



PAT McCrory
Governor

NICHOLAS J. TENNYSON
Secretary

October 12, 2016

US Army Corps of Engineers
Raleigh Regulatory Field Office
3331 Heritage Trade Dr., Suite 105
Wake Forest, NC 27587

Attention: Eric Alsmeyer
NCDOT Coordinator, Division 5

Subject: **Modification Request for Section 404 Individual Permit, Individual Section 401 Water Quality Certification, Neuse Buffer Authorization, and Issuance of Tar-Pamlico Buffer Authorization** for the Rolesville Bypass from NC 96 (Zebulon Road) to SR 1103 (Flat Rock Church Road/Clifton Pond Road), Wake/Franklin Counties, Federal Aid No. STP-401(249), State Project No. 81403001, Division 5, TIP R-2814 C. Debit \$570.00 from WBS Element 34506.1.1.

Reference: Section 404 Individual Permit, issued July 14, 2009, USACE Action ID 2008-01316

Section 404 Individual Permit extension, issued November 4, 2014

Section 401 Individual Water Quality Certification, Isolated Wetlands Permit and Neuse Riparian Buffer Authorization issued June 16, 2009, NCDENR-DWQ Water Quality Certification Project No. 20090104 ver.1

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to construct an 18.5 mile long, widening and new location roadway in Wake and Franklin Counties known as the Rolesville Bypass. It is proposed as a four lane, median divided facility. NCDOT received the above stated permits for the entire project (Sections A, B, C and D) with final design approval for Sections A and B. Construction has been completed on these sections. Section C is currently scheduled to Let on January 15, 2019, however it is estimated that utility relocations will take 21-24 months. Therefore, the Department would like to initiate utility relocations early December 2016.

Table 1. Description of Project Sections for Construction Purposes

Section	Project Termini	Let Date
R-2814A	Widen US 401 from SR 2044 to SR 2226	Completed
R-2814B	New Location from SR 2226 to NC 96	Completed
R-2814C	Widen US 401 from NC 96 to SR 1103	01/15/19
R-2814D	Widen US 401 from SR 1103 to SR 1700	Post year



The permits stated above only approved preliminary impacts for Section C. Section C now has final design. The purpose of this submittal is to request a modification to the Section 404 permit, Section 401 Water Quality Certification and Neuse Buffer Authorization for Section C. The permit package consists of the cover letter, Hydraulic Review (Concurrence Point 4B and 4C) meeting minutes for Section C, N.C. Division of Mitigation Services (DMS) acceptance letter, Stormwater Management Plan, utility drawings, permit drawings, and roadway plan sheets.

This permit modification request has been evaluated for compliance with the avoidance/minimization criteria, and all surveys and conclusions summarized in the original permit application dated January 21, 2008 are still valid including the following: ICE, Protected Species, FEMA compliance, and Cultural Resources.

IMPACTS TO WATERS OF THE UNITED STATES

Impacts to wetlands for Section C are located in HUC 03020201 of the Neuse River Basin and HUC 03020101 of the Tar-Pamlico Basin. Preliminary impacts were 2.40 acres and final permanent impacts are 2.39 acres.

Table 2. R-2814C Wetland Impacts-Preliminary Compared with Final Design

Permit Site No.	Wetland Reference No.*	Riparian or Non-Riparian	Preliminary Permanent Impacts (Acres)	Final Permanent Fill (Acres)	Final Excavation (Acres)	Final Mechanized Clearing (Acres)	Temporary Fill In Wetlands
Neuse 03020201							
1	AC	Riparian	0.06	0.04		<0.01	
1A	AO	Riparian	Not available		0.03		
2	AM	Riparian	Not Available	0.04		0.01	
3	AM	Riparian	0.56			<0.01	
4	G	Riparian	0.53	0.37		0.10	0.09
5	H	Riparian	0.49	0.42	0.02	0.07	0.06
5A	I	Riparian	0.08	0.06	0.01	0.07	0.02
6	Not identified	Riparian	Not available	0.04	0.01	0.03	0.03
7	Not identified	Riparian	Not available	0.04		0.03	
8	J	Riparian	0.19	0.20	0.04	0.11	<0.01
8A	K	Riparian	0.04	<0.01	0.01	0.05	
9	AF	Riparian	0.16	0.17			
10	AG	Riparian	0.06	0.01		0.05	
Tar-Pamlico 03020101							
11A	AH	Riparian	0.21	0.20	<0.01	0.03	
14	M	Riparian	0.02	0.06		0.04	0.04
Neuse 03020201			2.17	1.41**	0.11**	0.54	0.20**
Tar-Pamlico 03020101			0.23	0.26	<0.01	0.07	0.04
Total			2.40	1.67**	0.11**	0.61**	0.24**

*refers to Figure 4 in FONSI

** number calculated due to rounding

Utility impacts

Utility relocations will impact an additional 0.37 acre of riparian wetlands in HUC 03020101 and 0.08 acre of riparian wetlands in HUC 03020101 due to mechanized clearing.

Surface Waters

Preliminary permanent stream impacts for R-2814C were 678 linear feet. Final permanent stream impacts for R-2814C are 1,683 linear feet and additional pond impacts of 0.28 acre. Temporary stream impacts are 281 linear feet. Tables 3 and 4 list the site number, reference number, stream name, amount of permanent impacts, amount of mitigation required, pond impacts, DWR classification, and DWR index number. The stream reference numbers correspond to the Table 2 in the FONSI.

One stream, Crooked Creek (Site 14) is listed on the 2014 List of impaired waters [Section 303(d)] within the project area. It is listed due to low dissolved oxygen. Little River (Site 4) is listed as a High Quality Water (HQW) within the project limits.

Table 3. R-2814C Surface Waters

Permit Site No. (Reference No.)	Stream Name	Intermittent/ Perennial	DWR Class	DWR Index number
Neuse 03020201				
3 (unnamed)	UT to Little River	Pond	WS-II; HQW, NSW	27-57-(1)
3 (29)	UT to Little River	Intermittent	WS-II; HQW, NSW	27-57-(1)
5/5A (31)	UT to Little River	Perennial	WS-II; HQW, NSW	27-57-(1)
6 (31)	UT to Little River	Perennial	WS-II; HQW, NSW	27-57-(1)
8/8A (32)	UT to Little River	Perennial	WS-II; HQW, NSW	27-57-(1)
Tar-Pamlico 03020101				
11/11A (33)	UT to Clifton's Pond	Perennial	C; NSW	28-30-1
12 (34)	Clifton's Pond	Perennial	C; NSW	28-30-1
13 (35A)	UT to Crooked Creek	Perennial	C; NSW	28-30
13A (35B)	UT to Crooked Creek	Perennial	C; NSW	28-30
14 (35)	Crooked Creek	Perennial	C; NSW	28-30
15 (unnamed)	UT to Crooked Creek	Pond	C; NSW	28-30

Table 4. R-2814C Surface Water Impacts-Preliminary Compared with Final Design

Permit Site No. (Reference No.)	Preliminary Permanent Stream Impacts (feet)	Final Permanent Stream Impacts (feet)	Final Temporary Stream Impacts (feet)	Open Water Impacts (acres)	Final Mitigation Needed (ratio)
Neuse 03020201					
3 (unnamed)	Not available			0.28	0
3 (29)	159	10*	10		0
5/5A (31)	80	259	70		2:1
6 (31)	Not available	108	33		2:1
8/8A (32)	43	288	59		2:1
Tar-Pamlico 03020101					
11/11A (33)	23	148	15		2:1
12 (34)	52	212	31		2:1
13 (35A)	42	247	21		
13A (35B)	Not available	153			2:1
14 (35)	279	258	32		2:1
15 (unnamed)	Not available			<0.01	0
Neuse Subtotal	282	665	172	0.28	655
Tar-Pam Subtotal	396	1018	99	<0.01	1018
Totals	678	1683	271	0.28	1673

*Bank stabilization requiring no mitigation.

Utility impacts

There will be no impacts to jurisdictional streams due to utility relocations. A majority of the relocations are to aerial powerlines. Any underground utilities needing to be relocated will be directionally bored under jurisdictional streams.

BUFFER IMPACTS

Section C impacts buffers in the Neuse and Tar-Pamlico River Basins. Wetlands are present within the impacted buffer areas. The mitigable buffer impacts within the proposed wetland impacts have been subtracted out. Buffer impacts in these areas will be covered by mitigation for the overlapping wetland impacts. All buffer impacts associated with the relocation of utilities are considered exempt.

Table 5. R-2814C Riparian Buffer Impacts

Mitigation requirements	Allowable with mitigation*	Allowable with mitigation**	Allowable**	Total
Neuse 03020201				
Preliminary Impact Zone 1 and 2 Combined (sq. ft)				53,578
Zone 1 Impact (sq. ft)		62,110	9,519	71,629
Zone 2 Impact (sq. ft)		37,288	4,176	41,464
Tar-Pamlico 03020101				
Preliminary Impact Zone 1 and 2 Combined (sq. ft)				34,412
Zone 1 Impact (sq. ft)	10,615	55,422	5,946	71,983
Zone 2 Impact (sq. ft)	6,758	33,845	7,530	48,133

*- Impacts other than Road Crossing

**- Road Crossing

MITIGATION OPTIONS

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

Avoidance and Minimization

Impacts to jurisdictional streams and wetlands could not be avoided. Minimization efforts have taken place continually through the planning and design process and are listed below.

- NCDOT's Best Management Practices for Construction and Maintenance Activities will be enforced.
- Design Standards in Sensitive Watersheds will be implemented.
- Runoff from impervious surfaces has been diverted away from surface waters or has been treated using grass swales prior to entering jurisdictional waters.
- Grass swales are being used at several locations along the length of the project.

Compensatory Mitigation

Compensatory mitigation requirements for the proposed Rolesville Bypass Section C are summarized in Table 6 below. Mitigation of impacts to jurisdictional streams and wetlands will be provided by DMS.

Table 6. Jurisdictional Impacts Requiring Mitigation

River Basin/HUC	Riparian Wetlands (ac)	Streams (ft)
Neuse 03020201	1.52 ac @ 2:1 ratio 0.54 ac @ 1:1 ratio*	355 ft @ 2:1 ratio 300 ft @ 1:1 ratio**
Tar/Pamlico 03020101	0.26 ac @ 2:1 ratio 0.07ac @ 1:1 ratio*	689 ft @ 2:1 ratio 329 ft @ 1:1 ratio

*1:1 mitigation ratio for mechanized clearing of wetlands

**1:1 mitigation ratio for bank stabilization. An additional 10 ft (not included above) requires no mitigation (Site 3).

Table 7. R-2814C Total Riparian Buffer Impacts Requiring Mitigation

	Zone 1 (sq. ft.)		Zone 2 (sq. ft.)	
River Basin	Neuse 03020201	Tar-Pamlico 03020101	Neuse 03020201	Tar-Pamlico 03020101
Buffer Impacts requiring mitigation	62,110	66,037	37,288	40,603
Minus buffers in wetlands	34,141	6,348	14,618	4,803
Total Buffer impacts requiring mitigation	27,969	59,689	22,670	35,800

Total Zone 1 buffer impacts requiring mitigation are 87,749 square feet (sq ft) (27,969 sq ft Neuse, 59,689 sq ft Tar-Pamlico) and Zone 2 impacts requiring mitigation are 58,568 sq ft (22,670 sq ft Neuse, 35,800 sq ft Tar-Pamlico) for Section C. Mitigation for impacts to riparian buffers will be provided by DMS. A revised DMS acceptance letter providing changes in buffer mitigation amounts is forthcoming.

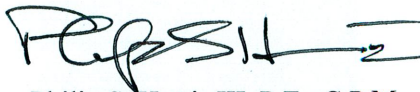
REGULATORY APPROVALS

Application is hereby made for a modification to the Department of the Army Section 404 Individual Permit as required for the above-described activities for the proposed TIP project R-2814 Section C. The NCDOT understands that a permit modification will be required for Section D after final design is complete and prior to construction.

