

PROJECT COMMITMENTS

Winston Salem Northern Beltway
T.I.P Project Nos.
R-2247 Sections B-Phase 2, CA, CB, CD, D, EA, EB, and EC (from I-40 to US 52);
U-2579 Sections C-Phase 2, D, E, and F (from US 52 to US 311 North); and
U-2579 Sections AA and AB (from I-40 Business to US 311 South)
Forsyth County
State Project Nos. 6.628001T and 8.2625101
WBS Element 34409.3.23

COMMITMENTS FROM PROJECT DEVELOPMENT AND DESIGN

PDEA, Roadway Design, Division 9:

1. Archaeological site 31FY570**, a historic cemetery, will require avoidance or compliance with North Carolina General Statute, Chapter 70. **Site 31FY570** is located in R-2247 Segment EA.**

This commitment will be fulfilled at final design and during construction

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. **Site 31FY64 is located outside of the Preferred Alternative, north of U-2579 Segment D.**

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 2016. 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 2016 for U-2579C under the NCDOT 2011 noise abatement criteria.

The Design Noise Report for R-2247 EC and CD was completed and approved in October 2016. A Design Noise Report Addendum for R-2247CD was completed and approved in September 2017, and a Design Noise Report Addendum for R-2247EC was completed and approved in October 2017. Six noise walls (Noise Walls 1, 2, 3, and 4 for R-2247CD and Noise Walls 8A and 8B for R-2247EC) were found to be feasible and reasonable and recommended for construction, pending the outcome of the balloting process. Noise walls 4, 8A, and 8B have passed the balloting process and will be constructed. The balloting process for Noise Walls 1, 2, and 3 is still underway at the time of this consultation preparation, and will conclude on or before December 11, 2017. Walls that pass the balloting process will be constructed.

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.~~

~~— Data Recovery Plan will be developed and implemented after design is completed and Right of Way is acquired.~~

~~*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.~~

~~— Data Recovery Plan will be developed and implemented after design is completed and Right of Way is acquired.~~

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

~~— This commitment will be fulfilled after the completion of the DRP.~~

~~*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.~~

~~— This commitment will be fulfilled after the completion of each data recovery effort.~~

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

~~— This commitment will take place after the completion of the DRP.~~

~~*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.~~

~~— This commitment will be fulfilled after the completion of the DRP.~~

~~*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.~~

~~—
Action: Sites 31FY912 and 31FY925** are located within the Area of Potential Effects (A.P.E.) of R-2247EB. NCDOT will conduct data recovery excavations once right-of-way is acquired or right of entry is secured and prior to construction.~~

- 5. The NCDOT will conduct archaeological data recovery excavation at archaeological sites 31FY888, 31FY893**, 31FY901, 31FY902**, 31FY903, 31FY910**, 31FY911**, 31FY912**, 31FY921, 31FY925**, 31FY944, and 31FY1053/1053**, all of which will be affected by the subject project, in consultation with the North Carolina State Historic Preservation Office (SHPO). Excavations will be conducted after Right-of-Way is acquired (or once Right-of-Entry is secured) from the property owners and prior to construction activities within the sites' locations.**

- a. Site 31FY888 is located within R-2247 segment CB.*
- b. Site 31FY893** is located within R-2247 segment D.*
- c. Site 31FY901 is located within R-2247 segment D.*
- d. Site 31FY902** is located within R-2247 segment D.*
- e. Site 31FY903 is located within R-2247 segment D.*
- f. Site 31FY910** is located within R-2247 segment EA.*
- g. Site 31FY911** is located within R-2247 segment EA.*

- h. Site 31FY912** is located within R-2247 segment EA.*
- i. Site 31FY921 is located within R-2247 segment EB/EA.*
- j. Site 31FY925** is located within R-2247 segment EB/EA.*
- k. Site 31FY944 is located within R-2247 segment D.*
- l. Site 31FY1053** is located within U-2579 segment D.*

(Please note that the asterisks [**] next to some of the archaeological site numbers indicate the sites are historic period remains. Prehistoric archaeological site numbers do not have asterisks)

A Table is attached to this Greensheet that lists each of the twelve (12) archaeological sites, along with the Sections in which they are located, and their corresponding Let dates.

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, Project U-2579, and Project U-2579A 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 coordinated with the NCDENR Division of Waste Management and the property owner regarding the Reynolds Auto Junkyard. No known issues remain within the right of way of this site. Other sites along the selected alternatives for Projects R-2247, U-2579, and U-2579A 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 sites of concern. This coordination will occur prior to the parcel being acquired. Prior to construction the GeoEnvironmental Section will also address contaminated soil and ground water that may be encountered during construction. Contamination will be addressed by removal and/or in a Project Special Provision.

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 1.0 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.

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.

- 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:

1. 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:

1. 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.

COMMITMENTS FROM PERMITTING

Division 9, Construction Unit:

USACE Section 404 Phased Permit: This permit only authorizes work on Sections U-2579C-Phase 2, R-2247EC, and R-2247CD. Construction on any other phase of the Winston-Salem Northern Beltway shall not commence until final design has been completed for those sections, the permittee has minimized impacts to waters and wetlands to the maximum extent practicable, any modifications to the plans, and a compensatory mitigation plan, have been approved by the USACE.

NCDWR 401 Water Quality Certification, Conditions of Certification #2: When final designs are completed for other Sections (in Table 7) of this phased project, a modification to the 401 Water Quality Certification shall be submitted with five copies and fees to the NC Division of Water Resources. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams and other surface water, and buffers. No construction activities that impact any wetlands, streams or surface waters, other than those referenced above in Tables 1 through 6 for U-2579C Phase 2, R-2247CD and R-2247EC shall begin until after the permittee applies for, and receives a written modification of the 401 Water Quality from the NC Division of Water Resources. [15A NCAC 02H. 0506(b)]
(see also the USACE 404 Permit Condition #17 for the same pipe burial exemptions)

NCDWR 401 Water Quality Certification, Conditions of Certification #3: As discussed in Merger and restated in the above referenced permit application, NCDWR will not require burial of pipes/culverts in the streambed at impact sites for R-2247CD and EC. However, design and placement of culverts and other structures shall be constructed in such a manner that the original stream profiles are not altered (i.e., the depth of the channel must not be reduced by a widening of the streambed). Existing stream dimensions (including pattern and profile) are to be maintained above and below locations of each culvert. The structures shall be designed and installed to allow for fish and other wildlife movement as well as prevent headcutting of the stream. The applicant may be required to provide evidence that the equilibrium has been maintained if requested in writing by the NCDWR. [15A NCAC 02H. 0506(b)(2)]

NCDWR 401 Water Quality Certification, Conditions of Certification #4: For U-2579C Phase 2, the inlet invert of the 60-inch pipe crossing at Site 2 will not be buried to prevent head cutting. However, the outlet will be buried one foot. At Site 3A, the culvert will be buried 0.75 feet. Design and placement of culverts and other structures including temporary erosion control

measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and downstream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by the NCDWR. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact the NCDWR for guidance on how to proceed and to determine whether or not a permit modification will be required. [15A NCAC 02H. 0506(b)(2)]

Winston-Salem Northern Beltway (R-2247/U-2579/U-2579A)
National Register of Historic Places (NRHP)-Eligible
Archaeological Sites by Section
Caleb Smith (1/24/2018)

Section	Approximate Section Limits	Eligible Archaeological Sites?	Construction Letting Date
R-2247EC	N.C. 65 Interchange	n/a	January 2018
R-2247CD	U.S. 421/S. Peace Haven Rd. intersection	n/a	January 2018
U-2579C-Phase 2	U.S. 311 (New Walkertown Rd.) to approx. 500' east of SR 4556 (Old Walkertown Rd.)	n/a	January 2018
U-2579D	500' east of SR 4556 (Old Walkertown Rd.) to SR 2111 (Baux Mountain Rd.)	31FY1053/1053**	March 2018
U-2579E	SR 2111 (Baux Mountain Rd.) to N.C. 8	n/a	March 2018
U-2579F	N.C. 8 to U.S. 52	n/a	March 2018
R-2247EB	Interchange at U.S. 52 and the Beltway	31FY921	July 2018
		31FY925**	
U-2579AA	I-74/U.S. 311 to I-40	n/a	FY 2020
U-2579AB	I-40 to U.S. 421/I-40 Business	n/a	FY2020
R-2247EA	N.C. 67 to south of U.S. 52	31FY910**	FY 2021
		31FY911**	
		31FY912**	
		31FY921	
		31FY925**	
R-2247B-Phase 2	South of I-40 to south of U.S. 421 Interchange	n/a	Post-Year
R-2247CA	Interchange of U.S. 421 with SR 1348 (Robin Hood Rd.)	n/a	Post-Year
R-2247CB	North of the U.S. 421 Interchange to SR 1348 (Robin Hood Rd.)	31FY888	Post-Year
R-2247D	North of SR 1348 (Robin Hood Rd.) / Meadowlark Dr. to N.C. 67	31FY893**	Post-Year
		31FY901	
		31FY902**	
		31FY903	
		31FY944	

*(Please note that the asterisks [**] next to some of the archaeological site numbers indicate that the sites are historic period remains. Prehistoric archaeological site numbers do not have asterisks)*



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

January 22, 2018

Regulatory Division

Action ID: SAW-2017-02112

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

Dear Mr. Harris:

In accordance with the written request of 2 October 2017, and the ensuing administrative record, enclosed is a Department of the Army (DA) Permit to construct a 34.5 mile long portion of new location roadway known as the Winston-Salem Northern Beltway, TIPS R-2247 (Western Section), U-2579 (Eastern Section), and U-2579A (Eastern Section Extension), in Forsyth County.

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


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

- a. You must complete construction before December 31, 2028.
- b. You must notify this office in advance as to when you intend to commence and complete work.
- c. You must allow representatives from this office to make periodic visits to your worksite as deemed necessary to assure compliance with permit plans and conditions.

You should address all questions regarding this authorization to Mr. James Lastinger in the Raleigh Regulatory Field Office, telephone number (919) 554-4884 ext. 32.

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

Sincerely,


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

Enclosures

Copy Furnished (with enclosures):

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

Copies Furnished with special conditions and plans:

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

Mr. Kenneth Riley, Ph.D.
Habitat Conservation Division
National Marine Fisheries Service Southeast Region
101 Pivers Island Road
Beaufort, North Carolina 28516

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

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

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

DEPARTMENT OF THE ARMY PERMIT

Permittee **NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**
ATTN: MR. PHILIP S. HARRIS III, P.E., C.P.M.

Permit No. **SAW-2017-02112**

Issuing Office **CESAW-RG-R**

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

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

Project Description: The project involves construction of 34.5 mile long portion of new location roadway known as the Winston-Salem Northern Beltway in Forsyth County, TIPS R-2247 (Western Section), U-2579 (Eastern Section), and U-2579A (Eastern Section Extension). The project involves the permanent discharge of dredged or fill material into 59,395 linear feet of stream channel, and 9.41 acre of riparian wetlands.

Project Location: The project area is a new alignment linear transportation corridor from I-40 near the Town of Clemmons to US 311 North near the town of Walkertown and from I-40 Business to US 311 South around Winston-Salem, Forsyth County, North Carolina.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on **December 31, 2028.** If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

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

Special Conditions:

SEE ATTACHED SPECIAL CONDITIONS

Further Information:


1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:
 - () Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).
 - (X) Section 404 of the Clean Water Act (33 U.S.C. 1344).
 - () Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).
2. Limits of this authorization.
 - a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.
 - b. This permit does not grant any property rights or exclusive privileges.
 - c. This permit does not authorize any injury to the property or rights of others.
 - d. This permit does not authorize interference with any existing or proposed Federal project.
3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:
 - a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
 - b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
 - c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
 - d. Design or construction deficiencies associated with the permitted work.
 - e. Damage claims associated with any future modification, suspension, or revocation of this permit.
4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.
5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:
 - a. You fail to comply with the terms and conditions of this permit.
 - b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

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

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

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

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




for (PERMITTEE) NC DEPARTMENT OF TRANSPORTATION
ATTN: MR. PHILIP S. HARRIS III

01-22-2018

(DATE)

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



(DISTRICT COMMANDER) ROBERT J. CLARK, COLONEL

22 Jan 2018

(DATE)

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

(TRANSFEREE)

(DATE)

SPECIAL CONDITIONS
ACTION ID. SAW-2017-02112
NC DEPARTMENT OF TRANSPORTATION
WINSTON-SALEM NORTHERN BELTWAY
TIP NO.'S R-2247EC, R-2247CD AND U-2579C PHASE 2

Work Limits

1. CONSTRUCTION PLANS: All work authorized by this permit must be performed in strict compliance with the attached plans for U-2579C phase 2, R-2247EC, and R-2247CD, Wetland Surface Water Impacts Permit, dated October 2, 2017, Any modification to these plans must be approved by the US Army Corps of Engineers (Corps) prior to implementation.
2. PHASED PERMIT: This permit only authorizes work on Sections U-2579C phase 2, R-2247EC, and R-2247CD. Construction on any other phase of the Winston-Salem Northern Beltway shall not commence until final design has been completed for those sections, the permittee has minimized impacts to waters and wetlands to the maximum extent practicable, any modifications to the plans, and a compensatory mitigation plan, have been approved by the USACE.
3. UNAUTHORIZED DREDGE OR FILL: Except as authorized by this permit or any Corps approved modification to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, within waters or wetlands. This permit does not authorize temporary placement or double handling of excavated or fill material within waters or wetlands outside the permitted area. This prohibition applies to all borrow and fill activities connected with this project.
4. MAINTAIN CIRCULATION AND FLOW OF WATERS: Except as specified in the plans attached to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, in such a manner as to impair normal flows and circulation patterns within waters or wetlands or to reduce the reach of waters or wetlands.
5. DEVIATION FROM PERMITTED PLANS: The permittee shall ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Written verification shall be provided that the final construction drawings comply with the attached permit drawings prior to any active construction in waters of the United States, including wetlands. Any deviation in the construction design plans will be brought to the attention of the Corps of Engineers, Mr. James Lastinger of the Raleigh Regulatory Field Office prior to any active construction in waters or wetlands.
6. PRECONSTRUCTION MEETING: The Permittee shall schedule an onsite preconstruction meeting between its representatives, the contractor's representatives and the appropriate Corps of Engineers Project Manager prior to undertaking any work within jurisdictional waters and wetlands to ensure that there is a mutual understanding of all terms and conditions contained within the Department of the Army permit. The Permittee shall notify the Corps of Engineers Project Manager a minimum of thirty (30) days

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in advance of the scheduled meeting in order to provide that individual with ample opportunity to schedule and participate in the required meeting.

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

Related Laws

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

9. The North Carolina Division of Environmental Quality (DEQ) permit/certification number 4131 was issued for this project on December 21, 2017. Special conditions were issued associated with this water quality permit/certification and a copy of these conditions is attached as Exhibit A. These referenced conditions are hereby incorporated as special conditions of this permit.

Project Maintenance

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

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

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

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

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

15. EROSION CONTROL MEASURES IN JURISDICTIONAL WATERS:

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

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

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

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

17. INSTALLATION OF CULVERTS: Unless otherwise requested in the applicant's application and depicted on the approved work plans, culverts greater than 48 inches in diameter will be buried at least one foot below the bed of the stream. Culverts 48 inches in diameter and less shall be buried or placed on the stream bed as practicable and appropriate to maintain aquatic passage, and every effort shall be made to maintain existing channel slope. The bottom of the culvert must be placed at a depth below the natural

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stream bottom to provide for passage during drought or low flow conditions. Destabilizing the channel and head cutting upstream should be considered in the placement of the culvert. The following pipes are exempt from this condition:

R-2247CD			
Pipe Location	Size & Material	Impact Site	Pipe Invert Burial Depth (feet)
-Y17- 54+96	48" WSP	4.5	0.0
-DW1- 15+46	54" RCP	5	0.0
-Y17- 63+32	60" WSP	7	0.0
R-2247EC			
Pipe Location	Size & Material	Impact Site	Pipe Invert Burial Depth (feet)
-L- 108+08	48" WSP	1	0.0
-Y1- 26+19	60" RCP	2	0.0
-L- 111+69	66" WSP	3	0.0
-Y62LPA- INT 13+91	42" RCP/WSP	4.6	0.0
-Y62RPB- INT 19+95	42" RCP	6	0.0
-L- 141+03	42" WSP	7	0.0

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

ESA

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

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Section 103

20. CULTURAL RESOURCES: The Permittee shall fully implement the Memorandum of Agreement between the Permittee, the North Carolina State Historic Preservation Officer, and the Federal Highway Administration, dated March 15, 2006, which is incorporated herein by reference. (See Exhibit B)

21. UNKNOWN CULTURAL RESOURCES: While accomplishing the authorized work, if the permittee discovers any previously unknown cultural resources, the District Engineer will be immediately notified so that required coordination can be initiated with the North Carolina Division of Cultural Resources.

Enforcement

22. REPORTING ADDRESS: All reports, documentation and correspondence required by the conditions of this permit shall be submitted to the following address: U.S. Army Corps of Engineers, Regulatory Division, Raleigh Regulatory Field Office, c/o Mr. James Lastinger, 3331 Heritage Trade Drive, Suite 105, Wake Forest, North Carolina 27587, and by telephone at: 919-554-4884, extension 32. The Permittee shall reference the following permit number, SAW-2017-02112, on all submittals.

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

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

Compensatory Mitigation

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. (See Exhibit C)

U.S. ARMY CORPS OF ENGINEERS

Wilmington District

Compensatory Mitigation Responsibility Transfer Form

Permittee: North Carolina Department of Transportation
Project Name: Winston Salem Northern Beltway

Action ID: SAW-2017-02112
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
4,834				1.03		

*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
9,668				2.06		

Mitigation Site Debited: NCDMS

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

Section to be completed by the Mitigation Sponsor

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

Mitigation Sponsor Name: _____

Name of Sponsor's Authorized Representative: _____

Signature of Sponsor's Authorized Representative

Date of Signature

**USACE Wilmington District
Compensatory Mitigation Responsibility Transfer Form, Page 2**

Conditions for Transfer of Compensatory Mitigation Credit:

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

Comments/Additional Conditions: This Mitigation Transfer responsibility form is only for final design sections R-2247CD, R-2247EC, and U-2579C phase 2 of the Winston Salem Northern Beltway.

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: James Lastinger
USACE Field Office: Raleigh Regulatory Field Office
US Army Corps of Engineers
3331 Heritage Trade Drive, Suite 105
Wake Forest, NC 27587

Email: james.c.lastinger@usace.army.mil



USACE Project Manager Signature

January 12, 2018

Date of Signature



ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

LINDA CULPEPPER
Interim Director

December 21, 2017

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

Subject: 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS for Proposed Winston Salem Northern Beltway from I-40 to US 52 (TIP Nos. R-2247B Phase 2, CA, CB, CD, D, EA, EB, and EC); and from 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) in Forsyth County. State Project Nos. 6.628001T and 8.2625101. NCDWR Project No. 19980260 v2. Revision 2.

Dear Mr. Harris:

Attached hereto is a copy of Certification No. WQC004131 issued to The North Carolina Department of Transportation (NCDOT) dated December 21, 2017.

The original Certification dated November 14, 2017 was revised (Revision 1) to include Table 7. Revision 1 was signed and dated November 27, 2017.

This hereto is a revision to the November 27, 2017 Certification. This revision clarifies Condition No. 4 of Condition(s) of Certification below with respect to culvert burial at Sites 2 and 3A of U-2579C Phase 2; adds a General Condition 1 relative to culvert burial practices; clarifies the type of permanent impacts at Sites 4 and 5 of R-2247CD as footnoted in Table 3 below; designates mitigation requirements to Sites 4 and 5 in Table 3; and, accounts for additional mitigation in Condition 1 of Condition(s) of Certification relative to Sites 4 and 5.

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

Sincerely,

A handwritten signature in black ink that reads 'Linda Culpepper for'.

Linda Culpepper, Interim Director
Division of Water Resources

Attachments

Electronic copy only distribution:

James Lastinger, US Army Corps of Engineers, Raleigh Field Office
Amy Euliss, Division 9 Environmental Officer
Carla Dagnino, NC Department of Transportation
Bill Barret, NC Department of Transportation
Chris Millitscher, US Environmental Protection Agency
Marella Buncick, US Fish and Wildlife Service
Marla Chambers, NC Wildlife Resources Commission
Beth Harmon, Division of Mitigation Services
File Copy

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

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Resources (NCDWR) Regulations in 15 NCAC 2H .0500. This certification authorizes the NCDOT to impact 1.03 acres of jurisdictional wetlands and 5,519 linear feet of jurisdictional streams in Forsyth County as summarized in Tables 1 through 6 below. This portion of the phased project shall be constructed pursuant to the application dated received October 2, 2017.

This certification also authorizes future wetland and stream impacts for other Sections as summarized in Table 7 below.

Table 1. Stream Impacts in the Yadkin Pee Dee River Basin (U-2579C Phase 2)

Site	Permanent Fill in Intermittent Stream (linear ft)	Temporary Fill in Intermittent Stream (linear ft)	Permanent Fill in Perennial Stream (linear ft)		Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
	Roadway Fill		Roadway Fill/Culvert	Bank Stabilization			
1	-	-	1,148	40	31	1,219	1,148
2	-	-	552	45	35	632	552
3A	-	-	914	33	55	1,002	914
4	-	-	405	-	40	445	405
5	390	-	-	-	-	390	-
Total	390	-	3,019	118	161	3,688	3,019

Total Stream Impacts for this Section: 3,688 linear feet

Table 2. Wetland (Riverine) Impacts in the Yadkin Pee Dee River Basin (U-2579C Phase 2)

Site	Fill (ac)	Excavation (ac)	Mechanized Clearing (ac)	Total Wetland Impact (ac)	Impacts Requiring Mitigation (ac)
1	0.57	-	-	0.57	0.57
3B	0.02	0.01	0.01	0.04	0.04
3C	0.06	-	-	0.06	0.06
5	0.02	-	-	0.02	0.02
Total	0.66	0.01	0.01	0.68	0.68

Total Wetland Impacts for this Section 0.68 acres.

Table 3. Stream Impacts in the Yadkin Pee Dee River Basin (R-2247CD)

Site	Permanent Fill in Perennial Stream (linear ft)				Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
	Fill	Ditch	Channel Change/Fill	Bank Stabilization/ RipRap			
2	-	75	-	-	7	82	-
4	-	-	56*	-	4	60	56
5	160	-	15*	72*	-	247	247
6	-	-	-	-	45	45	-
7	17	-	216	-	26	259	-
8	-	-	-	16	10	26	-
9	-	-	-	55	15	70	-
10	-	-	-	17	14	31	-
Total	177	75	287	160	121	820	303

**Note: Impacts at Sites 4 and 5 include riprap in the stream bed which will require mitigation.*

Total Stream Impacts for this Section: 820 linear feet

Table 4. Wetland (Riverine) Impacts in the Yadkin Pee Dee River Basin (R-2247CD)

Site	Fill (ac)	Excavation (ac)	Mechanized Clearing (ac)	Total Wetland Impact (ac)	Impacts Requiring Mitigation (ac)
1	<0.01	-	<0.01	<0.01	<0.01
2	<0.01	<0.01	-	<0.01	<0.01
3	0.01	-	-	0.01	0.01
7	-	-	0.01	0.01	0.01
Total	0.02	<0.01	0.02	0.04	0.04

Total Wetland Impacts for this Section: 0.04 acres.

Table 5. Stream Impacts in the Yadkin Pee Dee River Basin (R-2247EC)

Site	Permanent Fill in Intermittent Stream (linear ft)		Temporary Fill in Intermittent Stream (linear ft)	Permanent Fill in Perennial Stream (linear ft)		Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
	Pipe	Channel Change		Channel Change	Bank Stabilization			
1	-	-	-	112	15	20	147	-
2	-	-	-	156	21	25	202	156
3	-	-	-	165	15	19	199	165
4	54	-	10	-	-	-	64	-
6	-	275	44	-	-	-	319	-
7	-	-	-	22	-	11	33	-
8	-	-	-	30	-	17	47	-
Total	54	275	54	485	51	92	1,011	321

Total Stream Impacts for this Section: 1,011 linear feet

Table 6. Wetland (Riverine) Impacts in the Yadkin Pee Dee River Basin (R-2247EC)

Site	Fill (ac)	Excavation (ac)	Mechanized Clearing (ac)	Total Wetland Impact (ac)	Impacts Requiring Mitigation (ac)
1	<0.01	<0.01	<0.01	<0.01	<0.01
4	0.04	-	0.02	0.06	0.06
5	0.22	-	0.01	0.24	0.24
Total	0.26	<0.01	0.04	0.31	0.31

Total Wetland Impacts for this Section: 0.31 acres.

Table 7. Summary of Preliminary Stream and Wetland Impacts for Future Sections

Section	Stream Impacts (linear feet)	Wetland Impacts (acres)	Impacts Requiring Mitigation	
			Streams (linear feet)	Wetlands (acres)
U-2579AA	3,019	1.43	3,019	1.43
U-2579AB	10,351	1.50	10,351	1.50
U-2579D	5,043	0.08	5,043	0.08
U-2579E	4,864	0.99	4,864	0.99
U-2579F	2,544	0.24	2,544	0.24
R-2247EA	6,536	0.57	6,536	0.57
R-2247EB	6,593	0.09	6,593	0.09
R-2247B Phase 2	862	0.27	862	0.27
R-2247CA	3,056	0.71	3,056	0.71
R-2247CB	5,674	1.98	5,674	1.98
R-2247D	5,762	0.52	5,762	0.52
Total	54,304	8.38	54,304	8.38

Notes: Mitigation totals are estimates. Mitigation is not required for intermittent streams. Final mitigation requirements will be determined once permit is modified and preliminary impacts are finalized for other Sections.

The 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 dated received October 2, 2017. Should your project change, you are required to notify the NCDWR and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 300 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). 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:

1. Compensatory mitigation for 3,643 linear feet of impacts to streams and 1.03 acres of wetlands is required for Sections R-2247EC, R-2247CD and U-2579C Phase 2. 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. When final design plans are completed for other Sections (in Table 7) of this phased project, a modification to the 401 Water Quality Certification shall be submitted with five copies and fees to the NC Division of Water Resources. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams, and other surface waters, and buffers. No construction activities that impact any wetlands, streams or surface waters, other than those referenced above in Tables 1 through 6 for U-2579C Phase 2, R-2247 CD and R-2247EC, shall begin until after the permittee applies for, and receives a written modification of the 401 Water Quality from the NC Division of Water Resources. [15A NCAC 02H. 0506(b)]
3. As discussed in Merger and restated in the above reference permit application, NCDWR will not require burial of pipes/culverts in the streambed at impact sites for R-2247CD and EC. However, design and placement of culverts and other structures shall be constructed in such a manner that the original stream profiles are not altered (i.e., the depth of the channel must not be reduced by a widening of the streambed). Existing stream dimensions (including pattern and profile) are to be maintained above and below locations of each culvert. The structures shall be designed and installed to allow for fish and other wildlife movement as well as prevent headcutting of the stream. The applicant may be required to provide evidence that the equilibrium has been maintained if requested in writing by the NCDWR. [15A NCAC 02H.0506(b)(2)]
4. For U-2579C Phase 2, the inlet invert of the 60-inch pipe crossing at Site 2 will not be buried to prevent head cutting. However, the outlet will be buried one foot. At Site 3A, the culvert will be buried 0.75 feet. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and downstream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by the NCDWR. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact the NCDWR for guidance on how to proceed and to determine whether or not a permit modification will be required. [15A NCAC 02H.0506(b)(2)]
5. The post-construction removal of any temporary bridge structures must return the project site to its preconstruction contours and elevations. The impacted areas shall be revegetated with appropriate native species. [15A NCAC 02H .0506(b)(2)]
6. Bridge demolition and construction must be accomplished in strict compliance with the most recent version of NCDOT's Best Management Practices for Construction and Maintenance Activities. [15A NCAC 02H .0507(d)(2) and 15A NCAC 02H .0506(b)(5)]
7. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. [15A NCAC 02H .0507(d)(2) and 15A NCAC 02H .0506(b)(5)]

General Conditions

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

2. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills. [15A NCAC 02B.0200]
3. During the construction of the project, no staging of equipment of any kind is permitted in waters of the U.S., or protected riparian buffers. [15A NCAC 02H.0506(b)(2)]
4. The dimension, pattern and profile of the stream above and below the crossing shall not be modified. Disturbed floodplains and streams shall be restored to natural geomorphic conditions. [15A NCAC 02H.0506(b)(2)]
5. The use of rip-rap above the Normal High Water Mark shall be minimized. Any rip-rap placed for stream stabilization shall be placed in stream channels in such a manner that it does not impede aquatic life passage. [15A NCAC 02H.0506(b)(2)]
6. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval. [15A NCAC 02H .0507(c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]
7. All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water. [15A NCAC 02H.0506(b)(3) and (c)(3)]
8. Heavy equipment shall be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the introduction of other pollutants into the stream. [15A NCAC 02H.0506(b)(3)]
9. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials. [15A NCAC 02H.0506(b)(3)]
10. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification. [15A NCAC 02H.0506(b)(3)]
11. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited. [15A NCAC 02H.0506(b)(3)]
12. The permittee and its authorized agents shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act) and any other appropriate requirements of State and Federal law. If the NCDWR determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, the NCDWR may reevaluate and modify this certification. [15A NCAC 02B.0200]
13. All fill slopes located in jurisdictional wetlands shall be placed at slopes no flatter than 3:1, unless otherwise authorized by this certification. [15A NCAC 02H.0506(b)(2)]
14. A copy of this Water Quality Certification shall be maintained on the construction site at all times. In addition, the Water Quality Certification and all subsequent modifications, if any, shall be maintained with the Division Engineer and the on-site project manager. [15A NCAC 02H .0507(c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]
15. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization shall be clearly marked by highly visible fencing/flagging prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this certification. [15A NCAC 02H.0501 and .0502]
16. The issuance of this certification does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (i.e. local, state, and federal) having

jurisdiction, including but not limited to applicable buffer rules, stormwater management rules, soil erosion and sedimentation control requirements, etc.

17. The Permittee shall report any violations of this certification to the Division of Water Resources within 24 hours of discovery. [15A NCAC 02B.0506(b)(2)]
18. Upon completion of the project (including any impacts at associated borrow or waste sites), the NCDOT Division Engineer (or appointee) shall complete and return the enclosed "Certification of Completion Form" to notify the NCDWR when all work included in the 401 Certification has been completed. [15A NCAC 02H.0502(f)]
19. Native riparian vegetation must be reestablished in the riparian areas within the construction limits of the project by the end of the growing season following completion of construction. [15A NCAC 02H.0506(b)(2)]
20. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated with this permit without appropriate modification. Should waste or borrow sites, or access roads to waste or borrow sites, be located in wetlands or streams, compensatory mitigation will be required since that is a direct impact from road construction activities. [15A NCAC 02H.0506(b)(3) and (c)(3)]
21. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards [15A NCAC 02H.0506(b)(3) and (c)(3)]:
 - a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*.
 - b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
 - c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.
 - d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.
22. Sediment and erosion control measures shall not be placed in wetlands or waters unless otherwise approved by this Certification. [15A NCAC 02H.0506(b)(3) and (c)(3)]

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

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

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

The mailing address for the Office of Administrative Hearings is:

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

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

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

This the 21st day of December 2017

DIVISION OF WATER RESOURCES

Linda Culpepper for
Linda Culpepper, Interim Director

WQC No. WQ004131

**AMENDED MEMORANDUM OF AGREEMENT
BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION AND
NORTH CAROLINA STATE HISTORIC PRESERVATION OFFICER
FOR
WINSTON-SALEM NORTHERN BELTWAY
(TIP No.'s R-2247, U-2579 & U-2579A)
Federal Aid No. NHF-0918(14)
TO ADDRESS EFFECTS TO
The Alexander Hege House
and
Archaeological Sites 31FY888, 31FY893**, 31FY901, 31FY902**, 31FY903,
31FY910**, 31FY911**, 31FY912**, 31FY921, 31FY925**,
31FY944, and 31FY1053/1053**.
Forsyth County, North Carolina**

WHEREAS, the Federal Highway Administration (FHWA) has determined that the Winston-Salem Northern Beltway, Forsyth County, North Carolina (the Undertaking) will have an effect upon the Alexander Hege House and upon archaeological sites 31FY888, 31FY893**, 31FY901, 31FY902**, 31FY903, 31FY910**, 31FY911**, 31FY912**, 31FY921, 31FY925**, 31FY944, and 31FY1053/1053**, properties determined eligible for listing in the National Register of Historic Places, and has consulted with the North Carolina State Historic Preservation Officer (SHPO) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f); and

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

WHEREAS, this Amended Memorandum of Agreement (MOA) supercedes a previously executed MOA signed by FHWA, SHPO, and NCDOT on April 26, 1996; and

WHEREAS, NCDOT and Bettie P. Slater, owner of the Alexander Hege House (Owner), participated in the consultation and has been invited to concur in this Amended Memorandum of Agreement (Agreement) pursuant only to the Alexander Hege House; and

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

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

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

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

NOW, THEREFORE, FHWA and the North Carolina SHPO agree that the Undertaking will be implemented in accordance with the following stipulations in order to take into account the effects of the Undertaking on the historic properties. FHWA will ensure that the following terms and conditions will be implemented in a timely manner and with adequate resources in compliance with the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470).

STIPULATIONS

I. Data Recovery of Archaeological Sites:

- ◆ 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.
- ◆ 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.
- ◆ As they are developed, each individual DRP will be forwarded for review by the SHPO.
- ◆ 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.
- ◆ Upon receipt of the Management Summary, the SHPO will respond within ten (10) days to the recommendations contained within the document.
- ◆ 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.
- ◆ 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.

II. Alexander Hege House Recordation:

- ◆ Prior to the initiation of construction, NCDOT will record the existing condition of the Alexander Hege House and its surroundings in accordance with the attached Historic Structures and Landscape Recordation Plan (Appendix A).

III. Alexander Hege House and Project Construction:

- ◆ NCDOT will align the Alexander Hege House driveway opposite the new intersection ramp, so property access will be under full traffic signal control. This will allow NCDOT and the property owner full movement for equipment and trucks.
- ◆ In consultation with SHPO, NCDOT 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.
- ◆ 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.

IV. Preservation Easement:

- ◆ The Alexander Hege House property owner may pursue a preservation easement for the National Register-eligible Alexander Hege House at the owner's discretion.

OTHER TERMS AND CONDITIONS

Unanticipated Discovery

In accordance with 36 CFR 800.11(a), and prior to initiation of construction activities, NCDOT will ensure preparation of a plan of action should archaeological or architectural resources be inadvertently or accidentally discovered during the construction phase of the project. The plan will provide for an assessment of the significance of the discovery in consultation amongst NCDOT, FHWA, and the SHPO. Inadvertent or accidental discovery of human remains will be handled in accordance with North Carolina General Statutes 65 and 70.

Dispute Resolution

Modification, amendment, or termination of this agreement as necessary will be accomplished by the signatories in the same manner as the original agreement. Disputes regarding the completion of the terms of this agreement will be resolved by the signatories. If the signatories cannot agree regarding a dispute, any one of the signatories may request the participation of the Council to assist in resolving the dispute.

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

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

Notify FHWA that it will comment pursuant to 36 CFR Section 800.7(c) and proceed to comment. Any Council comment provided in response to such a request will be taken

into account by FHWA in accordance with 36 CFR Section 800.7 (c) (4) with reference to the subject of the dispute.

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

Execution of Agreement


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

Expiration and Extension of Agreement

This agreement will be null and void if its terms are not carried out within five (5) years from the date of its execution, unless the signatories agree in writing to an extension for carrying out its terms.

AGREE:

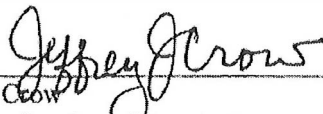
Federal Highway Administration:

FOR 

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

Date: 3/29/06

State Historic Preservation Officer:



Jeffrey J. Crow
North Carolina State Historic Preservation Officer

Date: 2/17/06

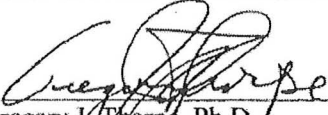
FILED BY:

Advisory Council on Historic Preservation

Date: _____

CONCUR:

North Carolina Department of Transportation:



Date: 15 Mar 06
Gregory J. Thorpe, Ph.D.
Manager, Project Development and Environmental Analysis Branch

CONCUR:

Alexander Hege House:

Bettie P. Slater, Owner

Date: _____

APPENDIX A

**Historic Structures and Landscape Recordation Plan
For the Alexander Hege House and Site
TIP No.'s R-2247, U-2579 & U-2579A
Winston-Salem Northern Beltway
Federal Aid No. NHF-0918(14)
Forsyth County, North Carolina**

Photographic Requirements

- Overall views of the Alexander Hege House and surrounding landscape (elevations and oblique views).
- Selected photographic views of the Alexander Hege House.
- Views of the property and landscape showing the relationship to existing roads.

Photographic Format

- Color slides (all views)
- 35 mm or larger black and white negatives (all views)
- Two (2) sets of black and white contact sheets (all views)
- All processing to be done to archival standards
- All photographs and negatives to be labeled according to Division of Archives and History standards

Copies and Curation

One (1) set of all photographic documentation will be deposited with the North Carolina Division of Archives and History/State Historic Preservation Office to be made a permanent part of the statewide survey and iconographic collection. One contact sheet will be deposited in the files of the Historic Architecture Section of NCDOT.



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR NCDOT PROJECTS



(Version 2.07; Released October 2016)

WBS Element: 34839.1.9 TIP No.: U-2579C County(ies): Forsyth Page 1 of 4

General Project Information

WBS Element:	34839.1.9	TIP Number:	U-2579C	Project Type:	New Location	Date:	1/14/2017
NCDOT Contact:	Stephen Morgan, PE		Contractor / Designer:	Sungate Design Group			
Address:	Hydraulics Unit 1590 Mail Service Center Raleigh, NC 27699-1590		Address:	905 Jones Franklin Rd Raleigh, NC 27606			
	Phone:	(919) 707-6739		Phone:	(919) 859-2243		
	Email:	smorgan@ncdot.gov		Email:	belam@sungatedesign.com		
City/Town:	Winston Salem		County(ies):	Forsyth			
River Basin(s):	Yadkin-Pee Dee		CAMA County?	No			
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	1.99	Surrounding Land Use:	Residential, Agricultural, Rural				
		Proposed Project	Existing Site				
Project Built-Upon Area (ac.)	43.6	ac.	5.8	ac.			
Typical Cross Section Description:	Three 12ft lanes with 14ft outside shoulders (12ft paved) and 12ft paved inside shoulders in each direction with a 22ft grassed median.			N/A			

Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	81,670	Year:	2037	Existing:	65,592	Year:	2017
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General Project Narrative:
(Description of Minimization of Water Quality Impacts)

I-74 Winston-Salem Northern Beltway from East of US 311 to US 158: Measures have been taken throughout the project to limit impacts to wetlands and surface waters. Two Dry Detention basins will be utilized in the gore areas between the -L- line and Ramps B and C. These basins will serve to attenuate peak stormwater flows, promote settlement of suspended solids and reduce erosive velocities downstream. Further, no deck drains will be used on the Lowery Mill Creek bridge, eliminating potential for direct roadway runoff into surface waters. A rip rap energy dissipator basin will be used at storm drain system outlet, in the Lowery Mill Creek floodplain, to reduce peak flow velocities to Lowery Mill Creek. 2:1 slopes will be used in fill areas to reduce impacts to surrounding wetlands and jurisdictional streams.

