




STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J.R. "JOEY" HOPKINS
SECRETARY

June 13, 2024

MEMORANDUM TO: Division Environmental and Construction Units

FROM:  Michael A. Turchy, ECAP Group Leader
Environmental Analysis Unit

SUBJECT: Environmental Permits for the Improvements to NC 150 in Catawba and Iredell Counties Division 12, **TIP: R-2307.**

Please find enclosed the following permits for this project:

Agency	Permit Type	Permit Expiration
US Army Corps of Engineers Section 404 Clean Water Act Permit	Individual Permit, dated 9/3/2020	Dec. 31, 2025
NC Division of Water Resources Section 401 Water Quality Certification	Individual Certification, dated 4/17/2019	Dec. 31, 2025
NC Division of Water Resources Catawba Riparian Buffer Authorization	Authorization, dated 4/17/2019	Dec. 31, 2025

Since the acquisition of the above referenced permits, minor design modifications have been made and a permit modification and renewal is under review with the environmental agencies. Below is a summary of the changes.

Once the permit modification and renewal is received, a new permit package will be distributed.

Permit Site Changes between 2020 and 2024 Permitting:

Site 3: Permanent Surface Water Impacts decreased from 3.11 acres to 3.079 acres due to minor slope stake changes at Lake Norman.

Site 3: Three temporary Surface Water Impacts were added down to elevation 750 ft on Permit Drawing Sheets 2-5. Temporary Surface Water Impacts increased from 0 to 0.070 acre.

Site 3/ Permit Drawing Sheets 4-6: Due to concerns from Duke Energy regarding boater safety and the alignment of bridge piers with the existing structure, the proposed bridge span arrangement was modified to better match the existing bridge. Permit Drawing Sheets 4-6 and associated footnote on the Impact Summary Sheet were updated.

Site 4: Permanent Surface Water Impacts decreased from 3.91 acres to 3.859 acres due to minor slope changes at Lake Norman.

Site 4: Two temporary Surface Water Impacts were added down to elevation 750 ft on Permit Drawing Sheets 7-8. Temporary Surface Water Impacts increased from 0 to 0.162 acre.

Site 10: The previous design proposed a 9' diameter precast manhole connecting an existing RCBC to a proposed 78" RCP at the downstream culvert extension at 784+50 RT (Permit Site 10). NCDOT determined that attaching a precast manhole to the existing RCBC is not feasible and would require a cast in place connection. To avoid this situation, the existing 5'W x 6'H RCBC will be extended. This will result in the outlet of the RCBC shifting 3' west of the previous 78" RCP outlet. However, the inverts, lengths, and channel layout will remain the same. There are no changes to stream impacts.

Site 12: Permanent impact decreased from 28 to 27 linear feet due to a corrected measurement (The change is only reflected on the Impact Summary Sheet, no change to the plan view).



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

September 3, 2020

Regulatory Division

Action ID: SAW-2018-02343

Project Development and Environmental Analysis Unit,
Attn: Mr. Philip Harris, P.E.,
1548 Mail Service Center
Raleigh, NC 27699-1598

Dear Mr. Harris:

Enclosed is a Department of the Army permit for the NC 150 (R-2307 and I-5717) Improvement Project which involves the improvement of approximately 15 miles of existing NC 150 to a median-divided 'superstreet' facility which includes road widening (widened to a four or six-lane divided facility including curb and gutter and a multi-use path), replacing several bridges, and access management measures. Specifically, impacts will involve 1,634 linear feet of stream channel, 0.84 acres of wetlands and 13.18 acres of open water (based on final design for Section B and preliminary design for Section A and not including temporary impacts for Section A). The project is located along existing NC 150 and begins at the intersection of NC 150 with the NC 16 Bypass in Catawba County and extends approximately 15 miles northeast along NC 150 through Catawba County into Iredell County to terminate just west of the NC 150 intersection with US 21 in Mooresville, Iredell County, North Carolina. The project has been divided into two phases: Section A extends from NC 16 Bypass to SR 1902 (Harvel Road). Section B extends from Harvel Road to just west of the US 21/NC 150 Interchange and includes the I-5717 component, the I-77 interchange. This permit authorization includes final design and final impact numbers for Section B and preliminary designs and impacts for Section A. Approval for final design plans and impacts for Segment A will be completed through a permit modification. The Corps is issuing this permit in response to your written request of December 21, 2018 and the ensuing administrative record.


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, 2025
- b. You must notify this office in advance as to when you intend to commence and complete work.
- c. You must allow representatives from this office to make periodic visits to your worksite as deemed necessary to assure compliance with permit plans and conditions.
- d. In order to compensate for impacts associated with this permit, mitigation shall be provided in accordance with the provisions outlined in the U.S. Army Corps of Engineers, Wilmington District, Compensatory Mitigation Responsibility Transfer Form. The requirements of this form, including any special conditions listed on this form, are hereby incorporated as special conditions of this permit authorization.

You should address all questions regarding this authorization to Crystal Amschler at the Asheville Regulatory Field Office, telephone (828) 271-7980 extension 4231.

FOR THE DISTRICT ENGINEER

 Date: 2020.09.03
08:00:29 -04'00'

Monte Matthews
Lead Project Manager

Enclosures

Project Development and Environmental Analysis Unit,
Attn: Mr. Michael Turchy.,
1548 Mail Service Center
Raleigh, NC 27699-1598

Mr. Todd Bowers
Wetlands Protection Section – Region IV
Water Management Division
U.S. Environmental Protection Agency
61 Forsyth Street, SW
Atlanta, Georgia 30303

Ms. Amy S. Chapman
Transportation Permitting Unit
NC Division of Water Quality
1617 Mail Service Center
Raleigh, NC 27699-1617

Ms. Marla Chambers
Western Region Highway Project Coordinator
NCWRC
12275 Swift Road
Oakboro, NC 28129

US Fish and Wildlife Service
Asheville Ecological Services Field Office
Attn: Byron Hamstead
160 Zillicoa Street
Asheville, NC 28801-1082

Ms. Renee Gledhill-Early
Environmental Review Coordinator
NC State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617

BCC (without enclosures) (via Email):

CESAW-RG-A/Crystal Amschler
CESAW-RG-R/Matthews
CESAW-RG/McLendon
CESAW-OC/Pruitt

DEPARTMENT OF THE ARMY PERMIT

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

Permit No. **SAW-2018-02343**

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: The NC 150 (R-2307 and I-5717) Improvement Project involves the improvement of approximately 15 miles of existing NC 150 to a median-divided 'superstreet' facility which includes road widening (widened to a four or six-lane divided facility including curb and gutter and a multi-use path), replacing several bridges, and access management measures. Specifically, impacts will involve 1,634 linear feet of stream channel, 0.84 acres of wetlands and 13.18 acres of open water (based on final design for Section B and preliminary design for Section A and not including temporary impacts for Section A). The project is located along existing NC 150 and begins at the intersection of NC 150 with the NC 16 Bypass in Catawba County and extends approximately 15 miles northeast along NC 150 through Catawba County into Iredell County to terminate just west of the NC 150 intersection with US 21 in Mooresville, Iredell County, North Carolina. The project has been divided into two phases: Section A extends from NC 16 Bypass to SR 1902 (Harvel Road). Section B extends from Harvel Road to just west of the US 21/NC 150 Interchange and includes the I-5717 component, the I-77 interchange. This permit authorization includes final design and final impact numbers for Section B and preliminary designs and impacts for Section A. Approval for final design plans and impacts for Segment A will be completed through a permit modification.

Project Location: The project is located along existing NC 150 and begins at the intersection of NC 150 with the NC 16 Bypass in Catawba County and extends approximately 15 miles northeast along NC 150 through Catawba County into Iredell County to terminate just west of the NC 150 intersection with US 21 in Mooresville, Iredell County, North Carolina.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on **December 31, 2025**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

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

Special Conditions:

SEE ATTACHED SPECIAL CONDITIONS

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

() Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

() Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

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

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures

provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

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

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

Carla Dagnino September 2, 2020 *For/*
(PERMITTEE) NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (DATE)
for MR. PHILIP S. HARRIS III, P.E., C.P.M.

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

FOR THE DISTRICT ENGINEER

FOR - *Monte Matthewz* Date: 2020.09.03
(DISTRICT COMMANDER) BENJAMIN A. BENNETT, COLONEL (DATE) 08:03:54 -04'00'

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

(TRANSFeree) (DATE)

SPECIAL CONDITIONS
Action ID: SAW-2018-02343
R-2307 and I-5717

1. **Phased Permit:** This permit only authorizes work on Segment B of the NC 150 R2307 Improvement Project. Construction on Segment A shall not commence until: (a) final design has been completed for those sections and submitted to the U.S. Army Corps of Engineers (Corps); (b) the Permittee has minimized impacts to waters and wetlands to the maximum extent practicable and the Corps concurs with this assessment through standard Merger 4B and 4C meetings; (c) any modification to the plans have been approved by the Corps in writing; and (d) a final compensatory mitigation plan has been submitted by the Permittee and approved by the Corps.

2. **Work Limits:** All work authorized by this permit shall be performed in strict compliance with the attached permit plans dated 7/11/2018, which are a part of this permit. The Permittee shall ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Any modification to the attached permit plans must be approved by the US Army Corps of Engineers prior to any active construction in waters or wetlands.

3. **Unauthorized Dredge or Fill:** Except as authorized by this permit or any U.S. Army 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, or shall any activities take place that cause the degradation of waters or wetlands. There shall be no excavation from, waste disposal into, or degradation of, jurisdictional wetlands or waters associated with this permit without appropriate modification of this permit, including appropriate compensatory mitigation. This prohibition applies to all borrow and waste activities connected with this project. 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 impair normal flows and circulation patterns within, into, or out of waters or wetlands or to reduce the reach of waters or wetlands

4. **Permit Distribution:** The Permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit. A copy of this permit, including all conditions, drawings and attachments shall be available at the project site during the construction and maintenance of this project.

5. **Pre-Construction Meeting:** The Permittee shall schedule and attend a preconstruction meeting between its representatives, the contractors representatives, and the U.S. Army Corps of Engineers, Asheville Field Office, NCDOT Regulatory Project Manager, prior to any work within jurisdictional waters and wetlands to ensure that there is a mutual understanding of all the terms and conditions contained with this

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Department of Army Permit. The Permittee shall provide the Corps, Asheville Field Office, NCDOT Project Manager, with a copy of the final permit plans at least two weeks prior to the preconstruction meeting along with a description of any changes that have been made to the project's design, construction methodology or construction timeframe. The Permittee shall schedule the preconstruction meeting for a time frame when the Corps, NCDCM, and NCDWQ Project Managers can attend. The Permittee shall invite the Corps, NCDCM, and NCDWQ Project Managers a minimum of thirty (30) days in advance of the scheduled meeting in order to provide those individuals with ample opportunity to schedule and participate in the required meeting. The thirty (30) day requirement can be waived with the concurrence of the Corps.

6. Notification of Construction Commencement and Completion: The Permittee shall notify the U.S. Army Corps of Engineers in writing prior to beginning the work authorized by this permit and again upon completion of the work authorized by this permit.

7. Reporting Address: All reports, documentation, and correspondence required by the conditions of this permit shall be submitted to the following: U.S. Army Corps of Engineers, Wilmington District Asheville Regulatory Field Office, Attn: Crystal Amschler 151 Patton Avenue, Room 208 or Crystal.C.Amschler@usace.army.mil. The Permittee shall reference the following permit number, SAW-2018-02343, on all submittals.

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

9. Reporting Violations: Violation of these permit conditions or violation of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act shall be reported to the Corps in writing and by telephone at: 828-271-7980 within 24 hours of the Permittee's discovery of the violation.

10. Clean Fill: The Permittee shall use only clean fill material for this project. The fill material shall be free from items such as trash, construction debris, metal and plastic products, and concrete block with exposed reinforcement bars. Soils used for fill shall not be contaminated with any toxic substance in concentrations governed by Section 307 of the Clean Water Act. Unless otherwise authorized by this permit, all fill material placed in waters or wetlands shall be generated from an upland source.

11. Endangered Species Act: The Permittee shall implement all necessary measures to ensure the authorized activity does not kill, injure, capture, harass, or otherwise harm any federally-listed threatened or endangered species. While accomplishing the authorized work, if the Permittee discovers or observes an injured or dead threatened or endangered species, the U.S. Army Corps of Engineers, Wilmington District Asheville

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Regulatory Field Office, Attn: Crystal Amschler, 151 Patton Avenue, Room 208 or Crystal.C.Amschler@usace.army.mil will be immediately notified to initiate the required Federal coordination.

- A. Habitat is present within the project corridor for the Dwarf-flowered heartleaf (*Hexastylis naniflora*) (Iredell and Catawba) and the Schweinitz's sunflower (*Helianthus schweinitzii*) (Catawba). Surveys were conducted for these species on October 24, 2018 and no species were found. The survey for the Dwarf-flowered heartleaf is good for 5 years and the survey for the Schweinitz's sunflower is good for 2 years. As such, new surveys will need to be conducted for these species within permit areas for Segment A and will also need to be conducted for Segment B if construction is not complete prior to survey expiration.
- B. Habitat is present within the project corridor for the Northern long-eared bat (NLEB) (*Myotis septentrionalis*). In order to avoid impacts to potential roosting NLEB, NCDOT will do the following:
 - a. Inspect existing bridges prior to demolition or other work that may affect the NLEB, for the presence of federally listed bats and contact the Corps and FWS if any bats are observed

12. Culverts:

1) Unless otherwise requested in the application and depicted on the approved permit plans, culverts greater than 48 inches in diameter shall be buried at least one foot below the bed of the stream or, if prior approval given, set at the current stream bed elevation. Culverts 48 inches in diameter and less shall be buried or placed on the stream bed as practicable and appropriate to maintain aquatic passage, and every effort shall be made to maintain existing channel slope. Culverts shall be designed and constructed in a manner that minimizes destabilization and head cutting.

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

3) The Permittee shall implement all reasonable and practicable measures to ensure that equipment, structures, fill pads, work, and operations associated with this project do not adversely affect upstream and/or downstream reaches. Adverse effects include, but are not limited to, channel instability, flooding, and/or stream bank erosion. The Permittee shall routinely monitor for these effects, cease all work when detected, take initial corrective measures to correct actively eroding areas, and notify this office immediately. Permanent corrective measures may require additional authorization by the U.S. Army Corps of Engineers.

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4) Culverts placed within wetlands must be installed in a manner that does not restrict the flows and circulation patterns of waters of the United States. Culverts placed across wetland fills purely for the purposes of equalizing surface water shall not be buried, but the culverts must be of adequate size and/or number to ensure unrestricted transmission of water.

13. Sediment and Erosion Control:

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

2) No fill or excavation impacts for the purposes of sedimentation and erosion control shall occur within jurisdictional waters, including wetlands, unless the impacts are included on the plan drawings and specifically authorized by this permit. This includes, but is not limited to, sediment control fences and other barriers intended to catch sediment losses.

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

4) The Permittee shall use appropriate sediment and erosion control practices which equal or exceed those outlined in the most recent version of the "North Carolina Sediment and Erosion Control Planning and Design Manual" to ensure compliance with the appropriate turbidity water quality standard. Erosion and sediment control practices shall be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to ensure compliance with the appropriate turbidity water quality standards. This shall include, but is not limited to, the immediate installation of silt fencing or similar appropriate devices around all areas subject to soil disturbance or the movement of earthen fill, and the immediate stabilization of all disturbed areas. Additionally, the project shall remain in full compliance with all aspects of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statutes Chapter 113A, Article 4). Adequate sedimentation and erosion control measures shall be implemented prior to any ground disturbing activities to minimize impacts to downstream aquatic resources. These measures shall be inspected and maintained regularly, especially following rainfall events. All fill material shall be adequately stabilized at the earliest practicable date to prevent sediment from entering into adjacent waters or wetlands.

14. Temporary Fills: Within thirty (30) days of the date of completing the authorized work, the Permittee shall remove all temporary fills in waters of the United States and

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restore the affected areas to pre-construction contours and elevations. The affected areas shall be re-vegetated with native, non-invasive vegetation as necessary to minimize erosion and ensure site stability.

15. Borrow and Waste: To ensure that all borrow and waste activities occur on high ground and do not result in the degradation of adjacent waters and wetlands, except as authorized by this permit, the Permittee shall require its contractors and/or agents to identify all areas to be used as borrow and/or waste sites associated with this project. The Permittee shall provide the U.S. Army Corps of Engineers with appropriate maps indicating the locations of proposed borrow and/or waste sites as soon as such information is available. The Permittee shall submit to the Corps site-specific information needed to ensure that borrow and/or waste sites comply with all applicable Federal requirements, to include compliance with the Endangered Species Act and the National Historic Preservation Act, such as surveys or correspondence with agencies (e.g., the USFWS, the NC-HPO, etc.). The required information shall also include the location of all aquatic features, if any, out to a distance of 400 feet beyond the nearest boundary of the site. The Permittee shall not approve any borrow and/or waste sites before receiving written confirmation from the Corps that the proposed site meets all Federal requirements, whether or not waters of the U.S. , including wetlands, are located in the proposed borrow and/or waste site. All delineations of aquatic sites on borrow and/or waste sites shall be verified by the U.S. Army Corps of Engineers and shown on the approved reclamation plans. The Permittee shall ensure that all borrow and/or waste sites comply with Special Condition 3 of this permit. Additionally, the Permittee shall produce and maintain documentation of all borrow and waste sites associated with this project. This documentation will include data regarding soils, vegetation, hydrology, any delineation(s) of aquatic sites, and any jurisdictional determinations made by the Corps to clearly demonstrate compliance with Special Condition 3. All information will be available to the U.S. Army Corps of Engineers upon request. The Permittee shall require its contractors to complete and execute reclamation plans for each borrow and/or waste site and provide written documentation that the reclamation plans have been implemented and all work is completed. This documentation will be provided to the U.S. Army Corps of Engineers within 30 days of the completion of the reclamation work.

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

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

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18. **NCDWR 401 Cert:** In accordance with 33 U.S.C. 1341(d), all conditions of the North Carolina Division of Water Resources 401 Water Quality Certification No. 3845 dated April 17, 2019 are hereby incorporated as special conditions of this permit

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

20. **Discovery of Previously Unknown Remains and Artifacts:** If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

21. **Segment A, Affects to Navigation Evaluation:** Once final plans are completed for Segment A, information regarding potential effects to navigation for the two bridge replacements over Lake Norman on NC 150 in Segment A should be included with the permit modification request. Information should include temporary and permanent impacts to lake users, the boater's safety plan and verification that the bridge replacements will be designed in accordance with the Lake Norman Management Plan.

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

Permittee: NCDOT, Project Development and Environmental Analysis Unit
Project Name: NC 150 (R-2307 and I-5717) Improvement Project

Action ID: SAW-2018-02343
County: Catawba and Iredell Counties

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

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

Permitted Impacts and Compensatory Mitigation Requirements

Permitted Impacts Requiring Mitigation*: **8-digit HUC and Basin:** 03050101, Catawba River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
447				0.06		

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

Compensatory Mitigation Requirements: **8-digit HUC and Basin:** 03050101, Catawba River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
894				0.12		

Mitigation Site Debited: NC DMS

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

Section to be completed by the Mitigation Sponsor

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

Mitigation Sponsor Name: _____

Name of Sponsor's Authorized Representative: _____

Signature of Sponsor's Authorized Representative

Date of Signature

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

Conditions for Transfer of Compensatory Mitigation Credit:

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

Comments/Additional Conditions:

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

USACE Project Manager: Crystal Amschler
USACE Field Office: Asheville Regulatory Field Office
US Army Corps of Engineers
151 Patton Avenue, Room 208
Asheville, NC 28801-5006

Email:

AMSCHLER.CRYSTAL.CAMILLE.1238614178

Digitally signed by
AMSCHLER.CRYSTAL.CAMILLE.1238614178
Date: 2020.08.31 11:23:43 -04'00'

Click here to enter a date.

USACE Project Manager Signature

Date of Signature

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

Page 2 of 2

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



ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

April 17, 2019

Mr. Philip S. Harris, III, P.E., CPM
Environmental Analysis Unit Head
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina, 27699-1598

Subject: 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act CATAWBA BUFFER RULES with ADDITIONAL CONDITIONS for Proposed improvements to Highway 150 from the intersection with the Highway 16 bypass in Lincoln County to intersection with Highway 21 in Iredell County, including the I-77/Highway 150 interchange improvements in Lincoln, Catawba and Iredell Counties, Federal Aid Project No. STP-150(19), State Project No. R-2307AB, I-5717. NCDWR Project No. 20181732

Dear Mr. Harris:

Attached hereto is a copy of Certification No. WQC004181 issued to The North Carolina Department of Transportation (NCDOT) dated April 17, 2019. Please be advised that this project is being constructed under a phased permit. As of the date of its issuance, only impacts for R-2307B and I-5717 are permitted. Before construction can begin on R-2307A, this individual permit must be modified with final design impact numbers on streams, wetlands, and Catawba buffers, as applicable, as well as an updated letter from Division of Mitigation Services.

Additionally, this project has a known and unknown areas of coal ash fill along the entirety of the project. Those areas, whether known or discovered during construction, are subject to the Coal Ash Management Act, North Carolina General Statute 130A-309. Ground disturbance of those properties is subject to the Act.

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

Sincerely,

DocuSigned by:
Amy Chapman
Linda Culpepper, Director
Division of Water Resources

Attachments

Electronic copy only distribution:

Nicholle Braspennickx, US Army Corps of Engineers, Charlotte Field Office
Trish Beam, Division 12 Environmental Officer
Carla Dagnino, NC Department of Transportation
Amanetta Somerville, US Environmental Protection Agency



Claire Ellwanger, US Fish and Wildlife Service
Marla Chambers, NC Wildlife Resources Commission
Beth Harmon, Division of Mitigation Services
Donna Hood, NC Division of Water Resources Mooresville Regional Office
File Copy

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

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Resources (NCDWR) Regulations in 15 NCAC 2H .0500 and 15A NCAC 2B .0243. This certification authorizes the NCDOT to impact 0.06 acres of jurisdictional wetlands, 447 linear feet of jurisdictional streams and 35,328 square feet of protected riparian buffers in Catawba and Iredell Counties. The project shall be constructed pursuant to the application dated received December 21, 2019. The authorized impacts are as described below:

Stream Impacts in the Catawba River Basin

Site	Permanent 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 Impact per Site (DWR mitigation determination)	Stream Impacts Requiring Mitigation (linear ft)
7 (L W 555+00)	117			117		0
8 (L W 755+00)		39		39	107	0
9 (L E 755+00)		68	17	85		0
10 (L E 784+00)		97	20	117	97	0
11 (L E 792+00)		98	19	117	126	0
12 (L W 793+00)		28	20	48		0
Total	117	330	76	519	330	0

Total Stream Impact for Project: 519 linear feet
DWR Stream Mitigation Required: 0 linear feet
ACOE Stream Mitigation Required: 447 linear feet

Wetland Impacts in the Catawba River Basin

Site	Fill (ac)	Fill (temporary) (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Area under Bridge (ac)	Total Wetland Impact (ac)
7 (L Sta 555+00)	0.05			0.01			0.06
Total							0.06

Total Wetland Impact for Project: 0.06 acres.

Open Water Impacts in the Catawba River Basin

Site	Permanent Fill in Open Waters (ac)	Temporary Fill in Open Waters (ac)
1 (L W 451+00)	<0.01	<0.01
2 (L W 457+00)	<0.01	0.02
3 (L W 457+00 to 467+00)	3.11	
4 (L W 474+00 to 487+00)	3.91	
5 (L E 486+00)	0.01	0.02
6 (L E 520+00)	0.02	0.06
Total	7.05	0.10

Total Open Water Impact for Project: 7.05 acres.

Catawba Riparian Buffer Impacts

Buffer Site	Zone 1 Impact (sq ft)	minus Wetlands in Zone 1 (sq ft)	= Zone 1 Buffers (not wetlands) (sq ft)	Zone 1 Buffer Mitigation Required (using 1:1 ratio, in HUC)	Zone 2 Impact (sq ft)	minus Wetlands in Zone 2 (sq ft)	= Zone 2 Buffers (not wetlands) (sq ft)	Zone 2 Buffer Mitigation Required (using 1:1 ratio, in HUC)
Lake Norman	20,406	0	20,406	20,406	14,922	0	14,922	14,922
Totals								

Total Buffer Impact for Project: 35,328 square feet.

