STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

May 4, 2018

U.S. Army Corps of Engineers
Raleigh Regulatory Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, NC 27587

ATTN: Mr. David Bailey
NCDOT Division 7 Project Coordinator

SUBJECT: **Application for Modification to Phased Permit Application for Section 404 Individual Permit and Section 401 Water Quality Certification** for the proposed relocation of NC 119 from Interstate 40/85 to north of SR 1918 (Mrs. While Lane) in Mebane (Mebane Bypass), Alamance County, North Carolina, Division 7. Federal Aid Project No. STP-119 (1), TIP No. U-3109 A&B.

Debit $570.00 from WBS 34900.1.2

REFERENCES: U.S. Army Corps of Engineers Section 404 Individual Permit, Action ID No. SAW-2002-20667, dated June 27, 2017.

N.C. Division of Water Resources, Section 401 Water Quality Certification, NCDWR Project No. 20170239, dated March 24, 2017.

Dear Sir:

The purpose of this letter is to request a modification to the United Stated Army Corps of Engineers (USACE) Section 404 Individual Permit and North Carolina Division of Water Resources Section 401 Certification for the above-referenced project.

The original 2017 permit application (submitted February 27, 2017) presented final impacts for U-3109A (3.3 miles, from near the Interstate 85/40 [I-85/I-40] interchange to north of SR 1921/SR 1996 [Mebane Rogers Road/East Stagecoach Road]). This modification presents the final design impacts for U-3109B (1.5 miles, from north of Mebane Rogers Road/ East Stagecoach Road to north of SR 1918 [Mrs. White Lane]). In addition to the final design impacts for Section B, this letter also requests modification to Section A, where changes to the design have increased wetland impacts at Site 19.

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

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

Location:
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

Please see the enclosed ENG form; DMS mitigation acceptance letter for Section B; South Buffalo Creek Mitigation Site debit ledger insert for wetland impacts to Section A; Concurrence Points 4B and 4C meeting minutes for Section B; Cates Farm on-site mitigation meeting minutes for Section B; Revised permit drawings for Sites 18, 19, and 20 within Section A; stormwater management plan and permit drawings for Section B; and roadway plans for Section B.

PROJECT SCHEDULE

This project is being permitted in two phases, Sections A and B. Section A let on May 16, 2017 and is currently under construction. Section B currently has a let date of July 17, 2018 and a let review date of May 29, 2018.

NEPA DOCUMENT STATUS

A Draft Environmental Impact Statement (DEIS) and Draft Section 4(F) Evaluation were completed for this project in August 2007. Subsequently, a FEIS and Final Section 4(F) Evaluation were completed in June 2009. The Record of Decision (ROD) was completed in December 2009. A FEIS re-evaluation was completed in July 2013. A Right-of-Way (ROW) Consultation for the entire project was completed in October 2014. A Construction Consultation for U-3109A/ROW Consultation for U-3109B was completed in July 2017. A Construction Consultation for U-3109B is currently in progress. Additional copies are available upon request.

In compliance with the NEPA/404 Merger Process, Concurrence Points (CP) 3 and 4A were reached on June 19, 2008. Alternative 9 (the Preferred Alternative) was selected as the Least Environmentally Damaging Practicable Alternative (LEDPA) at CP 3. CP 4B was reached for Section A on July 25, 2013 and CP 4C was reached on May 14, 2015. CP 4B was reached for Section B on October 19, 2017 and CP 4C was reached on February 15, 2018.

IMPACTS TO WATERS OF THE U.S.

Summary of Impacts

Summary of U-3109 Surface Water and Wetland Impacts

The original final impacts for Section A included 4,759 linear feet of permanent stream impacts; 167 linear feet of bank stabilization; 461 linear feet of temporary stream impacts; 0.32 acres of open water impacts; 0.27 acres of permanent wetland impacts; 0.02 acres of wetland excavation; and 0.09 acres of mechanized clearing. Current changes to Site 19 have resulted in the addition of 0.01 acre of permanent wetland impacts. The revised total wetland impacts for Section A are now 0.39 acre.

Preliminary design impacts for Section B of the project from the 2017 Permit Application were 1,306 linear feet of permanent stream impacts and 0.51 acres of permanent wetland impacts. Final design impacts are now 562 linear feet of permanent stream impacts (27 linear feet of which do not constitute a loss of waters); 85 linear feet of bank stabilization; 90 linear feet of temporary stream impacts; 0.23 acres of permanent wetland

impacts; 0.01 acres of excavation; and 0.03 acres of mechanized clearing. The reduction of impacts from preliminary to final design was primarily due to a refinement of the roadway and stormwater design. This resulted in the elimination of preliminary design Sites 7 – 9 from the permit drawings. The proposed roadway for Section B was also reduced from a four-lane roadway to a two lane-roadway. Additionally, the design was modified on Y21REV (North First Street) so that the intersection with the L-line was moved and impacts to preliminary design Sites 10 and 11 were eliminated from the project.

Please see Tables 1 and 2 for a breakdown of surface water and wetland impacts, by type, for the entire project. Please also see *Jurisdictional Impacts by Section* below for an explanation of the revisions to Section A and a site-by-site breakdown of the impacts for Section B.

Table 1. Summary of Surface Water Impacts for U-3109

Section	Design Stage	Stream Impact Type	Impact Length (lin. ft.)
U-3109A	Final	Permanent Fill	4,759
		Bank Stabilization	167
		Temporary Fill	461
U-3109B	Final	Permanent Fill	562
		Bank Stabilization	85
		Temporary Fill	90
TOTAL[1]			5,573 Permanent 551 Temporary

[1] In addition to the impacts listed in the table, 0.32 acre of permanent open water impacts also occur in Section A.

Table 2. Summary of Wetland Impacts for U-3109

Section	Design Stage	Wetland Impact Type	Acreage (ac.)
U-3109A	Final	Permanent Fill	0.28
		Excavation	0.02
		Mechanized Clearing	0.09
U-3109B	Final	Permanent Fill	0.23
		Excavation	0.01
		Mechanized Clearing	0.03
TOTAL			0.66

Utility Impacts

No utility impacts to jurisdictional features will occur in either Section A or Section B of the project.

Buffer Impacts

U-3109 (Sections A and B) reached CPs 3 (LEDPA) and 4A (Avoidance and Minimization) on June 19, 2008, which is prior to the effective date of the Jordan Lake Riparian Buffer Rules, which were initially enacted on August 11, 2009. Therefore, the project footprint presented at the time of CP 4A is considered exempt from the Jordan Lake Riparian Buffer Rules.

Jurisdictional Impacts by Section

U-3109A

Design modifications to Site 19 within the A Section will result in the addition of 0.01 acre of permanent fill to the wetland WA. There will also be slight culvert alignment changes to changes to sites 18 and 20. These changes will not involve any additional impacts at those sites. Table 4 details how these additional impacts have altered the final impacts for Section A.

Table 3. U-3109A Revised Final Stream Impacts (Remain the same as original)

	Impacts (lin. ft.)	Impacts Requiring USACE mitigation (lin. ft.)	Impacts Requiring 1:1 DWR mitigation (lin. ft.)
Total Temporary Fill Impacts	461	0	0
Total Permanent Fill Impacts	4,759	4,506	3,523
Total Bank Stabilization Impacts	167	0	167

Table 4. U-3109A Revised Final Wetland Impacts (Bold indicates the revision)

	Permanent Impacts (ac.)	Impacts Requiring USACE mitigation (ac.)
Total Permanent Fill	**0.28**	**0.28**
Total Excavation	0.02	0.02
Total Mechanized Clearing	0.09	0.09
TOTAL IMPACTS	**0.39**	**0.39**[1]

[1] Wetland WA (0.04 acres of permanent fill and 0.01 acres of mechanized clearing) has a 1:1 mitigation ratio. All other wetlands have a 2:1 mitigation ratio.

U-3109B

Tables 5 and 6 provide site-by-site impacts to streams and wetlands within Section B of the project. These impacts are based on final design. The proposed impacts for this section are 562 linear feet of permanent stream impacts (27 linear feet of which do not constitute a loss of waters); 85 linear feet of bank stabilization; and 90 linear feet of temporary stream impacts.

Table 5. U-3109B Final Stream Impacts

Permit Site No.	Stream Name	Stream ID (FEIS ID)[1]	Int./Per.	Impact Type	Impacts (lin. ft.)	Impacts Requiring USACE mitigation (lin. ft.)	USACE Mitigation Ratio	Impacts Requiring 1:1 DWR mitigation (lin. ft.)
1	UT of Mill Creek (Forest Lake)	SA (UT14)[2]	Per.	Perm. Fill	120	120	2:1	0
				Perm. Fill – No Loss of Waters	27	0[3]		0
				Bank Stabil.	51	0		0
				Temp. Fill	50	0		0
2	Mill Creek	Mill Creek	Per.	Bank Stabil.	12	0		0
				Temp. Fill	10	0		0
3	UT of Mill Creek	SB (UT16)	Int.	Perm. Fill	288	288	2:1	0
				Bank Stabil.	22	0		0
				Temp. Fill	20	0		0
4	UT of Mill Creek	SC (UT17)	Int.	Perm. Fill	127	0[4]	0[4]	0
				Temp. Fill	10	0		0
TOTAL PERMANENT FILL IMPACTS					**562**	**408**		**0**
TOTAL BANK STABILIZATION IMPACTS					**85**	**0**		**0**
TOTAL TEMPORARY FILL IMPACTS					**90**	**0**		**0**

[1] Stream IDs are from the October 2016 JD re-verification. Corresponding Stream IDs that were used in the FEIS are in parentheses, where applicable.

[2] Stream SA is also Stream SU in Section A.

[3] Per USACE, these impacts do not constitute a loss of waters and, therefore, will not require mitigation.

[4] Per USACE, Stream SC does not require mitigation.

Table 6. U-3109B Final Wetland Impacts

Permit Site No.	Wetland ID[1]	Wetland Type[2]	Impact Type	Permanent Impacts (ac.)[3]	Impacts Requiring USACE mitigation (ac.)
5	WA	FP	Perm. Fill	<0.01	<0.01
			Excavation	<0.01	<0.01
			Mechanized Clearing	<0.01	<0.01
6	WB	NTFM	Perm. Fill	0.06	0.06
			Excavation	<0.01	<0.01
			Mechanized Clearing	0.01	0.01
7	WC	NTFM	Perm. Fill	0.17	0.17
			Excavation	<0.01	<0.01
			Mechanized Clearing	0.02	0.02
TOTAL IMPACTS				**0.27**	**0.27**

[1] Wetland IDs are from the October 2016 JD re-verification. No wetlands were identified in the FEIS in the B Section of the project.

[2] FP – Floodplain Pool; NTFM – Non-Tidal Freshwater Marsh. All wetlands are Riparian.

[3] Rounded totals are sum of actual impacts.

Permit Site 1: The installation of a 12-foot by 6-foot single barrel Reinforced Concrete Box Culvert (RCBC) under the L-line will result in 120 linear feet of permanent impacts; 51 linear feet of bank stabilization impacts; and 50 linear feet of temporary stream impacts to Stream SA. Additionally, there will be 27 linear feet of permanent impacts separate from the above-listed 120 linear feet due to the placement of riprap along the streambed downstream of the RCBC. This 27 linear feet is considered a permanent impact, but the riprap is keyed into the streambed and does not constitute a loss of waters; therefore, no mitigation will be required for this length of impact.

Permit Site 2: The installation of two Hazardous Spill Basins (HSB) and their associated drainage systems along the L-line will result in 12 linear feet of bank stabilization impacts and 10 linear feet of temporary stream impacts to Mill Creek.

Permit Site 3: The installation of a 42-inch Reinforced Concrete Pipe (RCP) under the L-line will result in 288 linear feet of permanent impacts; 22 linear feet of bank stabilization impacts; and 20 linear feet of temporary stream impacts to Stream SB.

Permit Site 4: The installation of a 30-inch RCP under the L-line will result in 127 linear feet of permanent stream impact and 10 linear feet of temporary stream impact to Stream SC.

Permit Site 5: The installation of the same 30-inch RCP as Site 4 will result in <0.01 acres of permanent wetland impacts; <0.01 acres of excavation; and <0.01 acres of mechanized clearing to Wetland WA.

Permit Site 6: The installation of a 30-inch RCP under the L-line will result in 0.06 acres of permanent wetland impacts; <0.01 acres of excavation; and 0.01 acres of mechanized clearing to Wetland WB.

Permit Site 7: The installation of a 36-inch RCP under the L-line and adjacent Y-line intersection with Y-21 (North First Street) will result in 0.17 acres of permanent wetland impacts; <0.01 acres of excavation; and 0.02 acres of mechanized clearing to Wetland WC.

The alignment of this Y-line intersection has shifted north since the original permit application was submitted, resulting in additional impacts to Wetland WC. The shift in alignment was due to a request received from the Town of Mebane to move the alignment to eliminate impacts to a water line. Due to this agreement, NCDOT had to maximize the movement of the new alignment away from the previous proposed location to ensure that it would not cause a sight distance issue. Although impacts to Wetland WC increased due to the alignment revision, preliminary design Sites 10 and 11 were eliminated from the project. This removed <0.01 acres of permanent wetland impacts and 480 linear feet of permanent stream impacts that were proposed in the preliminary design from the project.

MITIGATION OPTIONS

The USACE has adopted, through the Council on Environmental Quality (CEQ), a wetland mitigation policy that embraces the concept of "no net loss of wetlands" and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of the waters of the United States. CEQ has defined mitigation of wetland and surface water impacts to include: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts (40 CFR 1508.20).

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning phase and minimization measures were incorporated as part of the project design. Minimization includes the examination of appropriate and practicable steps to reduce the adverse impacts.

Avoidance and Minimization, Section B

Avoidance and minimization has been employed in the project area to the maximum extent practicable. Listed below are some of the measures implemented on the project as a whole:

- NCDOT's Best Management Practices (BMPs) for the Protection of Surface Waters will be enforced.
- NCDOT's Best Management Practices for Construction and Maintenance Activities will also be employed.
- Due to a portion of the project being within the Graham-Mebane Reservoir watershed crticial area, Design Standards in Sensitive Watersheds will be employed.

Avoidance and Minimization included in FEIS/CP 4A (Section B only)

Below is an overview of the avoidance and minimization that NCDOT has agreed to for this project, listed based on the document or meeting that it is attributed to. Any additional information for an item is listed below the item in italics.

FEIS

- During the development of the preliminary engineering designs for each Detailed Study Alternative, including the Preferred Alternative (Alternative 9), efforts were made to avoid and minimize impacts to wetlands and streams wherever practicable. Where stream crossings were unavoidable, they were located, within design constraints, as perpendicular as practicable, in order to minimize the length of stream impacted.
- Jurisdictional impacts would be further minimized by a reduction in side slopes to 2:1 in the areas of wetland impacts. Sensitive placement of drainage structures, during final design of Preferred Alternative 9, would minimize degradation of water quality and reduce adverse impacts on aquatic habitat viability in streams and tributaries. Based on preliminary designs, there are no substantial fill slopes associated with this project. A determination would be made during final design if retaining walls should be included in the design. Once surveys of the project area are available, the preliminary design can be revised to further minimize impacts to the human and natural environments.
- The tie-in from proposed NC 119 to existing NC 119 south of the Mill Creek community was designed to end before the Mill Creek crossing for the Detailed Study Alternatives, including Preferred Alternative 9, in this area.
- A bridge over Mill Creek is an additional minimization component. Bridging floodplain wetlands along the larger stream systems, such as Mill Creek, would decrease the degree of potential habitat fragmentation and reduce potential wildlife mortality due to traffic operations by providing riparian corridors for wildlife use.
    - *The bridge will span Mill Creek.*

CP 4A (items that were not listed in the FEIS)

- The Cates Farm on-site stream restoration project will be discussed and evaluated at CP 4B.
    - *A more detailed restoration discussion for the Cates Farm site will occur below in the Compensatory Mitigation Section.*

Avoidance and Minimization, Section B Stormwater Management Plan

After CP 4A, the project was split into its 2 Sections. The information that follows in this section is for the B Section of the project only.

- Approximately 5,800 linear feet of grass swales have been incorporated in roadside ditches, where possible, to reduce the velocity and promote the infiltration of runoff.
- Riprap at pipe outlets, ditches, and streambanks has been incorporated to minimize erosion on slopes where vegetation will not be adequate.
- Storm drainage discharging directly to wetlands has been designed to meet non-erosive velocity requirements.
- NCDOT standards for ground cover, vegetation, and slope stabilization will be adhered to during the life of this project, and will be specified in the NCDOT Erosion and Sediment Control Plan for the project.
- Five hazardous spill basins are proposed to protect against the accidental release of hazardous material into receiving jurisdictional waters. Hazardous Spill Basins will be installed at the following locations:
    - –L– 199+50 LT to –L– 206+00 LT
    - –L– 198+50 RT to –L– 205+00 RT
    - –L– 206+00 LT to –L– 210+00 LT
    - –L– 220+50 RT to –L– 228+50 RT
    - –L– 232+00 RT to –L– 228+50 RT
    - –L– 267+00 LT to –L– 256+50 LT

Compensatory Mitigation

U-3109A

Compensatory mitigation requirements for permanent stream and wetland impacts associated with U-3109A are summarized below in Table 7. These impacts occur in HUC 03030002.

Due to a revision to a revision at Site 19, the wetland impacts for Section A have increased by 0.01 acre. All other stream impacts remain the same as the original permit.

Compensatory mitigation at a 2:1 ratio for 0.33 acre of permanent riparian wetland impacts resulting from roadway fill (0.23 acre), mechanized clearing (0.08 acre), and excavation (0.02 acre); and 0.05 acre at a 1:1 ratio resulting from roadway fill (**0.05** acre)

and mechanized clearing (0.01 acre) will be offset by NCDOT by debiting the South Buffalo Creek Mitigation Site. See the attached debit ledger transaction.

Table 7. U-3109A Revised Compensatory Mitigation Summary (Bold indicates the revision)

	Stream Impacts (lin. ft.)	Riparian Wetland Impacts (ac.)
Impacts Requiring Mitigation	4,506	0.38
Mitigation Ratio	3,888 at 2:1	0.33 at 2:1
	618 at 1:1	**0.06** at 1:1
Total DMS Mitigation	8,394	---
Total Debit Ledger Mitigation	---	**0.72**

U-3109B

Compensatory mitigation requirements for permanent stream and wetland impacts associated with U-3109B are summarized below in Table 8. These impacts occur in HUC 03030002.

Six hundred forty-seven linear feet of permanent stream impacts are proposed in the B Section; of that total, 85 linear feet are bank stabilization impacts, which do not require mitigation per USACE. Of the remaining 562 linear feet of permanent stream impacts, 408 linear feet require compensatory mitigation at a 2:1 ratio per USACE and 154 linear feet do not require any mitigation (Sites 1 and 4). Since NCDWR-mandated compensatory mitigation is not required for any permanent impacts along intermittent streams or any bank stabilization impacts, and no permanent impacts along perennial streams equal or exceed 300 linear feet, mitigation for NCDWR is not required for any stream impacts within the B Section.

The total USACE stream mitigation requirement exceeds the NCDWR stream mitigation requirement; therefore, NCDOT has requested compensatory mitigation from DMS for the 408 linear feet of permanent stream impacts at a 2:1 ratio. NCDOT will also request mitigation from DMS to offset 0.27 acres (2:1 ratio) of permanent riparian wetland impacts.

Table 8. U-3109B Revised Compensatory Mitigation Summary

	Stream Impacts (lin. ft.)	Riparian Wetland Impacts (ac.)
Impacts Requiring Mitigation	408	0.27
Mitigation Ratio	2:1	2:1
Total DMS Mitigation	816	0.54

NCDOT has requested that DMS provide compensatory mitigation for impacts associated with the B Section at this time. The numbers presented in the attached DMS letter (1,306 linear feet or warm water streams and 0.51 acres of riparian wetlands) are based on the preliminary design presented in the original permit application. These numbers are larger than the impacts requiring mitigation in the Section B final design. However, NCDOT has not asked that DMS revise these numbers to match the final design impacts since other mitigation options, such as debit ledger and/or on-site mitigation, are currently being pursued. The Cates Farm property is currently being considered as an on-site mitigation site that would offset impacts in this section. Based on the site visit on December 5, 2017 (please see attached meeting minutes), there is currently between 1,456–1,746 linear feet of potential stream credit and 0.168 acres of wetland credit available at this site. However, the mitigation plans were not complete at the time of this submittal, which is why NCDOT has chosen to submit this application with DMS covering the mitigable impacts.

Once on-site mitigation plans are finalized for Cates Farm, the potential stream credits at this site would more than offset stream mitigation required for the B Section and cover a portion of the wetland mitigation required. At that time, NCDOT would request that the compensatory mitigation burden be transferred from DMS to the Cates Farm site to cover the stream mitigation and the portion of the wetland mitigation. Any remaining wetland mitigation required would either remain with DMS or be covered by debit ledger, if available.

MORATORIUM

No moratoria are proposed for section of this project.

FEDERALLY PROTECTED SPECIES

Plants and animals with Federal classification of Endangered (E) or Threatened (T) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of March 26, 2018, the U.S. Fish and Wildlife Service (USFWS) lists one federally protected species for Alamance County, Cape Fear shiner (*Notropis mekistocholas*). Due to its recent listing, it is not included in any previous NEPA documentation or the original permit application. Previously, no Threatened or Endangered species were listed in the county.

This species is listed as Endangered, but as a "range by basin" species, meaning that the project would have to occur within the range defined by USFWS on their website (https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=6063 for this species) in order to require detailed assessment. U-3109 in its entirety is well outside of the defined range of Cape Fear shiner; therefore, there is no habitat for this species within the project footprint and a Biological Conclusion of **No Effect** has been rendered for this species.

Northern long-eared bat

The USFWS has developed a programmatic biological opinion (PBO) in conjunction with FHWA, USACE, and NCDOT for the northern long-eared bat (NLEB) (*Myotis septentrionalis*) in eastern North Carolina. The PBO covers the entire NCDOT program in Divisions 1-8, including all NCDOT projects and activities. The programmatic determination for NLEB for the NCDOT program is **May Affect, Likely to Adversely Affect**. The PBO provides incidental take coverage for NLEB and will ensure compliance with Section 7 of the Endangered Species Act for five years for all NCDOT projects with a federal nexus in Divisions 1-8, which includes Alamance County, where U-3109 is located. This level of incidental take is authorized from the effective date of a final listing determination through April 30, 2020.

Bald eagle

Habitat for the bald eagle primarily consists of mature forest in proximity to large bodies of open water for foraging. Large dominant trees are utilized for nesting sites, typically within 1.0 mile of open water.

A desktop-GIS assessment of the entire project (Sections A and B), as well as the area within a 1.13-mile radius (1.0 mile plus 660 feet) of the project limits, was performed on January 3, 2017 using the newest-available color aerials of the review area. Water bodies large enough and/or sufficiently open to be considered potential feeding sources were identified, including the Graham-Mebane Reservoir and Forest Lake. Since there was foraging habitat within the review area, a survey of the project study area and the area within 660 feet of the project limits was conducted on January 24, 2017. No individuals or nests were identified within the nesting survey area. Additionally, a review of the N.C. Natural Heritage Program (NCNHP) database on January 3, 2018 revealed no known occurrences of this species within 1.0 mile of the project study area. Due to the lack of

habitat, known occurrences, and minimal impact anticipated for this project, it has been determined that this project will not affect this species.

CULTURAL RESOURCES

Section 4(f) Resources and Historical Architecture, Section B

There is one resource within the boundaries of the Section B, the Cates Farm, which is protected under Section 4(f) of the Department of Transportation Act. For the preferred alternative (Alternative 9), the proposed roadway is anticipated to be visible and audible from the farmhouse. However, it will not require the removal of any structures associated with the Cates Farm. The Historic Preservation Office (HPO) initially determined that Alternative 9 will have an "adverse effect" on the property in their concurrence form dated June 6, 2002, which is included in the FEIS. A subsequent concurrence form, dated August 21, 2007, confirms the HPO's previous finding and is also included in the FEIS.

A Memorandum of Agreement (MOA) for mitigative measures concerning impacts to the Cates Farm was signed in October 2009 and was included with the original permit application. The MOA stipulates that the NCDOT will complete a photo-documentation record of the Cates Farm and its surroundings and prepare a landscape plan that incorporates native plants along the top of the roadway slope in a natural appearance and composition to help to screen the farm from the roadway. The photo-documentation of the Cates Farm is underway and will be completed prior to construction. The landscape plan will be prepared in coordination with the property owners and implemented once construction is completed.

REGULATORY APPROVALS

A request is hereby made to the Department of the Army to modify the existing Section 404 Individual Permit as required for the above-described activities for T.I.P. Project No. U-3109.

We are also hereby requesting a modification to the Section 401 Water Quality Certification. In compliance with Section 143-215.3D(e) of the North Carolina Administrative Code (NCAC), we will provide $570.00 to act as payment for processing the Section 401 permit. We are providing two copies of this application to the North Carolina Department of Environmental Quality (NCDEQ), NCDWR, for their review and approval.

A copy of this permit modification application and its distribution list will be posted on the NCDOT website under *Quick Links > Permit Applications* at https://connect.ncdot.gov/resources/Environmental/Pages/default.aspx. Copies of the NEPA documents are also available at the above website address under *Quick Links > Environmental Documents*. Thank you for your time and assistance with this project. Please contact Carla Dagnino at either cdagnino@ncdot.gov or (919) 707-6110 if you have any questions or need additional information.

Please contact Carla Dagnino at either cdagnino@ncdot.gov or (919) 707-6110 if you have any questions or need additional information.

Sincerely,

for Philip S. Harris III, P.E., C.P.M.
Environmental Analysis Unit Head

Cc:
NCDOT Permit Application Standard Distribution List

U.S. ARMY CORPS OF ENGINEERS

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

OMB APPROVAL NO. 0710-0003
EXPIRES: 28 FEBRUARY 2013

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 - NCDOT-Environmental Analysis Unit	Company -
E-mail Address - jsmason@ncdot.gov	E-mail Address -
6. APPLICANT'S ADDRESS:	**9. AGENT'S ADDRESS:**
Address- 1598 Mail Service Center	Address-
City - Raleigh State - NC Zip - 27699 Country - 1598	City - State - Zip - Country -
7. APPLICANT'S PHONE NOs. w/AREA CODE	**10. AGENTS PHONE NOs. w/AREA CODE**
a. Residence b. Business 919-707-6136 c. Fax 919-212-5785	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)
U-3109 (Mebane Bypass)

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
MoAdams Creek, Back Creek, Mill Creek	Address
15. LOCATION OF PROJECT Latitude: °N 36.108733 Longitude: °W -79.286213	City - State- Zip-

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

17. DIRECTIONS TO THE SITE
Please see attached vicinity map and cover letter.

18. Nature of Activity (Description of project, include all features)
NCDOT proposes to improve NC 119 from near the Interstate 40/85 (I-40/I-85) interchange southwest of downtown Mebane to the existing SR 1962 (3rd Street) Extension. The project then proceeds onto new location, relocating NC 119 to the west and north of downtown Mebane before tying into existing NC 119 just south of SR 1918 (Mrs. White Lane). The project terminates just north of Mrs. White Lane. The new location portion of NC 119 will be constructed as a four-lane, median-divided facility. Existing NC 119 in the vicinity of I-40/I-85 is proposed to be widened to six-lanes. Y-line improvements are also proposed. The project, also known as the Mebane Bypass, is comprised of two sections. Section A, which is approximately 3.3 miles in length, will begin near the I-85/I-40 interchange and end north of SR 1921/SR 1996 (Mebane Rogers Road/East Stagecoach Road). Section B, which is approximately 1.5 miles in length, will begin north of Mebane Rogers Road/ East Stagecoach Road and end north of Mrs. White Lane.

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

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

20. Reason(s) for Discharge
Impacts will result from improving the existing roadway and shoulders, construction of new roadway on new location, and work associated with secondary roads along the project.

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
See attached cover letter & permit drawings		

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)
Acres See attached cover letter & permit drawings.
or
Linear Feet See attached cover letter & permit drawings.

23. Description of Avoidance, Minimization, and Compensation (see instructions)
See attached cover letter.

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

Section A is currently under construction, but has not been completed.

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 permit drawing packet.

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

05-04-2018

DATE

SIGNATURE OF AGENT

DATE

for PHILIP S. HARRIS III

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.

Environmental Quality

ROY COOPER
Governor

February 16, 2017

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

Dear Mr. Harris:

Subject: Mitigation Acceptance Letter:

U-3109B, Mebane Bypass – NC 119 Relocation from North of SR 1921 / SR 1996 (Mebane Rogers Road / East Stagecoach Road) to North of SR 1918 (Mrs. White Lane), Alamance County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the compensatory stream and wetland mitigation for the subject project. Based on the information supplied by you on February 13, 2017, the impacts are located in CU 03030002 of the Cape Fear River basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Cape Fear 03030002 CP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	1,306.0	0.51	0	0	0	0

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

The impacts and associated mitigation needs were under projected by the NCDOT in the 2017 impact data. DMS will commit to implement sufficient compensatory stream 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 Beth Harmon at 919-707-8420.

Sincerely,

James B. Stanfill
Credit Management Supervisor

cc: Mr. David Bailey, USACE – Raleigh Regulatory Field Office
Ms. Amy Chapman, NCDWR
File: U-3109B

South Buffalo Creek Mitigation Site
ONEID 041-009

The South Buffalo Creek mitigation site is located in Guilford County within the USGS hydrologic unit 03030002 of the Cape Fear River. NCDOT acquired a 31.73 acres parcel to mitigate for unavoidable, jurisdictional impacts associated with TIP I-2402, U-2525 and I-2201F/E. This parcel produced 16.2 acres of Riparian Wetland Preservation and 15.53 acres of Riparian Wetland Restoration. Monitoring requirements were performed from 1999 to 2003 and the site was closed out in 2004. Table 1 shows the final mitigation quantities approved for the site. The site has been placed on the NCDOT On-site Debit Ledger for use within HUC 03030002. Table 2 indicates all mitigation debits that have occurred per regulatory agency approval.

In order to offset an additional 0.01 acres of unavoidable impacts on U-3109A at Site 19, NCDOT will be debiting the South Buffalo Creek Mitigation Site at for 0.01 acres of impact at a 1:1 ratio, totaling 0.01 acres of mitigation.

Table 1. Mitigation Quantities Approved

HUC	Mitigation Type	Starting Amount (AC)	Additional Notes
3030002	Riparian Wetland Preservation	16.2	
3030002	Riparian Wetland Restoration	15.53	

Table 2. Mitigation Debits –

Mitigation Type	Debit Amount (Ac)	Status	SITE TIP	Action ID#	Notes
Riparian Wetland Preservation	3.36	Close Out	I-2201F		
Riparian Wetland Preservation	1.23	Close Out	I-2402D mod	199502886	
Riparian Wetland Preservation	9.4	Close Out	U-2525A & I-2402D	199300243	

TYPE	Debit Amount (Ac)	Status	SITE TIP	Action ID#	Notes
Riparian Wetland Restoration	0.96	Close Out	I-2201F		
Riparian Wetland Restoration	0.35	Close Out	I-2402D mod	199502886	
Riparian Wetland Restoration	0.14	Close Out	Mit Work		
Riparian Wetland Restoration	0.95	Close Out	R-2000AA/AB		
Riparian Wetland Restoration	9.1	Close Out	U-2525A & I-2402D	199300243	
Riparian Wetland Restoration	0.71	Close Out	U-3109A	200220667	Impacts were 0.33 acres with 2:1 ratio and 0.05 acres at 1:1
Riparian Wetland Restoration	0.01	Close Out	U-3109A mod	200220667	Impacts were 0.01 acres with 1:1 ratio

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Donaldson K. Barton, Jr.
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Jon S. Meadows
Mark D. Prochak
Mark E. Puckett
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8000 Regency Parkway, Suite 175, Cary, North Carolina 275180
Phone: 919.650.1038

Memorandum

DRMP Job #: 16-0264.001 Date: October 20, 2017

To: Craig Lee, P.E.

From: Ryan Mitchell, P.E.

Subject: U-3109B – 4B Merger Meeting, Division 7, Alamance County

A 4B Merger Meeting was held on October 19, 2017 at 1:00 pm in the NCDOT Century Center Complex, Structures Conference Room 'C' in Raleigh, NC. Those in attendance were:

Craig Lee	NCDOT – Hydraulics Unit	919-707-6708	cjlee@ncdot.gov
Bill Elam	NCDOT – Hydraulics Unit	919-707-6718	belam@ncdot.gov
Hemang Surti	NCDOT – TPB	919-707-0989	hmsurti@ncdot.gov
Mark Staley	NCDOT – REU	919-707-2948	mstaley@ncdot.gov
April Norton	DWR	919-707-9111	April.norton@ncdenr.gov
Chris Kirkman	NCDOT – Division 7	336-451-68-36	cdkirkman@@ncdot.gov
Stephen Robinson	NCDOT – Division 7	336-516-5616	sjrobinson@ncdot.gov
John Williams	NCDOT – Division 7	252-619-1876	Jmwilliams8@ncdot.gov
Jim Mason	NCDOT – ECAP	919-707-6136	Jsmason@ncdot.gov
David Teague	NCDOT – Geotech	919-707-6877	dteague@ncdot.gov
Tatia L. White	NCDOT – Project Mgmt.	919-707-6342	twhite@ncdot.gov
Piotr Stojda	NCDOT – Roadway	919-707-6322	pstojda@ncdot.gov
Nick Lineberger	NCDOT – Cong. Mgmt.	919-814-5079	nclineberger@ncdot.gov
Felix Davila	FHWA	919-747-7021	Felix.davila@dot.gov
Carla Dagnino	NCDOT-EAU	919-707-6110	cdagnino@ncdot.gov
David E. Bailey	USACE	919-554-4884 x30	David.baley2@asce.army.mil
John Williams	NCDOT – PMU	919-707-6178	jwilliams@ncdot.gov
Patty Eason (phone)	NCDOT – Division 7	336-4887-0000	peason@ncdot.gov
Chris Haire	DRMP	919-230-7857	chaire@drmp.com
Ryan Mitchell	DRMP	919-650-7859	rmitchell@drmp.com

An overview of the project and watershed was provided. The proposed roadway will cross Mill Creek and one (1) unnamed tributary to Mill Creek. The project is within a Water Supply-II (WS-II) watershed and located along the ½ mile Critical Area (CA) buffer of the water supply reservoir. April Norton asked if the project was actually within the CA. Bill Elam stated that NCDOT policy is to provide protection measures for project within a ½ mile of the ½ mile CA buffer. This project will include protection measures such as Hazardous Spill Basin (HSB) and grass swales to the maximum extent practical (MEP). This project has been grandfathered and the Jordan Lake Buffer Rules do not apply.

The meeting included a discussion of all jurisdictional areas on each plan sheet. The following is a description of the topics discussed on each sheet:

- **Plan Sheet 4:** No jurisdictional areas.
- **Plan Sheet 5:** A 6'x 6' reinforced concreate box culvert (RCBC) will be constructed to provide conveyance of the unnamed tributary to Mill Creek, Jurisdictional Stream SA. The culvert will include sills and baffles and will be buried one-foot below existing surface. DRMP's hydraulic design will include HSBs to the MEP for outfalls to this stream.

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- **Plan Sheet 6:** The proposed roadway will include a three span, 150' concrete girder bridge over Mill Creek. Bents will be placed outside the stream. Spill throughs will be at 1.5:1. DRMP's hydraulic design will attempt to provide HSBs to the MEP for outfalls to this stream.

  A construction specification note will be added that the bridge is to be construction from each side. No causeway is to be used for construction.

- **Plan Sheet 7:** The crossing at Jurisdictional Stream SB will include a 24" cross pipe approximately 220 feet in length at 4.9% slope. The pipe will not be buried. Riprap end treatment may be used in channel based on outfall analysis. Headwalls will not be used on pipes less than 36". DRMP will look at converting the 18" connecting pipe into a special cut ditch. Mitigation will need to include dissipater pad if used.

  David Bailey of USACE stated that this was a high quality stream.

- **Plan Sheet 8:** The crossing at Jurisdictional Wetland WA and Jurisdictional Stream SC will include a 24" cross pipe approximately 140 feet in length at 2.8% slope. Pipe will not be buried. A specification note for construction will be included for all cross-pipe inverts to be placed at existing ground elevation for all wetlands to avoid affecting wetland hydroperiod. If construction disturbances impact the majority of the wetland, the wetland may be considered a total take. The stream is a low-quality feature and may not require mitigation.

  The crossing at Jurisdictional Wetland WB will include an 18" cross pipe approximately 140 feet in length at 1.4% slope. The pipe will not be buried. No headwall and standard riprap pad at outfall. Cross pipe inverts to be placed at existing ground elevation for all wetlands.

  The crossing at Jurisdictional Wetland WC will include an 18" to 24" cross pipe approximately 115 feet in length at 1.1% slope. The pipe will not be buried. No headwall and standard riprap pad at outfall. Cross pipe inverts to be placed at existing ground elevation for all wetlands.

- **Plan Sheet 9:** All jurisdictional features are outside of the Right of Way.

- **Plan Sheet 10:** The crossing at Jurisdictional Wetland WA and Jurisdictional Stream SI will include a 24" to 30"cross pipe approximately 170 feet in length at 0.3% slope. The stream is braided at this location and two lines are shown on survey. Only main channel length is to be used for mitigation calculation. Note this feature on permit drawings. Wetland will be total take.

  The crossing at Jurisdictional Stream SJ will include a 42" to 48" cross pipe approximately 130 feet at 1.8% slope. Outfall stabilization to include dissipater pad and riprap in channel. The gap in stream channel is where the stream goes underground. No mitigation for the length of stream gap.

- **Plan Sheet 11:** All jurisdictional features outside of Right of Way.

DRMP will begin working on permit drawings upon completion and submittal of hydraulics plans (65%) on December 5, 2017.

4C Meeting will be scheduled for January 2018.

Permit drawings to be completed by January 31, 2018.

Permit package to be submitted by March 1, 2018.

Let date: July 17, 2018. 4-week advertisement for construction.

End of Memorandum

DRMP, INC.

PRINCIPALS
Wayne D. Chalifoux
Donaldson K. Barton, Jr.
Glenn J. Lusink
Jon S. Meadows
Mark D. Prochak
Mark E. Puckett
Lawrence L. Smith, Jr.

8000 Regency Parkway, Suite 175, Cary, North Carolina 275180
Phone: 919.650.1038

Memorandum

DRMP Job #: 16-0264.001 Date: February 18, 2018

To: Craig Lee, P.E.

From: Ryan Mitchell, P.E.