Waterbody Information

Surface Water Body (1):	Lowery Mill Creek		NCDWR Stream Index No.:	12-94-12-3-(0.5)				
NCDWR Surface Water Classification for Water Body	Primary Classification:	Water Supply III (WS-III)						
	Supplemental Classification:							
Other Stream Classification:								
Impairments:	None							
Aquatic T&E Species?	No	Comments:						
NRTR Stream ID:							Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	Yes	Deck Drains Discharge Over Buffer?	No	Dissipator Pads Provided in Buffer?				N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)			(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)			
(If yes, provide justification in the General Project Narrative)								



North Carolina Department of Transportation
 Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
 FOR NCDOT PROJECTS



(Version 2.07; Released October 2016)

WBS Element: 34839.1.9 **TIP No.:** U-2579C **County(ies):** Forsyth **Page** 2 **of** 4

Additional Waterbody Information

Surface Water Body (2):		Frazier Creek		NCDWR Stream Index No.:		12-94-12-6-1	
NCDWR Surface Water Classification for Water Body		Primary Classification:		Class C			
		Supplemental Classification:					
Other Stream Classification:							
Impairments:		None					
Aquatic T&E Species?		No		Comments:			
NRTR Stream ID:				Buffer Rules in Effect:		N/A	
Project Includes Bridge Spanning Water Body?		No		Deck Drains Discharge Over Buffer?		N/A	
Deck Drains Discharge Over Water Body?		N/A		(If yes, provide justification in the General Project Narrative)		Dissipator Pads Provided in Buffer?	
(If yes, provide justification in the General Project Narrative)						(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	

Surface Water Body (3):				NCDWR Stream Index No.:			
NCDWR Surface Water Classification for Water Body		Primary Classification:					
		Supplemental Classification:					
Other Stream Classification:							
Impairments:							
Aquatic T&E Species?				Comments:			
NRTR Stream ID:				Buffer Rules in Effect:			
Project Includes Bridge Spanning Water Body?				Deck Drains Discharge Over Buffer?			
Deck Drains Discharge Over Water Body?				(If yes, provide justification in the General Project Narrative)		Dissipator Pads Provided in Buffer?	
(If yes, provide justification in the General Project Narrative)						(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	

Surface Water Body (4):				NCDWR Stream Index No.:			
NCDWR Surface Water Classification for Water Body		Primary Classification:					
		Supplemental Classification:					
Other Stream Classification:							
Impairments:							
Aquatic T&E Species?				Comments:			
NRTR Stream ID:				Buffer Rules in Effect:			
Project Includes Bridge Spanning Water Body?				Deck Drains Discharge Over Buffer?			
Deck Drains Discharge Over Water Body?				(If yes, provide justification in the General Project Narrative)		Dissipator Pads Provided in Buffer?	
(If yes, provide justification in the General Project Narrative)						(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	

Surface Water Body (5):				NCDWR Stream Index No.:			
NCDWR Surface Water Classification for Water Body		Primary Classification:					
		Supplemental Classification:					
Other Stream Classification:							
Impairments:							
Aquatic T&E Species?				Comments:			
NRTR Stream ID:				Buffer Rules in Effect:			
Project Includes Bridge Spanning Water Body?				Deck Drains Discharge Over Buffer?			
Deck Drains Discharge Over Water Body?				(If yes, provide justification in the General Project Narrative)		Dissipator Pads Provided in Buffer?	
(If yes, provide justification in the General Project Narrative)						(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	



North Carolina Department of Transportation
 Highway Stormwater Program
 STORMWATER MANAGEMENT PLAN
 FOR NCDOT PROJECTS



(Version 2.07; Released October 2016)

WBS Element: TIP No.: U-2579C County(ies): Forsyth Page 3 of 4

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
11	473+00 -L- RT 36.146976, -78.578803	(1)Lowery Mill Creek	Riprap Energy Dissipator Basin	Class I	20.7	Pipe	36	56.1	23.9	N/A

Additional Comments

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



North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS



(Version 2.07; Released October 2016)

WBS Element: 34839.1.9 TIP No.: U-2579C County(ies): Forsyth Page 4 of 4

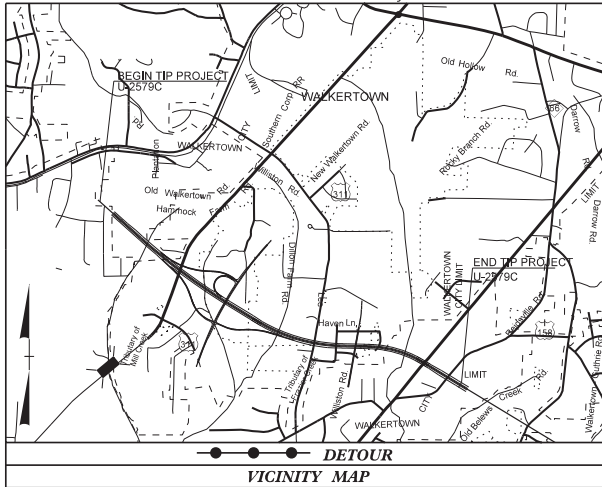
Other Best Management Practices

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	BMP Type	Drainage Area (ac)	New Built-Up Area (ac)	Volume Treated (ac-ft)	Precipitation Depth Treated over NBUA (in)	BMP Associated w/ Buffer Rules?
6	400+00 -L- RT 36.153435, -80.182593	(2)Frazier Creek	Dry Detention Basin	13.4	3.9	1.37	4.44	No
6	400+00 -L- LT 36.154528, -80.181637	(2)Frazier Creek	Dry Detention Basin	7.4	2.0	0.63	3.98	No

Additional Comments

TIP PROJECT: U-2579C PHASE II

See Sheet 1A For Index of Sheets
 See Sheet 1B For Conventional Symbols
 See Sheets 1C-1 Thru 1C-7 For Survey Control Sheets



STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
FORSYTH COUNTY

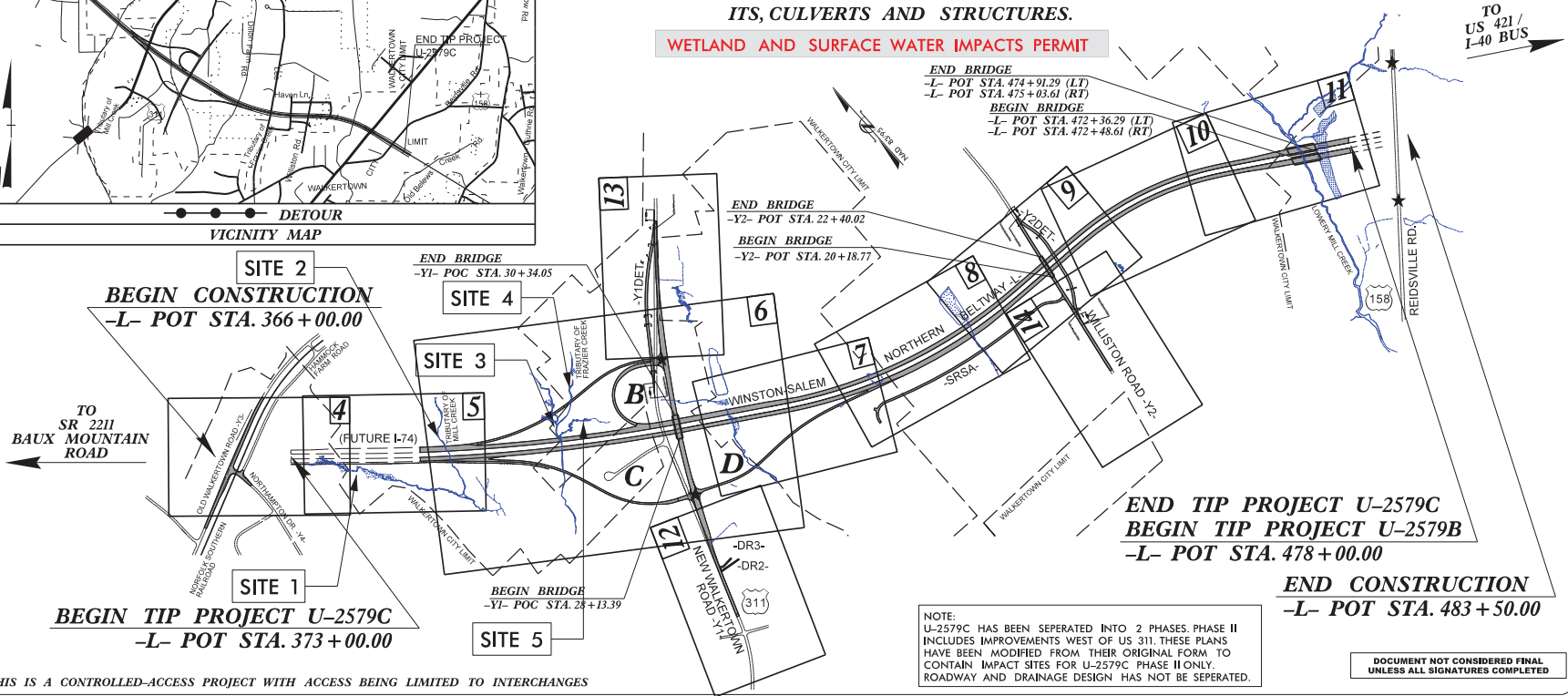
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579C	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34839.1.9	N/A	PE	
34839.2.6	N/A	RW	
34839.2.GV18	NHP-0918(062)	RW	
34839.2.16	N/A	UTIL	
34839.3.GV6	NHP-0918(062)	CONSTR.	

LOCATION: WINSTON - SALEM NORTHERN BELTWAY (EASTERN SECTION)
 FROM US 311 TO US 158 (FUTURE I-74)

TYPE OF WORK: WIDENING, GRADING, PAVING, DRAINAGE, SIGNING, SIGNALS,
 ITS, CULVERTS AND STRUCTURES.

PERMIT DRAWING
 SHEET 1 OF 23

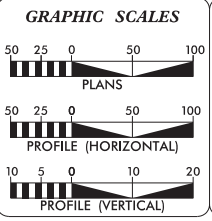
WETLAND AND SURFACE WATER IMPACTS PERMIT



NOTE:
 U-2579C HAS BEEN SEPARATED INTO 2 PHASES. PHASE II
 INCLUDES IMPROVEMENTS WEST OF US 311. THESE PLANS
 HAVE BEEN MODIFIED FROM THEIR ORIGINAL FORM TO
 CONTAIN IMPACT SITES FOR U-2579C PHASE II ONLY.
 ROADWAY AND DRAINAGE DESIGN HAS NOT BEEN SEPARATED.

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

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



DESIGN DATA

ADT 2017 =	65,592
ADT 2037 =	93,112
K =	10 %
D =	60 %
T =	18 % *
V =	70 MPH
*(TTST = 12% + DUAL = 6%)	
FUNC. CLASS = INTERSTATE STATEWIDE TIER	

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT U-2579C	=	1.941 Miles
LENGTH OF STRUCTURE PROJECT U-2579C	=	0.048 Mile
TOTAL LENGTH OF TIP PROJECT U-2579C	=	1.989 Miles

PLANS PREPARED BY:
 &
 8601 SIX FORKS RD, SUITE 260
 RALEIGH, NC 27615
 919-926-4100

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 302 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
 AUGUST 28, 2015

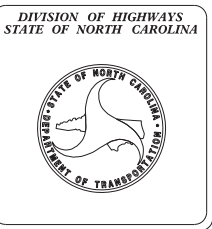
LETTING DATE:
 OCTOBER 17, 2017

HYDRAULICS ENGINEER

ROADWAY DESIGN ENGINEER

SIGNATURE: _____

SIGNATURE: _____



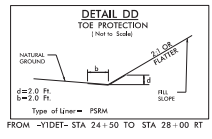
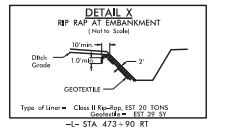
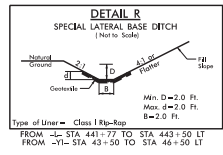
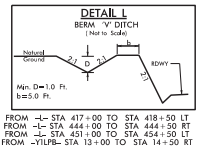
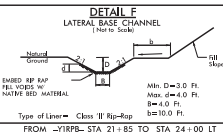
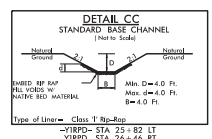
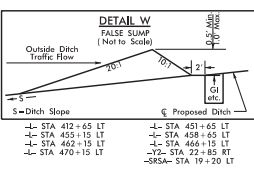
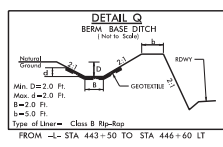
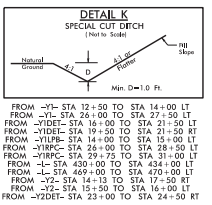
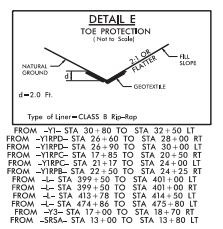
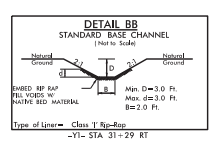
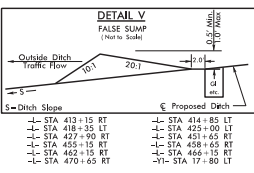
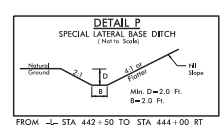
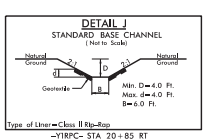
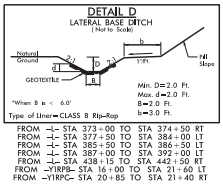
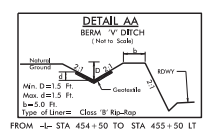
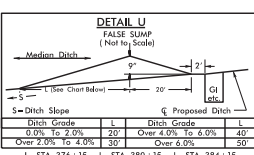
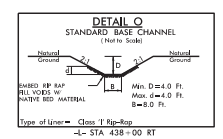
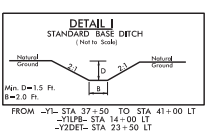
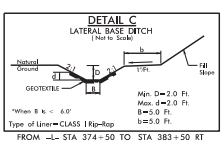
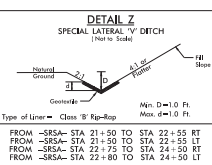
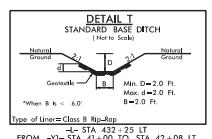
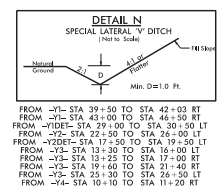
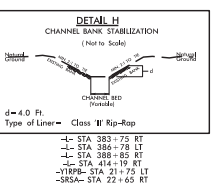
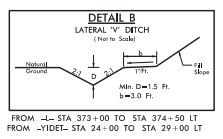
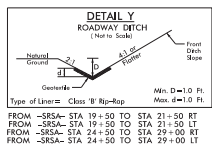
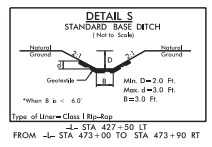
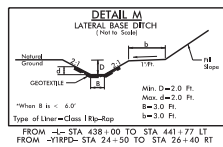
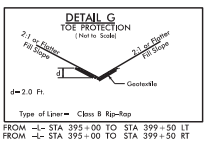
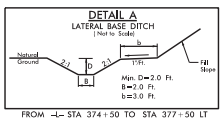
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5/14/25

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U-2579C	2D-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 2 OF 23



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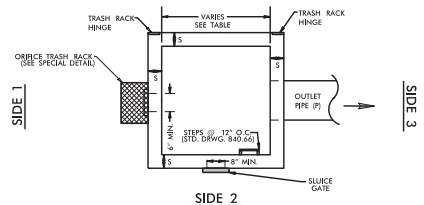
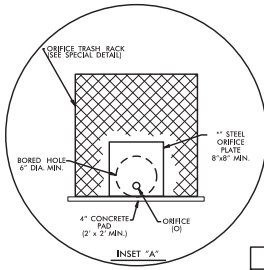
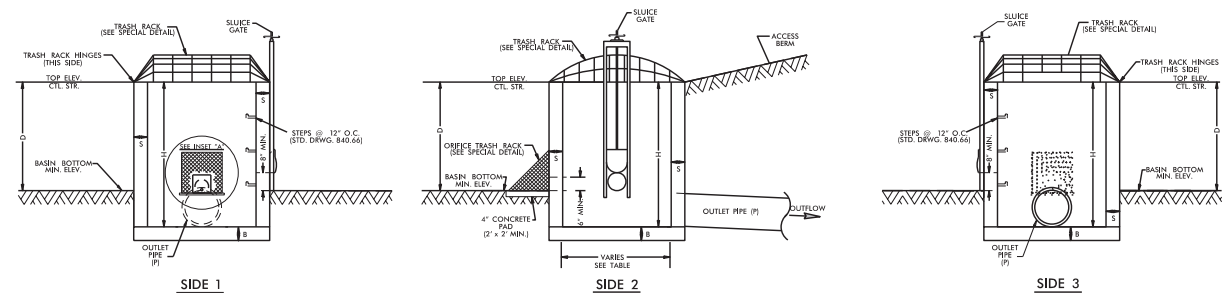
5/14/25

PROJECT REFERENCE NO. U-2579C	SHEET NO. 2D-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

**PERMIT DRAWING
SHEET 3 OF 23**

DETAIL EE
DRY DETENTION BASIN DRAWDOWN STRUCTURE
NOT TO SCALE



PLAN VIEW
TRASH RACK NOT SHOWN FOR CLARITY

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

MINIMUM DIMENSIONS FOR DRY DETENTION BASIN DRAWDOWN STRUCTURE											
STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	MAX. STORAGE DEPTH(D) FEET	INV. ELEV.	CTL. STR. DIMENSIONS (W x L x H)	ORIFICE DIAMETER (O) INCHES	ORIFICE INV. ELEV.	OUTLET PIPE DIAMETER(P) INCHES
400+00 -L- LT	0623	6"	18"	940,0	944,0	4,0	938,0	5' X 5' X 6'	6"	940,0	24
400+08 -L- RT	0609	6"	15"	947,0	950,0	3,0	945,0	5' X 5' X 5'	6"	947,0	24

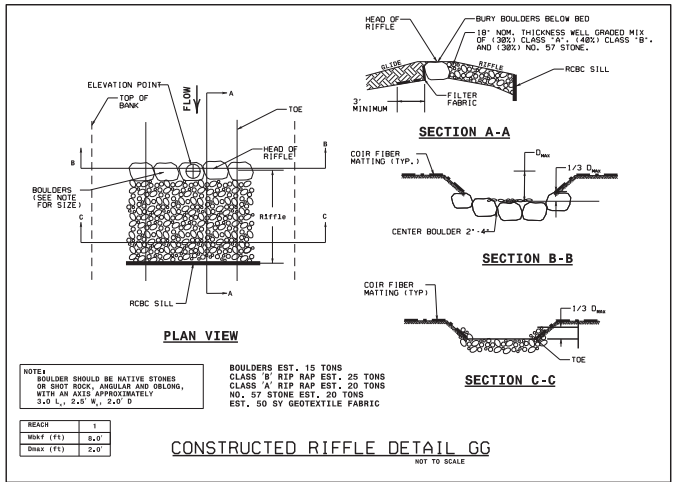
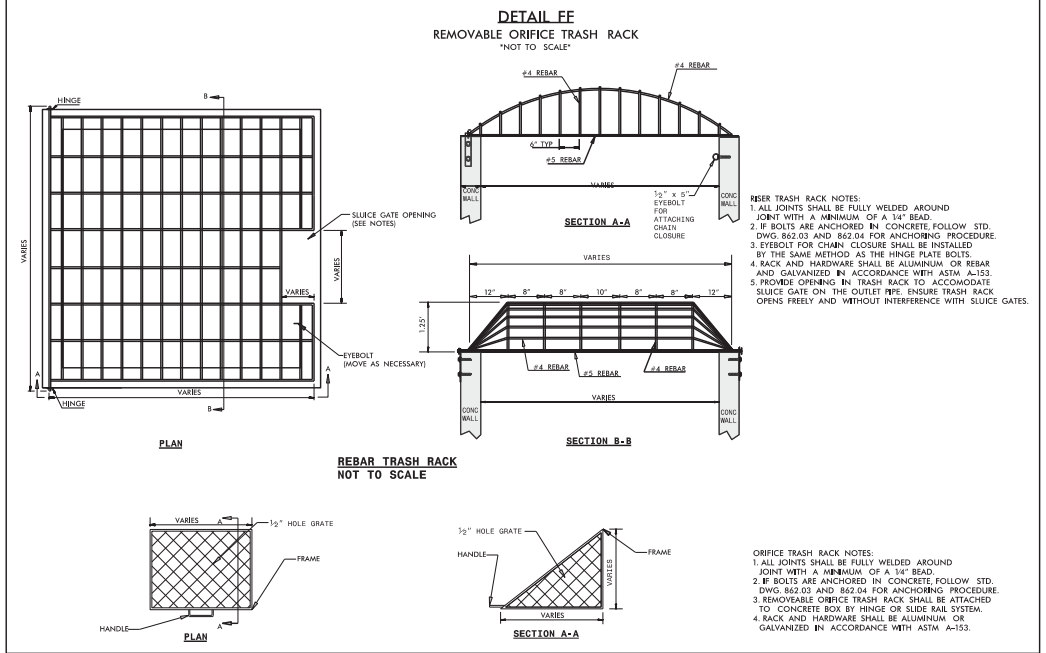
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5/14/25

PROJECT REFERENCE NO. U-2579C	SHEET NO. 2D-3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

**PERMIT DRAWING
SHEET 4 OF 23**



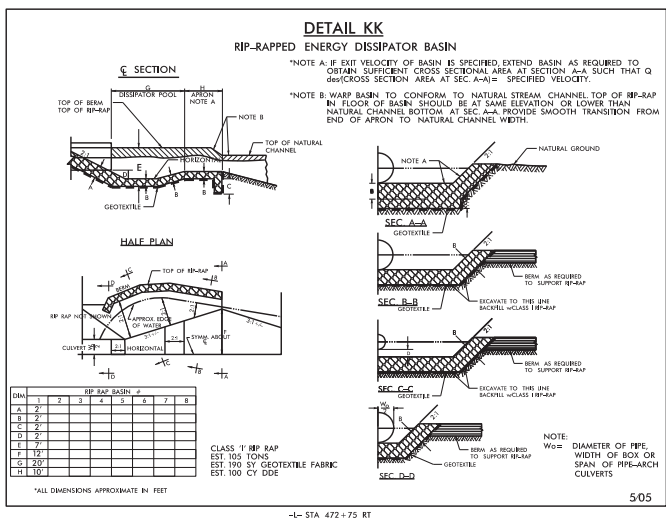
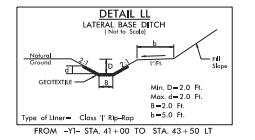
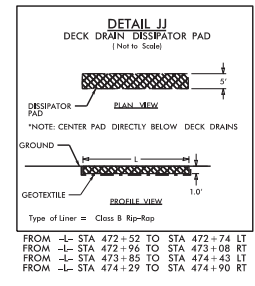
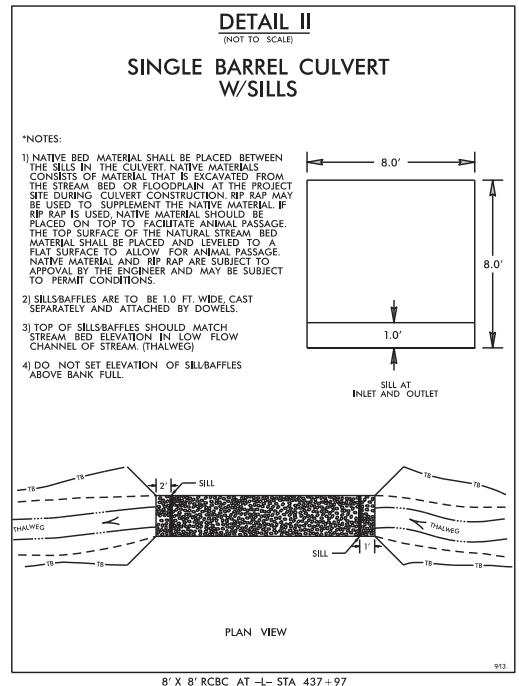
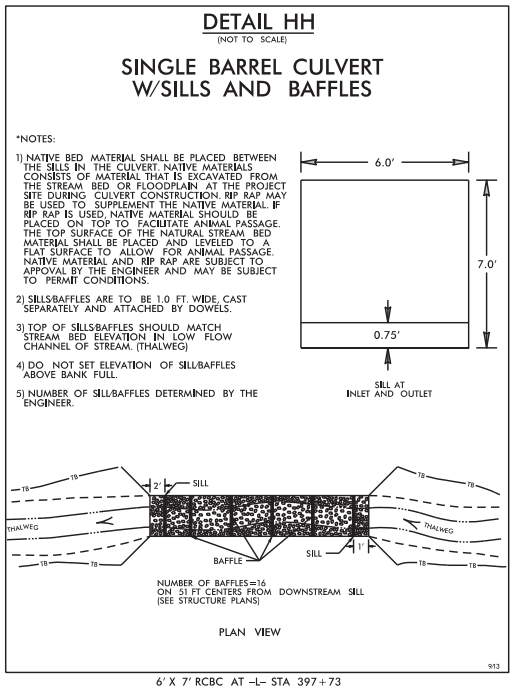
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5/14/05

PROJECT REFERENCE NO. U-2579C	SHEET NO. 2D-4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

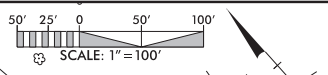
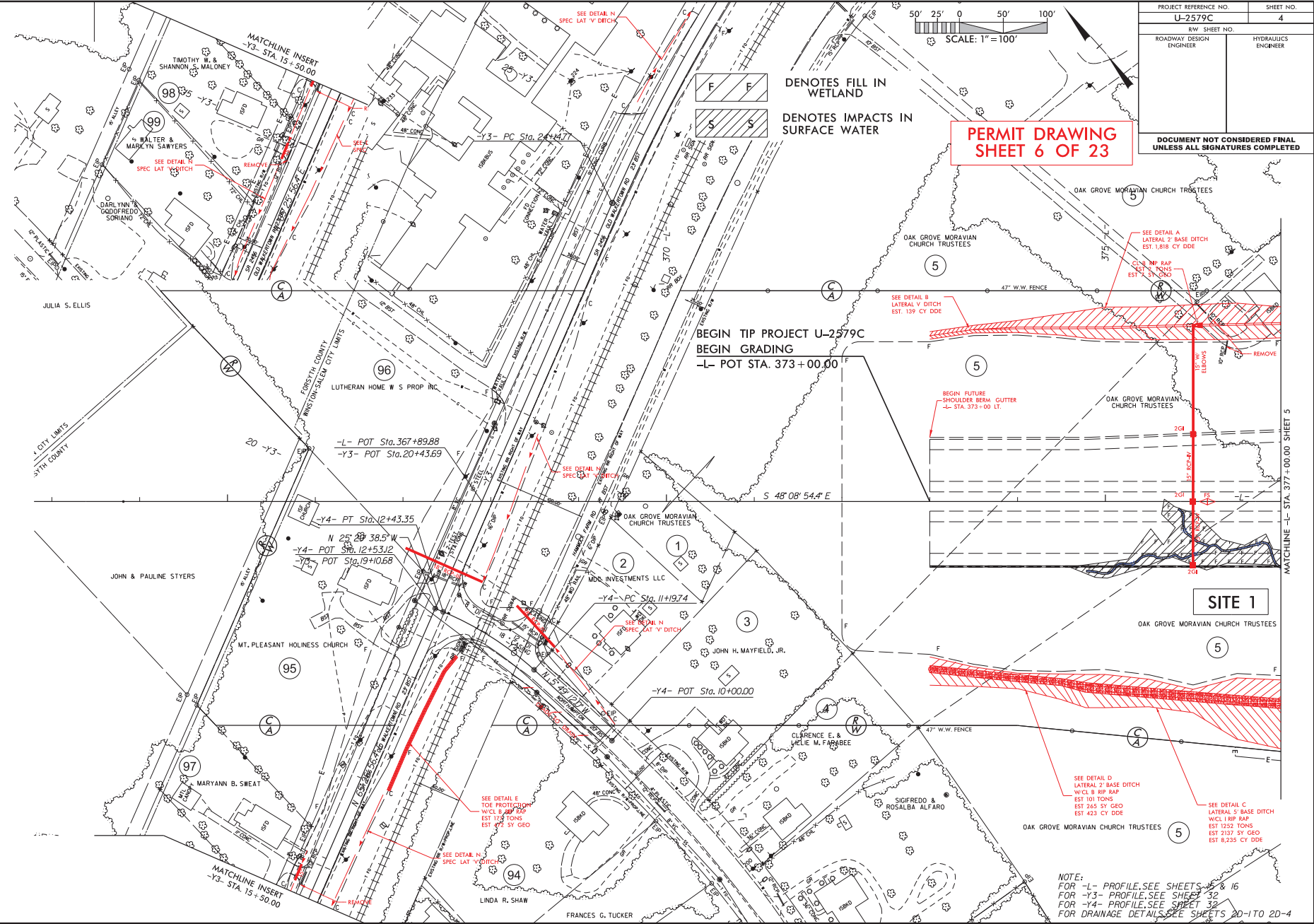
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PERMIT DRAWING SHEET 5 OF 23



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8/17/20



PROJECT REFERENCE NO.	SHEET NO.
U-2579C	4
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

**PERMIT DRAWING
SHEET 6 OF 23**

BEGIN TIP PROJECT U-2579C
 BEGIN GRADING
 -L- POT STA. 373+00.00

SITE 1

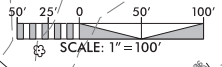
NOTE:
 FOR -L- PROFILE, SEE SHEETS 3 & 16
 FOR -Y3- PROFILE, SEE SHEET 32
 FOR -Y4- PROFILE, SEE SHEET 33
 FOR DRAINAGE DETAILS, SEE SHEETS 20-1 TO 20-4

8/17/24

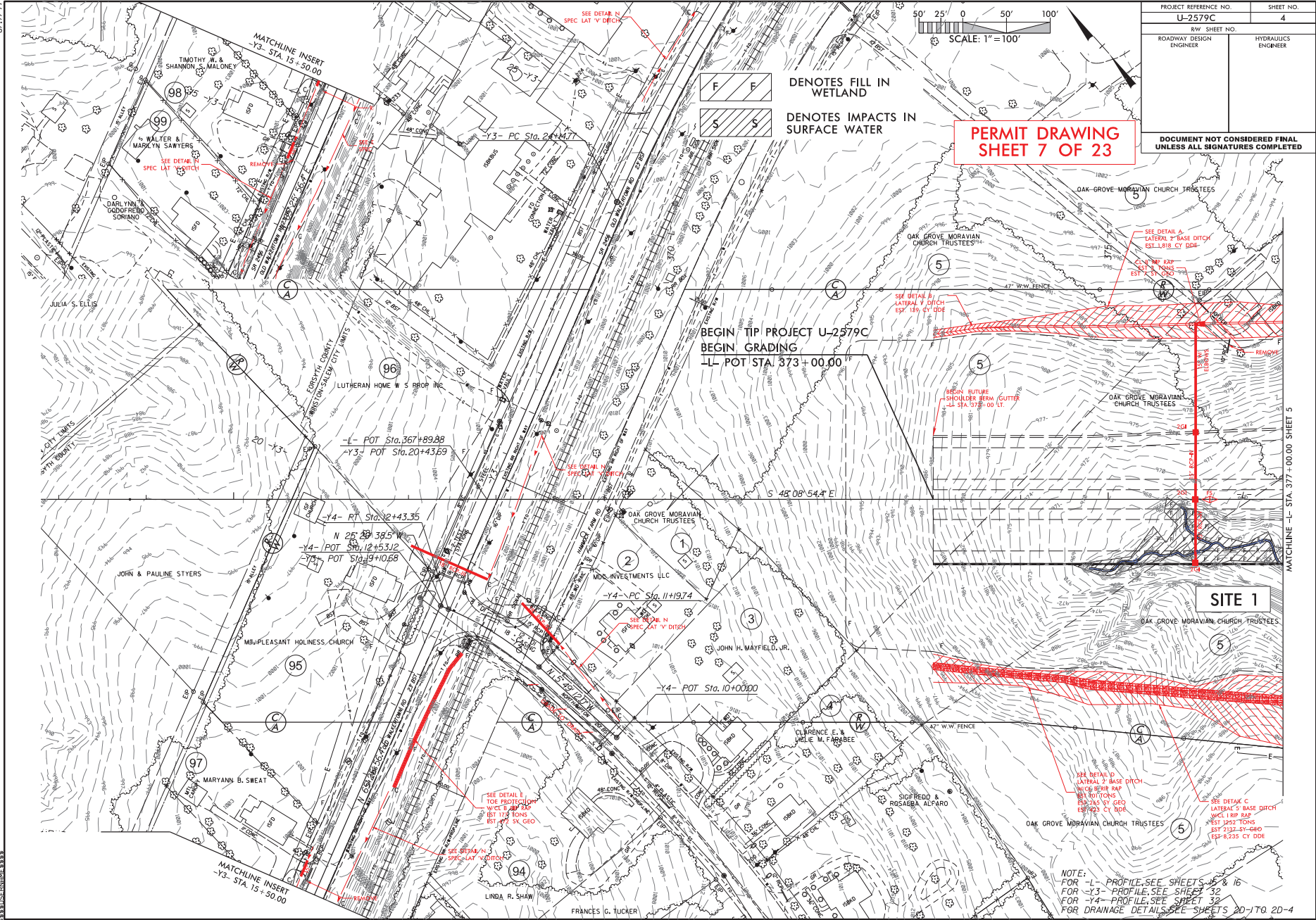
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U-2579C	4
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

PERMIT DRAWING SHEET 7 OF 23

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DENOTES FILL IN WETLAND
 DENOTES IMPACTS IN SURFACE WATER



BEGIN TIP PROJECT U-2579C
 BEGIN GRADING
 LL POT STA: 373+00.00

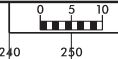
SITE 1

NOTE:
 FOR -L- PROFILE, SEE SHEETS 15 & 16
 FOR -Y3- PROFILE, SEE SHEET 32
 FOR -Y4- PROFILE, SEE SHEET 32
 FOR DRAINAGE DETAILS, SEE SHEETS 20- TO 20-4

MATCHLINE -L- STA. 377+00.00 SHEET 5

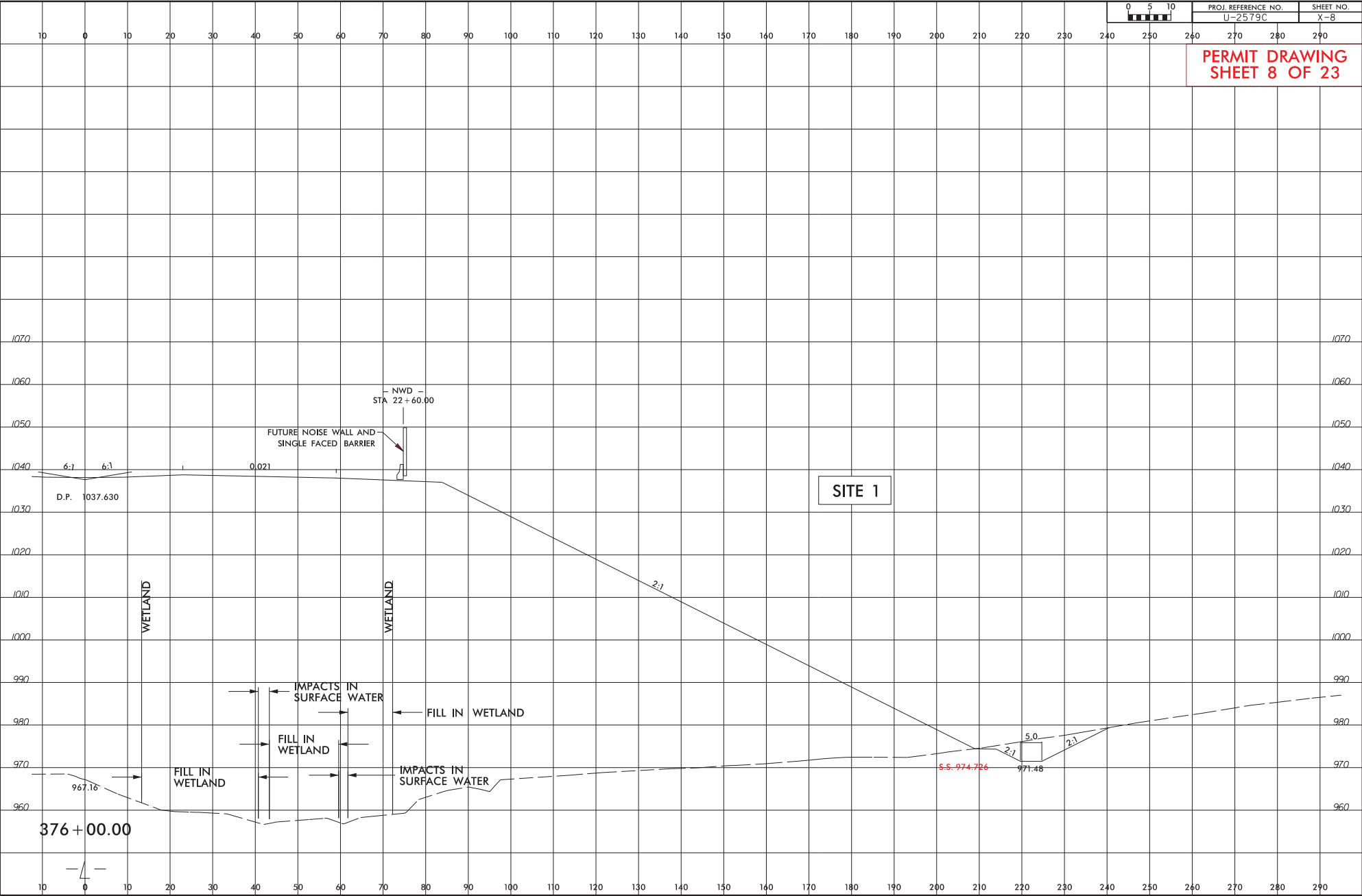
8/17/24

6/23/16



PROJ. REFERENCE NO. U-2579C	SHEET NO. X-8
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PERMIT DRAWING
SHEET 8 OF 23

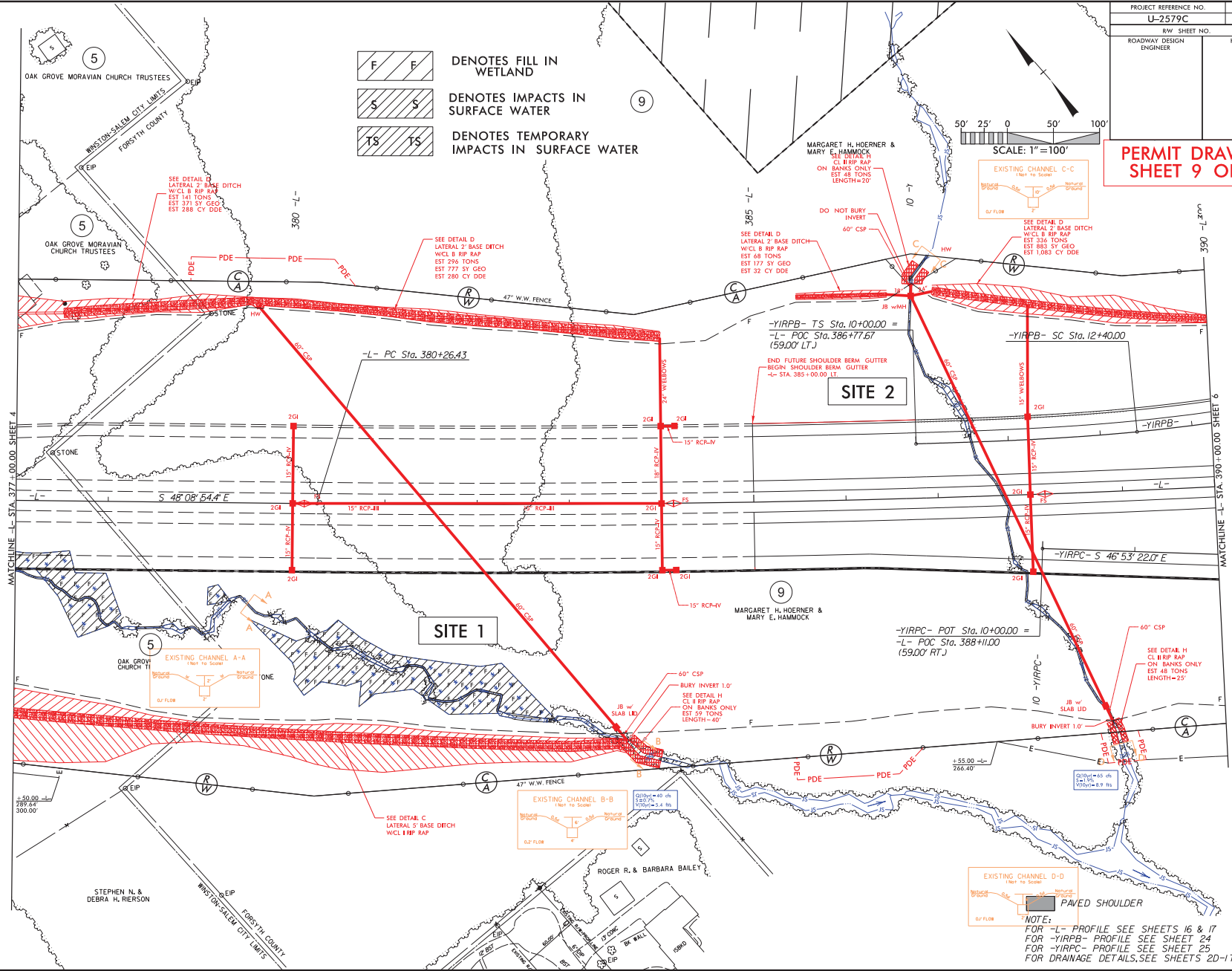
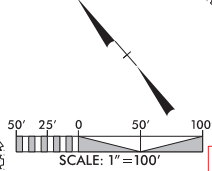


8/17/09

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	5
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