We are also hereby requesting a modification of the Individual Section 401 Water Quality Certification and Neuse Riparian Buffer Authorization from the Division of Water Resources. In addition, NCDOT is requesting the issuance of a Tar-Pamlico Buffer Authorization for the project. In compliance with Section 143-215.3D(e) of the NCAC, we will provide \$570 to act as payment for processing the Section 401 permit modification.

A copy of this modification request will be posted on the NCDOT website at <https://connect.ncdot.gov/resources/Environmental/>. If you have any questions or need additional information, please contact Jason Dilday at 919-707-6111 or jldilday@ncdot.gov.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. S. Harris III', with a stylized horizontal line extending to the right.

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

cc: NCDOT Permit Application Standard Distribution List



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

Minutes of the Interagency Hydraulic Design Review
NEPA\404 Merger Team – Concurrence Point 4B Meeting
May 15, 2013

R-2814C

State Project 34506.1.1

**US 401 Rolesville Bypass from NC 96 (Zebulon Road), Wake County
to 0.42 miles north of SR 1103 (Clifton Pond Road), Franklin County**

Place\Time: NCDOT, Hydraulics Unit Conference Room, 8:00 A.M.

Team Members: Felix Davila – FHWA (Present)
Eric Alsmeyer – USACE (Present)
Gary Jordan – USFWS (Present)
Travis Wilson – NCWRC (Absent)
Chris Militscher – USEPA (on-phone)
Rob Ridings – NCDWQ (Present)

Participants: Nathan Adima – NCDOT Roadway Design
Dennis Jernigan – NCDOT Division 5 (Absent)
Rachelle Beauregard – NCDOT Natural Environment
David Harris – NCDOT Roadside Environmental (Absent)¹
Mack Bailey – NCDOT Structures (Absent)²
Matthew (Matt) Lauffer – NCDOT Hydraulics Unit
Beverly Robinson – NCDOT PDEA
Greg Price – NCDOT NEU
Chris Murray - NCDOT Division 5
Dennis Lowery – NCDOT Roadway Design
Ray Lovinggood – NCDOT Hydraulics Unit
Linda Johns – NCDOT Hydraulics Unit

¹ Substitute Mark Staley (Present)

² Substitute Doug Calhoun (Present)

The 30% Hydraulic Review was held to in order to reach agreement on concurrence point 4B for the US 401 Rolesville Bypass in Wake and Franklin Counties. The following items were discussed and conclusions reached:

Matt Lauffer opened the meeting with introductions and a brief description of the project. Matt mentioned that only plan sheets with jurisdictional features were sent out for review.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
HYDRAULICS UNIT
1590 MAIL SERVICE CENTER
RALEIGH NC 27699-1590

TELEPHONE: 919-707-6700
FAX: 919-250-4108

WEBSITE: WWW.NCDOT.ORG/DOH/

LOCATION:
CENTURY CENTER COMPLEX
BUILDING B
1020 BIRCH RIDGE DRIVE
RALEIGH NC

Sheets 4-5:

Chris Murray, Eric Alsmeyer and Rob Ridings met on the site of Wetland AL. R-2814B did not show this wetland as an impact. The team reviewed the quality of this area and agreed it was no longer a jurisdictional resource and therefore should be removed from R-2814C as an existing wetland.

Sheet 5:

There are three wetlands on this sheet; Wetland AO, Wetland AC and Wetland AD. This portion of the project is open shoulder and will incorporate ditches and grass swales where possible to obtain treatment prior to jurisdictional features.

Pond on this sheet is non-jurisdictional. There was a question about the non-jurisdictional call on the pond located at -L- Sta. 55+00 Lt, since it appears on the soils map as a "blue line". Rachelle says there is a letter on file stating this pond is non-jurisdictional.

Chris Murray mentioned the proposed design will include rip rap for toe-protection where roadway fill slopes impacts wetlands at all locations on this project to prevent further impacts. It was also agreed to not bury cross pipes that originate from or terminate into wetlands, unless there is also a jurisdictional stream associated with the upstream end of the crossing.

There was discussion about a possible diversion of water from Wetland AD, if the current pipe crossing alignment at -L- Sta. 59+50 is retained. It was agreed to outlet the cross pipe and rip rap pad at the lowest point of the wetland at the fill slope located near -L- Sta. 55+42 Rt. in order to retain this wetland.

Sheets 6:

Jurisdictional features on this sheet include a buffered pond at Sta. 65+00 Lt, stream #29, Wetland AM and Wetland AE.

There was a question about why the pond on this sheet is jurisdictional but the one on Sheet 5 is not. Rob clarified that since this pond has connectivity with the stream it was also jurisdictional.

It was mentioned that there will be only a small portion of Wetland AM remaining, but Rachelle Beauregard clarified Wetland AM does continue further downstream of what is shown in the plans. She said both the wetland and stream narrow, but then widen outward as they continue downstream. Eric Alsmeyer said since the hydrology will be cut off, the point at which the wetland narrows just below the "JS" text, should be considered a permanent wetland impact limit. However, this wetland will not be considered a total take. Permanent stream impacts should include from the end of the pipe to the downstream end of the bank stabilization. Temporary stream impacts will continue for ten feet beyond the permanent impacts. The team agreed that the area required to clear in the wetlands would be hand cleared and considered "Temporary Fill in Wetlands", if the area is reforested. This will be reviewed further in 4C.

Beverly Robinson wanted to ensure the plans show historic properties on site.

Wetland AE at Sta. 68+75 Rt. does not have a jurisdictional stream feeding it, therefore the cross pipe that outlets into this wetland should not be buried.

Clarification was provided on why the jurisdictional stream feature was not connected to the pond at -L- Sta. 65+00 Lt. Once the pond reaches a certain elevation, it spills through an overflow swale and into the roadway ditch. Chris Murray requested and it was agreed to not bury the cross pipe at the outlet end, since we don't have constant flow at this site.

Clarification was requested to know how a Contractor would know if pipe is buried. Ray Lovinggood said only when we intend for a pipe to be buried do we label that pipe as "buried" on the plans.

Sheet 9:

Major crossing #1 of Little River has an existing 4@8'x10' RCBC, OAL=41'. The proposed structure is 3@12'x11' RCBC, OAL =132', buried 1.0', located at -L- Sta. 107+88. The photos dated November 2012 were reviewed. Rachelle mentioned that the impounded nature of the crossing had not changed since 2004. Gary Jordan concurred and mentioned the dwarf mussel status in 2005 was "No Habitat".

There was discussion about wetland and buffer zone impacts at this river. Since there is an overlap of wetland in the buffer zones, wetland areas in the buffer zones should be quantified and deducted per site for mitigation purposes.

Fill slopes in red depict the adjusted fill slope footprint needed when guardrail is added to minimize impacts to the buffers and wetlands. The lateral grass swale at the south-eastern corner appears to flow into the wing wall. This grass swale will be adjusted.

There was some confusion about ditches being routed through swamps. All ditches and grass swales end before wetland boundaries. Confusion could be due to the red dashed lines shown through the wetland and buffers. These red lines correspond to an adjusted footprint of the roadway fill slope to be used with the presence of guardrail.

It was also mentioned that PSHs would most likely be removed and replaced with rip rap pads, prior to wetland boundaries to reduce velocities.

Rob Ridings wondered if the pipe in the median enters the box culvert. This pipe is connected to the box culvert. The median accepts drainage from the north-bound lanes and should be treated prior to reaching the 3GI. If treatment cannot be obtained in this design, the pipe from the 3GI would be routed to the system along the left side of the roadway into a grass swale to attempt to provide enough treatment.

Felix Davila asked if there is a hydraulic concern when a pipe enters the side of the major structure crossing. Would the pipe be depicted in the hydraulic model and are there other issues with this type of pipe installation? There is no concern associated with such a pipe in a hydraulic model, since it provides a minimal amount of flow compared to offsite flow. Hydraulics asked if this configuration would compromise the long-term integrity of this structure. Doug Calhoun said “no” and mentioned this type of configuration is typically accommodated with additional reinforcement around the connection point.

Sheet 11:

Major crossing #2 of Little River Tributary 3 at -Y6- (NC 98) Sta. 21+86 has an existing 1@6'x5' RCBC, OAL=34'. The proposed structure is 1@12'x7' RCBC, OAL=83', buried 1.0'.

Chris Murray said beaver activity is a concern at all major stream crossings along this project corridor. There was “delayed entry” for the contractor on R-2814B, due to beaver activity. Dewatering is a construction concern and previous Contractors blamed beaver activity and removal as an “unforeseen activity” causing project delays. One suggestion included a separate contract for beaver removal for this project prior to let. Chris asked if there would be additional jurisdictional impacts associated with beaver removal and subsequent dewatering? The consensus was there should be no additional impacts. Hydrology would be affected, but only on a temporary basis. Access to beaver removal could have temporary impacts to jurisdictional streams or wetlands. It was agreed for the team to meet on site, approximately 6 weeks prior to 4C to determine which crossings would have impoundment issues due to the presence of beavers.

Chris Murray requested rip rap toe protection for fill slopes in swamps and bank stabilization at each stream crossing that requires a transition between its defined channel and respective upstream or downstream end of proposed culvert. Hydraulics also mentioned that these design features are not currently on the plans, but will be added as the design is finalized. The team concurred with these additions to the design. Major crossing #3 of Little River Tributary 3 at -L- (US 401) Sta. 137+22 has an existing 1@8'x6' RCBC, OAL=49'. The proposed structure is 1@12'x7' RCBC, OAL=173', buried 1.0'.

Sheet 12:

Jurisdictional pond and recently delineated wetlands are located in the lower left corner of this sheet. Current design shows an open ended fill slope at -Y6- Sta. 32+35 Rt. Additional impacts will occur in order to tie into the existing toe in final design, just beyond the project limits. Side slopes will be adjusted to minimize impacts as much as possible.

Sheet 13:

Major crossing #4 of Unnamed Tributary to Little River Tributary 3B at -L- Sta. 168+23 has an existing 1@6'x5' RCBC, OAL=46'. The proposed structure is 1@9'x8' RCBC, OAL=172', buried 1.0'. The group noticed the downstream pipe is a 24" CMP and discussed flooding concerns for downstream properties. Hydraulics mentioned the drive pipe is undersized and the driveway is probably overtopped by current storms.

Sheet 14:

The two wetlands on this sheet are Wetland AF and Wetland AG. Wetland AF will be a total take. Wetland AG consists of a series of depressions. Roadway will provide one driveway per parcel. A driveway pipe will be added if a proposed driveway cuts off hydraulic connectivity to or from Wetland AG.

Sheet 16: (not provided)

Boundary between Neuse River basin, HQW WS II class waters and Tar-Pamlico River Basin, Class C, NSW waters occurs approximately along the same alignment of Tarboro Road.

Sheets 17-18:

It was stated that there are no impacts on Sheet 17, however buffer zones 1 and 2 for a jurisdictional feature on the next page (Sheet 18) will most likely have impacts in final design. There is one jurisdictional stream crossing at -L- Sta. 229+80 and two wetlands; Wetland AH and Wetland AN on Sheet 18. It was suggested to provide 5'-10' bank stabilization on the upstream channel banks, and an additional 10' of bank stabilization downstream of the bank stabilization already proposed on the plans to retain the natural turn in the next 10' downstream.

It was suggested to remove all existing cross pipes and replace with new pipes. Field inspection proved all existing pipes to be in good condition, so they will be retained unless they are considered undersized for future conditions. If a different size is warranted, existing cross pipes will be removed and replaced. All drainage recommendations will be based on Franklin County future land use zoning maps.

