STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

April 4, 2017

MEMORANDUM TO: Mr. Mark Stafford, P.E.
Division 12 Engineer

FROM: for Philip S. Harris, III, P.E., Manager
Natural Environment Section

SUBJECT: Cleveland County; US 74 Shelby Bypass From Just West of the First Broad River to Just East of the NC 150 Interchange; Federal Aid No. NHF-74(14); WBS 8.1801001; **TIP R-2707C.**

Attached are the US Army Corps of Engineers (USACE) Individual Permit and NC Division of Water Resources (NCDWR) Water Quality Certification. 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. Andy Gay, P.E. State Contract Office
Ms. Patricia Beam, Division 12 Environmental Officer
Dr. Majed Al-Ghandour, P.E., Programming and TIP
Ms. Brenda Moore, P.E., Roadway Design
Mr. Carl Barclay , Utilities Unit
Mr. Matt Lauffer, P.E., Hydraulics
Mr. Brian Hanks, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. Ron Hancock, P.E., State Roadway Construction Engineer
Ms. Beverly Robinson, Project Development, Western Section
Ms. Beth Harmon, NC Division of Mitigation Services
Mr. Philp Ayscue, Single Audit Compliance

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
NATURAL ENVIRONMENT SECTION
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. R-2707C
US 74 Shelby Bypass
From west of NC 226 to east of NC 150
Cleveland County, North Carolina
Federal-Aid No. NHF-74(14)
State Project No. 8.1801001
WBS Number 34497.1.2

COMMITMENTS FROM PROJECT DEVELOPMENT AND DESIGN

Project Development and Environmental Analysis Unit

Stream Relocations and Modifications. Stream relocations or modifications will be coordinated with the US Fish and Wildlife Service (USFWS), US Army Corps of Engineers (COE), the North Carolina Department of Environment and Natural Resources, Division of Water Quality (DWQ) and the North Carolina Wildlife Resources Commission (WRC) in accordance with the Fish and Wildlife Coordination Act [72 Stat. 563, as amended; 16 USC 661 et seq. (1976)]. An on-site stream mitigation review will be held with the COE, the USFWS, the WRC, and the DWQ. The assessment will determine where on-site stream mitigation is possible. Bioengineering techniques will be applied to relocated streams. These techniques will result in meandering streams with riffles and pools. Native vegetation will be used to stabilize banks and root wads will be used instead of rip-rap as appropriate. A 2:1 off-site compensatory mitigation ratio will be required unless an on-site stream is being relocated via natural stream design techniques; the latter will be at a 1:1 stream mitigation ratio. Stream mitigation (i.e., enhancement, preservation) adjacent to the project must still be completed at a 2:1 mitigation ratio if the mitigation is not an on-site natural stream design relocation. Based on the preliminary design for this project, two stream relocations will be required:

- A stream relocation will be required for the tributary of Buffalo Creek between SR 2063 and the Light Oak community. An approximately 950-foot segment of this stream will require relocation, most likely to the east of its existing location.
- A stream relocation will be required just to the west of Lithia Springs Road for a tributary of the First Broad River. This relocation is approximately 1,100 feet in length, and will be to the north of the existing stream bed.

Action: This commitment applies to Sections C and D and these locations will be addressed during the final design phase.

First Broad River. The following measures will be implemented at the First Broad River crossing to minimize both short-term construction impacts and long-term impacts:

- A temporary causeway or work bridge will be constructed.
- A drainage system will be utilized on the bridge for stormwater runoff.
- Coordination will be conducted with the local water supply administrator.
- Hazardous spill basins will be utilized.
- Vegetation will be left in place as much as is practicable.
- Deck drainage will not be released directly into the waterway.

Action: Hazardous spill basins will be installed on the both sides of the First Broad River and drainage will not directly flow into the river from the bridge. The First Broad River is located between Sections B & C and per current design will not have permitted impacts from this project.
Action: A hazardous spill basin will be installed on the east bank of the river with drainage above the west bank directed away from the river.

Geodetic Markers. The North Carolina Geodetic Survey will be notified prior to construction to allow ample time for relocation of any affected geodetic markers.

Project Development and Environmental Analysis Unit, Division 12

Street Closings. Any street closings will be coordinated with fire, police, and EMS personnel.

Project Development and Environmental Analysis Branch, Roadway Design Unit, Hydraulics Unit

Lithia Springs. Impacts to Lithia Springs will be avoided and/or minimized to the extent practicable during the final design phase of the project. A study of the impacts to the underground water table due to road grading operations at Lithia Springs will be undertaken during final design.

Action: This commitment applies to Section C and NCDOT Hydraulics.

COMMITMENTS FROM ORIGINAL PERMITTING

Natural Environment Section/Division 12

From the 404 Individual Permit, Special Condition *z*: NCDOT shall implement the 8 conservation measures listed in the US Fish and Wildlife Service November 9, 2012 Biological Opinion (attached) for this project and shall reinitiate consultation with USFWS under Section 7 of the Endangered Species Act for Sections C, D, and E when they are scheduled for construction.

From the 401 Water Quality Certification – the following Conditions of Certification:

1) When the final design plans are completed for R-2707 Sections C, D, and E, a modification to the 401 Water Quality Certification shall be submitted with 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. No construction activities that impact any wetlands, streams, or surface waters in R-2707 Sections C, D, or E 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.

From the 404 Individual Permit – Special Conditions

2) First Broad_River site: A temporary causeway or work bridge will be constructed. A drainage system will be utilized on the bridge for stormwater runoff. Coordination will be conducted with the local water supply administrator. Hazardous spill basins will be utilized. Vegetation will be left in place as much as is practicable. Deck drainage will not be released directly into the waterway;

2) Hazardous spill basins will be installed on the both sides of the First Broad River and drainage will not directly flow into the river from the bridge.
Action: A hazardous spill basin will be installed on the east bank of the river with drainage above the west bank directed away from the river.

Natural Environment Section / Division 12

A US Fish and Wildlife Service proposal for listing the Northern Long-eared Bat (*Myotis septentrionalis*) as an Endangered species was published in the Federal Register in October 2013. The listing will become effective on or before April, 2015. Furthermore, this species is included in USFWS's current list of protected species for Cleveland County. NCDOT is working closely with the USFWS to understand how this proposed listing may impact NCDOT projects. NCDOT will continue to coordinate appropriately with USFWS to determine if this project will incur potential effects to the Northern long-eared bat, and how to address these potential effects, if necessary.

The Northern long-eared bat (NLEB) was added to the USFWS Cleveland County list on April 2, 2015. The entire project (R-2707A–E) was reviewed for effects on NLEB in a report issued June 15, 2016 by NCDOT's Biological Surveys Group. The report determined that the nearest NLEB hibernacula record is 31 miles west of the project and no known NLEB roost trees occur within 150 feet of the project area. NCDOT has determined that the proposed action does not require separate consultation on the grounds that the proposed action is consistent with the final Section 4(d) rule, codified at 50 C.F.R. § 17.40(o) and effective February 16, 2016. NCDOT may presume its determination is informed by best available information and consider Section 7 responsibilities fulfilled for NLEB.

From Conservation Measures 1-8 in the Amendment to the Biological Opinion issued November 9, 2012.

Natural Environment Section / Division 12

1.) Pre-construction meeting - A United States Fish and Wildlife Service (Service) biologist will attend the preconstruction meeting to discuss (a) the importance of avoiding dwarf-flowered heartleaf plants and (b) other environmental commitments that are a part of the project.

Action: The pre-construction meeting for the C section of the US 74 Shelby Bypass (Bypass) is planned for June 2017. A Service biologist will be notified of this meeting prior to its occurrence.

Roadside Environmental Unit / Division 12

2.) Dwarf-flowered heartleaf protective barriers - Before construction activities begin at dwarf-flowered heartleaf Sites 7, 10, 11, 15, 16, 20, 22, 24, 25, 28, 31, 32, and 49, the portion of occupied dwarf-flowered heartleaf habitat remaining intact from construction activities (i.e., adverse direct effects and indirect effects from drainage activities) will be protected by placing orange safety fencing or otherwise hardened barriers with appropriate signage along the construction limits. The signed fencing or barriers will protect the remaining plants from accidental disturbance during construction. The portions of dwarf-flowered heartleaf sites that are protected will remain on the project's design plans throughout construction activities and will be labeled on the plans as "sensitive areas."

Action: Protective barrier and signage requirements for dwarf-flowered heartleaf Sites 10 and 11 on the C section of the Bypass are to be included in the final construction contract.

Natural Environment Section / Roadway Design Unit / Division 12 Right-of-Way

3.) On-site protection - The portions dwarf-flowered-flowered heartleaf Sites 7, 10, 11, 15, 16, 20,22, 24, 25, 28, 31, 32, and 49 not lost from project construction will be protected in perpetuity. A protective buffer of up to 400 feet out from the limits of preserved occupied dwarf-flowered heartleaf habitat will be placed around these plant sites and also preserved in perpetuity. Final buffer widths will vary for each site. Design Plan Sheet Nos. 16-26 of 26 in the amended Biological Assessment depict the area of occupied dwarf-flowered heartleaf habitat to be protected and the approximate limits of the protective buffers. Final site configurations, including buffer limits, will be mapped and submitted to the Service when right-of-way (ROW) acquisitions are complete.

Action: On the C section of the Bypass, the portions of Sites 10 and 11 not lost from project construction are protected in perpetuity within NCDOT right-of-way as of October 7, 2016. Most of the protective buffer around Site 10 and the entire buffer around Site 11 are also protected in perpetuity on NCDOT right-of-way as of October 7, 2016. Right-of-way for the remaining small portion of protective buffer around Site 10 is to be finalized in a recorded deed in April or May 2017. The expanded right-of-way protections for both sites are depicted on Permit Drawing Sheet 14 of 68 submitted as part of the project's Clean Water Act §404 Individual Permit. Final site configurations, including buffer limits, are to be mapped and submitted to the Service upon completion of the sites' first dwarf-flowered heartleaf monitoring report.

Natural Environment Section / Division 12 Right-of-Way

4.) Conservation easements- The NCDOT will attempt to enter into conservation easements with access points, where appropriate, for all or portions of dwarf-flowered heartleaf Sites 1, 8, 12, 13, 14, 26, 29, 33, 34, 35, 43, and 48. The portions of Sites 25 and 32 remaining intact upon project construction and not already protected by ROW extensions will also be pursued for potential conservation easements. Written documentation will be provided to the Service and North Carolina Natural Heritage Program once easements are successfully obtained at any of these sites.

Action: Dwarf-flowered heartleaf Sites 12 and 13 fall within the C section of the Bypass. A conservation easement could not be obtained for either of these sites because their respective landowners were unwilling to enter into such an agreement with NCDOT upon being contacted by the Department.

Natural Environment Section

5.) On-site monitoring- For on-site conservation sites entered into a secured protective ownership, either though ROW extension via settlement/condemnation or through a conservation easement with a landowner, the NCDOT will quantitatively and qualitatively monitor occupied dwarf-flowered heartleaf habitat preserved in perpetuity. Monitoring efforts will begin with the acquisition of pre-

construction/easement acquisition environmental baseline data. The preserved sites will then be monitored post-construction/easement acquisition once every 2 years over a 6-year period to ensure the protection, and detect trends in numbers, of dwarf-flowered heartleaf plants that may or may not be due to project construction. Monitoring reports detailing the monitoring results and any appropriate management activities undertaken will be submitted to the Service at the end of each monitoring period.

Action: Pre-construction monitoring surveys of dwarf-flowered heartleaf Sites 10 and 11 are to be completed before the let date for the C section of the Bypass. A monitoring report documenting the findings of this pre-construction survey is also to be submitted to the Service after the monitoring survey is completed.

Natural Environment Section / Roadside Environmental Unit

6.) Management of nonnative, invasive species - For on-site conservation sites entered into a secured protective ownership, either though ROW extension via settlement/condemnation or through a conservation easement, adverse effects from biological pollution can be avoided and/or minimized on a case-by-case basis through effective efforts to manage the growth of nonnative, invasive species within the areas of occupied dwarf-flowered heartleaf habitat that is preserved.

Action: Nonnative, invasive species are to be assessed at dwarf-flowered heartleaf Sites 10 and 11 found on the C section of the Bypass on a case-by-case basis during each of the sites' monitoring efforts of the plant species.

Natural Environment Section / Division 12 Right-of-Way

7.) Future anticipated adverse effects - The NCDOT has designated an expected 50-foot-wide greenway corridor through dwarf-flowered heartleaf Sites 12, 14, 22, 23, 25, and 26. Future anticipated adverse effects (not counting biological pollution) associated with the planned greenway's footprint must remain excluded from the area of occupied dwarf-flowered heartleaf habitat that the NCDOT can protect at these sites.

Action: A conservation easement could not be obtained for Site 12 along the C section of the Bypass because the site's primary landowner was unwilling to enter into such an agreement with NCDOT. The site cannot, therefore, be protected in perpetuity by NCDOT.

Natural Environment Section

8.) Broad River Greenway Conservation Area - The NCDOT entered into a conservation easement on July 18, 2008, with the Broad River Greenway, Inc., of approximately 1,000 acres of land referred to as the Broad River Greenway Conservation Area

(BRGCA). In accordance with the stated measures of the BRGCA's Conservation Plan as well as additional monitoring requirements and guidelines provided by the Service, the NCDOT will quantitatively and qualitatively monitor occupied dwarf-flowered heartleaf habitat within the BRGCA. Monitoring efforts began with the acquisition of environmental baseline data prior to obtaining the conservation easement. The BRGCA is then to be monitored once every 3 years over a 9-year period to ensure the protection, and detect trends in numbers, of dwarf-flowered heartleaf plants over time. Monitoring reports detailing the monitoring results and any appropriate management activities undertaken will be submitted to the Service at the end of each monitoring period.

Action: The third of three post-environmental baseline monitoring surveys on the BRGCA was completed in 2015, with a draft monitoring report for this survey completed in 2016. A final monitoring report for submittal to the Service is pending completion.

COMMITMENTS FROM R-2707C April 2017 PERMITTING

Natural Environment Unit/Division 12

From the 404 Phased Mod Permit (issued March 31, 2017) – Special Condition 3:

At least two weeks prior to any work in a jurisdictional waters and wetlands at Permit Site 6, NCDOT shall notify the Corps of Engineers, Asheville Regulatory Field Office, NCDOT Regulatory Project Manager of the schedule for impacts in that location so that a site meeting to review the field conditions can be scheduled. During the field meeting further actions may be required to stabilize the area. This may include, but is not limited to, better establishment of vegetation from seeding or planting, grading a channel within the old pond bed and adding grade control to prevent channel migration/down cutting.

From the 401 WQC Phased Mod Permit (issued April 4, 2017) – Special Condition 5:

At locations where ponds will be drained, proper measures will be taken to drain the pond with limited impact to upstream and downstream channel stability as well as to native aquatic species. Proper measures will be taken to avoid sediment release and/or sediment accumulation downstream as a result of pond draining. If typical pond draining techniques will create significant disturbance to native aquatic species, additional measures such as collection shall consult with NC Wildlife Resources staff to determine if there are any sensitive species, and the most appropriate measures to limit impacts to these species. The permittee shall observe any natural channel re-establishment, or utilize natural channel construction techniques, to ensure that the jurisdictional stream channel above and below the drained pond remain stable, and that no additional

impacts occur within the natural stream channel as a result of draining the pond. [15A NCAC 2H.0506(b)(3)]

In addition to normal protocol for pond drainage, Site 6 shall also require an on-site preconstruction meeting. Please refer to the following special condition of the USACE 404 permit and include NC DWR Transportation Permitting Branch on any correspondence that relates to Site 6:

" At least two weeks prior to any work in jurisdictional waters and wetlands at Permit Site 6, NCDOT shall notify the Corps of Engineers, Asheville Regulatory Field Office, NCDOT Regulatory Project Manager of the schedule for impacts in that location so that a site meeting to review the field conditions can be scheduled. During the field meeting further actions may be required in order to stabilize the area. This may include, but is not limited to, better establishment of vegetation from seeding or planting, grading a channel within the old pond bed and adding grade control to prevent channel migration/down cutting."

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

March 31, 2017

Regulatory Division/1200A

Action ID: SAW-2009-01449

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

Dear Mr. Harris:

I refer to your Department of the Army (DA) Individual Permit dated April 12, 2013, in which we authorized the placement of fill material into 4.05 acres of wetlands and 5,190 linear feet (lf) of stream associated with the construction of sections A and B of the Shelby Bypass, located north of the town of Shelby, in Cleveland County, North Carolina (TIP Number R-2707). This was a phased permit, which only authorized work on Sections A and B. Sections C, D and E were not authorized to commence until final design was completed, impacts to waters and wetlands were minimized to the extent practicable, and all modified plans including, but not limited to, a compensatory mitigation plan were submitted and approved by the US Army Corps of Engineers (Corps).

I also refer to the letter of January 11, 2017, to modify your Department of the Army (DA) permit seeking authorization to permanently impact 7,644 linear feet of stream, 0.94 acre of permanent impacts to wetlands and 3.09 acres of temporary stream impact associated with Section C of the Shelby Bypass. This modification presents the final design impacts for R-2707C, a 4.79 mile section of the US 74 Shelby Bypass from West of NC 226 to west of NC 150 in Cleveland County, North Carolina.

This modification request included details for each proposed impact site, the updated mitigation acceptance letter, stormwater management plan, permit drawings, and design plans for Section C. This final design of Section C reflects changes to many areas with an overall addition of 370 linear feet of permanent stream impacts and 0.02 acre of permanent wetland impacts. The updated projected impacts for the overall project (Sections A-E) are 6.05 acres of permanent wetland impacts and 21,758 linear feet of permanent stream impacts (20,959 linear feet of fill and 799 linear feet of bank stabilization), and 0.34 acre of temporary stream impacts.

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After review of the information you submitted and the inclusion of the following special conditions, we have determined that your existing DA authorization is modified to include the work detailed in your submittal dated January 13, 2017 and updated March 30, 2017.

1. All work authorized by this permit must be performed in strict compliance with the originally approved application and plans for R-2707, which were received on July 2, 2012, the previously approved modification dated October 23, 2013 and the updated modification request and plans received January 13, 2017 and updated March 30, 2017.

2. This permit only authorizes work on Sections A, B and C of TIP R-2707. Construction on Sections D and E 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, modifications to the plans and a compensatory mitigation plan have been approved by the Corps. Preliminary plans for R-2707D & E were provided with the July 2, 2012 application, however, these plans are not to be used for construction purposes.

3. At least two weeks prior to any work in jurisdictional waters and wetlands at Permit Site 6, NCDOT shall notify the Corps of Engineers, Asheville Regulatory Field Office, NCDOT Regulatory Project Manager of the schedule for impacts in that location so that a site meeting to review the field conditions can be scheduled. During the field meeting further actions may be required in order to stabilize the area. This may include, but is not limited to, better establishment of vegetation from seeding or planting, grading a channel within the old pond bed and adding grade control to prevent channel migration/down cutting.

4. 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. Mitigation for R-2707 Sections A & B were already required by the permit issued April 12, 2013. A Mitigation Responsibility Transfer Form is attached requiring NCDOT to offset final design impacts to Section C of R-2707.

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In addition to special conditions stated above, all conditions of the original permit and its expiration date of December 31, 2020 remain applicable.

If you have questions, please contact Steve Kichefski at (828) 271-7980 extension 4234.

Sincerely,

Kevin P. Landers Sr.
Colonel, U.S. Army
District Commander

Copies Furnished:

NCDOT - Technical Services
Attn: Mr. Roger Rochelle, P.E.
1516 Mail Service Center
Raleigh, NC 27699-1516

NCDEQ, DWR - Transportation Permitting Units
Attn: Ms. Amy Chapman
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

NCDEQ, DWR – Transportation Permitting Unit
Attn: Donna Hood
NC DEQ Mooresville Regional Office
610 E. Center Ave.
Mooresville, NC 28115

Ms. Marella Buncick
U.S. Fish & Wildlife Service
160 Zillicoa Street
Asheville, North Carolina 2880

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Marla Chambers // NCDOT Coordinator
Habitat Conservation Program
NC Wildlife Resources Commission
c/o NCDOT
206 Charter Street
Albemarle, North Carolina 28001

Ms. Cynthia Van Der Wiele
U.S. EPA - Region 4 NEPA Program Office
c/o USEPA-RTP
109 T.W. Alexander Dr. - Mail Code: E143-08
Research Triangle Park, NC 27709

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

Permittee: NCDOT/ Attn: Mr. Philip Harris **Action ID:** SAW-2009-01449
Project Name: NCDOT/R-2707/US 74 Shelby Bypass **County:** Cleveland

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:** 03050105, Broad River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
7,126				0.94		

*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:** 03050105, Broad River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
13,668				1.88		

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

Section to be completed by the Mitigation Sponsor

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

Mitigation Sponsor Name: NCDEQ DMS

Name of Sponsor's Authorized Representative: Bruce Harmon

Bruce Harmon — 04/05/2017

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: Mitigation for R-2707 Sections A&B were already required by permit issued April 12, 2013 and this additional compensatory mitigation is required to offset final design impacts to R-2707C Section C.

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, 11405 Falls of Neuse Road, 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: Steve Kichefski
USACE Field Office: Asheville Regulatory Field Office
US Army Corps of Engineers
151 Patton Avenue, Room 208
Asheville, North Carolina 28801-5006
Email: **steven.l.kichefski@usace.army.mil**

KICHEFSKI.STEVEN.L.1386908539

Digitally signed by KICHEFSKI.STEVEN.L.1386908539
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=KICHEFSKI.STEVEN.L.1386908539
Date: 2017.03.31 14:40:08 -04'00'

USACE Project Manager Signature

March 31, 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.

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

Environmental Quality

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

S. JAY ZIMMERMAN
Director

April 4, 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 with ADDITIONAL CONDITIONS for Proposed improvements for Section C of the proposed US 74 Shelby Bypass in Cleveland County from just west of the First Broad River to just east of the NC 150 Interchange. Federal Aid Project No. NHF-74(14), State Project No. 8.1801001, WBS Number 34497.1.2, Division 12, TIP R-2707C.
NCDWR Project No. 20120673v.3

Dear Mr. Harris:

Attached hereto is a modification of Certification No. 003941 issued to The North Carolina Department of Transportation (NCDOT) dated September 18, 2012 and August 9, 2013.

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

Sincerely,

for S. Jay Zimmerman, Director
Division of Water Resources

Attachments

Electronic copy only distribution:
Steve Kichefski, US Army Corps of Engineers, Asheville Field Office
Trish Beam, Division 12 Environmental Officer
Rodger Rochelle, NC Department of Transportation
Carla Dagnino, NC Department of Transportation
Marella Buncick, US Fish and Wildlife Service
Marla Chambers, NC Wildlife Resources Commission
Beth Harmon, Division of Mitigation Services
File Copy

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

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Resources (NCDWR) Regulations in 15 NCAC 2H .0500. This certification authorizes the NCDOT to impact 0.94 acres of jurisdictional wetlands, 7,126 linear feet of jurisdictional streams in Cleveland County. The project shall be constructed pursuant to the application for modification dated received January 11, 2016. The authorized impacts for the modification are as described below:

Stream Impacts in the Broad River Basin

Site	Bank Stabilization	Permanent Fill in Intermittent Stream (linear ft)	Temporary Fill in Intermittent Stream (linear ft)	Permanent Fill in Perennial Stream (linear ft)	Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear ft)
1	19				30	49
2	22			358	60	440
3	39			322	30	391
4	55			340	31	426
5	25			163	16	204
7	50			498	26	574
8 (I)	33	245	31			309
9 (I)		163				163
10	44			328	26	398
11				294	18	312
12				161	23	161
13	22			1274	22	1296
14	15			384	15	399
15(I)	17	176	32			225
16	20			453	86	559
17	35			533	38	606
18	69			747	25	841
19				64	29	93
20	27			235	31	293
21	23			211	27	261
22	40			177	25	242
Total	555	584	63	6542	558	8242

Total Stream Impact for Project: 8242 linear feet
USACE Mitigation Impact Totals: 7126 linear feet

Wetland Impacts in the Broad River Basin

Site	Fill (ac)	Fill (temporary) (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Area under Bridge (ac)	Total Wetland Impact (ac)
5 (bwb)	0.02						0.02
6 (bwa)	0.19						0.19
8 (qa)	<0.01						0.01
12 (bxf)	0.14						0.14
16 (bwj)	0.45						0.45
19 (bwt)	0.02		<0.01	<0.01			0.02
21 (bqa)	0.08		<0.01	0..2			0.11
Total	0.91		0.01	0.02			0.94

Total Wetland Impact for Project: 0.94 acres.

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

This approval is only valid for the purpose and design that you submitted in your application dated received January 11, 2016. Should your project change, you are required to notify the NCDWR and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 150 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). 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:

Specific Conditions:

1. The NCDOT Division Environmental Officer or Environmental Assistant will conduct a pre-construction meeting with all appropriate staff to ensure that the project supervisor and essential staff understand the

potential issues with stream and pipe alignment at the permitted site. NCDWR staff shall be invited to the pre-construction meeting. [15A NCAC 02H.0506(b)(2) and (b)(3)

2. Two copies of the final construction drawings shall be furnished to the NCDWR Central Office prior to the pre-construction meeting. The permittee shall provide written verification that the final construction drawings comply with the permit drawings contained in the application dated January 11, 2017. Any deviations from the approved drawings are not authorized unless approved by the NC Division of Water Resources.

3. Channel relocations shall be completed and stabilized, and approved on site by NCDWR staff, prior to diverting water into the new channel. Stream banks shall be matted with coir-fiber matting. Vegetation used for bank stabilization shall be limited to native riparian vegetation, and should include establishment of a vegetated buffer on both sides of the relocated channel to the maximum extent practical. Also, rip-rap may be allowed if it is necessary to maintain the physical integrity of the stream, but the applicant must provide written justification and any calculations used to determine the extent of rip-rap coverage requested. Once the stream has been turned into the new channel, it may be necessary to relocate stranded fish to the new channel to prevent fish kills. [15A NCAC 02H .0506(b)(3)

4. Native stream bed material excavated to install associated impacts and appurtenances shall be retained, stored separately from other stockpiled material, and used to restore the streambed to proper elevation that allows for aquatic passage. [15A NCAC 02H.0506(b)(2)]

5. At locations where ponds will be drained, proper measures will be taken to drain the pond with limited impact to upstream and downstream channel stability as well as to native aquatic species. Proper measures will be taken to avoid sediment release and/or sediment accumulation downstream as a result of pond draining. If typical pond draining techniques will create significant disturbance to native aquatic species, additional measures such as collection and relocation may be necessary to prevent a significant fish kill. NCDOT shall consult with NC Wildlife Resources staff to determine if there are any sensitive species, and the most appropriate measures to limit impacts to these species. The permittee shall observe any natural channel re-establishment, or utilize natural channel construction techniques, to ensure that the jurisdictional stream channel above and below the drained pond remain stable, and that no additional impacts occur within the natural stream channel as a result of draining the pond. [15A NCAC 2H.0506(b)(3)

   In addition to normal protocol for pond drainage, Site 6 shall also require an on-site preconstruction meeting. Please refer to the following special condition of the USACE 404 permit and include NC DWR Transportation Permitting Branch on any correspondence that relates to Site 6:

   " At least two weeks prior to any work in jurisdictional waters and wetlands at Permit Site 6, NCDOT shall notify the Corps of Engineers, Asheville Regulatory Field Office, NCDOT Regulatory Project Manager of the schedule for impacts in that location so that a site meeting to review the field conditions can be scheduled. During the field meeting further actions may be required in order to stabilize the area. This may include, but is not limited to, better establishment of vegetation from seeding or planting, grading a channel within the old pond bed and adding grade control to prevent channel migration/down cutting."

