STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

December 21, 2017

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

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

SUBJECT: Guilford County; Greensboro Eastern Loop from US 70 Relocation to SR 2303 (Lawndale Drive); WBS 34821.1.1; **TIP U-2525B & C.**

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

A copy of this permit package will be posted on the NCDOT website at:
https://connect.ncdot.gov/resources/Environmental/Pages/default.aspx
Quick Links>Permit Documents> Issued Permits.

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

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

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL ANALYSIS UNIT
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

Telephone: (919) 707-6000
Fax: (919) 212-5785
Customer Service: 1-877-368-4968
Website: www.ncdot.gov

Location:
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

PROJECT COMMITMENTS

TIP Project No. U-2525B and U-2525C
Greensboro Eastern Loop from US 70 Relocation
to SR 2303 (Lawndale Drive)
Guilford County
WBS Element 34821.1.1

COMMITMENTS FROM PROJECT DEVELOPMENT AND DESIGN

Project Development and Environmental Analysis Unit/ Human Environment Section

Noise abatement measures will continue to be considered throughout the design phase of the project.

U-2525B NOTES: Based on the noise wall survey results, the noise wall at the SR 2827 (Four Mile Loop Road) – Relocated US 70(Burlington Road) interchange will not be built. Landscape screening will be utilized instead of a noise wall. The landscape plans will be developed and planting will occur after the roadway construction is completed. Also, based on the noise analyses performed for the SR 2568 (Assembly Road) area at the US 29 interchange, the results showed that there are no anticipated noise impacts in accordance with NCDOT's Traffic Noise Abatement Policy. Noise abatement is not required for Quail Oaks subdivision.

The Kerenoff neighborhood service road redesign developed in 2011 was reviewed, and noise abatement is not required for Kerenoff subdivision.

The southeast quadrant of the US 29/Greensboro Loop interchange was reviewed since this interchange quadrant was not included in previous studies. A noise barrier was predicted to provide at least a 5 dB (A) noise reduction for three receptors, and as much as a 7 dB (A) noise level reduction for one front row receptor. However, the total area of the barrier per predicted benefited receptor was above the allowable square footage per benefit; therefore, a noise barrier in this location would not be reasonable and is not recommended for construction.

U-2525C NOTE: No noise walls meet feasible and reasonable justification within U-2525C project limits. Noise abatement measures shown on the U-2525C design plans are justified under the U-2524D project and will be constructed under U-2524D.

Sidewalks will be incorporated into the project. Further coordination is needed with the City of Greensboro regarding the specific sidewalk locations. A municipal agreement will be executed for Greensboro's participation.

NOTES: According to NCDOT's Pedestrian Policy guidelines, any pedestrian facilities that the City of Greensboro wishes to incorporate into the project plans must be sent in writing to NCDOT by the Project Final Field Inspection (FFI) date.

The City of Greensboro has verbally requested that sidewalks be incorporated into all proposed curb and gutter construction along –Y- lines. NCDOT will provide the City with cost estimates to initiate the municipal agreement process.

Response to NOTES: The municipal agreement is currently being finalized for signatures.

U-2525C NOTE: Sidewalks and wider proposed structures to accommodate the City of Greensboro's future plans to add features such as sidewalk and bike lanes will be incorporated into the project. The wider proposed structures over the Greensboro Loop are requested at the following locations: SR 2526 (Summit Avenue), SR 2523 (Yanceyville Road), and N. Church Street. Further coordination will be needed with the City of Greensboro to discuss costs. A municipal agreement will be executed for Greensboro's participation.

Hydraulics Unit

The final designs will be coordinated with appropriate state and local officials and the Federal Emergency Management Agency (FEMA) to assure compliance with FEMA, state, and local floodway and floodplain regulations.

NOTE: Standard Commitment.

The design of any necessary drainage structures at greenways will be coordinated with the Guilford County Parks and Recreation Department.

NOTE: There are no greenways located within the U-2525B or U-2525C project limits.

Bridges will be considered during the design phase at major waterway and floodplain crossings.

U-2525B NOTE: Bridges span North Buffalo Creek and the bridge at SR 2825 (Camp Burton Road) was lengthened to span an unnamed tributary of North Buffalo Creek and wetlands.
U-2525C NOTE: No proposed bridges over waterways or floodplain crossings are needed based on the limited drainage area sizes located within the U-2525C project limits.

Location & Surveys Unit

Geodetic survey control monuments will be located during design and the U.S. Coastal and Geodetic Survey and North Carolina Geodetic Survey will be notified of their location.

NOTE: Standard commitment.

Roadside Environmental Unit, Hydraulics Unit, and Division 7

NCDOT's "Best Management Practices for Protection of Surface Waters" will be implemented, where applicable, including hazardous spill catch basins in water supply watershed critical areas where the roadway crosses a water supply.

NOTE: Standard commitment.

U-2525C NOTE: For portions of the project that drain to the Reedy Fork (Lake Brandt, Lake Townsend) section, sedimentation and erosion control measures shall adhere to NCDOT's "Design Standards in Sensitive Watersheds".

Geotechnical Unit and Division 7

Any underground storage tanks discovered during construction will be reported to the North Carolina Division of Environmental Management.

NOTE: Standard Commitment.

Project Development and Environmental Analysis Unit

Mitigation for unavoidable wetland loss will be provided through implementation of a wetland mitigation plan developed during the permitting phase of the project.

NOTE: Standard Commitment.

Recommendations to restore stream segments to resemble the destroyed habitat will be considered where practicable. Banks and beds of relocated channels will be stabilized with vegetation or other protective devices as practicable, including consideration of using logs to line banks.

NOTE: NCDOT plans to use on-site stream mitigation, including relocation, restoration, and enhancement to offset unavoidable impacts to existing streams caused by the Greensboro Eastern Loop construction.

Response to NOTE: The on-site mitigation commitment has been fulfilled. NCDOT has provided 2,055 LF of on-site stream mitigation at three sites through stream relocation and restoration. The remainder of the mitigation will be provided by the ~~Ecosystem Enhancement Program (EEP)~~ Division of Mitigation Services (DMS).

Surveys for small whorled pogonia will be required for U-2525B due to the presence of potential, but limited, habitat. These surveys will be conducted within two to three years of the project Let date.

NOTE: Small whorled pogonia surveys will be conducted within the project area later this year (2012) in the appropriate season.

Response to NOTE: Surveys for small whorled pogonia were conducted by Atkins, Inc. biologists on June 13-15 and June 18-19, 2012 in areas of suitable habitat. No specimens were found. A review of the North Carolina Natural Heritage Program (NCNHP) database on November 13, 2013, indicated no occurrences of small whorled pogonia within one mile of the project study area. Therefore, the biological conclusion of 'No Effect' was determined for small whorled pogonia which will remain valid for five years. Surveys for small whorled pogonia were conducted within the U-2525C footprint on June 8 and July 1, 2014. No specimens were found and the biological conclusion remains 'No Effect'.

A combined Screening ICE and ICE Land Use Scenario Assessment will be completed prior to obtaining permits for the project.

NOTE: The ICE and ICE Land Use Scenario Assessment report was completed on October 30, 2009.

NCDOT will mitigate for all of the wetland and stream impacts contained within Quadrant D of the US 29 interchange including areas not directly impacted by construction.

NOTE: The permit included this mitigation.

U-2525 B and C will be permitted together using a phased permit. Preliminary plans for U-2525 C will need to be submitted when permit drawings for U-2525 B are submitted.

NOTE: The permit included this commitment.

Project Development and Environmental Analysis Unit and Division 7
Historic Architecture Stipulations:

1. *Recordation:*
   Prior to the initiation of construction, NCDOT will record the existing condition of the Schoolfield-Hatcher Farm and its surroundings in accordance with the attached Historic Structures and Landscape Recordation Plan.

NOTE: The Schoolfield-Hatcher Farm Historic Structures and Landscape Recordation Plan was completed in October 2010.

2. *Landscape Plan:*
   In consultation with SHPO and the property owner, NCDOT will develop a landscape plan for the Schoolfield-Hatcher property. Installation of plantings will be limited to the non-wooded areas of the parcel north and east of the

roadway. As the installed plantings mature, they are intended to form a natural buffer between the roadway and the farm's primary structures. NCDOT will replace in kind any landscape elements which die within two years of installation.

NOTE: The Schoolfield-Hatcher Farm landscape plan was developed and approved by the State Historic Preservation Office on January 21, 2014. See Appendix A for the landscape plan. A separate contract for landscaping will be developed by Division 7, and the landscaping will be installed after the roadway construction is completed. NCDOT will replace in kind any landscape elements planted as a buffer for the Schoolfield-Hatcher property which die within two years of installation.

3. *Shifted Roadway Alignment:*
   The original middle alternative alignment (ALT-1) will be shifted away from the farm's primary structures as described in the shifted alternative (ALT-2~~)~~.

NOTE: The alignment was shifted as described in the shifted alternative (ALT-2) to reduce impacts to the Schoolfield-Hatcher Farm.

4. *Access:*
   The new transportation facility with control-of-access fencing will divide the farm into two discontiguous parcels. Access to the first parcel, containing the house and primary farm structures, will be retained via the current driveway. NCDOT will provide a cul-de-sac to allow access to the second parcel.

NOTE: The driveway and cul-de-sac are included in the U-2525B final design plans.

Division 7, Right of Way Unit, Environmental Analysis Unit – Archaeology Group
Archaeological Commitments:

1. *Archaeological Monitoring*
   *The NCDOT will monitor initial ground-disturbing activities within the property limits of Sites 31GF452** (Schoolfield-Hatcher Farm, U-2525B) and 31GF466 (Site in SE Quadrant of the proposed SR 2352 (North Elm Street) interchange, U-2525C) in accordance with the attached Archaeological Monitoring Plan.*

Archaeological Monitoring Plan (to be included in the construction contract proposal)

NCDOT (Archaeology Group) Contact Information:
Matt Wilkerson, Archaeology Group Leader, 919-707-6089
Paul J. Mohler, Archaeologist, 919-707-6080

- *The contractor will contact the NCDOT (Archaeology Group) when ground-disturbing activities are anticipated within the property limits of Site 31GF452** (Schoolfield-Hatcher Farm) and Site 31GF466 (i.e., SE quadrant of Elm Street Interchange).*

- *The contractor will provide 48-hours notice to the NCDOT (Archaeology Group) prior to ground-disturbing activities within the property limits of Site 31GF452** (Schoolfield-Hatcher Farm) and Site 31GF466 (i.e., SE quadrant of Elm Street Interchange). The 48-hour period will begin upon acknowledgment by the NCDOT (Archaeology Group) that the contractor has contacted them.*
- *The NCDOT (Archaeology Group) will be on-site during ground-disturbing activities in order to monitor said activities within the property limits of Site 31GF452** (Schoolfield-Hatcher Farm) and Site 31GF466 (i.e., SE quadrant of Elm Street Interchange). Monitoring activities may include, but not be limited to: 1) cleaning and photographing areas exposed during construction, 2) mapping both plan and profile views of open trenches, and 3) collecting materials or artifacts exposed during construction. The NCDOT (Archaeology Group) will have the authority to halt all construction work within the property limits of Site 31GF452** (Schoolfield-Hatcher Farm) and Site 31GF466 (i.e., SE quadrant of Elm Street Interchange) in order to assess the need for further archaeological excavations.*
- *Should archaeological resource(s) deemed eligible for the National Register of Historic Places (NRHP) be discovered during the monitoring phase as determined by the NCDOT (Archaeology Group), then all work will be halted within the limits of the NRHP resource and the State Historic Preservation Office will be contacted. As per the Memorandum of Agreement (MOA), the NC-HPO will consult with the NCDOT (Archaeology Group), on-site if necessary, in order to develop appropriate protection/mitigation measures for the resource(s). Appropriate measures for the resource(s) may include preservation in place, photographing and mapping, and/or additional archaeological excavations.*
- *Both the NC-HPO and the NCDOT (Archaeology Group) will agree upon and provide to the contractor a written description of the measures required for the resource(s). The description will include a schedule for implementing and completing the measures. Upon receipt of written confirmation from the NCDOT (Archaeology Group) that the resource measures have been completed, construction activities may resume in the location containing the resource.*

2. *U-2525C Archaeological Data Recovery*
   Sites 31GF456 (Site near Summit Avenue, U-2525C) and 31GF466 (Site in SE Quadrant of the proposed SR 2352 (North Elm Street) interchange, U-2525C) are recommended as eligible for the National Register of Historic Places (NRHP). Both archaeological sites will be avoided by the Undertaking as currently designed; however, if design plans change prior to construction thereby causing an adverse impact to either of these sites, the NCDOT, in consultation with the NC-HPO and USACE will develop archaeological Data Recovery Plans (DRPs) in order to mitigate the adverse impact(s) to these sites. Given their proximity to the Undertaking, a visual barrier will be placed along the proposed ROW in order to avoid and prevent any disturbance(s) to these sites.

NOTE: Both sites are located within the U-2525C project limits and will be reviewed during future consultations for U-2525C.

Response to NOTE: U-2525C – Site 31GF466
This site was to be avoided by the Undertaking; however, design plans have changed thereby causing an adverse effect to this site. The NCDOT Archaeology Group, in consultation with the NC-HPO and USACE developed a Data Recovery Plan (DRP) in order to mitigate the adverse effect to Site 31GF466.

Data Recovery investigations were completed at Site 31GF466 in June 2017. Once concurrence on the fieldwork was received from the NC-HPO, the Right-of-Way Unit was notified by the NCDOT Archaeology Group in August 2017 so that they could proceed with any work on this property.

Response to NOTE: U-2525C – Site 31GF456
This site will be avoided by the Undertaking as currently designed; however if design plans change prior to construction thereby causing an adverse effect to this site, the NCDOT Archaeology Group, in consultation with the NC-HPO and USACE will develop a Data Recovery Plan (DRP) in order to mitigate the adverse effect to Site 31GF456.

Given the proximity of Site 31GF456 to the Undertaking, the Right-of-Way Unit will place a visual barrier (e.g. orange construction fencing) along the Proposed ROW/Controlled Access in order to avoid and prevent any inadvertent disturbance to Site 31GF456.

The Right-of-Way Unit will contact the NCDOT Archaeology Group prior to any ground-disturbing activities in order to obtain the location of Site 31GF456 for proper placement of the visual barrier.

3. *Cemetery Removal and Relocation*
   *The May/Hudson Cemetery (Site 31GF445** in the NE quadrant of the proposed interchange at SR 2770 (Huffine Mill Road), U-2525 B) cannot be avoided and will be relocated in accordance with the provisions of NCGS Chapter 65.*

*U-2525B NOTE: The May/Hudson Cemetery (Site 31GF445**) was removed and relocated in June 2014 per North Carolina General Statute 65, in coordination with the Right-of-Way Unit.*

4. *Access-Denied Areas*
   Of the five (5) areas not surveyed during the study due to denial of access, only the Louise Coble parcel (15.64 acres within the proposed SR 2770 (Huffine Mill Road) interchange, U-2525 B) is to be affected by the Undertaking and will require additional investigations once access has been granted or ROW has been acquired <u>and</u> prior to any construction activities.

NOTE: The Coble Parcel archaeological survey was completed in January 2014 and identified one archaeological site and two isolated finds with unknown prehistoric lithic components. None of the sites are recommended eligible for the NRHP, and no further archaeological investigation is recommended for this project as it is currently defined.

Project Development and Environmental Analysis Unit, Roadside Environmental Unit and Division 7

NCDOT will adhere to Design Standards for Sensitive Watersheds in the areas of the 5 unnamed tributaries (UTs) of South Buffalo Creek that drain into a section of the creek designated as Section 303(d) waters due to turbidity.

NOTE: Since South Buffalo Creek and its UTs are not listed on the 2012 303(d) Final List of Impaired Waters of North Carolina for turbidity or sedimentation, NCDOT will not need to adhere to Design Standards for Sensitive Watersheds as previously mentioned.

COMMITMENTS FROM PERMITTING

Division 7, Environmental Analysis Unit, and Hydraulics Unit

This permit only authorizes work on Section B of TIP U-2525. Construction on Section C of TIP U-2525 shall not commence until final design has been completed for this section, the permittee has minimized impacts to waters and wetlands to the maximum extent practicable, any modifications to the plans, and a compensatory mitigation plan, have been approved by the US Army Corps of Engineers (the Corps). Preliminary plans for U-2525C were provided with the August 28, 2013 application (Sheets 1-89) however, these plans are not to be used for construction purposes.

When final design plans are completed for U-2525C, a modification to the 401 Water Quality Certification shall be submitted with two copies and fees to the NC Division of Water Quality. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams, and other surface waters, and buffers. No construction activities that impact any wetlands, streams, surface waters, or buffers located in U-2525C shall begin until after the permittee applies for, and receives a written modification of the 401 Water Quality Certification from the NC Division of Water Quality.

NOTE: Final plans for U-2525C were submitted and permitted via Phased 404 and 401 Modification in December 2017.

Environmental Analysis Unit and Division 7

The Permittee shall fully implement the compensatory mitigation plan, entitled, Mitigation Plan Greensboro Eastern Loop, Guilford County North Carolina T.I.P Number U-2525B dated August 12, 2013 and revised March 17, 2014. The mitigation plan includes 14 plan sheets received on August 28, 2013 (OSM-1, OSM-1A, OSM-1B, OSM-2, OSM-2A, OSM-2B, OSM-2C, OSM-2D, OSM-2E, OSM-2F, OSM-3, OSM-4, OSM-5, OSM-6, OSM-7). These mitigation

plans are for the unavoidable impacts to 2,055 linear feet of streams. Activities prescribed by this plan shall be initiated prior to, or concurrently with, commencement of any construction activities within jurisdictional areas authorized by this permit. The permittee shall relocate and restore 2,055 linear feet of streams in accordance with the plan with the following conditions:

a) The permittee, NCDOT, is the party responsible for the implementation, performance and long term management of the compensatory mitigation project.

b) Any changes or modifications to your mitigation plan shall be approved by the Corps.

c) The permittee shall maintain the entire mitigation site in its natural condition, as altered by the work in the mitigation plan, in perpetuity. Prohibited activities within the mitigation site specifically include, but are not limited to: Filling; grading; excavating; earth movement of any kind; construction of roads, walkways, buildings, signs, or any other structure; any activity that may alter the drainage patterns on the property; the destruction, cutting, removal, mowing, or other alteration of vegetation on the property; disposal or storage of any garbage, trash, debris or other waste material; graze or water animals, or use for any agricultural or horticultural purpose; or any other activity which would result in the property being adversely impacted or destroyed, except as specifically authorized by this permit.

d) All mitigation areas shall be monitored for a minimum of 5 years or until deemed successful by the Corps in accordance with the monitoring requirements included in the mitigation plan.

Compensatory mitigation for impacts to 8,083 linear feet of streams at a replacement ratio of 1:1 is required. Partial compensatory mitigation for impacts to jurisdictional streams shall be provided by onsite stream relocations of 2,055 linear feet of stream. The onsite stream relocation shall be constructed in accordance with the design submitted in the August 27, 2013 application. All on-site mitigation sites shall be protected in perpetuity by a conservation easement or through NCDOT fee simple acquisition and recorded in the NCDOT Natural Environment Section mitigation geodatabase. Please be reminded that as-builts for the completed streams shall be submitted to the North Carolina Division of Water Resources 401 Wetlands Unit with the as-builts for the rest of the project. If the parameters of this condition are not met, then the permittee shall supply additional stream mitigation for the 2,055 linear feet of impacts. All channel relocations shall be allowed to stabilize for an entire growing season. All stream relocations shall have a 50-foot wide native wooded buffer planted on both sides of the stream unless otherwise authorized by this Certification. A transitional phase incorporating rolled erosion control product (RECP) and appropriate temporary ground cover is allowable. The stream mitigation site shall be monitored annually for five years or until success criteria are satisfied. Monitoring protocols shall follow the Monitoring Level I outlined in the Stream Mitigation Guidelines, April 2003. Success of the mitigation site shall be determined by the NCDWR during an on-site visit at or near the end of the monitoring period.

NOTE: The on-site mitigation commitment has been fulfilled. NCDOT has provided 2,055 LF of on-site stream mitigation at three sites through stream relocation and restoration. The remainder of the mitigation will be provided by the Division of Mitigation Services (DMS).

Human Environment Section and Division 7

The Permittee shall fully implement the Archaeological Monitoring Plan, which was one of the environmental commitments agreed to by NCDOT, and is listed on Page 5 of 8 of this Greensheet.

Permit Modification:

As a result of the 401 and 404 permit modifications issued March 18, 2016, the following special conditions were added due to modifications made near Permit Site 37 on U-2525B:

> 401 Condition 1: Downstream bi-monthly monitoring reports as described in the [March 9, 2016] application shall be submitted to NCDWR for review as soon as is practicable or within 15 days following the monitoring event.
>
> 404 Condition x: Within three days of the conclusion of bank stabilization installation described herein, the temporary wetland impact area shown on permit drawing Sheet 38A2 must be restored by re-establishing the pre-impact grade and contour, ameliorating areas of soil compaction by disking or similar means, and seeding with wetland seed mix comprised of native species.
>
> 404 Condition xx: NCDOT shall monitor the bank stabilization area described herein, as well as the stream bank within 200 feet up and downstream of the bank stabilization area, for further stream bank instability. Monitoring reports shall be submitted to the Corps beginning within two weeks of the conclusion of bank stabilization installation described herein, and continuing on a bi-monthly basis for a period of six months. These monitoring reports shall include geo-referenced color photographs of the bank stabilization area as well as the entire stream bank within 200 feet up and downstream of the bank stabilization area. In addition, he monitoring reports shall include narrative descriptions of the relative stability of the stream bank monitoring area and detailed descriptions of any streak bank erosion occurring within this area.
>
> 404 Condition xxx: In the event that stream bank erosion occurs within the stream bank monitoring area during the monitoring period, NCDOT shall provide a stream bank restoration or contingency plan for Corps review and approval.

Department of the Army
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

November 28, 2017

Regulatory Division

Action ID: SAW-2005-21386

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

Dear Mr. Harris:

Reference the Department of the Army (DA) permit issued on April 15, 2014, to Ms. Deborah Barbour of the North Carolina Department of Transportation, for impacts associated with the project identified as U-2525BC. The project is a 9.7 mile, four-lane/six-lane divided facility on new location extending from the US 70 relocation to SR 2303 (Lawndale Drive) in Greensboro, Guilford County, North Carolina. Section B of this project begins at the US 70 relocation and terminates at US 29, and Section C begins at US 29 and ends at SR 2303 (Lawndale Drive). Coordinates (in decimal degrees) for the site are: 36.089772° North, -79.697302° West for the eastern terminus and 36.141773° North, -79.825120° West for the western terminus. The site contains portions of four (4) unnamed tributaries to South Buffalo Creek, twenty (20) unnamed tributaries to North Buffalo Creek, five (5) unnamed tributaries to an unnamed tributary at Camp Herman, fourteen (14) unnamed tributaries to Reedy Fork, a portion of Richland Creek, and ten (10) unnamed tributaries to Richland Creek, as well as 50 (50) adjacent wetland areas and five (5) open water ponds in the Cape Fear River Basin (8-Digit Cataloging Unit 03030002).

Impacts authorized by the permit (including U-2525C conceptual impacts) as well as subsequent permit modifications dated June 18, 2014, October 31, 2014, December 4, 2014, March 12, 2015, July 24, 2015, and March, 18, 2016 included: 1) the permanent placement of fill material into 23,467 linear feet of jurisdictional stream channel, 9.95 acres of adjacent riparian wetlands, and 2.32 acres of jurisdictional open waters and, 2) the temporary placement of fill material into 785 linear feet of jurisdictional stream channel and 0.31 acre of adjacent riparian wetlands associated with construction access and the relocation of utility lines. In addition, permit modifications dated August 11, 2016 and December 19, 2016 released U-2525C Permit Sites 1-3, 11, and 12 for construction, including 1) the permanent placement of fill material into 777 linear feet of jurisdictional stream channel and 0.62 acres of adjacent riparian wetlands, and 2) the temporary placement of fill material into 30 linear feet of jurisdictional stream channel

associated with construction access. Since impacts to waters of the US for U-2525C were originally permitted as a conceptual sum, refinement of impacts to Permit Sites 1-3, 11, and 12 could not be used to further update the total impact amount for the entire U-2525BC project. Compensatory mitigation was implemented for the unavoidable impacts by payment into the North Carolina Ecosystem Enhancement Program, now known as the North Carolina Division of Mitigation Services (NCDMS), as well as permittee responsible mitigation referenced in the permit special conditions.

Also reference your permit modification request letter submitted by e-mail and dated November 14, 2017, proposing the following:

Release of the remainder of Section C of TIP U-2525 for construction, consisting of Permit Sites 4, 4A, 5-9, 9A, 10, 10A, 13, 13A and B, 14, 15, 15A, 16, 17, 17A, 18, 18A, 19, 19A, and 20-23, per Special Condition 2 of the DA permit issued on April 15, 2014;

Authorization of permanent discharge of fill material into 11,461 linear feet of stream channel, 2.96 acres of wetlands, and 1.52 acres of open waters related to:
Placing 11,134 linear feet of stream channel in culverts and other fills resulting in permanent loss of waters;
Adding rip rap bank stabilization to 327 linear feet of stream channel;
Placing fill material, conducting mechanized land clearing and/or excavation, and/or draining 2.34 acres of wetlands;
Placing fill material into and/or draining 1.52 acres of open water ponds;

Authorization of temporary discharge of fill material in 1,029 linear feet (0.18 acre) of stream channel and 0.03 acre of wetlands related to:
Disturbing 956 linear feet (0.17 acre) of stream channel for temporary construction access and dewatering;
Disturbing 73 linear feet (0.01 acre) of stream channel associated with the relocation/installation of water mains and sewer lines;
Temporary wetland excavation in 0.03 acre of wetlands associated with the relocation/installation of water mains and sewer lines;

Authorization of indirect impacts to 751 linear feet of stream channel, resulting in reduced aquatic function from "isolating" a 568 linear foot reach and a 183 linear foot reach of stream channel between two long culvert segments.

Following evaluation of the information submitted in your modification request, the U.S. Army Corps of Engineers, Wilmington District has determined that it is appropriate and reasonable and not contrary to the public interest. Therefore, the permit is modified to release the above referenced Permit Sites for Section C of U-2525 for construction, including the requested additional stream, wetland, and open water impacts. This work must be constructed as follows:

for U-2525C Permit Sites 4, 4A, 5-9, 9A, 10, 10A, 13, 13A and B, 14, 15, 15A, 16, 17, 17A, 18, 18A, 19, 19A, and 20-23, as shown on the Wetland and Stream Impacts drawings for U-2525C (Permit Drawing Sheets 1-70) submitted in the "Request for Modification to the Section 404 Individual Permit..." letter dated November 14, 2017;

for U-2525C utility Sites 1- 6 as shown on the Utility Construction sheets UC-9, UC-11A, UC-12, UC-15, and UC-23 for U-2525C, included in the "Request for Modification to the Section 404 Individual Permit..." letter dated November 14, 2017.

In addition, the following special conditions regarding additional compensatory mitigation, endangered species, and archeological resources have been incorporated:

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

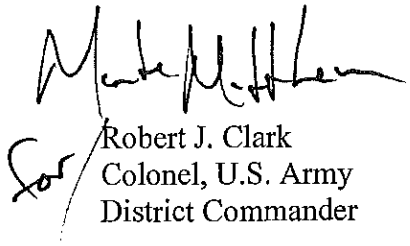
xx) This USACE permit does not authorize you to take a threatened or endangered species, in particular, the Northern Long-eared Bat (NLEB) (*Myotis septentrionalis*). In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (ESA) (e.g., a Biological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

xxx) The Permittee shall fully implement the Amended Memorandum of Agreement between the Permittee, the North Carolina State Historic Preservation Officer and the Wilmington District US Army Corps of Engineers, finalized on November 21, 2016, which is incorporated herein by reference. (see Exhibit A)

All other conditions of the permit, including the permit expiration date of December 31, 2019, remain in effect as written. The U-2525BC project now totals permanent impacts to 23,059 linear feet of jurisdictional stream channel, 10.37 acres of adjacent riparian wetlands, and 2.14 acre of open water ponds, and 2) the temporary placement of fill material into 1,844 linear feet of jurisdictional stream channel and 0.34 acre of adjacent riparian wetlands, and 3) indirect

impacts to 751 linear feet of stream channel. Should you have questions, contact Mr. David E. Bailey, Raleigh Regulatory Field Office at telephone (919) 554-4884, Extension 30.

Sincerely,



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

Copies Furnished with Attachment:

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

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

Copies Furnished without Attachment:

Ms. Erin Cheely
North Carolina Department of Transportation Division of Highways
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Mr. Chris Werner, P.E.
Technical Services Administrator
North Carolina Department of Transportation
1516 Mail Service Center
Raleigh, North Carolina 27699-1516

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

Mr. Chris Militscher
U.S. Environmental Protection Agency
Region 4 NEPA Program Office
61 Forsyth Street, Southwest
Mail Code: 9T25
Atlanta, Georgia 30303-8960

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

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

Permittee: North Carolina Department of Transportation **Action ID:** SAW-2005-21386
Project Name: NCDOT/U-2525 B and C/Division 7 **County:** Guilford

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

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

Permitted Impacts and Compensatory Mitigation Requirements

Permitted Impacts Requiring Mitigation*: **8-digit HUC and Basin:** 03030002, Cape Fear River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
20,771				10.36		

*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:** 03030002, Cape Fear River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
37,438.5				20.7		

Mitigation Site Debited: North Carolina Division of Mitigation Services (NCDMS)
(List the name of the bank to be debited. For umbrella banks, also list the specific site. For NCDMS, list NCDMS. If the NCDMS acceptance letter identifies a specific site, also list the specific site to be debited).

Section to be completed by the Mitigation Sponsor

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

Mitigation Sponsor Name: _____

Name of Sponsor's Authorized Representative: _____

_____ _____
Signature of Sponsor's Authorized Representative **Date of Signature**

USACE Wilmington District
Compensatory Mitigation Responsibility Transfer Form, Page 2

Conditions for Transfer of Compensatory Mitigation Credit:

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

Comments/Additional Conditions:

- **This Form supersedes the Compensatory Mitigation Responsibility Transfer Forms dated April 14, 2014, October 31, 2014, December 4, 2014, and July 23, 2015 that were included as part of the DA Permit dated April 15, 2014 and subsequent Permit Modifications.**
- **This modification results in a net DECREASE in the number of stream credits required (1,152.5 fewer), and a net INCREASE in the number of wetland credits required (0.82 additional), relative to the original DA Permit dated April 15, 2014 and subsequent Permit Modifications.**
- **Additional on-site mitigation was required by special permit condition included in the original DA Permit dated April 15, 2014. This requirement has not changed as a result of this modification.**

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

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

David E Bailey

USACE Project Manager Signature

November 28, 2017

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.

Exhibit A

AMENDED
MEMORANDUM OF AGREEMENT
AMONG THE
UNITED STATES ARMY CORPS OF ENGINEERS,
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION,
AND
NORTH CAROLINA STATE HISTORIC PRESERVATION OFFICER
GREENSBORO EASTERN/NORTHERN URBAN LOOP
GUILFORD COUNTY, NC
TIP U-2525 B&C

WHEREAS, the Regulatory Division of the United States Army Corps of Engineers (USACE), Wilmington District, is considering the issuance of a permit to the North Carolina Department of Transportation (NCDOT), pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344), for construction of the Greensboro Eastern/Northern Urban Loop, Guilford County, North Carolina (the Undertaking); and

WHEREAS, all stipulations contained in the Section 106 Memorandum of Agreement (MOA) for this Undertaking executed in October, 2008 (See Appendix A) regarding adverse effects to the Schoolfield-Hatcher Farm remain in force; and

WHEREAS, the Undertaking will adversely effect archaeological site 31GF466, a property determined eligible for listing in the National Register of Historic Places; and

WHEREAS, the USACE and NCDOT have consulted with the North Carolina State Historic Preservation Officer (SHPO), pursuant to 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f) and 33 CFR 325 Appendix C; and

WHEREAS, the USACE has notified the Advisory Council on Historic Preservation (Council) of the adverse effect to site 31GF466 and it has declined to comment or participate in the consultation; and

WHEREAS, the consulting parties agree that the recovery of significant information from the archaeological site 31GF466 may be done in accordance with the published guidance; and

WHEREAS, the consulting parties agree that it is in the public interest to expend funds for the recovery of significant information from archaeological site 31GF466 to mitigate the adverse effects of the project; and

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

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

NOW, THEREFORE, the USACE, NCDOT, and the SHPO agree that the Undertaking shall be implemented in accordance with the following stipulations in compliance with the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470).

I. Stipulations

1. The NCDOT will develop a Data Recovery Plan (DRP) for Site 31GF466, which will be affected by the subject project, in consultation with the SHPO.
2. The NCDOT will ensure that the DRP will be implemented after Right-of-Way is acquired and prior to construction activities within the site location as shown in the DRP.
3. Upon completion of the Data Recovery efforts, the NCDOT will prepare and forward a Management Summary to the SHPO detailing the results of the Data Recovery field investigations. The Management Summary will contain sufficient information to demonstrate that the field investigation portion of the DRP has been implemented.
4. Upon receipt of the Management Summary, the SHPO will respond within ten (10) days to the recommendations contained within the document.
5. Upon acceptance of the recommendations contained in the Management Summary, the SHPO will issue the NCDOT documentation that the Data Recovery field investigations have been completed.
6. The analysis and report preparation, detailing Site 31GF466, will be completed by the NCDOT, or their consultants, within eighteen (18) months after completion of the fieldwork.

II. Unanticipated Discovery

In accordance with 36 CFR 800.11(a), if NCDOT identifies additional cultural resource(s) during construction and determine them to be eligible for the NRHP, all work will be halted within the limits of the NRHP-eligible resource(s) and the USACE and SHPO contacted. If after consultation with the Signatory and Concurring Party additional mitigation is determined necessary, the NCDOT, in consultation with the Signatory and Concurring Party, will develop and implement appropriate protection/mitigation measures for the resource(s). Inadvertent or accidental discovery of human remains will be handled in accordance with North Carolina General Statutes 65 and 70 as well as 33 CFR 325 Appendix C.

III. Dispute Resolution

Should any Signatory object within (30) days to any plans or documentation provided for review pursuant to this Agreement, the USACE shall consult with the objecting party(ies) to resolve the objection. If the USACE or objecting party(ies) determines that the objection cannot be resolved, the USACE will forward all documentation relevant to the dispute to the Advisory Council on Historic Preservation (Council). Within thirty (30) days after receipt of all pertinent documentation, the Council will either:

A. Provide the USACE with recommendations, which the USACE will take into account in reaching a final decision regarding the dispute, or
B. Notify the USACE that it will comment pursuant to 36 CFR Section 800.7(c) and proceed to comment. Any Council comment provided in response to such a request will be taken into account by the USACE, in accordance with 36 CFR Section 800.7 (c) (4) with reference to the subject of the dispute.

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

IV. Amendments

If any Signatory to this MOA believes that its terms cannot be carried out, or that an amendment to the terms must be made, that party(ies) shall immediately consult with the other party(ies) to develop amendments in accordance with 36 CFR 800.6(c)(7). If an amendment cannot be agreed upon, the dispute resolution process set forth in Section III will be followed.

V. Termination

Any Signatory to this MOA may terminate the agreement by providing notice to the other party(ies), provided that the party(ies) will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. Termination of this MOA will require compliance with 36 CFR 800 and 33 CFR 325 Appendix C. This MOA may be terminated by the execution of a subsequent MOA that explicitly terminates or supersedes its terms.

VI. Duration

Unless terminated as detailed above, this MOA will be in effect until the USACE, in consultation with the other Signatories, determines that all of its terms have satisfactorily been fulfilled or if NCDOT is unable or decides not to seek issuance of a permit from the USACE for construction of the Undertaking.

Execution of this Memorandum of Agreement by the USACE and the North Carolina SHPO, its subsequent filing with the Council and implementation of its terms evidence that USACE, has afforded the Council an opportunity to comment on the Undertaking, and that the USACE, has taken into account the effects of the Undertaking on the archaeological site 31GF466.

