



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

May 31, 2018

Wilmington Regulatory Field Office
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, North Carolina 28403

ATTN: Ms. Liz Hair
NCDOT Coordinator

Subject: **Request for Modification to Individual Section 404 and Section 401 Water Quality Certification** for Fayetteville Outer Loop from I-95 South of Fayetteville to NC 24-87, Cumberland, Hoke, and Robeson Counties. Federal Aid Project No. NHP-0620(031), State Project No. 34817.3.13, TIP Nos. X-0002 B & C, and U-2519 AA, AB, BA, BB, CA, CB, DA, & E. Debit \$570 from WBS 34817.3.13

References: Section 404 and 401 Individual Permit Application requested April 25, 2008
Section 404 Individual Permit issued October 23, 2008 (SAW-2008-01413)
Section 401 Water Quality Certification issued October 6, 2008 (20080737)
Section 404 and 401 Modification requested May 21, 2010
Section 401 Modification issued June 3, 2010 (20080737 v.2)
Section 404 and 401 Modification requested October 7, 2010
Section 401 Modification issued December 16, 2010 (20080737 v.3)
Section 404 Modification issued December 21, 2010 (SAW-2008-01413)
Section 401 Modification issued May 22, 2014 (20080737 v.4)
Section 404 Modification issued June 24, 2014 (SAW-2008-01413)
Section 401 Modification issued January 19, 2017 (20080737 v.5)
Section 404 Modification issued April 26, 2017 (SAW-2008-01413)
Section 401 Modification issued May 5, 2017 (20080737 v.6)

Dear Madam:

The purpose of this modification request is to provide final design and impact calculations for U-2519 BA & BB which were in preliminary design when the original permit was requested in 2008. As you are aware, several sections of X-0002 B & C and U-2519 are constructed or currently under construction. U-2519 BA is an approximately 3.77 mile section of the Fayetteville Outer Loop that begins south of SR 1003 (Camden Road) and extends to south of SR 1104 (Strickland Bridge Road). U-2519 BB is an approximately 1.25 mile section of the Fayetteville Outer Loop that begins south of SR 1104 (Strickland Bridge Road) and extends to south of US 401.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL ANALYSIS UNIT
1598 MAIL SERVICE CENTER
RALEIGH, NC 27699-1548

Telephone: (919) 707-6000
Fax: (919) 250-4224
Customer Service: 1-877-368-4968

Location:
1020 BIRCH RIDGE DRIVE
RALEIGH, NC 27610

Website: www.ncdot.gov

There will be 1,463 linear feet of permanent stream impact and 267 linear feet of temporary stream impact associated with construction of the U-2519 BA & BB sections. Permanent impacts to wetlands total 7.67 acres due to fill, excavation, and mechanized clearing on the project. A total of <0.01 acre of temporary wetland impacts and 0.62 acre of hand clearing will occur due to project construction.

Please see the enclosed 4B & 4C Merger Meeting minutes, Stormwater Management Plans, permit drawings, roadway plans, and a revised Privateer Wetland and Stream Mitigation Site Debit Ledger for sections U-2519 BA & BB.

Surveys for all federally-protected species listed for Cumberland County were updated in June 2016. A biological conclusion of “no effect” remains current for all species except the red-cockaded woodpecker (RCW). A Biological Opinion was issued on April 28, 2005; however, the 2016 report for sections U-2519 BA & BB states that “no RCW cavity trees will be impacted or ‘taken’ by the project.”

Table 1. U-2519 BA Wetlands Impacts

Permit Site Number	FEIS Site ID	Riverine or Non-Riverine	Permanent Impacts (ac.) *	Temporary Impacts (ac.)	Mitigation Required**
1	Z60	Non-Riverine	1.85	0	Yes
2A	Z59	Non-Riverine	2.91	0	Yes
2B	Z59	Non-Riverine	0.16	0	Yes
3	Z57	Non-Riverine	0.80	0	Yes
4	Z56	Riverine	0.03	<0.01	Yes
5	Z55	Riverine	0.04	0	Yes
6	Z55	Riverine	0.93	0	Yes
7	WB	Non-Riverine	0.39	0	Yes
Total:			7.11	<0.01	

Notes: Rounded totals are sum of actual impacts

* Includes fill, excavation, and mechanized clearing. ** For permanent impacts.

Hand clearing: Site 4 - 0.60 ac.

Table 2. U-2519 BB Wetlands Impacts

Permit Site Number	FEIS Site ID	Riverine or Non-Riverine	Permanent Impacts (ac.) *	Temporary Impacts (ac.)	Mitigation Required**
1	Z9	Riverine	0.13	0	Yes
2	Z9	Riverine	0.34	0	Yes
4	Z7	Riverine	0.08	0	Yes
5	WA	Riverine	0.02	0	Yes
Total:			0.56	0	

Notes: Rounded totals are sum of actual impacts

* Includes fill, excavation, and mechanized clearing. ** For permanent impacts.

Hand clearing: Site 4 - 0.02 ac.

Table 3. U-2519 BA Surface Water Impacts and Descriptions

Permit Site Number	Waterbody	Permanent		Temporary		Type of Stream	Mitigation Required**
		lf.	ac.	lf.	ac.		

1	UT to Rockfish Creek (Z60)	494	0.03	13	<0.01	Perennial	Yes
1*	UT to Rockfish Creek (Z60)	25	<0.01	12	<0.01	Perennial	Yes
Total:		519	0.03	25	<0.01		

Notes: ** For permanent impacts

Table 4. U-2519 BB Surface Water Impacts and Descriptions

Permit Site Number	Waterbody	Permanent		Temporary		Type of Stream	Mitigation Required**
		lf.	ac.	lf.	ac.		
2	UT to Little Rockfish Creek (Z9)	100	<0.01	20	<0.01	Intermittent	Yes
3	Bones Creek (BC)	145	0.01	60	<0.01	Intermittent	Yes
4	UT to Little Rockfish Creek (Z7)	364	0.02	35	<0.01	Intermittent	Yes
5*	Stewarts Creek (SA)	11	<0.01	0	0	Perennial	Yes
6	UT to Little Rockfish Creek (Z9)	0	0.17	0	0	Intermittent	Yes
7	UT to Little Rockfish Creek (Z9)	126	0.01	36	<0.01	Intermittent	Yes
8	UT to Little Rockfish Creek (Z9)	199	0.02	45	<0.01	Intermittent	Yes
9	UT to Little Rockfish Creek (Z9)	0	0	45	<0.01	Intermittent	Yes
Total:		945	0.24	241	<0.01		

Notes: ** For permanent impacts

Compensatory Mitigation

Compensatory mitigation for the 7.67 acres of permanent wetland impacts will be debited from the Privateer Wetland and Stream Mitigation Site. This brings total project wetland impacts to 51.35 acres. The 1,428 linear feet of stream impacts requiring mitigation will also be debited from the Privateer Wetland and Stream Mitigation Site, bringing the total project stream impacts to 12,292 linear feet. A revised debit ledger for the Privateer Wetland and Stream Mitigation Site is attached to this modification request.

Utility Impacts

Utility relocations will be accomplished by means of directional bore in jurisdictional areas. Therefore, no jurisdictional impacts due to utility relocations will occur. Please see the attached Utility Environmental Permit Narratives for more detailed descriptions of utility relocations.

Regulatory Approvals

U-2519 BA & BB have a combined letting date of September 18, 2018 and a review date of June 26, 2018.

Section 404: We are hereby requesting the modifications described above and an expiration date of July 1, 2021 for the USACE Individual 404 Permit signed October 23, 2008 (SAW-2008-01413), for the above-described activities.

Section 401: We are hereby requesting a modification to the 401 Water Quality Certification from the NCDWR issued October 6, 2008 (DWQ No. 003278). In compliance with Section

143-215.3D(e) of the NCAC, please debit \$570.00 from WBS 34817.3.13 for processing the Section 401 permit modification.

A copy of this modification request and its distribution list will be posted on the NCDOT website at: <https://connect.ncdot.gov/resources/Environmental>.

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Tyler Stanton at 919-707-6156 or tstanton@ncdot.gov.

Sincerely,

DocuSigned by:

33883EFFD0F44D3...

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

cc:
NCDOT Permit Application Standard Distribution List.

Privateer
WM 026-005

The Privateer Farms Restoration Site (Site) is located in Bladen and Cumberland Counties, North Carolina, approximately fourteen miles southeast of Fayetteville. Prior to restoration, land use on the Site over the past 20 years had been primarily row crop agriculture. Stream and riparian functions on the Site had been severely impacted as a result of agricultural conversion. Harrison Creek had historically meandered through the Site, but was channelized in the early 1980s to reduce flooding and provide a drainage outlet for the extensive network of ditches excavated across the Site. Subsequent to channelization, Harrison Creek existed as a large canal running straight through the Site.

Restoration activities for the Site involved moving the stream channel back to its historic location and elevation, and filling drainage ditches to raise the local water table and restore wetland and stream hydrology. The plan also included scarification of the fields and breaking of the local plow pan to increase surface water storage and provide a range of hydrologic conditions suitable for a variety of native wetland plant species. The restoration plan for the Site predicted the restoration of 405 acres of riverine wetlands, 25 acres of riverine wetland enhancement, and 33,985 linear feet (LF) of stream restoration. Following construction, the as-built data indicated that the total area of restored riverine wetlands was 402.5 acres (excluding 2.5 acres for road accesses), with 25 acres of enhanced riverine wetlands, and 34,005 LF of restored stream channel.

As of fall 2009, the Site has met all prescribed hydrologic and vegetative monitoring criteria and been recommended for closeout.

To offset unavoidable wetland and stream impacts associated with T.I.P. U-2519 BA/BB, the Privateer Mitigation Site will be debited 1 ac of Riparian wetland for 1 acre of Riparian wetland impact, 20.01 acres of Riparian Wetland for 6.67 acre of non-riparian wetland impact, and 2142 linear feet of stream for 1428 linear of stream impacts. These debits and credits are reflected in the following ledger.

HUC	Mitigation Type	Starting Amount	Additional Notes
3030004	Stream Restoration	25676	**Out of service area ratios: 1.5:1 ratio for stream impacts 3:1 for wetland impacts
3030004	Riparian Wetland Restoration	185.58	**Out of service area ratios: 1.5:1 ratio for stream impacts 3:1 for wetland impacts

Privateer
WM 026-005

TYPE	DEBITAMOUNT	Status	SITE TIP	Action ID#	Notes
S_REST	-25676	Close Out	From EEP for U-2519/X-2		Credits transferred from EEP. **Out of service area ratios: 1.5:1 ratio for stream impacts 3:1 for wetland impacts
S_REST	-918	Close Out	U-2519CB, DA Mod	2008-01413	612 lf reduction @ 1.5:1
S_REST	-529.5	Close Out	U-2519CB, DA Mod	2008-01413	353 lf reduction @ 1.5:1
S_REST	214.5	Close Out	U-2519CB, DA Mod	2008-01413	143 lf addition @ 1.5:1
S_REST	615	Close Out	X-0002C Site 8 Mod	2008-01413	410 lf addition @ 1.5:1
S_REST	852	Close Out	U-2519CA Mod	2008-01413	568 lf addition @ 1.5:1
S_REST	1329	Close Out	U-2519, X-0002 Mod	2008-01413	886 lf addition @ 1.5:1. Unable to Confirm in permits. Taken from old ledger (Math works out)
S_REST	1518	Close Out	R-4903	2009-00655	1012 lf of impacts @ 1.5:1.
S_REST	8329	Close Out	EEP		Site transferred to EEP
S_REST	18519	Close Out	U-2519, X-0002	2008-01413	12,346 lf @ 1.5:1. Original Permit
S_REST	2142	Close Out	U-2519 BA BB		1428 lf @ 1.5:1

Privateer
WM 026-005

TYPE	DEBIT AMOUNT	Status	SITE TIP	Action ID#	Notes
RW_REST	-101.76	Close Out	From EEP for U-2519/X-2		Credits transferred from EEP. **Out of service area ratios: 1.5:1 ratio for stream impacts 3:1 for wetland impacts
RW_REST	-39.6	Close Out	From EEP for R-2303		Credits transferred from EEP. **Out of service area ratios: 1.5:1 ratio for stream impacts 3:1 for wetland impacts
RW_REST	-23.86	Close Out	From EEP for U-2519/X-2		Credits transferred from EEP. **Out of service area ratios: 1.5:1 ratio for stream impacts 3:1 for wetland impacts
RW_REST	-20.36	Close Out	From EEP for U-2519		Credits transferred from EEP. **Out of service area ratios: 1.5:1 ratio for stream impacts 3:1 for wetland impacts
RW_REST	-0.6	Close Out	U-2519CB, DA Mod	2008-01413	0.2 ac reduction @ 3:1.
RW_REST	-0.06	Close Out	U-2519CB, DA Mod	2008-01413	0.02 ac reduction @ 3:1.
RW_REST	0.15	Close Out	R-2303A	1992-03237	Permit Mod 0.5 ac impacts @ 3:1
RW_REST	1.14	Close Out	U-2519CB, DA Mod	2008-01413	0.38 ac addition @ 3:1.
RW_REST	1.29	Close Out	X-0002C Site 8	2008-01413	0.43 ac addition @ 3:1.
RW_REST	5.1	Close Out	U-2519E		Unable to Confirm. Unknown what the source of this debit is.
RW_REST	6.99	Close Out	U-2519CA Mod	2008-01413	2.33 ac addition @ 3:1.
RW_REST	7.38	Close Out	R-2303A	1992-03237	
RW_REST	145.29	Close Out	U-2519, X-0002	2008-01413	48.43 ac @ 3:1. Original Permit Estimate for all sections
RW_REST	216.92	Close Out	EEP		Site Transferred to EEP
RW_REST	1	Close Out	U-2519 BA/BB		1 ac Riparian Wetland impact @ 1:1 ratio
RW_REST	20.01	Close Out	U-2519 BA/BB		6.67 ac Non-Riparian wetland impact @ 3:1

Memorandum of Meeting

Date: March 23th, 2016

Place: NCDOT, Hydraulics Unit Conference Room, 11:00 A.M.

Team Members: Mason Herndon (NCDWR)
Liz Hair (USACE)
Dr. Cynthia Van Der Wiele (USEPA)
Travis Wilson (NCWRC)
Ron Lucas (FHWA) – Absent
Gary Jordan (USFWS) - Absent

Others Present: Paul Atkinson, PE (NCDOT- Hydraulics)
Brook Anderson, PE (NCDOT- Hydraulics)
Jeff Meador, PE (RK&K)
Alexis Stys, EI (RK&K)
Randy Wise (NCDOT- Div. 6)
Jim Rerko (NCDOT- Div. 6)
Mark Staley (NCDOT- REU)
Jay McInnis (NCDOT- PDEA)
Hemal Shah (NCDOT- TPB)
John Schriner (Wetherill- Utilities)
Sam St. Clair (NCDOT Roadway)
Kevin Fischer (NCDOT Structures)
Tyler Stanton (NCDOT- NES)

Subject: NEPA\404 Merger Team - Concurrence Point 4B Meeting
U-2519BA - Fayetteville Outer Loop from South of SR 1003 (Camden Road) to South of SR 1104 (Strickland Bridge Road), Cumberland County, Division 6

The Concurrence Point 4B Meeting for U-2519BA in Cumberland County was held on February 17th, 2016 in accordance with NCDOT policy. The following items were discussed and conclusions reached:

Jeff Meador opened the meeting with introductions and a brief description of the project. Jeff continued by providing a summary of the preliminary drainage design at each jurisdictional feature on the plans. The following comments and decisions were reached.

Sheets 2B-1 & 2B-2: No jurisdictional features

Sheet 2B-3: This site is at a detour alignment for Camden Road. There are no impacts to the wetlands on the south side of the road for the detour. The impacts on the north side are within the footprint of the wetlands required for the permanent construction which is shown on Sheet 6. The wetlands on the north side of the road will be a total take.

Sheets 2B-4 - 2B-7: No jurisdictional features

Sheet 4 & 5: Roadway drainage at this site includes a 66" RCP-IV with a wetland at the inlet and outlet end of the pipe. The pipe will not be buried.

- Mason Herndon asked if there was a UT to Rock Fish Creek within the wetland. Mason will verify that this is not a jurisdictional stream.
- As a general comment erosive velocities are a concern where ditches enter wetlands. This is especially an issue with steeper ditch slopes. Ditch velocities will be designed to be non-erosive where they enter wetlands and steep ditch grades will be avoided.

- Sediment releases have been an issue with hand clearing adjacent to slopes near wetlands. It was requested that these areas be permitted as mechanized clearing with at least 5-10' impact beyond the proposed slope stake for erosion control measures and temporary sediment storage.

Sheets 5 & 6: Roadway drainage at this site includes a 60"/72" RCP cross pipe connected with multiple junction boxes and gore area tie-ins with a wetland at the inlet and outlet end of the piped system. Storm drainage from the ramp gores and surrounding areas was brought in via junction boxes to minimize ditching to the edge of wetlands. The pond under -Y13RPC- at approximately Sta. 19+50 is non jurisdictional.

Sheet 6: At -Y13- Sta. 58+00 +/- the proposed crossing will be 2 42" pipes that are not buried. The wetland on the left side of the roadway will be a total take. The majority of the storm drainage for the roadway was brought to left side of the road to minimize ditching to the edge of wetlands on the right side of the road.

Sheet 7 & 8: There is an existing pond upstream of the wetland at -Y13RPA- that outlets to a swale that will be filled in by the ramp. The proposed drainage design at this location includes a ditch through the wetland to convey this water past the ramp. The drainage area to this location is approximately 15 acres and toe protection alone is not sufficient to protect the slope. The proposed ditch will be designed not to be lower than the existing swale to avoid draw down effects. It was noted that there is an existing swale that is not drawing the wetland down and a new ditch at a similar depth may not have any additional effect.

Sheet 9: This site includes a proposed bridge to span the entire limits of UT to Stewarts Creek and the wetlands in the flood plain.

- NCDOT committed to span the entire wetland with a 15' offset from the toe of fill to the wetland. There will be impacts for the proposed piers and any work bridge that is required.
- The ditches bringing the proposed roadway drainage to the wetland will be checked for erosive velocities and steep slopes.
- A work bridge and not a work-pad will be required at this site to avoid compaction.
- Deck drains are not required for the proposed bridges.

Sheet 10: The proposed roadway drainage at this site includes a 42" RCP. A junction box near the exit of the pipe has been added to lower the velocity exiting into the wetland since there is a large elevation difference from the upstream to downstream end of the pipe.

Sheets 11-12: No impacts to jurisdictional features.

Sheet 13: The site includes two wetlands tied together with an existing 18" RCP. The roadway drainage proposes removal of this pipe and connecting the wetlands with a standard base ditch. To receive mitigation credit it was requested that the existing access road be removed and returned to the original contours between the wetlands.

The proposed roadway drainage includes a 54"/60" cross-pipe (not buried) with storm drain systems from the roadway drainage tied in to the cross pipe. This large proposed pipe system outlets into an existing jurisdictional pond which is proposed to be rock filled to avoid water in the ROW. Mason asked if any BMP was provided in this area. Jeff responded that this area mostly includes inlets picking up grass lined ditches but further options will be investigated for feasibility.

Sheet 14-30: No jurisdictional features

Memorandum of Meeting

Date: March 7, 2017

Place: NCDOT, Structures Unit Conference Room, 9:00 A.M.

Team Members: Ron Lucas (FHWA)
Joanne Steenhuis (NCDWR)
Liz Hair (USACE) - Phone
Dr. Cynthia Van Der Wiele (USEPA) - Phone
Travis Wilson (NCWRC) - Phone
Gary Jordan (USFWS) - Absent

Others Present Jeff Meador. PE (RK&K)
Alexis Stys, EI (RK&K)
Paul Atkinson, PE (NCDOT- Hydraulics)
Brook Anderson, PE (NCDOT- Hydraulics)
Keith Paschal (NCDOT-SMU)
Mark Staley (NCDOT- REU)
Jim Rerko (NCDOT- Div. 6)
Hemal Shah (NCDOT- TPB)
Sam St. Clair (NCDOT Roadway)
Jay McInnis (NCDOT- PDEA)
Randy Wise (NCDOT- Div. 6)
Nabil Hamdau (NCDOT Utilities)
Chris Rivenbark (NCDOT - NEU)

Subject: NEPA\404 Merger Team - Concurrence Point 4C Meeting
U-2519BA - Fayetteville Outer Loop from South of SR 1003 (Camden Road) to South of SR 1104 (Strickland Bridge Road), Cumberland County, Division 6

The Concurrence Point 4C Meeting for U-2519BA in Cumberland County was held on February 15th, 2017 in accordance with NCDOT policy. The following items were discussed and conclusions reached:

Jeff Meador opened the meeting with introductions and a brief description of the project. Jeff continued by providing a summary of the impacts/design at each site. The following comments and decisions were reached.

Site 1 (Permit Sheets 4-9): As requested at the 4B meeting, NCDOT evaluated this site to determine if there was a jurisdictional stream within the wetland. NCDOT determined that there was a stream within the wetland. The crossing includes a 72" RCP buried 1' below the stream bed with rip-rap shown on the banks only.

Site 2A (Permit Sheets 9-19): This site is all one large wetland with a 66" RCP. The 10-year outlet velocity to the wetlands is 1.8 ft/s with a Q10 of 180.0 cfs. Jim Rerko commented that the velocity value seemed low for the amount of discharge. Mr. Meador responded that the outlet pad is large for a 66" pipe outlet and the area is flat, producing an allowable V10. At the 4B meeting it was discussed that the pond at Ramp C 19+50 +/- is not jurisdictional. However, it shows up with a wetland boundary on the permit drawings. Chris Rivenbark will check to confirm that the pond is not jurisdictional and the boundary will be removed from the drawings.

Site 2B (Permit Sheets 20-22): The portion of the wetland on the inlet end of the pipe is a total take. The temporary on-site detour for -Y13- is shown in light grey on the sheet. The detour does not create any additional impacts relative to the final design.

Site 3 (Permit Sheets 23-25): There is an existing pond upstream of this site with no apparent outlet control device which is located along the ramp. There is also a proposed drainage area of approximately 22.5 acres draining to this location. These factors require a proposed ditch through the wetland to protect the roadway fill slope. The proposed ditch grade was minimized to minimize drawdown impacts.

Site 4 (Permit Sheets 26-29): The site includes a bridge spanning the UT to Stewarts Creek and wetlands. No deck drains are required for the bridge. There is a minimum 15 foot offset between the wetland boundary and the toe of slope. A temporary work bridge is provided for construction and is shown on the permit drawings (dashed line under bridge). Currently the design of the work bridge is under review from the structures unit. It is noted on the final summary sheet that the work bridge impacts are not final until approval of the work bridge.

Site 5 (Permit Sheets 31-32): A junction box with a manhole added to the cross pipe to create a drop in the system to dissipate energy before the water outlets into the wetland. The outlet pipe from the junction box is proposed at a 0.4% slope maximum and is noted on the roadway plans.

Site 6 (Permit Sheets 33-35): Rock fill proposed in the pond to eliminate standing water inside the right-of-way. He also noted that in the 4B meeting a request was made to determine if a BMP could be designed in this area. Mr. Meador explained that because of the steep contours, the roadway grade, and the way that the wetlands extend up the hillside a BMP was not feasible. Jim Rerko asked if the TDE in areas where no drainage is proposed was for erosion control devices, which Mr. Meador confirmed. As requested at the 4B meeting the existing dirt road and cross pipe on the right side of the proposed road is being removed and returned to natural contours.

Site 7 (Permit Sheets 36-38): This site was not discussed at 4B meeting because it had not been identified as a wetland at that time. The area was determined to be a wetland after further investigation. The crossing consists of a 48"/54" pipe with a 10-year outlet velocity of 1.4 ft/s. There is a new residential development under construction just north of the site.

Other Discussion:

Dr. Van Der Wiele asked if there were equalizer pipes used on the project. Mr Meador responded that there were not since all of the crossings had topography that keeps water moving from one side of the road to the other.

Joanne Steenhuis asked if impacts noted as <0.01 acres could be reported as square footages so that impacts can be accounted for accurately in DEQ's system. Chris Rvienbark noted that the impacts are being reported per NCDOT's standard procedure and that square footage impacts are being added together behind the scenes in the summary spreadsheet. Chris noted that NCDOT will work with DEQ to make sure they have adequate information.

Subject: U-2519BB - Fayetteville Outer Loop from South of SR 1104 (Strickland Bridge Rd.) to South of US 401 in Cumberland County

Date: 3/21/2016

Minutes of Interagency 4B Hydraulics Design Review – 2/17/2016

An Interagency 4B Hydraulics Design Review meeting was held on February 17, 2016 at 9:45 AM in the NCDOT Century Center Hydraulics Conference Room. The purpose of the meeting was to discuss the environmental impact concerns that may be encountered while completing the hydraulic design that will be provided by Mulkey Engineers and Consultants for U-2519BB.

Team Members:

Paul Atkinson (Present)	NCDOT – Hydraulics	919-707-6707	patkinson@ncdot.gov
Ron Lucas (Absent)	FHWA	---	---
Liz Hair (via phone)	USACE	---	sarah.e.hair@usace.army.mil
Travis Wilson (via phone)	NCWRC	---	---
Dr. Cynthia Van Der Wiele (Absent)	USEPA	---	---
Mason Herndon (Present)	NCDWR	910-308-4021	mason.herndon@ncdenr.gov

Participants:

Jay McInnis	NCDOT – PDEA	919-707-6029	jmcinnis@ncdot.gov
Mark Staley	NCDOT – REU	919-707-2948	mstaley@ncdot.gov
Hemal Shah	NCDOT – TPB	919-707-0992	hishah@ncdot.gov
Tyler Stanton	NCDOT – NES	919-707-6156	tstanton@ncdot.gov
Chris Rivenbark	NCDOT – NES	919-707-6152	crivenbark@ncdot.gov
Randy Wise	NCDOT – Division 6	910-486-1496	rwise@ncdot.gov
Jim Rerko	NCDOT – Division 6	910-437-0207	jrerko@ncdot.gov
John Schrinier	Wetherill Utilities	919-851-8077	jschriner@wetherilleng.com
Sam St. Clair	NCDOT – Roadway	919-707-6321	sstclair@ncdot.gov
Brook Anderson	NCDOT – Hydraulics	919-707-6706	beanderson@ncdot.gov
David Bocker	Mulkey E&C	704-566-4342	dbocker@mulkeyinc.com
Jay Subedi	Mulkey E&C	704-566-4306	jsubedi@mulkeyinc.com

The following is a brief summary of the discussions on the project:

Introductions were made by all in attendance. David Bocker (Mulkey Engineers & Consultants) proceeded to give an overview of the project and its location along the Fayetteville Outerloop corridor and then proceeded with the review of the project.

General

- All waters within the project are Class ‘C’ (suitable for aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture).
- Project falls within the Cape Fear River Basin, more specifically to Rockfish Creek & Stewarts Creek.
- Grass Swale treatment will occur throughout the project in the median and in areas where flat slopes can be maintained.
- Cross pipes in jurisdictional streams will be buried 1ft for pipes greater than 48 inches and 20% of the pipe diameter for culvert less than 48 inches in diameter to provide for fish passage.
- By request of NCDWR, Mulkey will evaluate the feasibility of eliminating outlet riprap in the bed of the JS at each crosspipe location to minimize stream impacts.

Sheet 5

- The Existing 53"x41" CSPA is to be replaced with 72" RCP (buried 1 ft) with standard riprap apron at 24+50 Ramp C.
- Wetlands are located between Ramp C & the mainline -L-; roadway fill slopes "outside" of the interchange will be minimized to 3:1 to minimize impacts.
- A 72" RCP (buried 1 ft) with standard riprap apron is proposed at -L- 545+00. NCDOT-Roadway stated that fill slopes would need to remain 4:1 inside the interchange.
- Ditches in quadrant that drain to wetlands will be designed to provide non-erosive velocities
- As part of the drainage design, the existing 54" pipe in quadrant B will be removed. Mulkey asked if the removal of the 54" pipe can offset total project impacts. It was determined that the removal of the 54" pipe will be credited to the overall project and thus offset the total stream impacts.
- A 66" RCP (buried 1 ft) with standard riprap apron is proposed at 25+75 Ramp B.

Sheet 6

- Proposed 66" RCP (buried 1ft) with standard riprap apron is proposed at -L- 569+00.
- Fill slopes will be reduced to 3:1 in the wetland areas to minimize wetland impacts.
- Ditch from line back to be designed to provide non-erosive velocities. The Division expressed concern with ditches on steep slopes; past experience shows that riprap is ultimately needed in this area of the state due to the soil type. It is recommended that riprap be considered for any ditches over 4%.
- Additionally, for permit drawing purposes; based on discussions with NCDOT field personnel and contractors, NCDWR suggest using 5-10' of mechanized clearing beyond the fill slopes at wetland impact areas for erosion control measures and sediment storage. A substantial increase in the number of sediment releases impacting adjacent jurisdictional resources have been noted over the past few years because erosion control measures placed at the toe of fill are being overwhelmed.

Sheet 8

- Mulkey pointed out that stream crossing (2 @ 78"x108" CMP) to the west of the project (Stewart Creek) was not included in the wetland file provided by NES. It is anticipated that this stream will be considered JS; however, NES will confirm.
- Proposed ditch along -Y17- will outlet at JS; therefore Riprap at Embankment Detail is proposed to provide bank stabilization.

Sheet 12

- Pond impacts at 63+00 RT; roadway fill slopes will be "rock fill in pond", see detail. This ensures that if pond is groundwater fed, that it has opportunity to drain out. Proposed R/W will be pulled in and minimized.
- Mulkey pointed out that the JS line shown from the pond outlet does not extend downstream to the JS at the proposed cul-de-sac and was not included in the wetland file provide by NES. NES will confirm.
- Those present from the Merger Team did not have objection to rerouting the existing channel on -SR2- to the cul-de-sac that is cut off (between 14+00 and 15+50 RT).
- Proposed 60" RCP (buried 1ft) with standard riprap apron at -SR2- Cul-de-sac.

- Proposed 54" RCP (buried 1 ft) with standard riprap apron at -Y17- 65+75. Also, slopes to be reduced to 3:1 to minimize stream impacts.

Sheets 4, 7, 9, 10, 11, 13, 14, 15, & 16

- No jurisdictional streams or wetlands, therefore, no impacts.

Subject: U-2519BB - Fayetteville Outerloop from South of SR 1104 (Strickland Bridge Rd.) to South of US 401 in Cumberland County

Date: 3/23/2017

Minutes of Interagency 4C Hydraulics Design Review – 2/15/2017

An Interagency 4C Hydraulics Design Review meeting was held on February 15, 2017 at 11:00 AM in the NCDOT Century Center Structures Design Conference Room. The purpose of the meeting was to review the permit drawings and impacts associated with the hydraulic design completed by CALYX Engineers and Consultants for U-2519BB.