Sheets 21-22:

Major crossing #5 is Crooked Creek Tributary 3 at -L- Sta. 283+85 has an existing 1@9'x7' RCBC, OAL=48'. The proposed structure is 1@12'x7' Crownspan Bottomless Culvert, OAL=148'. Bedrock is present upstream and downstream of the existing structure. This proposed structure could work if part of the rock ledge, located just upstream of the proposed face was removed. This type of controlled blasting to obtain positive flow was considered feasible by NCDOT Division 5. Eric Alsmeyer mentioned his concern for bank erosion at both ends of the proposed crossing. Footing construction is a concern. Material type below the existing RCBC bottom is a concern. Potential blasting a new channel, where the old structure was located is also a concern. Gary Jordan and Eric Alsmeyer typically want to see bottomless culvert structures for aquatic passage, but they are not as concerned with aquatic passage at this location. Constructability will also be reviewed as well as the other noted concerns to determine the best type of structure at this location. The team wants to know which structure is recommended prior to 4C.

Environmental site design includes use of a site's natural features including existing contours, soils and uptake from trees to provide stormwater treatment, prior to it reaching a jurisdictional feature. The preliminary design in this case outlets stormwater from the drainage system to an area outside the fill slope and where contours suggest a localized contained area. Once the drainage is allowed to stage up, it would then flow over an earthen dike located at the southern end, and then flow to Crooked Creek Tributary 3. Chris Murray said he has had erosion issues with earthen spillway devices, and suggested to armor it with fabric and Class II rip rap should we decide to include one.

Sheet 23:

Jurisdictional stream 35A crosses the proposed roadway at -L- Sta. 307+60. There are concerns with the soil quality at the proposed outlet location if we excavate the upland to be the new stream bed. The concerns include not knowing how these upland soils will behave once exposed to water and erosive forces. The proposed cross pipe outlet end will either be adjusted to line up with the existing JS at the fill slope or extended to meet the jurisdictional stream, 10 feet or so past the fill slope. Bank stabilization will also be added to the upstream opening of this crossing.

A spring box will be added near 306+25 Rt, where stream 35B seems to originate. A pipe will route this flow to the right fill slope to a lateral ditch to the main stream; stream 35A. Although jurisdictional stream 35B would be a total take for surface waters, it would not have to be a complete take of buffers on the right side only. The mitigation quantity could be lowered if we provide a lateral ditch outside the fill slope as planned, reforest right of the ditch and provide PDE. A cost analysis should be performed here to include land cost and cost of mitigation to know which design would be more cost effective.

Sheet 24:

Major crossing #6 is Crooked Creek at -L- Sta. 314+63 has an existing 3@9'x9' RCBC, OAL=59'. The proposed structure is 3@10'x10' RCBC, OAL=158', buried 1.0'. Photos were reviewed for Crooked Creek. Gary Jordan said there is a Section 7 Concurrence from 2005 where concurrence was provided for the project corridor for dwarf wedge mussel and concur with "May Effect" or "Not Likely to Adversely Effect" call. There is a requirement to reassess Section 7. Gary Jordan mentioned that in 2005, the habitat was not good for the dwarf wedge mussel. Rachelle Beauregard said Neil is aware of the reassessment and will redo survey and will contact Gary Jordan before the permit modification application is settled.

Eric Alsmeyer mentioned the channel is so wide, we do not have to be concerned with maintaining low flows through one or two barrels.

Sheet 26:

The only jurisdictional feature includes a buffered pond with buffer impacts only.

Other Issue:

Chris Murray mentioned he would ask Division 5 about retaining any existing cross pipes on this project.



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

Minutes of the Interagency Hydraulic Design Review
NEPA\404 Merger Team – Concurrence Point 4C Meeting
April 16, 2015 & July 16, 2015

R-2814C

State Project 34506.1.1

**US 401 Rolesville Bypass from NC 96 (Zebulon Road), Wake County
to 0.42 miles north of SR 1103 (Clifton Pond Road), Franklin County**

Place\Time: NCDOT, Structure Design Conference Room, 12:30-2:30 P.M.

Team Members: Felix Davila – FHWA (Present)
Eric Alsmeyer – USACE (Present 7-16-15)
Gary Jordan – USFWS (Absent)
Travis Wilson – NCWRC (Absent)
Cynthia Van Der Wiele – USEPA (Present 4-16-15)
Rob Ridings – NCDENR, DWR (Present)

Participants: Kevin Moore - NCDOT Roadway Design (Present 7-16-15)¹
Dennis Jernigan – NCDOT Division 5 (Absent)
Rachelle Beauregard – NCDOT Natural Environment Section (NES), (Present)
David Harris – NCDOT Roadside Environmental Unit (Absent)²
Mack Bailey – NCDOT Structures Management Unit (Present 4-16-15)
Korey Newton - NCDOT Structures Management Unit (Present 4-16-15)
Beverly Robinson – NCDOT PDEA (Absent)
John Schriner – Wetherill Engineering Utilities (Present)
Donald Proper – NCDOT Utilities (Present)
Matthew (Matt) Lauffer – NCDOT Hydraulics Unit (Present)
Bill Elam – NCDOT Hydraulics Unit (Present)
Chris Murray - NCDOT Div. 5 Division Environmental Officer (DEO) (Present)
Eddie Douglas – NCDOT Roadway Design (Present 4-16-15)
Brittney Kelly – NCDOT Roadway Design (Present 4-16-15)
Ray Lovinggood – NCDOT Hydraulics Unit (Present 4-16-15)
Linda Johns – NCDOT Hydraulics Unit (Present)
Craig Lee – NCDOT Hydraulics Unit (Present)

¹ Substitute Nathan Adima (Present)

² Substitute Mark Staley (Present)

“(Present)” = Present: 4-16-15 & 7-16-15

“(Absent)” = Absent: 4-16-15 & 7-16-15

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
HYDRAULICS UNIT
1590 MAIL SERVICE CENTER
RALEIGH NC 27699-1590

TELEPHONE: 919-707-6700
FAX: 919-250-4108

WEBSITE: WWW.NCDOT.ORG/DOH/

LOCATION:
CENTURY CENTER COMPLEX
BUILDING B
1020 BIRCH RIDGE DRIVE
RALEIGH NC

These 4C minutes originate from the 4C meeting on 4-16-15. If the comment was made on the 4C meeting on 7-16-15, it will be noted as "(7-16-15).of permanent impacts shown in these locations.

Site 5, Buffer Impacts: Sheet 13 of 35:

"Pond" label should be added to enlarged view drawing.

Wetland boundary and Jurisdictional Pond location should be discussed with USACE, including possible adjustment of the jurisdictional stream line to the wetland boundary. If the surface water location moves, buffer zone 1 & 2 will also move.

Site 6 Buffer Impacts: Sheet 16 of 35:

Excavation hatching should be turned off, with correct type of permanent impacts shown in these locations.

The wide PUE on the right side of the roadway will likely be reduced.

The large amount of TDE on the left side of the roadway is due to a Temporary Stilling basin.

Entering Tar-Pamlico Watershed, Class C, NSW

Site 7, Buffer Impacts: Sheet 19 of 35:

Need to reconcile fill slope stake lines at the downstream end (Rt side of the roadway) of the 54" RCP, there are currently two sets. The fill slope stake lines with Toe Protection are correct.

Construction Easement associated with Roadway's fill slope stake lines also should be deleted.

DEO concurs with impacts as shown.

Site 8, Buffer Impacts: Sheet 22 of 35:

DEO requests buffer zone 1 & 2 lines to be extended to the wetland boundary at the south-west quadrant of this stream crossing.

DEO requests buffer zone impacts to be shown in TDE area for Temporary Stilling Basin. Post meeting note: This TDE for the Temporary Stilling Basin will be eliminated. The Environmental Site Design area, located east and north of this TDE will be used as a temporary Stilling Basin during construction, which should be restored to the original lines and grades upon completion of the culvert construction.

Excavation hatching should be turned off, with correct type of permanent impacts shown in these locations.

There will be aerial utility impacts at this site.

Site 9, Buffer Impacts: Sheet 25 of 35:

Adjust the location of the proposed PDE on the upstream end of the proposed 66" RCP cross pipe so it has the same offset as the adjacent PUE.

DEO requests buffer zone 1 & 2 impacts to include area up to the PDE limit on the upstream side of the 66" RCP cross pipe.

NES requested addition of Site 9A for the small stream segment on the right side of the existing roadway that ties into the stream that crosses the roadway, since it is a separate stream. Add a boundary between the two stream buffer zones to distinguish between the two streams. If applicable, revise Site 9A's type of buffer zone 1 & 2 impacts to "Allowable".

NES requested addition of Site 9B for the different type of buffer zone impact on the right side of the proposed roadway, located just north of the proposed 15" CSP storm drain outlet at -L- Sta 309+50 Rt. Extend the buffer zone 2 boundary from -L- Sta. 309+69, 95' Rt. at Site 9 north-eastward to the PDE. If applicable, revise Site 9B's buffer zone 1 & 2 impacts to "Allowable".

Site 10, Buffer Impacts: Sheet 28 of 35:

Excavation hatching should be turned off, with correct type of permanent impacts shown in these locations.

Use impervious dike location from Construction Sequence plans as the outer limit of buffer zone impacts (north-west quadrant) and downstream (south-east quadrant) sides of the 3@11'x11' RCBC.

Add buffer zone 2 hatching at south-eastern quadrant to outer buffer zone 2 limit, near proposed toe protection.

Adjust TDE at -L- Sta. 314+89, 207' Rt. To avoid all buffer zone 1 impacts from the temporary Stilling Basin.

Site 11, Buffer Impacts: Sheet 31 of 35:

No comments.

Wetland & Stream Impacts Permit Drawing Review, Beginning in Neuse River Watershed, WS II, NSW (HQW):

Site 1 & 2, Wetland & Stream: Sheet 4 of 58:

DEO requested re-verification of the wetland boundary of Site 2.

Site 2: Widen the "Fill in Wetland" area to mimic the "Fill in Wetland" as shown at Site 1. Otherwise, there is concurrence with impacts shown, including "Fill in Wetland" limits shown at 4' outside fill slope.

NES has requested an adjustment of labels for Wetland sites so each Wetland has its own label. Site 1 on the left side of the roadway will be Site 1A and the wetland on the right side of the roadway will remain Site 1. This is a typical note for all wetland locations. In other words, wetland boundaries will be treated separately if located on two sides of the roadway.

Site 3, Wetland & Stream: Sheet 8 of 58:

DEO has requested all Proposed Top of Bank tie-ins be removed from ends of Bank Stabilization at all locations on this project. For example, there is a proposed tie-in on the right side of the roadway, located downstream of the Bank Stabilization at Site 3 that will be removed.

DEO has requested the use of Bank Stabilization, Detail BM (sheet 57 of 58) for the rip rap shown at the downstream end of the Proposed 30" RCP.

DEO has requested the wetland boundary at Site 3 to be reviewed. NES stated the wetland boundary at this location is correct.

Site 4, Wetland & Stream: Sheet 12 of 58:

"Toe Protection" was removed from the fill slope since "Rock Embankment" is being used by Geotechnical at both sides of the roadway, within the wetland boundaries.

Adjust wetland impacts so they do not exceed impervious dike boundary on Construction Sequence plans.

Excavation hatching should be turned off, with correct type of permanent impacts shown in these locations.

Curtain wall protection is proposed at the downstream end of the proposed box culverts. The issue of filling in the scour hole with rip rap was discussed. Per this discussion, this area will not be filled in.