AGREED:

By: _____ Date: 11.21.16
United States Army Corps of Engineers, Wilmington District

By: _____ Date: 11-07-2016
North Carolina State Historic Preservation Officer

By: _____ Date: 11/16/16
North Carolina Department of Transportation

AMENDED
MEMORANDUM OF AGREEMENT
AMONG THE
UNITED STATES ARMY CORPS OF ENGINEERS,
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION,
AND
NORTH CAROLINA STATE HISTORIC PRESERVATION OFFICER
GREENSBORO EASTERN/NORTHERN URBAN LOOP
GUILFORD COUNTY, NC
TIP U-2525 B&C

Execution of this Memorandum of Agreement by the USACE and the North Carolina SHPO, its subsequent filing with the Council and implementation of its terms evidence that USACE, has afforded the Council an opportunity to comment on the Undertaking, and that the USACE, has taken into account the effects of the Undertaking on the archaeological site 31GF466.

FILED:

By: _____ Date: _____
Advisory Council on Historic Preservation

APPENDIX A

October 2008 U-2525 B&C
Memorandum of Agreement

Environmental Quality

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

LINDA CULPEPPER
Interim Director

December 8, 2017

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

Subject: Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act and Jordan Lake Buffer Rules with ADDITIONAL CONDITIONS for Proposed improvements to Greensboro Eastern Loop from US 70 Relocation to SR 2303 (Lawndale), Guilford County; WBS Element No. 34821.1.5; TIP U-2525BC. NCDWR Project No. 20130918 V.10; Certification No. 3978.

Dear Mr. Harris:

Attached hereto is a modification of Certification No. 3978 issued to The North Carolina Department of Transportation (NCDOT) originally dated February 6, 2014 with subsequent modifications on the following dates: June 24, October 15, December 11, 2014; March 18 and July 21, 2015; and March 18, August 12, and December 2016. This modification will be Version 10.

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

Sincerely,

Linda Culpepper, Interim Director
Division of Water Resources

Attachments

Electronic copy only distribution:
David Bailey, US Army Corps of Engineers, Raleigh Field Office
Jerry Parker, Division 7 Environmental Officer
Nicole Thomson, Division 7 Environmental Officer Assistance
Erin Cheely, NC Department of Transportation, Project Development and Environmental Analysis Unit
Carla Dagnino, NC Department of Transportation, Project Development and Environmental Analysis Unit
Chris Militscher, US Environmental Protection Agency (only for NEPA/Merger projects)
Gary Jordan, US Fish and Wildlife Service
Travis Wilson, NC Wildlife Resources Commission
Beth Harmon, Division of Mitigation Services
April Norton, NC Division of Water Resources Office
File Copy

Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act and Jordan Lake Watershed 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.0267. This certification authorizes the NCDOT to impact an additional 2.36 acres of jurisdictional wetlands, 1.52 acres of open waters, and 11,461 linear feet of jurisdictional streams in Guilford County. The project shall be constructed pursuant to the modification dated and received November 14, 2017. The authorized impacts are as described below:

Stream Impacts in the Cape Fear River Basin

U-2525 C Section Site	Permanent Fill in Intermittent Stream (linear ft) Culvert/Bank Stabilization	Temporary Fill in Intermittent Stream (linear ft)	Permanent Fill in Perennial Stream (linear ft)		Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
			Culvert	Bank Stabilization			
1**	--	--	41	5	<0.01	46	-
2**	--	--	362	--	--	362	362
3**	61	--	--	--	<0.01	61	-
4	--	--	780 (568*)	45	<0.01	825 (568*)	780
4A	405	--	--	--	--	405	--
5	--	<0.01	--	--	--	<0.01	--
6	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--
8	--	--	489	16	<0.01	505	489
9	342	--	93	18	--	453	93
9A	--	--	52	--	--	52	--
10	--	--	2,126		<0.01	2,126	2,126
10A	--	--	283	20	<0.01	303	--
11**	--	--	--	--	--	--	--
12**	--	--	284	24	<0.01	308	308
13	--	--	791	--	0.02	791	791
13A	--	--	225	--	<0.01	225	--
13B	225	<0.01	--	--	--	225	--
14	364/71	--	--	--	--	435	--
15	--	--	518	--	0.01	518	518

15A	--	--	169	--	--	169	--
16	--	--	--	--	0.01	0.01	--
17	--	--	410	26	<0.01	436	410
17A	--	--	--	--	<0.01	<0.01	--
18	--		551	--	<0.01	551	551
18A	80	<0.01	--	--	--	80	--
19	--	--	775 (183*)	40	0.02	815 (183*)	775
19A	--	--	61	32	0.01	93	--
20	594/30	<0.01	--	--	<0.01	624	--
21	--	--	632	--	0.04	632	632
22	--	--	745	10	<0.01	755	745
23	--	--	424	19	<0.01	443	424
Totals	**2,172**	**<0.04**	**5,343 (751*)**		**0.18**	**11,461**	**9,004**

*Indicates a loss of function
**Previously permitted sites

Total Stream Impact for Modification: 11,461 linear feet

Wetland Impacts in the Cape Fear River Basin

Site	Fill (ac)	Excavation (ac)	Mechanized Clearing (ac)	Impacts Requiring Mitigation (ac)
1**	0.03	0.02	0.03	0.08
2**	0.43	0.03	--	0.46
4	0.55	0.04	0.02	0.62
5	0.16	0.02	--	0.18
6	0.13	--	0.03	0.16
7	0.05	--	0.03	0.08
8	0.16	--	0.01	0.17
9	0.05	--	0.01	0.07
10	0.08	--	--	0.08
10A	--	--	<0.01	<0.01
11**	0.05	--	0.03	0.08
15	0.60	0.04	0.03	0.67

16	<0.01	--	0.01	0.01
21	0.11	0.05	0.10	0.26
22	0.02	--	--	0.02
23	0.02	--	0.01	0.03
Total	2.45	0.20	0.32	2.96

**Indicates previously permitted site

Total Wetland Impact for Modification: 2.96 acres.

Open Water Pond Impacts in the Cape Fear River Basin

Site	Permanent Fill in Open Waters (ac)	Temporary Fill in Open Waters (ac)	Total Fill in Open Waters (ac)
9	0.59	-	0.59
16	0.93	-	0.93
Total	**1.52**	-	**1.52**

Total Open Water Impact for Modification: 1.52 acres.

Jordan Lake Riparian Buffer Impacts

U-2525 C Section Site	Zone 1 Impact (sq ft)	*minus* Wetlands in Zone 1 (sq ft)	= Zone 1 Buffer Impacts (sq ft)	Zone 1 Buffer Mitigation Required (using 3:1 ratio)	Zone 2 Impact (sq ft)	*minus* Wetlands in Zone 2 (sq ft)	= Zone 2 Buffer Impacts (sq ft)	Zone 2 Buffer Mitigation Required (sq ft) (using 1.5:1 ratio)
1**	2,848	1,079	1,799	-	1,586	418	1,168	142 (213)
Totals	2,848	1,079	1,799	-	1,586	418	1,168	142 (213)

Notes: Project is exempt from Jordan Lake Buffer Rules. New mitigation requirements for modification version 9 arise from impacts that exist outside of the original project area. **Indicates previously permitted site.

Total Buffer Impact for Modification: 4,434 square feet.

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

This approval is only valid for the purpose and design that you submitted in your modified application dated and received November 14, 2017. All the authorized activities and conditions of certification associated with the original Water Quality Certification dated February 6, 2014 with subsequent modifications on June 24, October 15, December 11, 2014; March 18 and July 21, 2015; and March 18, August 12, and December 19, 2016 still apply except where superceded by this certification. Should your project change, you are required to notify the NCDWR and submit a

new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 300 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). Additional buffer impacts may require compensatory mitigation as described in 15A NCAC 2B .0267. For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Condition(s) of Certification:

1. Compensatory mitigation for 9,004 linear feet of impact to streams and 2.96 acres of riverine/riparian wetlands is required. We understand that you have chosen to perform compensatory mitigation for impacts to streams through the North Carolina Division of Mitigation Service (DMS) (formerly NCEEP), and that the DMS has agreed to implement the mitigation for the project. The DMS has indicated in a letter dated November 18, 2016 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the DMS Mitigation Banking Instrument signed July 28, 2010.
2. This modification is applicable only to the additional proposed activities. All the authorized activities and conditions of certification associated with the original Water Quality Certification dated February 6, 2014 with subsequent modifications on June 24, October 15, December 11, 2014; March 18 and July 21, 2015; and, March 18, August 12, and December 19, 2016 still apply except where superseded by this certification.
3. All stormwater runoff shall be directed as sheetflow through stream buffers at non-erosive velocities, unless otherwise approved by this certification (15A NCAC 2B .0267).
4. All riparian buffers impacted by the placement of temporary fill or clearing activities shall be restored to the preconstruction contours and revegetated. Maintained buffers shall be permanently revegetated with non-woody species by the end of the growing season following completion of construction. For this condition, maintained buffer areas are defined as areas within the transportation corridor that will be subject to regular NCDOT maintenance activities including mowing. The area with non-maintained buffers shall be permanently revegetated with native woody species before the next growing season following completion of construction (15A NCAC 2B .0267).
5. Pursuant to 15A NCAC 2B .0267, sediment and erosion control devices shall not be placed in Zone 1 of any Jordan Lake Watershed Riparian 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, or anywhere on this project. Moreover, sediment and erosion control devices shall be allowed in Zone 2 of the buffers if Zone 1 is not compromised and that discharge is released as diffuse flow.
6. Any modifications to this 401 Water Quality Certification that propose additional stream impacts or increased impervious surface requiring additional stormwater management may be subject the Jordan Lake Water Supply Nutrient Strategy (15A NCAC02B .0267). The NCDOT shall coordinate with the NCDWR prior to submitting a modification request to determine the applicability of the Jordan Water Supply Nutrient Strategy. This condition does not apply to major modifications for additional sections of the project that were covered under the Finding of No Significant Impact or approved in the Avoidance and Minimization stage of the project.
7. Compensatory mitigation for impacts to 142 square feet of protected riparian buffers in Zone 2 shall be required. We understand that you have chosen to perform compensatory mitigation for impacts to protected buffers through use of the North Carolina Division of Mitigation Services (DMS) (formerly NCEEP). Mitigation for unavoidable impacts to Jordan Lake Watershed Riparian Buffers shall be provided in the Cape Fear River Basin and done in accordance with 15A NCAC .02B .0295. The DMS has indicated in a letter dated November 18, 2016 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.

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:

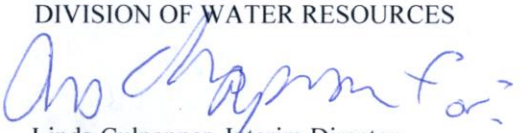
Office of Administrative Hearings
6714 Mail Service Center
Raleigh, NC 27699-6714
Telephone: (919) 431-3000, Facsimile: (919) 431-3100

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 8th day of December 2017

DIVISION OF WATER RESOURCES



Linda Culpepper, Interim Director

WQC No. 3978

Environmental Quality

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

LINDA CULPEPPER
Interim Director

NCDWR Project No.: _____ **County:** _____

Applicant: _____

Project Name: _____

Date of Issuance of 401 Water Quality Certification: _____

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

Applicant's Certification

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

Signature: _____ Date: _____

Agent's Certification

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

Signature: _____ Date:_____

Engineer's Certification

_____ Partial _____ Final

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

Signature _____ Registration No. _____ Date _____

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.04; Released November 2015)

WBS Element:	34821.1.5	TIP No.:	U-2525C	County(ies):	Guilford	Page	1	of	5

General Project Information

WBS Element:	34821.1.5	**TIP Number:**	U-2525C	**Project Type:**	New Location	**Date:**	10/18/2017
NCDOT Contact:	William Elam, Jr., PE			**Contractor / Designer:**	Wetherill Engineering / Max Price, PE		
Address:	Hydraulics Unit 1020 Birch Ridge Road Raleigh, NC 27610			**Address:**	1223 Jones Franklin Road Raleigh, NC 27606		
Phone:	919-707-6718			**Phone:**	919-851-8077 (DIRECT 984-242-0593)		
Email:	belam@ncdot.gov			**Email:**	mprice@wetherilleng.com		
City/Town:	Greensboro			**County(ies):**	Guilford		
River Basin(s):	Cape Fear			**CAMA County?**	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	5.27	**Surrounding Land Use:**	Residential / Light Industrial

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	28.3 ac.	ac.
Typical Cross Section Description:	6-Lane Divided Highway; Pavement varies 24' to 36' in each direction with 14' shoulders (12' paved) and 46' grassed median.	New Location
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 96400 Year: 2040	Existing: Year:
General Project Narrative: (Description of Minimization of Water Quality Impacts)	This roadway project is a portion of the Eastern Greensboro Loop. The U2525C portion is from US 29 North of Greensboro to East of SR 2303 (Lawndale Drive). The project has been exempted from the 2009 Jordan Lake Riparian Buffer Rules. The surrounding area consists of multi-family residential neighborhoods with light industrial sporadically interspersed. The project mainline will have a typical sections that predominately consist of a divided highway with a 46' median at 6:1 slopes where 22' is grass lined with non-erosive velocities throughout the project to the extent practicable. Hazardous Spill Basins are used with the critical area. These basins utilize media filter to treat discharge from the roadway to the extent practicable.	

Waterbody Information

Surface Water Body (1):	UT to North Buffalo Creek		**NCDWR Stream Index No.:**	16-11-14-1	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Water Supply V (WS-V)		
		Supplemental Classification:	Nutrient Sensitive Waters (NSW)		
Other Stream Classification:	None				
Impairments:	zinc (Zn)	copper (Cu)	NO2 +NO3-N		
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SI and SJ			**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)		Exempt from the 2009 Jordan Lake Riparian Buffer Rules.	
(If yes, provide justification in the General Project Narrative)					

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.04; Released November 2015)

Additional Waterbody Information

Surface Water Body (2):	UT at Camp Herman		**NCDWR Stream Index No.:**	16-11-10-(2)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Water Supply V (WS-V)			
		Supplemental Classification:	Nutrient Sensitive Waters (NSW)			
Other Stream Classification:						
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SBS and SBT			**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)						

Surface Water Body (3):	UT to Reedy Fork / Townsend Lake		**NCDWR Stream Index No.:**	16-11-(3.5)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Water Supply III (WS-III)			
		Supplemental Classification:	Nutrient Sensitive Waters (NSW)			
Other Stream Classification:	CA					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SBO, SBN, SBP, SBQ, SBW, SBV, SBU, SBM, SBL, SBJ, and SBK			**Buffer Rules in Effect:**		
Project Includes Bridge Spanning Water Body?		**Deck Drains Discharge Over Buffer?**		**Dissipator Pads Provided in Buffer?**		
Deck Drains Discharge Over Water Body?		(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)						

Surface Water Body (4):	UT to Richland Creek / Lake		**NCDWR Stream Index No.:**	16-11-7-(1)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Water Supply III (WS-III)			
		Supplemental Classification:	Nutrient Sensitive Waters (NSW)			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SBF, SBH, SBE, SBG, SBD, SBC, SBI, and SBB			**Buffer Rules in Effect:**		
Project Includes Bridge Spanning Water Body?		**Deck Drains Discharge Over Buffer?**		**Dissipator Pads Provided in Buffer?**		
Deck Drains Discharge Over Water Body?		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.04; Released November 2015)

WBS Element: 34821.1.5 **TIP No.:** U-2525C **County(ies):** Guilford

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?
10	333+70 -L- RT 40.8905150 / -65.1678451	(3)UT to Reedy Fork /	0.0	3.0	3.0	0.3	25	240	0.30%	0.6	0.8	0.7	0.8	No	No
10	344+67-L- RT 40.8933477 / -65.1801402	(3)UT to Reedy Fork /	0.0	3.0	3.0	1.8	180	200	0.60%	3.2	1.5	4.0	1.7	No	No

Additional Comments

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.04; Released November 2015)

WBS Element: 34821.1.5 **TIP No.:** U-2525C **County(ies):** Guilford

Level Spreaders, Hazardous Spill Basins, and Forebays

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Level Spreader, Hazardous Spill Basin, or Forebay?	Drainage Area (ac)	New Built-Upon Area (ac)	Required / Minimum Treatment			Treatment Achieved		BMP Associated w/ Buffer Rules?
10	Basin #1 -L- 333+50 (RT) 36.1514 / -79.7584	(3)UT to Reedy Fork /	Hazardous Spill Basin	2.79	1.58	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	4000.0	cf	102010.0	cf	No
11	Basin #2 -L- 347+70 (RT) 36.1515 / -79.7598	(3)UT to Reedy Fork /	HSB/MF-FB	5.00	3.34	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	6300.0	cf	5204.0	cf	No
11	Basin #3 -L- 355+00 (RT) 36.1515 / -79.7617	(3)UT to Reedy Fork /	HSB/MF-FB	4.33	2.08	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	5100.0	cf	4703.0	cf	No
12	Basin #4 -L- 367+40 (RT) 36.1516 / -79.7663	(3)UT to Reedy Fork /	HSB/MF-FB	5.72	3.67	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	6900.0	cf	5718.0	cf	No
13	Basin 5 -L- 378+40 (LT) 36.1496 / -79.7694	(3)UT to Reedy Fork /	HSB/MF-FB	4.29	3.13	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	5800.0	cf	8179.0	cf	No
14	Basin #6 -L- 387+82 (LT) 36.1483 / -79.7720	(3)UT to Reedy Fork /	HSB/MF-FB	10.26	4.64	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	9900.0	cf	9819.0	cf	No
14	Basin #7 -L- 393+75 (LT) 36.1473 / -79.7737	(3)UT to Reedy Fork /	HSB/MF-FB	20.22	3.36	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	14200.0	cf	10437.9	cf	No
14	Basin #8-Y14LPC- 13+00 (LT) 36.1479 / -79.7751	(3)UT to Reedy Fork /	Hazardous Spill Basin	9.25	2.01	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	7500.0	cf	24911.0	cf	No
15	Basin #9 -Y4RPA- 13+25 (RT) 36.1439 / -79.7805	(3)UT to Reedy Fork /	HSB/MF-FB	12.55	5.99	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	11900.0	cf	8472.0	cf	No

*Hazardous spill basins are pollution prevention measures designed for spill containment rather than stormwater treatment. Under Required / Minimum Treatment and Treatment Achieved, provide the minimum required volume and the actual HSB volume, respectively. Refer to the NCDOT Stormwater Best Management Practices Toolbox (2014) for design guidance.

Additional Comments

All the HSB's are within 1/2 mile of a critical area. Basins 2-7 and 9 include treatment using Media Filter - Filtration Basin, the volume is for the area between the riser elevation for the water quality treament and the emergency spillway. For Basin #2 the total volume is 11537.8 cf; for Basin #3 the total volume is 9813 cf; for Basin #4 the total volume is 12652.5 cf; for Basin #5 the total volume is 14024 cf; for Basin # 6 the total volume is 19755 cf; for Basin # 7 the total volume is 24707.9 cf; for Basin # 9 the total volume is 20406.3 cf. For Basins 1 and 8 the volume is the area below freeboard elevation. This elevation accounts for 1.0' freeboard below the maximum berm height.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.04; Released November 2015)

WBS Element: 34821.1.5 **TIP No.:** U-2525C **County(ies):** Guilford

Other Best Management Practices

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	BMP Type	Drainage Area (ac)	New Built-Upon Area (ac)	Volume Treated (ac-ft)	Precipitation Depth Treated over NBUA (in)	BMP Associated w/ Buffer Rules?
11	Basin #2 -L- 347+70 (RT) 36.1515 / -79.7598	(3)UT to Reedy Fork /	HSB/MF-FB	5.0	3.3	0.15	0.57	No
11	Basin #3 -L- 355+00 (RT) 36.1515 / -79.7617	(3)UT to Reedy Fork /	HSB/MF-FB	4.3	2.1	0.12	0.73	No
12	Basin #4 -L- 367+40 (RT) 36.1516 / -79.7663	(3)UT to Reedy Fork /	HSB/MF-FB	5.7	3.7	0.16	0.55	No
13	Basin #5 -L- 378+40 (LT) 36.1496 / -79.7694	(3)UT to Reedy Fork /	HSB/MF-FB	4.3	3.1	0.13	0.52	No
14	Basin #6 -L- 387+82 (LT) 36.1483 / -79.7720	(3)UT to Reedy Fork /	HSB/MF-FB	10.3	4.6	0.23	0.63	No
14	Basin #7 -L- 393+75 (LT) 36.1473 / -79.7737	(3)UT to Reedy Fork /	HSB/MF-FB	20.2	3.4	0.33	1.24	No
15	Basin #9 -Y4RPA- 13+25 (RT) 36.1439 / -79.7805	(3)UT to Reedy Fork /	HSB/MF-FB	12.6	6.0	0.27	0.57	No

Additional Comments

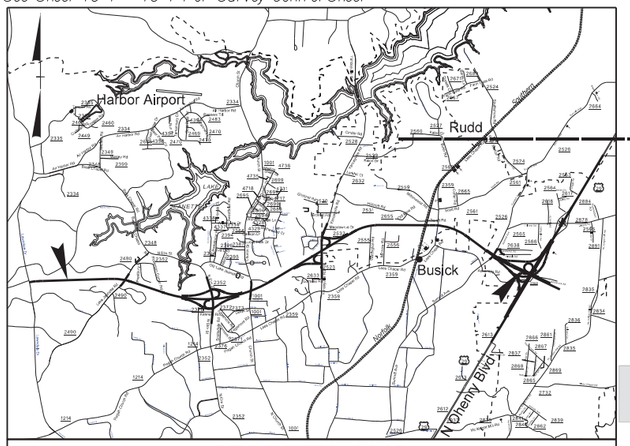
The Media Filter - Filtration Basins are incorporated with Hazardous Spill Basins. The basins were sized to the extent praticable with the attempt to treat at least 50% of the first inch of runoff from the NBUA.

09/08/99

TIP PROJECT: U-2525C

CONTRACT: C204096

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Plan Sheet Symbols
See Sheet 1C-1 - 1C-4 For Survey Control Sheet



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

PERMIT DRAWING
SHEET 1 OF 70

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2525C	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34821.1.5		PE
34821.2.4		R/W, UTIL.
34821.3.7		CONST.

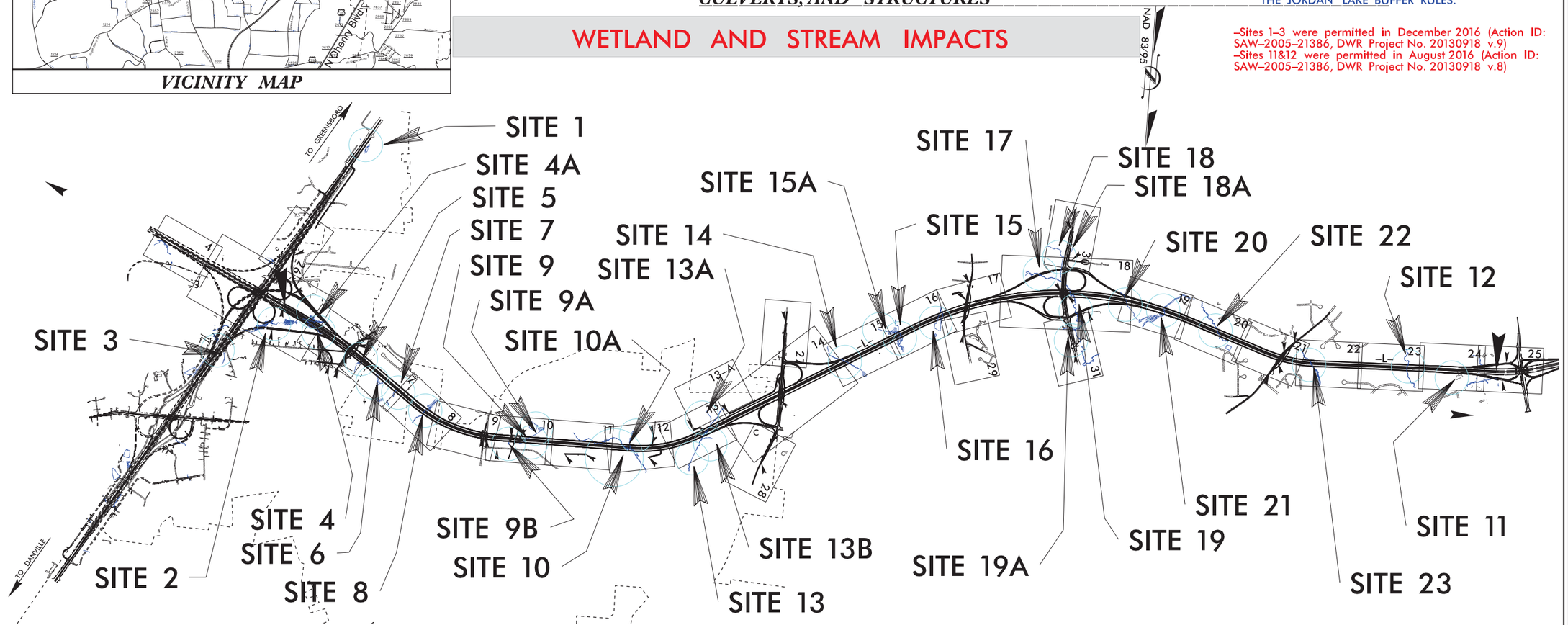
NOTE: THIS PROJECT IS LOCATED IN THE JORDAN LAKE WATERSHED. HOWEVER, THIS PROJECT IS EXEMPT FROM THE 2009 JORDAN LAKE RIPARIAN BUFFER RULES DUE TO FONSI OR CONCURRENCE POINT 4A APPROVAL PRIOR TO THE ADOPTION OF THE JORDAN LAKE RIPARIAN BUFFER RULES. WATER RESOURCES AT PERMIT SITE 1 WERE LOCATED AFTER THE 4A APPROVAL AND WILL BE SUBJECT TO THE JORDAN LAKE BUFFER RULES.

LOCATION: GREENSBORO LOOP FROM US 29 NORTH OF GREENSBORO TO EAST OF LAWNDALE DRIVE

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

WETLAND AND STREAM IMPACTS

–Sites 1–3 were permitted in December 2016 (Action ID: SAW–2005–21386, DWR Project No. 20130918 v.9)
–Sites 11&12 were permitted in August 2016 (Action ID: SAW–2005–21386, DWR Project No. 20130918 v.8)



GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2018 = 63160
ADT 2040 = 96400
K = 10 %
D = 60 %
T = 14 % *
V = 70 MPH
* TTST = 8% DUAL = 6%
FUNC CLASS = INTERSTATE "STATEWIDE TIER"

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U–2525C = 5.190 MILES
LENGTH STRUCTURE TIP PROJECT U–2525C = 0.075 MILES
TOTAL LENGTH OF TIP PROJECT U–2525C = 5.265 MILES

Prepared for the North Carolina Department of Transportation in the Office of:

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 31, 2016

LETTING DATE: MARCH 20, 2018

EDWARD G. WETHERILL, PE
PROJECT ENGINEER

BOB A. MAY, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT: TATIA L. WHITE, PE, PLS
ROADWAY DESIGN: PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 23993 ENGINEER

P.E.

SIGNATURE:

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER

P.E.

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

10/23/2017
FBrooks
P:\2015\15107.01-U-2525C\Hydraulics\PERMITS_Environmental\Drawings\Plansheets\Plansheets_2017_FNB\U-2525C_Hyd_4B_TSH.dgn

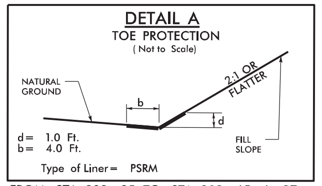
8/17/99

WETHERILL ENGINEERING
1223 Jones Franklin Road
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

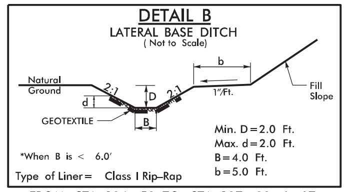
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	2D-1
R/W SHEET NO.	
	HYDRAULICS ENGINEER

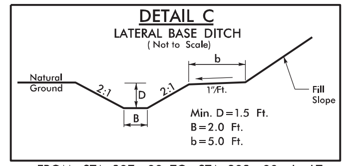
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



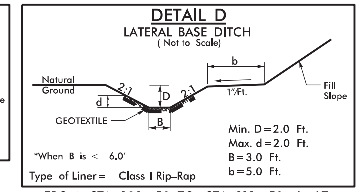
FROM STA. 303+35 TO STA. 303+65 –L– RT
FROM STA. 306+95 TO STA. 307+35 –L– RT



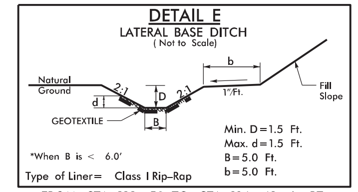
FROM STA. 304+50 TO STA. 307+00 –L– LT
FROM STA. 429+65 TO STA. 431+65 –L– LT



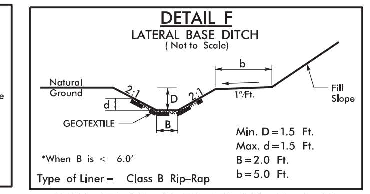
FROM STA. 307+00 TO STA. 308+00 –L– LT
FROM STA. 379+60 TO STA. 381+50 –L– RT
FROM STA. 441+23 TO STA. 441+50 –L– RT
FROM STA. 463+50 TO STA. 464+00 –L– LT
FROM STA. 500+75 TO STA. 504+50 –L– RT



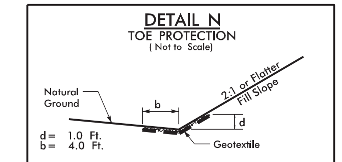
FROM STA. 309+50 TO STA. 313+50 –L– LT



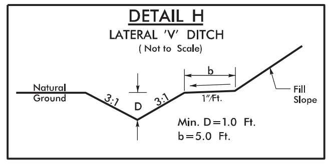
FROM STA. 313+50 TO STA. 314+42 –L– RT



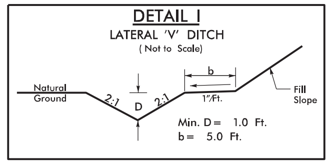
FROM STA. 301+50 TO STA. 302+12 –L– RT
FROM STA. 322+50 TO STA. 326+00 –L– RT
FROM STA. 357+00 TO STA. 360+00 –L– RT
FROM STA. 489+00 TO STA. 492+00 –L– LT
FROM STA. 504+00 TO STA. 505+05 –L– LT
FROM STA. 506+00 TO STA. 509+00 –L– RT



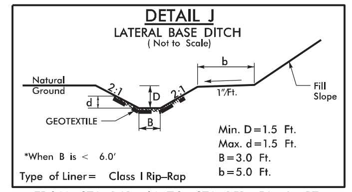
FROM STA 10+20 TO STA. 11+37 –Y13RPA– RT
FROM STA 11+45 TO STA. 13+50 –Y13RPA– RT
FROM STA. 302+05 TO STA. 302+45 –L– RT
FROM STA. 313+60 TO STA. 315+60 –L– LT
FROM STA. 315+70 TO STA. 316+00 –L– LT
FROM STA. 374+20 TO STA. 375+87 –L– LT
FROM STA. 464+00 TO STA. 465+20 –L– LT
FROM STA. 15+25 TO STA. 15+59.38 –Y6RPA– RT
FROM STA. 25+50 TO STA. 28+00 –Y6RPB– LT
FROM STA. 442+13 TO STA. 442+97 –L– LT
FROM STA. 473+05 TO STA. 473+50–L– RT
FROM STA. 484+58 TO STA. 485+88 –L– RT
FROM STA. 492+20 TO STA. 494+18 –L– LT
FROM STA. 491+50 TO WINGWALL –L– RT
FROM WINGWALL TO STA. 493+25 –L– RT
FROM STA. 530+74 TO STA. 530+85 –L– RT



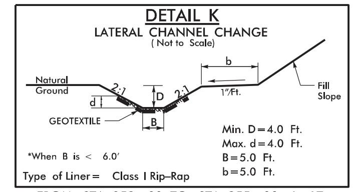
FROM STA. 342+50 TO STA. 344+50 –L– RT



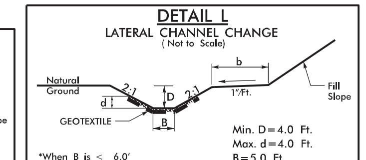
FROM STA. 274+50 TO STA. 276+50 –L– LT
FROM STA. 335+00 TO STA. 336+40 –L– RT
FROM STA. 352+50 TO STA. 353+63 –L– RT
FROM STA. 355+17 TO STA. 357+00 –L– RT
FROM STA. 365+50 TO STA. 369+00 –L– LT
FROM STA. 488+60 TO STA. 489+00 –L– LT
FROM STA. 15+33 TO STA. 16+34 –Y6– RT
FROM STA. 15+59.38 TO STA. 16+80 –Y6RPA– RT



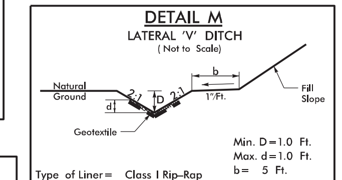
FROM STA. 348+60 TO STA. 351+50 –L– RT
FROM STA. 493+25 TO STA. 494+50 –L– RT
FROM STA. 495+50 TO STA. 500+50 –L– RT
FROM STA. 528+31 TO STA. 531+00 –L– LT
FROM STA. 21+50 TO STA. 22+79 –Y6RPC– RT
FROM STA. 278+88 TO STA. 279+50 –L– RT
FROM STA. 280+00 TO STA. 284+00 –L– RT



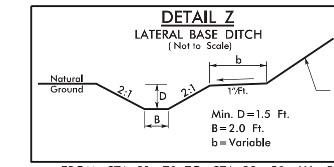
FROM STA. 353+00 TO STA. 355+00 –L– LT



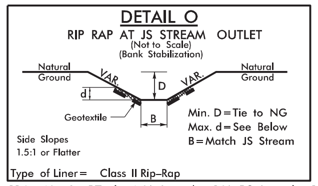
FROM STA. 350+18 TO STA. 353+00 –L– LT
FROM STA. 355+00 TO STA. 363+70 –L– LT



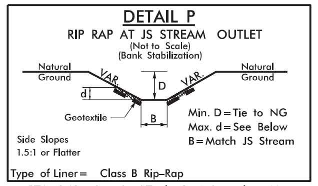
FROM STA. 382+00 TO STA. 385+50 –L– RT



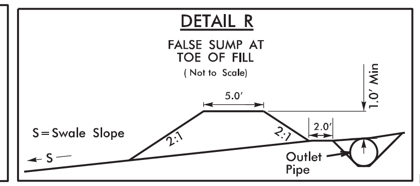
FROM STA. 21+70 TO STA. 22+50 –Y6– RT



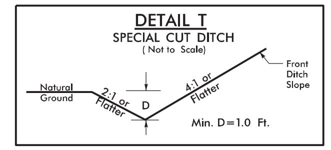
STA. 314+40 –L– RT; d=4.0'; Length=30'; BS Length=16'
(INLET) STA. 416+00 –L– LT; d=D; BS Length=40'
STA. 418+30 –L– RT; d=2.0'; BS Length=31'
STA 485+90 –L– RT; d=D; BS Length=30'



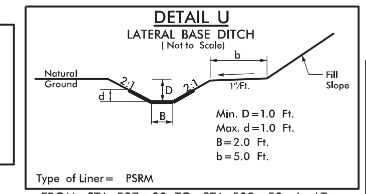
STA 342+65 –L– LT; d=3.5'; Length=18'