PERMIT DRAWING SHEET 9 OF 23

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



MATCHLINE - L - STA. 377+00.00 SHEET 4

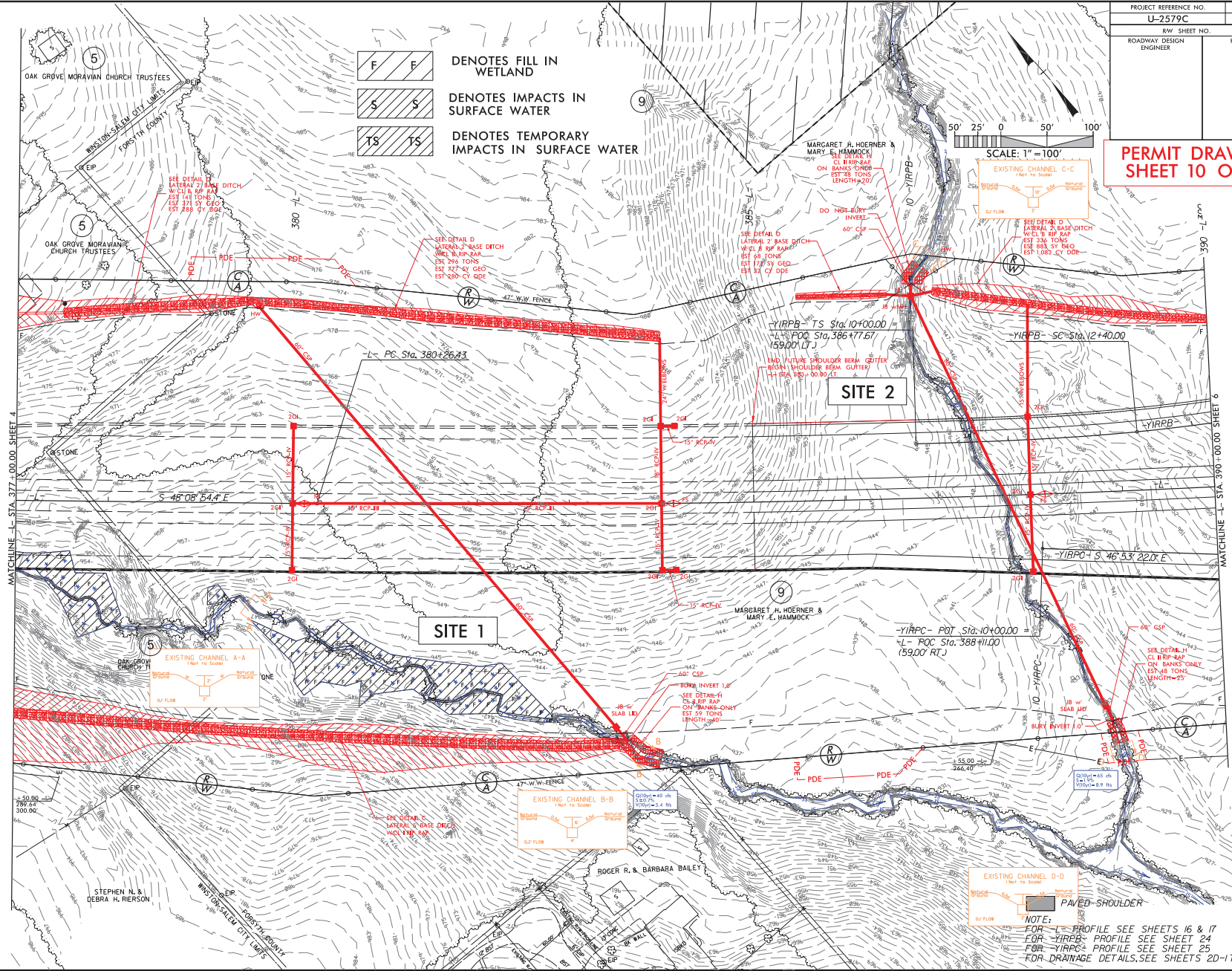
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NOTE:
 FOR -L- PROFILE SEE SHEETS 16 & 17
 FOR -YIRPB- PROFILE SEE SHEET 24
 FOR -YIRPC- PROFILE SEE SHEET 25
 FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 TO 2D-4

8/17/09

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	5
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

PERMIT DRAWING SHEET 10 OF 23



8/17/09
 U-2579C
 SHEET 10 OF 23
 8/17/09

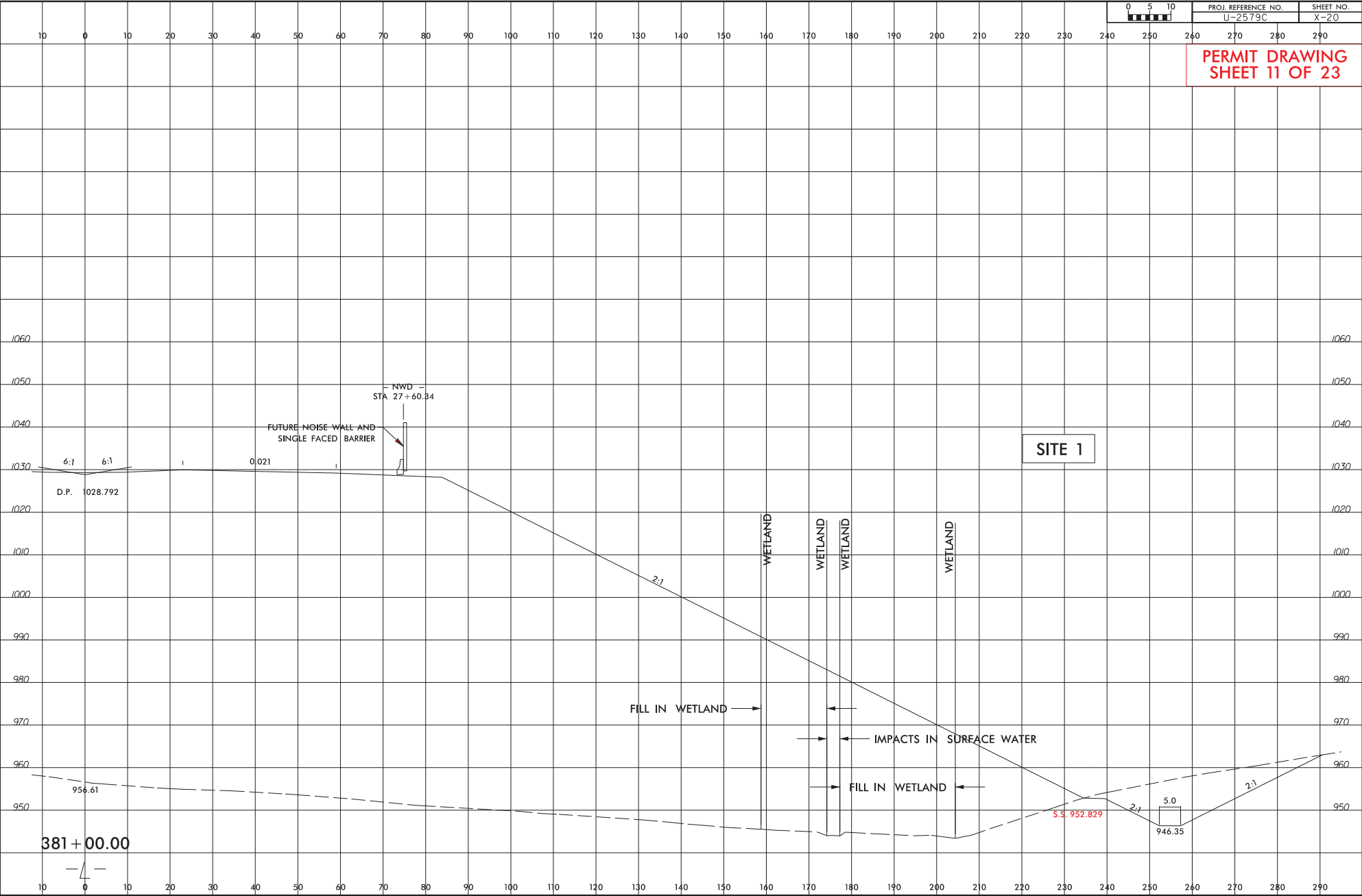
NOTE:
 FOR -YIRPB- PROFILE SEE SHEETS 16 & 17
 FOR -YIRPB- PROFILE SEE SHEET 24
 FOR -YIRPC- PROFILE SEE SHEET 25
 FOR DRAINAGE DETAILS, SEE SHEETS 20-1 TO 20-4

6/23/16



PROJ. REFERENCE NO. U-2579C	SHEET NO. X-20
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**PERMIT DRAWING
SHEET 11 OF 23**



***** SYSTEMS ENGINEERING *****
***** DESIGN *****
***** CONSTRUCTION *****

381+00.00



6/23/16



PROJ. REFERENCE NO.	SHEET NO.
U-2579C	5C

300 200 100 0 100 200 300

381+46 -L-

PERMIT DRAWING
SHEET 12 OF 23

1050
1040
1030
1020
1010
1000
990
980
970
960
950
940
930
920

SITE 1

INV IN 969.0

60" CSP
SLOPE = 5.6%

JB W/SLAB IJD
TOP = 942.4
INV IN = 935.6
INV OUT = 933.1

60" CSP
SLOPE = 0.5%

INV OUT = 933.0
BURY 1 FT

SYSTEMS

6/23/16



PROJ. REFERENCE NO.	SHEET NO.
U-2579C	50

300 200 100 0 100 200 300

387+72 -L-

PERMIT DRAWING
SHEET 13 OF 23

SITE 2

JB W/MH
TOP=947.0
INV=939.0

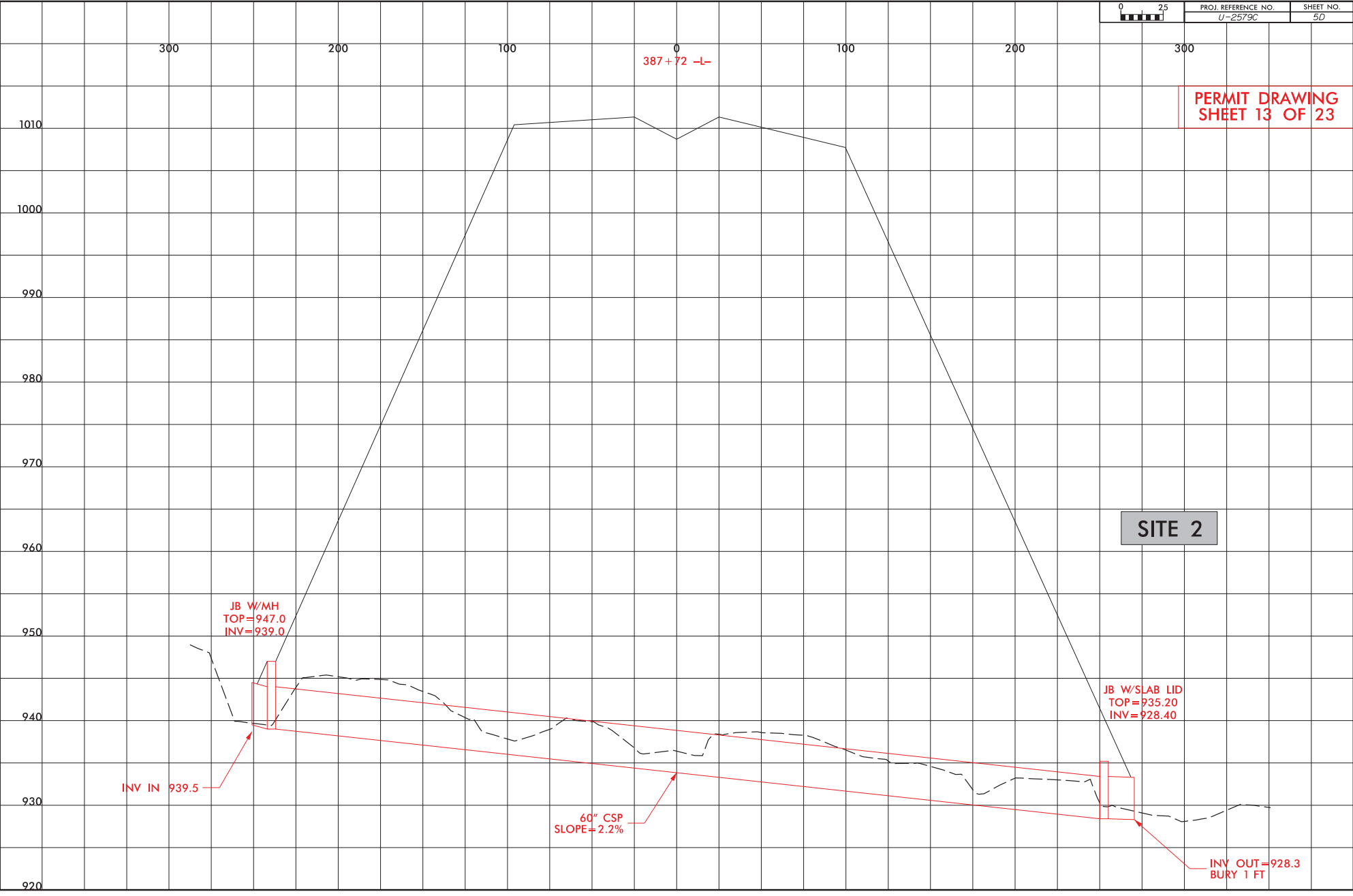
JB W/SLAB LID
TOP=935.20
INV=928.40

INV IN 939.5

60" CSP
SLOPE=2.2%

INV OUT=928.3
BURY 1 FT

*****SYSTEMS INFORMATION*****
*****PROJECT INFORMATION*****

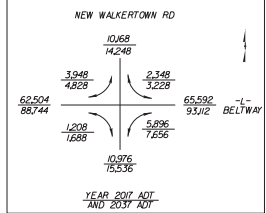
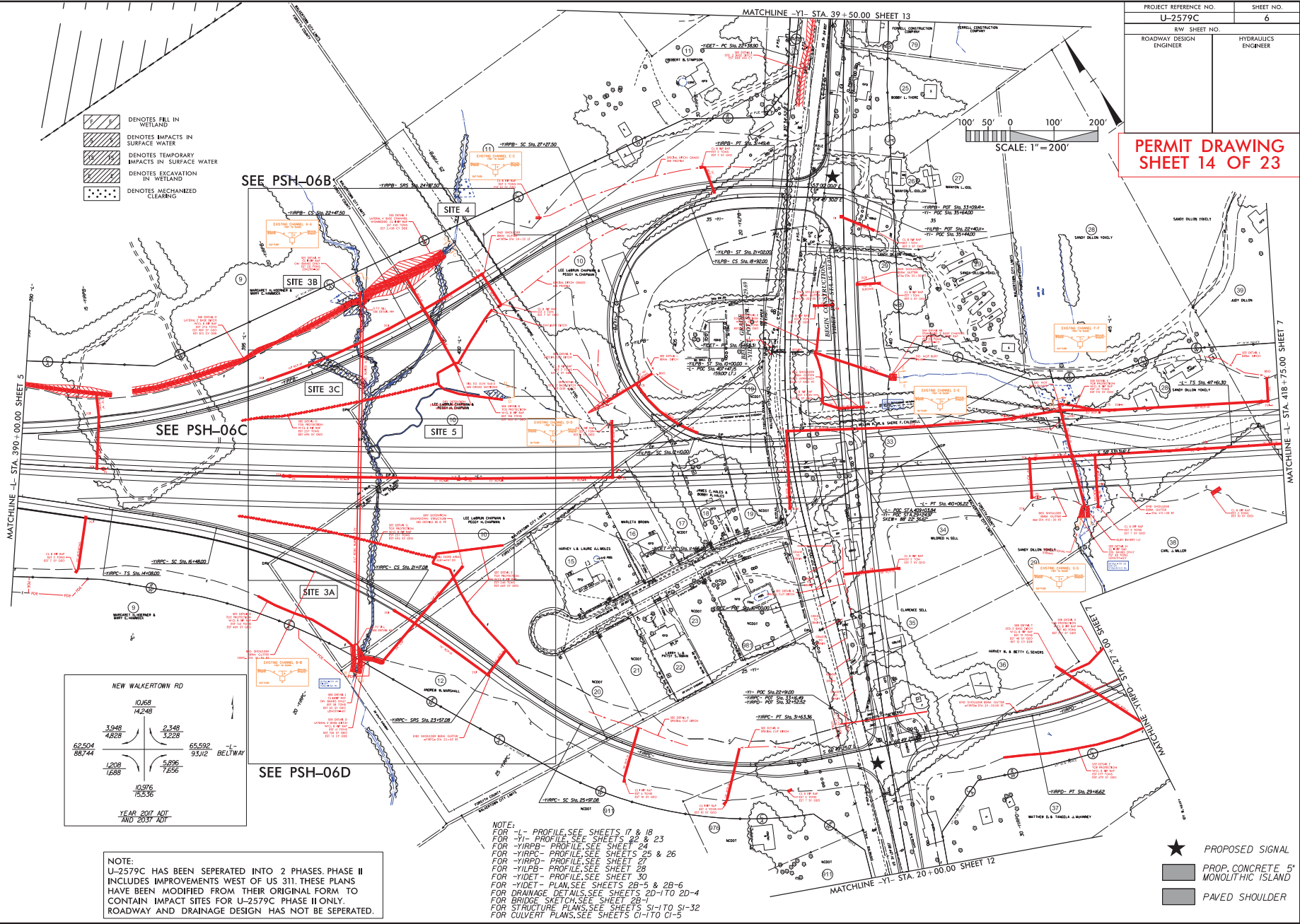
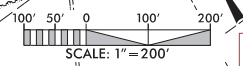


8/17/09

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING
SHEET 14 OF 23**

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



NOTE:
U-2579C HAS BEEN SEPERATED INTO 2 PHASES. PHASE II INCLUDES IMPROVEMENTS WEST OF US 311. THESE PLANS HAVE BEEN MODIFIED FROM THEIR ORIGINAL FORM TO CONTAIN IMPACT SITES FOR U-2579C. PHASE II ONLY. ROADWAY AND DRAINAGE DESIGN HAS NOT BE SEPERATED.

NOTE:
FOR -L- PROFILE, SEE SHEETS 17 & 18
FOR -Y1- PROFILE, SEE SHEETS 22 & 23
FOR -YIRB- PROFILE, SEE SHEET 24
FOR -YIRPD- PROFILE, SEE SHEET 27
FOR -YILPB- PROFILE, SEE SHEET 28
FOR -YIDET- PROFILE, SEE SHEET 30
FOR -YIDET- PLAN, SEE SHEETS 2B-5 & 2B-6
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 TO 2D-4
FOR BRIDGE SKETCH, SEE SHEET 2B-1
FOR STRUCTURE PLANS, SEE SHEETS S1-1 TO S1-32
FOR CULVERT PLANS, SEE SHEETS C1-1 TO C1-5

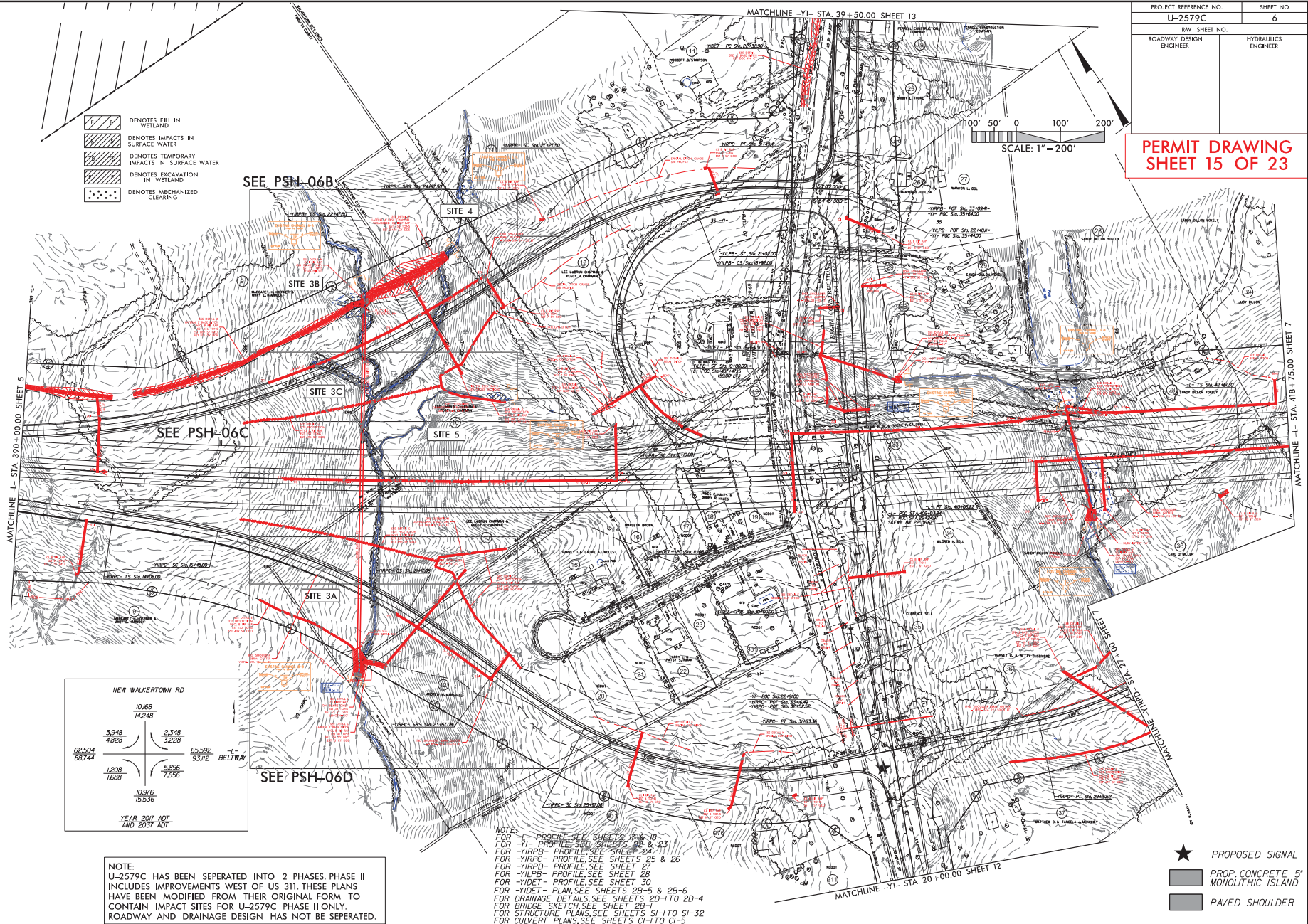
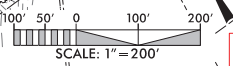
- PROPOSED SIGNAL
- PROP. CONCRETE 5' MONOLITHIC ISLAND
- PAVED SHOULDER

8/17/20

PROJECT REFERENCE NO. U-2579C	SHEET NO. 6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING
SHEET 15 OF 23**

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

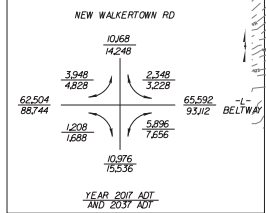


MATCHLINE -L- STA. 370+00.00 SHEET 5

MATCHLINE -YI- STA. 39+50.00 SHEET 13

MATCHLINE -L- STA. 418+75.00 SHEET 7

MATCHLINE -YI- STA. 20+00.00 SHEET 12



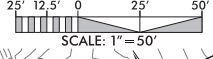
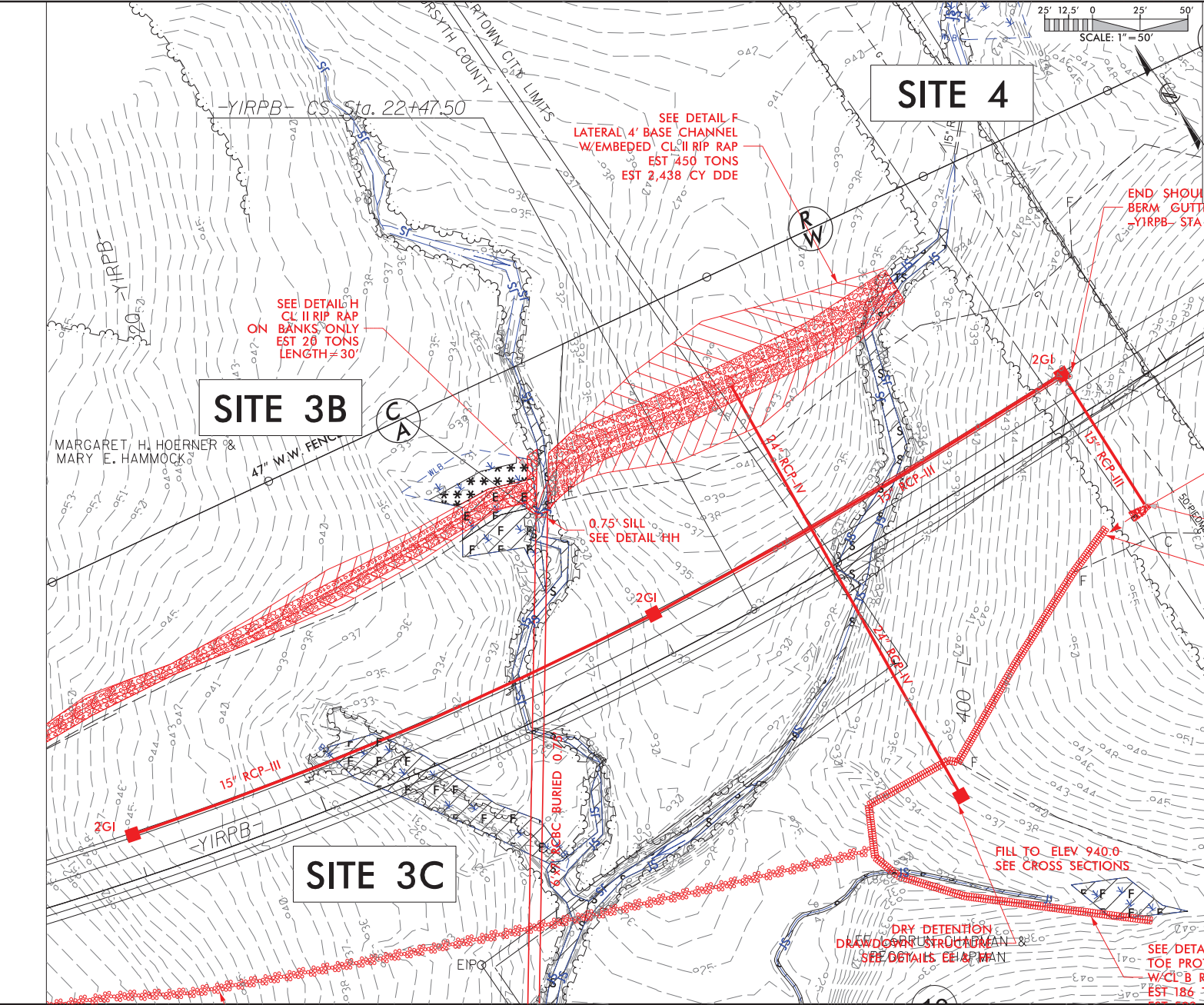
NOTE:
U-2579C HAS BEEN SEPERATED INTO 2 PHASES. PHASE II INCLUDES IMPROVEMENTS WEST OF US 311. THESE PLANS HAVE BEEN MODIFIED FROM THEIR ORIGINAL FORM TO CONTAIN IMPACT SITES FOR U-2579C PHASE II ONLY. ROADWAY AND DRAINAGE DESIGN HAS NOT BE SEPERATED.

- NOTE:**
- FOR -L- PROFILE SEE SHEETS 10 & 18
 - FOR -YI- PROFILE SEE SHEETS 2 & 23
 - FOR -YIRPB- PROFILE SEE SHEETS 24 & 11
 - FOR -YIRPD- PROFILE SEE SHEETS 25 & 26
 - FOR -YIRPB- PROFILE SEE SHEET 27
 - FOR -YIRPB- PROFILE SEE SHEET 28
 - FOR -YIDET- PROFILE SEE SHEET 30
 - FOR -YIDET- PLAN SEE SHEETS 28-5 & 28-6
 - FOR DRAINAGE DETAILS SEE SHEETS 20-1 TO 20-4
 - FOR BRIDGE SKETCH SEE SHEET 22-1
 - FOR STRUCTURE PLANS SEE SHEETS S1-1 TO S1-32
 - FOR CULVERT PLANS SEE SHEETS C1-1 TO C1-5

- PROPOSED SIGNAL
- PROP. CONCRETE 5' MONOLITHIC ISLAND
- PAVED SHOULDER

8/17/09

REVISIONS



PROJECT REFERENCE NO. R-2579C	SHEET NO. 6B
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

INCOMPLETE PLANS
DO NOT USE FOR PERMIT ACCEPTANCE

PERMIT DRAWING
SHEET 16 OF 23

SITE 4

SITE 3B

SITE 3C

SEE DETAIL F
LATERAL 4' BASE CHANNEL
W/EMBEDDED CL II RIP RAP
EST 450 TONS
EST 2,438 CY DDE

SEE DETAIL H
ON CL II RIP RAP BANKS ONLY
EST 28 TONS
LENGTH=30'

END SHOULDER
BERM GUTTER
-YIRPB- STA 24+55' LT

0.75' SILL
SEE DETAIL HH

FILL TO ELEV 940.0
SEE CROSS SECTIONS

DRY DETENTION
POND CONSTRUCTION
SEE DETAILS CHAPMAN

SEE DETAIL E
TOE PROTECTION
W/CL B RIP RAP
EST 186 TONS

CL B RIP RAP
EST 2 TONS
EST 7 SY GE

DAYLIGHT

SPECIAL

EST

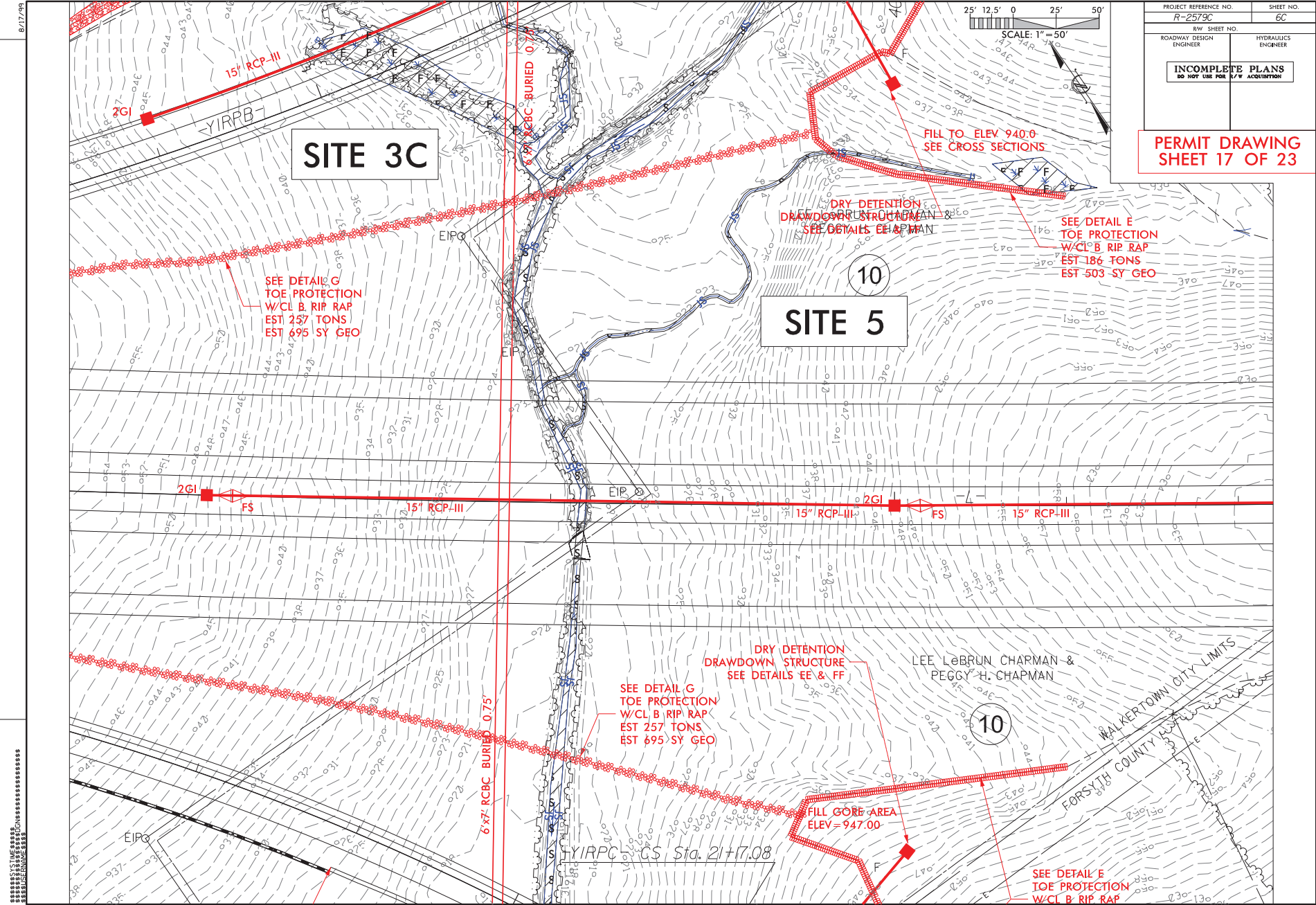
STD

EST

EST

8/17/09

REVISIONS



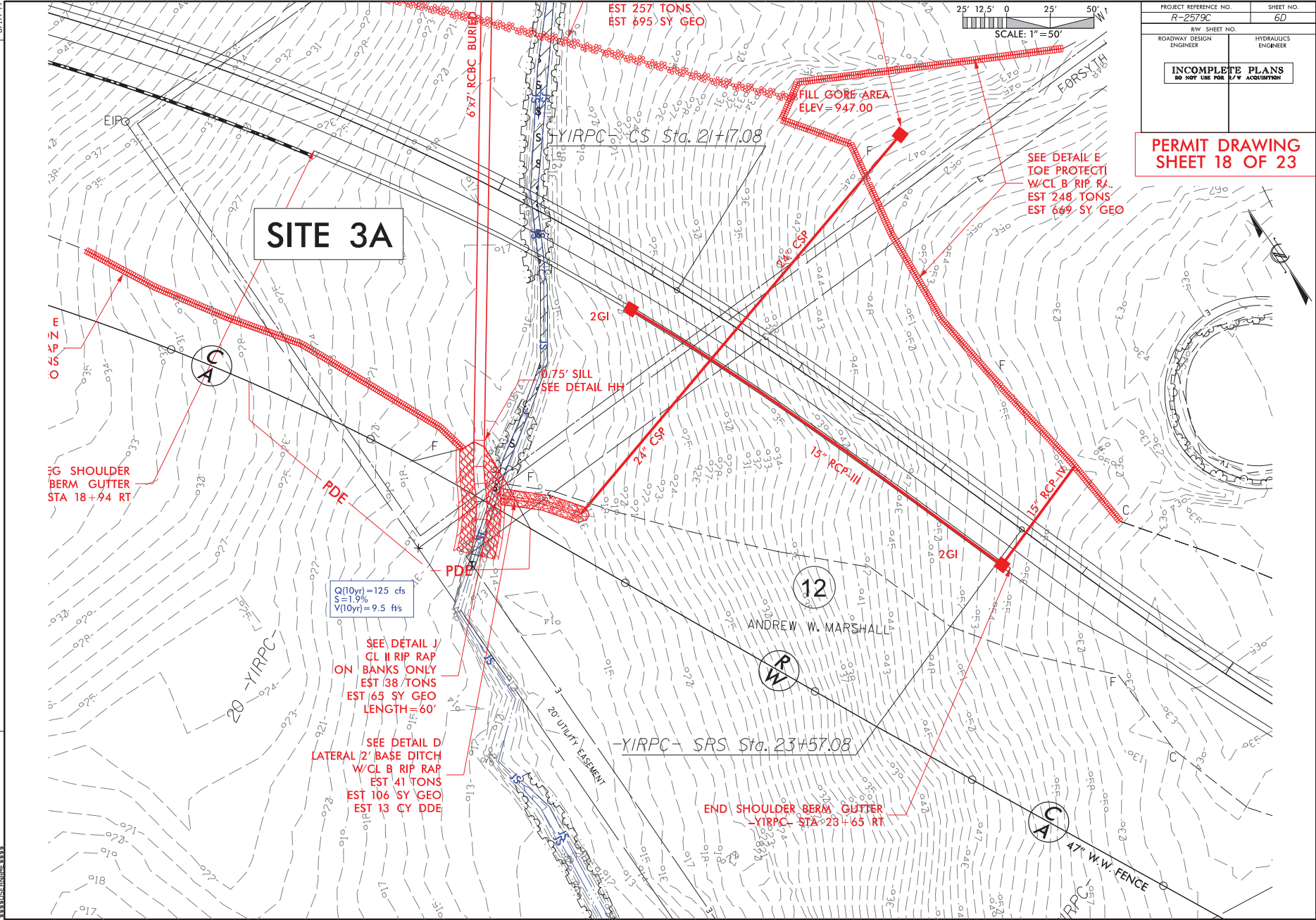
PROJECT REFERENCE NO. R-2579C	SHEET NO. 6C
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

INCOMPLETE PLANS
DO NOT USE FOR ANY ACCELERATION

PERMIT DRAWING
SHEET 17 OF 23

8/17/09

REVISIONS



SITE 3A

EST 257 TONS
EST 695 SY GEO

FILL GORF AREA
ELEV=947.00

SEE DETAIL E
TOE PROTECTI
W/CL B RIP RA..
EST 248 TONS
EST 669 SY GEO

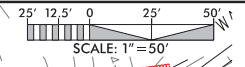
5G SHOULDER
BERM GUTTER
STA 18+94 RT

Q(10yr)=125 cfs
S=1.9%
V(10yr)=9.5 f/s

SEE DETAIL J
CL II RIP RAP
ON BANKS ONLY
EST 38 TONS
EST 65 SY GEO
LENGTH=60'

SEE DETAIL D
LATERAL 2" BASE DITCH
W/CL B RIP RAP
EST 41 TONS
EST 106 SY GEO
EST 13 CY DDE

END SHOULDER BERM GUTTER
YIRPC STA 23+65 RT



PROJECT REFERENCE NO. R-2579C	SHEET NO. 6D
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS <small>DO NOT USE FOR R/W ACQUISITION</small>	

**PERMIT DRAWING
SHEET 18 OF 23**



12

ANDREW W. MARSHALL

R
W

A
C

47' W.W. FENCE

YIRPC CS Sta. 21+7.08

YIRPC SRS Sta. 23+57.08

6x7' RCBC BURIED

2GI

0.75' SILL
SEE DETAIL HH

24' CSP

13' RCP-III

15' RCP-IV

2GI

PDE

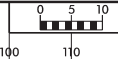
PDE

20' YIRPC

20' UTILITY EASEMENT

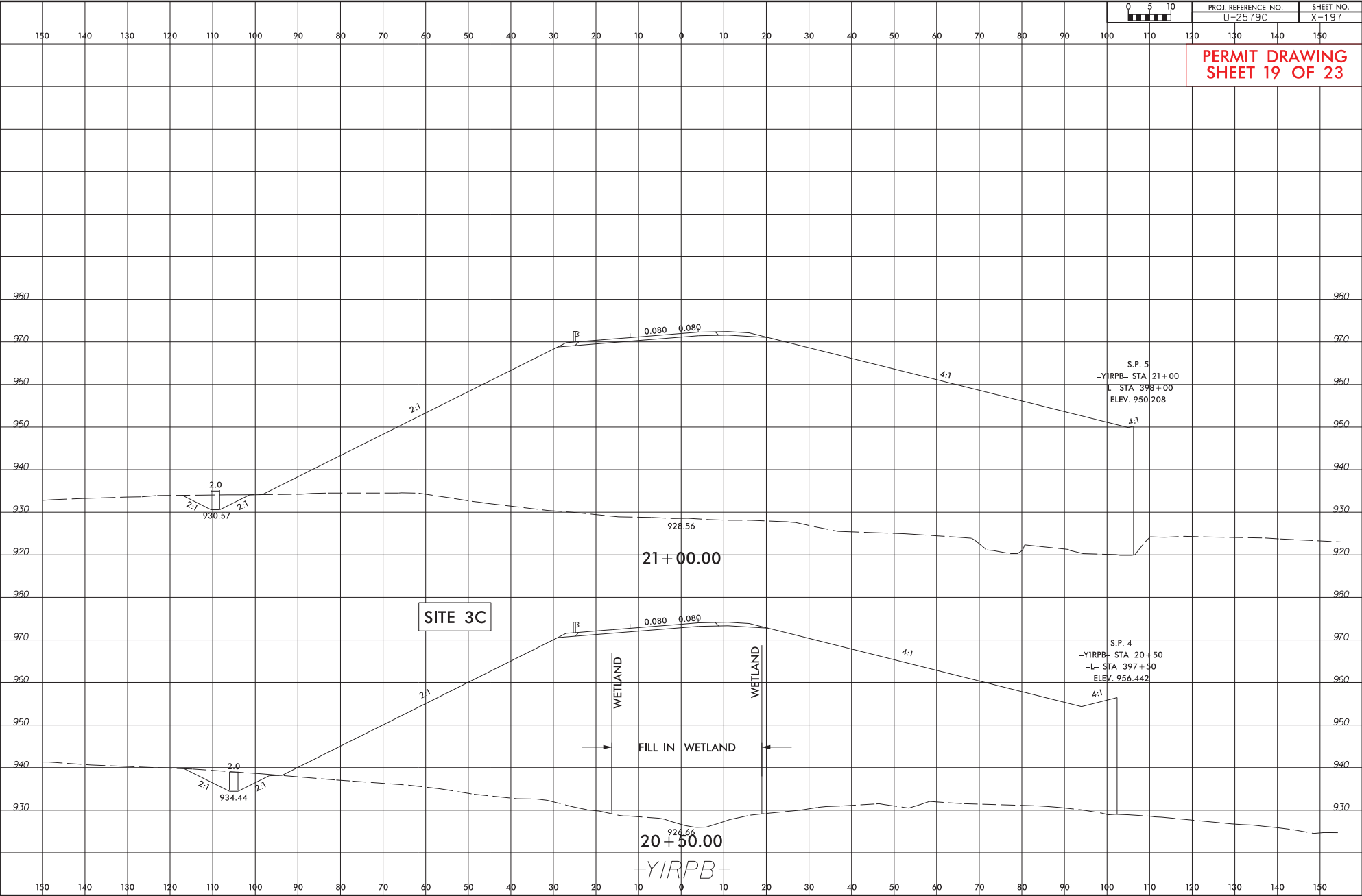
YIRPC

6/23/16



PROJ. REFERENCE NO. U-2579C	SHEET NO. X-197
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**PERMIT DRAWING
SHEET 19 OF 23**