Issue not discussed: The team should be reminded of 4B discussion regarding beaver activity being a concern at all major stream crossings along this project corridor. There was "delayed entry" for the contractor on R-2814B, due to beaver activity. Dewatering is a construction concern and previous Contractors blamed beaver activity and removal as an "unforeseen activity" causing project delays. One suggestion during 4B included a separate contract for beaver removal for this project prior to let. DEO asked if there would be additional jurisdictional impacts associated with beaver removal and subsequent dewatering? The consensus was there should be no additional impacts. Hydrology would be affected, but

only on a temporary basis. Access to beaver removal could have temporary impacts to jurisdictional streams or wetlands. It was agreed for the team to meet on site, approximately 6 weeks prior to 4C to determine which crossings would have impoundment issues due to the presence of beavers. (Field notes indicate beaver dams 300' downstream of Little River and 245' downstream of Crooked Creek Trib 3).

Site 5 & 6 Wetland & Stream: Sheet 17 of 58:

Re-label the right side of the roadway wetland as Site 5A.

Excavation hatching should be turned off, with correct type of permanent impacts shown in these locations.

“Bank Stabilization” label is on the plan view, but it is not noted on the Detail sheet. Bank Stabilization details for each major stream crossing have been provided on each CSR. However, since the Contractor does not receive CSRs, Bank Stabilization details from each CSR will be added to Roadway Detail sheets.

Bank Stabilization areas should be accounted as “Fill in Wetlands” from JS line to top of banks.

Maintain 10’ “Mechanized Clearing at the south-east quadrant of Site 5A.

It is yet to be determined if the “Wetland Excavation” located near the upstream end of Site 5 should be temporary or permanent.

Site 7, Wetland & Stream: Sheet 24 of 58:

Wetland boundary and Jurisdictional Pond location should be discussed with USACE. Should the jurisdictional stream line be adjusted to the wetland boundary?

Site 8, Wetland & Stream: Sheet 28 of 58:

NES requests addition of Site 8A on the right side of the roadway.

DEO requests extension of the “Lateral ‘V’ Ditch” at 168+00 Lt to the wetland boundary.

Excavation hatching should be turned off, with correct type of permanent impacts shown in these locations.

Adjust leader for Excavation at north western quadrant to proper location.

Include Bank Stabilization as “Fill in Wetland” or “Surface Water” impacts, where applicable.

“Bank Stabilization” label is on the plan view, but it is not noted on the Detail sheet. Bank Stabilization details for each major stream crossing have been provided on each CSR. However, since the Contractor does not receive CSRs, Bank Stabilization details from each CSR will be added to Roadway Detail sheets.

Site 9 & 10, Wetland & Stream: Sheet 33 of 58:

No comments.

Entering Tar-Pamlico Watershed, Class C, NSW

Site 11, Wetland & Stream: Sheet 38 of 58:

Need to reconcile fill slope stake lines at the downstream end (Rt side of the roadway) of the 54” RCP, there are currently two sets. The fill slope stake lines with Toe Protection are correct.

Include Bank Stabilization as “Fill in Wetland” or “Surface Water” impacts, where applicable. Provide Site 11A for the right side of the roadway.

Discussion at -L- Sta 279+80 Lt. Wetland & Stream: Sheet 40 of 58:

DEO requested to show impacts similarly to Site 15. Site 15 has a proposed base ditch that ties into the toe of the JS pond. However, this location has a standard base ditch that ends prior to the wetland. There should be no impacts at this wetland.

Site 12, Wetland & Stream: Sheets 42 of 58:

Add note for Bank Stabilization and ensure it is on the Detail sheet.

Excavation hatching should be turned off, with correct type of permanent impacts shown in these locations.

Can we delete the TDE from Sta 284+30 Lt to 285+20 Lt? Post 4C discussion with REU approves the temporary use of the Environmental Site design for a Stilling Basin during Construction Sequencing, as long as it is returned to the same lines and grades of pre-construction.

Note (not discussed at 4C): At 4B, the crossing at Crooked Creek Tributary 3 at -L- Sta. 283+85 was proposed as 1@12'x7' Crownspan Bottomless Culvert, OAL=148'. This proposed structure has since been revised to 1@10'x8' RCBC, with 1.0' sills on each side.

Site 13, Wetland & Stream: Sheets 46 of 58:

NES requested addition of Site 13A for the small stream on the right side of the existing roadway that ties into the stream that crosses the roadway, since it is a separate stream.

DEO requested additional 5' of Temporary Surface water impacts at the upstream end of the crossing.

Eliminate the proposed top of bank tie-in at the upstream and downstream ends of the Bank Stabilization.

Provide velocity for the Standard 4' base ditch, lined with rip rap located at -L- Sta. 306+00 Lt.

Site 14, Wetland & Stream: Sheet 49 of 58:

Add note for Bank Stabilization and ensure detail is on Detail sheet.

Include Bank Stabilization as "Fill in Wetland" or "Surface Water" impacts, where applicable.

Show de-watered areas as Temporary Surface Water Impacts, inside proposed impervious dikes.

Site 15, Wetland & Stream: Sheet 53 of 58:

The jurisdictional feature includes a buffered pond, that may be dropped as a JS feature, to be determined by USACE and NES.



PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

November 18, 2016

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

Dear Mr. Harris:

Subject: EEP Mitigation Acceptance Letter:

R-2814C, US 401 Improvements from NC 96 to SR 1103, Wake and Franklin Counties

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the stream, wetland and buffer mitigation for the subject project. Based on the information supplied by you on November 17, 2016, the stream, wetland and buffer impacts are located in CUs 03020201 of the Neuse River basin and CU 03010201 of the Tar-Pamlico River basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Stream and Wetlands	River Basin	CU Location	Eco-Region	Stream			Wetlands		
				Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh
Impacts	Neuse	03020201	CP	0	0	655.0	2.04	0	0
Impacts	Tar-Pamlico	03010201	CP	0	0	1,021.0	0.33	0	0

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

All buffer mitigation requests and approvals are administrated through the Riparian Restoration Buffer Fund. The NCDOT will be responsible to ensure that appropriate compensation for the buffer mitigation will be provided in the agreed upon method of fund transfer. Upon receipt of the NCDWR's Buffer Authorization Certification, DMS will transfer funds from the NCDOT 2984 Fund into the Riparian Restoration Buffer Fund. Upon completion of transfer payment, NCDOT will have completed its riparian buffer mitigation responsibility for TIP Number R-2814C. Subsequently, DMS will conduct a review of current NCDOT ILF Program mitigation projects in the river basin to determine if available buffer mitigation credits exist. If there are buffer mitigation credits available, then the Riparian Restoration Buffer Fund will purchase the appropriate amount of buffer mitigation credits from NCDOT ILF Program.

Mr. Harris
November 18, 2016
Page Two
NCDOT TIP R-2814C

Buffer	River Basin	CU	Eco-Region	Buffer Impacts		
				Zone 1	Zone 2	TOTAL
Impacts	Neuse	03020201	CP	31,416.0	23,197.0	50,639.0
Impacts	Tar-Pamlico	03020101	CP	59,689.0	35,800.0	95,489.0

The mitigation acceptance letter replaces the mitigation acceptance letter issued on October 14 and November 8, 2016. The impacts and associated mitigation needs were under projected by the NCDOT in the 2016 impact data. DMS will commit to implement sufficient compensatory mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies using the delivery timeline listed in Section F.3.c.iii of the In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from DMS.

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

Sincerely,



James B. Stanfill
DMS Credit Management Supervisor

Cc: Mr. Eric Alsmeyer, USACE – Raleigh Regulatory Field Office
Ms. Amy Chapman, NC Division of Water Resources
File: R-2814C Revised 2



FOR NCDOT PROJECTS

Page 1 of 5

General Project Information

WBS Element:		34506.1.1	TIP Number:	R-2814C	Project Type:		Roadway Widening	Date:	9/1/2016
NCDOT Contact:		Linda Johns			Contractor / Designer:		NCDOT Hydraulics Unit		
	Address:	NCDOT Hydraulics Unit 1590 Mail Service Center Raleigh, NC 27699-1590				Address:	1590 Mail Service Center Raleigh, NC 27699-1590		
	Phone:	919-707-6728				Phone:	919-707-6728		
	Email:	lmjohns@ncdot.gov				Email:	lmjohns@ncdot.gov		
City/Town:		Rolesville			County(ies):		Wake	Franklin	
River Basin(s):		Neuse	Tar-Pamlico		CAMA County?		No	No	
Wetlands within Project Limits?		Yes							

Project Description

Project Length (lin. miles or feet):	6.595 miles	Surrounding Land Use:	Rolling topography, agriculture, forests, rural residential, changing to urban			
	Proposed Project			Existing Site		
Project Built-Up Area (ac.)	61.0	ac.	28.0	ac.		
Typical Cross Section Description:	The proposed cross-section for most of the project is four-lane, 46 ft. median divided section, utilizing 4 ft paved shoulders. North of -Y8-, Beaver Dam Dr. to the end of this portion of the project, a four-lane 20 ft median divided section utilizing curb and gutter is proposed . Lanes along the -L- line are typically 12 ft, and 10 ft on the -Y- lines.			Existing US 401 is a two to three-lane roadway, with variable width grass shoulders. The existing roadway has 10 ft lane widths, with 2 ft paved shoulders.		
Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	15,848	Year: 2036	Existing:	10,892	Year: 2016
General Project Narrative: (Description of Minimization of Water Quality Impacts)	R-2814C is the third part of four on R-2814, widening of US 401 in Wake and Franklin Counties from SR 2044 (Ligon Mill Rd) to SR 1700 (Fox Park Rd) in Louisburg, to a four-lane, median divided, superstreet design facility. Widening will be to the east or to the west of the existing two lanes of US 401. The proposed project is needed to alleviate the existing and future capacity deficiencies along US 401.					
	Best Management Practices include utilization of an open shoulder typical section, as well as steepening fill slopes (and providing guardrail) to minimize impacts to jurisdictional features.					
	Grass swales are proposed primarily as stormwater control measures where possible throughout the Neuse River basin, WS II (HQW) NSW areas, and in areas adjacent to jurisdictional features in the Tar-Pam River basin Class C, NSW areas. In open shoulder areas, shoulder berm gutter are proposed to capture roadway runoff into storm drain systems and route to outlets located far enough away from jurisdictional features so grass swale treatment could be obtained prior to reaching wetland, jurisdictional stream and/or buffer zone.					
	Rip Rap bank stabilization is included in the design upstream and downstream of all major stream crossings, and downstream of all minor jurisdictional stream crossings. Rip rap at embankment is also added at the ends of ditches that outlet to jurisdictional streams. Rip rap toe protection is proposed at the bottom of all fill slopes that are adjacent to wetlands. Flat rip rap pads were used at the ends of ditches to slow velocities and diffuse concentrated flow.					
	Environmental Site Design is proposed as a stormwater control device for roadway drainage entering Crooked Creek Trib 3.					

