Transportation

PAT McCRORY
Governor

NICHOLAS J. TENNYSON
Secretary

March 24, 2016

Raleigh Regulatory Field Office
US Army Corps of Engineers
3331 Heritage Trade Drive, Suite 105
Wake Forest, North Carolina 27587

ATTN: Mr. Andy Williams
NCDOT Project Manager

Subject: **Application for US Army Corps of Engineers Clean Water Act (CWA) Section 404 Individual Permit and Section 401 Water Quality Certification** for the proposed R-2536 Asheboro Southern Bypass and Zoo Connector. Debit $570 from WBS Element 34450.3.S1

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to construct an approximately 16.4 mile bypass (US 64 Bypass/R-2536) around Asheboro, NC, which includes improvements to the US 64 corridor in Asheboro and upgraded access to the North Carolina Zoological Park (Zoo). The Bypass is a 14.6 mile, four-lane, divided limited access facility with no driveway access; the Zoo Connector is a 1.8 mile, two-lane parkway. The project also includes interchanges, utility relocations, approximately 4.35 miles of service roads, and additional related improvements (e.g., stormwater management, mitigation implementation, building relocation/demolition, etc.).

The purpose of this letter is to request approval for a Clean Water Act (CWA) Section 404 Individual Permit and a Section 401 Water Quality Certification (WQC) for R-2536, based on final design impacts for the Asheboro Bypass and Zoo Connector, and related improvements. All Waters of the US (WOUS) in the study area are non-tidal and not navigable, therefore, Section 10 of the Rivers and Harbors Act is not applicable. In addition to the cover letter and ENG Form 4345, this application package includes the following: Minutes from the interagency hydraulic design review meetings (4B) and interagency permit impacts meetings (4C) (Appendix 5), stormwater management plan (SWP), permit drawings, half-size roadway plans (Appendix 3), United States Fish and Wildlife Service (USFWS) Section 7 concurrence (Appendix 4), and North Carolina Division of Mitigation Services (NCDMS) mitigation acceptance letter (Appendix 1). A discussion of protected species, including the Schweinitz's sunflower, Cape Fear shiner, and Northern long-eared bat, as well as cultural resources, are discussed in Sections 8 and 9, respectfully.

1.0 Purpose and Need

The purpose of this project is to improve flow and enhance mobility of regional traffic on US 64 by providing an alternative "free flowing" limited access route around Asheboro. The separation of local and regional traffic will reduce congestion and thereby increase safety on US 64, enhance high speed regional travel, and improve currently limited access to the Zoo. The project will address the following existing and anticipated conditions: Traffic congestion and above average accident rates on US 64, land use conditions, and congestion/backups on NC 159. The project is an essential component (Asheboro Bypass) for NCDOT's plan to upgrade the US 64 Intrastate corridor in central North Carolina from Statesville to Raleigh and the NC 49 corridor from Charlotte to Raleigh. The proposed Zoo Connector will address Zoo-related traffic and safety issues along NC 159 by diverting approximately 30 percent of traffic without requiring widening and reconstruction of the roadway or resulting residential displacement.

Economic benefits are expected due to improved access to commercial areas and the Zoo.

2.0 Project Description

The proposed action will improve the US 64 corridor in the Asheboro area and provide better access to the Zoo, located southeast of the project area in Randolph County. There are six proposed interchanges along the US 64 Bypass: existing US 64 west of Asheboro, NC 49, US 220 Bypass (future I-73/74), Zoo Connector, NC 42, and existing US 64 east of Asheboro. Special aesthetic design features for the bridge and surrounding landscape will enhance the entrance to the Zoo. Design modifications include the expansion of service roads and related utilities.

3.0 Summary of Impacts

Waters of the US (wetlands, streams, ponds): Proposed impacts to jurisdictional areas are based on preliminary design totals of 8.66 acres (ac) of wetland impacts of which 6.44 ac are permanent impacts requiring mitigation (5.35 ac permanent fill, 0.25 ac excavation, 0.84 ac mechanized clearing, 2.19 ac temporary, and 0.03 ac hand clearing); 31,992 linear feet (lf) of permanent stream impacts, 2,841 lf of temporary stream impacts, and 10.54 ac of pond impacts. Table 1 summarizes impacts to jurisdictional waters (wetlands, streams, ponds) based on the proposed design. Impact numbers are identified for each impact location and summarized in Appendix 2. Impacts are also noted on the permit drawings (Appendix 3).

Table 1. Summary of Wetland, Stream, and Pond Impacts for R-2536

Section	River Basin	HUC Unit	Permanent Wetland (ac)	Temporary Wetland (ac)	Permanent Stream (lf)	Temporary Stream (lf)	Pond (ac)
			Riparian	Riparian			
1	Yadkin	03040103	1.24		11,650	490	1.11
2	Yadkin	03040104	2.21	0.18	5,453	212	0.73
	Cape Fear	03030003	1.87		8,137	519	6.01
3	Cape Fear	03030003	1.11	2.04*	6,752	1,620	2.69
TOTAL			**6.44**	**2.22***	**31,992**	**2,841**	**10.54**

Note: Totals may be slightly different due to rounding of section numbers
***Temporary impact includes 0.03 acre of hand clearing in Section 3.**

4.0 Summary of Mitigation

All unavoidable impacts to 6.44 ac of jurisdictional riparian wetlands will be offset by compensatory mitigation provided by the NCDMS. Unavoidable impacts to 31,992 lf of jurisdictional streams will be provided by NCDMS in addition to on-site relocations determined by NCDOT.

Tables 2A/B and C contain summary information for compensatory wetland and stream mitigation, respectfully.

There is the potential for on-site mitigation to be completed on Squirrel Creek on the Jarrell Investments Property (Squirrel Creek Mitigation Site) in Section 3 of the project. Should this site become available and feasible, NCDOT would like to reserve the potential to use this site for on-site mitigation to substitute for an appropriate portion of the mitigation to be provided by NCDMS. NCDOT will request a modification to the permit should the Squirrel Creek Mitigation Site be available for compensation.

Table 2A. Summary of NCDMS Committed Riparian Wetland Mitigation for R-2536

Section	River Basin/HUC	Ratio of Riparian Wetland Mitigation (ac)	Source
		Restoration 2:1*	
Section 1	Yadkin 03040103	2.48	NCDMS
Section 2	Yadkin 03040104	4.42	NCDMS
	Cape Fear 03030003	3.74	NCDMS
Section 3	Cape Fear 03030003	2.22	NCDMS
TOTAL		**12.88**	NCDMS

** Total based on Permanent Fill, Mechanized Clearing, and Excavation.*

Table 2B. Summary of NCDMS Committed Stream Mitigation for R-2536

Section	River Basin/HUC	Ratio of Stream Mitigation Applied (lf)		Total Restoration Proposed (lf)	Source
		Restoration *			
		(1:1)	(2:1)		
Section 1	Yadkin 03040103	258	22,784	23,042	NCDMS
Section 2	Yadkin 03040104	330	10,246	10,576	NCDMS
	Cape Fear 03030003	1,023	14,228	15,251	NCDMS
Section 3	Cape Fear 03030003	1,110	11,284	12,394	NCDMS
TOTAL		**2,721**	**58,542**	**61,263**	**NCDMS**

** Ratio assignments based on NCDOT/USACE field determinations*.

Based on site evaluations with the USACE, the compensatory mitigation for the streams noted in Table 2C will be at a 1:1 ratio.

Table 2C. Streams with 1:1 Ratio for Mitigation

Section	Stream Name	Site Number	Mitigation Ratio	Impact Length (lf)
1	SM-AA	5	1:1	258
2	SBB-B	31	1:1	330
2	SCC-B	32	1:1	148
2	SS-B	44	1:1	231
2	ST-B	45a	1:1	202
2	SH-D	52	1:1	442
3	SI-C/SYY-C	64	1:1	461
3	SV-C	82	1:1	649
TOTAL			**1:1**	**2,721**

5.0 Project Schedule

Construction is scheduled to begin August 2016 with anticipated completion within three years.

6.0 NEPA Document Status

The Federal Highway Administration (FHWA) and NCDOT completed the Draft Environmental Impact Statement (DEIS) in July 2002 in compliance with NEPA guidelines (NCDOT, 2002). The DEIS was approved and circulated to federal, state, and local agencies. An Abbreviated Final Environmental Impact Statement (FEIS) was completed in March 2007 and a Record of Decision (ROD) in December 2007. A re-evaluation of the FEIS was completed in April 2015. Since completion of the FEIS, final design changes necessitated work outside the right-of-way (ROW). Additional documentation was prepared and NEPA construction consultation completed (January 2016). Additional NEPA construction consultation documentation is currently being prepared for

additional service roads/driveways not originally considered in the project scope. Consultation concurrence is anticipated to be provided in April 2016. Copies of the project documents have been provided to regulatory review agencies involved in the approval process with additional copies available upon request.

Concurrence Point (CP) 4A of the merger process was completed on May 25, 2006. CP 4B meetings were held October 21, 2015, November 12, 2015, and December 16, 2015 with field meetings completed November 16, 2015. CP 4C, with final design changes, were completed on December 16, 2015 and January 14, 2016, respectfully. An additional CP 4B/4C meeting was conducted on March 10, 2016, specifically to review modifications made in February/March 2016 to the project regarding service roads. These modifications included new service roads, re-design of service roads, and the "re-inclusion" of service roads that were part of initial consultation but had been removed from the project at an earlier stage.

6.1 Public Coordination

An additional public meeting was held February 23, 2016 to discuss updates to the project including changes in service roads and east and west end interchanges. A small group meeting was held with public on February 2, 2016 regarding the east end of the alignment due to project expansion and design changes. On-going coordination with affected property owners to address service road relocations and design changes that have occurred since the public hearing are on-going and planned to continue until design is complete/final.

6.2 Independent Utility

R-2536 is in compliance with 23 CFR Part 771.111(f) – Early Coordination, Public Involvement, and Project Development to ensure evaluation of alternatives and avoidance of commitments to improvements not fully evaluated. Each action shall:

- Connect logical termini and be of sufficient length to address environmental matters on a broad scope.
- Have independent utility or significance (i.e., usable and reasonable expenditure of funds, even if no additional transportation improvements are made in the area).
- Fully consider alternatives for other reasonably foreseeable transportation improvements.

7.0 Resource Status

The project is located in the Cape Fear and Yadkin River Basins and lies within Hydrologic Unit Codes (HUCs) 03030003, 03040103, and 03040104 in the Central Piedmont ecoregion (NCDENR, 2014). The project is divided into three sections (Sections 1 (A, B), 2, and 3(A, B)) with 93 streams and 15 ponds in the project area (NCDOT, 2012). The project crosses Cable Creek, Taylors Creek, Little River, North Prong Richland Creek, South Prong Richland Creek, Tantraugh Branch, Vestal Creek, Squirrel Creek, Gabriels Creek, and multiple unnamed tributaries (UT) to the named streams.

7.1 Wetland Delineations

Wetlands were delineated in 1999 as part of the DEIS and reevaluated in 2012 and 2014 due to a shift in the study area. Work was conducted in accordance with the NCDOT Natural Environment

Section (NES) standard operating procedures (SOPs), the US Army Corps of Engineers (USACE) Wetland Delineation Manual (1987), and preliminary designs intended to avoid and/or minimize wetlands to the maximum extent possible. Design changes necessitated new ROW post USACE approval of Waters of the US as noted above. Wetlands in these new areas (service roads, east and west interchanges, and pond dewatering areas) were evaluated in November/December 2015 and February 2016 by NCDOT and RK&K scientists. Five Service Roads and a couple driveways were added to the project in February/March 2016 by NCDOT and RK&K scientists completed wetlands/waters delineation in these locations February 25, 26, 29, and March 15, 2016. NCDOT is preparing a request for a Preliminary Jurisdictional Determination (PJD) for all new areas in the corridor not part of initial study area/Jurisdictional Determination. The PJD is being submitted concurrently with the Individual Permit application for the project.

The project is expected to permanently impact a total of 6.44 ac (5.35 fill, 0.25 excavation, and 0.84 mechanized clearing) of jurisdictional wetlands (RK&K, 2016). Jurisdictional wetlands are associated with streams and tributaries along Squirrel Creek, Tantraugh Branch, Little River, and several other smaller areas within the corridors. There are no wetlands along the alignment that carry any special designation. Wetlands were flagged in the field for future reference. The initial project delineation was field verified by Ronnie Smith (USACE Wilmington District) and David Wainwright (North Carolina Division of Water Resources (NCDWR)) on January 10, 11 and February 7, 2012. Due to updates in the alignment and expansion to areas outside the original corridor, Liz Hair (USACE) and David Wainwright (NCDWR) conducted a field review of new locations on February 6, 2014. Areas under the original Jurisdictional Determination were field verified by Andy Williams (USACE) and David Wanucha (NCDWR) on November 16, 2015. All approved limits of jurisdictional waters/wetlands are shown on the permit drawings and construction plans and used in calculating impacts as summarized in the tables included in this application.

The USACE assigned Jurisdictional Determination Action ID No. SAW-2002-01260: Notification of Jurisdictional Determination (JD) was issued on September 12, 2014. NCDOT has requested a Preliminary Jurisdictional Determination (PJD) for all new ROW areas not originally included in the 2014 JD. A PJD application is being made concurrently with this permit application for all new areas not included in the original JD.

7.2 Stream Delineations

In 2014, a total of 73,704 lf of streams were identified in the project study area based on United States Geological Survey (USGS) geographic information system (GIS) spatial data (AECOM, 2014). For mitigation purposes, streams have been designated as warm water. Stream delineations were field verified by Ronnie Smith (USACE Wilmington District) and David Wainwright (NCDWR) on January 10, 11 and February 7, 2012. The new areas were delineated by Liz Hair (USACE) and David Wainwright (NCDWR) on February 6, 2014. Questionable areas under the original Jurisdictional Determination were field verified by Andy Williams (USACE) and David Wanucha (NCDWR) on November 16, 2015. All approved limits of jurisdictional waters/wetlands are shown on the permit drawings and construction plans and used in calculating impacts as summarized in the tables included in this application.

The USACE assigned Jurisdictional Determination Action ID No. SAW-2002-01260: Notification of Jurisdictional Determination (JD) was issued on September 12, 2014. NCDOT has requested a Preliminary Jurisdictional Determination (PJD) for all new ROW areas not originally included in the 2014 JD including pond dewatering locations, new service roads/driveways, and re-design at

interchange locations. A PJD application is being made concurrently with this permit application for all new areas not included in the original JD.

7.3 Characterization of Jurisdictional Sites

7.3.1 Wetlands

Sixty-six jurisdictional wetlands sites were initially identified within the project corridor (NCDOT, 2012). After design revisions (avoidance/minimization and expansion of the corridor ROW), there are 56 jurisdictional wetlands sites of which 46 will be permanently impacted (of which 29 are total takes) by the proposed project. Wetland systems throughout the study area vary in vegetative composition depending on hydrological regime and site-specific disturbances. The project area contains the following wetland types: Headwater forest, seep, basin wetland, bottomland hardwood forest, and non-tidal freshwater marsh.

7.3.2 Streams

The project study area is included in two sub-basins: Sub-basin 03-04-01 includes Cable Creek, Taylors Creek, and Little River and their tributaries. Sub-basin 03-03-00 includes Cable Creek, Taylors Creek, Little River, North Prong Richland Creek, South Prong Richland Creek, Tantraugh Branch, Vestal Creek, Squirrel Creek, Gabriels Creek, and their tributaries. Streams located in the project study area with NCDWQ class designation, have a Best Usage Classification of C.

There are no waters within one mile downstream of the study area classified as High Quality Waters (HQW) or water supply watersheds (WS-I: Undeveloped watersheds or WS-II: Predominately undeveloped watersheds) (NCDOT, 2012). There are no waters within the project study area listed as "Impaired" on the North Carolina 2010 Final 303(d) list of impaired waters (NCDOT and FHA, 2015).

7.4 Impacts to Jurisdictional Resources

Preliminary estimated impacts to jurisdictional areas within the project corridor (Sections 1(A, B), 2, and 3(A, B)) are summarized in Table 1. Impacts are the result after minimization and avoidance measures and represent the maximum possible impacts foreseen at this time. Proposed changes will be coordinated with the relevant review agencies in the form of permit modification requests. Impacts to jurisdictional wetlands and surface waters for R-2536 are summarized in Appendix 2, Jurisdictional Sites and Mitigation Table. This Appendix includes information for impacts based on the various stages of the project including NRTR, Contractor Bid, Hearing Map, and permit drawings for the permit application. This table incorporates various types of impacts including permanent and temporary. The table also includes mitigation projections based on mitigation ratios and projected impacts noted on the permit drawings. Impacts and mitigation needs are shown by project section and River Basin/HUC. Avoidance and minimization measures are also noted on the table for specific sites.

<u>Permanent Impacts (Bypass/Connector, interchanges, and service roads):</u> Proposed permanent impacts include fill, excavation, and mechanized clearing of wetlands. This includes impacts to 6.44 ac of wetlands. Proposed permanent impacts to streams are 31,992 lf.

Temporary Impacts: There are proposed temporary impacts to wetlands totaling 2.19 ac. There will be an additional 0.03 ac. impact due to hand clearing. Proposed temporary fill in surface waters/streams is 2,841 lf.

Utility Impacts: All utilities, with the exception of an overhead transmission line in Section 3, are proposed to be located within the limits of proposed road disturbance/impacts/ROW. The overhead transmission line will have minor impacts for relocating tower footings and hand clearing/temporary impacts to wetlands/waters.

8.0 Protected Species

The project area includes Randolph County, portions of the City of Asheboro, the Asheboro extra-territorial jurisdiction, and unincorporated, rural southern Randolph County. The USFWS lists two federally protected species in Randolph County, as of December 26, 2012: Cape Fear shiner and Schweinitz's sunflower (Table 3).

Table 3. Federally Protected Species in Randolph County (NCDOT, 2012)

Scientific Name	Common Name	Federal Status	Habitat	Biological Conclusion
Helianthus schweinitzii	Schweinitz's sunflower	E*	Yes	MANLAA**
Notropis mekistocholas	Cape Fear shiner	E*	Yes	No Effect

*Endangered
**May Affect, Not Likely to Adversely Affect

8.1 Schweinitz's sunflower

Schweinitz's sunflower, Biological Conclusion: Revised since 2012 - May Affect, Not Likely to Adversely Affect (NCDOT, 2015).

AECOM and NCDOT biologists surveyed the entire project study area on September 11, 13, and 23, 2013 for the presence of Schweinitz's sunflower. Suitable habitat for the sunflower was present in numerous locations throughout the project study area in the form of shrub dominated roadsides and utility ROWs. No populations of Schweinitz's sunflower were found in the project study area during the survey. There are numerous known populations of Schweinitz's sunflower in close proximity to the project study area. Six sites occur within one and a half miles north of the project's terminus, east of Asheboro, with the closest site three quarters of a mile from the study area. Three other sites occur within one and a half miles north of the project area on Zoo Parkway, Southmont Drive, and Brower's Chapel Road. None of these known locations will be impacted by the US 64 Asheboro Bypass. Previous surveys conducted by AECOM in 1999, 2004, 2006 and 2011 did not find Schweinitz's sunflower populations within the project study area. The biological conclusion was "No Affect" (NCDOT, 2012).

The Schweinitz's sunflower survey for R-2536 was updated by NCDOT biologists as of September 17, 2015. The project area was surveyed and no specimens were observed within the project limits. Due to the many known occurrences of Schweinitz's sunflower near the project study area, the biological conclusion was revised to "May Affect, Not Likely to Adversely Affect" for the entirety of

the project study area. New areas for construction proposed through September 2015 outside of the corridor since project award, necessitated by design changes, were surveyed by RK&K biologists on October 1, 2015. No Helianthus species of any type (including schweinitzii) were observed. Known local populations were found to be in bloom during both surveys conducted in 2015. In February 2016 several driveways and service roads were added to the project. RK&K biologists have reviewed these areas for potential Helianthus habitat (March 2016). Areas of potential Helianthus habitat will be surveyed in late April to mid-May for the presence of Helianthus genus specimens. Should Helianthus genus specimens be identified within these areas, surveys for Schweinitz's species will be conducted for these locations in August to October during its flowering season.

8.2 Cape Fear shiner

Cape Fear shiner, Biological Conclusion: No Effect (NCDOT 2011).

A review of the North Carolina Natural Heritage Program (NCNHP) database, conducted by NCDOT biologists on May 25, 2011, indicated no known occurrences of the Cape Fear shiner within the project study area. The nearest occurrence was approximately 12 miles from the study area in the Deep River, over one and a half miles upstream from its confluence with Richland Creek. NCDOT biologists conducted site evaluations along the entire project corridor and determined Vestal Creek and Richland Creek had the best potential habitat for Cape Fear shiner. These streams were surveyed by electrofishing and seining on May 26, 2011; Cape Fear shiners were not caught in either stream. Richland Creek was previously surveyed by NCDOT biologists in July 2002, October 2004, and October 2005. Vestal Creek was previously surveyed in October 2005. No Cape Fear shiners were collected during previous surveys. Vestal and Richland Creeks lack the clean gravel/cobble/boulder habitat preferred by the Cape Fear shiner; it appears the species does not occur in the project study area (NCDOT 2011):

> *The USFWS issued concurrence that this project will have No Effect on any Cape Fear shiner populations in a letter dated October 22, 2013 (Appendix 4) based on a lack of suitable habitat. Additionally, the USFWS indicated coordination with them on the Cape Fear shiner is no longer required (2014).*

8.3 Northern long-eared bat (NLEB)

Northern long-eared bat, Biological Conclusion: May Affect, Likely to Adversely Affect (NCDOT 2015).

The USFWS has developed a programmatic biological opinion (PBO) in conjunction with the Federal Highway Administration (FHWA), the USACE, and NCDOT for the NLEB in eastern North Carolina. The PBO covers the entire NCDOT program in Divisions 1-8, including all NCDOT projects and activities. The PBO for NLEB for the NCDOT program in Divisions 1-8 is "May Affect, Likely to Adversely Affect". The PBO will provide incidental take coverage for NLEB and will ensure compliance with Section 7 of the Endangered Species Act (ESA) for five years for all NCDOT projects with a federal nexus in Divisions 1-8, which includes Randolph County, where the project is located.

The Raleigh Field Office of the USFWS signed the letter on April 10, 2015 converting the programmatic conference opinion for the NLEB to the PBO.

8.4 ESA Candidate Species

As of December 26, 2012, the USFWS lists one candidate species for Randolph County (Georgia aster). A review of NCNHP records, updated October 2015, indicates no known occurrences of Georgia aster within one mile of the study area.

8.5 National Marine Fisheries Service Essential Fish Habitat

The 1996 Congressional amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) set forth new requirements for the National Marine Fisheries Service (NMFS), regional fishery management councils (FMC), and other Federal agencies to identify and protect important marine and anadromous fish habitat. These amendments established procedures for the identification of essential fish habitat (EFH) and a requirement for interagency coordination to further the conservation of federally managed fisheries.

Randolph County is not an EFH identified coastal county and does not border the ocean or estuarine waters; therefore; there will be no EFH impacts associated with this project.

8.6 Moratoria

No construction moratoria have been recommended for R-2536; anadromous fish, or EFH, as designated by the NMFS, do not occur in the project area (NCDOT, 2012).

8.7 North Carolina River Basin Buffer Rules

There are no streamside riparian zones within the project study area protected by buffer rules and regulations administered by NCDWR.

8.8 Rivers and Harbors Act Section 10 Navigable Waters

No streams/waterbodies in the project study area have been designated by the USACE as a Navigable Waters and are non-tidal systems; therefore, proposed actions are not subject to Section 10 of the Rivers and Harbors Act.

9.0 Cultural Resources

Historic Architecture

A survey of historic architectural resources identified one property, Cox-Brown Farm, listed on the National Register of Historic Places (NRHP) and/or eligible for inclusion in the Register (NCDOT, 2007). The preferred alternative (29) is located one mile south of the site; the North Carolina State Historic Preservation Office (HPO) and NCDOT agree the project will have no effect on this historic property.

Archaeology

An archeology survey of the preferred alternative (29) was conducted from June through August 2005. There were three properties recommended as eligible for listing in the NRHP: Sites

31RD1398 (Schoolhouse Ridge Site), 31RD1399 (Tantraugh Branch Site), and 31RD1426/1426** (Trogdon-Squirrel Creek Site) (NCDOT, 2007). According to the North Carolina HPO, Office of State Archaeology (OSA), the proposed project would have adverse effect on these properties. A memorandum of Agreement (MOA), signed by NCDOT, the FHWA, and the state HPO, specifies mitigation measures to be undertaken (NCDOT, 2007). A new MOA was executed on January 20, 2012 containing the same seven stipulations of the original MOA from 2006, but removing the expiration date. Data recovery plans have been developed in coordination with OSA and approved for each site, in accordance to the MOA, and NCDOT will ensure that each Data Recovery Plan is implemented after ROW is acquired and prior to construction activities at the site locations.

Additional archaeological surveys have been completed or are ongoing at locations resulting from refinements in design that were not included in the original 2006 archaeological survey Area of Potential Effects (NCDOT, 2014, and ongoing NCDOT, 2016). The NCDOT-Archaeology Group is working in consultation with HPO and OSA to identify any NRHP-eligible resources within the updated APE and document the potential for adverse effects. If any additional NRHP-eligible sites will be adversely effected and cannot be avoided, the NCDOT-Archaeology Group may develop a Data Recovery Plan to mitigate adverse effects due to the design modifications. If needed, the NCDOT-Archaeology Group will coordinate with FHWA, HPO, and OSA to discuss a potential amendment to the January 20, 2012 MOA to address any newly identified NRHP-eligible archaeological sites adversely effected by the design modifications. In addition, the Data Recovery Plan for archaeological site 31Rd1398 will be updated to reflect the design modification for Staley's Farm Road, if needed. Regular consultation with OSA has been maintained when new design considerations have occurred.

Changes to these resources have/may have occurred. Final information relating to locations and impacts is still being evaluated.

Jarrell Investments Property on Squirrel Creek (31RD1426): Data recovery efforts are scheduled to be initiated as soon as ROW has been secured for this location. Data recovery will be completed prior to construction. NCDOT is conducting additional Phase 1 surveys for areas required for the project not identified in the original APE. NCDOT will coordinate with SHPO and whether mitigation measures should be undertaken for any of the new locations to be assessed.

NCDOT identified the need to dewater several ponds in and adjacent to the ROW for safety considerations. Several of the ponds were not in the originally defined APE. NCDOT conducted a direct consultation with NC OSA on Feb 3, 2016 and resulted in a conclusion that no further archaeological work is recommended for the subject pond drainings. During NCDOT's consultation, we were able to review detailed design plans, modern aerial photography, and a series of USGS mapping that generally demonstrate the evolution of the ponds over a span of about seventy years. Reviews of archaeological surveys in the area did not yield information suggestive that these ponds were associated with historic mills. One or more small, low density archaeological sites were noted during the previous survey in close proximity to the ponds to be drained, though those were not recommended as eligible for listing on the NRHP.

Having some idea of how these mid-twentieth century ponds were constructed, presumably with heavy equipment and involving vast amounts of earthmoving, any archaeological sites that may

have been present at the same location have probably been destroyed. NCDOT does not anticipate that the permanent drainage will adversely affect any yet unknown, intact, significant and NRHP-eligible archaeological resources. NCDOT concluded that no further archaeological investigation was warranted at these pond locations.

10.0 FEMA Compliance

The project has been coordinated with appropriate state and local officials and the Federal Emergency Management Agency (FEMA) to assure compliance with applicable floodway regulations. Little River, Vestal Creek, tributaries of Taylor's Creek, and Richland Creek are FEMA-regulated streams within the project area.

11.0 Mitigation Options

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts to Waters of the US. Avoidance measures were taken during the planning and NEPA compliance stages as well as project design; minimization measures were incorporated as part of the project design. As a result, actual wetland and stream impacts are less than preliminary plan estimates.

Mitigation requirements for the proposed R-2536 improvements were determined in consultation with appropriate Federal and State environmental resource and regulatory agencies. Conceptual plans and feasibility studies have been developed as part of the permitting phase (NCDOT, 2007). DMS will assume all mitigation for impacts to jurisdictional wetlands/streams/ponds per the DMS Mitigation Acceptance letter, March 23, 2016 (Appendix 1).

NCDOT has identified a potential stream/wetland mitigation site in Section 3 along Squirrel Creek on the Jarrell Investments Property and is presently pursuing acquisition. Should acquisition occur, NCDOT will coordinate with the regulatory agencies regarding site planning, design, and construction. Following site close out and the approval of mitigation credit quantities, NCDOT will submit a permit modification application and reconcile mitigation payments with DMS.

11.1 Avoidance and Minimization

The NCDOT attempted to avoid and minimize impacts to streams and wetlands to the greatest extent practicable during the alternatives analysis and documented in the NEPA documents. Alternative 29 –the preferred alternative, subject of this application, was selected based on that avoidance, minimization assessment conducted during that process. The following summarizes efforts to avoid and minimize impacts associated with specific activities associated with the selected alternative.

Jurisdictional features within the corridor for R-2536 were delineated, field verified and surveyed. Using the surveyed features, preliminary designs were adjusted to avoid and/or minimize impacts to jurisdictional areas. NCDOT employs many strategies to avoid and minimize impacts to jurisdictional areas in its designs. Many of these strategies have been incorporated into best management practice (BMP) documents that have been reviewed and approved by the resource

agencies and which will be followed throughout construction. Wetland areas not affected by the project will be protected from unnecessary encroachment.

Avoidance and minimization measures are noted by site in Appendix 2. The following summarizes many of the measures taken by the design team throughout the project limits to avoid and minimize impacts to wetlands and streams.

- Innovative ways to minimize impacts on wetlands, streams, and other environmentally sensitive areas:
    - Carefully design outlet of stormwater pipes to areas just outside wetlands and buffers to minimize impacts from fill footprint and to provide for energy dissipation to reduce erosion potential, provide additional hydrology to help maintain wetland function, and allow the natural buffer to help treat the stormwater.
    - Minimize the number of outlet pipes at jurisdictional features.
    - Retain ditch discharges to existing wetlands.
    - Align channels at confluences to reduce energy of discharges into receiving water and limit stabilization needs.
    - Provide for fish passage needs in perennial channels in appropriate culvert designs in locations where fish passage is feasible and likely.
    - Eliminate existing direct discharges into jurisdictional features, where feasible.
    - Identify access routes at construction crossings that minimize jurisdictional impacts and clearing of buffers.
    - Ensure construction in jurisdictional areas is in strict compliance with all permits.
    - Use BMPs, including grass swales, preformed scour holes, dry detention basins, and riprap energy dissipaters, to minimize impacts.
    - Develop a project-specific Environmental and Permit Monitoring Plan.
- Shift alignment for –FLY– slightly to the east to move the gore area from underneath Stutts Road Bridge to simplify the bridge geometry and shorten the Stutts Road overpass bridge and reduce earthwork, property, and wetland impacts.
- Revise interchange configuration at NC 42 to partial cloverleaf. Eliminate Service Road for SR 2724 (Brownstone Hills Drive) extension. Eliminate all stream impacts along the east side of NC 42.
- Revise service road –Y17A– alignment to minimize stream impacts.
- Select service road alignments that minimize stream and wetland crossings while meeting design criteria and minimize property impacts.
- Revise east end and west end interchanges to reduce impacts.
- Whenever possible place utilities into proposed road alignment rather than separate corridor that would have impacts to additional jurisdictional features. Only one utility, an overhead powerline, requires minor impacts solely for the utility relocation.
- Design pond dewatering activities to create stable remnant channels in pond footprint and require minimal impacts to tie into existing jurisdictional waters.
- When appropriate and feasible relocate channels using natural stream channel design methods.
- Eliminate some service roads meeting NCDOT criteria.
- Design team has focused on minimizing impacts to floodplains.
- Drainage will be designed to minimize impacts to jurisdictional features and water quality.
- When feasible use construction methods that revise permanent impacts to be temporary impacts in instances such as construction access locations and utility relocations and employ

appropriate restorative techniques at those locations to return conditions to pre-construction functions. Other techniques such as use of mats, temporary bridges for stream crossings are identified for construction methods.

- Many others as noted in the CP 4B and 4C meetings.

11.2 Compensation

The NCDOT will provide stream and wetland mitigation opportunities based on the final design and location of the preferred alternative. Mitigation for wetlands and streams impacts will be provided by NCDMS for the R-2536 project (Appendix 1).

The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible, as described above. The unavoidable impacts to jurisdictional riparian and non-riparian wetlands and surface waters/streams will be offset by compensatory mitigation provided by DMS. Refer to Table 4 for R-2536 Compensatory Mitigation Summary.

Table 4. R-2536 Compensatory Mitigation Summary

	Stream Impacts in Length (lf)	**Riparian Wetland Impacts (ac.)**
Impacts Requiring Mitigation	31,992	6.44
Required NCDMS Mitigation	29,271 @ 2:1 2,721 @ 1:1	6.44@2:1
Total NCDMS Mitigation Required	**61,263**	**12.88**

Compensatory mitigation requirements for R-2536 are summarized in Table 4. This project will permanently impact 31,992 lf of warm water streams. The USACE is requiring 2:1 mitigation for 29,271 lf of permanent stream impacts and 1:1 for 2,721 lf of permanent impacts.

NCDWR is requiring 1:1 mitigation for 31,760 lf. Therefore, the total USACE mitigation requirement exceeds the NCDWR requirement. NCDOT has requested that NCDMS provide compensatory mitigation for 29,271 lf of stream impact at a 2:1 ratio and 2,721 lf of stream impact at a 1:1 ratio. NCDMS will also provide mitigation for 6.44 ac (2:1 ratio) of permanent riparian, non-isolated wetland impacts resulting from roadway fill, mechanized clearing and excavation.

12.0 Indirect and Cumulative Effects

An Indirect and Cumulative Effects Report was prepared for the proposed project in 2005. The following findings were noted (NCDOT, 2007):

- Project will primarily affect through travelers on US 64, who will benefit from reduced

congestion on US 64 in Asheboro; local traffic and residents along NC 159, who will experience less traffic volume; and it is assumed from the Asheboro support documents that property owners in the vicinity of the proposed NC 49, US 64 West, and US 220 interchanges, will experience an increase in property values and change in land use due to improved accessibility.

- Project may indirectly enhance the County's ability to attract transportation and distribution operations.
- Cumulative effects to natural resources are not anticipated to be substantial.

13.0 Regulatory Approvals

Section 404: Application is hereby made for a Clean Water Act Individual 404 Permit as required for the above-described activities.

Section 401: Application is hereby made for a Clean Water Act Section 401 Water Quality Certification from the NCDWR.

A copy of this permit application and its distribution list will be posted on the NCDOT website at: https://connect.ncdot.gov/resources/Environmental/Pages.

If you have any questions or need additional information, please contact Jason Dilday at 919-707-6111 or jldilday@ncdot.gov.

Sincerely,

Philip S. Harris III, P.E., C.P.M.
Natural Environment Section Head

cc: NCDOT Permit Application Standard Distribution List.

U.S. ARMY CORPS OF ENGINEERS

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

(33 CFR 325)

OMB APPROVAL NO. 0710-0003
EXPIRES: 31 AUGUST 2012

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Philip Middle - S Last - Harris III	First - Middle - Last -
Company - North Carolina Department of Transportation (NCDOT)	Company -
E-mail Address - pharris@ncdot.gov	E-mail Address -
6. APPLICANT'S ADDRESS:	**9. AGENT'S ADDRESS:**
Address- 1020 Birch Ridge Drive	Address-
City - Raleigh State - NC Zip - 27610 Country - USA	City - State - Zip - Country -
7. APPLICANT'S PHONE NOs. w/AREA CODE	**10. AGENTS PHONE NOs. w/AREA CODE**
a. Residence b. Business 919-707-2900 c. Fax	a. Residence b. Business c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

_____ _____
SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
R-2536 US 64 Asheboro Southern Bypass and Zoo Connector

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
See attached.	Address
15. LOCATION OF PROJECT Latitude: °N See attached. Longitude: °W See attached.	City - State- Zip-

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)
State Tax Parcel ID Municipality Asheboro, NC
Section - Township - Randolph County Range -

17. DIRECTIONS TO THE SITE

The project spans 16.4 miles in Randolph County and includes portions of the City of Asheboro, the Asheboro extra-territorial jurisdiction, and unincorporated, rural southern Randolph County. The alignment is south of Asheboro and spans the existing US 64 west of Asheboro to the existing US 64 east of Asheboro. The Zoo Connector runs from east of Staley's Farm Road (SR 2839) to the existing NC 159/Zoo Entrance.

18. Nature of Activity (Description of project, include all features)

See attached.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

See attached.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

The project does not require dredging. However, the project will require clean fill material be discharged into wetlands and waters to accommodate highway and associated improvements, crossing of streams/wetlands, stabilization of outfall discharges to waters, or for improvement of embankments for construction or safety areas on or adjacent to wetlands/waters.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards

Please see attached Permit Drawings

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres 6.44 acres permanent Wetlands Impacts

or

Linear Feet 31,992 feet of permanent Stream Impacts

23. Description of Avoidance, Minimization, and Compensation (see instructions)

See attached.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

NOTE: IF any element is initiated before the submittal need to include here

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- See attached.

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT — DATE: 03/24/2016

SIGNATURE OF AGENT — DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

ENG Form 4345
Supplemental Information
March 18, 2016

13. Name of Waterbody

Little River, Vestal Creek, Squirrel Creek, Gabriels Creek, Cable Creek, Taylors Creek, North Prong Richland Creek, South Prong Richland Creek, Tantraugh Branch, and multiple un-named tributaries.

15. Location of Project, Latitude/longitude

- West end: 529,410.591/217,443.988 Meters
- East end: 542,991.857/219,454.826 Meters
- Southern-most tip: 538,699.249/209,244.005 Meters

18. Nature of Activity

NCDOT proposes to construct an approximately 16.4 mile bypass (US 64 Bypass) around Asheboro, NC, which includes improvements to the US 64 corridor in Asheboro and upgraded access to the North Carolina Zoological Park (Zoo), called the Zoo Connector. The US 64 Bypass is a 14.6 mile, four-lane divided, new location freeway, with no driveway access and a 46-foot median. There will be 12-foot outside shoulders with four-foot full depth and six-foot partial depth paved shoulders along the US 64 corridor. The Zoo Connector is a 1.8 mile, two-lane parkway on new location. The project includes associated utilities and utility relocations, service roads, interchanges, building relocations/removal, associated stormwater management facilities, and compensatory mitigation.

The project will impact jurisdictional Waters of the US including wetlands and streams associated with the crossing of several of the waterbodies in the study area.

Other project details include:

- Two hydraulic bridges including a two-span, 199’ 54” prestressed modified concrete bulb tee bridge at Little River and a 195 foot long two span, 56" prestressed modified concrete bulb tee bridge at Vestal Creek. Foundations include spread footings, driven steel piles, pile supported footings, and drilled piers. Due to shallow rock at some of the sites, pile excavation or pre-drilling may be required at some locations.
- Six interchanges: Existing US 64 west of Asheboro, NC 49, US 220 Bypass (future I-73/74), Zoo Connector, NC 42, and existing US 64 east of Asheboro.
- High fill and cut sections with fill heights as high as 70 feet and cut sections as deep as 60 feet.
- Underdrains for groundwater within six feet of subgrade.
- Asphalt pavement.
- Partial depth paved shoulders with three inches of surface course (S9.5B or S9.5C) on a minimum seven inch layer of aggregate base course.
- Culverts, abutment, retaining, and noise walls.
- Utility relocations (water, sewer, power, IT, etc.) and approximately 4.35 miles of service roads and related improvements.

19. Project Purpose

The purpose of this project is to improve flow and enhance mobility of regional traffic on existing US 64 by providing an alternative around Asheboro. The separation of local and regional traffic will reduce congestion and thereby increase safety on US 64, enhance high speed regional travel, and improve currently limited access to the Zoo. The project will address the following existing and anticipated conditions: Traffic congestion and above average accident rates on US 64, land use conditions, and congestion/backups on NC 159. The project is essential for NCDOT's plan to upgrade US 64 Intrastate Corridor in central North Carolina and NC 49 corridors from Statesville to Raleigh.

The proposed Zoo Connector will address Zoo-related traffic and safety issues along NC 159 by diverting approximately 30 percent of traffic without requiring widening and reconstruction of the roadway or resulting residential displacement.

Economic benefits are expected due to improved access to commercial areas and the Zoo.

Construction is scheduled to begin in August 2016 with anticipated completion within three years.

23. Description of Avoidance, Minimization, and Compensation.

Refer to the NEPA documentation and related updates for details of the efforts made by the NCDOT regarding avoidance and minimization measures in selecting the preferred alternative (Alternative 29). This section summarizes efforts during the design process for the preferred alternative to avoid and minimize jurisdictional impacts to wetlands and waters of the US within the preferred corridor.

Impacts to waters/wetlands will require compensatory mitigation. Compensatory mitigation will be provided through the North Carolina Division of Mitigation Services (NCDMS) for all wetland/water impacts.

Throughout the design process, measures have been taken to avoid and minimize impacts to jurisdictional waters/wetlands across the project corridor. Avoidance and minimization opportunities were evaluated with every project modification from the original project corridor and public hearing maps for preliminary design, including changes to the main highway, interchanges, service roads, utilities and related improvements, such as stormwater management. Where design modifications were necessary, and alternatives evaluated, potential impacts to jurisdictional features were part of the discussion.

The following summarizes many of the measures taken by the design team throughout the project limits to avoid and minimize impacts to wetlands and streams.

- Innovative ways to minimize impacts on wetlands, streams, and other environmentally sensitive areas:
    - Carefully design outlet of stormwater pipes to areas just outside wetlands and buffers to minimize impacts from fill footprint and to provide for energy dissipation to reduce erosion potential, provide additional hydrology to help maintain wetland function, and allow the natural buffer to help treat the stormwater.
    - Minimize the number of outlet pipes at jurisdictional features.
    - Retain ditch discharges to existing wetlands.

    - Align channels at confluences to reduce energy of discharges into receiving water and limit stabilization needs.
    - Provide for fish passage needs in perennial channels in appropriate culvert designs in locations where fish passage is feasible and likely.
    - Eliminate existing direct discharges into jurisdictional features, where feasible.
    - Identify access routes at construction crossings that minimize jurisdictional impacts and clearing of buffers.
    - Ensure construction in jurisdictional areas is in strict compliance with all permits.
    - Use BMPs, including grass swales, preformed scour holes, dry detention basins, and riprap energy dissipaters, to minimize impacts.
    - Develop a project-specific Environmental and Permit Monitoring Plan.
- Shift alignment for –FLY– slightly to the east to move the gore area from underneath Stutts Road Bridge to simplify the bridge geometry and shorten the Stutts Road overpass bridge and reduce earthwork, property, and wetland impacts.
- Revise interchange configuration at NC 42 to partial cloverleaf. Eliminate Service Road for SR 2724 (Brownstone Hills Drive) extension. Eliminate all stream impacts along the east side of NC 42.
- Revise service road –Y17A– alignment to minimize stream impacts.
- Select service road alignments that minimize stream and wetland crossings while meeting design criteria and minimize property impacts.
- Revise east end and west end interchanges to reduce impacts.
- Whenever possible place utilities into proposed road alignment rather than separate corridor that would have impacts to additional jurisdictional features. Only one utility, an overhead powerline, requires minor impacts solely for the utility relocation.
- Design pond dewatering activities to create stable remnant channels in pond footprint and require minimal impacts to tie into existing jurisdictional waters.
- When appropriate and feasible relocate channels using natural stream channel design methods.
- Eliminate some service roads meeting NCDOT criteria.
- Design team has focused on minimizing impacts to floodplains.
- Drainage will be designed to minimize impacts to jurisdictional features and water quality.
- And many others as noted in the CP 4B and 4C meetings.
- When feasible use construction methods that revise permanent impacts to be temporary impacts in instances such as construction access locations and utility relocations and employ appropriate restorative techniques at those locations to return conditions to pre-construction functions. Other techniques such as use of mats, temporary bridges for stream crossings are identified for construction methods.

25. Address of Property Owners

Professional Property Services, Inc. EIS Relocation Report (2014) details properties potentially requiring future relocation assistance. Copy Attached. A copy of all affected/adjacent property owners is attached.

Based on revised project design as of February 2016 the project will result in 153 residential relocations (88 owner occupants and 65 tenants) and 23 business relocations.

Appendix 1: NCDEQ DMS Mitigation Acceptance Letter

Environmental Quality

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

March 23, 2016

Mr. Philip S. Harris III, P.E., CPM
Natural Environment Section, PDEA
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Mr. Harris:

Subject: DMS Mitigation Acceptance Letter: **R-2536,** US 64 – Asheboro Bypass, Randolph County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the stream and wetland mitigation for the subject project. Based on the information supplied by you on March 23, 2016, the stream and wetland impacts are located in CU 03030003 of the Cape Fear River basin and in CUs 03040103 and 03040104 of the Yadkin River basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Stream & Wetlands	River Basin	CU Location	Eco-Region	Stream			Wetlands		
				Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh
Impacts	Cape Fear	03030003	CP	0	0	14,889.0	2.98	0	0
Impacts	Yadkin	03040103	CP	0	0	11,650.0	1.24	0	0
Impacts	Yadkin	03040104	CP	0	0	5,453.0	2.21	0	0

*Some of the stream and wetland impacts may be proposed to be mitigated at a 1:1 mitigation ratio. See permit application for details.

This acceptance letter replaces the acceptance letter issued on August 26, 2014. Some of these impacts and associated mitigation needs were under projected by the NCDOT in the 2014 impact data. DMS will commit to implement sufficient compensatory stream and riparian wetland mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies using the delivery timeline listed in Section F.3.c.iii of the In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from DMS.

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-707-8420.

Sincerely,

James B. Stanfill
DMS Credit Management Supervisor

Cc: Mr. David Bailey, USACE – Raleigh Regulatory Field Office
Ms. Amy Chapman, NC Division of Water Resources – Raleigh
File: R-2536 Revised

Appendix 2: Wetlands, Streams, Ponds Impacts Table

		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO
6			SITE	Permit Drawing No.	NRTR Section ID	4B/4C Merger Concurrence Section ID	NRTR ID	NRTR Figure	River Basin	HUC	Stream Name/ Wetland Classification	STA	NRTR Mitigation Stream Length (ft)	Perm Fill in Surface Water (ft)	Current Design Phase Fill in Surface Water (lf)	Hearing Map Fill in Surface Water (ft)	Temp Fill in Surface Water (ft)	Current Design Temp Fill in Surace Water (LF)**	NRTR Mitigation Wetland Area (ac)	Wetland (ac)	Current Design Wetland (Ac)***	Hearing Map Wetland (ac)	NRTR Mitigation Pond Area (ac)	Pond (ac)	Current Design Pond (AC)	Hearing Map Pond (ac)	Mech. Clearing (ac.)	TOTAL TAKE Wetlands/ Ponds	Indirect Portion of Total (ac)	Bank Stabilization Portion (lf)	DATE Last Revision	Ratio*	Mitigation (ft)	Ratio	Mitigation (ft)	Ratio	Mitigation (ac)	Ratio	Mitigation (ac)	Ratio	Mitigation (ac)
7			1A, 1B	5	AA	1A	SB-AA	Figure 3A	Yadkin	3040103	UT to Back Creek	-DR- 13+32	369.00	111	237	95	28	22.00													3/22/2016	2:1	474	1:1	237	2:1	0	2:1	0	1:1	0
8					AA	1A	WA-AA	Figure 3A	Yadkin	3040103	Headwater Forest	1A- 100+00 RT							0.10	0.03											3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
9			2	8	AA	1A	SD-AA	Figure 3A	Yadkin	3040103	UT to Cable Creek	LY- 13+50 - 1	724.00	420	523	664	57	11.00													3/22/2016	2:1	1046	1:1	523	2:1	0	2:1	0	1:1	0
10					AA	1A	PA-AA	Figure 3A	Yadkin	3040103		-FLY- 14+00 RT												1.11	1.11	1.11	1.11		X			3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	1.11
11					AA	1A	WYZ-AA	Figure 3A	Yadkin	3040103	Headwater Forest	-L- 33+16 RT							0.09	0.09	0.09	0.09						X			3/22/2016	2:1	0	1:1	0	2:1	0.18	2:1	0.18	1:1	0
12					AA	1A	WXX-AA	Figure 3A	Yadkin	3040103	Headwater Forest	FLY- 16+20 RT							0.03	0.03	0.03	0.03						X			3/22/2016	2:1	0	1:1	0	2:1	0.06	2:1	0.06	1:1	0
13		3	12	AA	1A	SAA-AA	Figure 3A	Yadkin	3040103	UT to Cable Creek	1- 19+13 LT	525.00	204	205	479	7	14.00													3/22/2016	2:1	410	1:1	205	2:1	0	2:1	0	1:1	0
14					AA	1A	WB-AA	Figure 3A	Yadkin	3040103	Headwater Forest	-R1- 18+70 RT							0.04	0.00	0.002	0.04									3/22/2016	2:1	0	1:1	0	2:1	0.004	2:1	0.004	1:1	0
15		5	12	AA	1A	SM-AA	Figure 3A	Yadkin	3040103	UT to Cable Creek	-Y- 15+00 LT	318.00	258	258	229	10	25.00													3/22/2016	2:1	258	1:1	258	2:1	0	2:1	0	1:1	0
16		4A	12	AA	1A	SE-AA	Figure 3A	Yadkin	3040103	UT to Cable Creek	-Y- 16+00 LT	3064.00	556	69	51	123	10.00													3/22/2016	2:1	138	1:1	69	2:1	0	2:1	0	1:1	0
17		4B	12	AA	1A	SE-AA	Figure 3A	Yadkin	3040103	UT to Cable Creek	-L- 49+00 RT			689	563	383	10													3/22/2016	2:1	1126	1:1	563	2:1	0	2:1	0	1:1	0
18		4C	12	AA	1A	SE-AA	Figure 3A	Yadkin	3040103	UT to Cable Creek	-LPD- 22+00				795	451		20.00												3/22/2016	2:1	1590	1:1	795	2:1	0	2:1	0	1:1	0
19		4D	12	AA	1A	SE-AA	Figure 3A	Yadkin	3040103	UT to Cable Creek	-L- 63+00 RT			752	11	258	10	21.00												3/22/2016	2:1	22	1:1	11	2:1	0	2:1	0	1:1	0
20		4E	12	AA	1A	SE-AA	Figure 3A	Yadkin	3040103	UT to Cable Creek	-L- 66+00 RT				753	423		10.00												3/22/2016	2:1	1506	1:1	753	2:1	0	2:1	0	1:1	0
21		6A, 6B, 6C	12	AA	1A	SZZ-AA	Figure 3B	Yadkin	3040103	UT to Cable Creek	-FLY- 41+45	892.00	725	651	349	30	40.00				0.02									3/22/2016	2:1	1301.2	1:1	650.6	2:1	0.04	2:1	0.04	1:1	0
22		6A, 6B	12	AA	1A	WUU-AA	Figure 3B	Yadkin	3040103	Headwater Forest	-FLY- 41+45								0.60	0.36	0.33	0.17					0.02			3/22/2016	2:1	0	1:1	0	2:1	0.66	2:1	0.66	1:1	0
23		18A, 18B, 18C	23	AA	1A	SH-AA	Figure 3B	Yadkin	3040103	UT to Cable Creek	Y- 45+60 LT	844.00	321	419	312	20	32.00													3/22/2016	2:1	837.786	1:1	418.893	2:1	0	2:1	0	1:1	0
24		19	25	AA	1A	SK-AA	Figure 3B	Yadkin	3040103	UT to Cable Creek	RT- 15+00 R	519.00	291	312	176	20	20.00													3/22/2016	2:1	623	1:1	311.5	2:1	0	2:1	0	1:1	0
25		19	25	AA	1A	WD-AA	Figure 3B	Yadkin	3040103	Seep	RT- 14+00 RT								0.01	0.01	0.01	0.01						X		3/22/2016	2:1	0	1:1	0	2:1	0.014	2:1	0.014	1:1	0
26		20	28	AA	1A	WE-AA	Figure 3B	Yadkin	3040103	Headwater Forest	-Y- 61+10 RT								0.07	0.07	0.07	0.07						X		3/22/2016	2:1	0	1:1	0	2:1	0.134	2:1	0.134	1:1	0
27		7	20	AA	1A	SG-AA	Figure 3B	Yadkin	3040103	Cable Creek	-L- 69+00	1908.00	1372	1355	1054	30	20.00													3/22/2016	2:1	2709.4	1:1	1354.7	2:1	0	2:1	0	1:1	0
28		8	31	AA	1B	SJ-AA	Figure 3D	Yadkin	3040103	UT to Taylors Creek	L- 127+20 R	407.00	271	267	297	10	10.00													3/22/2016	2:1	534	1:1	267	2:1	0	2:1	0	1:1	0
29		8	31	AA	1B	WYY-AA	Figure 3D	Yadkin	3040103	Headwater Forest	RT								0.18	0.13	0.18	0.14					0.01	X		3/22/2016	2:1	0	1:1	0	2:1	0.36	2:1	0.36	1:1	0
30		9	31	AA	1B	WZZ-AA	Figure 3D	Yadkin	3040103	Headwater Forest	16+50 LT								0.67	0.49	0.46	0.25					0.02			3/22/2016	2:1	0	1:1	0	2:1	0.92	2:1	0.92	1:1	0
31					AA	1B	WZZ-AA														0.03									3/22/2016				0		0.06		0.06		
32			9	31	AA/AB	1B	SO-AB/SI-AA	Figure 3D	Yadkin	3040103	UT to Taylors Creek	-L- 133+00	2880.00	1001	1091	797	20	21.00													3/22/2016	2:1	2182	1:1	1091	2:1	0	2:1	0	1:1	0
33			9	31	AA/AB	1B	SO-AB/SI-AA	Figure 3D	Yadkin	3040103	UT to Taylors Creek	PC- 24+50 L T/RT				569															3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
34					AB	1B	SP-AB	Figure 3D	Yadkin	3040103	UT to Taylors Creek	PC- 24+00 L	232.00			212															3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
35			21	53	AA/AB	1B	SO-AB/SI-AA	Figure 3D	Yadkin	3040103	UT to Taylors Creek	-Y2- 34+00		293	547	357	20	27.00													3/22/2016	2:1	1094	1:1	547	2:1	0	2:1	0	1:1	0
36			22	56	AB	1B	SM-AB	Figure 3D	Yadkin	3040103	Taylors Creek	2- 60+00 LT/	2678.00	277	585	1233	20	33.00													3/22/2016	2:1	1170	1:1	585	2:1	0	2:1	0	1:1	0
37					AB	1B	WK-AB	Figure 3D	Yadkin	3040103	bottomland Hardwood Forest	Y2- 60+00 LT							0.16	0.00		0.00									3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
38			10	37	AB	1B	SM-AB	Figure 3D	Yadkin	3040103	Taylors Creek	-154+00 LT/RT		757	759	443	20	49.00													3/22/2016	2:1	1518	1:1	759	2:1	0	2:1	0	1:1	0
39			11	37	AB	1B	SL-AB	Figure 3D	Yadkin	3040103	UT to Taylors Creek	-155+50 LT	560.00	361	378	191	10	10.00													3/22/2016	2:1	756	1:1	378	2:1	0	2:1	0	1:1	0
40					AB	1B	SK-AB	Figure 3E	Yadkin	3040103	UT to Taylors Creek	K- 17+27 LT/RT		138	0	0	20														3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
41					AB	1B	SZZ-AB	Figure 3E	Yadkin	3040103	UT to Taylors Creek	R4- 22+95 R	93.00	68	0	0	10														3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
42			12	41	AB	1B	WH-AB			3040103	BasinWetland										0.02							X		3/22/2016	2:1	0	1:1	0	2:1	0.04	2:1	0.04	1:1	0
43			12	41	AB	1B	PB-AB	Figure 3E	Yadkin	3040103	UT to Taylors Creek	L- 168+00 RT													0.00					3/22/2016	2:1	0	1:1	0	2:1	0	1:1	0.0031
44			13	44	AB	1B	SK-AB	Figure 3E	Yadkin	3040103	UT to Taylors Creek	00 LT, -L-18	1297.00	776	782	592	20	22.00													3/22/2016	2:1	1564	1:1	782	2:1	0	2:1	0	1:1	0
45			14	44	AB	1B	SI-AB	Figure 3E	Yadkin	3040103	UT to Taylors Creek	L- 179+71 L	246.00	72	84	34	10	10.00													3/22/2016	2:1	168	1:1	84	2:1	0	2:1	0	1:1	0
46			15	44	AB	1B	SJ-AB	Figure 3E	Yadkin	3040103	UT to Taylors Creek	-L- 183+00	639.00	318	322	365	20	36.00													3/22/2016	2:1	644	1:1	322	2:1	0	2:1	0	1:1	0
47			16	49	AB	1B	SF-AB	Figure 3E/3F	Yadkin	3040103	UT to Taylors Creek	-L- 198+00	1057.00	516	564	461	20	27.00													3/22/2016	2:1	1128	1:1	564	2:1	0	2:1	0	1:1	0
48			17	49	AB	1B	SH-AB	Figure 3E	Yadkin	3040103	UT to Taylors Creek	L- 198+00 L	116.00	119	121	121	0														3/22/2016	2:1	242	1:1	121	2:1	0	2:1	0	1:1	0
49			17	49	AB	1B	WG-AB	Figure 3F	Yadkin	3040103	Headwater Forest	L- 198+00 LT							0.00	0.00	0.00	0.00						X			3/22/2016	2:1	0	1:1	0	2:1	0.0068	2:1	0.0068	1:1	0
50					AB	2	SE-AB	Figure 3F	Yadkin	3040103	UT to Taylors Creek	L- 214+22 RT	254.00																		3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
51			23A	64	AB	2	SC-AB	Figure 3F	Yadkin	03040104	UT to Little River	L- 234+00 L	1372.00	18	10	10	20	38.00												10	3/22/2016	2:1	20	1:1	0	2:1	0	2:1	0	1:1	0
52			23B	64	AB	2	WF-AB	Figure 3F	Yadkin	03040104	Basin Wetland	L- 233+87 LT							0.12	0.04	0.03	0.03									3/22/2016	2:1	0	1:1	0	2:1	0.06	2:1	0.06	1:1	0
53							WF-AB														0.006									3/22/2016				0						
54			23C	66	AB	2	WE-AB	Figure 3F	Yadkin	03040104	Basin Wetland	L- 235+77 LT							0.01	0.00	0.01	0.01						X			3/22/2016	2:1	0	1:1	0	2:1	0.016	2:1	0.016	1:1	0
55			23C	66	AB	2	PA-AB	Figure 3F	Yadkin	03040104	Impounded RPW	235+00 LT/RT											0.73	0.73	0.73	0.73		X			3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0.73
56			23D	66	AB	2	WA-AB	Figure 3F	Yadkin	03040104	Headwater Forest	L- 236+90 RT							0.07	0.07	0.07	0.07						X			3/22/2016	2:1	0	1:1	0	2:1	0.1318	2:1	0.1318	1:1	0
57			23D	66	AB	2	WB-AB	Figure 3F	Yadkin	03040104	Basin Wetland	L- 236+90 CL							0.04	0.04	0.04	0.04						X			3/22/2016	2:1	0	1:1	0	2:1	0.0784	2:1	0.0784	1:1	0
58			23D	66	AB	2	WC-AB	Figure 3F	Yadkin	03040104	Basin Wetland	236+93 L T/CL							0.01	0.01	0.01	0.01						X			3/22/2016	2:1	0	1:1	0	2:1	0.0112	2:1	0.0112	1:1	0
59		23D, 23E	66	AB	2	SA-AB	Figure 3F	Yadkin	03040104	UT to Little River	37+00-243+0	1874.00	478	905	892	10	30.03													3/22/2016	2:1	1810.788	1:1	905.394	2:1	0	2:1	0	1:1	0
60			24	66	AB	2	WD-AB	Figure 3F	Yadkin	03040104	Headwater Forest	L- 238+00 CL							0.01	0.01	0.01	0.01						X			3/22/2016	2:1	0	1:1	0	2:1	0.0212	2:1	0.0212	1:1	0
61			24	66	AB	2	SB-AB	Figure 3F	Yadkin	03040104	UT to Little River	L- 238+60 C	20.00	87	86	86		0.00													3/22/2016	2:1	172.4	1:1	86.2	2:1	0	2:1	0	1:1	0
62			25	70	AB	2	WM-AB	Figure 3F/3H	Yadkin	03040104	bottomland Hardwood Forest	251+50 LT/RT							1.76	0.67	0.47	0.67									3/22/2016	2:1	0	1:1	0	2:1	0.94	2:1	0.94	1:1	0
63							WM-AB														0.30									3/22/2016				0		0.6		0.6		
64			26	70	AB	2	Little River	Figure 3F/3H	Yadkin	03040104	Little River	252+50 LT/RT		0	53	0	0	40.00												53	3/22/2016	2:1	106	1:1	0	2:1	0	2:1	0	1:1	0
65			26	70	AB	2	WN-AB	Figure 3H	Yadkin	03040104	bottomland Hardwood Forest	254+00 LT/RT							0.05	0.05	0.05	0.05						X			3/22/2016	2:1	0	1:1	0	2:1	0.1	2:1	0.1	1:1	0
66			27	75	B	2	SR-B	Figure 3H	Yadkin	03040104	UT to Little River	270+50 LT/	1107.00	985	982	1023	10	11.30													3/22/2016	2:1	1964.6	1:1	982.3	2:1	0	2:1	0	1:1	0
67			29	77	B	2	SW-B	Figure 3H	Yadkin	03040104	UT to Little River	-L- 294+00	1646.00	998	971	1643	10	13.30													3/22/2016	2:1	1942	1:1	971	2:1	0	2:1	0	1:1	0
68			30	77	B	2	SZ-B	Figure 3H	Yadkin	03040104	UT to Little River	-L- 296+50	1443.00	1226	1161	1311	20	26.20													3/22/2016	2:1	2322	1:1	1161	2:1	0	2:1	0	1:1	0
69			48	119	B	2	SAA-B	Figure 3H	Yadkin	03040104	UT to Little River	Y5- 40+65	2361.00	229	334	234	10	20.60													3/22/2016	2:1	668.6	1:1	334.3	2:1	0	2:1	0	1:1	0
70			48	119	B	2	WYY-B	Figure 3H	Yadkin	03040104	bottomland Hardwood Forest	Y5- 43+00 LT							0.34	0.00		0.00									3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
71			48	119	B	2	WXX-B	Figure 3H	Yadkin	03040104	bottomland Hardwood Forest	5- 40+20 LT/RT							2.54	1.08	1.05	0.95									3/22/2016	2:1	0	1:1	0	2:1	2.096	2:1	2.096	1:1	0
72							WXX-B														0.17									3/22/2016				0						
73			49	119	B	2	SWW-B	Figure 3H	Yadkin	03040104	UT to Little River	Y5- 40+65 L	1359.00	67	100	53	10	10.00													3/22/2016	2:1	199.2	1:1	99.6	2:1	0	2:1	0	1:1	0
74			28	77	B	2	SWW-B	Figure 3H	Yadkin	03040104	UT to Little River	Y4RPD- 19+60		528	520	268	10	10.00													3/22/2016	2:1	1040	1:1	520	2:1	0	2:1	0	1:1	0
75			31	83	B	2	WP-B	Figure 3I	Yadkin	03040104	Headwater Forest	L- 329+50 LT							0.10	0.00	0.004	0.00					0.00				3/22/2016	2:1	0	1:1	0	2:1	0.008	2:1	0.008	1:1	0
76							WP-B														0.004									3/22/2016				0						
77			31	83	B	2	SBB-B	Figure 3I	Yadkin	03040104	T North Prong Richland Cree	329+50 LT/	519.00	307	330	287	10	13.00													3/22/2016	1:1	330.2	1:1	330.2	2:1	0	2:1	0	1:1	0
78			32	83	B	2	SCC-B	Figure 3I	Cape Fear	03030003	T North Prong Richland Cree	L- 337+50 R	340.00	145	148	140	10	10.00													3/22/2016	2:1	147.9	1:1	147.9	2:1	0	2:1	0	1:1	0
79			33	87	B	2	SDD-B	Figure 3I	Cape Fear	03030003	T North Prong Richland Cree	355+00 LT/	829.00	547	551	522	20	28.80													3/22/2016	2:1	1101.8	1:1	550.9	2:1	0	2:1	0	1:1	0
80			34	89	B	2	SEE-B	Figure 3I	Cape Fear	03030003	T North Prong Richland Cree	361+72 LT/	731.00	506	535	486	20	29.00													3/22/2016	2:1	1070	1:1	535	2:1	0	2:1	0	1:1	0
81			35	89	B	2	SHH-B	Figure 3I	Cape Fear	03030003	T North Prong Richland Cree	364+74 LT/	702.00	317	443	326	10	21.00													3/22/2016	2:1	886	1:1	443	2:1	0	2:1	0	1:1	0
82			35	89	B	2	SFF-B	Figure 3I	Cape Fear	03030003	T North Prong Richland Cree	L- 363+80 R	209.00	107	0	75	10	0.00													3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
83			36	89	B	2	SGG-B	Figure 3I	Cape Fear	03030003	T North Prong Richland Cree	L- 367+00 R	499.00	579	581	581															3/22/2016	2:1	1161.4	1:1	580.7	2:1	0	2:1	0	1:1	0
84			37A, 37B	94	B	2	SQQ-B	re 3J (7/14 vers	Cape Fear	03030003	UT Tantraugh Branch	-LY- 11+37 -	37.00		101	0	10	70.00													3/22/2016	2:1	202	1:1	101	2:1	0	2:1	0	1:1	0
85			37B	94	B	2	WTT-B	re 3J (7/14 vers	Cape Fear	03030003	Headwater Forest	-LY- 11+37 - 12+09							0.01	0.00	0.02	0.00						X			3/22/2016	2:1	0	1:1	0	2:1	0.0306	2:1	0.0306	1:1	0
86			104	94	B	2	WSS-B	re 3J (7/14 vers	Cape Fear	03030003	Headwater Forest	Y9FLY-10+00							0.03	0.00		0.00									3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
87					B	2	WRR-B	re 3J (7/14 vers	Cape Fear	03030003	Headwater Forest	RFLY- 27+30 LT							0.02	0.01											3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
88					B	2	WQQ-B	re 3J (7/14 vers	Cape Fear	03030003		-SERRD4- 19+60 LT/RT							0.01	0.03											3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
89				94	B	2	SPP1-B	NA	Cape Fear	03030003		-SERRD1- 12+90																		3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
90			104	94	B	2	SPP-B	re 3J (7/14 vers	Cape Fear	03030003	UT Tantraugh Branch	RD4- 19+60	687.00	125	345			49.00													3/22/2016	2:1	690	1:1	345	2:1	0	2:1	0	1:1	0
91			38A, 38B, 38C	94	B	2	WU-B	Figure 3J	Cape Fear	03030003	bottomland Hardwood Forest	L- 409+18 LT							4.64	1.59	1.60	1.77									3/22/2016	2:1	0	1:1	0	2:1	3.2	2:1	3.2	1:1	0
92							WU-B														0.16									3/22/2016				0						
93					B	2	SKK-B	Figure 3J	Cape Fear	03030003	Tantraugh Branch	L- 410+00 L	2530.00	0	0	0															3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
94			38B	94	B	2	SII-B	Figure 3J	Cape Fear	03030003	UT Tantraugh Branch	408+50 LT/	1305.00	505	481	416	10	20.60													3/22/2016	2:1	961.6	1:1	480.8	2:1	0	2:1	0	1:1	0
95			40	103	B	2	SKK-B	Figure 3J	Cape Fear	03030003	Tantraugh Branch	433+00 LT/RT		450	534	375	20	22.40													3/22/2016	2:1	1068	1:1	534	2:1	0	2:1	0	1:1	0
96					B	2	WNN-B	re 3M (7/14 vers	Cape Fear	03030003	bottomland Hardwood Forest	L- 434+35 LT							0.33	0.00											3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
97			41	103	B	2	WPP-B	re 3M (7/14 vers	Cape Fear	03030003	Headwater Forest	-L- 433+75							0.02	0.02	0.02	0.02						X			3/22/2016	2:1	0	1:1	0	2:1	0.0352	2:1	0.0352	1:1	0
98			41	103	B	2	WOO-B	re 3M (7/14 vers	Cape Fear	03030003	Basin Wetland	L- 435+28 CL							0.03	0.03	0.03	0.03						X			3/22/2016	2:1	0	1:1	0	2:1	0.0674	2:1	0.0674	1:1	0
99			39	103	B	2	SNN-B	re 3M (7/14 vers	Cape Fear	03030003	UT Tantraugh Branch	L- 434+00 L	159.00		3	0	10	10.60												3	3/22/2016	2:1	6.574	1:1	0.287	2:1	0	2:1	0	1:1	0
100			41	103	B	2	SLL-B	re 3M (7/14 vers	Cape Fear	03030003	UT Tantraugh Branch	L- 435+50 L	470.00	273	352	339	20	11.82													3/22/2016	2:1	703.83	1:1	351.915	2:1	0	2:1	0	1:1	0
101					B	2	WQ-B	Figure 3J	Cape Fear	03030003		-Y9A- 50+85 RT							0.06	0.01											3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
102					B	2	SKK-B	Figure 3J	Cape Fear	03030003	Tantraugh Branch	A- 51+70 LT/RT		144		68	20														3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO
6		SITE	Permit Drawing No.	NRTR Section ID	4B/4C Merger Concurrence Section ID	NRTR ID	NRTR Figure	River Basin	HUC	Stream Name/ Wetland Classification	STA	NRTR Mitigation Stream Length (ft)	Perm Fill in Surface Water (ft)	Current Design Phase Fill in Surface Water (lf)	Hearing Map Fill in Surface Water (ft)	Temp Fill in Surface Water (ft)	Current Design Temp Fill in Surace Water (LF)**	NRTR Mitigation Wetland Area (ac)	Wetland (ac)	Current Design Wetland (Ac)***	Hearing Map Wetland (ac)	NRTR Mitigation Pond Area (ac)	Pond (ac)	Current Design Pond (AC)	Hearing Map Pond (ac)	Mech. Clearing (ac.)	TOTAL TAKE Wetlands/ Ponds	Indirect Portion of Total (ac)	Bank Stabilization Portion (lf)	DATE Last Revision	Ratio*	Mitigation (ft)	Ratio	Mitigation (ft)	Ratio	Mitigation (ac)	Ratio	Mitigation (ac)	Ratio	Mitigation (ac)
141	SECTION 3	74	189	C	3A	SQ-C	Figure 3P	Cape Fear	03030003	Squirrel Creek	610+55 LT/	1333.00		306	380		130.00													3/22/2016	2:1	612	1:1	306	2:1	0	2:1	0	1:1	0
142		75	189	C	3A	SS-C	Figure 3P	Cape Fear	03030003	UT to Squirrel Creek	L- 612+00 L	2066.00	230	277	306	20	48.00													3/22/2016	2:1	554	1:1	277	2:1	0	2:1	0	1:1	0
143				C	3A	SW-C	Figure 3Q	Cape Fear	03030003	UT to Squirrel Creek	L- 635+38 L	99.00																	3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
144		77	193	C	3A	PD-C	Figure 3Q	Cape Fear	03030003	POND	L- 640+00 LT											1.00		1.14	0.06		X			3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	1.14
145		78	193	C	3A	WJ-C	Figure 3Q	Cape Fear	03030003	Basin Wetland	L- 641+50 LT							0.15	0.02	0.14	0.08						X			3/22/2016	2:1	0	1:1	0	2:1	0.28	2:1	0.28	1:1	0
146		76/76A/78/82	193	C	3A	SV-C	Figure 3Q	Cape Fear	03030003	UT to Squirrel Creek/POND	L- 642+25 L	69.00		649	618		20.00							0.99						3/22/2016	1:1	649	1:1	649	2:1	0	2:1	0	1:1	0.99
147		80	193	C	3A	PE-C	Figure 3Q	Cape Fear	03030003	POND	L- 644+70 LT											0.66	0.66	0.56	0.28		X			3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0.56
148		79	197	C	3A	WG-C	Figure 3Q	Cape Fear	03030003	Basin Wetland	645+50 L T/RT							0.03	0.03	0.03	0.04						X			3/22/2016	2:1	0	1:1	0	2:1	0.06	2:1	0.06	1:1	0
149		82	197	C	3A	WH-C	Figure 3Q	Cape Fear	03030003	Headwater Forest	L- 645+75 LT							0.05	0.04	0.03	0.03						X			3/22/2016	2:1	0	1:1	0	2:1	0.06	2:1	0.06	1:1	0
150		82	197	C	3A	WF-C	Figure 3Q	Cape Fear	03030003	Headwater Forest	L- 647+50 RT							0.27	0.12	0.12	0.26									3/22/2016	2:1	0	1:1	0	2:1	0.24	2:1	0.24	1:1	0
151						WF-C														0.02										3/22/2016				0		0.04		0.04		
152		83	197	C	3A	WE-C	Figure 3Q	Cape Fear	03030003	Headwater Forest	3- 14+00 LT/RT							0.10	0.10	0.10	0.10						X			3/22/2016	2:1	0	1:1	0	2:1	0.2	2:1	0.2	1:1	0
153		81	197	C	3A	WI-C	Figure 3Q	Cape Fear	03030003	Headwater Forest	L- 644+75 RT							0.04	0.03	0.04	0.03						X			3/22/2016	2:1	0	1:1	0	2:1	0.08	2:1	0.08	1:1	0
154		85	206	C	3B	SX-C	Figure 3R	Cape Fear	03030003	UT to Gabriels Creek	670+00 LT/	946.00	287	318	383	20	101.00													3/22/2016	2:1	636	1:1	318	2:1	0	2:1	0	1:1	0
155		85	206	C	3B	WL-C	Figure 3R	Cape Fear	03030003	Headwater Forest	L- 670+00 RT							0.10	0.07	0.05	0.10									3/22/2016	2:1	0	1:1	0	2:1	0.1	2:1	0.1	1:1	0
156						WL-C														0.02										3/22/2016				0		0.04		0.04		
157		84	206	C	3B	WK-C	Figure 3R	Cape Fear	03030003	Headwater Forest	L- 670+00 RT							0.01	0.01	0.02	0.01						X			3/22/2016	2:1	0	1:1	0	2:1	0.04	2:1	0.04	1:1	0
158		101/102/103	244	C	3B	SBB-C/SAA-C	Figure 3R	Cape Fear	03030003	UT to Gabriels Creek	YA- 23+50 L	262.00	103	153	181	20	77.00												15	3/22/2016	2:1	306	1:1	138	2:1	0	2:1	0	1:1	0
159		90	221	C	3B	SNN-C/WV-C/WU-C	Figure 3R	Cape Fear	03030003	Gabriels Creek	PB- 22+00	2223.00	260	461	482	125	120.00			0.01	0.02						X			3/22/2016	2:1	922	1:1	461	2:1	0.02	2:1	0.02	1:1	0
160		88	221	C	3B	WAA-C	Figure 3S	Cape Fear	03030003	Bottomland Hardwood Forest	PB- 20+00 LT/RT							0.41	0.34	0.14	0.28									3/22/2016	2:1	0	1:1	0	2:1	0.28	2:1	0.28	1:1	0
161						WAA-C														0.07										3/22/2016				0		0.14		0.14		
162				C	3B	WX-C	Figure 3S	Cape Fear	03030003		Y17- 28+00 RT							0.25	0.21		0.23									3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
163		93	221	C	3B	WW-C	Figure 3S	Cape Fear	03030003	Bottomland Hardwood Forest	LPD- 34+00 LT							1.41	0.97	0.05	1.25									3/22/2016	2:1	0	1:1	0	2:1	0.1	2:1	0.1	1:1	0
164						WW-C														0.03										3/22/2016				0		0.06		0.06		
165		87	213	C	3B	SCC/SEE-C	Figure 3S	Cape Fear	03030003	UT to Gabriels Creek	697+00 LT/	1055.00	197	146	308	20	66.00												65	3/22/2016	2:1	292	1:1	81	2:1	0	2:1	0	1:1	0
166				C	3B	WY-C	Figure 3S	Cape Fear	03030003		L- 696+15 LT							0.13	0.01		0.05									3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
167		97/98	235	C	3B	SFF/SKK-C	Figure 3S	Cape Fear	03030003	UT to Gabriels Creek	723+50 LT/	457.00	208	240	378	40	92.00													3/22/2016	2:1	480	1:1	240	2:1	0	2:1	0	1:1	0
168		96	235	C	3B	SMM-C	Figure 3S	Cape Fear	03030003	UT to Gabriels Creek	L- 723+00 L	219.00	39	124	136	10	18.00													3/22/2016	2:1	248	1:1	124	2:1	0	2:1	0	1:1	0
169		100	239	C	3B	SGG-C	Figure 3S	Cape Fear	03030003	UT Mill Creek	L- 737+84 R	325.00		227			11.00													3/22/2016	2:1	454	1:1	227	2:1	0	2:1	0	1:1	0
170				C	3B	SZZ-C	Figure 3S	Cape Fear	03030003	UT Mill Creek	L- 765+50 L	644.00	127			47														3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
171				C	3B	WSA-C	Figure 3S	Cape Fear	03030003		L- 765+50 LT							0.35												3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
172				C	3B	SII-C	Figure 3S	Cape Fear	03030003	UT Mill Creek	L- 765+50 RT		124		143	30			0.15											3/22/2016	2:1	0	1:1	0	2:1	0	2:1	0	1:1	0
173		94	221	C	3B	SNN-C		Cape Fear	03030003	Gabriels Creek	LY- 46+50 LT/RT			178			105.00													3/22/2016	2:1	356	1:1	178	2:1	0	2:1	0	1:1	0
174		95	221	C	3B	WTA-C		Cape Fear	03030003	Bottomland Hardwood Forest	FLY- 49+00 RT									0.01	0.22									3/22/2016	2:1	0	1:1	0	2:1	0.02	2:1	0.02	1:1	0
175		92	221	C	3B	WTA-C		Cape Fear	03030003	Bottomland Hardwood Forest	17- 45+00 LT									0.04										3/22/2016	2:1	0	1:1	0	2:1	0.08	2:1	0.08	1:1	0
176		89	221	C	3B	SNN-C		Cape Fear	03030003	Gabriels Creek	RS- 15+50 LT/RT			57			31.00											57	3/22/2016	2:1	114	1:1	0	2:1	0	2:1	0	1:1	0
177		86	213	C	3B	WZ-C		Cape Fear	03030003	Headwater Forest	17FLY- LT/RT									0.03						X				3/22/2016	2:1	0	1:1	0	2:1	0.06	2:1	0.06	1:1	0
178		90	221	C	3B	SNN-C		Cape Fear	03030003	Gabriels Creek	17- 41+00 LT			20			32.00											20	3/22/2016	2:1	40	1:1	0	2:1	0	2:1	0	1:1	0
179		91	221	C	3B	SNN-C		Cape Fear	03030003	Gabriels Creek	17- 44+57 LT			13			23.00												3/22/2016	2:1	26	1:1	13	2:1	0	2:1	0	1:1	0
180		99	239	C	3B	WT-C		Cape Fear	03030003	Basin Wetland	R6- 24+00 LT									0.01										3/22/2016	2:1	0	1:1	0	2:1	0.02	2:1	0.02	1:1	0
181						WT-C														0.01											2:1	0	1:1	0	2:1	0.02	2:1	0.02	1:1	0
182																																								
183		**Total**										**65442.00**	**26309.00**	**31991.66**	**29478.44**	**1532.00**	**2841.21**	**15.69**	**7.20**	**6.46**	**7.34**	**4.28**	**3.28**	**10.54**	**3.32**	**0.05**			**232**			**61262.366**		**31759.661**		**12.2626**		**12.2626**		**10.5404**
184													-																											
185											**EEP Acceptance I**	**31817.00**		31,817				**8.875**		**8.875**																				
186		*All mitigation ratios based on DMS supplying mitigation credits. There is no On-Site Mitigation "Scope of Work" for entire project limits (R-2536).																																						
187		** Temp Fill in Surface water captures Bank Stabilization below 150 feet in length. No mitigation required by DWR or USACE.																																						
188		*** Calculations include permanent impacts for fill, excavation, and mechanized land clearing.																																						

Appendix 3: Permit Drawings

North Carolina Department of Transportation

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FOR NCDOT PROJECTS

(Version 2.03; Released October 2015)

General Project Information

WBS Element:	34450.3.S1	**TIP Number:**	R-2536 Section 1A	**Project Type:**	New Location	**Date:**	12/15/2015
NCDOT Contact:	Matthew Lauffer, P.E.			**Contractor / Designer:**	Asheboro Bypass Constructors, LLC/ RK&K: Jeff Meador, PE		
Address:	NCDOT Hydraulics Unit 1590 Mail Service Center Raleigh, NC 27699-1590			**Address:**	900 Ridgefield Drive, Suite 350 Raleigh, NC 27609		
Phone:	919-707-6703			**Phone:**	919-878-9560		
Email:	mslauffer@ncdot.gov			**Email:**	jmeador@rkk.com		
City/Town:	Asheboro			**County(ies):**	Randolph		
River Basin(s):	Yadkin-Pee Dee	Cape Fear		**CAMA County?**	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	2.5 Miles	**Surrounding Land Use:**	Agriculture, Residential, Commercial		
	Proposed Project			**Existing Site**	
Project Built-Upon Area (ac.)	71.6 ac.			9.2 ac.	
Typical Cross Section Description:	Grassed ditch median with 6:1 side slopes. 4 paved lanes (total 48' wide) 12' shoulder on each side (15' with guardrail), 4' paved. Varying fill and cut slopes (see project XSC's for detailed information).			US 64 (beg. to end): 2 lanes (total 24' wide), 4-10' shoulders (13' with guardrail), (11' with guardrail), 2' paved.	
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 18,800	Year: 2040		Existing: 12,600	Year: 2015
General Project Narrative: (Description of Minimization of Water Quality Impacts)	The North Carolina Department of Transportation (NCDOT) has proposed to construct a bypass for US 64 in Asheboro, NC. There is one proposed major structure involved with the construction of design section 1A. The proposed structure, on Cable Creek, is a 2@8'x8' Reinforced Concrete Box Culvert (RCBC). The culvert will be buried 1' below the channel to allow for aquatic passage. One of the two barrels has a high flow sill to restrict normal flow to just one barrel of the culvert. The width of the barrel carrying normal stream flow matches the existing channel width at this location. The structures has been designed to have as little environmental and surface water impacts as possible. Channel improvements were made for the proposed box culvert designs. Excavation was kept to a minimum and proposed stream channels were tied into the existing stream with as little impact as possible. Where excavation is necessary, coir fiber matting and rip-rap were utilized for bank stabilization in an attempt to reduce sediment transport and streambank erosion. Velocities at jurisdictional features are nonerosive. All of design section 1a is within the Yadkin River Basin.				

Waterbody Information

Surface Water Body (1):	UT to Back Creek		**NCDWR Stream Index No.:**	13-2-3-3-3-(1.5)	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	Yes	Comments:			
NRTR Stream ID:	SB-AA			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

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Additional Waterbody Information

Surface Water Body (2):	UT to Cable Creek		**NCDWR Stream Index No.:**	13-2-3-3-3		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SD-AA			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (3):	UT to Cable Creek		**NCDWR Stream Index No.:**	13-2-3-3-3		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SAA-AA			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (4):	UT to Cable Creek		**NCDWR Stream Index No.:**	13-2-3-3-3		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	Yes	Comments:				
NRTR Stream ID:	SE-AA			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (5):	UT to Cable Creek		**NCDWR Stream Index No.:**	13-2-3-3-3		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SM-AA			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

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(Version 2.03; Released October 2015)

WBS Element:	34450.3.S1	TIP No.:	R-2536 Section 1A	County(ies):	Randolph	Page	3	of	3

Additional Waterbody Information

Surface Water Body (6):	UT to Cable Creek			**NCDWR Stream Index No.:**	13-2-3-3-3				
NCDWR Surface Water Classification for Water Body			**Primary Classification:**	Class C					
			Supplemental Classification:	None					
Other Stream Classification:									
Impairments:									
Aquatic T&E Species?	No	Comments:							
NRTR Stream ID:	SZZ-AA				**Buffer Rules in Effect:**	N/A			
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A		**Dissipator Pads Provided in Buffer?**	N/A			
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)			(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)				
(If yes, provide justification in the General Project Narrative)									

Surface Water Body (7):	Cable Creek			**NCDWR Stream Index No.:**	13-2-3-3-3				
NCDWR Surface Water Classification for Water Body			**Primary Classification:**	Class C					
			Supplemental Classification:	None					
Other Stream Classification:									
Impairments:									
Aquatic T&E Species?	No	Comments:							
NRTR Stream ID:	SG-AA				**Buffer Rules in Effect:**	N/A			
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A		**Dissipator Pads Provided in Buffer?**	N/A			
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)			(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)				
(If yes, provide justification in the General Project Narrative)									

Surface Water Body (8):	UT to Cable Creek			**NCDWR Stream Index No.:**	13-2-3-3-3				
NCDWR Surface Water Classification for Water Body			**Primary Classification:**	Class C					
			Supplemental Classification:	None					
Other Stream Classification:									
Impairments:									
Aquatic T&E Species?	No	Comments:							
NRTR Stream ID:	SH-AA				**Buffer Rules in Effect:**	N/A			
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A		**Dissipator Pads Provided in Buffer?**	N/A			
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)			(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)				
(If yes, provide justification in the General Project Narrative)									

Surface Water Body (9):	UT to Cable Creek			**NCDWR Stream Index No.:**	13-2-3-3-3				
NCDWR Surface Water Classification for Water Body			**Primary Classification:**	Class C					
			Supplemental Classification:	None					
Other Stream Classification:									
Impairments:									
Aquatic T&E Species?	No	Comments:							
NRTR Stream ID:	SK-AA				**Buffer Rules in Effect:**	N/A			
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A		**Dissipator Pads Provided in Buffer?**	N/A			
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)			(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)				
(If yes, provide justification in the General Project Narrative)									

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General Project Information

WBS Element:	34450.3.S1	**TIP Number:**	R-2536 Section 1B	**Project Type:**	New Location	**Date:**	11/10/2015
NCDOT Contact:	Matthew Lauffer, P.E.			**Contractor / Designer:**	Asheboro Bypass Constructors, LLC/ RK&K: Jeff Meador, PE		
	Address: NCDOT Hydraulics Unit 1590 Mail Service Center Raleigh, NC 27699-1590				**Address:** 900 Ridgefield Drive, Suite 350 Raleigh, NC 27609		
	Phone: 919-707-6703				**Phone:** 919-878-9560		
	Email: mslauffer@ncdot.gov				**Email:** jmeador@rkk.com		
City/Town:	Asheboro			**County(ies):**	Randolph		
River Basin(s):	Yadkin-Pee Dee	Cape Fear		**CAMA County?**	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	2.5 Miles	**Surrounding Land Use:**	Agriculture, Residential, Commercial

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	42.5 ac.	6.5 ac.
Typical Cross Section Description:	Grassed ditch median with 6:1 side slopes. 4 paved lanes (total 48' wide) 12' shoulder on each side (15' with guardrail), 4' paved. Varying fill and cut slopes (see project XSC's for detailed information).	NC 49 (beg. to 64+55): shoulder section, 4 lanes (total 48' wide), 10' shoulders (13' with guardrail), 4' paved. NC 49 (64+55 to end): curb and gutter section, 4 lanes (total 48' wide), 10' grass berms. Old NC 49: shoulder section, 2 lanes (total 24' wide), 8' shoulders (11' with guardrail), 2' paved.
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 18,800 Year: 2040	Existing: 12,600 Year: 2015

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

The North Carolina Department of Transportation (NCDOT) has proposed to construct a bypass for US 64 in Asheboro, NC. There are two proposed major structures involved with the construction of design section 1B. The first proposed structure, on Taylor's Creek, is a 2@8'x8' Reinforced Concrete Box Culvert (RCBC). The culvert will be buried 1' below the channel to allow for aquatic passage. One of the two barrels has a high flow sill to restrict normal flow to just one barrel of the culvert. The width of the barrel carrying normal stream flow matches the existing channel width at this location. The second structure is also on Taylor's Creek and is an extension of an existing 6'x5' RCBC on both the upstream and downstream side. The proposed culvert extensions will not be buried below the stream bed since the existing culvert is not burried. Taylor's Creek is not included in a FEMA study in the vicinity of the project. These structures have been designed to have as little environmental and surface water impacts as possible. Channel improvements were made for the proposed box culvert designs. Excavation was kept to a minimum and proposed stream channels were tied into the existing stream with as little impact as possible. Where excavation is necessary, coir fiber matting and rip-rap were utilized for bank stabilization in an attempt to reduce sediment transport and streambank erosion. Velocities at jurisdictional features are nonerosive. All of design section 1B is within the Yadkin River Basin.

Waterbody Information

Surface Water Body (1):	UT to Taylors Creek			**NCDWR Stream Index No.:**	13-2-3-5		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**		Class C			
		Supplemental Classification:		None			
Other Stream Classification:							
Impairments:							
Aquatic T&E Species?	Yes	Comments:					
NRTR Stream ID:	SJ-AA				**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A		**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)			(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)							

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Additional Waterbody Information

Surface Water Body (2):	UT to Taylors Creek		**NCDWR Stream Index No.:**	13-2-3-5		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	Si-AA/SO-AB			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (3):	Taylors Creek		**NCDWR Stream Index No.:**	13-2-3-5		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SM-AB			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (4):	UT to Taylors Creek		**NCDWR Stream Index No.:**	13-2-3-5		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	Yes	Comments:				
NRTR Stream ID:	SL-AB			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (5):	UT to Taylors Creek		**NCDWR Stream Index No.:**	13-2-3-5		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SK-AB			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

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WBS Element: 34450.3.S1 **TIP No.:** R-2536 Section 1B **County(ies):** Randolph

Additional Waterbody Information

Surface Water Body (6):	UT to Taylors Creek		**NCDWR Stream Index No.:**	13-2-3-5		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SI-AB			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (7):	UT to Taylors Creek		**NCDWR Stream Index No.:**	13-2-3-5		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SJ-AB			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (8):	UT to Taylors Creek		**NCDWR Stream Index No.:**	13-2-3-5		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SF-AB			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (9):	UT to Taylors Creek		**NCDWR Stream Index No.:**	13-2-3-5		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SH-AB			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

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General Project Information

WBS Element:	34450.3.S2	**TIP Number:**	R-2536 Section 2	**Project Type:**	New Location	**Date:**	12/3/2015
NCDOT Contact:	Matthew Lauffer, P.E.			**Contractor / Designer:**	Asheboro Bypass Constructors, LLC/ RK&K: Matt Cook, PE		
	Address: NCDOT Hydraulics Unit 1590 Mail Service Center Raleigh, NC 27699-1590				**Address:** 900 Ridgefield Drive, Suite 350 Raleigh, NC 27609		
	Phone: 919-707-6703				**Phone:** 919-878-9560		
	Email: mslauffer@ncdot.gov				**Email:** mcook@rkk.com		
City/Town:	Asheboro			**County(ies):**	Randolph		
River Basin(s):	Yadkin-Pee Dee	Cape Fear		**CAMA County?**	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	4.8 Miles	**Surrounding Land Use:**	Agriculture, Residential, Commercial

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	110.2 ac.	19.3 ac.
Typical Cross Section Description:	Grassed ditch median with 6:1 side slopes. 4 paved lanes (total 48' wide) 12' shoulder on each side (15' with guardrail), 4' paved. Varying fill and cut slopes (see project XSC's for detailed information).	Mack Rd: shoulder sec., (2)12' lanes. US HWY 220: 4-Lane div. (48' wide). Southmont Dr.: shoulder sec., (2)11' lanes. US 220 Bus.: shoulder sec., (2)12' lanes. Pastureview Rd: shoulder sec., (2)10' lanes. Old Cox Rd: shoulder sec., (2)12' lanes. Staley's Farm Rd.: shoulder sec., (2)12' lanes. NC 159 Zoo Parkway: shoulder sec., (2)12' lanes.
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 18,800 Year: 2040	Existing: 12,600 Year: 2015
General Project Narrative: (Description of Minimization of Water Quality Impacts)	The North Carolina Department of Transportation (NCDOT) has proposed to construct a bypass for US 64 in Asheboro, NC. There are 9 proposed major structures and two proposed stormwater ponds involved with the construction of design section 2. The first proposed structure (B6), over Little River, is a two span, dual bridge (1@85'-6", 1@112'-10") that minimizes impacts to Little River. The second proposed structure (C300), on UT to Big Branch, is a 2@ 7'x7' Reinforced Concrete Box Culvert buried 1'. Normal flow is restricted to one barrel with sills and alternating baffles are used in the low flow barrel to match the existing stream width. The third proposed structure (C250), on UT to Little River, is an extension of a 4'x5' Reinforced Concrete Box Culvert. The extension is angled to tie as close as possible to the existing stream location. The fourth proposed structure (C301), on UT to Big Branch, is a 3@ 10'x7' Reinforced Concrete Box Culvert buried 1'. Normal flow is restricted to one barrel with sills and alternating baffles are used in the low flow barrel to match the existing stream width. The fifth proposed structure (C350), on UT to North Prong Richland Creek is a 6'x7' Reinforced Concrete Box Culvert buried 1'. Sills will be used at the inlet and outlet to retain native material. The sixth proposed structure (C400), on North Prong Richland Creek, is a 2@ 14'x10' Reinforced Concrete Box Culvert buried 1'. Normal flow is restricted to one barrel with sills and alternating baffles are used in the low flow barrel to match the existing stream width. The seventh proposed structure (C440), on UT to South Prong Richland Creek, is a 6'x7' Reinforced Concrete Box Culvert buried 1'. The eighth proposed structure (C470), on UT to Tantraugh Branch, is a 6'x7' Reinforced Concrete Box Culvert buried 1'. The ninth proposed structure (C500), on Tantraugh Branch, is a 3@ 9'x7' Reinforced Concrete Box Culvert buried 1'. Normal flow is restricted to one barrel with sills and alternating baffles are used in the low flow barrel to match the existing stream width. There are two stormwater ponds proposed along the project, located at the interchange with -Y4- US 220 and the interchange with the (-Y9-) Zoo connector. All of the major structures have been designed to have as little environmental and surface water impacts as possible. Channel improvements were made for the proposed box culvert designs. Excavation was kept to a minimum and proposed stream channels were tied into the existing stream with as little impact as possible. Where excavation is necessary, coir fiber matting and rip-rap were utilized for bank stabilization in an attempt to reduce sediment transport and streambank erosion. Velocities at jurisdictional features are nonerosive and 2:1 fill slopes were used in jurisdictional area to minimize impacts. Design section 2 is within the Yadkin River Basin and the Cape Fear River Basin, separation is located near the proposed US 220 Business (-Y6-).	

Waterbody Information

Surface Water Body (1):	UT to Little River		**NCDWR Stream Index No.:**	13-25-(1)	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SU-B, SC-AB, SA-AB, SR-B, SWW-B, SS-B			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

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Additional Waterbody Information

Surface Water Body (2):	Little River		**NCDWR Stream Index No.:**	13-25-(1)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	Little River			**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)						

Surface Water Body (3):	UT to Big Branch		**NCDWR Stream Index No.:**	13-25-(1)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SZ-B			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (4):	UT to North Prong Richland Creek		**NCDWR Stream Index No.:**	17-22-1		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SHH-B, SGG-B, SBB-B, SCC-B, SDD-B, SEE-B, SH-D			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (5):	North Prong Richland Creek		**NCDWR Stream Index No.:**	17-22-1		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SG-D			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

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WBS Element: 34450.3.S2 **TIP No.:** R-2536 Section 2 **County(ies):** Randolph

Additional Waterbody Information

Surface Water Body (6):	UT to South Prong Richland Creek		**NCDWR Stream Index No.:**	17-22-2		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SC-D/SD-D, SF-D			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (7):	UT to Tantraugh Branch		**NCDWR Stream Index No.:**	17-22-3		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SII-B, SNN-B,SLL-B, SPP-B, SQQ-B			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (8):	Tantraugh Branch		**NCDWR Stream Index No.:**	17-22-3		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SKK-B			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (9):	UT to Vestal Creek		**NCDWR Stream Index No.:**	17-22-4		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SC-C			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

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WBS Element: **TIP No.:** R-2536 Section 2 **County(ies):** Randolph

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
21	-L- 250+20 LT	(2)Little River	PSH	Class 'B'	1.6	Pipe	18	6.8	1.2	No
31	-L- 408+00 LT	(7)UT to Tantraugh	PSH	Class 'B'	0.8	Pipe	15	2.9	0.9	No
75	-Y5- 42+23 RT	(1)UT to Little River	PSH	Class 'B'	0.3	Pipe	15	1.4	0.7	No

Additional Comments

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

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WBS Element: 34450.3.S2 **TIP No.:** R-2536 Section 2 **County(ies):** Randolph

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?
70	-Y4- 60+40 LT (US 220 Interchange)	(1)UT to Little River	Dry Detention Basin	15.5	1.5	1.024	8.51	No
30	-Y9FLY- 21+50 LT (Zoo Connector Interchange)	(8)Tantraugh Branch	Dry Detention Basin	17.4	3.2	1.234	4.81	No

Additional Comments

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(Version 2.02; Released April 2015)

WBS Element: 34450.3.S1 **TIP No.:** R-2536 Section 3 **County(ies):** Randolph

General Project Information

WBS Element:	34450.3.S1	**TIP Number:**	R-2536 Section 3A	**Project Type:**	New Location
NCDOT Contact:	Matthew Lauffer, PE	**Contractor / Designer:**	Trent Cormier, PE, CPESC, CPSWQ	**Date:**	11/6/2015
Address:	NCDOT Hydraulics Unit 1590 Mail Service Raleigh, NC 27699-1590	**Address:**	ICA Engineering 5121 Kingdom Way, Suite 100 Raleigh, NC 27607		
Phone:	(919) 707-6703	**Phone:**	(919) 900-1608		
Email:	mslauffer@ncdot.gov	**Email:**	trenton.cormier@hdrinc.com		
City/Town:	Asheboro	**County(ies):**	Randolph		
River Basin(s):	Cape Fear	**CAMA County?**	No		
Wetlands within Project Limits?	Yes				

Project Description

Project Length (lin. miles or feet):	3.842 miles	**Surrounding Land Use:**	Agricultural, Low Residential and Commercial

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	48.0 ac.	4.9 ac.
Typical Cross Section Description:	Grassed ditch median with 6:1 side slopes. 4 paved lanes (total 48' wide) 12' shoulder on each side (15' with guardrail), 4' paved. Varying fill and cut slopes (see project XSC's for detailed information).	NC HWY 42: open shoulder section, 2 paved lane (total 24' wide); Luck Road (SR 2604), Pine Hill Road (SR 2824) & Fleta Brown Road (SR 2827): open shoulder section, 2 paved lane (total 20' wide); Miles Moffit Road (SR 2828): open shoulder section, 2 paved lane (total 19' wide).
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 18,800 Year: 2040	Existing: 12,600 Year: 2015

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

The North Carolina Department of Transportation (NCDOT) has proposed to construct a bypass for US 64 in Asheboro, NC. There are five proposed major structures involved with the construction of the US 64 Bypass, all of which will be constructed at new stream crossing locations. The first proposed structure, over Vestal Creek, is a two span, dual bridge (1@81', 1@114'), 56" pre-stressed concrete MBT (modified bulb tee) girders with 4' end bent caps. This structure will utilize a 66" RCP as an overflow structure. The proposed bridge will have spill through abutments. In the project limits, Vestal Creek is a FEMA limited detailed studied stream with non-encroachment widths established. Regulatory floodways are not delineated on the FIRM and flood profiles have not been developed. The second proposed structure, on UT to Vestal Creek, is a 2@9'x6' Reinforced Concrete Box Culvert (RCBC) UT to Vestal Creek is not a FEMA detailed studied stream as listed in the effective Randolph County FIS. The third major structure, on Squirrel Creek, is a 3@10'x7' RCBC. Squirrel Creek is not a FEMA detailed studied stream as listed in the effective Randolph County FIS. The fourth major structure, on UT to Vestal Creek, is a 1@6'x7' RCBC. UT to Vestal Creek is not a FEMA detailed studied stream as listed in the effective Randolph County FIS. The fifth major structure, on UT to Vestal Creek, is a 1@6'x7' RCBC. UT to Vestal Creek is not a FEMA detailed studied stream as listed in the effective Randolph County FIS. These structures have been designed to have as little environmental and surface water impacts as possible. Channel improvements were made for the proposed box culvert designs. Excavation was kept to a minimum and proposed stream channels were tied into the existing stream with as little impact as possible. Where excavation is necessary, coir fiber matting and rip-rap were utilized for bank stabilization in an attempt to reduce sediment transport and streambank erosion. Throughout the project, multiple Preformed Scour Holes have been utilized for energy dissipation purposes. Grassed swales were used for treatment when BMP design standards could be met. Velocities at jurisdictional features are non-erosive. Raised OTCB's were placed along NC Highway 42 to reduce sediment transport. 20,460 LF of grassed swales were used to reduce flow velocity, promote sedimentation, infiltration and runoff attenuation.

Waterbody Information

Surface Water Body (1):	UT to Vestal Creek/SD-C	**NCDWR Stream Index No.:**	17-22-4		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SD-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the	

(If yes, provide justification in the General Project Narrative)				General Project Narrative)	

WBS Element: 34450.3.S1 **TIP No.:** R-2536 Section 3 **County(ies):** Randolph

Additional Waterbody Information

Surface Water Body (2):	UT to Vestal Creek/PB-C	**NCDWR Stream Index No.:**	17-22-4		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	PB-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	No
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)					

Surface Water Body (3):	Vestal Creek	**NCDWR Stream Index No.:**	17-22-4		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SG-C			**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)					

Surface Water Body (4):	UT to Vestal Creek/SF-C	**NCDWR Stream Index No.:**	17-22-4		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SF-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	No
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 (5):	UT to Vestal Creek/SE-C	**NCDWR Stream Index No.:**	17-22-4		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SE-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

WBS Element: 34450.3.S1 **TIP No.:** R-2536 Section 3 **County(ies):** Randolph

Additional Waterbody Information

Surface Water Body (6):	UT to Vestal Creek/SH-C		**NCDWR Stream Index No.:**	17-22-4	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SH-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (7):	UT to Vestal Creek/SI-C/SYY-C		**NCDWR Stream Index No.:**	17-22-4	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SI-C/SYY-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (8):	UT to Vestal Creek/SJ-C		**NCDWR Stream Index No.:**	17-22-4	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SJ-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (9):	UT to Squirrel Creek/SK-C		**NCDWR Stream Index No.:**	17-22-6	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SK-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

WBS Element: 34450.3.S1 **TIP No.:** R-2536 Section 3 **County(ies):** Randolph

Additional Waterbody Information

Surface Water Body (10):	UT to Squirrel Creek/SL-C		**NCDWR Stream Index No.:**	17-22-6	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SL-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (11):	UT to Squirrel Creek/SM-C		**NCDWR Stream Index No.:**	17-22-6	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SM-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (12):	UT to Squirrel Creek/SN-C		**NCDWR Stream Index No.:**	17-22-6	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SN-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (13):	UT to Squirrel Creek/SO-C		**NCDWR Stream Index No.:**	17-22-6	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SO-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

WBS Element: 34450.3.S1 **TIP No.:** R-2536 Section 3 **County(ies):** Randolph

Additional Waterbody Information

Surface Water Body (14):	Squirrel Creek		**NCDWR Stream Index No.:**	17-22-6	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SQ-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (15):	UT to Squirrel Creek/SS-C		**NCDWR Stream Index No.:**	17-22-6	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SS-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (16):	UT to Squirrel Creek/SU-C		**NCDWR Stream Index No.:**	17-22-6	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SU-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (17):	UT to Squirrel Creek/SW-C		**NCDWR Stream Index No.:**	17-22-6	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SW-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

WBS Element: 34450.3.S1 **TIP No.:** R-2536 Section 3 **County(ies):** Randolph

Additional Waterbody Information

Surface Water Body (18):	UT to Squirrel Creek/PD-C		**NCDWR Stream Index No.:**	17-22-6	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	PD-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (19):	UT to Squirrel Creek/PE-C		**NCDWR Stream Index No.:**	17-22-6	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	PE-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (20):	UT to Squirrel Creek/SV-C		**NCDWR Stream Index No.:**	17-22-6	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SV-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (21):	Gabriels Creek/SCC-C		**NCDWR Stream Index No.:**	17-14	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SNN-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.02; Released April 2015)

WBS Element: **TIP No.:** R-2536 Section 3 **County(ies):** Randolph

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
37	488+34 -L- RT	(4)UT to Vestal	PSH	Class 'B'	0.4	Pipe	15	2.1	0.5	No
39	505+73 -L- RT	(7)UT to Vestal	PSH	Class 'B'	1.2	Pipe	15	4.5	0.7	No
40	520+22 -L- RT	(8)UT to Vestal	PSH	Class 'B'	0.9	Pipe	15	3.2	0.6	No
41	548+28 -L- RT	(9)UT to Squirrel	PSH	Class 'B'	1.4	Pipe	18	6.0	0.7	No
46	609+74 -L- RT	(14)Squirrel Creek	PSH	Class 'B'	1.9	Pipe	18	6.3	0.8	No
48	642+54 -L- LT	(16)UT to Squirrel	PSH	Class 'B'	0.3	Pipe	15	1.7	0.4	No

Additional Comments

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

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.04; Released November 2015)

General Project Information

WBS Element:	34550.3.S1	**TIP Number:**	R-2536 Section 3B	**Project Type:**	New Location	**Date:**	12/7/2015
NCDOT Contact:	Matthew Lauffer, PE			**Contractor / Designer:**	Trent Cormier, PE, CPESC, CPSWQ		
Address:	NCDOT Hydraulics Unit 1590 Mail Service Raleigh, NC 27699-1590			**Address:**	ICA Engineering 5121 Kingdom Way, Suite 100 Raleigh, NC 27607		
Phone:	(919) 707-6703			**Phone:**	(919) 900-1608		
Email:	mslauffer@ncdot.gov			**Email:**	trenton.cormier@hdrinc.com		
City/Town:	Asheboro			**County(ies):**	Randolph		
River Basin(s):	Cape Fear			**CAMA County?**	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	14.74 mi.	**Surrounding Land Use:**	Agricultural, Low Residential and Commercial

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	32.2 ac.	14.9 ac.
Typical Cross Section Description:	Grassed ditch median with 6:1 side slopes. 4 paved lanes (total 48' wide) 12' shoulder on each side (15' with guardrail), 4' paved. Varying fill and cut slopes (see project XSC's for detailed information).	US Hwy 64: Grassed ditch median with 6:1 side slopes, 4 paved lanes (total 48' wide), 4' paved shoulder on each side. Trogdon Hill Road (SR2713): open shoulder section, 2 paved lane (total 24' wide)
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 18,800 Year: 2040	Existing: 12,600 Year: 2015

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

The North Carolina Department of Transportation (NCDOT) has proposed to construct a bypass for US 64 in Asheboro, NC. There are three proposed major structures involved with the construction of the US 64 Bypass, all of which will be constructed at new stream crossing locations. The first proposed structure, on UT to Gabriels Creek, is a 1@6'x7' Reinforced Concrete Box Culvert (RCBC). UT to Gabriels Creek is not a FEMA detailed studied stream as listed in the effective Randolph County FIS. The second proposed structure, on Gabriels Creek, is a 2@10'x8' RCBC. Gabriels Creek is a FEMA Limited Detailed studied stream with non-encroachment widths established. Regulatory floodways are not delineated on the FIRM and flood profiles have not been developed. The third proposed structure, on Gabriels Creek, is a 2@12'x8' RCBC. Gabriels Creek is a FEMA Limited Detailed Studied stream with non-encroachment widths established. Regulatory floodways are not delineated on the FIRM and flood profiles have not been developed. These structures have been designed to have as little environmental and surface water impacts as possible. Channel improvements were made for the proposed box culvert designs. Excavation was kept to a minimum and proposed stream channels were tied into the existing stream with as little impact as possible. Where excavation is necessary, coir fiber matting and rip-rap were utilized for bank stabilization in an attempt to reduce sediment transport and streambank erosion. Throughout the project, multiple Preformed Scour Holes have been utilized for enegy dissipation purpopses. Grassed swales were used for treatment when BMP design standards could be met. Velocities at jurisdictional features are non-erosive. 12,241 LF of grassed swales were used to reduce flow velocity, promote sedimentation, infiltration and runoff attenuation.

Waterbody Information

Surface Water Body (1):	UT to Gabriels Creek/SX-C		**NCDWR Stream Index No.:**	17-14	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SX-C			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.04; Released November 2015)

WBS Element:	34550.3.S1	TIP No.:	R-2536 Section 3	County(ies):	Randolph	Page	2	of	4

Additional Waterbody Information

Surface Water Body (2):	Gabriels Creek		**NCDWR Stream Index No.:**	17-14			
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C				
		Supplemental Classification:	None				
Other Stream Classification:	None						
Impairments:	None						
Aquatic T&E Species?	No	Comments:					
NRTR Stream ID:	SNN-C			**Buffer Rules in Effect:**	N/A		
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A		
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)			
(If yes, provide justification in the General Project Narrative)							

Surface Water Body (3):	UT to Gabriels Creek/SCC-C		**NCDWR Stream Index No.:**	17-14			
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C				
		Supplemental Classification:	None				
Other Stream Classification:	None						
Impairments:	None						
Aquatic T&E Species?	No	Comments:					
NRTR Stream ID:	SCC-C			**Buffer Rules in Effect:**			
Project Includes Bridge Spanning Water Body?		**Deck Drains Discharge Over Buffer?**		**Dissipator Pads Provided in Buffer?**			
Deck Drains Discharge Over Water Body?		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)			
(If yes, provide justification in the General Project Narrative)							

Surface Water Body (4):	UT to Gabriels Creek/SAA-C		**NCDWR Stream Index No.:**	17-14			
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C				
		Supplemental Classification:	None				
Other Stream Classification:	None						
Impairments:	None						
Aquatic T&E Species?	No	Comments:					
NRTR Stream ID:	SAA-C			**Buffer Rules in Effect:**	N/A		
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A		
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)			
(If yes, provide justification in the General Project Narrative)							

Surface Water Body (5):	UT to Gabriels Creek/SBB-C		**NCDWR Stream Index No.:**	17-14			
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C				
		Supplemental Classification:	None				
Other Stream Classification:	None						
Impairments:	None						
Aquatic T&E Species?	No	Comments:					
NRTR Stream ID:	SBB-C			**Buffer Rules in Effect:**	N/A		
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A		
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)			
(If yes, provide justification in the General Project Narrative)							

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.04; Released November 2015)

WBS Element: 34550.3.S1 **TIP No.:** R-2536 Section 3 **County(ies):** Randolph

Additional Waterbody Information

Surface Water Body (6):	UT to Gabriels Creek/SMM-C		**NCDWR Stream Index No.:**	17-14		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SMM-C			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (7):	UT to Gabriels Creek/SKK-C		**NCDWR Stream Index No.:**	17-14		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	None			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SKK-C			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (8):	UT to Gabriels Creek/SFF-C		**NCDWR Stream Index No.:**	17-14		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	None			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SFF-C			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (9):	UT to Mill Creek/SGG-C		**NCDWR Stream Index No.:**	17-18		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SGG-C			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.04; Released November 2015)

WBS Element: **TIP No.:** R-2536 Section 3 **County(ies):** Randolph

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
53	24+15 -Y17RPDA- RT		PSH	Class 'B'	1.0	Pipe	15	5.1	0.7	No
53	48+31 -Y17FLY- RT		PSH	Class 'B'	0.3	Pipe	15	1.5	0.4	No

Additional Comments

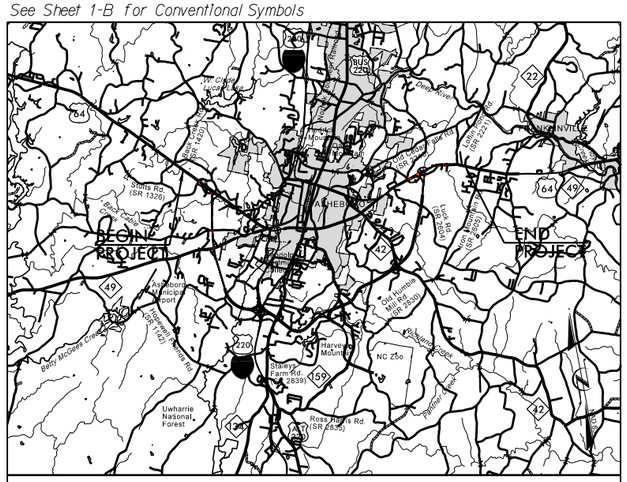
* Refer to the NCDOT Best Management Practices Toolbox (2014), NCDOT Standards, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and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

09/08/99

TIP PROJECT: R-2536

CONTRACT: C203617

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


BEGIN PROJECT
END PROJECT
Asheboro Municipal Airport
Uwharrie National Forest
Naylors Mountain
Liberty
Staley
Ramseur
Seagrove
Sophia
Farmer
Franklinville
Randleman
Trinity
Archdale
Jamestown
Greensboro
High Point
Thomasville
Lexington
Winston-Salem
Kernersville
Pleasant Garden
Julian
Gibsonville
Elon
Graham
Mebane
Hillsborough
Chapel Hill
Carrboro
Pittsboro
Siler City
Sanford
Asheboro
Randolph
Moore
Chatham
Alamance
Orange
Guilford
Davidson
Montgomery
Stanly
Alamance Co.
Orange Co.
Chatham Co.
Randolph Co.
Moore Co.
Guilford Co.
Davidson Co.
Montgomery Co.
Stanly Co.
Alamance Co. Airport
Piedmont Triad Int'l Airport
Seagrove Winery
Pisgah National Forest
Uwharrie Point
Uwharrie Mountains
Uwharrie River
Deep River
Haw River
Rocky River
Big Alamance Creek
Little Alamance Creek
Back Creek
Brush Creek
Cedar Creek
Cox Creek
Deep River
Dicks Creek
Fork Creek
Hasketts Creek
Hickory Creek
Little Creek
Little Fork Creek
Little Indian Creek
Little River
Mill Creek
Muddy Creek
Naylors Creek
Polecat Creek
Richland Creek
Rocky Creek
Sandy Creek
Silver Creek
Tabernacle Creek
Taylors Creek
Trinity Creek
Turkey Creek
Uharie River
Wheat Creek
Whitehead Creek
Wilkes Creek
Winters Creek
Zoo Creek
Zoo Entrance Rd. (SR 1401)
Fox Farm Rd. (SR 1326)
Old Cox Rd. (SR 1420)
Pineview Rd. (SR 1421)
Farmer Rd. (SR 1422)
Staley Rd. (SR 1326)
Staley Farm Rd. (SR 1839)
Rocky Ford Rd. (SR 2835)
Old Cox Rd. (SR 1420)
Pisgah Church Rd. (SR 2550)
Old Liberty Rd. (SR 2550)
Old Farm Rd. (SR 2550)
Liberty Rd. (SR 2550)
Old Liberty Rd. (SR 2550)
Old Randleman Rd. (SR 2550)
Randleman Rd. (SR 2550)
Old Greensboro Rd. (SR 2550)
Old Asheboro Rd. (SR 2550)
Old Trinity Rd. (SR 2550)
Old Lexington Rd. (SR 2550)
Old Salisbury Rd. (SR 2550)
Old Mocksville Rd. (SR 2550)
Old Statesville Rd. (SR 2550)
Old Winston Rd. (SR 2550)
Old Greensboro Rd. (SR 2550)
Old Asheboro Rd. (SR 2550)
Old Trinity Rd. (SR 2550)
Old Lexington Rd. (SR 2550)
Old Salisbury Rd. (SR 2550)
Old Mocksville Rd. (SR 2550)
Old Statesville Rd. (SR 2550)
Old Winston Rd. (SR 2550)
US 64
US 220
US 220 BUS.
NC 49
NC 42
NC 159
NC 159 SPUR
NC 159 ZOO
NC 159 ZOO CONNECTOR
NC 159 ZOO PARKWAY

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	2D-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

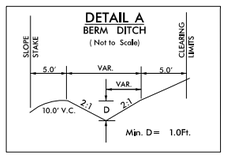
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

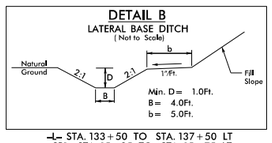
PERMIT DRAWING SHEET 2 OF 257

DETAIL A
BERM DITCH
(Not to Scale)



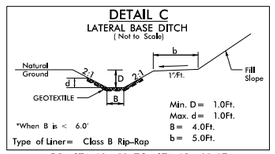
–L– STA. 25+50 TO STA. 28+50 RT
–L– STA. 27+00 TO STA. 28+00 LT
–L– STA. 71+00 TO STA. 72+00 LT
–L– STA. 89+00 TO STA. 90+00 RT
–L– STA. 106+50 TO STA. 110+50 RT
–L– STA. 166+00 TO STA. 169+00 LT
–L– STA. 207+00 TO STA. 210+00 LT
–Y– STA. 25+50 TO STA. 26+65 LT
–Y2– STA. 64+00 TO STA. 65+00 RT
–Y2– STA. 74+00 TO STA. 78+22 RT
–Y2– STA. 79+18 TO STA. 82+50 RT

DETAIL B
LATERAL BASE DITCH
(Not to Scale)



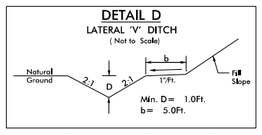
–L– STA. 133+50 TO STA. 137+50 LT
–SR1– STA. 15+25 TO STA. 15+75 LT
–SR1– STA. 18+69 TO STA. 19+50 RT, B=2'
–SR E– STA. 11+00 TO STA. 13+00 LT
–Y1A– STA. 20+50 TO STA. 23+00 RT
–Y2– STA. 28+50 TO STA. 29+00 LT
–Y2RPD– STA. 22+50 TO STA. 23+50 RT
–Y2RPD– STA. 11+87.06 TO STA. 15+35 LT

DETAIL C
LATERAL BASE DITCH
(Not to Scale)



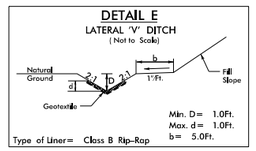
–DR– STA. 10+50 TO STA. 13+65 LT
–DR– STA. 14+25 TO STA. 14+45 LT
–FLY– STA. 19+25 TO STA. 21+25 LT
–FLY– STA. 36+80 TO STA. 37+50 RT
–L– STA. 90+50 TO STA. 92+50 RT
–L– STA. 137+05 TO STA. 138+50 RT
–L– STA. 178+50 TO STA. 181+50 RT
–L– STA. 199+00 TO STA. 200+15 RT
–RPA– STA. 20+50 TO STA. 23+39 RT
–SR1– STA. 19+50 TO STA. 20+97 RT, B=2'
–SR1– STA. 26+80 TO STA. 27+98 RT
–Y– STA. 30+00 TO STA. 34+50 LT
–Y– STA. 38+25 TO STA. 38+50 RT
–Y– STA. 44+75 TO STA. 45+00 LT
–Y– STA. 47+00 TO STA. 47+50 LT
–Y– STA. 58+00 TO STA. 60+30 RT
–Y2– STA. 35+00 TO STA. 36+92 RT
–Y2– STA. 52+00 TO STA. 56+00 LT
–Y2RPD– STA. 20+27 TO STA. 22+50 RT

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



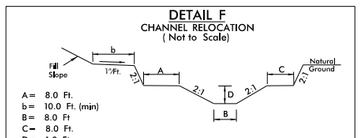
–DR6– STA. 11+50 TO STA. 12+30 RT
–FLY– STA. 13+66 TO STA. 14+63 RT
–FLY– STA. 41+50 TO STA. 41+66 LT
–FLY– STA. 43+50 TO STA. 44+85 LT
–L– STA. 31+56 TO STA. 32+50 LT
–L– STA. 33+84 TO STA. 34+00 LT
–L– STA. 168+18 TO STA. 168+50 RT
–L– STA. 182+00 TO STA. 183+57 LT
–L– STA. 182+85 TO STA. 183+00 RT
–RPA– STA. 23+39 TO STA. 24+50 RT
–SR1– STA. 15+75 TO STA. 17+00 LT
–SR1– STA. 18+69 TO STA. 19+50 RT
–SR E– STA. 10+20 TO STA. 11+00 LT
–SR F– STA. 10+82 TO STA. 11+35 LT
–SR F– STA. 12+30 TO STA. 13+00 LT
–Y– STA. 27+50 TO STA. 28+50 RT
–Y– STA. 37+25 TO STA. 38+25 RT
–Y1– STA. 20+62 TO STA. 22+00 LT
–Y1– STA. 20+63 TO STA. 22+00 RT
–Y1– STA. 31+50 TO STA. 33+00 RT
–Y1A– STA. 14+50 TO STA. 16+00 LT
–Y1A– STA. 26+30 TO STA. 27+00 RT
–Y2– STA. 39+07 TO STA. 40+00 RT
–Y2– STA. 52+50 TO STA. 53+60 RT
–Y2– STA. 52+00 TO STA. 56+00 LT
–Y2RPD– STA. 26+50 TO STA. 29+95 RT

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



–FLY– STA. 14+63 TO STA. 15+11 RT
–L– STA. 90+57 TO STA. 90+80 LT
–L– STA. 152+25 TO STA. 152+63 LT, D=1.5', d=1.5'
–L1A– STA. 12+87 TO STA. 13+50 LT
–SR F– STA. 11+00 TO STA. 11+35 LT

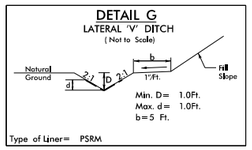
DETAIL F
CHANNEL RELOCATION
(Not to Scale)



A= 8.0 Ft.
b= 10.0 Ft. (min)
B= 8.0 Ft
C= 8.0 Ft.
D= 1.0 Ft.