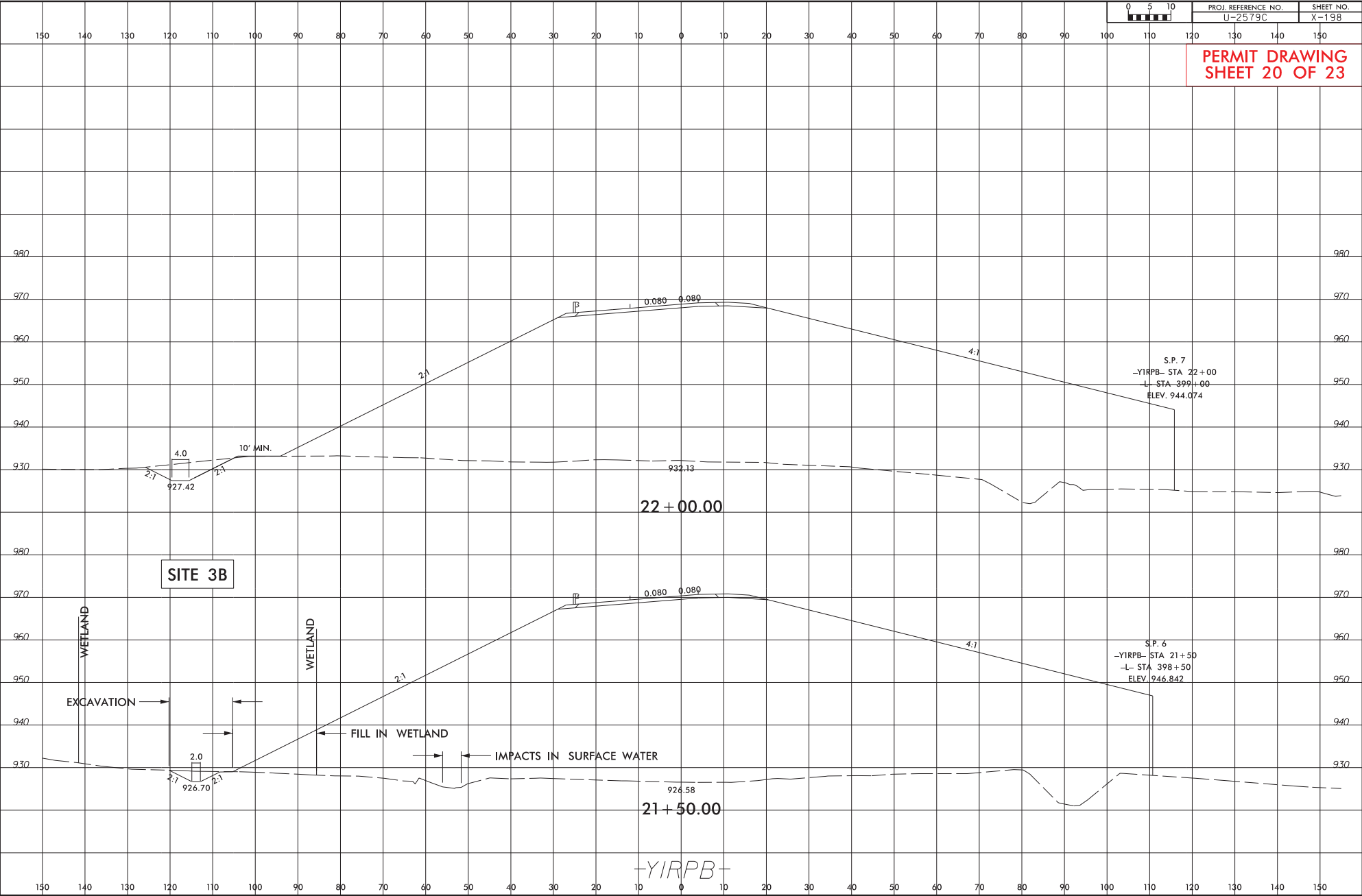
*****SYSTEMS ENGINEERING*****
*****DESIGN*****
*****CONSTRUCTION*****

6/23/16



PROJ. REFERENCE NO. U-2579C	SHEET NO. X-198
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**PERMIT DRAWING
SHEET 20 OF 23**



SITE 3B

22 + 00.00

21 + 50.00

-YIRPB-

S.P. 7
-YIRPB- STA 399+00
ELEV. 944.074

S.P. 6
-YIRPB- STA 398+50
ELEV. 946.842

EXCAVATION

WETLAND

WETLAND

FILL IN WETLAND

IMPACTS IN SURFACE WATER

4.0
927.42
2:1
10' MIN.
2:1

2.0
926.70
2:1
2:1

0.080 0.080

0.080 0.080

2:1

4:1

2:1

4:1

932.13

926.58

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

980 970 960 950 940 930 980 970 960 950 940 930

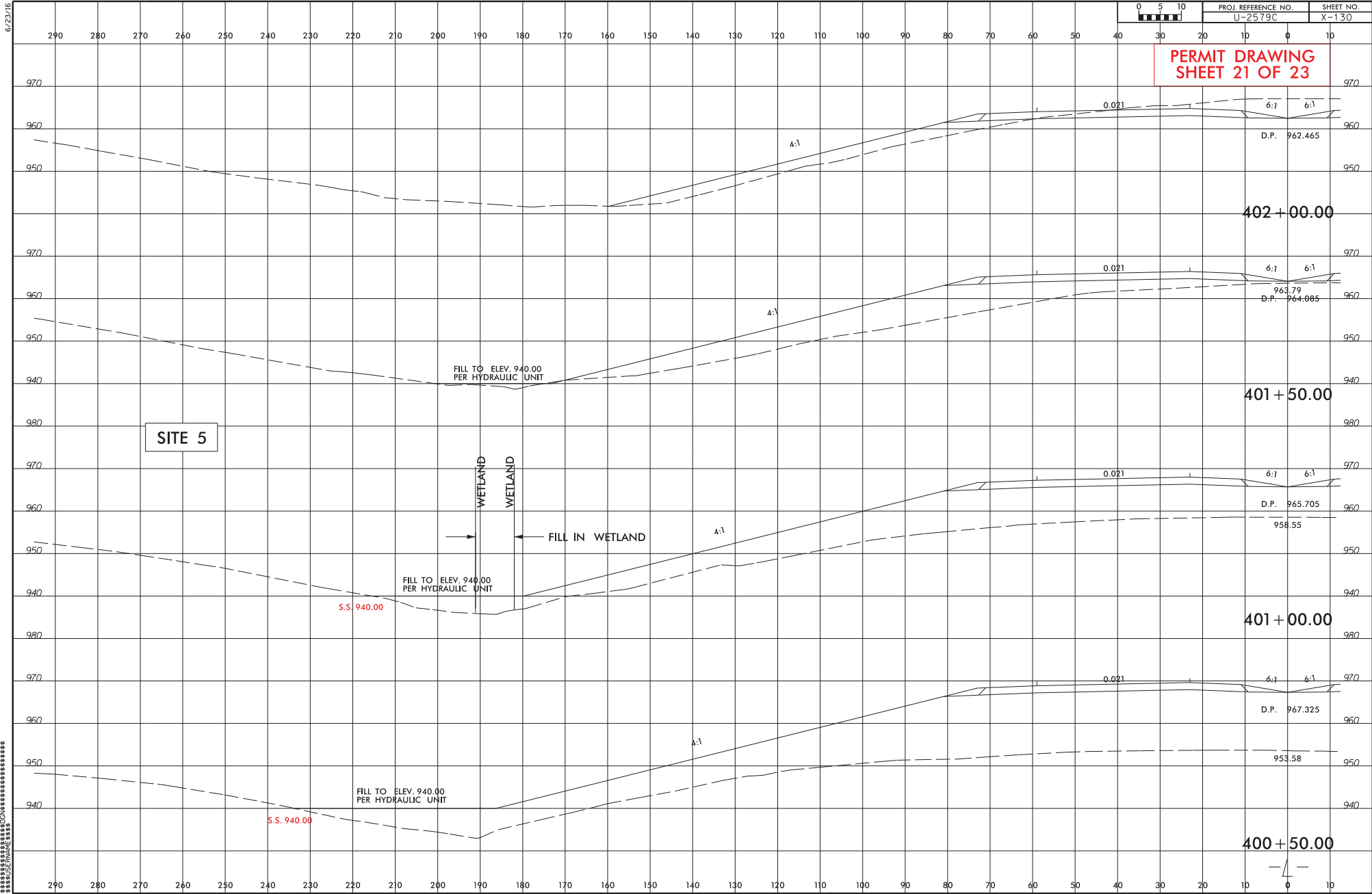
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

*****SYSTEMS ENGINEERING*****
*****SURVEYING*****

6/23/16

0 5 10	PROJ. REFERENCE NO. U-2579C	SHEET NO. X-130
--------	--------------------------------	--------------------

PERMIT DRAWING
SHEET 21 OF 23



SITE 5

FILL TO ELEV. 940.00
PER HYDRAULIC UNIT

WETLAND
WETLAND

FILL IN WETLAND

S.S. 940.00

FILL TO ELEV. 940.00
PER HYDRAULIC UNIT

S.S. 940.00

FILL TO ELEV. 940.00
PER HYDRAULIC UNIT

SYSTEMS

6/23/16

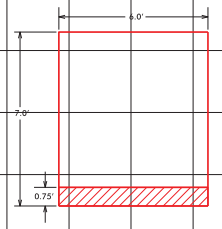


PROJ. REFERENCE NO. U-2579C	SHEET NO. 6H
PERMIT DRAWING SHEET 22 OF 23	

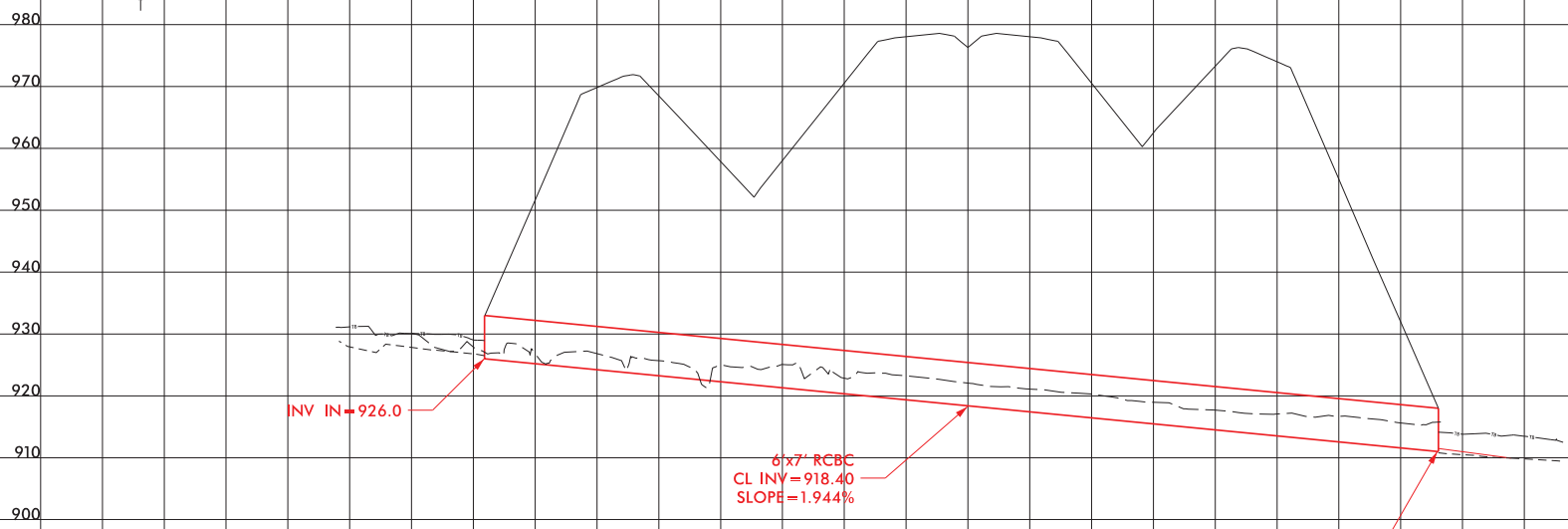
500 400 300 200 100 0 100 200 300 400 500

6'x7' RCBC
STA 397+73 -L-

Culvert Detail



SITE 3



INV IN=926.0

6'x7' RCBC
CL INV=918.40
SLOPE=1.944%

INV CUT=911.0

SYSTEMS

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	374+59-384+06 -L- RT	ROADWAY FILL	0.57					0.07	< 0.01	1148	31	
		BANK STABILIZATION (Downstream)						< 0.01		40		
2	386+73-388+95 -L-	60" CSP						0.03	< 0.01	552	35	
		BANK STABILIZATION						< 0.01		45		
3A	396+56-398+20 -L-	6'x7' RCBC						0.09	< 0.01	914	55	
		BANK STABILIZATION (Upstream)						< 0.01		33		
3B	21+17-21+80 -Y1RPB- LT	ROADWAY FILL	0.02		0.01	0.01						
3C	20+10-21+05 -Y1RPB-	ROADWAY FILL	0.06									
4	21+05-24+11 -Y1RPB-	ROADWAY FILL						0.05	< 0.01	405	40	
5	398+07-401+19 -L- LT	ROADWAY FILL	0.02					0.02		390		
TOTALS*:			0.66		0.01	0.01		0.26	0.02	3527	161	0

*Rounded totals are sum of actual impacts

NOTES:

- Site 1: Perm Fill = 0.5674 ac
- Site 2: Upstream Bank Stabilization = 0.001 AC / 20 LF, Downstream Bank Stabilization = 0.002 AC / 25 LF
- Site 3B: Perm Fill = 0.0169 ac / Excav. = 0.0147 ac / Mech. Clearing = 0.0118 ac
- Site 3C: Perm Fill = 0.0582 ac
- Site 5: Perm Fill = 0.0150 ac

NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 September 27, 2017
 FORSYTH
 U-2579C Phase II
 34839.3.6
 SHEET 23 OF 23



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR NCDOT PROJECTS



(Version 2.07; Released October 2016)

WBS Element: 34409.3.23 TIP No.: R-2247CD County(ies): Forsyth Page 1 of 4

General Project Information

WBS Element:	34409.3.23	TIP Number:	R-2247CD	Project Type:	Roadway Widening	Date:	9/25/2017
NCDOT Contact:	Michael J. Shumsky, PE		Contractor / Designer:	Randal C. Howard, PE			
Address:	NCDOT Design Build Unit 1595 Mail Service Center Raleigh, NC 27699-1595		Address:	Sungate Design Group, PA 905 Jones Franklin Road Raleigh, NC 27606			
	Phone:	(919) 707-6627		Phone:	(919) 859-2243		
	Email:	mshumsky@ncdot.gov		Email:	rhoward@sungatedesign.com		
City/Town:	Winston-Salem		County(ies):	Forsyth			
River Basin(s):	Yadkin-Pee Dee		CAMA County?	No			
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	.867 miles	Surrounding Land Use:	Medium density residential				
	Proposed Project			Existing Site			
Project Built-Upon Area (ac.)	23.6	ac.	15.9	ac.			
Typical Cross Section Description:	Y17 (US 421): Three (3) 12' travel lanes each direction, concrete barrier rail median with 18' paved median shoulders, and 12' paved outside shoulders with grass roadway ditches, both sides.			Y17 (US 421): Two 12' travel lanes with paved shoulders, grass median, and grass roadway ditches, both sides.			

Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	77,735	Year:	2036	Existing:	57,065	Year:	2016
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General Project Narrative:
(Description of Minimization of Water Quality Impacts)

The R-2247CD project involves US 421 and Peace Haven Road Interchange improvements for future Winston-Salem Northern Beltway along with other improvements to adjacent roadways including realignments. Grass swales have been incorporated in roadside ditches, where possible, to reduce velocities and promote infiltration of runoff. A dry detention basin is proposed to treat runoff and attenuate peak flows for portions on the roadway runoff. Riprap at pipe outlets, ditches, and streambanks has been incorporated to minimize erosion on slopes where vegetation will not be adequate. Storm drainage discharging directly to wetlands has been design to meet non-erosive velocity requirements. Bridge deck drainage for the Kester Mill Road bridge will be collected and discharged outside the limits of the surface-water. NCDOT standards for ground cover, vegetation, and slope stabilization will be adhered to during the life of this project, as spcified in the approved NCDOT Erosion and Sediment Control Plan for the project.

Waterbody Information

Surface Water Body (1):	Muddy Creek		NCDWR Stream Index No.:	12-94-(0.5)				
NCDWR Surface Water Classification for Water Body	Primary Classification:	Class C						
	Supplemental Classification:	None						
Other Stream Classification:	None							
Impairments:	None							
Aquatic T&E Species?	No	Comments:						
NRTR Stream ID:							Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	No	Dissipator Pads Provided in Buffer?				N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)			(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)			
(If yes, provide justification in the General Project Narrative)								



North Carolina Department of Transportation
 Highway Stormwater Program
 STORMWATER MANAGEMENT PLAN
 FOR NCDOT PROJECTS



(Version 2.07; Released October 2016)

WBS Element: 34409.3.23 TIP No.: R-2247CD County(ies): Forsyth Page 2 of 4

Additional Waterbody Information

Surface Water Body (2):	Silas Creek		NCDWR Stream Index No.:	12-94-10	
NCDWR Surface Water Classification for Water Body	Primary Classification:	Class C			
	Supplemental Classification:	None			
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:				Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	Yes	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
	(If yes, provide justification in the General Project Narrative)				



North Carolina Department of Transportation
 Highway Stormwater Program
 STORMWATER MANAGEMENT PLAN
 FOR NCDOT PROJECTS



(Version 2.07; Released October 2016)

WBS Element: 34409.3.23

TIP No.: R-2247CD

County(ies): Forsyth

Page 4 of 4

Other Best Management Practices

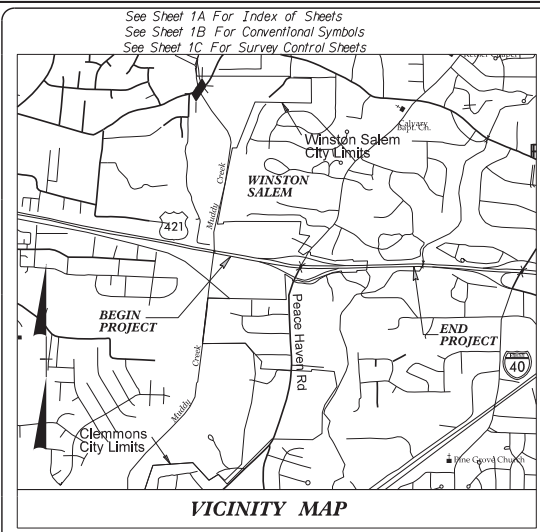
Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	BMP Type	Drainage Area (ac)	New Built-Up Area (ac)	Volume Treated (ac-ft)	Precipitation Depth Treated over NBUA (in)	BMP Associated w/ Buffer Rules?
6	Y17 50+00 RT	Silas Creek	Dry Detention Basin	15.1	6.4	0.32	0.63	No

Additional Comments

07/08/14

TIP PROJECT: R-2247CD

CONTRACT: C203840



60% ROADWAY PLANS

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

FORSYTH COUNTY

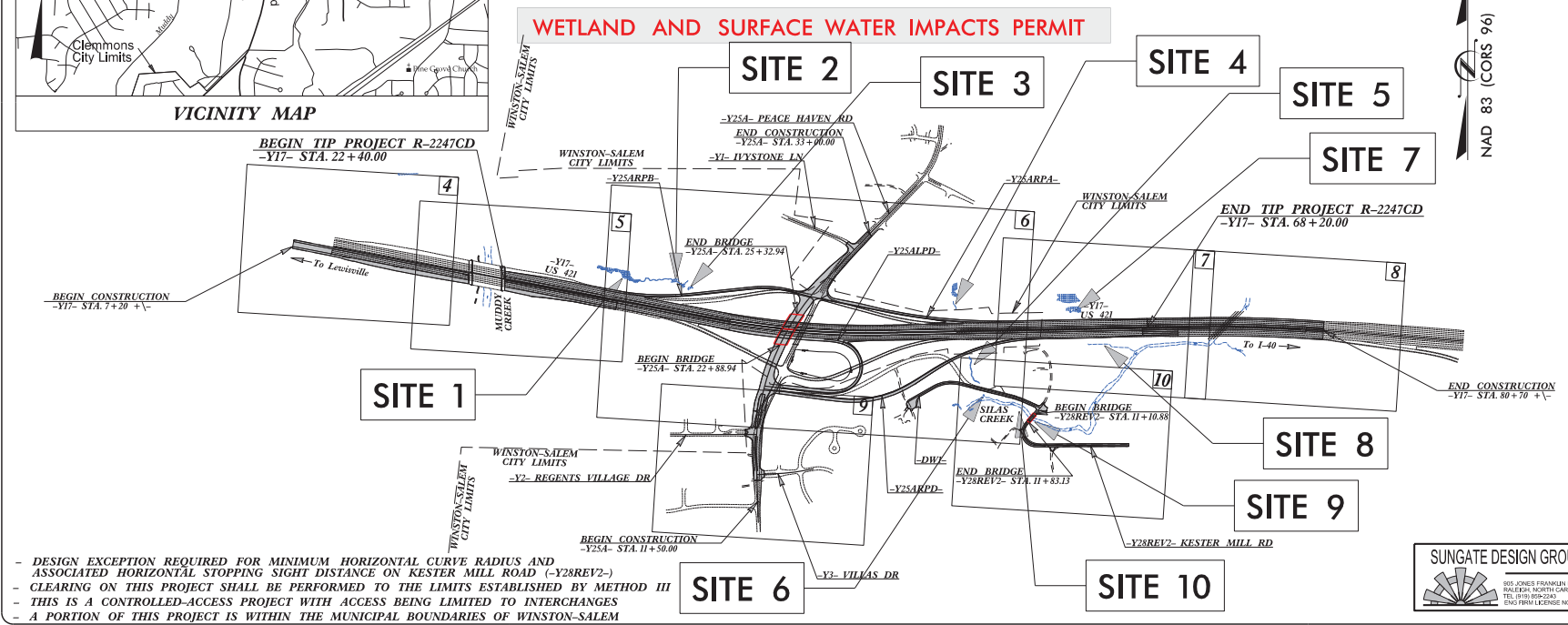
LOCATION: WINSTON-SALEM NORTHERN BELTWAY - MODIFICATION OF THE US 421/SR 1891 (PEACE HAVEN ROAD) INTERCHANGE

TYPE OF WORK: GRADING, DRAINAGE, PAVING, GUARDRAIL, STRUCTURES, SIGNING, SIGNALS, NOISE WALLS AND RETAINING WALL

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2247CD	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION:	
34409.3.23	NHP-0421(088)	P.E.	
34409.3.23	NHP-0421(088)	RW & UTIL.	
34409.3.23	NHP-0421(088)	CONST.	

**PERMIT DRAWING
SHEET 1 OF 23**

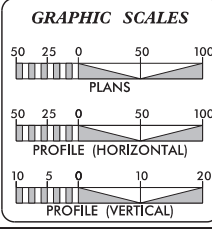
WETLAND AND SURFACE WATER IMPACTS PERMIT



- DESIGN EXCEPTION REQUIRED FOR MINIMUM HORIZONTAL CURVE RADIUS AND ASSOCIATED HORIZONTAL STOPPING SIGHT DISTANCE ON KESTER MILL ROAD (-Y28REV2-)
- CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III
- THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES
- A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF WINSTON-SALEM

SUNGATE DESIGN GROUP, P.A.

801 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL: 919/983-0400
ENG. FIRM LICENSE NO. C-890



DESIGN DATA

ADT 2016 =	57,065
ADT 2036 =	77,735
DHV =	10 %
D =	65 %
T =	7 % *
V =	70 MPH
* (TTST = 4% + DUAL 3%)	
FUNC CLASS =	FREEWAY

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2247CD	=	.867 MI.
TOTAL LENGTH TIP PROJECT R-2247CD	=	.867 MI.

Prepared in the Office of: KCI Associates of N.C., P.A. 1505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-0214 Fax (919) 783-0208	Plans Prepared For: DIVISION OF HIGHWAYS 1000 Birch Ridge Dr. Raleigh NC, 27610
2012 STANDARD SPECIFICATIONS RIGHT OF WAY DATE: NOVEMBER 15, 2016	CHARLES L. FLOWE, P.E. PROJECT ENGINEER
LETTING DATE: NOVEMBER 15, 2016	BARRY C. SMITH, P.E. PROJECT DESIGN ENGINEER
NCDOT CONTACT:	K. ZAK HAMIDI, PE PROJECT ENGINEER - DESIGN BUILD UNIT

HYDRAULICS ENGINEER

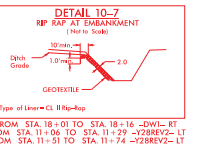
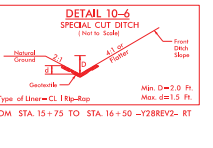
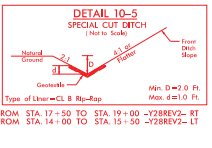
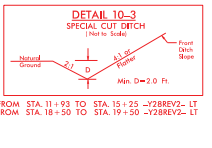
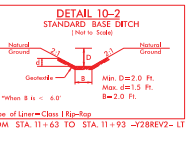
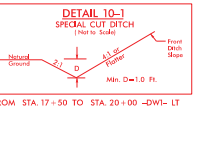
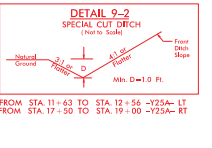
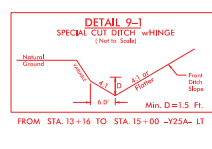
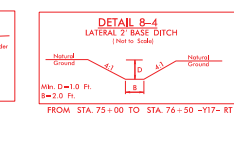
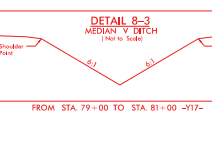
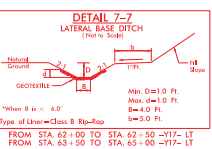
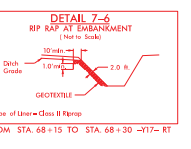
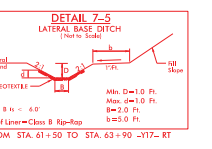
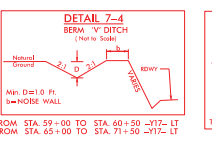
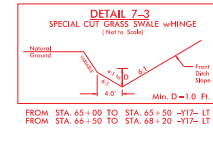
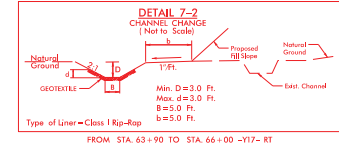
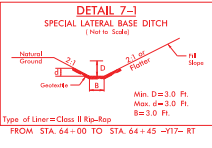
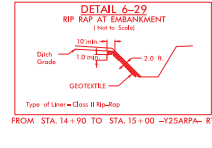
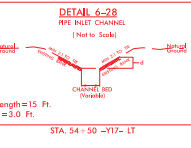
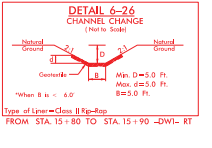
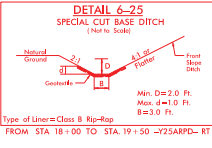
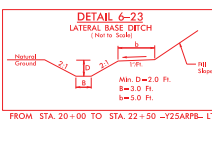
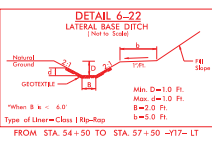
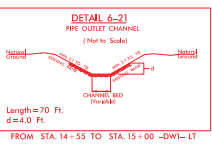
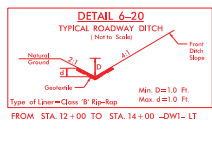
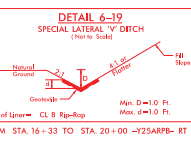
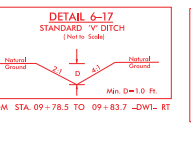
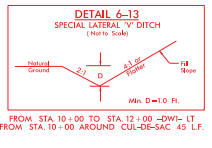
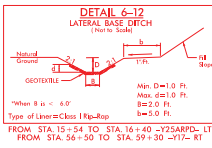
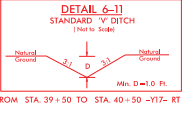
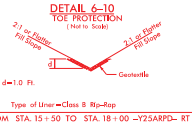
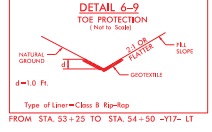
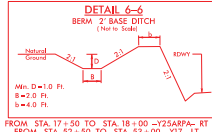
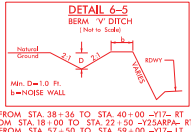
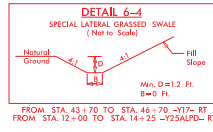
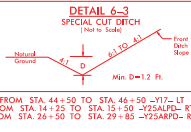
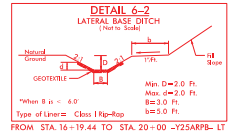
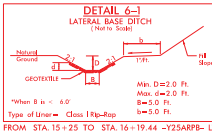
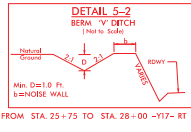
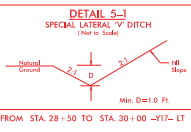
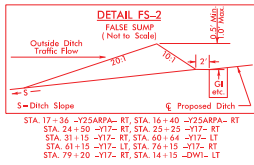
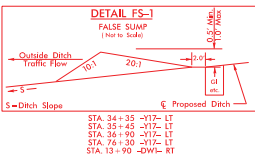
SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



9/16/2017 R2247CD_Hyd.prm_wet_01.dgn



Vertical text on the left margin, likely a scale or legend.

6/2/04

PROJECT REFERENCE NO. R-2247CD	SHEET NO. 20-3
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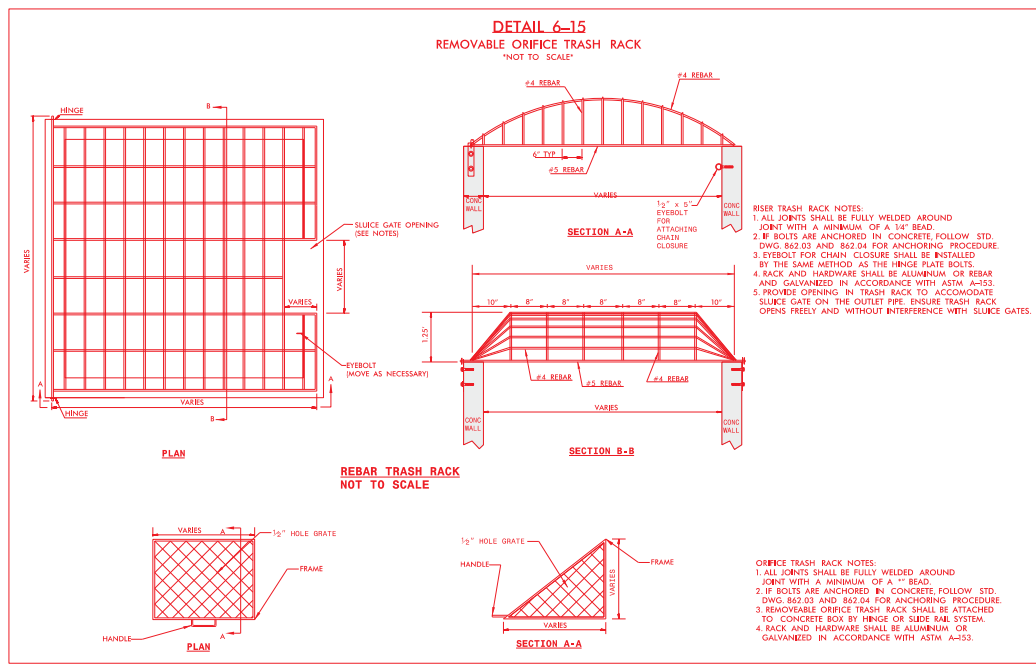
HYDRAULICS
ENGINEER

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

SUNGATE DESIGN GROUP, P.A.

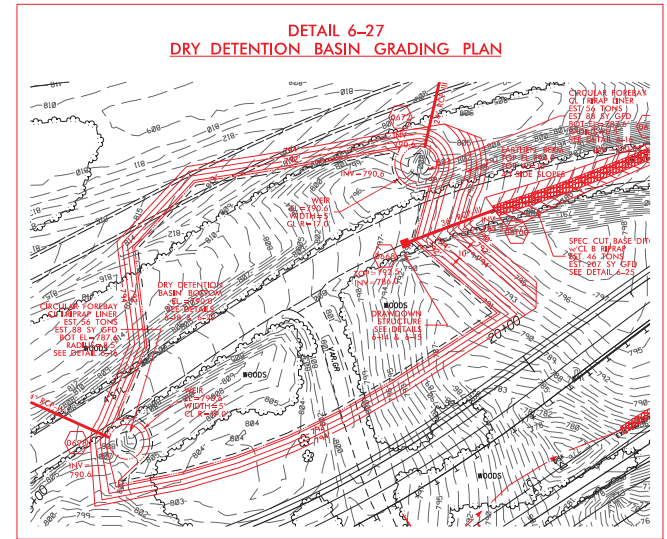
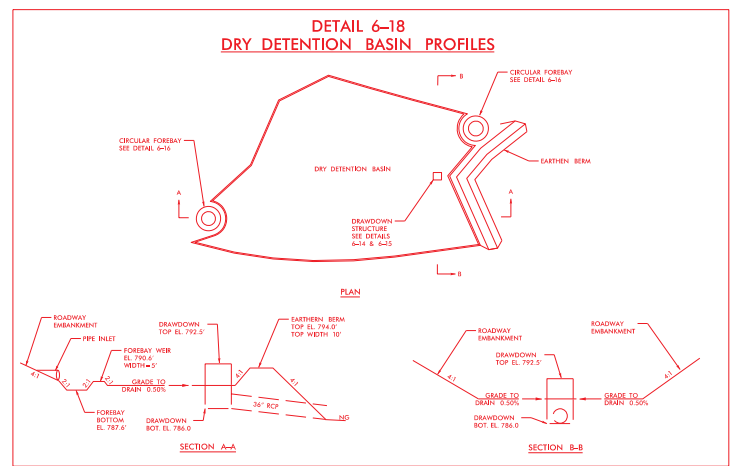
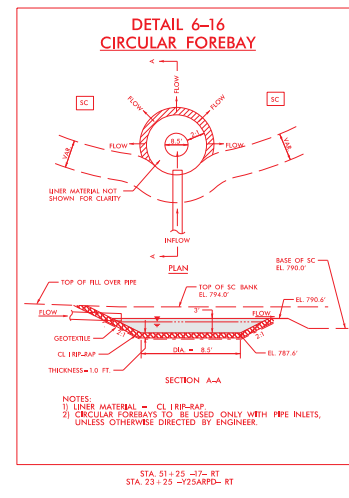
REG. ENGINEER/PA/00000000
REG. CIVIL ENGINEER/00000000
REG. PROFESSIONAL LANDSCAPE ARCHITECT/00000000
REG. PROFESSIONAL SURVEYOR/00000000

**PERMIT DRAWING
SHEET 4 OF 23**

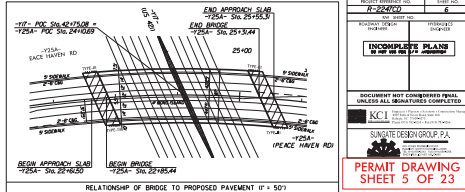


RISER TRASH RACK NOTES:

1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR RIBBON AND GALVANIZED IN ACCORDANCE WITH ASTM A-53.
5. PROVIDE OPENING IN TRASH RACK TO ACCOMMODATE SLUICE GATE ON THE OUTLET PIPE. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATES.



R254201_Hyd.dwg, wt: 8/20/03.dgn



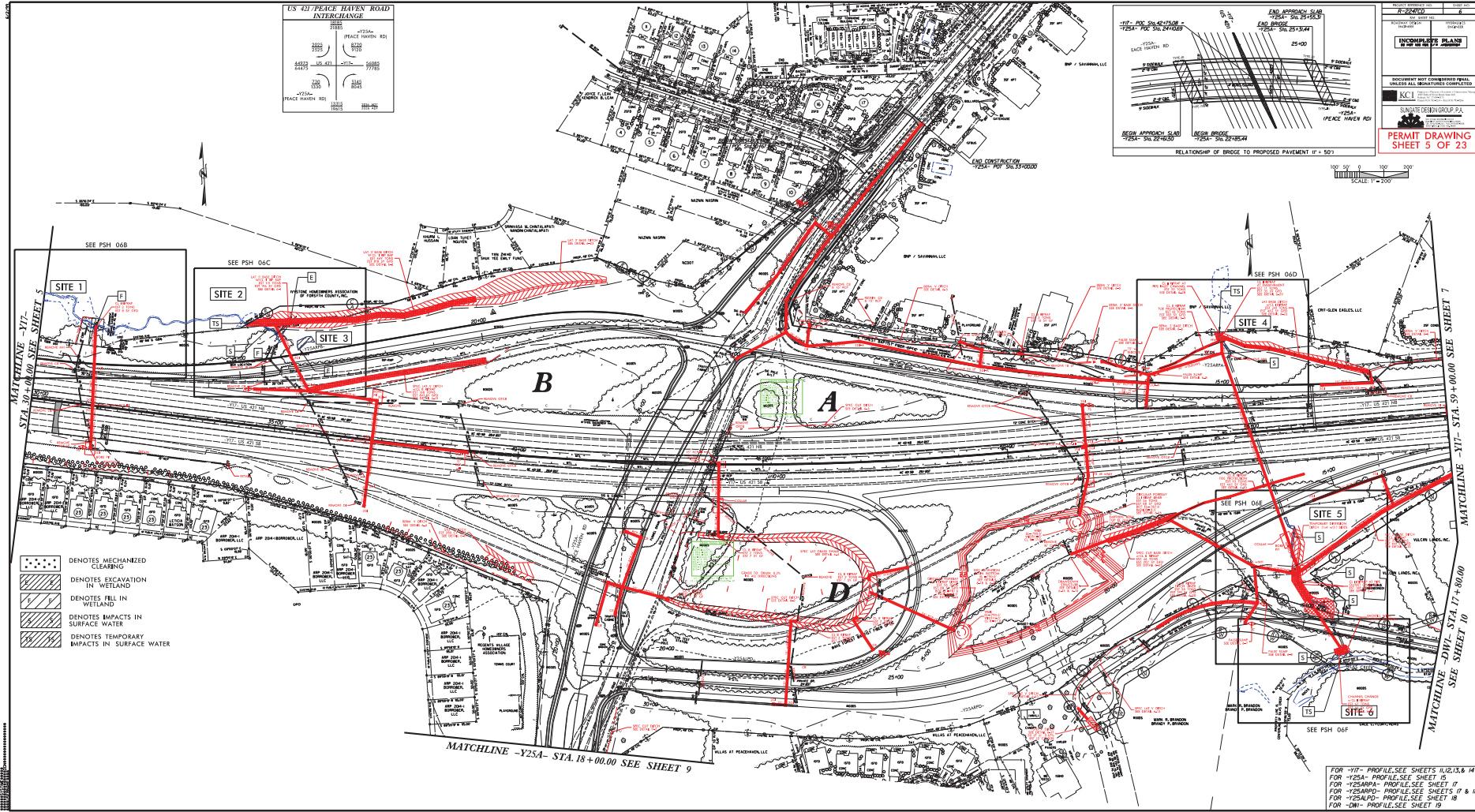
PERMIT DRAWING SHEET 5 OF 23

INCORPORATED PLAN

GOVERNMENT ENGINEERS SHALL UNLESS ALL REGULATIONS COMPLETED

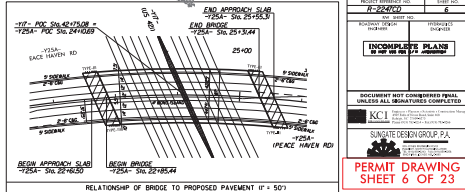
KCI

SUNSHINE DESIGN GROUP, P.A.