* n/a = Total for Site is less than 1/3 acre and 150 linear feet of impact, no mitigation required

The application provides adequate assurance that the discharge of fill material into the waters of the Catawba 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 21, 2018. Should your project change, you are required to notify the NCDWR and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 150 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). Additional buffer impacts may require compensatory mitigation as described in 15A NCAC 2B .0243. For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Condition(s) of Certification:

Project Specific Conditions

1. This project has known, and potentially unknown, coal ash fill areas. Additional requirements will be needed to ensure compliance with the Coal Ash Management Act of North Carolina. Please see the enclosed attachment for additional requirements. NCGS §130A-309
2. All stormwater runoff shall be directed as sheetflow through stream buffers at non-erosive velocities, unless otherwise approved by this certification. Sheetflow requirements are waived per request with low velocities achieved per submitted plans and email. 15A NCAC 2B .0243
3. All riparian buffers impacted by the placement of temporary fill or clearing activities shall be restored to the preconstruction contours and revegetated. Maintained buffers shall be permanently revegetated with non-woody species by the end of the growing season following completion of construction. For the purpose of this condition, maintained buffer areas are defined as areas within the transportation corridor that will be subject to regular NCDOT maintenance activities including mowing. The area with non-maintained buffers shall be permanently revegetated with native woody species before the next growing season following completion of construction. 15A NCAC 2B .0243
4. Pursuant to 15A NCAC 2B .0245(6), sediment and erosion control devices shall not be placed in Zone 1 of any Catawba Buffer without prior approval by the NCDWR. At this time, the NCDWR has approved no sediment and erosion control devices in Zone 1, outside of the approved project impacts, anywhere on this project. Moreover, sediment and erosion control devices shall be allowed in Zone 2 of the buffers provided that Zone 1 is not compromised and that discharge is released as diffuse flow.
5. The NCDOT Division Environmental Officer or Environmental Assistant will conduct a pre-construction meeting with all appropriate staff to ensure that the project supervisor and essential staff understand the potential issues with stream and pipe alignment at the permitted site. NCDWR staff shall be invited to the pre-construction meeting. [15A NCAC 02H.0506(b)(2) and (b)(3)]
6. The post-construction removal of any temporary bridge structures must return the project site to its preconstruction contours and elevations. The impacted areas shall be revegetated with appropriate native species. [15A NCAC 02H .0506(b)(2)]
7. As a condition of this 401 Water Quality Certification, the bridge demolition and construction must be accomplished in strict compliance with the most recent version of NCDOT's Best Management Practices for Construction and Maintenance Activities. [15A NCAC 02H .0507(d)(2) and 15A NCAC 02H .0506(b)(5)]
8. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. To meet the requirements of NCDOT's NPDES permit NCS000250, please refer to the most recent version of the *North Carolina Department of Transportation Stormwater Best Management Practices Toolbox* manual for approved measures. [15A NCAC 02H .0507(d)(2) and 15A NCAC 02H .0506(b)(5)]
9. Bridge piles and bents shall be constructed using driven piles (hammer or vibratory) or drilled shaft construction methods. More specifically, jetting or other methods of pile driving are prohibited without prior written approval from the NCDWR first. [15A NCAC 02H.0506(b)(2)]
10. No drill slurry or water that has been in contact with uncured concrete shall be allowed to enter surface waters. This water shall be captured, treated, and disposed of properly. [15A NCAC 02H .0506(b)(3)]

11. A turbidity curtain will be installed in the stream if driving or drilling activities occur within the stream channel, on the stream bank, or within 5 feet of the top of bank, or during the removal of bents from an old bridge. This condition can be waived with prior approval from the NCDWR. [15A NCAC 02H .0506(b)(3)]
12. All bridge construction shall be performed from the existing bridge, temporary work bridges, temporary causeways, or floating or sunken barges. If work conditions require barges, they shall be floated into position and then sunk. The barges shall not be sunk and then dragged into position. Under no circumstances should barges be dragged along the bottom of the surface water. [15A NCAC 02H .0506(b)(3)]
13. If multiple pipes or barrels are required, they shall be designed to mimic natural stream cross section as closely as possible including pipes or barrels at flood plain elevation and/or sills where appropriate. Widening the stream channel should be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage. [15A NCAC 02H.0506(b)(2)]
14. Riprap shall not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be properly designed, sized and installed. [15A NCAC 02H.0506(b)(2)]
15. For the ___ linear feet of streams being impacted due to site dewatering activities, the site shall be graded to its preconstruction contours and revegetated with appropriate native species. [15A NCAC 02H.0506(b)(2)]
16. The stream channel shall be excavated no deeper than the natural bed material of the stream, to the maximum extent practicable. Efforts must be made to minimize impacts to the stream banks, as well as to vegetation responsible for maintaining the stream bank stability. Any applicable riparian buffer impact for access to stream channel shall be temporary and be revegetated with native riparian species. [15A NCAC 02H.0506(b)(2)]
17. NCDOT shall be in compliance with the NCS00250 issued to the NCDOT, including the applicable requirements of the NCG01000. Please note the extra protections for the sensitive watersheds.
18. All portions of the proposed project draining to 303(d) listed watersheds that are impaired due to turbidity shall be designed, constructed, and operated with sediment and erosion control measures that meet Design Standards in Sensitive Watersheds (15A NCAC 4B .0124). However, due to the size of the project, NC DOT shall not be required to meet 15A NCAC 4B .0124(a) regarding the maximum amount of uncovered acres.
19. All portions of the proposed project draining to 303(d) listed watersheds that are impaired due to biological criteria exceedances shall not discharge stormwater directly to surface waters. Stormwater shall be treated using appropriate best management practices (e.g., vegetated conveyances, constructed wetlands, detention ponds, etc.) prior to discharging to surface waters.
20. The NCDOT shall design, construct, and operate and maintain hazardous spill catch basins (HSCBs) at lake crossing within the WS CA watershed. The HSCBs shall be located at Station numbers L Sta 456+00 and 487+00.[15A NCAC 02B.0200]
21. Compensatory mitigation for impacts to 20,406 square feet of protected riparian buffers in Zone 1 and 14,922 square feet of protected riparian buffers in Zone 2 shall be required. We understand that you have chosen to perform compensatory mitigation for impacts to protected buffers through use of the North Carolina Division of Mitigation Services (DMS) (formerly NCEEP). Mitigation for unavoidable impacts to **Catawba** Riparian Buffers shall be provided in the Catawba River Basin and done in accordance with 15A NCAC .02B .0295. The DMS has indicated in a letter dated December 19, 2018 that they will assume responsibility for satisfying the compensatory mitigation requirements for the above-referenced project, in accordance with DMS's Mitigation Banking Instrument signed June 14, 2016. 15A NCAC .02B .0243
22. Compensatory mitigation for impacts to **0.06 riverine** wetlands is required. We understand that you have chosen to perform compensatory mitigation for impacts to wetlands through the North Carolina Division of

Mitigation Services (DMS) (formerly NCEEP), and that the DMS has agreed to implement the mitigation for the project. DMS has indicated in a letter dated December 19, 2018 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with DMS's Mitigation Banking Instrument signed July 28, 2010. [15A NCAC 2H.0506(h)]

23. Compensatory mitigation for **447 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 Division of Mitigation Service (DMS) (formerly NCEEP), and that the DMS has agreed to implement the mitigation for the project. The DMS has indicated in a letter dated December 19, 2018 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the DMS Mitigation Banking Instrument signed July 28, 2010. [15A NCAC 2H.0506(h)]
24. When final design plans are completed for R-2307 Section A, a modification to the 401 Water Quality Certification and the **Catawba River Riparian Buffer Certification** shall be submitted with five copies and fees to the NC Division of Water Resources. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams, and other surface waters, and buffers. No construction activities that impact any wetlands, streams, surface waters, or buffers located in R-2307 Section A shall begin until after the permittee applies for, and receives a written modification of the 401 Water Quality Certification and the **Catawba River Riparian Buffer Authorization** from the NC Division of Water Resources. [15A NCAC 02H. 0506(b)]
- 25.

General Conditions:

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

sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water. [15A NCAC 02H.0506(b)(3) and (c)(3)]

8. Heavy equipment shall be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the introduction of other pollutants into the stream. [15A NCAC 02H.0506(b)(3)]
9. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials. [15A NCAC 02H.0506(b)(3)]
10. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification. [15A NCAC 02H.0506(b)(3)]
11. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited. [15A NCAC 02H.0506(b)(3)]
12. When applicable, all construction activities shall be performed and maintained in full compliance with G.S. Chapter 113A Article 4 (Sediment and Pollution Control Act of 1973). Regardless of applicability of the Sediment and Pollution Control Act, all projects shall incorporate appropriate Best Management Practices for the control of sediment and erosion so that no violations of state water quality standards, statutes, or rules occur. [15A NCAC 02H.0506(b)(3) and (c)(3) and 15A NCAC 02B.0200]
13. Design, installation, operation, and maintenance of all sediment and erosion control measures shall be equal to or exceed the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*, or for linear transportation projects, the *NCDOT Sediment and Erosion Control Manual*.
14. All devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) sites, including contractor-owned or leased borrow pits associated with the project. Sufficient materials required for stabilization and/or repair of erosion control measures and stormwater routing and treatment shall be on site at all times.
15. For borrow pit sites, the erosion and sediment control measures shall be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*. Reclamation measures and implementation shall comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act and the Mining Act of 1971.
16. If the project occurs in waters or watersheds classified as Primary Nursery Areas (PNAs), SA, WS-1, WS-11, High Quality Waters (HQW), or Outstanding Resource Waters (ORW), then the sedimentation and erosion control designs shall comply with the requirements set forth in 15A NCAC 04B.0124, *Design Standards in Sensitive Watershed*. [15A NCAC 02H.0506(b)(3) and (c)(3); GC 4135]
17. The permittee and its authorized agents shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act) and any other appropriate requirements of State and Federal law. If the NCDWR determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, the NCDWR may reevaluate and modify this certification. [15A NCAC 02B.0200]
18. All fill slopes located in jurisdictional wetlands shall be placed at slopes no flatter than 3:1, unless otherwise authorized by this certification. [15A NCAC 02H.0506(b)(2)]
19. A copy of this Water Quality Certification shall be maintained on the construction site at all times. In addition, the Water Quality Certification and all subsequent modifications, if any, shall be maintained with the Division

- Engineer and the on-site project manager. [15A NCAC 02H .0507(c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]
20. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization, including all non-commercial borrow and waste sites associated with the project, shall be clearly marked by highly visible fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this certification. [15A NCAC 02H.0501 and .0502]
 21. 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.
 22. The Permittee shall report any violations of this certification to the Division of Water Resources within 24 hours of discovery. [15A NCAC 02B.0506(b)(2)]
 23. Upon completion of the project (including any impacts at associated borrow or waste sites), the NCDOT Division Engineer shall complete and return the enclosed "Certification of Completion Form" to notify the NCDWR when all work included in the 401 Certification has been completed. [15A NCAC 02H.0502(f)]
 24. Native riparian vegetation (**ex. Salix nigra, Juncus (spp), Carex (spp), et al.**) must be reestablished in the riparian areas within the construction limits of the project by the end of the growing season following completion of construction. [15A NCAC 02B.0231(b)(6)]
 25. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated with this permit without appropriate modification. Should waste or borrow sites, or access roads to waste or borrow sites, be located in wetlands or streams, compensatory mitigation will be required since that is a direct impact from road construction activities. [15A NCAC 02H.0506(b)(3) and (c)(3)]
 26. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards [15A NCAC 02H.0506(b)(3) and (c)(3):
 - a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*.
 - b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
 - c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.
 - d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.
 27. Sediment and erosion control measures shall not be placed in wetlands or surface waters, or within 5 feet of the top of bank, without prior approval from DWR. [15A NCAC 02H.0506(b)(3) and (c)(3)]

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

If you wish to contest any statement in the attached Certification you must file a petition for an administrative

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

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


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

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

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

This the 17th day of April 2019

DIVISION OF WATER RESOURCES

DocuSigned by:

9C9886312DCD474...

Linda Culpepper, Director

WQC No. 004181



ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NCDWR Project No.: _____ County: _____

Applicant: _____

Project Name: _____

Date of Issuance of 401 Water Quality Certification: _____

Certificate of Completion

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

Applicant's Certification

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

Signature: _____ Date: _____

Agent's Certification

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

Signature: _____ Date: _____

Engineer's Certification

_____ Partial _____ Final

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

Signature _____ Registration No. _____

Date _____





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



(Version 2.07; Released October 2016)

WBS Element: 37944.1.FR5/50134. **TIP No.:** R-2307B/I-5717 **County(ies):** Catawba Iredell **Page** 1 **of** 6

General Project Information

WBS Element:	37944.1.FR5/50134.1.FS1	TIP Number:	R-2307B/I-5717	Project Type:	Roadway Relocation	Date:	12/22/2017
NCDOT Contact:	Craig A. Freeman, PE			Contractor / Designer:	TGS Engineers (David B. Petty, PE)		
Address:	1590 Mail Service Center Raleigh, NC 27699-1590			Address:	706 Hillsborough Street Suite 200 Raleigh NC, 27603		
Phone:	919-707-6721			Phone:	919-773-8887 ext. 104		
Email:	cafreeman2@ncdot.gov			Email:	dpetty@tgsengineers.com		
City/Town:	Mooresville, NC			County(ies):	Catawba	Iredell	
River Basin(s):	Catawba			CAMA County?	No	No	
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	6.94 miles	Surrounding Land Use:	Commercial, Medium Density Residential
	Proposed Project		Existing Site
Project Built-Upon Area (ac.)	121.0 ac.		69.0 ac.
Typical Cross Section Description:	four lane shoulder section with 23'+ grassed median and four to six lane curb and gutter section with 0' to 23' raised grassed median - all 12' lanes		two lane undivided shoulder section and four lane undivided curb and gutter section - all 12' lanes
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 58860	Year: 2039	Existing: 47900
General Project Narrative: (Description of Minimization of Water Quality Impacts)	<p>The proposed project involves widening NC 150, an existing two & four-lane undivided arterial, to a four & six-lane median divided superstreet to improve vehicular mobility and safety from Greenwood Rd (SR 1840) in Catawba County to US 21 in Iredell County. The existing 10-span, approximately 1170-ft long by 34-ft wide bridge over Lake Norman will remain in place and transition from one lane in each direction to two eastbound lanes. A proposed 9-span, approx. 1210-ft by 52-ft wide bridge will carry two westbound lanes and a 10-ft multiuse path just upstream of the existing bridge. Bridge to be constructed from anchored barges. Existing causeways will be widened on the upstream side using rock fill up to 2 ft above Duke Energy Full Pond elevation and then grassed sideslopes from there up. There are five proposed culvert extensions over UT's toward end of project – riprap is proposed in base of channels to reduce discharge velocities.</p> <p>Roadway runoff in the vicinity of the Lake Norman crossing is routed to two hazardous spill basins. Dry detention/filtration basins are proposed on sheets 14, 17(dry detention only) 19, 20 & 22 for both peak attenuation and treatment. Otherwise, stormwater diversion has been minimized. Grassed swales are used for treatment throughout the project, where practical. Outlet pipe slopes are minimized. All BMP's have been incorporated throughout the project to the maximum extent practicable.</p>		

Waterbody Information

Surface Water Body (1):	Catawba River (Lake Norman below elevation 760)	NCDWR Stream Index No.:	11-(75)
NCDWR Surface Water Classification for Water Body	Primary Classification:	Water Supply IV (WS-IV)	Class B
	Supplemental Classification:	None	Critical Area (CA)
Other Stream Classification:	None		
Impairments:	None		
Aquatic T&E Species?	Yes	Comments: per EA: no effect on Dwarf-flowered heartleaf&Schweinitz's sunflower; unresolved on Northern long-eared bat	
NRTR Stream ID:		Buffer Rules in Effect:	Catawba
Project Includes Bridge Spanning Water Body?	Yes	Deck Drains Discharge Over Buffer?	No
Deck Drains Discharge Over Water Body?	No	(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)



North Carolina Department of Transportation
 Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
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(Version 2.07; Released October 2016)

WBS Element: 37944.1.FR5/50134.
TIP No.: R-2307B/I-5717
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Additional Waterbody Information

Surface Water Body (2):	McCrary Creek		NCDWR Stream Index No.:	11-91	
NCDWR Surface Water Classification for Water Body	Primary Classification:	Water Supply IV (WS-IV)		Class B	Critical Area (CA)
	Supplemental Classification:	None			
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	Yes	Comments: per EA: no effect on Dwarf-flowered heartleaf&Schweinitz's sunflower; unresolved on Northern long-eared bat			
NRTR Stream ID:				Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					



North Carolina Department of Transportation
 Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
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County(ies): Catawba Iredell

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Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
4	-Y- 10+50 RT	(1)Catawba River (Lake)	0.0	3.0	3.0	0.3	33	50	2.30%	0.6	1.4	0.7	1.5	No	Yes
	-Y- 11+00 RT	(1)Catawba River (Lake)	0.0	3.0	3.0	0.3	33	50	2.30%	0.6	1.4	0.7	1.5	No	Yes
4	-L- 433+00 LT	(1)Catawba River (Lake)	0.0	6.0	6.0	1.0	100	100	2.40%	3.0	1.9	3.9	2.0	No	Yes
	-L- 434+00 LT	(1)Catawba River (Lake)	0.0	6.0	6.0	1.0	100	100	2.40%	3.0	1.9	3.9	2.0	No	Yes
5	-L- 436+50 RT	(1)Catawba River (Lake)	0.0	6.0	4.0	1.0	103	350	2.60%	2.6	1.9	3.3	2.0	No	Yes
	-L- 440+00 RT	(1)Catawba River (Lake)	0.0	6.0	4.0	1.0	103	350	2.60%	2.6	1.9	3.3	2.0	No	Yes
5	-L- 443+20 RT	(1)Catawba River (Lake)	0.0	6.0	4.0	0.5	50	245	2.60%	1.3	1.6	1.7	1.7	No	Yes
	-L- 445+65 RT	(1)Catawba River (Lake)	0.0	6.0	4.0	0.5	50	245	2.60%	1.3	1.6	1.7	1.7	No	Yes
5	-L- 440+20 LT	(1)Catawba River (Lake)	0.0	6.0	4.0	0.7	72	230	2.60%	2.1	1.8	2.7	1.9	No	Yes
	-L- 442+50 LT	(1)Catawba River (Lake)	0.0	6.0	4.0	0.7	72	230	2.60%	2.1	1.8	2.7	1.9	No	Yes
5	-L- 442+50 LT	(1)Catawba River (Lake)	0.0	6.0	4.0	0.9	85	300	2.60%	2.3	1.9	3.0	2.3	No	Yes
	-L- 445+50 LT	(1)Catawba River (Lake)	0.0	6.0	4.0	0.9	85	300	2.60%	2.3	1.9	3.0	2.3	No	Yes
5/6	-L- 445+50 LT	(1)Catawba River (Lake)	0.0	6.0	4.0	1.0	97	450	0.3 to 2.2%	2.6	1.9	3.4	2.0	No	Yes
	-L- 450+00 LT	(1)Catawba River (Lake)	0.0	6.0	4.0	1.0	97	450	0.3 to 2.2%	2.6	1.9	3.4	2.0	No	Yes
6	-L- 449+00 MED	(1)Catawba River (Lake)	0.0	3.0	4.0	0.4	41	50	1.0 to 0.7%	1.2	1.2	1.5	1.3	No	Yes
	-L- 453+50 MED	(1)Catawba River (Lake)	0.0	3.0	4.0	0.4	41	50	1.0 to 0.7%	1.2	1.2	1.5	1.3	No	Yes
6	-L- 453+50 MED	(1)Catawba River (Lake)	0.0	3.0	4.0	0.7	72	400	0.50%	1.9	1.2	2.5	1.3	No	Yes
	-L- 457+50 MED	(1)Catawba River (Lake)	0.0	3.0	4.0	0.7	72	400	0.50%	1.9	1.2	2.5	1.3	No	Yes
6	-L- 457+50 MED	(1)Catawba River (Lake)	0.0	4.0	4.6	0.3	31	150	0.50%	0.8	0.8	1.0	0.9	No	Yes
	-L- 459+00 MED	(1)Catawba River (Lake)	0.0	4.0	4.6	0.3	31	150	0.50%	0.8	0.8	1.0	0.9	No	Yes
6/7	-L- 459+00 MED	(1)Catawba River (Lake)	0.0	4.0	4.6	1.1	114	650	0.30%	2.9	1.1	3.8	1.2	No	Yes
	-L- 465+50 MED	(1)Catawba River (Lake)	0.0	4.0	4.6	1.1	114	650	0.30%	2.9	1.1	3.8	1.2	No	Yes
8	-L- 478+00 MED	(1)Catawba River (Lake)	0.0	5.0	4.0	0.3	26	125	0.40%	0.6	0.7	0.8	0.7	No	Yes
	-L- 479+25 MED	(1)Catawba River (Lake)	0.0	5.0	4.0	0.3	26	125	0.40%	0.6	0.7	0.8	0.7	No	Yes
8	-L- 479+25 MED	(1)Catawba River (Lake)	0.0	5.0	4.0	0.6	63	225	0.40%	1.5	1.0	1.9	1.1	No	Yes
	-L- 481+50 MED	(1)Catawba River (Lake)	0.0	5.0	4.0	0.6	63	225	0.40%	1.5	1.0	1.9	1.1	No	Yes
8	-L- 481+50 MED	(1)Catawba River (Lake)	0.0	4.4	4.0	0.7	71	350	0.30%	1.9	1.0	2.5	1.0	No	Yes
	-L- 485+00 MED	(1)Catawba River (Lake)	0.0	4.4	4.0	0.7	71	350	0.30%	1.9	1.0	2.5	1.0	No	Yes
8	-L- 485+00 MED	(1)Catawba River (Lake)	0.0	4.4	4.0	0.6	60	350	0.30%	1.7	1.0	2.3	1.0	No	Yes
	-L- 488+50 MED	(1)Catawba River (Lake)	0.0	4.4	4.0	0.6	60	350	0.30%	1.7	1.0	2.3	1.0	No	Yes
9	-L- 497+50 RT	(1)Catawba River (Lake)	0.0	6.0	4.0	0.4	42	200	3.00%	1.1	1.7	1.5	1.8	No	Yes
	-L- 499+50 RT	(1)Catawba River (Lake)	0.0	6.0	4.0	0.4	42	200	3.00%	1.1	1.7	1.5	1.8	No	Yes
9	-L- 501+00 RT	(1)Catawba River (Lake)	0.0	3.0	3.0	1.9	193	500	0.40%	5.3	1.6	6.9	1.8	No	Yes
	-L- 506+00 RT	(1)Catawba River (Lake)	0.0	3.0	3.0	1.9	193	500	0.40%	5.3	1.6	6.9	1.8	No	Yes
9	-L- 503+50 LT	(1)Catawba River (Lake)	0.0	4.0	6.0	0.4	44	150	0.60%	0.8	0.8	1.0	0.9	No	Yes
	-L- 505+00 LT	(1)Catawba River (Lake)	0.0	4.0	6.0	0.4	44	150	0.60%	0.8	0.8	1.0	0.9	No	Yes
9*	-Y2- 13+00 LT	(1)Catawba River (Lake)	2.0	4.0	4.0	1.5	152	95	1.90%	3.5	1.9	4.5	2.0	No	Yes
	-Y2- 14+40 LT	(1)Catawba River (Lake)	2.0	4.0	4.0	1.5	152	95	1.90%	3.5	1.9	4.5	2.0	No	Yes

Additional Comments

Swales have been added to attenuate runoff and promote sedimentation and infiltration before discharging through the riparian buffer.
 Where slope (and drainage area/discharge) vary, max. applicable velocity is entered.
 *200+ ft of existing swale upstream of Sheet 9 -Y2- swale.



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



(Version 2.07; Released October 2016)

WBS Element: 37944.1.FR5 TIP No.: R-2307B/I-5717 County(ies): Catawba Iredell Page 4 of 6

Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
9	-Y2- 13+70 RT -Y2- 14+40 RT	(1)Catawba River (Lake)	0.0	4.0	4.0	0.4	44	70	1.30%	1.2	1.6	1.6	1.7	No	Yes
10	-L- 505+50 LT -L- 508+50 LT	(1)Catawba River (Lake)	0.0	6.0	4.0	1.1	110	300	0.3 to 2.0%	2.4	2.0	3.1	2.2	No	Yes
10	-L- 516+00 RT -L- 517+50 RT	(1)Catawba River (Lake)	6.0	3.0	3.0	1.7	170	150	2.00%	5.4	2.0	7.0	2.2	No	Yes
11	-L- 523+50 RT -L- 525+75 RT	(1)Catawba River (Lake)	0.0	6.0	4.0	0.5	46	225	3.10%	1.3	1.8	1.7	1.9	No	Yes
11	-L- 526+50 RT -L- 529+50 RT	(1)Catawba River (Lake)	0.0	6.0	4.0	0.8	82	300	2.4 to 0.8%	2.4	1.9	3.1	2.4	No	Yes
11	-L- 527+50 LT -L- 529+50 LT	(1)Catawba River (Lake)	0.0	6.0	4.0	0.5	46	200	2.30%	1.3	1.8	1.7	2.0	No	Yes
12*	-L- 532+50 RT -L- 534+00 RT	(1)Catawba River (Lake)	2.0	4.0	4.0	2.7	273	150	0.80%	6.4	1.9	8.3	2.0	No	Yes
12*	-L- 539+50 RT -L- 541+00 RT	(1)Catawba River (Lake)	2.0	3.0	3.0	1.7	167	150	1.40%	4.7	1.8	6.1	2.3	No	Yes
12*	-L- 546+00 RT -L- 547+50 RT	(1)Catawba River (Lake)	0.0	6.0	4.0	0.3	34	150	2.90%	1.0	1.9	1.3	2.0	No	Yes
25	-Y31- 29+85 LT -Y31- 31+50 LT	(1)Catawba River (Lake)	0.0	6.0	4.0	1.1	110	165	1.70%	1.9	1.5	2.5	1.9	No	Yes
25	-Y31- 34+60 LT -Y31- 35+50 LT	(1)Catawba River (Lake)	0.0	6.0	6.0	0.4	40	90	1.50%	0.9	1.2	1.2	1.2	No	Yes
25	-Y31- 29+63 RT -Y31- 31+50 RT	(1)Catawba River (Lake)	0.0	6.0	4.0	0.7	70	187	1.00%	1.2	1.1	1.5	1.2	No	Yes
25	-Y31- 34+10 RT -Y31- 36+70 RT	(1)Catawba River (Lake)	0.0	6.0	4.0	1.6	160	260	1.80%	3.6	1.8	4.7	1.9	No	Yes
33	-Y17- 27+00 RT -Y17- 34+50 RT	(1)Catawba River (Lake)	0.0	4.0	4.0	1.1	112	750	1.9 to 0.3%	1.8 to 3.1	1.9	2.4 to 4.0	2.1	No	Yes
35**	-Y26A- 19+20 RT -Y26A- 20+15 RT	(2)McCrary Creek	4.0	3.0	3.0	2.6	260	65	0.30%	9.2	1.5	11.9	1.6	No	Yes
36***	-Y39- 13+50 RT -Y39- 14+25 RT	(1)Catawba River (Lake)	6.0	4.0	3.0	2.3	230	75	2.10%	5.9	2.0	7.7	2.2	No	Yes
6	-L- 455+50 LT -L- 457+50 LT	(1)Catawba River (Lake)	0.0	3.0	4.0	0.2	21	200	0.40%	0.4	0.7	0.6	0.7	No	Yes

Additional Comments

Swales have been added to attenuate runoff and promote sedimentation and infiltration before discharging through the riparian buffer.
 Where slope (and drainage area/discharge) vary, max. applicable velocity is entered.
 *Sheet 12 has three separate swales inline for total DA of 2.73 ac (recommend treatment=273 ft) with 450 ft provided.
 **Sheet 35 swale ties into an existing 115 ft swale.
 *** 400+ ft of existing swale upstream of Sheet 36 swale.