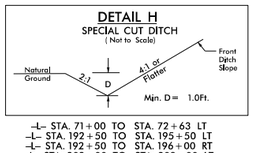
–L– STA. 66+18.43 TO STA. 70+95.02 RT

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



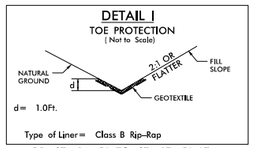
–DR6– STA. 10+37 TO STA. 11+59 LT
–DR6– STA. 10+50 TO STA. 11+50 RT
–FLY– STA. 12+85 TO STA. 13+66 RT
–FLY– STA. 18+00 TO STA. 19+25 LT
–FLY– STA. 31+50 TO STA. 36+80 RT
–FLY– STA. 39+88 TO STA. 41+50 LT
–FLY– STA. 41+66 TO STA. 43+50 LT
–L– STA. 25+78 TO STA. 26+20 LT
–L– STA. 32+50 TO STA. 33+84 LT
–L– STA. 50+64 TO STA. 50+80 RT
–L– STA. 89+50 TO STA. 90+57 LT
–L– STA. 125+00 TO STA. 128+16 LT
–L– STA. 176+50 TO STA. 176+80 LT
–L– STA. 179+45 TO STA. 181+50 LT
–L– STA. 183+00 TO STA. 184+00 RT
–L– STA. 196+50 TO STA. 197+50 LT, D=1.5', d=1.5'
–LPD– STA. 14+50 TO STA. 15+00 RT
–LPD– STA. 20+73 TO STA. 23+22 LT
–SR1– STA. 11+00 TO STA. 13+00 LT
–SR1– STA. 15+00 TO STA. 15+50 LT
–SR1– STA. 16+26 TO STA. 17+50 RT
–SR2– STA. 11+40 TO STA. 14+00 RT
–SR F– STA. 12+00 TO STA. 12+30 LT
–SR F– STA. 13+00 TO STA. 14+00 LT
–Y– STA. 15+99 TO STA. 16+40 LT
–Y– STA. 28+82 TO STA. 29+40 LT
–Y– STA. 62+00 TO STA. 63+50 RT
–Y– STA. 23+00 TO STA. 24+80 RT
–Y– STA. 24+55 TO STA. 25+50 LT
–Y– STA. 55+76 TO STA. 58+00 RT
–Y2A– STA. 11+15 TO STA. 11+50 LT

DETAIL H
SPECIAL CUT DITCH
(Not to Scale)



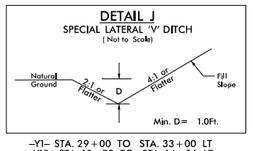
–L– STA. 71+00 TO STA. 72+63 LT
–L– STA. 192+50 TO STA. 195+50 LT
–L– STA. 192+50 TO STA. 196+00 RT
–L– STA. 202+00 TO STA. 203+00 LT
–SR1– STA. 20+97 TO STA. 21+97 RT
–SR1– STA. 34+50 TO STA. 35+00 LT
–SR1– STA. 34+50 TO STA. 34+76 RT
–Y– STA. 25+50 TO STA. 27+50 LT
–Y– STA. 63+50 TO STA. 64+33 RT
–Y1– STA. 22+00 TO STA. 24+50 LT
–Y1– STA. 22+00 TO STA. 24+50 RT
–Y1A– STA. 29+50 TO STA. 30+66 RT
–Y1A– STA. 11+66 TO STA. 12+50 LT
–Y1B– STA. 12+62 TO STA. 13+78 LT
–Y2– STA. 21+83 TO STA. 22+50 RT
–Y2– STA. 27+00 TO STA. 29+00 LT
–Y2– STA. 32+50 TO STA. 33+50 RT
–Y2A– STA. 15+50 TO STA. 16+14 LT
–Y2A– STA. 15+50 TO STA. 16+07 RT

DETAIL I
TOE PROTECTION
(Not to Scale)



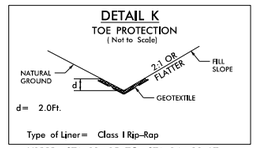
–DR– STA. 14+50 TO STA. 17+50 LT
–L– STA. 34+00 TO STA. 35+50 LT
–L– STA. 62+40 TO STA. 63+20 LT
–L– STA. 64+00 TO STA. 64+35 LT
–L– STA. 156+25 TO STA. 156+60 LT
–L– STA. 176+50 TO STA. 178+50 RT
–L– STA. 183+00 TO STA. 183+50 LT
–LPD– STA. 13+50 TO STA. 14+25 RT
–SR E– STA. 12+50 TO STA. 14+00 RT
–SR E– STA. 13+00 TO STA. 14+00 LT
–Y– STA. 23+55 TO STA. 24+50 LT
–Y– STA. 54+50 TO STA. 55+30 LT

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



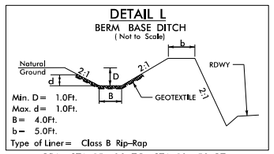
–Y1– STA. 29+00 TO STA. 33+00 LT
–Y1B– STA. 13+78 TO STA. 14+36 LT
–Y1DET– STA. 19+77 TO STA. 21+84 RT

DETAIL K
TOE PROTECTION
(Not to Scale)



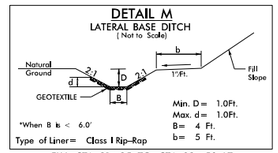
–Y2RPB– STA. 13+15 TO STA. 14+82 LT

DETAIL L
BERM BASE DITCH
(Not to Scale)



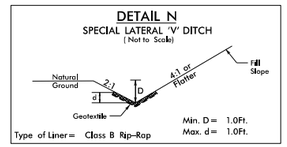
–RPA– STA. 15+20 TO STA. 19+50 RT
–Y2RPB– STA. 18+50 TO STA. 20+50 LT
–Y– STA. 39+00 TO STA. 40+00 LT
–Y– STA. 47+50 TO STA. 50+25 LT
–Y– STA. 53+00 TO STA. 54+50 LT

DETAIL M
LATERAL BASE DITCH
(Not to Scale)



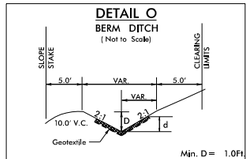
–FLY– STA. 21+25 TO STA. 22+50 LT
–L– STA. 15+96 TO STA. 17+00 RT
–L– STA. 126+50 TO STA. 127+16 RT
–L– STA. 197+50 TO STA. 199+00 LT
–RPA– STA. 19+00 TO STA. 20+50 RT
–SR1– STA. 14+90 TO STA. 15+25 LT
–Y– STA. 12+81 TO STA. 13+82 LT
–Y2– STA. 29+00 TO STA. 30+00 LT
–Y2– STA. 34+50 TO STA. 35+00 RT
–Y2RPB– STA. 18+25 TO STA. 19+00 RT

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



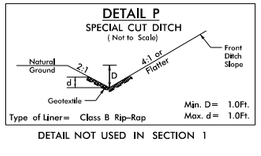
DETAIL NOT USED IN SECTION 1

DETAIL O
BERM DITCH
(Not to Scale)



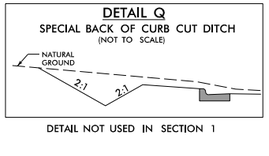
–L– STA. 86+17 TO STA. 89+00 RT
–L– STA. 161+00 TO STA. 166+00 LT
–Y2– STA. 64+00 TO STA. 68+00 RT
–Y2RPB– STA. 20+50 TO STA. 22+00 LT

DETAIL P
SPECIAL CUT DITCH
(Not to Scale)



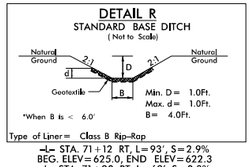
DETAIL NOT USED IN SECTION 1

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



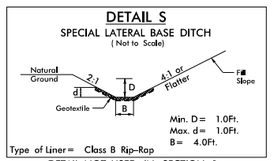
DETAIL NOT USED IN SECTION 1

DETAIL R
STANDARD BASE DITCH
(Not to Scale)



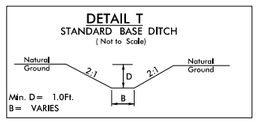
–L– STA. 71+12 RT, L=93', S=2.9%
BEG. ELEV=625.0, END ELEV=622.3
–L– STA. 71+20 RT, L=69', S=0.3%
BEG. ELEV=622.5, END ELEV=622.3
–L– STA. 181+50 RT, L=36', S=1.08%
BEG. ELEV=707.4, END ELEV=707.0
–LPD– STA. 20+73 LT, L=48', S=0.75%
BEG. ELEV=661.4, END ELEV=661.0
–Y2– STA. 63+50 LT, L=35', S=9.3%
BEG. ELEV=753.3, END ELEV=750.0

DETAIL S
SPECIAL LATERAL BASE DITCH
(Not to Scale)

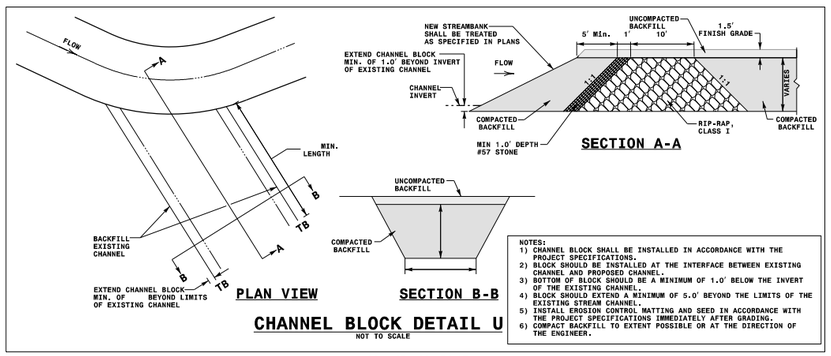


DETAIL NOT USED IN SECTION 1

DETAIL T
STANDARD BASE DITCH
(Not to Scale)

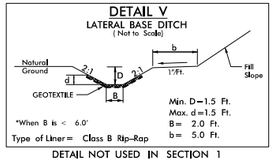


–L– STA. 81+43 RT, L=90', S=23.6%
BEG. ELEV=754.0, END ELEV=732.68
–Y– STA. 24+75 RT, B=2', L=34', S=0.76%
BEG. ELEV=664.5, END ELEV=664.2
–Y1A– STA. 20+50 RT, L=127', S=4.4%
BEG. ELEV=686.5, END ELEV=680.9



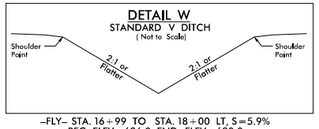
–RPA– STA. 22+76 LT
–L– STA. 62+75 LT
–L– STA. 70+65 RT
–L– STA. 127+21 RT
–L– STA. 176+90 LT
–L– STA. 179+23 LT
–L– STA. 200+15 LT
–Y– STA. 45+55 RT
–Y2– STA. 31+25 RT
–Y2– STA. 53+65 RT

DETAIL V
LATERAL BASE DITCH
(Not to Scale)



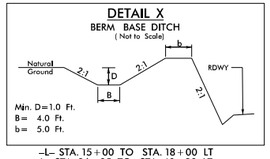
DETAIL NOT USED IN SECTION 1

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



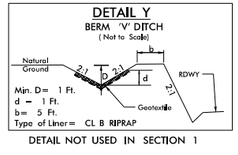
–FLY– STA. 16+99 TO STA. 18+00 LT, S=5.9%
BEG. ELEV=696.0, END ELEV=690.0
–L– STA. 63+00 RT, L=28', S=0.32%
BEG. ELEV=637.11, END ELEV=637.02
–L– STA. 168+20 RT, L=19', S=3.2%
BEG. ELEV=754.6, END ELEV=754.0
–Y– STA. 58+30 TO STA. 58+69 LT, S=4.46%
BEG. ELEV=755.00, END ELEV=753.28
–Y2– STA. 32+50 TO STA. 34+50 RT, S=0.3%
BEG. ELEV=691.74, END ELEV=691.14

DETAIL X
BERM BASE DITCH
(Not to Scale)



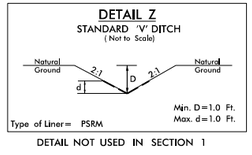
–L– STA. 15+00 TO STA. 18+00 LT
L– STA. 36+05 TO STA. 40+90 LT
–Y– STA. 21+50 TO STA. 23+50 LT
–Y– STA. 34+50 TO STA. 38+75 LT
–Y2– STA. 65+00 TO STA. 68+00 RT

DETAIL Y
BERM 'V' DITCH
(Not to Scale)



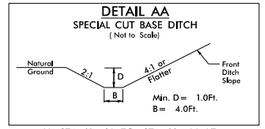
DETAIL NOT USED IN SECTION 1

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



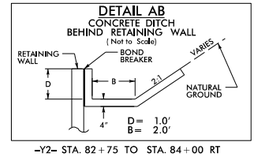
DETAIL NOT USED IN SECTION 1

DETAIL AA
SPECIAL CUT BASE DITCH
(Not to Scale)



–Y– STA. 61+60 TO STA. 63+00 LT

DETAIL AB
CONCRETE DITCH
BEHIND RETAINING WALL
(Not to Scale)



–Y2– STA. 82+75 TO STA. 84+00 RT

7/29/2006
R:\Projects\PERMITS_Environmental\Drawings\4C\Section 1A\R-2536_PRM_WET_DitchDet_SEC1.dgn
default

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	2D-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

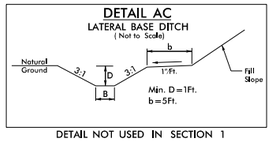
PLANS PREPARED BY :

RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

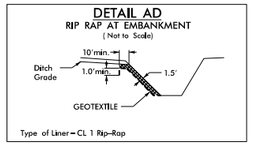
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL AC
LATERAL BASE DITCH
(Not to Scale)



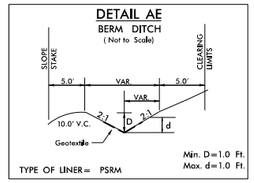
DETAIL NOT USED IN SECTION 1

DETAIL AD
RIP RAP AT EMBANKMENT
(Not to Scale)



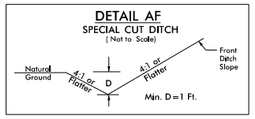
DETAIL NOT USED IN SECTION 1

DETAIL AE
BERM DITCH
(Not to Scale)



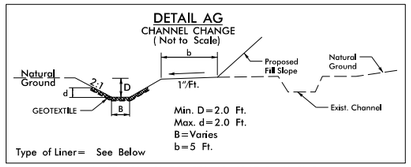
–L– STA. 82+00 TO STA. 89+00 RT

DETAIL AF
SPECIAL CUT DITCH
(Not to Scale)



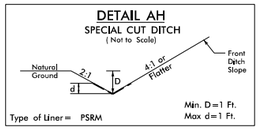
DETAIL NOT USED IN SECTION 1

DETAIL AG
CHANNEL CHANGE
(Not to Scale)



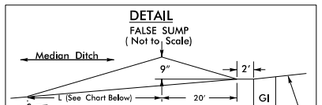
–L– STA. 62+40 TO STA. 63+11 LT, B=4', CL B
–L– STA. 63+95 TO STA. 64+35 LT, B=4', CL B
–L– STA. 64+90 TO STA. 66+24 RT, B=4', CL I
–L– STA. 127+16 TO STA. 133+50 RT, B=4', CL B
–L– STA. 133+50 TO STA. 135+00 RT, B=5', CL I
–L– STA. 135+00 TO STA. 137+05 RT, B=5', CL B
–L– STA. 152+63 TO STA. 156+43 LT, B=4', CL B
–L– STA. 176+80 TO STA. 178+30 LT, B=3', GRASS
–L– STA. 178+30 TO STA. 179+34 LT, B=3', CL B
–L– STA. 183+25 TO STA. 183+90 LT, B=2', CL B
–RPA– STA. 21+50 TO STA. 22+77 LT, B=4', CL B
–SR2– STA. 56+28 TO STA. 58+78 LT, B=6', CL B
–Y– STA. 13+82 TO STA. 15+99 LT, B=4', CL B
–Y– STA. 43+91 TO STA. 45+92 RT, B=9', CL I
–Y2– STA. 30+61 TO STA. 31+50 RT, B=6', CL B
–Y2– STA. 53+47 TO STA. 54+35 RT, B=6', CL B
–Y2– STA. 56+28 TO STA. 58+78 LT, B=6', CL B

DETAIL AH
SPECIAL CUT DITCH
(Not to Scale)



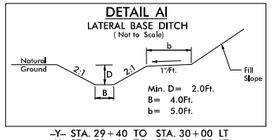
DETAIL NOT USED IN SECTION 1

DETAIL
FALSE SUMP
(Not to Scale)



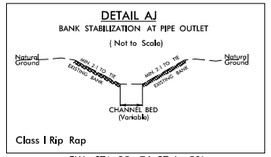
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

DETAIL AI
LATERAL BASE DITCH
(Not to Scale)



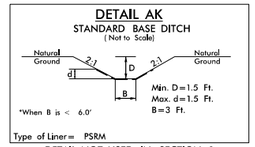
–Y– STA. 29+40 TO STA. 30+00 LT
–Y– STA. 58+69 TO STA. 60+75 LT
–Y2– STA. 30+00 TO STA. 35+04 LT

DETAIL AJ
BANK STABILIZATION AT PIPE OUTLET
(Not to Scale)



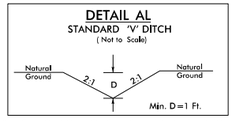
–FLY– STA. 35+76 RT, L=50'
–FLY– STA. 42+03 RT, L=35'
–FLY– STA. 45+52 RT, L=36'
–L– STA. 181+69 RT, L=50'
–L– STA. 198+57 RT, L=50'
–LPD– STA. 11+87 LT, L=42'
–SR1– STA. 16+30 RT, L=50'
–SR2– STA. 11+42 LT, L=50'
–SR3– STA. 13+50 RT, L=50'
–Y– STA. 45+00 RT, L=30'

DETAIL AK
STANDARD BASE DITCH
(Not to Scale)



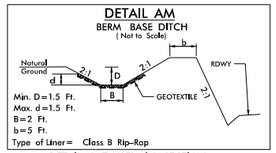
DETAIL NOT USED IN SECTION 1

DETAIL AL
STANDARD "V" DITCH
(Not to Scale)



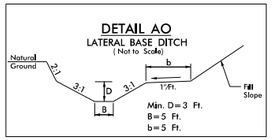
–Y1– STA. 27+25 TO STA. 27+60 RT, S=0.60%
BEG. ELEV=778.68, END ELEV=778.47
–Y– STA. 44+00 RT, L=30' S=2.6%
BEG. ELEV=666.2, END ELEV=665.5

DETAIL AM
BERM BASE DITCH
(Not to Scale)



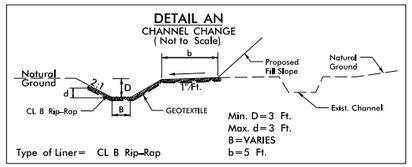
DETAIL NOT USED IN SECTION 1

DETAIL AO
LATERAL BASE DITCH
(Not to Scale)



DETAIL NOT USED IN SECTION 1

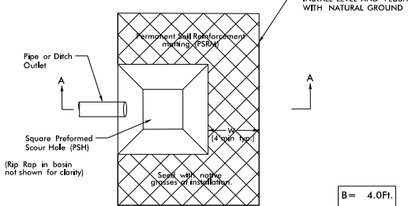
DETAIL AN
CHANNEL CHANGE
(Not to Scale)



DETAIL NOT USED IN SECTION 1

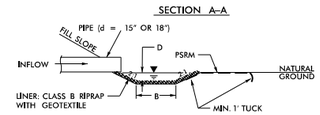
PREFORMED SCOUR HOLE DETAIL AP
*NOT TO SCALE

PLAN VIEW



B= 4.0Ft.
D= 1.0Ft.
W= 4.0Ft.

SECTION A–A



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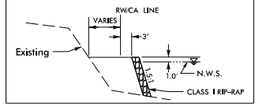
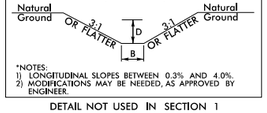
DETAIL NOT USE IN SECTION 1

DETAIL AQ
FILL IN POND W/ROCK PLATING
(Not to Scale)



–L– STA. 168+20 RT

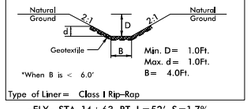
DETAIL AR
STANDARD BASE GRASSED SWALE
(Not to Scale)



*NOTES:
1) LONGITUDINAL SLOPES BETWEEN 0.3% AND 4.0%.
2) MODIFICATIONS MAY BE NEEDED, AS APPROVED BY ENGINEER.

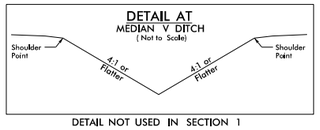
DETAIL NOT USED IN SECTION 1

DETAIL AS
STANDARD BASE DITCH
(Not to Scale)



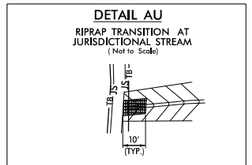
–FLY– STA. 14+63 RT, L=52', S=1.7%
BEG. ELEV=649.9, END ELEV=649.0
–FLY– STA. 18+90 LT, L=47', S=14.9%
BEG. ELEV=685.0, END ELEV=678.0
–L– STA. 8+95 TO 9+50 LT, S=11.4%
BEG. ELEV=564.0, END ELEV=570.5
–L– STA. 48+00 RT, L=47' S=12.3%
BEG. ELEV=690.5, END ELEV=684.7
–LPD– STA. 13+50 RT, L=36', S=11.9%
BEG. ELEV=689.0, END ELEV=684.7
–Y– STA. 45+00 LT, L=50', S=11.2%
BEG. ELEV=698.0, END ELEV=692.4
–Y– STA. 45+85 RT, L=40', S=12.6%
BEG. ELEV=674.5, END ELEV=669.5

DETAIL AT
MEDIAN V DITCH
(Not to Scale)



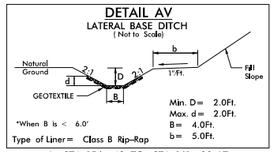
DETAIL NOT USED IN SECTION 1

DETAIL AU
RIPRAP TRANSITION AT JURISDICTIONAL STREAM
(Not to Scale)



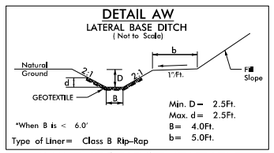
–L– STA. 8+85 LT
–L– STA. 128+05 LT
–L– STA. 197+46 LT
–Y2– STA. 35+15 LT

DETAIL AV
LATERAL BASE DITCH
(Not to Scale)



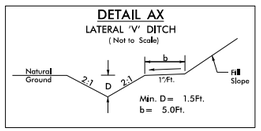
–L– STA. 156+43 TO STA. 161+00 LT
–Y2RPD– STA. 15+35 TO STA. 20+27 LT
–L– STA. 181+69 TO STA. 182+25 RT
–L– STA. 198+00 TO STA. 199+50 RT
–Y– STA. 45+00 TO STA. 45+20 LT
–Y2– STA. 35+04 TO STA. 40+50 LT
–Y2– STA. 57+90 TO STA. 62+00 RT

DETAIL AW
LATERAL BASE DITCH
(Not to Scale)



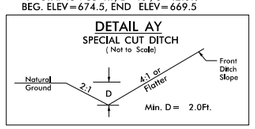
–Y2RPB– STA. 16+20 TO STA. 18+50 LT

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



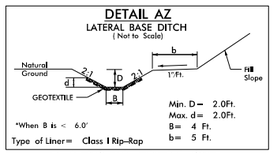
DETAIL NOT USED IN SECTION 1

DETAIL AY
SPECIAL CUT DITCH
(Not to Scale)



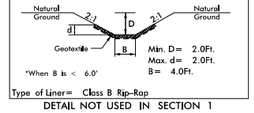
DETAIL NOT USED IN SECTION 1

DETAIL AZ
LATERAL BASE DITCH
(Not to Scale)



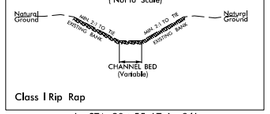
DETAIL NOT USED IN SECTION 1

DETAIL BA
STANDARD BASE DITCH
(Not to Scale)

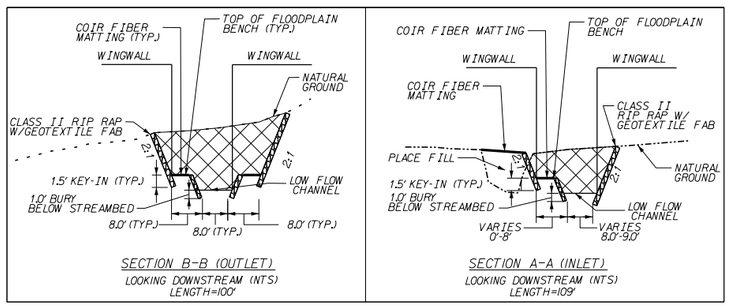


DETAIL NOT USED IN SECTION 1

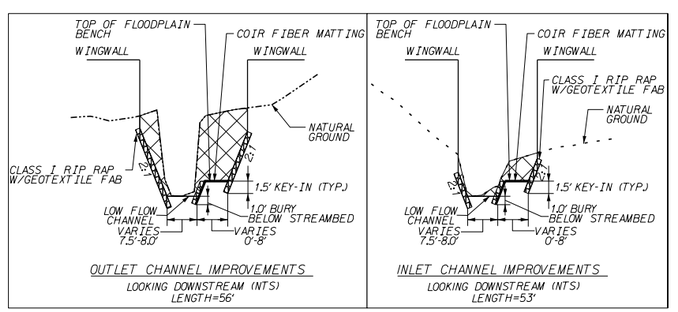
DETAIL BB
BANK STABILIZATION AT PIPE OUTLET
(Not to Scale)



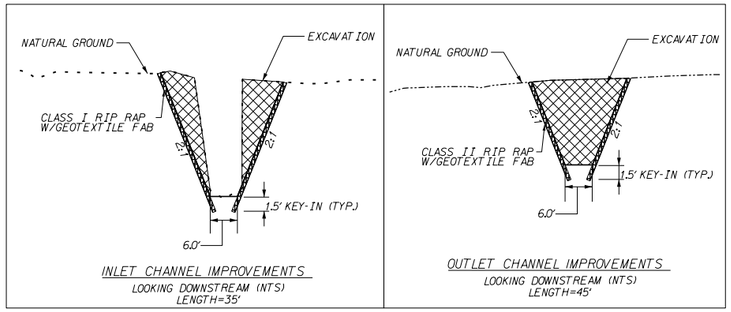
–L– STA. 90+55 LT, L=36'
–Y– STA. 58+00 RT, L=30'



CULVERT INLET/OUTLET DETAILS
–L– STA 65+84



CULVERT INLET/OUTLET DETAILS
–L– STA 153+70



CULVERT INLET/OUTLET DETAILS
–Y2– STA 55+28

PERMIT DRAWING
SHEET 3 OF 257

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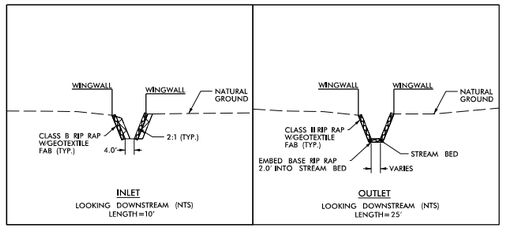

CULVERT INLET/OUTLET DETAIL
–DR– STA 13+42

PERMIT DRAWING
SHEET 4 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R–2536	2D–X
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PLANS PREPARED BY :

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

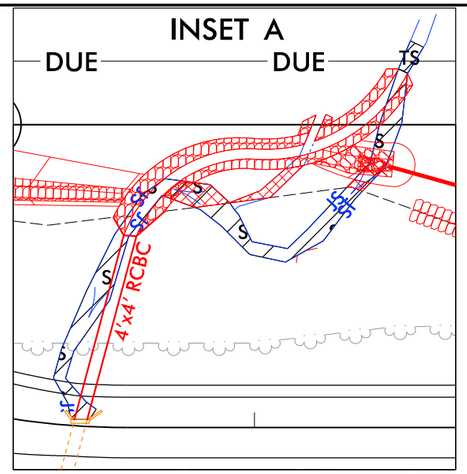
S S — DENOTES IMPACTS IN SURFACE WATER

PERMIT DRAWING SHEET 5 OF 257

ENGLISH

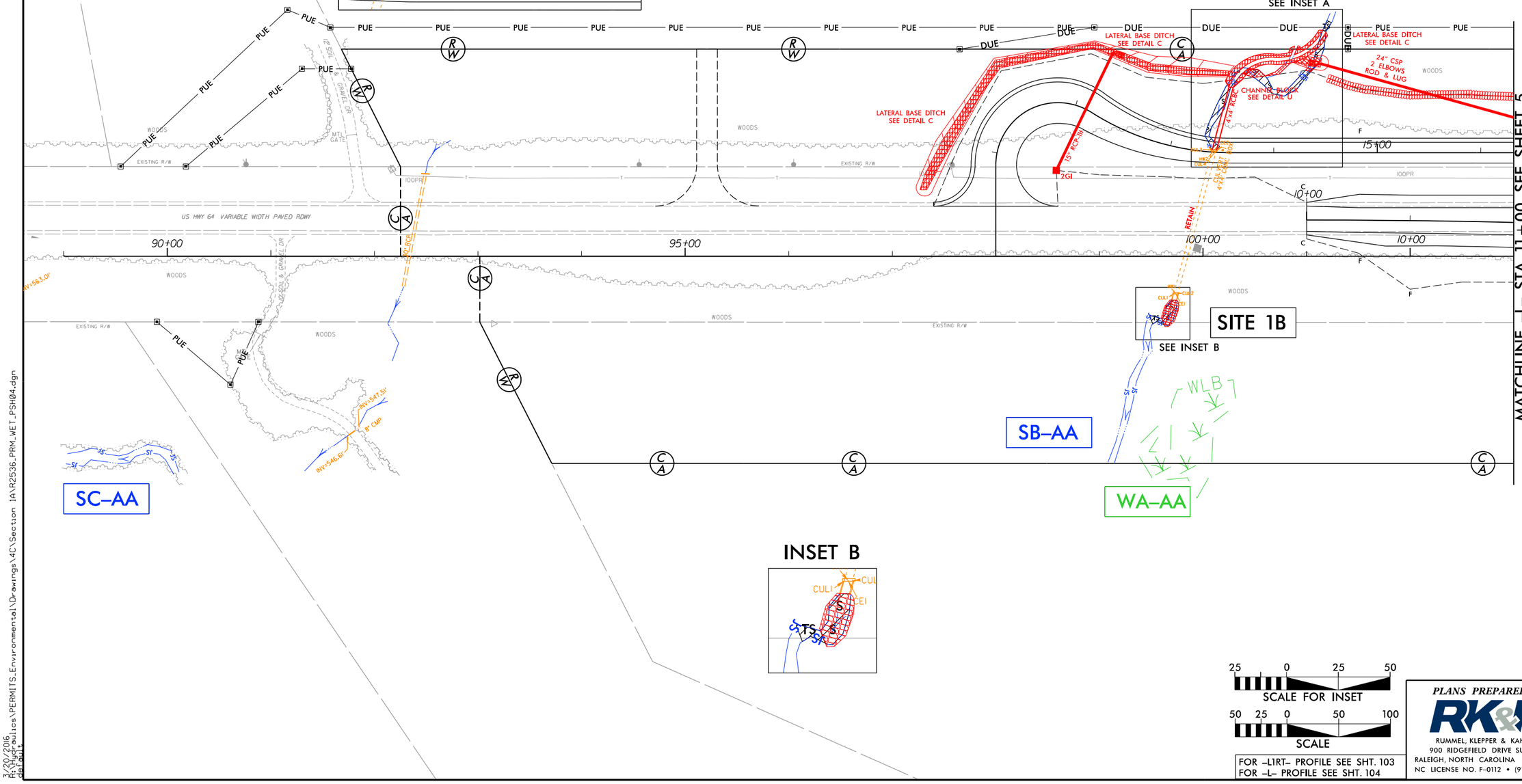
NAD 83/95

INSET A



SB–AA | SITE 1A

SEE INSET A



INSET B

SCALE FOR INSET: 25 0 25 50

SCALE: 50 25 0 50 100

FOR –L1RT– PROFILE SEE SHT. 103
FOR –L– PROFILE SEE SHT. 104

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PERMIT DRAWING
SHEET 6 OF 257

ENGLISH

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TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

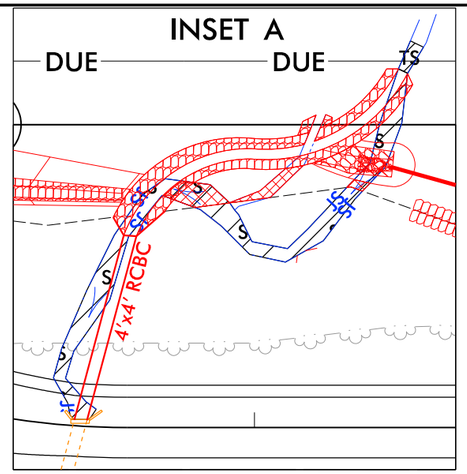
NAD 83/95

PROJECT REFERENCE NO.	SHEET NO.
R-2536	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INSET A


DUE
DUE
TS
S
4'x4' RCBC
SC
SC
S

5/14/99

PROJECT REFERENCE NO.	SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

ENGLISH

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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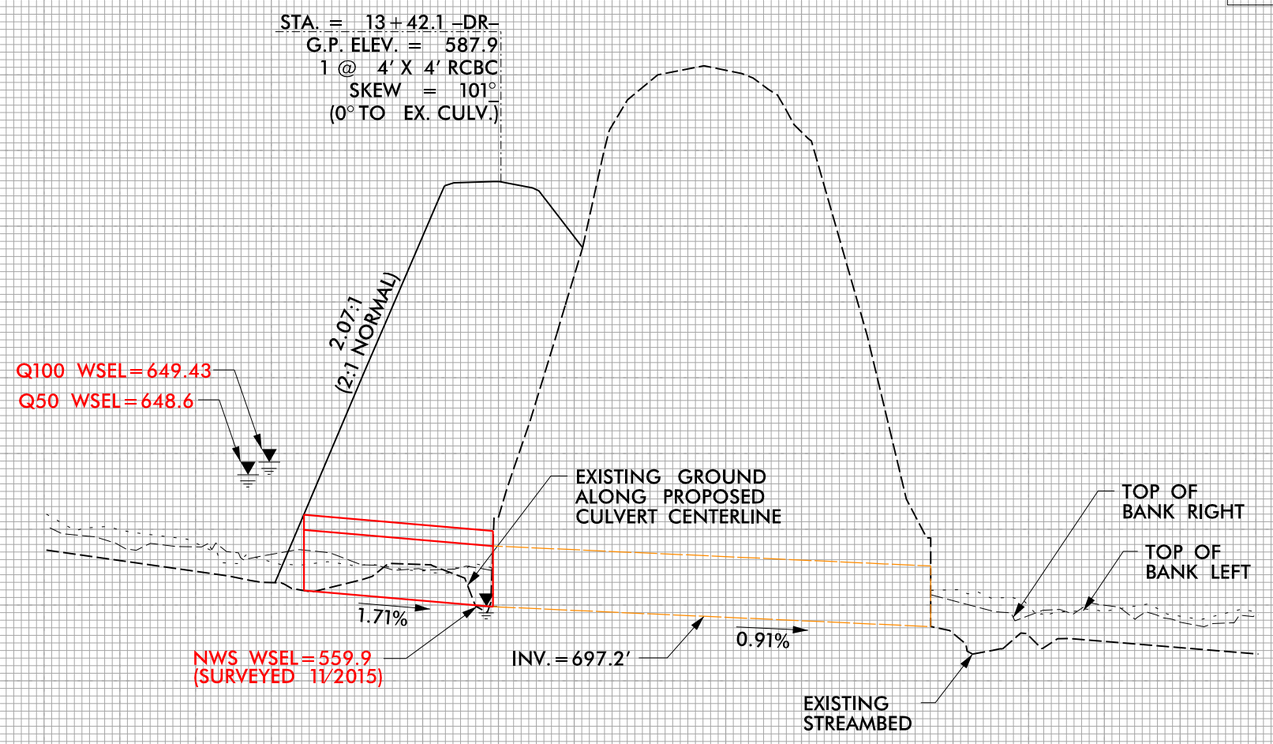
PERMIT DRAWING
SHEET 7 OF 257

SITE 1
–DR– STA. 13+52



EXTEND EXISTING 4'x4' RCBC, NOT BURIED (TOTAL LENGTH=205')

250 200 150 100 50 0 50 100 150 200 250

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING SHEET 8 OF 257

NAD 83/95

MATCHLINE –Y1B– STA. 10+75 SEE SHEET 57

MATCHLINE –Y1A– STA. 21+50 SEE SHEET 57

MATCHLINE –L– STA. 23+00 SEE SHEET 5

MATCHLINE –L– STA. 36+00 SEE SHEET 7

MATCHLINE –FLY– STA. 16+75 SEE SHEET 7

MATCHLINE –SR1– STA. 17+25 SEE SHEET 7

WYZ–AA

WXX–AA

SD–AA

SITE 2

PA–AA

INSET A

SEE INSET A

DENOTES IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

ENGLISH

50 25 0 50 100
SCALE

25 0
SCALE

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FOR FUTURE CONSTR. DETAIL SEE SHT. 02C–1
FOR –L– PROFILE SEE SHT. 104
FOR –L1RT– PROFILE SEE SHT. 103
FOR –Y1A– PROFILE SEE SHT. 133
FOR –FLY– PROFILE SEE SHT. 136
FOR –SR1– PROFILE SEE SHT. 146

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING SHEET 9 OF 257

NAD 83/95

MATCHLINE –Y1B– STA. 10+75 SEE SHEET 57

MATCHLINE –Y1A– STA. 21+50 SEE SHEET 57

MATCHLINE –L– STA. 23+00 SEE SHEET 5

MATCHLINE –L– STA. 36+00 SEE SHEET 7

MATCHLINE –FLY– STA. 16+75 SEE SHEET 7

MATCHLINE –SR1– STA. 17+25 SEE SHEET 7

WYZ–AA

WXX–AA

SD–AA

SITE 2

PA–AA

INSET A

SEE INSET A

DENOTES IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

ENGLISH

SCALE 50 25 0 50 100

SCALE 25 0

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

FOR FUTURE CONSTR. DETAIL SEE SHT. 02C-1
FOR –L– PROFILE SEE SHT. 104
FOR –L1RT– PROFILE SEE SHT. 103
FOR –Y1A– PROFILE SEE SHT. 133
FOR –FLY– PROFILE SEE SHT. 136
FOR –SR1– PROFILE SEE SHT. 146

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0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-27

PERMIT DRAWING
SHEET 10 OF 257

SITE 2

34+50.00

–FLY–
Sta. 14+68.45
EL = 703.14

0.020 | 6:1 | 6:1 | 0.020 | 0.078 | 0.077

D.P. 703.134
700.93

2:1 | 2:1 | 2:1 | 2:1 | 2.075:1

650.13

34+00.00

–FLY–
Sta. 14+16.91
EL = 703.28

0.020 | 6:1 | 6:1 | 0.020 | 0.079 | 0.079

701.79
D.P. 702.745

2:1 | 2:1 | 2:1 | 2:1 | 2.052:1

672.50

WETLAND

651.82

33+50.00

–FLY–
Sta. 13+65.86
EL = 703.49

0.020 | 6:1 | 6:1 | 0.020 | 0.080 | 0.080

701.38
D.P. 702.425

2:1 | 2:1 | 2:1 | 2:1 | 2.034:1

675.10

WETLAND

654.00

33+00.00

–FLY–
Sta. 13+15.21
EL = 703.70

0.020 | 6:1 | 6:1 | 0.020 | 0.071 | 0.072

D.P. 702.167
699.16

2:1 | 2:1 | 2:1 | 2:1 | 2.020:1

680.30

WETLAND

660.89

730 720 710 700 690 680 670 660 650

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

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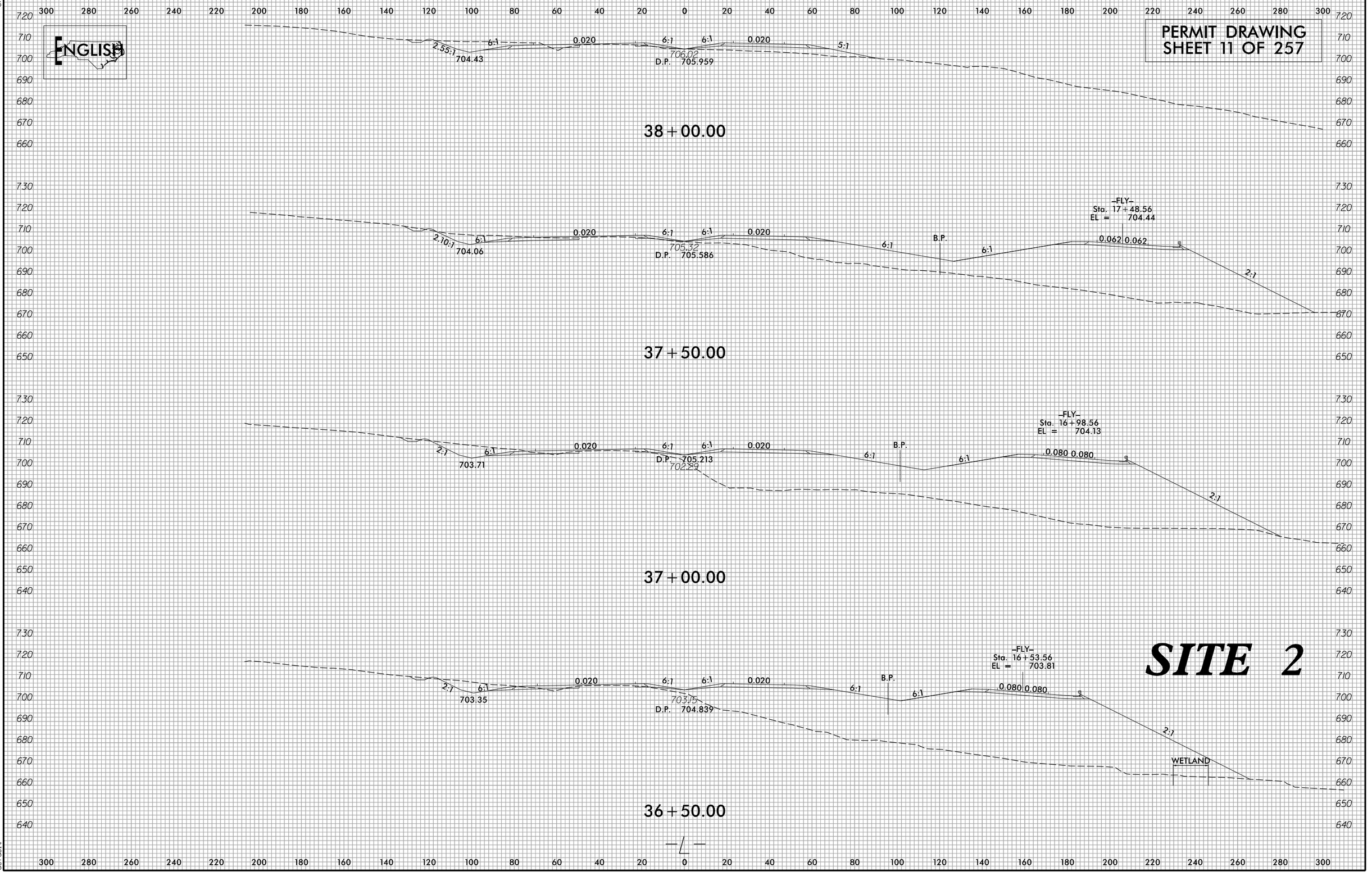
PERMIT DRAWING
SHEET 11 OF 257

ENGLISH



SITE 2

8/23/99
3/20/2016
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R/W REVISION: DATE:
– ADDED PARCEL 27F AS A PORTION OF PARCEL 27B WAS SOLD.

PROJECT REFERENCE NO.	SHEET NO.
R-2536	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

PERMIT DRAWING
SHEET 12 OF 257

DETAIL SHEET FOR SITE 4 & 5

SITE 5
SM–AA

SITE 4A
SE–AA

MATCHLINE –L– STA. 36+00 SEE SHEET 6

MATCHLINE –FLY– STA. 6+75 SEE SHEET 6

MATCHLINE –SRI– STA. 17+25 SEE SHEET 6

BEGIN JS

SITE 3
SAA–AA

WB–AA

SITE 4B
SE–AA

SITE 4C
INTERMITTENT
SE–AA
PERENNIAL

DETAIL SHEET FOR SITE 6

MATCHLINE –Y– STA. 28+50 SEE SHEET 58

MATCHLINE –FLY– STA. 25+00 SEE SHEET 58

SZZ–AA

BEGIN JS

SITE 6A

WUU–AA

SITE 6B

SE–AA

SITE 4D

SE–AA

SITE 4E

MATCHLINE –L– STA. 65+00 SEE SHEET 8

DETAIL SHEET FOR SITE 3

MATCHLINE –SRI– STA. 34+25

END CONSTRUCTION –SRI– POT Sta. 34+85.00

–SRI– PC Sta. 35+20.65

–SRI– PT Sta. 36+90.02

–SRI– POT Sta. 38+35.55

DETAIL SHEET FOR SITE 4

MATCHLINE –SRI– STA. 34+25 SEE INSET

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND (+)

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

GRAPHIC SCALE
50 0 50 100
PLANS

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

PERMIT DRAWING
SHEET 13 OF 257

DETAIL SHEET FOR SITE 4 & 5

SITE 5
SM–AA

SITE 4A
SE–AA

MATCHLINE –L– STA. 36+00 SEE SHEET 6

MATCHLINE –FLY– STA. 6+75 SEE SHEET 6

MATCHLINE –SR1– STA. 17+25 SEE SHEET 6

BEGIN JS

SITE 3
SAA–AA

WB–AA

SITE 4B
SE–AA

SITE 4C
INTERMITTENT
SE–AA
PERENNIAL

DETAIL SHEET FOR SITE 6

SZZ–AA

BEGIN JS

SITE 6A

MATCHLINE –Y– STA. 28+50 SEE SHEET 58

MATCHLINE –FLY– STA. 25+00 SEE SHEET 58

WUU–AA

SITE 6B

DETAIL SHEET FOR SITE 3

MATCHLINE –SR1– STA. 34+25

END CONSTRUCTION –SR1– POT Sta. 14+85.00

–SR1– PC Sta. 35+20.65

–SR1– PT Sta. 36+90.02

–SR1– POT Sta. 38+35.55

DETAIL SHEET FOR SITE 4

SE–AA

SITE 4D

SE–AA

SITE 4E

MATCHLINE –L– STA. 65+00 SEE SHEET 8

MATCHLINE –SR1– STA. 34+25 SEE INSET

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

GRAPHIC SCALE
50 0 50 100
PLANS

PLANS PREPARED BY
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PROJECT REFERENCE NO.	SHEET NO.
R-2536	7A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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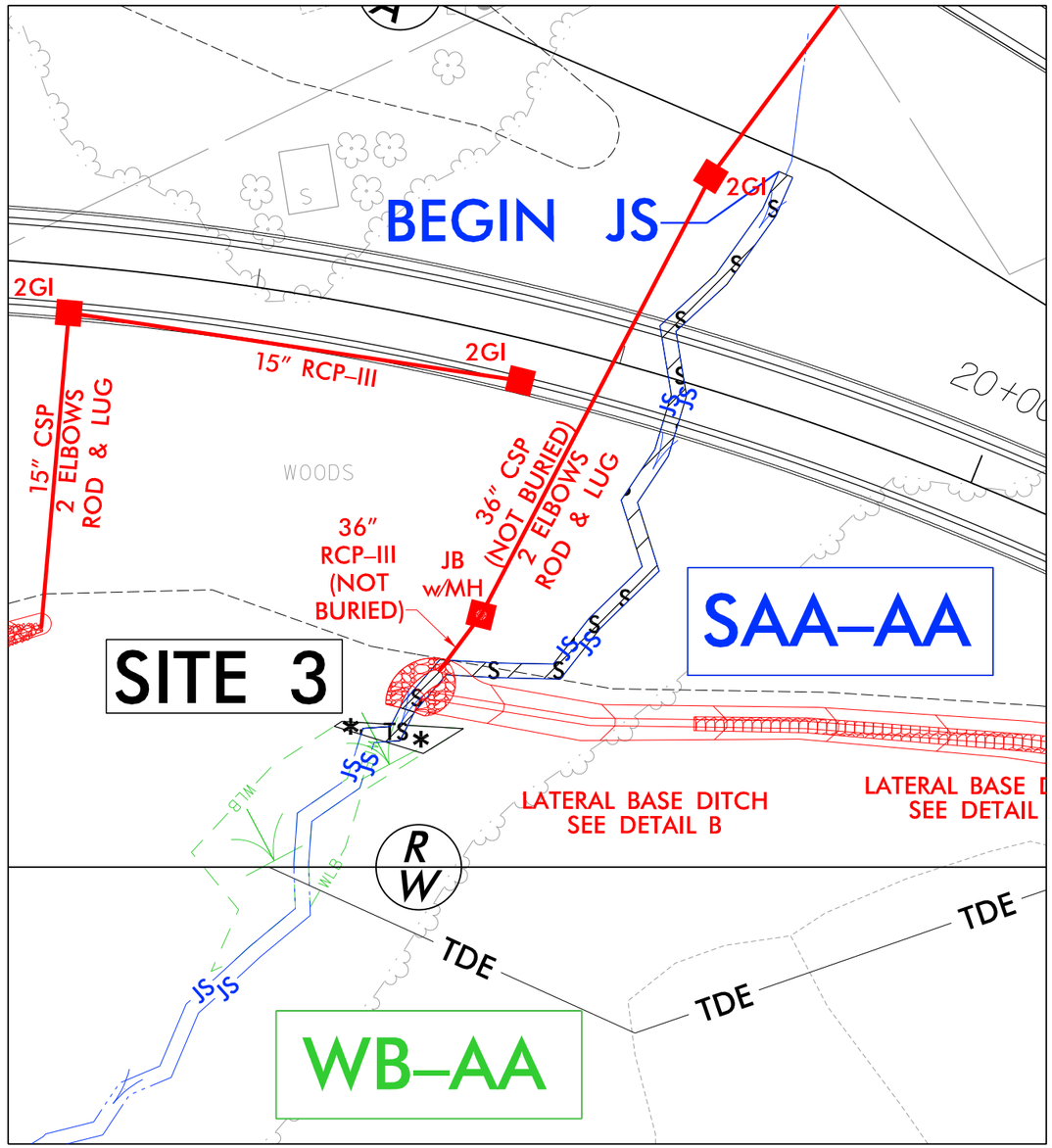
SHEET 14 OF 257

DETAIL SHEET FOR SITE 3



DENOTES MECHANIZED CLEARING

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

25 0 25 50
SCALE

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DETAIL SHEET FOR SITE 4 & 5

PROJECT REFERENCE NO.	SHEET NO.
R-2536	7B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95

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ENGLISH

PERMIT DRAWING
SHEET 15 OF 257

SITE 5
SM–AA

SITE 4A
SE–AA

SITE 4B
SE–AA

SITE 4C
INTERMITTENT
SE–AA
PERENNIAL

SEE INSET A
SEE INSET B
SEE INSET C

REMOVE PIPE MATCH BASE DITCH TO EXISTING STREAM

CHANNEL CHANGE SEE DETAIL AG

LATERAL BASE DITCH SEE DETAIL M

LATERAL V DITCH SEE DETAIL G

STANDARD BASE DITCH SEE DETAIL AS

STANDARD BASE DITCH SEE DETAIL R

CHANNEL BLOCK SEE DETAIL U

15" CSP 2 ELBOWS ROD & LUG

36" CSP (NOT BURIED) 2 ELBOWS ROD & LUG

12" CSP 2 ELBOWS ROD & LUG

15" RCP-III

36" RCP-IV (NOT BURIED)

54" RCP-CD (NOT BURIED)

Sp. Det JB w/Slab Lid

COLLAR & EXTEND

REMOVE

RETAIN

CONC HW

2GI

FS

MTL GATE

MTL SIGN

15+00

50+00

10+00

EXISTING R/W

WOODS

GRASS

FALLOW

CLEAR CUT

SOIL & GR

BROKEN BST

ISBLKBUS

50PR

25PR

4" WW

6" CHL

CONC

DUE

TS

JS

S

F

C

CB

HW

INSET A

INSET B

INSET C

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SCALE
50 25 0 50 100

SCALE FOR INSETS
25 0 25 50

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DETAIL SHEET FOR SITE 4

PROJECT REFERENCE NO.	SHEET NO.
R-2536	7C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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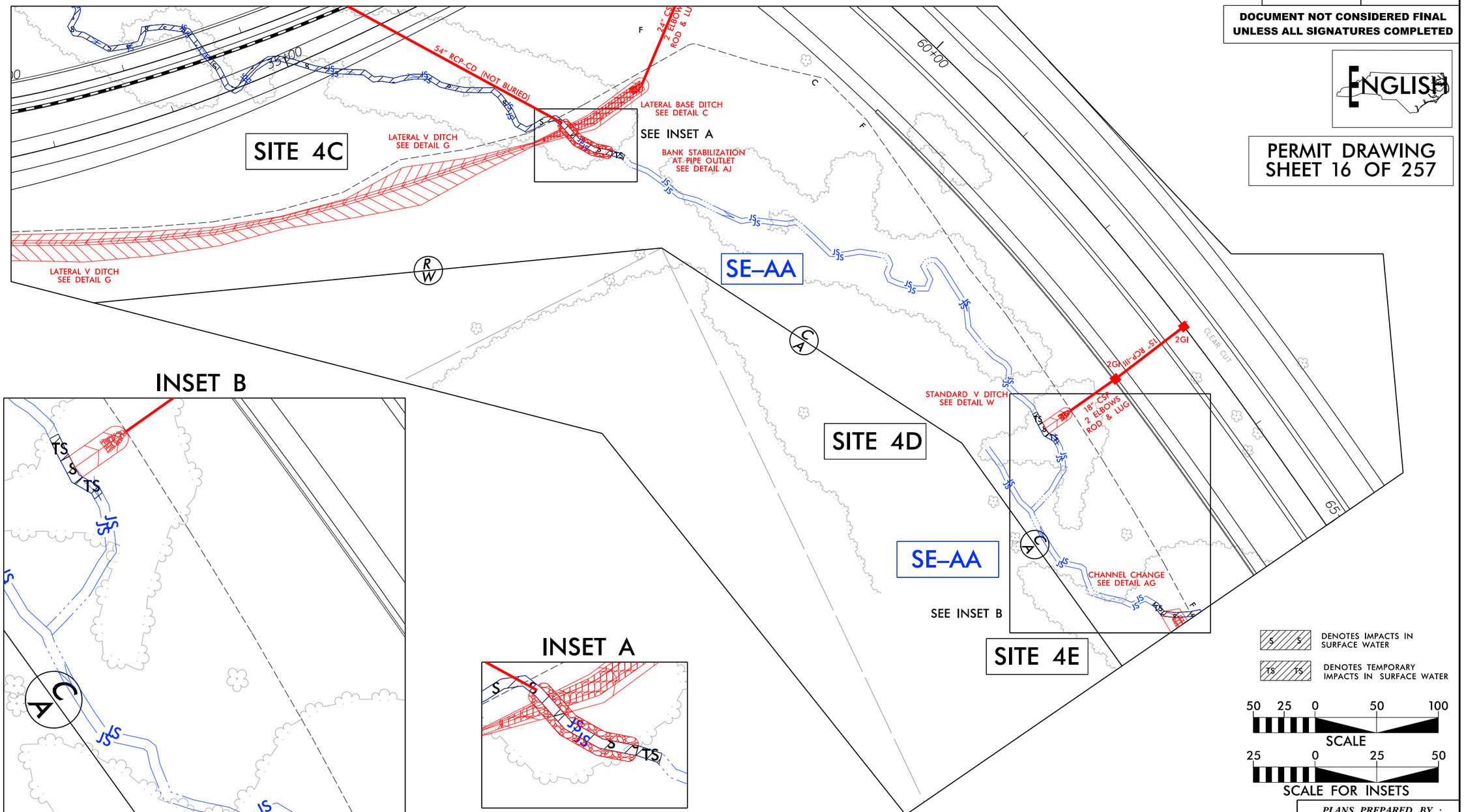
ENGLISH

PERMIT DRAWING SHEET 16 OF 257



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PROJECT REFERENCE NO.	SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL
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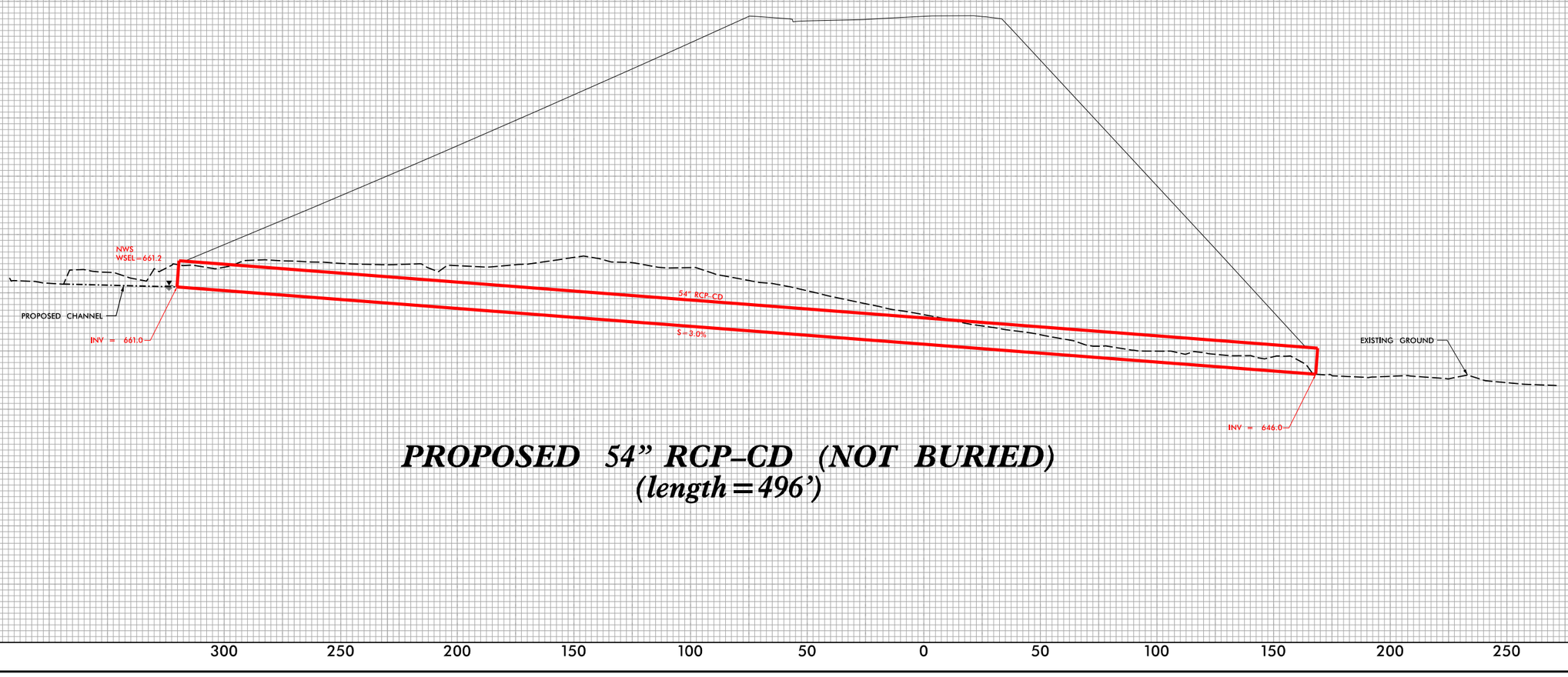
PERMIT DRAWING
SHEET 17 OF 257

ENGLISH

SITE 4C
–FLY– 35+83



PROPOSED 54" RCP–CD (NOT BURIED)
(length = 496')

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DETAIL SHEET FOR SITE 6

PROJECT REFERENCE NO.	SHEET NO.
R-2536	7D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

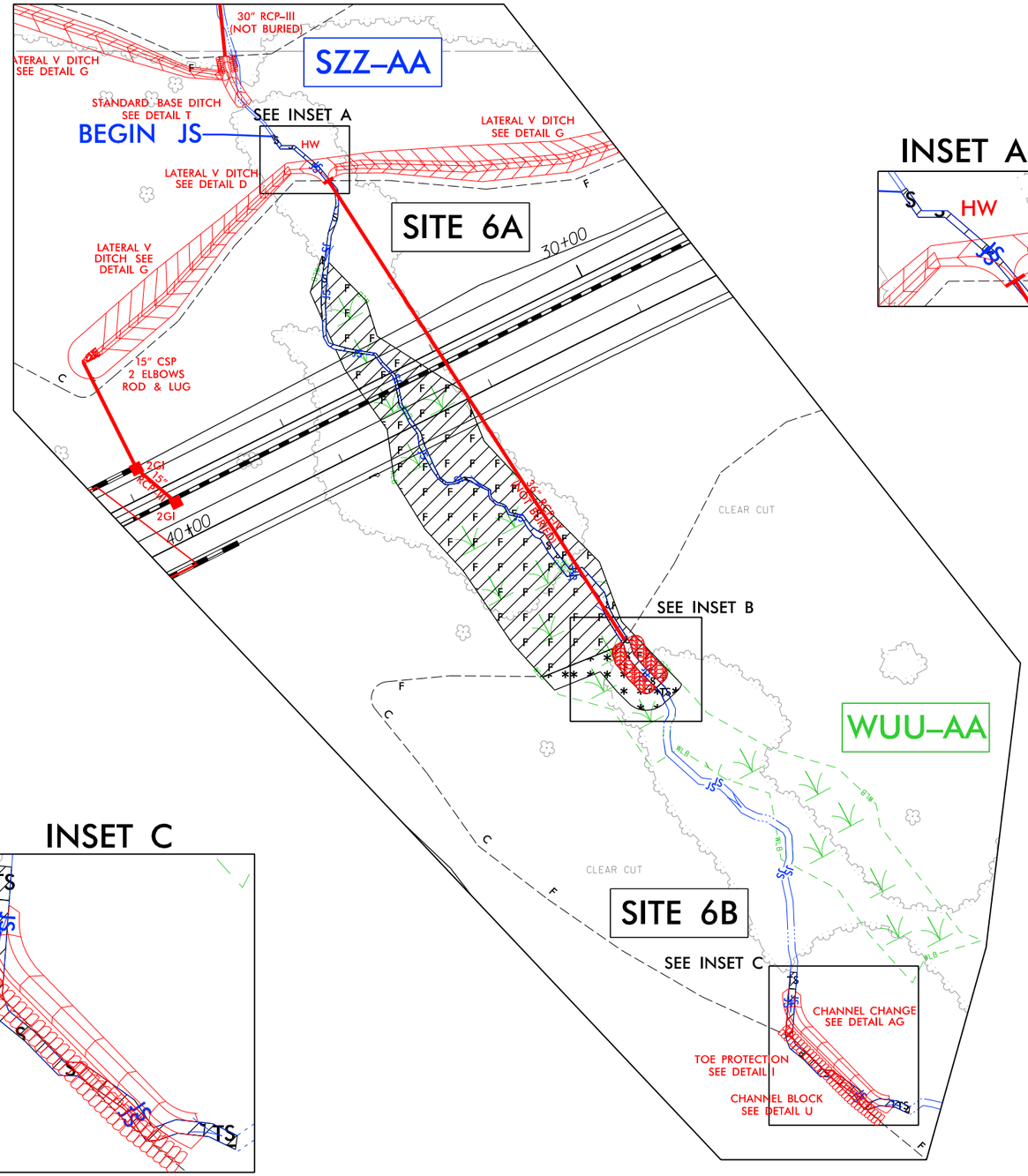
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

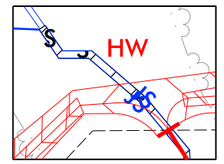
NAD 83/95

ENGLISH

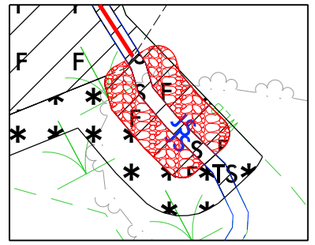
PERMIT DRAWING
SHEET 18 OF 257



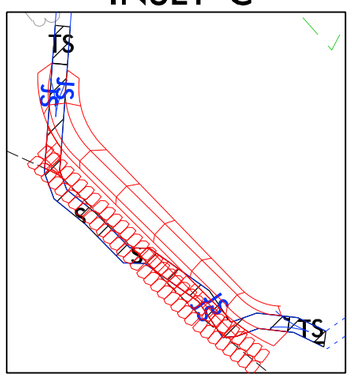
INSET A



INSET B



INSET C



DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50 25 0 50 100
SCALE

25 0 25 50
SCALE FOR INSETS

PLANS PREPARED BY :

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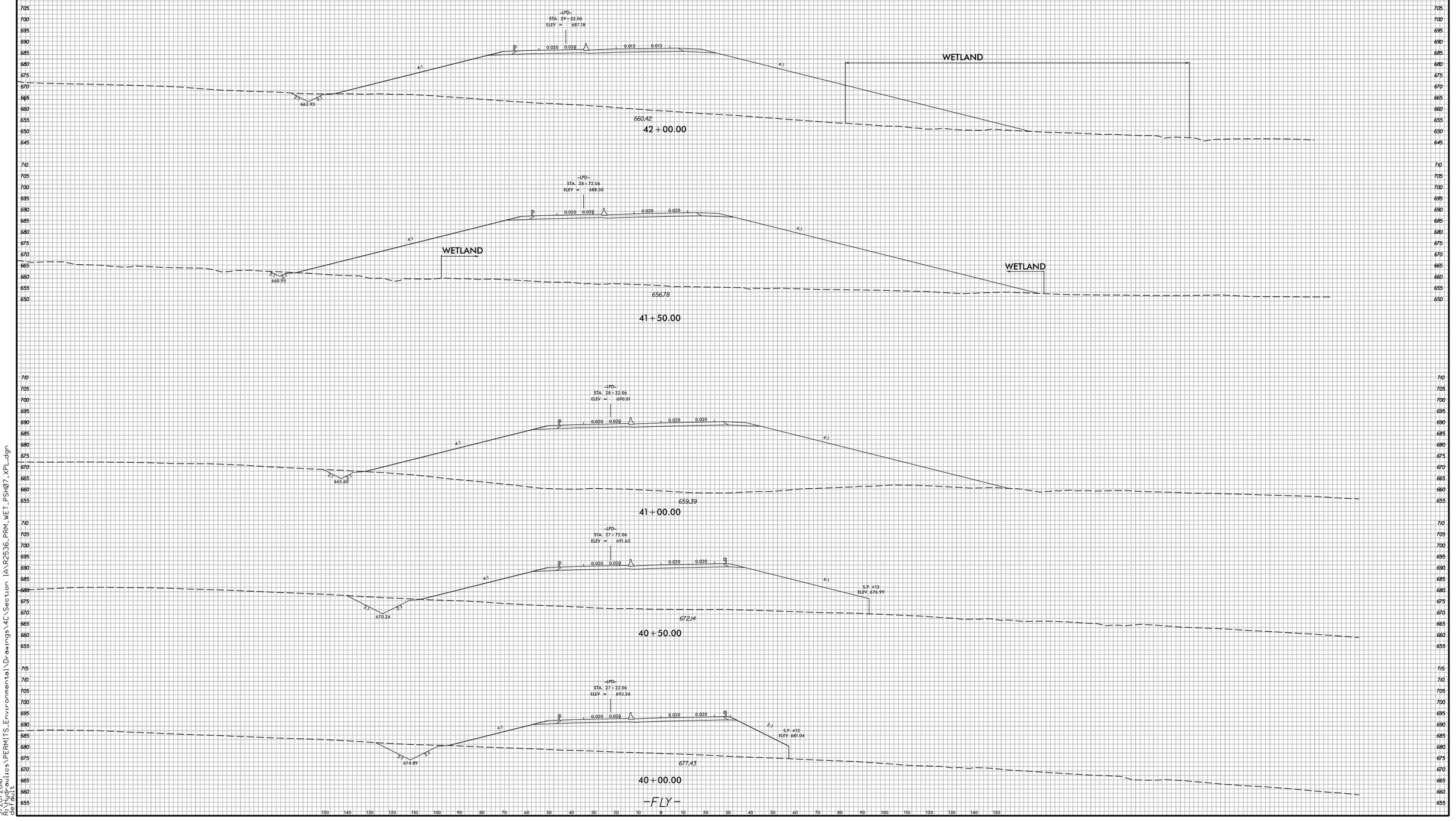
0	PROJ. REFERENCE NO.	SHEET NO.

ENGLISH

PERMIT DRAWING
SHEET 19 OF 257

SITE 6



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/95

PERMIT DRAWING SHEET 20 OF 257

ENGLISH

MATCHLINE –RPA– STA. 20+50 SEE SHEET 58

MATCHLINE –L– STA. 65+00 SEE SHEET 7

MATCHLINE –L– STA. 78+00 SEE SHEET 9

SITE 7

LATERAL BASE DITCH SEE DETAIL M

15" CSP 2GI 2 ELBOWS ROD & LUG

BERM BASE DITCH SEE DETAIL L

BERM DITCH SEE DETAIL A

BDO

18" CSP 2 ELBOWS ROD & LUG

15" CSP 2 ELBOWS ROD & LUG

SPECIAL CUT DITCH SEE DETAIL H

FS MIN EL. 673.0

2GI

15" CSP 2 ELBOWS FS 2GI ROD & LUG

2-@ 8'X 8' RCBC

15" RCP-III

2GI

15" CSP 2 ELBOWS ROD & LUG

24" RCP-V

36" RCP-III

2GI-A

36" RCP-III

36" CSP 2 ELBOWS ROD & LUG

SEE INSET A

JB w/MH

24" RCP-III

CHANNEL CHANGE SEE DET AG

INTERMITTENT

PERENNIAL

SEE CULVERT OUTLET DETAIL –L– STA. 65+84

CHANNEL RELOCATION SEE DETAIL F

CHANNEL BLOCK SEE DETAIL U

CLASS I RIP RAP W/GEO FAB ON BANKS ONLY

STANDARD BASE DITCH SEE DETAIL R

SE–AA

SITE 4E

SG–AA

SITE 7

INSET A

24" RCP

CLEAR CUT

ROCKS

SOIL LOGGING RD

TDE

SCALE 25 0

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SCALE 50 25 0 50 100

FOR –L– PROFILE SEE SHT. 106
FOR –RPA– PROFILE SEE SHT. 139

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/95

PERMIT DRAWING SHEET 21 OF 257

ENGLISH

MATCHLINE –RPA– STA. 20+50 SEE SHEET 58

MATCHLINE –L– STA. 65+00 SEE SHEET 7

MATCHLINE –L– STA. 78+00 SEE SHEET 9

SITE 7

LATERAL BASE DITCH SEE DETAIL M

15" CSP 2GI 2 ELBOWS ROD & LUG

BERM BASE DITCH SEE DETAIL L

BERM DITCH SEE DETAIL A

18" CSP 2 ELBOWS ROD & LUG

15" CSP 2 ELBOWS ROD & LUG

SPECIAL CUT DITCH SEE DETAIL H

FS MIN EL. 673.0

15" CSP 2 ELBOWS FS 2GI ROD & LUG

2-@ 8'X 8' RCBC

FS 2GI

15" RCP-III

2GI

15" CSP 2 ELBOWS ROD & LUG

SEE INSET A

JB

24" RCP-III

CHANNEL CHANGE SEE DET AG

INTERMITTENT

PERENNIAL

SEE CULVERT OUTLET DETAIL –L– STA. 65+84

CHANNEL RELOCATION SEE DETAIL F

CHANNEL BLOCK SEE DETAIL U

CLASS I RIP RAP W/GEO FAB ON BANKS ONLY

STANDARD BASE DITCH SEE DETAIL R

SE–AA

SITE 4E

SG–AA

SITE 7

2GI-A

24" RCP-V

36" RCP-III

36" CSP 2 ELBOWS ROD & LUG

INSET A

24" RCP

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50 25 0 50 100
SCALE

25 0
SCALE

FOR –L– PROFILE SEE SHT. 106
FOR –RPA– PROFILE SEE SHT. 139

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PROJECT REFERENCE NO.	SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

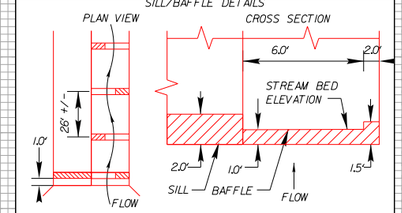
PERMIT DRAWING
SHEET 22 OF 257

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SITE 7
–L– 65+84

PROPOSED 2 @ 8'X 8'RCBC
(length=602')

SILL/BAFFLE DETAILS



PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET.

ALTERNATE BAFFLE SECTIONS TO FORCE STREAM TO MEANDER LEFT TO RIGHT ALONG THE LENGTH OF THE CULVERT.

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

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	58
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 23 OF 257

ENGLISH

NAD 83/95

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SZZ–AA

SITE 6C

SEE INSET A

SH–AA

SITE 18C

SITE 7

SG–AA

SEE INSET B

SITE 7

SG–AA

SEE INSET C

SH–AA

SITE 18B

SH–AA

SITE 18A

SEE INSET D

MATCHLINE –RPA– STA. 20+50 SEE SHEET 8

MATCHLINE –FLY– STA. 45+00 SEE SHEET 7

MATCHLINE –Y– STA. 28+50 SEE SHEET 7

MATCHLINE –FLY– STA. 54+00 SEE SHEET 59

MATCHLINE –Y– STA. 38+00 SEE SHEET 59

INSET A

INSET B

INSET C

INSET D

TOE PROTECTION SEE DETAIL I

CHANNEL CHANGE SEE DETAIL AG

CHANNEL BLOCK SEE DETAIL U

54" RCP–III (NOT BURIED)

2 @ 8'X 8' RCBC

LATERAL BASE DITCH SEE DETAIL C

LATERAL V DITCH SEE DETAIL D

SEE CULVERT INLET DETAIL STA. 65+84

15" CSP 2 ELBOWS ROD & LUG

36" RCP–IV (NOT BURIED)

RETAIN 36" RCP

Sp. Box Det. JB w/Slab Lid

15" RCP–III

LATERAL V DITCH SEE DETAIL G

36" RCP–III (NOT BURIED)

LATERAL BASE DITCH SEE DETAIL AI

BERM BASE DITCH SEE DETAIL K

BERM BASE DITCH SEE DETAIL X

REMOVE

CLEAR CUT

WOODS

GRASS

SOIL & GRAVEL

80' PAVED RDWY THREE B RD (SR 1425)

EXISTING R/W

PUE

TDE

S 64°59'43.8" E

S 6°59'43.8" E

25+00

30+00

35+00

40+00

50+00

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	58
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 24 OF 257

ENGLISH

NAD 83/95

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SZZ–AA

SITE 6C

SEE INSET A

SH–AA

SITE 18C

SITE 7

SG–AA

SITE 7

SG–AA

SH–AA

SITE 18B

SH–AA

SITE 18A

MATCHLINE –RPA– STA. 20+50 SEE SHEET 8

MATCHLINE –FLY– STA. 45+00 SEE SHEET 7

MATCHLINE –Y– STA. 28+50 SEE SHEET 7

MATCHLINE –FLY– STA. 54+00 SEE SHEET 59

MATCHLINE –Y– STA. 38+00 SEE SHEET 59

INSET A

INSET B

INSET C

INSET D

SEE CULVERT INLET DETAIL

SCALE FOR INSETS

SCALE

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ENGLISH

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/95

PROJECT REFERENCE NO.	SHEET NO.
R-2536	59
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 25 OF 257

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

MATCHLINE –Y– STA. 38+00 SEE SHEET 58

MATCHLINE –FLY– STA. 54+00 SEE SHEET 58

MATCHLINE –Y– STA. 52+00 SEE SHEET 60

US HWY 64 VARIABLE WIDTH PAVED ROWY

PUE — TDE — WOODS — GRASS — CLEAR CUT — STUMP PILE — FALLOW — ATV TRAILS — MUD HOLE — WOOD BILLBOARD — EXISTING R/W — PROP. SBG

LATERAL BASE DITCH SEE DETAIL C

BERM BASE DITCH SEE DETAIL X

BERM BASE DITCH SEE DETAIL L

STANDARD BASE DITCH SEE DETAIL AS

LATERAL BASE DITCH SEE DETAIL AV

BDO

FS ELEV. 712.0

18" CSP 2 ELBOWS ROD & LUG

18" RCP-III COLLAR

2GI–D

15" CSP 2 ELBOWS ROD & LUG

30" CSP 2 ELBOWS ROD & LUG

LONG HW COLLAR & EXTEND

18" RCP REMOVE

15" RCP–III

REMOVE 15" RCP

Sp. Det. JB w/Slab Lid

JB CSP 2 ELBOWS ROD & LUG

15" CSP (NOT BURIED) 2 ELBOWS ROD & LUG

30" RCP–III (NOT BURIED)

JB w/MH

COLLAR & EXTEND

WD–AA

SEE INSET A

CHANNEL BLOCK SEE DETAIL U

STD. V DITCH SEE DETAIL AL

STD. BASE DITCH SEE DETAIL AS

CHANNEL CHANGE SEE DETAIL AG

BANK STABILIZATION AT PIPE OUTLET SEE DETAIL AJ

SK–AA

SITE 19

INSET A

40+00 45+00 50+00 10+00 15+00 20+00 55+00

FOR FUTURE CONSTR. DETAIL SEE SHT. 02C–4
FOR –Y– PROFILE SEE SHT. 135
FOR –FLY– PROFILE SEE SHT. 137
FOR –RPA– PROFILE SEE SHT. 140

25 0 25 50
SCALE FOR INSET

50 25 0 50 100
SCALE

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ENGLISH

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

F F DENOTES FILL IN WETLAND

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NAD 1983

PERMIT DRAWING SHEET 26 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	59
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

MATCHLINE –Y– STA. 38+00 SEE SHEET 58

MATCHLINE –FLY– STA. 54+00 SEE SHEET 58

MATCHLINE –Y– STA. 52+00 SEE SHEET 60

PUE PUE PUE

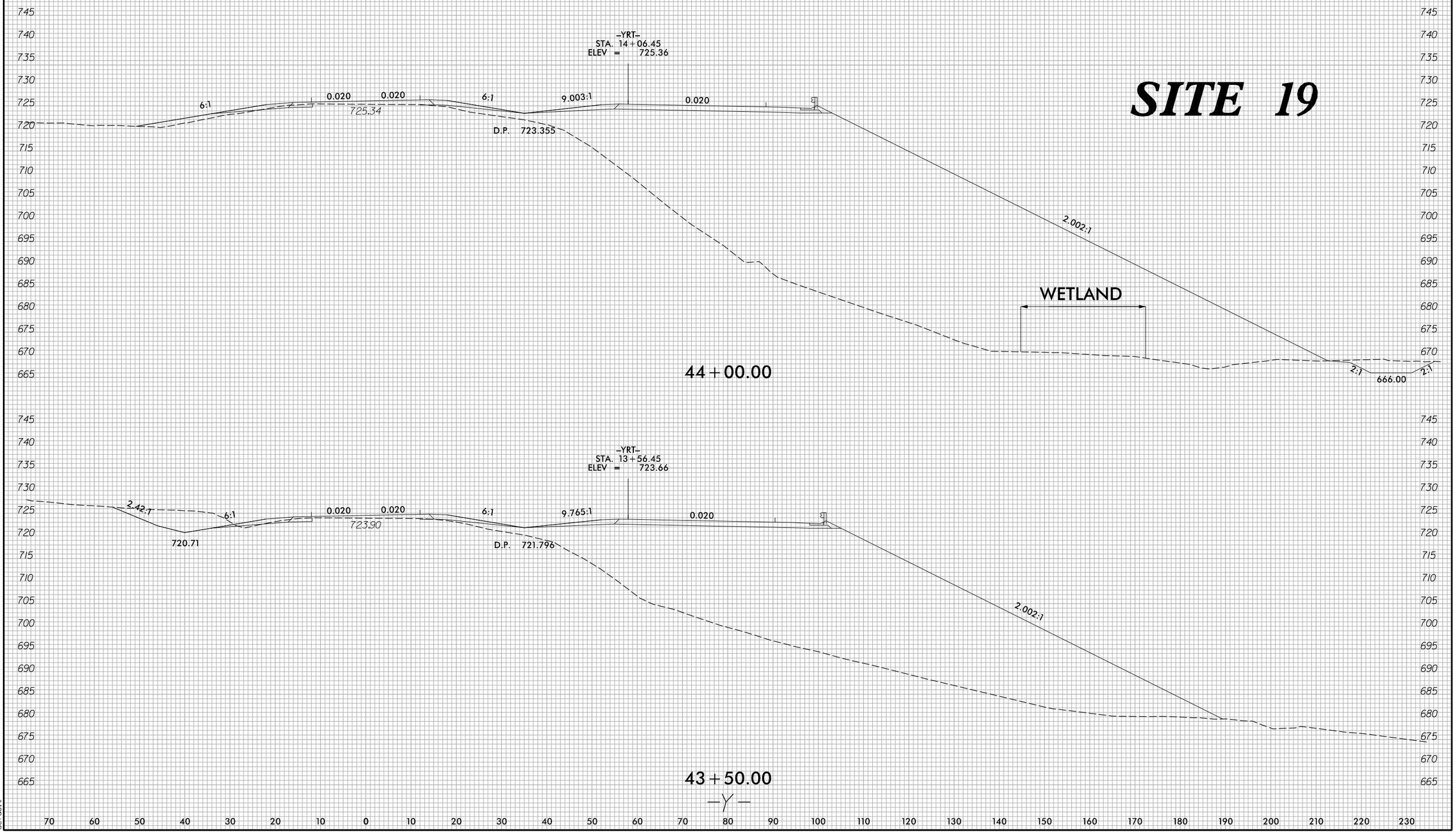
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-172

PERMIT DRAWING
SHEET 27 OF 257

ENGLISH

SITE 19



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ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	60
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 28 OF 257

NAD 83/95

F F DENOTES FILL IN WETLAND

MATCHLINE –Y– STA. 52+00 SEE SHEET 59

MATCHLINE –Y– STA. 66+00 SEE SHEET INSET

PUE BERM BASE DITCH SEE DETAIL L
TOE PROTECTION SEE DETAIL I
BDO
FS 2GI
15" CSP 2 ELBOWS ROD & LUG
15" RCP-III
15" RCP REMOVE
2GI
STANDARD V DITCH SEE DETAIL W
LATERAL BASE DITCH SEE DETAIL AI
15" CSP 2 ELBOWS ROD & LUG
24" CSP 2 ELBOWS ROD & LUG
3GI
SP. CUT BASE DITCH SEE DETAIL AA
RIP RAP
55+00
60+00
65+00
30+00
25+00
35+00
US HWY 64 VARIABLE WIDTH PAVED RDWY
EXISTING R/W
SEE INSET A
LATERAL V DITCH SEE DETAIL G
LATERAL BASE DITCH SEE DETAIL C
REMOVE HW
BANK STABILIZATION AT PIPE OUTLET SEE DETAIL BB
36" CMP RETAIN
18" CSP 2 ELBOWS ROD & LUG
SPECIAL CUT DITCH SEE DETAIL H
WE–AA
SITE 20
SK–AA

INSET A

SCALE FOR INSET: 25 0 25 50

SCALE: 50 25 0 50 100

FOR FUTURE CONSTR. DETAIL SEE SHT. 02C–5
FOR –Y– PROFILE SEE SHT. 135

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8/17/99

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	60
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 29 OF 257

F F DENOTES FILL IN WETLAND

NAD 83/95

MATCHLINE –Y– STA. 52+00 SEE SHEET 59

MATCHLINE –Y– STA. 66+00 SEE SHEET INSET

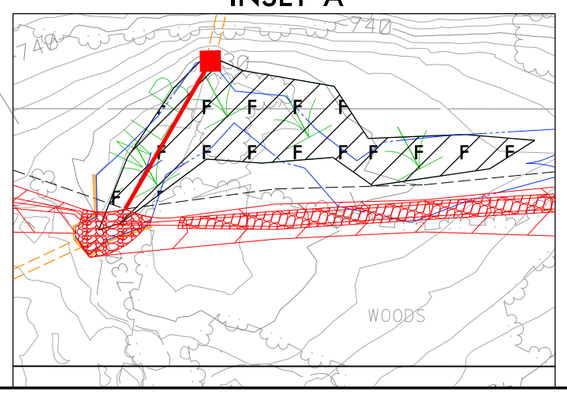
PUE
BERM BASE DITCH SEE DETAIL L
TOE PROTECTION SEE DETAIL I
BDO
FS 2GI
15" CSP 2 ELBOWS ROD & LUG
15" RCP-III
REMOVE
STANDARD V DITCH SEE DETAIL W
LATERAL BASE DITCH SEE DETAIL AI
24" CSP 2 ELBOWS ROD & LUG
SP CUT BASE DITCH SEE DETAIL AA
3GI
SEE INSET A
Sp. Det Jb w/Slab Lid
LATERAL V DITCH SEE DETAIL G
REMOVE HW
BANK STABILIZATION AT PIPE OUTLET SEE DETAIL BB
LATERAL BASE DITCH SEE DETAIL C
36" CMP
RETAIN
SPECIAL CUT DITCH SEE DETAIL H
US HWY 64 VARIABLE WIDTH PAVED RDWY
55+00
25+00
60+00
30+00
65+00
35+00

SK–AA

WE–AA

SITE 20

INSET A



SCALE FOR INSET: 25 0 25 50

SCALE: 50 25 0 50 100

FOR FUTURE CONSTR. DETAIL SEE SHT. 02C–5
FOR –Y– PROFILE SEE SHT. 135

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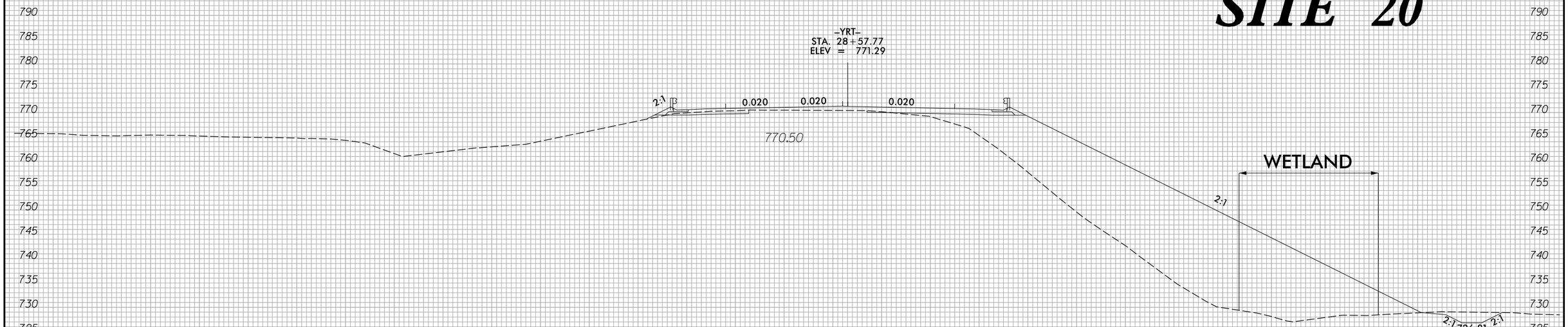
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-185

ENGLISH

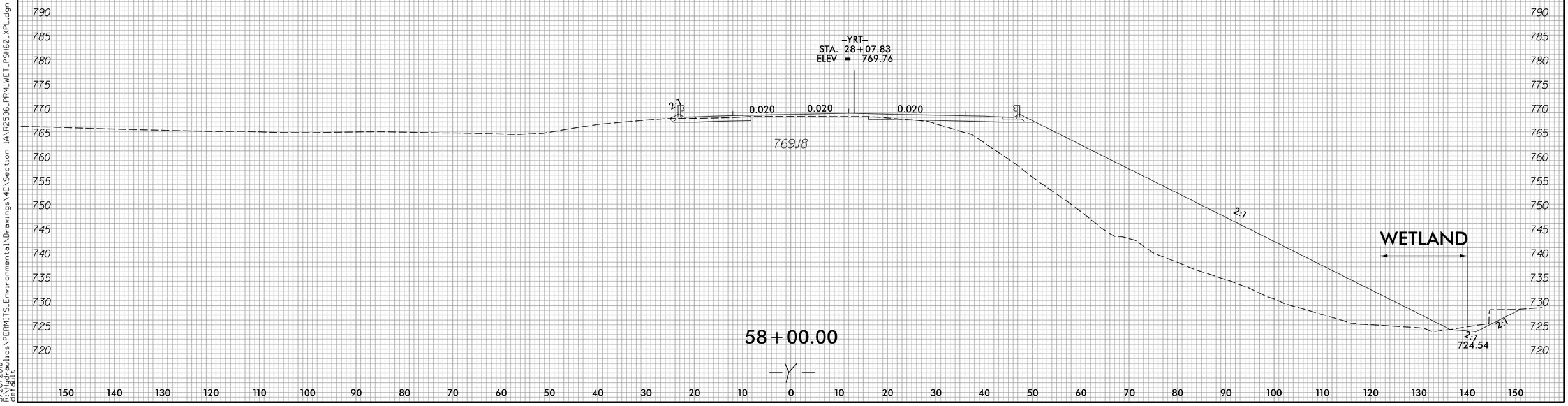
PERMIT DRAWING
SHEET 30 OF 254

SITE 20

58+50.00



58+00.00



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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

PERMIT DRAWING SHEET 31 OF 257

DETAIL SHEET FOR SITES 8 & 9

SITE 9

WZZ–AA

SO–AB/SI–AA

MATCHLINE –L– STA. 118+00 SEE SHEET 11

MATCHLINE –Y2RPB– STA. 14+50 SEE SHEET 13

MATCHLINE –L– STA. 130+00 SEE SHEET 13

120+00

125+00

10+00

S 11°15'47.7" E

2GI

FS

2GI-A

18" RCP-III

30" RCP-III

36" RCP-III

15" CSP 2 ELBOWS ROD & LUG

15" RCP-III

2-2GI

2 ELBOWS ROD & LUG

LATERAL V DITCH SEE DETAIL G

TOE PROTECTION SEE DETAIL K

CHANNEL BLOCK SEE DETAIL U

CHANNEL CHANGE SEE DETAIL AG

LATERAL BASE DITCH SEE DETAIL M

HW

WOODS

REMOVE

18" RCP BROKEN

WYY–AA

SJ–AA

SITE 8

F F DENOTES FILL IN WETLAND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

50 25 0 50 100
SCALE

FOR –L– PROFILE SEE SHT. 108
FOR –Y2RPB– PROFILE SEE SHT. 144

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

PERMIT DRAWING SHEET 32 OF 257

DETAIL SHEET FOR SITES 8 & 9

SITE 9

WZZ–AA

SO–AB/SI–AA

MATCHLINE –L– STA. 118+00 SEE SHEET 11

MATCHLINE –Y2RPB– STA. 14+50 SEE SHEET 13

MATCHLINE –L– STA. 130+00 SEE SHEET 13

S 11°15' 47.7" E

120+00

125+00

10+00

2GI

FS

18" RCP-III

30" RCP-III

2GI-A

36" RCP-III

15" RCP-III

T5 RCP-III

15" CSP 2 ELBOWS ROD & LUG

50" RCP-III (HOT RUNNER)

LATERAL V DITCH SEE DETAIL G

TOE PROTECTION SEE DETAIL K

2–2GI

15" CSP 2 ELBOWS ROD & LUG

CHANNEL BLOCK SEE DETAIL U

CHANNEL CHANGE SEE DETAIL AG

LATERAL BASE DITCH SEE DETAIL M

18" RCP BROKEN

WYY–AA

SJ–AA

SITE 8

WOODS

HW

DENOTES FILL IN WETLAND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

50 25 0 50 100
SCALE

FOR –L– PROFILE SEE SHT. 108
FOR –Y2RPB– PROFILE SEE SHT. 144

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
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NAD 83/95

ENGLISH

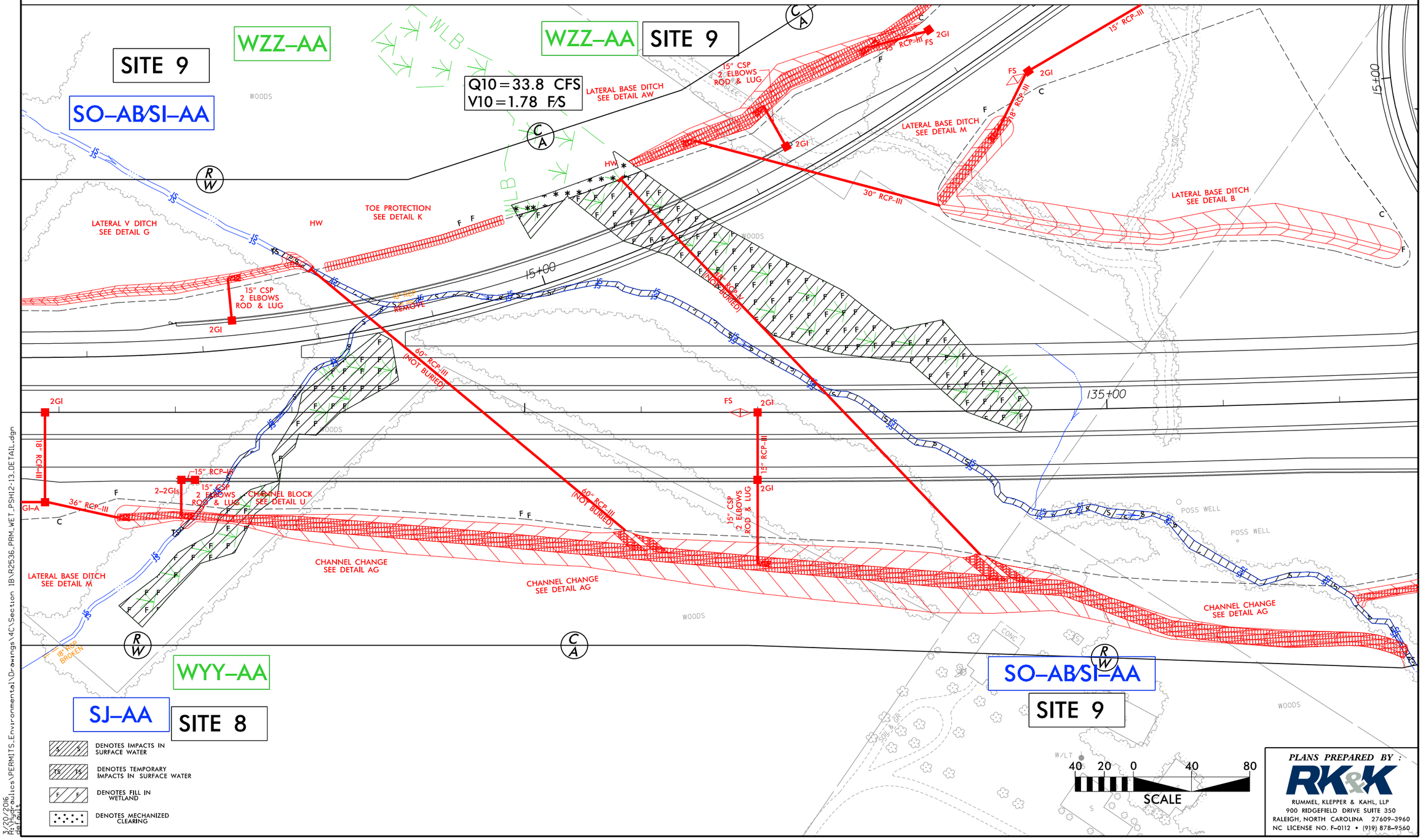
PROJECT REFERENCE NO.	SHEET NO.
R-2536	12-13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING
SHEET 33 OF 257

DETAIL SHEET FOR SITES 8 & 9



PLANS PREPARED BY :

RK&K

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900 RIDGEFIELD DRIVE SUITE 350
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5/14/99

PROJECT REFERENCE NO.	SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

ENGLISH

PERMIT DRAWING
SHEET 34 OF 257

SITE 9
–L– 129+64

PROPOSED 60" RCP–III (NOT BURIED)
(length=351')

3/30/2016
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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-78

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

ENGLISH

SITE 8

PERMIT DRAWING
SHEET 35 OF 257

765 760 755 750 745 740 735 730 725 720

–Y2RPB–
Sta. 13+27.09
EL = 746.34

2.032:1 | 0.079 | 0.079 | 0.020 | 6:1 | 6:1 | 0.020 | 2:1

D.P. 744.915

WETLAND

730.48

128+50.00

765 760 755 750 745 740 735 730 725 720

–Y2RPB–
Sta. 12+76.47
EL = 746.28

2.019:1 | 0.079 | 0.079 | 0.020 | 6:1 | 6:1 | 0.020 | 2:1 | 2:1 | 2:1 | 2:1

727.29

D.P. 744.487

WETLAND

732.87

730.96

128+00.00

765 760 755 750 745 740 735 730 725 720

–Y2RPB–
Sta. 12+26.14
EL = 746.14

2.009:1 | 0.079 | 0.079 | 0.020 | 6:1 | 6:1 | 0.020 | 2:1 | 2:1 | 2:1 | 2:1

729.83

D.P. 744.150

WETLAND

734.39

730.47

127+50.00

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

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8/23/99

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-80

SITE 9

PERMIT DRAWING
SHEET 36 OF 257

ENGLISH

132+50.00

–Y2RPB–
Sta. 17+20.00
EL = 743.14

WETLAND

D.P. 750.551

719.01

728.43

719.23

132+00.00

–Y2RPB–
Sta. 16+70.00
EL = 743.26

WETLAND

D.P. 749.789

720.69

725.15

720.75

131+50.00

–Y2RPB–
Sta. 16+20.00
EL = 743.59

WETLAND

D.P. 749.026

722.55

722.26

131+00.00

–Y2RPB–
Sta. 15+70.00
EL = 744.13

WETLAND

D.P. 748.264

724.62

723.78

130+50.00

–Y2RPB–
Sta. 15+25.00
EL = 744.68

WETLAND

D.P. 747.502

726.11

725.29

3/20/2016
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ROW REVISION: DATE: 2/5/2016
- PARCELS 42 AND 43 COMBINED INTO ONE PARCEL, 42, JAMES AND JUDITH OWENS.
- PARCELS 37 AND 37A COMBINED INTO ONE PARCEL, 37, KENNETH STOUT.
- PARCEL 35 DIVIDED INTO PARCELS 35, BERNADETTE LAMBETH, AND 250, CORBY T. LAMBETH.
- ROW REVISED TO INCLUDE ALL OF PARCEL 36, GREGORY ALLEN PARR.

PROJECT REFERENCE NO.	SHEET NO.
R-2536	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

PERMIT DRAWING
SHEET 37 OF 257

NAD 83/95

MATCHLINE –Y2– STA. 52+25 SEE SHEET 64

DETAIL SHEET FOR SITES 8 & 9

WZZ–AA
SITE 9

Q10 = 33.8 CFS
V10 = 1.78 FS

MATCHLINE –Y2RPB– STA. 15+00 SEE SHEET 12

MATCHLINE –L– STA. 130+00 SEE SHEET 12

SO–ABSP–AA
SITE 9

SP–AB

MATCHLINE –Y2– STA. 37+00 SEE SHEET 63A

DETAIL SHEET FOR SITES 10 & 11

SITE 10
SM–AB

SITE 11
SL–AB

MATCHLINE –L– STA. 157+00 SEE SHEET 14

MATCHLINE –Y2RPD– STA. 16+00 SEE SHEET 14

A

B

C

D

FOR –L– PROFILE SEE SHTS. 108–109
FOR –Y2– PROFILE SEE SHTS. 141–142
FOR –Y2LPB– PROFILE SEE SHT. 143
FOR –Y2RPB– PROFILE SEE SHTS. 144–145
FOR –Y2LPD– PROFILE SEE SHT. 144
FOR –Y2RPD– PROFILE SEE SHT. 145

SCALE 50 25 0 50 100

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

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 ROSEMEAD PARK SUITE 250
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0672 • (919) 878-9560

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2/5/2016
8:41:41

R/W REVISION: DATE: 2/5/2016
– PARCELS 42 AND 43 COMBINED INTO ONE PARCEL, 42, JAMES AND JUDITH OWENS.
– PARCELS 37 AND 37A COMBINED INTO ONE PARCEL, 37, KENNETH STOUT.
– PARCEL 35 DIVIDED INTO PARCELS 35, BERNADETTE LAMBETH, AND 250, CORBY T. LAMBETH.
– ROW REVISED TO INCLUDE ALL OF PARCEL 36, GREGORY ALLEN PARR.

PROJECT REFERENCE NO.	SHEET NO.
R-2536	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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ENGLISH

PERMIT DRAWING
SHEET 38 OF 257

NAD 83/95

MATCHLINE –Y2– STA. 52+25 SEE SHEET 64

DETAIL SHEET FOR SITES 8 & 9

WZZ–AA
SITE 9

Q10 = 33.8 CFS
V10 = 1.78 FS

MATCHLINE –Y2RPB– STA. 15+00 SEE SHEET 12

MATCHLINE –L– STA. 130+00 SEE SHEET 12

SO–ABSP–AA
SITE 9

SP–AB

MATCHLINE –Y2– STA. 37+00 SEE SHEET 63A

DETAIL SHEET FOR SITES 10 & 11

SITE 10
SM–AB

SITE 11
SL–AB

MATCHLINE –L– STA. 157+00 SEE SHEET 14

MATCHLINE –Y2RPD– STA. 16+00 SEE SHEET 14

A

B

C

D

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

PLANS PREPARED BY :

RK&K

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900 ROUSE/BIRCH DRIVE SUITE 330
RALEIGH, NORTH CAROLINA 27609-3960
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FOR –L– PROFILE SEE SHTS. 108-109
FOR –Y2– PROFILE SEE SHTS. 141-142
FOR –Y2LPB– PROFILE SEE SHT. 143
FOR –Y2RPB– PROFILE SEE SHTS. 144-145
FOR –Y2LPD– PROFILE SEE SHT. 144
FOR –Y2RPD– PROFILE SEE SHT. 145

50 25 0 50 100
SCALE

R2536_Sheet_Index_VERMIT15_Environmental\3Dmerge\4C-Section 18\R2536_PRM_MET_PSH13_CON.dgn
2/10/2016
4:38:21

8/17/99

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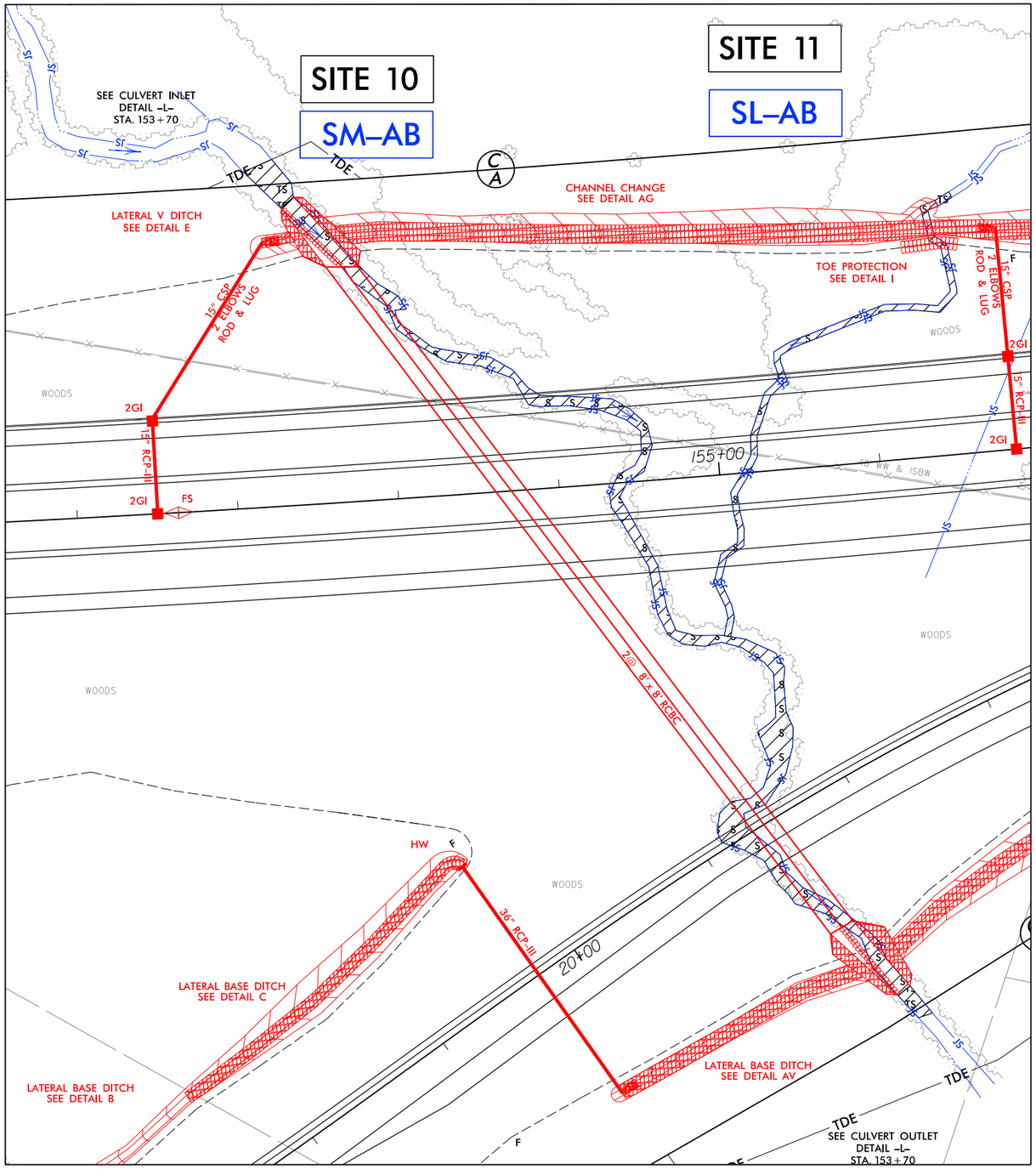
ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	13A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DETAIL SHEET FOR SITES 10 & 11



40 20 0 40 80

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING SHEET 39 OF 257

PLANS PREPARED BY :

RK&K

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PROJECT REFERENCE NO.	SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL
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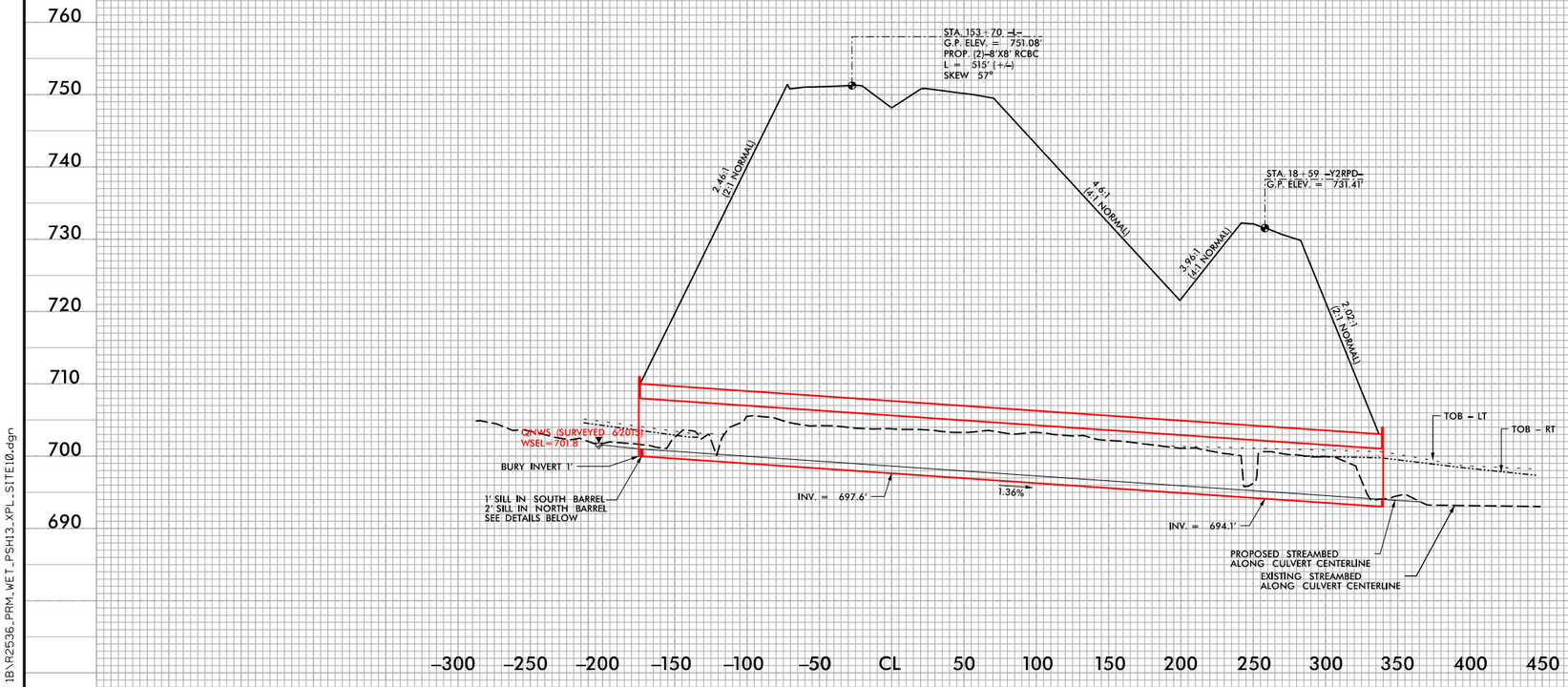
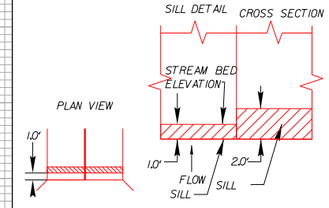
PERMIT DRAWING
SHEET 40 OF 257

ENGLISH

SITE 10
–L– 153+70



PROPOSED 2 @ 8'X 8' RCBC
(length=515')



PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET.