Team Members:

Ron Lucas (via phone)	FHWA	---	---
Liz Hair (via phone)	USACE	---	sarah.e.hari@usace.army.mil
Travis Wilson (via phone)	NCWRC	---	---
Dr. Cynthia Van Der Wiele (via phone)	USEPA	---	---
Joanne Steenhuis (Present)	NCDWR	910-308-4021	joanne.steenhuis@ncdenr.gov

Participants:

Paul Atkinson	NCDOT – Hydraulics	919-707-6707	patkinson@ncdot.gov
Brook Anderson	NCDOT – Hydraulics	919-707-6706	beanderson@ncdot.gov
Jay McInnis	NCDOT – PDEA	919-707-6029	jmcinnis@ncdot.gov
Mark Staley	NCDOT – REU	919-707-2948	mstaley@ncdot.gov
Hemal Shah (via phone)	NCDOT – TPB	919-707-0992	hishah@ncdot.gov
Chris Rivenbark	NCDOT – NES	919-707-6152	crivenbark@ncdot.gov
Randy Wise	NCDOT – Division 6	910-486-1496	rwise@ncdot.gov
Jim Rerko	NCDOT – Division 6	910-437-0207	jrerko@ncdot.gov
Gary Lovering	NCDOT – Roadway	919-707-6271	glovering@ncdot.gov
Sam St. Clair	NCDOT – Roadway	919-707-6321	sstclair@ncdot.gov
David Bocker	CALYX E&C	704-566-4342	dbocker@CALYXengineers.com
Jay Subedi	CALYX E&C	704-566-4306	jsubedi@CALYXengineers.com
J.R. Hopson	CALYX E&C	704-566-4317	jhopson@CALYXengineers.com

The following is a brief summary of the discussions on the project:

Introductions were made by all in attendance. David Bocker (CALYX Engineers & Consultants) proceeded to give an overview of the project and its location along the Fayetteville Outerloop corridor and then proceeded with the review of the project and permit drawings.

General

- All waters within the project are Class 'B' (suitable for aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture).
- Project falls within the Cape Fear River Basin, more specifically to Rockfish Creek & Stewarts Creek.
- Grass Swale treatment will occur throughout the project in the median and in areas where flat slopes can be maintained.
- Cross pipes in jurisdictional streams will be buried 1ft for pipes greater than 48 inches and 20% of the pipe diameter for culvert less than 48 inches in diameter to provide for fish passage.
- By request of NCDWR at the 4B meeting, CALYX evaluated the feasibility of eliminating outlet riprap in the bed of the JS at crosspipe locations to minimize stream impacts. After the 4B

meeting, it was determined that riprap is needed at all outlet locations to stabilize the pipe outlets due to high velocities.

Site 1 – 72” RCP –Y17RPC- 24+50 (Permit Drawing Sheet 2)

- The Existing 53”x41” CSPA will be replaced with 72” RCP (buried 1 ft) with standard riprap apron at 24+50 Ramp C. Wetlands are located between Ramp C & the mainline –L-; roadway fill slopes “outside” of the interchange have been minimized to 3:1 to minimize impacts. Permanent impacts for the pipe, as well as temporary impacts and mechanized clearing have been shown beyond the proposed fill slopes to account for construction/installation activities.
- NCDWR requested that the design be evaluated to consider not burying the 72” RCP since a JS is not present, wetlands exist at the inlet and outlet of the 72” RCP. Pipe will be revised to 66” unburied.

Site 2 – 72” RCP –L- 545+11 (Permit Drawing Sheet 2)

- A 72” RCP (buried 1 ft) with standard riprap apron is proposed at –L- 545+00. Permanent impacts for the pipe, as well as temporary impacts and mechanized clearing have been shown beyond the proposed fill slopes to account for construction/installation activities.
- NCDWR requested that the design be evaluated to consider not burying the 72” RCP since a JS is not present, only wetlands exist at the outlet of the 72” RCP. Pipe will be revised to 66” unburied.

Site 3 – 72” RCP –Y17RPB- 25+70 (Permit Drawing Sheet 2)

- A 72” RCP (buried 1 ft) with standard riprap apron is proposed at 25+75 Ramp B. Permanent impacts for the pipe, as well as temporary impacts have been shown to account for construction/installation activities.
- No Comments.

Site 4 – 60” RCP –L- 569+00 (Permit Drawing Sheet 12)

- Proposed 60” RCP (buried 1ft) with standard riprap apron is proposed at –L- 569+00. Fill slopes have been reduced to 3:1 in the wetland areas to minimize wetland impacts. Permanent impacts for the pipe, as well as temporary impacts and mechanized clearing have been shown beyond the proposed fill slopes to account for construction/installation activities.
- No Comments.

Site 5 – Ditch and Bank Stabilization –Y17- 8+85 (Permit Drawing Sheet 15)

- Proposed ditch along –Y17- outlets at JS; therefore Riprap at Embankment Detail has been proposed to provide bank stabilization.
- No Comments.

Site 6 – Roadway Fill at Pond –Y17- 62+85 (Permit Drawing Sheet 18)

- Roadway fill impacts the pond; it was decided that this would be a total take. Permanent impacts for the fill have been shown.
- No Comments.

Site 7 – 60” RCP –SR2- 16+25 (Permit Drawing Sheet 18)

- Proposed 60” RCP (buried 1ft) with standard riprap apron at –SR2- Cul-de-sac. Permanent impacts for the pipe, as well as temporary impacts have been shown to account for construction/installation activities.
- No Comments.

Site 8 – 54” RCP –Y17- 65+80 (Permit Drawing Sheet 18)

- Proposed 54” RCP (buried 1 ft) with standard riprap apron at –Y17- 65+75. Also, slopes to be reduced to 3:1 to minimize stream impacts. Permanent impacts for the pipe, as well as temporary impacts have been shown to account for construction/installation activities.
- NCDWR requested that additional riprap at embankment be considered for the existing stream bank opposite of the ditch that outlet to the stream on the inlet of the 54” RCP. Since the proposed ditch is on a minimum 0.3% grade and outlets at the bed elevation of the JS, no riprap embankment is warranted at this location.

Site 9 – 24” RCP –Y18- 24+70 (Permit Drawing Sheet 2)

- The existing 54” pipe in quadrant B will be removed and the stream will be reestablished. Temporary impacts for the pipe removal and grading of channel has been shown.
- No Comments.

Impact Summary Table

- It was requested that the Temporary SW and channel impacts for Site #9 be shown on the correct row.



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



(Version 2.07; Released October 2016)

WBS Element: 34817.1.FR7 TIP No.: U-2519BA County(ies): Cumberland Page 1 of 2

General Project Information

WBS Element:	34817.1.FR7	TIP Number:	U-2519BA	Project Type:	New Location	Date:	3/2/2018
NCDOT Contact:	Paul Atkinson, PE			Contractor / Designer:	RK&K: Jeff Meador, PE		
	Address:	1000 Birch Ridge Dr. Raleigh, NC 27610			Address:	900 Ridgefield Drive, Suite 350 Raleigh, NC 27609	
	Phone:	919-707-6707			Phone:	919-878-9560	
	Email:	patkinson@ncdot.gov			Email:	jmeador@rkk.com	
City/Town:	Fayetteville			County(ies):	Cumberland		
River Basin(s):	Cape Fear			CAMA County?	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	3.77	Surrounding Land Use:	Residential, Commercial					
	Proposed Project		Existing Site					
Project Built-Up Area (ac.)	62.5	ac.	15.7	ac.				
Typical Cross Section Description:	4 lane divided highway w/ a 70ft median: (2) 12 foot paved shoulders, (2) 12 foot travel lanes, (2) 4 foot paved median shoulders, 62 foot grass median - Total width of 142'		New location					
Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	34,000	Year:	2038	Existing:	27,300	Year:	2018

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

The proposed project (U-2519BA) is to construct a fully controlled access, four-lane divided highway from South of SR 1003 (Camden Road) to South of SR 1104 (Strickland Bridge Road). The project will have an interchange at Camden Road and grade separations at King Road and Stoney Point Road. There is one major structure along the project, a 3-span, 320' long bridge over UT to Stewarts Creek. In order to avoid impacts, the bridge was designed to span UT to Stewarts Creek and adjacent wetlands, with permanent impacts for the piers only. A temporary work bridge will be utilized to construct the bridge to minimize impacts during construction. All other stream crossings through the alignment will use pipes and have been designed to have as little environmental and surface water impacts as possible. Near station -L- 442+00 RT, an existing roadbed & 18" RCP is proposed to be removed to reconnect an existing wetland on the project. Where excavation is necessary, coir fiber matting and rip-rap were utilized for bank stabilization in an attempt to reduce sediment transport and streambank erosion. Measures have been taken, including reduction of pipe slopes, to lower velocities at jurisdictional features to non-erosive. In an effort to minimize impacts to the project, the team used 3:1 side slopes with guardrail in stream areas where feasible. All of the design is within the Cape Fear River Basin.

Waterbody Information

Surface Water Body (1):	Rockfish Creek [(Upchurches Pond, Old Brower Mill Pond (Number Two Lake))]		NCDWR Stream Index No.:	18-31-(18)	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Class B		
	Supplemental Classification:		None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Z60-W (Stream not included in NRTR - Stream within wetland Z60-W)			Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					



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



(Version 2.07; Released October 2016)

WBS Element: 34817.1.FR7 TIP No.: U-2519BA County(ies): Cumberland Page 2 of 2

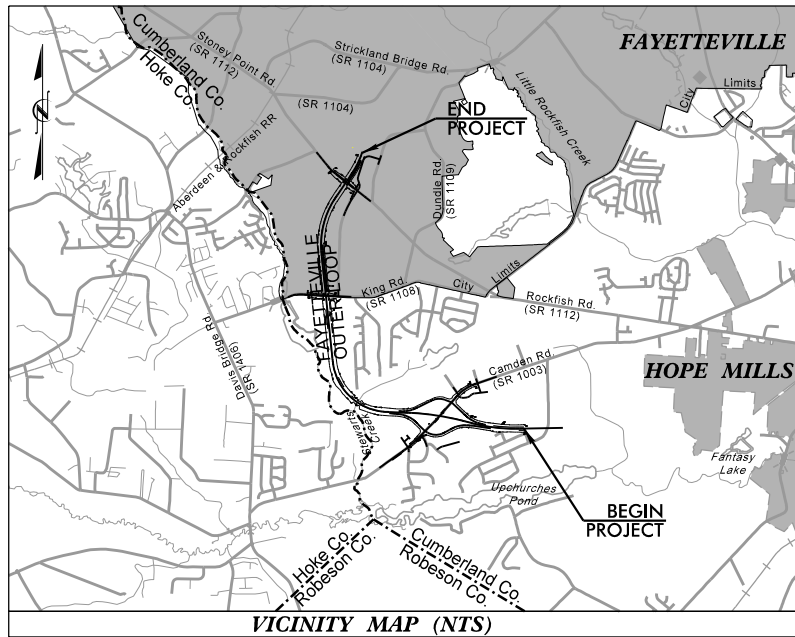
Additional Waterbody Information

Surface Water Body (2):	UT to Stewarts Creek		NCDWR Stream Index No.:	18-31-21	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Class C		
	Supplemental Classification:		None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Z56-S		Buffer Rules in Effect:	N/A	
Project Includes Bridge Spanning Water Body?	Yes	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					
Surface Water Body (3):	Pond Z55A-P		NCDWR Stream Index No.:	N/A	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Class C		
	Supplemental Classification:		None		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Z55A-P		Buffer Rules in Effect:	N/A	
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

TIP PROJECT: U-2519BA

CONTRACT:

See Sheet 1A For Index of Sheets



VICINITY MAP (NTS)

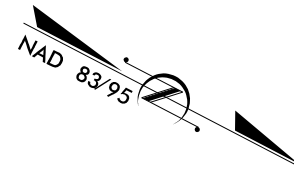
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

LOCATION: FAYETTEVILLE OUTER LOOP FROM SOUTH OF
SR 1003 (CAMDEN ROAD) TO SOUTH OF SR 1104
(STRICKLAND BRIDGE ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNALS
SIGNING, STRUCTURES, & NOISE WALLS

WETLAND AND STREAM IMPACTS



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2519BA	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34817.1.FR7	NHF-0100(24)	P.E.	
34817.2.FR14	NHF-0100(24)	UTILITIES & RW	

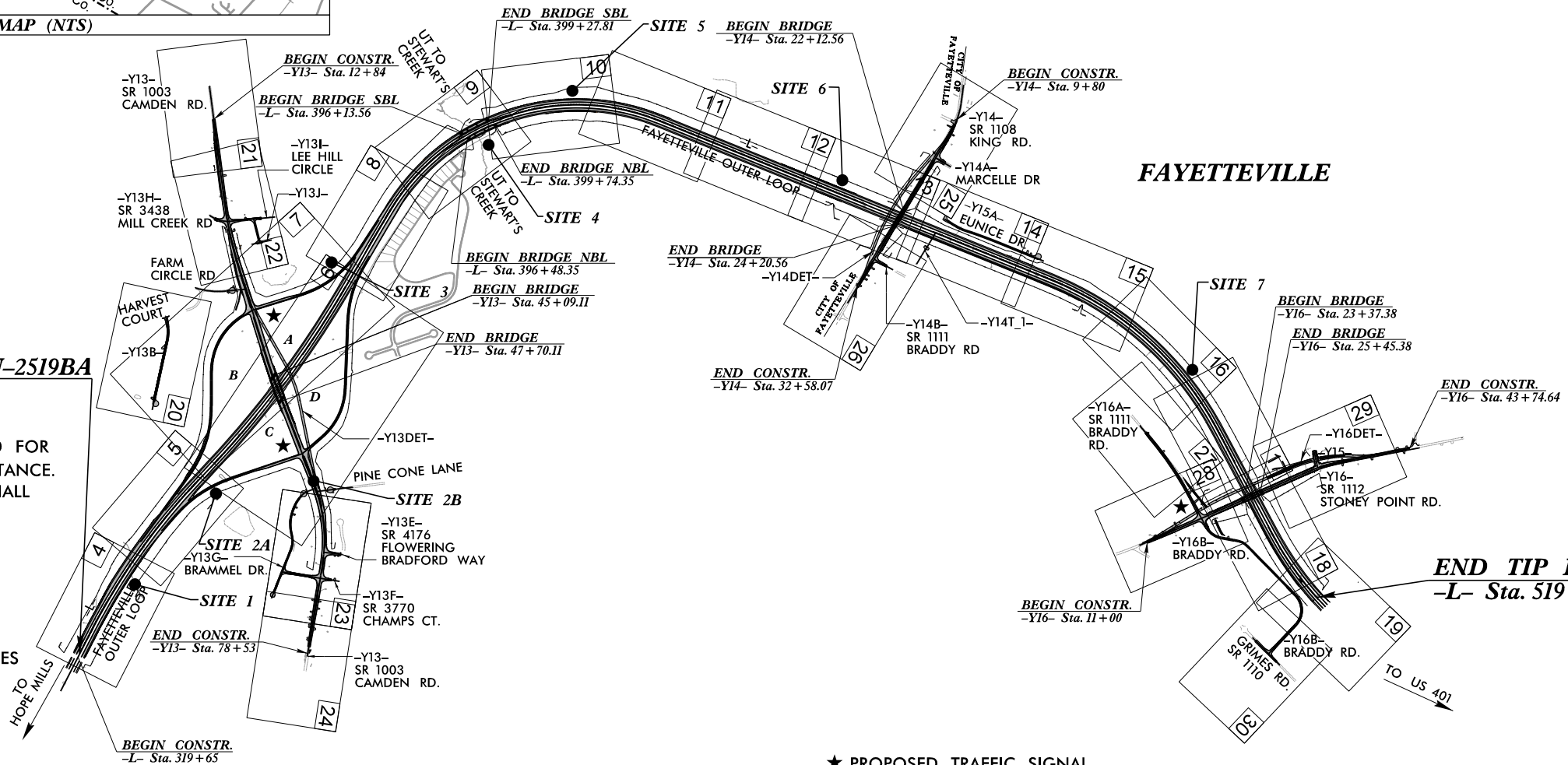
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 1 OF 39

BEGIN TIP PROJECT U-2519BA
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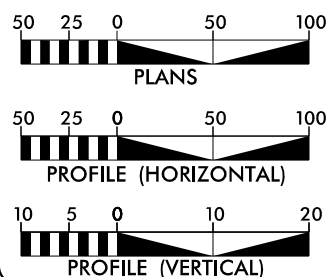
NOTES:

1. DESIGN EXCEPTION IS REQUIRED FOR HORIZONTAL STOPPING SIGHT DISTANCE.
2. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.
3. THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.
4. A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF FAYETTEVILLE.



★ PROPOSED TRAFFIC SIGNAL

GRAPHIC SCALES



DESIGN DATA

ADT 2018 = 27,300
ADT 2038 = 34,000
K = 8%
D = 55%
T = 12% *
V = 70 MPH

FUNC CLASS = INTERSTATE

* (TTST 4% + DUAL 8%)
STATEWIDE TIER

PROJECT LENGTH
(NB LANE)

LENGTH ROADWAY TIP PROJECT U-2519BA.....3.707 miles
LENGTH STRUCTURES TIP PROJECT U-2519BA.....0.062 miles
TOTAL LENGTH OF TIP PROJECT U-2519BA.....3.769 miles

PREPARED IN THE OFFICE OF:
RK&K
FOR NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

SEPTEMBER 16, 2016

LETTING DATE:

SEPTEMBER 18, 2018

NCDOT CONTACT:

B. KEITH SKINNER, PE
PROJECT ENGINEER
RK&K, LLP

MICHAEL T. MERRITT, PE
PROJECT DESIGN ENGINEER
RK&K, LLP

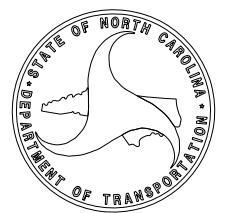
GARY LOVERING, PE
PROJECT ENGINEER - ENGR. COORD.

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN
ENGINEER

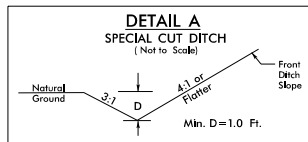
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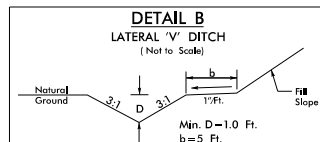
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U-2915BA	2D-1
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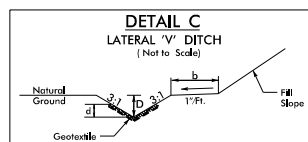
**PERMIT DRAWING
SHEET 2 OF 39**



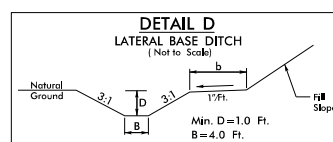
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 -Y13- STA. 56+00 TO STA. 57+45 RT
 -Y13- STA. 77+50 TO STA. 78+00 RT
 -Y13B- STA. 20+00 TO STA. 20+50 LT
 -Y13 CUL1- STA. 13+50 TO STA. 14+50 LT
 -Y13 CUL3- STA. 12+00 TO STA. 13+35 LT
 -Y13 CUL3- STA. 12+00 TO STA. 13+46 RT
 -Y13DET- STA. 14+00 TO STA. 16+50 RT
 -Y13DET- STA. 30+50 TO STA. 33+50 RT
 -Y16DET- STA. 31+50 TO STA. 34+50 LT
 -Y13C- STA. 10+56 TO STA. 13+50 LT
 -Y13B- STA. 13+25 TO STA. 13+75 LT
 -Y13RPD- STA. 22+50 TO STA. 23+50 LT
 -Y14- STA. 13+00 TO STA. 14+00 LT
 -Y14- STA. 29+18 TO STA. 32+00 LT
 -Y14B- STA. 10+59 TO STA. 11+50 RT
 -Y14B- STA. 10+75 TO STA. 11+50 LT
 -Y16- STA. 12+00 TO STA. 13+35 RT
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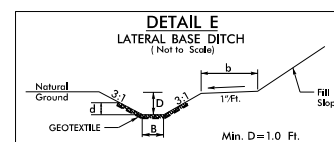
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 -L- STA. 468+00 TO STA. 469+00 RT
 -L- STA. 472+50 TO STA. 475+00 RT
 -L- STA. 472+95 TO STA. 477+00 LT
 -L- STA. 495+00 TO STA. 496+00 LT
 -L- STA. 517+50 TO STA. 519+00 LT
 -Y13- STA. 28+00 TO STA. 31+66 RT
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 -Y13B- STA. 10+58 TO STA. 11+50 RT
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 -Y14- STA. 24+18 TO STA. 26+00 LT
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 -Y16- STA. 18+74 TO STA. 20+12 LT
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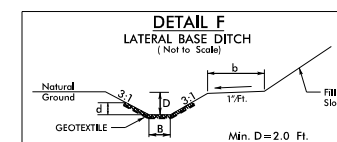
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 -Y13B- STA. 10+50 TO STA. 12+17 LT



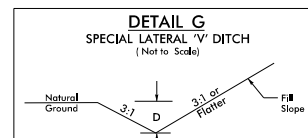
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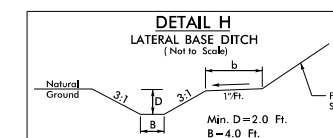
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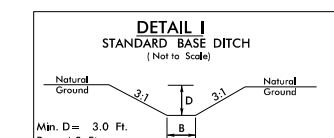
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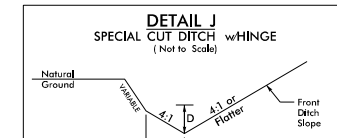
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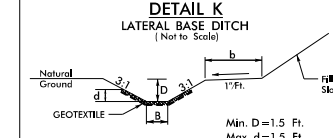
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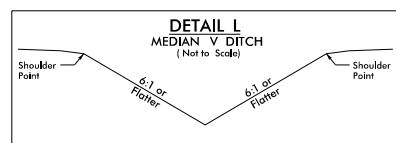
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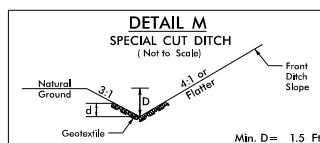
-L- STA. 405+00 TO STA. 406+00 RT
 -L- STA. 417+50 TO STA. 419+50 RT
 -L- STA. 422+00 TO STA. 422+50 LT
 -L- STA. 426+00 TO STA. 431+00 RT
 -L- STA. 428+50 TO STA. 431+00 LT
 -L- STA. 454+00 TO STA. 456+00 RT
 -L- STA. 454+00 TO STA. 456+00 LT



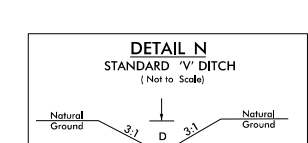
-L- STA. 394+00 TO STA. 395+93.14 LT
 -L- STA. 398+96 TO STA. 399+60 RT
 -L- STA. 489+00 TO STA. 493+50 RT
 -Y13RPA- STA. 20+00 TO STA. 22+00 RT
 -Y13RPD- STA. 16+50 TO STA. 19+00 LT



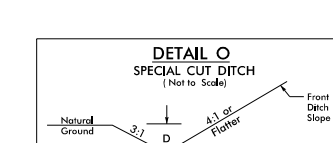
-L- STA. 426+00 TO STA. 431+00 CL
 -L- STA. 518+50 TO STA. 519+00 CL



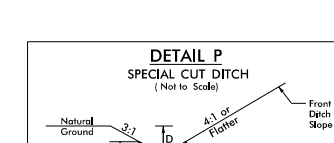
-L- STA. 457+18 TO STA. 458+00 LT, CL 1
 -L- STA. 463+50 TO STA. 465+50 LT, CL B
 -Y13B- STA. 19+50 TO STA. 20+00 LT, CL B
 -Y13RPB- STA. 23+50 TO STA. 24+50 RT, CL B
 -Y14- STA. 10+50 TO STA. 13+00 RT, CL 1
 -Y15A- STA. 12+17 TO STA. 13+00 RT, CL 1
 -Y15A- STA. 19+17 TO STA. 21+00 LT, CL B
 -Y16A- STA. 18+50 TO STA. 19+50 RT, CL B



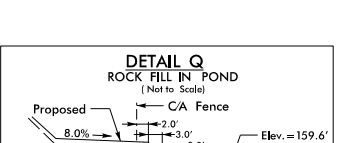
-Y13- STA. 34+00 TO STA. 36+22 RT, L=222'
 S=0.32%, BEG. ELEV=178.00, END ELEV=176.70
 -Y13CUL1- STA. 14+50 TO STA. 15+06 LT, L=56'
 S=0.96%, BEG. ELEV=177.05, END ELEV=176.51
 -Y13CUL1- STA. 14+80 TO STA. 15+14 RT, L=34'
 S=0.79%, BEG. ELEV=176.97, END ELEV=176.70
 -Y14- STA. 8+20 TO STA. 9+87 RT, L=170'
 S=2.38%, BEG. ELEV=161.96, END ELEV=166.0
 -Y14B- STA. 11+50 TO STA. 12+05 LT, L=55'
 S=1.2%, BEG. ELEV=196.95, END ELEV=196.29
 -Y14B- STA. 11+50 TO STA. 12+40 RT, L=90'
 S=0.67%, BEG. ELEV=196.52, END ELEV=195.92
 -Y14T- STA. 12+00 LT, L=110', S=1.71%
 BEG. ELEV=190.17, END ELEV=188.29
 -Y14T- STA. 12+25 RT, L=135', S=1.67%
 BEG. ELEV=189.21, END ELEV=186.95
 -Y15- STA. 10+70 RT, L=31', S=2.58%
 BEG. ELEV=214.20, END ELEV=215.00
 -Y16- STA. 13+65 RT, L=48', S=0.3%
 BEG. ELEV=212.14, END ELEV=212.00
 -Y16- STA. 44+25 LT, L=105', S=0.45%
 BEG. ELEV=213.12, END ELEV=212.65



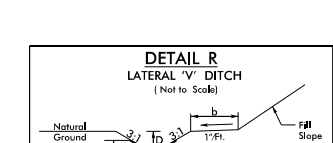
-Y13- STA. 21+00 TO STA. 25+50 RT
 -Y13CUL2- STA. 10+96 TO STA. 12+12 LT
 -Y13 CUL2- STA. 11+25 TO STA. 12+71 RT
 -Y13RPA- STA. 27+00 TO STA. 28+29 RT
 -Y16- STA. 35+00 TO STA. 37+50 RT
 -Y16B- STA. 29+50 TO STA. 33+00 LT



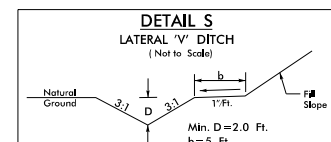
-L- STA. 415+00 TO STA. 415+50 RT
 -L- STA. 456+80 TO STA. 458+50 RT
 -Y13- STA. 12+91 TO STA. 14+00 LT
 -Y13- STA. 12+84 TO STA. 14+00 RT
 -Y13DET- STA. 36+15 TO STA. 37+50 LT
 -Y14- STA. 10+00 TO STA. 11+00 LT
 -Y14DET- STA. 11+78 TO STA. 14+50 RT
 -Y15A- STA. 12+30 TO STA. 13+00 LT



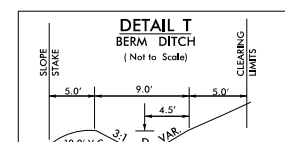
-L- STA. 440+90 TO STA. 441+98 LT



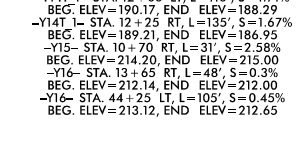
-Y13F- STA. 10+61 TO STA. 11+50 LT



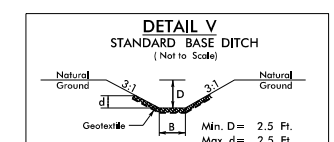
-L- STA. 506+00 TO STA. 513+00 RT
 -Y13- STA. 31+66 TO STA. 36+25 LT
 -Y14- STA. 15+00 TO STA. 18+67 RT
 -Y13DET- STA. 15+50 TO STA. 38+50 LT
 -Y13DET- STA. 34+00 TO STA. 34+70 LT
 -Y14DET- STA. 14+50 TO STA. 19+20 RT
 -Y16- STA. 21+27 TO STA. 23+56 RT



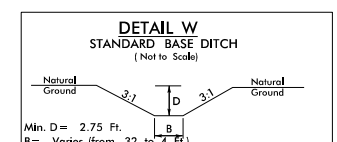
-L- STA. 354+00 TO STA. 358+82 LT
 -L- STA. 377+00 TO STA. 380+50 RT
 -L- STA. 431+50 TO STA. 435+50 RT
 -L- STA. 450+90 TO STA. 451+79 RT
 -Y13RPB- STA. 23+50 TO STA. 36+00 RT



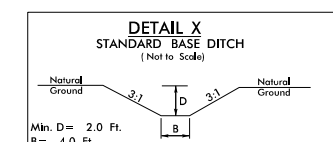
-L- STA. 372+50 TO STA. 373+29.10 LT, D=4'
 -Y13- STA. 67+00 TO STA. 67+00 LT, D=3'
 -Y16B- STA. 26+62 TO STA. 27+50 RT, D=4.5'



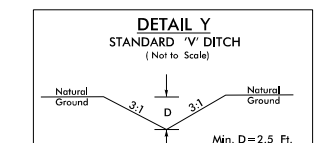
-Y15A- STA. 12+29 LT, L=139', S=0.39%
 BEG. ELEV=184.20, END ELEV=183.66
 -Y16C- STA. 33+34 RT, L=74', S=0.3%
 BEG. ELEV=206.10, END ELEV=205.88
 -Y13L- STA. 13+75 LT, L=145', S=0.5%
 BEG. ELEV=175.65, END ELEV=175.08



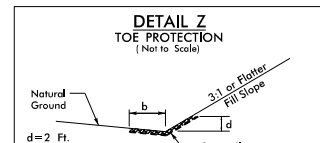
-Y15A- STA. 12+29 LT, L=139', S=0.39%
 BEG. ELEV=184.20, END ELEV=183.66
 -Y16C- STA. 33+34 RT, L=74', S=0.3%
 BEG. ELEV=206.10, END ELEV=205.88
 -Y13L- STA. 13+75 LT, L=145', S=0.5%
 BEG. ELEV=175.65, END ELEV=175.08



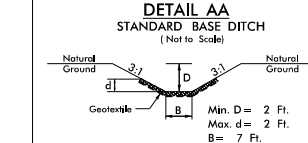
-Y16DET- STA. 21+17 RT, L=68', S=0.09%
 BEG. ELEV=213.70, END ELEV=213.64