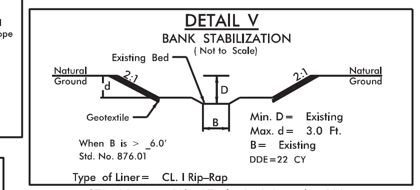
STA. 381+80 –L– RT
STA. 492+05 –L– LT



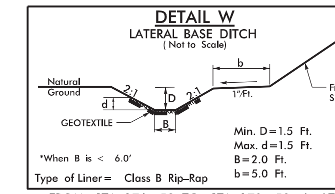
FROM STA. 17+11 TO STA. 17+60 –Y5– RT
FROM STA. 17+00 TO STA. 17+60 –Y5– LT
FROM STA. 18+50 TO STA. 20+90 –Y5– LT
FROM STA. 19+00 TO STA. 20+90 –Y5– RT
FROM STA. 27+50 TO STA. 28+00 –Y5– RT
FROM STA. 27+50 TO STA. 28+50 –Y5– LT
FROM STA. 453+50 –L– TO 10+65.94 –Y6RPC– RT
FROM STA. 10+95.22 TO STA. 11+97.06 –Y6LPA– LT
FROM STA. 15+09.21 TO STA. 24+53.63–Y6RPA– LT
FROM STA. 20+50 TO STA. 22+50 –Y6RPA– RT
FROM STA. 17+50 TO STA. 18+00 –Y6– LT
FROM STA. 20+00 TO STA. 21+50 –Y6– LT
FROM STA. 20+50 TO STA. 21+00 –Y6RPC– RT
FROM STA. 296+50 TO STA. 298+50 –L– RT
FROM STA. 296+50 TO STA. 298+00 –L– LT
FROM STA. 443+00 TO STA.443+50 –L– LT
FROM STA. 11+63 TO STA. 14+50 –Y17– LT
FROM STA. 13+70 TO STA. 14+50 –Y18– LT
FROM STA. 14+00 TO STA. 16+05 –Y16– LT
FROM STA. 19+69 TO STA. 21+00 –Y16– RT
FROM STA. 30+00 TO STA. 30+50 –Y6RPB– RT
FROM STA. 12+50 TO STA. 14+50 –Y16DET– RT
FROM STA. 11+00 TO STA. 13+50 –Y16DET– LT
FROM STA. 12+00 TO STA. 17+50 –Y7DET– RT
FROM STA. 17+00 TO STA. 18+50 –Y7DET– LT



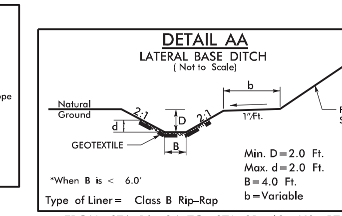
FROM STA. 507+00 TO STA. 509+50 –L– LT



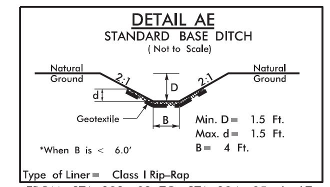
STA. 33+00 –Y6– LT; d=3.0'; Length=32'



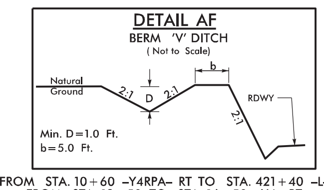
FROM STA. 276+50 TO STA. 279+50 –L– LT



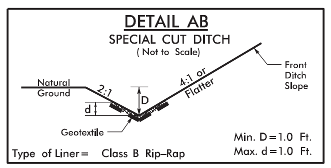
FROM STA. 16+34 TO STA. 21+62 –Y6– RT



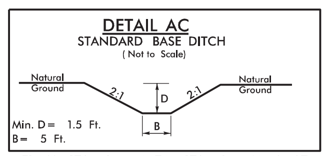
FROM STA. 383+92 TO STA. 384+95 –L– LT



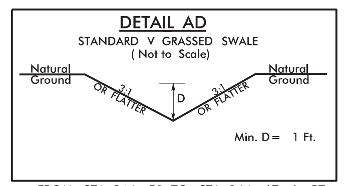
FROM STA. 10+60 –Y4RPA– RT TO STA. 421+40 –L– LT
FROM STA. 12+50 TO STA. 16+50 –Y4– RT
FROM STA. 24+00 TO STA. 26+00 –Y4– LT
FROM STA. 28+00 TO STA. 29+50 –Y6RPB– LT
FROM STA. 29+88 TO STA. 34+38 –Y13RPD– RT
FROM STA. 421+40 TO STA. 423+60 –L– LT
FROM STA. 437+00 TO STA. 439+60 –L– LT
FROM STA. 444+50 TO STA. 447+50 –L– LT
FROM STA. 532+90 TO STA. 536+50 –L– LT
FROM STA. 536+50 TO STA. 541+00 –L– LT



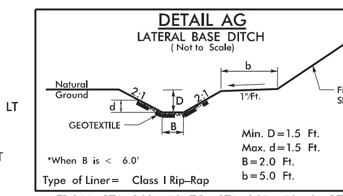
FROM STA. 13+59.62 TO STA. 15+09.23 –Y6RPA– RT



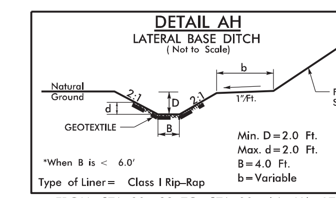
FROM STA. 528+00 TO STA. 528+40 –L– LT



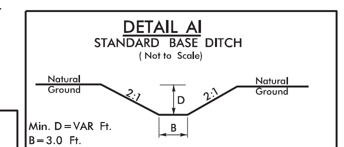
FROM STA. 344+50 TO STA. 344+67 –L– RT
FROM STA. 331+30 TO STA. 333+70 –L– RT



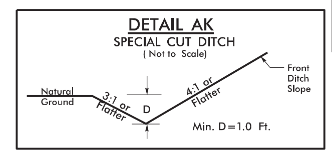
FROM STA. 362+50 TO STA. 365+50 –L– RT
FROM STA. 380+00 TO STA. 384+82 –L– LT



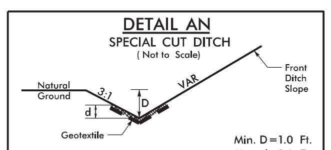
FROM STA. 22+00 TO STA. 22+64 –Y6– LT



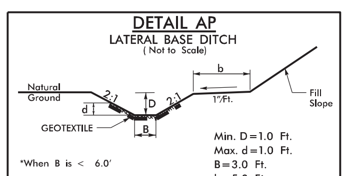
FROM STA. 439+07 TO STA. 439+74 –L– RT



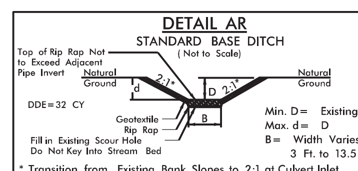
FROM STA. 438+50 TO STA. 439+50 –L– RT



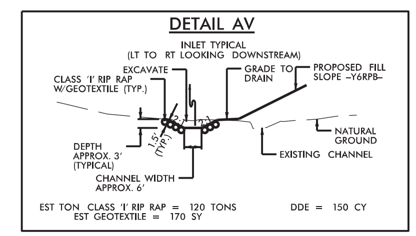
FROM STA. 441+00 TO STA. 442+00 –L– LT



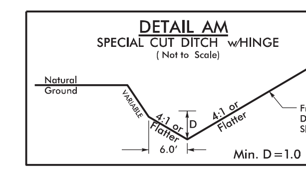
FROM STA. 471+42 TO STA. 472+95 –L– LT
FROM STA. 22+50 TO STA. 24+50 –Y6RPB– LT



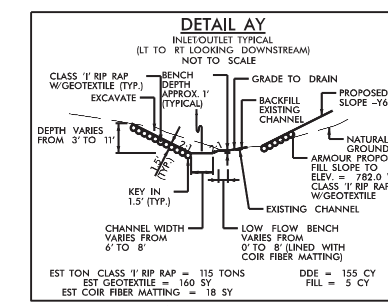
–Y6– STA. 32+44 (RT)



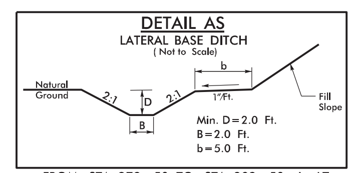
STA. 24+44 TO STA. 25+44 –Y6RPB– LT



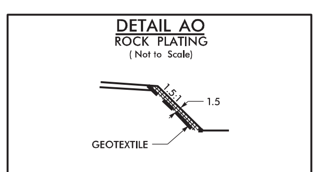
FROM STA. 18+00 TO STA. 21+50 –Y13RPA– RT
FROM STA. 21+50 TO STA. 27+61 –Y13RPA– RT
FROM STA. 20+50 TO STA. 22+50 –LACFLY– RT
FROM STA. 437+00 TO STA. 441+00 –L– LT
FROM STA. 436+50 TO STA. 438+50 –L– RT
FROM STA. 442+00 TO STA. 444+00 –L– RT
FROM STA. 24+83.30 TO STA. 25+85.96 Y6RPC– RT
FROM STA. 480+00 TO STA. 481+00 –L– LT
FROM STA. 513+50 TO STA. 514+00 –L– RT
FROM STA. 44+00 TO STA. 44+50 –Y4– LT



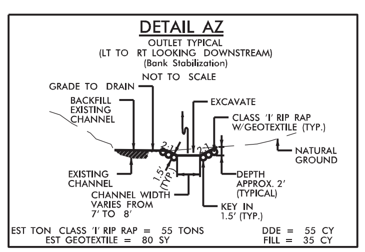
STA 471+23 –L– LT



FROM STA. 279+50 TO STA. 282+50 –L– LT



FROM STA. 508+50 TO STA. 511+25 –L– RT



STA 472+86 –L– RT; BS Length=9'

DETAIL BA
INLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
NOT TO SCALE
BENCH DEPTH APPROX. 1' (TYPICAL)
EXISTING CHANNEL
EXCAVATE
DEPTH VARIES FROM 1' TO 2'
NATURAL GROUND
KEY IN 1.5' (TYP.)
CLASS 'I' RIP RAP W/GEOTEXTILE (TYP.)
CHANNEL WIDTH VARIES FROM 5' TO 6'
LOW FLOW BENCH VARIES FROM 0' TO 8' (LINED WITH COIR FIBER MATTING)
EST TON CLASS 'I' RIP RAP = 17 TONS
EST GEOTEXTILE = 23 SY
EST COIR FIBER MATTING = 17 SY
DDE = 62 CY
FILL = 3 CY

STA 21+80 –Y6– RT

DETAIL BB
INLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
NOT TO SCALE
CLASS I RIP RAP W/GEOTEXTILE (TYP.)
EXCAVATE
NATURAL GROUND
2.5' HIGH BENCH WIDTH VARIES FROM 11' TO 0'
DEPTH APPROX. 3.5' (TYP.)
KEY IN 1.5' (TYP.)
CHANNEL WIDTH VARIES FROM 18' TO 23'
EST TON CLASS I RIP RAP = 88 TONS
EST GEOTEXTILE = 119 SY
DDE = 38 CY

STA 494+44 –L– LT

DETAIL BC
OUTLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
NOT TO SCALE
NATURAL GROUND
EXCAVATE
2.5' HIGH BENCH WIDTH VARIES FROM 11' TO 0'
DEPTH APPROX. 1.'
CLASS I RIP RAP W/GEOTEXTILE (TYP.)
CHANNEL WIDTH VARIES FROM 22' TO 18'
KEY IN 1.5' (TYP.)
EST TON CLASS I RIP RAP = 83 TONS
EST GEOTEXTILE = 111 SY
DDE = 23 CY

STA 492+38 –L– RT

DETAIL BD
INLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
NOT TO SCALE
NATURAL GROUND
EXCAVATE
CLASS 'I' RIP RAP W/GEOTEXTILE (TYP.)
DEPTH VARIES FROM 4' TO 5'
CHANNEL WIDTH VARIES FROM 5' TO 6'
DEPTH APPROX. 5'
EST TON CLASS 'I' RIP RAP = 72 TONS
EST GEOTEXTILE = 102 SY
DDE = 75 CY

STA 384+80 –L– LT

DETAIL BE
OUTLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
NOT TO SCALE
EXCAVATE
GRADE TO DRAIN
BACKFILL EXISTING CHANNEL W/ MATERIAL APPROVED BY ENGINEER
CLASS 'I' RIP RAP W/GEOTEXTILE (TYP.)
NATURAL GROUND
DEPTH APPROX. 2' (TYP.)
CHANNEL WIDTH VARIES FROM 5' TO 6'
EXISTING CHANNEL
EST TON CLASS 'I' RIP RAP = 65 TONS
EST GEOTEXTILE = 92 SY
DDE = 150 CY
FILL = 50 CY

STA 379+55 –L– RT

DETAIL AW
OUTLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
(Bank Stabilization)
PROPOSED FILL SLOPE –Y6RPB–
EXCAVATE
CLASS 'I' RIP RAP W/GEOTEXTILE (TYP.)
NATURAL GROUND
DEPTH APPROX. 2' (TYPICAL)
CHANNEL WIDTH VARIES FROM 6' TO 12'
EST TON CLASS 'I' RIP RAP = 13 TONS
EST GEOTEXTILE = 18 SY
DDE = 9 CY

STA 26+90 –Y6RPB– RT
BS Length = 26'

DETAIL BH
INLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
(Bank Stabilization)
NOT TO SCALE
TIE TO EXISTING TOP OF BANK (SLOPE 2:1 OR FLATTER)
EXCAVATE
CLASS 'I' RIP RAP W/GEOTEXTILE (TYP.)
NATURAL GROUND
DEPTH VARIES FROM 3' TO 4'
DEPTH APPROX. 2'
CHANNEL WIDTH APPROX. 8'
EST TON CLASS 'I' RIP RAP = 22 TONS
EST GEOTEXTILE = 30 SY
DDE = 8 CY

STA 25+60 –Y6RPD– RT
BS Length=21'

DETAIL BI
OUTLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
(Bank Stabilization)
NOT TO SCALE
DEPTH APPROX. 1' (TYPICAL)
EXCAVATE
NATURAL GROUND
DEPTH APPROX. 6'
CHANNEL WIDTH APPROX. 8'
CLASS 'I' RIP RAP W/GEOTEXTILE (TYP.)
EST TON CLASS 'I' RIP RAP = 21 TONS
EST GEOTEXTILE = 29 SY
DDE = 18 CY

STA 25+60 –Y6RPD– LT
BS Length=19'

DETAIL BJ
STANDARD BASE DITCH
(Not to Scale)
Natural Ground
2:1
D
2:1
Natural Ground
d
Geotextile
B
Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 3.0 Ft.
*When B is < 6.0'
Type of Liner= Class B Rip-Rap

FROM STA. 341+67 TO STA. 342+74 –L– LT

DETAIL BN
INLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
NOT TO SCALE
(Bank Stabilization)
CLASS 'I' RIP RAP W/GEOTEXTILE (TYP.)
EXCAVATE
GRADE TO DRAIN
BACKFILL EXISTING CHANNEL W/ MATERIAL APPROVED BY ENGINEER
DEPTH VARIES FROM 2' TO 12'
NATURAL GROUND
EXISTING CHANNEL
DEPTH APPROX. 3'
CHANNEL WIDTH VARIES FROM 4' TO 8'
EST TON CLASS 'I' RIP RAP = 85 TONS
EST GEOTEXTILE = 115 SY
DDE = 190 CY
FILL = 50 CY

STA 363+75 –L– LT
BS Length=20'

DETAIL BO
OUTLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
NOT TO SCALE
GRADE TO DRAIN
EXCAVATE
CLASS 'I' RIP RAP W/GEOTEXTILE (TYP.)
BACKFILL EXISTING CHANNEL W/ MATERIAL APPROVED BY ENGINEER
NATURAL GROUND
CHANNEL WIDTH VARIES FROM 7' TO 8'
DEPTH APPROX. 4' (TYP.)
EXISTING CHANNEL
EST TON CLASS 'I' RIP RAP = 45 TONS
EST GEOTEXTILE = 70 SY
DDE = 42 CY
FILL = 33 CY

STA 365+60 –L– RT

DETAIL BP
JS CHANNEL CHANGE
(Not to Scale)
Natural Ground
Varies from Existing to 2:1 to at RCBC
D
Natural Ground
d
Geotextile
B
Min. D= 2.0 Ft.
Max. d= D
B=Varies from 6 Ft. at RCBC to Existing
When B is > 6.0'
Std. No. 876.01
DDE=93Cu. Yds. EST. GEO=137Sq. Yds.
EST. 62 Tons CL. I Rip-Rap

–L– STA. 430+22 RT
–L– STA. 431+60 LT

DETAIL BF
RIP RAP AT JS STREAM OUTLET
(Not to Scale)
(Bank Stabilization)
Natural Ground
VAR.
D
VAR.
Natural Ground
d
Geotextile
B
Min. D=Tie to NG
Max. d=See Below
B=Match JS Stream
Side Slopes
1.5:1 or Flatter
Type of Liner= Class I Rip-Rap

STA 278+80 –L– RT; d=3.5'; Length=45'; DDE=24 CY
STA 505+15 –L– LT; d=1.5'; Length=29'; BS Length=10'; DDE=10 CY
STA 530+95 –L– RT; d=3.5'; Length=19'; DDE=12 CY

10/24/2017
FBrooks
P:\2015\15107.01-U-2525C\Hydraulics\PERMITS Environmental\Drawings\Plansheets\Plansheets 2017 FNB\U2525C hyd drn details permits.dgn

8/17/99

PERMIT DRAWING
SHEET 3 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	2D-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CSR #1 DETAIL
(NOT TO SCALE)

SINGLE BARREL CULVERT SKEWED CHANNEL AND SILLS

*NOTES:

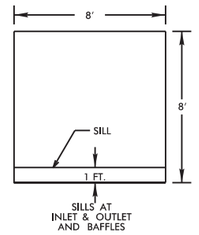
1) BACKFILL BETWEEN SILLS/BAFFLES WITH NATIVE MATERIAL FLUSH WITH THE TOP OF THE SILLS/BAFFLES. IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

2) SILLS/BAFFLES ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

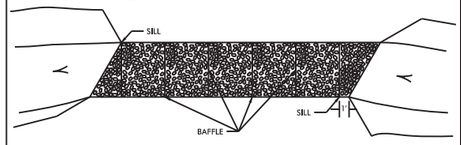
3) TOP SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) NUMBER OF SILL/BAFFLES DETERMINED BY THE ENGINEER.

5) A LOW FLOW CHANNEL WILL NOT BE CREATED AT THIS LOCATION SINCE UPSTREAM OF THE SITE HAS APPROXIMATELY A 4' CHANNEL BASE AND DOWNSTREAM OF THE SITE HAS A APPROXIMATELY A 8' BASE DUE TO A LARGE TRIBUTARY ENTERING THE STREAM IN THE LOCATION OF THE PROPOSED FILL IN THE PROPOSED CONDITIONS THE TRIBUTARY WILL ENTER AT THE INLET.



SILLS AT INLET & OUTLET AND BAFFLES



NUMBER OF BAFFLES=23
ON 20 FT CENTERS FROM DOWNSTREAM SILL

PLAN VIEW

913

CSR #2 DETAIL
(NOT TO SCALE)

SINGLE BARREL CULVERT SKEWED CHANNEL AND SILLS

*NOTES:

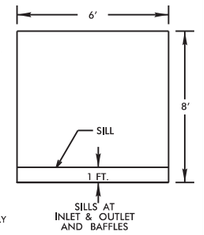
1) BACKFILL BETWEEN SILLS/BAFFLES WITH NATIVE MATERIAL FLUSH WITH THE TOP OF THE SILLS/BAFFLES. IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

2) SILLS/BAFFLES ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

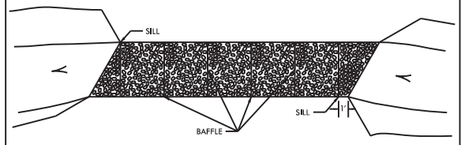
3) TOP SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) NUMBER OF SILL/BAFFLES DETERMINED BY THE ENGINEER.

5) A LOW FLOW CHANNEL WILL NOT BE CREATED AT THIS LOCATION SINCE THE UPSTREAM AND DOWNSTREAM CHANNEL WIDTH IS APPROXIMATELY 6 FOOT, WHICH MATCHES THE WIDTH OF THE PROPOSED CULVERT.



SILLS AT INLET & OUTLET AND BAFFLES



NUMBER OF BAFFLES=24
ON 25 FT CENTERS FROM DOWNSTREAM SILL

PLAN VIEW

913

CSR #3 DETAIL
(NOT TO SCALE)

SINGLE BARREL CULVERT SKEWED LOW FLOW CHANNEL AND SILLS

*NOTES:

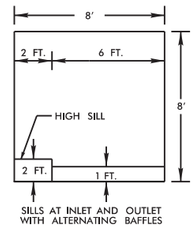
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

2) SILLS/BAFFLES ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

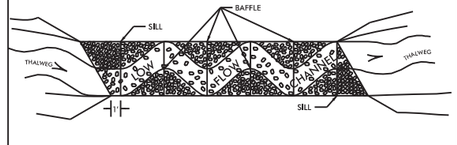
3) TOP OF LOW FLOW SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) DO NOT SET ELEVATION OF HIGH SILL/BAFFLES ABOVE BANK FULL.

5) NUMBER OF SILL/BAFFLES DETERMINED BY THE ENGINEER.



SILLS AT INLET AND OUTLET WITH ALTERNATING BAFFLES



NUMBER OF BAFFLES=4
ON 67.5 FT CENTERS FROM DOWNSTREAM SILL

PLAN VIEW

913

CSR #4 DETAIL
(NOT TO SCALE)

SINGLE BARREL CULVERT SKEWED CHANNEL AND SILLS

*NOTES:

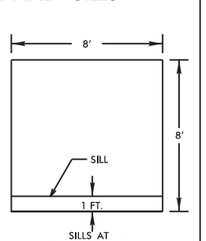
1) BACKFILL BETWEEN SILLS/BAFFLES WITH NATIVE MATERIAL FLUSH WITH THE TOP OF THE SILLS/BAFFLES. IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

2) SILLS/BAFFLES ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

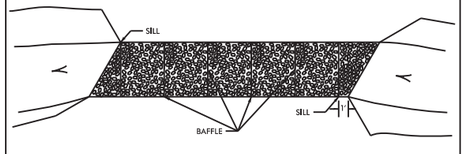
3) TOP SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) NUMBER OF SILL/BAFFLES DETERMINED BY THE ENGINEER.

5) A LOW FLOW CHANNEL WILL NOT BE CREATED AT THIS LOCATION SINCE UPSTREAM AND DOWNSTREAM CHANNEL WIDTH IS APPROXIMATELY 8 FOOT, WHICH ALSO MATCHES THE WIDTH OF THE PROPOSED CULVERT.



SILLS AT INLET & OUTLET AND BAFFLES



NUMBER OF BAFFLES=12
ON 25 FT CENTERS FROM DOWNSTREAM SILL

PLAN VIEW

913

CSR #5 DETAIL
(NOT TO SCALE)

SKEWED MULTI–BARREL CULVERT LOW FLOW CHANNEL,SILLS AND FLOOD PLAIN

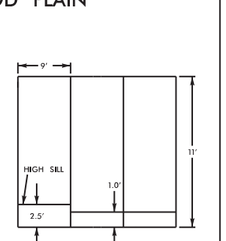
*NOTES:

1) NATIVE MATERIAL BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARRELS. RIP-RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL IF RIP-RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

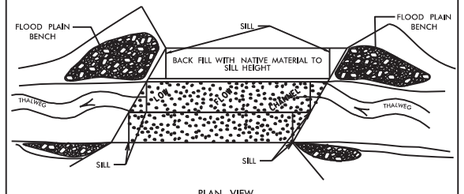
2) SILLS ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

3) TOP OF LOW FLOW SILLS SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) DO NOT SET ELEVATION OF HIGH SILL/BAFFLES ABOVE BANK FULL.



SILLS AT INLET AND OUTLET



PLAN VIEW

913

CSR #8 DETAIL
(NOT TO SCALE)

SINGLE BARREL CULVERT LOW FLOW CHANNEL AND SILLS

*NOTES:

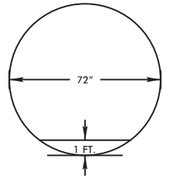
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

2) SILLS/BAFFLES ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

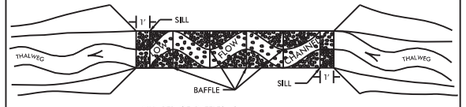
3) TOP OF LOW FLOW SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) DO NOT SET ELEVATION OF HIGH SILL/BAFFLES ABOVE BANK FULL.

5) NUMBER OF SILL/BAFFLES DETERMINED BY THE ENGINEER.



SILLS AT INLET AND OUTLET



NUMBER OF BAFFLES=2
ON 1FT CENTERS FROM DOWNSTREAM SILL

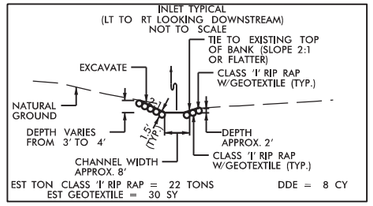
PLAN VIEW

913

CSR #9 DETAIL
(NOT TO SCALE)

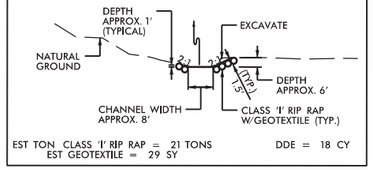
SINGLE BARREL CULVERT CHANNEL DETAIL

INLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
NOT TO SCALE



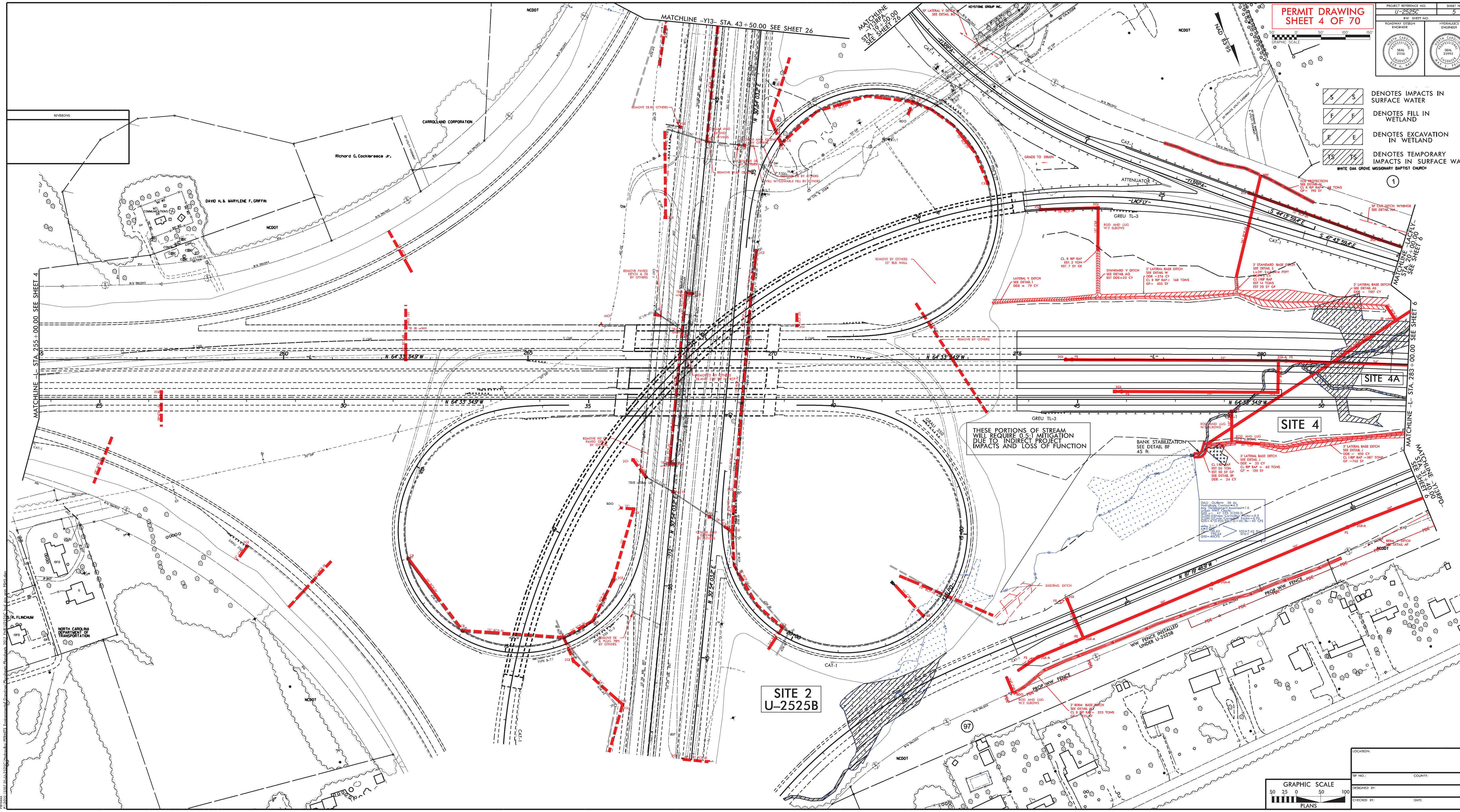
EST TON CLASS 'I' RIP RAP = 22 TONS DDE = 8 CY
EST GEOTEXTILE = 30 SY

OUTLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
NOT TO SCALE



EST TON CLASS 'I' RIP RAP = 21 TONS DDE = 18 CY
EST GEOTEXTILE = 29 SY

10/12/2017
Plotted by:
P:\2015\15107.01\d\U-2525C\Hydraulics\PERMITS_Environmental\Drawings\Roadway\U2525C_hyd_dra_orm_Details_Permit Drawings.dgn


PERMIT DRAWING
SHEET 4 OF 70
PROJECT REFERENCE NO. U-2525C
SHEET NO. 5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
GRAPHIC SCALE
NAD 83/95
DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
DENOTES EXCAVATION IN WETLAND
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
WHITE OAK GROVE MISSIONARY BAPTIST CHURCH
MATCHLINE -Y13- STA. 43+50.00 SEE SHEET 26
MATCHLINE -Y13RPA- STA. 19+50.00 SEE SHEET 26
MATCHLINE -LACFLY- STA. 20+00.00 SEE SHEET 6
MATCHLINE -L- STA. 283+00.00 SEE SHEET 6
MATCHLINE -Y13RPD- STA. 31+40.00 SEE SHEET 6
MATCHLINE -L- STA. 255+00.00 SEE SHEET 4
REVISIONS
CARROLLAND CORPORATION
Richard G. Cocklereece Jr.
DAVID H. & MARYLENE F. GRIFFIN
NCDOT
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
THESE PORTIONS OF STREAM WILL REQUIRE 0.5:1 MITIGATION DUE TO INDIRECT PROJECT IMPACTS AND LOSS OF FUNCTION
BANK STABILIZATION SEE DETAIL BF 45 ft.
SITE 4A
SITE 4
SITE 2
U-2525B
WW FENCE INSTALLED UNDER U-2525B
PROP WW FENCE
GRAPHIC SCALE
PLANS
LOCATION:
TIP NO.:
COUNTY:
DESIGNED BY:
CHECKED BY:
DATE:

PERMIT DRAWING
SHEET 5 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 21016 — NORTH CAROLINA PROFESSIONAL ENGINEER

HYDRAULICS ENGINEER — SEAL 23993 — NORTH CAROLINA PROFESSIONAL ENGINEER

GRAPHIC SCALE 0 50 100 150

S S DENOTES IMPACTS IN SURFACE WATER

F F DENOTES FILL IN WETLAND

E E DENOTES EXCAVATION IN WETLAND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE –Y13– STA. 43+50.00 SEE SHEET 26

MATCHLINE –Y13– STA. 40+50.00 SEE SHEET 26

MATCHLINE –L– STA. 255+00.00 SEE SHEET 4

MATCHLINE –L– STA. 283+00.00 SEE SHEET 6

MATCHLINE –L– STA. 279+00.00 SEE SHEET 6

MATCHLINE –Y13– STA. 40+00.00 SEE SHEET 26

WHITE OAK GROVE MISSIONARY BAPTIST CHURCH

CARROLLAND CORPORATION

Richard G. Cockerecke Jr.

DAVID AL & MARYLENE F. GRIFFIN

N. FLINCHUM

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

KEYSTONE GROUP INC.

