

PROJECT COMMITMENTS

T.I.P. Project No. R-2247EB
Winston-Salem Northern Beltway Interchange at US 52 (Future I-74)
Forsyth County
Federal-Aid Project No. NHP-0074(213)
WBS No. 34839.3.GV7

All commitments developed during the project development and design phase have been incorporated into the design. Current status, changes, or additions to the project commitments as shown in the environmental document for the project are printed in *italic* font; commitments, which are not pertinent to R-2247EB have been grayed out.

PDEA, Roadway Design, Division 9:

1. Archaeological site 31FY570**, a historic cemetery, will require avoidance or compliance with North Carolina General Statute, Chapter 70.

This site is located outside of the Area of Potential Effects (A.E.P.) of the segment, a short distance west of R-2247EB.

2. Temporary construction easements may be needed on the historic Clayton Family Farm property. It has been determined that these temporary easements do not constitute a use under Section 4(f). No permanent right of way will be acquired from the Clayton Family Farm property. All work will be contained in temporary easements, and the encroachment on the property will be minimal. The duration of the temporary encroachment on the Clayton Family Farm property will be shorter than the timeframe for the construction of the project. The land temporarily occupied from the Clayton Family Farm will be fully restored, that is, the Clayton Family Farm property will be returned to a condition that is at least as good as that which existed prior to the project.

Based on the preliminary plans, temporary easement is required. This commitment will be fulfilled during right of way acquisition and construction.

3. Eligibility of Site 31FY64 is unknown because archaeologists were denied access to the property. If the site falls within the Preferred Alternative after final design, an assessment would be conducted prior to construction after it is acquired by NCDOT. Currently, the site is adjacent to non-preferred Detailed Study Alternative segment E3.

This commitment will be fulfilled during right of way acquisition.

4. A design noise study will be prepared for the selected alternative. The date of public knowledge for noise abatement purposes is the date the Record of Decision (ROD) is signed. Projects let for construction on or after July 13, 2011 shall be reviewed under NCDOT 2011 noise analysis criteria; however, the original date of public knowledge shall remain unchanged.

Action: The ROD was signed in February 2008. Design Noise Reports based upon preliminary design were completed for U-2579 AB, B & C in 2009. A Revised Design Noise Report based upon final design was completed for U-2579B and approved by FHWA in 2014. A Revised Design Noise Report based upon final design will be completed for U-2579C in 2015. Revised Design Noise Reports based upon final design of U-2579AA and AB will be completed prior to Project Letting scheduled for October 2021. All Design Noise Reports are subject to approval by NCDOT and FHWA. The original Date of Public Knowledge of February 15, 2008 will remain unchanged for all sections of U-2579. A revised DNR will be prepared in 2015 for U-2579C under the NCDOT 2011 noise abatement criteria.

The design noise study for the Project R-2247 portion of the Beltway will include an evaluation of Ronald Reagan High School.

- *6. The NCDOT will develop Data Recovery Plans (DRP) for Sites 31FY888, 31FY893**, 31FY901, 31FY902**, 31FY903, 31FY910**, 31FY911 **, 31FY912**, 31FY921, 31FY925**, 31FY944, 31FY1053/1053**, all of which will be affected by the subject project, in consultation with the North Carolina SHPO.

*A Data Recovery Plan for excavation of site 31FY925** was developed and implemented. Data recovery was completed in February 2019.*

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

A Data Recovery Plan was developed and implemented after design was completed and Right-of-Way was acquired. Data recovery was completed in February 2019.

- *8. As they are developed, each individual DRP will be forwarded for review by the SHPO.

The data recovery plan was submitted to SHPO on 9/30/2018. SHPO concurred with the data recovery plan on 11/9/2018

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

The end of fieldwork management summary was submitted to SHPO on 2/26/2019.

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

SHPO concurred with the results of the management summary on 3/18/2019.

- *11. Upon acceptance of the recommendations contained in the Management Summary, the SHPO will issue the NCDOT documentation that the Data Recovery field investigations have been completed.

SHPO concurred with the recommendation that no further archaeological work is required on 3/18/2019.

- *12. The analysis and report preparation, detailing Sites 31FY888, 31FY893**, 31FY901, 31FY902**, 31FY903, 31FY910**, 31FY911 **, 31FY912**, 31FY921, 31FY925**, 31FY944, 31FY1053/1053** will be completed by the NCDOT, or their consultants, within twenty-four (24) months after completion of each site's fieldwork schedule.

*This commitment is not necessary for site 31FY925** because the end of fieldwork*

management summary recommended no further work. SHPO agreed on 3/18/2019.

Roadway Design, Division 9, Right of Way Branch:

- *1. In the vicinity of Alexander Hege House, NCDOT in consultation with SHPO will determine the extent of control-of-access fencing, as well as its type, material, and finish. NCDOT will purchase and then install the control-of-access fencing within the NCDOT right-of-way. NCDOT will maintain the control-of-access fencing.

Roadway Design, Utility Unit, Division 9, Right of Way Branch, GeoEnvironmental:

1. NCDOT will continue to work with residents of affected communities to develop mitigation strategies for community impacts. The following options will be considered during final design to minimize impacts to communities/subdivisions: construction of noise abatement barriers landscaping or vegetative screens based on NCDOT policies and guidelines. These types of options already have been incorporated into the Project R-2247 preliminary engineering designs where practicable, but will be further considered during final design.

Action: The final designs are completed; the above commitments have been addressed.

2. During final design for Projects R-2247, U-2579, and U-2579A, all utility providers and railroad operators would be coordinated with to ensure that the proposed design and construction of the project would not substantially disrupt service.

This is a standard commitment.

3. The development of this project will be further coordinated with the City of Winston Salem and Forsyth County Parks and Recreation Departments to minimize any conflicts with future parks and greenways planning. Provisions will be considered to maintain the future viability of any impacted proposed greenways.

Action: Roadway Design coordinated with the city of Winston Salem and avoided any impacts to greenways.

4. NCDOT will coordinate with the NCDENR Division of Waste Management regarding the Reynolds Auto Junkyard and other solid waste sites along the selected alternatives for Projects R-2247, U-2579, and U-2579A. Impacted sites will be remediated as required.

Action: The GeoEnvironmental Section of the Geotechnical Engineering Unit will coordinate with the Right of Way Branch to provide acquisition recommendations for potentially contaminated parcels. This coordination will occur prior to the parcel being acquired. Prior to construction the GeoEnvironmental Section will also coordinate with the NCDENR Division of Waste Management to address contaminated soil and ground water that may be encountered during construction.

5. NCDOT will consider wildlife crossings where appropriate in the vicinity of stream crossings, which will allow animals to cross under the Beltway.

Action: No special wildlife crossings are proposed. Opportunities for wildlife to cross exist along streams under bridges and through culverts. Also, small wildlife can use floodplain drains which are provided in the B and C projects.

6. NCDOT will coordinate with the Town of Kernersville regarding the compatibility of the Beltway design with the proposed Big Mill Farm Road interchange at US 421. This coordination will take place once all relevant design information has been obtained regarding the design of the Big Mill Farm Road interchange.

Action: Roadway Design coordinated and will continue to coordinate until project completion.

7. NCDOT intends to maintain a connection from Northampton Road to Old Walkertown Road. The final design will be developed based on design constraints and cost considerations.

Action: Current connection will be maintained.

- *8. NCDOT will align the Alexander Hege House driveway opposite the new intersection ramp, so property access will be under full traffic control. This will allow NCDOT and the property owner full movement for equipment and trucks.

Hydraulics Unit:

1. All bridges and culverts located in designated FEMA flood zones will be designed such that an increase in flood elevation would not exceed the lesser of 0.5 foot for the 100-year flood event or the elevation needed to protect structures.

Action: This commitment has been fulfilled.

2. The Hydraulics Unit will coordinate with the NC Floodplain Mapping Program (FMP), to determine status of project with regard to applicability of NCDOT'S Memorandum of Agreement, or approval of a Conditional Letter of Map Revision (CLOMR) and subsequent final Letter of Map Revision (LOMR).

The Hydraulics Unit will continue coordinate with the NC Floodplain Mapping Program (FMP) until project completion.

3. NCDOT will avoid installing bridge bents in creeks to the maximum extent practicable.

Action: This commitment has been fulfilled and no bridge bents are located in creeks.

Roadside Environmental, Division 9:

1. During design and construction, efforts will be made to minimize the impact to existing vegetative buffers and natural areas. NCDOT will prepare a post construction landscape design/corridor plan to mitigate construction impacts and integrate enhancements, while remaining sensitive to the environment and to the safety of the traveling public.

This is standard commitment; post construction plans will be prepared.

2. NCDOT will incorporate sediment and erosion control measures according to the Design Standards in Sensitive Watersheds for all construction in high quality water (HQW) zones in compliance with 15a NCAC 04B.0124.

Action: There are no qualifying factors present at this section.

- *3 NCDOT will provide tree protection measures along the National Register boundary lines adjoining project construction areas. NCDOT will exercise best management practices to minimize, as practicable, tree trimming and disturbance of existing plantings along the National Register boundary.

Action: NCDOT will implement this commitment as described in the concurrence form with SHPO. Properties listed are Alexander Hege House, Samuel Stauber House & Barn John Henry Kapp Farm, Clayton Family Farm Seaver's Gas Station, Hammock Family Farm And John & Charles Fries Day Farm.

Roadway, Hydraulics:

Generally, 2:1 slopes will be used where possible to minimize culvert length, and NCDOT will shorten culvert lengths where possible and daylight systems between culverts where possible in interchange areas.

Action: The current plans show side slopes near streams and wetlands are mostly 2:1 to minimize impact.

Right of Way Branch:

1. NCDOT will work with the property owner of Walker Mobile Home Park off of Bethania-Tobaccoville Road to determine the feasibility of relocating the homes to another area of the parcel.

This commitment will take place after design is complete and during Right of Way acquisition.

2. NCDOT will contact the pastor of Mount Pleasant Holiness Church prior to the public hearing and will, if desired, meet with the pastor and members of the church to discuss the impact of Project U-2579 on the church, NCDOT relocation policies, and potential mitigation.

Action: Since the 2004 SFEIS/SDEIS, NCDOT and consultant staff met with the Pastor and members of Mount Pleasant Holiness Church during the 2005 Public hearings. The church representatives declined to attend an Additional meeting regarding this project or impacts of the Northern Beltway on the church.

3. NCDOT will contact minority residents of North Oaks subdivision prior to the public hearing and will, if desired, meet with them to discuss the impacts of Project U-2579 on the community, NCDOT relocation policies, and potential mitigation.

Action: NCDOT and consultant staff met with North Oaks community on November 15, 2004

Division 9, Construction Unit:

A pre-construction survey will be done in areas of possible concern regarding structural damage to assess a pre-construction condition.

This commitment will be done prior to initiation of construction.

Division 9:

1. During construction for Project U-2579AB, NCDOT will coordinate with the Forsyth County School Board to ensure the safety of those students bicycling and/or walking to Sedge Garden Elementary School. If a portion of school property is needed for a temporary construction easement, that area will be fenced to keep school children out of the construction site. The school property will be restored following construction.

This commitment will be implemented during construction.

2. NCDOT will coordinate with local media during the construction of the project to alert the public of traffic restrictions and construction related activities.

This commitment will be implemented during construction

3. NCDOT shall not approve any new driveway permits along the property of the historic John Henry Kapp Farm within the right of way for the Preferred Alternative. This condition shall be filed in the NCDOT Division office responsible for driveway permits.

This commitment will be implemented as described in the concurrence form with SHPO, during construction of the project.

4. This project involves construction activities on or adjacent to FEMA-regulated stream(s). Therefore, the Division shall submit sealed as-built construction plans to the Hydraulics Unit upon completion of project construction, certifying that the drainage structure(s) and roadway embankment that are located within the 100-year floodplain were built as shown in the construction plans, both horizontally and vertically.

This commitment will be fulfilled after the completion of the project.

PDEA-NES:

The biological conclusion for the Northern long-eared bat is Unresolved. Construction authorization will not be requested until ESA compliance is satisfied for the northern long-eared bat.

NCDOT has determined that the proposed action does not require separate consultation on the grounds that the proposed action is consistent with the final Section 4(d) rule, codified at 50 C.F.R. § 17.40(o) and effective February 16, 2016. NCDOT may presume its determination is informed by best available information and consider Section 7 responsibilities fulfilled for NLEB.

COMMITMENTS FROM PERMITTING

Design Build Team:

401 WQC Project Specific Condition No. 3: 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 stream beds or banks, adjacent to or upstream and downstream of the above structures. The applicant is required to provide evidence that equilibrium is being maintained if requested in writing by NCDWR. Table 3 below summarizes approved culvert burial practices as described in the permit modification application. [15A NCAC 02H.0506(b)(2)]

Table 3. Pipe invert burial depths for R-2247EB*.

Site	Location	Burial Depth (feet)
15A	186+91-L-	1.0

*All other pipe locations as described in the permit modification application do not require burial.



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

August 13, 2019

Regulatory Division

Action ID: SAW-2017-02112, NC DOT R-2247EB, Winston-Salem Northern Beltway,
Interchange at US 52 (Future I-74), Individual Permit issued January 22, 2018

Mr. Philip S. Harris III, P.E., C.P.M.
Environmental Analysis Unit 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 issued on January 22, 2018, to the North Carolina Department of Transportation, (NC DOT) for impacts associated with the new location project known as the Winston Salem Northern Beltway, TIP R-2247, (Western Section). The R-2247EB section is at the northern extent of the proposed new road in Winston-Salem, from I-40 to US 52, in Forsyth County, North Carolina. Coordinates (in decimal degrees) for the site are 36.185° North and -80.278° West. The R-2247EB section contains Grassy Creek, as well as unnamed tributaries to Grassy Creek in the Yadkin River Basin. This section also contains impacts to eight (8) wetland areas in the Yadkin River Basin. Also reference North Carolina Department of Environmental Quality Water Quality Certification #004131 dated July 23, 2019.

Impacts authorized by the by the January 22, 2018 phased standard permit included preliminary designs for R-2247EB. A Special Condition within the phased permit stipulated that construction on those sections containing preliminary designs could not commence until final design had been completed for those sections, impacts to waters and wetlands had been minimized to the maximum extent practicable, and a compensatory mitigation plan submitted and approved by the USACE. On June 26, 2019, the U.S. Army Corps of Engineers (Corps) received all the required information stated above along with a request from NC DOT to modify the phased standard permit, SAW No. 2017-02112, to allow construction for the R-2247EB segment with the following considerations:

The project limits for R-2247EB have shifted over time, with R-2247EA lengthened by shifting its end point further east of NC 65. Additionally, R-2247EB was extended to the ramp gore area of the Westinghouse Road interchange which is north of the original permit project limits. As a result of the project limit shift, 0.01 acre of wetland 23 and 774 linear feet of stream QQ are now part of the R-2247EA project.

Some impacts to waters of the U.S. were missed in previous submittals. The original permit for SAW No. 2017-02112 did not identify impacts to Stream WW and Wetland 42. The R-2247EB widening of US 52 within the R-2247EC project limits created additional impacts to Wetland 49, Wetland 50 and Wetland 26 and to Streams III, TTT, LLL and SS. These impacts were not included in the impact tabulations for the R-2247EB project at the preliminary design at the time of the original January 22, 2018 standard permit.

Design revisions for R-2247EB included higher design speed which increased the impacts at Streams RR and VV totaling 320 linear feet for the interchange with US 52. The interchange was shifted slightly to decrease impacts to Streams DDD and WW while increasing impacts to Wetlands 43 and 34 and Streams VV and RR. These changes in impacts due to design changes were included in the information presented at the 4B and 4C Merger Meetings. Also during Merger 4B and 4C meetings, the federal and state agencies, in concert with NC DOT, decided that Wetland 29 and Wetland 26 would be totally impacted versus partially impacted.

These modifications to the above phased standard permit are for the following impacts: 5,817 linear feet of permanent stream impacts, 494 linear feet of which are for bank stabilization. Therefore, 5,323 linear feet of permanent stream channel impacts requires mitigation. NC DOT will use the North Carolina Division of Mitigation Services (DMS) In Lieu Fee program to mitigate for the unavoidable impacts to stream channels and wetlands. There will be 516 linear feet of temporary stream impacts for the project. Permanent impacts to wetlands include 0.43 acres of fill, excavation, and mechanized clearing. All 0.43 acres of permanent wetland impacts will be mitigated for using the DMS In-Lieu Fee program. There are no temporary impacts to wetlands for the proposed R-2247EB project.

The Corps has completed the evaluation of your request and has determined that the modification is appropriate and reasonable, and no public notice is required for this modification. As such, the SAW No. 2017-02112 standard permit is modified as requested and shown on the enclosed "WINSTON-SALEM NORTHERN BELTWAY – INTERCHANGE AT US 52 (FUTURE I-74)," Sheets 1-70, dated April 29, 2019.

For your information, the following special conditions from the original authorization have been updated to include the new compensatory mitigation requirements and the new modified plan set:

1. Construction Plans: All work authorized by this permit must be performed in strict compliance with the attached plans, entitled: "WINSTON-SALEM NORTHERN BELTWAY – INTERCHANGE AT US 52 (FUTURE I-74)," Sheets 1-71, dated June 3, 2019. Any modification to these plans must be approved by the U.S. Army Corps of Engineers (Corps) prior to implementation.
25. 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.

This correspondence contains a proffered modified permit for the above described project. If you object to this decision, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for appeal (RFA) form. If you request to appeal this decision you must submit a completed RFA form to the following address:

District Engineer, Wilmington Regulatory Division
Attn: Ms. Nicholle Braspenickx
69 Darlington Avenue
Wilmington, North Carolina 28403

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP.

It is not necessary to submit an RFA form to the Division Office if you do not object to the decision contained in this correspondence.

All other conditions of the permit, including the permit expiration date of December 31, 2028, remain in effect as written. Should you have questions, contact Ms. Nicholle Braspenickx, Charlotte Regulatory Field Office, via email at Nicholle.M.Braspenickx@usace.army.mil or by telephone at (704) 510-0162.

FOR THE COMMANDER



Monte Matthews
Lead Project Manager
Wilmington District

Enclosures

1. Permit Impact Sheets 1-70, dated April 29, 2019
2. Compensatory Mitigation Responsibility Transfer Form
3. Notification of Administrative Appeal Options Process and Request for Appeal Form

Copies furnished w/o enclosures:

Mr. Dave Wanucha
Transportation Permitting Unit
Division of Water Resources
North Carolina Department of
Environment and Natural Resources
450 West Hanes Mill Road, Suite 300
Winston-Salem, North Carolina 27105

Ms. Amy Euliss
Division Environmental Officer, Division 9
North Carolina Department of Transportation
375 Silas Creek Parkway
Winston-Salem, North Carolina 27127

Ms. Claire Ellwanger
U.S. Fish and Wildlife Services
Asheville Ecological Service Field Office
160 Zillicoa Street
Asheville, North Carolina 28801

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

Ms. Marla Chambers
Division of Inland Fisheries
North Carolina Wildlife Resources Commission
7121 Mail Service Center
Raleigh, North Carolina 27699-1721

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

Permittee: North Carolina Department of Transportation

Action ID: SAW No. 2017-02112

Project Name: R-2247EB, Winston-Salem Northern Beltway, Interchange at US 52 (Future I-74) County: Forsyth

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: 03040101, Yadkin River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
5,323 l.f.			0.43 acre			

*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: 03040101, Yadkin River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
10,646 l.f.			0.86 acre			

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: NCDMS

Name of Sponsor's Authorized Representative: Beth Harmon

Beth Harmon
Signature of Sponsor's Authorized Representative

08/14/2019
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 is for R-2247EB, Winston-Salem Northern Beltway Interchange at US 52 (Future I-74). As a result of a project limits shift, 0.01 acre of Wetland 23 and 774 linear feet of Stream QQ are now part of the R-2247EA project.

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: Nicholle Braspenickx
USACE Field Office: Wilmington Regulatory Field Office
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403

Email: Nicholle.M.Braspenickx@usace.army.mil

Nicholle Braspenickx

USACE Project Manager Signature

August 13, 2019

Date of Signature

ROY COOPER

Governor

MICHAEL S. REGAN

Secretary

LINDA CULPEPPER

Director



NORTH CAROLINA
Environmental Quality

August 13, 2019

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 401 Water Quality Certification** Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS for Proposed Winston Salem Northern Beltway Interchange (TIP R-2247EB) at US 52 (Future I-74) in Forsyth County of which is part of the overall Winston Salem Northern Beltway that includes the following projects: Northern Beltway from I-40 to US 52 (TIP Nos. R-2247B Phase 2, CA, CB, CD, D, EA, EB, and EC); US 52 to US 311 north (U-2579C Phase 2, D, E, and F) and from I-40 Business to US 311 south (U-2579AA and AB). Federal Aid Project No. NHP-0074(213), WBS No. 34839.3.GV7; NCDWR Project No. 19980260 v4.

Dear Mr. Harris:

Attached hereto is a copy of modified Certification No. WQC004131 for TIP R-2247EB issued to The North Carolina Department of Transportation (NCDOT) dated August 13, 2019.

For reference, WQC004131 was initially issued on November 14, 2017, revised on November 27, 2017, December 21, 2017 and again on February 7, 2019. Version 4 issued on July 23, 2019 needs to be replaced with this version 4 of which corrects a typographical error.

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

Sincerely,
Designed by:

Amy Chapman

Linda Culpepper, Director
Division of Water Resources

Electronic copy only distribution:

Nicholle Braspennickx, US Army Corps of Engineers, Charlotte Field Office
Amy Euliss, Division 9 Environmental Officer
Bill Barret, NC Department of Transportation
Carla Dagnino, NC Department of Transportation
Chris Militscher, US Environmental Protection Agency
Claire Ellwanger, US Fish and Wildlife Service
Marla Chambers, NC Wildlife Resources Commission
Beth Harmon, Division of Mitigation Services
File Copy



North Carolina Department of Environmental Quality | Division of Water Resources
512 North Salisbury Street | 1617 Mail Service Center | Raleigh, North Carolina 27699-1617
919.707.9000

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

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Resources (NCDWR) Regulations in 15 NCAC 2H .0500. This certification authorizes the NCDOT to impact an additional 0.43 acres of jurisdictional wetlands, and 6,333 linear feet (including permanent, temporary and bank stabilization impacts) of jurisdictional streams in Forsyth County. The project shall be constructed pursuant to the modification application dated June 26, 2019. The authorized impacts are as described below:

Table 1. Stream Impacts in the Yadkin Pee Dee River Basin, R-2247EB.

Site	Stream Designation	Description of Impacts	Permanent Impacts (linear ft)	Temporary Impacts (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
1	Perennial	Culvert	23	17	-
		Bank Stabilization	43	-	-
2	Intermittent	Fill	85	-	-
3			50	-	-
4A	Perennial	Culvert	30	16	-
		Bank Stabilization	39	-	-
4B		Outlet Protection	40	7	-
5	Intermittent	Pipe	12	-	-
		Outlet Protection	29	-	-
6A	Perennial	Culvert	15	25	-
		Outlet Protection	16	-	-
		Fill*	10	-	-
7		Outlet Protection	27	25	-
		Fill*	11	-	-
8B	Intermittent	Fill*	33	-	-
9A	Perennial	Fill	504	-	504
		Fill*	17	-	17
10A		Rip Rap Fill	30	26	30

Table 1. Stream Impacts in the Yadkin Pee Dee River Basin, R-2247EB.

Site	Stream Designation	Description of Impacts	Permanent Impacts (linear ft)	Temporary Impacts (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
10B	Perennial	Bank Stabilization	8	23	-
10C		Culvert	281	28	281
		Outlet Protection	33	-	33
		Bank Stabilization	30	-	-
10D			47	-	-
10E	Perennial	Culvert	343	25	343
		Bank Stabilization	24	-	-
		Outlet Protection	29	-	29
10F		Culvert	215	27	215
		Bank Stabilization	33	-	-
		Outlet Protection	47	-	47
10G		Bank Stabilization	97	-	-
10H		Culvert	273	27	273
		Rip Rap Fill	75	-	75
12A		Channel Change	282	11	-
13A	Intermittent	Pipe	52	-	-
	Perennial	Pipe	23	25	-
Outlet Protection		36	-	-	
14A		Culvert	154	10	154
		Bank Stabilization	24	-	-
14B		Culvert/Channel Change	926	-	926
15A		Culvert	83	27	83
		Bank Stabilization	37	-	-
15B		Channel Change	1,092	25	1,092
15C		Bank Stabilization	34	22	-

Table 1. Stream Impacts in the Yadkin Pee Dee River Basin, R-2247EB.

Site	Stream Designation	Description of Impacts	Permanent Impacts (linear ft)	Temporary Impacts (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
15D	Perennial		13	44	-
15E			13	19	-
15F			19	26	-
15G		Culvert	334	22	334
15G	Perennial	Rip Rap	27	-	27
16		Culvert	39	27	-
		Inlet Protection	22	-	-
17B	Intermittent	Ditch	25	-	-
18		Bank Stabilization	33	12	-
Totals			5,817	516	4,463

* Due to an overlap in projects, impacts were previously accounted for in Section EC and have been adjusted herewith.

Table 2. Wetland (Riverine/Riparian) Impacts in the Yadkin Pee Dee River Basin, R-2247EB.

Site	Fill (ac)	Excavation (ac)	Mechanized Clearing (ac)	Impacts Requiring Mitigation (ac)
6B*	0.01	-	-	0.01
8A*	0.02	-	0.02	0.02
8C*	0.07	-	-	0.06
9B	0.12	0.06	0.04	0.22
11	0.03	<0.01	<0.01	0.04
12B	-	<0.01	<0.01	0.01
13B	<0.01	-	-	<0.01
17A	0.02	0.05	-	0.07
Total	0.29	0.12	0.07	0.43

* Due to an overlap in projects, impacts were previously accounted for in Section EC and have been adjusted herewith. Mitigation totals are rounded.

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

This approval is only valid for the purpose and design that you submitted in your application for a modification dated June 26, 2019. All the authorized activities and conditions associated with the phased permit Water Quality Certification issued on November 14, 2017, revised on November 27, 2017, revised again on December 21, 2017 and February 7, 2019, still apply except where superseded by this certification.

Should your project change, you are required to notify 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). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Condition(s) of Certification:

Project Specific Conditions

1. Compensatory mitigation for 4,463 linear feet of impact to streams and 0.43 acres of 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 September 29, 2017 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. This approval is only valid for the purpose and design that you submitted in your application for a modification dated June 26, 2019. All the authorized activities and conditions associated with the phased permit Water Quality Certification issued on November 14, 2017, revised on November 27, 2017, December 21, 2017 and again on February 7, 2019 still apply except where superseded by this certification.

3. 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 equilibrium is being maintained if requested in writing by NCDWR. Table 3 below summarizes approved culvert burial practices as described in the permit modification application. [15A NCAC 02H.0506(b)(2)]

Table 3. Pipe invert burial depths for R-2247EB*.

Site	Location	Invert Burial Depth (feet)
15A	186+91 -L-	1.0

*All other pipe locations as described in the permit modification application do not require burial.

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 that 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 13th day of August 2019

DIVISION OF WATER RESOURCES

DocuSigned by:

9C9886312DCD474...

Linda Culpepper, Director

WQC No. 004131

6/3/2019 R:\Hydraulics\PERMITS-Environmental\Drawings\PRM SH\PRM SH_T03-xx-2019\R2247EB-Hyd-prm-psht01.tsh.dgn waldropb

TIP PROJECT: R-2247EB

CONTRACT: C204137

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

FORSYTH COUNTY

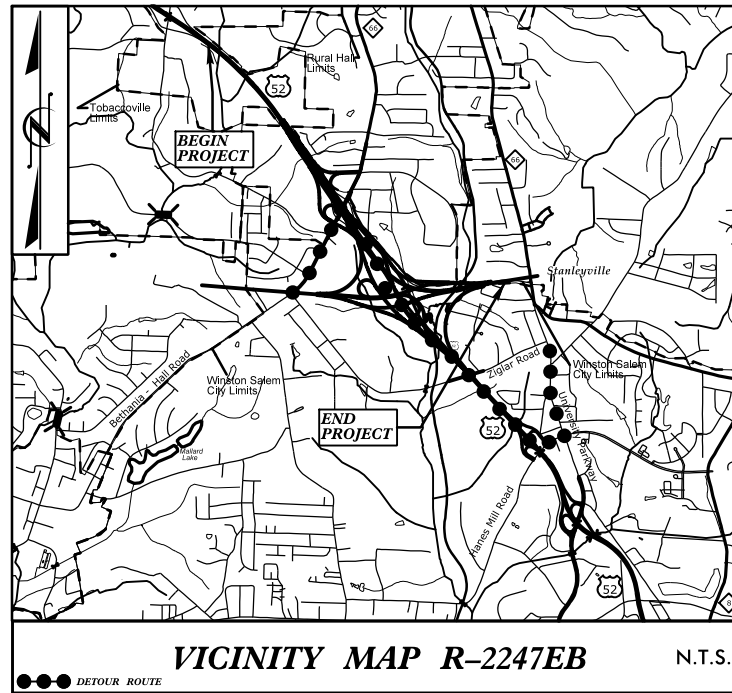
LOCATION: WINSTON-SALEM NORTHERN BELTWAY -
INTERCHANGE AT US 52 (FUTURE I-74)

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

WETLAND AND SURFACE WATER IMPACTS PERMIT

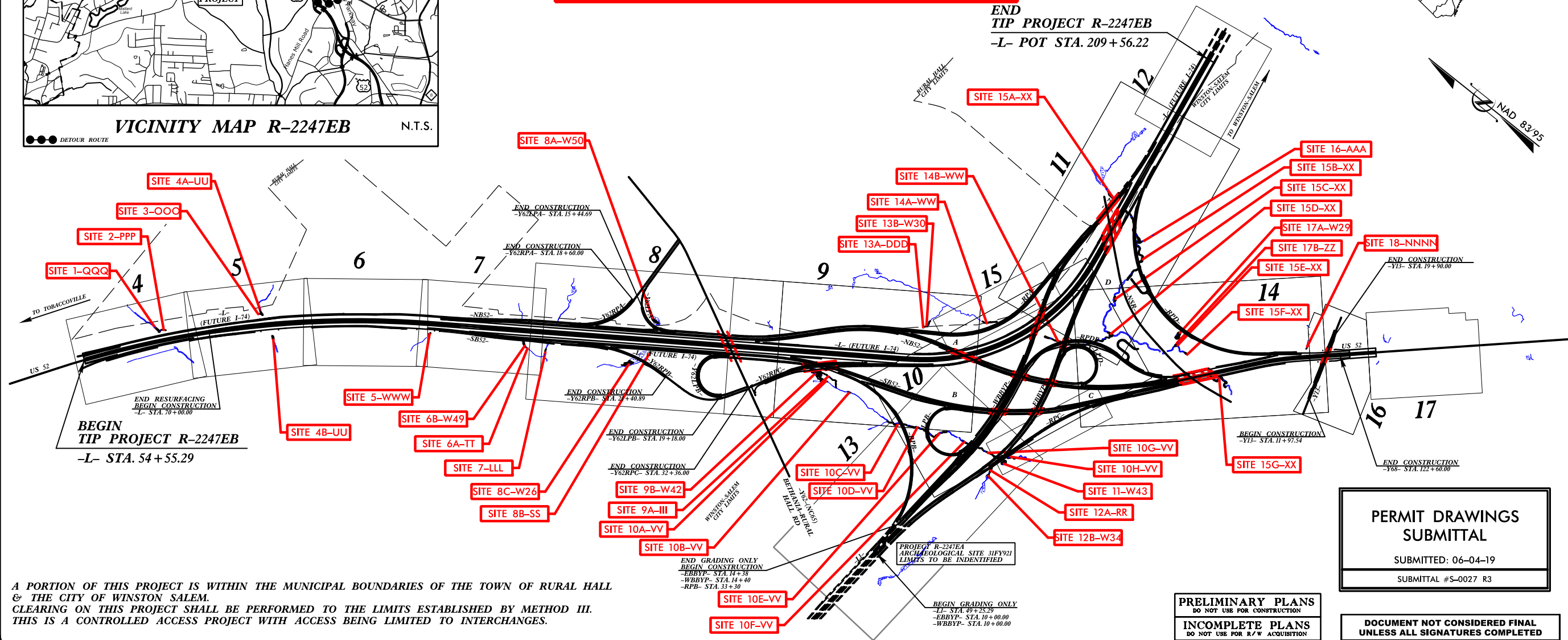
PERMIT DRAWING
SHEET 1 OF 71

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2247EB	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34409.3.17	NHP-0052(056)	P.E., ROW, UTILITIES & CONSTRUCTION	



VICINITY MAP R-2247EB

N.T.S.



A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF RURAL HALL & THE CITY OF WINSTON SALEM.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.
THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

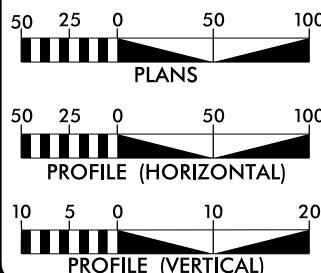
PERMIT DRAWINGS
SUBMITTAL

SUBMITTED: 06-04-19
SUBMITTAL #S-0027 R3

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

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2015 = 61,700
ADT 2035 = 68,700
K = 9%
D = 55%
T = 21%*
V = 70 MPH
* (TTST=14%+DUAL 7%)
FUNC. CLASSIFICATION =
RURAL FREEWAY
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2247EB = 2.875 MILES
LENGTH STRUCTURE TIP PROJECT R-2247EB = 0.061 MILES*
TOTAL LENGTH OF TIP PROJECT R-2247EB = 2.936 MILES
* LENGTH BASED ON EB BRIDGES

NCDOT CONTACT: K. ZAK HAMIDI, PE
DESIGN BUILD PROJECT ENGINEER -
TRANSPORTATION PROGRAM MANAGEMENT UNIT

PLANS PREPARED FOR THE NCDOT BY:



2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
AUGUST 21, 2018

LETTING DATE:
AUGUST 21, 2018



STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

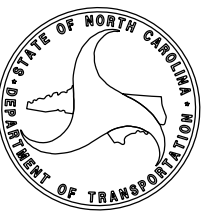
MARK F. ROBBINS, PE
DESIGN PROJECT MANAGER

J. ADAM FREEMAN, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

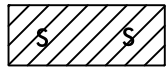
SIGNATURE: P.E.
ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.





DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



DENOTES IMPACTS IN
SURFACE WATER

BLYTHE

STV ^{100 years}
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.		SHEET NO.	
R-2247EB		4	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

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PERMIT DRAWING
SHEET 2 OF 71

SITE 1 - QQQ

SEE PERMIT DRAWING
SHEET 4

LANTAL TEXTILES, INC.

SITE 2 - PPP

ARC HBRHLNCOOL, LLC

MATCHLINE -L- STA 68+00
SEE SHEET 5

2' LATERAL BASE DITCH
CLASS '1' RIP RAP
EST 264 TONS
EST 447 SY GEOTEXTILE
SEE DETAIL 2

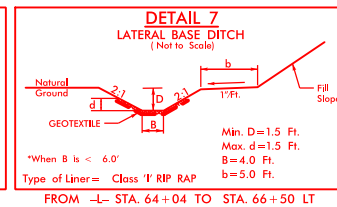
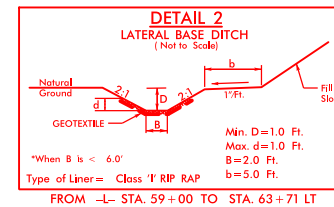
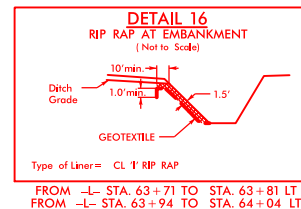
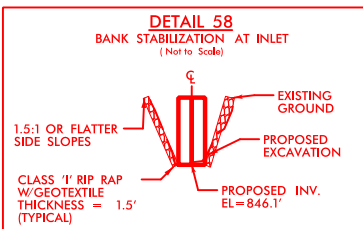
2' SPECIAL LATERAL BASE DITCH
SEE DETAIL 18

BANK STABILIZATION
AT INLET
CLASS '1' RIP RAP
EST 34 TONS
EST 57 SY GEOTEXTILE
SEE DETAIL 16 & 58

4' LATERAL BASE DITCH
CLASS '1' RIP RAP
EST 230 TONS
EST 389 SY GEOTEXTILE
SEE DETAIL 7

EXTEND EXISTING
DOUBLE 7' X 7' RCBC 26 L.F.
WITH HEADWALL & WINGWALLS
NOT BURIED

JERRY D. STOLTZ





DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



DENOTES IMPACTS IN
SURFACE WATER



STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.

R-2247EB

SHEET NO.

