



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

BEVERLY PERDUE  
GOVERNOR

EUGENE CONTI  
SECRETARY

February 25, 2010

MEMORANDUM TO: Mr. Jay Swain, Jr., PE  
Division Thirteen Engineer

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

SUBJECT: Rutherford County, US 221 Widening from the South Carolina Line to US 74  
Bypass; T.I.P. Number R-2233A; WBS No. 34400.1.1;

Attached is the U.S. Army Corps of Engineers Section 404 Individual Permit and N.C. Division of Water Quality Section 401 Individual Water Quality Certification for the above referenced project. All environmental permits have been received for the construction of this project.

A copy of this permit package will be posted on the NCDOT website at:  
<http://www.ncdot.gov/doh/preconstruct/pe/neu/permit.html>

PSH/gyb

Attachment

Cc: W/attachment  
Mr. Roger Bryan, Division Environmental Officer

Cc: W/o attachment (see website for attachments)  
Mr. Majed Alghandour, P. E., Programming and TIP  
Mr. Jay Bennett, P.E., Roadway Design  
Dr. David Chang, P.E., Hydraulics  
Mr. Art McMillan, P.E., Highway Design  
Mr. Tom Koch, P.E., Structure Design  
Mr. Mark Staley, Roadside Environmental  
Mr. John F. Sullivan, FHWA  
Mr. Ron Hancock, P.E., State Roadway Construction Engineer  
Mr. Mike Robinson, P.E., State Bridge Construction Engineer  
Ms. Beth Harmon, EEP  
Ms. Teresa Hart, P.E., PDEA Western Region Unit Head

## Project Commitments

Rutherford County  
US 221 Widening from the South  
Carolina Line to US 74 Bypass  
WBS No. 34400.1 1  
TIP No. R 2233A

### **Commitment developed during Project Development**

#### Geotechnical Unit

The proposed project will likely require right of way from 21 potentially contaminated properties. Preliminary site assessments to identify the nature and extent of any contamination will be performed on these sites prior to right of way acquisition.

#### PDEA-NEU

Additional coordination with the USFWS regarding the projects potential effects on the federally protected dwarf flowered heartleaf will be conducted prior to construction of the project.

#### PDEA-HEU

An archeological survey to identify significant archeological resources will be performed prior to construction activities.

### **Commitment Developed during Permitting.**

#### PDEA-Natural Environment Unit

Compensatory mitigation for unavoidable impacts to 2,870 linear feet of cool weather stream channel (HUC 03050105) associated with the proposed project shall be provided by EEP as outlined in the October 22, 2007 letter from William Gilmore, P.E., EEP director. Pursuant to Section X of the EEP MOA and as revised March 8, 2007 between the State of North Carolina and the USACE signed July 22, 2003 the EEP will provide 5,740 linear feet of cool water stream restoration in the Upper Broad River Basin, HUC 03050105

All Conservation Measures recommended in the attached Biological Opinion from the US Fish and Wildlife Service dated May 12, 2009 are hereby incorporated as special conditions of this permit.

#### Division 12 Construction

During construction of the bridge over the Broad River at Site 5, no more than half the channel shall be blocked by causeways at any time.

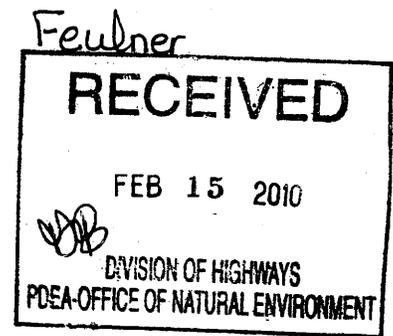
#### Natural Environment Unit

The NCDOT will resurvey the corridor for the dwarf flowered heartleaf prior to project let for R 2233B. If plants are found, NCDOT will reinitiate consultation.



REPLY TO  
ATTENTION OF:

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



February 12, 2010

Regulatory Division

Action ID: SAW-2008-02242; NCDOT TIP No. R-2233A

Dr. Gregory J. Thorpe, PhD, Manager  
Project Development and Environmental Analysis Branch  
N.C. Department of Transportation  
Division of Highways  
1598 Mail Service Center  
Raleigh, North Carolina 27699-1598

Dear Dr. Thorpe:

Enclosed is a Department of the Army permit to discharge fill material into 3,342 linear feet of stream channel in Floyds Creek, the Broad River and unnamed tributaries and 0.14 acre of adjacent wetland, within the Broad River drainage, associated with the widening of US Highway 221 in Rutherfordton, Rutherford County, North Carolina (TIP No. R-2233A).

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

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

- a. You must complete construction before December 31, 2015.
- b. 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 must notify this office in advance as to when you intend to commence and complete work.

You should address all questions regarding this authorization to Mr. David Baker, Regulatory Division, Asheville Regulatory Field Office, telephone (828) 271-7980, extension 225.

Sincerely,



FOR: Jefferson M. Ryscavage  
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. Ronald J. Mikulak, Chief  
Wetlands Regulatory Section  
61 Forsyth Street  
Atlanta, Georgia 30303

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

Mr. Ron Sechler  
National Marine Fisheries Service  
Pivers Island  
Beaufort, North Carolina 28516

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

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

RECEIVED

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REGULATORY  
WILMFLDOFC.

DEPARTMENT OF THE ARMY PERMIT

Permittee **North Carolina Department of Transportation**

Permit No. **SAW 2008-2242**

Issuing Office **CESAW-RG-A**

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

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

Project Description: **to discharge fill material into 0.14 acres of wetland, and 3,342 linear feet of stream channel in Floyds Creek, the Broad River, and unnamed tributaries in conjunction with the widening of US Highway 221 (TIP No. R-2233A)**

Project Location: **in Rutherfordton, Rutherford County, North Carolina.**

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on **January 28, 2015**. 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).
  - 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.



## **SPECIAL CONDITIONS**

**AID #: SAW 2008-2242**

1. All work must be performed in strict compliance with the attached plans, which are a part of this permit. Any modifications to the permit plans must be approved by the Corps of Engineers prior to implementation.
2. Failure to institute and carry out the details of the following special conditions will result in a directive to cease all ongoing and permitted work within waters and/or wetlands associated with the permitted project or such other remedies and/or fines as the District Engineer or his authorized representatives may seek.
3. The permittee will ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Written verification shall be provided that the final construction drawings comply with the attached permit drawings prior to any active construction in waters of the United States, including wetlands. Any deviation in the construction design plans will be brought to the attention of the Corps of Engineers, Asheville Regulatory Field Office prior to any active construction in waters and wetlands.
4. The permittee shall schedule a pre-construction meeting between their representatives, the contractor and the Corps of Engineers, Asheville Regulatory Field Office, NCDOT Regulatory Project Manager prior to any work in jurisdictional waters and wetlands to ensure that there is a mutual understanding of all terms and conditions contained in this DA permit. The permittee shall provide the NCDOT Regulatory Project Manager with a copy of the final plans at least two weeks prior to the pre-construction meeting along with a description of any changes that have been made to the project's design, construction methodology or construction timeframe. The permittee shall schedule the pre-construction meeting for a time when the Corps of Engineers and North Carolina Division of Water Quality (NCDWQ) Project Managers can attend. The permittee shall notify the Corps of Engineers and NCDWQ Project Managers a minimum of thirty (30) days in advance of the meeting.
5. 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, and any authorized modifications. A copy of this permit and any authorized modifications, including all conditions, shall be available at the project site during construction and maintenance of this project.
6. Except as authorized by this permit or any Corps of Engineers 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 nor shall any activities take place that cause the degradation of waters or wetlands. In addition, except as specified in the plans attached to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project in such a manner as to

**SPECIAL CONDITIONS**  
**AID #: SAW 2008-2242**

12. All authorized culverts will be installed to allow the passage of low stream flows and the continued movement of fish and other aquatic life as well as to prevent head-cutting of the streambed. For all box culverts and for pipes greater than 48 inches in diameter, the bottom of the culvert will be buried one foot below the bed of the stream unless such burial would be impractical and the Corps of Engineers has waived this requirement. For culverts 48 inches in diameter or smaller, the bottom of the pipe will be buried below the bed of the stream to a depth equal to or greater than 20 percent of the diameter of the culvert. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in the disequilibrium of wetlands, streambeds or stream banks adjacent to, upstream of or downstream of the structures. In order to allow for the continued movement of bed load and aquatic organisms, existing channel widths and depths will be maintained at the inlet and outlet ends of culverts. Riprap armoring of streams at culvert inlets and outlets shall be minimized above ordinary high water elevation in favor of bioengineering techniques such as bank sloping, erosion control matting and revegetation with deep-rooted native woody plants.

13. Unless 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.

14. All mechanized equipment operating near surface waters shall be regularly inspected to prevent contamination of streams from leakage of fuels, lubricants, hydraulic fluids or other toxic materials. No equipment staging or storage of construction material will occur in wetlands. Hydro-seeding equipment will not be discharged or washed out into any surface waters or wetlands. In the event of a spill of petroleum products or any other hazardous waste, the permittee shall immediately report it to the NC Division of Water Quality at (919) 733-5083 or (800) 662-7956 and provisions of the North Carolina Oil Pollution and Hazardous Substances Control Act will be followed.

15. Compensatory mitigation for unavoidable impacts to 2,870 linear feet of cool-water stream channel (HUC 03050105) associated with the proposed project shall be provided by the Ecosystem Enhancement Program (EEP) as outlined in the October 22, 2007 letter from William D. Gilmore, P.E., EEP Director. Pursuant to Section X of the EEP Memorandum of Agreement (MOA) and as revised on March 8, 2007, between the State of North Carolina and the US Army Corps of Engineers, Wilmington District, signed on July 22, 2003, the EEP will provide 5,740 linear feet of cool water stream restoration in the Upper Broad River Basin, Hydrologic Cataloging Units 03050105.



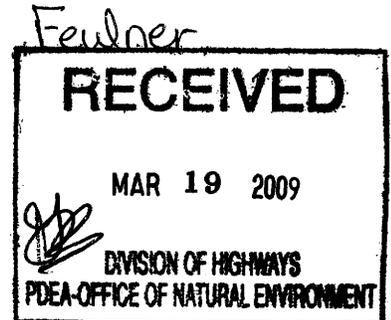
North Carolina Department of Environment and Natural Resources

Division of Water Quality  
Coleen H. Sullins  
Director

Beverly Eaves Perdue  
Governor

Dee Freeman  
Secretary

March 5, 2009



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

**Subject:** 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS for Proposed improvements to US 221 from the South Carolina line to US 74 Bypass in Rutherford County TIP R 2233A, Division 13.  
DWQ Project No. 20081809

Dear Dr. Thorpe:

Attached hereto is a copy of Certification No. 3784 issued to The North Carolina Department of Transportation dated March 5, 2009

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

Sincerely



Coleen H. Sullins  
Director

**Attachments**

cc: David Baker, US Army Corps of Engineers, Asheville Field Office  
Roger Bryan, Division 13 Environmental Officer  
Kathy Matthews, Environmental Protection Agency  
Marla Chambers, NC Wildlife Resources Commission  
Mike Parker, DWQ Asheville Regional Office  
File Copy



North Carolina Department of Environment and Natural Resources

Division of Water Quality  
 Coleen H. Sullins  
 Director

Dee Freeman  
 Secretary

Beverly Eaves Perdue  
 Governor

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

**THIS CERTIFICATION** is issued in conformity with the requirements of Section 401 Public Laws 92 500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality (DWQ) Regulations in 15 NCAC 2H .0500 This certification authorizes the NCDOT to impact 0.02 acres of jurisdictional wetlands and 3,580 linear feet of jurisdictional streams in Rutherford County The project shall be constructed pursuant to the application dated received December 10, 2008. The authorized impacts are as described below:

**R-2233AA Stream Impacts in the Broad River Basin**

| 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) |
|--------------|---|---|--|--|---------------------------------|---|
| 1            | 90  |   |  |  | 90                              |   |
| 2            |   |   | 205  |  | 205                             | 205   |
| 3            |   |   | 109  |  | 109                             |   |
| 4            |   |   | 188  |  | 188                             | 188   |
| 5            |   |   | 36   | 127  | 163                             |   |
| 6            | 156   |   |  |  | 156                             |   |
| 7            |   |   | 615  |  | 615                             | 615   |
| 8            |   |   | 832  |  | 832                             | 832   |
| 9            |   |   | 210  |  | 210                             | 210   |
| 10           |   |   | 408  |  | 408                             | 408   |
| <b>Total</b> | <b>246</b>  |   | <b>2,603</b>                                   | <b>127</b>                                     | <b>2,976</b>                    | <b>2,458</b>                                    |

**Total Stream Impact for Project: 2,976 linear feet**

**R-2233AB Stream Impacts in the Broad River Basin**

| 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) |
|--------------|---|---|--|--|---------------------------------|---|
| 1            |   |   | 60   | 20   | 80                              |   |
| 2            | 226   |   |  |  | 226                             |   |
| 3            |   |   | 228  | 45   | 273                             | 228   |
| 4            |   |   | 15   | 10   | 25                              |   |
| <b>Total</b> | <b>226</b>  |   | <b>303</b>                                     | <b>75</b>                                      | <b>604</b>                      | <b>228</b>                                      |

**Total Stream Impact for Project: 604 linear feet**



North Carolina Department of Environment and Natural Resources

Division of Water Quality

Coleen H. Sullins

Director

Beverly Eaves Perdue  
Governor

Dee Freeman  
Secretary

**R-2233AA Wetland Impacts in the Broad River Basin**

| Site         | Fill<br>(ac) | Fill<br>(temporary)<br>(ac) | Excavation<br>(ac) | Mechanized<br>Clearing<br>(ac) | Hand<br>Clearing<br>(ac) | Total<br>Wetland<br>Impact (ac) |
|--------------|--------------|-----------------------------|--------------------|--------------------------------|--------------------------|---------------------------------|
| 3            | 0.01         |                             |                    | 0.01                           |                          | 0.02                            |
| <b>Total</b> | <b>0.01</b>  |                             |                    | <b>0.01</b>                    |                          | <b>0.02</b>                     |

**Total Wetland Impact for Project: 0.02 acres.**

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

This approval is only valid for the purpose and design that you submitted in your application dated received December 10, 2008. Should your project change, you are required to notify the DWQ and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 150 linear feet, respectively additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

**Condition(s) of Certification:**

1. During construction of the bridge over the Broad River at Site 5, no more than half of the channel shall be blocked by causeways at any time.
2. The dwarf flowered heartleaf population located at station Y2 12+50 shall be protected in perpetuity by a conservation easement or through NCDOT's fee simple acquisition and recorded in the NCDOT Natural Environment Unit mitigation geodatabase.
3. At Station No. -L-534+17 a 2-foot sill shall be installed in the overflow pipe and four baffles shall be installed in both pipes to mimic the natural stream flow
4. Compensatory mitigation for 2,686 linear feet of impact to streams is required. We understand that you have chosen to perform compensatory mitigation for impacts to streams through the North Carolina Ecosystem Enhancement Program (EEP), and that the EEP has agreed to implement the mitigation for the project. EEP has indicated in a letter dated September 29 2008 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the Tri-Party MOA signed on July 22, 2003 and the Dual-Party MOA signed on April 12, 2004.



North Carolina Department of Environment and Natural Resources

Division of Water Quality

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- 5 Two copies of the final construction drawings shall be furnished to NCDWQ Central Office prior to the pre-construction meeting. The permittee shall provide written verification that the final construction drawings comply with the permit drawings contained in the application dated December 10, 2008 (dated received December 10, 2008). Any deviations from the approved drawings are not authorized unless approved by the NC Division of Water Quality
6. All channel relocations will be constructed in a dry work area and stabilized before stream flows are diverted. Channel relocations will be completed and stabilized, and must be approved on site by DWQ staff, prior to diverting water into the new channel. Whenever possible, channel relocations shall be allowed to stabilize for an entire growing season. Vegetation used for bank stabilization shall be limited to native woody species, and should include establishment of a 30 foot wide wooded and an adjacent 20 foot wide vegetated buffer on both sides of the relocated channel to the maximum extent practical. A transitional phase incorporating coir fiber and seedling establishment is allowable. Also, rip-rap may be allowed if it is necessary to maintain the physical integrity of the stream, but the applicant must provide written justification and any calculations used to determine the extent of rip-rap coverage requested.
- 7 At locations where ponds will be drained, proper measures will be taken to drain the pond with limited impact to upstream and downstream channel stability as well as to native aquatic species. Proper measures will be taken to avoid sediment release and/or sediment accumulation downstream as a result of pond draining. If typical pond draining techniques will create significant disturbance to native aquatic species, additional measures such as collection and relocation may be necessary to prevent a significant fish kill. NCDOT shall consult with NC Wildlife Resources Commission staff to determine if there are any sensitive species, and the most appropriate measures to limit impacts to these species. NCDOT shall observe any natural channel re-establishment, or utilize natural channel construction techniques, to ensure that the jurisdictional stream channel above and below the drained pond remain stable, and that no additional impacts occur within the natural stream channel as a result of draining the pond.
8. Bridge deck drains should not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Please refer to the most current version of *Stormwater Best Management Practices*.
- 9 Unless otherwise approved in this certification, placement of culverts and other structures in waters, streams, and wetlands 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 DWQ. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact the NC DWQ for guidance on how to proceed and to determine whether or not a permit modification will be required.



North Carolina Department of Environment and Natural Resources

Division of Water Quality  
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10. 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.
11. 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.
12. 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.
13. 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.
14. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval.
15. 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.
16. 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.
17. 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.
18. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification.
19. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited.
20. 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 DWQ 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, DWQ may reevaluate and modify this certification.
21. All fill slopes located in jurisdictional wetlands shall be placed at slopes no flatter than 3:1, unless otherwise authorized by this certification.
22. A copy of this Water Quality Certification shall be maintained on site at 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.



North Carolina Department of Environment and Natural Resources

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- 23 The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization shall be clearly marked by highly visible fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this certification.
24. 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.
- 25 The Permittee shall report any violations of this certification to the Division of Water Quality within 24 hours of discovery
26. Upon completion of the project (including any impacts at associated borrow or waste site), the NCDOT Division Engineer shall complete and return the enclosed "Certification of Completion Form" to notify DWQ when all work included in the 401 Certification has been completed.
- 27 Native riparian vegetation (ex. river birch, shagbark hickory green ash, black gum, sycamore, black willow, tag alder, red chokeberry ironwood, silky dogwood, spicebush, swamp milkwood, hop sedge, lurid sedge, bottlebrush grass, joe-pye-weed, boneset) must be reestablished within the construction limits of the project by the end of the growing season following completion of construction.
28. 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.
- 29 Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards:
  - a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*.
  - b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
  - c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.
  - d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.



North Carolina Department of Environment and Natural Resources

Division of Water Quality

Coleen H. Sullins

Director

Dee Freeman

Secretary

Beverly Eaves Perdue

Governor

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

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

If this Certification is unacceptable to you have the right to an adjudicatory hearing upon written request within sixty (60) days following receipt of this Certification. This request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-6714. If modifications are made to an original Certification, you have the right to an adjudicatory hearing on the modifications upon written request within sixty (60) days following receipt of the Certification. Unless such demands are made, this Certification shall be final and binding.

This the 5th day of March 2009

DIVISION OF WATER QUALITY

Coleen H. Sullins

Director

WQC No. 3784



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Asheville Field Office  
160 Zillicoa Street  
Asheville, North Carolina 28801

May 12, 2009

MAY 14 2009

Mr. David Baker  
Asheville Regulatory Field Office  
U.S. Army Corps of Engineers  
151 Patton Avenue, Room 208  
Asheville, North Carolina 28801 5006

Dear Mr. Baker:

Subject: Proposed Widening of US 221 in Rutherford County North Carolina, and Its Effects on the Federally Threatened Dwarf-flowered Heartleaf

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion (Opinion) based on our review of the North Carolina Department of Transportation's (NCDOT) Biological Assessment (BA) on the effects of the subject highway widening on the federally threatened dwarf-flowered heartleaf (*Hexastylis naniflora*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act). Your January 8, 2009 request for formal consultation was received on January 13, 2009

This Opinion is based on information provided in the BA, telephone conversations, e-mail, office files, published literature, field investigations, and other available literature and sources of information. A complete administrative record of this consultation is on file at this office.

The BA concludes that the rock gnome lichen (*Gymnoderma lineare*) and white irisette (*Sisyrrinchium dichotomum*) would not be affected by the proposed project. In addition, the BA states that the project is "not likely to adversely affect" the Indiana bat (*Myotis sodalis*) or small whorled pogonia (*Isotria medeoloides*). We concur with these determinations. Therefore, we believe the requirements under section 7 of the Act are fulfilled for these species. However, consultation under section 7 of the Act must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.

## BIOLOGICAL OPINION

### CONSULTATION HISTORY

A consultation history of this project is provided in Appendix A.

### DESCRIPTION OF THE PROPOSED ACTION

The NCDOT proposes to widen US 221 in Rutherford County from the South Carolina state line northward (R-2233A) to Rutherfordton, North Carolina. The current two-lane road will be widened to a four-lane divided highway for about 10 miles. TIP No. R-2233B will provide a bypass of the city of Rutherfordton and continue northward; this portion of the project is about 9 miles long. The dwarf-flowered heartleaf occurs in several locations along R 2233A and in the proposed interchange area at US 221 and US 74. The interchange area is considered part of the R-2233B project. No dwarf-flowered heartleaf plants have been located on the remainder of R-2233B to the north. (See map on the following page of this Opinion.)

Surveys conducted along the project corridor resulted in the discovery of seven occurrences of the dwarf-flowered heartleaf along the corridor of R-2233A and one population in the interchange area of R-2233A and B. These eight occurrences are estimated to contain 4, 478 plants. About 330 plants will be directly affected by project construction, and another 740 plants will be indirectly affected by corridor construction and maintenance.

### Conservation Measures

In addition to asymmetrical widening along the corridor to avoid the dwarf-flowered heartleaf, the NCDOT has committed to several design and construction practices to further avoid and minimize impacts to the species. These measures include the following:

Use 1.5:1 or 2:1 slopes to minimize the construction footprint at dwarf-flowered heartleaf Sites 1, 2, 3, 5, 6, and 7 (EO #s 106, 174, 114, 113 and 175, 76, and 172).

Use wing walls on the culverts to minimize impacts at dwarf-flowered heartleaf Sites 5, 6, and 7 (EO #s 113 and 175, 76, and 172).

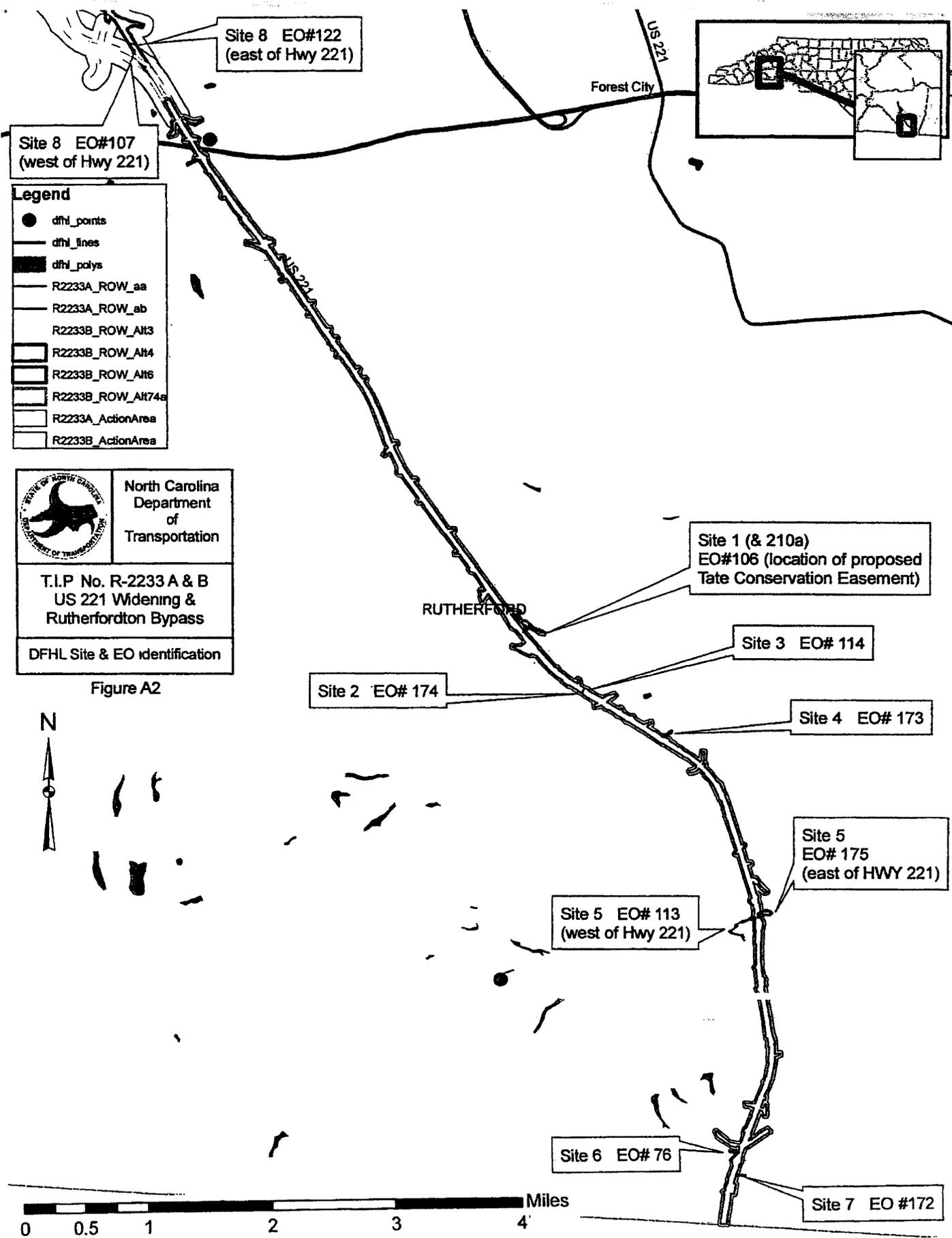
Reduce the mechanical clearing limits to less than the standard 10 feet at dwarf-flowered heartleaf Sites 2 and 6 (EO #s 174 and 76).

Use the NCDOT's native seed mix throughout the corridor, where possible.

Resurvey the corridor for dwarf-flowered heartleaf prior to project start for R-2233B. If plants are found, reinstate consultation.

Obtain a conservation easement on the Tate property (Site 1 and EO # 106), about 8 acres and 2,350 plants.

Transplant the estimated 330 dwarf-flowered heartleaf plants that will be directly impacted to the conservation area.

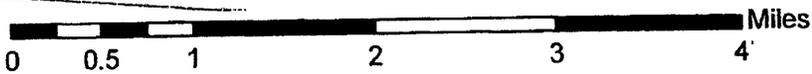


**Legend**

- dfhl\_points
- dfhl\_lines
- dfhl\_polys
- R2233A\_ROW\_aa
- R2233A\_ROW\_ab
- R2233B\_ROW\_Alt3
- R2233B\_ROW\_Alt4
- R2233B\_ROW\_Alt6
- R2233B\_ROW\_Alt74a
- R2233A\_ActionArea
- R2233B\_ActionArea

|                               |   |
|-------------------------------|---|
|                               | North Carolina<br>Department<br>of<br>Transportation                |
|                               | T.I.P No. R-2233 A & B<br>US 221 Widening &<br>Rutherfordton Bypass |
| DFHL Site & EO Identification |   |

Figure A2



## Action Area

The action area should be determined based on consideration of all direct and indirect effects of the proposed action (50 CFR 402.2 and 402.14(h)(2)). The direct and indirect effects of the actions and activities must be considered in conjunction with the effects of other past and present federal, state, or private activities, as well as the cumulative effects of reasonably certain future state or private activities within the action area.

The action area for R-2233A and B is a linear corridor beginning at the North Carolina/South Carolina state line and continuing for about 19 miles, terminating north of the city of Rutherfordton. The width of the corridor is the existing roadway including the current right-of-way (ROW) and 100 feet beyond the ROW limits. In the interchange area of US 221 and US 74, the action area was extended to 400 feet beyond the ROW to accommodate the entire interchange area.

## STATUS OF THE SPECIES AND ITS CRITICAL HABITAT

### Species Description and Life History

The dwarf-flowered heartleaf is a low-growing herbaceous plant in the birthwort family (Aristolochiaceae). Blomquist (1957) described the species in his revision of the genus *Hexastylis*. The plant's heart-shaped dark green leaves are evergreen and leathery and are supported by long thin petioles from a subsurface rhizome. Maximum height rarely exceeds 15 centimeters (6 inches). The jug-shaped flowers are usually beige to dark brown in color and appear from mid-March to early June. The flowers are small and inconspicuous and are found near the base of the petioles. The fruit matures from mid-May to early July (Blomquist 1957; Gaddy 1980, 1981). The plant grows in acidic soils, usually along north-facing bluffs and adjacent slopes and in floodplains next to streams and creek heads in the upper Piedmont Region of North Carolina and South Carolina. It is most often found on Madison and Pacolet soils. Its small flower distinguishes this species from other members of the genus *Hexastylis*.

Thrips (sucking insects) and flies are the major pollinators of most plant species in the genus *Hexastylis*. As yet, the pollination method for the dwarf-flowered heartleaf is unproven, but biologists speculate that it may be pollinated by snails and/or slugs. With most *Hexastylis* species, the vectors--flies and thrips--spend most of their lives in the plant's flower tissues and feed on pollen grains or on portions of the plant's outer skin. Once the flowers have been fertilized, ants distribute the seeds. These ants eat the coating of the seeds and leave the seeds near the plant site or by the ant nest. Seed germination takes place in the spring, after the seeds have been exposed to cool temperatures.

### Status and Distribution

The dwarf-flowered heartleaf was listed as a threatened species on April 14, 1989 (54 FR 14964). No critical habitat has been designated. At the time of listing, threats to the species included residential and industrial development, conversion of its habitat to pasture or small ponds, timber-harvesting, and cattle-grazing. As of 2006, the combined databases of the North Carolina Natural Heritage Program (NCNHP) and the South Carolina Department of Natural Resources' Heritage Trust Program contain records of about 103 locations that are sufficiently geographically distinct as to be regarded as proxies for populations of the species (Draft Five Year Review for *Hexastylis naniflora*, Asheville Field Office, September 2006). This is roughly four times the

number of populations known when the species was federally listed as threatened in 1989. Of these populations, 76 occur in North Carolina, and 29 occur in South Carolina. The species' known range has since expanded to include Alexander, Caldwell, Iredell, and Polk Counties, North Carolina. Despite the relatively large number of known sites and many that have been located since its designation as threatened, threats identified at listing continue to affect the species; at least nine sites have been destroyed, including five that have been discovered since listing. Many more sites have been partially impacted or destroyed because of development, and fewer than ten sites have permanent legal protection from habitat loss or alteration. Further, fewer than 15 percent of all known populations have been reported to contain more than 1,000 rosettes (Service, Draft Five-Year Review for *Hexastylis naniflora*, September 2006).

### **Analysis of the Species Likely to be Affected**

At a minimum, the action area contains about 4,500 dwarf-flowered heartleaf plants. Of the total, about 330 plants will be directly impacted by project construction, and another 740 could be indirectly affected by the effects of clearing and other alterations of the microclimate at the project edges and by the invasion of nonnative plants.

### **ENVIRONMENTAL BASELINE**

Under section 7(a)(2) of the Act, when considering the effects of an action on federally listed species, we are required to take into consideration the environmental baseline. The environmental baseline includes past and ongoing natural factors and past and present impacts from all federal, state, or private actions and other activities in the action area (50 CFR 402.02), including federal actions in the area that have already undergone section 7 consultation and the impacts from state or private actions that are contemporaneous with the consultation in progress. The discussion that follows is our evaluation of the factors and impacts from the activities within the action area that make up the environmental baseline.

### **Status of the Species within the Action Area**

The action area contains about 4,500 dwarf-flowered heartleaf plants. About 330 plants will be directly affected by construction. These plants will be relocated to a protected area. Based on the survival of previously relocated dwarf-flowered heartleaf plants, mortality is not expected to exceed 50 percent. In addition to the direct impacts of the project, about 740 plants may be impacted indirectly.

The subject project may result in the loss of less than one-half of 1 percent of all known individual dwarf-flowered heartleaf plants and about 25 percent of the plants within the action area.

### **Factors Affecting the Species' Environment within the Action Area**

Surveys for the dwarf-flowered heartleaf have been conducted across the entire action area. No other impacts are planned or expected beyond those described in this Opinion.

### **EFFECTS OF THE ACTION**

Under section 7(a)(2) of the Act, "effects of the action" refers to the direct and indirect effects of an action on the species or its critical habitat, together with the effects of other activities that are

interrelated or interdependent with that action. Under section 7 of the Act, the federal agency is responsible for analyzing these effects. The effects of the proposed action are added to the environmental baseline to determine the future baseline, which serves as the basis for the determination in this Opinion. Should the effects of the federal action result in a situation that would jeopardize the continued existence of the species, we may propose reasonable and prudent alternatives that the federal agency can take to avoid violation of section 7(a)(2) of the Act. The discussion that follows is our evaluation of the expected direct and indirect effects of the construction of the subject switching station and transmission line. Indirect effects are those caused by the proposed action that will occur later but that are still reasonably certain to occur (50 CFR 402.02). We have determined that there are no interrelated or interdependent actions apart from the action under consideration.

### **Factors to be Considered**

As previously stated, 330 of the estimated 4,500 dwarf-flowered heartleaf plants within the action area will be directly affected by the proposed highway widening. An estimated 740 additional plants are expected to be impacted indirectly because of habitat changes at the edges of the construction corridor. These areas may provide suitable habitat for the species in the future as the canopy closes in the unmaintained portions of the ROW

The NCDOT has purchased a conservation easement to permanently protect about 2,350 plants on the Tate property (Site 1), including about 4 acres of habitat and an additional 4 acres that will buffer the existing plants and provide suitable habitat for expansion of the “population.”

The total number of dwarf-flowered heartleaf plants throughout its known range (estimated to be in excess of 100 populations) is not considered a limiting factor toward recovery of the species; rather, it is the protection of populations from continued developmental threats (such as the activities associated with this project) that is limiting the species’ recovery

### **Analyses of the Effects of the Action**

**Direct effects.** In the action area, 330 dwarf-flowered heartleaf plants and about 1 acre of habitat will be directly affected by the proposed project. These plants will be relocated to the conservation area.

**Indirect effects.** Indirect effects to the dwarf-flowered heartleaf are anticipated to occur to about 740 plants and about 1.9 acres of habitat. Impacts may result from the edge of the pavement out to the cleared ROW by allowing increased sunlight to plants that occur adjacent to areas that are cleared. After the removal of trees, the additional sunlight would alter habitat conditions at the immediate edge of the tree line, making the area less hospitable to the dwarf-flowered heartleaf and potentially causing additional losses of individual plants. Although increased sunlight could result in increased flowering of the dwarf-flowered heartleaf rosettes just inside the new tree line, it is not known whether this increased flowering would result in increased seedling recruitment or long-term changes in the number of established plants in these locations.

The removal of trees could also result in an influx of native and nonnative invasive species, and dense understories could form from the resultant increase in sunlight. It is likely that the area cleared for the transmission line ROW will result in an increase in the number of invasive species into the action area. If allowed to establish and spread into areas currently occupied by the dwarf-flowered

heartleaf, these invasive species would ultimately result in the loss of additional dwarf-flowered heartleaf plants.