NCDOT

SITE 2
U–2525B

SITE 4

SITE 4A

THESE PORTIONS OF STREAM WILL REQUIRE 0.5:1 MITIGATION DUE TO INDIRECT PROJECT IMPACTS AND LOSS OF FUNCTION

WW FENCE INSTALLED UNDER U-2525B

PROP. WW FENCE

ATTENUATOR

–L– PI STA. 279+00.00

–L– PT STA. 283+00.00

BANK STABILIZATION SEE DETAIL RF

LOCATION:

TIP NO.: COUNTY:

DESIGNED BY:

CHECKED BY: DATE:

GRAPHIC SCALE 50 25 0 50 100 PLANS

10/2/2017
Projects
P:\projects\U-2525C\Hydraulics_Roadway_Programming\Roadway_Design\Plan_Sheets\U-2525C_PS_Sheet_05.dgn
PW-28B

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 6 OF 70

8/17/99

REVISIONS

MATCHLINE –L– STA. 283+00.00 SEE SHEET 5

MATCHLINE –L– STA. 296+00.00 SEE SHEET 7

MATCHLINE –LACFLY– STA. 20+00.00 SEE SHEET 5

MATCHLINE –Y13RPD– STA. 31+40.00 SEE SHEET 5

NAD 83/95

SITE 4A

SITE 4

S 47° 43' 59.4" E

N 29° 18' 08.9" E

N 89° 44' 27.4" W

N 87° 46' 09.5" W

WHITE OAK GROVE MISSIONARY BAPTIST CHURCH

THOMAS C. CHRISTOPHER and SYLVIA R. CHRISTOPHER

FELTS FAMILY LTD PARTNERSHIP

NCDOT (FORMERLY GREGORY FELTS)

NCDOT (FORMERLY ROBERT B. KING)

NCDOT (FORMERLY WILMA KING)

NCDOT (FORMERLY ROBERT CABLE)

NCDOT (MABEL CHILTON HEIRS)

NCDOT (Formerly Janet K. Morris)

(NO CLAIM) RONALD A. GREENE

ANTONIO ROSAS

(NO CLAIM) JERRY WAYNE GREGORY

NCDOT (FORMERLY JERRY GREGORY)

NCDOT (FORMERLY STEVIE CRAWFORD)

NCDOT (FORMERLY JOHN HOFFMAN)

LARRY D. BUCKNER (FORMERLY ROBERT D. HOPE & SCOLEST)

BILLY DEAN BUCKNER & KRISTY LYNN BUCKNER

DDH PARTNERS, LLC

JIMMY R. MANNING & PEGGY O. MANNING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

GRAPHIC SCALE 50' 0' 50' 100' 150'

PERMIT DRAWING SHEET 7 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS 8/17/99

DENOTES FILL IN WETLAND (F F)

DENOTES IMPACTS IN SURFACE WATER (S S)

50' 0' 50' 100' 150'
GRAPHIC SCALE

NAD 83/95

MATCHLINE -L- STA. 283+00.00 SEE SHEET 5

MATCHLINE -L- STA. 296+00.00 SEE SHEET 7

MATCHLINE -Y13RPD- STA. 31+40.00 SEE SHEET 5

MATCHLINE -LACFLY- STA. 20+00.00 SEE SHEET 5

SITE 4A

SITE 4

WHITE OAK GROVE MISSIONARY BAPTIST CHURCH

THOMAS C. CHRISTOPHER and SYLVIA R CHRISTOPHER

FELTS FAMILY LTD PARTNERSHIP

2SBLK BAPTIST CHURCH

NCDOT (FORMERLY GREGORY FELTS)

NO CLAIM 109

907

908 909 901

NCDOT (FORMERLY ROBERT B. KING)

NCDOT (FORMERLY WILMA KING)

959 NCDOT (FORMERLY ROBERT CABLE)

975 NCDOT (MABEL CHILTON HEIRS)

912 NCDOT (FORMERLY STEVIE CRAWFORD)

(NO CLAIM) RONALD A. GREENE 85

86 NCDOT (Formerly Janet K. Morris)

87 (NO CLAIM) JERRY WAYNE GREGORY

88 (NO CLAIM) NCDOT (FORMERLY JERRY GREGORY)

932 NCDOT (FORMERLY JERRY GREGORY)

99 DDH PARTNERS, LLC

100 JIMMY R. MANNING & PEGGY O. MANNING

4 LARRY D. BUCKNER (FORMERLY ROBERT D. & HOPE R. SCALLET)

BILLY DEAN BUCKNER & KRISTY LYNN BUCKNER

NCDOT (FORMERLY JOHN HOFFMAN)

ANTONIO ROSAS

PRIVATE PUMP STATION

DO NOT DISTURB WELL

42" RCP-III (NOT BURIED)

15" RCP-III

18" RCP-III

24" RCP-III

30" RCP-III

36" RCP-III

15" CSP

SPECIAL CUT DITCH SEE DETAIL AM

JB-WMH

2GI

2GI-A

FS

RETAIN

REMOVE

CLEAN OUT DITCH

PINDALS ROAD

-LACFLY-

-L-

-Y13RPD-

-Y16-

S 47° 43' 59.4" E

N 89° 44' 27.4" W

N 29° 18' 08.9" E

N 87° 46' 09.5" W

N 20° 30' 00" W

285 290 295 55 60 35

PUE

EXISTING R/W

EXISTING B/R

10/22/2017
FRevels
P:\2015\15107.01-U-2525C\Hydraulics PERMITS Environmental Drawings\Plansheets Plansheets 2017 FNB\U2525C_hyd_drn_pm_PSH06_con.dgn

SITE 4 /4A ENLARGEMENT

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	5/6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 8 OF 70

GRAPHIC SCALE 50' 0' 50' 100' 150'

UNDER U-2525B INSTALLED

DENOTES IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES EXCAVATION IN WETLAND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/95

-L- SC Sta. 279+50.09

S 47° 43' 59.4" E

36" RCP

CAT-1

2GI

15" RCP

15"

18"

15" CSP

2' LATERAL BASE DITCH
SEE DETAIL AS
DDE = 1187 CY

42" RCP-III (NOT BURIED)

36" RCP-III

JB w/MH

SITE 4A

280

285

2GI-A FS

2GI-A

15" RCP-IV

24" RCP-III

SITE 4

N 64° 33' 34.9" W

50

-LCD-

-LCD- TS Sta. 49+76.70

-LCD- SC Sta. 50+56.70

ROD AND LUG
W/2 ELBOWS

30" CSP

3' LATERAL BASE DITCH
SEE DETAIL J
DDE = 33 CY
CL I RIP RAP = 60 TONS

CL I RIP RAP
EST 26 TON

3' LATERAL BASE DITCH
SEE DETAIL J
DDE = 450 CY
CL I RIP RAP = 387 TONS
GF = 765 SY

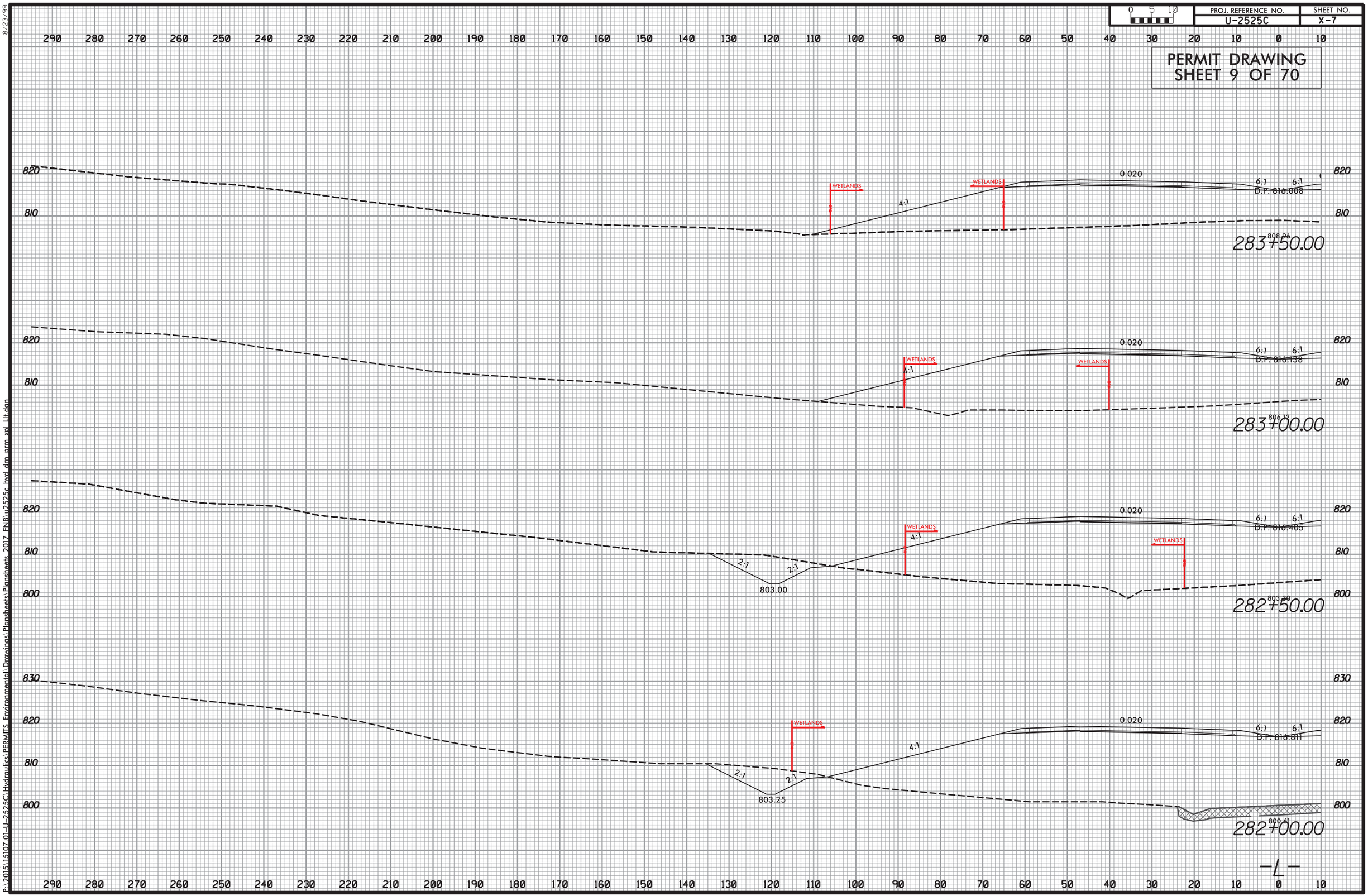
-Y13RPD-

5/14/99

10/23/2017
FBrooks
P:\2015\15107.01-U-2525C\Hydraulics\PERMITS Environmental\Drawings\Plansheets\Plansheets 2017 FNB\U2525C_hyd_drn_prm_PSH5_SITE4_enl.dgn

PROJ. REFERENCE NO.	SHEET NO.
U-2525C	X-7

PERMIT DRAWING
SHEET 9 OF 70



-L-

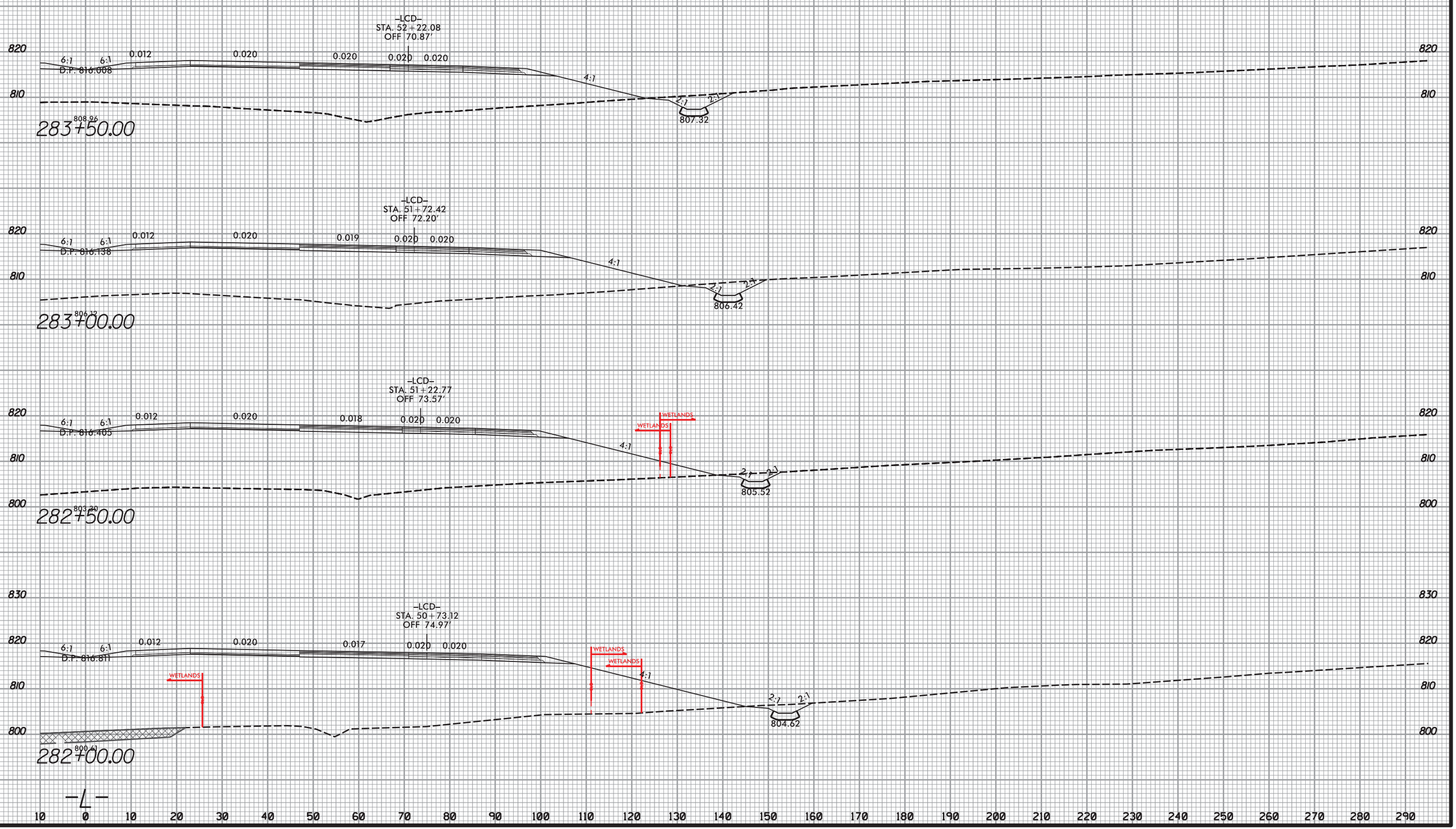
8/23/99

10/23/2017
FBrooks
P:\2015\15107.01-U-2525C\Hydraulics\PERMITS_Environmental\Drawings\Plansheets\Plansheets_2017_FNB\u2525c_hyd_drn_prm_xsl_llt.dgn

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2525C	X-212

PERMIT DRAWING
SHEET 10 OF 70

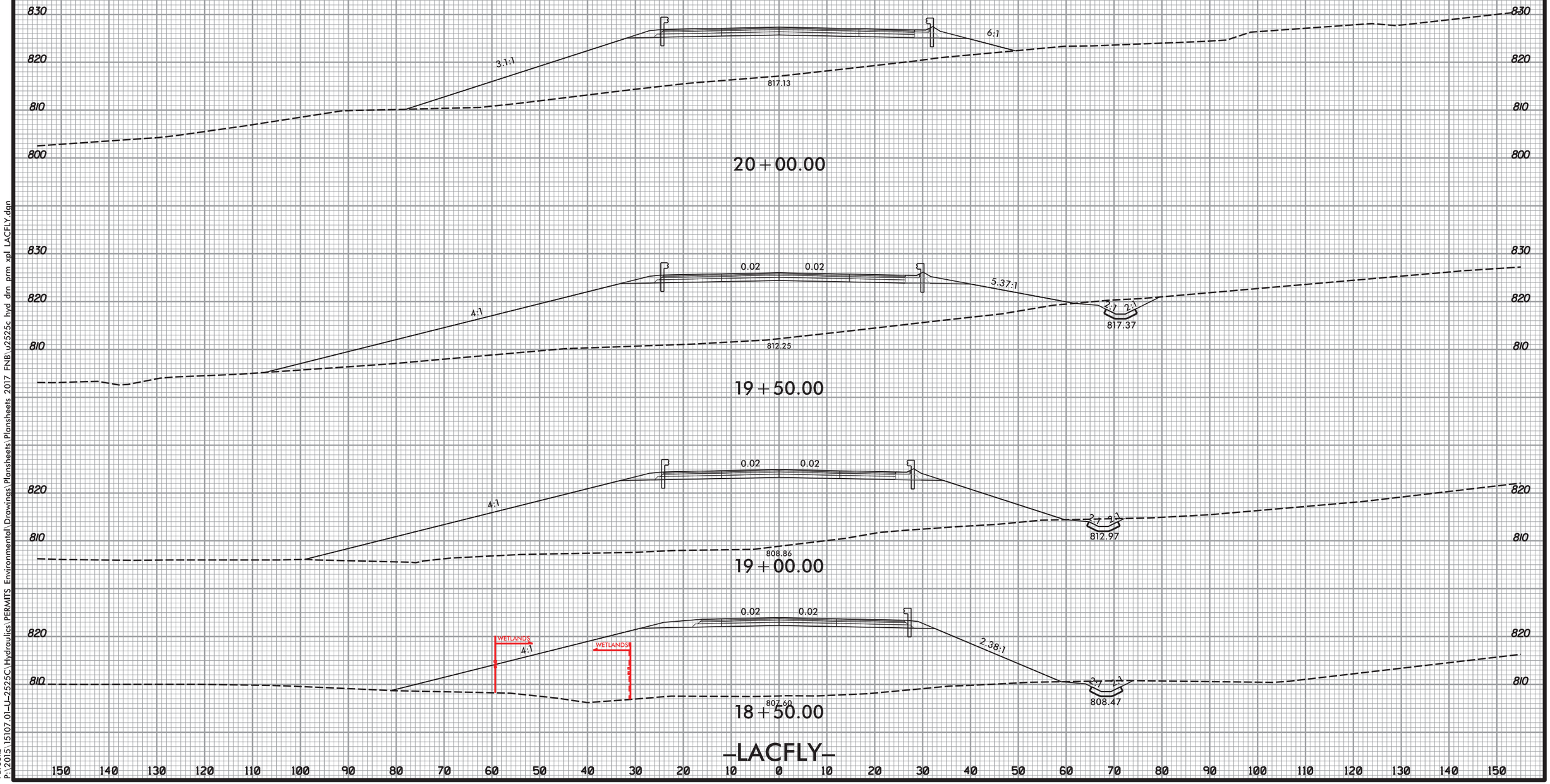


10/22/2017
FRANKLIN
P:\2015\15107.01-U-2525C\Hydraulics\PERMITS Environmental Drawings\Plansheets Plansheets 2017 ENB\u2525c_hyd-dim_prm_xpl_Lrt.dgn

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2525C	X-447

PERMIT DRAWING
SHEET 11 OF 70

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



–LACFLY–

PERMIT DRAWING
SHEET 12 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS 8/17/99

NAD 83/95

ELIZABETH MCCULLEY

CHATOYANCY, LLC

CRYSTAL R. WRIGHT-POOLE

TRIFECTA SQUARE, LLC

RAM HOMES, INC.

ANDREW MICHAEL JORDAN & EVA M. JORDAN

PELAGIC PROPERTIES OF NORTH CAROLINA, LLC

TRIFECTA SQUARE LLC

BLUE ROCK CT. (NON-SYSTEM) 26.2' BST

BLUE ROCK CHURCH RD (SYSTEM) 26.2' BST

NCDOT (FORMERLY ROBERT CABLE)

NCDOT (FORMERLY CHATOYANCY, LLC)

NCDOT (MABEL CHILTON HEIRS)

NCDOT (FORMERLY STEVIE CRAWFORD)

LARRY D. BUCKNER (FORMERLY ROBERT D. & HOPE F. SCALES)

CYGNUS NC LOTS, LLC (FORMERLY CHATOYANCY, LLC)

959 963 975 912 4

WOODS

DENOTES MECHANIZED CLEARING

DENOTES EXCAVATION IN WETLAND

DENOTES FILL IN WETLAND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

GRAPHIC SCALE 50' 0' 50' 100' 150'

MATCHLINE -L- STA. 296+00.00 SEE SHEET 6

MATCHLINE -L- STA. 308+00.00 SEE SHEET 8

N 53° 33' 55.7" W 305

300

65

SITE 5

SITE 6

SITE 7

SP. CUT DITCH SEE DETAIL 'I'

CL B RIP RAP EST 5 TON EST 14 SY GF LENGTH=15'

CL B RIP RAP EST 2 TON EST 7 SY GF

20' UTILITY EASEMENT

LATERAL 4' BASE DITCH SEE DETAIL "B" DDE = 251 CY CL B RIP RAP = 100 TONS EST = 570 SY GF

LATERAL 2' BASE DITCH SEE DETAIL "C" DDE 100 CY

ROD AND LUG W/2 ELBOWS

TOE PROTECTION SEE DETAIL "A" EST = 20 SY

TOE PROTECTION SEE DETAIL "N" CL B RIP RAP = 12 TONS EST = 40 SY

Q10=4.5 cfs V10=1.43 fps

LATERAL 5' BASE DITCH SEE DETAIL "F" DDE = 14 CY CL B RIP RAP = 35 TONS GF=95 SY

TOE PROTECTION SEE DETAIL "A"

CL B RIP RAP LENGTH = 17' EST 11 TONS EST 28 SY GF

15" RCP-IV 18" CSP 36" RCP-IV 15" RCP-V 15" CSP ELBOW 2GI FS

10/23/2017
P:\2015\15107.01-U-2525C Hydraulics PERMITS Environmental Provisions Plansheets Plansheets 2017 ENB\U2525C_hyd_dsn_mm_PSH07.dgn

PERMIT DRAWING
SHEET 13 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

8/17/99

REVISIONS

MATCHLINE -L- STA. 296+00.00 SEE SHEET 6

MATCHLINE -L- STA. 308+00.00 SEE SHEET 8

NAD 83/95

CRYSTAL R. WRIGHT-POOLE

BM #1

ELIZABETH MCCLELLEY

CHATOYANCY, LLC

TRIFECTA SQUARE, LLC

HAM HOMES, INC.

MICHAEL JORDAN & EVA M. JORDAN

PELAGIC PROPERTIES OF NORTH CAROLINA, LLC

BLUE ROCK CT. (NON-SYSTEM) 26.2' BST

BLUE ROCK CT. (NON-SYSTEM) 26.2' BST

NCDOT (FORMERLY ROBERT CABLE)

NCDOT (FORMERLY CHATOYANCY, LLC)

NCDOT (MABEL CHILTON HEIRS)

NCDOT (FORMERLY STEVIE CRAWFORD)

LARRY D. BUCKNER (FORMERLY ROBERT D. & HOPE F. SCALES)

CYGNUS NC LOTS, LLC (FORMERLY CHATOYANCY, LLC)

WOODS

959

963

975

912

4

65

300

N 53° 33' 55.7" W 305

SR CUT DITCH SEE DETAIL 'T'

CL B RIP RAP EST 5 TON EST 14 SY GF LENGTH=15'

CL B RIP RAP EST 2 TON EST 7 SY GF

LATERAL 4' BASE DITCH SEE DETAIL 'B' DDE = 251 CY CL B RIP RAP= 570 TONS EST= 570 SY GF

LATERAL 2' BASE DITCH SEE DETAIL 'C' DDE 100 CY

ROD AND LUG W/2 ELBOWS

15" RCP-IV

15" RCP-V

36" RCP-IV

2GI

FS

SITE 5

SITE 6

SITE 7

TOE PROTECTION SEE DETAIL "N" CL B RIP RAP= 12 TONS GF= 40 SY

TOE PROTECTION SEE DETAIL "A" RIP RAP= 20 SY

LATERAL 5' BASE DITCH SEE DETAIL 'F' DDE = 14 CY CL B RIP RAP= 35 TONS GF=95 SY

Q10=4.3 cfs V10=1.43 fps

TOE PROTECTION SEE DETAIL "A"

CL B RIP RAP LENGTH = 17' EST 11 TONS EST 28 SY GF

20' UTILITY EASEMENT

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES EXCAVATION IN WETLAND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'

GRAPHIC SCALE

10/23/2017
RPeacock
P:\2015\15107.01-U-2525C-Hydraulics-PERMITS-Environmental Provisions-Plansheets-Planshests_2017_ENB-U2525C_hyd_dsn_rpm_PSH07_con.dgn

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2525C	X-14

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

PERMIT DRAWING
SHEET 14 OF 70

850
840

2:1
6:1
839.89
0.020
0.002
66:1
6:1
846.88
D.P. 841.920

298+50.00

850
840

2:1
6:1
838.97
0.020
0.007
5.98 6:1
6:1
D.P. 840.720
840.72

298+00.00

850
840
830

3:1
6:1
837.54
0.020
0.012
66:1
6:1
D.P. 839.920
837.37

297+50.00

840
830

WETLANDS
W
3:1
6:1
835.55
0.020
0.017
5.96 6:1
6:1
D.P. 838.920
835.08

297+00.00

-L-

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

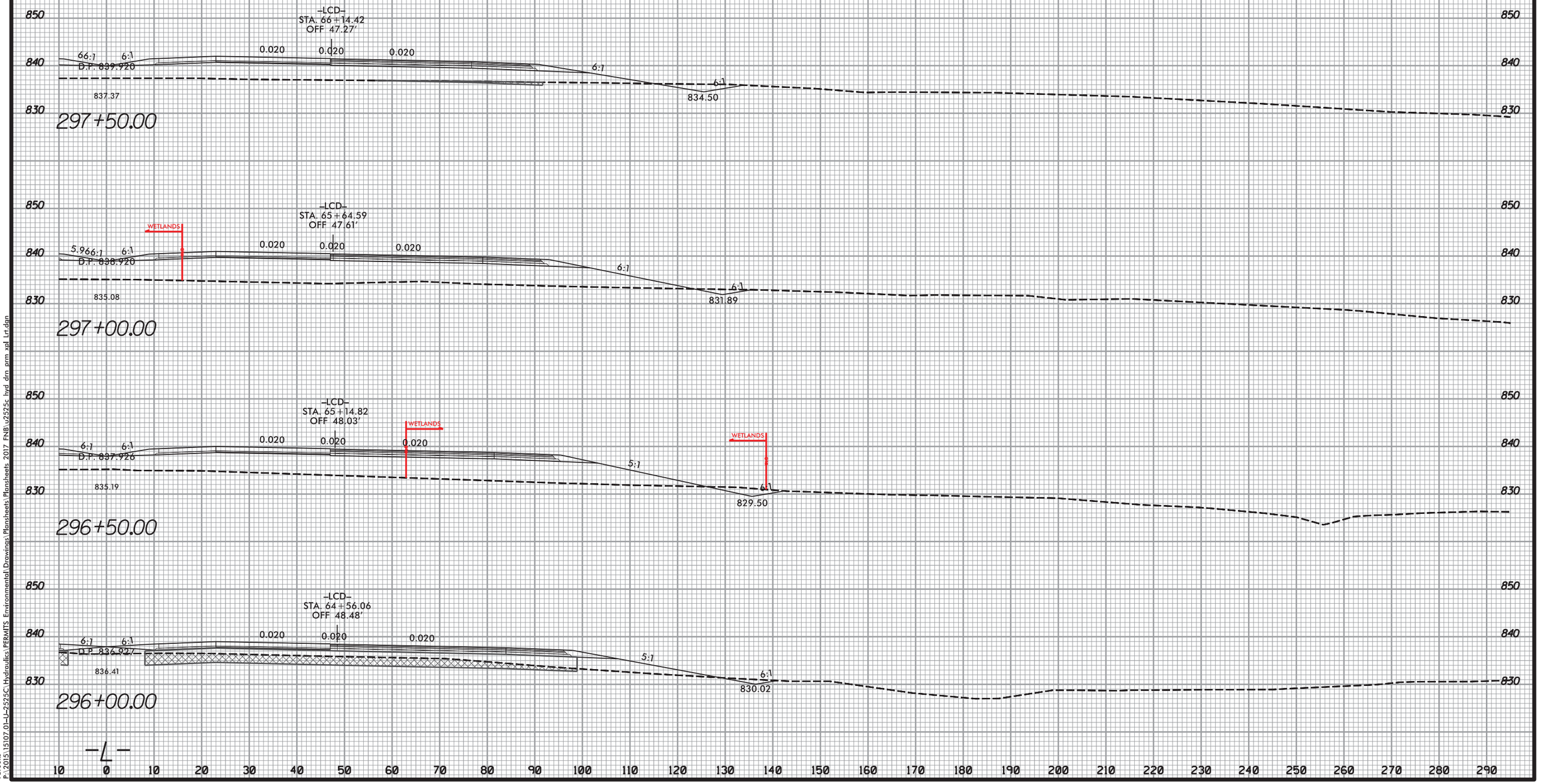
10/23/2017
FBrooks
P:\2015\15107.01-U-2525C\Hydraulics\PERMITS Environmental\Drawings\Plansheets\Plansheets 2017 FNB\u2525c_hyd_dm_prm_sgl_Llt.dgn

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2525C	X-219

PERMIT DRAWING
SHEET 15 OF 70

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290



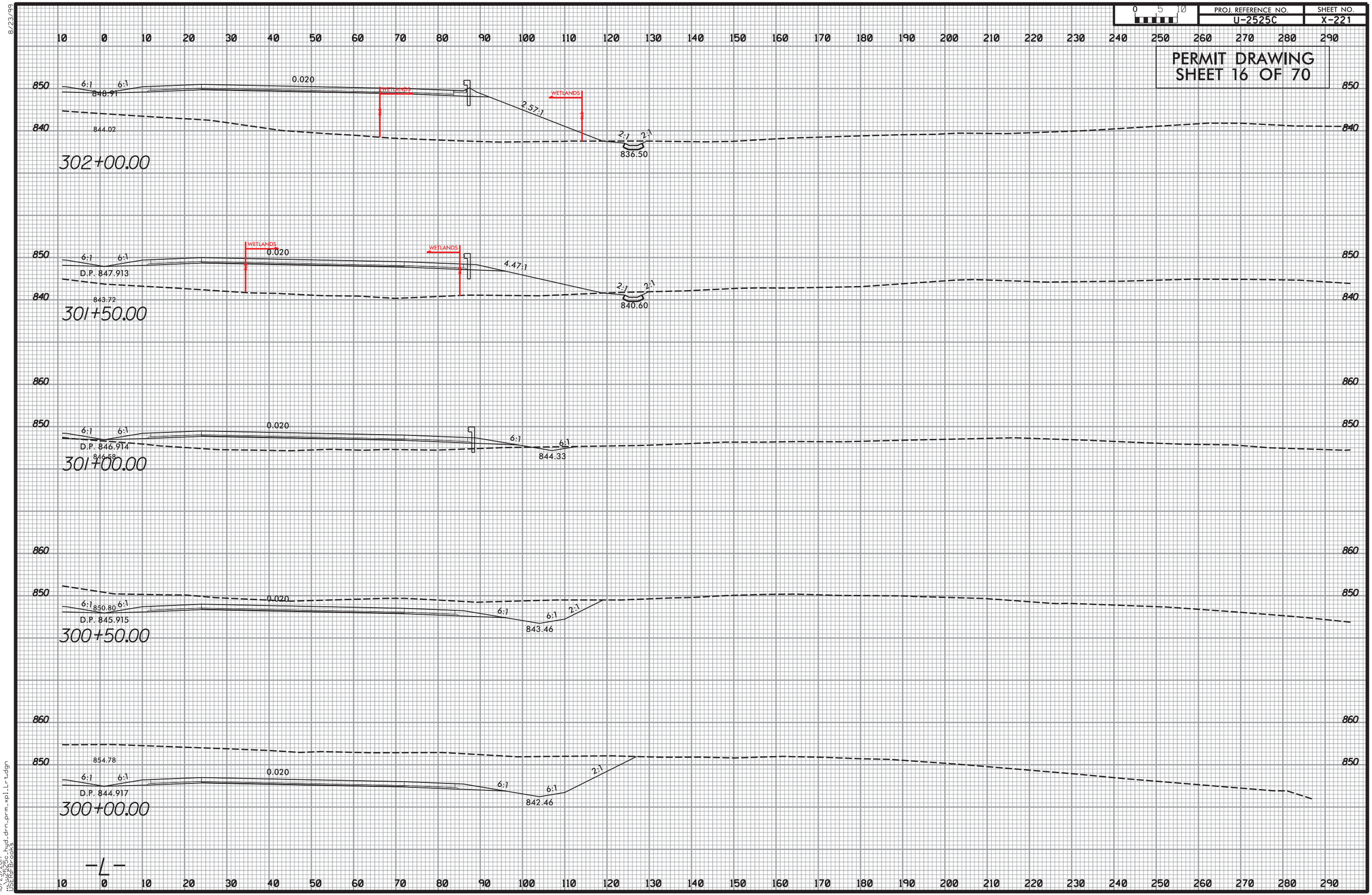
10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

10/23/2017
FBrooks
P:\2015\15107.01–U–2525C\Hydraulics\PERMITS Environmental\Drawings\Plansheets\Plansheets 2017 FNB\u2525c_hyd_dm_prm_xsl Lrt.dgn

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2525C	X-221

PERMIT DRAWING
SHEET 16 OF 70



8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2525C	X-222

PERMIT DRAWING
SHEET 17 OF 70

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

850
840
830

6:1 6:1 853.91 0.020 2:1 843.56

304+50.00

6:1 6:1 852.91 0.020 2:1 843.68

304+00.00

6:1 6:1 851.91 0.020 2:1 843.64

WETLANDS WETLANDS

303+50.00

6:1 6:1 850.91 0.020 2:1 845.30

WETLANDS WETLANDS

303+00.00

6:1 6:1 849.91 0.020 2:1 844.75

WETLANDS WETLANDS

302+50.00

-L-

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

10/23/2017
PBrooks
P:\2015\15107.01-LU-2525C\Hydraulics\PERMITS_Environmental\Drawings\Plansheets\Plansheets_2017_ENB\u2525c_hyd_drn_prm_xpl_Lrt.dgn

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2525C	X-224

0 5 10

PERMIT DRAWING
SHEET 18 OF 70

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

860
850
840
830

6:1 6:1 860.90 0.020 2:1 839.82

308+00.00

6:1 6:1 859.90 0.020 2:1 837.08

307+50.00

6:1 6:1 858.90 0.020 2:1 836.73

WETLANDS WETLANDS WETLANDS WETLANDS

307+00.00

—L—

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

10/23/2017
FB 0004
P:\2015\15107.01-LJ-2525C\Hydraulics\PERMITS Environmental\Drawings\Plansheets\Plansheets 2017 FNB u2525c hyd dm pmn.xsl Lrt.dgn

PERMIT DRAWING
SHEET 19 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

50' 0' 50' 100' 150'
GRAPHIC SCALE

NAD 83/95

REVISIONS 8/17/99

SITE 8

MATCHLINE –L– STA. 308+00.00 SEE SHEET 7

MATCHLINE –L– STA. 319+00.00 SEE SHEET 9

NORMAN SCOTT WHITE
5

WE ARE ONE CHRISTIAN FELLOWSHIP INC.
(FORMERLY ALLEN LYNN ROWE)
6

GUILFORD COUNTY
BOARD OF EDUCATION
7

NCDOT

PROP. WW FENCE

LATERAL 3' BASE DITCH
SEE DETAIL "D"
DDE = 424 CY
CL I RIP RAP = 458 TONS
GF = 865 SY

TEMP. IMPACTS
IN SURFACE WATERS

TOE PROTECTION
SEE DETAIL "N"
CL B RIP RAP= 10 TONS
GF= 30 SY

TOE PROTECTION
SEE DETAIL "N"
CL B RIP RAP= 60 TONS
GF= 180 SY

ROD AND LUG
W/2 ELBOWS

24" CSP

15" RCP-IV

24" RCP-IV

2GI

2GI-A

36" RCP-CD

54" RCP-CD (NOT BURIED)

963
NCDOT
(FORMERLY CHATOYANCY, LLC)

CYGNUS NC LOTS, LLC
(FORMERLY CHATOYANCY, LLC)

BANK STABILIZATION
SEE DETAIL O
16 ft.

PROPOSED
EXCAVATION
EST. = 15 CY

CL II RIP RAP
W/GEOTEXTILE
LENGTH = 30'
EST. 35 TON
EST. 67 SY GF
SEE DETAIL "O"

LATERAL 5' BASE DITCH
SEE DETAIL "E"
DDE = 107 CY
CL 1 RIP RAP =104 TONS
GF =195 SY

NCDOT
(FORMERLY ALLEN LYNN ROWE)
960

5
NORMAN SCOTT WHITE

SEE SHEETS 2D-1 THRU 2D-6 FOR DRAINAGE DETAILS
SEE SHEET 41 FOR –L– PROFILE

10/23/2017
FRevans
P:\2015\15107.00-U-2525C\Hydraulics PERMITS Environmental Drawings\Plansheets Plansheets 2017 FNS\U2525C hyd drn prm PSH08.dgn

PERMIT DRAWING
SHEET 20 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

50' 0' 50' 100' 150'
GRAPHIC SCALE

NAD 83/95

TEMP. IMPACTS IN SURFACE WATERS

GUILFORD COUNTY BOARD OF EDUCATION
7

WE ARE ONE CHRISTIAN FELLOWSHIP INC.
(FORMERLY ALLEN LYNN ROWE)
6

NORMAN SCOTT WHITE
5

LATERAL 3' BASE DITCH
SEE DETAIL "D"
DDE = 424 CY
CL I RIP-RAP = 458 TONS
GF = 865 SY

TOE PROTECTION
SEE DETAIL "N"
CL B RIP RAP = 10 TONS
GF = 30 SY

SITE 8

PROP. WW FENCE

NCDOT

ROD AND LUG W/2 ELBOWS

TOE PROTECTION
SEE DETAIL "N"
CL B RIP RAP = 60 TONS
GF = 180 SY

24" CSP

15" RCP-IV

24" RCP-IV

2GI

2GI-A

36" RCP-CD

54" RCP-CD (NOT BURIED)

MATCHLINE -L- STA. 308+00.00 SEE SHEET 7

MATCHLINE -L- STA. 319+00.00 SEE SHEET 9

BANK STABILIZATION
SEE DETAIL O
16 ft.