CONTRACT: TIP PROJECTS: R-2307B & I-5717

See Sheet 1-A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CATAWBA & IREDELL COUNTIES

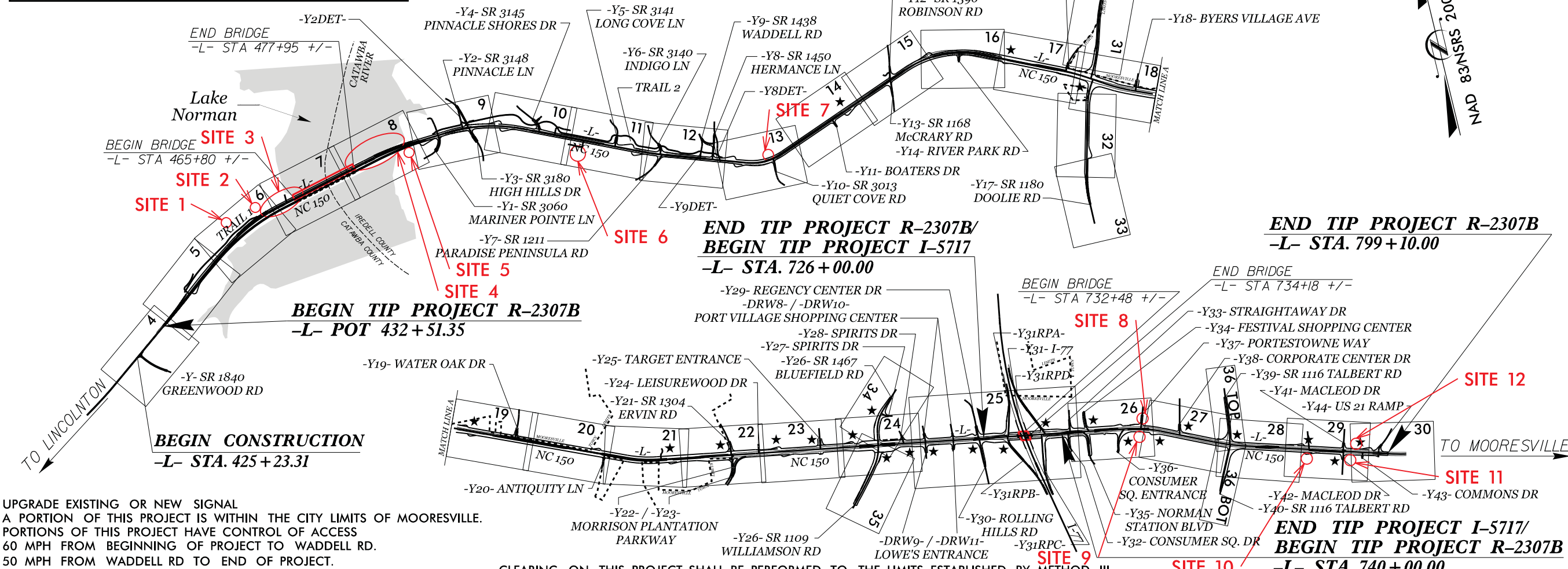
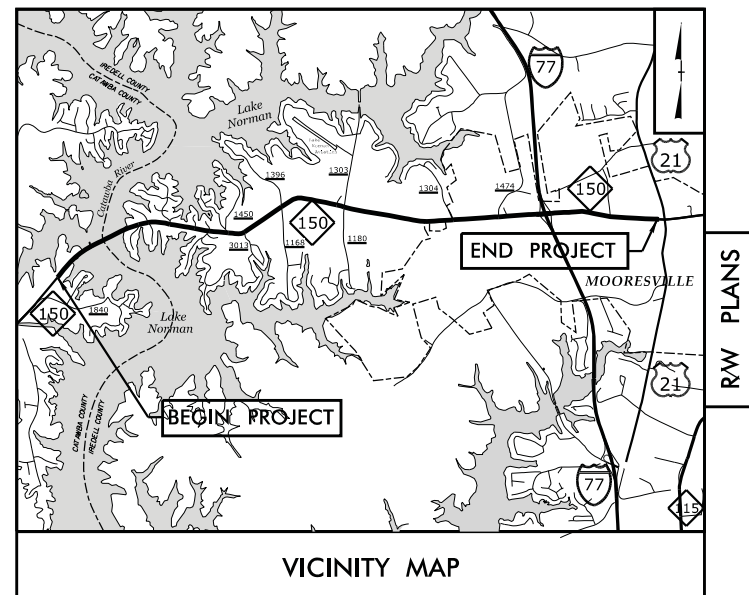
LOCATION: NC 150 FROM SR 1840 (GREENWOOD RD) IN CATAWBA COUNTY TO US 21 IN IREDELL COUNTY

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, AND SIGNALS
WETLAND & STREAM IMPACTS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2307B, I-5717	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
37944.1.FR5	STP-0150(36)	PE (R-2307B)	
50134.1.FS1	NHPP-077-1(221)37	PE (I-5717)	
37944.2.4	STP-0150(036)	R/W (R-2307B)	
37944.2.5	STP-0150(036)	UTILITIES (R-2307B)	
50134.2.1	NHPP-077-1(221)37	R/W, UTILITIES (I-5717)	

PERMIT DRAWING SHEET 1 OF 22

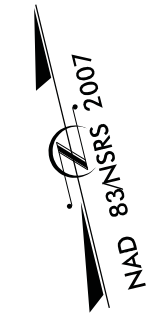
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



★ UPGRADE EXISTING OR NEW SIGNAL
A PORTION OF THIS PROJECT IS WITHIN THE CITY LIMITS OF MOORESVILLE.
PORTIONS OF THIS PROJECT HAVE CONTROL OF ACCESS
** 60 MPH FROM BEGINNING OF PROJECT TO WADDELL RD.
50 MPH FROM WADDELL RD TO END OF PROJECT.

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

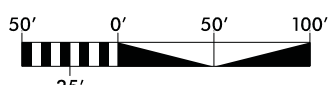
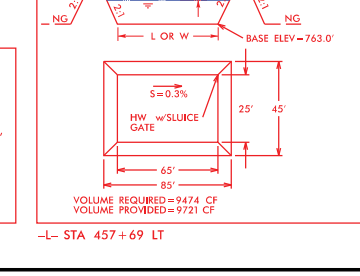
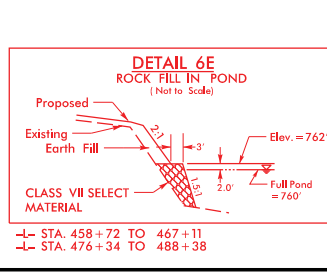
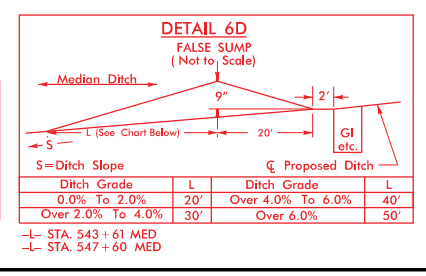
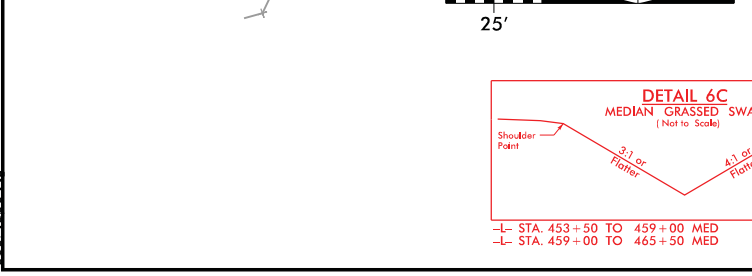
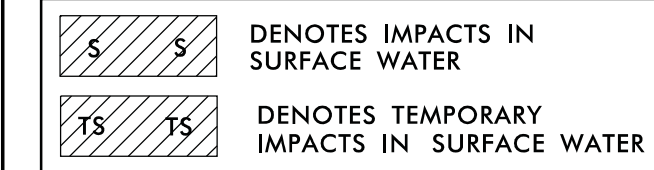
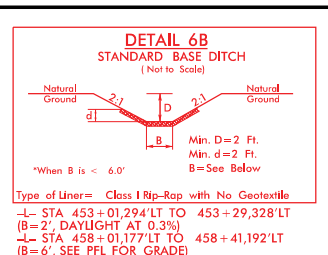
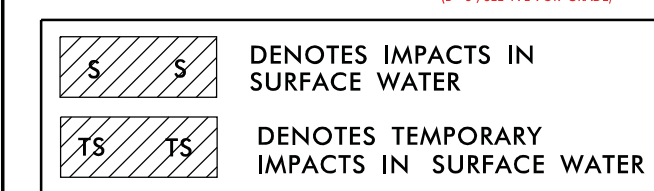
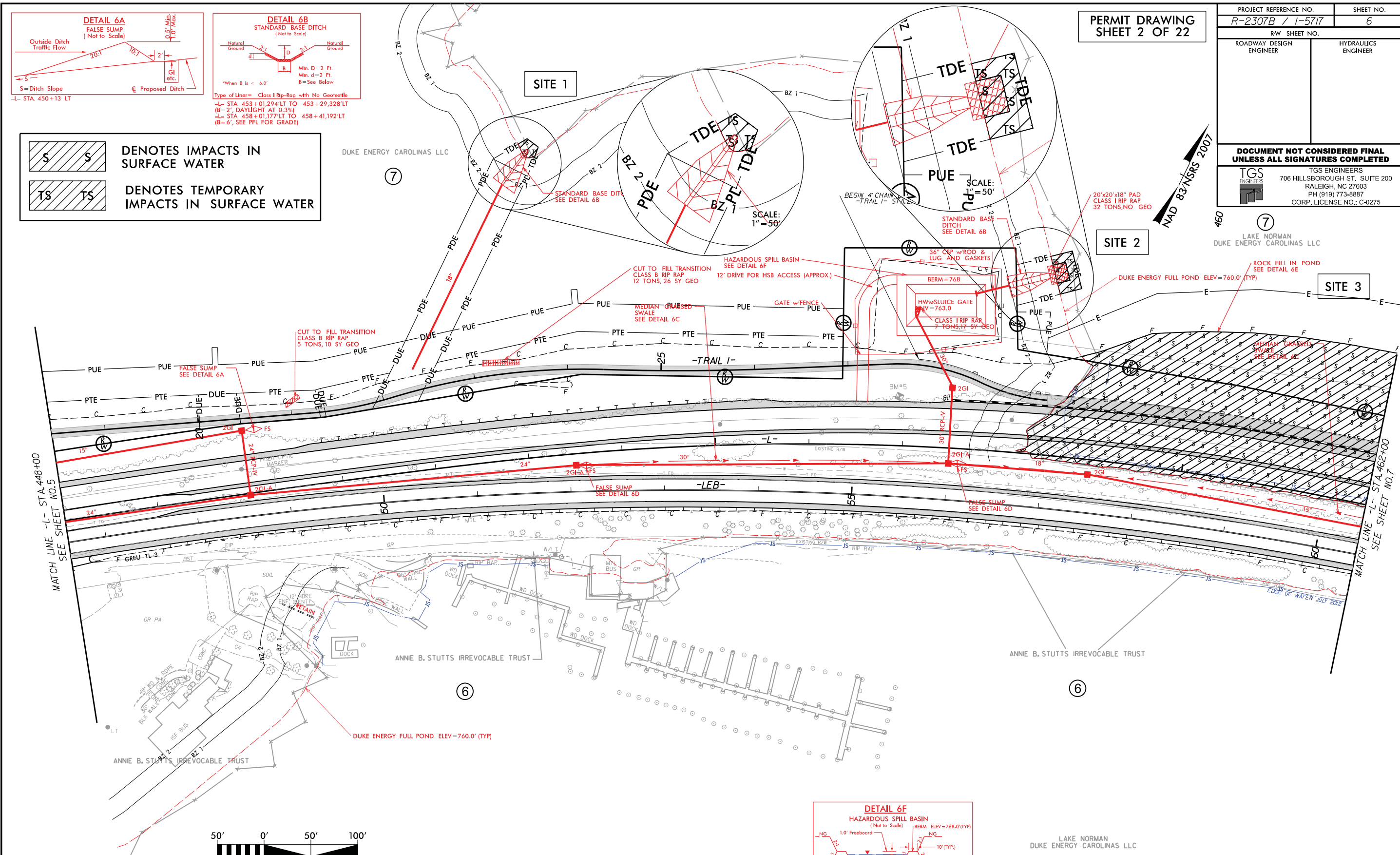
<p>GRAPHIC SCALES</p>	<p>DESIGN DATA</p> <p>ADT 2019 = 47,900 ADT 2039 = 58,860 K = 8% D = 55% T = 6%* V = **</p> <p>* TTST 2%+ DUAL 4% FUNC CLASS = PRINCIPAL ARTERIAL STATEWIDE TIER</p>	<p>PROJECT LENGTH</p> <p>LENGTH ROADWAY TIP PROJECT R-2307B = 6.448 mile LENGTH STRUCTURES TIP PROJECT R-2307B = 0.230 mile TOTAL LENGTH TIP PROJECT R-2307B = 6.678 mile</p> <p>LENGTH ROADWAY TIP PROJECT I-5717 = 0.233 mile LENGTH STRUCTURES TIP PROJECT I-5717 = 0.032 mile TOTAL LENGTH TIP PROJECT I-5717 = 0.265 mile</p> <p>TOTAL LENGTH TIP PROJECT R-2307B / I-5717 = 6.943 mile</p>	<p>Prepared For: DIVISION OF HIGHWAYS 1000 Birch Ridge Dr., Raleigh NC, 27610</p> <p>By: TGS ENGINEERS 706 HILLSBOROUGH ST SUITE 200 RALEIGH, NC 27603</p> <p>PH (919) 773-8887 CORP. LICENSE NO.: C-0275</p> <p>2012 STANDARD SPECIFICATIONS</p> <p>RIGHT OF WAY DATE: AUGUST 31, 2017</p> <p>LETTING DATE: JULY 16, 2019</p> <p>BURKE EVANS, PE PROJECT ENGINEER</p> <p>TRAVIS COOK, EI PROJECT DESIGN ENGINEER</p> <p>BRYAN KEY, PE PROJECT ENGINEER NCDOT ROADWAY DESIGN</p>	<p>HYDRAULICS ENGINEER</p> <p>SIGNATURE: _____ P.E.</p> <p>ROADWAY DESIGN ENGINEER</p> <p>SIGNATURE: _____ P.E.</p>	
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7/11/2018 X:\NCDOT\IR-2307B\Hydraulics\PERMITS_Environmental\Drawings\IR-2307B-RDY_TSH.dgn User:dpetty

8/17/99

PROJECT REFERENCE NO. R-2307B / 1-5717		SHEET NO. 6	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
		TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	

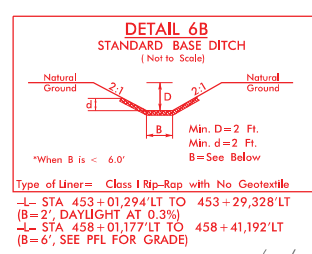
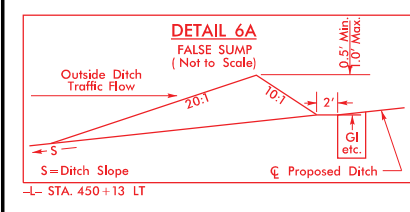


SEE SHEET 38 FOR -L- PROFILE
SEE SHEET 53 FOR -LEB- PROFILE
SEE SHEET 73 FOR -TRAIL- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

7/2/2008
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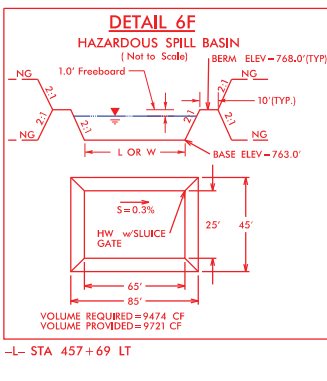
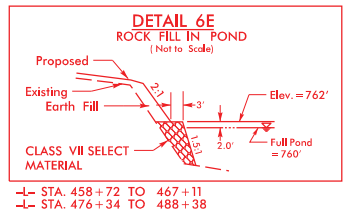
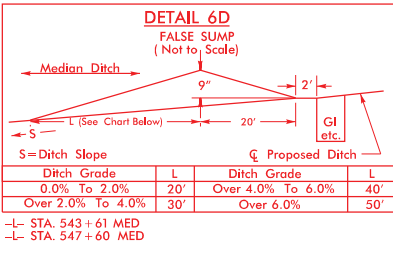
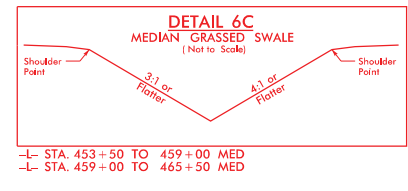
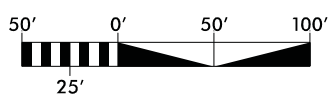
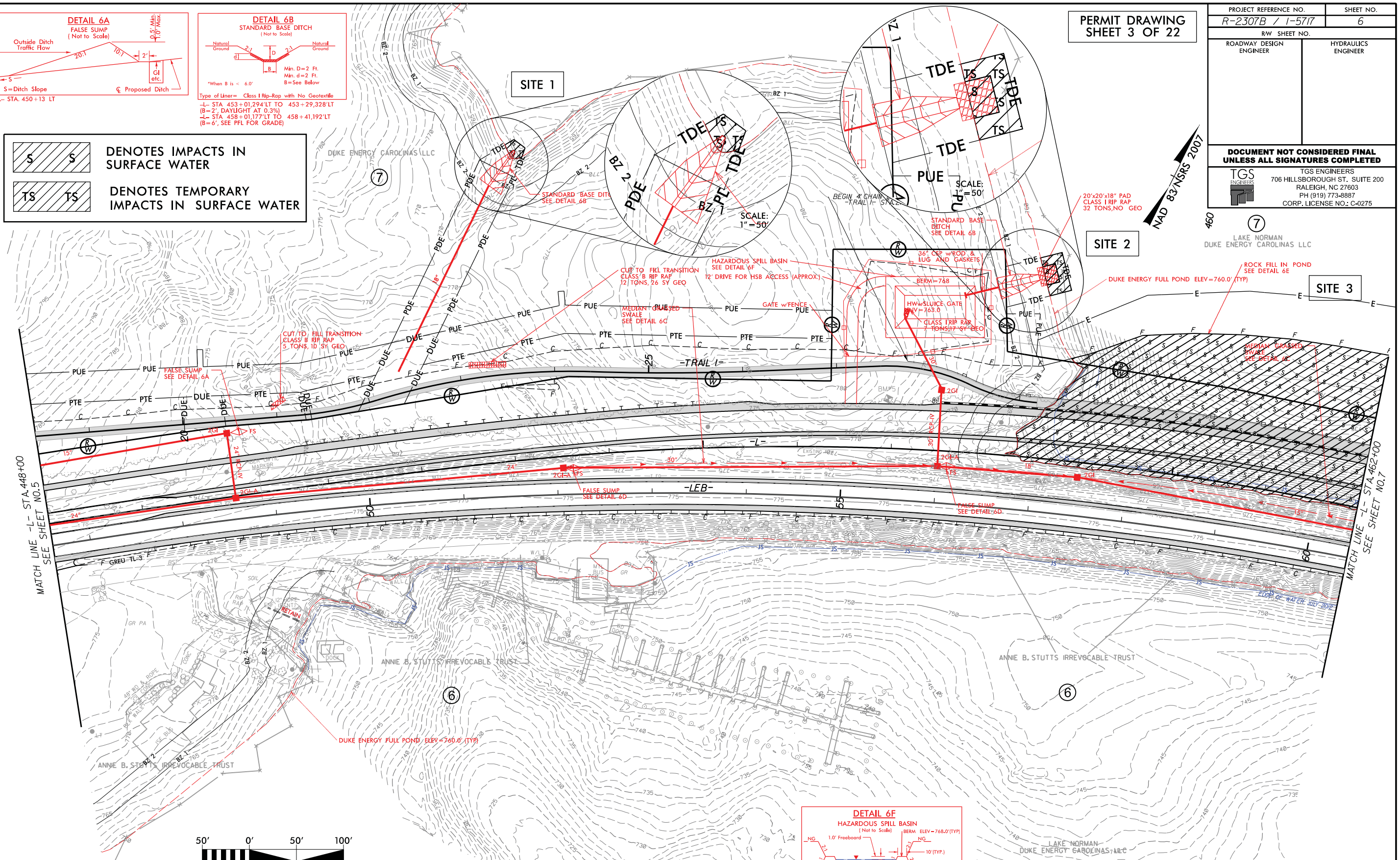
**PERMIT DRAWING
SHEET 3 OF 22**



SS DENOTES IMPACTS IN SURFACE WATER
TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

8/17/99

7/2/2008 X:\NCDDOT\IR-2307B\Hydraulics\PERMITS\Environmental\Drawings\IR-2307B_RDY_PSH_06.dgn




PTC PERMANENT TRAIL EASEMENT

SEE SHEET 38 FOR -L- PROFILE
 SEE SHEET 53 FOR -LEB- PROFILE
 SEE SHEET 73 FOR -TRAIL- PROFILE
 SEE SHEET 2B-1 FOR CURVE DATA

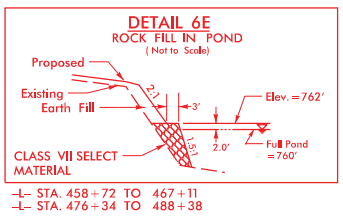
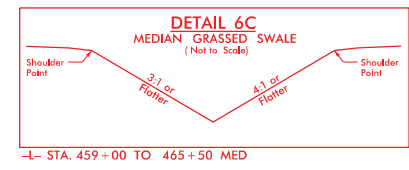
CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
 DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

8/17/99

PROJECT REFERENCE NO. R-2307B / 1-5717	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	