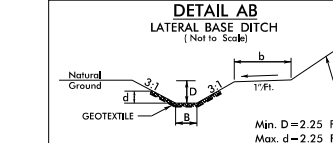
-Y13CUL2- STA. 12+12 LT, L=832', S=0.3%
 BEG. ELEV=169.77, END ELEV=172.25
 -Y13CUL2- STA. 10+96 LT, L=30', S=0.3%
 BEG. ELEV=169.42, END ELEV=169.33



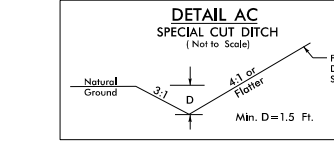
-L- STA. 328+00 TO STA. 331+50 RT
 -L- STA. 331+50 TO STA. 334+50 LT
 -L- STA. 392+27 TO STA. 393+50 RT
 -L- STA. 440+50 TO STA. 443+35 RT
 -L- STA. 440+50 TO STA. 443+50 LT
 -Y13RPB- STA. 20+00 TO STA. 22+00 LT
 -Y13RPC- STA. 17+00 TO STA. 19+00 RT



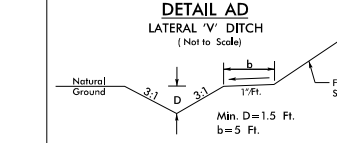
-L- STA. 420+27 RT, L=116', S=3.82%
 BEG. ELEV=175.20, END ELEV=179.63



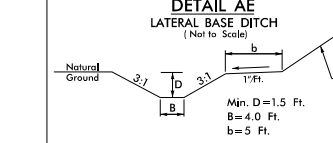
-L- STA. 331+15 TO STA. 332+00 RT
 -Y13- STA. 67+00 TO STA. 69+00 LT
 -Y13RPA- STA. 16+75 TO STA. 20+00 RT
 -Y13RPD- STA. 12+53 TO STA. 16+50 LT



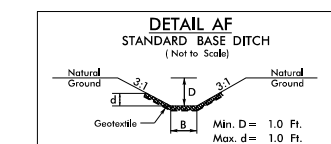
-L- STA. 370+00 TO STA. 371+00 RT
 -Y13- STA. 21+00 TO STA. 25+50 LT
 -Y13- STA. 29+50 TO STA. 31+66 LT
 -Y13- STA. 59+00 TO STA. 67+50 RT
 -Y13DET- STA. 1+00 TO STA. 15+50 LT
 -Y13DET- STA. 30+50 TO STA. 34+00 LT
 -Y13B- STA. 16+25 TO STA. 18+00 LT
 -Y13B- STA. 15+00 TO STA. 18+00 RT
 -Y13C- STA. 10+20 TO STA. 13+50 RT
 -Y13RPB- STA. 38+50 TO STA. 40+50 RT
 -Y14- STA. 14+00 TO STA. 15+00 RT
 -Y16A- STA. 13+00 TO STA. 16+17 LT
 -Y16DET- STA. 12+95 TO STA. 14+00 RT
 -Y16DET- STA. 31+00 TO STA. 33+50 RT



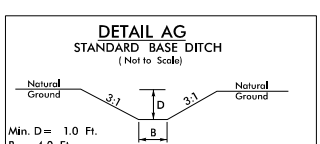
-L- STA. 371+00 TO STA. 371+61 RT
 -L- STA. 375+40 TO STA. 379+00 LT
 -L- STA. 464+20 TO STA. 468+00 RT
 -L- STA. 490+00 TO STA. 496+00 LT
 -Y13- STA. 37+38 TO STA. 45+00 RT
 -Y13- STA. 67+50 TO STA. 76+50 RT
 -Y13H- STA. 15+00 TO STA. 11+56 LT
 -Y13C- STA. 10+50 TO STA. 12+50 LT
 -Y13RPA- STA. 18+59 TO STA. 22+00 LT
 -Y13RPD- STA. 16+15 TO STA. 19+50 RT
 -Y13DET- STA. 16+50 TO STA. 30+50 RT
 -Y15- STA. 11+50 TO STA. 11+50 RT
 -Y16- STA. 29+00 TO STA. 32+00 LT
 -Y16B- STA. 23+00 TO STA. 25+00 LT
 -Y16DET- STA. 14+00 TO STA. 16+00 RT
 -Y16DET- STA. 18+75 TO STA. 21+17 LT



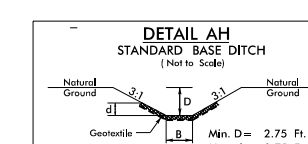
-L- STA. 332+00 TO STA. 338+00 RT
 -L- STA. 375+35 TO STA. 376+50 RT
 -L- STA. 489+39 TO STA. 490+00 LT



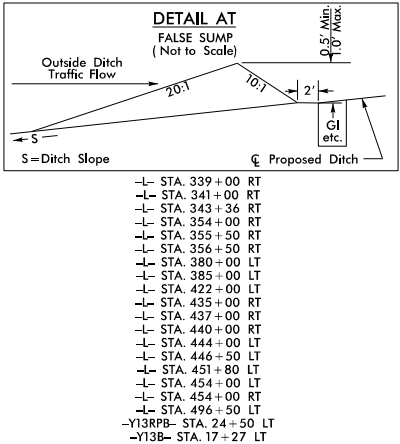
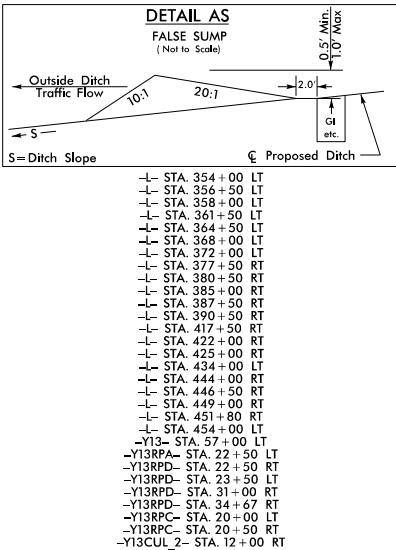
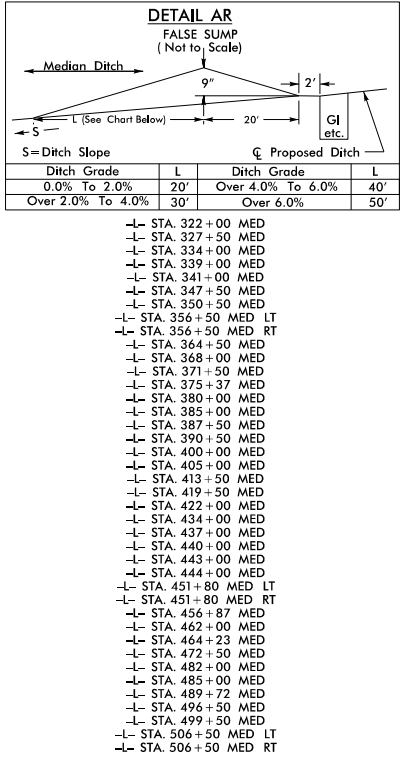
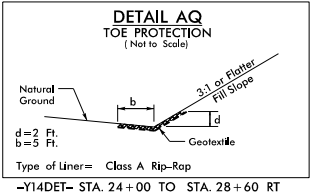
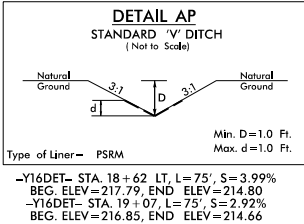
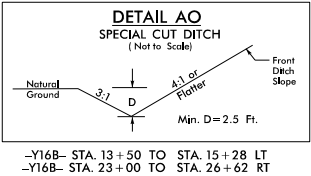
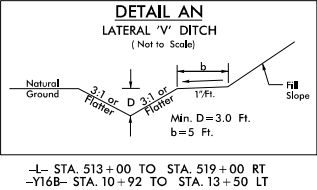
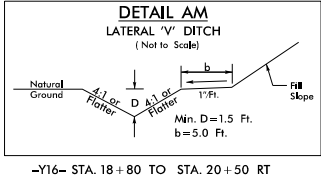
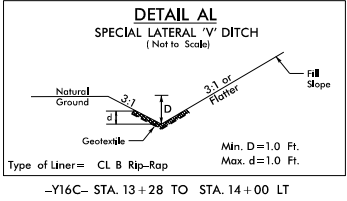
-Y13B- STA. 20+50 RT, L=57', S=4.9%
 BEG. ELEV=154.81, END ELEV=152.00
 -L- 376+92 RT, L=60', S=8.3%
 BEG. ELEV=154.50, END ELEV=149.55
 -Y13RPD- 18+89 LT, L=44', S=8.3%
 BEG. ELEV=160.20, END ELEV=156.57
 -Y13B- STA. 18+80 RT, L=50', S=7.4%
 BEG. ELEV=156.70, END ELEV=153.00



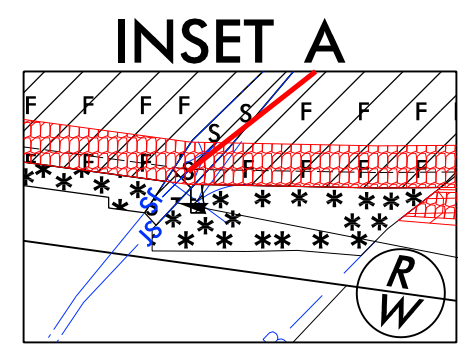
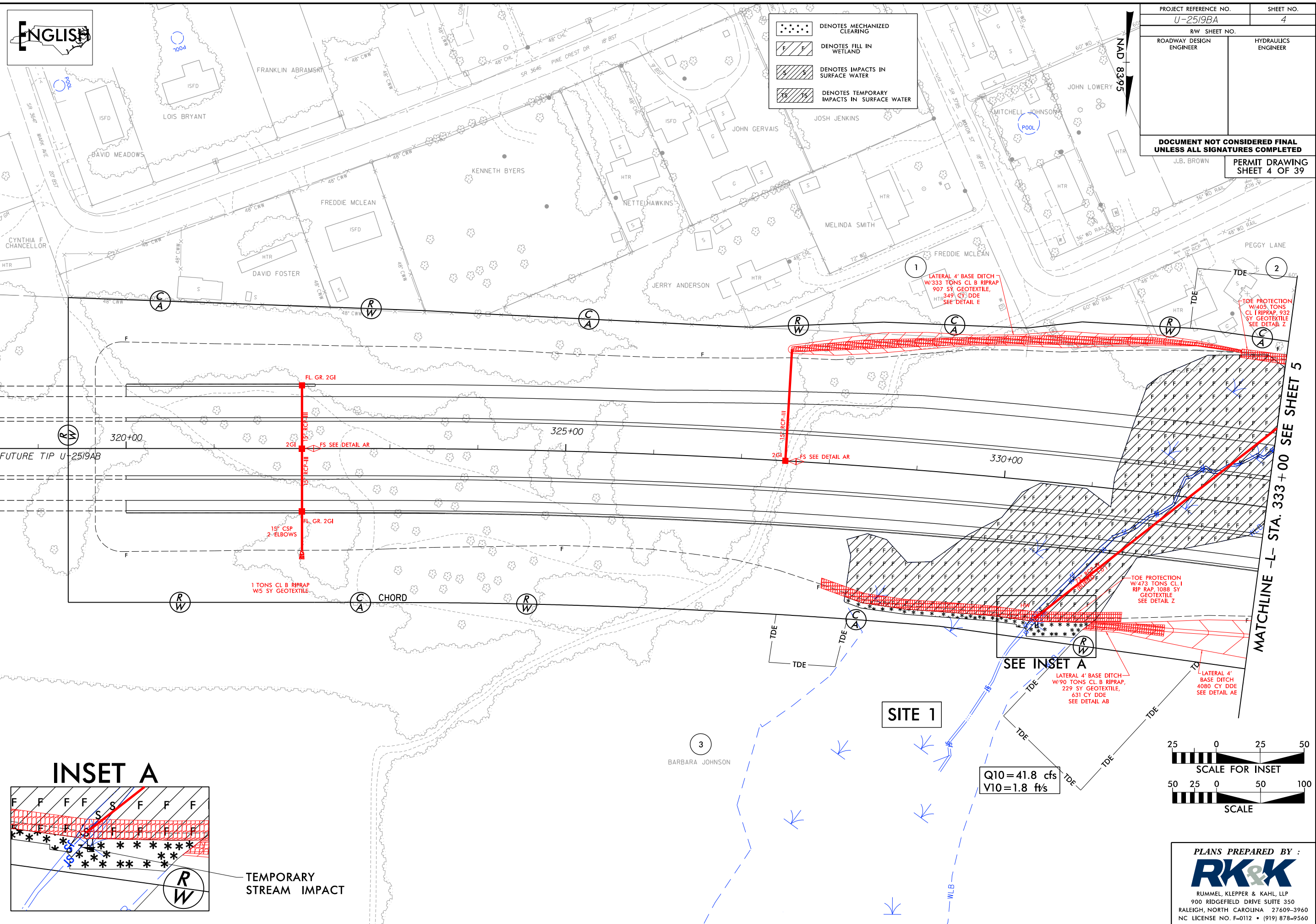
-Y14- STA. 6+80 TO 7+80 RT, L=100', S=1.46%
 BEG. ELEV=161.20, END ELEV=159.74



-Y13L- STA. 13+75 LT, L=15', S=0.5%
 BEG. ELEV=175.08, END ELEV=175.00
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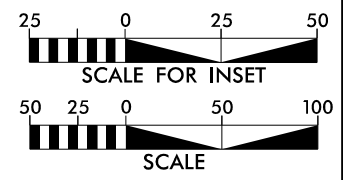


- DENOTES MECHANIZED CLEARING
- DENOTES FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
U-2519BA	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
J.B. BROWN	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PERMIT DRAWING SHEET 4 OF 39	

SITE 1

Q10=41.8 cfs
V10=1.8 ft/s



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NAD 83/95

LATERAL 4" BASE DITCH -
W/333 TONS CL B RIPRAP
907 SY GEOTEXTILE,
349 CY DDE
SEE DETAIL E

TOE PROTECTION
W/405 TONS
CL I RIPRAP, 932
SY GEOTEXTILE
SEE DETAIL Z

TOE PROTECT
W/473 TON
RIP RAP, 108
GEOTEXT
SEE DETAIL

LATERAL 4' BASE DITCH-
W/90 TONS CL. B RIPRAP,
229 SY GEOTEXTILE,
631 CY DDE
SEE DETAIL AB

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SITE 1

Q10 = 41.8 cfs
V10 = 1.8 ft/s

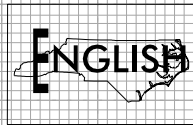
INSET A

— TEMPORARY
STREAM IMPACT

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5/14/99

3/2/2018
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Elevs

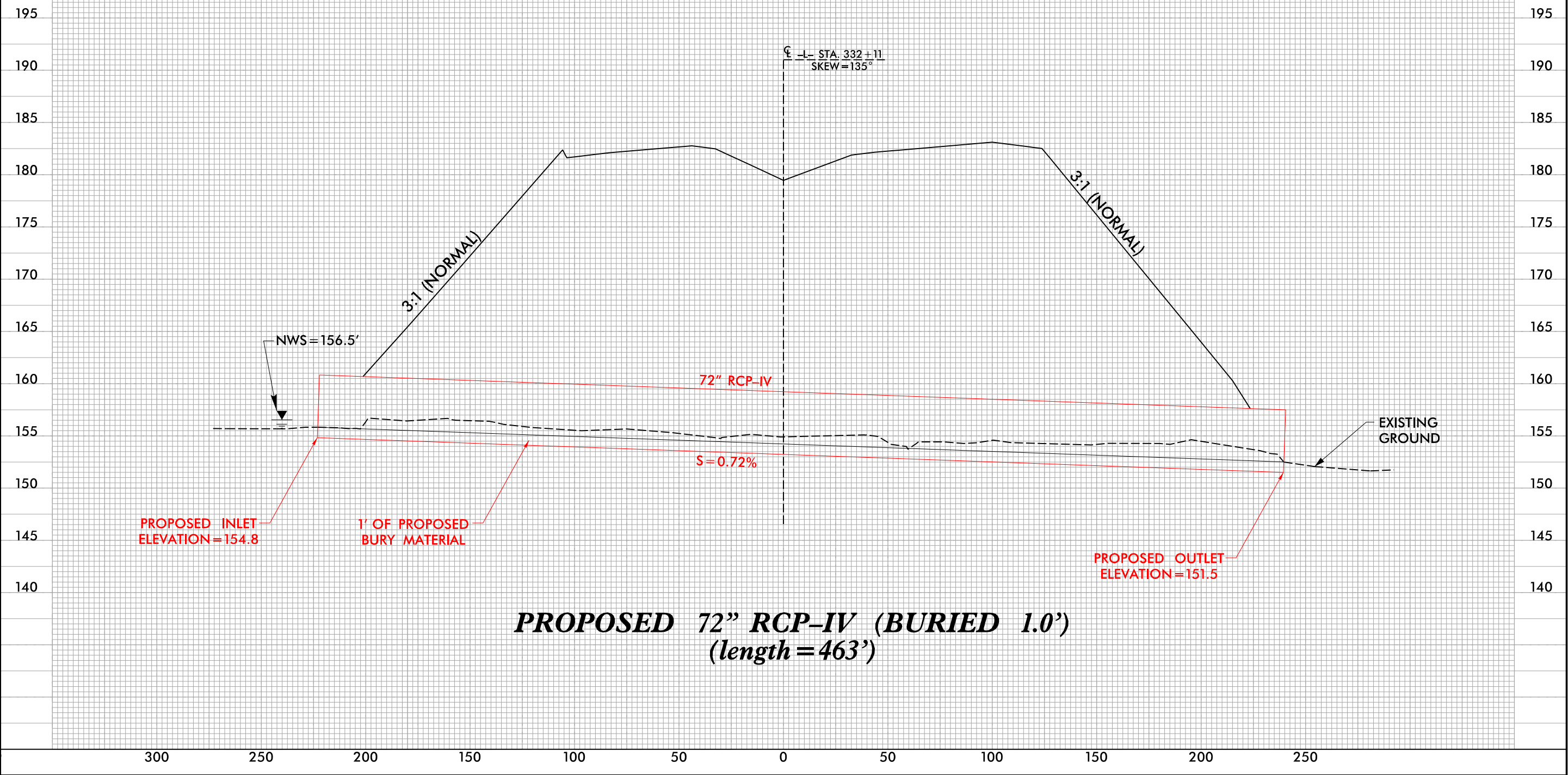


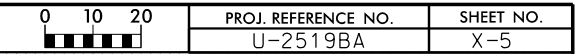
PROJECT REFERENCE NO.		SHEET NO.
U-2519BA		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

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UNLESS ALL SIGNATURES COMPLETED

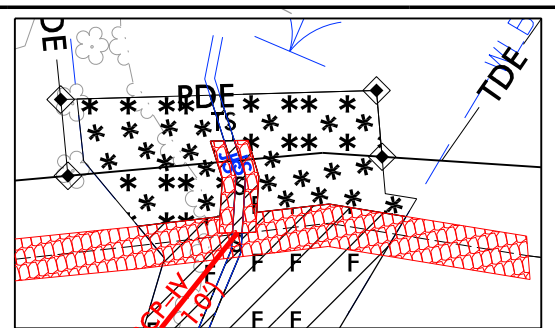
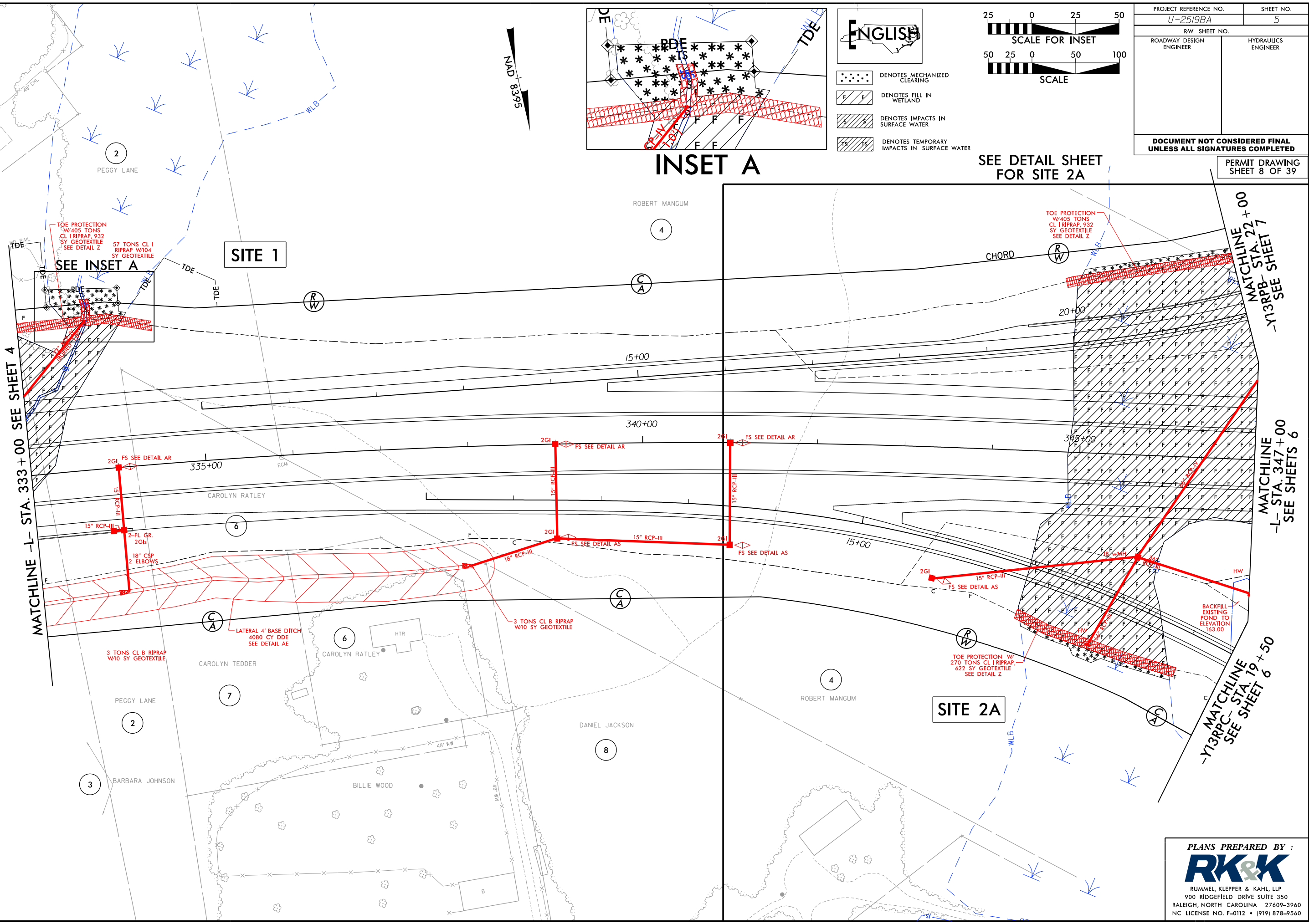
PERMIT DRAWING
SHEET 6 OF 39

SITE 1 -L- 332+11





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3/2/2018
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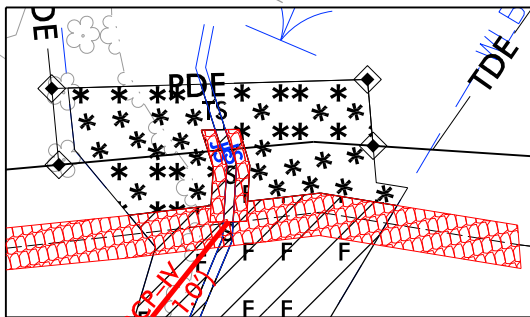
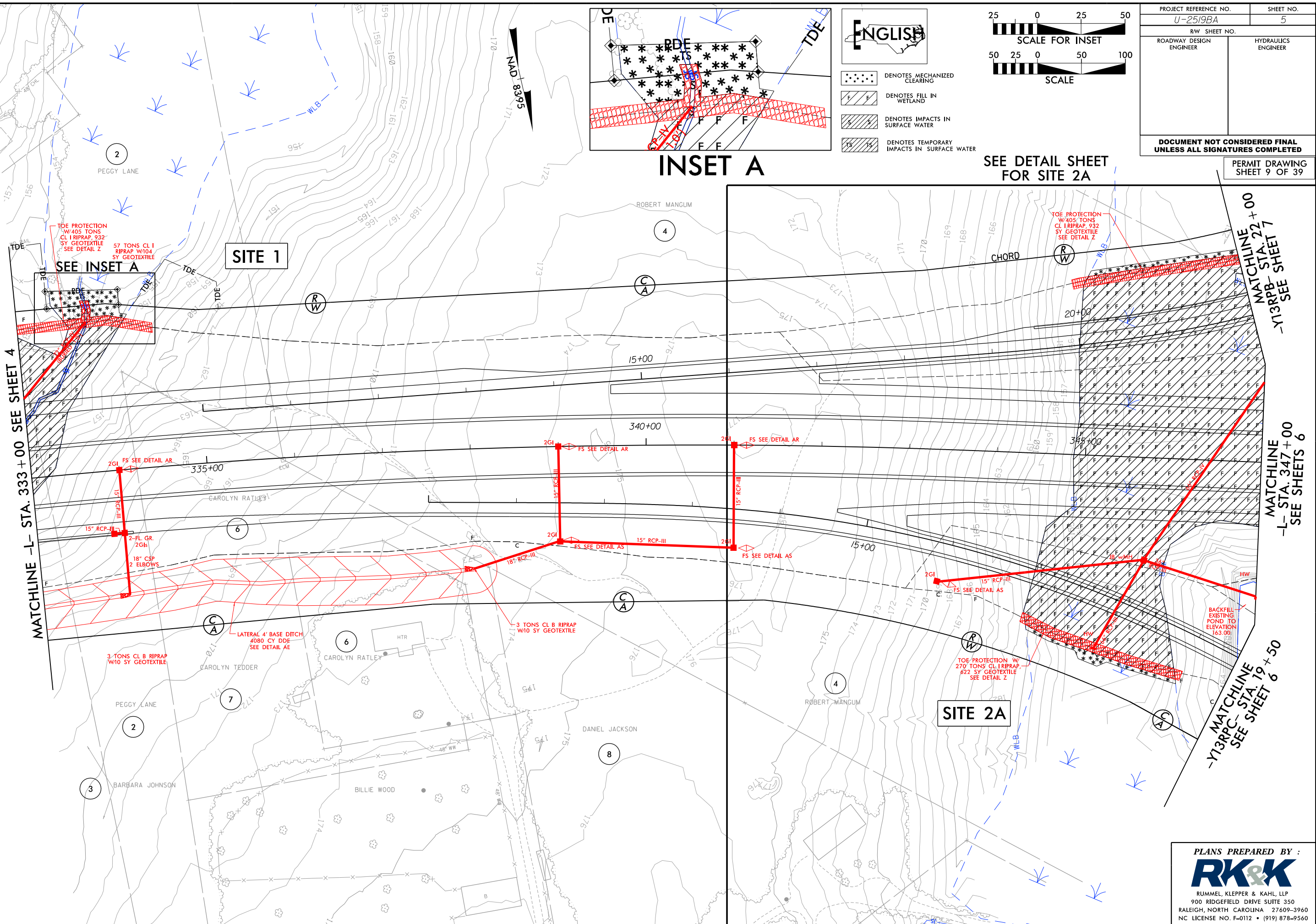
INSET A

SEE DETAIL SHEET
FOR SITE 2A

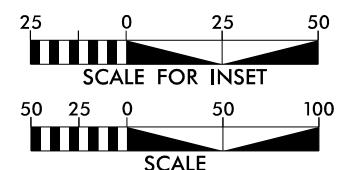
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U-2519BA		5	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
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		PERMIT DRAWING SHEET 8 OF 39	

PLANS PREPARED BY :
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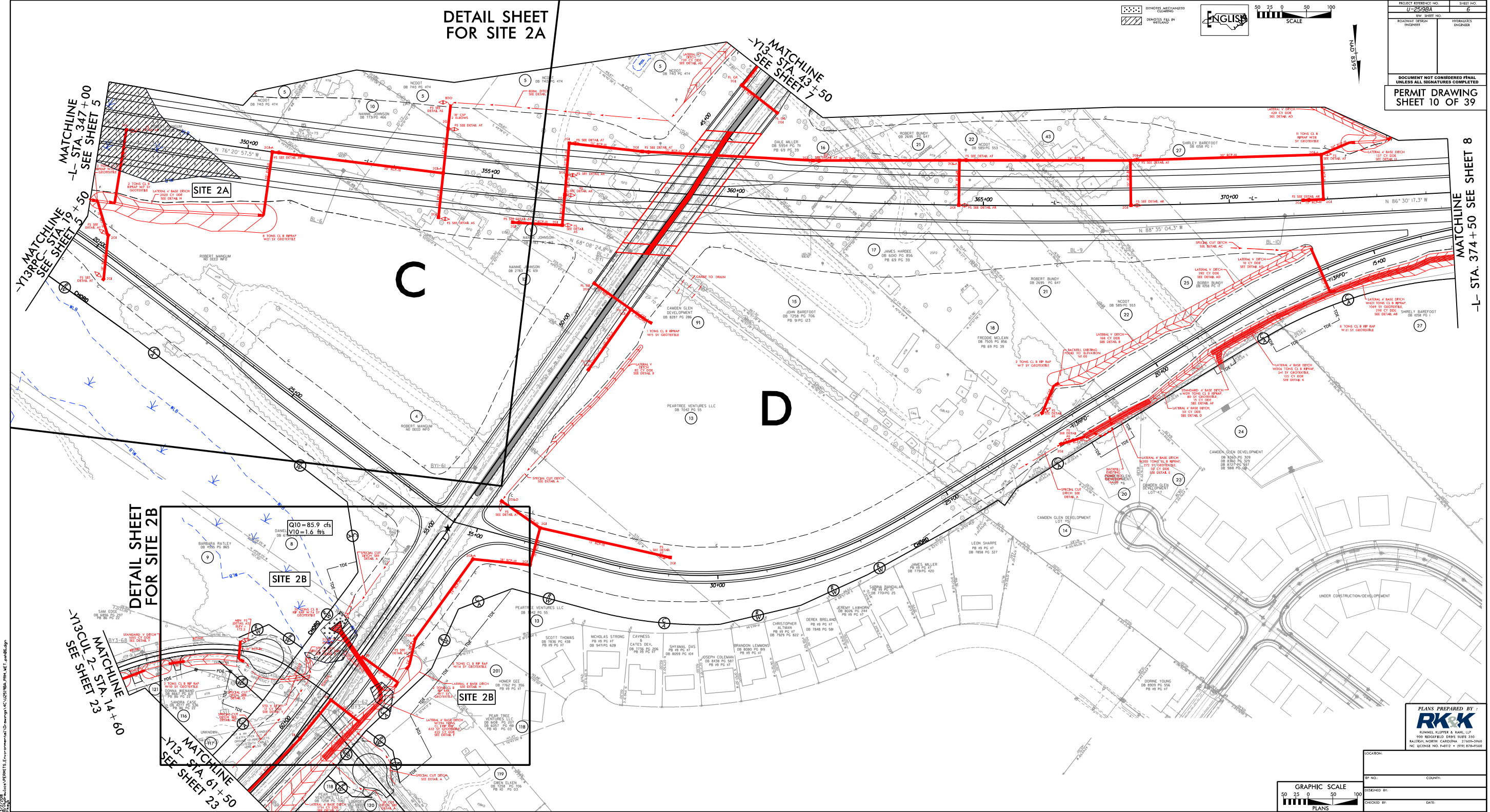
INSET A