Subject: U-3109B – 4C Merger Meeting, Division 7, Alamance County

A 4C Merger Meeting was held on February 15, 2018 at 3:00 pm in the NCDOT Century Center Complex, Structures Conference Room 'C' in Raleigh, NC. Those in attendance were:

Bill Elam	NCDOT – Hydraulics Unit	919-707-6718	belam@ncdot.gov
Mark Staley (phone)	NCDOT – REU	919-707-2948	mstaley@ncdot.gov
April Norton	DWR	919-707-9111	April.norton@ncdenr.gov
Jim Mason	NCDOT – ECAP	919-707-6136	Jsmason@ncdot.gov
David Teague	NCDOT – Geotech	919-707-6877	dteague@ncdot.gov
Piotr Stojda	NCDOT – Roadway	919-707-6322	pstojda@ncdot.gov
Nick Lineberger	NCDOT – Cong. Mgmt.	919-814-5079	nclineberger@ncdot.gov
David E. Bailey	USACE	919-554-4884 x30	David.bailey2@asce.army.mil
Patty Eason (phone)	NCDOT – Division 7	336-4887-0000	peason@ncdot.gov
Chris Haire	DRMP	919-230-7857	chaire@drmp.com
Ryan Mitchell	DRMP	919-650-7859	rmitchell@drmp.com

An overview and update of the project was provided. The proposed roadway will cross Mill Creek and one (1) unnamed tributary to Mill Creek. The project is within a Water Supply-II (WS-II) watershed and located along the ½ mile Critical Area (CA) buffer of the water supply reservoir. This project will include protection measures such as Hazardous Spill Basin (HSB) and grass swales to the maximum extent practical (MEP). This project has been grandfathered and the Jordan Lake Buffer Rules do not apply.

The meeting included a discussion of all jurisdictional areas impacted by the project. The following is a description of the topics discussed at each site:

- **Site 1:** A 12'x 6' reinforced concreate box culvert (RCBC) will be constructed to provide conveyance of the unnamed tributary to Mill Creek, Jurisdictional Stream SA. The culvert will include sills and baffles and will be buried one-foot below existing surface. The hydraulic design includes HSBs for outfalls to this stream.

  David Baily asked that the sill and baffle detail be added to the culvert profile sheet.

  David Bailey and Jim Mason discussed if mitigation was needed for surface water impacts at the downstream end of the culvert where riprap is to be installed in the stream bed. Follow-up determination is to be provided by Jim Mason.

- **Site 2:** The proposed roadway will include a single span, 160' steel girder bridge over Mill Creek. Spill throughs will be at 1.5:1. Hydraulic design will include HSBs for outfalls to this stream.

  Bridge bents from revised bridge design to be removed from final permit plans.

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- **Site 3:** The crossing at Jurisdictional Stream SB will include a 42" cross pipe with headwall on upstream end. The pipe will not be buried. Riprap end treatment to be used for pipe outfall.
- **Site 4 and 5:** The crossing at Jurisdictional Wetland WA and Jurisdictional Stream SC will include a 30" cross pipe. Pipe will not be buried. No headwall and standard riprap pad at outfall. The location of the Jurisdiction Stream on the plans will be revised by Location and Survey to match the pipe outfall location.

  David Bailey stated that compensatory mitigation will not be required for Stream SC impacts due to low aquatic function. 2:1 mitigation will be required for impacts to Wetland WA.
- **Site 6:** The crossing at Jurisdictional Wetland WB will include a 30" cross pipe. The pipe will not be buried. No headwall and standard riprap pad at outfall. Cross pipe inverts to be placed at existing ground elevation for all wetlands. Excavation for ditches in wetland areas will be minimal (approx. 4"-6"). The location of the Wetland WB on the plans will be revised to match the pipe outfall location.

  David Bailey noted that ditch detail "F" is not found on the ditch detail sheet. The call out for these ditches will be revised to refer to ditch detail "N".
- **Site 7:** The crossing at Jurisdictional Wetland WC will include a 36" cross pipe with headwall on upstream end. The pipe will not be buried. Riprap end treatment to be used for pipe outfall.

  Wetland fill hatching to be added for rip rap outfall and accounted for in impact summary table.

  Wetland boundary to be extended on south end of wetland to reflect actual boundary.

  Explanation for why alignment was changed to this location needs to be added to permit narrative.

ACTION ITEMS

DRMP: Revise permit plans in accordance with comments stated in these meeting minutes.

NCDOT:

- Revise WB and WC wetland boundaries in WEX CADD file.
- Revise location of Jurisdictional Stream SC in FS CADD file.
- Determine mitigation needs for rip rap in stream bed for 12'x6' culvert outlet.

End of Memorandum

Cates Farm On-Site Mitigation Meeting Minutes

On Tuesday, December 5, 2017, representatives of the USACE, NCDWR, and NCDOT met on the Cates Farm property to review the proposed mitigation areas. Present were David Bailey, Monte Matthews, Andrea Hughes, Kim Browning, April Norton, Ginny Baker, LeiLani Paugh, Jim Mason, and Chris Underwood. What follows is a summary of what was discussed at each stream reach, relating to credit ratios and what NCDOT proposes to do for mitigation credit.

We started at Reach 1 (see map) and walked downstream in order to see the condition of the channel, in particular the optic fiber/cattle crossing. The stream was fairly stable with little sign of active erosion. There were a couple of beaver dams on the upstream part of the reach. Credit ratios discussed ranged from 3.5-3:1 with a lower ratio applicable to a buffer 75 feet or greater. Todd's extra buffer calculator would come into play here. There is no credit for the fiber optic easement. We discussed that monitoring for seven years would be required for plantings with years 4 and 6 being visual monitoring only.

Some of the reaches on the property exhibits evidence of prior damage due to cattle previously having access to the streams. These areas have started recovery on their own since the cattle are being pastured in non-easement areas. LeiLani described to the group what the farm was like when NCDOT initially started talking with the landowner. This was a large part of the discussion during this field review and has a large bearing on the ratios that were given for the reaches discussed.

At Reach 2 a Regenerative Stormwater Conveyance was discussed for the upper end of the reach but was decided that it wasn't necessary. We walked in to the intermittent/ephemeral break to view the channel condition. The channel is located close to the eastern property line and the protected buffer is less than 50 feet in a couple of places. Credit is to be given only in the downstream portion where there is at least 50 feet of buffer on both sides. The natural grade control near the perennial point, downstream, was the start of the 5:1 credit section. From the natural grade control to the limits of standard buffer, upstream, the credit ratio will be 7.5:1. The perennial section measures 150 feet and the intermittent section measures 230 feet.

We then crossed Mill Creek to go look at the northern reaches of the conservation easement. That property is now owned by the Town of Mebane, but NCDOT retains a conservation easement. We looked at Reach 3 and determined that a 3:1 ratio would be applicable due to the proposed replanting and fencing. No credit for the ephemeral section.

There was a discussion of the Town of Mebane wanting to construct a greenway within our easement on the north side of Mill Creek in conjunction with a disc golf course. Andrea mentioned that the USACE didn't like trails through easements and any area within the easement that had a trail would be removed from the credit area. LeiLani stated that we have had trails within our easements before. The overall consensus of the regulatory agencies was there would be no credit allowed if trails were constructed. LeiLani left at this point for another meeting.

We discussed Reach 5 but didn't visit it. It is ephemeral grading to intermittent with a potential wetland in the upper part of the ephemeral portion of the channel. NCDOT will perform a wetland delineation to confirm the presence of a wetland. The ratio discussed for Reach 5 was 5:1. On a later visit by NCDOT, It was determined that there was no wetland present. No credit for the ephemeral section.

We walked up to Reach 4 to determine the stability and substrate of the channel. Just within the Duke Power ROW, the substrate was cobble and bedrock and that is representative of the entire reach. It is also intermittent. The ratios determined for this reach and Reach 6 were 5:1. No credit for the ephemeral section.

We then walked the buffer down to Mill Creek so the team could see the buffer of the north side of Mill Creek. We didn't walk to Reach 7 but relied upon the recollections of Dave, Jim, and Chris who had visited it on an earlier date. They described the reach as the highest quality stream on the property and one of the better in the county. A ratio of 3.5:1 was determined for that reach. It was discussed that some sort of BMP be installed for the upper end of Reach 7 since the road abuts the easement there. Dave stated that the hydro plans showed a riprap pad there, which should be sufficient.

For Mill Creek, the initial thoughts of the team were for a 5:1 ratio for the entire reach. However, due to the lower quality of the channel, 7.5:1 was considered. It was determined that NCDOT should propose a ratio and justify it. Ways to achieve a lower ratio included bridge abutment removal, log jam removal, planting a higher percentage of the buffer, or protecting a wider than standard buffer. No credit unless buffer is on both sides.

We broke for lunch at 1:40 PM.

Reach	Amount and Ratio	Potential Amount of Credit
1	1,016 lf and 0.59 acre wetland (3.5:1)	290 lf; 0.197 acres wetland
2	150 lf and 230 lf (5:1 and 7.5:1)	61 lf
3	308 lf (3.1)	103 lf
4	489 lf (5:1)	98 lf
5	158 lf (5:1)	32 lf
6	359 lf (5:1)	72 lf
7	770 lf (3.5:1)	220 lf
Mill Creek	4,352 lf (7.5:1 to 5:1)	580-870 lf
Total	7,832 lf and 0.59 acre of wetland	1456-1746 lf; 0.197 ac. wetland

We are waiting on "Todd's Extra Buffer Calculator" to finalize the credit for Mill Creek.

THE FOLLOWING PAGES PERTAIN TO THE CHANGES ON SECTION A

PROJECT REFERENCE NO.	SHEET NO.
U-3109A	30

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

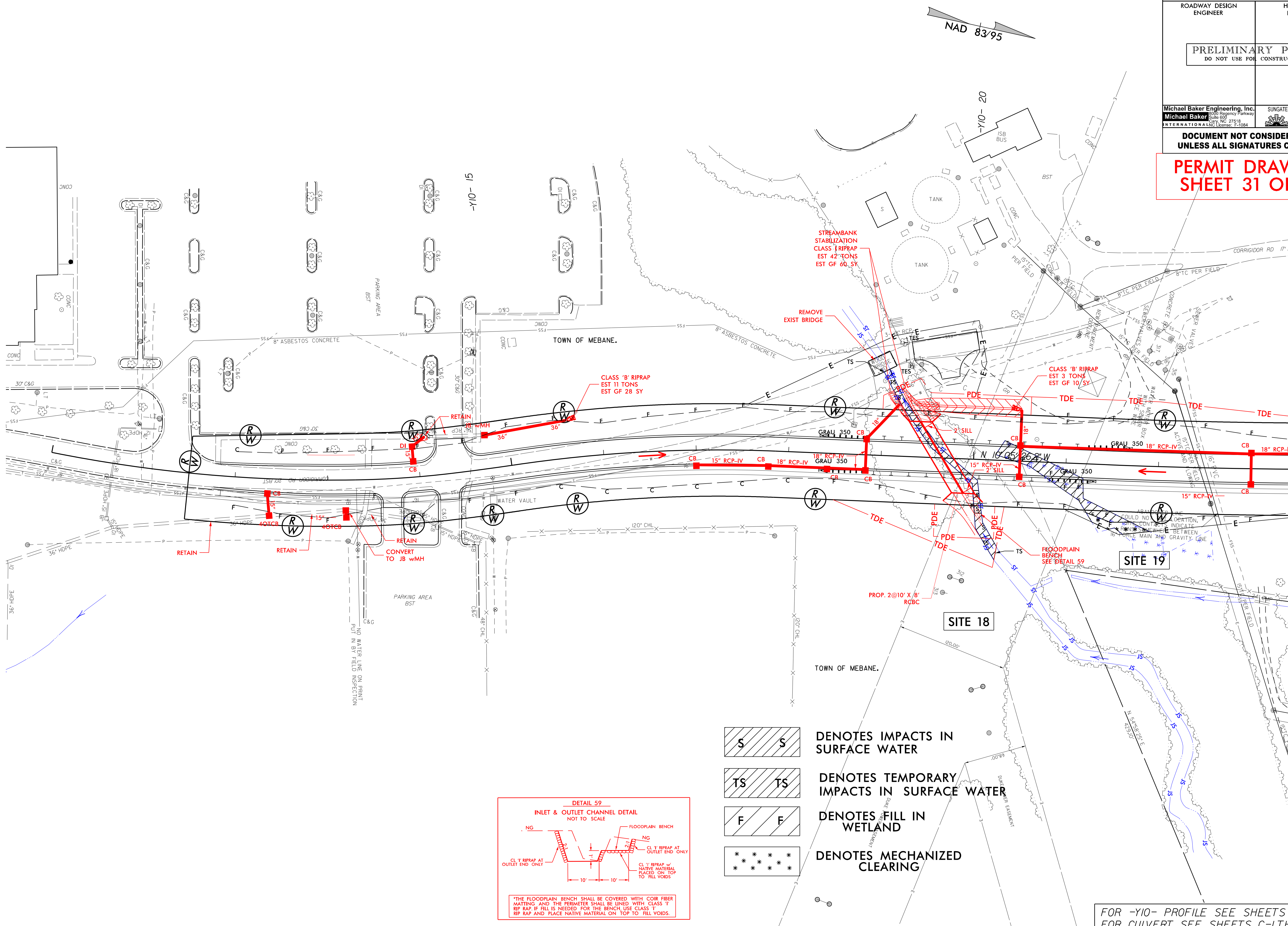
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Michael Baker Engineering, Inc. — 8000 Regency Parkway, Suite 600, Cary, NC 27518, NC License: F-1084

SUNGATE DESIGN GROUP, P.A. — 915 Jones Franklin Road, Raleigh, NC 27606, NC COA No. C-0890

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 31 OF 43



DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

DETAIL 59
INLET & OUTLET CHANNEL DETAIL
NOT TO SCALE

NG — FLOODPLAIN BENCH — CL 'I' RIPRAP AT OUTLET END ONLY — CL 'I' RIPRAP w/ NATIVE MATERIAL PLACED ON TOP TO FILL VOIDS — 10' — 10'

*THE FLOODPLAIN BENCH SHALL BE COVERED WITH COIR FIBER MATTING AND THE PERIMETER SHALL BE LINED WITH CLASS 'I' RIP RAP. IF FILL IS NEEDED FOR THE BENCH, USE CLASS 'I' RIP RAP AND PLACE NATIVE MATERIAL ON TOP TO FILL VOIDS.

FOR -Y10- PROFILE SEE SHEETS 48 & 49
FOR CULVERT SEE SHEETS C-1 THRU C-15

REVISIONS

5/14/99

5/2/2018
U3109A_Hyd_prm_wet_psh_30.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-3109A	30

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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8000 Regency Parkway Suite 600
Cary, NC 27518
NC License: F-1084

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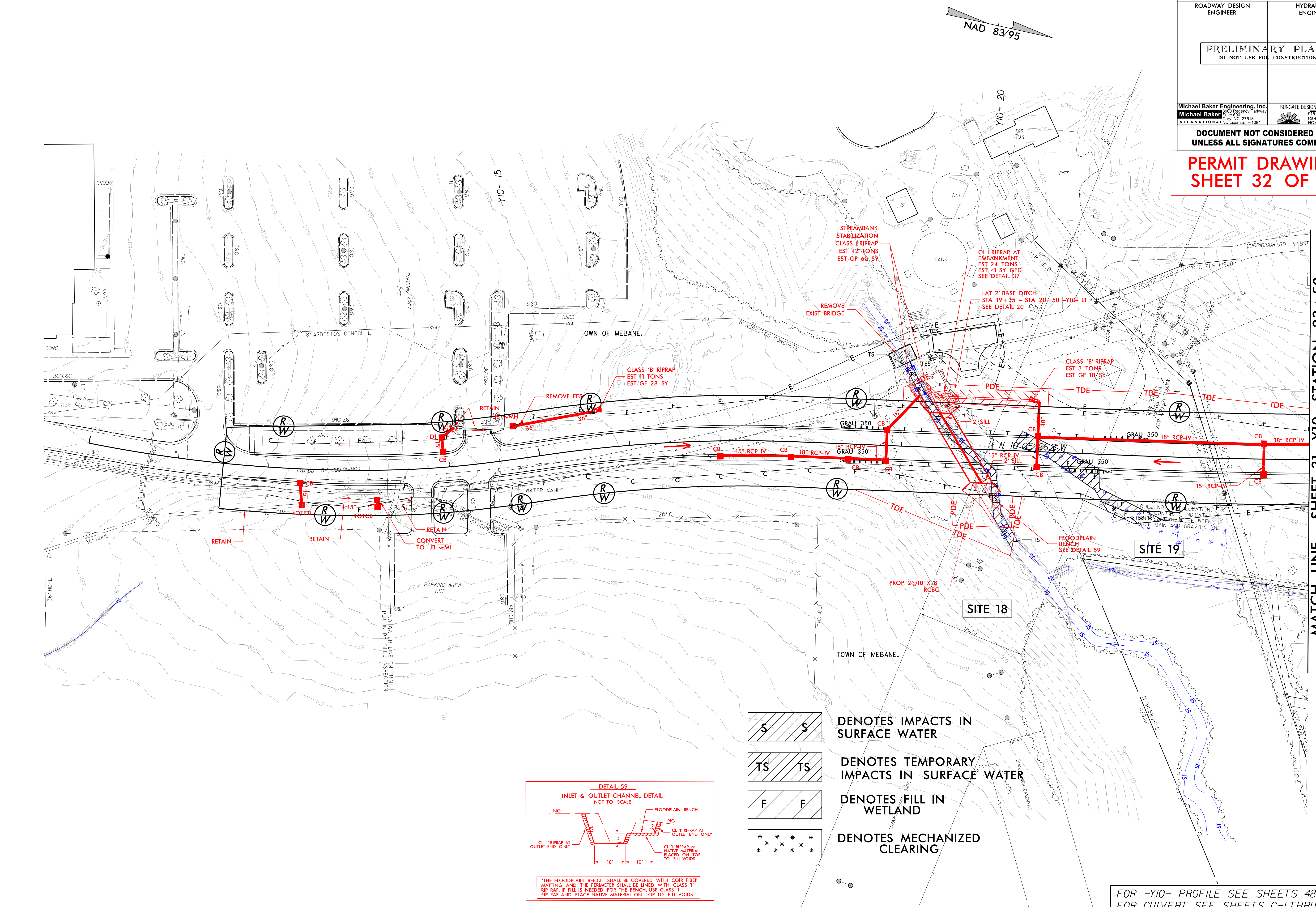
PERMIT DRAWING SHEET 32 OF 43



DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

DETAIL 59
INLET & OUTLET CHANNEL DETAIL
NOT TO SCALE

*THE FLOODPLAIN BENCH SHALL BE COVERED WITH COIR FIBER MATTING AND THE PERIMETER SHALL BE LINED WITH CLASS 'I' RIP RAP. IF FILL IS NEEDED FOR THE BENCH, USE CLASS 'I' RIP RAP AND PLACE NATIVE MATERIAL ON TOP TO FILL VOIDS.

FOR -Y10- PROFILE SEE SHEETS 48 & 49
FOR CULVERT SEE SHEETS C-1 THRU C-15

REVISIONS

5/2/2018
U3109A_Hyd_prm_wet_psh_30_con.dgn

PROJECT REFERENCE NO.	SHEET NO.

R/W SHEET NO.

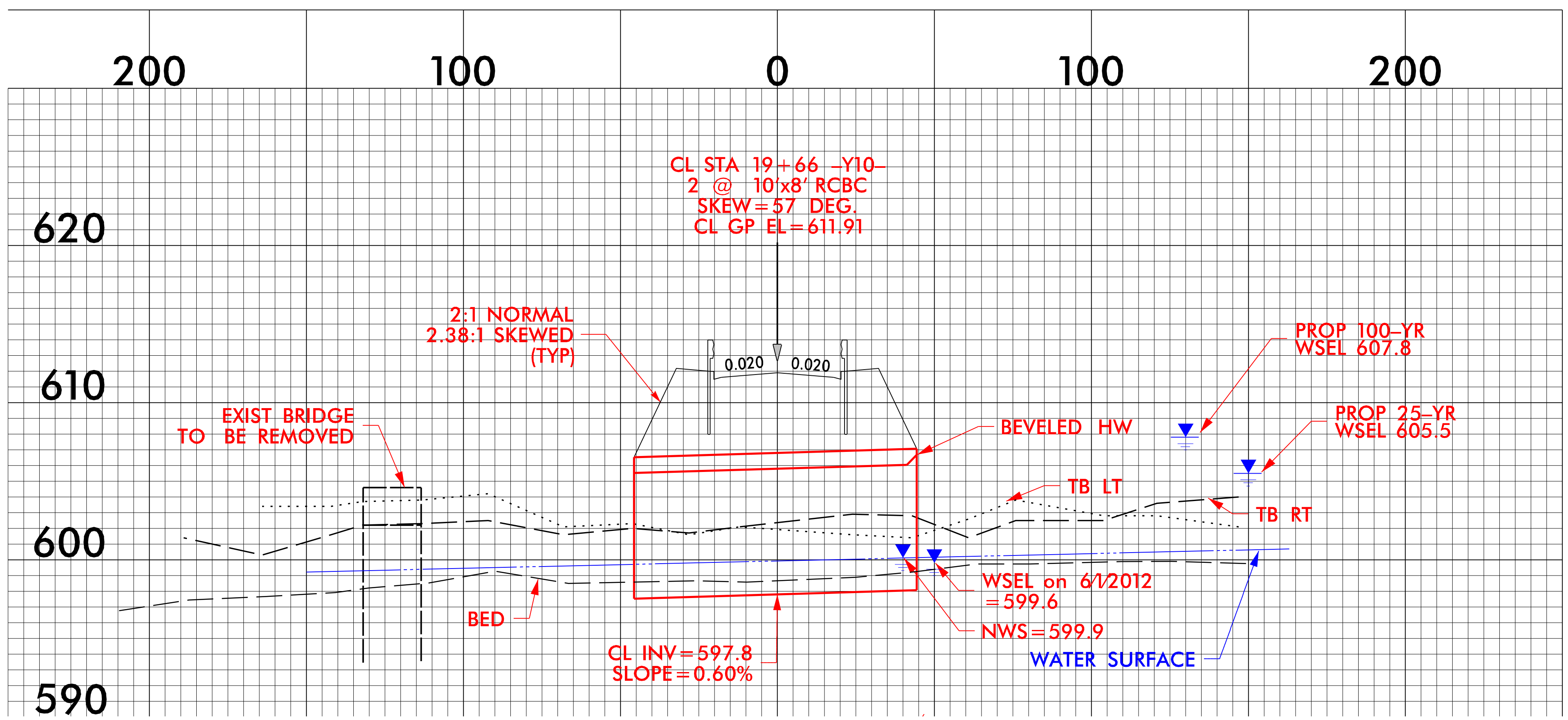
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING
SHEET 33 OF 43

SITE 18



REVISIONS

8/17/99

5/1/2018
U3109A_Hyd_prm_wet_psh_30_csr.dgn
harvey

PROJECT REFERENCE NO.	SHEET NO.
U-3109A	31

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

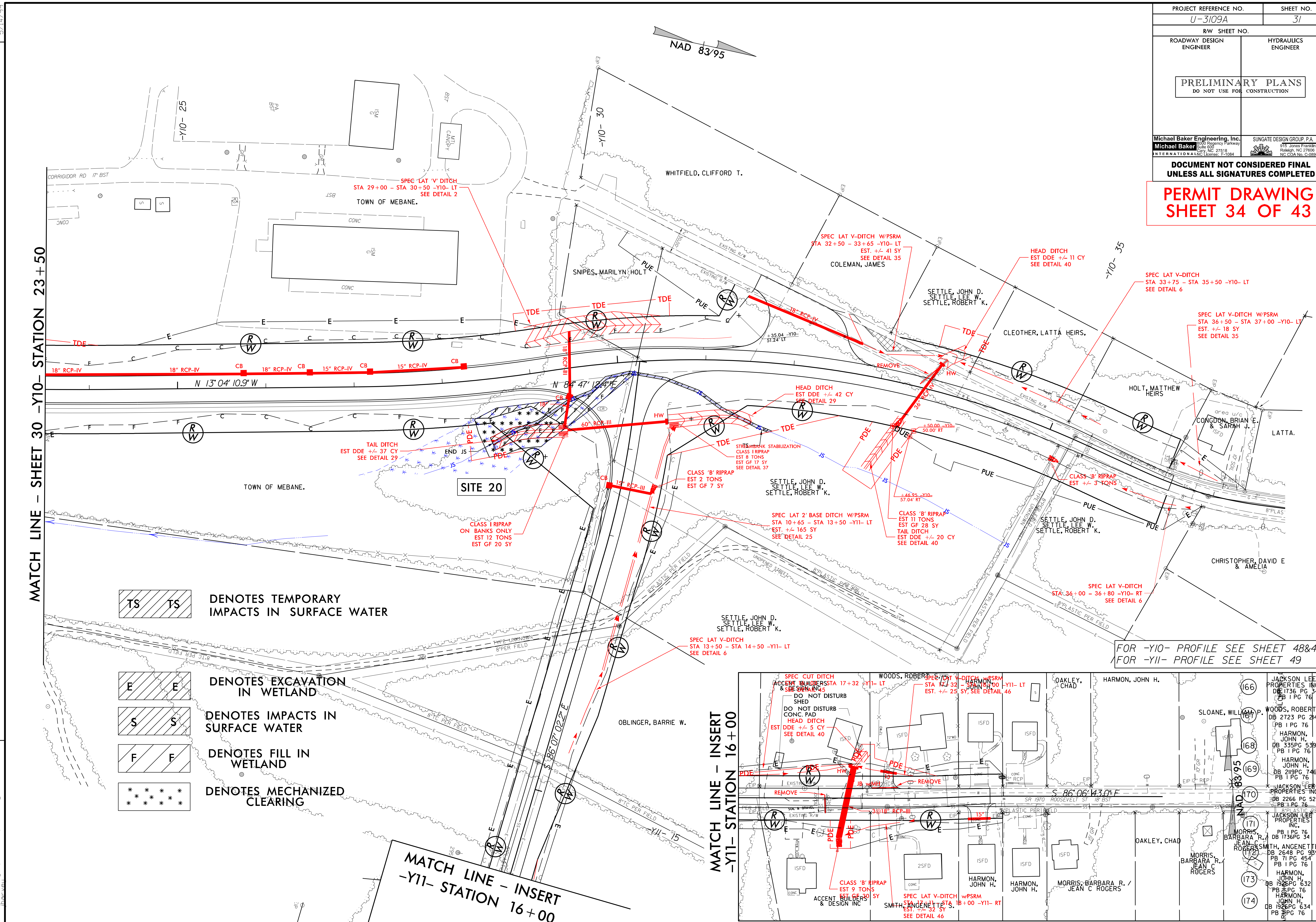
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Michael Baker Engineering, Inc.

SUNGATE DESIGN GROUP, P.A.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 34 OF 43



5/1/2018
U3109A_Hyd_prm_wet_psh_31.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-3109A	31

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

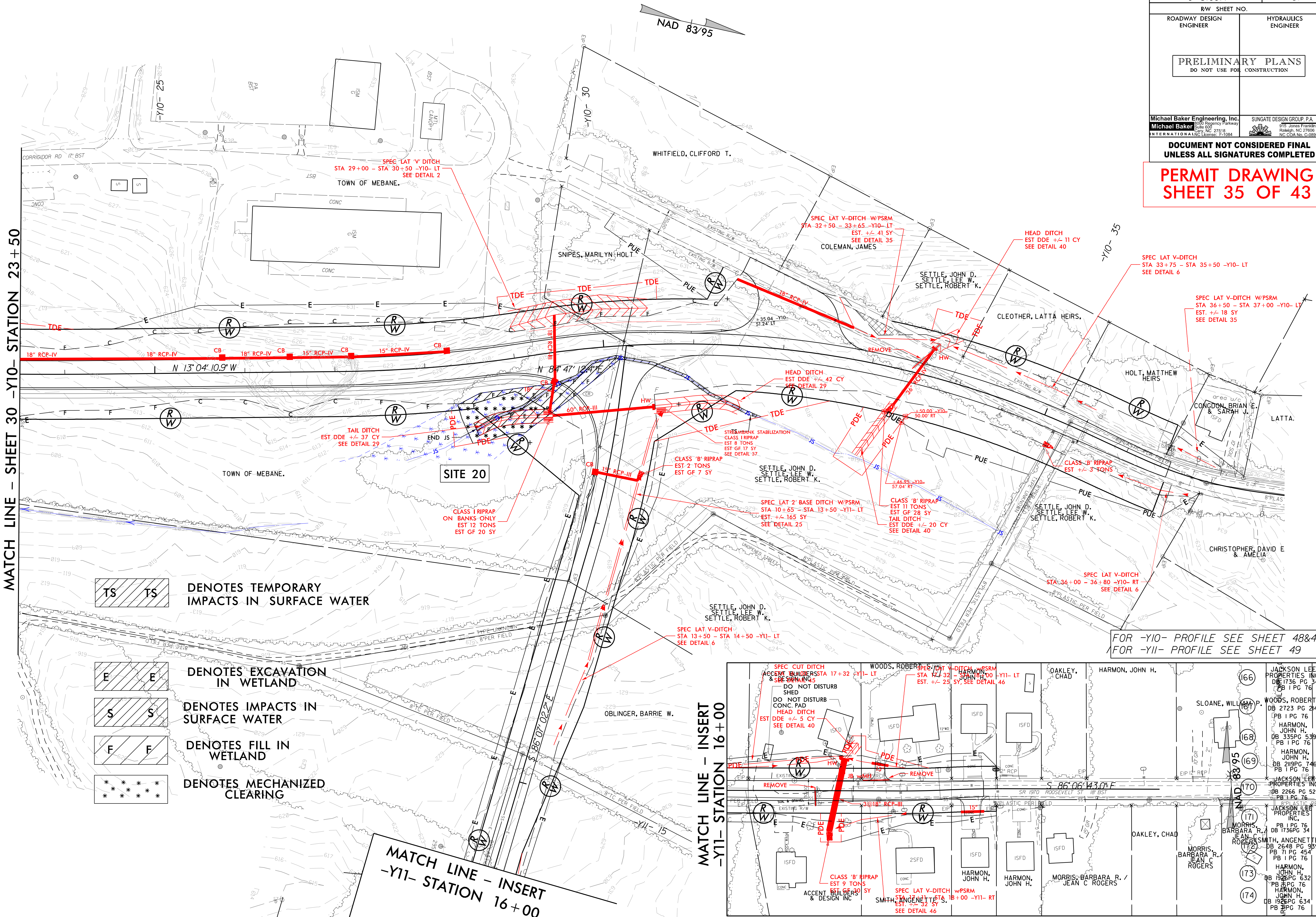
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Michael Baker Engineering, Inc.
Michael Baker INTERNATIONAL
8000 Regency Parkway Suite 600 Cary, NC 27518 NC License: F-1084

SUNGATE DESIGN GROUP, P.A.
915 Jones Franklin Road Raleigh, NC 27606 NC COA No. C-0890

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 35 OF 43



NAD 83/95
MATCH LINE - SHEET 30 -Y10- STATION 23+50
MATCH LINE - INSERT -Y11- STATION 16+00
MATCH LINE - INSERT -Y11- STATION 16+00
-Y10- 25
-Y10- 30
-Y10- 35
-Y11- 15
TOWN OF MEBANE.
WHITFIELD, CLIFFORD T.
SNIPES, MARILYN HOLT
COLEMAN, JAMES
SETTLE, JOHN D. SETTLE, LEE W. SETTLE, ROBERT K.
CLEOTHER, LATTA HEIRS.
HOLT, MATTHEW HEIRS
CONGDON, BRIAN E. & SARAH J.
LATTA.
CHRISTOPHER, DAVID E & AMELIA
OBLINGER, BARRIE W.
SITE 20
N 13°04'10.9" W
N 84°47'12.4" E
S 86°07'02.2" E
SPEC LAT 'V' DITCH STA 29+00 - STA 30+50 -Y10- LT SEE DETAIL 2
SPEC LAT V-DITCH W/PSRM STA 32+50 - 33+65 -Y10- LT EST. +/- 41 SY SEE DETAIL 35
HEAD DITCH EST DDE +/- 11 CY SEE DETAIL 40
SPEC LAT V-DITCH STA 33+75 - STA 35+50 -Y10- LT SEE DETAIL 6
SPEC LAT V-DITCH W/PSRM STA 36+50 - STA 37+00 -Y10- LT EST. +/- 18 SY SEE DETAIL 35
HEAD DITCH EST DDE +/- 42 CY SEE DETAIL 29
TAIL DITCH EST DDE +/- 37 CY SEE DETAIL 29
CLASS 'B' RIPRAP EST 2 TONS EST GF 7 SY
CLASS I RIPRAP ON BANKS ONLY EST 12 TONS EST GF 20 SY
SPEC LAT 2' BASE DITCH W/PSRM STA 10+65 - STA 13+50 -Y11- LT EST. +/- 165 SY SEE DETAIL 25
CLASS 'B' RIPRAP EST 11 TONS EST GF 28 SY TAIL DITCH EST DDE +/- 20 CY SEE DETAIL 40
CLASS 'B' RIPRAP EST +/- 3 TONS
SPEC LAT V-DITCH STA 36+00 - 36+80 -Y10- RT SEE DETAIL 6
SPEC LAT V-DITCH STA 13+50 - STA 14+50 -Y11- LT SEE DETAIL 6
18" RCP-IV
15" RCP-IV
60" RCP-III
15" RCP-III
TDE
PDE
PUE
REMOVE
FOR -Y10- PROFILE SEE SHEET 48&49
FOR -Y11- PROFILE SEE SHEET 49
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
E E DENOTES EXCAVATION IN WETLAND
S S DENOTES IMPACTS IN SURFACE WATER
F F DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
MATCH LINE - INSERT -Y11- STATION 16+00
S 86°06'43.0" E
SPEC CUT DITCH
DO NOT DISTURB SHED
DO NOT DISTURB CONC. PAD
HEAD DITCH EST DDE +/- 5 CY SEE DETAIL 40
CLASS 'B' RIPRAP EST 9 TONS
SPEC LAT V-DITCH W/PSRM
SEE DETAIL 46
WOODS, ROBERT S.
HARMON, JOHN H.
OAKLEY, CHAD
SLOANE, WILLIAM P.
JACKSON LEE PROPERTIES INC.
MORRIS, BARBARA R./ JEAN C ROGERS
SMITH, ANGENETTE S.
ACCENT BUILDERS & DESIGN INC

5/14/99

REVISIONS

5/1/2018
U3109A_Hyd_prm_wet_psh_31_con.dgn

PROJECT REFERENCE NO.	SHEET NO.