4A

ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

PRELIMINARY PLANS
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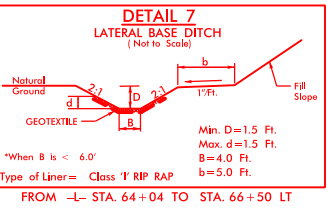
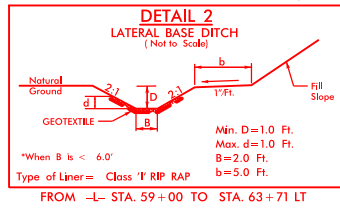
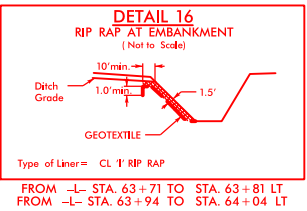
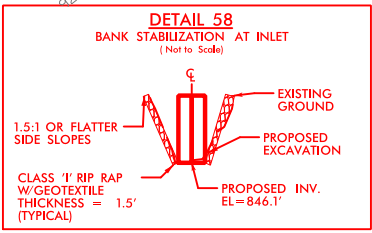
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SHEET 3 OF 71

SITE 1 - QQQ

SEE PERMIT DRAWING
SHEET 4

SITE 2 - PPP

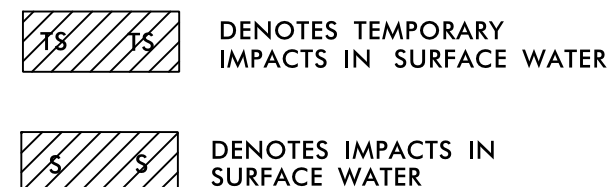
MATCHLINE -L- STA 68+00
SEE SHEET 5



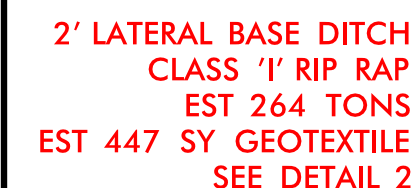
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PERMIT DRAWING
SHEET 4 OF 71



— BANK STABILIZATION
AT INLET
CLASS 'I' RIP RAP
EST 24 TONS
EST 34 SY GEOTEXTILE
SEE DETAIL 16 & 58

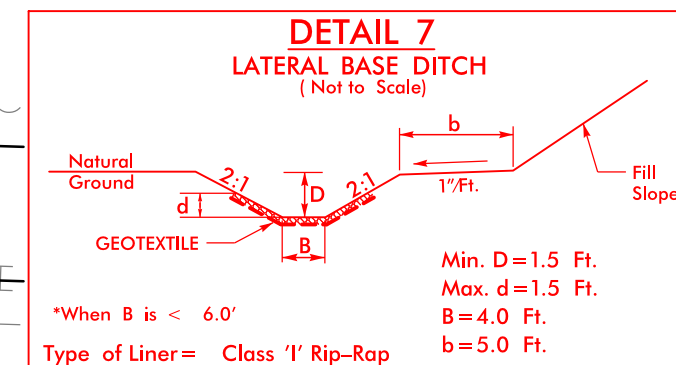


**BANK STABILIZATION
AT INLET
CLASS 'I' RIP RAP
EST 18 TONS
EST 25 SY GEOTEXILE
SEE DETAIL 16 & 58**

4' LATERAL BASE DITCH
CLASS 'I' RIP RAP
EST 230 TONS
EST 389 SY GEOTEXTILE
SEE DETAIL 7



FROM -L- STA. 63+71 TO STA. 63+81 LT
FROM -L- STA. 63+94 TO STA. 64+04 LT



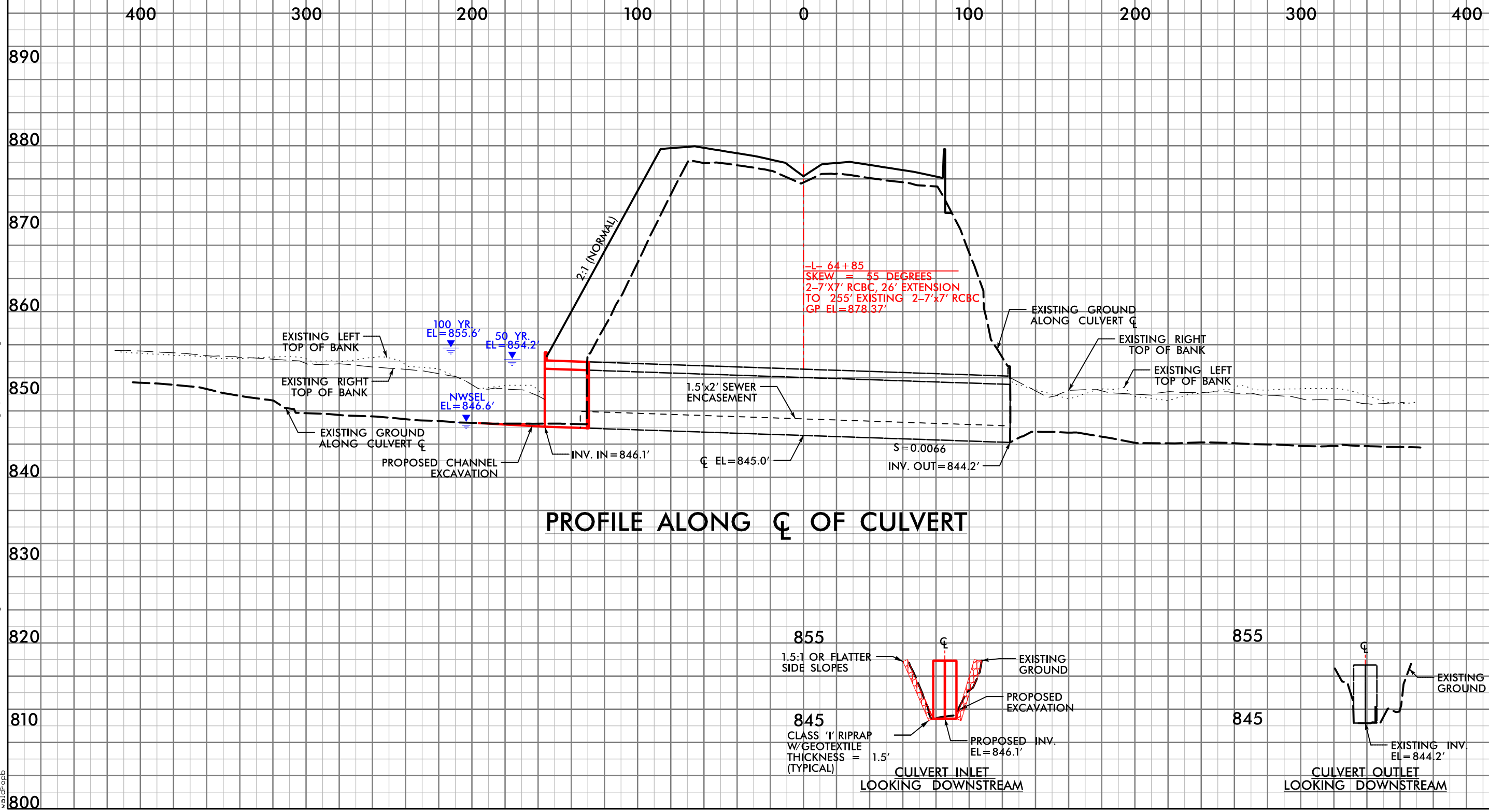
FROM -L- STA. 64+04 TO STA. 66+50 LT

(FUTURE 1-74) -L-

6/23/16
6/3/2019
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redrpb

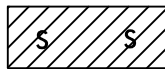
PROJECT REFERENCE NO.		SHEET NO.	
R-2247EB		4C	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
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SITE 1 – QQQ





DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



DENOTES IMPACTS IN
SURFACE WATER

SITE 3 - 000

SITE 4A - UU



PROJECT REFERENCE NO.		SHEET NO.	
R-2247EB		5	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

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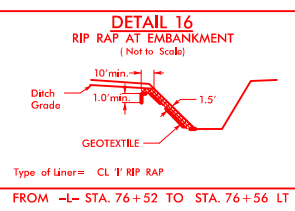
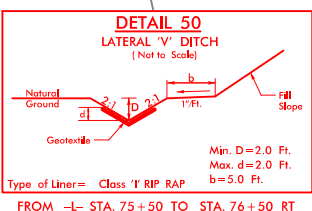
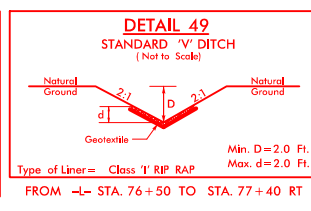
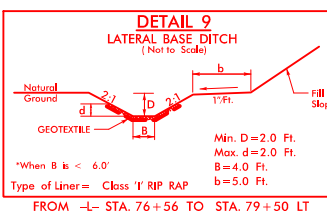
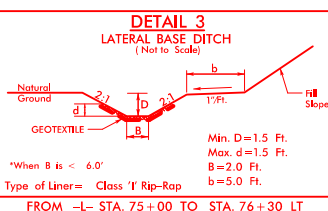
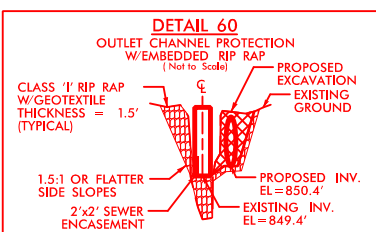
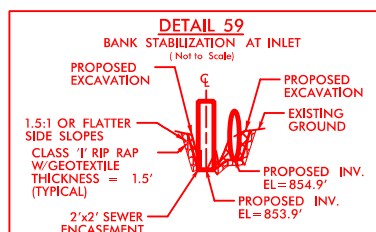
PERMIT DRAWING
SHEET 6 OF 71

UPDATED Permit Sheet,
July 2023

SEE PERMIT DRAWING
SHEET 8

SEE PERMIT DRAWING
SHEET 9

SITE 4B - UU

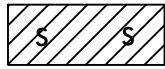


PLANS

2/1/2022 R:\Hydraulics\PERMITS\Environmental\Drawings\PRM_SHT_03-xx-2019\R2247EB_Hyd-prm_PSH05.dgn



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



DENOTES IMPACTS IN
SURFACE WATER

SITE 3 - 000

SITE 4A - UU

SITE 4B - UU

BLYTHE

STV ¹⁰⁰ years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number E-0991

PROJECT REFERENCE NO.	SHEET NO.
R-2247EB	5A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 7 OF 71

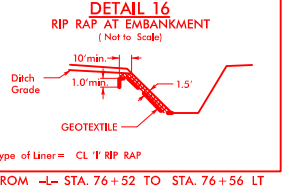
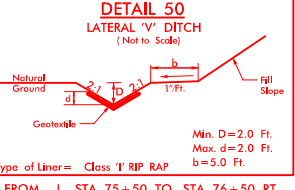
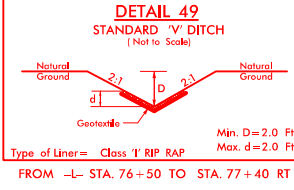
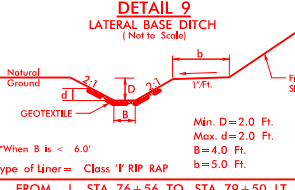
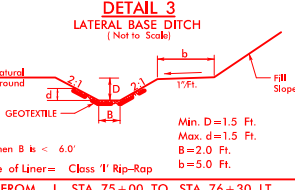
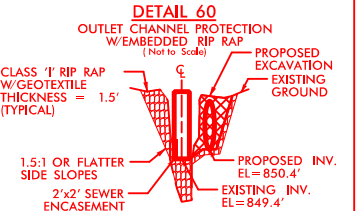
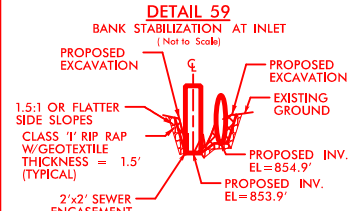
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July 2023

SEE PERMIT DRAW
SHEET 8

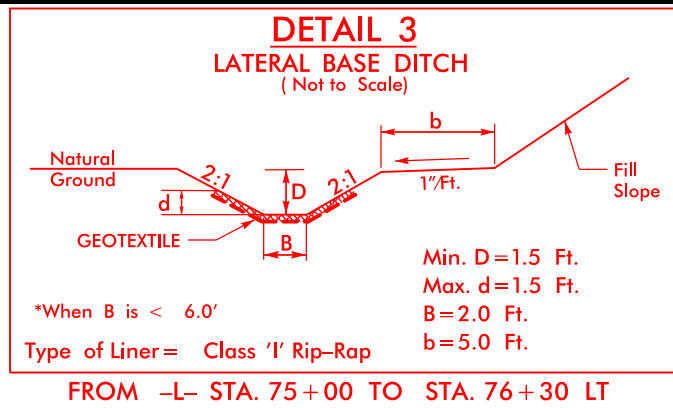
SEE PERMIT DRAWING
SHEET 9

MATCHLINE -L- STA 68+00
SEE SHEET 4

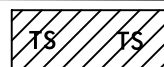
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SEE SHEET 6



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DENOTES IMPACTS IN
SURFACE WATER



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

2' LATERAL BASE DITCH
CLASS 'I' RIP RAP
EST 105 TONS
EST 177 SY GEOTEXTILE
SEE DETAIL 3

BANK STABILIZATION
AT INLET
CLASS 'I' RIP RAP
EST 53 TONS
EST 91 SY GEOTEXTILE
SEE DETAIL 16 & 59

EXISTING
BANK STABILIZATION
AT CROSSING

PROPOSED SANITARY SEWER



UPDATED Permit Sheet,
July 2023

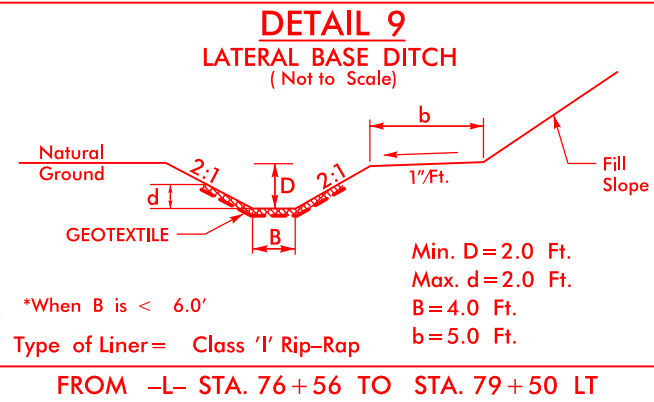
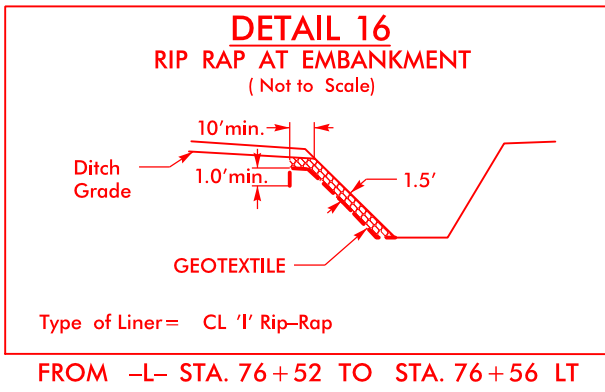
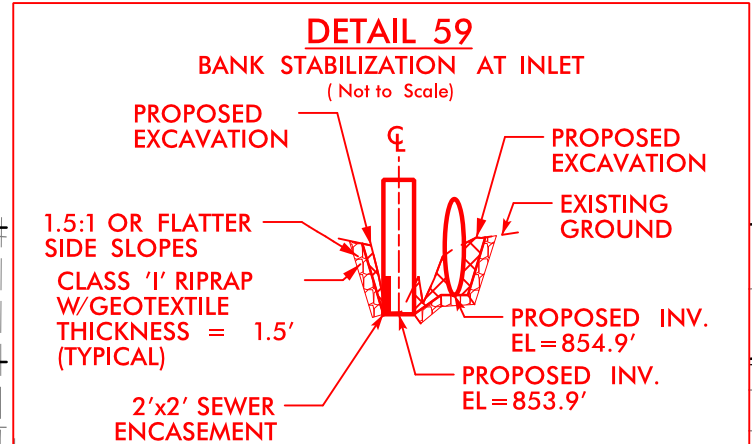
SITE 4A - UU

SITE 3 - OOO

4' LATERAL BASE DITCH
CLASS 'I' RIP RAP
EST 330 TONS
EST 559 SY GEOTEXTILE
SEE DETAIL 9

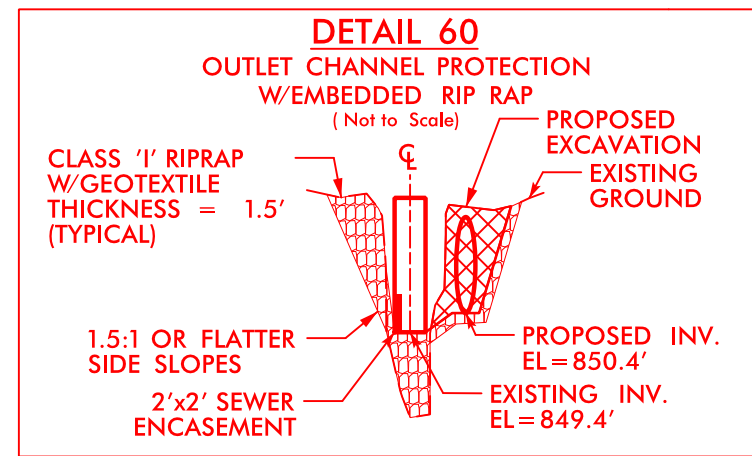
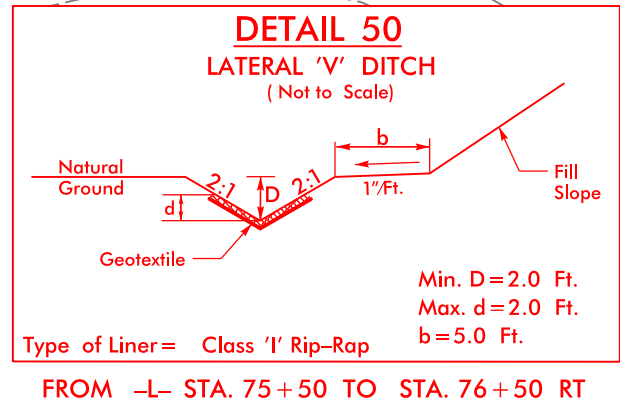
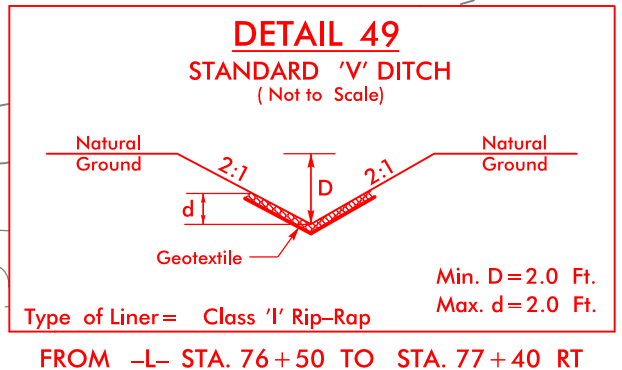
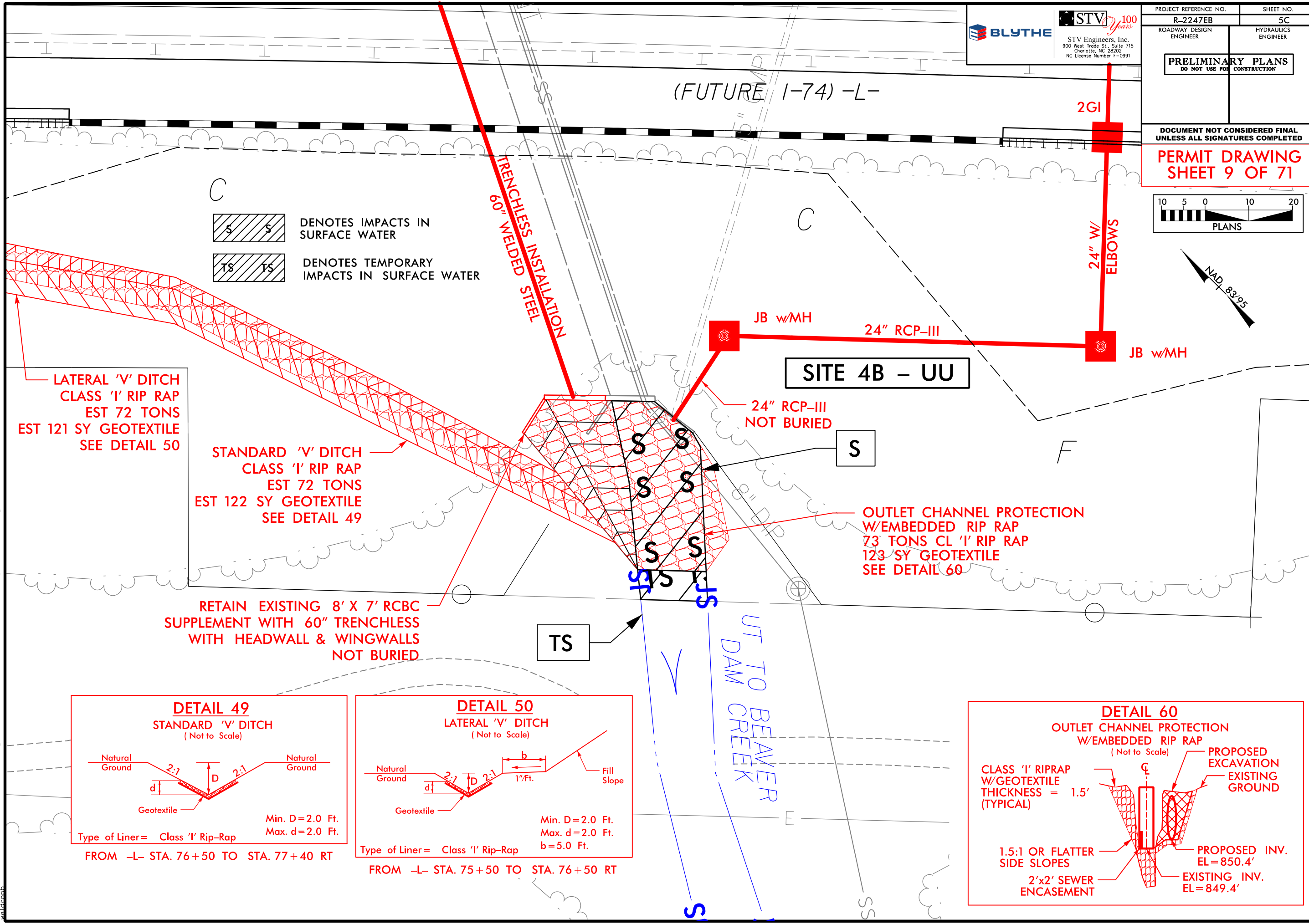
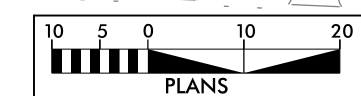
24" RCP-III
NOT BURIED

JB w/MH



(FUTURE I-74) -L-

I:\25\2022\Blythe\Drawings\PRM_SHT_03-xx-2019\2247EB_Hyd1.prm.PSH05B.dgn

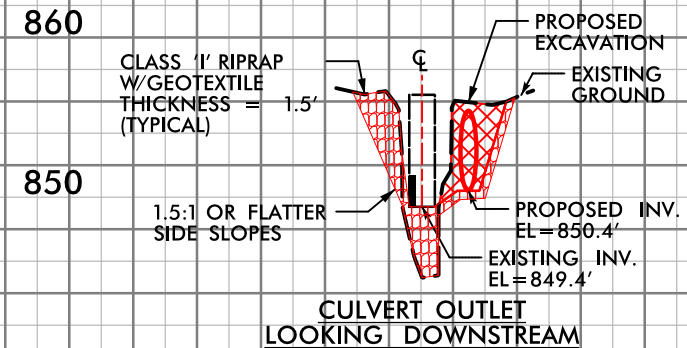
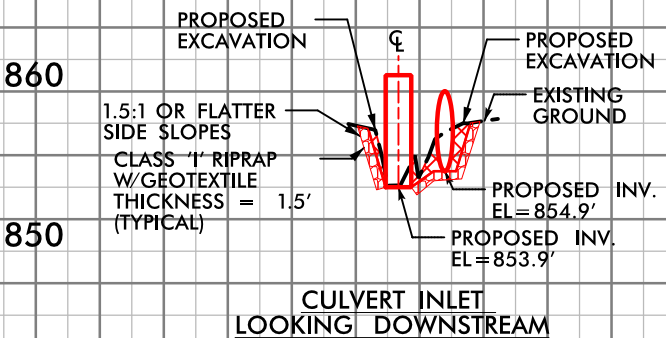
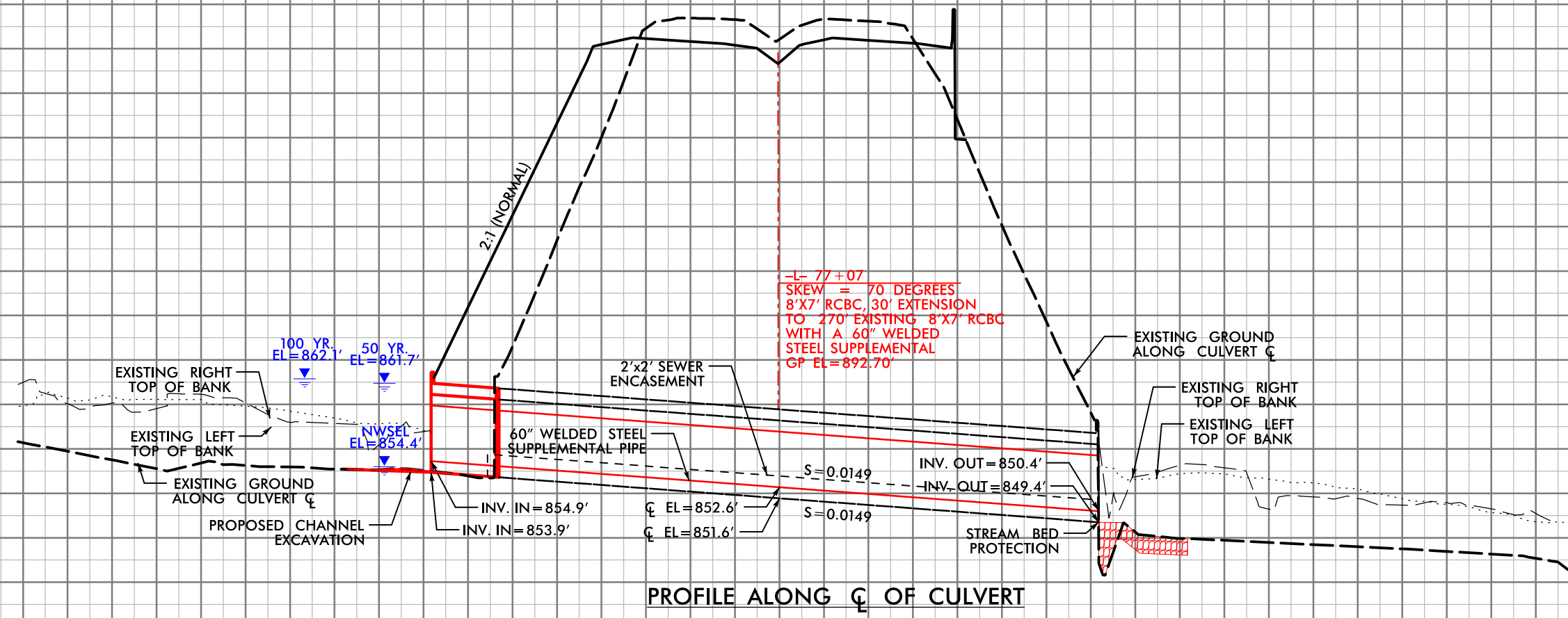


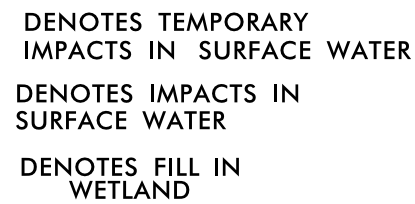
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6/23/16
6/3/2019
R:\Hydraulics\PERMITS\Environmental\Drawings\PRM_SHT_03-xx-2019\2247EB_hyd-prm_PSH05D.dgn
SolidProp

PROJECT REFERENCE NO.	SHEET NO.
R-2247EB	5D
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SITE 4A – UU SITE 4B – UU





	DENOTES EXCAVATION IN WETLAND (R-2247EC)
	DENOTES FILL IN WETLAND (R-2247EC)
	DENOTES MECHANIZED CLEARING (R-2247EC)
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER (R-2247EC)
	DENOTES IMPACTS IN SURFACE WATER (R-2247EC)



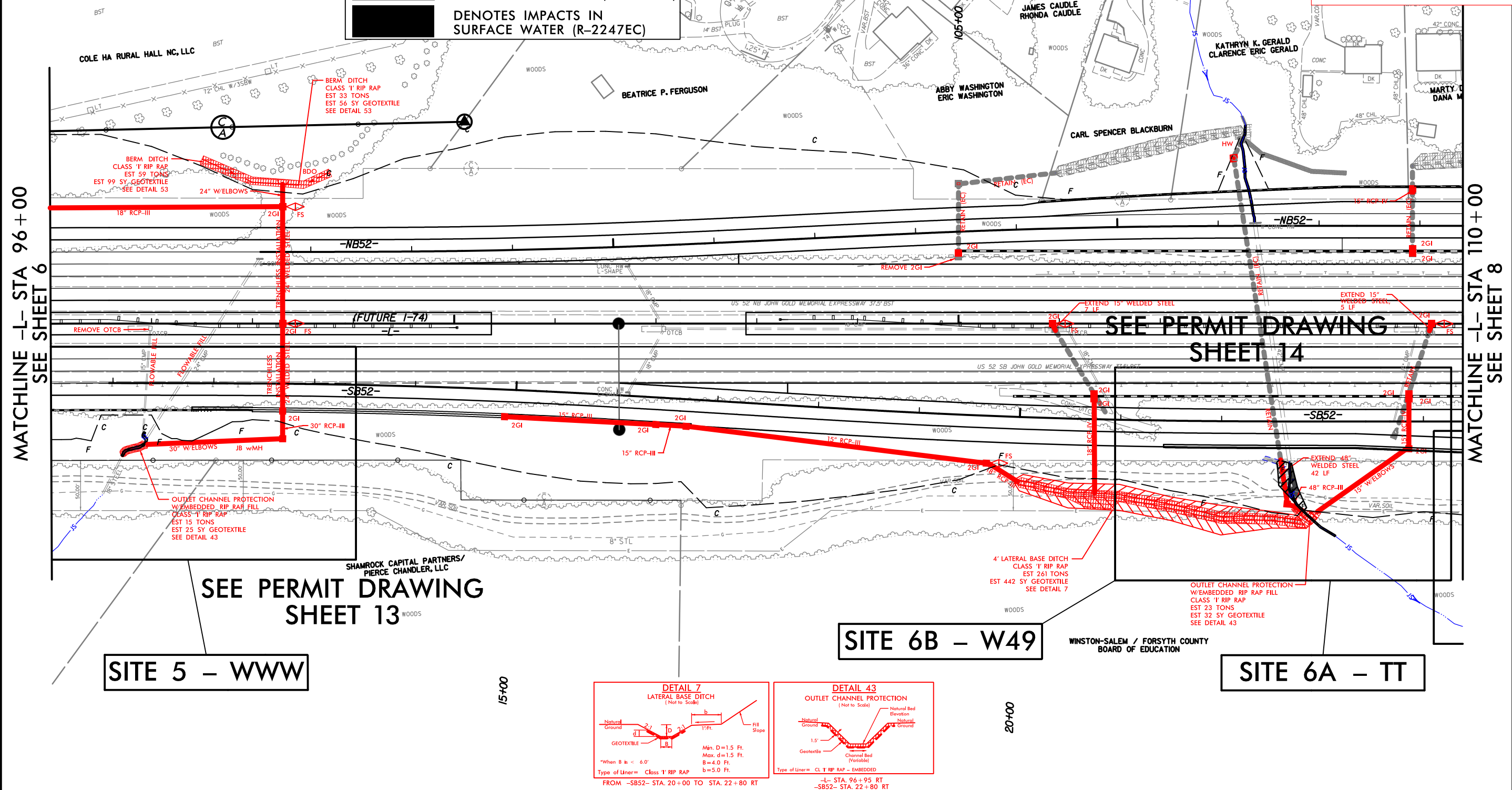
PROJECT REFERENCE NO.	SHEET NO.
R-2247EB	7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS

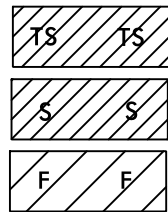
DO NOT USE FOR CONSTRUCTION

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

PERMIT DRAWING
SHEET 11 OF 71



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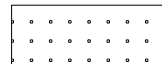


DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN
SURFACE WATER

DENOTES FILL IN
WETLAND

R-2247EC SITE #1



DENOTES EXCAVATION IN
WETLAND (R-2247EC)



DENOTES FILL IN
WETLAND (R-2247EC)



DENOTES MECHANIZED
CLEARING (R-2247EC)



DENOTES TEMPORARY IMPACTS
IN SURFACE WATER (R-2247EC)



DENOTES IMPACTS IN
SURFACE WATER (R-2247EC)

BLYTHE

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STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
No. License Number F-0991

PROJECT REFERENCE NO.

R-2247EB

SHEET NO.