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

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PERMIT DRAWING
SHEET 41 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

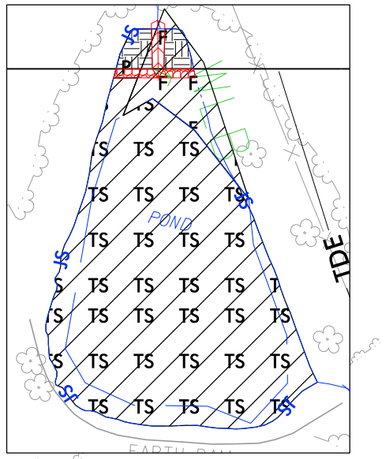
NAD 83/95

TS/TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

F/F DENOTES FILL IN WETLAND

ENGLISH

INSET A



25 0 25 50
SCALE FOR INSET

MATCHLINE –SR F– STA. 30+00 SEE SHEET 67

30+00

S 87° 57' 07" E

EXISTING R/W

60.00'

18" RCP III

FIELD

MTL U/G TANK

MTL CANOPY

12' SOIL & GR

NO OUTLET

14' CONC

CONC

ISBKD

48" CONC

WOODS

WORKSHOP

SL–AB

48" WM & ISBW

15" RCP

15" RCP III

GRADE TO DRAIN

LATERAL BASE DITCH SEE DETAIL AV

BERM DITCH SEE DETAIL O

BERM DITCH SEE DETAIL A

BDO

18" CSP 2 ELBOWS ROD & LUG

FS

2GI

18" RCP III

165+00

160+00

170+00

10+00

15+00

45 ELEC

MATCHLINE –L– STA. 170+00 SEE SHEET 15

MATCHLINE –L– STA. 157+00 SEE SHEET 13

MATCHLINE –Y2RPD– STA. 16+00 SEE SHEET 13

PASTURE

REMOVE 15" RCP

LATERAL BASE DITCH SEE DETAIL

GRADE TO DRAIN

12" CONC

12" ROCK WALK

36" BK

WALKER RD

LATERAL BASE DITCH SEE DETAIL AV

LATERAL V DITCH SEE DETAIL D

STANDARD V DITCH SEE DETAIL W

FILL IN POND W/ROCK PLATING SEE DETAIL AQ

WH–AB

PB–AB

SITE 12

TEMPORARY DRAIN POND

SEE INSET A

50 25 0 50 100
SCALE

PLANS PREPARED BY :

RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
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PERMIT DRAWING
SHEET 42 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

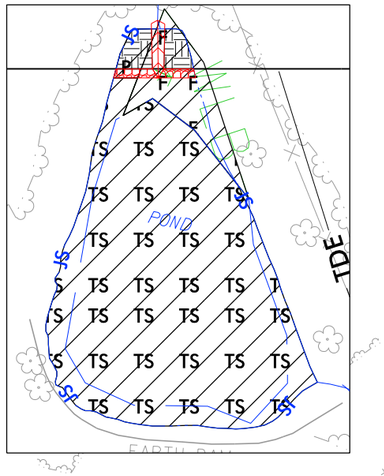
TS/TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

F/F DENOTES FILL IN WETLAND

ENGLISH

NAD 83/95

INSET A



25 0 25 50
SCALE FOR INSET

MATCHLINE –SR F– STA. 30+00 SEE SHEET 67

30+00

18" RCP III

S 87° 57' 07" W

NO OUTLET

MATCHLINE –L– STA. 170+00 SEE SHEET 15

MATCHLINE –L– STA. 157+00 SEE SHEET 13

MATCHLINE –Y2RPD– STA. 16+00 SEE SHEET 13

SL–AB

WH–AB

PB–AB

SITE 12

BERM DITCH SEE DETAIL A

BDO

18" CSP 2 ELBOWS ROD & LUG

BERM DITCH SEE DETAIL O

GRADE TO DRAIN

LATERAL BASE DITCH SEE DETAIL AV

LATERAL BASE DITCH SEE DETAIL A

LATERAL V DITCH SEE DETAIL D

STANDARD V DITCH SEE DETAIL W

FILL IN POND W/ROCK PLATING SEE DETAIL AQ

TEMPORARILY DRAIN POND

SEE INSET A

REMOVE 15" RCP

15" RCP III

18" RCP III

2GI

FS

TDE

50 25 0 50 100
SCALE

PLANS PREPARED BY :

RK&K

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900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

3/20/2006
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8/23/99

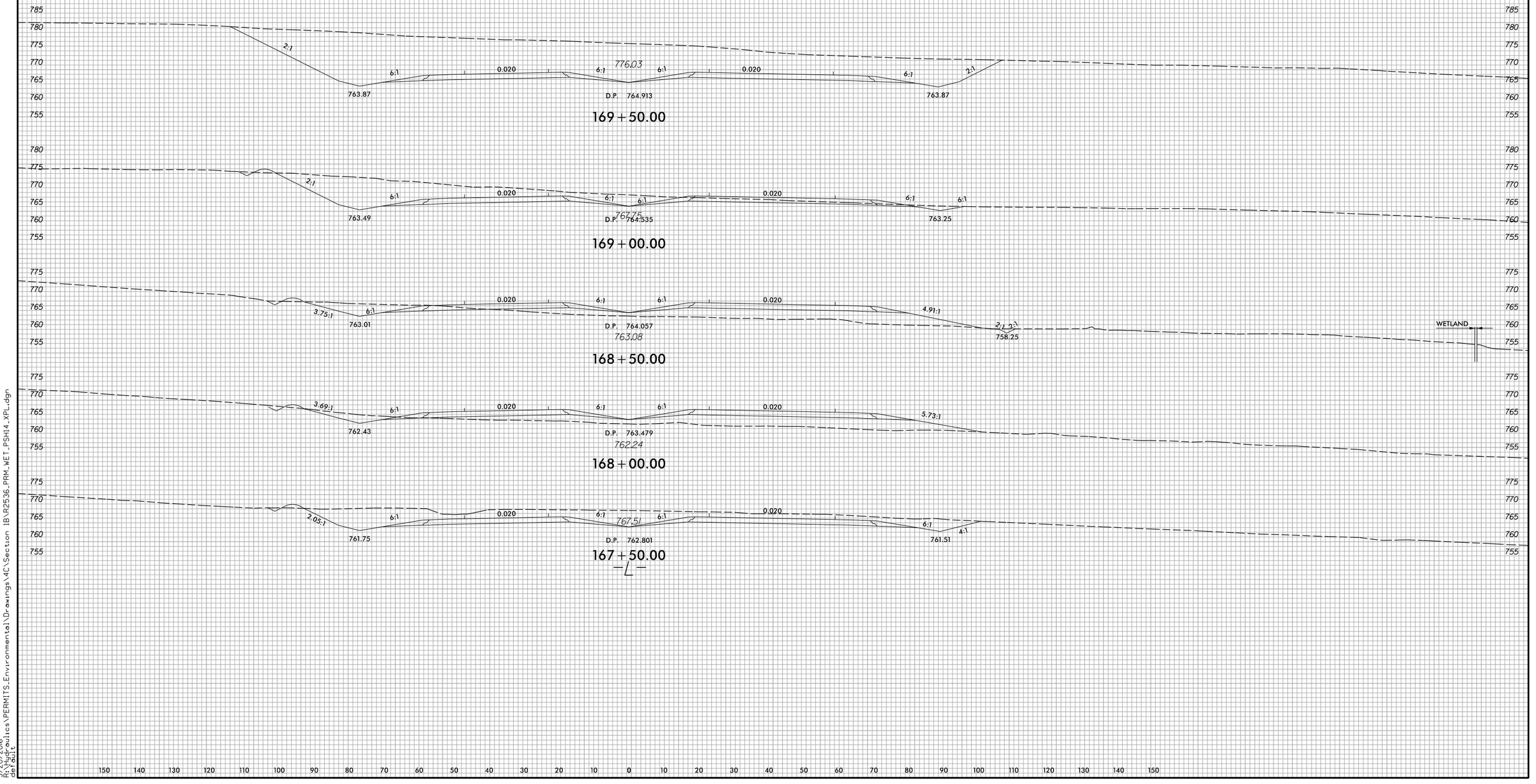
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-XX

PERMIT DRAWING
SHEET 43 OF 257

SITE 12

ENGLISH

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



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

3/20/2016
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

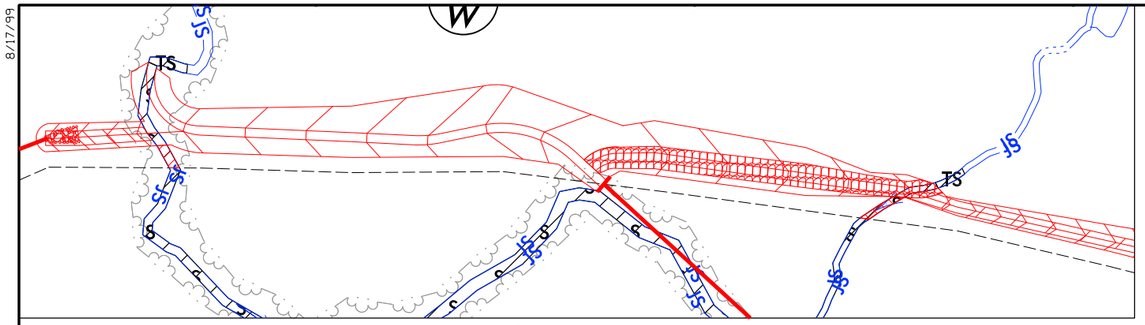
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/95

PERMIT DRAWING SHEET 44 OF 257

ENGLISH


W
TS
TS'
SJS
SJS
SJS

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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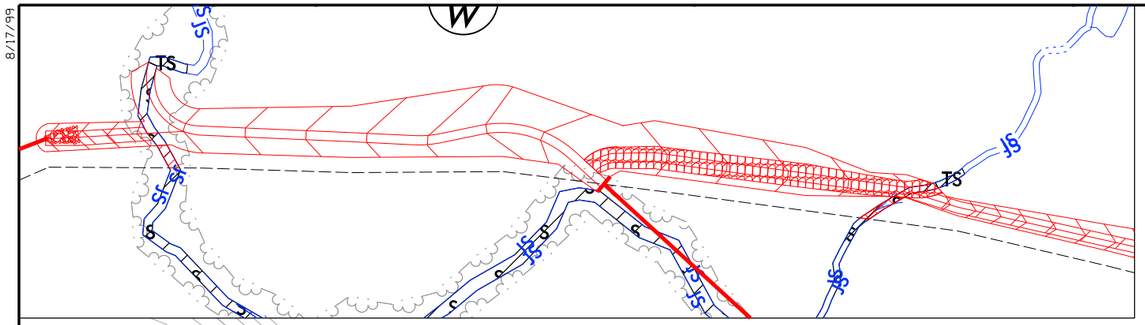
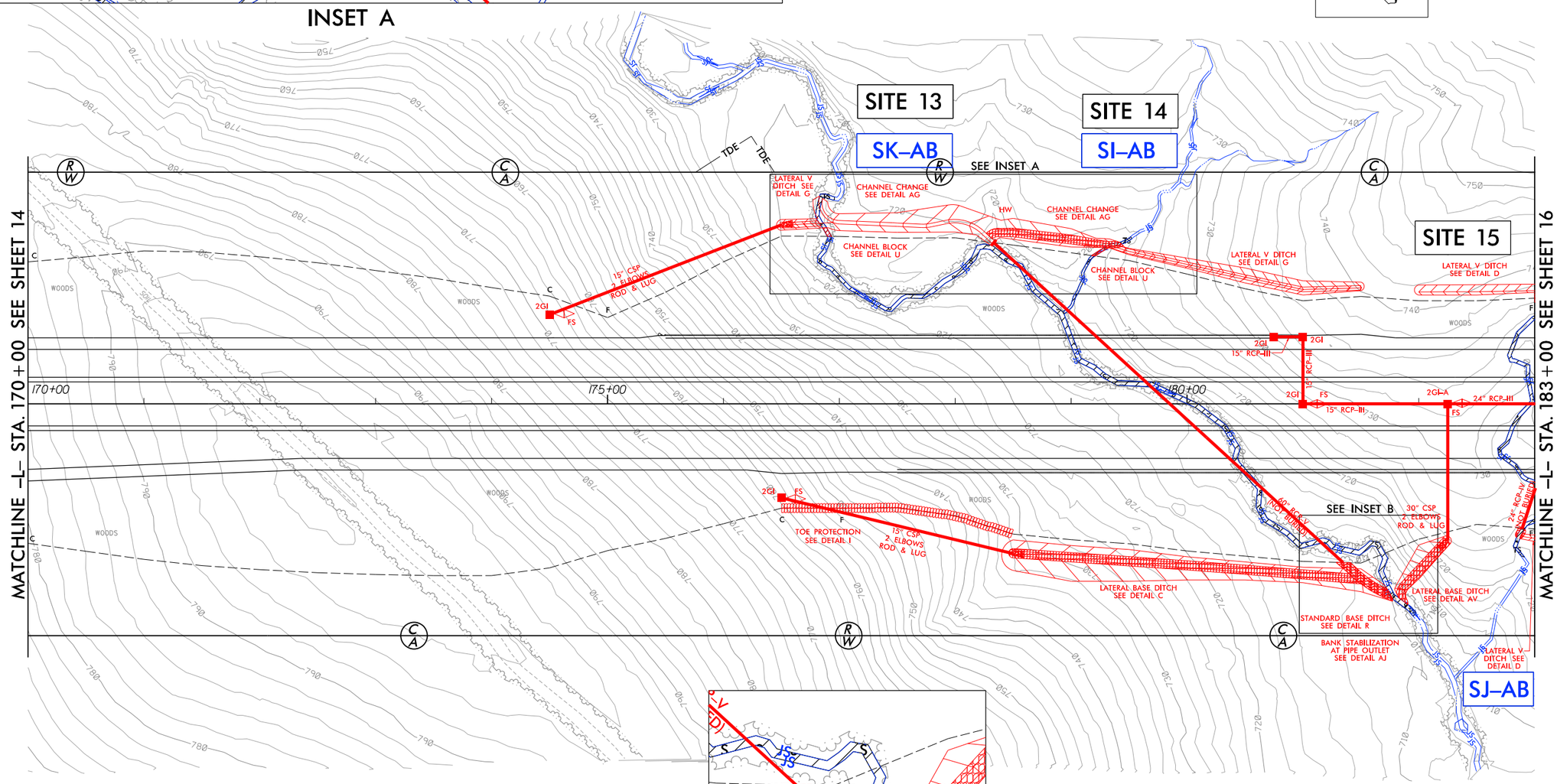
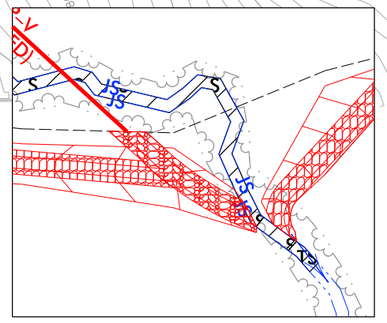
ENGLISH



INSET A





INSET B

5 5 DENOTES IMPACTS IN SURFACE WATER

15 15 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

FOR –L– PROFILE SEE SHT. 110

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ENGLISH

PROJECT REFERENCE NO.	SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

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PERMIT DRAWING
SHEET 46 OF 257

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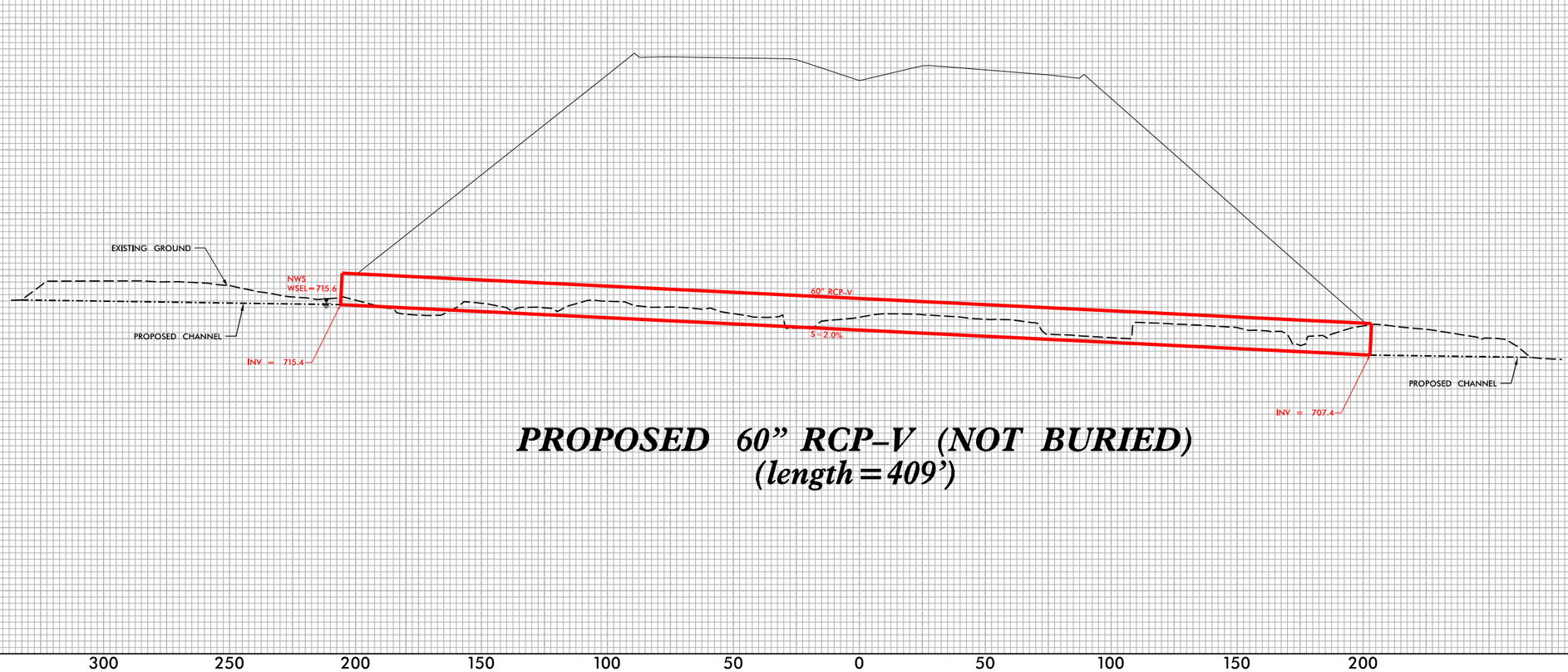
SITE 13
–L– 179+85



PROPOSED 60" RCP–V (NOT BURIED)
(length = 409')

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	16

R/W SHEET NO.

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SHEET 47 OF 257

ENGLISH

INSET A

SJ-AB

SITE 15

MATCHLINE -L- STA. 183+00 SEE SHEET 15

MATCHLINE -L- STA. 196+00 SEE SHEET 17

LATERAL V DITCH SEE DETAIL D

TOE PROTECTION SEE DETAIL I

SEE INSET A

54" RCP-IV BURIED

2GI

18" RCP-III

2GI-A

24" RCP-III

PIPES DO NOT INTERSECT

185+00

S 24° 21' 19.9" E

190+00

195+00

2GI-D

15" RCP-III

FS

15" RCP-III

15" CSP 2 ELBOWS ADD 8 LUG

LATERAL V DITCH SEE DETAIL G

SPECIAL CUT DITCH SEE DETAIL H

EARTH DAM

DOG LOT

WD TIMBERS

POOL

GRASS

WOODS

EIP

35SW

45° WW

SOIL & GAT

B

SITE 15

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50 25 0 50 100
SCALE

FOR -L- PROFILE SEE SHTS. 110-111

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
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ENGLISH

INSET A

SCALE 25 0

SJ–AB

SITE 15

MATCHLINE –L– STA. 183+00 SEE SHEET 15

MATCHLINE –L– STA. 196+00 SEE SHEET 17

LATERAL V DITCH SEE DETAIL D

TOE PROTECTION SEE DETAIL T

SEE INSET A

RCP–IV BURIED

2GI

18" RCP–III

2GI–A

24" RCP–III

185+00

S 24° 21' 19.9" E

190+00

195+00

PIPES DO NOT INTERSECT

15" RCP–III

15" CSP

2 ELBOWS

RDD & LIC

LATERAL V DITCH SEE DETAIL G

SPECIAL CUT DITCH SEE DETAIL H

2GI–D

15" RCP–III

18" RCP–III

EARTH DAM

POOL

WD TIMBERS

DOG LOT

GRASS

WOODS

EIP

FS

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50 25 0 50 100

SCALE

FOR –L– PROFILE SEE SHTS. 110–111

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PRELIMINARY PLANS
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PERMIT DRAWING
SHEET 49 OF 257

ENGLISH

SF–AB

INSET A

SITE 16

WG–AB | SITE 17

SH–AB

SEE INSET A

SEE INSET B

MATCHLINE –L– STA. 196+00 SEE SHEET 16

MATCHLINE –L– STA. 210+00 SEE SHEET 18

200+00

205+00

S 24° 21' 19.9" E

LATERAL V DITCH SEE DETAIL G

HW w/Sill See Detail (Sht.2B–?)

LATERAL BASE DITCH SEE DETAIL M

LATERAL BASE DITCH SEE DETAIL C

CHANNEL BLOCK SEE DETAIL U

SPECIAL CUT DITCH SEE DETAIL H

BDO

BERM DITCH SEE DETAIL A

15" CSP 2 ELBOWS ROD & LUG

18" CSP 2 ELBOWS ROD & LUG

24" CSP 2 ELBOWS ROD & LUG

15" RCP–III

18" RCP–III

24" RCP–III

2GI

2GI–A

FS

WOODS

BANK STABILIZATION AT PIPE OUTLET SEE DETAIL AJ

TDE

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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SHEET 50 OF 257

ENGLISH

SF–AB

SH–AB

WG–AB

SITE 16

SITE 17

INSET A

INSET B

SEE INSET A

SEE INSET B

MATCHLINE –L– STA. 196+00 SEE SHEET 16

MATCHLINE –L– STA. 210+00 SEE SHEET 18

200+00

205+00

S 24° 21' 19.9" E

15" CSP
2 ELBOWS
ROD & LUG

18" CSP
2 ELBOWS
ROD & LUG

24" CSP
2 ELBOWS
ROD & LUG

HW w/Sill
See Detail
(Sht.28–?)

LATERAL V DITCH
SEE DETAIL G

LATERAL BASE DITCH
SEE DETAIL M

LATERAL BASE DITCH
SEE DETAIL C

CHANNEL BLOCK
SEE DETAIL U

SPECIAL CUT DITCH
SEE DETAIL H

BERM DITCH
SEE DETAIL A

BANK STABILIZATION
AT PIPE OUTLET
SEE DETAIL AJ

BDO

2GI

2GI–A

18" RCP–III

15" RCP–III

24" RCP–III

TDE

WOODS

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

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PROJECT REFERENCE NO.	SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

ENGLISH

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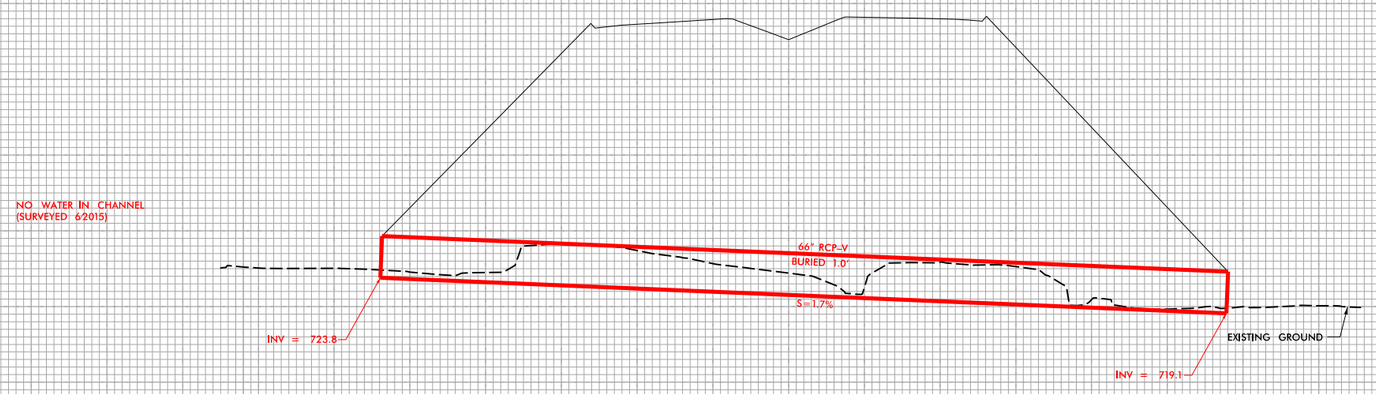
SHEET 51 OF 257

SITE 16
–L– 198+02



PROPOSED 66" RCP–V (BURIED 1.0')
(length=280')

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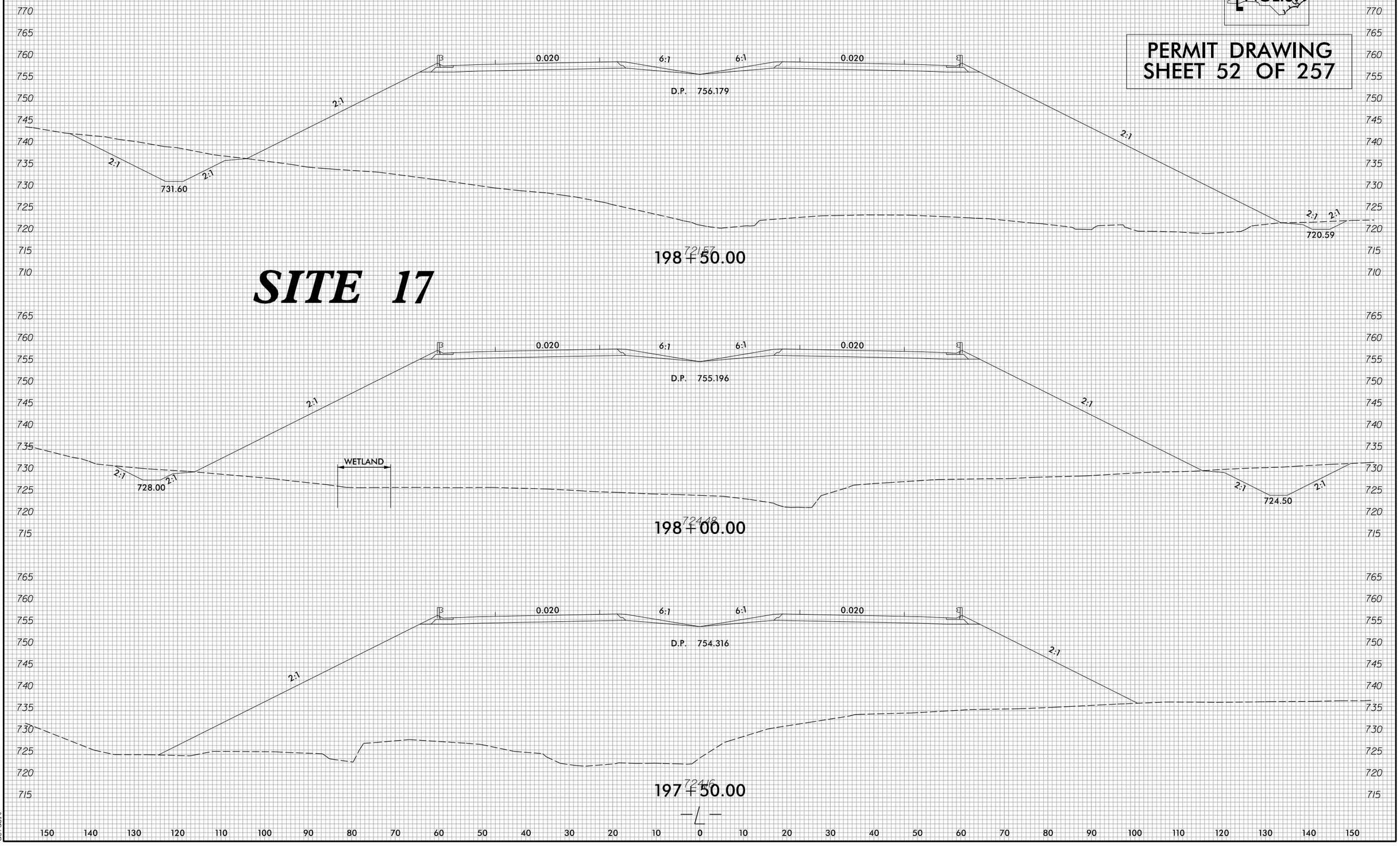
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-121

ENGLISH

PERMIT DRAWING
SHEET 52 OF 257

SITE 17



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	63A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PRELIMINARY PLANS
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ENGLISH

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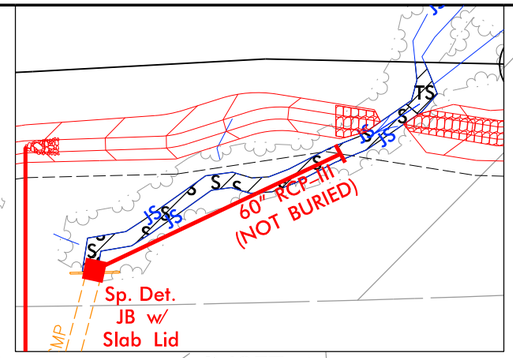
PERMIT DRAWING SHEET 53 OF 257

INSET A

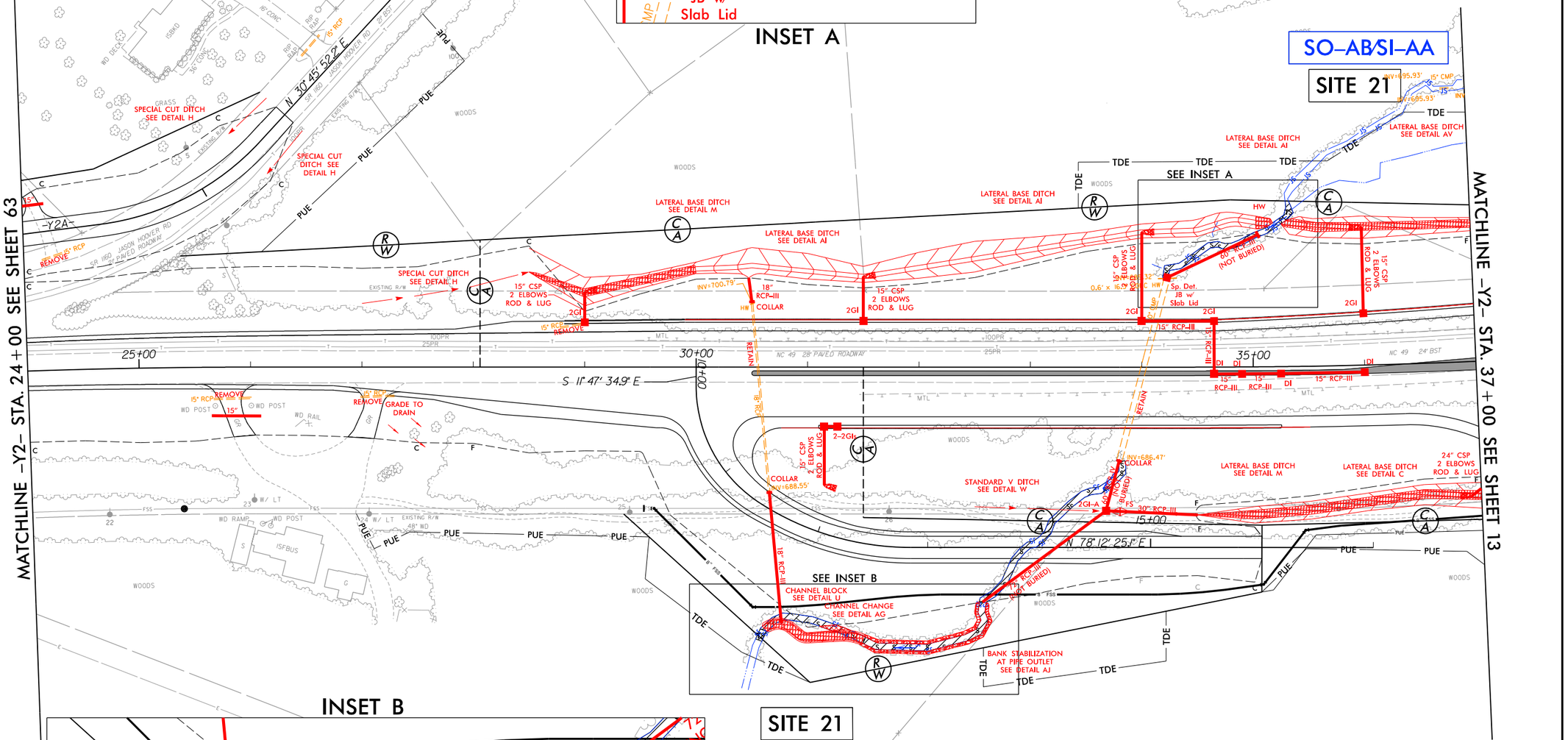


SO-AB/SI-AA

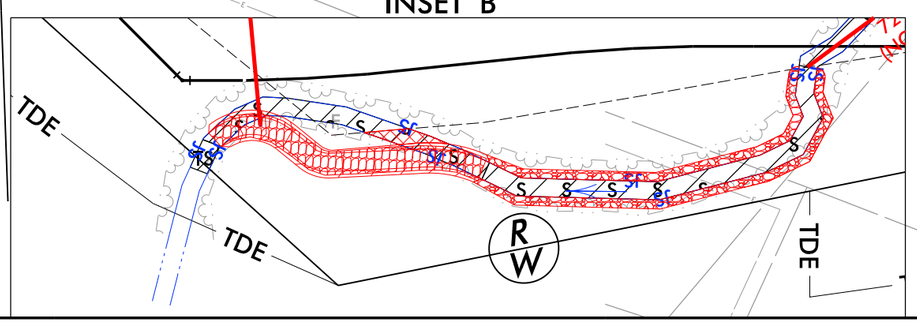
SITE 21

MATCHLINE -Y2- STA. 24+00 SEE SHEET 63

MATCHLINE -Y2- STA. 37+00 SEE SHEET 13



INSET B



SITE 21

SCALE FOR INSETS
25 0 25 50

SCALE
50 25 0 50 100

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR -Y2- PROFILE SEE SHT. 141
FOR -Y2A- PROFILE SEE SHT. 145A
FOR -SR3- PROFILE SEE SHT. 147

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R-2536	63A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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ENGLISH

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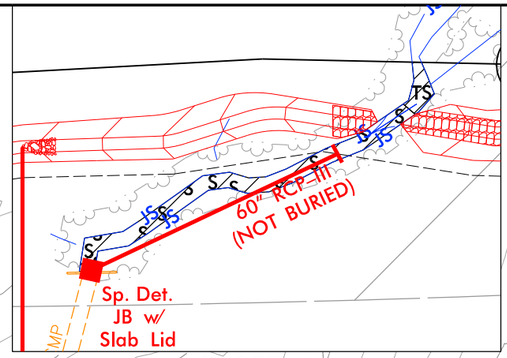
PERMIT DRAWING SHEET 54 OF 257

INSET A



SO-AB/SI-AA

SITE 21

MATCHLINE -Y2- STA. 24+00 SEE SHEET 63

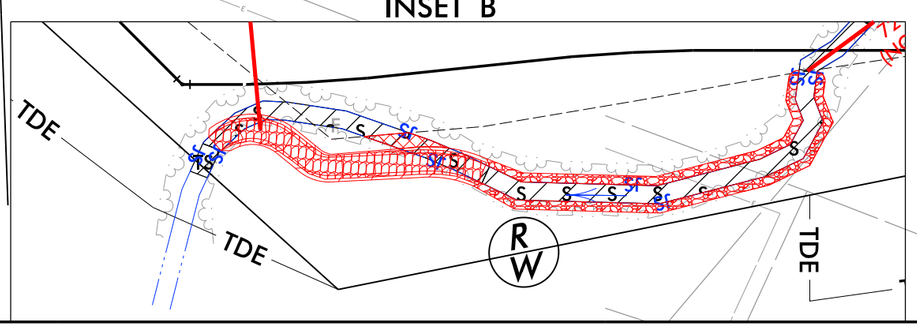
MATCHLINE -Y2- STA. 37+00 SEE SHEET 13

SEE INSET A

SEE INSET B

SITE 21

INSET B



SCALE FOR INSETS
25 0 25 50

SCALE
50 25 0 50 100

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR -Y2- PROFILE SEE SHT. 141
FOR -Y2A- PROFILE SEE SHT. 145A
FOR -SR3- PROFILE SEE SHT. 147

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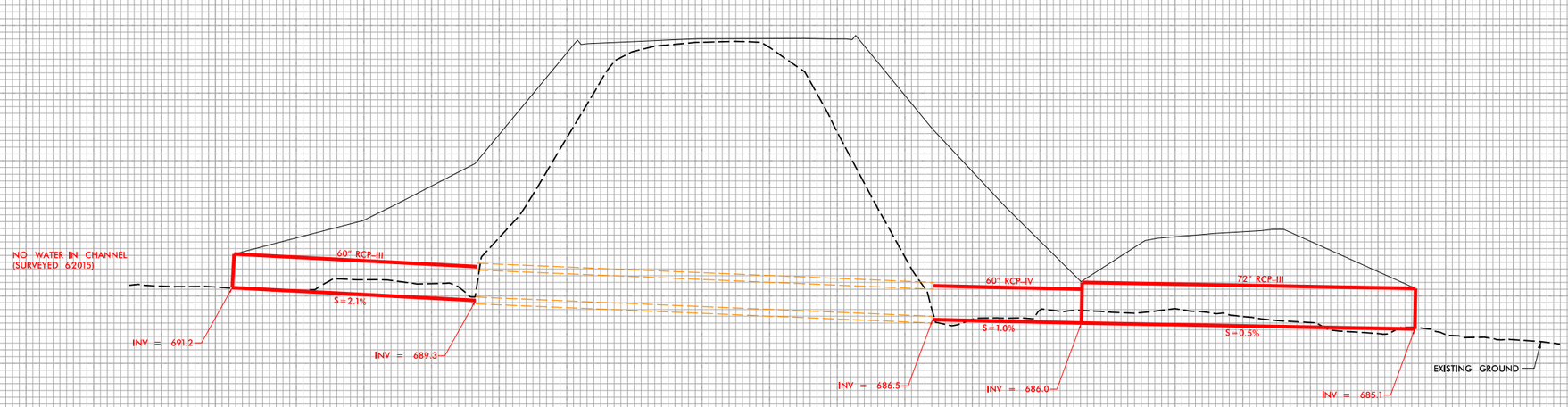
SHEET 55 OF 257

ENGLISH

SITE 21
–Y2– 34+02



EXISTING 60" CMP EXTENDED WITH 60" RCP–III (UPSTREAM END) AND 60" RCP–IV AND 72" RCP–III (DOWNSTREAM END) (TOTAL LENGTH=437', NOT BURIED)

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	64
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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SHEET 56 OF 257

ENGLISH

NAD 83/95

INSET A

SITE 22
SM–AB

WK–AB

SEE INSET A

SEE INSET B

MATCHLINE –Y2– STA. 52+25 SEE SHEET 13

MATCHLINE –Y2– STA. 66+00 SEE SHEET 65

MATCHLINE –SR F– STA. 15+50 SEE SHEET 67

INSET B

SITE 22
SM–AB

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR –SR F– PROFILE SEE SHT. 140A
FOR –Y2– PROFILE SEE SHT. 142
FOR –SR2– PROFILE SEE SHT. 147

SCALE FOR INSETS: 25 0 25 50

SCALE: 50 25 0 50 100

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	64
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
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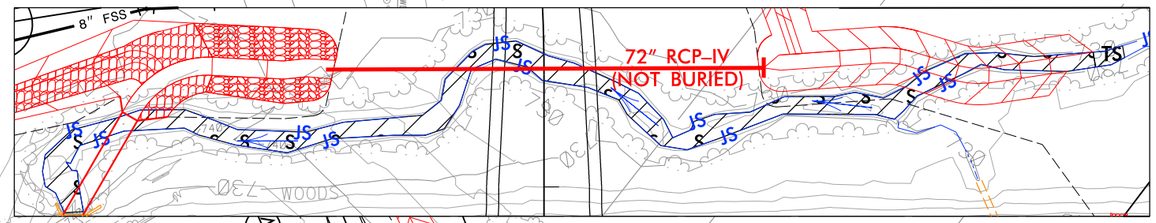
ENGLISH

NAD 83/95

INSET A



SITE 22
SM–AB

WK–AB

SEE INSET A

HW
72" RCP-IV
(NOT BURIED)

CULVERT "A"
ONE BARREL
6.0' x 5.0' CONC

N 33° 50' 46.3" W

S 23° 50' 46.3" E

N 56° 06' 37.7" E

-SR2-

-Y2- STA. 52+25
SEE SHEET 13

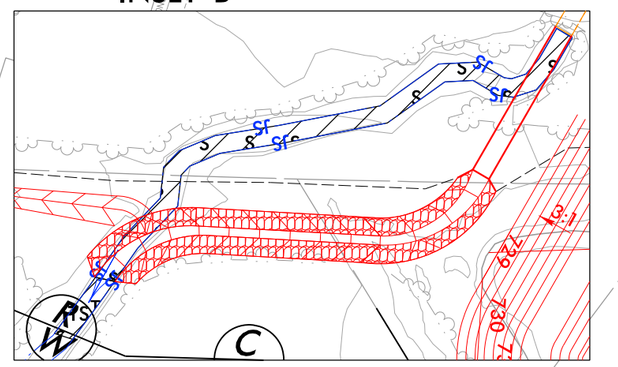
-Y2- STA. 66+00
SEE SHEET 65

MATCHLINE -SR F- STA. 15+50
SEE SHEET 67

SEE INSET B

SITE 22
SM–AB

INSET B



DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR –SR F– PROFILE SEE SHT. 140A
FOR –Y2– PROFILE SEE SHT. 142
FOR –SR2– PROFILE SEE SHT. 147

SCALE FOR INSETS: 25 0 25 50

SCALE: 50 25 0 50 100

PLANS PREPARED BY :

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HYDRAULICS ENGINEER

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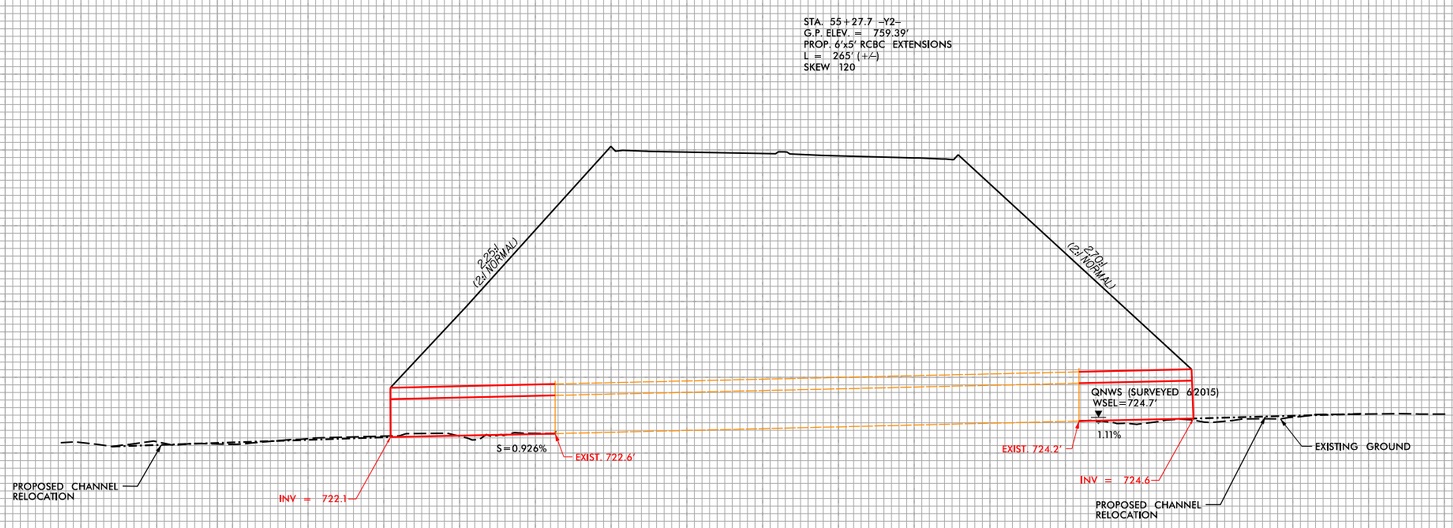
PERMIT DRAWING
SHEET 58 OF 257

SITE 22
–Y2– 55+28



EXISTING 6'X 5'CONCRETE BOX CULVERT EXTENDED WITH 6'X 5'RCBC (BOTH ENDS) (TOTAL LENGTH=265', NOT BURIED)

300 250 200 150 100 50 0 50 100 150 200

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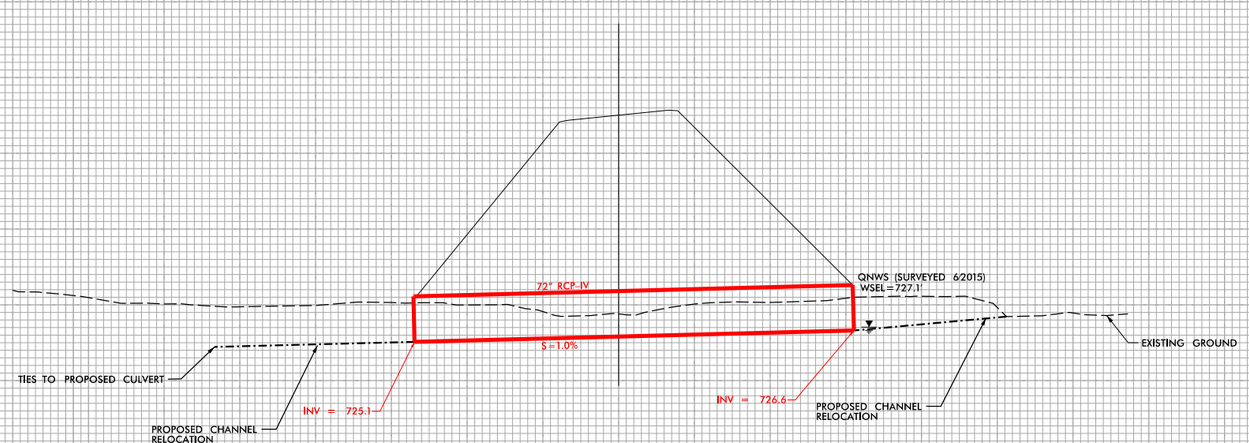
SHEET 59 OF 257

SITE 22
–SR2– 11+39



PROPOSED 72" RCP–IV (NOT BURIED)
(LENGTH=145')

3/29/2016
R:\Projects\PERMITS_Environmental\Drawings\4C\Section 1B\R2536_PRM_WET_PSH64_XPL_SITE22A.dgn
default

09/08/99

TIP PROJECT: R-2536

CONTRACT: C203617

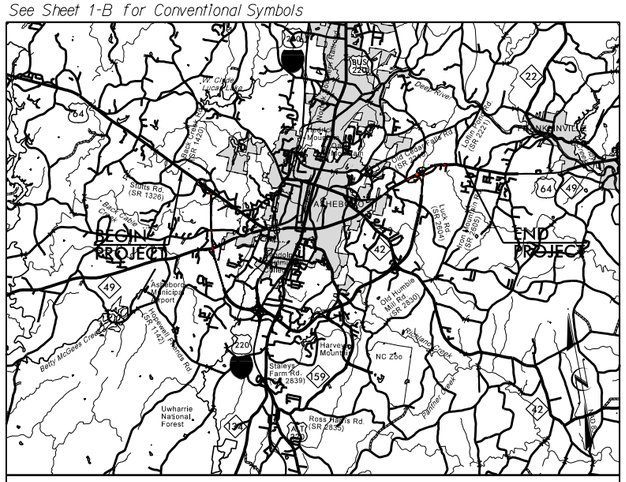
See Sheet 1-A for Index of Sheets
See Sheet 1-B for Conventional Symbols

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RANDOLPH COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2536	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34450.3.S1		PE


BEGIN PROJECT
END PROJECT
Asheboro Municipal Airport
Uwharrie National Forest
Randleman Dam Rec. Area
Seagrove
Liberty
Ramseur
Staley
Farmer
Franklinville
Archdale
Trinity
Randolph
Guilford
Alamance
Davidson
Montgomery
Moore
Chatham
Lee
Stanly
Union
Anson
Richmond
Cabarrus
Rowan
Iredell
Davie
Yadkin
Surry
Stokes
Rockingham
Caswell
Person
Granville
Vance
Warren
Wake
Johnston
Harnett
Lee
Chatham
Orange
Durham
Alamance
Guilford
Rockingham
Caswell
Person
Granville
Vance
Warren
Franklin
Wake
Johnston
Harnett
Lee
Moore
Montgomery
Stanly
Union
Anson
Richmond
Scotland
Hoke
Cumberland
Robeson
Columbus
Bladen
Pender
New Hanover
Brunswick
Onslow
Jones
Lenoir
Greene
Wayne
Duplin
Sampson
Bladen
Pender
Columbus
Brunswick
New Hanover
Onslow
Jones
Lenoir
Greene
Wayne
Duplin
Sampson
Cumberland
Robeson
Hoke
Scotland
Richmond
Anson
Union
Stanly
Montgomery
Moore

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	2D-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

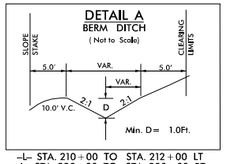
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 61 OF 257

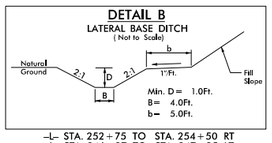
DETAIL A
BERM DITCH
(Not to Scale)



Min. D= 1.0Ft.

–L– STA. 210+00 TO STA. 212+00 LT
–L– STA. 229+00 TO STA. 230+00 RT
–L– STA. 301+50 TO STA. 303+50 LT
–L– STA. 339+12 TO STA. 340+50 LT
–L– STA. 449+70 TO STA. 451+50 LT
–SR_Q– STA. 17+48.76 TO STA. 20+48.76 RT
–SR_Q– STA. 21+98.77 TO STA. 26+81.87 RT
–Y48RPA– STA. 33+40 TO STA. 35+80 RT
–Y5– STA. 18+50 TO STA. 19+50 LT
–Y9FLY– STA. 39+25 TO STA. 44+00 RT
–Y9– STA. 37+75 TO STA. 41+50 LT
–Y9– STA. 48+58 TO STA. 50+00 RT
–Y9RPD– STA. 19+00 TO STA. 22+00 LT
–Y9RPD– STA. 23+00 TO STA. 27+50 LT

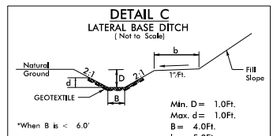
DETAIL B
LATERAL BASE DITCH
(Not to Scale)



Min. D= 1.0Ft.
B= 4.0Ft.
b= 5.0Ft.

–L– STA. 252+75 TO STA. 254+50 RT
–L– STA. 346+37 TO STA. 347+25 LT
–L– STA. 357+00 TO STA. 359+50 LT
–L– STA. 392+00 TO STA. 393+00 LT
–L– STA. 455+37 TO STA. 455+75 RT
–L– STA. 457+50 TO STA. 460+00 RT
–SERRD3– STA. 23+00 to STA. 25+25 LT
–SERRD5– STA. 12+00 TO STA. 15+00 LT
–SR_Q– STA. 11+98.76 TO STA. 14+48.76 RT
–SR_Q– STA. 20+48.76 TO STA. 20+88 RT
–SR_Q– STA. 34+19 TO STA. 37+04 RT
–SR_Q– STA. 37+56.54 TO STA. 42+00 RT
–Y4– STA. 38+60 TO STA. 40+50 RT
–Y4LPB– STA. 11+45 TO STA. 20+50 RT
–Y4LPD– STA. 11+41 TO STA. 19+50 RT
–Y4RPD– STA. 21+50 TO STA. 23+23 LT
–Y7– STA. 20+85 TO STA. 23+00 LT
–Y9– STA. 28+53 TO STA. 29+25 RT
–Y9– STA. 30+00 TO STA. 31+50 RT
–Y9– STA. 70+00 TO STA. 73+50 LT
–Y9– STA. 78+50 TO STA. 79+00 LT
–Y9– STA. 78+50 TO STA. 79+00 LT
–Y9B– STA. 12+00 TO STA. 15+00 LT
–Y9C– STA. 11+50 TO STA. 13+55 RT
–Y9FLY– STA. 10+00 TO STA. 11+50 RT
–Y9FLY– STA. 16+50 TO STA. 19+50 LT
–Y9FLY– STA. 20+50 TO STA. 22+80 LT
–Y9FLY– STA. 26+50 TO STA. 28+00 LT
–Y9LPB– STA. 16+90 TO STA. 19+77 RT
–Y9RPB– STA. 18+90 TO STA. 23+15 RT
–Y9RPC– STA. 19+50 TO STA. 23+50 LT
–Y9RPC– STA. 20+50 TO STA. 23+50 RT

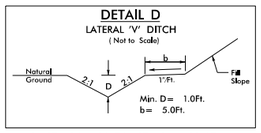
DETAIL C
LATERAL BASE DITCH
(Not to Scale)



Min. D= 1.0Ft.
Max. d= 1.0Ft.
B= 4.0Ft.
b= 5.0Ft.
*When B is < 6.0'
Type of Liner= Class B Rip-Rap

–L– STA. 228+00 TO STA. 229+00 RT
–L– STA. 234+25 TO STA. 241+50 LT
–L– STA. 234+50 TO STA. 235+00 RT
–L– STA. 254+50 TO STA. 261+50 RT
–L– STA. 274+47 TO STA. 277+65 RT
–L– STA. 274+50 TO STA. 275+00 LT
–L– STA. 346+00 TO STA. 346+37 LT
–L– STA. 355+00 TO STA. 357+00 LT
–L– STA. 363+73 TO STA. 364+50 RT
–L– STA. 365+50 TO STA. 368+00 RT
–L– STA. 393+00 TO STA. 396+65 LT
–L– STA. 433+06 TO STA. 435+00 RT
–L– STA. 455+75 TO STA. 457+50 RT
–SERRD3– STA. 37+26 TO STA. 38+85 LT
–SERRD5– STA. 13+85 TO STA. 14+50 RT
–Y4LPD– STA. 10+00 TO STA. 11+41 RT
–Y4RPC– STA. 12+50 TO STA. 16+40 RT
–Y4RPD– STA. 13+35 TO STA. 14+71 RT
–Y4RPD– STA. 24+20 TO STA. 25+44 RT
–Y5– STA. 12+21 TO STA. 14+50 LT
–Y5– STA. 12+31.67 TO STA. 15+00 RT
–Y5– STA. 46+50 TO STA. 50+50 LT
–Y9– STA. 14+50 TO STA. 15+75 RT
–Y9– STA. 11+50 TO STA. 15+00 LT
–Y9– STA. 16+50 TO STA. 18+20 LT
–Y9– STA. 22+00 TO STA. 24+00 LT
–Y9A– STA. 37+00 TO STA. 38+25 LT
–Y9C– STA. 11+00 TO STA. 13+00 LT
–Y9FLY– STA. 19+50 TO STA. 20+50 LT
–Y9FLY– STA 50+00 TO STA. 51+15 RT
–Y9RPC– STA. 23+50 TO STA. 29+38 RT

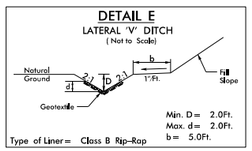
DETAIL D
LATERAL 'V' DITCH
(Not to Scale)



Min. D= 1.0Ft.
b= 5.0Ft.

–L– STA. 244+00 TO STA. 245+23 LT
–L– STA. 252+50 TO STA. 253+75 LT
–L– STA. 249+00 TO STA. 249+65 LT
–L– STA. 299+36 TO STA. 301+50 LT
–L– STA. 455+00 TO STA. 455+37 RT
–SERRD1– STA. 24+50 TO STA. 28+30 LT
–SERRD3– STA. 40+82 TO STA. 41+87 LT
–SERRD5– STA. 10+00 TO STA. 11+00 LT
Y3_DET– STA. 15+91.75 TO STA. 18+20.50 LT
–Y4– STA. 74+54 TO STA. 80+35 RT
–Y4LPA– STA. 17+20 TO STA. 23+39 RT
–Y4LPB– STA. 18+30 TO STA. 20+00 LT
–Y4LPC– STA. 20+50 TO STA. 23+25 RT
–Y4RPA– STA. 21+50 TO STA. 24+00 RT
–Y4RPB– STA. 14+90 TO STA. 16+25 LT
–Y4RPB– STA. 18+75 TO STA. 20+25 LT
–Y4RPB– STA. 21+25 TO STA. 25+50 LT
–Y4RPB– STA. 30+65 TO STA. 31+60 LT
–Y4RPD– STA. 15+18 TO STA. 16+75 LT
–Y6– STA. 27+00 TO STA. 29+00 LT
–Y8– STA. 10+50 TO STA. 13+00 LT
–Y8– STA. 14+00 TO STA. 15+00 LT
–Y9– STA. 19+90 TO STA. 22+00 LT
–Y9– STA. 44+50 TO STA. 45+25 RT
–Y9– STA. 60+00 TO STA. 60+96 RT
–Y9– STA. 69+50 TO STA. 72+53 RT
–Y9– STA. 78+00 TO STA. 78+50 RT
–Y9A– STA. 33+50 TO STA. 35+00 RT
–Y10– STA. 11+00 TO STA. 13+50 RT

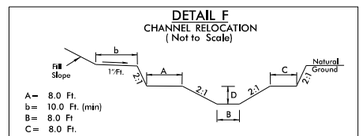
DETAIL E
LATERAL 'V' DITCH
(Not to Scale)



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

–L– STA. 336+77 TO STA. 337+50 RT
–SERRD1– STA. 20+35 TO STA. 21+67 LT, CL 1
–Y5– STA. 23+00 TO STA. 24+81 LT
–Y5A– STA. 11+00 TO STA. 13+00 LT

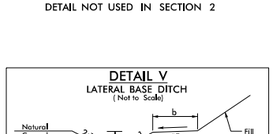
DETAIL F
CHANNEL RELOCATION
(Not to Scale)



A= 8.0 Ft.
b= 10.0 Ft. (min)
B= 8.0 Ft
C= 8.0 Ft.
D= 1.0 Ft.

DETAIL NOT USED IN SECTION 2

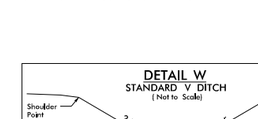
DETAIL G
LATERAL 'V' DITCH
(Not to Scale)



Min. D=1.5 Ft.
Max. d=1.5 Ft.
b=5 Ft.
Type of Liner= PSRM

–L– STA. 329+06 TO STA. 333+00 LT
–L– STA. 329+82 TO STA. 333+00 RT
–SERRD1– STA. 18+15 TO STA. 20+35 LT
Y3_DET– STA. 15+21.14 TO STA. 15+91.75 LT
–Y9– STA. 16+63 TO STA. 20+00 RT
–Y9– STA. 48+00 TO STA. 48+58 RT
–Y9– STA. 48+00 TO STA. 49+29 LT
–Y9A– STA. 29+00 TO STA. 33+50 RT

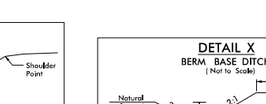
DETAIL H
SPECIAL CUT DITCH
(Not to Scale)



Min. D= 1.0Ft.

–L– STA. 219+50 TO STA. 227+50 LT
–L– STA. 220+75 TO STA. 226+00 RT
–L– STA. 247+50 TO STA. 249+00 LT
–L– STA. 301+50 TO STA. 307+50 LT
–L– STA. 302+00 TO STA. 303+50 RT
–L– STA. 336+50 TO STA. 339+00 LT
–L– STA. 337+50 TO STA. 339+00 RT
–L– STA. 451+50 TO STA. 455+00 LT
–L– STA. 449+50 TO STA. 453+00 RT
–SERRD3– STA. 10+00 TO STA. 11+50 LT
–SERRD3– STA. 43+99 TO STA. 45+85 RT
–SR_Q– STA. 11+02.65 TO STA. 11+98.76 RT
–SR_Q– STA. 14+48.76 TO STA. 15+48.76 RT
–Y3– STA. 10+50 TO STA. 11+50 RT
–Y3– STA. 20+50 TO STA. 20+87 RT
–Y4– STA. 49+00 TO STA. 50+00 RT
–Y4– STA. 50+50 TO STA. 54+50 RT
–Y4– STA. 86+00 TO STA. 86+42 RT
–Y4LPA– STA. 13+50 TO STA. 14+00 LT
–Y4LPC– STA. 23+25 TO STA. 23+85 RT
–Y4RPA– STA. 35+08 TO STA. 36+08 RT
–Y4RPC– STA. 21+00 TO STA. 22+50 LT
–Y4RPC– STA. 21+00 TO STA. 25+00 RT
–Y5– STA. 10+00 TO STA. 11+00 LT
–Y6– STA. 13+00 TO STA. 14+00 LT
–Y6– STA. 15+00 TO STA. 16+00 RT
–Y7– STA. 10+00 TO STA. 10+50 RT
–Y7– STA. 11+00 TO STA. 14+50 RT
–Y7– STA. 23+50 TO STA. 24+30 LT
–Y7– STA. 23+50 TO STA. 24+16 RT
–Y8– STA. 9+75 TO STA. 10+50 LT
–Y8– STA. 9+75 TO STA. 11+00 RT
–Y8– STA. 13+00 TO STA. 14+00 LT
–Y8– STA. 28+50 TO STA. 29+55 RT
–Y9– STA. 34+50 TO STA. 36+50 RT
–Y9– STA. 42+50 TO STA. 44+50 RT
–Y9– STA. 52+00 TO STA. 53+00 RT
–Y9– STA. 52+00 TO STA. 54+50 LT
–Y9– STA. 58+50 TO STA. 60+00 RT
–Y9A– STA. 12+40 TO STA. 14+00 RT
–Y9A– STA. 13+50 TO STA. 14+50 LT
–Y9A– STA. 37+50 TO STA. 39+00 RT
–Y9A– STA. 41+00 TO STA. 42+50 RT
–Y9B– STA. 16+50 TO STA. 18+00 RT
–Y9FLY– STA. 11+50 TO STA. 14+00 RT
–Y9FLY– STA. 40+00 TO STA. 43+00 RT
–Y9RPC– STA. 19+00 TO STA. 19+50 LT
–Y9RPC– STA. 20+00 TO STA. 20+50 RT
–Y9RPD– STA. 17+00 TO STA. 17+50 LT
–Y10– STA. 23+00 TO STA. 23+99 RT
–Y10A– STA. 15+00 TO STA. 15+74 RT
–Y10END– STA. 14+00 TO STA. 16+00 RT
–Y10END– STA. 18+00 TO STA. 19+50 RT

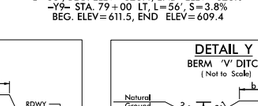
DETAIL I
TOE PROTECTION
(Not to Scale)



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

–L– STA. 327+50 TO STA. 329+05 LT
–L– STA. 352+00 TO STA. 353+82 LT
–L– STA. 354+90 TO STA. 357+50 RT
–L– STA. 360+00 TO STA. 364+50 LT
–L– STA. 360+00 TO STA. 363+25 RT
–L– STA. 364+50 TO STA. 365+50 RT
–L– STA. 405+25 TO STA. 414+30 LT
–L– STA. 406+85 TO STA. 412+00 RT
–L– STA. 431+50 TO STA. 433+00 LT
–L– STA. 455+00 TO STA. 458+10 LT
–L– STA. 462+50 TO STA. 465+00 RT
–SERRD3– STA. 41+35 TO STA. 42+39 LT
–SERRD3– STA. 20+70 TO STA. 23+75 LT
–SERRD3_DR1– STA. 11+58 TO STA. 12+68 LT
–SERRD5– STA. 12+50 TO STA. 13+80 RT
–SERRD5– STA. 15+00 TO STA. 17+00 LT
–Y4RPC– STA. 16+40 TO STA. 21+00 RT
–Y4RPC– STA. 19+78 TO STA. 21+50 LT
–Y5– STA. 21+00 TO STA. 23+00 LT
–Y5– STA. 45+50 TO STA. 46+50 LT
–Y9– STA. 15+75 TO STA. 16+50 RT
–Y9– STA. 23+50 TO STA. 25+00 RT
–Y9– STA. 27+00 TO STA. 29+40 LT
–Y9– STA. 31+25 TO STA. 32+50 LT
–Y9– STA. 36+35 TO STA. 37+50 LT
–Y9– STA. 45+45 TO STA. 46+00 RT
–Y9– STA. 61+00 TO STA. 61+50 RT
–Y98AB– STA. 10+55 TO –NC159– STA. 12+00 LT
–Y9C– STA. 13+50 TO STA. 14+00 LT
–Y9FLY– STA. 10+75 TO STA. 11+80 LT
–Y9FLY– STA. 17+00 TO STA. 19+50 RT
–Y9FLY– STA. 24+30 TO STA. 27+25 RT

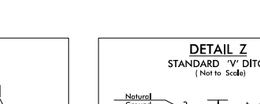
DETAIL J
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D= 1.0Ft.

–Y4RPB– STA. 27+27 TO STA. 30+42 RT; 4:1
–Y9– STA. 36+50 TO STA. 37+00 RT
–Y9– STA. 53+00 TO STA. 54+00 RT

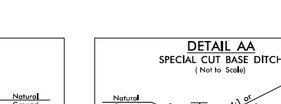
DETAIL K
TOE PROTECTION
(Not to Scale)



d= 2.0Ft.
Type of Liner= Class I Rip-Rap

–Y5– STA. 37+75 TO STA. 41+08 LT

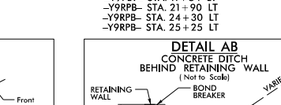
DETAIL L
BERM BASE DITCH
(Not to Scale)



Min. D= 1.0Ft.
Max. d= 1.0Ft.
B= 4.0Ft.
b= 5.0Ft.
Type of Liner= Class B Rip-Rap

–L– STA. 212+00 TO STA. 216+50 LT
–L– STA. 222+00 TO STA. 228+00 RT
–L– STA. 230+00 TO STA. 234+50 RT
–L– STA. 317+20 TO STA. 318+20 LT
–SR_Q– STA. 13+98.76 TO STA. 14+98.76 RT CL 1
–Y5– STA. 16+69 TO STA. 18+50 LT
–Y5– STA. 19+50 TO STA. 21+00 LT
–Y9– STA. 31+50 TO STA. 42+00 RT

DETAIL M
LATERAL BASE DITCH
(Not to Scale)



Min. D= 1.0Ft.
Max. d= 1.0Ft.
b= 5 Ft.
*When B is < 6.0'
Type of Liner= Class I Rip-Rap

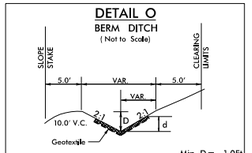
–L– STA. 280+00 TO STA. 280+50 LT
–L– STA. 368+00 TO STA. 371+50 RT
–SERRD5– STA. 14+50 TO STA. 17+17 RT
–Y4– STA. 71+00 TO STA. 72+50 RT
–Y4LPB– STA. 9+50 TO STA. 11+45 RT
–Y4RPD– STA. 23+23 TO STA. 24+20 RT
–Y9– STA. 10+00 TO STA. 14+50 RT
–Y9A– STA. 29+00 TO STA. 32+83 LT

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

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

DETAIL NOT USE IN SECTION 2

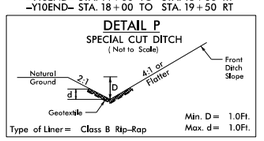
DETAIL O
BERM DITCH
(Not to Scale)



Min. D= 1.0Ft.
Max. d= 1.0Ft.
Type of Liner= Class B Riprap

DETAIL NOT USED IN SECTION 2

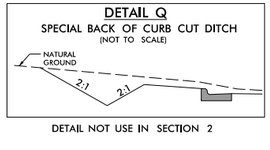
DETAIL P
SPECIAL CUT DITCH
(Not to Scale)



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

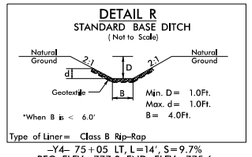
–Y5A– STA. 14+50 TO STA. 15+00 LT
–Y10END– STA. 21+50 TO STA. 22+34 RT

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



DETAIL NOT USE IN SECTION 2

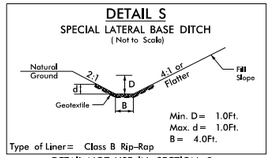
DETAIL R
STANDARD BASE DITCH
(Not to Scale)



*When B is < 6.0'
Min. D= 1.0Ft.
Max. d= 1.0Ft.
B= 4.0Ft.
Type of Liner= Class B Rip-Rap

–Y4– 75+05 LT, L=14', S=9.7%
BEG. ELEV=777.0, END ELEV=775.6
–Y4LPA– 19+90 LT, L=82', S=7.3%
BEG. ELEV=829.0, END ELEV=823.0
–Y4LPD– 22+75 RT, L=89', S=8.0%
BEG. ELEV=825.0, END ELEV=817.7
–Y5– 46+00 RT, L=50', S=8.0%
BEG. ELEV=806.0, END ELEV=802.0
–Y9– 53+33 LT, B=2', S=0.53%
L=68', BEG. ELEV=626.4, END ELEV=626.0
–Y9– 79+00 LT, L=56', S=3.8%
BEG. ELEV=611.5, END ELEV=609.4

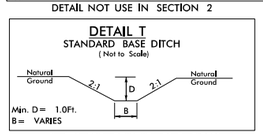
DETAIL S
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D= 1.0Ft.
Max. d= 1.0Ft.
B= 4.0Ft.
Type of Liner= Class B Rip-Rap

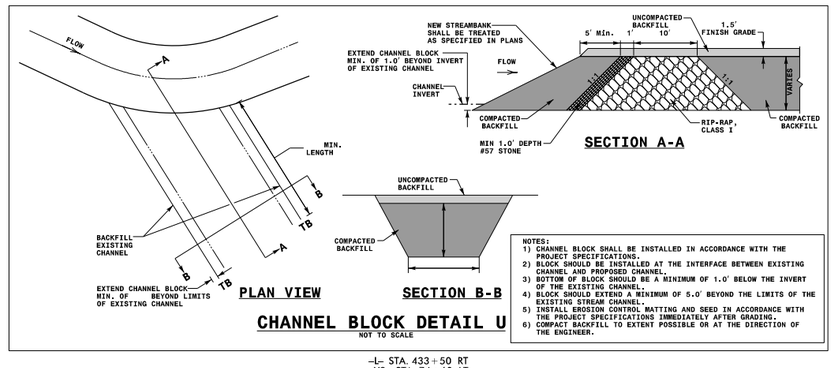
DETAIL NOT USE IN SECTION 2

DETAIL T
STANDARD BASE DITCH
(Not to Scale)



Min. D= 1.0Ft.
B= VARIES

–L– STA. 314+35 LT, B=2', S=1.00%
L=50', BEG. ELEV=854.0, END ELEV=853.5
–L– STA. 445+54 RT, L=92', S=6.5%
BEG. ELEV=690.0, END ELEV=684.0
–NC159– STA. 12+00 LT, B=4' S=4.1%
BEG. ELEV=610.0, END ELEV=600.9
–SR_Q– STA. 40+00 LT, L=30', S=0.50%
BEG. ELEV= 617.2, END ELEV=617.1
–Y3– STA. 15+80 RT, L=44', S=0.68%
BEG. ELEV= 817.5, END ELEV=817.2
–Y4LPB– STA. 20+50 TO STA. 21+68 RT, B=4'
S=1.73%, L=118', BEG. ELEV=821.2, END ELEV=819.7
–Y6 DET– STA. 11+31.48 RT, B=4', S=0.96%
L=78', BEG. ELEV=846.8, END ELEV=846.0
–Y9B– STA. 15+00 LT, L=76', S=8.8%
BEG. ELEV=723.9, END ELEV=717.2

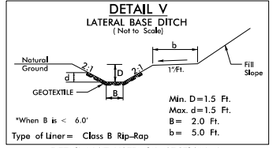


CHANNEL BLOCK DETAIL U
NOT TO SCALE

NOTES:
1) CHANNEL BLOCK SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2) BLOCK SHOULD BE INSTALLED AT THE INTERFACE BETWEEN EXISTING CHANNEL AND PROPOSED CHANNEL.
3) BOTTOM OF BLOCK SHOULD BE A MINIMUM OF 1.0' BELOW THE INVERT OF THE EXISTING CHANNEL.
4) BLOCK SHOULD EXTEND A MINIMUM OF 5.0' BEYOND THE LIMITS OF THE EXISTING STREAM CHANNEL.
5) INSTALL EROSION CONTROL MATTING AND SEED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS IMMEDIATELY AFTER GRADING.
6) COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.

–L– STA. 433+50 RT
–Y9– STA. 74+60 LT
–Y9– STA. 75+72 LT
–Y9– STA. 76+20 LT
–Y9FLY– STA. 11+54 LT
–Y98PB– STA. 21+90 LT
–Y9RPB– STA. 24+30 LT
–Y9RPB– STA. 25+25 LT

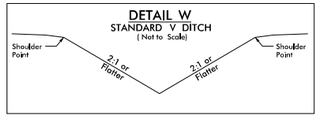
DETAIL V
LATERAL BASE DITCH
(Not to Scale)



Min. D=1.5 Ft.
Max. d=1.5 Ft.
B= 2.0 Ft.
b= 5.0 Ft.
*When B is < 6.0'
Type of Liner= Class B Rip-Rap

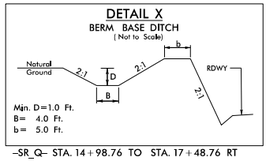
DETAIL NOT USED IN SECTION 2

DETAIL W
STANDARD V DITCH
(Not to Scale)



–L– STA. 221+50 TO STA. 222+00 RT, L=61'
S=0.31%, BEG. ELEV=833.1, END ELEV=832.9
–SERRD3– STA. 39+80 TO STA. 41+35 RT
–Y4RPA– STA. 26+00 RT, L=73', S=0.41%
BEG. ELEV=822.8, END ELEV=822.5
–Y4RPC– STA. 22+50 TO STA. 25+50 LT
–Y9A– STA. 42+50 RT, L=20', S=0.35%
BEG. ELEV= 630.1, END ELEV=630.0
–Y9LPB– STA. 16+00 LT, L=50', S=7.6%
BEG. ELEV= 643.8, END ELEV=640.0

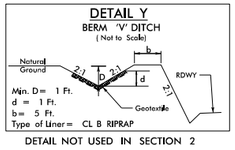
DETAIL X
BERM BASE DITCH
(Not to Scale)



Min. D=1.0 Ft.
B= 4.0 Ft.
b= 5.0 Ft.

–SR_Q– STA. 14+98.76 TO STA. 17+48.76 RT

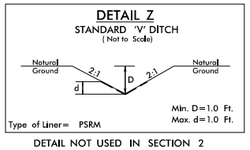
DETAIL Y
BERM 'V' DITCH
(Not to Scale)



Min. D= 1 Ft.
d = 1 Ft.
b= 5 Ft.
Type of Liner= CL B RIPRAP

DETAIL NOT USED IN SECTION 2

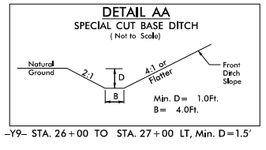
DETAIL Z
STANDARD 'V' DITCH
(Not to Scale)



Min. D=1.0 Ft.
Max. d=1.0 Ft.
Type of Liner= PSRM

DETAIL NOT USED IN SECTION 2

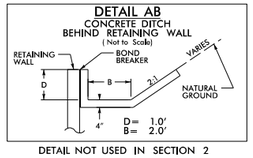
DETAIL AA
SPECIAL CUT BASE DITCH
(Not to Scale)



Min. D= 1.0Ft.
B= 4.0Ft.

–Y9– STA. 26+00 TO STA. 27+00 LT, Min. D=1.5'

DETAIL AB
CONCRETE DITCH
BEHIND RETAINING WALL
(Not to Scale)



D= 1.0'
B= 2.0'

DETAIL NOT USED IN SECTION 2

PLANS PREPARED BY :

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

3/29/2006
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default

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	2D-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING SHEET 62 OF 257

PLANS PREPARED BY :
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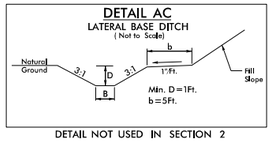
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

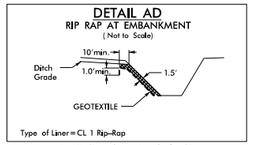
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL AC
LATERAL BASE DITCH
(Not to Scale)



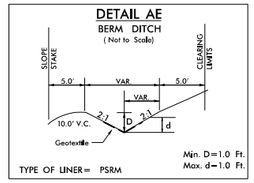
DETAIL NOT USED IN SECTION 2

DETAIL AD
RIP RAP AT EMBANKMENT
(Not to Scale)



DETAIL NOT USED IN SECTION 2

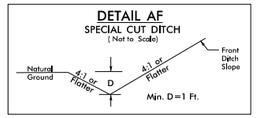
DETAIL AE
BERM DITCH
(Not to Scale)



TYPE OF LINER= PSRM

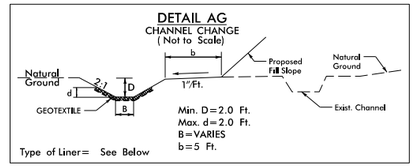
–L– STA. 451+50 TO STA. 455+00 LT
–Y4RPA– STA. 31+50 TO STA. 33+40 RT

DETAIL AF
SPECIAL CUT DITCH
(Not to Scale)



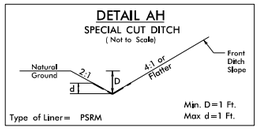
DETAIL NOT USED IN SECTION 2

DETAIL AG
CHANNEL CHANGE
(Not to Scale)



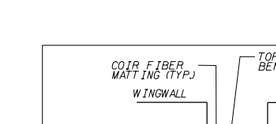
–L– STA. 237+00 TO STA. 243+00 RT, B=4', CL B
–SR Q– 34+19 RT, L=35', B=4', CL I
–Y4– STA. 80+35 TO 80+66 RT, B=3', CL B
–Y4RPD– STA. 25+44 TO 26+48 RT, B=5', GRASS
–Y5– STA. 40+28 TO 41+63 LT, B=4', GRASS
–Y9– STA. 73+50 TO STA. 76+31 LT, B=4', CL I
–Y9– STA. 79+06 TO STA. –NC159– 12+09' LT, B=4'–11', CL B

DETAIL AH
SPECIAL CUT DITCH
(Not to Scale)



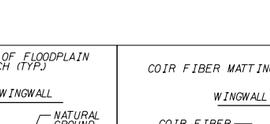
DETAIL NOT USED IN SECTION 2

DETAIL AI
LATERAL BASE DITCH
(Not to Scale)



–L– STA. 353+82 TO STA. 355+00 LT
–SERRD3– STA. 19+50 TO STA. 20+49 LT
–Y5– STA. 24+81 TO STA. 29+46 LT
–Y9– STA. 15+00 TO STA. 16+50 LT
–Y9– STA. 24+00 TO STA. 26+00 LT

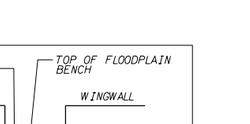
DETAIL AJ
BANK STABILIZATION AT PIPE OUTLET
(Not to Scale)



Class I Rip Rap

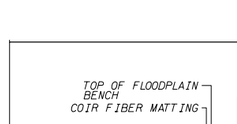
–L– STA. 242+90 RT, L=32'
–L– STA. 329+80 RT, L=50'
–L– STA. 356+89 RT, L=45'
–L– STA. 363+29 RT, L=45'
–L– STA. 458+10 LT, L=45'
–Y9A– STA. 43+05 RT, L=30'
–Y9– STA. 16+53 RT, L=48'
–Y9– STA. 60+40 LT, L=35'

DETAIL AK
STANDARD BASE DITCH
(Not to Scale)



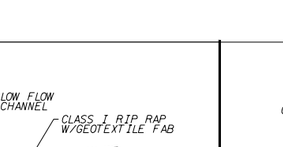
DETAIL NOT USED IN SECTION 2

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



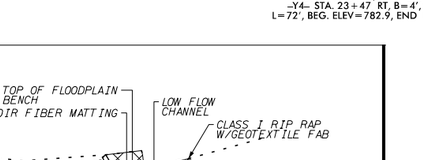
–L– STA. 247+56 RT, L=80', S=4.8%
BEG. ELEV=746.0, END ELEV=742.2
–SERRD3– STA. 45+85 RT, L=125', S=7.38%
BEG. ELEV=786.0, END ELEV=776.8
–SERRD3– STA. 45+85 LT, L=32', S=0.32%
BEG. ELEV=774.3, END ELEV=774.2

DETAIL AM
BERM BASE DITCH
(Not to Scale)



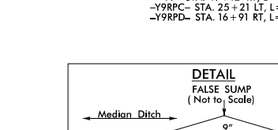
–L– STA. 335+00 TO STA. 338+35 LT
–Y9RPD– STA. 12+20 TO STA. 19+00 LT

DETAIL AN
CHANNEL CHANGE
(Not to Scale)



–Y9FLY– STA. 11+54 TO STA. 11+76 LT, B=4
–Y9RPB– STA. 21+89 TO STA. 22+45 LT, B=2'
–Y9RPB– STA. 24+31 TO STA. 25+83 LT, B=2'

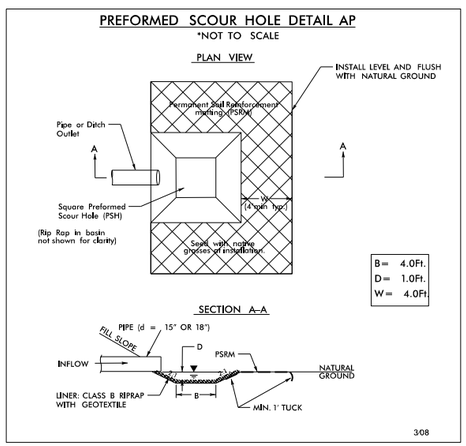
DETAIL AO
LATERAL BASE DITCH
(Not to Scale)



DETAIL NOT USED IN SECTION 2

PREFORMED SCOUR HOLE DETAIL AP
*NOT TO SCALE

PLAN VIEW



SECTION A-A

–L– STA. 250+20 LT
–L– STA. 408+00 LT
–Y4– STA. 77+82 LT
–Y5– STA. 42+23 RT

DETAIL AQ
FILL IN POND W/ROCK PLATING
(Not to Scale)

DETAIL NOT USED IN SECTION 2

DETAIL AR
STANDARD BASE GRASSED SWALE
(Not to Scale)

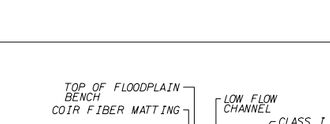
*NOTES:
1) LONGITUDINAL SLOPES BETWEEN 0.3% AND 4.0%.
2) MODIFICATIONS MAY BE NEEDED, AS APPROVED BY ENGINEER.

DETAIL NOT USED IN SECTION 2

DETAIL AS
STANDARD BASE DITCH
(Not to Scale)

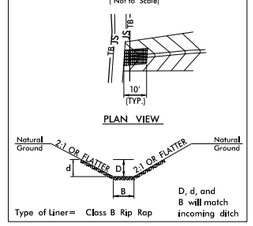
–L– STA. 354+62 RT, L=80', S=13.7%
BEG. ELEV=735.3, END ELEV=724.3
–L– STA. 455+37 RT, L=78', S=3.8%
BEG. ELEV=658.5, END ELEV=655.5
–SERRD1– STA. 10+00, B=4', S=0.3%
L=70', BEG. ELEV=709.4, END ELEV=709.1
–SERRD1– STA. 11+00, B=4', S=9.0%
L=70', BEG. ELEV=715.7, END ELEV=709.4
–SR Q– STA. 13+48.57 LT, L=45', S=6.0%
BEG. ELEV=632.4, END ELEV=629.7
–Y9B– STA. 17+20 RT, L=137', S=9.5%
BEG. ELEV=722.0, END ELEV=709.0
–Y9FLY– 12+00 LT, L=60', S=9.6%
BEG. ELEV=712.5, END ELEV=706.7

DETAIL AT
MEDIAN 'V' DITCH
(Not to Scale)

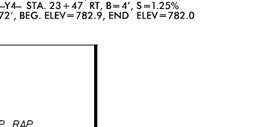


–L– STA. 220+00 TO STA. 226+00 CL
–Y9FLY– STA. 40+00 TO 43+00 CL

DETAIL AU
RIPRAP TRANSITION AT JURISDICTIONAL STREAM
(Not to Scale)



PLAN VIEW

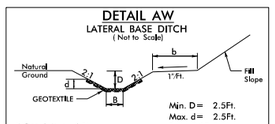


–L– STA. 252+60 LT & RT
–L– STA. 247+56 RT
–Y4– STA. 80+33 RT
–Y9– STA. 16+65 RT
–Y9– STA. 60+94 RT
–Y9– STA. 74+58 LT
–SERRD3– STA. 40+88 LT

DETAIL AV
LATERAL BASE DITCH
(Not to Scale)

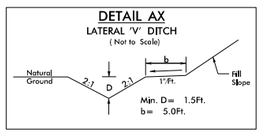
–L– STA. 274+50 TO STA. 275+00 LT
–L– STA. 353+82 TO STA. 359+50 LT
–L– STA. 363+73 TO STA. 364+50 RT
–L– STA. 365+50 TO STA. 368+00 RT
–SERRD3– STA. 37+26 TO STA. 38+85 LT
–Y4– STA. 72+50 TO STA. 74+54 RT
–Y4RPA– STA. 10+00 TO STA. 21+50 RT
–Y9– STA. 14+50 TO STA. 15+75 RT
–Y9RPC– STA. 23+50 TO STA. 29+38 RT

DETAIL AW
LATERAL BASE DITCH
(Not to Scale)



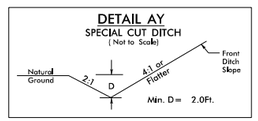
–L– STA. 234+25 TO STA. 241+50 LT
–L– STA. 433+37 TO STA. 435+00 RT, Min. D=3.5'
–Y9– STA. 11+50 TO STA. 15+00 LT

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



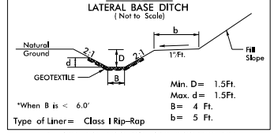
–L– STA. 227+50 TO STA. 229+74 LT

DETAIL AY
SPECIAL CUT DITCH
(Not to Scale)



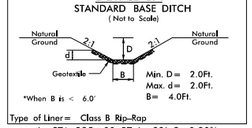
–Y9FLY– STA. 33+00 TO STA. 37+95 RT
–Y10END– STA. 21+50 TO STA. 22+05 LT

DETAIL AZ
LATERAL BASE DITCH
(Not to Scale)



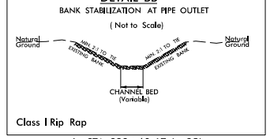
–L– STA. 435+93 TO STA. 439+00 RT
–Y4RPD– STA. 26+48 TO STA. 31+30 RT

DETAIL BA
STANDARD BASE DITCH
(Not to Scale)



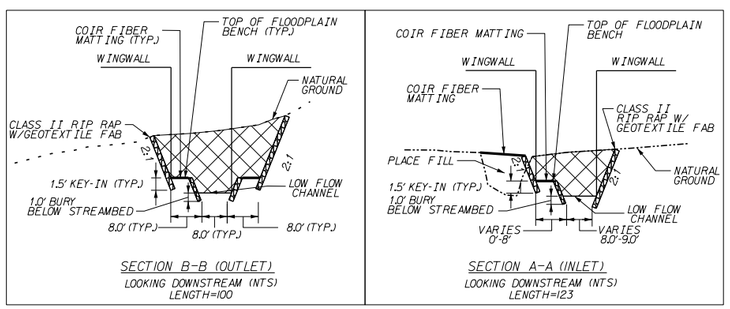
–L– STA. 235+00 RT, L=83', S=0.30%
BEG. ELEV=776.4, END ELEV=776.1
–Y10END– 19+00 LT, L=41', S=1.1%
BEG. ELEV=641.5, END ELEV=641.0
–Y4– STA. 23+47 RT, B=4', S=1.25%
L=72', BEG. ELEV=782.9, END ELEV=782.0

DETAIL BB
BANK STABILIZATION AT PIPE OUTLET
(Not to Scale)

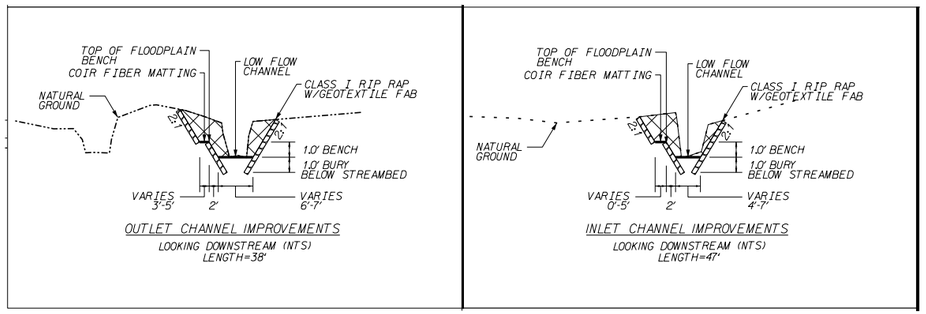


Class I Rip Rap

–L– STA. 229+60 LT, L=25'
–L– STA. 346+96 RT, L=25'
–L– STA. 410+75 LT, L=30'
–L– STA. 414+35 LT, L=10'
–SERRD3– STA. 20+29 LT, L=24'
–SERRD5– STA. 13+85 RT, L=35'
–Y4– STA. 58+92 LT, L=20'
–Y5– STA. 12+32 RT, L=16'
–Y5– STA. 21+95 RT, L=25'
–Y9– STA. 36+00 LT, L=25'
–Y9– STA. 45+52 LT, L=35'
–Y9– STA. 49+12 RT, L=16'
–Y9RPC– STA. 25+21 LT, L=45'
–Y9RPD– STA. 16+91 RT, L=30'

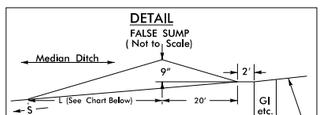


CULVERT INLET/OUTLET DETAILS
–Y4– STA 80+35



CULVERT INLET/OUTLET DETAILS
–L– STA 296+26

DETAIL
FALSE SUMP
(Not to Scale)



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'

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	2D-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
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PERMIT DRAWING SHEET 63 OF 257

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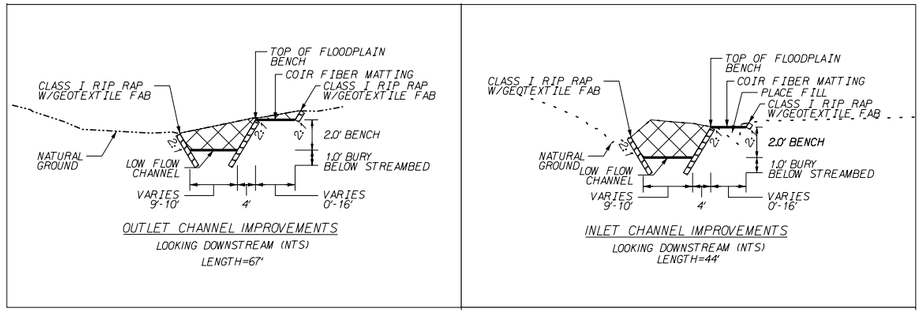
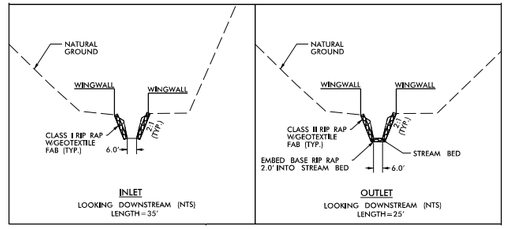
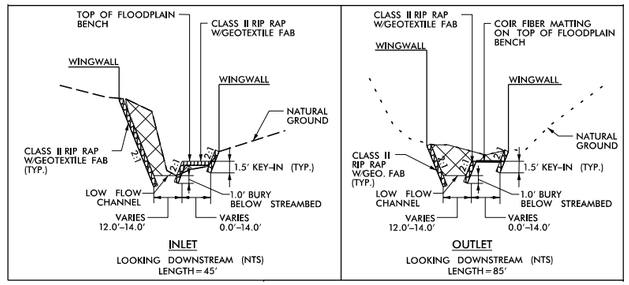


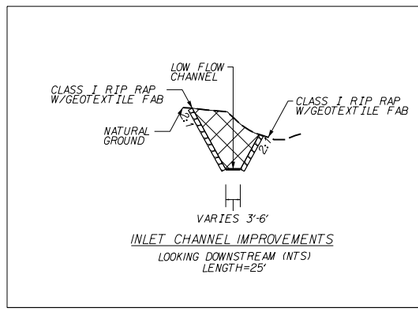
CULVERT INLET/OUTLET DETAILS
-Y5- STA 41+00



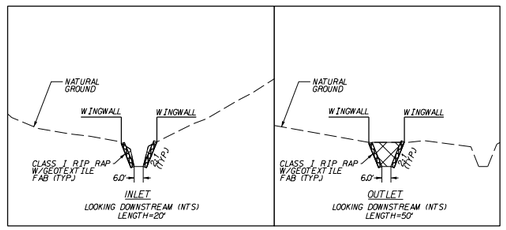
CULVERT INLET/OUTLET DETAILS
-L- STA 364+22



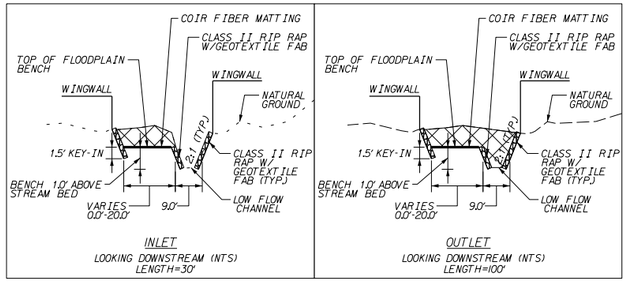
CULVERT INLET/OUTLET DETAILS
-Y9- STA 29+09



CULVERT INLET/OUTLET DETAILS
-Y9- STA 75+04



CULVERT INLET/OUTLET DETAILS
-L- STA 408+00



CULVERT INLET/OUTLET DETAILS
-L- STA 433+31

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PERMIT DRAWING
SHEET 64 OF 257

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

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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SITE 23A

SC–AB

WF–AB

SITE 23B

SEE INSET A

MATCHLINE –L– STA. 223+50 SEE SHEET 18

MATCHLINE –L– STA 234+00 SEE SHEET 20

REMOVE PIPE MATCH BASE DITCH TO EXISTING STREAM

SPECIAL CUT DITCH SEE DETAIL H

LATERAL V DITCH SEE DETAIL AX

MEDIAN V DITCH SEE DETAIL AP

SPECIAL CUT DITCH SEE DETAIL H

NOTE: TIE CUT AND BERM DITCHES DOWN TO LATERAL BASE DITCH

LATERAL BASE DITCH SEE DETAIL C

BERM BASE DITCH SEE DETAIL L

BERM DITCH SEE DETAIL A

BERM BASE DITCH SEE DETAIL L

30" RCP III

24" RCP III

15" RCP III

2GI

FS

WOODS

LABANDI

ISBKD

ISFD

HTR

BLK TELE COMM BLDG

SOIL & GR

14' SOIL & GR

16' SOIL & GR

15' SOIL & GR

EXISTING R/W

48" CONC.

60" RCP

66" RCP

72" RCP

200LF

400LF

300LF

100LF

PVC

SR 1144 MACK RD

23' BST

SR 1142 DANNY BELL RD

SR 1142 HOPEWELL FRIENDS RD

TO SR 1142 HOPEWELL FRIENDS RD

Approximate Location Based on RK&K Plans provided

48" CMP

30' EASEMENT

PUE

RW

CA

NAD 83\95

INSET A

24" RCP

SCALE 25 0

SCALE 50 25 0 50 100

FOR –L– PROFILE SEE SHT. 23

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PERMIT DRAWING
SHEET 65 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

F F DENOTES FILL IN WETLAND

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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SITE 23A

SC–AB

WF–AB

SITE 23B

SEE INSET A

MATCHLINE –L– STA. 223+50 SEE SHEET 18

MATCHLINE –L– STA 234+00 SEE SHEET 20

REMOVE PIPE MATCH BASE DITCH TO EXISTING STREAM

SPECIAL CUT DITCH SEE DETAIL H

LATERAL V DITCH SEE DETAIL AX

MEDIAN V DITCH SEE DETAIL AP

30" RCP III

15" RCP III

2GI

FS

NOTE: TIE CUT AND BERM DITCHES DOWN TO LATERAL BASE DITCH

LATERAL BASE DITCH SEE DETAIL C

BERM BASE DITCH SEE DETAIL L

BERM DITCH SEE DETAIL A

BERM BASE DITCH SEE DETAIL L

NAD 83/95

INSET A

24" RCP

FOR –L– PROFILE SEE SHT. 23

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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PERMIT DRAWING SHEET 66 OF 254

ENGLISH

NAD 83/95

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

INSET A

SITE 23B
WF–AB
SITE 23C
PA–AB
WD–AB
WE–AB
WC–AB
SITE 24
SB–AB
WB–AB
SA–AB
WA–AB
SITE 23D
SITE 23D
SITE 23D

SEE INSET A
SEE INSET B

MATCHLINE –L– STA. 234+00 SEE SHEET 19

MATCHLINE –L– STA. 247+00 SEE SHEET 21

PERMANENTLY DRAIN POND

LATERAL BASE DITCH SEE DETAIL AW

LATERAL BASE DITCH SEE DETAIL C

LATERAL V DITCH SEE DETAIL D

STANDARD BASE DITCH SEE DETAIL BA

CHANNEL CHANGE SEE DETAIL AG

FS MIN EL. 758.5

HW

PUE

INSET B

SCALE FOR INSETS 25 0 25 50

SCALE 50 25 0 50 100

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 67 OF 257

ENGLISH

NAD 83/95

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

F F DENOTES FILL IN WETLAND

P P DENOTES IMPACTS IN SURFACE WATER (POND)

INSET A

SITE 23B
WF–AB
SITE 23C
PA–AB
WD–AB
WE–AB
WC–AB
SITE 24
SB–AB
WB–AB
SA–AB
WA–AB
SITE 23D
SITE 23D
SITE 23D

SEE INSET A
SEE INSET B

MATCHLINE –L– STA. 234+00 SEE SHEET 19

MATCHLINE –L– STA. 247+00 SEE SHEET 21

LATERAL BASE DITCH SEE DETAIL AW
LATERAL BASE DITCH SEE DETAIL AW
LATERAL V DITCH SEE DETAIL D
LATERAL BASE DITCH SEE DETAIL C
STANDARD BASE DITCH SEE DETAIL BA
CHANNEL CHANGE SEE DETAIL AG
CHANNEL CHANGE SEE DETAIL AG

PERMANENTLY DRAIN POND

PUE PUE PUE PUE PUE PUE PUE PUE PUE

235+00 240+00 245+00

FS MIN EL. 758.5

INSET B

SCALE FOR INSETS
25 0 25 50

SCALE
50 25 0 50 100

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	R-2536	X-XX

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

SITE 23

PERMIT DRAWING
SHEET 68 OF 257

ENGLISH

790 785 780 775 770 765

0.050 6:1 7.413:1 0.050 3:1 3.62:1 2:1 2:1

D.P. 780.566

772.33

773.08

235+50.00

790 785 780 775 770 765

0.050 6:1 7.413:1 0.050 4:1 3.59:1 2:1 2:1 2:1

D.P. 781.668

773.20

774.24

776.36

235+00.00

795 790 785 780 775 770

WETLAND

WETLAND

0.050 6:1 7.413:1 0.050 5:1 3.39:1 2:1 2:1 2:1

D.P. 782.771

774.07

776.30

779.50

234+50.00

795 790 785 780 775 770 765

WETLAND

0.050 6:1 7.413:1 0.050 6:1 3.99:1 3.48:1

D.P. 783.873

780.45

784.46

234+00.00

800 795 790 785 780 775

WETLAND

0.050 6:1 7.413:1 0.050 6:1 3.01:1 3.58:1

D.P. 784.975

781.75

785.56

233+50.00

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

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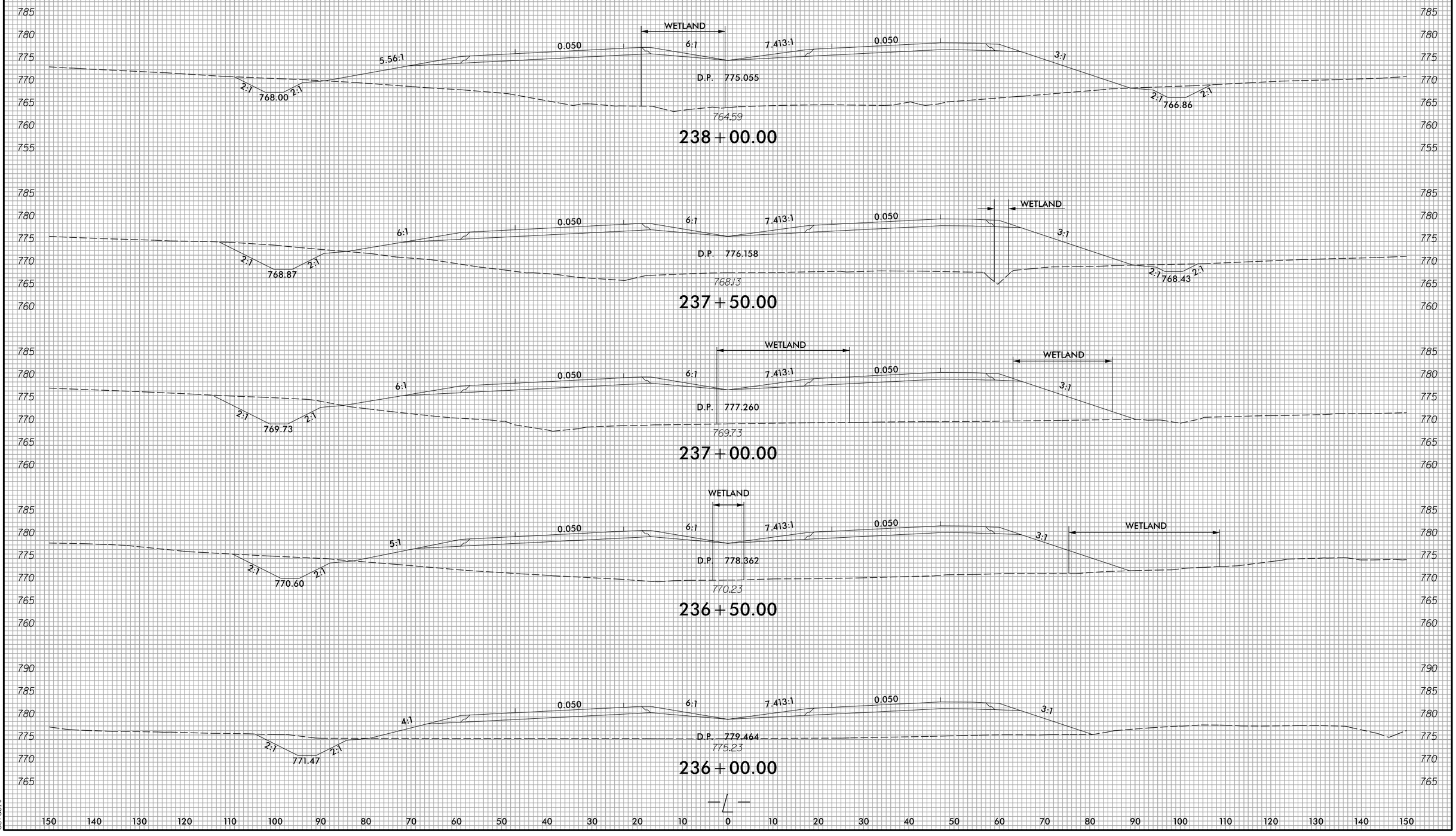
	R-2536	X-XX

SITE 23

PERMIT DRAWING
SHEET 69 OF 257

ENGLISH



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 70 OF 257

PRELIMINARY PLANS
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TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

F F DENOTES FILL IN WETLAND

ENGLISH

NAD 83'95

MATCHLINE –L– STA. 247+00 SEE SHEET 20

MATCHLINE –L– STA. 260+00 SEE SHEET 22

SPECIAL CUT DITCH SEE DETAIL H

LATERAL V DITCH SEE DETAIL D

BDO

18" CSP 2 ELBOWS ROD & LUG

15" CSP 2 ELBOWS ROD & LUG

15" RCP-III

RIPRAP TRANSITION SEE DETAIL AU

18" CSP 2 ELBOWS ROD & LUG

15" RCP-III

24" RCP

18" RCP

15" RCP

250+00

255+00

WM–AB

WN–AB

SITE 25

SITE 23E

SA–AB

LITTLE RIVER

SITE 26

RIPRAP TRANSITION SEE DETAIL AU

RIPRAP TRANSITION SEE DETAIL AU

STANDARD V DITCH SEE DETAIL AI

SEE INSET A

INSET A

SCALE 25 0

WOODS

LITTLE RIVER

2SFD

1SFD

POOL

CONC

60" CHL

18" CONC

24" CONC

BK CHL

PUE

JS

TS

S

F

WLB

GR

EIP

SOIL & GW

50' R/W

SCALE 50 25 0 50 100

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 71 OF 257

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

F F DENOTES FILL IN WETLAND

ENGLISH

NAD 83/95

MATCHLINE –L– STA. 247+00 SEE SHEET 20

MATCHLINE –L– STA. 260+00 SEE SHEET 22

SPECIAL CUT DITCH SEE DETAIL H

LATERAL V DITCH SEE DETAIL D

BDO

18" CSP 2 ELBOWS ROD & LUG

15" CSP 2 ELBOWS ROD & LUG

15" RCP-III

RIPRAP TRANSITION SEE DETAIL AU

STANDARD V DITCH SEE DETAIL AT

SEE INSET A

WM–AB

WN–AB

SITE 25

SITE 23E

SITE 26

SA–AB

LITTLE RIVER

INSET A

SCALE 25 0

50 25 0 50 100
SCALE

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-L-

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	113
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 72 OF 257

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BM 201
ELEV=744.81'
-BL- STA. 5+00
180.14' RT
-L- STA 249+42.30
170.13' RT
RR SPIKE IN BASE
OF 15" OAK

PI = 249+30.00
EL = 752.80'
VC = 1,200'
K = 193
V = 70 MPH

BEGIN BRIDGES
-L- Sta.251+45.61 (LT)
-L- Sta.251+50.95 (RT)

PROPOSED GRADE

EXISTING GROUND

(-)2.4286%

(-)3.1429%

(-)0.8000%

(-)1.4146%

(-)12.2043%

(-)2.8047%

(+)4.0000%

PI = 238+00.00
EL = 768.00

PI = 240+50.00
EL = 759.00

END LAT.BASE DITCH LT
-L- STA.241+50.00
EL = 759.50

END CHANNEL CHANGE RT
-L- STA.243+00.00
EL = 757.00

BEGIN LAT.V DITCH LT
-L- STA.244+00.00
EL = 756.14

END LAT.V DITCH LT
-L- STA.245+25.00
EL = 755.00

BEGIN SP.CUT DITCH LT
-L- STA.247+50.00
EL = 756.53

END SP.CUT DITCH LT
BEGIN LAT.V DITCH LT

END LAT.V DITCH LT
-L- STA.249+65.00
EL = 750.50

BEGIN LAT.V DITCH LT
-L- STA.252+50.00
EL = 732.98

238+00 239+00 240+00 241+00 242+00 243+00 244+00 245+00 246+00 247+00 248+00 249+00 250+00 251+00 252+00

720 730 740 750 760 770 780

BM 202
ELEV=762.03'
-BL- STA. 14+62
305' LT
-L- STA 259+54.82
298.80' LT
RR SPIKE IN BASE
OF 15" WHITE OAK

-Y4RPB- STA. 10+00.00 =
-L- STA. 261+71.40

-Y4RPC- STA. 10+00.00 =
-L- STA. 264+50.77

BRIDGE HYDRAULIC DATA
-L- 252+46

DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 2,100	CFS
DESIGN HW ELEVATION	= 742.7	FT
100 YEAR DISCHARGE	= 2,300	CFS
100 YEAR FREQUENCY	= 100	YRS
100 YEAR HW ELEVATION	= 743.0	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 2,900	CFS
OVERTOPPING ELEVATION	= 743.8	FT

PI = 249+30.00
EL = 752.80'
VC = 1,200'
K = 193
V = 70 MPH

END BRIDGES
-L- Sta.253+45.08 (LT)
-L- Sta.253+48.12 (RT)

PROPOSED GRADE

EXISTING GROUND

-L- STRUCTURE

LITTLE RIVER

Q_{100} WSE = 738.7'

$Q_{SUPERVISED\ 1/2\ 2015}$ WSE = 734.1'

(+)4.0000%

(+)7.6000%

(+)4.3333%

(+)7.8000%

(+)5.0000%

(+)2.0160%

(+)1.6971%

PI = 257+50.00
EL = 758.50

PI = 259+00.00
EL = 765.00

END LAT.BASE DITCH RT
-L- STA.261+50.00
EL = 784.00

END LAT.V DITCH LT
-L- STA.253+75.00
EL = 735.50

PI = 255+00.00
EL = 739.00

BEGIN LAT.BASE DITCH RT
-L- STA.252+75.00
EL = 733.53

END LAT.BASE DITCH RT
BEGIN LAT.V DITCH RT
-L- STA.254+50.00
EL = 736.50

252+00 253+00 254+00 255+00 256+00 257+00 258+00 259+00 260+00 261+00 262+00 263+00 264+00 265+00 266+00

720 730 740 750 760 770 780 790 800 810 820

FOR -L- PLAN SEE SHTS. 20-22

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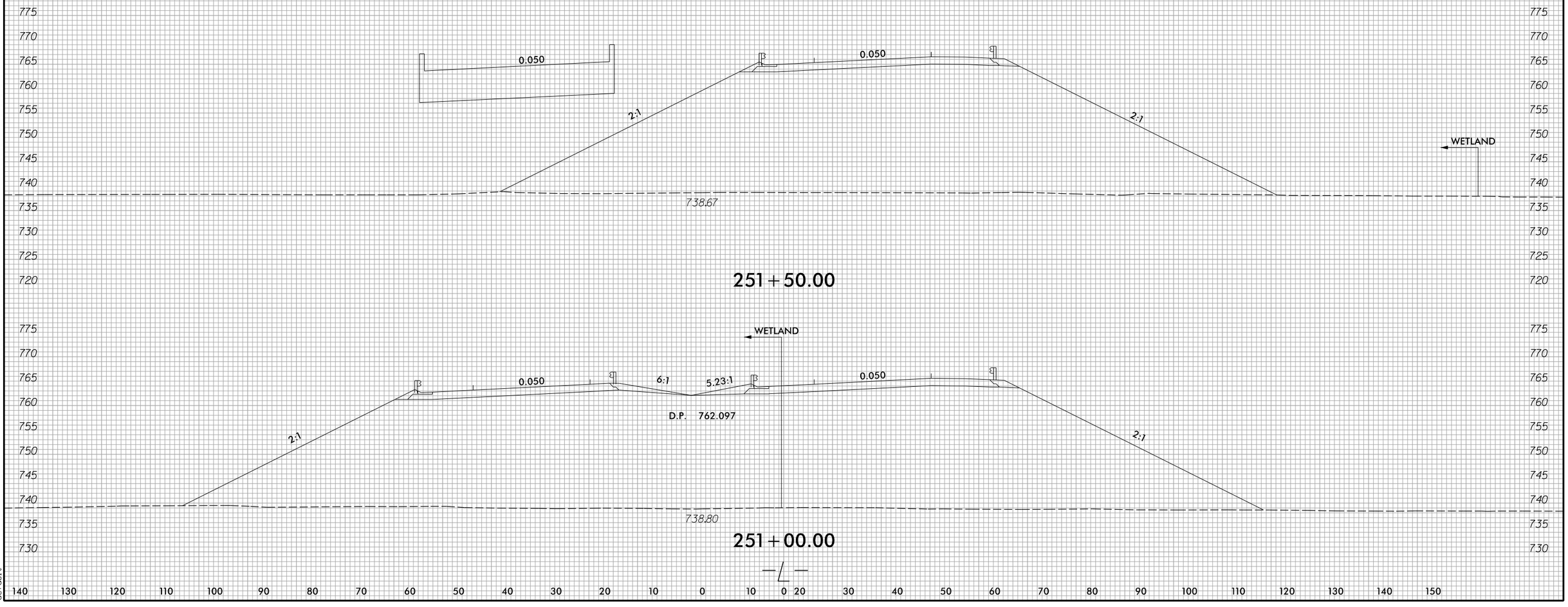
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-21

PERMIT DRAWING
SHEET 73 OF 257

ENGLISH

SITE 25



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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-24

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

PERMIT DRAWING
SHEET 74 OF 257

ENGLISH

785 780 775 770 765 760 755 750 745 740 735 730 725

0.050 0.050 6:1 7.578:1 0.050 0.050

D.P. 774.13

2.002:1 2:1

744.01

2:1 739.00 2:1

255+00.00

780 775 770 765 760 755 750 745 740 735

0.050 0.050 6:1 7.578:1 0.050

D.P. 771.953

2.002:1 2:1

741.83

2:1 736.50 2:1

254+50.00

SITE 26

780 775 770 765 760 755 750 745 740 735 730

0.050 0.050 6:1 7.578:1 0.050

D.P. 770.064

2.002:1 2:1

WETLAND

738.48

2:1 735.65 2:1

254+00.00

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

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TS / TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S / S DENOTES IMPACTS IN SURFACE WATER

ENGLISH

PERMIT DRAWING SHEET 75 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MATCHLINE –L– STA. 260+00 SEE SHEET 21

MATCHLINE –L– STA. 272+00 SEE SHEET 23

MATCHLINE –SERRD3– STA. 10+80 SEE SHEET 23

MATCHLINE –Y4RPB– STA. 20+50 SEE SHEET 23

MATCHLINE –Y4RPC– STA. 17+50 SEE SHEET 23

NAD 83/95

SITE 27

SR–B

SITE 27

INSET A

SCALE 25 0

SEE INSET A

50 25 0 50 100
SCALE

FOR –L– PROFILE SEE SHTS. 113–114
FOR –Y4RPB– PROFILE SEE SHT. 160
FOR –Y4RPC– PROFILE SEE SHTS. 162
FOR –SERRD3– PROFILE SEE SHT. 181

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TS / TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S / S DENOTES IMPACTS IN SURFACE WATER

PERMIT DRAWING SHEET 76 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

MATCHLINE –L– STA. 260+00 SEE SHEET 21

MATCHLINE –L– STA. 272+00 SEE SHEET 23

MATCHLINE –SERRD3– STA. 10+80 SEE SHEET 23

MATCHLINE –Y4RPB– STA. 20+50 SEE SHEET 23

MATCHLINE –Y4RPC– STA. 17+50 SEE SHEET 23

SITE 27

SR–B

SITE 27

SPECIAL CUT DITCH SEE DETAIL H

LATERAL V DITCH SEE DETAIL D

LATERAL BASE DITCH SEE DETAIL C

TOE PROTECTION SEE DETAIL I

SEE INSET A

INSET A

SCALE 25 0

48" RCP–III JB w/MH

15" CSP 2 ELBOWS ROD & LUG

15" RCP–III

2–2GIs

2GI

FS

12" HDPE

24" RCP–CO

12" RCP–CO (NOT BURIED)

30" CSP 2 ELBOWS ROD & LUG (NOT BURIED)

48" RCP–III

N 76° 20' 09.0" E

N 68° 32' 10.9" E

S 86° 34' 46.0" E

10+00 15+00 20+00 260+00 265+00 270+00

–L– –Y4RPB– –Y4RPC– –SERRD3–

PUE TDE

30.00' ACCESS EASEMENT (DB 1397 PG 868)

30.00' ACCESS EASEMENT (DB 1397 PG 868)

NAD 83/95

50 25 0 50 100 SCALE

FOR –L– PROFILE SEE SHTS. 113–114
FOR –Y4RPB– PROFILE SEE SHT. 160
FOR –Y4RPC– PROFILE SEE SHTS. 162
FOR –SERRD3– PROFILE SEE SHT. 181

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REVISIONS

PERMIT DRAWING SHEET 77 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/95

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DETAIL SHEET FOR SITE 27

DETAIL SHEET FOR SITES 29 & 30

DETAIL SHEET FOR SITE 28

MATCHLINE -SERRD3- STA. 16+00 SEE SHEET 70

MATCHLINE -Y4RPB- STA. 27+50 SEE SHEET 70

MATCHLINE -Y4- STA. 54+00 SEE SHEET 70

MATCHLINE -Y4RPA- STA. 76+00 SEE SHEET 70

MATCHLINE -SERRD2- STA. 10+80 SEE SHEET 23

MATCHLINE -Y4RPB- STA. 20+50 SEE SHEET 22

MATCHLINE -L- STA. 272+00 SEE SHEET 22

MATCHLINE -Y4RC- STA. 11+50 SEE SHEET 22

MATCHLINE -Y4RC- STA. 28+50 SEE SHEET 69

MATCHLINE -Y4- STA. 40+00 SEE SHEET 69

MATCHLINE -Y4RD- STA. 47+00 SEE SHEET 69+00

MATCHLINE -L- STA. 299+00 SEE SHEET 24

BEGIN JS

SITE 27

SR–B

SITE 28

SWW–B

SW–B

SITE 29

SITE 30

SZ–B

TOE FOR EROSION CONTROL DEVICE

GRAPHIC SCALE
50 25 0 50 100
PLANS

ENGLISH

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REVISIONS

PERMIT DRAWING SHEET 78 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

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NAD 83/95

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DETAIL SHEET FOR SITE 27

DETAIL SHEET FOR SITES 29 & 30

DETAIL SHEET FOR SITE 28

MATCHLINE -SERRD3- STA. 16+00 SEE SHEET 70

MATCHLINE -Y4RPB- STA. 27+50 SEE SHEET 70

MATCHLINE -Y4- STA. 54+00 SEE SHEET 70

MATCHLINE -Y4RPA- STA. 76+00 SEE SHEET 70

MATCHLINE -SERRD2- STA. 10+80 SEE SHEET 23

MATCHLINE -Y4RPB- STA. 20+50 SEE SHEET 22

MATCHLINE -L- STA. 272+00 SEE SHEET 22

MATCHLINE -Y4RC- STA. 11+50 SEE SHEET 22

MATCHLINE -L- STA. 299+00 SEE SHEET 24

MATCHLINE -Y4RPA- STA. 29+00 SEE SHEET 24

MATCHLINE -Y4- STA. 40+00 SEE SHEET 69

MATCHLINE -Y4RC- STA. 28+50 SEE SHEET 69

MATCHLINE -Y4RD- STA. 47+00 SEE SHEET 69

BEGIN JS

SITE 27

SR–B

SITE 28

SWW–B

SITE 29

SW–B

SITE 30

SZ–B

GRAPHIC SCALE
50 25 0 50 100
PLANS

ENGLISH

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	23A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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ENGLISH

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DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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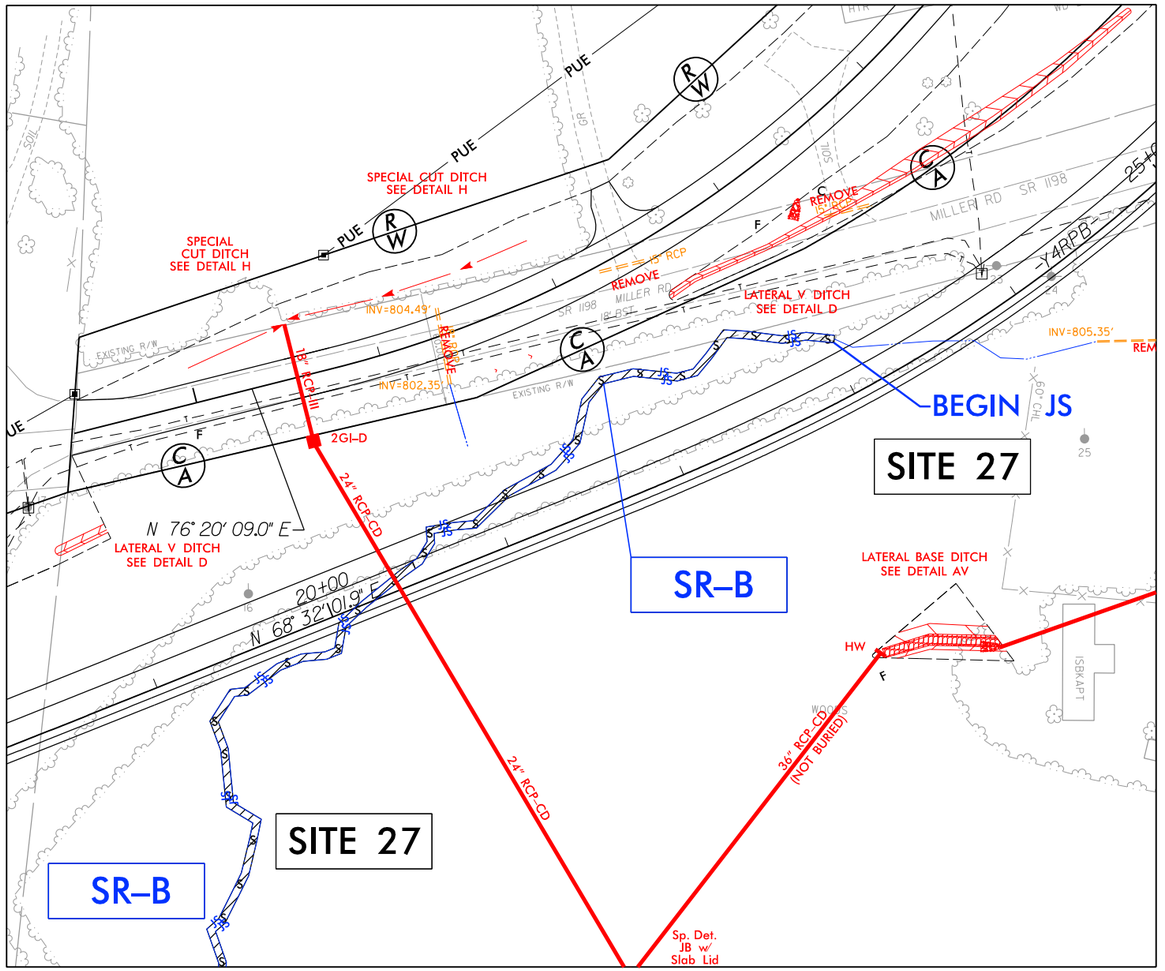
DETAIL SHEET FOR SITE 27



40 20 0 40 80

DENOTES IMPACTS IN SURFACE WATER

PERMIT DRAWING SHEET 79 OF 257

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DETAIL SHEET FOR SITE 28

NAD 83/95

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	23B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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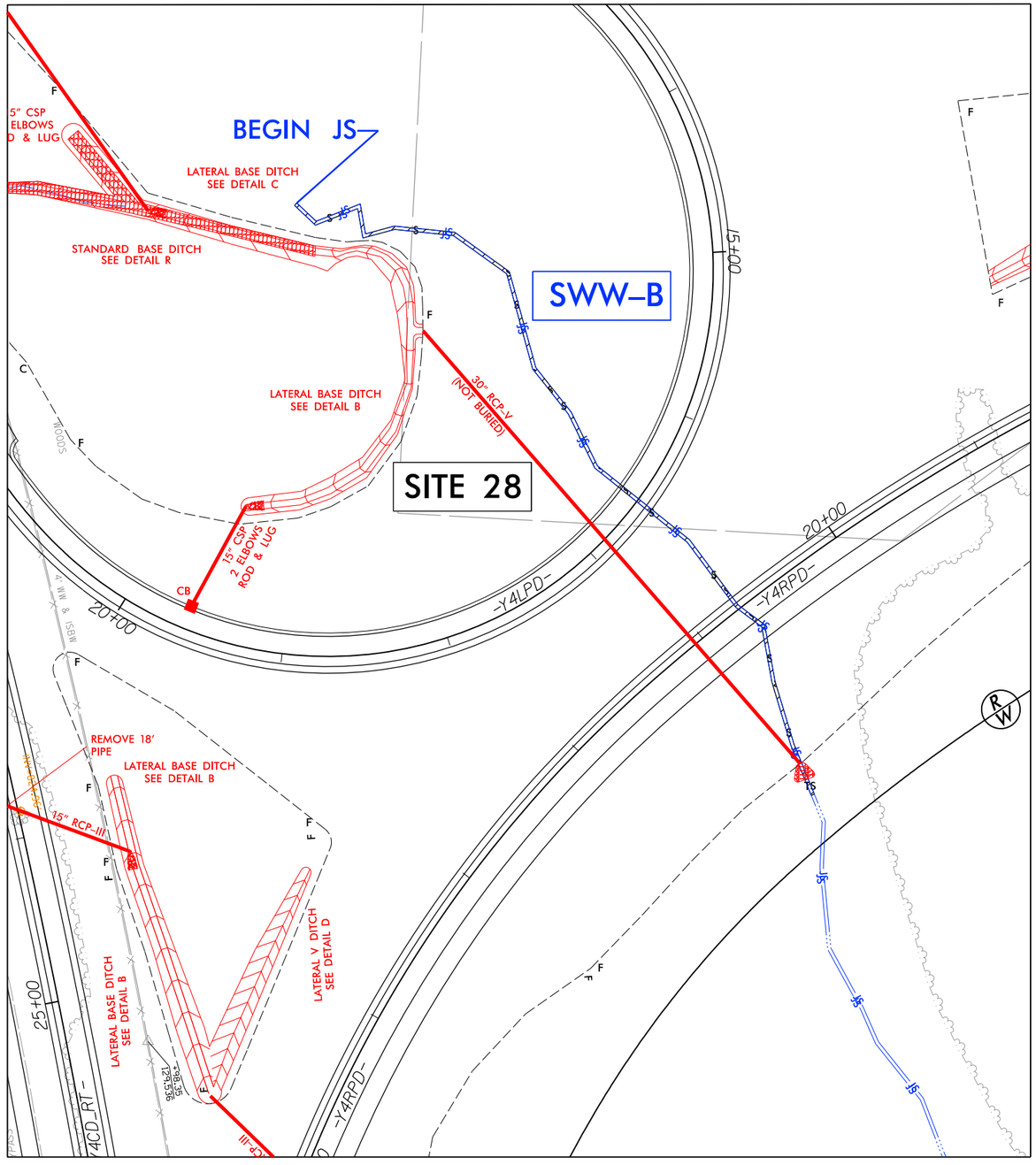
40 20 0 40 80

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING SHEET 80 OF 257



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DETAIL SHEET FOR SITES 29 & 30

NAD 83/95

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	23C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PRELIMINARY PLANS
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40 20 0 40 80

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING SHEET 81 OF 257

LATERAL BASE DITCH SEE DETAIL AV

CULTIVATED FIELD

TDE

BEGIN PERM. IMPACTS IN SURFACE WATERS

BEGIN TEMP. IMPACTS IN SURFACE WATERS

SZ–B

SEE CULVERT INLET DETAIL –L– STA. 296+26

15+00

2GI

15" RCP-III

15" CSP 2 ELBOWS ROD & LUG

FS

BEGIN C/A FENCE -Y4RPA- STA. 13+81.41

END C/A FENCE -Y4RPA- STA. 13+49.80

LATERAL BASE DITCH SEE DETAIL AV

WOODS

295+00

N 69° 35' 17.1" W

(2)-7'x7' RCBC

SW–B

SITE 29

SITE 30

LATERAL BASE DITCH SEE DETAIL B

30" RCP-IV

25+00

BEGIN C/A FENCE -Y4RPD- STA. 25+79.37

END C/A FENCE -Y4RPD- STA. 25+33.19

BEGIN PERM. IMPACTS IN SURFACE WATERS

BEGIN TEMP. IMPACTS IN SURFACE WATERS

LATERAL BASE DITCH SEE DETAIL AZ

LATERAL BASE DITCH SEE DETAIL M

LATERAL BASE DITCH SEE DETAIL C

CHANNEL CHANGE SEE DETAIL AG SEE CULVERT OUTLET DETAIL –L– STA. 296+26

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5/14/99

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PROJECT REFERENCE NO.	SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