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

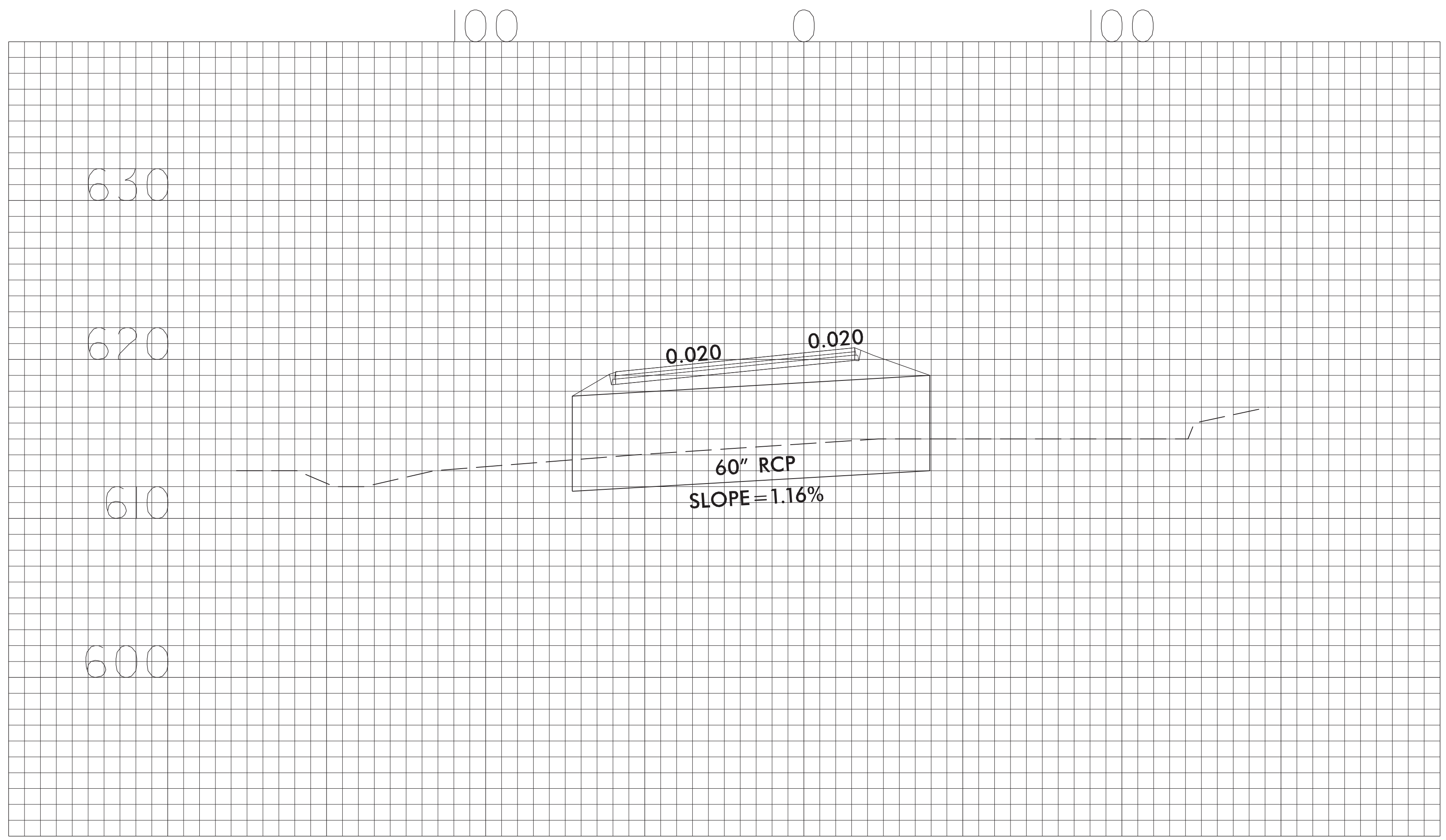
HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 20

PERMIT DRAWING
SHEET 36 OF 43



REVISIONS

8/17/99

2/29/2016
U3109A_Hyd_prm_wet_psh_31_xsc.dgn
harvey

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-3109A	X-175

PERMIT DRAWING
SHEET 40 OF 43

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

630 620 610 600 590

0.020 0.020
4:1 4:1
2:1
605.80
607.21
22+00.00

0.020 0.020
2:1 2:1 2:1 4:1
604.63
606.97
21+50.00

SITE 19

WETLAND BOUNDARY
WETLAND BOUNDARY

0.020 0.020
2:1 2:1
FILL IN WETLAND
2:1
2:1 2:1
603.47
605.23
21+00.00

0.020 0.020
2:1 2:1
3:1 3:1
602.38
603.62
20+50.00

-Y10-

2/29/2016
U3109A_hyd_prm_wet_xpl_-Y10-_175.dgn
jharvey

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-3109A	X-179

PERMIT DRAWING
SHEET 41 OF 43

640 630 620 610

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

2:1 4:1 0.019 0.019 617.30 615.30

29 + 50.00

SITE 20

WETLAND BOUNDARY
MECHANIZED CLEARING
IMPACTS IN SURFACE WATER
WETLAND BOUNDARY
FILL IN WETLAND
EXCAVATION
MECHANIZED CLEARING

2:1 4:1 0.005 0.005 616.70 617.25

29 + 00.00

2:1 4:1 0.029 0.029 615.73 618.40 4:1

28 + 50.00

2:1 4:1 0.040 0.040 614.72 621.30 4:1 2:1 615.68

28 + 00.00

-Y10-

2/29/2016
U3109A_tgd_prm_wet_xpl_-Y10-_179.dgn
jharvey

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	63+59-65+75 -L-	48" RCP						0.03		235		
		48" RCP						0.01	< 0.01	117	16	
2	69+92-70+95 -L-	54" RCP						0.04	< 0.01	348	17	
3	11+61 -Y7A-	66" RCP						0.04	< 0.01	320	10	
4	78+10-79+64 -L-LT	ROAD FILL						0.10				
5	78+25 -L- RT	3 AT 30" RCP							< 0.01		16	
6	85+02-86+67 -L-	54" RCP						0.02	< 0.01	257	35	
7	93+65-97+92 -L-	3 @ 11'x9' RCBC						0.15	0.02	501	52	
		STREAMBANK STABILIZATION						0.02		63		
7A	94+25 -L- RT	CHANNEL REALIGNMENT						< 0.01	< 0.01	18	20	
8A	108+00-111+82 -L-	48" RCP						0.04	< 0.01	463	19	
8B	110+64-111+10 -L- RT	48" RCP						< 0.01	< 0.01	82	21	
9	113+72-114+35 -L-RT	ROAD FILL	< 0.01			0.01						
10	125+99-127+49 -L-	72" RCP						0.04	< 0.01	396	25	
10A	127+41-127+99 -L- LT	ROAD FILL						< 0.01		74		
11	133+53 -L-	48" RCP						0.02	< 0.01	270	25	
12	155+09-157+67 -L-	30" RCP	0.08					0.13				
12A	156+91-157+54 -L-LT		0.03									
12B	157+25-157+73 -L-LT							< 0.01	< 0.01	105	7	
12C	157+55-L-LT								< 0.01		13	
13	162+01-162+68-L-	66" RCP	0.07			0.01		0.09	< 0.01	183	21	
14	26+00 -Y16RPA- LT	36" RCP							< 0.01		19	
15	178+79-180+22 -L-	1 @ 10'x7' RCBC						0.06	< 0.01	447	44	
SUB TOTALS *:			0.18			0.02		0.82	0.05	3879	360	

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5-1-18
ALAMANCE COUNTY
U-3109A
34900.1.1

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)
16	17+83-21+62 -Y6RPA-	42" RCP						0.03	< 0.01	494	32	
17	33+97 -Y20-	STREAMBANK STABILIZATION						< 0.01		35		
18	19+72 -Y10-	2 @ 10'x8' RCBC						0.02	< 0.01	122	45	
		S STREAMBANK STABILIZATIO						< 0.01		25		
		DS STREAMBANK STABILIZATION						< 0.01		44		
19	20+18-22+74 -Y10-RT	ROAD FILL	0.05			0.01						
20	10+14 -Y11-	60" RCP	0.05		0.02	0.05		0.02	< 0.01	327	24	
TOTALS FROM PREVIOUS SHEET			0.18			0.02		0.82	0.05	3879	360	
TOTALS*:			0.28		0.02	0.09		0.91	0.06	4926	461	

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5-1-18
ALAMANCE COUNTY
U-3109A
34900.1.1
SHEET 43 OF 43

Revised 2013 10 24

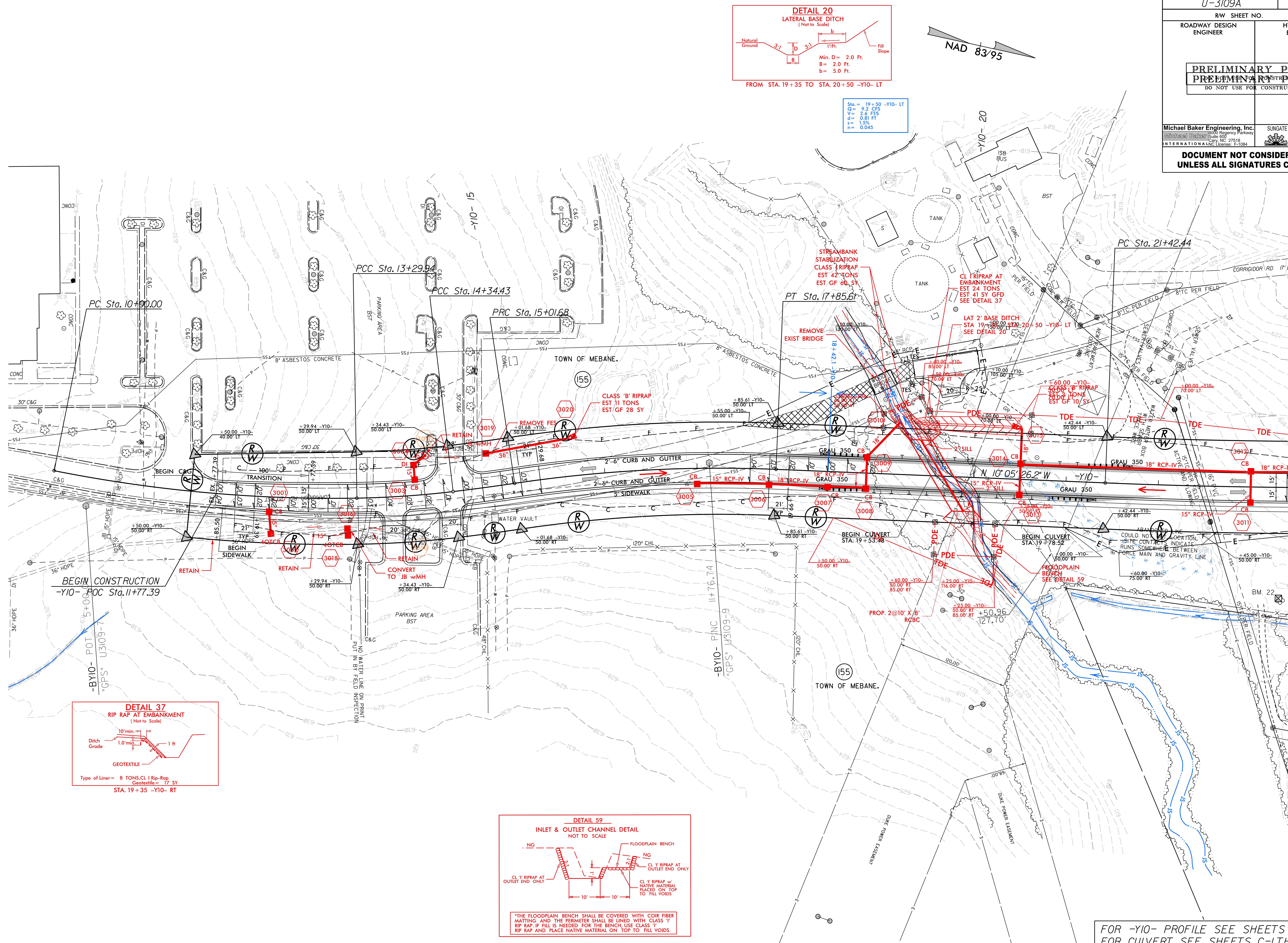
PROJECT REFERENCE NO.	SHEET NO.
U-3109A	30
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Michael Baker Engineering, Inc. 8000 Regency Parkway Suite 600 Cary, NC 27518 NC License: F-1084

SUNGATE DESIGN GROUP, P.A. 915 Jones Franklin Road Raleigh, NC 27606 NC COA No. C-0890

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DETAIL 20
LATERAL BASE DITCH
(Not to Scale)
Min. D = 2.0 Ft.
B = 2.0 Ft.
b = 5.0 Ft.
FROM STA. 19+35 TO STA. 20+50 -Y10- LT
Sta.= 19+50 -Y10- LT
Q= 9.2 CFS
V= 2.6 FPS
d= 0.81 FT
s= 1.5%
n= 0.045
NAD 83/95
PC Sta. 10+90.00
PCC Sta. 13+29.94
PCC Sta. 14+34.43
PRC Sta. 15+01.68
PT Sta. 17+85.61
PC Sta. 21+42.44
TOWN OF MEBANE.
STREAMBANK STABILIZATION CLASS I RIPRAP EST 42 TONS EST GF 60 SY
REMOVE EXIST BRIDGE
CL I RIPRAP AT EMBANKMENT EST 24 TONS EST 41 SY GFD SEE DETAIL 37
LAT 2' BASE DITCH STA 19+35 TO STA 20+50 -Y10- LT SEE DETAIL 20
CLASS 'B' RIPRAP EST 11 TONS EST GF 28 SY
2'-6" CURB AND GUTTER
5' SIDEWALK
BEGIN CULVERT STA. 19+53.48
PROP. 2@10' X 8' RCBC
FLOODPLAIN BENCH SEE DETAIL 59
BEGIN CONSTRUCTION -Y10- POC Sta. 11+77.39
CONVERT TO JB w/MH
NO WATER LINE ON PRINT PUT IN BY FIELD INSPECTION
MATCH LINE - SHEET 31 -Y10- STATION 23+50
DETAIL 37
RIP RAP AT EMBANKMENT
(Not to Scale)
Type of Liner = 8 TONS,CL I Rip-Rap
Geotextile = 17 SY
STA. 19+35 -Y10- RT
DETAIL 59
INLET & OUTLET CHANNEL DETAIL
NOT TO SCALE
*THE FLOODPLAIN BENCH SHALL BE COVERED WITH COIR FIBER MATTING AND THE PERIMETER SHALL BE LINED WITH CLASS 'I' RIP RAP. IF FILL IS NEEDED FOR THE BENCH, USE CLASS 'I' RIP RAP AND PLACE NATIVE MATERIAL ON TOP TO FILL VOIDS.

FOR -Y10- PROFILE SEE SHEETS 48 & 49
FOR CULVERT SEE SHEETS C-1 THRU C-15

REVISIONS

6/17/99

PROJECT REFERENCE NO.
U-3109A
SHEET NO.
31
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Michael Baker Engineering, Inc.
SUNGATE DESIGN GROUP, P.A.
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/95
DETAIL 6
SPECIAL LATERAL 'V' DITCH
FROM STA. 33+75 TO STA. 35+50 -Y10- LT
FROM STA. 36+00 TO STA. 36+80 -Y10- RT
FROM STA. 13+50 TO STA. 14+50 -Y11- LT
DETAIL 25
SPECIAL LATERAL BASE DITCH
FROM STA. 10+65 TO STA. 13+50 -Y11- LT
DETAIL 35
SPECIAL LATERAL 'V' DITCH
FROM STA. 32+50 TO STA. 33+65 -Y10- LT
FROM STA. 36+50 TO STA. 37+00 -Y10- LT
DETAIL 2
SPECIAL LATERAL 'V' DITCH
FROM STA. 29+00 TO STA. 30+50 -Y10- LT
DETAIL 37
RIP RAP AT EMBANKMENT
STA. 10+65 -Y11- LT
DETAIL 46
SPECIAL LATERAL 'V' DITCH
FROM STA. 17+11 TO STA. 18+00 -Y11- RT
FROM STA. 17+32 TO STA. 18+00 -Y11- LT
DETAIL 40
STANDARD BASE DITCH
FROM STA. 32+97 TO STA. 33+38 -Y10- RT
FROM STA. 33+56 TO STA. 33+89 -Y10- LT
FROM STA. 17+30 TO STA. 17+50 -Y11- LT
DETAIL 29
STANDARD BASE DITCH
FROM STA. 28+48 TO STA. 29+34 -Y10- RT
FROM STA. 30+45 TO STA. 31+58 -Y10- RT
MATCH LINE - SHEET 30 -Y10- STATION 23+50
MATCH LINE - INSERT -Y11- STATION 16+00
PT Sta. 24+54.41
PC Sta. 27+04.41
PRC Sta. 29+20.66
-Y11- POT Sta. 10+00.00 = -Y10- POC Sta. 30+25.14
PC Sta. 10+63.05
PT Sta. 12+21.81
PRC Sta. 35+59.03
PT Sta. 37+55.86
PCC Sta. 36+19.81
END CONSTRUCTION -Y10- POC Sta. 37+34.42
FOR -Y10- PROFILE SEE SHEET 48&49
FOR -Y11- PROFILE SEE SHEET 49
TOWN OF MEBANE.
WHITFIELD, CLIFFORD T.
SNIPES, MARILYN HOLT
COLEMAN, JAMES
SETTLE, JOHN D.
SETTLE, LEE W.
SETTLE, ROBERT K.
CLEOTHER, LATTA HEIRS
HOLT, MATTHEW HEIRS
CONGDON, BRIAN E. & SARAH J.
CHRISTOPHER, DAVID E & AMELIA
OBLINGER, BARRIE W.
N 13°04'10.9" W
N 84°47'12.4" E
-BYII-121 PINC 9+78.92
PRC Sta. 18+43.15
PC Sta. 17+93.87
PT Sta. 19+06.26
POT Sta. 20+80.49
END CONSTRUCTION -Y11- POT Sta. 19+49.32
S 86°06'43.0" E
MATCH LINE - INSERT -Y11- STATION 16+00
WOODS, ROBERT S.
HARMON, JOHN H.
OAKLEY, CHAD
SLOANE, WILLIAM P.
JACKSON LEE PROPERTIES INC.
MORRIS, BARBARA R. / JEAN C ROGERS
SMITH, ANGENETTE S.
ACCENT BUILDERS & DESIGN INC
REVISIONS

THE FOLLOWING PAGES ARE THE PERMIT DRAWINGS FOR SECTION B

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element:	34900.1.FR3	**TIP No.:**	U-3109B	**County(ies):**	Alamance

General Project Information

WBS Element:	34900.1.FR3	**TIP Number:**	U-3109B	**Project Type:**	New Location	**Date:**	1/24/2018
NCDOT Contact:	William H Elam, Jr.			**Contractor / Designer:**	DRMP / Ryan Mitchell, P.E.		
	Address: NCDOT 1590 Mail Service Center Raleigh, NC 27699-1590				**Address:** 8000 Regency Parkway Suite 175 Cary, NC 27518		
	Phone: 919-707-6718				**Phone:** 919.650.1038		
	Email: belam@ncdot.gov				**Email:** rmitchell@drmp.com		
City/Town:	Mebane			**County(ies):**	Alamance		
River Basin(s):	Cape Fear			**CAMA County?**	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	1.424 miles	**Surrounding Land Use:**	Undeveloped/Open Land

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	6.5 ac.	N/A ac.
Typical Cross Section Description:	One (1) 12' travel lanes each direction. 4' paved shoulders with grass roadway ditches, both sides. 10' paved shoulders with guardrail.	
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 10,983 vpd Year: 2038	Existing: 8,809 Year: 2018
General Project Narrative: (Description of Minimization of Water Quality Impacts)	The U-3109B project is a new alignment between SR 1921 (Mebane Rogers/ Stage Coach Rd) and SR 1918 (Mrs. White Ln). Approximately 5,800 linear feet of grass swales have been incorporated in roadside ditches, where possible, to reduce the velocity and promote the infiltration of runoff. Five hazardous spill basins are proposed to protect against the accidental realease of hazardous material into receiving jurisdictional waters. Riprap at pipe outlets, ditches, and streambanks has been incorporated to minimize erosion on slopes where vegetation will not be adequate. Storm drainage discharging directly to wetlands has been designed to meet non-erosive velocity requirements. NCDOT standards for ground cover, vegetation, and slope stabilization will be adhered to during the life of this project, and will be specified in the NCDOT Erosion and Sediment Control Plan for the project.	

Waterbody Information

Surface Water Body (1):	Mill Creek		**NCDWR Stream Index No.:**	16-18-3-(1.5)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Water Supply II (WS-II)			
		Supplemental Classification:	High Quality Waters (HQW)	(NSW)	CA	
Other Stream Classification:						
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	Mill Creek			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element:	34900.1.FR3	TIP No.:	U-3109B	County(ies):	Alamance	Page	2	of	5

Additional Waterbody Information

Surface Water Body (2):	UT to Mill Creek (SA)		**NCDWR Stream Index No.:**			
NCDWR Surface Water Classification for Water Body		**Primary Classification:**				
		Supplemental Classification:				
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?		Comments:				
NRTR Stream ID:	SA			**Buffer Rules in Effect:**		
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**		N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (3):	UT to Mill Creek (SB)		**NCDWR Stream Index No.:**			
NCDWR Surface Water Classification for Water Body		**Primary Classification:**				
		Supplemental Classification:				
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?		Comments:				
NRTR Stream ID:	SB			**Buffer Rules in Effect:**		
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**		N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (4):	UT to Mill Creek (SB)		**NCDWR Stream Index No.:**			
NCDWR Surface Water Classification for Water Body		**Primary Classification:**				
		Supplemental Classification:				
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?		Comments:				
NRTR Stream ID:	SC			**Buffer Rules in Effect:**		
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**		N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element: 34900.1.FR3 **TIP No.:** U-3109B **County(ies):** Alamance

Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
4	-L- 199+50 LT. -L- 196+50 LT.	(2)UT to Mill Creek (SA)	0.0	6.0	3.0	0.7	71	300	0.50%	1.6	1.6	2.0	1.7		No
4	-L- 199+50 LT. -L- 205+50 LT.	(2)UT to Mill Creek (SA)	0.0	6.0	3.0	1.2	115	600	1.50%	1.9	1.9	2.4	2.0		No
5	-L- 210+08 LT. -L- 213+00 LT.		0.0	6.0	4.0	0.5	46	292	1.43%	0.8	1.3	1.0	1.4		No
6	-L- 220+50 LT. -L- 224+60 LT.	(1)Mill Creek	0.0	3.0	3.0	0.5	49	410	1.34%	0.9	1.7	1.2	1.8		No
6	-L- 233+00 LT. -L- 229+90 LT.	(1)Mill Creek	0.0	4.0	3.0	0.6	64	310	2.80%	1.1	1.8	1.4	1.9		No
7	-L- 233+00 LT. -L- 235+50 LT.	(3)UT to Mill Creek (SB)	0.0	3.0	3.0	0.7	73	250	2.46%	0.7	1.7	0.9	1.8		No
7	-L- 243+05.37 LT. -L- 237+50 LT.	(3)UT to Mill Creek (SB)	0.0	6.0	4.0	0.9	92	555	1.16%	0.9	1.5	1.1	1.6		No
7	-L- 243+05.37 LT. -L- 245+00 LT.	(4)UT to Mill Creek (SB)	0.0	6.0	3.0	0.6	55	245	0.32%	0.8	0.8	1.0	0.8		No
8	-L- 249+78 LT. -L- 248+00 LT.		0.0	6.0	4.0	0.3	26	178	1.16%	0.5	1.1	0.6	1.2		No
8	-L- 251+50 LT. -L- 251+00 LT.		0.0	3.0	3.0	0.3	34	50	2.00%	0.7	1.6	0.9	1.7		No
8	-L- 253+76.14 LT. -L- 253+00 LT.		0.0	6.0	6.0	0.1	9	76	1.16%	0.2	0.8	0.3	0.9		No
9	-L- 263+00 LT. -L- 259+00 LT.		0.0	6.0	4.0	2.2	215	400	1.18%	2.9	1.8	3.7	1.9		No
9	-L- 271+92 LT. -L- 267+00 LT.		0.0	6.0	4.0	2.0	201	492	1.38%	3.1	2.0	3.9	2.1		No
8	-L- 255+00 LT. -L- 255+50 LT.		0.0	3.0	3.0	0.3	27	50	2.00%	1.0	1.8	1.0	1.8		No
4	-L- 198+50 RT. -L- 196+00 RT.		0.0	6.0	3.0	0.5	46	250	0.51%	0.4	0.8	0.5	0.8		No
4	-L- 198+50 RT. -L- 205+00 RT.	(2)UT to Mill Creek (SA)	0.0	6.0	4.0	1.3	134	650	1.98%	2.2	2.0	2.7	2.1		No
5	-L- 211+00 RT. -L- 209+00 RT.	(2)UT to Mill Creek (SA)	0.0	6.0	3.0	0.4	35	200	0.30%	0.6	0.7	0.7	0.7		No
5	-L- 211+00 RT. -L- 212+50 RT.		0.0	6.0	4.0	0.2	21	150	1.40%	0.4	1.1	0.5	1.2		No
5	-L- 214+00 RT. -L- 217+50 RT.		0.0	6.0	4.0	0.4	44	350	1.40%	0.8	1.3	1.0	1.4		No

Additional Comments

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element: 34900.1.FR3 **TIP No.:** U-3109B **County(ies):** Alamance

Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
6	-L- 218+00 RT. -L- 220+00 RT.		0.0	6.0	3.0	0.2	23	200	0.30%	0.4	0.6	0.5	0.7		No
6	-L- 220+00 RT. -L- 222+00 RT.	(1)Mill Creek	0.0	6.0	4.0	0.6	58	200	1.40%	0.9	1.4	1.2	1.5		No
7	-L- 243+00 RT. -L- 237+50 RT.	(3)UT to Mill Creek (SB)	0.0	6.0	4.0	1.2	115	550	1.45%	2.4	2.0	3.0	2.1		No
7	-L- 243+00 RT. -L- 245+50 RT.	(4)UT to Mill Creek (SB)	0.0	6.0	3.0	0.5	50	250	0.30%	0.9	0.8	1.2	0.8		No
5	-L- 208+00 RT. -L- 207+33.29 RT.	(2)UT to Mill Creek (SA)	0.0	3.0	3.0	0.2	22	67	0.75%	1.0	0.9	1.2	0.9		No
8	-L- 253+69 RT. -L- 252+00 RT.		0.0	3.0	3.0	0.2	20	169	3.70%	0.5	1.9	0.6	2.0		No
8	-Y21- 14+00 RT. -Y21- 11+90 RT.		0.0	3.0	3.0	0.4	35	210	2.91%	0.9	1.4	1.1	1.6		No
8	-Y21- 14+27 RT. -Y21- 16+00 RT.		0.0	6.0	4.0	0.2	22	173	3.90%	0.6	1.9	0.8	2.0		No
10	-Y21- 20+50 RT. -Y21- 19+50 RT.		0.0	6.0	4.0	0.2	15	100	1.24%	0.4	1.1	0.5	1.0		No
10	-Y21- 20+50 RT. -Y21- 21+50 RT.		0.0	6.0	4.0	0.1	11	100	1.20%	0.2	0.6	0.3	0.7		No
8	-Y21- 11+00 LT. -Y21- 13+30 LT.		0.0	3.0	3.0	0.4	39	230	0.30%	1.0	0.9	1.2	1.0		No
8	-Y21- 13+50 LT. -Y21- 15+00 LT.		0.0	6.0	4.0	0.2	19	150	3.28%	0.5	1.7	0.5	1.8		No
10	-Y21- 18+00 LT. -Y21- 20+00 LT.		0.0	6.0	6.0	0.5	53	200	1.24%	0.7	1.5	0.9	1.6		No

Additional Comments

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element: 34900.1.FR3 **TIP No.:** U-3109B **County(ies):** Alamance

Level Spreaders, Hazardous Spill Basins, and Forebays

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Level Spreader, Hazardous Spill Basin, or Forebay?	Drainage Area (ac)	New Built-Upon Area (ac)	Required / Minimum Treatment			Treatment Achieved		BMP Associated w/ Buffer Rules?
5	-L- 199+50 LT. -L- 206+00 LT.	(2)UT to Mill Creek (SA)	Hazardous Spill Basin	1.46	0.41	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	2413.0	cf	2912.0	cf	N/A
5	-L- 198+50 RT. -L- 205+00 RT.	(2)UT to Mill Creek (SA)	Hazardous Spill Basin	1.36	0.41	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	2375.0	cf	2548.0	cf	N/A
5	-L- 206+00 LT. -L- 210+00 LT.	(2)UT to Mill Creek (SA)	Hazardous Spill Basin	0.44	0.35	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	1961.0	cf	3373.0	cf	N/A
6	-L- 220+50 LT. -L- 228+50 RT.	(1)Mill Creek	Hazardous Spill Basin	1.64	0.68	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	2705.0	cf	3659.0	cf	N/A
6	-L- 232+00 RT. -L- 228+50 RT.	(1)Mill Creek	Hazardous Spill Basin	1.17	0.44	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	2319.0	cf	11913.0	cf	N/A
8	-L- 267+00 LT. -L- 256+50 LT.		Hazardous Spill Basin	3.71	0.85	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	3674.0	cf	5775.0	cf	N/A

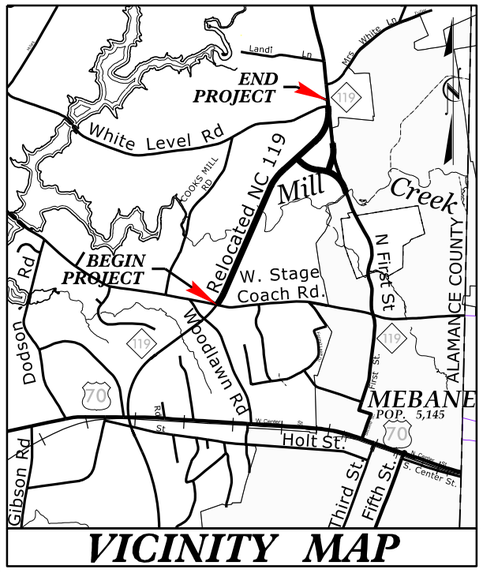
*Hazardous spill basins are pollution prevention measures designed for spill containment rather than stormwater treatment. Under Required / Minimum Treatment and Treatment Achieved, provide the minimum required volume and the actual HSB volume, respectively. Refer to the NCDOT Stormwater Best Management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

Additional Comments

05/30/17

TIP PROJECT: U-3109B

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols
See 1C Sheet Series For Survey Control



VICINITY MAP

NOT TO SCALE

ROW/CFI PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ALAMANCE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3109B	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34900.1.FR3	STP-0119(11)	PE
34900.2.3	STP-0119(8)	R/W
34900.2.3	STP-0119(8)	UTILITIES

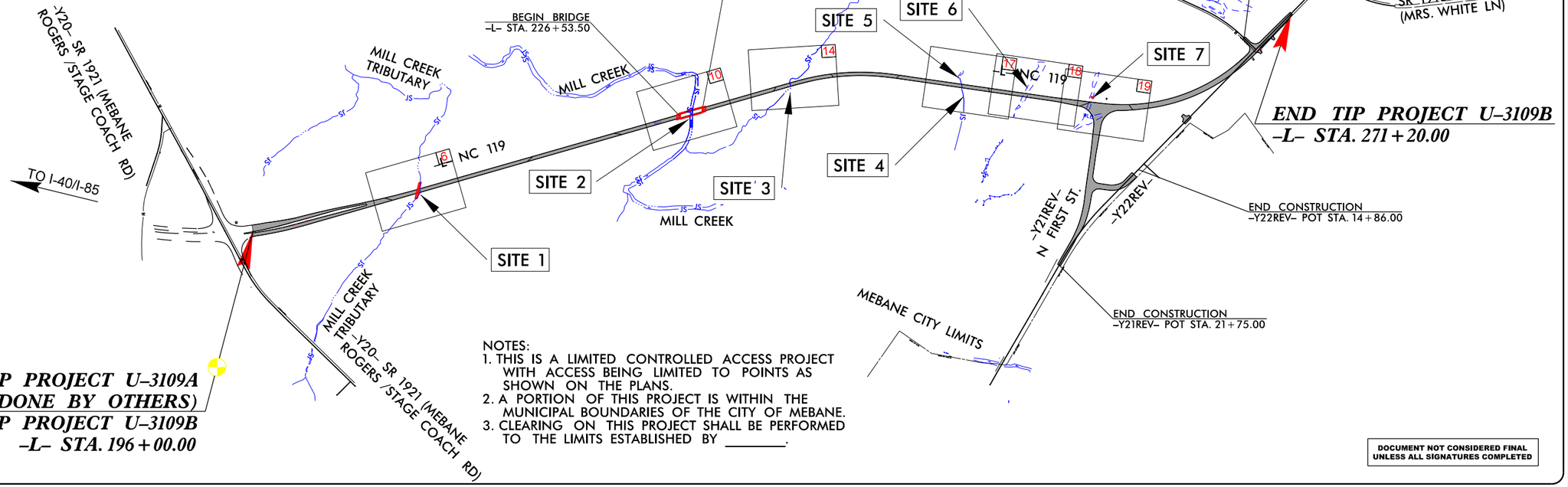
PERMIT DRAWING
SHEET 1 OF 22

LOCATION: *NC 119 RELOCATION FROM NORTH OF SR 1921 (MEBANE ROGERS/STAGE COACH ROAD) TO SOUTH OF SR 1918 (MRS. WHITE LANE)*

TYPE OF WORK: *GRADING, PAVING, DRAINAGE, SIGNALS, AND STRUCTURE*

WETLAND AND SURFACE WATER IMPACTS PERMIT

04/10/2018



END TIP PROJECT U-3109B
-L- STA. 271+20.00

END TIP PROJECT U-3109A
(TO BE DONE BY OTHERS)
BEGIN TIP PROJECT U-3109B
-L- STA. 196+00.00

NOTES:
1. THIS IS A LIMITED CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.
2. A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF MEBANE.
3. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY _____.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT:

GRAPHIC SCALES

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

DESIGN DATA

ADT 2018 = 8,809
ADT 2038 = 10,983
K = 9 %
D = 65 %
T = 5 % *
V = 50 MPH
(* TTST = 4% + DUAL 1%)
FUNC CLASS = MAJOR COLLECTOR REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3109B ..... 1.394 mi
LENGTH STRUCTURE TIP PROJECT U-3109B ..... 0.030 mi
TOTAL LENGTH OF TIP PROJECT U-3109B ..... 1.424 mi

PLANS PREPARED BY:

DRMP ENGINEERS PLANNERS SCIENTISTS
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NORTH CAROLINA 28210
(704) 332-2289
NC LICENSE NO. C-2213

FOR DIVISION OF HIGHWAYS

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
AUGUST 30, 2017

LETTING DATE:
JULY 17, 2018

CHRISTOPHER K. HAIRE, PE
PROJECT ENGINEER
MICHAEL D. HAGE, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT:
TATIA L. WHITE, PE, PLS
SENIOR PROJECT MANAGER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

2/23/2018 3:54:02 PM
R:\U3109B Hydraulics\PERMITS_Environmental\Drawings\U3109B_Hyd_prm_tsh.dgn
ZMeg

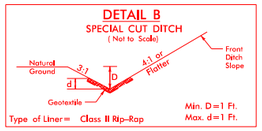
8/17/99

REVISIONS

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)

FROM STA. 196+50 TO STA. 199+50 –L– LT
FROM STA. 196+00 TO STA. 198+50 –L– RT
FROM STA. 203+00 TO STA. 205+00 –L– RT
FROM STA. 203+50 TO STA. 205+97 –L– LT
FROM STA. 208+71 TO STA. 211+00 –L– RT
FROM STA. 212+50 TO STA. 213+50 –L– RT
FROM STA. 213+65 TO STA. 214+00 –L– RT
FROM STA. 218+00 TO STA. 220+00 –L– RT
FROM STA. 222+00 TO STA. 224+40 –L– LT
FROM STA. 224+00 TO STA. 224+60 –L– LT
FROM STA. 229+90 TO STA. 230+50 –L– LT
FROM STA. 230+00 TO STA. 232+00 –L– RT
FROM STA. 233+50 TO STA. 234+50 –L– LT
FROM STA. 243+00 TO STA. 245+50 –L– RT
FROM STA. 246+54 TO STA. 249+00 –L– RT
FROM STA. 249+00 TO STA. 250+50 –L– RT
FROM STA. 243+06 TO STA. 246+23 –L– LT
FROM STA. 253+76 TO STA. 255+50 –L– LT
FROM STA. 17+50 TO STA. 18+00 –Y21REV– RT
FROM STA. 19+50 TO STA. 21+50 –Y21REV– RT

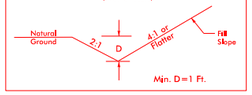
DETAIL B
SPECIAL CUT DITCH
(Not to Scale)



Type of Liner= Class II Rip-Rap

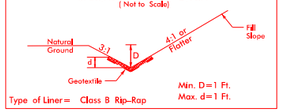
FROM STA. 235+65 TO STA. 237+00 –L– LT

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



FROM STA. 251+50 TO STA. 252+50 –L– RT

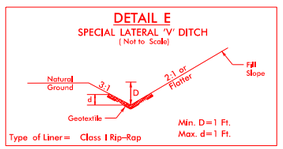
DETAIL D
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= Class B Rip-Rap

FROM STA. 249+50 TO STA. 250+50 –L– RT

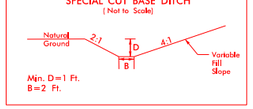
DETAIL E
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= Class I Rip-Rap

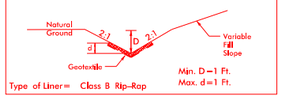
FROM STA. 245+50 TO STA. 246+54 –L– RT

DETAIL G
SPECIAL CUT BASE DITCH
(Not to Scale)



FROM STA. 16+50 TO STA. 17+50 –Y21REV– LT
FROM STA. 18+00 TO STA. 19+50 –Y21REV– RT
FROM STA. 11+00 TO STA. 12+00 –Y22REV– RT

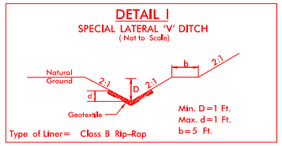
DETAIL H
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= Class B Rip-Rap

FROM STA. 257+11 TO STA. 259+00 –L– LT

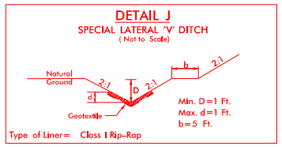
DETAIL I
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= Class B Rip-Rap

FROM STA. 208+00 TO STA. 209+00 –L– LT

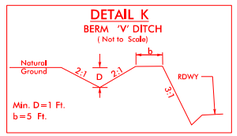
DETAIL J
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= Class I Rip-Rap

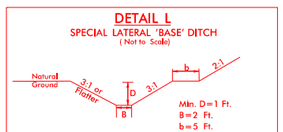
FROM STA. 207+00 TO STA. 208+00 –L– LT

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



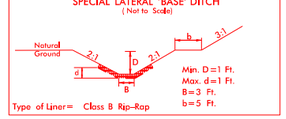
FROM STA. 231+82 TO STA. 234+00 –L– LT
FROM STA. 237+00 TO STA. 243+06 –L– LT
FROM STA. 243+06 TO STA. 246+00 –L– LT

DETAIL L
SPECIAL LATERAL 'BASE' DITCH
(Not to Scale)



FROM STA. 206+00 TO STA. 207+17 –L– RT
FROM STA. 226+00 TO STA. 226+86 –L– RT
FROM STA. 227+22 TO STA. 227+41 –L– RT
FROM STA. 234+50 TO STA. 237+00 –L– RT

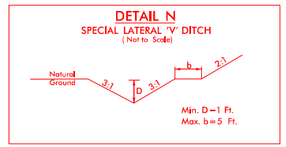
DETAIL M
SPECIAL LATERAL 'BASE' DITCH
(Not to Scale)



Type of Liner= Class B Rip-Rap

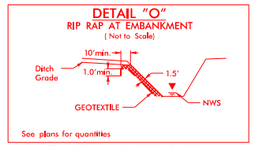
FROM STA. 235+65 TO STA. 237+00 –L– LT

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



FROM STA. 207+34 TO STA. 208+71 –L– RT
FROM STA. 234+50 TO STA. 235+50 –L– LT
FROM STA. 249+78 TO STA. 251+00 –L– LT
FROM STA. 251+00 TO STA. 253+00 –L– LT
FROM STA. 253+77 TO STA. 255+50 –L– LT
FROM STA. 250+50 TO STA. 253+69 –L– RT
FROM STA. 253+69 TO STA. 255+28 –L– RT
FROM STA. 11+90 TO STA. 14+00 –Y21REV– RT
FROM STA. 10+50 TO STA. 13+50 –Y21REV– LT

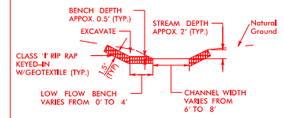
DETAIL "O"
RIP RAP AT EMBANKMENT
(Not to Scale)



See plans for quantities

STA. 207+00 –L– RT NWS=581.2
STA. 207+38 –L– RT NWS=581.2
STA. 207+99 –L– LT NWS=578.1
STA. 208+20 –L– LT NWS=578.1
STA. 226+87 –L– RT NWS=539.9
STA. 227+24 –L– RT NWS=539.9
STA. 235+65 –L– LT NWS=N/A
STA. 235+77 –L– LT NWS=N/A

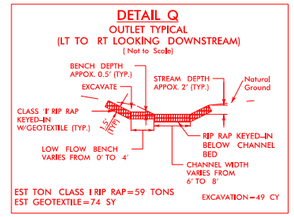
DETAIL P
INLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
(Not to Scale)



EST TON CLASS I RIP RAP=27 TONS
EST GEOTEXTILE=34 SY
EXCAVATION=26 CY

STA. 207+44 –L– RT NWS 581.2

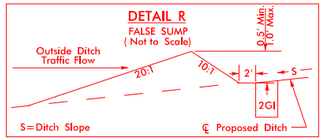
DETAIL Q
OUTLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
(Not to Scale)



EST TON CLASS I RIP RAP=59 TONS
EST GEOTEXTILE=74 SY
EXCAVATION=49 CY

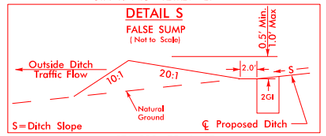
STA. 208+00 –L– LT NWS=578.1

DETAIL R
FALSE SUMP
(Not to Scale)