Waterbody Information

Surface Water Body (1):		Little River		NCDWR Stream Index No.:		27-57-(1)a		
NCDWR Surface Water Classification for Water Body			Primary Classification:		Water Supply II (WS-II)			
			Supplemental Classification:		High Quality Waters (HQW)			
Other Stream Classification:				(NSW)				
Impairments:		biological impairment						
Threatened/Endangered Species?		Yes	Comments: Endangered: Michaux's sumac (Unresolved), dwarf-wedge mussel (Unresolved), Tar River spiny mussel (Unresolved)					
NRTR Stream ID:						Buffer Rules in Effect:		Neuse
Project Includes Bridge Spanning Water Body?		No	Deck Drains Discharge Over Buffer?		No	Dissipator Pads Provided in Buffer?		N/A
Deck Drains Discharge Over Water Body?		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 2.01; Released December 2014)

WBS Element: 34506.1.1 TIP No.: R-2814C County(ies): Wake Franklin Page 2 of 5

Additional Waterbody Information

Surface Water Body (2):	Little River Trib 3	NCDWR Stream Index No.:	27-57-(1)
NCDWR Surface Water Classification for Water Body	Primary Classification:	Water Supply II (WS-II)	
	Supplemental Classification:	High Quality Waters (HQW)	(NSW)
Other Stream Classification:			
Impairments:			
Threatened/Endangered Species?	Yes	Comments: Endangered: Michaux's sumac (Unresolved), dwarf-wedge mussel (Unresolved), Tar River spiny mussel (Unresolved)	
NRTR Stream ID:		Buffer Rules in Effect:	Neuse
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)			

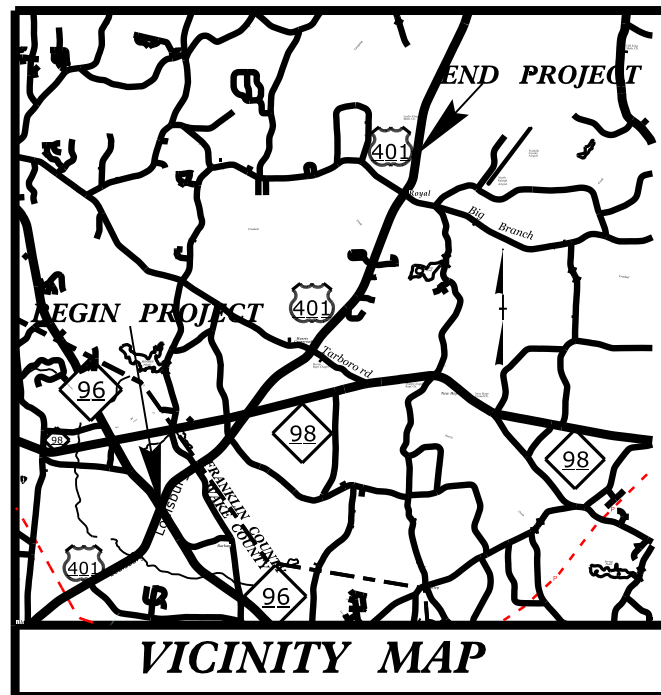
Surface Water Body (3):	UT to Little River Trib 3b	NCDWR Stream Index No.:	27-57-(1)
NCDWR Surface Water Classification for Water Body	Primary Classification:	Water Supply II (WS-II)	
	Supplemental Classification:	High Quality Waters (HQW)	(NSW)
Other Stream Classification:			
Impairments:			
Threatened/Endangered Species?	Yes	Comments: Endangered: Michaux's sumac (Unresolved), dwarf-wedge mussel (Unresolved), Tar River spiny mussel (Unresolved)	
NRTR Stream ID:		Buffer Rules in Effect:	Neuse
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)			

Surface Water Body (4):	Crooked Creek Trib 3 (Cliftons Pond)	NCDWR Stream Index No.:	28-30-01
NCDWR Surface Water Classification for Water Body	Primary Classification:	Class C	
	Supplemental Classification:	Nutrient Sensitive Waters (NSW)	
Other Stream Classification:			
Impairments:			
Threatened/Endangered Species?		Comments: Endangered: Michaux's sumac (Unresolved), dwarf-wedge mussel (Unresolved), Tar River spiny mussel (Unresolved)	
NRTR Stream ID:		Buffer Rules in Effect:	Tar-Pamlico
Project Includes Bridge Spanning Water Body?		Deck Drains Discharge Over 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):	Crooked Creek	NCDWR Stream Index No.:	28-30
NCDWR Surface Water Classification for Water Body	Primary Classification:	Class C	
	Supplemental Classification:	Nutrient Sensitive Waters (NSW)	
Other Stream Classification:			
Impairments:	dissolved oxygen (DO)		
Threatened/Endangered Species?	Yes	Comments: Endangered: Michaux's sumac (Unresolved), dwarf-wedge mussel (Unresolved), Tar River spiny mussel (Unresolved)	
NRTR Stream ID:		Buffer Rules in Effect:	Tar-Pamlico
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)			

PERMIT DRAWING
SHEET 1 OF 61

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2814C	1	
STATE PROJ.NO.	F.A.PROJ.NO.	DESCRIPTION	
34506.1.4	STP-401(249)	PE	
34506.2.FR7	STP-401(249)	R/W	
34506.2.FRU7	STP-401(249)	UTILITIES	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	



WAKE/FRANKLIN COUNTY

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CURB AND GUTTER, CULVERTS, AND SIGNALS

WETLAND AND STREAM IMPACTS

-L- STA 381+40.55 END TIP PROJECT R-2814C

TIP PROJECT: R-2814C

-L- STA 33+18.85 BEGIN TIP PROJECT R-2814C

VICINITY MAP

-L- STA 33+18.85 BEGIN TIP PROJECT R-2814C

SITE 1,1A,&2

SITE 3

SITE 4

SITE 5,5A,&6

SITE 8&8A

SITE 7

SITE 9&10

SITE 11&11A

SITE 12

SITE 13&13A

SITE 14

SITE 15

-L- POT STA 383+00.00 END CONST. R-2814C

TO RALEIGH

TO LOUISBURG

Y1- NC 96

Y2- MOORE'S POND RD

Y3- BARHAM SIDING RD

Y4- DARIUS PEARCE RD

Y5- DARIUS PEARCE RD

Y6- NC 98

Y7- THORPE RD

Y8- BEAVER DAM DR

Y9- GREEN BARK DR

Y10- CASTLE DRIVE

Y11- CLIFTON RD

FLAT ROCK RD

BEGIN CULVERT -L- STA 107+69.33

END CULVERT -L- STA 108+06.67

BEGIN CULVERT -L- STA 314+43.10

END CULVERT -L- STA 314+83.34

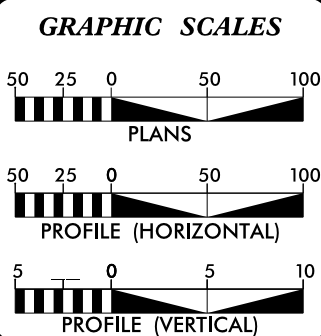
COUNTY BOUNDARY LINE

SITE 1,1A,&2

THIS IS A FULL AND PARTIAL CONTROL OF ACCESS PROJECT WITH ACCESS POINTS SHOWN ON THE PLANS.
THIS PROJECT IS NOT WITHIN THE LIMITS OF MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:



DESIGN DATA

ADT 2016 = 10,892
ADT 2036 = 15,848
K = 10 %
D = 65 %
T = 6 % *
V = 60 MPH
TTST = 2% DUAL = 4%
FUNC CLASS =
MAJOR COLLECTOR
STATEWIDE TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2814C	= 6.580 MILES
LENGTH STRUCTURES TIP PROJECT R-2814C	= 0.015 MILES
TOTAL LENGTH OF TIP PROJECT R-2814C	= 6.595 MILES

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 28, 2015

LETTING DATE:
PY

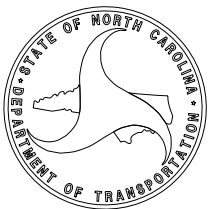
KEVIN E. MOORE, PE
PROJECT ENGINEER

NATHAN N. ADIMA, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

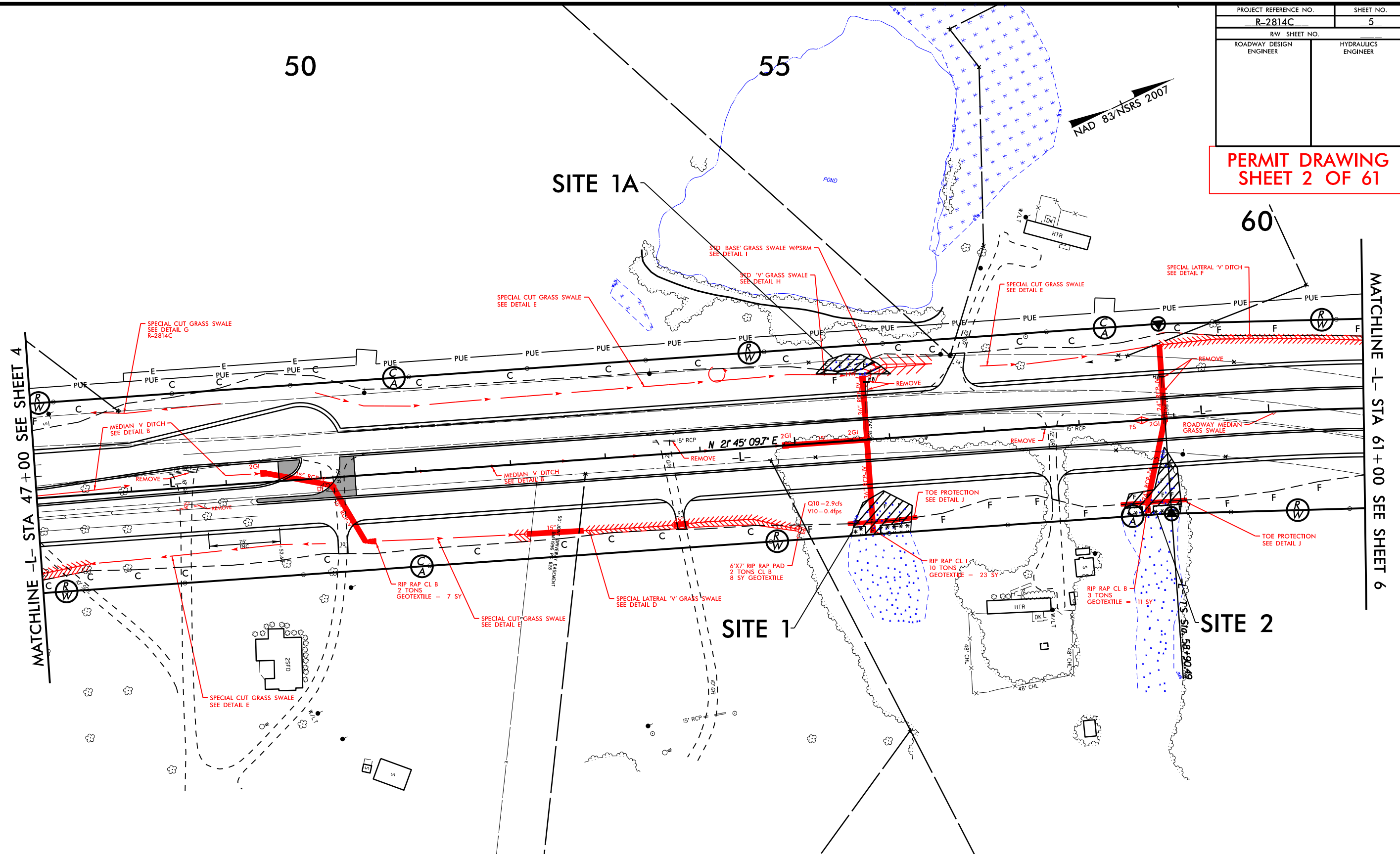
SIGNATURE: _____ P.E. _____
ROADWAY DESIGN ENGINEER

SIGNATURE: _____ *P.E.*



PROJECT REFERENCE NO.		SHEET NO.	
R-2814C		5	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	

PERMIT DRAWING
SHEET 2 OF 61



A horizontal graphic scale bar. The top left is labeled '100'' and the top right is labeled '0''. The bar is divided into two sections: the left section is a checkerboard pattern of black and white squares, and the right section is solid black. Below the bar, the text 'GRAPHIC SCALE' is written in all caps.



 DENOTES FILL IN WETLAND

 DENOTES MECHANIZED CLEARING

 DENOTES EXCAVATION
IN WETLAND

RIGHT OF WAY REVISION:
 REVERSED, FROM OFFSET 1486.43, FROM 100' RT TO 100.36' RT AT -L- STA. 58+90.49 ON PARCEL 5, BDK 02-12-2015.