### **Species' Response to the Proposed Action**

The proposed construction activities will result in the removal of all vegetation within the impact area and permanent conversion of suitable habitat to the roadway and maintained shoulders. The proposed project will result in direct impacts to about 330 dwarf-flowered heartleaf plants out of the estimated 4,500 plants in the action area. The predicted impacts will not have negative effects on the recovery of the species.

### **CUMULATIVE EFFECTS**

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this Opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require a separate consultation pursuant to section 7 of the Act (Service and National Marine Fisheries Service 1998). There are no other state, tribal, local, or private actions reasonably certain to occur in the action area that would affect the dwarf-flowered heartleaf.

### **CONCLUSION**

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

### **INCIDENTAL TAKE STATEMENT**

Section 9 of the Act and federal regulations pursuant to section 4(d) of the Act prohibit the taking of endangered and threatened species without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, such as breeding, feeding, or sheltering. Harass is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not for the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the Act, provided that such taking is in compliance with the terms and conditions of this incidental take statement.

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, section 9(a)(2)(B) provides limited protection to listed plants from take to the extent that the Act prohibits the removal and reduction to possession of federally listed endangered plants or the malicious damage to such plants on areas under federal jurisdiction or the destruction of endangered plants on nonfederal areas in violation of state law or regulation or in the course of any violation of a

state criminal trespass law. Therefore, for this Opinion, incidental take does not apply, and an incidental take statement is not necessary.

## CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to further minimize or avoid the adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We request that the NCDOT implement the following conservation recommendations:

1. Develop a management plan for the dwarf-flowered heartleaf on the conservation easement area (Tate property). This plan, which would require our approval, should address the long-term conservation of all occurrences of the dwarf-flowered heartleaf on this property and is to be in place before any construction begins. A draft plan is to be submitted to the Service's Asheville Field Office by December 31, 2009.
2. Provide general location, population, and condition information on the subject eight dwarf-flowered heartleaf "sub-populations" located within this project's footprint to the NCNHP within 1 year of the date of this Opinion. Notify the Service's Asheville Field Office when the information has been provided to the NCNHP.
3. Notify the Service's Asheville Field Office when the dwarf-flowered heartleaf plants have been transplanted. This notification should occur no later than 2 weeks after transplanting.
4. Monitor (using a qualified botanist/biologist) the relocated dwarf-flowered heartleaf plants 1 year after they are relocated to determine survival.
5. Provide a written report summarizing the survival of the relocated dwarf-flowered heartleaf plants, as well as any seemingly significant threats or management issues; within 13 months of the completion of transplanting. This report should be submitted to the NCNHP and the Service's Asheville Field Office. This report should include maps and photographs sufficient to clearly convey the general vicinity and specific location of the conservation (transplant) area, the specific locations within the project area in which the dwarf-flowered heartleaf occurs and is monitored, and a condition assessment of the species and its habitat.

In order for us to be kept informed about actions that minimize or avoid adverse effects or that benefit listed species or their habitats, we request notification of the implementation of any conservation recommendations. This notification can be sent via e-mail to Ms. Marella Buncick (marella\_buncick@fws.gov), the lead biologist for this consultation, and Dr. Carolyn Wells (carolyn\_wells@fws.gov), species recovery coordinator for the dwarf-flowered heartleaf.

## REINITIATION/CLOSING STATEMENT

This concludes formal consultation on the action outlined in your January 8, 2009 request for formal consultation. As provided in 50 CFR 402.16, the reinitiation of formal consultation is required where

discretionary federal agency involvement or control over an action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion, (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this Opinion, or (4) a new species is listed or critical habitat is designated that may be affected by the action.

If you have any questions or concerns about this consultation or the consultation process in general, please feel free to contact Ms. Buncick at 828/258-3939 Ext. 237 or me, Ext. 223. In any future correspondence concerning this project, please reference our Log Number 4-2-09-100.

Sincerely,



Brian P Cole  
Field Supervisor

cc:

Regional Director, FWS, Atlanta, GA (ES, Attention: Mr. Ken Graham)

**References:**

Blomquist, H.L. 1957 A revision of the *Hexastylis* of North America. *Brittonia* 8:255-281.

Gaddy, L.L. 1980. Status report on *Hexastylis naniflora*. Prepared for the U.S. Fish and Wildlife Service. Unpublished report. 25 pp.

----- 1981. The status of *Hexastylis naniflora* Blomquist in North Carolina. Unpublished report. 58 pp.

U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1998. Endangered Species Consultation Handbook – Procedures for Conducting Consultation and Conference Activities under Section 7 of the Endangered Species Act. Washington, D.C.

## Appendix A. Consultation History

Early consultation for segments of this project began as long ago as 1999. Initially, R-2233 was a single project. In 2000, it was separated into R-2233A and B.

09/1999 Initial Scoping letter from NCDOT  
09/1999 Service sends comments to NCDOT

#### R-2233B

06/2000 Service attends an interagency meeting to review Purpose and Need  
02/2001 Service attends an interagency meeting to discuss Alternatives  
10/2001 Service attends an interagency meeting to discuss Alternatives  
03/2002 Service attends an interagency meeting to further discuss Alternatives  
11/2003 Service is notified that dwarf-flowered heartleaf has been found in the interchange area between R-2233A and B.  
10/2007 Service attends an interagency meeting to discuss bridge and culvert locations  
04/2009 Service attends an interagency meeting to discuss choosing a LEDPA.

#### R-2233A

08/2002 Service attends first Merger meeting  
09/2003 Service receives natural resources report with locations of dwarf-flowered heartleaf locations along the proposed widening.  
12/2003 Service attends interagency meeting to discuss bridging and culvert decisions  
05/2004 Service receives more detailed information regarding plant locations along proposed route  
02/2006 Service attends an interagency meeting to discuss Alternatives  
03/2006 Service provides comments on the State Environmental Assessment  
05/2006 Service attends interagency meeting to discuss avoidance and minimization measures, including those to avoid impacts to dwarf-flowered heartleaf

The service provided comments regarding avoidance and minimization measures for dwarf-flowered heartleaf during the Merger meetings for the individual projects.

Informal consultation continued with:

08/08 a review and comments on the draft BA  
09/08 further comments on the draft BA  
10/08 comments on the proposed conservation area for the project  
01/09 Formal consultation began

*Please meet  
to.*

**Baker David K SAW**

---

**From:** Fontaine, Lance P Ph.D. [lfontaine@ncdot.gov]  
**Sent:** Monday, June 22, 2009 9:16 AM  
**To:** Baker, David K SAW  
**Cc:** Williams, Logan; Feulner Brett M  
**Subject:** Biological Assessment/Biological Opinion for R-2233

David-

I received word from our USEWS rep (Marella Buncick) that she sent to you a Biological Opinion in response to the Biological Assessment that NCDOT prepared and submitted in Dec 2008 for R-2233 (US 221 widening in Rutherford Co ) I'm not sure when she sent it or if you have had sufficient time to review the document

Please confirm your receipt of the BA/BO and forward the document to our office at your earliest convenience With the project approaching Let in less than 1 year our office needs all relevant documentation in order for permitting issues to be resolved.

Please don't hesitate to contact me if you have any questions

Lance

Lance P Fontaine, Ph.D  
\*  
Environmental Biologist  
Natural Environment Unit  
NC Department of Transportation

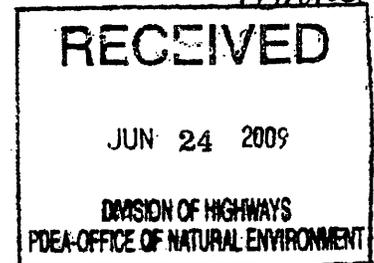
lfontaine@ncdot.gov

Mobile - 919-259-5354  
Office - 919-431-6667  
Fax - 919-431-2002

Mailing Address  
NC Department of Transportation  
1598 Mail Service Center  
Raleigh, NC 27699

Physical Address  
PDEA Environmental Resource Center  
4701 Atlantic Ave, Ste 116  
Raleigh, NC 27604

Email correspondence to and from this sender is subject to the N C Public Records Law and may be disclosed to third parties



See Sheet 1-A For Index of Sheets  
See Sheet 1-B For Conventional Symbols

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**RUTHERFORD COUNTY**

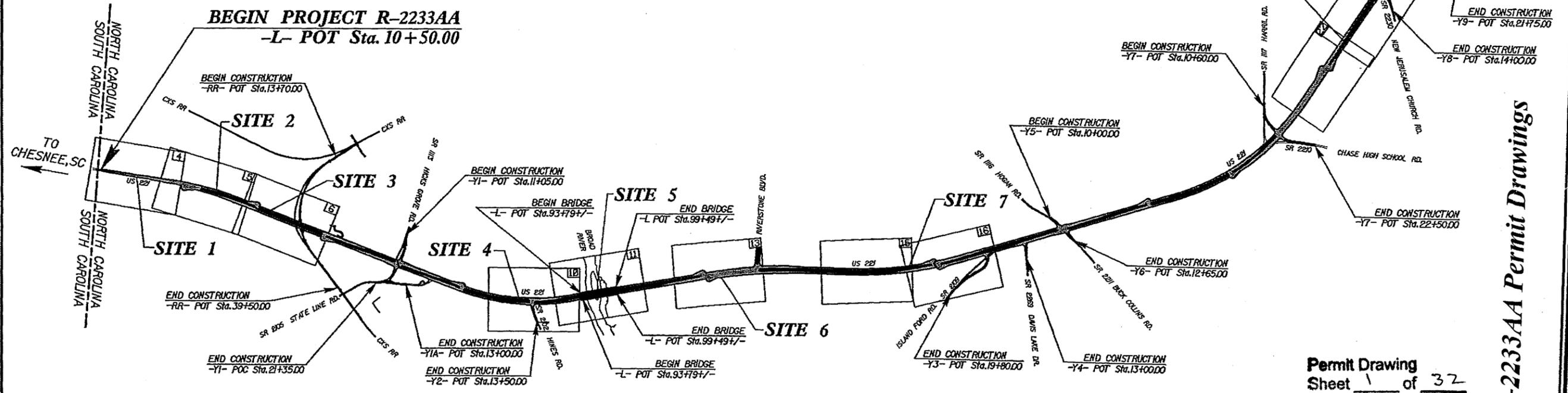
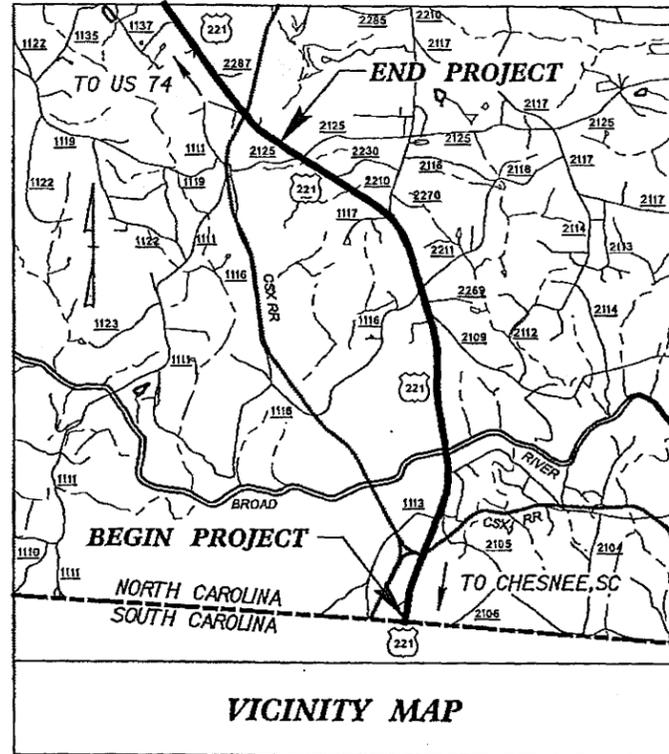
LOCATION: US 221 FROM SOUTH CAROLINA STATE LINE  
TO SOUTH OF FLOYD'S CREEK

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

**R-2233AA Permit Drawings**

|                 |                             |             |              |
|-----------------|-----------------------------|-------------|--------------|
| STATE           | STATE PROJECT REFERENCE NO. | SHEET NO.   | TOTAL SHEETS |
| N.C.            | R-2233AA                    | 1           |              |
| STATE PROJ. NO. | F.A. PROJ. NO.              | DESCRIPTION |              |
| 34400.1.1       |                             | P.E.        |              |
|                 |                             |             |              |
|                 |                             |             |              |
|                 |                             |             |              |
|                 |                             |             |              |

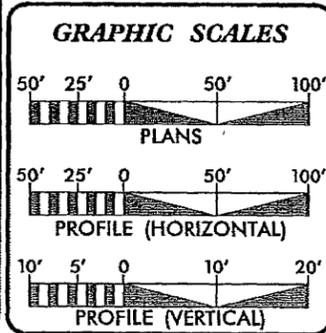
**TIP PROJECT: R-2233AA**



Permit Drawing Sheet 1 of 32

**R-2233AA Permit Drawings**

**CONTRACT:**



**DESIGN DATA**

|                |          |
|----------------|----------|
| ADT 2005 =     | 9,100    |
| ADT 2030 =     | 16,700   |
| DHV =          | 11 %     |
| D =            | 55 %     |
| T =            | 12 % *   |
| V =            | 60 MPH   |
| FUNC. CLASS. = | ARTERIAL |
| * TTST 7%      | DUAL 5%  |

**PROJECT LENGTH**

|   |           |
|---|-----------|
| LENGTH ROADWAY TIP PROJECT R-2233AA =   | 4.883 MI. |
| LENGTH STRUCTURE TIP PROJECT R-2233AA = | 0.108 MI. |
| TOTAL LENGTH OF TIP PROJECT R-2233AA =  | 4.991 MI. |

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr.  
Raleigh, NC 27610

2002 STANDARD SPECIFICATIONS

|                                 |  |
|---------------------------------|--|
| RIGHT OF WAY DATE:<br>JUNE 2007 | ROGER D. THOMAS, P.E.<br>PROJECT ENGINEER          |
| LETTING DATE:<br>JUNE 16, 2009  | MICHAEL W. LITTLE, P.E.<br>PROJECT DESIGN ENGINEER |

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**ROADWAY DESIGN ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS  
DO NOT USE FOR R.F.W. ACQUISITION

**DIVISION OF HIGHWAYS**  
STATE OF NORTH CAROLINA

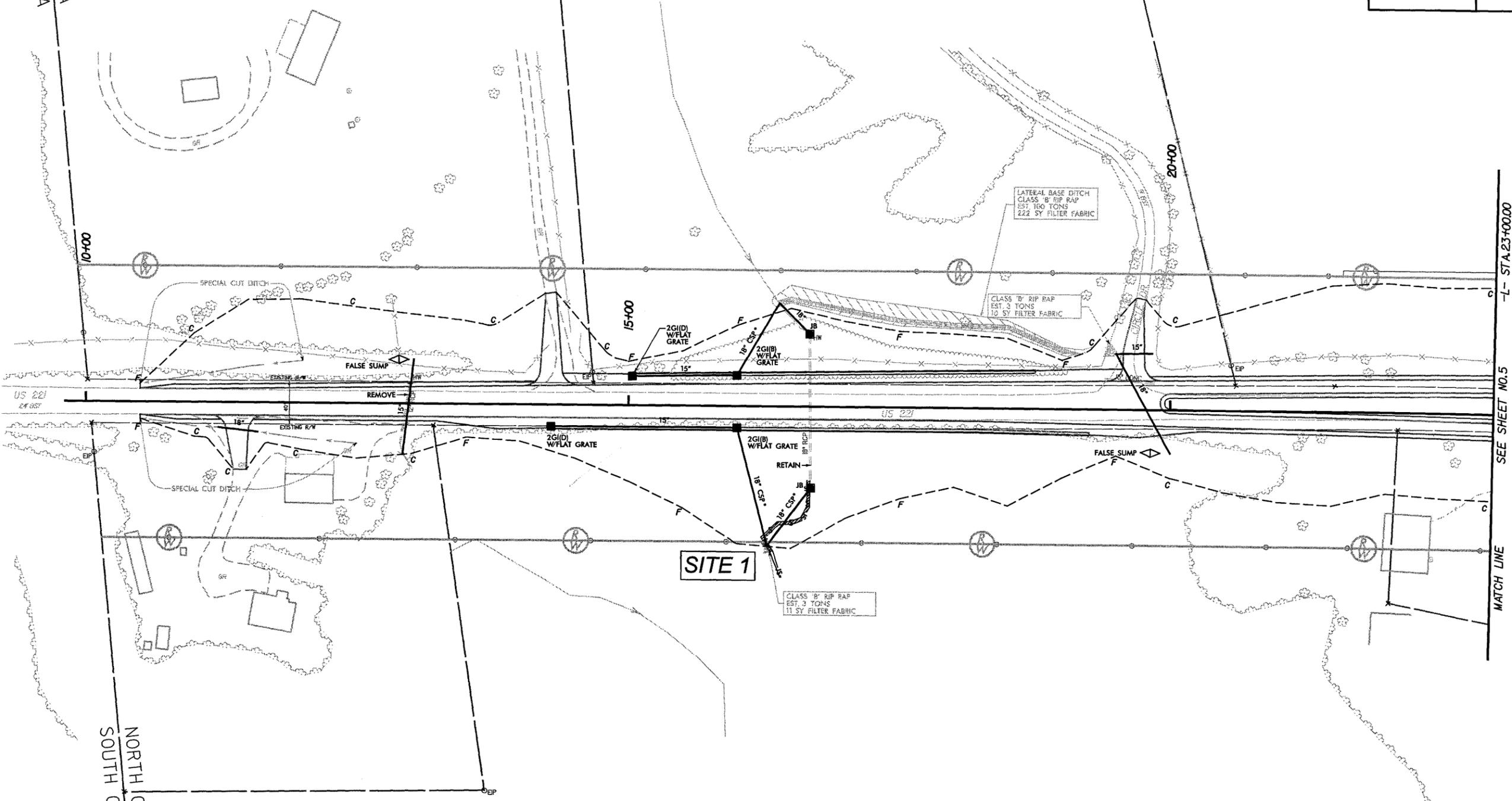
STATE HIGHWAY DESIGN ENGINEER

R:\15423097\Permits\N-2233aa\hyd\_per\_tsh.dgn

|   |                       |
|---|-----------------------|
| PROJECT REFERENCE NO.<br><b>R-2233AA</b>                  | SHEET NO.<br><b>4</b> |
| RW SHEET NO.  |                       |
| ROADWAY DESIGN ENGINEER                                   | HYDRAULICS ENGINEER   |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION   |                       |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION |                       |

NAD 83/95

NORTH CAROLINA  
SOUTH CAROLINA



**SITE 1**

-L- STA. 23+00.00  
SEE SHEET NO. 5  
MATCH LINE

REVISIONS

Permit Drawing  
Sheet 2 of 32

FILL IN SURFACE WATERS

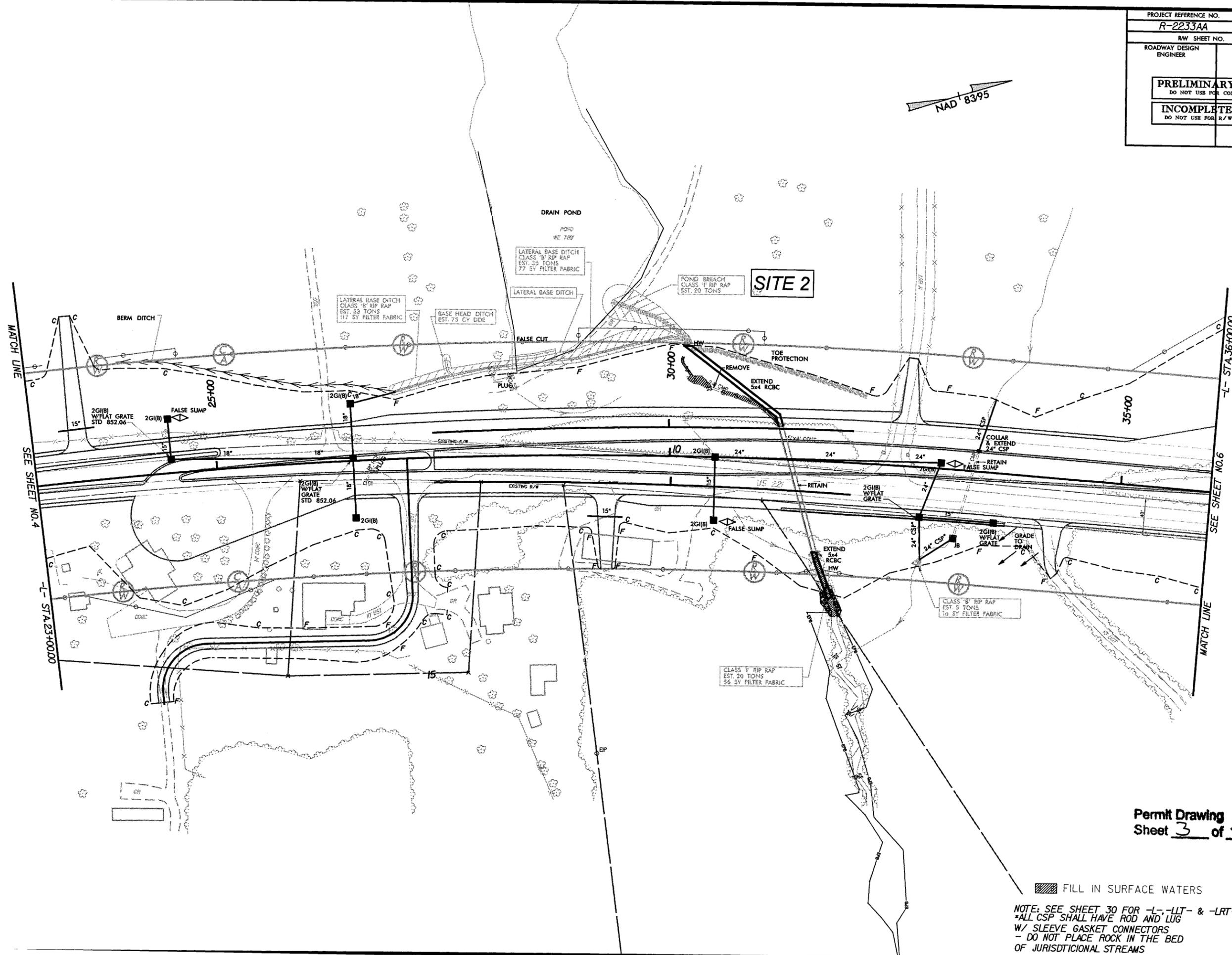
NOTE: SEE SHEET 29 FOR -L- PROFILE  
\*ALL CSP SHALL HAVE ROD AND LUG  
W/ SLEEVE GASKET CONNECTORS  
- DO NOT PLACE ROCK IN THE BED  
OF JURISDICTIONAL STREAMS

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psh04

|   |                     |
|---|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA                         | SHEET NO.<br>5      |
| RAW SHEET NO.   |                     |
| ROADWAY DESIGN ENGINEER                                   | HYDRAULICS ENGINEER |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION   |                     |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION |                     |



REVISIONS



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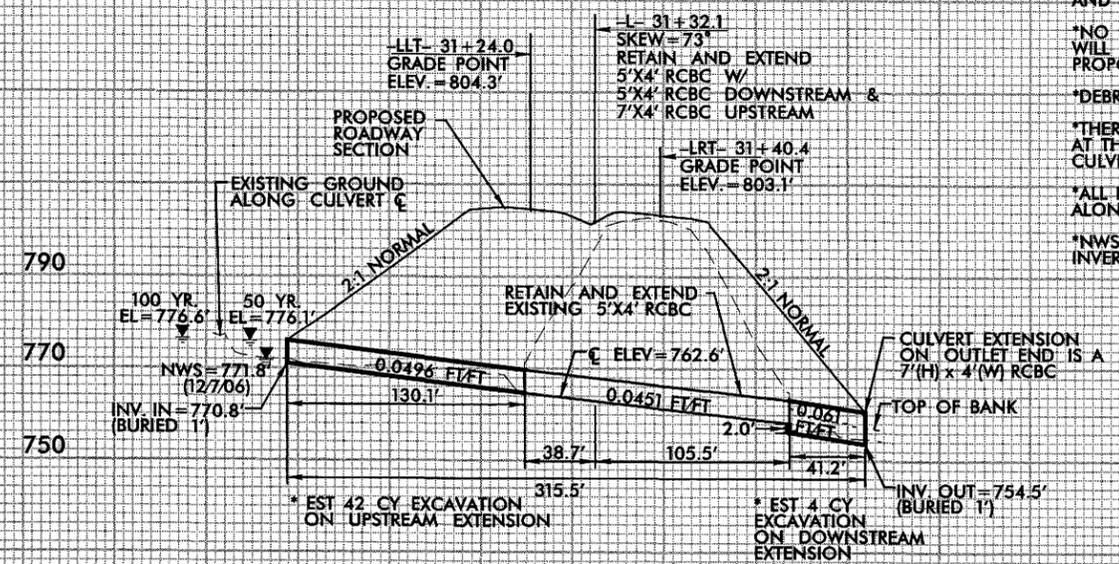
Permit Drawing  
Sheet 3 of 3

FILL IN SURFACE WATERS  
 NOTE: SEE SHEET 30 FOR -L-, -LIT- & -LRT- PROFILES  
 \*ALL CSP SHALL HAVE ROD AND LUG  
 W/ SLEEVE GASKET CONNECTORS  
 - DO NOT PLACE ROCK IN THE BED  
 OF JURISDTICIONAL STREAMS

5/28/99

# SITE 2 R2233 AA

|   |                           |
|---|---------------------------|
| PROJECT REFERENCE NO.<br><b>R-2233AA</b>                | SHEET NO.<br><b>CSR-5</b> |
| ROADWAY DESIGN ENGINEER                                 | HYDRAULICS ENGINEER       |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR ACQUISITION   |                           |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION |                           |



**HYDRAULIC DATA**

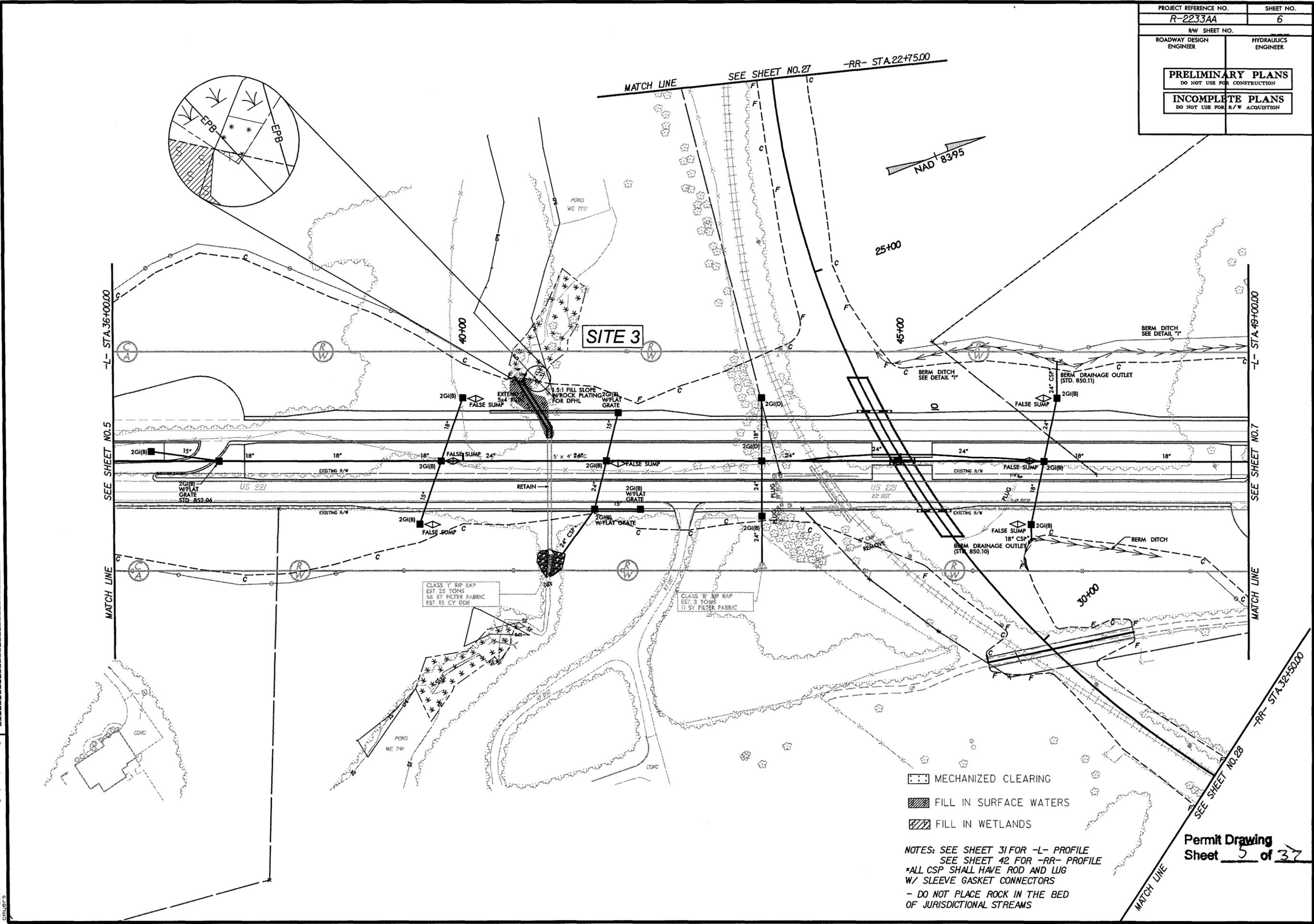
|                             |            |
|-----------------------------|------------|
| DRAINAGE AREA.....          | 54 ACRES   |
| DESIGN DISCHARGE.....       | 100 CFS    |
| DESIGN FREQUENCY.....       | 50 YEAR    |
| DESIGN HIGH WATER ELEV..... | 776.1 FEET |
| BASE DISCHARGE.....         | 120 CFS    |
| BASE HIGH WATER ELEV.....   | 776.6 FEET |
| OVERTOPPING DISCHARGE.....  | 690 CFS    |
| OVERTOPPING ELEV.....       | 803.5 FEET |

**PROFILE ALONG C OF CULVERT**

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|   |                       |
|---|-----------------------|
| PROJECT REFERENCE NO.<br><b>R-2233AA</b>                  | SHEET NO.<br><b>6</b> |
| RW SHEET NO.  |                       |
| ROADWAY DESIGN ENGINEER                                   | HYDRAULICS ENGINEER   |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION   |                       |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION |                       |

REVISIONS



-L- STA 36+00.00

SEE SHEET NO.5

MATCH LINE

SEE SHEET NO.27

-RR- STA.22+75.00

-L- STA 49+00.00

SEE SHEET NO.7

MATCH LINE

-RR- STA.32+50.00

Permit Drawing  
Sheet **5** of **37**

- MECHANIZED CLEARING
- FILL IN SURFACE WATERS
- FILL IN WETLANDS

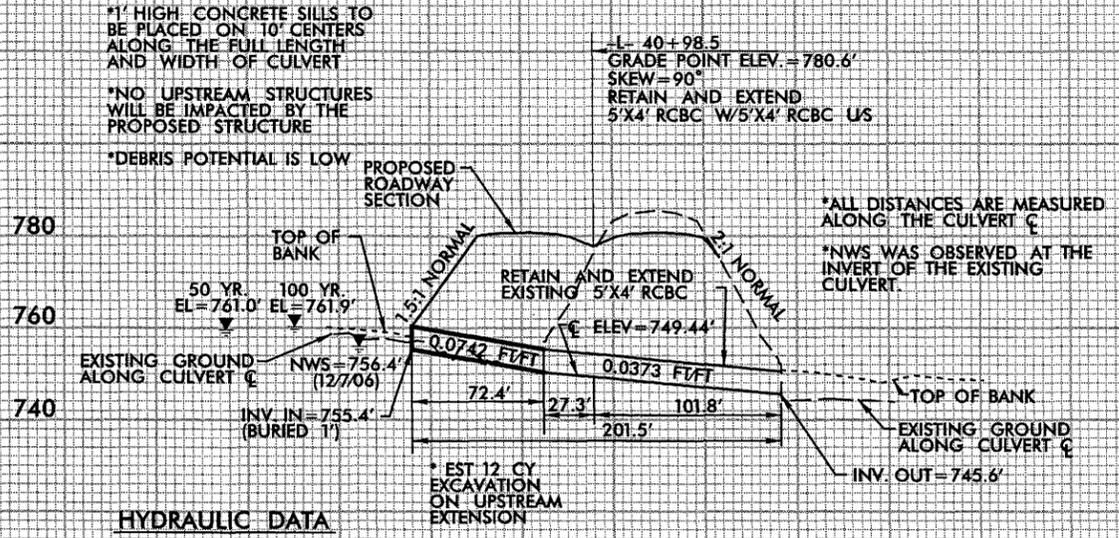
NOTES: SEE SHEET 31 FOR -L- PROFILE  
SEE SHEET 42 FOR -RR- PROFILE  
\*ALL CSP SHALL HAVE ROD AND LUG  
W/ SLEEVE GASKET CONNECTORS  
- DO NOT PLACE ROCK IN THE BED  
OF JURISDICTIONAL STREAMS

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5/28/99

# SITE 3 R2233 AA

|   |                           |
|---|---------------------------|
| PROJECT REFERENCE NO.<br><b>R-2233AA</b>                | SHEET NO.<br><b>CSR-6</b> |
| ROADWAY DESIGN ENGINEER                                 | HYDRAULICS ENGINEER       |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR ACQUISITION   |                           |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION |                           |



\*1' HIGH CONCRETE SILLS TO BE PLACED ON 10' CENTERS ALONG THE FULL LENGTH AND WIDTH OF CULVERT

\*NO UPSTREAM STRUCTURES WILL BE IMPACTED BY THE PROPOSED STRUCTURE

\*DEBRIS POTENTIAL IS LOW

\*ALL DISTANCES ARE MEASURED ALONG THE CULVERT C

\*NWS WAS OBSERVED AT THE INVERT OF THE EXISTING CULVERT.