7A

ROADWAY DESIGN
ENGINEER

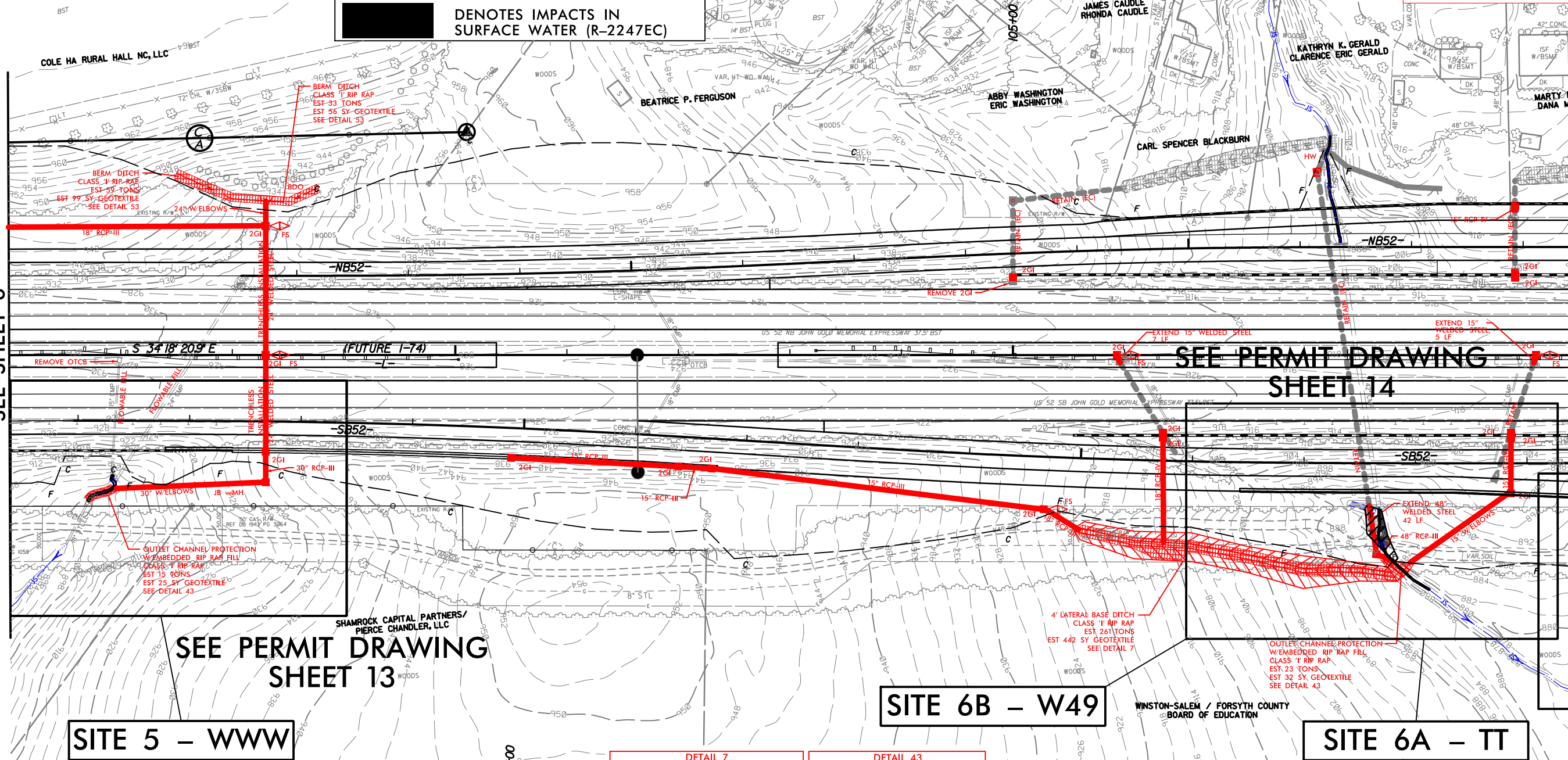
HYDRAULICS
ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

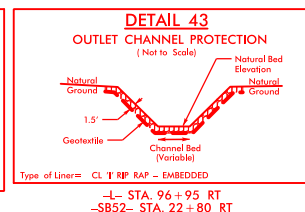
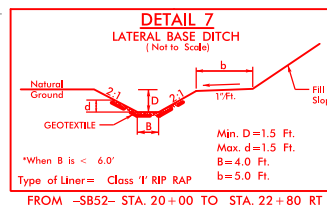
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 12 OF 71

MATCHLINE -L- STA 96+00
SEE SHEET 6

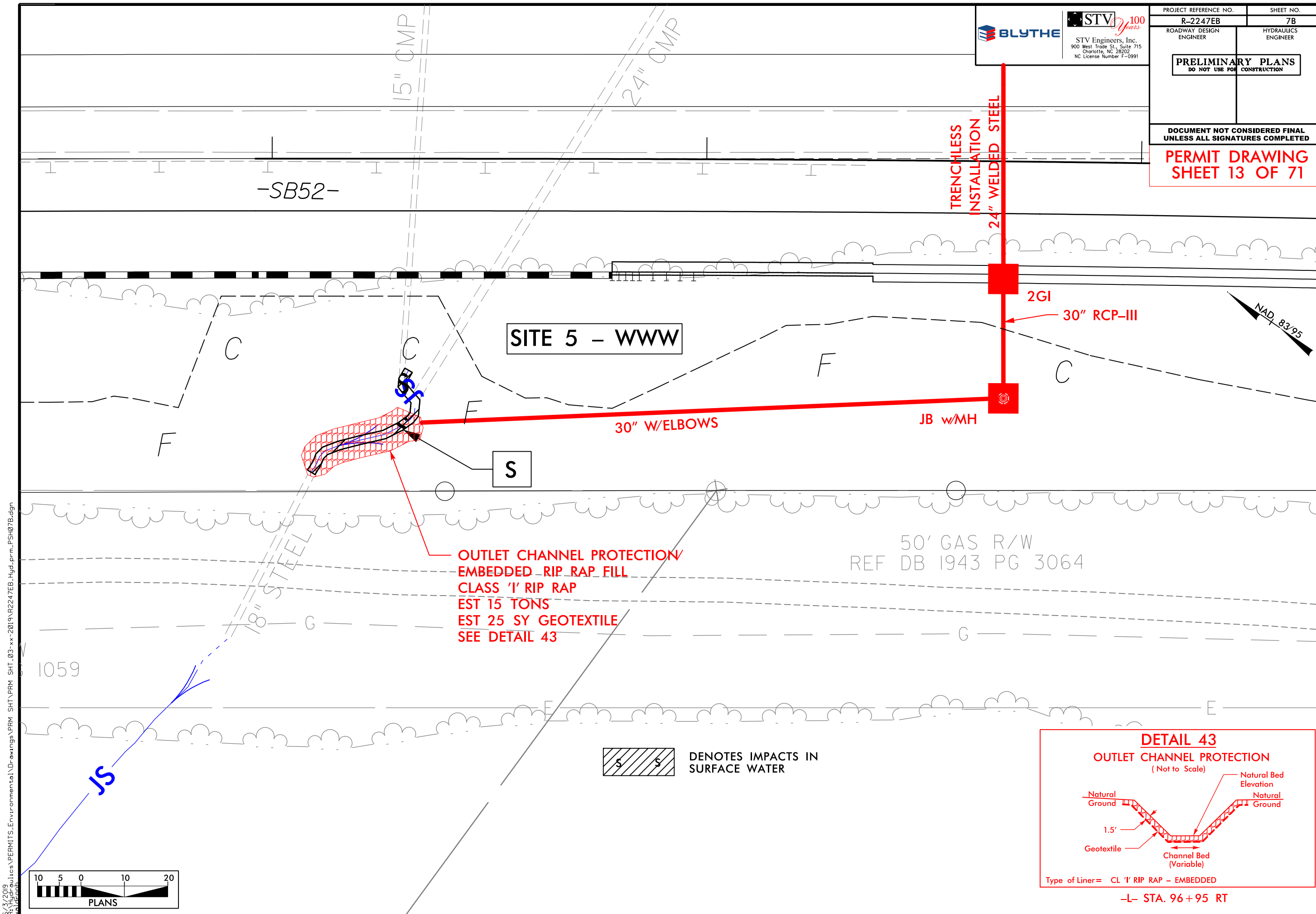


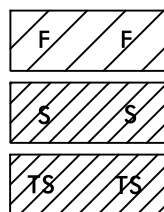
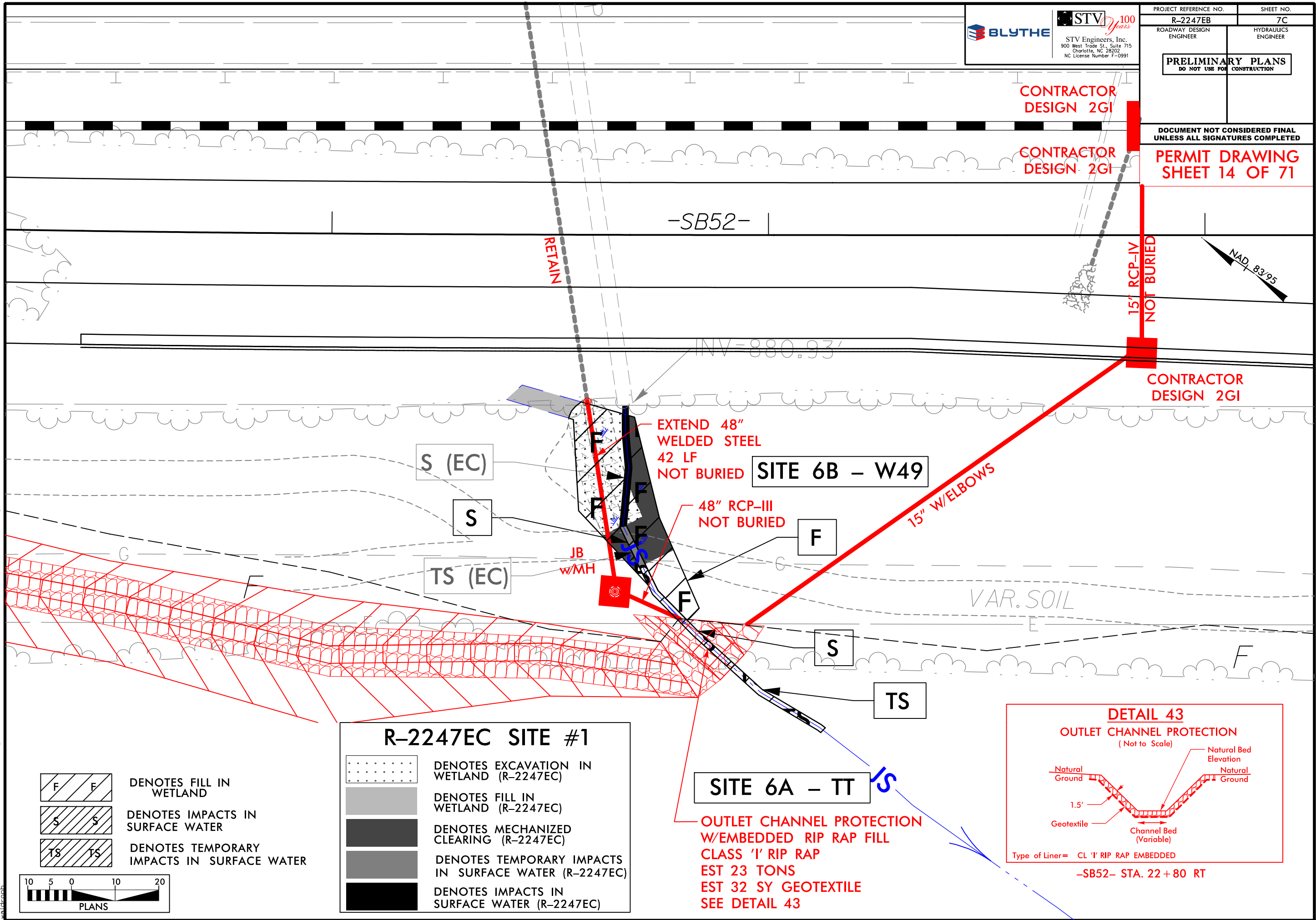
MATCHLINE -L- STA 110+00
SEE SHEET 8



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

PERMIT DRAWING
SHEET 13 OF 71





DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

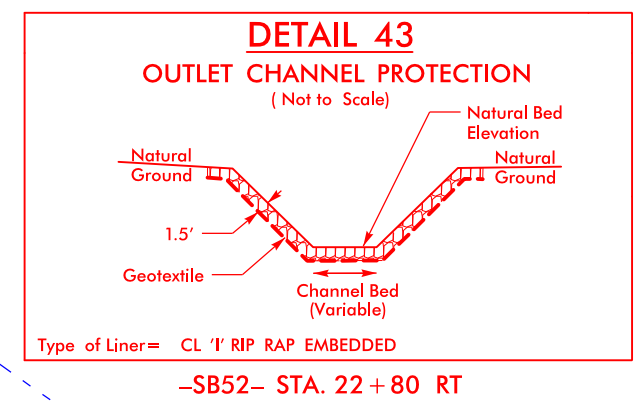
DENOTES TEMPORARY IMPACTS IN SURFACE WATER



R-2247EC SITE #1	
	DENOTES EXCAVATION IN WETLAND (R-2247EC)
	DENOTES FILL IN WETLAND (R-2247EC)
	DENOTES MECHANIZED CLEARING (R-2247EC)
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER (R-2247EC)
	DENOTES IMPACTS IN SURFACE WATER (R-2247EC)

SITE 6A – TT

OUTLET CHANNEL PROTECTION W/EMBEDDED RIP RAP FILL
CLASS 'I' RIP RAP
EST 23 TONS
EST 32 SY GEOTEXTILE
SEE DETAIL 43



6/23/16

6/3/2019
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wa\arapb



PROJ. REFERENCE NO.	SHEET NO.
R-2247EB	7D

PERMIT DRAWING
SHEET 15 OF 71

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

930
920
910
900
890
880

930
920
910
900
890
880

0.010 0.010

218.26

901.79

2.7

WETLAND

WETLAND

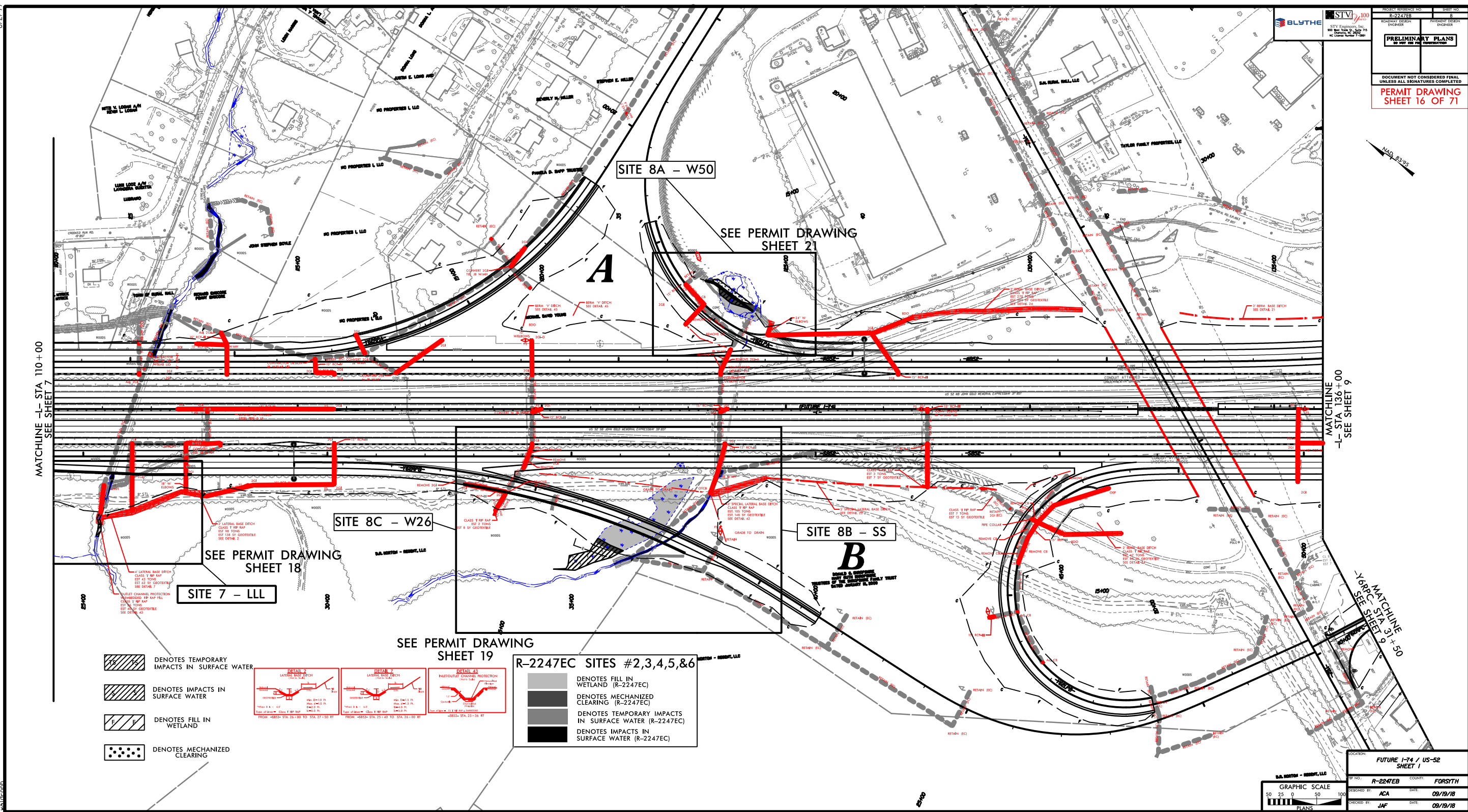
R-2247EC

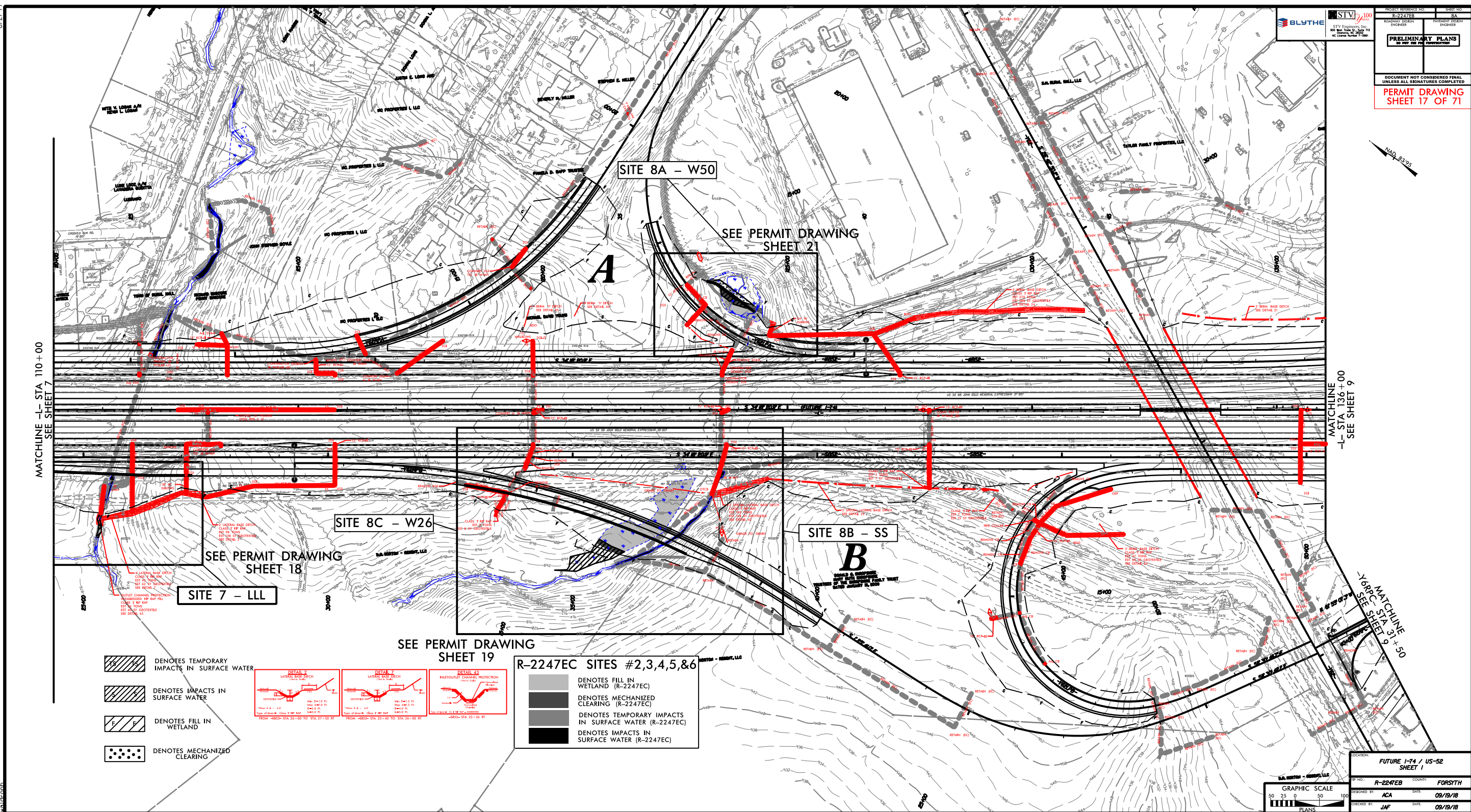
FILL IN WETLANDS

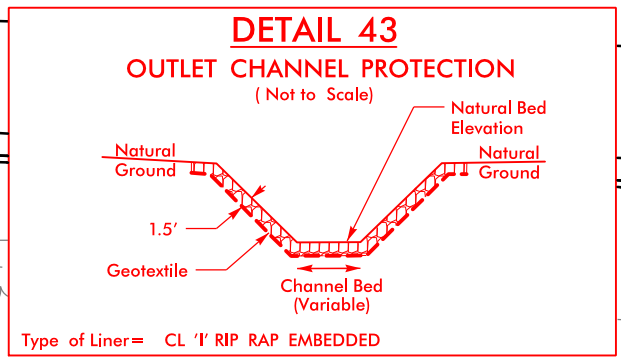
22 + 78.00

-SB52-

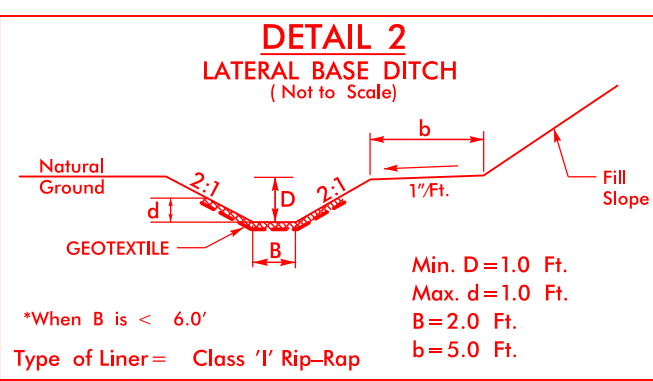
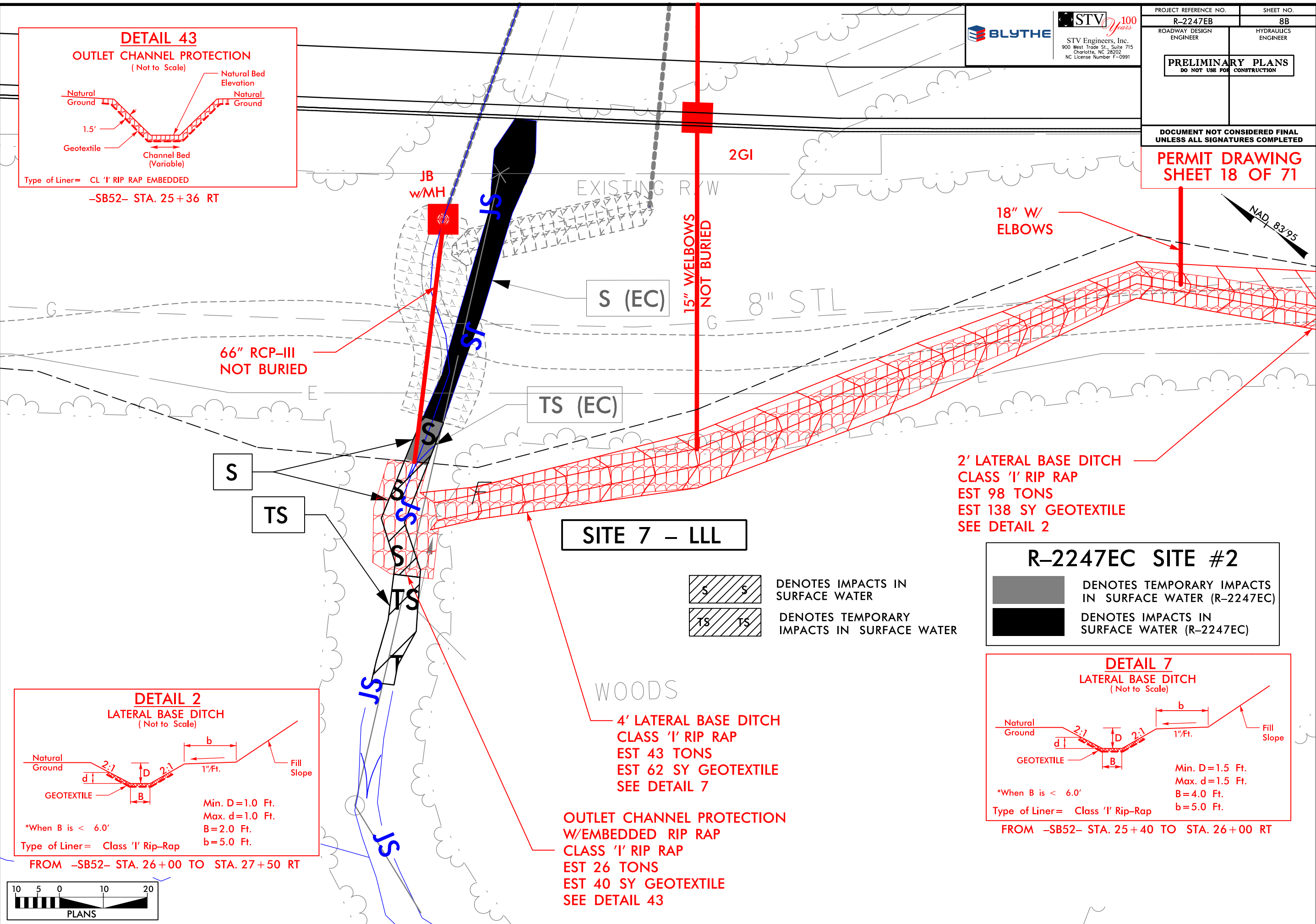
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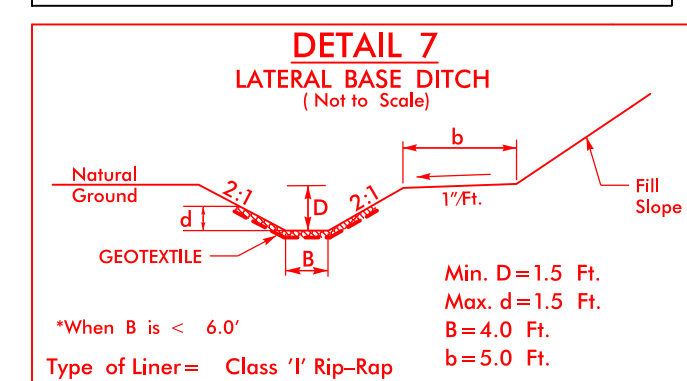
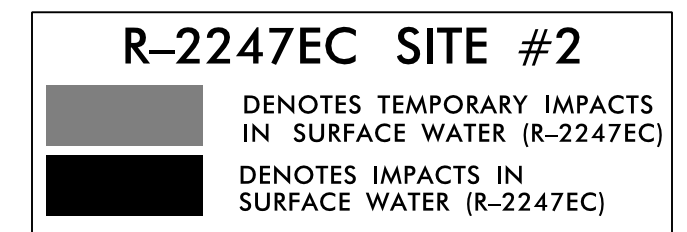


-SB52- STA. 25 + 36 RT

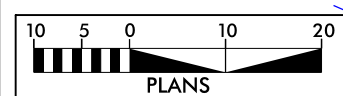


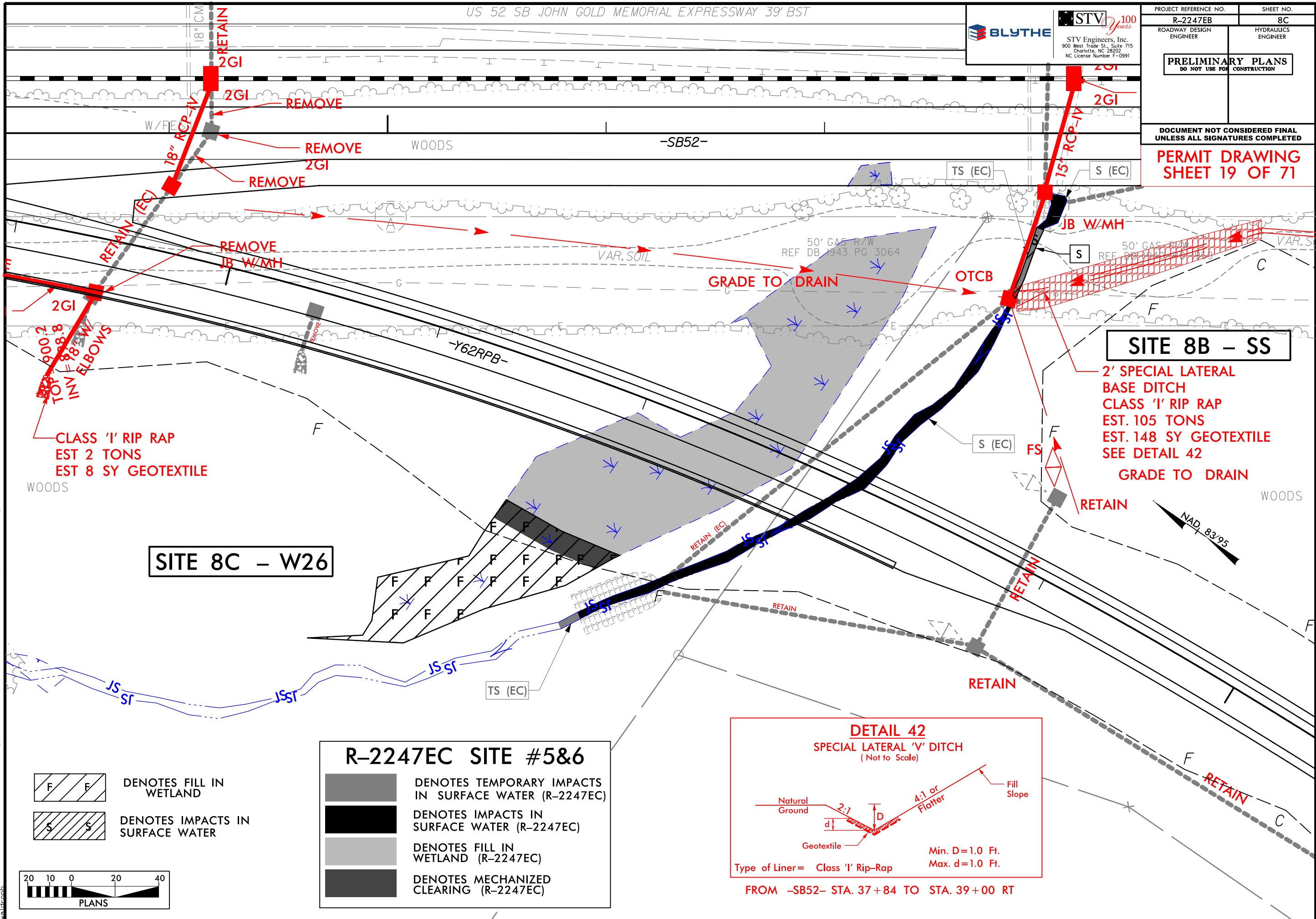
FROM -SB52- STA. 26 + 00 TO STA. 27 + 50 RT

2' LATERAL BASE DITCH
CLASS 'I' RIP RAP
EST 98 TONS
EST 138 SY GEOTEXTILE
SEE DETAIL 2



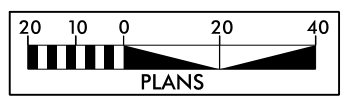
FROM -SB52- STA. 25 + 40 TO STA. 26 + 00 RT





DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER



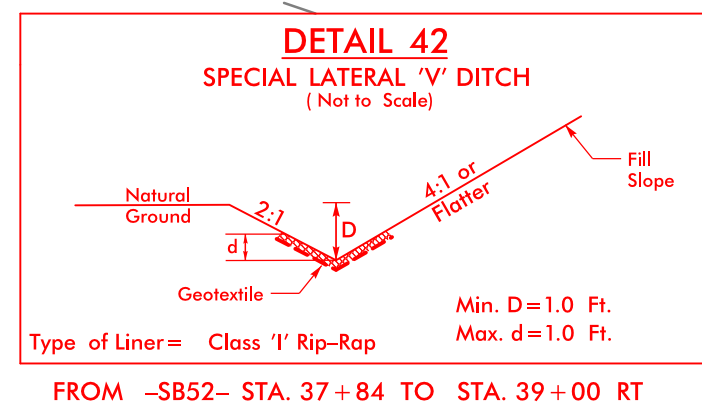
R-2247EC SITE #5&6

DENOTES TEMPORARY IMPACTS IN SURFACE WATER (R-2247EC)

DENOTES IMPACTS IN SURFACE WATER (R-2247EC)

DENOTES FILL IN WETLAND (R-2247EC)

DENOTES MECHANIZED CLEARING (R-2247EC)



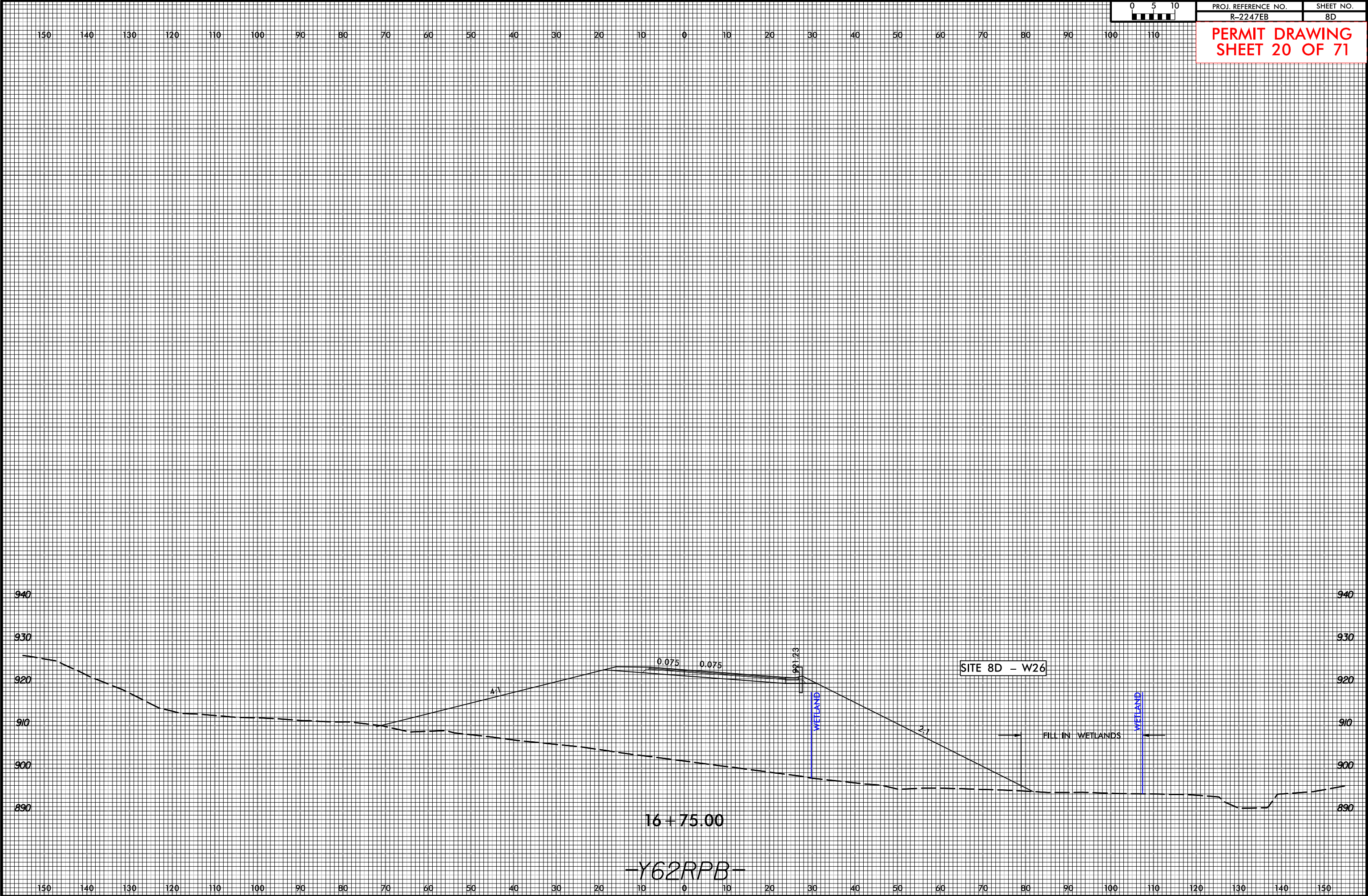
6/23/16

6/3/2019
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wa\drpb



PROJ. REFERENCE NO.	SHEET NO.
R-2247EB	8D

PERMIT DRAWING
SHEET 20 OF 71



R-2247EC SITE #4

DENOTES TEMPORARY IMPACTS
IN SURFACE WATER (R-2247EC)

DENOTES IMPACTS IN
SURFACE WATER (R-2247EC)

DENOTES FILL IN
WETLAND (R-2247EC)

DENOTES MECHANIZED
CLEARING (R-2247EC)

F

DENOTES FILL IN
WETLAND

*

DENOTES MECHANIZED
CLEARING

SITE 8A - W50

TOE PROTECTION
EST 55 TONS
EST 99 SY GEOTEXTILE
SEE DETAIL 35

DETAIL 35
TOE PROTECTION
(Not to Scale)