6. Bridge piles and bents shall be constructed using driven piles (hammer or vibratory) or drilled shaft construction methods. More specifically, jetting or other methods of pile driving are prohibited without prior written approval from the NCDWR first. [15A NCAC 02H.0506(b)(2)]

7. No drill slurry or water that has been in contact with uncured concrete shall be allowed to enter surface waters. This water shall be captured, treated, and disposed of properly. [15A NCAC 02H .0506(b)(3)

8. The post-construction removal of any temporary bridge structures must return the project site to its preconstruction contours and elevations. The impacted areas shall be revegetated with appropriate native species. [15A NCAC 02H .0506(b)(2)

9. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. To meet the requirements of NCDOT's NPDES permit

NCS0000250, please refer to the most recent version of the *North Carolina Department of Transportation Stormwater Best Management Practices Toolbox* manual for approved measures. [15A NCAC 02H .0507(d)(2) and 15A NCAC 02H .0506(b)(5)]

10. If multiple pipes or barrels are required, they shall be designed to mimic natural stream cross section as closely as possible including pipes or barrels at flood plain elevation and/or sills where appropriate. Widening the stream channel should be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage. [15A NCAC 02H.0506(b)(2)]

11. Riprap shall not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be properly designed, sized and installed. [15A NCAC 02H.0506(b)(2)]

12. For all linear feet of streams being impacted due to site dewatering activities, the site shall be graded to its preconstruction contours and revegetated with appropriate native species. [15A NCAC 02H.0506(b)(2)]

13. Compensatory mitigation for 7,126 linear feet of impact to streams is required. We understand that you have chosen to perform compensatory mitigation for impacts to streams through the North Carolina Division of Mitigation Service (DMS) (formerly NCEEP), and that the DMS has agreed to implement the mitigation for the project. The DMS has indicated in a letter dated December 16, 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.

14. Compensatory mitigation for impacts to 0.94 riverine wetlands is required. We understand that you have chosen to perform compensatory mitigation for impacts to wetlands through the North Carolina Division of Mitigation Services (DMS) (formerly NCEEP), and that the DMS has agreed to implement the mitigation for the project. DMS has indicated in a letter dated December 16, 2016 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with DMS's Mitigation Banking Instrument signed July 28, 2010.

15. When final design plans are completed for R-2707 Section(s) D and E, a modification to the 401 Water Quality Certification shall be submitted with five copies and fees to the NC Division of Water Resources. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams, and other surface waters, and buffers. No construction activities that impact any wetlands, streams, surface waters, or buffers located in R-2707 Section(s) D and E 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 Resources.

General Conditions:

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

2. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills. [15A NCAC 02B.0200]

3. During the construction of the project, no staging of equipment of any kind is permitted in waters of the U.S., or protected riparian buffers. [15A NCAC 02H.0506(b)(2)]

4. The dimension, pattern and profile of the stream above and below the crossing shall not be modified. Disturbed floodplains and streams shall be restored to natural geomorphic conditions. [15A NCAC 02H.0506(b)(2)]

5. The use of rip-rap above the Normal High Water Mark shall be minimized. Any rip-rap placed for stream stabilization shall be placed in stream channels in such a manner that it does not impede aquatic life passage. [15A NCAC 02H.0506(b)(2)]

6. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval. [15A NCAC 02H .0507 (c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]

7. All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water. [15A NCAC 02H.0506(b)(3) and (c)(3)]

8. Heavy equipment shall be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the introduction of other pollutants into the stream. [15A NCAC 02H.0506(b)(3)]

9. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials. [15A NCAC 02H.0506(b)(3)]

10. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification. [15A NCAC 02H.0506(b)(3)]

11. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited. [15A NCAC 02H.0506(b)(3)]

12. The permittee and its authorized agents shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act) and any other appropriate requirements of State and Federal law. If the NCDWR determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, the NCDWR may reevaluate and modify this certification. [15A NCAC 02B.0200]

13. All fill slopes located in jurisdictional wetlands shall be placed at slopes no flatter than 3:1, unless otherwise authorized by this certification. [15A NCAC 02H.0506(b)(2)]

14. A copy of this Water Quality Certification shall be maintained on the construction site at all times. In addition, the Water Quality Certification and all subsequent modifications, if any, shall be maintained with the Division Engineer and the on-site project manager. [15A NCAC 02H .0507(c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]

15. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization, including all non-commercial borrow and waste sites associated with the project, shall be clearly marked by highly visible fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this certification. [15A NCAC 02H.0501 and .0502]

16. The issuance of this certification does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (i.e. local, state, and federal) having jurisdiction, including but not limited to applicable buffer rules, stormwater management rules, soil

erosion and sedimentation control requirements, etc.

17. The Permittee shall report any violations of this certification to the Division of Water Resources within 24 hours of discovery. [15A NCAC 02B.0506(b)(2)]

18. Upon completion of the project (including any impacts at associated borrow or waste sites), the NCDOT Division Engineer shall complete and return the enclosed "Certification of Completion Form" to notify the NCDWR when all work included in the 401 Certification has been completed. [15A NCAC 02H.0502(f)]

19. Native riparian vegetation (**ex. Salix nigra, Juncus (spp), Carex (spp), et al.**) must be reestablished in the riparian areas within the construction limits of the project by the end of the growing season following completion of construction. [15A NCAC 02B.0231(b)(6)]

20. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated with this permit without appropriate modification. Should waste or borrow sites, or access roads to waste or borrow sites, be located in wetlands or streams, compensatory mitigation will be required since that is a direct impact from road construction activities. [15A NCAC 02H.0506(b)(3) and (c)(3)

21. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards [15A NCAC 02H.0506(b)(3) and (c)(3).

    a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*.
    b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
    c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.
    d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.

22. Sediment and erosion control measures shall not be placed in wetlands or waters unless otherwise approved by this Certification. [15A NCAC 02H.0506(b)(3) and (c)(3)

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

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

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

Office of Administrative Hearings
6714 Mail Service Center
Raleigh, NC 27699-6714

Telephone: (919) 431-3000, Facsimile: (919) 431-3100

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

Mr. Sam M. Hayes, General Counsel
Department of Environmental Quality
1601 Mail Service Center

This the 4th day of April 2017

DIVISION OF WATER RESOURCES

S. Jay Zimmerman, Director

WQC No. 003941

Dagnino, Carla S

From: Hood, Donna
Sent: Tuesday, April 04, 2017 2:20 PM
To: Dagnino, Carla S; Hemphill, Jeffrey L
Subject: RE: Shelby Bypass Correction

Hi Carla and Jeff,
The impact tables had an error in them as you noted in the email chain below. This email can serve as a correction to eliminate the bank stabilization at Sites 13 & 14, however; the stabilization can stay in if you prefer in case field conditions call for its use.

Regards,
Donna

From: Dagnino, Carla S
Sent: Tuesday, April 04, 2017 2:12 PM
To: Hood, Donna <donna.hood@ncdenr.gov>
Subject: RE: Shelby Bypass

Hi Donna,
Thanks.

We are looking at the 401 that Rob signed and sent and found a couple of areas where Bank Stabilization (BS) was added but was not part of the permit application. For sites 13 and 14 there should not be BS on those two sites. I am not sure what you would like to do – is it possible to send an email? WE need to process this permit right now, so we can slip something in later once you decide what to do.
Thanks.
Carla

From: Hood, Donna
Sent: Tuesday, April 04, 2017 1:53 PM
To: Dagnino, Carla S
Subject: RE: Shelby Bypass

Here you go!! u

From: Dagnino, Carla S
Sent: Tuesday, April 04, 2017 12:01 PM
To: Hood, Donna <donna.hood@ncdenr.gov>
Subject: RE: Shelby Bypass

Donna,
Thank you for sending the conditions. Is it possible for you to send the DRAFT permit so that we can look that over too? That way, once it gets signed and sent to us, we can just slip it into the permit package and send it on.
Thanks.
Carla

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.06; Released June 2016)

General Project Information

WBS Element:	34497.1.2	**TIP Number:**	R-2707C	**Project Type:**	New Location
Date:	11/11/2016				

NCDOT Contact:	Bill Zerman, PE	**Contractor / Designer:**	Sungate Design Group
Address:	Hydraulics Unit 1590 Mail Service Center Raleigh, NC 27699-1590	**Address:**	915 Jones Franklin Rd Raleigh NC 270603
Phone:	(919) 707-6755	**Phone:**	(919) 859-2243
Email:	bzerman@ncdot.gov	**Email:**	belam@sungatedesign.com

City/Town:	Shelby		**County(ies):**	Cleveland	
River Basin(s):	Broad		**CAMA County?**	No	
Wetlands within Project Limits?	Yes				

Project Description

Project Length (lin. miles or feet):	4.792 Miles	**Surrounding Land Use:**	Residential, Agricultural, Rural

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	74.7 ac.	19.8 ac.
Typical Cross Section Description:	Two 12ft lanes with 12ft outside shoulders (10ft paved) and 6ft inside shoulders (4ft paved) in each direction with a 34ft grassed median.	N/A
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 35,110 Year: 2037	Existing: 21,010 Year: 2017

General Project Narrative: (Description of Minimization of Water Quality Impacts)

US 74 Shelby bypass from East of NC 226 to East of NC 150: Measures have been taken throughout the project to limit impacts to wetlands and surface waters. A Hazardous Spill Basin will be utilized for -L- line roadway runoff that discharges within 1/2 mile of the First Broad River's Critcal Area. The Critical Area is associated with the City of Shebly's raw water intake, and the Hazardous Spill Basin will used to protect surface water quality by temporarily detaining hazardous materials accidentally released on roadway facilities. Further, no deck drains will be used on the First Broad River bridge, eliminating potential for direct roadway runoff into surface waters. A Dry Detention basin will be utilized at approximate station 599+50 -L- Right. This basin will serve to attenuate peak stormwater flows, promote settlement of suspended solids and reduce errosive velocities downstream. 2:1 slopes will be used in fill areas to reduce impacts to surrounding wetlands and jurisdictional streams.

Waterbody Information

Surface Water Body (1):	First Broad River	**NCDWR Stream Index No.:**	9-50-(19.5)
NCDWR Surface Water Classification for Water Body	**Primary Classification:**	Water Supply IV (WS-IV)	
	Supplemental Classification:	None	
Other Stream Classification:	None		
Impairments:	None		
Aquatic T&E Species?		Comments:	
NRTR Stream ID:		**Buffer Rules in Effect:**	N/A

Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.06; Released June 2016)

Additional Waterbody Information

Surface Water Body (2):	Williams Creek		**NCDWR Stream Index No.:**	9-50-26		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Water Supply IV (WS-IV)			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?		Comments:				
NRTR Stream ID:				**Buffer Rules in Effect:**		
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):	Hickory Creek		**NCDWR Stream Index No.:**	9-50-30		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?		Comments:				
NRTR Stream ID:				**Buffer Rules in Effect:**		
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 (4):	Buffalo Creek		**NCDWR Stream Index No.:**	9-53-(2.9)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Water Supply III (WS-III)	CA		
		Supplemental Classification:				
Other Stream Classification:						
Impairments:	None					
Aquatic T&E Species?		Comments:				
NRTR Stream ID:				**Buffer Rules in Effect:**		
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**		N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.06; Released June 2016)

WBS Element: 34497.1.2 **TIP No.:** R-2707C **County(ies):** Cleveland

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?
4	385+90 -L- RT 35.319580 / -81.559430	(1)First Broad River	Hazardous Spill Basin	17.30	4.00	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	13900.0	cf	13959.0	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

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.06; Released June 2016)

WBS Element: 34497.1.2 **TIP No.:** R-2707C **County(ies):** Cleveland

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?
20	586+00 -L- RT 35.315242 / -81.493484	(4)Buffalo Creek	Dry Detention Basin	7.9	3.1	0.32	1.30	No
21	599+50 -L- RT 35.317586 / -81.496375	(3)Hickory Creek	Dry Detention Basin	3.7	1.7	0.18	1.34	No

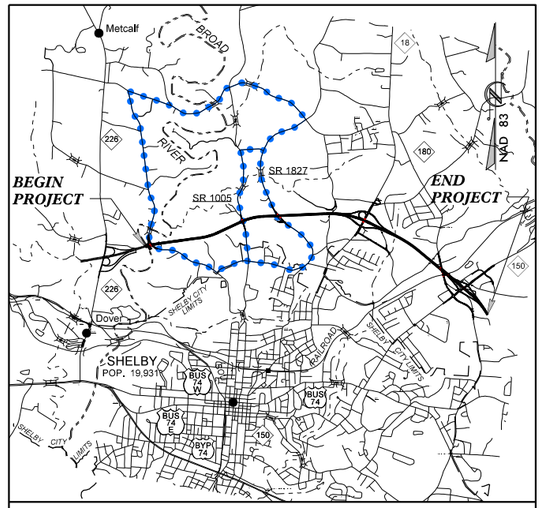
Additional Comments

09/08/99

TIP PROJECT: R-2707C

CONTRACT:

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



VICINITY MAP

OFFSITE DETOURS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CLEVELAND COUNTY

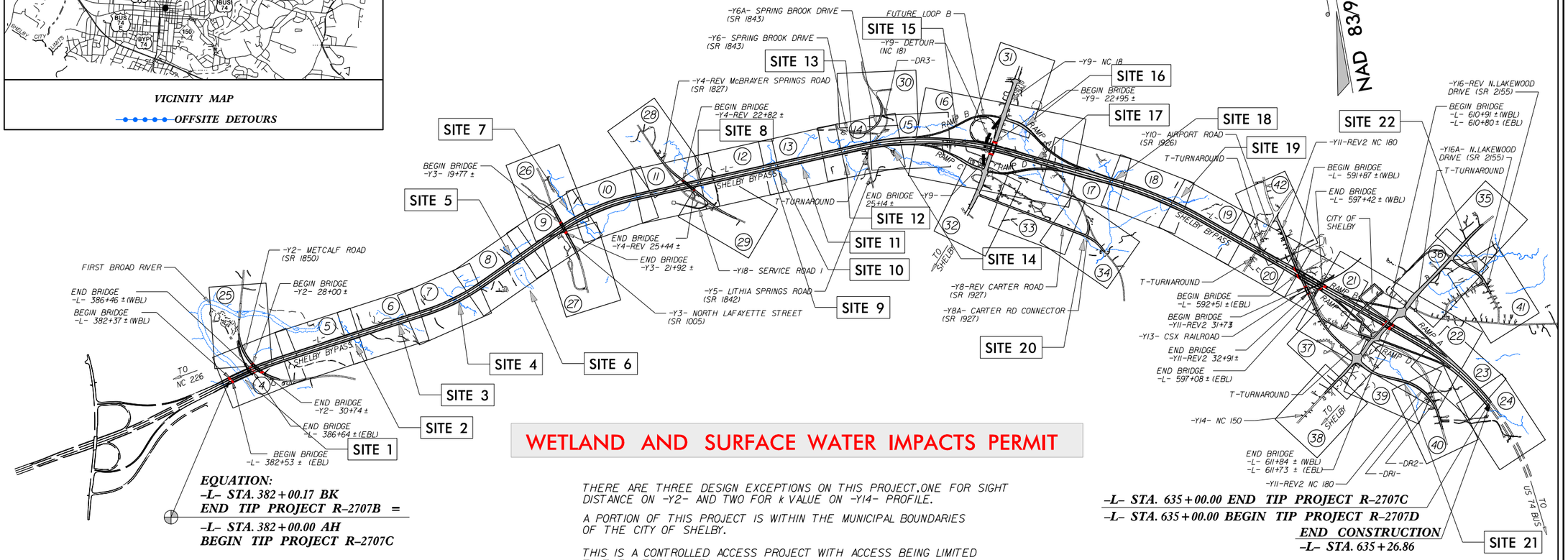
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2707C	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34497.1.2	NHF-74(14)	P.E.
34497.2.FS9	NHF-0074(152)	ROW
34497.2.U4	NHF-0074(152)	UTILITY

PERMIT DRAWING SHEET 1 OF 68

LOCATION: *US 74 SHELBY BYPASS FROM EAST OF NC 226 TO EAST OF NC 150*

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



EQUATION:
-L- STA. 382+00.17 BK
END TIP PROJECT R-2707B =
-L- STA. 382+00.00 AH
BEGIN TIP PROJECT R-2707C

-L- STA. 635+00.00 END TIP PROJECT R-2707C
-L- STA. 635+00.00 BEGIN TIP PROJECT R-2707D
END CONSTRUCTION
-L- STA. 635+26.86

WETLAND AND SURFACE WATER IMPACTS PERMIT

THERE ARE THREE DESIGN EXCEPTIONS ON THIS PROJECT.ONE FOR SIGHT DISTANCE ON -Y2- AND TWO FOR k VALUE ON -Y14- PROFILE.

A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF SHELBY.

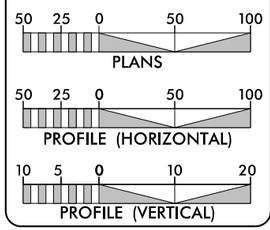
THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO THE INTERCHANGES.

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

NCDOT CONTACT: REKHA PATEL,PE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2017	=	21,010
ADT 2037	=	35,110
DHV	=	11 %
D	=	55 %
T	=	14 % *
V	=	70 MPH
FUNC CLASS	=	FREEWAY

(* TTST 9% DUAL 5%)
STATEWIDE TIER

PROJECT LENGTH

LENGTH OF ROADWAY STATE PROJECT R-2707C	=4.592 MILES
LENGTH OF STRUCTURES STATE PROJECT R-2707C	=0.200 MILES**
LENGTH OF STATE PROJECT R-2707C	=4.792 MILES

**NOTE : LENGTH BASED ON WBL BRIDGES

Prepared for NCDOT In the Office of:
moffatt & nichol
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
November 21, 2014

LETTING DATE:
May 16, 2017

TIM R. REID, P.E.
PROJECT ENGINEER

TRENT E. HUFFMAN, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
(T) (919) 854-2241 (F) (919) 854-2259
CERTIFICATE OF AUTHORIZATION NO. C-2490

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

moffatt & nichol
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

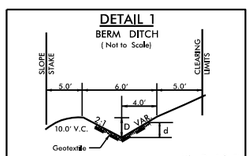
11/30/2016
R2707C_Hyd_prm_wet_psh_01.dgn
jnarvey

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	2D-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 2 OF 68

Revised 3/30/2017

DETAIL 1
BERM DITCH
(Not to Scale)

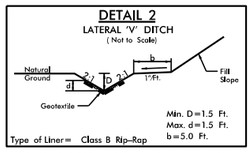


Min. D=1.0 Ft.
Max. d=1.0 Ft.

Type of Liner= Class 'B' Rip Rap

FROM STA. 443+50 TO STA. 449+00 –L– RT
FROM STA. 463+80 TO STA. 469+50 –L– LT
FROM STA. 471+00 TO STA. 475+00 –L– RT
FROM STA. 484+00 TO STA. 487+50 –L– RT
FROM STA. 572+50 TO STA. 576+00 –L– LT

DETAIL 2
LATERAL 'V' DITCH
(Not to Scale)

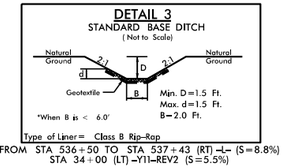


Min. D=1.5 Ft.
Max. d=1.5 Ft.
b=5.0 Ft.

Type of Liner= Class B Rip–Rap

FROM STA 6+00 TO STA 8+30 (RT) –Y9RPA–
FROM STA 8+30 TO STA 12+00 (RT) –Y9RPA–
FROM STA 15+20 TO STA 17+00 (RT) –Y9–DETOUR

DETAIL 3
STANDARD BASE DITCH
(Not to Scale)



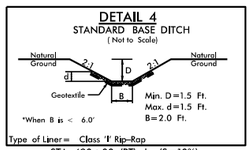
Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=2.0 Ft.

*When B is < 6.0'

Type of Liner= Class B Rip–Rap

FROM STA 536+50 TO STA 537+43 (RT) –L– (S=8.8%)
STA 34+00 (LT) –Y11–REV2 (S=5.5%)

DETAIL 4
STANDARD BASE DITCH
(Not to Scale)



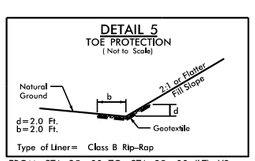
Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=2.0 Ft.

*When B is < 6.0'

Type of Liner= Class 'I' Rip–Rap

STA 490+00 (RT) –L– (S=10%)
STA 23+50 (RT) –Y14– (S=13%)

DETAIL 5
TOE PROTECTION
(Not to Scale)

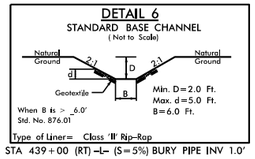


d=2.0 Ft.
b=2.0 Ft.

Type of Liner= Class B Rip–Rap

FROM STA 25+00 TO STA 28+00 (LT) –Y2–
FROM STA 402+50 TO STA 404+00 (LT) –L–
FROM STA 403+50 TO STA 407+00 (RT) –L–
FROM STA 405+00 TO STA 406+50 (LT) –L–
FROM STA 413+65 TO STA 416+00 (LT) –L–
FROM STA 425+50 TO STA 427+00 (RT) –L–
FROM STA 438+50 TO STA 439+20 (LT) –L–
FROM STA 451+50 TO CULVERT (RT) –L–
FROM STA 451+50 TO CULVERT (LT) –L–
FROM CULVERT TO STA 454+50 (LT) –L–
FROM STA 475+75 TO STA 476+50 (LT) –L–
FROM STA 488+50 TO STA 493+00 (LT) –L–
FROM STA 490+50 TO STA 492+00 (RT) –L–
FROM STA 495+00 TO STA 495+50 (RT) –L–
FROM STA 508+20 TO STA 513+00 (RT) –L–
FROM STA 564+00 TO STA 567+70 (LT) –L–
FROM STA 567+95 TO STA 568+70 (LT) –L–
FROM STA 15+40 TO STA 18+50 (LT) –Y9RPA–
FROM STA 11+00 TO STA 15+50 (LT) –Y9RPD–
FROM STA 19+70 TO STA 20+50 (LT) –Y14–
FROM STA 14+00 TO STA 14+85 (LT) –Y16–REV

DETAIL 6
STANDARD BASE CHANNEL
(Not to Scale)



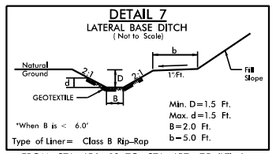
When B is > 6.0'
Std. No. 876.01

Min. D=2.0 Ft.
Max. d=5.0 Ft.
B=6.0 Ft.

Type of Liner= Class 'H' Rip–Rap

STA 439+00 (RT) –L– (S=5%) BURY PIPE INV 1.0'

DETAIL 7
LATERAL BASE DITCH
(Not to Scale)



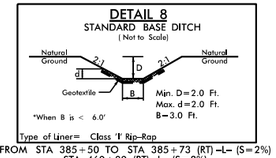
*When B is < 6.0'

Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=2.0 Ft.
b=5.0 Ft.

Type of Liner= Class B Rip–Rap

FROM STA 456+10 TO STA 457+75 (LT) –L–
FROM STA 488+50 TO STA 490+10 (RT) –L–
FROM STA 494+00 TO STA 496+00 (LT) –L–
FROM STA 584+50 TO STA 585+60 (RT) –L–
FROM STA 597+50 TO STA 598+75 (RT) –L–
FROM STA 601+15 TO STA 605+50 (RT) –L–
FROM STA 28+00 TO STA 31+75 (RT) –Y8–REV
FROM STA 11+60 TO STA 12+40 (RT) –DR1–

DETAIL 8
STANDARD BASE DITCH
(Not to Scale)



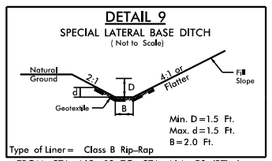
*When B is < 6.0'

Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=3.0 Ft.

Type of Liner= Class 'I' Rip–Rap

FROM STA 385+50 TO STA 385+73 (RT) –L– (S=2%)
STA 460+00 (RT) –L– (S=8%)
FROM STA 635+00 TO STA 635+56 (RT) –L– (S=3.6%)

DETAIL 9
SPECIAL LATERAL BASE DITCH
(Not to Scale)

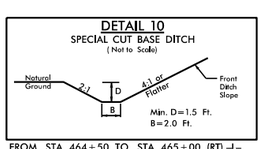


Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=2.0 Ft.

Type of Liner= Class B Rip–Rap

FROM STA 463+10 TO STA 464+50 (RT) –L–
FROM STA 487+50 TO STA 488+50 (RT) –L–
FROM STA 26+50 TO STA 28+00 (RT) –Y8–REV
FROM STA 27+60 TO STA 33+78.19 (RT) –Y14–
FROM STA 13+50 TO STA 13+62 (LT) –Y14RPB–

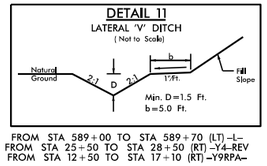
DETAIL 10
SPECIAL CUT BASE DITCH
(Not to Scale)



Min. D=1.5 Ft.
B=2.0 Ft.

FROM STA 464+50 TO STA 465+00 (RT) –L–
FROM STA 583+75 TO STA 585+00 (LT) –L–
FROM STA 605+50 TO STA 607+50 (RT) –L–

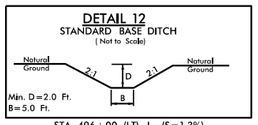
DETAIL 11
LATERAL 'V' DITCH
(Not to Scale)



Min. D=1.5 Ft.
b=5.0 Ft.

FROM STA 589+00 TO STA 589+70 (LT) –L–
FROM STA 25+50 TO STA 28+50 (RT) –Y4–REV
FROM STA 12+50 TO STA 17+10 (RT) –Y9RPA–

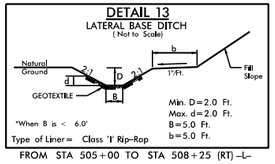
DETAIL 12
STANDARD BASE DITCH
(Not to Scale)



Min. D=2.0 Ft.
B=5.0 Ft.

STA 496+00 (LT) –L– (S=1.3%)
STA 14+12 (LT) –Y14RPD– (S=0.3%)

DETAIL 13
LATERAL BASE DITCH
(Not to Scale)



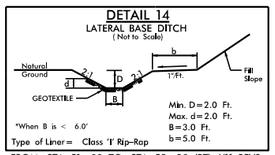
*When B is < 6.0'

Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=5.0 Ft.
b=5.0 Ft.

Type of Liner= Class 'I' Rip–Rap

FROM STA 505+00 TO STA 508+25 (RT) –L–

DETAIL 14
LATERAL BASE DITCH
(Not to Scale)



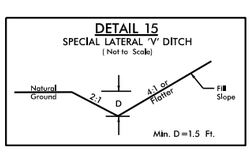
*When B is < 6.0'

Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=3.0 Ft.
b=5.0 Ft.

Type of Liner= Class 'I' Rip–Rap

FROM STA 51+00 TO STA 59+20 (RT) –Y11–REV2

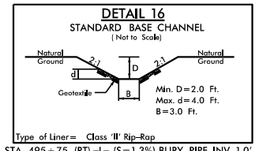
DETAIL 15
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D=1.5 Ft.