STATION: +L= 40+98.5  
GRADE POINT ELEV. = 780.6'  
SKEW = 90°  
RETAIN AND EXTEND  
5'x4' RCBC W/5'x4' RCBC US

**HYDRAULIC DATA**

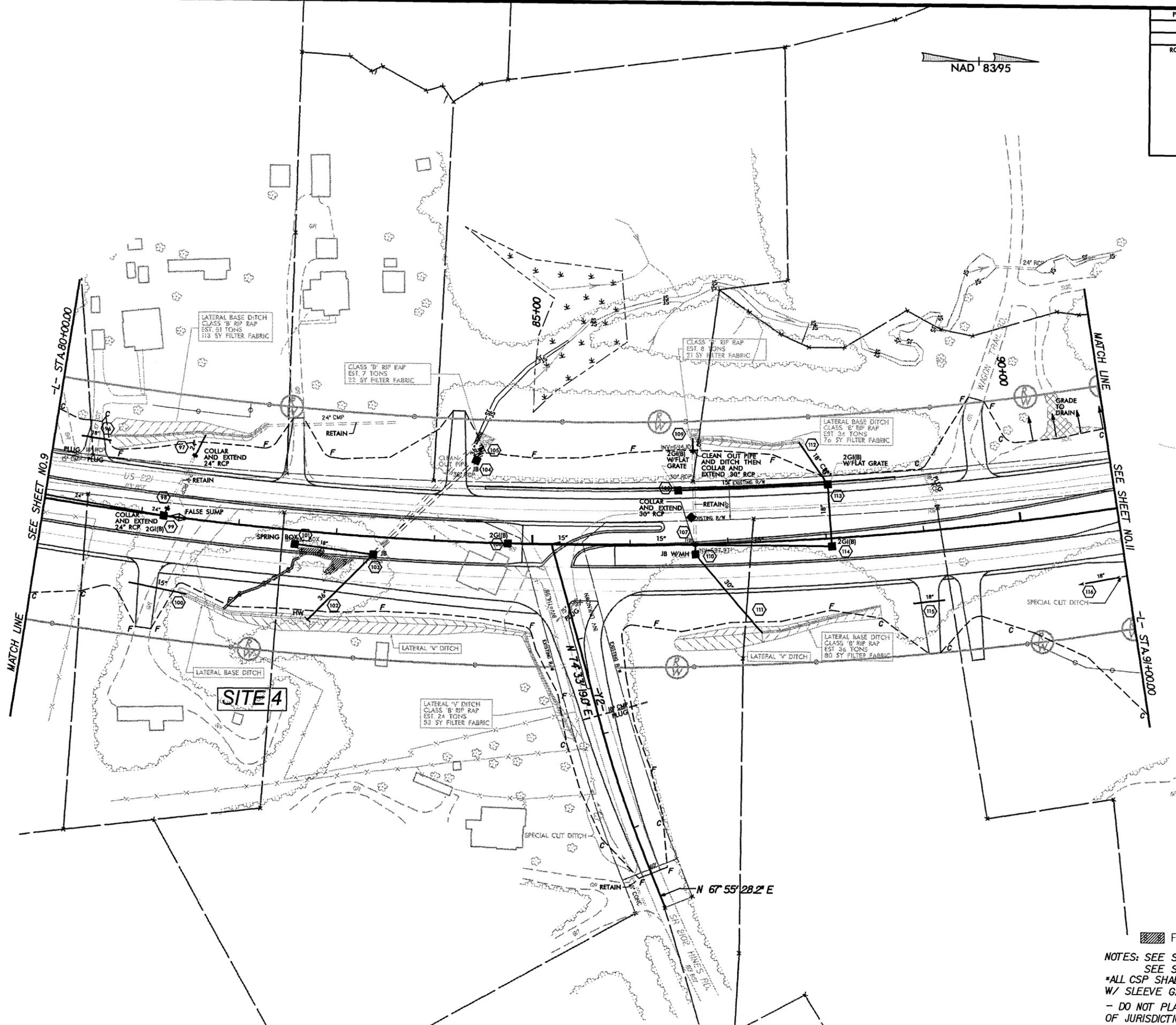
|                             |            |
|-----------------------------|------------|
| DRAINAGE AREA.....          | 109 ACRES  |
| DESIGN DISCHARGE.....       | 110 CFS    |
| DESIGN FREQUENCY.....       | 50 YEAR    |
| DESIGN HIGH WATER ELEV..... | 761.0 FEET |
| BASE DISCHARGE.....         | 140 CFS    |
| BASE HIGH WATER ELEV.....   | 761.9 FEET |
| OVERTOPPING DISCHARGE.....  | 490 CFS    |
| OVERTOPPING ELEV.....       | 780.0 FEET |

### PROFILE ALONG C OF CULVERT

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|  |                        |
|--|------------------------|
| PROJECT REFERENCE NO.<br><b>R-2233AA</b> | SHEET NO.<br><b>10</b> |
| RW SHEET NO.                             |                        |
| ROADWAY DESIGN ENGINEER                  | HYDRAULICS ENGINEER    |

NAD 8395



REVISIONS

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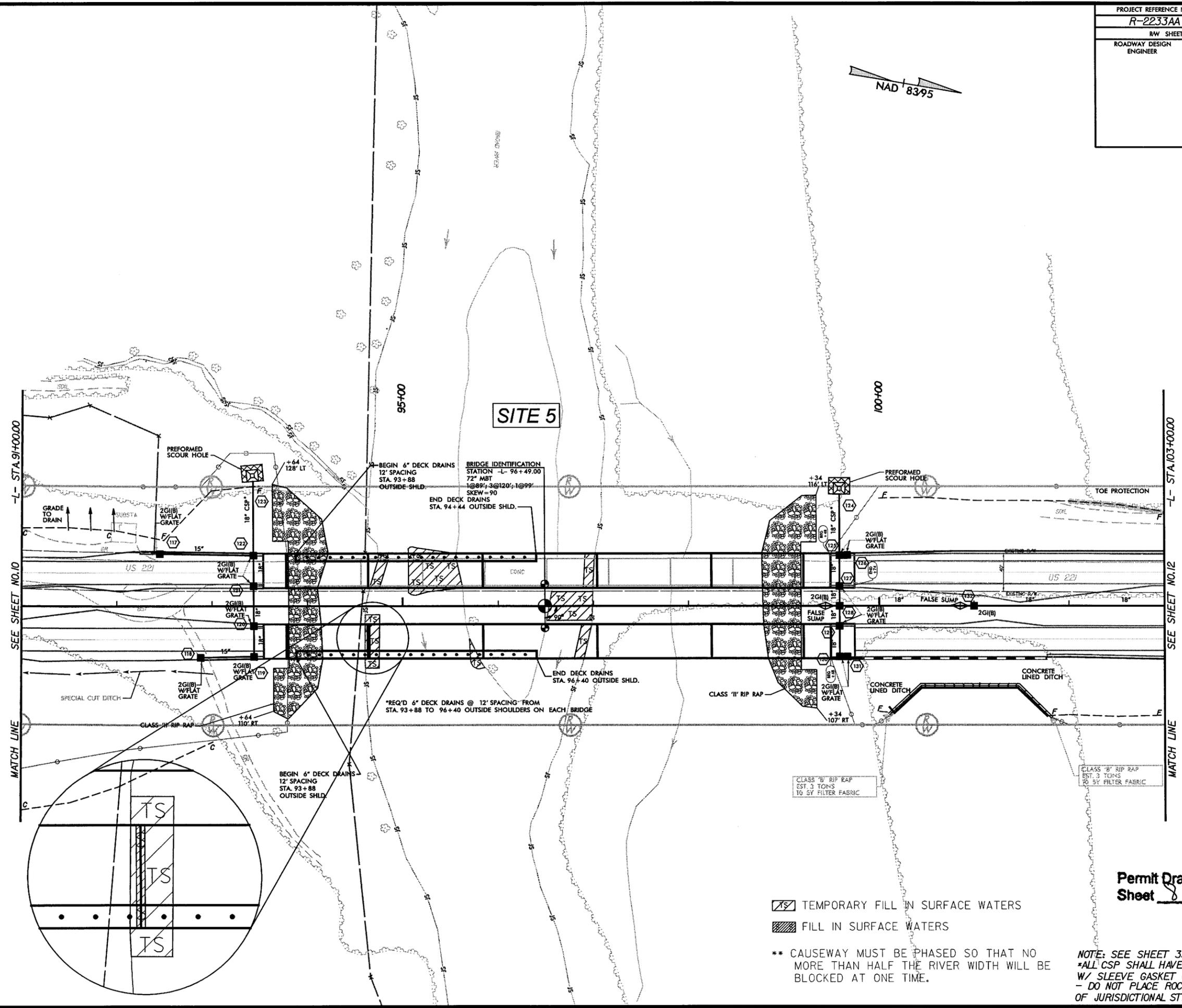
Permit Drawing  
Sheet 7 of 32

[Hatched Box] FILL IN SURFACE WATERS  
 NOTES: SEE SHEET 31 FOR -L- PROFILE  
 SEE SHEET 42 FOR -RR- PROFILE  
 \*ALL CSP SHALL HAVE ROD AND LUG  
 W/ SLEEVE GASKET CONNECTORS  
 - DO NOT PLACE ROCK IN THE BED  
 OF JURISDICTIONAL STREAMS

|                                   |                     |
|-----------------------------------|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA | SHEET NO.<br>11     |
| RW SHEET NO.                      |                     |
| ROADWAY DESIGN ENGINEER           | HYDRAULICS ENGINEER |



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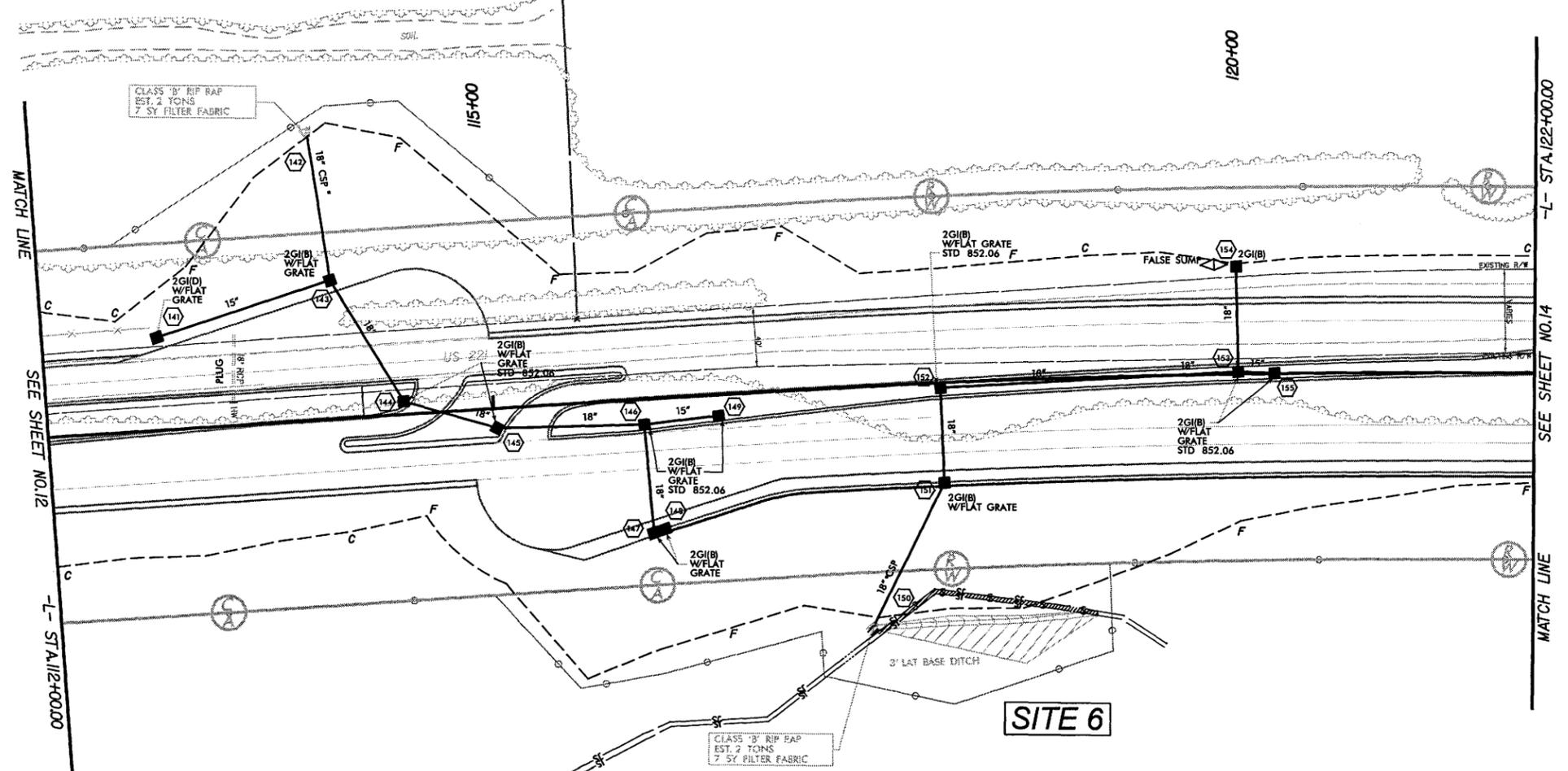
- TEMPORARY FILL IN SURFACE WATERS
- FILL IN SURFACE WATERS

\*\* CAUSEWAY MUST BE PHASED SO THAT NO MORE THAN HALF THE RIVER WIDTH WILL BE BLOCKED AT ONE TIME.

Permit Drawing  
Sheet 8 of 32

NOTE: SEE SHEET 33 FOR -L- PROFILE  
\*ALL CSP SHALL HAVE ROD AND LUG W/ SLEEVE GASKET CONNECTORS - DO NOT PLACE ROCK IN THE BED OF JURISDICTIONAL STREAMS

|                                   |                     |
|-----------------------------------|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA | SHEET NO.<br>13     |
| RW SHEET NO.                      |                     |
| ROADWAY DESIGN ENGINEER           | HYDRAULICS ENGINEER |



REVISIONS

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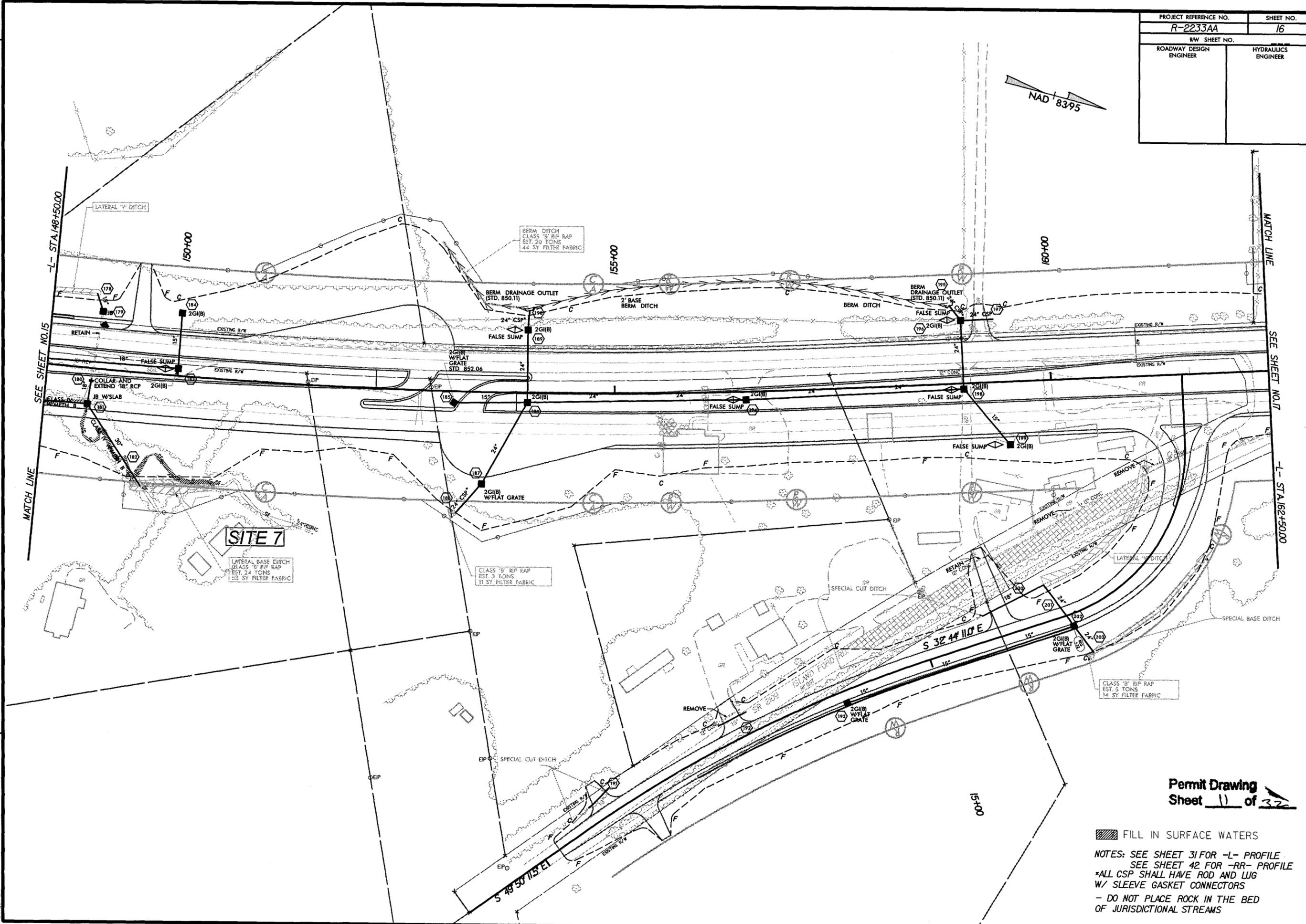
Permit Drawing  
Sheet 9 of 32

FILL IN SURFACE WATERS

NOTES: SEE SHEET 31 FOR -L- PROFILE  
SEE SHEET 42 FOR -RR- PROFILE  
\*ALL CSP SHALL HAVE ROD AND LUG  
W/ SLEEVE GASKET CONNECTORS  
- DO NOT PLACE ROCK IN THE BED  
OF JURISDICTIONAL STREAMS



|                         |                     |
|-------------------------|---------------------|
| PROJECT REFERENCE NO.   | SHEET NO.           |
| R-2233AA                | 16                  |
| RW SHEET NO.            |                     |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |



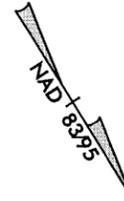
REVISIONS

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cmj

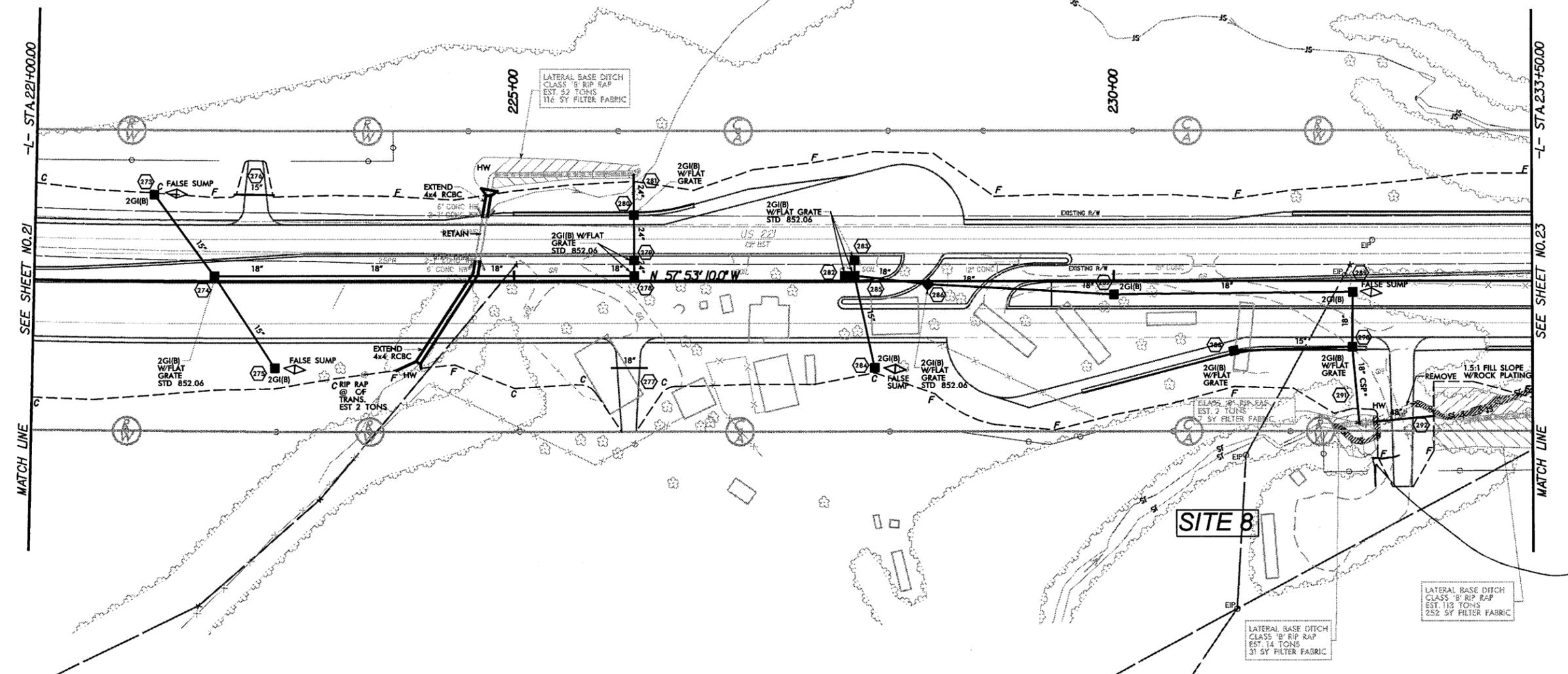
Permit Drawing  
Sheet 11 of 32

- ▨ FILL IN SURFACE WATERS
- NOTES: SEE SHEET 31 FOR -L- PROFILE
- SEE SHEET 42 FOR -RR- PROFILE
- \*ALL CSP SHALL HAVE ROD AND LWG W/ SLEEVE GASKET CONNECTORS
- DO NOT PLACE ROCK IN THE BED OF JURISDICTIONAL STREAMS

|   |                     |
|---|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA                         | SHEET NO.<br>22     |
| RW SHEET NO.  |                     |
| ROADWAY DESIGN ENGINEER                                   | HYDRAULICS ENGINEER |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION   |                     |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION |                     |



*Div concerned with 90° discharge*



REVISIONS

SEE SHEET NO. 21  
MATCH LINE

MATCH LINE  
SEE SHEET NO. 23

**SITE 8**

LATERAL BASE DITCH  
CLASS 'B' RIP RAP  
EST. 113 TONS  
252 SY FILTER FABRIC

LATERAL BASE DITCH  
CLASS 'B' RIP RAP  
EST. 14 TONS  
31 SY FILTER FABRIC

**Permit Drawing**  
**Sheet 12 of 32**

- ▨ FILL IN SURFACE WATERS
- NOTES: SEE SHEET 31 FOR -L- PROFILE  
SEE SHEET 42 FOR -RR- PROFILE
- \*ALL CSP SHALL HAVE ROD AND LUG  
W/ SLEEVE GASKET CONNECTORS
- DO NOT PLACE ROCK IN THE BED  
OF JURISDICTIONAL STREAMS

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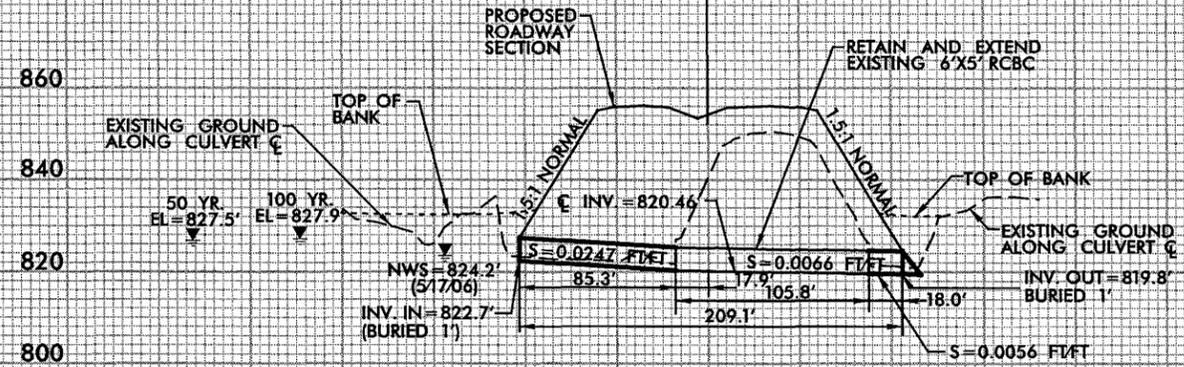
5/28/99

# SITE 8 R2233 AA

|   |                            |
|---|----------------------------|
| PROJECT REFERENCE NO.<br><b>R-2233AA</b>                  | SHEET NO.<br><b>CSR-23</b> |
| ROADWAY DESIGN ENGINEER                                   | HYDRAULICS ENGINEER        |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION |                            |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION   |                            |

\*NO UPSTREAM STRUCTURES WILL BE IMPACTED BY PROPOSED STRUCTURE  
 \*DEBRIS POTENTIAL IS LOW  
 \*ALL DIMENSIONS MEASURED ALONG CENTERLINE OF CULVERT  
 \*NWS WAS OBSERVED AT THE INVERT OF THE EXISTING CULVERT

-L- 234+89.7  
 GRADE POINT ELEV. = 856.16'  
 SKEW = 90°  
 RETAIN AND EXTEND  
 6'X5' RCBC BURIED 1'



### HYDRAULIC DATA

|                             |            |
|-----------------------------|------------|
| DRAINAGE AREA.....          | 76 ACRES   |
| DESIGN DISCHARGE.....       | 120 CFS    |
| DESIGN FREQUENCY.....       | 50 YEAR    |
| DESIGN HIGH WATER ELEV..... | 827.5 FEET |
| BASE DISCHARGE.....         | 140 CFS    |
| BASE HIGH WATER ELEV.....   | 827.9 FEET |
| OVERTOPPING DISCHARGE.....  | 780 CFS    |
| OVERTOPPING ELEV.....       | 855.7 FEET |

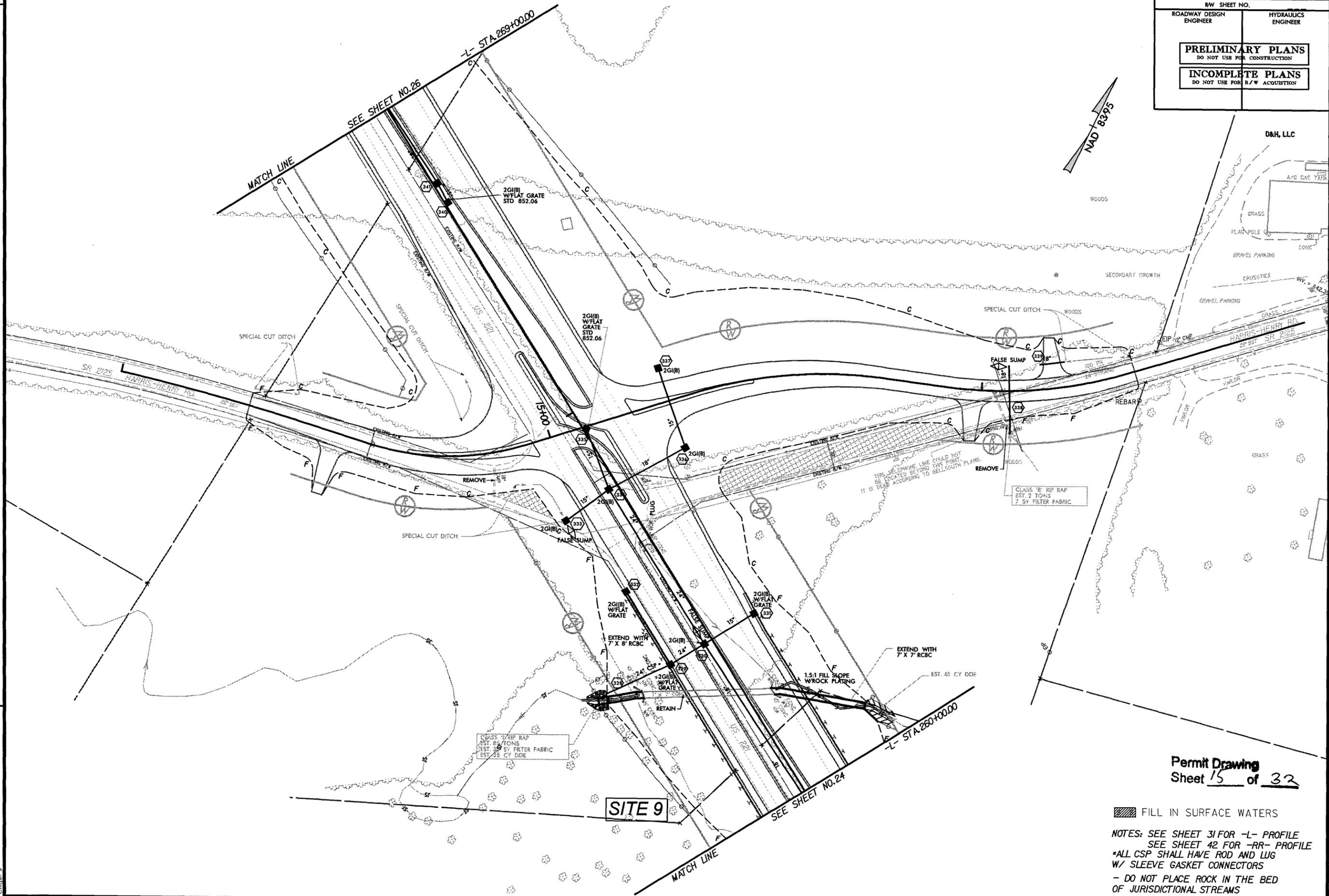
### PROFILE ALONG C OF CULVERT

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|   |                     |
|---|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA                         | SHEET NO.<br>25     |
| RW SHEET NO.  |                     |
| ROADWAY DESIGN ENGINEER                                   | HYDRAULICS ENGINEER |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION   |                     |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION |                     |



REVISIONS



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Permit Drawing  
Sheet 15 of 32

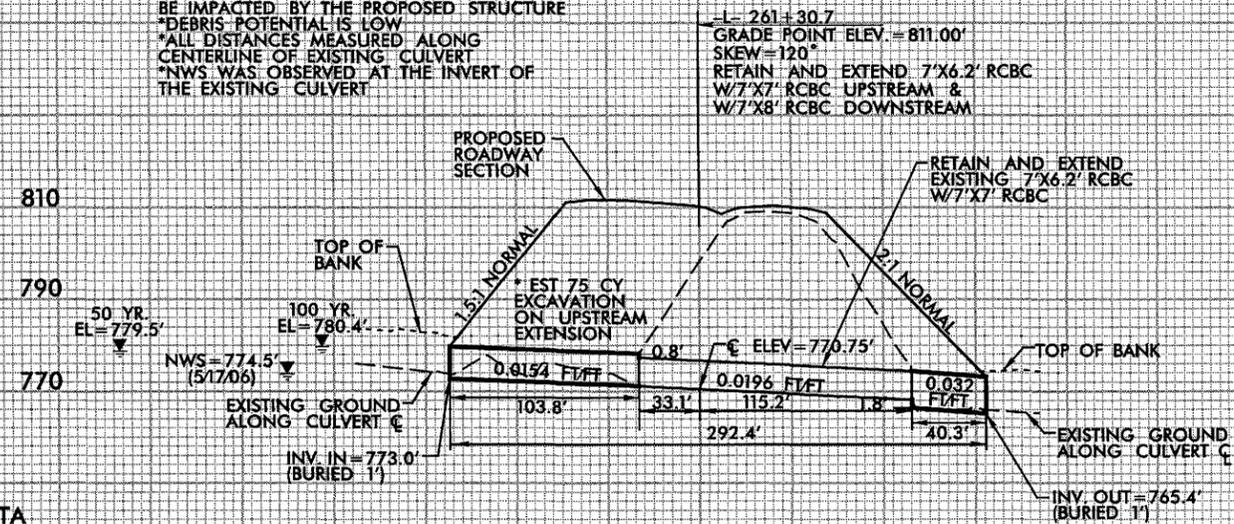
FILL IN SURFACE WATERS  
 NOTES: SEE SHEET 31 FOR -L- PROFILE  
 SEE SHEET 42 FOR -RR- PROFILE  
 \*ALL CSP SHALL HAVE ROD AND LUG  
 W/ SLEEVE GASKET CONNECTORS  
 - DO NOT PLACE ROCK IN THE BED  
 OF JURISDICTIONAL STREAMS

5/28/99

# SITE 9 R2233 AA

|   |                            |
|---|----------------------------|
| PROJECT REFERENCE NO.<br><b>R-2233AA</b>                  | SHEET NO.<br><b>CSR-25</b> |
| ROADWAY DESIGN ENGINEER                                   | HYDRAULICS ENGINEER        |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION |                            |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION   |                            |

\*NO UPSTREAM STRUCTURES WILL BE IMPACTED BY THE PROPOSED STRUCTURE  
 \*DEBRIS POTENTIAL IS LOW  
 \*ALL DISTANCES MEASURED ALONG CENTERLINE OF EXISTING CULVERT  
 \*NWS WAS OBSERVED AT THE INVERT OF THE EXISTING CULVERT



### HYDRAULIC DATA

|                             |            |
|-----------------------------|------------|
| DRAINAGE AREA.....          | 159 ACRES  |
| DESIGN DISCHARGE.....       | 250 CFS    |
| DESIGN FREQUENCY.....       | 50 YEAR    |
| DESIGN HIGH WATER ELEV..... | 779.5 FEET |
| BASE DISCHARGE.....         | 310 CFS    |
| BASE HIGH WATER ELEV.....   | 780.4 FEET |
| OVERTOPPING DISCHARGE.....  | 1355 CFS   |
| OVERTOPPING ELEV.....       | 810.9 FEET |

### PROFILE ALONG C OF CULVERT

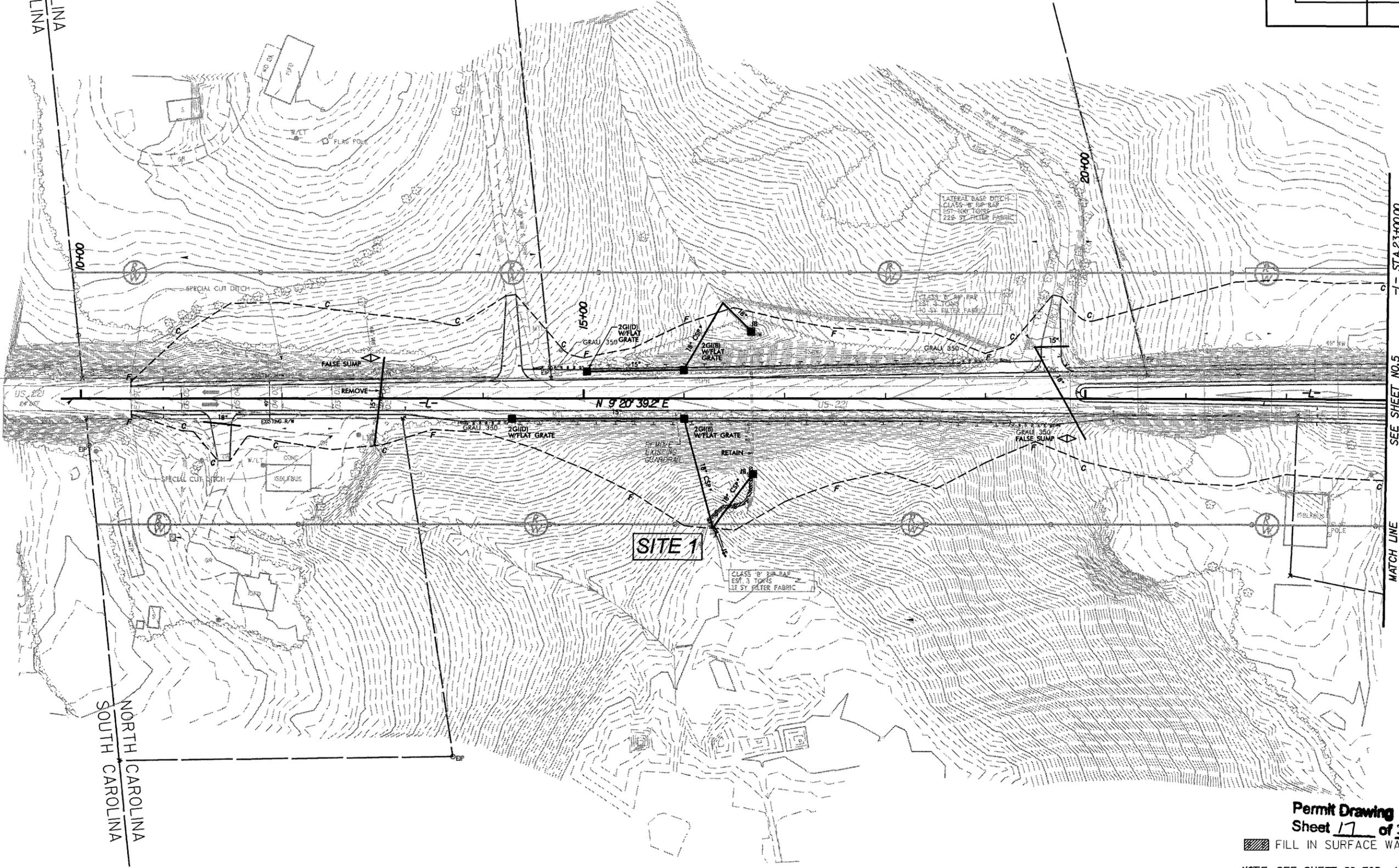
Permit Drawing  
 Sheet 16 of 32

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|   |                     |
|---|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA                         | SHEET NO.<br>4      |
| RW SHEET NO.  |                     |
| ROADWAY DESIGN ENGINEER                                   | HYDRAULICS ENGINEER |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION   |                     |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION |                     |