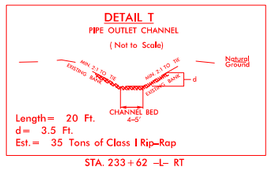
STA. 213+10 –L– LT
STA. 224+70 –L– LT
STA 19+43 –Y21REV– LT

DETAIL S
FALSE SUMP
(Not to Scale)



STA. 229+75 –L– LT

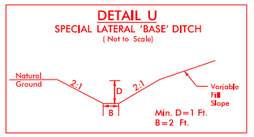
DETAIL T
PIPE OUTLET CHANNEL
(Not to Scale)



Length= 20 Ft.
d= 3.5 Ft.
Est.= 35 Tons of Class I Rip-Rap

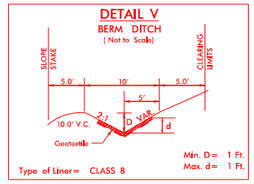
STA. 233+62 –L– RT

DETAIL U
SPECIAL LATERAL 'BASE' DITCH
(Not to Scale)



FROM STA. 246+23 TO STA. 248+00 –L– LT

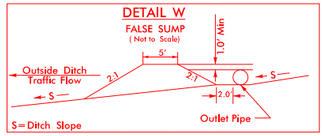
DETAIL V
BERM DITCH
(Not to Scale)



Type of Liner= CLASS B

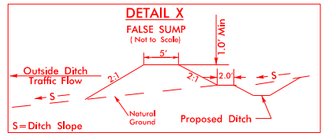
FROM STA. 237+00 TO STA. 239+00 –L– LT

DETAIL W
FALSE SUMP
(Not to Scale)



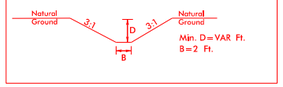
STA. 262+50 –L– LT

DETAIL X
FALSE SUMP
(Not to Scale)



STA. 12+00 –Y22– RT

DETAIL Y
STANDARD BASE TAIL DITCH
(Not to Scale)

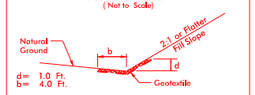


FROM STA. 262+74 TO STA. 262+84 –L– RT

DETAIL Z
STANDARD BASE TAIL DITCH
(Not to Scale)

FROM STA. 19+50 TO STA. 20+00 –Y21REV– RT

DETAIL AA
TOE PROTECTION
(Not to Scale)



Type of Liner= Class B Rip-Rap

FROM STA. 256+75.00 TO STA. 258+50 –L– RT

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	DETAILS-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PLANS PREPARED BY:

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PERMIT DRAWING
SHEET 2 OF 22

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8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	2D-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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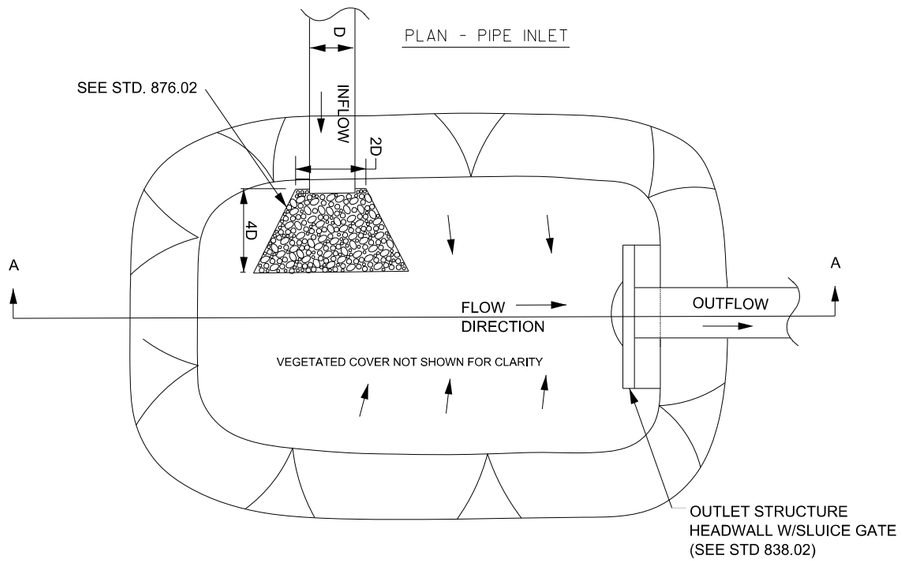
SHEET 3 OF 22

HAZARDOUS SPILL BASIN DETAIL

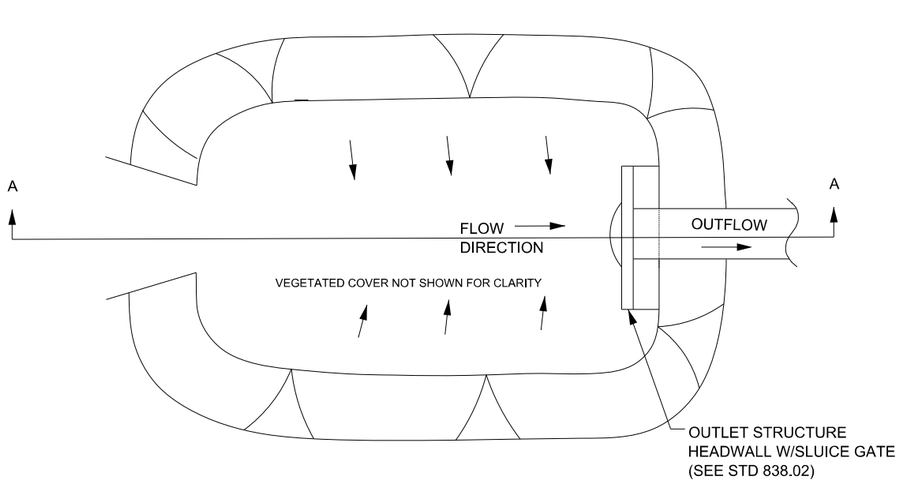
NOT TO SCALE

BASIN LAYOUT POINTS AND ELEVATIONS																		
POINT	HSB1: Station 206+00 LT			HSB2: Station 205+00 RT			HSB3: Station 210+00 LT			HSB4: Station 224+50 RT			HSB5: Station 229+50 RT			HSB6: Station 256+50		
LOCATION	NORTH	EAST	RADIUS	NORTH	EAST	RADIUS	NORTH	EAST	RADIUS	NORTH	EAST	RADIUS	NORTH	EAST	RADIUS	NORTH	EAST	RADIUS
1	859,689.08	1,915,820.16	1.0'	859,560.97	1,915,873.55	1.0'	860,029.51	1,915,971.64	5.0'	861,330.71	1,916,666.15	4.0'	861,783.71	1,916,853.70	4.0'	863,900.08	1,918,445.04	8.0'
2	859,683.87	1,915,832.07	1.0'	859,555.75	1,915,885.46	1.0'	860,027.50	1,915,976.21	5.0'	861,323.42	1,916,682.76	4.0'	861,777.34	1,916,868.21	4.0'	863,891.81	1,918,463.99	8.0'
3	859,733.04	1,915,839.45	1.0'	859,604.93	1,915,892.84	1.0'	860,056.98	1,915,983.69	5.0'	861,368.32	1,916,675.01	4.0'	861,845.42	1,916,882.17	4.0'	863,935.33	1,918,479.52	8.0'
4	859,726.33	1,915,850.41	1.0'	859,727.82	1,915,851.35	1.0'	860,054.97	1,915,988.27	5.0'	861,358.22	1,916,698.03	4.0'	861,839.59	1,916,893.90	4.0'	863,927.05	1,918,498.47	8.0'
	INLET/BASE ELEV = 595.0'			INLET/BASE ELEV = 596.0'			INLET/BASE ELEV = 589.0'			INLET/BASE ELEV = 566.0'			INLET/BASE ELEV = 571.0'			INLET/BASE ELEV = 612.0'		
	STORAGE ELEV = 596.8'			STORAGE ELEV = 596.8'			STORAGE ELEV =591.1'			STORAGE ELEV = 567.6'			STORAGE ELEV = 572.2'			STORAGE ELEV = 613.4'		
	BERM/TOP ELEV = 598.0'			BERM/TOP ELEV = 599.0'			BERM/TOP ELEV = 593.0'			BERM/TOP ELEV = 569.0'			BERM/TOP ELEV = 576.0'			BERM/TOP ELEV = 615.0'		
	OUTLET ELEV = 594.8			OUTLET ELEV = 595.8			OUTLET ELEV = 588.8'			OUTLET ELEV = 565.8'			OUTLET ELEV = 570.8'			OUTLET ELEV = 610.8'		

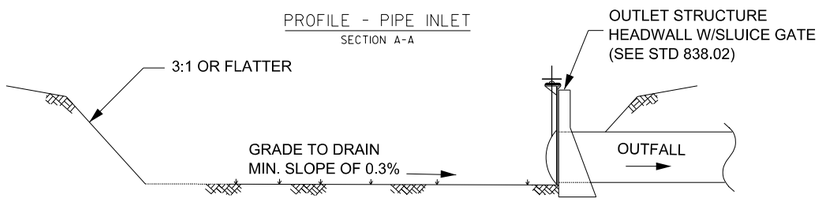
PLAN - PIPE INLET



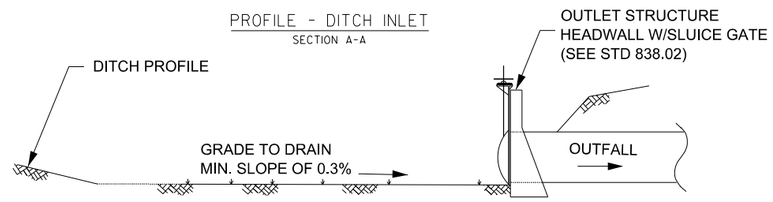
PLAN - DITCH INLET



PROFILE - PIPE INLET
SECTION A-A



PROFILE - DITCH INLET
SECTION A-A



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PROJECT REFERENCE NO.	SHEET NO.
U-3109B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 4 OF 22

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REVISIONS

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

NAD 83/95

SA SITE 1

6

MATCH LINE -L- STA. 204+10 SEE SHEET 4

MATCH LINE -L- STA. 218+00 SEE SHEET 6

N 09°08'29" W 62.74'

EIP

N 88°51'31" E 124.90'

N 09°13'17" W 506.75'

NCDOT

BM II

915

NCDOT formerly SWATHMORE FARM DB 3371 PG 501

48" WW FENCE

-L- +50.00 180.00' LT

-LX- POC Sta.18+90.85 = -L- POT Sta.207+99.46, 27' RT

SPECIAL CUT DITCH SEE DETAIL "A"

SPECIAL LATERAL 'V' DITCH SEE DETAIL "J"

HEADWALL W/ SLUICE GATE INV=594.80

CLASS I RIP RAP W/GEOTEXTILE (TYPICAL) SEE DETAIL "Q"

CLASS B RIP RAP W/GEOTEXTILE SEE DETAIL "O"

SPECIAL LATERAL 'V' DITCH SEE DETAIL "I"

HEADWALL W/ SLUICE GATE INV=588.8

CL B RIP RAP EST 1 TON EST 5 SY

CL I RIP RAP EST 7 TON EST 15 SY

HSB 1 See PSH Details-2

HSB 2 See PSH Details-2

HSB 3 See PSH Details-2

18" ELBOW

TIE FENCE TO ENDWALL

-L- +88.58

-L- +18.81

-L- +21.65

-L- +62.55

15" RCP-IV

24" RCP-III NOT BURIED

GREU, TL-3

10' PS

4' PS

8:1

-L- +50.00 BEGIN SBG

-L- +45.00 BEGIN SBG

-L- +75.00 END SBG

-L- +02.00 END SBG

CL I RIP RAP EST 4 TON EST 10 SY

CLASS B RIP RAP W/GEOTEXTILE EST 4 TONS EST 5 SY GF SEE DETAIL "O"

SPECIAL LATERAL 'V' DITCH SEE DETAIL "F"

CLASS I RIP RAP W/GEOTEXTILE (TYPICAL) SEE DETAIL "P"

CLASS B RIP RAP W/GEOTEXTILE EST 5 TONS EST 7 SY GF SEE DETAIL "O"

SPECIAL LATERAL 'BASE' DITCH SEE DETAIL "L"

SPECIAL CUT DITCH SEE DETAIL "A"

600' TAPER

CONSERVATION EASEMENT

EXISTING R/W

-BL-50

-BL-51

-BL-52

-BL-53

MARSHA ALTMEYER
DB 3389 PG 224
DB 3389 PG 220

N 25°13'50" E 323.06'

N 23° 41' 12.1" E

-LX-
PI Sta 16+41.11
△ = 5° 01' 26.4" (LT)
D = 1° 00' 18.7"
L = 499.81'
T = 250.06'
R = 5,700.00'
SE = SEE PLANS
RO = SEE PLANS

100' 0' 100'
1"=100'

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PROJECT REFERENCE NO.	SHEET NO.
U-3109B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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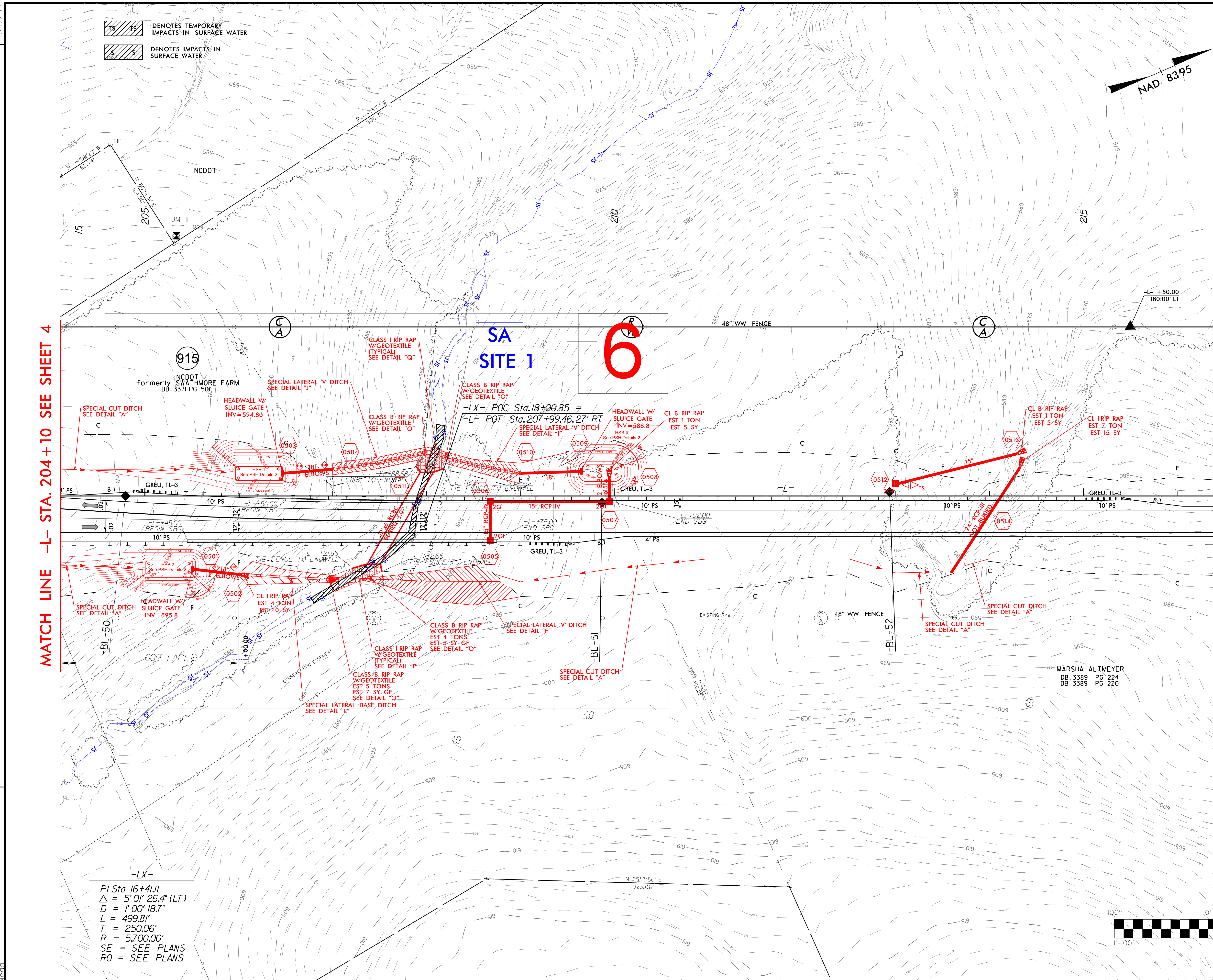
SHEET 5 OF 22



REVISIONS

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20' 0' 20'
SCALE 1"=20'

915

C A

SS DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SA
SITE 1

NAD 83/2011

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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SHEET 6 OF 22

DITCH "

HSB 1
See PSH Details-2

HSB 2
See PSH Details-2

HSB 3
See PSH Details-2

3' WIDE BERM

2 ELBOWS 18"

12'x6' RCBC BURIED 1.0'

15" RCP-IV

2GI

T DITCH "A"

CONSERVATION EASEMENT

-BL-51

REVISIONS

8/17/99

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Ford

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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SHEET 7 OF 22

8/17/99

REVISIONS

SINGLE BARREL CULVERT LOW FLOW CHANNEL AND SILLS

1 @ 12' x 6' W/SILLS AND BAFFLES
(NOT TO SCALE)

*NOTES:

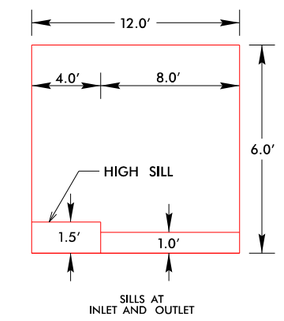
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT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

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

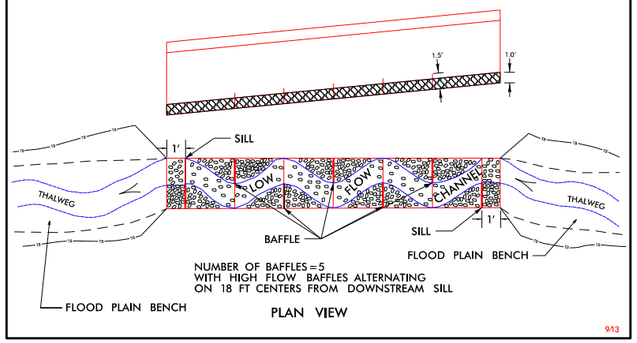
3) TOP OF LOW FLOW SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

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

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



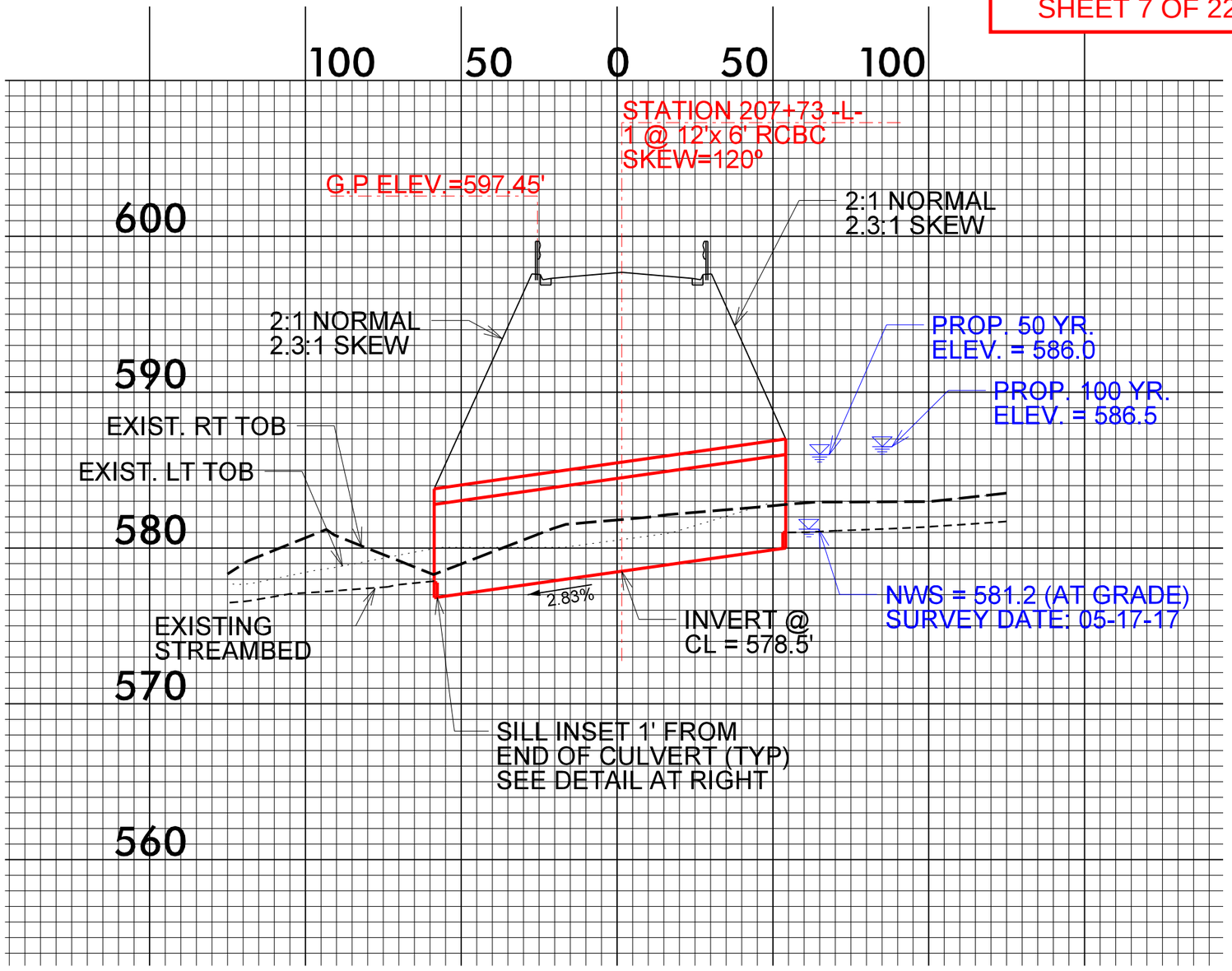
SILLS AT
INLET AND OUTLET



NUMBER OF BAFFLES = 5
WITH HIGH FLOW BAFFLES ALTERNATING
ON 18 FT CENTERS FROM DOWNSTREAM SILL

PLAN VIEW

9/13



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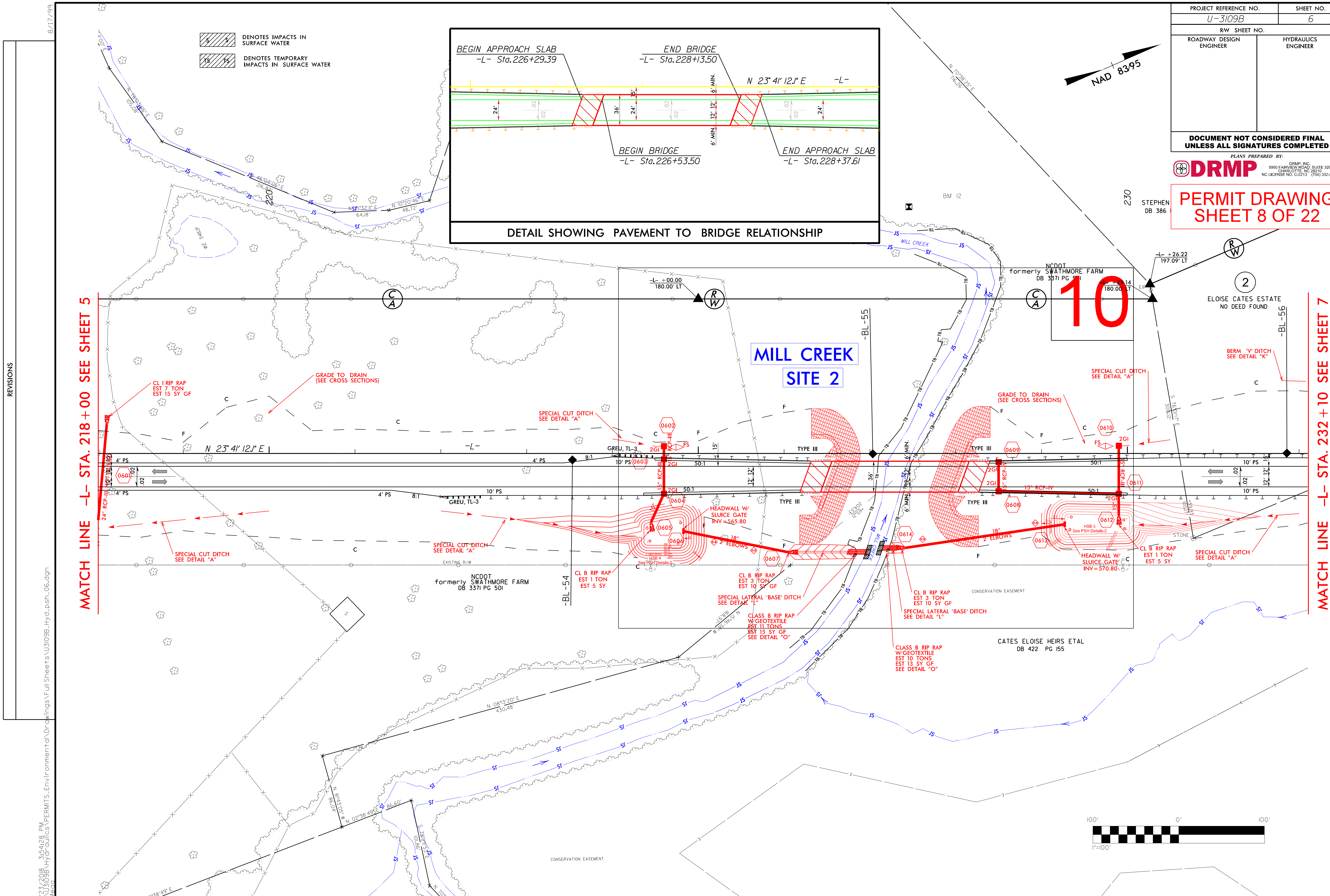
PROJECT REFERENCE NO. U-3109B
SHEET NO. 6
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
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PLANS PREPARED BY:
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PERMIT DRAWING SHEET 8 OF 22
NAD 83/95
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DETAIL SHOWING PAVEMENT TO BRIDGE RELATIONSHIP
BEGIN APPROACH SLAB -L- Sta.226+29.39
END BRIDGE -L- Sta.228+13.50
BEGIN BRIDGE -L- Sta.226+53.50
END APPROACH SLAB -L- Sta.228+37.61
N 23° 41' 12.1" E
MILL CREEK
SITE 2
10
MATCH LINE -L- STA. 218+00 SEE SHEET 5
MATCH LINE -L- STA. 232+10 SEE SHEET 7
NCDOT formerly SWATHMORE FARM DB 3371 PG 501
ELOISE CATES ESTATE NO DEED FOUND
CATES ELOISE HEIRS ETAL DB 422 PG 155
STEPHEN DB 386
CONSERVATION EASEMENT
GRADE TO DRAIN (SEE CROSS SECTIONS)
SPECIAL CUT DITCH SEE DETAIL "A"
CL I RIP RAP EST 7 TON EST 15 SY GF
CL B RIP RAP EST 1 TON EST 5 SY
CL B RIP RAP EST 3 TON EST 10 SY GF
SPECIAL LATERAL 'BASE' DITCH SEE DETAIL "L"
CLASS B RIP RAP W/GEOTEXTILE EST 11 TONS EST 15 SY GF SEE DETAIL "O"
CLASS B RIP RAP W/GEOTEXTILE EST 10 TONS EST 13 SY GF SEE DETAIL "O"
HEADWALL W/ SLUICE GATE INV=565.80
HEADWALL W/ SLUICE GATE INV=570.80
BERM "V" DITCH SEE DETAIL "K"
CL B RIP RAP EST 1 TON EST 5 SY
-BL-54
-BL-55
-BL-56
BM 12
1"=100'

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	6

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

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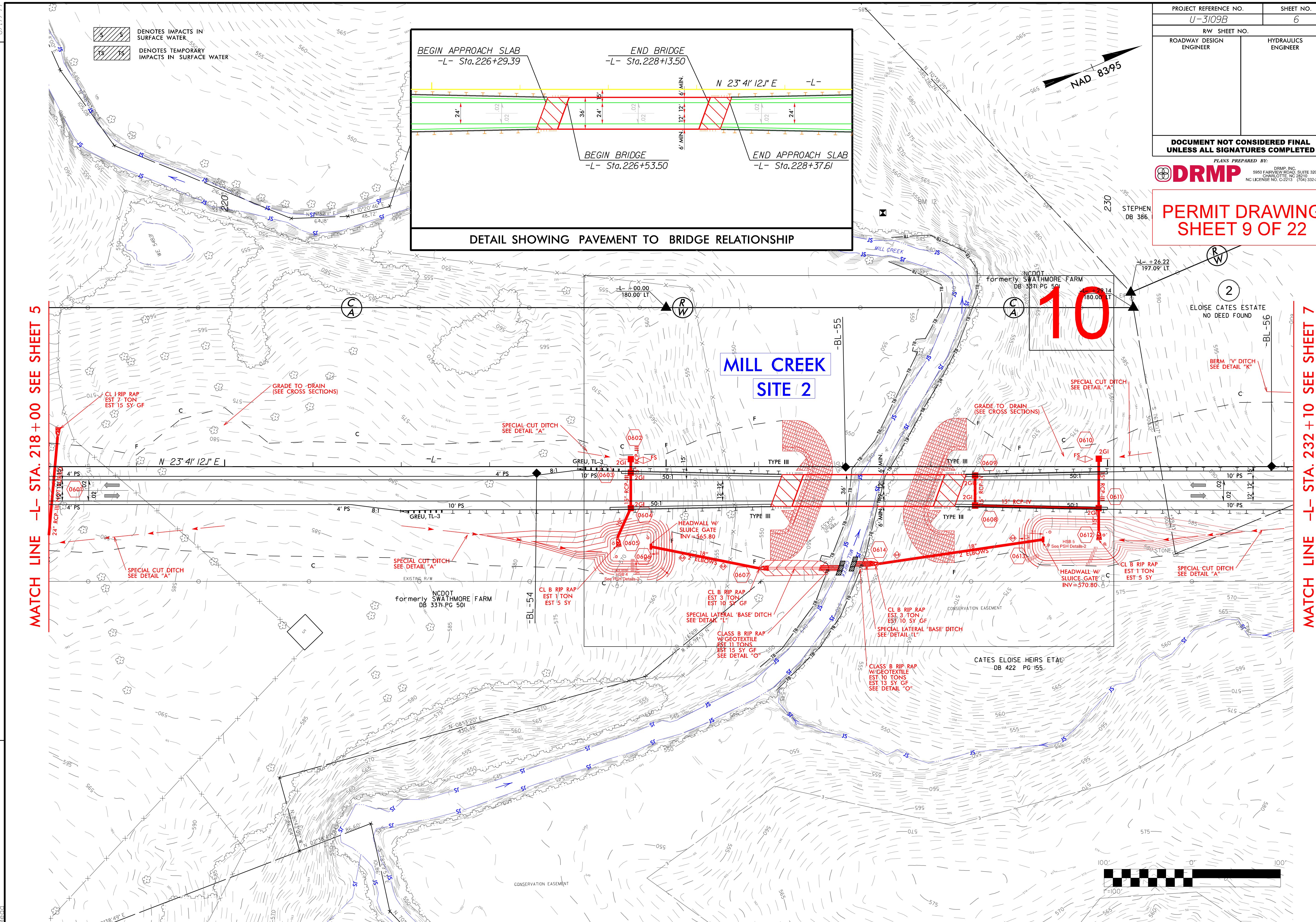
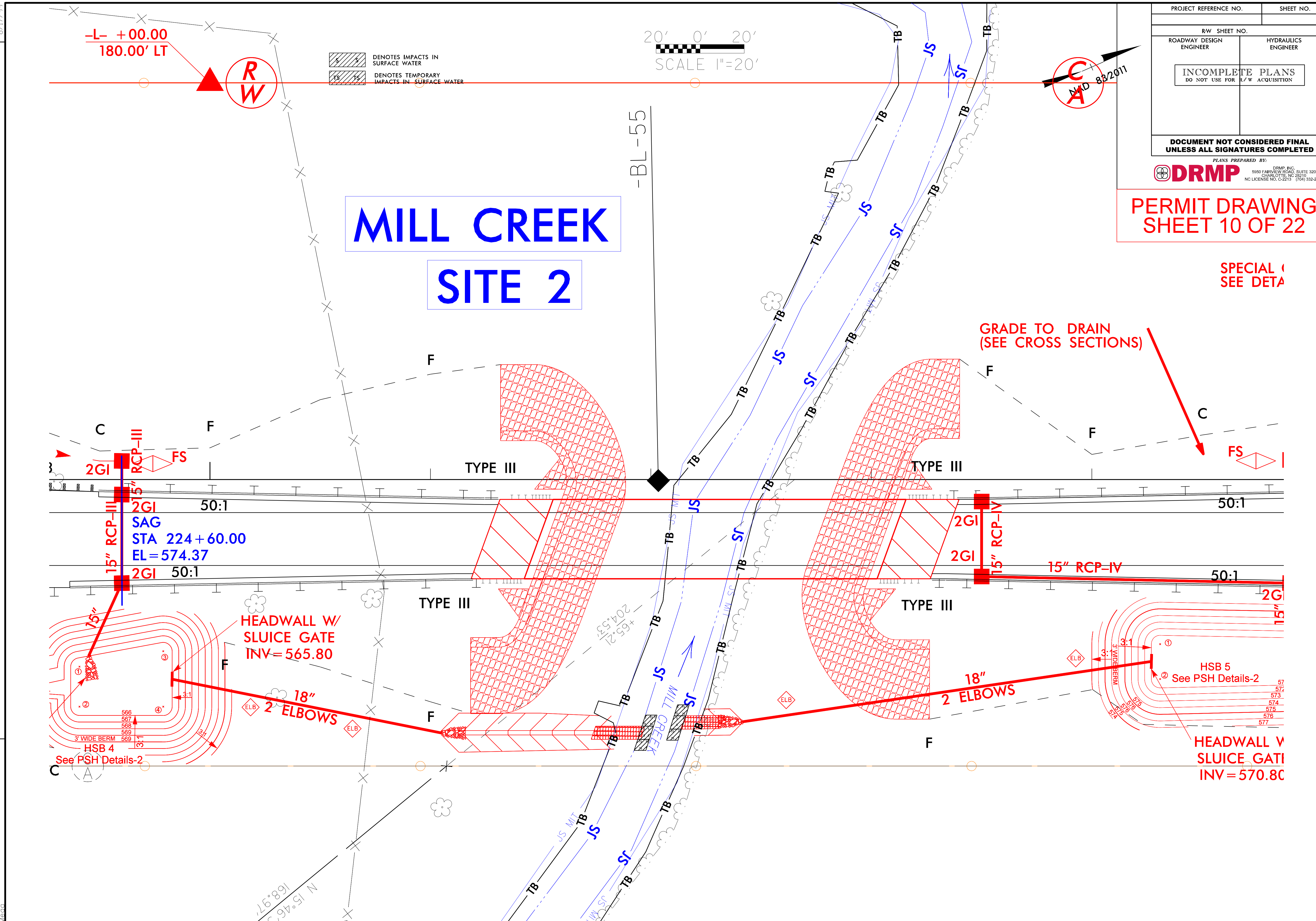
SHEET 9 OF 22



DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
BEGIN APPROACH SLAB -L- Sta.226+29.39
END BRIDGE -L- Sta.228+13.50
BEGIN BRIDGE -L- Sta.226+53.50
END APPROACH SLAB -L- Sta.228+37.61
N 23° 41' 12.1" E
DETAIL SHOWING PAVEMENT TO BRIDGE RELATIONSHIP
NAD 83/95
MILL CREEK
SITE 2
10
MATCH LINE -L- STA. 218+00 SEE SHEET 5
MATCH LINE -L- STA. 232+10 SEE SHEET 7
NCDOT formerly SWATHMORE FARM DB 3371 PG 501
ELOISE CATES ESTATE NO DEED FOUND
CATES ELOISE HEIRS ETAL DB 422 PG 155
CL I RIP RAP EST 7 TON EST 15 SY GF
GRADE TO DRAIN (SEE CROSS SECTIONS)
SPECIAL CUT DITCH SEE DETAIL "A"
HEADWALL W/ SLUICE GATE INV=565.80
HEADWALL W/ SLUICE GATE INV=570.80
CL B RIP RAP EST 1 TON EST 5 SY
CL B RIP RAP EST 3 TON EST 10 SY GF
SPECIAL LATERAL 'BASE' DITCH SEE DETAIL "L"
CLASS B RIP RAP W/ GEOTEXTILE EST 11 TONS EST 15 SY GF SEE DETAIL "O"
CLASS B RIP RAP W/ GEOTEXTILE EST 10 TONS EST 13 SY GF SEE DETAIL "O"
BERM 'V' DITCH SEE DETAIL "K"
CONSERVATION EASEMENT
-BL-54
-BL-55
-BL-56



MILL CREEK
SITE 2
PERMIT DRAWING
SHEET 10 OF 22
PROJECT REFERENCE NO.
SHEET NO.
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
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PLANS PREPARED BY:
DRMP
-L- +00.00
180.00' LT
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
20' 0' 20'
SCALE 1"=20'
-BL-55
GRADE TO DRAIN
(SEE CROSS SECTIONS)
TYPE III
50:1
SAG
STA 224+60.00
EL=574.37
15" RCP-III
15" RCP-IV
2GI
FS
HEADWALL W/
SLUICE GATE
INV=565.80
18"
2 ELBOWS
3' WIDE BERM
HSB 4
See PSH Details-2
HSB 5
See PSH Details-2
HEADWALL W/
SLUICE GATE
INV=570.80
MILL CREEK