NATURAL GROUND

d

2:1 OR FLATTER

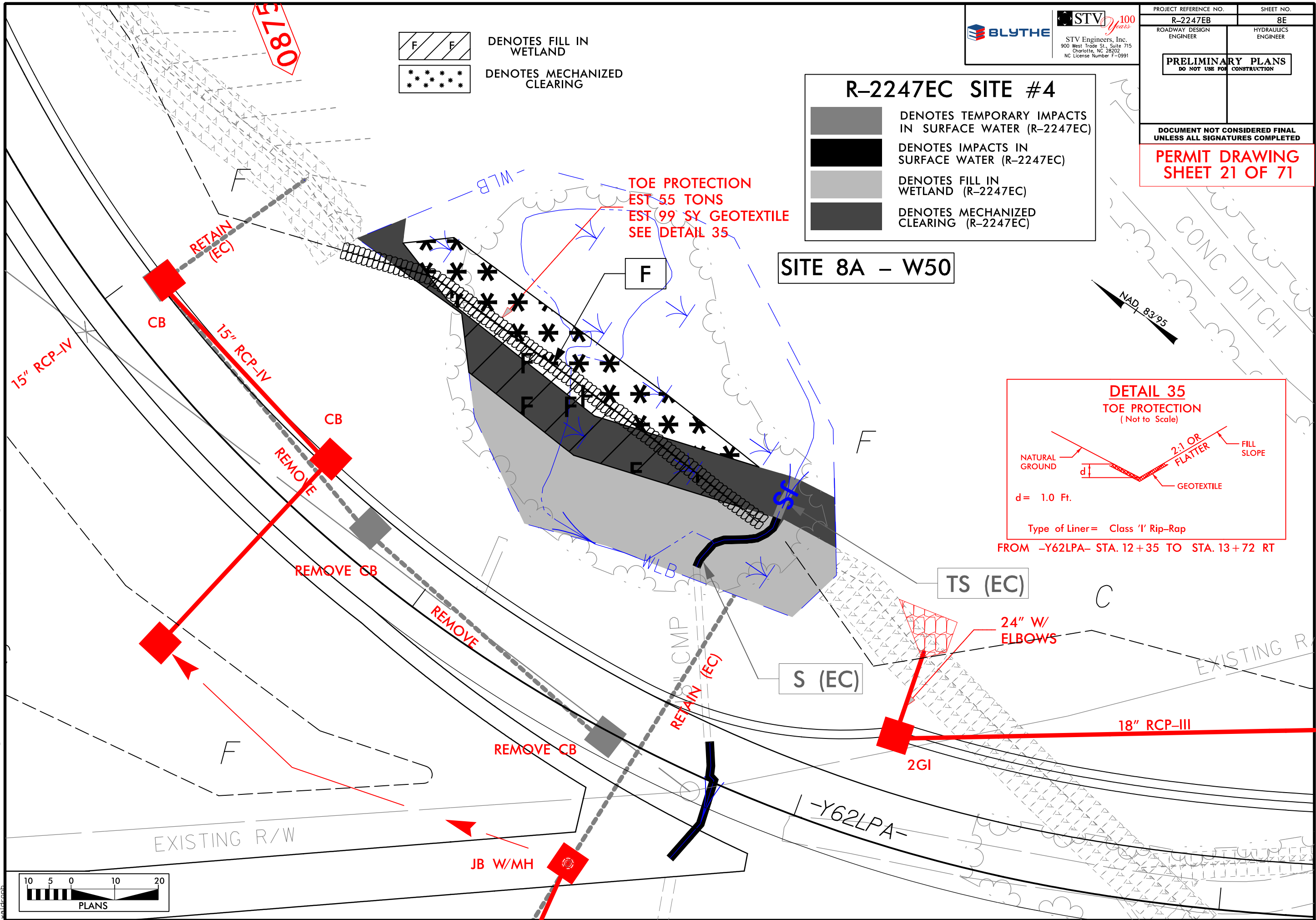
FILL SLOPE

GEOTEXTILE

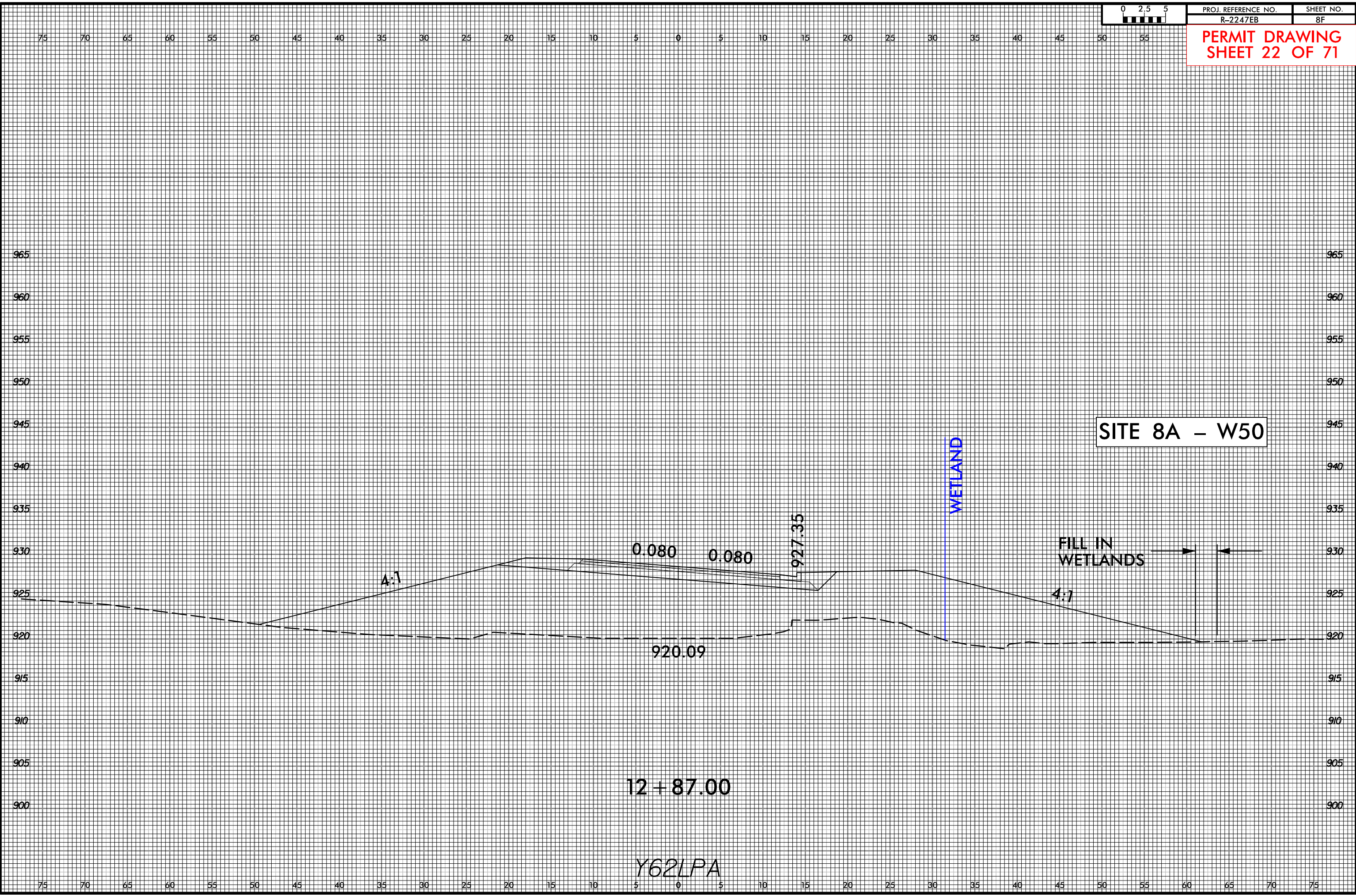
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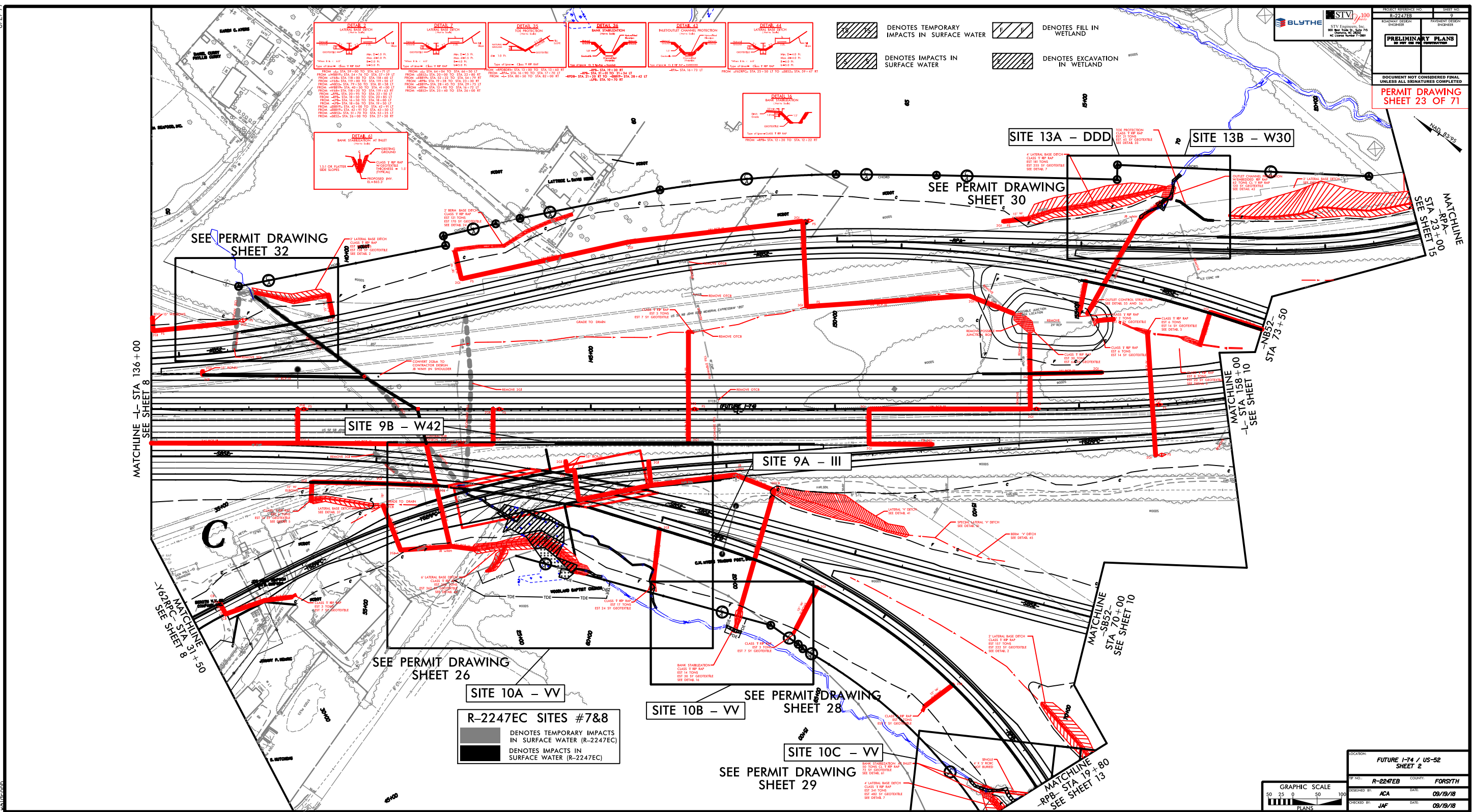
Type of Liner = Class 'I' Rip-Rap

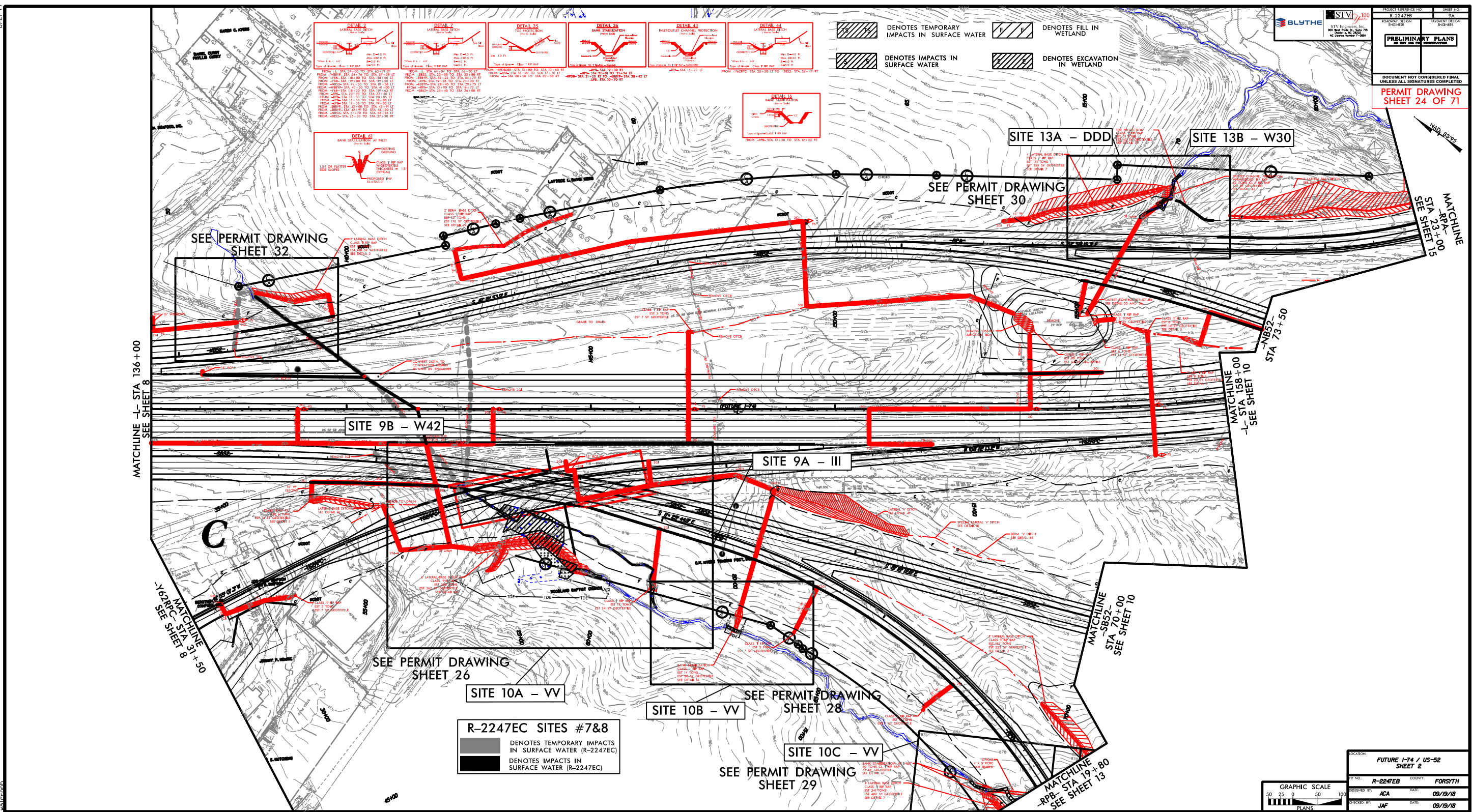
FROM -Y62LPA- STA. 12+35 TO STA. 13+72 RT



6/23/16
6/3/2019
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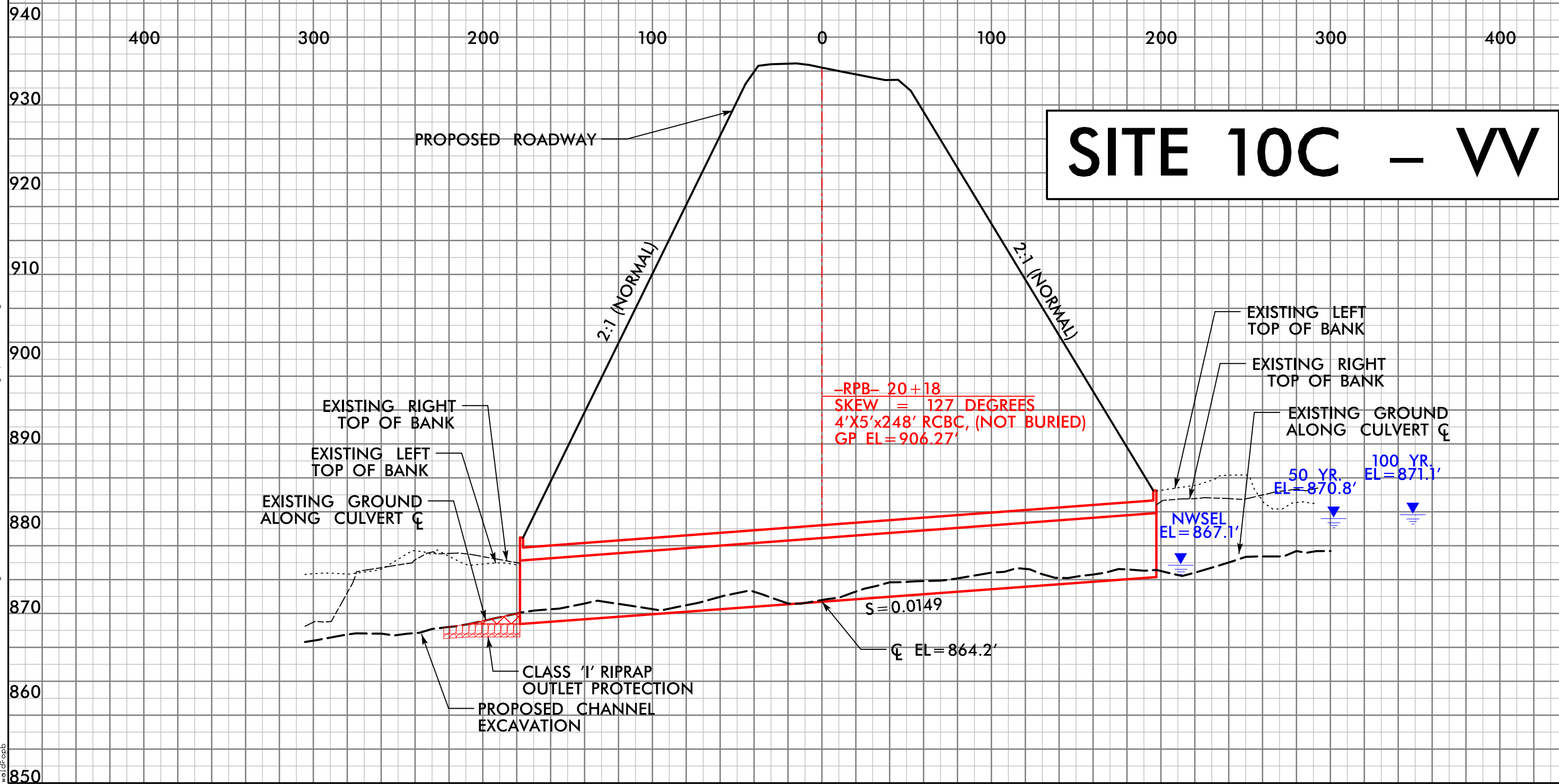
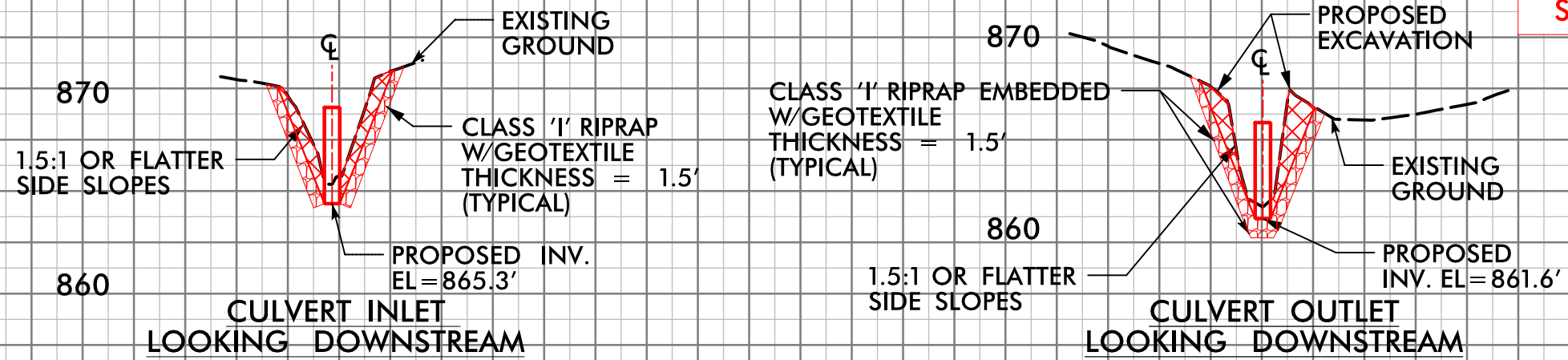




6/23/16
6/3/2019
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redProp

PERMIT DRAWING
SHEET 25 OF 71

PROJECT REFERENCE NO.	SHEET NO.
R-2247EB	9B
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

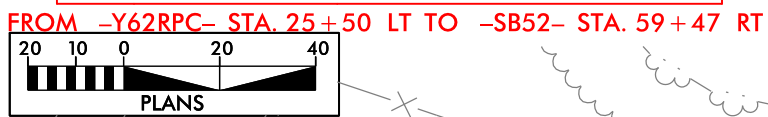
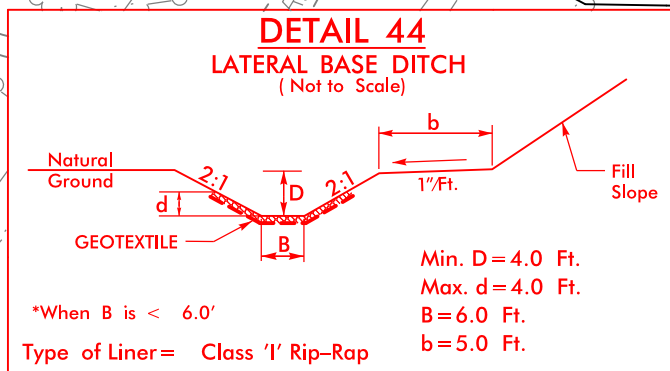
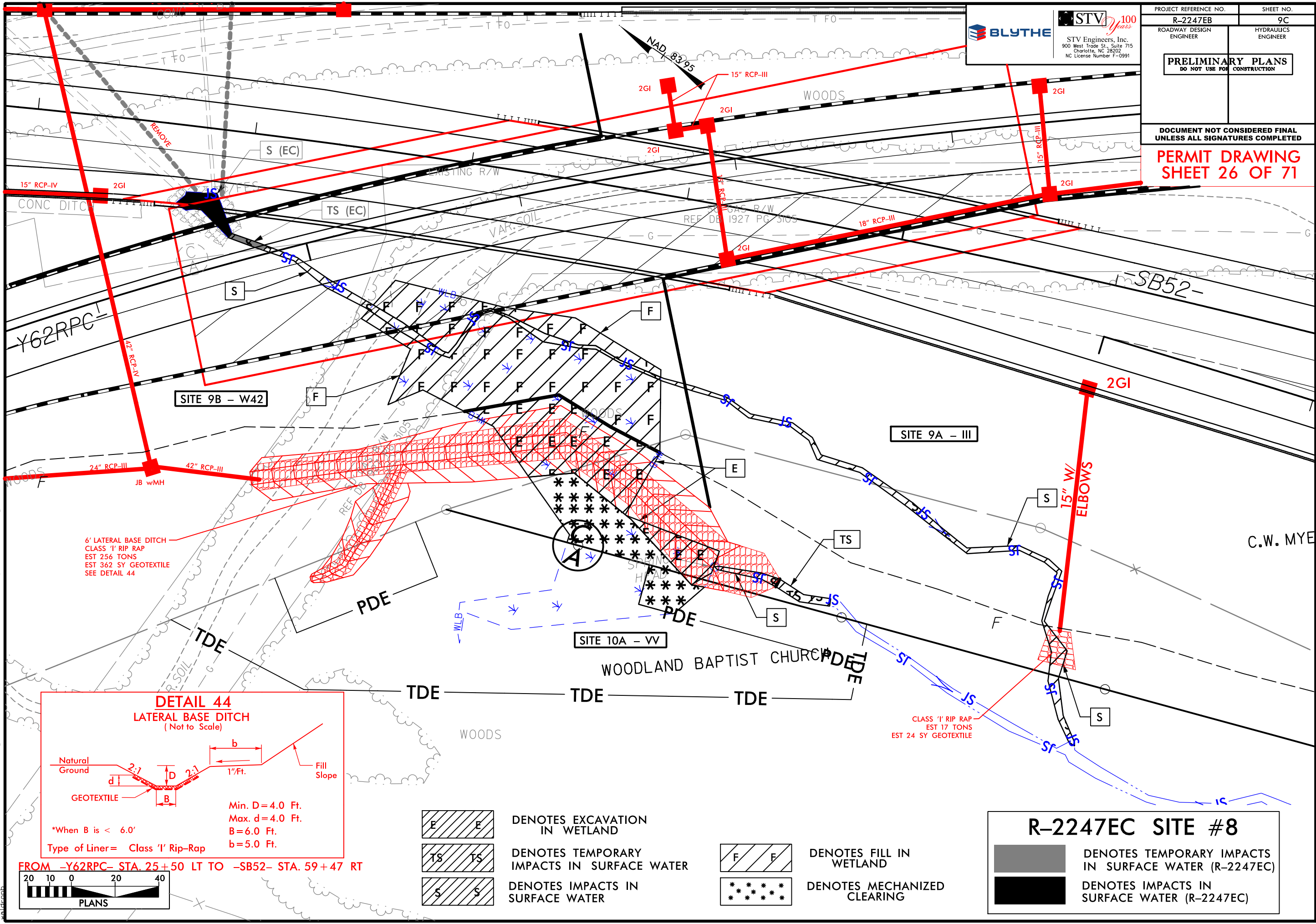


STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
No. License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
R-2247EB	9C
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 26 OF 71

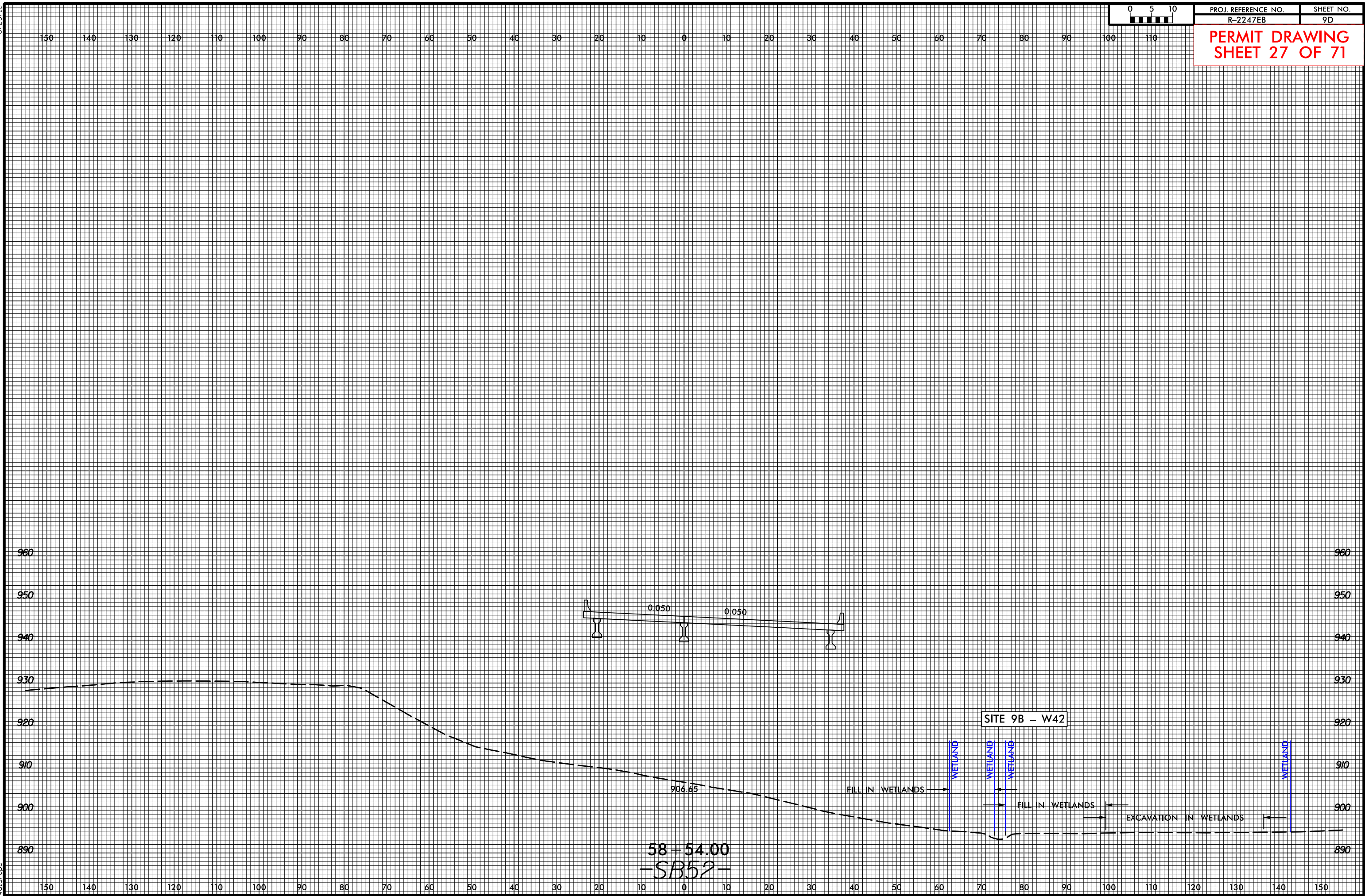


- DENOTES EXCAVATION IN WETLAND
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING

R-2247EC SITE #8

DENOTES TEMPORARY IMPACTS IN SURFACE WATER (R-2247EC)

DENOTES IMPACTS IN SURFACE WATER (R-2247EC)





STV

100 Years

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Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.		SHEET NO.	
R-2247EB		9E	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
PERMIT DRAWING SHEET 28 OF 71			



TS

TS

TS

DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

S

S

S

DENOTES IMPACTS IN
SURFACE WATER

CLASS 'I' RIP RAP
EST 3 TONS
EST 7 SY GEOTEXTILE

15" W/
ELBOWS

C
A

PDE
TS
S
PDE
PDE

TS



C
A



C
A

Sr JS

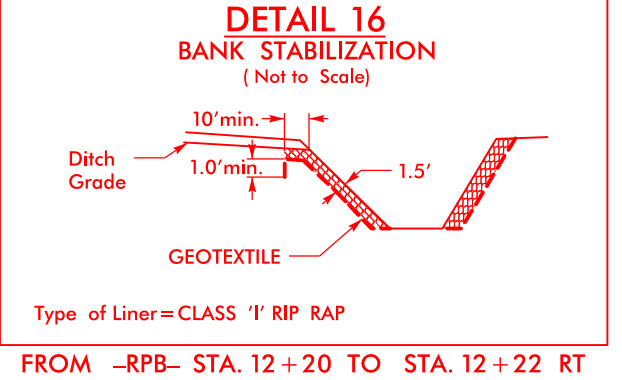
Sr JS

Sr JS

Sr JS

SITE 10B - VV

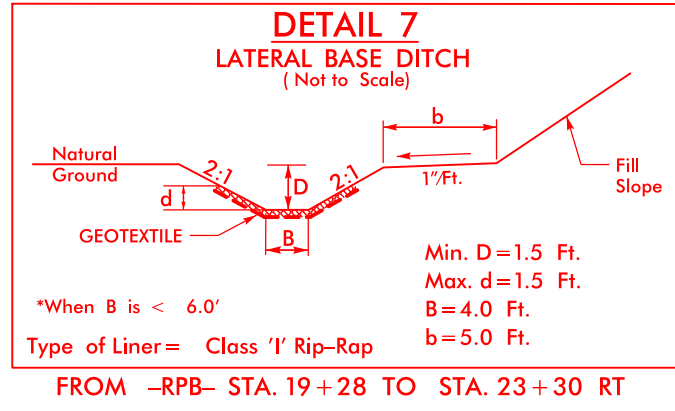
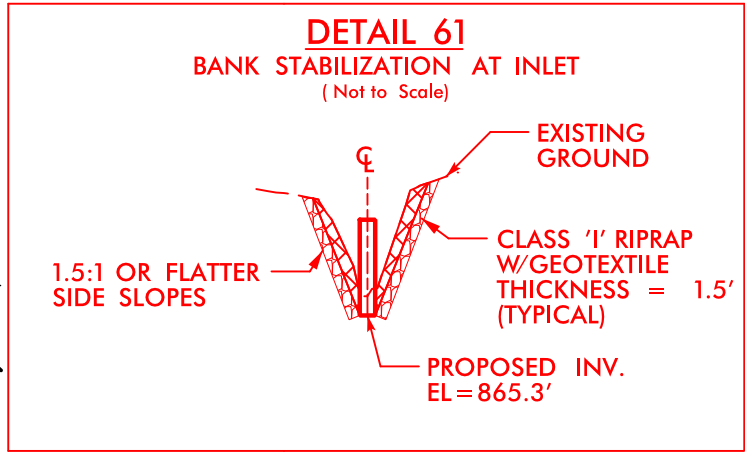
BANK STABILIZATION
CLASS 'I' RIP RAP
EST 14 TONS
EST 30 SY GEOTEXTILE
SEE DETAIL 16



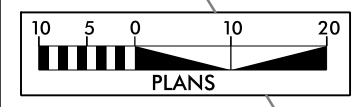
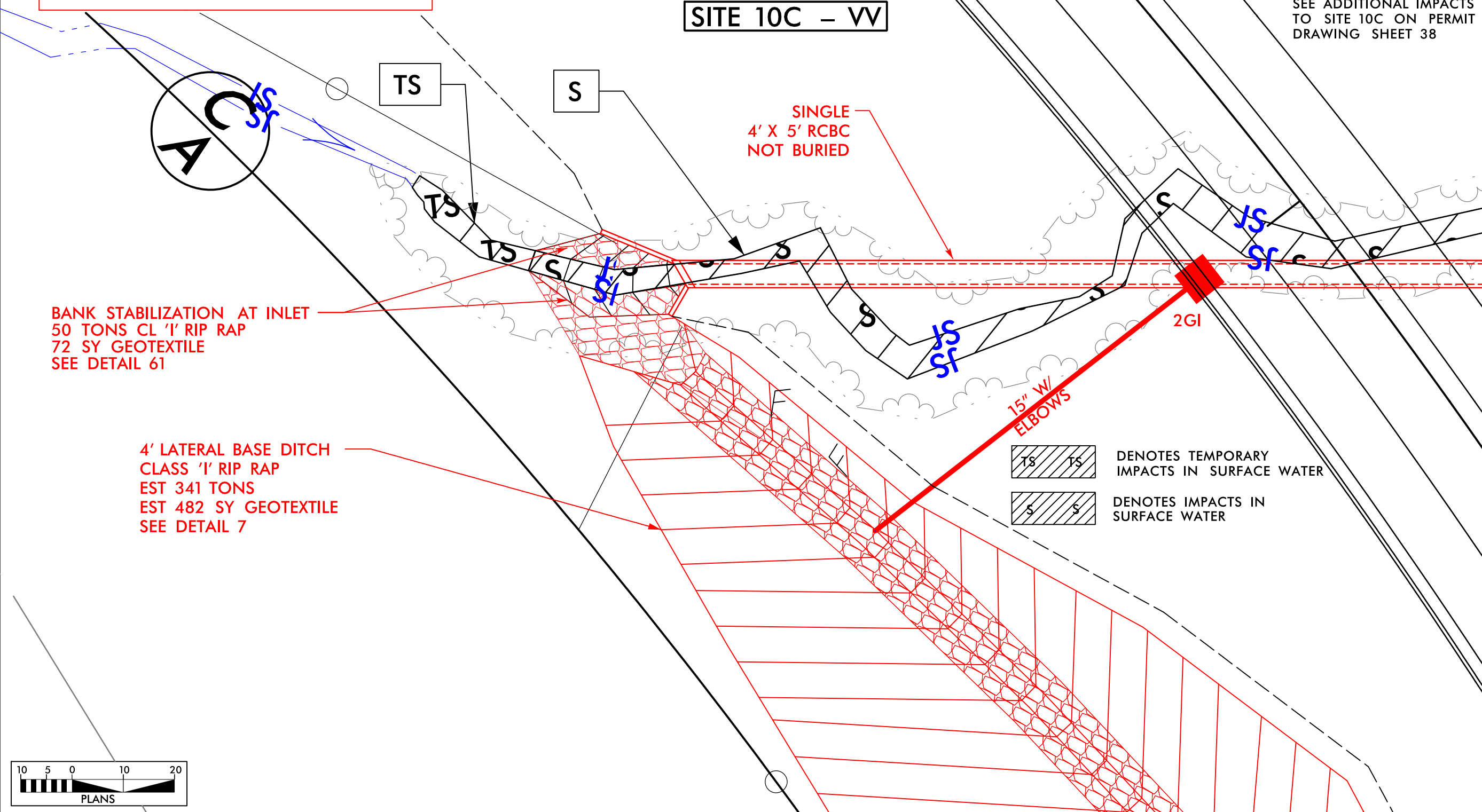
FROM -RPB- STA. 12+20 TO STA. 12+22 RT



6/3/2019
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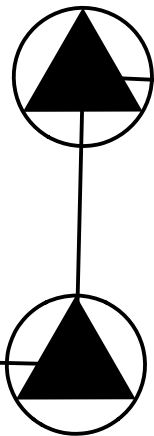
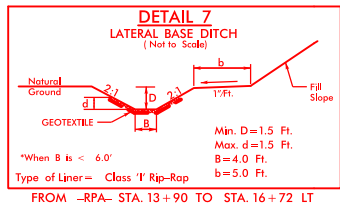


SITE 10C - VV



MATCHLINE
SEE PERMIT DRAWING SHEET 38

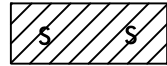
SEE ADDITIONAL IMPACTS
TO SITE 10C ON PERMIT
DRAWING SHEET 38



DENOTES FILL IN
WETLAND



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



DENOTES IMPACTS IN
SURFACE WATER

BLYTHE

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Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO. SHEET NO.