5/7/2015
:lee
R:\Hydra

8/17/99

REVISIONS

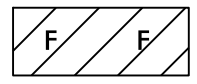
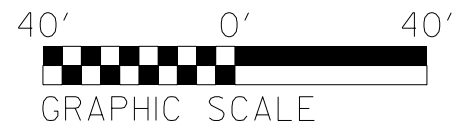
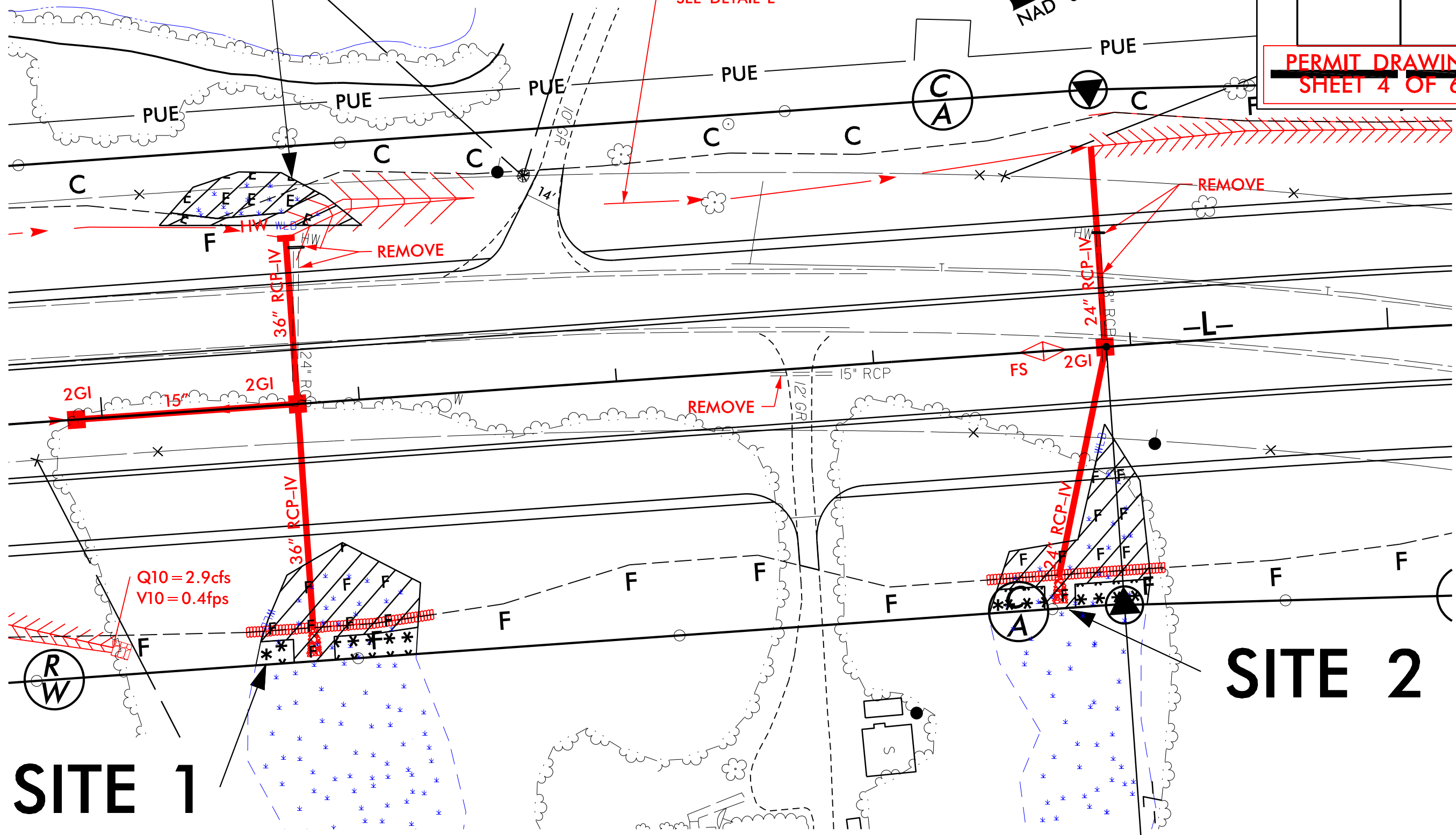
5/11/2015
R:\Hydraulics\Permits Environmental\R2814C PERMIT 2015 Drawings\Surface Water & Wetland - TP\R2814C_Hyd_prm_wet_psh05_Zoom.dgn

5/11/2015
R:\Hydraulics\Permits Environmental\R2814C PERMIT 2015 Drawings\Surface Water & Wetland - TP\R2814C_Hyd_prm_wet_psh05_Zoom.dgn

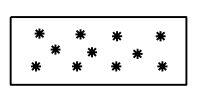
SITE 1A

SITE 1

SITE 2



DENOTES FILL IN
WETLAND



DENOTES MECHANIZED
CLEARING



DENOTES EXCAVATION
IN WETLAND

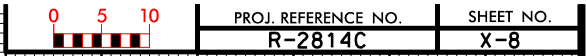
PROJECT REFERENCE NO.
R-2814C

SHEET NO.
5A

RW SHEET NO.
ROADWAY DESIGN
ENGINEER

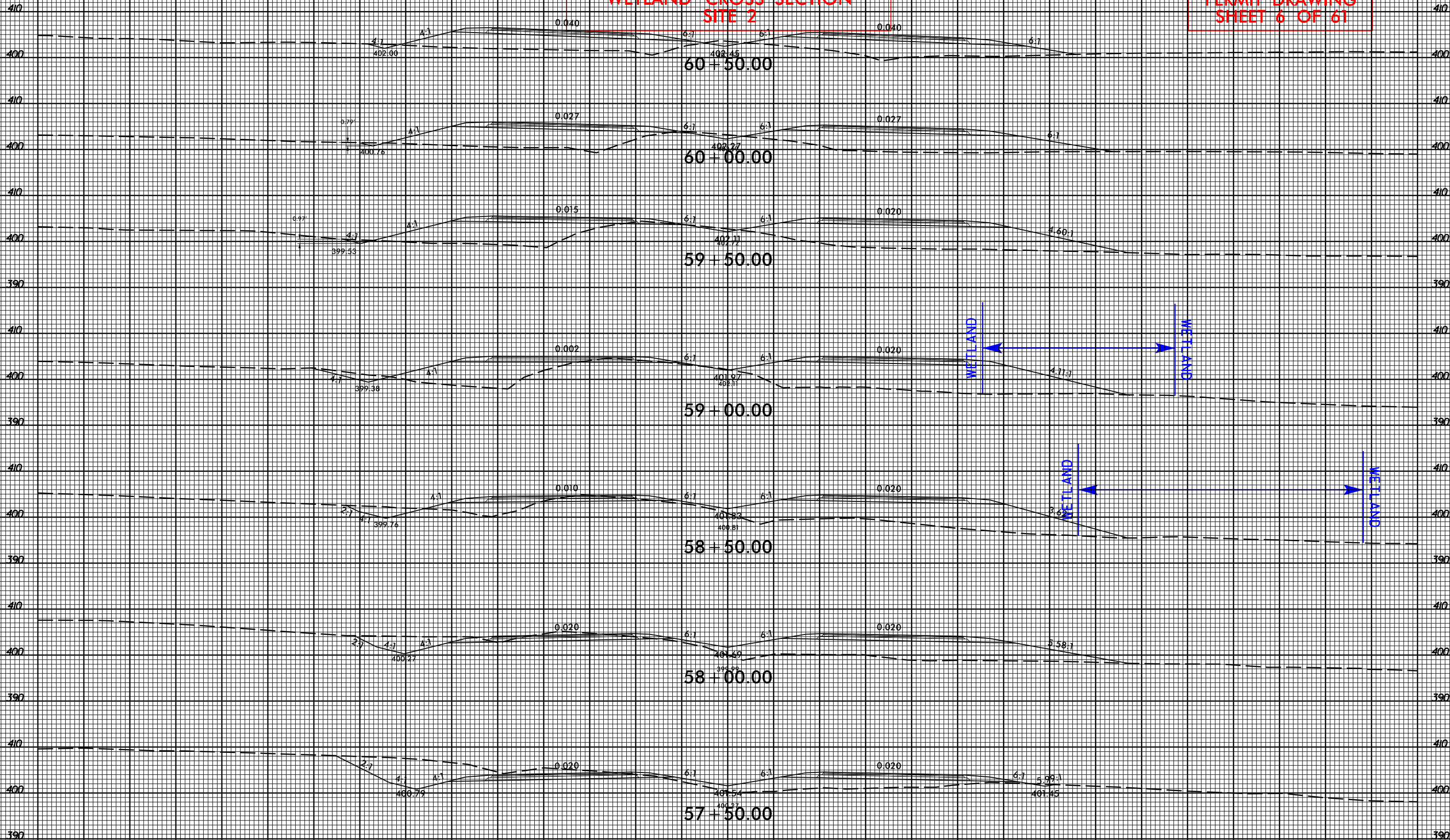
HYDRAULICS
ENGINEER

**PERMIT DRAWING
SHEET 4 OF 61**



WETLAND CROSS SECTION
SITE 2

PERMIT DRAWING
SHEET 6 OF 61



75

70

SPECIAL CUT GRASS SWALE -
SEE DETAIL G

-L- ST Sta. 69+48.29

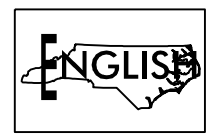
8/17/99

\$555 draw

RIGHT OF WAY REVISION:

5/1/2015
tpincus

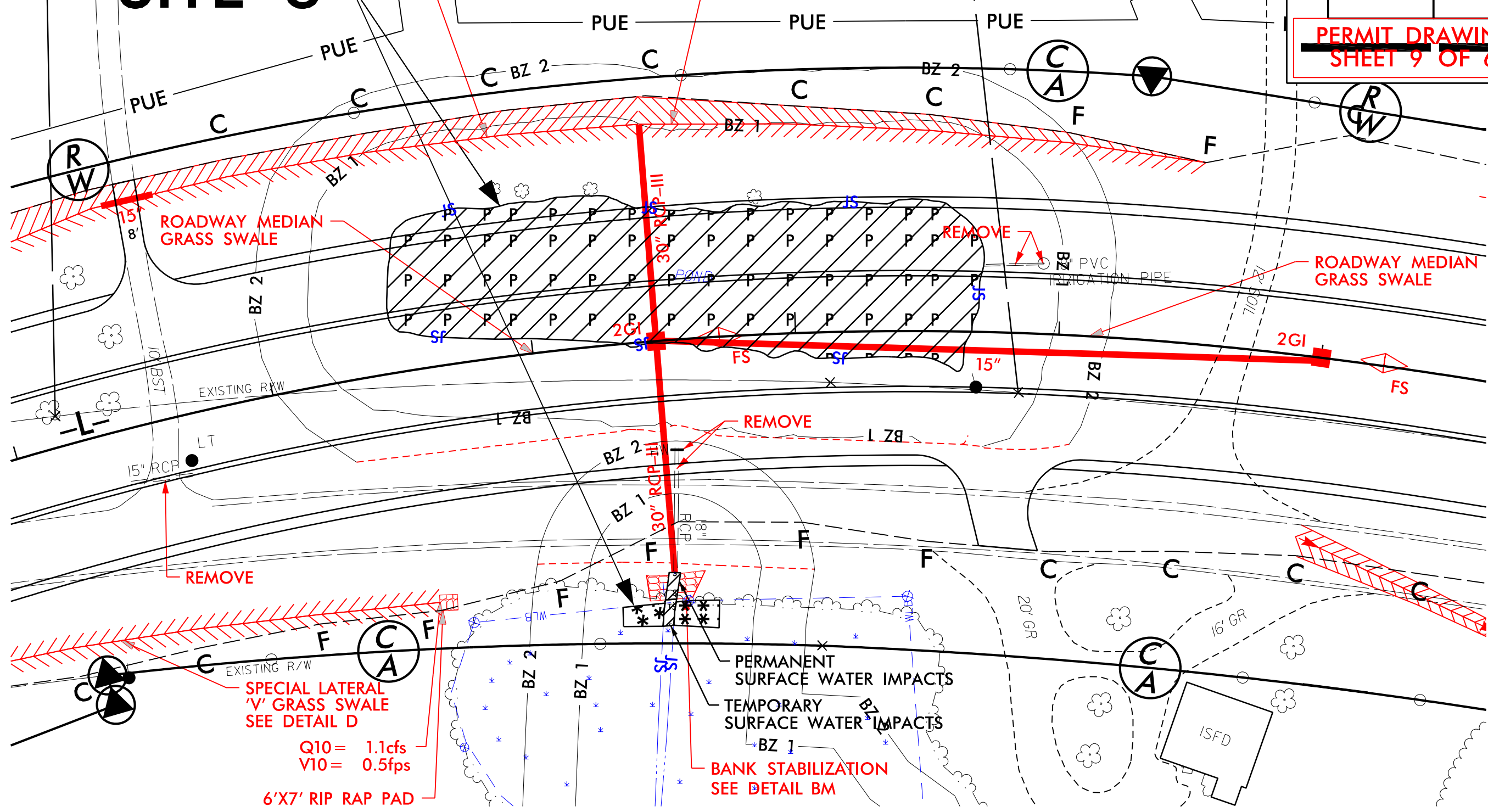
A horizontal graphic scale bar. It is divided into two main sections. The left section is a checkerboard pattern of black and white squares, with a '0'' mark at its right end. The right section is a solid black bar, with '100'' marks at both its left and right ends. The text 'GRAPHIC SCALE' is printed below the checkerboard section.