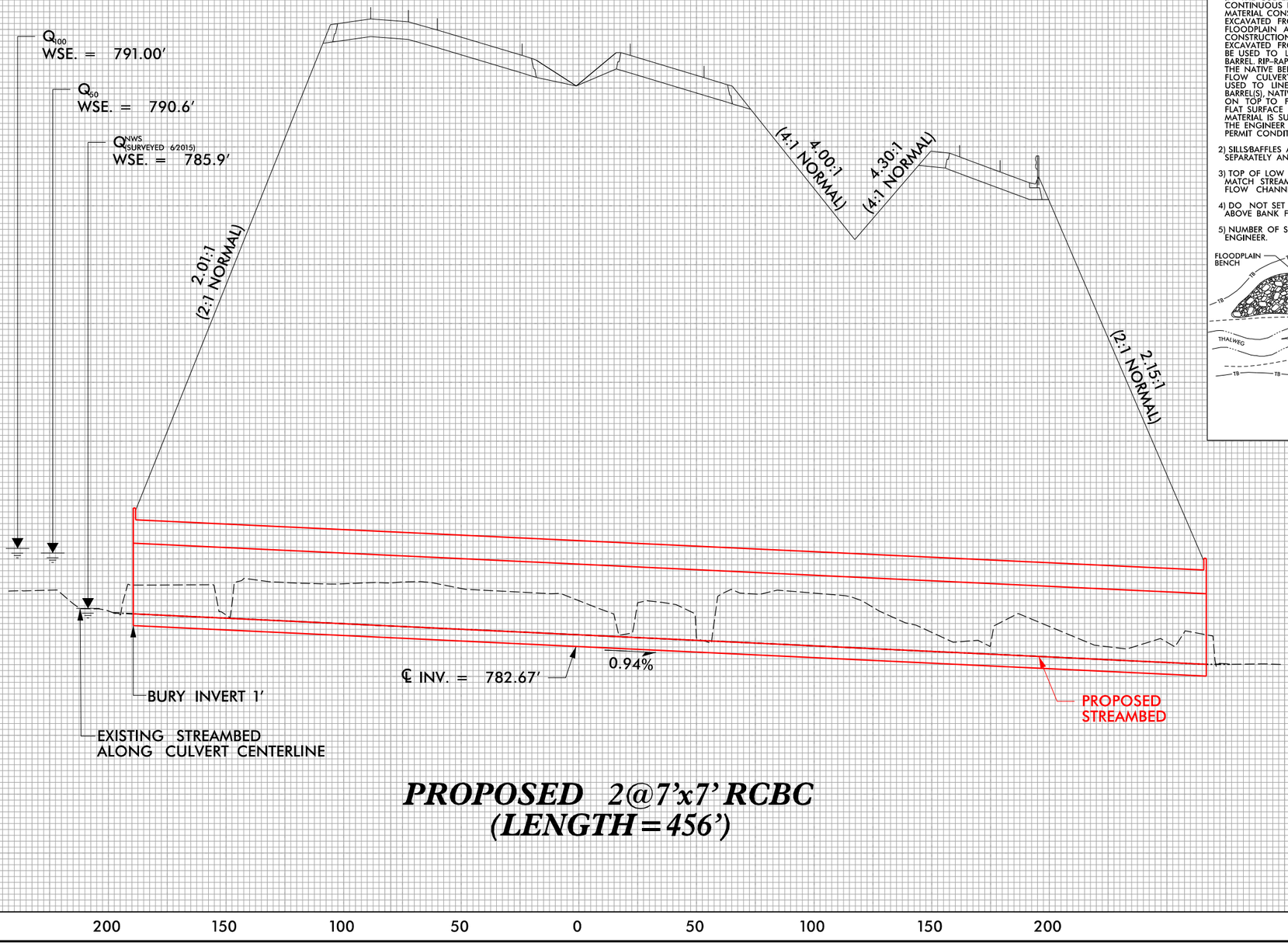
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING
SHEET 82 OF 257

ENGLISH

SITE 30
–L– 296+26



SILL/BAFFLE DETAILS

(NOT TO SCALE)

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

*NOTES:

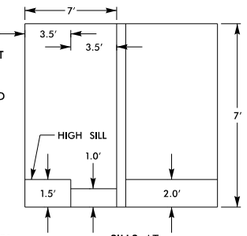
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE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

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

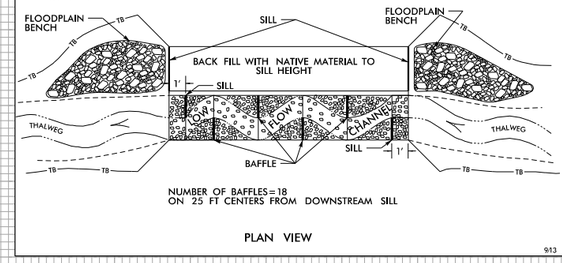
3) TOP OF LOW FLOW SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

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

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



SILLS AT INLET AND OUTLET



NUMBER OF BAFFLES = 18
ON 25 FT CENTERS FROM DOWNSTREAM SILL

PLAN VIEW

913

PROPOSED 2@7'x7' RCBC (LENGTH = 456')

3/30/2016
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	26
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 83 OF 257

- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- E E — DENOTES EXCAVATION IN WETLAND
- F F — DENOTES FILL IN WETLAND

INSET A

SITE 31
WP–B

SBB–B

SCC–B

SITE 32

MATCHLINE –L– STA. 327+00 SEE SHEET 25

MATCHLINE –L– STA. 341+00 SEE SHEET 27

MATCHLINE –Y7– STA. 16+00 SEE SHEET 77

SEE INSET A

SEE INSET B

SEE INSET C

BEGIN JS

CHORD

PROP. 47" WW FENCE

PROP. SBG

LATERAL V DITCH SEE DETAIL G

TOE PROTECTION SEE DETAIL I

SPECIAL CUT DITCH SEE DETAIL H

LATERAL BASE DITCH SEE DETAIL B

BERM DITCH SEE DETAIL AM

BERM DITCH SEE DETAIL A

LATERAL V DITCH SEE DETAIL D

LATERAL V DITCH SEE DETAIL E

BANK STABILIZATION AT PIPE OUTLET SEE DETAIL AJ

60" RCP–V (NOT BURIED)

30" CSP 2 ELBOWS ROD & LUG

30" CSP 2 ELBOWS ROD & LUG (NOT BURIED)

15" CSP 2 ELBOWS ROD & LUG

15" RCP–III

18" CSP

24" RCP–III

JB w/MH

REMOVE 15" CMP

GRADE TO DRAIN

NAD 8395

INSET B

INSET C

SCALE FOR INSETS 25 0 25 50

SCALE 50 25 0 50 100

ENGLISH

FOR –L– PROFILE SEE SHT. 116
FOR –Y7– PROFILE SEE SHT. 168
FOR –Y7_DR3– PROFILE SEE SHT. 184

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 84 OF 257

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

INSET A

SITE 31
WP–B

SEE INSET A

MATCHLINE –L– STA. 327+00 SEE SHEET 25

PROP. 47" WW FENCE

LATERAL V DITCH SEE DETAIL G

TOE PROTECTION SEE DETAIL I

15" RCP–III

2GI

PROP. SBG

330+00

335+00

24" RCP–III 2GI–A

30" CSP 2 ELBOWS ROD & LUG

SEE INSET B

SBB–B

60" RCP–V (NOT BURIED)

BANK STABILIZATION AT PIPE OUTLET SEE DETAIL AJ

LATERAL V DITCH SEE DETAIL G

PROP. 47" WW FENCE

SPECIAL CUT DITCH SEE DETAIL H

LATERAL BASE DITCH SEE DETAIL B

JB w/MH

18" RCP–III

CHORD

BERM DITCH SEE DETAIL AM

BDO

30" RCP–III (NOT BURIED)

30" x 15" RCP REDUCER

30" CSP 2 ELBOWS ROD & LUG (NOT BURIED) 2GI

SPECIAL CUT DITCH SEE DETAIL H

BEGIN JS

15" RCP–III 2GI

SEE INSET C

SCC–B

SITE 32

SPECIAL CUT DITCH SEE DETAIL H

LATERAL V DITCH SEE DETAIL E

15" CSP 2 ELBOWS ROD & LUG

LATERAL V DITCH SEE DETAIL D

GRADE TO DRAIN

CHORD

MATCHLINE –Y7– STA. 16+00 SEE SHEET 77

BERM DITCH SEE DETAIL A

MATCHLINE –L– STA. 341+00 SEE SHEET 27

NAD 83/95

INSET B

INSET C

SCALE FOR INSETS 25 0 25 50

SCALE 50 25 0 50 100

ENGLISH

FOR –L– PROFILE SEE SHT. 116
FOR –Y7– PROFILE SEE SHT. 168
FOR –Y7_DR3– PROFILE SEE SHT. 184

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PROJECT REFERENCE NO.	SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

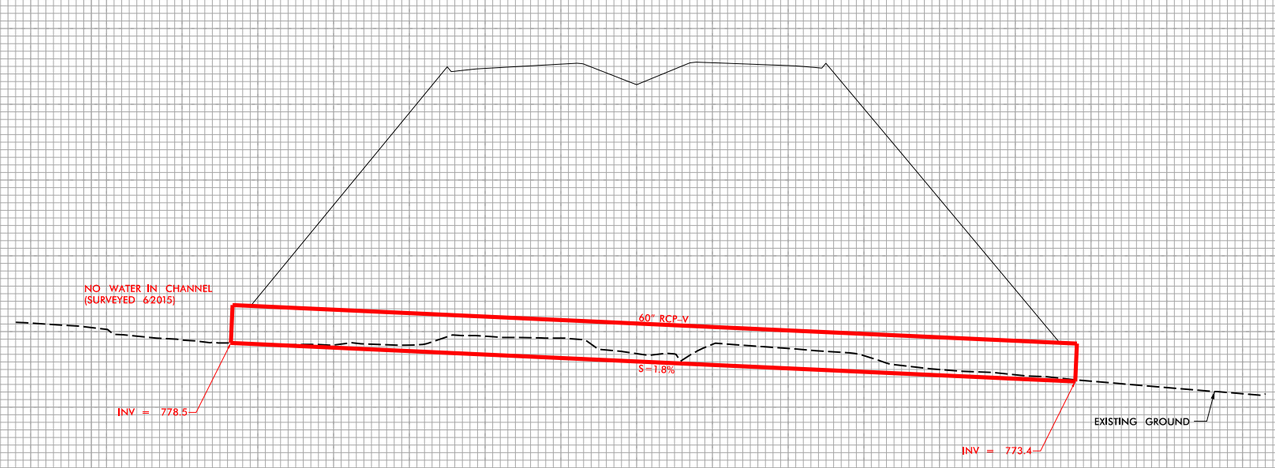
ENGLISH

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 31
–L– 329+42

PERMIT DRAWING
SHEET 85 OF 257



PROPOSED 60" RCP–V (NOT BURIED)
(LENGTH=280')

3/30/2016
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8/23/99

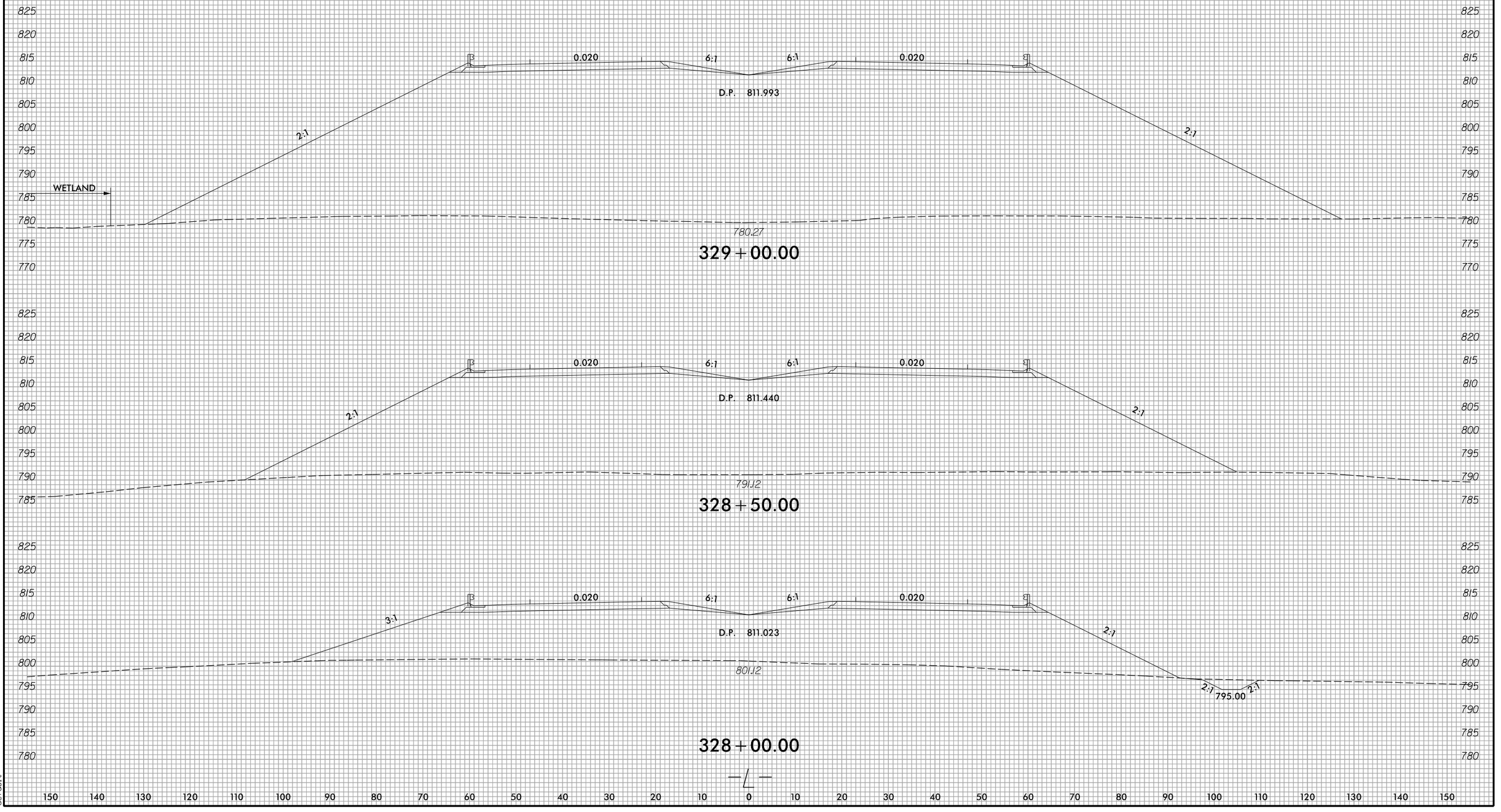
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-XX

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

SITE 31

PERMIT DRAWING
SHEET 86 OF 257

ENGLISH



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default

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PERMIT DRAWING
SHEET 87 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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NAD 8395

INSET A

HW

48" RCP-CD (NOT BURIED)

SCALE 25 0

MATCHLINE EXISTING FOOTHILLS DRIVE SEE SHEET 78

SITE 33

SDD-B

SEE INSET A

LATERAL BASE DITCH SEE DETAIL C

TOE PROTECTION SEE DETAIL I

MATCHLINE -L- STA. 341+00 SEE SHEET 26

MATCHLINE -L- STA. 354+00 SEE SHEET 28

MATCHLINE SEE SHEET 77

LATERAL BASE DITCH SEE DETAIL B

PERMANENTLY DRAIN POND

345+00

350+00

15" RCP-III

24" RCP-III

30" RCP-III

2GI

FS

REMOVE 15" RCP

REMOVE 15" CMP

RETAIN

PUE

GRASS

WOODS

TREES

HTR

EXISTING R/W

SCALE 50 25 0 50 100

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PERMIT DRAWING
SHEET 88 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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NAD 8395

INSET A

HW

48" RCP-CD (NOT BURIED)

25 0 SCALE

MATCHLINE EXISTING FOOTHILLS DRIVE SEE SHEET 78

SEE INSET A

SITE 33

SDD-B

LATERAL BASE DITCH SEE DETAIL C

TOE PROTECTION SEE DETAIL I

MATCHLINE -L- STA. 341+00 SEE SHEET 26

MATCHLINE -L- STA. 354+00 SEE SHEET 28

MATCHLINE SEE SHEET 77

LATERAL BASE DITCH SEE DETAIL B

PERMANENTLY DRAIN POND

345+00

350+00

24" RCP-III

15" RCP-III

2GI

FS

REMOVE 15" RCP

REMOVE 24" RCP

RETAIN

PUE

50 25 0 50 100 SCALE

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PERMIT DRAWING SHEET 89 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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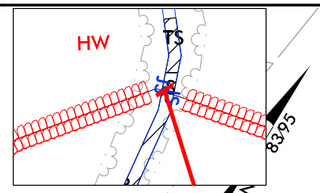
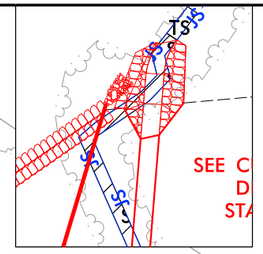
INSET A



INSET B



MATCHLINE –L– STA. 354+00 SEE SHEET 27

MATCHLINE –L– STA. 367+00 SEE SHEET 29

SHH–B
SITE 35

SEE INSET B

SEE INSET A

SGG–B

SEE–B SITE 34

SDD–B

SITE 33

SEE INSET C

SEE INSET D

SITE 36

SFF–B

LATERAL BASE DITCH SEE DETAIL AI

LATERAL BASE DITCH SEE DETAIL C

LATERAL BASE DITCH SEE DETAIL B

LATERAL BASE DITCH SEE DETAIL AV

STD. BASE DITCH SEE DETAIL AS

TOE PROTECTION SEE DETAIL I

18" CSP 2 ELBOWS ROD & LUG

15" CSP 2 ELBOWS ROD & LUG

30" CSP 2 ELBOWS ROD & LUG

15" RCP-III

18" RCP-III

48" RCP-III (NOT BURIED)

48" RCP-IV (NOT BURIED)

Sp. Det. JB w/Slope Lid

JB w/MH

2GI

FS

BDO

355+00

360+00

365+00

PROP. SBG

WOODS

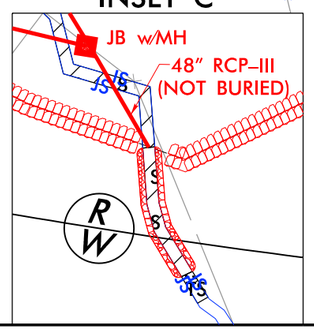
TDE

SEE CULVERT INLET DETAIL –L– STA. 364+22

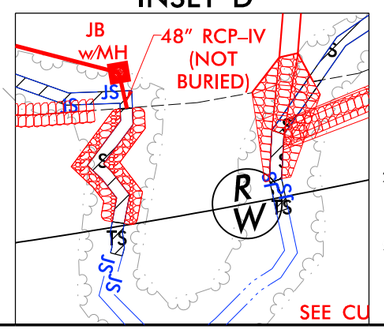
SEE CULVERT OUTLET DETAIL –L– STA. 364+22

BANK STABILIZATION AT PIPE OUTLET SEE DETAIL AJ

INSET C



INSET D



25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

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PERMIT DRAWING
SHEET 90 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

ENGLISH

INSET A

INSET B

SEE C D STA

MATCHLINE –L– STA. 354+00 SEE SHEET 27

MATCHLINE –L– STA. 367+00 SEE SHEET 29

SHH–B
SITE 35

SEE INSET A

SEE INSET B

SEE CULVERT INLET DETAIL –L– STA. 364+22

SGG–B

SEE–B SITE 34

SDD–B

SEE INSET C

SITE 33

SEE INSET D

SITE 36

SFF–B

LATERAL BASE DITCH SEE DETAIL AI

LATERAL BASE DITCH SEE DETAIL C

LATERAL BASE DITCH SEE DETAIL B

LATERAL BASE DITCH SEE DETAIL AV

STD. BASE DITCH SEE DETAIL AS

TOE PROTECTION SEE DETAIL I

BANK STABILIZATION AT PIPE OUTLET SEE DETAIL AJ

SEE CULVERT OUTLET DETAIL –L– STA. 364+22

18" CSP 2 ELBOWS ROD & LUG

15" CSP 2 ELBOWS ROD & LUG

30" CSP 2 ELBOWS ROD & LUG

15" RCP-III

18" RCP-III

48" RCP-III (NOT BURIED)

48" RCP-IV (NOT BURIED)

6'x7' RCBC

Sp. Det. JB w/Step Lid

JB w/MH

2GI

FS

BDO

PROP. SBG

355+00

360+00

365+00

INSET C

INSET D

SCALE FOR INSETS: 25 0 25 50

SCALE: 50 25 0 50 100

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SITE 35
–L– 364+22

PROJECT REFERENCE NO.	SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

ENGLISH

INCOMPLETE PLANS
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PRELIMINARY PLANS
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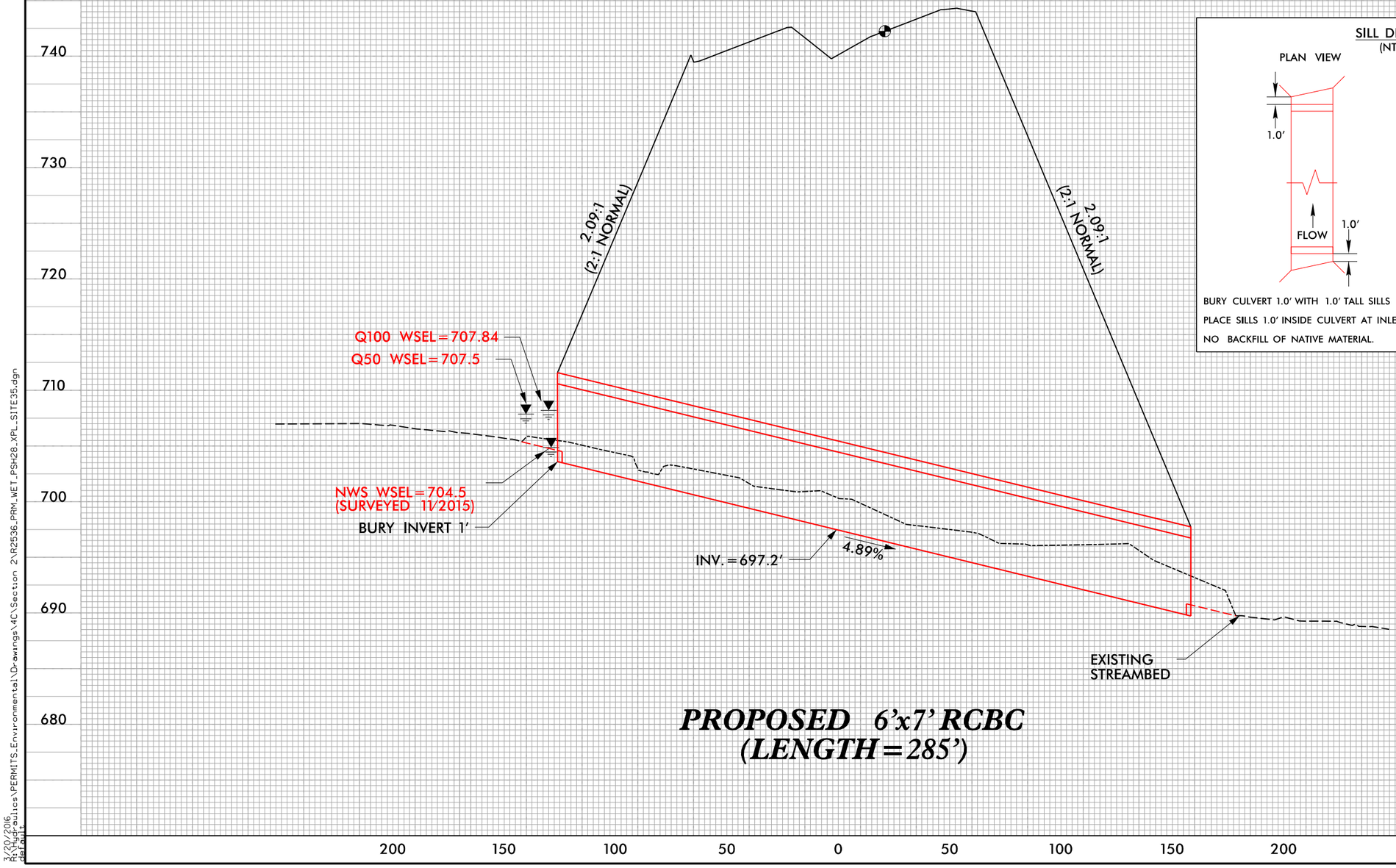
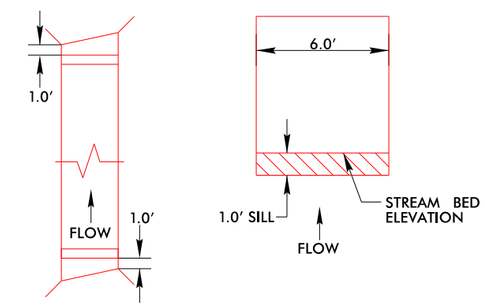
PERMIT DRAWING
SHEET 91 OF 257

HORIZ. SCALE: 1=50'
VERT. SCALE: 1=10'



SILL DETAILS
(NTS)



BURY CULVERT 1.0' WITH 1.0' TALL SILLS
PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET PERPENDICULAR TO SIDEWALL.
NO BACKFILL OF NATIVE MATERIAL.

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PERMIT DRAWING
SHEET 92 OF 257

S S DENOTES IMPACTS IN SURFACE WATER

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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NAD 8395

MATCHLINE –L– STA. 367+00 SEE SHEET 28

MATCHLINE –L– STA. 381+00 SEE SHEET 30

MATCHLINE –Y9RPB– STA. 16+50 SEE SHEET 30

PROP. 48" CL FENCE

END CL FENCE

36" CMP

15" CMP

18" RCP-III

2GI

FS

BEGIN PERM. IMPACTS IN SURFACE WATERS

LATERAL BASE DITCH SEE DETAIL M

WOODS

GRASS

SOIL & GR

HTR

ROCK&WD WALL

48" WW & ISBW

48" CML

370+00

375+00

380+00

10+00

15+00

–L–

–Y9RPB–

N 38° 36' 30.0" E

SGG–B

SITE 36

50 25 0 50 100

SCALE

FOR –L– PROFILE SEE SHTS. 117–118
FOR –Y9RPB– PROFILE SEE SHT. 174

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PERMIT DRAWING
SHEET 93 OF 257

DENOTES IMPACTS IN SURFACE WATER

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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NAD 8395

MATCHLINE –L– STA. 367+00 SEE SHEET 28

MATCHLINE –L– STA. 381+00 SEE SHEET 30

MATCHLINE –Y9RPB– STA. 16+50 SEE SHEET 30

PROP. 48" CL FENCE

END CL FENCE

36" CMP

15" CMP

18" RCP-III

2GI

FS

370+00

375+00

380+00

10+00

15+00

–Y9RPB–

–L–

N 38° 36' 30.0" E

18" CSP
2 ELBOWS
ROD & LUG

BEGIN PERM. IMPACTS IN SURFACE WATERS

15" RCP-III

LATERAL BASE DITCH
SEE DETAIL M

SGG–B

SITE 36

SCALE 50 25 0 50 100

FOR –L– PROFILE SEE SHTS. 117–118
FOR –Y9RPB– PROFILE SEE SHT. 174

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REVISIONS

DETAIL SHEET
FOR SITE 37A, 37B, 104

SITE 37A
SQQ–B
WPP–B

SITE 104
SPP–B
SPP1–B

SITE 37B
SQQ–B
WTT–B

MATCHLINE –Y9RPB– STA. 10+30
SEE SHEET 79

MATCHLINE –L– STA. 381+00
SEE SHEET 29

MATCHLINE –Y9RPB– STA. 16+50
SEE SHEET 29

MATCHLINE –L– STA. 407+00
SEE SHEET 31

MATCHLINE –Y9FLY– STA. 29+00
SEE SHEET 81

MATCHLINE –Y9RPC– STA. 25+50
SEE SHEET 81

SITE 38A
WU–B

SITE 38B
SII–B

DETAIL SHEET
FOR SITE 38

B
C
D

N 42° 06' 30.11" E

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

PROJECT REFERENCE NO. R-2536
SHEET NO. 30
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

PERMIT DRAWING
SHEET 94 OF 257

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

NAD 83/93

GRAPHIC SCALE
50 25 0 50 100
PLANS

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REVISIONS

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ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

PERMIT DRAWING SHEET 95 OF 257

DETAIL SHEET FOR SITE 37A, 37B, 104

SITE 37A
SQQ–B
WPP–B
SPP–B
SITE 104
SPP1–B
SITE 37B
SQQ–B
WTT–B

MATCHLINE –SERRD1– STA. 10+30 SEE SHEET 79

MATCHLINE –Y9RPB– STA. 16+50 SEE SHEET 29

MATCHLINE –L– STA. 381+00 SEE SHEET 29

MATCHLINE –L– STA. 407+00 SEE SHEET 31

MATCHLINE –Y9RPC– STA. 25+50 SEE SHEET 81

MATCHLINE –Y9FLY– STA. 29+00 SEE SHEET 81

SITE 38A
WU–B
SII–B
SITE 38B

DETAIL SHEET FOR SITE 38

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

F F DENOTES FILL IN WETLAND

GRAPHIC SCALE
50 25 0 50 100
PLANS

PLANS PREPARED BY :

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3/22/2018
dgriffith

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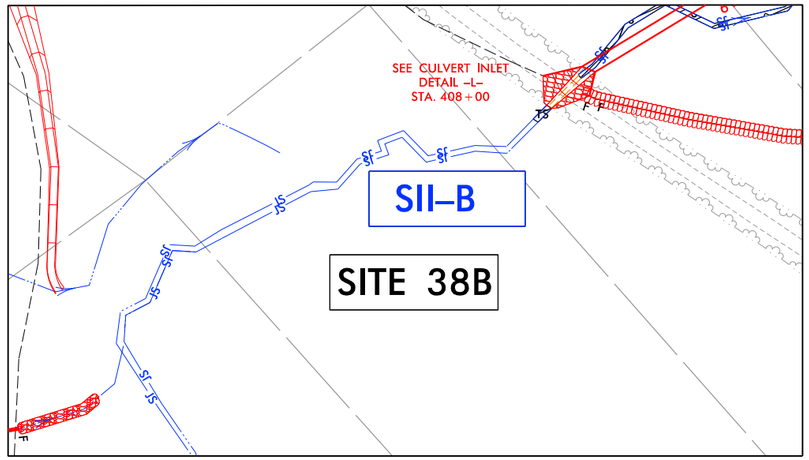
DETAIL SHEET FOR SITE 38



NAD 83/95

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	30A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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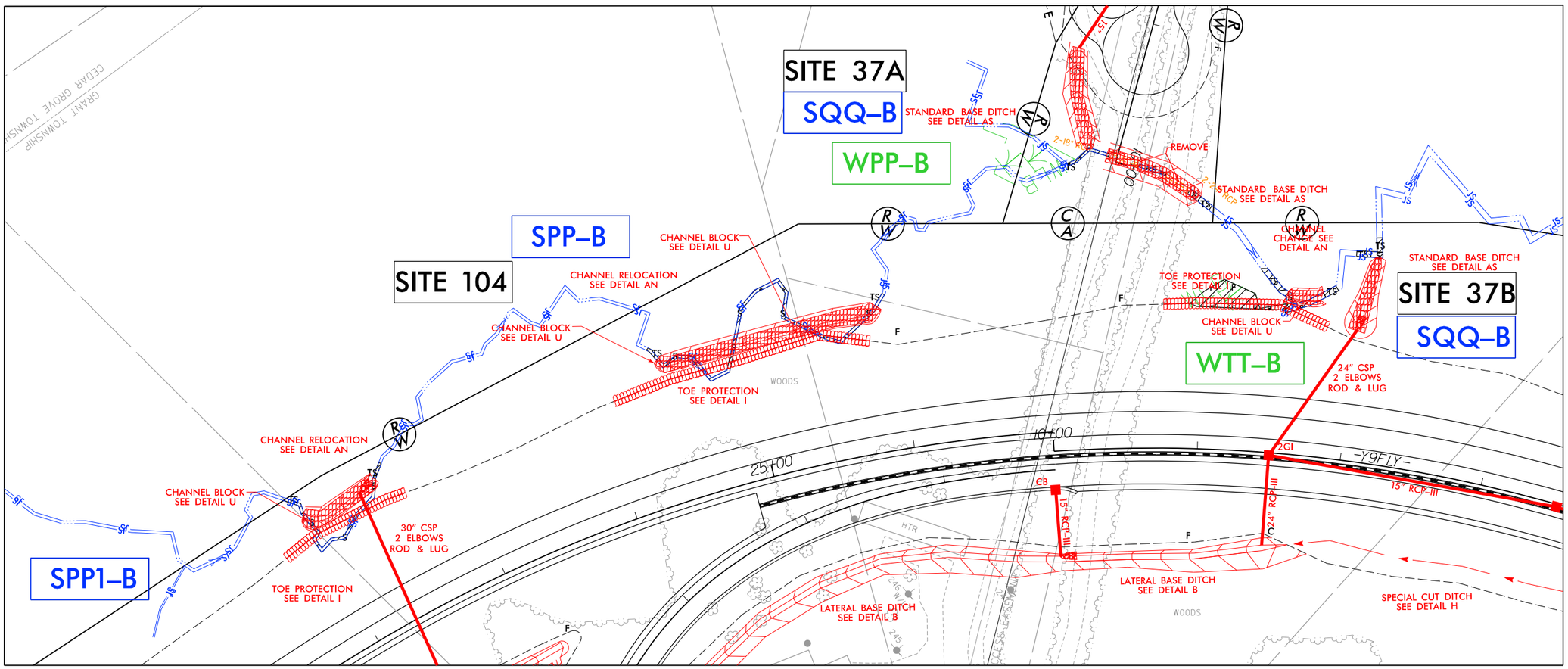
PERMIT DRAWING SHEET 96 OF 257

40 20 0 40 80

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND



DETAIL SHEET FOR SITE 37A, 37B, 104

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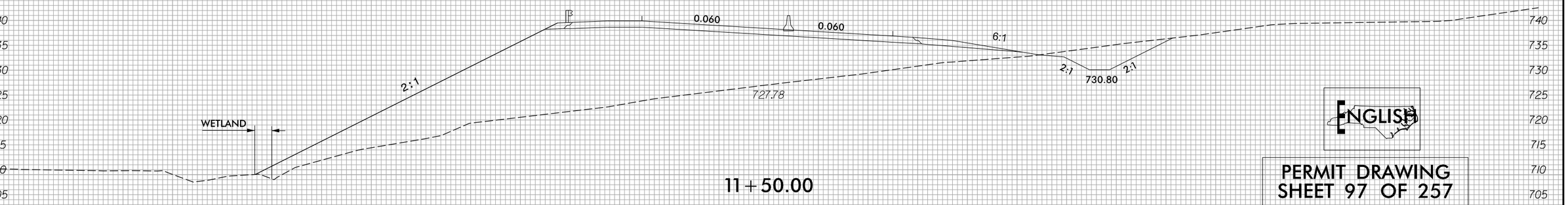
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-XX



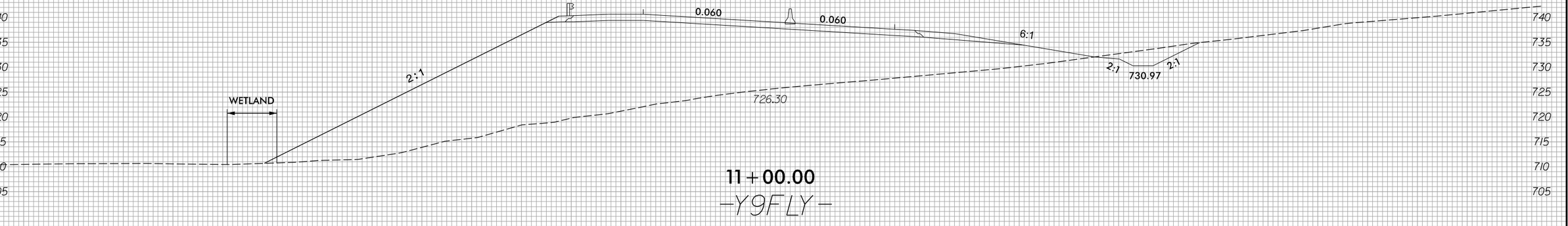
11+50.00

-Y9FLY-

ENGLISH

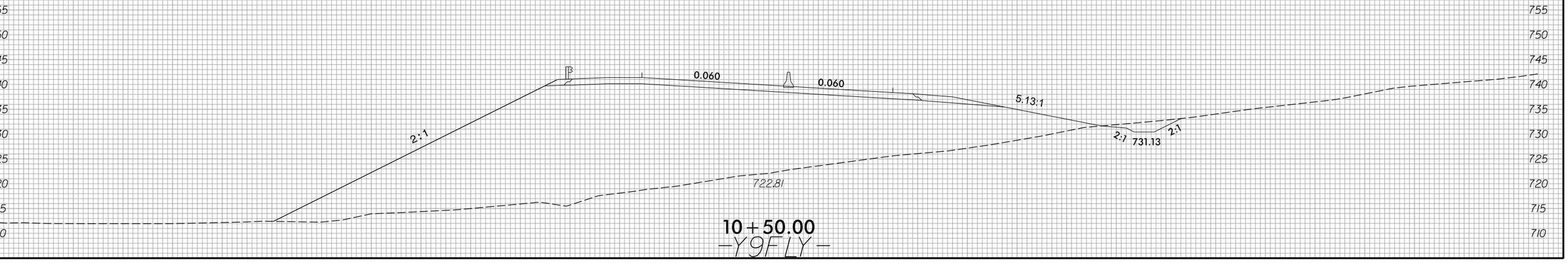
PERMIT DRAWING
SHEET 97 OF 257

SITE 37



11+00.00

-Y9FLY-



10+50.00

-Y9FLY-

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 98 OF 257

SKK–B

SII–B

WU–B

SITE 38A

SITE 38B

SITE 38C

SEE CULVERT OUTLET DETAIL –L– STA. 408+00

SEE INSET A

Q10 = 36.6 CFS
V10 = 1.36 F/S

PROP. 47" WW FENCE

PLACE RIPRAP ONLY ON SLOPES IN WETLANDS

PSH

15" CSP 2 ELBOWS ROD & LUG

SYSTEMS DO NOT CONNECT

2GI

FS

6'x7' RCBC

TOE PROTECTION SEE DETAIL I

TOE PROTECTION SEE DETAIL I PLACE RIPRAP ONLY ON SLOPES IN WETLANDS

15" RCP-III

18" RCP-III

24" RCP-III

30" RCP-III

2GI-A

410+00

415+00

10+00

15+00

20+00

–L–

–Y9RPD–

WOODS

CULTURAL RESOURCE

BERM DITCH SEE DETAIL AM

SPECIAL CUT DITCH SEE DETAIL H

BERM DITCH SEE DETAIL A

SR 2839 STALEYS FARM RD 20' RST

LIBERTY CIRCLE

LIBERTY CIRCLE EXT.

FREEDOM TRAIL

PUE

PROP. 47" WW FENCE

INV=174.89

INV=171.54

RETAIN

15" RCP

18" RCP

24" RCP

30" RCP

MATCHLINE –L– STA. 407+00 SEE SHEET 30

MATCHLINE –L– STA. 419+00 SEE SHEET 32

MATCHLINE –Y9RPD– STA. 22+50 SEE SHEET 81

NAD 83/95

F F DENOTES FILL IN WETLAND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

E E DENOTES EXCAVATION IN WETLAND

ENGLISH

INSET A

25 0 SCALE

50 25 0 50 100 SCALE

FOR –L– PROFILE SEE SHT. 119
FOR –Y9RPD– PROFILE SEE SHT. 176

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PERMIT DRAWING SHEET 99 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SKK–B

SEE CULVERT OUTLET DETAIL –L– STA. 408+00

SITE 38A | SITE 38B | SITE 38C

WU–B

SII–B

SEE INSET A

Q10 = 36.6 CFS
V10 = 1.36 F/S

PROP. 47" WW FENCE

PLACE RIPRAP ONLY ON SLOPES IN WETLANDS

PSH

15" CSP 2 ELBOWS ROD & LUG

SYSTEMS DO NOT CONNECT

6'x7' RCBC

TOE PROTECTION SEE DETAIL I

TOE PROTECTION SEE DETAIL I PLACE RIPRAP ONLY ON SLOPES IN WETLANDS

15" RCP-III

18" RCP-III

24" RCP-III

2GI

FS

410+00

415+00

10+00

15+00

20+00

–L–

–Y9RPD–

MATCHLINE –L– STA. 407+00 SEE SHEET 30

MATCHLINE –L– STA. 419+00 SEE SHEET 32

MATCHLINE –Y9RPD– STA. 22+50 SEE SHEET 81

CULTURAL RESOURCE

BERM DITCH SEE DETAIL AM

SPECIAL CUT DITCH SEE DETAIL H

BERM DITCH SEE DETAIL A

SITE 38C

INSET A

SCALE 25 0

PUE

WOODS

TREES

STALEYS FARM RD

LIBERTY CIRCLE

LIBERTY CIRCLE EXT.

FREEDOM TRAIL

ATV TRAIL

RETAIN 15" RCP

RETAIN 18" RCP

RETAIN 24" RCP

15" RCP

NAD 83/95

F F DENOTES FILL IN WETLAND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

E E DENOTES EXCAVATION IN WETLAND

ENGLISH

50 25 0 50 100
SCALE

FOR –L– PROFILE SEE SHT. 119
FOR –Y9RPD– PROFILE SEE SHT. 176

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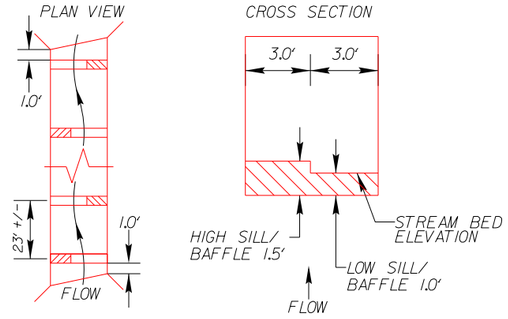
5/14/99

SILL/BAFFLE DETAILS (NTS)



PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET PERPENDICULAR TO SIDEWALL.

ALTERNATE 1.5' TALL HIGH SILL/BAFFLES LEFT AND RIGHT TO FORCE STREAM TO MEANDER ALONG THE LENGTH OF THE CULVERT.

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

SITE 38
–L– 408+00

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.

ROADWAY DESIGN ENGINEER

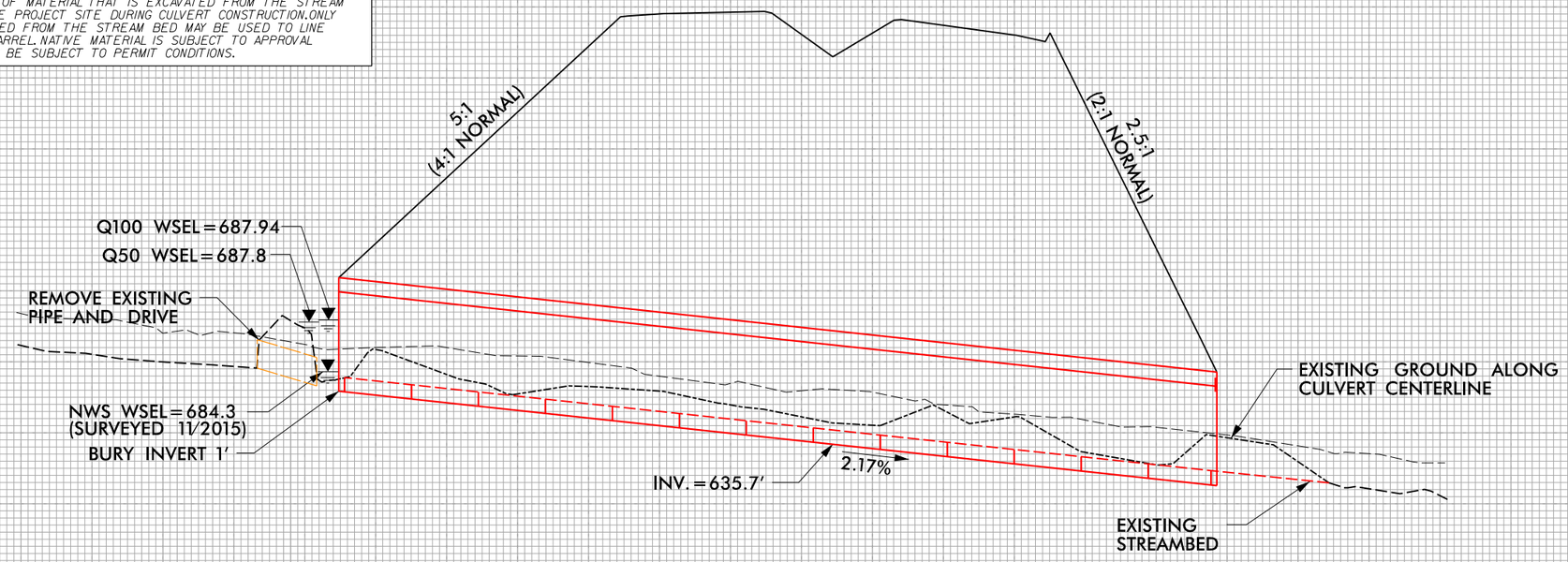
HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 100 OF 257



PROPOSED 6'x7' RCBC
(length=310')

710 700 690 680 670 660 650 640

200 150 100 50 0 50 100 150 200

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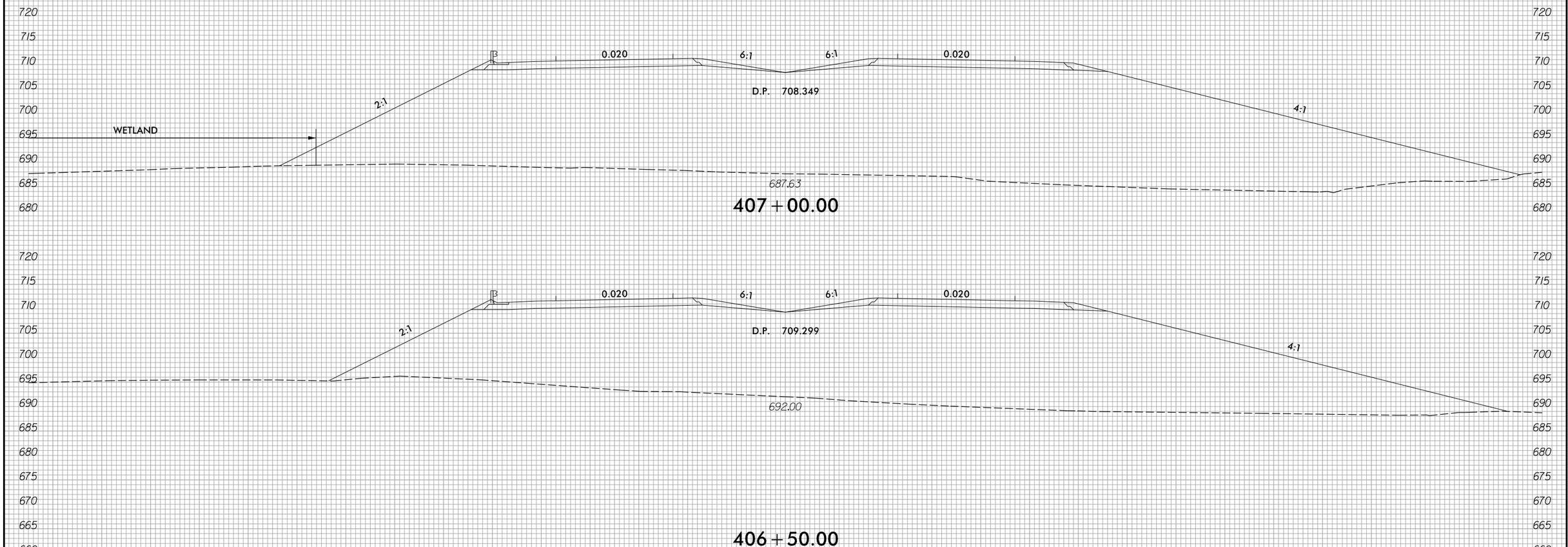
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-115

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

ENGLISH

PERMIT DRAWING
SHEET 101 OF 257

SITE 38



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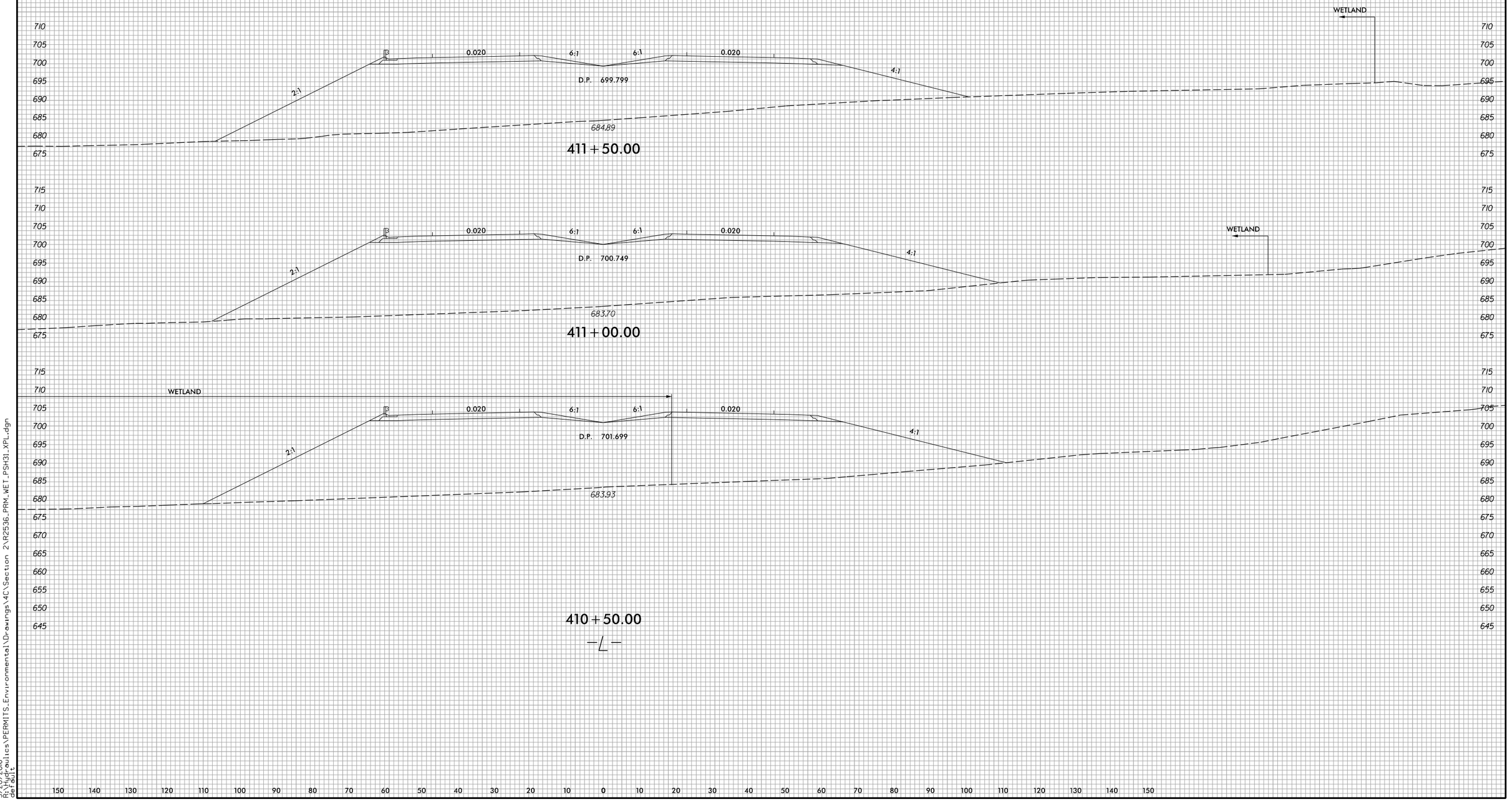
PROJ. REFERENCE NO.	SHEET NO.
R-2536	X-118

0 5 10

ENGLISH

PERMIT DRAWING
SHEET 102 OF 257

SITE 38



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	33
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

PERMIT DRAWING SHEET 103 OF 257

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES IMPACTS IN SURFACE WATER

F F — DENOTES FILL IN WETLAND

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

NAD 83/95

WNN–B
SITE 39
SNN–B
WOO–B
WPP–B
SLL–B
SITE 41
SKK–B
SITE 40

MATCHLINE –L– STA. 431+00 SEE SHEET 32

MATCHLINE –L– STA. 443+00 SEE SHEET 34

SEE INSET A

SEE INSET B

SPECIAL CUT DITCH SEE DETAIL AY

SPECIAL CUT DITCH SEE DETAIL P

SPECIAL CUT DITCH SEE DETAIL H

SEE CULVERT INLET DETAIL –L– STA. 433+31

STANDARD BASE DITCH SEE DETAIL BA

TOE PROTECTION SEE DETAIL L

LATERAL BASE DITCH SEE DETAIL AZ

LATERAL BASE DITCH SEE DETAIL AW

SEE CULVERT OUTLET DETAIL –L– STA. 433+31

20 TONS CL I RIPRAP W/39 SY GEO FAB

30" CSP 2 ELBOWS ROD & LUG CHANNEL BLOCK SEE DETAIL U

15" CSP 2 ELBOWS ROD & LUG

JB WMH

RETAIN

(2) 30" RCP-IV

REMOVE

24" RCP-III

30" RCP-III

15" RCP-III

14" RCP-M

2GI

2GI-A

FS

PDE

WOODS

ISFD

ARBOR

LATTICE

SOIL & GR

MTL SHED CONC

20+00

435+00

440+00

INSET A

INSET B

FOR –L– PROFILE SEE SHTS. 119–120
FOR –Y10_END– PROFILE SEE SHT. 180

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ENGLISH

PERMIT DRAWING
SHEET 104 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

F F DENOTES FILL IN WETLAND

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2536	33
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/95

WNN–B
SITE 39
SNN–B
WOO–B
WPP–B
SLL–B
SITE 41
SKK–B
SITE 40

MATCHLINE –L– STA. 431+00 SEE SHEET 32

MATCHLINE –L– STA. 443+00 SEE SHEET 34

SEE INSET A

SEE INSET B

SPECIAL CUT DITCH SEE DETAIL AY

SPECIAL CUT DITCH SEE DETAIL P

SPECIAL CUT DITCH SEE DETAIL H

RETAIN SYSTEM

STANDARD BASE DITCH SEE DETAIL BA

SEE CULVERT INLET DETAIL –L– STA. 433+31

TOE PROTECTION SEE DETAIL L

JB W/MH

RETAIN

(2) 30" RCP–IV

REMOVE

30" CSP 2 ELBOWS ROD & LUG CHANNEL BLOCK SEE DETAIL U

20 TONS CL I RIPRAP W/39 SY GEO FAB

LATERAL BASE DITCH SEE DETAIL AW

LATERAL BASE DITCH SEE DETAIL AZ

SEE CULVERT OUTLET DETAIL –L– STA. 433+31

INSET A

SEE CULVERT INLET DETAIL –L– STA. 433+31

INSET B

FOR –L– PROFILE SEE SHTS. 119–120
FOR –Y10_END– PROFILE SEE SHT. 180

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5/14/99

SITE 40
–L– 433+32

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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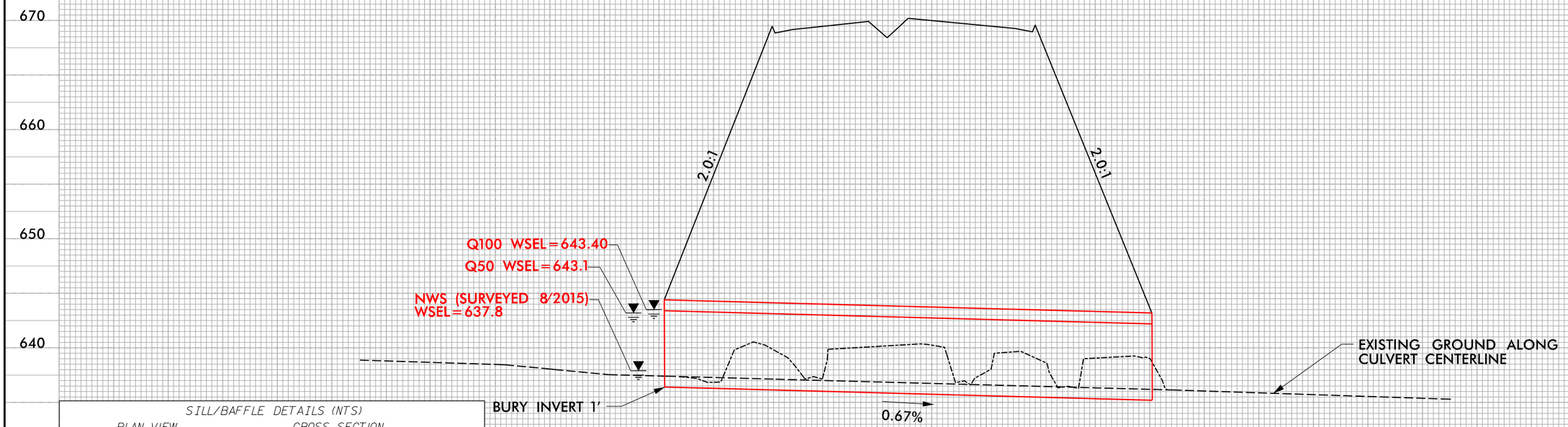
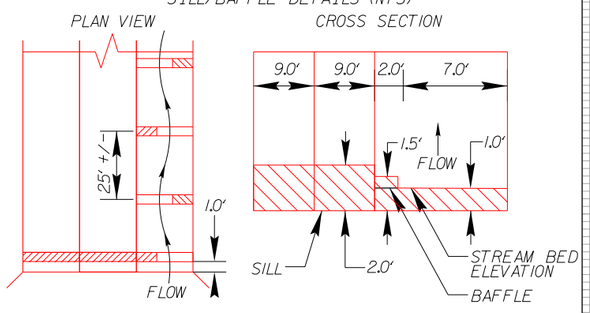
PERMIT DRAWING
SHEET 105 OF 257



PROPOSED 3@9'x7' RCBC
(length=224')

SILL/BAFFLE DETAILS (NTS)



PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET.

ALTERNATE BAFFLE SECTIONS TO FORCE STREAM TO MEANDER LEFT TO RIGHT ALONG THE LENGTH OF THE CULVERT.

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

3/30/2016
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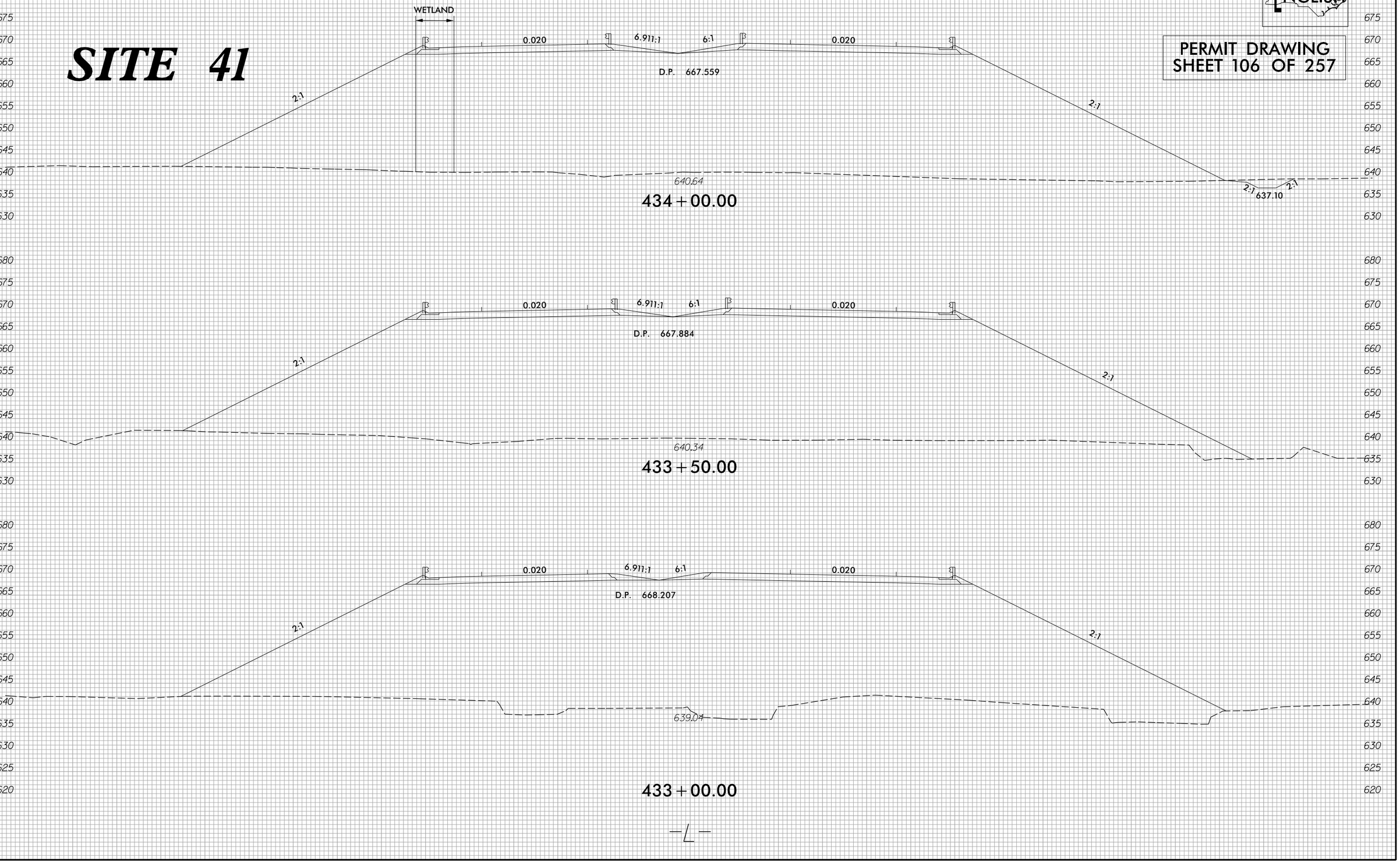
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-XX

ENGLISH

PERMIT DRAWING
SHEET 106 OF 257

SITE 41



3/20/2016
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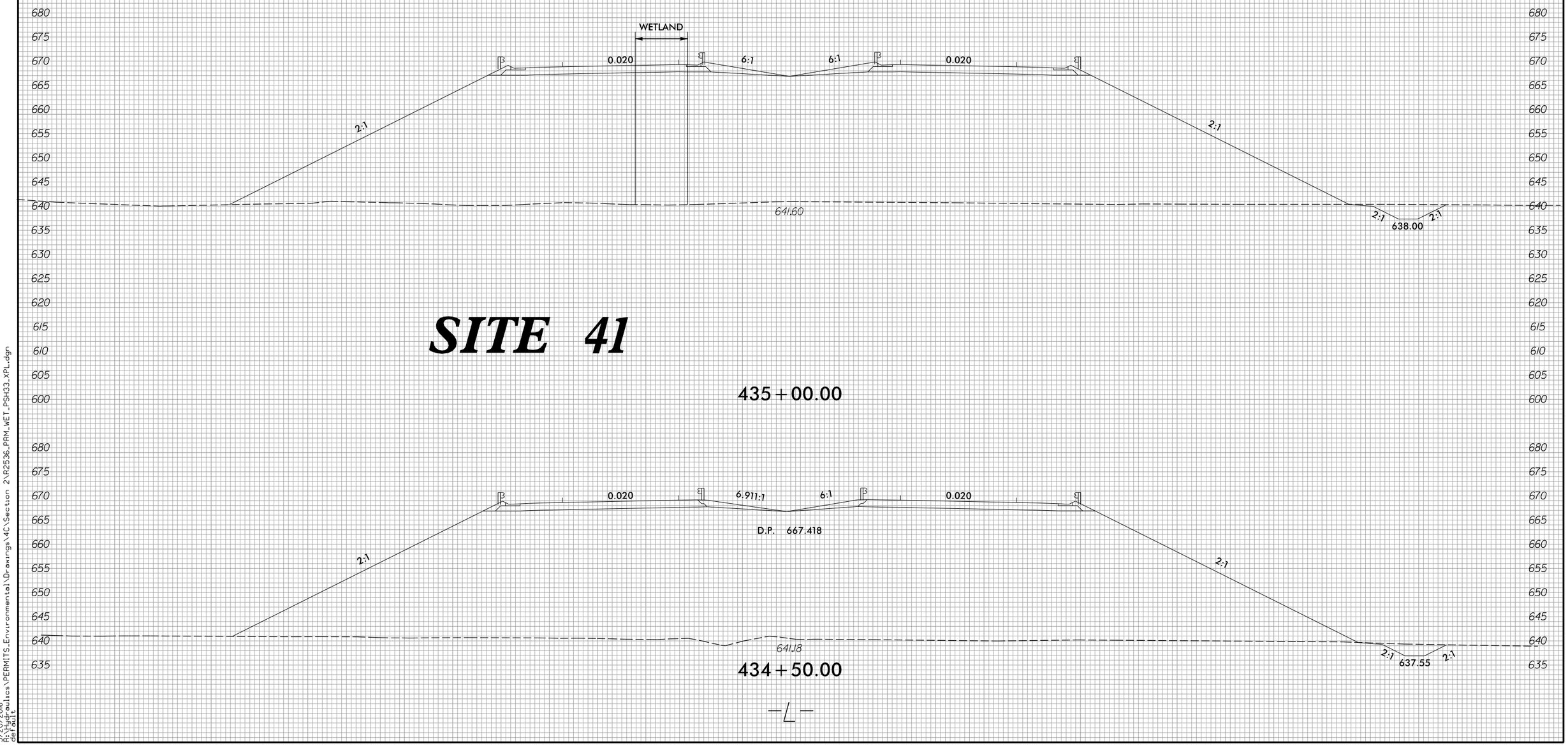
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-XX

ENGLISH

PERMIT DRAWING
SHEET 107 OF 257



SITE 41

435 + 00.00

434 + 50.00

3/20/2016
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8/17/99

ENGLISH

PERMIT DRAWING
SHEET 108 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

P P DENOTES IMPACTS IN SURFACE WATER (POND)

NAD 8395

PROJECT REFERENCE NO.	SHEET NO.
R-2536	34
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MATCHLINE –Y8– STA. 23+00 SEE SHEET 92

MATCHLINE –L– STA. 443+00 SEE SHEET 33

MATCHLINE –L– STA. 455+00 SEE SHEET 35

MATCHLINE –Y8– STA. 14+50 SEE SHEET 91

15 BK BUS

CONC DR

CONC PARKING

CONC WALK

ISFD

SEPTIC

24" RCP-III

18" RCP-III

15" RCP-III

2GI-A

2GI

FS

445+00

450+00

455+00

PSRM

15" RCP-III

18" OTCB RCP-III

15" CSP 2 ELBOWS ROD & LUG

REMOVE 18" RCP

REMOVE 12" CMP

REMOVE 15" CSP

REMOVE 18" RCP

BERM DITCH SEE DETAIL A

BERM DITCH SEE DETAIL AE

SPECIAL CUT DITCH SEE DETAIL H

BDO

STANDARD BASE DITCH SEE DETAIL T

PERMANENT/P (MAIN) POND

NOTE: VERIFY BOTTOM OF POND ELEVATION TO TIE TO LATERAL BASE DITCH. COORD. WITH CONTRACTOR FOR A PERMANENT DITCH THROUGH THE POND IF NECESSARY

POND

PDE

LATERAL V DITCH SEE DETAIL D

SITE 42

PG–B

PF–B

SITE 43A

PH–B

SB–C

SA–C

-Y8-

-L-

-L- 15+00

TGE

PUE

FIELD

WOODS

GRASS

SOIL & GR

RUINS

4' CHL

W/LT

MTL SHED

50 25 0 50 100

SCALE

PLANS PREPARED BY :

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ENGLISH

PERMIT DRAWING
SHEET 109 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

P P DENOTES IMPACTS IN SURFACE WATER (POND)

NAD 8395

PROJECT REFERENCE NO.	SHEET NO.
R-2536	34
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MATCHLINE –Y8– STA. 23+00 SEE SHEET 92

MATCHLINE –L– STA. 443+00 SEE SHEET 33

MATCHLINE –L– STA. 455+00 SEE SHEET 35

MATCHLINE –Y8– STA. 14+50 SEE SHEET 91

15 BK BUS

CONC PARKING

CONC WALK

CONC CR

ISFD

36" BRK

24" RCP–III

18" RCP–III

15" RCP–III

2GI–A

2GI

FS

PSRM

15" RCP

18" OTCB

15" CSP 2 ELBOWS ROD & LUG

REMOVE

BERM DITCH SEE DETAIL A

BERM DITCH SEE DETAIL AE

SPECIAL CUT DITCH SEE DETAIL H

BDO

LATERAL V DITCH SEE DETAIL D

STANDARD BASE DITCH SEE DETAIL T

PERMANENT RAIN POND

NOTE: VERIFY BOTTOM OF POND ELEVATION TO TIE TO LATERAL BASE DITCH. COORD WITH CONTRACTOR FOR A PERMANENT DITCH THROUGH THE POND IF NECESSARY

SITE 42
PG–B

PF–B

SA–C

SITE 43A
PH–B

SB–C

445+00

450+00

455+00

-Y8-

-L- 15+90

FIELD

WOODS

GRASS

PUE

PDE

SCALE 50 25 0 50 100

PLANS PREPARED BY :
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default

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PERMIT DRAWING
SHEET 110 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	35
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

P P DENOTES IMPACTS IN SURFACE WATER (POND)

NOTE: VERIFY BOTTOM OF POND ELEVATION TO TIE TO LATERAL BASE DITCH. COORD. WITH CONTRACTOR FOR A PERMANENT DITCH THROUGH THE POND IF NECESSARY

INSET B

SITE 43D

PA–C

WA–C

SC–C

SITE 43C

SEE INSET B

SEE SHEET 34

SEE SHEET 36

MATCHLINE –L– STA. 455+00

MATCHLINE –L– STA. 468+00

455+00

460+00

465+00

–L–

N 19° 36' 18.9" E

BDO

15" CSP
2 ELBOWS
ROD & LUG

TOE PROTECTION
SEE DETAIL I

2GI

FS

WOODS

SITE 57

SD–C

TOE PROTECTION
W/CL B RIPRAP
EST 415 TONS
EST 1244 SY GEOTEXTILE
SEE DETAIL I

END SBG +77

15" RCP–III

TOE PROTECTION
W/CL I RIPRAP
EST 192 TONS
EST 391 SY GEOTEXTILE
SEE DETAIL K

SEE INSET A

LATERAL BASE DITCH
SEE DETAIL C

LATERAL BASE DITCH
SEE DETAIL B

STANDARD BASE DITCH
SEE DETAIL AS

SITE 43B

PH–B

NOTE: VERIFY BOTTOM OF POND ELEVATION TO TIE TO LATERAL BASE DITCH. COORD. WITH CONTRACTOR FOR A PERMANENT DITCH THROUGH THE POND IF NECESSARY

INSET A

HW

SECTION 2 SECTION 3

–L– 465+00

SCALE FOR INSETS
25 0 25 50

SCALE
50 25 0 50 100

FOR –L– PROFILE SEE SHTS. 120–121

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PERMIT DRAWING
SHEET 111 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	35
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

P P DENOTES IMPACTS IN SURFACE WATER (POND)

NOTE: VERIFY BOTTOM OF POND ELEVATION TO TIE TO LATERAL BASE DITCH. COORD. WITH CONTRACTOR FOR A PERMANENT DITCH THROUGH THE POND IF NECESSARY

INSET B

SITE 43D

PA–C

WA–C

SC–C

SITE 43C

SEE INSET B

SEE SHEET 34

MATCHLINE –L– STA. 455+00

BDO

15" CSP 2 ELBOWS ROD & LUG

TOE PROTECTION SEE DETAIL I

2GI

FS

SEE INSET A

PERMANENT DRAIN POND

HW

LATERAL BASE DITCH SEE DETAIL C

LATERAL BASE DITCH SEE DETAIL B

STANDARD BASE DITCH SEE DETAIL AS

SITE 43B

PH–B

INSET A

PDE

SITE 57

SD–C

TOE PROTECTION W/CL B RIPRAP EST. 415 TONS EST 1244 SY GEOTEXTILE SEE DETAIL I

15" CSP 2 ELBOWS ROD & LUG

END SBG +77

15" RCP-III

RCP-FW

460+00

465+00

–L–

N 19° 36' 18.9" E

TOE PROTECTION W/CL I RIPRAP EST 192 TONS EST 391 SY GEOTEXTILE SEE DETAIL K

SECTION 2 SECTION 3

–L– 465+00

SEE SHEET 36

MATCHLINE –L– STA. 468+00

SCALE FOR INSETS: 25 0 25 50

SCALE: 50 25 0 50 100

FOR –L– PROFILE SEE SHTS. 120–121

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	70
R/W SHEET NO.	
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PRELIMINARY PLANS
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TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

MATCHLINE –Y4– STA. 63+00 SEE SHEET 71

SS–B
SITE 44

SPECIAL CUT DITCH SEE DETAIL H

LATERAL BASE DITCH SEE DETAIL B

TOE PROTECTION SEE DETAIL I

BERM DITCH SEE DETAIL A

DRY DETENTION POND

RISER

BANK STABILIZATION AT PIPE OUTLET SEE DETAIL BB

SEE INSET A

LATERAL V DITCH SEE DETAIL D

SP. LAT V DITCH SEE DETAIL J

REMOVE 20' PIPE

REMOVE 39' PIPE

REMOVE DI

SPECIAL CUT DITCH SEE DETAIL H

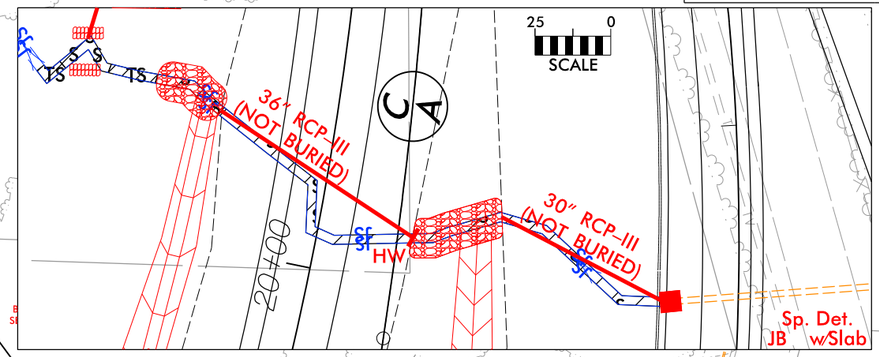
MATCHLINE –SERRD3– STA. 16+00 SEE SHEET 23

MATCHLINE –Y4RPB– STA. 27+50 SEE SHEET 23

MATCHLINE –Y4– STA. 54+00 SEE SHEET 23

MATCHLINE –Y4RPA– STA. 26+00 SEE SHEET 23

INSET A



NAD 8395

50 25 0 50 100
SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	70
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TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

MATCHLINE –Y4– STA. 63+00 SEE SHEET 71

SS–B
SITE 44

INSET A

SCALE 25 0

NAD 83

95

SEE INSET A

MATCHLINE –SERRD3– STA. 16+00 SEE SHEET 23

MATCHLINE –Y4RPB– STA. 27+50 SEE SHEET 23

MATCHLINE –Y4– STA. 54+00 SEE SHEET 23

MATCHLINE –Y4RPA– STA. 26+00 SEE SHEET 23

B

A

SCALE 50 25 0 50 100

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	71
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SHEET 114 OF 257

ENGLISH

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

NAD 1983

MATCHLINE –Y4– STA. 63+00 SEE SHEET 70

MATCHLINE –Y4– STA. 76+00 SEE SHEET 72

SITE 45B

SITE 45A

ST–B

SEE INSET A

INSET A

LATERAL BASE DITCH SEE DETAIL B

LATERAL BASE DITCH SEE DETAIL M

LATERAL BASE DITCH SEE DETAIL AV

LATERAL V DITCH SEE DETAIL D

15" CSP 2 ELBOWS ROD & LUG

36" RCP–III (NOT BURIED)

REMOVE 37' PIPE

REMOVE DI

TB JB w/Slab Lid

REMOVE SYSTEM

US HWY 220 BYPASS 38.5' BST

EXISTING R/W

WOODS

25+00 30+00 35+00 50+00 55+00 60+00 65+00 70+00 75+00

SCALE FOR INSET 25 0 25 50

SCALE 50 25 0 50 100

FOR –Y4– PROFILE SEE SHTS. 157–158
FOR –Y4CD– RT PROFILE SEE SHT. 152–153
FOR –Y4CD– LT PROFILE SEE SHT. 152–153
FOR –Y4RPB– PROFILE SEE SHT. 161
FOR –SERRD3– PROFILE SEE SHT. 181

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R-2536	71
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PRELIMINARY PLANS
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PERMIT DRAWING SHEET 115 OF 257

ENGLISH

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

NAD 1983

MATCHLINE –Y4– STA. 63+00 SEE SHEET 70

MATCHLINE –Y4– STA. 76+00 SEE SHEET 72

SITE 45B

SITE 45A

ST–B

INSET A

SCALE FOR INSET 25 0 25 50

SCALE 50 25 0 50 100

FOR –Y4– PROFILE SEE SHTS. 157–158
FOR –Y4CD– RT PROFILE SEE SHT. 152–153
FOR –Y4CD– LT PROFILE SEE SHT. 152–153
FOR –Y4RPB– PROFILE SEE SHT. 161
FOR –SERRD3– PROFILE SEE SHT. 181

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SHEET 116 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	72
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 1983

INSET A

MATCHLINE –Y4– STA. 76+00 SEE SHEET 71

SITE 45B
ST–B

SITE 47B
SU–B

SITE 46
SV–B

SITE 47A
SU–B

LATERAL BASE DITCH SEE DETAIL AV

SEE CULVERT OUTLET DETAIL –Y4– STA. 80+35

LATERAL V DITCH SEE DETAIL D

SEE INSET A

STANDARD V DITCH SEE DETAIL AL

STANDARD V DITCH SEE DETAIL W

SPECIAL CUT DITCH SEE DETAIL H

TOE PROTECTION SEE DETAIL I

RETAIN SYSTEM

15" RCP REMOVE SYSTEM

15" CSP 2 ELBOWS ROD & LUG

SEE INSET B

CHANNEL CHANGE SEE DETAIL AG

RIPRAP TRANSITION SEE DETAIL AU

SEE CULVERT INLET DETAIL –Y4– STA. 80+35

INSET B

–SERRD3–

–Y4–

40+00 45+00 80+00 85+00 90+00

N 39° 14' 15.0" W

US HWY 220 BYPASS 39' BST

SR 1203 SKYCREST COUNTRY RD 20' BST

US HWY 220 BYPASS 38' BST

WOODS TREES

SCALE FOR INSETS 25 0 25 50

SCALE 50 25 0 50 100

FOR –Y4– PROFILE SEE SHTS. 158–158A
FOR –SERRD3– PROFILE SEE SHTS. 181–182

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TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	72
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 1983

INSET A

MATCHLINE –Y4– STA. 76+00 SEE SHEET 71

SITE 45B
ST–B

SITE 47B
SU–B

SITE 46
SV–B

SITE 47A
SU–B

LATERAL BASE DITCH SEE DETAIL AV

SEE CULVERT OUTLET DETAIL –Y4– STA. 80+35

LATERAL V DITCH SEE DETAIL D

SEE INSET A

STANDARD V DITCH SEE DETAIL AL

40+00

45+00

N 39°14'15.0" W

–SERRD3–

STANDARD V DITCH SEE DETAIL W

SPECIAL CUT DITCH SEE DETAIL H

STANDARD V DITCH SEE DETAIL AL

TOE PROTECTION SEE DETAIL I

RETAIN SYSTEM

US HWY 220 BYPASS

80+00

–Y4–

85+00

15" RCP REMOVE SYSTEM

15" CSP 2 ELBOWS ROD & LUG

SEE INSET B

LATERAL V DITCH SEE DETAIL D

RIPRAP TRANSITION SEE DETAIL AU

CHANNEL CHANGE SEE DETAIL AG

15" RCP-III

SEE CULVERT INLET DETAIL –Y4– STA. 80+35

SPECIAL CUT DITCH SEE DETAIL H

RETAIN SYSTEM

90+00

INSET B

SCALE FOR INSETS
25 0 25 50

SCALE
50 25 0 50 100

FOR –Y4– PROFILE SEE SHTS. 158–158A
FOR –SERRD3– PROFILE SEE SHTS. 181–182

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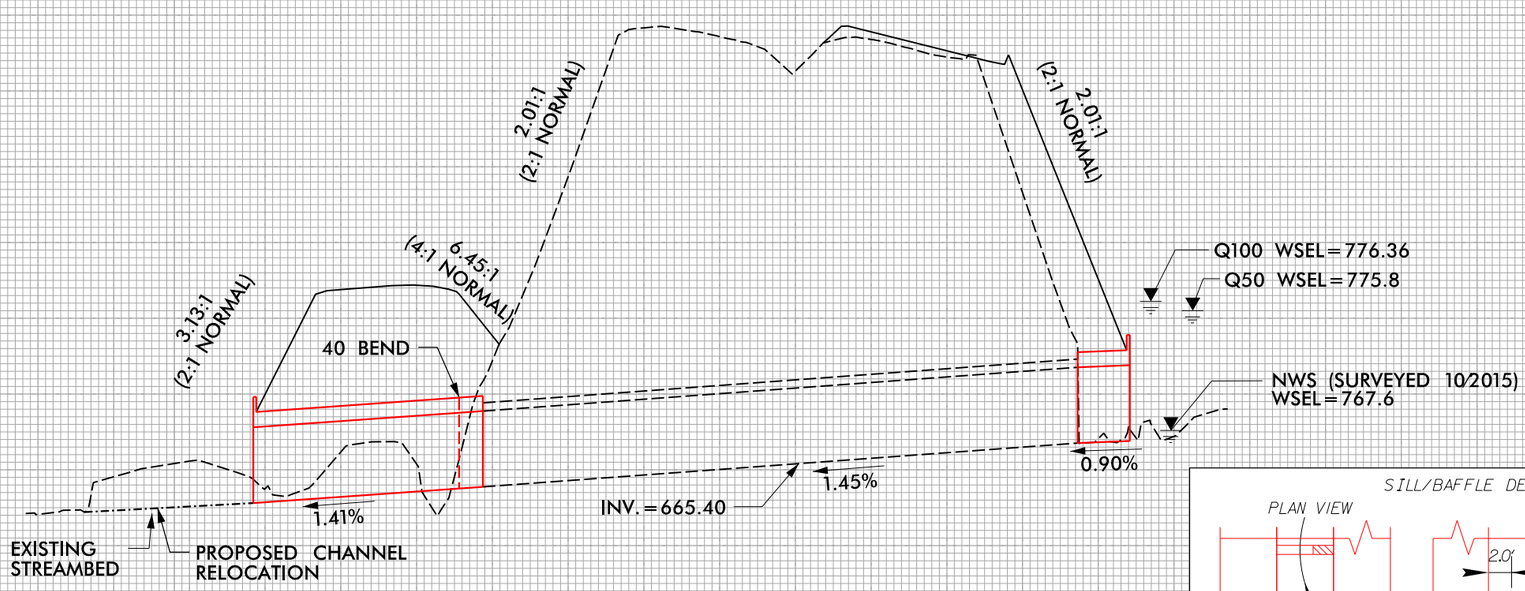
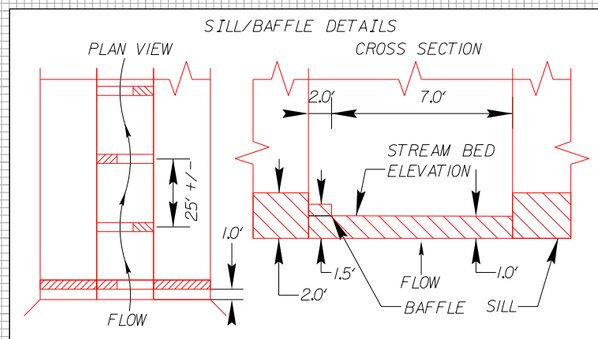
PERMIT DRAWING
SHEET 118 OF 257

ENGLISH

SITE 47
–Y4– 80+35



EXTEND EXISTING 4'x5' RCBC
(total length=291')



PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET.

ALTERNATE BAFFLE SECTIONS TO FORCE STREAM TO MEANDER LEFT TO RIGHT ALONG THE LENGTH OF THE CULVERT.

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

800 790 780 770 760 750 740 730

200 150 100 50 0 50 100 150 200

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	75
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING
SHEET 119 OF 257

NAD 8395

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

INSET A

SITE 49
SWW–B
WYY–B
SITE 48
SEE INSET A
SEE CULVERT INLET DETAIL –Y5– STA. 41+00
PLACE RIPRAP ONLY ON SLOPES IN WETLANDS
CHANNEL RELOCATION SEE DETAIL AG
TDE FOR EROSION CONTROL DEVICE
TDE
TOE PROTECTION SEE DETAIL K
REMOVE
–Y5–
N 72° 35' 33.2" E
40+00
45+00
2GI
15" CSP
2 ELBOWS
ROD & LUG
MATCHLINE –Y5– STA. 36+00 SEE SHEET 69
WXX–B
SAA–B
SEE INSET B
SITE 48
SEE CULVERT OUTLET DETAIL –Y5– STA. 41+00
TDE FOR EROSION CONTROL DEVICE
TOE PROTECTION SEE DETAIL I
FS ELEV=814.3
44" RCP
PDE
STANDARD BASE DITCH SEE DETAIL R
LATERAL BASE DITCH SEE DETAIL C
POND WE #6
PC–B
MATCHLINE –Y5– STA. 50+00 SEE SHEET 76

INSET B

ENGLISH

SCALE FOR INSETS
25 0 25 50

SCALE
50 25 0 50 100

FOR –Y5– PROFILE SEE SHTS. 165–166

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R-2536	75
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SHEET 120 OF 257

NAD 8395

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

INSET A

SITE 49
SWW–B
WYY–B
SITE 48
SEE INSET A
SEE CULVERT INLET DETAIL –Y5– STA. 41+00
PLACE RIPRAP ONLY ON SLOPES IN WETLANDS
CHANNEL RELOCATION SEE DETAIL AG
TDE FOR EROSION CONTROL DEVICE
TDE
TOE PROTECTION SEE DETAIL K
REMOVE
40+00
–Y5–
N 72° 35' 33.2" E
MATCHLINE –Y5– STA. 36+00 SEE SHEET 69
2GI
15" CSP 2 ELBOWS ROD & LUG
45+00
TOE PROTECTION SEE DETAIL I FS ELEV=814.3
24" RCP W
TDE FOR EROSION CONTROL DEVICE
LATERAL BASE DITCH SEE DETAIL C
STANDARD BASE DITCH SEE DETAIL R
POND WE 806
WXX–B
SAA–B
SITE 48
SEE INSET B
PC–B
MATCHLINE –Y5– STA. 50+00 SEE SHEET 76

INSET B

SCALE FOR INSETS 25 0 25 50
SCALE 50 25 0 50 100
FOR –Y5– PROFILE SEE SHTS. 165–166

ENGLISH

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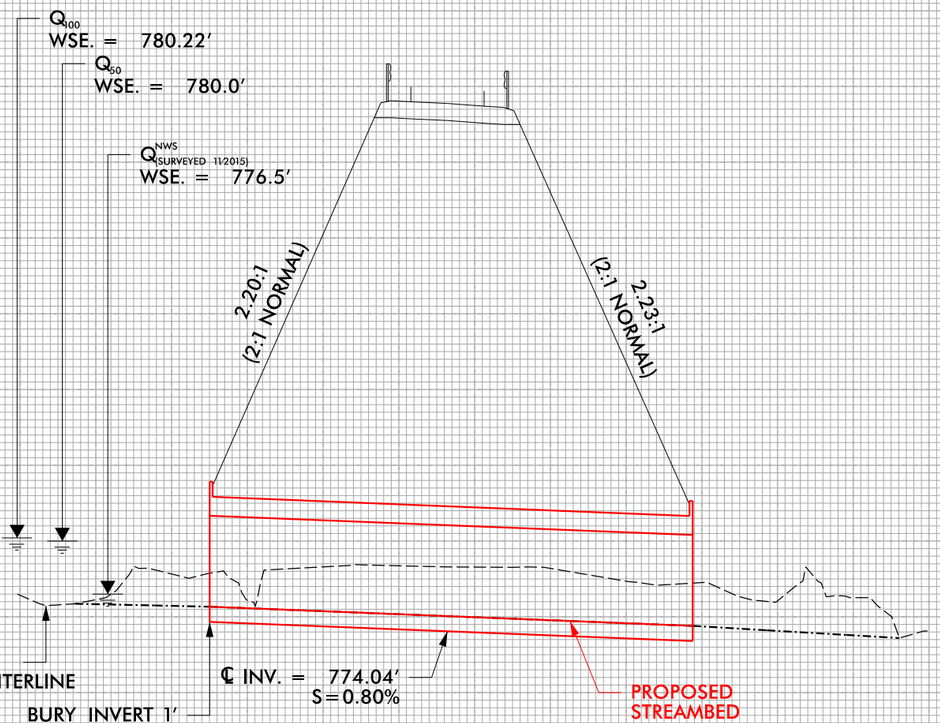
SHEET 121 OF 257

SITE 48
–Y5– 41+00



PROPOSED 3@10'x7' RCBC
(length=160')

SILL/BAFFLE DETAILS
(NOT TO SCALE)

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

*NOTES:

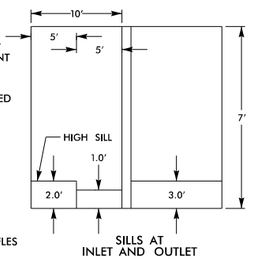
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE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

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

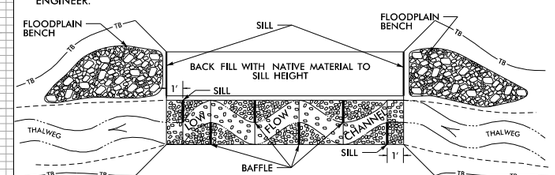
3) TOP OF LOW FLOW SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

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

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



SILLS AT INLET AND OUTLET



NUMBER OF BAFFLES=8
ON 23 FT CENTERS FROM DOWNSTREAM SILL

PLAN VIEW

913

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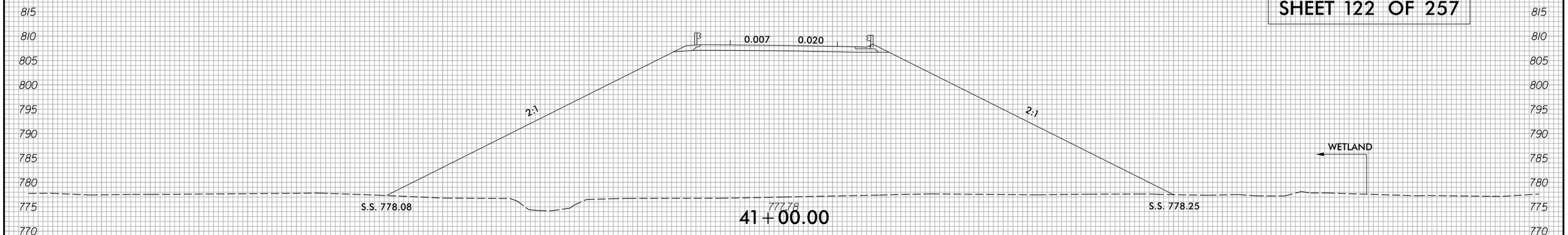
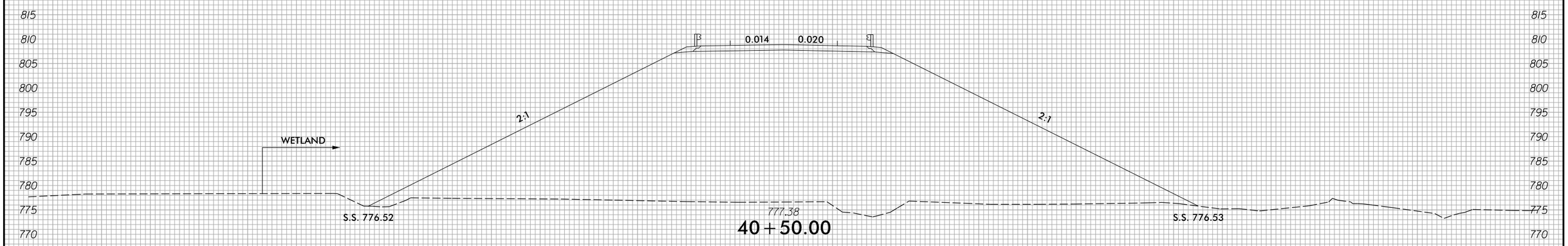
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-XX

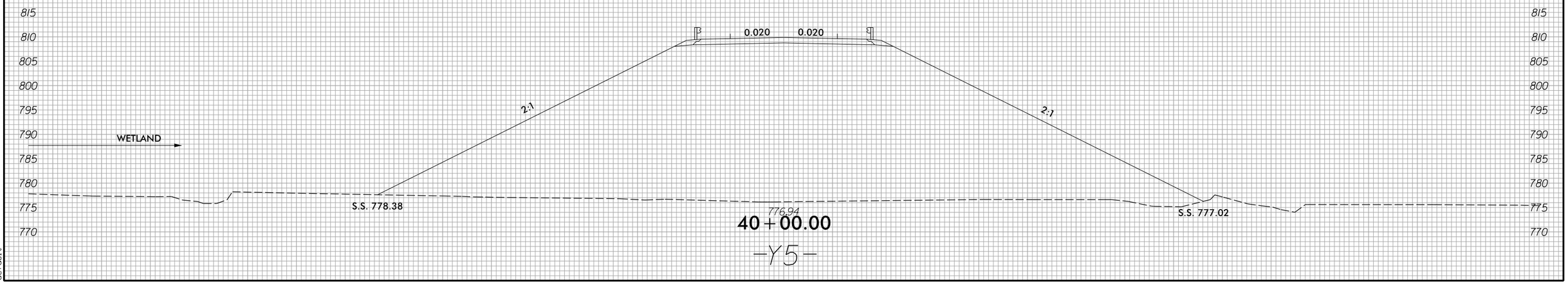
SITE 48

ENGLISH

PERMIT DRAWING
SHEET 122 OF 257







-Y5-

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default

PROJECT REFERENCE NO.	SHEET NO.
R-2536	80
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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PERMIT DRAWING
SHEET 123 OF 257

ENGLISH

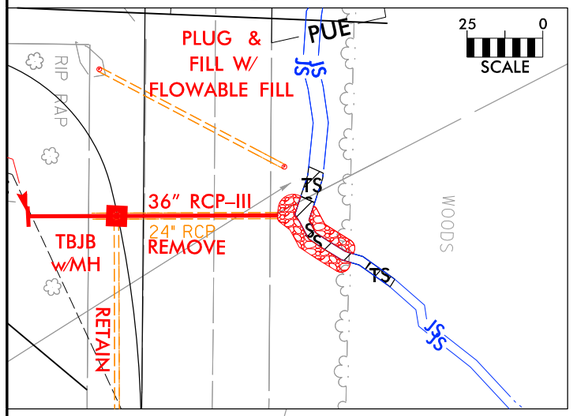
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

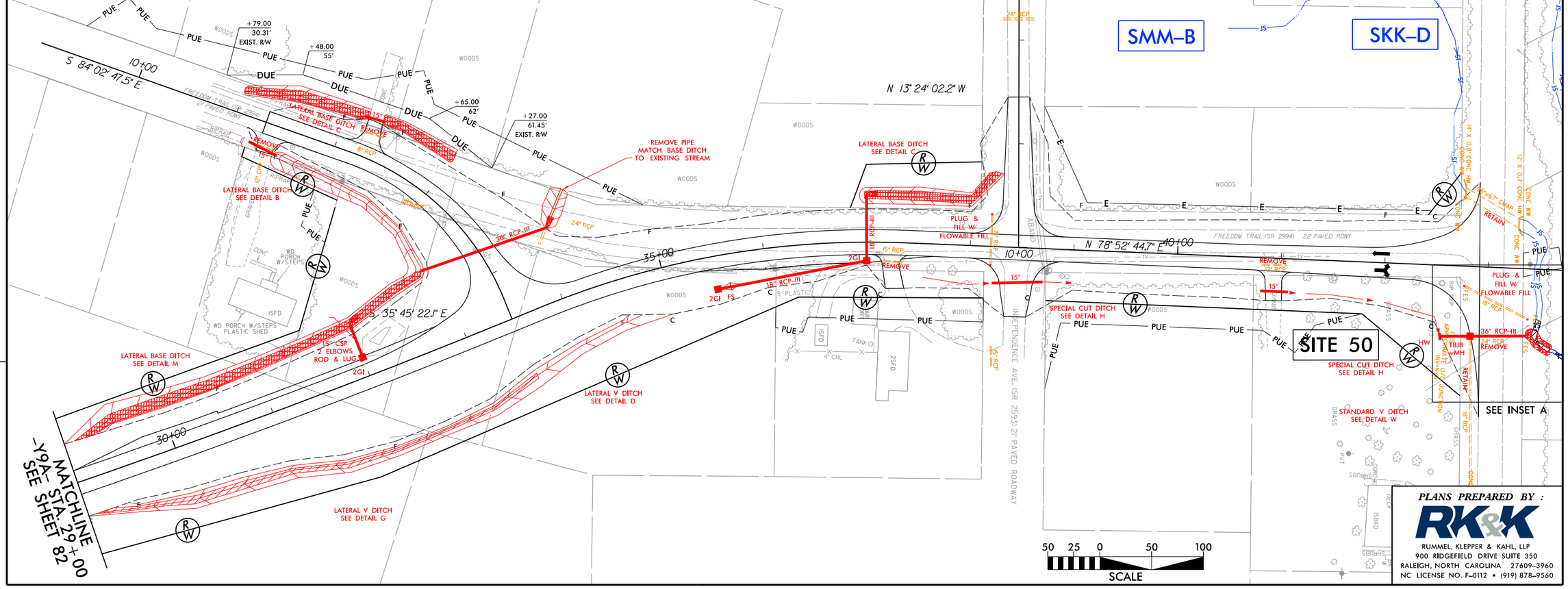
S S DENOTES IMPACTS IN SURFACE WATER

NAD 83'95

R/W REVISION: DATE: 3/4/2016 - COMBINED PARCELS 35I AND 35IJ INTO ONE PARCEL NO.35I

INSET A





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PERMIT DRAWING
SHEET 124 OF 257

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2536	80
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

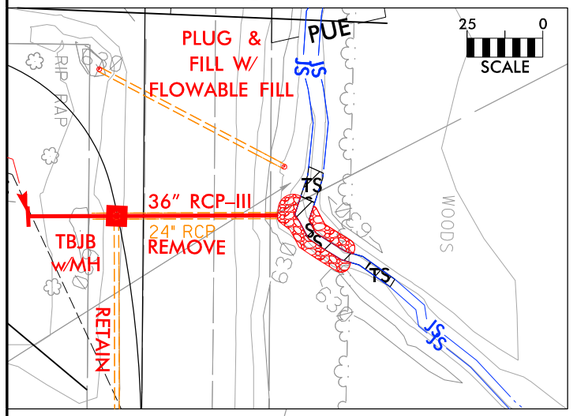
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

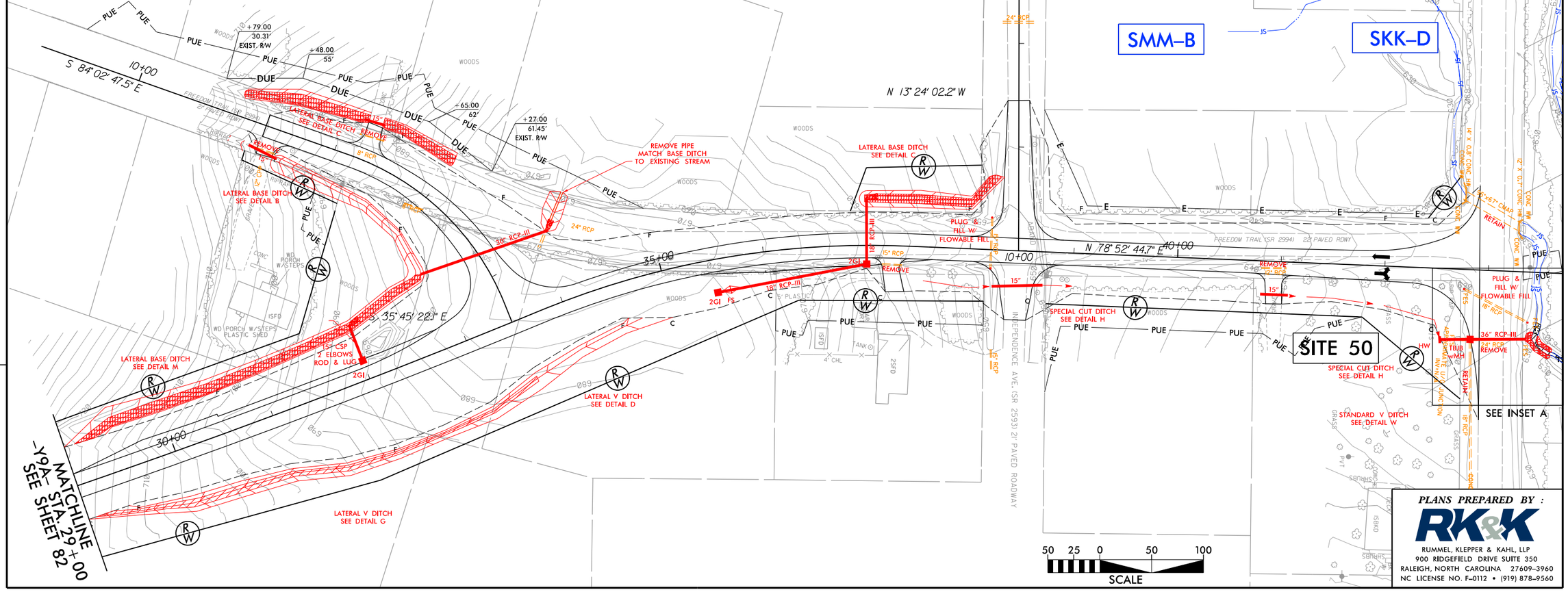
S S DENOTES IMPACTS IN SURFACE WATER

NAD 83'95

R/W REVISION: DATE: 3/4/2016 - COMBINED PARCELS 35I AND 35IJ INTO ONE PARCEL NO.35I

INSET A





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PROJECT REFERENCE NO.	SHEET NO.
R-2536	82
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

PERMIT DRAWING
SHEET 125 OF 257

DENOTES IMPACTS IN SURFACE WATER (POND)

NAD 83/95

PA-D

SITE 51

NOTE: VERIFY BOTTOM OF POND ELEVATION TO TIE TO LATERAL BASE DITCH. COORD. WITH CONTRACTOR FOR A PERMANENT DITCH THROUGH THE POND IF NECESSARY

PERMANENTLY DIVERT POND

LATERAL BASE DITCH SEE DETAIL AW

POND OVERFLOW @ TIDE SYSTEM

-Y9A- STA. 29+00 SEE SHEET 80

MATCHLINE -Y9A- STA. 23+00 SEE SHEET 81

MATCHLINE -Y9B- STA. 1+25 SEE SHEET 82

MATCHLINE -Y9FLY- STA. 43+00 SEE SHEET 81

MATCHLINE -Y9- STA. 13+00 SEE SHEET 83

-Y9FLY-

-Y9-

N 46° 16' 25.0" W

S 66° 59' 35.5" E

45+00

50+00

10+00

TDE

CONC

2GI

FS

15" RCP-III

2GI-A

24" RCP-III

2GH-A

24" CSP

REMOVE EXIST RCP & SUMP

INV=6.25

LATERAL BASE DITCH SEE DETAIL C

BERM DITCH SEE DETAIL A

LATERAL BASE DITCH SEE DETAIL M

50 25 0 50 100
SCALE

FOR -Y9FLY- PROFILE SEE SHT. 170
FOR -Y9- PROFILE SEE SHT. 171
FOR -Y9A- PROFILE SEE SHT. 178
FOR -Y9B- PROFILE SEE SHT. 178

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	82
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

PERMIT DRAWING SHEET 126 OF 257

50 25 0 50 100
SCALE

DENOTES IMPACTS IN SURFACE WATER (POND)

NAD 83/95

PA–D

SITE 51

–Y9A– STA. 29+00 SEE SHEET 80

MATCHLINE –Y9A– STA. 25+00 SEE SHEET 82

MATCHLINE –Y9B– STA. 1+25 SEE SHEET 82

MATCHLINE –Y9A– STA. 23+00 SEE SHEET 81

N 46° 16' 25.0" W

MATCHLINE –Y9FLY– STA. 43+00 SEE SHEET 81

–Y9FLY–

45+00

S 66° 59' 35.5" E

50+00

10+00

MATCHLINE –Y9– STA. 13+00 SEE SHEET 83

–Y9–

TDE

NOTE: VERIFY BOTTOM OF POND ELEVATION TO TIE TO LATERAL BASE DITCH. COORD. WITH CONTRACTOR FOR A PERMANENT DITCH THROUGH THE POND IF NECESSARY

PERMANENTLY DRAIN POND

POND OVERFLOW @ ELEVATION 630

LATERAL BASE DITCH SEE DETAIL AW

LATERAL BASE DITCH SEE DETAIL C

BERM DITCH SEE DETAIL A

LATERAL BASE DITCH SEE DETAIL M

2GI

2GI–A

FS

24" RCP–III

24" CSP

ROD & TUCS

INV=625

CONC

FOR –Y9FLY– PROFILE SEE SHT. 170
FOR –Y9– PROFILE SEE SHT. 171
FOR –Y9A– PROFILE SEE SHT. 178
FOR –Y9B– PROFILE SEE SHT. 178

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SHEET 127 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	83
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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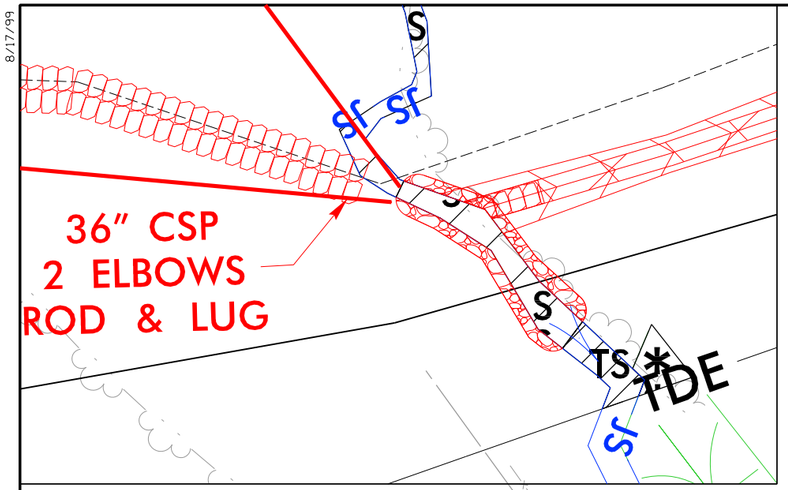
ENGLISH

NAD 8395

TS / TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S / S — DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING



INSET A

MATCHLINE –Y10– STA. 15+50 SEE SHEET 90

MATCHLINE –Y9– STA. 13+00 SEE SHEET 82

MATCHLINE –Y9– STA. 25+00 SEE SHEET 84

SITE 52

SH–D

WZZ–D

SITE 52

–BEGIN JS

SEE INSET A

TDE FOR EROSION CONTROL DEVICE

LATERAL BASE DITCH SEE DETAIL AW

LATERAL BASE DITCH SEE DETAIL B

LATERAL BASE DITCH SEE DETAIL C

LATERAL V DITCH SEE DETAIL D

LATERAL V DITCH SEE DETAIL G

LATERAL BASE DITCH SEE DETAIL AV

LATERAL BASE DITCH SEE DETAIL M

TOE PROTECTION SEE DETAIL I

RIPRAP TRANSITION SEE DETAIL AU

REMOVE SYSTEM

15" CSP 2 ELBOWS ROD & LUG

36" CSP 2 ELBOWS ROD & LUG

15" RCP–III

45 ELEC

45SELEC

HW

BDO

TDE

DI

2GI

F

RW

CA

-Y10-

-Y9-

15+00

20+00

25+00

N 36° 37' 51.5" E

00+01

12.5 0 12.5 25
SCALE FOR INSET

50 25 0 50 100
SCALE

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PERMIT DRAWING
SHEET 128 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	83
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

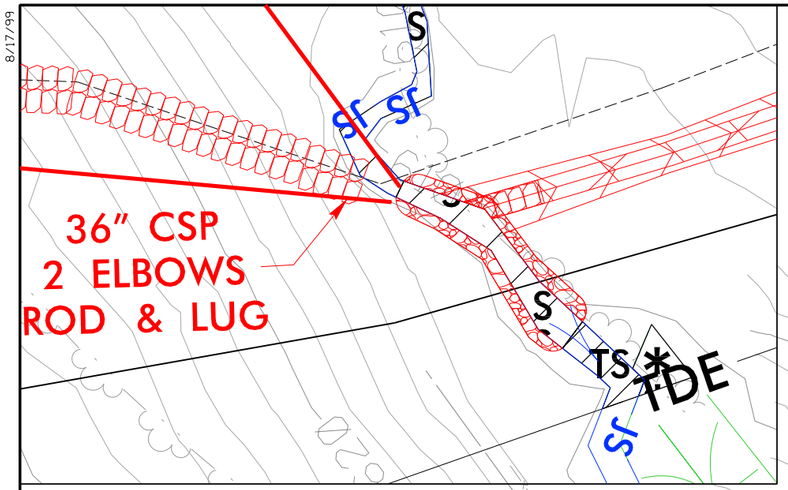
ENGLISH

NAD 8395

TS/TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S/S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING



INSET A

MATCHLINE –Y10– STA. 15+50 SEE SHEET 90

MATCHLINE –Y9– STA. 13+00 SEE SHEET 82

MATCHLINE –Y9– STA. 25+00 SEE SHEET 84

SITE 52

–BEGIN JS

SH–D

WZZ–D

SITE 52

TDE FOR EROSION CONTROL DEVICE

LATERAL BASE DITCH SEE DETAIL AW

LATERAL BASE DITCH SEE DETAIL B

LATERAL BASE DITCH SEE DETAIL C

LATERAL V DITCH SEE DETAIL D

LATERAL BASE DITCH SEE DETAIL AV

LATERAL BASE DITCH SEE DETAIL M

LATERAL V DITCH SEE DETAIL G

TOE PROTECTION SEE DETAIL I

RIPRAP TRANSITION SEE DETAIL AU

15" CSP 2 ELBOWS ROD & LUG

36" CSP 2 ELBOWS ROD & LUG

15" RCP-III

REMOVE SYSTEM

SEE INSET A

TDE

12.5 0 12.5 25
SCALE FOR INSET

50 25 0 50 100
SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	84
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING SHEET 129 OF 257

NAD 8395

SG–D

SITE 53

SEE CULVERT OUTLET DETAIL –Y9– STA. 29+09

SEE INSET A

INSET A

TDE FOR EROSION CONTROL DEVICE

TOE PROTECTION SEE DETAIL I

SPECIAL CUT BASE DITCH SEE DETAIL AA

30" CSP 2 ELBOWS ROD & LUG

BDO

2 @ 10'-14"

PROPOSED

15" CSP 2 ELBOWS ROD & LUG

LATERAL BASE DITCH SEE DETAIL B

NOTE: TIE CUT DITCH AND BERM BASE DITCH DOWN TO LATERAL BASE DITCH

BERM BASE DITCH SEE DETAIL L

SPECIAL CUT DITCH SEE DETAIL H

ELEV. 620.5' FS

2GI

SP. LAT. DITCH SEE DETAIL J

30" RCP-III

SEE CULVERT INLET DETAIL –Y9– STA. 29+09

SEE INSET B

INSET B

MATCHLINE –Y9– STA. 25+00 SEE SHEET 83

MATCHLINE –Y9– STA. 38+00 SEE SHEET 85

–Y9–

30+00

35+00

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

ENGLISH

FOR –Y9– PROFILE SEE SHTS. 171–172

SCALE FOR INSETS: 25 0 25 50

SCALE: 50 25 0 50 100

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	84
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING SHEET 130 OF 257

NAD 8395

SG–D

SITE 53

SEE CULVERT OUTLET DETAIL –Y9– STA. 29+09

SEE INSET A

INSET A

TDE FOR EROSION CONTROL DEVICE

TOE PROTECTION SEE DETAIL I

30" CSP 2 ELBOWS ROD & LUG

SPECIAL CUT BASE DITCH SEE DETAIL AA

BDO

2 @ 10'-1/4"

PROPOSED

15" CSP 2 ELBOWS ROD & LUG

2GI

LATERAL BASE DITCH SEE DETAIL B

SEE CULVERT INLET DETAIL –Y9– STA. 29+09

SEE INSET B

LATERAL BASE DITCH SEE DETAIL B

NOTE: TIE CUT DITCH AND BERM BASE DITCH DOWN TO LATERAL BASE DITCH

BERM BASE DITCH SEE DETAIL L

30" RCP III

15" CSP 2 ELBOWS ROD & LUG

SPECIAL CUT DITCH SEE DETAIL H

ELEV. 620.5' FS

SP. LAT. DITCH SEE DETAIL J

MATCHLINE –Y9– STA. 25+00 SEE SHEET 83

MATCHLINE –Y9– STA. 38+00 SEE SHEET 85

INSET B

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

ENGLISH

FOR –Y9– PROFILE SEE SHTS. 171–172

SCALE FOR INSETS: 25 0 25 50

SCALE: 50 25 0 50 100

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

ENGLISH

INCOMPLETE PLANS
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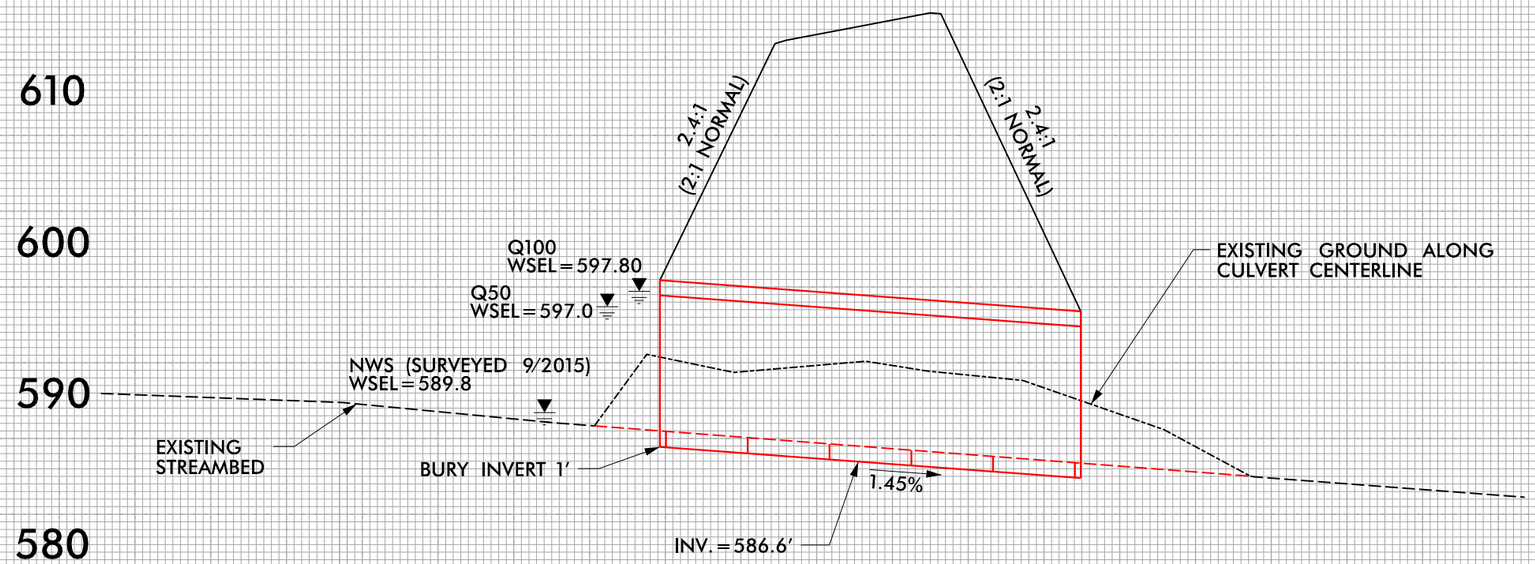
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

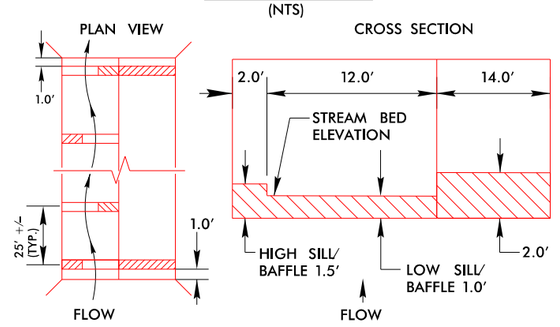
PERMIT DRAWING
SHEET 131 OF 257

SITE 53
–Y9– 29+09



PROPOSED 2@14'x10' RCBC
(length=138')

SILL/BAFFLE DETAILS
(NTS)



PLACE SILLS 1.0' INSIDE CULVERT AT INLET AND OUTLET.

ALTERNATE 1.5' TALL HIGH SILL/BAFFLES LEFT AND RIGHT TO FORCE STREAM TO MEANDER ALONG THE LENGTH OF THE CULVERT.