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

PROJECT REFERENCE NO. U-2519BA	SHEET NO. 5
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PERMIT DRAWING SHEET 9 OF 39	

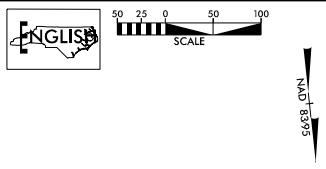
PLANS PREPARED BY :
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RUMMEL, KLEPPER & KAHL, LLP
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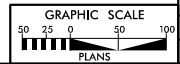
DETAIL SHEET
FOR SITE 2A

DETAIL SHEET
FOR SITE 2B

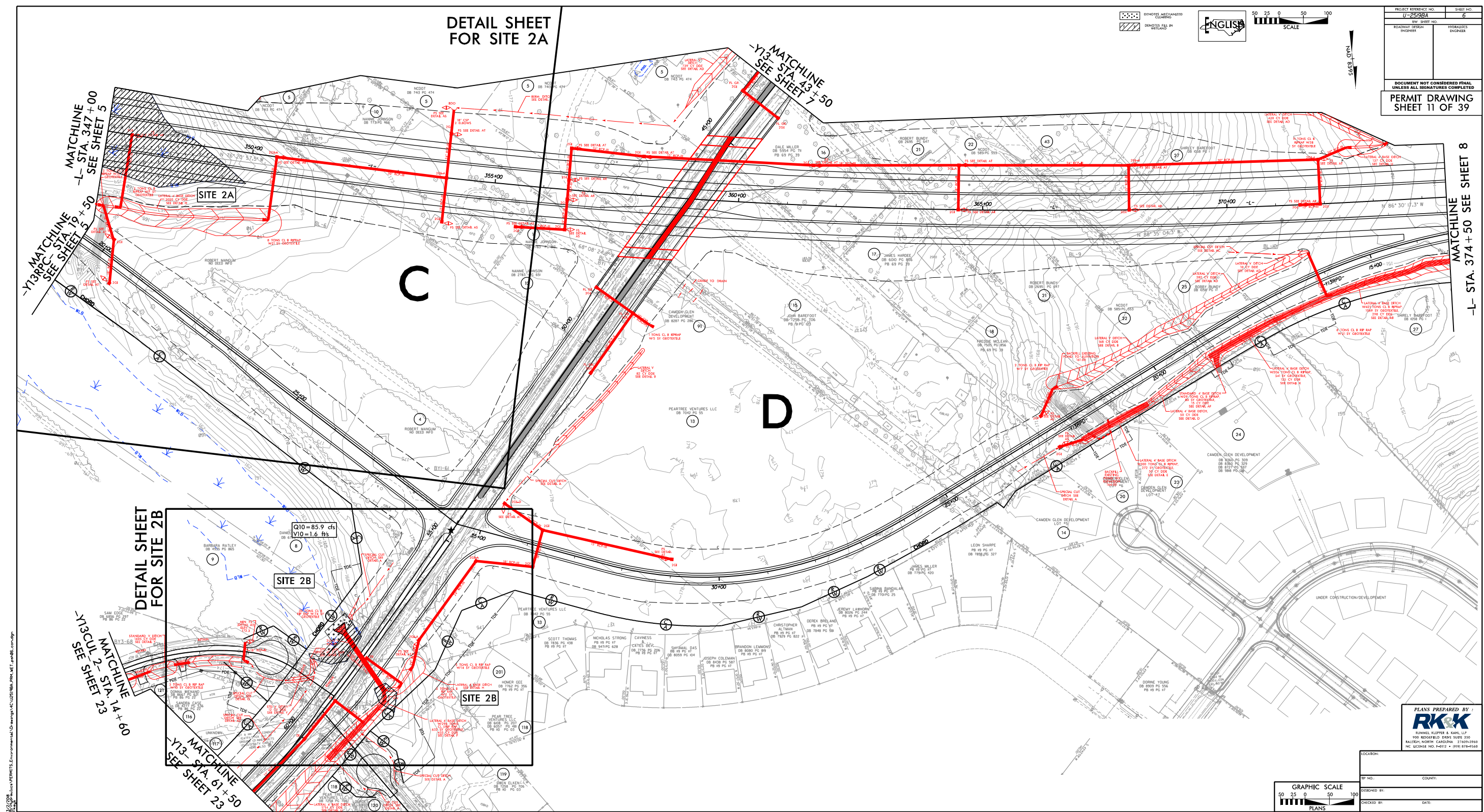
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SHEET NO.	6
REV SHEET NO.	
ROADWAY DESIGN	HYDRAULICS
ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PERMIT DRAWING SHEET 10 OF 39	



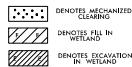
PLANS PREPARED BY:
RK&K
JENNIFER WATKINS & KIM LEE
100 REDGIFIELD DRIVE SUITE 310
RALEIGH, NORTH CAROLINA 27609-2949
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LOCATION:	
TP NO.:	COUNTY:
DESIGNED BY:	
CHECKED BY:	DATE:



3/2/2018
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Q10=180.0 cfs
V10=1.8 ft/s

SITE 2A

FOR BENTONITE
IN PDA TRENCH
FOR 12" DIA. 10' ST
STANDARD
SEE TOTAL 22'

48" LONG CL 1/2" MIN
W/8" ST GEOTEXTILE

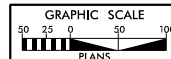
00 + 22.5
3
SHEETS
SEE 33-1
TAM

05198A.PRM.NET_psa07_cen.dgn

**DETAIL SHEET
FOR SITE 2A**

DETAIL SHEET FOR SITE 3


MATCHLINE
 —Y13RPA— STA. 17+50
 SEE SHEET 8



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

PLANS PREPARED BY :
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RUMMEL, KLEPPER & KAHL, LLP
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PROJECT REFERENCE NO. U-25198A	SHEET NO. 7
B/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PERMIT DRAWING SHEET 13 OF 39	

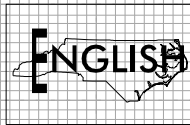


5/14/99

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jbulles

SITE 2A

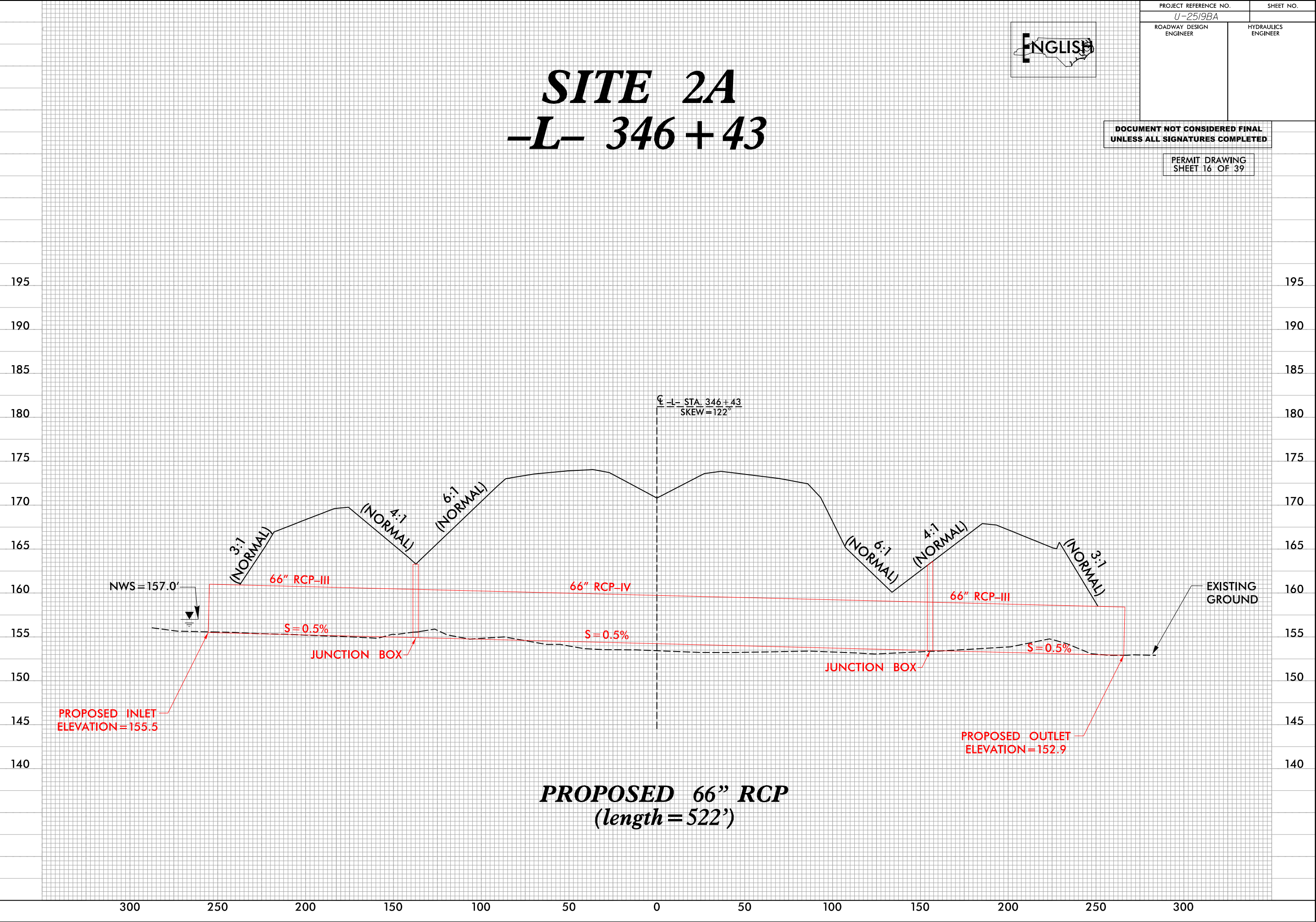
-L- 346 + 43



PROJECT REFERENCE NO.		SHEET NO.
U-2519BA		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

DOCUMENT NOT CONSIDERED FINAL
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PERMIT DRAWING
SHEET 16 OF 39



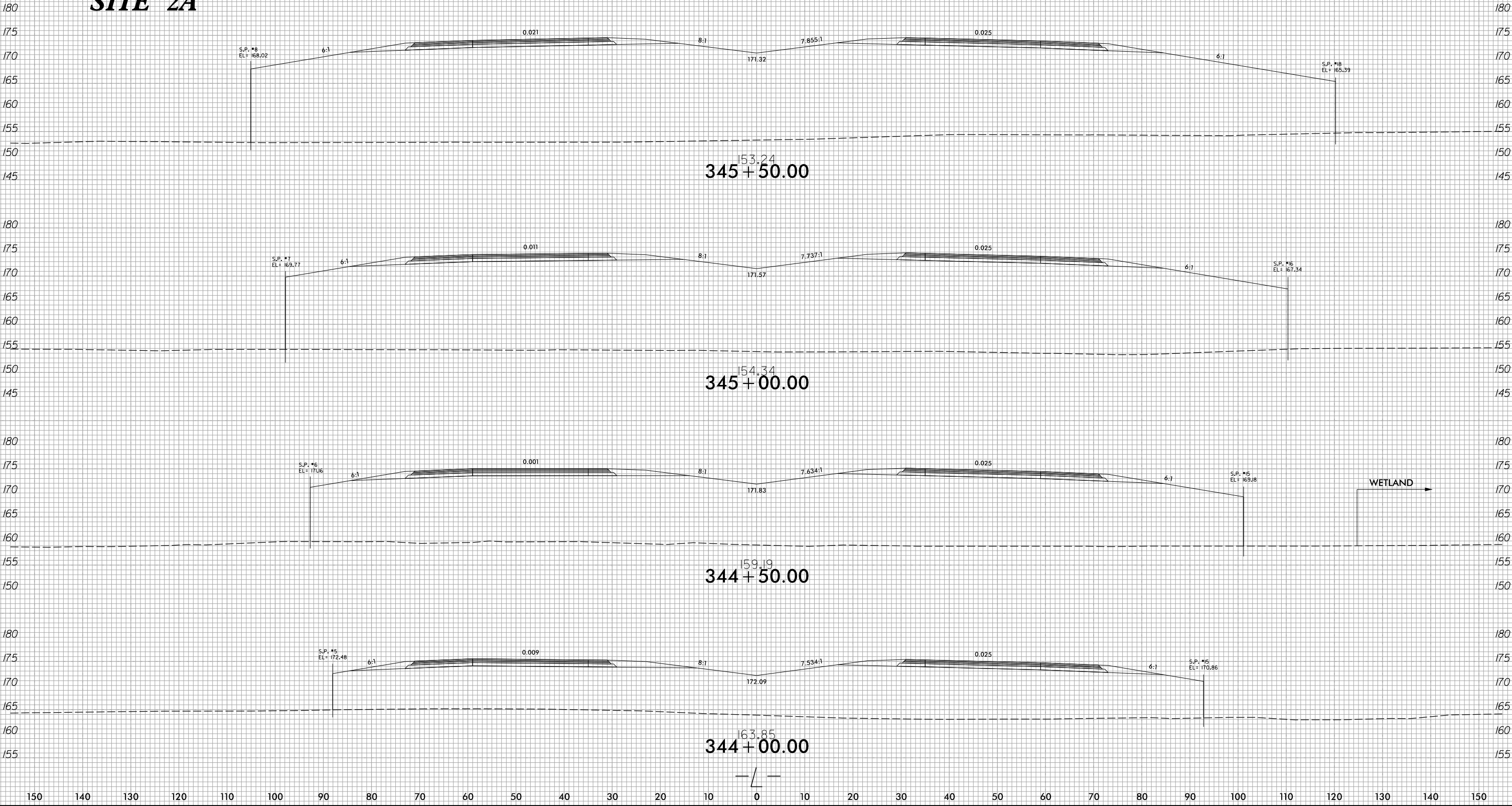
8/23/99

3/2/2018
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PERMIT DRAWING
SHEET 17 OF 39

SITE 2A

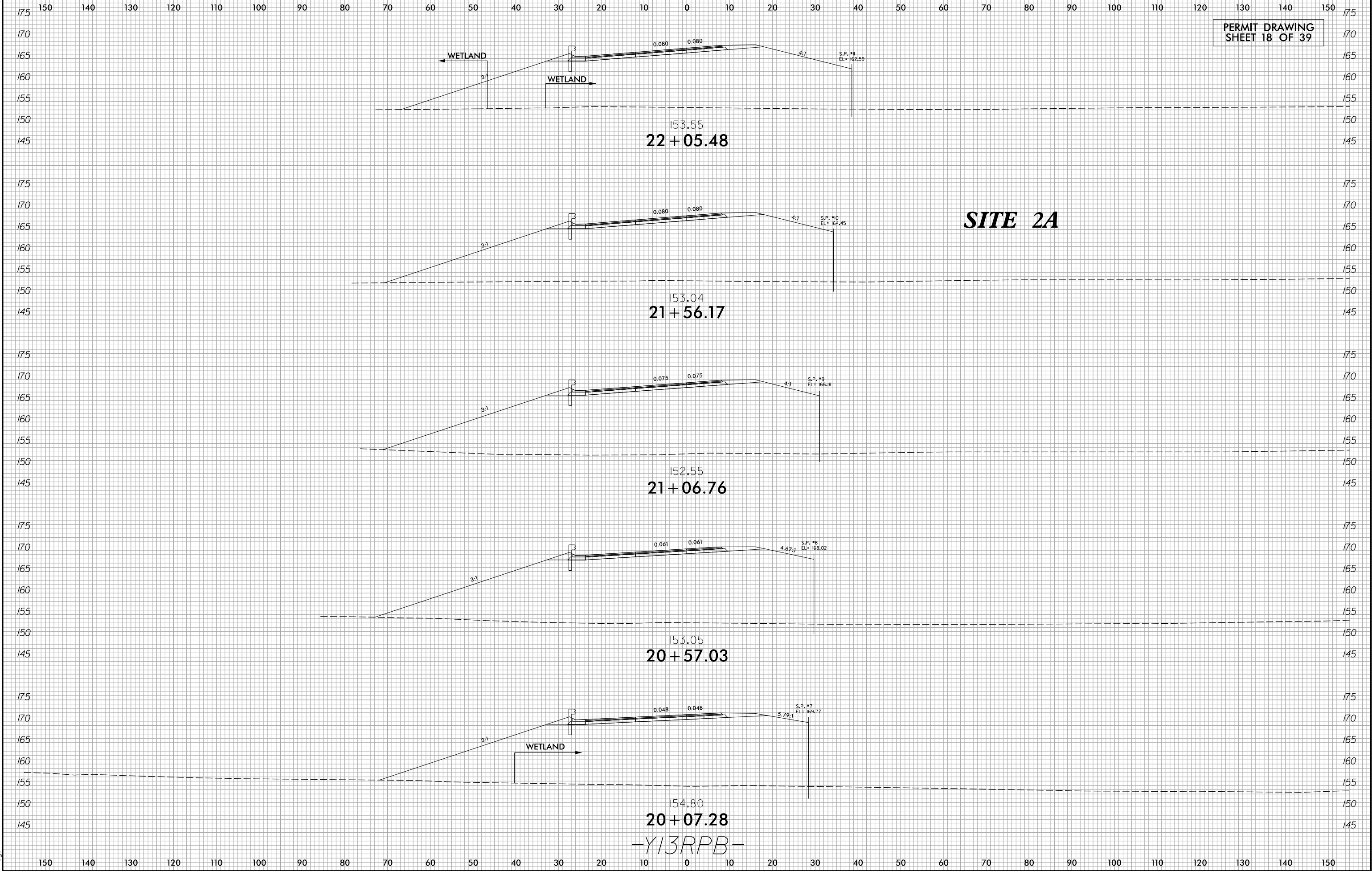


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3/2/2018
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PERMIT DRAWING
SHEET 18 OF 39

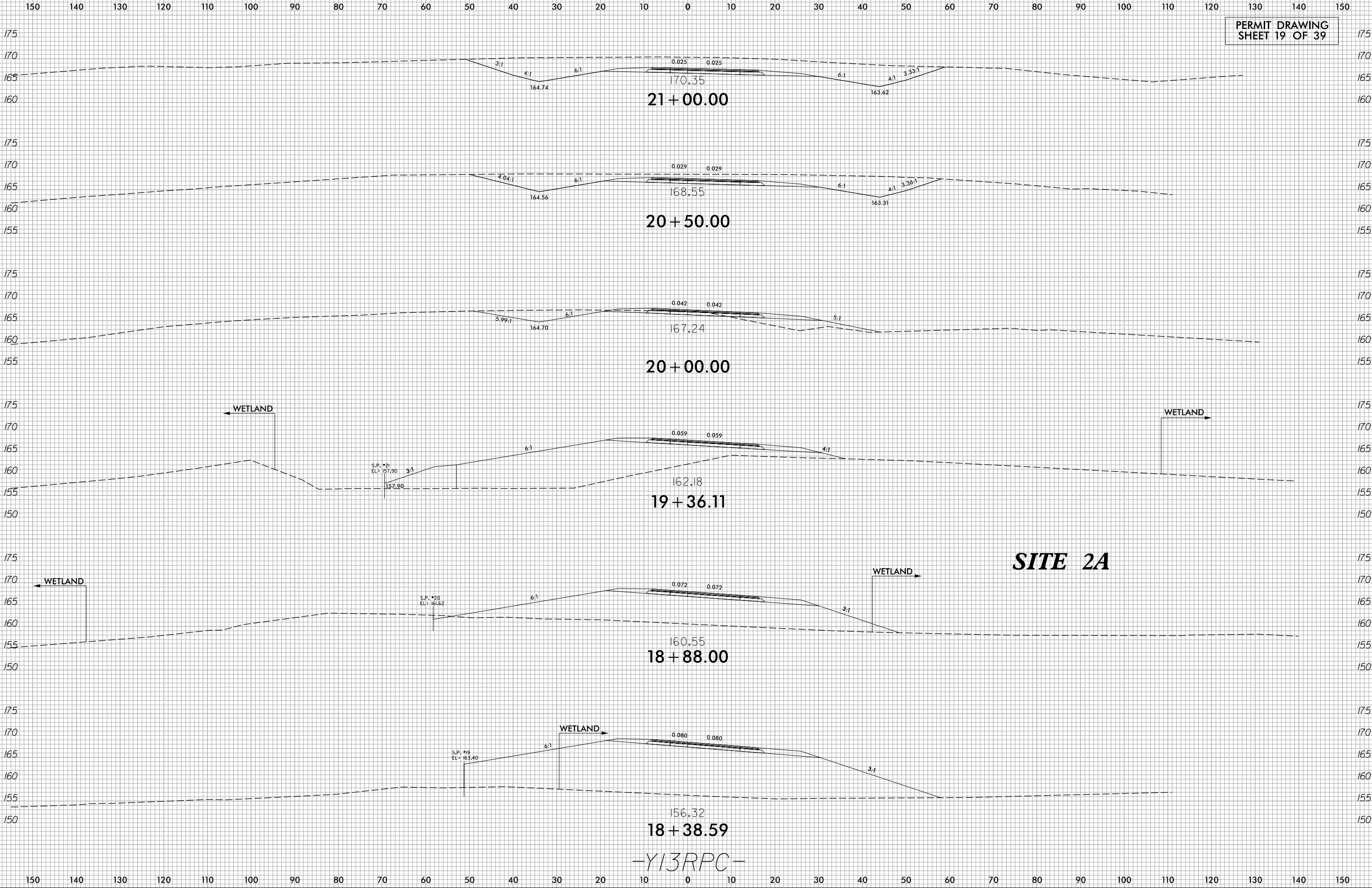


8/23/99



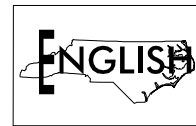
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U-2519BA	X-96

PERMIT DRAWING
SHEET 19 OF 39

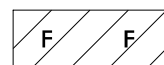


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Kels

8/17/99



DENOTES MECHANIZED
CLEARING



DENOTES FILL IN
WETLAND

SITE 2B

Q10 = 85.9 cfs
V10 = 1.6 ft/s

8

C
A

SPECIAL CUT
DITCH SEE
DETAIL A

ALPHA
BOX
TWC

2GI-A

18" RCP-III

2GI

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 20 OF 39

NAD
8395

MIN FS
(DETAIL AT)
ELEV. =
172.3

RETAIN

18" RCP-IV

REMOVE

3 TONS CL B RIP RAP
W/10 SY GEOTEXTILE

DONNA WIENAND
DB 8667 PG 621
PB 86 PG 22

SANDRA CASE
DB 4277 PG 536
PB 86 PG 22

116

SPECIAL CUT
DITCH SEE
DETAIL O

SPECIAL CUT
DITCH SEE
DETAIL AC

STD. V DITCH
12 CY DDE
SEE DETAIL Y

REMOVE

REMOVE

2@42" RCP-II

STD. * BASE
DITCH 40' CF DDE
SEE DETAIL I

REMOVE

DI

15" RCP-IV

DI

15" RCP-V

DI

DI

DI

2GI-A

FS SEE
DETAIL AT

24" RCP-III

5 TONS CL B RIP RAP
W/14 SY GEOTEXTILE

LATERAL 4' BASE DITCH
SEE DETAIL H

2 TONS CL B
RIP RAP
W/7 SY
GEOTEXTILE

SITE 2B

LATERAL 4' BASE DITCH
W/296 TONS
CL. I RIP RAP
632 SY GEOTEXTILE,
455 CY DDE
SEE DETAIL F

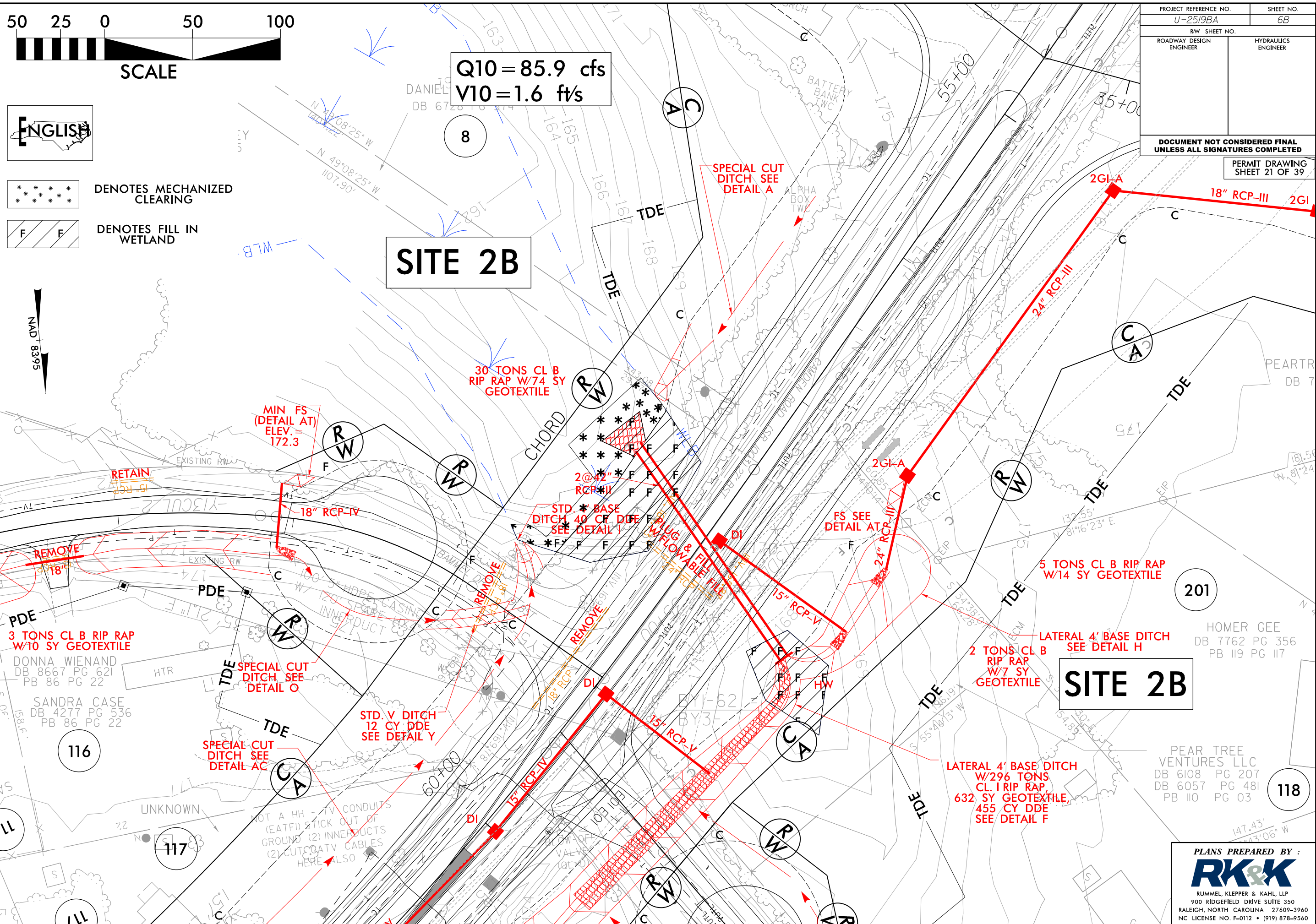
HOMER GEE
DB 7762 PG 356
PB 119 PG 117

PEAR TREE
VENTURES LLC
DB 6108 PG 207
DB 6057 PG 481
PB 110 PG 03

118

PLANS PREPARED BY :
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3/2/2018
B:\Hydro\Drawings\Drawings\4C\U2519BA_PRM_WET_psh06B.con.dgn



PROJECT REFERENCE NO. <i>U-2519BA</i>		SHEET NO. <i>6B</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
</			

PLANS PREPARED BY :

RK&K

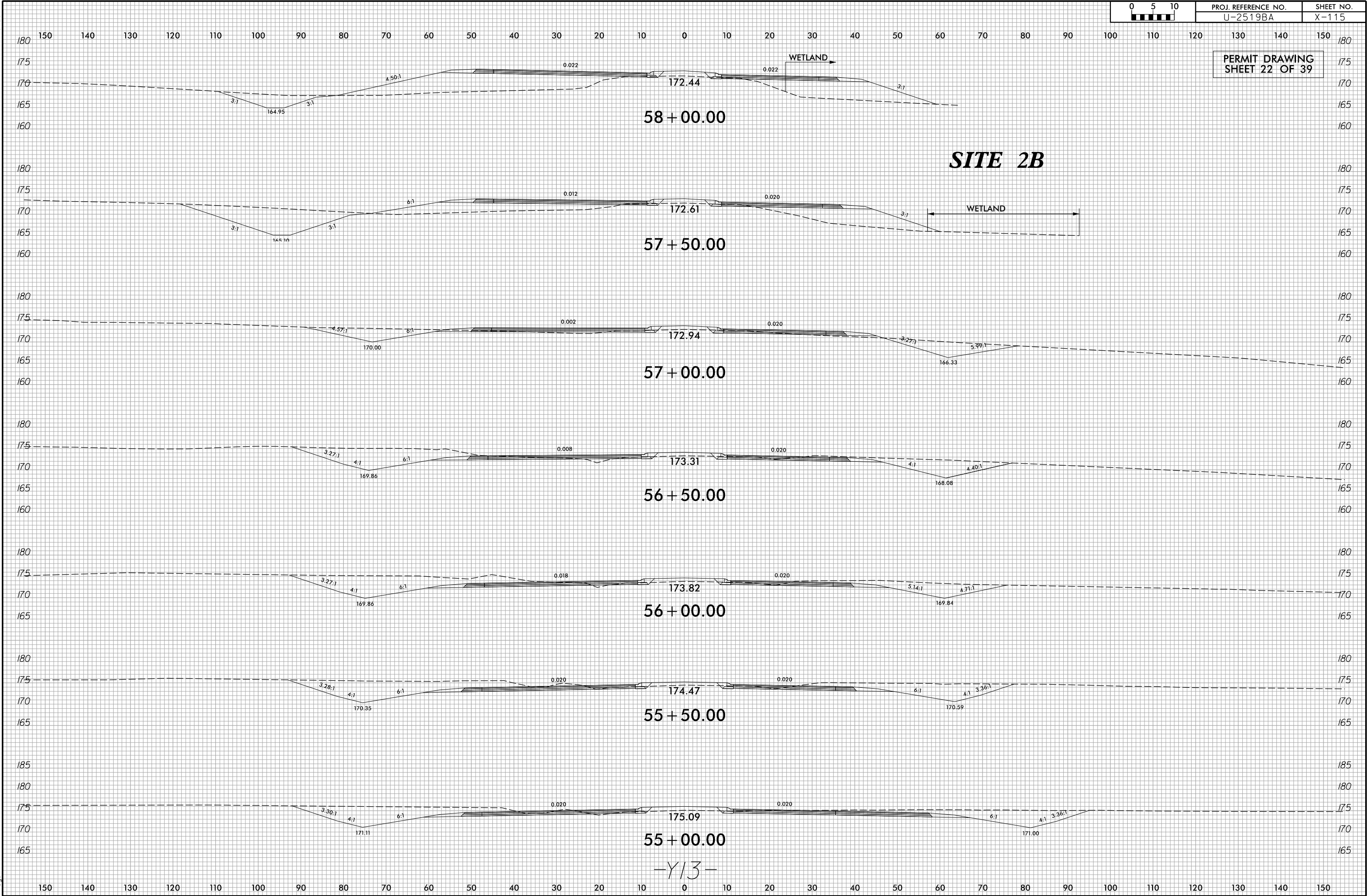
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3/2/2018
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cel5