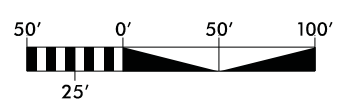
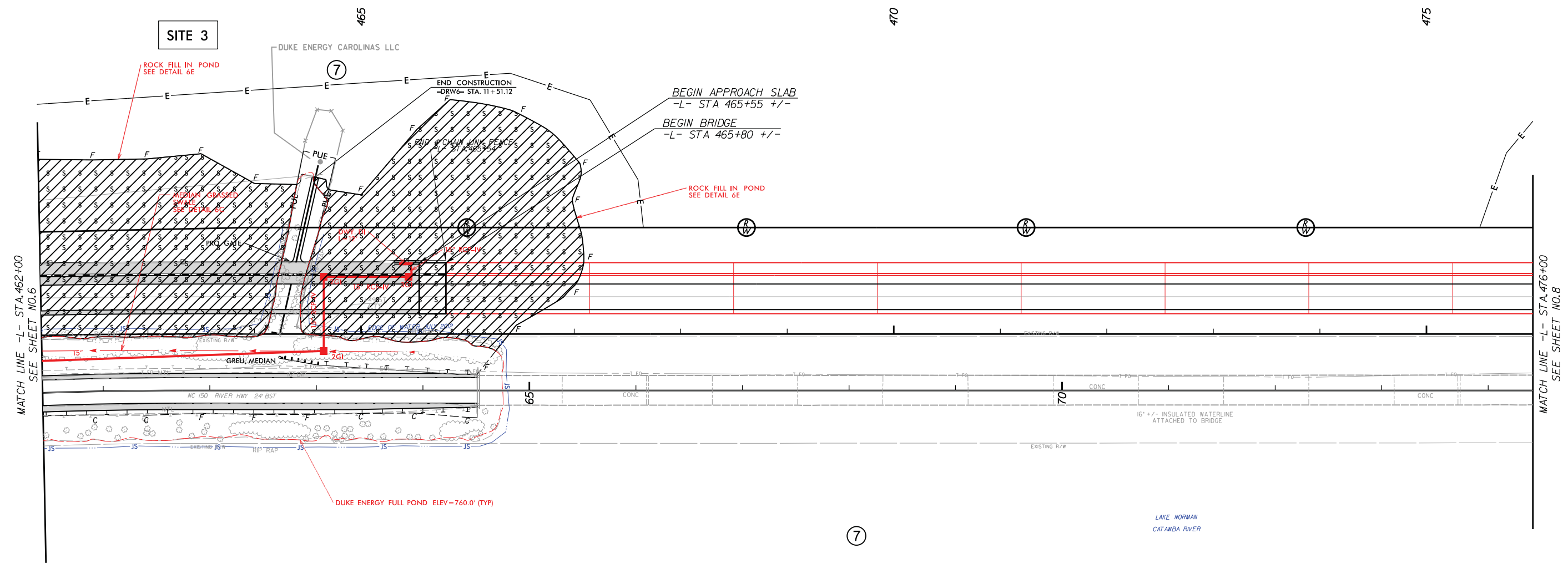
PERMIT DRAWING
SHEET 4 OF 22

 DENOTES IMPACTS IN SURFACE WATER



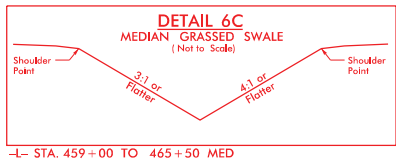
LAKE NORMAN
DUKE ENERGY CAROLINAS LLC

NAD 83 NSRS 2007

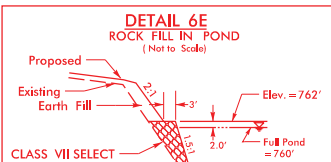


SEE SHEET 39 FOR -L- PROFILE
SEE SHEETS 53 THRU 54 FOR -LEB- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA

7/11/2008
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User: jst




-L- STA. 459+00 TO 465+50 MED

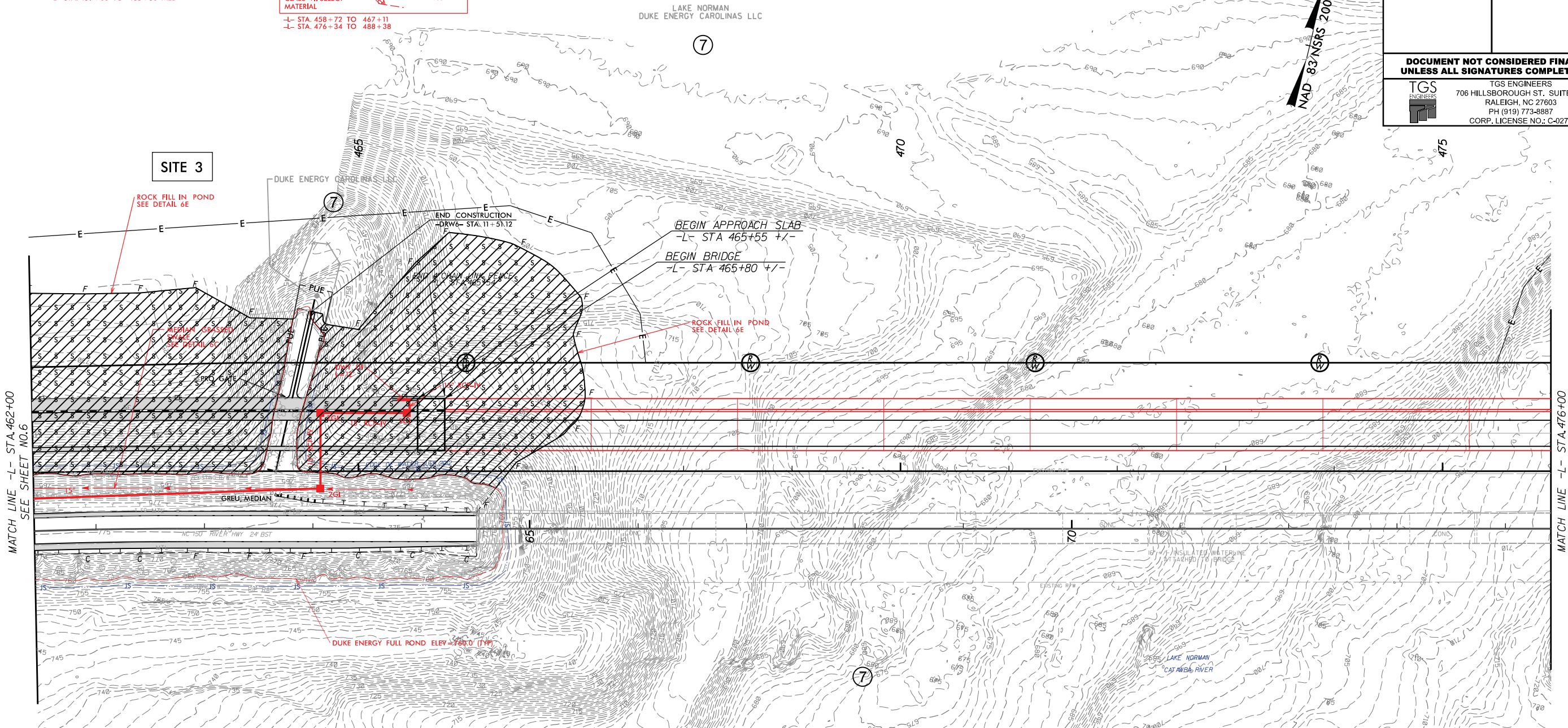


CLASS VII SELECT MATERIAL
 -L- STA. 458+72 TO 467+11
 -L- STA. 476+34 TO 488+38

PERMIT DRAWING SHEET 5 OF 22

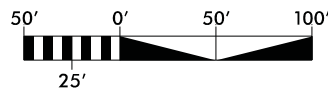
 DENOTES IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO. R-2307B / 1-5717	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	



MATCH LINE -L- STA. 462+00 SEE SHEET NO. 6

MATCH LINE -L- STA. 476+00 SEE SHEET NO. 8



SEE SHEET 39 FOR -L- PROFILE
 SEE SHEETS 53 THRU 54 FOR -LEB- PROFILE
 SEE SHEET 2B-1 FOR CURVE DATA

MATCH LINE -L- STA. 476+00 SEE SHEET NO. 8

5/14/99

TGS ENGINEERS
 706 HILLSBOROUGH ST. SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

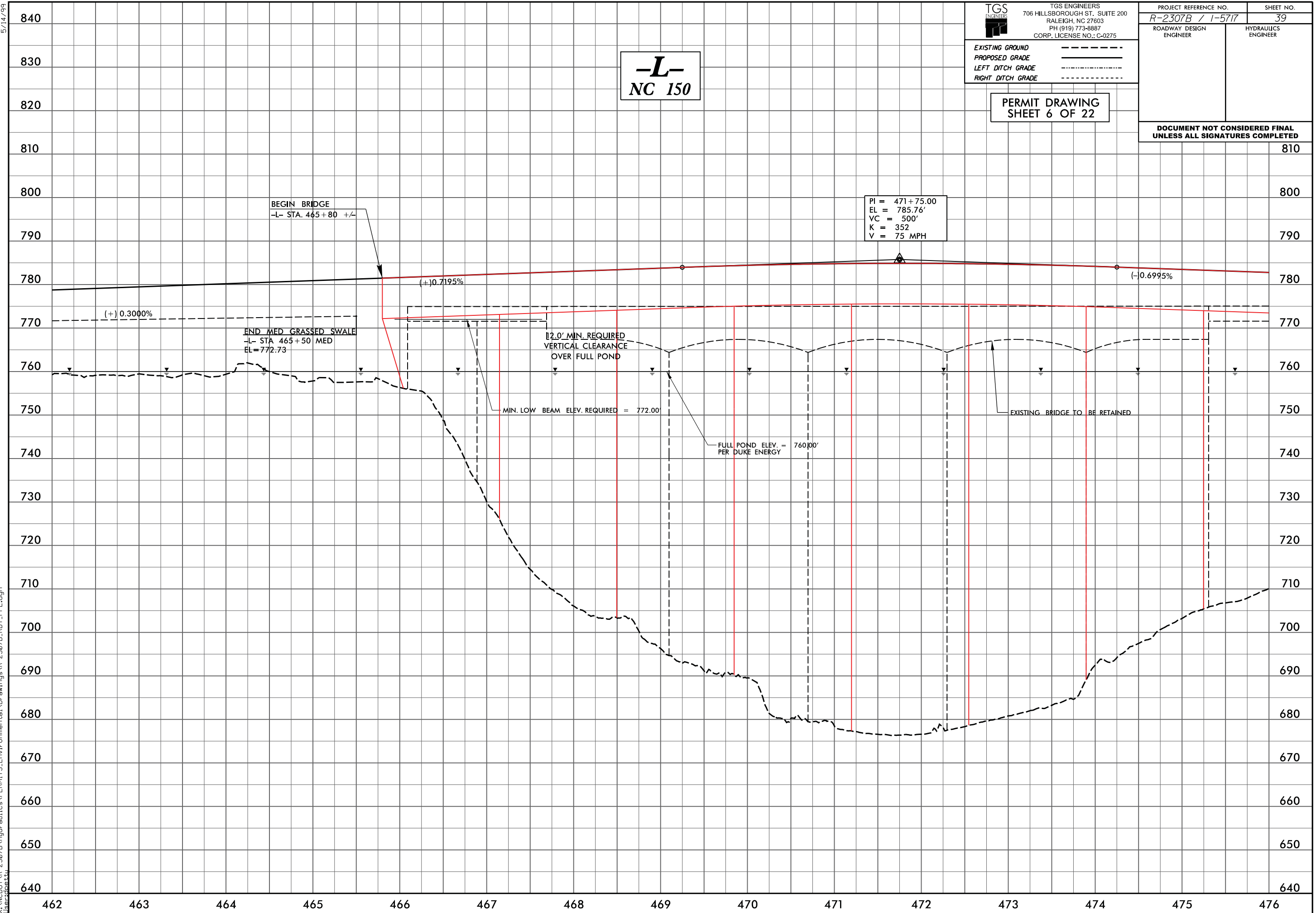
EXISTING GROUND -----
 PROPOSED GRADE _____
 LEFT DITCH GRADE - - - - -
 RIGHT DITCH GRADE - - - - -

PROJECT REFERENCE NO. <i>R-2307B / 1-5717</i>	SHEET NO. 39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 6 OF 22


DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

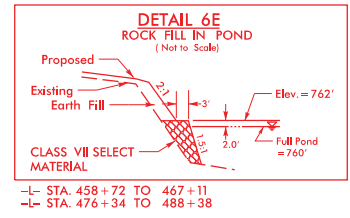
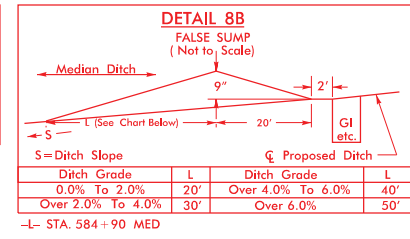
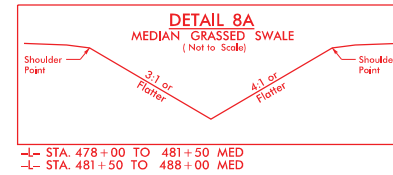
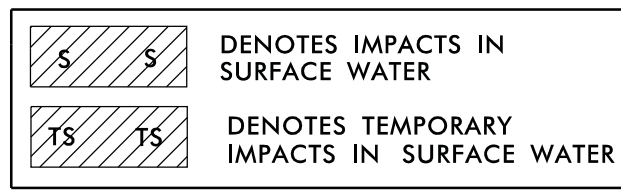
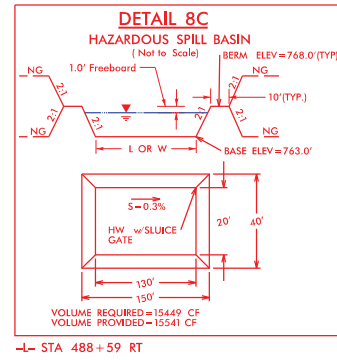
-L-
NC 150



7/2/2008
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8/17/99

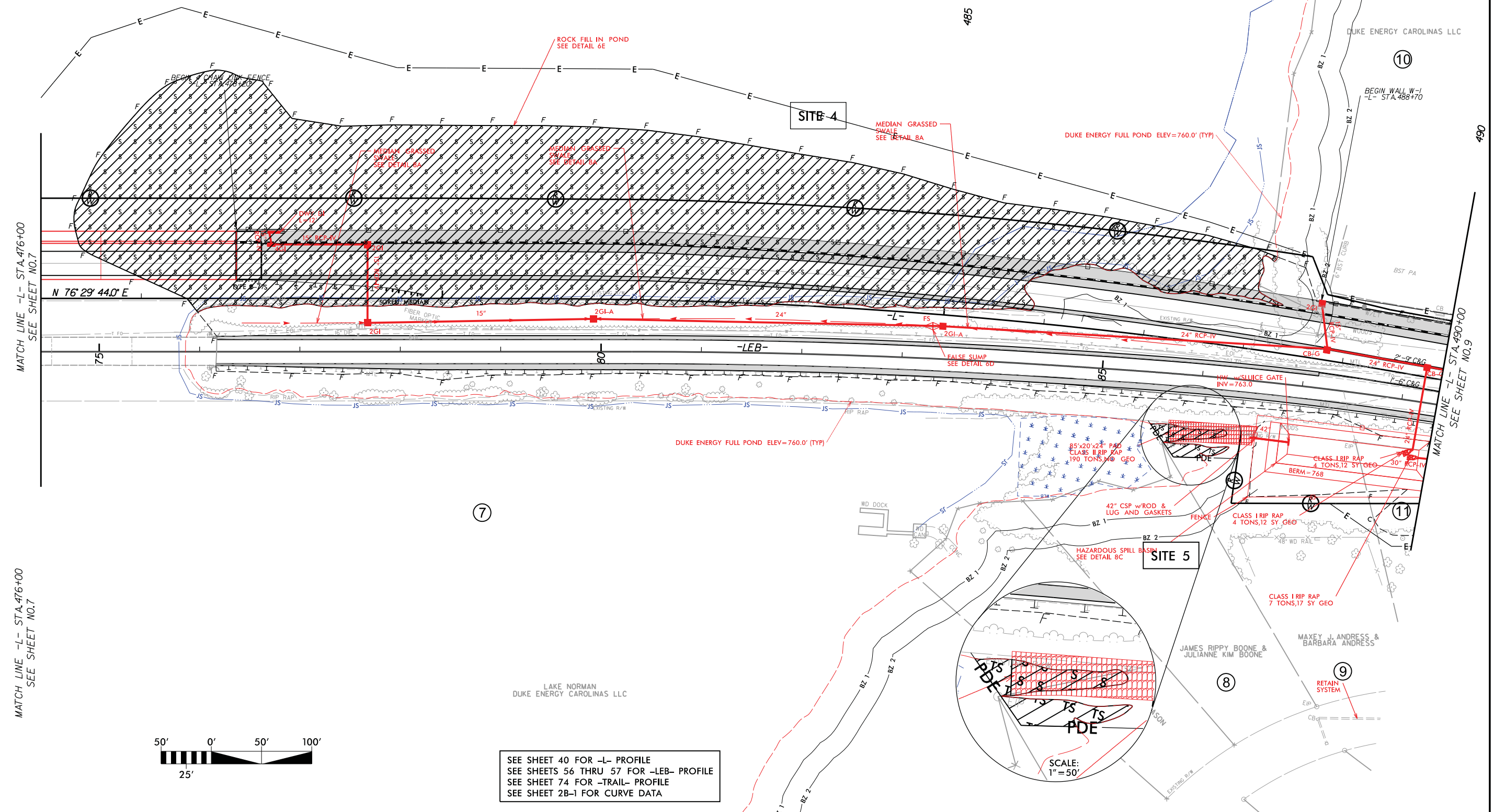
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	



**PERMIT DRAWING
SHEET 7 OF 22**

NAD 83 NSRS 2007

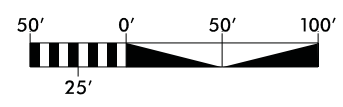
LAKE NORMAN
DUKE ENERGY CAROLINAS LLC
7



MATCH LINE -L- STA. 476+00
SEE SHEET NO. 7

MATCH LINE -L- STA. 476+00
SEE SHEET NO. 7

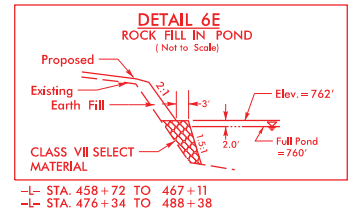
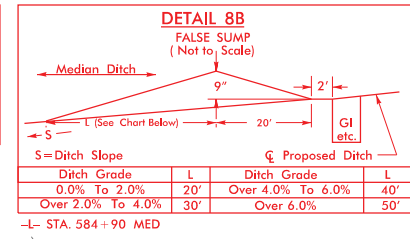
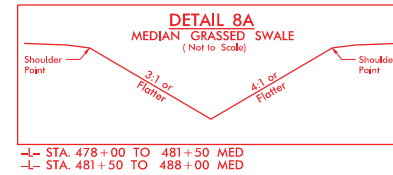
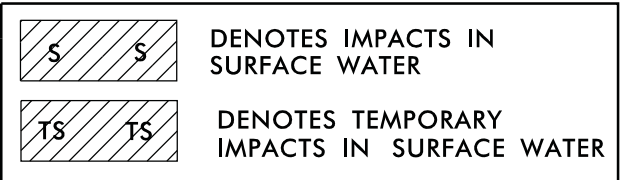
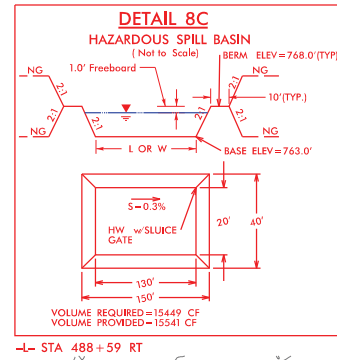
MATCH LINE -L- STA. 490+00
SEE SHEET NO. 9



SEE SHEET 40 FOR -L- PROFILE
SEE SHEETS 56 THRU 57 FOR -LEB- PROFILE
SEE SHEET 74 FOR -TRAIL- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA

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PROJECT REFERENCE NO. R-2307B / 1-5717	SHEET NO. 8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

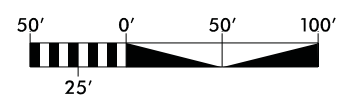
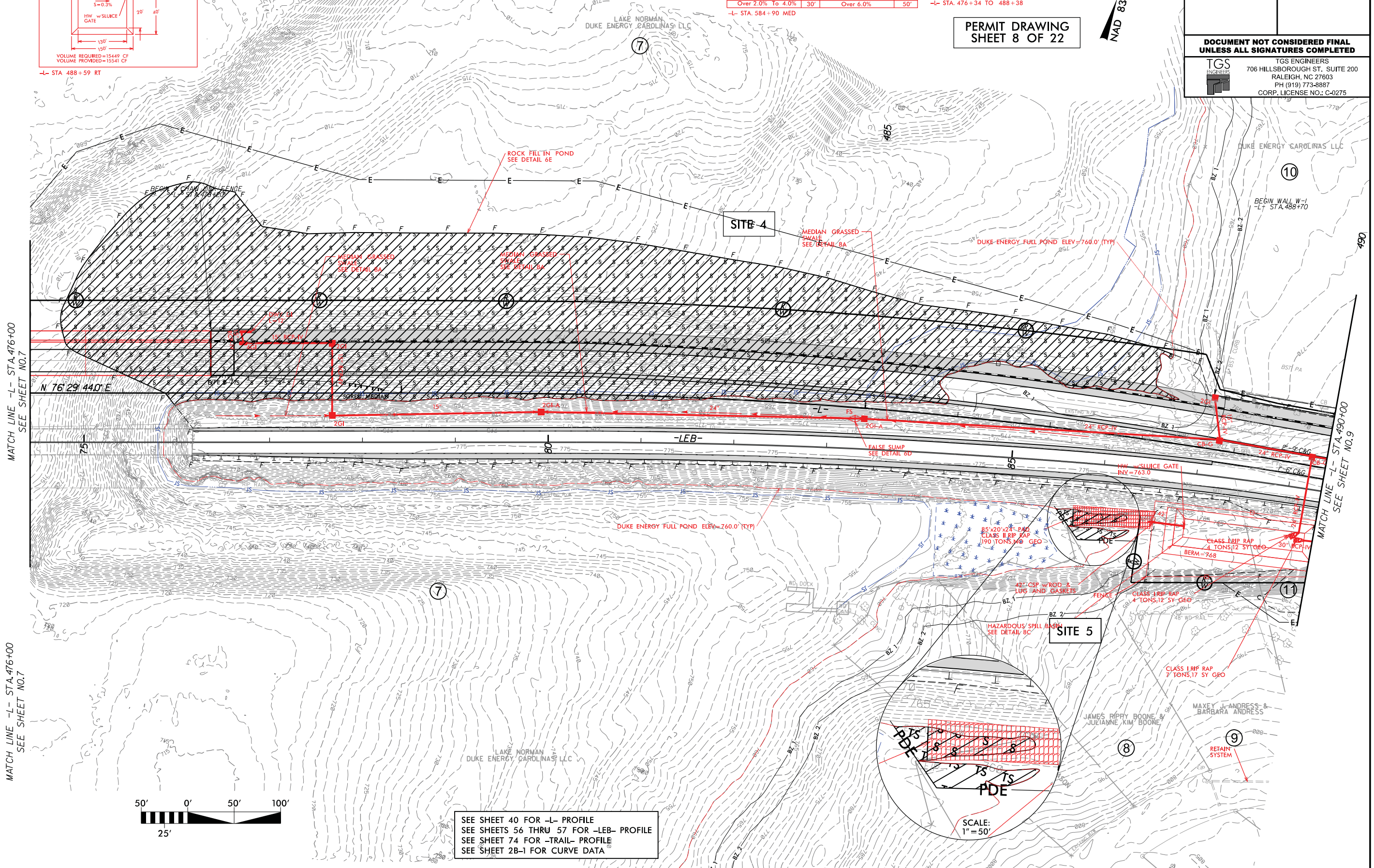


PERMIT DRAWING
SHEET 8 OF 22



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TGS ENGINEERS
706 HILLSBOROUGH ST., SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275



SEE SHEET 40 FOR -L- PROFILE
SEE SHEETS 56 THRU 57 FOR -LEB- PROFILE
SEE SHEET 74 FOR -TRAIL- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA

5/14/99

TGS ENGINEERS
 706 HILLSBOROUGH ST. SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