963
NCDOT
(FORMERLY CHATOYANCY, LLC)

CYGNUS NC LOTS, LLC
(FORMERLY CHATOYANCY, LLC)

LATERAL 5' BASE DITCH
SEE DETAIL "E"
DDE = 107 CY
CL I RIP RAP = 104 TONS
GF = 195 SY

PROPOSED EXCAVATION
EST. = 15 CY

CL II RIP RAP W/GEOTEXTILE
LENGTH = 30'
EST. 35 TON
EST. 25 SY GF
SEE DETAIL "O"

NCDOT
(FORMERLY ALLEN LYNN ROWE)
960

5
NORMAN SCOTT WHITE

SEE SHEETS 2D-1 THRU 2D-6 FOR DRAINAGE DETAILS
SEE SHEET 41 FOR -L- PROFILE

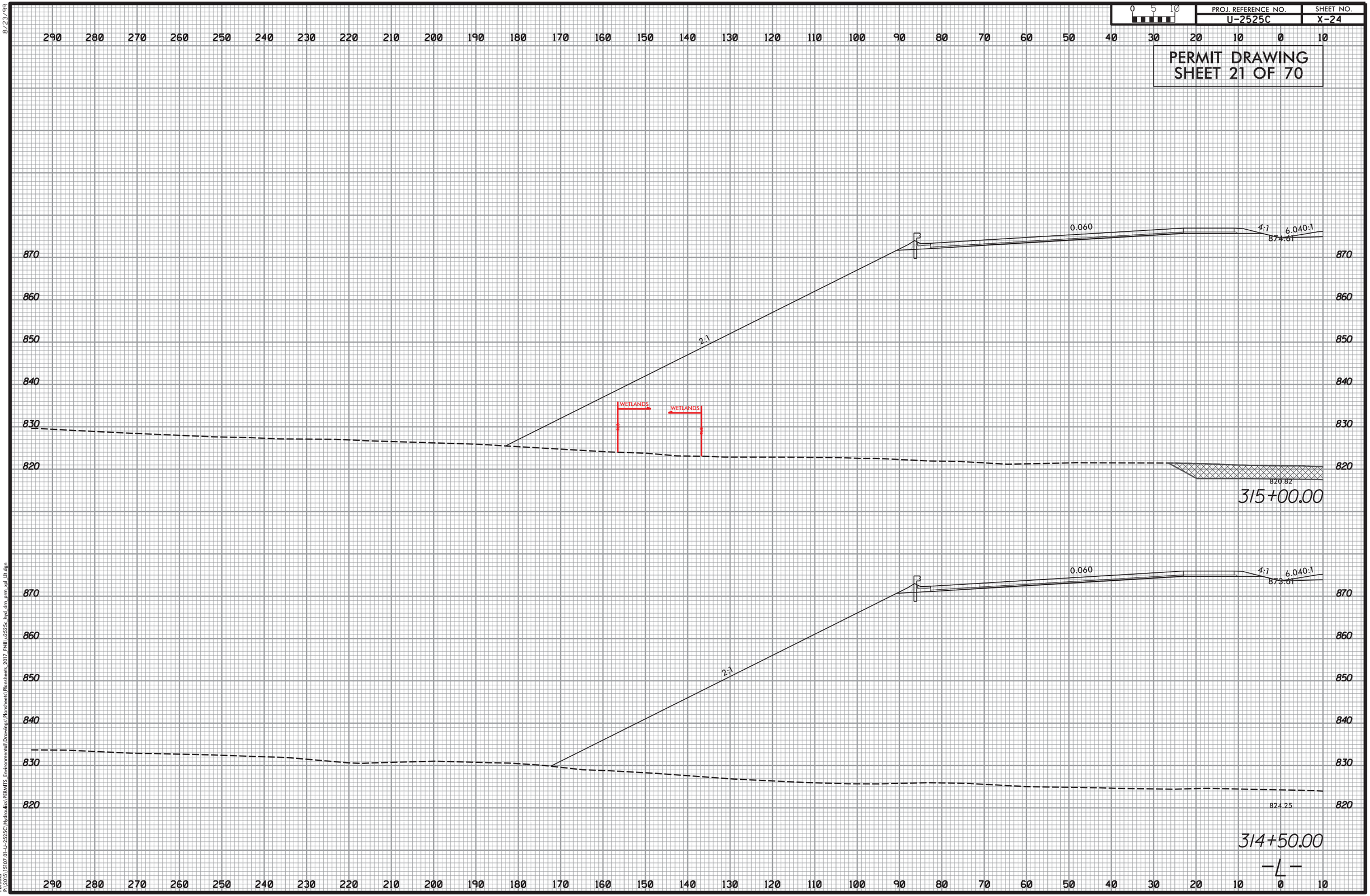
REVISIONS
8/17/99

10/23/2017
Plotted: 10/23/2017 10:07:01 AM
P:\2015\15107.01-U-2525C\Hydraulics PERMITS Environmental Drawings\Plansheets Plansheets 2017 ENB\U2525C_hyd_dsn_rpm_PS1108_con.dgn

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2525C	X-24

PERMIT DRAWING
SHEET 21 OF 70



PERMIT DRAWING
SHEET 22 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

50' 0' 50' 100' 150'
GRAPHIC SCALE

NAD 83/95

REVISIONS 8/17/99

HSB BOUNDARY

MATCHLINE –L– STA. 332+00.00 SEE SHEET 9

MATCHLINE –L– STA. 345+00.00 SEE SHEET 11

SITE 9A

SITE 9

SITE 9B

10 SHEARIN LEWIS WHITFIELD (FORMERLY DONALD LEWIS)

949 NCDOT (FORMERLY HARRIET D. KING)

938 NCDOT (FORMERLY PATRICIA COFFER)

941 NCDOT (FORMERLY KENNETH R. COFFER)

936

11 OSCAR F. DONNELL SHAROL G. DONNELL

12

101 TIMOTHY JOHN LILLY SHELLEY ALBEA LILLY

EDWARD P. MITCHELL

HAROLD D. WRENN & LINDA N. WRENN

PAULA G. NELSON RONALD E. NELSON

GREGORY T. HOPKINS PAMELA J. HOPKINS

ESTABLISH A CHANNEL IF ONE DOES NOT EXIST ONCE PIPE/PIPES IS DRAINED
6' STANDARD BASE DITCH SEE DETAIL "B"
L = 140' S = 0.93 FT/FT
DDE = EST 237 CU YDS
CL B RIP RAP = 15 TONS
GF = 12K SY
PERMANENTLY DRAIN PIPE/S

CLASS B RIP RAP W/GEOTEXTILE EST 13 TONS EST 33 SY GF SEE DETAIL "P"

REMOVE

GRADE TO DRAIN

BANK STABILIZATION SEE DETAIL P 18 ft.

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

15" RCP-IV 2GI
15" RCP-V 2GI
18" RCP-IV 2GI
12" CONC
15" CSP

ISOLATED WETLANDS NOT JURISDICTIONAL

CL B RIP RAP EST 17 TONS EST 44 SY GF

CL B RIP RAP EST 3 TONS EST 10 SY GF
INVERT = 850.0'

OUTFALL STRUCTURE & SLUICE GATE

STANDARD V GRASSED SWALE SEE DETAIL "AD" L=240', S=0.03 FT/FT DDE = 51 CY

LATERAL DITCH SEE DETAIL "H" DDE = 9.4 CY

STANDARD V GRASSED SWALE SEE DETAIL "AD" L=220', S=0.006 FT/FT DDE = 315 CU.YDS

RETAIN PIPE CLEANOUT

N 89° 49' 38.8" W

S 15° 17' 00.9" E

SR 2531 HILLCROFT RD 20' BST

SR 2531 HILLCROFT RD 19' BST

48" WD RAIL & WW

48" WD RAIL

24" WD RAIL

48" CHL

100PR

75PR

60.00'

140.00'

EXISTING R/W

RR SIGNAL

NORFOLK SOUTHERN RR

POSSIBLE BURIED PIPE

BM

2SFD

ISFD

WD DK

CONC

GR

PUE

10/23/2017
Plotted By: jmcgee
P:\2015\15107.01\LL\2525C\Hydraulics\PERMITS\Environmental Provisions\Plansheets\Plansheets_2017_ENB\U2525C_hyd_drn_prm_PSH10.dgn

8/17/99

REVISIONS

PERMIT DRAWING
SHEET 23 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

50' 0' 50' 100' 150'
GRAPHIC SCALE

NAD 83/95

HSB BOUNDARY

MATCHLINE –L– STA. 332+00.00 SEE SHEET 9

MATCHLINE –L– STA. 345+00.00 SEE SHEET 11

SITE 9A

SITE 9

SITE 9B

10 SHEARIN LEWIS WHITFIELD (FORMERLY DONALD LEWIS)

938 NCDOT (FORMERLY PATRICIA COFFER)

936

949 NCDOT (FORMERLY HARRIET D. KING)

941 NCDOT (FORMERLY KENNETH R. COFFER)

11 OSCAR F. DONNELL SHAROL G. DONNELL

101 TIMOTHY JOHN LILLY SHELLEY ALBEA LILLY

EDWARD P. MITCHELL

HAROLD D. WRENN & LINDA N. WRENN

PAULA G. NELSON RONALD E. NELSON

GREGORY T. HOPKINS PAMELA J. HOPKINS

12

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

ESTABLISH A CHANNEL IN ONE DIGS WITH EXISTING PINEFORK IS DRAINED

6' STANDARD BASE DITCH SEE DETAIL "B1" L = 150' S = 0.93 FT/FT DDE = EST 237 CU YDS CL B RIP RAP = 15 TONS CSE = 175 SY

PERMANENTLY RIP-RAP PRINCE

CLASS B RIP RAP W/GEOTEXTILE EST 13 TONS EST 33 SY GF SEE DETAIL "P"

BANK STABILIZATION SEE DETAIL P 18 ft

REMOVE

GRADE TO DRAIN

ISOLATED WETLANDS NOT JURISDICTIONAL

CL B RIP RAP EST 17 TONS EST 44 SY GF

CL B RIP RAP EST 3 TONS EST 10 SY GF INVERT = 850.0

OUTFALL STRUCTURE & SLUICE GATE

STANDARD V GRASSED SWALE SEE DETAIL "AD" L = 240' S = 0.03 FT/FT DDE = 51 CY

STANDARD V GRASSED SWALE SEE DETAIL "AD" L = 220' S = 0.006 FT/FT DDE = 315 CU YDS

LATERAL DITCH SEE DETAIL "AH" DDE = 9 CY

RETAIN PIPE CLEANOUT

N 89° 49' 38.8" W

S 15° 10' 09" E

SR 2531 HILLCROFT RD 20' BST

SR 2531 HILLCROFT RD 19' BST

NORFOLK SOUTHERN RR

RR SIGNAL

EXISTING R/W

48" CHL

48" WD RAIL & WW

15" RCP-IV

18" RCP-IV

15" CSP

12" COND

15" CONC

12" CONC

18" CONC

24" CONC

30" CONC

36" CONC

42" CONC

48" CONC

60" CONC

10/23/2017
Plotted: 10/23/2017
P:\2015\15107.01\U-2525C\Hydraulics\PERMITS\Environmental Provisions\Plansheets\Plansheets_2017_ENB\U2525C_hyd_prm_PS10.dgn

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2525C	X-249

PERMIT DRAWING
SHEET 24 OF 70

339+00.00

338+50.00

4.556:1 6:1 0.020 2:1

5.305:1 6:1 0.020 2:1

WETLANDS

10/23/2017
FBrooks
P:\2015\15107.01-U-2525C\Hydraulics\PERMITS_Environmental\ Drawings\Plansheets\Plansheets_2017_FNB\u2525c_hyd_dm_prm_xpl_Lrr.dgn

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2525C	X-44

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

PERMIT DRAWING
SHEET 25 OF 70

890 880 870 860 850 840 830

2:1

0.020

4:1 6.358:1

887.71

WETLANDS

WETLANDS

828.01

339+50.00

890 880 870 860 850 840 830

2:1

0.020

4:1 6:1

4.556:1

888.53

832.91

339+00.00

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

10/23/2017
PB0004
P:\2015\15107.01-LU-2525C\Hydraulics\PERMITS Environmental\Drawings\Plansheets\Planshеets 2017 FNB\u2525c_hyd_drn_prm_xpl LB.dgn

PERMIT DRAWING
SHEET 26 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

S/S DENOTES IMPACTS IN SURFACE WATER

TS/TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

F/F DENOTES FILL IN WETLAND

NAD 83/95

50' 0' 50' 100' 150'
GRAPHIC SCALE

REVISIONS
8/17/99

MATCHLINE –L– STA. 345+00.00 SEE SHEET 10

MATCHLINE –L– STA. 359+00.00 SEE SHEET 12

SITE 10

LATERAL 5' BASE CHANNEL CHANGE SEE DETAIL "L" DDE = 7118 CY CL I RIP RAP =566 TONS GF =955 SY

LATERAL 5' BASE CHANNEL CHANGE SEE DETAIL "K" DDE = 8642 CY CL I RIP RAP =401 TONS GF =675 SY

100A

WILLIAM BULLARD

PROP. WW FENCE

TEMPORARY IMPACTS OF SURFACE WATER

FILL & CLASS I RIP RAP IN AREA OF EXISTING STREAM

REMOVE

NCDOT (FORMERLY RENEE CASHIER)

NCDOT (FORMERLY SYDNEY J. MITCHELL)

MICHAEL KENT & BRENDA B. SUMMERS

936

13

933

N 89° 49' 38.8" W 350

355

42" RCP-CD

15" RCP-V

15" RCP-IV

24" RCP-IV

18" RCP-IV

2GI

2GI-A

2GI FS

ROD AND LUG W/2 ELBOWS

GRADE TO DRAIN

LATERAL 3' BASE DITCH SEE DETAIL "J" DDE =290 CY CL I RIP RAP = 281 TONS GF =555 SY

24" CL I RIP RAP

S 87° 09' 56.5" W

JB W/MH

CL B RIP RAP EST 22 TONS EST 57 SY GF

OUTFALL STRUCTURE & SLUICE GATE

PROP. WW FENCE

EXISTING R/W

CL B RIP RAP EST 16 TONS EST 142 SY GF

CL B RIP RAP EST 8 TONS EST 22 SY GF

OUTFALL STRUCTURE & SLUICE GATE

ROBERT EUGENE & LINDA LUANN GRUNDMAN

14

LATERAL 2' BASWITCH SEE DETAIL "F" DDE = 212 CY CL B RIP RAP= 168 TONS GF= 455 SY

PROP. WW FENCE

MERLOND C. COX JUNE H. COX

15

ROY L. MEADOWS & CHRISTY L. MEADOWS

12

OLD MINE RD

15' EST

ISFD

WD DK

CONC

WD GATE

WD RAIL

48" WW

24" CSP

60" CMP

25 ELEC

15 ELEC

15' UTILITY EASEMENT

10/23/2017
R:\2015\15107.01-U-2525C-Hydraulics-PERMITS-Environmental Provisions-Plansheets-Planshsets_2017_ENB-U2525C_hyd_pm_PSH11.dgn

PERMIT DRAWING
SHEET 27 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

S S — DENOTES IMPACTS IN SURFACE WATER
TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
F F — DENOTES FILL IN WETLAND

NAD 83/95

50' 0' 50' 100' 150'
GRAPHIC SCALE

REVISIONS
8/17/99

MATCHLINE –L– STA. 345+00.00 SEE SHEET 10

MATCHLINE –L– STA. 359+00.00 SEE SHEET 12

SITE 10

LATERAL 5' BASE CHANNEL CHANGE SEE DETAIL "L" DDE = 7118 CY CL I RIP RAP = 566 TONS GF = 955 SY

LATERAL 5' BASE CHANNEL CHANGE SEE DETAIL "K" DDE = 8642 CY CL I RIP RAP = 401 TONS GF = 675 SY

100A

WILLIAM BULLARD

PROP. WW FENCE

TEMPORARY IMPACTS OF SURFACE WATER

FILL & CROSS I RIP RAP IN AREA OF EXISTING STREAM

NCDOT (FORMERLY RENEE CASHIER)

936

MICHAEL KENT & BRENDA B. SUMMERS

13

N 89°49'38.8" W

350

355

NCDOT (FORMERLY SYDNEY J. MITCHELL)

933

REMOVE

60' CMP

25' ELEC

15' UTILITY EASEMENT

15" RCP-IV

18" RCP-IV

24" RCP-IV

42" RCP-CO

2GI

2GI_A

2GI_FS

ROD AND LUG W/2 ELBOWS

GRADE TO DRAIN

LATERAL 3' BASE DITCH SEE DETAIL "J" DDE = 290 CY CL I RIP RAP = 281 TONS GF = 555 SY

CL I RIP RAP

S 87°09'56.5" W

JB W/MH

OUTFALL STRUCTURE & SLUICE GATE

CL B RIP RAP EST 22 TONS EST 57 SY GF

CL B RIP RAP EST 16 TONS EST 142 SY GF

CL B RIP RAP EST 8 TONS EST 25 SY GF

CL B RIP RAP

EXISTING R/W

ROY L. MEADOWS & CHRISTY L. MEADOWS

12

OLD MINE RD

16' DIRT

14

ROBERT EUGENE & LINDA LUANN GRUNDMAN

LATERAL 2' BASE DITCH SEE DETAIL "F" DDE = 212 CY CL B RIP RAP = 168 TONS GF = 455 SY

PROP. WW FENCE 26' CONC

48" CONC

15

MERLOND C. COX
JUNE H. COX

PERMIT DRAWING
SHEET 28 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS
8/17/99

10/23/2017
PROJECT:
P:\2015\15107.01-U-2525C\Hydraulics\PERMITS Environmental\Drawings\Plansheets_Plansheets_2017_ENG\U2525C_hyd_dm_pmp_PSH12.dgn

5' LATERAL BASE CHANNEL CHANGE SEE DETAIL "L" DDE = 11606 CY CL I RIP RAP =1745 TONS GF =2945 SY

TEMPORARY IMPACTS OF SURFACE WATER

HOUSTON H. & VIRGINIA H. COLEMAN
LEONARD G. & FRANCES N. COLEMAN
NOAH MARVIN & HAZEL S. COLEMAN
20

NAD 83/95

ROGER DALE ARNOLD

BANK STABILIZATION SEE DETAIL BN 20 FT.

MECHANIZED CLEARING

CLASS I RIP RAP W/GEOTEXTILE (TYPICAL) SEE DETAIL "BN" DDE = 190 CY

2SFD LOG CABIN

BK GRIL

23
JAMES E. SOHL

ISBKD

REMOVE 20' OF 15" CONC

N 30° 06' 58" E 50.00'

SR 2555 WATAUGA RD

19' BBT

REV. CLASS I RIP RAP IN AREA OF EXISTING STREAM CL 1 RIP RAP= 85 TONS GF= 115 SY

NCDOT
(FORMERLY SYDNEY J. MITCHELL)

933
1 @ 8' X 8' RCBC W/BEVELED HEADWALL BURIED ONE FOOT WITH BAFFLES AT 20 FT SPACING ON CENTER FROM OUTLET END
CULVERT 1

18" CSP W/2 ELBOWS

PUE

9' CONC

15" PRIVATE ROAD

60' CHL

22

20' UTILITY EASEMENT

ARNOLD LANE

TIE TO EXISTING DITCH

MATCHLINE -L- STA. 359+00.00 SEE SHEET 11

15" RCP-IV

360 N 89° 49' 38.8" W

MARK BRIAN BAILEY
19

REMOVE

18
DAVID L. ADAMS

21
ARCHIE ADAMS

MATCHLINE -L- STA. 373+00.00 SEE SHEET 13

SITE 10A

SITE 10

LATERAL 2' BASE DITCH SEE DETAIL "F"

18" CSP ROD AND LUG W/2 ELBOWS

24" RCP CD

JB w/MH

FS AT TOE OF FILL SEE DETAIL "Q"

MTL CANOPY

ISFD

MERLOND C. COX
JUNE H. COX
15

LATERAL 2' BASE DITCH SEE DETAIL "AG" DDE = 312 CY CL I RIP RAP =267 TONS GF =540 SY

CL I RIP RAP= 45 TONS GF= 70 SY (TYPICAL) SEE DETAIL "BO" DDE = 42 CY

CL B RIP RAP EST 29 TONS EST 75 SY GF

TEMPORARY IMPACTS OF SURFACE WATER

16
JEFFREY A. LOFTIS

OUTFALL STRUCTURE W/ SLUICE GATE

CL B RIP RAP EST 3 TONS EST 11 SY GF

CL B RIP RAP

24" CSP W/2 ELBOWS

JB w/MH

ROD AND LUG W/2 ELBOWS

RUINS

CANOPY

HTR

CAT-1

CHARLES G. APPLE
17

GREU-TL3

N 12° 38' 08.1" W

N 72° 37' 21.1" E

ARCHIE J. ADAMS &
LOUISE A. ADAMS
21

JEFFREY A. LOFTIS
16

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

50' 0' 50' 100' 150'
GRAPHIC SCALE

PERMIT DRAWING
SHEET 29 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

8/17/99

REVISIONS

MATCHLINE -L- STA. 359+00.00 SEE SHEET 11

MATCHLINE -L- STA. 373+00.00 SEE SHEET 13

SITE 10A

SITE 10

TEMPORARY IMPACTS OF SURFACE WATER

5' LATERAL BASE CHANNEL CHANGE SEE DETAIL "K" DDE = 11606 CY CL I RIP RAP =1745 TONS GF =2945 SY

BANK STABILIZATION SEE DETAIL BN 20 FT.

MECHANIZED CLEARING

CLASS I RIP RAP W/GEOTEXTILE (TYPICAL) SEE DETAIL "BN" DDE = 790 CY

RELOC. CLASS I RIP RAP IN AREA OF EXISTING STREAM CL I RIP RAP= 85 TONS GF= 115 SY

1 @ 8' X 8' RCBC W/BEVELED HEADWALL BURIED ONE FOOT W/ BAFFLES AT 20 FT SPACING ON CENTER FROM OUTLET END

CULVERT 1

933

18" CSP W/2 ELBOWS

15" RCP-IV

24" RCP-CSP

24" RCP-V

48" WW

LATERAL 2' BASE DITCH SEE DETAIL "F"

18" CSP ROD AND LUG W/2 ELBOWS

FS AT TOE OF FILL SEE DETAIL "Q"

LATERAL 2' BASE DITCH SEE DETAIL "AG" DDE = 312 CY CL I RIP RAP =267 TONS GF =540 SY

CL I RIP RAP = 45 TONS GF= 70 SY (TYPICAL) SEE DETAIL "BO" DDE = 42 CY

CL B RIP RAP EST 29 TONS EST 75 SY GF

OUTFALL STRUCTURE & SLUICE GATE

CL B RIP RAP EST 3 TONS EST 11 SY GF

CL B RIP RAP

TIE TO EXISTING DITCH

REMOVE

REMOVE 20' OF 15" CONC

N 89° 49' 38.8" W

N 3° 03' 06.5" E

N 72° 37' 27" E

N 12° 38' 08.1" W

HOUSTON H. & VIRGINIA H. COLEMAN
LEONARD G. & FRANCES N. COLEMAN
NOAH MARVIN & HAZEL S. COLEMAN

NCDOT
(FORMERLY SYDNEY J. MITCHELL)

MARK BRIAN BAILEY

ROGER DALE ARNOLD

JAMES E. SOHL

DAVID L. ADAMS

ARCHIE ADAMS

MERLOND C. COX
JUNE H. COX

JEFFREY A. LOFTIS

CHARLES G. APPLE

ARCHIE J. ADAMS &
LOUISE A. ADAMS

SR 2555 WATKINS RD

ARNOLD LANE

15" PRIVATE ROAD P

20' UTILITY EASEMENT

2SFD LOG CABIN

8K GRILL

ISBKD

ISFD

ISFB

MTL CANOPY

CANOPY

HTR

RUINS

CAT-1

GREU-TL3

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

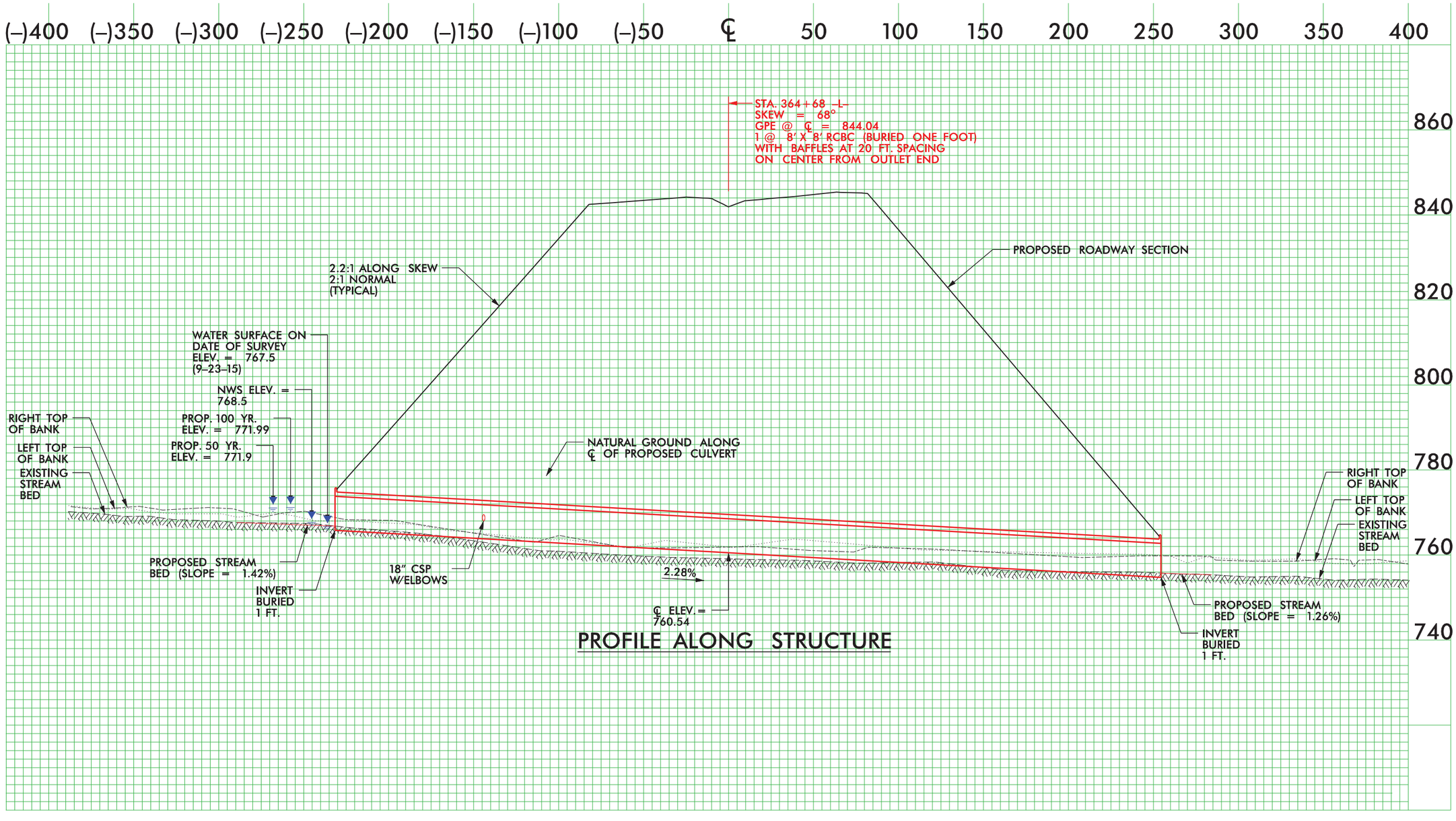
50' 0' 50' 100' 150'
GRAPHIC SCALE

10/23/2017
R.Rhodes
P:\2015\15107.01\1-2525C\Hydraulics\PERMITS Environmental Provision\Plansheets Plansheets 2017 ENB\U2525C_hyd_dirn_envn_PSH12_con.dgn

PERMIT DRAWING
SHEET 30 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	Plan Sheet 12
R/W SHEET NO.	___
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 10 & 10A



PROFILE ALONG STRUCTURE

REVISIONS

8/17/99

10/2/2017
FBrooks
P:\2015\15107.01-U-2525C\Hydraulics\PERMITS_Environmental\Drawings\Plansheets_Planshests_2017_FNB-U-2525C_Hyd_prm_wet_profile_CSR_1_Site_10.dgn

8/23/99

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
U-2525C	X-72

PERMIT DRAWING
SHEET 31 OF 70

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

850
840
830
820
810
800
790
780

0.020
6:1
6:1
854.09
2:1
2:1
2:1
775.76
WETLANDS
WETLANDS
784.92
358+00.00
-L-

10232017
FBrooks
P:\2015\15107.01-U-2525C\Hydraulics\PERMITS Environmental\ Drawings\Plansheets\Plansheets 2017 FNB\u2525c_hyd drn_prm_xsl_Llt.dgn

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2525C	X-82

PERMIT DRAWING
SHEET 32 OF 70

0.020

6:1 6:1

845.03

2:1

2:1 2:1

768.25

WETLANDS

WETLANDS

760.08

363700.00

-L-

10/23/2017
12:26:20
USER:FBrooks
u2525c_hyd_drn_prm_xpl_llt.dgn

8/17/99

REVISIONS

PERMIT DRAWING SHEET 33 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

S/S DENOTES IMPACTS IN SURFACE WATER

TS/TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'

GRAPHIC SCALE

NAD 83/95

HSB BOUNDARY

MATCHLINE -L- STA. 373+00.00 SEE SHEET 12

MATCHLINE -L- STA. 387+00.00 SEE SHEET 14

ROBERT A. LANCASTER & MARTHA M. LANCASTER

UZELLIA W. FINLEY

JAMES E. SOHL

GARY W. & LISA B. ARNOLD

LARRY L. HOWELL

NCDOT (FORMERLY RONALD D. SMITH)

JOSEPH C. SMITH

ARCHIE J. ADAMS & LOUISE A. ADAMS

DORIS B. STONEMAN

MARK EDWARD MILLAWAY KAREN M. SMITH

SITE 13A

SITE 13

SITE 13B

4' STANDARD BASE DITCH SEE DETAIL "AE" L=150', S=0.0047 FT/FT DDE=385 CU. YDS. CL I RIP RAP EST 16 TON EST 35 SY GF

CL B RIP RAP EST 20 TONS EST 52 SY GF

CL B RIP RAP EST 5 TONS EST 16 SY GF

CII Rip-Rap

CL I RIP RAP= 72 TONS GF= 102 SY (TYPICAL) SEE DETAIL "BD" DDE = 104 CY

TEMP IMPACTS IN SURFACE WATERS

1 @ 6' X 8' RCBC W/BEVELED HEADWALL BURIED ONE FOOT WITH BAFFLES AT 25 FT SPACING ON CENTER FROM OUTLET END CULVERT 2

LATERAL 2' BASE DITCH SEE DETAIL "AG" DDE = 1141 CY CL I RIP RAP= 428 TONS GF =870 SY

OUTFALL STRUCTURE & SLUICE GATE

ROD AND LUG W/2 ELBOWS

REMOVE

CL I RIP RAP W/GEOTEXTILE LENGTH=28' EST 20 TONS EST 44 SY GF

TEMPORARY IMPACTS OF SURFACE WATER

LATERAL 2' BASE DITCH SEE DETAIL "C" DDE 136 CY

FS AT TOE OF FILL SEE DETAIL "R"

LATERAL V DITCH SEE DETAIL "M" DDE =167 CY CL I RIP RAP =194 TONS GF =465 SY

CL I RIP RAP=65 TONS GF=92 SY (TYPICAL) SEE DETAIL "BE" DDE = 150 CY

N 66° 00' 52.7" E

S 30° 41' 53.1" E

S 59° 11' 20.8" W

-Y4RPC-

S 62° 11' 20.8" W

15" RCP-IV

18" RCP-IV

24" CSP

30" RCP-IV

36" RCP-IV

48" RCP-CD

15" RCP-V

2GI

FS

HW

BM #6

10/23/2017
Plotted by:
P:\2015\15107.01-U-2525C\Hydraulics\PERMITS Environmental Drawings\Plansheets Plansheets 2017 ENB\U2525C hyd dm pm PSH13.dgn

8/17/99

REVISIONS

PERMIT DRAWING
SHEET 34 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

S/S DENOTES IMPACTS IN SURFACE WATER

TS/TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'

GRAPHIC SCALE

NAD 83/95

HSB BOUNDARY

SITE 13A

SITE 13

SITE 13B

MATCHLINE -L- STA. 373+00.00 SEE SHEET 12

MATCHLINE -L- STA. 387+00.00 SEE SHEET 14

ROBERT A. LANCASTER & MARTHA M. LANCASTER

UZELLIA W. FINLEY

JAMES E. SOHL

GARY W. & LISA B. ARNOLD

LARRY L. HOWELL

NCDOT (FORMERLY RONALD D. SMITH)

JOSEPH C. SMITH

ARCHIE J. ADAMS & LOUISE A. ADAMS

DORIS B. STONEMAN

MARK EDWARD MILLAWAY KAREN M. SMITH

4' STANDARD BASE DITCH SEE DETAIL "AE" L=150' S=0.0047 FT/FT DDE=385 CU YDS CL I RIP RAP EST 16 TON EST 35 SY GF

CL I RIP RAP= 72 TONS GF= 102 SY (TYPICAL) SEE DETAIL "AG" DDE = 134 CY

CL B RIP RAP EST 5 TONS EST 16 SY GF

CL I Rip-Rap

TEMP IMPACTS IN SURFACE WATERS

CL B RIP RAP EST 20 TONS EST 52 SY GF

OUTFALL STRUCTURE & STOCK GATE

ROD AND LUG W/2 ELBOWS

REMOVE

LATERAL 2' BASE DITCH SEE DETAIL "AG" DDE = 1141 CY CL I RIP RAP= 428 TONS GF =870 SY

1@ 6' X 8' RCBC W/BEVELED HEADWALL BURIED ONE FOOT WITH BAFFLES AT 25 FT SPACING ON CENTER FROM OUTLET END

CULVERT 2

CL I RIP RAP WGEOTEXTILE LENGTH=28' EST 20 TONS EST 44 SY GF

TEMPORARY IMPACTS OF SURFACE WATER

FS AT TOE OF FILL SEE DETAIL "R"

LATERAL 2' BASE DITCH SEE DETAIL "C" DDE 136 CY

TEMPORARY IMPACTS OF SURFACE WATER

LATERAL V DITCH SEE DETAIL "M" DDE =167 CY CL I RIP RAP =194 TONS GF =465 SY

CL I RIP RAP=65 TONS GF=92 SY (TYPICAL) SEE DETAIL "BE" DDE = 150 CY

BM #5

N 66°00'52"E

S 30°41'53"E

S 59°11'20.8"W

S 62°11'20.8"W

-Y4RPC-

10/23/2017
Plotted: 10:15
P:\2015\15107.01-U-2525C\Hydraulics\PERMITS_Environmental\Drawings\Plansheets\Plansheets_2017_ENB\U2525C_hyd_dm_pm_PSH13_con.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	Plan Sheet 13
R/W SHEET NO.	___
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 35 OF 70

SITE 13

(–)350 (–)300 (–)250 (–)200 (–)150 (–)100 (–)50 ℄ 50 100 150 200 250 300 350 400 450

820
810
800
790
780
770
760
750

STA. 382+49 –L–
SKEW = 149°
GPE @ ℄ = 811.76
1 @ 6' X 8' RCBC (BURIED ONE FOOT)
WITH BAFFLES AT 25 FT. SPACING
ON CENTER FROM OUTLET END

3.9:1 ALONG SKEW
2:1 NORMAL
(TYPICAL)

PROPOSED ROADWAY SECTION

PROP. 100 YR. ELEV. = 772.85
PROP. 50 YR. ELEV. = 772.3
RIGHT TOP OF BANK
LEFT TOP OF BANK
EXISTING STREAM BED
PROPOSED STREAM BED (SLOPE = 1.01%)
NWS ELEV. = 768.3
WATER SURFACE ON DATE OF SURVEY ELEV. = 767.3 (9–23–15)
INVERT BURIED 1 FT.

1.50%
℄ ELEV. = 761.99
48" RCP–CD
INVERT = 761.0

NATURAL GROUND ALONG ℄ OF PROPOSED CULVERT
LEFT TOP OF BANK
RIGHT TOP OF BANK
PROPOSED STREAM BED (SLOPE = 1.97%)
INVERT BURIED 1 FT.

PROFILE ALONG STRUCTURE

REVISIONS
8/17/99

10232017
RPeters
P:\2015\15107.00-U-2525C Hydraulics PERMITS Environmental Drawings\Plansheets 2017 ENB\U-2525C Hyd prm xsct profile CSB 2 Site 13.dgn

PERMIT DRAWING
SHEET 36 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5 5 DENOTES IMPACTS IN SURFACE WATER

15 15 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'
GRAPHIC SCALE

NAD 83'95

REVISIONS 8/17/99

MATCHLINE –Y4RPA– STA. 15+20.00 SEE SHEET 14

MATCHLINE –L– STA. 415+00.00 SEE SHEET 14

MATCHLINE –L– STA. 429+00.00 SEE SHEET 16

SITE 14

HSB BOUNDARY

BANK STABILIZATION
SEE DETAIL O
40 ft.

42A
CITY OF GREENSBORO

SRC NORTHWINDS INC.
(FORMERLY HRATCHFORD, LLC)

394' DUKE POWER R/W

GARY S. & VIRGINIA W. CHURCH
52

SHARON MCADOO CHAPPELL FAMILY TRUST
(FORMERLY ELMER A. MCADOO JR
SHARON M. CHAPPEL)
47

OUTFALL STRUCTURE & SLUICE GATE

CL B RIP RAP
EST 28 TONS
EST 72 SY GF

CL B RIP RAP

CL II RIP RAP W/GEOTEXTILE
LENGTH = 34'
EST 24 TONS
EST 45 SY GF
SEE DETAIL "B"

30" RCP-III

BERM 'V' DITCH
SEE DETAIL "AF"

BERM 'V' DITCH
SEE DETAIL "AF"

JB W/M/H

18"

15" CSP W/2 ELBOWS

15" RCP-V

24"

84" RCP-V BURIED 1'

-Y4_RPA- N 62° 11' 20.8" E

S 59° 11' 20.8" W

420

425

15" RCP-IV

2GI

FS

905
NCDOT

98

49

TURNBRIDGE APARTMENTS, LLC
(FORMERLY NHC PARTNERSHIP 7, L.P.)

BANK STABILIZATION
SEE DETAIL O
31 ft.