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

FOR -Y17- PROFILE, SEE SHEETS 11, 12, 13, & 14
 FOR -Y25A- PROFILE, SEE SHEET 15
 FOR -Y25A(B)- PROFILE, SEE SHEET 17
 FOR -Y25A(B)- PROFILE, SEE SHEETS 17 & 18
 FOR -Y25A(B)- PROFILE, SEE SHEET 18
 FOR -D17- PROFILE, SEE SHEET 19



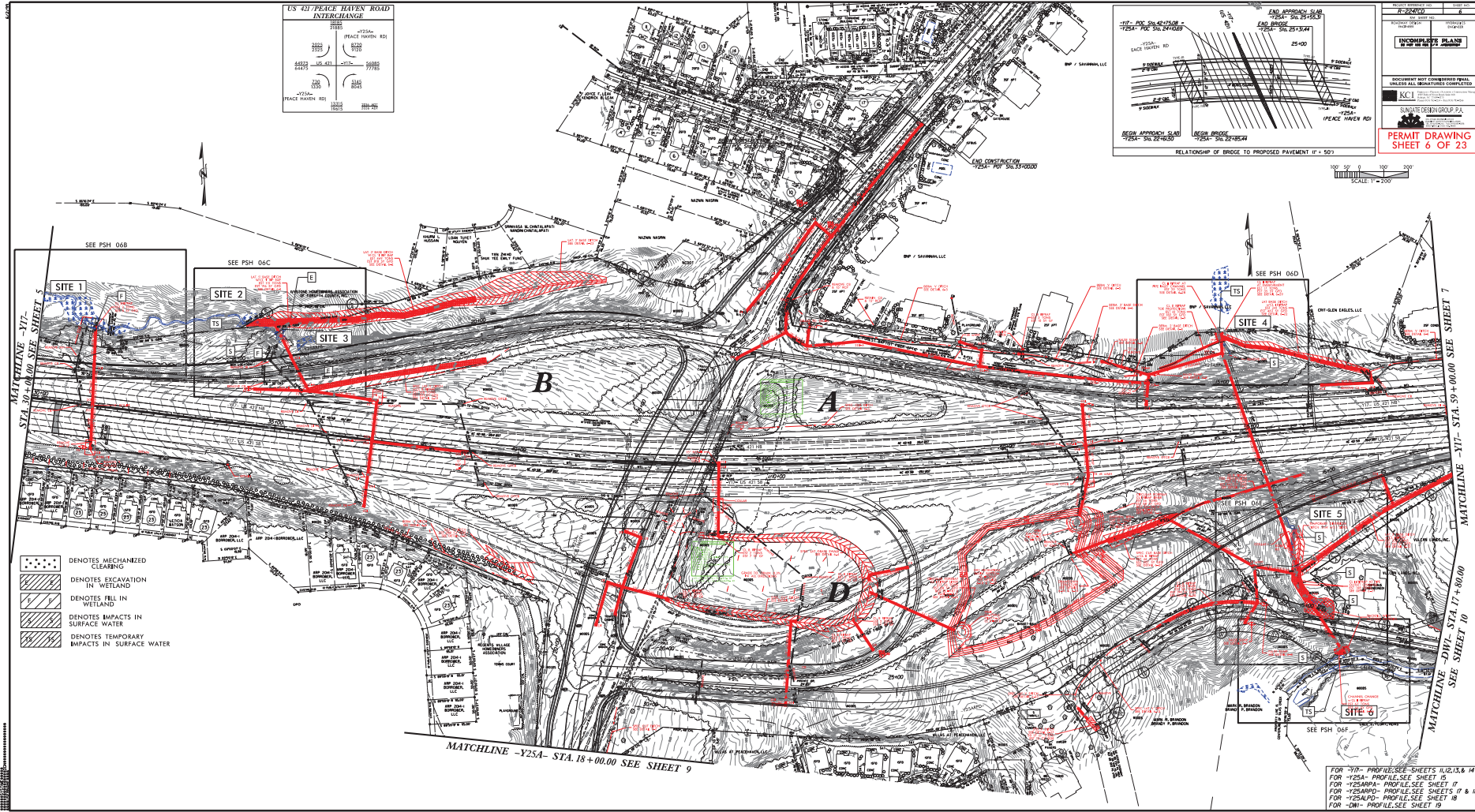
INCORPORATED BRAND

CONTRACT DOCUMENTS SHALL UNLESS ALL MODIFICATIONS COMPLETED

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SUNSHINE DESIGN GROUP, P.A.

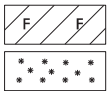
PERMIT DRAWING SHEET 6 OF 23



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

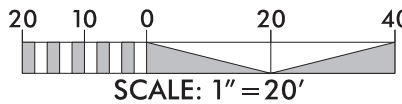
FOR "10" PROFILE SEE SHEETS 11, 12, 13 & 14
 FOR "12.5A" PROFILE SEE SHEET 15
 FOR "12.5A(B)" PROFILE SEE SHEET 17
 FOR "12.5A(BD)" PROFILE SEE SHEETS 17 & 18
 FOR "12.5A(P)" PROFILE SEE SHEET 18
 FOR "10" PROFILE SEE SHEET 19

8/17/99



DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

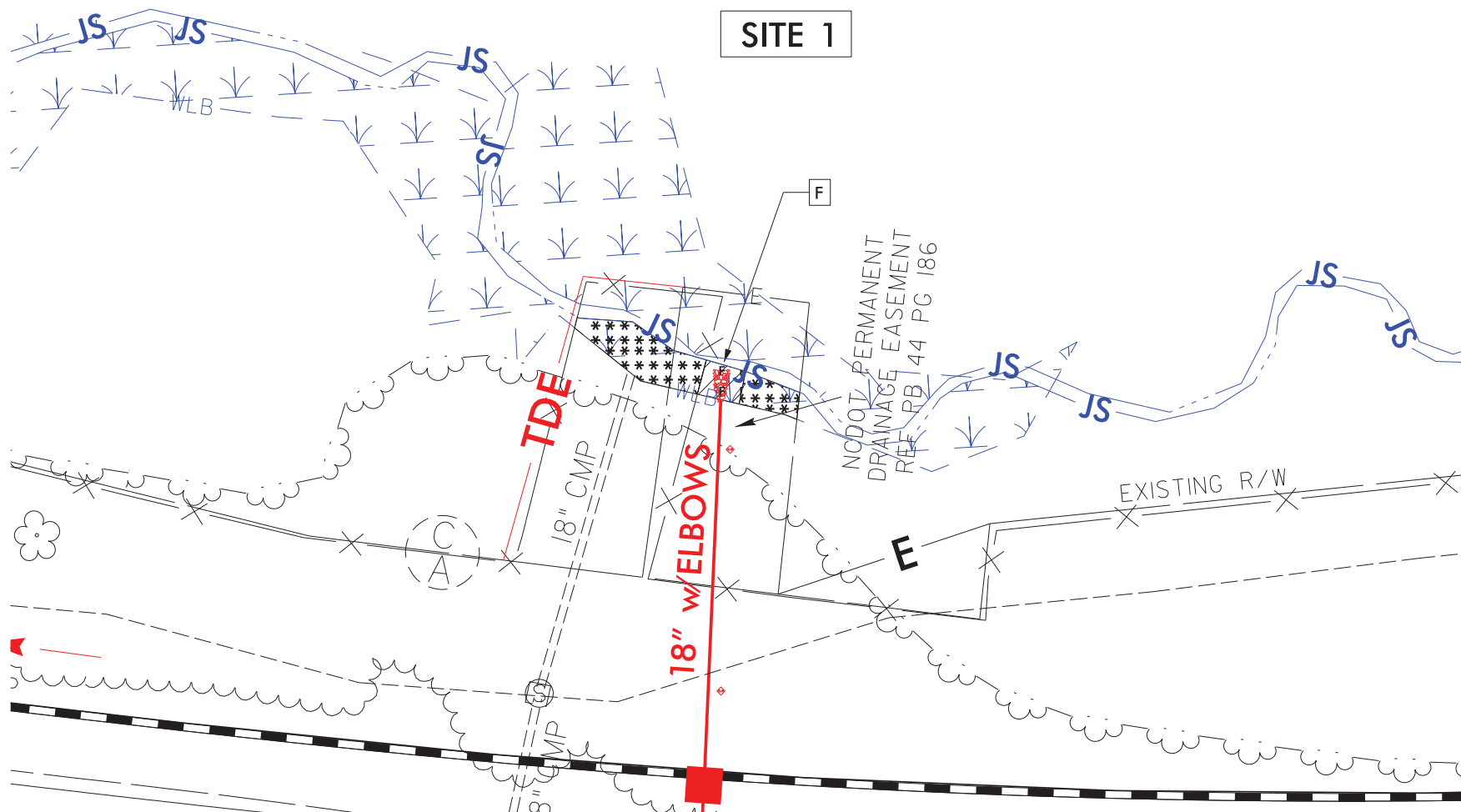


PROJECT REFERENCE NO. <i>R-2247CD</i>	SHEET NO. <i>6B</i>
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

PERMIT DRAWING
SHEET 7 OF 23

REVISIONS

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DENOTES FILL IN WETLAND



DENOTES EXCAVATION IN WETLAND



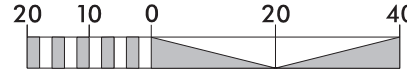
DENOTES IMPACTS IN SURFACE WATER



DENOTES TEMPORARY IMPACTS IN SURFACE WATER



DENOTES MECHANIZED CLEARING



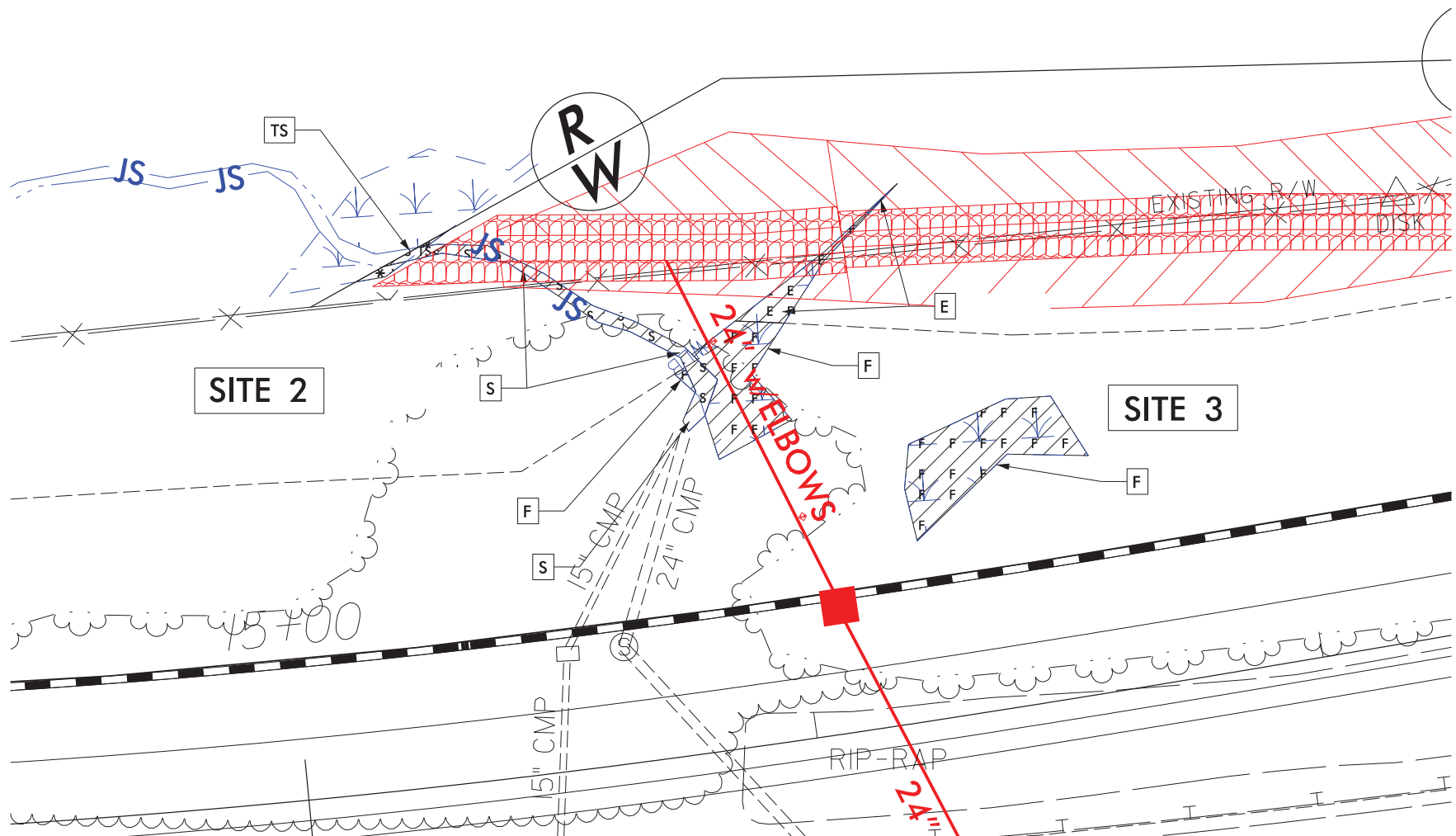
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PROJECT REFERENCE NO. R-2247CD	SHEET NO. 6C
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

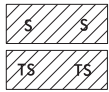
PERMIT DRAWING
SHEET 8 OF 23

REVISIONS



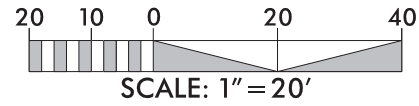
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DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

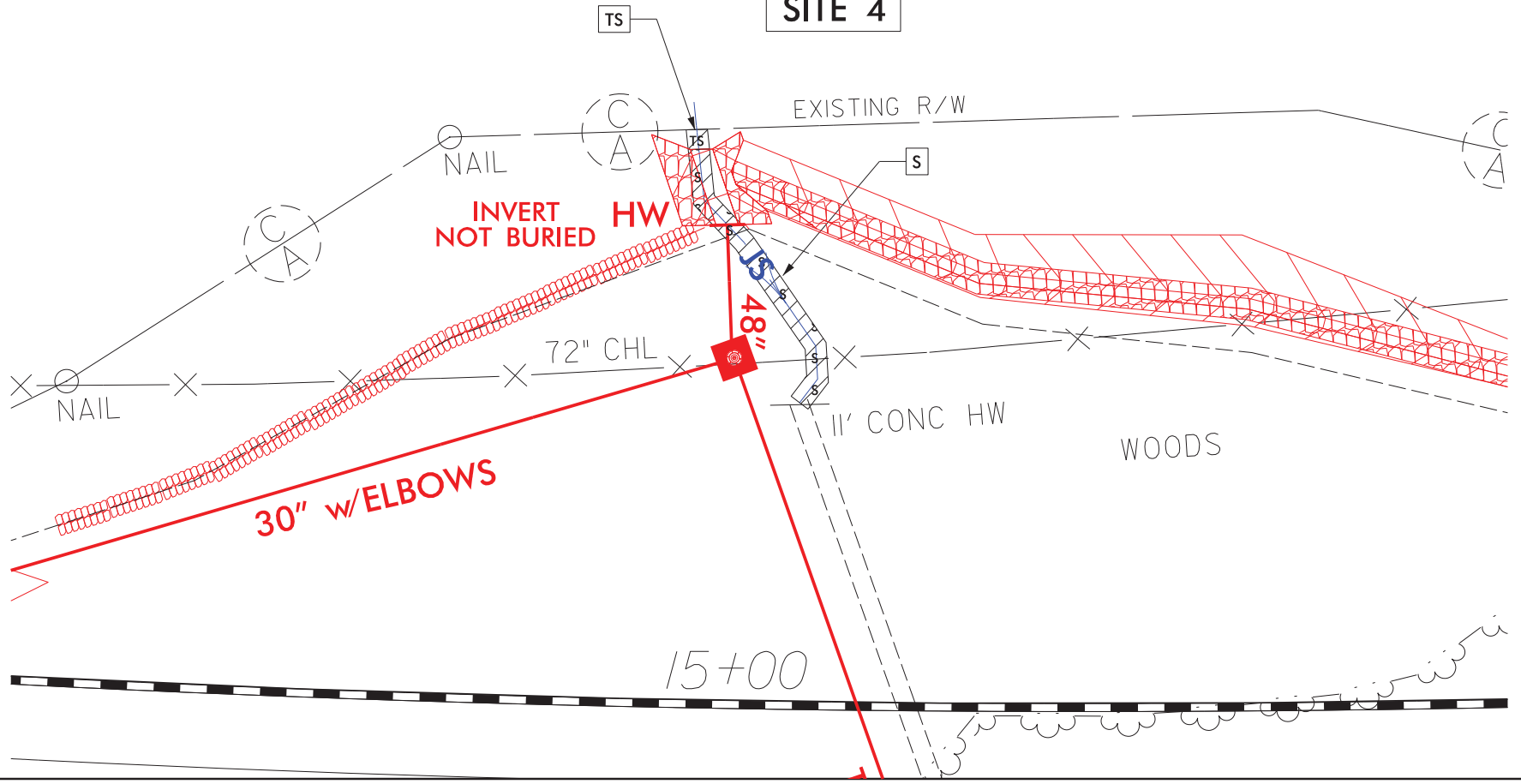


PROJECT REFERENCE NO. R-2247CD	SHEET NO. 6D
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

PERMIT DRAWING
SHEET 9 OF 23

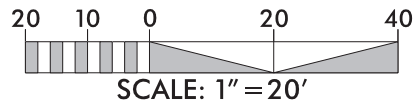
REVISIONS

SITE 4



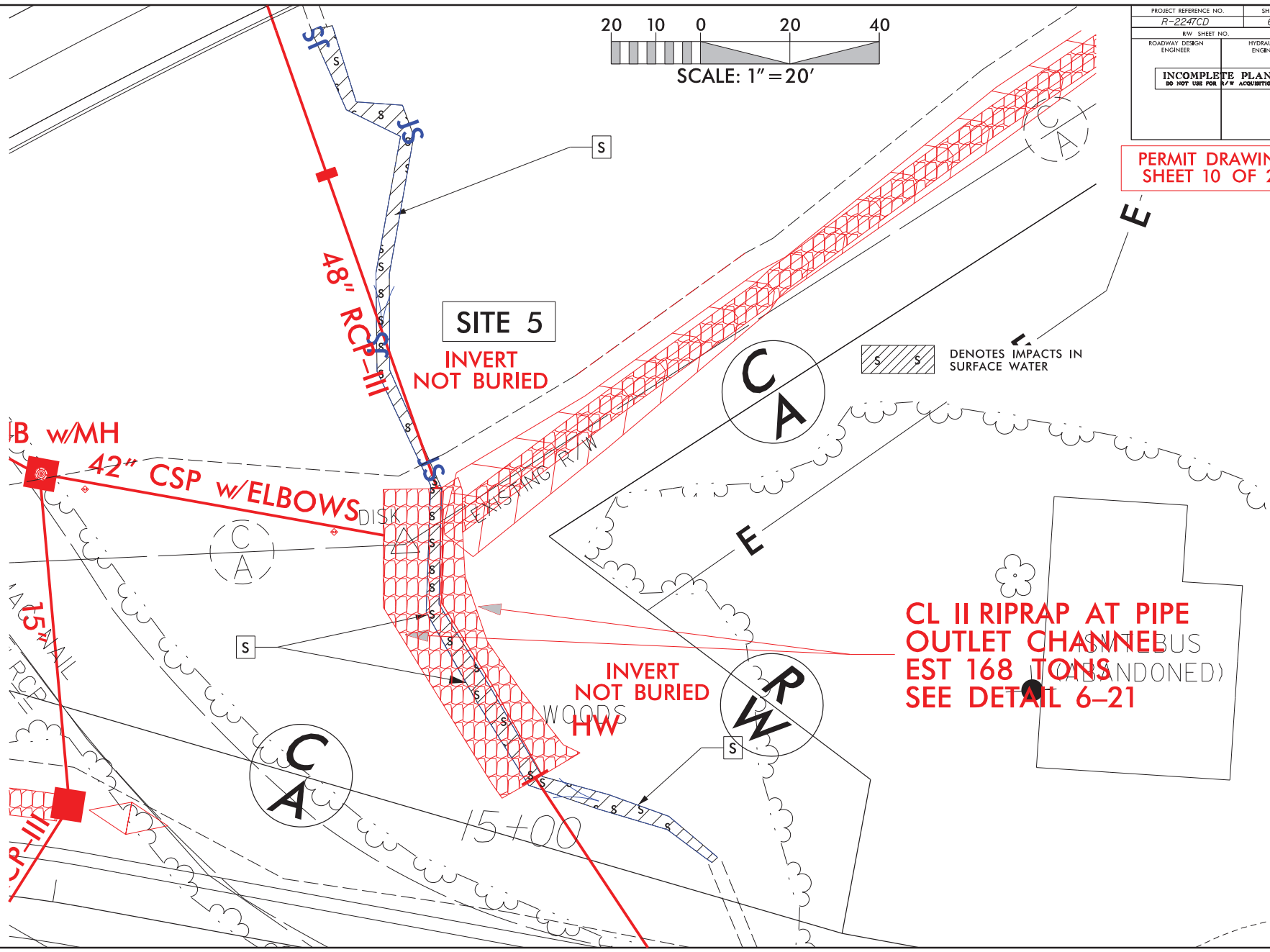
8/17/99

REVISIONS



PROJECT REFERENCE NO. R-2247CD	SHEET NO. 6E
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	

PERMIT DRAWING
SHEET 10 OF 23



SITE 5

INVERT NOT BURIED

5 5 DENOTES IMPACTS IN SURFACE WATER

**CL II RIPRAP AT PIPE
OUTLET CHANNEL**
EST 168 TONS
(ABANDONED)
SEE DETAIL 6-21

INVERT NOT BURIED
HW

15+00

1. CHANGES TO THE ORIGINAL DESIGN SHALL BE INDICATED BY RED LINES AND RED TEXT.
 2. ALL DIMENSIONS SHALL BE IN FEET UNLESS OTHERWISE NOTED.
 3. ALL DISTANCES SHALL BE MEASURED ALONG THE CENTERLINE OF THE PIPE.
 4. ALL CONCRETE SHALL BE 4000 PSI STRENGTH.
 5. ALL RIPRAP SHALL BE 3/4\"/>

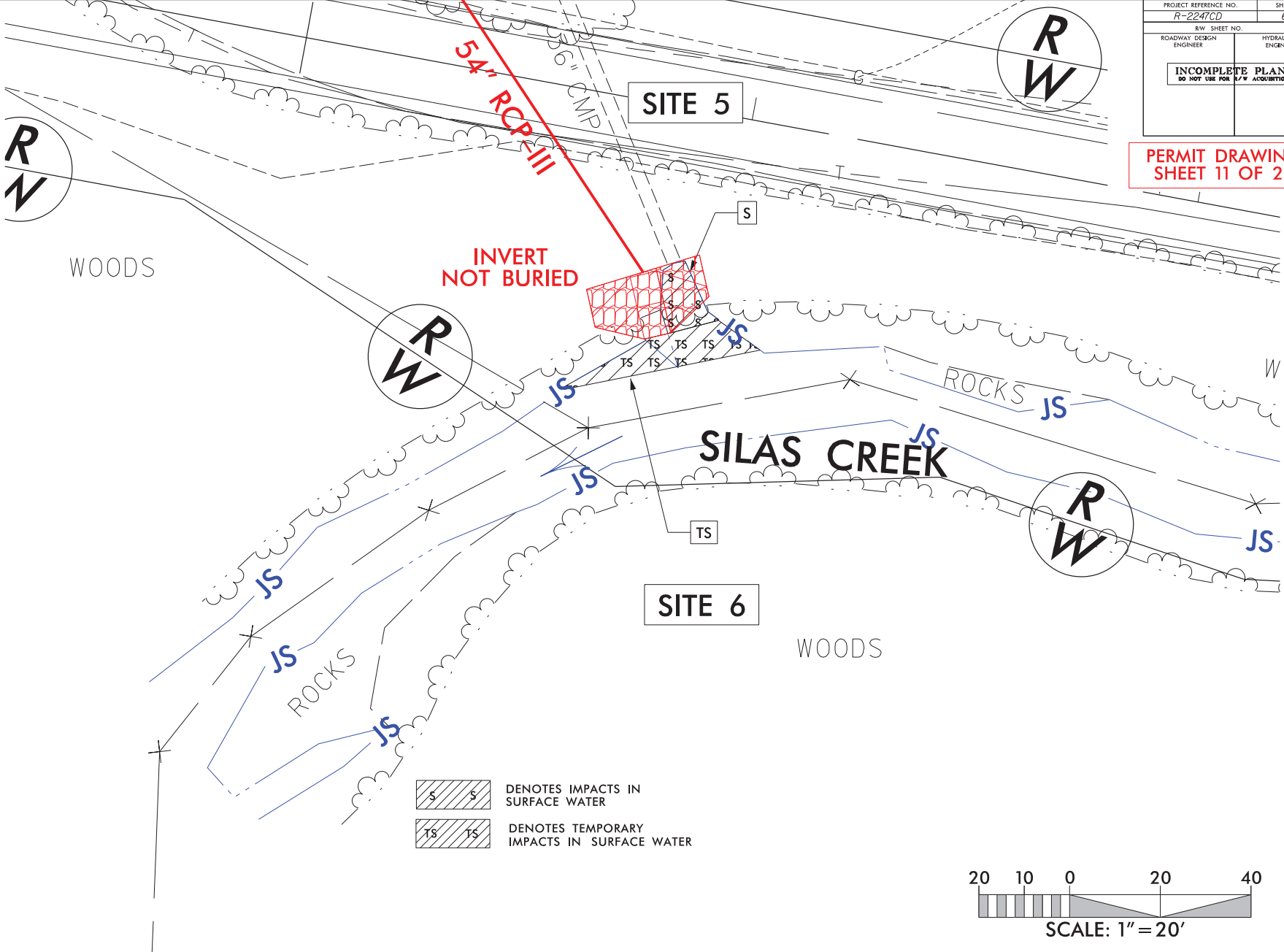
8/17/99

REVISIONS

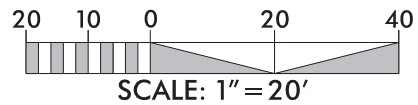
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CHECKED
APPROVED

PROJECT REFERENCE NO. R-2247CD	SHEET NO. 6F
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	


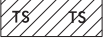

PERMIT DRAWING
SHEET 11 OF 23

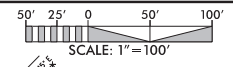


DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER




6/2/2018

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

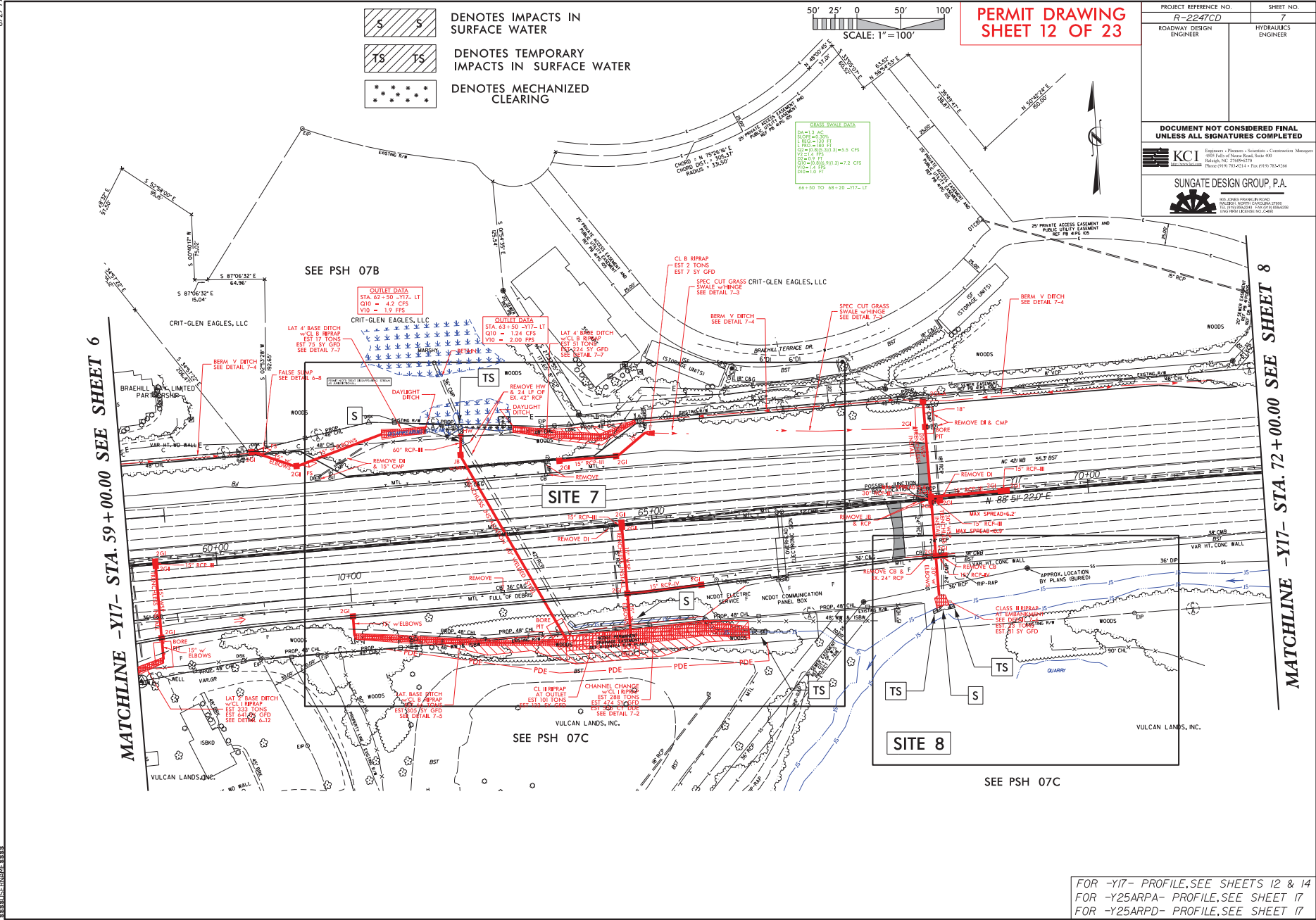


**PERMIT DRAWING
SHEET 12 OF 23**

PROJECT REFERENCE NO. R-2247CD	SHEET NO. 7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
	
SUNGATE DESIGN GROUP, P.A. <small>100 JONES FERRY ROAD PROJECTS SOUTH COUNTY ROAD 100 TAYLOR, MISSISSIPPI 39375 (601) 835-1000 FAX (601) 835-1005 WWW.SUNGATEDESIGN.COM</small>	

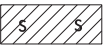
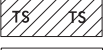

MATCHLINE -Y17- STA. 59+00.00 SEE SHEET 6

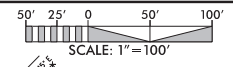
MATCHLINE -Y17- STA. 72+00.00 SEE SHEET 8




FOR -Y17- PROFILE, SEE SHEETS 12 & 14
 FOR -Y25ARPA- PROFILE, SEE SHEET 17
 FOR -Y25ARPD- PROFILE, SEE SHEET 17

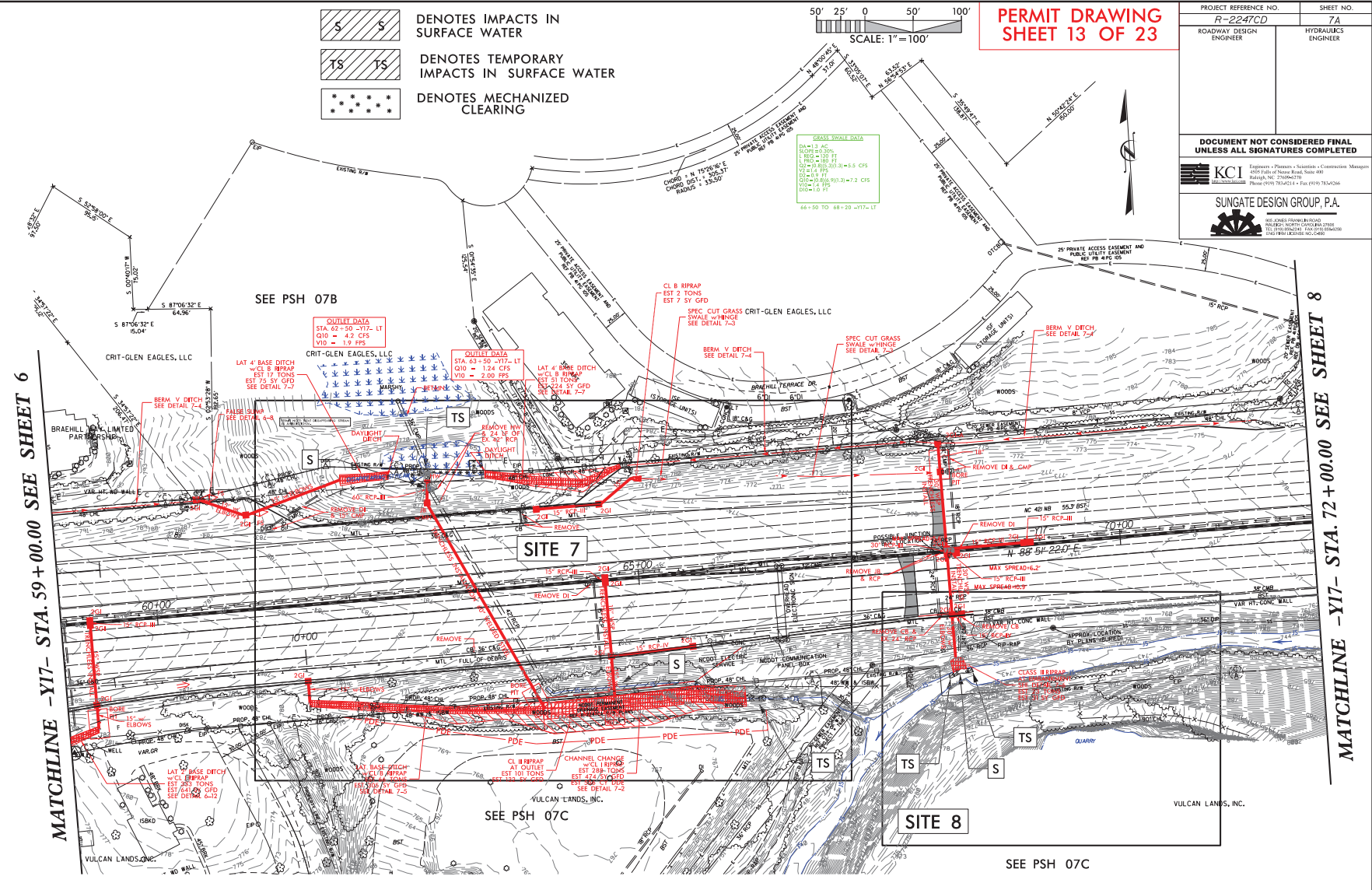
6/2/24

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



**PERMIT DRAWING
SHEET 13 OF 23**

PROJECT REFERENCE NO. R-2247CD	SHEET NO. 7A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
	
SUNGATE DESIGN GROUP, P.A. <small>NO. 4000 FRANKLIN ROAD PROJECTS, SUITE 2000 BLDG 1000 THE PINNACLES, FAYETTEVILLE, NC 27034-4710 PHONE: 703.762.0211 FAX: 703.762.0206 WWW: WWW.SUNGATEDESIGN.COM</small>	



MATCHLINE -Y17- STA. 59+00.00 SEE SHEET 6

MATCHLINE -Y17- STA. 72+00.00 SEE SHEET 8

FOR -Y17- PROFILE, SEE SHEETS 12 & 14
 FOR -Y25ARPA- PROFILE, SEE SHEET 17
 FOR -Y25ARPD- PROFILE, SEE SHEET 17

8/17/99



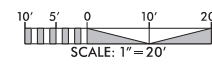
DENOTES MECHANIZED CLEARING



DENOTES TEMPORARY IMPACTS IN SURFACE WATER

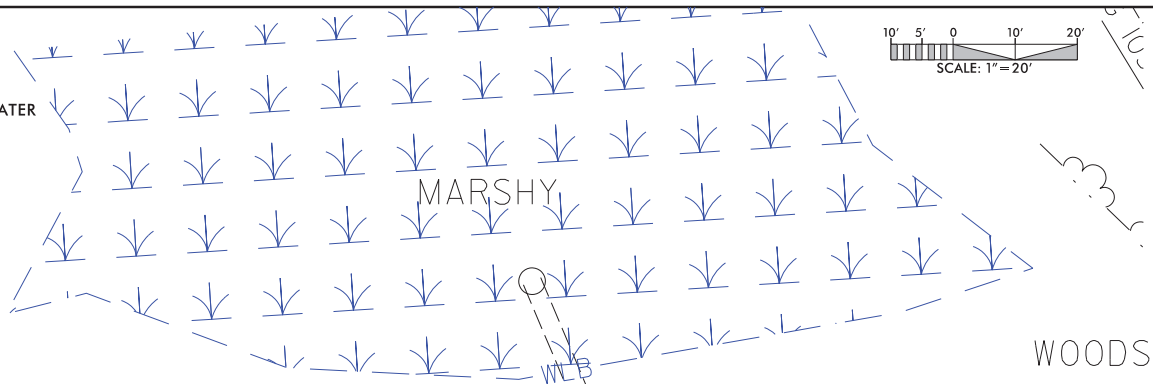


DENOTES IMPACTS IN SURFACE WATER



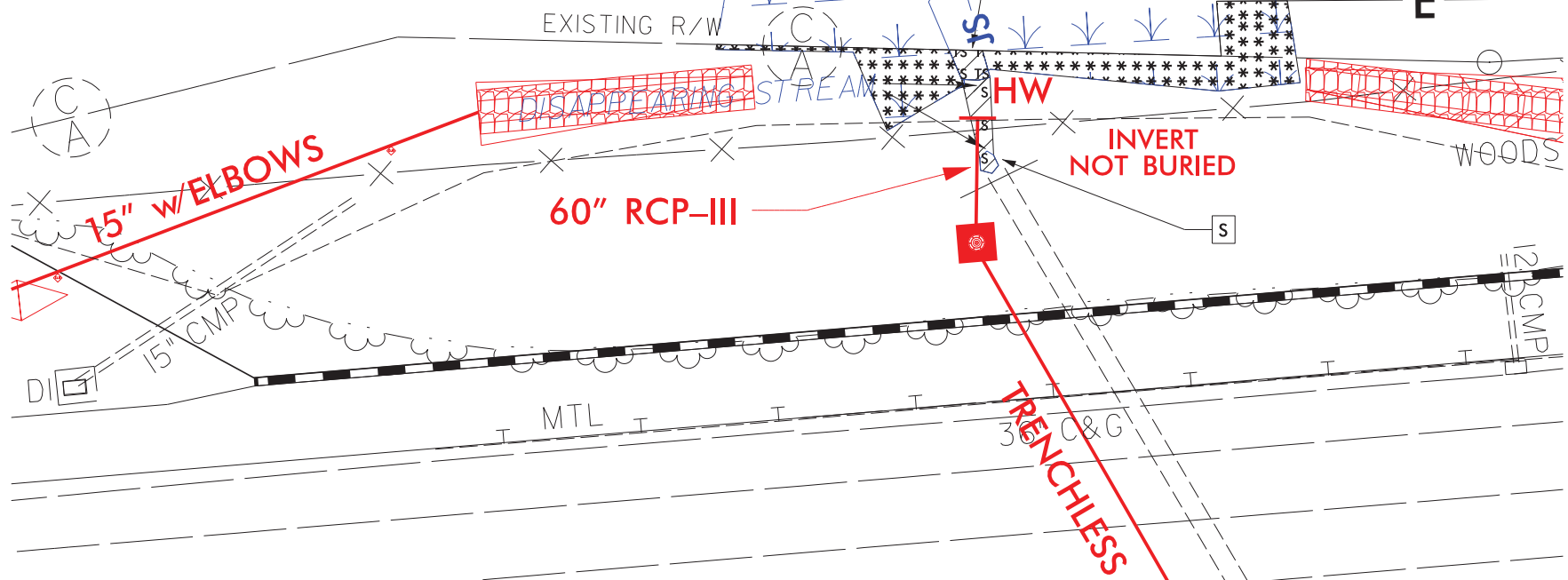
PROJECT REFERENCE NO. R-2247CD	SHEET NO. 7B
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR P.W. ACQUISITION	

PERMIT DRAWING
SHEET 14 OF 23



SITE 7

PERMIT NOTE: TREAT DISSAPPEARING STREAM AS JURISDICTIONAL.