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2519BA	X-115

PERMIT DRAWING
SHEET 22 OF 39



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3/2/2018
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paulica

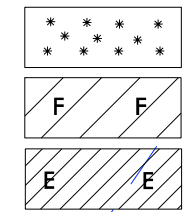
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U-2519BA	7A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL
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PERMIT DRAWING
SHEET 23 OF 39



SCALE



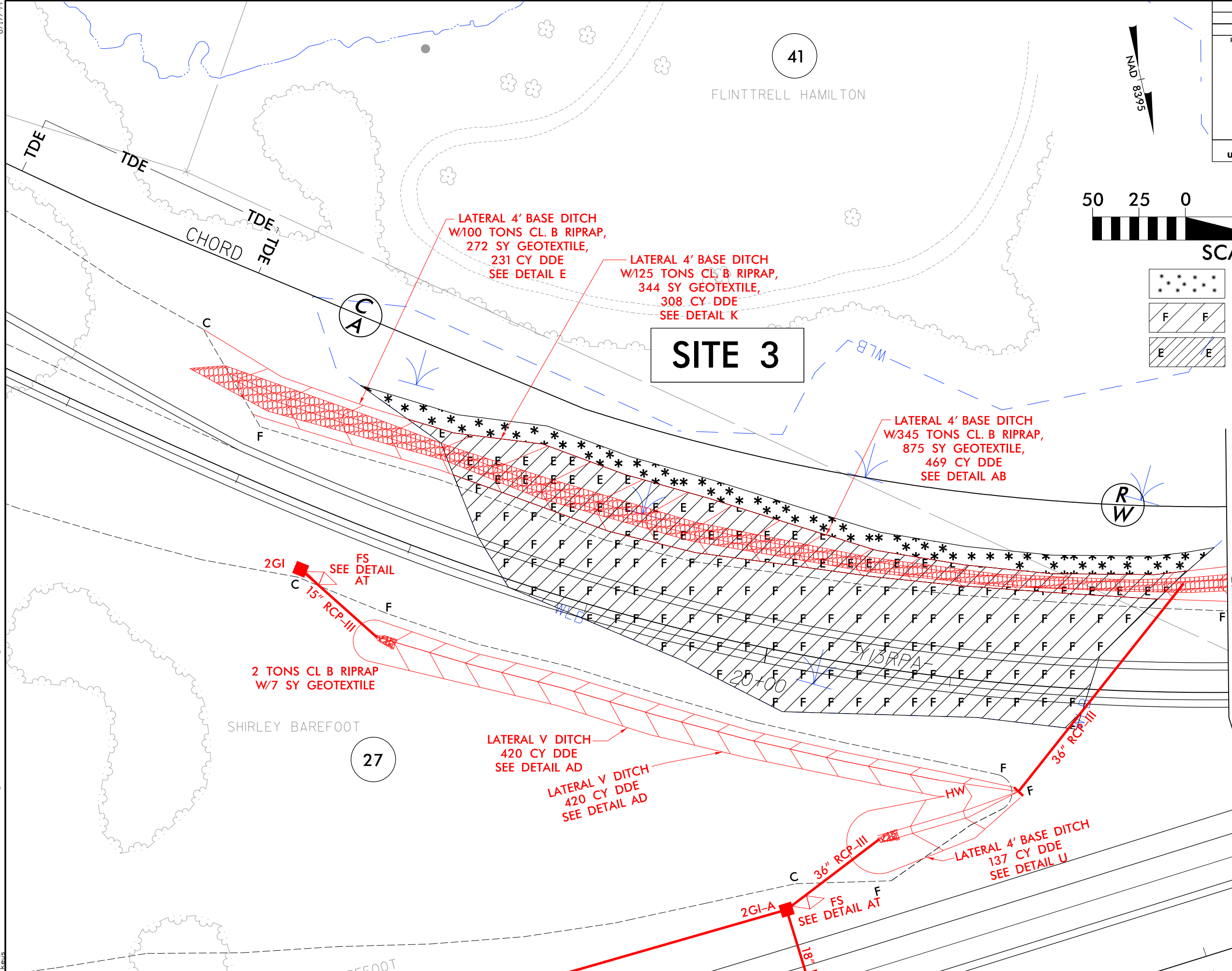
DENOTES MECHANIZED
CLEARING

DENOTES FILL IN
WETLAND

DENOTES EXCAVATION
IN WETLAND



ENGLISH



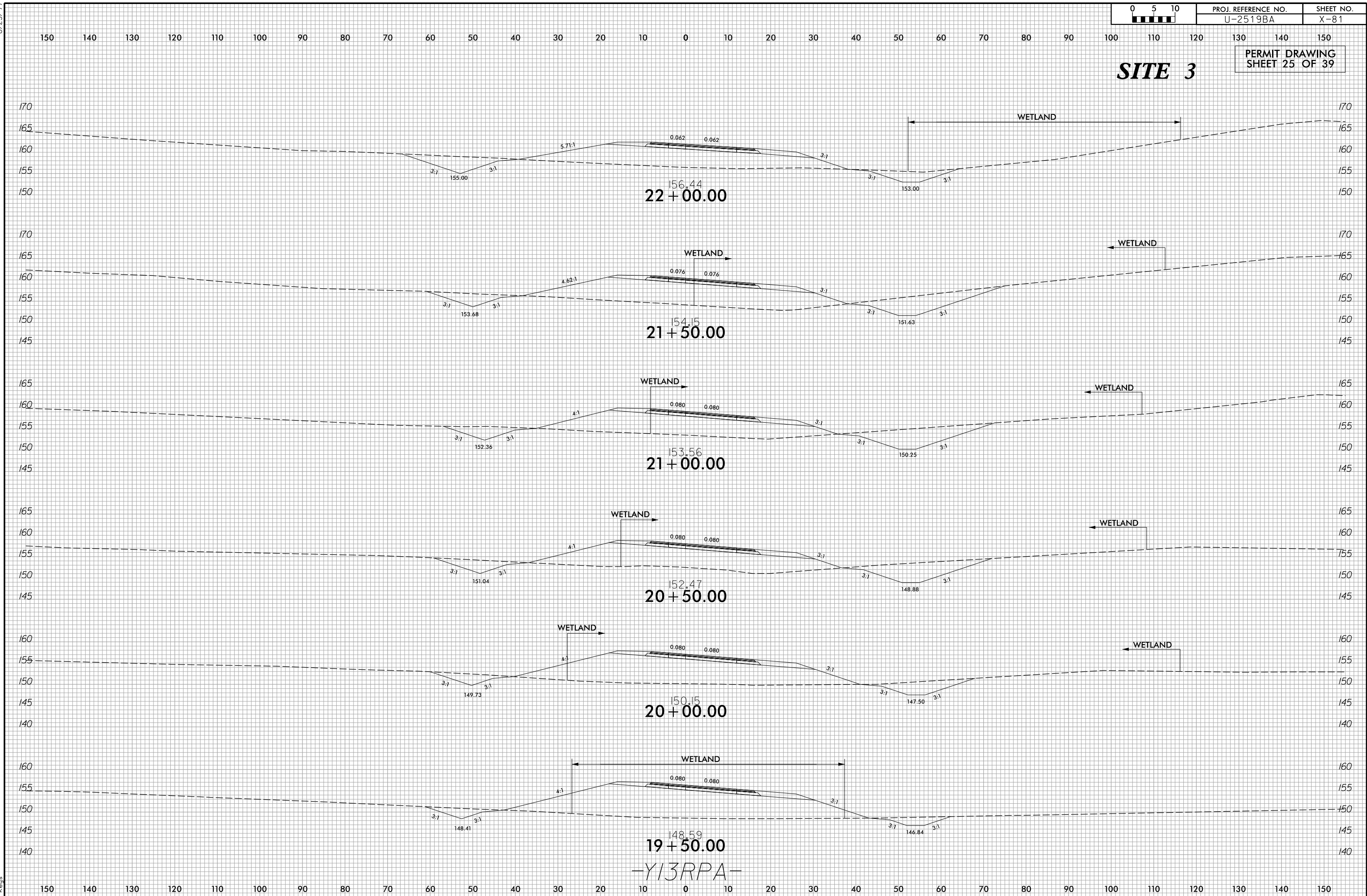
MATCHLINE
-Y13RPA- STA. 17 + 50
SEE SHEET 8

MATCHLINE
-L- STA. 37A + 50
SEE SHEET 8

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- DENOTES HAND CLEARING

PROJECT REFERENCE NO.		SHEET NO.
U-2519BA		9
RW SHEET NO.		
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER

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UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 26 OF 39

CAMDEN GLEN DEVELOPMENT LLC

209

44

JOHNNY BEASLEY

SITE 4

MATCHLINE -L- STA. 388+00 SEE SHEET 8

MATCHLINE -L- STA. 401+00 SEE SHEET 10

8 TONS CL B RIP RAP
W/21 SY GEOTEXTILE

LATERAL 4' BASE DITCH
1011 CY DDE
SEE DETAIL D

Q10=17.6 cfs
V10=1.8 ft/s

CLASS II RIP RAP
PLACE TO
EL. 140.0'
(STRUCTURE PAY ITEM)

CLASS II RIP RAP
PLACE TO
EL. 140.0'
(STRUCTURE PAY ITEM)

TEMP.
WORK
BRIDGE

390+00
FS
SEE DETAIL AR

24" RCP-III

30" RCP-III

2GI-A

FS SEE DETAIL AT

2GI

TOE PROTECTION
W/CL I RIPRAP
SEE DETAIL Z

395+00

FL GR
2GI

15" RCP-III

FL GR
2GI

15" CSP
2 ELBOWS

Q10=8.8 cfs
V10=1.3 ft/s

LATERAL 4' BASE DITCH
W/179 TONS CL B
RIP RAP, 488 SY GEOTEXTILE,
234 CY DDE
SEE DETAIL E

LATERAL 4' BASE DITCH
W/40 TONS CL B RIP RAP,
110 SY GEOTEXTILE, 80 CY DDE
SEE DETAIL K

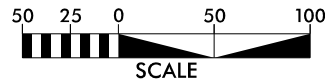
Q10=12.9 cfs
V10=1.6 ft/s

LATERAL 4' BASE DITCH
W/227 TONS CL B RIP RAP,
617 SY GEOTEXTILE,
427 CY DDE
SEE DETAIL E

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8/17/99

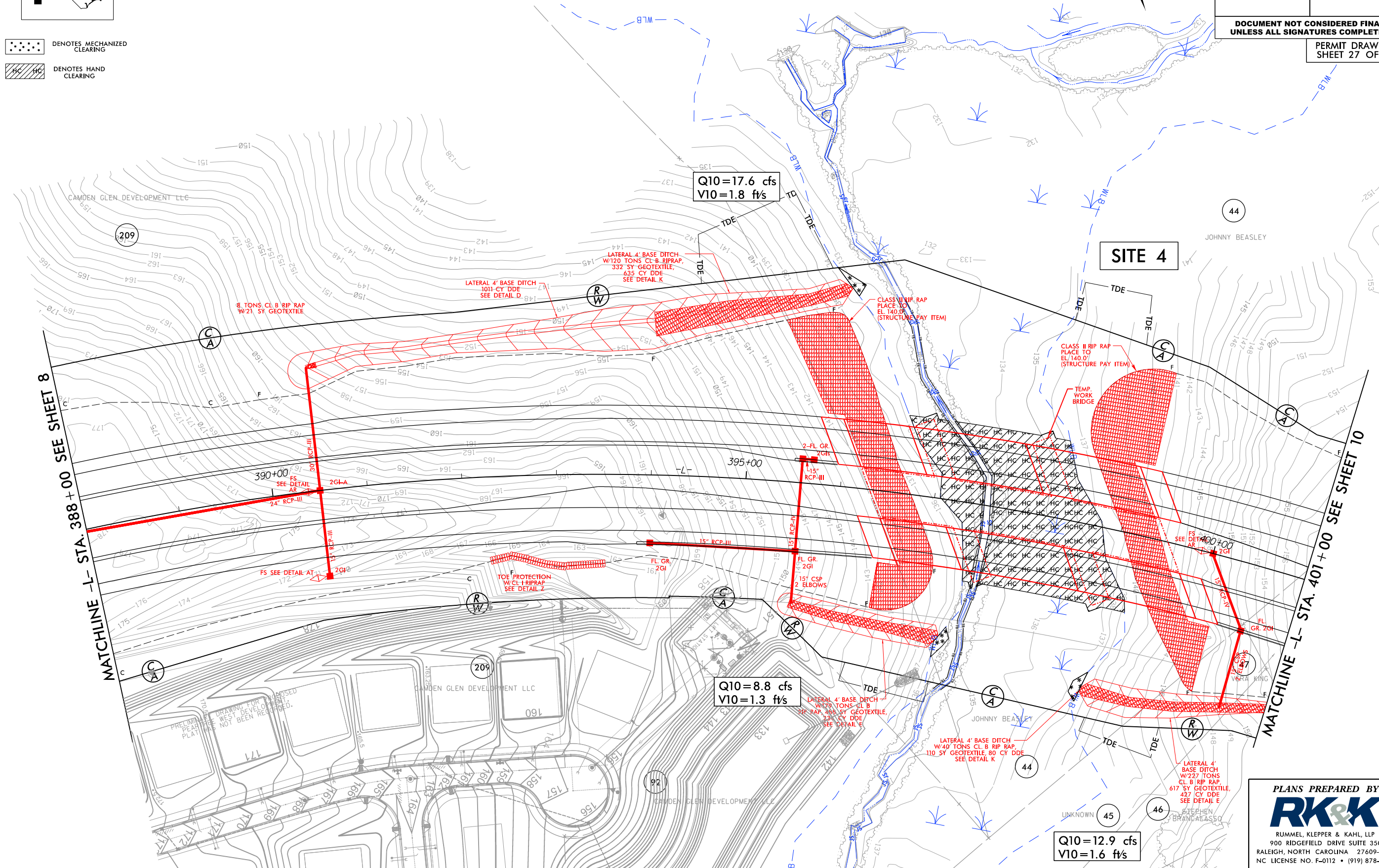


- DENOTES MECHANIZED CLEARING
- HC HC DENOTES HAND CLEARING

PROJECT REFERENCE NO.		SHEET NO.
U-2519BA		9
RW SHEET NO.		
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER

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SHEET 27 OF 39



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5/28/99

-L-

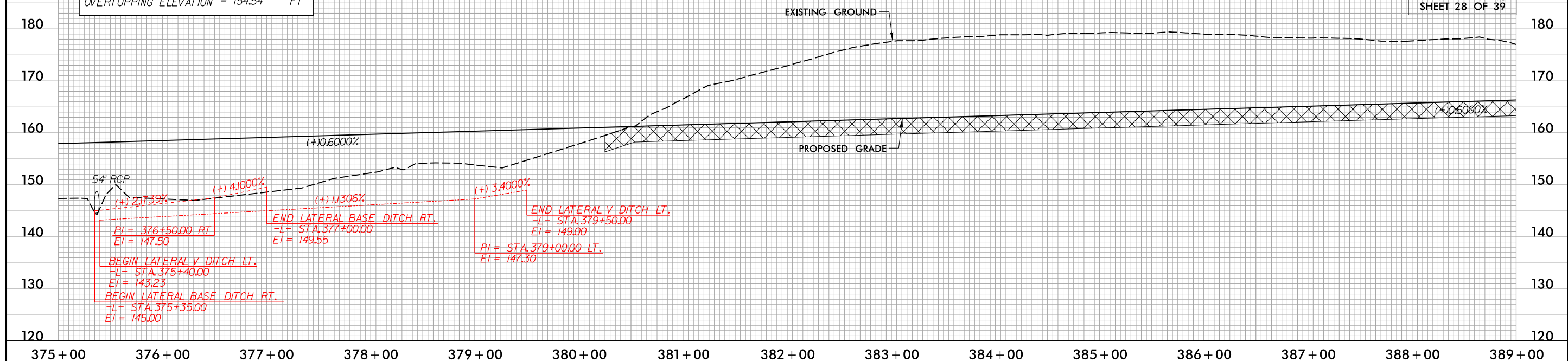
PROJECT REFERENCE NO.		SHEET NO.
U-2519BA		33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 28 OF 39

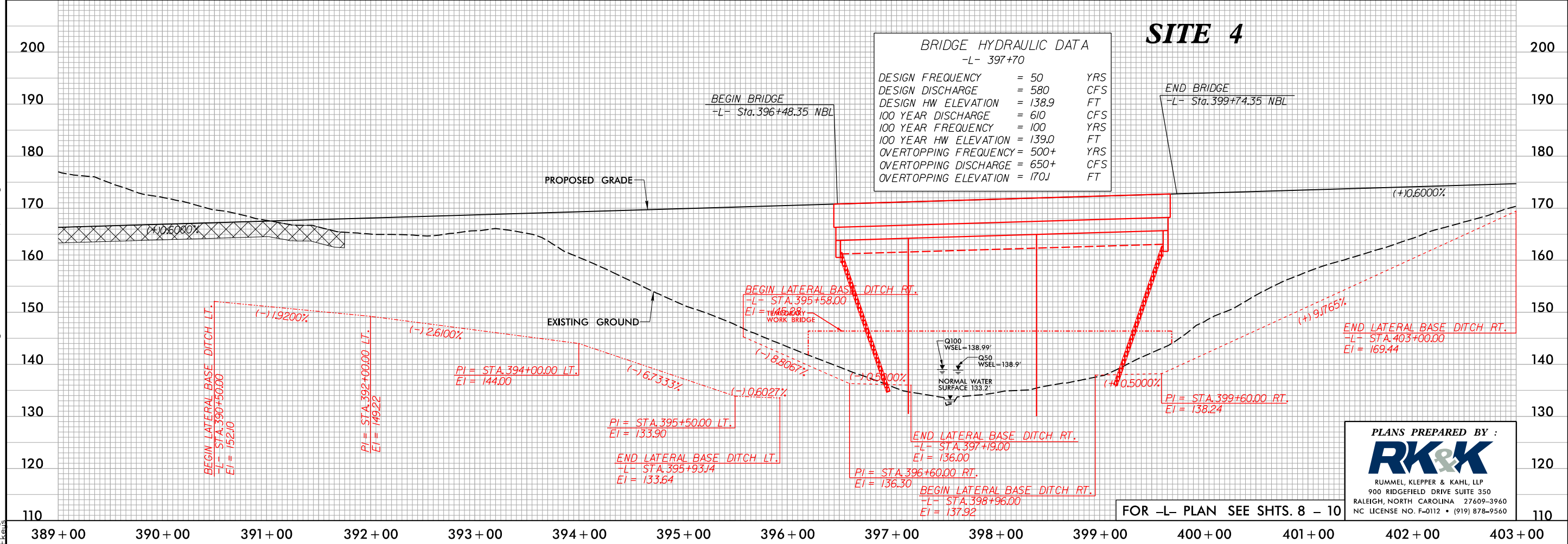
PIPE HYDRAULIC DATA		
-L- STA. 375+37		
DRAINAGE AREA	= 45.0	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 130.0	CFS
DESIGN HW ELEVATION	= 150.31	FT
100 YEAR DISCHARGE	= 140.0	CFS
100 YEAR HW ELEVATION	= 150.58	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 226.3	CFS
OVERTOPPING ELEVATION	= 154.54	FT

BM # 182
N 443073 E 1990463
-L- STA. 381+24.43 OFF 135.74' RT
ELEV=176.25'



SITE 4

BRIDGE HYDRAULIC DATA		
-L- 397+70		
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 580	CFS
DESIGN HW ELEVATION	= 138.9	FT
100 YEAR DISCHARGE	= 610	CFS
100 YEAR FREQUENCY	= 100	YRS
100 YEAR HW ELEVATION	= 139.0	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 650+	CFS
OVERTOPPING ELEVATION	= 170.1	FT

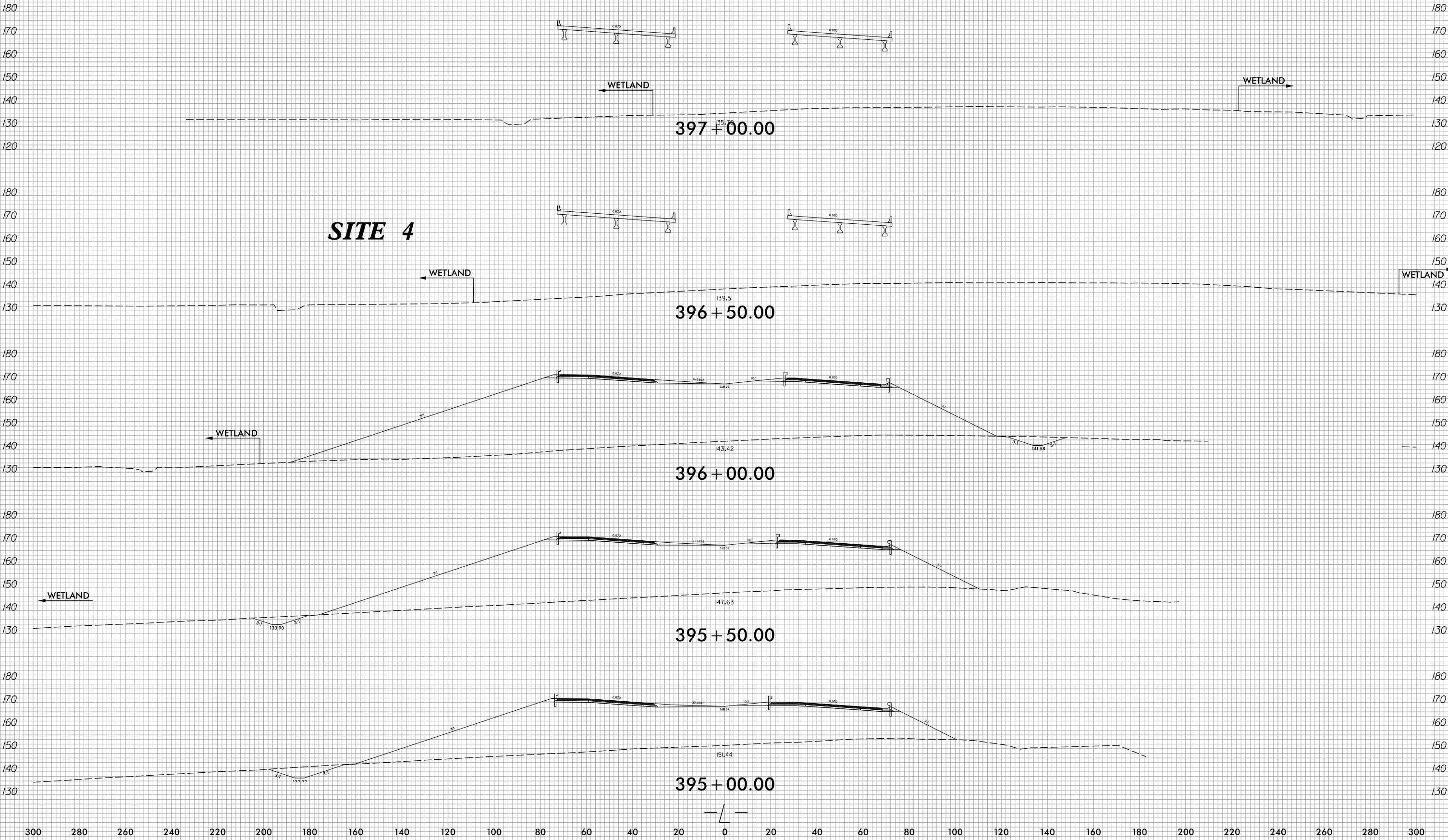


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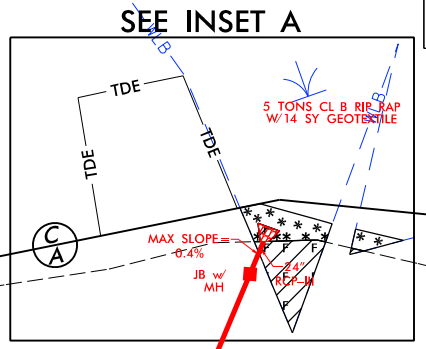
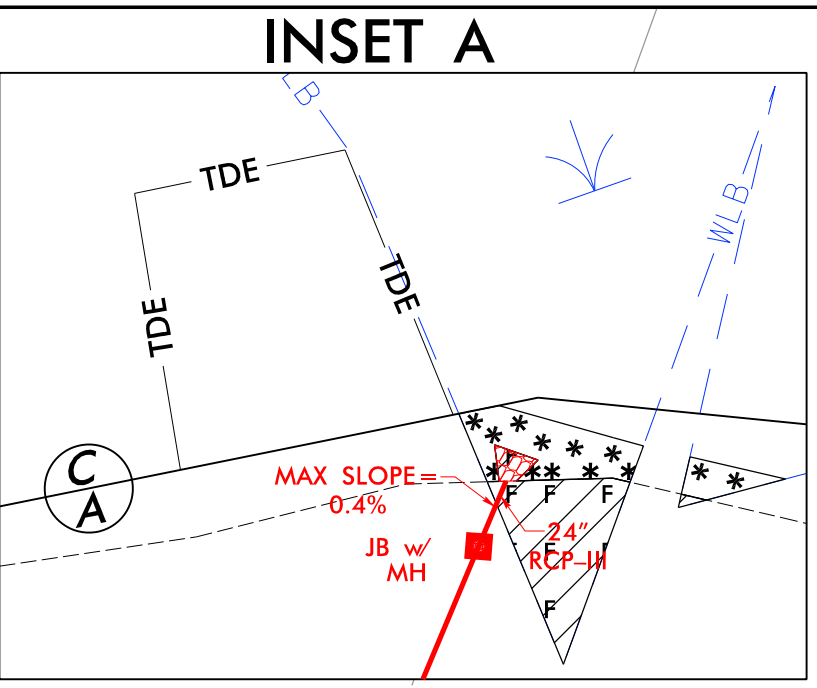
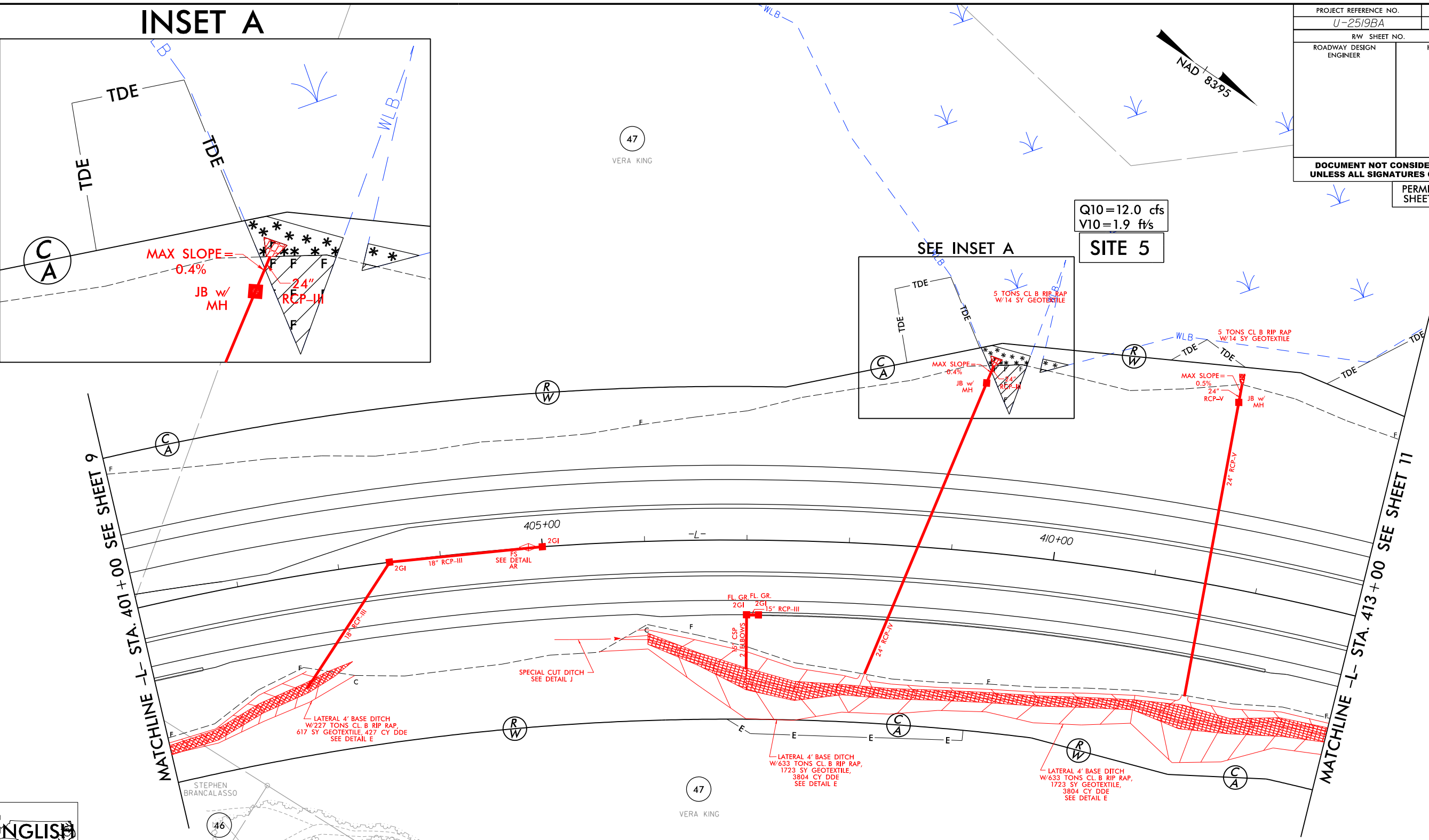
FOR -L- PLAN SEE SHTS. 8 - 10