FROM STA 535+00 TO STA 536+50 (RT) –L–
FROM STA 537+25 TO STA 542+74 (LT) –L–
FROM STA 616+00 TO STA 617+00 (LT) –L–
FROM STA 619+50 TO STA 621+50 (RT) –L–
FROM STA 15+00 TO STA 21+40 (RT) –Y4–REV
FROM STA 9+50 TO STA 11+50 (RT) –Y9RPD–
FROM STA 29+30 TO STA 30+50 (RT) –Y4–REV
FROM STA 32+00 TO STA 33+00 (LT) –Y8–REV
FROM STA 22+00 TO STA 26+00 (RT) –Y11–REV2
FROM STA 21+90 TO STA 31+50 (LT) –Y11–REV2
FROM STA 34+00 TO STA 40+00 (LT) –Y11–REV2
FROM STA 33+20 TO STA 38+00 (RT) –Y11–REV2
FROM STA 46+00 TO STA 47+37 (LT) –Y11–REV2
FROM STA 46+00 TO STA 47+50 (RT) –Y11–REV2
FROM STA 65+00 TO STA 70+00 (LT) –Y11–REV2
FROM STA 54+00 TO STA 55+00 (LT) –Y14–
FROM STA 12+50 TO STA 13+50 (LT) –Y14RPB–
FROM STA 9+00 TO STA 14+00 (RT) –Y14RPD–
FROM STA 9+00 TO STA 14+00 (LT) –Y14RPD–
FROM STA 14+00 TO STA 14+80 (RT) –Y16A–
FROM STA 13+65 TOP STA 15+50 (LT) –SR2–
FROM STA 13+80 TO STA 15+00 (RT) –SR2–
FROM STA 13+00 TO STA 16+20 (LT) –Y9–DETOUR
FROM STA 17+00 TO STA 22+50 (RT) –Y9–DETOUR
FROM STA 18+75 TO STA 22+00 (LT) –Y9–DETOUR

DETAIL 16
STANDARD BASE CHANNEL
(Not to Scale)

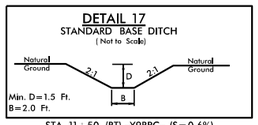


Min. D=2.0 Ft.
Max. d=4.0 Ft.
B=3.0 Ft.

Type of Liner= Class 'H' Rip–Rap

STA 495+75 (RT) –L– (S=1.3%) BURY PIPE INV 1.0'
STA 495+95 (LT) –L– (S=1.0%) BURY PIPE INV 1.0'
STA 537+00 (LT) –L– (S=2.2%) BURY PIPE INV 1.0'
STA 564+25 (RT) –L– (S=3.0%) BURY PIPE INV 1.0'
STA 567+80 (LT) –L– (S=1.6%) BURY PIPE INV 1.0
STA 17+15 (RT) –Y9RPA– (S=2.5%) BURY PIPE INV 1.0'

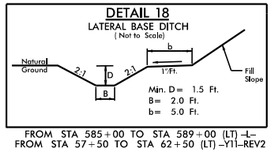
DETAIL 17
STANDARD BASE DITCH
(Not to Scale)



Min. D=1.5 Ft.
B=2.0 Ft.

STA 11+50 (RT) –Y9RPC– (S=0.6%)
STA 54+00 (LT) –Y14– (S=2.4%)

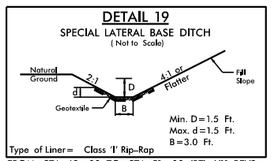
DETAIL 18
LATERAL BASE DITCH
(Not to Scale)



Min. D= 1.5 Ft.
B= 2.0 Ft.
b= 5.0 Ft.

FROM STA 585+00 TO STA 589+00 (LT) –L–
FROM STA 57+50 TO STA 62+50 (LT) –Y11–REV2

DETAIL 19
SPECIAL LATERAL BASE DITCH
(Not to Scale)

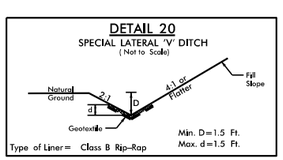


Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=3.0 Ft.

Type of Liner= Class 'I' Rip–Rap

FROM STA. 49+00 TO STA. 51+00 (RT) –Y11–REV2

DETAIL 20
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

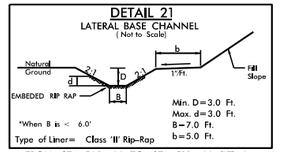


Min. D=1.5 Ft.
Max. d=1.5 Ft.

Type of Liner= Class B Rip–Rap

FROM STA 578+50 TO STA 579+50 (RT) –L–
FROM STA 607+50 TO STA 608+70 (LT) –L–
FROM STA 615+50 TO STA 616+00 (LT) –L–
FROM STA 33+00 TO STA 35+80 (LT) –Y8–REV
FROM STA 35+00 TO STA 35+87.81 (LT) –Y14–
FROM STA 35+35 TO STA 36+50 (RT) –Y14–
FROM STA 13+00 TO STA 15+47 (LT) –Y14RPA–
FROM STA 10+50 TO STA 13+00 (RT) –Y14RPB–

DETAIL 21
LATERAL BASE CHANNEL
(Not to Scale)



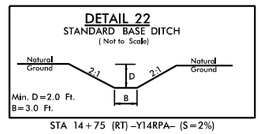
*When B is < 6.0'

Min. D=3.0 Ft.
Max. d=3.0 Ft.
B=7.0 Ft.
b=5.0 Ft.

Type of Liner= Class 'H' Rip–Rap

FROM STA. 503+00 TO STA. 513+00 (LT) –L–

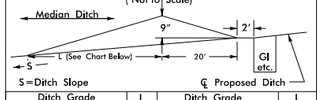
DETAIL 22
STANDARD BASE DITCH
(Not to Scale)



Min. D=2.0 Ft.
B=3.0 Ft.

STA 14+75 (RT) –Y14RPA– (S=2%)

DETAIL 23
FALSE SUMP
(Not to Scale)

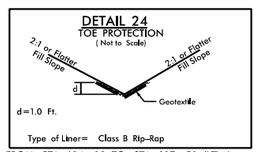


S=Ditch Slope ℄ Proposed Ditch

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

STA. 382+24 –L– STA. 387+76 –L– STA. 389+76 –L–
STA. 392+76 –L– STA. 395+26 –L– STA. 397+76 –L–
STA. 403+76 –L– STA. 409+26 –L– STA. 412+26 –L–
STA. 416+26 –L– STA. 419+76 –L– STA. 427+26 –L–
STA. 432+26 –L– STA. 434+76 –L– STA. 440+26 –L–
STA. 443+26 –L– STA. 446+26 –L– STA. 451+26 –L–
STA. 454+76 –L– STA. 459+76 –L– STA. 464+82 –L–
STA. 469+76 –L– STA. 477+26 –L– STA. 480+76 –L–
STA. 484+26 –L– STA. 488+76 –L– STA. 493+76 –L–
STA. 497+76 –L– STA. 502+26 –L– STA. 507+76 –L–
STA. 511+26 –L– STA. 514+76 –L– STA. 520+26 –L–
STA. 523+26 –L– STA. 527+26 –L– STA. 536+24 –L–
STA. 542+99 –L– STA. 547+24 –L– STA. 551+74 –L–
STA. 558+76 –L– STA. 562+76 –L– STA. 567+76 –L–
STA. 572+16 –L– STA. 578+26 –L– STA. 585+91 –L–
STA. 588+76 –L– STA. 599+24 –L– STA. 602+76 –L–
STA. 610+74 –L– STA. 616+24 –L– STA. 620+74 –L–
STA. 622+74 –L– STA. 626+24 –L– STA. 630+24 –L–
STA. 634+24 –L–

DETAIL 24
TOE PROTECTION
(Not to Scale)

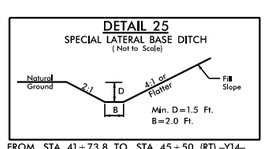


d=1.0 Ft.

Type of Liner= Class B Rip–Rap

FROM STA 604+00 TO STA 607+50 (LT) –L–
FROM STA 604+00 TO STA 607+50 (RT) –L–

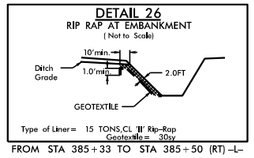
DETAIL 25
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D=1.5 Ft.
B=2.0 Ft.

FROM STA 41+73.8 TO STA 45+50 (RT) –Y14–
FROM STA 14+00 TO STA 16+90 (RT) –Y14RPD–

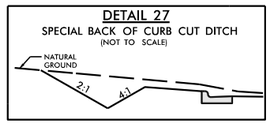
DETAIL 26
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= 15 TONS,CL 'H' Rip–Rap
Geotextile= 30oy

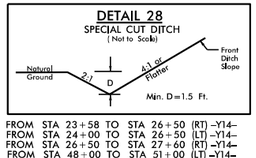
FROM STA 385+33 TO STA 385+50 (RT) –L–

DETAIL 27
SPECIAL BACK OF CURB CUT DITCH
(NOT TO SCALE)



FROM STA. 14+00 TO STA. 15+50 (RT) –Y9–
FROM STA. 11+45.09 TO STA. 12+00 (LT) –Y14RPC–
FROM STA. 40+13.84 TO STA. 40+60 (RT) –Y14–

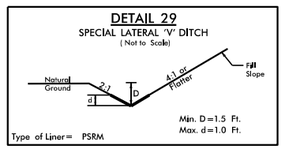
DETAIL 28
SPECIAL CUT DITCH
(Not to Scale)



Min. D=1.5 Ft.

FROM STA 23+58 TO STA 26+50 (RT) –Y14–
FROM STA 24+00 TO STA 26+50 (LT) –Y14–
FROM STA 26+50 TO STA 27+60 (RT) –Y14–
FROM STA 48+00 TO STA 51+00 (LT) –Y14–
FROM STA 50+00 TO STA 55+00 (RT) –Y14–
FROM STA 51+50 TO STA 53+50 (LT) –Y14–

DETAIL 29
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

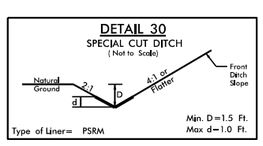


Min. D=1.5 Ft.
Max. d=1.0 Ft.

Type of Liner= PSRM

FROM STA 19+00 TO STA 20+70 (RT) –Y14–

DETAIL 30
SPECIAL CUT DITCH
(Not to Scale)



Min. D=1.5 Ft.
Max. d=1.0 Ft.

Type of Liner= PSRM

FROM STA 15+50 TO STA 19+00 (RT) –Y14–
FROM STA 21+30 TO STA 22+50 (RT) –Y14–

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	2D-2
RW SHEET NO.	
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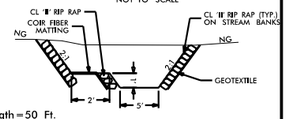
Revised 3/30/2017

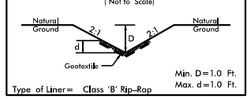
DETAIL 31
OUTLET CHANNEL DETAIL
NOT TO SCALE



Length = 50 Ft.
Est. = 110 Tons of Class 'II' Rip-Rap, 200 SY Geotextile

STA 554+00 (RT) –L– (S=1.2%)

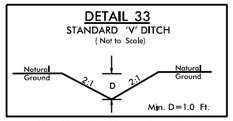
DETAIL 32
STANDARD 'V' DITCH
(Not to Scale)



Min. D=1.0 Ft.
Max. d=1.0 Ft.
Type of Liner= Class 'B' Rip-Rap

STA. 583+35 (LT) –L– (S=6.4%)

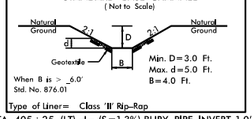
DETAIL 33
STANDARD 'V' DITCH
(Not to Scale)



Min. D=1.0 Ft.

STA. 583+30 (RT) –L– (S=0.6%)

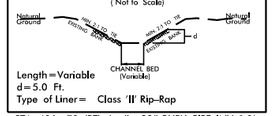
DETAIL 34
STANDARD BASE CHANNEL
(Not to Scale)



When B is > 6.0'
Std. No. 876.01
Min. D=3.0 Ft.
Max. d=5.0 Ft.
B=4.0 Ft.
Type of Liner= Class 'II' Rip-Rap

STA 405+25 (LT) –L– (S=1.3%) BURY PIPE INVERT 1.0'
STA 512+90 (RT) –L– (S=7.0%) BURY PIPE INV 1.0'
STA 30+00 (LT) –Y8–REV (S=2.5%) BURY PIPE INV 1.0'

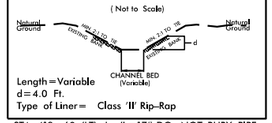
DETAIL 35
PIPE INLET /OUTLET CHANNEL BANK STABILIZATION
(Not to Scale)



Length = Variable
d = 5.0 Ft.
Type of Liner= Class 'II' Rip-Rap

STA 406+70 (RT) –L– (L=22') BURY PIPE INV 1.0'
STA 425+50 (LT) –L– (L=31') BURY PIPE INV 1.0'
STA 426+75 (RT) –L– (L=24') BURY PIPE INV 1.0'
STA 439+25 (LT) –L– (L=25') BURY PIPE INV 1.0'
STA 490+40 (LT) –L– (L=22') BURY PIPE INV 1.0'
STA 491+55 (RT) –L– (L=22') BURY PIPE INV 1.0'
STA 554+20 (RT) –L– (L=39')
STA 554+55 (LT) –L– (L=30') BURY PIPE INV 1.0'
STA 15+25 (LT) –Y9RPA– (L=20') BURY PIPE INV 1.0'
STA 6+45 (LT) –Y9RPD– (L=35') BURY PIPE INV 1.0'
STA 31+70 (RT) –Y8–REV (L=27') BURY PIPE INV 1.0'
STA 59+20 (RT) –Y11–REV2 (L=23') BURY PIPE INV 1.0'

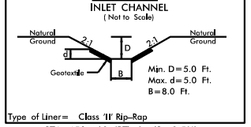
DETAIL 36
PIPE INLET /OUTLET CHANNEL BANK STABILIZATION
(Not to Scale)



Length = Variable
d = 4.0 Ft.
Type of Liner= Class 'II' Rip-Rap

STA 413+60 (LT) –L– (L=17') DO NOT BURY PIPE
STA 415+70 (RT) –L– (L=22') DO NOT BURY PIPE
STA 475+75 (LT) –L– (L=17') BURY PIPE INV 0.8'
STA 476+85 (RT) –L– (L=16') BURY PIPE INV 0.8'
STA 10+75 (LT) –Y9RPB– (L=17') BURY PIPE INV 0.6'
STA 14+20 (RT) –Y16–REV (L=20') BURY PIPE INV 1.0'
STA 14+85 (LT) –Y16–REV (L=20') BURY PIPE INV 1.0'

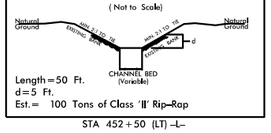
DETAIL 37
INLET CHANNEL
(Not to Scale)



Min. D=5.0 Ft.
Max. d=5.0 Ft.
B=8.0 Ft.
Type of Liner= Class 'II' Rip-Rap

STA 453+60 (RT) –L– (S=0.5%)

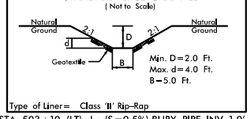
DETAIL 38
INLET & OUTLET CHANNEL BANK STABILIZATION
(Not to Scale)



Length = 50 Ft.
d = 5 Ft.
Est. = 100 Tons of Class 'II' Rip-Rap

STA 452+50 (LT) –L–

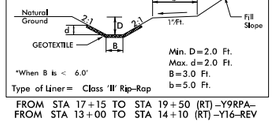
DETAIL 39
STANDARD BASE CHANNEL
(Not to Scale)



Min. D=2.0 Ft.
Max. d=4.0 Ft.
B=5.0 Ft.
Type of Liner= Class 'II' Rip-Rap

STA 503+10 (LT) –L– (S=0.5%) BURY PIPE INV 1.0'
STA 554+35 (RT) –L– (S=1.2%) BURY PIPE INV 1.0'

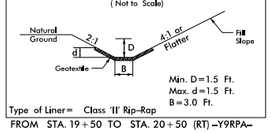
DETAIL 40
LATERAL BASE DITCH
(Not to Scale)



Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=3.0 Ft.
b=5.0 Ft.
*When B is < 6.0'
Type of Liner= Class 'II' Rip-Rap

FROM STA 17+15 TO STA 19+50 (RT) –Y9RPA–
FROM STA 13+00 TO STA 14+10 (RT) –Y16–REV

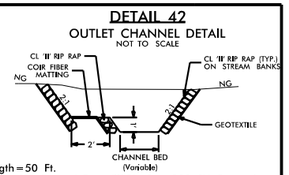
DETAIL 41
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=3.0 Ft.
Type of Liner= Class 'II' Rip-Rap

FROM STA. 19+50 TO STA. 20+50 (RT) –Y9RPA–

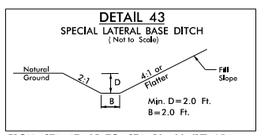
DETAIL 42
OUTLET CHANNEL DETAIL
NOT TO SCALE



Length = 50 Ft.
Est. = 110 Tons of Class 'II' Rip-Rap, 200 SY Geotextile

STA 552+50 (LT) –L– (S=1.2%)

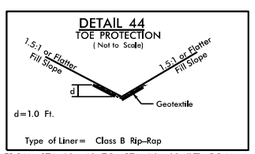
DETAIL 43
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D=2.0 Ft.
B=2.0 Ft.

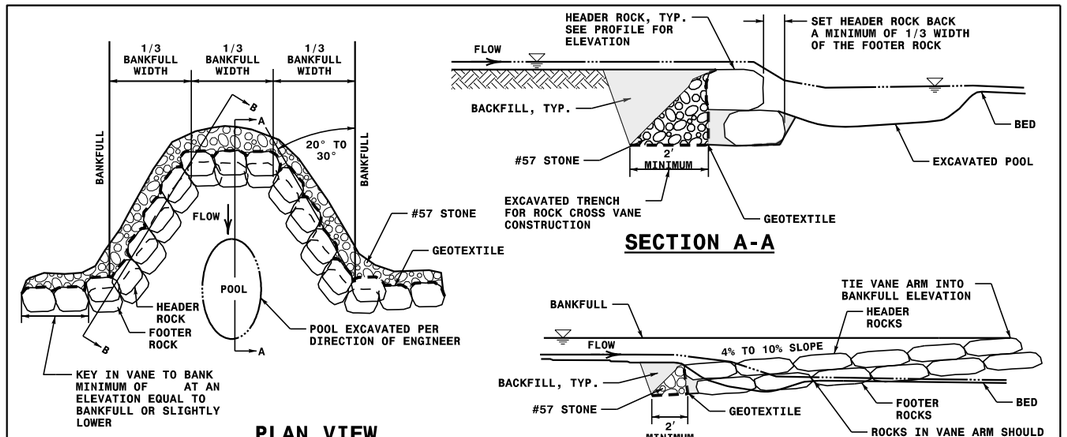
FROM STA 47+15 TO STA 50+00 (RT) –Y14–

DETAIL 44
TOE PROTECTION
(Not to Scale)



d=1.0 Ft.
Type of Liner= Class B Rip-Rap

FROM STA 10+40 TO STA 16+60 (LT) –DR4–

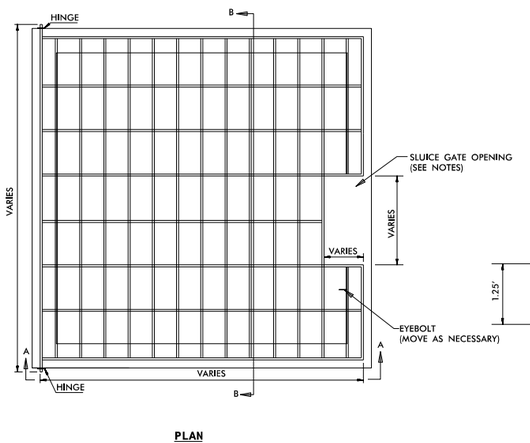


	BOULDER DIMENSIONS (FT)		
STATION	HEIGHT	LENGTH	WIDTH
438+60	2.0'	3.0'	2.0'

ROCK CROSS VANE DETAIL
NOT TO SCALE

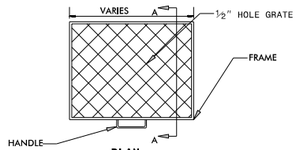
NOTES:
1) DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2) DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
3) CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
4) COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
5) POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

DETAIL #45
REMOVABLE ORIFICE TRASH RACK
NOT TO SCALE



REBAR TRASH RACK
NOT TO SCALE

RISER TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR REBAR AND GALVANIZED IN ACCORDANCE WITH ASTM A-153.
5. PROVIDE OPENING IN TRASH RACK TO ACCOMODATE SLUICE GATE ON THE OUTLET PIPE. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATES.



ORIFICE TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A " BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. REMOVEABLE ORIFICE TRASH RACK SHALL BE ATTACHED TO CONCRETE BOX BY HINGE OR SLIDE RAIL SYSTEM.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR GALVANIZED IN ACCORDANCE WITH ASTM A-153.

PROJECT REFERENCE NO.	SHEET NO.
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
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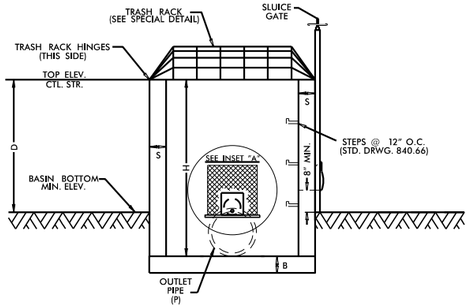
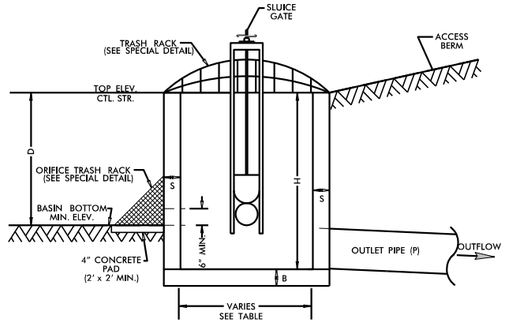
DETAIL #46

DRY DETENTION BASIN DRAWDOWN STRUCTURE

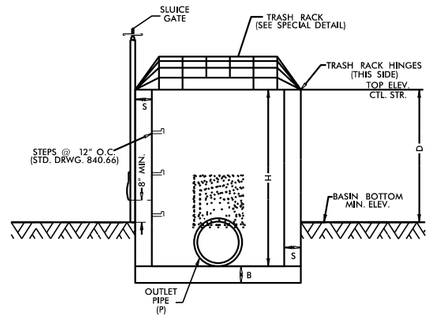
NOT TO SCALE



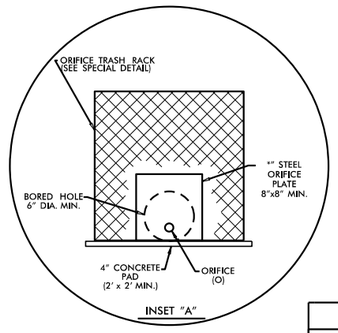
SIDE 1



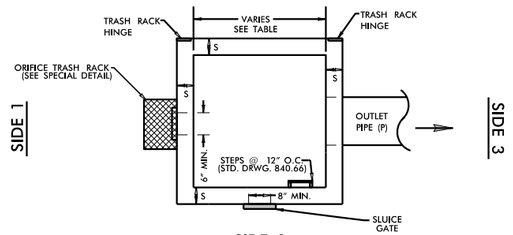
SIDE 2



SIDE 3



INSET "A"



SIDE 2

PLAN VIEW

TRASH RACK NOT SHOWN FOR CLARITY

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

MINIMUM DIMENSIONS FOR DRY DETENTION BASIN DRAWDOWN STRUCTURE

STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	MAX. STORAGE DEPTH(D) FEET	INV. ELEV. CTL. STR.	CTL. STR. DIMENSIONS (W x L x H)	ORIFICE DIAMETER (O) INCHES	ORIFICE INV. ELEV.	OUTLET PIPE DIAMETER(P) INCHES
586+97 -L- RT	2012	6"	18"	935.0	938.0	3.0'	933.0	5.0' X 5.0' X 5.0'	2"	935.0	24"
600+50 -L- RT	2113	6"	18"	925.0	929.0	4.0'	923.0	5.0' X 5.0' X 6.0'	2"	925.0	24"

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	2D-4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

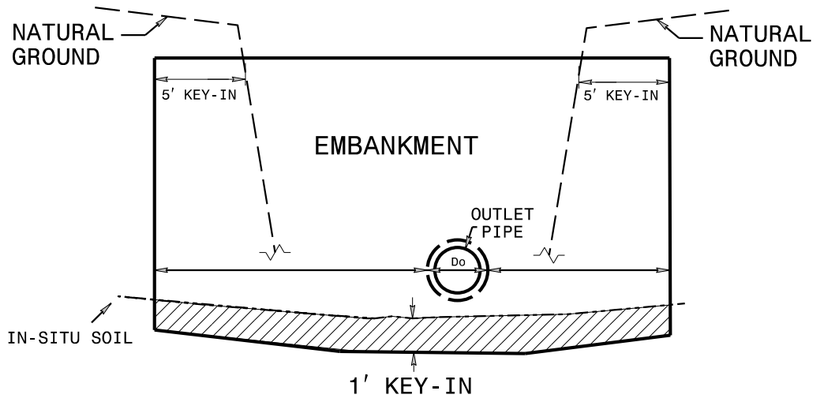
PERMIT DRAWING
SHEET 5 OF 68

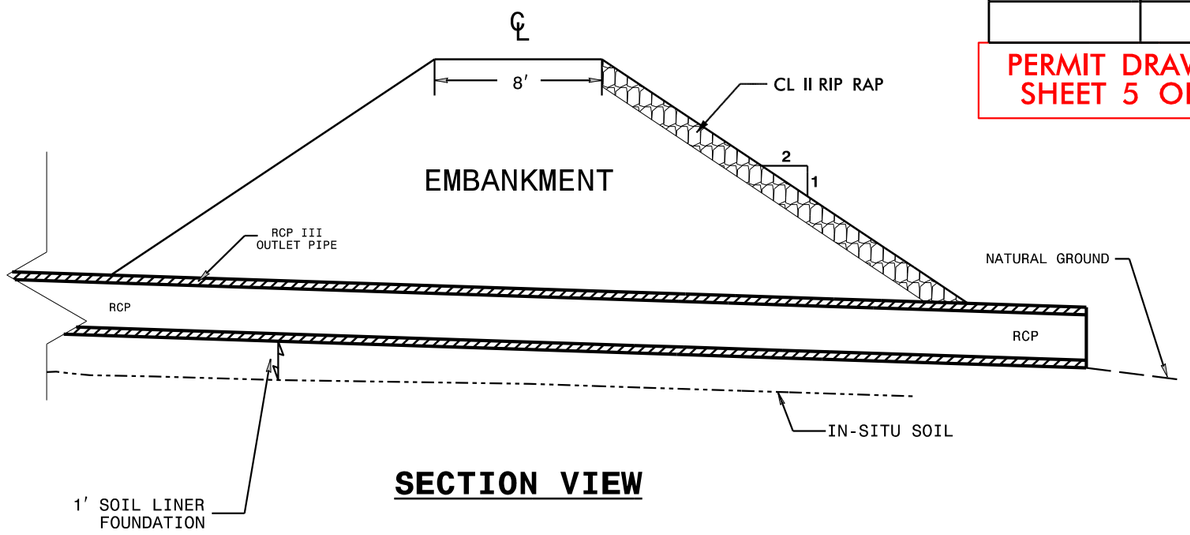
DETAIL #47

HAZARDOUS SPILL BASIN EMBANKMENT AND LINER

(NOT TO SCALE)

ELEVATION VIEW





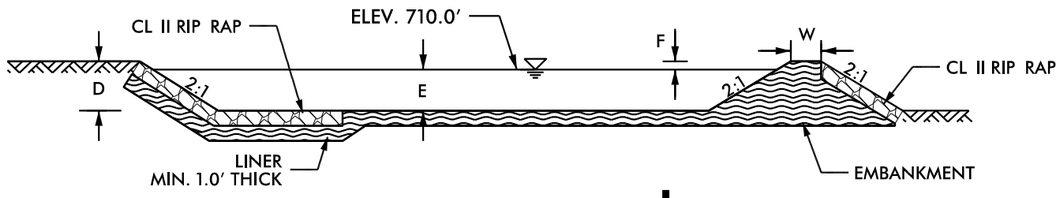
SECTION VIEW

EMBANKMENT NOTES
1. EMBANKMENT TO CONSIST OF A-5, A-6 OR A-7 NATURAL SOILS.
2. KEY IN EMBANKMENT A MINIMUM OF 1′ INTO IN-SITU SOIL FOUNDATION.