EXISTING GROUND - - - - -
 PROPOSED GRADE - - - - -
 LEFT DITCH GRADE - - - - -
 RIGHT DITCH GRADE - - - - -

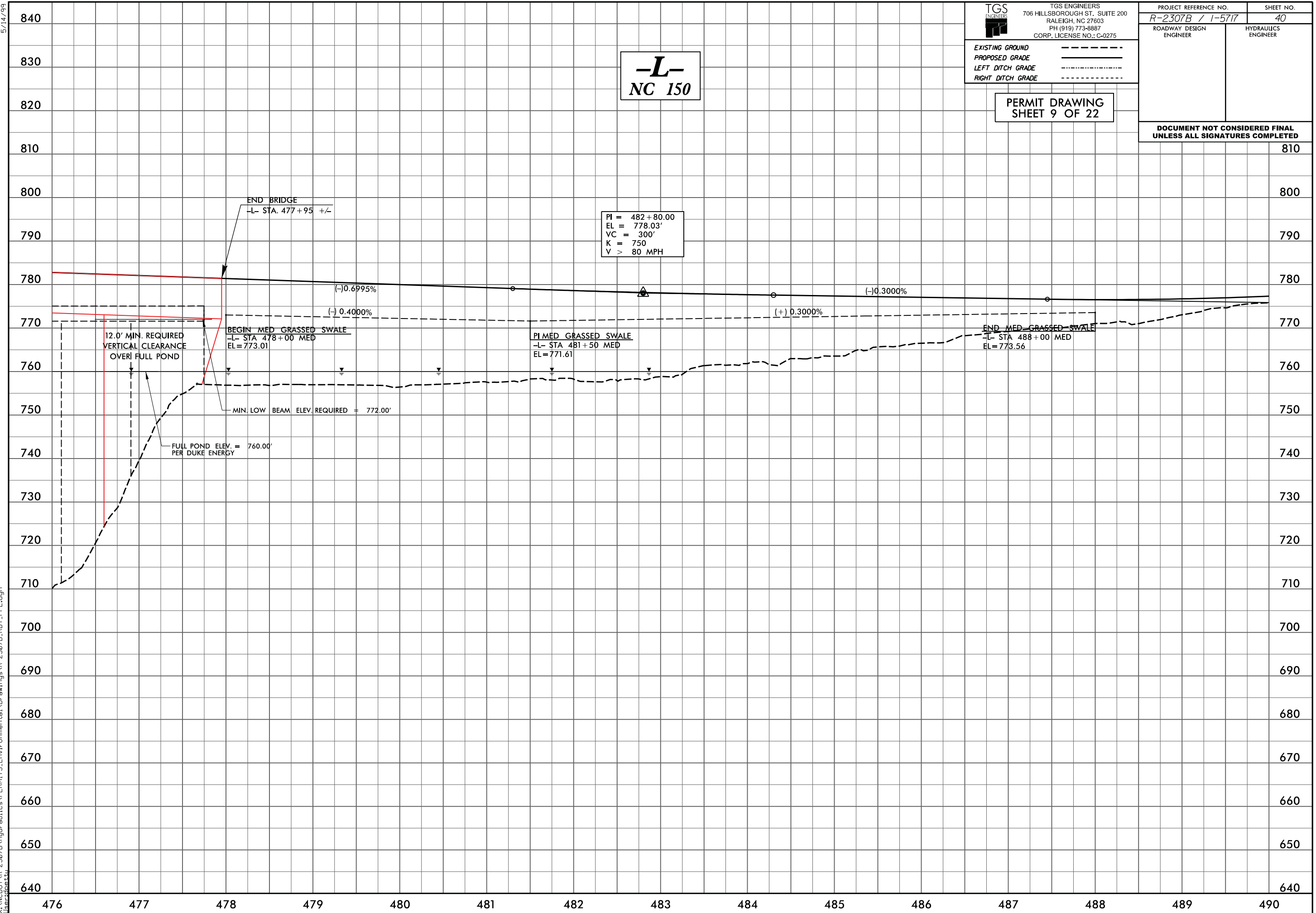
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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 9 OF 22

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

-L-
NC 150

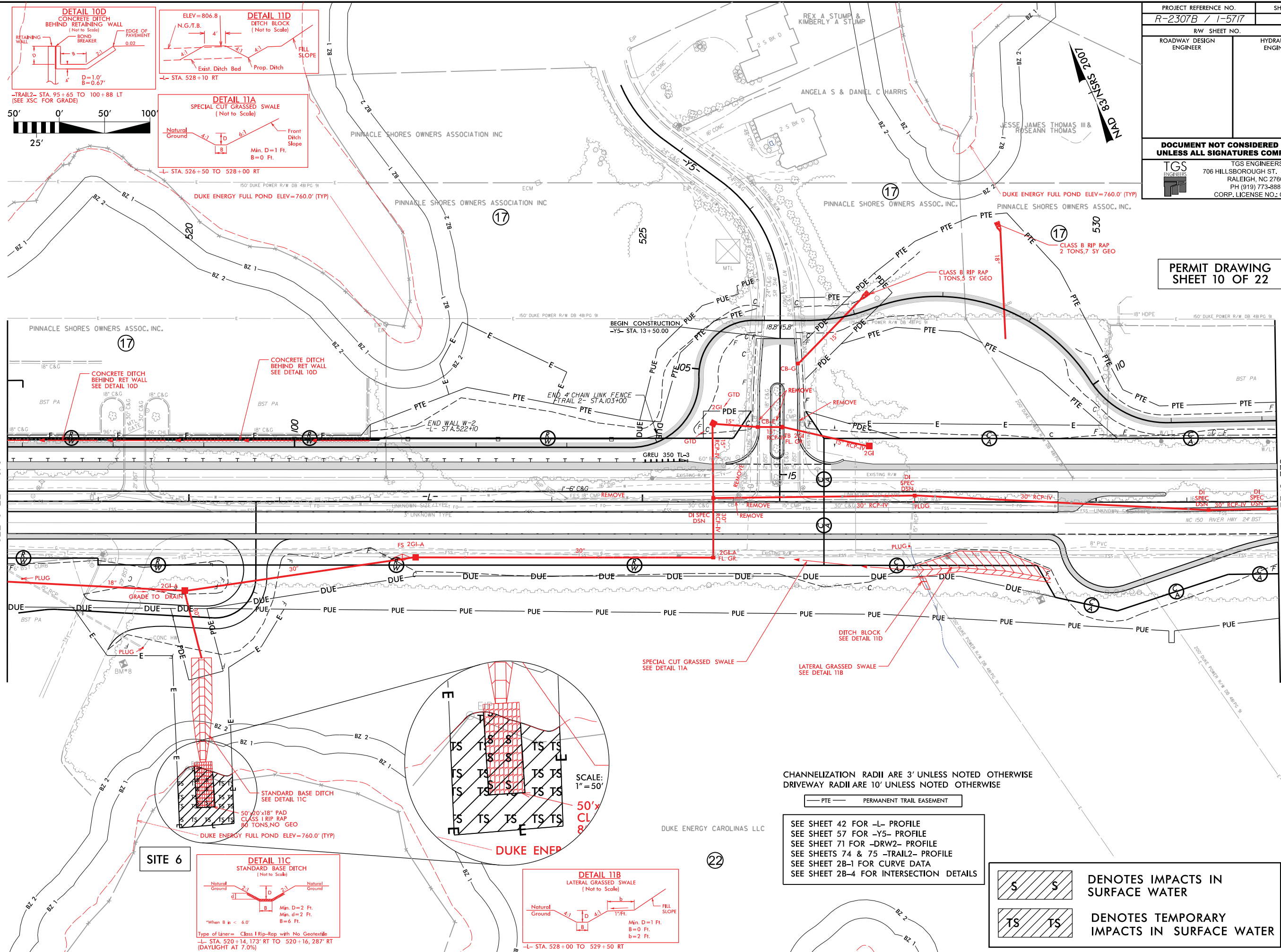
PI = 482+80.00
 EL = 778.03'
 VC = 300'
 K = 750
 V > 80 MPH



7/2/2008
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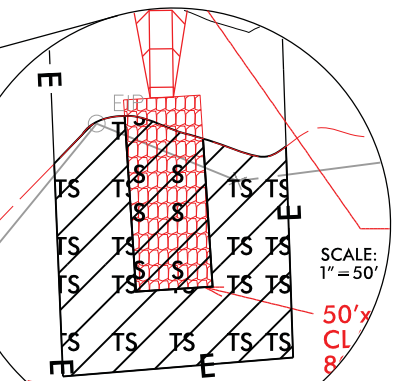
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RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275		TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	

**PERMIT DRAWING
SHEET 10 OF 22**



MATCH LINE -L- STA. 518+00
SEE SHEET NO. 10

MATCH LINE -L- STA. 532+00
SEE SHEET NO. 12



CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

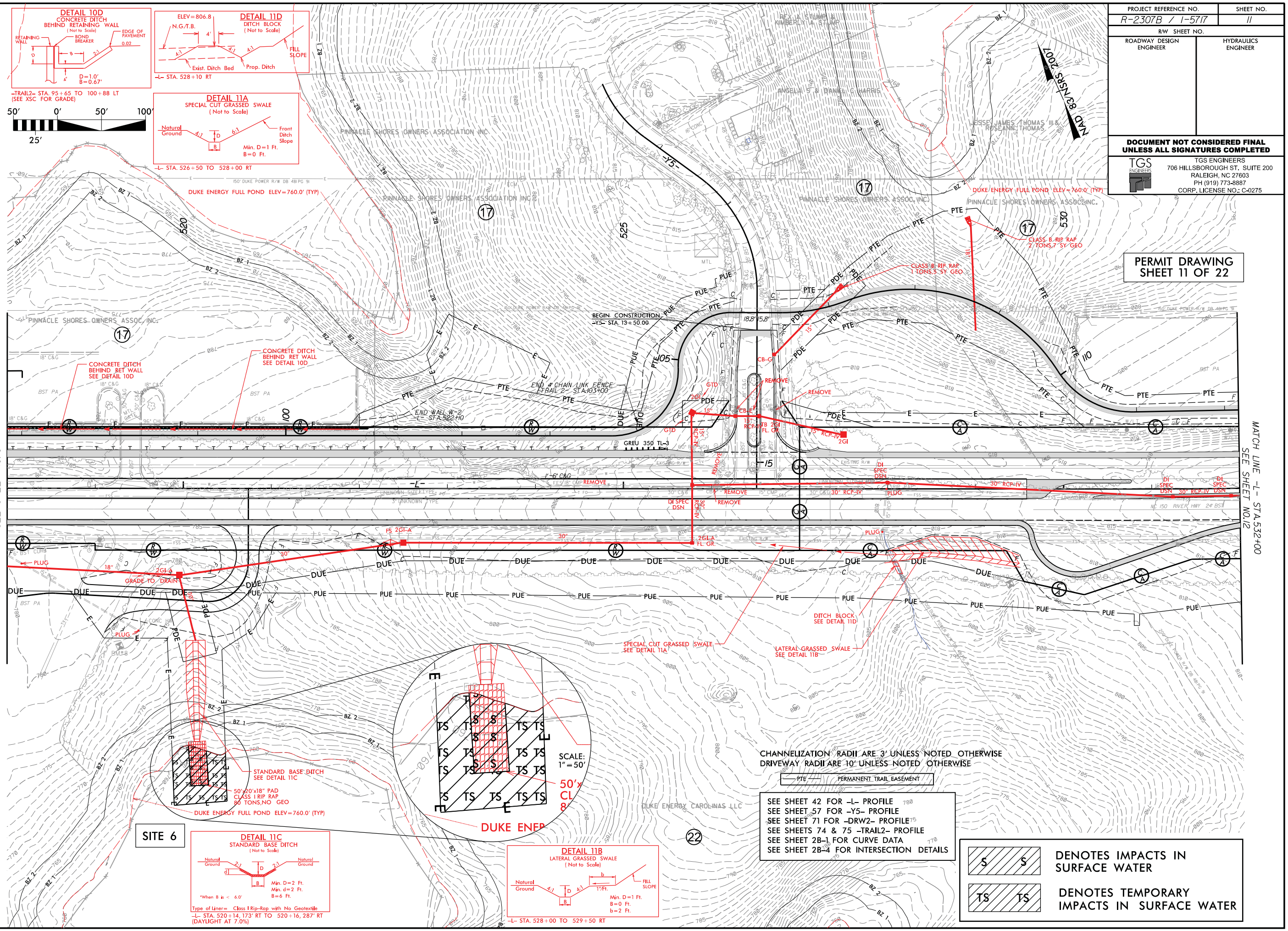
SEE SHEET 42 FOR -L- PROFILE
SEE SHEET 57 FOR -Y5- PROFILE
SEE SHEET 71 FOR -DRW2- PROFILE
SEE SHEETS 74 & 75 -TRAIL2- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-4 FOR INTERSECTION DETAILS

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

8/17/99
7/2/2008
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PROJECT REFERENCE NO. R-2307B / 1-5717	SHEET NO. 11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
TGS ENGINEERS	TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275

PERMIT DRAWING
SHEET 11 OF 22



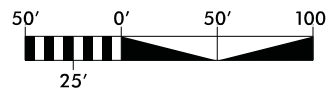
MATCH LINE -L- STA. 518+00
SEE SHEET NO. 10

MATCH LINE -L- STA. 532+00
SEE SHEET NO. 12

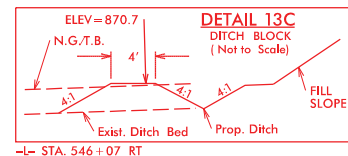
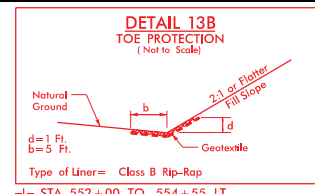
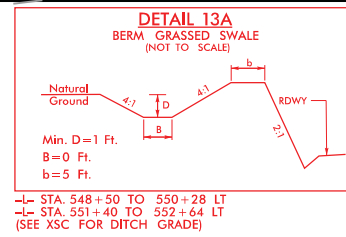
SEE SHEET 42 FOR -L- PROFILE
SEE SHEET 57 FOR -Y5- PROFILE
SEE SHEET 71 FOR -DRW2- PROFILE
SEE SHEETS 74 & 75 -TRAIL2- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-4 FOR INTERSECTION DETAILS

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

8/17/99
7/2/2008
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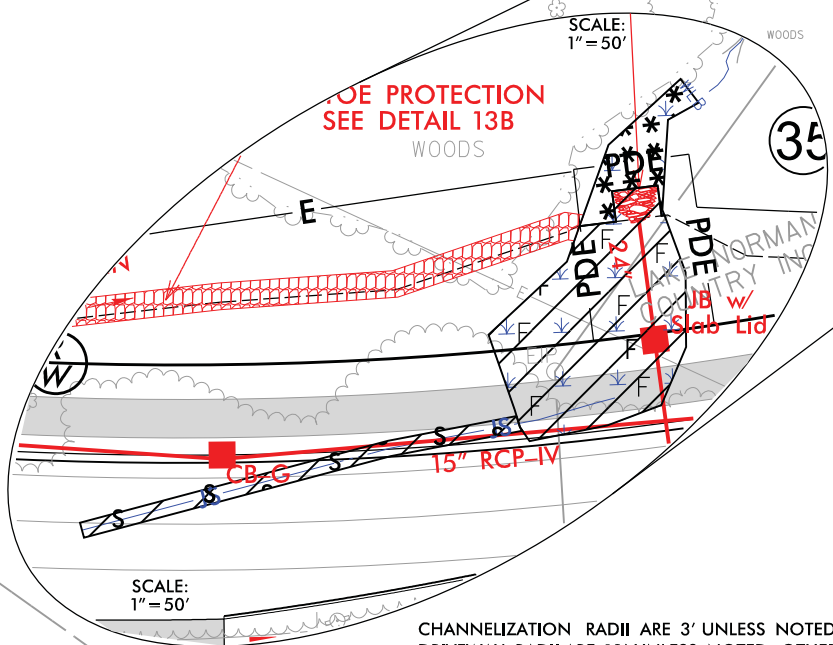
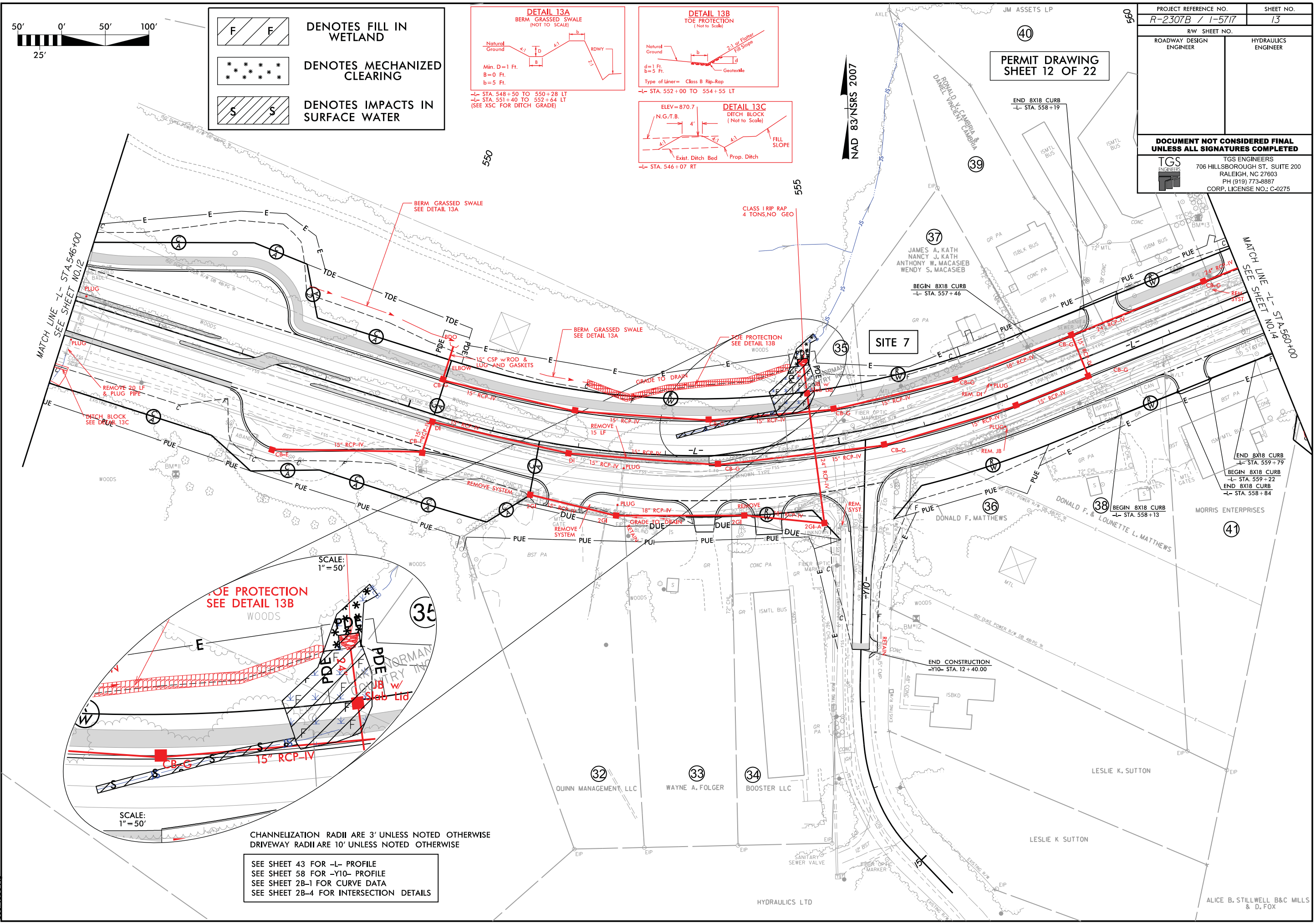


	DENOTES FILL IN WETLAND
	DENOTES MECHANIZED CLEARING
	DENOTES IMPACTS IN SURFACE WATER



PROJECT REFERENCE NO. R-2307B / 1-5717	SHEET NO. 13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	

**PERMIT DRAWING
SHEET 12 OF 22**

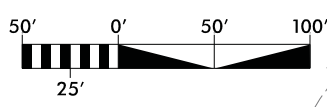


CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 43 FOR -L- PROFILE
SEE SHEET 58 FOR -Y10- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-4 FOR INTERSECTION DETAILS

8/17/99
 7/2/2008
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 User: dca

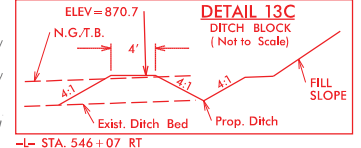
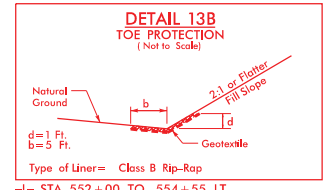
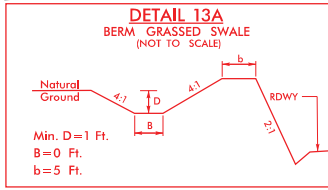
8/17/99



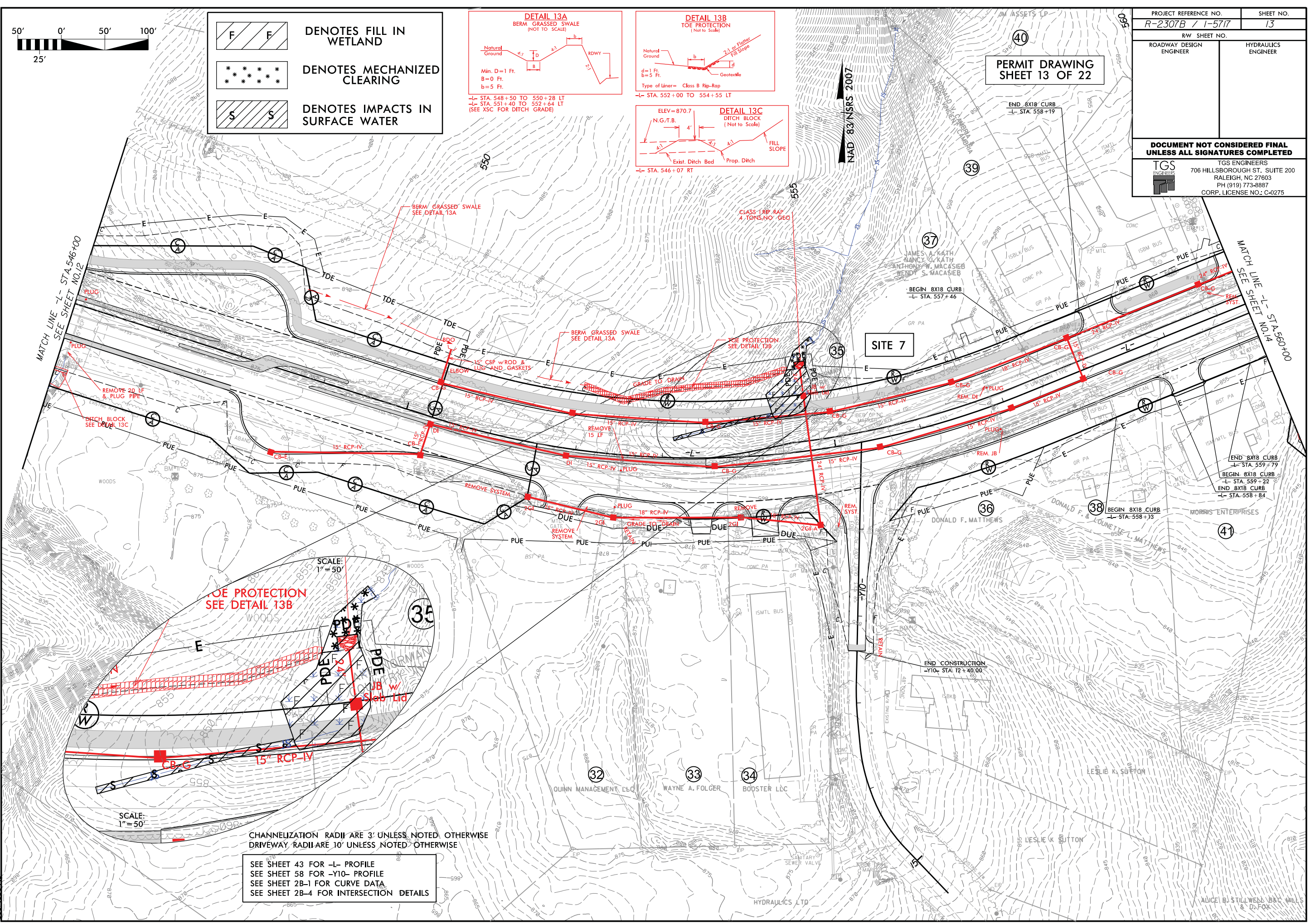
F F DENOTES FILL IN WETLAND

*** * * * *** DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER



PROJECT REFERENCE NO. R-2307B / 1-5717	SHEET NO. 13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PERMIT DRAWING SHEET 13 OF 22	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	



MATCH LINE -L- STA. 546+00
SEE SHEET NO. 12

MATCH LINE -L- STA. 560+00
SEE SHEET NO. 14

SCALE: 1" = 50'

SCALE: 1" = 50'

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 43 FOR -L- PROFILE
SEE SHEET 58 FOR -Y10- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-4 FOR INTERSECTION DETAILS

7/2/2008 X:\NCDDOT\R-2307B\Hydraulics\PERMITS\Environmental\Drawings\R-2307B_RDY_PSH.13.dgn

6/23/16



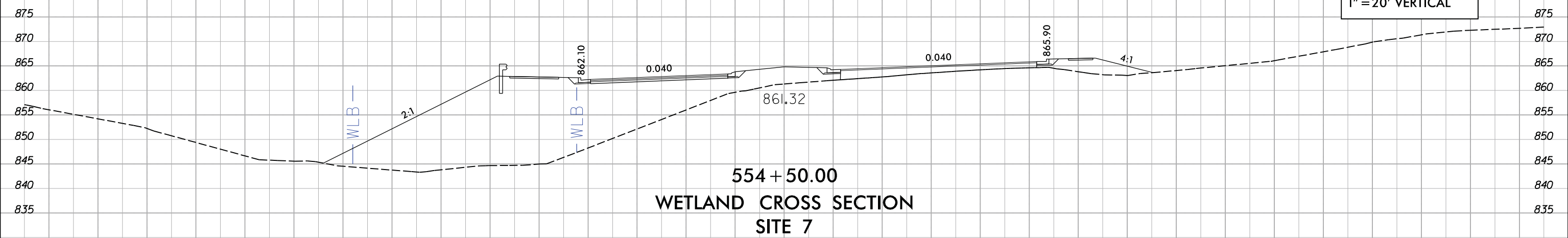
PROJ. REFERENCE NO. R-2307B SHEET NO. X-69

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

PERMIT DRAWING SHEET 14 OF 22

 DENOTES FILL IN WETLAND

SCALE
1" = 20' HORIZONTAL
1" = 20' VERTICAL

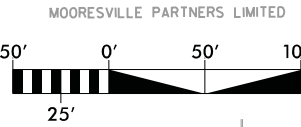


554 + 50.00 WETLAND CROSS SECTION SITE 7

7/2/2016 1:23:08 PM
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User:dpctj