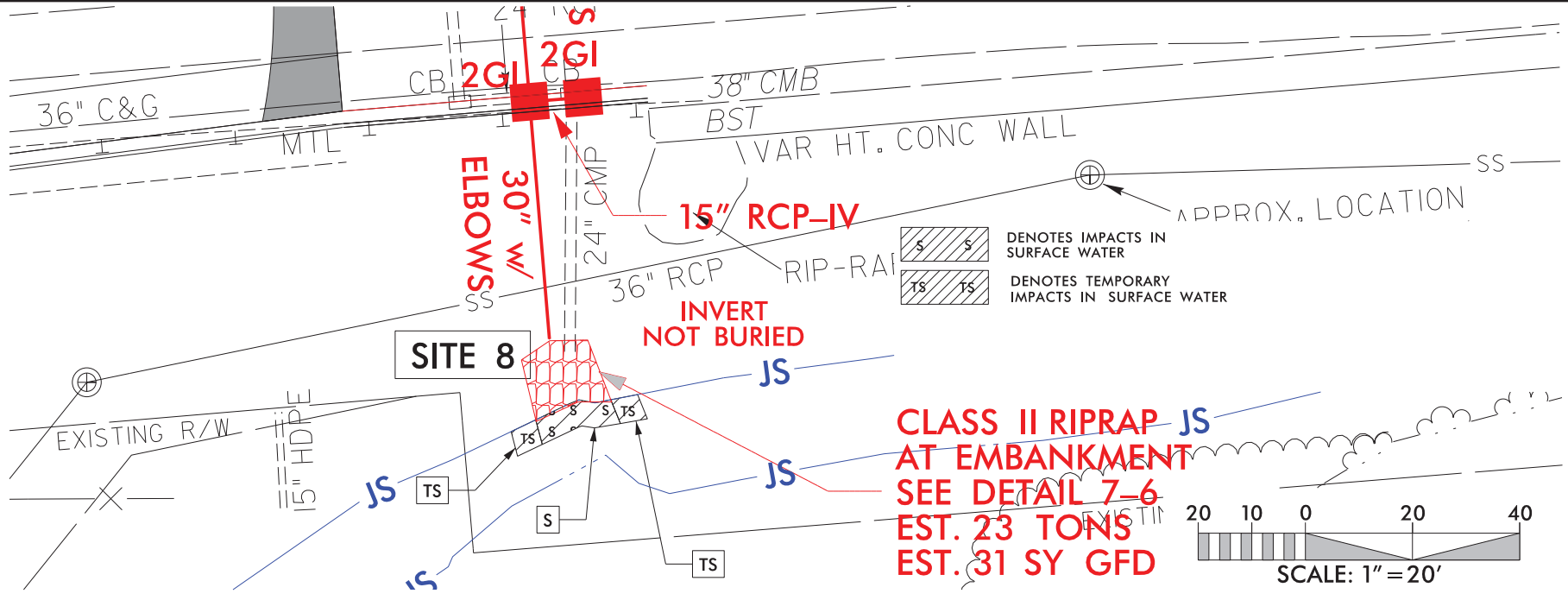
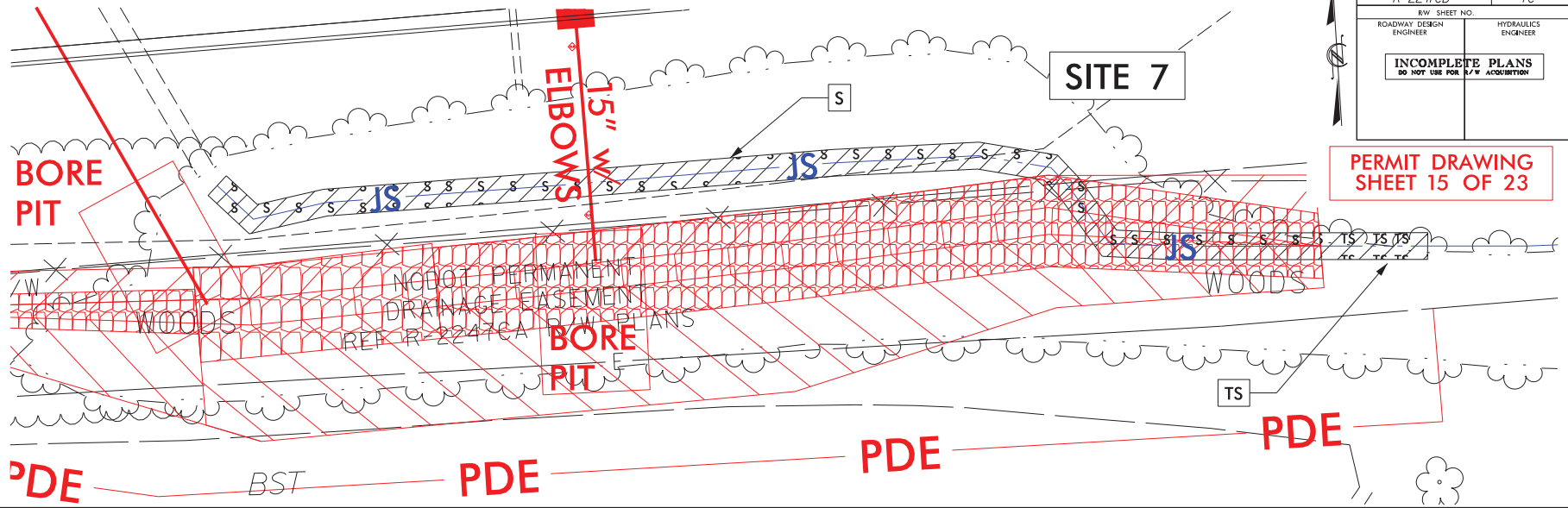
REVISIONS

DATE
BY
CHECKED
APPROVED

8/17/99

PROJECT REFERENCE NO. R-2247CD	SHEET NO. 7C
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	

PERMIT DRAWING SHEET 15 OF 23

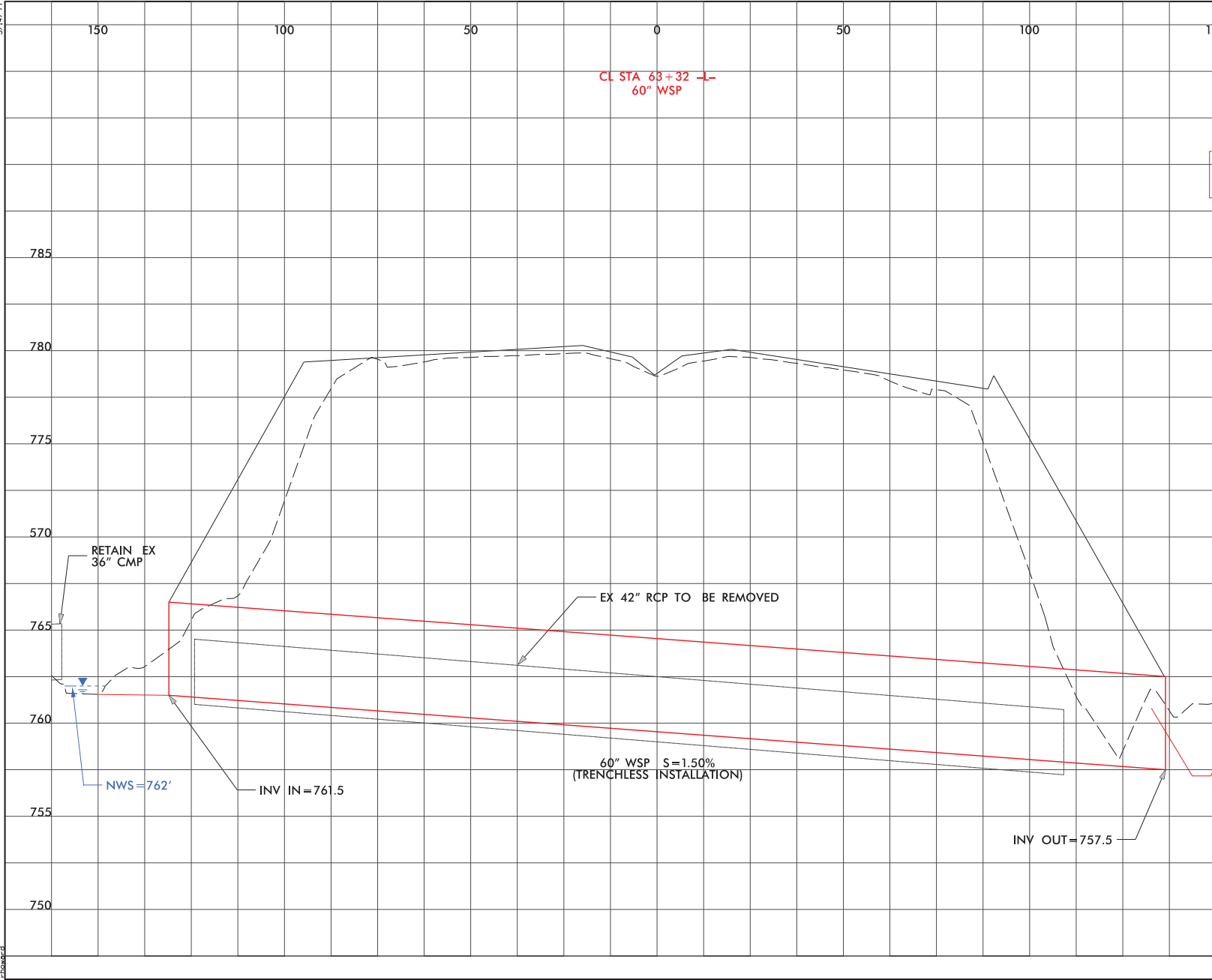


REVISIONS

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5/14/09

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CL STA 68+32
60" WSP

150

100

50

0

50

100

150

785

780

775

570

765

760

755

750

RETAIN EX
36" CMP

NWS=762'

INV IN=761.5



60" WSP S=1.50%
(TRENCHLESS INSTALLATION)

EX 42" RCP TO BE REMOVED

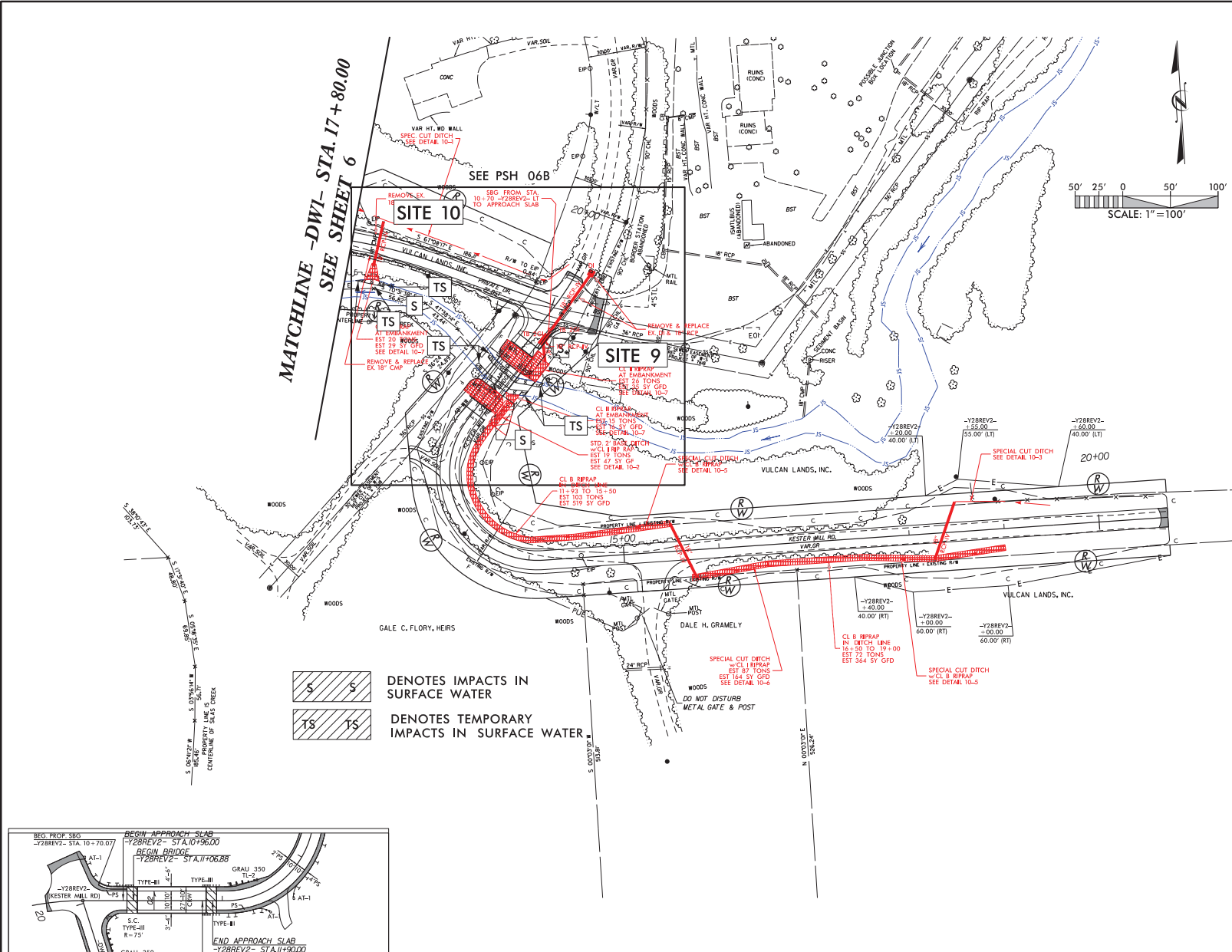
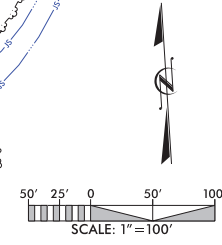
INV OUT=757.5



PROJECT REFERENCE NO. <i>R-2247CD</i>	SHEET NO. <i>7D</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PERMIT DRAWING SHEET 16 OF 23	

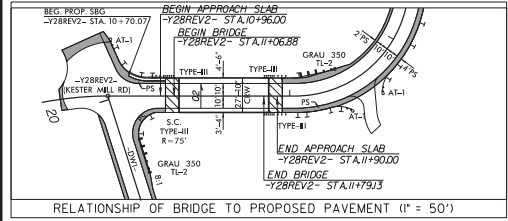
6/2/09

PROJECT REFERENCE NO. R-2247CD	SHEET NO. 10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 KCI <small>Engineers • Planners • Scientists • Construction Managers</small> <small>4001 Falls of the Neuse Road, Suite 400</small> <small>Raleigh, NC 27604-2270</small> <small>Phone: 919.763.2414 • Fax: 919.763.2450</small>	
 SUNGATE DESIGN GROUP, P.A.	

**PERMIT DRAWING
SHEET 17 OF 23**





 DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER



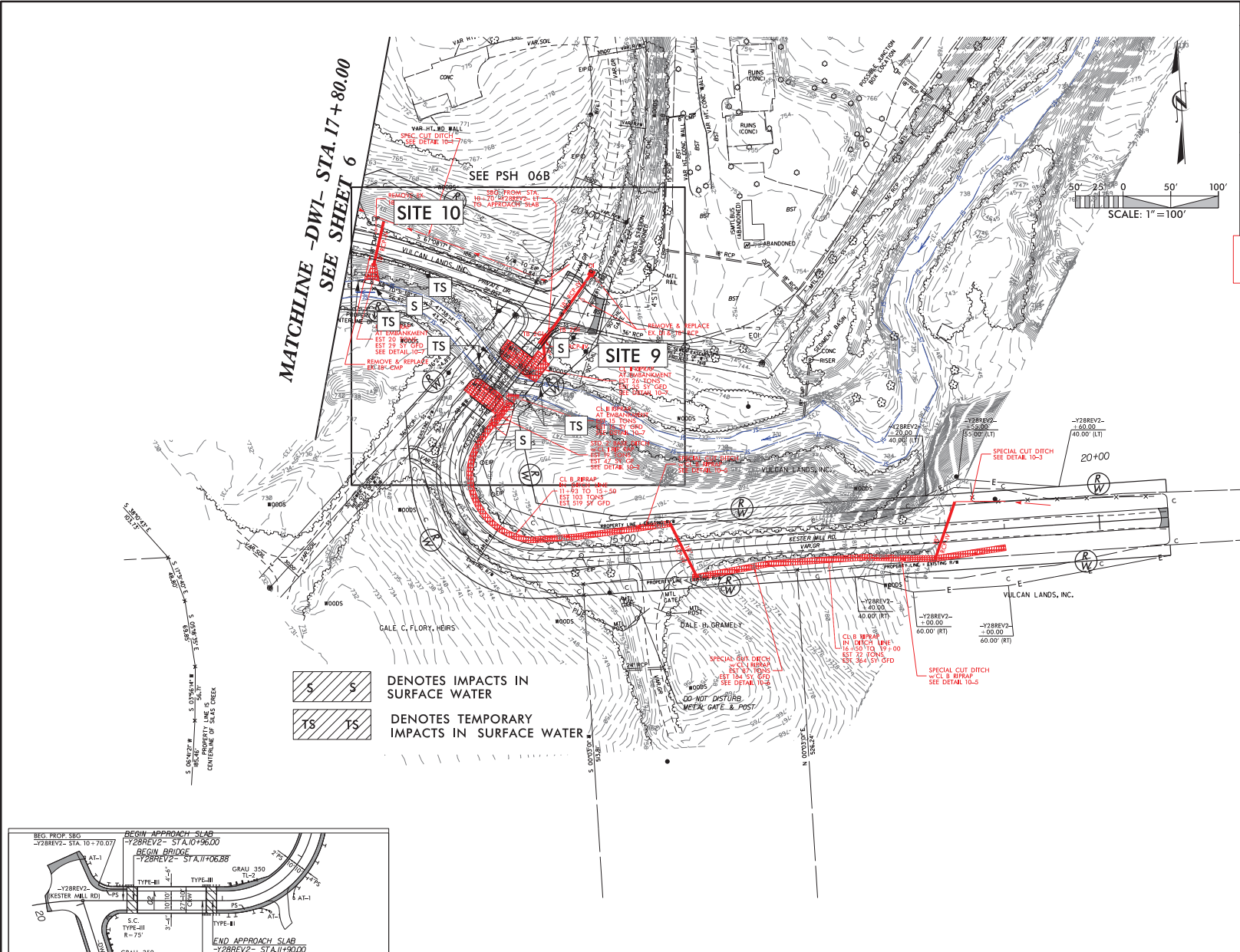
NOTE:
 ** DESIGN EXCEPTION FOR MIN. HORIZONTAL RADIUS
 AND ASSOCIATED HORIZONTAL STOPPING SIGHT DISTANCE.

FOR -DWI- PROFILE, SEE SHEET 19
 FOR -Y28REV2- PROFILE, SEE SHEET 19



6/2/09

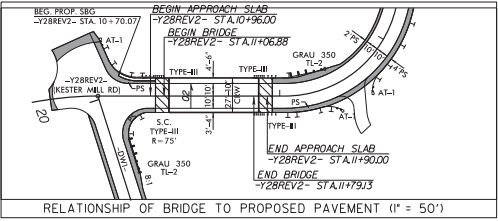
PROJECT REFERENCE NO. R-2247CD	SHEET NO. 10A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 KCI Engineers • Planners • Scientists • Construction Managers 4015 Park of Nations Road, Suite 400 Raleigh, NC 27604-2279 Phone: 919.763.4114 • Fax: 919.763.4050	
 SUNGATE DESIGN GROUP, P.A.	

**PERMIT DRAWING
SHEET 18 OF 23**



**MATCHLINE -DWI- STA. 17 + 80.00
SEE SHEET 6**

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



NOTE:
** DESIGN EXCEPTION FOR MIN. HORIZONTAL RADIUS
AND ASSOCIATED HORIZONTAL STOPPING SIGHT DISTANCE.

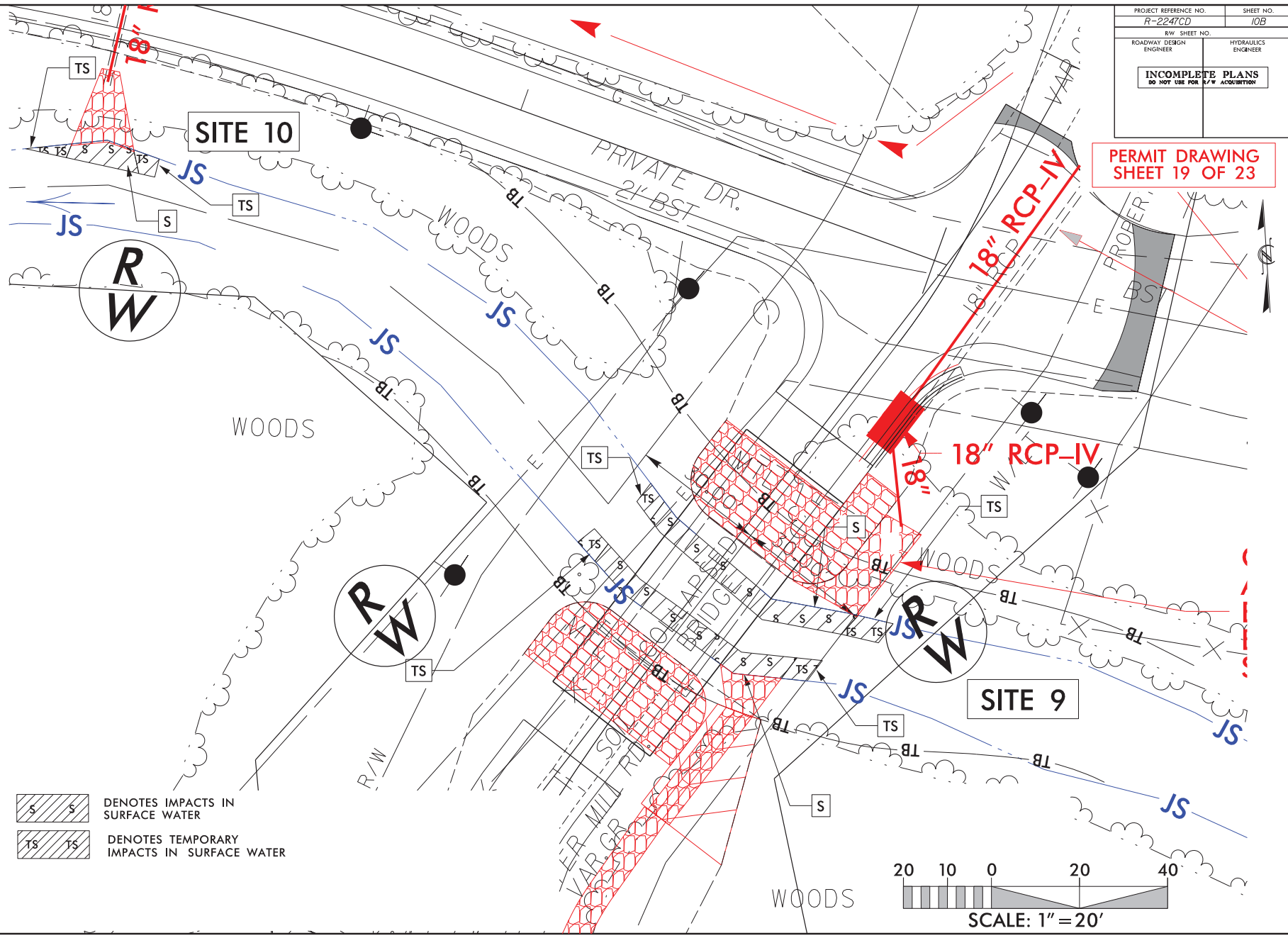
FOR -DWI- PROFILE, SEE SHEET 19
FOR -Y28REV2- PROFILE, SEE SHEET 19

8/17/99

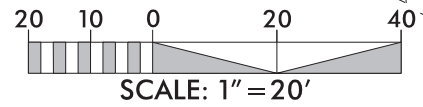
PROJECT REFERENCE NO. R-2247CD	SHEET NO. 10B
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	

PERMIT DRAWING SHEET 19 OF 23

REVISIONS



DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER



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5/28/04



PERMIT DRAWING SHEET 20 OF 23

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 3440	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 740J	FT
BASE DISCHARGE	= 4550	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 740.6	FT
OVERTOPPING DISCHARGE	= 5500	CFS
OVERTOPPING FREQUENCY	= <500	YRS
OVERTOPPING ELEVATION	= 741.2	FT
DATE OF SURVEY	= 11-23-16	FT
W.S.ELEVATION AT DATE OF SURVEY	= 729.2	FT

BEGIN GRADE
Y28REV2 STA 10+00.00
ELEV = 745.00
TIE TO EXIST. PAV.

BEGIN BRIDGE
Y28REV2 STA 11+10.88
ELEV = 741.89

PI = 10#90.00
EI = 74.00
VC = 100
K = 11
DS = 15

PI = 13+20.00
EI = 742.89
VC = 315
K = 30
DS = 30

PI = 18#60.00
EI = 752.87
VC = 235
K = 29
DS = 35

PIPE HYDRAULIC DATA

18" RCP Sta. 15+63 -Y28REV2-

DRAINAGE AREA	= 1.5	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 5.5	CFS
DESIGN HW ELEVATION	= 763J	FT
100 YEAR DISCHARGE	= 6J	CFS
100 YEAR HW ELEVATION	= 763.2	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 18	CFS
OVERTOPPING ELEVATION	= 766.0	FT

PIPE HYDRAULIC DATA

18" RCP Sta. 18+37 -Y28REV2-

DRAINAGE AREA	= 0.5	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 1.8	CFS
DESIGN HW ELEVATION	= 785.4	FT
100 YEAR DISCHARGE	= 2.0	CFS
100 YEAR HW ELEVATION	= 875.5	FT
OVERTOPPING FREQUENCY	= +500	YRS
OVERTOPPING DISCHARGE	= 18	CFS
OVERTOPPING ELEVATION	= 789.3	FT

PIPE HYDRAULIC DATA

54" RCP Sta. 15+46 -DWI-

DRAINAGE AREA	= 45	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 110	CFS
DESIGN HW ELEVATION	= 741.8	FT
100 YEAR DISCHARGE	= 110	CFS
100 YEAR HW ELEVATION	= 741.8	FT
OVERTOPPING FREQUENCY	= +500	YRS
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING ELEVATION	= 744	FT

PIPE HYDRAULIC DATA

18" RCP Sta. 18+07 -DWI-

DRAINAGE AREA	= 2.8	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 7	CFS
DESIGN HW ELEVATION	= 740.0	FT
100 YEAR DISCHARGE	= 8	CFS
100 YEAR HW ELEVATION	= 740.2	FT
OVERTOPPING FREQUENCY	= +100	YRS
OVERTOPPING DISCHARGE	= 15	CFS
OVERTOPPING ELEVATION	= 741.7	FT

PI = 10#95.00
EI = 795.00
VC = 100
K = 10
DS = 23

PI = 15#95.00
EI = 743.8
VC = 500
K = 41
DS = 32

END RESURFACING
DWI STA 20+62.38
ELEV = 741.96

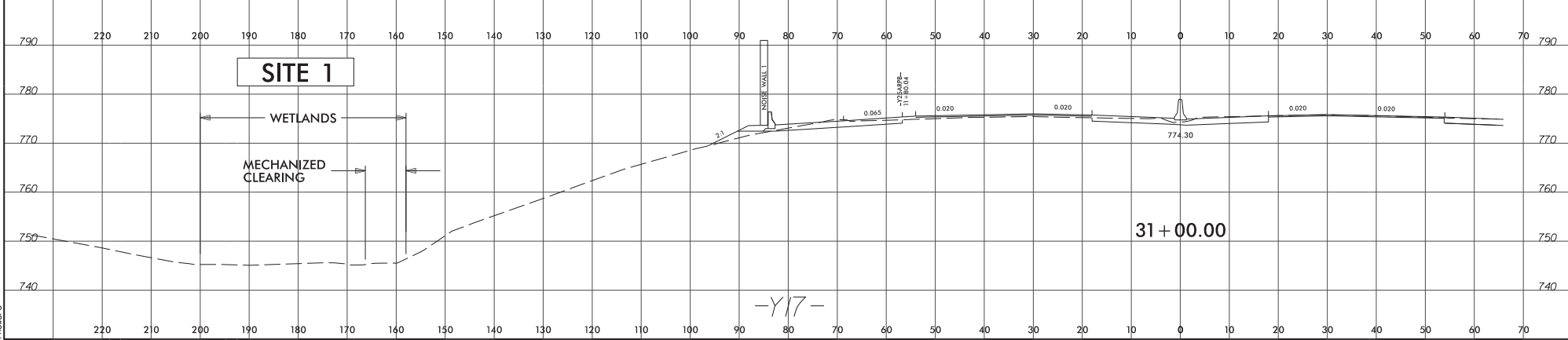
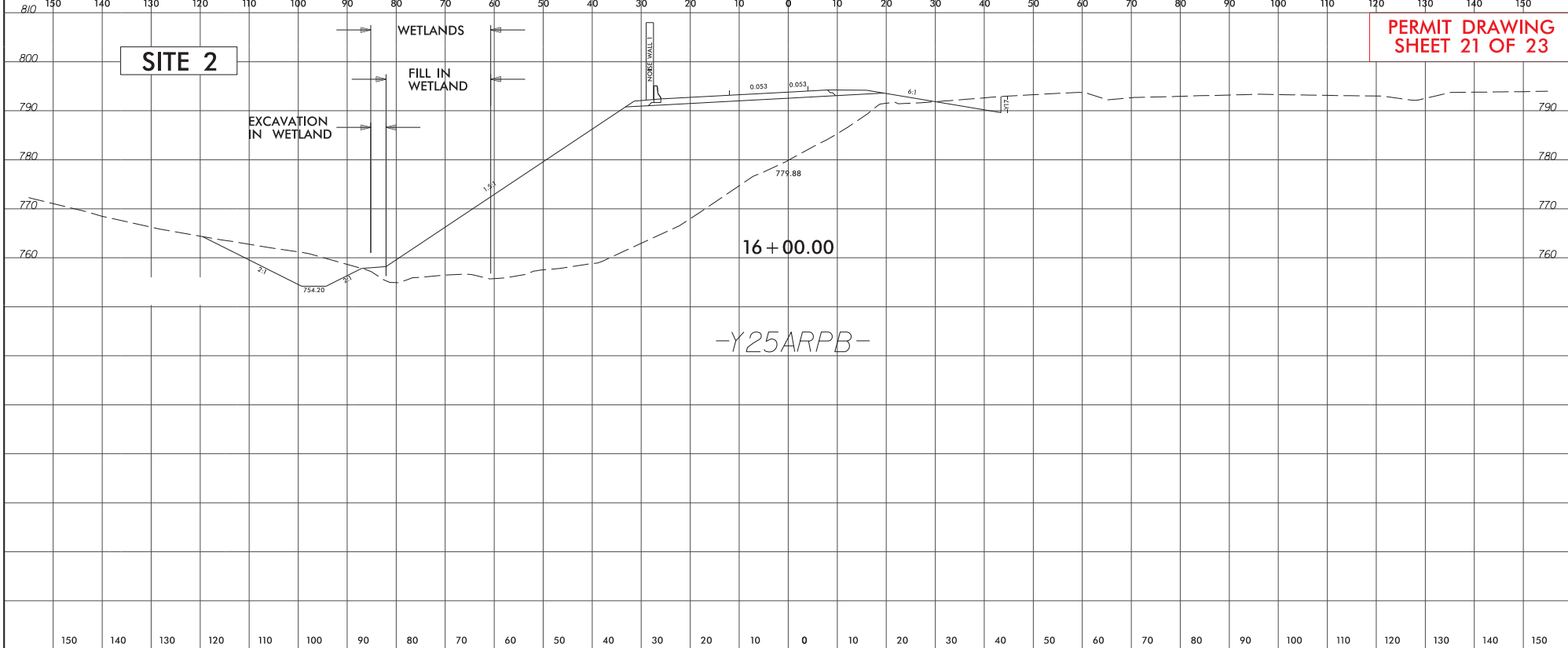
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8/23/19



PROJ. REFERENCE NO. R-2247CD	SHEET NO. X-53
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**PERMIT DRAWING
SHEET 21 OF 23**



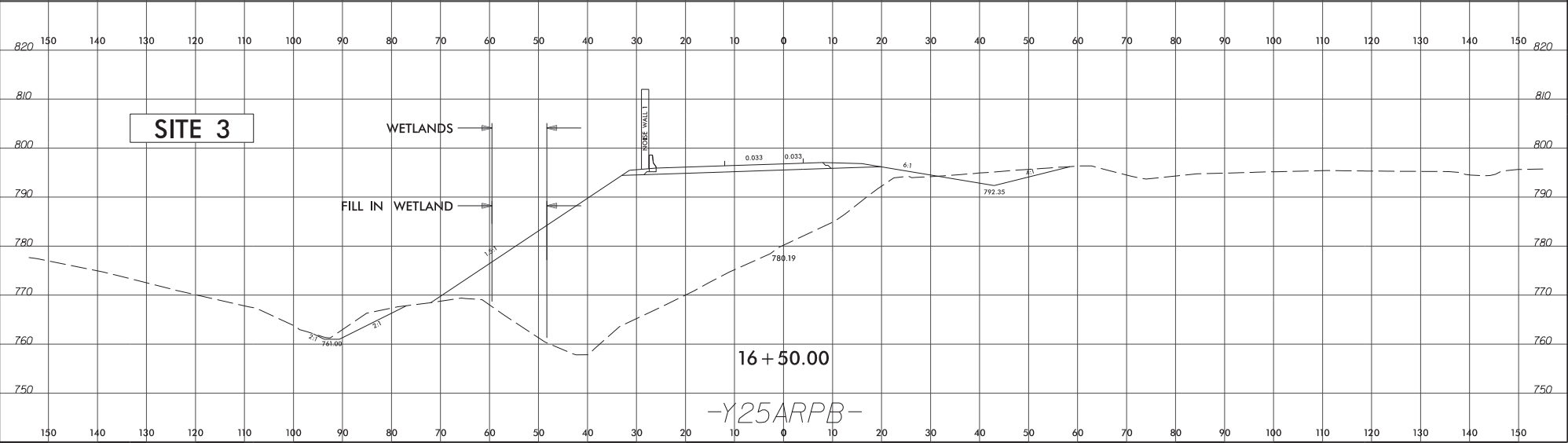
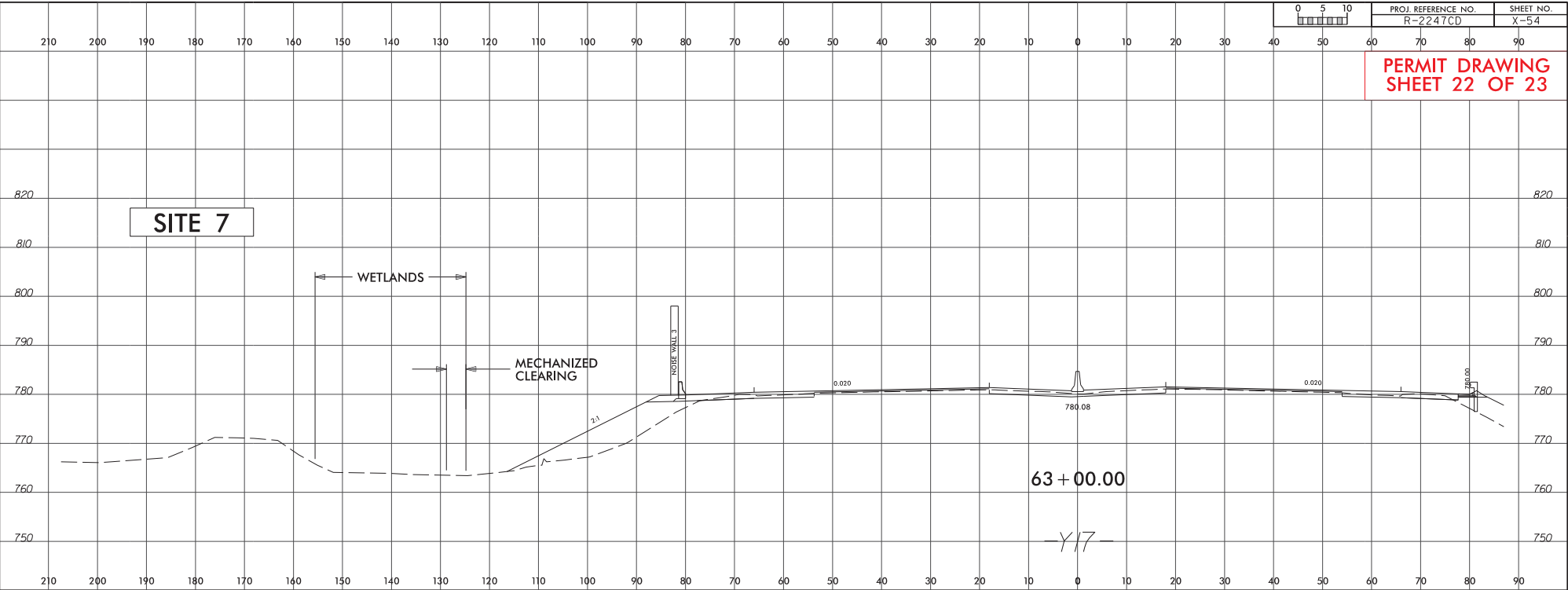
8/23/19
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Rover

8/23/19



PROJ. REFERENCE NO. R-2247CD	SHEET NO. X-54
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**PERMIT DRAWING
SHEET 22 OF 23**



8/23/19
R-2247CD-Hyd.prm.wet.plt.dwg
11/20/19

WETLAND AND SURFACE 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)	
1	11+67 to 12+14 -Y2SARPB- LT	RIPRAP PAD & TEMP. E&SC	< 0.01			< 0.01							
2	15+25 to 16+32 -Y2SARPB- LT	ROADWAY FILL & DITCH EXCAV.	< 0.01		< 0.01	< 0.01			< 0.01	< 0.01	75	7	
3	16+24 to 16+61 -Y2SARPB- LT	ROADWAY FILL	0.01										
4	14+88 to 15+17 -Y2SARPA- RT	ROADWAY FILL & CHANNEL CHANGE							< 0.01	< 0.01	56	4	
5	14+21 to 15+45 -DW1- LT	ROADWAY FILL & CHANNEL CHANGE							0.01		160		
*	14+66 to 15+02 -DW1- LT	RIPRAP LINED CHANNEL							< 0.01		72		
*	15+87 to 16+01 -DW1- RT	CHANNEL CHANGE							< 0.01		15		
6	15+70 to 16+11 -DW1- RT	CHANNEL CHANGE								< 0.01		45	
7	62+44 to 63+49 -Y17- LT	ROADWAY FILL & TEMP. E&SC				0.01			< 0.01	< 0.01	17	6	
*	63+94 to 66+20 -Y17- RT	CHANNEL CHANGE							0.02	< 0.01	216	20	
8	68+11 to 68+36 -Y17- RT	BANK STABILIZATION							< 0.01	< 0.01	16	10	
9	11+27 to 11+57 -Y28REV2- LT & RT	BANK STABILIZATION							0.01	< 0.01	55	15	
10	18+96 to 19+22 -DW1- RT	BANK STABILIZATION							< 0.01	< 0.01	17	14	
TOTALS*:			0.02		< 0.01	0.02			0.07	0.01	699	121	0

*Rounded totals are sum of actual impacts

Fill in Wetlands:
 Site 1: Perm. Fill in Wetlands = 0.0012 ac. / Mech. Clearing in Wetlands = 0.0056 ac.
 Site 2: Perm. Fill in Wetlands = 0.0068 ac. / Excavation in Wetlands = 0.0020 ac. / Mech. Clearing in Wetlands = 0.0003 ac.
 Site 3: Perm. Fill in Wetlands = 0.0100 ac.
 Site 7: Mech. Clearing in Wetlands = 0.0144 ac.

NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 9-28-2017
 FORSYTH COUNTY
 R-2247CD
 34409.3.23

Revised 2016 09 09 SHEET 23 OF 23



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
 FOR NCDOT PROJECTS



(Version 2.07; Released October 2016)

WBS Element: 34409.3.23 TIP No.: R-2247EC County(ies): Forsyth Page 1 of 1

General Project Information

WBS Element:	34409.3.23	TIP Number:	R-2247EC	Project Type:	Roadway Widening	Date:	8/28/2017
NCDOT Contact:	Craig Lee, PE		Contractor / Designer:	Brad T. Smith, EI			
Address:	NCDOT Design Build Unit 1595 Mail Service Center Raleigh, NC 27699-1595		Address:	Sungate Design Group, PA 905 Jones Franklin Road Raleigh, NC 27606			
	Phone:	(919) 707-6708		Phone:	(919) 859-2243		
	Email:	cilee@ncdot.gov		Email:	bsmith@sungatedesign.com		
City/Town:	Winston-Salem		County(ies):	Forsyth			
River Basin(s):	Yadkin-Pee Dee		CAMA County?	No			
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	1.042 miles	Surrounding Land Use:	Medium density residential, business, and industrial					
	Proposed Project		Existing Site					
Project Built-Up Area (ac.)	21.8	ac.	14.1	ac.				
Typical Cross Section Description:	Y62 (NC 65): One 14' travel lane and one 12' travel lane in each direction with 2'-6" curb and gutter drainage, sidewalk, and a concrete island.			Y62 (NC 65): Two 12' travel lanes with grass shoulders and grass roadway ditches, both sides.				
Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	79,300	Year:	2035	Existing:	61,700	Year:	2015
General Project Narrative: (Description of Minimization of Water Quality Impacts)	<p>The R-2247EC project involves US 52 and Bethania-Rural Hall Road Interchange improvements for the future Winston-Salem Northern Beltway along with other improvements to adjacent roadways, including realignments. Due to the steep geophraphy of the site, achieving treatment through the use of grass swales is not practicable. Riprap dissipation has been incorporated at drainage pipe outlets and outfalls, where applicable. Proposed cross pipes in jurisdictional streams will not be buried in order to prevent channel degradation as agreed upon during the merger process due to the steep grade of existing streams. Stormwater basins are not used due to the regrading and ramp reconfiguration that will occur on site with the future section EB that will follow this project.</p>							

Waterbody Information

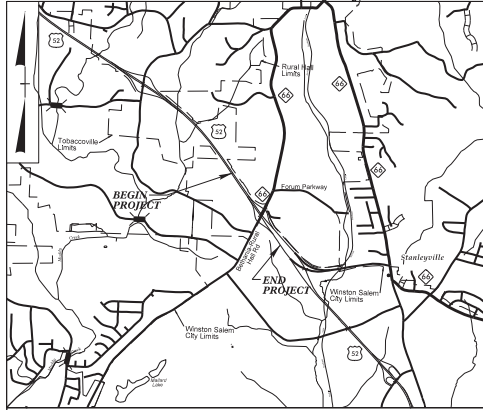
Surface Water Body (1):	Grassy Creek and unnamed tributaries		NCDWR Stream Index No.:	12-94-7-3			
NCDWR Surface Water Classification for Water Body	Primary Classification:	Class C					
	Supplemental Classification:	None					
Other Stream Classification:	None						
Impairments:	None						
Aquatic T&E Species?	No	Comments:					
NRTR Stream ID:	N/A		Buffer Rules in Effect:	N/A			
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	N/A		
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)			
(If yes, provide justification in the General Project Narrative)							

05/08/17

TIP PROJECT: R-2247EC

CONTRACT: C203840

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols
See Sheet 1C For Survey Control Sheets



VICINITY MAP

RIGHT OF WAY PLANS

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS FORSYTH COUNTY

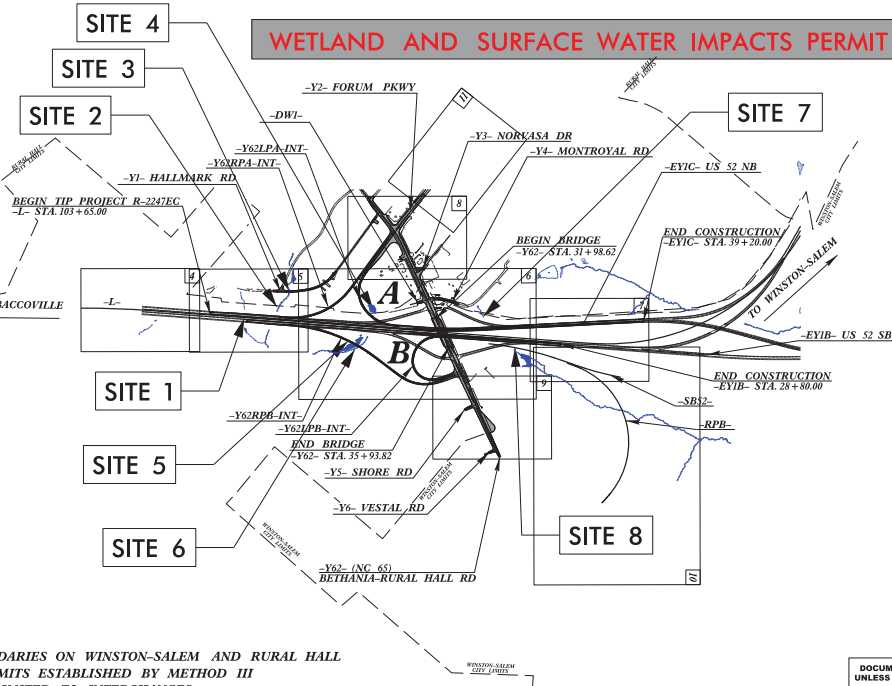
LOCATION: WINSTON-SALEM NORTHERN BELTWAY - MODIFICATION OF THE US 52 (FUTURE I-74) / NC 65 (BETHANIA HALL ROAD) INTERCHANGE

TYPE OF WORK: GRADING, DRAINAGE, PAVING, GUARDRAIL, CABLE GUIDERAIL, STRUCTURES, SIGNING, SIGNALS AND NOISE WALLS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2247EC	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34409.3.23	NHP-0421(088)	P.E.	
34409.3.23	NHP-0421(088)	R/W & UTIL.	
34409.3.23	NHP-0421(088)	CONST.	
RIGHT OF WAY PLANS			
SUBMITAL NO.: S-033		DATE: 09/14/17	

**PERMIT DRAWING
SHEET 1 OF 21**

WETLAND AND SURFACE WATER IMPACTS PERMIT

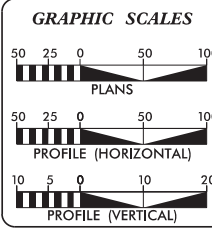


- A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES ON WINSTON-SALEM AND RURAL HALL
- CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III
- THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SUNGATE DESIGN GROUP, P.A.