8/23/99

PERMIT DRAWING
SHEET 29 OF 39



8/17/99
3/2/2018
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Q10=12.0 cfs
V10=1.9 ft/s
SITE 5

PROJECT REFERENCE NO. <i>U-2519BA</i>		SHEET NO. <i>10</i>
RW SHEET NO.		
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
		PERMIT DRAWING SHEET 30 OF 39

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

25 0 25 50
SCALE FOR INSET

50 25 0 50 100
SCALE

PLANS PREPARED BY :

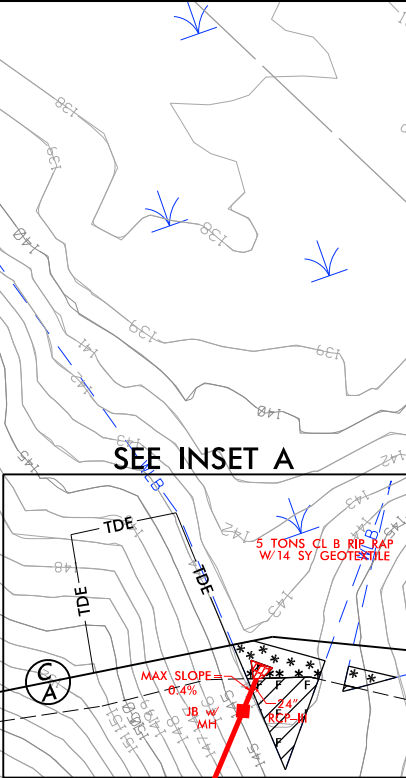
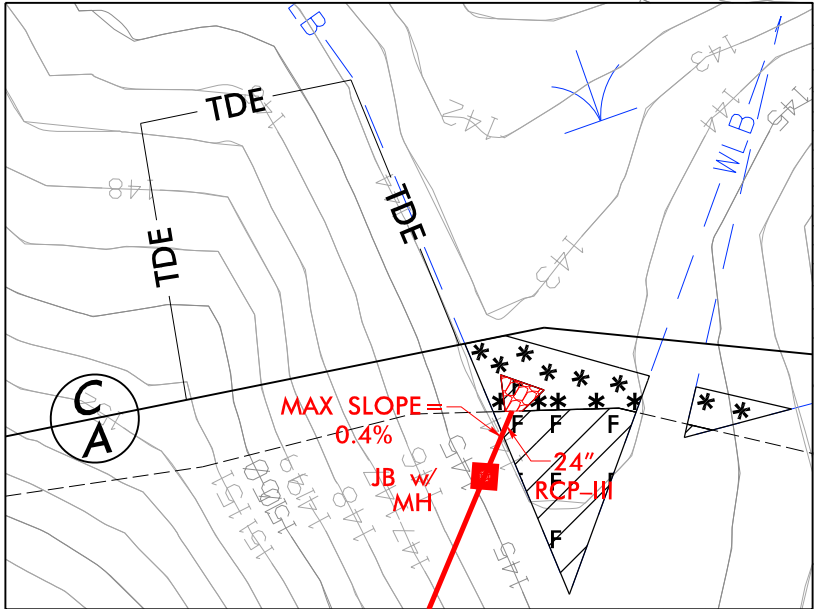
RK&K

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INSET A



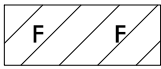
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V10=1.9 ft/s

SITE 5

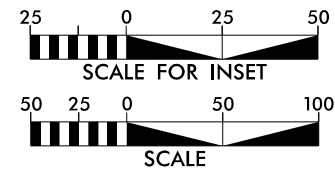
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RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
		PERMIT DRAWING SHEET 31 OF 39	



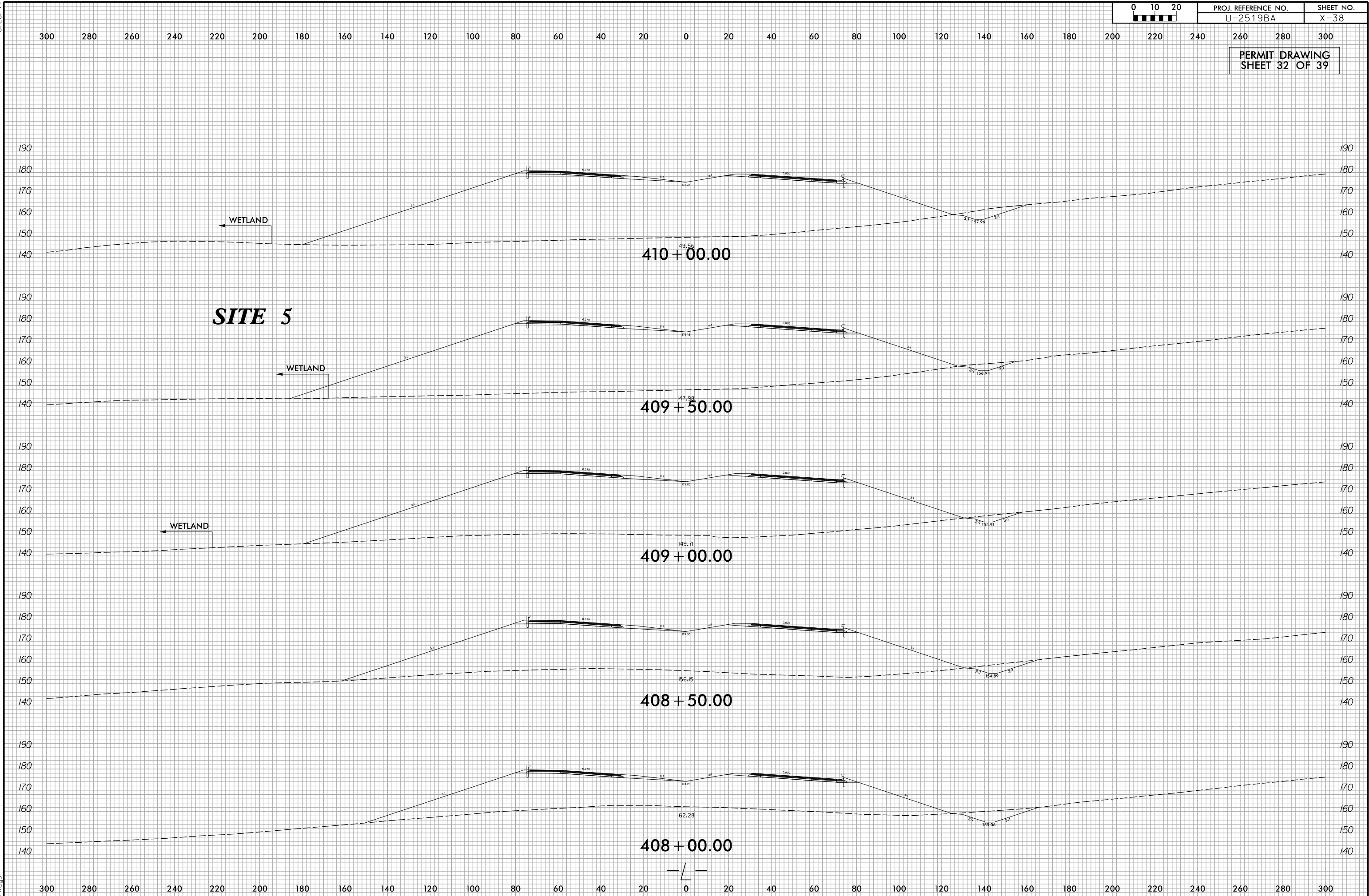
DENOTES
MECHANIZED
CLEARING



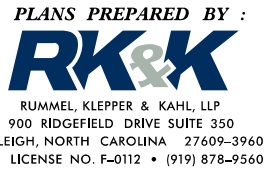
DENOTES FILL
IN WETLAND

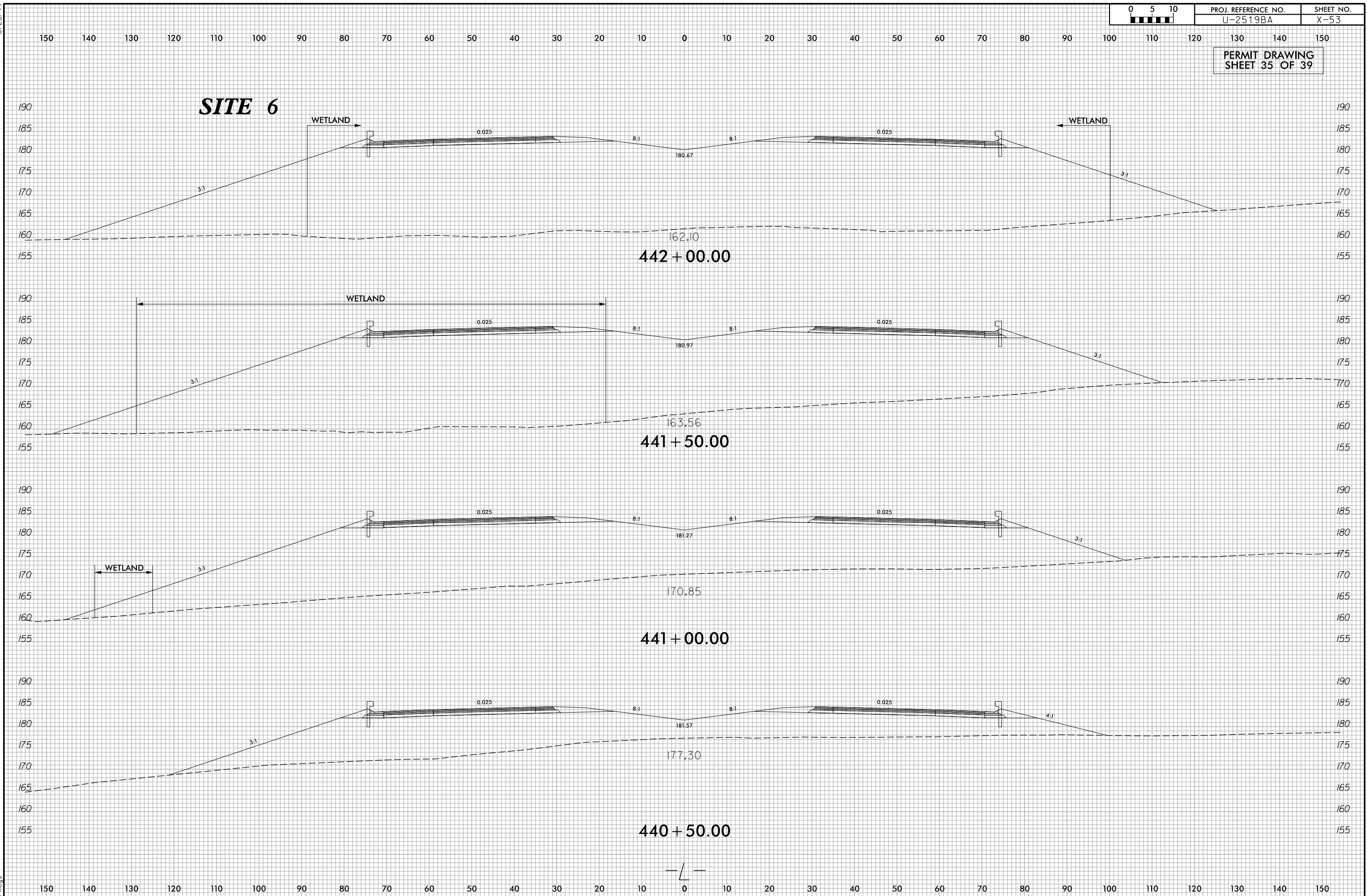


PLANS PREPARED BY :
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 DENOTES MECHANIZED CLEARING
 DENOTES FILL IN WETLAND

INSET A

SITE 7

$$\begin{aligned} Q_{10} &= 10.3 \text{ cfs} \\ V_{10} &= 1.4 \text{ ft/s} \end{aligned}$$

MATCHLINE -L- STA. 479+00 SEE SHEET 15

BRIDGE

APPROACH

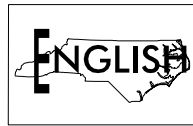
APPROACH

MATCHLINE - L- STA. 491+00 SEE SHEET 17

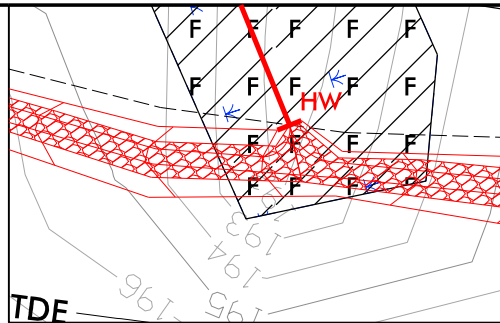
SEE INSET A

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3/2/2018
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- DENOTES MECHANIZED CLEARING
- DENOTES FILL IN WETLAND



INSET A

DAYD PROPERTIES DEVELOPMENT, INC

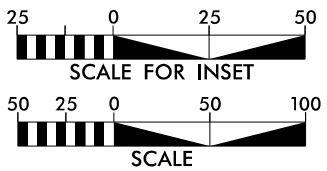
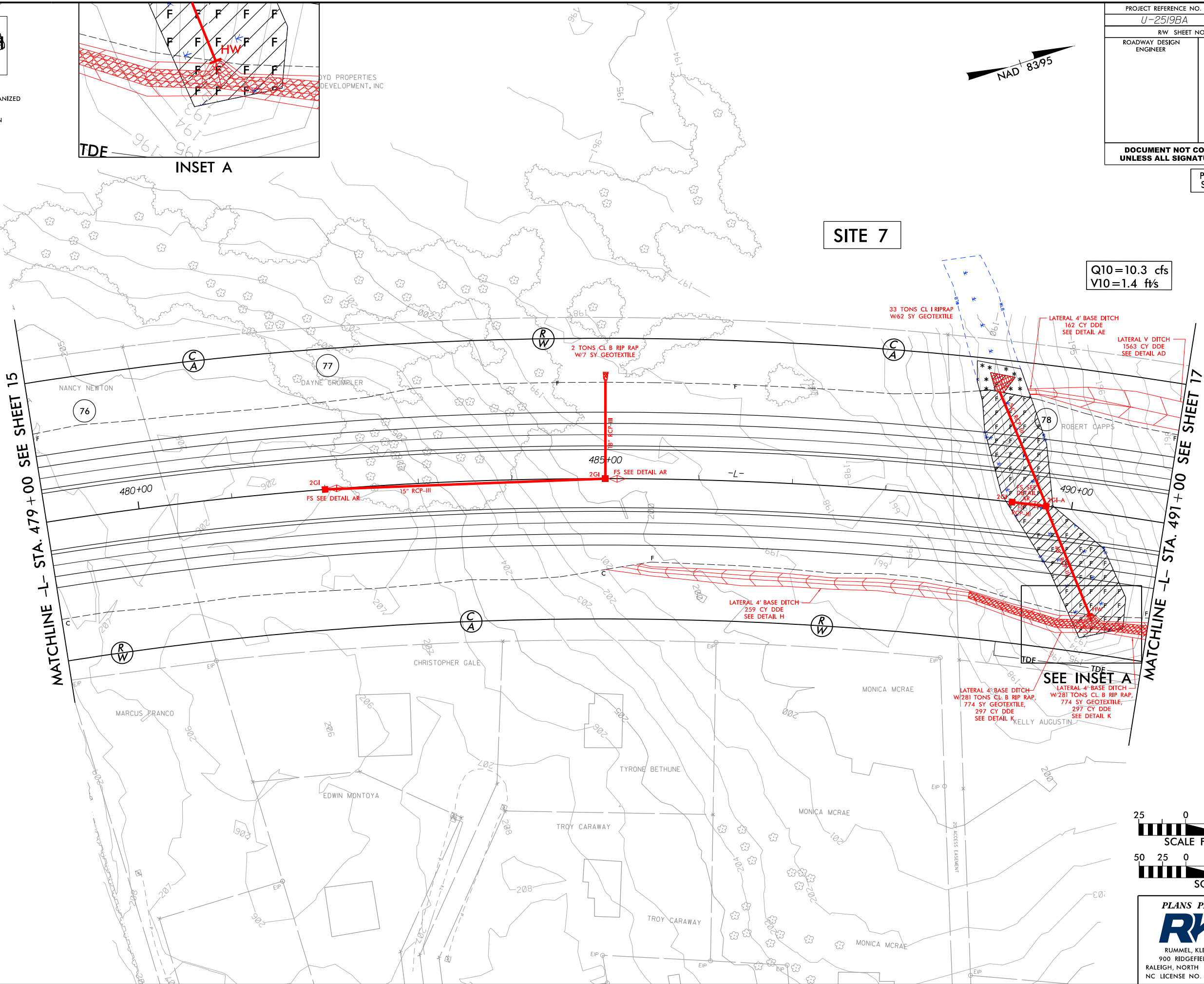


PROJECT REFERENCE NO. <i>U-2519BA</i>		SHEET NO. <i>16</i>
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

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SHEET 37 OF 39

SITE 7

Q10=10.3 cfs
V10=1.4 ft/s



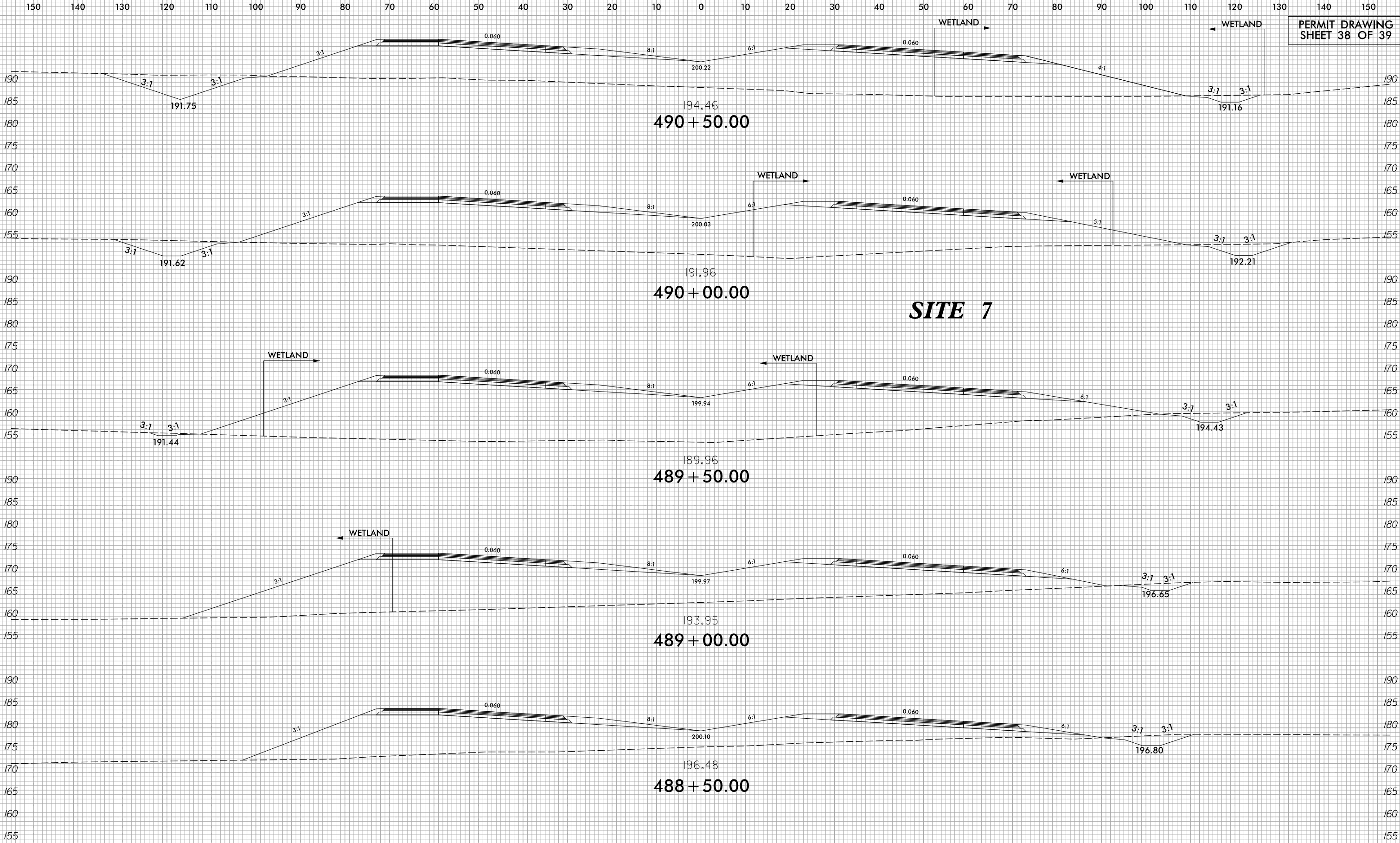
PLANS PREPARED BY :
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PROJ. REFERENCE NO.	SHEET NO.
U-2519BA	X-53

PERMIT DRAWING
SHEET 38 OF 39



SITE 7

490 + 50.00

490 + 00.00

489 + 50.00

489 + 00.00

488 + 50.00



		North Carolina Department of Transportation Highway Stormwater Program STORMWATER MANAGEMENT PLAN					
(Version 2.07; Released October 2016)							
WBS Element: 34817.1.FR8		TIP No.: U-2519BB		County(ies): Cumberland		Page 1 of 2	
General Project Information							
WBS Element:		34817.1.FR8		TIP Number: U-2519BB		Project Type: New Location	
NCDOT Contact:		Paul Atkinson, PE		Contractor / Designer:		CALYX Engineers + Consultants / David P. Bocker, PE	
		Address: 1020 Birch Ridge Drive Raleigh, NC 27610				Address: 7500 East Independence Blvd. Suite 100 Charlotte, NC 28227	
		Phone: 919-707-6707				Phone: 704-566-4342	
		Email: p.atkinson@ncdot.gov				Email: dbocker@CALYXengineers.com	
City/Town:		Fayetteville		County(ies):		Cumberland	
River Basin(s):		Cape Fear		CAMA County?		No	
Wetlands within Project Limits?		Yes					
Project Description							
Project Length (lin. miles or feet):		1.25		Surrounding Land Use: Varies - Primarily Undeveloped Farmland and Woodlands with adjacent Residential Areas			
		Proposed Project		Existing Site			
Project Built-Up Area (ac.):		35.0 ac.		4.7 ac.			
Typical Cross Section Description:		Controlled Access Freeway Facility - 6-lane divided section with grassed median and interchange at Strickland Bridge Road (-Y17-)		New Location / Undeveloped with some residential and various 2-lane roadways			
Annual Avg Daily Traffic (veh/hr/day):		Design/Future: 46800		Year: 2038		Existing: 37400	
General Project Narrative: (Description of Minimization of Water Quality Impacts)		The project consists of a section of new location controlled access facility west of Fayetteville in Cumberland County, NC. U-2519BB also consists of a full interchange at Strickland Bridge Road along with several side road realignments and relocations. The proposed stormwater runoff from the proposed freeway facility and associated side roads will utilize both ditches and storm drainage systems. Grass swale treatment will occur throughout the project in the median and in areas where flat slopes can be maintained. In wetland areas, roadway embankment/ fill slopes outside of the interchange have been minimized to 3:1 to minimize impacts. There are no major structures on this section of the project; however, several crosspipes are proposed which have been buried 1' to allow for fish passage. Additionally, where proposed ditches exceed 5% grade, riprap has been utilized to minimize erosion prior to outletting into the receiving outfalls.					
Waterbody Information							
Surface Water Body (1):		Little Rockfish Creek		NCDWR Stream Index No.:		18-31-24-(3)	
NCDWR Surface Water Classification for Water Body		Primary Classification:		Class B			
		Supplemental Classification:		None			
Other Stream Classification:		None					
Impairments:		None					
Aquatic T&E Species?		No		Comments:			
NRTS Stream ID:						Buffer Rules in Effect:	
Project Includes Bridge Spanning Water Body?		No		Deck Drains Discharge Over Buffer?		N/A	
Deck Drains Discharge Over Water Body?		N/A		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)							
WBS Element: 34817.1.FR8		TIP No.: U-2519BB		County(ies): Cumberland		Page 2 of 2	

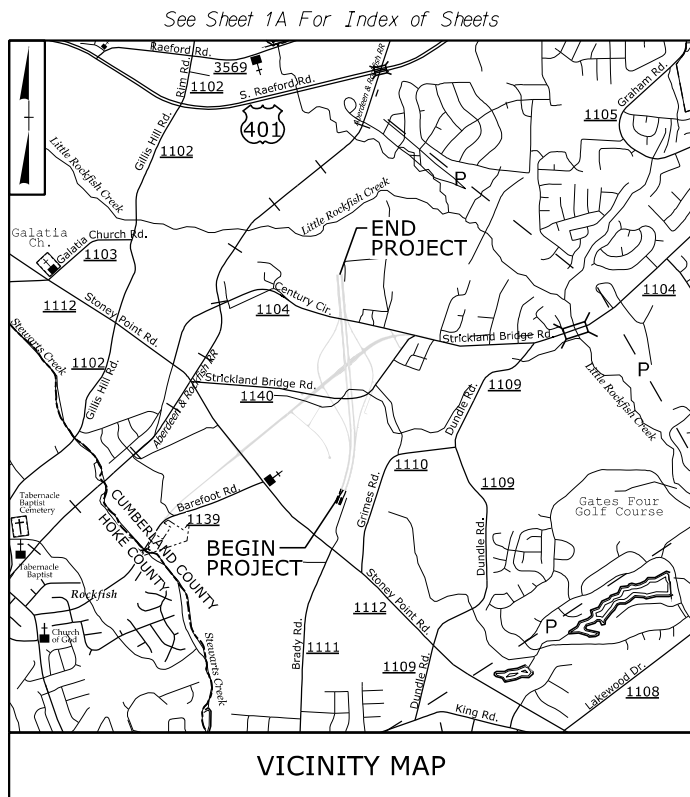
		North Carolina Department of Transportation Highway Stormwater Program STORMWATER MANAGEMENT PLAN FOR NCDOT PROJECTS			
(Version 2.07; Released October 2016)					
Additional Waterbody Information					
Surface Water Body (2):		Stewarts Creek		NCDWR Stream Index No.: 18-31-21	
NCDWR Surface Water Classification for Water Body		Primary Classification:		Class C	
		Supplemental Classification:		None	
Other Stream Classification:		None			
Impairments:		None			
Aquatic T&E Species?		Comments:			
NRTR Stream ID:				Buffer Rules in Effect:	
Project Includes Bridge Spanning Water Body?		No		N/A	
Deck Drains Discharge Over Water Body?		N/A		Dissipator Pads Provided in Buffer?	
(If yes, provide justification in the General Project Narrative)		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
Surface Water Body (3):					
NCDWR Surface Water Classification for Water Body		Primary Classification:			
		Supplemental Classification:			
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?		Comments:			
NRTR Stream ID:				Buffer Rules in Effect:	
Project Includes Bridge Spanning Water Body?				Dissipator Pads Provided in Buffer?	
Deck Drains Discharge Over Water Body?		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					
Surface Water Body (4):					
NCDWR Surface Water Classification for Water Body		Primary Classification:			
		Supplemental Classification:			
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?		Comments:			
NRTR Stream ID:				Buffer Rules in Effect:	
Project Includes Bridge Spanning Water Body?				Dissipator Pads Provided in Buffer?	
Deck Drains Discharge Over Water Body?		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					
Surface Water Body (5):					
NCDWR Surface Water Classification for Water Body		Primary Classification:			
		Supplemental Classification:			
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?		Comments:			
NRTR Stream ID:				Buffer Rules in Effect:	
Project Includes Bridge Spanning Water Body?				Dissipator Pads Provided in Buffer?	
Deck Drains Discharge Over Water Body?		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

09/08/99

4/11/2018 R:\Hydraulics\PERMITS_Environmental\Drawings\U2519BB_hyd_prm_TSH.dgn

TIP PROJECT: U-2519BB

CONTRACT: C204110

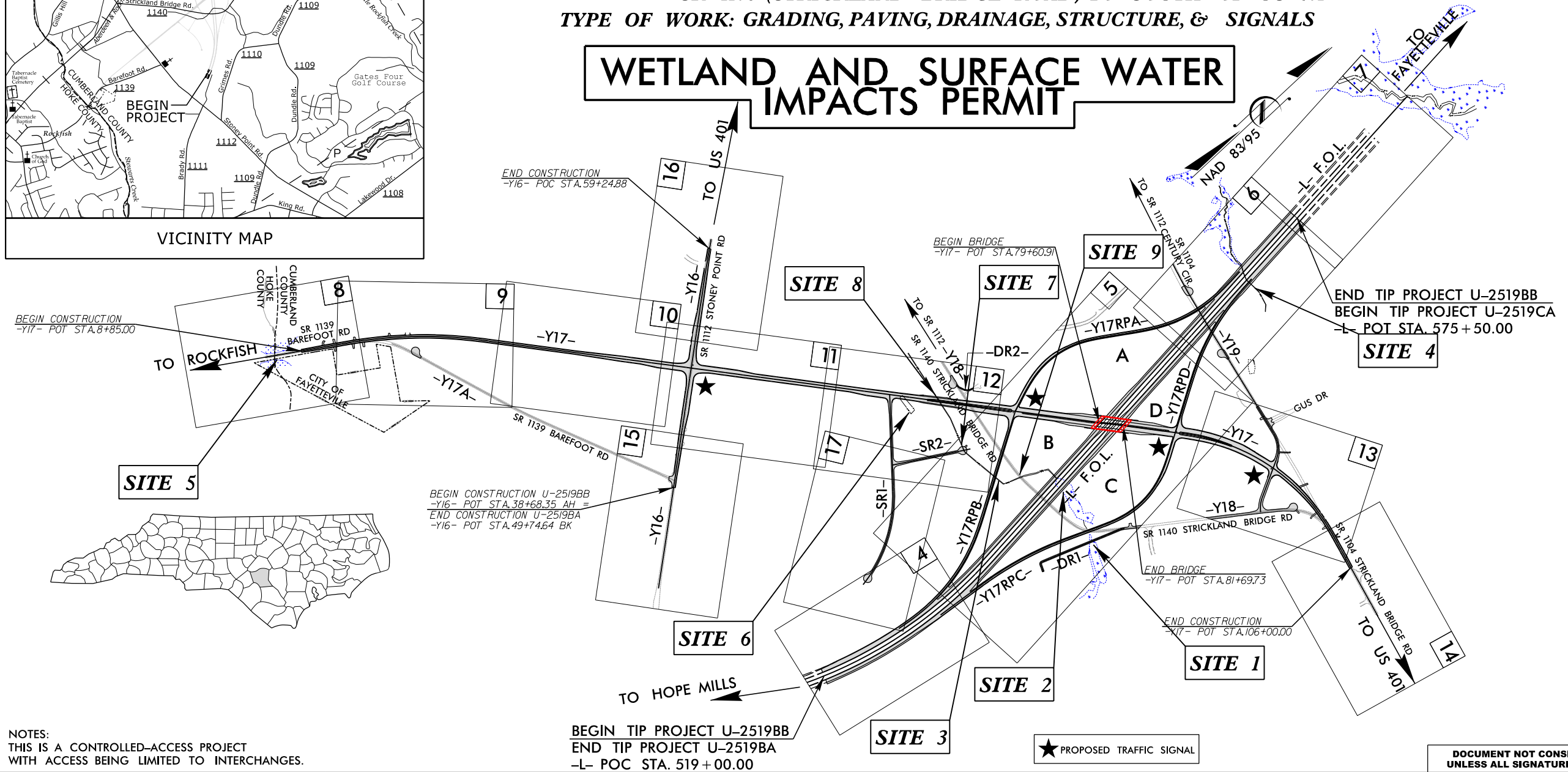


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

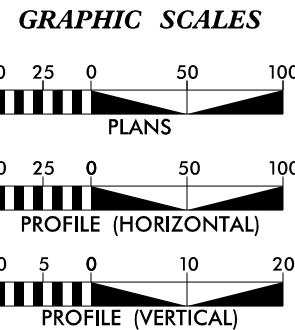
LOCATION: FAYETTEVILLE OUTER LOOP (F.O.L.) FROM SOUTH OF
SR 1104 (STRICKLAND BRIDGE ROAD) TO SOUTH OF US 401
TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURE, & SIGNALS