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

8/17/99



CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

PERMIT DRAWING
SHEET 15 OF 22

SEE SHEET 50 FOR -L- PROFILE
SEE SHEET 67 FOR -Y34- & -Y35- PROFILES
SEE SHEET 68 FOR -Y36- & -Y37- PROFILES
SEE SHEETS 2B-1 & 2B-3 FOR CURVE DATA
SEE SHEET 26A FOR RW & EASEMENT DATA

DENOTES IMPACTS IN SURFACE WATER

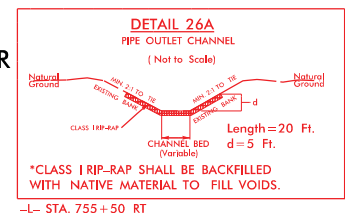
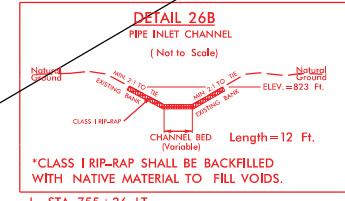
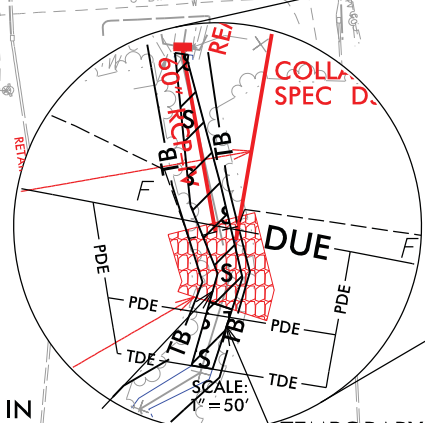
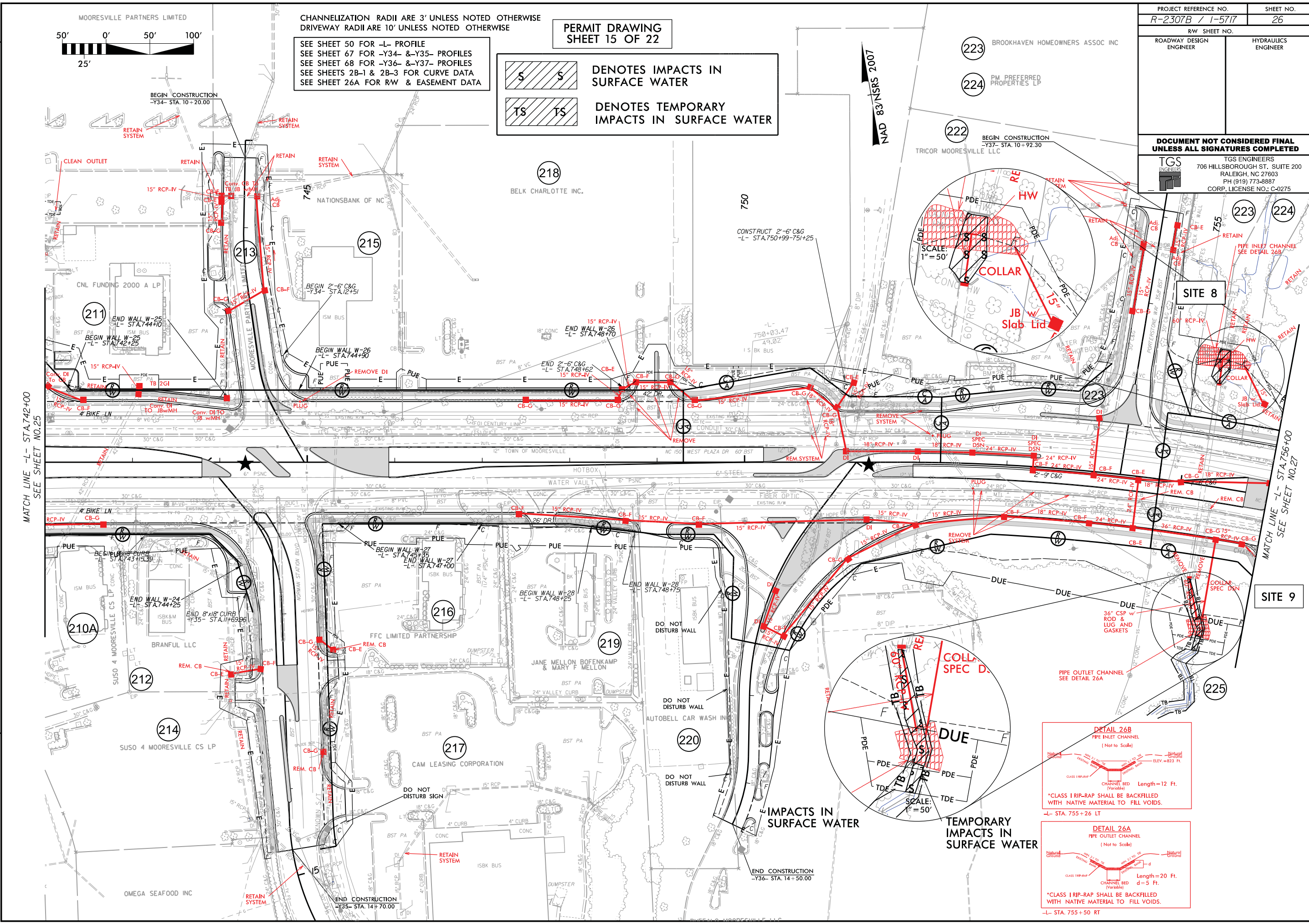
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO. R-2307B / 1-5717	SHEET NO. 26
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	

10-5-2017 REVISED EASEMENTS ON PARCELS 218,219 & 222

MATCH LINE -L- STA.742+00
SEE SHEET NO.25

MATCH LINE -L- STA.756+00
SEE SHEET NO.27



IMPACTS IN SURFACE WATER

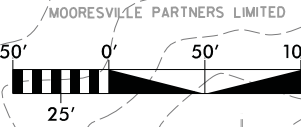
TEMPORARY IMPACTS IN SURFACE WATER

END CONSTRUCTION
-Y36- STA. 14+50.00

OMEGA SEAFOOD INC

END CONSTRUCTION
-Y35- STA. 14+70.00

8/17/99



CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

PERMIT DRAWING
SHEET 16 OF 22

SEE SHEET 50 FOR -L- PROFILE
SEE SHEET 67 FOR -Y34- & -Y35- PROFILES
SEE SHEET 68 FOR -Y36- & -Y37- PROFILES
SEE SHEETS 2B-1 & 2B-3 FOR CURVE DATA
SEE SHEET 26A FOR RW & EASEMENT DATA

DENOTES IMPACTS IN SURFACE WATER

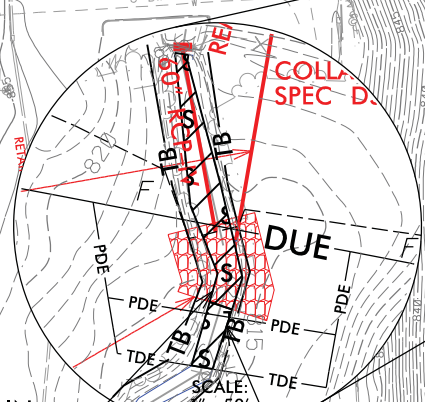
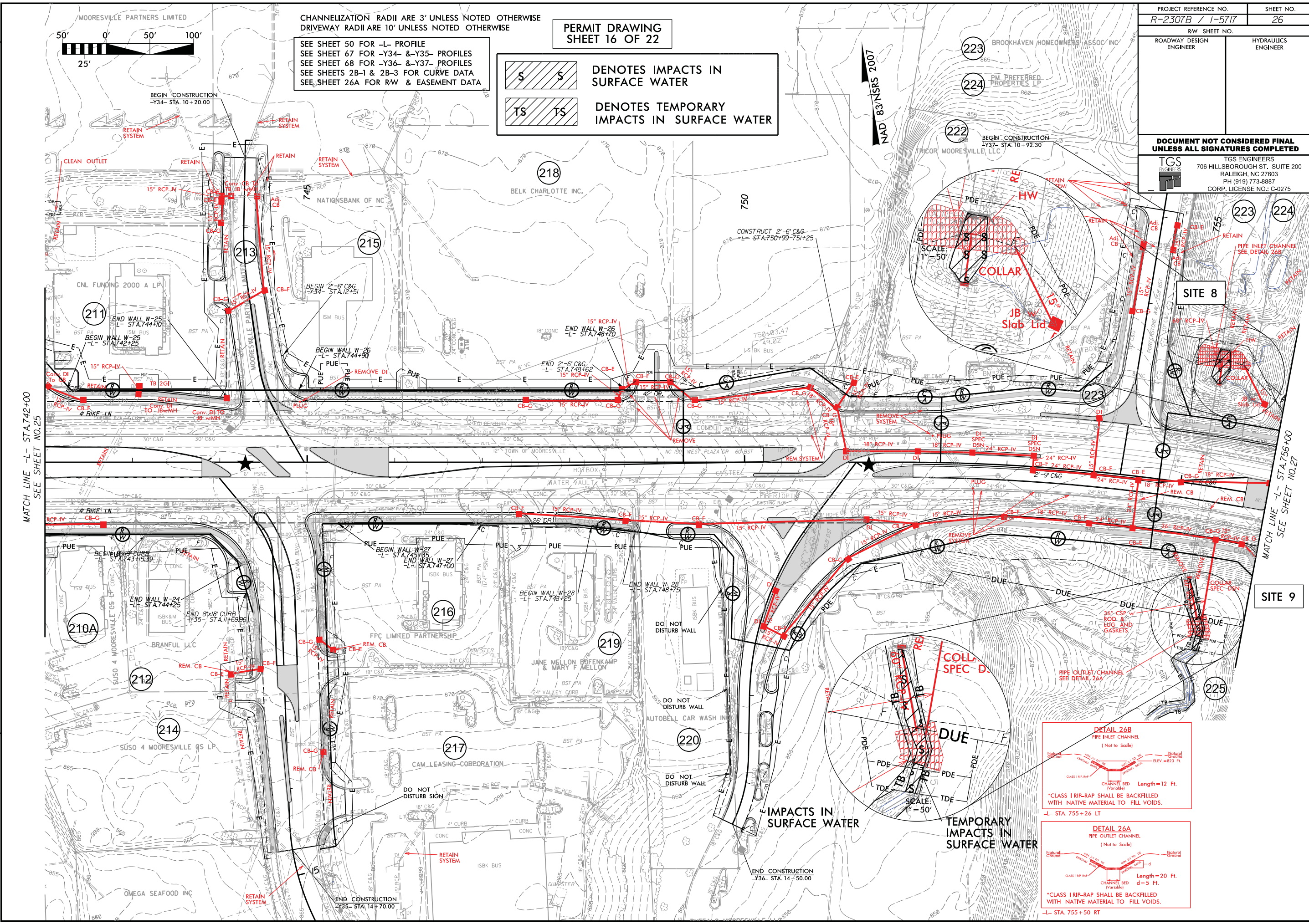
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO. R-2307B / 1-5717	SHEET NO. 26
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	

10-5-2017 REVISED EASEMENTS ON PARCELS 218,219 & 222

MATCH LINE -L- STA.742+00
SEE SHEET NO.25

MATCH LINE -L- STA.756+00
SEE SHEET NO.27

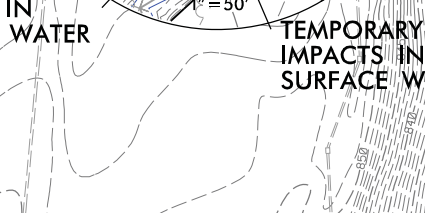


DETAIL 268
PIPE INLET CHANNEL
(Not to Scale)

Channel Bed Length=12 Ft.
Channel Bed (Variable)

*CLASS 1 RIP-RAP SHALL BE BACKFILLED WITH NATIVE MATERIAL TO FILL VOIDS.

-L- STA. 755+26 LT



DETAIL 26A
PIPE OUTLET CHANNEL
(Not to Scale)

Channel Bed Length=20 Ft.
Channel Bed (Variable)
d=5 Ft.

*CLASS 1 RIP-RAP SHALL BE BACKFILLED WITH NATIVE MATERIAL TO FILL VOIDS.

-L- STA. 755+50 RT

IMPACTS IN SURFACE WATER

TEMPORARY IMPACTS IN SURFACE WATER

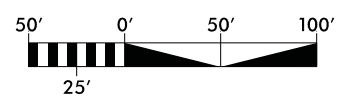
END CONSTRUCTION
-Y36- STA. 14+70.00


END CONSTRUCTION
-Y35- STA. 14+70.00


BEGIN CONSTRUCTION
-Y34- STA. 10+20.00

BEGIN CONSTRUCTION
-Y37- STA. 10+92.30

PROJECT REFERENCE NO. R-2307B / 1-5717		SHEET NO. 29	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
		TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	



 DENOTES IMPACTS IN SURFACE WATER

 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

268 BEK PROPERTIES LLC

262 DAWN PROPERTIES LLC

MATCH LINE -L- STA. 783+00
SEE SHEET NO. 28

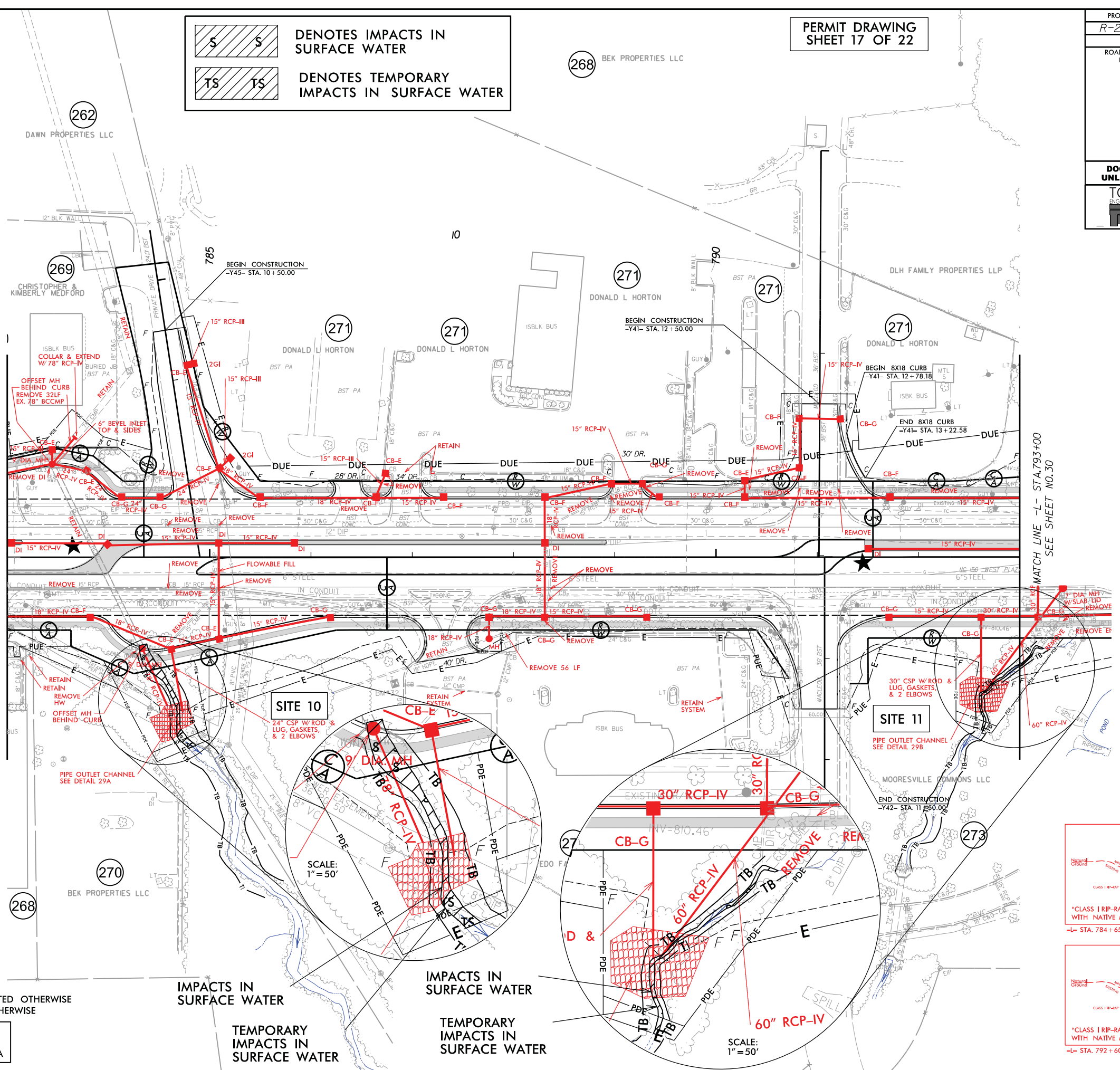
MATCH LINE -L- STA. 793+00
SEE SHEET NO. 30

2002 SUSAN B. MAD

-Y40- MACLEOD		2019 ADT		2039 ADT	
	500				
	980				
39,470	250	250			
51,310	490	490			
			-L- NC 150		
1,440	2,600	40,640			
1,600	3,080	52,800			
			4,030		
			4,670		
					-Y40- MACLEOD

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 51 FOR -L- PROFILE
SEE SHEET 70 FOR -Y41- & -Y42- PROFILES
SEE SHEET 29A FOR RW & EASEMENT DATA

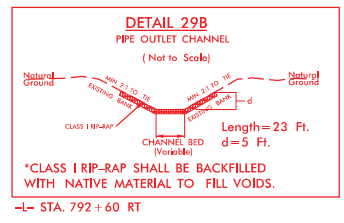
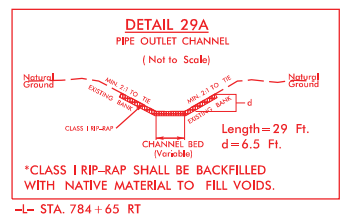


SITE 10

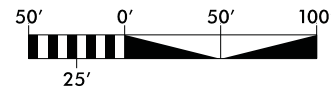
SITE 11

SCALE: 1" = 50'

SCALE: 1" = 50'



8/17/99

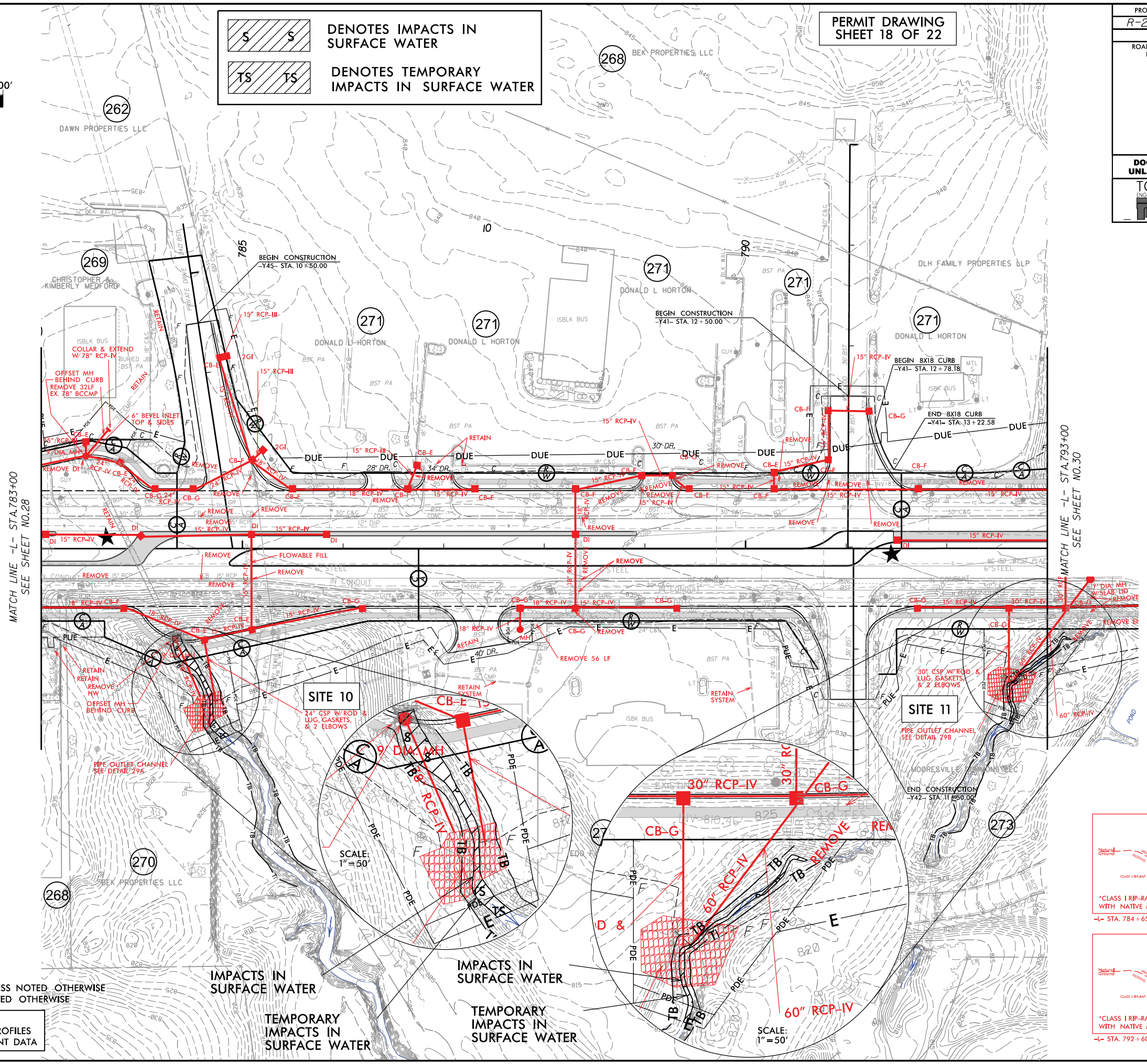


S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING SHEET 18 OF 22

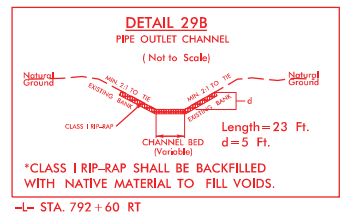
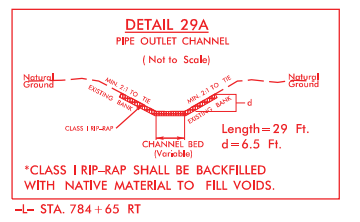
PROJECT REFERENCE NO. R-2307B / 1-5717	SHEET NO. 29
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
	TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275



-Y40- MACLEOD	2019 ADT	2039 ADT
500	980	
39,470	250	250
51,310	490	490
	-L- NC 150	
1,440	2,600	40,640
1,600	3,080	52,800
		4,030
		4,670
	-Y40- MACLEOD	

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 51 FOR -L- PROFILE
SEE SHEET 70 FOR -Y41- & -Y42- PROFILES
SEE SHEET 29A FOR RW & EASEMENT DATA



7/2/2008 X:\NCDDOT\R-2307B\Hydraulics\PERMITS\Environmental\Drawings\R-2307B_RDY_PSH_29.dgn

5/14/99

TGS ENGINEERS
 706 HILLSBOROUGH ST., SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