105 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27608
TEL: (919) 852-2843
ENV. PERM. LICENSE NO. C-198



DESIGN DATA

ADT 2015 =	61,700
ADT 2035 =	79,300
DHV =	10 %
D =	60 %
T =	21 % *
V =	70 MPH
* TTST =	14 DUAL 7
FUNC CLASS =	FREEWAY

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2247EC	= 1.042 MI.
TOTAL LENGTH TIP PROJECT R-2247EC	= 1.042 MI.

Prepared In the Office of:

KCI
KCI Associates of N.C., P.A.
5015 Falls of Neuse Road, Suite 400
Raleigh, NC 27609
Phone (919) 783-9214
Fax (919) 783-9266

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 15, 2016

LETTING DATE:
NOVEMBER 15, 2016

NCDOT CONTACT:
K. ZAK HAMIDI, P.E.
PROJECT ENGINEER - DESIGN BUILD UNIT

Plans Prepared For:

DIVISION OF HIGHWAYS
1000 Birch Ridge Dr.
Raleigh, NC, 27610

CHARLES L. FLOWE, P.E.
PROJECT ENGINEER

BRYAN E. HOUGH, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



***** SYSTEMS TIME *****
***** 05/08/17 *****
***** 08:51 *****
***** 05/08/17 *****
***** 08:51 *****

6/2/09

PERMIT DRAWING SHEET 2 OF 21

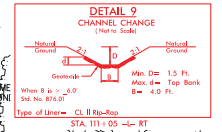
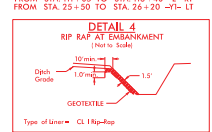
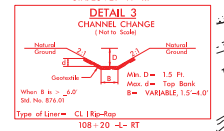
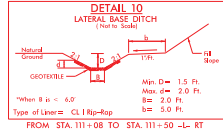
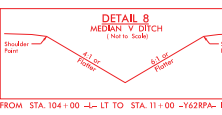
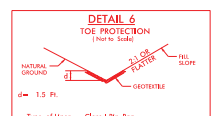
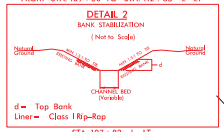
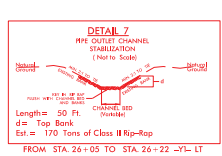
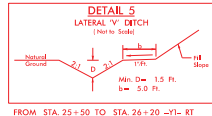
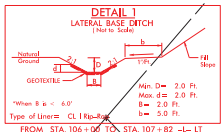
SUNGATE DESIGN GROUP, P.A.
100 JONES BRIDGE ROAD
DURHAM, NORTH CAROLINA 27603
TEL: 919.487.4400 FAX: 919.487.4401
WWW.SUNGATEDESIGN.COM

PROJECT REFERENCE NO. R-2247EC SHEET NO. 5

ROADWAY DESIGN ENGINEER PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

KCI
Engineers, Planners, Scientists & Construction Managers
4015 Hill of Hope Road, Suite 400
Raleigh, NC 27604-2070
Phone: 919.775.2414 Fax: 919.775.2450



MATCHLINE -L- STA. 101 + 50.00 SEE SHEET 4

-L- POT Sta. 103+65.00

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

WINSTON-SALEM / FORSYTH COUNTY BOARD OF EDUCATION

END CONSTRUCTION
-YI- Sta. 28+00.00

SITE 1

SITE 2

SITE 3

SEE SHEET 06D

SEE SHEET 06C

SEE SHEET 06E

MATCHLINE -L- STA. 115 + 50.00 SEE SHEET 6
MATCHLINE -YI- STA. 24 + 00.00 SEE SHEET 6

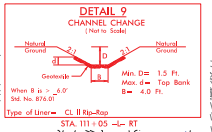
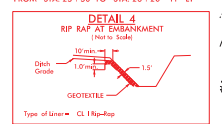
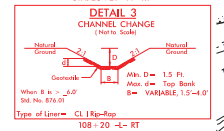
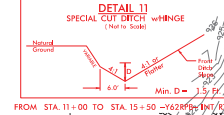
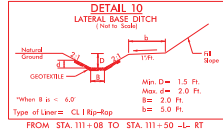
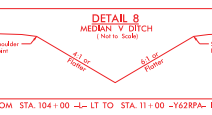
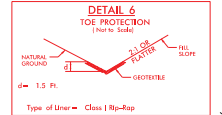
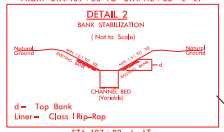
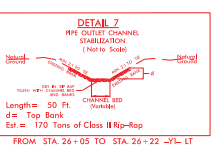
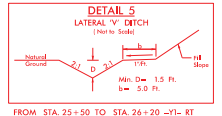
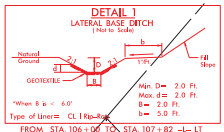
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FOR -Y62RPA-INT- PROFILE, SEE SHEETS 15-16
FOR -Y62RPA-INT- PROFILE, SEE SHEETS 17-18
FOR -YI- PROFILE, SEE SHEET 19

PERMIT DRAWING SHEET 3 OF 21

SUNGATE DESIGN GROUP, P.A.
100 JONES BRIDGE ROAD
DUNEDIN, SOUTH CAROLINA 29528
(803) 791-1111
FAX: (803) 791-1110

PROJECT REFERENCE NO. R-2247EC	SHEET NO. 5
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

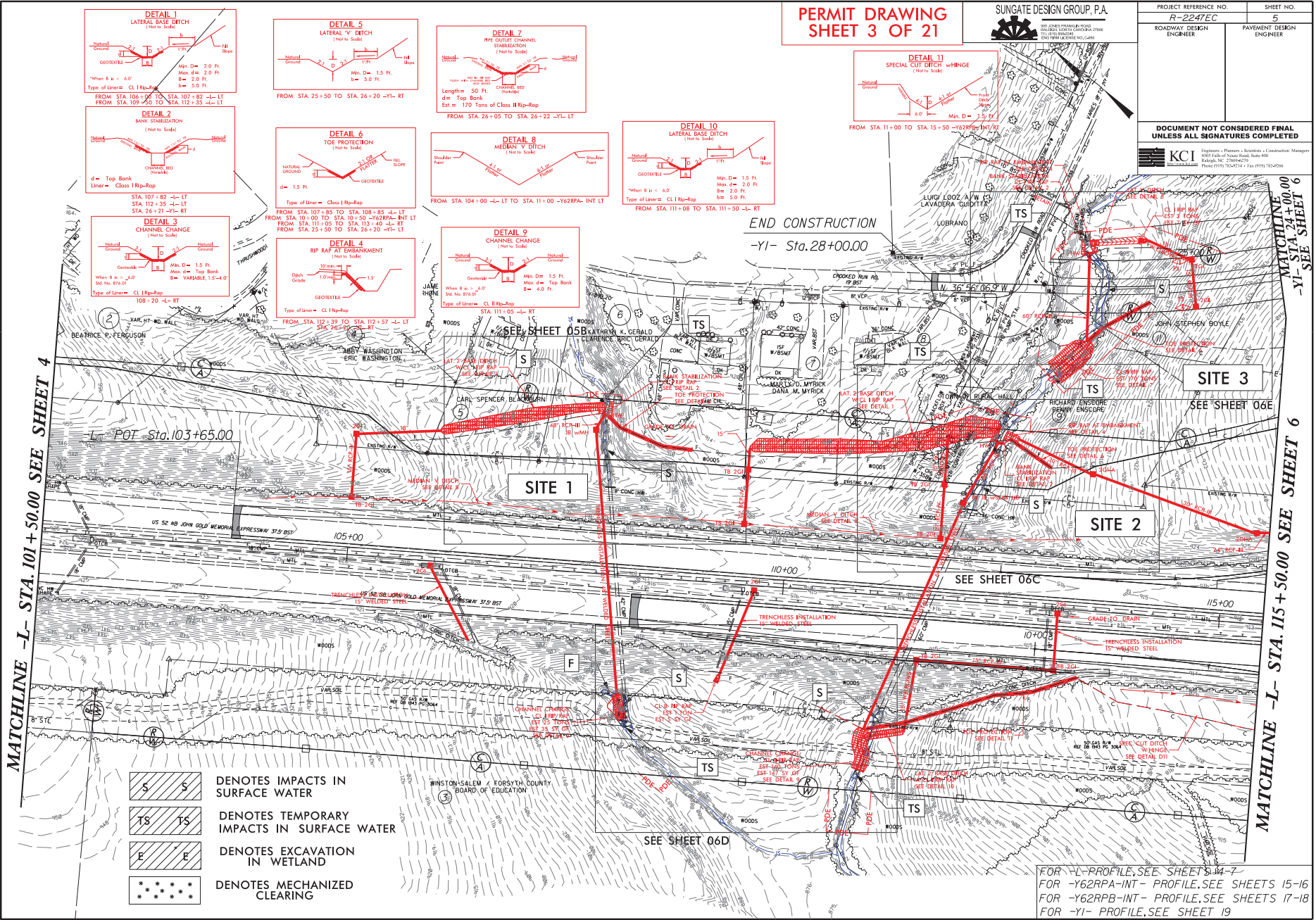
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UNLESS ALL SIGNATURES COMPLETED



END CONSTRUCTION
-YI- Sta. 28+00.00

MATCHLINE -L- STA. 101+50.00 SEE SHEET 4

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



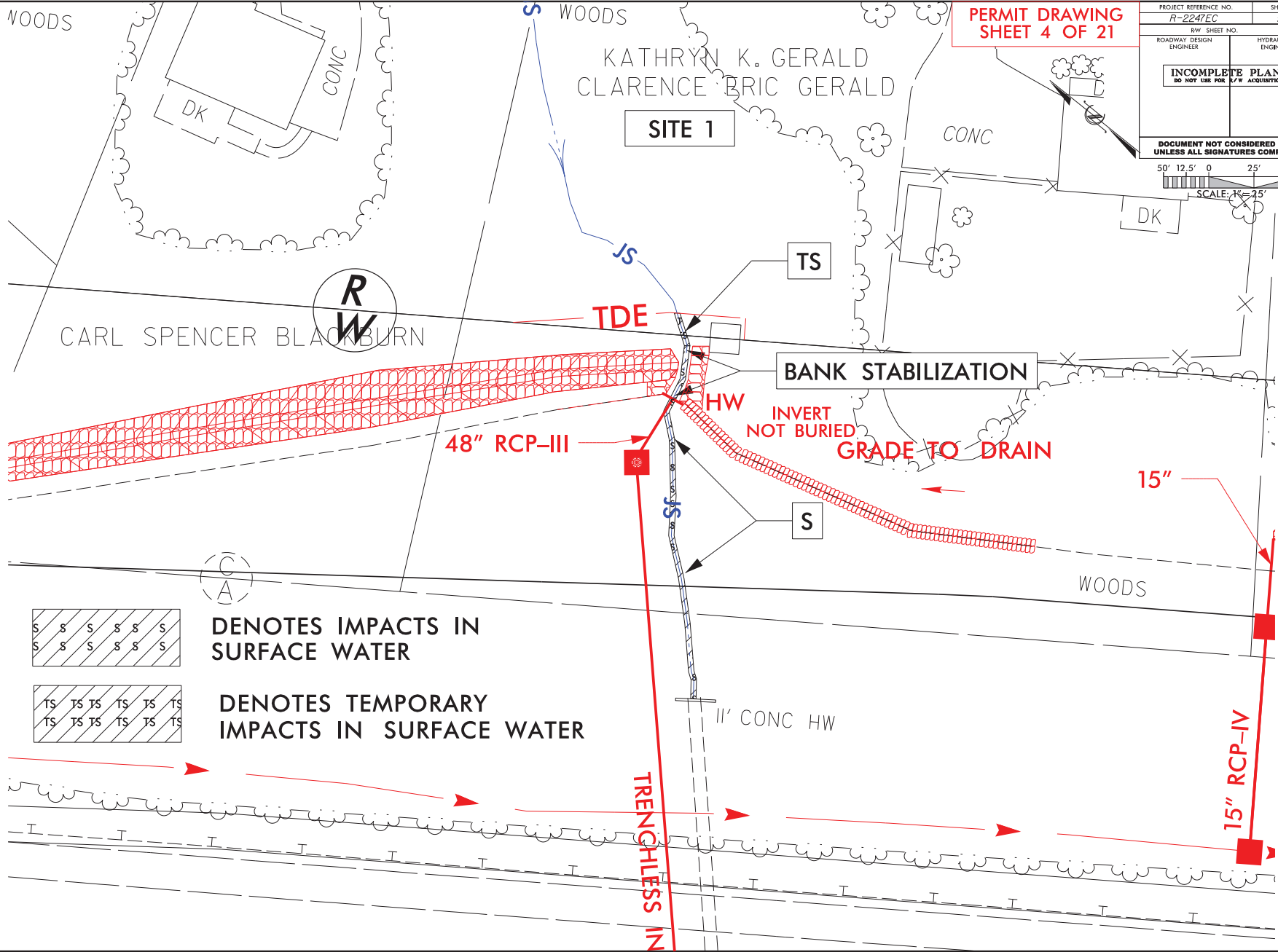
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MATCHLINE -L- STA. 115+50.00 SEE SHEET 6

FOR -L- PROFILE, SEE SHEETS 14-17
FOR -Y62RPA-INT- PROFILE, SEE SHEETS 15-16
FOR -Y62RPA-INT- PROFILE, SEE SHEETS 17-18
FOR -YI- PROFILE, SEE SHEET 19

8/17/09

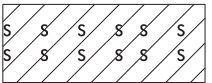
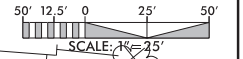
REVISIONS



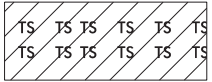
PERMIT DRAWING
SHEET 4 OF 21

PROJECT REFERENCE NO. R-2247EC	SHEET NO. 5B
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DENOTES IMPACTS IN
SURFACE WATER

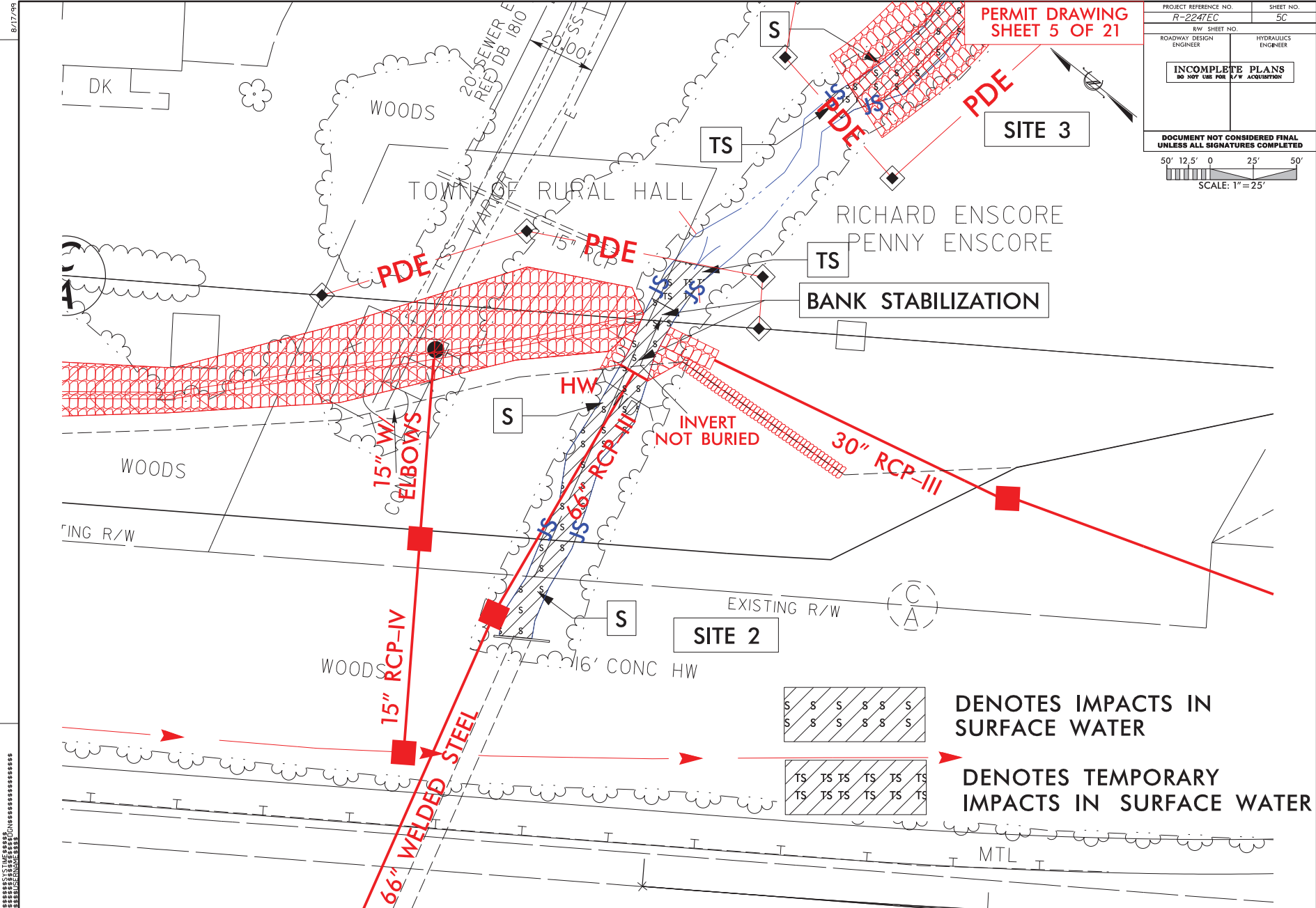


DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

01
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8/17/99

REVISIONS



PERMIT DRAWING
SHEET 5 OF 21

PROJECT REFERENCE NO. R-2247EC	SHEET NO. 50
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
50' 12.5' 0 25' 50'	
SCALE: 1" = 25'	

DENOTES IMPACTS IN
SURFACE WATER

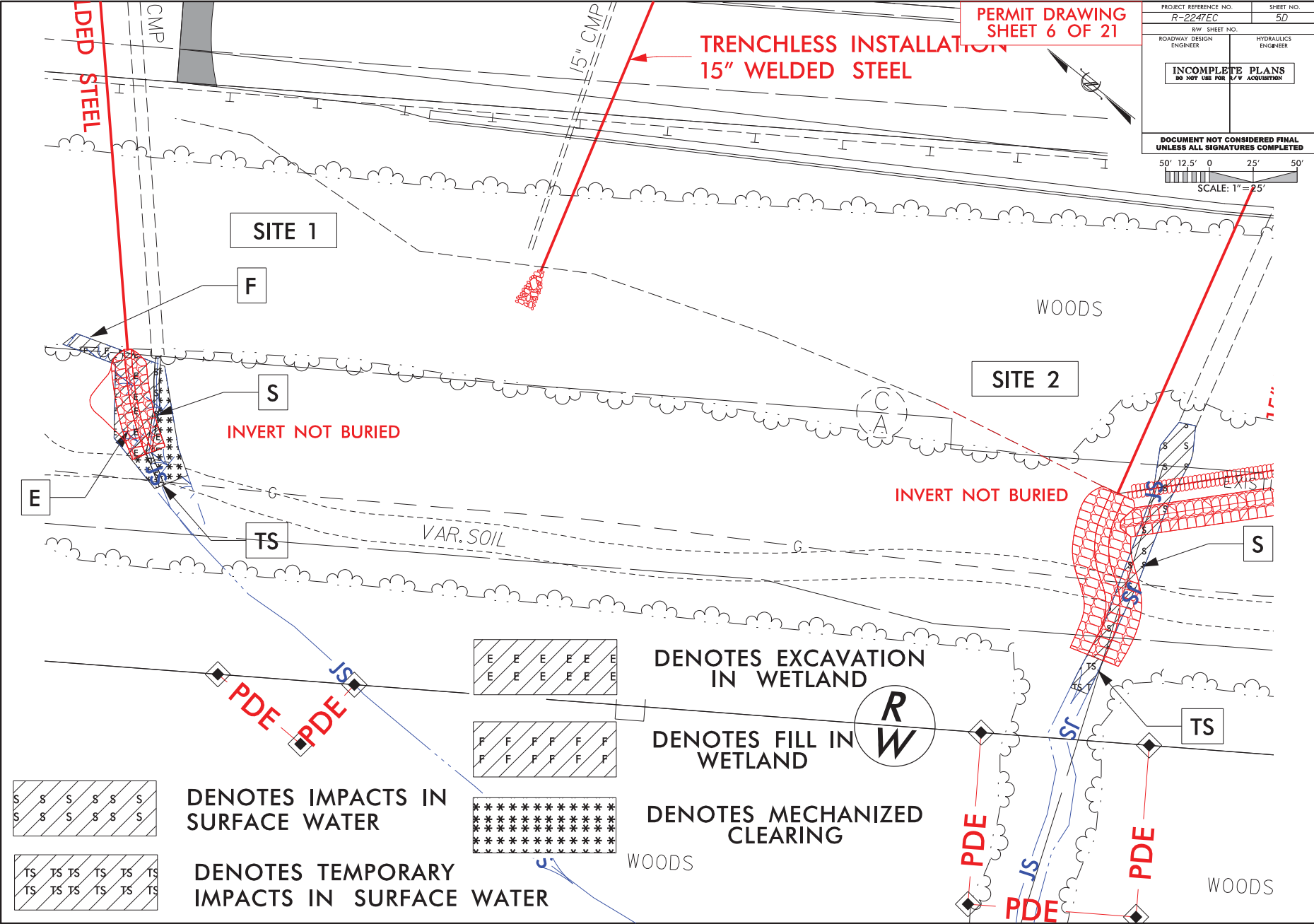
DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

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8/17/09

REVISIONS

DATE
BY
CHECKED
DATE
BY
CHECKED

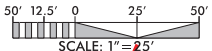


PERMIT DRAWING
SHEET 6 OF 21

PROJECT REFERENCE NO. R-2247EC	SHEET NO. 50
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



SITE 1

SITE 2

INVERT NOT BURIED

INVERT NOT BURIED

DENOTES EXCAVATION
IN WETLAND

DENOTES FILL IN
WETLAND

DENOTES MECHANIZED
CLEARING

DENOTES IMPACTS IN
SURFACE WATER

DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

WOODS

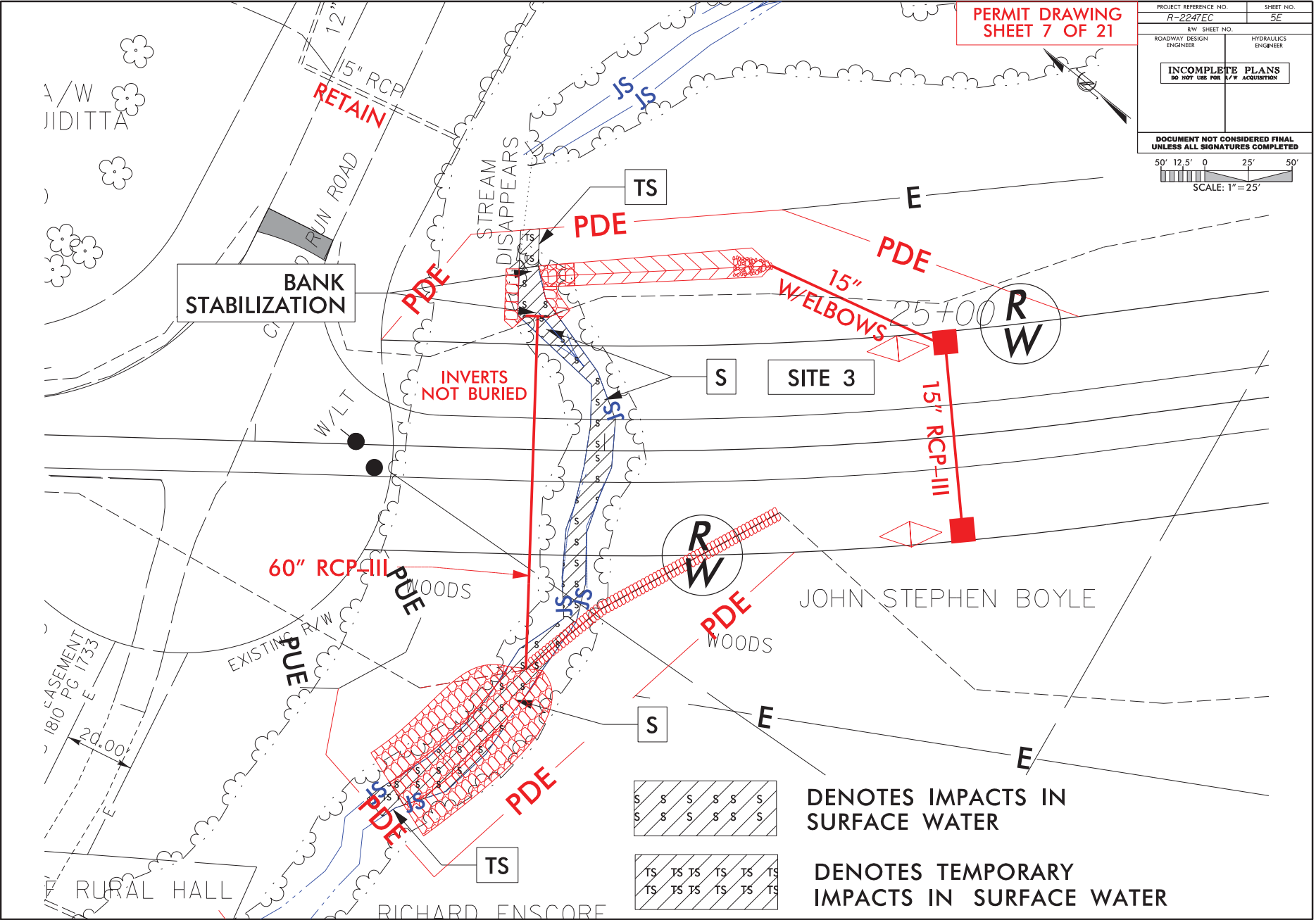
WOODS

8/17/99

REVISIONS

**PERMIT DRAWING
SHEET 7 OF 21**


PROJECT REFERENCE NO. R-2247EC	SHEET NO. 5E
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
<p>SCALE: 1" = 25'</p>	

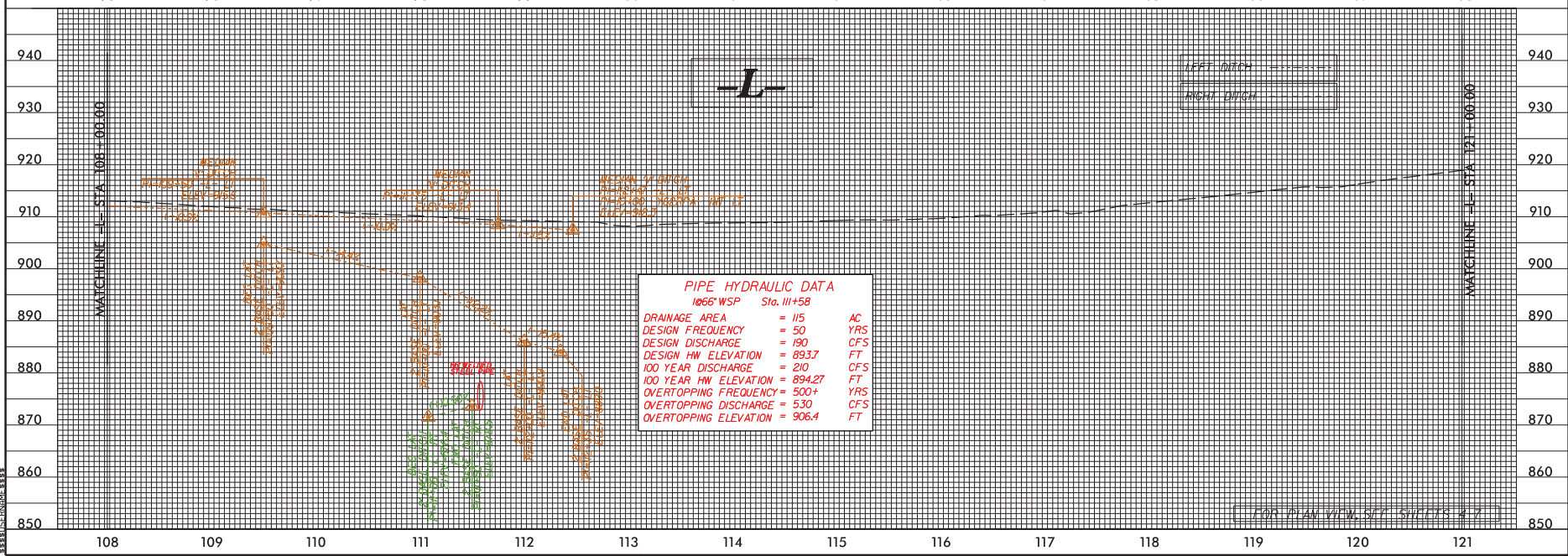
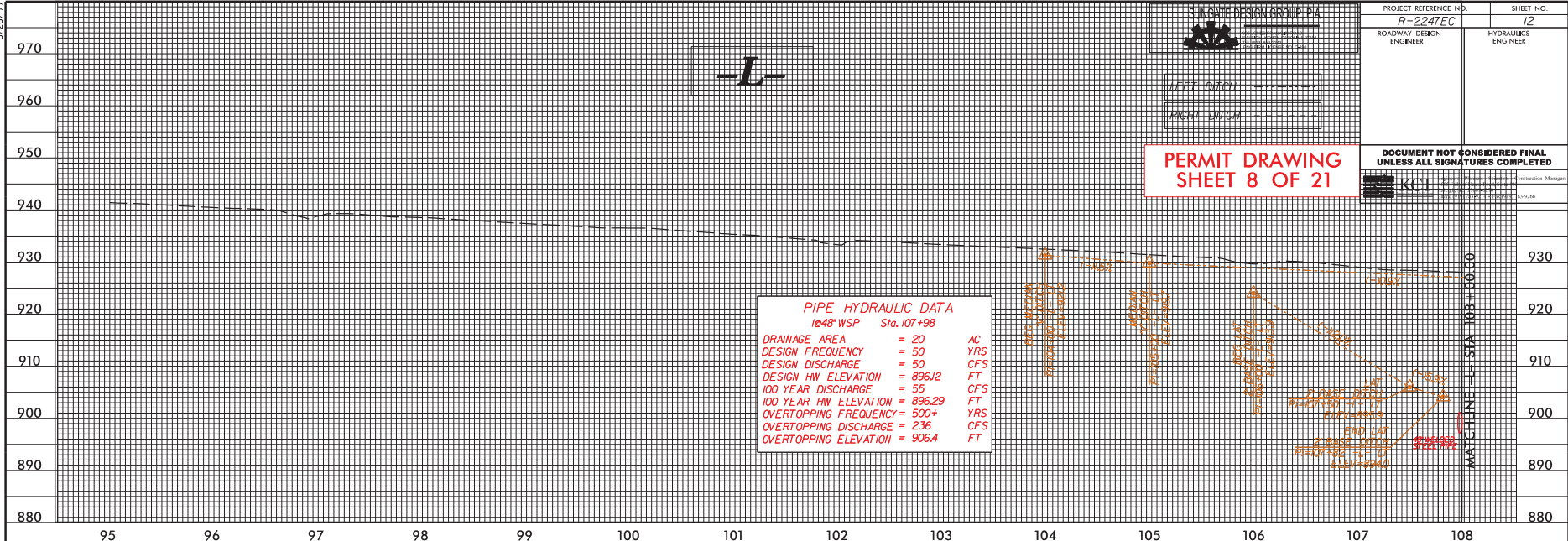


DATE: 8/17/99
DRAWN BY: [unreadable]
CHECKED BY: [unreadable]
APPROVED BY: [unreadable]

5/28/24

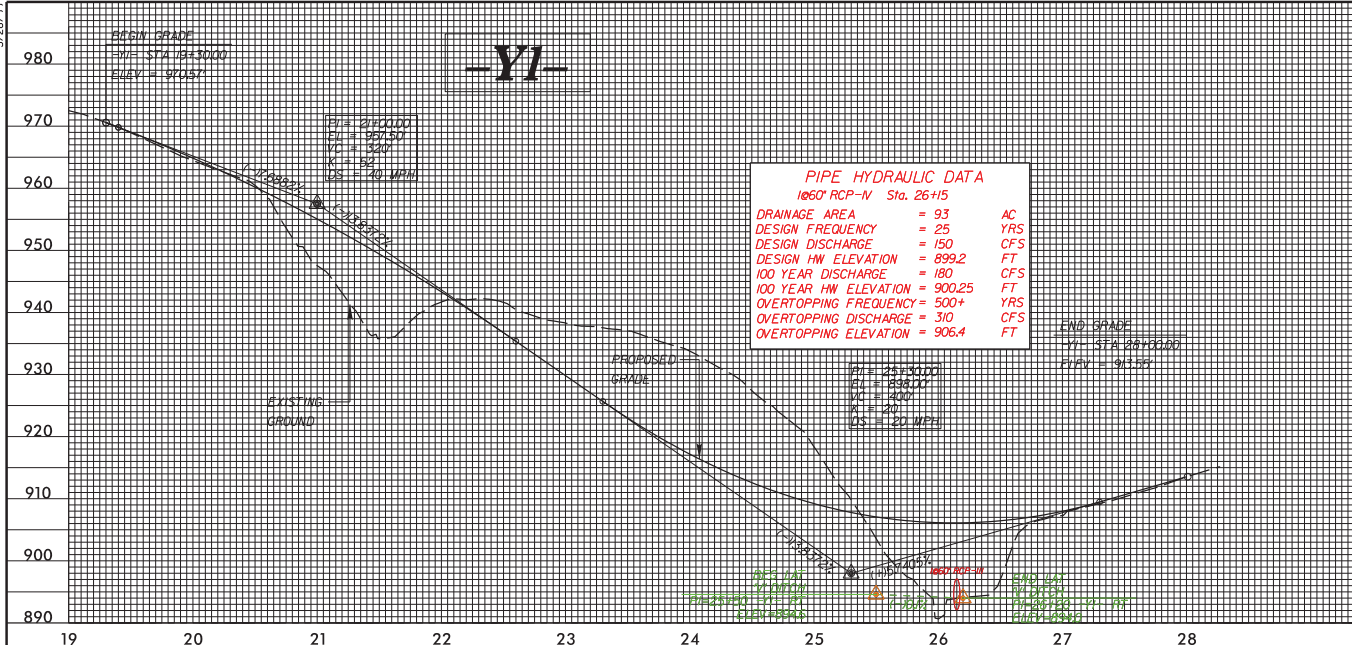
PERMIT DRAWING
SHEET 8 OF 21

PROJECT REFERENCE NO. R-2247EC	SHEET NO. 12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
	



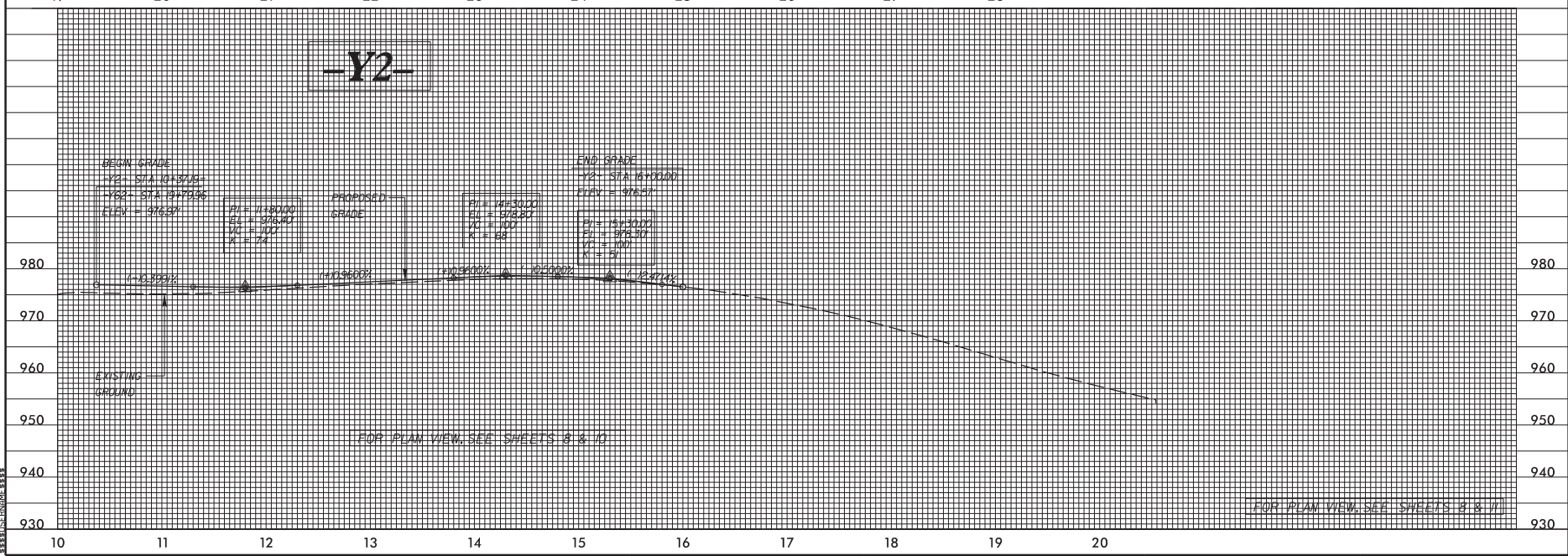
FOR BEAR VIEW SEE SHEET 7

5/28/24



KCI
 KIMMEL DESIGN GROUP, P.A.
 SUMMIT DESIGN GROUP, P.A.
PERMIT DRAWING
SHEET 9 OF 21

PROJECT REFERENCE NO. R-2247EC	SHEET NO. 19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