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

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PERMIT DRAWING
SHEET 132 OF 257

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES IMPACTS IN SURFACE WATER

F F — DENOTES FILL IN WETLAND

PROJECT REFERENCE NO.	SHEET NO.
R-2536	86
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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ENGLISH

NAD 83/95

N 87°27'23" W
1495.95

INSET A

SF–D
SITE 55

SITE 54A
WD–D

TDE FOR EROSION CONTROL DEVICE

SEE INSET A

MATCHLINE –Y9– STA. 51+00 SEE SHEET 85

MATCHLINE –SR Q– STA. 12+00 SEE SHEET 85

MATCHLINE –Y9– STA. 64+00 SEE SHEET 87

MATCHLINE –SR Q– STA. 24+50 SEE SHEET 87

STANDARD BASE DITCH SEE DETAIL R

SPECIAL CUT DITCH SEE DETAIL H

SP. LAT. DITCH SEE DETAIL J

STANDARD BASE DITCH SEE DETAIL AS

55+00 –Y9– S 8°14' 38.3" W 60+00

15+00 S 8° 25' 50.0" W 20+00

FS ELEV 643.0

RIPRAP TRANSITION SEE DETAIL AU

LATERAL V DITCH SEE DETAIL D

TOE PROTECTION SEE DETAIL I

15" CSP 2 ELBOWS ROD & LUG

18" CSP 2 ELBOWS ROD & LUG

15" RCP (NOT INCLUDED)

18" RCP (NOT INCLUDED)

FS 2GI

FS BDO

2GI

SEE INSET B

BERM BASE DITCH SEE DETAIL L

BERM BASE DITCH SEE DETAIL X

BERM DITCH SEE DETAIL A

NOTE: TIE BERM DITCH DOWN TO LATERAL BASE DITCH

LATERAL BASE DITCH SEE DETAIL B

WE–D
SITE 54B

INSET B

SCALE FOR INSETS
25 0 25 50

SCALE
50 25 0 50 100

FOR –Y9– PROFILE SEE SHT. 172
FOR –SR Q– PROFILE SEE SHT. 180A

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PERMIT DRAWING
SHEET 133 OF 257

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES IMPACTS IN SURFACE WATER

F F — DENOTES FILL IN WETLAND

PROJECT REFERENCE NO.	SHEET NO.
R-2536	86
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

N 87°27'23" W 1495.95

INSET A

SF–D
SITE 55

SITE 54A
WD–D

WE–D
SITE 54B

TDE FOR EROSION CONTROL DEVICE

SEE INSET A

SEE INSET B

MATCHLINE –Y9– STA. 51+00 SEE SHEET 85

MATCHLINE –SR Q– STA. 12+00 SEE SHEET 85

MATCHLINE –Y9– STA. 64+00 SEE SHEET 87

MATCHLINE –SR Q– STA. 24+50 SEE SHEET 87

55+00 –Y9– S 8°14' 38.3" W 60+00

15+00 S 8° 25' 50.0" W 20+00

STANDARD BASE DITCH SEE DETAIL R

SPECIAL CUT DITCH SEE DETAIL H

SP. LAT. DITCH SEE DETAIL J

STANDARD BASE DITCH SEE DETAIL AS

36" CSP

15" CSP 2 ELBOWS ROD & LUG

15" RCP

18" CSP 2 ELBOWS ROD & LUG

18" CSP 2 ELBOWS ROD & LUG

FS ELEV 643.0

FS 2GI

FS BDO

2GI

RIPRAP TRANSITION SEE DETAIL AU

LATERAL V DITCH SEE DETAIL D

TOE PROTECTION SEE DETAIL I

BERM BASE DITCH SEE DETAIL L

BERM BASE DITCH SEE DETAIL X

BERM DITCH SEE DETAIL A

NOTE: TIE BERM DITCH DOWN TO LATERAL BASE DITCH

LATERAL BASE DITCH SEE DETAIL B

INSET B

SCALE FOR INSETS
25 0 25 50

SCALE
50 25 0 50 100

FOR –Y9– PROFILE SEE SHT. 172
FOR –SR Q– PROFILE SEE SHT. 180A

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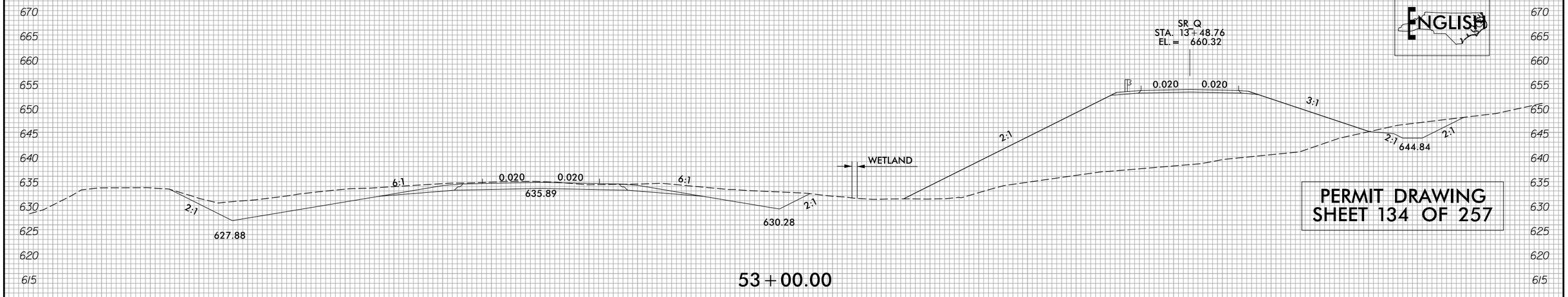
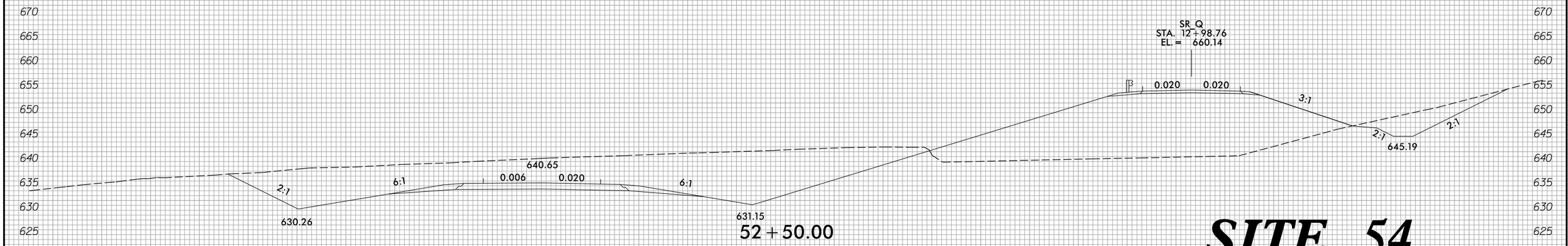
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-XX

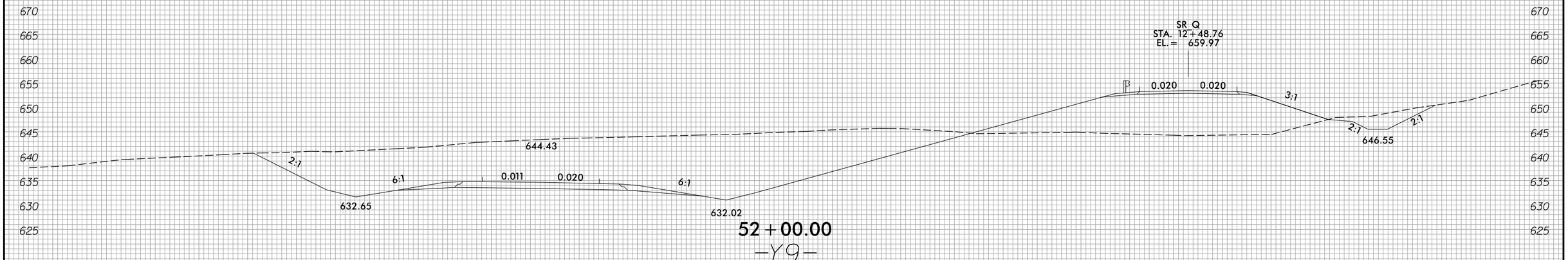
ENGLISH

PERMIT DRAWING
SHEET 134 OF 257





SITE 54



-Y9-

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default

8/17/99

PERMIT DRAWING
SHEET 135 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

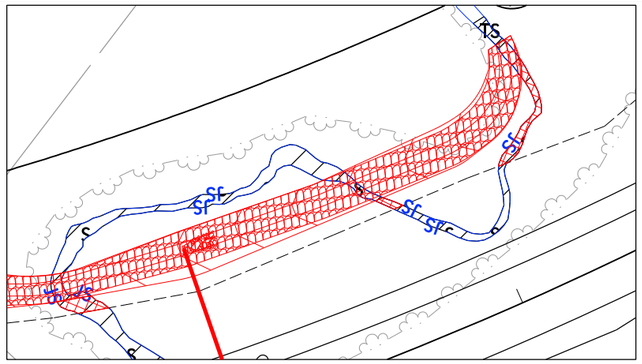
S S DENOTES IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2536	87
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



INSET A

NAD 8395

MATCHLINE –SR Q– STA. 24+50 SEE SHEET 86

MATCHLINE –Y9– STA. 64+00 SEE SHEET 86

MATCHLINE –Y9– STA. 77+00 SEE SHEET 88

MATCHLINE –SR Q– STA. 38+50 SEE SHEET 88

65+00

25+00

70+00

30+00

35+00

75+00

–Y9–

–SR Q–

SEE INSET A

SEE INSET B

CHANNEL BLOCK SEE DETAIL U

CHANNEL CHANGE SEE DETAIL AG

LATERAL BASE DITCH SEE DETAIL B

BERM DITCH SEE DETAIL A

15" CSP 2 ELBOWS ROD & LUG

2GI

15" RCP-III

18" RCP-III

FS ELEV 630.6

TDE

TDE FOR EROSION CONTROL DEVICE

SC/SD-D

SITE 56A

INSET B

FOR –Y9– PROFILE SEE SHT. 173
FOR –SR Q– PROFILE SEE SHT. 180A, 180B

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

PLANS PREPARED BY :

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
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PERMIT DRAWING
SHEET 136 OF 257

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

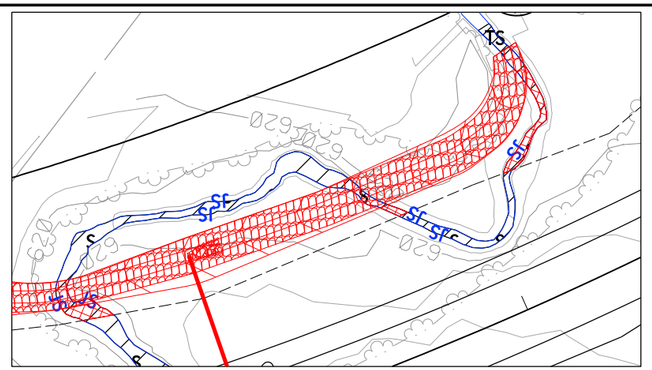
PROJECT REFERENCE NO.	SHEET NO.
R-2536	87
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83'95



INSET A

MATCHLINE –SR Q– STA. 24+50 SEE SHEET 86

MATCHLINE –Y9– STA. 64+00 SEE SHEET 86

MATCHLINE –Y9– STA. 77+00 SEE SHEET 88

MATCHLINE –SR Q– STA. 38+50 SEE SHEET 88

SEE INSET A

CHANNEL BLOCK SEE DETAIL U

CHANNEL CHANGE SEE DETAIL AG

LATERAL BASE DITCH SEE DETAIL B

BERM DITCH SEE DETAIL A

15" CSP 2 ELBOWS ROD & LUG

2GI

FS ELEV 630.6

18" RCP-III

15" RCP-III

SEE INSET B

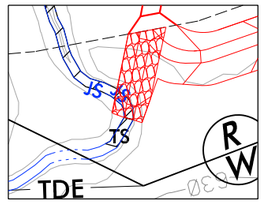
TDE

TDE FOR EROSION CONTROL DEVICE

SCSD-D

SITE 56A

INSET B



FOR –Y9– PROFILE SEE SHT. 173
FOR –SR Q– PROFILE SEE SHT. 180A, 180B

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

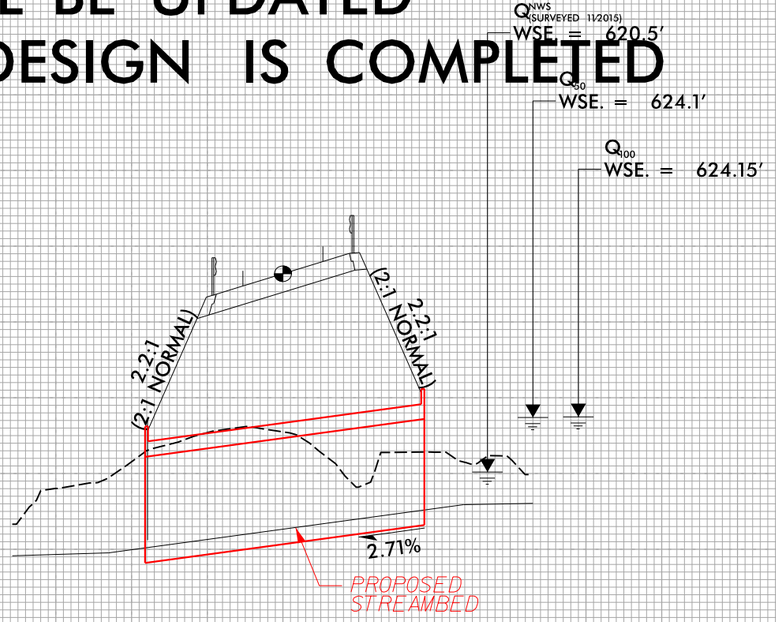
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 137 OF 257

SITE 56
–Y9– 74+40

PERMIT SHEET WILL BE UPDATED WHEN CULVERT DESIGN IS COMPLETED



PROPOSED 6'x7' RCBC
(length = 92')

SILL/BAFFLE DETAILS

(NOT TO SCALE)

SINGLE BARREL CULVERT LOW FLOW CHANNEL AND SILLS

*NOTES:

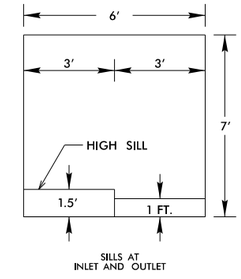
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT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

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

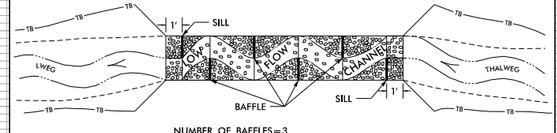
3) TOP OF LOW FLOW SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

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

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



SILLS AT INLET AND OUTLET



NUMBER OF BAFFLES = 3
ON 22.5 FT CENTERS FROM DOWNSTREAM SILL

PLAN VIEW

9/13

640 630 620 610 600 590 580 570

200 150 100 50 0 50 100 150 200

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PERMIT DRAWING
SHEET 138 OF 257

NAD 8395

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2536	88
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MATCHLINE EXISTING NC 159 SEE SHEET 89

MATCHLINE –NC159– STA. 19+00

MATCHLINE –NC159– STA. 19+00 SEE SHEET INSET

SITE 56B

SITE 56C

SITE 56D

SC/SD–D

SEE INSET A

SEE INSET B

CHANNEL CHANGE SEE DETAIL AG

STD. BASE DITCH SEE DETAIL R

LATERAL BASE DITCH SEE DETAIL B

LATERAL V DITCH SEE DETAIL D

STANDARD BASE DITCH SEE DETAIL T

TOE PROTECTION SEE DETAIL I

54" RCP

30" RCP-III

15" CSP 2 ELBOWS ROD & LUG

15" RCP-III

18" RCP-III

REMOVE 13" 18" RCP

72" CONC

RETAIN

CB

DI

80+00

S 72° 53' 10.3" E

S 53° 57' 40.2" E

S 75° 47' 14.5" E

15+00

MATCHLINE –SR Q– STA. 38+50 SEE SHEET 88

MATCHLINE –Y9– STA. 77+00 SEE SHEET 87

–Y9–

–NC159_SPUR–

NC 159 SPUR

ENTRANCE RD

CAROLINA POWER & LIGHT EASEMENT

48" WW & ISBW

EXISTING R/W

EOP

EOT

MTL

24' BST

10' BST

26' BST

INSET A

INSET B

25 0 25 50
SCALE FOR INSETS

50 25 0 50 100
SCALE

ENGLISH

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PERMIT DRAWING
SHEET 139 OF 257

PROJECT REFERENCE NO.	SHEET NO.
R-2536	88
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S DENOTES IMPACTS IN SURFACE WATER

NAD 8395

MATCHLINE EXISTING NC 159 SEE SHEET 89

MATCHLINE –NC159– STA. 19+00

SITE 56B

SITE 56C

SITE 56D

SC/SD–D

SEE INSET A

SEE INSET B

CHANNEL CHANGE SEE DETAIL AG

STD. BASE DITCH SEE DETAIL R

LATERAL BASE DITCH SEE DETAIL B

LATERAL V DITCH SEE DETAIL D

STANDARD BASE DITCH SEE DETAIL F

STANDARD BASE DITCH SEE DETAIL T

TOE PROTECTION SEE DETAIL I

54" RCP

30" RCP-III

24" RCP-III

15" RCP-III

18" RCP-III

15" CSP 2 ELBOWS & ROD & LUG

CB

80+00

S 72° 53' 10.3" E

S 53° 57' 40.2" E

S 75° 47' 14.5" E

15+00

–Y9–

–NC159_SPUR–

NC 159 SPUR

ENTRANCE RD

REMOVE 13' 18" RCP

RETAIN 72" CONC

MATCHLINE –SR Q– STA. 38+50 SEE SHEET 88

MATCHLINE –Y9– STA. 77+00 SEE SHEET 87

MATCHLINE –NC159– STA. 19+00 SEE SHEET INSET

INSET A

INSET B

SCALE FOR INSETS 25 0 25 50

SCALE 50 25 0 50 100

ENGLISH

PLANS PREPARED BY :

RK&K

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TIP PROJECT: R-2536

CONTRACT: C203617

2/2/2016
ICA ENGINEERING, INC.
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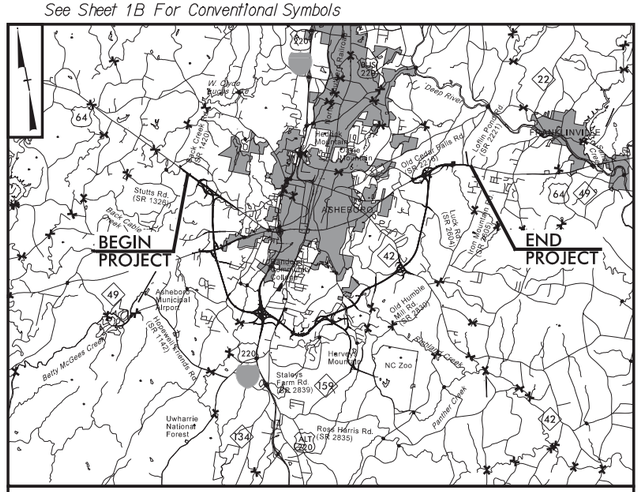
See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RANDOLPH COUNTY

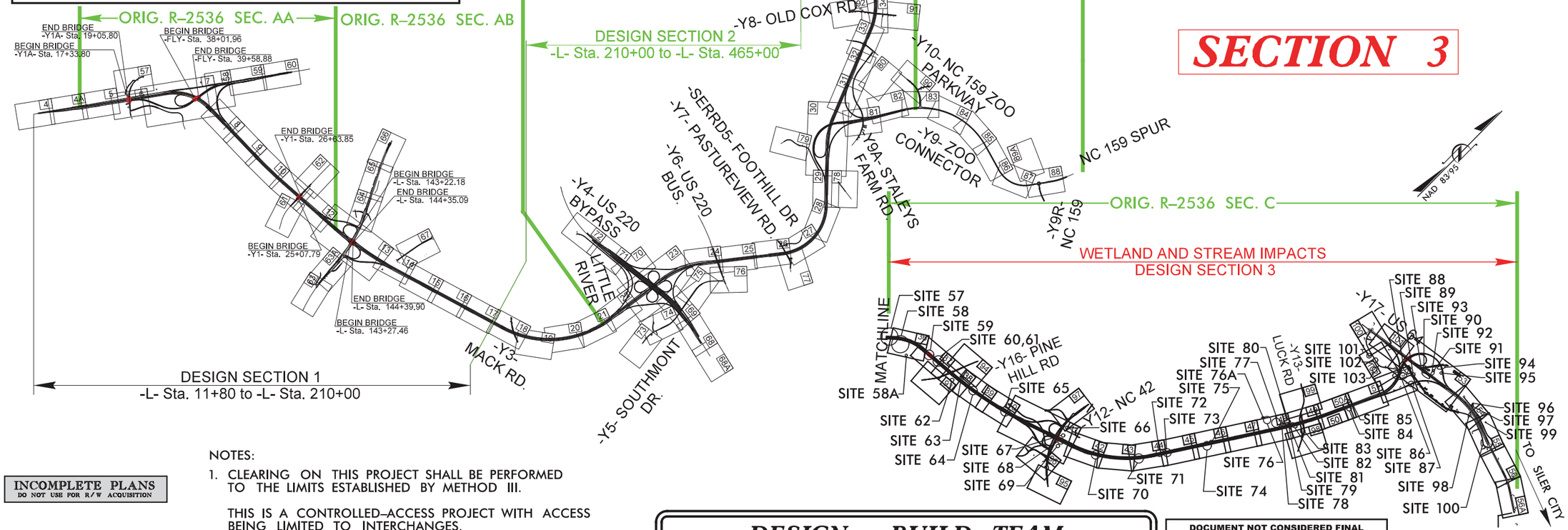
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2536	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
34450.3.S1		PE	

LOCATION: *US 64 BYPASS FROM EXISTING US 64 WEST OF ASHEBORO TO EXISTING US 64 EAST OF ASHEBORO AND THE ZOO CONNECTOR FROM EAST OF STALEYS FARM ROAD TO EXISTING NC 159/ZOO ENTRANCE*

PERMIT DRAWING
SHEET 140 OF 257

WETLAND AND STREAM IMPACTS

SECTION 3



NOTES:

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

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

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN - BUILD TEAM

GRAPHIC SCALES

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

DESIGN DATA

ADT 2015 = 12,600
ADT 2040 = 18,800
DHV = 11 %
D = 60 %
T = 13 % *
V = 70 MPH
*(TTST=8% + DUAL=5%)

FUNCTIONAL CLASSIFICATION
FREEWAY

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2536..... 14.619 mi
LENGTH STRUCTURE TIP PROJECT R-2536..... 0.121 mi
TOTAL LENGTH TIP PROJECT R-2536..... 14.740 mi

NCDOT CONTACT

K. Zak Hamidi, P.E.
PROJECT ENGINEER - DESIGN-BUILD UNIT

ICA Engineering
ICA ENGINEERING
5121 KINGDOM WAY, SUITE 100
RALEIGH, NC 27607
NC LICENSE NO: F-0258
(919) 851-6066

FOR
DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

LETTING DATE:
JUNE 29, 2015

David C. Waller, P.E.
PROJECT ENGINEER

Henry W. Bare
PROJECT DESIGN ENGINEER

CONTRACTOR

ASHEBORO 64 Bypass Constructors, LLC
WRIGHT BROTHERS RK&K

HYDRAULICS ENGINEER

TRENTON J. CORMIER P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

DAVID C. WALLER P.E.
SIGNATURE:

DIVISION OF HIGHWAYS

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

STATE OF NORTH CAROLINA

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R–2536	2D–1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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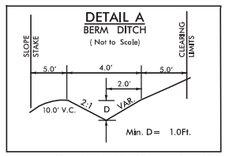
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

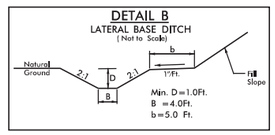
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL A
BERM DITCH
(Not to Scale)



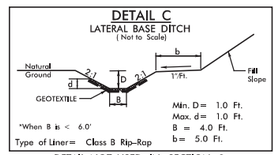
–Y12LPB– STA. 13+15 TO STA. 17+24 RT

DETAIL B
LATERAL BASE DITCH
(Not to Scale)



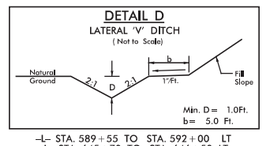
DETAIL NOT USED IN SECTION 3

DETAIL C
LATERAL BASE DITCH
(Not to Scale)



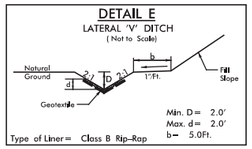
DETAIL NOT USED IN SECTION 3

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



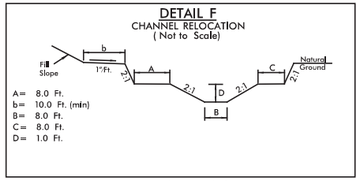
–L– STA. 589+55 TO STA. 592+00 LT
–L– STA. 645+70 TO STA. 646+50 LT
–L– STA. 650+70 TO STA. 651+09 RT
–Y13– STA. 16+50 TO STA. 19+10 RT
–Y13– STA. 21+30 TO STA. 21+68 LT
–Y16DET– STA. 19+00 TO STA. 19+90 RT
–SR5– STA. 27+25 TO STA. 29+23 LT

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



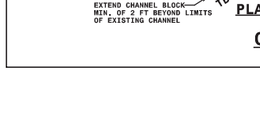
DETAIL NOT USED IN SECTION 3

DETAIL F
CHANNEL RELOCATION
(Not to Scale)



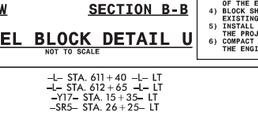
DETAIL NOT USED IN SECTION 3

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



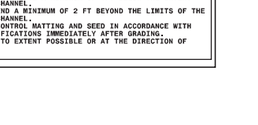
DETAIL NOT USED IN SECTION 3

DETAIL H
SPECIAL CUT DITCH
(Not to Scale)



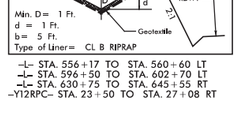
–L– STA. 475+50 TO STA. 478+00 LT
–L– STA. 491+25 TO STA. 493+00 RT
–L– STA. 496+15 TO STA. 498+00 RT
–L– STA. 501+25 TO STA. 502+00 RT
–L– STA. 502+00 TO STA. 504+00 LT
–L– STA. 502+75 TO STA. 504+50 RT
–L– STA. 515+00 TO STA. 519+00 RT
–L– STA. 538+00 TO STA. 542+50 RT
–L– STA. 538+25 TO STA. 542+50 LT
–L– STA. 557+50 TO STA. 562+50 LT
–L– STA. 583+00 TO STA. 585+50 LT
–L– STA. 605+00 TO STA. 605+75 LT
–L– STA. 646+50 TO STA. 647+00 LT
–Y12LPB– STA. 10+00 TO STA. 11+60 RT
–Y12LPC– STA. 10+00 TO STA. 12+10 LT
–Y16– STA. 15+58 TO STA. 16+94 RT
–Y16– STA. 17+30 TO STA. 19+84 RT
–Y16– STA. 16+00 TO STA. 18+30 LT
–Y16– STA. 19+00 TO STA. 20+00 LT
–Y16– STA. 24+00 TO STA. 24+40 LT
–Y16– STA. 24+00 TO STA. 26+00 RT
–Y12– STA. 18+00 TO STA. 22+90 RT
–Y12– STA. 25+70 TO STA. 27+00 LT
–Y12– STA. 43+00 TO STA. 45+60 LT
–Y12– STA. 45+00 TO STA. 50+00 RT
–Y16DET– STA. 15+58 TO STA. 16+94 RT
–Y16DET– STA. 27+50 TO STA. 29+00 RT
–Y17FLY– STA. 50+95 TO STA. 52+77 LT
–Y17– STA. 58+00 TO STA. 58+50 LT
–SR5– STA. 12+50 TO STA. 15+21 LT
–Y17ADRLT– STA. 10+45 TO STA. 11+25 LT
–Y17A– STA. 23+15 TO STA. 23+75 LT
–Y17A– STA. 25+00 TO STA. 28+00 LT

DETAIL I
TOE PROTECTION
(Not to Scale)



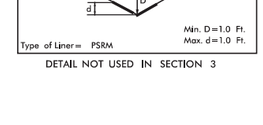
–L– STA. 464+50 TO STA. 474+50 LT
–L– STA. 482+75 TO STA. 483+90 RT
–L– STA. 487+52 TO STA. 488+57 LT
–L– STA. 505+24 TO STA. 507+65 LT
–L– STA. 506+76 TO STA. 509+45 RT
–L– STA. 519+50 TO STA. 520+00 RT
–L– STA. 521+75 TO STA. 524+00 LT
–L– STA. 562+75 TO STA. 563+65 LT
–L– STA. 563+73 TO STA. 565+75 LT
–L– STA. 577+75 TO STA. 580+50 LT
–L– STA. 593+85 TO STA. 594+50 LT
–L– STA. 594+59 TO STA. 596+00 LT
–L– STA. 607+70 TO STA. 609+65 RT
–L– STA. 666+00 TO STA. 668+75 LT
–L– STA. 666+20 TO STA. 669+35 RT
–Y13– STA. 15+27 TO STA. 16+71 LT
–Y17– STA. 65+00 TO STA. 67+00 RT
–Y17FLY– STA. 20+00 TO STA. 21+53 LT
–SR5– STA. 14+87 TO STA. 15+68 RT

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



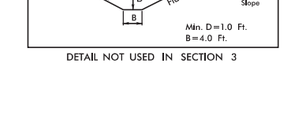
–L– STA. 474+70 TO STA. 475+50 LT
–L– STA. 492+00 TO STA. 493+00 LT
–L– STA. 489+75 TO STA. 491+25 RT
–L– STA. 536+00 TO STA. 538+00 RT
–L– STA. 536+00 TO STA. 538+25 LT
–L– STA. 635+08 TO STA. 636+00 LT
–Y16– STA. 26+00 TO STA. 28+49 RT
–Y12– STA. 28+50 TO STA. 31+75 LT
–Y12– STA. 34+88 TO STA. 37+50 LT
–Y12– STA. 42+28 TO STA. 43+00 LT
–Y12A– STA. 11+17 TO STA. 12+00 RT
–Y16DET– STA. 18+50 TO STA. 19+00 RT
–SRV– STA. 13+00 TO STA. 15+50 RT
–Y17RPC– STA. 18+70 TO STA. 21+04 LT
–Y17– STA. 58+50 TO STA. 60+50 LT

DETAIL K
TOE PROTECTION
(Not to Scale)



–L– STA. 463+00 TO STA. 467+56 RT

DETAIL L
BERM BASE DITCH
(Not to Scale)

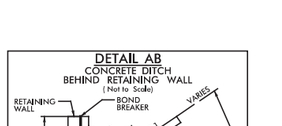


DETAIL NOT USED IN SECTION 3

DETAIL M
LATERAL BASE DITCH
(Not to Scale)

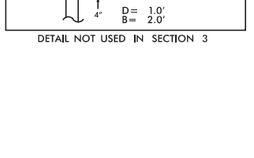
–L– STA. 664+00 TO STA. 665+68 LT

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



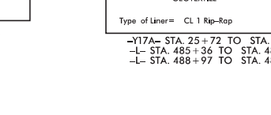
–Y17RPC– STA. 18+70 TO STA. 21+04 LT

DETAIL O
BERM DITCH
(Not to Scale)



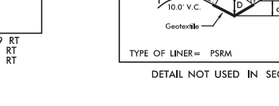
DETAIL NOT USED IN SECTION 3

DETAIL P
SPECIAL CUT DITCH
(Not to Scale)



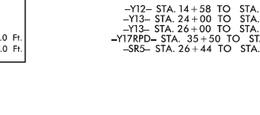
DETAIL NOT USED IN SECTION 3

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



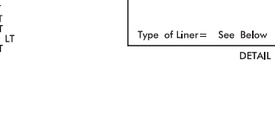
–SR6– STA. 33+89 TO STA. 34+85 LT

DETAIL R
STANDARD BASE DITCH
(Not to Scale)



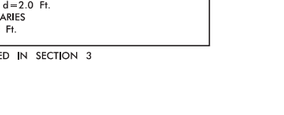
DETAIL NOT USED IN SECTION 3

DETAIL S
SPECIAL LATERAL BASE DITCH
(Not to Scale)



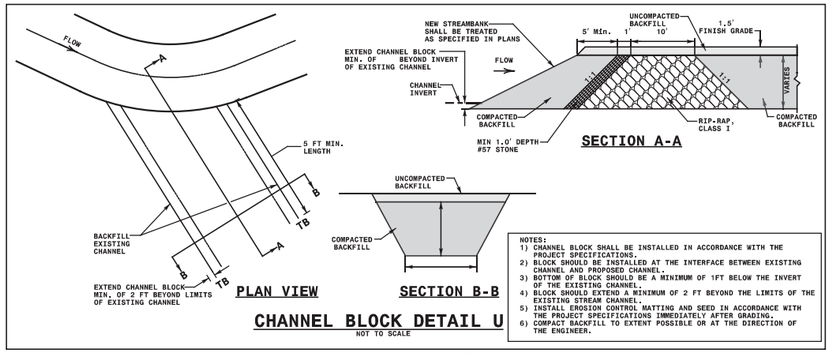
DETAIL NOT USED IN SECTION 3

DETAIL T
STANDARD BASE DITCH
(Not to Scale)



–L– STA. 471+22 TO STA. 471+50 RT, B=3'
–Y12– STA. 24+68 TO STA. 25+00 RT, B=4'
–Y12– STA. 25+02 TO STA. 25+47 RT, B=2
–Y13– STA. 17+25 TO STA. 18+07 LT, B=3'
–Y17– STA. 44+53 TO STA. 44+57 LT, B=3'
–Y17A– STA. 25+75 TO STA. 26+31 RT, B=2'
–Y17RPC– STA. 17+30 TO STA. 18+27 LT, B=2'
SR6DRI– STA. 10+20 TO STA. 10+40 LT, B=2'

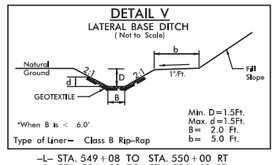
CHANNEL BLOCK DETAIL U
NOT TO SCALE



NOTES:
1) CHANNEL BLOCK SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2) BLOCK SHOULD BE INSTALLED AT THE INTERFACE BETWEEN EXISTING CHANNEL AND PROPOSED CHANNEL.
3) BOTTOM OF BLOCK SHOULD BE A MINIMUM OF 1FT BELOW THE INVERT OF THE EXISTING CHANNEL.
4) BLOCK SHOULD EXTEND A MINIMUM OF 2 FT BEYOND THE LIMITS OF THE EXISTING STREAM CHANNEL.
5) INSTALL EROSION CONTROL MATTING AND SEED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS IMMEDIATELY AFTER GRADING.
6) COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.

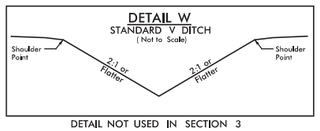
–L– STA. 611+40 –L– LT
–L– STA. 612+65 –L– LT
–Y17– STA. 15+35– LT
–SR5– STA. 26+25– LT

DETAIL V
LATERAL BASE DITCH
(Not to Scale)



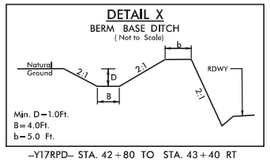
–L– STA. 549+08 TO STA. 550+00 RT
–L– STA. 594+02 TO STA. 596+10 RT

DETAIL W
STANDARD V DITCH
(Not to Scale)



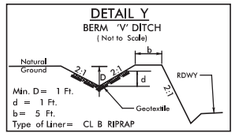
DETAIL NOT USED IN SECTION 3

DETAIL X
BERM BASE DITCH
(Not to Scale)



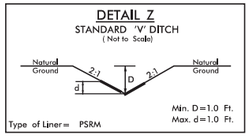
–Y17RPD– STA. 42+80 TO STA. 43+40 RT

DETAIL Y
BERM 'V' DITCH
(Not to Scale)



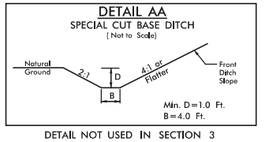
–L– STA. 556+17 TO STA. 560+60 LT
–L– STA. 596+50 TO STA. 602+70 LT
–L– STA. 630+75 TO STA. 645+55 RT
–Y12RPC– STA. 23+50 TO STA. 27+08 RT

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



DETAIL NOT USED IN SECTION 3

DETAIL AA
SPECIAL CUT BASE DITCH
(Not to Scale)

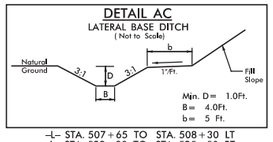


DETAIL NOT USED IN SECTION 3

DETAIL AB
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)

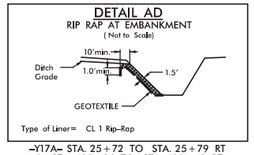
DETAIL NOT USED IN SECTION 3

DETAIL AC
LATERAL BASE DITCH
(Not to Scale)



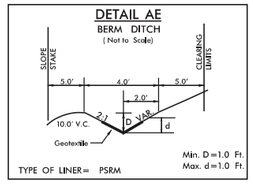
–L– STA. 507+65 TO STA. 508+30 LT
–L– STA. 522+30 TO STA. 525+50 RT
–SR5– STA. 26+04 TO STA. 28+40 LT

DETAIL AD
RIP RAP AT EMBANKMENT
(Not to Scale)



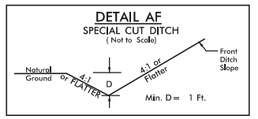
–Y17A– STA. 25+72 TO STA. 25+79 RT
–L– STA. 485+36 TO STA. 485+43 RT
–L– STA. 488+97 TO STA. 489+02 RT

DETAIL AE
BERM DITCH
(Not to Scale)



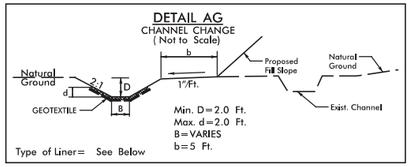
DETAIL NOT USED IN SECTION 3

DETAIL AF
SPECIAL CUT DITCH
(Not to Scale)



–Y12– STA. 14+58 TO STA. 16+00 RT
–Y13– STA. 24+00 TO STA. 26+80 LT
–Y13– STA. 26+00 TO STA. 26+80 RT
–Y17RPD– STA. 35+50 TO STA. 39+00 LT
–SR5– STA. 26+44 TO STA. 27+25 LT

DETAIL AG
CHANNEL CHANGE
(Not to Scale)



DETAIL NOT USED IN SECTION 3

PERMIT DRAWING
SHEET 141 OF 257

$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$ENGINEERING_INFO$$$$

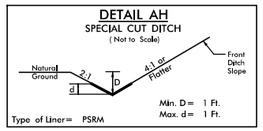
PROJECT REFERENCE NO.	SHEET NO.
R-2536	2D-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

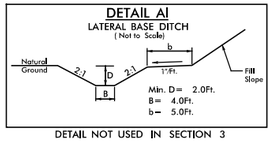
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL AH
SPECIAL CUT DITCH
(Not to Scale)



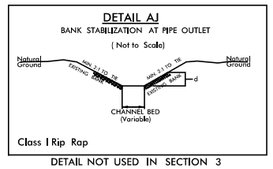
–L– STA. 512+00 TO STA. 512+50 LT
–L– STA. 588+00 TO STA. 591+00 RT
–L– STA. 663+00 TO STA. 664+00 RT
–Y12RPB– STA. 17+14 TO STA. 19+10 RT
–Y12RPC– STA. 15+85 TO STA. 17+80 LT
–Y12A– STA. 17+00 TO STA. 19+00 LT
–Y12A– STA. 18+00 TO STA. 19+60 RT
–Y12– STA. 24+80 TO STA. 25+70 LT
–Y12RPB– STA. 27+29 TO STA. 28+33 LT
–Y12– STA. 39+00 TO STA. 41+27 LT
–Y12B– STA. 11+50 TO STA. 13+12 LT
–SR5– STA. 12+78 TO STA. 14+04 RT
–Y17A– STA. 12+00 TO STA. 13+25 LT
–Y17A– STA. 14+35 TO STA. 16+00 LT
–Y17A– STA. 18+50 TO STA. 20+75 LT
–Y17A– STA. 22+50 TO STA. 23+15 LT

DETAIL AI
LATERAL BASE DITCH
(Not to Scale)



DETAIL NOT USED IN SECTION 3

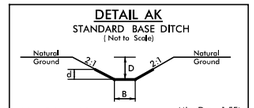
DETAIL AJ
BANK STABILIZATION AT PIPE OUTLET
(Not to Scale)



Class I Rip Rap

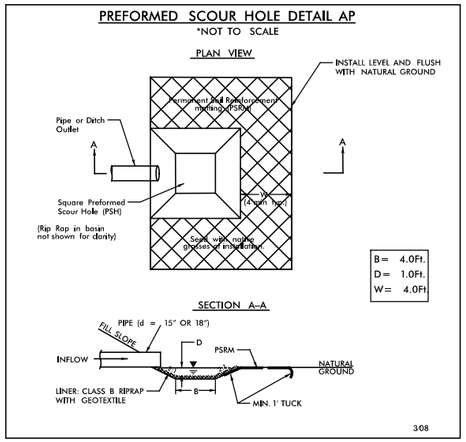
DETAIL NOT USED IN SECTION 3

DETAIL AK
STANDARD BASE DITCH
(Not to Scale)



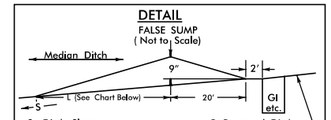
–L– STA. 646+96 TO STA. 647+33 RT

PREFORMED SCOUR HOLE DETAIL AP
*NOT TO SCALE



–L– STA. 488+33 RT
–L– STA. 488+67 LT
–L– STA. 505+70 RT
–L– STA. 520+20 RT
–L– STA. 548+28 RT
–L– STA. 609+74 RT
–L– STA. 642+54 LT
–Y17RPDA– STA. 24+15 RT
–Y17FLY– STA. 48+28 RT

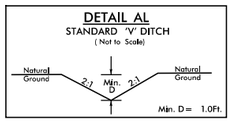
DETAIL
FALSE SUMP
(Not to Scale)



S=Ditch Slope

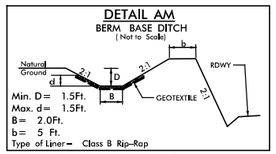
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

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



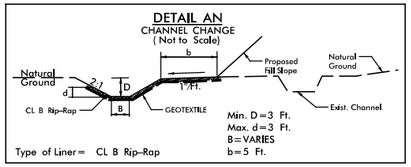
–L– STA. 526+50 TO STA. 527+37 RT
–Y12– STA. 14+80 LT

DETAIL AM
BERM BASE DITCH
(Not to Scale)



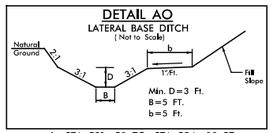
–L– 651+09 STA. TO STA. 657+50 RT

DETAIL AN
CHANNEL CHANGE
(Not to Scale)



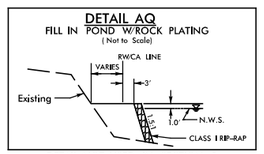
DETAIL NOT USED IN SECTION 3

DETAIL AO
LATERAL BASE DITCH
(Not to Scale)



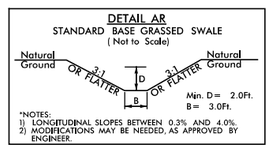
–L– STA. 591+50 TO STA. 594+00 RT

DETAIL AQ
FILL IN POND W/ROCK PLATING
(Not to Scale)



DETAIL NOT USED IN SECTION 3

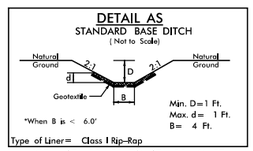
DETAIL AR
STANDARD BASE GRASSED SWALE
(Not to Scale)



*NOTES:
1) LONGITUDINAL SLOPES BETWEEN 0.3% AND 4.0%.
2) MODIFICATIONS MAY BE NEEDED, AS APPROVED BY ENGINEER.

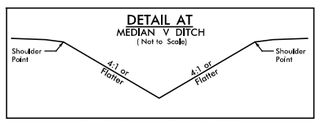
–L– STA. 498+27 TO STA. 498+44 RT
–Y12– STA. 39+13 TO STA. 39+65 RT
–Y17LPDA– STA. 17+33 TO STA. 17+50 LT

DETAIL AS
STANDARD BASE DITCH
(Not to Scale)



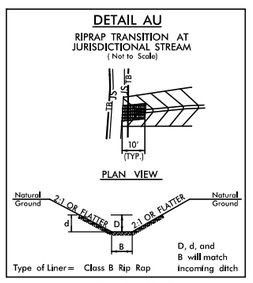
–Y17A– STA. 20+39 TO STA. 20+46 RT

DETAIL AT
MEDIAN 'V' DITCH
(Not to Scale)



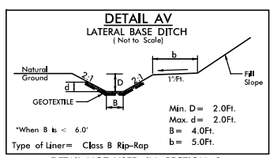
–Y17FLY– STA. 15+50 TO 17+00
–Y17– STA. 23+00 TO 24+00
–Y17– STA. 31+00 TO 32+00

DETAIL AU
RIPRAP TRANSITION AT JURISDICTIONAL STREAM
(Not to Scale)



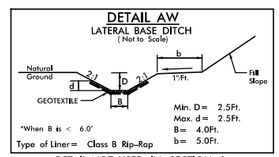
–L– STA. 490+65 LT
–L– STA. 498+44 RT
–L– STA. 508+30 LT
–L– STA. 589+55 LT
–L– STA. 594+00 RT
–L– STA. 610+17 RT
–Y12– STA. 30+44 RT
–Y12– STA. 35+15 RT
–Y12– STA. 39+13 RT
–L– STA. 671+16 LT
–Y17– STA. 44+53 LT
–Y17FLY– STA. 46+77 LT
–Y17LPDA– STA. 17+33 LT

DETAIL AV
LATERAL BASE DITCH
(Not to Scale)



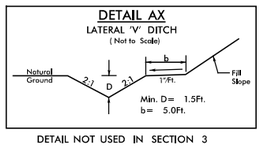
DETAIL NOT USED IN SECTION 3

DETAIL AW
LATERAL BASE DITCH
(Not to Scale)



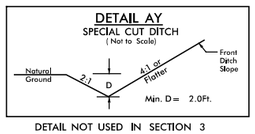
DETAIL NOT USED IN SECTION 3

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



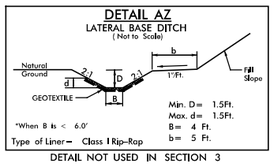
DETAIL NOT USED IN SECTION 3

DETAIL AY
SPECIAL CUT DITCH
(Not to Scale)



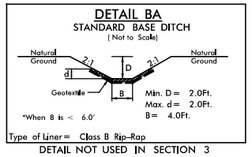
DETAIL NOT USED IN SECTION 3

DETAIL AZ
LATERAL BASE DITCH
(Not to Scale)



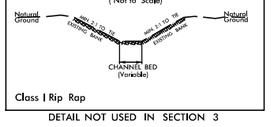
DETAIL NOT USED IN SECTION 3

DETAIL BA
STANDARD BASE DITCH
(Not to Scale)



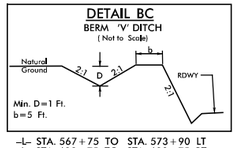
DETAIL NOT USED IN SECTION 3

DETAIL BB
BANK STABILIZATION AT PIPE OUTLET
(Not to Scale)



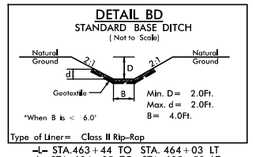
DETAIL NOT USED IN SECTION 3

DETAIL BC
BERM 'V' DITCH
(Not to Scale)



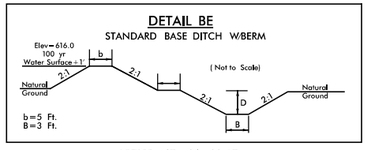
–L– STA. 567+75 TO STA. 573+90 LT
–L– STA. 629+75 TO STA. 630+75 RT
–L– STA. 648+00 TO STA. 649+44 RT
–L– STA. 647+43 TO STA. 649+47 LT
–L– STA. 674+00 TO STA. 677+00 RT
–Y12– STA. 45+00 TO STA. 50+00 LT
–Y17RPD– STA. 43+40 TO STA. 44+67 RT
–Y17– STA. 19+30 TO STA. 20+33 LT
–Y17– STA. 21+10 TO STA. 28+08 LT
–Y17– STA. 61+15 TO STA. 64+00 RT
–SR5– STA. 18+95 TO STA. 21+20 RT

DETAIL BD
STANDARD BASE DITCH
(Not to Scale)



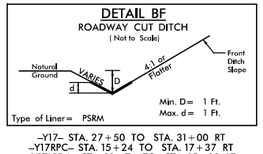
–L– STA. 463+44 TO STA. 464+03 LT
–L– STA. 634+85 TO STA. 635+59 LT
–L– STA. 637+43 TO STA. 638+92 LT
–L– STA. 640+75 TO STA. 643+05 LT

DETAIL BE
STANDARD BASE DITCH W/BERM
(Not to Scale)



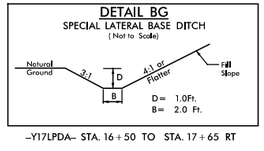
–Y17RPD– STA. 36+88 LT

DETAIL BF
ROADWAY CUT DITCH
(Not to Scale)



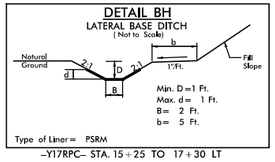
–Y17– STA. 27+50 TO STA. 31+00 RT
–Y17RPC– STA. 15+24 TO STA. 17+37 RT
–Y17LPDA– STA. 12+74 TO STA. 15+22 LT
–Y17A– STA. 11+40 TO STA. 12+00 LT
–Y17A– STA. 16+00 TO STA. 18+50 LT
–Y17A– STA. 17+00 TO STA. 19+50 RT
–Y17A– STA. 20+50 TO STA. 23+00 RT
–Y17A– STA. 20+75 TO STA. 22+50 LT
–Y17B– STA. 10+50 TO STA. 10+85 LT
–Y17B– STA. 11+12 TO STA. 12+00 LT
–Y17B– STA. 10+50 TO STA. 12+00 RT

DETAIL BG
SPECIAL LATERAL BASE DITCH
(Not to Scale)



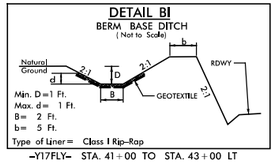
–Y17LPDA– STA. 16+50 TO STA. 17+65 RT

DETAIL BH
LATERAL BASE DITCH
(Not to Scale)



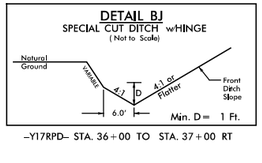
–Y17RPC– STA. 15+25 TO 17+30 LT

DETAIL BI
BERM BASE DITCH
(Not to Scale)



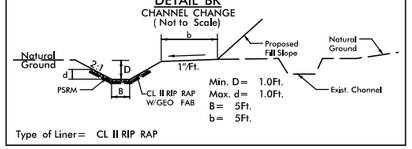
–Y17FLY– STA. 41+00 TO STA. 43+00 LT

DETAIL BJ
SPECIAL CUT DITCH wHINGE
(Not to Scale)



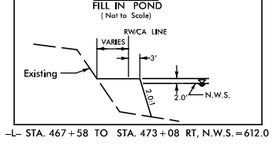
–Y17RPD– STA. 36+00 TO STA. 37+00 RT

DETAIL BK
CHANNEL CHANGE
(Not to Scale)



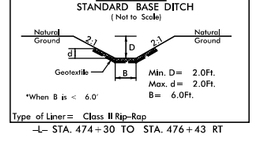
–L– STA. 488+90 TO STA. 490+65 LT

DETAIL BL
FILL IN POND
(Not to Scale)



–L– STA. 467+58 TO STA. 473+08 RT, N.W.S.=612.0

DETAIL BM
STANDARD BASE DITCH
(Not to Scale)



–L– STA. 474+30 TO STA. 476+43 RT

PERMIT DRAWING
SHEET 142 OF 257

3/23/2016
R-2536 Grading\R-2536 Hyd.DitchDet.SEC3.dgn
FLOYD ENGINEERING, INC.

PROJECT REFERENCE NO.	SHEET NO.
R–2536	2D–3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

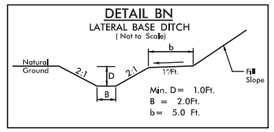
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

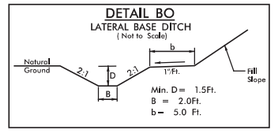
PERMIT DRAWING SHEET 143 OF 257

DETAIL BN
LATERAL BASE DITCH
(Not to Scale)



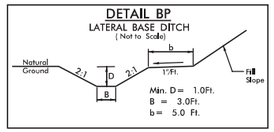
–L– STA. 473+24 TO STA. 476+00 RT
–L– STA. 483+72 TO STA. 485+42 RT
–L– STA. 500+80 TO STA. 502+00 LT
–L– STA. 673+00 TO STA. 674+12 LT

DETAIL BO
LATERAL BASE DITCH
(Not to Scale)



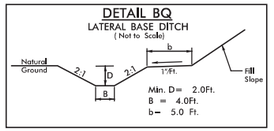
–L– STA. 610+17 TO STA. 611+50 RT

DETAIL BP
LATERAL BASE DITCH
(Not to Scale)



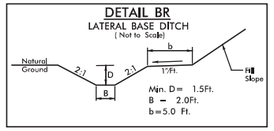
–L– STA. 669+34 TO STA. 669+83 RT

DETAIL BQ
LATERAL BASE DITCH
(Not to Scale)



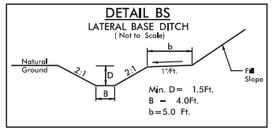
–Y17RPD– STA. 30+10 TO STA. 30+75 RT

DETAIL BR
LATERAL BASE DITCH
(Not to Scale)



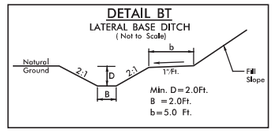
–SR5– STA. 14+25 TO STA. 14+80 RT

DETAIL BS
LATERAL BASE DITCH
(Not to Scale)



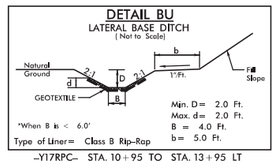
–Y12– STA. 23+77 TO STA. 24+68 RT

DETAIL BT
LATERAL BASE DITCH
(Not to Scale)



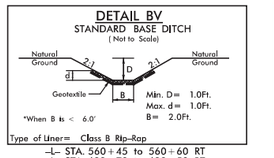
–Y13– STA. 15+65 TO STA. 16+50 RT

DETAIL BU
LATERAL BASE DITCH
(Not to Scale)



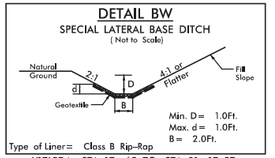
–Y17RPC– STA. 10+95 TO STA. 13+95 LT

DETAIL BV
STANDARD BASE DITCH
(Not to Scale)



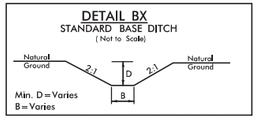
–L– STA. 560+45 to 560+60 RT
–L– STA. 622+73 to 623+50 RT
–L– STA. 630+21 to 630+41 LT
–Y12– STA. 46+55 to 46+69 RT

DETAIL BW
SPECIAL LATERAL BASE DITCH
(Not to Scale)



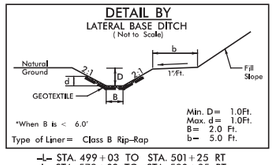
–Y17LPDA– STA. 17+65 TO STA. 21+17 RT

DETAIL BX
STANDARD BASE DITCH
(Not to Scale)



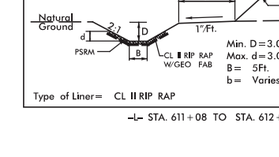
SR6– STA. 15+10 TO STA. 15+35 LT, B=2' D=1.5'

DETAIL BY
LATERAL BASE DITCH
(Not to Scale)



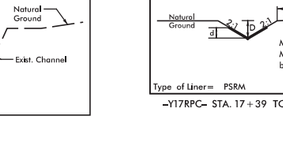
–L– STA. 499+03 TO STA. 501+25 RT
–L– STA. 579+02 TO STA. 580+95 RT
–L– STA. 580+87 TO STA. 583+00 LT
–L– STA. 581+28 TO STA. 582+34 RT
–L– STA. 592+00 TO STA. 593+85 LT
–L– STA. 605+75 TO STA. 609+00 LT
–L– STA. 623+50 TO STA. 626+05 RT
–L– STA. 668+75 TO STA. 670+37 LT
–Y17RPC– STA. 13+95 TO STA. 15+25 LT

DETAIL BZ
LATERAL BASE DITCH
(Not to Scale)



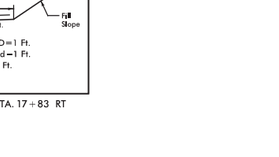
–L– STA. 609+00 TO STA. 610+50 LT
–Y17RPD– STA. 27+50 TO STA. 29+93 RT

DETAIL CA
BERM BASE DITCH
(Not to Scale)



–Y17RPD– STA. 10+11 TO STA. 25+50 RT
–Y17FLY– STA. 36+50 TO STA. 37+50 RT
–Y17– STA. 56+00 TO STA. 57+07 RT

DETAIL CB
BERM BASE DITCH
(Not to Scale)



–Y17RPD– STA. 32+50 TO STA. 42+80 RT

DETAIL CC
BERM BASE DITCH
(Not to Scale)

–Y17RPD– STA. 30+75 TO STA. 32+50 RT

DETAIL CD
LATERAL BASE DITCH
(Not to Scale)

–L– STA. 490+65 TO STA. 492+00 LT
–L– STA. 489+01 TO STA. 489+75 RT
–L– STA. 499+90 TO STA. 500+72 LT
–L– STA. 524+18 TO STA. 535+27 LT
–L– STA. 580+50 TO STA. 580+85 LT
–L– STA. 670+64 TO STA. 671+50 RT
–L– STA. 673+00 TO STA. 674+12 LT

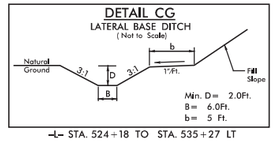
DETAIL CE
LATERAL BASE DITCH
(Not to Scale)

–L– STA. 671+15 TO STA. 673+00 LT

DETAIL CF
LATERAL BASE DITCH
(Not to Scale)

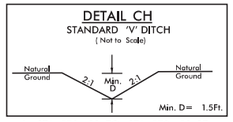
–Y17FLY– STA. 46+77 TO STA. 50+50 LT

DETAIL CG
LATERAL BASE DITCH
(Not to Scale)



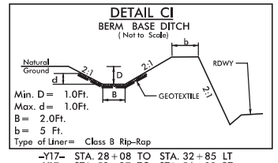
–L– STA. 524+18 TO STA. 535+27 LT

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



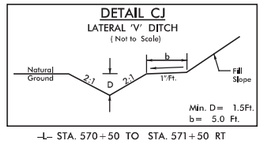
–L– STA. 570+32 TO STA. 570+50 RT

DETAIL CI
BERM BASE DITCH
(Not to Scale)



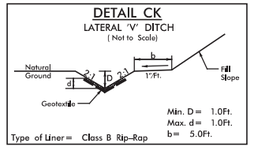
–Y17– STA. 28+08 TO STA. 32+85 LT
–Y17– STA. 52+27 TO STA. 56+00 RT
–Y17– STA. 57+07 TO STA. 61+15 RT
–Y17FLY– STA. 31+00 TO STA. 36+50 LT
–Y17FLY– STA. 37+50 TO STA. 41+00 LT
–SR5– STA. 16+26 TO STA. 18+95 RT

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



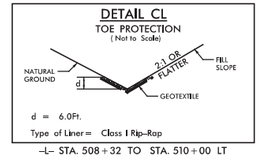
–L– STA. 570+50 TO STA. 571+50 RT

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



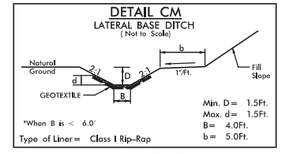
–Y17FLY– STA. 28+05 TO STA. 29+00 LT

DETAIL CL
TOE PROTECTION
(Not to Scale)



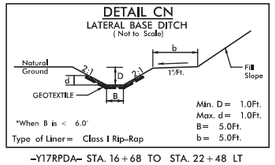
–L– STA. 508+32 TO STA. 510+00 LT

DETAIL CM
LATERAL BASE DITCH
(Not to Scale)



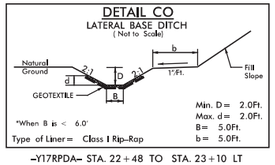
–Y17FLY– STA. 43+50 TO STA. 46+68 LT

DETAIL CN
LATERAL BASE DITCH
(Not to Scale)



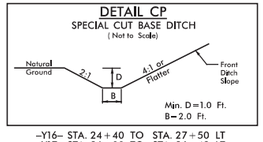
–Y17RPDA– STA. 16+68 TO STA. 22+48 LT

DETAIL CO
LATERAL BASE DITCH
(Not to Scale)



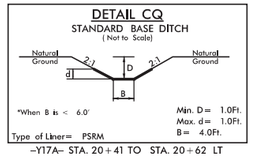
–Y17RPDA– STA. 22+48 TO STA. 23+10 LT

DETAIL CP
SPECIAL CUT BASE DITCH
(Not to Scale)



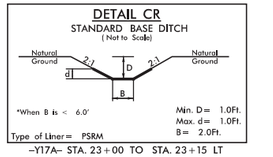
–Y16– STA. 24+40 TO STA. 27+50 LT
–Y17– STA. 36+00 TO STA. 36+49 LT

DETAIL CQ
STANDARD BASE DITCH
(Not to Scale)



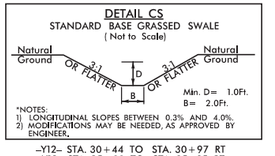
–Y17A– STA. 20+41 TO STA. 20+62 LT

DETAIL CR
STANDARD BASE DITCH
(Not to Scale)



–Y17A– STA. 23+00 TO STA. 23+15 LT

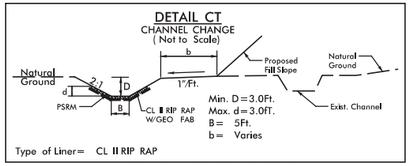
DETAIL CS
STANDARD BASE GRASSED SWALE
(Not to Scale)



*NOTES:
1) LONGITUDINAL SLOPES BETWEEN 0.3% AND 4.0%.
2) MODIFICATIONS MAY BE NEEDED, AS APPROVED BY ENGINEER.

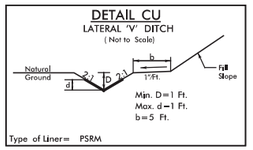
–Y12– STA. 30+44 TO STA. 30+97 RT
–Y12– STA. 35+00 TO STA. 35+15 RT

DETAIL CT
CHANNEL CHANGE
(Not to Scale)



–L– STA. 611+08 TO STA. 612+58 LT

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



–Y17RPC– STA. 17+39 TO STA. 17+83 RT

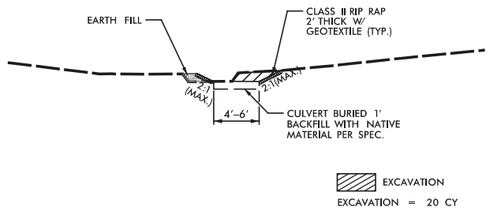
$$$

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R–2536	2D–4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

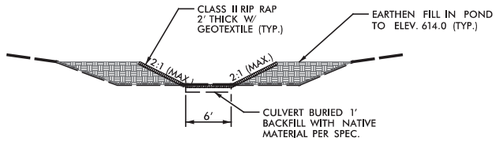
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



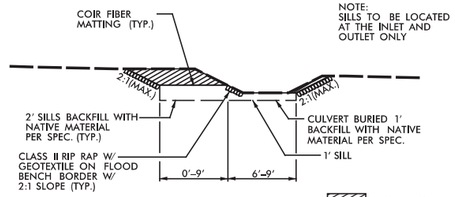
INLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.



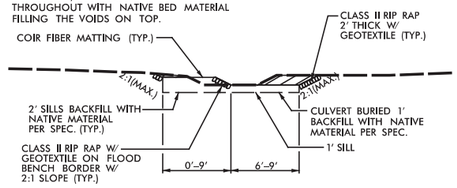
OUTLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

C550
1 @ 6' x 7' RCBC
STA. 466+00 –L–



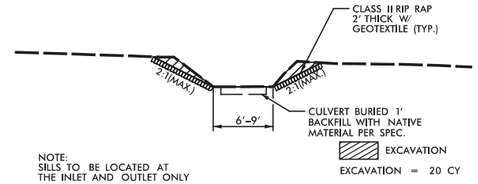
INLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

NOTE:
FOR CUT CONDITION, USE CLASS II RIP RAP FLOOD BENCH BORDER WITH NATURAL GROUND COVERED WITH COIR FIBER MAT INSIDE BORDER. IN FILL CONDITION, USE CLASS II RIP RAP FILL THROUGHOUT WITH NATIVE BED MATERIAL FILLING THE VOIDS ON TOP.



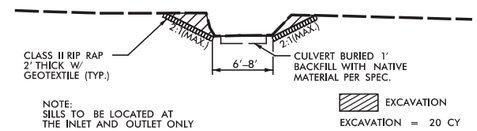
OUTLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

C600
2 @ 9' x 6' RCBC
STA. 500+00 –L–



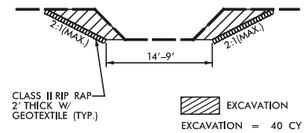
INLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.



OUTLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

C650
1 @ 6' x 7' RCBC
STA. 523+16 –L–

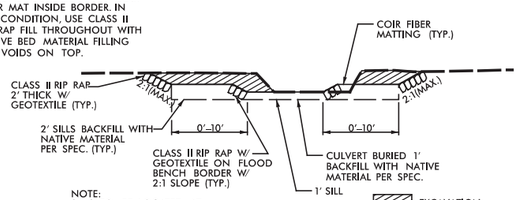


OUTLET CHANNEL IMPROVEMENT
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

66" RCP–III OVERFLOW
STA. 488+14.55 –L–

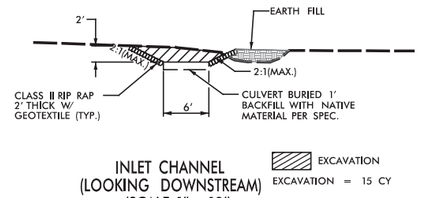
INLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

NOTE:
FOR CUT CONDITION, USE CLASS II RIP RAP FLOOD BENCH BORDER WITH NATURAL GROUND COVERED WITH COIR FIBER MAT INSIDE BORDER. IN FILL CONDITION, USE CLASS II RIP RAP FILL THROUGHOUT WITH NATIVE BED MATERIAL FILLING THE VOIDS ON TOP.



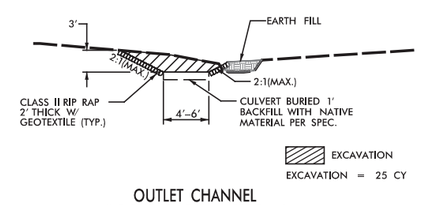
OUTLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

C700
3 @ 10' x 7' RCBC
STA. 610+42 –L–



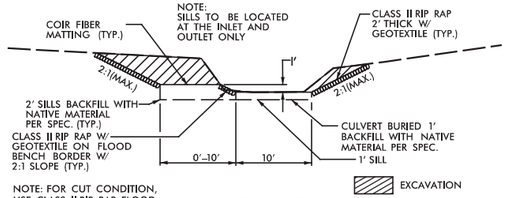
INLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAMBED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.



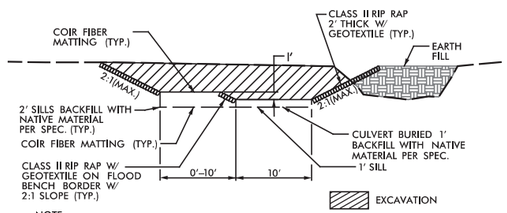
OUTLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

C750
1 @ 6' x 7' RCBC
STA. 30+09 –Y17RPD–



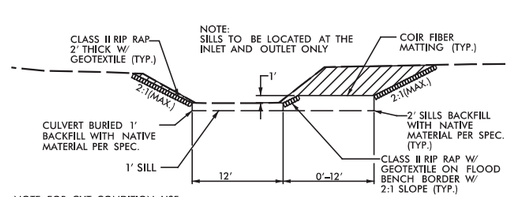
INLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

NOTE: FOR CUT CONDITION, USE CLASS II RIP RAP FLOOD BENCH BORDER WITH NATURAL GROUND COVERED WITH COIR FIBER MAT INSIDE BORDER. IN FILL CONDITION, USE CLASS II RIP RAP FILL THROUGHOUT WITH NATIVE BED MATERIAL FILLING THE VOIDS ON TOP.



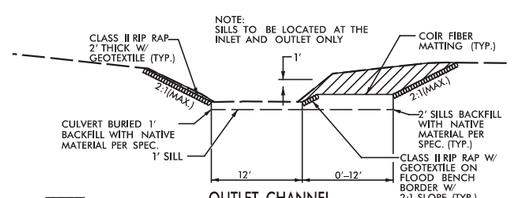
OUTLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

C800
2 @ 10' x 8' RCBC
STA. 22+13 –Y17FLY–



INLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

NOTE: FOR CUT CONDITION, USE CLASS II RIP RAP FLOOD BENCH BORDER WITH NATURAL GROUND COVERED WITH COIR FIBER MAT INSIDE BORDER. IN FILL CONDITION, USE CLASS II RIP RAP FILL THROUGHOUT WITH NATIVE BED MATERIAL FILLING THE VOIDS ON TOP.



OUTLET CHANNEL
(LOOKING DOWNSTREAM)
(SCALE 1" =10')

C801
2 @ 12' x 8' RCBC
STA. 46+76 –Y17FLY–

PERMIT DRAWING
SHEET 144 OF 257

2/2/2016
R:\Drainage\R-2536_Hyd_DitchDet_SEC3.dgn
T.A. ENGINEERING, INC.

PROJECT REFERENCE NO.	SHEET NO.
R-2536	35A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 145 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

50 LF OF INLET CHANNEL IMPROVEMENT
EST. 35 TONS CL II RIP RAP
EST. 35 SY GEOTEXTILE

C/A

R/W

SITE 57

GRADE TO DRAIN
STA. 466+00 TO
STA. 467+50 –L– LT

F F F F

200' R/W

SD-C

BEGIN PERM. IMPACTS IN SURFACE WATERS

WOODS

END SBG +77

2GI

15" RCP–IV

465+00

2GI

FS

15" RCP–IV

2GI

15" RCP–III

1 @ 6'x 7' RCBC

200' R/W

F F

BEGIN PERM. IMPACTS IN SURFACE WATERS

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- S S DENOTES PERMANENT IMPACTS IN SURFACE WATER
- P P DENOTES IMPACTS IN SURFACE WATER (POND)

DETAIL SHEET FOR SITE 57

50' 25' 0' 50' 100'
GRAPHIC SCALE

$DATES
$(USERNAME)$
$FILES

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

SITE 57
–L– 466+00

PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

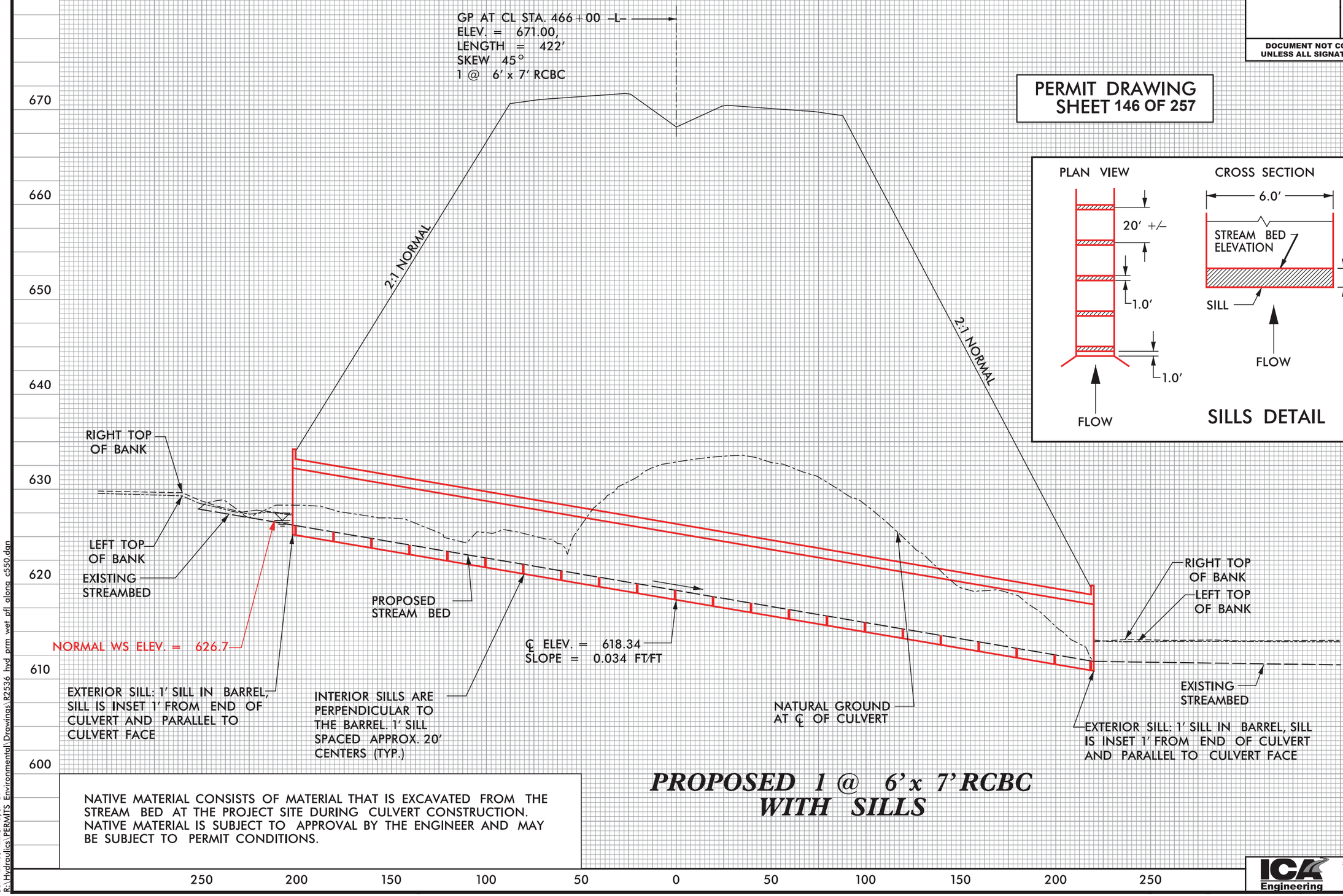
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

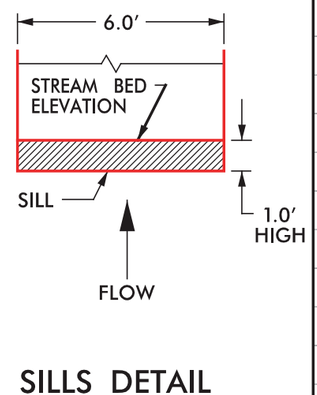
PERMIT DRAWING SHEET 146 OF 257

GP AT CL STA. 466+00 –L–
ELEV. = 671.00,
LENGTH = 422'
SKEW 45°
1 @ 6' x 7' RCBC



PLAN VIEW

CROSS SECTION



SILLS DETAIL

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

PROPOSED 1 @ 6' x 7' RCBC WITH SILLS

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

2/2/2016
ICA ENGINEERING, INC.
R:\Hydraulics\PERMITS Environmental\Drawings\R2536 hyd prm wet pfl along c550.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2536	36
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 147 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

MATCHLINE –L– STA. 468+00
SEE SHEET 35A

MATCHLINE –L– STA. 481+00
SEE SHEET 37

177
JAMES & SHARON SIDES

178
EDWARD & EVE ARROYO

WOODS

TOE PROTECTION
W/CLASS B RIPRAP
SEE DETAIL I

SPECIAL LATERAL ' V' DITCH
SEE DETAIL J

20' X 10'
PSRM

SPECIAL CUT DITCH
SEE DETAIL H

200' R/W

470+00

475+00

480+00

2GI

FS

15" RCP-IV

15" RCP-III

18" RCP-III

24" RCP-III

30" RCP-V

END SBG +55

2 ELBOWS
ROD & LUG

2 TONS CL B RIPRAP
W/7 ST GEO FAB

26 TONS CL I RIPRAP
W/42 SY GEO FAB

STANDARD BASE DITCH
SEE DETAIL T

5 TONS CL B RIPRAP
W/14 SY GEO FAB

LATERAL BASE DITCH
SEE DETAIL BN

SITE 58

SITE 58A

EARTHEN FILL IN POND
SEE DETAIL BE

POND

DRAIN POND

PB-C

TDE

BEGIN PERM. IMPACTS
IN SURFACE WATER

12" HDPE

BEGIN TEMP. IMPACTS
IN SURFACE WATER

GRADE TO

SITE 58 AND 58A
PLAN VIEW

LEGEND

F F	DENOTES IMPACTS IN SURFACE WATER (POND)
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
S S	DENOTES IMPACTS IN SURFACE WATER

FOR –L– PROFILE SEE SHT. 121

100' 0' 100' 200'
GRAPHIC SCALE

2/17/2016
ICA ENGINEERING, INC.
R:\Hydraulics\PERMITS Environmental\Drawings\R2536 hyd prm wet psh 036.dgn

ICA Engineering
5121 Kingdom Way,
Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
R-2536	36
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 148 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

MATCHLINE -L- STA. 468+00
SEE SHEET 35A

MATCHLINE -L- STA. 481+00
SEE SHEET 37

177 JAMES & SHARON SIDES

178 EDWARD & EVE ARROYO

WOODS

TOE PROTECTION W/CLASS B RIPRAP SEE DETAIL I

SPECIAL LATERAL 'V' DITCH SEE DETAIL J

20' X 10' PSRM

SPECIAL CUT DITCH SEE DETAIL H

200' R/W

470+00

475+00

480+00

481+00

2GI

FS

15" RCP-III

15" RCP-IV

15" CSP

2 ELBOWS ROD & LUG

2 TONS CL B RIPRAP W/7 ST GEO FAB

24 TONS CL I RIPRAP W/42 SY GEO FAB

80" RCP-V

STANDARD BASE DITCH SEE DETAIL T

5 TONS CL B RIPRAP W/14 SY GEO FAB

LATERAL BASE DITCH SEE DETAIL BN

END SBG +55

24" RCP-III

18" RCP-III

GRADE TO

SITE 58

EARTHEN FILL IN POND SEE DETAIL BE

POND

DRAIN POND

PB-C

TDE

SITE 58A

STANDARD BASE DITCH WITH CLASS I RIPRAP SEE DETAIL BH

BEGIN PERM. IMPACTS IN SURFACE WATER

12" HDPE

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

SITE 58 AND 58A
PLAN VIEW

LEGEND

F P	DENOTES IMPACTS IN SURFACE WATER (POND)
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
S S	DENOTES IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHT. 121

100' 0' 100' 200'
GRAPHIC SCALE

2/17/2016
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PROJECT REFERENCE NO.	SHEET NO.
R-2536	36A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 149 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

2 ELBOWS
ROD & LUG
WOODS
2 TONS CL B RIPRAP
W/7 ST GEO FAB

15" CSP

30" RCP-V

26 TONS CL I RIPRAP
W/42 SY GEO FAB

STANDARD BASE DITCH
SEE DETAIL T

5 TONS CL B RIPRAP
W/14 SY GEO FAB

SITE 58

200' R/W

WOODS

LATERAL BASE DITCH
SEE DETAIL BN

5 TONS CL B RIPRAP
W/14 SY GEO FAB

EARTHEN FILL IN POND
SEE DETAIL BE

POND

DRAIN POND

PB-C

NAD 83/95

TDE

JAMES & SHARON SIDES

177

12" HDPE

BEGIN PERM. IMPACTS
IN SURFACE WATER

BEGIN PERM. IMPACTS
IN SURFACE WATER

BEGIN PERM. IMPACTS
IN SURFACE WATER

BEGIN TEMP. IMPACTS
IN SURFACE WATER

STANDARD BASE DITCH
WITH CLASS II RIPRAP
SEE DETAIL BM
SLOPE = 0.5%

SITE 58A

LEGEND

P P — DENOTES IMPACTS IN SURFACE WATER (POND)

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES IMPACTS IN SURFACE WATER

60' 30' 0' 60' 120'
GRAPHIC SCALE

DETAIL SHEET FOR SITE 58 AND 58A

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	37
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 150 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

MATCHLINE –L– STA. 481+00 SEE SHEET 36

MATCHLINE –L– STA. 492+00 SEE SHEET 38

NAD 83/95

182 MARY LEE

183 JOHN PRESNELL

181 JAMES DAVIS

180 JACK HARRISON

179 MARY GRAY

178 EDWARD & EVE ARROYO

SF-C

SG-C

CONSTRUCT PROPOSED FLOODPLAIN (HATCHED AREA) PER PROPOSED CONTOUR AND GRADING SLOPE. AT PROPOSED FLOODPLAIN BOUNDARY, USE 2:1 SLOPE TO TIE TO CUT LIMITS OR TIE TO EXIST. CONTOUR DIRECTLY AS SHOWN.

NO DECK DRAINS REQUIRED

CUT LIMIT

+59.00 –L– 170' LT

+19.00 –L– 170' LT

2:1 SLOPE (TYP)

PROPOSED CONTOUR EL=597.0

PROPOSED GRADING SLOPE 3:1 (TYP)

PROPOSED GRADING SLOPE 2:1 (TYP)

VESTAL CREEK

GTD

END SBG +92

BEG SBG +64

END SBG +49

PROPOSED CONTOUR AT C BRIDGE ELEV. = 596.5

15" RCP-III

485+00

ROCK OUTCROP

END SBG +20

18" RCP-III

BEG SBG +00

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

SITE 59

BEGIN SBG +33

PROPOSED CONTOUR EL=596.0

CL II RIP RAP UP TO ELEV. 602.0 (TYP.) TIE TO EXIST. CONTOUR

LATERAL BASE DITCH SEE DETAIL BN

5 TONS CL B RIPRAP W/14 SY GEO FAB

+69.00 –L– 180' RT

+41.00 –L– 187' RT

NO DECK DRAINS REQUIRED

TIE TO EXIST. CONTOUR

TEMPORARY WORK /HAUL BRIDGE

TIE TO EXIST. CONTOUR

200' R/W

BEGIN TEMP. IMPACTS IN SURFACE WATER WOODS

BEGIN PERM. IMPACTS IN SURFACE WATER

SITE 60

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

PSH SEE DETAIL AP

15" CSP 2 ELBOWS ROD & LUG

54" RCP III OVERFLOW NOT BURIED

490+00

2 ELBOWS ROD & LUG

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

PSH SEE DETAIL AP

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

SPECIAL LATERAL 'V' DITCH SEE DETAIL J

3 TONS CL B RIPRAP W/10 SY GEO FAB

LATERAL BASE DITCH SEE DETAIL CD

CHANNEL CHANGE W/CL II RIPRAP SEE DETAIL BK

JURISDICTIONAL RIPRAP TRANSITION SEE DETAIL AU

SITE 61

END SBG +78

CONCRETE CSW ENDWALL

15" CSP 2 ELBOWS ROD & LUG

3 TONS CL B RIPRAP W/10 SY GEO FAB SPECIAL LATERAL 'V' DITCH SEE DETAIL J

SPECIAL CUT DITCH SEE DETAIL H

LATERAL BASE DITCH SEE DETAIL CD

30 LF OF OUTLET CHANNEL IMPROVEMENT EST. 60 TONS CL II RIP RAP EST. 60 SY GEOTEXTILE SEE DETAIL SHEET 2D-2

SEWELL

NP LLW

SITE 59, 60 AND 61 PLAN VIEW

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

100' 0' 100' 200'

GRAPHIC SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	37
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 151 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

MATCHLINE -L- STA. 481+00 SEE SHEET 36

MATCHLINE -L- STA. 492+00 SEE SHEET 38

NAD 83/95

182 MARY LEE

183 JOHN PRESNELL

181 JAMES DAVIS

180 JACK HARRISON

179 MARY GRAY

178 EDWARD & EVE ARROYO

SF-C

SG-C

CONSTRUCT PROPOSED FLOODPLAIN (HATCHED AREA) PER PROPOSED CONTOUR AND GRADING SLOPE AT PROPOSED FLOODPLAIN BOUNDARY. USE 2:1 SLOPE TO TIE TO CUT LIMITS OR TIE TO EXIST. CONTOUR DIRECTLY AS SHOWN.

NO DECK DRAINS REQUIRED

CUT LIMIT

+59.00 -L- 170' LT

+19.00 -L- 170' LT

2:1 SLOPE (TYP.)

PROPOSED CONTOUR ELEV. 597.0

PROPOSED GRADING SLOPE TO EXIST. GROUND

VESTAL CREEK

BEGIN TEMP. IMPACTS IN SURFACE WATER WOODS

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

SITE 60

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

PSH SEE DETAIL AP

15" CSP 2 ELBOWS ROD & LUG

3 TONS CL B RIPRAP W/10 SY GEO FAB

LATERAL BASE DITCH SEE DETAIL CD

CHANNEL CHANGE W/CL II RIPRAP SEE DETAIL BK

JURISDICTIONAL RIPRAP TRANSITION SEE DETAIL AU

SITE 61

SPECIAL LATERAL 'V' DITCH SEE DETAIL J

200' R/W

485+00

490+00

BEG SBG +64

END SBG 549

END SBG +92

PROPOSED CONTOUR AT I.C. BRIDGE ELEV. = 596.5

15" RCP-III

18" RCP-III

54" RCP-III OVERFLOW NOT BURIED

ROCK OUTCROP

END SBG +78

BEG SBG +00

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

SITE 59

BEGIN SBG +33

CL II RIP RAP UP TO ELEV. 602.0 (TYP.) TIE TO EXIST. CONTOUR

PROPOSED CONTOUR ELEV. 596.0

LATERAL BASE DITCH SEE DETAIL BN

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

CONCRETE ENDWALL

3 TONS CL B RIPRAP W/14 SY GEO FAB

3 TONS CL B RIPRAP W/10 SY GEO FAB SPECIAL LATERAL 'V' DITCH SEE DETAIL J

SPECIAL CUT DITCH SEE DETAIL H

LATERAL BASE DITCH SEE DETAIL CD

+69.00 -L- 180' RT

+41.00 -L- 187' RT

NO DECK DRAINS REQUIRED

TIE TO EXIST. CONTOUR

TEMPORARY WORK / HAUL BRIDGE

30 LF OF OUTLET CHANNEL IMPROVEMENT EST. 60 TONS CL II RIP RAP EST. 60 SY GEOTEXTILE SEE DETAIL SHEET 2D-2

TIE TO EXIST. CONTOUR

GTD

SITE 59, 60 AND 61 PLAN VIEW

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

100' 0' 100' 200'

GRAPHIC SCALE

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DETAIL SHEET FOR SITE 59, 60, AND 61

PROJECT REFERENCE NO.	SHEET NO.
R-2536	37A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 152 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

SG-C

CUT LIMIT

C A

R W

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

+19.00 –L– 170' LT

PROPOSED GRADING SLOPE=0.3%

VESTAL CREEK

JS

SF

SITE 60

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

200' R/W

+90

GTD

CUT LIMIT

END SBG +92

PSH SEE DETAIL AP

CHANNEL CHANGE W/CL II RIPRAP SEE DETAIL BK

JURISDICTIONAL RIPRAP TRANSITION SEE DETAIL AU

SITE 61

3 TONS CL B RIPRAP W/10 SY GEO FAB LATERAL DITCH SEE DETAIL CD

15" CSP 2 ELBOWS ROD & LUG

2GI

HW

54" RCP-III OVERFLOW NOT BURIED

66" RCP-III OVERFLOW NOT BURIED

485+00

490+00

ROCK OUTCROP

END SBG +90

2 ELBOWS ROD & LUG

END SBG +78

CONCRETE ENDWALL

BEGIN SBG +33

+40

SITE 59

CL II RIP RAP UP TO ELEV. 602.0 (TYP.) TIE TO EXIST. CONTOUR

PROPOSED CONTOUR ELEV. 596.0

PSH SEE DETAIL AP

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

3 TONS CL B RIPRAP W/10 SY GEO FAB SPECIAL LATERAL 'V' DITCH SEE DETAIL J

LATERAL BASE DITCH SEE DETAIL CD

+69.00 –L– 180' RT

+41.00 –L– 187' RT

GTD

DECK DRAINS REQUIRED

TO EXIST. CONTOUR

TEMPORARY WORK /HAUL

50' 25' 0' 50' 100'

GRAPHIC SCALE

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	121
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 153 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-

ENGLISH

BEGIN CONSTRUCTION SECTION 3A
TIP PROJECT R-2536
-L- POT 465+00.00 L.B. =
-L- POT 465+09.27 L.A.
EL = 673.48'

PROPOSED GRADE

(-)27.369%

EXISTING GROUND

6'x7' RCBC

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	130	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	629.9	FT
BASE DISCHARGE	=	140	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	630.4	FT
OVERTOPPING DISCHARGE	=	650	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	639.0	FT

459+00 460+00 461+00 462+00 463+00 464+00 465+00 465+00 466+00 467+00 468+00 469+00 470+00 471+00 472+00

700 690 680 670 660 650 640 630 620 610

BEGIN DITCH STA. 474+70 - LT ELEV. 640.00

STA. 475+00 - LT ELEV. 638.90

STA. 475+50 - LT ELEV. 638.75

END DITCH STA. 478+00 - LT ELEV. 637.02

(-)3.67%

(-)10.30%

(-)10.69%

BM #1
RR SPIKE IN BASE OF 12" POPLAR
-L- STA. 480+87.96, OFFSET 328.24' LT,
ELEV = 625.65'

BEGIN DITCH STA. 473+24 - RT ELEV. 616.96

30" RCP-V

(+) 2.73%

END DITCH STA. 476+00 - RT ELEV. 624.50

PIPE HYDRAULIC DATA
30" RCP-V Sta. 472+05 -L-

DRAINAGE AREA	=	7	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	19	CFS
DESIGN HW ELEVATION	=	631.9	FT
100 YEAR DISCHARGE	=	20	CFS
100 YEAR HW ELEVATION	=	632.0	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	87	CFS
OVERTOPPING ELEVATION	=	641.4	FT

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	2600	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	600.8	FT
BASE DISCHARGE	=	2900	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	601.7	FT
OVERTOPPING DISCHARGE	=	12,000	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	609.8	FT
DATE OF SURVEY	=	6-18-2015	
W.S. ELEVATION AT DATE OF SURVEY	=	593.5	FT

(-)27.369%

SS DEPTH = 5.69'

MIN. LOW CHORD EL = 608.50'

STA. 484+50-RT ELEV. 594.85

VESTAL CREEK

END DITCH STA. 485+42-RT ELEV. 593.50

CLASS II RIP RAP SLOPE 1.5:1 (2 FT. THICK) (NORMAL TO CAP) (TYP.)

(-)14.04%

(-) 1.47%

NORMAL WS ELEV. = 594.0

BEGIN DITCH STA. 483+72 - RT ELEV. 598.00

472+00 473+00 474+00 475+00 476+00 477+00 478+00 479+00 480+00 481+00 482+00 483+00 484+00 485+00 486+00

660 650 640 630 620 610 600 590 580 570

FOR -L- PLAN SEE SHTS. 35A, 36, 37

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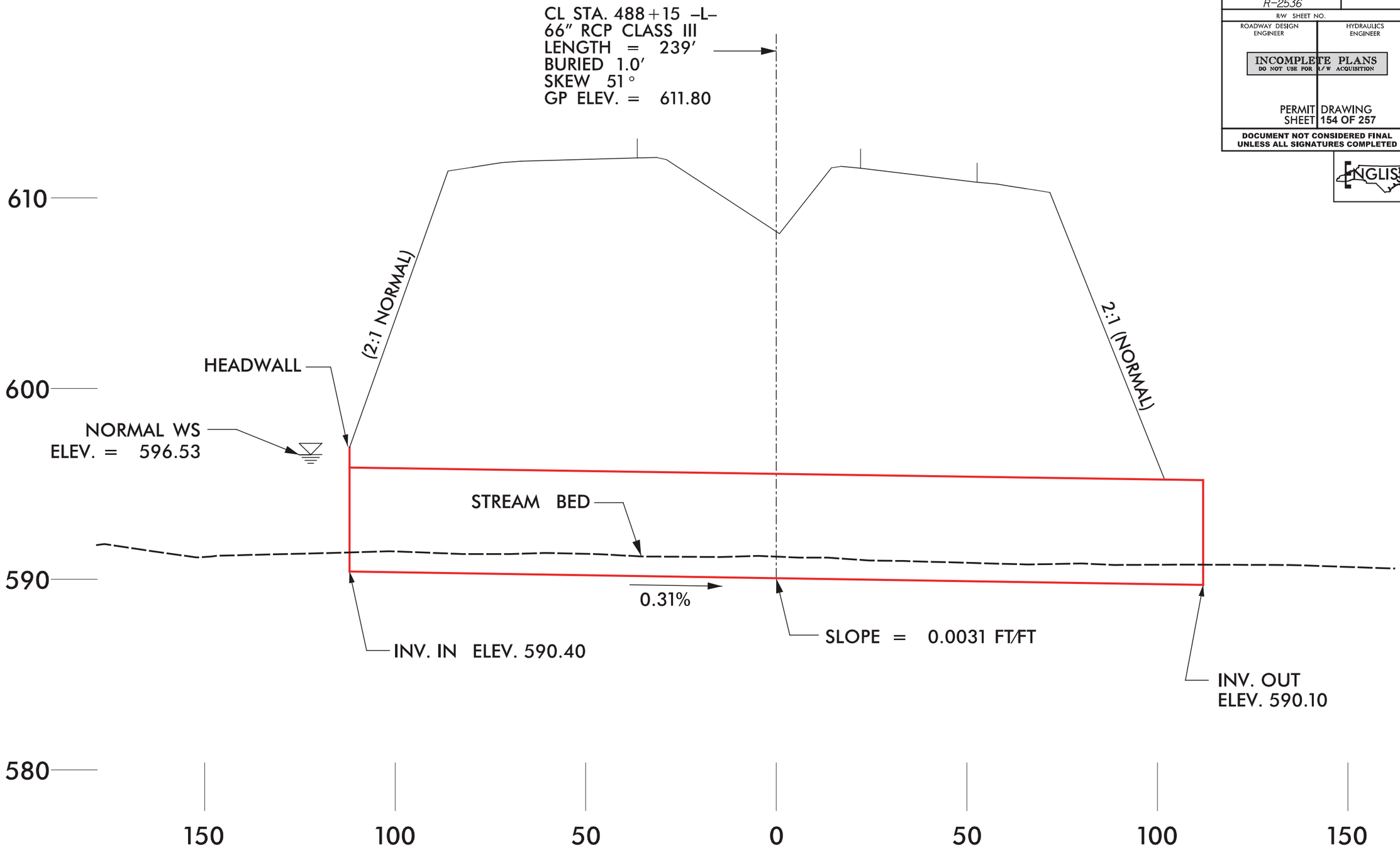
PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 154 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 60
PROFILE ALONG STRUCTURE
STA. 488+15 –L–

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 155 OF 257

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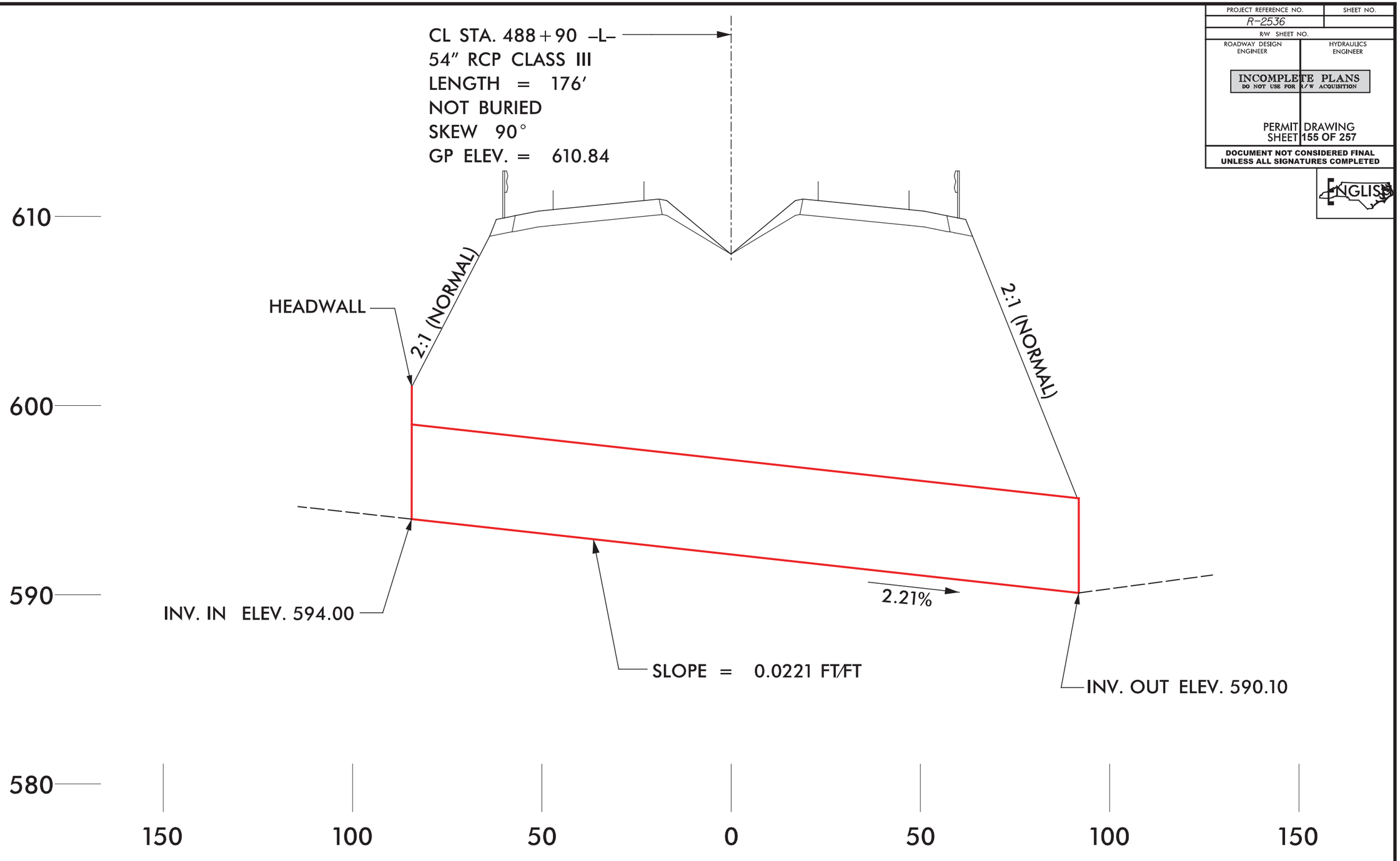
ENGLISH



SITE 61
PROFILE ALONG STRUCTURE
STA. 488+90 –L–

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	38
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 156 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

MATCHLINE –Y16– STA 26+00
SEE SHEET 94

MATCHLINE –L– STA 492+00
SEE SHEET 37

MATCHLINE –L– STA 503+00
SEE SHEET 39

MATCHLINE –Y16– STA 18+50
SEE SHEET 93

JESSIE GRANT 184
JOHN PRESNELL 183
MARY LEE 182
JAMES DAVIS 181
RUBY CROWN 192
BENJAMIN PUGH 192A
CAROLYN WATKINS LUCK 190
CAROLYN WATKINS LUCK 188
FRANCES LEE 189
KENNY YORK 195
FRANCES LEE 191
ROBERT WELSH

6" DECK DRAINS @ 12' O.C., –Y16–
FROM STA. 21+22 TO STA. 21+58 RT SHLD
STA. 22+96 TO STA. 23+32 RT SHLD.
STA. 21+06 TO STA. 21+42 LT SHLD.
STA. 22+80 TO STA. 23+16 LT SHLD.

SITE 62

STANDARD GRASS SWALE SEE DETAIL AR SLOPE = 3.0% DDE=70 CY

SITE 63

ADDITIONAL TCE REQ'D FOR TEMP. BASIN

CLASS II RIP RAP ON FLOOD BENCH BORDER EST. 10 TONS CL II RIP RAP EST. 10 SY GEOTEXTILE

40 LF OF INLET CHANNEL IMPROVEMENT EST. 45 TONS CL II RIP RAP EST. 45 SY GEOTEXTILE

5 TONS CL B RIPRAP W/14 SY GEO FAB

32 LF OF OUTLET CHANNEL IMPROVEMENT EST. 10 TONS CASS II RIP RAP EST. 30 SY GEOTEXTILE

8 TONS CL B RIPRAP W/21 SY GEO FAB

5 TONS CL B RIPRAP W/14 SY GEO FAB

RETAIN

REMOVE 14 LF EX 24" RCP

JURISDICTIONAL RIPRAP TRANSITION SEE DETAIL AU

SPECIAL CUT DITCH W/PSMS SEE DETAIL CP

SPECIAL CUT DITCH SEE DETAIL H

SPECIAL LATERAL 'V' DITCH SEE DETAIL J

LATERAL BASE DITCH SEE DETAIL CD

LATERAL BASE DITCH W/CL B RIPRAP SEE DETAIL BY

LATERAL BASE DITCH SEE DETAIL BN

COIR FIBER MATTING

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEG SBG +85

END SBG +30

BEG SBG +55

END SBG +18

BURIED 1

2GI

2GI-A

30" RCP-III

24" RCP-III

18" RCP-III

15" RCP

2 ELBOWS ROD & LUG

FS

JS

SS

DB

DBL

DIR ONLY

20' ACCESS EASEMENT

50' ACCESS EASEMENT DB 1836 PG 0852

ACCESS EASEMENT DB 136 PG 0850

ACCESS EASEMENT DB 1836 PG 0850

COPPER HEAD NO. 2 PRIVATE

CENTURY LINK

POS. SEWER CLEANOUT

36" CHAIN LINK

PINE HILL ROAD 18' PAVED ROADWAY

LEE VALLEY RD (PRIVATE)

WOODS

FIELD

WD DECK

WD STEPS

HTR

MTL RAMP

CONC PAD

SHD DR

SHED

INV=630.68'

INV=604.34'

200' R/W

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR –L– PROFILE SEE SHT. 122
FOR –Y16– PROFILE SEE SHT. 195
FOR –Y16DET– SEE SHT. 2B–5

100' 0' 100' 200'
GRAPHIC SCALE

SITE 62 AND 63
PLAN VIEW

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	38
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 157 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

MATCHLINE –L– STA 492+00
SEE SHEET 37

MATCHLINE –L– STA 503+00
SEE SHEET 39

MATCHLINE –Y16– STA 26+00
SEE SHEET 94

MATCHLINE –Y16– STA 18+50
SEE SHEET 93

NAD 83/95

JESSIE GRANT 184

JOHN PRESNELL 183

MARY LEE 182

JAMES DAVIS 181

RUBY BROWN 192

BENJAMIN PUGH 192A

CAROLYN WATKINS LUCK 188

CAROLYN WATKINS LUCK 190

FRANCES LEE 189

KENNY YORK 195

FRANCES LEE 191

ROBERT WELSH

20' ACCESS EASEMENT

COPPER ROAD (PRIVATE)

PINE HILL ROAD (PRIVATE)

LEE VALLEY RD (PRIVATE)

6" DECK DRAINS @ 12' O.C., –Y16–
FROM STA. 21+22 TO STA. 21+58 RT SHLD
STA. 22+96 TO STA. 23+32 RT SHLD.
STA. 21+06 TO STA. 21+42 LT SHLD.
STA. 22+80 TO STA. 23+16 LT SHLD.

SPECIAL CUT DITCH W/PSIW SEE DETAIL CP

SPECIAL CUT DITCH, SEE DETAIL H

SPECIAL LATERAL 'V' DITCH SEE DETAIL J

SITE 63

SITE 62

ADDITIONAL TCE REQ'D FOR TEMP. BASIN

CLASS II RIP RAP ON FLOOD BENCH BORDER
EST. 10 TONS CL II RIP RAP
EST. 10 SY GEOTEXTILE

60 LF OF INLET CHANNEL IMPROVEMENT
EST. 45 TONS CL II RIP RAP
EST. 45 SY GEOTEXTILE

5 TONS CL B RIPRAP W/14 SY GEO FAB

COIR FIBER MATTING
BEGIN TEMP. IMPACTS IN SURFACE WATER
BEGIN PERM. IMPACTS IN SURFACE WATER

LATERAL BASE DITCH SEE DETAIL CD

LATERAL BASE DITCH SEE DETAIL BM

LATERAL BASE DITCH W/CL B RIPRAP SEE DETAIL BY

CLASS II RIP RAP ON FLOOD BENCH BORDER (TYP.)
EST. 5 TONS CL II RIP RAP
EST. 5 SY GEOTEXTILE

COIR FIBER MATTING

32 LF OF OUTLET CHANNEL IMPROVEMENT
EST. 30 TONS CASS II RIP RAP
EST. 30 SY GEOTEXTILE

STANDARD GRASS SWALE SEE DETAIL AR
SLOPE = 3.0%
DDE=70 CY

JURISDICTIONAL RIPRAP TRANSITION SEE DETAIL AU

REMOVE 14 LF EX. 24" RCP

RETAIN

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

END SBG +50

BEG. SBG +85

END SBG +18

BEG. SBG +25

24" RCP–III

30" RCP–III

18" RCP

SPECIAL CUT DITCH SEE DETAIL H

SPECIAL CUT DITCH W/CL B RIPRAP SEE DETAIL H

SPECIAL CUT DITCH SEE DETAIL AS

SPECIAL CUT DITCH SEE DETAIL H

SPECIAL CUT DITCH SEE DETAIL H

SPECIAL CUT DITCH SEE DETAIL H

SPECIAL CUT DITCH SEE DETAIL H

SPECIAL CUT DITCH SEE DETAIL H

5 TONS CL B RIPRAP W/14 SY GEO FAB

5 TONS CL B RIPRAP W/21 SY GEO FAB

2GI

2GI–A

FS 2GI–A

FS 2GI

WOODS

POS SEWER CLEANOUT

WD DECK HTR

WD STEPS

HTR

CONC PAD

INFL RAMP

CENTURY LINK

ACCESS EASEMENT DB 136 PG 1850

DIR DRN

FIELD

EXISTING W/R

200' R/W

LEGEND

18 FS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
S S	DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR –L– PROFILE SEE SHT. 122
FOR –Y16– PROFILE SEE SHT. 195
FOR –Y16DET– SEE SHT. 2B–5

100' 0' 100' 200'
GRAPHIC SCALE

SITE 62 AND 63
PLAN VIEW

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	38A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 158 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

DITCH, SEE DETAIL H

WOODS

CAROLYN WATKINS LUCK

ADDITIONAL TCE REQ'D FOR TEMP. BASIN

CLASS II RIP RAP ON FLOOD BENCH BORDER
EST. 10 TONS CL II RIP RAP
EST. 10 SY GEOTEXTILE

40 LF OF INLET CHANNEL IMPROVEMENT
EST. 45 TONS CL II RIP RAP
EST. 45 SY GEOTEXTILE

COIR FIBER MATTING
BEGIN TEMP. IMPACTS IN SURFACE WATER

SPECIAL CUT DITCH SEE DETAIL H

BEGIN PERM. IMPACTS IN SURFACE WATER

195

KENNY YORK

LATERAL BASE DITCH SEE DETAIL CD

LATERAL BASE DITCH SEE DETAIL BN

5 TONS CL B RIPRAP W/14 SY GEO FAB

15" CSP 2 ELBOWS ROD & LUG

BEG SBG +85

2GI

SITE 63

200' R/W

END SBG +30

500+00

12" GR

NAD 83/95

2GI-A

FS

30" RCP-III

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEG SBG +95

2GI

9' x 6' RCBC @ 2

BURIED 1'

END SBG +18

190

SPECIAL CUT DITCH SEE DETAIL H

30' ACCESS EASEMENT DB 1458, PG. 893

FRANCES LEE

191

LATERAL BASE DITCH W/CL B RIPRAP SEE DETAIL BY

CLASS II RIP RAP ON FLOOD BENCH BORDER (TYP.)
EST. 5 TONS CL II RIP RAP
EST. 5 SY GEOTEXTILE

COIR FIBER MATTING

8 TONS CL B RIPRAP W/21 SY GEO FAB

SITE 62

STANDARD GRASS SWALE
SEE DETAIL AR
SLOPE = 3.0%
DDE=70 CY

32 LF OF OUTLET CHANNEL IMPROVEMENT
EST. 10 TONS CASS II RIP RAP
EST. 30 SY GEOTEXTILE

JURISDICTIONAL RIPRAP TRANSITION SEE DETAIL AU

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

INV=604.3'

RETAIN

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'

GRAPHIC SCALE

191 DETAIL SHEET FOR SITE 62 AND 63

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5/24/99

PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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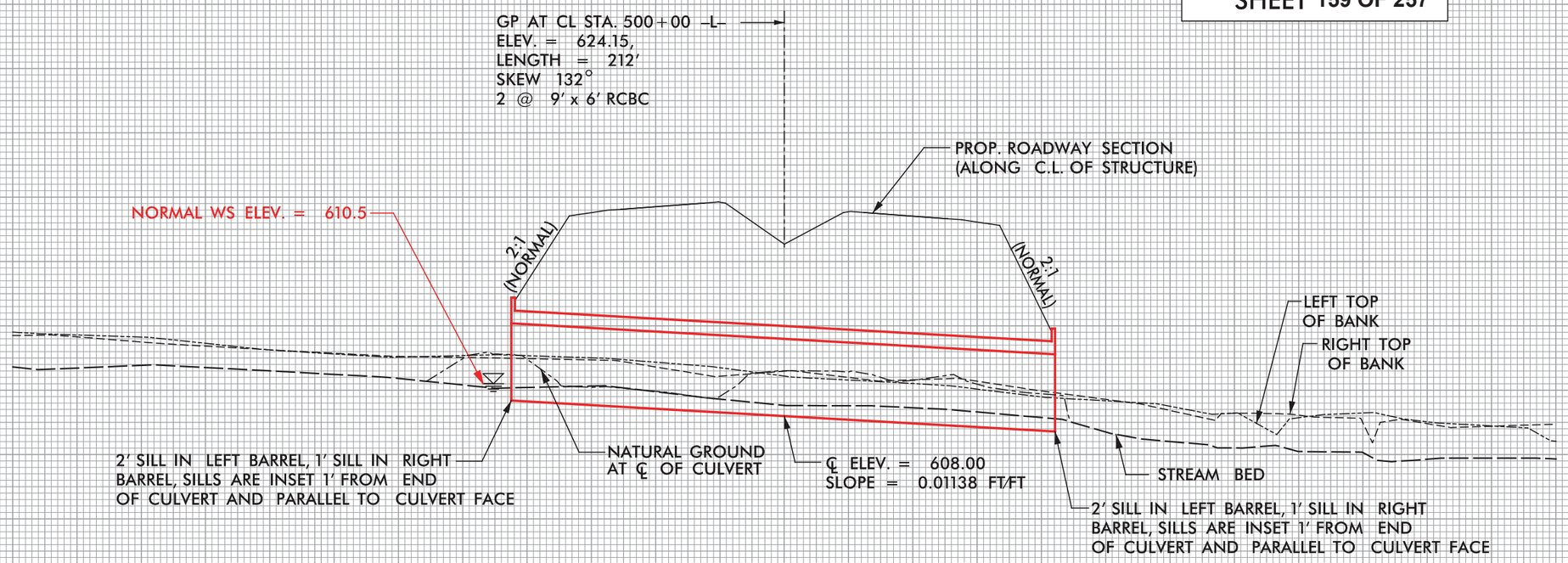
ENGLISH

SITE 63
–L– 500+00

PERMIT DRAWING
SHEET 159 OF 257



PROPOSED 2 @ 9'X6' RCBC

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

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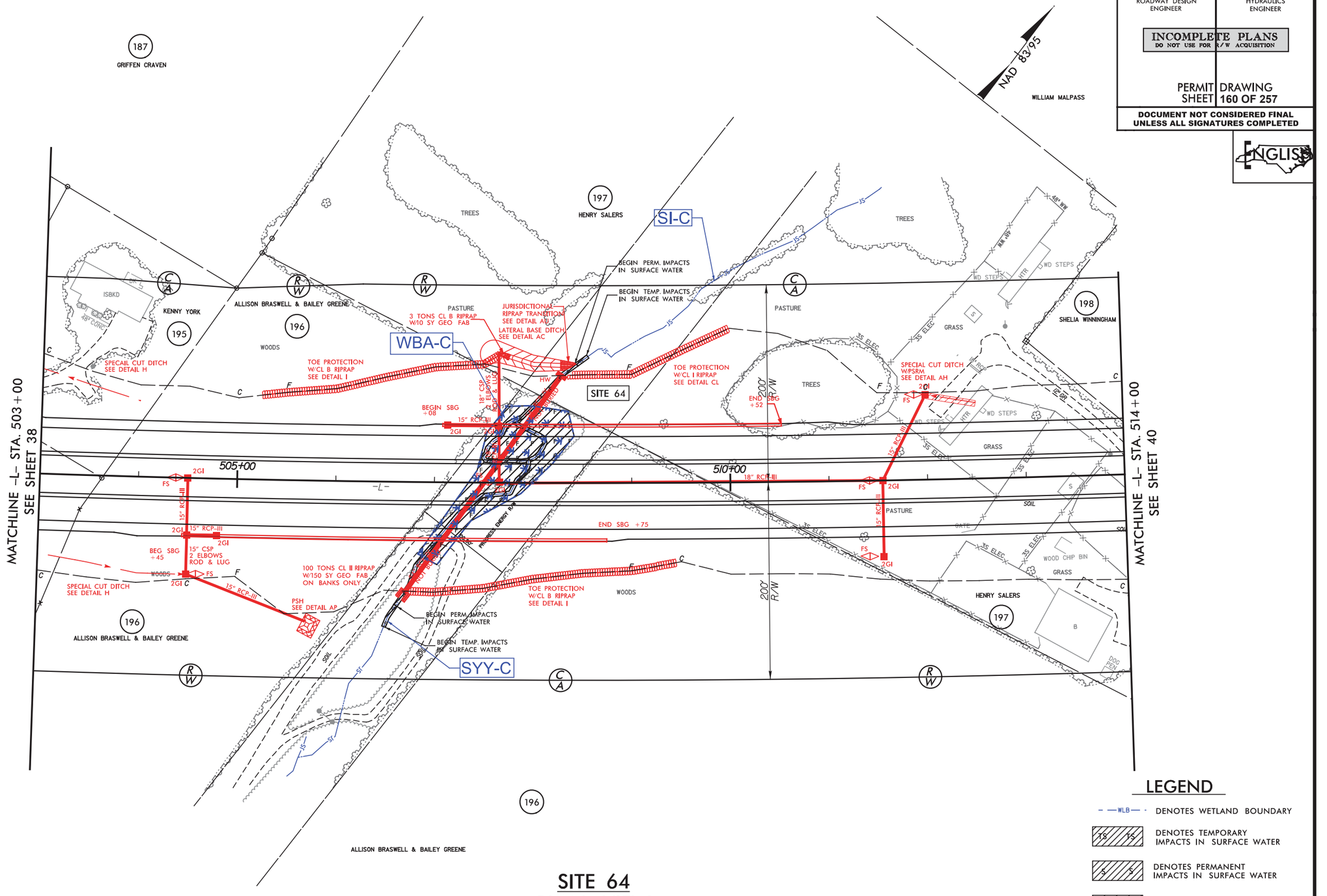
PROJECT REFERENCE NO.	SHEET NO.
R-2536	39
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 160 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 64
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS / TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S / S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- F / F — DENOTES FILL IN WETLAND

FOR -L- PROFILE SEE SHT. 122

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	39
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 161 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

SITE 64
PLAN VIEW

MATCHLINE –L– STA. 503+00 SEE SHEET 38

MATCHLINE –L– STA. 514+00 SEE SHEET 40

NAD 83/95

WBA-C

SI-C

SYY-C

SITE 64

187 GRIFFEN CRAVEN

195 KENNY YORK

196 ALLISON BRASWELL & BAILEY GREENE

197 HENRY SALERS

198 SHELIA WINNINGHAM

WILLIAM MALPASS

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

JURISDICTIONAL RIPRAP TRANSITION SEE DETAIL AB

LATERAL BASE DITCH SEE DETAIL AC

3 TONS CL B RIPRAP W/10 SY GEO FAB

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

TOE PROTECTION W/CL I RIPRAP SEE DETAIL CL

SPECIAL CUT DITCH SEE DETAIL H

SPECIAL CUT DITCH W/PSMS SEE DETAIL AH

BEGIN SBG +08

END SBG +52

END SBG +75

18" CSP 2 ELBOWS ROD & LUG

15" RCP-III

2GI

505+00

510+00

200' R/W

100 TONS CL II RIPRAP W/150 SY GEO FAB ON BANKS ONLY

PSH SEE DETAIL AP

BEG SBG +45

15" CSP 2 ELBOWS ROD & LUG

PRINCESS BERRY RUN

TRIBUTARY TO PRINCESS BERRY RUN

PASTURE

WOODS

TREES

GRASS

SOIL

GATE

WOOD CHIP BIN

WD STEPS

35 ELEC

ISBKD

48" CONC

18" CONC

48" WM

HW

F

C

S

TS

FS

LEGEND

- – —WLB— · DENOTES WETLAND BOUNDARY
- TS / TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S / S DENOTES PERMANENT IMPACTS IN SURFACE WATER
- F / F DENOTES FILL IN WETLAND

FOR –L– PROFILE SEE SHT. 122

100' 0' 100' 200'
GRAPHIC SCALE

2/2016
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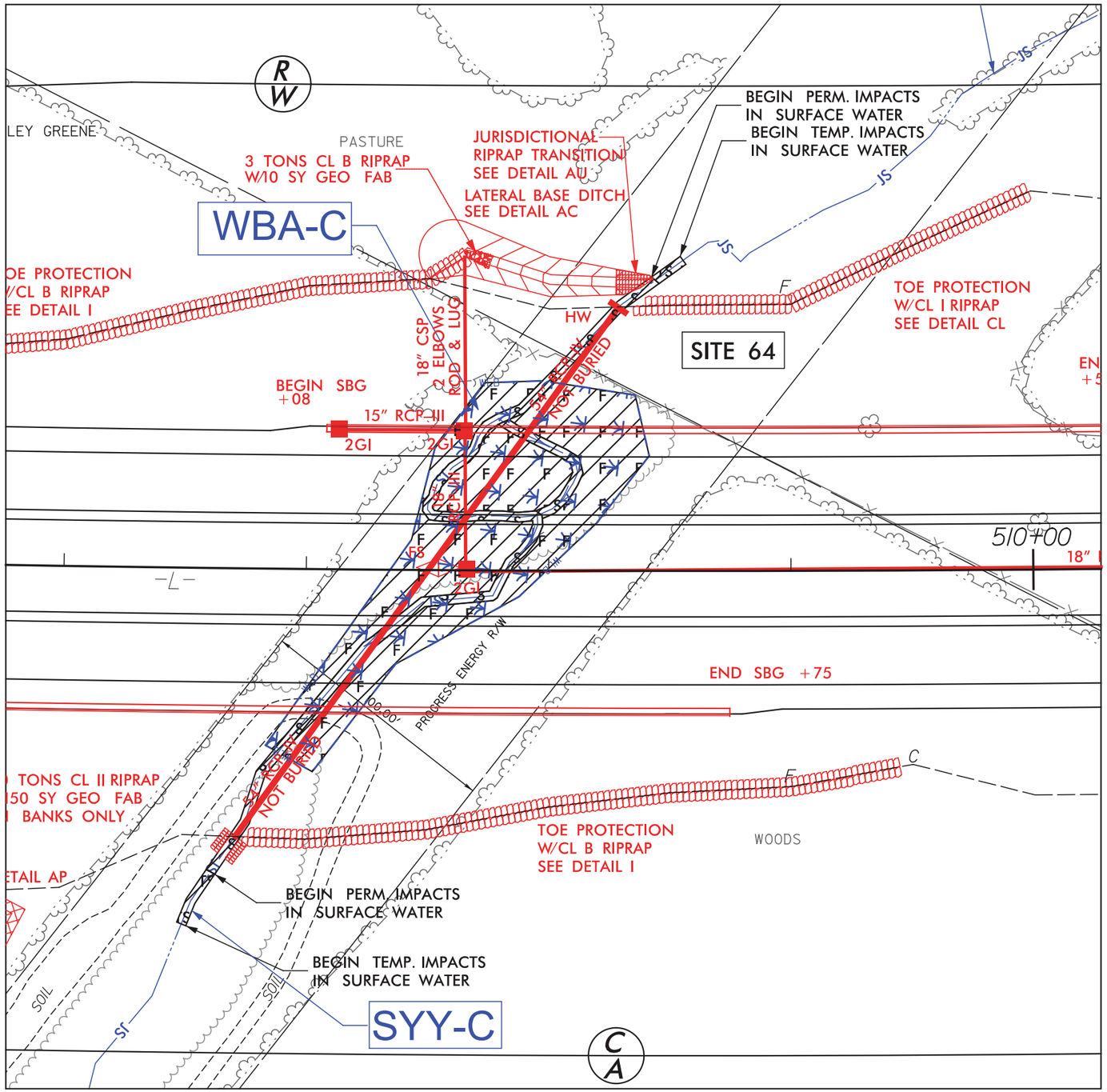
DETAIL SHEET FOR SITE 64



PROJECT REFERENCE NO.	SHEET NO.
R-2536	39A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 162 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS / TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S / S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- F / F — DENOTES FILL IN WETLAND