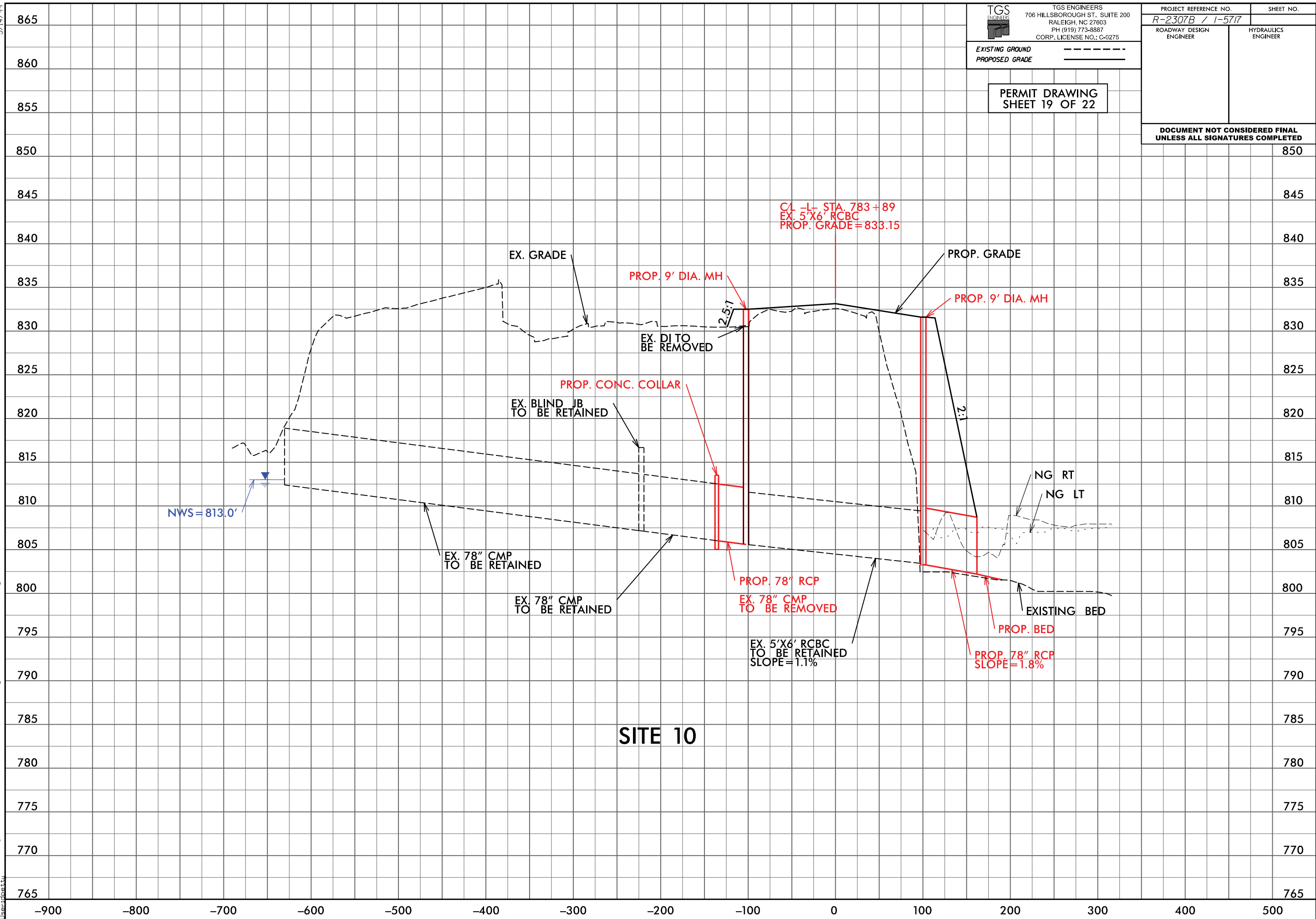
EXISTING GROUND -----
 PROPOSED GRADE _____

PROJECT REFERENCE NO. <i>R-2307B / 1-5717</i>	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 19 OF 22


DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



7/2/2018
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User:dsttu

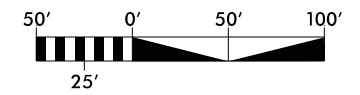


SITE 10

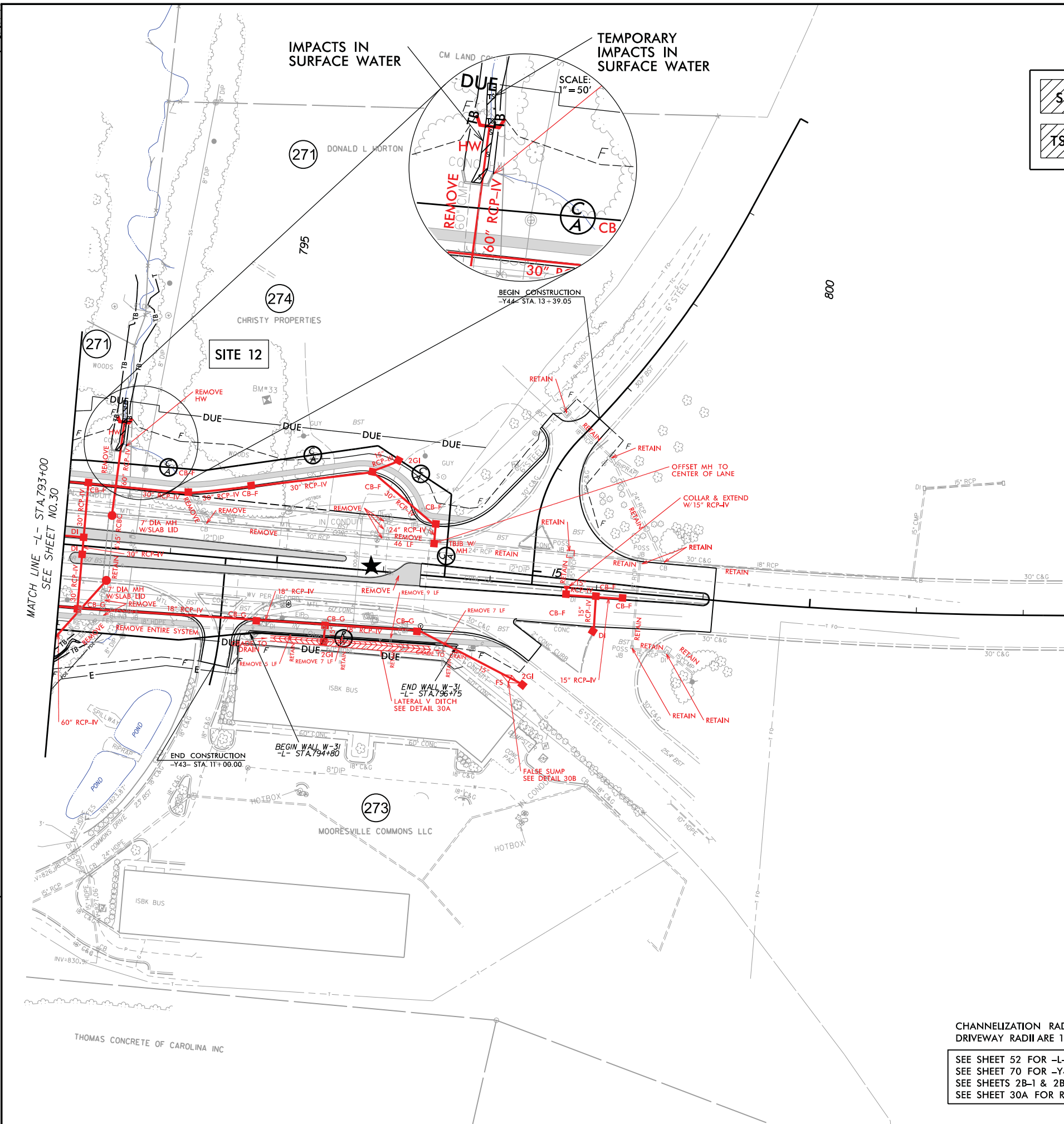
PERMIT DRAWING
SHEET 20 OF 22

PROJECT REFERENCE NO. R-2307B / 1-5717	SHEET NO. 30
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER



NAD 83 N/SRS 2007



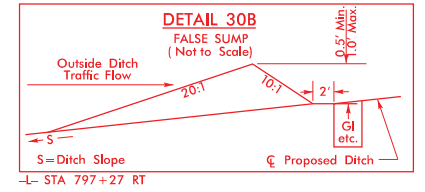
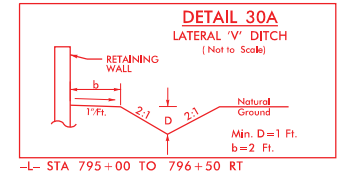
MATCH LINE -L- STA. 793+00
SEE SHEET NO. 30


10-5-2017 REVISED DUES ON PARCELS 271 & 274.



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User:dpetty

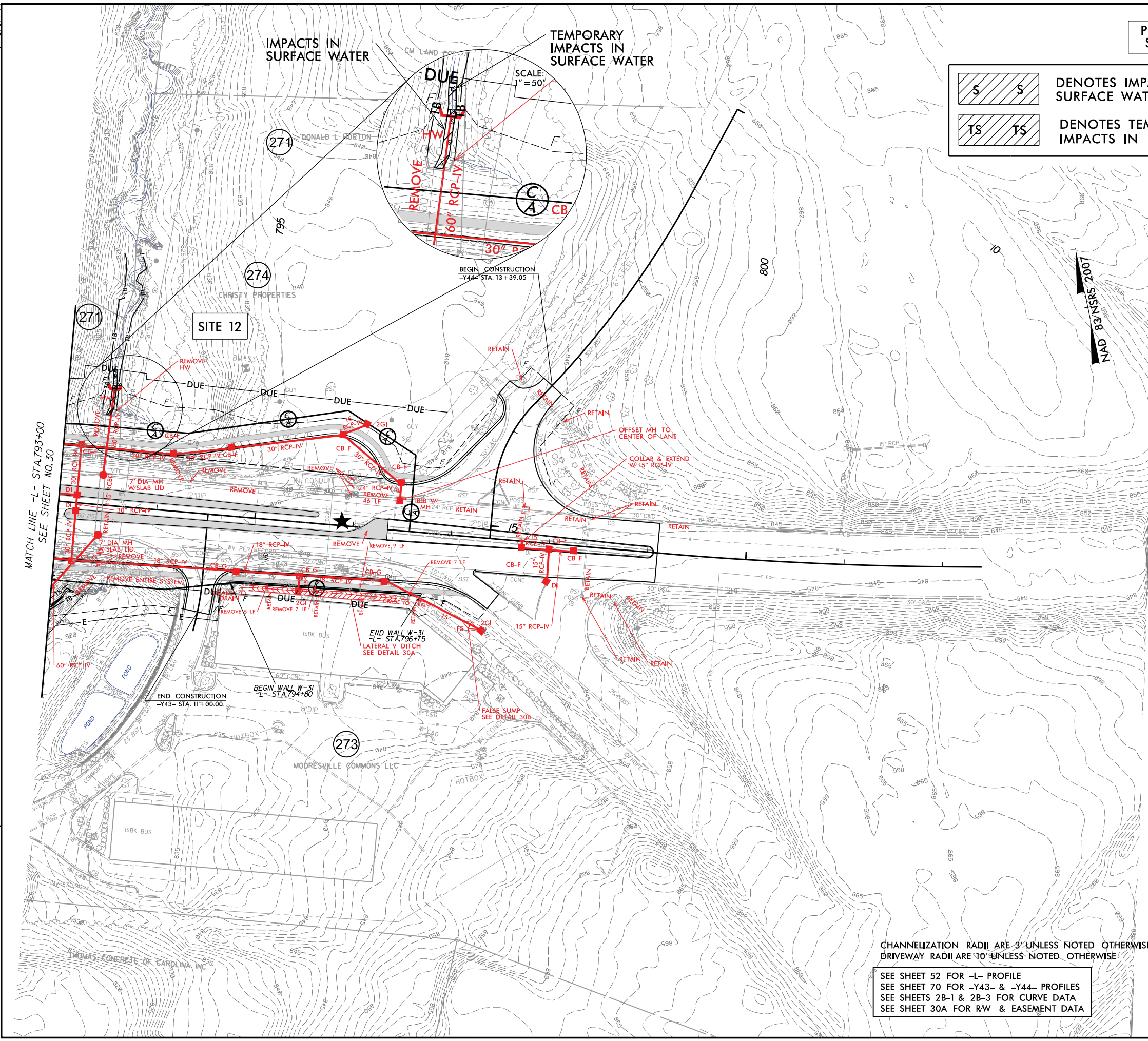
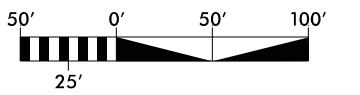
CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 52 FOR -L- PROFILE
SEE SHEET 70 FOR -Y43- & -Y44- PROFILES
SEE SHEETS 2B-1 & 2B-3 FOR CURVE DATA
SEE SHEET 30A FOR RW & EASEMENT DATA



PROJECT REFERENCE NO. R-2307B / 1-5717	SHEET NO. 30
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER



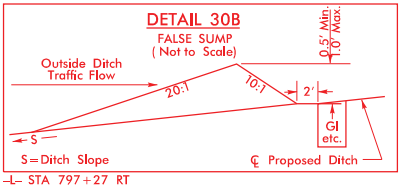
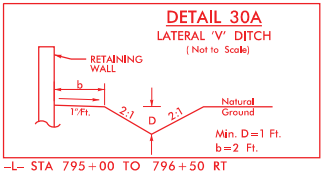
MATCH LINE -L- STA. 793+00
SEE SHEET NO. 30

10-5-2017 REVISED DUES ON PARCELS 271 & 274.

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User:dpetty

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 52 FOR -L- PROFILE
SEE SHEET 70 FOR -Y43- & -Y44- PROFILES
SEE SHEETS 2B-1 & 2B-3 FOR CURVE DATA
SEE SHEET 30A FOR RW & EASEMENT DATA



WETLAND AND SURFACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 453+21/453+40 LT	18" PIPE						< 0.01	< 0.01			
2	-L- 458+40/458+74 LT	36" CSP						< 0.01	0.02			
3	-L- 458+21/467+07 LT	ROCK CAUSEWAY						3.11				
4	-L- 476+33/488+33 LT	ROCK CAUSEWAY						3.91				
5	-L- 487+17/488+00 LT	42" PIPE						0.01	0.02			
6	-L- 519+88/520+50 RT	30" PIPE						0.02	0.06			
7**	-L- 554+25/554+82 LT	24" PIPE	0.05			< 0.01		0.01		117		
8	-L- 755+17/755+36 LT	60" RCP						0.01		39		
9	-L- 755+24/755+53 RT	60" RCP						< 0.01	< 0.01	68	17	
10	-L- 784+30/784+87 RT	78" RCP						0.01	< 0.01	97	20	
11	-L- 792+60/793+23 RT	60" RCP						< 0.01	< 0.01	98	19	
12	-L- 793+40/793+49 LT	60" RCP						< 0.01	< 0.01	28	20	
TOTALS*:			0.05			< 0.01		7.11	0.11	447	76	0

*Rounded totals are sum of actual impacts

NOTES:

0.02 acres of Permanent SW impacts for bridge interior bents at 467+15, 468+50, 469+85, 471+20, 472+55, 473+90, 475+25 and 476+60.

** - Site 7 wetland is accounted for as a total take per 4C meeting minutes.

NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 7/2/2018
 CATAWBA/IREDELL COUNTIES
 R-2307B / I-5717
 37944.1.FR5 / 50134.1.FS1
 SHEET 22 OF 22

CONTRACT: TIP PROJECTS: R-2307B & I-5717

See Sheet 1-A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CATAWBA & IREDELL COUNTIES

LOCATION: NC 150 FROM SR 1840 (GREENWOOD RD) IN CATAWBA COUNTY TO US 21 IN IREDELL COUNTY

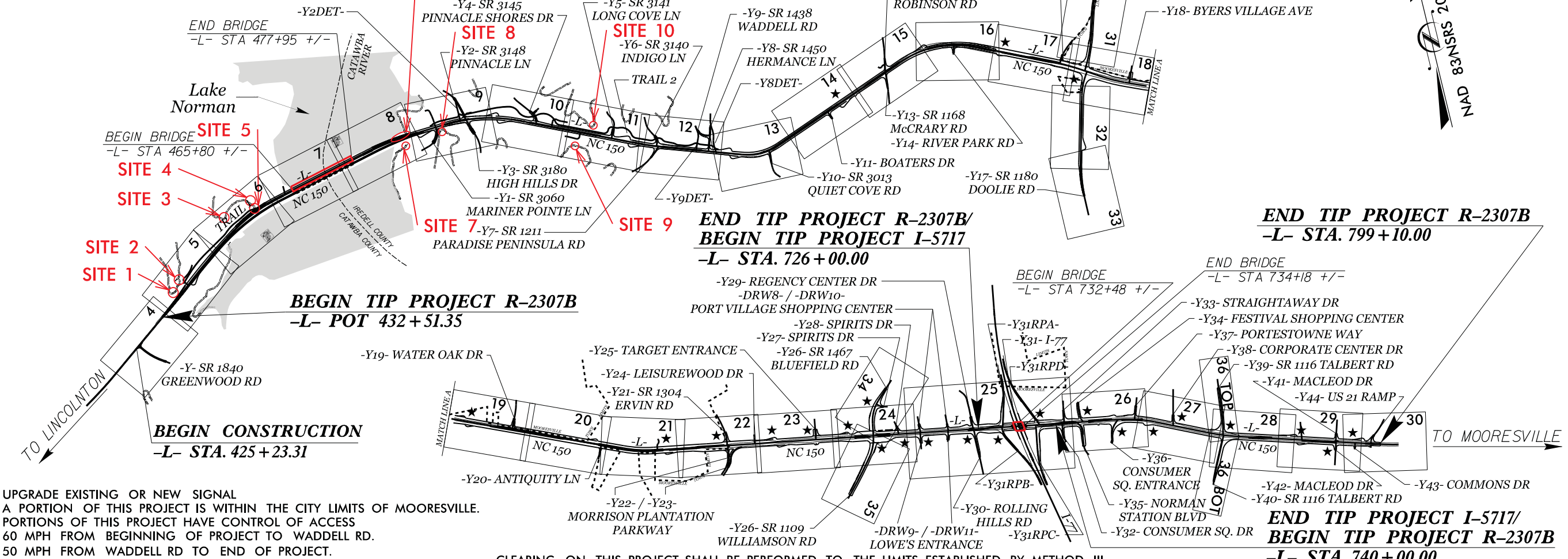
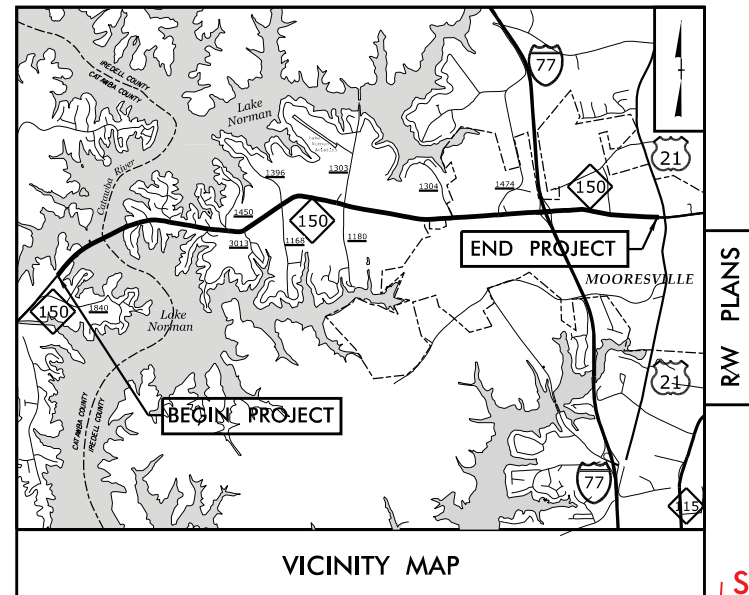
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, AND SIGNALS

BUFFER IMPACTS PERMIT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2307B, I-5717	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
37944.1.FR5	STP-0150(36)	PE (R-2307B)	
50134.1.FS1	NHPP-077-1(221)37	PE (I-5717)	
37944.2.4	STP-0150(036)	R/W (R-2307B)	
37944.2.5	STP-0150(036)	UTILITIES (R-2307B)	
50134.2.1	NHPP-077-1(221)37	R/W, UTILITIES (I-5717)	

BUFFER DRAWING SHEET 1 OF 7

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



★ UPGRADE EXISTING OR NEW SIGNAL
A PORTION OF THIS PROJECT IS WITHIN THE CITY LIMITS OF MOORESVILLE.
PORTIONS OF THIS PROJECT HAVE CONTROL OF ACCESS
** 60 MPH FROM BEGINNING OF PROJECT TO WADDELL RD.
50 MPH FROM WADDELL RD TO END OF PROJECT.

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

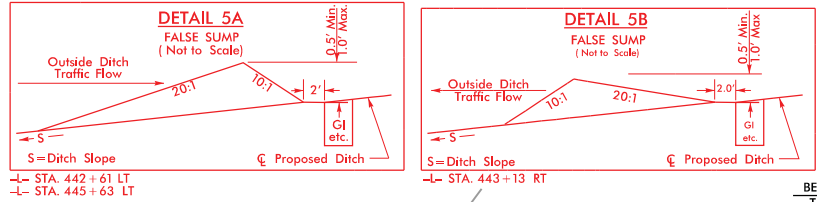
<p>GRAPHIC SCALES</p> <p>PLANS</p>	<p>DESIGN DATA</p> <p>ADT 2019 = 47,900 ADT 2039 = 58,860 K = 8% D = 55% T = 6%* V = **</p> <p>* TTST 2%+ DUAL 4% FUNC CLASS = PRINCIPAL ARTERIAL STATEWIDE TIER</p>	<p>PROJECT LENGTH</p> <p>LENGTH ROADWAY TIP PROJECT R-2307B = 6.448 mile LENGTH STRUCTURES TIP PROJECT R-2307B = 0.230 mile TOTAL LENGTH TIP PROJECT R-2307B = 6.678 mile</p> <p>LENGTH ROADWAY TIP PROJECT I-5717 = 0.233 mile LENGTH STRUCTURES TIP PROJECT I-5717 = 0.032 mile TOTAL LENGTH TIP PROJECT I-5717 = 0.265 mile</p> <p>TOTAL LENGTH TIP PROJECT R-2307B / I-5717 = 6.943 mile</p>	<p>Prepared For: DIVISION OF HIGHWAYS 1000 Birch Ridge Dr., Raleigh NC, 27610</p> <p>By: TGS ENGINEERS 706 HILLSBOROUGH ST SUITE 200 RALEIGH, NC 27603</p> <p>PH (919) 773-8887 CORP. LICENSE NO.: C-0275</p> <p>2012 STANDARD SPECIFICATIONS</p> <p>RIGHT OF WAY DATE: AUGUST 31, 2017</p> <p>LETTING DATE: JULY 16, 2019</p>	<p>HYDRAULICS ENGINEER</p> <p>SIGNATURE: _____ P.E.</p> <p>ROADWAY DESIGN ENGINEER</p> <p>SIGNATURE: _____ P.E.</p>	
---	---	---	---	---	--



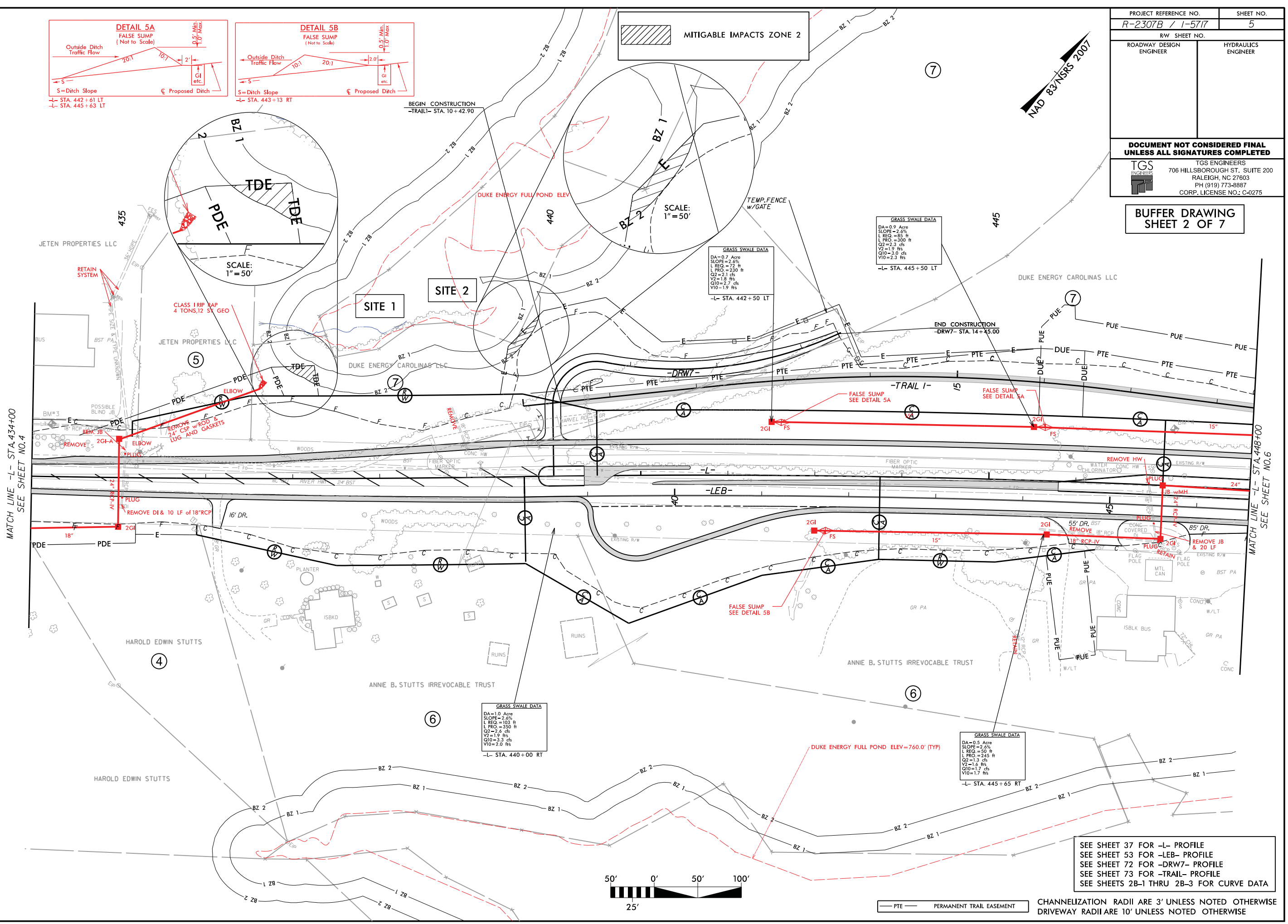
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PROJECT REFERENCE NO. R-2307B / 1-5717	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	