6/23/16



PROJ. REFERENCE NO.	SHEET NO.
R-2247EC	5J

**PERMIT DRAWING
SHEET 11 OF 21**

100 50 0 50 100

STA 26+18 -YI-
1@60" RCP-IV

905

900

895

890

885

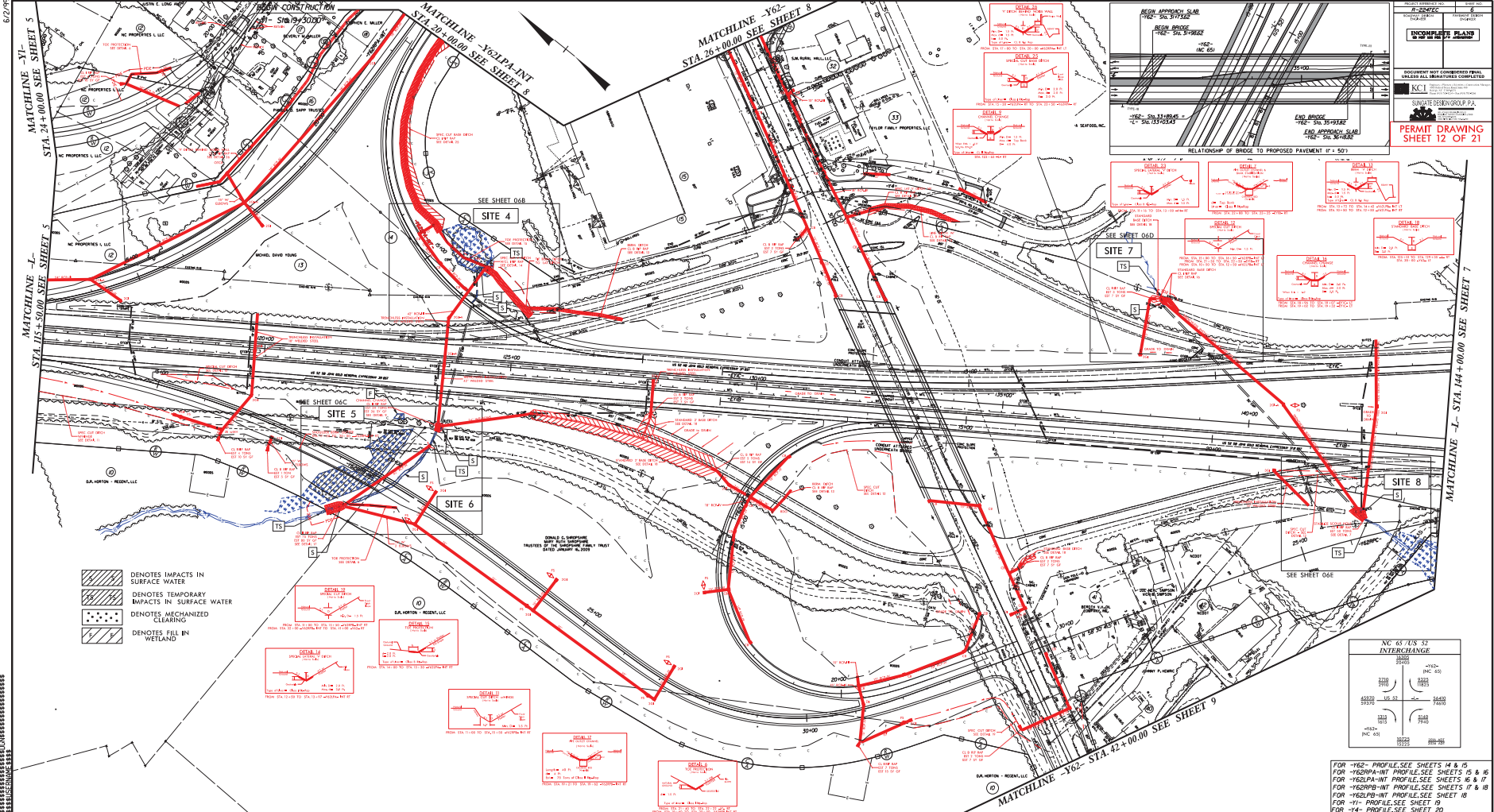
880





INV IN = 892.7

60" RCP-III
S = 2.18%

INV OUT = 890.5

C:\Users\jmc\Documents\Projects\2016\2247\2247-11.dwg

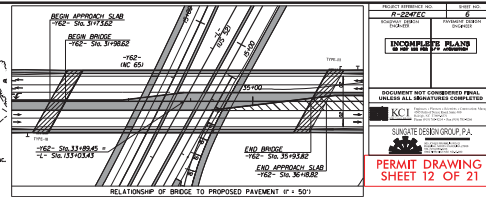


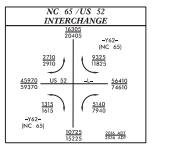
-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER
-  DENOTES MECHANIZED CLEARING
-  DENOTES FILL IN WETLAND

PERMIT DRAWING SHEET 12 OF 21

INCOMPLETE PLAN
DOCUMENT NOT COMPLETED FINAL PERMITS ALL NECESSARY COMPLETION

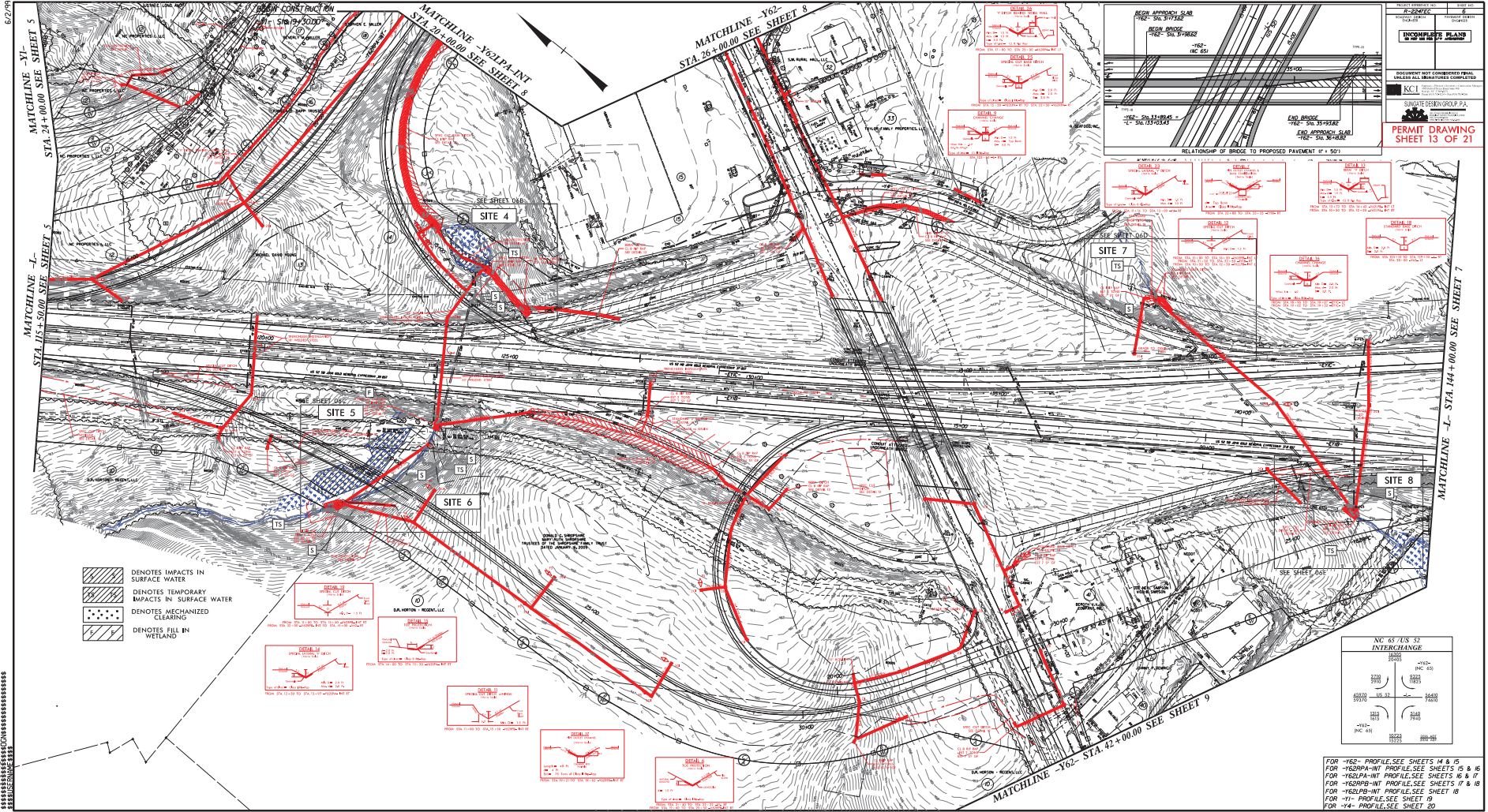
KCI ENGINEERING GROUP, P.A.
3000 W. WILSON ROAD, SUITE 200, RALEIGH, NC 27604
704.253.1234

RELATIONSHIP OF BRIDGE TO PROPOSED PAVEMENT (P + 50')




FOR -Y62- PROFILE SEE SHEETS 14 & 15
 FOR -Y62BP-INT PROFILE SEE SHEETS 15 & 16
 FOR -Y62PA-INT PROFILE SEE SHEETS 16 & 17
 FOR -Y62PB-INT PROFILE SEE SHEETS 17 & 18
 FOR -Y62PB-INT PROFILE SEE SHEET 18
 FOR -Y11- PROFILE SEE SHEET 19
 FOR -Y14- PROFILE SEE SHEET 20

85115 85116 85117 85118 85119 85120 85121 85122 85123 85124 85125 85126 85127 85128 85129 85130 85131 85132 85133 85134 85135 85136 85137 85138 85139 85140 85141 85142 85143 85144 85145 85146 85147 85148 85149 85150 85151 85152 85153 85154 85155 85156 85157 85158 85159 85160 85161 85162 85163 85164 85165 85166 85167 85168 85169 85170 85171 85172 85173 85174 85175 85176 85177 85178 85179 85180 85181 85182 85183 85184 85185 85186 85187 85188 85189 85190 85191 85192 85193 85194 85195 85196 85197 85198 85199 85200



11-224222C
 11-224222
INCOMPLETE PLAN
 DOCUMENT NOT COMPLETED FINAL
 THE FINAL DESIGN IS COMPLETED
 KCI
 SHAPIRO ENGINEERING P.A.
PERMIT DRAWING
 SHEET 13 OF 21

672-94
 MATCHLINE -Y1- STA. 24+00.00 SEE SHEET 5
 MATCHLINE -J- STA. 15+50.00 SEE SHEET 5
 MATCHLINE -Y62- STA. 26+00.00 SEE SHEET 8
 MATCHLINE -J- STA. 144+00.00 SEE SHEET 7
 MATCHLINE -Y62- STA. 42+00.00 SEE SHEET 9

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

NC 65 / US 52
INTERCHANGE

FOR -Y62- PROFILE SEE SHEETS 14 & 15
 FOR -Y62PA-INT PROFILE SEE SHEETS 15 & 16
 FOR -Y62PA-INT PROFILE SEE SHEETS 16 & 17
 FOR -Y62PB-INT PROFILE SEE SHEETS 17 & 18
 FOR -Y62PB-INT PROFILE SEE SHEET 18
 FOR -Y1- PROFILE SEE SHEET 19
 FOR -J- PROFILE SEE SHEET 20

8/17/99

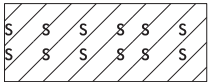
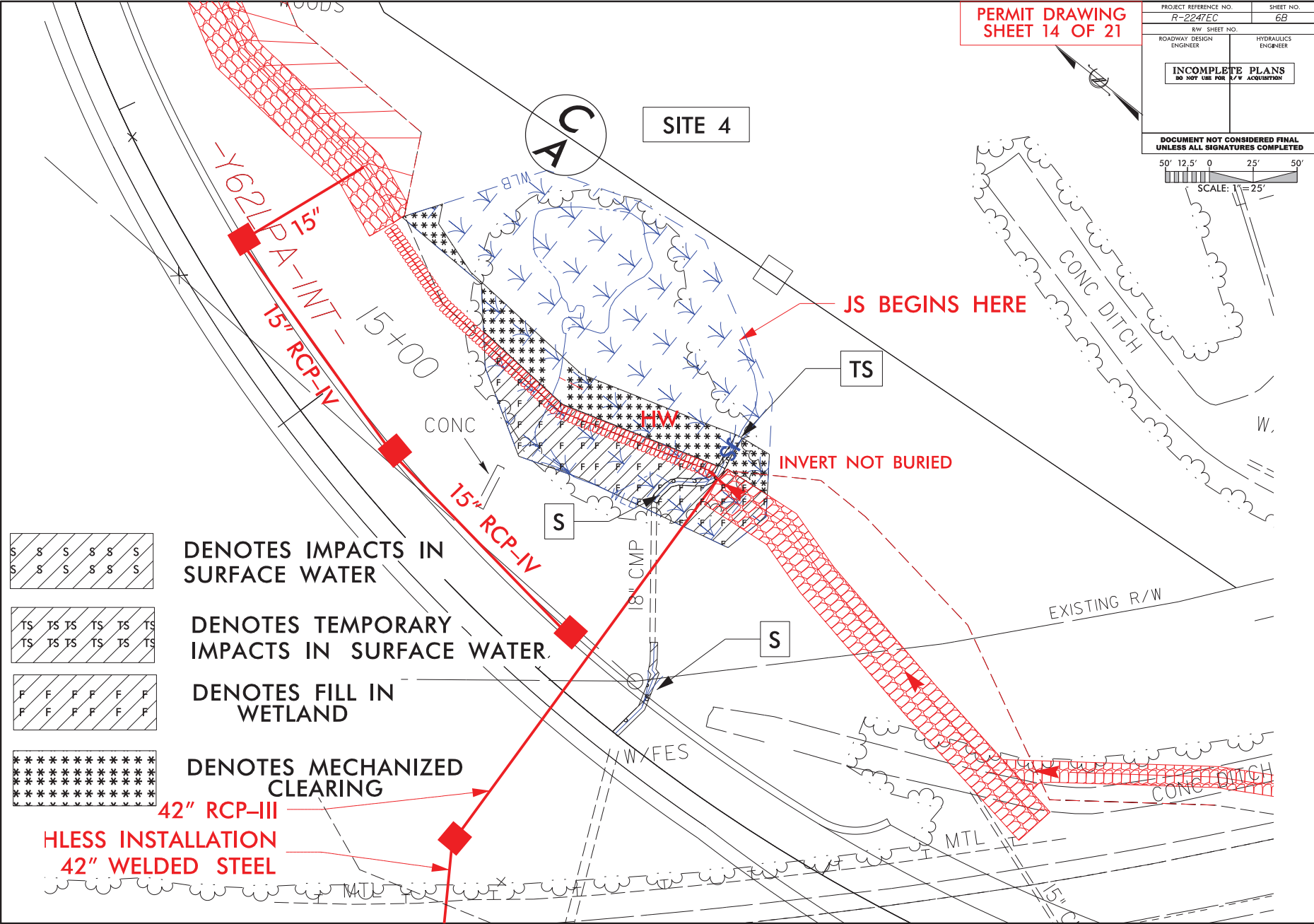
REVISIONS

PERMIT DRAWING
SHEET 14 OF 21

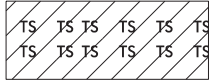
PROJECT REFERENCE NO. R-2247EC	SHEET NO. 6B
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 SCALE: 1"=25'	

SITE 4

AC



DENOTES IMPACTS IN
SURFACE WATER



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



DENOTES FILL IN
WETLAND



DENOTES MECHANIZED
CLEARING

42" RCP-III
LESS INSTALLATION
42" WELDED STEEL

JS BEGINS HERE

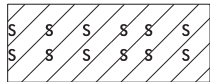
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DATE: 8/17/99
BY: [Signature]

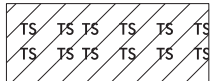
8/17/99

REVISIONS

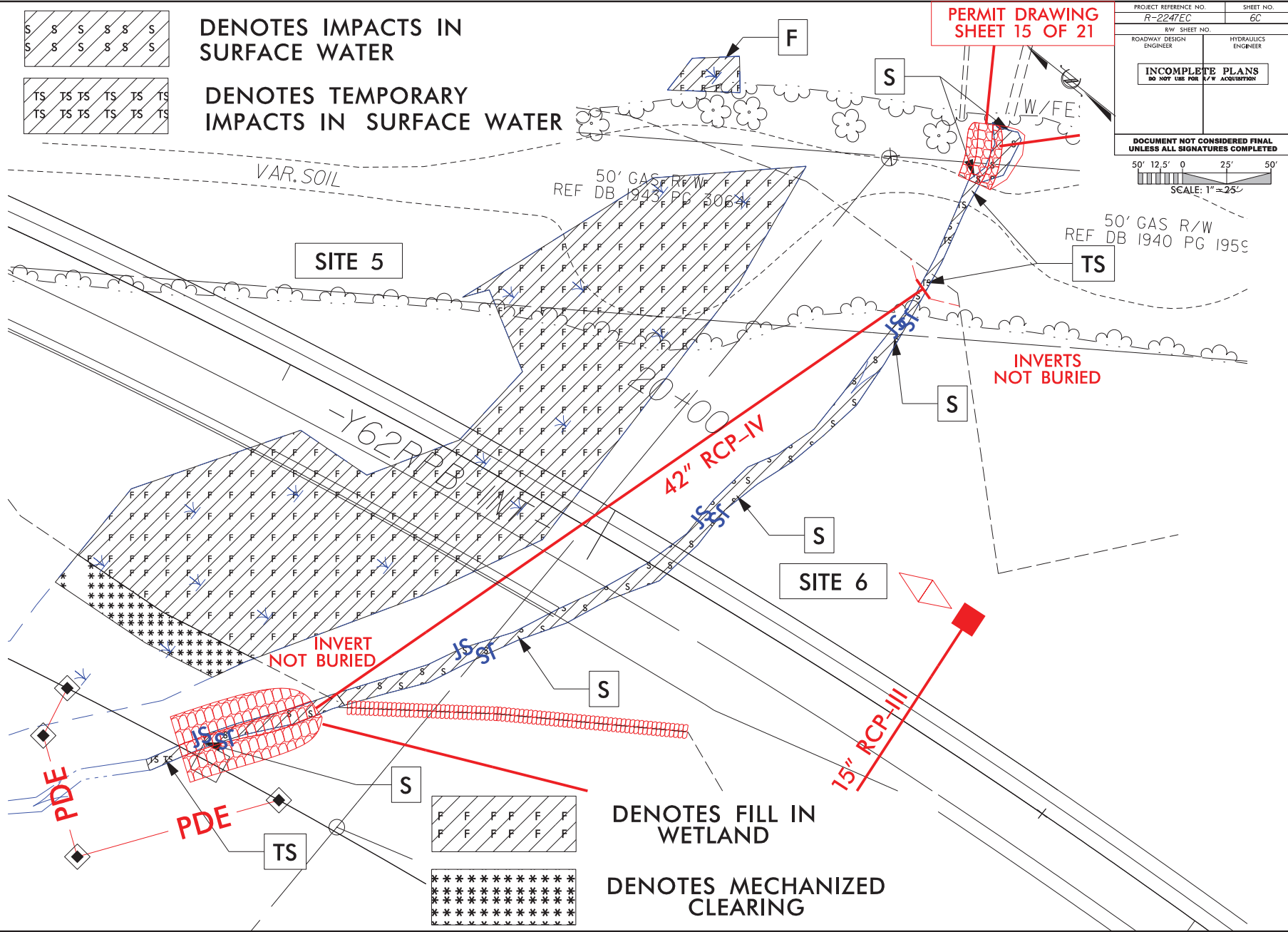
PROJECT NO. 05-1120
SHEET NO. 60
DATE 8/17/99
BY [Signature]



DENOTES IMPACTS IN
SURFACE WATER



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



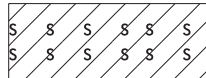
PERMIT DRAWING
SHEET 15 OF 21

PROJECT REFERENCE NO. R-2247EC	SHEET NO. 60
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
50' 12.5' 0 25' 50' SCALE: 1"=25'	

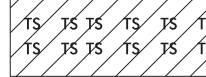
8/17/99

REVISIONS

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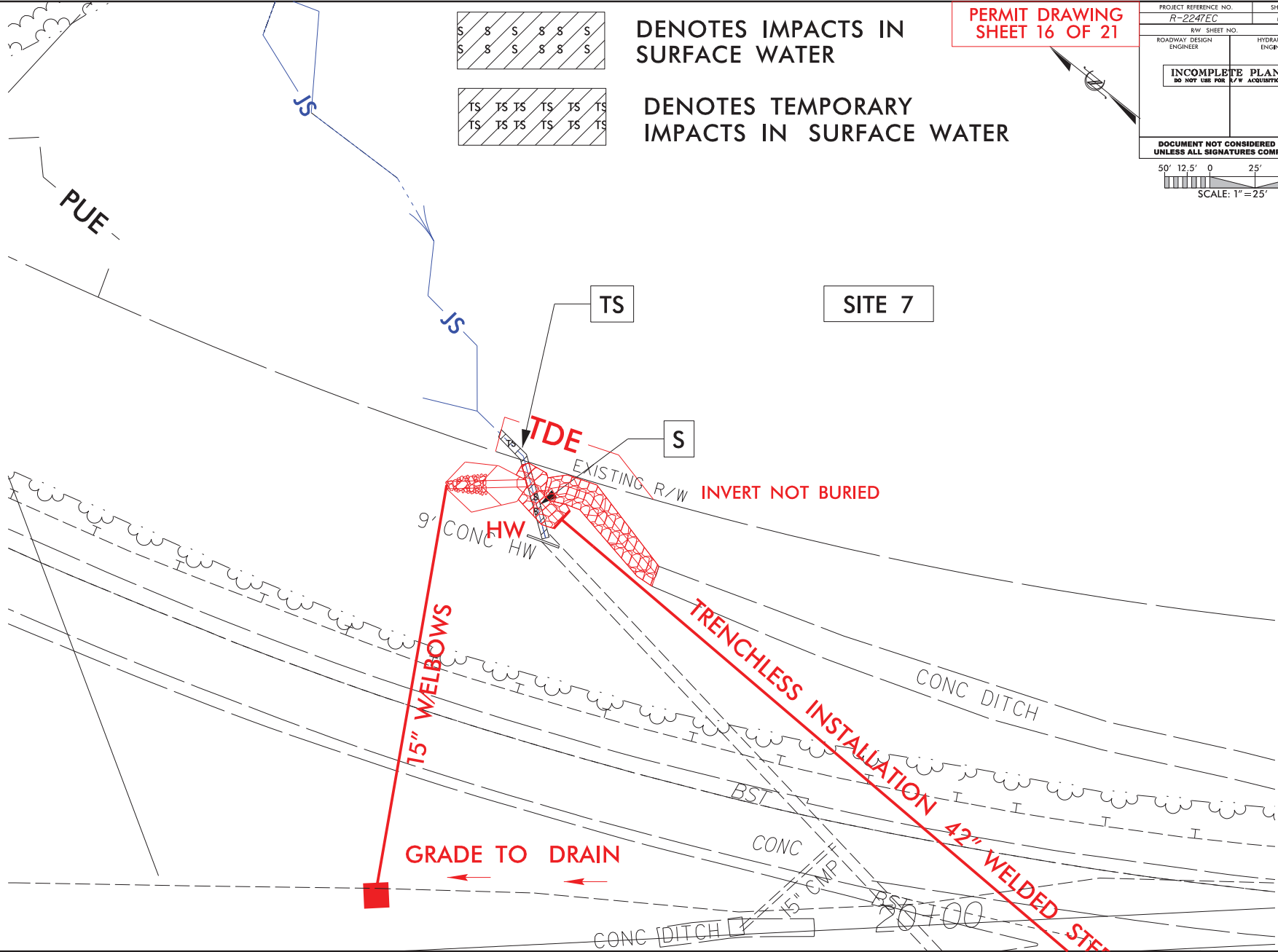
DENOTES IMPACTS IN SURFACE WATER



DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 16 OF 21

PROJECT REFERENCE NO. R-2247EC	SHEET NO. 60
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 SCALE: 1" = 25'	



SITE 7

GRADE TO DRAIN

CONC DITCH

CONC DITCH

BST

CONC

15" CMP

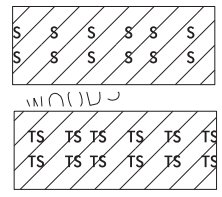
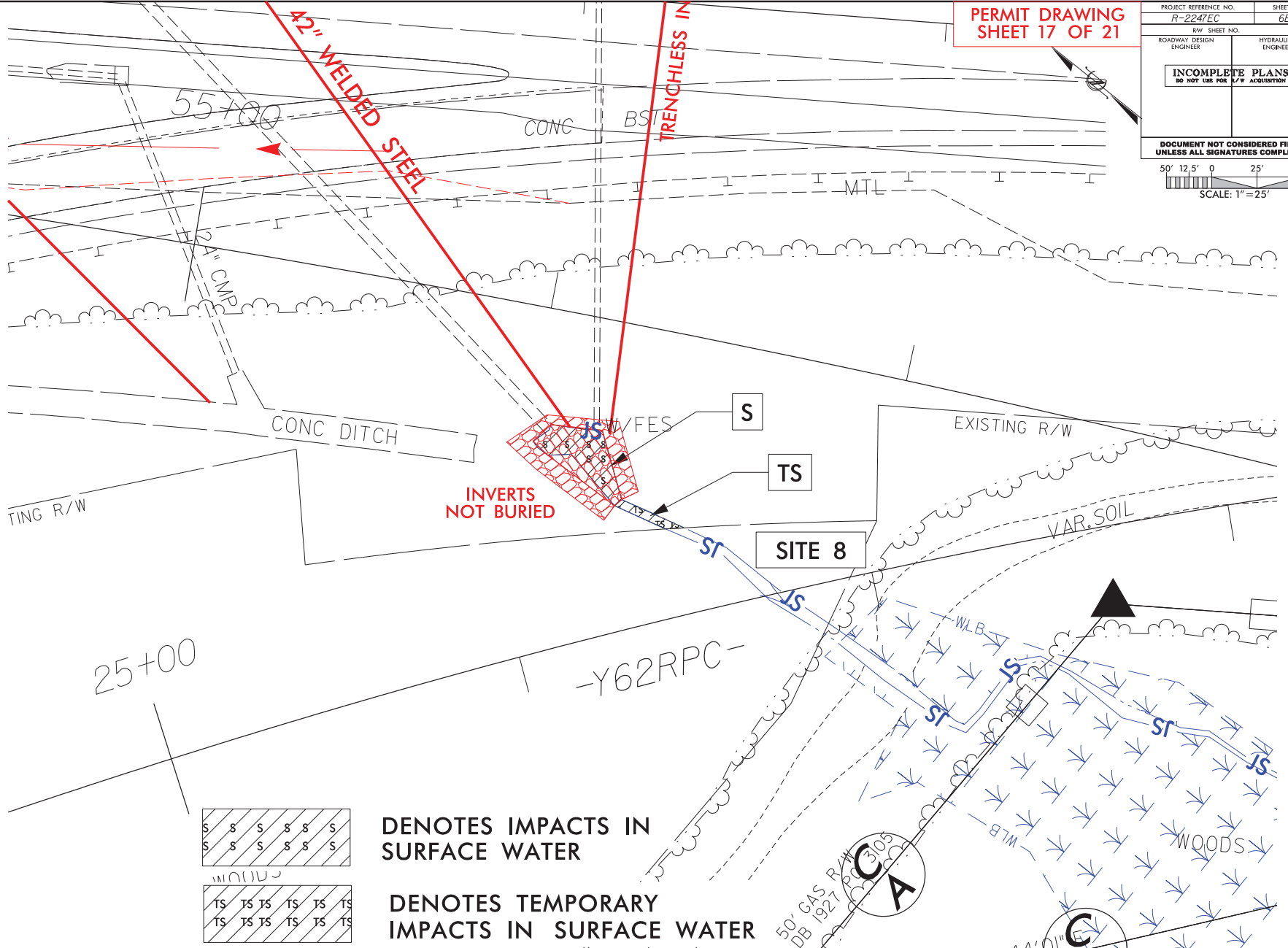
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8/17/99

REVISIONS

PERMIT DRAWING
SHEET 17 OF 21

PROJECT REFERENCE NO. R-2247EC	SHEET NO. 6E
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
<p>SCALE: 1"=25'</p>	



DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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5/28/99

-Y62LPA-INT-

QUINCY DESIGN GROUP, P.A.
 1000 W. MONROE ST. SUITE 200
 CHICAGO, ILL. 60606
 (312) 467-1000
 WWW.QDGROUP.COM

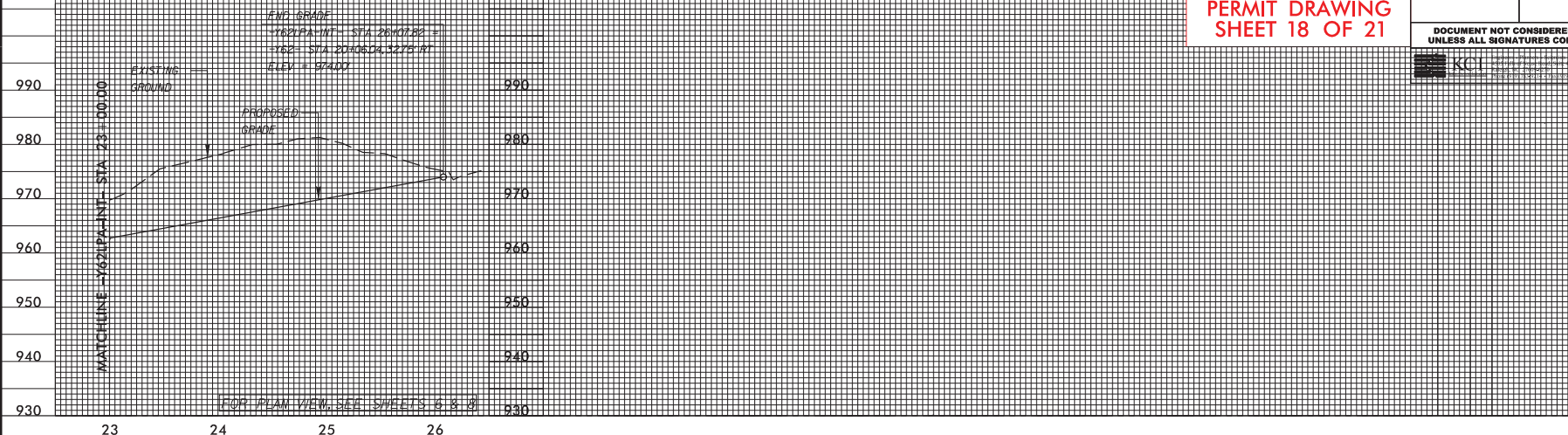
LEFT DITCH
 RIGHT DITCH

PROJECT REFERENCE NO. R-2247EC	SHEET NO. 17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING
SHEET 18 OF 21**

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

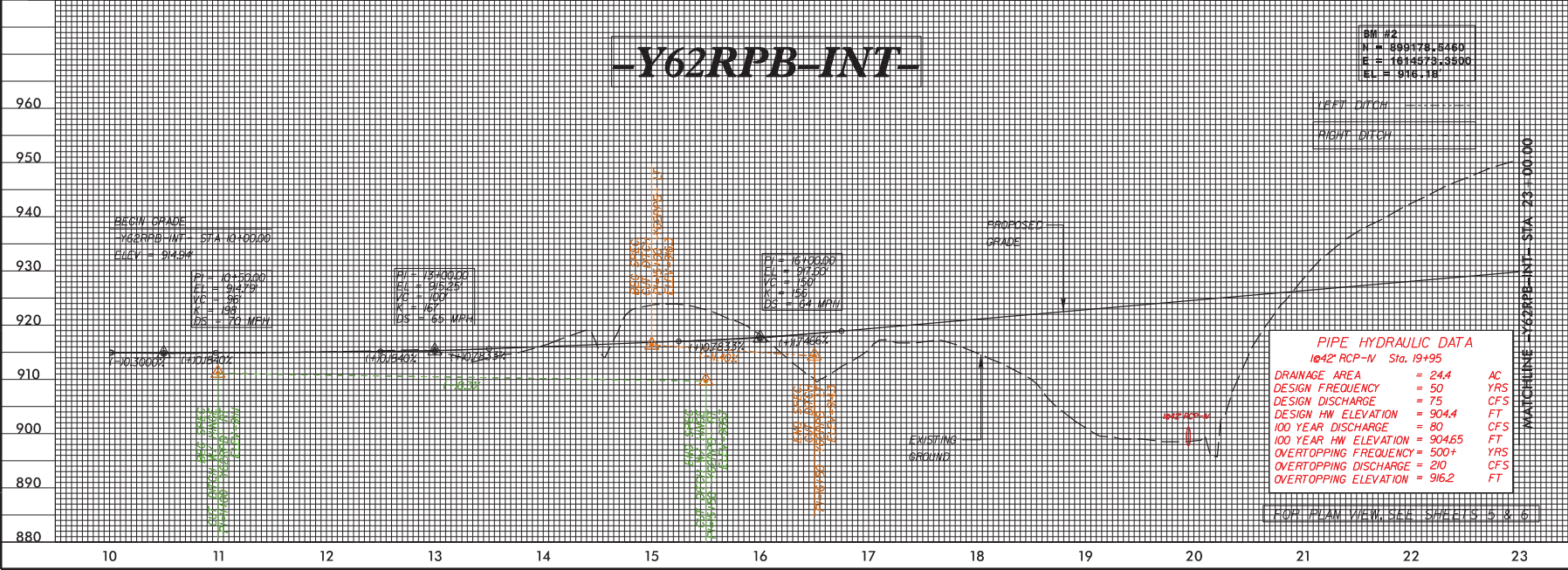
KCI
 1400 N. LAKE ST. SUITE 200
 CHICAGO, ILL. 60610
 (312) 467-1000



-Y62RPB-INT-

BM #2
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 E = 1614579.3500
 EL = 916.18

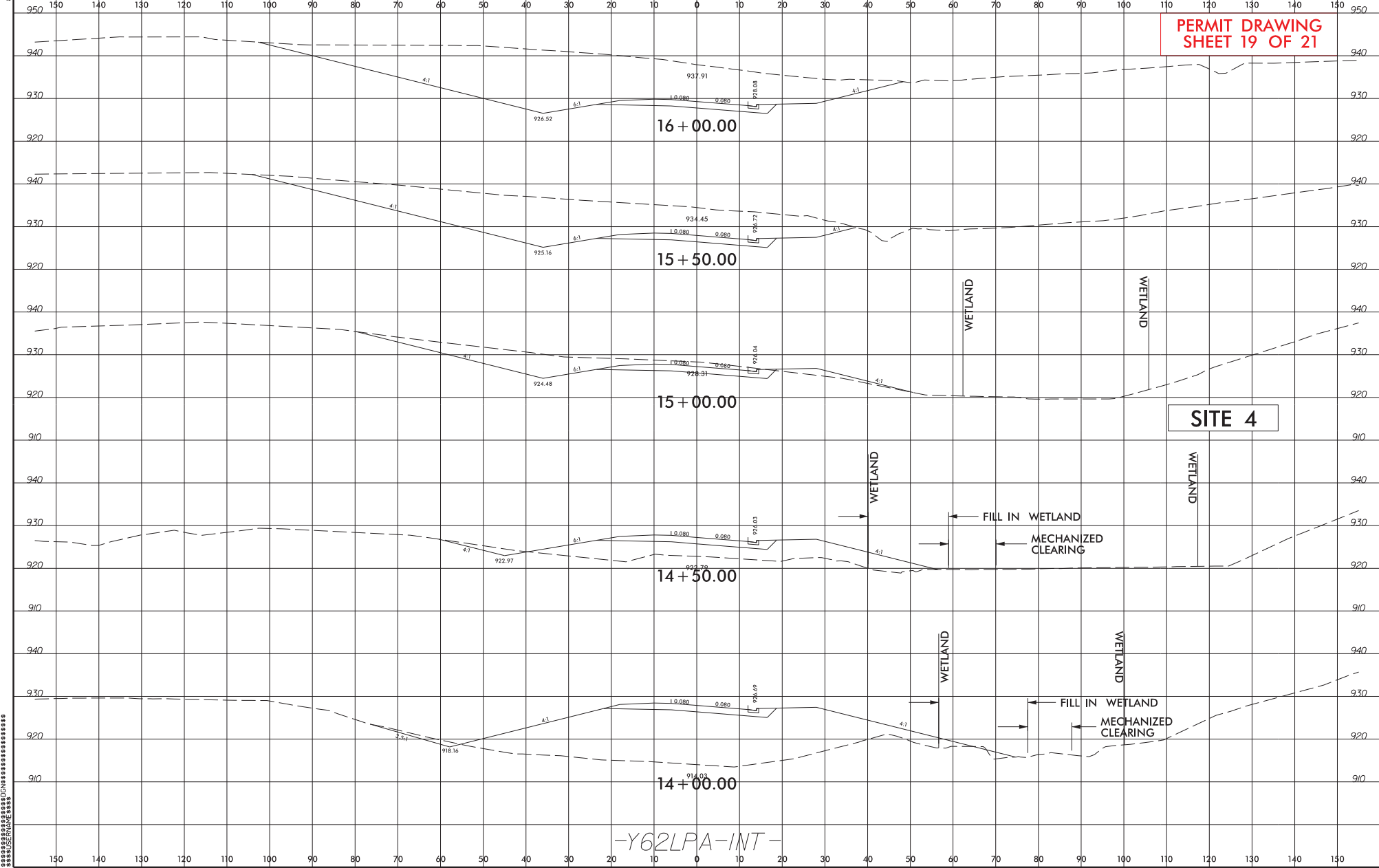
LEFT DITCH
 RIGHT DITCH



B/22498

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2247EC	X-55

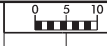
PERMIT DRAWING
SHEET 19 OF 21



-Y62LPA-INT-

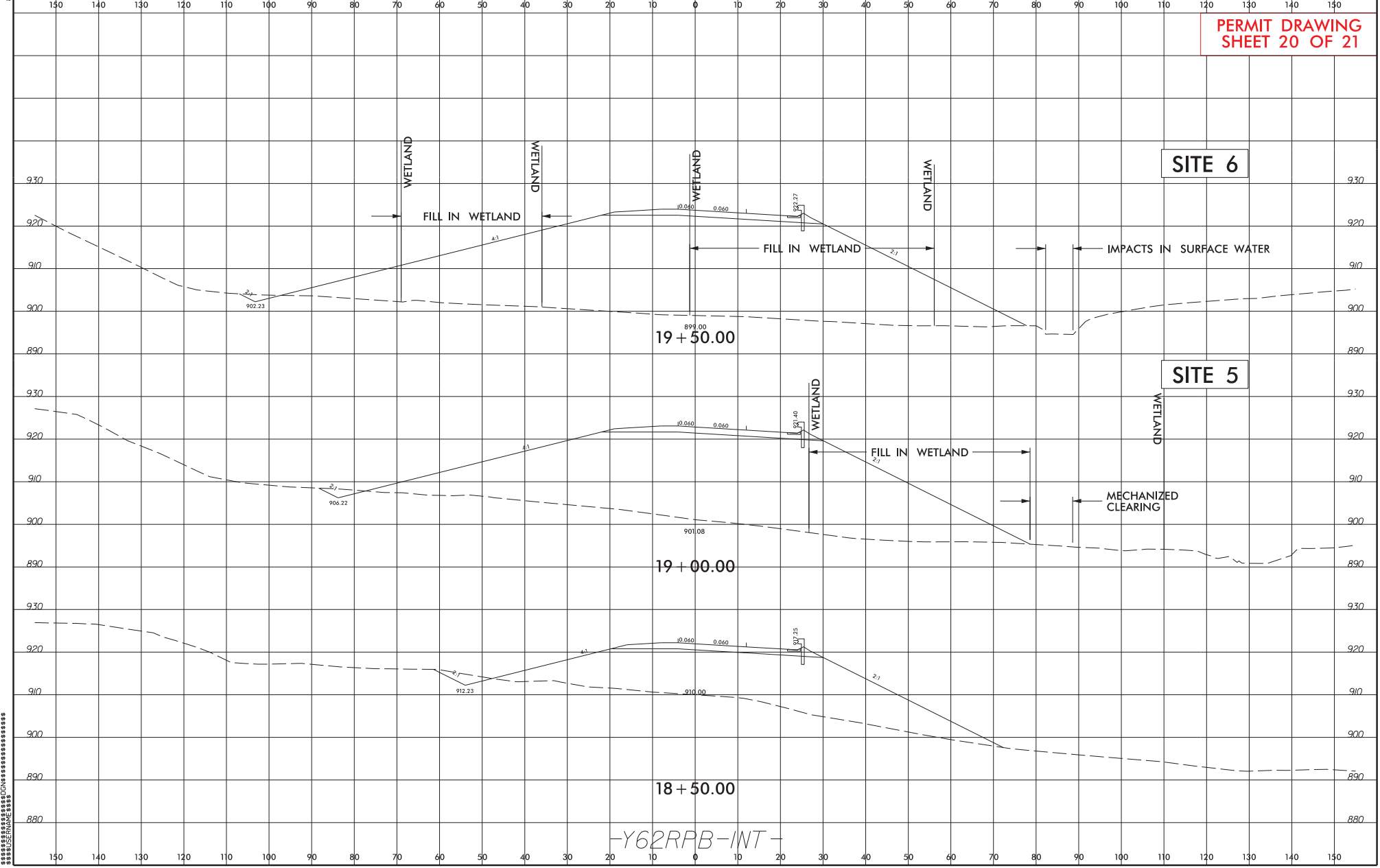
DATE PLOTTED: 11/11/2011 10:00 AM

8/22/09



PROJ. REFERENCE NO.	SHEET NO.
R-2247EC	X-62

PERMIT DRAWING
SHEET 20 OF 21



-Y62RPB-INT-