R-2247EB 9G

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

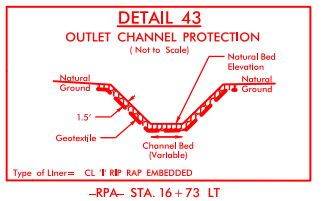
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 30 OF 71

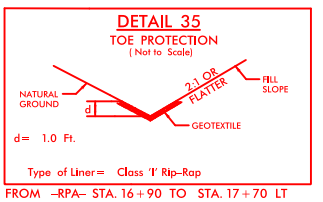
CHORD

TS

SITE 13B - W30



**OUTLET CHANNEL
PROTECTION
W/EMBEDDED RIP RAP
62 TONS CL 'I' RIP RAP
120 SY GEOTEXTILE
SEE DETAIL 43**



**TOE PROTECTION
CLASS 'I' RIP RAP
EST. 21 TONS
EST. 45 SY GEOTEXTILE
SEE DETAIL 35**

SITE 13A - DDD

**4' LATERAL BASE DITCH
CLASS 'I' RIP RAP
EST 181 TONS
EST 255 SY GEOTEXTILE
SEE DETAIL 7**

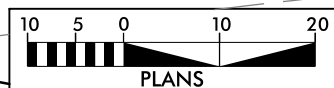
CONC DITCH

JB w/MH

42" WELBOWS

42" RCP-IV

-RPA-



6/3/2019 8:21 AM C:\Users\Blythe\Documents\Drawings\PRM_SHT_03-xx-2019\2247EB_Hyd.prm.PSH09G.dgn
Blythe Hydraulic PERMITS Environmental Drawings\PRM_SHT_03-xx-2019\2247EB_Hyd.prm.PSH09G.dgn
valid for

6/23/16

6/3/2019
R:\Hydro\lics\PERMITS\Environmental\Drawings\PM SH\PM SHT_03-xx-2019\A2247EB_Hyd-prm-PS409H.dgn
adad92b5



PROJ. REFERENCE NO.	SHEET NO.
R-2247EB	9H

PERMIT DRAWING
SHEET 31 OF 71



R-2247EC SITE #7



DENOTES TEMPORARY IMPACTS
IN SURFACE WATER (R-2247EC)

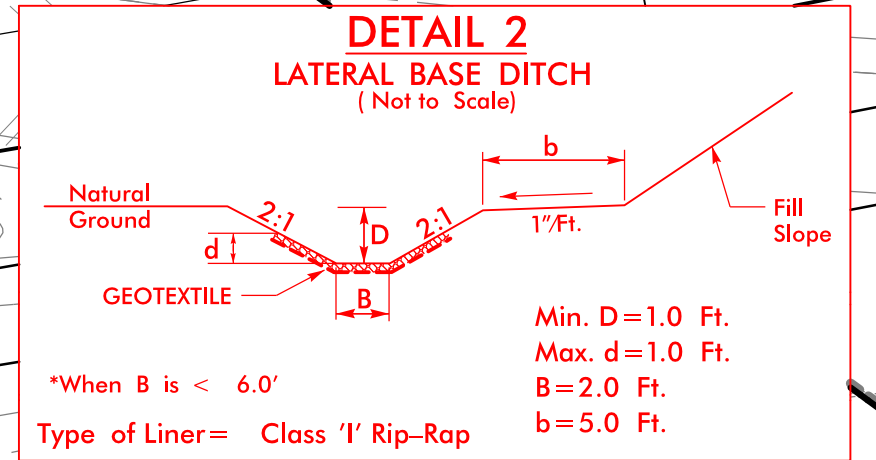
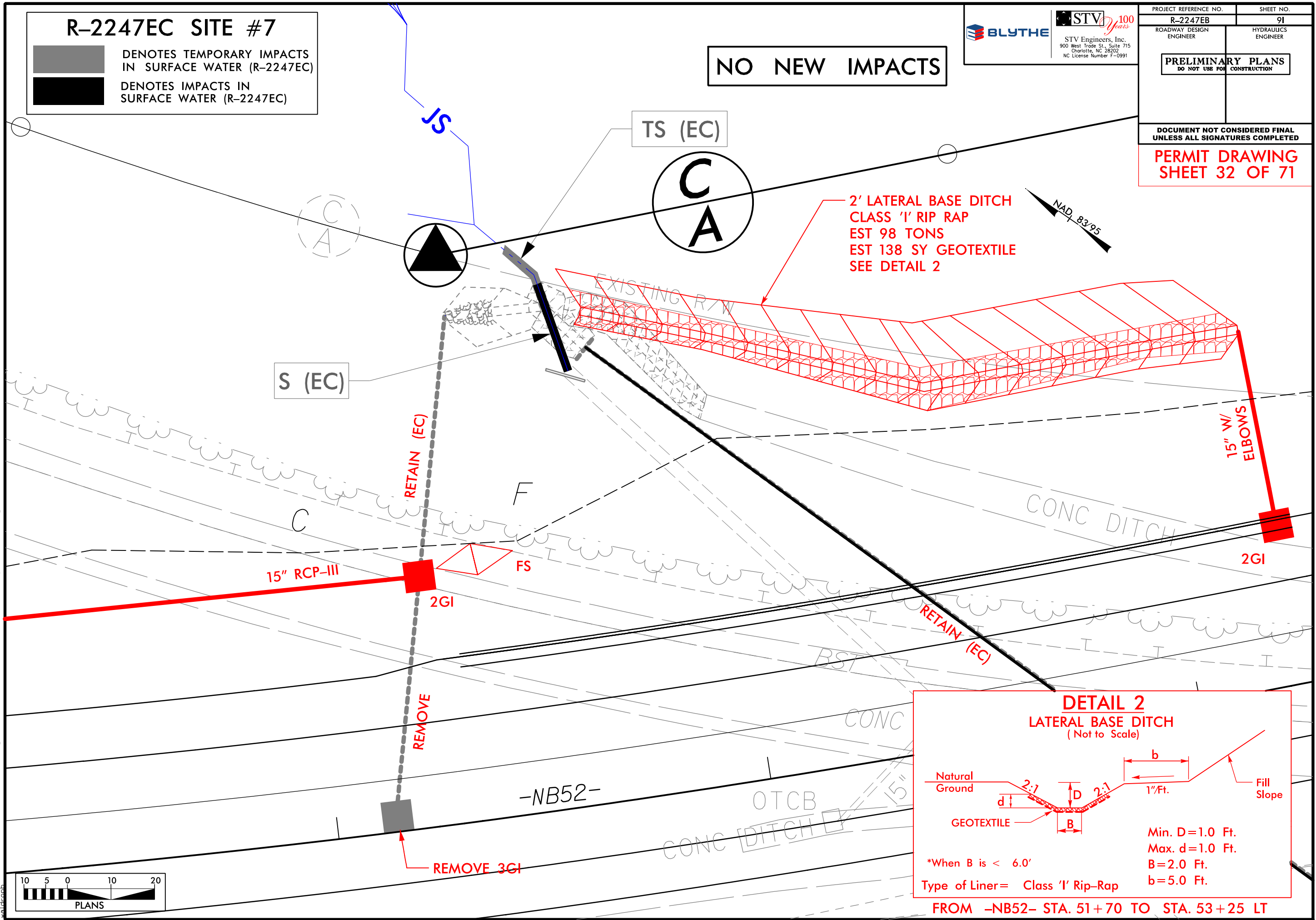
DENOTES IMPACTS IN
SURFACE WATER (R-2247EC)

NO NEW IMPACTS



PROJECT REFERENCE NO.	SHEET NO.
R-2247EB	91
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

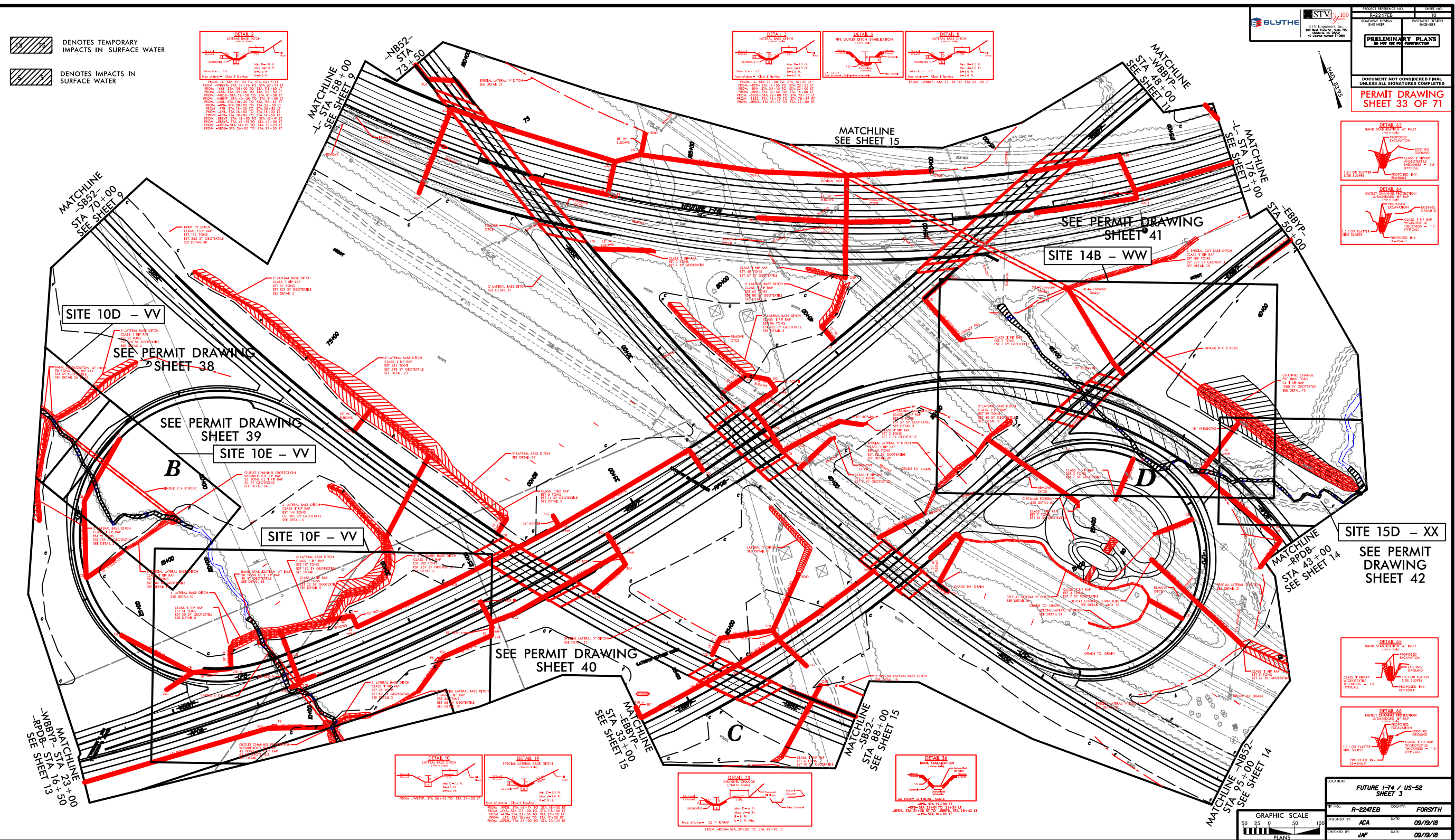
PERMIT DRAWING
SHEET 32 OF 71



FROM -NB52- STA. 51+70 TO STA. 53+25 LT



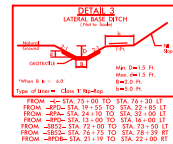
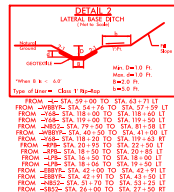
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6/2/2019
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6/2/99

DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN
SURFACE WATER



PROJECT NUMBER: R-2247EB SHEET NO: 00A

STV Engineering, Inc.
300 West Main St., Suite 100
Forsyth, NC 27504
NC License Number: 0000000000

PRELIMINARY PLANS
NO PERMITS REQUIRED

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 34 OF 71

DETAIL 63
BANK STABILIZATION AT INLET

Min. D=18" FL
Max. D=18" FL
S=0.00 FL
Type of Slope: Class 1 1:1

FROM: -SBS- STA 77+00 TO STA 81+77.11
FROM: -SBS- STA 84+77.11 TO STA 87+11.11
FROM: -SBS- STA 101+00 TO STA 101+00 LT
FROM: -SBS- STA 101+00 TO STA 101+00 RT
FROM: -SBS- STA 101+00 TO STA 101+00 LT
FROM: -SBS- STA 101+00 TO STA 101+00 RT

DETAIL 64
OUTLET CHANNEL RESTRICTION

Min. D=18" FL
Max. D=18" FL
S=0.00 FL
Type of Slope: Class 1 1:1

FROM: -SBS- STA 77+00 TO STA 81+77.11
FROM: -SBS- STA 84+77.11 TO STA 87+11.11
FROM: -SBS- STA 101+00 TO STA 101+00 LT
FROM: -SBS- STA 101+00 TO STA 101+00 RT
FROM: -SBS- STA 101+00 TO STA 101+00 LT
FROM: -SBS- STA 101+00 TO STA 101+00 RT

DETAIL 65
BANK STABILIZATION AT INLET

Min. D=18" FL
Max. D=18" FL
S=0.00 FL
Type of Slope: Class 1 1:1

FROM: -SBS- STA 77+00 TO STA 81+77.11
FROM: -SBS- STA 84+77.11 TO STA 87+11.11
FROM: -SBS- STA 101+00 TO STA 101+00 LT
FROM: -SBS- STA 101+00 TO STA 101+00 RT
FROM: -SBS- STA 101+00 TO STA 101+00 LT
FROM: -SBS- STA 101+00 TO STA 101+00 RT

DETAIL 66
OUTLET CHANNEL RESTRICTION

Min. D=18" FL
Max. D=18" FL
S=0.00 FL
Type of Slope: Class 1 1:1

FROM: -SBS- STA 77+00 TO STA 81+77.11
FROM: -SBS- STA 84+77.11 TO STA 87+11.11
FROM: -SBS- STA 101+00 TO STA 101+00 LT
FROM: -SBS- STA 101+00 TO STA 101+00 RT
FROM: -SBS- STA 101+00 TO STA 101+00 LT
FROM: -SBS- STA 101+00 TO STA 101+00 RT

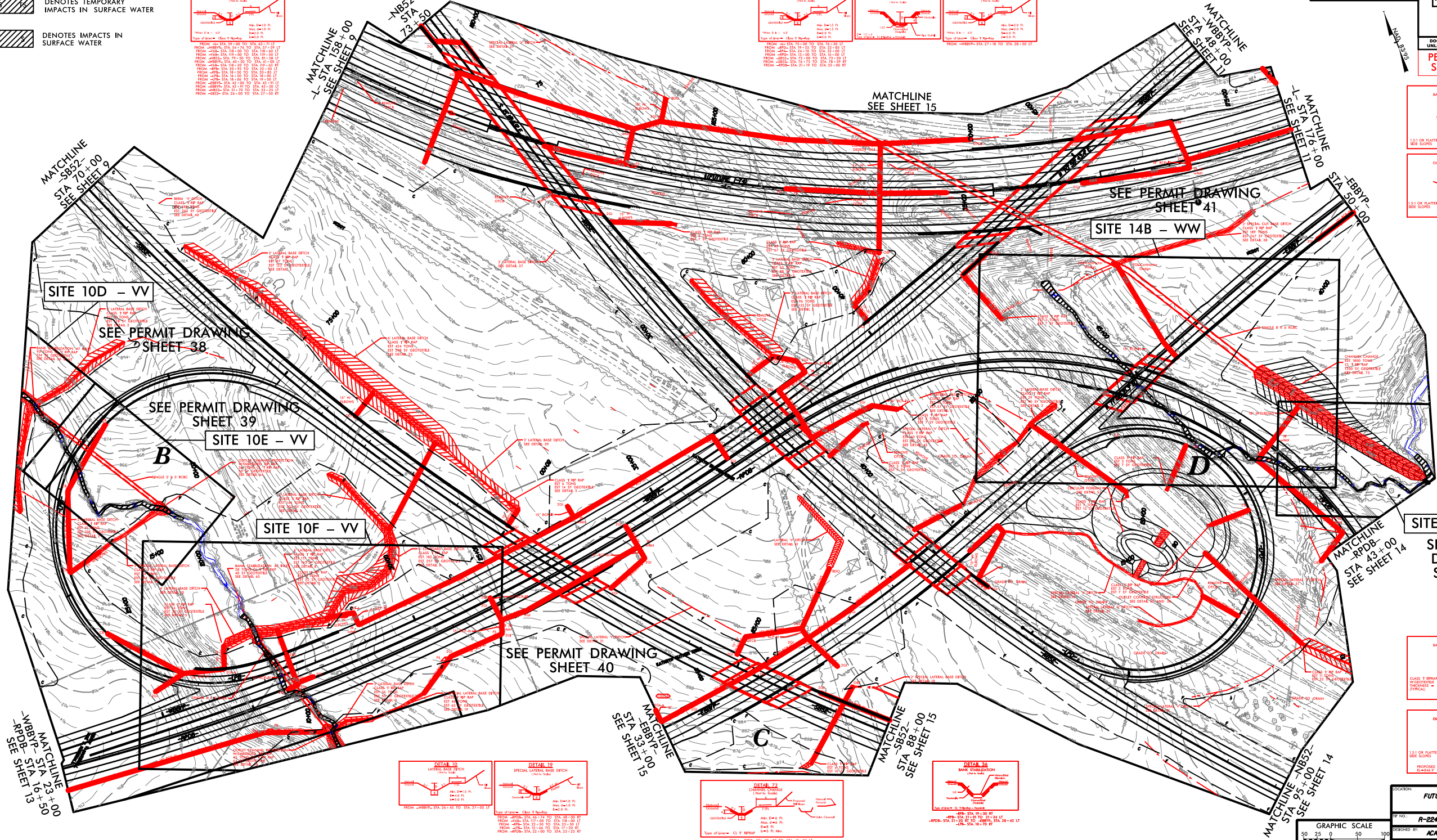
GRAPHIC SCALE
0 25 50 100
PLANS

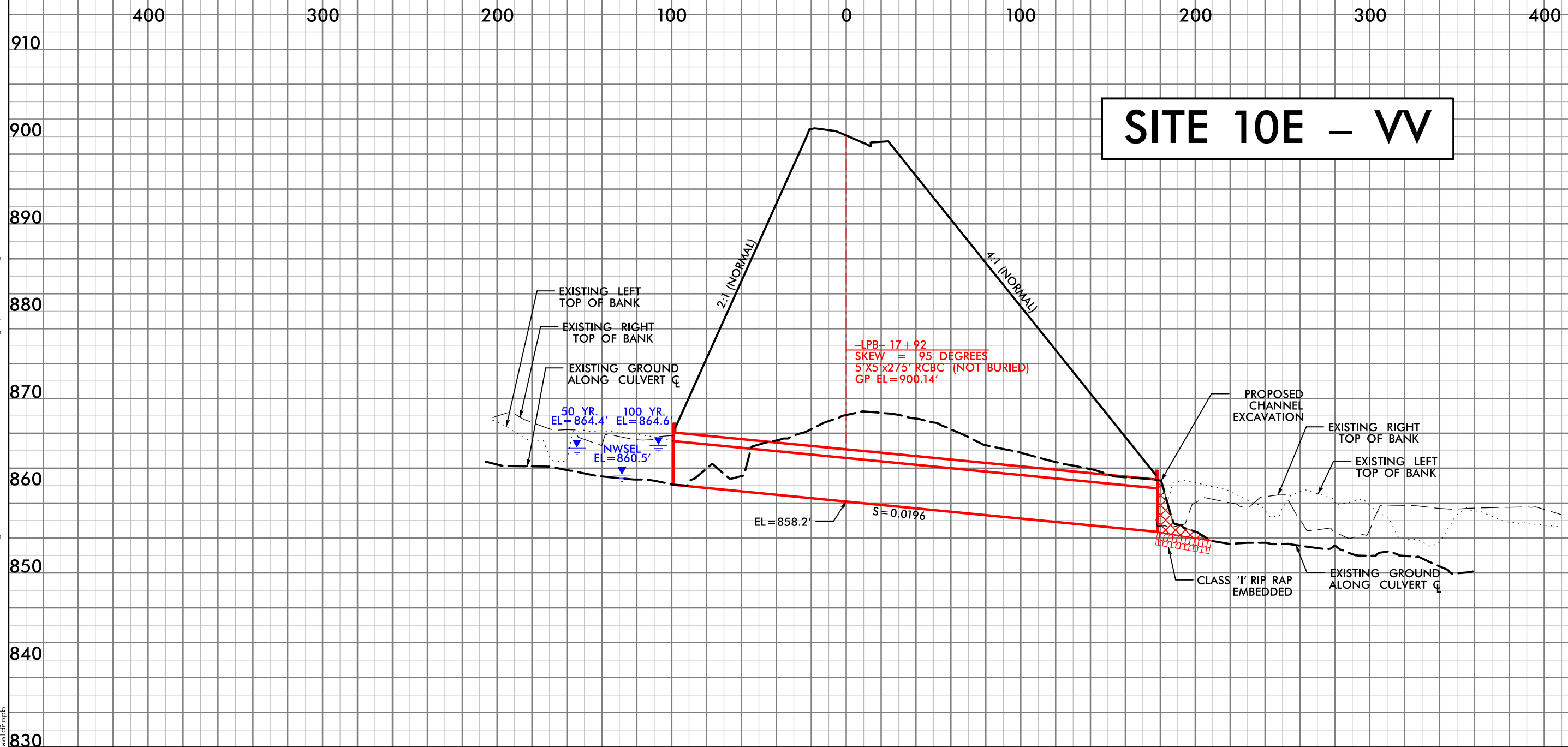
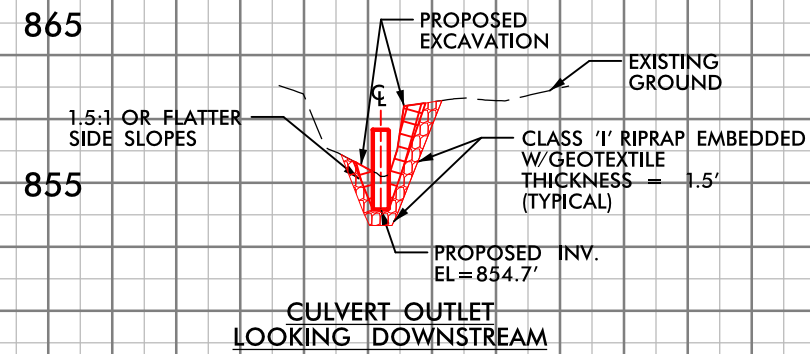
LOCATION: FUTURE I-74 / US-52
SHEET 3

TP NO: R-2247EB COUNTY: FORSYTH

DRAWN BY: ACA DATE: 09/19/18

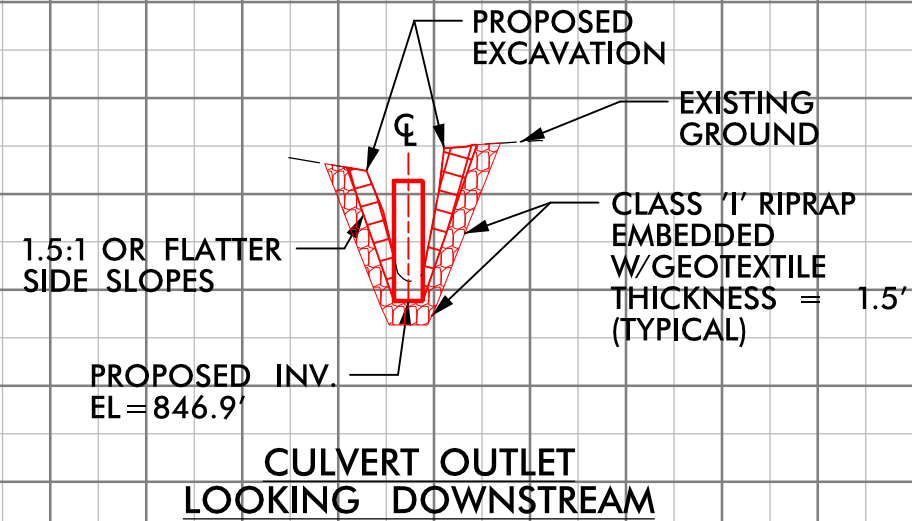
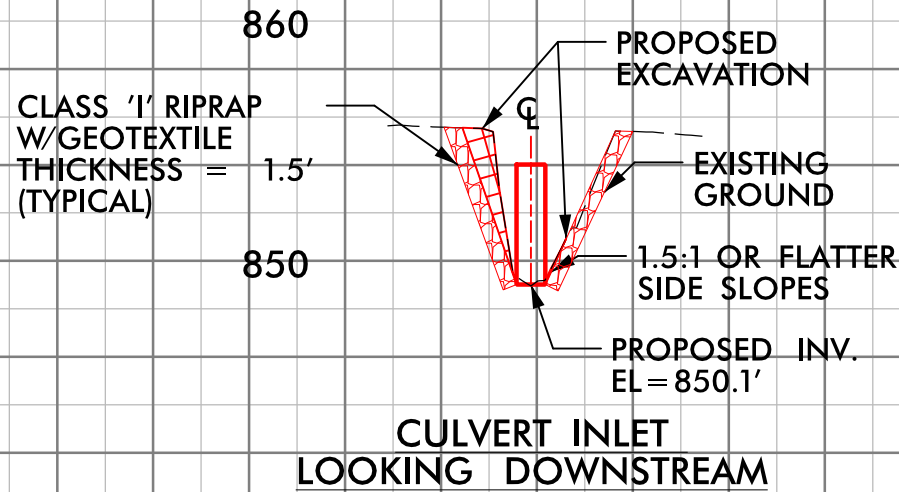
CHECKED BY: JAF DATE: 09/19/18





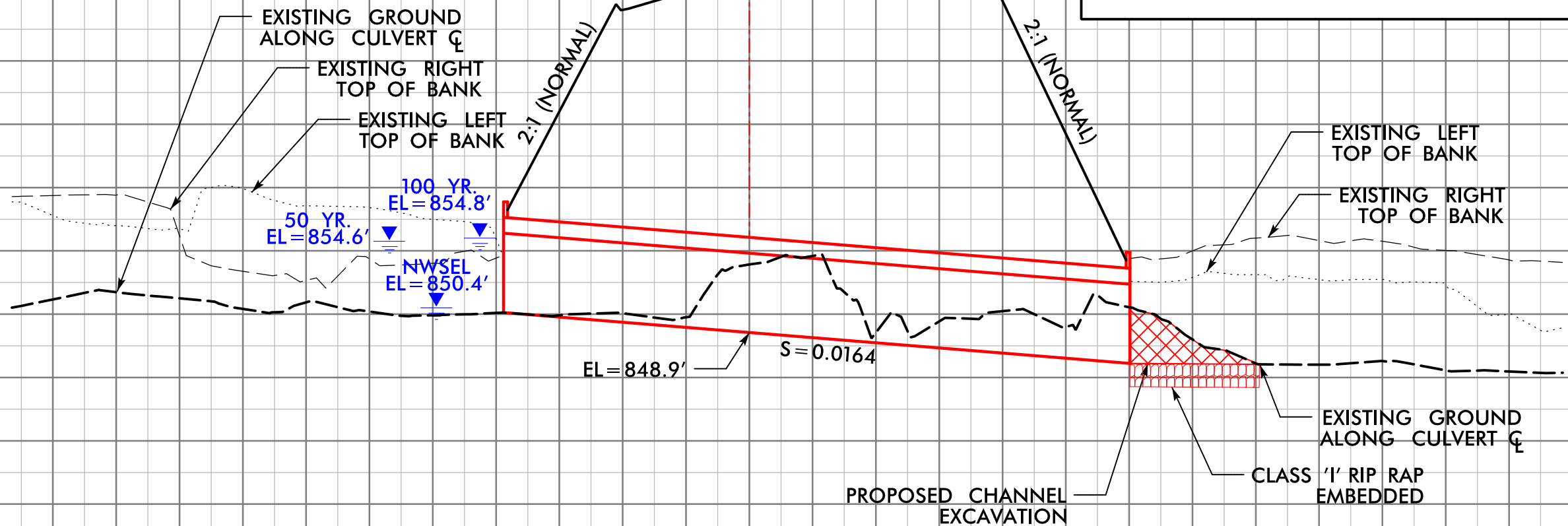
6/23/16

PROJECT REFERENCE NO.	SHEET NO.
R-2247EB	10C
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-WBBYP- 27 + 38
SKEW = 72 DEGREES
6'X5'X196' RCBC (NOT BURIED)
GP EL = 871.36'

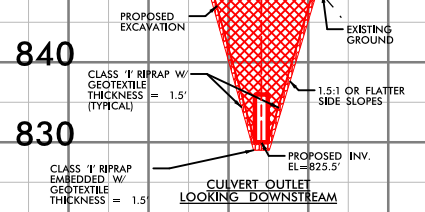
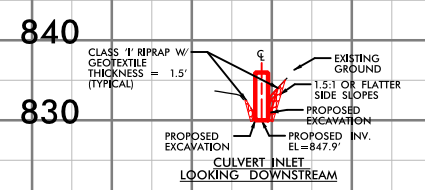
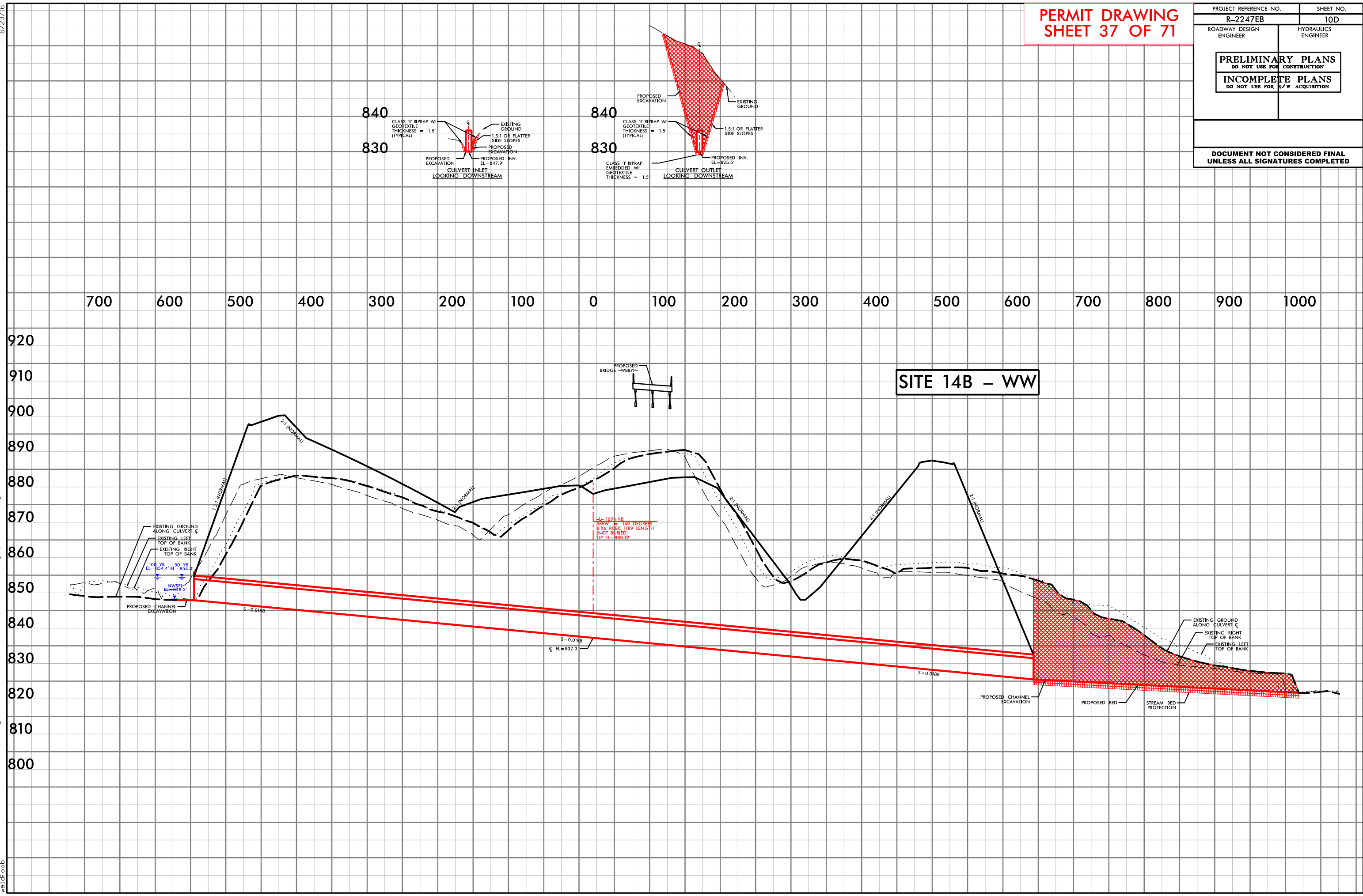
SITE 10F - VV



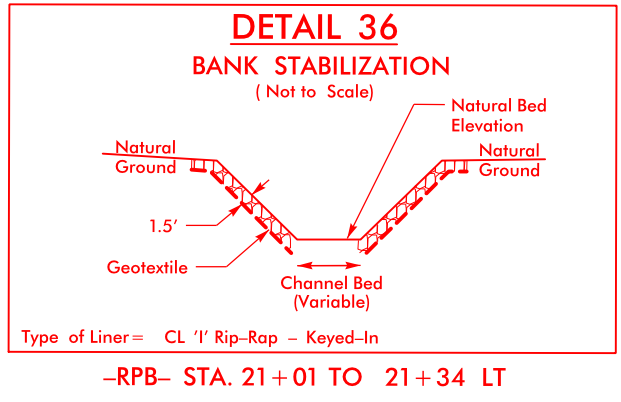
6/23/16
6/3/2019
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6/3/2019
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PERMIT DRAWING
SHEET 37 OF 71

PROJECT REFERENCE NO.	SHEET NO.
R-2247EB	10D
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



SITE 14B - WW



2' LATERAL BASE DITCH
CLASS '1' RIP RAP
EST 91 TONS
EST 128 SY GEOTEXTILE
SEE DETAIL 2

BANK STABILIZATION AT INLET
37 TONS CL '1' RIP RAP
52 SY GEOTEXTILE
SEE DETAIL 36 & 63

SITE 10D - VV

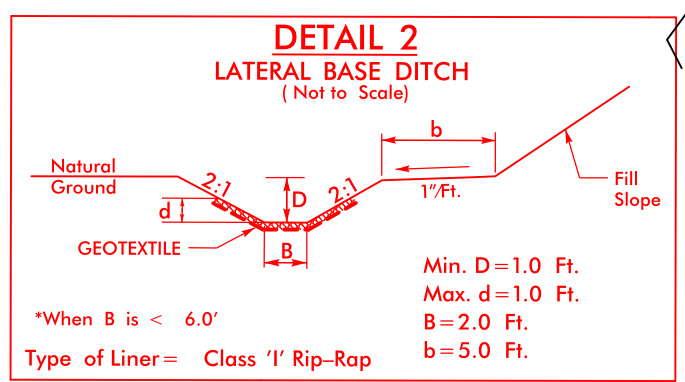
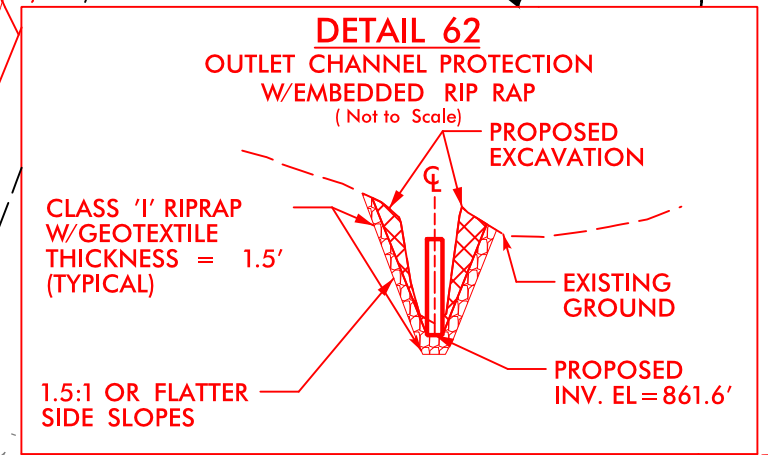
BANK STABILIZATION
95 TONS CL '1' RIP RAP
134 SY GEOTEXTILE
SEE DETAIL 36

SINGLE
4' X 5' RCBC
NOT BURIED

SEE ADDITIONAL IMPACTS
TO SITE 10C ON PERMIT
DRAWING SHEET 29

2' LATERAL BASE DITCH
CLASS '1' RIP RAP
EST 157 TONS
EST 222 SY GEOTEXTILE
SEE DETAIL 2

SITE 10C - VV



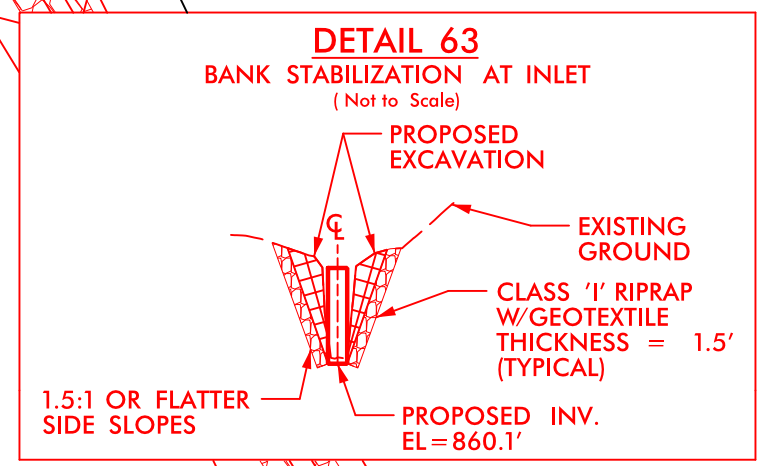
FROM -RPB- STA. 20+95 TO STA. 22+50 LT
FROM -RPB- STA. 18+50 TO STA. 20+85 LT

OUTLET CHANNEL
PROTECTION W/
EMBEDDED RIP RAP
36 TONS CL '1' RIP RAP
50 SY GEOTEXTILE
SEE DETAIL 62

2' LATERAL BASE DITCH
CLASS '1' RIP RAP
EST 91 TONS
EST 128 SY GEOTEXTILE
SEE DETAIL 2

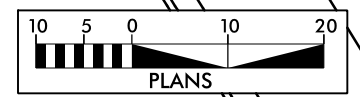
2' LATERAL BASE DITCH
CLASS '1' RIP RAP
EST 55 TONS
EST 78 SY GEOTEXTILE
SEE DETAIL 2