— SPECIAL LATERAL 'V' GRASS SWALE
SEE DETAIL D

SITE 3

NAD 83/NSRS 2007



– SPECIAL LATERAL
'V' GRASS SWALE
SEE DETAIL D

Q10 = 1.1 cfs
V10 = 0.5 fps

6'X7' RIP RAP PAD

PERMANENT SURFACE WATER IMPACTS

TEMPORARY SURFACE WATER IMPACTS

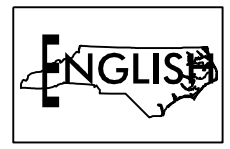
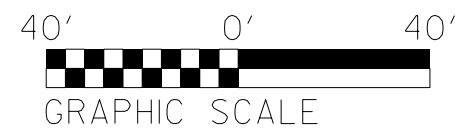
~~- BANK STABILIZATION
SEE DETAIL BM~~

DENOTES MECHANIZED
CLEARING

DENOTES IMPACTS IN
SURFACE WATER
(POND)

DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

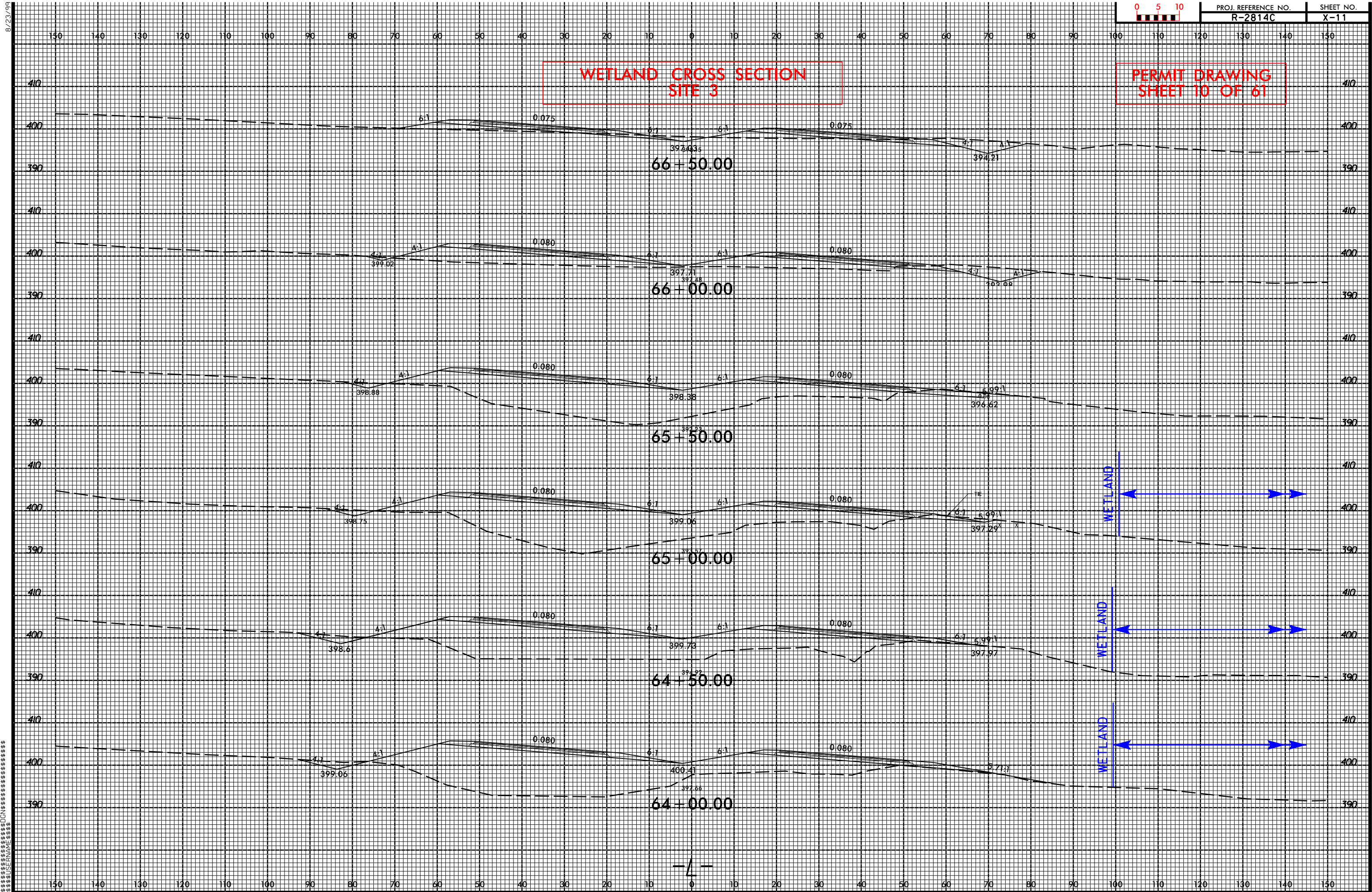
DENOTES IMPACTS IN
SURFACE WATER



REVISIONS

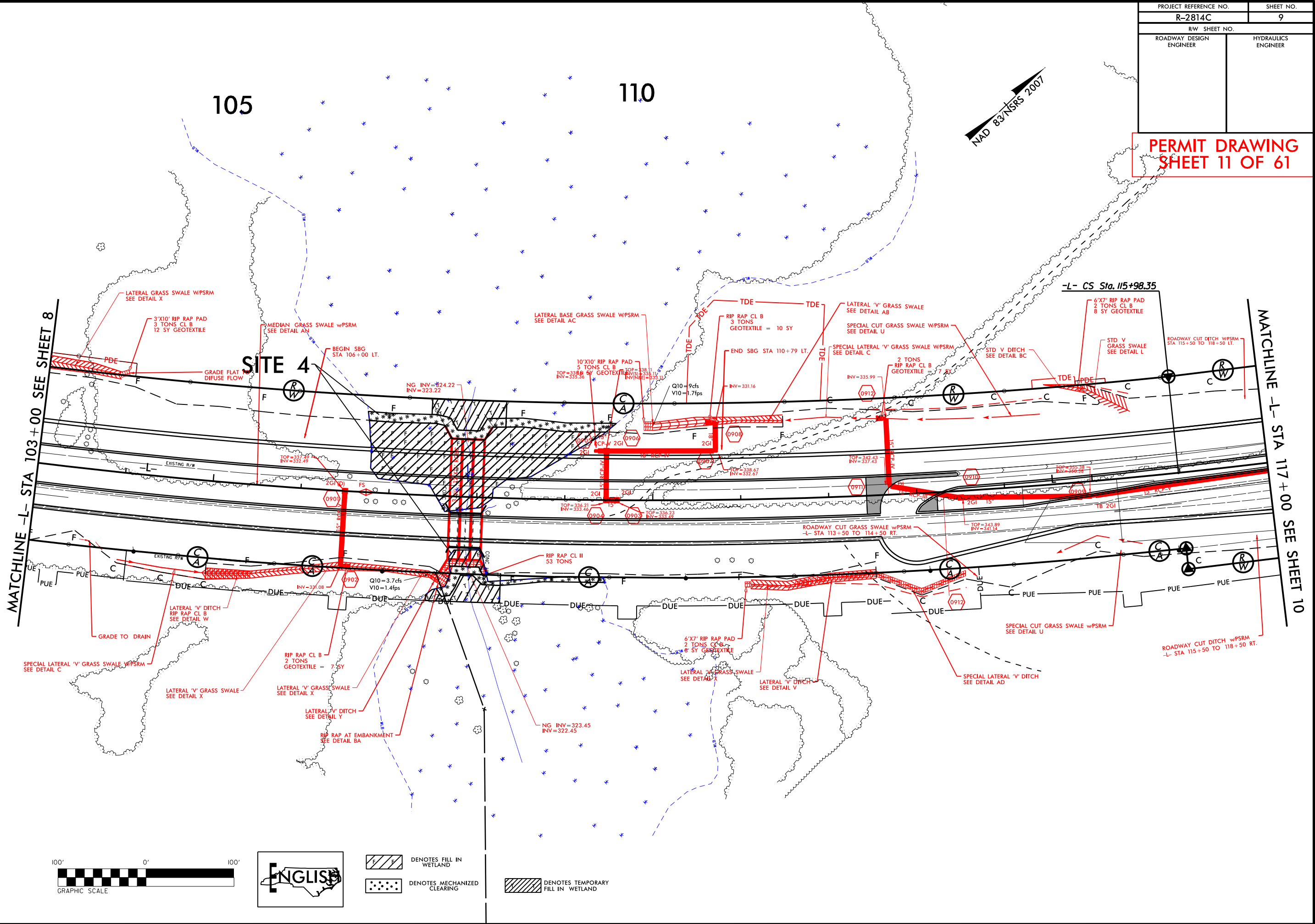
5/1/2015
Ipaicus
R:\Hydroalics\Permits_Environmental\R2814C PERMIT 2015 drawings\Surface Water & Wetland -- TP\R2814C_Hyd_pcm_wet_psh06_Zoom.dgn

5/1/2015
tpincus



PROJECT REFERENCE NO.	SHEET NO.
R-2814C	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