LINER FOR BASIN BOTTOM
1. LINER TO CONSIST OF A-5, A-6 OR A-7 NATURAL SOILS.
2. LINER MINIMUM 1.0 THICK.

GENERAL NOTES
1. COMPACT BASIN EMBANKMENT AND LINER ACCORDING TO SECTION 235 OF STANDARD SPECS.

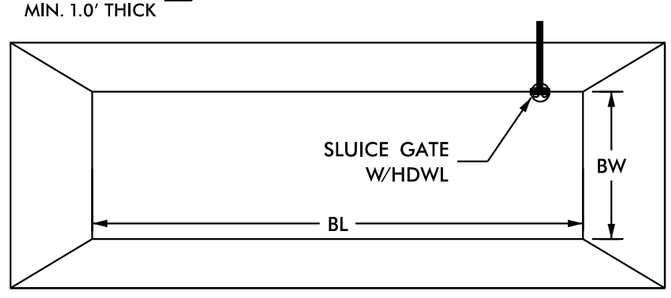
TOTAL CAPACITY REQUIRED: 516 CY
TOTAL CAPACITY PROVIDED: 517 CY
@ ELEV. 710.0 w/1.0 FT. FREEBOARD



DIMENSIONS

BASIN NO.	PROJECT STATION	DEPTH (D)	BERM WIDTH (W)	BERM ELEV.	BOTTOM LENGTH (BL)	BOTTOM WIDTH (BW)	BOTTOM ELEV.	DESIGN DEPTH (E)	FREE-BOARD (F)
1	-L- 386+00 (RT)	4.0′	8.0′	711.0′	113′	33′	707.0′	3.0′	1.0′

NOTES:
1. SHAPE OF BASIN MAY VARY DEPENDING ON SITE CONSTRAINTS.
2. ACCESS BERM SHOULD BE PROVIDED FOR MAINTENANCE.
3. RIP-RAP EXTENDS 20′ BEYOND PIPE AT BASIN INLET(SEE PLANS)
4. MINIMUM SLOPE OF THE BOTTOM OF THE BASIN SHOULD BE 0.3%.



MODEL 20–10C SLUICE GATE

PERMIT DRAWING
SHEET 6 OF 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

MATCHLINE STA 25+00 -Y2- SEE SHEET 25

MATCHLINE STA 394+00 SEE SHEET 5

EQUATION:
-L- STA. 382+00.17 BK
END TIP PROJECT R-2707B
-L- STA. 382+00.00 AH
BEGIN TIP PROJECT R-2707C

1 OLIVIA A. WITHROW HEIRS C/O CALVIN LOWE

33 C. CLAY CABANISS

7 DEBBIE ANN WEBBER

6 OMAR MOLETTE

5 ESSIE B. SHIPP

4 CHARLES W. & BEVERLY C. BROWNING

8 OLIVIA A. WITHROW HEIRS C/O CALVIN LOWE

9 FRANK TOMS, JR.

41 CHARLES A. HORN

2 ELSIE LOGAN

3 ESKRIDGE LAURY

STACEY SEWELL

DIANE L. BLANTON
ESTATE FILE 02E PG 99
REF. DB 187 PG 364

-DR4- PT 13+79.90

-DR4- PT +50.80

-DR4- POT 17+26.25

-L- PT 393+07.22

-L- POC 387+54.08
-Y2- POC 29+07.16
Δ = 62° 34' 38.2"
PC Sta. 15+88.82

-Y2- POC 33+25.00
END GRADE

-Y2- POC 33+75.00
END CONSTRUCTION
END OVERLAY

GRADING ONLY

SHELBY BYPASS
GRADING ONLY

SITE 1

TOE PROTECTION STA 10+40 TO STA 16+60 RT -DR4-
CL 'B' RIP RAP
SEE DETAIL #44
EST 178 TONS
EST 540 SY GEOTEXTILE

CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE

TOE PROTECTION STA 25+00 TO STA 28+00 LT -Y2-
SEE DETAIL #5
CL 'B' RIP RAP
EST 180 TONS
EST 400 SY GEOTEXTILE

CL 'B' RIP RAP
EST 3 TONS
EST 11 SY GEOTEXTILE

CL 'II' RIP RAP TO TOP OF BERM

CL 'II' RIP RAP TO TOP OF BERM

SHOULDER BERM GUTTER STA 386+75 TO 388+88 -L- LT

SHOULDER BERM GUTTER STA 387+05 TO 389+50 -L- RT

SHOULDER BERM GUTTER STA 385+15 TO 387+20 -L- MED

'S' BASE DITCH W/CL 'I' RIP RAP
SEE DETAIL #8
EST 29 TONS
EST 50 SY GEOTEXTILE
EST 11 CY DDE

BANK STABILIZATION SEE DETAIL #26

HAZARDOUS SPILL BASIN W/EMBANKMENT AND LINER
SEE DETAIL #47
MIN. CAPACITY = 516 CY
TOTAL CAPACITY @ ELEV. 710.0
W/1.0FT FREEBOARD = 517 CY

CL 'II' RIP RAP
EST 310 TONS
EST 575 SY GEOTEXTILE

CL 'B' RIP RAP
EST 3 TONS
EST 11 SY GEOTEXTILE

RETAIN

COLLAR AND EXTEND

REMOVE DI

REMOVE 96' EX 15" PIPE

HW C/W SLUICE GATE

MSE RETAINING WALL #1

GRADE TO DRAIN

REMOVE

24" RCP-III

30" RCP-III

15" RCP-IV

15" RCP-III

24" RCP

36" RCP

36" W ELBOWS

2GI-B W/FG

2GI-A W/FG

2GI-D

FS

FUT. TYPE B-77

FUT. TYPE M350

FUT. CAT-1

FUT. GRAU 350 TL-3

GRAU 350 TL-3

TYPE B-77

25FBMD

25FD

40' BLK WALL

60' BLK WALL

12' CONC WALL

ISFD

ISFD ABAND

W/D LDK

W/L T

SR 1850 METCALF RD 22'BST

SOBHELSC

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DESIGN EXCEPTION NEEDED FOR SIGHT DISTANCE ON -Y2-

FOR DITCH DETAILS SEE SHEET 2D-1
FOR -L- PROFILE SEE SHEET 43
FOR -Y2- PROFILE SEE SHEET 56

PERMIT DRAWING
SHEET 7 OF 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

MATCHLINE STA 25+00 -Y2- SEE SHEET 25

EQUATION:
-L- STA 382+00.17 BK
END TIP PROJECT R-2707B
-L- STA 382+00.00 AH
BEGIN TIP PROJECT R-2707C

1 OLIVIA A. WITHROW HEIRS C/O CALVIN LOWE

33 C. CLAY CABANISS

-DR4- PT 13+79.90

TOE PROTECTION STA 10+40 TO STA 16+60 RT -DR4-
CL 'B' RIP RAP
SEE DETAIL #44
EST 178 TONS
EST 540 SY GEOTEXTILE

24" RCP-IV
RETAIN
CL 'B' RIP RAP EST 3 TONS EST 11 SY GEOTEXTILE
2GI-B
COLLAR AND EXTEND
FS

CL 'I' RIP RAP TO TOP OF BERM

FUT. TYPE B-77

-L- STA 15+88.82

SHOULDER BERM GUTTER STA 386+75 TO 388+88 -L- LT

-L- POC 387+54.08
-Y2- POC 29+07.6
Δ = 62°34'38.2"

FUT. GRAU 350 TL-3

2GI-B
FS

GRADING ONLY

ISFD ABAND

SHELBY BYPASS

GRADING ONLY

FUT. TYPE M350

30" RCP-III

24" RCP-III

2GI-A

FUT. CAT-1

MSE RETAINING WALL #1

SHOULDER BERM GUTTER STA 387+05 TO 389+50 -L- RT

-DR4- PT 17+50.83

REMOVE DI

15" RCP

2GI-B W/FG

REMOVE 96' EX 15" PIPE

9' BASE DITCH W/CL 'I' RIP RAP SEE DETAIL #8 EST 29 TONS EST 50 SY GEOTEXTILE EST 15 CY DDE

SITE 1

BANK STABILIZATION SEE DETAIL #26

-DR4- POT 17+26.25

PUE

RW CA

CHARLES A. HORN

HAZARDOUS SPILL BASIN W/EMBANKMENT AND LINER SEE DETAIL #27 MIN CAPACITY = 518 CY TOTAL CAPACITY @ ELEV 710.0 W/1.0FT FREEBOARD = 577 CY

CL 'B' RIP RAP EST 310 TONS EST 575 SY GEOTEXTILE

CL 'B' RIP RAP EST 11 TONS EST 11 SY GEOTEXTILE

2 ELSIE LOGAN

7 DEBBIE ANN WEBBER

1 OLIVIA A. WITHROW HEIRS C/O CALVIN LOWE

6 OMAR MOLETTE

-L- PT 393+07.22

5 ESSIE B. SHIPP

-L- POC 387+54.08
-Y2- POC 29+07.6
Δ = 62°34'38.2"

2GI-B
FS

4 CHARLES W. & BEVERLY C. BROWNING

GRADE TO DRAIN

8 OLIVIA A. WITHROW HEIRS C/O CALVIN LOWE

-Y2- POC 33+25.00
END GRADE

POC 33+75.00
END CONSTRUCTION
END OVERLAY

9 FRANK TOMS, JR.

3 ESKRIDGE LAURY

SIACEY SEWELL

DIANE L. BLANTON
ESTATE FILE 02E PG 99
REF. DB 187 PG 364

MATCHLINE STA 394+00 SEE SHEET 5

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DESIGN EXCEPTION NEEDED FOR SIGHT DISTANCE ON -Y2-

FOR DITCH DETAILS SEE SHEET 2D-1
FOR -L- PROFILE SEE SHEET 43
FOR -Y2- PROFILE SEE SHEET 56

PERMIT DRAWING
SHEET 8 OF 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-L- US 74 (SHELBY BYPASS)

BEGIN GRADE TIP PROJECT R-2707C
STA 382+00.00, EL = 739.13' A.H.
END GRADE TIP PROJECT R-2707B
STA 382+00.17, EL = 739.13' B.K.

BM # 17
EL = 707.47'
N = 581328.8 E = 1236485.0
8 INCH NAIL IN BASE OF 20 INCH SYCAMORE
-L- STA. 385+52.11 93.83' (LT.)

-Y2- OVER -L-

-L- STA. 387+54.08 = -Y2- STA. 29+07.16
EL = 733.81'

PI = 387+05.00
EL = 728.87'
VC = 1,010'
K = 258
DS = 80 MPH

PROPOSED GRADE

(-)2.0323%

(+)1.8783%

EXISTING GROUND

1.5:1

CL 'H' RIP RAP
1.5:1 NORMAL
1.6:1 SKEWED
TO TOP OF BERM

WSE ON 12-11-14
=696.8

SITE 1

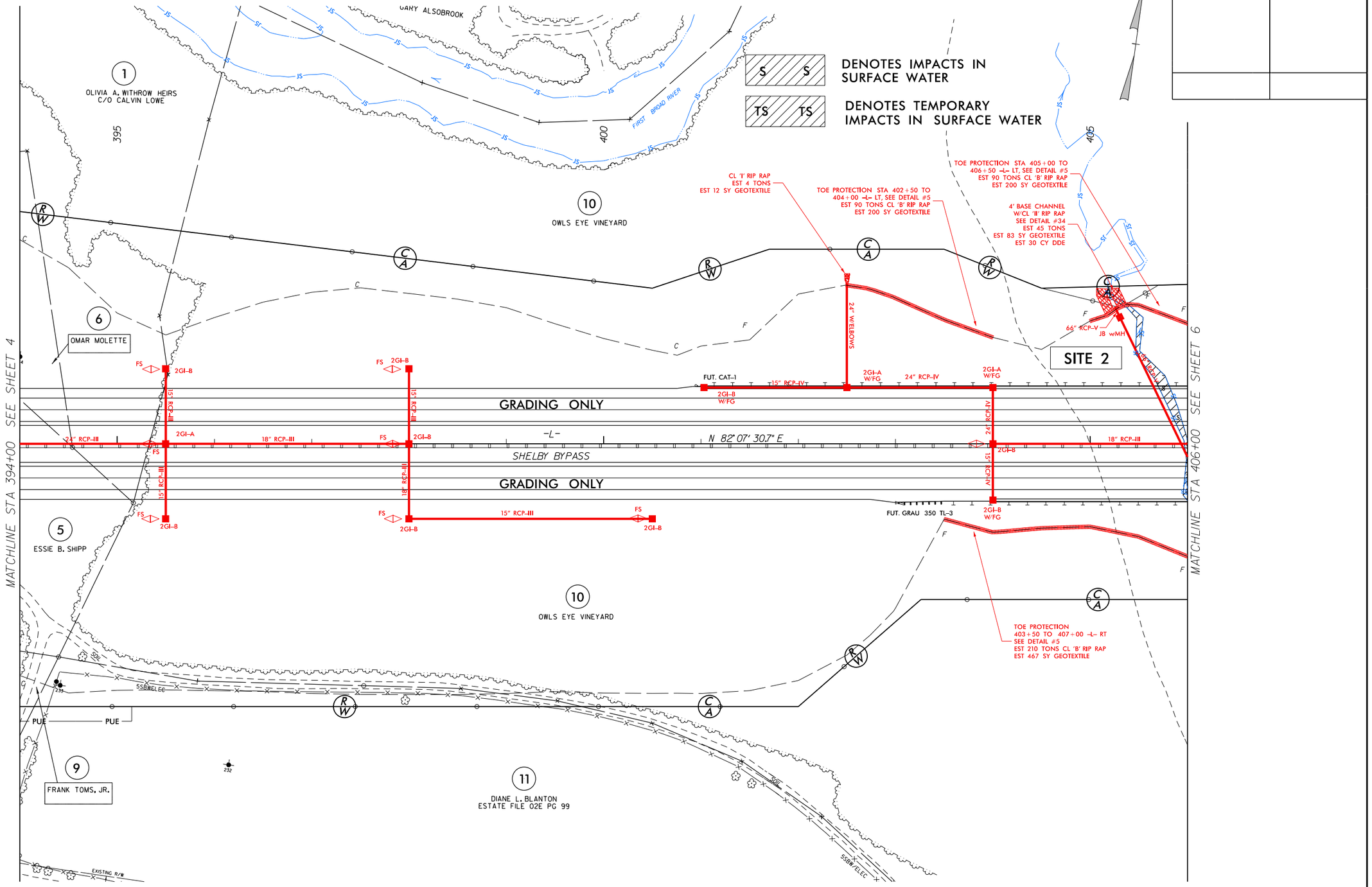
FOR -L- PLAN SEE SHEET 4

810 800 790 780 770 760 750 740 730 720 710 700 690 680 670 660 650

380 381 382 383 384 385 386 387 388 389 390 391 392 393 394

PERMIT DRAWING
SHEET 9 OF 68

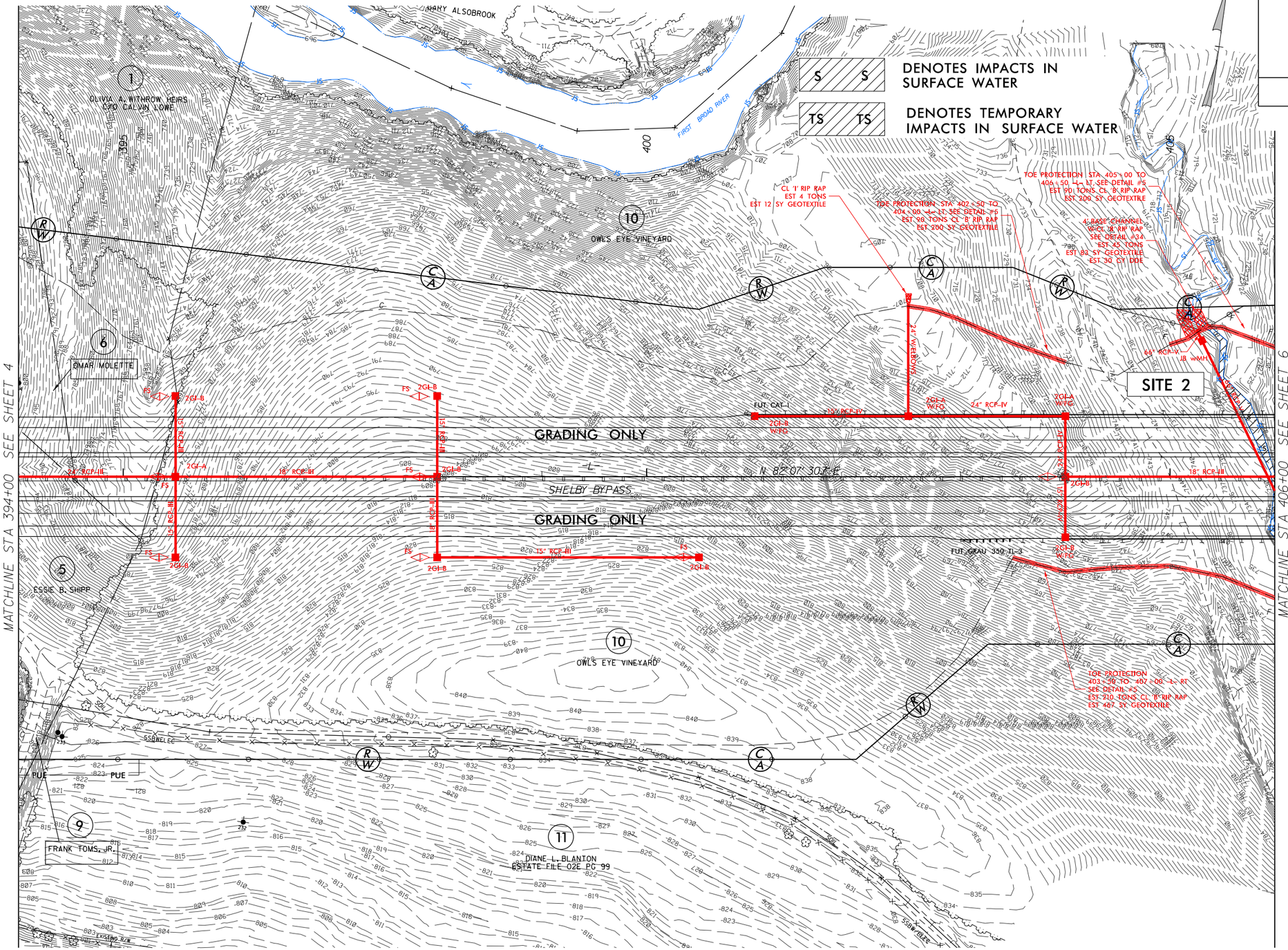
PROJECT REFERENCE NO.	SHEET NO.
R-2707C	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



FOR DITCH DETAILS SEE SHEET 2D-1
FOR -L- PROFILE SEE SHEET 44

PERMIT DRAWING
SHEET 10 OF 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



FOR DITCH DETAILS SEE SHEET 2D-1
FOR -L- PROFILE SEE SHEET 44

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2707C	5b
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 11 OF 68

150 100 50 0 50 100

405+99 –L–
66" RCP

SITE 2

775
770
765
760
755
750
745
740
735
730
725
720
715
710
705

JB W/MH
TOP=728.5
INV IN =720.6
INV OUT=717.1

EXTG NATURAL GROUND
AT PIPE CENTERLINE

EXTG BED

INV IN
=730.0

66" RCP
SLOPE=3.2%

EXTG BED

66" RCP
SLOPE=0.8%

INV OUT
=717.0

11/30/2016
U-2707C_hyd_prm_wet_psh_05b.dgn
harvey

PERMIT DRAWING
SHEET 12 OF 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

10 OWLS EYE VINEYARD

MATCHLINE STA 406+00 SEE SHEET 5

MATCHLINE STA 418+00 SEE SHEET 7

TOE PROTECTION STA 405+00 TO 406+50 –L– LT, SEE DETAIL #5
CL 'B' RIP RAP
EST +/-90 TONS
EST 200 SY GEOTEXTILE

CL 'I' RIP RAP
EST 2 TONS
EST 6 SY GEOTEXTILE

CL 'II' RIP RAP BANK STABILIZATION
SEE DETAIL #36
EST 30 TONS
EST 55 SY GEOTEXTILE

TOE PROTECTION
STA 413+65 TO 416+00 –L– LT
SEE DETAIL #5
CL 'B' RIP RAP
EST 150 TONS
EST 333 SY GEOTEXTILE

FUT. GRAU 350 TL-3

FUT. CAT-1

2GI-B

2GI-A

15" RCP-III

18" RCP-III

24" RCP-III

15" W-BEAM

36" RCP-V

66" RCP-V

JB wMH

HW

GRADING ONLY

SITE 2

SITE 3

N 82° 07' 30.7" E

-L- SHELBY BYPASS

SOIL

TOE PROTECTION
403+50 TO 407+00 –L– RT
SEE DETAIL #5
EST 210 TONS CL 'B' RIP RAP
EST 467 SY GEOTEXTILE

CL 'II' RIP RAP BANK STABILIZATION
SEE DETAIL #35
EST 45 TONS
EST 83 SY GEOTEXTILE

CL 'II' RIP RAP BANK STABILIZATION
SEE DETAIL #36
EST 30 TONS
EST 55 SY GEOTEXTILE

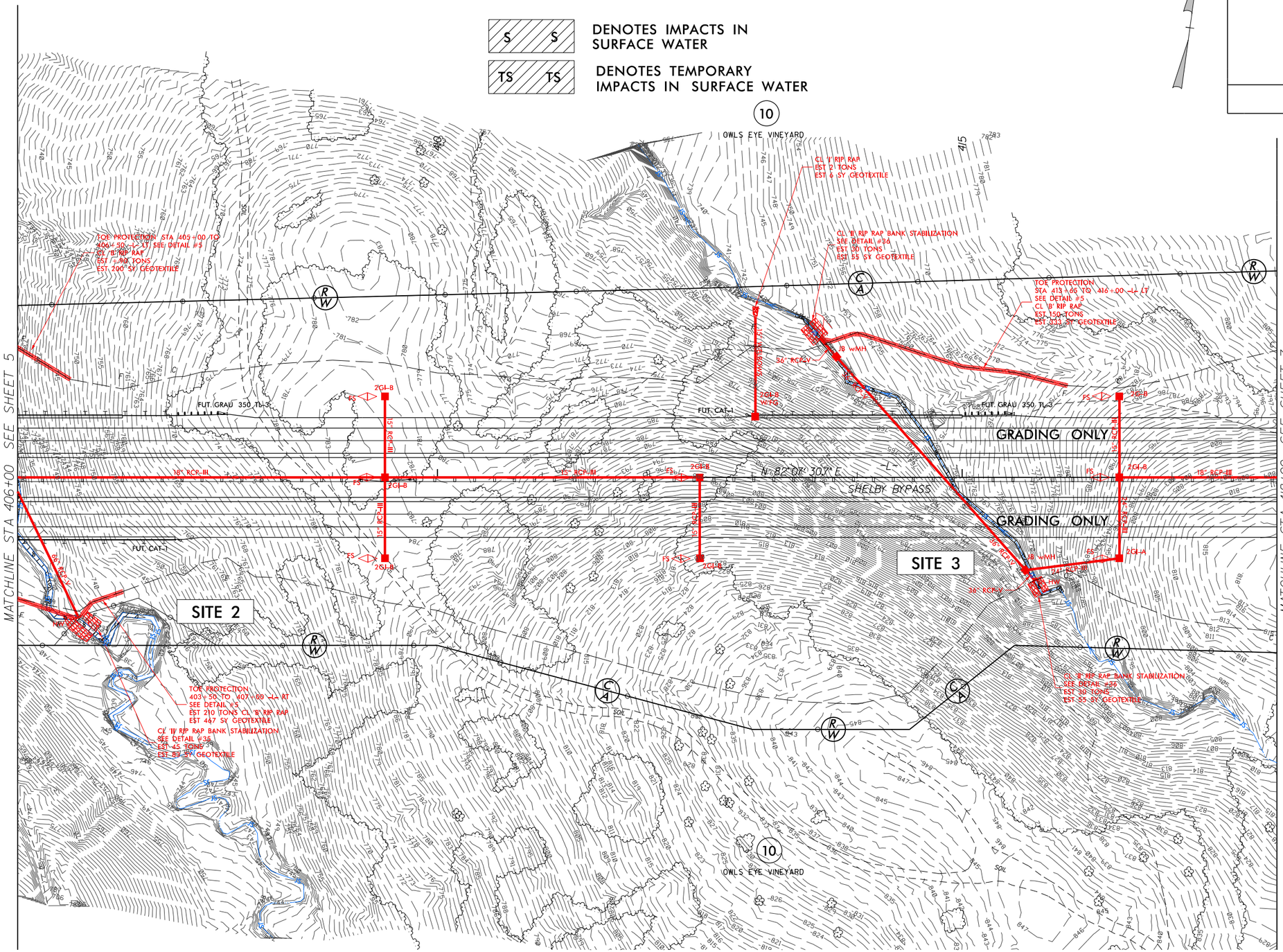
FOR DITCH DETAILS SEE SHEET 2D-1
FOR –L– PROFILE SEE SHEET 44

PERMIT DRAWING
SHEET 13 OF 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER



FOR DITCH DETAILS SEE SHEET 2D-1
FOR -L- PROFILE SEE SHEET 44

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 14 OF 68

REVISIONS

R/W REVISION 9-2-15 (PCP) - PARCEL 12 AND 13 - COMBINED PARCEL 12 WITH 13.

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

10 OWLS EYE VINEYARD

13 EMILE LOUIS GEBEL

SITE 4

-L- TS 419+08.08

-L- SC 421+58.08

MATCHLINE STA 418+00 SEE SHEET 6

MATCHLINE STA 430+00 SEE SHEET 8

SHELBY BYPASS

GRADING ONLY

GRADING ONLY

N 82° 07' 30.7" E

RUINS

CL 'II' RIP RAP BANK STABILIZATION
SEE DETAIL #35
EST 65 TONS
EST 120 SY GEOTEXTILE

CL 'I' RIP RAP
EST 11 TONS
EST 22 SY GEOTEXTILE

CL 'II' RIP RAP BANK STABILIZATION
SEE DETAIL #35
EST 65 TONS
EST 120 SY GEOTEXTILE

TOE PROTECTION
STA 425+50 TO 427+00 -L- RT
SEE DETAIL #5
EST 90 TONS CL 'B' RIP RAP
EST 200 SY GEOTEXTILE

30" WELBOWS

72" RCP-V

15" WELBOWS

72" RCP-V

24" RCP-III

24" RCP-III

15" RCP-III

15" RCP-III

18" RCP-III

15" RCP-III

15" RCP-IV

FUT. CAT-1

FUT. GRAU 350 TL-3

FUT. GRAU 350 TL-3

FUT. CAT-1

2GI-A

2GI-B

2GI-B W/FG

2GI-B W/FG

FS

FOR DITCH DETAILS SEE SHEET 2D-1
FOR -L- PROFILE SEE SHEET 45

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 15 OF 68

REVISIONS

R/W REVISION 9-2-15 (PCP) - PARCEL 12 AND 13 - COMBINED PARCEL 12 WITH 13.