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 163 OF 257

DOCUMENT NOT CONSIDERED FINAL
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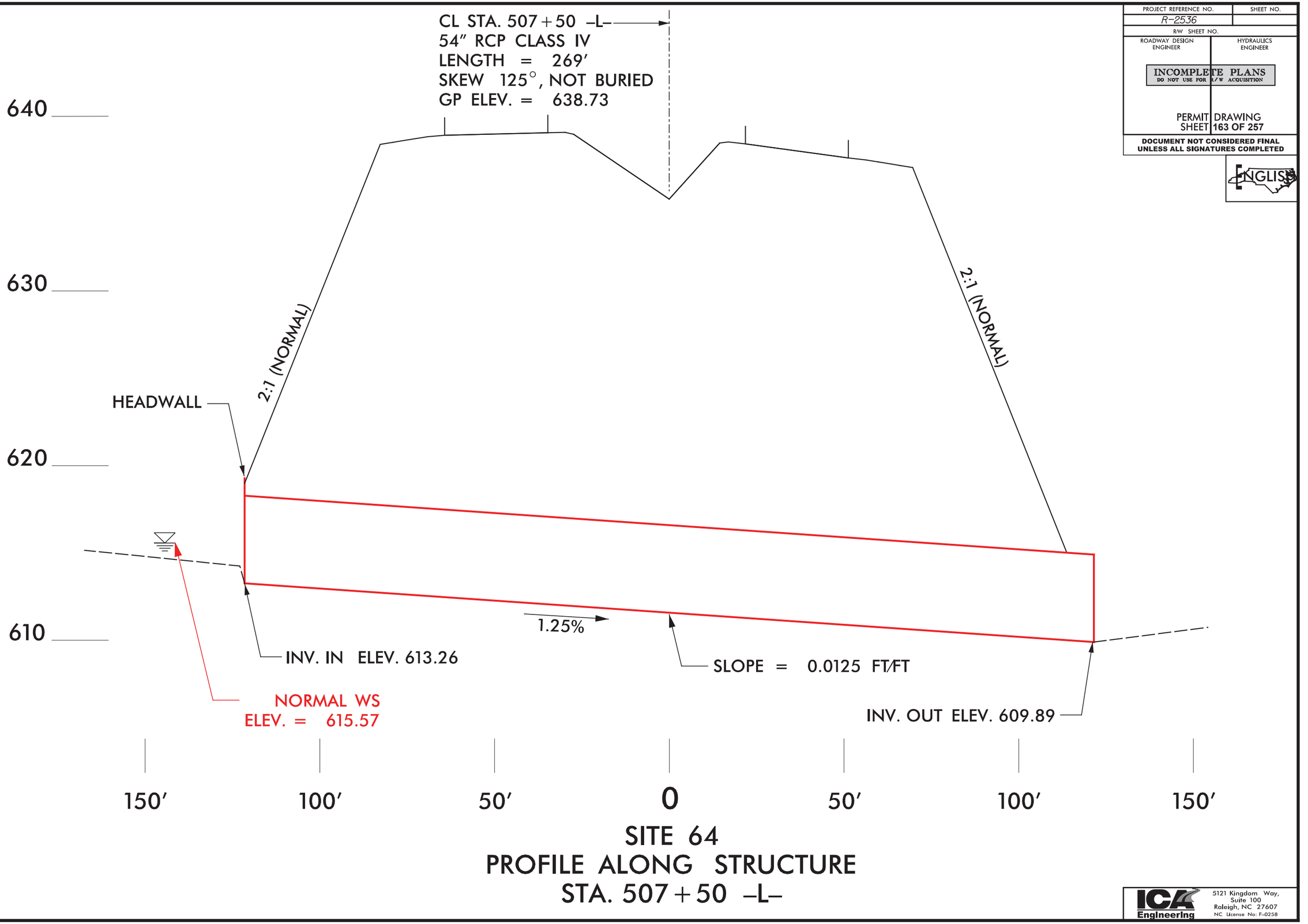
ENGLISH



SITE 64
PROFILE ALONG STRUCTURE
STA. 507+50 –L–

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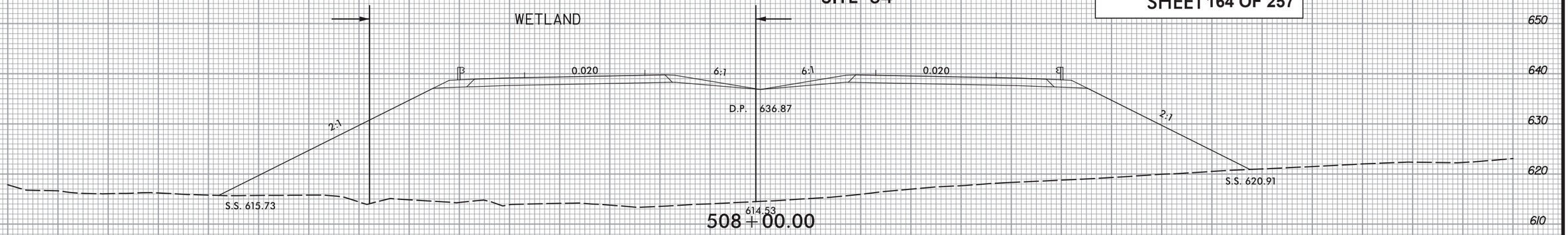
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-31

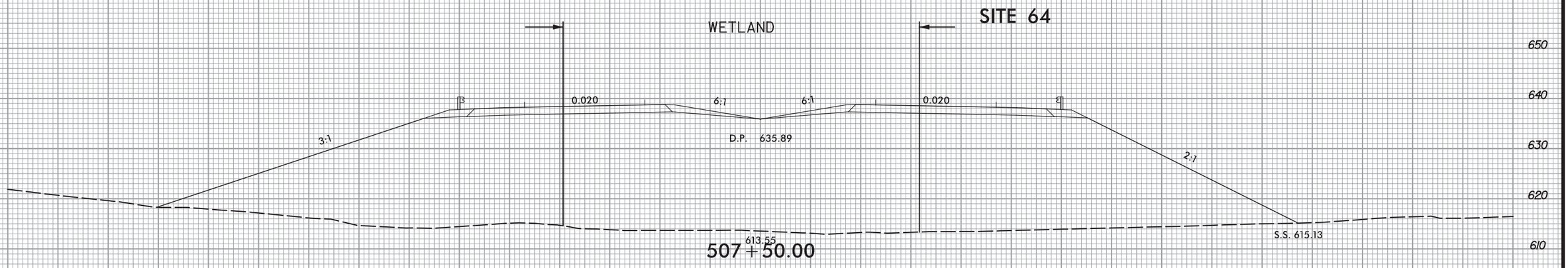
ENGLISH

PERMIT DRAWING
SHEET 164 OF 257

SITE 64

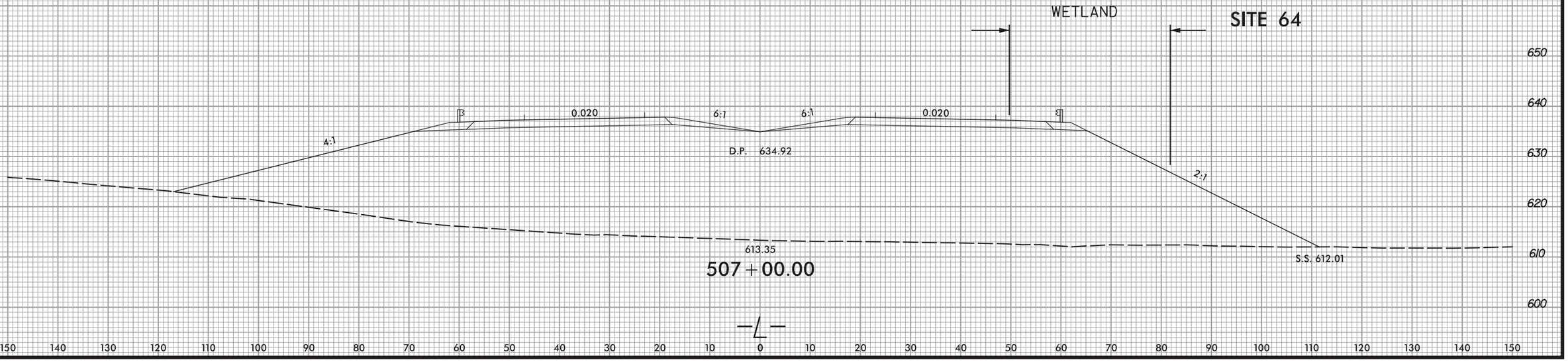


SITE 64



WETLAND

SITE 64



2/2016
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PROJECT REFERENCE NO.	SHEET NO.
R-2536	40
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 165 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83'95

WILLIAM MALPASS

198 SHELIA WINNINGHAM

BRIAN YOW 199

198 SHELIA WINNINGHAM

EY2 TO PINE HILL ROAD SR 2824

MATCHLINE -L- STA 514+00 SEE SHEET 39

MATCHLINE -L- STA 525+00 SEE SHEET 41

515+00

520+00

-L-

200' R/W

CUTOVER

SITE 65

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

40 LF OF INLET CHANNEL IMPROVEMENT EST. 70 TONS CL II RIPRAP EST. 70 SY GEOTEXTILE

LATERAL BASE DITCH SEE DETAIL CG

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

FS 2GI

BEGIN SBG +06

15" RCP-III

1 @ 6' x 7' RCBC

18" RCP-III

24" CSP

WOODS

CUTOVER

SPECIAL CUT DITCH SEE DETAIL H

BEGIN SBG +00

END SBG +94

40 LF OF OUTLET CHANNEL IMPROVEMENT EST. 55 TONS CASS II RIPRAP EST. 60 SY GEOTEXTILE

15" CSP 2 ELBOWS ROD & LUG

PSH SEE DETAIL AP

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

LATERAL BASE DITCH SEE DETAIL AC

5 TONS CL B RIPRAP W/14 SY GEO FAB

SJ-C

197 HENRY SALERS

196 ALLISON BRASWELL & BAILEY GREENE

198 SHELIA WINNINGHAM

200 FURMAN GREENE, JR.

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

SITE 65
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

FOR -L- PROFILE SEE SHT. 123

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	40
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 166 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

MATCHLINE –L– STA 514+00
SEE SHEET 39

MATCHLINE –L– STA 525+00
SEE SHEET 41

WILLIAM MALPASS

198 SHELIA WINNINGHAM

BRIAN YOW

199

HTR

DK

SHELIA WINNINGHAM

198

–EY2– 70 PINE HILL ROAD SR 2824

NAD 83'95

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

40' LF OF INLET CHANNEL IMPROVEMENT EST. 70 TONS CL II RIPRAP EST. 70 SY GEOTEXTILE

LATERAL BASE DITCH SEE DETAIL CG

WOODS

SITE 65

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

CUTOVER

FS

2GI

15" RCP-III

BEGIN SBG +06

1 @ 6' x 7' RCBC

18" RCP-III

END SBG +94

WOODS

CUTOVER

SPECIAL CUT DITCH SEE DETAIL H

BEGIN SBG +00

15" CSP 2 ELBOWS W/ HOOD & TUBE

40 LF OF OUTLET CHANNEL IMPROVEMENT EST. 55 TONS CASS II RIPRAP EST. 60 SY GEOTEXTILE

24" CSP

5 TONS CL B RIPRAP W/14 SY GEO FAB

LATERAL BASE DITCH SEE DETAIL AC

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

PSH SEE DETAIL AP

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

SJ-C

197 HENRY SALERS

196 ALLISON BRASWELL & BAILEY GREENE

198 SHELIA WINNINGHAM

200 FURMAN GREENE, JR.

200' R/W

515+00

520+00

SITE 65
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR –L– PROFILE SEE SHT. 123

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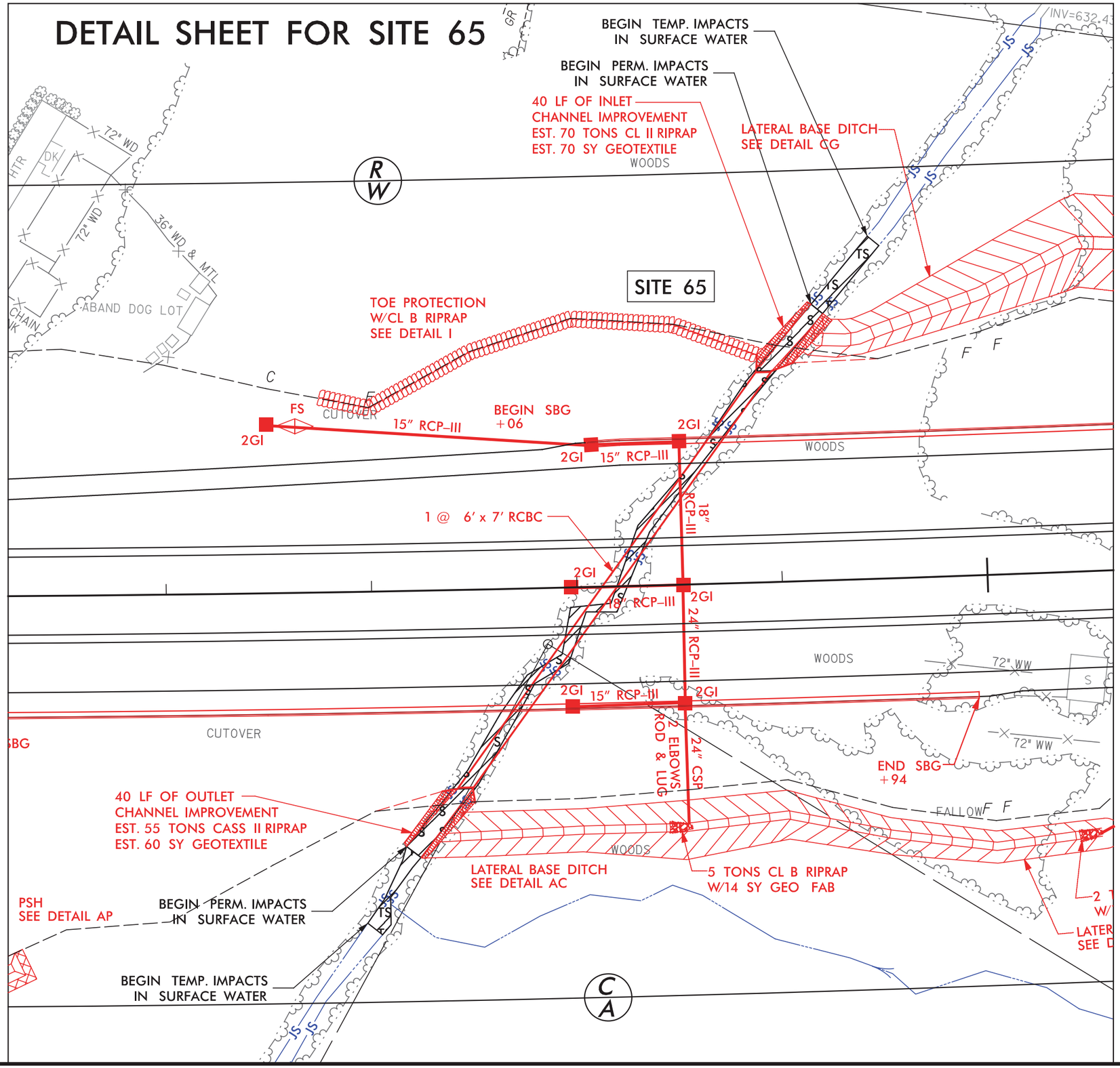
DETAIL SHEET FOR SITE 65



PROJECT REFERENCE NO.	SHEET NO.
R-2536	40A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 167 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'
GRAPHIC SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

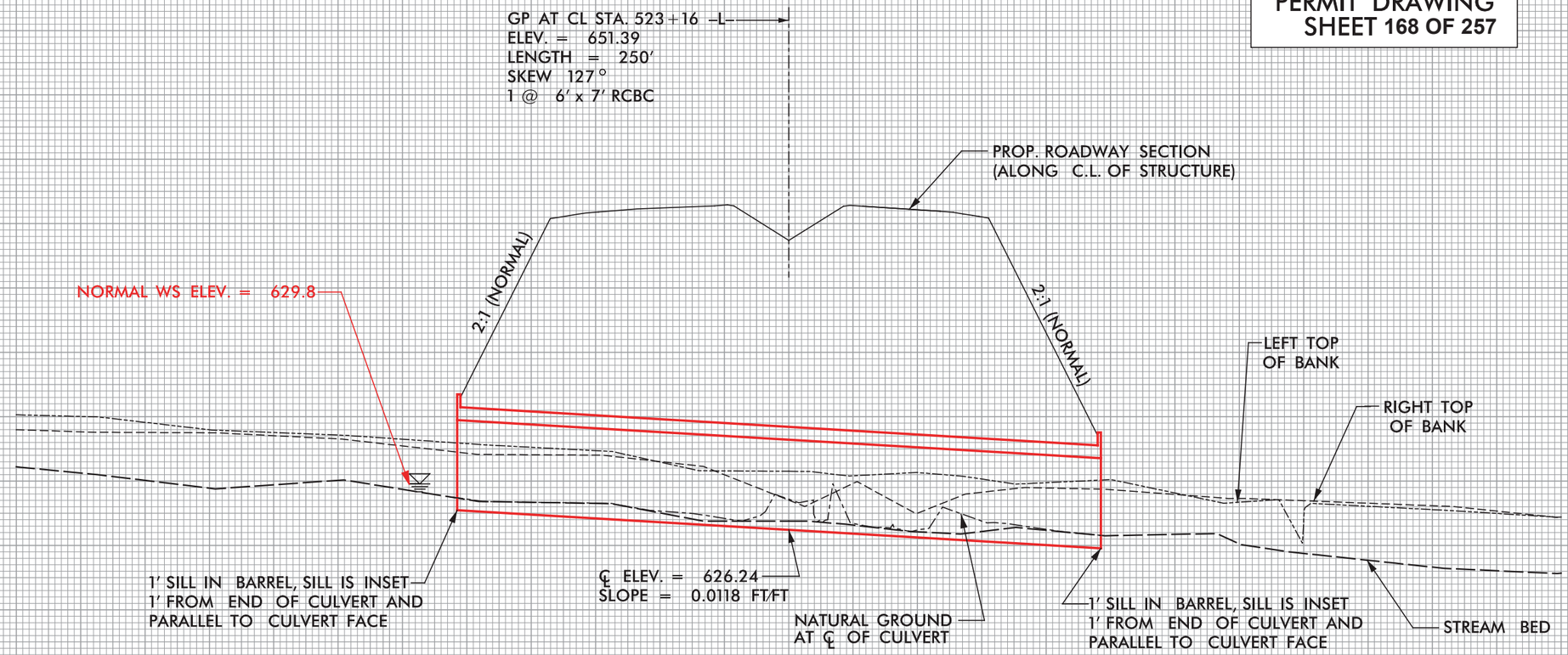
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

PERMIT DRAWING
SHEET 168 OF 257

SITE 65
–L– 523+16



PROPOSED 1 @ 6'x 7'RCBC

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

250 200 150 100 50 0 50 100 150 200 250

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REVISIONS
RIGHT-OF-WAY REVISION 1-29-2016 : ADDED PUE ON PARCEL 224 FROM -Y12- 25+42.22 TO -Y12- 26+57.02 LT

PROJECT REFERENCE NO.	SHEET NO.
R-2536	41
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR C/E ACQUISITION

PERMIT DRAWING
SHEET 169 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

MATCHLINE -Y12- STA 40+50
SEE SHEET 97

MATCHLINE -L- STA. 525+00
SEE SHEET 40

MATCHLINE -L- STA. 553+00
SEE SHEET 42

MATCHLINE -Y12- STA 26+00
SEE SHEET 96

NAD 1983

SITE 66
SITE 67
SITE 68
SITE 69

SK-C

–L– (US 64 BYPASS) –Y12– (NC 42)		
ADT 2015 ADT 2040	7,800 9,400	
2,500 3,400		2,300 2,900
US 64 BYPASS –L–		7,000 10,300
7,400 11,700		
2,500 4,000		2,300 3,100
	7,900 10,200	

–Y12– (NC 42)

PAVEMENT–BRIDGE RELATIONSHIP SKETCH

–L– POT 546+93.98 =
–Y12– POT 3+79.00 STA.

8' P.S. 8' P.S. –Y12– –L– 35+00 8' P.S. 8' P.S.
24' 22' 60.00' 250' MIN. CLEAR RDWY

LEGEND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES PERMANENT IMPACTS IN SURFACE WATER

SITE 66, 67, 68, AND, 69,
PLAN VIEW

* GUARDRAIL ANCHOR UNIT REQUIRED

BRIDGE APPROACH SLAB

PAVEMENT REMOVAL

FOR –L– PROFILE SEE SHTS. 123 – 124
FOR –Y12– PROFILE SEE SHT. 185
FOR –Y12RPB– PROFILE SEE SHTS. 186 – 187
FOR –Y12RPC– PROFILE SEE SHT. 188
FOR –Y12LPB– PROFILE SEE SHT. 187
FOR –Y12LPC– PROFILE SEE SHT. 189

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2121 Kingdom Way
Suite 100
Raleigh, NC 27607
NC License No: P-0258

LOCATION: NC 42 -Y12-2 AT US 64 BYPASS (–L–)

TIP NO.: R-2536 COUNTY: RANDOLPH

DESIGNED BY: HWB

CHECKED BY: DCW DATE: 7-23-15

GRAPHIC SCALE
50 25 0 50 100
PLANS

2/27/2016
2:43:57 PM
K:\ENTERPRISE\ROADWAY\SHEETS\

REVISIONS
RIGHT-OF-WAY REVISION 1-29-2016 : ADDED PUE ON PARCEL 224 FROM -Y12- 25+42.22 TO -Y12- 26+57.02 LT

PROJECT REFERENCE NO.	SHEET NO.
R-2536	41
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR C/E AUTHORIZATION

PERMIT DRAWING
SHEET 170 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

MATCHLINE –Y12– STA 40+50
SEE SHEET 97

NAD 83/93

MATCHLINE –L– STA. 525+00
SEE SHEET 40

MATCHLINE –L– STA. 553+00
SEE SHEET 42

MATCHLINE –Y12– STA 26+00
SEE SHEET 96

B

C

SITE 66

SITE 67

SITE 68

SITE 69

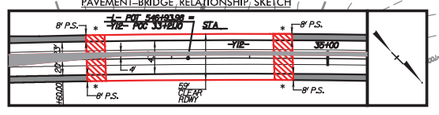
SK-C

–L– (US 64 BYPASS) –Y12– (NC 42)

ADT 2015 ADT 2040		7,800 9,400	
	2,500 3,400		2,300 2,900
US 64 BYPASS –L–			7,000 10,300
7,400 11,700	2,500 4,000		2,300 3,100
		7,900 10,200	

–Y12– (NC 42)

PAVEMENT–BRIDGE RELATIONSHIP, SKETCH



* GUARDRAIL ANCHOR UNIT REQUIRED

BRIDGE APPROACH SLAB

PAVEMENT REMOVAL

LEGEND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES PERMANENT IMPACTS IN SURFACE WATER

SITE 66, 67, 68, AND, 69, PLAN VIEW

FOR –L– PROFILE SEE SHTS. 123 – 124
FOR –Y12– PROFILE SEE SHT. 185
FOR –Y12RPB– PROFILE SEE SHTS. 186 – 187
FOR –Y12RPC– PROFILE SEE SHT. 188
FOR –Y12LPB– PROFILE SEE SHT. 187
FOR –Y12LPC– PROFILE SEE SHT. 189

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Suite 100
Raleigh, NC 27607
NC License No: P-0238

LOCATION:	NC 42 –Y12-2 AT US 64 BYPASS (–L–)
TIP NO.: R-2536	COUNTY: RANDOLPH
DESIGNED BY: HWB	
CHECKED BY: DCW	DATE: 7-23-15

GRAPHIC SCALE
50 25 0 50 100
PLANS

2/27/2016
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PROJECT REFERENCE NO.	SHEET NO.
R-2536	41
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 171 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

REVISIONS

MATCHLINE –Y12– STA 40+00

MATCHLINE –L– STA 541+00

MATCHLINE –L– STA 553+00

MATCHLINE –Y12– STA 30+00

2 TONS CL B RIPRAP W/7 SY GEO FAB

20' x 10' PSRM

SPECIAL CUT DITCH W/PSRM SEE DETAIL AH

REMOVE RCP-III

DI 60" RCP-III

2GI JB w/MH

39" CSP 2 ELBOWS ROD&LUG

30" RCP-III

8 TONS CL B RIPRAP W/8 SY GEO FAB

STANDARD GRASS SWALE SEE DETAIL AR DDE=190 CY

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

20 LF SLOPE=0.5%

SITE 66

JURISDICTIONAL RIPRAP TRANSITION SEE DETAIL AU

KENYON DAVIDSON, JR.

213

60" CHL

HTR

TO NC HWY 42

CENTER LINE

OLD FORD

910

NCDOT DB 2369 PG 391

226

THE McDOWELL FAMILY LIMITED PARTNERSHIP

212

ROBERT DAVIDSON

WOODS

BERM DITCH SEE DETAIL A

6" DECK DRAINS @ 6' O.C. LT OF –Y12– ISLAND FROM STA. 32+20 TO STA. 32+56 STA. 33+04 TO STA. 33+10 STA. 33+30 TO STA. 33+36 STA. 33+88 TO STA 34+24

15" CSP 2 ELBOWS ROD & LUG

BDO

2 TONS CL B RIPRAP W/7 SY GEO FAB

SPECIAL LATERAL 'V' DITCH SEE DETAIL J

REMOVE 18" RCP

18" CSP 2 ELBOWS ROD & LUG

18" RCP-III

JB w/MH

3 TONS CL B RIPRAP W/10 SY GEO FAB

STANDARD GRASS SWALE SEE DETAIL CS DDE=135 CY

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

JURISDICTIONAL RIPRAP TRANSITION SEE DETAIL AU

SITE 67

20 LF SLOPE=0.5%

SLOPE=3%

20' X 10' PSRM

END SBG +74

BEGIN SBG +56

BEGIN SBG +72

HW w/SILL

SPECIAL CUT DITCH SEE DETAIL H

NC HWY 42 24' PAVED ROADWAY

200' R/W

545+00

550+00

SITE 68

–L–

BEGIN SBG +88

END SBG +63

END SBG +91

5 TONS CL B RIPRAP W/14 SY GEO FAB

24" RCP-III

66" RCP-III BURIED 1'

PSH SEE DETAIL AP

120 TONS CL II RIPRAP W/183 SY GEO FAB ON BANKS ONLY

LATERAL BASE DITCH W/CL B RIPRAP SEE DETAIL V

SITE 69

JURISDICTIONAL RIPRAP TRANSITION SEE DETAIL AU

GRASS

GRAVEL

EXISTING R/W

60.00'

100.00'

CB

DI

GR

S

TDE

NAD 83/95

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

SITE 66, 67, 68 AND 69 PLAN VIEW

100' 0' 100' 200'

GRAPHIC SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	41
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 172 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

REVISIONS

MATCHLINE –Y12– STA 40+00

MATCHLINE –L– STA 541+00

MATCHLINE –L– STA 553+00

MATCHLINE –Y12– STA 30+00

25+00 20+00 15+00 –Y12– 35+00 545+00 550+00

SITE 66 SITE 67 SITE 68 SITE 69

20' x 10' PSRM

SPECIAL CUT DITCH W/PSRM SEE DETAIL AH

2 TONS CL B RIPRAP W/7 SY GEO FAB

6" DECK DRAINS @ 6' O.C.
LT OF –Y12– ISLAND FROM
STA. 32+20 TO STA. 32+56
STA. 33+04 TO STA. 33+10
STA. 33+30 TO STA. 33+36
STA. 33+88 TO STA. 34+24

BERM DITCH SEE DETAIL A

SPECIAL LATERAL 'V' DITCH SEE DETAIL

SPECIAL CUT DITCH SEE DETAIL AI

SPECIAL CUT DITCH SEE DETAIL AI

SPECIAL LATERAL 'V' DITCH SEE DETAIL J

SPECIAL LATERAL 'V' DITCH SEE DETAIL J

REMOVE EXISTING 36" CMP

REMOVE EXISTING 48" CMP

REMOVE EXISTING 24" CMP

REMOVE EXISTING 18" CMP

REMOVE EXISTING 15" CMP

REMOVE EXISTING 60" CMP

REMOVE EXISTING 60" CHU

REMOVE EXISTING 24" RCP

REMOVE EXISTING 18" RCP

REMOVE EXISTING 15" RCP

REMOVE EXISTING 24" RCP

REMOVE EXISTING 18" RCP

REMOVE EXISTING 15" RCP

REMOVE EXISTING 8' BOX CULVERT

REMOVE EXISTING 6' BOX CULVERT

REMOVE EXISTING 6' BOX CULVERT

REMOVE EXISTING 6

PROJECT REFERENCE NO.	SHEET NO.
R-2536	4IA
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 173 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

DETAIL SHEET FOR SITE 66, 67

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

50′ 25′ 0′ 50′ 100′
GRAPHIC SCALE

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SITE 66

2GI JB w/MH
30" CSP
2 ELBOWS
ROD&LUG
30" RCP–III
SLOPE = 3%
TDE
8 TONS CL B RIPRAP
W/21 SY GEO FAB
STANDARD GRASS SWALE
SEE DETAIL AR
DDE = 190 CY
20 LF
SLOPE = 0.5%
BEGIN TEMP. IMPACTS
IN SURFACE WATER
BEGIN PERM. IMPACTS
IN SURFACE WATER
BEGIN TEMP. IMPACTS
IN SURFACE WATER
BEGIN PERM. IMPACTS
IN SURFACE WATER
JURISDICTIONAL
RIPRAP TRANSITION
SEE DETAIL AU
KENYON DAVIDSON, JR.
213
60" CHL
WOODS
910
NCDC
AP
15" RCP–IV
DI
CB
EXISTING R/W
20+00
100.00'
F
C
E
RW
WOODS

SITE 67

STANDARD GRASS SWALE
SEE DETAIL CS
DDE = 135 CY
3 TONS
CL B RIPRAP
W/10 SY
GEO FAB
BEGIN TEMP. IMPACTS
IN SURFACE WATER
BEGIN PERM. IMPACTS
IN SURFACE WATER
JURISDICTIONAL
RIPRAP TRANSITION
SEE DETAIL AU
BEGIN TEMP. IMPACTS
IN SURFACE WATER
BEGIN PERM. IMPACTS
IN SURFACE WATER
WOODS
18" CSP
2 ELBOWS
ROD & LUG
JB
w/MH
SLOPE = 3%
20 LF
SLOPE = 0.5%
DI
2GI
15" RCP–IV
18" RCP–III
18" RCP–II
REMOVE
35+00
–Y12–
EXISTING R/W
E
RW

PROJECT REFERENCE NO.	SHEET NO.
R-2536	41B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 174 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

DETAIL SHEET FOR SITE 68, 69

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

50′ 25′ 0′ 50′ 100′
GRAPHIC SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 175 OF 257

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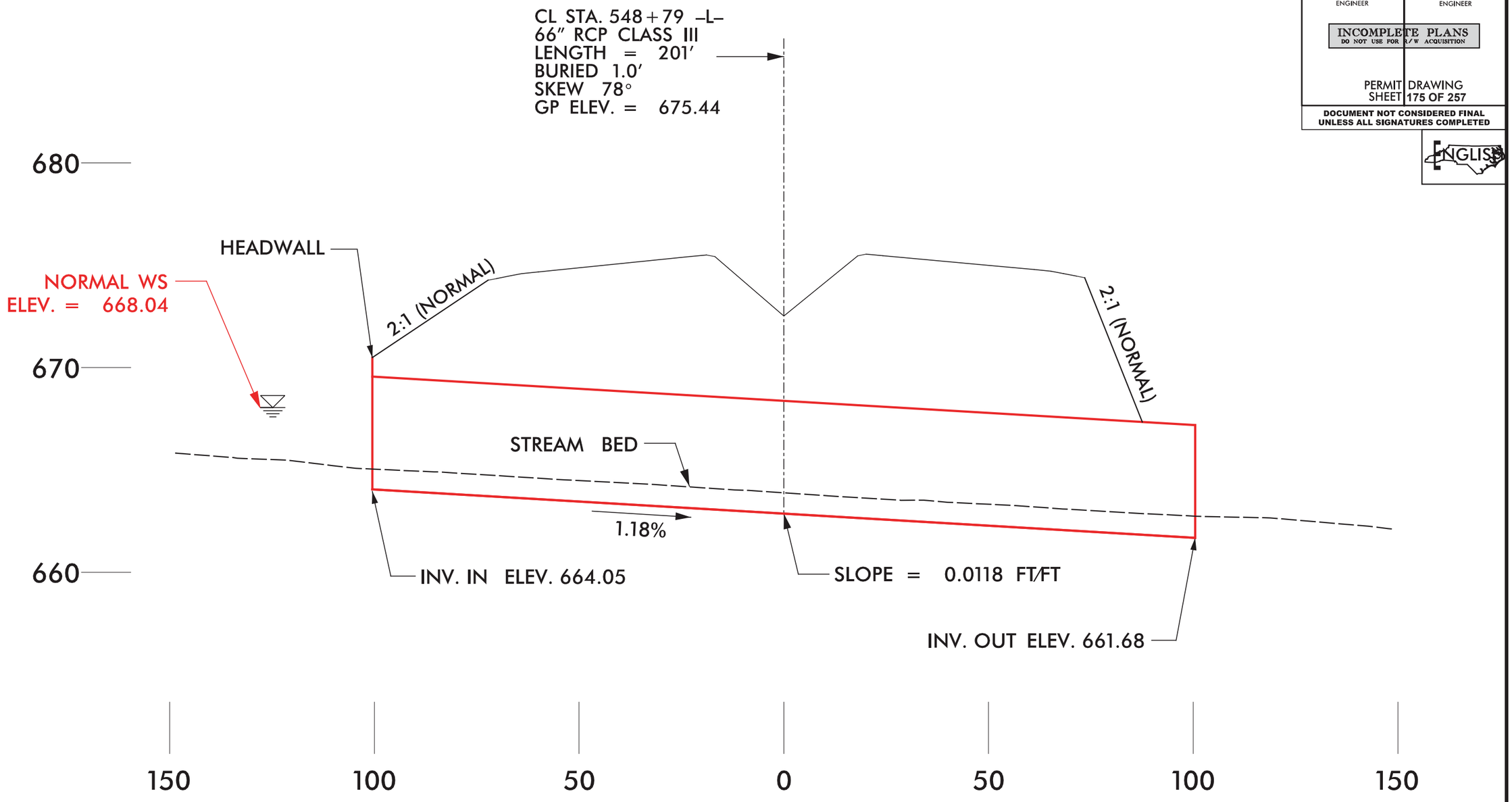
ENGLISH



SITE 68
PROFILE ALONG STRUCTURE
STA. 548+79 –L–

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	42
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PERMIT DRAWING
SHEET 176 OF 257

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DARRELL MILLER

DAVID LAMB

BUFFALO CHURCH ROAD (SR 2020)

EXISTING R/W

20' PAVED ROADWAY

DEAD END

CENTURY LINK

15" RCP

90 W/LT

EXISTING R/W

ISFD

ABAND

DAVID LAMB

228 KENYON DAVIDSON, JR.

228 KENYON DAVIDSON, JR.

228 KENYON DAVIDSON, JR.

226 THE McDOWELL FAMILY LIMITED PARTNERSHIP

GRAVEL

ROCK

JULIE H. KINNEY & SCOTT HANCOCK

227

TREES

226 THE McDOWELL FAMILY LIMITED PARTNERSHIP

CUTOVER

WOODS

BERM DITCH W/CL B RIPRAP SEE DETAIL Y

SPECIAL CUT DITCH SEE DETAIL H

SPECIAL CUT DITCH SEE DETAIL H

CUTOVER

SWL

200' R/W

SL-C

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

TOE PROTECTION W/CL B RIPRAP HW SEE DETAIL I

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

BEGIN SBG +20

SBG

MATCHLINE -L- STA. 553+00 SEE SHEET 41

555+00

560+00

565+00

MATCHLINE -L- STA. 566+00 SEE SHEET 43

15" RCP-III

18" RCP-III

24" RCP-III

42" RCP-III

2GI

FS

5 TONS CL B RIPRAP W/14 SY GEO FAB

STANDARD BASE DITCH W/CL B RIPRAP SLOPE = 6.25% EST 30 TONS CL B RIPRAP EST 65 SY GEO FAB DDE=14 CY

TDE

CUTOVER

200' R/W

SITE 70

BEGIN PERM. IMPACTS IN SURFACE WATER

72 TONS CL II RIPRAP W/98 SY GEO FAB ON BANKS ONLY

BEGIN TEMP. IMPACTS IN SURFACE WATER

226 THE McDOWELL FAMILY LIMITED PARTNERSHIP

TIDS

100' 0' 100' 200'

GRAPHIC SCALE

SITE 70
PLAN VIEW

LEGEND

TS FS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHT. 124

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	42
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 177 OF 257

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ENGLISH

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MATCHLINE –L– STA. 553+00
SEE SHEET 41

MATCHLINE –L– STA. 566+00
SEE SHEET 43

DARRELL MILLER
DAVID LAMB
BUFFALO ROAD (SR 2302)
20' PAVED ROADWAY
EXISTING R/W
DEAD END
CENTURY LINK
15" RCP
30" RCP
12" CPP
ROCK
ISFD
GRAVEL
TREES
JULIE H. KINNEY & SCOTT HANCOCK
KENYON DAVIDSON, JR.
THE McDOWELL FAMILY LIMITED PARTNERSHIP
CUTOVER
WOODS
SOIL
200' R/W
SL-C
BEGIN TEMP. IMPACTS IN SURFACE WATER
BEGIN PERM. IMPACTS IN SURFACE WATER
TOE PROTECTION W/CL B RIPRAP SEE DETAIL I
BERM DITCH W/CL B RIPRAP SEE DETAIL Y
SPECIAL CUT DITCH SEE DETAIL H
BEGIN SBG +20
SITE 70
BEGIN PERM. IMPACTS IN SURFACE WATER
72 TONS CL II RIPRAP W/98 SY GEO FAB ON BANKS ONLY
BEGIN TEMP. IMPACTS IN SURFACE WATER
5 TONS CL B RIPRAP W/14 SY GEO FAB
STANDARD BASE DITCH W/CL B RIPRAP SEE DETAIL BY
SLOPE = 6.25%
EST. 30 TONS CL B RIPRAP
EST. 95 SY GEO FAB
DDE=14 CY
TDE
555+00
560+00
565+00
2GI
FS
18" RCP-III
15" RCP-III
24" RCP-III
42" RCP-III
JB W/MH

SITE 70
PLAN VIEW

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR –L– PROFILE SEE SHT. 124

100' 0' 100' 200'
GRAPHIC SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	42A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 178 OF 257

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ENGLISH

SL-C

BEGIN TEMP. IMPACTS IN SURFACE WATER

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

HW

BEGIN PERM. IMPACTS IN SURFACE WATER

AL CUT DITCH DETAIL H

CUTOVER

SOIL

200' R/W

42" RCP-V NOT BURIED

565+00

POND

EARTH DAM

2GI FS

NAD 83/95

SITE 70

JB w/MH

42" RCP-III

72 TONS CL II RIPRAP W/98 SY GEO FAB ON BANKS ONLY

BEGIN PERM. IMPACTS IN SURFACE WATER

CUTOVER

AP

BEGIN TEMP. IMPACTS IN SURFACE WATER

JS

SF

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'
GRAPHIC SCALE

DETAIL SHEET FOR SITE 70

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	44
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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ENGLISH

NAD 83/95

226
THE McDOWELL FAMILY LIMITED PARTNERSHIP

234
JARRELL INVESTMENT PROPERTIES, LLC

MATCHLINE –L– STA. 579+00
SEE SHEET 43

MATCHLINE –L– STA. 592+00
SEE SHEET 45

SITE 71

SITE 72

SN-C

SM-C

WB-C

LATERAL BASE DITCH SEE DETAIL CD

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

3 TONS CL B RIPRAP W/10 SY GEO FAB

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

LATERAL BASE DITCH W/CL B RIPRAP SEE DETAIL BY

CUTOVER

200' R/W

SPECIAL CUT DITCH SEE DETAIL H

BEGIN SBG +56

END SBG +07

2 CSP 2 ELBOW W/ ROD & LUG

18" RCP-III

15" RCP-III

60" RCP-V NOT BURIED

40" RCP-V NOT BURIED

580+00

585+00

590+00

WOODS

GRASS

SOIL

JURISDICTIONAL RIPRAP TRANSITION SEE DETAIL AU

LATERAL 'V' DITCH SEE DETAIL D

54" RCP-III NOT BURIED

SPECIAL CUT DITCH W/PSRM SEE DETAIL AH

15" CSP 2 ELBOWS ROD & LUG

119 TONS CL II RIPRAP W/150 GEO FAB

ARMOR 50' OF RIGHT BANK 3' HIGH FROM PIPE OUTFALL W/EST 40 TONS CL I RIP RAP EST 55 SY GEO FAB

BDO

18" CSP

3 TONS CL B RIPRAP W/10 SY GEO FAB

LATERAL BASE DITCH W/CL B RIPRAP SEE DETAIL BY

BEGIN PERM. IMPACTS IN SURFACE WATER

144 TONS CL II RIPRAP W/185 GEO FAB

BEGIN TEMP. IMPACTS IN SURFACE WATER

ROCK WALK

CONC

25TD

ISMTLBUS

232
CHARLIE & PATTY WILLARD

233
PHILIP SMITH

234
JARRELL INVESTMENT PROPERTIES, LLC

SITE 71 AND 72
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- F F — DENOTES FILL IN WETLAND

FOR –L– PROFILE SEE SHT. 125

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	44
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 180 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

MATCHLINE –L– STA. 579+00 SEE SHEET 43

MATCHLINE –L– STA. 592+00 SEE SHEET 45

226 THE McDOWELL FAMILY LIMITED PARTNERSHIP

234 JARRELL INVESTMENT PROPERTIES, LLC

232 CHARLIE & PATTY WILLARD

233 PHILIP SMITH

234 JARRELL INVESTMENT PROPERTIES, LLC

SITE 71

SITE 72

SM-C

WB-C

SN-C

LATERAL BASE DITCH SEE DETAIL CD

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

3 TONS CL B RIPRAP W/10 SY GEO FAB

LATERAL BASE DITCH W/CL B RIPRAP SEE DETAIL BY

CUTOVER

200' R/W

SPECIAL CUT DITCH SEE DETAIL H

END SBG +07

BEGIN SBG +56

2 ELBOWS ROD & LUG

18" RCP-III

14" RCP-III

15" RCP-III

60" RCP-III NOT BURIED

580+00

585+00

590+00

WOODS

GRASS

SOIL

ROCK WALL

DOME

ISMTLBUS

BDO

144 TONS CL II RIPRAP W/185 GEO FAB

BEGIN TEMP. IMPACTS IN SURFACE WATER

JURISDICTIONAL RIPRAP TRANSITION SEE DETAIL AU

LATERAL 'V' DITCH SEE DETAIL D

SPECIAL CUT DITCH W/PSRM SEE DETAIL AH

54" RCP-III

15" CSP/ 2 ELBOWS ROD & LUG

119 TONS CL II RIPRAP W/150 GEO FAB

ARMOR 50' OF RIGHT BANK 3' HIGH FROM PIPE OUTFALL W/EST 40 TONS CL I RIP RAP EST 55 SY GEO FAB

SITE 71 AND 72 PLAN VIEW

100' 0' 100' 200'

GRAPHIC SCALE

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- 18 FS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- F F — DENOTES FILL IN WETLAND

FOR –L– PROFILE SEE SHT. 125

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NC License No: F-0258

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DETAIL SHEET FOR SITE 71

PROJECT REFERENCE NO.	SHEET NO.
R-2536	44A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 181 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

LATERAL BASE DITCH
SEE DETAIL CD

BEGIN TEMP. IMPACTS
IN SURFACE WATER

BEGIN PERM. IMPACTS
IN SURFACE WATER

TOE PROTECTION
W/CL B RIPRAP
SEE DETAIL I

3 TONS CL B RIPRAP
W/10 SY GEO FAB

LATERAL BASE DITCH
W/CL B RIPRAP
SEE DETAIL BY

3 TONS CL B RIPRAP
W/10 SY GEO FAB

SPECIAL CUT
SEE DETAIL H

SITE 71

BEGIN SBG
+56

END SBG
+07

18" CSP
2 ELBOW
ROD & LUG

60" RCP-V
NOT BURIED

15" CSP

18"
RCP-III

15"
RCP-III

580+00

2GI

FS

HW

SM-C

WB-C

LATERAL BASE DITCH
W/CL B RIPRAP
SEE DETAIL BY

BDO

18" CSP

3 TONS CL B RIPRAP
W/10 SY GEO FAB

LATERAL BASE DITCH
W/CL B RIPRAP
SEE DETAIL BY

144 TONS CL II RIPRAP
W/18 SY GEO FAB

BEGIN PERM. IMPACTS
IN SURFACE WATER

BEGIN TEMP. IMPACTS
IN SURFACE WATER

60" RCP-V
NOT BURIED

CUTOVER

WOODS

200'
R/W

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- F F — DENOTES FILL IN WETLAND

50' 25' 0' 50' 100'
GRAPHIC SCALE

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Raleigh, NC 27607
NC License No: F-0258

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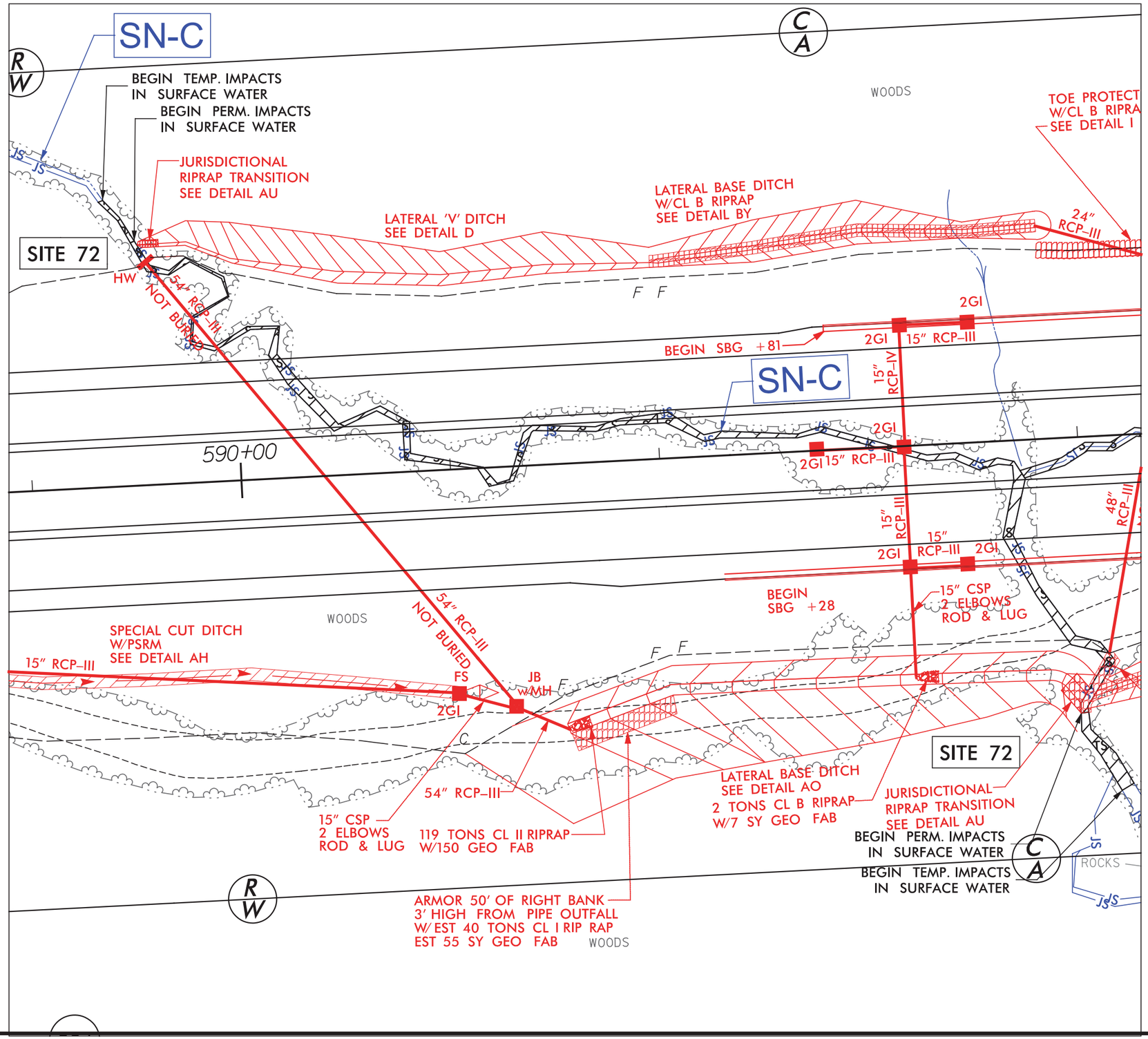
R:\Hydraulics\PERMITS Environmental\Drawings\R2536 hyd prm wet psh 044 site 71 detail.dgn

DETAIL SHEET FOR SITE 72



PROJECT REFERENCE NO.	SHEET NO.
R-2536	44B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 182 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'
GRAPHIC SCALE

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CL STA. 581+67 –L–, 60" RCP CLASS V
LENGTH = 283', SKEW 63°, NOT BURIED,
GP ELEV. = 682.01

680

670

2:1 (NORMAL)

2:1 (NORMAL)

HEADWALL

660

NORMAL
WS ELEV.
= 653.83

650

INV. IN ELEV. 651.74

SLOPE = 0.0427

4.27%

640

INV. OUT ELEV. 639.67

150' 100' 50' 0 50' 100' 150'

PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 183 OF 257

DOCUMENT NOT CONSIDERED FINAL
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SITE 71
PROFILE ALONG STRUCTURE
STA. 581+67 –L–

2232016
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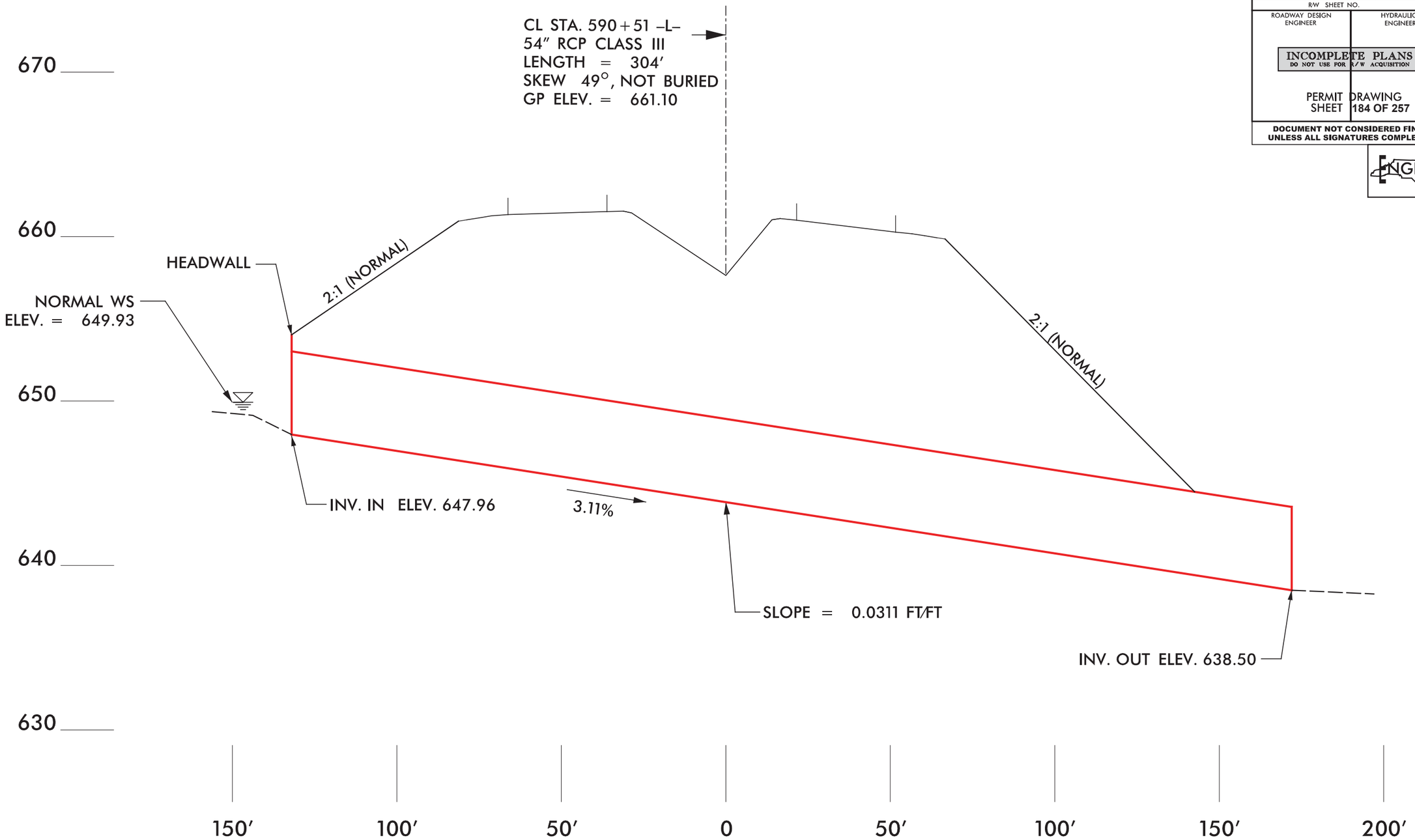
PROJECT REFERENCE NO.	SHEET NO.
R-2536	44
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 184 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



SITE 72
PROFILE ALONG STRUCTURE
STA. 590+51 –L–

2232016
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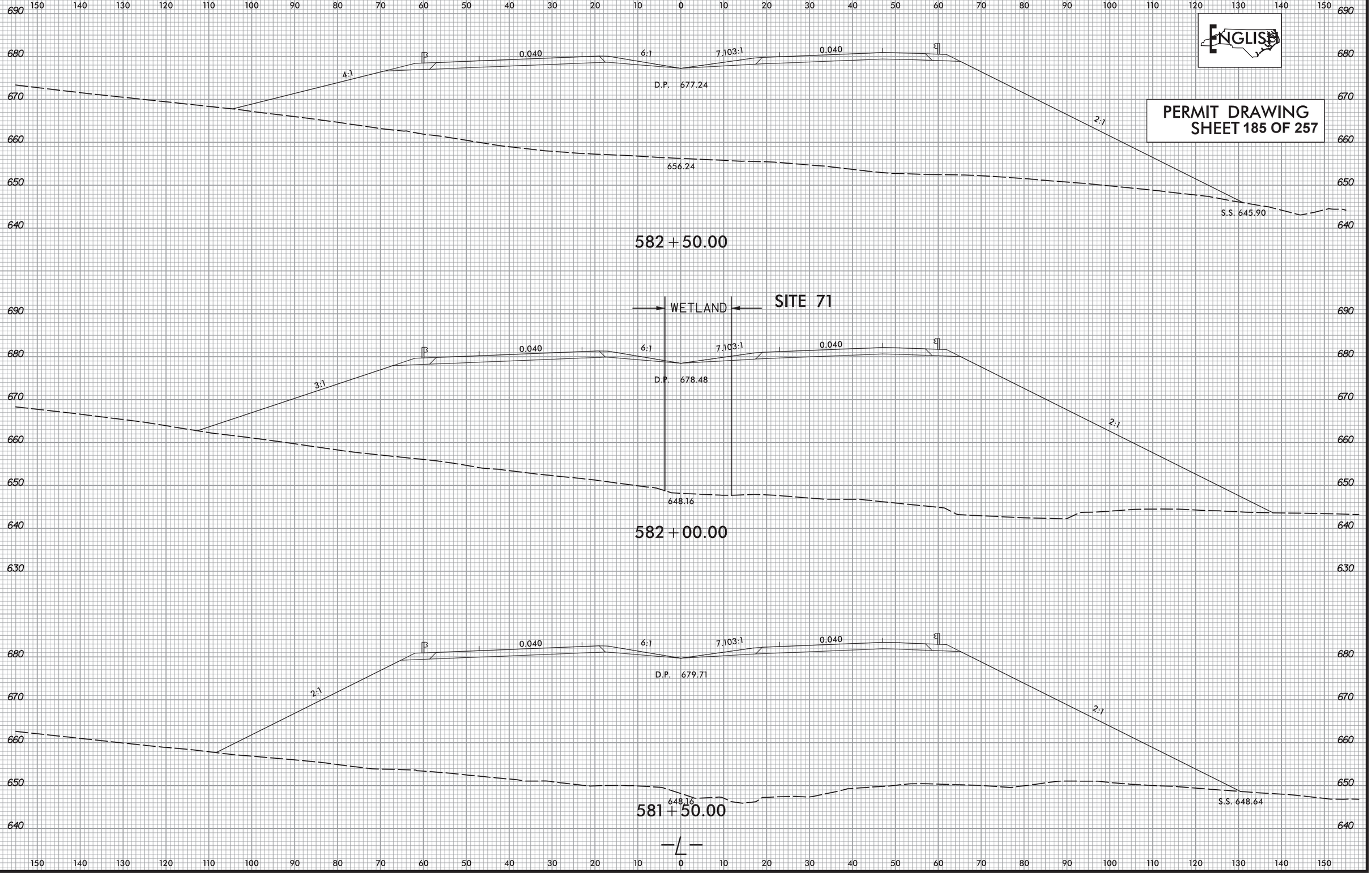
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-86

ENGLISH

PERMIT DRAWING
SHEET 185 OF 257



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PROJECT REFERENCE NO.	SHEET NO.
R-2536	45
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

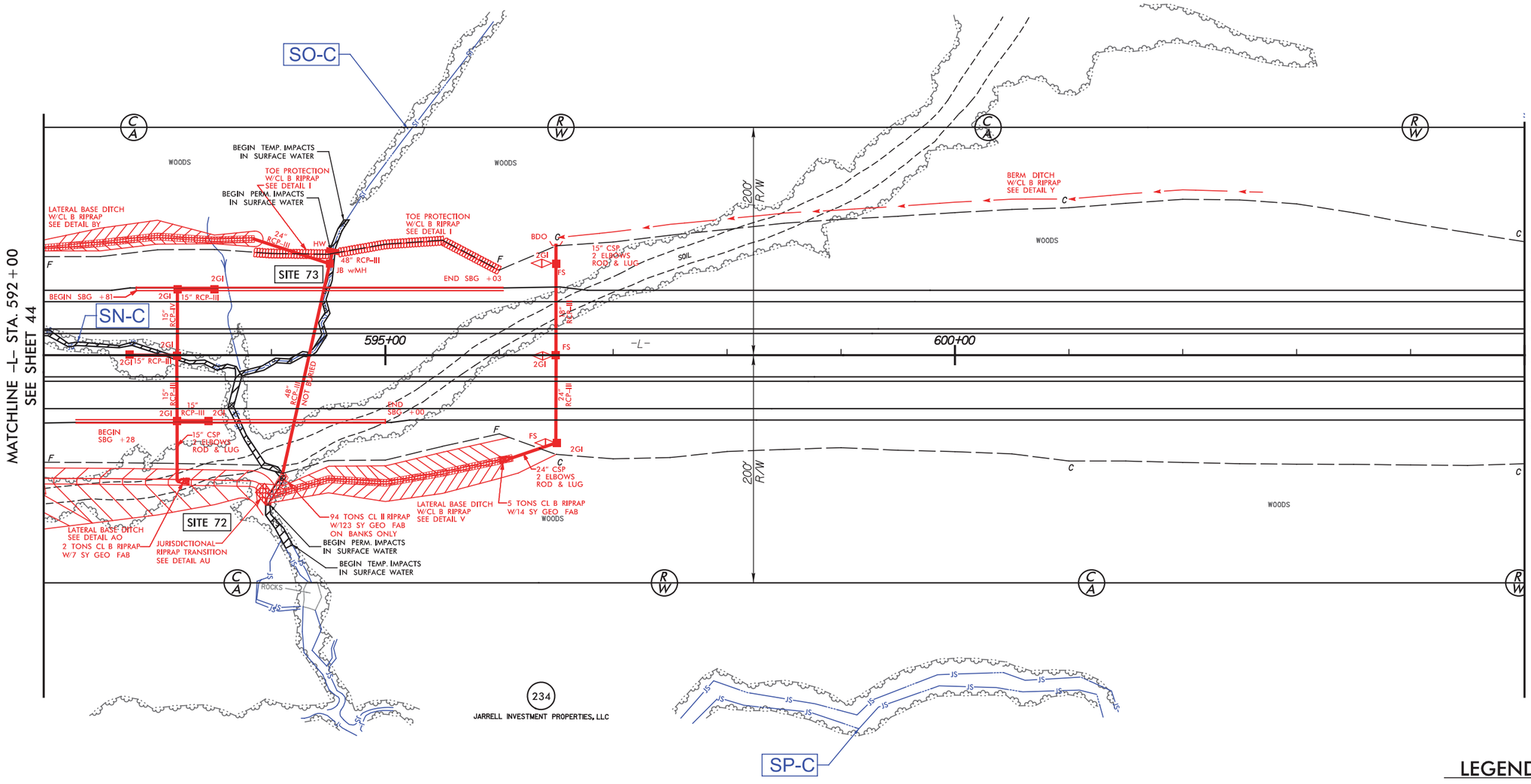
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 186 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95



SITE 72 AND 73
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR –L– PROFILE SEE SHTS. 125 – 126

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	45
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 187 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

MATCHLINE –L– STA. 592+00
SEE SHEET 44

MATCHLINE –L– STA. 605+00
SEE SHEET 46

SO-C

SN-C

SP-C

SITE 73

SITE 72

595+00

600+00

–L–

200' R/W

JARRELL INVESTMENT PROPERTIES, LLC

WOODS

ROCKS

BEGIN TEMP. IMPACTS IN SURFACE WATER

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

BEGIN PERM. IMPACTS IN SURFACE WATER

LATERAL BASE DITCH W/CL B RIPRAP SEE DETAIL BY

24" RCP-III

HW

48" RCP-III

JB w/MH

END SBG +03

BEGIN SBG +81

2GI

15" RCP-III

18" RCP-III

BDO

15" CSP 2 ELBOWS ROD & LUG

SOIL

FS

BERM DITCH W/CL B RIPRAP SEE DETAIL Y

48" RCP-III NOT BURIED

END SBG +00

BEGIN SBG +28

24" CSP 2 ELBOWS ROD & LUG

LATERAL BASE DITCH SEE DETAIL AO

2 TONS CL B RIPRAP W/7 SY GEO FAB

JURISDICTIONAL RIPRAP TRANSITION SEE DETAIL AU

94 TONS CL II RIPRAP W/123 SY GEO FAB ON BANKS ONLY

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

LATERAL BASE DITCH W/CL B RIPRAP SEE DETAIL V

5 TONS CL B RIPRAP W/14 SY GEO FAB

SITE 72 AND 73
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR –L– PROFILE SEE SHTS. 125 – 126

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	45A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 188 OF 257

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

SO-C

C/A

R/W

WOODS

WOODS

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

LATERAL BASE DITCH W/CL B RIPRAP SEE DETAIL BY

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

24" RCP-III

HW

48" RCP-III

JB w/MH

SITE 73

BDO

2GI

15" CSP 2 ELBO ROD &

FS

END SBG +03

BEGIN SBG +81

2GI

15" RCP-III

SN-C

15" RCP-IV

18" RCP-III

595+00

2GI

15" RCP-III

FS

2GI

15" RCP-III

48" RCP-III NOT BURIED

24" RCP-III

15" RCP-III

2GI

2GI

15" CSP 2 ELBOWS ROD & LUG

END SBG +00

FS

2GI

24" CSP 2 ELBOWS ROD & LUG

LATERAL BASE DITCH SEE DETAIL AO 2 TONS CL B RIPRAP W/7 SY GEO FAB

JURISDICTIONAL RIPRAP TRANSITION SEE DETAIL AU

SITE 72

94 TONS CL II RIPRAP W/123 SY GEO FAB ON BANKS ONLY

LATERAL BASE DITCH W/CL B RIPRAP SEE DETAIL V

5 TONS CL B RIPRAP W/14 SY GEO FAB

WOODS

ROCKS

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'

GRAPHIC SCALE

DETAIL SHEET FOR SITE 73

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	46
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 189 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

234
JARRELL INVESTMENT PROPERTIES, LLC

MATCHLINE –L– STA. 605+00
SEE SHEET 45

MATCHLINE –L– STA. 618+00
SEE SHEET 47

SQ-C

SS-C

WD-C

COIR FIBER MATTING (TYP.)

CUTOVER

25 LF OF INLET CHANNEL IMPROVEMENT
EST. 30 TONS CASS II RIP RAP
EST. 30 SY GEOTEXTILE

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

CHANNEL CHANGE W/CL II RIP RAP
SEE DETAIL CT

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

LATERAL BASE DITCH W/CL B RIPRAP
SEE DETAIL BW

LATERAL BASE DITCH W/CL B RIPRAP
SEE DETAIL BY

2 TONS CL B RIPRAP W/7 SY GEO FAB

SPECIAL CUT DITCH
SEE DETAIL H

WOODS

15" CSP
2 ELBOWS
ROD & LUG

15" RCP-IV

CHANNEL BLOCK
SEE DETAIL U

CLASS II RIP RAP ON FLOOD BENCH BORDER (TYP.)
EST. 15 TONS CL II RIP RAP
EST. 15 SY GEOTEXTILE

BEGIN PERM. IMPACTS IN SURFACE WATER
CHANNEL BLOCK
SEE DETAIL U

20' x 10' PSRM

SITE 75

200' R/W

BEGIN SBG +80

END SBG +63

610+00

615+00

15" RCP-III

18" RCP-III

BEGIN SBG +28

END SBG +94

3@ 10'x 7' CSBC

18" CSP
2 ELBOWS
ROD & LUG

CLASS II RIP RAP ON FLOOD BENCH BORDER (TYP.)
EST. 15 TONS CL II RIP RAP
EST. 15 SY GEOTEXTILE

TOE PROTECTION
W/CL B RIPRAP
SEE DETAIL I

BEGIN PERM. IMPACTS IN SURFACE WATER

WOODS

PSH
SEE DETAIL AP

COIR FIBER MATTING (TYP.)

25 LF OF OUTLET CHANNEL IMPROVEMENT
EST. 25 TONS CASS II RIP RAP
EST. 25 SY GEOTEXTILE

LATERAL BASE DITCH
SEE DETAIL BO

SITE 74

18" CSP
2 ELBOWS, ROD & LUG

3 TONS CL B RIPRAP
W/10 SY GEO FAB

JURISDICTIONAL
RIPRAP TRANSITION
SEE DETAIL AU

BEGIN TEMP. IMPACTS IN SURFACE WATER

234
JARRELL INVESTMENT PROPERTIES, LLC

SITE 74, AND 75
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR –L– PROFILE SEE SHT. 126

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	46
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 190 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

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MATCHLINE –L– STA. 605+00
SEE SHEET 45

MATCHLINE –L– STA. 618+00
SEE SHEET 47

234
JARRELL INVESTMENT PROPERTIES, LLC

SQ-C

SS-C

WD-C

SITE 75

SITE 74

610+00

615+00

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

COIR FIBER MATTING (TYP.)

CUTOVER

25 LF OF INLET CHANNEL IMPROVEMENT EST. 30 TONS CASS II RIP RAP EST. 30 SY GEOTEXTILE

CHANNEL CHANGE W/CL II RIP RAP SEE DETAIL CT

LATERAL BASE DITCH W/CL B RIPRAP SEE DETAIL BY

SPECIAL CUT DITCH SEE DETAIL H

2 TONS CL B RIPRAP W/7 SY GEO FAB

15" CSP 2 ELBOWS ROD & LUG

15" RCP-IV

CHANNEL BLOCK SEE DETAIL U

CLASS II RIP RAP ON FLOOD BENCH BORDER (TYP.) EST. 15 TONS CL II RIP RAP EST. 15 SY GEOTEXTILE

28' x 10' PSRM

200' R/W

BEGIN SBG +80

END SBG +63

BEGIN SBG +28

END SBG +94

15" RCP-III

18" RCP-III

3@ 10' x 7' RCBC

18" CSP 2 ELBOWS ROD & LUG

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

BEGIN PERM. IMPACTS IN SURFACE WATER WOODS

PSH SEE DETAIL AP

COIR FIBER MATTING (TYP.)

25 LF OF OUTLET CHANNEL IMPROVEMENT EST. 25 TONS CASS II RIP RAP EST. 25 SY GEOTEXTILE

LATERAL BASE DITCH SEE DETAIL BO

3 TONS CL B RIPRAP W/10 SY GEO FAB

JURISDICTIONAL RIPRAP TRANSITION SEE DETAIL AU

BEGIN TEMP. IMPACTS IN SURFACE WATER

SITE 74, AND 75
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

TS / TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S / S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR –L– PROFILE SEE SHT. 126

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	46A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

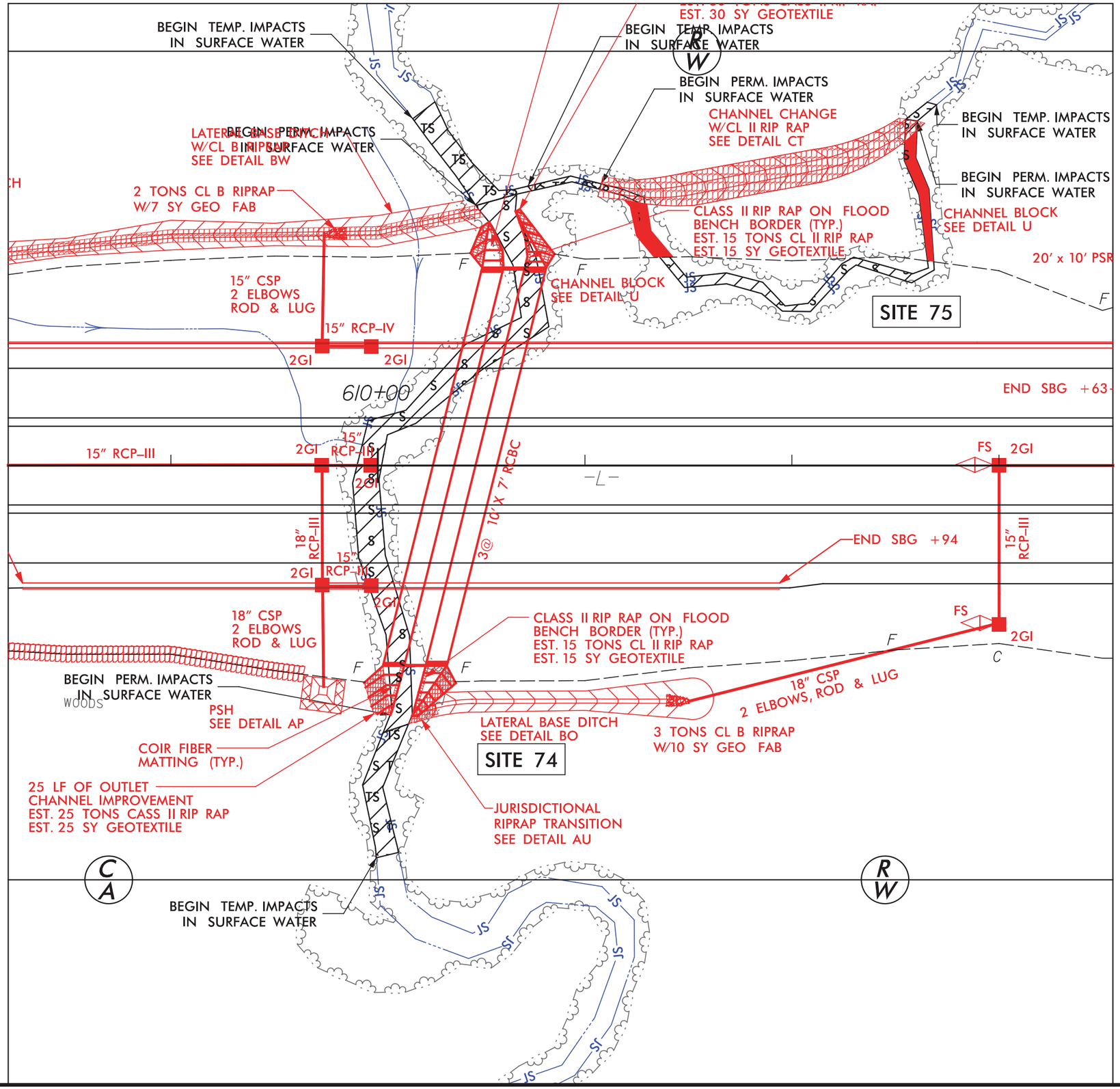
PERMIT DRAWING SHEET 191 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

DETAIL SHEET FOR SITE 74, AND 75



LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'
GRAPHIC SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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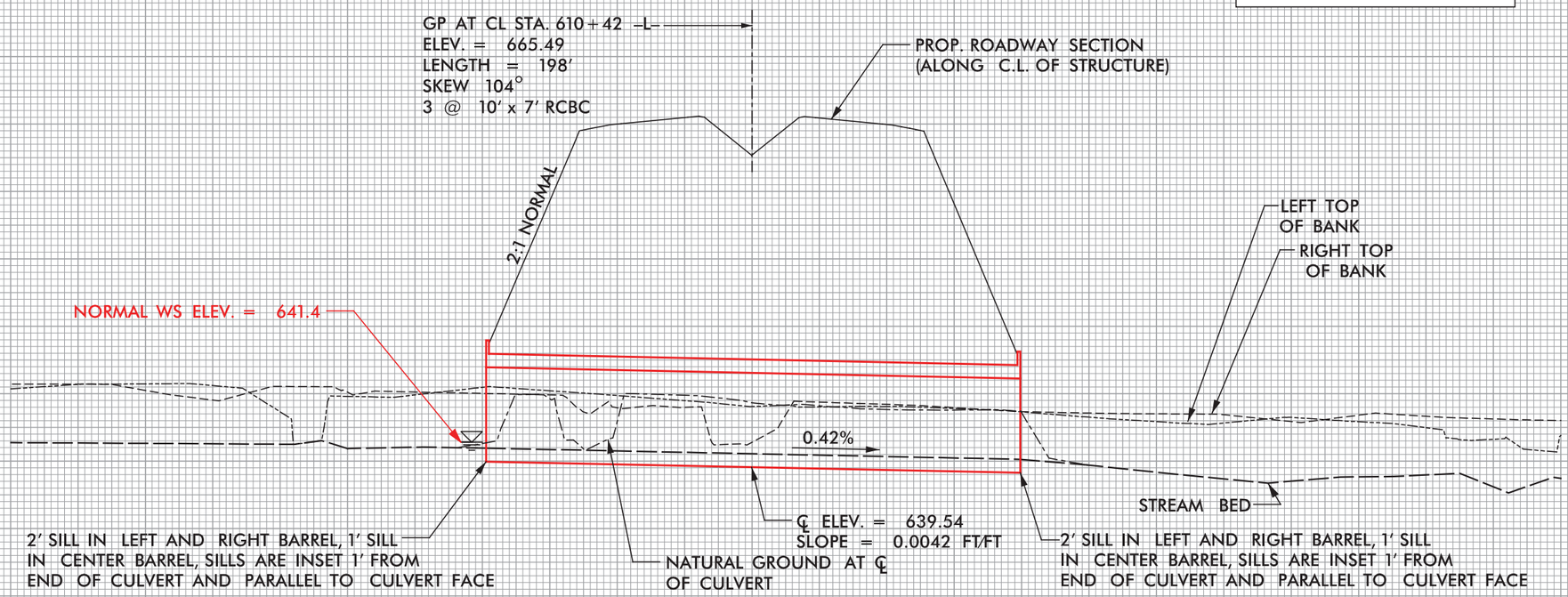
ENGLISH

PERMIT DRAWING
SHEET 192 OF 257

SITE 74
-L- 610+42



PROPOSED 3 @ 10' x 7' RCBC

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

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	48
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 193 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/95

ENGLISH

SITE 76A

SITE 76

SITE 77

SITE 78

SITE 80

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

STANDARD BASE DITCH W/CLASS II RIPRAP SEE DETAIL BD SLOPE = 0.5% DDE = 390 CY

STANDARD BASE DITCH W/CLASS II RIPRAP SEE DETAIL BD SLOPE = 0.5% DDE = 550 CY

DRAIN POND. VERIFY BOTTOM OF POND ELEVATION TO TIE TO LATERAL BASE DITCH.COORDINATE WITH CONTRACTOR FOR A PERMANENT DITCH THROUGH POND IF NECESSARY.

DRAIN POND. VERIFY BOTTOM OF POND ELEVATION TO TIE TO LATERAL BASE DITCH.COORDINATE WITH CONTRACTOR FOR A PERMANENT DITCH THROUGH POND IF NECESSARY.

DRAIN POND VERIFY BOTTOM OF POND ELEVATION TO TIE TO LATERAL BASE DITCH. COORDINATE WITH CONTRACTOR FOR A PERMANENT DITCH THROUGH POND IF NECESSARY.

SW-C

SV-C

PD-C

WJ-C

PE-C

MATTHEW & NICOLE HOGAN 238

236 MARK WHITE

237 NORMAN LIVENGOOD, JR.

239

235 MARY JOHNSON

GREGORY

WOOD STEPS

ISFD

WOODS

CENTURY LINK

ROMAN ROAD (PRIVATE)

EXISTING R/W

SPECIAL LATERAL 'V' DITCH SEE DETAIL J

5 TONS CL B RIPRAP W/14 SY GEO FAB

2 TONS CL B RIPRAP W/7 SY GEO FAB

24" CSP 2 ELBOWS ROD & LUG

END SBG +00

BEG SBG +79

BEG SBG +10

15" RCP-III

24" RCP-III

18" CSP 2 ELBOWS ROD & LUG

18" RCP-III

15" CSP 2 ELBOWS ROD & LUG

Q10 = 0.7 CFS
V10 = 0.4 FPS

Q10 = 1.7 CFS

Q10 = 23.9 CFS
V10 = 1.1 FPS

BERM DITCH W/CL B RIPRAP SEE DETAIL Y

635+00

640+00

200' R/W

MATCHLINE –L– STA. 631+00 SEE SHEET 47

MATCHLINE –L– STA. 644+00 SEE SHEET 49

48" CHL

GRASS

DK & POOL

ISBKD

CONC

FIELD

6' WW

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- P P — DENOTES IMPACTS IN SURFACE WATER (POND)
- F F — DENOTES FILL IN WETLAND
- S S — DENOTES IMPACTS IN SURFACE WATER

100' 0' 100' 200'
GRAPHIC SCALE

SITE 76, 76A, 77, 78 AND 80 PLAN VIEW

FOR –L– PROFILE SEE SHT. 127

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	48
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 194 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

MATCHLINE –L– STA. 631+00
SEE SHEET 47

MATCHLINE –L– STA. 644+00
SEE SHEET 49

SITE 76A

SITE 76

SITE 77

SITE 78

SITE 80

SW-C

SV-C

PD-C

WJ-C

PE-C

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

STANDARD BASE DITCH W/CLASS II RIPRAP SEE DETAIL BD SLOPE = 0.5% DDE = 450 CY

DRAIN POND. VERIFY BOTTOM OF POND ELEVATION TO TIE TO LATERAL BASE DITCH.COORDINATE WITH CONTRACTOR FOR A PERMANENT DITCH THROUGH POND IF NECESSARY.

STANDARD BASE DITCH W/CLASS II RIPRAP SEE DETAIL BD SLOPE = 0.5% DDE = 450 CY

DRAIN POND. VERIFY BOTTOM OF POND ELEVATION TO TIE TO LATERAL BASE DITCH.COORDINATE WITH CONTRACTOR FOR A PERMANENT DITCH THROUGH POND IF NECESSARY.

DRAIN POND VERIFY BOTTOM OF POND ELEVATION TO TIE TO LATERAL BASE DITCH. COORDINATE WITH CONTRACTOR FOR A PERMANENT DITCH THROUGH POND IF NECESSARY.

SPECIAL LATERAL 'V' DITCH SEE DETAIL J

5 TONS CL B RIPRAP W/14 SY GEO FAB

2 TONS CL B RIPRAP W/7 SY GEO FAB

24" CSP 2 ELBOWS ROD & LUG

15" RCP-III

18" CSP 2 ELBOWS ROD & LUG

18" RCP-III

15" CSP 2 ELBOWS ROD & LUG

15" RCP-III

BERM DITCH W/CL B RIPRAP SEE DETAIL Y

Q10 = 0.7 CFS
V10 = 0.4 FPS

Q10 = 1.7 CFS

Q10 = 23.9 CFS
V10 = 1.1 FPS

236 MARK WHITE

237 NORMAN LIVENGOOD, JR.

238 MATTHEW & NICOLE HOGAN

239

235 MARY JOHNSON

2x GREGORY

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- P P — DENOTES IMPACTS IN SURFACE WATER (POND)
- F F — DENOTES FILL IN WETLAND
- S S — DENOTES IMPACTS IN SURFACE WATER

100' 0' 100' 200'
GRAPHIC SCALE

SITE 76, 76A, 77, 78 AND 80 PLAN VIEW

FOR –L– PROFILE SEE SHT. 127

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	48A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 195 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/95

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- F F — DENOTES IMPACTS IN SURFACE WATER (POND)
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- F F — DENOTES FILL IN WETLAND
- S S — DENOTES IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER
BEGIN PERM. IMPACTS IN SURFACE WATER
15" HDPE
TDE
JS
SITE 76A
STANDARD BASE DITCH W/CLASS II RIPRAP SEE DETAIL BD SLOPE = 0.5% DDE = 350 CY
DRAIN POND. VERIFY BOTTOM OF POND ELEVATION TO TIE TO LATERAL BASE DITCH.COORDINATE WITH CONTRACTOR FOR A PERMANENT DITCH THROUGH POND IF NECESSARY.
POND
SITE 76
STANDARD BASE DITCH W/CLASS II RIPRAP SEE DETAIL BD SLOPE = 0.5% DDE = 550 CY
PDE
SF
MATTHEW & NICOLE HOGAN
238
PUE
SITE 77
RW
SV-C
PIER
237
NORMAN LIVENGOOD, JR.
STANDARD BASE DITCH W/CLASS II RIPRAP SEE DETAIL BD SLOPE = 0.4% DDE = 450 CY
PD-C
WJ-C
2 TONS CL B RIPRAP W/7 SY GEO FAB
SITE 78
5 TONS CL B RIPRAP W/14 SY GEO FAB
15" CSP 2 ELBOWS ROD & LUG
15" HDPE
12" GR
94
CENTURY LINK
18" PLASTIC
SPECIAL LATERAL 'V' DITCH SEE DETAIL J
5 TONS CL B RIPRAP W/14 SY GEO FAB
2 TONS CL B RIPRAP W/7 SY GEO FAB
15" RCP-III
24" CSP 2 ELBOWS ROD & LUG
END SBG +00
FS
2GI
FIELD
95
96
ROMAN ROAD (PRIVATE)
EXISTING R/W
45.00'
336
WB

60' 30' 0' 60' 120'
GRAPHIC SCALE

DETAIL SHEET FOR SITE 76, 76A, 77, AND 78

FOR –L– PROFILE SEE SHT. 122

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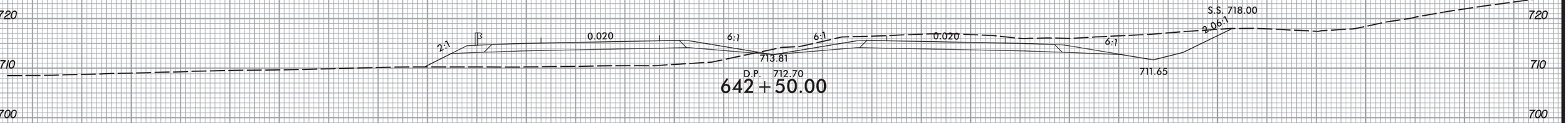
PERMIT DRAWING
SHEET 196 OF 257

ENGLISH

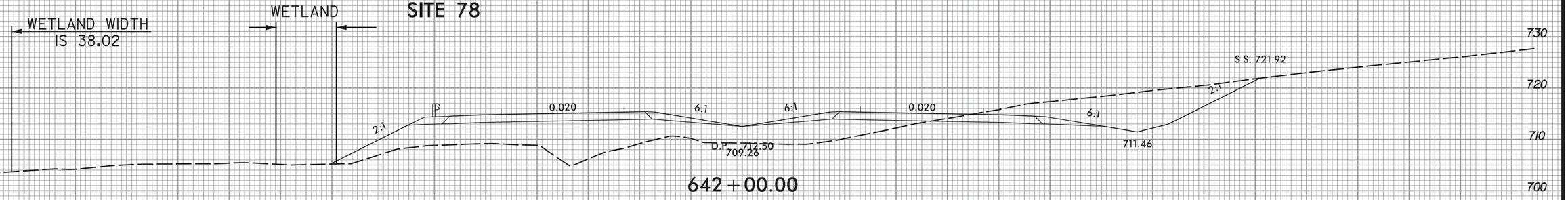
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

730 720 710 700



642 + 50.00

SITE 78



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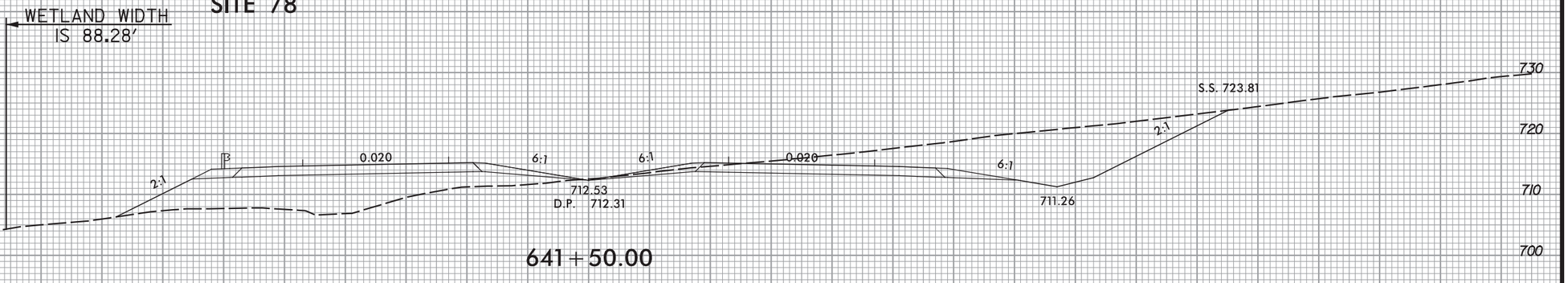
SITE 78



641 + 50.00

—℄—

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	49
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 197 OF 257

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ENGLISH

NAD 83/95

MATCHLINE -Y13- STA. 24+00
SEE SHEET 99

MATCHLINE -L- STA. 644+00
SEE SHEET 48

MATCHLINE -L- STA. 657+00
SEE SHEET 50

MATCHLINE -Y13- STA. 17+00
SEE SHEET 98

389 ANGELA SPENCER

243 STEVEN HARRELL

239 VERONICA PANIADGUA MARTINEZ

242 THOMAS BRITT

244 STEVE BATES, JR.

246 TIMOTHY HUSSEY

245 BRUCE TROGDON

247 VICKIE COX

ROMAN ROAD (PRIVATE) CENTURY LINK

ROMAN RD 10' GR

45' R/W PB 92 PG 94

END FENCE

HTR

DK

ISPD

ROCK WALL

5' WW

4' WW ELECTRIC

WOODS

GRASS

FIELD

DOG LOT

TREES

SOIL

200' R/W

SITE 79

SITE 80

SITE 81

SITE 82

SITE 83

WH-C

PE-C
DRAIN POND

WG-C

SV-C

WI-C

WF-C

WE-C

Q10 = 87.0 CFS
V10 = 3.2 FPS

Q10 = 2.7 CFS
V10 = 2.6 FPS

Q10 = 0.5 CFS
V10 = 1.8 FPS

Q10 = 1.4 CFS
V10 = 1.8 FPS

Q10 = 0.5 CFS
V10 = 1.8 FPS

Q10 = 2.0 CFS
V10 = 3.4 FPS

Q10 = 37.7 CFS
V10 = 3.4 FPS

2 TONS CL B RIPRAP W/7 SY GEO FAB

LATERAL 'V' DITCH SEE DETAIL D

SPECIAL CUT DITCH SEE DETAIL H

BEGIN PERM. IMPACTS IN SURFACE WATER

BERM DITCH SEE DETAIL BC

FISH POND

REMOVE

END SBG +00 4' WOOD

RCP-III BURIED

15" RCP-IV

15" CSP 2 ELBOWS ROD & LUG

30" RCP-III

24" CSP 2 ELBOWS ROD & LUG

JB w/MH

FS

BDO

TB

2GI

BST

GRADE TO DRAIN

BERM DITCH W/CL B RIPRAP EST 514 TONS EST 1548 SY GEOTEXTILE SEE DETAIL Y

STANDARD BASE DITCH W/PSRM EST 40 SY SEE DETAIL AK SLOPE = 10% DDE = 15 CY EST 40 SY PSRM

BEGIN TEMP. IMPACTS IN SURFACE WATER

STANDARD BASE DITCH SEE DETAIL SLOPE = 2% DDE= 120 CY

BASE BERM DITCH W/CL B RIPRAP EST 287 TONS EST 813 SY GEOTEXTILE SEE DETAIL AM

6" DECK DRAINS @ 6' O.C. LT AND RT SHLD FROM STA. 19+44 TO STA. 19+68
STA. 20+90 TO STA. 21+14
6" DECK DRAINS LT AND RT SHLD AT STA. 20+20 ND STA. 20+43

ADDITIONAL TCE REQ'D FOR TEMP. CWD

645+00 650+00 655+00 20+00

SITE 79, 80, 81, 82 AND 83
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- E E — DENOTES EXCAVATION IN WETLAND
- F F — DENOTES FILL IN WETLAND
- S S — DENOTES IMPACTS IN SURFACE WATER

FOR -L- PROFILE SEE SHTS. 127 – 128
FOR -Y13- PROFILE SEE SHT. 196

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	49
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PERMIT DRAWING
SHEET 198 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

MATCHLINE -Y13- STA. 24+00
SEE SHEET 99

MATCHLINE -L- STA. 644+00
SEE SHEET 48

MATCHLINE -L- STA. 657+00
SEE SHEET 50

MATCHLINE -Y13- STA. 17+00
SEE SHEET 98

389 ANGELA SPENCER
243 STEVEN HARRELL
VERONICA PANIAGUA MARTINEZ
239
242 THOMAS BRITT
244 STEVE BATES, JR.
246 TIMOTHY HUSSEY
245 BRUCE TROGDON
247 VICKIE COX

SITE 79
SITE 80
SITE 81
SITE 82
SITE 83

WH-C
PE-C
WG-C
SV-C
WF-C
WI-C
WE-C

Q10 = 87.0 CFS
V10 = 3.2 FPS

Q10 = 2.7 CFS
V10 = 2.6 FPS

Q10 = 0.5 CFS
V10 = 1.8 FPS

Q10 = 1.4 CFS
V10 = 1.8 FPS

Q10 = 0.5 CFS
V10 = 1.8 FPS

Q10 = 2.0 CFS
V10 = 3.4 FPS

Q10 = 37.7 CFS
V10 = 3.4 FPS

2 TONS CL B RIPRAP W/7 SY GEO FAB
LATERAL 'V' DITCH SEE DETAIL D
SPECIAL CUT DITCH SEE DETAIL H
BEGIN PERM. IMPACTS IN SURFACE WATER
BERM DITCH SEE DETAIL BC
FISH POND
DRAIN POND
RCP-III BURIED
END SBG
15" CSP 2 ELBOWS ROD & LUG
15" RCP-IV
30" RCP-III
24" CSP 2 ELBOWS ROD & LUG
STANDARD BASE DITCH W/PSRM EST 40 SY SEE DETAIL AK SLOPE = 10% DDE = 15 CY EST 40 SY PSRM
BEGIN TEMP. IMPACTS IN SURFACE WATER
BASE BERM DITCH W/CL B RIPRAP EST 287 TONS EST 813 SY GEOTEXTILE SEE DETAIL AM
6" DECK DRAINS @ 6' O.C. LT AND RT SHLD FROM STA. 19+44 TO STA. 19+68
STA. 20+90 TO STA. 21+14
6" DECK DRAINS LT AND RT SHLD AT STA. 20+20 ND STA. 20+43
ADDITIONAL TCE REQ'D FOR TEMP. CWD
FOR -L- PROFILE SEE SHTS. 127 - 128
FOR -Y13- PROFILE SEE SHT. 196

SITE 79, 80, 81, 82 AND 83
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- E E DENOTES EXCAVATION IN WETLAND
- F F DENOTES FILL IN WETLAND
- S S DENOTES IMPACTS IN SURFACE WATER

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DETAIL SHEET FOR SITE 79, 80, 81, AND 82

PROJECT REFERENCE NO.	SHEET NO.
R-2536	49A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 199 OF 257

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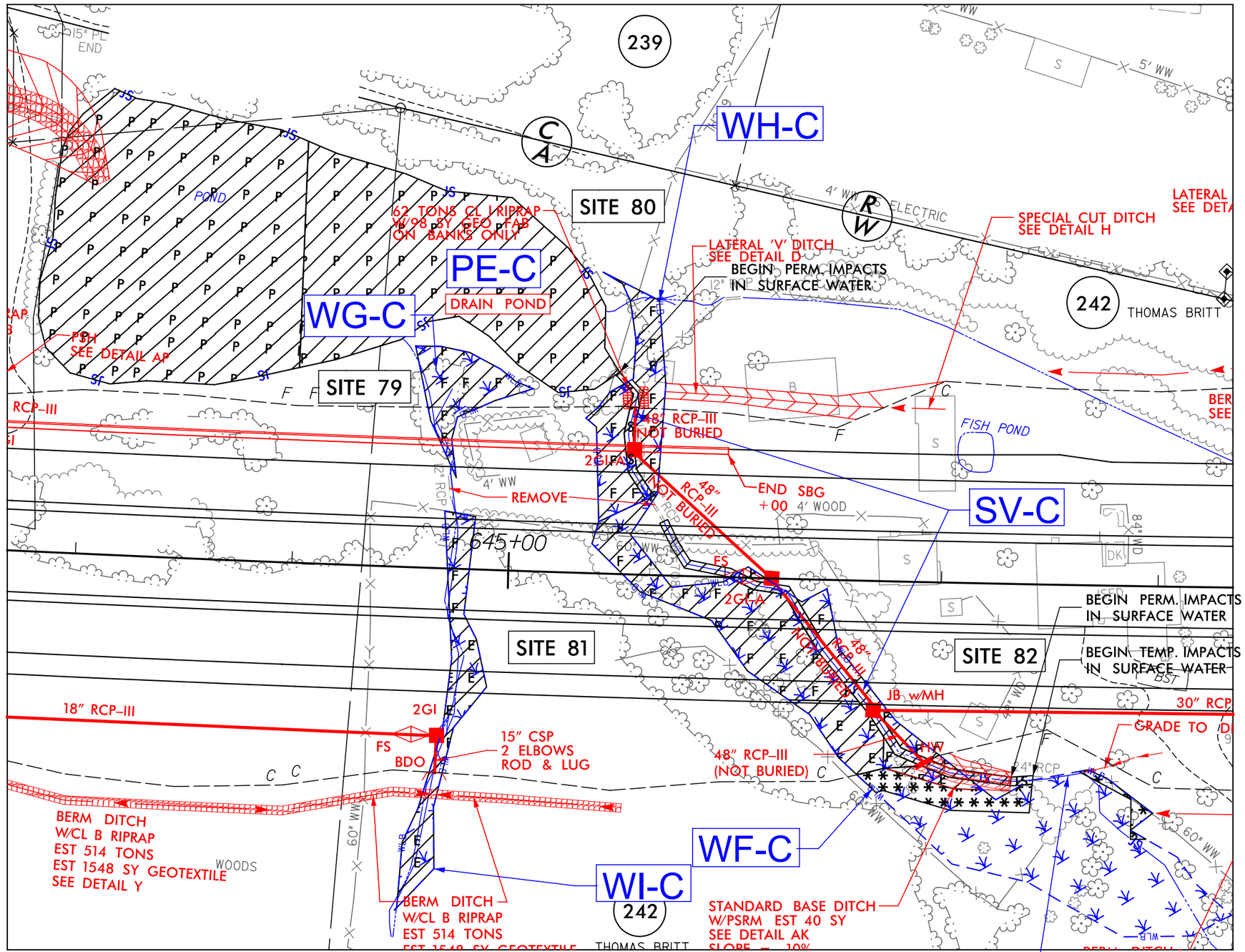
ENGLISH

NAD 83/95



50′ 25′ 0′ 50′ 100′

GRAPHIC SCALE

LEGEND

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

FOR –L– PROFILE SEE SHT. 122

3/17/2016
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$FILELS

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-131

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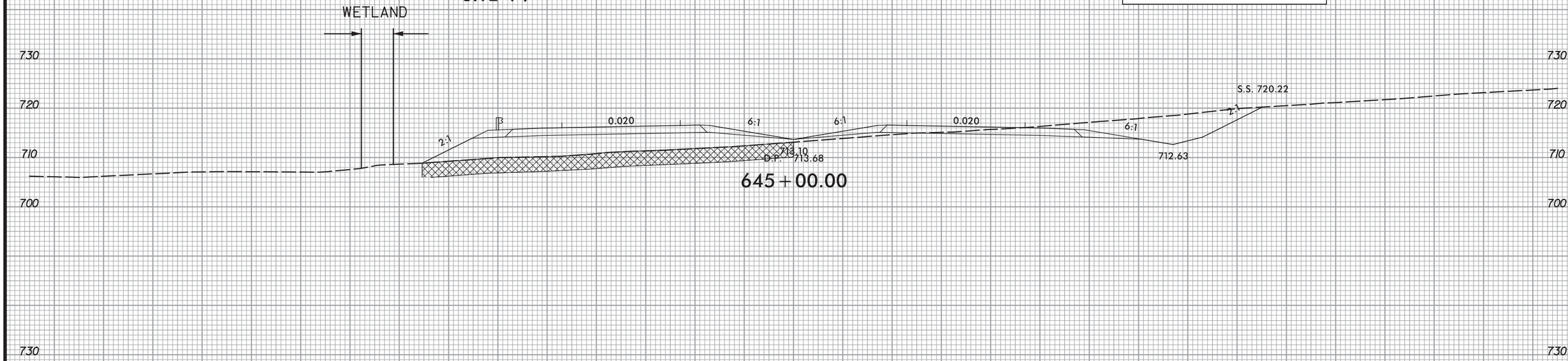
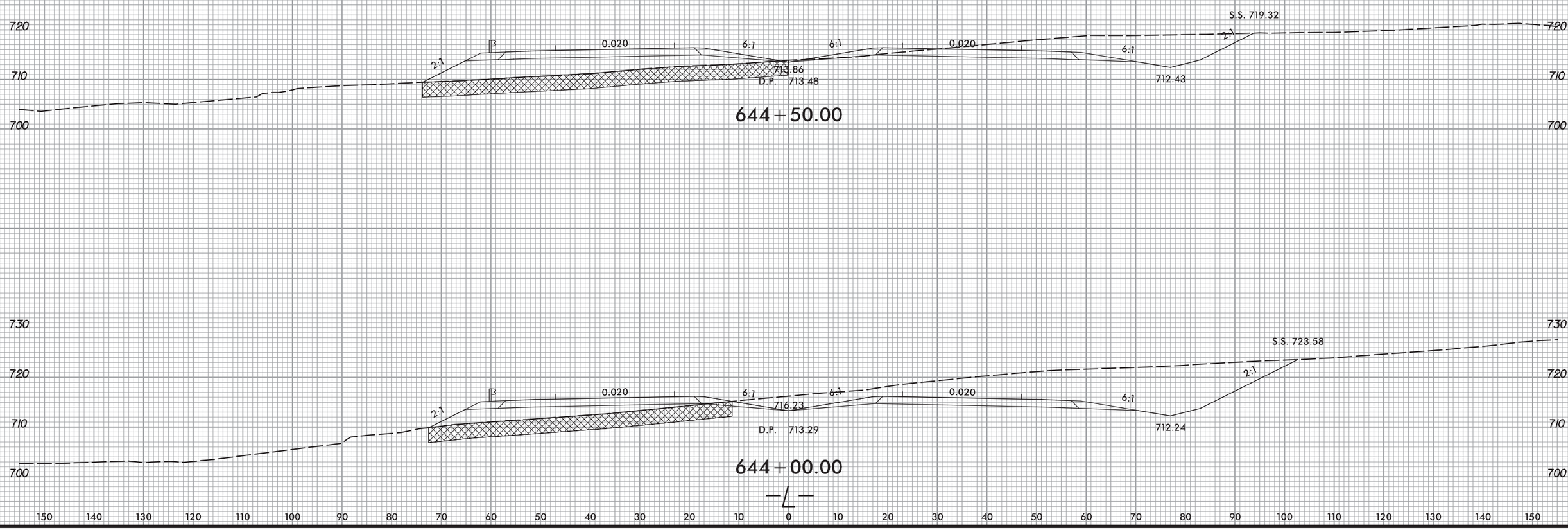
ENGLISH

PERMIT DRAWING
SHEET 200 OF 257

SITE 79





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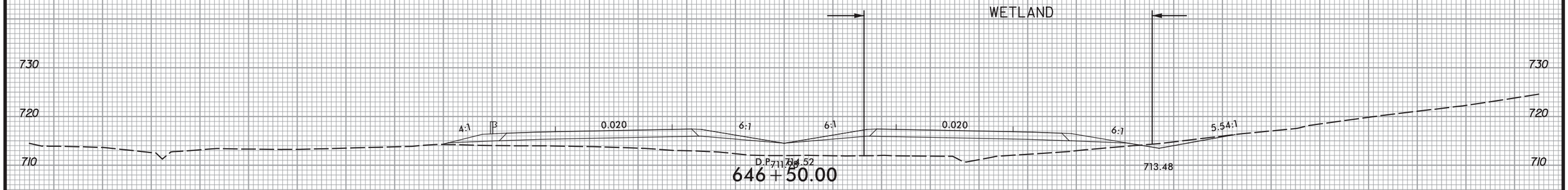
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-132

ENGLISH

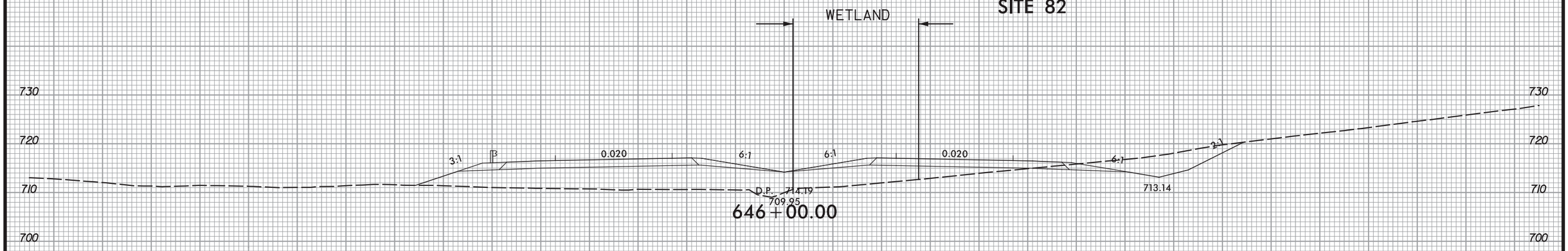
PERMIT DRAWING
SHEET201 OF 257

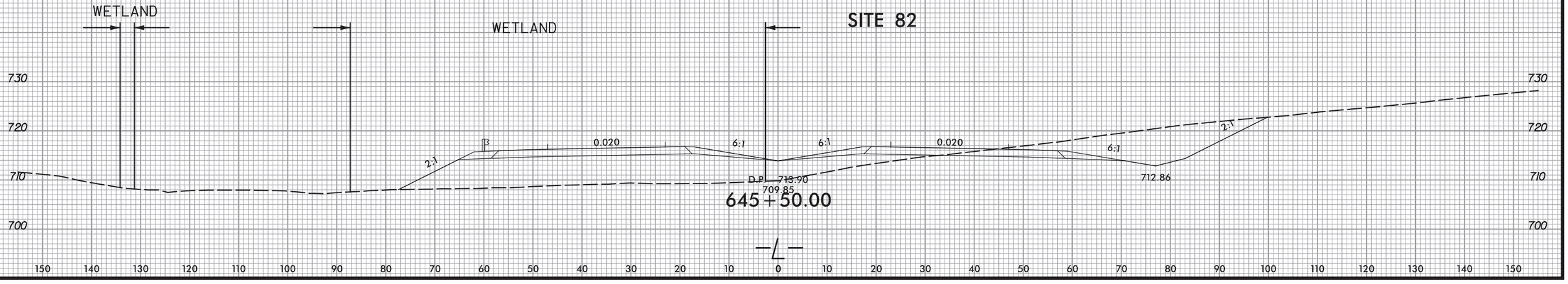
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

SITE 82



SITE 82





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PROJECT REFERENCE NO.	SHEET NO.
R-2536	98
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 202 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

MATCHLINE -Y13- STA 17+00
SEE SHEET 49

NAD 83/95

SITE 83

WE-C

2 TONS CL B RIPRAP W/7 SY GEO FAB

TOE PROTECTION W/CLASS B RIPRAP SEE DETAIL I

RETAIN EX CSP

LUCK ROAD SR 2806

EX CSP

PROP 36" RCP CLASS III

PROP CSP W/FES & LUG

PROP 18" RCP

HWL

LATERAL BASE DITCH SEE DETAIL BT

BEG SBG +95

-L- 15+00

GRADE TO DRAIN

8' ACCESS EASEMENT DB 1502, PG 176

12" GR

HAWK WATCH RD

12" GR

16' ACCESS EASEMENT DB 3915, PG 570

HAWK WATCH ROAD (PRIVATE)

RETAIN

SHRUBS

C

11" GRAVEL

RETAIN

18" SOIL

ROCK WALL

GRADE TO DRAIN

GRASS

EXISTING R/W 60.00'

48" WW

EXISTING R/W

GRADE TO DRAIN

11" GRAVEL

PASTURE

-L- 14+00

TO IRON MOUNTAIN ROAD

SR 2806

WOODS

241 GREGORY CRAVEN

245 BRUCE TROGDON

391 JAMES WEAVER

393 MOZELLE PRICE

GREGORY CRAVEN

393 MOZELLE PRICE

FIELD

392 DAVID BECKHAM

393 MOZELLE PRICE

WOODS

WOODS

100' 0' 100' 200'

GRAPHIC SCALE

SITE 83
PLAN VIEW

LEGEND

F F DENOTES FILL IN WETLAND

FOR -Y13- PROFILE SEE SHT. 196

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	98
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 203 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

MATCHLINE -Y13- STA 17+00
SEE SHEET 49

NAD 83/95

SITE 83

WE-C

15"00

2 TONS CL B RIPRAP W/7 SY GEO FAB

TOE PROTECTION W/CLASS B RIPRAP SEE DETAIL

REG SBG +25

LATERAL BASE DITCH SEE DETAIL BT

GRADE TO DRAIN

HAWK WATCH RD

HAWK WATCH ROAD (PRIVATE)

60' ACCESS EASEMENT DB 1902 PG 176

60' R/W

EXISTING R/W 60.00'

SR 2805 TO IRON MOUNTAIN ROAD

241 GREGORY CRAVEN

245 BRUCE TROGDON

391 JAMES WEAVER

392 DAVID BECKHAM

393 MOZELLE PRICE

393 GREGORY CRAVEN

WOODS

FIELD

SHRUBS

GRASS

PASTURE

11' GRAVEL

RETAIN

REPAIR

SITE 83
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

F F DENOTES FILL IN WETLAND

FOR -Y13- PROFILE SEE SHT. 196

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	98A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 204 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

DITCH

BERM DITCH
SEE DETAIL BC

PUE

TDE

STANDARD BASE DITCH
SEE DETAIL T
SLOPE = 1%
DDE = 120 CY

2 TONS CL B RIPRAP
W/7 SY GEO FAB

TOE PROTECTION
W/CLASS B RIPRAP
SEE DETAIL I

15" CSP
2 ELBOWS
ROD & LUG

TB
2GI

2 TONS CL B RIPRAP
W/7 SY GEO FAB

REMOVE 15" RCP

EXISTING R/W

RANDOLPH (FO)

WE-C

54 TONS
CL II RIPRAP
W/73 SY
GEO FAB

SITE 83

36" RCP-IV

RETAIN 15" HDPE

LUCK ROAD (SR 2604)
20' PAVED ROADWAY

15" CSP
2 ELBOWS
ROD & LUG

TB 2GI

36" RCP-III

HW

BDO

LATERAL BASE DITCH
SEE DETAIL BT

245
BRUCE TROGDON

391
JAMES WEAVER

WOODS

GRASS

FIELD

HAWK WATCH

WE-C

BEG SBG
+95

15" RCP-III

GRADE
TO DRAIN

ESS EASEMENT DB 1302

15+00

DETAIL SHEET FOR SITE 83

LEGEND

F F — DENOTES FILL IN WETLAND

50' 25' 0' 50' 100'
GRAPHIC SCALE

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Suite 100
Raleigh, NC 27607
NC License No: F-0258

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-223

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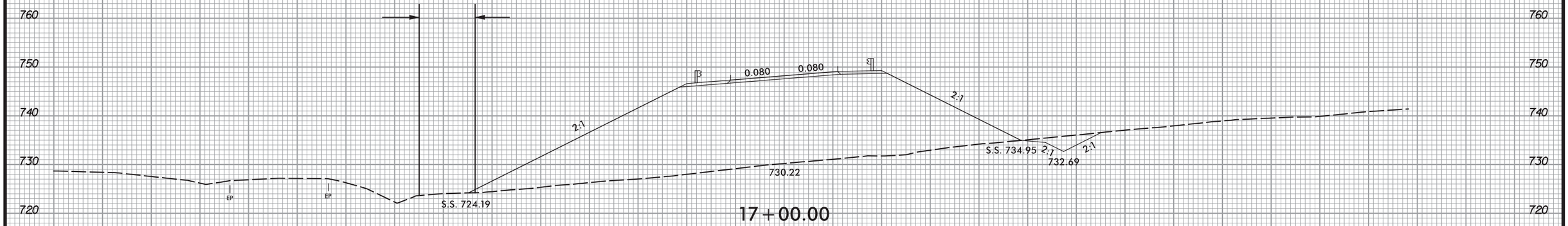
ENGLISH

PERMIT DRAWING
SHEET 205 OF 257

SITE 83

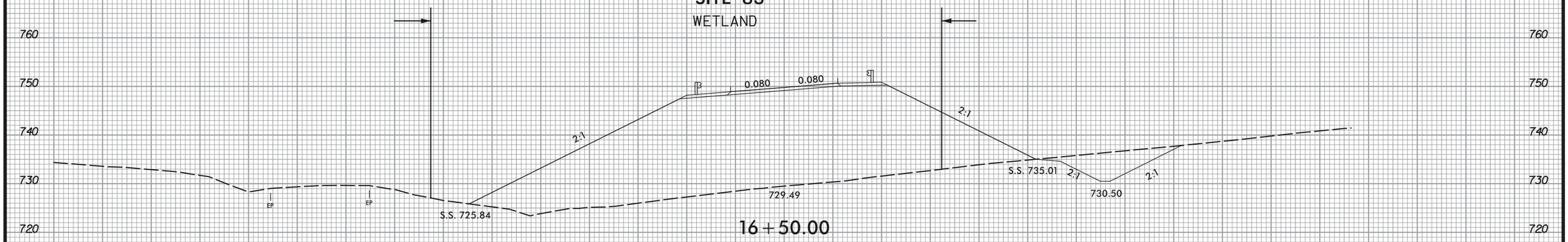
WETLAND



17+00.00

SITE 83

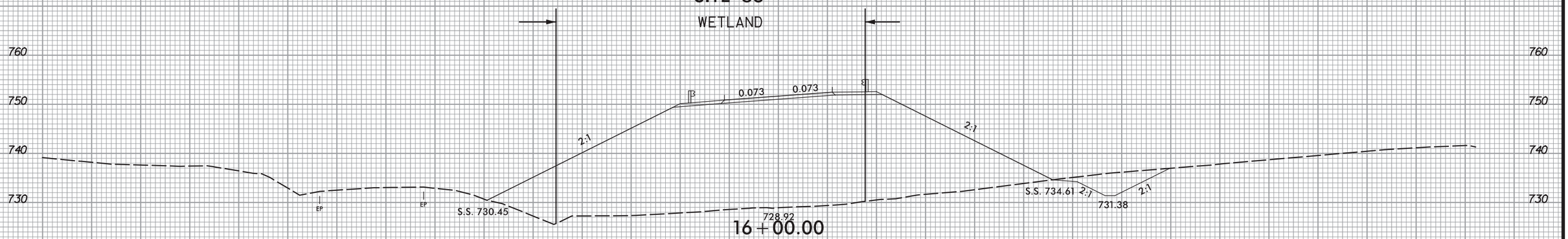
WETLAND



16+50.00

SITE 83

WETLAND



16+00.00

-Y13-

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

2/2/2016
ICA ENGINEERING, INC.
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PROJECT REFERENCE NO.	SHEET NO.
R-2536	50
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 206 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

BEGIN CONSTRUCTION SECTION 3B
TIP PROJECT R-2536
-L- POT 668+00.00

MATCHLINE -L- STA. 657+00
SEE SHEET 49

MATCHLINE -L- STA. 671+00
SEE SHEET 51

248 DAVID KAMINSKI

249 KEVIN COX

250 ADLETTA DELK

BM #10 ELEVATION = 687.03'
N 714257 E 1775235
BL STATION 212+39.00 224' LEFT
RR SPIKE IN BASE OF 22" OAK

660+00 665+00 670+00

200' R/W

FIELD

WOODS

ROCK WALL

EIP

BLK WELL

STD

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

SX-C

SITE 85

SITE 84

WK-C

WL-C

SY-C

SX-C

36 TONS CL I RIPRAP W/58 SY GEO FAB

LATERAL BASE DITCH W/CL I RIPRAP SEE DETAIL M

36" RCP-III

SPECIAL CUT DITCH SEE DETAIL AF

2GI-A

24" RCP-III

2GI

FS

BEG SBG +35

TOE PROTECTION W/CLASS B RIPRAP SEE DETAIL I

2 TONS CL B RIPRAP W/7 SY GEO FAB

LATERAL BASE DITCH W/113 SY GEO FAB W/CL B RIPRAP SEE DETAIL BY

60 TONS CL I RIPRAP ON BANKS ONLY

15" CSP 2 ELBOWS ROD & LUG

42" RCP-III

CJB w/MH

60" RCP-III RCP-IV BURIED

END SBG +99

BEG SBG +00

18" CSP 2 ELBOWS ROD & LUG

BDO

GRADE TO DRAIN

SPECIAL CUT DITCH W/PSRM SEE DETAIL AH

BASE BERM DITCH W/CL B RIPRAP SEE DETAIL AM

LATERAL BASE DITCH SEE DETAIL BP

40 TONS CL I RIPRAP W/7 SY GEO FAB ON BANKS ONLY

Q10 = 4.1 CFS
V10 = 1.4 FPS

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS FS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- E E — DENOTES EXCAVATION IN WETLAND
- F F — DENOTES FILL IN WETLAND

250 ADLETTA DELK

100' 0' 100' 200'
GRAPHIC SCALE

SITE 84 AND 85
PLAN VIEW

FOR -L- PROFILE SEE SHT. 128

ICA Engineering
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Raleigh, NC 27607
NC License No: F-0258

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	50
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 207 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

BEGIN CONSTRUCTION SECTION 3B
TIP PROJECT R-2536
-L- POT 668+00.00

MATCHLINE -L- STA. 657+00
SEE SHEET 49

MATCHLINE -L- STA. 671+00
SEE SHEET 51

248 DAVID KAMINSKI

249 KEVIN COX

250 ADLETTA DELK

BM #10 ELEVATION = 687.03'
N 714257 E 1775235
Bk STATION 212+39.00 224' LEFT
RR SPIKE IN BASE OF 22" OAK

660+00 665+00 670+00

200' R/W

FIELD
WOODS
BLK WELL
ISTD
EIP
SIP

36" RCP-III
36 TONS CL I RIPRAP W/58 SY GEO FAB
LATERAL BASE DITCH W/CL I RIPRAP SEE DETAIL M
SPECIAL CUT DITCH SEE DETAIL AF
2GI-A
FS
24" RCP-III
2GI
BEG SBG +35
TOE PROTECTION W/CLASS B RIPRAP SEE DETAIL I
2 TONS CL B RIPRAP W/7 SY GEO FAB
LATERAL BASE DITCH W/113 SY GEO FAB ON BANKS ONLY
W/CL B RIPRAP SEE DETAIL BT
60 TONS CL I RIPRAP
BEGIN TEMP. IMPACTS IN SURFACE WATER
BEGIN PERM. IMPACTS IN SURFACE WATER
SX-C
SITE 85
15" CSP 2 ELBOWS ROD & LUG
18" CSP 2 ELBOWS ROD & LUG
BDO
GRADE TO DRAIN
SPECIAL CUT DITCH W/PSRM SEE DETAIL AH
BASE BERM DITCH W/CL B RIPRAP SEE DETAIL AM
END SBG +99
BEG SBG +00
SITE 84
WK-C
SY-C
WL-C
Q10 = 4.1 CFS
V10 = 1.4 FPS
LATERAL BASE DITCH SEE DETAIL BP
40 TONS CL I RIPRAP W/73 SY GEO FAB ON BANKS ONLY

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS / FS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S / S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- E / E — DENOTES EXCAVATION IN WETLAND
- F / F — DENOTES FILL IN WETLAND

100' 0' 100' 200'
GRAPHIC SCALE

SITE 84 AND 85
PLAN VIEW

FOR -L- PROFILE SEE SHT. 128

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	51
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 208 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

250
ADLETTA DELK

SX-C

BEGIN TEMP. IMPACTS IN SURFACE WATER
BEGIN PERM. IMPACTS IN SURFACE WATER
BEGIN PERM. IMPACTS IN SURFACE WATER

SITE 85

RIPRAP TRANSITION AT JURISDICTIONAL STREAM SEE DETAIL AU

LATERAL BASE DITCH SEE DETAIL CE

LATERAL BASE DITCH SEE DETAIL CD

5 TONS CL B RIPRAP W/14 Y GEO FAB

WOODS
PASTURE
TREES
PASTURE
WOODS
PASTURE
WOODS
PASTURE
WOODS

MATCHLINE –L– STA. 671+00
SEE SHEET 50A

MATCHLINE –Y17FLY– STA. 12+00
SEE SHEET 52

MATCHLINE –Y17RPD– STA. 18+00
SEE SHEET 52

675+00
680+00
15+00

15" RCP-III
24" RCP-III
END SBG +25
18" RCP-III
30" RCP-III
24" CSP
2 ELBOWS
ROD & LUG
BDO
18" CSP
2 ELBOWS
ROD & LUG

2GI
FS
2GI-A

BERM DITCH SEE DETAIL BC
BERM DITCH SEE DETAIL BC
BERM DITCH SEE DETAIL CA
BERM DITCH SEE DETAIL CA

BARBED WIRE
FENCE

165' R/W

+45 165'
+30 220'
+70 215'

250
ADLETTA DELK

100' 0' 100' 200'
GRAPHIC SCALE

SITE 85
PLAN VIEW

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR –L– PROFILE SEE SHT. 129
FOR –Y17FLY– PROFILE SEE SHT. 129
FOR –Y17RPD– PROFILE SEE SHT. 209
FOR –Y17RPDA– PROFILE SEE SHT. 211

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	51
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 209 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

MATCHLINE –L– STA. 671+00
SEE SHEET 50A

MATCHLINE –Y17FLY– STA. 12+00
SEE SHEET 52

MATCHLINE –Y17RPD– STA. 18+00
SEE SHEET 52

SX-C

SITE 85

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

RIPRAP TRANSITION AT JURISDICTIONAL STREAM SEE DETAIL AU

LATERAL BASE DITCH SEE DETAIL CE

LATERAL BASE DITCH SEE DETAIL CD

5 TONS CL B RIPRAP W/14 Y GEO. FAB

LATERAL BASE DITCH SEE DETAIL CD

15" RCP-III

24" RCP-III

END SBG +25

18" RCP-III

18" CSP 2 ELBOWS ROD & LUG

BDO

BERM DITCH SEE DETAIL BG

BERM DITCH SEE DETAIL BC

BERM DITCH SEE DETAIL CA

BERM DITCH SEE DETAIL CA

24" CSP 2 ELBOWS ROD & LUG

BDO

30" RCP-III

675+00

680+00

15+00

165' R/W

+45 185'

+30 220'

+70 215'

250 ADLETTA DELK

250 ADLETTA DELK

250 ADLETTA DELK

WOODS

PASTURE

TREES

BARBED WIRE

SITE 85
PLAN VIEW

100' 0' 100' 200'
GRAPHIC SCALE

LEGEND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR –L– PROFILE SEE SHT. 129
FOR –Y17FLY– PROFILE SEE SHT. 129
FOR –Y17RPD– PROFILE SEE SHT. 209
FOR –Y17RPDA– PROFILE SEE SHT. 211

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	50A-51
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 210 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