SITE 10E - VV



DENOTES IMPACTS IN
SURFACE WATER

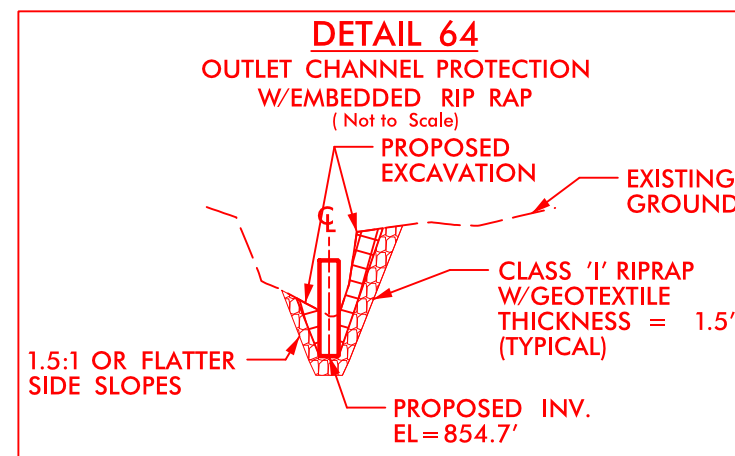
SEE ADDITIONAL IMPACTS
TO SITE 10E ON PERMIT
DRAWING SHEET 39



MATCHLINE
SEE PERMIT DRAWING SHEET 29

MATCHLINE
SEE PERMIT DRAWING SHEET 39

PERMIT DRAWING
SHEET 39 OF 71



 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 DENOTES IMPACTS IN SURFACE WATER

SITE 10E – VV

SEE ADDITIONAL IMPACTS
TO SITE 10E ON PERMIT
DRAWING SHEET 38

**MATCHLINE
SEE PERMIT DRAWING SHEET 38**

-1PB-

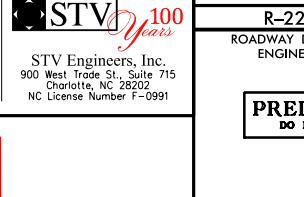
15" RCP-11

**SINGLE 5' X 5' RCBC
NOT BURIED**

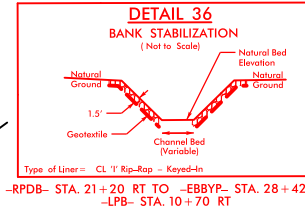
TS

— 2' SPECIAL LATERAL BASE DITCH
CLASS 'I' RIP RAP
EST 74 TONS
EST 104 SY GEOTEXTILE
SEE DETAIL 19



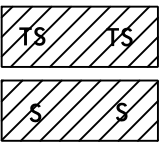


PERMIT DRAWING
SHEET 40 OF 71



**DOCUMENT
UNLESS AL**

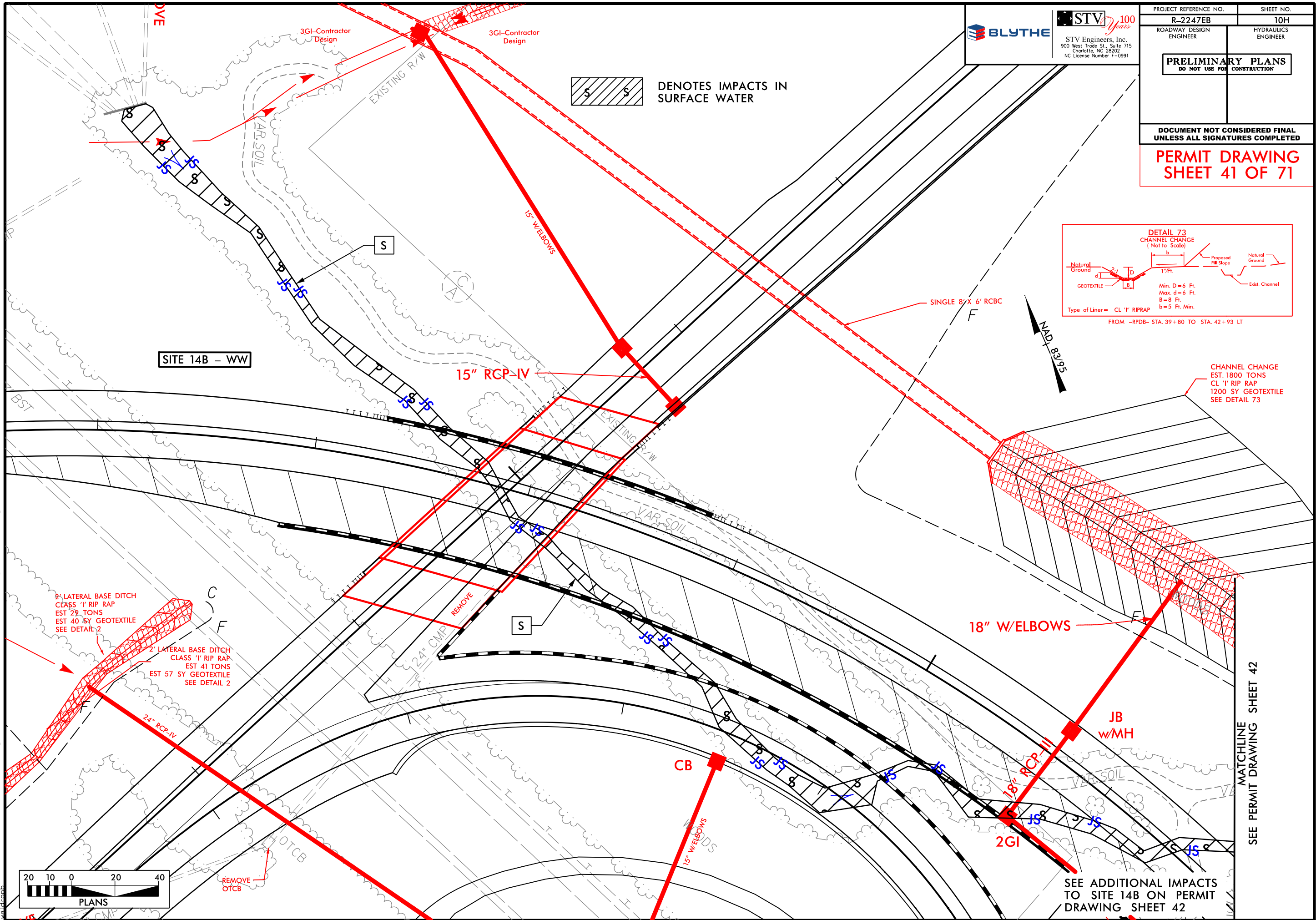
MATCHLINE
SEE PERMIT DRAWING SHEET 54



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

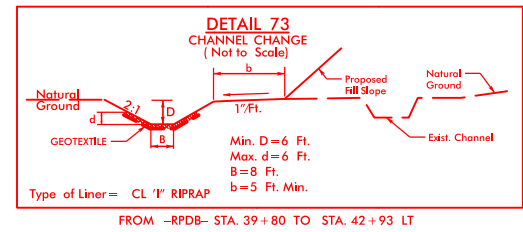
DENOTES IMPACTS IN
SURFACE WATER

6/3/2019 8:11 AM B:\Hydraulics\PERMITS\Environmental\Drawings\PRM_SHT_03-xx-2019\2247EB_Hyd.prm.PSH10H.dgn
Valid for 30 days



BLYTHE **STV** 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-1991

PROJECT REFERENCE NO.		SHEET NO.	
R-2247EB		10H	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
PERMIT DRAWING SHEET 41 OF 71			



MATCHLINE
SEE PERMIT DRAWING SHEET 42

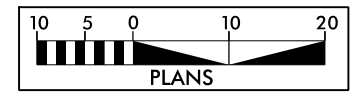


STV

100 Years

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900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number E-1991

PROJECT REFERENCE NO. R-2247EB		SHEET NO. 101	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
PERMIT DRAWING SHEET 42 OF 71			





TS

Denotes Temporary Impacts in Surface Water



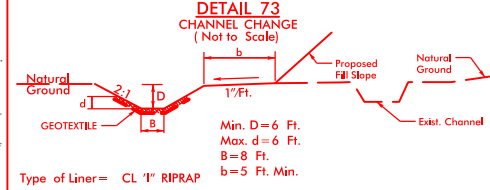
S

Denotes Impacts in Surface Water

SITE 15D - XX

BANK STABILIZATION
SEE DETAIL 36

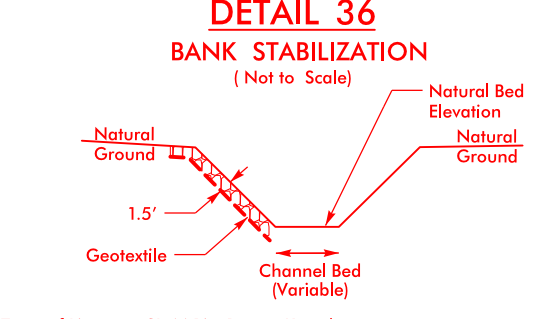
DETAIL 73
CHANNEL CHANGE
(Not to Scale)



Type of Liner = CL '1' RIPRAP
FROM -RPDB- STA. 39+80 TO STA. 42+93 LT

CHANNEL CHANGE
EST. 1800 TONS
CL '1' RIP RAP
1200 SY GEOTEXTILE
SEE DETAIL 73

DETAIL 36
BANK STABILIZATION
(Not to Scale)



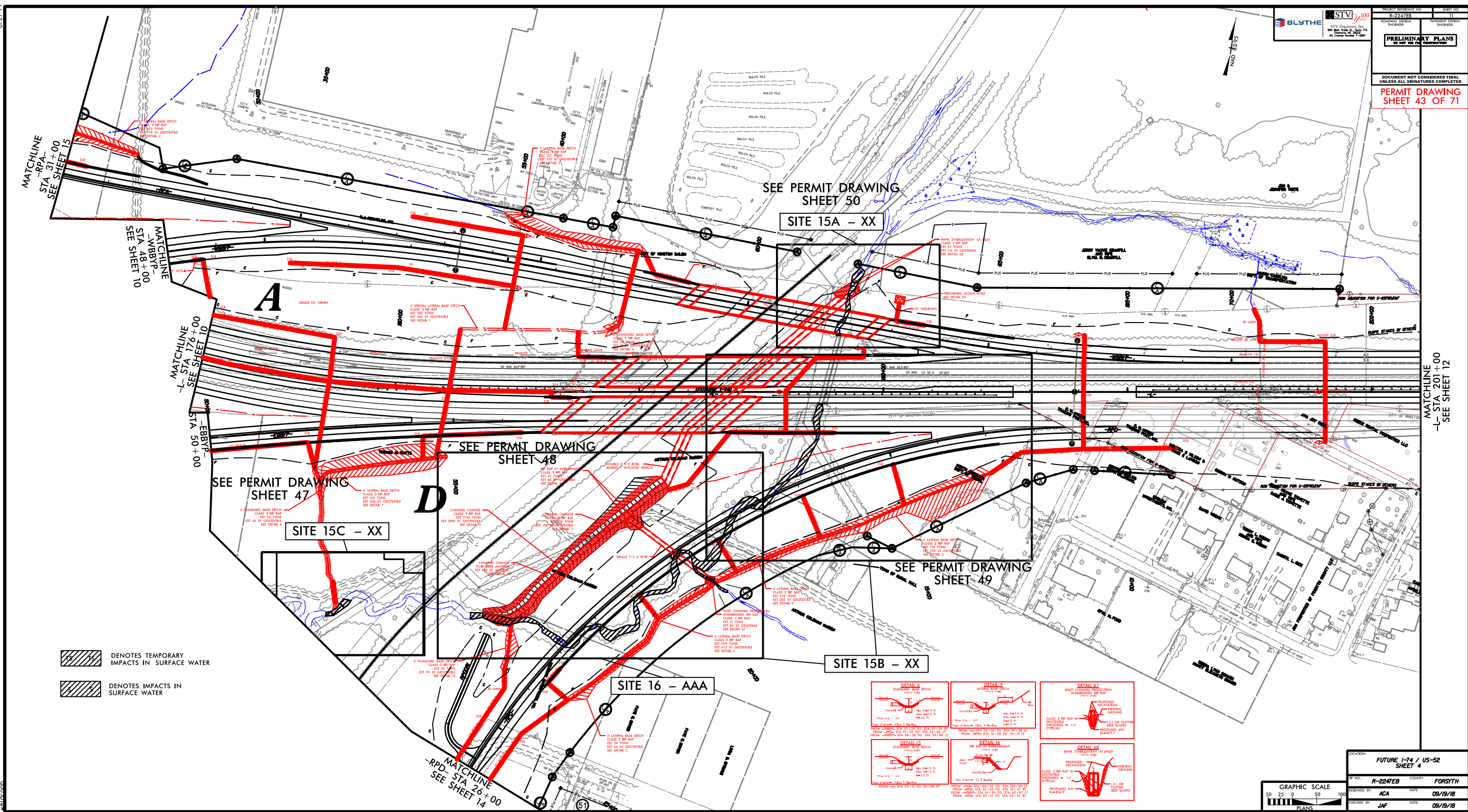
Type of Liner = CL '1' Rip-Rap - Keyed-In

SITE 14B - WW

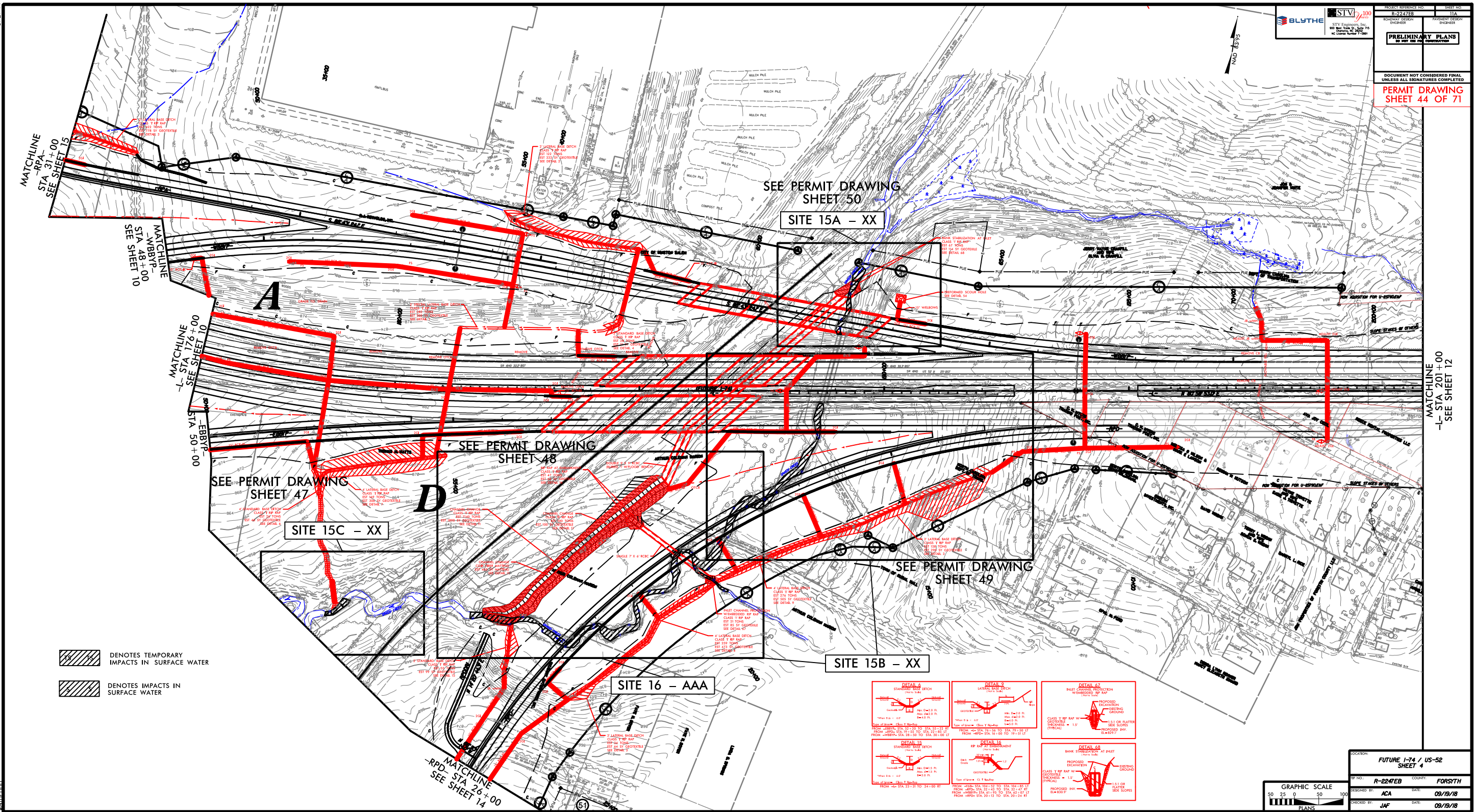
SEE ADDITIONAL IMPACTS
TO SITE 14B ON PERMIT
DRAWING SHEET 41

MATCHLINE
SEE PERMIT DRAWING SHEET 41

6/3/2019 8:31 AM C:\Users\Blythe\Documents\Drawings\PRM_SHT_03-xx-2019\2247EB_Hyd.prm.PSH101.dgn



6/2/2019 R:\Hydro\Public\PERMITS\Environmental\Drawings\PRM_SHT_03-xx-2019\R2247EB_Hyd.prm_PSH1A.dgn 6/2/19



6/23/16

PROJECT REFERENCE NO.	SHEET NO.
R-2247EB	11B
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

300 200 100 0 100 200

870

-RPD- 19+90
SKEW = 72 DEGREES
7'X6' RCBC, 172' LENGTH
(NOT BURIED)
GP EL=862.31'

860

SITE 16 - AAA

850

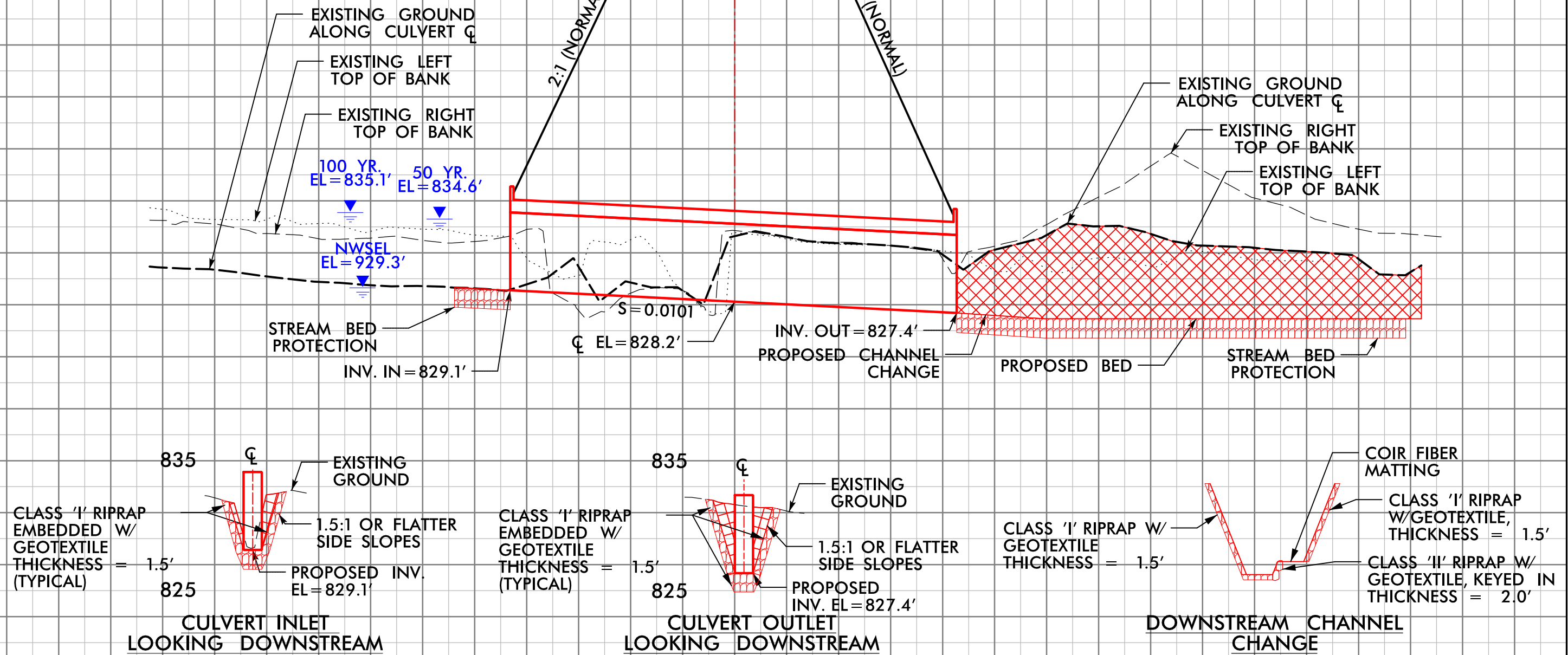
840

830

820

810

800

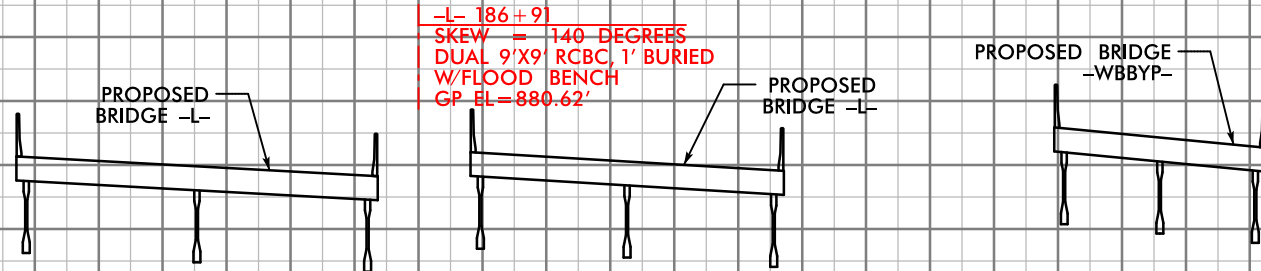
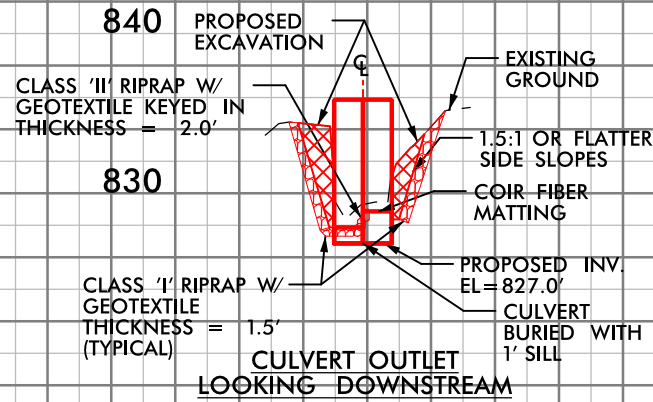
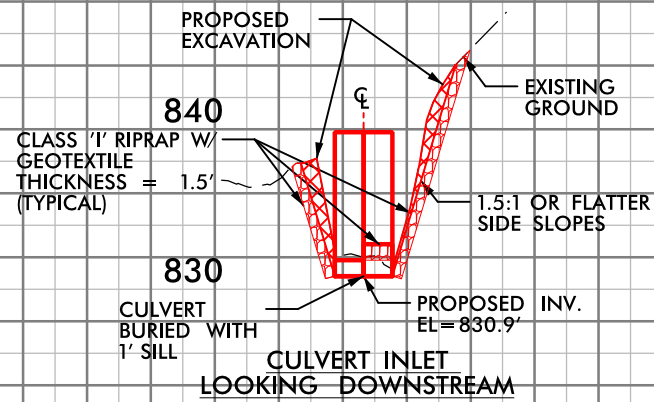


6/23/16

6/3/2019 R:\Hydraulics\PERMITS\Environmental\Drawings\PRM SHT\PRM SHT_03-xx-2019\R2247EB_hyd-prm_PSH11C.dgn

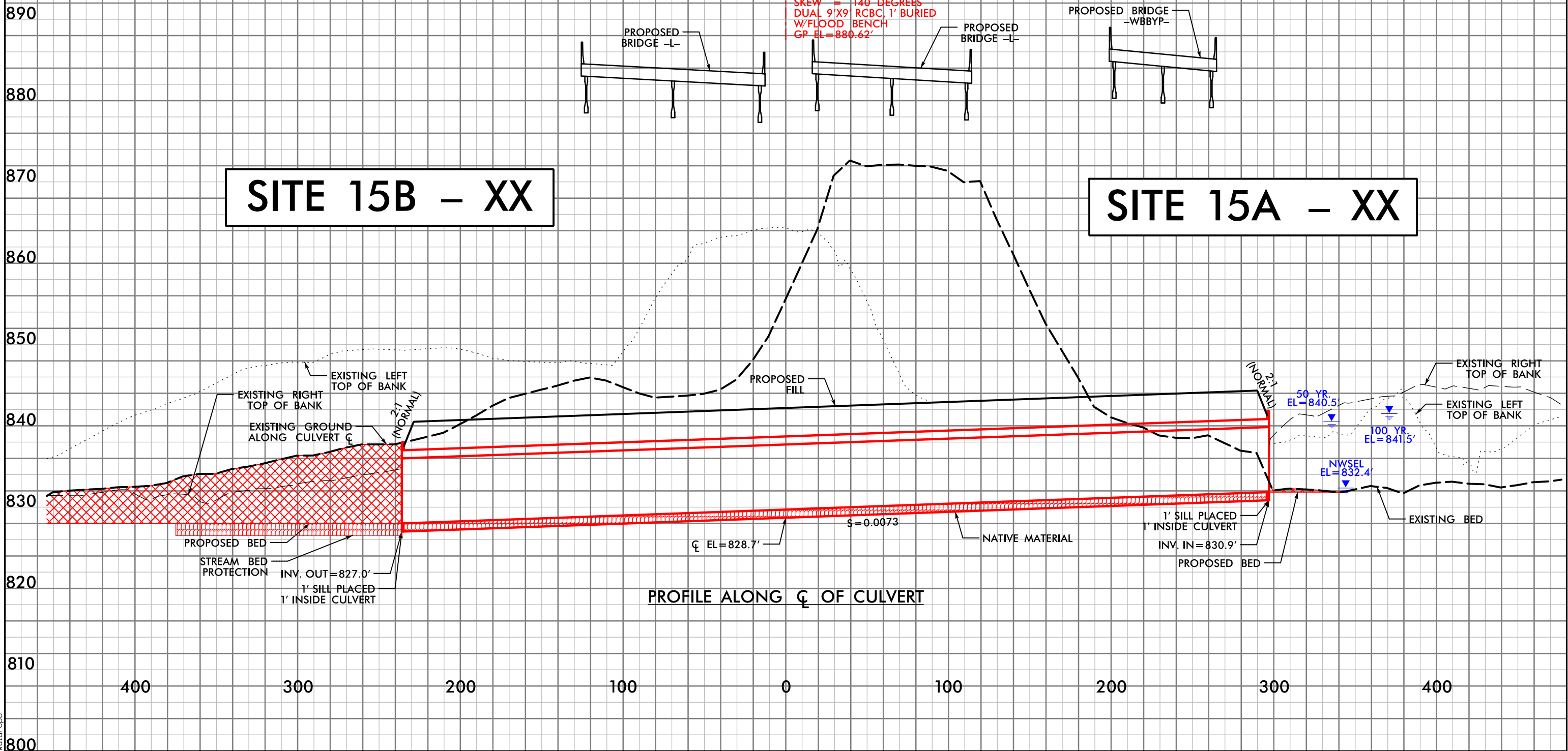
PERMIT DRAWING
SHEET 46 OF 71

PROJECT REFERENCE NO. R-2247EB	SHEET NO. 11C
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

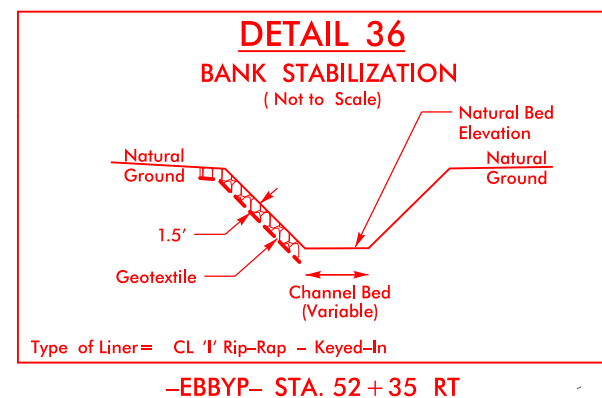


SITE 15B - XX

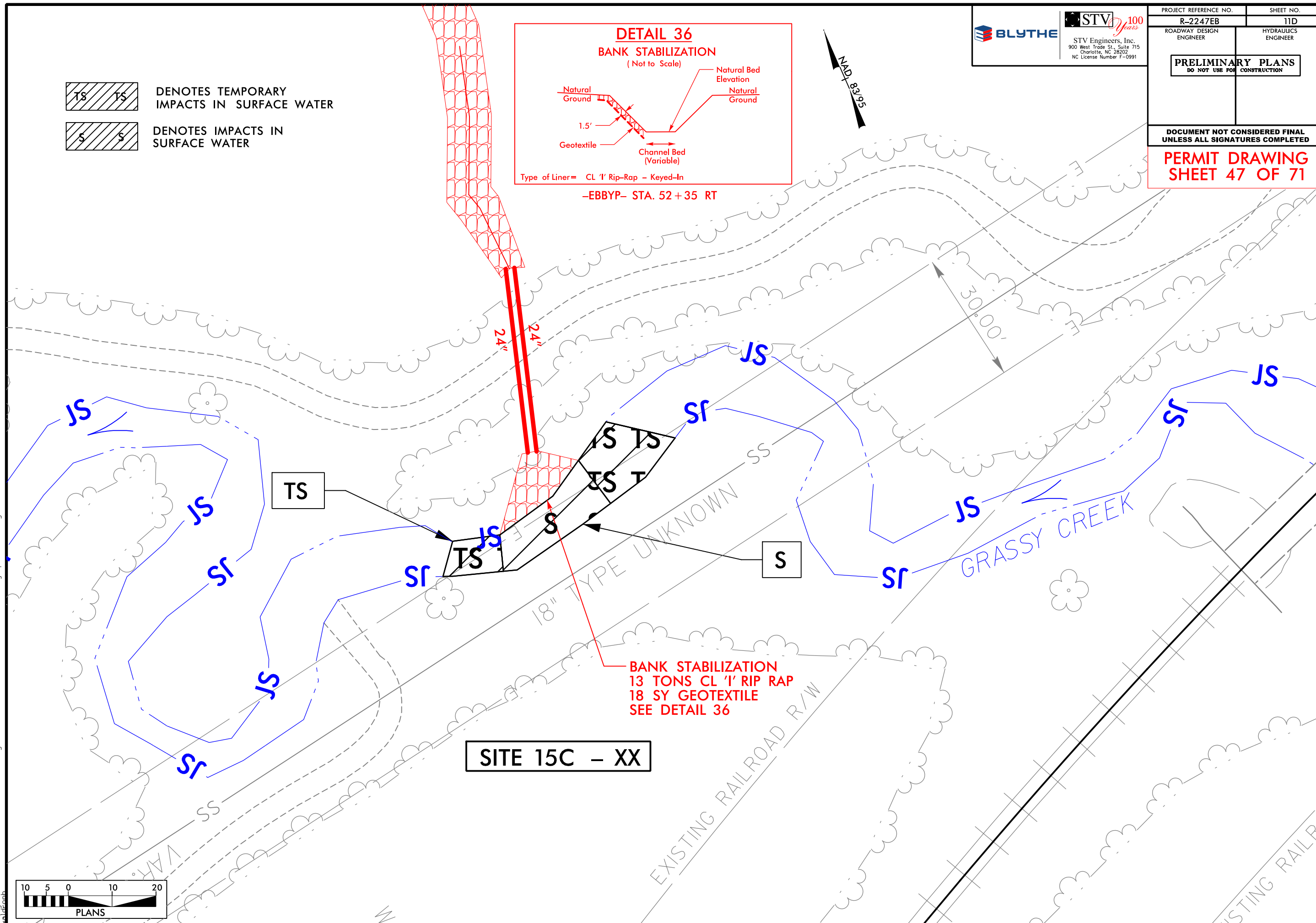
SITE 15A - XX

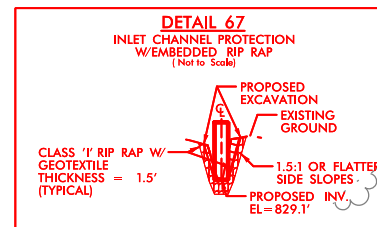
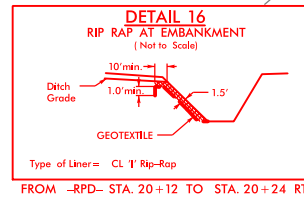
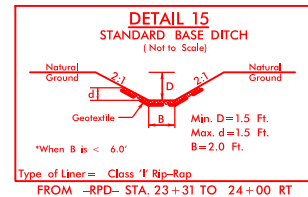
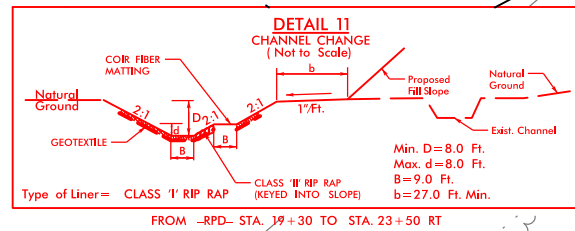
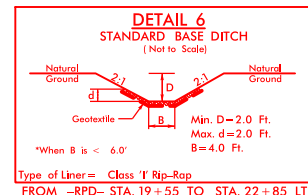


PERMIT DRAWING
SHEET 47 OF 71



-EBBYP- STA. 52+35 RT





2' STANDARD BASE DITCH
CLASS 'I' RIP RAP
EST 55 TONS
EST 99 SY GEOTEXTILE
SEE DETAIL 15

CHANNEL CHANGE
CLASS 'II' RIP RAP
EST 100 TONS
ST 100 SY GEOTEXTILE
SEE DETAIL 11

RIP RAP AT EMBANKMENT
CLASS 'I' RIP RAP
EST 47 TONS
EST 66 SY GEOTEXILE
SEE DETAIL 16

CHANNEL CHANGE
CLASS '1' RIP RAP
EST 7140 TONS
EST 1890 SY GEOTEXTILE
SEE DETAIL 11

CHANNEL CHANGE
COIR FIBER MATTING
ST 460 SY MATTING
SEE DETAIL 11

DOUBLE 9' X 9' RCBC
(BURIED 1' W/FLOOD BENCH)

SINGLE 7' X 6' RCBC -
NOT BURIED

— 4' LATERAL BASE DITCH
CLASS 'I' RIP RAP
EST 259 TONS
EST 473 SY GEOTEXTILE
SEE DETAIL 6

INLET CHANNEL PROTECTION
W/EMBEDDED RIP RAP
CLASS 'I' RIP RAP
EST 51 TONS
EST 85 SY GEOTEXTILE
SEE DETAIL 67

DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN
SURFACE WATER

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

PERMIT DRAWING
SHEET 48 OF 71

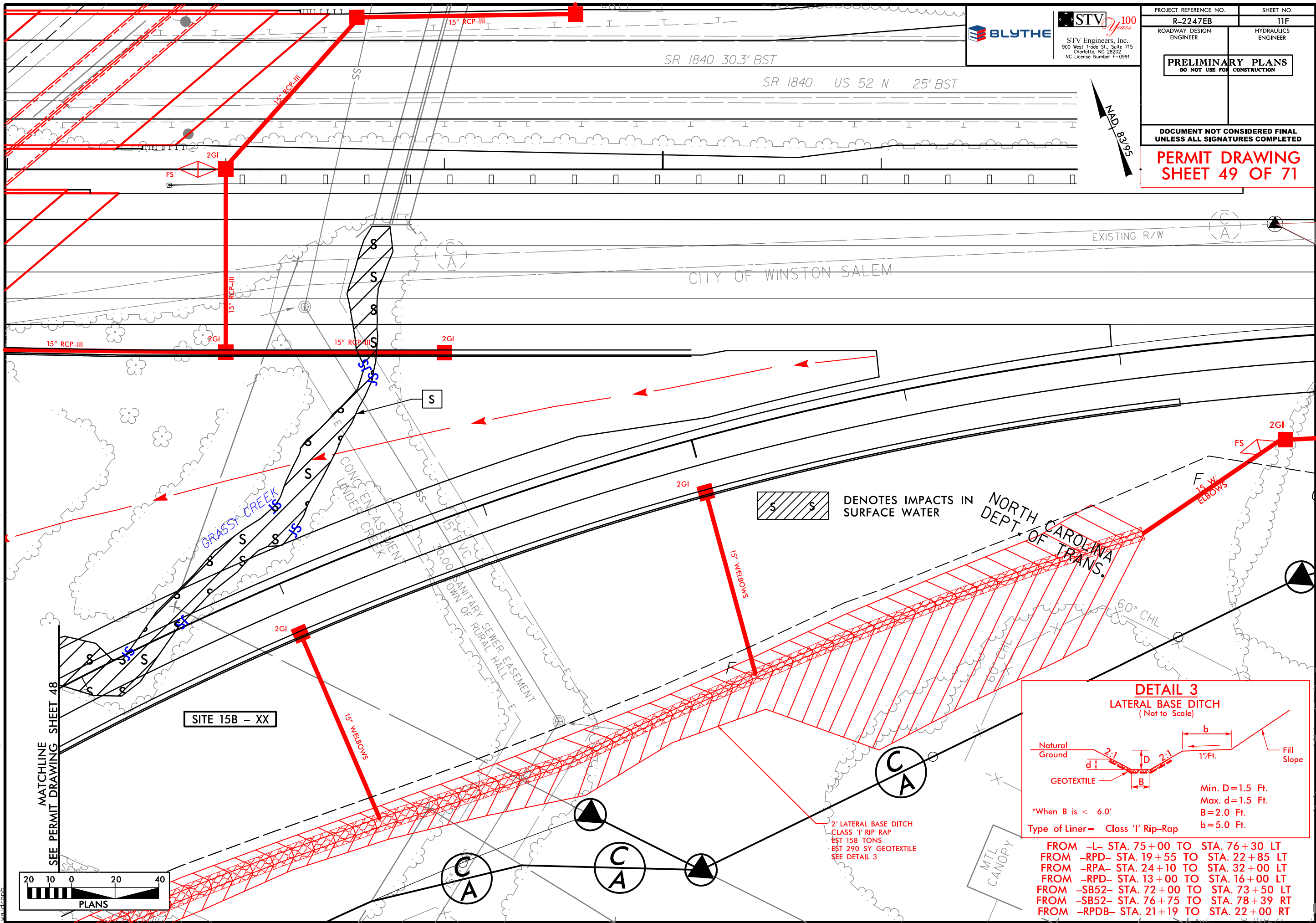
SEE PERMIT DRAWING SHEET 49

PROJECT REFERENCE NO.	SHEET NO.
R-2247EB	11E
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