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

10 OWLS EYE VINEYARD

13 EMILE LOUIS GEBEL

SITE 4

GRADING ONLY

GRADING ONLY

SHELBY BYPASS

-L- STA 418+00 SEE SHEET 6

-L- TS 419+08.08

-L- SC 421+58.08

-L- STA 430+00 SEE SHEET 8

N 82° 07' 30.7" E

CL II RIP RAP BANK STABILIZATION SEE DETAIL #35 EST 65 TONS EST 120 SY GEOTEXTILE

CL I RIP RAP EST 11 TONS EST 22 SY GEOTEXTILE

CL II RIP RAP BANK STABILIZATION SEE DETAIL #35 EST 65 TONS EST 120 SY GEOTEXTILE

TOE PROTECTION STA 425+50 TO 427+60 -L- RT SEE DETAIL #5 EST 90 TONS CL B RIP RAP EST 200 SY GEOTEXTILE

FUT. GRAU 350 TL-3

FUT. CAT-1

FOR DITCH DETAILS SEE SHEET 2D-1
FOR -L- PROFILE SEE SHEET 45

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	07b
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 16 OF 68

150 100 50 0 50 100

426+15 –L–
72" RCP

SITE 4

810
805
800
790
785
780
775
770
765
760
755
750
745
740

JB W/MH
TOP=773.0
INV IN=764.5
INV OUT=759.6

EXTG NG AT
PIPE CENTERLINE

72" RCP
SLOPE=0.8%

INV OUT
=759.4

EXTG BED

72" RCP
SLOPE=1.2%

EXTG BED

INV IN
=767.3

11/30/2016
R2707C_hyd_prm_wet_psh_07b.dgn
jbarvau

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 17 OF 68

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

P P DENOTES IMPACTS IN SURFACE WATER (POND)

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

-L- CS 430+44.59

-L- ST 432+94.59

MATCHLINE STA 430+00 SEE SHEET 7

MATCHLINE STA 442+00 SEE SHEET 9

13 EMILE LOUIS GEBEL

14 DR. GARY L. MANGUM

435

440

-L- SHELBY BYPASS

N 65° 04' 39.3" E

SITE 5

SITE 6

GRADING ONLY

GRADING ONLY

2GI-B

2GI-A

24" RCP-III

18" RCP-III

15" RCP-III

FUT. CAT-1

FUT. GRAU 350 TL-3

JB w/MH

66" RCP-IV

30" WELBORE

TOE PROTECTION
STA 438+50 TO 439+20 -L- LT
SEE DETAIL #5
EST 42 TONS CL 'B' RIP RAP
EST 93 SY GEOTEXTILE

CL 'II' RIP RAP BANK STABILIZATION
SEE DETAIL #35
EST 45 TONS
EST 83 SY GEOTEXTILE

CL 'II' RIP RAP
EST 11 TONS
EST 22 SY GEOTEXTILE

REMOVE HW

24" CMP

DAM

6' BASE CHANNEL
W/CL II' RIP RAP
SEE DETAIL #6
EST 198 TONS
EST 370 SY GEOTEXTILE
EST 3807 CY DDE

ROCK CROSS VANE
SEE DETAIL SHEET 2D-2

TDE

2SFD

CHAGRIN FARM RD BST

FOR DITCH DETAILS SEE SHEET 2D-1
FOR -L- PROFILE SEE SHEET 45

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 18 OF 68

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

P P DENOTES IMPACTS IN SURFACE WATER (POND)

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE STA 430+00 SEE SHEET 7

MATCHLINE STA 442+00 SEE SHEET 9

-L- CS 430+44.59

-L- ST 432+94.59

SHELBY BYPASS

N 65° 04' 39.3" E

13 EMILE LOUIS GEBEL

14 DR. GARY L. MANGUM

SITE 5

SITE 6

GRADING ONLY

GRADING ONLY

TOE PROTECTION
STA 438+50 TO 439+20 -L- LT
SEE DETAIL #2
EST 42 TONS CL B RIP RAP
EST 93 SY GEOTEXTILE

CL II RIP RAP BANK STABILIZATION
SEE DETAIL #3B
EST 45 TONS CL I
EST 83 SY GEOTEXTILE

CL II RIP RAP
EST 11 TONS
EST 22 SY GEOTEXTILE

4' BASE CHANNEL W/CL II RIP RAP
SEE DETAIL #4
EST 198 TONS
EST 379 SY GEOTEXTILE
EST 3807 CY DDE

ROCK CROSS VANE
SEE DETAIL SHEET 2D-2

24" RCP-III
18" RCP-III
15" RCP-III
66" RCP-IV
30" MES RCP
2GI-A
2GI-B
JB w/ MH
FUT. CAT-1
FUT. GRAU 350 TL-3
REMOVE
DAM
TDE
2SFD
CHASKIN FARM RD BST
EMILE LOUIS GEBEL

FOR DITCH DETAILS SEE SHEET 2D-1
FOR -L- PROFILE SEE SHEET 45

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	08b
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 19 OF 68

Revised 3/30/2017

150 100 50 0 50 100

438+98 –L–
66" RCP

SITE 5

SITE 6

830
825
820
815
810
805
800
795
790
785
780
775
770
765

JB W/MH
TOP=791.00
INV IN=783.1
INV OUT=779.1

EXTG 24" CMP

INV IN
=789.0

66" RCP
SLOPE=0.5%

66" RCP
SLOPE=2.9%

EXTG BED

INV OUT
=779.0

EXTG NATURAL GROUND
AT PIPE CENTERLINE

EXTG BED

3/30/2017
R2707C_Hyd_prm_wet_psh_08b.dgn
Adam

7/2/99

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
R-2707C	X-155

PERMIT DRAWING
SHEET 20 OF 68

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

880
870
860
850
840
830
820
810
800
790
780
770

SITE 5

L
439+00.00

808.9

6:1 6:1

D.P. 805.840

2:1

IMPACTS IN SURFACE WATER

S.S. 785.858

787.10

439+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

7/2/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2707C	X-224

PERMIT DRAWING
SHEET 21 OF 68

SITE 6

IMPACTS IN SURFACE WATER POND

L
439+00.00

808.9

6:1 6:1 6:1

D.P. 805.840

S.S. 804.269

787.10

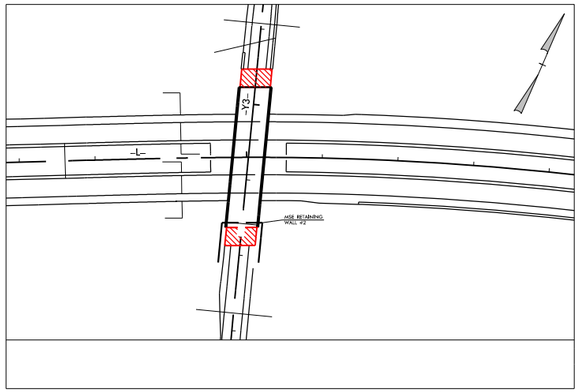
439+00.00
-L-

PERMIT DRAWING
SHEET 22 OF 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER



MATCHLINE STA 16+00 -Y3- SEE SHEET 26

BEGIN OVERLAY

-Y3- POS 17+90.00
BEGIN GRADE

-Y3- CS 16+94.67

-L- TS 447+89.28

-Y3- ST 18+44.67

-L- SC 450+39.28

-L- POS 450+02.49
-Y3- POT 20+70.23
Δ = 95° 37' 38.8"

-Y3- TS 24+29.02

MATCHLINE STA 442+00 SEE SHEET 8

MATCHLINE STA 454+00 SEE SHEET 10

MATCHLINE STA 25+00 -Y3- SEE SHEET 27

SITE 7

GRADING ONLY

GRADING ONLY

SHELBY BYPASS

RETAIN

TIE TO EXISTING DITCH

REMOVE

REMOVE

CL 'II' RIP RAP
BANK STABILIZATION
SEE DETAIL #38
EST. 100 TONS
EST. 190 SY GEOTEXTILE

CL 'B' RIP RAP
EST 1 TONS
EST 5 SY GEOTEXTILE

15" W/ ELBOWS

TOE PROTECTION
STA. 451+50 TO CULVERT AND
CULVERT TO 454+50 -L- LT
SEE DETAIL #5
EST 159 TONS CL 'B' RIP RAP
EST 353 SY GEOTEXTILE

2GI-B W/NSFG

2GI-B W/NSFG

2GI-B W/NSFG

2GI-B W/FG

2GI-B W/FG

2GI-B W/FG

2GI-A

2GI-B

FS

15" RCP-III

18" RCP-III

24" RCP-III

48" WW

54" CHL

48" MD RAIL

36" RCP

18" RCP

15" RCP-IV

18" WELBOWS

15" WELBOWS

8'x8' RCBC W/SILLS

8'x5' RCBC W/SILLS

7'6" STONE HW

3.6' 15" RCP STONE HW

2.4' 48" RCP STONE HW

TYPE B-77

FUT. TYPE B-77

FUT. CONC BARRIER

FUT. ATTENUATOR

FUT. CONRETE BARRIER

FUT. GRAU 350 TL-3

GRAU 350 TL-3

8:1 TAPER

FUT. CAT-1

MSE RETAINING WALL #2

NORTH LAKE SIDE DR

SOUTH LAKE SIDE DR

13' BST

24" CMP

PDE

BDO

DETAIN 1

COLLAR AND EXTEND

CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE
TOE PROTECTION
STA. 451+50 TO CULVERT -L- RT
SEE DETAIL #5
EST 123 TONS CL 'B' RIP RAP
EST 273 SY GEOTEXTILE

FILL EXISTING CHANNEL
WITH SUITABLE MATERIAL
EST 170 CY

8' BASE CHANNEL
W/CL 'II' RIP RAP
SEE DETAIL #37
EST 120 TONS
EST 200 SY GEOTEXTILE
EST 180 CY DDE

BERM DITCH LINED W/CL 'B' RIP RAP
STA 443+50 TO 449+00 -L- RT
SEE DETAIL #1
SEE PROFILE FOR GRADE
EST 165 TONS
EST 367 SY GEOTEXTILE
EST 224 CY DDE

13
EMILE LOUIS GEBEL

14
DR. GARY L. MANGUM

15
MINOR LEE MELTON

16
DR. GARY L MANGUM

16
DR. GARY L MANGUM
DB 165 PG 153

PERMIT DRAWING
SHEET 23 OF 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	9
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE STA 16+00 -Y3- SEE SHEET 26

BEGIN OVERLAY

-Y3- POS 17+90.00

BEGIN GRADE

RETAIN

TIE TO EXISTING DITCH

CL 'II' RIP RAP BANK STABILIZATION SEE DETAIL #38 EST. 100 TONS EST. 190 SY GEOTEXTILE

-Y3- CS 16+94.67

13 EMILE LOUIS GEBEL

15 MINOR LEE MELTON

16 DR. GARY L. MANGUM

TOE PROTECTION STA 451+50 TO CULVERT AND CULVERT TO 454+50 -L- LT SEE DETAIL #5 EST 139 TONS CL 'B' RIP RAP EST 353 SY GEOTEXTILE

-L- TS 447+89.28

-L- POS 447+89.28

-Y3- ST 18+44.67

REMOVE

CL 'B' RIP RAP EST 7 TONS EST 5 SY GEOTEXTILE

16" W ELBOWS

2GI-B W/NSFG

24" RCP-III W/NSFG

TYPE B-77

PDE

SITE 7

8'x8' RCBC W/SILLS

54" CMP

20

14 DR. GARY L. MANGUM

GRADING ONLY

SHELBY BYPASS

-L-

24" RCP-III

2GI-A

2GI-B

18" RCP-III

15" RCP-III

18" RCP-III W/FES

FS

BDO

MATCHLINE STA 442+00 SEE SHEET 8

MATCHLINE STA 454+00 SEE SHEET 10

-L- PI 450+39.28

80' TAPER FUT. CAT-1

FUT. CONC BARRIER FUT. TYPE B-77

FUT. ATTENUATOR FUT. TYPE B-77

FUT. TYPE B-77

FUT. CONCRETE BARRIER

FUT. ATTENUATOR

2GI-B W/FG

18" RCP-III

FUT. GRAU 350 TL-3 MSE RETAINING WALL #2

REMOVE

CL 'B' RIP RAP EST 1 TONS EST 5 SY GEOTEXTILE

TOE PROTECTION STA 451+50 TO CULVERT -L- RT SEE DETAIL #5 EST 123 TONS CL 'B' RIP RAP EST 273 SY GEOTEXTILE

FILL EXISTING CHANNEL WITH SUITABLE MATERIAL EST 170 CY

B' BASE CHANNEL W/CL 'II' RIP RAP SEE DETAIL #37 EST 170 TONS EST 200 SY GEOTEXTILE EST 180 CY DDE

PDE

BERM DITCH LINED W/CL 'B' RIP RAP STA 443+50 TO 449+00 -L- RT SEE DETAIL #1 SEE PROFILE FOR GRADE EST 165 TONS EST 367 SY GEOTEXTILE EST 224 CY DDE

36" RCP

3.6 ac RAP STONE

15" W ELBOWS

DETAIN

15" RCP-III

18" RCP-III W/FES

CL 'B' RIP RAP EST 1 TONS EST 5 SY GEOTEXTILE

COLLAR AND EXTEND

-L- PI 450+02.49

-Y3- POT 20+70.23

Δ = 95° 37' 38.8"

-X3- TS 24+29.02

MATCHLINE STA 25+00 -Y3- SEE SHEET 27

16 DR. GARY L MANGUM DB 165 PG 153

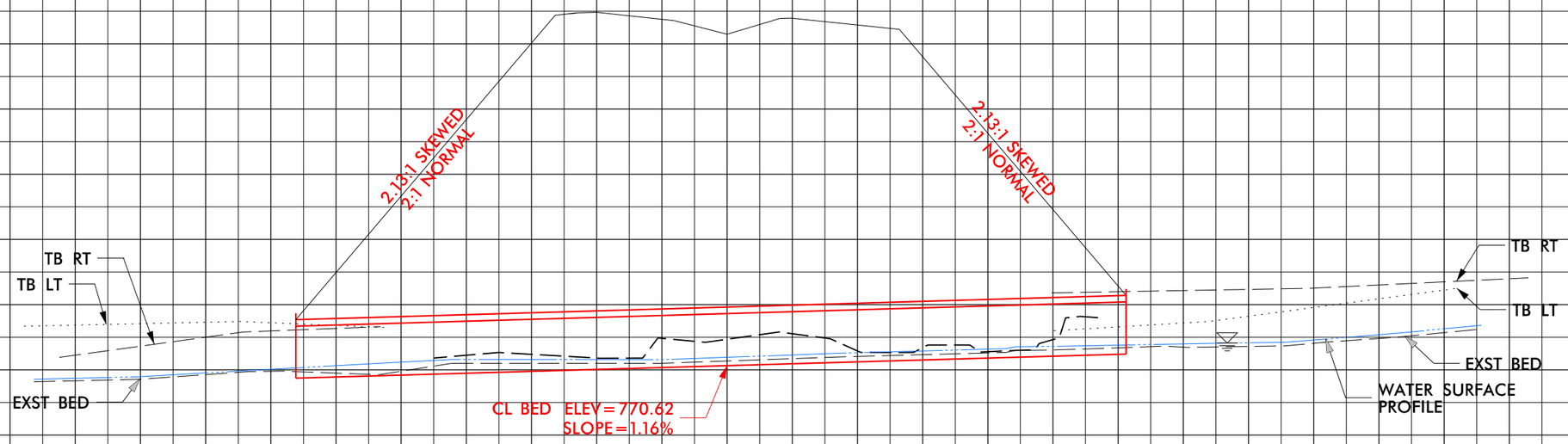
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 24 OF 68

SITE 7

CL STA 453+07 –L–
1@ 8' x 8' RCBC W/SILL
SKEW = 70°
GP EL = 823.85



11/30/2016
H:\2017C\hyd-prm_wet_psh_09b.dgn
bpavey

PERMIT DRAWING
SHEET 25 OF 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

S S DENOTES IMPACTS IN SURFACE WATER

16
DR. GARY L MANGUM

17A
BOYCE J. HANNA

17
CITY OF SHELBY

TOE PROTECTION
STA 451+50 TO CULVERT AND
CULVERT TO 454+50 -L- LT
SEE DETAIL #5
EST 159 TONS CL 'B' RIP RAP
EST 353 SY GEOTEXTILE

2' BASE DITCH LINED W/CL 'B' RIP RAP
STA 456+10 TO 457+75 -L- LT
SEE DETAIL #7
EST 66 TONS
EST 147 SY GEOTEXTILE
EST 184 CY DDE

CL 'B' RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE

STD. BERM DITCH LINED W/CL 'B' RIP RAP
STA 463+80 TO 469+50 -L- LT
SEE DETAIL #1
EST 171 TONS
EST 380 SY GEOTEXTILE
EST 71 CY DDE

CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE

CL 'I' RIP RAP
EST 11 TONS
EST 22 SY GEOTEXTILE

3' BASE TAIL DITCH LINED
W/CL 'I' RIP RAP
SEE DETAIL #8
EST 29 TONS
EST 61 SY GEOTEXTILE
EST 82 CY DDE

SPEC CUT 2' BASE DITCH LINED
W/CL 'B' RIP RAP
STA 463+10 TO 464+50 -L- RT
SEE DETAIL #9
EST 84 TONS
EST 187 SY GEOTEXTILE

SPEC CUT 2' BASE DITCH
STA 464+50 TO 465+00 -L- RT
SEE DETAIL #10

SITE 7

GRADING ONLY
SHELBY BYPASS
GRADING ONLY

FUT. GRAU 350 TL-3
FUT. CAT-1
TDE
PDE
PDE
SOLID IRON
ANGLE IRON
CHORD
CHORD
SOIL

2GI-A
2GI-B
2GI-B W/FG
24" RCP-III
30" RCP-III
18" RCP-III
24" W/ ELBOWS
24" RCP-III
24" RCP-III
18" RCP-III
N 87° 35' 28.8" E

-L- CS 462+90.19
-L- ST 465+40.19
MATCHLINE STA 454+00 SEE SHEET 9
MATCHLINE STA 466+00 SEE SHEET 11

455
460
465

FOR DITCH DETAILS SEE SHEET 2D-1
FOR PFSH DETAILS SEE SHEET 2D-2
FOR -L- PROFILE SEE SHEET 46

PERMIT DRAWING
SHEET 26 OF 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

S S DENOTES IMPACTS IN SURFACE WATER

TOE PROTECTION
STA 451+50 TO CULVERT AND
CULVERT TO 454+50 -L- LT
SEE DETAIL #5
EST 169 TONS CL 'B' RIP RAP
EST 353 SY GEOTEXTILE

2' BASE DITCH LINED W/CL 'B' RIP RAP
STA 456+10 TO 457+75 -L- LT
SEE DETAIL #7
EST 98 TONS
EST 192 SY GEOTEXTILE
EST 184 CY DDE

CL 'B' RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE

STD. BEAM DITCH LINED W/CL 'B' RIP RAP
STA 463+80 TO 469+50 -L- LT
SEE DETAIL #1
EST 171 TONS
EST 380 SY GEOTEXTILE
EST 71 CY DDE

16
DR. GARY L. MANGUM

17A
BOYCE J. HANNA

17
CITY OF SHELBY

16
DR. GARY L. MANGUM

SITE 7

FUT. GRAU 350 TL-3

GRADING ONLY

SHELBY BYPASS

GRADING ONLY

FUT. CAT-1

TDE

PDE

2GI-A
FES
24" RCP-III

2GI-B
FES
24" RCP-III
W/FES

2GI
24" RCP-III
24" RCP-III
18" RCP-III
N 87° 35' 28.8" E

2GI-B
FES
24" RCP-III
W/FES

CL 'B' RIP RAP
EST 1 TONS
EST. 5 SY GEOTEXTILE

CL 'I' RIP RAP
EST 11 TONS
EST 22 SY GEOTEXTILE

3' BASE TAIL DITCH LINED
W/CL 'I' RIP RAP
SEE DETAIL #8
EST 29 TONS
EST 61 SY GEOTEXTILE
EST 82 CY DDE

SPEC CUT 2' BASE DITCH
STA 464+50 TO 465+00 -L- RT
SEE DETAIL #10

SPEC CUT 2' BASE DITCH LINED
W/CL 'B' RIP RAP
STA 463+10 TO 464+50 -L- RT
SEE DETAIL #9
EST 64 TONS
EST 187 SY GEOTEXTILE

ANGLE IRON

SOLID IRON

CHORD

CHORD

12+1 W. ELBOWS

BDO

48"WW/45"SW

C/L SHELBY BYPASS -L- STA 465+40.09

C/L SHELBY BYPASS -L- STA 462+90.09

SEE SHEET 9
MATCHLINE STA 454+00

SEE SHEET 11
MATCHLINE STA 466+00

FOR DITCH DETAILS SEE SHEET 2D-1
FOR PFSH DETAILS SEE SHEET 2D-2
FOR -L- PROFILE SEE SHEET 46

PERMIT DRAWING SHEET 27 OF 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS

R/W REVISION 9-2-15 (PCP) - PARCEL 17A - CHANGED PROPERTY OWNER NAMES AND DEED INFORMATION.

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

-L- POT 474+45.79
-Y4-REV POT 24+05.50
Δ = 52°03'41.1"

MATCHLINE STA 19+00 -Y4-REV SEE SHEET 28

MATCHLINE STA 466+00 SEE SHEET 10

MATCHLINE STA 478+00 SEE SHEET 12

MATCHLINE STA 28+00 -Y4-REV SEE SHEET 29

MATCHLINE STA 15+00 -Y18-

17A BOYCE J. HANNA

16 DR. GARY L MANGUM

17 CITY OF SHELBY

18 CHESTER PEELER

19 BRIDGETTE M. EPPS

SITE 8

GRADING ONLY

-L- SHELBY BYPASS

-Y4-REV ST 21+84.99

-Y18- POT 10+00.00

-Y18- POT 12+00.00
BEGIN CONSTRUCTION

-Y18- PC 13+65.16

-Y4- ST 28+06.14

STD. BERM DITCH LINED W/CL 'B' RIP RAP
STA 463+80 TO 469+50 -L- LT
SEE DETAIL #1

SPEC LAT V-DITCH
STA 15+00 TO 21+40 -Y4-REV RT
SEE DETAIL #15

STD. BERM DITCH LINED W/CL 'B' RIP RAP
STA 471+00 TO 475+00 -L- RT
SEE DETAIL #1
EST 160 TONS
EST 356 SY GEOTEXTILE
EST 160 CY DDE

LAT V-DITCH
STA 25+50 TO 28+50 -Y4-REV RT
SEE DETAIL #15
EST 387 CY DDE

CL 'II' RIP RAP BANK STABILIZATION
SEE DETAIL #36
EST 30 TONS
EST 55 SY GEOTEXTILE

TOE PROTECTION
STA 475+75 TO 476+50 -L- LT
SEE DETAIL #5
EST 45 TONS CL 'B' RIP RAP
EST 100 SY GEOTEXTILE

CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE

CL 'II' RIP RAP
BANK STABILIZATION
SEE DETAIL #36
EST 30 TONS
EST 55 SY GEOTEXTILE

REMOVE

FUT. CONCRETE BARRIER
FUT. TYPE B-77
FUT. ATTENUATOR

FOR DITCH DETAILS SEE SHEET 2D-1
FOR PFSH DETAILS SEE SHEET 2D-2
FOR -L- PROFILE SEE SHEET 47
FOR -Y4-REV PROFILE SEE SHEET 57
FOR -Y18- PROFILE SEE SHEET 76

PERMIT DRAWING
SHEET 28 OF 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS

R/W REVISION 9-2-15 (PCP) - PARCEL 17A - CHANGED PROPERTY OWNER NAMES AND DEED INFORMATION.

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

-L- POT 474+45.79
+Y4-REV POT 24+05.50
Δ = 52°03'41.1"

MATCHLINE STA 19+00 -Y4-REV SEE SHEET 28

MATCHLINE STA 466+00 SEE SHEET 10

MATCHLINE STA 478+00 SEE SHEET 12

MATCHLINE STA 28+00 -Y4-REV SEE SHEET 29

MATCHLINE STA 15+00 -Y18-

17A BOYCE J. HANNA

16 DR. GARY L. MANGUM

17 CITY OF SHELBY

18 CHESTER PEELER

19 BRIDGETTE M. EPPS

SITE 8

GRADING ONLY

-L- SHELBY BYPASS

REMOVE 4.9' CONC HW

REMOVE

REMOVE 5.2' CONC HW

STD. BERM DITCH LINED W/CL 'B' RIP RAP
STA 463+80 TO 469+50 -L- LT
SEE DETAIL #1

SPEC LAT V-DITCH
STA 15+00 TO 21+40 -Y4-REV RT
SEE DETAIL #15

STD BERM DITCH LINED W/CL 'B' RIP RAP
STA 471+00 TO 475+00 -L- RT
SEE DETAIL #1
EST 160 TONS
EST 356 SY GEOTEXTILE
EST 160 CY DDE

LAY V-DITCH
STA 25+30 TO 28+50 -Y4-REV RT
SEE DETAIL #15
EST 387 CY DDE

CL 'H' RIP RAP BANK STABILIZATION
SEE DETAIL #36
EST 30 TONS
EST 55 SY GEOTEXTILE

TOE PROTECTION
STA 475+75 TO 476+50 -L- LT
SEE DETAIL #35
EST 45 TONS CL 'B' RIP RAP
EST 393 SY GEOTEXTILE

CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE

CL 'H' RIP RAP
BANK STABILIZATION
SEE DETAIL #36
EST 30 TONS
EST 55 SY GEOTEXTILE

-Y18- POT 10+00.00

-Y18- POT 12+00.00
BEGIN CONSTRUCTION

-Y18- PC 13+65.16

-Y4- ST 28+06.14

FUT. CONCRETE BARRIER
FUT. TYPE B-77
FUT. ATTENUATOR
FUT. TYPE B-77
FUT. CONCRETE BARRIER

FOR DITCH DETAILS SEE SHEET 2D-1
FOR PFSH DETAILS SEE SHEET 2D-2
FOR -L- PROFILE SEE SHEET 47
FOR -Y4-REV PROFILE SEE SHEET 57
FOR -Y18- PROFILE SEE SHEET 76

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2707C	X-344

PERMIT DRAWING
SHEET 29 OF 68

7/2/99

WETLAND

WETLAND

SITE 8

L
477+00.00

85452

FILL IN WETLAND

6:1 6:1

85122
D.P. 852519

4:1

477+00.00

L
476+50.00

85388

6:1 6:1

D.P. 852092

843.47

4:1

8.0'

2:1

84460
Ditch Elevation

476+50.00

910 900 890 880 870 860 850 840 830

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

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 30 OF 68

S S DENOTES IMPACTS IN SURFACE WATER

19 BRIDGETTE M. EPPS

20 LOU DEAN D. HAMRICK

18 CHESTER PEELER

480

485

SEE SHEET 11

MATCHLINE STA 478+00

SEE SHEET 13

MATCHLINE STA 490+00

SITE 9

TOE PROTECTION
STA 488+50 TO 493+00 -L- LT
SEE DETAIL #5
CL 'B' RIP RAP
EST 270 TONS
EST 600 SY GEOTEXTILE

GRADING ONLY

SHELBY BYPASS

GRADING ONLY

-L-

FS 2GI-B 15" RCP-III

FS 2GI-A 24" RCP-III 18" RCP-III

FS 2GI-B 18" RCP-III

FS 2GI-B 15" RCP-III

2GI-B W/FG FUT. CAT-1 15" RCP-IV

2GI-B W/FG 15" RCP-IV

FS 2GI-B 15" RCP-IV

2GI-B W/FG 18" RCP-IV 15" RCP-IV

FUT. GRAU 350 TL-3 18" 2GI-B W/FG

CL 'I' RIP RAP
EST 4 TONS
EST 10 SY GEOTEXTILE

SPEC 2' LAT BASE DITCH
LINED W/CL 'B' RIP RAP
STA 487+50 TO 488+50 -L- RT
SEE DETAIL #9
EST 40 TONS
EST 89 SY GEOTEXTILE

SPEC 2' LAT BASE DITCH
LINED W/CL 'B' RIP RAP
STA 488+50 TO 490+10 -L- RT
SEE DETAIL #7
EST 64 TONS
EST 142 SY GEOTEXTILE
EST 974 CY DDE