**BUFFER DRAWING
SHEET 2 OF 7**

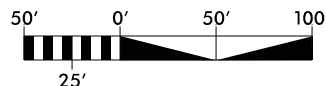


MITIGABLE IMPACTS ZONE 2



MATCH LINE -L- STA. 434+00
SEE SHEET NO. 4

MATCH LINE -L- STA. 448+00
SEE SHEET NO. 6

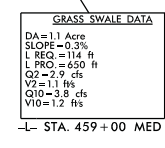
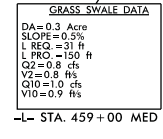
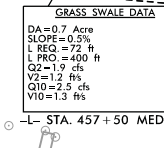
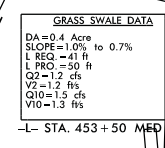
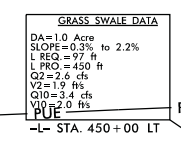
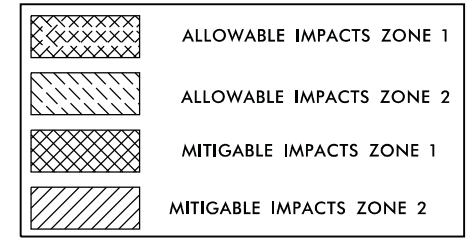
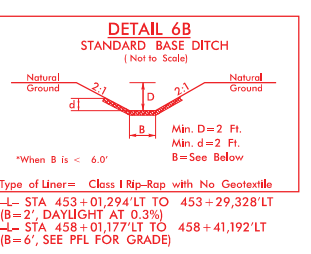
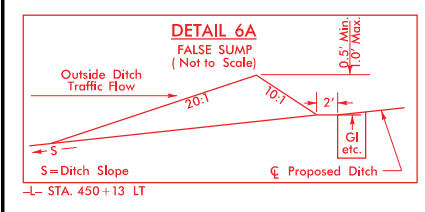


SEE SHEET 37 FOR -L- PROFILE
 SEE SHEET 53 FOR -LEB- PROFILE
 SEE SHEET 72 FOR -DRW7- PROFILE
 SEE SHEET 73 FOR -TRAIL I- PROFILE
 SEE SHEETS 2B-1 THRU 2B-3 FOR CURVE DATA

— PTE — PERMANENT TRAIL EASEMENT
 CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
 DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

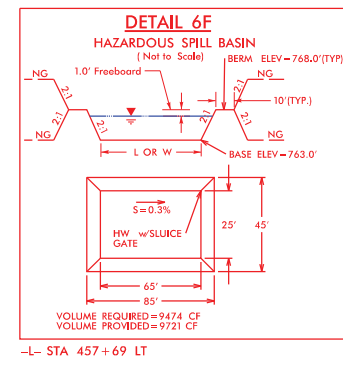
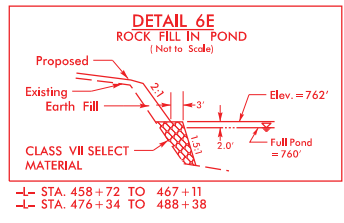
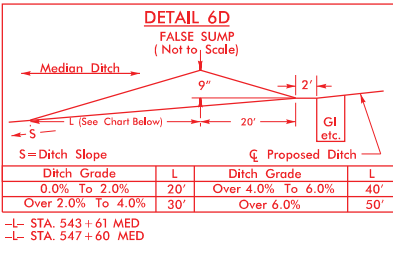
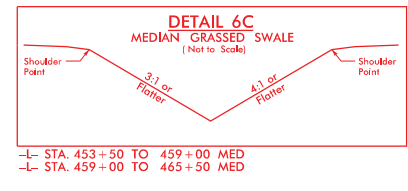
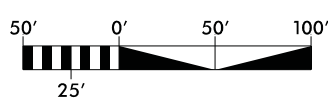
**BUFFER DRAWING
SHEET 3 OF 7**

NAD 83 NRS 2007
460
7



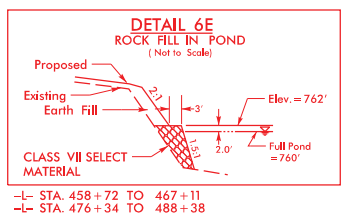
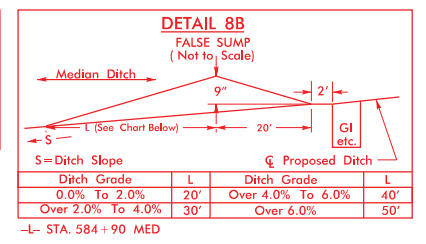
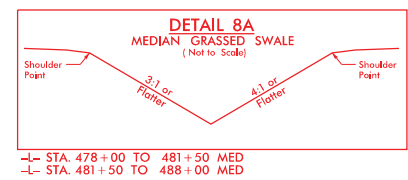
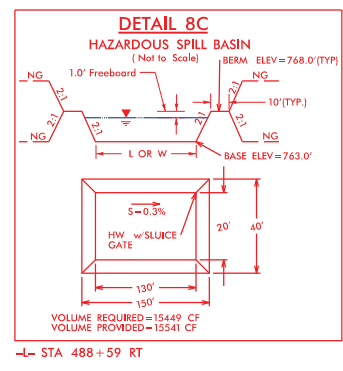
MATCH LINE -L- STA. 448+00
SEE SHEET NO.5

MATCH LINE -L- STA. 462+00
SEE SHEET NO.7

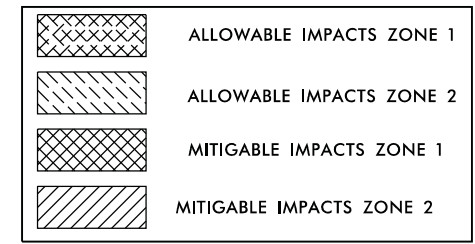


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User:dotst

CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE



**BUFFER DRAWING
SHEET 4 OF 7**



GRASS SWALE DATA

DA=0.6 Acre
SLOPE=0.3%
L REQ=60 ft
L PRO=350 ft
Q2=1.7 cfs
V2=1.0 ffs
Q10=2.3 cfs
V10=1.0 ffs

GRASS SWALE DATA

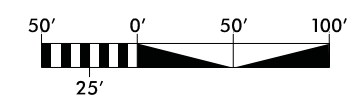
DA=0.3 Acre
SLOPE=0.4%
L REQ=26 ft
L PRO=135 ft
Q2=0.6 cfs
V2=0.7 ffs
Q10=0.8 cfs
V10=0.7 ffs

GRASS SWALE DATA

DA=0.6 Acre
SLOPE=0.4%
L REQ=63 ft
L PRO=350 ft
Q2=1.5 cfs
V2=1.0 ffs
Q10=1.9 cfs
V10=1.1 ffs

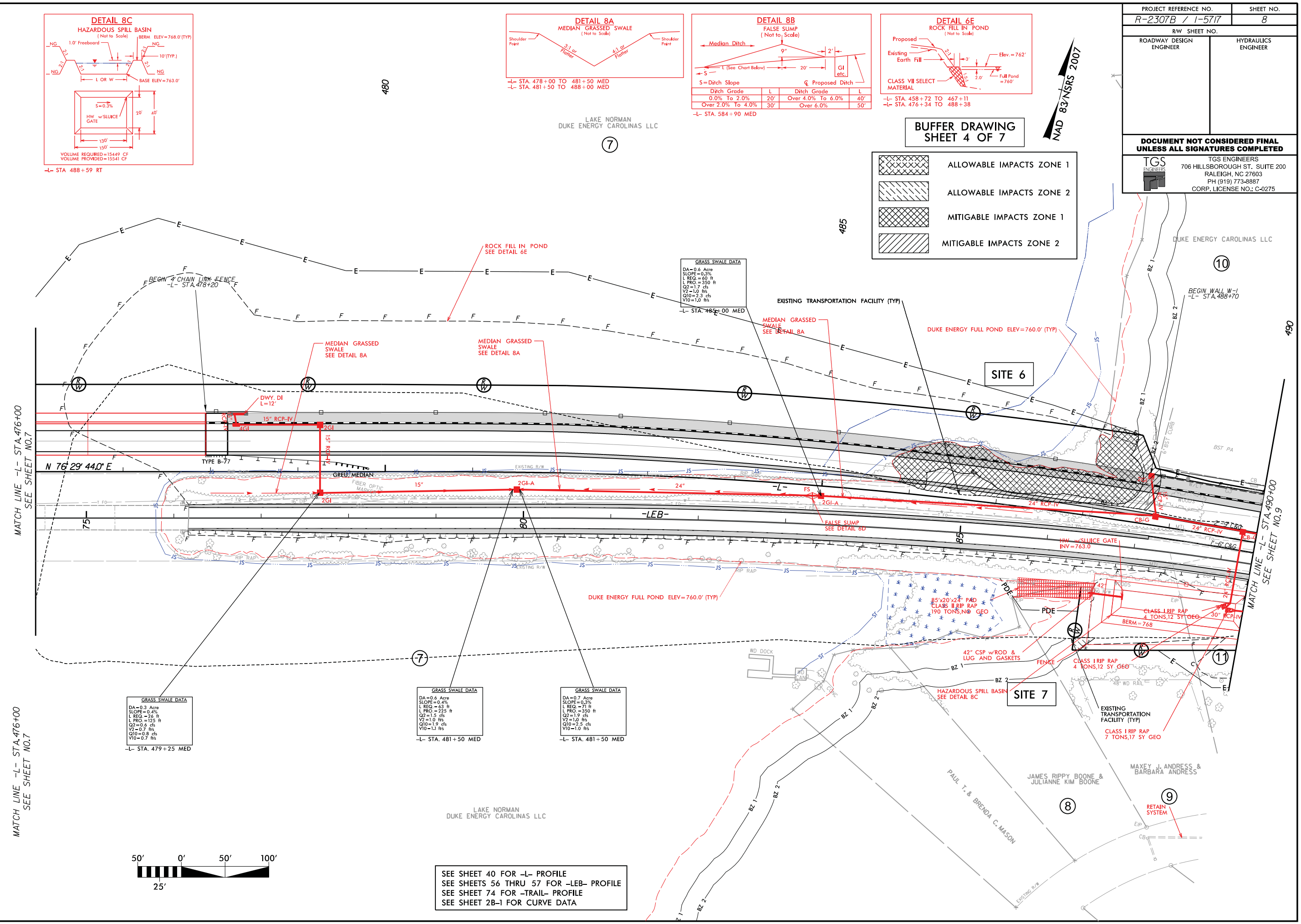
GRASS SWALE DATA


DA=0.7 Acre
SLOPE=0.3%
L REQ=71 ft
L PRO=350 ft
Q2=1.9 cfs
V2=1.0 ffs
Q10=2.5 cfs
V10=1.0 ffs



SEE SHEET 40 FOR -L- PROFILE
SEE SHEETS 56 THRU 57 FOR -LEB- PROFILE
SEE SHEET 74 FOR -TRAIL- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA

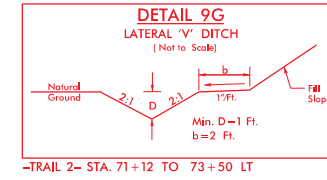
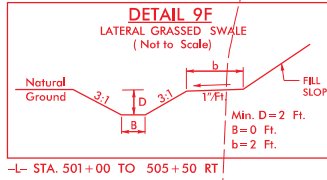
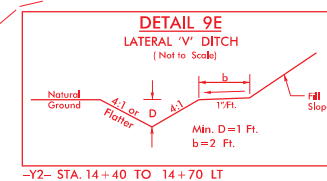
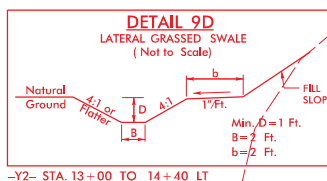
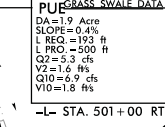
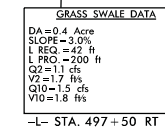
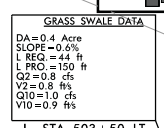
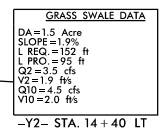
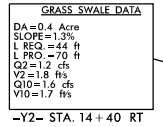
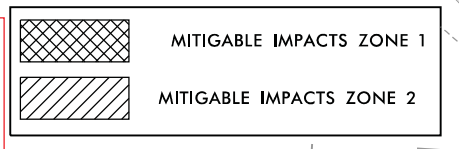
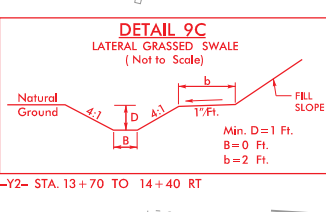
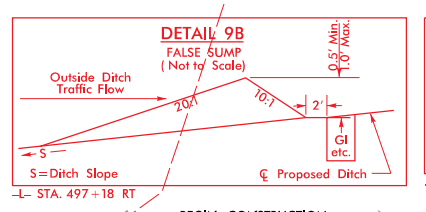
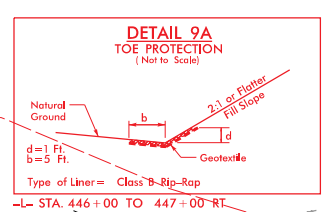
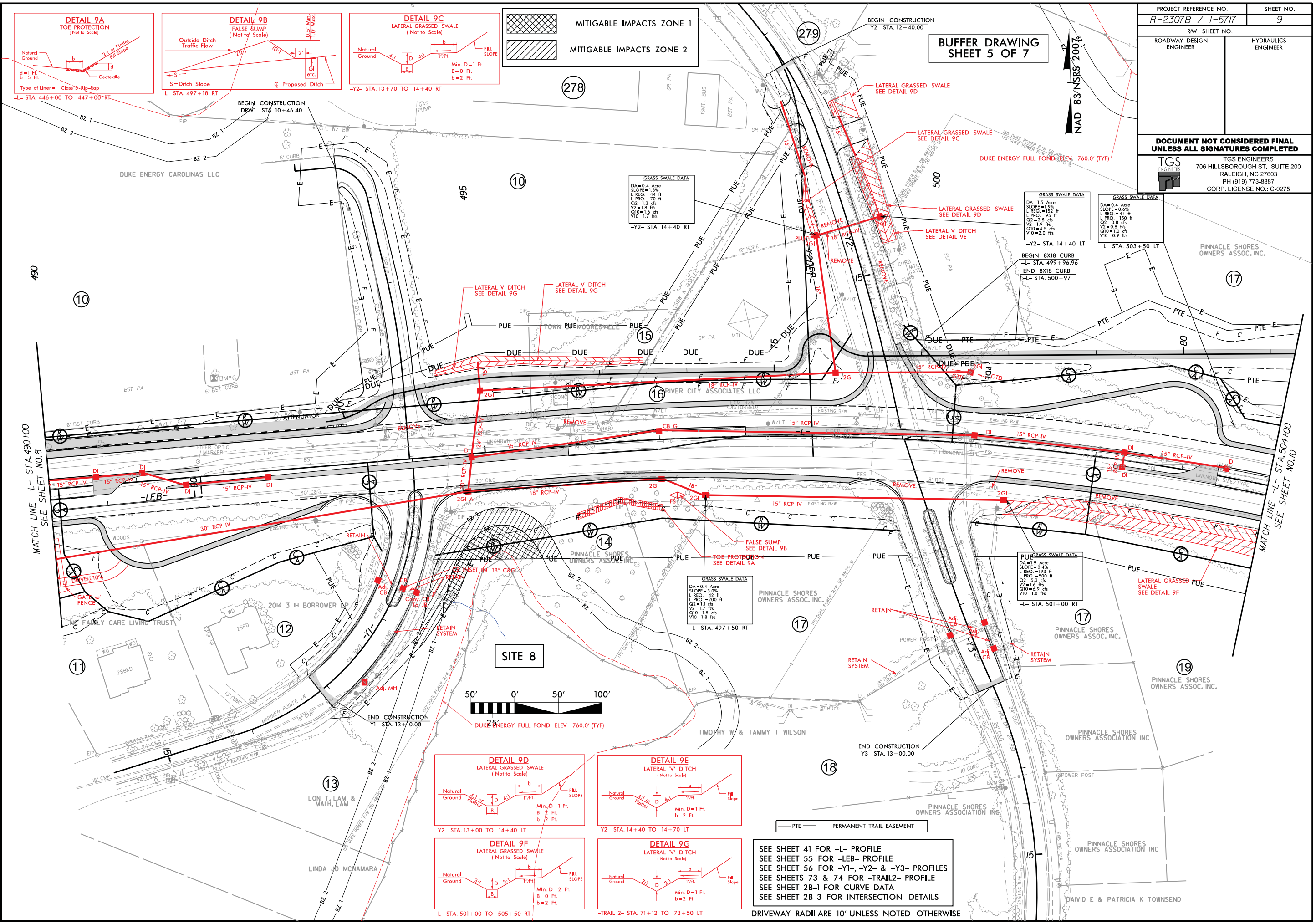
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7/2/2008
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PROJECT REFERENCE NO. R-2307B / 1-5717	SHEET NO. 9
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	

**BUFFER DRAWING
SHEET 5 OF 7**


NAD 83/NSRS 2007



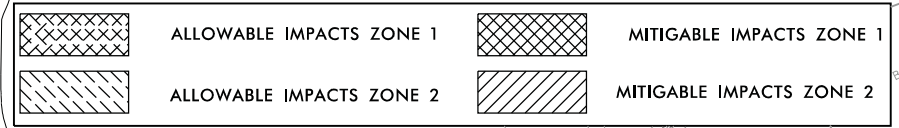
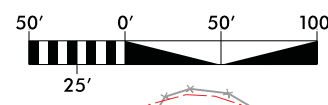
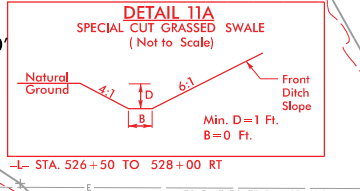
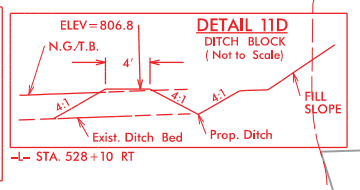
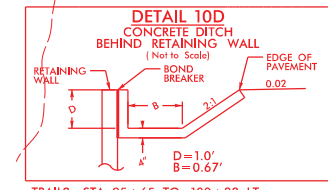
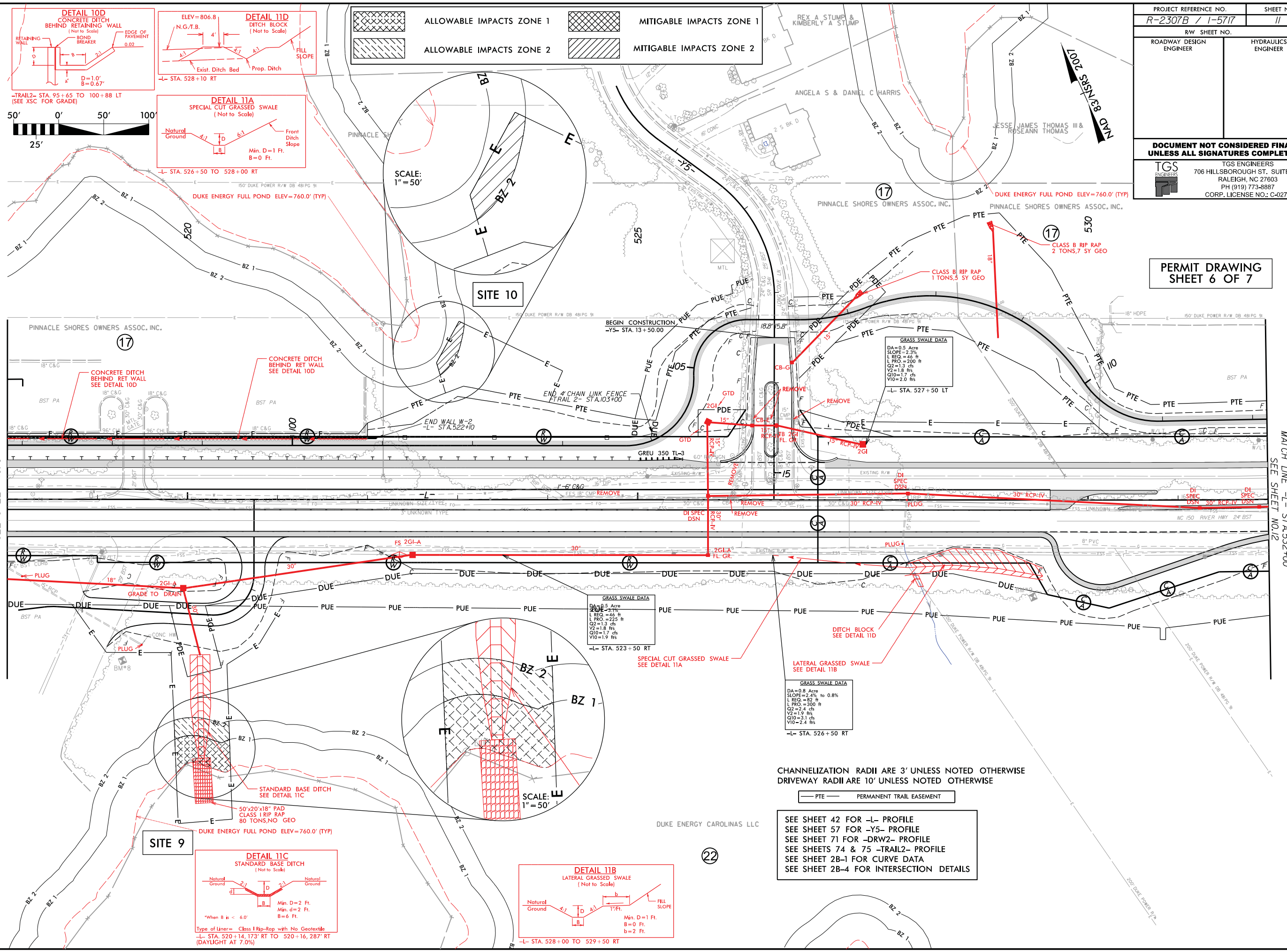
SEE SHEET 41 FOR -L- PROFILE
SEE SHEET 55 FOR -LEB- PROFILE
SEE SHEET 56 FOR -Y1-, -Y2- & -Y3- PROFILES
SEE SHEETS 73 & 74 FOR -TRAIL2- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-3 FOR INTERSECTION DETAILS

DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

8/17/99
7/2/2008
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PROJECT REFERENCE NO. R-2307B / 1-5717	SHEET NO. 11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	

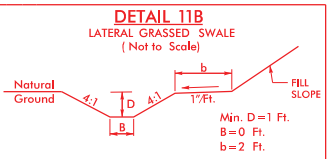
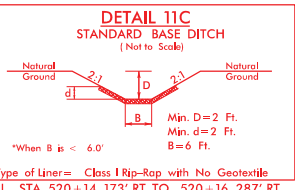
**PERMIT DRAWING
SHEET 6 OF 7**



SCALE:
1" = 50'

SITE 10

SITE 9



CHANNELIZATION RADII ARE 3' UNLESS NOTED OTHERWISE
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE



SEE SHEET 42 FOR -L- PROFILE
SEE SHEET 57 FOR -Y5- PROFILE
SEE SHEET 71 FOR -DRW2- PROFILE
SEE SHEETS 74 & 75 -TRAIL2- PROFILE
SEE SHEET 2B-1 FOR CURVE DATA
SEE SHEET 2B-4 FOR INTERSECTION DETAILS

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7/2/2008
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MATCH LINE -L- STA. 518+00
SEE SHEET NO.10

MATCH LINE -L- STA. 532+00
SEE SHEET NO.12

RIPARIAN BUFFER IMPACTS SUMMARY

SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	IMPACT									BUFFER REPLACEMENT		
			TYPE			ALLOWABLE			MITIGABLE			ZONE 1 (ft ²)	ZONE 2 (ft ²)	
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft ²)	ZONE 2 (ft ²)	TOTAL (ft ²)	ZONE 1 (ft ²)	ZONE 2 (ft ²)	TOTAL (ft ²)			
1	Roadway	-L- 436+90/437+28 LT			X						415	415		
2	Roadway	-L- 439+50/439+85 LT			X						474	474		
3	Ditch	-L- 452+83/453+36 LT			X	1,072	882	1,954						
4	Ditch	-L- 457+90/458+53 LT	X			1,254	1,125	2,379						
5	Roadway	-L- 457+71/458+93 LT	X						5,745	3,820	9,564			
6	Roadway	-L- 485+78/488+83 LT	X						11,213	4,284	15,497			
7	Shoreline Protection	-L- 488+18/488+35 RT	X				225	225						
8	Roadway	-L- 493+96/495+76 RT			X				3,449	5,164	8,612			
9	Ditch	-L- 519+85/520+46 RT			X	1,962	1,262	3,224						
10	Temp. S&EC	-L- 522+76/523+07 LT			X					766				
TOTAL:						4,288	3,494	7,782	20,406	14,922	34,563	0.0	0.0	

Notes:
There are no wetland impacts within buffer impacts on this project.

N.C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 R-2307B / I-5717
 CATAWBA / IREDELL COUNTIES
 PROJECT: 37944.1.FR5 / 50134.1.FS1

DATE 7/2/2018
 SHEET 7 OF 7