WETLAND AND SURFACE WATER IMPACTS PERMIT



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2519BB	1	
STATE WBS NO.	F.A. PROJ. NO.	DESCRIPTION	
34817.1.FR8	NHF-0100(25)	PE	
34817.1.FR15	NHF-0100(25)	ROW, UTIL CONST	

PERMIT DRAWING
SHEET 1 OF 21

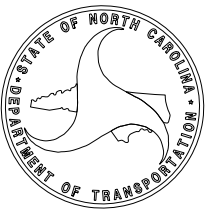


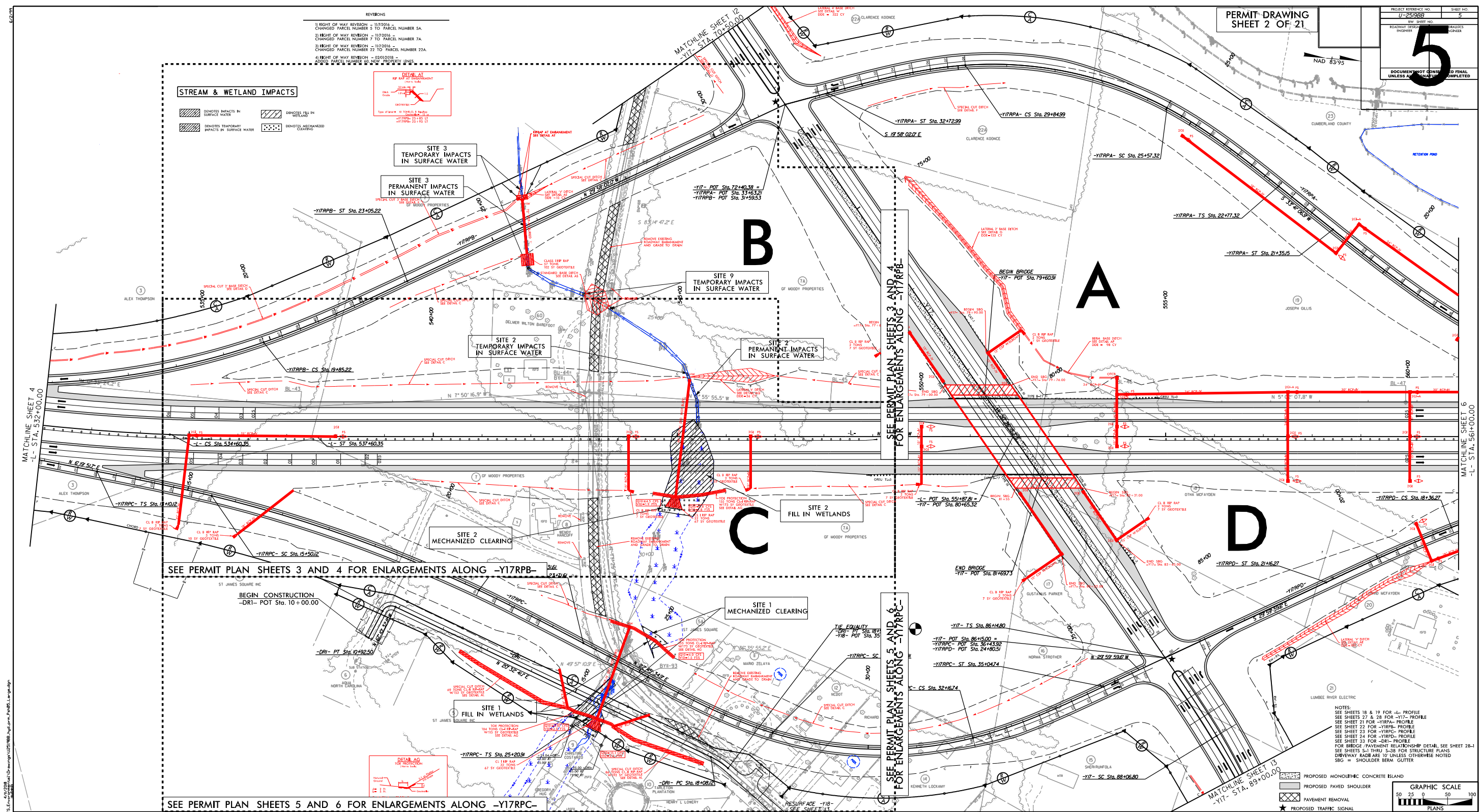
DESIGN DATA	
ADT 2018 =	37,400
ADT 2038 =	46,800
K =	8 %
D =	55 %
T =	12 % *
V =	70 MPH
* 4% TTST + 8% DUAL	
FUNC CLASS=INTERSTATE STATEWIDE TIER	

PROJECT LENGTH	
LENGTH ROADWAY TIP PROJECT U-2519BB	= 1.070 MILES
TOTAL LENGTH TIP PROJECT U-2519BB	= 1.070 MILES

Prepared in the Office of: CALYX Engineers & Consultants (Formerly Mulvey Engineers and Consultants) FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
2018 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: SEPTEMBER 29, 2016	JOHNNY BANKS CALYX E & C PROJECT MANAGER
LETTING DATE: SEPTEMBER 18, 2018	STEPHEN C. BROWDE, PE CALYX E & C PROJECT DESIGN ENGINEER
NCDOT CONTACT:	GARY LOVERING, PE ROADWAY DESIGN - PROJECT ENGINEER

HYDRAULICS ENGINEER	
SIGNATURE:	P.E.
ROADWAY DESIGN ENGINEER	
SIGNATURE:	P.E.

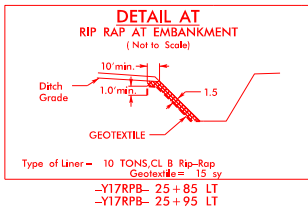




8/17/99

STREAM & WETLAND IMPACTS

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



NAD 83/95

PROJECT REFERENCE NO.	SHEET NO.
U-2519BB	5B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PERMIT DRAWING SHEET 3 OF 21

B

**SITE 9
TEMPORARY IMPACTS
IN SURFACE WATER**

**SITE 2
PERMANENT IMPACTS
IN SURFACE WATER**

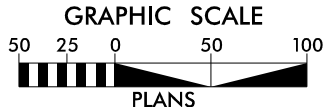
**SITE 2
TEMPORARY IMPACTS
IN SURFACE WATER**

**SITE 3
TEMPORARY IMPACTS
IN SURFACE WATER**

**SITE 3
PERMANENT IMPACTS
IN SURFACE WATER**

**SITE 2
FILL IN WETLANDS**

**SITE 2
MECHANIZED CLEARING**



4/1/2018 R:\HYDRAULICS\PERMITS\Environmental\Drawings\U2519BB_bud.pcm_Pat05B.dgn

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

NAD 83/95

SITE 3 PERMANENT IMPACTS IN SURFACE WATER

SITE 9 TEMPORARY IMPACTS IN SURFACE WATER

SITE 2 TEMPORARY IMPACTS IN SURFACE WATER

SITE 2 PERMANENT IMPACTS IN SURFACE WATER

SITE 2
FILL IN WETLANDS

SITE 2 MECHANIZED CLEARING

GRAPHIC SCALE



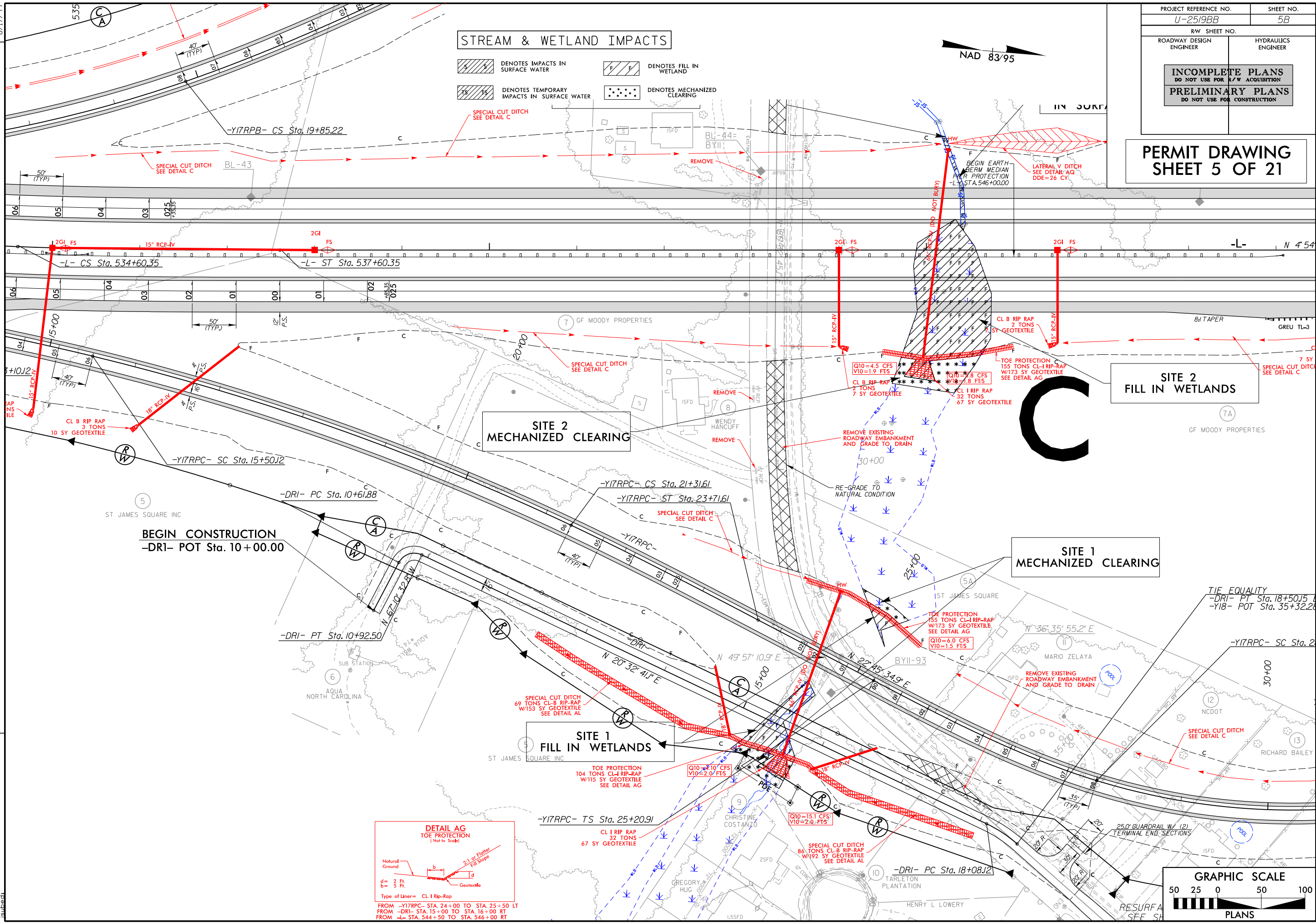
4/11/2018
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PERMIT DRAWING
SHEET 5 OF 21

STREAM & WETLAND IMPACTS

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

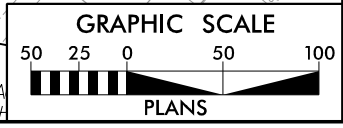
NAD 83/95



DETAIL AG
TOE PROTECTION
(Not to Scale)

Type of Liner = CL I Rip-Rap

FROM -Y17RPC- STA. 24+00 TO STA. 25+50 LT
FROM -DRI- STA. 15+00 TO STA. 16+00 RT
FROM -L- STA. 544+50 TO STA. 546+00 RT



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

NAD 83/95

PERMIT DRAWING
SHEET 6 OF 21

SITE 2 IN WETLANDS

**SITE 1
MECHANIZED CLEARING**

**SITE 2
MECHANIZED CLEARING**

BEGIN CONSTRUCTION
-DR1- POT Sta. 10+00.00

DETAIL AG
TOE PROTECTION
(Not to Scale)

Diagram illustrating a cross-section of a road construction. The structure shows a 2:1 or flatter fill slope, a geotextile layer, and a rip-rap layer. Dimensions are indicated: $d = 2 \text{ Ft.}$ and $b = 5 \text{ Ft.}$. The diagram also shows the relationship between the rip-rap layer and the underlying geotextile.

Stationing information:

- FROM -Y17RPC- STA. 24+00 TO STA. 25+50
- FROM -DR1- STA. 15+00 TO STA. 16+00 RT
- FROM -LA- STA. 544+50 TO STA. 546+00 RT

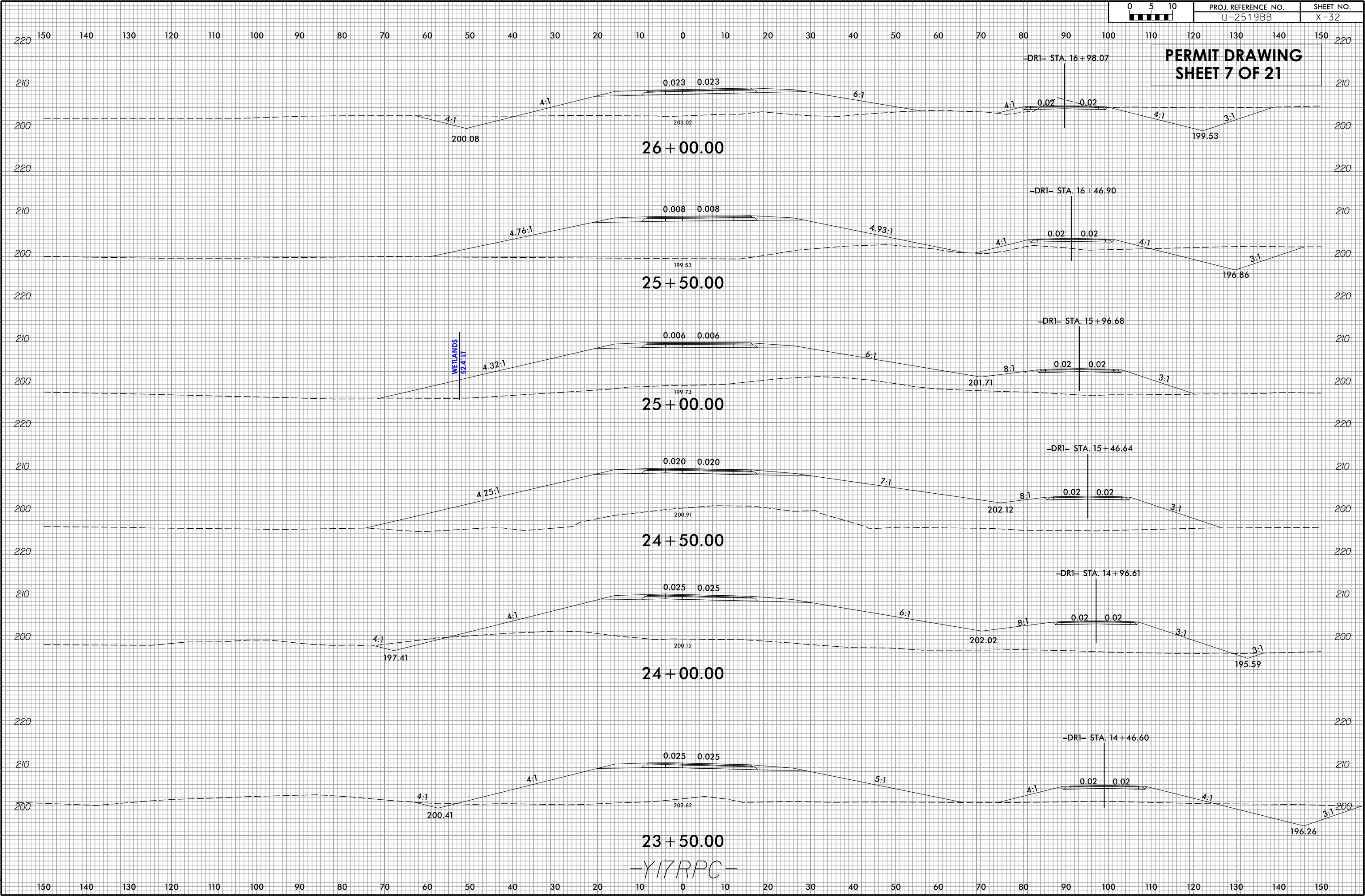
GRAPHIC SCALE
25 0 50 1
PLANS

4/11/2018
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Sheet: 1 of 1

REVISIONS

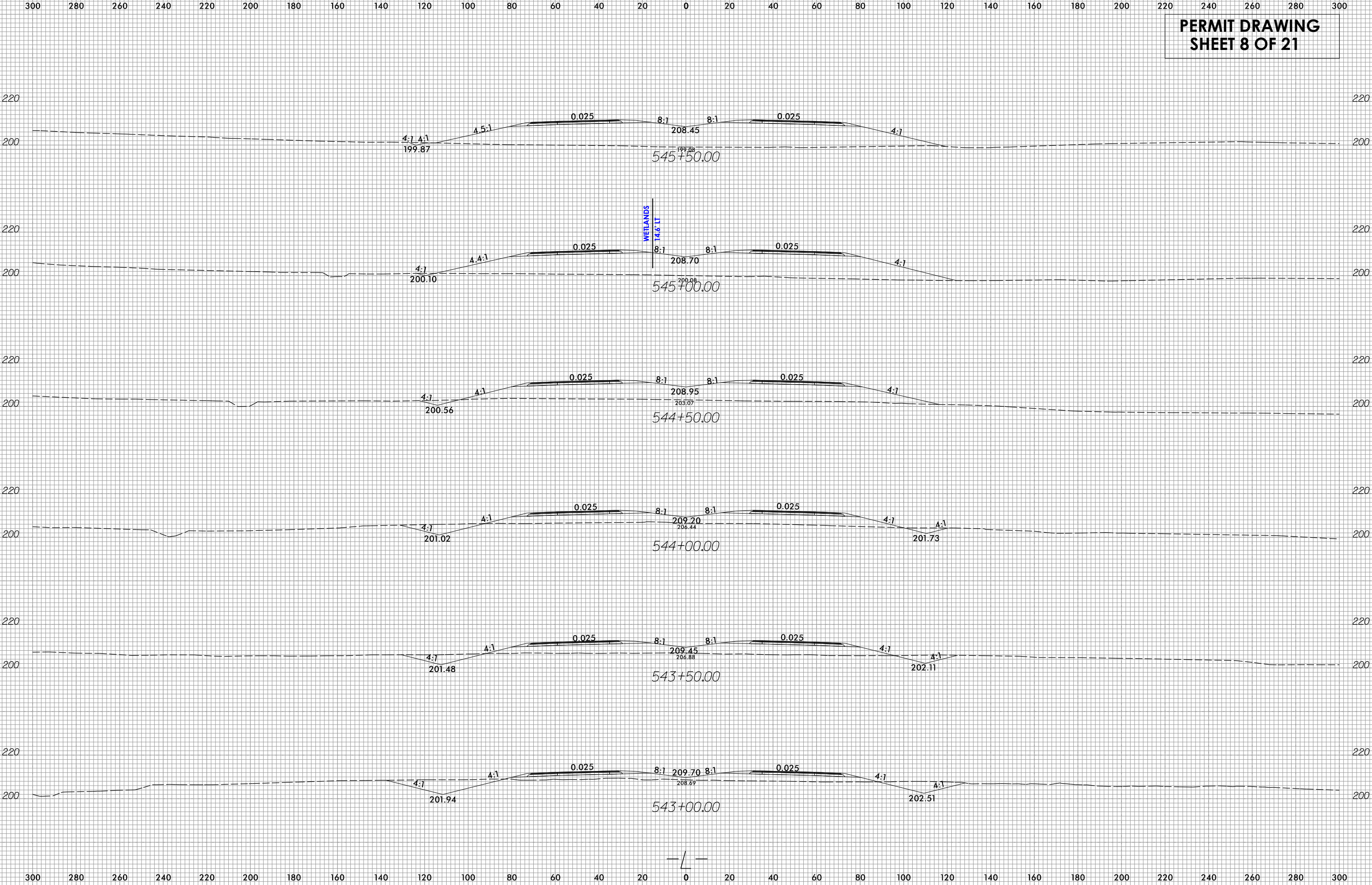
8/23/99

PERMIT DRAWING
SHEET 7 OF 21



8/23/99

PERMIT DRAWING
SHEET 8 OF 21



6/23/16

6/23/16



PROJ. REFERENCE NO.	SHEET NO.
U-2519BB	X-4

PERMIT DRAWING
SHEET 9 OF 21

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

220 210 200 190 220 210 200 190

200.89

24 + 50.53

EXISTING BED

NSW = 196.54'

INV. IN = 196.00'

INV. OUT = 195.30

EXISTING BED

EXISTING
GROUND ALONG CL

4:1 NORMAL
4.36 SKEWED

PROPOSED FINISHED
GRADE

3:1 NORMAL
2.62:1 SKEWED

200 LF -66" RCP-IV @ 0.35%

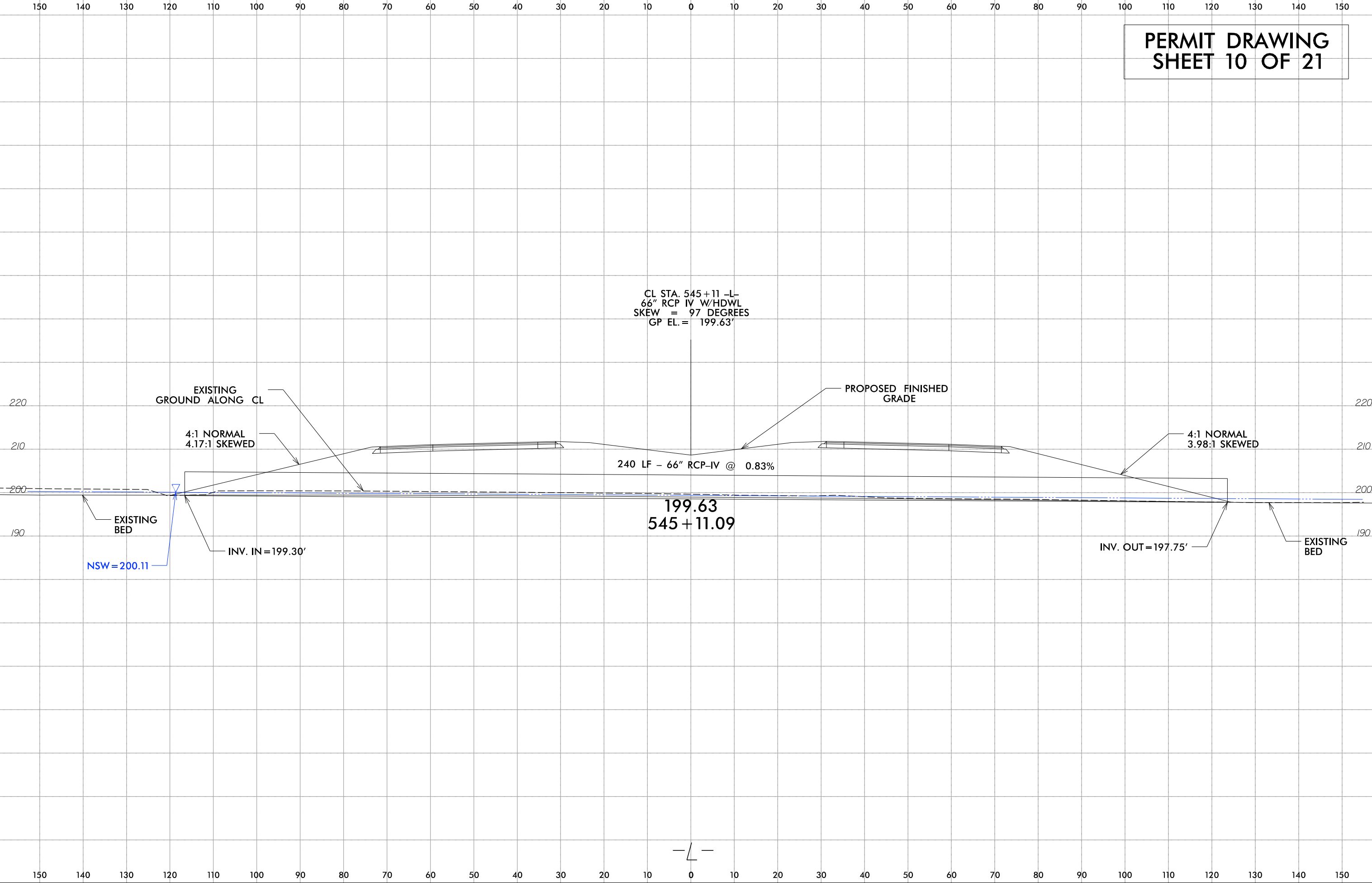
CL STA. 24 + 50 -Y17RPC-
66" RCP IV W/HDWL
SKEW = 82 DEGREES
GP EL. = 200.89'

-Y17RPC-

6/23/16

0	5	10	PROJ. REFERENCE NO.	SHEET NO.
			U-2519BB	X-1

PERMIT DRAWING
SHEET 10 OF 21

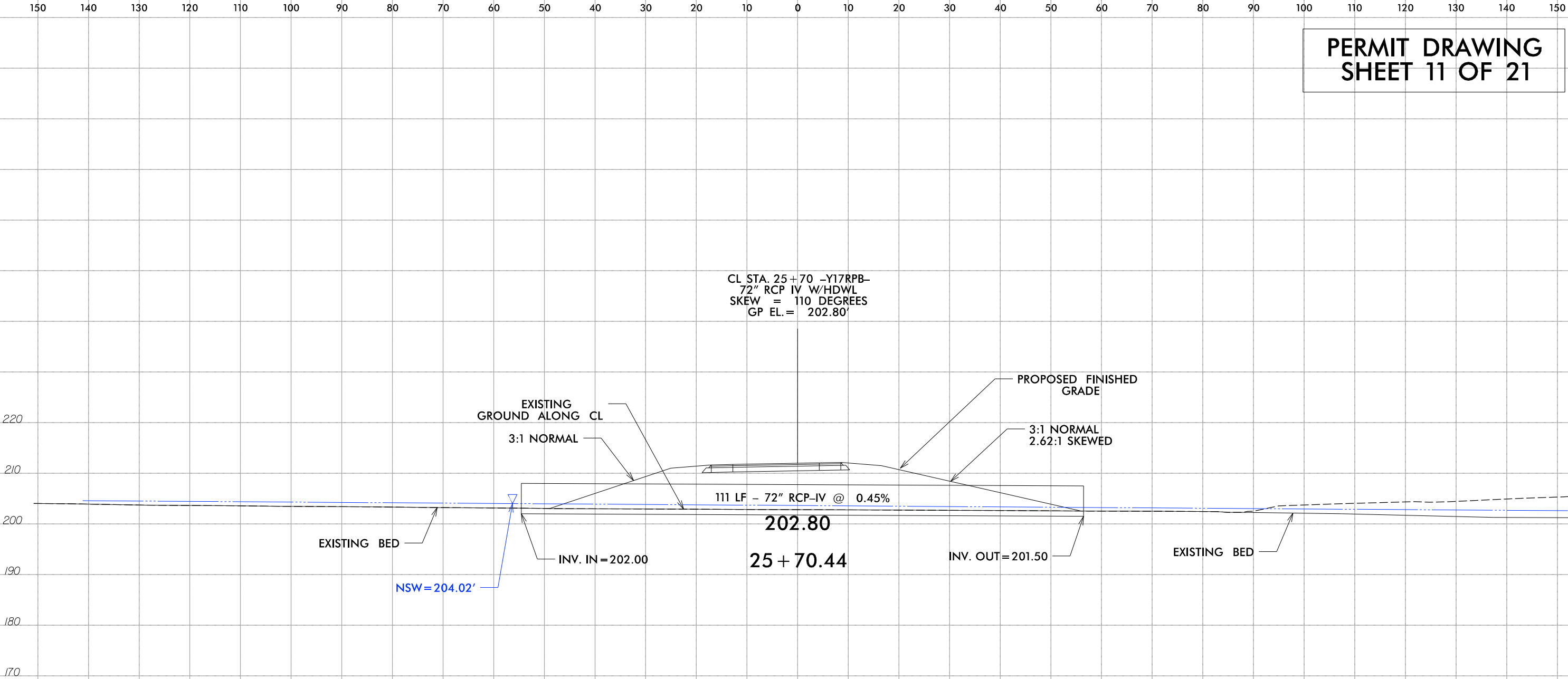


6/23/16

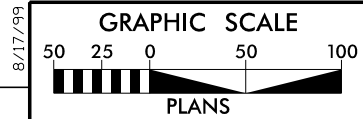
4/1/2018
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JPS

0 5 10 [Scale Bar]	PROJ. REFERENCE NO.	SHEET NO.
	U-2519BB	X-3

PERMIT DRAWING
SHEET 11 OF 21



-Y17RPB-



CALYX
ENGINEERS & CONSULTANTS
6750 TRYON ROAD
CARY, NC 27518
phone: 919.851.1912
CALYXengineers.com
NC License # F-1333
Formerly: Hixson Engineers & Consultants

PROJECT REFERENCE NO. <i>U-2519BB</i>		SHEET NO. <i>6</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

PERMIT DRAWING SHEET 12 OF 21

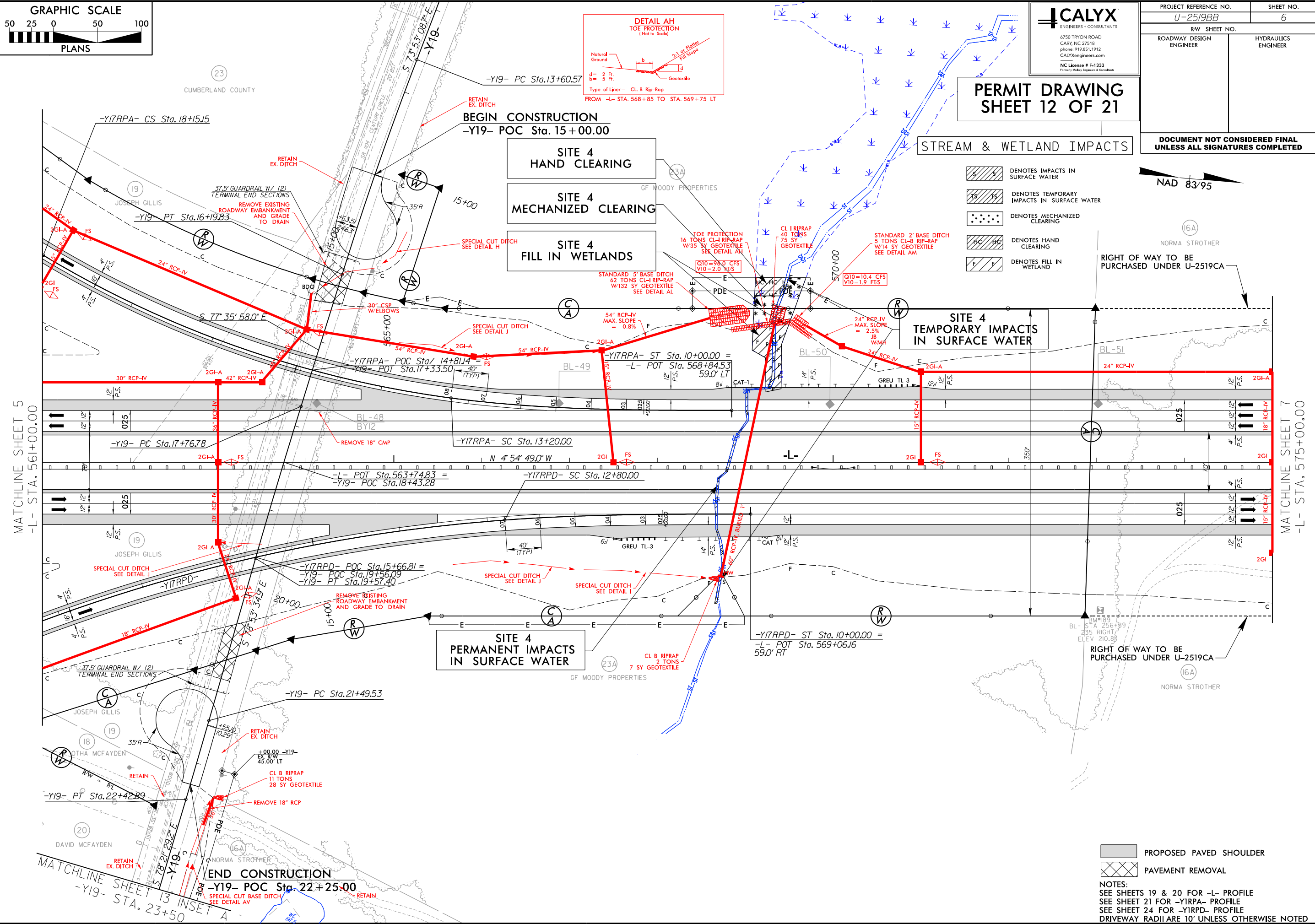
STREAM & WETLAND IMPACTS

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

NAD 83/95

MATCHLINE SHEET 5
-L- STA. 561+00.00

MATCHLINE SHEET 7
-L- STA. 575+00.00



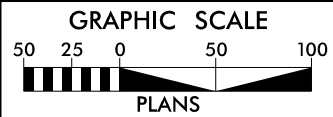
- PROPOSED PAVED SHOULDER
- PAVEMENT REMOVAL

NOTES:
SEE SHEETS 19 & 20 FOR -L- PROFILE
SEE SHEET 21 FOR -Y1RPA- PROFILE
SEE SHEET 24 FOR -Y1RPD- PROFILE
DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED

RIGHT OF WAY REVISION - 7/24/2017 - REMOVED ROW ON PARCEL NUMBER 16A NORMA STROTHER.