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289

PERMIT DRAWING
SHEET 11 OF 22

REVISIONS 8/17/99

225+00 226+00 227+00 228+00 22

580 570 560 550 540

SAG ELEV. 574.8'
-L- STA. 224+60

PROPOSED GRADE

℄ STA. -L- 227+33.50
1@160'-6"-0" STEEL GIRDER
W/ 4" CAPS
SKEW 110°
G.P. ELEV. 576.03

(+)0.5000%

LOWEST LOW CORD

1.5:1 NORMAL TO SKEW

1.5:1 NORMAL TO SKEW

NG RT

GRADE POINT PROFILE

GRADE POINT PROFILE

NG RT

NG LT

NG LT

100 YR WS=555.1'

50 YR WS=554.5'

CLASS II RIP RAP (TYP)
KEY-IN 3.5'
1.5:1 NORMAL TO STREAM

100 YR THEORETICAL SCOUR

NWS AND WS ELEV.=539.9'
5/17/2017

500 YR THEORETICAL SCOUR

JS

℄

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PROJECT REFERENCE NO.	SHEET NO.
U-3109B	7

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

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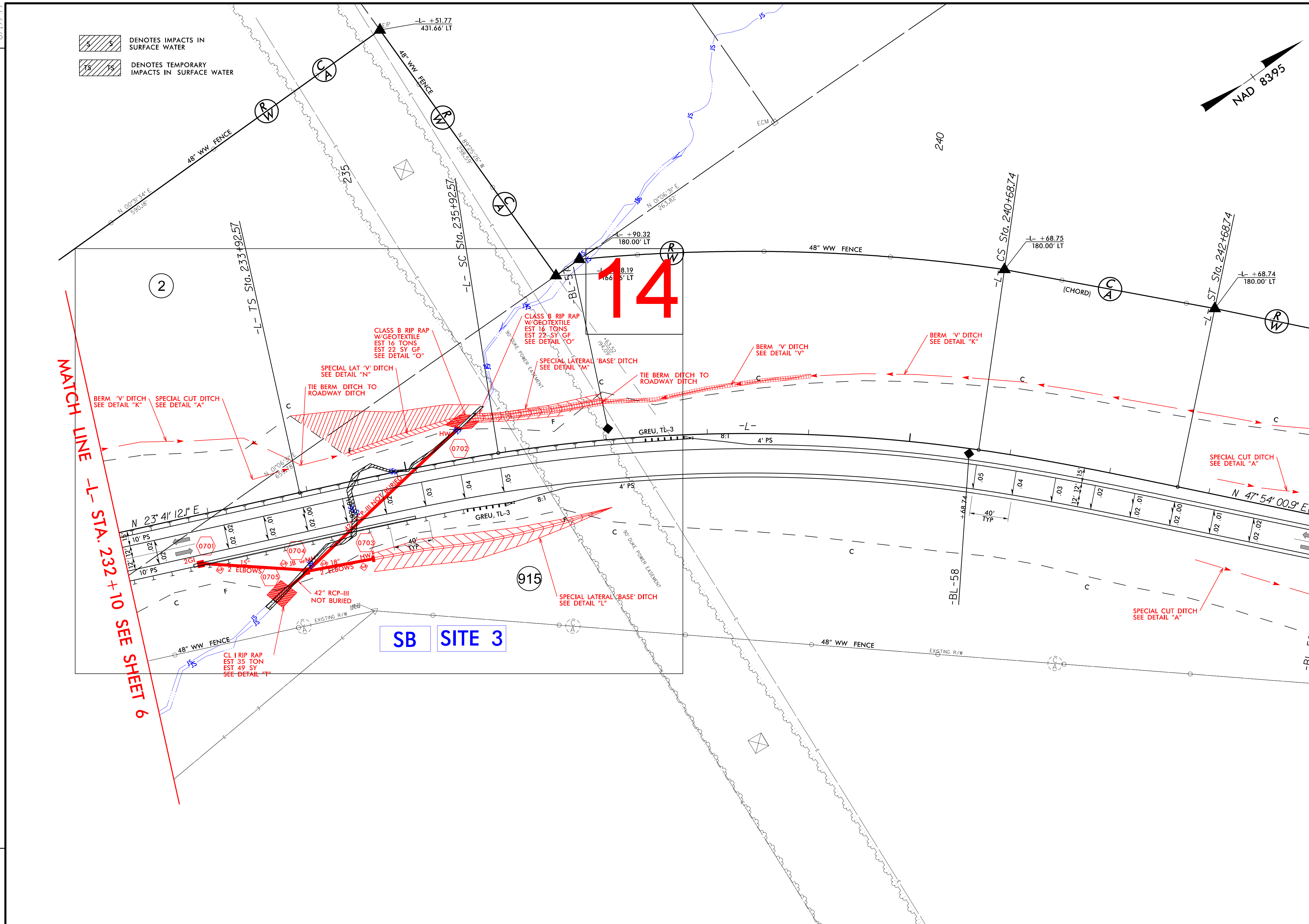
PERMIT DRAWING
SHEET 12 OF 22



DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
NAD 83/95
14
SB SITE 3
MATCH LINE -L- STA. 232+10 SEE SHEET 6
MATCH LINE -L- STA. 244+75 SEE SHEET 8
48" WW FENCE
-L- TS Sta. 233+92.57
-L- SC Sta. 235+92.57
-L- CS Sta. 240+68.74
-L- ST Sta. 242+68.74
N 23° 41' 12.1" E
N 47° 54' 00.9" E
CLASS B RIP RAP W/GEOTEXTILE EST 16 TONS EST 22 SY GF SEE DETAIL "O"
SPECIAL LAT 'V' DITCH SEE DETAIL "N"
TIE BERM DITCH TO ROADWAY DITCH
BERM 'V' DITCH SEE DETAIL "K"
SPECIAL CUT DITCH SEE DETAIL "A"
SPECIAL LATERAL 'BASE' DITCH SEE DETAIL "M"
BERM 'V' DITCH SEE DETAIL "V"
SPECIAL LATERAL 'BASE' DITCH SEE DETAIL "L"
42" RCP-III NOT BURIED
CL I RIP RAP EST 35 TON EST 49 SY SEE DETAIL "T"
GREU, TL-3
-BL-58
-BL-59

-L-

PIs Sta 235+25.93	PI Sta 238+32.43	PIs Sta 241+35.43
Θs = 3° 34' 51.6"	Δ = 17° 03' 05.7" (RT)	Θs = 3° 34' 51.6"
Ls = 200.00'	D = 3° 34' 51.6"	Ls = 200.00'
LT = 133.36'	L = 476.17'	LT = 133.36'
ST = 66.69'	T = 239.86'	ST = 66.69'
	R = 1,600.00'	
	SE = SEE PLANS	
	RO = SEE PLANS	

100' 0' 100'
1"=100'

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
U-3109B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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DRMP, INC.
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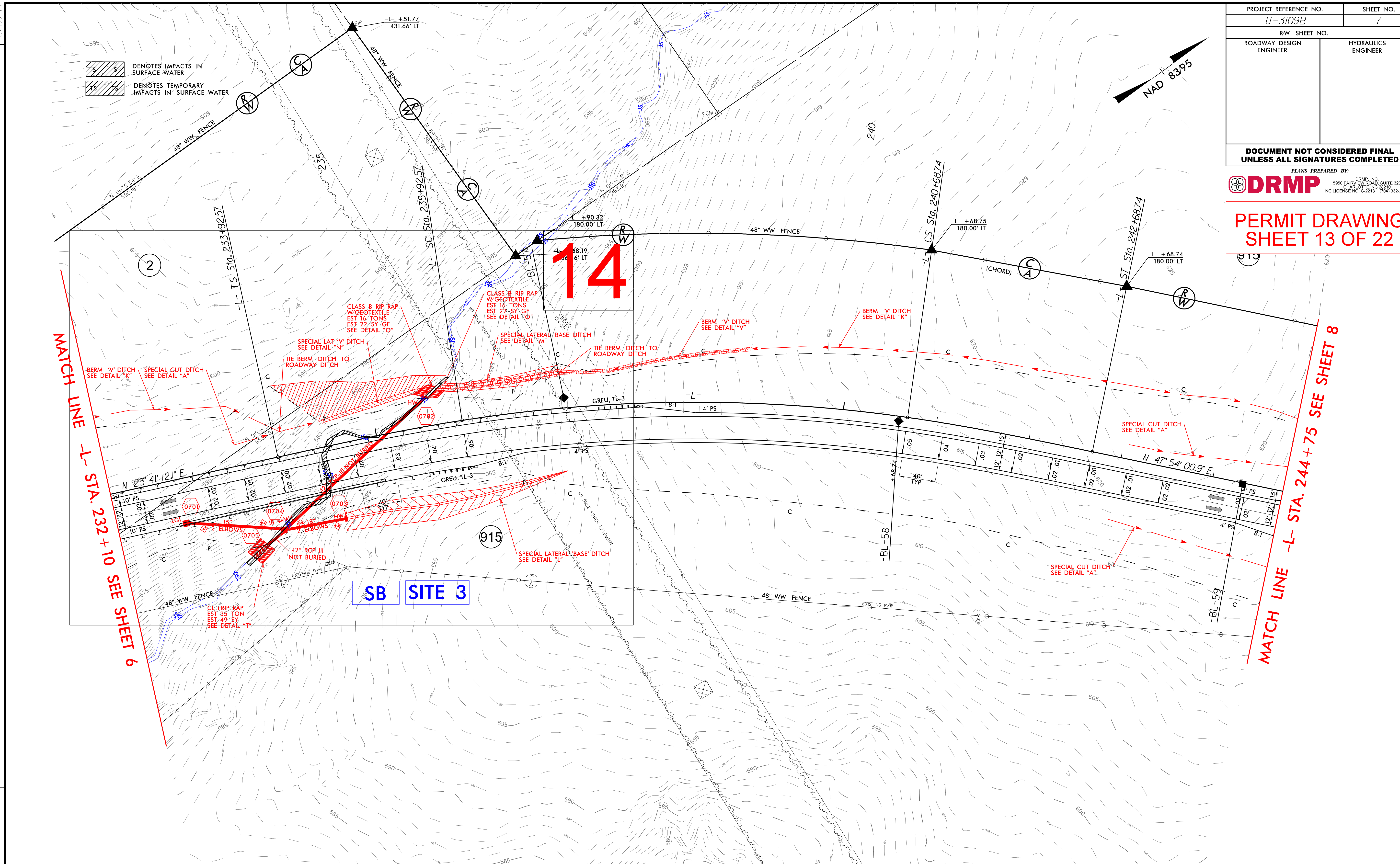
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289

PERMIT DRAWING SHEET 13 OF 22



DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
NAD 83/95
14
MATCH LINE -L- STA. 232+10 SEE SHEET 6
MATCH LINE -L- STA. 244+75 SEE SHEET 8
SB
SITE 3
-L- TS Sta. 233+92.57
-L- SC Sta. 235+92.57
-L- CS Sta. 240+68.74
-L- ST Sta. 242+68.74
48" WW FENCE
CLASS B RIP RAP W/GEOTEXTILE EST 16 TONS EST 22 SY GF SEE DETAIL "O"
SPECIAL LAT 'V' DITCH SEE DETAIL "N"
TIE BERM DITCH TO ROADWAY DITCH
BERM 'V' DITCH SEE DETAIL "K"
SPECIAL CUT DITCH SEE DETAIL "A"
SPECIAL LATERAL 'BASE' DITCH SEE DETAIL "M"
BERM 'V' DITCH SEE DETAIL "V"
SPECIAL LATERAL 'BASE' DITCH SEE DETAIL "L"
42" RCP-III NOT BURIED
CL I RIP RAP EST 35 TON EST 49 SY SEE DETAIL "T"
N 23° 41' 12.1" E
N 47° 54' 00.9" E
GREU, TL-3
-BL-58
-BL-59
915

-L-

PIs Sta 235+25.93	PI Sta 238+32.43	PIs Sta 241+35.43
Θs = 3° 34' 51.6"	Δ = 17° 03' 05.7" (RT)	Θs = 3° 34' 51.6"
Ls = 200.00'	D = 3° 34' 51.6"	Ls = 200.00'
LT = 133.36'	L = 476.17'	LT = 133.36'
ST = 66.69'	T = 239.86'	ST = 66.69'
	R = 1,600.00'	
	SE = SEE PLANS	
	RO = SEE PLANS	

100' 0' 100'
1"=100'

REVISIONS

8/17/99

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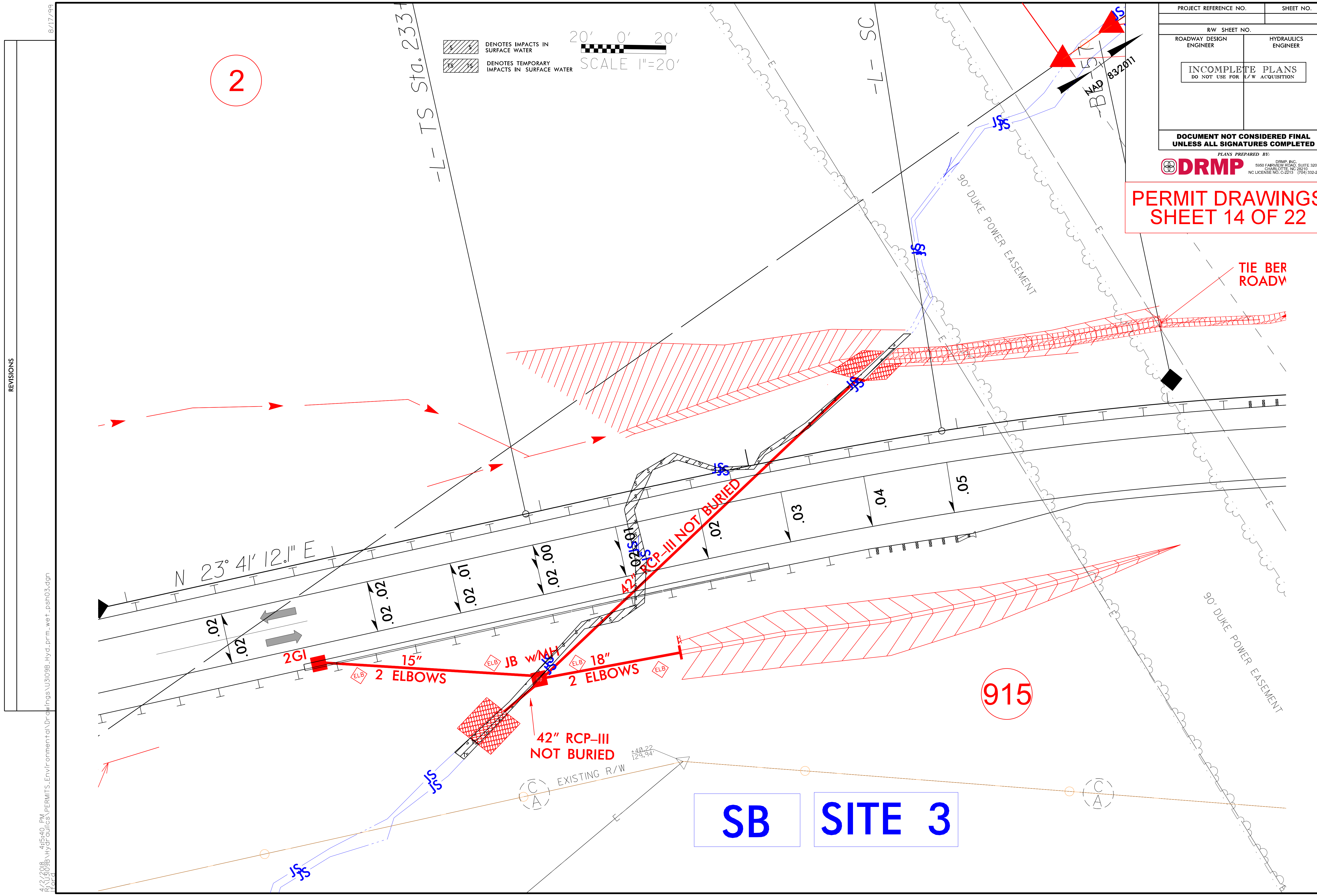

PROJECT REFERENCE NO.
SHEET NO.
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
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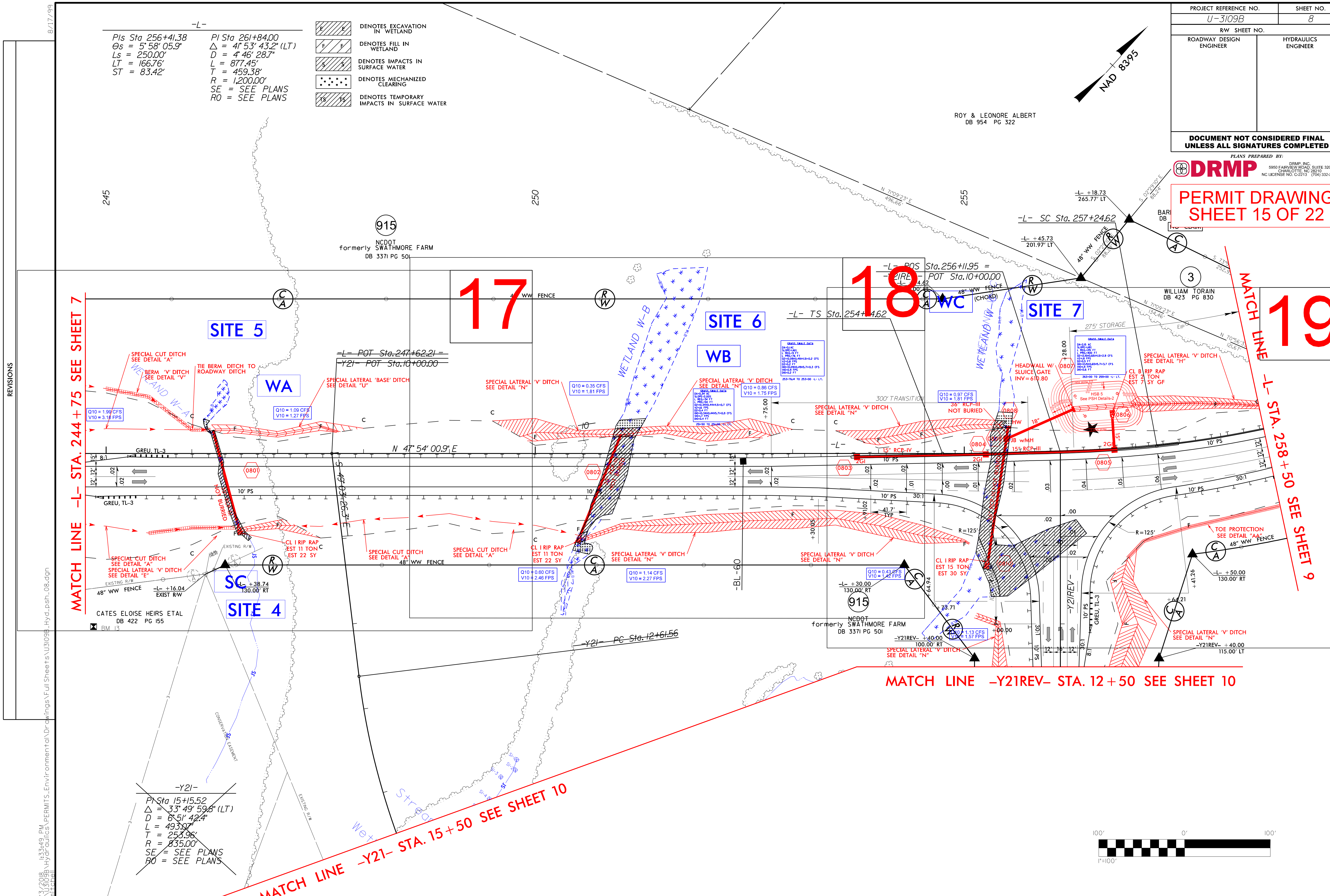
PLANS PREPARED BY:
DRMP
PERMIT DRAWINGS
SHEET 14 OF 22
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
SCALE 1"=20'
2
-L- TS Sta. 233+
-L- SC
NAD 83/2011
90' DUKE POWER EASEMENT
TIE BER
ROADW
N 23° 41' 12.1" E
2GI
15"
2 ELBOWS
JB w/MH
18"
2 ELBOWS
42" RCP-III NOT BURIED
42" RCP-III
NOT BURIED
EXISTING R/W
915
SB
SITE 3
REVISIONS



PROJECT REFERENCE NO. U-3109B
SHEET NO. 8
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
PLANS PREPARED BY:
DRMP
PERMIT DRAWING
SHEET 15 OF 22
NAD 83/95
-L-
PIs Sta 256+41.38
Θs = 5° 58′ 05.9″
Ls = 250.00′
LT = 166.76′
ST = 83.42′
PI Sta 261+84.00
Δ = 41° 53′ 43.2″ (LT)
D = 4° 46′ 28.7″
L = 877.45′
T = 459.38′
R = 1,200.00′
SE = SEE PLANS
RO = SEE PLANS
DENOTES EXCAVATION IN WETLAND
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
NCDOT formerly SWATHMORE FARM DB 3371 PG 501
ROY & LEONORE ALBERT DB 954 PG 322
WILLIAM TORAIN DB 423 PG 830
CATES ELOISE HEIRS ETAL DB 422 PG 155
SITE 4
SITE 5
SITE 6
SITE 7
WA
WB
WC
SC
17
18
19
-L- POT Sta. 247+62.21 = -Y21- POT Sta. 10+00.00
-L- POS Sta. 256+11.95 = -Y21REV- POT Sta. 10+00.00
-L- TS Sta. 254+14.62
-L- SC Sta. 257+24.62
N 47° 54′ 00.9″ E
-Y21- PC Sta. 12+61.56
MATCH LINE -L- STA. 244+75 SEE SHEET 7
MATCH LINE -L- STA. 258+50 SEE SHEET 9
MATCH LINE -Y21REV- STA. 12+50 SEE SHEET 10
MATCH LINE -Y21- STA. 15+50 SEE SHEET 10
-Y21-
PI Sta 15+15.52
Δ = 33° 49′ 59.8″ (LT)
D = 6° 51′ 42.4″
L = 493.07′
T = 253.96′
R = 835.00′
SE = SEE PLANS
RO = SEE PLANS

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PLANS PREPARED BY:

DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289

PERMIT DRAWING
SHEET 16 OF 22

-L-

PIs Sta 256+41.38
Θs = 5° 58′ 05.9″
Ls = 250.00′
LT = 166.76′
ST = 83.42′

PI Sta 261+84.00
△ = 41° 53′ 43.2″ (LT)
D = 4° 46′ 28.7″
L = 877.45′
T = 459.38′
R = 1,200.00′
SE = SEE PLANS
RO = SEE PLANS

▨ E	DENOTES EXCAVATION IN WETLAND
▨ F	DENOTES FILL IN WETLAND
▨ S	DENOTES IMPACTS IN SURFACE WATER
* * *	DENOTES MECHANIZED CLEARING
▨ TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

-Y21-

~~PI Sta 15+15.52~~
~~△ = 33° 49′ 59.8″ (LT)~~
~~D = 6° 51′ 42.4″~~
~~L = 493.07′~~
~~T = 253.96′~~
~~R = 835.00′~~
~~SE = SEE PLANS~~
~~RO = SEE PLANS~~

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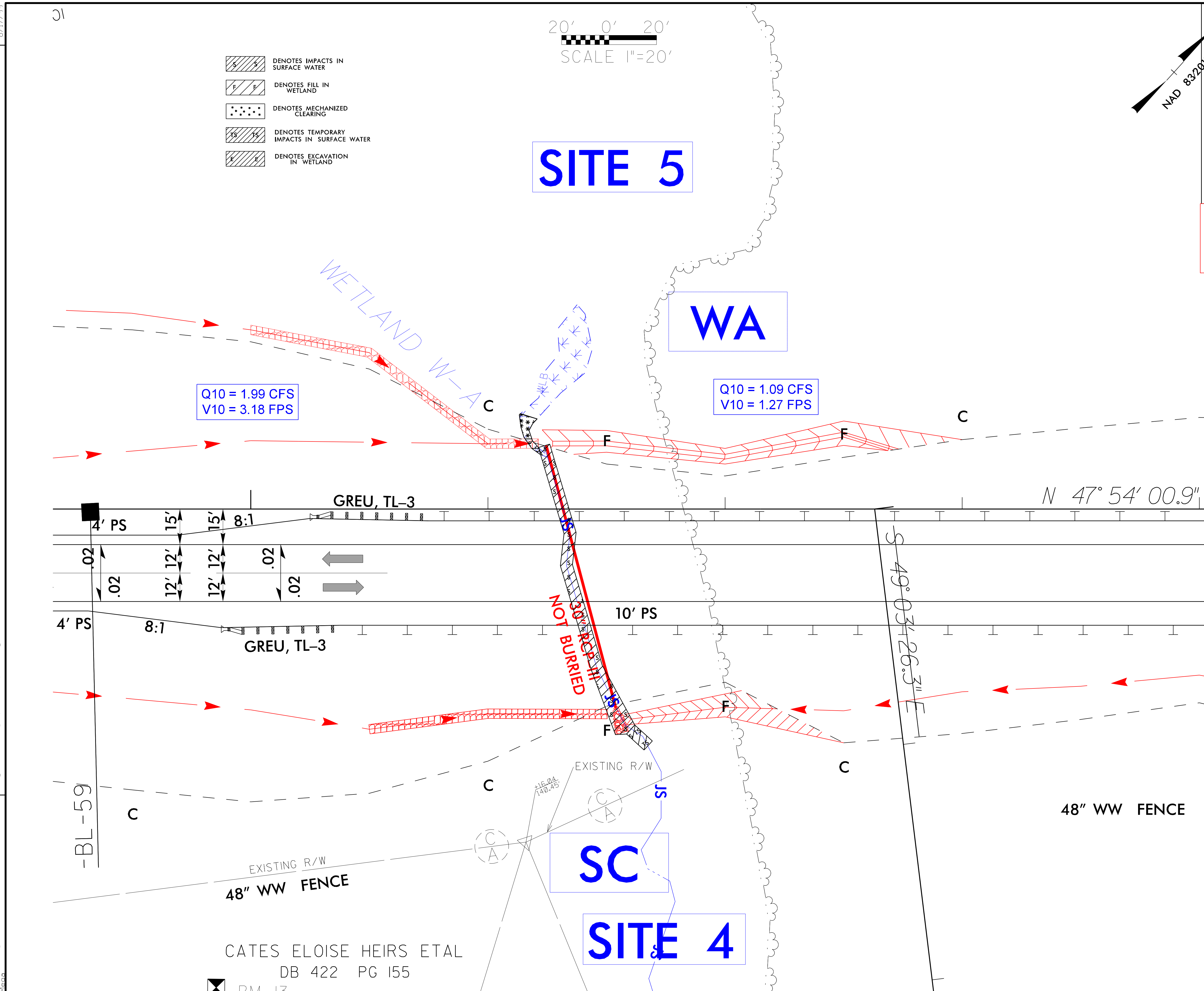
rmitchell



20' 0' 20'
SCALE 1"=20'
DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES EXCAVATION IN WETLAND
SITE 5
WETLAND W-A
WA
Q10 = 1.99 CFS
V10 = 3.18 FPS
Q10 = 1.09 CFS
V10 = 1.27 FPS
NAD 83/2011
GREU, TL-3
N 47° 54' 00.9" E
4' PS
8:1
10' PS
S 49° 03' 26.3" E
30" RCP-III
NOT BURIED
EXISTING R/W
48" WW FENCE
-BL-59-
SC
SITE 4
CATES ELOISE HEIRS ETAL
DB 422 PG 155
BM 13

PROJECT REFERENCE NO.	SHEET NO.

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 17 OF 22

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
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 18 OF 22

NAD 83/2011

20' 0' 20'
SCALE 1"=20'

F F DENOTES FILL IN WETLAND

F E DENOTES EXCAVATION IN WETLAND

DENOTES MECHANIZED CLEARING

SITE 6

WB

WETLAND W-B

WETLAND W-B

WLB

WLB

GRASS SWALE DATA
DA=0.1 AC
SLOPE=1.16%
L REQ.=9 FT
L PRO.=76 FT
Q2=(0.09)(0.49)(4.5)=0.2 CFS
V2=0.8 FPS
D2=0.2 FT
Q10=(0.09)(0.49)(5.7)=0.3 CFS
V10=0.9 FPS
D10=0.2 FT

253+76.14 TO 253+00 -L- LT.

Q10 = 0.35 CFS
V10 = 1.81 FPS

GRASS SWALE DATA
DA=0.34 AC
SLOPE=2.00%
L REQ.=34 FT
L PRO.=50 FT
Q2=(0.34)(0.44)(4.5)=0.7 CFS
V2=1.6 FPS
D2=0.4 FT
Q10=(0.34)(0.44)(5.7)=0.9 CFS
V10=1.7 FPS
D10=0.4 FT

251+50 TO 251+00 -L- LT.

Q10 = 0.86 CFS
V10 = 1.75 FPS

INV = 604.00

TOP = 619.25
INV = 616.50

15" RCP-I

2GI

0802

0803

30" RCP-III
NOT BURIED

.02

.02

.02

.02

C

F

Q10 = 0.60 CFS
V10 = 2.46 FPS

INV = 600.90

Q10 = 1.14 CFS
V10 = 2.27 FPS

CL I RIP RAP
EST 11 TON
EST 22 SY

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8/17/99

REVISIONS

20' 0' 20'
SCALE 1"=20'

DENOTES FILL IN WETLAND

DENOTES EXCAVATION IN WETLAND

DENOTES MECHANIZED CLEARING

WC

SITE 7

WETLAND W-C

WLB

GRASS SWALE DATA

DA=2.15 AC
SLOPE=1.18%
L REQ.=215 FT
L PRO.=400 FT
Q2=(2.15)(0.65)(4.5)=2.9 CFS
V2=1.8 FPS
D2=0.5 FT
Q10=(2.15)(0.65)(5.7)=3.7 CFS
V10=1.9 FPS
D10=0.6 FT

263+00 TO 259+00 -L- LT.

3' WIDE BERM

HSB 5
See PSH Details-2

3' WIDE BERM

Q10 = 0.97 CFS
V10 = 1.81 FPS

24"

15" RCP-IV

2GI

JB w/MH

15" RCP-III

2GI

15"

2GI

36" RCP-III NOT BURIED

.02 .02 .02 .02 .02 .01 .00 .01 .02 .03 .04 .05 .06

.00
.02
.01
.02
.02

Q10 = 0.43 CFS
V10 = 1.42 FPS

Q10 = 1.13 CFS
V10 = 1.57 FPS

SPECIAL LATERAL 'V' DITCH
SEE DETAIL "N"

NAD 83/2011

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

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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SHEET 19 OF 22

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6/23/16

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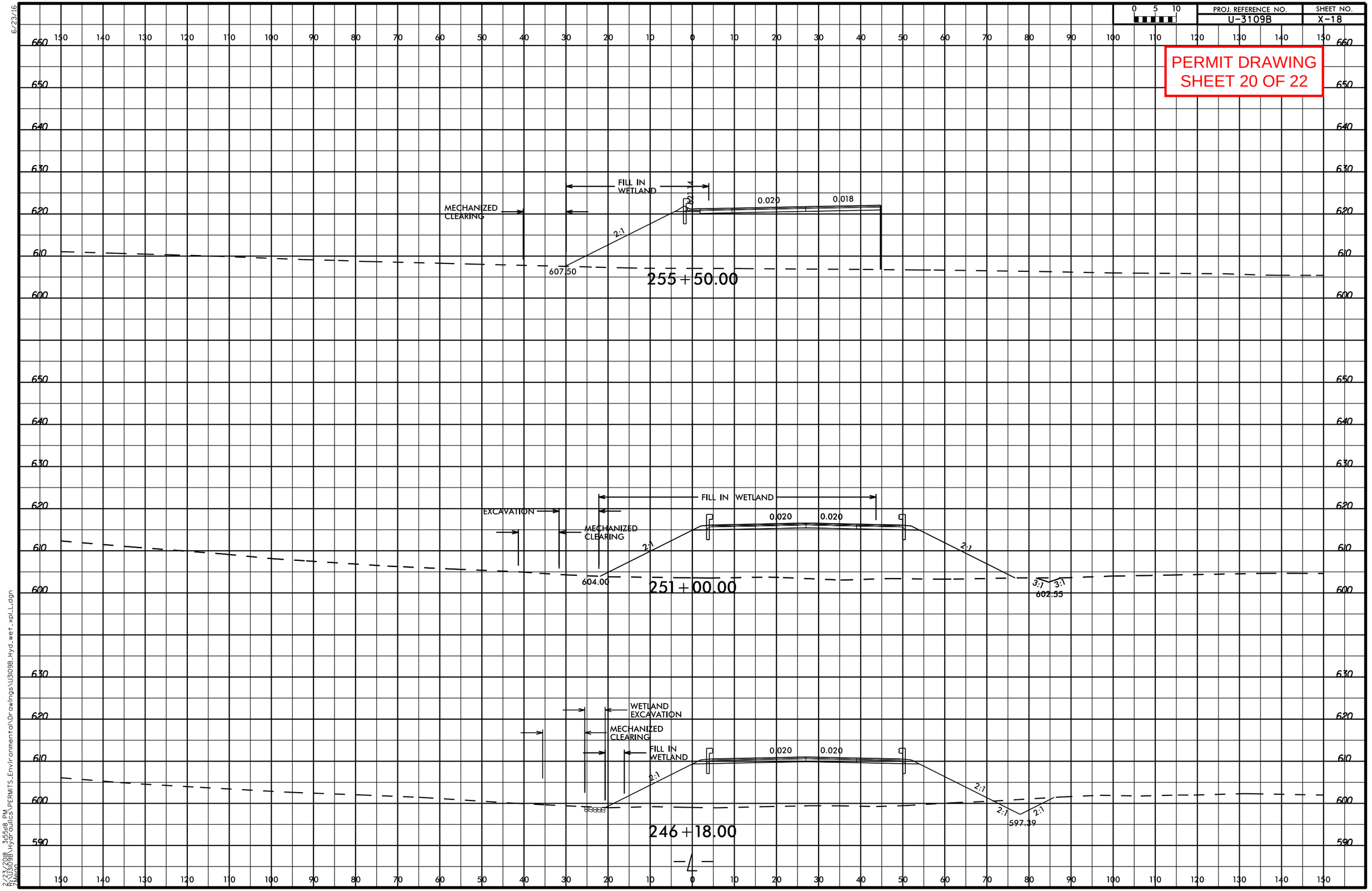
	U-3109B	X-18

PERMIT DRAWING
SHEET 20 OF 22



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6/23/16

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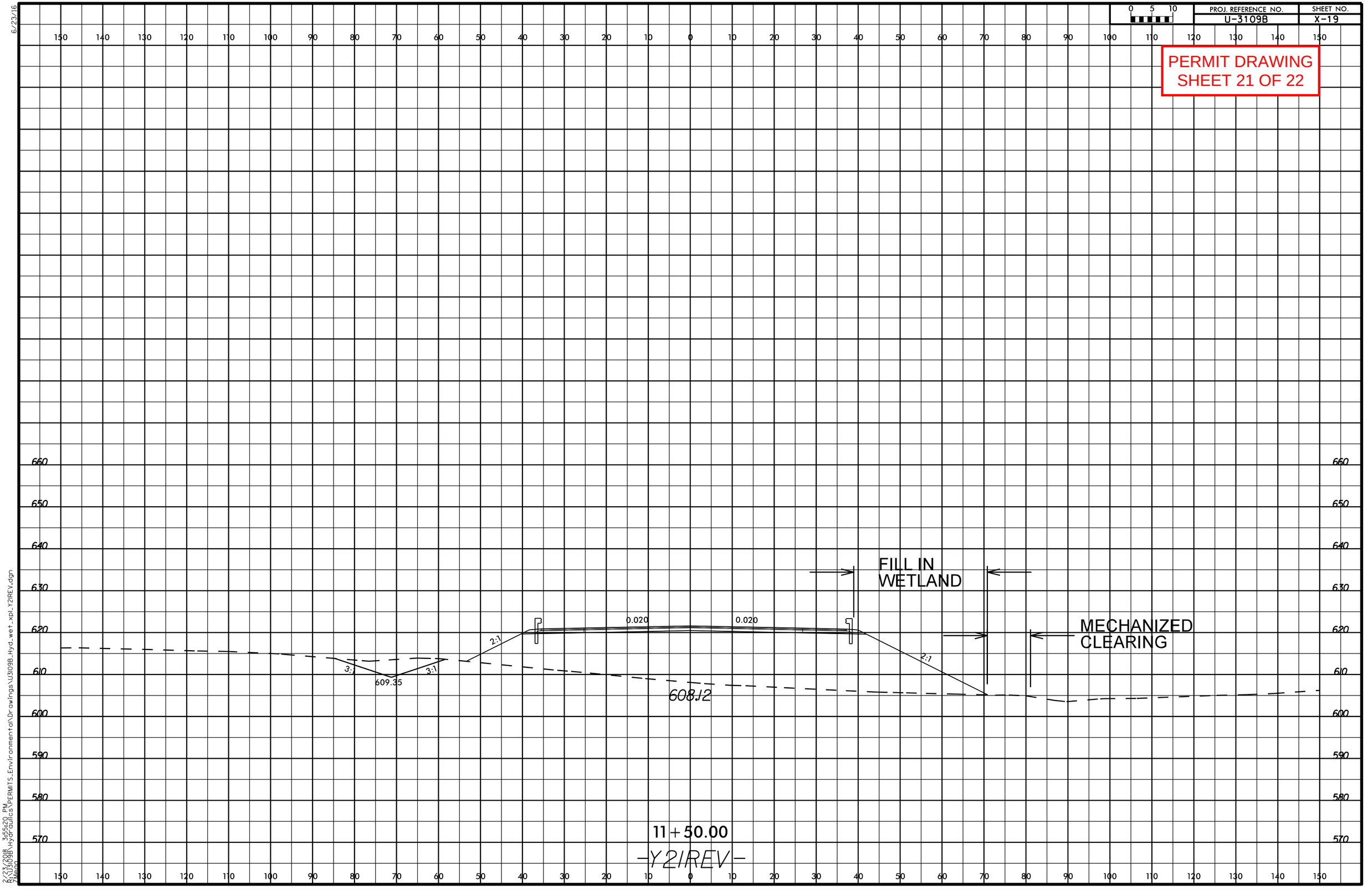
	U-3109B	X-19

PERMIT DRAWING
SHEET 21 OF 22



11+50.00

-Y2IREV-

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WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 207+00/208+15	12'X6' RCBC						0.02	< 0.01	120	50	
1	-L- 206+99/207+50	Bank stabilization						< 0.01		51		
1	-L- 207+98/208+14	Outlet Scour Hole Stabilization						< 0.01		27		
2	-L- 226+82/227+21	Bank stabilization						< 0.01	< 0.01	12	10	
3	-L- 233+50/235+77	42" RCP-III						0.02	< 0.01	268	20	
3	-L- 235+55/235+78	Bank stabilization						< 0.01		22		
3	-L- 233+44/233+64	Outlet Scour Hole Stabilization						< 0.01		20		
4-5	-L- 246+16/246+70	30" RCP-III	< 0.01		< 0.01	< 0.01		0.02	< 0.01	127	10	
6	-L- 250+61/251+17	30" RCP-III	0.06		< 0.01	0.01						
7	-L- 255+17/256+42	36" RCP-III	0.17		< 0.01	0.02						
TOTALS*:			0.23		0.01	0.03		0.07	0.01	647	90	0