NORTH CAROLINA  
SOUTH CAROLINA



REVISIONS

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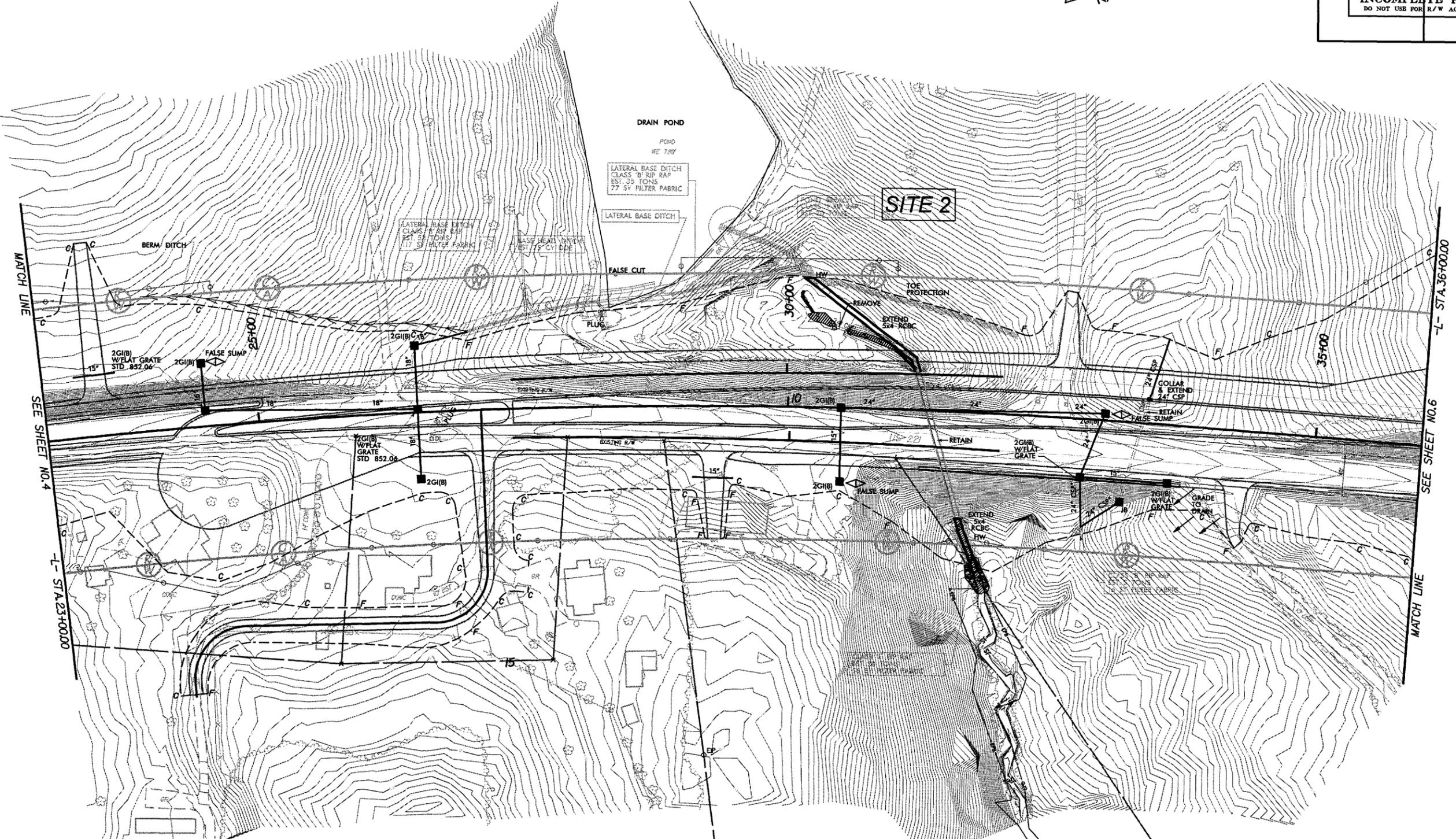
NORTH CAROLINA  
SOUTH CAROLINA

**Permit Drawing**  
Sheet 17 of 32

[Hatched Box] FILL IN SURFACE WATERS

NOTE: SEE SHEET 29 FOR -L- PROFILE  
\*ALL CSP SHALL HAVE ROD AND LUG  
W/ SLEEVE GASKET CONNECTORS  
- DO NOT PLACE ROCK IN THE BED  
OF JURISDICTIONAL STREAMS

|   |                     |
|---|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA                         | SHEET NO.<br>5      |
| RW SHEET NO.  |                     |
| ROADWAY DESIGN ENGINEER                                   | HYDRAULICS ENGINEER |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION   |                     |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION |                     |



Permit Drawing  
Sheet 18 of 32

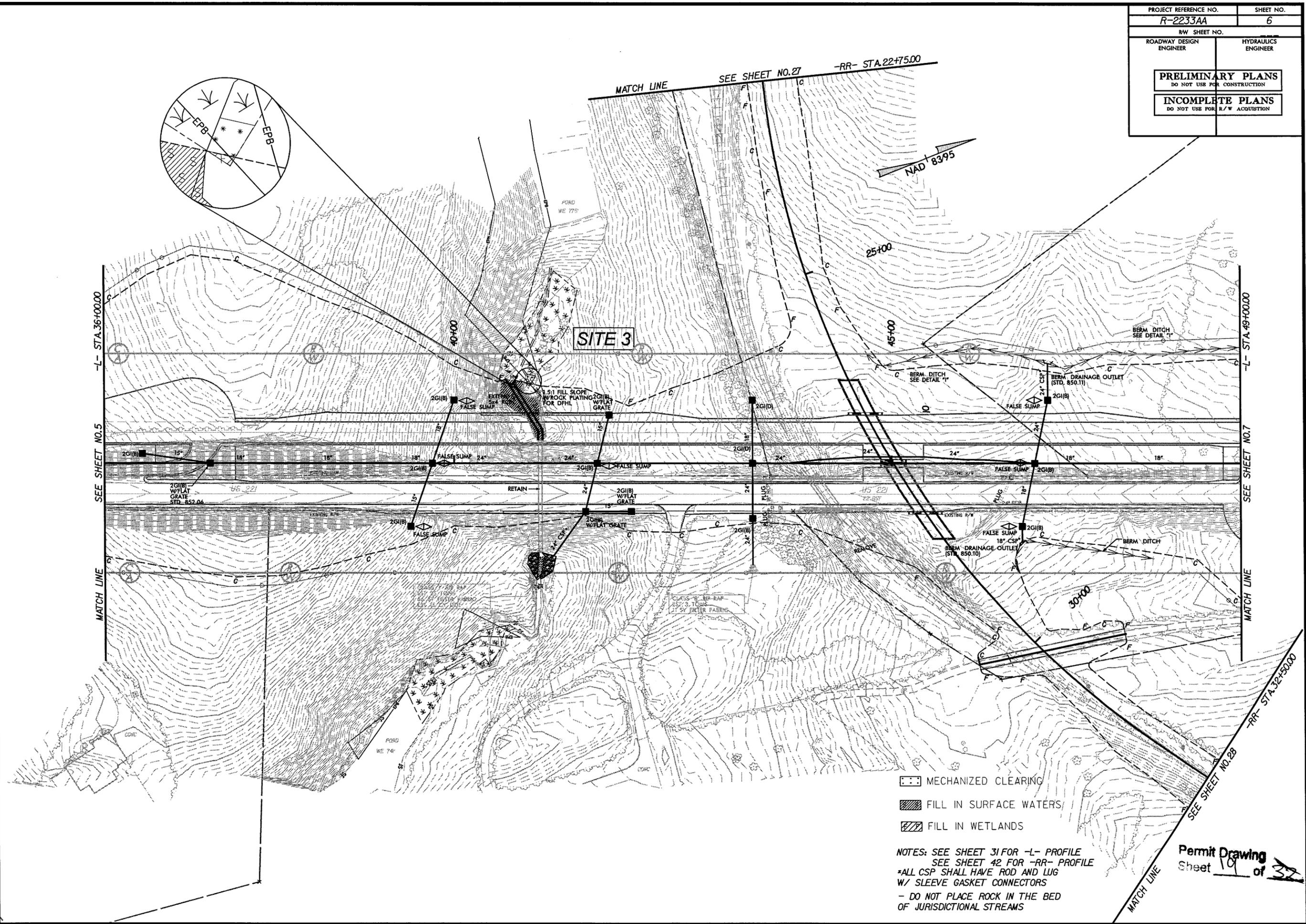
FILL IN SURFACE WATERS

NOTE: SEE SHEET 30 FOR -L-, -LT- & -LRT- PROFILES  
 \*ALL CSP SHALL HAVE ROD AND LUG  
 W/ SLEEVE GASKET CONNECTORS  
 - DO NOT PLACE ROCK IN THE BED  
 OF JURISDTICIONAL STREAMS

REVISIONS  
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|   |                     |
|---|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA                         | SHEET NO.<br>6      |
| RW SHEET NO.  |                     |
| ROADWAY DESIGN ENGINEER                                   | HYDRAULICS ENGINEER |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION   |                     |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION |                     |

REVISIONS  
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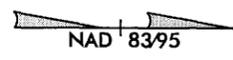


- MECHANIZED CLEARING
- FILL IN SURFACE WATERS
- FILL IN WETLANDS

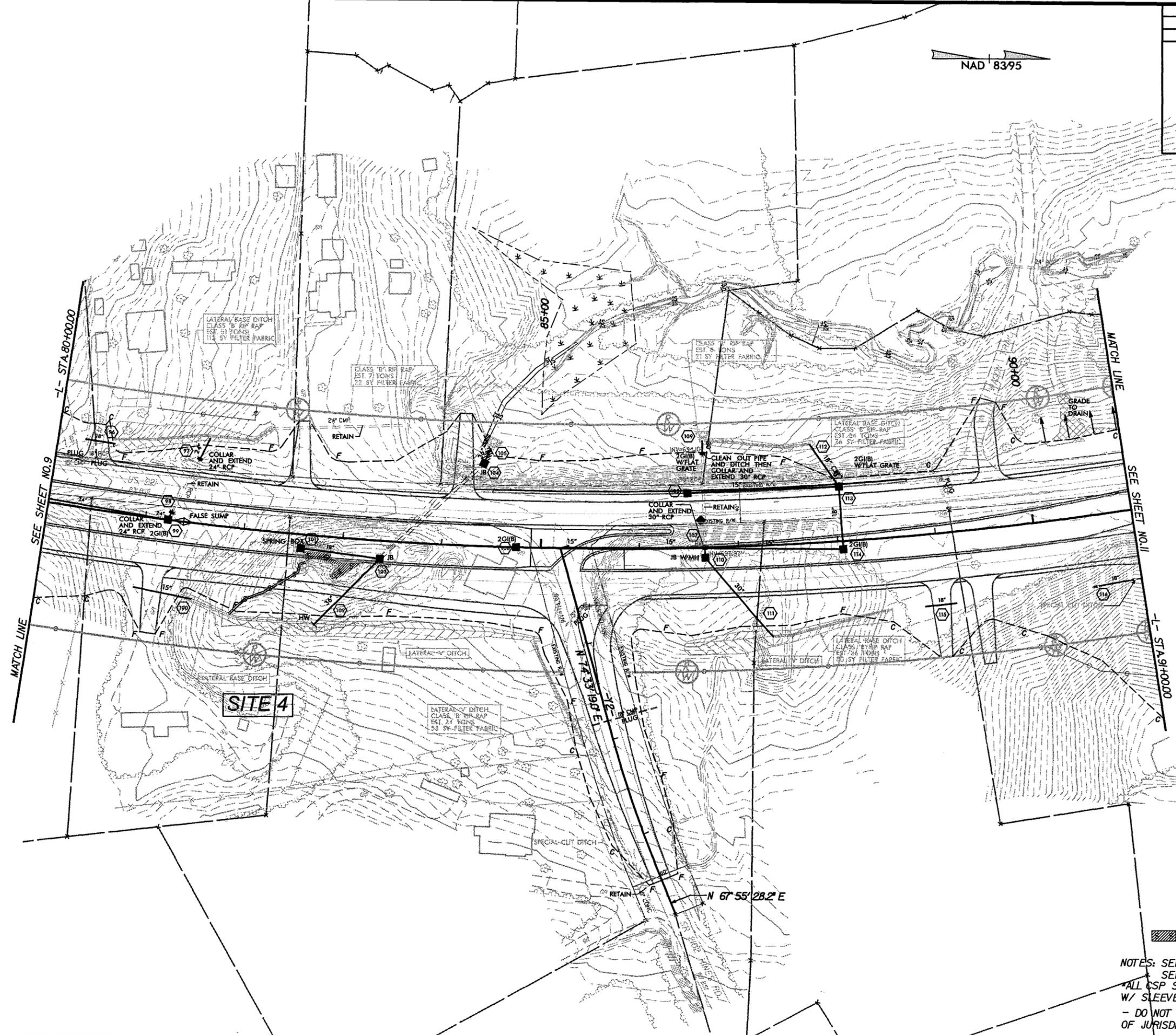
NOTES: SEE SHEET 31 FOR -L- PROFILE  
 SEE SHEET 42 FOR -RR- PROFILE  
 \*ALL CSP SHALL HAVE ROD AND LUG  
 W/ SLEEVE GASKET CONNECTORS  
 - DO NOT PLACE ROCK IN THE BED  
 OF JURISDICTIONAL STREAMS

Permit Drawing  
 Sheet 19 of 32

|                                   |                     |
|-----------------------------------|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA | SHEET NO.<br>10     |
| RW SHEET NO.                      |                     |
| ROADWAY DESIGN ENGINEER           | HYDRAULICS ENGINEER |



REVISIONS  
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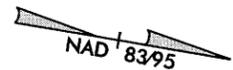


Permit Drawing  
 Sheet 20 of 32

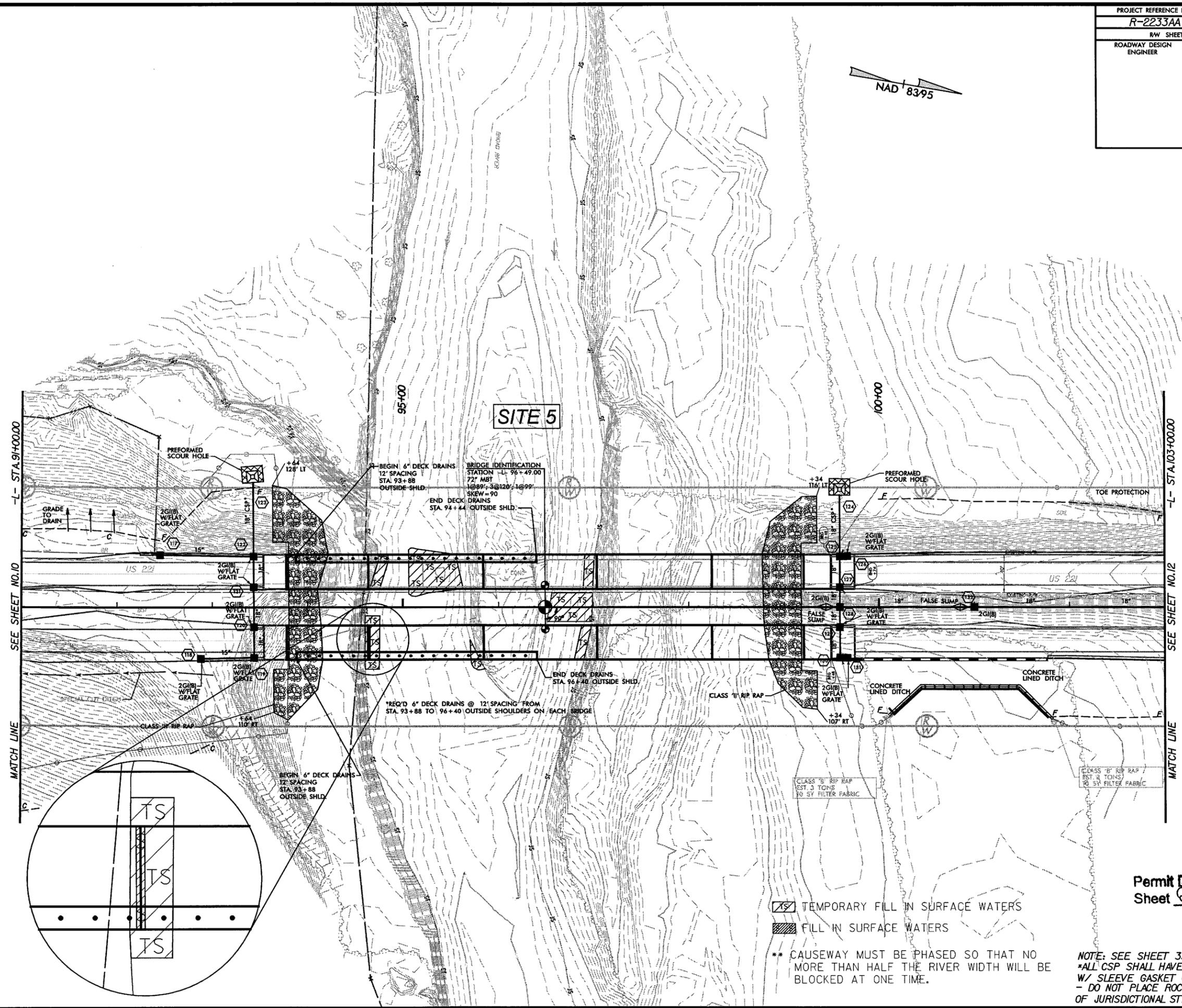
FILL IN SURFACE WATERS

NOTES: SEE SHEET 31 FOR -L- PROFILE  
 SEE SHEET 42 FOR -RR- PROFILE  
 ALL CSP SHALL HAVE ROD AND LUG  
 W/ SLEEVE GASKET CONNECTORS  
 - DO NOT PLACE ROCK IN THE BED  
 OF JURISDICTIONAL STREAMS

|                         |                     |
|-------------------------|---------------------|
| PROJECT REFERENCE NO.   | SHEET NO.           |
| R-2233AA                | 11                  |
| RW SHEET NO.            |                     |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |



REVISIONS



**SITE 5**

BRIDGE IDENTIFICATION  
STATION -L- 96+49.00  
72' MBT  
1@89°, 3@120°, 1@99°  
SKEW = 90

BEGIN 6" DECK DRAINS  
12' SPACING  
STA. 93+88  
OUTSIDE SHLD.

END DECK DRAINS  
STA. 96+40  
OUTSIDE SHLD.

REQ'D 6" DECK DRAINS @ 12' SPACING FROM  
STA. 93+88 TO 96+40 OUTSIDE SHOULDERS ON EACH BRIDGE

- TEMPORARY FILL IN SURFACE WATERS
- FILL IN SURFACE WATERS

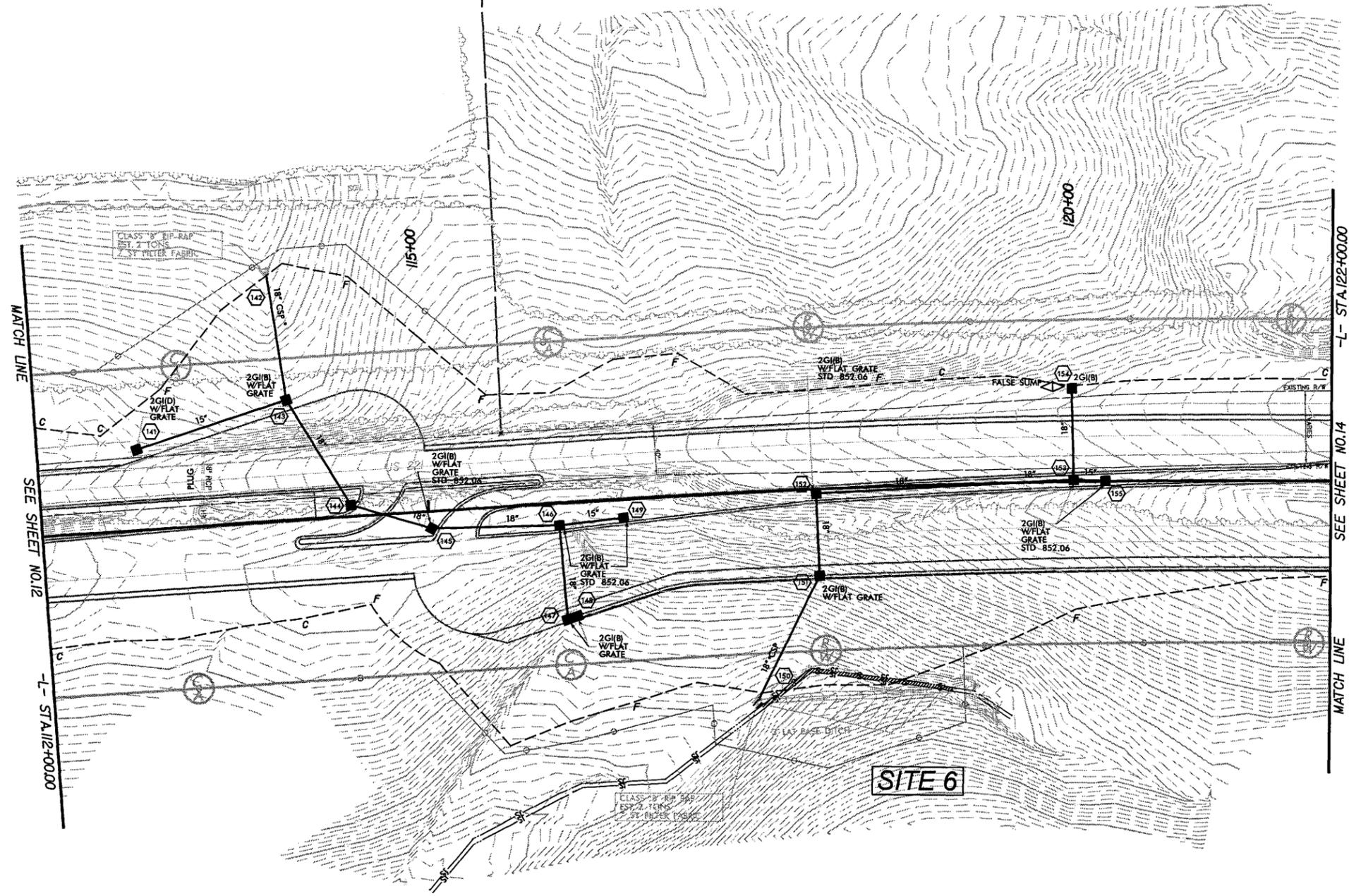
\*\* CAUSEWAY MUST BE PHASED SO THAT NO MORE THAN HALF THE RIVER WIDTH WILL BE BLOCKED AT ONE TIME.

NOTE: SEE SHEET 33 FOR -L- PROFILE  
\*ALL CSP SHALL HAVE ROD AND LUG W/ SLEEVE GASKET CONNECTORS - DO NOT PLACE ROCK IN THE BED OF JURISDICTIONAL STREAMS

Permit Drawing  
Sheet 21 of 32

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|                                   |                     |
|-----------------------------------|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA | SHEET NO.<br>13     |
| RW SHEET NO.                      |                     |
| ROADWAY DESIGN ENGINEER           | HYDRAULICS ENGINEER |



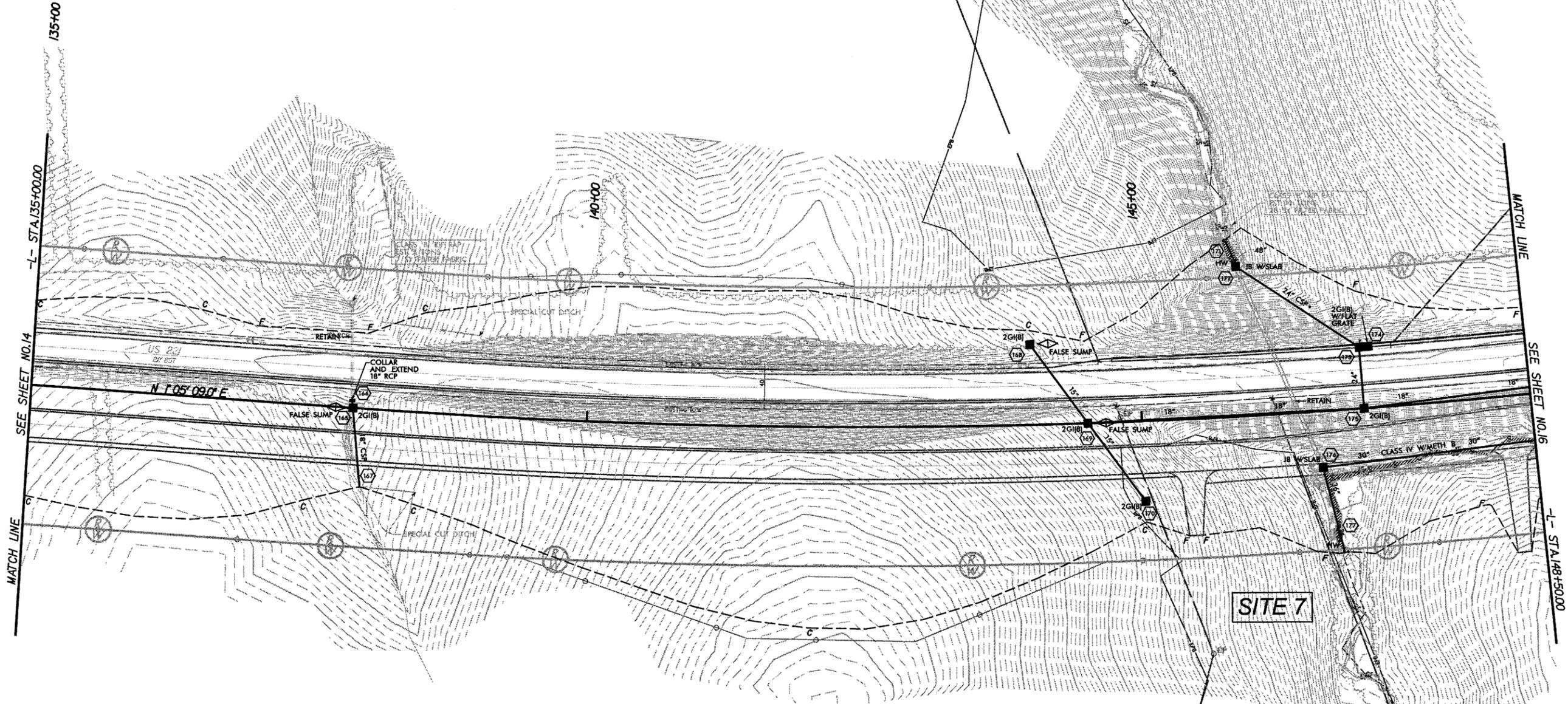
REVISIONS

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cmh

Permit Drawing  
Sheet 12 of 32

FILL IN SURFACE WATERS  
 NOTES: SEE SHEET 31 FOR -L- PROFILE  
 SEE SHEET 42 FOR -RR- PROFILE  
 \*ALL CSP SHALL HAVE ROD AND LUG  
 W/ SLEEVE GASKET CONNECTORS  
 - DO NOT PLACE ROCK IN THE BED  
 OF JURISDICTIONAL STREAMS

|                                   |                     |
|-----------------------------------|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA | SHEET NO.<br>15     |
| RW SHEET NO.                      |                     |
| ROADWAY DESIGN ENGINEER           | HYDRAULICS ENGINEER |



REVISIONS

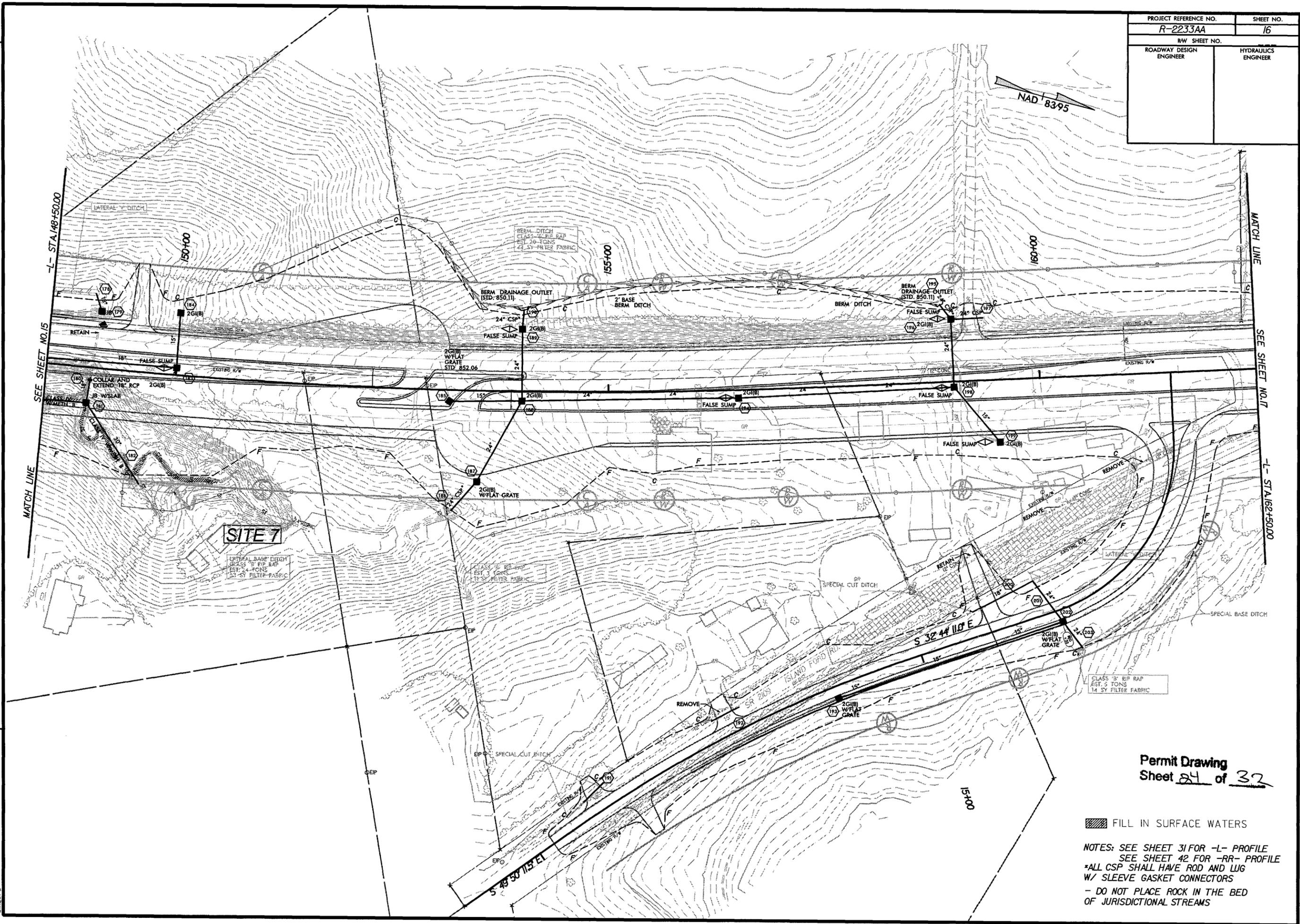
I:\2008\Permits\Con\_r2233aa\_hyd\_per\_pah15.dgn  
R:\2008\Permits\Con\_r2233aa\_hyd\_per\_pah15.dgn  
cmh/ers

FILL IN SURFACE WATERS

NOTES: SEE SHEET 31 FOR -L- PROFILE  
SEE SHEET 42 FOR -RR- PROFILE  
\*ALL CSP SHALL HAVE ROD AND LUG  
W/ SLEEVE GASKET CONNECTORS  
- DO NOT PLACE ROCK IN THE BED  
OF JURISDICTIONAL STREAMS

Permit Drawing  
Sheet 23 of 32

|                                   |                     |
|-----------------------------------|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA | SHEET NO.<br>16     |
| RW SHEET NO.                      |                     |
| ROADWAY DESIGN ENGINEER           | HYDRAULICS ENGINEER |



REVISIONS  
 1/9/2008 R:\2233AA\Permits\Con-r2233aa\_hyd\_per\_psh16.dgn  
 01/09/08