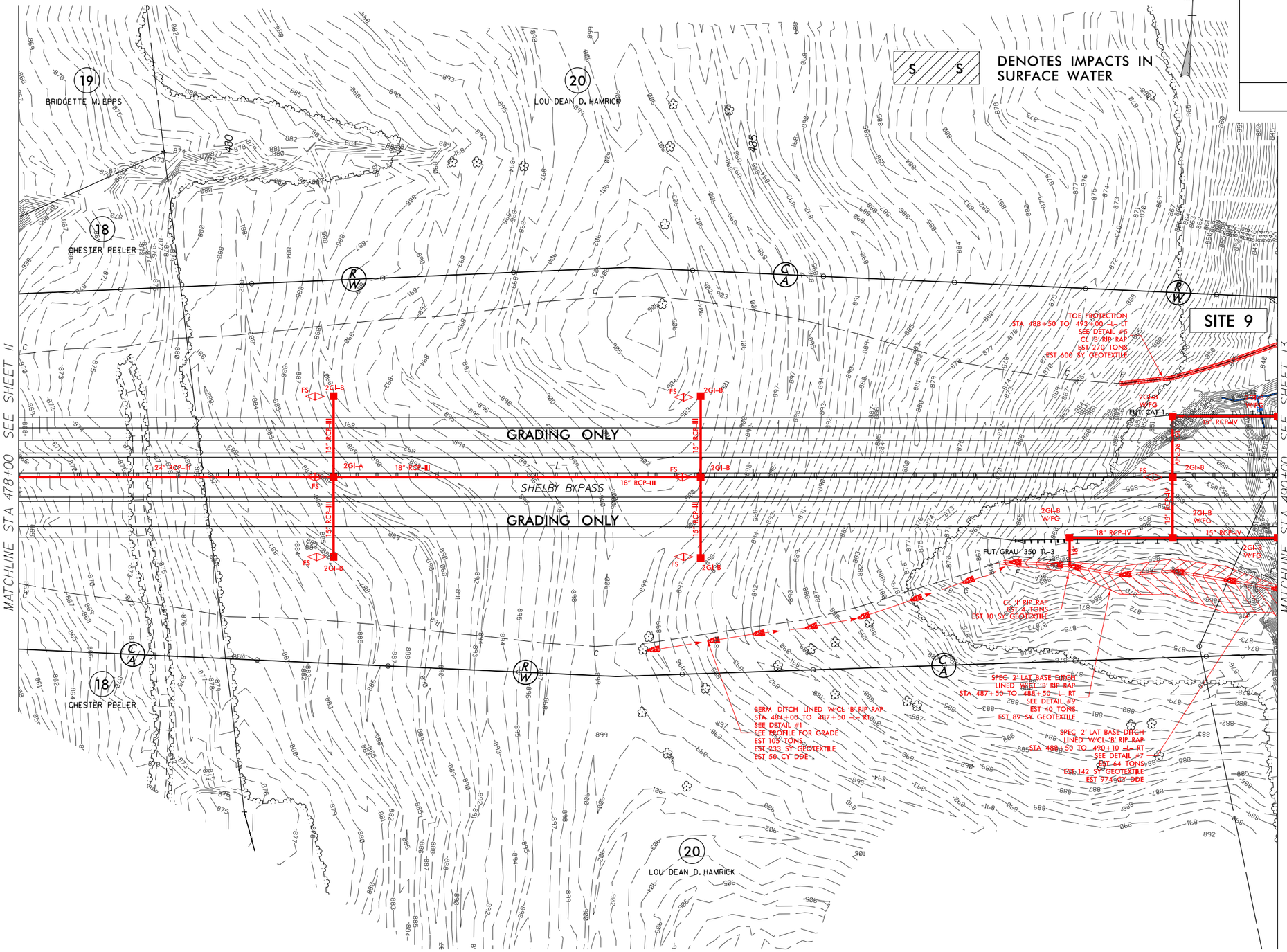
BERM DITCH LINED W/CL 'B' RIP RAP
STA 484+00 TO 487+50 -L- RT
SEE DETAIL #1
SEE PROFILE FOR GRADE
EST 105 TONS
EST 233 SY GEOTEXTILE
EST 50 CY DDE

FOR DITCH DETAILS SEE SHEET 2D-1
FOR -L- PROFILE SEE SHEET 47

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 31 OF 68

S S DENOTES IMPACTS IN SURFACE WATER



FOR DITCH DETAILS SEE SHEET 2D-1
FOR -L- PROFILE SEE SHEET 47

PERMIT DRAWING
SHEET 32 OF 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	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

MATCHLINE STA 490+00 SEE SHEET 12

MATCHLINE STA 502+00 SEE SHEET 14

20 LOU DEAN D. HAMRICK

21 HAL DEDMON

22 NC DEPT OF TRANSPORTATION

23 NC DEPT OF TRANSPORTATION

CARRIE NORVILLE TESSNER

SITE 9

SITE 10

SITE 11

CL 'II' RIP RAP BANK STABILIZATION
SEE DETAIL #35
EST 45 TONS
EST 83 SY GEOTEXTILE

TOE PROTECTION
STA 488+50 TO 493+00 -L- LT
SEE DETAIL #5
CL 'B' RIP RAP
EST 270 TONS
EST 600 SY GEOTEXTILE

2' LAT BASE DITCH
W/CL 'B' RIP RAP
STA 494+00 TO 496+00 -L- LT
SEE DETAIL #7
EST 60 TONS
EST 133 SY GEOTEXTILE
EST 119 CY DDE

3' BASE CHANNEL
W/CL 'II' RIP RAP
SEE DETAIL #16
EST 50 TONS
EST 93 SY GF
EST 20 CY DDE

JS GOES UNDERGROUND

PUE

GRADING ONLY

GRADING ONLY

SHELBY BYPASS

FUT. CAT-1

FUT. GRAU
350 TL-3

TOE PROTECTION
STA 490+50 TO 492+00 -L- RT
SEE DETAIL #5
CL 'B' RIP RAP
EST 90 TONS
EST 200 SY GEOTEXTILE

TOE PROTECTION
STA 495+00 TO 495+50 -L- RT
SEE DETAIL #5
CL 'B' RIP RAP
EST 30 TONS
EST 67 SY GEOTEXTILE

3' BASE CHANNEL
W/CL 'II' RIP RAP
SEE DETAIL #16
EST 35 TONS
EST 65 SY GEOTEXTILE
EST 45 CY DDE

2' BASE DITCH
W/CL 'I' RIP RAP
SEE DETAIL #4
EST 36 TONS
EST 65 SY GF
EST 10 CY DDE

CL 'II' RIP RAP BANK STABILIZATION
SEE DETAIL #35
EST 55 TONS
EST 102 SY GEOTEXTILE

ROY FRANKLIN WRAY

HTR

36' BK

ISBKD

GR

NC

FOR DITCH DETAILS SEE SHEET 2D-1
FOR -L- PROFILE SEE SHEET 48

PERMIT DRAWING
SHEET 33 OF 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	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

SITE 9

SITE 10

SITE 11

GRADING ONLY

GRADING ONLY

SHELBY BYPASS

MATCHLINE STA 490+00 SEE SHEET 12

MATCHLINE STA 502+00 SEE SHEET 14

20 LOU DEAN D. HAMRICK

21 HAL DEDMON

22 NC DEPT OF TRANSPORTATION

23 NC DEPT OF TRANSPORTATION

CARRIE NORVILLE TESSNER

ROY FRANKLIN WRAY

CL II RR RAP BANK STABILIZATION
SEE DETAIL #35
EST 45 TONS
EST 83 SY GEOTEXTILE

TOE PROTECTION
STA 489+50 TO 493+00 -L- LT
SEE DETAIL #5
CL 'B' RIP RAP
EST 270 TONS
EST 680 SY GEOTEXTILE

2' LAT BASE DITCH
W/CL 'B' RIP RAP
STA 494+00 TO 496+00 -L- LT
SEE DETAIL #7
EST 60 TONS
EST 733 SY GEOTEXTILE
EST 119 CY DDE

3' BASE CHANNEL
W/CL II RIP RAP
SEE DETAIL #16
EST 50 TONS
EST 93 SY GF
EST 20 CY DDE

JS GOES UNDERGROUND

TOE PROTECTION
STA 490+50 TO 492+00 -L- RT
SEE DETAIL #5
CL 'B' RIP RAP
EST 190 TONS
EST 200 SY GEOTEXTILE

TOE PROTECTION
STA 495+00 TO 495+50 -L- RT
SEE DETAIL #5
CL 'B' RIP RAP
EST 30 TONS
EST 67 SY GEOTEXTILE

3' BASE CHANNEL
W/CL II RIP RAP
SEE DETAIL #16
EST 35 TONS
EST 65 SY GEOTEXTILE
EST 45 CY DDE

2' BASE DITCH
W/CL 'A' RIP RAP
SEE DETAIL #4
EST 36 TONS
EST 85 SY GF
EST 10 CY DDE

CL II RIP RAP BANK STABILIZATION
SEE DETAIL #35
EST 96 TONS
EST 102 SY GEOTEXTILE

FUT. CAT-1

FUT. GRAU
350 TL-3

PUE

NC

GR

S

HTR

36"BK

ISBKD

FOR DITCH DETAILS SEE SHEET 2D-1
FOR -L- PROFILE SEE SHEET 48

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 34 OF 68

150 100 50 0 50 100

491+00 –L–
66" RCP

SITE 10

880
875
870
865
860
855
850
845
840
835
830
825
820
815
810

JB W/SLAB LID
TOP=841.3
INV IN 66"=834.0
INV IN 30"=834.0
INV OUT 66"/30"=830.0

EXTG NATURAL GROUND
AT PIPE CENTERLINE

EXTG BED

INV OUT
=829.6

66" RCP
SLOPE=0.7%

66" RCP
SLOPE=1.3%

EXTG BED

INV IN
=837.2

11/30/2016
R23071_tyd_prm_wet_psh_13b.dgn
bacveu

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 35 OF 68

Revised 3/30/2017

REVISIONS

R/W REVISION 10-05-15 (ESM) - PARCEL 24 - CHANGED PROPERTY OWNER INFORMATION

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

-Y6- POT 10+00.00 =
-Y6A- POT 10+00.00

-Y6A- PC 10+93.66

-Y5- POT 15+76.05 =
-Y6- POT 15+35.72

MATCHLINE STA 15+25 -Y6A- SEE SHEET 30

MATCHLINE STA 502+00 SEE SHEET 13

MATCHLINE STA 512+00 SEE SHEET 15

-L- TS 505+06.12

-L- POC 508+92.03
-Y5- POS 18+05.06
Δ = 136° 34' 48.8"

-L- SC 507+06.12

-L- SHELBY BYPASS

-Y6A-

22 NC DEPT OF TRANSPORTATION

23 DEPT OF TRANSPORTATION

24 LORA PASSMORE SPIVEY

25 MARY J. MISLE

26 CAROLINA WATER STORAGE

27 D. WAYNE ALLEN

28 CINDY C. EDWARDS & CAROLYN A. CODY

29 SINDY C. EDWARDS & CAROLYN A. CODY

SITE 12

SITE 13

SITE 14

GRADING ONLY

CL 'B' RIP RAP
EST 4 TON
EST 5 SY GEOTEXTILE
5' BASE CHANNEL
W/CL 'II' RIP RAP
SEE DETAIL #31
EST 50 TONS
EST 93 SY GEOTEXTILE
EST 20 CY DDE

7' LAT BASE CHANNEL W/
EMBEDED CL 'II' RIP RAP
STA 503+00 TO 513+00 -L- LT
SEE DETAIL #21
EST 2663 TONS
EST 3700 SY DDE

5' LAT BASE DITCH W/CL 'I' RIP RAP
STA 505+00 TO 508+25 -L- RT
SEE DETAIL #13
EST 452 TONS
EST 772 SY GEOTEXTILE
EST 600 CY DDE

TOE PROTECTION
STA 508+20 TO 513+00 -L- RT
SEE DETAIL #5
CL 'B' RIP RAP
EST 279 TONS
EST 620 SY GEOTEXTILE

FOR DITCH DETAILS SEE SHEET 2D-1
FOR PFSH DETAILS SEE SHEET 2D-2
FOR -L- PROFILE SEE SHEET 48
FOR -Y6A- PROFILE SEE SHEET 58

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 36 OF 68

Revised 3/30/2017

REVISIONS

R/W REVISION 10-05-15 (ESM) - PARCEL 24 - CHANGED PROPERTY OWNER INFORMATION

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE STA 502+00 SEE SHEET 13

MATCHLINE STA 512+00 SEE SHEET 15

MATCHLINE STA 15+25 -Y6A- SEE SHEET 30

-Y6- POT 10+00.00 =
-Y6A- POT 10+00.00

-Y6A- PC 10+93.66

-Y5- POT 15+76.05 =
-Y6- POT 15+35.72

-L- TS 505+06.12

-L- POC 508+92.03
-Y5- POS 18+05.06
Δ = 136° 34' 48.8"

-L- SC 507+06.12

-Y6A-

-L-

SITE 13

SITE 14

SITE 12

GRADING ONLY

SHELBY BYPASS

CHORD

SR 1843 SPRINGBROOK RD

SR 1842 LITHIA SPRINGS RD

24 LORA PASSMORE SPIVEY

22 NC DEPT OF TRANSPORTATION

25 MARY J. MISLE

26 CAROLINA WATER STORAGE

29 CINDY C. EDWARDS & CAROLYN A. CODY

28 CINDY C. EDWARDS & CAROLYN A. CODY

23 DEPT OF TRANSPORTATION

27 D. WAYNE ALLEN

JC CAUSBY

ROY FRANKLIN WRAY

CL 'B' RIP RAP
EST 4 TON
EST 5 SY GEOTEXTILE
5' BASE CHANNEL
W/CL 'II' RIP RAP
SEE DETAIL #39
EST 50 TONS
EST 93 SY GEOTEXTILE
EST 20 CY DDE

7' LAT BASE CHANNEL W/ EMBEDED CL 'II' RIP RAP
STA 503+00 TO 513+00 -L- LT
SEE DETAIL #21
EST 2663 TONS
EST 3700 SY DDE

5' LAT BASE DITCH W/CL 'I' RIP RAP
STA 505+00 TO 508+25 -L- RT
SEE DETAIL #13
EST 452 TONS
EST 772 SY GEOTEXTILE
EST 600 CY DDE

TOE PROTECTION
STA 508+20 TO 513+00 -L- RT
SEE DETAIL #5
CL 'B' RIP RAP
EST 279 TONS
EST 620 SY GEOTEXTILE

REMOVE

54" RCP-CD

JB w/MH

36" RCP-III

2GI-A

2GI-B W/FG

15" RCP-IV

15" W ELBOWS

TOP STAND PIPE

FOR DITCH DETAILS SEE SHEET 2D-1
FOR PPSH DETAILS SEE SHEET 2D-2
FOR -L- PROFILE SEE SHEET 48
FOR -Y6A- PROFILE SEE SHEET 58

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2707C	X-408

PERMIT DRAWING
SHEET 37 OF 68

7/2/99

SITE 11

889.26

6:1 6:1 2:1

DP. 886.88

WETLAND

FILL IN WETLAND

S.S. 852.370

844.70

504+00.00

SITE 11

888.62

6:1 6:1 2:1

DP. 885.544

WETLAND WETLAND

IMPACTS IN SURFACE WATER

FILL IN WETLAND

IMPACTS IN SURFACE WATER

S.S. 851.017

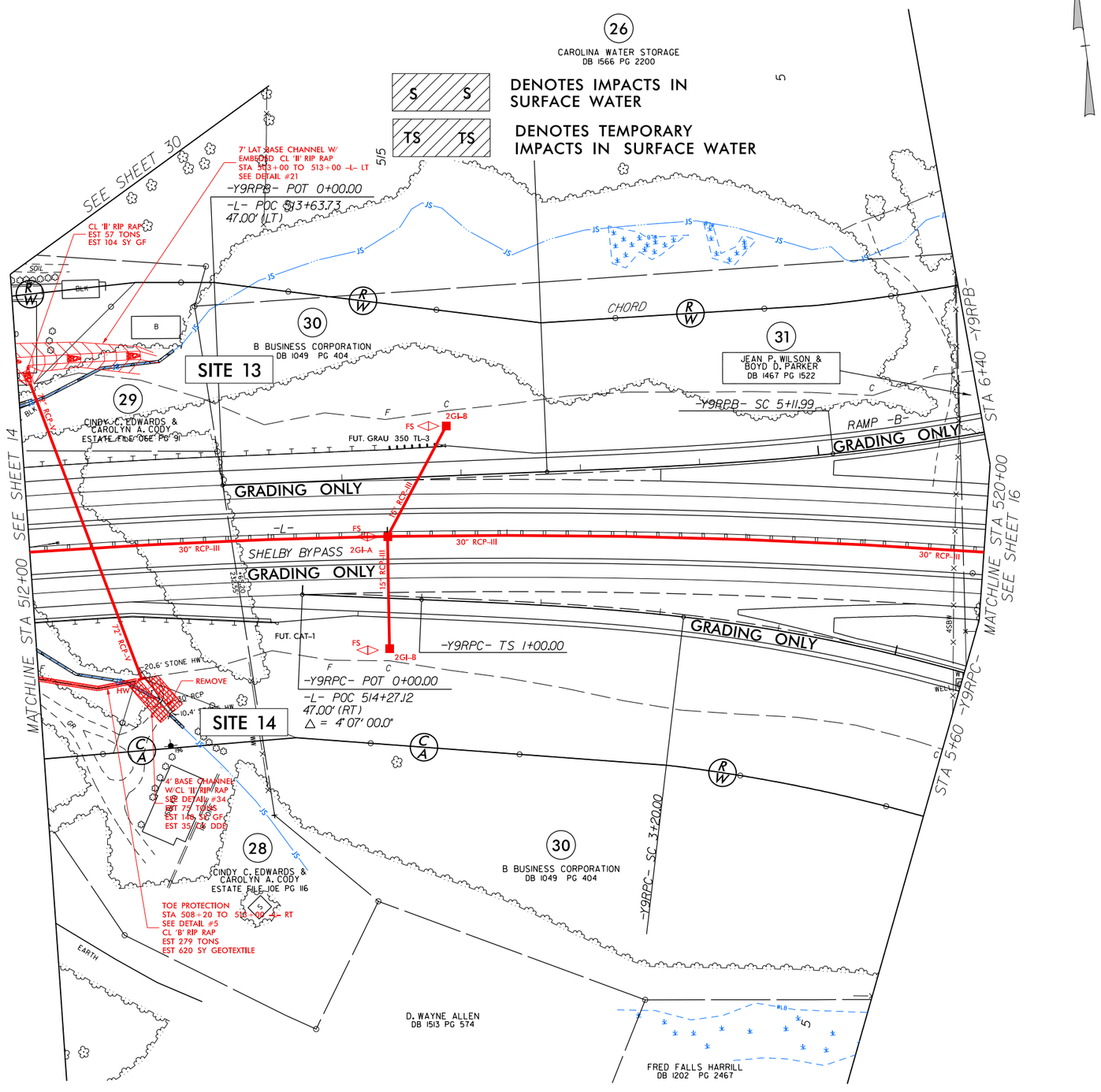
846.50

503+50.00

-L-

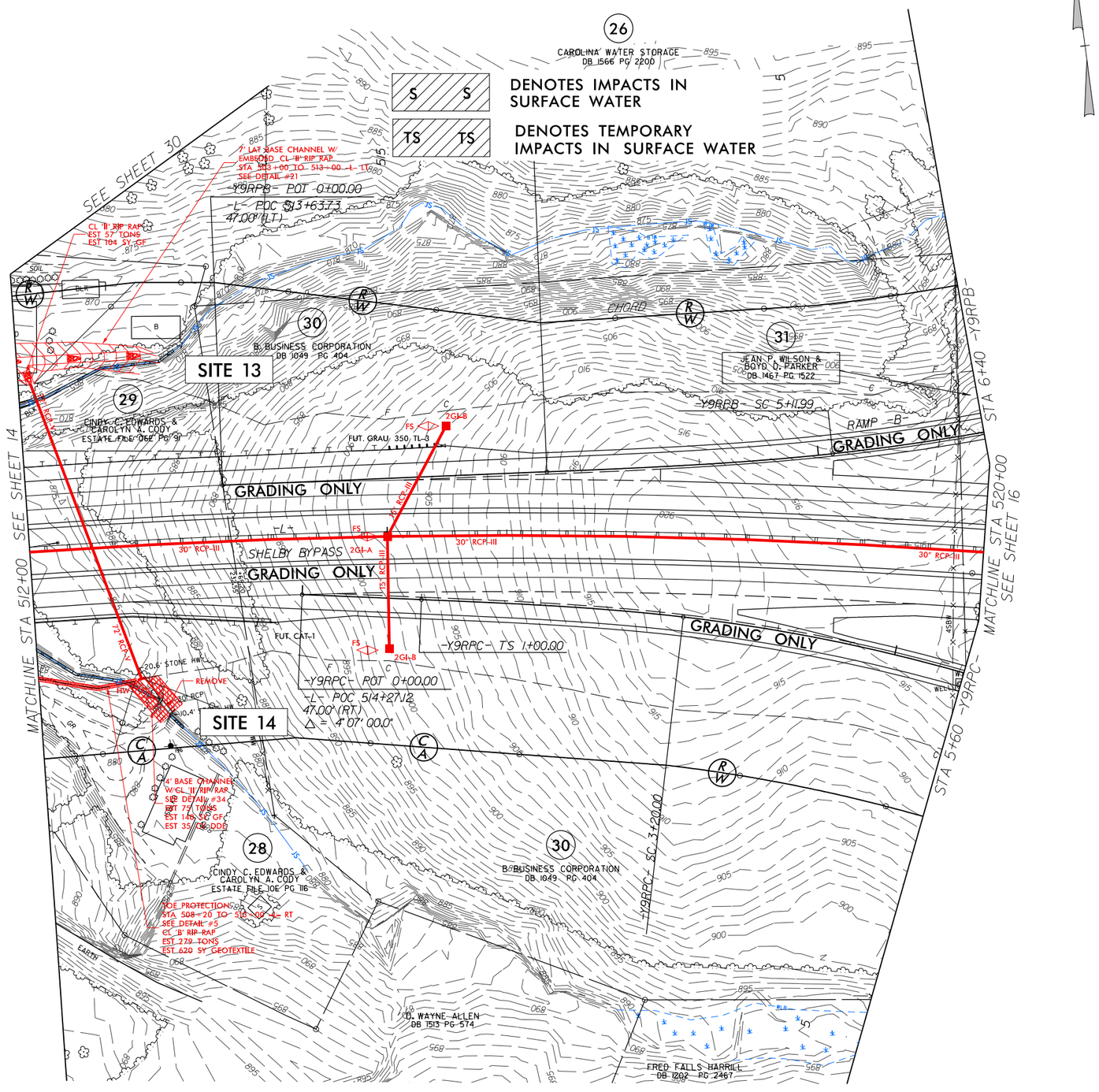
PROJECT REFERENCE NO.	SHEET NO.
R-2707C	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 38 OF 68



PROJECT REFERENCE NO.	SHEET NO.
R-2707C	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 39 OF 68



5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	15b
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 40 OF 68

300 200 100 0 100 200

915
910
905
900
895
890
885
880
875
870
865
860
855

512 + 50 –L–
72" RCP

SITE 14

EXTG NATURAL GROUND
AT PIPE CENTERLINE

EXTG 30" RCP

EXTG BED

INV IN
=869.4

72" RCP
SLOPE=2.75%

INV OUT
=862.1

11/30/2016
R2707C_hyd_prm_wet_psh_15b.dgn
jbarvau

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 41 OF 68

MATCHLINE STA 16+50 -Y9- SEE SHEET 31

ENLARGEMENT SEE SHEET 16f

ENLARGEMENT SEE SHEET 16e

SITE 15

SITE 16

SITE 17

ENLARGEMENT SEE SHEET 16g

MATCHLINE STA 30+00 -Y9- SEE SHEET 32

MATCHLINE STA 520+00 SEE SHEET 15

MATCHLINE STA 543+00 SEE SHEET 17

STA 9+60 -Y9RPC-

STA 6+85 -Y9RPA-

STA 4+05 -Y9RPD-

GRADING ONLY

FUTURE CONSTRUCTION

SHELBY BYPASS

CHORD

A

B

C

D

-Y9- POT 18+20.00
-Y9RPA- POT 21+25.98
-Y9RPB- POT 20+30.98

-Y9- POT 17+12.36
-Y9DET- POT 10+00.00

-Y9RPB- PT 18+26.82

-Y9RPB- SC 14+44.84

-Y9RPB- SRS 12+44.84

-Y9RPB- CS 10+04.84

-Y9RPA- PT 19+22.31

-Y9RPA- SC 16+46.93

-Y9RPA- SRS 14+46.93

-Y9RPA- CS 12+06.93

-Y9LPB- CS 11+38.76

-Y9LPB- ST 12+88.76
-Y9- POT 22+28.31
32.00' (RT)

-Y9LPB- ST 0+00.00
-L- POC 529+74.35
47.00' (LT)

-Y9LPB- SC 1+50.00

-L- POC 529+82.91
-Y9RPC- POT 11+34.51

-Y9RPC- SRS 11+75.06

-Y9RPC- CS 9+55.06

-Y9RPC- SC 13+75.06

-Y9RPC- PT 14+58.21

-L- POC 531+34.35
-Y9- POT 24+07.99
Δ = 96°0C 34.9"

-Y9- POT 28+45.00
-Y9RPC- POT 15+58.84
-Y9RPD- POT 19+61.05

-Y9RPD- SC 12+99.9

-Y9RPD- SRS 10+99.9

-Y9RPD- CS 8+59.8

-L- POC 537+48.37

-L- POC 555+48.37

-L- POC 555+48.37

-Y9RPA- PT 16+60.39

-Y9RPA- SC 18+60.39

-Y9RPA- SRS 20+60.39

-Y9RPA- CS 22+20.39

-Y9RPA- PT 23+20.39

-Y9RPA- SC 25+20.39

-Y9RPA- SRS 27+20.39

-Y9RPA- CS 29+20.39

-Y9RPA- PT 30+20.39

-Y9RPA- SC 32+20.39

-Y9RPA- SRS 34+20.39

-Y9RPA- CS 36+20.39

-Y9RPA- PT 37+20.39

-Y9RPA- SC 39+20.39

-Y9RPA- SRS 41+20.39

-Y9RPA- CS

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 42 OF 68

MATCHLINE STA 16+50 -Y9- SEE SHEET 31

ENLARGEMENT SEE SHEET 16f

ENLARGEMENT SEE SHEET 16e

SITE 15

SITE 16

SITE 17

ENLARGEMENT SEE SHEET 16g

MATCHLINE STA 5+50 -Y9RPC- SEE SHEET 15

MATCHLINE STA 30+00 -Y9- SEE SHEET 32

MATCHLINE STA 543+00 SEE SHEET 17

STA 5+60 -Y9RPC-

STA 4+05 -Y9RPD-

STA 4+65 -Y9RPA-

-Y9- POT 18+20.00
-Y9RPA- POT 21+25.98
-Y9RPB- POT 20+30.98
-Y9RPB- PT 18+26.82
-Y9- POT 11+12.36
-Y9DET- POT 10+00.00
-Y9RPB- SC 14+44.84
-Y9RPB- SRS 12+44.84
-Y9RPB- CS 10+04.84
-Y9RPA- PT 19+47.39
-Y9RPA- SC 16+46.93
-Y9RPA- SRS 14+46.93
-Y9RPA- CS 12+06.93
-Y9LPB- CS 11+38.76
-Y9LPB- ST 12+88.76
-Y9- POT 22+28.37
32.00 (RT)
-Y9LPB- ST 0+00.00
-L- POC 529+74.35
6.00 (LT)
-Y9LPB- SC 1+50.00
-L- POC 529+82.87
-Y9DET- POT 11+54.21
-Y9RPC- SC 9+50.00
-Y9RPC- CS 11+75.06
-Y9RPC- SC 13+75.06
-Y9RPC- PT 14+58.21
-L- POC 531+54.35
-Y9- POT 124+07.99
Δ = 9602'34.8"
-Y9RPD- PT 16+00.33
-Y9RPD- SC 11+99.93
-Y9RPD- SRC 10+99.93
-Y9RPD- CS 8+49.93