*Rounded totals are sum of actual impacts

NOTES:

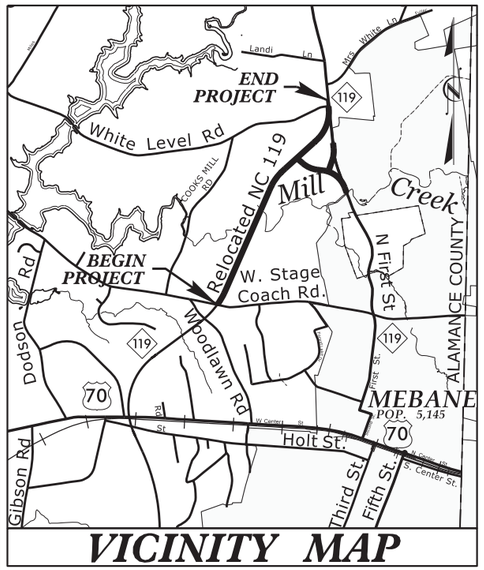
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
04/10/2018
ALAMANCE COUNTY
U-3109B
WBS #: 34900.1.FR3

05/30/17

TIP PROJECT: U-3109B

CONTRACT:

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols
See 1C Sheet Series For Survey Control



VICINITY MAP

NOT TO SCALE

ROW/CFI PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

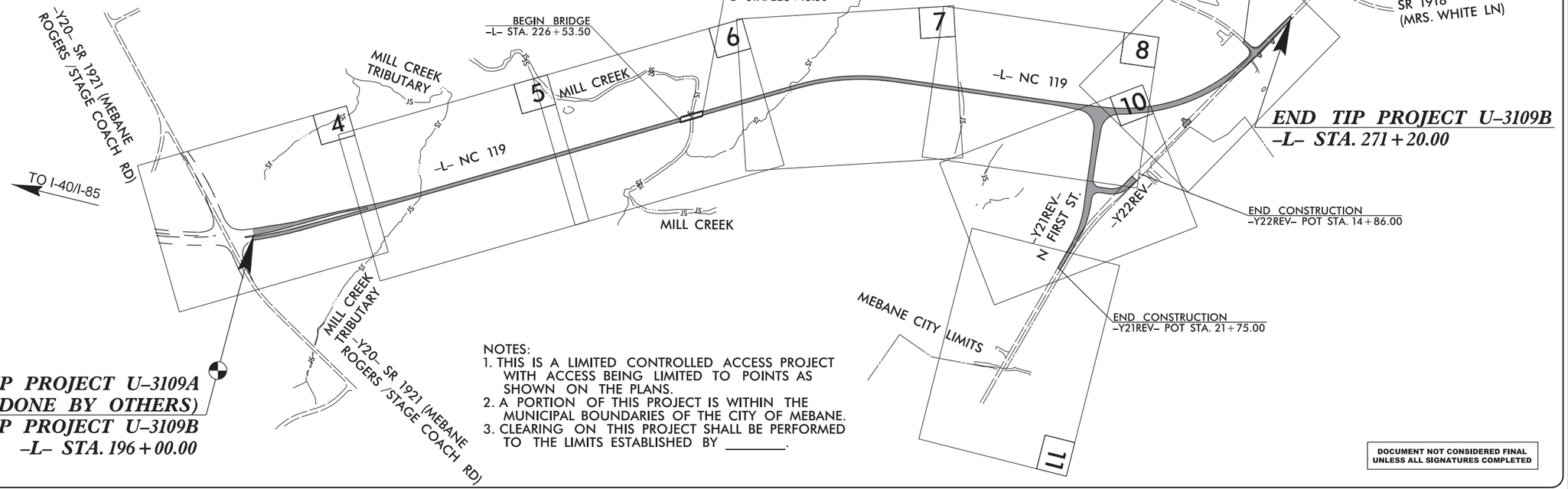
ALAMANCE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3109B	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34900.1.FR3	STP-0119(11)	PE
34900.2.3	STP-0119(8)	R/W
34900.2.3	STP-0119(8)	UTILITIES

LOCATION: NC 119 RELOCATION FROM NORTH OF SR 1921 (MEBANE ROGERS/STAGE COACH ROAD) TO SOUTH OF SR 1918 (MRS. WHITE LANE)

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



END TIP PROJECT U-3109B
-L- STA. 271+20.00

END TIP PROJECT U-3109A
(TO BE DONE BY OTHERS)
BEGIN TIP PROJECT U-3109B
-L- STA. 196+00.00

NOTES:
1. THIS IS A LIMITED CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.
2. A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF MEBANE.
3. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY _____.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2018 = 8,809
ADT 2038 = 10,983
K = 9 %
D = 65 %
T = 5 % *
V = 50 MPH
(* TTST = 4% + DUAL 1%)
FUNC CLASS = MAJOR COLLECTOR REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3109B ..... 1.394 mi
LENGTH STRUCTURE TIP PROJECT U-3109B ..... 0.030 mi
TOTAL LENGTH OF TIP PROJECT U-3109B ..... 1.424 mi

PLANS PREPARED BY:

DRMP
ENGINEERS • PLANNERS • SCIENTISTS
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NORTH CAROLINA 28210
(704) 332-2289
NC LICENSE NO. C-2213

FOR DIVISION OF HIGHWAYS

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
AUGUST 30, 2017

LETTING DATE:
JULY 17, 2018

CHRISTOPHER K. HAIRE, PE
PROJECT ENGINEER
MICHAEL D. HAGE, PE
PROJECT DESIGN ENGINEER
NCDOT CONTACT:
TATIA L. WHITE, PE, PLS
SENIOR PROJECT MANAGER

HYDRAULICS ENGINEER
P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER
P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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04/06/15

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- U/G Telephone Cable LOS B (S.U.E.*) — T
- U/G Telephone Cable LOS C (S.U.E.*) — T
- U/G Telephone Cable LOS D (S.U.E.*) — T
- U/G Telephone Conduit LOS B (S.U.E.*) — TC
- U/G Telephone Conduit LOS C (S.U.E.*) — TC
- U/G Telephone Conduit LOS D (S.U.E.*) — TC
- U/G Fiber Optics Cable LOS B (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS C (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS D (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E.*) — W
- U/G Water Line LOS C (S.U.E.*) — W
- U/G Water Line LOS D (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Cable LOS B (S.U.E.*) — TV
- U/G TV Cable LOS C (S.U.E.*) — TV
- U/G TV Cable LOS D (S.U.E.*) — TV
- U/G Fiber Optic Cable LOS B (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS C (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS D (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

DRMP

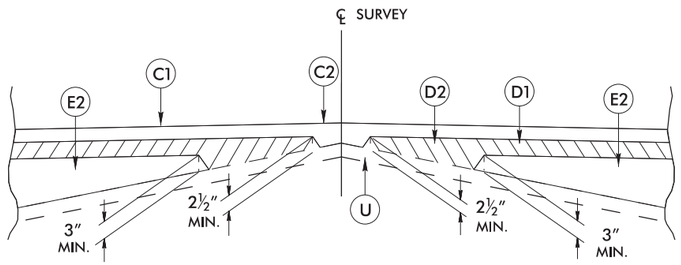
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO.: C-2213 (704) 332-2289

PAVEMENT SCHEDULE

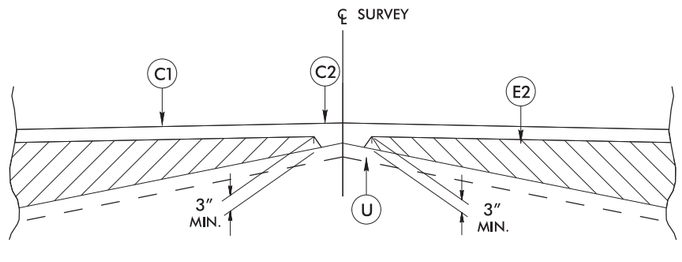
(PRELIMINARY PAVEMENT DESIGN)

C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3″ IN DEPTH OR GREATER THAN 5½″ IN DEPTH.	T	EARTH MATERIAL.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1½″ IN DEPTH OR GREATER THAN 2″ IN DEPTH.	J	PROP. 8″ AGGREGATE BASE COURSE.	U	EXISTING PAVEMENT.
D1	PROP. APPROX. 2½″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.	W1	VARIABLE DEPTH ASPHALT PAVEMENT.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½″ IN DEPTH OR GREATER THAN 4″ IN DEPTH.	R1	1′-6″ CONCRETE CURB AND GUTTER.	W2	VARIABLE DEPTH ASPHALT PAVEMENT.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R2	2′-6″ CONCRETE CURB AND GUTTER.		

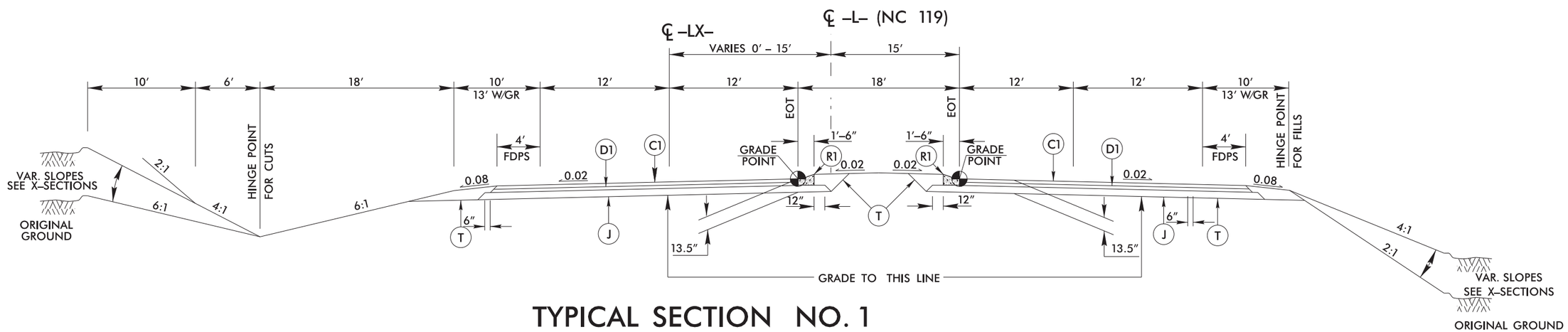
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



Detail #1 Showing Method of Wedging



Detail #2 Showing Method of Wedging



TYPICAL SECTION NO. 1

–L– STA. 196+00.00 TO –L– STA. 203+99.88

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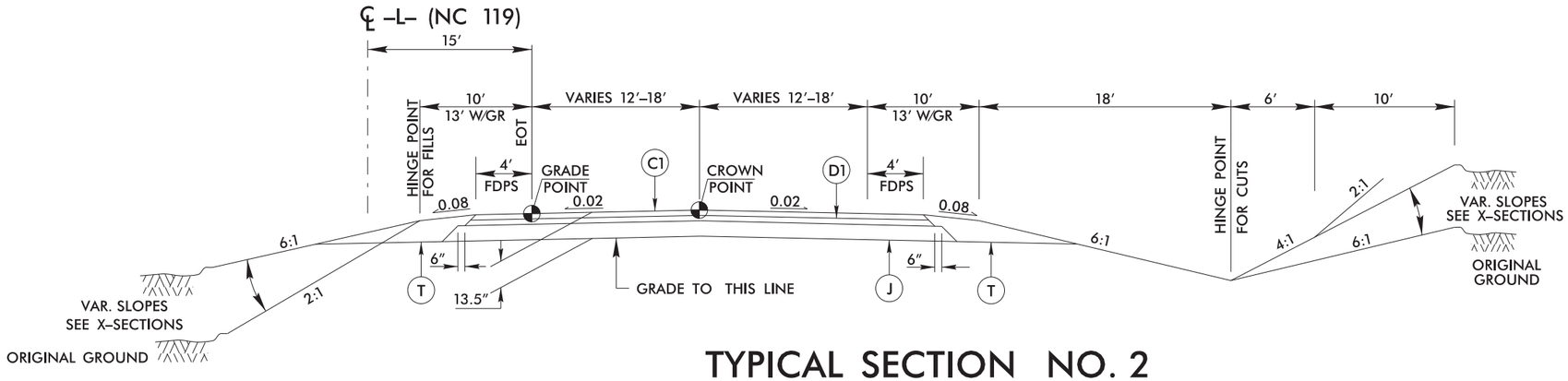
PROJECT REFERENCE NO.	SHEET NO.
U-3109B	2A-2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

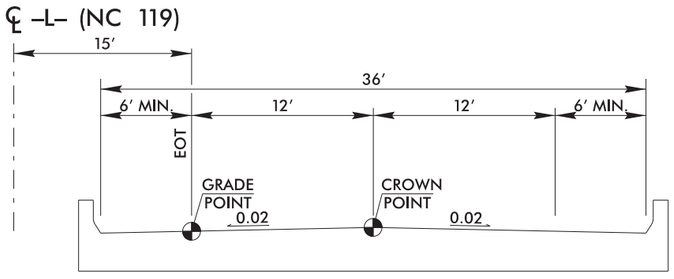
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
DRMP
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289



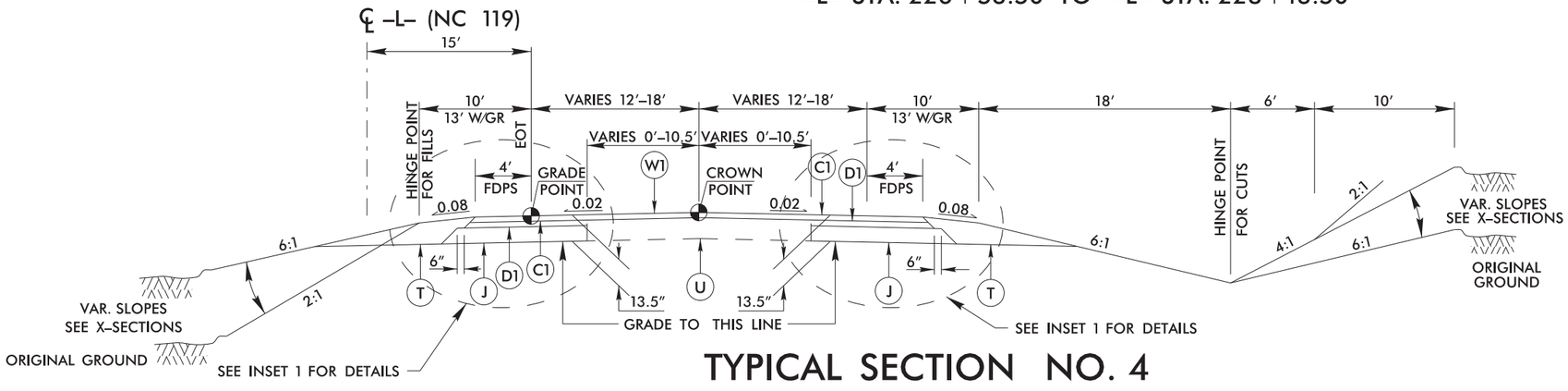
TYPICAL SECTION NO. 2

–L– STA. 203+99.88 TO –L– STA. 226+53.50 (BEGIN BRIDGE)
–L– STA. 228+13.50 (END BRIDGE) TO –L– STA. 265+00.00



TYPICAL SECTION NO. 3

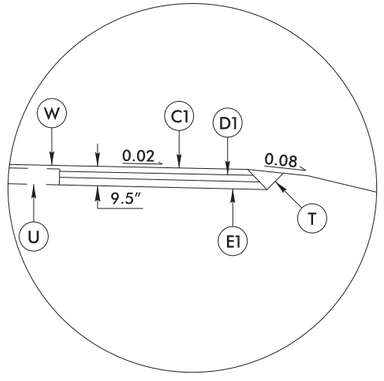
–L– STA. 226+53.50 TO –L– STA. 228+13.50



TYPICAL SECTION NO. 4

–L– STA. 265+00.00 TO –L– STA. 271+20.00

PAVEMENT SCHEDULE (PRELIMINARY PAVEMENT DESIGN)	
C1	3″ S9.5B
C2	VAR. S9.5B
D1	2.5″ I19.5B
D2	VAR. I19.0B
E1	4″ B25.0B
E2	VAR. B25.0
J	8″ ABC
P	.35 PRIME COAT
R1	1′-6″ C&G
R2	2′-6″ C&G
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W1	WEDGING
W2	WEDGING



INSET 1 – NARROW WIDENING
PAVEMENT DESIGN TO BE USED IN NARROW WIDENING AREAS OF LESS THAN 6 FEET

–L– STA. 266+37.71 TO –L– STA. 270+90.00

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PROJECT REFERENCE NO.	SHEET NO.
U-3109B	2A-3
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

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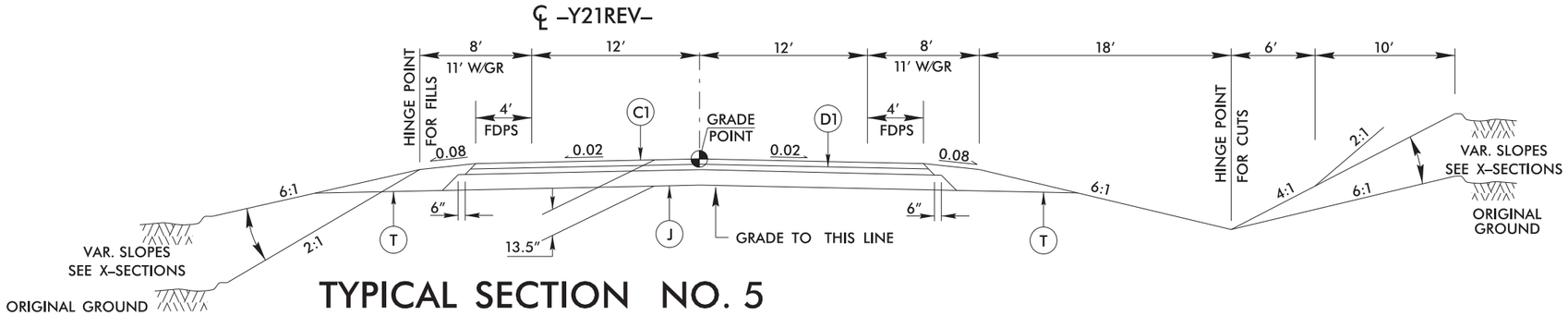
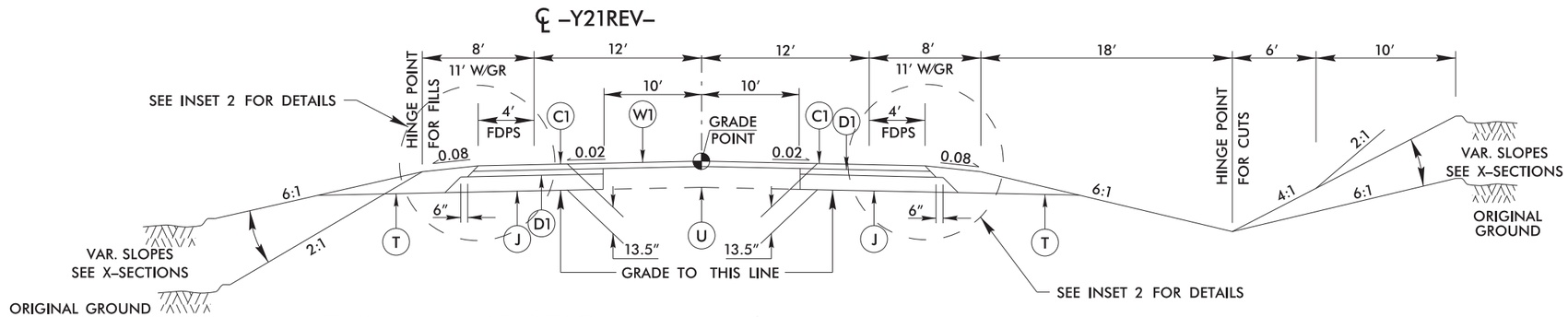
PLANS PREPARED BY:
DRMP
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289



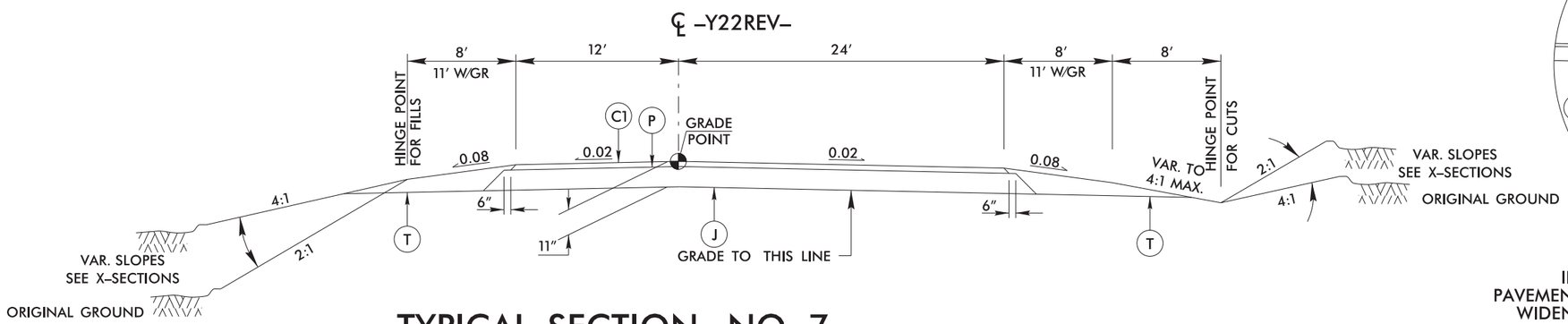
TYPICAL SECTION NO. 5

–Y21REV– STA. 10+45.02 TO –Y21REV– STA. 19+00.00



TYPICAL SECTION NO. 6

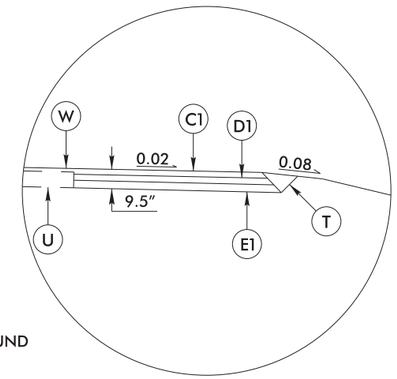
–Y21REV– STA. 19+00.00 TO –Y21REV– STA. 21+75.00



TYPICAL SECTION NO. 7

–Y22REV– STA. 10+18.00 TO –Y22REV– STA. 12+00.00

PAVEMENT SCHEDULE (PRELIMINARY PAVEMENT DESIGN)	
C1	3″ S9.5B
C2	VAR. S9.5B
D1	2.5″ I19.5B
D2	VAR. I19.0B
E1	4″ B25.0B
E2	VAR. B25.0
J	8″ ABC
P	.35 PRIME COAT
R1	1′-6″ C&G
R2	2′-6″ C&G
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W1	WEDGING
W2	WEDGING



INSET 2 – NARROW WIDENING
PAVEMENT DESIGN TO BE USED IN NARROW WIDENING AREAS OF LESS THAN 6 FEET

–Y21REV– STA. 20+04.18 TO –Y21REV– STA. 21+75.00

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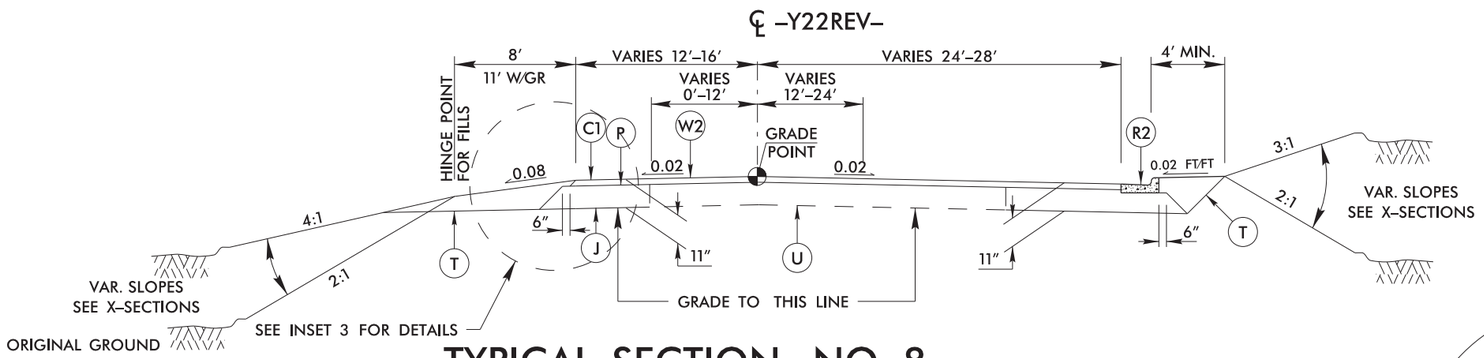
PROJECT REFERENCE NO.	SHEET NO.
U-3109B	2A-4
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

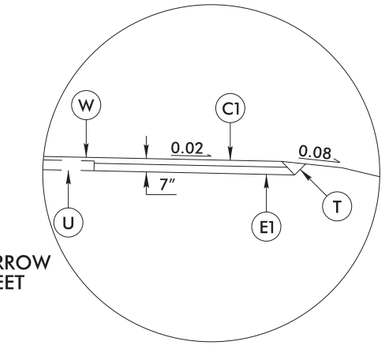
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
DRMP
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289



TYPICAL SECTION NO. 8

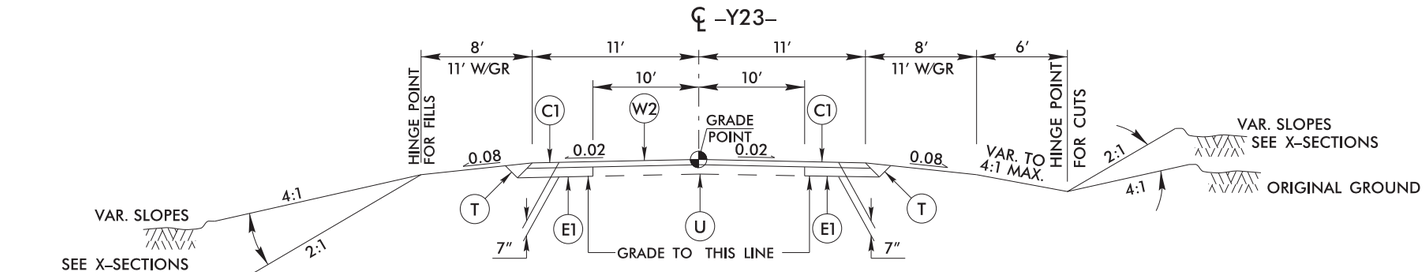
–Y22REV– STA. 12+00.00 TO –Y22REV– STA. 13+40.00



INSET 3 – NARROW WIDENING
PAVEMENT DESIGN TO BE USED IN NARROW WIDENING AREAS OF LESS THAN 6 FEET

–Y22REV– STA. 12+23.16 TO –Y22REV– STA. 14+44.05

PAVEMENT SCHEDULE (PRELIMINARY PAVEMENT DESIGN)	
C1	3″ S9.5B
C2	VAR. S9.5B
D1	2.5″ I19.5B
D2	VAR. I19.0B
E1	4″ B25.0B
E2	VAR. B25.0
J	8″ ABC
P	.35 PRIME COAT
R1	1′-6″ C&G
R2	2′-6″ C&G
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W1	WEDGING
W2	WEDGING



TYPICAL SECTION NO. 9

–Y23– STA. 19+30.00 TO –Y23– STA. 20+16.28

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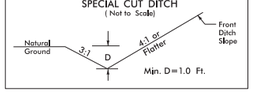
PROJECT REFERENCE NO.	SHEET NO.
U-3109B	2D-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

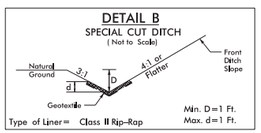
DRMP
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO.: C-2213 (704) 332-2289

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



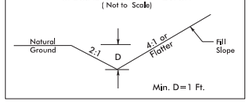
FROM STA. 196+50 TO STA. 199+50 –L– LT
FROM STA. 196+00 TO STA. 198+50 –L– RT
FROM STA. 203+00 TO STA. 205+00 –L– RT
FROM STA. 203+50 TO STA. 205+97 –L– LT
FROM STA. 208+71 TO STA. 211+00 –L– RT
FROM STA. 212+50 TO STA. 213+50 –L– RT
FROM STA. 213+65 TO STA. 214+00 –L– RT
FROM STA. 218+00 TO STA. 220+00 –L– RT
FROM STA. 222+00 TO STA. 224+40 –L– RT
FROM STA. 224+00 TO STA. 224+60 –L– LT
FROM STA. 229+90 TO STA. 230+50 –L– LT
FROM STA. 230+00 TO STA. 232+00 –L– RT
FROM STA. 233+50 TO STA. 234+50 –L– LT
FROM STA. 243+00 TO STA. 245+50 –L– RT
FROM STA. 246+54 TO STA. 249+00 –L– RT
FROM STA. 249+00 TO STA. 250+50 –L– RT
FROM STA. 243+06 TO STA. 246+23 –L– LT
FROM STA. 253+76 TO STA. 255+50 –L– LT
FROM STA. 17+50 TO STA. 18+00 –Y21REV– RT
FROM STA. 19+50 TO STA. 21+50 –Y21REV– RT

DETAIL B
SPECIAL CUT DITCH
(Not to Scale)



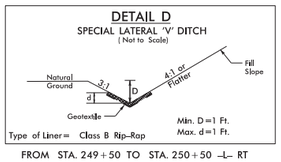
FROM STA. 235+65 TO STA. 237+00 –L– LT

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



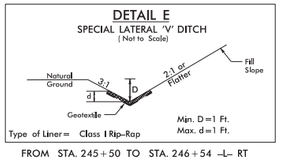
FROM STA. 251+50 TO STA. 252+50 –L– RT

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



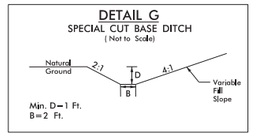
FROM STA. 249+50 TO STA. 250+50 –L– RT

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



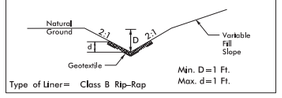
FROM STA. 245+50 TO STA. 246+54 –L– RT

DETAIL G
SPECIAL CUT BASE DITCH
(Not to Scale)



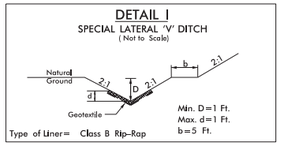
FROM STA. 16+50 TO STA. 17+50 –Y21REV– LT
FROM STA. 18+00 TO STA. 19+50 –Y21REV– RT
FROM STA. 11+00 TO STA. 12+00 –Y22REV– RT

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



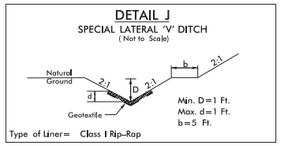
FROM STA. 257+11 TO STA. 259+00 –L– LT

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



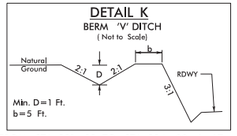
FROM STA. 208+00 TO STA. 209+00 –L– LT

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



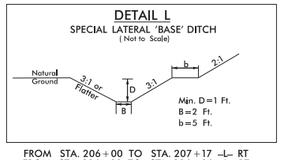
FROM STA. 207+00 TO STA. 208+00 –L– LT

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



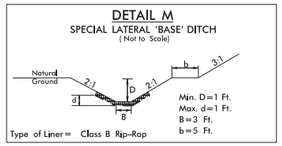
FROM STA. 231+82 TO STA. 234+00 –L– LT
FROM STA. 237+00 TO STA. 243+06 –L– LT
FROM STA. 243+06 TO STA. 246+00 –L– LT

DETAIL L
SPECIAL LATERAL 'BASE' DITCH
(Not to Scale)



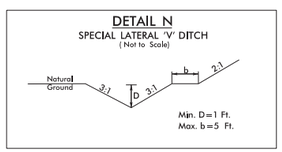
FROM STA. 206+00 TO STA. 207+17 –L– RT
FROM STA. 226+00 TO STA. 226+86 –L– RT
FROM STA. 227+22 TO STA. 227+41 –L– RT
FROM STA. 234+50 TO STA. 237+00 –L– RT

DETAIL M
SPECIAL LATERAL 'BASE' DITCH
(Not to Scale)



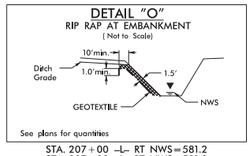
FROM STA. 235+65 TO STA. 237+00 –L– LT

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



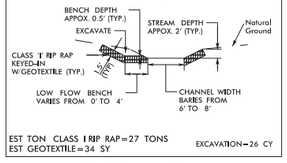
FROM STA. 207+34 TO STA. 208+71 –L– RT
FROM STA. 234+50 TO STA. 235+50 –L– LT
FROM STA. 249+78 TO STA. 251+00 –L– LT
FROM STA. 251+00 TO STA. 253+00 –L– LT
FROM STA. 253+77 TO STA. 255+50 –L– LT
FROM STA. 250+50 TO STA. 253+69 –L– RT
FROM STA. 253+69 TO STA. 255+28 –L– RT
FROM STA. 11+90 TO STA. 14+00 –Y21REV– RT
FROM STA. 10+50 TO STA. 13+50 –Y21REV– LT

DETAIL "O"
RIP RAP AT EMBANKMENT
(Not to Scale)



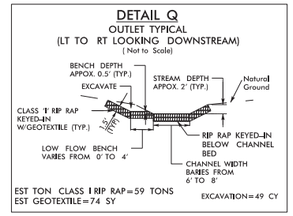
STA. 207+00 –L– RT NWS=581.2
STA. 207+38 –L– RT NWS=581.2
STA. 207+99 –L– LT NWS=578.1
STA. 208+20 –L– LT NWS=578.1
STA. 226+87 –L– RT NWS=539.9
STA. 227+24 –L– RT NWS=539.9
STA. 235+65 –L– LT NWS=N/A
STA. 235+77 –L– LT NWS=N/A

DETAIL P
INLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
(Not to Scale)



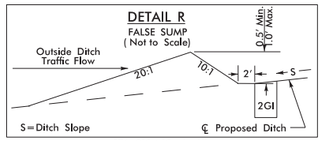
STA. 207+44 –L– RT

DETAIL Q
OUTLET TYPICAL
(LT TO RT LOOKING DOWNSTREAM)
(Not to Scale)



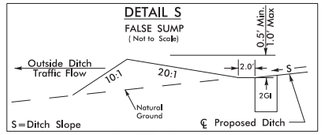
STA. 208+00 –L– LT

DETAIL R
FALSE SUMP
(Not to Scale)



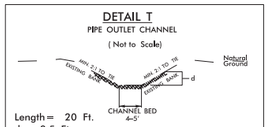
STA. 213+10 –L– LT
STA. 224+70 –L– LT
STA. 19+43 –Y21REV– LT

DETAIL S
FALSE SUMP
(Not to Scale)



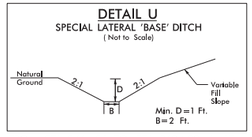
STA. 229+75 –L– LT

DETAIL T
PIPE OUTLET CHANNEL
(Not to Scale)



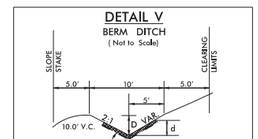
STA. 233+62 –L– RT

DETAIL U
SPECIAL LATERAL 'BASE' DITCH
(Not to Scale)



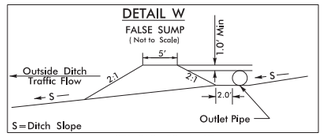
FROM STA. 246+23 TO STA. 248+00 –L– LT

DETAIL V
BERM DITCH
(Not to Scale)



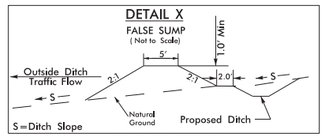
FROM STA. 237+00 TO STA. 239+00 –L– LT

DETAIL W
FALSE SUMP
(Not to Scale)



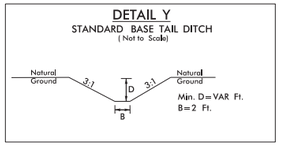
STA. 262+50 –L– LT

DETAIL X
FALSE SUMP
(Not to Scale)



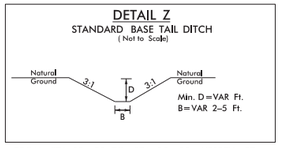
STA. 12+00 –Y22– RT

DETAIL Y
STANDARD BASE TAIL DITCH
(Not to Scale)



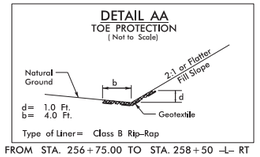
FROM STA. 262+74 TO STA. 262+84 –L– RT

DETAIL Z
STANDARD BASE TAIL DITCH
(Not to Scale)



FROM STA. 19+50 TO STA. 20+00 –Y21REV– RT

DETAIL AA
TOE PROTECTION
(Not to Scale)



FROM STA. 256+75.00 TO STA. 258+50 –L– RT

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	2D-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

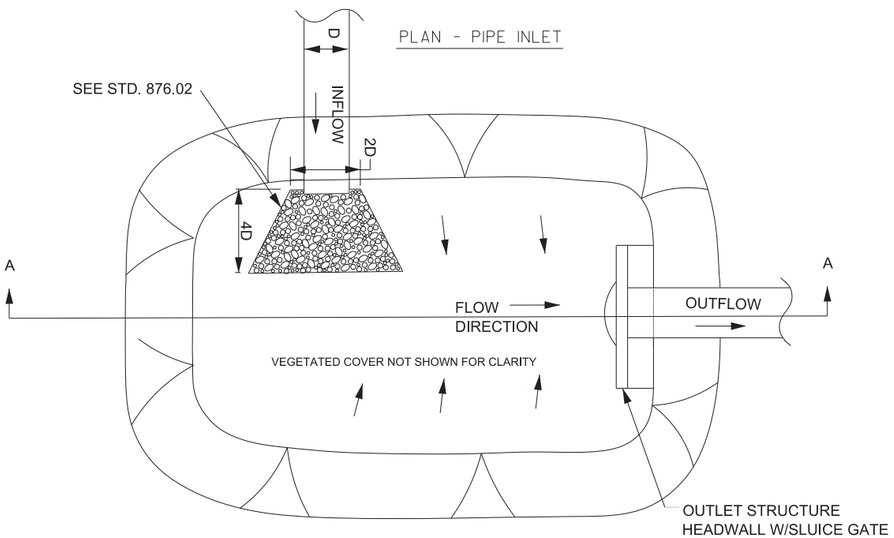
PLANS PREPARED BY:
DRMP
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289