MATCH LINE  
 SEE SHEET NO.15  
 -L- STA 148+50.00

MATCH LINE  
 SEE SHEET NO.17  
 -L- STA 162+50.00

**SITE 7**

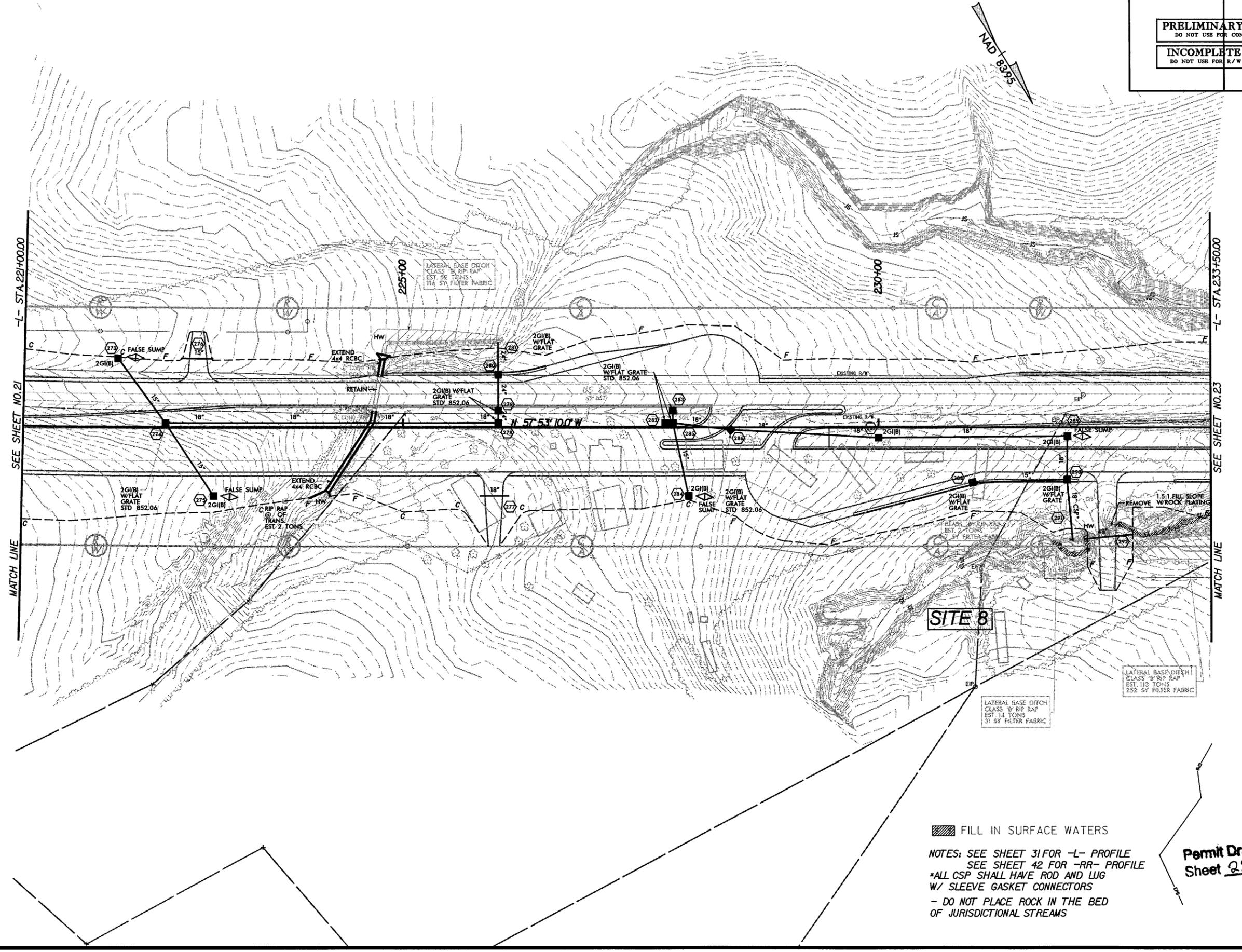
Permit Drawing  
 Sheet 24 of 32

FILL IN SURFACE WATERS

NOTES: SEE SHEET 31 FOR -L- PROFILE  
 SEE SHEET 42 FOR -RR- PROFILE  
 \*ALL CSP SHALL HAVE ROD AND LUG  
 W/ SLEEVE GASKET CONNECTORS  
 - DO NOT PLACE ROCK IN THE BED  
 OF JURISDICTIONAL STREAMS

|   |                     |
|---|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA                         | SHEET NO.<br>22     |
| RW SHEET NO.  |                     |
| ROADWAY DESIGN ENGINEER                                   | HYDRAULICS ENGINEER |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION   |                     |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION |                     |

REVISIONS

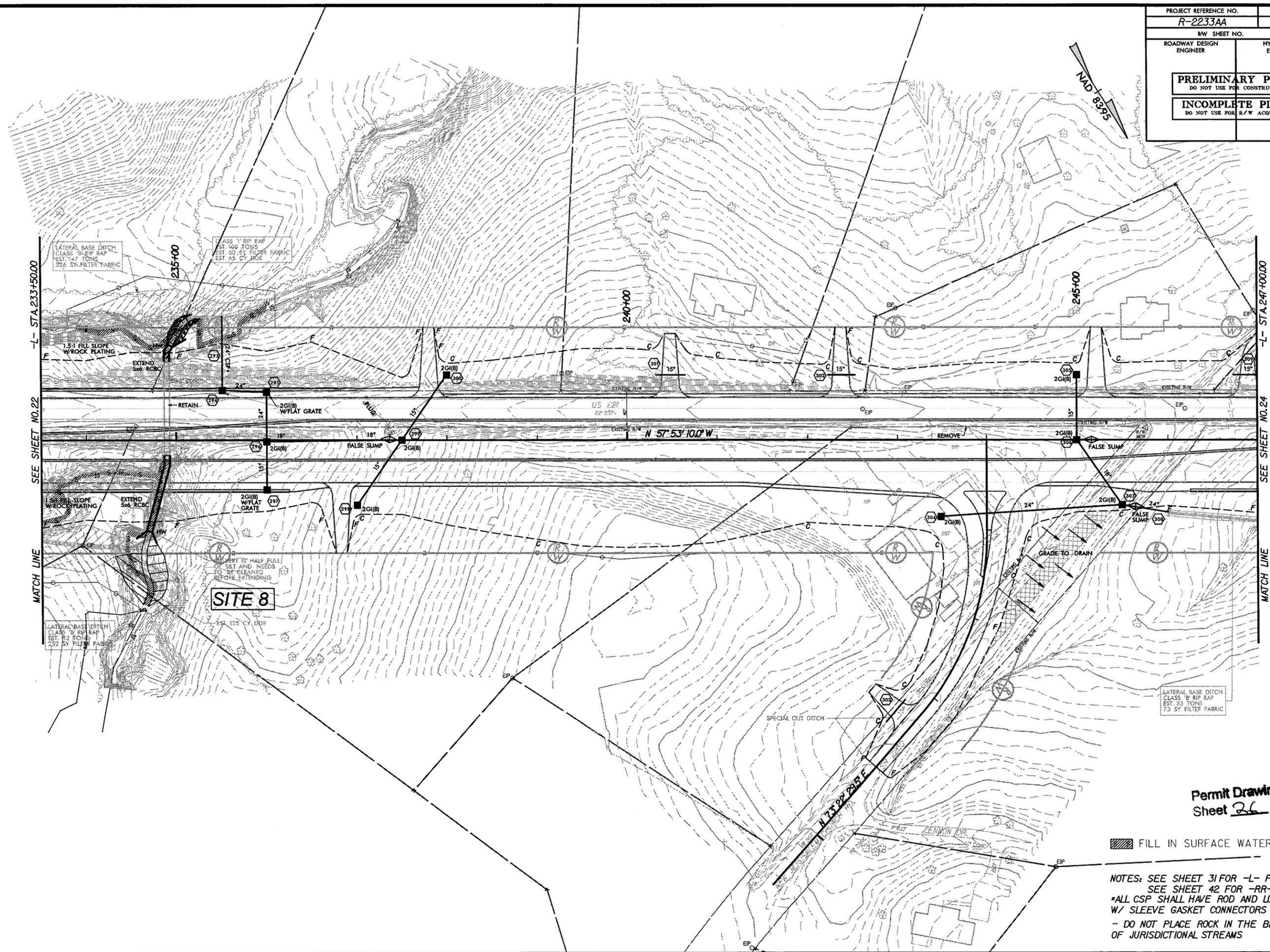


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cmj/s

■ FILL IN SURFACE WATERS  
 NOTES: SEE SHEET 31 FOR -L- PROFILE  
 SEE SHEET 42 FOR -RR- PROFILE  
 \*ALL CSP SHALL HAVE ROD AND LUG  
 W/ SLEEVE GASKET CONNECTORS  
 - DO NOT PLACE ROCK IN THE BED  
 OF JURISDICTIONAL STREAMS

Permit Drawing  
Sheet 25 of 32

|   |                     |
|---|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA                         | SHEET NO.<br>23     |
| RW SHEET NO.  |                     |
| ROADWAY DESIGN ENGINEER                                   | HYDRAULICS ENGINEER |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION   |                     |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION |                     |



REVISIONS

-L- STA. 233+50.00  
SEE SHEET NO. 22

-L- STA. 244+00.00  
SEE SHEET NO. 24

MATCH LINE

MATCH LINE

**SITE 8**

Permit Drawing  
Sheet 26 of 32

FILL IN SURFACE WATERS

NOTES: SEE SHEET 31 FOR -L- PROFILE  
SEE SHEET 42 FOR -RR- PROFILE  
\*ALL CSP SHALL HAVE ROD AND LUG  
W/ SLEEVE GASKET CONNECTORS  
- DO NOT PLACE ROCK IN THE BED  
OF JURISDICTIONAL STREAMS

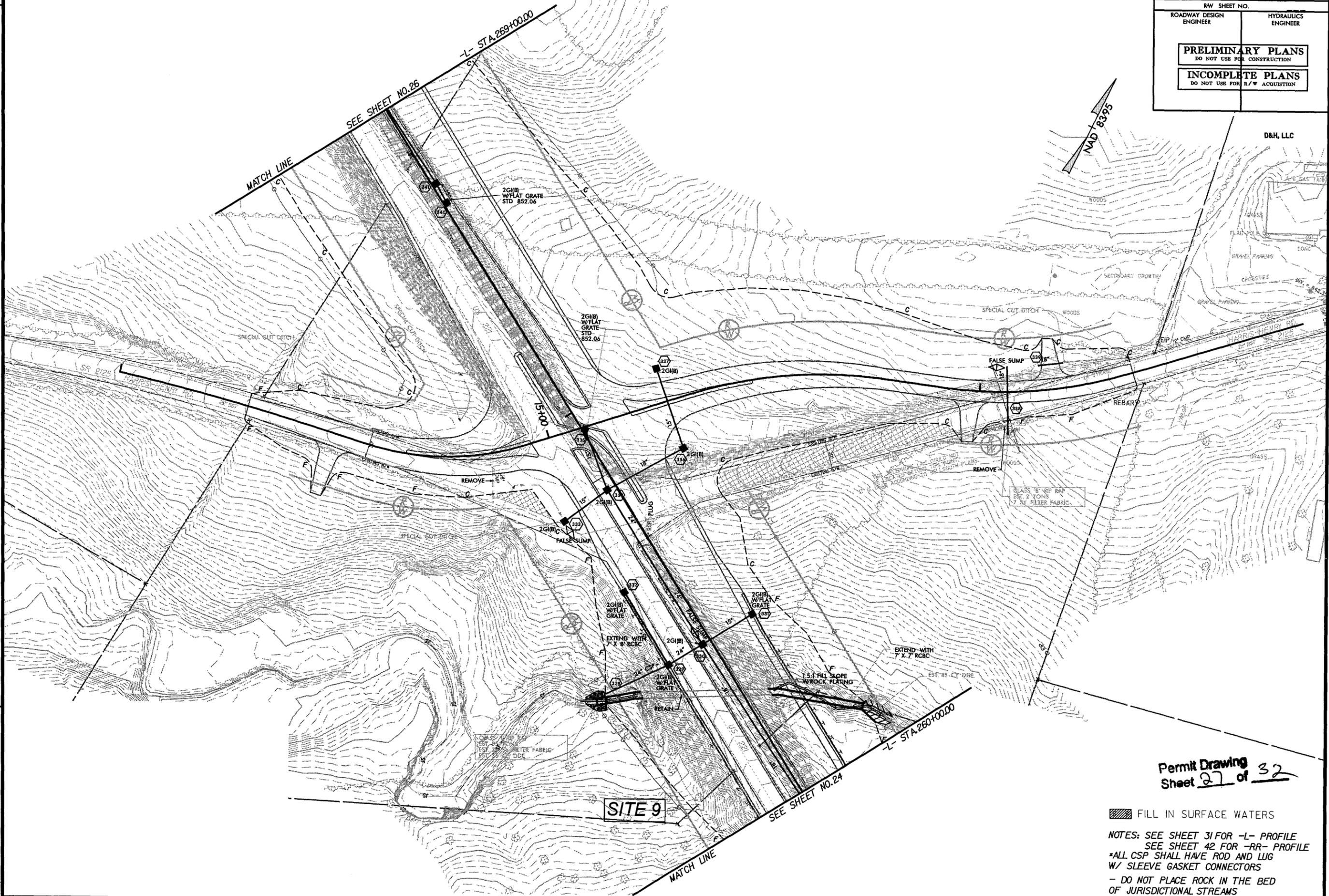
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cmiers

|   |                     |
|---|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA                         | SHEET NO.<br>25     |
| RW SHEET NO.  |                     |
| ROADWAY DESIGN ENGINEER                                   | HYDRAULICS ENGINEER |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION   |                     |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION |                     |

D&H, LLC



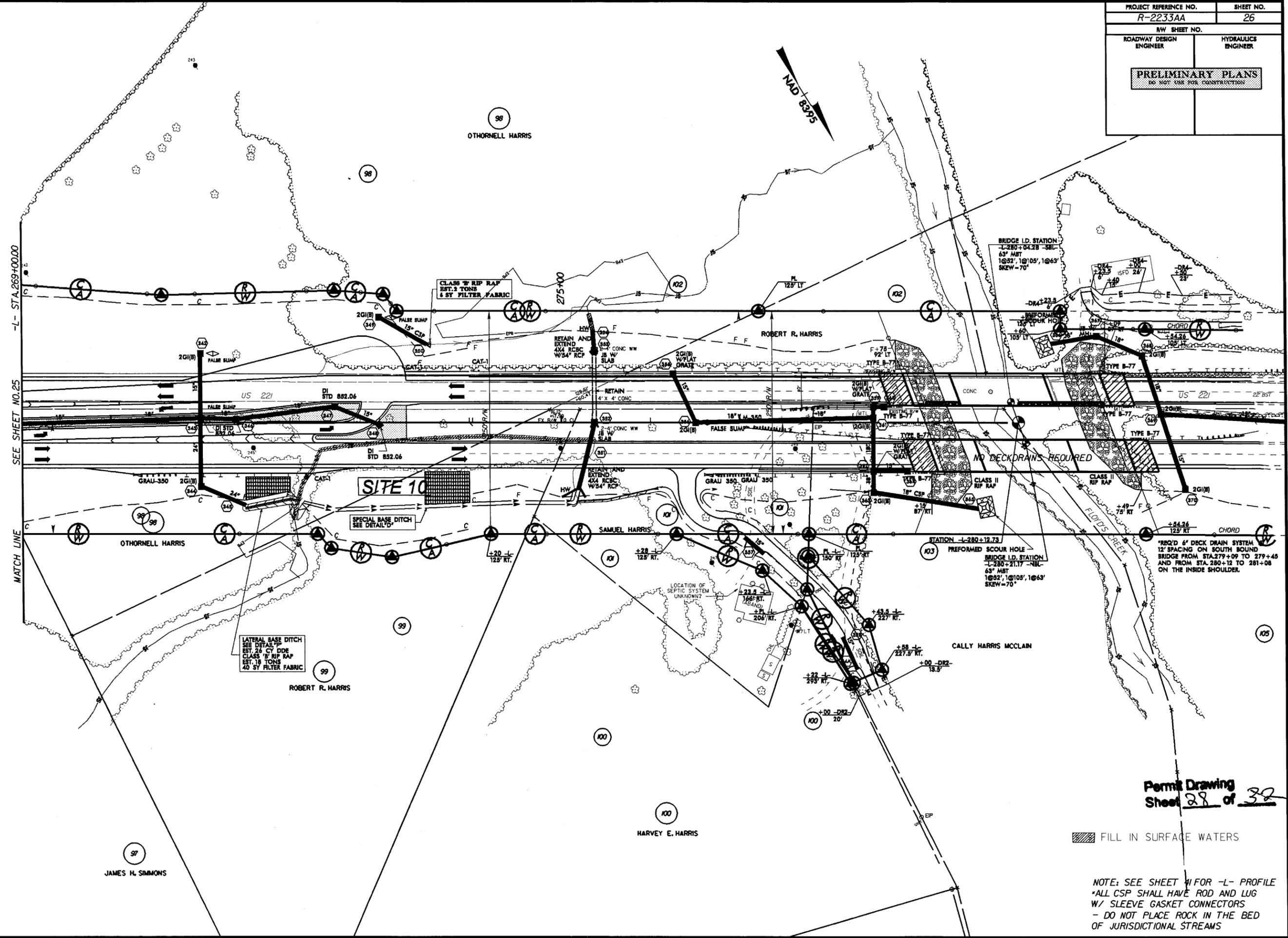
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 1/9/2008  
 gmlers



Permit Drawing  
Sheet 27 of 32

- ▨ FILL IN SURFACE WATERS
- NOTES: SEE SHEET 31 FOR -L- PROFILE  
SEE SHEET 42 FOR -RR- PROFILE
- \*ALL CSP SHALL HAVE ROD AND LUG  
W/ SLEEVE GASKET CONNECTORS
- DO NOT PLACE ROCK IN THE BED  
OF JURISDICTIONAL STREAMS

|  |                     |
|--|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA                                      | SHEET NO.<br>26     |
| HW SHEET NO.   |                     |
| ROADWAY DESIGN ENGINEER  | HYDRAULICS ENGINEER |
| <b>PRELIMINARY PLANS</b><br><small>DO NOT USE FOR CONSTRUCTION</small> |                     |



SEE SHEET NO. 25  
MATCH LINE

Permit Drawing  
Sheet 28 of 32

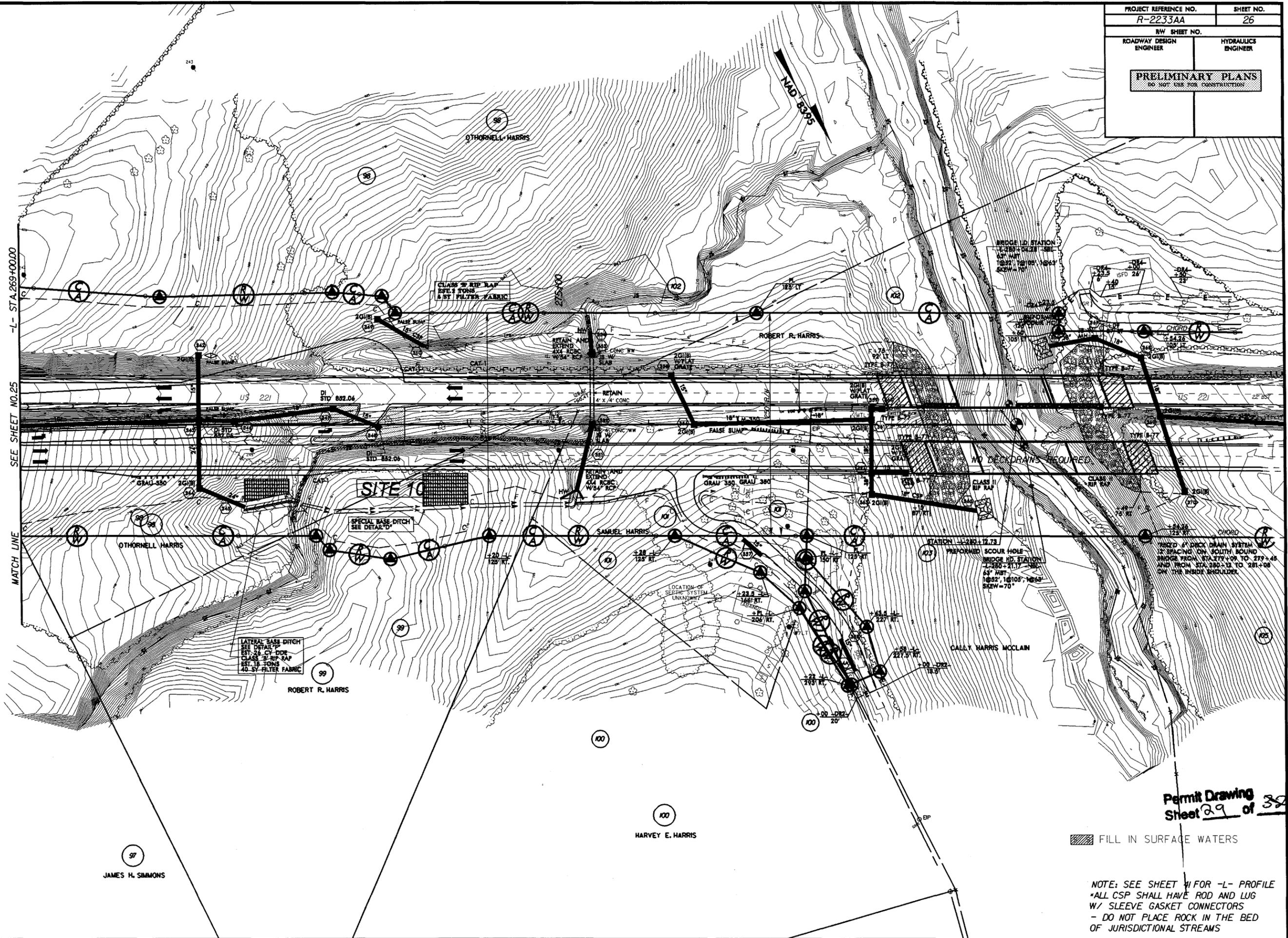
FILL IN SURFACE WATERS

NOTE: SEE SHEET #1 FOR -L- PROFILE  
 \*ALL CSP SHALL HAVE ROD AND LUG  
 W/ SLEEVE GASKET CONNECTORS  
 - DO NOT PLACE ROCK IN THE BED  
 OF JURISDICTIONAL STREAMS

REVISIONS

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 AT HY244955

|   |                     |
|---|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AA                       | SHEET NO.<br>26     |
| RW SHEET NO.  |                     |
| ROADWAY DESIGN ENGINEER                                 | HYDRAULICS ENGINEER |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION |                     |



REVISIONS

SEE SHEET NO. 25 -L- STA. 269+00.00  
MATCH LINE

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Permit Drawing  
Sheet 29 of 32

▨ FILL IN SURFACE WATERS

NOTE: SEE SHEET #1 FOR -L- PROFILE  
\*ALL CSP SHALL HAVE ROD AND LUG  
W/ SLEEVE GASKET CONNECTORS  
- DO NOT PLACE ROCK IN THE BED  
OF JURISDICTIONAL STREAMS

**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              | 16+67 -L-         | 18" RCP               |                                 |                             |                             |                                      |                                | <0.01                     |                       | 90                                      |                                     |                            |
| 2              | 31+32             | 5 x 4 RCBC            |                                 |                             |                             |                                      |                                | 0.022                     |                       | 205                                     |                                     |                            |
| 3              | 40+98             | 5 x 4 RCBC            | <0.01                           |                             |                             | <0.01                                |                                | 0.035                     |                       | 109                                     |                                     |                            |
| 4              | 83+59             | 36" RCP               |                                 |                             |                             |                                      |                                | 0.019                     |                       | 188                                     |                                     |                            |
| 5              | 96+49             | BRIDGE                |                                 |                             |                             |                                      |                                | <0.01                     | 0.130                 |   | 127                                 |                            |
| 6              | 118+00            | ROADWAY FILL          |                                 |                             |                             |                                      |                                | 0.011                     |                       | 156                                     |                                     |                            |
| 7              | 146+61 - 149+03   | 3 x 3 RCBC            |                                 |                             |                             |                                      |                                | 0.051                     |                       | 615                                     |                                     |                            |
| 8              | 232+53 - 234+90   | 5 x 6 RCBC            |                                 |                             |                             |                                      |                                | 0.103                     |                       | 832                                     |                                     |                            |
| 9              | 261+33            | 7 x 7 RCBC            |                                 |                             |                             |                                      |                                | 0.010                     |                       | 210                                     |                                     |                            |
| 10             | 272+34 - 274+00   | ROADWAY FILL          |                                 |                             |                             |                                      |                                | 0.040                     |                       | 408                                     |                                     |                            |
| <b>TOTALS:</b> |                   |                       | <0.01                           | 0.000                       | 0.000                       | <0.01                                | 0.000                          | 0.283                     | 0.130                 | 2813                                    | 127                                 | 0                          |

\*36 feet of impacts associated with bridge piers

NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

RUTHERFORD COUNTY  
34400.1.1 (R-2233AA)

# PROPERTY OWNERS

## NAMES AND ADDRESSES

| PARCEL NO. | NAMES             | ADDRESSES  | SITE NO. |
|------------|-------------------|--|----------|
| 1          | BETTY WEASE ALLEN | RTE. 2, BOX 251<br>MOORESBORO, NC 28114                    | 1        |
| 2          | RONALD L. GREENE  | 7162 US HWY 221S<br>MOORESBORO, NC 28114                   | 2, 3     |
| 3          | HOWARD L. PARRIS  | 7061 US HWY 221S<br>MOORESBORO, NC 28114                   | 2, 3     |
| 4          | MIKEL L. PARRIS   | 7141 US HWY 221S<br>MOORESBORO, NC 28114                   | 2        |
| 5          | MARTHA B. SIMS    | 2541 ROCK RD.<br>RUTHERFORDTON, NC 28139                   | 4        |
| 6          | FLOYD L. BUCKNER  | 130 HINES RD.<br>MOORESBORO, NC 28114                      | 4        |
| 7          | JAMES L. GRANT    | 794 HARRIS-HOLLY<br>SPRINGS RD.<br>RUTHERFORDTON, NC 28139 | 4        |
| 8          | GEORGE W TURNER   | 159 WAGON TRAIL<br>MOORESBORO, NC 28114                    | 4, 5     |
| 9          | LEID CORPORATION  | 300 DALLAS ST.<br>SPINDALE, NC 28160                       | 5, 6     |
| 10         | STEPHEN D. LOWE   | 2507 BETHEL CHURCH<br>JONESVILLE, NC 28642                 | 7        |

**NORTH CAROLINA**

DIVISION OF HIGHWAYS  
RUTHERFORD COUNTY  
PROJECT: 34400.L1 (R-2233AA)

US 221

# PROPERTY OWNERS

## NAMES AND ADDRESSES

| PARCEL NO. | NAMES                | ADDRESSES                                       | SITE NO. |
|------------|----------------------|---|----------|
| 11         | BOYCE C. GREENE, SR. | 2117 ISLAND FORD RD.<br>MOORESBORO, NC 28114    | 7        |
| 12         | FRANK B. GODFREY     | 5241 US HWY 221S<br>FOREST CITY, NC 28043       | 8        |
| 13         | TOMMY M. ROBBINS     | 164 BROOKFIELD DR.<br>FOREST CITY, NC 28043     | 8        |
| 14         | HICKS W. HELTON      | 1817 ISLAND FORD RD.<br>MOORESBORO, NC 28114    | 8        |
| 15         | BILLY D. HONEYCUTT   | 333 LAMBS GRILL RD.<br>RUTHERFORDTON, NC 28139  | 8        |
| 16         | ARNITA CAMP          | UNIT 15333<br>FOREST CITY, NC 28043             | 8        |
| 17         | HANNAH R. THOMPSON   | 212 FOREST ST.<br>FOREST CITY, NC 28043         | 9        |
| 18         | JAMES H. SIMMONS     | P.O. BOX 31682<br>CHARLOTTE, NC 28231           | 9        |
| 19         | ORTHORNELL HARRIS    | 5235 W. JEFFERSON ST.<br>PHILADELPHIA, PA 19131 | 10       |
|            |                      |   |          |

**NORTH CAROLINA**

DIVISION OF HIGHWAYS  
RUTHERFORD COUNTY  
PROJECT: 34400.11 (R-2233AA)

US 221

See Sheet 1-A For Index of Sheets  
See Sheet 1-B For Conventional Symbols

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

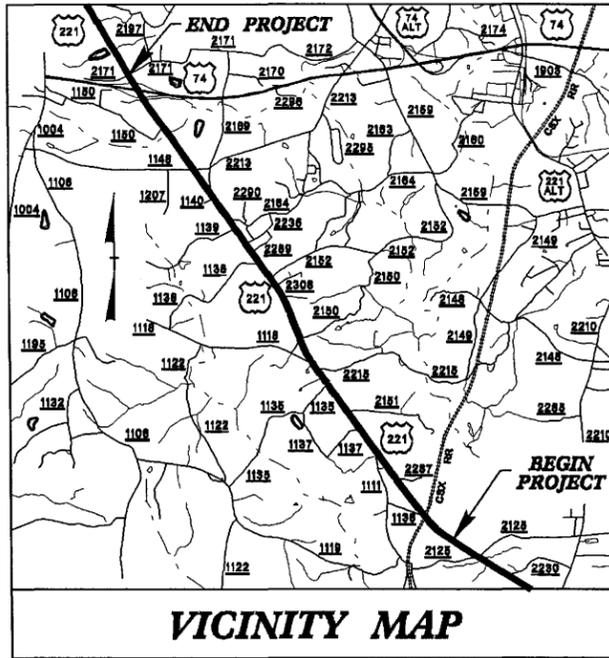
**RUTHERFORD COUNTY**

LOCATION: US 221 FROM SOUTH OF FLOYD'S CREEK TO  
NORTH OF US 74 BYPASS

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES

|                 |                             |             |              |
|-----------------|-----------------------------|-------------|--------------|
| STATE           | STATE PROJECT REFERENCE NO. | SHEET NO.   | TOTAL SHEETS |
| N.C.            | R-2233AB                    | 1           |              |
| STATE PROJ. NO. | F.A. PROJ. NO.              | DESCRIPTION |              |
| 34400.1.1       | NHF-221(9)                  | P.E.        |              |
| 34400.2.3       |                             | RW, UTIL.   |              |
|                 |                             |             |              |
|                 |                             |             |              |
|                 |                             |             |              |

TIP PROJECT: R-2233AB

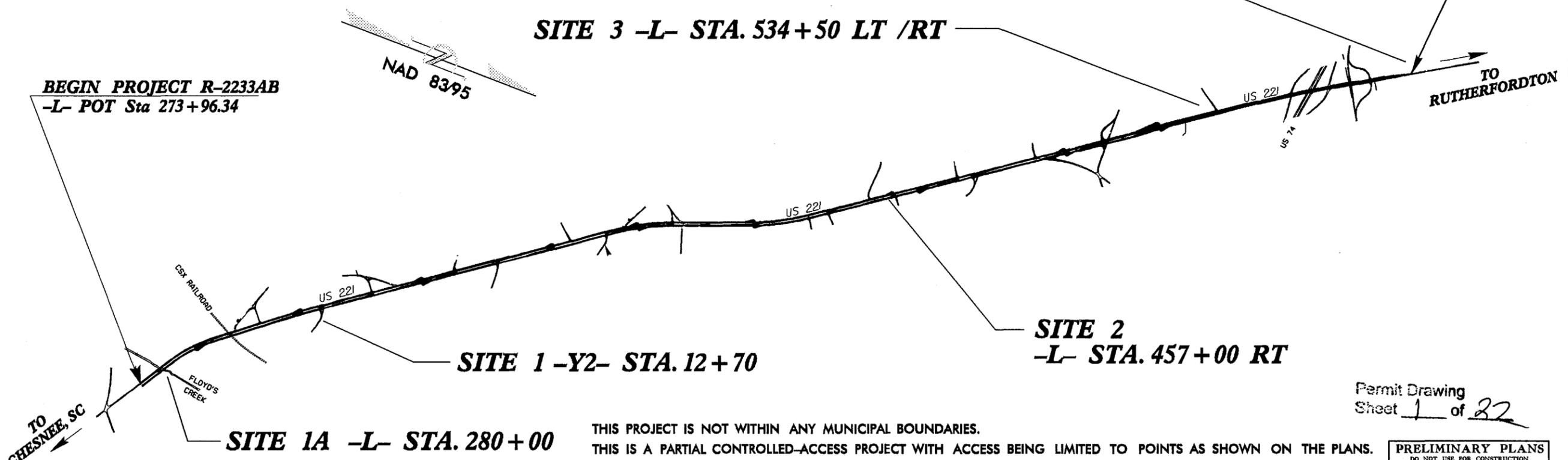


END PROJECT R-2233AB  
-L- POT Sta. 584+00.00

SITE 4 -L- STA. 584+18 LT

SITE 3 -L- STA. 534+50 LT /RT

BEGIN PROJECT R-2233AB  
-L- POT Sta 273+96.34

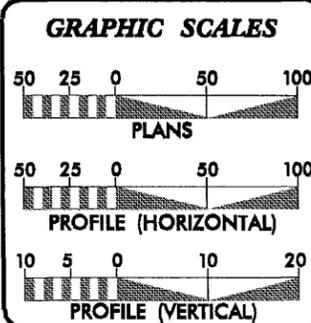


Permit Drawing  
Sheet 1 of 22

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.  
THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.  
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

CONTRACT:



**DESIGN DATA**

|                   |          |
|-------------------|----------|
| ADT 2005 =        | 10,900   |
| ADT 2030 =        | 19,000   |
| DHV =             | 11 %     |
| D =               | 55 %     |
| T =               | 12 % *   |
| V =               | 60 MPH   |
| FUNC. CLASS =     | ARTERIAL |
| * TTST 7% DUAL 5% |          |

**PROJECT LENGTH**

|   |             |
|---|-------------|
| LENGTH ROADWAY TIP PROJECT R-2233AB =   | 5.755 MILES |
| LENGTH STRUCTURE TIP PROJECT R-2233AB = | 0.117 MILES |
| TOTAL LENGTH TIP PROJECT R-2233AB =     | 5.872 MILES |

\* LENGTHS BASED ON NBL BRIDGES

Prepared In the Office of:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., Raleigh, NC, 27610

|                                     |  |
|-------------------------------------|--|
| 2006 STANDARD SPECIFICATIONS        |  |
| RIGHT OF WAY DATE:<br>JUNE 28, 2007 | ROGER D. THOMAS, PE<br>PROJECT ENGINEER      |
| LETTING DATE:<br>DECEMBER 15, 2009  | BRIAN P. ROBINSON<br>PROJECT DESIGN ENGINEER |