39

CL II RIP RAP W/GEOTEXTILE
LENGTH = 31'
EST 19 TONS
EST 35 SY GF
SEE DETAIL "O"

20' SANITARY SEWER EASEMENT

8" PLASTIC SS

END UNKNOWN

INEZ R. TURNER

KEN CONSTANT
JANET OPOKU

HOWARD L. HUTCHENS &
LYUDMILA P. HUTCHENS

HARVEST HILL PROPERTY OWNERS ASSOC.
(FORMERLY PROJECT HOMESTEAD)

SEE SHEETS 2D-1 THRU 2D-6 FOR DRAINAGE DETAILS
SEE SHEET 46 & 47 FOR –L– PROFILE
SEE SHEET 61 FOR –Y4RPA– PROFILE

10/23/2017
FRevels
P:\2015\15107.00-U-2525C\Hydraulics\PERMITS\Environmental\Drawings\Plansheets\Plansheets_2017_ENB\U2525C_hyd_dm_pmt_PSH15.dgn

PERMIT DRAWING
SHEET 37 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'
GRAPHIC SCALE

NAD 83 95

REVISIONS
8/17/99

MATCHLINE –Y4RPA– STA. 15+20.00 SEE SHEET 14

MATCHLINE –L– STA. 415+00.00 SEE SHEET 14

MATCHLINE –L– STA. 429+00.00 SEE SHEET 16

SITE 14

BANK STABILIZATION
SEE DETAIL O
40 ft.

42A
CITY OF GREENSBORO

CL B RIP RAP
EST 28 TONS
EST 72 SY GF

OUTFALL STRUCTURE
& SLUICE GATE

CL B
RIP RAP

CL II RIP RAP
W/GEOTEXTILE
LENGTH=30'
EST 24 TONS
EST 45 SY GF
SEE DETAIL "B"

NCDOT

SRC NORTHWINDS, INC.
(FORMERLY HRATCHFORD, LLC)

394' DUKE POWER R/W

GARY S. &
VIRGINIA W. CHURCH
52

SHARON MCADOO CHAPPELL FAMILY TRUST
(FORMERLY ELMEMER A. McADOO JR
SHARON M. CHAPPEL)
47

BERM 'V' DITCH
SEE DETAIL "AE"

BERM 'V' DITCH
SEE DETAIL "AF"

JB W/MH

BDO

15" CSP
W/2 ELBOWS

FS

2GI

18"

24"

15" RCP-V

36" RCP-V
BURIED

420

425

S 59°11' 20.8" W

-Y4RPA- N 62°11' 20.8" E

HSB BOUNDARY

NCDOT
905

TURNBRIDGE APARTMENTS, LLC
(FORMERLY NHC PARTNERSHIP 7, L.P.)
39

BANK STABILIZATION
SEE DETAIL O
31 ft.

CL II RIP RAP
W/GEOTEXTILE
LENGTH=31'
EST 19 TONS
EST 35 SY GF
SEE DETAIL "O"

PUE

20' SANITARY SEWER EASEMENT

8" PLASTIC

END
UNKNOWN

INEZ R. TURNER
98

KEN CONSTANT
JANET OPOKU

HOWARD L. HUTCHENS &
LYUDMILA P. HUTCHENS
49

HARVEST HILL PROPERTY OWNERS ASSOC.
(FORMERLY PROJECT HOMESTEAD)

SEE SHEETS 2D-1 THRU 2D-6 FOR DRAINAGE DETAILS
SEE SHEET 46 & 47 FOR –L– PROFILE
SEE SHEET 61 FOR –Y4RPA– PROFILE

10/23/2017
PROJECT
P:\2015\15107.00-LL-2525C\Hydraulics\PERMITS\Environmental Drawings\Plansheets\Plansheets_2017_FNL\U2525C_hyd_dm_env_PSH15_con.dgn

PERMIT DRAWING
SHEET 38 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS 8/17/99

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

50' 0' 50' 100' 150'
GRAPHIC SCALE

MATCHLINE –L– STA. 429+00.00 SEE SHEET 15

MATCHLINE –L– STA. 443+00.00 SEE SHEET 17

SITE 15A

SITE 15

SITE 16

GARY S. & VIRGINIA W. CHURCH (48)

GARY S. & VIRGINIA W. CHURCH (52)

SHARON MCADOO CHAPPELL FAMILY TRUST (FORMERLY ELMER A. McADOO JR SHARON M. CHAPPEL) (47)

NCDOT (FORMERLY GERALD CONNOLLY) (917)

GARY S. & VIRGINIA W. CHURCH (50)

RATH CHURCH PHILLIPS GARY S. CHURCH (52)

MARKET HILL PROPERTY OWNERS (FORMERLY PROJECT HOMESTEAD) (49)

LATERAL 4' BASE DITCH SEE DETAIL "B" DDE = 154 CY CL 1 RIP RAP EST = 245 TONS EST = 455 SY GF

JS CHANNEL CHANGE SEE DETAIL BP DDE = 46.5 CY CL 1 RIP RAP = 25 TONS GF = 56 SY

1@8' X 8' RCBC W/BEVELED HEADWALL BURIED 1 FOOT WITH BAFFLES CULVERT 3

JS CHANNEL CHANGE SEE DETAIL BP DDE = 46.5 CY CL 1 RIP RAP = 37 TONS GF = 81 SY

BERM 'V' DITCH SEE DETAIL "AF"

SPECIAL CUT DITCH SEE DETAIL "AN" CL 1 RIP RAP = 56 TONS GF = 135 SY

TOE PROTECTION SEE DETAIL N CL B RIP RAP = TONS GF = SY

CL B RIP RAP EST 1 TON EST 5 SY GF

SPECIAL CUT DITCH W/HINGE SEE DETAIL "AM"

SPECIAL CUT DITCH SEE DETAIL "AK"

SPECIAL CUT DITCH W/HINGE SEE DETAIL "AM"

CL B RIP RAP EST 3 TON EST 10 SY GF

SPECIAL CUT DITCH W/HINGE SEE DETAIL AM

2' LATERAL BASE DITCH SEE DETAIL C DDE = 103 CY

CL 1 RIP RAP W/GEOTEXTILE LENGTH = 22' EST 16 TON EST 44 SY GF

3' STANDARD BASE DITCH SEE DETAIL AI L = 90'; S = 0.032 FT/FT DDE = EST. 800 CU. YDS

S 59° 11' 20.8" W

RETAIN

ELEV 804.5'+/-

ELEV 807.0'+/-

END UNKNOWN

10/23/2017
Plotted by:
P:\2015\15107.01\Ll-2525C Hydraulics PERMITS Environmental Documents\Plansheets Plansheets 2017 FNB\U2525C_hyd_dra_pmt_PSH16.dgn

PERMIT DRAWING
SHEET 39 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

F F DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
S S DENOTES IMPACTS IN SURFACE WATER
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
P P DENOTES IMPACTS IN SURFACE WATER (POND)

50' 0' 50' 100' 150'
GRAPHIC SCALE

8/17/99
REVISIONS

MATCHLINE –L– STA. 429+00.00 SEE SHEET 15

MATCHLINE –L– STA. 443+00.00 SEE SHEET 17

SITE 15A

SITE 15

SITE 16

GARY S. & VIRGINIA W. CHURCH

SHARON MCADOO CHAPPELL FAMILY TRUST (FORMERLY ELMER A. McADOO JR SHARON M. CHAPPEL)

NCDOT (FORMERLY GERALD CONNOLLY)

RATH CHURCH PHILLIPS GARY S. CHURCH

HARRIS HILL PROPERTY OWNERS (FORMERLY PROJECT HOMESTEAD)

S 59° 11' 20.8" W

JS CHANNEL CHANGE SEE DETAIL 'BP' DDE = 46.5 CY CL I RIP RAP = 37 TONS GF = 81 SY

LATERAL 4' BASE DITCH SEE DETAIL 'B' DDE = 154 CY CL I RIP RAP EST = 245 TONS EST = 455 SY GF

JS CHANNEL CHANGE SEE DETAIL 'BP' DDE = 46.5 CY CL I RIP RAP = 25 TONS GF = 56 SY

6'-8" X 8' RCBC W/BEVELED HEADWALL BURIED 1 FOOT WITH BAFFLES CULVERT 3

BERM 'V' DITCH SEE DETAIL "AF"

SPECIAL CUT DITCH SEE DETAIL "AN" CL I RIP RAP = 56 TONS GF = 138 SY

SPECIAL CUT DITCH W/HINGE SEE DETAIL "AM"

SPECIAL CUT DITCH SEE DETAIL "AK"

SPECIAL CUT DITCH W/HINGE SEE DETAIL "AM"

TOE PROTECTION SEE DETAIL 'N' CL B RIP RAP = TONS GF = SY

CL B RIP RAP EST 1 TON EST 5 SY GF

CL B RIP RAP EST 3 TON

SPECIAL CUT EST 10 SY GF DITCH W/HINGE SEE DETAIL AM

2' LATERAL BASE DITCH SEE DETAIL C DDE = 103 CY

CL I RIP RAP W/GEOTEXTILE LENGTH = 22 EST 16 TON EST 44 SY GF

3' STANDARD BASE DITCH SEE DETAIL A1 L=90' S=0.032 FT/FT DDE = EST 800 CU YDS

RETAIN

ELEV 804.5' ±

ELEV 807.8' ±

END UNKNOWN

TIDE UNKNOWN

10/23/2017
FRevised
P:\2015\15107.01-U-2525C Hydro\Roll PERMITS Environmental Drawings\Plansheets Plansheets 2017 ENB\U2525C_hyd_drn_psht16_con.dgn

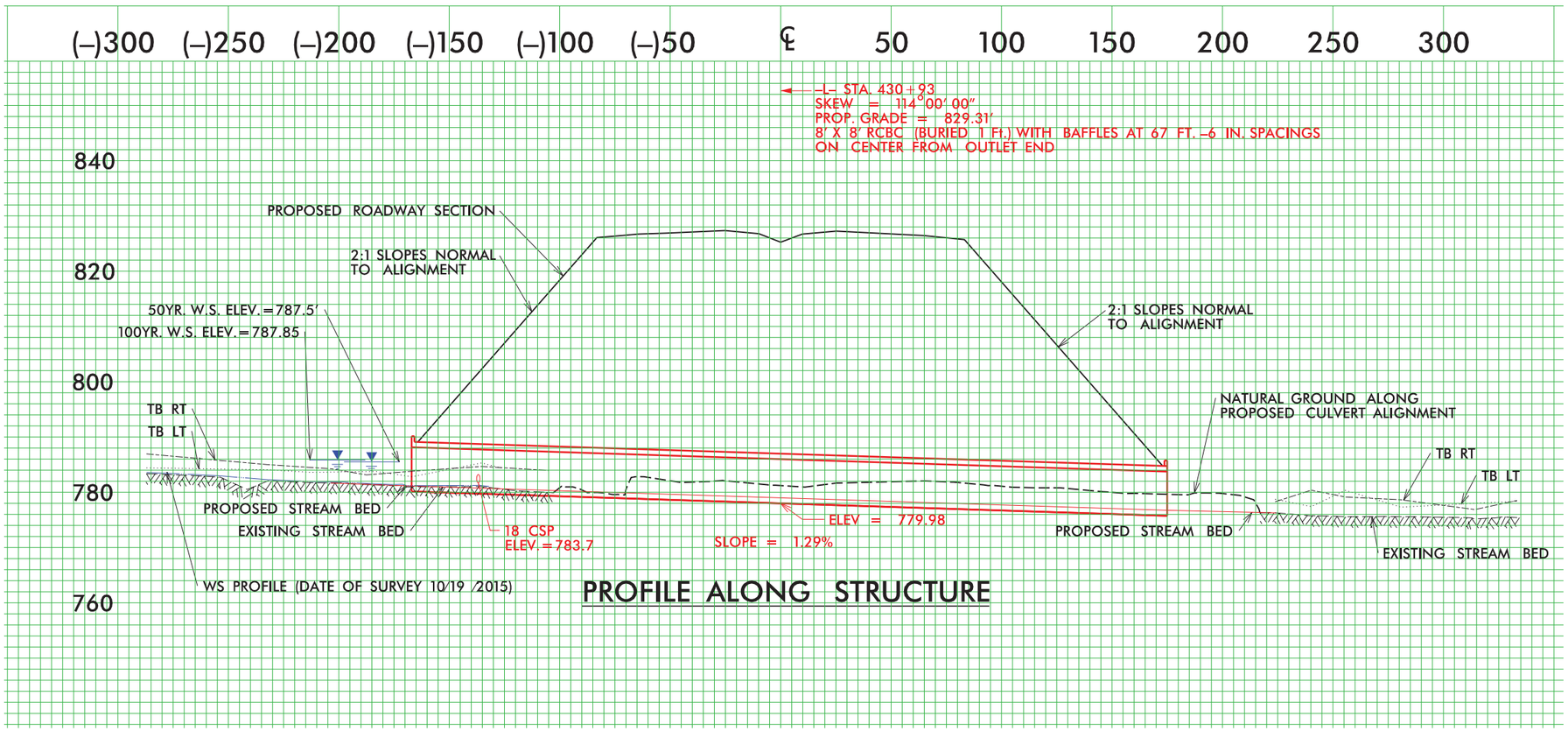
PERMIT DRAWING
SHEET 40 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	Plan Sheet 16
R/W SHEET NO.	___
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS

8/17/99

SITE 15



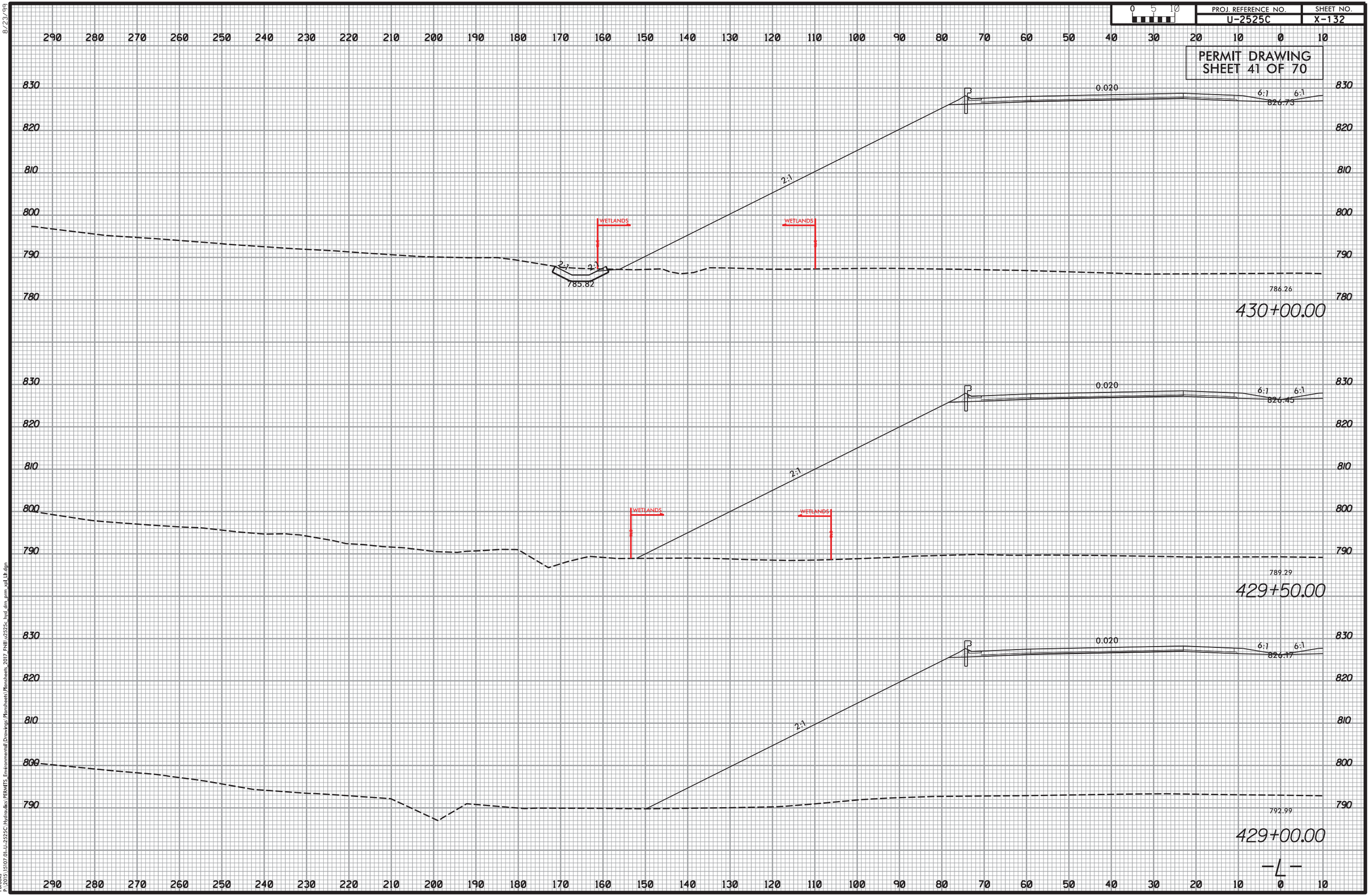
PROFILE ALONG STRUCTURE

10/23/2017
P:\2015\15107.00-U-2525C Hydraulics PERMITS Environmental Drawings Plansheets 2017 ENB U-2525C Hyd env wet profile CSR 3 Site 15.dgn

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2525C	X-132

PERMIT DRAWING
SHEET 41 OF 70



-L-

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2525C	X-335

0 5 10

PERMIT DRAWING
SHEET 42 OF 70

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

830 820 810 800 790 780

6:1 6:1 826.73 0.020 ℄ 2:1

WETLANDS WETLANDS

786.26
430+00.00

6:1 6:1 826.45 0.020 ℄ 2:1

789.29
429+50.00

6:1 6:1 826.17 0.020 ℄ 2:1

792.99
429+00.00

-L-

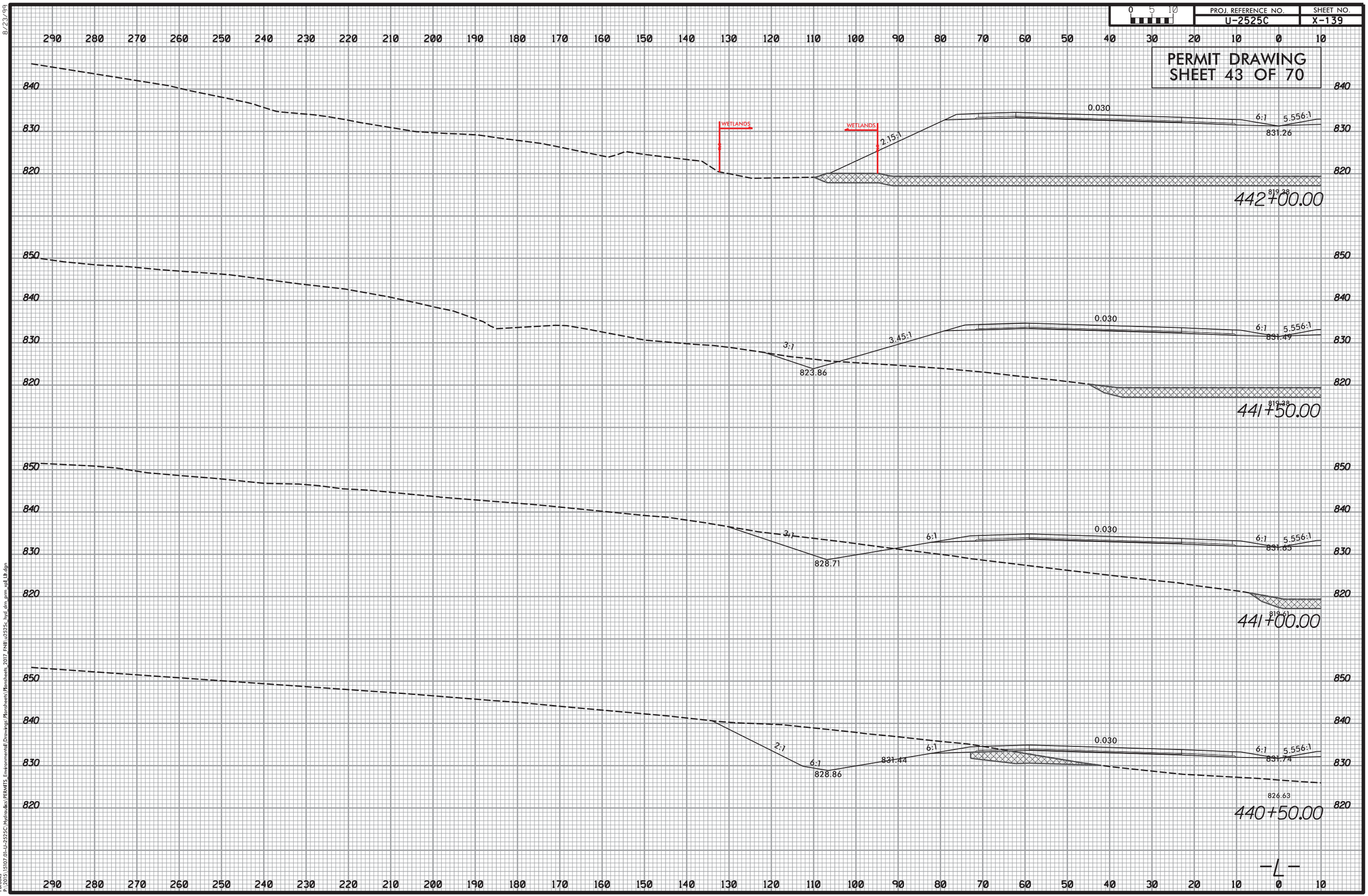
10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

10/27/2017
FBrooks
P:\2015\15107.01-U-2525C \Hydraulics\PERMITS Environmental\ Drawings\Plansheets\Planssheets 2017 ENB\u2525c_hyd_dtm_prm_xpl_Lrl.dgn

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2525C	X-139

PERMIT DRAWING
SHEET 43 OF 70



-L-

10/2/2017
FBrooks
P:\2015\15107.01-U-2525C Hydraulics\PERMITS Environmental\Drawings\Plansheets\Plansheets_2017_FNB\u2525c_hyd_drn_pmt_xsl_LR.dgn

PERMIT DRAWING
SHEET 44 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE -Y6- STA. 17+00.00 SEE SHEET 30

MATCHLINE -L- STA. 457+00.00 SEE SHEET 17

MATCHLINE -L- STA. 480+00.00 SEE SHEET 19

MATCHLINE -Y6- STA. 32+00.00 SEE SHEET 31

SITE 17A

SITE 17

SITE 18

SITE 19

SITE 20

A THESE PORTIONS OF STREAM WILL REQUIRE 0.5:1 MITIGATION DUE TO INDIRECT PROJECT IMPACTS AND LOSS OF FUNCTION

B THESE PORTIONS OF STREAM WILL REQUIRE 0.5:1 MITIGATION DUE TO INDIRECT PROJECT IMPACTS AND LOSS OF FUNCTION

C THESE PORTIONS OF STREAM WILL REQUIRE 0.5:1 MITIGATION DUE TO INDIRECT PROJECT IMPACTS AND LOSS OF FUNCTION

D THESE PORTIONS OF STREAM WILL REQUIRE 0.5:1 MITIGATION DUE TO INDIRECT PROJECT IMPACTS AND LOSS OF FUNCTION

CULVERT 4 TO BE EXTENDED 103'@36" RCBC

CULVERT 6 TO BE EXTENDED EXISTING 72"CMP

CULVERT 7 TO BE EXTENDED 68'@36" RCBC

BANK STABILIZATION SEE DETAIL AW 26 ft.

BANK STABILIZATION SEE DETAIL BR 21 ft.

BANK STABILIZATION SEE DETAIL AZ 9 ft.

BANK STABILIZATION SEE DETAIL BS 10 ft.

CITY OF GREENSBORO

WAYNE MILLER

ROBERT D. JONES, JR.

TIMOTHY A. McADOO

BLANCHE M. BELL

BOOD AND SCHLITHEISS REAL ESTATE, LLC

DONALD R. BAULDING JERRY D. BAULDING & LINDA B. LILLY

STEPHEN G. & TUYEN J.U TEAGUE

CHRISTINE E. ROBERTSON (FORMERLY) & BARRY L. & TINA C. W. BARRY L. ROBERTSON)

KIMBERLY D. DEATHERAGE (FORMERLY) KENNETH RAY COFFER, JR. & KIMBERLY D. COFFER)

KIMBERLY A. DEATHERAGE (FORMERLY KENNETH R. COFFER)

KENNETH E. BELL (FORMERLY) & CARL BELL HEIRS)

SHELDON GADSDEN

CANTERBURY SCHOOL (FORMERLY BETTY W. ALBRIGHT)

NCDOT (FORMERLY CRAMER ON ELM, LLC)

NCDOT (FORMERLY LSOP PARTNERS)

3805 NORTH ELM STREET INVESTORS, LLC (FORMERLY OPUS SOUTH CORPORATION)

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION:	
TIP NO.:	COUNTY:
DESIGNED BY:	
CHECKED BY:	DATE:

PERMIT DRAWING
SHEET 45 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE -Y6- STA. 17+00.00 SEE SHEET 30

SITE 18

SITE 17

SITE 17A

SITE 19

SITE 20

A

B

C

D

THESE PORTIONS OF STREAM WILL REQUIRE 0.5:1 MITIGATION DUE TO INDIRECT PROJECT IMPACTS AND LOSS OF FUNCTION

THESE PORTIONS OF STREAM WILL REQUIRE 0.5:1 MITIGATION DUE TO INDIRECT PROJECT IMPACTS AND LOSS OF FUNCTION

MATCHLINE -L- STA. 457+00.00 SEE SHEET 17

MATCHLINE -L- STA. 485+00.00 SEE SHEET 19

MATCHLINE -Y6- STA. 32+00.00 SEE SHEET 31

CULVERT 6

CULVERT 4

CULVERT 7

BANK STABILIZATION SEE DETAIL A2

BANK STABILIZATION SEE DETAIL A1

BANK STABILIZATION SEE DETAIL C1

CITY OF GREENSBORO

ROBERT D. JONES, JR.

TIMOTHY A. MCADOO

BLANCHE G. BELL

CANTERBURY SCHOOL OF GREATER GREENSBORO

SHELDON CARDEN

KENNETH E. BELL JR. ESTATE & J. CARL BELL HEIRS

3005 NORTH ELM STREET INVESTORS, LLC

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION:

DP NO.: COUNTY:

DESIGNED BY:

CHECKED BY: DATE:

5/14/99

SITE 17 /18 /19 ENLARGEMENT

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 46 OF 70

60′ 0′ 60′ 120′ 180′
GRAPHIC SCALE

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/95

-Y6- STA. 17+00.00 MATCHLINE SEE SHEET 30

4′ LATERAL BASE DITCH
SEE DETAIL AA
DDE = 3499 CY
CL B RIP RAP= 408 TONS
GF=1055 SY

BERM V DITCH
SEE DETAIL AF

BDO

W/2 ELBOWS

2GI-A

24″ CSP

24″ RCP-III

60″ RCP-III

REMOVE

36″ RCP

15″ RCP

RETAIN

Conv.

JB w/MH

DI

15″ RCP-IV

S 79° 18′ 55.0″ W

N 86° 31′ 35.4″ E

20 CB

18″

2GI

SP CUT
SEE DE

ISBK

CONC

ISFD

48″ CUL

EDGEMORE RD

84

WAYNE MILLER

PROP NW FENCE

SIDE PROTECTION
SEE DETAIL N
CL B RIP RAP= 75 TONS
GF= 225 SY

INLET TYPICAL
SEE DETAIL AV
DDE = 150 CY
= 120 TONS
GF= 170 SY

72″ RCP-III BURIED 1′

CULVERT 8

EXISTING R/W

SITE 17

SITE 17A

BANK STABILIZATION
SEE DETAIL AW
26 ft.

OUTLET TYPICAL
SEE DETAIL AW
DDE = 9 CY
CL I RIP RAP= 13 TONS
GF=18 SY

58

BLANCHE W. BELL

SITE 18

ROD AND LUG
CONNECTORS
W/2 ELBOWS

SP CUT DITCH
SEE DETAIL T

24″ CSP

4′ LATERAL BASE DITCH
SEE DETAIL AA

CULVERT 6
RETAIN AND EXTEND
EXISTING 2@72″ RCP

INLET TYPICAL
SEE DETAIL BA
CL I RIP RAP = 34 TONS
GF= 35 SY
DDE = 62 CY

2′ LATERAL BASE DITCH
SEE DETAIL Z
DDE = 70 CY
CL I RIP RAP= 17 TONS
GF=23 SY

SITE 19

15″ RCP-III
REMOVE
RETAIN

CL B RIP RAP

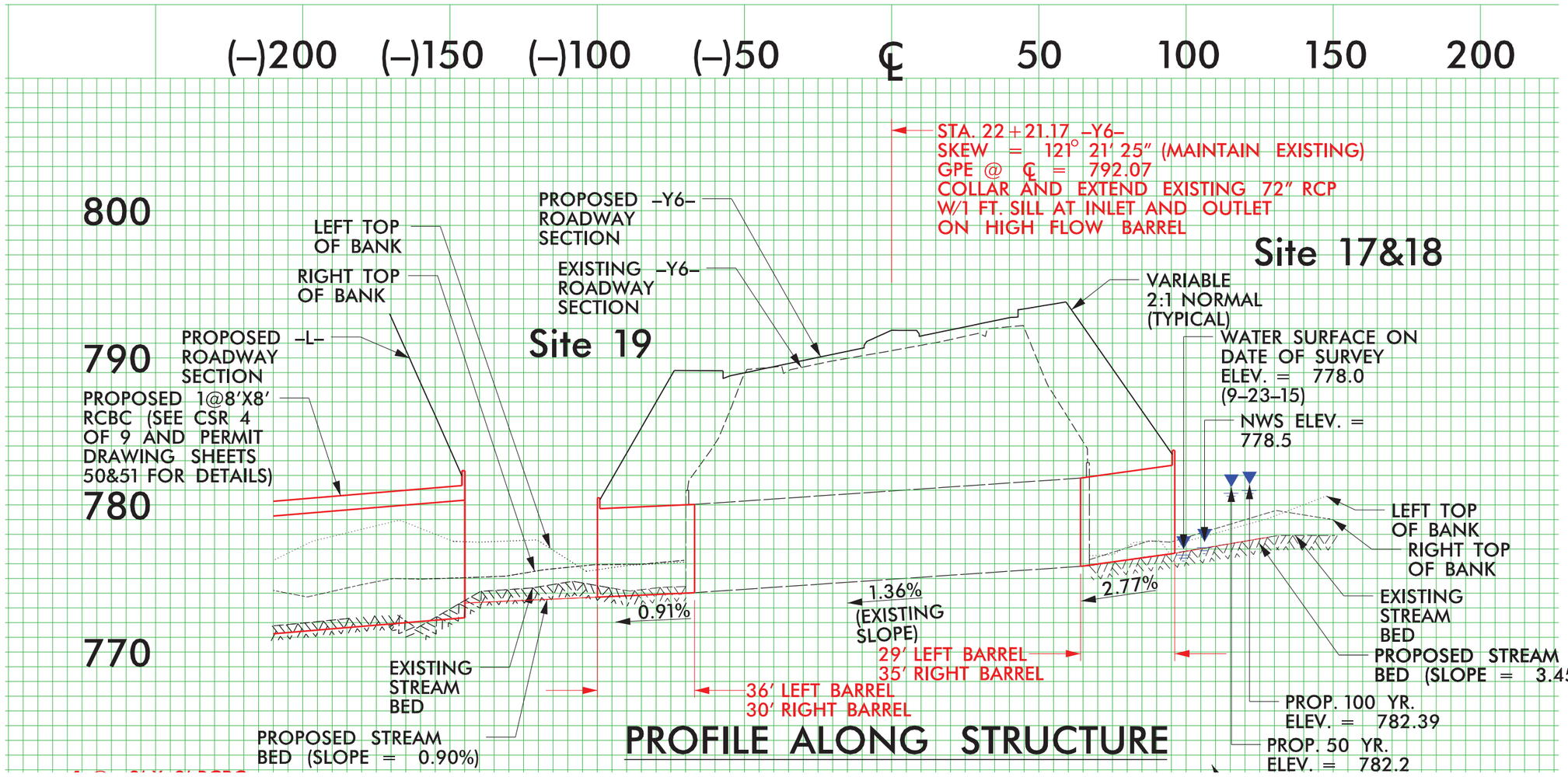
THESE PORTIONS OF STREAM
WILL REQUIRE 0.5:1 MITIGATION
DUE TO INDIRECT PROJECT
IMPACTS AND LOSS OF FUNCTION

10/23/2017
P:\2015\15107.01-U-2525C\Hydraulics\PERMITS\Environmental\Drawings\Plansheets\Planasheets 2017 ENB U2525C hyd dim anm PSH18 SITE17 enl.dgn

PERMIT DRAWING
SHEET 48 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	Plan Sheet 18
R/W SHEET NO.	___
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITES 17, 18 & 19



PROFILE ALONG STRUCTURE

REVISIONS
8/17/99

10/23/2017
FBrooks
P:\2015\15107.01–U-2525C\Hydraulics\PERMITS Environmental\Drawings\Plansheets\Plansheets 2017 FNB\U-2525C Hyd prm wet profile CSR 6 Sites 17&19.dgn

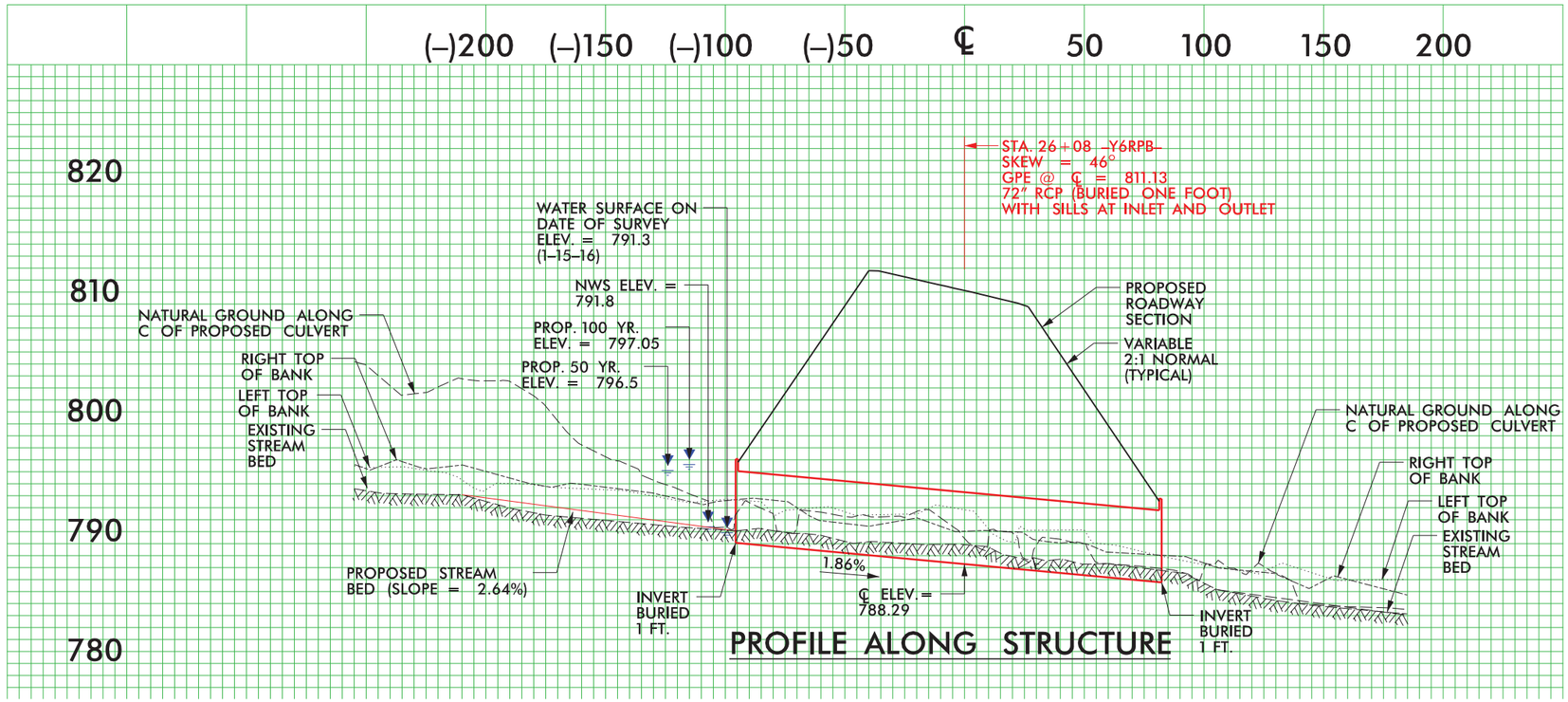
PERMIT DRAWING
SHEET 47 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	Plan Sheet 18
R/W SHEET NO.	___
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS

8/17/99

SITE 17



5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 49 OF 70

SITE 18A

SITE 18

SITE 18 /18A ENLARGEMENT

MATCHLINE STA. 19+75 –Y6–
PERMIT DRAWING SHEET 46

S 87° 14' 10.1" E
SR 2370 KENNETH RD

SEDIMENT BASIN

TTE BUILDING, LLC

LAKE JEANETTE BUILDING, LLC

SR 2352 N ELM ST 55' BST

OTHER END UNKNOWN

REMOVE DI

REMOVE

REMOVE CB

15" RCP-III

36" RCP-IV

30" RCP-IV

24" RCP-IV

18" RCP-IV

15" RCP-IV

FILL W/ FLOWABLE FILL

COLLAR AND EXTEND

RETAIN

CL B RIP RAP
EST 2 TON
EST 7 SY GF

LATERAL V DITCH
SEE DETAIL I

LATERAL V DITCH
SEE DETAIL I
DDE = 17 CY

4' LATERAL BASE DITCH
SEE DETAIL AA
DDE = 3499 CY
CL B RIP RAP= 408 TONS
GF=1055 SY

Conv. DI To TB/JB

60" RCP-III

24" RCP-III

W/2 ELBOWS

2GI-A

24" CSP

JB w/MH

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

100' 0' 100'

GRAPHIC SCALE

10/23/2017
FBrooks
P:\2015\15107.01-U-2525C\Hydraulics\PERMITS Environmental\Drawings\Plansheets\Planshests 2017 ENB\U2525C hwd dsn grm PSH18 SITE18 enl.dgn

5/14/99

Site 19 Enlargement

PERMIT DRAWING
SHEET 50 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50′ 0′ 50′
GRAPHIC SCALE

SITE 19

CULVERT 4
PROPOSED
1@8'X8' RCBC

ROD AND LUG
CONNECTORS
W/2 ELBOWS

15" RCP-IV
15" RCP-III
36" RCP-IV
15" CSP
18" RCP-IV
18" CSP
2GI
DI
CB
FES
JB w/MH
W/2 ELBOWS

TOE PROJECTION
SEE DETAIL N
CL B RIP RAP= 14 TONS
GF= 40 SY
OUTLET TYPICAL
SEE DETAIL AZ
DDE = 55 CY
CL I RIP RAP= 55 TONS
GF= 80 SY

BANK STABILIZATION
SEE DETAIL AZ
9 ft.