HAZARDOUS SPILL BASIN DETAIL

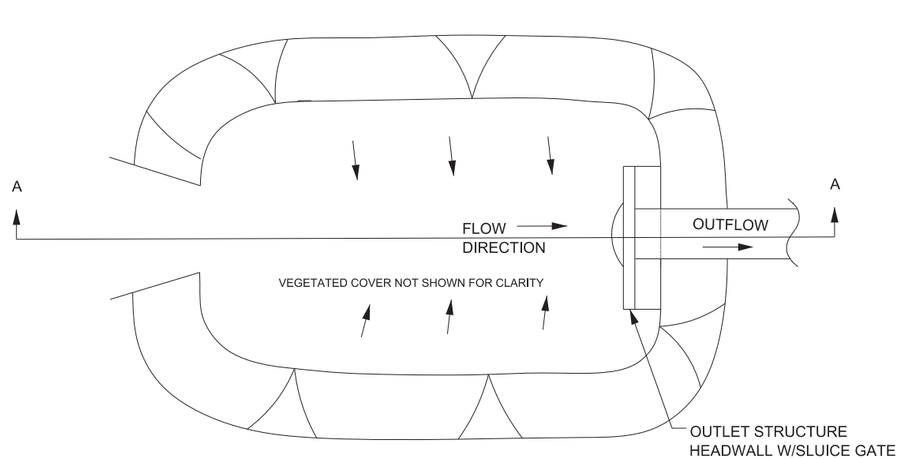
NOT TO SCALE

BASIN LAYOUT POINTS AND ELEVATIONS																		
POINT	HSB1: Station 206+00 LT			HSB2: Station 205+00 RT			HSB3: Station 210+00 LT			HSB4: Station 224+50 RT			HSB5: Station 229+50 RT			HSB6: Station 256+50		
LOCATION	NORTH	EAST	RADIUS	NORTH	EAST	RADIUS	NORTH	EAST	RADIUS	NORTH	EAST	RADIUS	NORTH	EAST	RADIUS	NORTH	EAST	RADIUS
1	859,689.08	1,915,820.16	1.0'	859,560.97	1,915,873.55	1.0'	860,029.51	1,915,971.64	5.0'	861,330.71	1,916,666.15	4.0'	861,783.71	1,916,853.70	4.0'	863,900.08	1,918,445.04	8.0'
2	859,683.87	1,915,832.07	1.0'	859,555.75	1,915,885.46	1.0'	860,027.50	1,915,976.21	5.0'	861,323.42	1,916,682.76	4.0'	861,777.34	1,916,868.21	4.0'	863,891.81	1,918,463.99	8.0'
3	859,733.04	1,915,839.45	1.0'	859,604.93	1,915,892.84	1.0'	860,056.98	1,915,983.69	5.0'	861,368.32	1,916,675.01	4.0'	861,845.42	1,916,882.17	4.0'	863,935.33	1,918,479.52	8.0'
4	859,726.33	1,915,850.41	1.0'	859,727.82	1,915,851.35	1.0'	860,054.97	1,915,988.27	5.0'	861,358.22	1,916,698.03	4.0'	861,839.59	1,916,893.90	4.0'	863,927.05	1,918,498.47	8.0'
	INLET/BASE ELEV = 595.0'			INLET/BASE ELEV = 596.0'			INLET/BASE ELEV = 589.0'			INLET/BASE ELEV = 566.0'			INLET/BASE ELEV = 571.0'			INLET/BASE ELEV = 612.0'		
	STORAGE ELEV = 596.8'			STORAGE ELEV = 596.8'			STORAGE ELEV =591.1'			STORAGE ELEV = 567.6'			STORAGE ELEV = 572.2'			STORAGE ELEV = 613.4'		
	BERM/TOP ELEV = 598.0'			BERM/TOP ELEV = 599.0'			BERM/TOP ELEV = 593.0'			BERM/TOP ELEV = 569.0'			BERM/TOP ELEV = 576.0'			BERM/TOP ELEV = 615.0'		
	OUTLET ELEV = 594.8			OUTLET ELEV = 595.8			OUTLET ELEV = 588.8'			OUTLET ELEV = 565.8'			OUTLET ELEV = 570.8'			OUTLET ELEV = 610.8'		

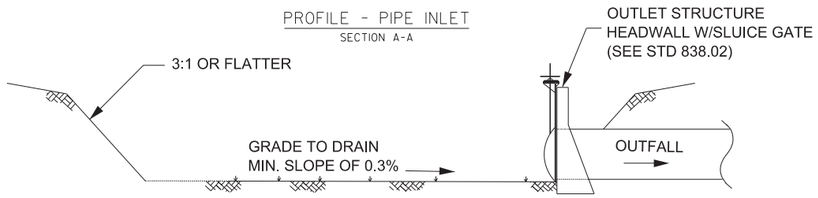
PLAN - PIPE INLET



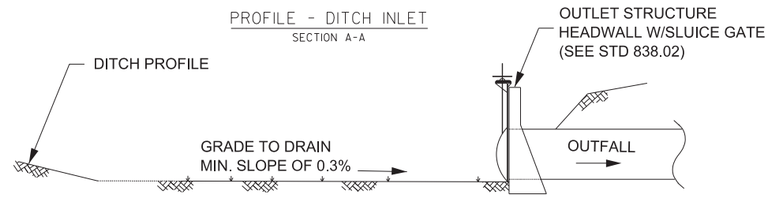
PLAN - DITCH INLET



PROFILE - PIPE INLET
SECTION A-A



PROFILE - DITCH INLET
SECTION A-A



1/6/2016 1:41:58 PM
K:\U3109B\Hydraulics\CADD\U3109B_Hyd_ddsh_02.dgn
RM1 chdell

COMPUTED BY: Nathan Wright, EI DATE: 01/17/2018
CHECKED BY: Mike Hage, PE DATE: 01/17/2018

PROJECT NO.	SHEET NO.
U-3109B	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

Station	Station	Uncl. Excav.	Undecut	Embank. +%	Borrow	Waste
-L- 196+00	-L- 226+00	78,832		24,227		54,605
(18,000 Unsuit. Excavation Per Geotech Report)						
SUBTOTALS:		78,832		24,226		54,605
-L- 228+50	-L- 242+00	37,554		12,215		25,339
SUBTOTALS:		37,554		12,214		25,339
-L- 242+00	-L- 271+20	32,604		32,686	82	
-Y21REV- 11+00	-Y21REV- 21+75	1,908		13,128	11,220	
-Y22REV- 10+50	-Y22REV- 13+40	116		1,307	1,191	
-Y23- 19+30	-Y23- 20+16	182		2		180
SUBTOTALS:		34,810		47,122	12,492	179
PROJECT TOTALS:		151,196		83,562	12,492	80,123
LOSS DUE TO CLEARING AND GRUBBING		-10,500				-10,500
(PER GEOTECH REPORT)						
WASTE IN LIEU OF BORROW					-12,492	-12,492
PROJECT TOTALS:		140,696		83,562		57,131
GRAND TOTALS:		140,696		83,562		57,131
SAY:				**84,000**		

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement, and Removal of Existing Pavement will be paid for at the contract lump sum price for grading.

Note: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

DRMP
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289

REVISIONS

04/04/18 - R/W REVISION: UPDATED PROPERTY OWNER NAME AND DEED REFERENCE FROM "NCDOT, DB 3436 PG 945" TO "BRAD THORNTON, DB 3684 PG 403" ON PARCEL LOCATED APPROXIMATELY AT "-L- STATION 201+00+/- LT.; ADDED PARCEL 915; REVISED PROPOSED R/W AND C/A ON PARCELS 1 AND 915. - NEW

8/17/99

END TIP PROJECT U-3109A
(TO BE DONE BY OTHERS)
BEGIN TIP PROJECT U-3109B
-L- POT Sta. 196+00.00

MATCH LINE -L- STA. 204+10 SEE SHEET 5

-Y20- (MEBANE ROGERS RD.)
-L- (NC 119)

1,830 / 2,439	-Y20-	604 / 691
9,565 / 12,870	-L- / -L-	5,465 / 6,770
3,917 / 6,265	-Y20-	1,043 / 1,913

3,478 / 7,043

2018 / 2038 AADT — 6,004 / 12,091

-LX- POC Sta.10+00.00 = -L- POS Sta.199+09.62,15' LT

-L- CS Sta.198+48.15

-L- ST Sta.200+39.64

-LX- PRC Sta.13+91.04

-L-
PI Sta 194+28.19
△ = 19° 26' 17.3" (LT)
D = 2° 17' 30.6"
L = 848.15'
T = 428.19'
R = 2,500.00'
SE = SEE PLANS
RO = SEE PLANS

PIs Sta 199+11.99
θs = 2° 11' 39.5"
Ls = 191.49'
LT = 127.67'
ST = 63.84'

-LX-
PI Sta 11+95.60
△ = 3° 55' 50.6" (RT)
D = 1° 00' 18.7"
L = 391.04'
T = 195.60'
R = 5,700.00'
SE = SEE PLANS
RO = SEE PLANS

PI Sta 16+41.11
△ = 5° 01' 26.4" (LT)
D = 1° 00' 18.7"
L = 499.81'
T = 250.06'
R = 5,700.00'
SE = SEE PLANS
RO = SEE PLANS

FOR -L- PROFILE SEE SHEET 12

$DATE$ $$TIME$$
R:\Roadway\PROJ\U3109B_Rdy_psh_04.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

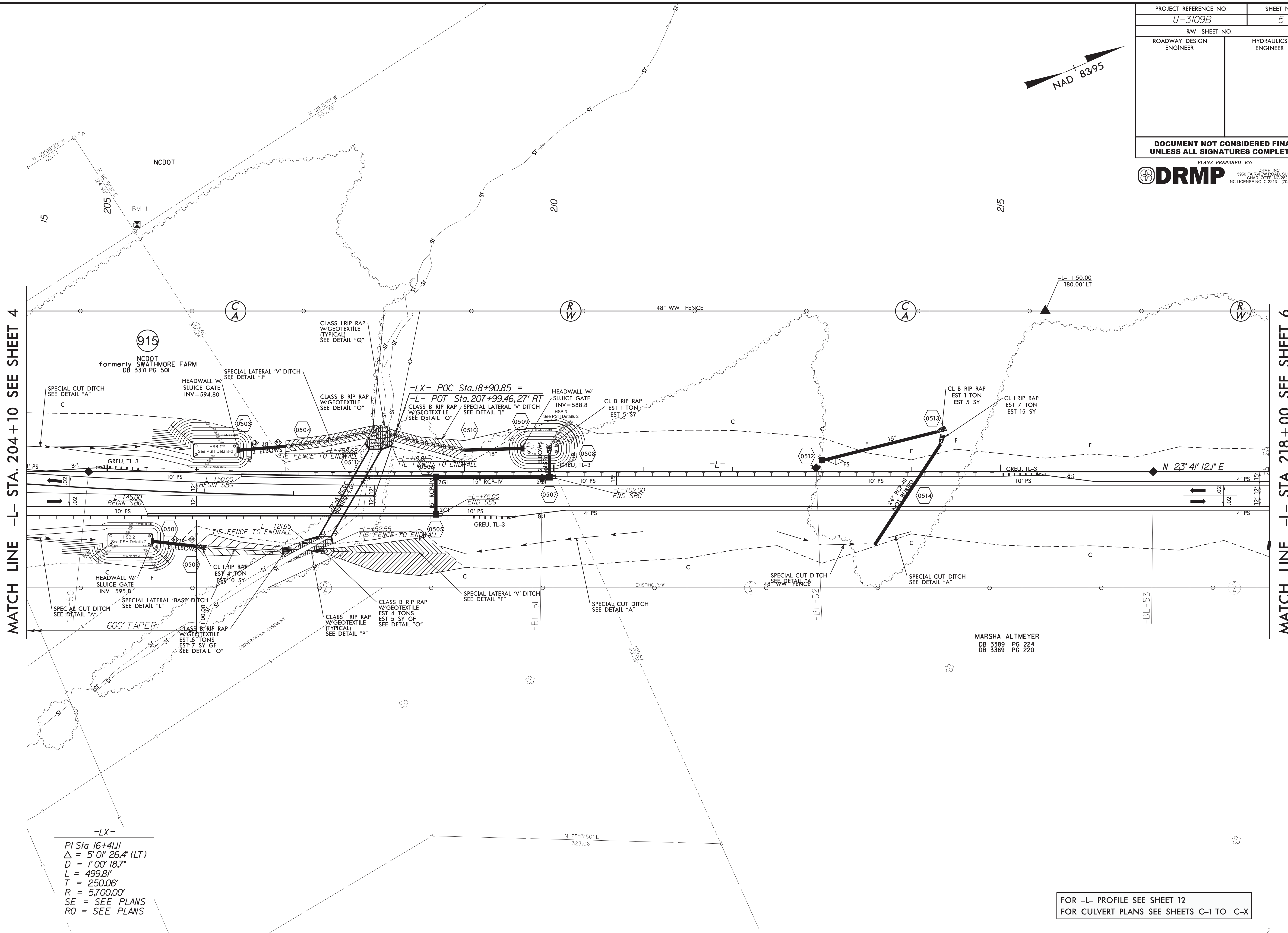
PLANS PREPARED BY:

DRMP

DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289

REVISIONS

04/04/18 – R/W REVISION: ADDED PARCEL 915; REVISED PROPOSED R/W AND C/A ON PARCEL 915 – NEW



NAD 83/95
NCDOT
BM II
915
NCDOT
formerly SWATHMORE FARM
DB 3371 PG 501
48" WW FENCE
-L- +50.00
180.00' LT
MATCH LINE -L- STA. 204+10 SEE SHEET 4
MATCH LINE -L- STA. 218+00 SEE SHEET 6
-LX- POC Sta.18+90.85 =
-L- POT Sta.207+99.46, 27' RT
SPECIAL CUT DITCH SEE DETAIL "A"
HEADWALL W/ SLUICE GATE INV=594.80
HEADWALL W/ SLUICE GATE INV=588.8
HEADWALL W/ SLUICE GATE INV=595.8
CLASS I RIP RAP W/GEOTEXTILE (TYPICAL) SEE DETAIL "Q"
SPECIAL LATERAL 'V' DITCH SEE DETAIL "J"
CLASS B RIP RAP W/GEOTEXTILE SEE DETAIL "O"
SPECIAL LATERAL 'V' DITCH SEE DETAIL "I"
CL B RIP RAP EST 1 TON EST 5 SY
CL B RIP RAP EST 1 TON EST 5 SY
CL I RIP RAP EST 7 TON EST 15 SY
CL I RIP RAP EST 4 TON EST 10 SY
SPECIAL LATERAL 'BASE' DITCH SEE DETAIL "L"
CLASS B RIP RAP W/GEOTEXTILE EST 5 TONS EST 7 SY GF SEE DETAIL "O"
CLASS I RIP RAP W/GEOTEXTILE (TYPICAL) SEE DETAIL "P"
CLASS B RIP RAP W/GEOTEXTILE EST 4 TONS EST 5 SY GF SEE DETAIL "O"
SPECIAL LATERAL 'V' DITCH SEE DETAIL "F"
SPECIAL CUT DITCH SEE DETAIL "A"
TIE FENCE TO ENDWALL
GREU, TL-3
-L- +50.00 BEGIN SBG
-L- +45.00 BEGIN SBG
-L- +75.00 END SBG
-L- +02.00 END SBG
15" RCP-IV
24" RCP-III NOT BURIED
N 23° 41' 12.1" E
600' TAPER
CONSERVATION EASEMENT
EXISTING R/W
MARSHA ALTMEYER
DB 3389 PG 224
DB 3389 PG 220
-BL-51
-BL-52
-BL-53
N 25°13'50" E 323.06'
N 09°13'11" W 506.75'

-LX-

PI Sta 16+41.11
Δ = 5° 01' 26.4" (LT)
D = 1° 00' 18.7"
L = 499.81'
T = 250.06'
R = 5,700.00'
SE = SEE PLANS
RO = SEE PLANS

FOR -L- PROFILE SEE SHEET 12
FOR CULVERT PLANS SEE SHEETS C-1 TO C-X

8/17/99

R:\Roadway\Proj\U3109B_Rdy_psh_05.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

DRMP

DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289

REVISIONS

8/17/99

04/04/18 - R/W REVISION: ADDED PARCEL 915; REVISED PROPOSED R/W AND C/A ON PARCELS 2 AND 915. - NEW

NAD 83/95

DETAIL SHOWING PAVEMENT TO BRIDGE RELATIONSHIP

BEGIN APPROACH SLAB -L- Sta. 226+29.39

END BRIDGE -L- Sta. 228+13.50

BEGIN BRIDGE -L- Sta. 226+53.50

END APPROACH SLAB -L- Sta. 228+37.61

N 23° 41' 12.1" E -L-

MATCH LINE -L- STA. 218+00 SEE SHEET 5

MATCH LINE -L- STA. 232+10 SEE SHEET 7

BM 12

915
NCDOT
formerly SWATHMORE FARM
DB 3371 PG 501

2
ELOISE CATES ESTATE
NO DEED FOUND

230
STEPHEN BREWER
DB 386 PG 259

CATES ELOISE HEIRS ETAL
DB 422 PG 155

MILL CREEK

-L- +00.00 180.00' LT

-L- +26.22 197.09' LT

-L- +29.14 180.00' LT

48" WW FENCE

CL I RIP RAP EST 7 TON EST 15 SY GF

GRADE TO DRAIN (SEE CROSS SECTIONS)

SPECIAL CUT DITCH SEE DETAIL "A"

BERM 'V' DITCH SEE DETAIL "K"

GREU, TL-3

2GI SAG STA 224+60.00 EL=574.37

-L- +49.47 BEGIN SBG

-L- +41.28 BEGIN SBG

-L- +00.00 END SBG

HEADWALL W/ SLUICE GATE INV=565.80

HEADWALL W/ SLUICE GATE INV=570.80

CL B RIP RAP EST 1 TON EST 5 SY

CL B RIP RAP EST 3 TON EST 10 SY GF

SPECIAL LATERAL 'BASE' DITCH SEE DETAIL "L"

CLASS B RIP RAP W/GEOTEXTILE EST 11 TONS EST 15 SY GF SEE DETAIL "O"

CLASS B RIP RAP W/GEOTEXTILE EST 10 TONS EST 13 SY GF SEE DETAIL "O"

CONSERVATION EASEMENT

FOR -L- PROFILE SEE SHEETS 12 & 13
FOR STRUCTURE PLANS SEE SHEETS S-1 TO S-XX

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$TIME$$
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$$$$USERNAME$$$$

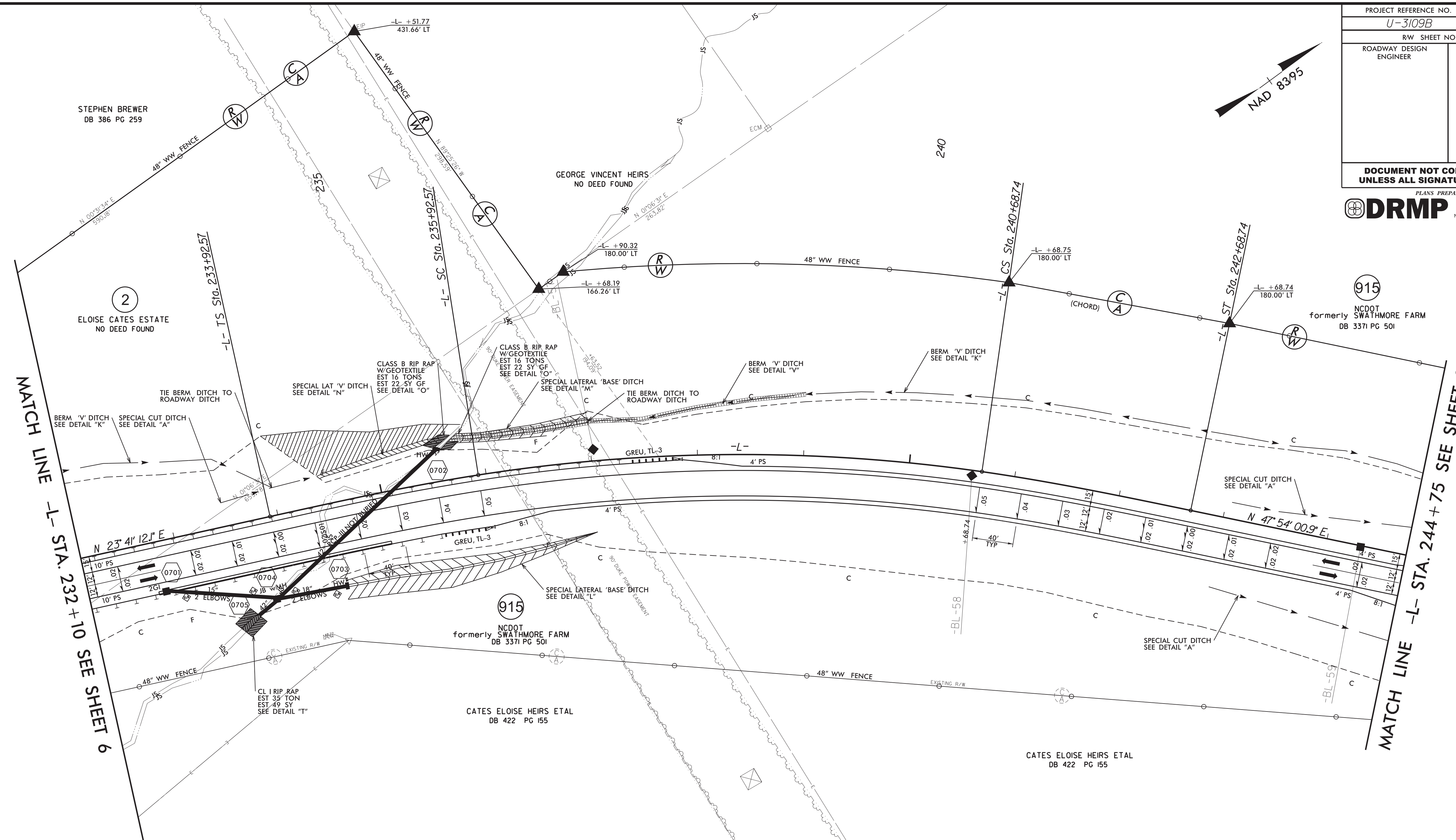
PROJECT REFERENCE NO.	SHEET NO.
U-3109B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
DRMP
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289

REVISIONS
04/04/18 – R/W REVISION: ADDED PARCEL 915; REVISED PROPOSED R/W AND C/A ON PARCELS 2 AND 915. – NEW

8/17/99



NAD 83/95
STEPHEN BREWER
DB 386 PG 259
GEORGE VINCENT HEIRS
NO DEED FOUND
2
ELOISE CATES ESTATE
NO DEED FOUND
915
NCDOT
formerly SWATHMORE FARM
DB 3371 PG 501
CATES ELOISE HEIRS ETAL
DB 422 PG 155
MATCH LINE -L- STA. 232+10 SEE SHEET 6
MATCH LINE -L- STA. 244+75 SEE SHEET 8
-L- TS Sta. 233+92.57
-L- SC Sta. 235+92.57
-L- CS Sta. 240+68.74
-L- ST Sta. 242+68.74
-L- +51.77
431.66' LT
-L- +90.32
180.00' LT
-L- +68.19
166.26' LT
-L- +68.75
180.00' LT
-L- +68.74
180.00' LT
48" WW FENCE
N 23° 41' 12.1" E
N 47° 54' 00.9" E
BERM 'V' DITCH SEE DETAIL "K"
SPECIAL CUT DITCH SEE DETAIL "A"
TIE BERM DITCH TO ROADWAY DITCH
SPECIAL LAT 'V' DITCH SEE DETAIL "N"
CLASS B RIP RAP W/GEOTEXTILE EST 16 TONS EST 22 SY GF SEE DETAIL "O"
SPECIAL LATERAL 'BASE' DITCH SEE DETAIL "M"
BERM 'V' DITCH SEE DETAIL "V"
SPECIAL LATERAL 'BASE' DITCH SEE DETAIL "L"
CL I RIP RAP EST 35 TON EST 49 SY SEE DETAIL "T"
GREU, TL-3
4' PS
10' PS
(CHORD)
-BL-58
-BL-59
240
235

-L-		
PIs Sta 235+25.93	PI Sta 238+32.43	PIs Sta 241+35.43
θs = 3° 34' 51.6"	Δ = 17° 03' 05.7" (RT)	θs = 3° 34' 51.6"
Ls = 200.00'	D = 3° 34' 51.6"	Ls = 200.00'
LT = 133.36'	L = 476.17'	LT = 133.36'
ST = 66.69'	T = 239.86'	ST = 66.69'
	R = 1,600.00'	
	SE = SEE PLANS	
	RO = SEE PLANS	

FOR -L- PROFILE SEE SHEET 13

$$DATE$$ $$TIME$$
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

DRMP

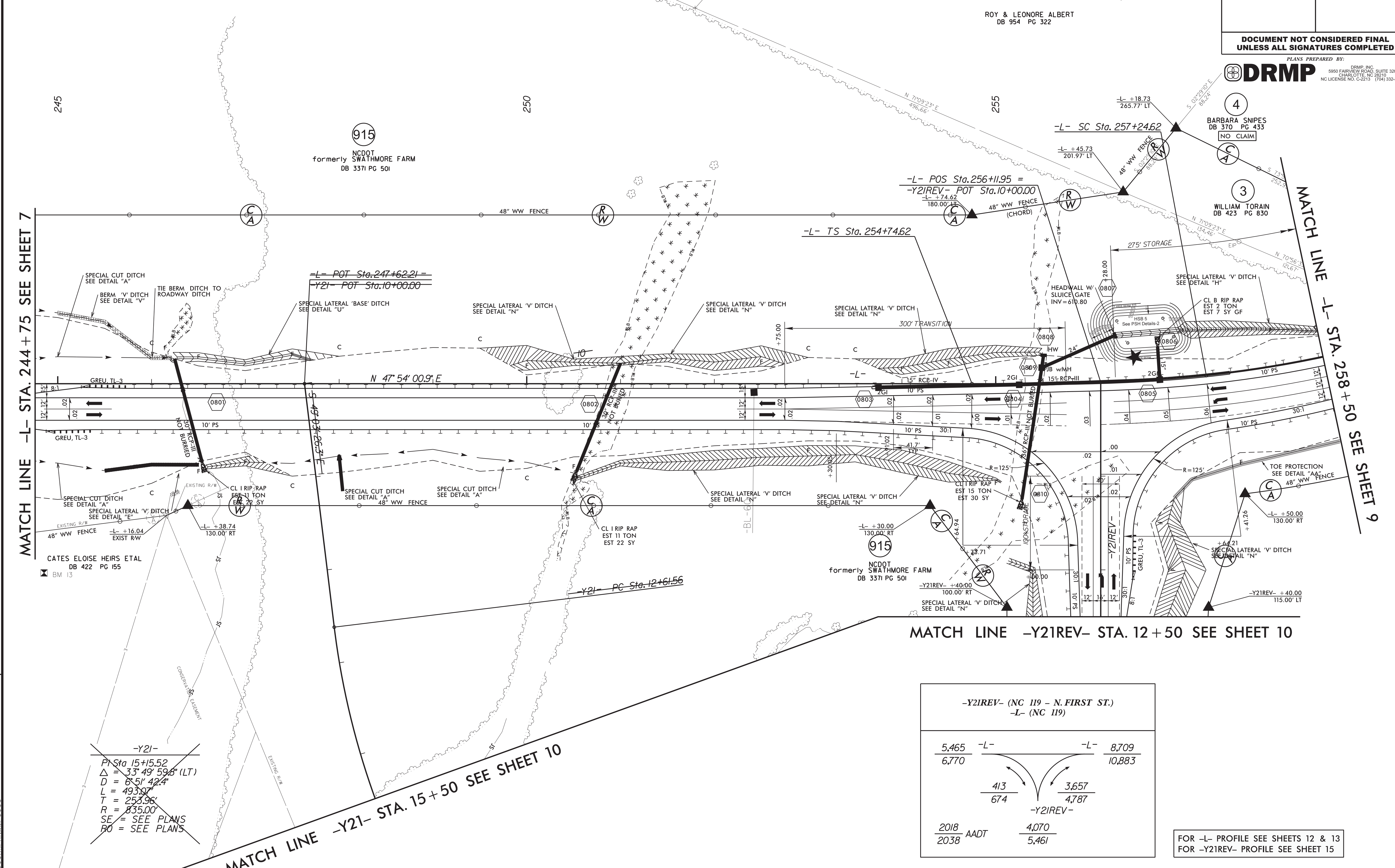
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289

REVISIONS

04/04/18 – R/W REVISION: ADDED PARCEL 915; REVISED PROPOSED R/W AND C/A ON PARCELS 3 AND 915. – NEW

-L-

PIs Sta 256+41.38	PI Sta 261+84.00
Θs = 5° 58' 05.9"	Δ = 41° 53' 43.2" (LT)
Ls = 250.00'	D = 4° 46' 28.7"
LT = 166.76'	L = 877.45'
ST = 83.42'	T = 459.38'
	R = 1,200.00'
	SE = SEE PLANS
	RO = SEE PLANS



NAD 83/95
ROY & LEONORE ALBERT
DB 954 PG 322
915
NCDOT
formerly SWATHMORE FARM
DB 3371 PG 501
4
BARBARA SNIPES
DB 370 PG 433
NO CLAIM
3
WILLIAM TORAIN
DB 423 PG 830
CATES ELOISE HEIRS ETAL
DB 422 PG 155
BM 13
-L- SC Sta. 257+24.62
-L- POS Sta. 256+11.95 = -Y21REV- POT Sta. 10+00.00
-L- TS Sta. 254+74.62
-L- POT Sta. 247+62.21 = -Y21- POT Sta. 10+00.00
-Y21- PC Sta. 12+61.56
N 47° 54' 00.9" E
48" WW FENCE
275' STORAGE
300' TRANSITION
SPECIAL CUT DITCH SEE DETAIL "A"
BERM 'V' DITCH SEE DETAIL "V"
TIE BERM DITCH TO ROADWAY DITCH
SPECIAL LATERAL 'BASE' DITCH SEE DETAIL "U"
SPECIAL LATERAL 'V' DITCH SEE DETAIL "N"
SPECIAL LATERAL 'V' DITCH SEE DETAIL "H"
SPECIAL LATERAL 'V' DITCH SEE DETAIL "E"
HEADWALL W/ SLUICE GATE INV=610.80
CL B RIP RAP EST 2 TON EST 7 SY GF
CL I RIP RAP EST 11 TON EST 22 SY
CL I RIP RAP EST 15 TON EST 30 SY
TOE PROTECTION SEE DETAIL "AA"
MATCH LINE -L- STA. 244+75 SEE SHEET 7
MATCH LINE -L- STA. 258+50 SEE SHEET 9
MATCH LINE -Y21REV- STA. 12+50 SEE SHEET 10
MATCH LINE -Y21- STA. 15+50 SEE SHEET 10
-Y21-
PI Sta 15+15.52
Δ = 33° 49' 59.8" (LT)
D = 6° 51' 42.4"
L = 493.07'
T = 253.96'
R = 835.00'
SE = SEE PLANS
RO = SEE PLANS
-Y21REV- (NC 119 – N. FIRST ST.)
-L- (NC 119)
5,465 / 6,770
8,709 / 10,883
413 / 674
3,657 / 4,787
2018 / 2038 AADT
4,070 / 5,461
FOR -L- PROFILE SEE SHEETS 12 & 13
FOR -Y21REV- PROFILE SEE SHEET 15

$$DATE$$ $$TIME$$
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PROJECT REFERENCE NO.	SHEET NO.
U-3109B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

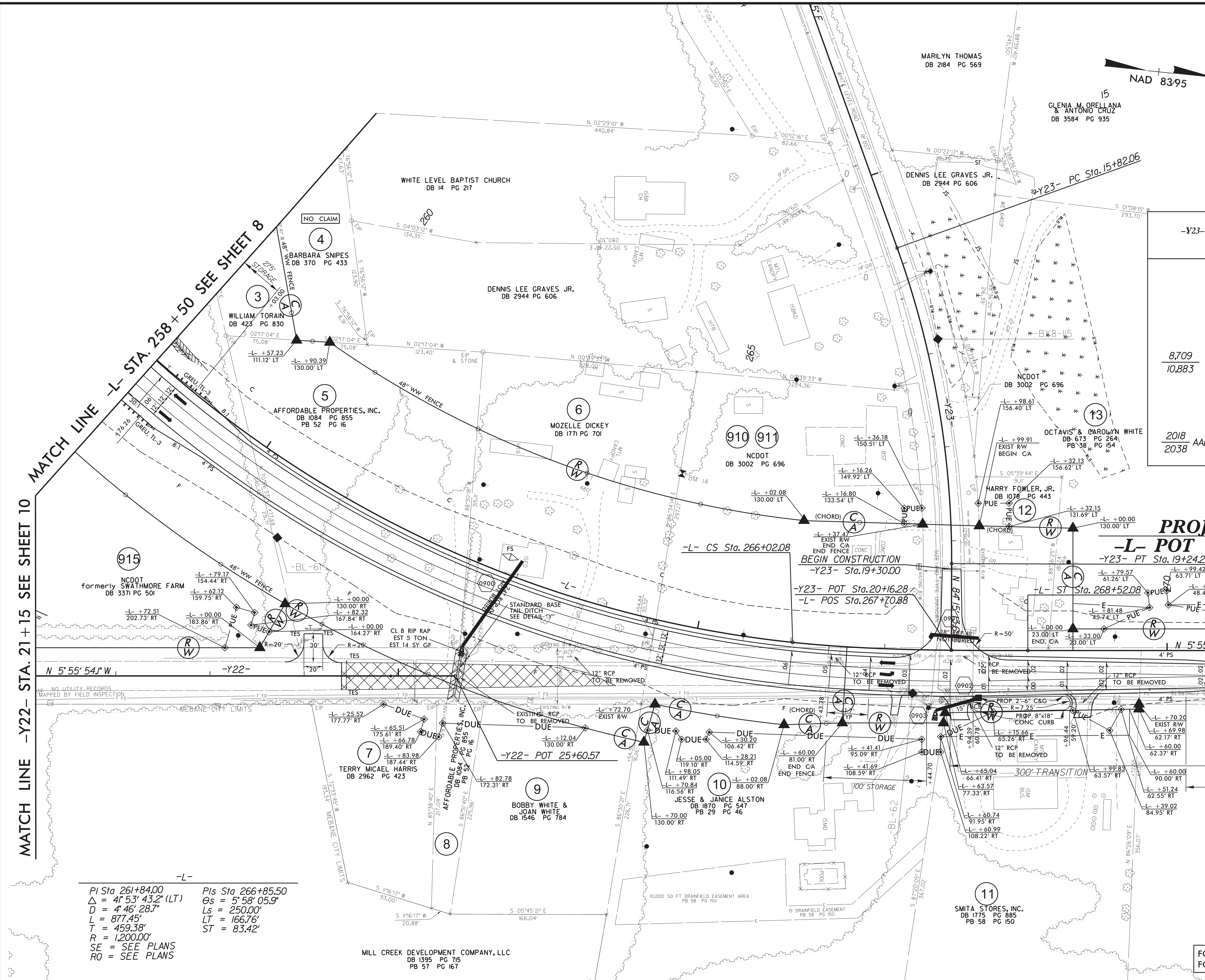
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
DRMP
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289

REVISIONS

12/14/17 – R/W REVISION: ADDED PARCEL NUMBERS 910, 911 AND 915; ADDED PUE ON PARCELS 7 THROUGH 13, 910, 911 AND 915; REVISED TCE ON PARCELS 10, 11 AND 13. – MDH
02/07/18 – R/W REVISION: REVISED PROPOSED R/W FROM -L- STA. 259+34.43 TO STA. 259+90.39 AND ELIMINATED A CLAIM ON PARCEL 4; REMOVED PROPOSED R/W AND ELIMINATED A CLAIM ON PARCEL 14. – NEW
04/04/18 – R/W REVISION: REVISED PROPOSED R/W AND C/A ON PARCEL 3; REVISED PUE TO DUE FROM -L- STA. 262+25.52 TO STA. 264+12.04 AND -L- STA. 264+70.84 TO STA 268+15.66 RT. ON PARCELS 7, 8, 9, 10 AND 11; REVISED PROPOSED R/W FROM -L- STA. 267+63.57 TO STA. 269+69.98 AND PUE FROM -L- STA. 268+99.83 TO STA. 269+51.24 ON PARCEL 11. – NEW

8/17/99



-Y23- (SR 1917 – WHITE LEVEL RD.)
-L- (NC 119)

-Y23-	1,217 / 1,565
	409 / 583
	709 / 883
-L- (west)	8,709 / 10,883
-L- (east)	8,809 / 10,983
	200 / 200
	50 / 50
-DRIVEWAY-	300 / 300
AADT	2018 / 2038

-L-

PI Sta 261+84.00	PIs Sta 266+85.50
Δ = 41° 53' 43.2" (LT)	θs = 5° 58' 05.9"
D = 4° 46' 28.7"	Ls = 250.00'
L = 877.45'	LT = 166.76'
T = 459.38'	ST = 83.42'
R = 1,200.00'	
SE = SEE PLANS	
RO = SEE PLANS	

FOR -L- PROFILE SEE SHEETS 14
FOR -Y23- PROFILE SEE SHEET 16

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

DRMP

DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289

NAD 83/95

REVISIONS

8/17/99

04/04/18 - R/W REVISION: ADDED PROPOSED R/W ON PARCEL 15; ADDED PARCEL 915; REVISED PROPOSED R/W AND C/A ON PARCEL 915. - NEW

MATCH LINE -Y21- STA. 15+50 SEE SHEET 8

MATCH LINE -Y21REV- STA. 12+50 SEE SHEET 8

MATCH LINE -Y22- STA. 21+15 SEE SHEET 9

MATCH LINE -Y21- STA. 23+00 SEE SHEET 11

MATCH LINE -Y21REV- STA. 22+00 SEE SHEET 11

-Y21REV-
PI Sta 18+43.06
Δ = 21° 37' 21.5" (RT)
D = 6° 51' 42.4"
L = 315.12'
T = 159.46'
R = 835.00'
SE = 0.06
RO = 144'

-Y22REV-
PI Sta 12+15.41
Δ = 53° 49' 55.0" (LT)
D = 37° 49' 18.2"
L = 144.69'
T = 78.18'
R = 154.00'
SE = 0.04
RO = 72'

-Y21- PT Sta. 17+54.63

-Y21- PC Sta. 19+54.63

-Y21REV- POT STA.15+70.49 =
-Y22REV- POT STA.10+00.00

-Y21REV- PC Sta. 16+83.60

-Y21- POC STA.21+21.62 =
-Y22- POT STA.10+00.00

-Y22- PC Sta. 14+03.34

-Y22REV- PT Sta. 12+81.92

-Y22REV- PC Sta. 11+37.23

END CONSTRUCTION
-Y22REV- POT STA.13+40.00
-Y22- POT STA.18+84.41

-Y21REV- PT Sta. 19+98.72

END CONSTRUCTION
-Y21REV- POT Sta.21+75.00

-Y22- PT Sta. 17+60.35

915
NCDOT
formerly SWATHMORE FARM
DB 3371 PG 501

CATES ELOISE HEIRS ETAL
DB 422 PG 155

THE HOMEOWNERS ASSOCIATION OF MILL CREEK
DB 1126 PG 811
PB 57 PG 167

EILEEN JEFFERSON
DB 1963
PG 684
PB 67
PG 340

LARRY P. WOOD JR.
DB 3103
PG 513
PB 67
PG 490

JOSEPH & JILL COWEN
DB 1962
PG 956
PB 67
PG 340

R. DEAL

PASHALES

CONSERVATION EASEMENT

EXISTING R/W

SPECIAL LATERAL 'V' DITCH SEE DETAIL "N"

SPECIAL CUT DITCH SEE DETAIL "A"

SPECIAL CUT BASE DITCH SEE DETAIL "G"

STANDARD BASE TAIL DITCH SEE DETAIL "Z"

CL B RIP RAP EST 3 TONS EST 10 SY

CL B RIP RAP EST 11 TON EST 22 SY

CL B RIP RAP EST 7 TON EST 7 SY

CL B RIP RAP EST 5 TONS EST 14 SY

Shallow natural grass channel w/wide flat slopes

NATURAL GROUND IS APPROXIMATELY ELEV. 598.5' AFTER PAVEMENT IS REMOVED.