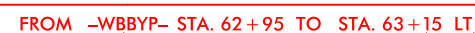


STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

ARTHUR COLEMAN BLYTHE



PERMIT DRAWING
SHEET 50 OF 71



308

~~-WBBYP-~~

SITE 15A – XX

— PREFORMED SCOUR HOLE
SEE DETAIL 54

- 15" W/ELBOWS

2G

2GI

15" RCP-III

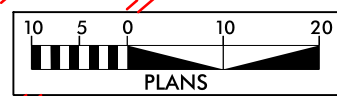
- DOUBLE 9' X 9' RCBC
(BURIED 1' W/FLOOD BENCH)

DETAIL 68
BANK STABILIZATION AT INLET
(Not to Scale)

CLASS 'I' RIPRAP W/
GEOTEXTILE
THICKNESS = 1.5'
(TYPICAL)

PROPOSED INV.
EL = 830.9'

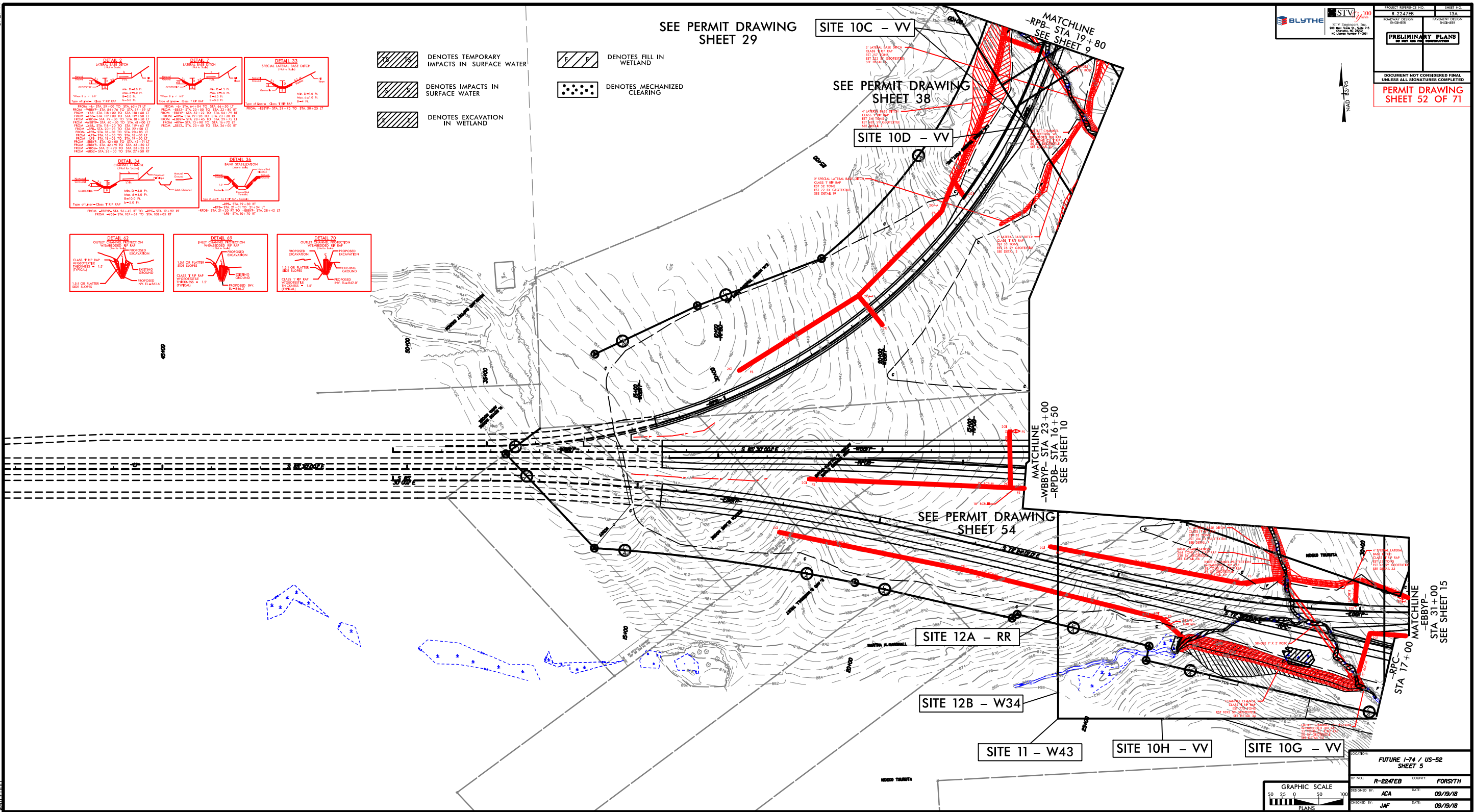
— 1.5:1 OR
FLATTER
SIDE SLOPES





6/2/99

6/3/2019
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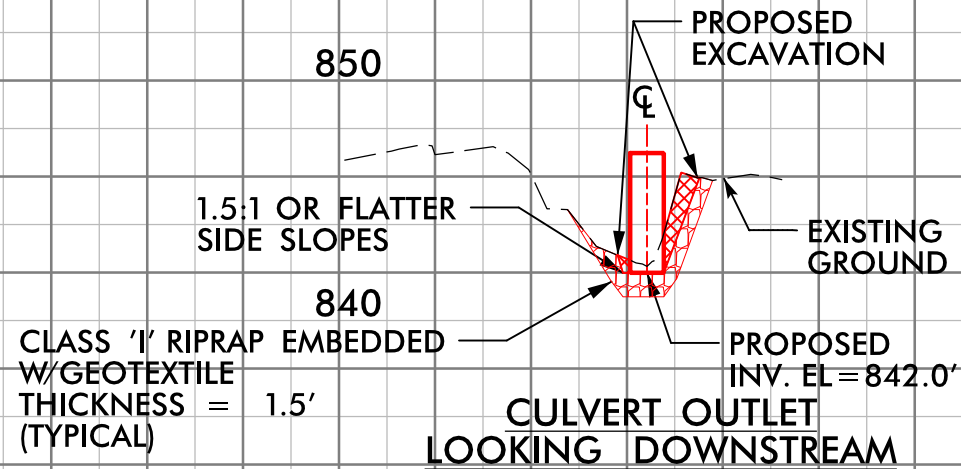
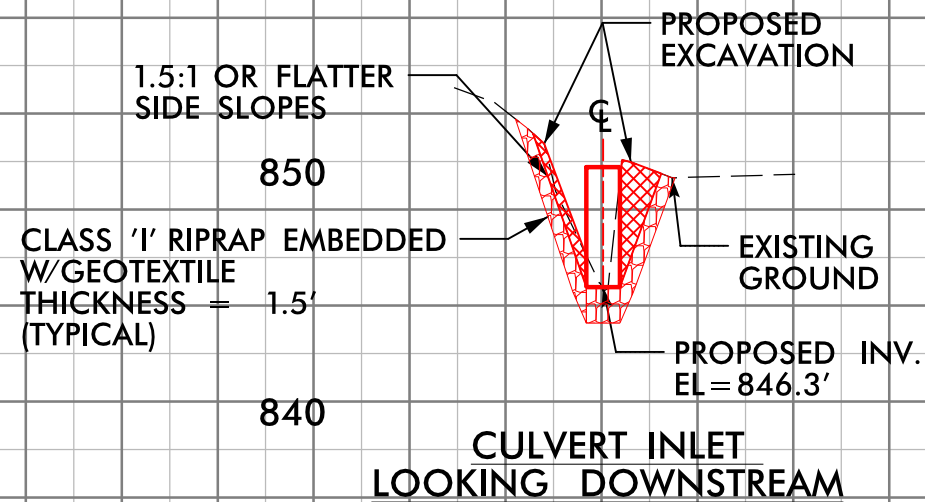


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6/3/2019
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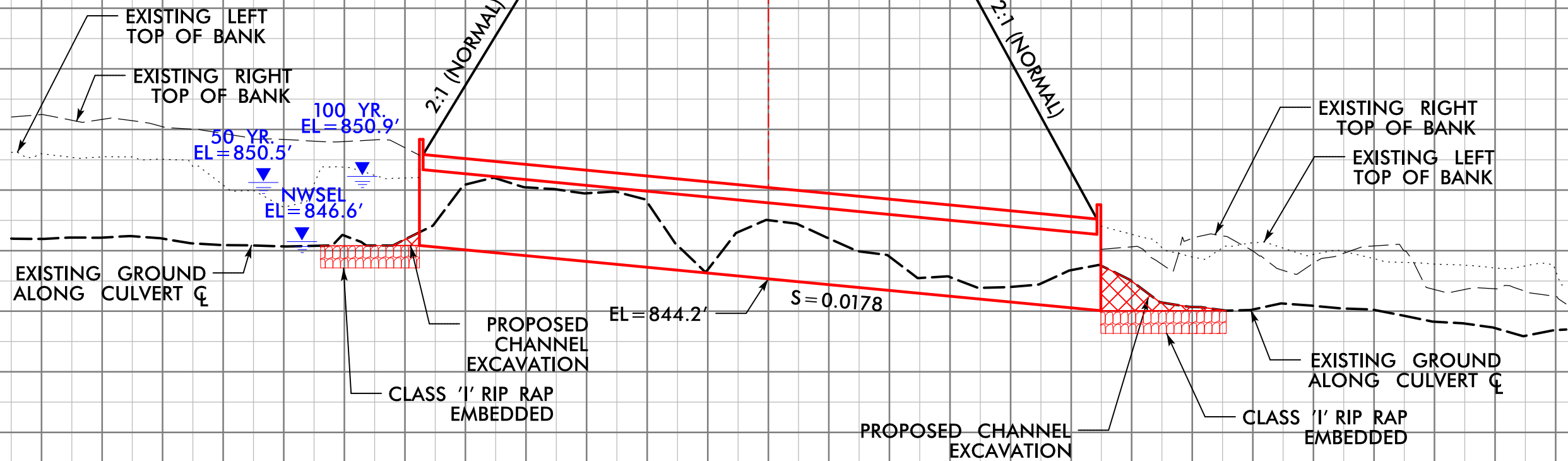
PERMIT DRAWING
SHEET 53 OF 71

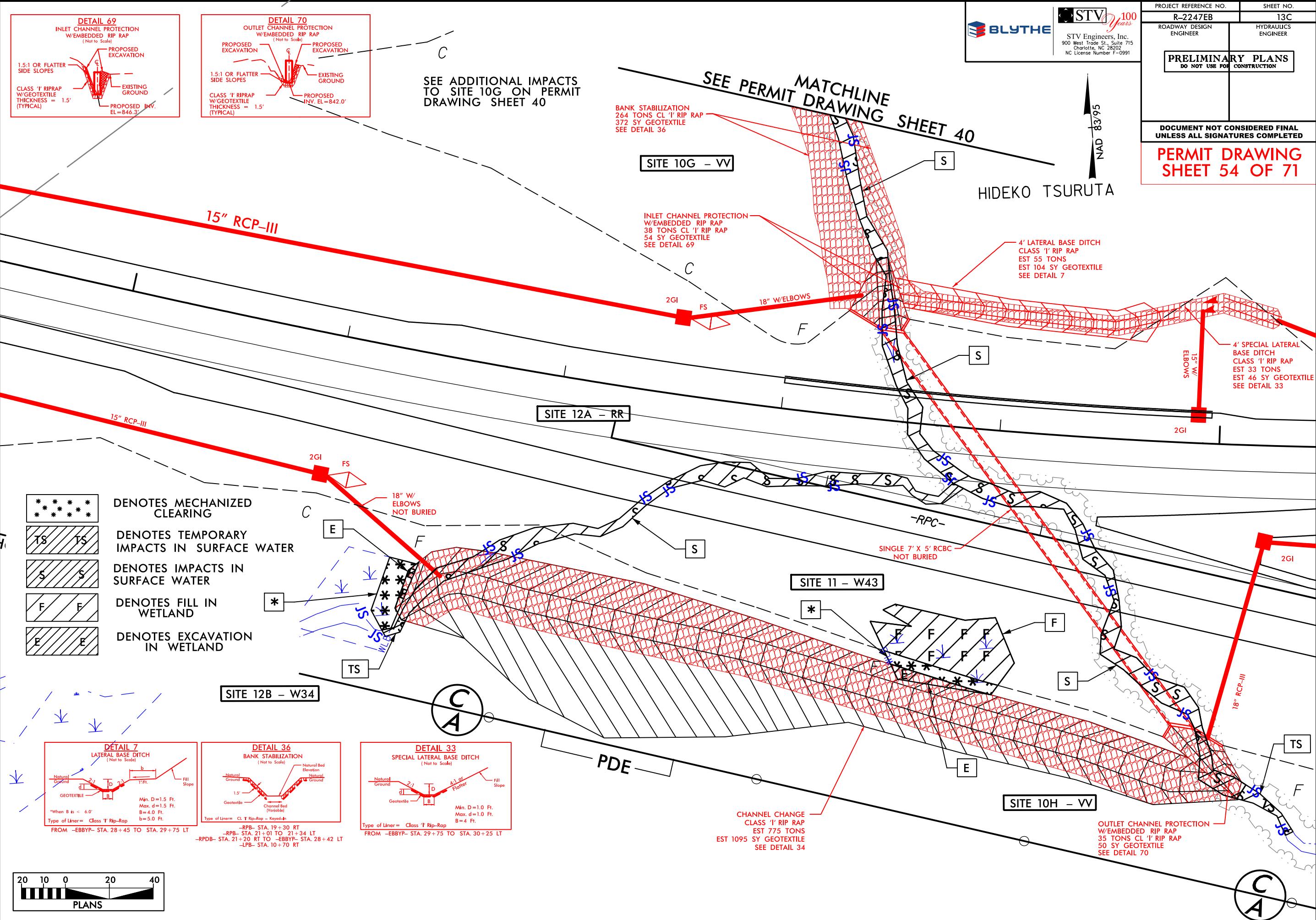
PROJECT REFERENCE NO. R-2247EB	SHEET NO. 13B
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



+RPC- 12+01
SKEW = 41 DEGREES
7'X5'x240' RCBC, (NOT BURIED)
GP EL=867.99'

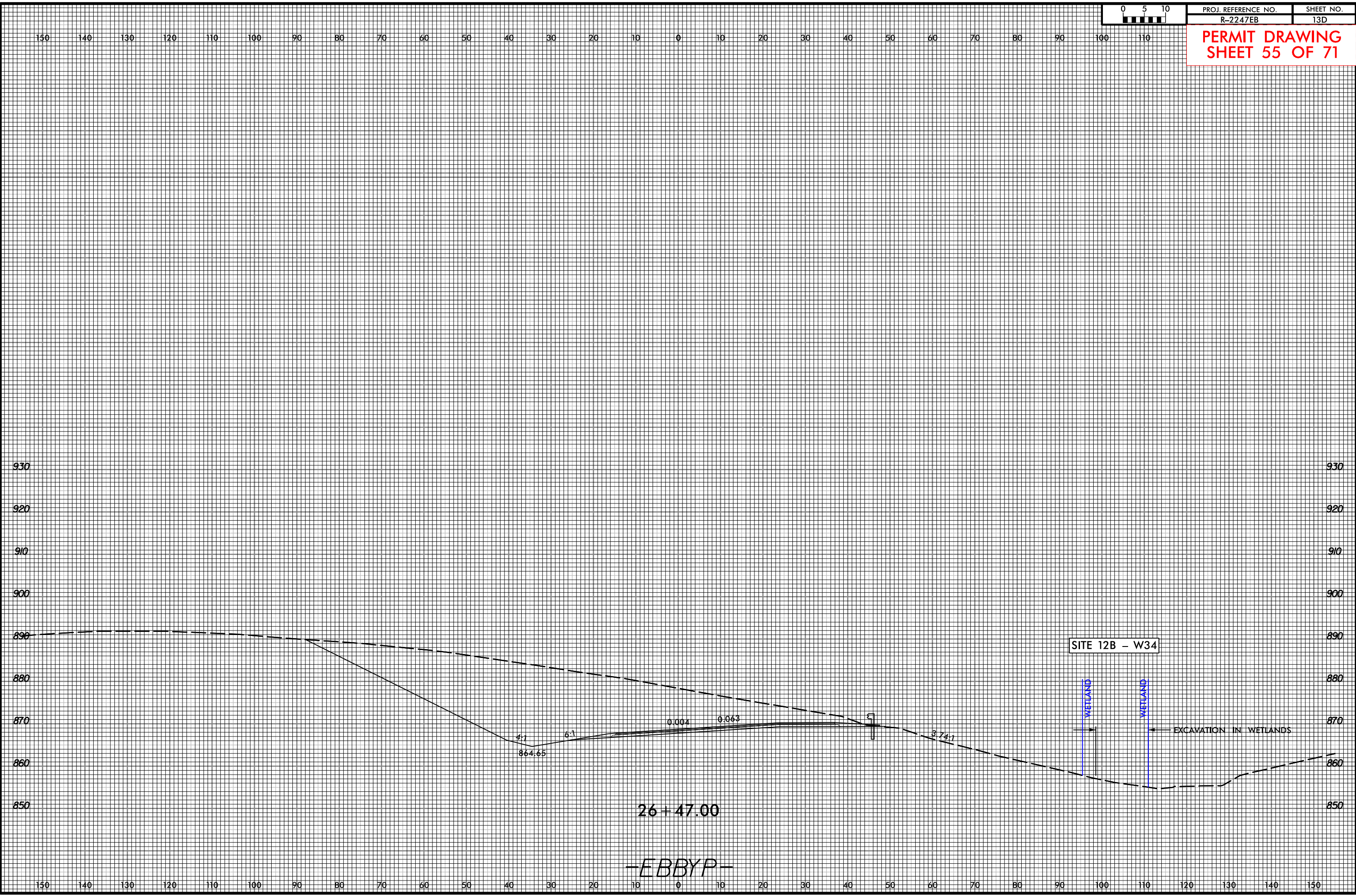
SITE 10H - VV





6/3/2019
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valid.pcb

6/23/16
6/3/2019
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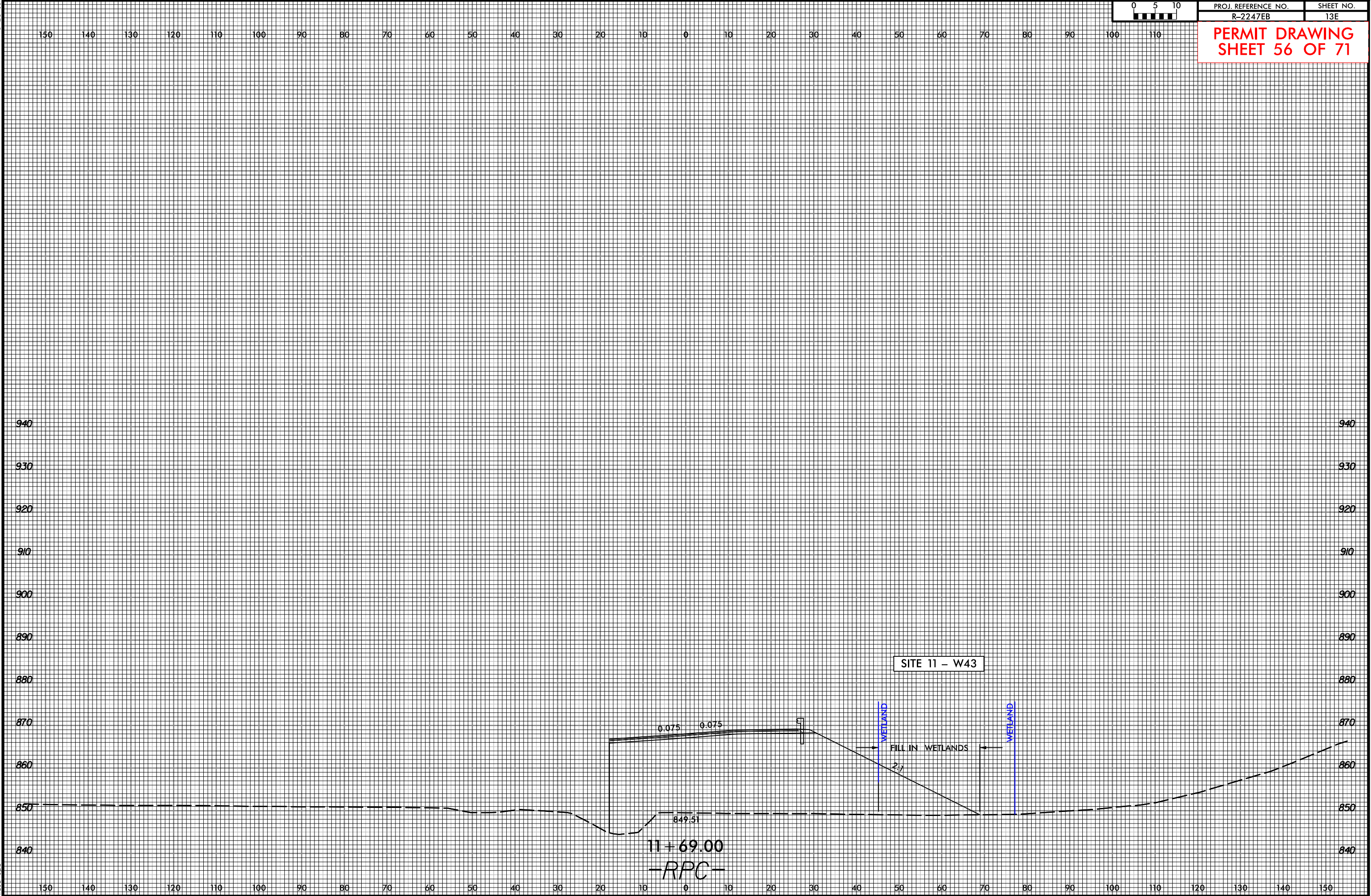


PROJ. REFERENCE NO.	SHEET NO.
R-2247EB	13D

PERMIT DRAWING
SHEET 55 OF 71

6/23/16

6/3/2019
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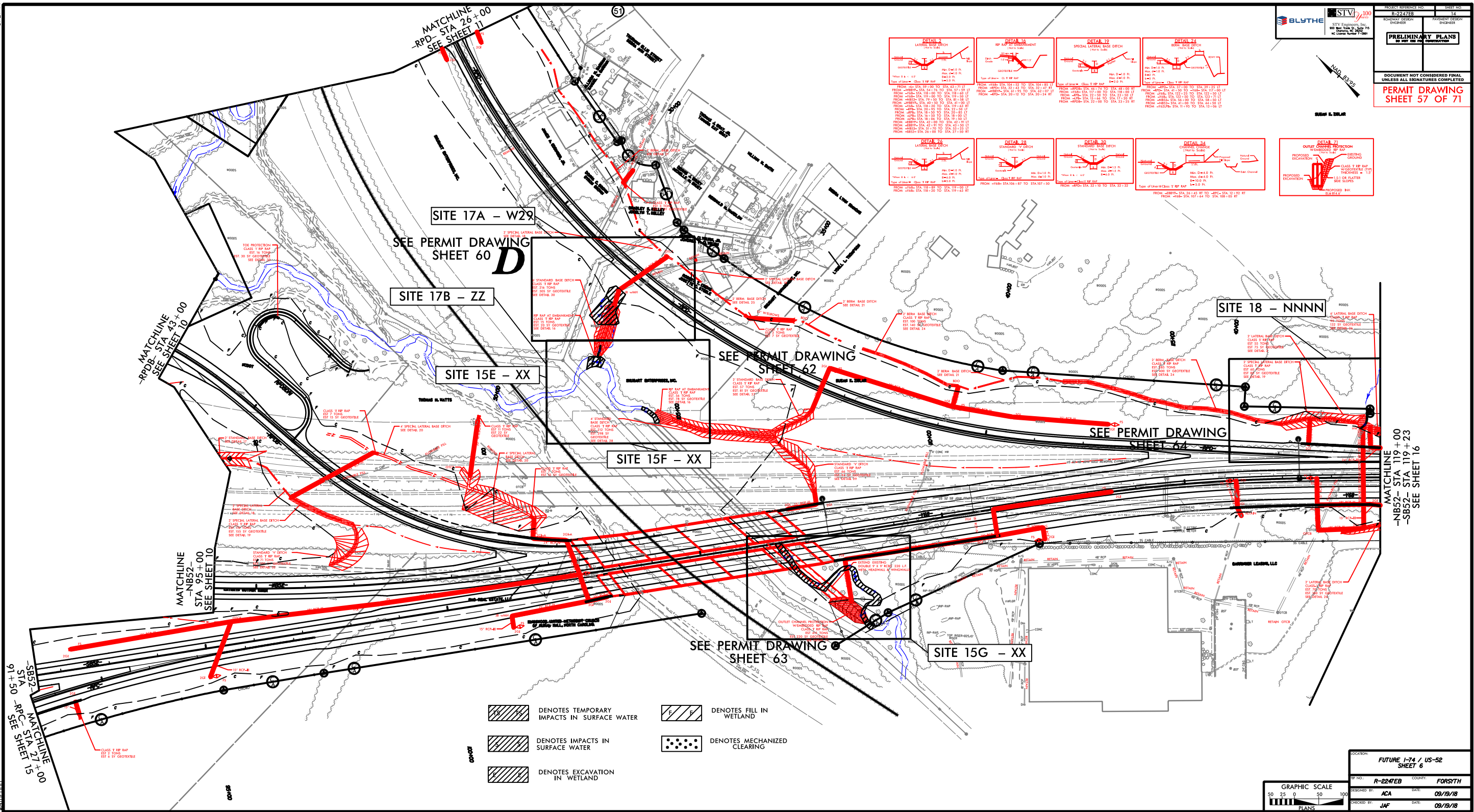


PROJ. REFERENCE NO.	SHEET NO.
R-2247EB	13E

PERMIT DRAWING
SHEET 56 OF 71

6/2/19

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BLYTEH **STV** **100**
STV Engineering, Inc.
300 West Main St., Suite 215
Hickory, NC 28601
NC License Number: 17099

PROJECT NUMBER: R-2247EB SHEET NO: 14
ROADWAY DESIGN: ENGINEER
PAYMENT DESIGN: ENGINEER

PRELIMINARY PLANS
NO IMP OR PLS

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

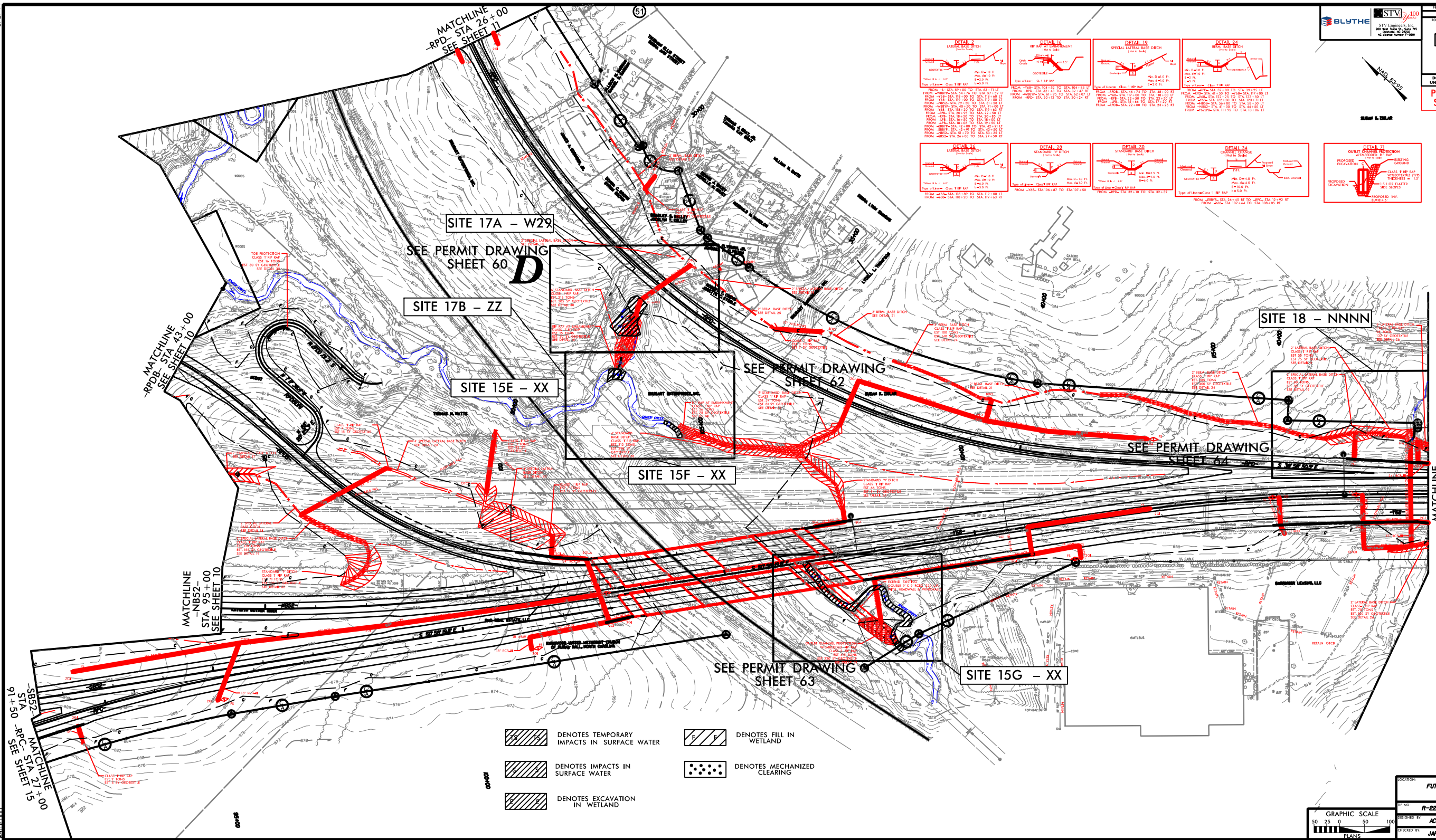
PERMIT DRAWING
SHEET 57 OF 71

LOCATION: FUTURE I-74 / US-52
SHEET 6

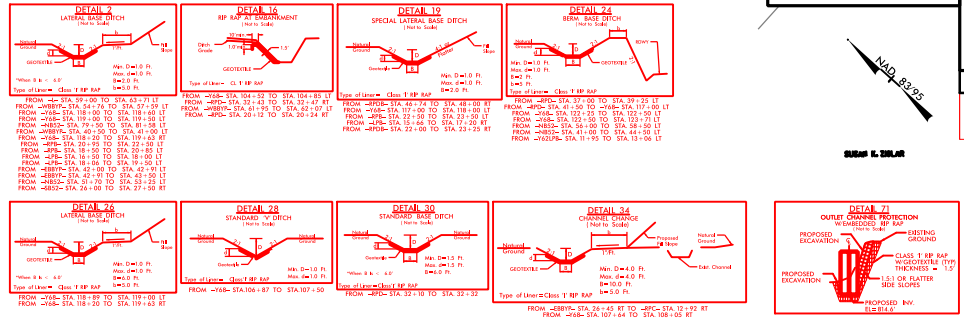
TP NO: R-2247EB COUNTY: FORSYTH
DESIGNED BY: ACA DATE: 09/19/18
CHECKED BY: JAF DATE: 09/19/18

6/2/99

6/3/2019 R:\Hydro\Permits\Environmental Drawings\PRM_SHT_03-xx-2019\R2247EB_Hyd.prm_PSH44A.dgn



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



STV 2000
300 West Main St., Suite 715
Portland, ME 04101
Tel: 603.761.1111
Fax: 603.761.1112
www.stv.com

PROJECT NUMBER: R-2247EB

SHEET NO: 14A

PRELIMINARY PLANS

NO IMP OR P

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 58 OF 71

GRAPHIC SCALE

0 25 50 100

PLANS

LOCATION: FUTURE I-74 / US-52

SHEET 6

TP NO: R-2247EB

COUNTY: FORSYTH

DESIGNED BY: ACA

DATE: 09/19/18

CHECKED BY: JAF

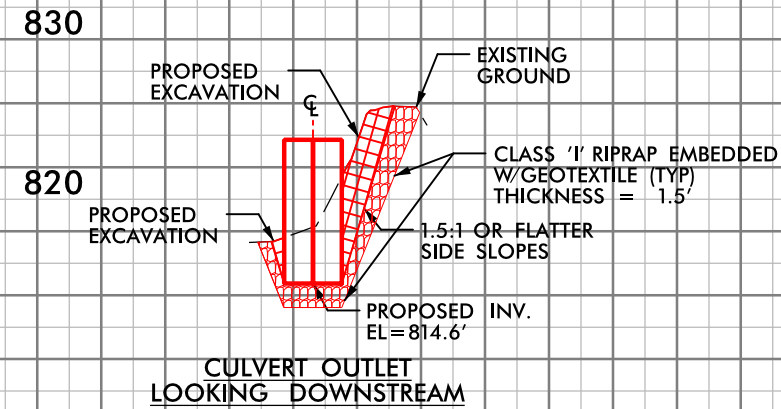
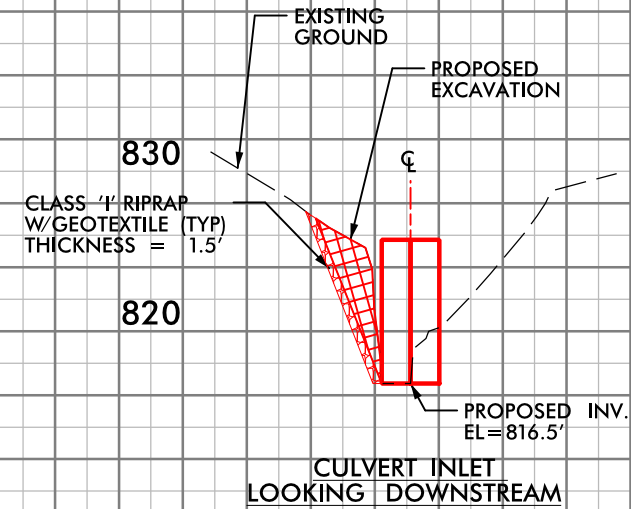
DATE: 09/19/18

6/23/16

6/3/2019
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PSH14B

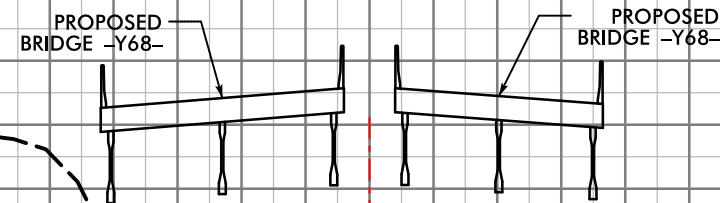
PERMIT DRAWING
SHEET 59 OF 71

PROJECT REFERENCE NO.		SHEET NO.	
R-2247EB		14B	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



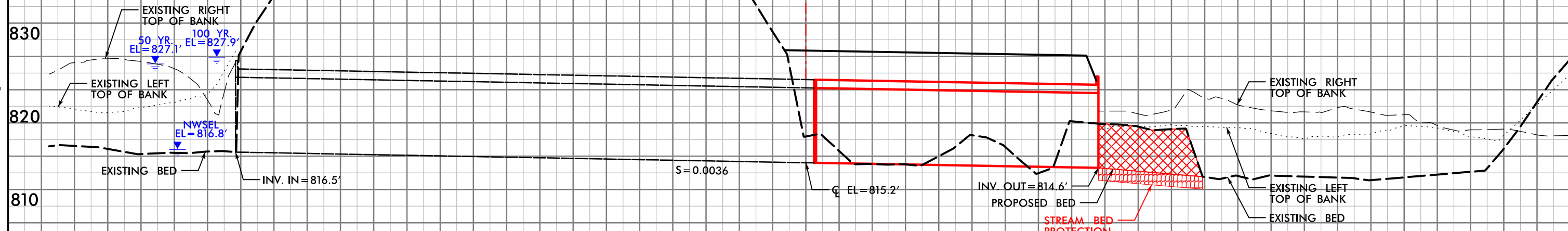
400 300 200 100 0 100 200 300 400

870
860
850
840
830
820
810
800



SITE 15G - XX

-Y68+ 106 + 53
SKEW = 49 DEGREES
2-9'x9' RCBC, EXTENSION
TO EXISTING 2-9'x9' RCBC
GP EL=859.74'