A

B

C

D

FUTURE CONSTRUCTION

SHELBY BYPASS

GRADING ONLY

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

FOR -Y9- DETOUR DETAILS SEE SHEETS 28-1 & 28-2
FOR INTERSECTION DETAILS SEE SHEETS 28-3 & 28-4
FOR DITCH DETAILS SEE SHEET 2D-1
FOR PFSH DETAILS SEE SHEET 2D-2
FOR -L- PROFILE SEE SHEET 50
FOR -Y9- PROFILE SEE SHEET 60
FOR -Y9RPA- PROFILE SEE SHEET 61
FOR -Y9RPB- PROFILE SEE SHEET 62
FOR -Y9RPC- PROFILE SEE SHEET 63
FOR -Y9RPD- PROFILE SEE SHEET 64
FOR -Y9LPB- PROFILE SEE SHEET 65

LOCATION:	INTERCHANGE AT -L- US 74 BYPASS AND -Y9- NC 18
TIP NO.: R-2707C	COUNTY: CLEVELAND
DESIGNED BY:	T. HUFFMAN
CHECKED BY: T. REID	DATE: 12/13/12

GRAPHIC SCALE
50 25 0 50 100
PLANS

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	16b
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 43 OF 68

SITE 17

200 100 0 100 200

538+58 –L–
66" RCP

7+07 –Y9RPD–
66" RCP

925
920
915
910
905
900
895
890
885
880
875
870
865

EXTG NATURAL GROUND
AT PIPE CENTERLINE

EXTG BED

EXTG 4'x4'
CULVERT

INV IN
=895.5

EXTG BED

66" RCP
SLOPE=3.1%

EXTG 48" CMP

INV OUT
=879.0

EXTG BED

11/30/2016
R2707C_hyd_prm_wet_psh_16b.dgn
jbarvau

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	16c
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 44 OF 68

SITE 16

200 100 0 100 200

16+50 –Y9RPA–
60" RCP

940 935 930 925 920 915 910 905 900 895 890 885 880

EXTG NATURAL GROUND
AT PIPE CENTELINE

EXTG BED

60" RCP
SLOPE = 2.22%

EXTG BED

11/30/2016
R2707C_hyd_prm_wet_psh_16c.dgn
jacveu

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2707C	X-734

PERMIT DRAWING
SHEET 45 OF 68

-Y9RPA-
17+50.00

935.66

0.080D 0.080D

4:1

2:1

S.S. 915.239

913.27

907.17

IMPACTS IN SURFACE WATER

17 + 50.00

SITE 16

-Y9RPA-
17+00.00

934.76

WETLAND

WETLAND

0.080D 0.080D

4:1

2:1

IMPACTS IN SURFACE WATER

FILL IN WETLAND

S.S. 910.529

909.62

17 + 00.00

-Y9RPA-
16+50.00

933.85

0.080D 0.080D

2:1

4:1

FILL IN WETLAND

IMPACTS IN SURFACE WATER

S.S. 908.090

909.04

909.25

16 + 50.00

–Y9RPA–

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	16e
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 46 OF 68

20 10 0 20 40
PLANS

REVISIONS 8/17/99

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

TEMPORARY IMPACTS IN SURFACE WATER

PERMANENT IMPACTS IN SURFACE WATER

TEMPORARY IMPACTS IN SURFACE WATER

CHORD

C A

2GI–B

15" RCP–III

FS

2GI–B

FS

15" RCP–II

18"

36" RCP–III

525

REMOVE

HW

JS

S

SITE 15 BLOW UP

36" CMP

INV=908.20'

32

TERRY R. PENDLETON
JERRY D. PENDLETON

DLETON
LETON

34

MAXINE LAIL NANNEY

35

ELIZABETH BULLMAN

GRADING ONLY

33

CONC

JERRY PENDLETON

RAIL

DK

ISFD

12/1/2016
R-2707C_Hyd_prm_wet_psh_16e_view-in.dgn
bslam

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	16f
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 47 OF 68

30 15 0 30 60
PLANS

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

F F DENOTES FILL IN WETLAND

TEMPORARY IMPACTS IN SURFACE WATER

PERMANENT IMPACTS IN SURFACE WATER

FILL IN WETLAND

SITE 16 BLOW UP

3' LAT BASE DITCH W/CL 'II' RIP RAP
STA 17+15 TO 19+50 –RAMP A– RT
SEE DETAIL #40
EST 249 TONS
EST 448 SY GEOTEXTILE
EST 400 CY DDE

3' BASE CHANNEL
W/CL 'II' RIP RAP
SEE DETAIL #16
EST 60 TONS
EST 111 SY GEOTEXTILE
EST 45 CY DDE

LAT V DITCH
STA 12+50 TO 17+10 –Y9RPA– RT
SEE DETAIL #11
EST 770 CY DDE

TOE PROTECTION
STA 15+40 TO STA 18+50 –Y9RPA– LT
SEE DETAIL #5
EST 186 TONS
EST 502 SY GEOTEXTILE

CL II RIP RAP BANK STABILIZATION
SEE DETAIL #35
EST 45 TONS
EST 83 SY GEOTEXTILE

3' BASE CHANNEL
W/CL 'II' RIP RAP
SEE DETAIL #16
EST 50 TONS
EST 93 SY GEOTEXTILE
EST 51 CY DDE

SPEC LAT V DITCH
STA 537+25 TO 542+74 –L– LT
SEE DETAIL #15

–Y9RPA– PT 19+22.31

–Y9RPA– SC 16+46.93

–Y9RPA– SRS 14+46.93

60" RCP-V

48" CMP

24" CONC

FUT. CAT-1

JERRY DALE COSTNER

NC DEPT OF TRANSPORTATION

ROXANNA B. CHAMPION

ISBK APT

ISFD

2SFD

533+48.37

535+48.37

540

REVISIONS 8/17/99

12/4/2016
R-2707C_Hyd_prm_wet_psh_16f_view-in.dgn
dglenn

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	16g
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 48 OF 68

30 15 0 30 60
PLANS

REVISIONS 8/17/99

3' BASE CHANNEL
W/CL 'II' RIP RAP
SEE DETAIL #16
EST 50 TONS
EST 93 SY GEOTEXTILE
EST 51 CY DDE

SPEC LAT V DITCH
STA 537+25 TO 542+74 –L– LT
SEE DETAIL #15

TEMPORARY IMPACTS IN SURACE WATER

REMOVE 4'x4' CONC ROCK CULV

-L- ST 535+48.37

BLOW UP
SITE 17

GRADING ONLY

PERMANENT IMPACTS IN SURFACE WATER

REMOVE

SPEC LAT V DITCH
STA. 535+00 TO 536+50 –L– RT
SEE DETAIL #15

STD BASE DITCH
W/CL 'B' RIP RAP
SEE DETAIL #3
EST 62 TONS
EST 167 SY GEOTEXTILE
EST 49 CY DDE

SPEC LAT V DITCH
STA 9+50 TO 11+50 –Y9RPD– RT
SEE DETAIL #15

54
NC DEPT OF TRANSPORTATION

PERMANENT IMPACTS IN SURFACE WATER

TEMPORARY IMPACTS IN SURACE WATER

-Y9RPD- CS 8+59.19

CL 'II' RIP RAP BANK STABILIZATION
SEE DETAIL #35
EST 45 TONS
EST 83 SY GEOTEXTILE

15" W/ELBOWS

CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

12/1/2016
R2707C_Hyd_prm_wet_psh_16g_view-in.dgn
ReLam

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 49 OF 68

56 BOBBY HULL

MARY J. IZOKOVIC

TONY WHISNANT

57 MATTHEW PAUL MALKMUS

58 NCDOT

59 DONNA LYNN LOVELACE

60 HENRY B. EDWARDS, JR. ESTATE
ESTATE FILE 10E PG 309
REF DB 1132 PG 827

61 MARVIN GLENN QUEEN

53 ROXANNA B. CHAMPION

55 FREIDA H. BURTON

-Y9RPA- SC 5+74.56

-Y9RPA- TS 3+34.56

-Y9RPA- POT 0+00.00
-L- POT 551+87.42
47.00' (LT)
Δ = 4° 07' 00.0"

-L- PC 554+11.59

-Y9RPD- SC 2+40.00

-Y9RPD- ST 0+00.00
-L- POT 547+05.16
47.00' (RT)

STA 8+85 -Y9RPA-

MATCHLINE STA 543+00
SEE SHEET 16

MATCHLINE STA 555+00 SEE SHEET 18

STA 4+05 -Y9RPD-

-L- SHELBY BYPASS

RAMP -A-

RAMP -D-

SR 1934 SOUTH OAK DR (S BST)

SR 1924 CARTER RD (T-BST)

S 25° 38' 18" E

LAT V DITCH W/CL 'B' RIP RAP
STA 6+00 TO 12+00 -Y9RPA- RT
SEE DETAIL #2
EST 181 TONS
EST 402 SY GEOTEXTILE
EST 310 CY DDE

CL 'I' RIP RAP
EST 20 TONS
EST 39 SY GEOTEXTILE

CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE

CL 'H' RIP RAP BANK STABILIZATION
W/FLOODPLAIN BENCH
SEE DETAIL #41
EST 110 TONS
EST 200 SY GEOTEXTILE

CL 'II' RIP RAP BANK STABILIZATION
SEE DETAIL #35
EST 65 TONS
EST 120 SY GEOTEXTILE

FILL EXISTING CHANNEL
WITH SUITABLE MATERIAL
EST 80 CY

5' BASE CHANNEL
W/CL 'II' RIP RAP
AND FLOODPLAIN BENCH
SEE DETAIL #31
EST. 110 TONS
EST. 200 SY GEOTEXTILE
EST. 130 CY DDE

5' BASE CHANNEL
W/CL 'II' RIP RAP
SEE DETAIL #39
EST 75 TONS
EST 140 SY GEOTEXTILE
EST 60 CY DDE

CL 'II' RIP RAP
BANK STABILIZATION
SEE DETAIL #35
EST. 60 TONS
EST. 110 SY GEOTEXTILE

CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE

1@9'x7' RCBC
W/SILLS AND BAFFLES

42" RCP-IV

15" RCP-IV

15" W/ELBOWS

66" RCP-CD

69" RCP-CD

2GI-B W/FG

2GI-B

FS

RETAIN

REMOVE

36" CMP

12" DIP

SITE 18

GRADING ONLY

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR DITCH DETAILS SEE SHEET 2D-1
FOR PFSH DETAILS SEE SHEET 2D-2
FOR -L- PROFILE SEE SHEET 51
FOR -Y9RPA- PROFILE SEE SHEET 61
FOR -Y9RPD- PROFILE SEE SHEET 64

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	17
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 50 OF 68

SITE 18

MATCHLINE STA 543+00 SEE SHEET 16

MATCHLINE STA 555+00 SEE SHEET 18

STA 8+85 -Y9RPA-

STA 4+05 -Y9RPD-

-Y9RPA- SC 5+74.56

-Y9RPA- TS 3+34.56

-Y9RPA- POT 0+00.00
-L- POT 551+87.42
47.00' (LT)
Δ = 4° 07' 00.0"

-L- PC 554+11.59

-Y9RPD- SC 2+40.00

-Y9RPD- ST 0+00.00
-L- POT 547+05.16
47.00' (RT)

-L-

SHELBY BYPASS

RAMP -A-

RAMP -D-

CHORD

GRADING ONLY

GRADING ONLY

GRADING ONLY

LAT V-DITCH W/CL 'B' RIP RAP
STA 6+00 TO 12+00 -Y9RPA- RT
SEE DETAIL #2
EST 181 TONS
EST 402 SY GEOTEXTILE
EST 310 CY DDE

CL 'A' RIP RAP BANK STABILIZATION
SEE DETAIL #35
EST 65 TONS
EST 120 SY GEOTEXTILE

CL 'A' RIP RAP BANK STABILIZATION
W/FLOODPLAIN BENCH
SEE DETAIL #33
EST 110 TONS
EST 200 SY GEOTEXTILE

FILL EXISTING CHANNEL
WITH SUITABLE MATERIAL
EST 80 CY

CL 'B' RIP RAP
EST 28 TONS
EST 39 SY GEOTEXTILE

CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE

CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE

CL 'A' RIP RAP
BANK STABILIZATION
SEE DETAIL #35
EST. 60 TONS
EST. 110 SY GEOTEXTILE

1@9'x7' RCBC
W/SILLS AND BAFFLES

5' BASE CHANNEL
W/CL 'B' RIP RAP
AND FLOODPLAIN BENCH
SEE DETAIL #31
EST. 110 TONS
EST. 200 SY GEOTEXTILE
EST. 130 CY DDE

5' BASE CHANNEL
W/CL 'B' RIP RAP
SEE DETAIL #39
EST 75 TONS
EST 140 SY GEOTEXTILE
EST 60 CY DDE

REMOVE

REMOVE

RETAIN

RETAIN

TES 36" CMP

36" CMP

42" RCP IV

15" RCP IV

15" RCP IV

66" RCP CD

15" W/ELBOWS

15" W/ELBOWS

2GI-B W/FG

2GI-B W/FG

2GI-B W/FG

2GI-B W/FG

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

53 ROXANNA B. CHAMPION

55 FREIDA H. BURTON

56 BOBBY HULL

56 BOBBY HULL

56 BOBBY HULL

57 MATTHEW PAUL MALKMUS

58 NCDOT

59 DONNA LYNN LOVELACE

60 HENRY B. EDWARDS, JR. ESTATE
ESTATE FILE 10E PG 309
REF DB 1132 PG 827

61 MARVIN GLENN QUEEN

MARY J. IZOKOVIC

TONY WHISNANT

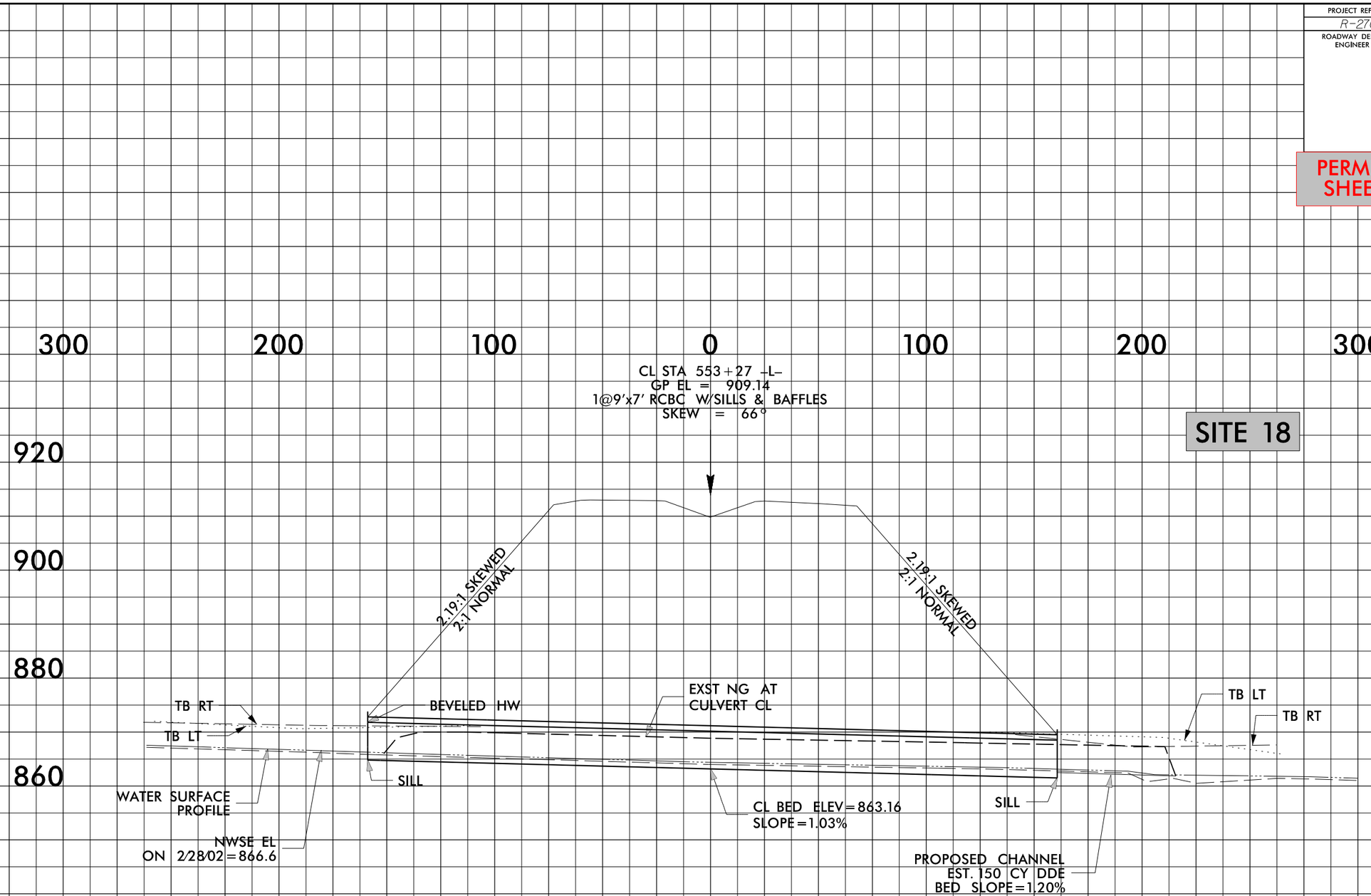
FOR DITCH DETAILS SEE SHEET 2D-1
FOR PFSH DETAILS SEE SHEET 2D-2
FOR -L- PROFILE SEE SHEET 51
FOR -Y9RPA- PROFILE SEE SHEET 61
FOR -Y9RPD- PROFILE SEE SHEET 64

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	17b
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 51 OF 68

SITE 18



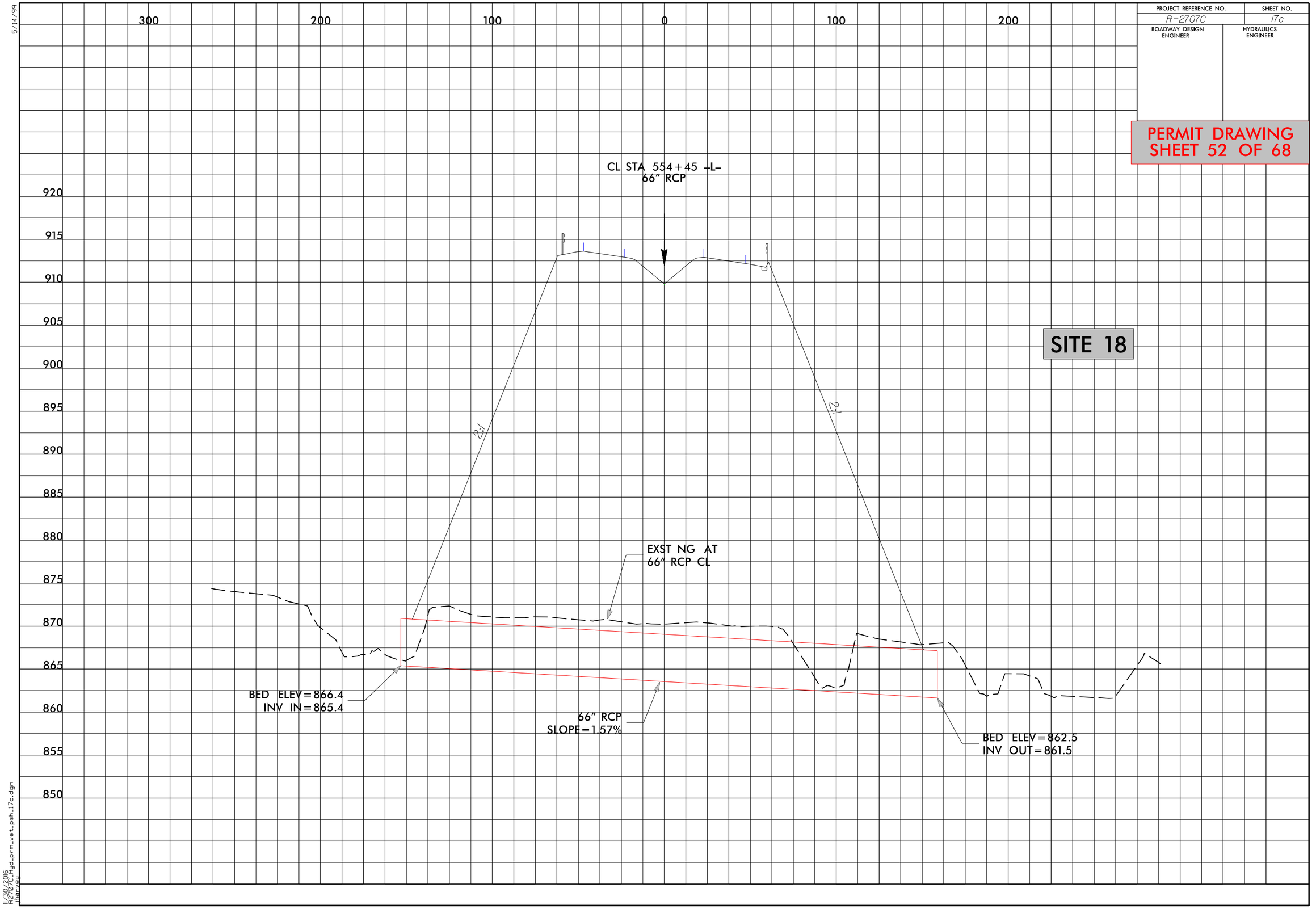
11/30/2016
R2707C_hyd_prm_wet_psh_17b.dgn
bacveu

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	17c
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 52 OF 68

SITE 18



1/30/2016
R-2707C_hyd_prm_wet_psh_17c.dgn
harvey

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 53 OF 68

REVISIONS

R/W REVISION 10-05-15 (ESM) - ADDED PARCEL 59.

59
DONNA LYNN LOVELACE

60
HENRY B. EDWARDS, JR. ESTATE

P P DENOTES IMPACTS IN SURFACE WATER (POND)

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SITE 19

TOE PROTECTION
STA 564+00 TO 567+70 -L- LT
SEE DETAIL #5
CL 'B' RIP RAP
EST 222 TONS
EST 493 SY GEOTEXTILE

FILL AREA TO ELEVATION 900.0

MATCHLINE STA 555+00 SEE SHEET 17

MATCHLINE STA 567+00 SEE SHEET 19

FUT. GRAU 350 TL-3

FUT. CAT-1

GRADING ONLY

-L-

SHELBY BYPASS

GRADING ONLY

2GI-B

15" RCP-IV

2-2GI-B W/FG

15" W/ELBOWS

CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE

FILL EXISTING CHANNEL WITH SUITABLE MATERIAL
EST 70 CY

2GI-B W/FG

15" W/ELBOWS

CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE

60" RCP-IV

JB w/MH

BREACH DAM 'P' & DRAIN POND

REMOVE

3' BASE CHANNEL
W/CL 'B' RIP RAP
SEE DETAIL #16
EST 110 TONS
EST 204 SY GEOTEXTILE
EST 400 CY DDE

TDE

61
MARVIN GLENN QUEEN

60
HENRY B. EDWARDS, JR. ESTATE

FOR DITCH DETAILS SEE SHEET 2D-1
FOR PFSH DETAILS SEE SHEET 2D-2
FOR -L- PROFILE SEE SHEET 51

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 54 OF 68

REVISIONS

R/W REVISION 10-05-15 (ESM) - ADDED PARCEL 59.