TIE PROPOSED DITCH TO EXIST. DITCH

TIE EXISTING DITCH TO PROPOSED DITCH

FOR -Y21REV- PROFILE SEE SHEET 15
FOR -Y22REV- PROFILE SEE SHEET 16

$DATE$ $$TIME$$
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PROJECT REFERENCE NO.	SHEET NO.
U-3109B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

DRMP

DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289

NAD 83/95

REVISIONS

8/17/99

04/04/18 R/W REVISION: ADDED PARCEL 915; REMOVED PROPOSED R/W FROM PARCELS 15,16 AND 915; ADDED "NO CLAIM" ON PARCEL 16. - NEW

MATCH LINE -Y21REV- STA. 22+00 SEE SHEET 10

MATCH LINE -Y21- STA. 23+00 SEE SHEET 10

PC Sta. 23+16.51

PT Sta. 23+99.45

-Y21REV- PT Sta. 28+66.36

-Y21REV- PT Sta. 30+27.68

-Y21REV- PT Sta. 32+00.00

-Y21REV- PT STA. 27+76.72 =
-Y21- POT STA. 30+27.81

END CONSTRUCTION
-Y21- POT Sta. 30+00.00

-BY7-113

BM 16

HENRY W. & HELEN K. FRENKE
REVOCABLE LIVING TRUST
DB 2483 PG 124
PB 69 PG 436

15
THE HOMEOWNERS ASSOCIATION OF MILL CREEK
DB 926 PG 811
PB 57 PG 167

915
NCDOT
formerly SWATHMORE FARM
DB 3371 PG 501

16
OAKLAND / THE CLUB AT MILL CREEK LIMITED PARTNERSHIP
DB 1295 PG 503
PB 63 PG 137

CATES ELOISE HEIRS ETAL
DB 422 PG 155

SWATHMORE FARM
DB 27 PG 402

BRIGHTON ASSOCIATES
DB 520 PG 818

CITY LIMITS

MEBANE CITY LIMITS

EXISTING R/W

NO UTILITY RECORDS MAPPED BY FIELD INSPECTION

90' DUKE POWER EASEMENT
PB 63 PG 137

90' DUKE POWER EASEMENT

8" PER RECORD

8" PLASTIC PER FIELD

15" PER RECORD

15" RCP

18" RCP

48" RCP

30" SANITARY SEWER EASEMENT

30" SANITARY SEWER & 10' WATER EASEMENT

LEGAL UNKNOWN

GOLF TRAIL

NO CLAIM

MILL CREEK

MEBANE CITY LIMITS (IN)

MEBANE CITY LIMITS (OUT)

25FD APT

S 20°28'37.6" E

S 20°13'23.8" E

S 20°33'00" E 252.41'

S 20°33'00" E 185.33'

S 69°27'00" W 106.56'

S 60°41'05" W 6.84'

N 60°41'05" E 244.17'

S 19°34'12" E 169.48'

N 50°16'56" E 355.00'

S 20°56'40" E 213.80'

S 61°44'55" E 287.10'

R = 162.50'
CH BRNG
N 21°06'09" E
CH = 212.13'

-Y21REV-

PI Sta 23+80.48	PI Sta 30+31.77
Δ = 0° 15' 13.8" (RT)	Δ = 0° 23' 51.2" (LT)
D = 0° 40' 08.8"	D = 0° 12' 28.7"
L = 37.94'	L = 191.17'
T = 18.97'	T = 95.59'
R = 8,563.05'	R = 27,551.16'

-Y21-

PI Sta 24+63.24	PI Sta 31+23.40
Δ = 62° 40' 02.3" (RT)	Δ = 0° 23' 51.2" (LT)
D = 6° 51' 30.3"	D = 0° 12' 28.7"
L = 913.73'	L = 191.17'
T = 508.61'	T = 95.59'
R = 835.41'	R = 27,551.16'
SE = SEE PLANS	SE = SEE PLANS
RO = SEE PLANS	RO = SEE PLANS

$DATE$ $$TIME$$
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$$$$USERNAME$$$$

PLANS PREPARED BY:

DRMP

DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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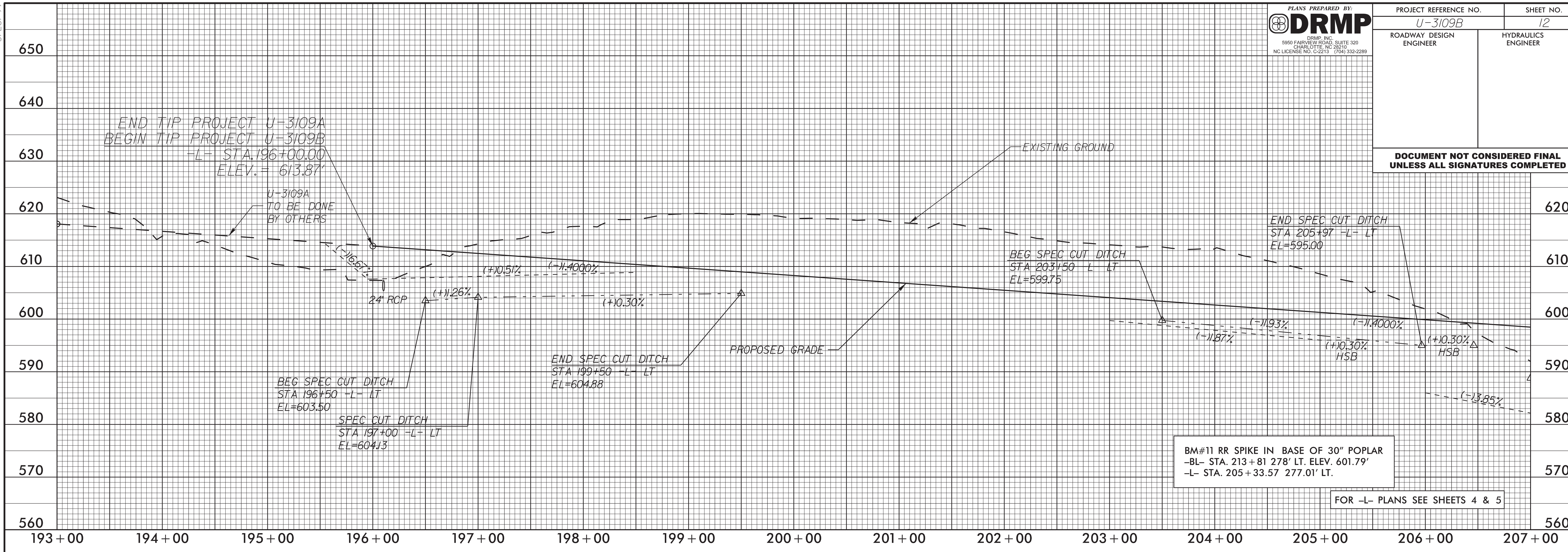
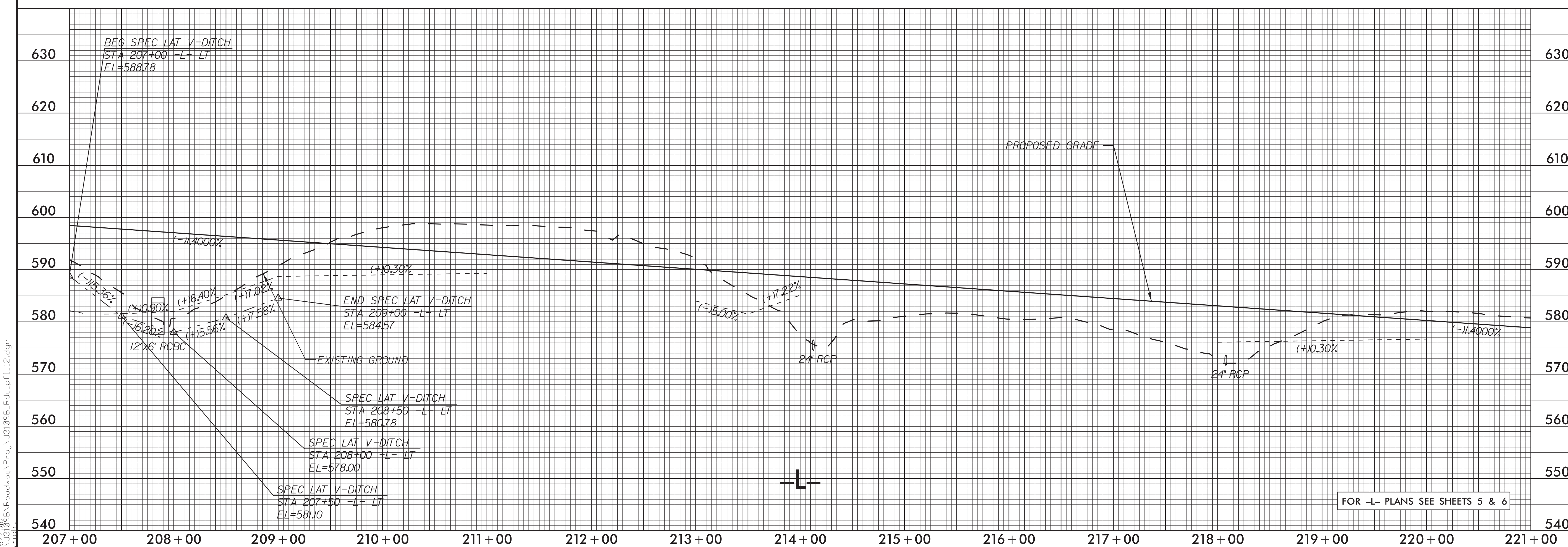


END TIP PROJECT U-3109A
BEGIN TIP PROJECT U-3109B
-L- STA.196+00.00
ELEV.= 613.87'
U-3109A TO BE DONE BY OTHERS
EXISTING GROUND
(-)16.67%
(+)0.51%
(-)1.4000%
24" RCP
(+)1.26%
(+)0.30%
BEG SPEC CUT DITCH
STA 196+50 -L- LT
EL=603.50
SPEC CUT DITCH
STA 197+00 -L- LT
EL=604.13
END SPEC CUT DITCH
STA 199+50 -L- LT
EL=604.88
PROPOSED GRADE
BEG SPEC CUT DITCH
STA 203+50 -L- LT
EL=599.75
END SPEC CUT DITCH
STA 205+97 -L- LT
EL=595.00
(-)1.93%
(-)1.87%
(-)1.4000%
(+)0.30%
HSB
(+)0.30%
HSB
(-)3.85%
BM#11 RR SPIKE IN BASE OF 30" POPLAR
-BL- STA. 213+81 278' LT. ELEV. 601.79'
-L- STA. 205+33.57 277.01' LT.
FOR -L- PLANS SEE SHEETS 4 & 5
650
640
630
620
610
600
590
580
570
560
193+00
194+00
195+00
196+00
197+00
198+00
199+00
200+00
201+00
202+00
203+00
204+00
205+00
206+00
207+00



BEG SPEC LAT V-DITCH
STA 207+00 -L- LT
EL=588.78
(-)1.4000%
(-)15.36%
(+)0.90%
(+)6.40%
(+)7.02%
(-)6.20%
(+)5.56%
(+)7.58%
12'x6' RCBC
(+)0.30%
END SPEC LAT V-DITCH
STA 209+00 -L- LT
EL=584.57
EXISTING GROUND
SPEC LAT V-DITCH
STA 208+50 -L- LT
EL=580.78
SPEC LAT V-DITCH
STA 208+00 -L- LT
EL=578.00
SPEC LAT V-DITCH
STA 207+50 -L- LT
EL=581.10
(-)5.00%
(+)7.22%
24" RCP
PROPOSED GRADE
24" RCP
(+)0.30%
(-)1.4000%
-L-
FOR -L- PLANS SEE SHEETS 5 & 6
630
620
610
600
590
580
570
560
550
540
207+00
208+00
209+00
210+00
211+00
212+00
213+00
214+00
215+00
216+00
217+00
218+00
219+00
220+00
221+00

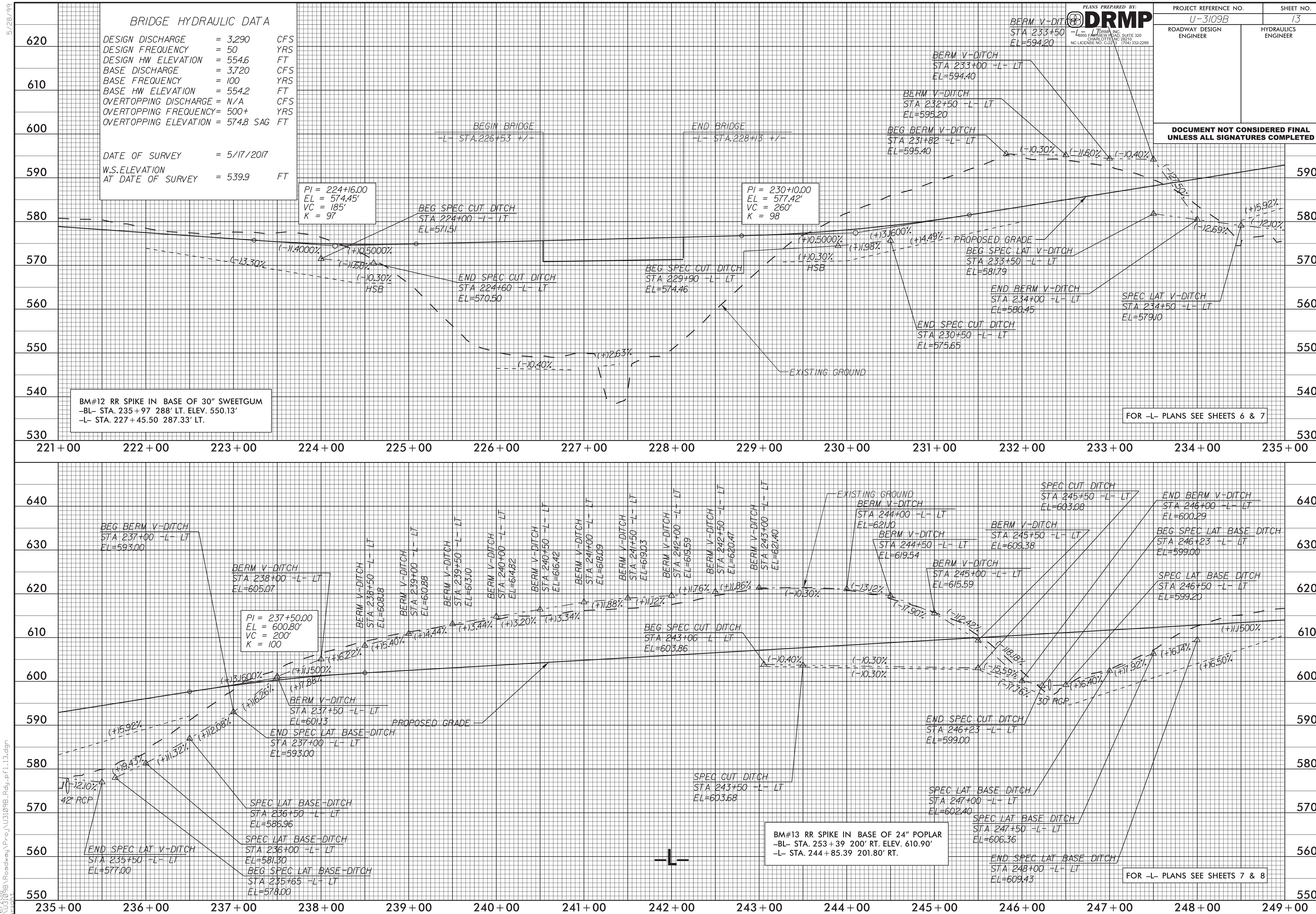
PROJECT REFERENCE NO.	SHEET NO.
U-3109B	13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PLANS PREPARED BY: DRMP
DRMP, INC. 5950 FAIRVIEW ROAD, SUITE 320 CHARLOTTE, NC 28210 NC LICENSE NO. C-2213 (704) 332-2289

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	3,290	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	554.6	FT
BASE DISCHARGE	=	3,720	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	554.2	FT
OVERTOPPING DISCHARGE	=	N/A	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	574.8 SAG	FT
DATE OF SURVEY	=	5/17/2017	
W.S. ELEVATION AT DATE OF SURVEY	=	539.9	FT



5/28/99
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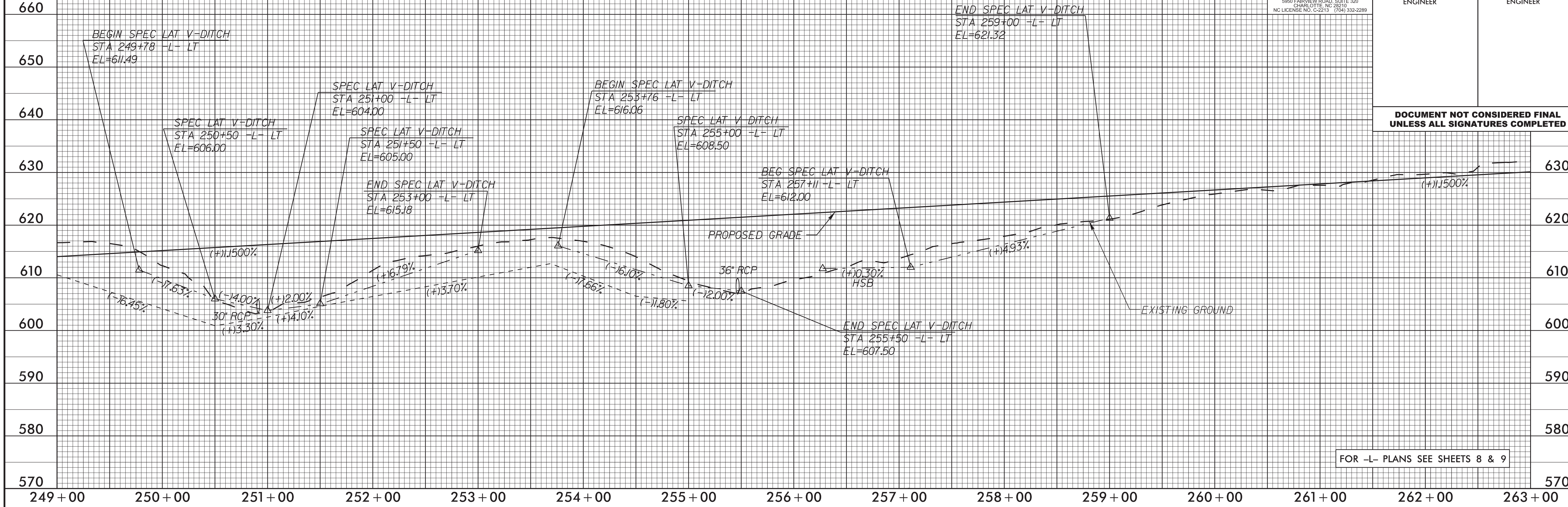
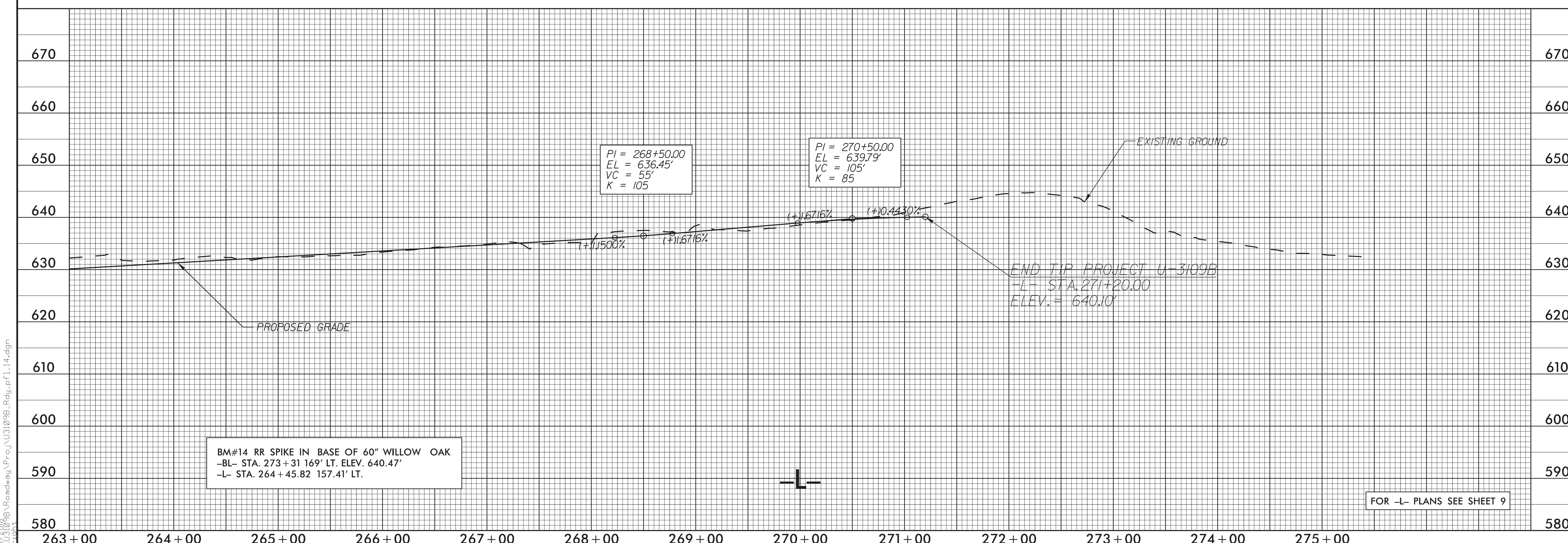
PLANS PREPARED BY:
DRMP
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



BEGIN SPEC LAT V-DITCH
STA 249+78 -L- LT
EL=611.49
SPEC LAT V-DITCH
STA 250+50 -L- LT
EL=606.00
SPEC LAT V-DITCH
STA 251+00 -L- LT
EL=604.00
SPEC LAT V-DITCH
STA 251+50 -L- LT
EL=605.00
END SPEC LAT V-DITCH
STA 253+00 -L- LT
EL=615.18
BEGIN SPEC LAT V-DITCH
STA 253+76 -L- LT
EL=616.06
SPEC LAT V-DITCH
STA 255+00 -L- LT
EL=608.50
BEG SPEC LAT V-DITCH
STA 257+11 -L- LT
EL=612.00
END SPEC LAT V-DITCH
STA 259+00 -L- LT
EL=621.32
END SPEC LAT V-DITCH
STA 255+50 -L- LT
EL=607.50
PROPOSED GRADE
EXISTING GROUND
30" RCP
36" RCP
HSB
(+)1.1500%
(-)16.45%
(-)17.63%
(-)14.00%
(+)3.30%
(+)2.00%
(+)4.10%
(+)16.79%
(+)3.70%
(-)17.66%
(-)16.10%
(-)11.80%
(-)12.00%
(+)0.30%
(+)4.93%
(+)1.1500%
FOR -L- PLANS SEE SHEETS 8 & 9
249+00
250+00
251+00
252+00
253+00
254+00
255+00
256+00
257+00
258+00
259+00
260+00
261+00
262+00
263+00



PI = 268+50.00
EL = 636.45'
VC = 55'
K = 105
PI = 270+50.00
EL = 639.79'
VC = 105'
K = 85
EXISTING GROUND
PROPOSED GRADE
(+)1.1500%
(+)1.6716%
(+)1.6716%
(+)0.4430%
END TIP PROJECT U-3109B
-L- STA.271+20.00
ELEV.= 640.10'
-L-
FOR -L- PLANS SEE SHEET 9
263+00
264+00
265+00
266+00
267+00
268+00
269+00
270+00
271+00
272+00
273+00
274+00
275+00

BM#14 RR SPIKE IN BASE OF 60" WILLOW OAK
-BL- STA. 273+31 169' LT. ELEV. 640.47'
-L- STA. 264+45.82 157.41' LT.

5/28/99

PLANS PREPARED BY:
DRMP
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BEGIN GRADE
-Y21REV- STA.10+45.02
-L- STA.256+10.56, 15.00' RT
ELEV. = 623.17'

PI = 13+31.00
EL = 618.88'
VC = 210'
K = 84

PI = 18+50.00
EL = 598.12'
VC = 240'
K = 98

PI = 21+00.00
EL = 594.27'
VC = 125'
K = 86

END GRADE
-Y21REV- STA.21+75.00
ELEV. = 592.03'

(-)1.500%
(-)4.000%
(-)10.30%
(+)11.00%
(+)3.68%
(-)14.10%
(-)11.50%
(-)15.46%
(-)14.000%
(-)11.500%
(+)12.57%
(+)1.24%
(-)5.400%
(-)12.99%
(-)1.34%
(-)10.46%

18" RCP

EXISTING GROUND

CONT DITCH FROM Y22

BEG SPEC CUT DITCH
STA 17+50 -Y21REV- RT
EL=597.70

BEG SPEC CUT DITCH
STA 11+90
EL=609.50

BEG SPEC LAT V DITCH
STA 11+90 -Y21REV- RT
EL=604.00

SPEC LAT V DITCH
STA 12+50 -Y21REV- RT
EL=604.60

END SPEC CUT DITCH
STA 13+30 -Y21REV- LT
EL=602.81

BEG SPEC CUT DITCH
STA 13+50 -Y21REV- LT
EL=603.28

END SPEC LAT V DITCH
STA 14+27 -Y21REV- RT
EL=604.2

BEG SPEC CUT BASE DITCH
STA 16+50 -Y21REV- LT
EL=596.30

SPEC CUT BASE DITCH
STA 17+00 -Y21REV- LT
EL=596.25

END SPEC CUT BASE DITCH
STA 17+50 -Y21REV- LT
EL=595.50

END SPEC CUT DITCH
STA 18+50 -Y21REV- RT
EL=595.00

BEG SPEC CUT BASE DITCH
STA 18+00 -Y21REV- RT
EL=595.00

END SPEC CUT BASE DITCH
STA 19+50 -Y21REV- RT
EL=594.6

BEG SPEC CUT DITCH
STA 19+50 -Y21REV- RT
EL=594.6

SPEC CUT DITCH
STA 20+50 -Y21REV- RT
EL=592.39

SPEC CUT DITCH
STA 21+00 -Y21REV- RT
EL=591.42

SPEC CUT DITCH
STA 21+50 -Y21REV- RT
EL=591.9

-L- TIE TO EXIST. DITCH

FOR -Y21REV- PLANS SEE SHEETS 8 & 10

FOR -Y21REV- PLANS SEE SHEET 11

-Y21REV-

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00
23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00

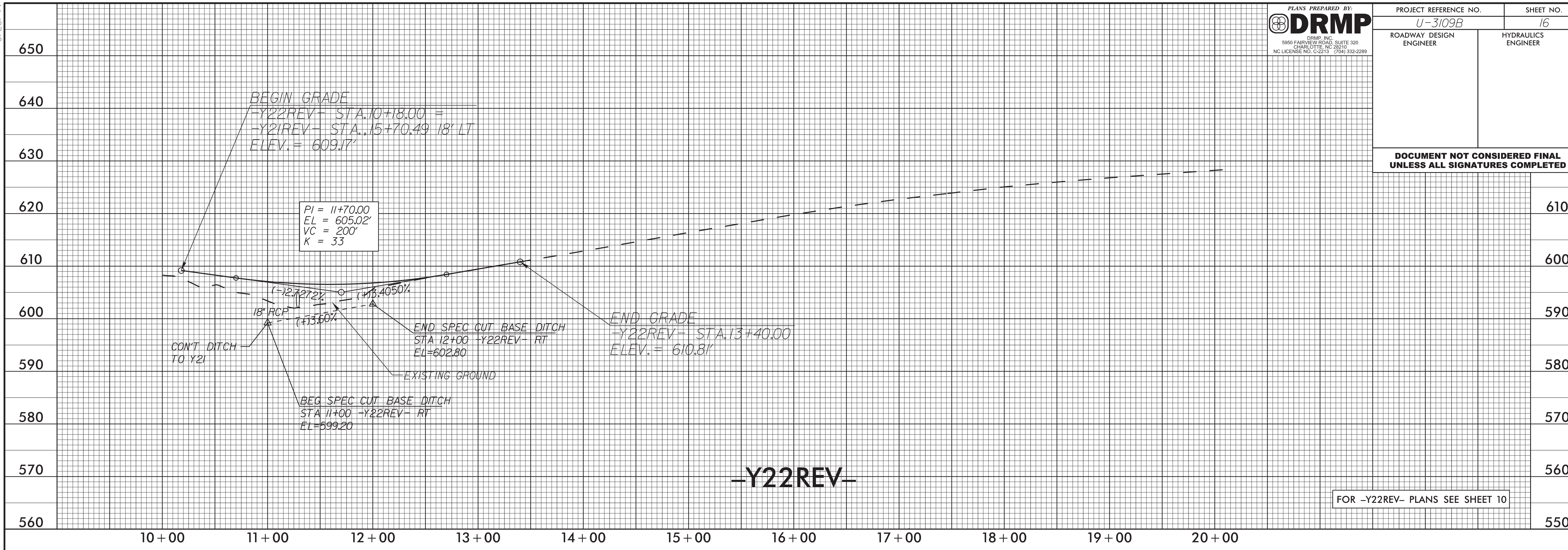
650 640 630 620 610 600 590 580 570 560 550

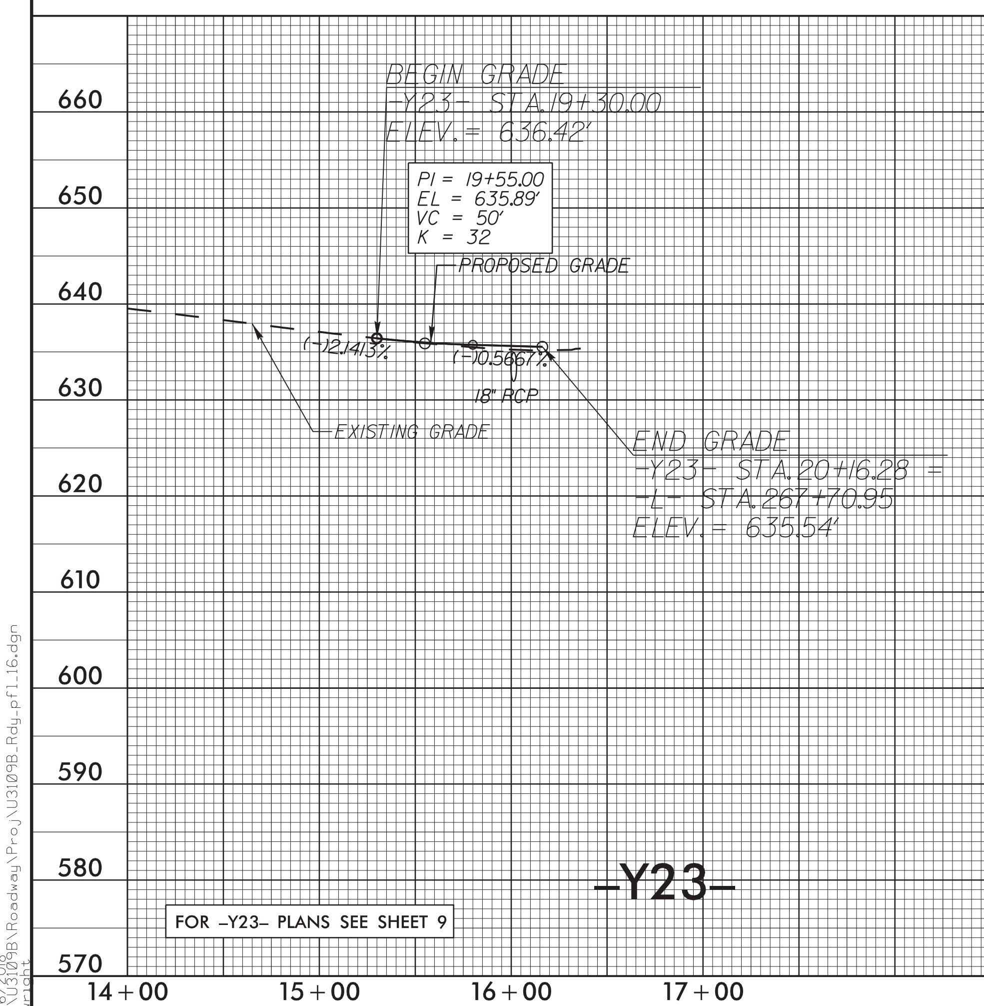
1/16/2018
R:\U3109B\Roadway\Proj\U3109B_Rdy_pf1_15.dgn
dw1401

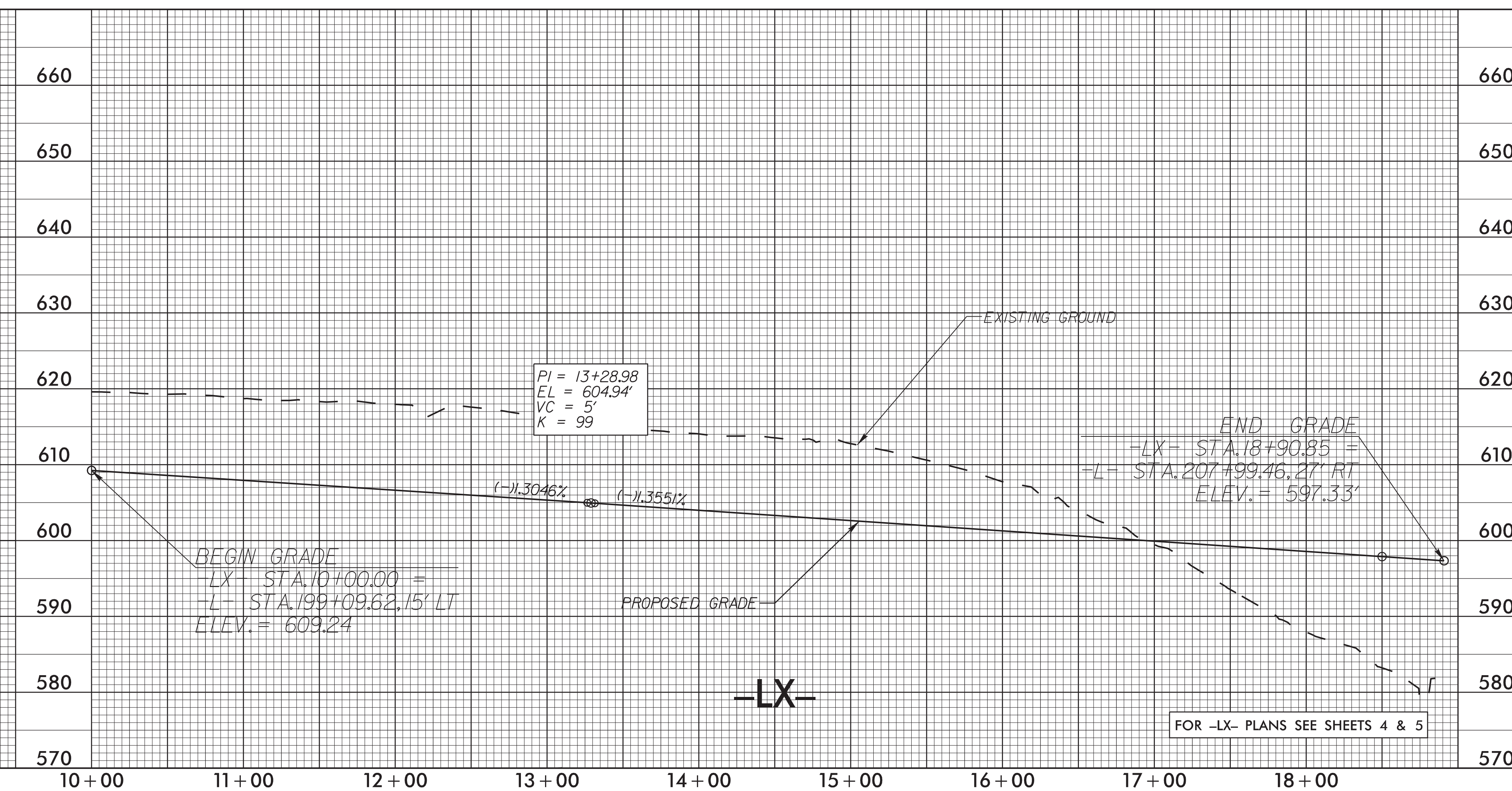
PLANS PREPARED BY:
DRMP
DRMP, INC.
5950 FAIRVIEW ROAD, SUITE 320
CHARLOTTE, NC 28210
NC LICENSE NO. C-2213 (704) 332-2289

PROJECT REFERENCE NO.	SHEET NO.
U-3109B	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED







5/28/99