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

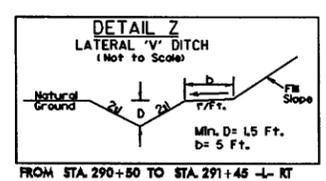
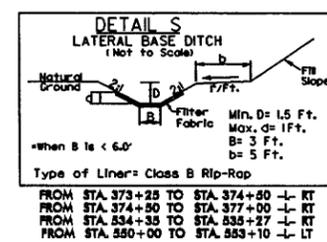
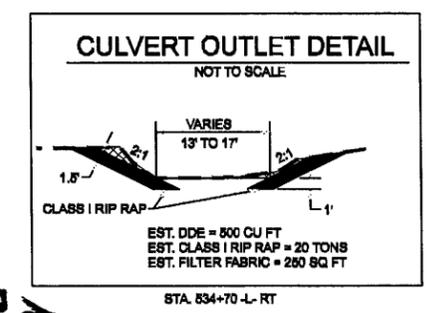
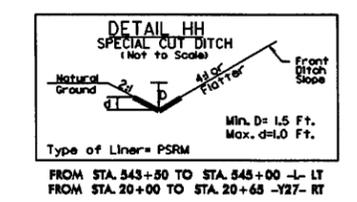
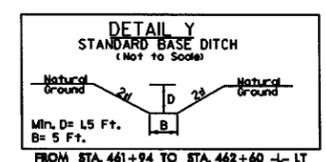
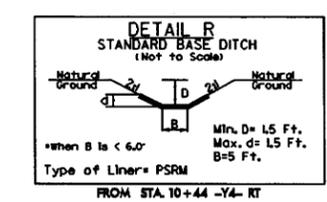
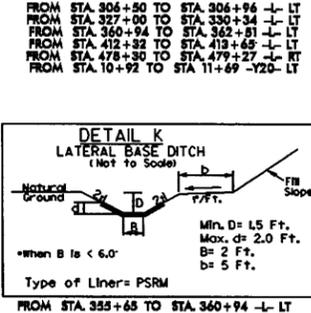
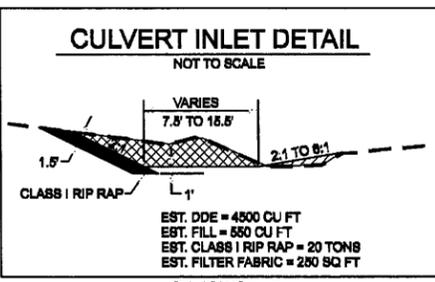
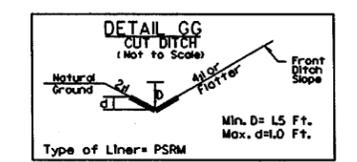
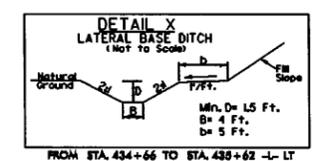
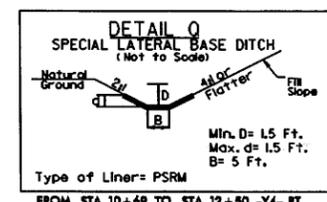
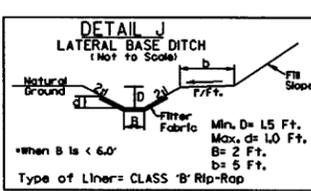
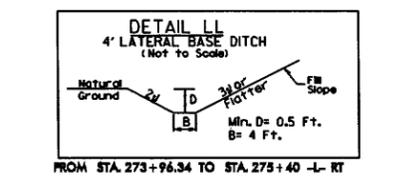
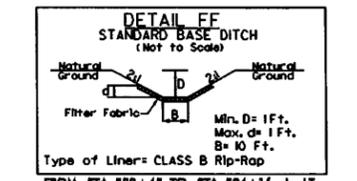
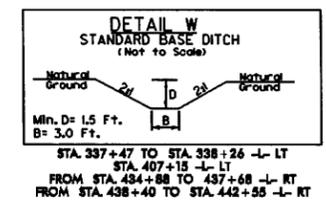
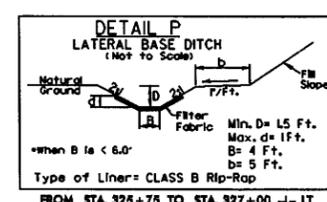
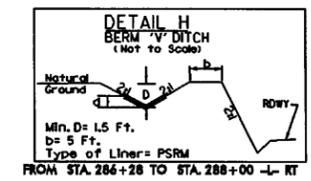
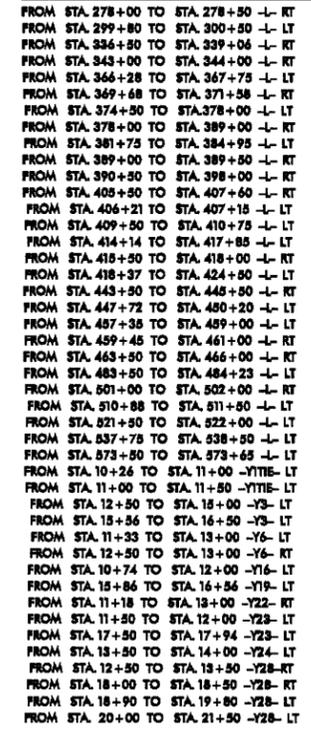
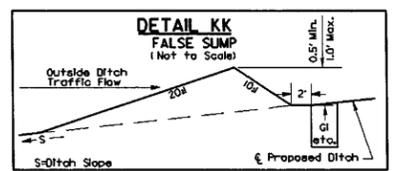
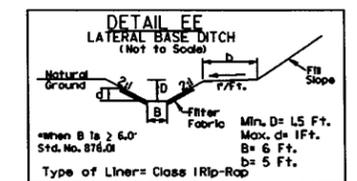
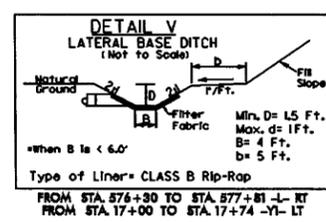
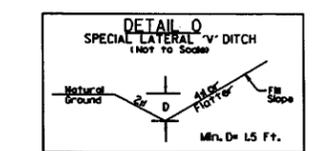
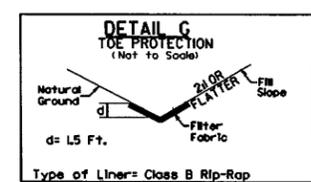
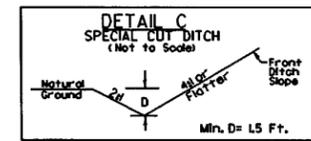
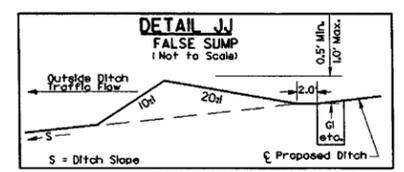
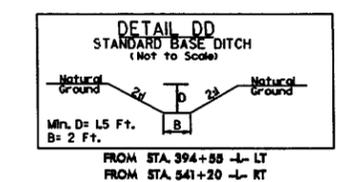
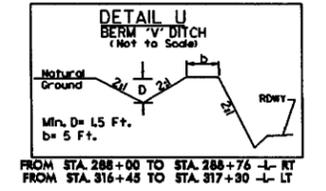
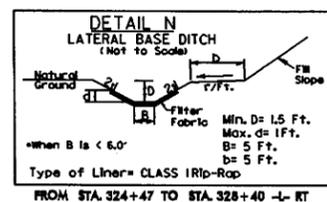
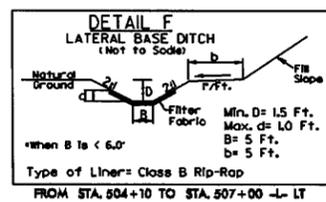
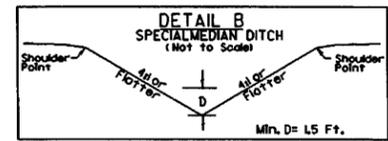
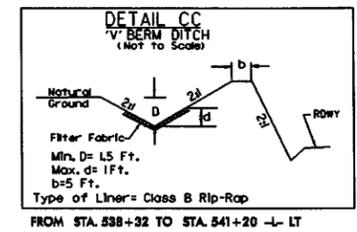
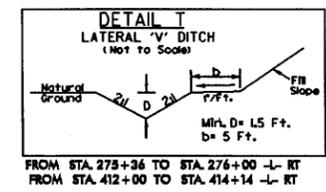
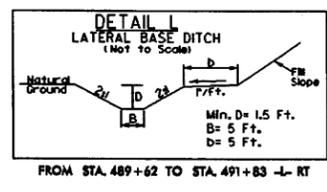
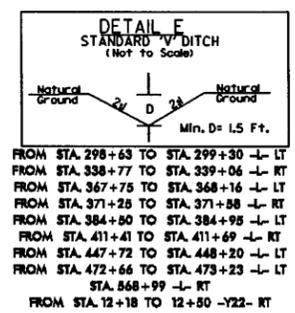
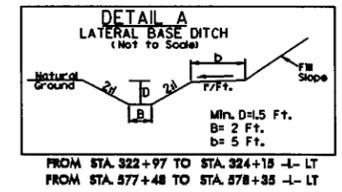
**ROADWAY DESIGN ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA**

STATE HIGHWAY DESIGN ENGINEER

08-SEP-2008 07:30 P:\hyd\quics\permits\_environmental\drawings\R2233ab\_rdy\_permit\_site\_vicinity.dgn gcalif AT HY244577



**DETAIL II**  
FALSE SUMP  
(Not to Scale)

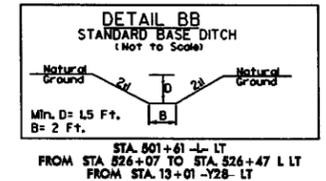
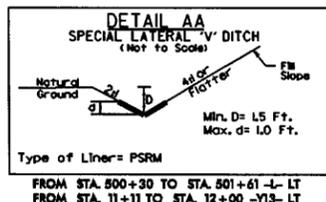
Median Ditch

0.5' Min. 1.0' Max.

| Ditch Grade       | L   | Ditch Grade       | L   |
|-------------------|-----|-------------------|-----|
| 0.0% To 2.0%      | 20' | Over 4.0% To 6.0% | 40' |
| Over 2.0% To 4.0% | 30' | Over 6.0%         | 50' |

S=Ditch Slope

FROM STA. 287+85 -L- M  
FROM STA. 299+80 -L- M  
FROM STA. 307+70 -L- M  
FROM STA. 317+60 -L- M  
FROM STA. 385+00 -L- M  
FROM STA. 434+50 -L- M  
FROM STA. 448+00 -L- M  
FROM STA. 452+75 -L- M  
FROM STA. 483+00 -L- M  
FROM STA. 487+80 -L- M  
FROM STA. 490+10 -L- M  
FROM STA. 529+00 -L- M  
FROM STA. 541+20 -L- M

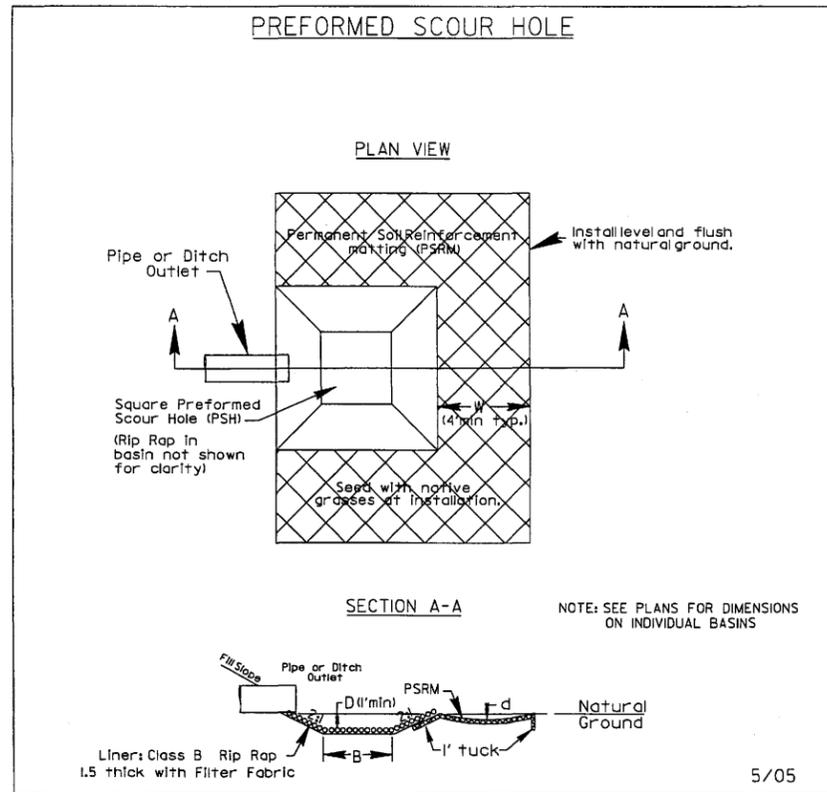


REVISIONS

8/17/99

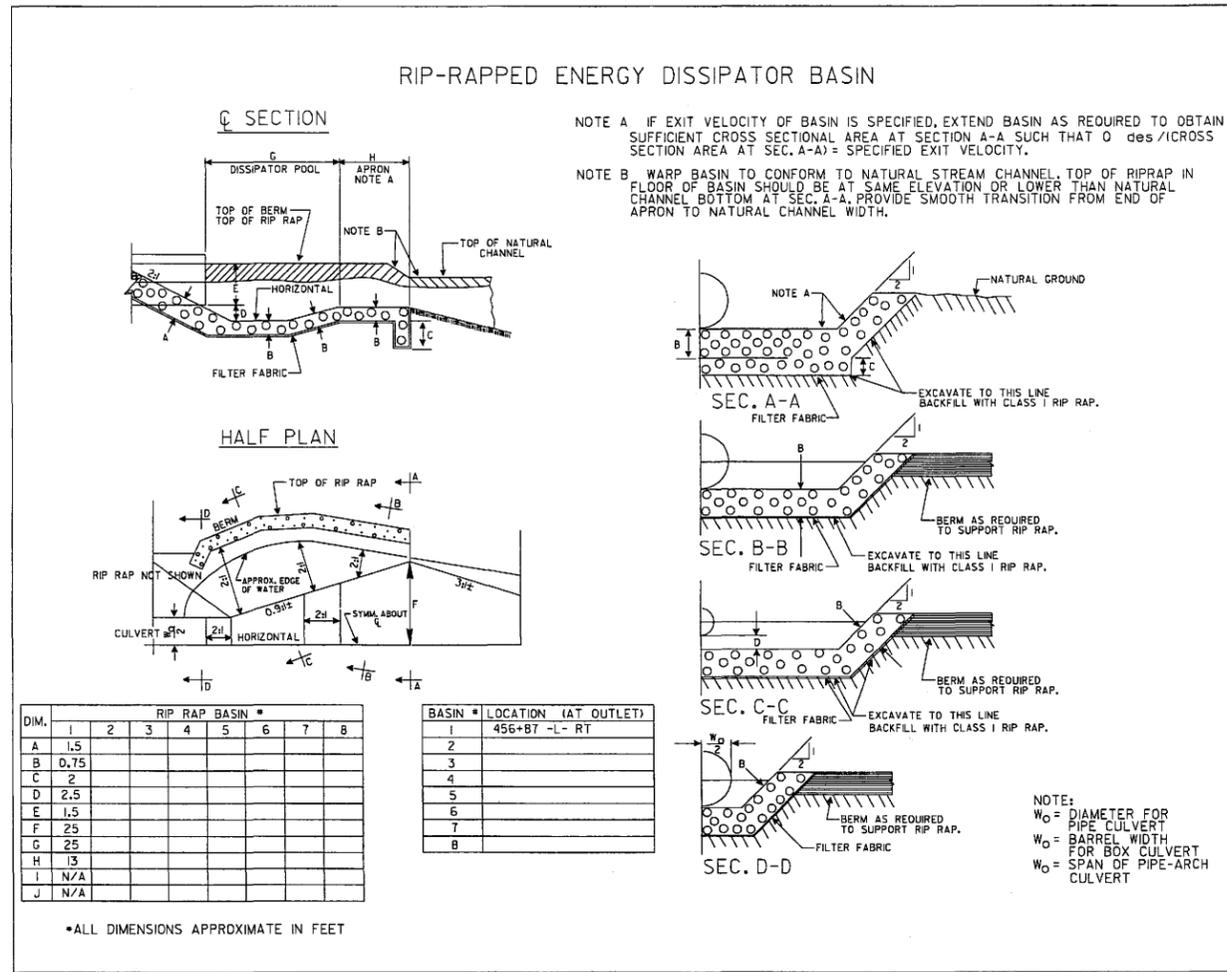
08-SEP-2008 14:05  
r:\drawing\ditchdetail.dgn  
Detail A HY241577

### PREFORMED SCOUR HOLE



- STA. 279+72 -L- RT
- STA. 280+44 -L- LT
- STA. 297+50 -L- RT
- STA. 321+90 -L- RT
- STA. 345+30 -L- LT
- STA. 351+70 -L- LT
- STA. 385+00 -L- LT
- STA. 426+50 -L- RT
- STA. 543+020 -L- RT
- STA. 583+020 -L- RT
- STA. 12+50 -Y5- LT
- STA. 11+00 -Y7- LT

### RIP-RAPPED ENERGY DISSIPATOR BASIN



|   |  |                     |  |
|---|--|---------------------|--|
| PROJECT REFERENCE NO.<br>R-2233AB                       |  | SHEET NO.<br>5      |  |
| HW SHEET NO.  |  |                     |  |
| ROADWAY DESIGN ENGINEER                                 |  | HYDRAULICS ENGINEER |  |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION |  |                     |  |

-DR4-

|                                      |                                      |
|--------------------------------------|--------------------------------------|
| PI Sta 10+54.78                      | PI Sta 13+21.94                      |
| $\Delta = 82^{\circ} 26' 36.3"$ (LT) | $\Delta = 91^{\circ} 05' 24.6"$ (RT) |
| D = 190' 59" 09.4'                   | D = 143' 14" 22.0'                   |
| L = 43.17'                           | L = 63.59'                           |
| T = 26.28'                           | T = 40.77'                           |
| R = 30.00'                           | R = 40.00'                           |

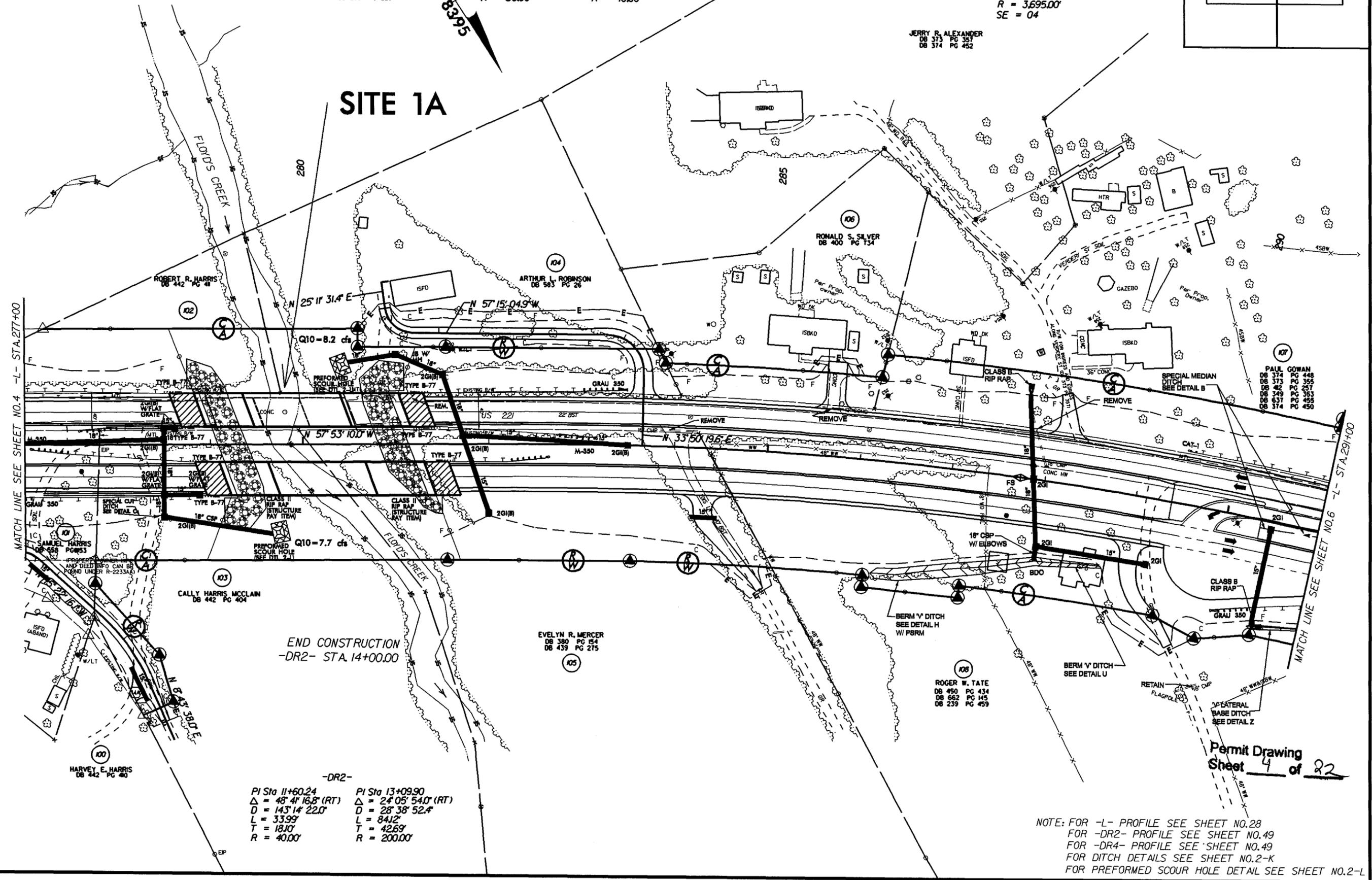
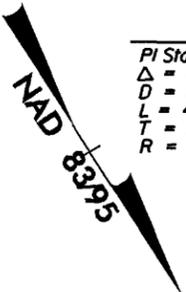
-L-

|                                  |                                      |
|----------------------------------|--------------------------------------|
| PIs Sta 282+87.60                | PI Sta 288+88.82                     |
| $\Theta_s = 1^{\circ} 33' 02.3"$ | $\Delta = 16^{\circ} 27' 49.5"$ (RT) |
| Ls = 200.00'                     | D = 133' 02.3'                       |
| LT = 133.34'                     | L = 1061.75'                         |
| ST = 66.67'                      | T = 534.56'                          |
|                                  | R = 3,695.00'                        |
|                                  | SE = 04                              |

OTHORNELL HARRIS  
DB 253 PG 225

JERRY R. ALEXANDER  
DB 373 PG 357  
DB 374 PG 452

# SITE 1A



-DR2-

|                                      |                                      |
|--------------------------------------|--------------------------------------|
| PI Sta 11+60.24                      | PI Sta 13+09.90                      |
| $\Delta = 48^{\circ} 41' 18.8"$ (RT) | $\Delta = 24^{\circ} 05' 54.0"$ (RT) |
| D = 143' 14" 22.0'                   | D = 28' 38" 52.4'                    |
| L = 33.99'                           | L = 841.2'                           |
| T = 18.10'                           | T = 42.69'                           |
| R = 40.00'                           | R = 200.00'                          |

NOTE: FOR -L- PROFILE SEE SHEET NO.28  
 FOR -DR2- PROFILE SEE SHEET NO.49  
 FOR -DR4- PROFILE SEE SHEET NO.49  
 FOR DITCH DETAILS SEE SHEET NO.2-K  
 FOR PREFORMED SCOUR HOLE DETAIL SEE SHEET NO.2-L

REVISIONS

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 created at 11/24/07

|   |                     |
|---|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AB                       | SHEET NO.<br>5      |
| R/W SHEET NO.   | DESIGNER            |
| ROADWAY DESIGN ENGINEER                                 | HYDRAULICS ENGINEER |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION |                     |

-DR4-

|   |  |
|---|--|
| PI Sta 10+5478<br>Δ = 82° 26' 36.3" (LT)<br>D = 130' 59" 09.4"<br>L = 43.7'<br>T = 26.28'<br>R = 30.00' | PI Sta 13+2194<br>Δ = 91° 05' 24.6" (RT)<br>D = 143' 14" 22.0"<br>L = 63.59'<br>T = 40.77'<br>R = 40.00' |
|---|--|

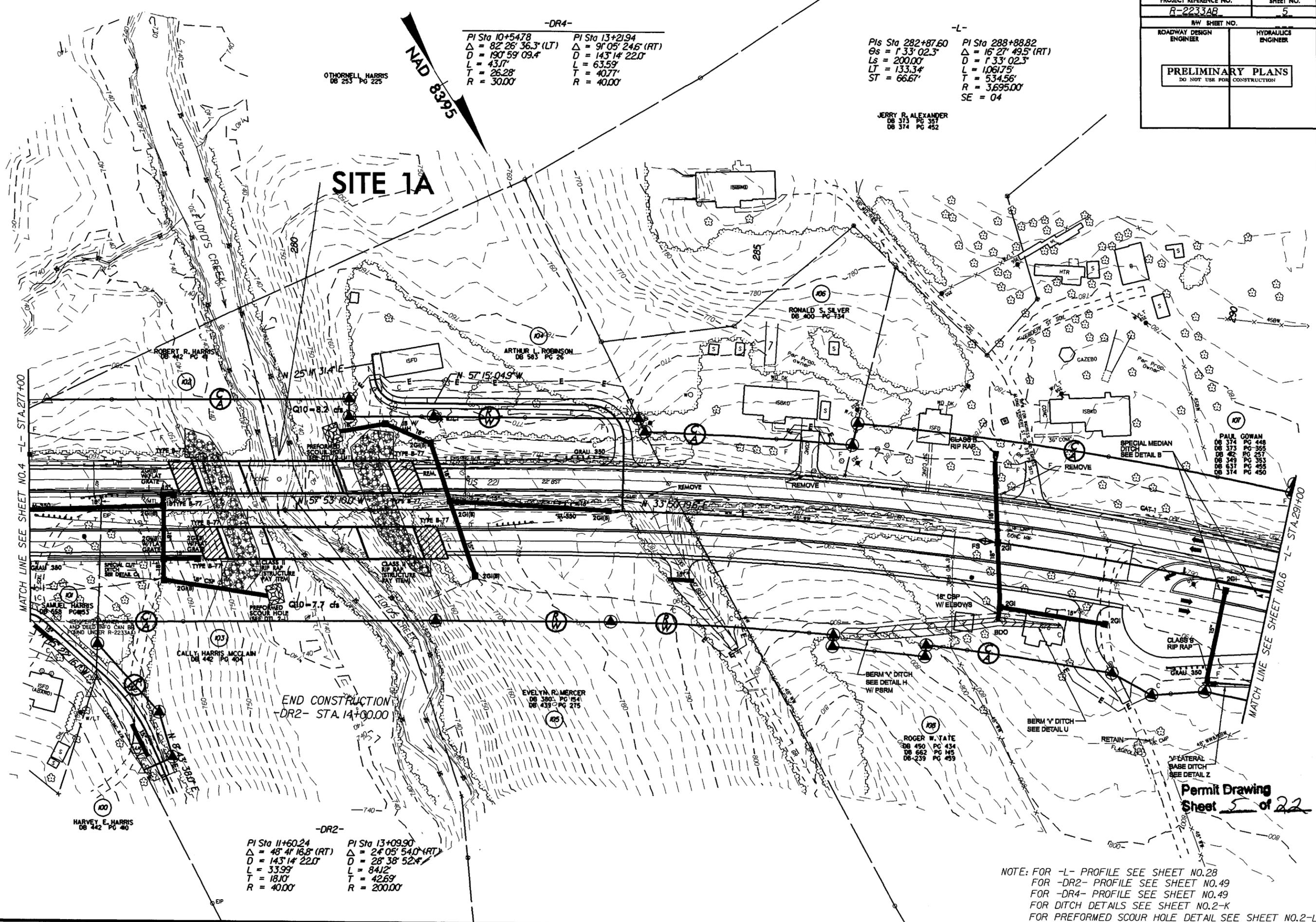
-L-

|   |   |
|---|---|
| PIs Sta 282+87.60<br>Gs = 1' 33" 02.3"<br>Ls = 200.00'<br>LT = 133.34'<br>ST = 66.67' | PI Sta 288+88.82<br>Δ = 16° 27' 49.5" (RT)<br>D = 1' 33" 02.3"<br>L = 106.175'<br>T = 53.456'<br>R = 3,695.00'<br>SE = 04 |
|---|---|

JERRY R. ALEXANDER  
DB 373 PG 357  
DB 374 PG 452

OTHORNELL HARRIS  
DB 253 PG 225

# SITE 1A



MATCH LINE SEE SHEET NO. 4 -L- STA. 277+00

MATCH LINE SEE SHEET NO. 6 -L- STA. 291+00

END CONSTRUCTION  
-DR2- STA. 14+00.00

-DR2-

|   |   |
|---|---|
| PI Sta 11+60.24<br>Δ = 48° 41' 16.8" (RT)<br>D = 143' 14" 22.0"<br>L = 33.99'<br>T = 18.10'<br>R = 40.00' | PI Sta 13+09.90<br>Δ = 24° 05' 54.0" (RT)<br>D = 28' 38" 52.4"<br>L = 84.12'<br>T = 42.69'<br>R = 200.00' |
|---|---|

Permit Drawing  
Sheet 5 of 22

NOTE: FOR -L- PROFILE SEE SHEET NO. 28  
FOR -DR2- PROFILE SEE SHEET NO. 49  
FOR -DR4- PROFILE SEE SHEET NO. 49  
FOR DITCH DETAILS SEE SHEET NO. 2-K  
FOR PREFORMED SCOUR HOLE DETAIL SEE SHEET NO. 2-L

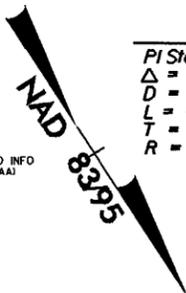
REVISIONS

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8/17/99

08-SEP-2008 09:46 2233ab\_r.dwg dsm\_psh05.dgn

|   |                     |
|---|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AB                       | SHEET NO.<br>5      |
| BW SHEET NO.  |                     |
| ROADWAY DESIGN ENGINEER                                 | HYDRAULICS ENGINEER |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION |                     |



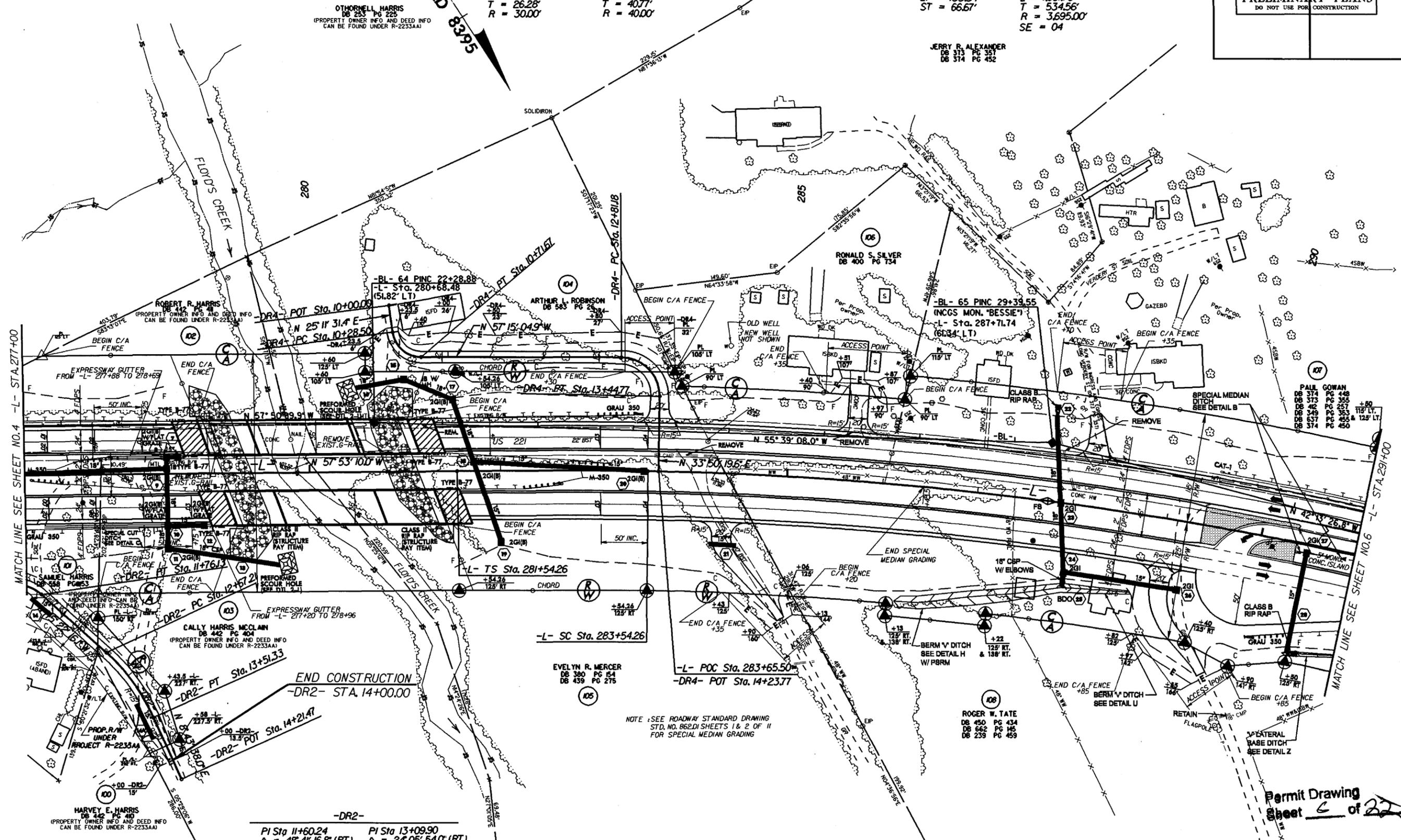
**-DR4-**

|  |  |
|--|--|
| PI Sta 10+5478<br>Δ = 82° 26' 36.3" (LT)<br>D = 190' 59' 09.4"<br>L = 43.17'<br>T = 26.28'<br>R = 30.00' | PI Sta 13+2194<br>Δ = 91° 05' 24.6" (RT)<br>D = 143' 14' 22.0"<br>L = 63.59'<br>T = 40.77'<br>R = 40.00' |
|--|--|

**-L-**

|   |   |
|---|---|
| PIs Sta 282+87.60<br>Θs = 1° 33' 02.3"<br>Ls = 200.00'<br>LT = 133.34'<br>ST = 66.67' | PI Sta 288+88.82<br>Δ = 16° 27' 49.5" (RT)<br>D = 1° 33' 02.3"<br>L = 1061.75'<br>T = 534.56'<br>R = 3,695.00'<br>SE = 04 |
|---|---|

JERRY R. ALEXANDER  
DB 315 PG 351  
DB 314 PG 452



**-DR2-**

|   |   |
|---|---|
| PI Sta 11+60.24<br>Δ = 48° 41' 16.8" (RT)<br>D = 143' 14' 22.0"<br>L = 33.99'<br>T = 18.10'<br>R = 40.00' | PI Sta 13+09.90<br>Δ = 24° 05' 54.0" (RT)<br>D = 28' 38' 52.4"<br>L = 84.12'<br>T = 42.69'<br>R = 200.00' |
|---|---|

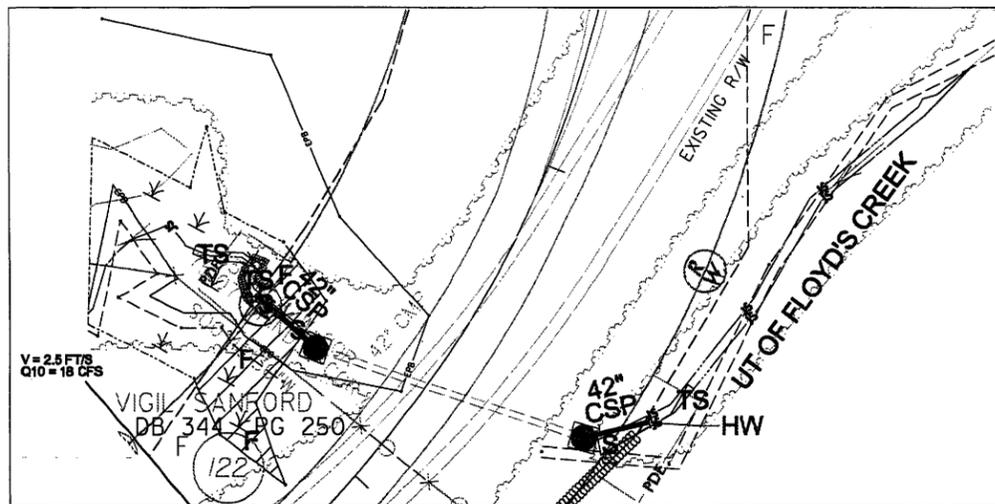
NOTE: SEE ROADWAY STANDARD DRAWING  
STD. NO. 862-D SHEETS 1 & 2 OF 11  
FOR SPECIAL MEDIAN GRADING