BEGIN CONSTRUCTION
SECTION 3B
TIP PROJECT R-2536
-L- POT 668+00.00

BM #10 ELEVATION = 687.03'
N 714257 E 1775235
BL STATION 212+39.00 224' LEFT
RR SPIKE IN BASE OF 22" OAK

200' R/W

SX-C

WOODS

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

SITE 85

RIPRAP TRANSITION AT JURSDICTIONAL STREAM SEE DETAIL AU

2 TONS CL B RIPRAP W/7 SY GEO FAB

LATERAL BASE DITCH w/CL B RIPRAP SEE DETAIL BY

60 TONS CL I RIPRAP W/113 SY GEO FAB ON BANKS ONLY

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

OTECTION
S B RIPRAP
TAIL I

15" CSP
2 ELBOWS
ROD & LUG

60" RCP-III
JB w/MH

SITE 85

BEGIN PERM. IMPACTS IN SURFACE WATER

SBL 2GI

60" RCP-III NOT BURIED

670+00

-L-

2GI 15" RCP-IV

BEGIN PERM. IMPACTS IN SURFACE WATER

END SBG+99 2GI

SITE 84

BEG SBG +00

CTION
RAP
I

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

15" CSP
21 ELBOWS
ROD & LUG

BARBED WIRE

LATERAL BASE DITCH SEE DETAIL CD

WK-C

2 TONS CL B RIPRAP W/7 SY GEO FAB

BEGIN TEMP. IMPACTS IN SURFACE WATER

LATERAL BASE DITCH SEE DETAIL BP

WL-C

40 TONS CL I RIPRAP W/75 SY GEO FAB ON BANKS ONLY

SY-C

WOODS

SX-C

DETAIL SHEET FOR SITE 84 AND 85

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- E E — DENOTES EXCAVATION IN WETLAND
- F F — DENOTES FILL IN WETLAND

50' 25' 0' 50' 100'
GRAPHIC SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING
SHEET 211 OF 257

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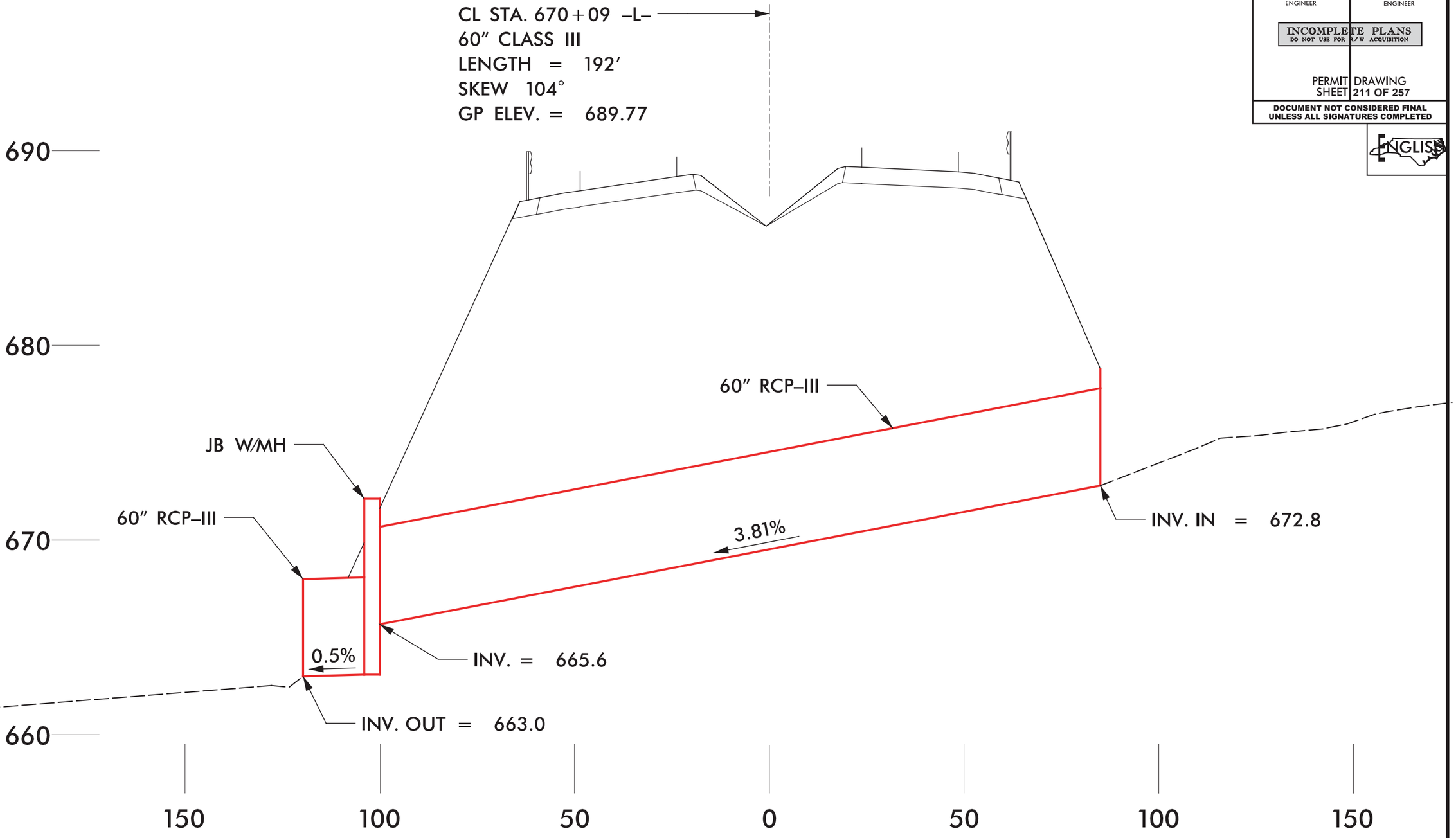
ENGLISH



SITE 85
PROFILE ALONG STRUCTURE
STA. 670+09 –L–

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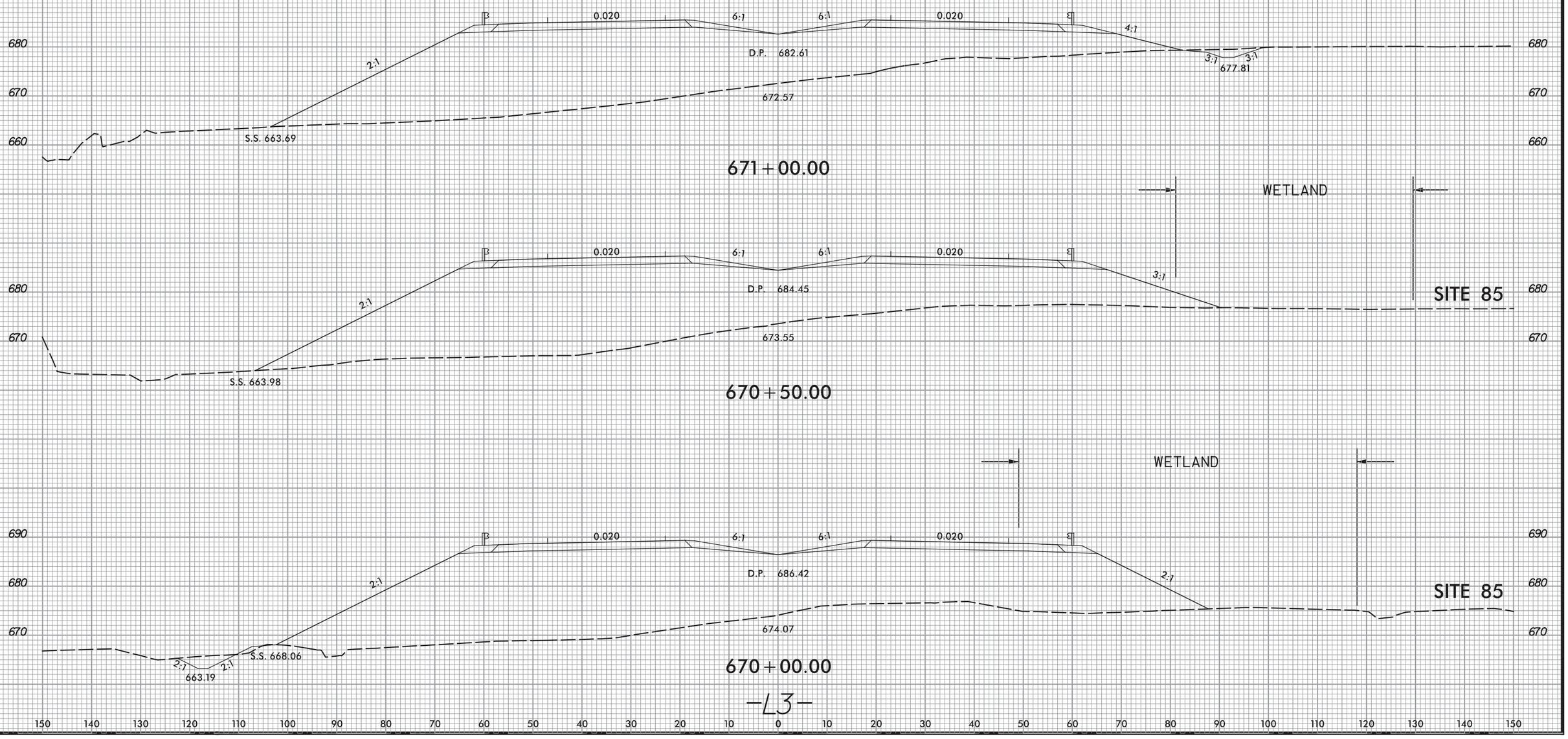
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-3

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

ENGLISH

PERMIT DRAWING
SHEET 212 OF 257



-L3-

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

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	52
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 213 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

MATCHLINE -Y17FLY- STA. 23+00
SEE SHEET 53

MATCHLINE -Y17FLY- STA. 12+00
SEE SHEET 51

MATCHLINE -Y17RPD- STA. 18+00
SEE SHEET 51

MATCHLINE -Y17RPD- STA. 31+00
SEE SHEET 53

RAEFORD & MARY ROUTHLIFE ESTATE)
TONY & MARK ROUTH

411 TANA SKIPPER
BEGIN PERM. IMPACTS IN SURFACE WATER

412

BEGIN TEMP. IMPACTS IN SURFACE WATER

LATERAL BASE DITCH W/CLASS B RIPRAP SEE DETAIL AY

KENNETH SYMES

TOMMY BARNES

403

404

GRAVEL DK

INV=53.86

JS

GAINES CREEK

40 LF OF INLET CHANNEL IMPROVEMENT
EST. 80 TONS CL II RIP RAP
EST. 80 SY GEOTEXTILE

SITE 86

WZ-C

251 HARMON TROGDON

TOE PROTECTION W/CLASS B RIPRAP SEE DETAIL I

-Y17RPC-

-Y17RPDA-

WOODS

402 JERRY T

SNN-C

53 LF OF INLET CHANNEL IMPROVEMENT
EST. 110 TONS CL II RIP RAP
EST. 120 SY GEOTEXTILE

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

LATERAL BASE DITCH W/CL I RIPRAP SEE DETAIL CO

251 HARMON TROGDON

SCC/SEE-C

WY-C

MTL GATE

PROGRESS ENERGY R/W 100.00'

250 ADLETTA DELK

R/W

GUY WIRES

I86

I87

I88

MEDIAN V DITCH SEE DETAIL AT

-BL- 733 PINC 230+59.97

WOODS

15+00

20+00

-Y17FLY- 20+00

50' R/W

BEG SBG +06

15" RCP-III

2GI

18" RCP-III

24" RCP-III

30" RCP-III

2GI-A

FS

LATERAL BASE DITCH W/CL I RIPRAP SEE DETAIL CN

3 TONS CL B RIPRAP W/10 SY GEO FAB

8 TONS CL B RIPRAP W/21 SY GEO FAB

-BL- 734 PINC 233+69.83

-BL- 735 PINC 236+53.85

HARMON TROGDON 251

N 7° 07' 28" E

N 2° 31' 45.6" W

N 4° 06' 17.6" E

-Y17RPD- CS 28+74.02

BEG SBG +50

END SBG +74

30+00

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

30 LF OF INLET CHANNEL IMPROVEMENT
EST. 35 TONS CL II RIP RAP
EST. 35 SY GEOTEXTILE

SITE 87

-BL- 736 PINC 238+27.85

BEG SBG +68

END SBG +55

2 TONS CL B RIPRAP W/7 SY GEO FAB

BERM DITCH SEE DETAIL CO

LATERAL BASE DITCH SEE DETAIL BQ

15" CSP 2 ELBOWS ROD & LUG

22 LF OF OUTLET CHANNEL IMPROVEMENT
EST. 25 TONS CASS II RIP RAP
EST. 25 SY GEOTEXTILE

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

CHORD

WP-C

SDD-C

PASTURE

2 @ 10' X 8' RCBC C800

15.62

-Y17FLY- 25+00

2GI

15" RCP-III

24" RCP-III

BDO

18" CSP 2 ELBOWS ROD & LUG

5 TONS CL B RIPRAP W/14 SY GEO FAB

LATERAL BASE DITCH W/CL B RIPRAP SEE DETAIL BZ

BERM DITCH SEE DETAIL CA

150' R/W

+05 158'

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- F F — DENOTES FILL IN WETLAND
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- PS PS — DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR -Y17FLY- PROFILE SEE SHT. 129-130
FOR -Y17RPC- PROFILE SEE SHT. 208
FOR -Y17RPD- PROFILE SEE SHT. 209-210
FOR -Y17RPDA- PROFILE SEE SHT. 211

100' 0' 100' 200'
GRAPHIC SCALE

SITE 86 And 87
PLAN VIEW

2/2/2016
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PROJECT REFERENCE NO.	SHEET NO.
R-2536	52
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 214 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

MATCHLINE -Y17FLY- STA. 23+00 SEE SHEET 53

MATCHLINE -Y17FLY- STA. 12+00 SEE SHEET 51

MATCHLINE -Y17RPD- STA. 18+00 SEE SHEET 51

MATCHLINE -Y17RPD- STA. 31+00 SEE SHEET 53

SITE 86

SITE 87

WZ-C

SNN-C

WY-C

SCC/SEE-C

WP-C

SDD-C

RAEFORD & MARY ROUTH(LIFE ESTATE) TONY & MARK ROUTH

412

411

TANA SKIPPER

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

LATERAL BASE DITCH W/CLASS B RIPRAP SEE DETAIL AY

KENNETH SYMES

403

TOMMY BARNES

404

INV=5.86

GABLES CREEK

40 LF OF INLET CHANNEL IMPROVEMENT EST. 80 TONS CL II RIP RAP EST. 80 SY GEOTEXTILE

251

HARMON TROGDON

TOE PROTECTION W/CLASS B RIPRAP SEE DETAIL I

-Y17RPC-

-Y17RPDA-

-Y17FLY-

20+00

15+00

25+00

30+00

WOODS

PASTURE

53 LF OF INLET CHANNEL IMPROVEMENT EST. 110 TONS CL II RIP RAP EST. 120 SY GEOTEXTILE

402

JERRY T

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

LATERAL BASE DITCH W/CL I RIPRAP SEE DETAIL CO

2 @ 10'-0" X 8'-0" RCBC C-800

5.62

250

ADLETTA DELK

MTL GATE

PROGRESS ENERGY R/W

GUY WIRES

I86

I87

I88

MEDIAN V DITCH SEE DETAIL AT

-BL- 1333 PINC 230+53.97

-L- 1333 PINC 236+53.85

N 4° 07' 28.8" E

N 2° 31' 45.6" W

3+69.83

50' R/W

15" RCP-III

2GI

BEG SBG +06

18" RCP-III

30" RCP-III

2GI-A

FS

LATERAL BASE DITCH W/CL I RIPRAP SEE DETAIL CN

8 TONS CL B RIPRAP W/21 SY GEO FAB

3 TONS CL B RIPRAP W/10 SY GEO FAB

LATERAL BASE DITCH W/CL I RIPRAP SEE DETAIL CN

HARMON TROGDON

251

30 LF OF INLET CHANNEL IMPROVEMENT EST. 35 TONS CL II RIP RAP EST. 35 SY GEOTEXTILE

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

SITE 87

END SBG +74

BEG SBG +50

-Y17RPD- CS 28+74.02

N 4° 06' 13.6" E

BEG SBG +68

END SBG +55

15" RCP-III

24" RCP-III

18" CSP 2 ELBOWS ROD & LUG

BDO

5 TONS CL B RIPRAP W/14 SY GEO FAB

2 TONS CL B RIPRAP W/7 SY GEO FAB

LATERAL BASE DITCH SEE DETAIL BQ

15" CSP 2 ELBOWS ROD & LUG

BERM DITCH SEE DETAIL CO

22 LF OF OUTLET CHANNEL IMPROVEMENT EST. 25 TONS CLASS II RIP RAP EST. 25 SY GEOTEXTILE

LATERAL BASE DITCH W/CL B RIPRAP SEE DETAIL BZ

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

CHORD

BERM DITCH SEE DETAIL CA

BERM DITCH SEE DETAIL CA

+05 158'

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- F F — DENOTES FILL IN WETLAND
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

FOR -Y17FLY- PROFILE SEE SHT. 129-130
FOR -Y17RPC- PROFILE SEE SHT. 208
FOR -Y17RPD- PROFILE SEE SHT. 209-210
FOR -Y17RPDA- PROFILE SEE SHT. 211

100' 0' 100' 200'

GRAPHIC SCALE

SITE 86 And 87 PLAN VIEW

2/2/2016
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5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
R-2536	52A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 215 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

50' 25' 0' 50' 100'
GRAPHIC SCALE

DETAIL SHEET FOR SITE 86

NAD 83/95

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- F F — DENOTES FILL IN WETLAND
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

MATCHLINE -Y17FLY- STA. 23+00
SEE SHEET 53

SITE 86

WZ-C

SNN-C

411
403
404
402
251

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

LATERAL BASE DITCH W/CLASS B RIPRAP SEE DETAIL AY

KENNETH SYMES

TOMMY BARNES

JERRY T

HARMON TROGDON

GABRIELS CREEK

INV=913.85'

2 @ 10' X 8' RCBC C800

LF OF INLET
ANNEL IMPROVEMENT
80 TONS CL II RIP RAP
80 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIPRAP SEE DETAIL I

55' LF OF INLET
CHANNEL IMPROVEMENT
EST. 110 TONS CL II RIP RAP
EST. 120 SY GEOTEXTILE

LATERAL BASE DITCH W/CL I RIPRAP SEE DETAIL CO

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

WOODS

PASTURE

15" RCP-III 2GI

2GI

15" RCP-IV

2GI

189

190

191

20+00

20+00

JS JS JS

PROJECT REFERENCE NO.	SHEET NO.
R-2536	52B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 216 OF 257

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ENGLISH

30' 15' 0' 30' 60'
GRAPHIC SCALE

DETAIL SHEET FOR SITE 87

NAD 83/95

WY-C

SCC/SEE-C

30 LF OF INLET
CHANNEL IMPROVEMENT
EST. 35 TONS CL II RIP RAP
EST. 35 SY GEOTEXTILE

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

SITE 87

END SBG +74

30+00

2GI

15" RCP-IV

C750 1 @ 6' X 7' RCBC

2GI

15" RCP-III

END SBG +55

BEG SBG +68

2GI

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

22 LF OF OUTLET
CHANNEL IMPROVEMENT
EST. 25 TONS CASS II RIP RAP
EST. 25 SY GEOTEXTILE

2 TONS
CL B RIPRAP
W/7 SY
GEO FAB

LATERAL BASE DITCH
SEE DETAIL BQ

15" CSP
2 ELBOWS
ROD & LUG

BERM DITCH SEE DETAIL CC

BERM DITCH SEE DETAIL X

WOODS

-Y17RPD-

LEGEND

- — WLB — DENOTES WETLAND BOUNDARY
- TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

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SITE 86
–Y17FLY– 22+13

GP AT CL STA. 22+13 –Y17FLY–
ELEV. = 661.94
LENGTH = 289'
SKEW 74°
2 @ 10' x 8' RCBC

PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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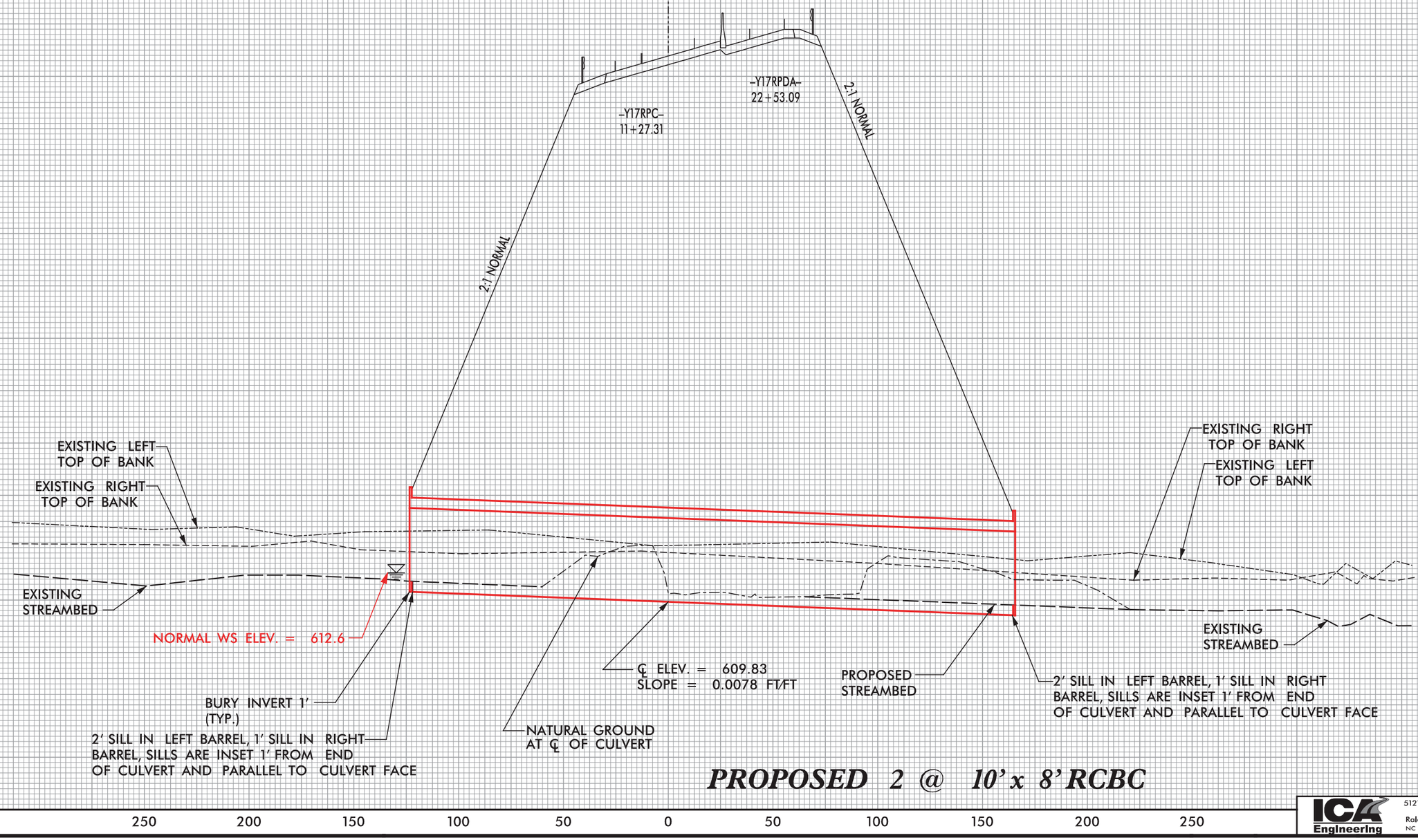
PERMIT DRAWING
SHEET 217 OF 257



PROPOSED 2 @ 10' x 8' RCBC

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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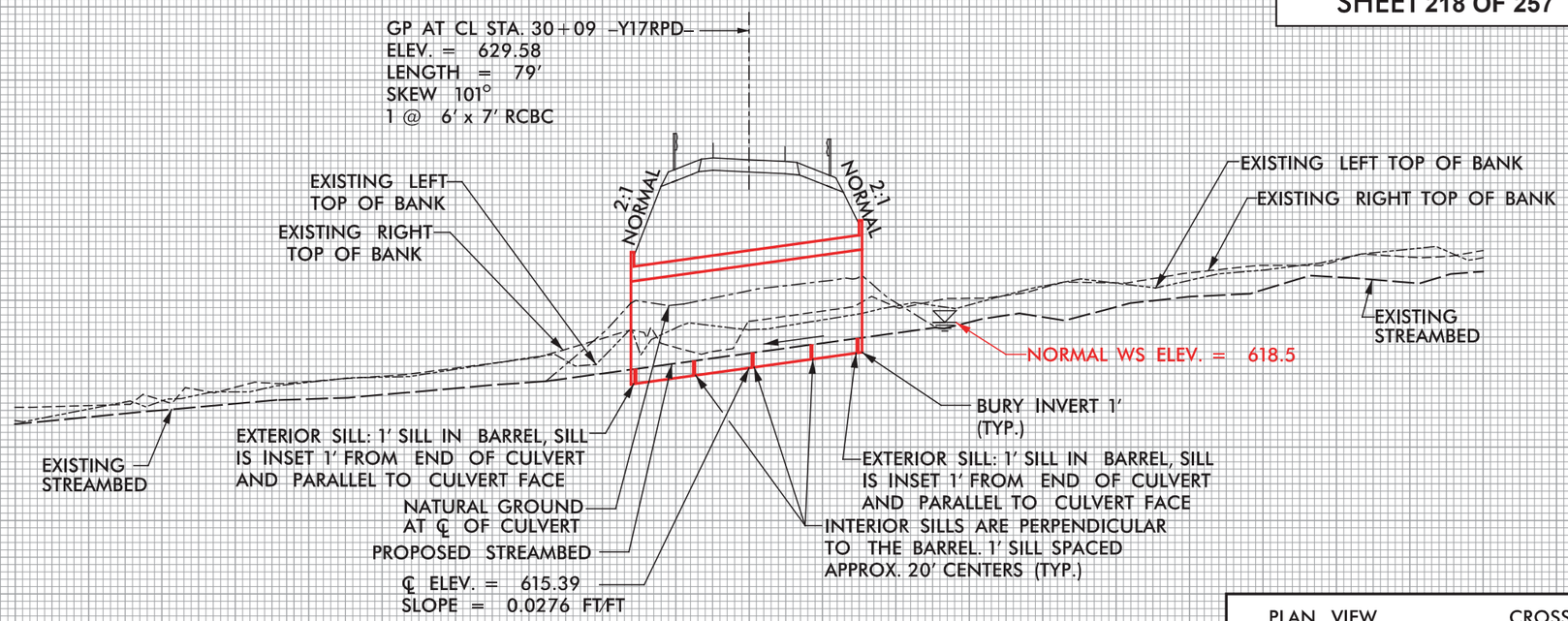
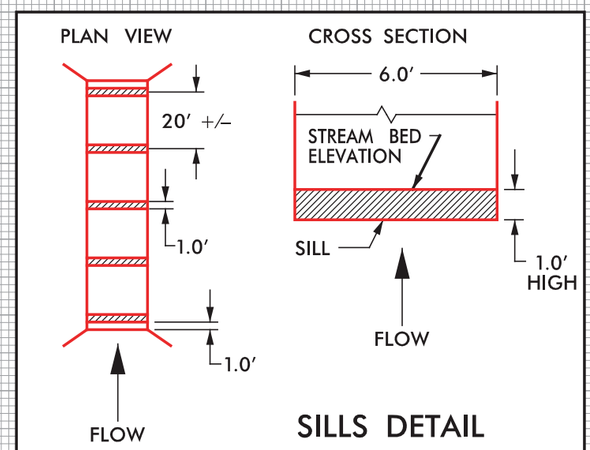
SITE 87
–Y17RPD– 30+09

PERMIT DRAWING
SHEET 218 OF 257





NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

PROPOSED 1 @ 6'x 7' RCBC

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-20

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

ENGLISH

PERMIT DRAWING
SHEET 219 OF 257

660
650
640
630
620
610

0.060 0.060 0.060

–Y17RPC–
11+27.31

2:1 2:1 2:1

612.75

22+00.00

WETLAND

SITE 86

0.060 0.060 0.060

–Y17RPC–
10+77.77

2:1

21+50.00

–Y17FLY–

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

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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-31

ENGLISH

PERMIT DRAWING
SHEET 220 OF 257

WETLAND

SITE 86

2/2016
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REVISIONS

PROJECT REFERENCE NO. R-2536 | SHEET NO. 53

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 221 OF 257

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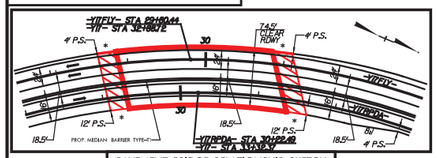
FOR –Y17– PROFILE SEE SHT. 203–208
FOR –Y17FLY– PROFILE SEE SHT. 129–131
FOR –Y17RPC– PROFILE SEE SHT. 208
FOR –Y17RPD– PROFILE SEE SHT. 209–210
FOR –Y17LFDA– PROFILE SEE SHT. 210
FOR –Y17RFDA– PROFILE SEE SHT. 211
FOR –Y17A PROFILE SEE SHT. 212
FOR –SR60RI– PROFILE SEE SHT. 215

ENGLISH

PAVEMENT–BRIDGE RELATIONSHIP SKETCH



* GUARDRAIL ANCHOR UNIT REQUIRED

BRIDGE APPROACH SLAB

PAVEMENT REMOVAL

LEGEND

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

SITE 88, 89, 90, 91, 92, 93, 94, AND 95 PLAN VIEW

MATCHLINE –Y17– STA. 30+00 SEE SHEET 101

MATCHLINE –Y17– STA. 58+00 SEE SHEET 54

MATCHLINE –Y17FLY– STA. 23+00 SEE SHEET 52

MATCHLINE –Y17RPD– STA. 31+00 SEE SHEET 52

MATCHLINE –Y17RPC– STA. 18+50 SEE SHEET 101

MATCHLINE –Y17A– STA. 37+00 SEE SHEET 102

MATCHLINE –ESR5– STA. 35+00 SEE SHEET 54

AS A RESULT OF THE PROPOSED CULVERT, THE MAXIMUM INCREASE IN BASE (100-YEAR) FLOOD ELEVATION IS 0.31' AND IS AT RIVER STATION 15800. APPROXIMATELY 200' UPSTREAM FROM THE PROPOSED CULVERT BASED ON LOWEST ADJACENT GRADE, 3 STRUCTURES (1SBKD AND TWO SHEDS) ON PARCEL #412 (RADFORD & MARY ROUTH (LIFE ESTATE), TONY & MARK ROUTH DB 2151 PG 1024) AND TWO STRUCTURES (1SBKD AND ONE SHED) ON PARCEL #411 (TANA SKIPPER, DB 1775 PG 1159) WILL BE AFFECTED BY THE INCREASE IN BASE FLOOD ELEVATION. THESE TWO PARCELS WITH ALL THE STRUCTURES ARE OUTSIDE OF THE PROPOSED RIGHT OF WAY AND WILL BE PURCHASED BY NCDOT.

LOCATION: U.S. 64 BYPASS AT U.S. 64 BUSINESS (–Y17–)

TIP NO.: R-2536 | COUNTY: RANDOLPH

DESIGNED BY: HWB

CHECKED BY: DCW | DATE: 11-00-15

GRAPHIC SCALE
50 25 0 50 100
PLANS

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Raleigh, NC 27607
NC License No. P-0218

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C:\Projects\R-2536\Roadway\Sheets\R2536_SHEET_53.dgn

REVISIONS

PROJECT REFERENCE NO. R-2536 | SHEET NO. 53

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 222 OF 257

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FOR -Y17- PROFILE SEE SHT. 203-208
FOR -Y17FLY- PROFILE SEE SHT. 129-131
FOR -Y17RPC- PROFILE SEE SHT. 208
FOR -Y17RPD- PROFILE SEE SHT. 209-210
FOR -Y17LFDA- PROFILE SEE SHT. 210
FOR -Y17RFDA- PROFILE SEE SHT. 211
FOR -Y17A PROFILE SEE SHT. 212
FOR -SR60RI- PROFILE SEE SHT. 215

ENGLISH

MID SLOPE

LEGEND

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

SITE 88, 89, 90, 91, 92, 93, 94, AND 95 PLAN VIEW

PAVEMENT-BRIDGE RELATIONSHIP SKETCH

-Y17EV- STA 29+80.44
-Y17- STA 32+18.12
74.5' CLEAR R/W
-Y17RPC- STA 30+29.62
-Y17- STA 31+06.62
-Y17RPD-
4' P.S.
30
12' P.S.
18.5'
PROP. MEDIAN BARRIER TYPE-T

* GUARDRAIL ANCHOR UNIT REQUIRED
BRIDGE APPROACH SLAB
PAVEMENT REMOVAL

A
B
C
D

SNN-C
WTA-C
WU-C
WV-C
WX-C
WW-C
WAA-C

SITE 88
SITE 89
SITE 90
SITE 91
SITE 92
SITE 93
SITE 94
SITE 95

-ESRS- PC 10+00.00
-ESRS- PT 11+78.93
-ESRS- PC 22+49.91
-ESRS- PT 26+48.13
-ESRS- PC 33+03.01

-BYG- T72 PNC 5+09.08
-BYSA- T72 POT 5+00.00

MATCHLINE -Y17- STA. 30+00
SEE SHEET 101

MATCHLINE -Y17- STA. 58+00
SEE SHEET 54

MATCHLINE -Y17FLY- STA. 18+50
SEE SHEET 101

MATCHLINE -Y17FLY- STA. 23+00
SEE SHEET 52

MATCHLINE -Y17RPD- STA. 31+00
SEE SHEET 52

MATCHLINE -Y17A- STA. 37+00
SEE SHEET 102

MATCHLINE -ESRS- STA 35+00
SEE SHEET 54

AS A RESULT OF THE PROPOSED CULVERT, THE MAXIMUM INCREASE IN BASE (100-YEAR) FLOOD ELEVATION IS 0.31 AND IS AT RIVER STATION 15800. APPROXIMATELY 200' UPSTREAM FROM THE PROPOSED CULVERT BASED ON LOWEST ADJACENT GRADE, 3 STRUCTURES (1SBKD AND TWO SHEDS) ON PARCEL #412 (RAEFORD & MARY ROUTH (LIFE ESTATE), TONY & MARK ROUTH DB 2151 PG 1024) AND TWO STRUCTURES (1SBKD AND ONE SHED) ON PARCEL #411 (TANA SKIPPER, DB 1775 PG 1159) WILL BE AFFECTED BY THE INCREASE IN BASE FLOOD ELEVATION. THESE TWO PARCELS WITH ALL THE STRUCTURES ARE OUTSIDE OF THE PROPOSED RIGHT OF WAY AND WILL BE PURCHASED BY NCDOT.

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: U.S. 64 BYPASS AT U.S. 64 BUSINESS (-Y17-)
TIP NO.: R-2536 | COUNTY: RANDOLPH
DESIGNED BY: HWB
CHECKED BY: DCW | DATE: 11-00-15

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	53-lb
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 223 OF 257

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ENGLISH

REMOVE
RIPRAP
DI
CONC 18" RCP
INV=645.81'
TOP=649.22'
END SBG +78
+76
12" CITY OF ASHEBORO
CENTURY LINK
EXISTING R/W
INV=641.49'
TREES
12" CITY OF ASHEBORO
NCDOT
INV=629.06'
18" RCP REMOVE
-ESR5- PC 10+00.00
-ESR5- PT 11+78.93
10+00
401
VERA HILL HEIRS
WOODS
WX-C
REMOVE EXISTING ROADWAY AND BRIDGE TO NATURAL GROUND
BEGIN TEMP. IMPACTS IN SURFACE WATER
BEGIN PERM. IMPACTS IN SURFACE WATER
SITE 89
15+00
BEGIN PERM. IMPACTS IN SURFACE WATER
BEGIN TEMP. IMPACTS IN SURFACE WATER
SITE 88
WAA-C
SNN-C
402
JERRY TROTTER
-Y17FLY-
-Y17RPDA-
2GI
NAD 83/95

D

AD

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- F F — DENOTES FILL IN WETLAND
- E E — DENOTES EXCAVATION IN WETLAND

50' 25' 0' 50' 100'
GRAPHIC SCALE

DETAIL SHEET FOR SITE 88 AND 89

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-149

ENGLISH

PERMIT DRAWING
SHEET 224 OF 257

SITE 88
WETLAND

620.57
0.09%
13+00.00

SITE 88
WETLAND

622.00
0.5%
12+50.00

SITE 88
WETLAND

623.84
1.7%
12+00.00

SITE 88
WETLAND

626.27
4%
11+50.00

SITE 88
WETLAND

628.97
14%
11+00.00

-ESR5-

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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-150

620 610 600

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

1.2% 618.63

16+00.00

ENGLISH

PERMIT DRAWING
SHEET 225 OF 257

1.5% 609.02

15+50.00

618.47 0.8%

15+00.00

618.58 2.5%

14+50.00

SITE 88
WETLAND

618.94 0.02%

14+00.00

SITE 88
WETLAND

619.54 0.18%

13+50.00

-ESR5-

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	53-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PERMIT DRAWING SHEET **226 OF 257**

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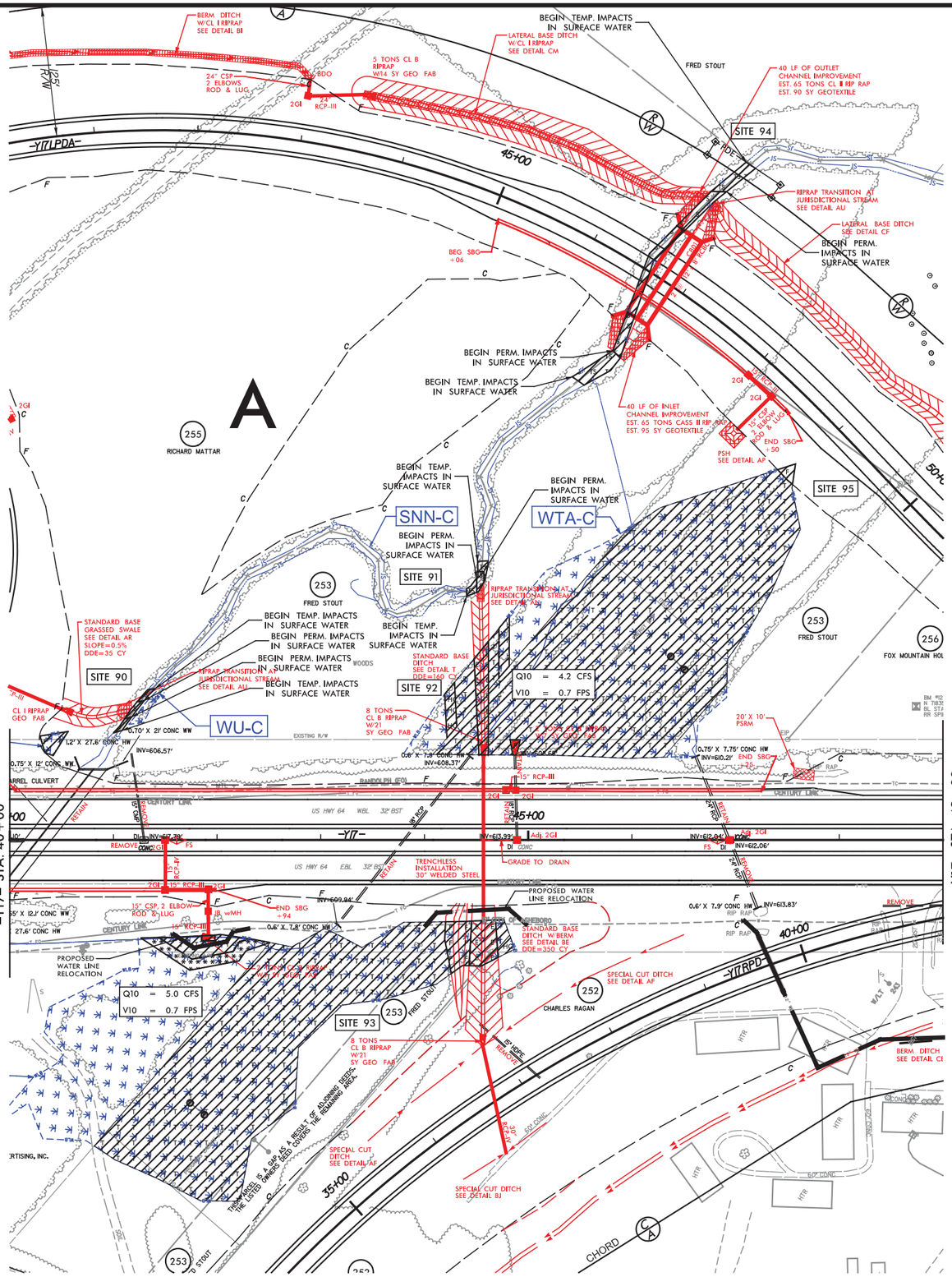
ENGLISH

NAD 83/95



LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES PERMANENT IMPACTS IN SURFACE WATER
- DENOTES EXCAVATION IN WETLAND
- DENOTES FILL IN WETLAND
- DENOTES TEMPORARY FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING

SITE 90, 91, 92, 93, AND 95 PLAN VIEW

120' 0' 120' 240'
GRAPHIC SCALE

FOR -Y17A- PROFILE SEE SHT. 212

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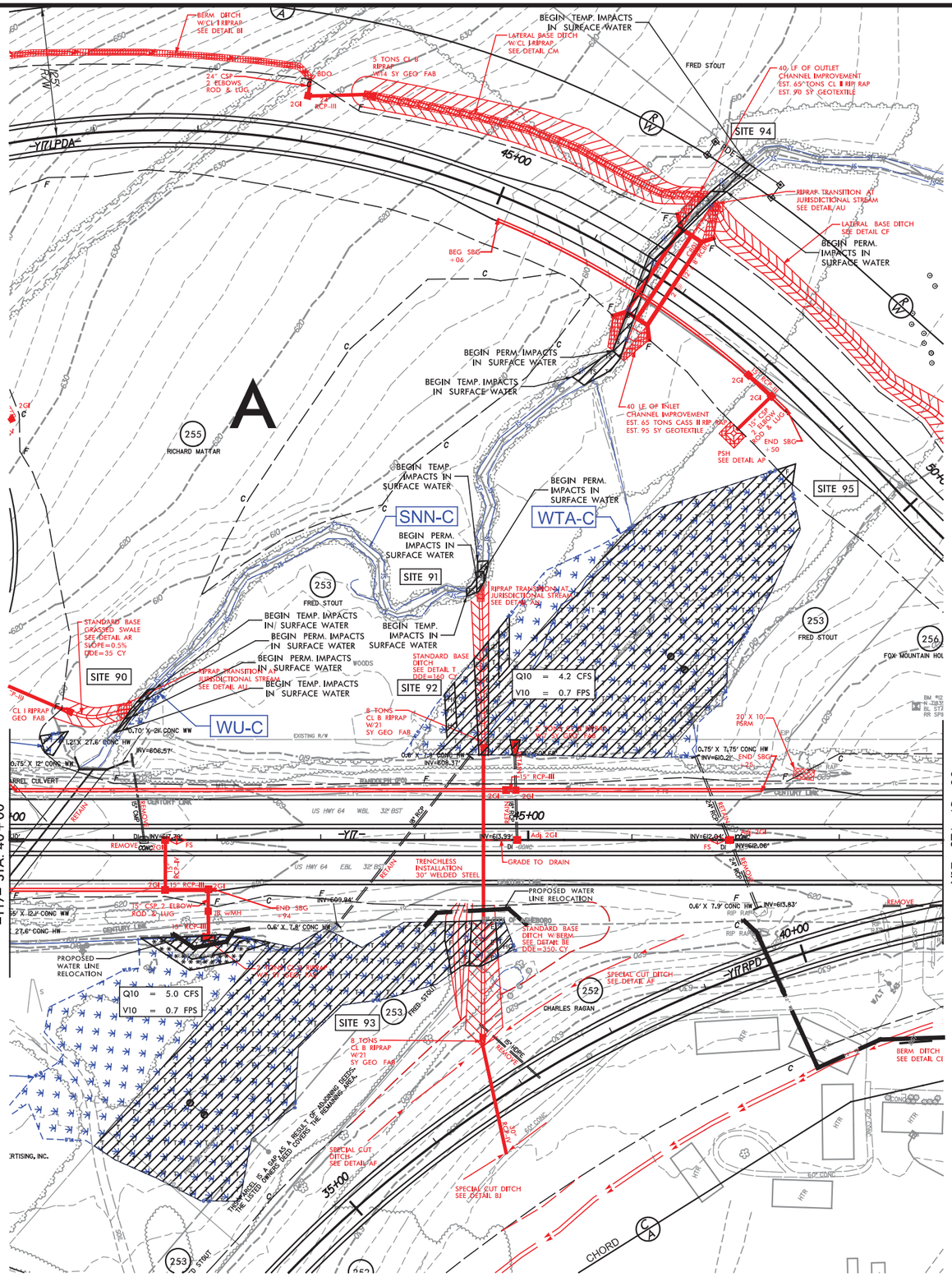

PROJECT REFERENCE NO.	SHEET NO.
R-2536	53-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 227 OF 257

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ENGLISH

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES PERMANENT IMPACTS IN SURFACE WATER
- DENOTES EXCAVATION IN WETLAND
- DENOTES FILL IN WETLAND
- DENOTES TEMPORARY FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING

SITE 90, 91, 92, 93, 94, AND 95 PLAN VIEW

120' 0' 120' 240'
GRAPHIC SCALE

FOR -Y17A- PROFILE SEE SHT. 212

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LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- E E — DENOTES EXCAVATION IN WETLAND
- F F — DENOTES FILL IN WETLAND
- T T — DENOTES TEMPORARY FILL IN WETLAND
- HC HC — DENOTES HAND CLEARING

NAD 83'95

PROJECT REFERENCE NO.	SHEET NO.
R-2536	53_2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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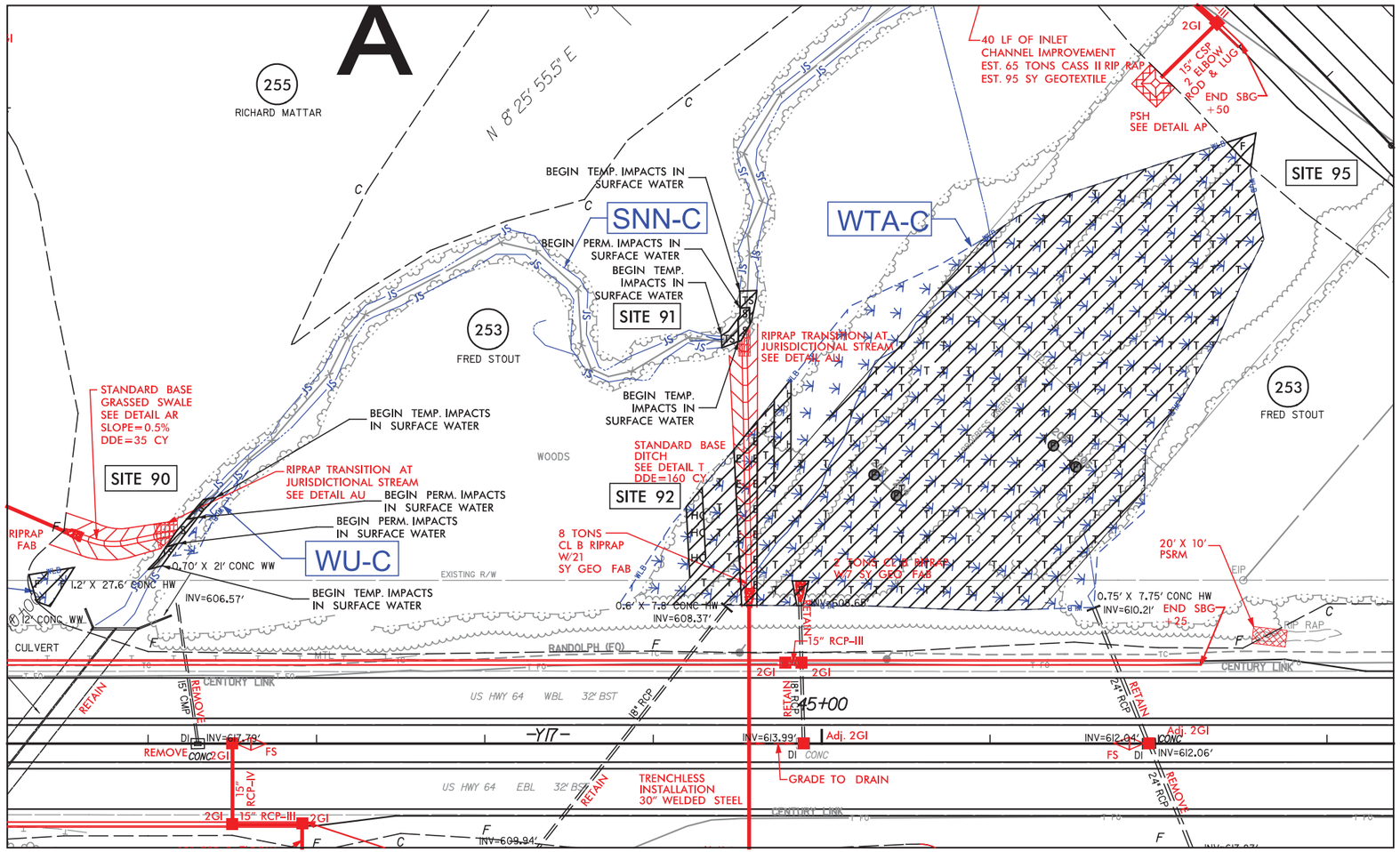
ENGLISH



80' 40' 0' 80' 160'

GRAPHIC SCALE

DETAIL SHEET FOR SITE 90, 91, 92 AND 95

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Raleigh, NC 27607
NC License No: F-0258

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ICA ENGINEERING, INC.
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PROJECT REFERENCE NO.	SHEET NO.
R-2536	53_2B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 229 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

RETAIN
REMOVE 15" CMP
DI INV=617.79'
REMOVE CONC 2GI
FS
15" RCP-IV
2GI
15" RCP-III
2GI
15" CSP, 2 ELBOW ROD & LUG
JB w/MH
END SBG +94
15" RCP-III
F
C
F
INV=609.94'
0.6' X 7.8' CONC HW
US HWY 64 WBL 32' BST
US HWY 64 EBL 32' BST
-Y17-
18" RCP
RETAIN
TRENCHLESS INSTALLATION 30" WELDED STEEL
RETAIN
45+00
INV=613.99'
Adj. 2GI
DI CONC
GRADE TO DRAIN
CENTURY LINK
T FO
PROPOSED WATER LINE RELOCATION
12" WL
12" CITY OF ASHEBORO W
STANDARD BASE DITCH W/BERM SEE DETAIL BE
DDE=350 CY
NC WW
HW
CENTURY LINK
PROPOSED WATER LINE RELOCATION
WLB
2 TONS CL B RIPRAP W/7 SY GEO FAB
253
FRED STOUT
SITE 93
252
CHARLES RAGAN
8 TONS CL B RIPRAP W/21 SY GEO FAB
15" HDPE
REMOVE
DEEDS.
THIS PARCEL IS A GAP AS A RESULT OF ADJOINING DEEDS. THE LISTED OWNERS DEED COVERS THE REMAINING AREA.
PROPOSED CHANNEL CLASS C
TO BE CLEARED
SPECIAL CUT DITCH SEE DETAIL AF
30" RCP-IV
60" CONC
35+00
SPECIAL CUT DITCH SEE DETAIL BJ
SOIL
198
253
FRED STOUT
252
CHARLES RAGAN
CHOR

NAD 83/95

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- F F — DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- E E — DENOTES EXCAVATION IN WETLAND
- T T — DENOTES TEMPORARY FILL IN WETLAND
- HC HC — DENOTES HAND CLEARING

DETAIL SHEET FOR SITE 93

50' 25' 0' 50' 100'
GRAPHIC SCALE

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NC License No: F-0258

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ICA ENGINEERING, INC.
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PROJECT REFERENCE NO.	53_2B
R-2536	53_2B
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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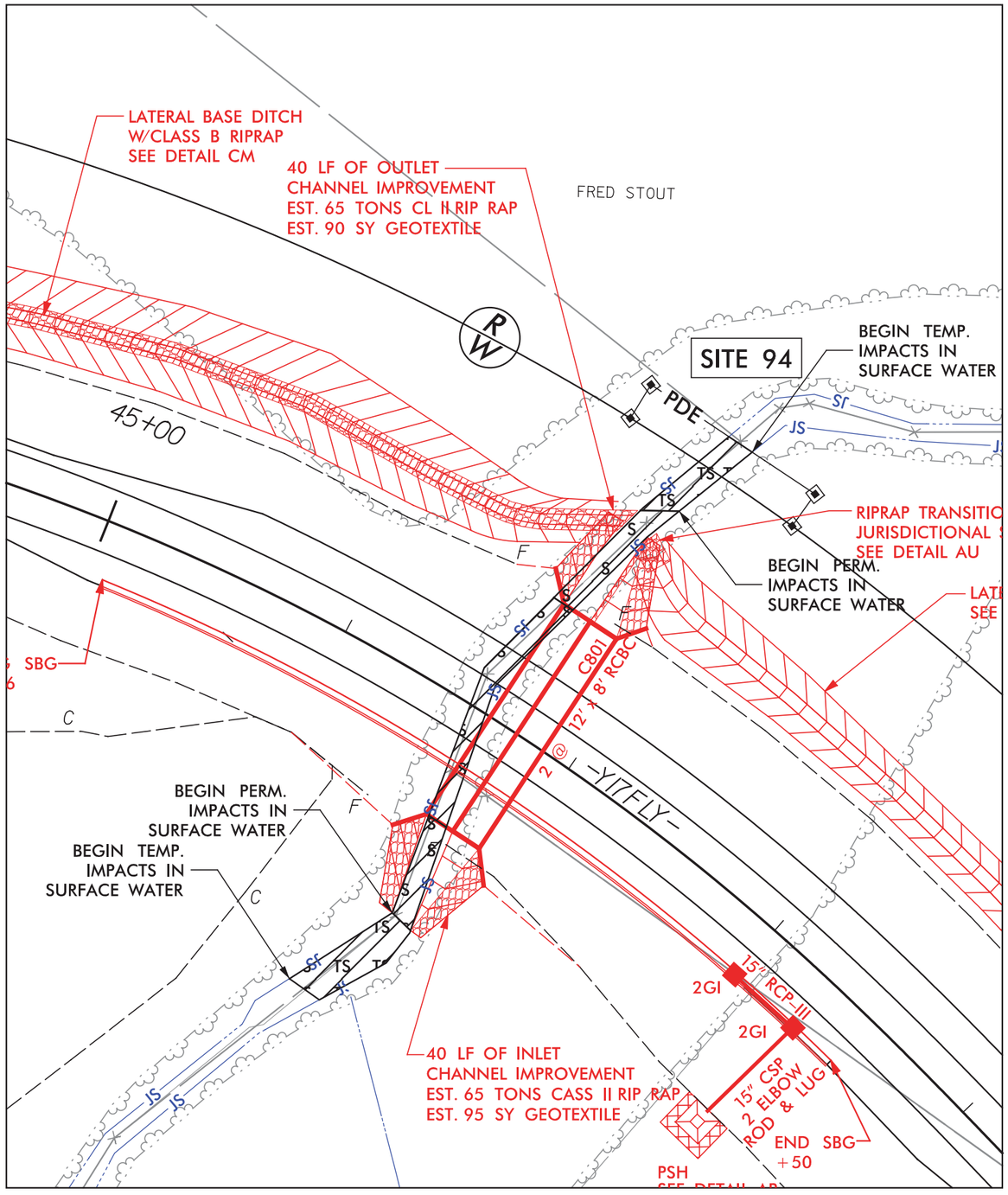
ENGLISH



NAD 83/95

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

DETAIL SHEET FOR SITE 94

50′ 25′ 0′ 50′ 100′
GRAPHIC SCALE

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5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

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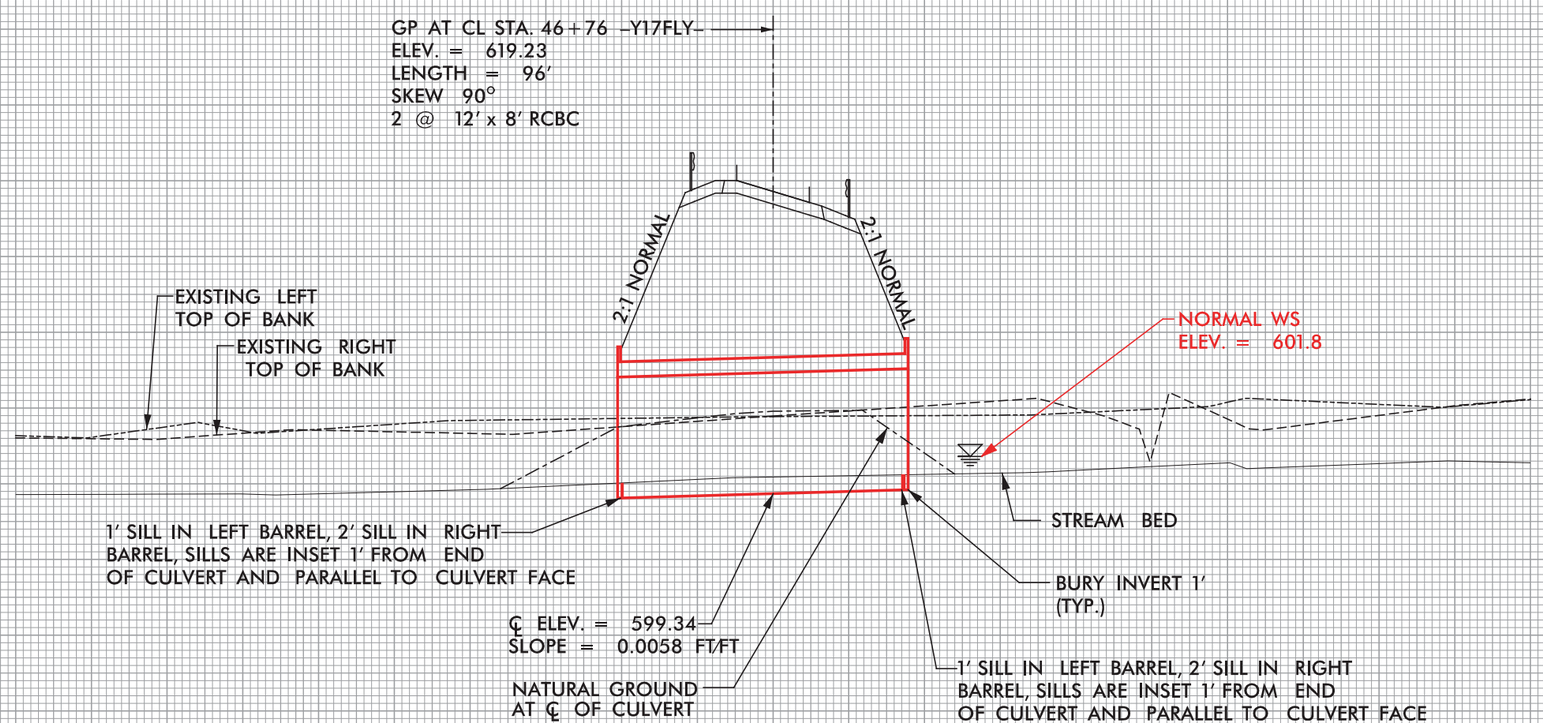
SITE 94
–Y17FLY– 46+76

PROJECT REFERENCE NO.	SHEET NO.
R-2536	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 231 OF 257



PROPOSED 2 @ 12' x 8' RCBC

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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-69

ENGLISH

PERMIT DRAWING
SHEET 232 OF 257

190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110

620
610

SITE 90

WETLAND

SP 463

2:1 | 0.020 | 6:1 | 6.2:1 | 0.020 | 2:1

621.01
D.P. 621.47

41+50.00

SP 461

SP 460

D.P. 622.45
622.78

41+00.00

SITE 90

WETLAND

SP 458

D.P. 623.96
624.26

40+50.00

630
620
610

SP 457

4:1

D.P. 625.36
625.93

40+00.00

0.080 | 0.080 | 6:1

–Y17LPDA–
18+28.00

SP 456

624.27

6:1

2:1

620.25

D.P. 627.39
627.79

39+50.00

–Y17–

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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-70

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

WETLAND WIDTH
IS 94.73'

SITE 92

WETLAND

SITE 93

ENGLISH

620
610

2:1 3 0.020 6:1 6.2:1 0.020 4.8:1

D.P. 617.22 617.53

44+50.00
SITE 92

PERMIT DRAWING
SHEET 233 OF 257

SITE 92

WETLAND

WETLAND

SITE 93

620
610

2:1 3 0.020 6:1 6.2:1 0.020 4:1

D.P. 617.59 617.72

44+00.00

WETLAND WIDTH
IS 57.57'

SITE 93

620
610

2:1 3 0.020 6:1 6.2:1 0.020 4:1

D.P. 617.72 618.11

43+50.00

WETLAND WIDTH
IS 91.85'

SITE 93

620
610

2:1 3 0.020 6:1 6.2:1 0.020 4:1

D.P. 618.55 618.67

43+00.00

WETLAND WIDTH
IS 176.93'

SITE 93

620
610

2:1 3 0.020 6:1 6.2:1 0.020 4.3:1

D.P. 619.22 619.42

42+50.00

WETLAND WIDTH
IS 256.37'

SITE 93

620
610

2:1 3 0.020 6:1 6.2:1 0.020 3.7:1

D.P. 619.97 620.35

42+00.00

-Y17-

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

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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-51

130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170

ENGLISH

620 / 610

SP 500

0.056 0.056

2:1 6:1 6:1

611.05

50+95.00

PERMIT DRAWING
SHEET 234 OF 257

620 / 610

SP 499

0.038 0.038

5:1 5:1

3:1 3:1

605.25

S.S. 614.12

50+50.00

620 / 610

SP 498

0.018 0.018

4:1 4:1

3:1 3:1

604.35

S.S. 610.98

50+00.00

620 / 610

0.002 0.002

3:1 4:1

3:1 3:1

603.46

49+50.00

WETLAND WIDTH
IS 390.57'

SITE 95

620 / 610

0.022 0.022

2:1 4:1

3:1 3:1

602.73

49+00.00

620 / 610

0.042 0.042

2:1 4:1

3:1 3:1

602.10

48+50.00

-Y17FLY-

130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	54
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 235 OF 257

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ENGLISH

NAD 83/95

MATCHLINE -Y17- STA. 58+00
SEE SHEET 53

MATCHLINE -Y17- STA. 71+00 -SR6- STA. 21+50
SEE SHEET 55

MATCHLINE -SR5- STA. 18+00
SEE SHEET 55

MATCHLINE -ESR5- STA. 35+00
SEE SHEET 53

SMM-C

SFF/SKK-C

SFF-C

SFF-C

SITE 96

SITE 97

SITE 98

BEGIN TEMP. IMPACTS IN SURFACE WATER
STANDARD BASE DITCH SEE DETAIL BX SLOPE=0.55% DDE=27 CY

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER
15 TONS CL I RIPRAP W/30 SY GEO FAB

7 TONS CL I RIPRAP W/15 SY GEO FAB

CHANNEL BLOCK SEE DETAIL U

JB wMH

JB wSlab Ltd

36" RCP-III

24" RCP-III

18" RCP-III

30" RCP

15" RCP-III

36" WELDED STEEL TRENCHLESS INSTALLATION

7 TONS CL B RIPRAP

4OTCB

15" CSP 2 ELBOWS ROD & LUG

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

BEGIN TEMP. IMPACTS IN SURFACE WATER

LATERAL BASE DITCH SEE DETAIL BR

SPECIAL CUT DITCH W/PSRM SEE DETAIL AH

BEGIN PERM. IMPACTS IN SURFACE WATER

STANDARD BASE DITCH SEE DETAIL T SLOPE=0.66% DDE=12 CY

3 TONS CL B RIPRAP W/10 SY GEO FAB

SPECIAL CUT DITCH SEE DETAIL H

SPECIAL LATERAL V DITCH SEE DETAIL J

BERM DITCH W/CL B RIPRAP SEE DETAIL CI

BERM DITCH SEE DETAIL BC

TOE PROTECTION W/CL B RIPRAP SEE DETAIL I

SPECIAL CUT DITCH SEE DETAIL H

BERM DITCH W/CL B RIPRAP SEE DETAIL CI

RETAIN 15" RCP

REMOVE 15" RCP

CONC. COLLAR DI-2GI-D

Adj. 2GI

2GI

2GI-D

60+00

65+00

70+00

15+00

20+00

10+00

40+00

-ESR5- PT 37+25.45

N 31° 06' 24.7" E

CHORD

EXISTING R/W

CENTURY LINE

CABLE

RANDOLPH (FO)

12" CITY OF ASHEBORO

WOODS

GRASS

BARRICADE

ROCK WALL

CONC WALK

ISBKD

ISFD

ISMTLBUS

ISFD ABAND

RUINS

BST

DK

CONC

SOIL

ROCK PAD

SEPTIC EASEMENT TANK & FIELD

PROGRESS ENERGY CAROLINAS

258 WAYNE TROGDON

259 LARRY MCKENZIE

264 PROGRESS ENERGY CAROLINAS

267 JUDY HALL

419 JOSEPH DOUB

915 NORTH CAROLINA DEPATMENT OF TRANSPORTATION

UNKNOWN OWNER

275 STEVEN COLEMAN

JUSTIN & SARAH KIVETT

CARL KEENE

GREGORY WILLIAMS

LEGEND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES PERMANENT IMPACTS IN SURFACE WATER

SITE 96 ,97 AND 98 PLAN VIEW

FOR -Y17- PROFILE SEE SHT. 205-206
FOR -SR5- PROFILE SEE SHT. 213
FOR -SR6- PROFILE SEE SHT. 214
FOR -SR6DR1- PROFILE SEE SHT. 215
FOR -SR6DR2- PROFILE SEE SHT. 215

100' 0' 100' 200'
GRAPHIC SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	54
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 236 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

MATCHLINE –Y17– STA. 58+00 SEE SHEET 53

MATCHLINE –SR5– STA. 18+00 SEE SHEET 55

MATCHLINE –Y17– STA. 71+00 –SR6– STA. 21+50 SEE SHEET 55

MATCHLINE –ESR5– STA. 35+00 SEE SHEET 53

SMM-C

SFF/SKK-C

SFF-C

SITE 96

SITE 97

SITE 98

NAD 83/95

PROGRESS ENERGY CAROLINAS

WAYNE TROGDON

JUDY HALL

JOSEPH DOUB

CARL KEENE

JUSTIN & SARAH KIVETT

GREGORY WILLIAMS

NORTH CAROLINA DEPATMENT OF TRANSPORTATION

UNKNOWN OWNER

STEVEN COLEMAN

LARRY MCKENZIE

CITY OF ASHEBORO

CENTURY LINK

RANDOLPH 4FOF

–ESR5– PT 37+25.45

N 31° 06' 24.7" E

LEGEND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES PERMANENT IMPACTS IN SURFACE WATER

SITE 96 ,97 AND 98 PLAN VIEW

FOR –Y17– PROFILE SEE SHT. 205–206
FOR –SR5– PROFILE SEE SHT. 213
FOR –SR6– PROFILE SEE SHT. 214
FOR –SR6DR1– PROFILE SEE SHT. 215
FOR –SR6DR2– PROFILE SEE SHT. 215

100' 0' 100' 200'
GRAPHIC SCALE

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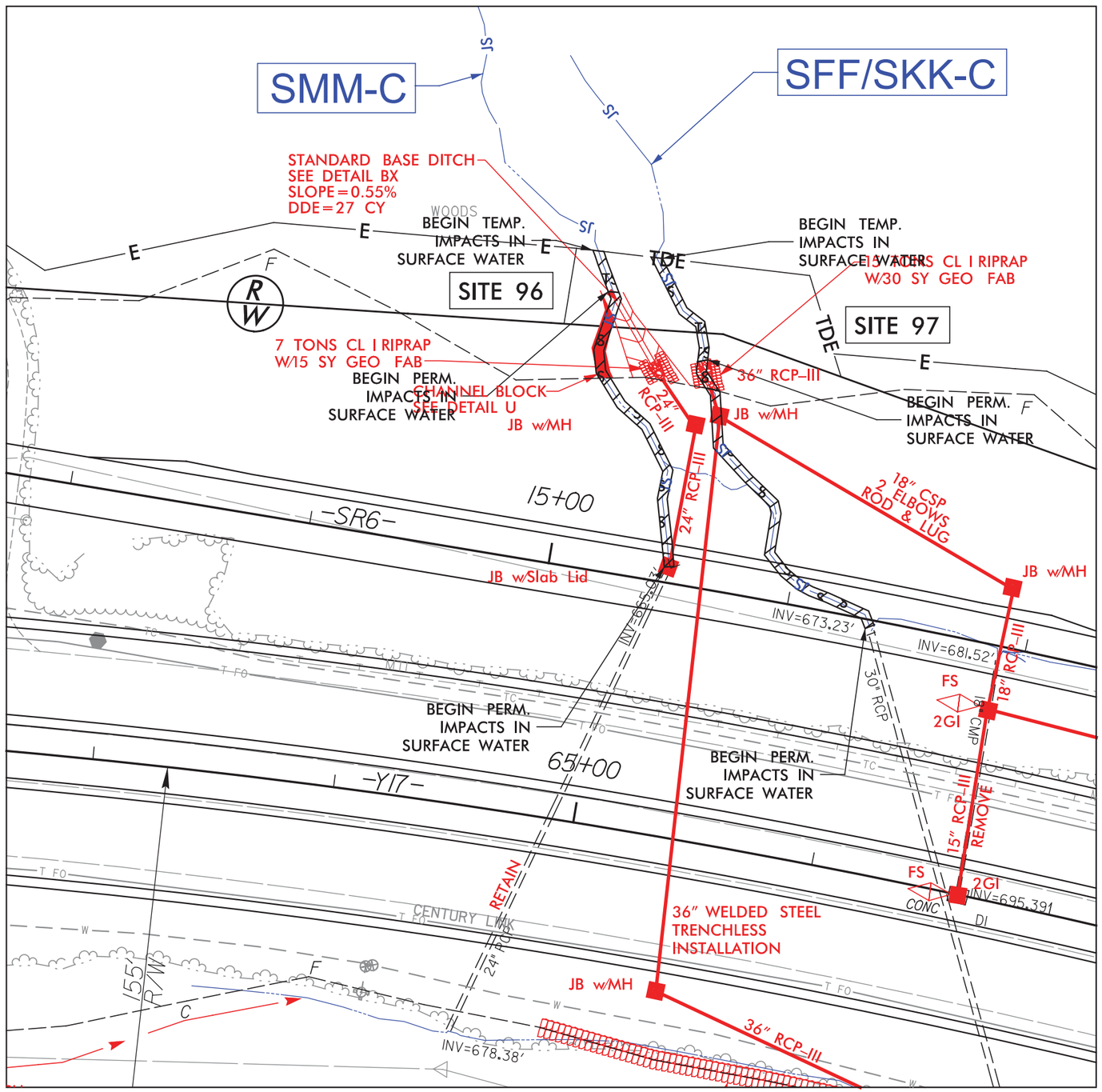
PROJECT REFERENCE NO.	SHEET NO.
R-2536	54
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 237 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



NAD 83/95

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

DETAIL SHEET FOR SITE 96 AND 97

50' 25' 0' 50' 100'
GRAPHIC SCALE

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Raleigh, NC 27607
NC License No: F-0258

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	54
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 238 OF 257

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ENGLISH

NAD 83/95

DETAIL SHEET FOR SITE 98

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

65+00
-SR6-
-Y17-
-S25-
15+00
RETAIN 24" RCP
36" WELDED STEEL TRENCHLESS INSTALLATION
BEGIN PERM. IMPACTS IN SURFACE WATER
JB w/MH
36" RCP-III
INV=678.38'
TOE PROTECTION W/CL B RIPRAP SEE DETAIL I
2 TONS CL B RIPRAP W/7 SY GEO FAB
4OTCB
INV=686.72'
15" CSP ELBOWS ROD & LUG
SITE 98
SFF-C
INV=689.25'
0.6'X6' CONC HW
EXISTING R/W
PROPOSED WATER LINE RELOCATION
12" WL
PUE
SPECIAL CUT DITCH SEE DETAIL H
242
2GI
15" RCP-III
REMOVE
18" RCP-III
INV=695.39'
FS
CONC
DI
CENTURY LINK
INV=700.37'
RETAIN 15" RCP
INV=700.86'
Adj. 2GI
INV=700.94'
INV=701.33'
12" CITY OF ASHEBORO DI
COLLAR
2GI-D
WOODS
BARRICADE
BEGIN PERM. IMPACTS IN SURFACE WATER
15" RCP-III
INV=696.90'
INV=696.10'
15" CSP 2 ELBOWS ROD & LUG
BDO
JB w/MH
HW
SOIL
18" RCP-III
237
SPECIAL CUT DITCH W/PSRM SEE DETAIL AH
LATERAL BASE DITCH SEE DETAIL BR
BEGIN PERM. IMPACTS IN SURFACE WATER
BEGIN TEMP. IMPACTS IN SURFACE WATER
RETAIN 15" RCP
236
10' BST
ROCK WALL
ISMTLBUS
CONC
358 W/LT
915
NORTH CAROLINA
DEPATMENT OF TRANSPORTATION
419

50' 25' 0' 50' 100'
GRAPHIC SCALE

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NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
R-2536	55
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 239 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

END GRADE –Y17– STA 84+60.00
BEGIN MILLING & RESURFACING

WT-C

SITE 99

SITE 100

SGG-C

MATCHLINE –SR6– STA. 21+50 SEE SHEET 54

MATCHLINE –Y17– STA. 71+00 SEE SHEET 54

MATCHLINE –SR5– STA. 18+00 SEE SHEET 54

MATCHLINE –Y17– STA. 85+00 SEE SHEET 56

MARTHA GOMEZ (260)

JULIO ROMERO (410)

A B D DEVELOPMENT, INC. (261)

MARY COX (262)

JAMES COBLE, JR. (279)

BETTY PACK (280)

AURORA PEREZ (281)

JOSEPH MILLINER (420)

BRENDA MOORE (283)

(284)

TERRY VUNCANNON (289)

D & L MANAGEMENT (287)

WILLIAM & INEZ BURROW (288)

HARRY & JUDY CHAMBERLIN (286)

MATTHEW DOMBROWSKI, JR. SUSAN DOMBROWSKI (277)

CAS INVESTMENTS, LLC (276)

JAMES COBLE, JR. (278)

5 TONS CL B RIPRAP W/14 SY GEO FAB

BERM DITCH W/CL B RIPRAP SEE DETAIL CI

BERM DITCH SEE DETAIL BC

18" CSP 2 ELBOWS ROD & LUG

ROADWAY CUT DITCH W/PSRM SEE DETAIL BF

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

LATERAL BASE DITCH SEE DETAIL AC

SPECIAL CUT DITCH SEE DETAIL AF

CHANNEL BLOCK SEE DETAIL U

LATERAL 'V' DITCH SEE DETAIL D

BACK OF CURB & DITCH SEE DETAIL

GRADE TO DRAIN

3 TONS CL B RIPRAP W/10 SY GEO FAB

RETAIN

REMOVE

US HWY 64 WBL

US HWY 64 EBL

RANDOLPH (I-0)

CENTURY LINK

100′ 0′ 100′ 200′
GRAPHIC SCALE

SITE 99 AND 100
PLAN VIEW

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- F F — DENOTES FILL IN WETLAND
- PAVEMENT REMOVAL

FOR –Y17– PROFILE SEE SHT. 206–207
FOR –Y17B– PROFILE SEE SHT. 213
FOR –Y17C– PROFILE SEE SHT. 213
FOR –SR5– PROFILE SEE SHT. 213
FOR –SR6– PROFILE SEE SHT. 214
FOR –SR6DR1– PROFILE SEE SHT. 215
FOR –SR6DR2– PROFILE SEE SHT. 215
FOR –SR6DR3– PROFILE SEE SHT. 215
FOR –SR6DR4– PROFILE SEE SHT. 215
FOR –SR6DR5– PROFILE SEE SHT. 215

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	55
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 240 OF 257

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ENGLISH

NAD 83/95

END GRADE –Y17– STA 84+60.00
BEGIN MILLING & RESURFACING

MATCHLINE –SR6– STA. 21+50 SEE SHEET 54

MATCHLINE –Y17– STA. 71+00 SEE SHEET 54

MATCHLINE –SR5– STA. 18+00 SEE SHEET 54

MATCHLINE –Y17– STA. 85+00 SEE SHEET 56

WT-C

SITE 99

SITE 100

SGG-C

260 MARTHA GOMEZ

261 A B'D DEVELOPMENT, INC.

262 MARY COX

279 JAMES COBLE, JR.

280 BETTY PACK

281 AURORA PEREZ

410 JULIO ROMERO

420 JOSEPH MILLINER

283 BRENDA MOORE

284

276 CAS INVESTMENTS, LLC

277 MATTHEW DOMBROWSKI, JR. SUSAN DOMBROWSKI

278 JAMES COBLE, JR.

286 HARRY & JUDY CHAMBERLIN

287 D & L MANAGEMENT

288 WILLIAM & INEZ BURROW

289 TERRY VUNCANNON

US HWY 64 WBL

US HWY 64 EBL

CENTURY LINK

25+00

30+00

75+00

80+00

20+00

35+00

5 TONS CL B RIPRAP W/14 SY GEO FAB

24" RCP-III

18" RCP-III

15" RCP-III

36" RCP-III

BERM DITCH W/CL B RIPRAP SEE DETAIL CI

BERM DITCH SEE DETAIL BC

18" CSP 2 ELBOWS ROD & LUG

ROADWAY CUT DITCH W/PSRM SEE DETAIL BF

CHANNEL BLOCK SEE DETAIL U

LATERAL 'V' DITCH SEE DETAIL D

LATERAL BASE DITCH SEE DETAIL AC

SPECIAL CUT DITCH SEE DETAIL AF

BACK OF CURB DITCH SEE DETAIL

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

GRADE TO DRAIN

3 TONS CL B RIPRAP W/10 SY GEO FAB

RETAIN

REMOVE

SITE 99 AND 100
PLAN VIEW

100′ 0′ 100′ 200′
GRAPHIC SCALE

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING
- F F — DENOTES FILL IN WETLAND
- PAVEMENT REMOVAL

FOR –Y17– PROFILE SEE SHT. 206–207
FOR –Y17B– PROFILE SEE SHT. 213
FOR –Y17C– PROFILE SEE SHT. 213
FOR –SR5– PROFILE SEE SHT. 213
FOR –SR6– PROFILE SEE SHT. 214
FOR –SR6DR1– PROFILE SEE SHT. 215
FOR –SR6DR2– PROFILE SEE SHT. 215
FOR –SR6DR3– PROFILE SEE SHT. 215
FOR –SR6DR4– PROFILE SEE SHT. 215
FOR –SR6DR5– PROFILE SEE SHT. 215

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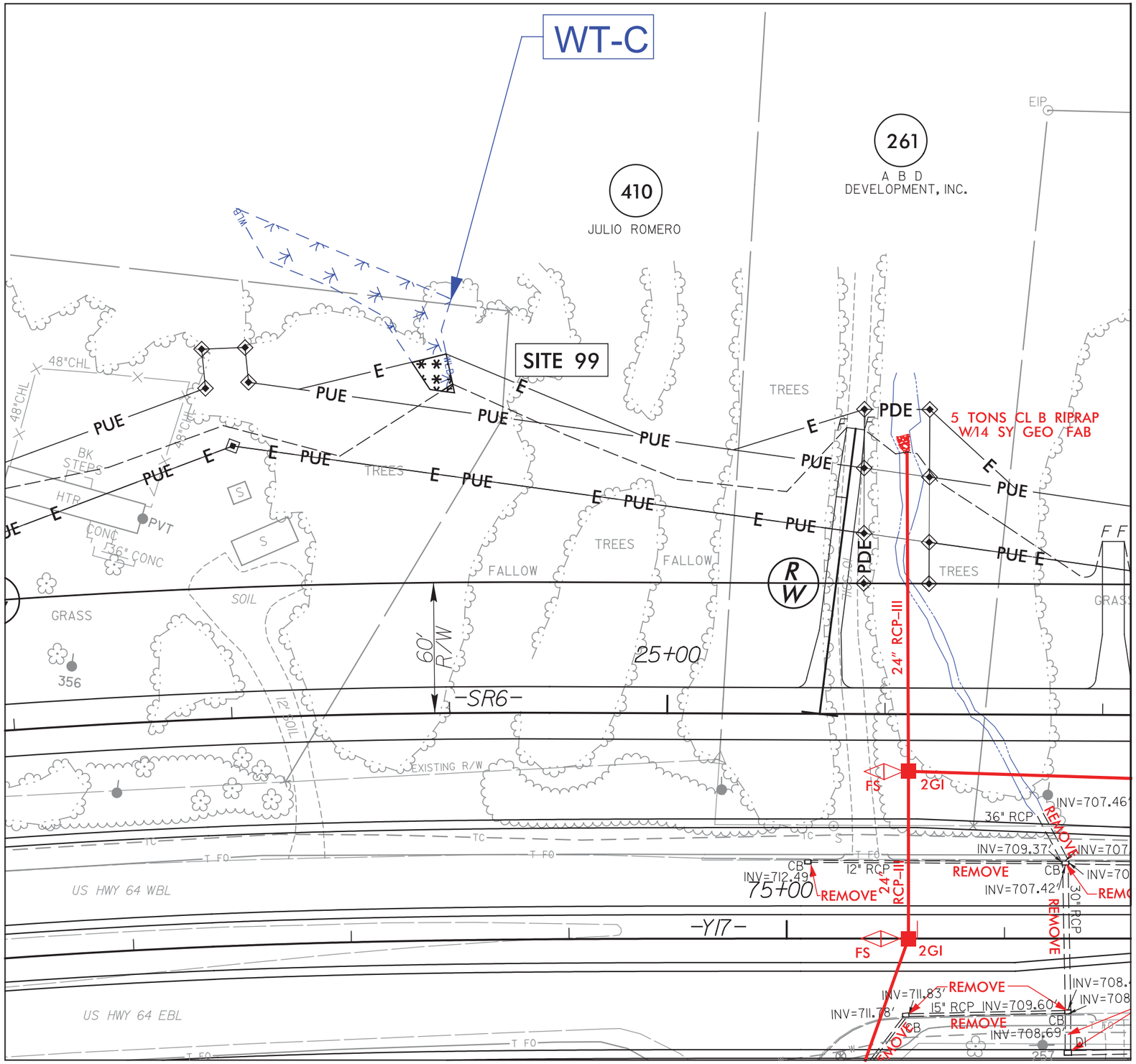
PROJECT REFERENCE NO.	SHEET NO.
R-2536	55
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 241 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH



DETAIL SHEET FOR SITE 99

LEGEND

WLB — DENOTES WETLAND BOUNDARY

DENOTES MECHANIZED CLEARING

F F — DENOTES FILL IN WETLAND

50' 25' 0' 50' 100'
GRAPHIC SCALE

NAD 83/95

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Raleigh, NC 27607
NC License No: F-0258

2/23/2016
ICA ENGINEERING, INC.
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PROJECT REFERENCE NO.	SHEET NO.
R-2536	55
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 242 OF 257

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

NAD 83/95

DETAIL SHEET FOR SITE 100

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES PERMANENT IMPACTS IN SURFACE WATER

50' 25' 0' 50' 100'
GRAPHIC SCALE

SITE 100

SGG-C

-Y17- PC 79+57.33

-SR5- PRC Sta. 27+39.19

80+00 25+00 30+00

287 D & L MANAGEMENT

288 WILLIAM & INEZ BURROW

286 HARRY & JUDY CHAMBERLIN

SPECIAL CUT DITCH SEE DETAIL AF

LATERAL 'V' DITCH SEE DETAIL D

LATERAL BASE DITCH SEE DETAIL AC

CHANNEL BLOCK SEE DETAIL U

20'x10' PSRM

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

GRADE TO DRAIN

3 TONS CL B RIPRAP W/10 SY GEO FAB

RANDOLPH (FO)

CENTURY LINK

12" CITY OF ASHEBORO

EXISTING R/W

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Raleigh, NC 27607
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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2536	X-337

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

ENGLISH

PERMIT DRAWING
SHEET 243 OF 257

730 720 710 700 690

0.015 0.020 4:1 4:1 0.010 6:1 6.77:1

715.58
715.53
D.P. 714.33

711.80

4:1

–SR6–
25 + 04.69

74 + 50.00

730 720 710 700 690

0.009 0.020 4:1 4:1 0.020 6:1 6.94:1

715.15
D.P. 714.13

711.66

4:1

–SR6–
24 + 54.21

74 + 00.00

730 720 710 700 690

SITE 99

WETLAND

0.020 0.020 4:1 4:1 0.029 6:1 6.63:1

714.42
D.P. 713.86

711.49

4:1

–SR6–
24 + 03.44

73 + 50.00

–Y17–

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

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	102
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PERMIT DRAWING SHEET 244 OF 257

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NAD 83/95

MATCHLINE –Y17A– STA. 31+00 SEE SHEET 53

MATCHLINE –Y17A– STA. 20+00 SEE SHEET 100

GEORGE THOMAS
BARBARA TAYLOR
ROBERT HUBBARD
WAYNE BRADY
GARY BARTON
TANA SKIPPER
RAEFORD & MARY ROUTH (LIFE ESTATE) TONY & MARK ROUTH
MARY HOWEY
ADLETTA DELK

LAWRENCE HEIGHTS AVENUE SR 2680
19' PAVED ROADWAY

SITE 101
SITE 102
SITE 103

SBB-C
SAA-C
WM-C

STANDARD BASE DITCH W/PSRM SEE DETAIL CQ SLOPE=11% DDE=80 CY

SPECIAL CUT DITCH W/PSRM SEE DETAIL AH

ROADWAY CUT DITCH W/PSRM SEE DETAIL BF

STANDARD BASE DITCH W/PSRM SEE DETAIL CR SLOPE=10.4% DDE=5 CY

SPECIAL CUT DITCH SEE DETAIL H

GRADE TO DRAIN

STANDARD BASE DITCH W/CL I RIPRAP SEE DETAIL AS SLOPE=0.5% DDE=20 CY

STANDARD BASE DITCH SEE DETAIL T DDE=200 CY

CL I RIPRAP AT EMBANKMENT SEE DETAIL AD

15 TONS CL I RIPRAP W/30 SY GEO FAB

3 TONS CL B RIPRAP W/10 SY GEO FAB

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

BEGIN PERM. IMPACTS IN SURFACE WATER

BEGIN TEMP. IMPACTS IN SURFACE WATER

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- P P — DENOTES IMPACTS IN SURFACE WATER (POND)

SITE 101, 102 AND 103 PLAN VIEW

100′ 0′ 100′ 200′
GRAPHIC SCALE

AS A RESULT OF THE PROPOSED CULVERT, THE MAXIMUM INCREASE IN BASE (100–YEAR) FLOOD ELEVATION IS 0.31′ AND IS AT RIVER STATION 15800, APPROXIMATELY 200′ UPSTREAM FROM THE PROPOSED CULVERT. BASED ON LOWEST ADJACENT GRADE, 3 STRUCTURES (1SBKD AND TWO SHEDS) ON PARCEL #412 (RAEFORD & MARY ROUTH (LIFE ESTATE), TONY & MARK ROUTH, DB 2151 PG 1024) AND TWO STRUCTURES (1SBKD AND ONE SHED) ON PARCEL #411 (TANA SKIPPER, DB 1775 PG 1159) WILL BE AFFECTED BY THE INCREASE IN BASE FLOOD ELEVATION. THESE TWO PARCELS WITH ALL THE STRUCTURES ARE OUTSIDE OF THE PROPOSED RIGHT OF WAY AND WILL BE PURCHASED BY NCDOT.

FOR –Y17A– PROFILE SEE SHT. 212
FOR –Y17ADRRT– PROFILE SEE SHT. 215

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	102
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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SHEET 245 OF 257

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MATCHLINE –Y17A– STA. 31+00 SEE SHEET 53

MATCHLINE –Y17A– STA. 20+00 SEE SHEET 100

SITE 101, 102 AND 103 PLAN VIEW

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- F F — DENOTES IMPACTS IN SURFACE WATER (POND)

GRAPHIC SCALE 100′ 0′ 100′ 200′

AS A RESULT OF THE PROPOSED CULVERT, THE MAXIMUM INCREASE IN BASE (100-YEAR) FLOOD ELEVATION IS 0.31′ AND IS AT RIVER STATION 15800, APPROXIMATELY 200′ UPSTREAM FROM THE PROPOSED CULVERT. BASED ON LOWEST ADJACENT GRADE, 3 STRUCTURES (1SBKD AND TWO SHEDS) ON PARCEL #412 (RAEFORD & MARY ROUTH (LIFE ESTATE), TONY & MARK ROUTH, DB 2151 PG 1024) AND TWO STRUCTURES (1SBKD AND ONE SHED) ON PARCEL #411 (TANA SKIPPER, DB 1775 PG 1159) WILL BE AFFECTED BY THE INCREASE IN BASE FLOOD ELEVATION. THESE TWO PARCELS WITH ALL THE STRUCTURES ARE OUTSIDE OF THE PROPOSED RIGHT OF WAY AND WILL BE PURCHASED BY NCDOT.

FOR –Y17A– PROFILE SEE SHT. 212
FOR –Y17ADRRT– PROFILE SEE SHT. 215

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PROJECT REFERENCE NO.	SHEET NO.
R-2536	102
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PERMIT DRAWING
SHEET 246 OF 257

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ENGLISH

NAD 83/95

DETAIL SHEET FOR SITE 101 AND 102

396
WAYNE BRADY

INV=667.62'
RETAIN
EXISTING R/W
DOG POT
178
ISFD
CONC
G
S
W
WOODS
STANDARD BASE DITCH
W/PSRM
SEE DETAIL CQ
SLOPE=11%
DDE=80 CY
TDE
TDE
TDE
R/W
C C
SPECIAL CUT DITCH
W/PSRM
SEE DETAIL AH
INV=665.78'
12" CMP
RETAIN
BEGIN TEMP. IMPACTS IN SURFACE WATER
BEGIN PERM. IMPACTS IN SURFACE WATER
INV=642.68'
JS
STANDARD BASE DITCH
W/PSRM
SEE DETAIL CR
SLOPE=10.4%
DDE=5 CY
SBB-C
SPECIAL CUT DITCH
SEE DETAIL H
48" WW
MADISON CIRCLE (UN-OPENED)
Pond
ROADWAY CUT DITCH
W/PSRM
SEE DETAIL BF
SPECIAL CUT DITCH
W/PSRM
SEE DETAIL AH
HW
FS
30" RCP-III
FS
-Y17A-
36" RCP-III
FS
JB w/MH
30" RCP-III
SITE 102
F F
C
C
15" CSP
2 ELBOWS
ROD & LUG
JB w/MH
ROADWAY CUT DITCH
W/PSRM
SEE DETAIL BF
2GI
C
F
R/W
15" CSP
2 ELBOWS
ROD & LUG
PUE
PUE
PUE
PUE
PUE
SITE 101
PDE
PDE
PDE
PDE
TDE
BEGIN TEMP. IMPACTS IN SURFACE WATER
15 TONS CL I RIPRAP
W/30 SY GEO FAB
BEGIN TEMP. IMPACTS IN SURFACE WATER
BEGIN PERM. IMPACTS IN SURFACE WATER
BEGIN PERM. IMPACTS IN SURFACE WATER
15 TONS CL I RIPRAP
W/30 SY GEO FAB
ON BANKS ONLY
BEGIN PERM. IMPACTS IN SURFACE WATER
JS
EIP
WLB
WLB
WAYNE BRADY
396
397
GARY BARTON
WOODS
STANDARD BASE DITCH
W/CL I RIPRAP
SEE DETAIL AS
SLOPE=0.5%
DDE=20 CY
WM-C
415

LEGEND

- WLB — DENOTES WETLAND BOUNDARY
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER
- P P — DENOTES IMPACTS IN SURFACE WATER (POND)

50' 25' 0' 50' 100'
GRAPHIC SCALE

2232016
$(USERNAME)$
$FILEL$

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Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
R-2536	102
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PERMIT DRAWING SHEET 247 OF 257

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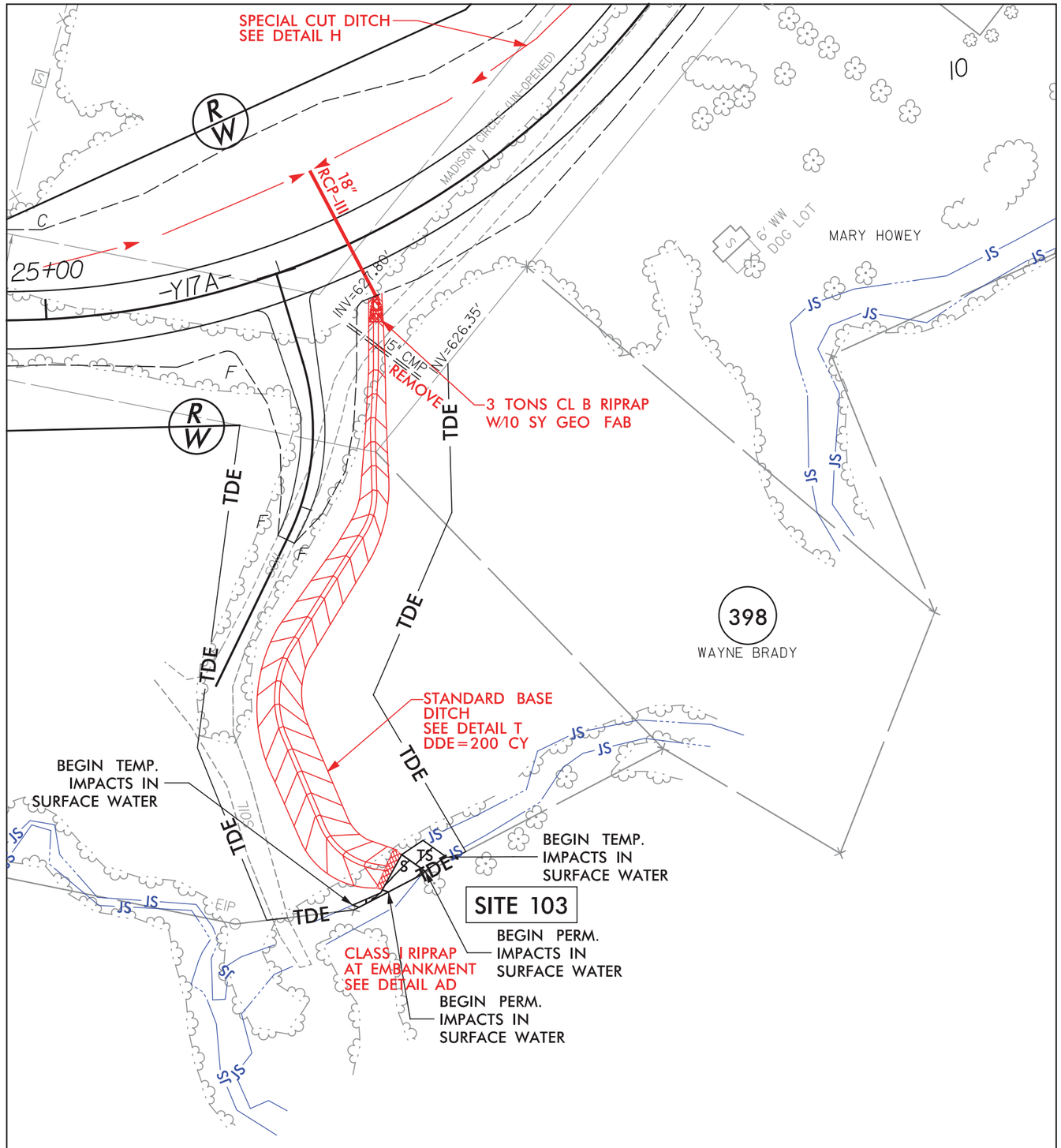
ENGLISH



DETAIL SHEET FOR SITE 103

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES PERMANENT IMPACTS IN SURFACE WATER

50′ 25′ 0′ 50′ 100′

GRAPHIC SCALE

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WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1A	-DR- 13+32 - 14+56	4' X 4' RCBC, L=70', SB-AA						0.03	< 0.01	211	10	
1B	-L- 7+80	SCOUR STABILIZATION, SB-AA						< 0.01	< 0.01	26	12	
2	-FLY- 13+02 -	48" RCP, L=251', SD-AA; TOTAL: PA-AA, WYZ-AA, WXX-AA	0.12					1.15	< 0.01	472	11	
	-SR1- 16+47	BANK STABILIZATION, SD-AA						< 0.01		51		
3	-SR1- 18+44 - 19+30	36" CSP, L=153', SAA-AA, WB-AA				< 0.01		0.02	< 0.01	205	14	
4A	-Y- 15+96 - 16+08	36" CSP, L=32', SE-AA						< 0.01	< 0.01	69	10	
4B	-LPD- 11+21 - 13+06	42" RCP, L=169', SE-AA						0.04		394		
		BANK STABILIZATION, SE-AA						0.02		169		
4C	-FLY- 32+99 - 37+12	54" RCP, L=496', SE-AA						0.07	< 0.01	759	20	
		BANK STABILIZATION, SE-AA						< 0.01		36		
4D	-L- 62+82 - 63+15	BANK STABILIZATION, SE-AA						< 0.01	< 0.01	11	21	
4E	-L- 64+72 - 70+83	FILL, SE-AA						0.07	< 0.01	753	10	
5	-Y- 13+18 - 16+08	FILL, SM-AA						0.01	< 0.01	258	25	
6A	-LPD- 28+45 -	36" RCP L=328', SZZ-AA, WUU-AA	0.33			0.02		0.02	< 0.01	424	10	
	-FLY- 42+22	BANK STABILIZATION, SZZ-AA						< 0.01		34		
6B	-L- 62+21 - 63+23	FILL, SZZ-AA						0.01	< 0.01	111	20	
6C	-L- 63+77 - 64+68	FILL, SZZ-AA						< 0.01	< 0.01	82	10	
7	-RPA- 24+13 -L- 71+29	2 @ 8' X 8' RCBC L=601', SG-AA						0.26	< 0.01	1330	20	
		BANK STABILIZATION, SG-AA						< 0.01		24		
18A	-Y- 29+31 - 29+45	FILL, SH-AA						< 0.01	< 0.01	42	10	
18B	-FLY- 45+56 - 45+81	36" RCP L=253, SH-AA						0.02	< 0.01	270	12	
		BANK STABILIZATION, SH-AA						< 0.01		36		
18C	-RPA- 22+46 - 22+81	FILL, SH-AA						< 0.01	< 0.01	71	10	
19	-YRT- 13+79 - 16+14	FILL, SK-AA; TOTAL: WD-AA	< 0.01					0.06	< 0.01	312	20	
20	-Y- 57+91 - 59+37	FILL, TOTAL: WE-AA	0.07									
TOTALS*:			0.51			0.02		1.82	0.03	6148	244	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
JANUARY 2016
RANDOLPH
R-2536
34450.3.S1
SHEET 248 OF 257

Revised 2013 10 24

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
8	-L- 126+51 - 128+92	FILL, SJ-AA; TOTAL: WYY-AA	0.18					0.02	< 0.01	267	10	
9	-L- 127+82 - 137+43	48" RCP L=447', WZZ-AA	0.46			0.03						
		60" RCP L=351', SO-AB/SI-AA						0.12	< 0.01	1064	21	
		BANK STABILIZATION, SO-AB/SI-AA						< 0.01		27		
10	-L- 152+24 - 156+02	2 @ 8' X 8' RCBC L=515', SM-AB						0.11	0.02	647	49	
		BANK STABILIZATION, SM-AB						0.02		112		
11	-L- 154+91 - 156+59	FILL, SL-AB						0.03	< 0.01	378	10	
12	-L- 168+03 - 168+40	FILL, PB-AB; TOTAL: WH-AB	0.02					< 0.01	0.15			
13	-L- 176+81 - 181+98	60" RCP L=409' , SK-AB						0.07	< 0.01	769	22	
		BANK STABILIZATION, SK-AB						< 0.01		13		
14	-L- 178+93 - 179+44	FILL, SI-AB						< 0.01	< 0.01	84	10	
15	-L- 182+68 - 183+77	24" RCP L=209', SJ-AB						0.02	< 0.01	310	36	
		BANK STABILIZATION, SJ-AB						< 0.01		12		
16	-L- 196+94 - 198+72	66" RCP L=280', SF-AB						0.04	< 0.01	503	27	
		BANK STABILIZATION, SF-AB						< 0.01		61		
17	-L- 197+85 - 198+51	FILL; TOTAL: SH-AB, WG-AB	< 0.01					< 0.01		121		
21	-Y2- 30+53 - 35+52	60" & 72" RCP L=444', SO-AB/SI-AA						0.05	< 0.01	384	27	
		BANK STABILIZATION, SO-AB/SI-AA						0.02		163		
22	-Y2- 53+36 - 59+27	6' X 5' RCBC L=92', SM-AB						0.08	< 0.01	585	33	
TOTALS*:			0.66			0.03		0.62	0.19	5500	247	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
OCTOBER 2015
RANDOLPH
R-2536
34450.3.S1
SHEET 249 OF 257

Revised 2013 10 24

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
23A	-L- 232+67 - 232+84	DITCH, SC-AB						< 0.01	< 0.01	10	20	
23B	-L- 233+75 - 234+85	FILL, SC-AB, WF-AB	0.03			< 0.01			< 0.01		18	
23C	-L- 234+12 - 236+05	FILL IN POND; TOTAL: PA-AB, WE-AB	< 0.01					0.73				
23D	-L- 235+81 - 242+97	FILL, SA-AB; TOTAL: WA-AB, WB-AB, WC-AB	0.11					0.06		704		
		BANK STABILIZATION, SA-AB						0.02	< 0.01	194	10	
23E	-L- 247+43 - 247+70	BANK STABILIZATION, SA-AB						< 0.01	< 0.01	8	20	
24	-L- 236+44 - 238+91	FILL, TOTAL: SB-AB, WD-AB	0.01					< 0.01		86		
25	-L- 250+52 - 251+97	FILL, WM-AB	0.47	0.18		0.30						
26	-L- 252+55 - 254+02	FILL; TOTAL: WN-AB	0.05									
		BANK STABILIZATION, LITTLE RIVER						< 0.01	< 0.01	53	40	
27	-Y4RPC- 16+26 - Y4RPB- 23+05	FILL, SR-B						0.09	< 0.01	982	11	
28	-Y4RPD- 19+34 18+81	FILL, SWW-B						0.02	< 0.01	520	10	
29	Y4RPD- 26+10	FILL, SW-B						0.04	< 0.01	971	13	
30	-Y4RPA- 13+56 - -Y4RPD- 25+21	2 @ 7' X 7' RCBC L=456', SZ-B						0.10	< 0.01	1018	26	
		BANK STABILIZATION, SZ-B						0.01		143		
31	-L- 328+96 - 330+00	60" RCP L=280', WP-B, SBB-B	< 0.01		< 0.01	< 0.01		0.03	< 0.01	279	13	
		BANK STABILIZATION SBB-B						< 0.01		51		
32	-L- 336+68 - 337+32	30" RCP L=244', SCC-B						0.01	< 0.01	148	10	
33	-L- 353+54 - 357+22	48" RCP L=440', SDD-B						0.05		496		
		BANK STABILIZATION, SDD-B						< 0.01	< 0.01	55	29	
34	-L- 361+20 - 363+31	48" RCP L=383', SEE-B						0.05	< 0.01	490	18	
		BANK STABILIZATION, SEE-B						< 0.01	< 0.01	45	11	
35	-L- 363+54 - 364+49	6' X 7' RCBC L=284', SHH-B						0.04	< 0.01	427	11	
		BANK STABILIZATION						< 0.01	< 0.01	16	10	
TOTALS*:			0.68	0.18	< 0.01	0.31		1.28	0.02	6694	270	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
JANUARY 2016
RANDOLPH
R-2536
34450.3.S2

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	WETLAND IMPACTS: Temp. Fill In Wetlands (ac)	WETLAND IMPACTS: Excavation in Wetlands (ac)	WETLAND IMPACTS: Mechanized Clearing in Wetlands (ac)	WETLAND IMPACTS: Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	SURFACE WATER IMPACTS: Temp. SW impacts (ac)	SURFACE WATER IMPACTS: Existing Channel Impacts Permanent (ft)	SURFACE WATER IMPACTS: Existing Channel Impacts Temp. (ft)	SURFACE WATER IMPACTS: Natural Stream Design (ft)
36	-L- 364+40 - 369+06	FILL; TOTAL: SGG-B						0.02		581		
37A	-SERRD1- 10+00	PIPE REMOVAL, SQQ-B						< 0.01	< 0.01	51	20	
37B	-Y9FLY- 11+37 - 12+09	DITCH, SQQ-B; TOTAL: WTT-B	0.02					< 0.01	< 0.01	50	50	
38A	-L- 406+64 - 407+50	FILL, WU-B	0.01			0.02						
38B	-L- 406+73 - 409+35	6' X 7' RCBC L=310', SII-B, WU-B			< 0.01	0.02		0.03	< 0.01	481	21	
38C	-L- 409+66 - 414+31	36" RCP L=224', WU-B	1.55		0.03	0.12						
39	-L- 433+34 - 433+46	BANK STABILIZATION, SNN-B						< 0.01	< 0.01	3	11	
40	-L- 432+76 - 433+64	3 @ 9' X 7' RCBC L=224', SKK-B						0.11	< 0.01	510	22	
		BANK STABILIZATION, SKK-B						< 0.01		24		
41	-L- 433+38 - -Y10END- 19+37	FILL, SLL-B; TOTAL: WPP-B, WOO-B	0.05					0.03	< 0.01	352	12	
42	-L- 445+23 - 446+59	DRAIN POND, TOTAL: PG-B						0.21				
43A	-L- 454+84 - 455+02	DITCH TIE IN, SB-C						< 0.01	< 0.01	4	15	
43B	-L- 454+88 - 458+13	48" RCP L=390', FILL IN POND, TOTAL: PH-B						0.78				
43C	-L- 457+82 - 458+59	48" RCP L=390', SC-C						< 0.01		39		
		BANK STABILIZATION, SC-C						< 0.01	< 0.01	46	10	
43D	-L- 457+82 - 458+59	DRAIN POND, WA-C; TOTAL: PA-C						1.19				
44	-SERRD3- 20+08 - 20+56	30" RCP L=60', 36" RCP L=76', SS-B						0.02	< 0.01	231	26	
45A	-Y4CD_RT- 58+23 - 60+40	DITCH/FILL, 36"/42" RCP L=334', ST-B						0.01	< 0.01	202	16	
45B	-SERRD3- 36+98 - 38+93	DITCH/FILL, 36"/42" RCP L=334', ST-B						0.02	< 0.01	264	13	
46	-Y4- 80+29 - 80+42	DITCH, SV-B						< 0.01	< 0.01	23	11	
47A	-Y4- 80+30 - 81+24	4' X 5' RCBC L=291', SU-B						< 0.01	< 0.01	77	10	
47B	-Y4- 79+43 - 80+42	4' X 5' RCBC L=291', SU-B						0.02	< 0.01	163	14	
TOTALS*:			1.63		0.03	0.16		2.47	0.02	3102	250	0

*Rounded totals are sum of actual impacts

NOTES:

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34450.3.S2

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
48	-Y5- 38+67 - 41+84	3 @ 10' X 7' RCBC L=160', WXX-B, SAA-B	0.96		0.09	0.17		0.05	< 0.01	334	21	
49	-Y5- 40+06 - 40+85	FILL, SWW-B						0.01	< 0.01	100	10	
50	-Y9A- 43+05	BANK STABILIZATION, SKK-D						< 0.01	< 0.01	36	20	
51	-Y9- 10+00 - 12+61	DRAIN POND; TOTAL: PA-D						1.18				
52	-Y9- 14+39 - 17+02	48" RCP L=313', SH-D						0.03		404		
		BANK STABILIZATION, SH-D, WZZ-D				< 0.01		< 0.01	< 0.01	38	15	
53	-Y9- 28+19 - 29+83	2 @ 10' X 14' RCBC L=138', SG-D						0.09	< 0.01	291	21	
		BANK STABILIZATION, SG-D						0.01		36		
54A	-Y9- 53+24 - 53+40	FILL; TOTAL: WD-D	0.02									
54B	-Y9- 53+24 - 53+40	ROW; TOTAL: WE-D	0.02									
55	-Y9- 60+09 - 61+01	36" RCP L=104', 42" RCP L=140', SF-D						0.02		319		
		BANK STABILIZATION, SF-D						< 0.01	< 0.01	82	21	
56A	-Y9- 72+52 - 76+35	6' X 7' RCBC L=170', SC/SD-D						0.06	< 0.01	810	21	
56B	-Y9- 78+92 - 79+23	DITCH, SC/SD-D						< 0.01	< 0.01	20	10	
56C	-Y9RAB- 80+53 - 81+03	PIPE REMOVAL, SC/SD-D						< 0.01		49		
56D	-NC159- 11+77 - 12+24	DITCH, SC/SD-D						< 0.01	< 0.01	42	10	
104	-Y9RPB- 22+00 - 26+00	FILL, SPP-B						0.02	< 0.01	345	49	
TOTALS*:			1.00		0.09	0.17		1.51	0.02	2906	198	0

*Rounded totals are sum of actual impacts

NOTES:

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WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
57	-L- 465+95	1 @ 6' X 7' RCBC L=422', SD-C						0.07		721		
		BANK STABILIZATION, SD-C						< 0.01		51		
58	-L- 470+00 RT	DRAIN POND; TOTAL: PB-C						2.64				
58A	-L- 476+43 RT	TAIL DITCH, BANK STABILIZATION, SD-C						0.02	< 0.01	116	12	
59	-L- 495+00 RT	HAUL ROAD CROSSING, SG-C							0.02		72	
		BANK STABILIZATION, SG-C						< 0.01	< 0.01	5	16	
60	-L- 488+15	66" RCP (OVERFLOW) L=239', SF-C						0.07	0.01	243	52	
		BANK STABILIZATION, SF-C						< 0.01	< 0.01	32	10	
61	-L- 489+70	54" RCP (OVERFLOW) L=176', SE-C						0.02		242		
		CHANNEL RELOCATION, SE-C						< 0.01	< 0.01	32	10	
62	-L- 498+26 RT	TAIL DITCH BANK STABILIZATION, SH-C						< 0.01	< 0.01	9	26	
63	-L- 500+00	2 @ 9' X 6' RCBC L=211', SH-C						0.02	0.02	197	137	
		BANK STABILIZATION, SH-C						< 0.01		84		
64	-L- 507+50	54" RCP L=269', FILL, SYY-C, SI-C; TOTAL: WBA-C	0.17					0.04		423		
		BANK STABILIZATION, SYY-C, SI-C						< 0.01	< 0.01	38	39	
65	-L- 523+20	1 @ 6' X 7' RCBC L=250', SJ-C						0.04	< 0.01	260		
		BANK STABILIZATION, SJ-C						0.02	< 0.01	79	86	
66	-Y12- 39+00 RT	TAIL DITCH BANK STABILIZATION, SK-C						< 0.01	< 0.01	9	18	
67	-Y12- 35+00 RT	TAIL DITCH BANK STABILIZATION, SK-C						< 0.01	< 0.01	29	28	
68	-L- 548+79	66" RCP L=192', SK-C						0.02	< 0.01	229	50	
		BANK STABILIZATION, SK-C						< 0.01	< 0.01	21	18	
69	-Y12- 30+60 RT	TAIL DITCH BANK STABILIZATION, SK-C						< 0.01	< 0.01	9	29	
70	-L- 563+93	42" RCP L=255', SL-C						0.03	< 0.01	346	14	
		BANK STABILIZATION, SL-C						< 0.01	< 0.01	14	10	
TOTALS*:			0.17					3.11	0.20	3189	627	0

*Rounded totals are sum of actual impacts

NOTES:

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WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
71	-L- 581+67	60" RCP L=283', SM-C; TOTAL: WB-C	< 0.01					0.04		336		
		BANK STABILIZATION, SM-C						< 0.01	< 0.01	66	35	
72	-L- 590+51	54" RCP L=276', SN-C						0.02		670		
		BANK STABILIZATION, SN-C						< 0.01	< 0.01	46	66	
73	-L- 594+33	48" RCP L=200', SO-C						0.02	< 0.01	164	30	
74	-L- 610+42	3 @ 10' X 7' RCBC L=198', SQ-C						0.06		238		
		BANK STABILIZATION, SQ-C						0.02	0.03	68	130	
75	-L- 611+00 - 612+68 LT	FILL & CHANNEL CHANGE, SS-C						0.03	< 0.01	277	48	
76	-L- 638+00 LT	TAIL DITCH, DRAIN POND, SV-C						1.01		180		
76A	-L- 634+83 LT	TAIL DITCH, BANK STABILIZATION, SV-C						< 0.01	< 0.01	43	10	
77	-L- 640+00 LT	DRAIN POND; TOTAL: PD-C						1.14				
78	-L- 641+67-642+24 LT	30" RCP L=165', SV-C, FILL; TOTAL: PE-C, WJ-C	0.14					< 0.01		146		
79	-L- 644+67 LT	FILL; TOTAL: WG-C	0.03									
80	-L- 644+00 LT	DRAIN POND; TOTAL: PE-C						0.56				
81	-L- 644+67 - 645+00 RT	FILL, CUT; TOTAL: WI-C	< 0.01		0.03							
82	-L- 646+22	48" RCP L=217', FILL & CUT, SV-C, WF-C; TOTAL: WG-C, WH-C	0.13		0.02	0.02		0.06	< 0.01	260	10	
		BANK STABILIZATION; TOTAL:WG-C, WH-C						< 0.01		20		
83	-Y13- 15+75 - 16+13 LT	FILL; TOTAL: WE-C	0.10									
TOTALS*:			0.42		0.05	0.02		3.01	0.09	2514	329	0

*Rounded totals are sum of actual impacts

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WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
84	-L- 669+26 RT	FILL, DIVERSION DITCH; TOTAL: WK-C	< 0.01		< 0.01							
85	-L- 670+00	60" RCP L=207', FILL, SX-C, WL-C	0.05			0.02		0.02	< 0.01	278	44	
		BANK STABILIZATION, SX-C						< 0.01	< 0.01	40	57	
86	-Y17FLY- 22+13	2 @ 10' X 8' RCBC L=289', SNN-C; TOTAL: WZ-C	0.03					0.06	0.03	341	120	
		BANK STABILIZATION, SNN-C						0.02		120		
87	-Y17RPD- 30+09	1 @ 6' X 7' RCBC L=79', SCC-C						< 0.01	< 0.01	81	66	
		BANK STABILIZATION, SCC-C						< 0.01		65		
88	-Y17RPDA- 25+91 - 26+95 RT	FILL & CUT, WAA-C	0.12		0.02	0.07						
89	-ESR5- 15+50	BRIDGE REMOVAL, SNN-C							< 0.01		31	
		BANK STABILIZATION, SNN-C						0.02		57		
90	-Y17- 41+00 LT	TAIL DITCH BANK STABILIZATION, SNN-C; TOTAL: WV-C	< 0.01						0.02	20	32	
91	-Y17- 44+57 LT	TAIL DITCH BANK STABILIZATION, SNN-C						< 0.01	< 0.01	13	23	
92	-Y17- 44+57 LT	TAIL DITCH & BORE HOLE, WTA-C		0.03	0.03		0.02					
	-Y17- 44+90 LT	RIP-RAP PAD, WTA-C	< 0.01									
	-Y17- 44+08 - 47+64 LT	UTILITY INSTALLATION, WTA-C		1.13								
93	-Y17- 42+00 RT	RIP-RAP PAD, WW-C	< 0.01									
	-Y17- 40+81 - 44+82 RT	UTILITY INSTALLATION, WW-C		0.85		0.03						
	-Y17- 44+57 RT	TAIL DITCH AND BERM, WW-C	0.02		0.02		< 0.01					
94	-Y17FLY- 46+76	2 @ 12' X 8' RCBC L=96', SNN-C						0.02	0.03	98	105	
		BANK STABILIZATION, SNN-C						0.02		80		
95	-Y17FLY- 49+00 RT	FILL, WTA-C	< 0.01									
96	-SR6- 15+40 LT	24" RCP L=83', TAIL DITCH, SMM-C						< 0.01	< 0.01	124	18	
97	-SR6- 15+63 LT	36" RCP L=250', SFF/SKK-C						< 0.01	< 0.01	133	49	
		BANK STABILIZATION, SFF/SKK-C						< 0.01		13		
TOTALS*:			0.27	2.01	0.08	0.12	0.03	0.23	0.15	1463	545	0

*Rounded totals are sum of actual impacts

NOTES:
SITE 95 ONLY INCLUDES PERMANENT FILL AT STA. 49+00 -Y17FLY- RT

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WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
98	-SR5- 17+45	36" RCP L=150', SFF/SKK-C						< 0.01	< 0.01	94	17	
		UTILITY INSTALLATION, SFF/SKK-C							< 0.01		26	
99	-SR6- 24+00 LT	FILL, WT-C	< 0.01			< 0.01						
100	-SR5- 26+57 - 28+48 RT	FILL & DITCH, SGG-C						0.02	< 0.01	227	11	
101	-Y17A- 19+54 RT	TAIL DITCH BANK STABILIZATION, SAA-C						< 0.01	< 0.01	15	32	
102	-Y17A- 23+44	30" RCP L=86', TAIL DITCH, SBB-C						< 0.01	< 0.01	112	11	
		BANK STABILIZATION, SBB-C						< 0.01	< 0.01	10	10	
103	-Y17A- 26+00	TAIL DITCH BANK STABILIZATION, SNN-C						< 0.01	< 0.01	16	24	
TOTALS*:			0.01			0.01		0.07	0.07	474	131	0

*Rounded totals are sum of actual impacts

NOTES:

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WETLAND PERMIT IMPACT SUMMARY - PROJECT TOTALS

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	WETLAND IMPACTS: Temp. Fill In Wetlands (ac)	WETLAND IMPACTS: Excavation in Wetlands (ac)	WETLAND IMPACTS: Mechanized Clearing in Wetlands (ac)	WETLAND IMPACTS: Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	SURFACE WATER IMPACTS: Temp. SW impacts (ac)	SURFACE WATER IMPACTS: Existing Channel Impacts Permanent (ft)	SURFACE WATER IMPACTS: Existing Channel Impacts Temp. (ft)	SURFACE WATER IMPACTS: Natural Stream Design (ft)
SUBTOTAL SECTION 1 PERMIT SHEET 248			0.51			0.02		1.82	0.03	6148	244	
SUBTOTAL SECTION 1 PERMIT SHEET 249			0.66			0.03		0.62	0.19	5500	247	
SUBTOTAL SECTION 2 PERMIT SHEET 250			0.68	0.18	< 0.01	0.31		1.28	0.02	6694	270	
SUBTOTAL SECTION 2 PERMIT SHEET 251			1.63		0.03	0.16		2.47	0.02	3102	250	
SUBTOTAL SECTION 2 PERMIT SHEET 252			1.00		0.09	0.17		1.51	0.02	2906	198	
SUBTOTAL SECTION 3 PERMIT SHEET 253			0.17					3.11	0.20	3189	627	
SUBTOTAL SECTION 3 PERMIT SHEET 254			0.42		0.05	0.02		3.01	0.09	2514	329	
SUBTOTAL SECTION 3 PERMIT SHEET 255			0.27	2.01	0.08	0.12	0.03	0.23	0.15	1463	545	
SUBTOTAL SECTION 3 PERMIT SHEET 256			0.01			0.01		0.07	0.07	474	131	
PROJECT TOTAL:			5.35	2.19	0.25	0.84	0.03	14.12	0.79	31990	2841	

*Rounded totals are the sum of actual impacts

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Appendix 4: USFWS Concurrence Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

October 22, 2013

Richard Hancock, P.E.
North Carolina Department of Transportation
Project Development and Environmental Analysis
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Mr. Hancock:

This letter is in response to your letter of October 15, 2013 which provided the U.S. Fish and Wildlife Service (Service) with the biological conclusion of the North Carolina Department of Transportation (NCDOT) that the proposed Asheboro Southern Bypass from US 64 west of Asheboro to US 64 east of Asheboro in Randolph County (TIP No. R-2536) may affect, but is not likely to adversely affect the federally endangered Schweinitz's sunflower (*Helianthus schweinitzii*). In addition, NCDOT has determined that the project will have no effect on the federally endangered Cape Fear shiner (*Notropis mekistocholas*). These comments are provided in accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

According to information provided, multiple plant surveys were conducted in the project study area in 1999, 2004, 2006 and 2011. Most recently, surveys were also conducted on September 11, 13 and 23 in 2013. Although there are several occurrences of Schweinitz's sunflowers near the project study area (as close as 0.22 miles), none were observed within the project study area. Based on the plant survey results and other available information, the Service concurs with your conclusion that the proposed project may affect, but is not likely to adversely affect the Schweinitz's sunflower. **However, due to the close proximity of known populations, surveys must be updated if the project is not constructed within two years of this concurrence.** Since Schweinitz's sunflowers often respond favorably to land disturbance, this need to update surveys is especially relevant if activities such as timber harvest, wildfire, land clearing, tillage, or any other ground disturbance occurs within the study area.