4/14/2018
R:\HYDRAULICS\PERMITS\Environmental\Drawings\U2519BB_hyd_perm_Psh06.dgn
SUBMIT

8/17/99



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ENGINEERS & CONSULTANTS
6750 TRYON ROAD
CARY, NC 27518
phone: 919.851.1912
CALYXengineers.com
NC License # F-1333
Formerly: Wilkes Engineers & Consultants

PROJECT REFERENCE NO.		SHEET NO.
U-2519BB		6
R/W SHEET NO.		
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 13 OF 21

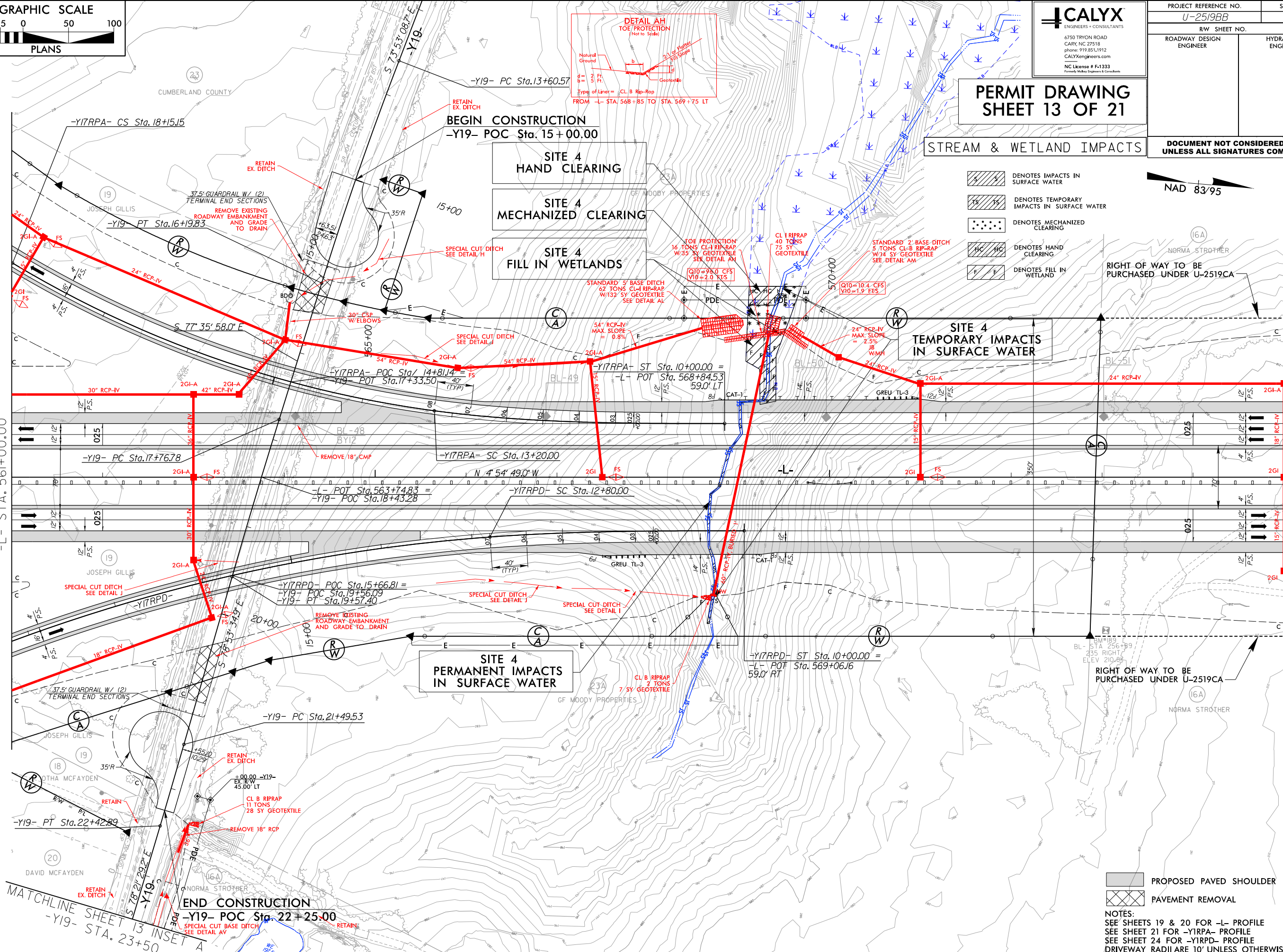
STREAM & WETLAND IMPACTS

NAD 83/95

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

MATCHLINE SHEET 5
-L- STA. 561+00.00

MATCHLINE SHEET 7
-L- STA. 575+00.00



- PROPOSED PAVED SHOULDER
- PAVEMENT REMOVAL

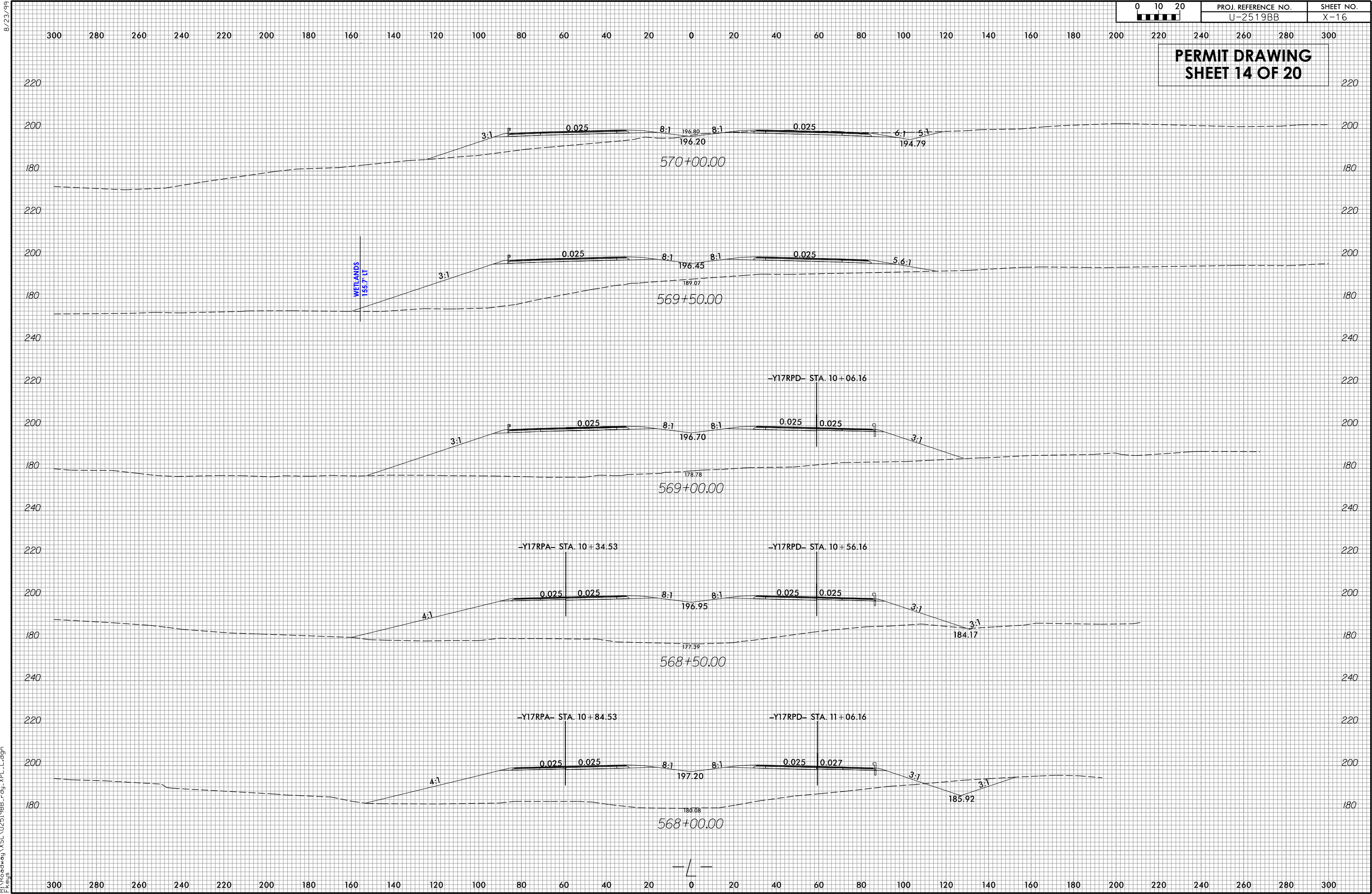
NOTES:
SEE SHEETS 19 & 20 FOR -L- PROFILE
SEE SHEET 21 FOR -Y19- PROFILE
SEE SHEET 24 FOR -Y19PD- PROFILE
DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED

RIGHT OF WAY REVISION - 7/24/2017 - REMOVED ROW ON PARCEL NUMBER 16A NORMA STROTHER.

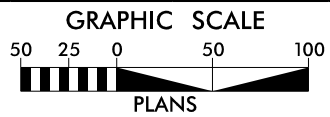
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8/23/99

PERMIT DRAWING
SHEET 14 OF 20



8/17/99



STREAM & WETLAND IMPACTS

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

CALYX
ENGINEERS + CONSULTANTS
6750 TRYON ROAD
CARY, NC 27518
phone: 919.851.1912
CALYXengineers.com
NC License # F-1333
Formerly Wilbur Smith Engineers & Consultants

PROJECT REFERENCE NO.		SHEET NO.
U-2519BB		8
RW SHEET NO.		
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

PERMIT DRAWING SHEET 15 OF 21

REVISIONS

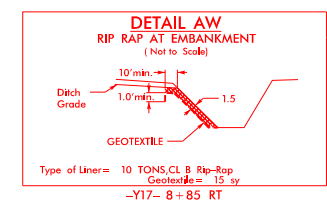
BEGIN CONSTRUCTION
-Y17- POT Sta. 8+85.00

SITE 5
PERMANENT IMPACTS
IN SURFACE WATER

Q10=13.3 CFS
M10=9.1 FTS

SITE 5
MECHANIZED CLEARING

SITE 5
EXCAVATION
IN WETLANDS



NOTES:
SEE SHEET 25 FOR -Y17- PROFILE
DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED

PAVED SHOULDER

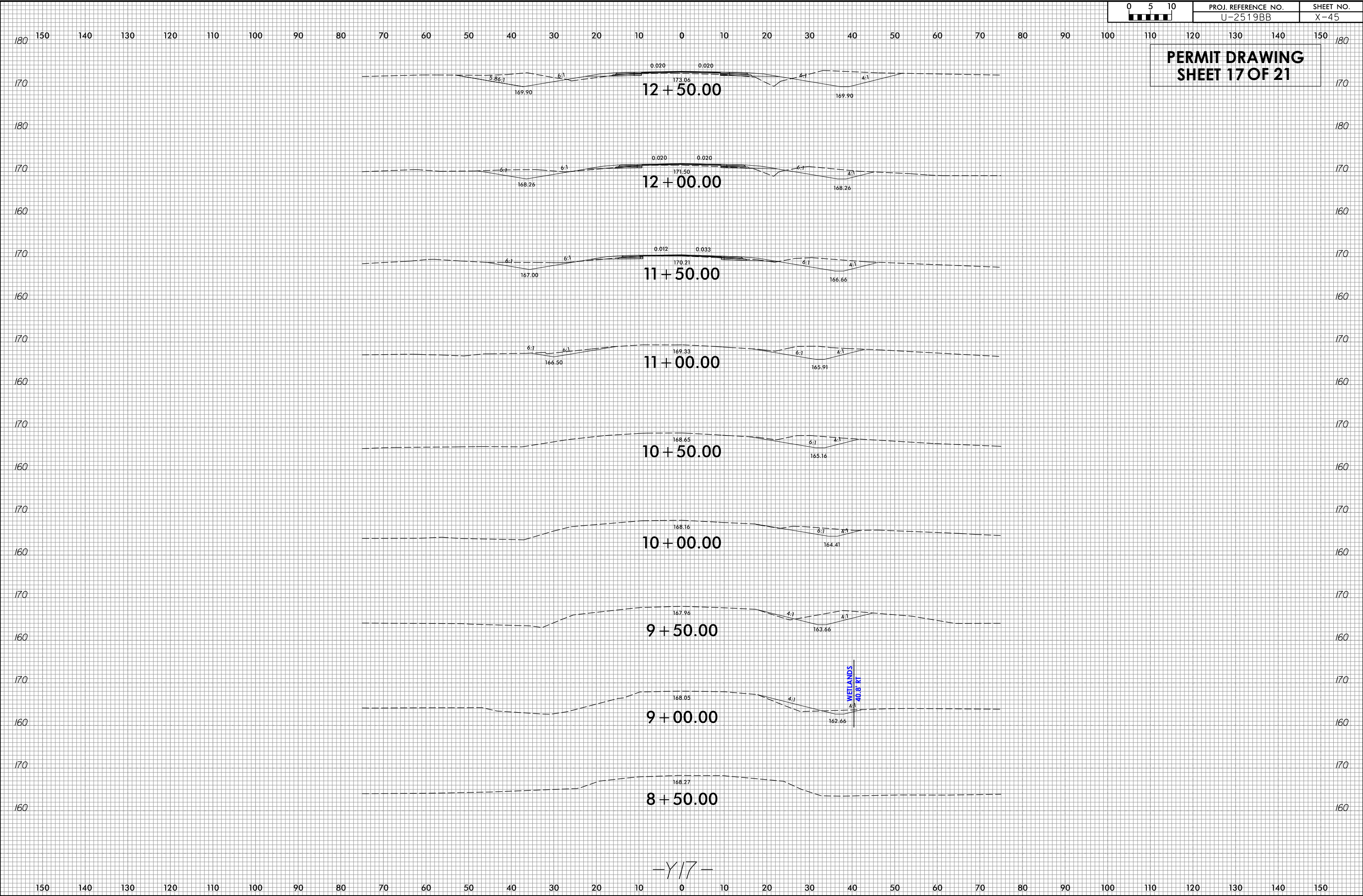
MATCHLINE SHEET 9
-Y17- STA. 15+00.00

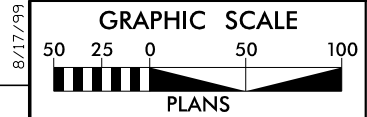
4/14/2018
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subject

8/23/99
9/29/2017
P:\Roadway\XSC\U2519BB-rdy-XPL-Y17.dgn
cel5

0 5 10 [Scale Bar]	PROJ. REFERENCE NO. U-2519BB	SHEET NO. X-45
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PERMIT DRAWING
SHEET 17 OF 21





STREAM & WETLAND IMPACTS

- 1S 1S DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S DENOTES IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 18 OF 21

CALYX
ENGINEERS & CONSULTANTS
6750 TRYON ROAD
CARY, NC 27518
phone: 919.851.1912
CALYXengineers.com
NC License # F-1333
Formerly: Hubbs Engineers & Consultants

PROJECT REFERENCE NO.	SHEET NO.
U-2519BB	12
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

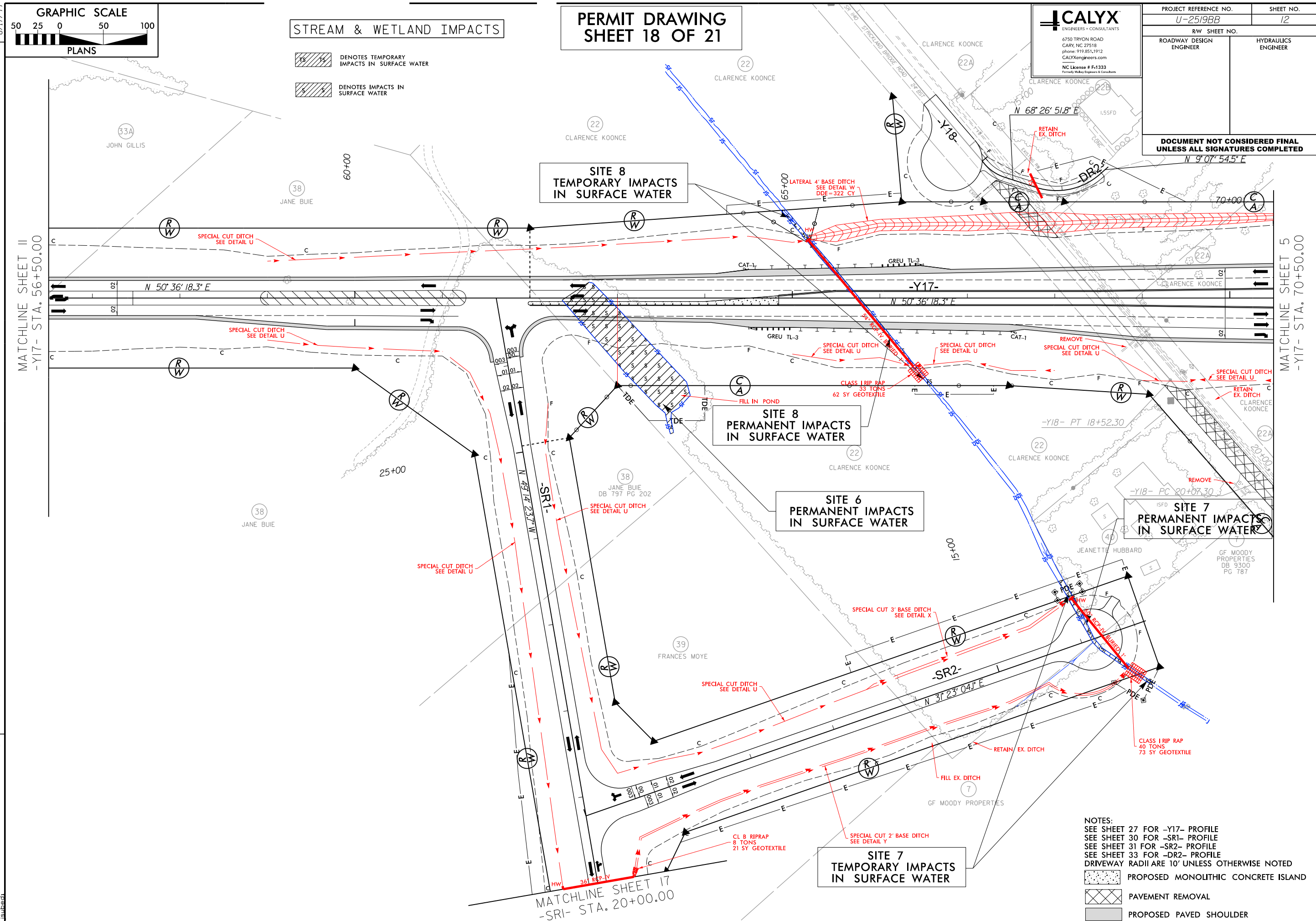
MATCHLINE SHEET 11
-Y17- STA. 56+50.00

MATCHLINE SHEET 5
-Y17- STA. 70+50.00

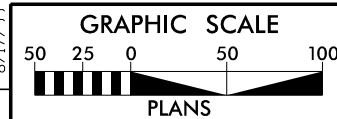
REVISIONS

1) RIGHT OF WAY REVISION - 3/29/2017 - CHANGED PARCEL NUMBER 22A TO PARCEL NUMBER 22B.

4/1/2018 R:\Hydraulics\PERMITS\Environmental\Drawings\U2519BB_hyd_perm_Psh12.dgn



- NOTES:
- SEE SHEET 27 FOR -Y17- PROFILE
- SEE SHEET 30 FOR -SR1- PROFILE
- SEE SHEET 31 FOR -SR2- PROFILE
- SEE SHEET 33 FOR -DR2- PROFILE
- DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED
- PROPOSED MONOLITHIC CONCRETE ISLAND
- PAVEMENT REMOVAL
- PROPOSED PAVED SHOULDER



 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

 DENOTES IMPACTS IN SURFACE WATER

SITE 8 TEMPORARY IMPACTS IN SURFACE WATER

BEGIN CONSTRUCTION
-Y18- POC Sta. 14 + 30.00
END CONSTRUCTION
-Y18- POC Sta. 15 + 33.97

E 8
PERMANENT IMPACTS
IN SURFACE WATER

22

CLARENCE KOONCE

SITE 6
PERMANENT IMPACTS
IN SURFACE WATER

ISFD **SITE 7**
PERMANENT IMPACTS
IN SURFACE WATER

END CONSTRUCTION
-SR2- POT Sta. 16+47.00

SITE 7 TEMPORARY IMPACTS IN SURFACE WATER

NOTES:
SEE SHEET 27 FOR -Y17- PROFILE
SEE SHEET 30 FOR -SR1- PROFILE
SEE SHEET 31 FOR -SR2- PROFILE
SEE SHEET 33 FOR -DR2- PROFILE
DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED

	PROPOSED MONOLITHIC CONCRETE ISLAND
	PAVEMENT REMOVAL
	PROPOSED PAVED SHOULDER

REVISIONS

RIGHT OF WAY REVISION - 3/29/2017 - CHANGED PARCEL NUMBER 22A TO PARCEL NUMBER 22B.

4/11/2018
G:\Hydraulics\PERMITS-Environmental\Drawings\J251988_hyd_prm_cont_Psh12.dgn

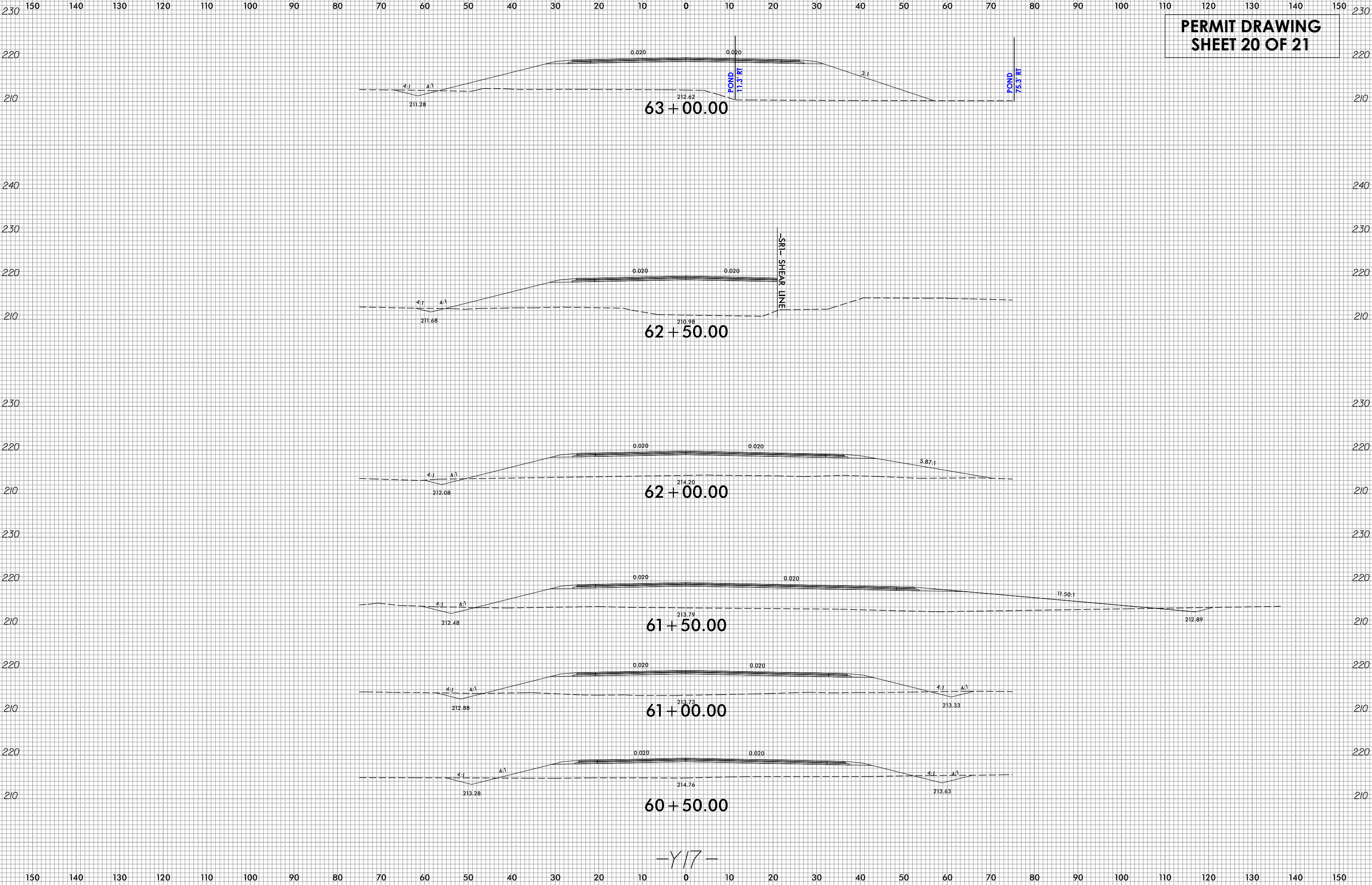
MATCHLINE SHEET 11
-Y17- STA. 56+50.00

MATCHLINE SHEET 5
-Y17- STA. 70+50.00

MATCHLINE SHEET 17
-SRI- STA. 20+00.00

8/23/99

PERMIT DRAWING
SHEET 20 OF 21



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)
SITE #1	-Y17RPC- 24+50	66" RCP	0.09			0.04						
SITE #2	-L- 545+11	66" RCP	0.29			0.05		< 0.01	< 0.01	100	20	
SITE #3	-Y17RPB- 25+70	72" RCP						0.01	< 0.01	145	60	
SITE #4	-L- 569+00	60" RCP	0.05			0.03	0.02	0.02	< 0.01	364	35	
SITE #5	-Y17- 8+85	Ditch & Bank Stabilization			< 0.01	0.02		< 0.01		11		
SITE #6	-Y17- 62+85	Roadway Fill						0.17				
SITE #7	-SR2- 16+25	54" RCP						0.01	< 0.01	126	36	
SITE #8	-Y17- 65+80	60" RCP						0.02	< 0.01	199	45	
SITE #9	-Y18- 24+70	24" RCP Removal							< 0.01		45	
TOTALS*:			0.42		< 0.01	0.14	0.02	0.24	< 0.01	945	241	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
4/11/2018
CUMBERLAND COUNTY
34817.1.FR8 (U-2519BB)