59
DONNA LYNN LOVELACE

60
HENRY B. EDWARDS, JR. ESTATE

P P DENOTES IMPACTS IN SURFACE WATER (POND)

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SITE 19

TOE PROTECTION
STA 564+00 TO 567+70 -L- LT
SEE DETAIL #5
CL 'B' RIP RAP
EST 222 TONS
EST 493 SY GEOTEXTILE

FILL AREA TO ELEVATION 900.0

*10000 -L- (LT)
PROP R/W (LT)

MATCHLINE STA 555+00 SEE SHEET 17

MATCHLINE STA 567+00 SEE SHEET 19

FUT. GRAU 350 TL-3

FUT. CAT-1

GRADING ONLY

-L-
SHELBY BYPASS

GRADING ONLY

2GI-B
15" RCP-IV
2GI-B W/FG
15" W/ELBOWS
CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE
FILL EXISTING CHANNEL WITH SUITABLE MATERIAL
EST 70 CY
2-2GI-B W/FG
ACMP-IV
60" RCP-IV
18" CMP
REMOVE
BREACH DAM & GRADE POND
3' RAP CHANNEL W/CL 'A' RIP RAP
SEE DETAIL #14
EST 110 TONS
EST 204 SY GEOTEXTILE
EST 300 CY DDE
TDE

61
MARVIN GLENN QUEEN

60
HENRY B. EDWARDS, JR. ESTATE

FOR DITCH DETAILS SEE SHEET 2D-1
FOR PFSH DETAILS SEE SHEET 2D-2
FOR -L- PROFILE SEE SHEET 51

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	18b
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 55 OF 68

SITE 19

200 100 0 100 200

566+29 –L–
60" RCP

935
930
925
920
915
910
905
900
895
890
885
880

EXTG NATURAL GROUND
AT PIPE CENTERLINE

JB W/MH
TOP=895.0
INV IN=887.6
INV OUT=884.0

INV IN
=898.5

60" RCP
SLOPE=2.66%

60" RCP
SLOPE=2.08%

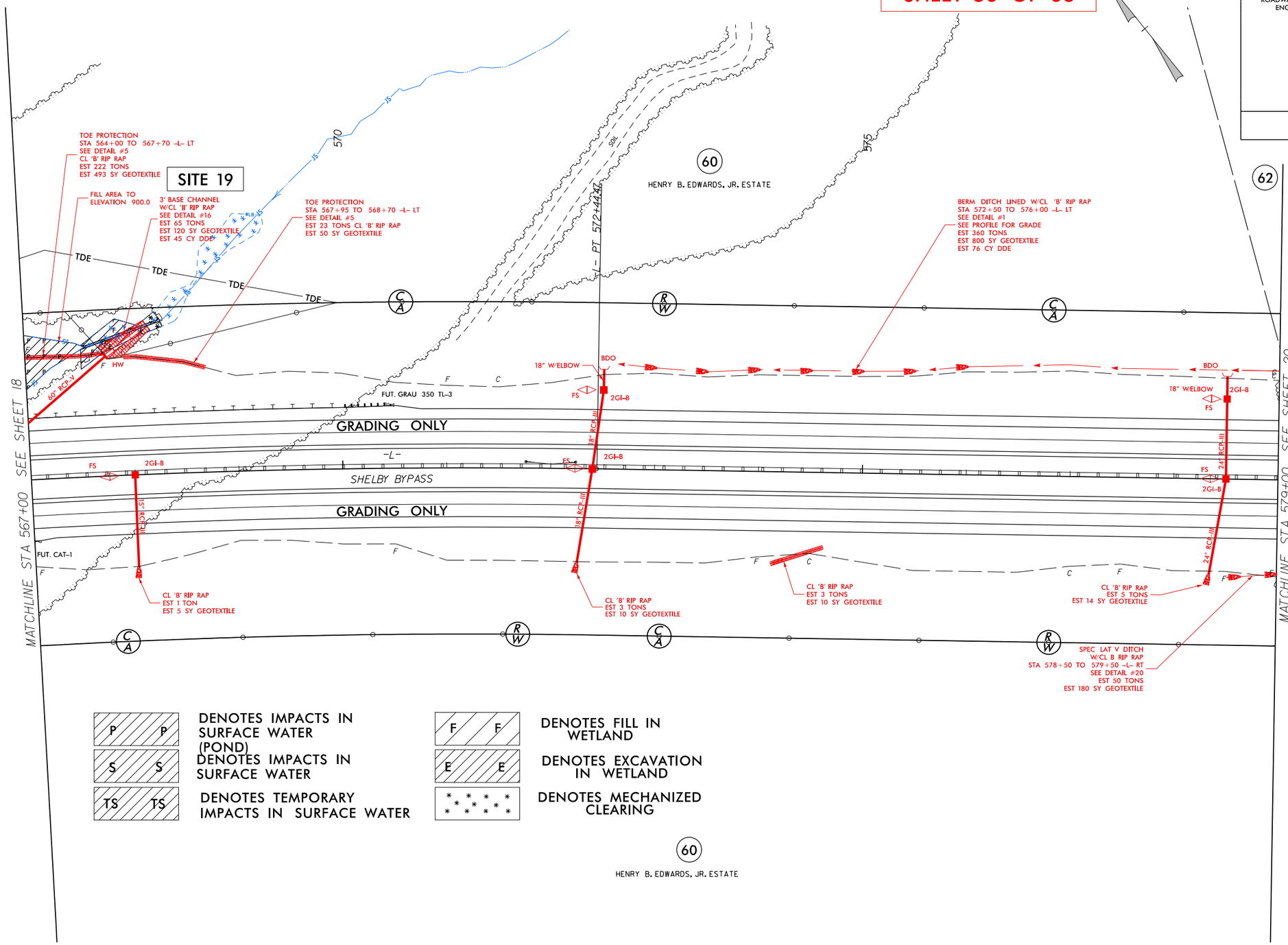
INV OUT
=883.5

EXTG BED

11/30/2016
R2707C_hyd_prm_wet_psh_18b.dgn
barvey

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 56 OF 68



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

60
HENRY B. EDWARDS, JR. ESTATE

FOR DITCH DETAILS SEE SHEET 2D-1
FOR PFSH DETAILS SEE SHEET 2D-2
FOR -L- PROFILE SEE SHEET 52

PERMIT DRAWING
SHEET 57 OF 68

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 19

TOE PROTECTION
STA 566+00 TO 567+70 -L- LT
SEE DETAIL #5
CL 'B' RIP RAP
EST 222 TONS
EST 493 SY GEOTEXTILE

FILL AREA TO ELEVATION 900.0

'S' BASE CHANNEL
W/CL 'B' RIP RAP
SEE DETAIL #16
EST 65 TONS
EST 120 SY GEOTEXTILE
EST 45 CY DDE

TOE PROTECTION
STA 567+85 TO 568+70 -L- LT
SEE DETAIL #5
EST 23 TONS CL 'B' RIP RAP
EST 50 SY GEOTEXTILE

BERM DITCH LINED W/CL 'B' RIP RAP
STA 572+50 TO 576+00 -L- LT
SEE DETAIL #15
SEE PROFILE FOR GRADE
EST 360 TONS
EST 800 SY GEOTEXTILE
EST 76 CY DDE

TDE

HW

30" RCP

FUT. GRAU 350 TL-3

18" W/ELBOW

BDO

2GI-B

FS

18" RCP III

24" RCP III

GRADING ONLY

-L-

SHELBY BYPASS

FUT. CAT-1

CL 'B' RIP RAP
EST 1 TON
EST 5 SY GEOTEXTILE

CL 'B' RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE

CL 'B' RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE

CL 'B' RIP RAP
EST 5 TONS
EST 14 SY GEOTEXTILE

SPEC LAT V DITCH
W/CL 'B' RIP RAP
STA 578+50 TO 579+50 -L- RT
SEE DETAIL #20
EST 50 TONS
EST 180 SY GEOTEXTILE

60 HENRY B. EDWARDS, JR. ESTATE

62

MATCHLINE STA 567+00 SEE SHEET 18

MATCHLINE STA 579+00 SEE SHEET 20

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

FOR DITCH DETAILS SEE SHEET 2D-1
FOR PFSH DETAILS SEE SHEET 2D-2
FOR -L- PROFILE SEE SHEET 52

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2707C	X-538

PERMIT DRAWING
SHEET 58 OF 68

7/2/99

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

960 950 940 930 920 910 900

930.04

0.080

6:1

5.946:1

930.04

0.080

6:1

2:1

D.P. 926.929

922.13

S.S. 907.783

S.S. 925.577

568+50.00

SITE 19

WETLAND BOUNDARY

WETLAND BOUNDARY

FILL IN WETLAND

IMPACTS IN SURFACE WATER

EXCAVATION

929.21

0.080

6:1

5.946:1

929.21

0.080

6:1

2:1

D.P. 926.101

918.08

S.S. 923.174

S.S. 903.329

568+00.00

960 950 940 930 920 910 900 890

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

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	34
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 59 OF 68

BEGIN CONSTRUCTION
-Y8A- POT 33+00.00

-Y8A- PC 33+30.33=
-Y8- POT 33+30.33

SITE 20
-Y8A- PT 35+58.07
-Y8-REV PC 31+07.23

-Y8-REV PT 34+55.55

-Y8-REV POT 36+00.00
END CONSTRUCTION

-Y8A- POT 36+08.71 =
-Y8-REV POC 31+50.00

-Y8-REV STA 27+00

MATCHLINE STA 27+00 -Y8-REV SEE SHEET 33

SR 1927 CARTER RD 18' BST

BOBBY HULL

89 BOBBY J. HULL

43 SAMUEL LAIL

88 JAMES W. & ELEANOR A. MORGAN

90 CHARLES R. & CATHERINE P. PRICE

MARVIN GLENN QUEEN

DAVID GLENN QUEEN

CHARLIE HARBISON

DEBRIS PILE

REMOVE 15SFG

SPEC LAT V DITCH
STA 32+00 TO 33+00 -Y8-REV LT
SEE DETAIL #15

SPEC LAT V DITCH
W/CL B RIP RAP
STA 33+00 TO 35+80 -Y8-REV LT
SEE DETAIL #20
EST 137 TONS
EST 506 SY GEOTEXTILE

4' BASE CHANNEL
W/CL 'II' RIP RAP
SEE DETAIL #34
EST 50 TONS
EST 93 SY GEOTEXTILE
EST 15 CY DDE

2' LAT BASE DITCH
W/CL 'B' RIP RAP
STA 28+00 TO 31+75 -Y8-REV RT
SEE DETAIL #7
EST 210 TONS
EST 569 SY GEOTEXTILE
EST 279 CY DDE

SPEC 2' LAT BASE DITCH
W/CL 'B' RIP RAP
STA 26+50 TO 28+00 -Y8-REV RT
SEE DETAIL #9

CL 'II' RIP RAP BANK STABILIZATION
SEE DETAIL #35
EST 50 TONS
EST 93 SY GEOTEXTILE

CL 'B' RIP RAP
EST 4 TON
EST 5 SY GEOTEXTILE

RETAIN

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR DICTH DETAILS SEE SHEET 2D-1
FOR PFSH DETAILS SEE SHEET 2D-2
FOR -Y8A- PROFILE SEE SHEET 58
FOR -Y8-REV PROFILE SEE SHEET 59

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	34
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 60 OF 68

BEGIN CONSTRUCTION
-Y8A- POT 33+00.00

-Y8A- PC 33+30.33=
-Y8- POT 33+30.33

SITE 20
-Y8A- PT 35+58.07
-Y8-REV PC 31+07.23

-Y8-REV

-Y8A- POT 36+08.71 =
-Y8-REV POC 31+50.00

-Y8-REV POT 36+00.00
END CONSTRUCTION

-Y8-REV POT 38+24.49

SEE SHEET 33 -Y8-REV STA 27+00

MATCHLINE STA 27+00 -Y8-REV

SR 1902 CARTER RD 18 BST

BOBBY HULL

BOBBY J. HULL

MARVIN GLENN QUEEN

DAVID GLENN QUEEN

SAMUEL LAIL

JAMES W. & ELEANOR A. MORGAN

CHARLES R. & CATHERINE P. PRICE

CHARLIE HARBISON

DEBRIS PILE

REMOVE

4' BASE CHANNEL
W/CL 'II' RIP RAP
SEE DETAIL #34
EST 50 TONS
EST 93 SY GEOTEXTILE
EST 15 CY DDE

SPEC LAT V DITCH
STA 32+00 TO 33+00 -Y8-REV LT
SEE DETAIL #15

SPEC LAT V DITCH
W/CL B' RIP RAP
STA 33+00 TO 35+80 -Y8-REV LT
SEE DETAIL #20
EST 137 TONS
EST 500 SY GEOTEXTILE

2' LAT BASE DITCH
W/CL 'B' RIP RAP
STA 28+00 TO 31+75 -Y8-REV RT
SEE DETAIL #7
EST 210 TONS
EST 569 SY GEOTEXTILE
EST 279 CY DDE

SPEC 2' LAT BASE DITCH
W/CL 'B' RIP RAP
STA 26+50 TO 28+00 -Y8-REV RT
SEE DETAIL #9

CL 'II' RIP RAP BANK STABILIZATION
SEE DETAIL #35
EST 50 TONS
EST 83 SY GEOTEXTILE

CL 'B' RIP RAP
EST 4 TON
EST 5 SY GEOTEXTILE

2 CL B WINGS

15" W-ELBOWS

66" RCP

GRAU 350 TL-3

RETAIN

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR DICTH DETAILS SEE SHEET 2D-1
FOR PFSH DETAILS SEE SHEET 2D-2
FOR -Y8A- PROFILE SEE SHEET 58
FOR -Y8-REV PROFILE SEE SHEET 59

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	34b
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 61 OF 68

150 100 50 0 50 100

30+88 –Y8REV–
66" RCP

SITE 20

885
880
875
870
865
860
855
850

EXTG NATURAL GROUND
AT PIPE CENTERLINE

EXTG BED

INV IN
=862.5

66" RCP
SLOPE=3.3%

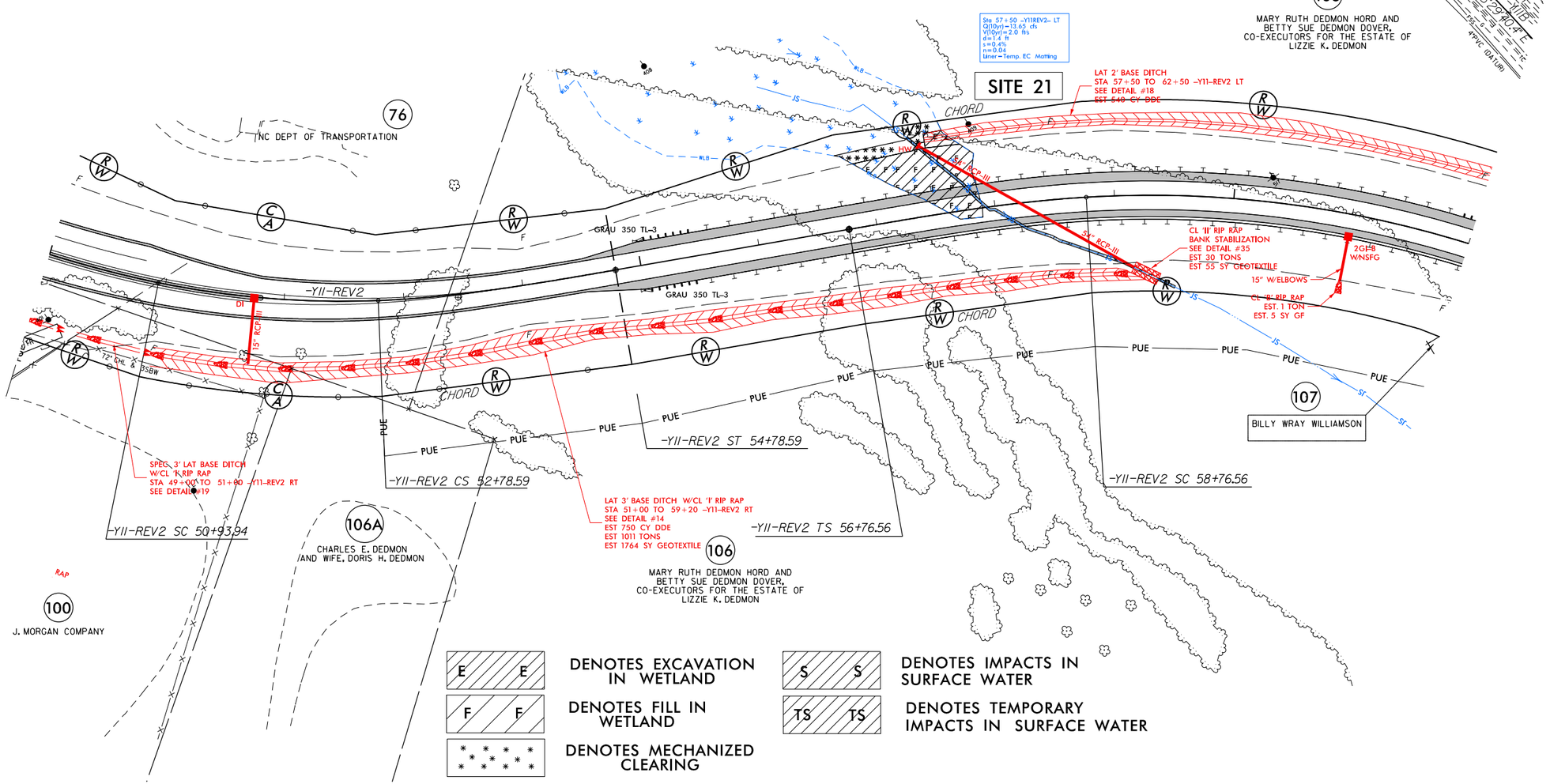
INV OUT
=859.2

EXTG BED

11/30/2016
R-2707C_hyd_prm_wet_psh_34b.dgn
barney

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	39
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

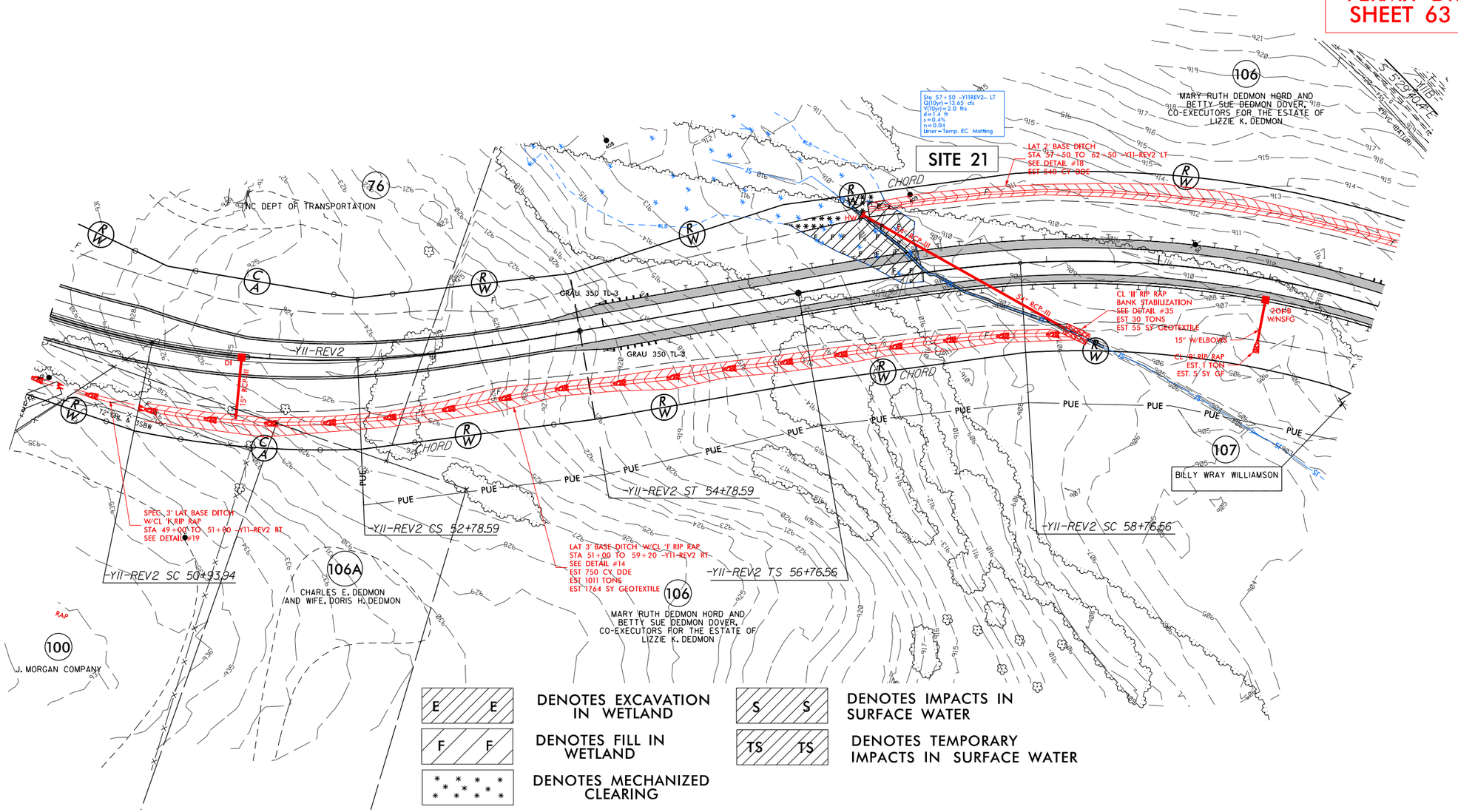
PERMIT DRAWING SHEET 62 OF 68



FOR -Y11-REV2 PROFILE SEE SHEETS 67

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	39
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 63 OF 68



FOR -Y11-REV2 PROFILE SEE SHEETS 67

8/23/99

7/2/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2707C	X-776

PERMIT DRAWING
SHEET 64 OF 68

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

930
920
910

0.049 0.049

2:1 2:1

S.S.910.41

908.35

S.S.909.72

57+99.999983

WETLAND BOUNDARY

WETLAND BOUNDARY

SITE 21

930
920
910

0.029 0.029

FILL IN WETLAND
EXCAVATION
IMPACT IN SURFACE WATER
FILL IN WETLAND

2:1 2:1

S.S.909.49

910.48

S.S.910.71

57+49.999973

930
920
910

0.009 0.020

2:1 2:1

S.S.910.56

911.09

S.S.912.64

56+99.999968

930
920
910

0.011 0.020

2:1 2:1

S.S.911.65

912.70

S.S.913.72

56+49.999968

-Y11-REV2

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

11/30/2016
R2707C_hyd_prm_wet_psh_39b.dgn
jharvey

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	41
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 65 OF 68

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SITE 22

-Y16-REV PC 16+23.48

-Y16-REV PT 16+39.39

-Y16-REV POC 12+45.99 = -Y16A- POT 15+14.26

-Y16-REV PC 12+25.43

BEGIN CONSTRUCTION -Y16A- STA 13+75.00

BEGIN CONSTRUCTION -Y16-REV STA 10+00.00

-Y16-REV STA 17+00

SEE SHEET 36

91 SARA WHITE GARDNER 15

112 BARBARA HARRIS DB 17B PG 113 PB 12 PG 58

113 ESTATE OF SHARON G. WHISNANT

114 RUSSEL A. BRITT DB 1541 PG 708 PB 12 PG 58

115 CHERYL D. BERMAN DB 1456 PG 1356 PB 12 PG 58

116 MARGARET D DURHAM MELVIN D DURHAM

117 TRACY L. RANDALL

118 EUGENE TALLENT

119 GILBERT KEITH RANDALL

REBECCA M. SMITH

J. R. PARKER

DONALD E. THOMPSON

THOMAS ERIC CLONINGER

MARY CRAWLEY HARTSELL

TANJA P. FITZGERALD

SHERRI FORTENBERRY

REBECCA M. TRAMMELL

LAURA L. DAVIS

AGNES BAILES

DO NOT DISTURB WELL

CL 'II' RIP RAP BANK STABILIZATION SEE DETAIL #36 EST 40 TONS EST 74 SY GEOTEXTILE

LAT 3' BASE DITCH W/CL 'II' RIP RAP STA 13+00 TO 14+50 -Y16-REV RT SEE DETAIL #40 EST 135 CY DDE EST 117 TONS EST 210 SY GEOTEXTILE

TOE PROTECTION STA 14+00 TO 14+85 -Y16-REV LT EST 45 TONS EST 125 SY GF SEE DETAIL #5

CL 'I' RIP RAP EST 2 TON EST 6 SY GF

CL 'II' RIP RAP BANK STABILIZATION SEE DETAIL #36 EST 40 TONS EST 74 SY GEOTEXTILE

SPEC LAT 'V' DITCH STA 14+00 TO 14+80 -Y16A- RT SEE DETAIL #15

FOR -Y16-REV PROFILE SEE SHEET 75

FOR -Y16A- PROFILE SEE SHEET 75

REVISIONS

R/W REVISION 9-2-15 (RCP) - PARCEL 116 - CHANGED PROPERTY OWNER NAME INFORMATION.
R/W REVISION 10-05-15 (ESM) - PARCEL 113 - CHANGED PROPERTY OWNER NAME INFORMATION.
R/W REVISION 10-15-15 (ESM) - PARCEL 117 - ADDED "DO NOT DISTURB WELL" TO PARCEL

PROJECT REFERENCE NO.	SHEET NO.
R-2707C	41
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 66 OF 68

REVISIONS

R/W REVISION 9-2-15 (PCP) - PARCEL 116 - CHANGED PROPERTY OWNER NAME INFORMATION.
R/W REVISION 10-05-15 (ESM) - PARCEL 113 - CHANGED PROPERTY OWNER NAME INFORMATION.
R/W REVISION 10-15-15 (ESM) - PARCEL 117 - ADDED "DO NOT DISTURB WELL" TO PARCEL

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SITE 22

-Y16-REV PC 16+23.48

-Y16-REV PC 12+45.99 =
-Y16A- POT 15+14.26

-Y16-REV PC 12+25.43

-Y16-REV PT 16+39.39

BEGIN CONSTRUCTION -Y16A- STA 13+75.00

BEGIN CONSTRUCTION -Y16-REV STA 10+00.00

SEE SHEET 36 -Y16-REV

114 RUSSEL A. BRITT DB 1541 PG 708 PB 12 PG 58

115 CHERYL D. BERMAN DB 1456 PG 1356 PB 12 PG 58

91 SARA WHITE GARDNER DB 130 PG 766

112 BARBARA HARRIS DB 17B PG 113 PB 12 PG 58

113 ESTATE OF SHARON G. WHISNANT

116 MARGARET D. DURHAM MELVIN D. DURHAM

117 TRACY L. RANDALL

118 EUGENE TALLENT

119 GILBERT KEITH RANDALL

SHERRI FORTENBERRY

REBECCA M. TRAMMELL

LAURA T. DAVIS

AGNES BAILES

REBECCA M. SMITH

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THOMAS ERIC CLONINGER

MARY CRAWLEY HARTSELL

TANJA P. FITZGERALD

CL II RIP RAP BANK STABILIZATION SEE DETAIL #86 EST 140 TONS EST 74 SY GEOTEXTILE

SPEC LAT 'V' DITCH STA 13+90 TO 14+80 -Y16A- RT SEE DETAIL #40 EST 135 CY DDE EST 117 TONS EST 210 SY GEOTEXTILE

SPEC LAT 'V' DITCH STA 14+00 TO 14+85 -Y16-REV LT EST 45 TONS EST 22 CY DDE SEE DETAIL #5

CL II RIP RAP EST 2 TONS EST 4 SY IGF

CL II RIP RAP BANK STABILIZATION SEE DETAIL #86 EST 40 TONS EST 19 SY GEOTEXTILE

SPEC LAT 'V' DITCH STA 14+80 TO 14+85 -Y16A- RT SEE DETAIL #5

REMOVE

FOR -Y16-REV PROFILE SEE SHEET 75
FOR -Y16A- PROFILE SEE SHEET 75

WETLAND PERMIT IMPACT 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	384+50 -L-	BRIDGE							0.05		30	
		BANK STABILIZATION						< 0.01		19		
2	405+99 -L-	66" RCP						0.04	< 0.01	358	60	
		BANK STABILIZATION						< 0.01		22		
3	414+88 -L-	36" RCP						0.02	< 0.01	322	30	
		BANK STABILIZATION						< 0.01		39		
4	425+38-426+75 -L-	72" RCP						0.04	< 0.01	340	31	
		BANK STABILIZATION						0.01		55		
5	438+67 - 439+29 -L- LT	66" RCP	0.02					0.02	< 0.01	163	16	
		BANK STABILIZATION						< 0.01		25		
6	438+70 -L- RT	DRAIN POND	0.19									
7	453+03 -L-	1@8'x8' RCBC						0.10	< 0.01	498	26	
		BANK STABILIZATION						0.01		50		
8	475+69 - 477+08 -L-	48" RCP	< 0.01					0.01	< 0.01	245	31	
		BANK STABILIZATION						< 0.01		33		
9	489+60 -L- LT	ROAD FILL						< 0.01		163		
10	490+88 -L-	66" RCP						0.05	< 0.01	328	26	
		BANK STABILIZATION						< 0.01		44		
11	495+03 - 491+14 -L-	54" RCP						0.02	< 0.01	294	18	
12	503+77 -L- RT	DRAIN WETLAND / 54" RCP	0.14					< 0.01		161		
13	502+82 - 513+25 -L- LT	ROAD FILL						0.14	< 0.01	1274	22	
SUBTOTALS*:			0.36					0.50	0.08	4433	290	

*Rounded totals are sum of actual impacts

NOTES:
SITE 6: Total Take Pond = 0.99 Acre Impacts in Surface Waters
SITE 8: Total Take Wetland

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WETLAND PERMIT IMPACT 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	510+98 - 513+02 -L-	ROAD FILL						0.02	< 0.01	384	15	
15	11+01 -Y9RPB-	36" RCP						< 0.01	< 0.01	176	32	
		BANK STABILIZATION						< 0.01		17		
16	15+19 - 17+97 -Y9RPA-	60" RCP	0.45					0.02	< 0.01	453	86	
		BANK STABILIZATION						< 0.01		20		
17	536+93 - 541+15 -L-	66" RCP						0.03	< 0.01	533	38	
		BANK STABILIZATION						< 0.01		35		
18	554+00-L-	1@9'x7' RCBC + 66" RCP						0.11	< 0.01	695	25	
		9'x7' RCBC BANK STABILIZATION						< 0.01		39		
		66" RCP BANK STABILIZATION						< 0.01		30		
		9'X7' RCBC CHANNEL IMPROVEMENT						< 0.01		52		
19	563+95 - 568+18-L-	60" RCP/DRAIN POND	0.02		< 0.01	< 0.01		< 0.01	< 0.01	64	29	
20	29+65 - 32+04 -Y8REV-	66" RCP						0.02	< 0.01	235	31	
		BANK STABILIZATION						< 0.01		27		
21	56+75 - 59+37 -Y11REV2-	54" RCP	0.08		< 0.01	0.02		< 0.01	< 0.01	211	27	
		BANK STABILIZATION						< 0.01		23		
22	14+10 - 15+00 -Y16REV-	54" RCP						0.02	< 0.01	177	25	
		BANK STABILIZATION						< 0.01		40		
SUBTOTALS FROM PAGE 1*:			0.36					0.50	0.08	4433	290	
SUBTOTALS FROM PAGE 2*:			0.55		0.01	0.02		0.25	0.02	3211	308	
TOTALS*:			0.91		0.01	0.02		0.75	0.10	7644	598	

*Rounded totals are sum of actual impacts

NOTES:
SITE 16: Total Take Wetland
SITE 19: Total Take Pond = 1.43 Acre Impacts in Surface Waters

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