Based on the lack of suitable habitat, the Service concurs with your biological conclusion that the project will have no effect on the federally endangered Cape Fear shiner. We believe that the requirements of Section 7(a)(2) of the ESA have been satisfied at this time. We remind you that obligations under Section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

The Service appreciates the opportunity to review this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

Sincerely,

Gary Jordan

for Pete Benjamin
Field Supervisor

Electronic copy: Ronnie Smith, USACE, Wilmington, NC
Travis Wilson, NCWRC, Creedmoor, NC
Felix Davila, FHWA, Raleigh, NC

Appendix 5: Interagency 4B and 4C Meeting Minutes

Design Section 1B and 3A
Concurrence Point 4B Meeting Minutes

Project: R-2536 (Asheboro Southern Bypass and Zoo Connector)
Date: October 21, 2015
Location: NCDOT Century Center – Hydraulic Design Conference Room
Time: 8:00 to 11:15 AM
Minutes Authored by: Jeff Meador, RK&K

Attendees:

Jason Dilday – NCDOT NES
Jennifer Kelley – NCDOT Design Build
Michael Shumsky – NCDOT Design Build
Lee Johnson – NCDOT Utilities
Matt Lauffer – NCDOT Hydraulics
Mark Staley – NCDOT REU
John Partin – NCDOT Div 8
Reuben Blakley – NCDOT Div 8
Brian Overton – NCDOT PDEA
Bill Elam – NCDOT Hydraulics
Craig Lee – NCDOT Hydraulics
Larry Brickey – Asheboro Bypass Constructors
Gary Jordan - USFWS
Andrew Williams - USACE
Travis Wilson - NCWRC
Dave Wanucha – NCDENR DWR
Dr. Cynthia Van Der Wiele - USEPA
Jim Eisenhardt – RK&K
Matthew Cook – RK&K
Tina Swiezy – RK&K
Jeff Meador – RK&K
Byron Holden – RK&K
Trent Cormier – ICA Engineering

The 30% Hydraulic Review was held to in order to reach agreement on concurrence point 4B for the US 64 Asheboro Bypass in Randolph County. The 4B review was completed for design sections 1B (Station 65+00 to 210+00) and 3A (Station 465+00 to 668+00). The following items were discussed and conclusions reached:

Tina Swiezy began the meeting with a brief overview of the project and introductions were made. She also gave a summary of the project limits to be discussed during the meeting.

Jeff Meador (Section 1B) and Trent Cormier (Section 3A) provided a summary of the preliminary drainage design at each jurisdictional feature on the plans. The following comments and decisions were reached.

Design Section 1B

Plan Sheet 8 (Streams SE-AA and SG-AA): The site consist of a two barrel 8'x8' RCBC carrying stream SG-AA through the interchange. The culvert invert will be buried 1' below the stream bed. Normal stream flow will be confined to one of the two barrels. The low flow barrel will have alternating baffles with a 6' low flow notch. Normal flow will be kept out of the high flow barrel with sills. The culvert will outlet to a new channel carrying SG-AA and relocated SE-AA. A portion of the outlet channel will utilize the existing channel location of stream SE-AA. The new outlet channel will have 8' floodplain benches on both sides of the channel and a 1' deep 8' bottom width channel. Jeff Meador noted that the relocation of SE-AA from 65+00 to 66+00 right will be rip rap lined. Dave Wanucha asked about backfill in the culvert barrels. The team discussed the backfill and noted that native material is preferred but rip rap can be used. Travis Wilson asked if the site could utilize two culverts and daylight a portion of the stream within the interchange. Jeff Meador noted that using two culverts was not feasible at this location due to the interchange fill slopes. Jason Dilday asked if the channel

relocation could offset any stream impacts. Andy Williams noted that the mitigation ratio could e reduced from 2:1 to 1:1 if natural channel design was used at the site.

Plan Sheet 9 (Stream SCC-AA): Stream SCC-AA begins just inside of the right-of-way line at 90+50 left. The feature is not jurisdictional within the roadway footprint and no impacts are expected to stream SC-AA.

Plan Sheet 10: No jurisdictional features.

Plan Sheet 11: No jurisdictional features.

Plan Sheets 12/13 (Streams SO-AB/SI-AA and SJ-AA, Wetlands WYY-AA and WZZ-AA): Stream SJ-AA will be picked up in a rip rap channel that runs along the right side of the interchange from 127+00 to 137+50 right. The channel will be excavated through wetland WYY-AA which will be permitted as a total take. Stream SO-AB/SI-AA will be carried in a 66" RCP buried 1.0' that will outlet to the rip rap channel. Wetland WZZ-AB will be picked up in a 48: pipe that will outlet to the rip rap channel. The rip rap ditch that outlets to wetland WZZ-AA will enter at non-erosive velocities (< 2 ft/s). Travis Wilson requested that the transition from the rip rap channel and stream SO-AB/SI-AA have a smoother transition. Jeff Meador also noted that the NC 49 interchange at this location has been redesigned since the Concurrence Point 4A meeting. The original design was a directional interchange with ramps in all four quadrants of the interchange. The revised design eliminates ramps in the A and C quadrants on the interchange resulting in large reductions of impacts to streams SO-AB/SI-AA and SM-AB. Andy Williams noted that the impact reductions should be documented in the permit application. Andy Williams with noted that he would like to visit this site, particularly the tie in, in the field.

Plan Sheet 13 (Streams SM-AB and SL-AB): Stream SL-AB will be relocated into a rip rap lined channel that flows to SM-AB. Stream SM-AB will utilize a 2@8'x8' RCBC. The culvert invert will be buried 1' below the stream bed. Normal stream flow will be confined to one of the two barrels. The low flow barrel will not have alternating baffles since the existing stream width of 8' matches the culvert width. Normal flow will be kept out of the high flow barrel with sills.

Plan Sheet 14 (Pond PB-AB and Wetland WH-AB): Pond PB-AB is partially within the proposed right-of-way. The pond will be placed in temporary drainage easement so that it can be temporarily drained. The portion of the old pond that is within the right-of-way will be filled with rock. The team asked if the location could be used to construct a permanent stormwater feature. It was noted that the outlet stream is likely jurisdictional, the area includes a large portion of offsite drainage and would not treat a large area of impervious roadway surface so it is not a good candidate for a permanent water quality BMP.

Plan Sheet 15 (Streams SK-AB and SI-AB): Streams SK-AB and SI-AB will be relocated in rip rap channels on the left side of the project to the pipe inlet at 178+50 left. The streams will be carried under the roadway in a 66" RCP buried 1.0'. The pipe will outlet to a rip rap outlet channel that will tie back to stream SK-AB. Andy Williams asked if the rip rap channels would be a problem for aquatic life passage with NCDWR, USFWS. Jeff Meador noted that the rip rap was needed for channel stability. Travis Wilson noted that channel stability was more important than aquatic passage and the long pipe length will likely prohibit aquatic passage. DOT personnel requested a smoother tie in to SK-AB at the upstream end and an improved angle from pipe outlet 1506 to stream SK-AB.

Plan Sheets 15/16 (Stream SJ-AB): A 30" RCP buried 0.5' will be used for stream SJ-AB. Dave Wanucha asked why the pipe would not be buried 1.0'. Jeff Meador noted that the pipe is buried 20% of the diameter per NCDOT policy. For smaller pipes the resulting bury depth is less than 1.0'

Plan Sheet 17 (Streams SF-AB and SH-AB, Wetland WG-AB): Stream SH-AB and WG-AB are located entirely under the proposed roadway fill and will be total takes. Stream SF-AB will utilize a 66" RCP buried 1.0'.

Plan Sheet 61: No jurisdictional features.

Plan Sheet 62: No jurisdictional features.

Plan Sheet 63: No jurisdictional features.

Plan Sheet 63A (Stream SO-AB/SI-AA): Stream SO-AB/SI-AA crosses existing NC 49 in a 60" CMP. The pipe will be extended on both ends using junction boxes. The pipe extensions will not be buried since the existing 60" CMP is not buried. Andy Williams requested that the permit application note the reason for not burying the extension. DOT personnel asked if the pipe was in good condition and Matt Cook noted that it was. A channel change will be required where -SR3- has parallel impacts to the channel.

Plan Sheet 64 (Stream SM-AB): Stream SM-AB crosses existing NC 49 in a 6'x5' RCBC. The culvert will be extended at its existing size on both sides of the road. The culvert extensions will not be buried since the existing culvert is not buried. -SR2- will also cross stream SM-AB. A 78" pipe buried 1.0' will be utilized at the crossing. A channel relocation will be required on both sides of the road to accommodate roadway fill. Jason Dilday asked if this location might be a candidate for natural stream design and a reduced mitigation ratio. It was noted that this site does not provide adequate relocation length and since the relocation is adjacent to the roadway fill stream/floodplain function would likely not be provided.

Plan Sheet 65: No jurisdictional features.

Plan Sheet 66: No jurisdictional features.

Plan Sheet 67 (Streams SK-AB and SZZ-AB): The service road originally show on this plan sheet has been eliminated from the project. There will be no proposed work on this sheet or impacts to streams SK-AB and SZZ-AB at this location.

Design Section 3A

Plan Sheet 35 (Stream SD-C): Stream SD-C connects an upstream pond and wetland outside the corridor with pond PB-C on the downstream side of the proposed roadway. The design currently reflects a 60"-CD pipe, but will be revised to a 6' x 7' RCBC as requested by NCDOT Division. We discussed that channel transitions would be provided upstream and downstream of the box culvert to convey stream SD-C in a non-erosive manner. The culvert inverts will be buried 1.0' and if the channel base width is less than 6' baffles and sills will be provided. Native material will be used for backfill.

Plan Sheet 36 (Pond PB-C): Pond PB-C is partially contained within the proposed right-of-way. The pond will be placed in temporary drainage easement and drained for construction. The portion of the old pond that is within the right-of-way will be filled and a rock slope provided to abut the pond as shown and will be permitted as a permanent impact. The portion of the pond outside of the fill will be permitted as a temporary impact and will fill back up with water after construction is completed in this area. The outfall of the pond is an elevated pipe with a degraded channel downstream. It was noted that the outlet is dry, potentially as a result of the evapotranspiration of water from the two inline ponds. We discussed that the pond embankment is nearly 20' high and that it would be difficult to breach the pond and safely tie in a ditch line downstream without extensive excavation or extending the project limits hundreds of feet.

Plan Sheet 37 (Streams SG-C, SF-C and SE-C): Stream SG-C is Vestal Creek and has a small permanent impact resulting from a ditch tie and is shown on the downstream side of the dual bridges. There are no stream impacts as a result of the proposed dual bridges. Stream SF-C and stream SE-C run north to south and combine underneath the proposed roadway fill. We discussed that this area is currently under review and will likely be redesigned to relocate SE-C laterally on the upstream side of the roadway to combine with SF- or to cross at an angle closer to 90 degrees. The stream at station 498+00 Rt that was shown as a single JS line on the plans has been confirmed to not be JS by the current wetland file.

Plan Sheet 38 (Stream SH-C): Stream SH-C is conveyed through the site via a 2 @9' x 6' RCBC. The western barrel is buried 1.0' and will be the low flow barrel. The eastern barrel is reserved for high flows and will have a 2' Sill at both ends of the culvert. Native material will be utilized for backfill with priority given to the low flow barrel. Channel transitions of up to 40' will be provided at the inlet and outlet of the proposed culvert.

Plan Sheet 39 (Stream SI-C, Stream SYY-C and Wetland WBA-C): In the existing condition stream SI-C flows north to south into wetland WBA-C while stream SYY-C exits the Wetland WBA-C and leaves the right of way. The proposed condition conveys stream SI-C under the fill to connect to stream SYY-C on the other side of the proposed roadway. Wetland WBA-CA is located under the roadway fill and will be permitted as a total take.

Plan Sheet 40 (Stream SJ-C): Stream SJ-C is currently shown as being conveyed through the site with a 78" RCP, but NCDOT Division has requested that this be revised to a 6' X 7' RCBC for maintenance reasons. The proposed culvert will be aligned with the stream and have 30 to 40 LF of transition at both the inlet and outlet of the culvert. The culvert will be buried 1.0' and the use of sills and baffles will be investigated. During the meeting we discussed combining the two lateral conveyances shown on the downstream side of the stream into one conveyance to reduce the potential for instability resulting from the multiple ties. The two conveyances will be combined for the final design.

Plan Sheet 41 (Stream SK-C): Stream SK-C parallels the east side of NC 42. There are several pipe outlets that discharge into stream SK-C. Each of these conveyances ties to stream SK-C with non-erosive velocities. Rip Rap transitions will also be shown at each of the ditch connections to stream SK-C and each will be permitted as a permanent impact. Stream SK-C is conveyed under the proposed facility with a 66" RCP. We discussed the potential for roadway removing the guardrail at this location. If roadway removed the guardrail for safety reasons the fill slope will spill out into the stream and cause the 66" pipe shown to be realigned.

Plan Sheet 42 (Stream SL-C): Stream SL-C is conveyed under the proposed roadway with a 48" RCP that is buried 0.8.' There is a junction box near the outlet that turns the outlet inline with the downstream channel. This is not a drop structure.

Plan Sheet 43: No jurisdictional features.

Plan Sheet 44 (Stream SM-C, SN-C, and Wetland WB-C): Stream SM-C is conveyed through the project by a 66" RCP Buried 1.0'. The proposed crossing is in line with the incoming and receiving channels. Wetland WB-C is located underneath the proposed roadway and will be permitted as a total take. Stream SN-C is conveyed through the site with a 60" RCP Buried 1.0' to a downstream channel relocation. A junction box is used at the outlet to redirect the flow with the ditch line. There is no drop in invert as a result of this junction box, so aquatic life passage can be maintained.

Plan Sheet 45 (Stream SN-C, SO-C and SP-C): Stream SN-C is located under fill and has been relocated to the east side of the roadway where it ties to stream SO-C. Stream SO-C is conveyed through the site with a 54" RCP Buried 1.0. ' The proposed pipe is aligned with the incoming and exiting channels to limit stream erosion. Stream SP-C is located outside the project right of way and no impacts area anticipated.

Plan Sheet 46 (Stream SQ-C, SS-C and Wetland WD-C): Stream SQ-C is Squirrel Creek and crosses the site in a 3 @ 10' X 7' RCBC. The center barrel is low flow and is buried one foot. The incoming and receiving channels range from 10-11' in base width, so sills and baffles are not recommended. The outside barrels will have 2'sills at the inlet and outlet and will serve as high flow conveyance. Channel transitions are located at the inlet and outlet of the culvert and are armored to maintain channel stability. During the meeting the design team was asked to consider removing the downstream ditch connection on SQ-C potentially relocating to the upstream side or providing a scour hole for diffuse flow. Stream SS-C runs north to south and dips underneath the proposed roadway fill. As a result a portion of the channel will be realigned and conveyed with non-erosive velocities to its existing connection with stream SQ-C on the upstream side of the culvert. Wetland WD-C is located outside of the anticipated work area no impacts are anticipated.

Plan Sheet 47 (Stream SS-C, SU-C and ST-C): Streams SS-C, SU-C and ST-C are located outside of the anticipated work area and no impacts are anticipated to be shown on this sheet.

Plan Sheet 48 (Stream SW-C and SV-C, Ponds PD-C and PE-C, and Wetland WJ-C): Stream SW-C begins its jurisdiction downstream of the project, so no impacts are anticipated. Ponds PE-C and PD-C will be permanently drained and contained in easement for future maintenance. The ditches currently shown on the plans through the pond embankments will be lined with PSRM and connected to limit erosion. The ponds will be graded to facilitate positive drainage. The ponds will be permitted as total takes. Wetland WJ-C will have permanent and temporary impacts resulting from the 30" RCP outlet into the wetland. Velocities at the 30"outlet will be less than 2.0 fps entering the wetland. Stream SV-C will be a permanent impact resulting from the loss of hydrology associated with breaching the ponds.

Plan Sheet 49 (Stream SV-C, Pond PE-C, and Wetlands WE-C, WI-C, WF-C, WG-C, WH-C): Stream SV-C begins jurisdiction within wetland WF-C and continues through the 54" RCP draining into Pond PE-C. Stream SV-C will have both permanent and temporary impacts resulting from the construction of the 54" RCP. A ditch will be constructed at the outlet of the 54" RCP and carried through pond PE-C to limit erosion of historical ponded sediment. There will be permanent and temporary drainage in and adjacent to wetlands WE-C, WI-C, WF-C, WG-C, WH-C which will result in permanent and temporary impacts. These impacts cannot be avoided. Wetland WE-C will be the only total take as it is located almost entirely underneath roadway fill.

Plan Sheet 50 through Station 668+00 -L-: No jurisdictional features.

Plan Sheet 93: No jurisdictional features.

Plan Sheet 94: No jurisdictional features.

Plan Sheet 95: No jurisdictional features.

Plan Sheet 96: No jurisdictional features.

Plan Sheet 97 (Stream SK-C): Stream SK-C is located outside of the right of way and no impacts are anticipated.

Plan Sheet 98 (Wetland WE-C): Wetland WE-C will be permitted as a total take. It is located almost entirely under the proposed roadway fill slope.

Plan Sheet 99: No jurisdictional features.

Other Discussion

Tina Swiezy discussed the Little River bridge crossing within Design Section 2. The bridge will be submitted to FEMA for review and approval soon and the Design Build team wanted feedback from the meeting attendees prior to the FEMA review. Ms. Swiezy asked if the current boundaries for the wetland on the west side of the river were correct since it does not continue further south and ends right at the bridge. Mr. Dilday recalled being on site. He stated that the wetland as shown is correct. The bridge span arrangement and location of the animal crossings and future greenway were discussed in relation to the existing wetlands adjacent to Little River. Tina noted that the span arrangement dictated by the DOT's RFP leaves space for the future greenway on the side of the bridge with wetlands adjacent to the stream. The team agreed that the bridge layout was acceptable given that there is no design plan for the future greenway.

A field meeting was previously scheduled for October 28th and 29th 2015. The group noted that the impact site on plan sheet 12/13 was the only site that needed to be visited in the field. The site will be reviewed on the November 16th and 17th field review dates with any sites that need to be seen from Design Section 2.

The NCDOT Hydraulics Unit requested a Pond Action Plan (PAP) that summarizes ponds on the project and actions to be taken for each pond. The PAP should include information on the existing pond such as physical characteristics, jurisdictional status, owners, use during construction, final condition and any special design features post-construction and H/H analysis done to support findings. The DB team will submit an outline format for NCDOT approval.

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R-2536 Design Section 1B, 2, 3A
4B Field Meeting Minutes

Project: R-2536 (Asheboro Southern Bypass and Zoo Connector)
Date: November 16, 2015
Location: Asheboro, NC
Time: 9:00 AM
Minutes Authored by: Matthew Cook, RK&K

Attendees:
Jason Dilday – NCDOT NES
Craig Lee – NCDOT Hydraulics
John Partin – NCDOT Division 8
Matthew Cook – RK&K
Andy Williams - USACE
Dave Wanucha – NCDENR DWR
Landis Bungarner - Asheboro Bypass Constructors
Hal Bain – RK&K

During the Concurrence point 4B meetings for the US 64 Asheboro Bypass Sections 1B, 2, and 3A in Randolph County, it was determined that certain sites needed to be reviewed in the field for better assessment. The above individuals met on site to visit those sites on November 16, 2015.

Section 1B, Plan Sheet 12 / 13 (Stream SO-AB/SI-AA): The tie in location for the ditch conveying SO-AB/SI-AA was questioned in the 4B meeting. Stream SO-AB/SI-AA will be carried in a 66" RCP buried 1.0' that will outlet to a rip rap channel. In the field, Dave Wanucha asked if there is any way we can use natural stream design in the ditch. Matthew Cook stated that due to steep existing contours through most of the ditch and steep contours approaching the back side of the ditch, it would be difficult. Riprap is being used due to stability in the ditch. Mr. Cook did state that a more natural design might be attainable near the end of the ditch (-L- 135+50-137+00 RT). This will be investigated during the design process.

Section 2, Plan Sheet 21 (Little River, Wetlands WM-AB, WN-AB): The stream was reviewed at this site. The riprap transitions in the ditch lines at –L- 252+50 LT & RT were discussed. Mr. Cook stated that the riprap will not impede the wildlife crossings. There was no further discussion.

Section 2, Plan Sheets 71-72 (Stream ST-B): ST-B is shown in the wetland file provided to the D-B Team as only a short portion of stream at –Y- 73+00 RT. Mr. Cook asked during the 4B meeting if it should continue to the existing 36" RCP under the road. It is also like this on the next sheet at –Y4- 77+00 LT. The stream is jurisdictional perpendicular to the project but not parallel to it. After reviewing the stream in the field, it was determined that the portion of the stream parallel to the road (both sides) should not have been excluded from the jurisdictional file. They will be considered jurisdictional. Mr. Wanucha asked that natural stream design be considered in the design for the entrance and exit of the 36" RCP.

Section 2, Plan Sheet 75 (Stream SWW-B, SAA-B and Wetland WXX-B): SAA-B is conveyed under –Y5- with a 3@10'x7' RCBC with outside cells using 2.5' sills for high flow, and the inside cell using a 1' sill and 6" baffles for low flow. SWW-B feeds SAA-B and ties in to it under the roadway footprint. SWW-B is conveyed in a 48" RCP. During the 4B meeting, Ms. Swiezy noticed that the 48" RCP discharges the flow in to a cell that is used for high flow and would not accommodate the average daily flow due to the 2' sills on either end of that cell. Several options were offered to remedy the situation: 1) shift the RCBC slightly and make the low flow cell the far right cell (facing downstream) so that the 48" RCP could discharge in to it; 2) Ditch SWW-B to the RCBC entrance (making sure to take the ditch around, not through, the high flow bench); 3) Allow SWW-B to terminate at the fill slope, line the fill slope with riprap, and let it meander along the fill slope to the RCBC on its own. Ms. Swiezy did not prefer option 1 since the design had already been submitted to NCDOT for review. Mr. Cook did not prefer option 3 since he was unsure if it would erode the fill slope and create a scour hole / maintenance problem. During the field review, SWW-B was observed as being a defined channel (2' base, 8' top, 3' depth with appr. 0.1' of water). This caused everyone in attendance to agree that option #3 would not be advisable. After deliberation, it was determined that ditching SWW-B to the entrance to the RCBC would be the best option. Drawdown affects would not occur since it is still feeding the wetland. It would need to be ditched around the high flow bench. Andy Williams asked that some degree of sinuosity be included to mimic a natural stream design. Mr. Cook stated that this could be done. Mr. Cook stated that the ditch stability would need to be checked to determine if a liner would be necessary, but every effort would be made to use a sinuous design without a liner.

These were the only sites per the 4B meetings that required field visits.

R-2536 Design Section 2
Concurrence Point 4B Meeting Minutes

Project: R-2536 (Asheboro Southern Bypass and Zoo Connector)
Date: November 12, 2015
Location: NCDOT Century Center – Structures Design Conference Room
Time: 1:00 to 5:00 PM
Minutes Authored by: Matthew Cook, RK&K

Attendees:
Jason Dilday – NCDOT NES
Jennifer Kelley – NCDOT Design Build
Mark Staley – NCDOT REU
Matt Lauffer – NCDOT Hydraulics
Bill Elam – NCDOT Hydraulics
Reuben Blakley – NCDOT Div 8
Hemal Shah – Transportation Planning
Michael Prince – Asheboro Bypass Constructors
Jake Stone – Asheboro Bypass Constructors
Michael Merritt – RK&K
Karen Capps – NCDOT Design Build
Gary Jordan - USFWS
Andy Williams - USACE
Dave Wanucha – NCDENR DWR
Cynthia Van Der Wiele - USEPA
Matthew Cook – RK&K
Jim Eisenhardt – RK&K
Brent Huskey – RK&K
Tina Swiezy – RK&K

The 30% Hydraulic Review was held to in order to reach agreement on concurrence point 4B for the US 64 Asheboro Bypass in Randolph County. The 4B review was completed for Design Section 2: -L- 210+00 to 465+00 and the Zoo Connector. The following items were discussed and conclusions reached:

Tina Swiezy began the meeting with a brief overview of the project and introductions were made. She also gave a summary of the project limits to be discussed during the meeting.

Matthew Cook provided a summary of the preliminary drainage design at each jurisdictional feature on the plans. The following comments and decisions were reached.

Plan Sheet 18 (Stream SE-AB): No impacts on this sheet. Mr. Cook stated that the jurisdictional stream starts 19' past the outlet of the 30" RCP at –L- 314+00 RT.

Plan Sheet 19 (Stream SC-AB and Wetland WF-AB): Stream SC-AB will be temporarily impacted so that an existing 24" RCP can be removed at –L- STA. 233+00 LT. The existing pipe will be replaced with a channel that matches the existing stream. The wetland will be impacted by the roadway facility but not considered a total take since it is fed by SC-AB.

Plan Sheet 20 (Streams SA-AB and SB-AB, Wetlands WA-AB, WB-AB, WC-AB, WD-AB, WE-AB and WF-AB, Pond PA-AB): Pond PA-AB, Wetland WA-AB, WB-AB, WC-AB, WD-AB and WE-AB will be total takes due to roadway fill. The existing pond will have a conveyance running on each side of the roadway fill with both running in a riprap lined channel. The riprap channel on the left will be directed into a 48" RCP that crosses the –L- alignment and ties to stream SB-AB. The riprap channel on the right runs along the fill slope and ties to stream SB-AB at the same location of the 48" RCP outlet. The 48" RCP will not be buried at either end due to the proposed riprap lined ditches that tie to the pipe. Wetland WF-AB will not be a total take since SC-AB will still feed the wetland. David Wanucha asked if natural stream design in this area is an option. Mr. Cook stated there will probably not be any natural stream design due to the steep existing contours in some areas and the need to line the channel with riprap due to stability requirements. Jason Dilday stated that since the pond is a total take, stream SA-AB at –L- 236+00 should be considered a take even though the project is not impacting it due to loss of flow. The question was asked if a cross pipe should be installed to not split the flow on both sides of the roadway. Matt Lauffer and Reuben Blakley preferred not installing a cross pipe.

Plan Sheet 21 (Littler River, Wetlands WM-AB and WN-AB: Little River will be bridged with dual bridges at –L- STA. 252+50. This is a FEMA regulated stream. WN-AB will be a total take due to roadway fill and the new bridge. Wetland WM-AB is not high quality. There will be small impacts to Little River

with rip rap transitions being installed at the ends of lateral ditches that tie into Little River. Gary Jordan stated that riprap in the lateral ditch could impact wildlife crossing. It was stated that the riprap will only take up 10' of the ditch and will be placed on the bank of the stream to provide dissipation for the flow in the ditch so the wildlife crossing will not be impacted. Mr. Cook stated that per guidance from the Division mechanized clearing will be used under and around the bridge instead of hand clearing. Asheboro Bypass Constructors will assist in placement of a temporary bridge crossing. Temporary stream impacts will be estimated at the bridge crossing as a preventive measure. It was suggested that we review this site in the field.

Plan Sheets 22 (Stream SR-B): SR-B starts on plan sheet 23 and flows onto plan sheet 22. It starts under –Y4RPB-, flows under –L-, and outlets the project in a 48" RCP at the fill slope of –Y4RPC-. The 48" RCP will not be buried in the channel since the stream does not become jurisdictional until it outlets the system. Andy Williams stated to make it clear on plans and in the permit application if pipes are being buried or not.

Plan Sheet 23 (Streams SR-B, SWW-B, SW-B and SZ-B): SR-B flows onto plan sheet 22. It starts under –Y4RPB-, flows under –L-, and outlets the project in a 48" RCP at the fill slope of –Y4RPC-. The 48" RCP will not be buried in the channel since the stream does not become jurisdictional until it outlets the system. SWW-B starts under –Y4LPD- and exits at the fill slope of –Y4LPD-. A 30" RCP outlets into SWW-B and is not buried in the channel since it does not become jurisdictional until it outlets the pipe. SW-B, starts off the project and ties into a rip rap channel that runs down the fill slope of –Y4RPA- and ties in to SZ-B that flows through a double barrel 7'x7' RCBC with a 2' sill in the high-flow barrel and a 1' sill with 6" baffles in the low-flow barrel. A general comment was made to provide blow up areas of impacts on all interchange sheets.

Plan Sheet 24-25: No jurisdictional features.

Plan sheet 26 (Streams SBB-B and SCC-B): Stream SB-B is conveyed across the project with a 66" RCP that is buried 1.0'. WP-B will be partially impacted by the roadway fill. SCC-B becomes jurisdictional at –L- 337+50 LT under the roadway footprint. It will be conveyed by a 30" RCP that is not buried since the stream begins under the roadway footprint.

Plan Sheet 27 (Stream SDD-B): SDD-B enters the project near matchline –L- 354+00 on this sheet. See Sheet 28 for a description of the impact.

Plan Sheet 28 (Streams SDD-B, SEE-B, SFF-B, SGG-B and SHH-B): SDD-B enters the project near matchline –L- 354+00 on this sheet. It is conveyed across the project with a 54" RCP that is buried 0.9' (20% of the opening). SEE-B is conveyed across the project with a 54" RCP that is buried 0.9' (20% of the opening). Mr. Lauffer suggested using a headwall with a sill on this pipe to prevent headcutting. He stated he would check with Travis Wilson, Wildlife Resource Commission, if this was acceptable. Mr. Cook stated that they are still working on the layout of this pipe in order to minimize the cut required to install it. SHH-B is conveyed across the project with a 60" RCP that is buried 1.0'. SGG-B enters SHH-B under the roadway fill. It is conveyed along sheet 28 and 29 in a riprap lined channel and a 30" CSP. SEE-B, SHH-B, and SGG-B all feed SFF-B. SFF-B is not impacted by the project.

A discussion was held regarding installing cross pipes on the project. Mr. Cook stated that rock is throughout the project and the ability to bury the pipes in jurisdictional streams is a concern. Mr. Williams stated that generally you need to ask for a waver if you are not going to bury a pipe that conveys a jurisdictional stream. The field personnel (DEO) contacts the USACE to make the change. Jim Eisenhardt asked if a statement could be written in to the permit allowing for non-burial of pipes in jurisdictional streams if extensive rock is encountered. The agencies would still be notified. Mr. Williams stated that this is a possibility, and Gary Jordan agreed with this method as well.

Plan Sheet 29 (Stream SGG-B): SGG-B begins under the roadway fill at –L- 369+00 RT. It continues on to sheet 28 and enters SHH-B under the roadway fill. It is conveyed along sheet 28 and 29 in a riprap lined channel and a 30" CSP.

Plan Sheet 30 (Streams SII-B, SPP-B and SQQ-B, Wetlands WSS-B, WTT-B and WU-B): SQQ-B will be impacted by construction of the roadway fill at –Y9FLY- 11+50 LT and also by a ditch tying roadway drainage to it. It does not need to be conveyed around / through the project; it continues to head north away from the project. SII-B is not impacted in the gore area near –L- 406+00 RT until it hits the fill slope at –L- 407+00 RT. It will be described on sheet 31. WTT-B is a total take under the roadway footprint and due to construction. WSS-B and WU-B are not impacted on this sheet.

Plan Sheet 31 (Streams SII-B and SKK-B, Wetland WU-B): SII-B runs through the interchange gore area and begins being impacted near matchline –L-407+00 on this sheet. It is currently shown as being conveyed across the project with a 72" RCP that is buried 1.0'. Due to an agreement with the Division, all crossings requiring 72" pipes on the project that are not time sensitive in construction nature are going to be installed as 6'x7' RCBCs. To tie the outlet to the stream at –L- 409+00 LT, Mr. Williams suggested a channel be installed in size that matches SII-B. This will be an excavation in weltands (WU-B). WU-B is impacted by the roadway footprint but is not a total take. SKK-B is not impacted.

Plan Sheet 32 (Stream SJJ-B): No Impacts on this sheet. The jurisdictional stream starts approximately 33' outside the ROW.

Plan Sheet 33 (Streams SKK-B, SLL-B and SNN-B, Wetlands WNN-B, WOO-B and WPP-B): SKK-B runs through the project and is Tantraugh Branch. It is conveyed in a 3@9'x7' RCBC with outside cells using 2' sills for high flow and a central cell using a 1' sill and 6" baffles for low flow. SNN-B is impacted

by the RCBC tie-in upstream to SKK-B. Mr. Williams asked if we could change the angle of the RCBC to tie further downstream in a straighter section. Mr. Cook stated that if that happened, additional stream would be impacted. SLL-B is currently shown as being impacted under the roadway fill and being conveyed in three 30" RCPs under –Y10 END- and a 48" RCP under the –L- footprint. NCDOT has requested a pipe arch be used under –Y10 END- and is currently being investigated. The remainder is being conveyed in a 48" RCP to limit impacts that would occur to SNN-B and WNN-B if it was ditched along the fill slope. Mr. Cook stated that the 48" RCP is meant to only carry the average daily flow in the channel. Higher storms would leave the channel and feed the RCBC. Mr. Williams agreed with this design for conveying the stream. WOO-B and WPP-B are total takes under the roadway footprint.

Plan Sheet 34 (Streams SA-C and SB-C, Ponds PG-B and PH-B): PG-B is a total take since it is inside the NCDOT right-of-way. Mr. Cook asked if the NCDOT planimetric boundary should be used or the wetland file boundary. Mr. Dilday said to use the NCDOT planimetirc file boundary. SA-C is not impacted. Tina Swiezy suggested tying SB-C to the 54" RCP on the next sheet with a channel. SB-C will be impacted with a temporary impact due to the channel. PH-B will be a total take.

Plan Sheet 35 (Stream SC-C, Wetland WA-C, Pont PG-B): PH-B will be a total take. SA-C and SB-C from sheet 34 are conveyed across the project in a 54" RCP that is buried 0.9' (20% of the opening). It will tie to SC-C. WA-C and PA-C will not be impacted. Bill Elam asked if TDE needed to be added around PA-C in case it needed to be cleaned out during construction. Mr. Blakley stated that it would not be needed. A right of entry agreement could be used instead. Mr. Lauffer suggested adding a headwall with a sill to the 54" RCP. Mr. Cook stated that SD-C on this sheet is considered part of the project's Section 3A and was covered in a previous 4B meeting (October 21. 2015).

Plan Sheet 68-69: No jurisdictional features.

Plan Sheet 70 (Stream SS-B): Stream SS-B becomes jurisdictional as it leaves an existing 24" RCP at –Y4RPB- 31+50 LT. It is picked up in a 30" pipe extended beyond the existing 24" RCP with a junction box. It outlets to the gore area and then enters a 36" RCP to be conveyed under –SERRD3-. It is not buried since the stream begins under the roadway footprint. A stormwater retention pond is located adjacent to the stream but does not impact it.

Plan Sheet 71 (Streams ST-B): ST-B is shown in the wetland file provided to the team as only a short portion of stream at –Y- 73+00 RT. Mr. Cook asked if it should continue to the existing 36" RCP under the road. It is also like this on the next sheet at –Y4- 77+00 LT. The stream is jurisdictional perpendicular to the project but not parallel to it. Mr. Dilday said he would check the jurisdictional determination. The existing 36" RCP will be extended on both ends to allow the stream to continue. It will be conveyed in a riprap lined channel downstream (sheet 72). The riprap was necessary for stability due to the steep existing contours in the area. It was suggested that we review this site in the field.

Plan Sheet 72 (Streams ST-B, SU-B and SV-B): For ST-B, see sheet 71. SV-B and SU-B enter an existing 4'x5' RCBC at –Y4- 80+50 RT. The RCBC will be extended on both ends to continue to allow stream passage. The RCBC will not be buried.

Plan Sheet 73 (Stream SXX-AB, Wetland WZZ-B): No impacts on this sheet. The jurisdictional stream and wetland are outside of the right-of-way.

Plan Sheet 74: No jurisdictional features.

Plan Sheet 75 (Streams SAA-B and SWW-B, Wetlands WXX-B and WYY-B, Pond PC-B): SAA-B is conveyed under –Y5- with a 3@10'x7' RCBC with outside cells using 2.5' sills for high flow, and the inside cell using a 1' sill and 6" baffles for low flow. SWW-B feeds SAA-B and ties in to it under the roadway footprint. SWW-B is conveyed in a 48" RCP. Ms. Swiezy noticed that the 48" RCP discharges the flow in to a cell that is used for high flow and would not accommodate the average daily flow due to the 2' sills on either end of that cell. Several options were offered to remedy the situation: 1) shift the RCBC slightly and make the low flow cell the far right cell (facing downstream) so that the 48" RCP could discharge in to it; 2) Ditch SWW-B to the RCBC entrance (making sure to take the ditch around, not through, the high flow bench); 3) Allow SWW-B to terminate at the fill slope, line the fill slope with riprap, and let it meander along the fill slope to the RCBC on its own. Ms. Swiezy did not prefer option 1 since the design had already been submitted to NCDOT for review. Mr. Cook did not prefer option 3 since he was unsure if it would erode the fill slope and create a scour hole / maintenance problem. It was decided that this site would be reviewed in the field to make a better determination. WXX-B will be impacted due to the roadway footprint. WYY-B and PC-B are not impacted by the project.

Plan Sheet 76-78: No jurisdictional features.

Plan Sheet 79: No jurisdictional features anticipated, however the D-B Team is awaiting additional survey to complete the design.

Plan Sheet 80 (Streams SKK-D and SMM-B, Wetland WMM-B): SKK-D is conveyed under the existing NC 159, Zoo Parkway. –Y9A- does not impact SKK-D. However, due to the alignment of –Y9A-, a new 36" RCP must be installed to take the drainage from one side of existing NC 159 to the other. Tying the 36" RCP to SKK-D will cause an impact.

Plan Sheet 81 (Stream SII-B): No impacts on this sheet. The jurisdictional stream starts approximately 72' past the outlet of 30" RCP.

Plan Sheet 82 (Pond PA-D): PA-D is inside the right-of-way for the project. It will be drained and ditched in a riprap lined ditch along the toe of the fill slope to a 48" RCP at –Y9- 15+00 LT. The entire pond will be placed in TDE to allow for it to be cleaned out if needed during construction.

Plan Sheet 83 (Stream SH-D, Wetland WZZ-D): SHH-D becomes jurisdictional under the roadway footprint. It is fed by the pond on sheet 82 (PA-D). The pond will be drained and ditched in a riprap lined ditch along the toe of the fill slope to a 48" RCP at –Y9- 15+00 LT. The 48" RCP is not buried due to SH-D not being jurisdictional upstream of the project and the pond flow being conveyed in a riprap lined ditch. WZZ-D will not be impacted.

Plan Sheet 84 (Stream SG-D): SG-D is North Prong Richland Creek and is a FEMA regulated stream. It is conveyed in a 2@14'x10' RCBC with one cell using a 1' sill and 6" baffles for the low flow and the other cell using a 2' sill for the high flow. The wetland upstream of the RCBC is not named and will not be impacted.

Plan Sheet 85: No jurisdictional features.

Plan Sheet 86 (Stream SF-D, Wetlands WD-D and WE-D): WD-B will be a total take under the roadway footprint. Mr. Cook stated that WE-D would not be impacted, however it was decided to consider it a total take due to possible drawdown affects and construction affects. SF-D is conveyed across –Y9- in a 42" RCP buried 0.7'. Mr. Lauffer asked that the drainage from 2GI #8603 exit in a pipe to the entrance of the 42" RCP, not under –Y9- to 2GI #8604.

Plan Sheet 87 (Stream SC/SD-D): SC/SD-D is currently shown as being conveyed across the project with a 72" RCP that is buried 1.0'. Due to an agreement with the Division, all crossings requiring 72" pipes on the project that are not time sensitive in construction nature are going to be installed as 6'x7' RCBCs. Mr. Wanucha asked if natural channel design could be used at the entrance and exit of the RCBC. Mr. Cook stated that this could be investigated at the entrance, however it would cause additional impacts at the outlet. Ms. Swiezy suggested using riprap toe protection along the fill slope –Y9- 74+50 – 79+00 LT due to the nature of the stream leaving the banks and entering the floodplain.

Plan Sheet 88 (Stream SC/SD-D): A more free-flowing natural stream design will be utilized to convey SC/SD-D across the existing zoo entrance. The existing pipes will be removed and the new channel installed with a more sinuous design as shown. The systems in the round-about and -NC159_SPUR- will be modified to outlet to a single point at the new channel tie-in to the existing channel.

Plan Sheet 89-92: No jurisdictional features.

Other Discussion

A field meeting was previously scheduled for November 16-17, 2015. The sites from this 4B meeting include the following:

- Plansheet 21: Little River
- Plansheets 71-72: ST-B
- Plansheet 75: SWW-B

The only site from the previous Sections 1B and 3A 4B meeting held on October 21, 2015 that required a field visit was on Plansheets 12-13 for SO-AB/SI-AA. It was agreed that we would meet at the NCDOT District office (300 DOT Dr. Asheboro, NC) at 9:00 AM.

Design Section 1B and 3A
Concurrence Point 4C Meeting Minutes
Design Section 1A and 3B
Concurrence Point 4B Meeting Minutes

Project: R-2536 (Asheboro Southern Bypass and Zoo Connector)
Date: December 16, 2015
Location: NCDOT Century Center – Hydraulic Design Conference Room
Time: 8:00 AM to 12:30 PM
Minutes Authored by: Jeff Meador, RK&K and Trent Cormier, ICA

Attendees:

Jason Dilday – NCDOT NES
Michael Shumsky – NCDOT Design Build
Dave Wanucha – NCDENR DWR
Matt Lauffer – NCDOT Hydraulics
Mark Staley – NCDOT REU
John Partin – NCDOT Div 8
Reuben Blakley – NCDOT Div 8
John Olinger – NCDOT Div 8
Bill Elam – NCDOT Hydraulics
Craig Lee – NCDOT Hydraulics
Michael Prince – Wright Brothers Construction
Jake Stone – Wright Brothers Construction
Andrew Williams - USACE
Travis Wilson - NCWRC
Jason Elliot – NCDOT NES
Chris Rivenbark - NCDOT NES
Jim Eisenhardt – RK&K
Keith Skinner – RK&K
Tina Swiezy – RK&K
Jeff Meador – RK&K
Brad Boggs – RK&K
Trent Cormier – ICA Engineering
Eric Leonhart – ICA Engineering
Tom Tallman – ICA Engineering

An interagency concurrence meeting was held in order to reach agreement on concurrence points 4B/4C for the US 64 Asheboro Bypass in Randolph County. The 4C review was completed for design sections 1B (Station 65+00 to 210+00) and 3A (Station 465+00 to 668+00). The 4B review was completed for design section 1A (Station 9+00 to 65+00) and 3B (Station 668+00 to 770+00). The following items were discussed and conclusions reached:

Matt Lauffer began the meeting with a brief overview of the project and introductions were made.

Jeff Meador (Section 1A/1B) and Trent Cormier (Section 3A/3B) provided a summary of the design at each jurisdictional feature on the plans. The following comments and decisions were reached.

Design Section 1B (Concurrence Point 4C)

Plan Sheets 12/13 (Streams SO-AB/SI-AA and SJ-AA, Wetlands WYY-AA and WZZ-AA): Stream SO-AB/SI-AA is perennial. Stream SJ-AA is intermittent. Stream SJ-AA will be picked up in a rip rap channel that runs along the right side of the interchange from 127+00 to 137+50 right. The channel will be excavated through wetland WYY-AA which will be permitted as a total take. Stream SO-AB/SI-AA will be carried in a 60" RCP that does not need to be buried. Wetland WZZ-AB will be picked up in a 48" pipe that will outlet to the rip rap channel. The rip rap ditch that outlets to wetland WZZ-AA will enter at non-erosive velocities (1.8 ft/s). Andy noted to make sure to state in the application that the pipe carrying SO-AB/SI-AA will not be buried because it outlets to a rip rap channel and has a long pipe length which will allow little change for movement of aquatic life. Jeff noted that the design team looked at providing a grass lining for a portion of the channel relocated channel length. However, because of the topography and expected discharge the channel is not stable without rip rap.

Plan Sheet 13 (Streams SM-AB and SL-AB): Stream AM-AB is perennial and stream SL-AB is intermittent stream. SL-AB will be relocated into a rip rap lined channel that flows to SM-AB. Stream SM-AB will utilize a 2@8'x8' RCBC. The culvert invert will be buried 1' below the stream bed. Normal stream flow will be confined to one of the two barrels. The low flow barrel will not have alternating baffles since the existing stream width of 8' matches the culvert width. Normal flow will be kept out of the high flow barrel with sills. The note shown on the plans concerning backfill of the culvert is to remain on the plans as is.

Plan Sheet 14 (Pond PB-AB and Wetland WH-AB): Pond PB-AB is partially within the proposed right-of-way. The pond will be placed in temporary drainage easement so that it can be temporarily drained. The portion of the pond that is within the right-of-way will be filled with rock.

Plan Sheet 15 (Streams SK-AB and SI-AB): Streams SK-AB and SI-AB are both Perennial. Stream SI-AB will be relocated in a rip rap channel on the left side of the project to the pipe inlet at 178+50 left. Jeff Meador noted to maintain stability the Rip Rap is needed. Stream SK-AB will be relocated in a channel without rip rap. The streams will be carried under the roadway in a 60" RCP that will not be buried. The pipe will outlet to a rip rap outlet channel that will tie back to stream SK-AB. Jeff Meador noted that the rip rap was needed for channel stability. Travis Wilson noted that the long pipe length will likely prohibit aquatic passage.

Plan Sheets 15/16 (Stream SJ-AB): Stream SJ-AB is intermittent. A 24" RCP that is not buried will be used for stream SJ-AB.

Plan Sheet 17 (Streams SF-AB and SH-AB, Wetland WG-AB): Stream SF-AB is perennial. Stream SH-AB is intermittent. Stream SH-AB and WG-AB are located entirely under the proposed roadway fill and will be total takes. Stream SF-AB will utilize a 66" RCP buried 1.0'. Bill Elam noted that all pipes that are to be buried should have an inlet sill to prevent head cuts.

Plan Sheet 63A (Stream SO-AB/SI-AA): Stream SO-AB/SI-AA is perennial. Stream SO-AB/SI-AA crosses existing NC 49 in a 60" CMP. The pipe will be extended on both ends using junction boxes. The pipe extensions will not be buried since the existing 60" CMP is not buried. The condition of the existing pipe is questionable and alternatives are still being discussed for repair/replacement. A channel change will be required where -SR3- has parallel impacts to the channel. Bank stabilization will be shown the full length of the channel within the TDE.

Plan Sheet 64 (Stream SM-AB): Stream SM-AB is perennial. Stream SM-AB crosses existing NC 49 in a 6'x5' RCBC. The culvert will be extended at its existing size on both sides of the road. The culvert extensions will not be buried since the existing culvert is not buried. -SR2- will also cross stream SM-AB. A 72" pipe that is not buried since the existing downstream culvert is not buried will be utilized at the crossing. A channel relocation will be required on both sides of the road to accommodate roadway fill.

Design Section 3A (Concurrence Point 4C)

Plan Sheet 35A (Stream SD-C and Ponds PA-C and PB-C): Stream SD-C is a perennial stream, therefore needs to accommodate aquatic passage. The site consists of a one barrel 6'x7' RCBC carrying stream SD-C through the divided highway. The culvert invert will be buried 1' below the natural stream bed. Normal stream flow will be confined within this single barrel. The culvert will inlet and outlet in new channels carrying SD-C between unaffected PA-C and affected PB-C. The channel improvements will ensure SD-C is conveyed in a non-erosive manner. The channel varies in width between 1.5' and 6.' Sills are being incorporated within the 6'x7' RCBC at 20' spacing to accommodate the culvert slope of 3.4%. Native material will be used for backfill. Pond PB-C will be temporarily drained. When construction is completed, it will be allowed to fill back up naturally. The existing detail within the details sheet of the plans will need to

be replaced with NCDOT Geotechnical's detail and any associated updates with the design need to be changed. A pond management plan will be completed to account for any construction sediment within the pond.

Plan Sheet 36 (Pond PB-C): Pond PB-C is fully contained within proposed right-of-way and temporary drainage easements. The pond will be drained for construction. The portion of the pond that is within the right-of-way will be filled and a rock slope will be provided to abut the pond as shown and will be permitted a permanent pond impact. The portion of the pond outside of the proposed right-of-way but contained within temporary drainage easement will be permitted as a temporary impact and will fill back up with water after construction is completed in this area. The existing detail within the details sheet of the plans will need to be replaced with NCDOT Geotechnical's detail and any associated updates with the design need to be changed. The outfall of the pond is an elevated pipe with a degraded channel downstream. It was noted that the outlet is dry, potentially as a result of the evapotranspiration of water from the two inline ponds. The proposed rock embankment will be constructed at a height of 2' above the existing Normal Water Surface Elevation. A standard 3' base ditch will be constructed at STA. 471+50 -L- RT to convey water to the pond from the opposite side of the roadway via a 30" RCP-V.

Plan Sheet 37 (Streams SG-C, SF-C and SE-C): Streams SG-C and SF-C are perennial. Stream SE-C is intermittent. Stream SG-C is Vestal Creek and has a small permanent impact resulting from a ditch tie and is shown on the downstream side of the dual bridges. This impact is offset 5' from the left bank of the jurisdictional stream. There are no stream impacts as a result of the proposed dual bridges and excavation to elevation 596.0'. Stream SF-C will be carried by a 66" RCP-III Overflow. This 66" RCP-III will be buried 1' in the channel section with a 0.13% slope. The existing channel at this location is an 11' wide channel, therefore, will require no channel improvements. Stream SE-C will be relocated into a rip-rap lined channel change and redirected into a 54" RCP-III Overflow to convey the flow once it exits the lined channel change. This 54" RCP-III runs perpendicular to the proposed US 64 Bypass at STA. 488+90 -L- with a 2.21% slope The original design plans showed the ditch being lined as a PSRM lined ditch, but as discussed within the meeting, the PSRM lining will wash away if any water is able to get beneath it, so rip-rap is better in this location. The original design plans also called for a 60" RCP, but since SE-C is intermittent, aquatic passage will not be considered, so a smaller pipe is applicable. Minimal flow and water impounding should be considered. A "Not Buried" note will be added to this pipe at this location. A special lateral 'V' ditch will tie into this channel change and include a jurisdictional rip-rap transition pad. The outlet channel is 9' wide and requires no channel improvements, but will be lined for approximately 22' with Class I rip-rap resulting in both temporary and permanent impacts. The stream at station 498+00 RT that was shown as a single JS line on the plans has been confirmed to not be JS by the current wetland file. Stream names are to be shown clearly within detail sections of the plans. Additional design details of the excavation for Vestal Creek will be supplemented upon approval from NCDOT Hydraulics. There with contractors to gather information about possible haul roads crossing Vestal Creek. Once confirmed, impacts will be shown in appropriate locations. The "No Deck Drains" note will be moved for clarity around the bridge spanning Vestal Creek in the detail sheet. The stream feature to the west of the Preformed Scour hole was incorrectly shown on previous plans as a jurisdictional stream, but after further investigations, this flow line is not a jurisdictional feature.

Plan Sheet 38 (Stream SH-C): Stream SH-C is perennial. Stream SH-C is conveyed through the site via a 2 @ 9'x6' RCBC at 1.14% grade. The western barrel is buried 1.0' and will be the low flow barrel. The eastern barrel is reserved for high flows and will have a 2.0' sill at both ends of the culvert. Native material will be utilized for backfill with priority given to the low flow barrel. Channel transitions of up to 40' will be provided at the inlet and outlet of the proposed culvert. The existing channel has a 6' base. In the original design, a standard grass swale tied in with Stream SH-C, resulting in easement being necessary. In the meeting, it was decided the 30" RCP should still remain tied into stream SH-C via a standard grass swale, but the ditch should be tied in and the bend just upstream of the previous design in order to eliminate the easement. There will still be permanent and temporary impacts associated with this ditch due to a jurisdictional rip-rap transition pad being incorporated.

Plan Sheet 39 (Stream SI-C, Stream SYY-C and Wetland WBA-C): Streams SI-C and SYY-C are intermittent In the existing condition stream SI-C flows north to south into wetland WBA-C while stream SYY-C exits the Wetland WBA-C and leaves the right of way. The proposed condition conveys stream SI-C under the fill via a 54" RCP-IV, at 1.25% grade, to connect to stream SYY-C on the other side of the proposed roadway. The 54" RCP-IV outlets into an existing channel. The channel requires no channel improvements, but will be lined with CL II rip-rap for approximately 20' which will result in a permanent stream impact. In our previous design, the pipe was designed as a 60" RCP and buried at 1', but it was decided at the meeting that due to both SI-C and SYY-C being intermittent, the pipe was not required to be buried and we could use a 54" pipe. Ensure the 54" pipe will convey minimal flow and not impound any water. A "Not Buried" note will be added to the pipe at this location. Wetland WBA-CA is located under the roadway fill and will be permitted as a total take.

Plan Sheet 40 (Stream SJ-C): Stream SJ-C is perennial. Stream SJ-C will be conveyed beneath the proposed US 64 Bypass via a 6'x7' RCBC at 1.18% grade. The proposed culvert will be aligned with the stream and have 40' of channel transition at both the inlet and outlet of the culvert. The culvert will be buried 1.0' and the will include a 1' sill that will be inset 1' from both the inlet and outlet of the culvert. During the meeting we discussed combining the two lateral conveyances shown on the downstream side of the stream into one conveyance to reduce the potential for instability resulting from the multiple ties. The two conveyances have been combined for the final design and will be outlet into Stream SJ-C immediately downstream of the culvert in the channel improvement area. All TB line styles should be turned off in permits for clarity reasons.

Plan Sheet 41 (Stream SK-C): Stream SK-C is perennial. Stream SK-C parallels the east side of NC 42. There are several pipe outlets that discharge into stream SK-C. Each of these conveyances will tie to stream SK-C via standard grass swales with non-erosive velocities. Rip Rap transition pads will also be shown at each of the ditch connections to stream SK-C and each will be permitted as a permanent impact. Stream SK-C is conveyed under the proposed facility with a 66" RCP-III buried 1' at the inlet and outlet. The slope of the 66" RCP will be 1.18%. On the downstream side of the 66" RCP, the channel geometry will remain the same, but the banks will be lined with CL II rip-rap for approximately 22', resulting in permanent stream impacts. TDE's are to be turned on within the detail sheets. A headwall with sill will be considered n order to protect sediment from within pipe from being washed away as well as to safeguard against headcutting. As discussed, the temporary diversion will be on the east side of the 66" RCP because the contractor will be approaching the site from NC42 and need that area on the west side of the pipe to work.

Plan Sheet 42 (Stream SL-C): Stream SL-C is both perennial and intermittent within the project limits. Stream SL-C is conveyed under the proposed roadway with a 42" RCP-V. The grade of this pipe will be 3.92%. The original design called for a 48" RCP, but since the pipe will not be buried due to the stream being intermittent, a smaller pipe can be used. There is a junction box near the outlet that turns the outlet inline with the downstream channel via a 42" RCP-III. This is not a drop structure. The outlet geometry with a 2' base will remain unchanged, but the banks will be lined with CL II rip-rap for approximately 14', resulting in permanent impacts. The pond to the north of the 48" RCP is not a jurisdictional feature, therefore there are no impacts required at this location.

Plan Sheet 44 (Stream SM-C, SN-C, and Wetland WB-C): Stream SM-C is perennial. Stream SM-C is conveyed through the project by a 60" RCP-IV at 4.27% grade. The original design called for the pipe to be a 66" RCP and be buried 1', but the slope is too steep to accommodate these plans. In the meeting, it was requested that the profile sheet for the 60" RCP be moved to after sheet 44A. The proposed crossing is in line with the incoming and receiving channels, therefore no channel changes are required. The banks of the outlet of the 60" RCP- will be lined with CL II rip-rap for approximately 28', resulting in permanent stream impacts. The rip-rap bank stabilization will be shown wrapped around the 90 degree bend just downstream of the outlet. Rip-rap was requested to be placed in the bed to help with energy dissipation from the pipe. This will be stretched to the same endpoint as the bank stabilization. Bed material will be analyzed at this location to determine is a concrete sill is necessary at the outlet. Wetland WB-C is located underneath the proposed roadway and will

be permitted as a total take. Stream SN-C is perennial. Upstream of the conveyance of SN-C through the project site, a lateral 'V' ditch will dissipate into the stream with a jurisdictional rip-rap transition pad, resulting in permanent impacts. Stream SN-C is conveyed through the site with a 54" RCP-III at 3.11% grade. Previous design showed this pipe as a 60" RCP buried 1', but after discussion in the meeting, the pipe size was adjusted to a 54" RCP and the pipe will not be buried because it will not act as a stream. A junction box is used at the outlet to redirect the flow into a lateral base ditch. Aquatic life passage will not be applicable in this location. Minimum flow and water impounding will be analyzed. Rip-rap has been requested to extend through the lateral base ditch and tie in with the jurisdictional rip-rap transition pad.

Plan Sheet 45 (Stream SN-C, SO-C and SP-C): Stream SN-C is perennial. Stream SN-C is located under fill and has been relocated to the east side of the roadway where it ties to stream SO-C. Stream SO-C is conveyed through the site with a 48" RCP-III' at a 2.78% grade. In our previous design, the pipe was a 54" and buried 1', but it was decided in the meeting to go with a smaller pipe due to aquatic passage not being feasible at this location. The proposed pipe is aligned with the incoming and exiting channels to limit stream erosion. There will be no channel change required with this pipe alignment, but the bed and banks on the outlet end will be lined with CL II rip-rap for approximately 18', resulting in permanent impacts. Stream SP-C is located outside the project right of way and no impacts are anticipated.

Plan Sheet 46 (Stream SQ-C, SS-C and Wetland WD-C): Stream SQ-C is Squirrel Creek and crosses the site in a 3 @ 10' X 7' RCBC at a 0.42% grade. The center barrel is low flow and is buried 1' with sills at each end. The outside barrels will have 2' sills at the inlet and outlet and will serve as high flow conveyance. Channel transitions are located at the inlet and outlet of the culvert and are armored to maintain channel stability. A preformed scour hole has been utilized to the south of the outlet of the RCBC. Downstream of the RCBC, a standard grass swale conveys drainage into SQ-C through a jurisdictional rip-rap transition pad, resulting in a permanent impact. Stream SS-C runs north to south and dips underneath the proposed roadway fill. As a result, a portion of the channel will be realigned and conveyed with non-erosive velocities to its existing connection with stream SQ-C on the upstream side of the culvert. As discussed in the meeting, this entire portion of SS-C will be taken and the channel location will be moved to a more suitable tie in location with SQ-C. The channel change will be lined with rip-rap in this location, allowing the toe protection to be removed. Wetland WD-C is located outside of the anticipated work area no impacts are anticipated. The standard grass swale downstream of the culvert is to be realigned and kept within existing right-of-way, specifically kept along the toe of the fill slope at this location. Associated impacts will also be moved to adjust to the new drainage plan.

Plan Sheet 47 (Stream SS-C, SU-C and ST-C): Streams SS-C, SU-C and ST-C are located outside of the anticipated work area and no impacts are anticipated to be shown on this sheet.

Plan Sheet 48 (Stream SW-C and SV-C, Ponds PD-C and PE-C, and Wetland WJ-C): Stream SW-C begins its jurisdiction downstream of the project, so no impacts are anticipated. Ponds PE-C and PD-C will be permanently drained and contained in easement for future maintenance. The decision to allow the stream to either reform naturally within the ponds or if they were to be constructed through fill sections was discussed. If the channel was to be constructed, it would need to be constructed in fill and stabilize. Both of these options could also produce a natural wetland in this area. The ditches between the ponds create a natural riser, therefore these areas could be used as stormwater BMP's within the right-of-way. The ditches currently shown on the plans through the pond embankments will be lined with rip-rap and connected to limit erosion. Previous designs showed the ditches to be lined with PSRM, but rip-rap is more reasonable in this area. The ponds will be graded to facilitate positive drainage. The ponds will be permitted as total takes. Wetland WJ-C will have permanent impacts resulting from the 30" RCP outlet into the wetland and the loss of its hydrology due to the rip-rap lined ditches. Stream SV-C is intermittent. Stream SV-C will be a permanent impact resulting from the loss of hydrology associated with breaching the ponds.

Plan Sheet 49 (Stream SV-C, Pond PE-C, and Wetlands WE-C, WI-C, WF-C, WG-C, WH-C): Stream SV-C begins jurisdiction within wetland WF-C and continues through the 48" RCP-III draining into Pond PE-C. Stream SV-C will have

both permanent and temporary impacts resulting from the construction of the 48" RCP. An existing ditch will convey discharge from the outlet of the 48" RCP and carry it through to pond PE-C to limit erosion of historical ponded sediment. Previous plans showed a 54" RCP in this area that was buried 1', but as discussed in the meet, this is an intermittent stream, therefore aquatic passage is not required. Add "Not Buried" note to pipe. There will be permanent and temporary drainage in and adjacent to wetlands WE-C, WI-C, WF-C, WG-C, WH-C which will result in permanent and temporary impacts. These impacts cannot be avoided. Wetland WE-C, WG-C, WH-C and WI-C will be permitted as total takes as they are located almost entirely underneath roadway fill or ditch excavation or lose their hydrology due to proposed conditions. Stream label for SV-C will be added on plan sheet 49 for clarity.

Plan Sheet 97 (Stream SK-C): Stream SK-C is located outside of the right of way and no impacts are anticipated.

Plan Sheet 98 (Wetland WE-C): Wetland WE-C will be permitted as a total take. It is located almost entirely under the proposed roadway fill slope.

Plan Sheet 99: No jurisdictional features.

Design Section 1A (Concurrence Point 4B)

Plan Sheet 4 (Stream SB-AA): Stream SB-AA is intermittent. This site is to tie a lateral ditch into Stream SB-AA and stabilize the tie in.

Plan Sheet 6 (Stream SD-AA, Wetlands WYZ-AA, WXX-AA, Pond PA-AA): Stream SD-AA is intermittent. The 54" RCP shown on the plans will not be buried, and therefore will be downsized to a 48" RCP. The outlets of the 30" RCP and the 18" RCP will be spread apart to aid in constructability. Wetlands WYZ-AA and WXX-AA are under the proposed roadway fill and will both be total takes. Pond PA-AA will also be a total take.

Plan Sheet 7 (Stream SAA-AA, Wetland WB-AA): Stream SAA-AA is intermittent. Stream SAA-AA begins under the proposed roadway fill. A 36" pipe which will not be buried ties into Stream SAA-AA and bank stabilization is utilized at the pipe outlet. The bank stabilization will be constructed within 10' of wetland WB-AA and mechanized clearing is shown to allow construction of the bank stabilization.

Plan Sheet 7 (Stream SE-AA): Stream SE-AA is intermittent/perennial. The location of the transition to perennial is unknown. An existing 36" RCP under existing US 64 will be extended on the upstream end utilizing a junction box. The downstream end utilizes a collar and extend. The section of stream inside the proposed loop will be permitted as bank stabilization. The 60" RCP shown on the plans will not be buried, and therefore will be downsized to a 54" RCP. There will be an impact at -L- 63+00 right to tie in the 18" pipe outlet to the stream and stabilize the tie in. At -L- Sta. 65+00 right stream SE-AA flows under the proposed roadway will. A channel relocation will be constructed that carries stream SE-AA to the tie in with Stream SG-AA shown on plan sheet 8.

Plan Sheet 7 (Stream SM-AA): Stream SM-AA is intermittent. Stream SM-AA will be relocated into a rip rap channel to flow into a 36" CSP at -L- 16+00 LT.

Plan Sheet 7 (Stream SZZ-AA, Wetland WUU-AA): Stream SZ-AA is intermittent stream. SZ-AA begins within the interchange and is permitted as a surface water impact from its beginning. The 42" RCP under -FLY- will not be buried and therefore will be downsized to a 36" RCP. Fill from the proposed roadway -FLY- will be permitted as fill in wetlands in wetland WUU-AA. Mechanized clearing is also provided to construct the bank stabilization at the outlet of the pipe. A channel change is to be constructed at Stream SZZ-AA where the roadway fill from the -L- alignment covers the existing channel.

Plan Sheet 8 (Stream SG-AA): Stream SG-AA is the named Perennial stream Cable Creek. 2 @ 8'x8' RCBC will be constructed to carry the flow under the -L- alignment. The low flow barrel will have alternating baffles constructed in it. A stream relocation will be constructed at the outlet end of the culvert to tie in with Stream SG-AA at –L- 70+90 RT.

Plan Sheet 58 (Stream SG-AA, SH-AA, SZZ-AA): Stream SG-AA is the upstream end of Cable Creek. Bank stabilization will be provided to direct the flow into the 2@ 8'x8' RCBC. Stream SZZ-AA is intermittent. Stream SZZ-AA will be relocated to enter a 54" pipe (not buried) that flows into the 2@8'x8' RCBC. Stream SH-AA is intermittent. A channel change will be constructed to direct Stream SH-AA into the same 54" pipe as SZZ-AA. Stream SH-AA flows under US 64 in an existing 30" RCP. This pipe will be extended on the upstream and downstream end utilizing junction boxes.

Plan Sheet 59 (Stream SK-AA, Wetland WD-AA): Stream SK-AA is perennial. Stream SK-AA will be relocated in a channel change due to the roadway fill covering the existing stream. Bank stabilization will be utilized at the stream tie ins. Wetland WD-AA is a total take due to the roadway fill covering it.

Plan Sheet 60 (Wetland WE-AA): Wetland WE-AA is a total take due to the roadway fill covering it. Stabilization will be provided adjacent to the wetland at the inlet end of the existing 36" CMP. The 36" CMP will be retained to hold grade.

Design Section 3B (Concurrence Point 4B)

Plan Sheet 50 (Streams SX-C and SY-C, and Wetlands WK-C and WL-C): Stream SX-C is perennial. Stream SX-C is conveyed through the project by a 60" RCP-III, at a 3.28% grade, and will be buried 1'. The proposed crossing is in line with the incoming and receiving channels, therefore no channel changes are required. The banks of the outlet of the 60" RCP will be lined with CL I rip-rap for approximately 20', resulting in permanent stream impacts. The current design utilizes a junction box including a drop in order to reduce velocities into the natural stream channel. In the meeting, it was requested we analyze a possible redesign in order to remove the drop in the structure in order to accommodate aquatic passage. Stream impacts will be extended between the end of the rip-rap lined banks and the lateral base ditch downstream. Downstream of the 60" RCP, a lateral base ditch drains into SX-C and includes a jurisdictional rip-rap transition pad, which requires permanent impacts. Stream SY-C is intermittent. Stream SY-C is to the east project area and will have no impacts associated with it. Wetland WK-C is located underneath the proposed roadway and altered by a lateral base ditch and will be permitted as a total take. Wetland WL-C is beneath roadway fill and will have permanent and temporary impacts associated with it. A lateral base ditch dissipates into WL-C and velocities will be non-erosive and less than 2.0 fps.

Plan Sheet 51 (Streams SX-C): Downstream of the 60" RCP, a lateral base ditch drains into SX-C and includes a jurisdictional rip-rap transition pad, which requires permanent impacts.

Plan Sheet 52 (Stream SNN-C, SCC/SEE-C and SDD-C, and Wetlands WP-C, WQ-C, WY-C and WZ-C): Stream SNN-C is Gabriels Creek and crosses this site in a 2 @ 10'x8' RCBC at 0.78% grade. The east barrel is the low flow barrel and is buried 1' with 1' sills inset 1' from the inlet and outlet of the culvert and are to be constructed parallel to the culvert face. The high flow barrel with have 2' sills and are to be inset 1' from the inlet and outlet and constructed parallel to the culvert face. The incoming and receiving channels are approximately 11' at the base. The inlet requires 40' of channel improvements and the outlet requires 55' of improvements. Native material will be utilized for backfill with priority given to the low flow barrel. Stream SCC/SEE-C is conveyed through the site via a 6'x7' RCBC at a 2.76% grade. 1' sills will be utilized within the culvert and inset 1' from the inlet and outlet face of the culvert. Native material will be utilized for backfill. 22' of channel improvements are required on the upstream side of the culvert while the downstream side requires 30' of channel improvements. Stream SDD-C merges with stream SCC/SEE-C before the right-of-way and requires no

impacts. Wetland WZ-C is located completely beneath roadway fill and will be permitted at a total take. Wetlands WP-C, WQ-C and WY-C are located outside of construction limits and will require no permitting impacts.

Plan Sheet 53 (Streams SNN-C and SCC/SEE-C, and Wetlands WAA-C, WX-C, WW-C, WV-C, WU-C and WTA-C): Stream SNN-C is Gabriels Creek and has multiple impacts on this sheet. The single span bridge on -ESR5- is proposed to be removed, which will result in temporary impacts from excavating the existing roadway to natural ground at this location. It was mentioned during the meeting to be sure the "Remove Bridge" note is visible in all drawings. It was discussed whether bank stabilization should be added at this bridge removal location or if the banks can be laid back enough to ensure stability. The impacts under the existing bridge will be reflected as permanent bank stabilization impacts, but bank stabilization will not be shown on the plans and will only be used if field conditions warrant. Stream SCC/SEE-C does not have any impacts within this plan sheet. At 41+00 -Y17- LT, SNN-C will be impacted by a standard 3' base grassed swale. A jurisdictional rip-rap transition pad will be used to dissipate velocities prior to it's outfall into SNN-C, resulting in both permanent and temporary impacts. SNN-C will be impacted by a standard 3' base ditch at approximately 44+50 –Y17- LT. Prior to it's outfall into SNN-C, the base ditch has a jurisdictional rip-rap transition pad, resulting in both temporary and permanent impacts at this location. SNN-C is conveyed under -Y17FLY- via a 2 @ 12'x8' RCBC at 0.58% grade. The west barrel is the low flow barrel and is buried 1' with 1' sills inset 1' from the inlet and outlet of the culvert and are to be constructed parallel to the culvert face. The east barrel will be designated as the high flow barrel and will have 2' sills which are to be inset 1' from the inlet and outlet of the culvert and to be constructed parallel to the culvert face. The inlet and outlet of the culvert require channel improvements of 40' on each respective side. Native material will be utilized for backfill with priority given to the low flow barrel. The existing channel is approximately 8' at its base. The 2:1 sideslopes of the inlet and outlet channels will be lined with CL II rip-rap and the proposed channel changes will be lined with coir fiber matting and geotextile. Immediately downstream of the culvert, a 4' lateral base ditch will be constructed and lined with CL B rip-rap flowing from the west side of the culvert, resulting in permanent stream impacts. Also immediately downstream of the culvert, a 5' lateral base ditch will be constructed on the east side of the culvert and will outlet water into SNN-C. A jurisdictional rip-rap transition pad will be installed to reduce velocities, resulting in permanent impacts. Wetland WAA-C will be impacted by roadway fill and excavation in the project area. Both temporary and permanent impacts have been accounted for on -Y17RPDA- and -ESR5-. Wetland WV-C will be permitted as a total take due to the majority of it being impacted by construction limits and roadway fill. Wetland WU-C will not be impacted based on the proposed plans. Wetland WW-C is impacted based on utility construction, 12" water line, and the outlet of a 15" CSP onto a rip-rap pad within the wetland boundary. The water lines will be turned on within the permit drawings and roadway plans. The installation will be shown as temporary fill within the wetlands as opposed to excavation in wetlands. Velocities entering the wetland will be non-erosive and less than 2.0 fps. Both temporary and permanent impacts have been implemented at this location. Furthermore, at approximately 44+50 -Y17- RT, wetland WW-C will be impacted by the construction of a 3' standard base ditch and berm, requiring both temporary and permanent impacts. Additionally, another 12" water line will be constructed at this same location. This construction will require both temporary and permanent wetland impacts. Wetland WTA-C will be impacted by the construction of a 3' standard base ditch within the wetland boundary at 44+50 -Y17- LT resulting in both temporary and permanent impacts. A bore hole will also require temporary permitting at this same location. Area will be allotted on both sides of the standard base ditch in order to place the bore and jack. A rip-rap pad is to be installed at 45+00 -Y17- LT within the wetland boundary, requiring both temporary and permanent impacts. The velocities entering the wetland will be non-erosive and less than 2.0 fps. In our current design, a rip-rap pad will be installed at 46+75 -Y17- LT and will encroach within the wetland boundaries. Velocities entering the wetland will be non-erosive and less than 2.0 fps. It was suggested during the meeting to remove the rip-rap pad and eliminate this impact site. Wetland WTA-C will also be impacted along -Y17FLY- at STA. 48+00 RT by roadway fill. Both temporary and permanent impacts are necessary in this location.

Plan Sheet 54 (Streams SMM-C, SFF-C and SKK-C): Stream SFF/SKK-C is intermittent. Stream SFF-C is conveyed through the project via a storm drainage system and outlet into Stream SKK-C. The water enters the system through a 36" RCP-III and transitions through a junction box before entering a 36" RCP-III before entering a 4OTCB. From then the

water is conveyed into a 36" RCP-III, enters another junction box, then another before being outlet into SKK-C. Both the inlet and outlet sections have permanent and temporary impacts, but neither requires channel changes due to the base of each channel being approximately 3' wide. The banks at the outlet of the system are to be lined with approximately 12' of CL I rip-rap, resulting in permanent stream impacts. Stream SMM-C is intermittent. Stream SMM-C begins beneath the proposed roadway fill and requires a channel change. Drainage from roadway is conveyed into SMM-C via a standard base ditch, requiring permanent and temporary impacts.

Plan Sheet 55 (Streams SGG-C and SHH-C, and Wetland WT-C): This sheet was not discussed at the meeting, but details are provided below to describe the team's intent. Stream SGG-C requires a channel change due to roadway fill and excavation interfering with its normal flow pattern. SGG-C will be diverted into a 4' lateral base ditch and will be tied into the natural channel downstream. This channel change will result in both permanent and temporary impacts at this location. Stream SHH-C is outside the right-of-way and no impacts are anticipated. Wetland WT-C is partially encroached by roadway fill, therefore there is a small portion of the wetland that will be permitted as fill and another small portion permitted as mechanized clearing.

Plan Sheet 56 (Stream SHH-C): This sheet was not discussed at the meeting, but details are provided below to describe the team's intent. Stream SHH-C is located outside of the right-of-way and no impacts are anticipated.

Plan Sheet 56A (Streams SJJ-C, SII-C and SZZ-C, and Wetlands WSA-C, WR-C and WS-C): This sheet was not discussed at the meeting, but details are provided below to describe the team's intent. Streams SZZ-C and SII-C are located within the right-of-way, but no changes to the existing roadway are anticipated other than mill and filling in this project location. Stream SJJ-C is located outside of the right-of-way and no impacts are anticipated. Wetland WSA-C is located within the right-of-way, but no changes to the existing roadway are anticipated other than mill and filling in this project location. Wetlands WR-C and WS-C are located outside of the right-of-way and no impacts are anticipated.

Plan Sheet 100 (Stream SAA-C): This sheet was not discussed at the meeting, but details are provided below to describe the team's intent. Stream SAA-C is located outside of the right-of-way and no impacts are anticipated.

Plan Sheet 101: This sheet was not discussed at the meeting, but details are provided below to describe the team's intent. No jurisdictional features.

Plan Sheet 102 (Streams SAA-C, SBB-C and SNN-C, and Wetland WM-C): This sheet was not discussed at the meeting, but details are provided below to describe the team's intent. Stream SAA-C will be impacted due to the outlet of a standard 4' base ditch lined with rip-rap, resulting in both temporary and permanent impacts. SBB-C is conveyed through the project via a 30" RCP-III. The 30" RCP is routed through a junction box before being outlet back into the natural channel for SBB-C. There will be no channel changes in this location due to the 2' channel being able to accommodate the proposed pipe. The banks at the outlet will be lined with CL I rip-rap, resulting in permanent impacts. Stream SNN-C will be impacted in this project location due to a 2' standard base ditch tying into the stream. A CL I rip-rap embankment will be used to tie the ditch to the stream, resulting in both permanent and temporary stream impacts. Wetland WM-C is outside of the right-of-way and no impacts are anticipated.

Other Discussion

General Comments to be applied to all sites are as follows. The Top of Bank line shown as TB on the permit sheets is to be removed from the permit sheets. Pipe sills will be added to all pipes that are to be buried to prevent the buried pipe from causing a head cut. If a Jurisdictional Stream feature is noted as intermittent, pipes are not required to be buried and should be labeled with "Not Buried" on plan view and profile view sheets. If a Jurisdictional Stream feature is labeled as a perennial stream feature, the pipe will be buried to the depth shown on the plan view unless otherwise noted. Pond impacts should be shown as Surface Water Impacts S instead of Pond P on the permit sheets.

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Design Sections 1A, 2 and 3B
Concurrence Point 4C Meeting Minutes

Project: R-2536 (Asheboro Southern Bypass and Zoo Connector)
Date: January 14, 2016
Location: NCDOT Century Center – Hydraulic Design Conference Room
Time: 8:00 AM to 12:00 PM
Minutes Authored by: Jeff Meador, RK&K; Matt Cook, RK&K; Trent Cormier, ICA

Attendees:

Jason Dilday – NCDOT NES
Michael Shumsky – NCDOT Design Build
Dave Wanucha – NCDENR DWR
Matt Lauffer – NCDOT Hydraulics
Mark Staley – NCDOT REU
John Partin – NCDOT Div 8
Reuben Blakley – NCDOT Div 8
Michael Abuya – NCDOT NCDOT Planning
Bill Elam – NCDOT Hydraulics
Craig Lee – NCDOT Hydraulics
Jake Stone – Wright Brothers Construction
Andrew Williams - USACE
Travis Wilson - NCWRC
Jason Elliot – NCDOT NES
Chris Rivenbark - NCDOT NES
Jim Eisenhardt – RK&K
Byron Holden – RK&K
Tina Swiezy – RK&K
Jeff Meador – RK&K
Matt Cook – RK&K
Trent Cormier – ICA Engineering
Eric Leonhart – ICA Engineering

An interagency concurrence meeting was held in order to reach agreement on concurrence points 4C for the US 64 Asheboro Bypass in Randolph County. The 4C review was completed for design sections 1A (9+00 to 65+00), 2 (210+00 to 465+00) and 3B (Station 668+00 to 770+00). The following items were discussed and conclusions reached:

Matt Lauffer began the meeting with a brief overview of the project and introductions were made. Matt Cook provided a summary of the design sections, the 4B/4C schedule and the project wide decisions that had been made in previous 4B/4C meetings. These decisions include:

- The Top of Bank lie shown on the 4C drawings will be removed
- Pipe sills will be used at the inlet end of all pipes that are to be buried to prevent headcutting
- Pipes on intermittent streams will not be buried and will be labeled as “not buried” on the plans
- The lengths of pipes/culverts will be shown on the pipe/culvert profiles in the permit drawings

Trent Cormier (Section 3B), Matt Cook (Section 2) and Jeff Meador (Section 1A) provided a summary of the design at each jurisdictional feature on the plans. The following comments and decisions were reached.

Design Section 3B

Plan Sheet 50 (Streams SX-C and SY-C, and Wetlands WK-C and WL-C): Stream SX-C is perennial. Stream SX-C is conveyed through the project by a 60” RCP-III, at a 3.28% grade, and is buried 1’. The proposed crossing is in line with the incoming and receiving channels, therefore no channel changes are required. The banks of the outlet of the 60” RCP are lined with CL I rip-rap for approximately 20’, resulting in permanent stream impacts. The current design utilizes a junction box including a drop in order to reduce velocities into the natural stream channel. Stream impacts were extended between the end of the rip-rap lined banks and the lateral base ditch downstream. Downstream of the 60” RCP, a lateral

base ditch drains into SX-C and includes a jurisdictional rip-rap transition pad, which requires permanent impacts. Stream SY-C is intermittent. Stream SY-C is to the east project area and has no impacts associated with it. Wetland WK-C is located underneath the proposed roadway and altered by a lateral base ditch and is permitted as a total take. Wetland WL-C is beneath roadway fill and there are permanent and temporary impacts associated with it. A lateral base ditch dissipates into WL-C and velocities are non-erosive and less than 2.0 fps.

Plan Sheet 51 (Streams SX-C): Downstream of the 60" RCP, a lateral base ditch drains into SX-C and includes a jurisdictional rip-rap transition pad, which requires permanent impacts. Impacts have been extended per request so there is no gap between impact sites.

Plan Sheet 52 (Stream SNN-C, SCC/SEE-C and SDD-C, and Wetlands WP-C, WQ-C, WY-C and WZ-C): Stream SNN-C is Gabriels Creek and crosses this site in a 2 @ 10'x8' RCBC at 0.78% grade. The east barrel is the low flow barrel and is buried 1' with 1' sills inset 1' from the inlet and outlet of the culvert and are to be constructed parallel to the culvert face. The high flow barrel with have 2' sills and are to be inset 1' from the inlet and outlet and constructed parallel to the culvert face. The incoming and receiving channels are approximately 11' at the base. The inlet requires 40' of channel improvements and the outlet requires 55' of improvements. Native material is to be utilized for backfill with priority given to the low flow barrel. Stream SCC/SEE-C is conveyed through the site via a 6'x7' RCBC at a 2.76% grade. 1' sills are utilized within the culvert and inset 1' from the inlet and outlet face of the culvert. Native material is to be utilized for backfill. 22' of channel improvements are required on the upstream side of the culvert while the downstream side requires 30' of channel improvements. Stream SDD-C merges with stream SCC/SEE-C before the right-of-way and requires no impacts. Wetland WZ-C is located completely beneath roadway fill and is permitted at a total take. Wetlands WP-C, WQ-C and WY-C are located outside of construction limits and require no permitting impacts.

Plan Sheet 53 (Streams SNN-C and SCC/SEE-C, and Wetlands WAA-C, WX-C, WW-C, WV-C, WU-C and WTA-C): Stream SNN-C is Gabriels Creek and has multiple impacts on this sheet. The single span bridge on -ESR5- is proposed to be removed, which resulted in both temporary and permanent impacts from excavating the existing roadway to natural ground at this location and showing impacts if bank stabilization the eastern side of the bridge is required. It was mentioned during the meeting to be sure the "Remove Bridge" note is visible in all drawings. The impacts under the existing bridge are reflected as permanent bank stabilization impacts, but bank stabilization is not shown on the plans and is to only be used if field conditions warrant. Stream SCC/SEE-C does not have any impacts within this plan sheet. At 41+00 -Y17- LT, SNN-C is impacted by a standard 3' base grassed swale. A jurisdictional rip-rap transition pad is used to dissipate velocities prior to its outfall into SNN-C, resulting in both permanent and temporary impacts. SNN-C is impacted by a standard 3' base ditch at approximately 44+50 –Y17- LT. Prior to its outfall into SNN-C, the base ditch has a jurisdictional rip-rap transition pad, resulting in both temporary and permanent impacts at this location. SNN-C is conveyed under -Y17FLY- via a 2 @ 12'x8' RCBC at 0.58% grade. The west barrel is the low flow barrel and is buried 1' with 1' sills inset 1' from the inlet and outlet of the culvert and are to be constructed parallel to the culvert face. The east barrel is designated as the high flow barrel and has 2' sills which are to be inset 1' from the inlet and outlet of the culvert and to be constructed parallel to the culvert face. The inlet and outlet of the culvert require channel improvements of 40' on each respective side. Native material is to be utilized for backfill with priority given to the low flow barrel. The existing channel is approximately 8' at its base. The 2:1 sideslopes of the inlet and outlet channels are to be lined with CL II rip-rap and the proposed channel changes are lined with coir fiber matting and geotextile. Immediately downstream of the culvert, a 4' lateral base ditch is constructed and lined with CL B rip-rap flowing from the west side of the culvert, resulting in permanent stream impacts. Also immediately downstream of the culvert, a 5' lateral base ditch is constructed on the east side of the culvert and outlets water into SNN-C. A jurisdictional rip-rap transition pad is installed to reduce velocities, resulting in permanent impacts. Wetland WAA-C is impacted by roadway fill and excavation in the project area. Both temporary and permanent impacts have been accounted for on -Y17RPDA- and -ESR5-. Wetland WV-C is permitted as a total take due to the majority of it being impacted by construction limits and roadway fill. Wetland WU-C is impacted based on the proposed plans. Wetland WW-C is impacted based on utility construction, 12" water line, and the outlet of a

15” CSP onto a rip-rap pad within the wetland boundary. The water lines are turned on within the permit drawings and roadway plans. The installation is currently shown as temporary fill within the wetlands as opposed to excavation in wetlands. Velocities entering the wetland are non-erosive and less than 2.0 fps. Both temporary and permanent impacts have been implemented at this location. Furthermore, at approximately 44+50 -Y17- RT, wetland WW-C is impacted by the construction of a 3’ standard base ditch and berm, requiring both temporary and permanent impacts. Additionally, another 12” water line is constructed at this same location. This construction requires both temporary and permanent wetland impacts. Wetland WTA-C is impacted by the construction of a 3’ standard base ditch within the wetland boundary at 44+50 -Y17- LT resulting in both temporary and permanent impacts. A bore hole also requires temporary permitting at this same location. Area will be allotted on both sides of the standard base ditch in order to place the bore and jack. Per contractor request, a 40’ width of impacts has been provided. As discussed in the meeting, hand clearing will be used within this wetland area as opposed to mechanized clearing. A rip-rap pad is to be installed at 45+00 -Y17- LT within the wetland boundary, requiring both temporary and permanent impacts. The velocities entering the wetland will be non-erosive and less than 2.0 fps. In our current design, a rip-rap pad will be installed at 46+75 -Y17- LT and will encroach within the wetland boundaries. Velocities entering the wetland will be non-erosive and less than 2.0 fps. It was suggested during the meeting to remove the rip-rap pad and eliminate this impact site. Wetland WTA-C will also be impacted along -Y17FLY- at STA. 48+00 RT by roadway fill. Both temporary and permanent impacts are necessary in this location.

Plan Sheet 54 (Streams SMM-C, SFF-C and SKK-C): Stream SFF/SKK-C is intermittent. Stream SFF-C is conveyed through the project via a storm drainage system and outlet into Stream SKK-C. The water enters the system through a 36” RCP-III and transitions through a junction box before entering a 36” RCP-III before entering a 4OTCB. From then the water is conveyed into a 36” RCP-III, enters another junction box, then another before being outlet into SKK-C. Both the inlet and outlet sections have permanent and temporary impacts, but neither requires channel changes due to the base of each channel being approximately 3’ wide. The banks at the outlet of the system are to be lined with approximately 12’ of CL I rip-rap, resulting in permanent stream impacts. There are temporary impacts on the inlet side of SFF-C due to the installation of a water line. During the meeting, it was discussed that a JS transition pad was shown at this location, causing permanent impacts, but the grade of the ditch does not require a JS transition pad, therefore the stream impacts have been changed from permanent to temporary to account for the water line installation. Stream SMM-C is intermittent. Stream SMM-C begins beneath the proposed roadway fill and requires a channel change. Drainage from roadway is conveyed into SMM-C via a standard base ditch, requiring permanent and temporary impacts. Both SFF/SKK-C and SMM-C temporary impacts were extended to the TDE line per request. Current plans showed a JS connecting the SFF/SKK-C and SMM-C, but upon further inspection of the wetland file and the NRTR, it was concluded that the connection was not a JS, therefore, the line style has been changed in the survey file.

Plan Sheet 55 (Streams SGG-C and SHH-C, and Wetland WT-C): Stream SGG-C requires a channel change due to roadway fill and excavation interfering with its normal flow pattern. SGG-C is diverted into a 4’ lateral base ditch and is tied into the natural channel downstream. This channel change results in both permanent and temporary impacts at this location. Stream SHH-C is outside the right-of-way and no impacts are anticipated. Wetland WT-C is partially encroached by roadway fill, therefore there is a small portion of the wetland that is permitted as fill and another small portion permitted as mechanized clearing. It was requested that the mechanized clearing impacts be stretched to the easement at this location.

Plan Sheet 56A (Streams SJJ-C, SII-C and SZZ-C, and Wetlands WSA-C, WR-C and WS-C): Streams SZZ-C and SII-C are located within the right-of-way, but no changes to the existing roadway are anticipated other than mill and filling in this project location. Stream SJJ-C is located outside of the right-of-way and no impacts are anticipated. Wetland WSA-C is located within the right-of-way, but no changes to the existing roadway are anticipated other than mill and filling in this project location. Wetlands WR-C and WS-C are located outside of the right-of-way and no impacts are anticipated.

Plan Sheet 100 (Stream SAA-C): Stream SAA-C is located outside of the right-of-way and no impacts are anticipated.

Plan Sheet 102 (Streams SAA-C, SBB-C and SNN-C, and Wetland WM-C): Stream SAA-C is impacted due to the outlet of a standard 4' base ditch lined with rip-rap, resulting in both temporary and permanent impacts. SBB-C is conveyed through the project via a 30" RCP-III. The 30" RCP is routed through a junction box before being outlet back into the natural channel for SBB-C. There are no channel changes in this location due to the 2' channel being able to accommodate the proposed pipe. The banks at the outlet is lined with CL I rip-rap, resulting in permanent impacts. Stream SNN-C is impacted in this project location due to a 2' standard base ditch tying into the stream. A CL I rip-rap embankment is used to tie the ditch to the stream, resulting in both permanent and temporary stream impacts. Wetland WM-C is outside of the right-of-way and no impacts are anticipated. The Army Corps of Engineers will investigate the addition of the pond by the homeowner along -Y17A-. It was decided during the meeting to show the pond on a dashed layer and not incorporate it as a Jurisdictional feature nor show any impacts. It was also decided that the hydrology in this area is to be returned to its original conditions, therefore, drainage and impacts are to remain the same as previously shown.

Design Section 2

Plan Sheet 19 (Stream SC-AB and Wetland WF-AB): Stream SC-AB will be temporarily impacted so that an existing 24" RCP can be removed at –L- STA. 233+00 LT. The existing pipe will be replaced with a channel that matches the existing stream. The wetland will be impacted by the roadway facility but not considered a total take since it is fed by SC-AB.

Plan Sheet 20 (Streams SA-AB and SB-AB, Wetlands WA-AB, WB-AB, WC-AB, WD-AB, WE-AB and WF-AB, Pond PA-AB): Pond PA-AB, Wetland WA-AB, WB-AB, WC-AB, WD-AB and WE-AB will be total takes due to roadway fill. The existing pond will have a conveyance running on each side of the roadway fill with both running in a riprap lined channel. The riprap channel on the left will be directed into a 48" RCP that crosses the –L- alignment and ties to stream SB-AB. The riprap channel on the right runs along the fill slope and ties to stream SB-AB at the same location of the 48" RCP outlet. The 48" RCP will not be buried at either end due to the proposed riprap lined ditches that tie to the pipe. Wetland WF-AB will not be a total take since SC-AB will still feed the wetland. Mr. Cook reiterated that from the 4B meeting. It was decided not to split the flow on both sides of the roadway. The pond impact hatching will be changed from fill in surface water to impacts in surface water (pond) which is shown with a "P".

Plan Sheet 21 (Streams Littler River and SA-AB, Wetlands WM-AB and WN-AB: Little River will be bridged with 56" MBT concrete girder dual bridges at –L- STA. 252+50. The bridges are 198'-4" in length. There will be impacts to Little River with rip rap transitions being installed at the ends of lateral ditches that tie into Little River. WN-AB will be a total take due to roadway fill and the new bridge. WM-AB will be impacted due to the roadway footprint and due to a temporary haul road needed for bridge construction. Mr. Cook stated that per guidance from the Division mechanized clearing will be used under and around the bridge instead of hand clearing. Asheboro Bypass Constructors will also use a temporary bridge crossing over the Little River for roadway construction. The temporary road and bridge will be shown on the permit drawings. The impacts to the wetland will be considered temporary wetland impact, and there are no anticipated stream impacts due to the temporary bridge. An additional impact will be made on SA-AB at –L- 247+50 RT due to the standard V ditch tying in. This will include permanent and temporary stream impacts.

Plan Sheet 22 (Stream SR-B): SR-B starts on plan sheet 23 and flows onto plan sheet 22. It starts under –Y4RPB-, flows under –L-, and outlets the project in a 48" RCP at the fill slope of –Y4RPC-. The 48" RCP will not be buried in the channel since the stream does not become jurisdictional until it outlets the system.

Plan Sheet 23 (Streams SR-B, SWW-B, SW-B and SZ-B): SR-B flows onto plan sheet 22. It starts under –Y4RPB-, flows under –L-, and outlets the project in a 48" RCP at the fill slope of –Y4RPC-. The 48" RCP will not be buried in the channel since the stream does not become jurisdictional until it outlets the system. SWW-B starts under –Y4LPD- and exits at the fill slope of –Y4LPD-. A 30" RCP outlets into SWW-B and is not buried in the channel since it does not become jurisdictional until it outlets the pipe. SW-B, starts off the project and ties into a rip rap channel that runs down the fill slope of –Y4RPA- and ties in to SZ-B that flows through a double barrel 7'x7' RCBC with a 2' sill in the high-flow barrel and a 1' sill with 6" baffles in the low-flow barrel. A sill and baffle detail will be added to the RCBC profile sheet.

Plan sheet 26 (Streams SBB-B and SCC-B, Wetland WP-B): Stream SBB-B is conveyed across the project with a 66" RCP that is buried 1.0'. It was discussed that since the stream is intermittent, the pipe does not need to be buried. It will be revised to 60' RCP and the profile sheet updated as well. WP-B will be partially impacted by the roadway fill. SCC-B becomes jurisdictional at –L- 337+50 LT under the roadway footprint. It will be conveyed by a 30" RCP that is not buried since the stream begins under the roadway footprint.

Plan Sheet 27 (Stream SDD-B): SDD-B enters the project near matchline –L- 354+00 on this sheet. See Sheet 28 for a description of the impact.

Plan Sheet 28 (Streams SDD-B, SEE-B, SGG-B and SHH-B): SDD-B enters the project near matchline –L- 354+00 on this sheet. It is conveyed across the project with a 54" RCP that is buried 0.9' (20% of the opening). Although the stream is perennial, it was discussed that the pipe would not need to be buried due to its length (440') and slope (4.4%). The pipe will be revised to a 48" RCP. SEE-B is conveyed across the project with a 54" RCP that is buried 0.9' (20% of the opening). Although the stream is perennial, it was discussed that the pipe would not need to be buried due to its length (383'). The pipe will be revised to a 48" RCP. He stated he would check with Travis Wilson, Wildlife Resource Commission, if these revisions were acceptable, as well as other locations with similar characteristics. SHH-B is conveyed across the project with a 6'x7' RCBC that is buried 1.0'. SGG-B enters SHH-B under the roadway fill. It is conveyed along sheet 28 and 29 in a riprap lined channel and a 30" CSP. SEE-B, SHH-B, and SGG-B all feed SFF-B. SFF-B is not impacted by the project.

Plan Sheet 29 (Stream SGG-B): SGG-B begins under the roadway fill at –L- 369+00 RT. It continues on to sheet 28 and enters SHH-B under the roadway fill. It is conveyed along sheet 28 and 29 in a riprap lined channel and a 30" CSP.

Plan Sheet 30 (Streams SQQ-B and SII-B, Wetland WTT-B and WU-B): SQQ-B will be impacted by construction of the roadway fill at –Y9FLY- 11+50 LT and also by a ditch tying roadway drainage to it. It does not need to be conveyed around / through the project; it continues to head north away from the project. WTT-B is a total take under the roadway footprint and due to construction. Mr. Wanucha asked if there are other options without riprap that we could use to convey the drainage in the ditch from the 24" RCP to stream SQQ-B. Mr. Cook stated that there are step pools or lowering the 24" RCP outlet elevation so that the ditch slope would not require riprap, however each would require greater amounts of cutting and possible additional impacts due to the close proximity to the portion of SQQ-B running parallel to the ditch. Mr. Lauffer pointed out that we are achieving some open channel grass lined ditch flow on the opposite side of –Y9FLY-. SII-B is not impacted in the gore area near –L- 406+00 RT until it hits the fill slope at –L- 407+00 RT. It will be described on sheet 31.

Plan Sheet 31 (Stream SII-B, Wetland WU-B): SII-B runs through the interchange gore area and begins being impacted near matchline –L- 407+00 on this sheet. It is conveyed across the project with a 6'x7' RCBC that is buried 1.0'. A channel is used to tie the RCBC outlet to the stream at –L- 409+00 LT. This will be an excavation in wetlands (WU-B). WU-B is impacted by the roadway footprint but is not a total take. SKK-B is not impacted by the channel leaving the RCBC. Craig Lee asked that additional riprap be added to the channel tie at the inlet end to meet the temporary stream impact shape or that the shape be sifted to the end of the riprap tie-in.

Plan Sheet 33 (Streams SKK-B, SLL-B and SNN-B, Wetlands WOO-B and WPP-B): SKK-B runs through the project and is Tantraugh Branch. It is conveyed in a 3@9'x7' RCBC with outside cells using 2' sills for high flow and a third cell using a 1' sill and 6" baffles for low flow. SNN-B is impacted by the RCBC tie-in upstream to SKK-B. SLL-B is impacted by the addition of 2 30" RCPs under –Y10 END-. The remainder of SLL-B is being conveyed in a 48" RCP to limit impacts that would occur to SNN-B and WNN-B if it was ditched along the fill slope. WOO-B and WPP-B are total takes under the roadway footprint. A sill and baffle detail will be added to the RCBC profile sheet.

Plan Sheet 34 (Stream SB-C, Ponds PG-B and PH-B): PG-B is a total take since it is inside the NCDOT right-of-way. SB-C will be impacted with a temporary impact due to a ditch connecting it to a 48" RCP. PH-B will be a total take. The pond impact hatching will be changed from fill in surface water to impacts in surface water (pond) which is shown with a "P".

Plan Sheet 35 (Stream SC-C, Pond PH-B): PH-B will be a total take. SA-C and SB-C from sheet 34 are conveyed across the project in a 54" RCP that is buried 0.9' (20% of the opening). Although the stream is perennial, it was discussed that the pipe would not need to be buried due to its length (390') and slope (3.3%). The pipe will be revised to a 48" RCP. It will tie to SC-C. The pond impact hatching will be changed from fill in surface water to impacts in surface water (pond) which is shown with a "P". Mr. Cook stated that SD-C on this sheet is considered part of the project's Section 3A and was covered in a previous 4C meeting (December 16, 2015).

Plan Sheet 70 (Stream SS-B): Stream SS-B becomes jurisdictional as it leaves an existing 24" RCP at –Y4RPB- 31+50 LT. It is picked up in a 30" pipe extended beyond the existing 24" RCP with a junction box. It outlets to the gore area and then enters a 36" RCP to be conveyed under –SERRD3-. It is not buried since the stream begins under the roadway footprint. A stormwater retention pond is located adjacent to the stream but does not impact it. The stormwater management pond will be labeled on the final permit drawing.

Plan Sheet 71 (Streams ST-B): ST-B was originally shown in the wetland file provided to the team as only a short portion of stream at –Y- 73+00 RT and also on the next sheet at –Y4- 77+00 LT. After reviewing the stream in the 4B field meeting, it was determined that the portion of the stream parallel to the road (both sides) should not have been excluded from the jurisdictional file. They will be considered jurisdictional. The existing 36" RCP will be extended on both ends to allow the stream to continue. It will be conveyed in a riprap lined channel upstream and downstream (sheet 72). The riprap was necessary for stability due to the steep existing contours in the area.

Plan Sheet 72 (Streams ST-B, SU-B and SV-B): For ST-B, see sheet 71. SV-B and SU-B enter an existing 4'x5' RCBC at –Y4- 80+50 RT. The RCBC will be extended on both ends to continue to allow stream passage. The RCBC will not be buried.

Plan Sheet 75 (Streams SAA-B and SWW-B, Wetland WXX-B): SAA-B is conveyed under –Y5- with a 3@10'x7' RCBC with outside cells using 3.0' sills for high flow, and the inside cell using a 1.0' sill and 1.0' baffles for low flow. SWW-B feeds SAA-B and ties in to it under the roadway footprint. SWW-B is conveyed ditch that continues ties to SAA-B just beyond the RCBC tie-in. This was determined to be the best design after the 4B field review. WXX-B will be impacted due to the roadway footprint. Mr. Lee asked that the hatching for the excavation in wetland be checked for the correct scale. A sill and baffle detail will be added to the RCBC profile sheet.

Plan Sheet 76-78: No jurisdictional features.

Plan Sheet 79: No jurisdictional features anticipated, however the D-B Team is awaiting additional survey to complete the design.

Plan Sheet 80 (Stream SKK-D): SKK-D is conveyed under the existing NC 159, Zoo Parkway. –Y9A- does not impact SKK-D. However, due to the alignment of –Y9A-, a new 36" RCP must be installed to take the drainage from one side of existing NC 159 to the other. Tying the 36" RCP to SKK-D will cause an impact. Additional retain / remove notes will be added to the drainage file to prevent confusion.

Plan Sheet 82 (Pond PA-D): PA-D is inside the right-of-way for the project. It will be drained and ditched in a riprap lined ditch along the toe of the fill slope to a 48" RCP at –Y9- 15+00 LT. The entire pond will be placed in TDE to allow for it to be cleaned out if needed during construction. The pond impact hatching will be changed from fill in surface water to impacts in surface water (pond) which is shown with a "P". Mr. Wanucha asked about the aquatic life that will be impacted. Mr. Cook stated that no aquatic life will be moved from the pond to other locations.

Plan Sheet 83 (Stream SH-D, Wetland WZZ-D): SHH-D becomes jurisdictional under the roadway footprint. It is fed by the pond on sheet 82 (PA-D). The pond will be drained and ditched in a riprap lined ditch along the toe of the fill slope to a 48" RCP at –Y9- 15+00 LT. The 48" RCP is not buried due to SH-D not being jurisdictional upstream of the project and the pond flow being conveyed in a riprap lined ditch. The JS label will be checked to make sure the beginning of stream call is shown at the correct location. WZZ-D will be impacted by mechanized clearing.

Plan Sheet 84 (Stream SG-D): SG-D is North Prong Richland Creek and is a FEMA regulated stream. It is conveyed in a 2@14'x10' RCBC with one cell using a 1' sill and 6" baffles for the low flow and the other cell using a 2' sill for the high flow. The wetland upstream of the RCBC is not named and will not be impacted. A sill and baffle detail will be added to the RCBC profile sheet. The right of way will be checked to see if the TDE can be moved outside the wetland.

Plan Sheet 86 (Stream SF-D, Wetlands WD-D and WE-D): WD-B will be a total take under the roadway footprint. Although WE-D would not be impacted, however it was decided during 4B to consider it a total take due to possible drawdown affects and construction affects. SF-D is conveyed across –Y9- in a 42" RCP buried 0.7'. It was discussed that since the stream is intermittent, the pipe does not need to be buried. It will be revised to 36' RCP.

Plan Sheet 87 (Stream SC/SD-D): SC/SD-D is conveyed across the project with a 6'x7' RCBC buried 1.0'. Tina Swiezy suggested tying the outlet channel in to the existing stream beyond the bend where it ties now.

Plan Sheet 88 (Stream SC/SD-D): A more free-flowing natural stream design will be utilized to convey SC/SD-D across the existing zoo entrance. The existing pipes will be removed and the new channel installed with a more sinuous design as shown. The systems in the round-about and -NC159_SPUR- outlet to a single point at the new channel tie-in to the existing channel.

Design Section 1A

Plan Sheet 4 (Stream SB-AA): Stream SB-AA is intermittent. Jeff Meador noted that this site has changed since it was presented at the December 4B meeting. The updated design was presented to the attendees. A driveway/service road is being added at this location which will result in the extension of the existing 4'x4' RCBC on the upstream end. The stream will also require some channel relocation at this area as a portion of it will be under the proposed roadway fill. The culvert extension will not be buried since the existing culvert under US64 is not buried. Wetland WA-AA will not be impacted.

Plan Sheet 6 (Stream SD-AA, Wetlands WYZ-AA, WXX-AA, Pond PA-AA): Stream SD-AA is intermittent. The 48" RCP under SR1 will not be buried. The outlets of the 30" RCP and the 18" RCP were spread apart to aid in

constructability per comments received at the 4B meeting. Wetlands WYZ-AA and WXX-AA are under the proposed roadway fill and will both be total takes. Pond PA-AA will also be a total take.

Plan Sheet 7 (Stream SAA-AA, Wetland WB-AA): Stream SAA-AA is intermittent. Stream SAA-AA begins under the proposed roadway fill. A 36" pipe which will not be buried ties into Stream SAA-AA and bank stabilization is utilized at the pipe outlet. The bank stabilization will be constructed within 10' of wetland WB-AA and mechanized clearing is shown to allow construction of the bank stabilization.

Plan Sheet 7 (Stream SE-AA): Stream SE-AA is intermittent/perennial. Jason Dilday noted that the location of the transition to perennial had been found and this location will be shown on the permit drawing. An existing 36" RCP under existing US 64 will be extended on the upstream end utilizing a junction box. The downstream end utilizes a collar and extend. Rip rap bank stabilization has been added to the section of stream inside the proposed loop as requested during the 4B meeting. The 54" RCP under Loop D/FLY will not be buried. There will be an impact at -L- 63+00 right to tie in the 18" pipe outlet to the stream and stabilize the tie in. At -L- Sta. 65+00 right stream SE-AA flows under the proposed roadway will. A channel relocation will be constructed that carries stream SE-AA to the tie in with Stream SG-AA shown on plan sheet 8.

Plan Sheet 7 (Stream SM-AA): Stream SM-AA is intermittent. Stream SM-AA will be relocated into a rip rap channel to flow into a 36" CSP at -L- 16+00 LT. The chevron pattern for the proposed ditch at 13+50 left will be corrected to shown the correct flow direction.

Plan Sheet 7 (Stream SZZ-AA, Wetland WUU-AA): Stream SZ-AA is intermittent stream. SZ-AA begins within the interchange and is permitted as a surface water impact from its beginning. The 36" RCP under -FLY- will not be buried. Fill from the proposed roadway -FLY- will be permitted as fill in wetlands in wetland WUU-AA. Mechanized clearing is also provided to construct the bank stabilization at the outlet of the pipe. A grass lined channel change is to be constructed at Stream SZZ-AA where the roadway fill from the -L- alignment covers the existing channel.

Plan Sheet 8 (Stream SG-AA): Stream SG-AA is the named Perennial stream Cable Creek. 2 @ 8'x8' RCBC will be constructed to carry the flow under the -L- alignment. The low flow barrel will have alternating baffles constructed in it. A stream relocation will be constructed at the outlet end of the culvert to tie in with Stream SG-AA at –L- 70+90 RT.

Plan Sheet 58 (Stream SG-AA, SH-AA, SZZ-AA): Stream SG-AA is the upstream end of Cable Creek. Bank stabilization will be provided to direct the flow into the 2@ 8'x8' RCBC. Stream SZZ-AA is intermittent. Stream SZZ-AA will be relocated to enter a 54" pipe (not buried) that flows into the 2@8'x8' RCBC. Stream SH-AA is intermittent. A channel change will be constructed to direct Stream SH-AA into the same 54" pipe as SZZ-AA. Stream SH-AA flows under US 64 in an existing 30" RCP. This pipe will be extended on the upstream and downstream end utilizing junction boxes.

Plan Sheet 59 (Stream SK-AA, Wetland WD-AA): Stream SK-AA is perennial. Stream SK-AA will be relocated in a channel change due to the roadway fill covering the existing stream. Bank stabilization will be utilized at the stream tie ins. Wetland WD-AA is a total take due to the roadway fill covering it. Matt Lauffer requested that the storm drain pipes coming into the stream from the roadway above be realigned to provide a better flow angle relative to the stream.

Plan Sheet 60 (Wetland WE-AA): Wetland WE-AA is a total take due to the roadway fill covering it. Stabilization will be provided adjacent to the wetland at the inlet end of the existing 36" CMP. The 36" CMP will be retained to hold grade.

Other Discussion

General Comments to be applied to all sites are as follows. Andy requested more detail on the impact summary tables. The length of pipes/culverts will be noted on the table and total takes will also be noted. If a site includes utility impacts it should be noted on the table. Pond impacts should be shown as Pond Impacts P on the permit sheets. This was incorrectly noted in the December interagency meeting minutes. Coordination needs to be held between the designers and the contractor to make sure no water is impounded on the upstream side of any crossings. If a crossing is buried, the stream bottom should still meet at an elevation that does not block flow for pipes and the low flow cells of RCBCs.

Due to heavy amounts of rock in the area, the Team discussed the possibility of not burying pipes that need to be buried if it is determined in the field that rock would protect against the possibility of scour / headcutting. Coordination would need to occur between the contractor and the agencies for approval and field review. Mr. Williams stated that he would investigate further the option to add verbiage to the permit to allow for this issue.

Tina Swiezy wrapped up the meeting and noted that the permit application will be submitted to NCDOT for review during the first week in February. The permit is expected to be submitted to the agencies during the first week of March. Matt Lauffer will follow up with Travis Wilson to ensure that we are being consistent with his expectations on burying pipes. Jim Eisenhardt confirmed that no additional field reviews are needed for the project. Jason Dilday and Andy Williams are going to visit the project to confirm mitigation ratios for the project. These ratios will be provided to the team. The team noted that the permit application could be reviewed by NCDOT if this information is not complete yet and the mitigation ratios could be updated during the NCDOT review.

Design Section 2
Additional Concurrence Point 4C
Service Roads
Meeting Minutes

Project: R-2536 (Asheboro Southern Bypass and Zoo Connector)
Date: March 10, 2016
Location: NCDOT Century Center – Hydraulic Design Conference Room
Time: 8:00 AM to 9:00 AM

Attendees:

Jason Dilday – NCDOT NES
Michael Shumsky – NCDOT Design Build
Karen Capps – NCDOT Design Build
Dave Wanucha – NCDENR DWR
Matt Lauffer – NCDOT Hydraulics
Mark Staley – NCDOT REU
John Partin – NCDOT Div 8
Reuben Blakley – NCDOT Div 8
Brian Overton – NCDOT Archaeology
Matt Cook – RK&K
Craig Lee – NCDOT Hydraulics
Larry Brickey – Asheboro Bypass Constructors
Landis Bumgarner – Asheboro Bypass Constructors
Andrew Williams - USACE
Travis Wilson – NCWRC
Ahmad Al-Sharawneh – NCDOT PDEA
Gary Jordan - USFWS
Chris Rivenbark - NCDOT NES
Jim Eisenhardt – RK&K
Michael Merritt – RK&K
John Olinger – NCDOT Div 8
Bill Elam – NCDOT Hydraulics
Brad Boggs – RK&K
Monte Matthews - USACE
Chris Underwood – NCDOT NES

An interagency concurrence meeting was held in order to reach agreement on concurrence point 4C for the US 64 Asheboro Bypass in Randolph County. The 4C review at this meeting involved additional service road areas in Section 2 that have been added to the project since the Section 2 4C meeting held January 14, 2016. The following items were discussed and conclusions reached:

Matt Lauffer began the meeting and turned it over to Matt Cook. Mr. Cook described the reason for this additional 4C meeting. The cost of right of way purchases and the cost of constructing service roads have been heavily evaluated over the last couple months. Several service roads were not included in the 4C meetings due to their viability at the time.

Part of the package Mr. Cook distributed included a titlesheet of the project showing the five service roads that were added and a driveway that was added as well. A spreadsheet was also added that described the areas of each addition and any jurisdictional features affected. RK&K personnel went in the field and checked for jurisdictional features since all of the areas below were outside the original jurisdictional corridor. (SERRD3 was not outside the corridor. It was removed from the project after the 4C meeting in January, but it was added back. It is shown for clarification purposes in detailing its history.) The following is a brief summary at each location. (The pond information is shown because field calls were made at the same time in order to tie to jurisdictional features beyond ponds that were outside the study corridor.)

R-2536 Asheboro Bypass - Service Road Summary Table							
Updated: 3/7/2016							
Service Road	**Appr. Location**	**Updated Juris. File**	**Updated Plan. File**	**Stream Calls**	**Wetland Calls**	**Impacts**	**Permit Drawings added to Package**
SERRD1	-L- 385+00 LT	Yes	Yes	1 Ext.: SPP-B; 1 New	No	1 New (SPP1-B); SPP-B New Impact; SQQ-B Additional Impact; WQQ-B New Impact	Yes
SERRD3	Along US 220 Ramp B	NA	NA	NA	NA	NA	NA
4 (SRF Ext.)	-L- 165+00 LT	Yes	Yes	2 Exts.: SL-AB, SK-AB; 2 New	3	No	No
I	-Y3- 220+00 LT	NA	NA	No	No	No	No
Q	Along Zoo Connector	Yes	Yes	1 Ext.: SC/SD-D; 1 New	No	SC/SD-D Additional Impact; SF-D Additional Impact	No
Driveways	-L- 41+00 LT	Yes	Yes	1 Ext.: SM-AA	No	No	No
During service road jurisdictional call field visit, the following pond information was also obtained							
PA-D	-Y9- 12+00 LT	Yes	Yes	1 New Upstream	No	No	No
PB-C	-L- 473+00 RT	Yes	Yes	1 New Downstream	No	Yes	No
No Name	-L- 636+00 LT	Yes	Yes	1 New Up and Downstream	No	Yes	No

To summarize the chart above, there are two service roads being added that have new jurisdictional features and impacts: SERRD1 and SRQ.

Due to the time of the year, the areas cannot be checked for Schweinitz's Sunflower. The Team has checked for habitat and plans on going back in the field in a couple months to check for the plant. It is also the intent of the Team to check again in the fall when it flowers and to yearly check for them. Gary Jordan suggested checking any new areas that get cleared within the project limits since the plant can show up in them as well. This will be documented in the permit application.

Mr. Cook stated that he provided Brian Overton with updated shapes reflecting all the new areas in order to check for archaeological features. Mr. Overton stated that consultants were ready to go in the field and should provide information in a month or so. This will be documented in the permit application.

Mr. Cook asked if an additional Environmental Consultation would be required since we are outside the original environmental document study corridor. It was agreed that this would be necessary, but it would not prevent the completed permit package from moving forward with submittal to the agencies and public notice. Andy Williams asked that, concerning the Least Environmentally Damaging Practical Alternative (LEDPA), that the most up to date information be available and to make sure that the Team explains all impacts, avoidance, minimization, etc. to the best of their ability.

Jim Eisenhardt stated that we did have April 2015 documentation and are within the timeframe window for timely documentation.

Mr. Cook also asked if the agencies needed to go in the field to verify the Team jurisdictional determinations. Mr. Williams stated that they did not need to go unless the Team was uncertain about certain features. Mr. Cook stated that they were not uncertain. Mr. Williams said that the Team needed to provide documentation and that they might go in the field if scheduling allowed.

The permit drawings were then reviewed.

Plan Sheet 35 (Streams SC-C and SD-C, Ponds PH-B and PA-C, Wetland WA-C): Site 43D (pond PA-C) and Site 57 (stream SD-C) were discussed because there has been a revision to the permit drawing. The pond impact was too large in previous drawings and has been revised (a reduction of 0.04ac). Also, two sets of jurisdictional stream were shown in the outlet area of pond PA-C. The correct stream is now shown on the plans and the correct impacts shown also. The ditch that is used to breach the dam feeds a swale instead of SD-C because this is the low point in the dam. Therefore, additional impacts are shown in SD-C since it will not be viable between the pond and the new RCBC post construction. These impacts and sites were not part of the service road discussion.

Plan Sheet 30 and 79 (Streams SQQ-B, SPP-B, SPP1-B and SII-B, Wetlands WTT-B, WSS-B and WU-B): With the addition of SERRD1, RK&K personnel went on site and determined that SPP-B should have been extended beyond what is shown in the NRTR. In addition, another stream was located near –Y9FLY- 13+00. It has been named SPP1-B. These streams will be impacted by SERRD1. SPP1-B will be a total take. Also, WSS-B will be a total take, and there will be additional impacts to SQQ-B. A 60" RCP will be used to convey the drainage. It will not be buried since the realignment of SPP-B is in a riprap lined ditch. Altogther at this location, there is an increase of 1293' of permanent stream impact, 29' of temporary stream impact, and 0.03ac of wetland impact. No other locations had additional impacts on this sheet.

Plan Sheet 86 (Stream SF-D, Wetlands WD-D and WE-D): Service Road Q (SRQ) will run parallel to –Y9-, the Zoo Connector. The slope stakes meet for the majority of the alignments, so they are seldomly seen between the two. There are additional impacts to SF-D. SF-D is conveyed across –Y9- in a 42" RCP that is not buried since the stream is intermittent. SF-D is conveyed across –SRQ- in a 36" RCP that is not buried since the stream is intermittent. At this location, there is an increase of 121' of permanent stream impact, 47' of bank stabilization, and 16' less of temporary stream impact. No other locations had additional impacts on this sheet.

Plan Sheet 87 (Stream SC/SD-D): Service Road Q (SRQ) will run parallel to –Y9-, the Zoo Connector. The slope stakes meet for the majority of the alignments, so they are seldomly seen between the two. There are additional impacts to SC/SD-D. SC/SD-D is conveyed across the project with a 6'x7' RCBC buried 1.0'. Mr. Cook presented two options for the conveyance under the alignments. The first one used a longer RCBC, however it tied better to the stream on the upstream end and eliminated the need for a 12' ditch to run alongside SRQ. The second option used an ECBC appr.25' shorter, however it did not tie as well to SC/SD-D and used a very deep ditch along SRQ. It was determined that the first option should be used. At this location, there is an increase of 63' of permanent stream impact and 2' less of temporary stream impact.

The meeting was adjourned following a discussion of the service roads, the LEDPA, and moving forward with the permit application. There will be detailed information included in the permit application that describes why the service roads were added and explains them.

Follow-up meeting held March 10, 2016

Attendees:

Matt Lauffer	Jason Dilday	Chris Rivenbark	Gary Jordan

An additional meeting was held in the afternoon of March 10 to review commitments for the Schweinitz's Sunflower. The service road locations were reviewed including locations where there are no stream or wetland impacts. Mr. Jordan is allowing survey work for the plant outside of the usual survey window due to the accelerated nature of the project. Habitat assessment will be done now and plant survey for the genus Helianthus will be done in May. If Helianthus are found, work in the area would need to wait until the flowering season to determine if they are Helianthus Schweinitzii, Schweinitz's Sunflower. This does not mean the service roads could not be built, but there would be a delay of construction because of the need for a Biological Assessment and Biological Opinion.

Follow-up conference call held March 11, 2016

Attendees:

Karen Capps	Michael Shumsky	Larry Brickey	Matt Cook	Michael Merritt
Matt Lauffer	Jason Dilday	Reuben Blakely		

Matt Lauffer sent an email to the agencies on March 10, 2016 after the 4C meeting stating the following:

Gentleman,
The Design Build team talked today with the Division and determined that they can stop the road at the 60" cross pipe and avoid the approximately 1200 feet of impacts to the identified stream that was discussed this morning. More information will be coming forth, but I wanted to let you know this was in the works. Thanks for your continued support.

Regards,
Matt

The conference call on March 11 was held to discuss this revision. SPP-B was not considered jurisdictional before the addition of SERRD1, and it also did not include the trib we are showing in the permit package we reviewed (SPP1-B). There are still impacts to these stream without SERRD1. The reason there were no impacts before is because it was not jurisdictional in the file before and not shown in the NRTR. RK&K went out to check for features for SERRD1, and determined it should have been jurisdictional. Therefore, moving forward with calling it jurisdictional, and also including SPP1-B, there are still impacts that run in and out of the stream in two locations, and SPP1-B will be a total take.

During the call, we discussed stopping the service road before the 60" RCP crossing, which would eliminate the WSS-B wetland impact and a good portion of the SPP-B impact and additional SQQ-B impacts.

The field forms for the stream determinations will be forwarded to NCDOT. Mr. Dilday will consult the forms and original forms. However, for purposes of the permit application, we are moving forward with the streams as if they are jurisdictional. Once the final roadway footprint is determined for SERRD1, if a revision is required, the new impact numbers and permit drawings will be forwarded to NCDOT / agencies.