NOTE: FOR -L- PROFILE SEE SHEET NO.28  
FOR -DR2- PROFILE SEE SHEET NO.49  
FOR -DR4- PROFILE SEE SHEET NO.49  
FOR DITCH DETAILS SEE SHEET NO.2-K  
FOR PREFORMED SCOUR HOLE DETAIL SEE SHEET NO.2-L

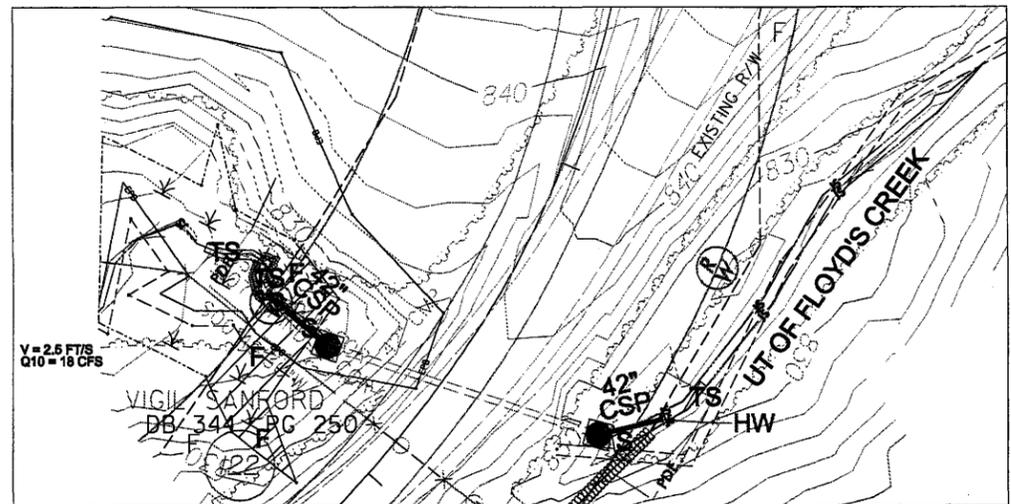
Permit Drawing  
Sheet 6 of 22

BEGIN CONSTRUCTION  
-Y3- POC STA. 12+25.00

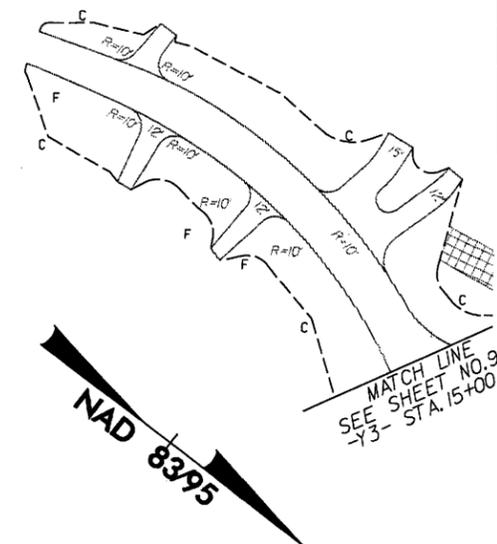
|   |                     |
|---|---------------------|
| PROJECT REFERENCE NO.<br>R-2233AB                       | SHEET NO.<br>8      |
| RW SHEET NO.  |                     |
| ROADWAY DESIGN ENGINEER                                 | HYDRAULICS ENGINEER |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION |                     |



**SITE 1 ENLARGED PLAN**

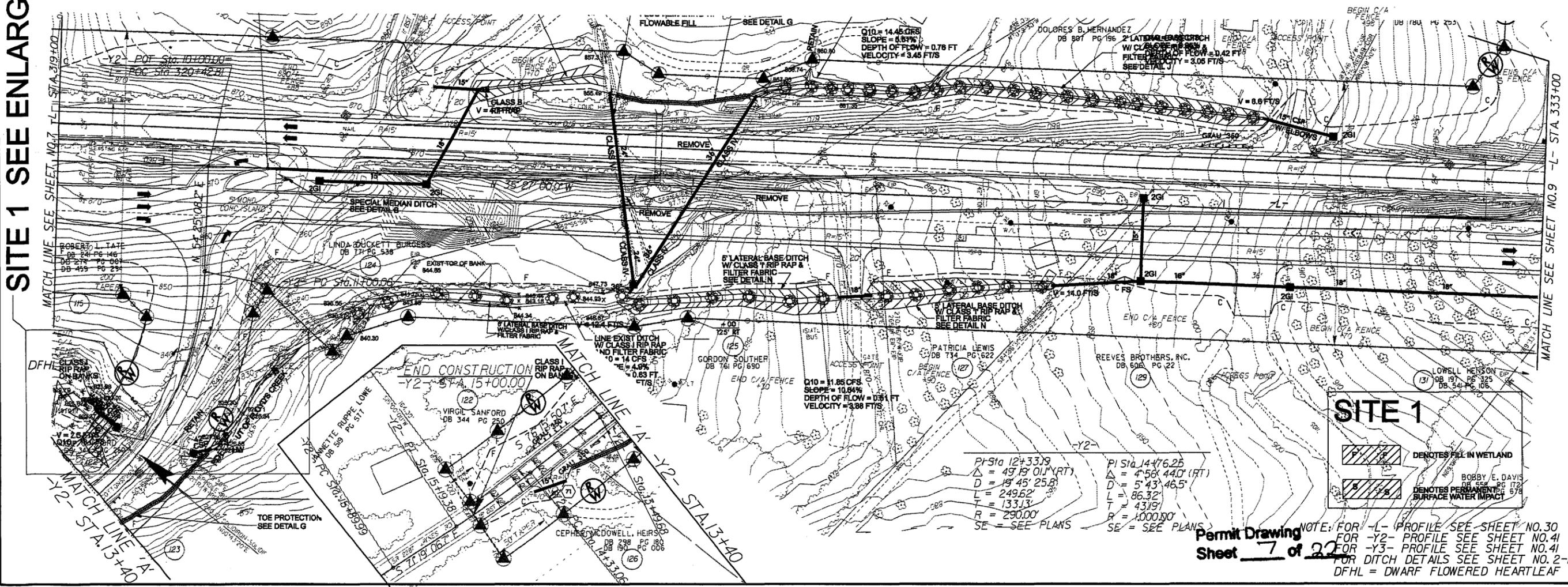


**SITE 1 ENLARGED PLAN (WITH CONTOURS)**



REVISIONS

SITE 1 SEE ENLARGED PLAN



**SITE 1**

- DENOTES FILL IN WETLAND
- DENOTES PERMANENT SURFACE WATER IMPACT

PI Sta 12+33.9  
 $\Delta = 49^{\circ} 01' 01''$  (RT)  
 $D = 19' 45' 25.8''$   
 $L = 249.62'$   
 $T = 133.13'$   
 $R = 290.00'$   
 SE = SEE PLANS

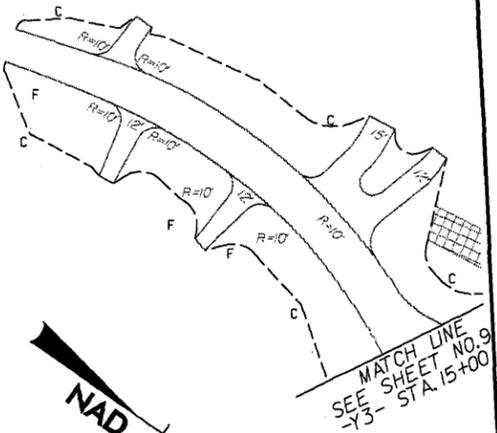
PI Sta 14+76.25  
 $\Delta = 4^{\circ} 56' 44.0''$  (RT)  
 $D = 5' 43' 46.5''$   
 $L = 86.32'$   
 $T = 43.19'$   
 $R = 1,000.00'$   
 SE = SEE PLANS

Permit Drawing  
 Sheet 7 of 22

NOTE: FOR -L- PROFILE SEE SHEET NO. 30  
 FOR -Y2- PROFILE SEE SHEET NO. 41  
 FOR -Y3- PROFILE SEE SHEET NO. 41  
 FOR DITCH DETAILS SEE SHEET NO. 2-K  
 DFHL = DWARF FLOWERED HEARTLEAF

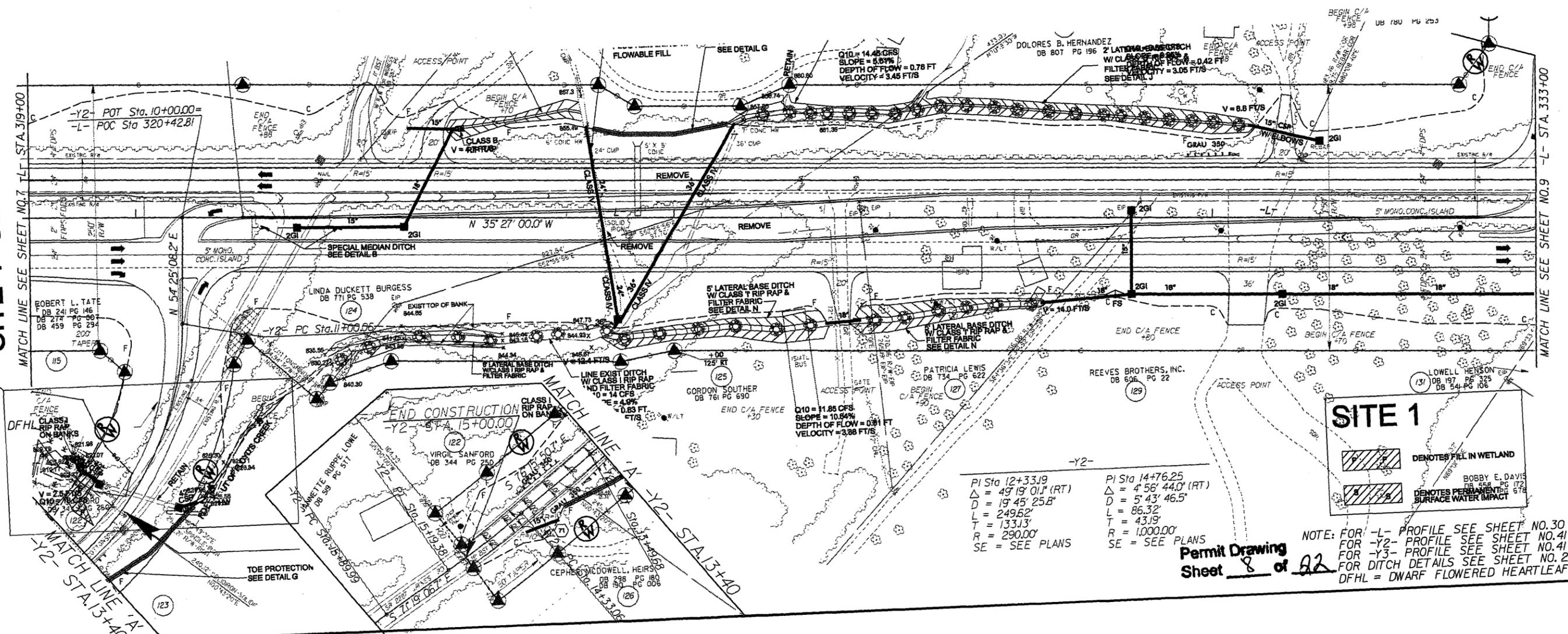
SYSTEMS  
 DESIGN  
 ENGINEERING

|   |                     |
|---|---------------------|
| R-2233AB  |                     |
| RW SHEET NO.  | 8                   |
| ROADWAY DESIGN ENGINEER                                 | HYDRAULICS ENGINEER |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION |                     |



SITE 1 SEE ENLARGED PLAN

REVISIONS



**SITE 1**

DENOTES FILL IN WETLAND  
 DENOTES PERMANENT SURFACE WATER IMPACT

|  |  |
|--|--|
| PI Sta 12+33.19<br>$\Delta = 49' 19" 01.1" (RT)$<br>$D = 19' 45" 25.8"$<br>$L = 249.62'$<br>$T = 133.13'$<br>$R = 290.00'$<br>SE = SEE PLANS | PI Sta 14+76.25<br>$\Delta = 4' 56' 44.0" (RT)$<br>$D = 5' 43' 46.5"$<br>$L = 86.32'$<br>$T = 43.19'$<br>$R = 1,000.00'$<br>SE = SEE PLANS |
|--|--|

NOTE: FOR -L- PROFILE SEE SHEET NO. 30  
 FOR -Y2- PROFILE SEE SHEET NO. 41  
 FOR -Y3- PROFILE SEE SHEET NO. 41  
 FOR DITCH DETAILS SEE SHEET NO. 2-K  
 DFHL = DWARF FLOWERED HEARTLEAF

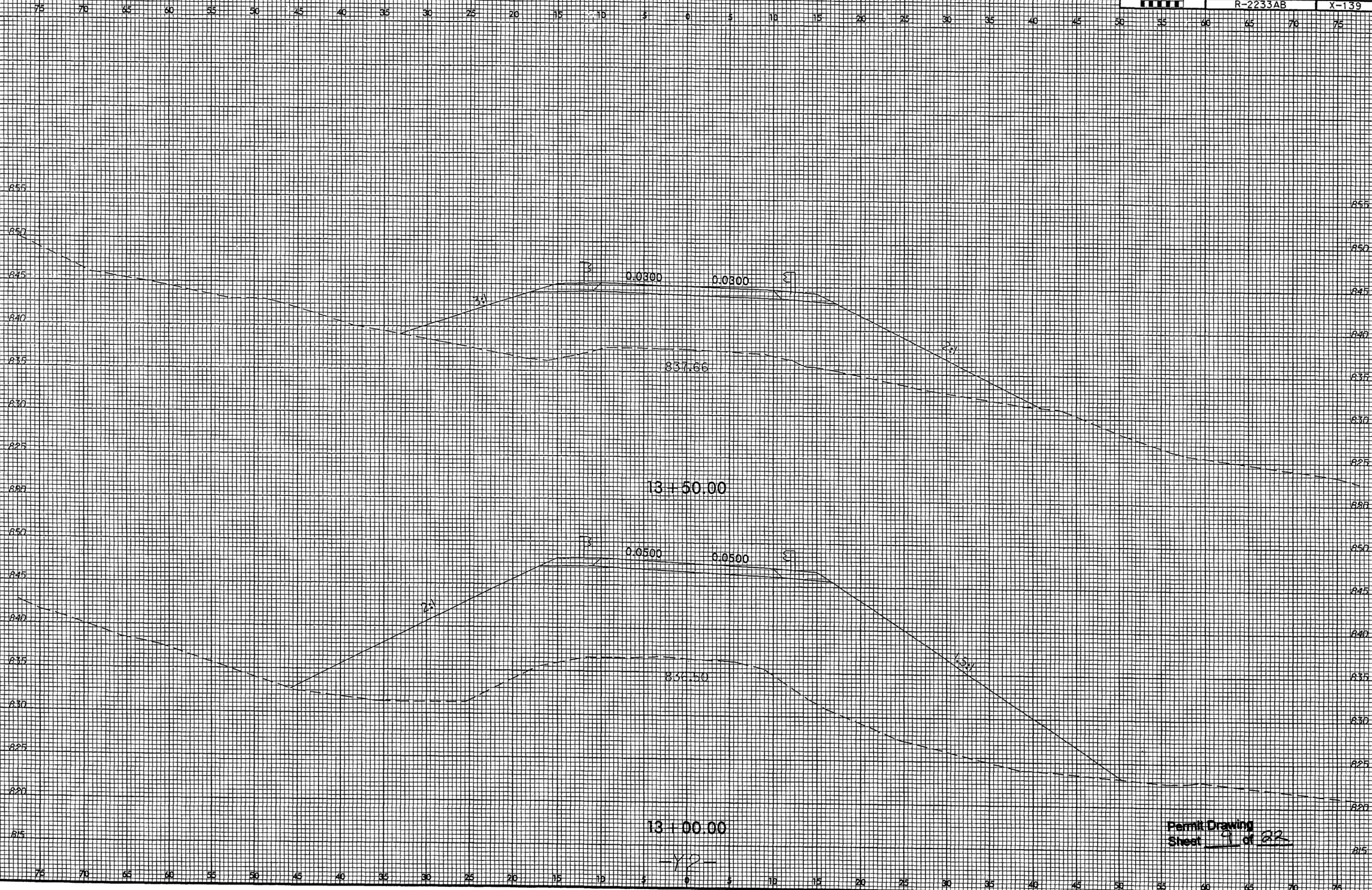
Permit Drawing  
Sheet 8 of 82

SYSTEMS ENGINEERING

8/23/99



|                     |           |
|---------------------|-----------|
| PROJ. REFERENCE NO. | SHEET NO. |
| R-2233AB            | X-139     |



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Permit Drawing Sheet 9 of 22

-Y2-



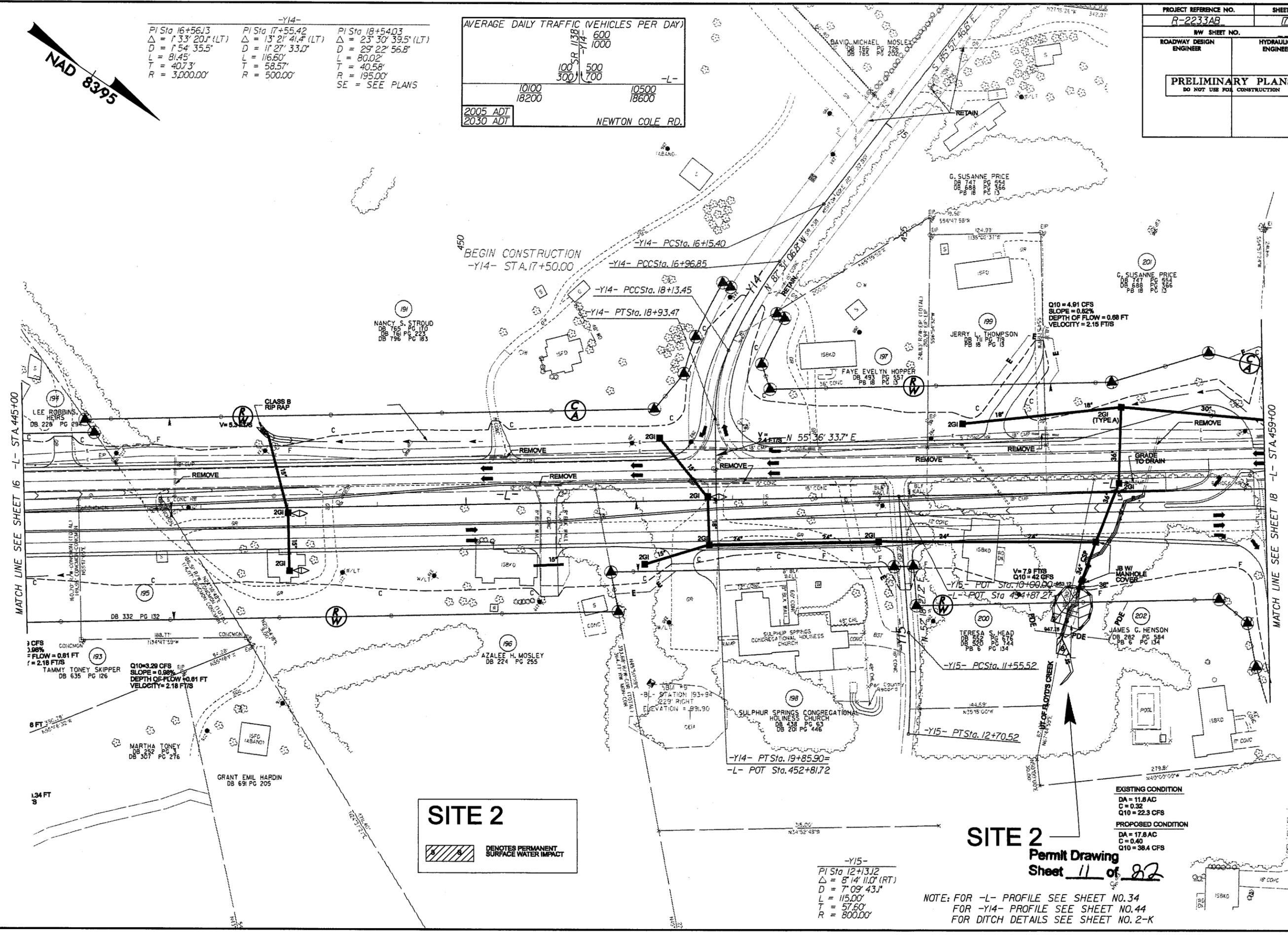
8/17/99



| -Y14-                         |                                |                                |
|-------------------------------|--------------------------------|--------------------------------|
| PI Sta 16+56.13               | PI Sta 17+55.42                | PI Sta 18+54.03                |
| $\Delta = 1' 33' 20.1''$ (LT) | $\Delta = 13' 21' 41.4''$ (LT) | $\Delta = 23' 30' 39.5''$ (LT) |
| D = 1' 54' 35.5"              | D = 11' 27' 33.0"              | D = 29' 22' 56.8"              |
| L = 81.45'                    | L = 116.60'                    | L = 80.02'                     |
| T = 40.73'                    | T = 58.57'                     | T = 40.58'                     |
| R = 3,000.00'                 | R = 500.00'                    | R = 195.00'                    |
| SE = SEE PLANS                |                                |                                |

| AVERAGE DAILY TRAFFIC VEHICLES PER DAY |       |
|--|-------|
| 10100                                  | 10500 |
| 18200                                  | 18600 |
| 2005 ADT                               |       |
| 2030 ADT                               |       |
| NEWTON COLE RD.                        |       |

|  |                        |
|--|------------------------|
| PROJECT REFERENCE NO.<br><b>R-2233AB</b> | SHEET NO.<br><b>17</b> |
| RW SHEET NO.                             |                        |
| ROADWAY DESIGN ENGINEER                  | HYDRAULICS ENGINEER    |
| <b>PRELIMINARY PLANS</b>                 |                        |
| DO NOT USE FOR CONSTRUCTION              |                        |



REVISIONS

MATCH LINE SEE SHEET 16 -L- STA 445+00

MATCH LINE SEE SHEET 18 -L- STA 459+00

**SITE 2**

DENOTES PERMANENT SURFACE WATER IMPACT

**SITE 2**

Permit Drawing  
Sheet 11 of 82

NOTE: FOR -L- PROFILE SEE SHEET NO. 34  
FOR -Y14- PROFILE SEE SHEET NO. 44  
FOR DITCH DETAILS SEE SHEET NO. 2-K

| -Y15-                         |  |
|-------------------------------|--|
| PI Sta 12+13.12               |  |
| $\Delta = 8' 14' 11.0''$ (RT) |  |
| D = 7' 09' 43.1"              |  |
| L = 115.00'                   |  |
| T = 57.60'                    |  |
| R = 800.00'                   |  |

| EXISTING CONDITION |  |
|--------------------|--|
| DA = 11.8 AC       |  |
| C = 0.32           |  |
| Q10 = 22.3 CFS     |  |
| PROPOSED CONDITION |  |
| DA = 17.8 AC       |  |
| C = 0.40           |  |
| Q10 = 38.4 CFS     |  |

3 CFS  
1.98%  
FLOW = 0.81 FT  
2.18 FT/S  
TAMMY TONEY SKIPPER  
DB 635 PG 126

Q10 = 3.29 CFS  
SLOPE = 0.98%  
DEPTH OF FLOW = 0.81 FT  
VELOCITY = 2.18 FT/S

Q10 = 4.91 CFS  
SLOPE = 0.82%  
DEPTH OF FLOW = 0.68 FT  
VELOCITY = 2.15 FT/S

V = 7.0 FT/S  
Q10 = 42 CFS

MARTHA TONEY  
DB 307 PG 276

GRANT EMIL HARDIN  
DB 691 PG 205

AZALEE H. MOSLEY  
DB 224 PG 255

-Y14- PTSta. 19+85.90=  
-L- POT Sta. 452+81.72

-Y15- PCSta. 11+55.52

-Y15- PTSta. 12+70.52

JAMES G. HENSON  
DB 282 PG 584  
PB 6 PG 134

TERESA S. HEAD  
DB 520 PG 944  
PB 6 PG 134

SULPHUR SPRINGS CONGREGATIONAL HOLINESS CHURCH  
DB 201 PG 446

SULPHUR SPRINGS CONGREGATIONAL HOLINESS CHURCH  
DB 438 PG 63

FAYE EVELYN HOPPER  
DB 493 PG 551  
PB 18 PG 134

-L- POT Sta. 434+87.27

-Y15- POT Sta. 10+60.00

2.42 STS N 55° 36' 33.7" E

BEGIN CONSTRUCTION  
-Y14- STA. 17+50.00

-Y14- PCSta. 16+15.40

-Y14- PCCSta. 18+13.45

-Y14- PTSta. 18+93.47

-Y14- PCCSta. 16+96.85

G. SUSANNE PRICE  
DB 747 PG 593  
DB 688 PG 593  
PB 18 PG 134

G. SUSANNE PRICE  
DB 747 PG 593  
DB 688 PG 593  
PB 18 PG 134

JERRY L. THOMPSON  
DB 18 PG 134

NANCY S. STROUD  
DB 765 PG 170  
DB 761 PG 223  
DB 796 PG 183

CLASS B RIP RAP

LEE ROBBINS HEIRS  
DB 228 PG 29

3 CFS  
1.98%  
FLOW = 0.81 FT  
2.18 FT/S  
TAMMY TONEY SKIPPER  
DB 635 PG 126

1.34 FT

| EXISTING CONDITION |  |
|--------------------|--|
| DA = 11.8 AC       |  |
| C = 0.32           |  |
| Q10 = 22.3 CFS     |  |
| PROPOSED CONDITION |  |
| DA = 17.8 AC       |  |
| C = 0.40           |  |
| Q10 = 38.4 CFS     |  |

**SITE 2**

Permit Drawing  
Sheet 11 of 82

NOTE: FOR -L- PROFILE SEE SHEET NO. 34  
FOR -Y14- PROFILE SEE SHEET NO. 44  
FOR DITCH DETAILS SEE SHEET NO. 2-K

| -Y15-                         |  |
|-------------------------------|--|
| PI Sta 12+13.12               |  |
| $\Delta = 8' 14' 11.0''$ (RT) |  |
| D = 7' 09' 43.1"              |  |
| L = 115.00'                   |  |
| T = 57.60'                    |  |
| R = 800.00'                   |  |

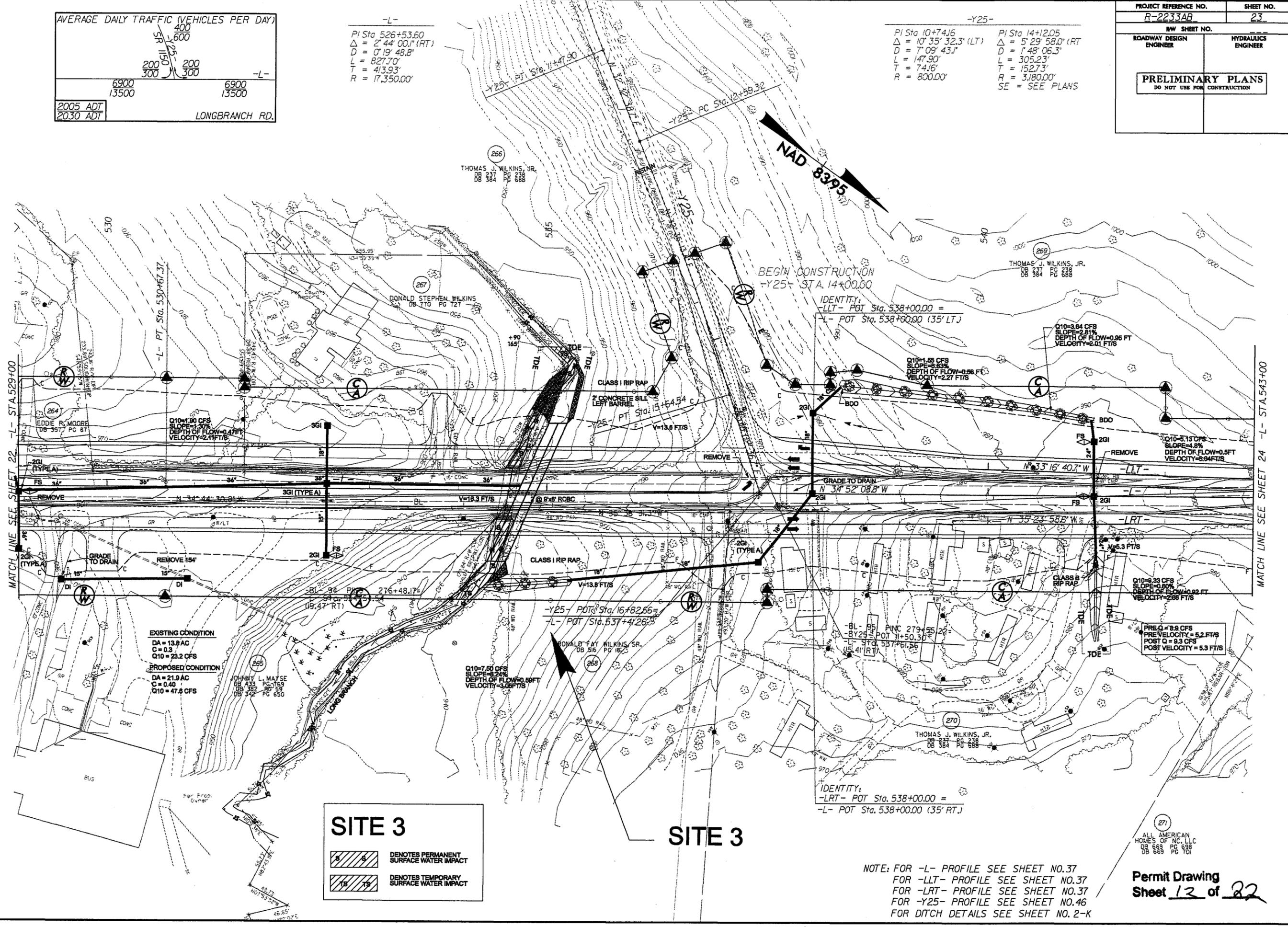
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|-----------------------------|---------------------|
| PROJECT REFERENCE NO.       | SHEET NO.           |
| R-2233AB                    | 23                  |
| R/W SHEET NO.               |                     |
| ROADWAY DESIGN ENGINEER     | HYDRAULICS ENGINEER |
| <b>PRELIMINARY PLANS</b>    |                     |
| DO NOT USE FOR CONSTRUCTION |                     |

|  |          |
|--|----------|
| AVERAGE DAILY TRAFFIC (VEHICLES PER DAY) |          |
| 400                                      | 600      |
| SR 1150                                  | SR 1150  |
| 200                                      | 200      |
| 300                                      | 300      |
| 6900                                     | 6900     |
| 13500                                    | 13500    |
| 2005 ADT                                 | 2030 ADT |
| LONGBRANCH RD.                           |          |

-L-  
 PI Sta 526+53.60  
 $\Delta = 2' 44" 00"$  (RT)  
 $D = 0' 19" 48.8"$   
 $L = 827.70'$   
 $T = 413.93'$   
 $R = 17,350.00'$

-Y25-  
 PI Sta 10+74.6  
 $\Delta = 10' 35" 32.3"$  (LT)  
 $D = 7' 09" 43.1"$   
 $L = 147.90'$   
 $T = 74.16'$   
 $R = 800.00'$

PI Sta 14+20.5  
 $\Delta = 5' 29" 58.0"$  (RT)  
 $D = 1' 48" 06.3"$   
 $L = 305.23'$   
 $T = 152.73'$   
 $R = 3,180.00'$   
 SE = SEE PLANS



**EXISTING CONDITION**  
 DA = 13.8 AC  
 C = 0.3  
 Q10 = 23.2 CFS

**PROPOSED CONDITION**  
 DA = 21.9 AC  
 C = 0.40  
 Q10 = 47.4 CFS

**SITE 3**

DENOTES PERMANENT SURFACE WATER IMPACT

DENOTES TEMPORARY SURFACE WATER IMPACT

NOTE: FOR -L- PROFILE SEE SHEET NO. 37  
 FOR -LLT- PROFILE SEE SHEET NO. 37  
 FOR -LRT- PROFILE SEE SHEET NO. 37  
 FOR -Y25- PROFILE SEE SHEET NO. 46  
 FOR DITCH DETAILS SEE SHEET NO. 2-K

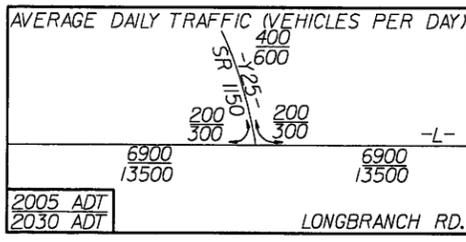
Permit Drawing  
 Sheet 13 of 22

ALL AMERICAN  
 HOMES OF NC, LLC  
 DB 668 PG 638  
 DB 669 PG 701

REVISIONS

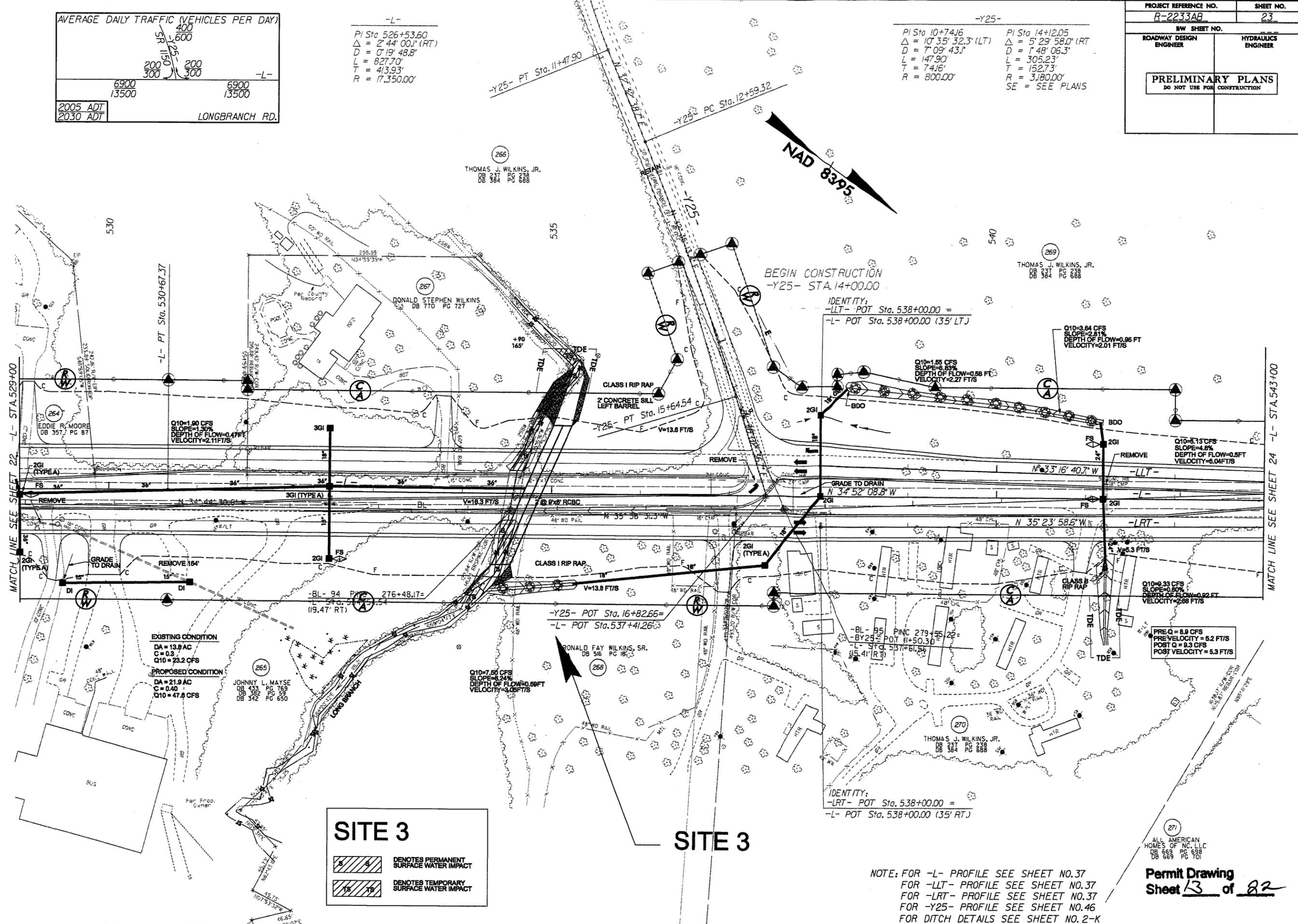
8/17/99

|                             |  |                     |  |
|-----------------------------|--|---------------------|--|
| PROJECT REFERENCE NO.       |  | SHEET NO.           |  |
| R-2233AB                    |  | 23                  |  |
| RW SHEET NO.                |  |                     |  |
| ROADWAY DESIGN ENGINEER     |  | HYDRAULICS ENGINEER |  |
|                             |  |                     |  |
| <b>PRELIMINARY PLANS</b>    |  |                     |  |
| DO NOT USE FOR CONSTRUCTION |  |                     |  |