PROFILE ALONG CL OF CULVERT





100 Years

STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
R-2247EB	14C
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

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UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 60 OF 71

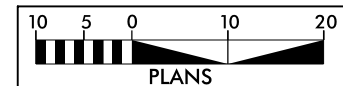
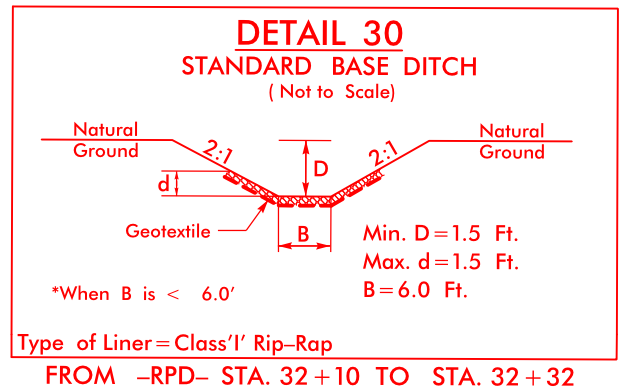

DENOTES FILL IN WETLAND


DENOTES EXCAVATION IN WETLAND

6' STANDARD BASE DITCH
CLASS 'I' RIP RAP
EST. 216 TONS
EST. 305 SY GEOTEXTILE
SEE DETAIL 30

2' SPECIAL LATERAL BASE DITCH
SEE DETAIL 18

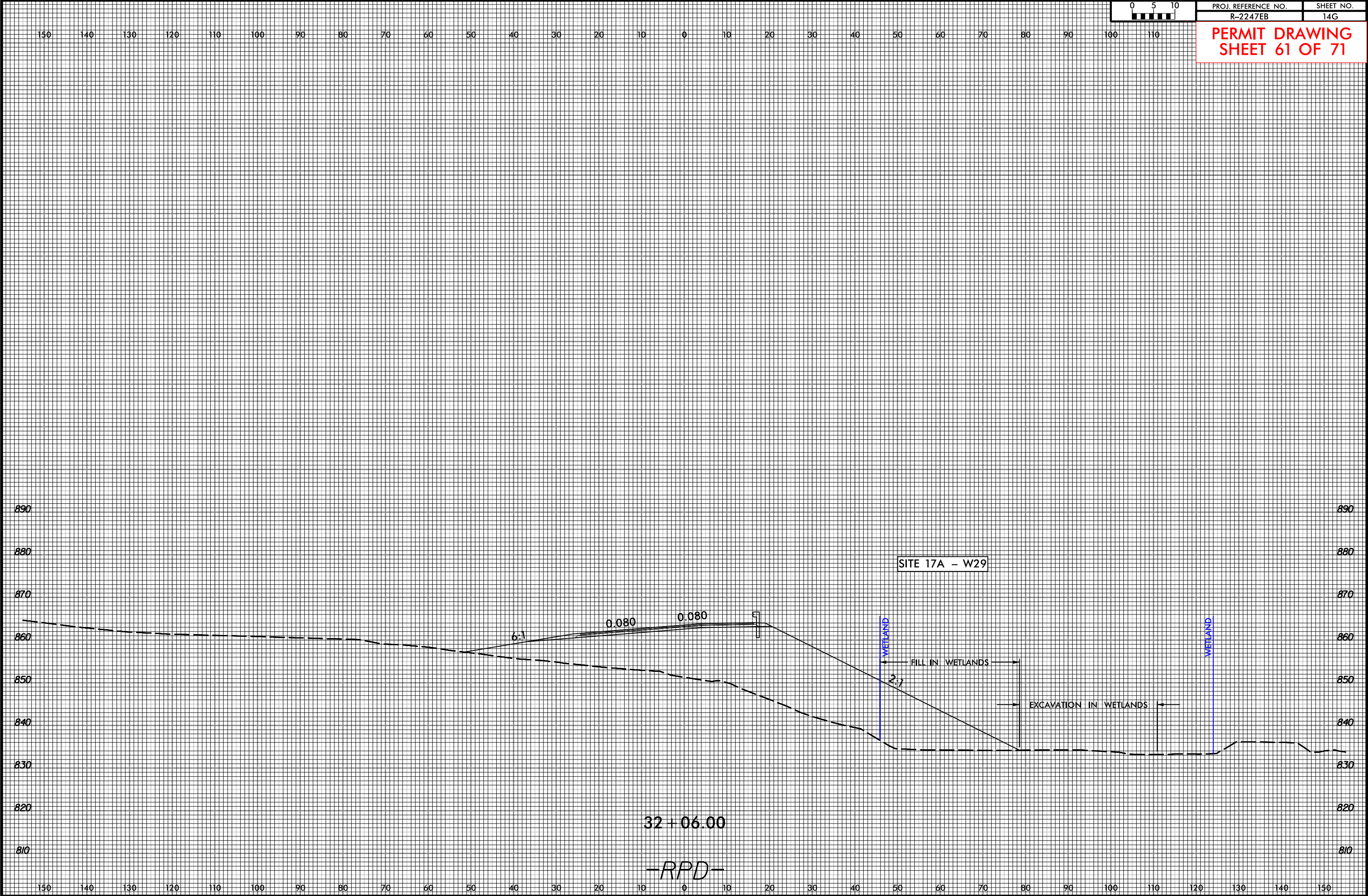
SITE 17A – W29

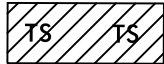


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6/23/16

6/3/2019
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valid.pds





DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

SITE 15E – XX

BANK STABILIZATION
CLASS 'I' RIP RAP
EST. 15 TONS
EST. 20 SY GEOTEXTILE
SEE DETAIL 16

SHUGART ENTERPRISES, INC.

SITE 15F – XX

BANK STABILIZATION
CLASS 'I' RIP RAP
EST. 56 TONS
EST. 78 SY GEOTEXTILE
SEE DETAIL 16

4' STANDARD
BASE DITCH
CLASS 'I' RIP RAP
EST. 212 TONS
EST. 298 SY
GEOTEXTILE
SEE DETAIL 28

EXISTING R/W

GRASSY CREEK

SITE 17B – ZZ

TS

S

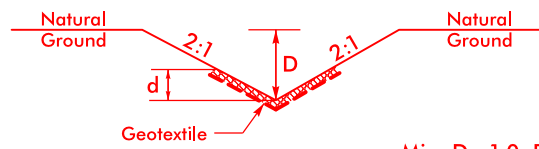
TS

S

S

DETAIL 28

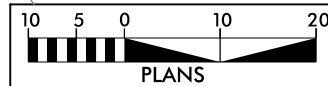
STANDARD 'V' DITCH
(Not to Scale)

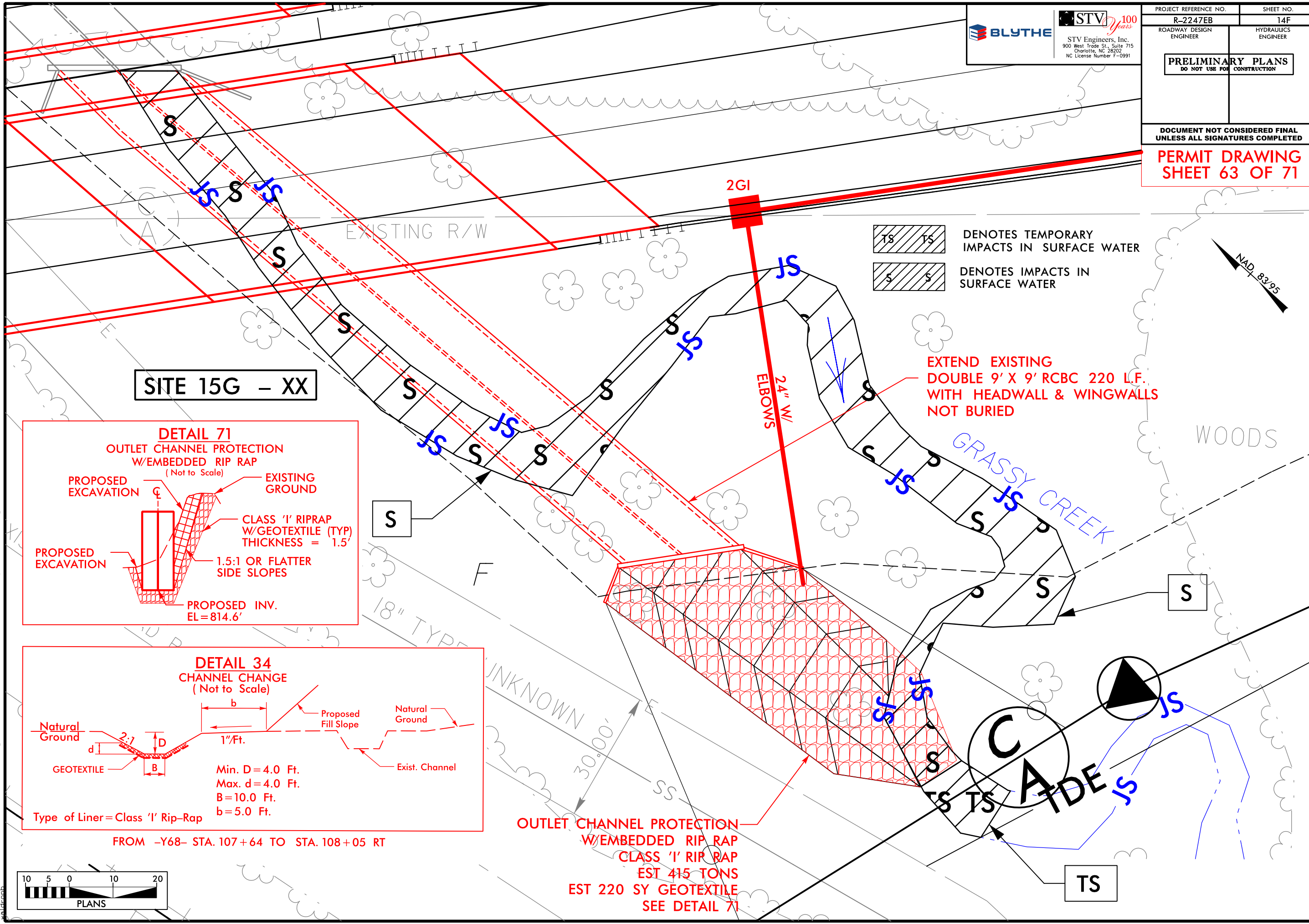


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Max. d=1.0 Ft.

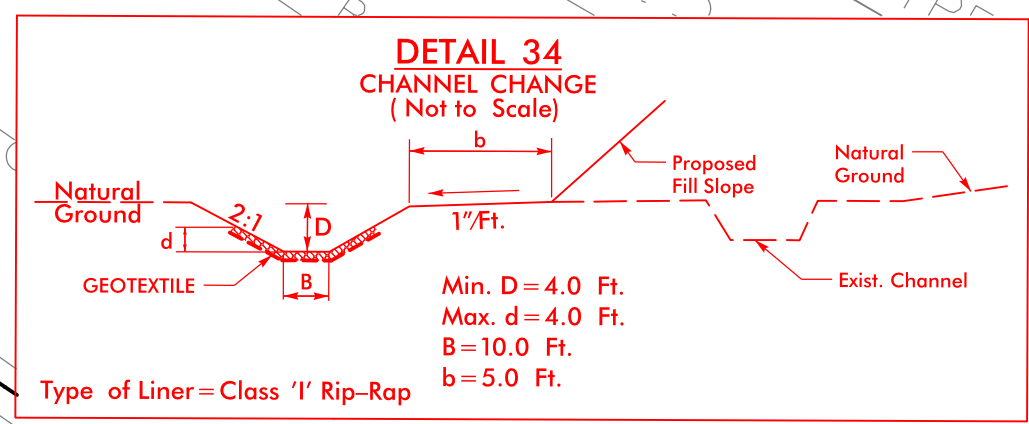
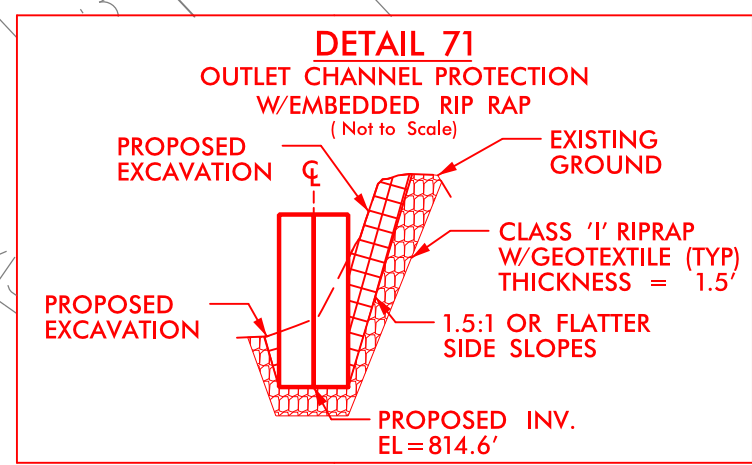
Type of Liner = Class 'I' Rip-Rap

FROM -Y68- STA.106 + 87 TO STA.107 + 50

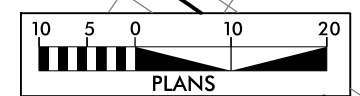




SITE 15G - XX



FROM -Y68- STA. 107+64 TO STA. 108+05 RT



6/3/2019 8:11 AM C:\Users\jperkins\Documents\Drawings\PRM_SHT_03-xx-2019\2247EB_Hyd1.prm.PSH14F.dgn

PROJECT REFERENCE NO. R-2247EB

SHEET NO. 14G

ROADWAY DESIGN ENGINEER

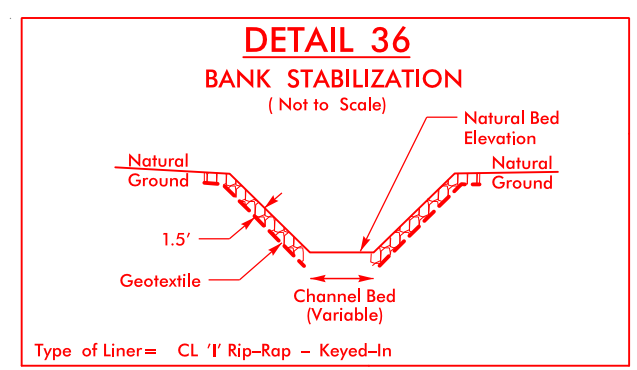
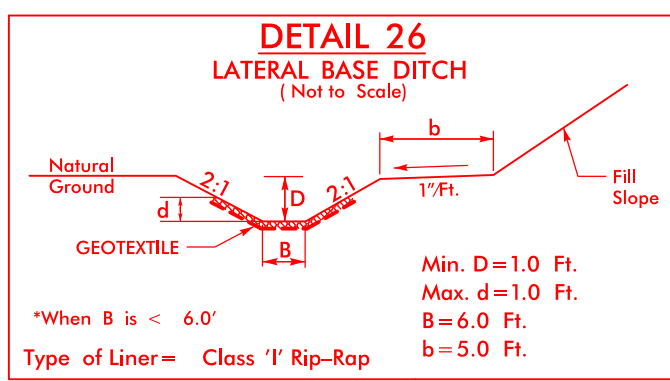
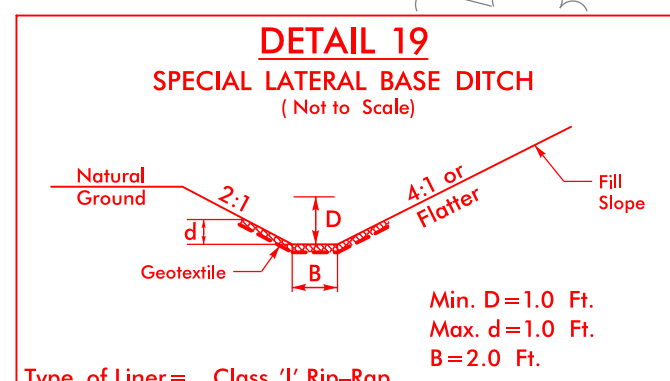
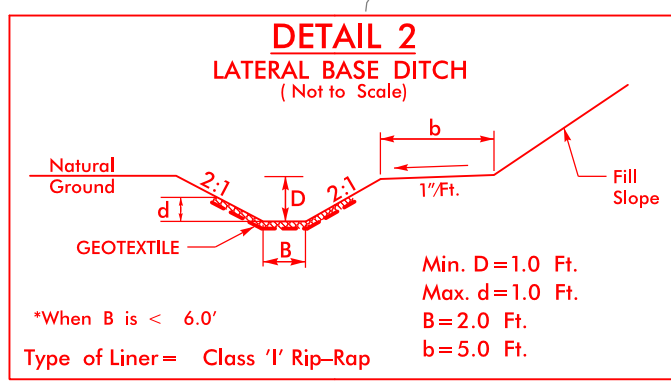
HYDRAULICS ENGINEER

PRELIMINARY PLANS

DO NOT USE FOR CONSTRUCTION

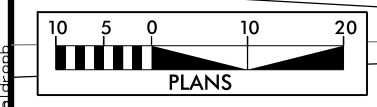
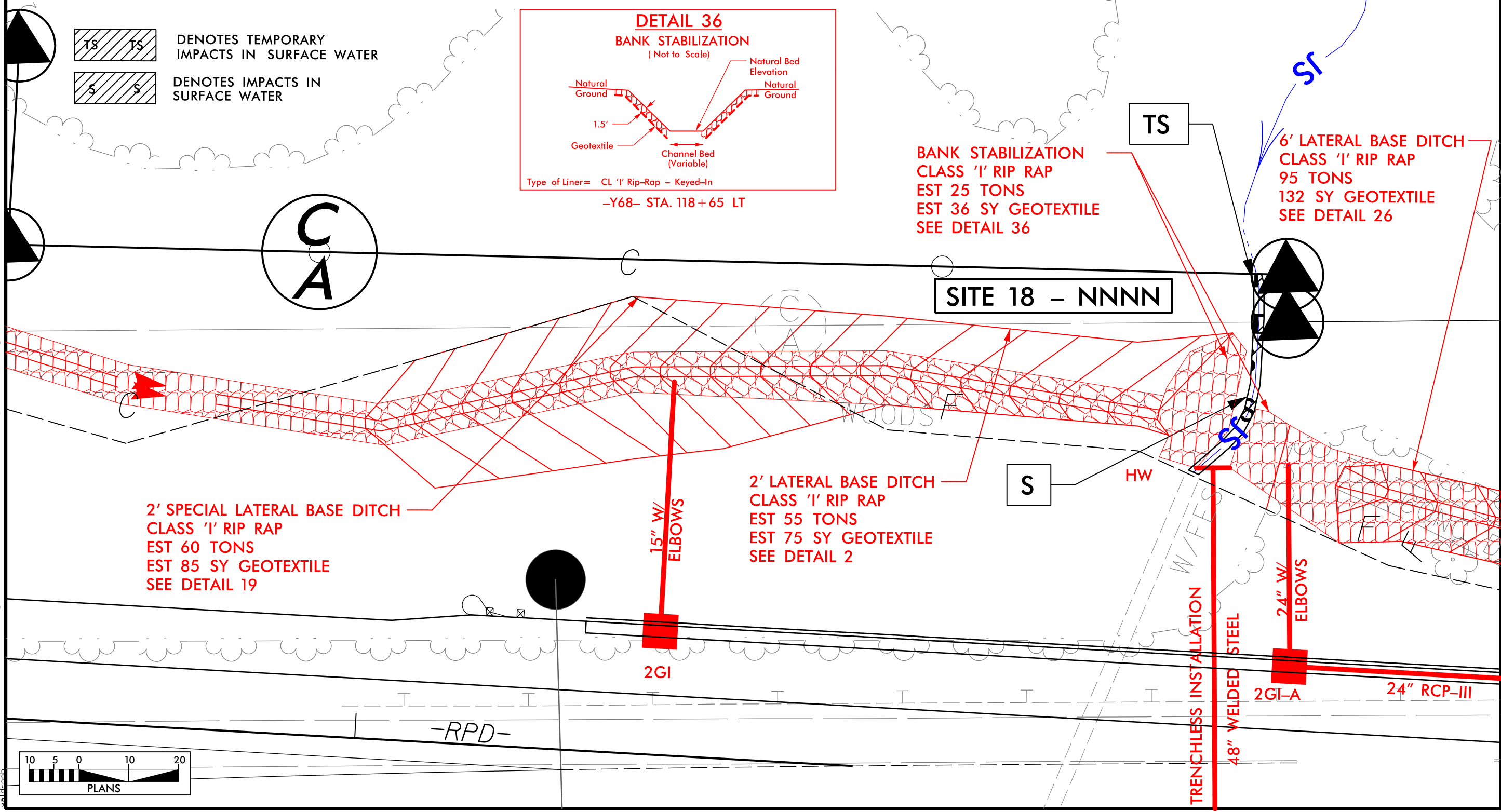
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PERMIT DRAWING SHEET 64 OF 71



DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER



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PROJECT REFERENCE NO. R-2247EB

SHEET NO. 15B

ROADWAY DESIGN ENGINEER

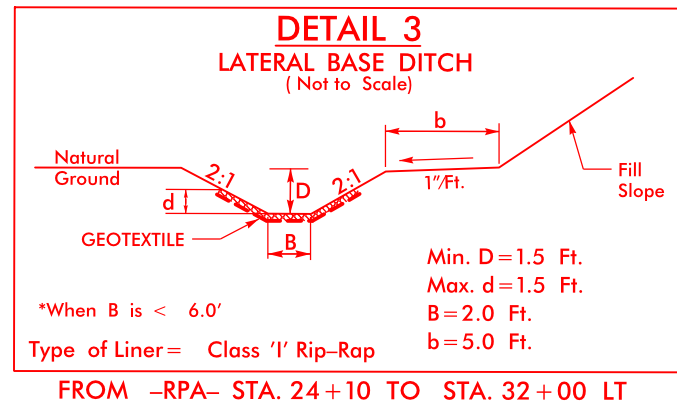
HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

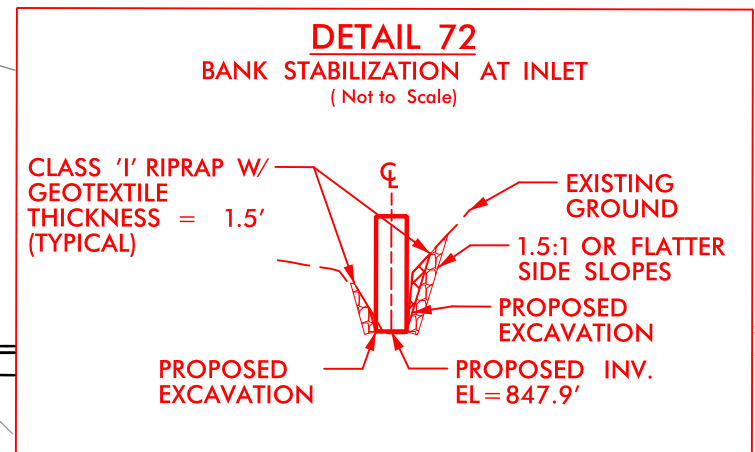
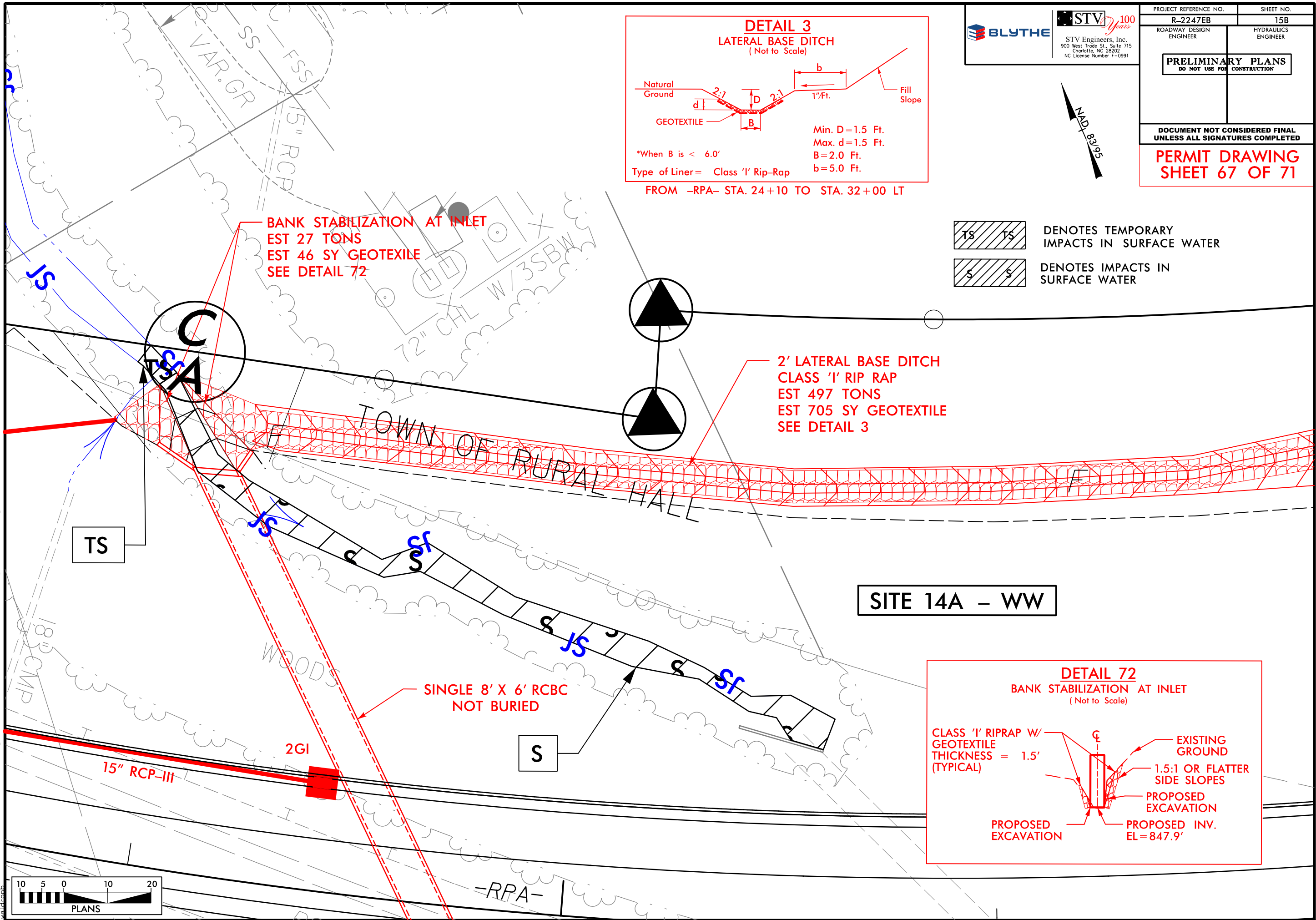
PERMIT DRAWING
SHEET 67 OF 71

STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-19991



DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER



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WETLAND AND SURFACE WATER IMPACTS SUMMARY												
			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 63+69 to 64+24 LT	2 @ 7' x 7' RCBC EXTENSION						< 0.01	< 0.01	23	17	
1	-L- 63+69 to 64+24 LT	BANK STABILIZATION ONLY						0.01		43		
2	-L- 64+21 to 65+97 LT	ROADWAY FILL						< 0.01		85		
3	-L- 76+12 to 76+55 LT	ROADWAY FILL						< 0.01		50		
4A	-L- 76+36 to 76+31 LT	8' x 7' RCBC EXTENSION						< 0.01	< 0.01	30	16	
4A	-L- 76+36 to 76+31 LT	BANK STABILIZATION ONLY						< 0.01		39		
4B	-L- 77+51 to 77+72 RT	OUTLET CHANNEL PROTECTION						0.01	< 0.01	40	7	
5	-L- 96+77 to 96+96 RT	30" ALTERNATE PIPE						< 0.01		12		
5	-L- 96+77 to 96+96 RT	OUTLET CHANNEL PROTECTION						< 0.01		29		
6A	-L- 108+27 to 108+77 RT	48" RCP-III/ROADWAY FILL						< 0.01	< 0.01	15	25	
6A	-L- 108+27 to 108+77 RT	OUTLET CHANNEL PROTECTION						< 0.01		16		
6A	-L- 108+27 to 108+77 RT	CHANGE FROM TEMPORARY IMPACTS IN EC TO PERMANENT IMPACTS IN EB						< 0.01		10		
6B***	-SB52- 22+78 RT	ROADWAY FILL	< 0.01									
6B**	-SB52- 22+78 RT	CHANGE FROM EXCAVATION IN WETLANDS IN EC TO FILL IN WETLANDS IN EB	< 0.01									
6B**	-SB52- 22+78 RT	CHANGE FROM MECHANIZED CLEARING IN EC TO FILL IN WETLANDS IN EB	< 0.01									
TOTALS*:			0.01	0	0	0	0	0.06	0.01	392	65	0

*Rounded totals are sum of actual impacts

NOTES:

**Mechanized Clearing and Excavation impacts previously mitigated through Project R-2247EC

*** Wetland W49 is a total take

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
6/4/2019
FORSYTH COUNTY
R-2247 EB
34409.3.17
SHEET 68 OF 71

WETLAND AND SURACE WATER IMPACTS SUMMARY												
Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
7	-L- 110+89 to 111+03 RT	OUTLET CHANNEL PROTECTION/RIP RAP FILL						< 0.01	< 0.01	27	25	
7	-L- 110+89 to 111+03 RT	CHANGE FROM TEMPORARY IMPACTS IN EC TO PERMANENT IMPACTS IN EB						< 0.01		11		
8A	-Y62LPA- 12+87 RT	ROADWAY FILL	< 0.01			0.02						
8A**	-Y62LPA- 12+87 RT	CHANGE FROM MECHANIZED CLEARING IN EC TO FILL IN WETLAND IN EB	0.02									
8B	-Y62LPA- 12+87 RT	CHANGE FROM TEMPORARY IMPACTS IN EC TO PERMANENT IMPACTS IN EB						< 0.01		33		
8C***	-Y62RPB- 16+75 RT	ROADWAY FILL	0.06									
8C**	-Y62RPB- 16+75 RT	CHANGE FROM MECHANIZED CLEARING IN EC TO FILL IN WETLAND IN EB	0.01									
9A	-SB52- 56+93 to 61+16 RT	ROADWAY FILL						0.03		504		
9A	-SB52- 56+93 to 61+16 RT	CHANGE FROM TEMPORARY IMPACTS IN EC TO PERMANENT IMPACTS IN EB						< 0.01		17		
9B	-SB52- 58+54 RT	ROADWAY FILL	0.12									
9B	-SB52- 58+54 RT	DITCH EXCAVATION			0.06	0.04						
10A	-SB52- 59+43 to 59+62 RT	RIP RAP FILL						< 0.01	< 0.01	30	26	
10B	-SB52- 63+03 RT	BANK STABILIZATION ONLY						< 0.01	< 0.01	8	23	
10C	-SB52- 68+58 to 71+57 RT	4' x 5' RCBC						0.03	< 0.01	281	28	
10C	-SB52- 68+58 to 71+57 RT	OUTLET CHANNEL PROTECTION/RIP RAP FILL						< 0.01		33		
10C	-SB52- 68+58 to 71+57 RT	BANK STABILIZATION ONLY						< 0.01		30		
10D	-SB52- 71+57 to 72+19 RT	BANK STABILIZATION ONLY						< 0.01		47		
TOTALS*:			0.23	0.00	0.06	0.05	0.00	0.14	0.02	1413	167	0
*Rounded totals are sum of actual impacts NOTES: **Mechanized Clearing impacts previously mitigated through Project R-2247EC ***Wetland W26 is a total take												
										NC DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS 6/4/2019 FORSYTH COUNTY R-2247 EB 34409.3.17		
Revised 2018 Feb										SHEET	69	OF 71

WETLAND AND SURACE WATER IMPACTS SUMMARY												
			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
10E	-SB52- 72+19 to 75+11 RT	5' x 5' RCBC						0.04	< 0.01	343	25	
10E	-SB52- 72+19 to 75+11 RT	OUTLET CHANNEL PROTECTION/RIP RAP FILL						< 0.01		29		
10E	-SB52- 72+19 to 75+11 RT	BANK STABILIZATION ONLY						< 0.01		24		
10F	-SB52- 77+21 to 79+59 RT	6' x 5' RCBC						0.03	< 0.01	215	27	
10F	-SB52- 77+21 to 79+59 RT	BANK STABILIZATION ONLY						< 0.01		33		
10F	-SB52- 77+21 to 79+59 RT	OUTLET CHANNEL PROTECTION/RIP RAP FILL						< 0.01		47		
10G	-SB52- 79+59 to 80+39 RT	BANK STABILIZATION ONLY						0.01		97		
10H	-SB52- 80+39 to 83+09 RT	7' x 5' RCBC						0.04	< 0.01	273	27	
10H	-SB52- 80+39 to 83+09 RT	RIP RAP FILL						< 0.01		75		
11**	-RPC- 11+69 RT	ROADWAY FILL	0.03			< 0.01						
11**	-RPC- 11+69 RT	DITCH EXCAVATION			< 0.01							
12A	EBBYP- 26+40 to 28+84 R	ROADWAY FILL/LOSS OF WATER DUE TO CHANNEL CHANGE						0.03	< 0.01	282	11	
12B	-EBBYP- 26+47 RT	DITCH EXCAVATION			< 0.01	< 0.01						
13A	-RPA- 16+18 to 16+89 LT	42" ALT W/ ELBOWS						< 0.01	< 0.01	75	25	
13A	-RPA- 16+18 to 16+89 LT	OUTLET CHANNEL PROTECTION/RIP RAP FILL						< 0.01		36		
13B***	-RPA- 16+65 LT	ROADWAY FILL	< 0.01									
14A	-RPA- 23+82 to 25+59 LT	8' x 6' RCBC						0.02	< 0.01	154	10	
14A	-RPA- 23+82 to 25+59 LT	BANK STABILIZATION ONLY						< 0.01		24		
TOTALS*:			0.27	0.00	0.07	0.07	0.00	0.36	0.04	3120	292	0

*Rounded totals are sum of actual impacts

NOTES:

**Wetland W43 is a total take

***Wetland W30 is a total take

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
6/4/2019
FORSYTH COUNTY
R-2247 EB
34409.3.17

SHEET
70
OF
71

WETLAND AND SURACE WATER IMPACTS SUMMARY												
			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
14B	-NB52- 84+51 to 93+96 LT	8' x 6' RCBC/LOSS OF WATER DUE TO CHANNEL CHANGE						0.12		926		
15A	-L- 189+05 to 189+45 LT	2 @ 9' x 9' RCBC						0.01	< 0.01	83	27	
15A	-L- 189+05 to 189+45 LT	BANK STABILIZATION ONLY						< 0.01		37		
15B	-L- 181+77 to 188+71 RT	ROADWAY FILL/LOSS OF WATER DUE TO CHANNEL CHANGE						0.30	< 0.01	1092	25	
15C	EBBYP- 52+13 to 52+60 R	BANK STABILIZATION ONLY						< 0.01	< 0.01	34	22	
15D	-RPDB- 42+56 to 43+02 LT	BANK STABILIZATION ONLY						< 0.01	0.01	13	44	
15E	-RPD- 32+41 to 32+64 RT	BANK STABILIZATION ONLY						< 0.01	< 0.01	13	19	
15F	-RPD- 33+82 to 34+06 RT	BANK STABILIZATION ONLY						< 0.01	< 0.01	19	26	
15G	-Y68- 106+60 to 108+27 RT	2 @ 9' x 9' RCBC EXTENSION						0.08	< 0.01	334	22	
15G	-Y68- 106+60 to 108+27 RT	RIP RAP FILL						< 0.01		27		
16	-RPD- 19+51 to 19+71 LT	7' x 6' RCBC						< 0.01	< 0.01	39	27	
16	-RPD- 19+51 to 19+71 LT	INLET CHANNEL PROTECTION/EMBEDDED RIP RAP						< 0.01		22		
17A**	-RPD- 32+06 RT	ROADWAY FILL	0.02									
17A**	-RPD- 32+06 RT	DITCH EXCAVATION			0.05							
17B	-RPD- 32+44RT	DITCH EXCAVATION						< 0.01		25		
18	-Y68- 118+61 to 118+74 LT	BANK STABILIZATION ONLY						< 0.01	< 0.01	33	12	
TOTALS*:			0.29	0.00	0.12	0.07	0.00	0.91	0.09	5817	516	0

*Rounded totals are sum of actual impacts

NOTES:

**Wetland W29 is a total take

*** Wetland W49 is a total take

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
6/4/2019
FORSYTH COUNTY
R-2247 EB
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