BANK STABILIZATION
SEE DETAIL BH
21 ft.

BANK STA
SEE DET
19 ft.

INLET TYPICAL
SEE DETAIL BH
DDE = 8CY

REMOVE
RETAIN

36" CONC
42"
24" CONC
30" CONC
30" C&G
30" CMP
20" CI
18" CONC
8" CLAY

WE 7736
CATCH BASIN
RETAIN POND
TO RISERS

APPROXIMATE LOCATION
OF 20" SECTION OF 8" DIP
PER RECORDS

EXISTING R/W

T FO
ET
EB
SS
JS
SF
GB

69°55'
35°00'
57° 25' 12.0" E

NAD 83/95

42D
CITY OF GREENSBORO

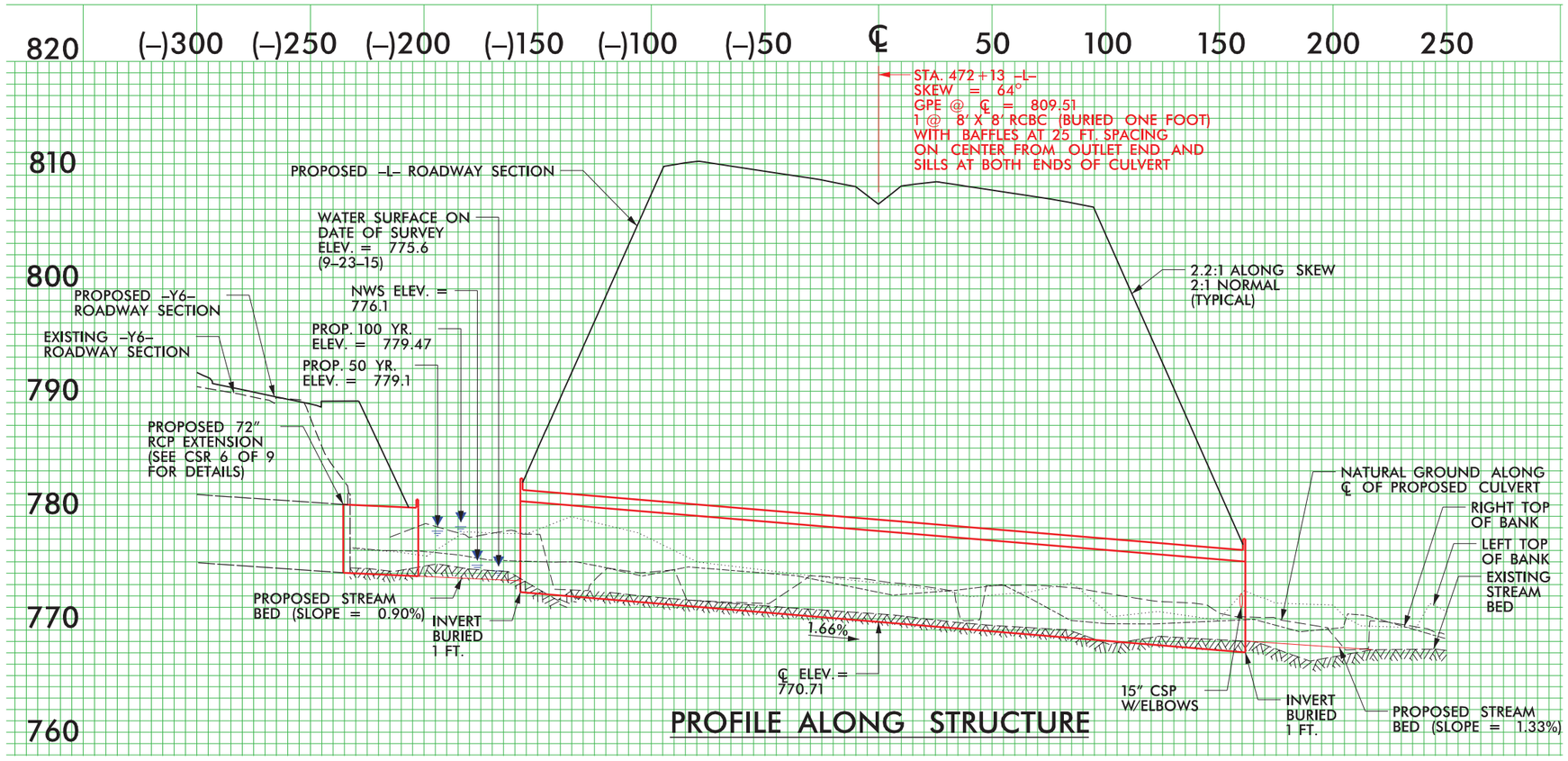
10/23/2017
Plotted:
P:\2015\15107.01-U-2525C Hydro\Rks\PERMITS Environmental\Drawings\Plansheets\Plansheets_2017 ENB\U2525C_hyd dtm sum_PSH18_SITE19 enl.dgn

PERMIT DRAWING
SHEET 51 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	Plan Sheet 18
R/W SHEET NO.	___
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SITE 19



PROFILE ALONG STRUCTURE

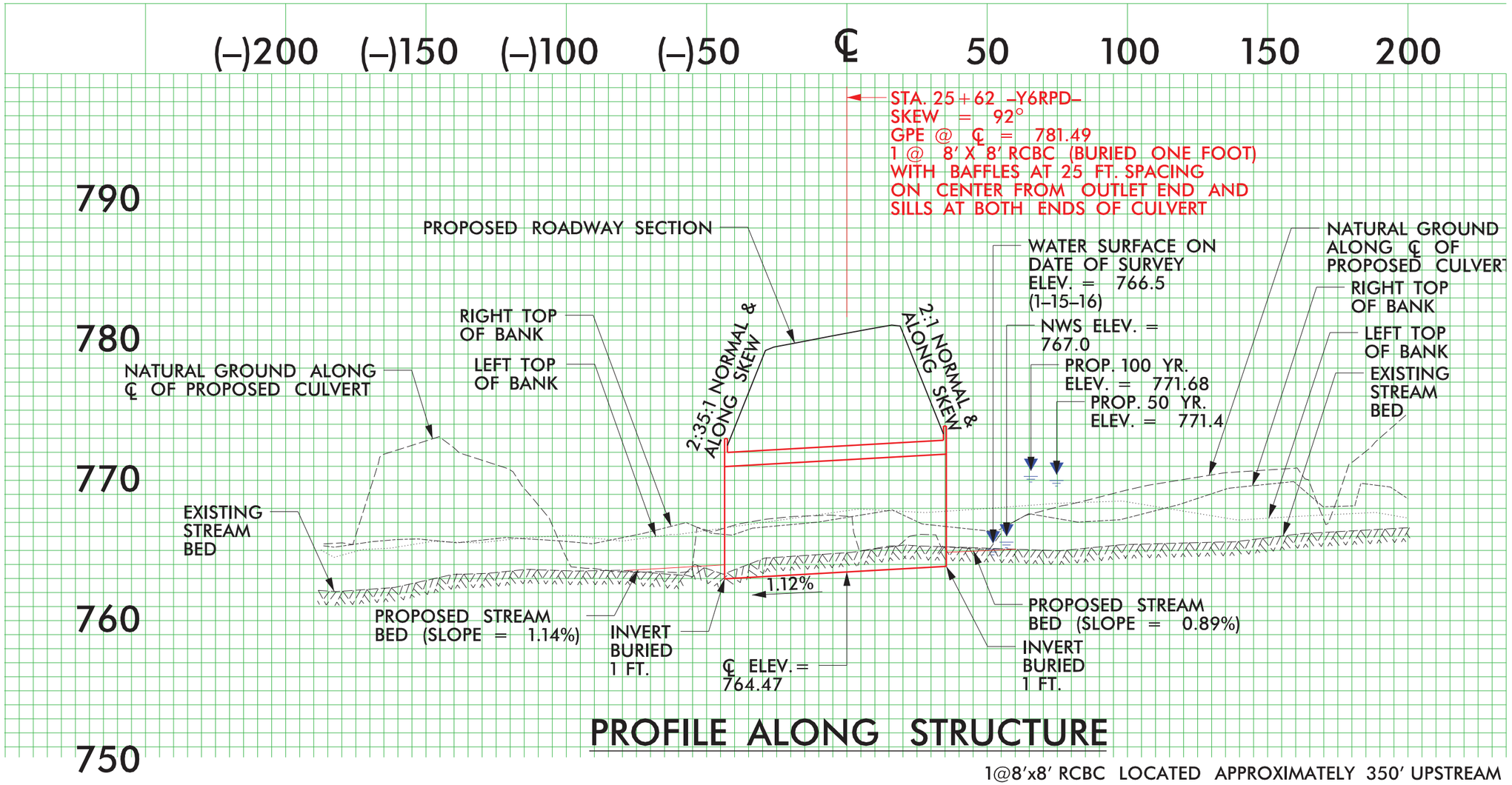
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	Plan Sheet 38
R/W SHEET NO.	___
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 52 OF 70

REVISIONS 8/17/99

SITE 19



PROFILE ALONG STRUCTURE

1@8'x8' RCBC LOCATED APPROXIMATELY 350' UPSTREAM

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 53 OF 70

8/17/99

REVISIONS

11/1016 R/W REVISION: ADDED PARCEL 976; ADJUSTED DUE ON PARCELS 65 AND 66. – (WEI,reo)
07/1417 R/W REVISION: REVISED A TRACT OF PARCEL 42 TO PARCEL 42B; CHANGED R/W MONUMENTS TO PERMANENT UTILITY MARKERS Y6 STATION 32+64.00, 33+23.00, 35+58.00, 35+85.00 AND 36+10.00 ON PARCELS 42B AND 64; ADJUSTED PROPERTY LINES ON PARCEL 65 AND 66; ELIMINATED A TRACT OF PARCEL 42 AND 66 (NO CLAIM). –(WEI,reo)

SITE 19A

MATCHLINE –Y6– STA. 32+00.00 SEE SHEET 18

3803 NORTH ELM STREET INVESTORS, LLC (80)

3805 NORTH ELM STREET INVESTORS, LLC (FORMERLY OPUS SOUTH CORPORATION) (64)

42B

CULVERT Z
60' RCP-III
REMOVE 4 LF
COLLAR AND
EXTEND

BANK STABILIZATION
SEE DETAIL V
CL I RIP RAP 44 TON
GF = 35 SY
32 ft.

CL B RIP RAP
EST 3 TON
EST 10 SY GF

PROP WW FENCE

CULVERT Y
60' RCP-III
COLLAR AND EXTEND

CULVERT X
60' RCP-III PUE
COLLAR AND
EXTEND

ISBKBUS
STANDARD
BASE DITCH
CL I RIP RAP
EST 34 TON
EST 60 SY GF
SEE DETAIL AR
DDE = 32 CY

Temp. Impacts in Surface Water

976

66
GSC ACQUISITION, LLC
(NO CLAIM)

65

64

42
CITY OF GREENSBORO
(NO CLAIM)

LAKE JEANETTE, LLC

NCDOT
(FORMERLY CRAMER ON ELM, LLC)

AREA DEDICATED TO CITY OF GREENSBORO FOR DRAINAGE WAY

SR 2352 N.ELM ST 62' BST

NAD 83/95

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'
GRAPHIC SCALE

SEE SHEETS 2D–1 THRU 2D–6 FOR DRAINAGE DETAILS
SEE SHEET 55 FOR –Y6– PROFILE

10/2/2017
FRevels
P:\2015\15107.01-U-2525C Hydraulics PERMITS Environmental Drawings\Plansheets Plansheets 2017 ENR\u2525c hyd dtn strm PSH31.dgn

PERMIT DRAWING
SHEET 54 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	31
R/W SHEET NO.	38
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 19A

MATCHLINE -Y6- STA. 32+00.00 SEE SHEET 18

MATCHLINE -Y6- STA. 36+00.00 SEE SHEET 55

3803 NORTH ELM STREET INVESTORS, LLC (80)

3805 NORTH ELM STREET INVESTORS, LLC (FORMERLY OPUS SOUTH CORPORATION) (64)

42B

CULVERT 7

BANK STABILIZATION SEE DETAIL Y
CL I RIP RAP 44 TON
GF = 35 SY
32 ft

60' RCP-III
REMOVE 4 LF COLLAR AND EXTEND

18" RCP-III

24" RCP-IV

15" RCP-IV

30" CONC

PROP. WW FENCE

CULVERT 8

60' RCP-III PLUG
COLLAR AND EXTEND

ISBKBUS
STANDARD BASE DITCH
CL I RIP RAP
EST 34 TON
EST 60 SY GF
SEE DETAIL AR
CDE = 32 CY

Temp. Impacts in Surface Water

976

66 GSC ACQUISITION, LLC (NO CLAIM)

65

64

42 CITY OF GREENSBORO (NO CLAIM)

LAKE JEANETTE, LLC

NCDOT (FORMERLY CRAMER ON ELM, LLC)

AREA DEDICATED TO CITY OF GREENSBORO FOR DRAINAGE WAY

SR 2352 N.ELM ST 62' BST

NAD 83/95

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'
GRAPHIC SCALE

SEE SHEETS 2D-1 THRU 2D-6 FOR DRAINAGE DETAILS
SEE SHEET 55 FOR -Y6- PROFILE

REVISIONS

11/1016 RW REVISION: ADDED PARCEL 976; ADJUSTED DUE ON PARCELS 66 AND 976; ADJUSTED PUE ON PARCELS 65 AND 66. - (WEI.rec)
07/1417 RW REVISION: REVISED A TRACT OF PARCEL 42 TO PARCEL 42B; CHANGED R/W MONUMENTS TO PERMANENT UTILITY MARKERS Y6 STATION 32+64.00, 33+23.00, 35+58.00, 35+85.00 AND 36+10.00 ON PARCELS 42B AND 64; ADJUSTED PROPERTY LINES ON PARCEL 65 AND 66; ELIMINATED A TRACT OF PARCEL 42 AND 66 (NO CLAIM). -(WEI.rec)

8/17/99

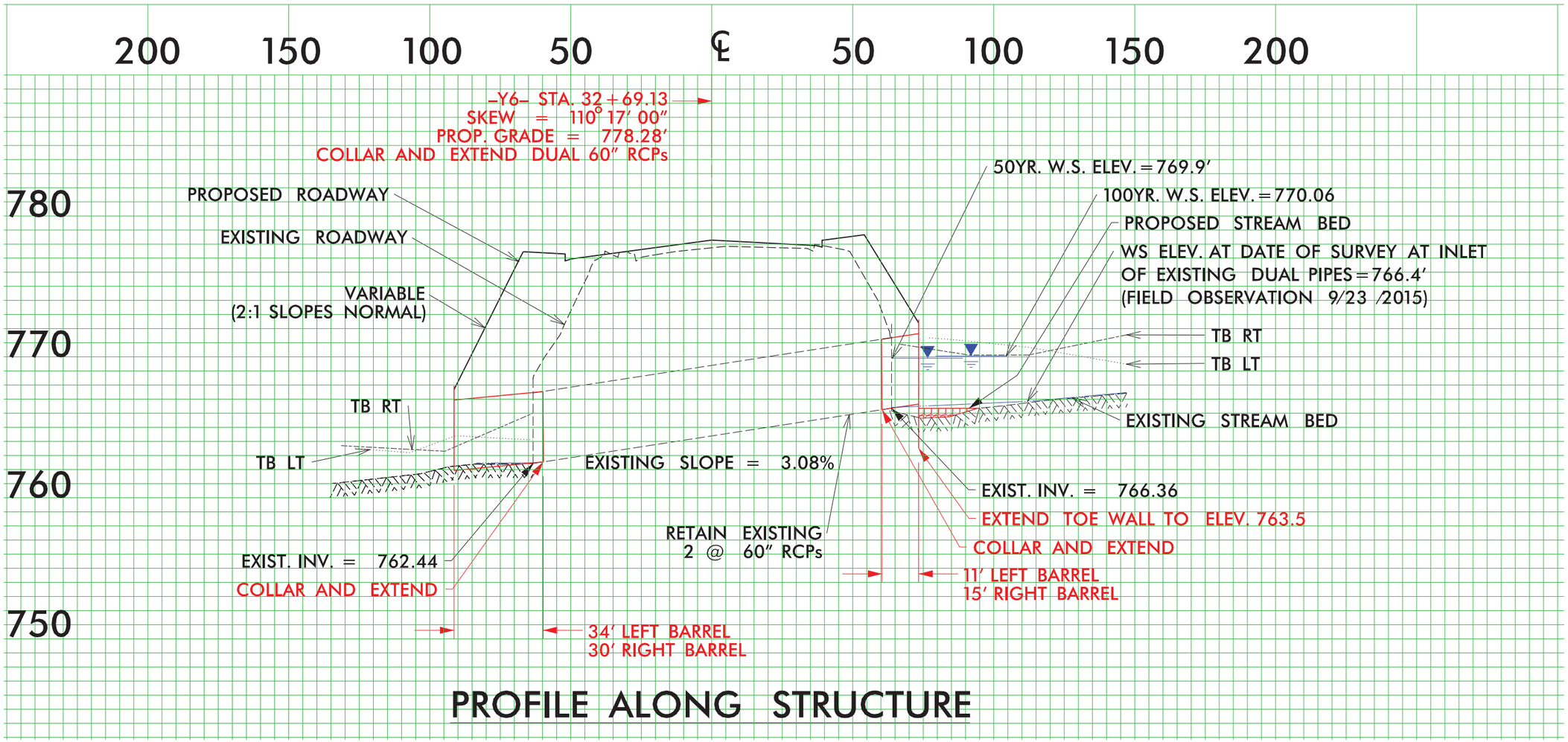
10/22/2017
File: U-2525C_Hydraulics_PERMITS_Environmental Drawings\Plansheets_Plansheets_2017_ENB\u2525c_hyd_dm_env_PSH31_con.dgn

PERMIT DRAWING
SHEET 55 OF 70

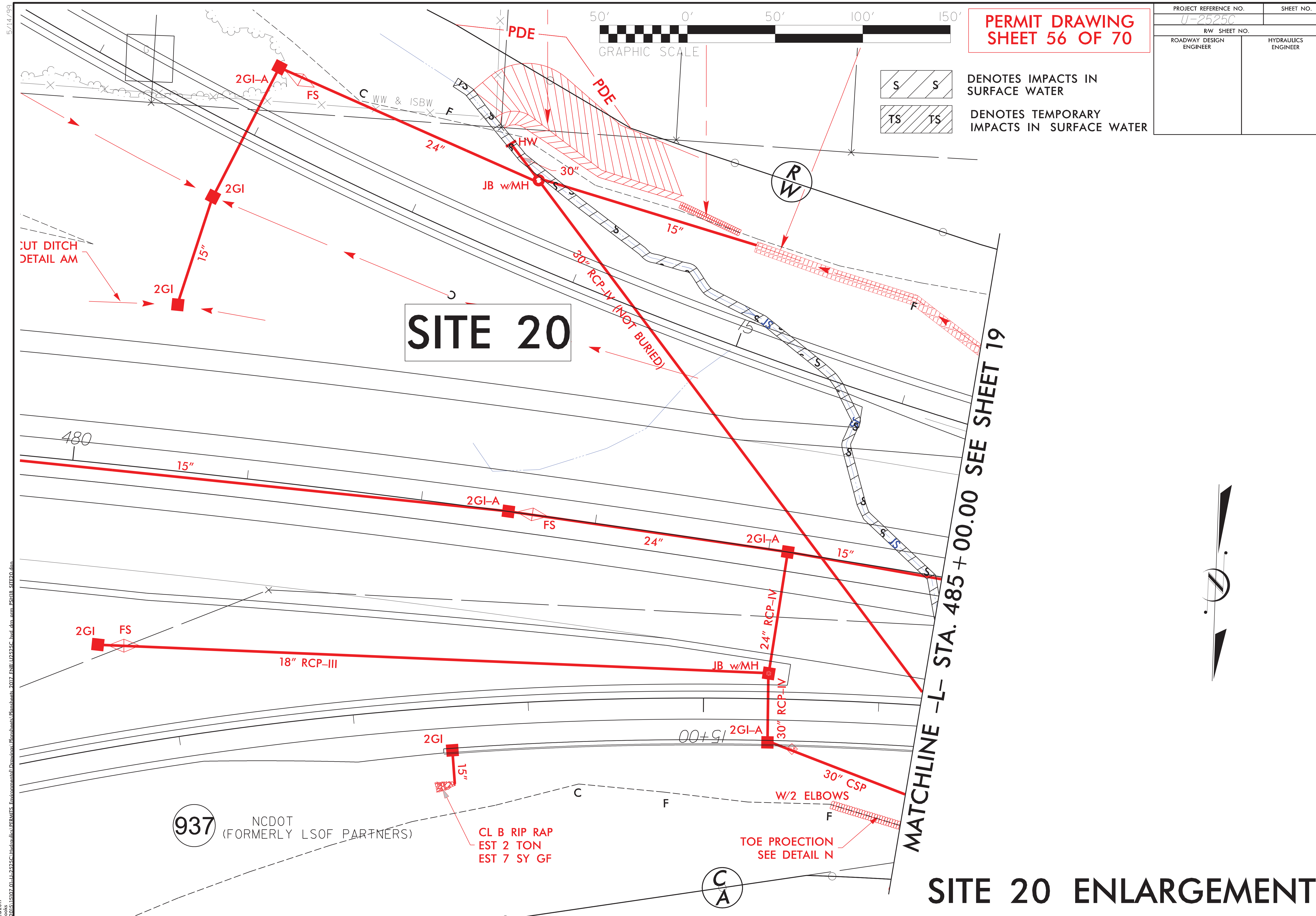
PROJECT REFERENCE NO.	SHEET NO.
U-2525C	Plan Sheet 31
R/W SHEET NO.	___
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS 8/17/99

SITE 19A



PROFILE ALONG STRUCTURE


PERMIT DRAWING
SHEET 56 OF 70
PROJECT REFERENCE NO.
SHEET NO.
U-2525C
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
50' 0' 50' 100' 150'
GRAPHIC SCALE
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
PDE
PDE
2GI-A
FS
C WW & ISBW
F
24"
HW
30"
JB w/MH
15"
2GI
15"
2GI
CUT DITCH
DETAIL AM
30" RCP-IV (NOT BURIED)
SITE 20
480
15"
2GI-A
FS
24"
2GI-A
15"
24" RCP-IV
2GI
FS
18" RCP-III
JB w/MH
30" RCP-IV
2GI-A
15+00
2GI
15"
30" CSP
W/2 ELBOWS
C
F
F
937
NCDOT
(FORMERLY LSOF PARTNERS)
CL B RIP RAP
EST 2 TON
EST 7 SY GF
TOE PROECTION
SEE DETAIL N
MATCHLINE -L- STA. 485+00.00 SEE SHEET 19
SITE 20 ENLARGEMENT

PERMIT DRAWING
SHEET 57 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

50' 0' 50' 100' 150'
GRAPHIC SCALE

NAD 83/95

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

REVISIONS 8/17/99

MATCHLINE –L– STA. 485+00.00 SEE SHEET 18

MATCHLINE –L– STA. 499+00.00 SEE SHEET 20

SITE 20

SITE 21

42D
CITY OF GREENSBORO

937
NCDOT
(FORMERLY LSOF PARTNERS)

64
3805 NORTH ELM STREET INVESTORS, LLC
(FORMERLY OPUS SOUTH CORPORATION)

77
CONE DENIM, LLC

65A
LAKE JEANETTE ASSOCIATION, INC.

TOE PROECTION
SEE DETAIL N
CL B RIP RAP= 60 TONS
GF= 180 SY

INLET TYPICAL
CL I RIP RAP= 88 TONS
GF= 119 SY
SEE DETAIL BB
DDE = 38 CY

2' LATERAL BASE DITCH
SEE DETAIL F
DDE = 364 CY
CL B RIP RAP= 168 TONS
GF= 455 SY

LATERAL V DITCH
SEE DETAIL I
DDE = 16 CY

SEE DETAIL R

ROD AND LUG
W/2 ELBOWS

24" CSP
W/2 ELBOWS

3 @ 11' X 9' RCBC
W/BEVELED HEADWALL; CENTER BARREL AND
EASTERNMOST BARREL BURIED 1 FOOT
WESTERNMOST BARREL BURIED 2.5 FOOT WITH A SILL
CULVERT 5

S 76°44'40.0" E

30" RCP-IV BURIED

W/2 ELBOWS

30" CSP

JB w/MH

48" BURIED 20%

TOE PROECTION
SEE DETAIL N
RIP RAP = 45 TONS
GF = 185 SY

BANK STABILIZATION
SEE DETAIL O
30 ft.

RIP RAP AT JS
STREAM OUTLET
SEE DETAIL O
LENGTH= 30'
CLASS II RIP RAP
EST 14 TONS
EST 20 SY GF

OUTLET TYPICAL
CL I RIP RAP= 83 TONS
GF= 111 SY
SEE DETAIL BC
DDE = 23 CY

TOE PROTECTION
SEE DETAIL N
CL B RIP RAP= 28 TONS
GF= 85 SY

Q10=22 cfs
V10=1.69 fps

CL I RIP RAP
EST 10 TON
EST 23 SY GF
LENGTH=12'

3' LATERAL
BASE DITCH
SEE DETAIL J
DDE =231 CY
CL I RIP RAP =111 TONS
GF =405 SY

3' LATERAL BASE DITCH
SEE DETAIL J
DDE = 899 CY
CL I RIP RAP = 484 TONS
GF= 955 SY

KENNETH RD

SEE SHEETS 2D-1 THRU 2D-6 FOR DRAINAGE DETAILS
SEE SHEET 49 FOR –L– PROFILE
SEE SHEET 66 FOR –Y6RPA– PROFILE
SEE SHEET 84 FOR –Y6RPD– PROFILE
SEE SHEETS C-1 THRU C-? FOR CULVERT PLANS

10/23/2017
Plotted By: jmiller
P:\2015\15107.01-U-2525C Hydraulics PERMITS Environmental Provisions Plansheets 2017 FNB\U2525C hyd dsn rem PSH19.dgn

PERMIT DRAWING
SHEET 58 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

50' 0' 50' 100' 150'
GRAPHIC SCALE

NAD 83/95

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

REVISIONS 8/17/99

MATCHLINE –L– STA. 485+00.00 SEE SHEET 18

MATCHLINE –L– STA. 499+00.00 SEE SHEET 20

SITE 20

SITE 21

42D CITY OF GREENSBORO

937 NCDOT (FORMERLY LSOF PARTNERS)

64 3805 NORTH ELM STREET INVESTORS, LLC (FORMERLY OPUS SOUTH CORPORATION)

77 CONE DENIM, LLC

65A LAKE JEANETTE ASSOCIATION, INC.

INLET TYPICAL
CL I RIP RAP = 88 TONS
GF = 119 SY
SEE DETAIL BB
DDE = 38 CY

TOE PROJECTION
SEE DETAIL N
CL B RIP RAP = 60 TONS
GF = 180 SY

2' LATERAL BASE DITCH
SEE DETAIL F
DDE = 364 CY
CL B RIP RAP = 168 TONS
GF = 455 SY

LATERAL V DITCH
SEE DETAIL I
DDE = 16 CY

ROD AND LUG W/2 ELBOWS

15" CSP

15" RCP-IV

2GI

S 76°44'40.0" E

490

3 @ 11' X 9' RCBC W/BEVELED HEADWALL, CENTER BARREL AND EASTERNMOST BARREL BURIED 1 FOOT WESTERNMOST BARREL BURIED 2.5 FOOT WITH A SAG
CULVERT 5

24" CSP W/2 ELBOWS

SEE DETAIL R

OUTLET TYPICAL
CL I RIP RAP = 83 TONS
GF = 111 SY
SEE DETAIL BC
DDE = 23 CY

BANK STABILIZATION
SEE DETAIL O
30 ft

TOE PROTECTION
SEE DETAIL N
RIP RAP = 45 TONS
GF = 185 SY

RIP RAP AT JS STREAM OUTLET
SEE DETAIL O
LENGTH = 28'
CLASS II RIP RAP
EST 14 TONS
EST 20 SY GF

TOE PROTECTION
SEE DETAIL N
CL B RIP RAP = 28 TONS
GF = 85 SY

CL I RIP RAP
EST 10 TON
EST 23 SY GF
LENGTH = 12'

3' LATERAL BASE DITCH
SEE DETAIL J
DDE = 231 CY
CL I RIP RAP = 111 TONS
GF = 405 SY

3' LATERAL BASE DITCH
SEE DETAIL J
DDE = 899 CY
CL I RIP RAP = 484 TONS
GF = 955 SY

Q10 = 22 cfs
V10 = 1.61 fps

SEE SHEETS 2D-1 THRU 2D-6 FOR DRAINAGE DETAILS
SEE SHEET 49 FOR –L– PROFILE
SEE SHEET 66 FOR –Y6RPA– PROFILE
SEE SHEET 84 FOR –Y6RPD– PROFILE
SEE SHEETS C-1 THRU C-? FOR CULVERT PLANS

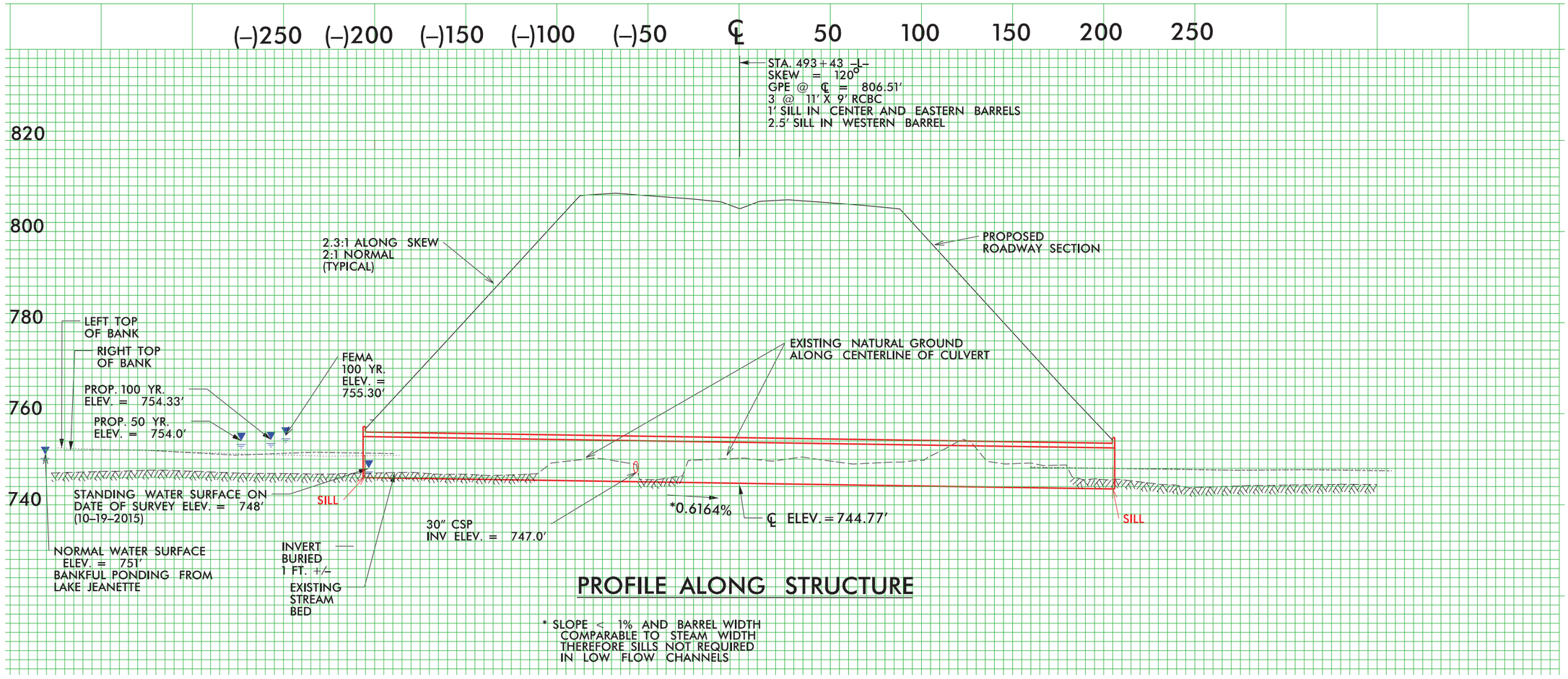
10/23/2017
Revised
P:\2015\15107.01-U-2525C Hydraulics PERMITS Environmental Drawings Plansheets Plansheets 2017 FNB\U2525C hyd dsn rem PSH19 con.dgn

PERMIT DRAWING
SHEET 59 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	Plan Sheet 19
R/W SHEET NO.	___
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS 8/17/99

SITE 21



PROFILE ALONG STRUCTURE

* SLOPE < 1% AND BARREL WIDTH COMPARABLE TO STEAM WIDTH THEREFORE SILLS NOT REQUIRED IN LOW FLOW CHANNELS

10/23/2017
Revised
P:\2015\15107.01\U-2525C Hydraulics PERMITS Environmental Provision\Plansheets Plansheets 2017 ENB\U-2525C Hyd prm wet profile CSR_5_Site 21.dgn

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2525C	X-170

0 5 10

PERMIT DRAWING
SHEET 60 OF 70

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

810
800
790
780
770
760
750

0.030
6:1
5.556:1
805.23
2:1
750.20
494+50.00

0.030
6:1
5.556:1
804.89
2:1
WETLANDS
WETLANDS
WETLANDS
WETLANDS
746.25
494+00.00

-L-

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2525C	X-373

0 5 10

PERMIT DRAWING
SHEET 61 OF 70

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

800
790
780
770
760
750

6:1 5.556:1 0.030
804.89
746.85
494+00.00
2:1
3:1 2:1 2:1
750.35

6:1 5.556:1 0.030
804.34
749.91
493+50.00
WETLANDS
WETLANDS
2:1
2:1 2:1
748.35

-L-

10/2/2017
FBrooks
P:\2015\15107.01-U-2525C\Hydraulics\PERMITS Environmental\Drawings\Plansheets\Plansheets 2017 FNB\u2525c_hyd_dm_prm_xsl_1.r.dgn

PERMIT DRAWING
SHEET 62 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

/S/ /S/ DENOTES IMPACTS IN SURFACE WATER

/F/ /F/ DENOTES FILL IN WETLAND

/TS/ /TS/ DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'
GRAPHIC SCALE

8/17/99

REVISIONS

MATCHLINE –L– STA. 499+00.00 SEE SHEET 19

MATCHLINE –L– STA. 513+00.00 SEE SHEET 21

CITY OF GREENSBORO

WHITEHALL AT RICHLAND CREEK HOMEOWNERS ASSOCIATION INC 78

NAD 83/95

END UNKNOWN 8" DIP 20' PERMANENT UTILITY EASEMENT 5' 8" DIP

100' DRAINAGE MAINTENANCE & UTILITY EASEMENT

42F

2' LATERAL BASE DITCH SEE DETAIL F DDE = 61 CY CL B RIP RAP= 59 TONS GF= 160 SY

SEE DETAIL BF CL 1 RIP RAP EST 14 TON EST 20 SY GF LENGTH = 29' DDE = 10 CY

ISF CONDO

WHITEHALL AT RICHLAND CREEK HOMEOWNERS ASSOCIATION INC 78

50PR WHITEHALL AT RICHLAND CREEK 50PR

PROP. WW FENCE

DRAINAGE WAY OR OPEN SPACE NOT BUILDABLE

BANK STABILIZATION SEE DETAIL BF 10 ft.