-L-  
 PI Sta 526+53.60  
 $\Delta = 2' 44" 00.1" (RT)$   
 $D = 0' 19" 48.8"$   
 $L = 827.70'$   
 $T = 413.93'$   
 $R = 17,350.00'$

-Y25-  
 PI Sta 10+74.16  
 $\Delta = 10' 35" 32.3" (LT)$   
 $D = 7' 09" 43.1"$   
 $L = 147.90'$   
 $T = 74.16'$   
 $R = 800.00'$   
 PI Sta 14+20.05  
 $\Delta = 5' 29" 58.0" (RT)$   
 $D = 1' 48" 06.3"$   
 $L = 305.23'$   
 $T = 152.73'$   
 $R = 3,180.00'$   
 SE = SEE PLANS



**EXISTING CONDITION**  
 DA = 13.9 AC  
 C = 0.3  
 Q10 = 23.2 CFS  
**PROPOSED CONDITION**  
 DA = 21.9 AC  
 C = 0.40  
 Q10 = 47.6 CFS

**SITE 3**

|  |  |
|--|--|
|  | DENOTES PERMANENT SURFACE WATER IMPACT |
|  | DENOTES TEMPORARY SURFACE WATER IMPACT |

NOTE: FOR -L- PROFILE SEE SHEET NO.37  
 FOR -LLT- PROFILE SEE SHEET NO.37  
 FOR -LRT- PROFILE SEE SHEET NO.37  
 FOR -Y25- PROFILE SEE SHEET NO.46  
 FOR DITCH DETAILS SEE SHEET NO.2-K

271  
 ALL AMERICAN HOMES OF NC, LLC  
 DB 668 PG 698  
 DB 669 PG 701  
**Permit Drawing**  
 Sheet 13 of 22

REVISIONS

MATCH LINE SEE SHEET 22 -L- STA.529+00

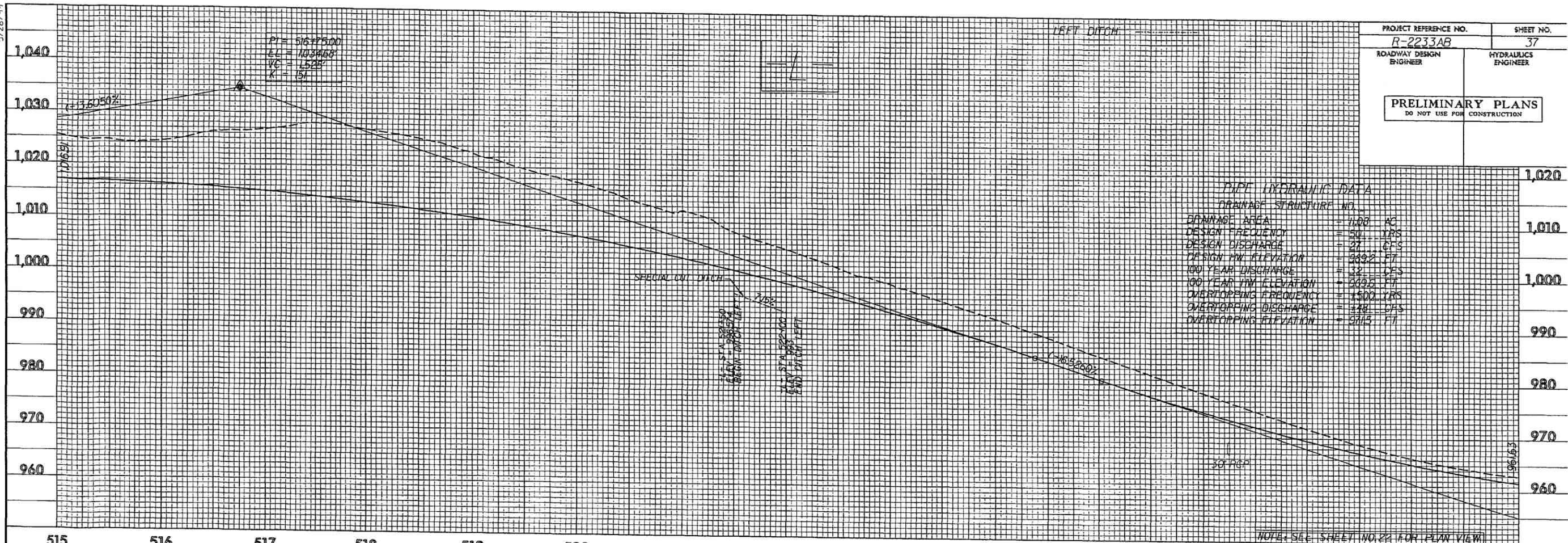
MATCH LINE SEE SHEET 24 -L- STA.543+00

8/17/99



5/28/99

|   |                        |
|---|------------------------|
| PROJECT REFERENCE NO.<br><b>R-2233AB</b>                | SHEET NO.<br><b>37</b> |
| ROADWAY DESIGN ENGINEER                                 | HYDRAULICS ENGINEER    |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION |                        |

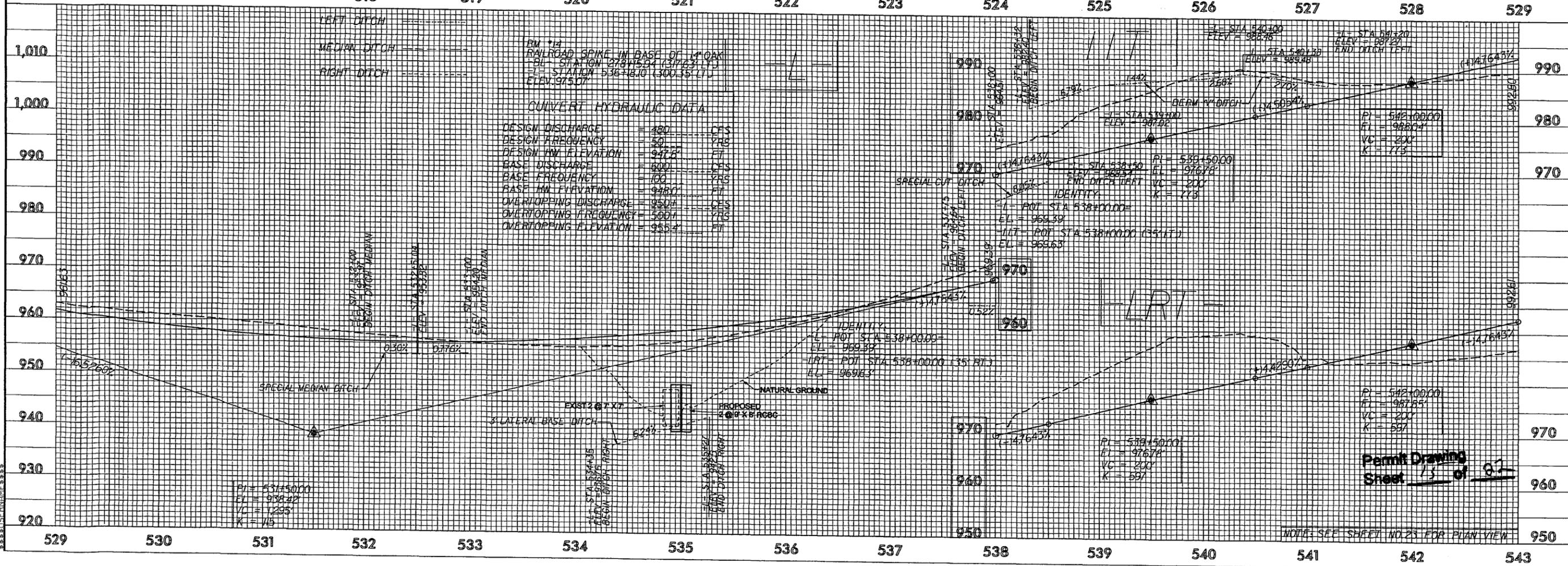


PIPE HYDRAULIC DATA  
DRAINAGE STRUCTURE NO. \_\_\_\_\_

|                       |            |
|-----------------------|------------|
| DRAINAGE AREA         | = 4.00 AC  |
| DESIGN FREQUENCY      | = 50 YRS   |
| DESIGN DISCHARGE      | = 27 CFS   |
| DESIGN HW ELEVATION   | = 989.2 FT |
| 100 YEAR DISCHARGE    | = 32 CFS   |
| 100 YEAR HW ELEVATION | = 992.5 FT |
| OVERTOPPING FREQUENCY | = 1000 YRS |
| OVERTOPPING DISCHARGE | = 48 CFS   |
| OVERTOPPING ELEVATION | = 995 FT   |

QUILT HYDRAULIC DATA

|                       |             |
|-----------------------|-------------|
| DESIGN DISCHARGE      | = 480 CFS   |
| DESIGN FREQUENCY      | = 50 YRS    |
| DESIGN HW ELEVATION   | = 947.5 FT  |
| BASE DISCHARGE        | = 600 CFS   |
| BASE FREQUENCY        | = 100 YRS   |
| BASE HW ELEVATION     | = 948.0 FT  |
| OVERTOPPING DISCHARGE | = 950.4 CFS |
| OVERTOPPING FREQUENCY | = 5000 YRS  |
| OVERTOPPING ELEVATION | = 955.4 FT  |



Permit Drawing  
Sheet 13 of 87

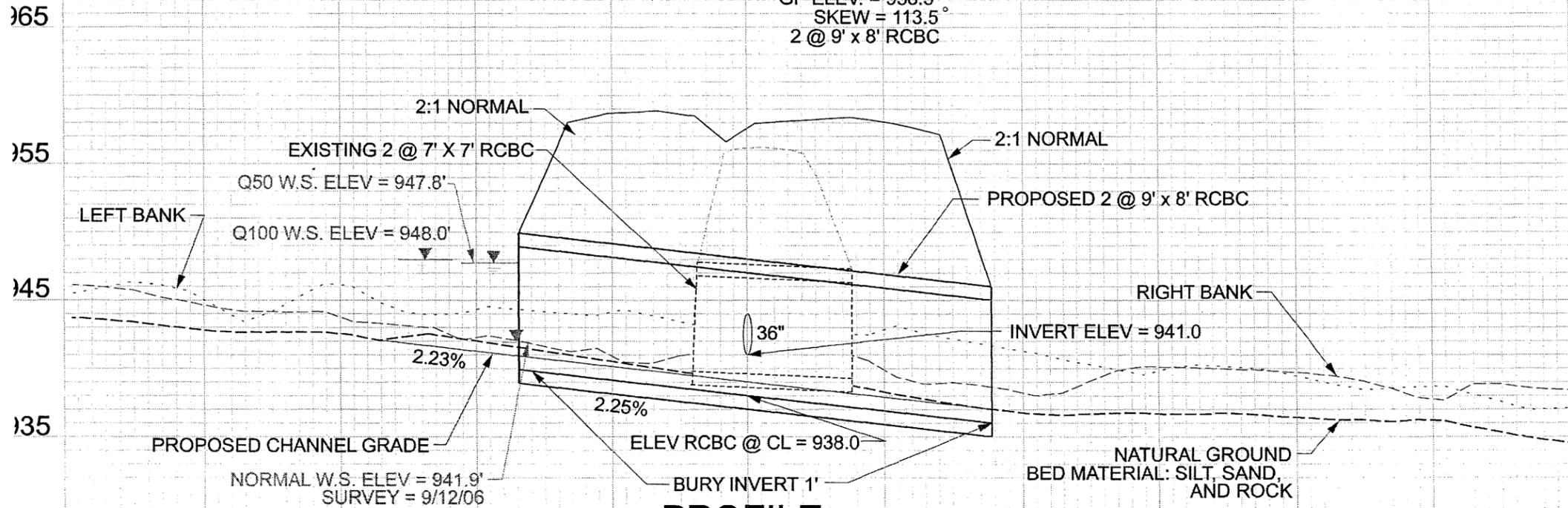
SYSTEMS  
SECTION  
STATION

NOTE: SEE SHEET NO. 25 FOR PLAN VIEW

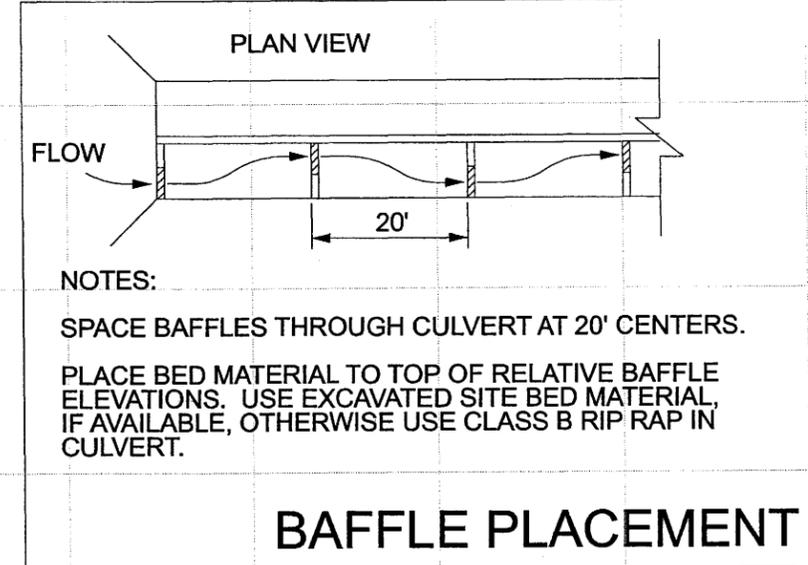
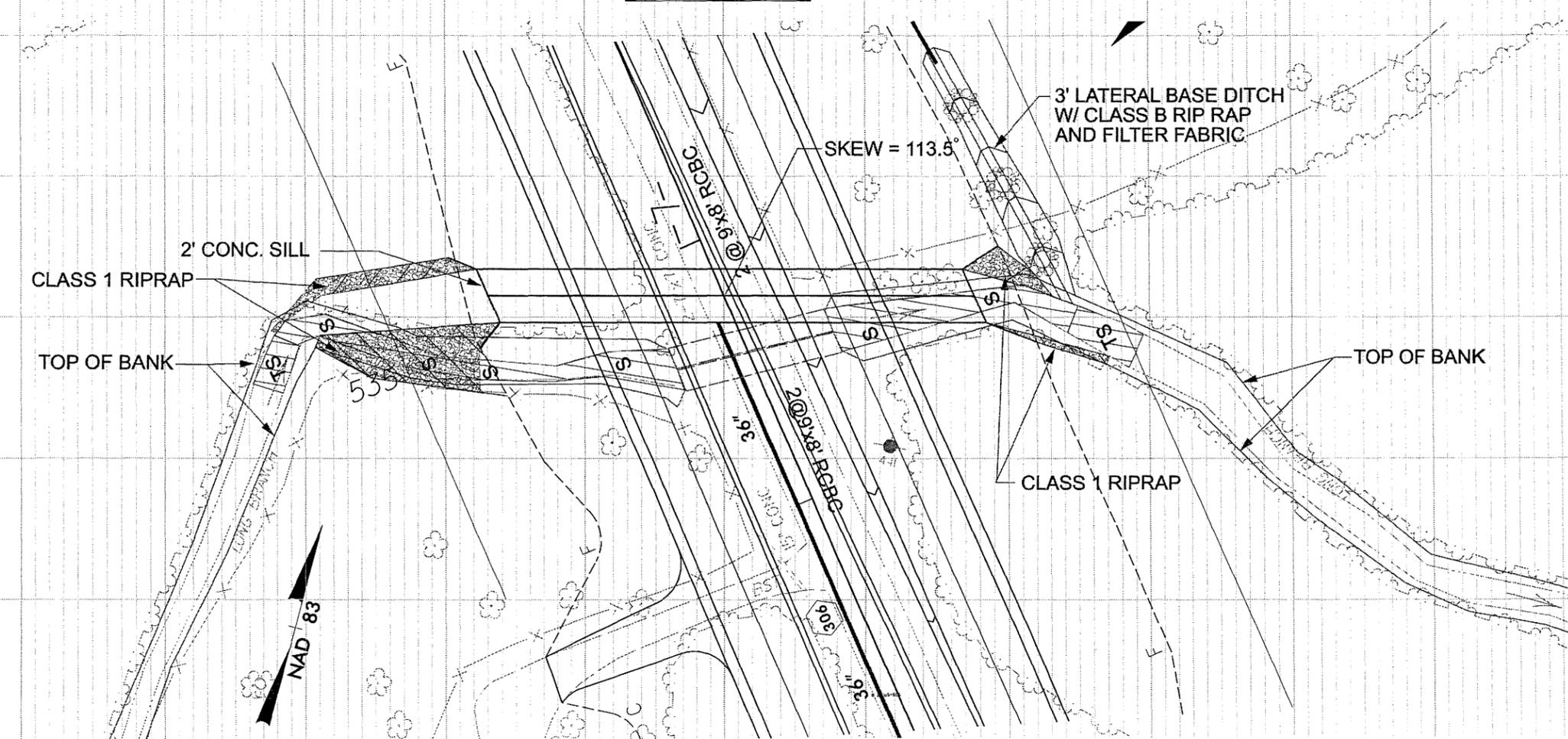
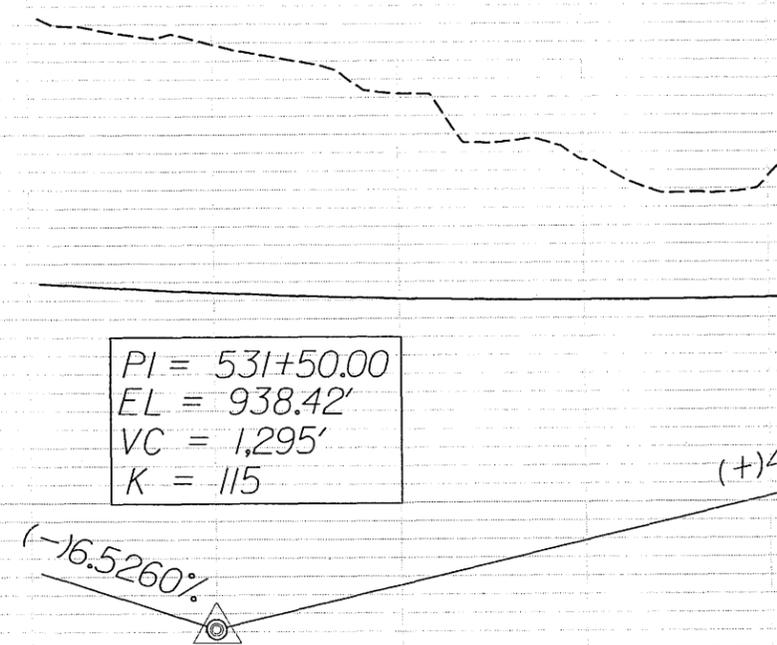
150 100 50 CL 50 100 150

531+00 532+00 533+

CL STA. 534+79 -L-  
GP ELEV. = 958.5'  
SKEW = 113.5°  
2 @ 9' x 8' RCBC

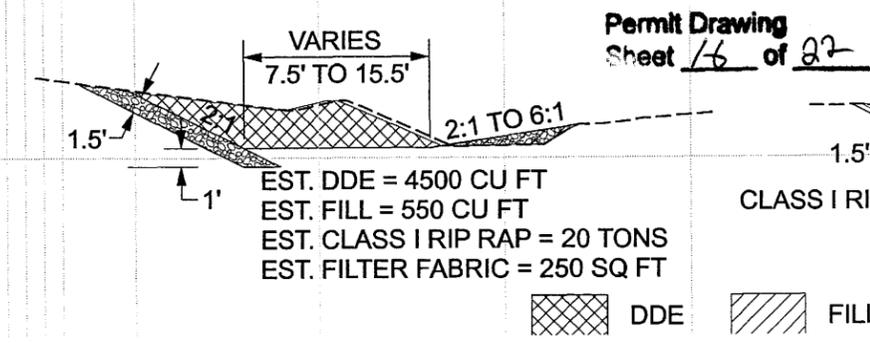


**PROFILE**



**INLET DETAIL**

NOT TO SCALE



Permit Drawing  
Sheet 16 of 22

-Y27-

|                                       |                                       |
|---------------------------------------|---------------------------------------|
| PI Sta 14+92.36                       | PI Sta 19+11.99                       |
| $\Delta = 81^{\circ} 28' 59.0''$ (LT) | $\Delta = 68^{\circ} 44' 58.0''$ (RT) |
| D = 24' 54' 40.4"                     | D = 24' 54' 40.4"                     |
| L = 327.09'                           | L = 275.98'                           |
| T = 198.12'                           | T = 157.34'                           |
| R = 230.00'                           | R = 230.00'                           |

SE = SEE PLANS SE = SEE PLANS

-Y28-

|                                       |
|---------------------------------------|
| PI Sta 12+31.36                       |
| $\Delta = 59^{\circ} 27' 56.1''$ (RT) |
| D = 24' 54' 40.4"                     |
| L = 238.71'                           |
| T = 131.36'                           |
| R = 230.00'                           |

SE = SEE PLANS

-L-

|                                      |
|--------------------------------------|
| PI Sta 577+43.05                     |
| $\Delta = 0^{\circ} 12' 32.7''$ (RT) |
| D = 0' 01' 08.8"                     |
| L = 1,094.82'                        |
| T = 547.41'                          |
| R = 300,000.00'                      |



### SITE 4

DENOTES PERMANENT SURFACE WATER IMPACT

AVERAGE DAILY TRAFFIC (VEHICLES PER DAY)

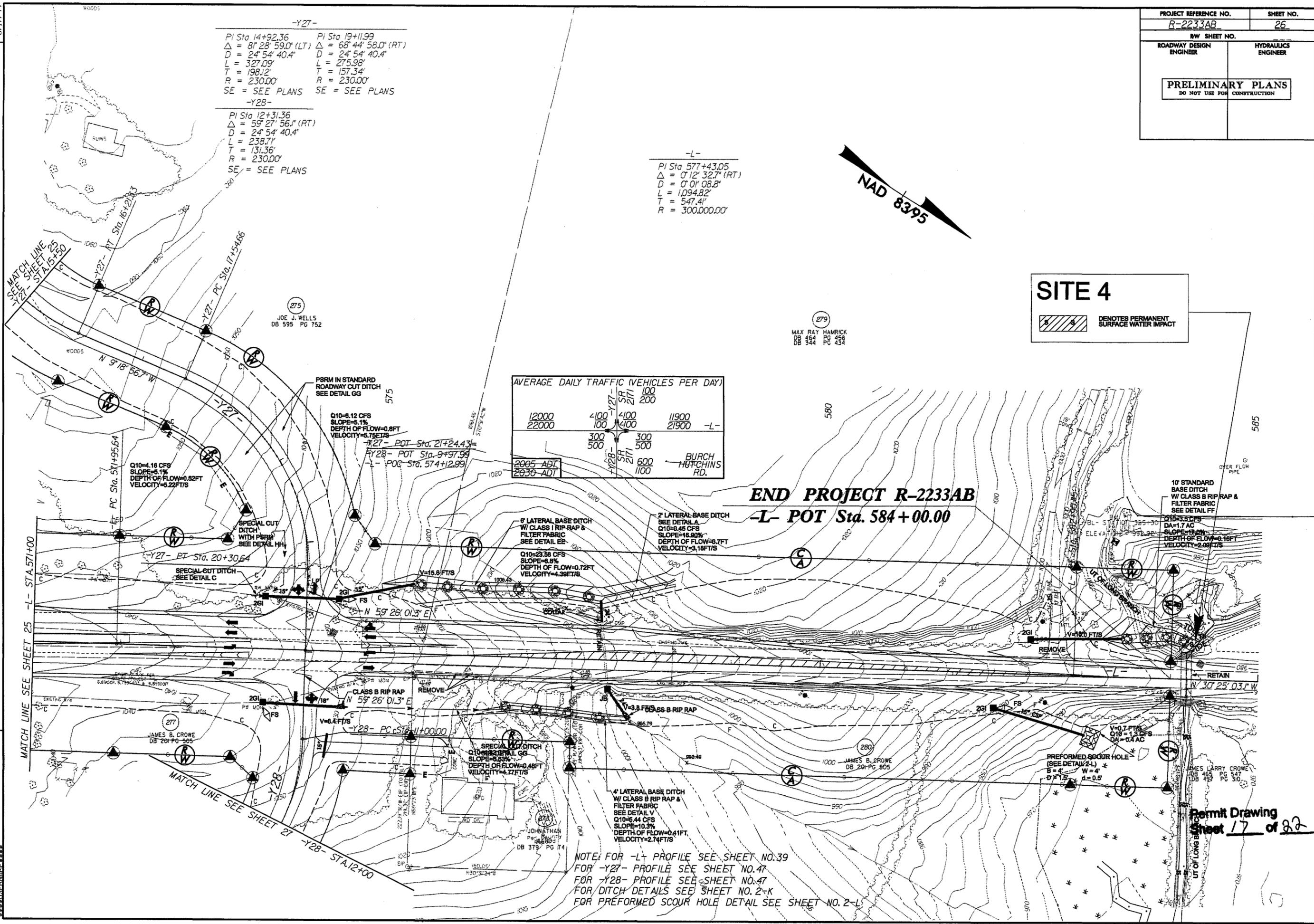
|       |     |     |       |
|-------|-----|-----|-------|
| 12000 | 400 | 400 | 11900 |
| 22000 | 100 | 100 | 21900 |
|       | 300 | 300 |       |
|       | 500 | 500 |       |

2005 ADT  
2030 ADT

BURCH HUTCHINS RD.

### END PROJECT R-2233AB

#### -L- POT Sta. 584+00.00



NOTE: FOR -L- PROFILE SEE SHEET NO.39  
 FOR -Y27- PROFILE SEE SHEET NO.47  
 FOR -Y28- PROFILE SEE SHEET NO.47  
 FOR DITCH DETAILS SEE SHEET NO.2-K  
 FOR PREFORMED SCOUR HOLE DETAIL SEE SHEET NO.2-L

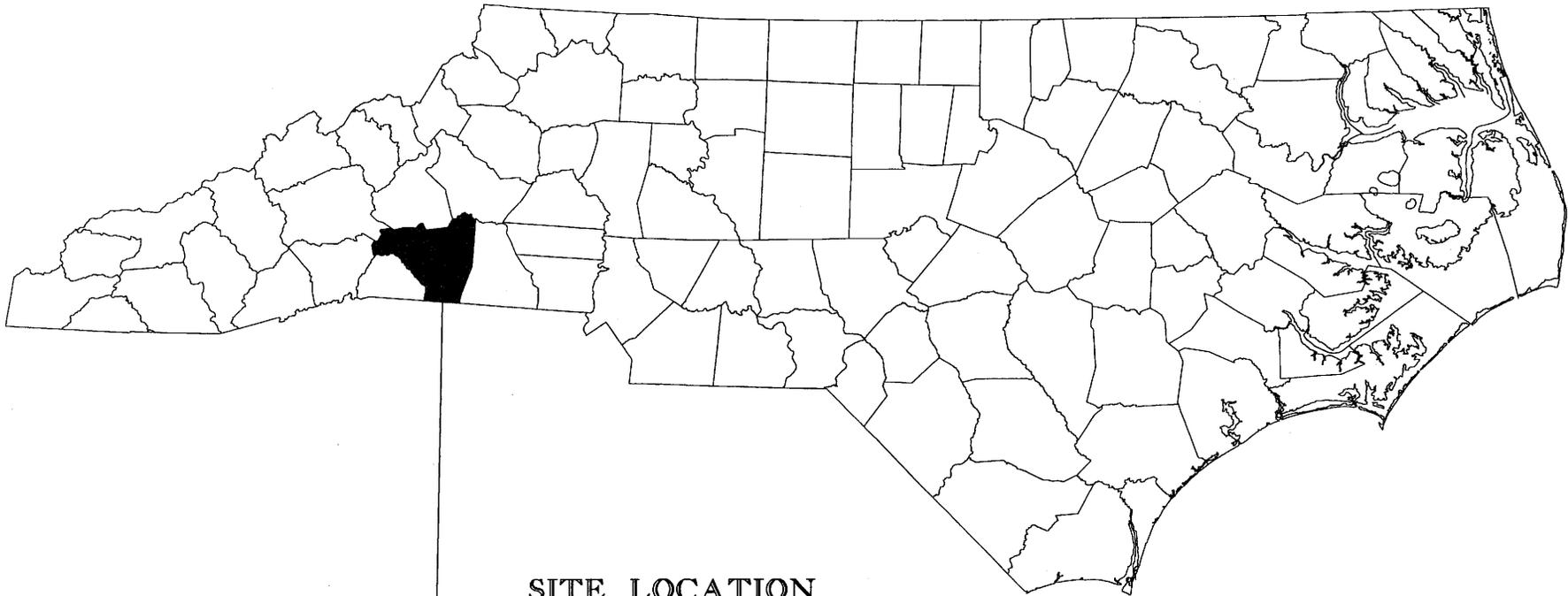
REVISIONS

8/17/99

SYSTEM: 11/11/98  
 USER: JLM  
 PROJECT: R-2233AB  
 SHEET: 26



# COUNTY LOCATION VICINITY MAP



SITE LOCATION  
IN RUTHERFORD COUNTY

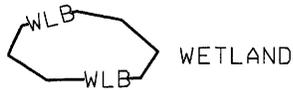
N. C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RUTHERFORD COUNTY

PROJECT: 34400.1.1 (R-2233AB)  
US 221 FROM SOUTH OF  
FLOYD'S CREEK TO  
NORTH OF US 74 BYPASS

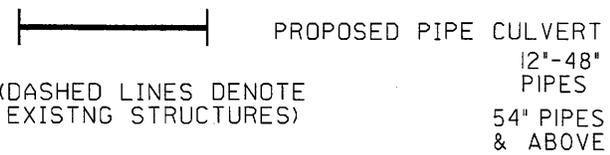
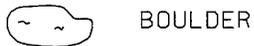
SHEET 19 OF 22 7-16-08

# WETLAND LEGEND

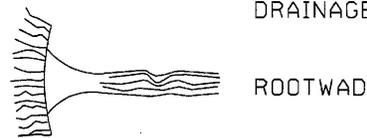
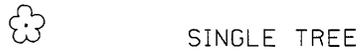
— WLB — WETLAND BOUNDARY



— FLOW DIRECTION



(DASHED LINES DENOTE EXISTING STRUCTURES)



N. C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RUTHERFORD COUNTY

PROJECT: 34400.1.1 (R-2233AB)  
US 221 FROM SOUTH OF  
FLOYD'S CREEK TO  
NORTH OF US 74 BYPASS

## PROPERTY OWNERS

| <u>PARCEL</u> | <u>OWNER NAME</u>      | <u>ADDRESS</u>   |
|---------------|------------------------|--|
| 122           | VIRGIL SANFORD         | 775 S. CHURCH ST.<br>APT. 602-A<br>FOREST CITY, NC 28043 |
| 123           | L. C. WRIGHT           | 147 JAYNES RD.<br>FOREST CITY, NC 28043                  |
| 200           | TERESA S. HEAD         | 2943 US HIGHWAY 221 SOUTH<br>FOREST CITY, NC 28043       |
| 202           | JAMES G. HENSON        | 128 ROBBINS DR.<br>FOREST CITY, NC 28043                 |
| 266           | THOMAS J. WILKINS      | 2257 US HIGHWAY 221 SOUTH<br>FOREST CITY, NC 28043       |
| 267           | DONALD STEPHEN WILKINS | 2150 US HIGHWAY 221 SOUTH<br>FOREST CITY, NC 28043       |
| 279           | MAX RAY HAMRICK        | 1800 US HIGHWAY 221 SOUTH<br>FOREST CITY, NC 28043       |

N. C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

RUTHERFORD COUNTY  
PROJECT: 3400.1.1 (R-2233AB)

US 221 FROM SOUTH OF  
FLOYD'S CREEK TO  
NORTH OF US 74 BYPASS

**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 - Bank Stabilization (ft) | Existing Channel Impacts Temp. (ft) | Natural Stream Design (ft) |
| 1A             | -L- 280+00                    | Bridge                    |                                 |                             |                             |                                      |                                | 0                         | 0                     | 0                                       | 0  | 0                                   |                            |
| 1              | -Y2-12+58 TO<br>13+18 RT      | 42" CSP                   | 0.020                           |                             |                             |                                      |                                |                           |                       | 50                                      | 10   | 20                                  |                            |
| 2              | -L- 456+60 TO<br>457+64 RT    | 36" CSP                   |                                 |                             |                             |                                      |                                | 0.02                      |                       | 170                                     | 56   |                                     |                            |
| 3              | -L- 534+17 RT TO<br>535+17 LT | 2 - 9' x 8' RCBC          |                                 |                             |                             |                                      |                                | 0.05                      | 0.010                 | 134                                     | 94   | 45                                  |                            |
| 4              | -L-584+11 TO<br>584+34 LT     | 10' BASE DITCH AT<br>BANK |                                 |                             |                             |                                      |                                |                           |                       |   | 15   | 10                                  |                            |
| <b>TOTALS:</b> |                               |                           | 0.02                            | 0.00                        | 0.00                        | 0.00                                 | 0.00                           | 0.07                      | 0.01                  | 354                                     |  | 75                                  | 0                          |

No Impacts anticipated to construct proposed or remove existing bridges.

NC DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RUTHERFORD COUNTY  
 PROJECT 34400.1.1 (R-2233AB)  
 US 221 FROM SOUTH OF FLOYD'S CREEK TO  
 NORTH OF US 74 BYPASS