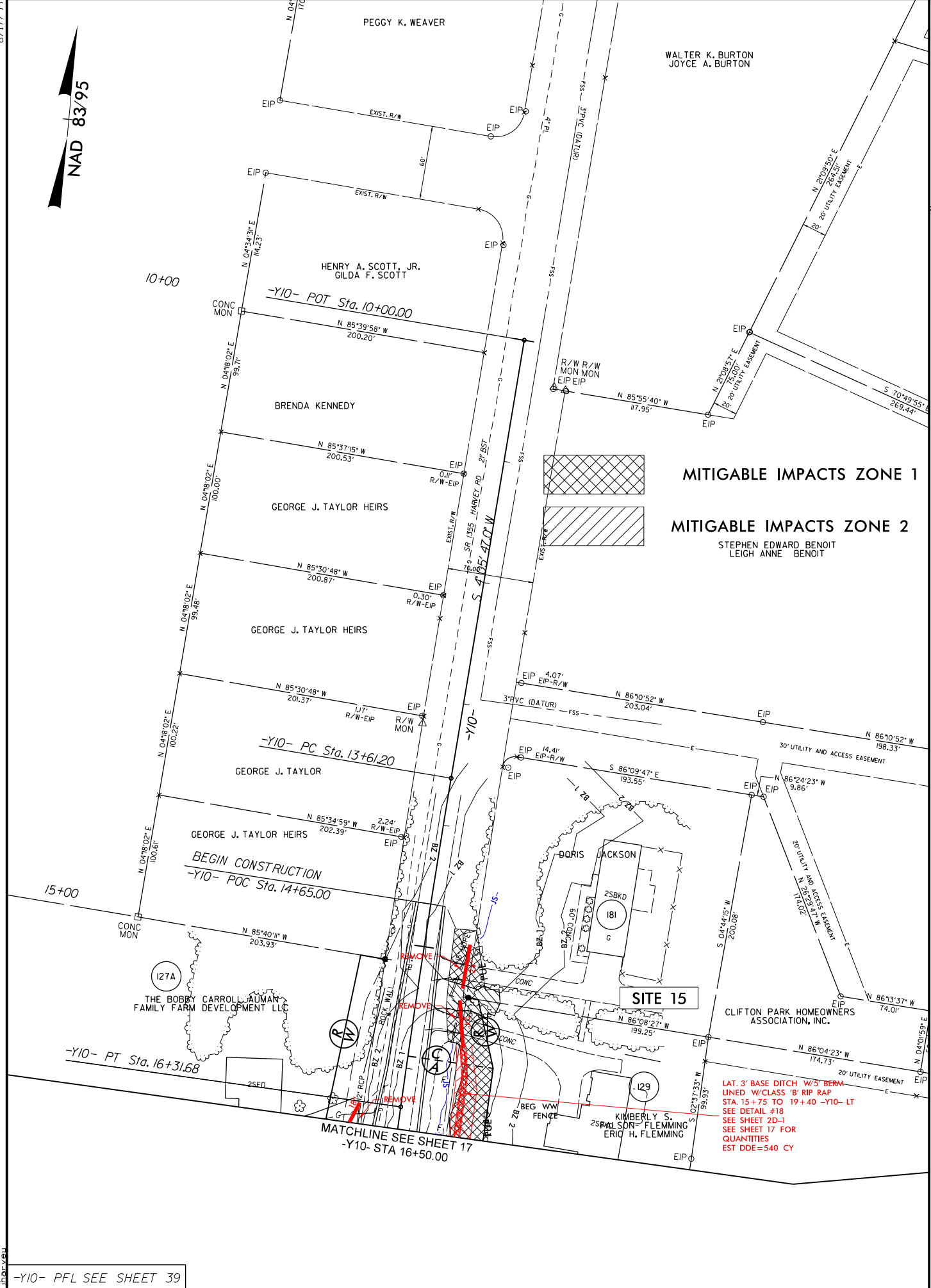
8/17/99
2/23/2018
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PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		18	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
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	PAVEMENT REMOVAL
-Y- PFL SEE SHEET 34	
-YA- PFL SEE SHEET 34	
-YC- PFL SEE SHEET 34	
-Y3- PFL SEE SHEET 35	

PROJECT REFERENCE NO.		SHEET NO.	
U-2412A		24	
RW SHEET NO.		23	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
 			



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RIPARIAN BUFFER IMPACTS SUMMARY													
			IMPACT									BUFFER REPLACEMENT	
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	TYPE			ALLOWABLE			MITIGABLE				
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft²)	ZONE 2 (ft²)	TOTAL (ft²)	ZONE 1 (ft²)	ZONE 2 (ft²)	TOTAL (ft²)	ZONE 1 (ft²)	ZONE 2 (ft²)
1	DITCH	27+94 to 28+68 -L- LT	X						21,406	18,009	39,415		
2	ROADWAY FILL	35+76 to 46+10 -L-	X						45,276	27,771	73,047		
3	36" RCP	51+06 to 51+57 -L-	X			5,208	4,972	10,180					
4	54" RCP	52+57 to 53+13-L-	X						26,140	20,878	47,018		
5	36" RCP	84+49 to 89+08 -L-	X						30,129	20,878	51,007		
6	BRIDGE	94+06 to 96+23-L-		X		11,465	7,451	18,916					
7	42" RCP	104+19 to 105+56-L-	X						17,689	11,782	29,471		
8	66" RCP	118+97 to 121+07-L-	X						26,549	17,359	43,908		
9	24" RCP	121+07 to 123+41 -L-	X						10,559	9,478	20,037		
10	BRIDGE	138+21 to 141+21 -L-		X		12,930	4,784	17,714					
11	BRIDGE	152+69 to 156+16-L-		X		22,336	15,050	37,386					
12	36" RCP/POND	157+16 to 160+51-L-	X						23,818	15,825	39,643		
13	6'x6' RCBC/POND	171+31 to 180+44-L-	X						61,627	35,903	97,530		
14	ROADWAY FILL	17+86 to 20+09-Y10-	X						6,068	4,602	10,670		
15	ROADWAY FILL	15+25 to 17+79-Y10-LT			X				11,181	5,682	16,863		
16	POND	188+45 to 194+47-L-LT	X			31,329	17,159	48,488	4,398	3,906	8,304		
17	36" RCP	19+00 to 19+80-Y-RT	X			1,320	720	2,040					
TOTAL:						84,588	50,136	134,724	284,840	192,073	476,913	0	0

NOTE:

Site 13 and 14 are on same stream

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILFORD COUNTY
PROJECT: 34802.2.2
U-2412A

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SHEET 20 OF 21

WETLANDS IN BUFFER IMPACTS SUMMARY

			WETLANDS IN BUFFERS		
SITE NO.	STATION (FROM/TO)		ZONE 1 (ft ²)	ZONE 2 (ft ²)	
1	27+94 to 28+68 -L- LT		1,369	246	
2	35+76 to 46+10 -L-		8,080	2,321	
5	84+49 to 89+08 -L-		1,214	103	
8	118+97 to 121+07-L-		12,301	6,564	
9	121+07 to 123+41 -L-		27	13	
10	138+21 to 141+21 -L-		6,844	3,479	
12	157+16 to 160+51-L-		2,265	0	
13	171+31 to 180+44-L-		16,929	2,516	
14	17+86 to 20+09-Y10-		473	67	
TOTAL:			49,502	15,309	

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILFORD COUNTY
PROJECT: 34802.2.2
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SHEET 21 OF 21