2' LATERAL BASE DITCH PSRM=181 SY SEE DETAIL U DDE = 277 CY

CL B RIP RAP EST 3 TON EST 10 SY GF

NCDOT (FORMERLY LSOF PARTNERS) 937

15" CSP ROD AND LUG W/2 ELBOWS

JB wMH

30" W/2 ELBOWS

SITE 22

CL B RIP RAP EST 3 TON EST 10 SY GF

18" CSP ROD AND LUG W/2 ELBOWS

18" 2GI FS C F

15" RCP-JW 2GI

24" RCP-V 2GI

500 505 N 71° 27' 27.3" W 510

15" 2GI FS

54" RCP-LD (NOT TURNED)

18" RCP-JW INSIDE 14' ENCASEMENT

ROCK PLATING CLASS I RIP RAP EST. 1,310 TON EST. 1,900 SY GF SEE DETAIL AD

JB wMH SEE SPECIAL DETAIL

PRESTBURY ASSOCIATION 79

CL B RIP RAP EST 4 TON EST 10 SY GF LENGTH =12'

18" CSP ROD AND LUG W/2 ELBOWS

3' LATERAL BASE DITCH SEE DETAIL J

2' LATERAL BASE DITCH SEE DETAIL C DDE =376 CY

CL B RIP RAP EST 2 TON EST 7 SY GF

2' LATERAL BASE DITCH SEE DETAIL F DDE = 523 CY CL B RIP RAP= 168 TONS GF= 425 SY

RETAIN CL B RIP RAP EST 50 TON EST 111 SY GF –L– 510+00 TO 511+00

4' LATERAL BASE DITCH SEE DETAIL U DDE =316 CY

42" CSP ROD AND LUG w/2 ELBOWS

LESLIE F MILLIKIN

YOUTH FOCUS INC.

65A LAKE JEANETTE ASSOCIATION, INC.

91 92 93 94 79

ISAC NELSON RANKIN

KATHLEEN S. GRANT

JOHN BRYANT (FORMERLY JAMES D. ELLIS)

MICHAEL W NIEGRO

GWENDOLYN E. JONES

PRESTBURY RD

EXISTING R/W

SEE SHEETS 2D-1 THRU 2D-6 FOR DRAINAGE DETAILS
SEE SHEET 49 & 50 FOR –L– PROFILE

10/22/2017
FRevels
P:\2015\15107.01-U-2525C\Hydraulics PERMITS Environmental Drawings\Plansheets Plansheets 2017 FNB\U2525C hyd drn pmt PSH20.dgn

PERMIT DRAWING
SHEET 63 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DENOTES IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'
GRAPHIC SCALE

REVISIONS
8/17/99

MATCHLINE –L– STA. 499+00.00 SEE SHEET 19

MATCHLINE –L– STA. 513+00.00 SEE SHEET 21

NAD 83/95

SITE 22

WHITEHALL AT RICHLAND CREEK HOMEOWNERS ASSOCIATION INC 78

CITY OF GREENSBORO

42F

END UNKNOWN 8" DIP 20' PERMANENT DITCH EASEMENT

2' LATERAL BASE DITCH SEE DETAIL F DDE =61 CY CL B RIP RAP= 39 TONS GF= 160 SY

SEE DETAIL BF CL I RIP RAP EST 14 TON EST 70 SY GF LENGTH= 57' DDE = 10 CY

100' DRAINAGE EASEMENT

PROP WW FENCE

DRAINAGE WAY OR OPEN SPACE NOT BUILDABLE

BANK STABILIZATION SEE DETAIL BF 10 ft.

NCDOT (FORMERLY LSOF PARTNERS) 937

15" CSP ROD AND LUG W/2 ELBOWS

JB WMH

30° W/2 ELBOWS

2' LATERAL BASE DITCH PSRM=181 SY SEE DETAIL U DDE = 277 CY

CL B RIP RAP EST 3 TON EST 10 SY GF

18" CSP ROD AND LUG W/2 ELBOWS

NCDOT (FORMERLY LSOF PARTNERS) 937

15" RCP-JW

24" RCP-W

18" RCP-JW

54" RCP ELBOW INSIDE 24" ENCASEMENT

54" RCP ELBOW NOT PURCHASED

500 505 N 71° 27' 27.3" W 510

2GI FS 15"

2' LATERAL BASE DITCH SEE DETAIL C DDE =376 CY

3' LATERAL BASE DITCH SEE DETAIL J

CL B RIP RAP EST 2 TON EST 7 SY GF

2' LATERAL BASE DITCH SEE DETAIL F DDE = 523 CY CL B RIP RAP= 168 TONS GF= 425 SY

ROCK PLATING CLASS I RIP RAP EST 1,315 TON EST 1,900 SY GF SEE DETAIL AG

JB WMH SEE SPECIAL DETAIL

PRESTBURY ASSOCIATION 79

CL B RIP RAP EST 4 TON EST 10 SY GF LENGTH= 12'

18" CSP ROD AND LUG W/2 ELBOWS

RETAIN CL B RIP RAP EST 50 TON EST 111 SY GF –L– 510+00 TO 511+00

APPROXIMATE DRAINAGE MAINTENANCE & UTILITY EASEMENT PERMANENT WET DETENTION POND

4' LATERAL BASE DITCH UNKNOWN SEE DETAIL V DDE =316 CY

42" CSP ROD AND LUG W/2 ELBOWS

PRESTBURY ASSOCIATION UNKNOWN

SIZE & TYPE UNKNOWN

END UNKNOWN

LESLIE F MILLIKIN

YOUTH FOCUS INC.

65A LAKE JEANETTE ASSOCIATION, INC.

91 92 93 94 79

ISFD 2SFD

ISAC NELSON RANKIN

KATHLEEN S. GRANT

JOHN BRYANT (FORMERLY JAMES D. ELLIS)

MICHAEL W NEGRO

GWENDOLYN E. JONES

PRESTBURY DR

EXISTING R/W

ISF CONDO

WHITEHALL AT RICHLAND CREEK HOMEOWNERS ASSOCIATION INC 78

50PP

SEE SHEETS 2D-1 THRU 2D-6 FOR DRAINAGE DETAILS
SEE SHEET 49 & 50 FOR –L– PROFILE

10/2/2017
FRS Version 4.0
P:\2015\15107.01-U-2525C\Hydraulics\PERMITS Environmental Drawings\Plansheets Plansheets 2017 FNB\U2525C hwd drw pmt PSH20 con.dgn

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2525C	X-181

PERMIT DRAWING
SHEET 64 OF 70

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

810
800
790
780
770

0.020
6:1
6:1
813.47
2:1
777.30
506+50.00

0.020
6:1
6:1
813.13
2:1
WETLANDS
WETLANDS
781.52
506+00.00

—L—

290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10

10/23/2017
FBrooks
P:\2015\15107.01-U-2525C\ Hydraulics\ PERMITS_Environmental\ Drawings\ Plansheets\ Plansheets_2017_FNB\u2525c_hyd_drn_prm_xsd_ul1.dgn

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2525C	X-386

PERMIT DRAWING
SHEET 65 OF 70

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

810 800 790 780

6:1 6:1 814.84 0.020 2:1 2:1 2:1 786.56 778.79

508+50.00

6:1 6:1 814.30 0.020 2:1 WETLANDS WETLANDS 2:1 2:1 2:1 780.54 781.75

508+00.00

6:1 6:1 814.16 0.020 2:1 2:1 2:1 2:1 774.48 784.05

507+50.00

—L—

PERMIT DRAWING
SHEET 66 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

S S DENOTES IMPACTS IN SURFACE WATER

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'
GRAPHIC SCALE

8/17/99
REVISIONS

NAD 83/95

MATCHLINE -L- STA. 527+00.00 SEE SHEET 21

MATCHLINE -L- STA. 541+00.00 SEE SHEET 23

SITE 23

ELLWOOD F KAMPERMAN

EBERET P. WILLIAMS & USHA L. WILLIAMS

JOHN PATRICK WILLIAMS

MICHEAL P. & TONI M. WILLIAMS

RALPH P. & SUSAN J. YEREX

KINYATA SHARRINE WILLIAMS

PAUL A. RIFFE

JOHNNY WAYNE GILES

LORRIE ANN MOORE

KEVIN M. HART

THE MEADOWS AT RICHLAND CREEK HOMEOWNER'S ASSOCIATION, INC

89

LATERAL 3' BASE DITCH
SEE DETAIL "J"
DDE = 378 CY
CL I RIP RAP =260 TONS
GF = 515 SY

TEMP. IMPACTS OF SURFACE WATER

5' STANDARD BASE DITCH
SEE DETAILS "AC"
L=40', S=0.05 %FT
DDE=60 CU. YDS

APPROXIMATE LOCATION 80' DRAINAGE MAINTENANCE & UTILITY EASEMENT

BERM 'V' DITCH
SEE DETAIL "AF"

NCDOT
(FORMERLY McNAIRY FAMILY FARM)

940

30" CSP W/2 ELBOWS

30" RCP-III

15" RCP-IV

42" RCP-IV BURIED 20%

Q10 = 28 cfs
V10 = 7.76 fps

JB w/MH

BANK STABILIZATION
SEE DETAIL BF
19 ft.

TOE PROTECTION
SEE DETAIL "N"
CL B RIP RAP= 4 TONS
GF= 12 SY

CLASS I RIP RAP
W/GEOTEXTILE
LENGTH=19'
EST 18 TONS
EST 37 SY GF
SEE DETAIL "BF"
DDE = 12 CY

BM #14

CITY OF GREENSBORO

15' R/W & PROPERTY TRAIL EASEMENT

GRANDE AT LAKE JEANETTE MASTER HOMEOWNERS ASSOCIATION, INC.

90

9' BK WALL

RIP-RAP

20' DRAINAGE EASEMENT

15' DRAINAGE EASEMENT

5' UTILITY EASEMENT EXISTING R/W

VIDYARANYA B. & INDUMATHI B. GARGEYA

REZA & MARIA E. MARDANI

JIM D. SKAGGS

JAMES E. LABRANCHE

TODD A. & LAURA S. MCDADE

SAT N. & MADHU GUPTA

S 88°12'10.2" W

SEE SHEETS 2D-1 THRU 2D-6 FOR DRAINAGE DETAILS
SEE SHEETS 51 & 52 FOR -L- PROFILE

10/23/2017
Revised
P:\2015\15107.01-LL-2525C Hydraulics PERMITS Environmental Provisions Plansheets Plansheets 2017 ENSU2525C hyd dsn PSH22.dgn

PERMIT DRAWING
SHEET 67 OF 70

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

S S DENOTES IMPACTS IN SURFACE WATER
F F DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'
GRAPHIC SCALE

8/17/99
REVISIONS

NAD 83/95

SITE 23

MATCHLINE –L– STA. 527 + 00.00 SEE SHEET 21

MATCHLINE –L– STA. 541 + 00.00 SEE SHEET 23

TEMPORARY IMPACTS OF SURFACE WATER

LATERAL 3' BASE DITCH
SEE DETAIL "I"
DDE = 378 CY
CL I RIP RAP = 260 TONS
GF = 515 SY

5' STANDARD BASE DITCH
SEE DETAILS "AC"
L=40' S=0.05 FT/FT
DDE=60 CU YDS

BERM "V" DITCH
SEE DETAIL "AF"

APPROXIMATE LOCATION 80' DRAINAGE MAINTENANCE & UTILITY EASEMENT

BERM "V" DITCH
SEE DETAIL "AF"

BDO

30" CSP W/2 ELBOWS

42" RCP-IV BURIED 20%

30" RCP-III

15" RCP-III

S 88°12'10.2" W

42" RCP-IV BURIED 20%

C10 = 26 MS
C70 = 77 (S)

BANK STABILIZATION
SEE DETAIL BF
19 ft.

TOE PROTECTION
SEE DETAIL "N"
CL B RIP RAP = 4 TONS
GF = 12 SY

CLASS I RIP RAP W/GEOTEXTILE
LENGTH=19'
EST 16 TONS
EST 17 SY GF
SEE DETAIL "BF"
DDE = 12 CY

BM #14

9' BK WALL

RIP RAP

20' DRAINAGE EASEMENT

15' DRAINAGE EASEMENT

5' UTILITY EASEMENT
EXISTING R/W

ELLWOOD F KAMPERMAN

EBERET P. WILLIAMS & USHA L. WILLIAMS

JOHN PATRICK WILLIAMS

MICHEAL P. & TONI M. WILLIAMS

RALPH P. & SUSAN J. YEREX

KINYATA SHARRINE WILLIAMS

PAUL A. RIFFE

JOHNNY WAYNE GILES

LORRIE ANN MOORE

KEVIN M. HART

THE MEADOWS AT RICHLAND CREEK HOMEOWNER'S ASSOCIATION, INC

THE MEADOWS AT RICHLAND CREEK HOMEOWNER'S ASSOCIATION, INC

NCDOT (FORMERLY McNAIRY FAMILY FARM)

NCDOT (FORMERLY McNAIRY FAMILY FARM)

CITY OF GREENSBORO

GRANDE AT LAKE JEANETTE MASTER HOMEOWNERS ASSOCIATION, INC.

GRANDE AT LAKE JEANETTE MASTER HOMEOWNERS ASSOCIATION, INC.

VIDYARANYA B. & INDUMATHI B. GARGEYA

REZA & MARIA C. MARDANI

JIM D. SKAGGS

JAMES E. LABRANCHE

DOUG A. & LAURA S. MCDADE

SAT N. & MADHU GUPTA

SEE SHEETS 2D-1 THRU 2D-6 FOR DRAINAGE DETAILS
SEE SHEETS 51 & 52 FOR –L– PROFILE

10/23/2017
Plotted: 10/23/2017
P:\2015\15027.01-U-2525C\Hydraulics\PERMITS Environmental Drawings\Plansheets\Plansheets 2017_ENSU2525C_hwd_drm_pen_PS1272.ctb_dan

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2525C	X-398

PERMIT DRAWING
SHEET 68 OF 70

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

840
830
820
810
800

5.943:1 6:1
825.00
0.021
2:1
812.14
WETLANDS
WETLANDS
531+00.00

5.575:1 6:1
825.55
0.030
2:1
810.36
530+50.00

5.250:1 6:1
826.02
0.038
2:1
806.65
530+00.00

—L—

10/23/2017
RENDER
P:\2015\15107.01\L-2525C\Hydraulics\PERMITS Environmental\Drawings\Plansheets\Planshseets 2017 ENB\U2525c hyd plan prm xsl Ltr.dgn

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	8+00/10+50 (Y13)	U-2525B (60" RCP)	0.03		0.02	0.03		< 0.01	< 0.01	41	5	
1	8+00/10+50 (Y13)	U-2525B (Bank Stabil.)						< 0.01		5		
2	15+00/21+15 (Y13RPD)	U-2525B (Roadway)	0.43		0.03			0.04		362		
3	66+50 (Y13)	U-2525B (54" RCP)						0.01	< 0.01	61	10	
4	278+62/285+32 (L)	Roadway	0.55		0.04	0.02		0.07	< 0.01	780	6	
4	278+62/278+90 (L)	Bank Stabilization						< 0.01		45		
4	274+38/278+56 (L)	Loss of Function						0.05		568		
4A	280+83/285+56 (L)	Roadway						0.04		405		
5	296+10/297+32 (L)	Roadway	0.16		0.02				< 0.01		28	
6	301+01/303+63 (L)	Roadway	0.13			0.03						
7	306+85/307+41 (L)	Roadway	0.05			0.03						
8	314+35/315+99 (L)	54" RCP-CP	0.16			0.01		0.04	< 0.01	489	14	
8	314+35/314+41 (L)	Bank Stabilization						< 0.01		16		
9	338+04/342+81 (L)	Roadway	0.05			0.01		0.04		435		
9	335+68/335+90 (L)	Pond						0.59				
9	342+66/342+78 (L)	Bank Stabilization						< 0.01		18		
9A	341+67/341+98 (L)	Roadway						< 0.01		52		
10	349+99/363+96 (L)	Roadway	0.08					0.24	< 0.01	2126	63	
10A	363+59/365+92 (L)	1@8'x8' RCBC				< 0.01		0.04	< 0.01	283	32	
10A	363+64/365+74 (L)	Bank Stabilization						< 0.01		20		
11	508+61/510+08 (L)	U-2524D (Roadway)	0.05			0.03						
12	521+16/521+61 (L)	U-2524D (72" RCP)						0.05	< 0.01	284	10	
12	521+16/521+61 (L)	U-2524D (Bank Stabil.)						< 0.01	< 0.01	24	5	
13	378+53/385+79 (L)	1@6'x8' RCBC						0.10	0.02	791	122	
13A	383+19/384+10 (L)	Roadway						0.02	< 0.01	225	15	
13B	379+93/382+07 (L)	Roadway						0.02	< 0.01	225	16	
14	415+71/418+52 (L)	66" RCP-V buried 1'						0.05	< 0.01	364	20	

*Rounded totals are sum of actual impacts

NOTES:
There is a 0.02 ac area (total take) of permanent fill impacts to an isolated basin wetland at Site 9B
The indirect loss of function impacts at sites 4 and 19 will be mitigated for at 0.5:1
Sites 1, 2, & 3 were permitted in December 2016 (Action ID: SAW-2005-21386, DWE Project No. 20130918 v.9)
Sites 11 & 12 were permitted in August 2016 (Action ID: SAW-2005-21386, DWE Project No. 20130918 v.8)

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
14	415+71/418+52 (L)	Bank Stabilization						< 0.01		71		
15	429+04/431+89 (L)	1@8'x8' RCBC	0.60		0.04	0.03		0.08	0.01	518	88	
15A	429+08/431+25 (L)	Roadway						0.02	< 0.01	169	57	
16	439+20/442+23 (L)	Roadway	< 0.01			0.01			0.01		46	
16	439+20/442+23 (L)	Pond						0.93				
17	463+00/470+25 (L)	72" conc.						0.05	< 0.01	410	51	
17	465+74/466+06 (L)	Bank Stabilization						< 0.01		26		
17A	462+70/463+24	Temp Impacts							< 0.01		56	
18	16+16/21+69 (Y6)	Roadway						0.05	< 0.01	551	15	
18A	14+36/14+72 (Y6)	Roadway						< 0.01	< 0.01	80	10	
19	469+29/473+17 (L)	1@8'x8', 1@8'x8', 2@72" EXT						0.12	0.02	775	150	
19	473+05/473+17 (L)	Bank Stabilization						< 0.01		40		
19	472+77/473+38 (L)	Loss of Function						0.02		183		
19A	32+24/33+21 (Y6)	dual 60" conc.						0.03	0.01	61	21	
19A	32+92/33+13 (Y6)	Bank Stabilization						< 0.01		32		
20	481+94/486+19 (L)	Roadway						0.07	< 0.01	594	18	
20	481+94/486+19 (L)	Bank Stabilization						< 0.01		30		
21	491+15/494+96 (L)	3@11'x11' RCBC	0.11		0.05	0.10		0.19	0.04	632	78	
22	505+06/510+10 (L)	Roadway	0.02					0.08	< 0.01	745	3	
22	505+06/505+11 (L)	Bank Stabilization						< 0.01		10		
23	527+89/531+24 (L)	Roadway	0.02			0.01		0.04	< 0.01	424	47	
23	530+94/531+11 (L)	Bank Stabilization						< 0.01		19		
Total impacts from previously permitted sites (1,2,3,11, & 12)			0.51		0.04	0.06		0.12	0.01	777	30	
Total new impacts			1.94		0.15	0.25		3.02	0.17	12212	956	
TOTAL IMPACTS FOR U-2525C*:			2.45		0.20	0.32		3.14	0.18	12989	986	

*Rounded totals are sum of actual impacts

Totals on this sheet include the summed amounts from previous sheet

NOTES:

Actual wetland impact numbers

Previously Permitted	0.508		0.044	0.062
New Impacts	1.939		0.154	0.254
TOTAL IMPACTS	2.447		0.198	0.316

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
10/23/2017
Guilford County
U-2525C

Revised 2016 09 09

5/14/99

REVISIONS

-L-	
PIs Sta 435+13.54	PI Sta 469+05.74
Θs = 0° 45' 50.2"	Δ = 47° 49' 31.4" (RT)
Ls = 200.00'	D = 0° 45' 50.2"
LT = 133.33'	L = 6,260.33'
ST = 66.67'	T = 3,325.53'
	R = 7,500.00'
	SE = .03

SITE 1:
-L- STA. 430+90, 187' LT.
PROP. 8" SANITARY GRAVITY SEWER
(TRENCH WIDTH 3 FT.)
TEMPORARY IMPACTS TO WETLANDS = 0.01 AC

SITE 2:
-L- STA. 430+50, 287' RT.
PROP. 8" DUCTILE IRON SANITARY GRAVITY SEWER
(AERIAL SEWER CROSSING OVER STREAM - RIGID
RESTRAINED MECHANICAL JOINTS FOR AERIAL D.I.P.)
(TRENCH WIDTH 3 FT. ACROSS WETLANDS)
TEMPORARY IMPACTS TO WETLANDS = 0.02 AC
TEMPORARY IMPACTS TO SURFACE WATER < 0.01 AC
TEMPORARY IMPACTS TO EXISTING CHANNEL = 15 L.F.

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	UC-9
DESIGNED BY: APL	
DRAWN BY: RDL	
CHECKED BY: APL	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95

25 0 50

MATCHLINE -L- STA. 429+00.00 SEE SHEET UC-8

MATCHLINE -L- STA. 443+00.00 SEE SHEET UC-10

PATTI CHURCH PHILLIPS
GARY S. CHURCH
DB 6254 PG 0132
PB 13 PG 92

GARY S. & VIRGINIA W. CHURCH
DB 3957 PG 929
PB 13 PG 92

SHARON MCADOO CHAPPELL FAMILY TRUST
(FORMERLY ELMER A. McADOO JR
SHARON M. CHAPPEL)

NCDOT
(FORMERLY GERALD CONNOLLY)
DB 4516 PG 43

GARY S. & VIRGINIA W. CHURCH
DB 2559 PG 663

SHARON MCADOO CHAPPELL FAMILY TRUST
(FORMERLY ELMER A. McADOO JR
SHARON M. CHAPPEL)
DB 7623 PG 90

PATTI CHURCH PHILLIPS
GARY S. CHURCH
DB 6254 PG 0132
PB 13 PG 92

DRAIN POND
-L- STA. 440+15 TO 441+97
310' RT. TO 92' LT.

UTILITY CONSTRUCTION PLANS PREPARED BY:
DAVIS • MARTIN • POWELL
ENGINEERS & SURVEYORS
6415 OLD PLANK RD., HIGH POINT, NC 27265
PHONE: (336)886-4821 FAX: (336)886-4458
WWW.DMP-INC.COM LICENSE: F-0245

25-NOV-2017 10:22
...\Engineering\UC\Proj\U2525c_ut_rdy16_UC09-EPD_psh.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	UC-11A
DESIGNED BY: APL	
DRAWN BY: RDL	
CHECKED BY: APL	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 3:
-L- STA. 467+30, 360' LT.
PROP. 20" WATER MAIN
(TRENCH WIDTH 4 FT.)
TEMPORARY IMPACTS TO SURFACE WATER < 0.01 AC
TEMPORARY IMPACTS TO EXISTING CHANNEL = 15 L.F.

MATCHLINE -Y6- STA. 17+00.00 SEE SHEET UC-22

MATCHLINE -Y6- STA. 26+50.00 SEE SHEET UC-11B

A

B

C

UTILITY CONSTRUCTION PLANS PREPARED BY:
DAVIS • MARTIN • POWELL
ENGINEERS & SURVEYO
6415 OLD PLANK RD. HIGH POINT, NC 27265
PHONE: (336)886-4821 FAX: (336)886-4458
WWW.DMP-INC.COM LICENSE: F-0245

REVISIONS 5/14/99

03-NOV-2017 13:26
C:\Users\U2525C_UTILITY\Engineering\UCVProj\u2525c_ut_rdy18_UC11A-EPD_psh.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	UC-12
DESIGNED BY: APL	
DRAWN BY: RDL	
CHECKED BY: APL	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 4:
-L- STA. 494+92, 251' LT.
PROP. 16" DUCTILE IRON SANITARY GRAVITY SEWER (AERIAL SEWER CROSSING OVER STREAM - RIGID RESTRAINED MECHANICAL JOINTS FOR AERIAL D.I.P.)
TEMPORARY IMPACTS TO SURFACE WATER < 0.01 AC
TEMPORARY IMPACTS TO EXISTING CHANNEL = 15 L.F.

NAD 83/95

25 0 50

-Y6RPA- POT Sta.10+00.00= -L- POC Sta. 488+56.07 OFF 59'

-Y6RPA- T.S. Sta.11+85.00

-L- CS Sta. 498+40.54

-L- Sta. 485+00.00

MATCHLINE -L- STA. 485+00.00 SEE SHEET UC-12

MATCHLINE -L- STA. 499+00.00 SEE SHEET UC-13

PROP. CONC. PIERS

INLET TYPICAL
CL I RIP RAP= 88 TONS
GF= 119 SY
SEE DETAIL BB
DDE = 38 CY

TOE PROECTION
SEE DETAIL N
CL B RIP RAP= 60 TONS
GF= 180 SY

TIE WW FENCE TO WALL

42D
CITY OF GREENSBORO
DB 4400 PG 1168
DB 4400 PG 1171

2' LATERAL BASE DITCH
SEE DETAIL F
DDE = 364 CY
CL B RIP RAP= 168 TONS
GF= 455 SY

LATERAL V DITCH
SEE DETAIL I
DDE = 16 CY

BEG. SBG
-Y6RPA-
+46.43

300' TAPER

ROD AND LUG
W/2 ELBOWS

30" CSP
W/2 ELBOWS

3 @ 11' X 11' RCBC
W/BEVELED HEADWALL; CENTER BARREL AND EASTERNMOST BARREL BURIED 1 FOOT
WESTERNMOST BARREL BURIED 2.5 FOOT WITH A SIL

SEE DETAIL R

30" CSP
W/2 ELBOWS

24" CSP

3' LATERAL BASE DITCH
SEE DETAIL J
DDE = 899 CY
CL I RIP RAP = 484 TONS
GF= 955 SY

3' LATERAL BASE DITCH
SEE DETAIL J
DDE =231 CY
CL I RIP RAP =111 TONS
GF =405 SY

CL I RIP RAP
EST 10 TON
EST 23 SY GF
LENGTH=12'

RIP RAP AT JS
STREAM OUTLET
SEE DETAIL O
LENGTH=30'
CLASS II RIP RAP
EST 14 TONS
EST 20 SY GF

OUTLET TYPICAL TIE WW FENCE TO WALL
RIP RAP= 83 TONS
GF= 111 SY
SEE DETAIL BC
DDE = 23 CY

TOE PROTECTION
SEE DETAIL N
CL B RIP RAP= 28 TONS
GF= 85 SY

CITY OF GREENSBORO
DB 4400 PG 1168
DB 4400 PG 1171
(NO CLAIM)

NCDOT
(FORMERLY LSOF PARTNERS)
DB 4918 PG 233
937

3805 NORTH ELM STREET INVESTORS, LLC
(FORMERLY OPUS SOUTH CORPORATION)
DB 7074 PG 1682
64

LENOIR WAREHOUSE GROUP, LLC
DB 7959 PG 563
77

LAKE JEANETTE ASSOCIATION, INC.
DB 5395 PG 0603
65A

-L-		-Y6RPA-
PI Sta 469+05.74	PIs Sta 499+07.20	PIs Sta 13+18.34
Δ = 47° 49' 31.4" (RT)	Θs = 0° 45' 50.2"	Θs = 2° 17' 30.6"
D = 0° 45' 50.2"	Ls = 200.00'	Ls = 200.00'
L = 6,260.33'	LT = 133.33'	LT = 133.34'
T = 3,325.53'	ST = 66.67'	ST = 66.68'
R = 7,500.00'		
SE = .03		

UTILITY CONSTRUCTION PLANS PREPARED BY:
DAVIS • MARTIN • POWELL ENGINEERS & SURVEYORS
6415 OLD PLANK RD. HIGH POINT, NC 27265
PHONE:(336)886-4821 FAX:(336)886-4458
WWW.DMP-INC.COM LICENSE:F-0245

REVISIONS

5/14/99

16-NOV-2017 12:24
$$$$USERNAME$$$$
...Engineering\UCVP-Proj\u2525c_ut_rdy1_UC12-EPD_psh.dgn

-L-
PI Sta 524+77.54 Δ = 13°56' 01.8" (LT) D = 1° 46' 45.7" L = 783.08' T = 393.48' R = 3,220.00'
PIs Sta 529+87.17 Θs = 3°12' 10.3" Ls = 360.00' LT = 240.04' ST = 120.04'

SITE 5:
-L- STA. 527+97, 143' LT.
PROP. 30" WATER MAIN
(TRENCH WIDTH 4.5 FT.)
TEMPORARY IMPACTS TO SURFACE WATER < 0.01 AC
TEMPORARY IMPACTS TO EXISTING CHANNEL = 18 L.F.

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	UC-15
DESIGNED BY: APL	
DRAWN BY: RDL	
CHECKED BY: APL	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

25 0 50

NAD 1983

MATCHLINE -L- STA. 527+00.00 SEE SHEET UC-14

MATCHLINE -L- STA. 541+00.00 SEE SHEET UC-16

THE MEADOWS AT RICHLAND CREEK HOMEOWNER'S ASSOCIATION, INC DB 4631PG 915

ELLWOOD F KAMPERMAN DB 4791PG 1275

EBERET P. WILLIAMS & USHA L. WILLIAMS DB 4663 PG 2074

JOHN PATRICK WILLIAMS DB 6153 PG 0617

MICHEAL P. & TONI M. WILLIAMS DB 6411PG 1521

RALPH P. & SUSAN J. YEREX DB 6052 PG 0464

KINYATA SHARRINE WILLIAMS DB 4826 PG 483

PAUL A. RIFFE DB 4432 PG 2141

JOHNNY WAYNE GILES DB 4454 PG 1398

DORRIE ANN MOORE DB 5689 PG 2084

KEVIN M. HART DB 6897 PG 2255

LATERAL 3' BASE DITCH SEE DETAIL "J" DDE = 378 CY CL I RIP RAP =260 TONS GF = 515 SY

5' STANDARD BASE DITCH SEE DETAILS "AC" L=40' S=0.05 FT/FT DDE=60 CU YDS

BERM "V" DITCH SEE DETAIL "AF"

APPROXIMATE LOCATION 10' DRAINAGE MAINTENANCE & UTILITY EASEMENT

NCDOT (FORMERLY McNAIRY FAMILY FARM) DB 4975 PG 1249

CAT-1

GREU-TL3 8:1

42" RCP-IV BURIED 20%

60' INC. TYPICAL

TOE PROTECTION SEE DETAIL "N" CL B RIP RAP= 4 TONS GF= 12 SY

CLASS I RIP RAP W/GEOTEXTILE LENGTH=18' EST 18 TONS EST 37 SY GF SEE DETAIL "BF" DDE = 12 CY

GRANDE AT LAKE JEANETTE MASTER HOMEOWNERS ASSOCIATION, INC. DB 4897 PG 0432

GRANDE AT LAKE JEANETTE MASTER HOMEOWNERS ASSOCIATION, INC. DB 5124 PG 1053

CITY OF GREENSBORO DB 5128 PG 1765

5' R/W & PROPERTY LINE EASEMENT

20' DRAINAGE EASEMENT

15' DRAINAGE EASEMENT

5' UTILITY EASEMENT EXISTING R/W

VIDYARANYA B. & INDUMATHI B. GARGEYA DB 5999 PG 2661

REZA & MARIA G. MARDANI DB 6781PG 0410

JIM D. SKAGGS DB 5976 PG 2324

SOUTHWIRE BAH AND NEUMAN, LLC DB 7717 PG 2713

SAT N. & MADHU GUPTA DB 6102 PG 0271

UTILITY CONSTRUCTION PLANS PREPARED BY:
DAVIS • MARTIN • POWELL ENGINEERS & SURVEYORS
8415 OLD PLANK RD., HIGH POINT, NC 27265
PHONE: (336)886-4821 FAX: (336)886-4458
WWW.DMP-INC.COM LICENSE: F-0245

REVISIONS

5/14/99

09-NOV-2017 15:57
C:\Users\U2525c\Engineering\UC\Proj\u2525c_ut_rdy22_UC15-EPD_psh.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-2525C	UC-23
DESIGNED BY: APL	
DRAWN BY: RDL	
CHECKED BY: APL	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95

25 0 50

SITE 6:
-Y6- STA. 32+33, 90' RT.
PROP. 24" WATER MAIN
(TRENCH WIDTH 4 FT.)
TEMPORARY IMPACTS TO SURFACE WATER < 0.01 AC
TEMPORARY IMPACTS TO EXISTING CHANNEL = 10 L.F.

UTILITY CONSTRUCTION PLANS PREPARED BY:
DAVIS • MARTIN • POWELL
ENGINEERS & SURVEYORS
6415 OLD PLANK RD., HIGH POINT, NC 27265
PHONE: (336)886-4821 FAX: (336)886-4458
WWW.DMP-INC.COM LICENSE: F-0245

REVISIONS 5/14/99

08-NOV-2017 16:17
C:\Users\U2525EUSERNAME$$$$\Engineering\UC\Proj\u2525c_ut_rdy31_UC23-EPD_psh.dgn

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: 404 Permanent Fill In Wetlands (ac)	CAMA Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	404 Hand Clearing in Wetlands (ac)	CAMA Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 430+90, 187' LT.	Prop. 8" Gravity Sewer Line				0.01*								
2	-L- 430+50, 287' RT.	Prop. 8" Gravity Sewer Line				0.02*					< 0.01**		15	
3	-L- 467+30, 360' LT.	Prop. 20" Water Main									< 0.01*		15	
4	-L- 494+92, 251' LT.	Prop. 16" Gravity Sewer (aerial)									< 0.01**		15	
5	-L- 527+97, 143' LT.	Prop. 30" Water Main									< 0.01*		18	
6	-Y6- 32+33, 90' RT.	Prop. 24" Water Main									< 0.01*		10	
TOTALS:			0.00		0.00	0.03*	0.00	0.00	0.00		0.01*	0	73	0.00

* Temporary Excavation:
Excavated material will be set to the side and then placed back into the trench.

**Equipment in channel to install aerial gravity sewer line.

ATN Revised 10/21/05

NC DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GUILFORD COUNTY

WBS - 34821.1.5 (U-2525C)

SHEET