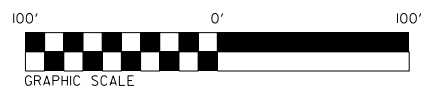
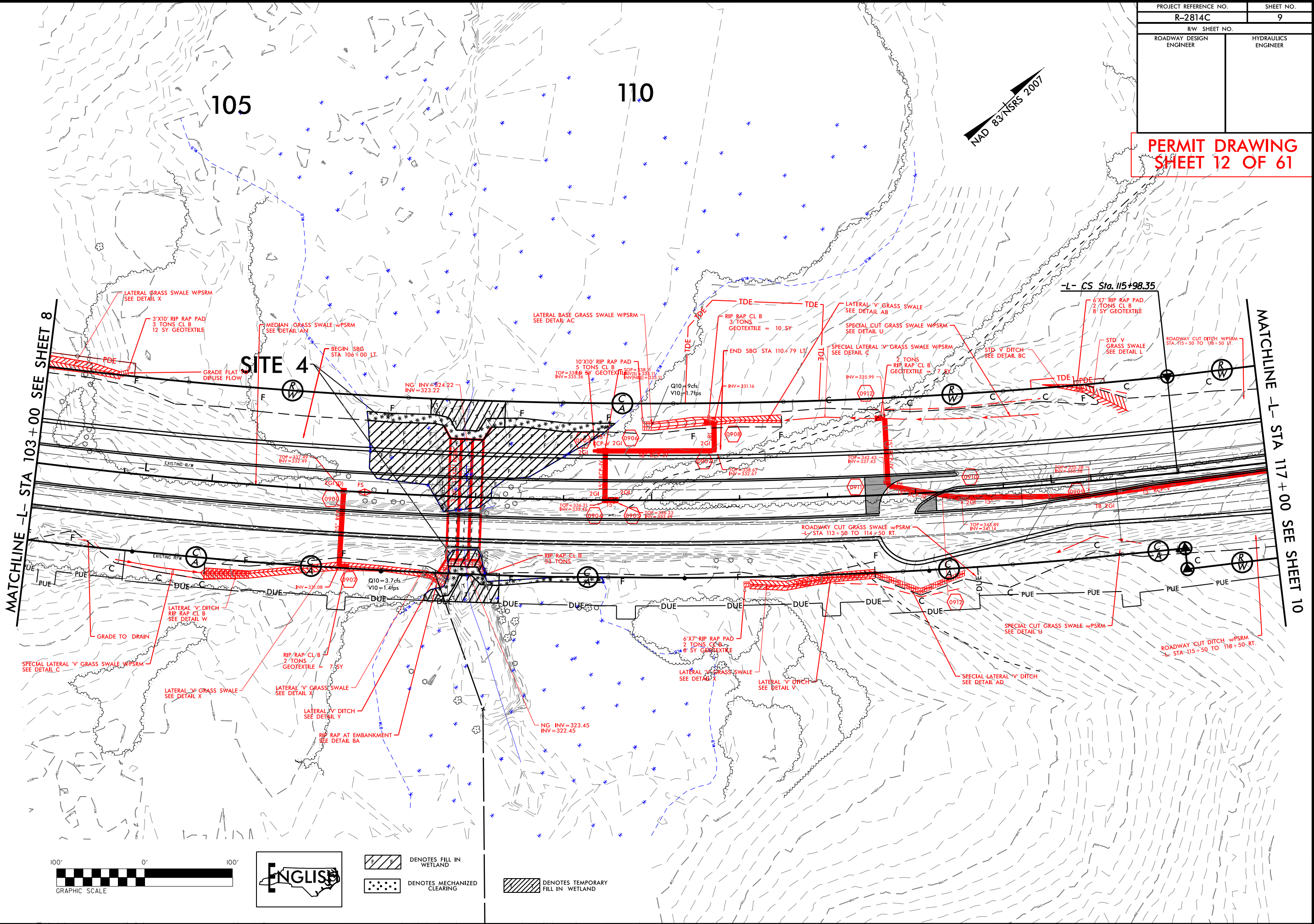
PERMIT DRAWING
SHEET 11 OF 61



PROJECT REFERENCE NO.	SHEET NO.
R-2814C	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 12 OF 61

NAD 83/NSRS 2007



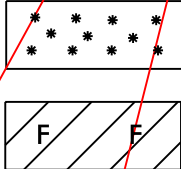
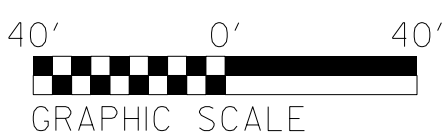
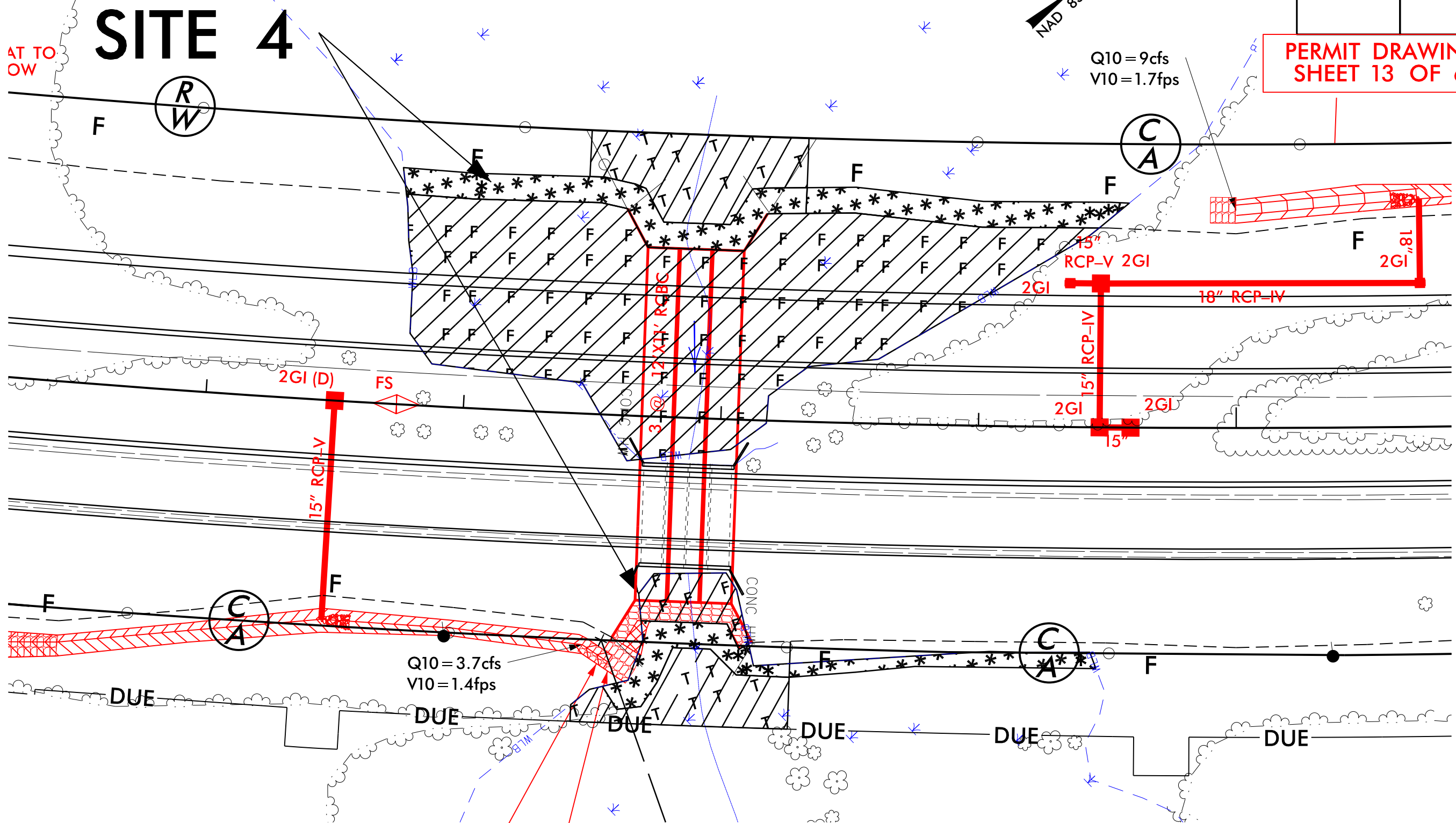
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES TEMPORARY FILL IN WETLAND

REVISIONS

10/2/2016
R:\Hydraulics\Permits\Environmental\2814C PERMIT 2015\Drawings\Surface
Water & Wetland - Working\2814C_Hyd_perm_wet_psh09.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2814C	9A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 13 OF 61



DENOTES MECHANIZED
CLEARING

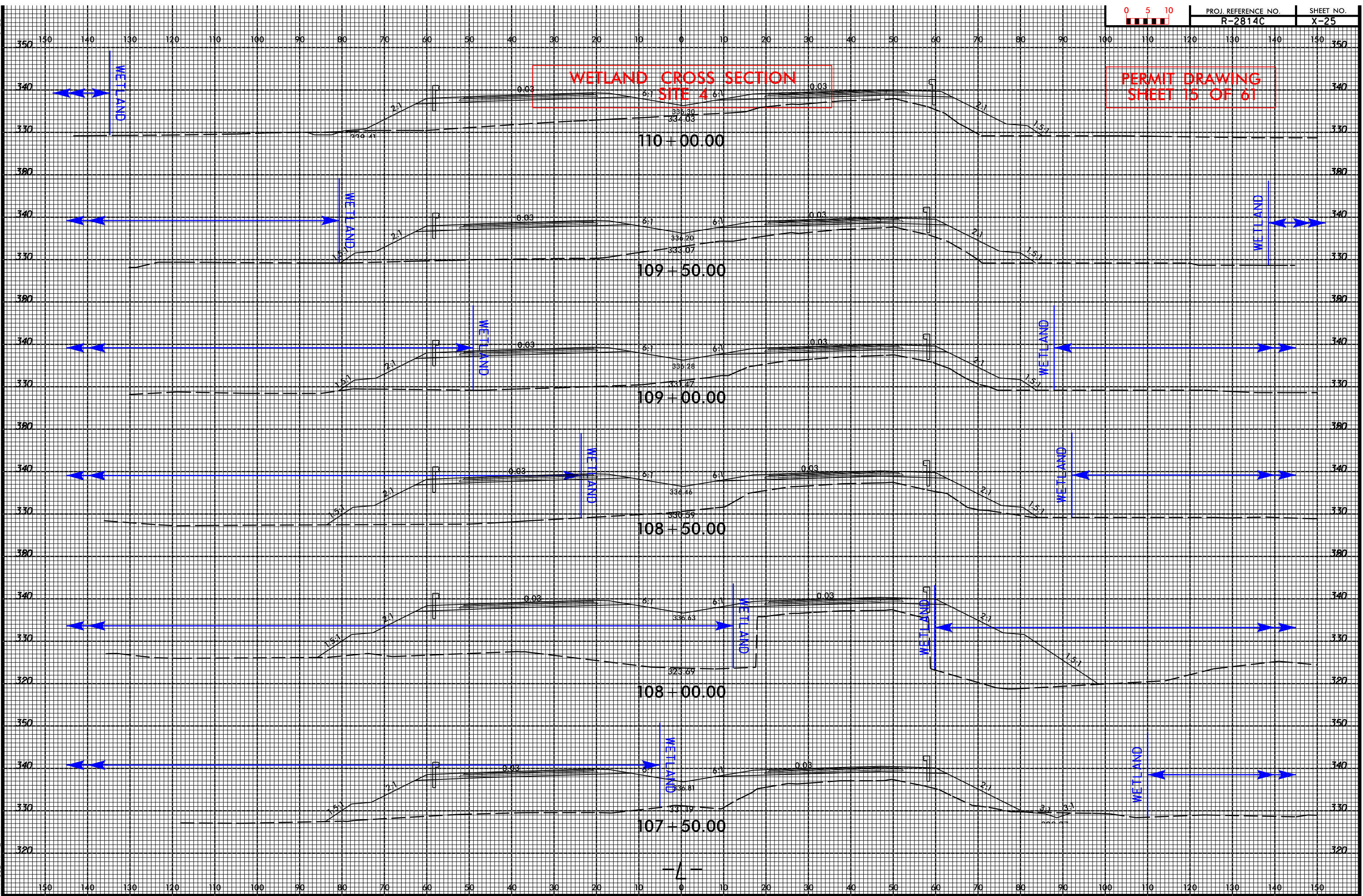
DENOTES FILL IN
WETLAND



DENOTES TEMPORARY
FILL IN WETLAND

REVISIONS

10/6/2016
mkelly
R:\Hydraulics\Permits Environmental\R2814C PERMIT 2015 Drawings\Surface Water & Wetland - Working\R2814C_Hyd_prm_wet_psh09_Zoom.dgn
\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$DGN\$\$\$\$\$
\$\$\$\$\$\$\$\$\$\$



MATCHLINE -L- STA 145+00 SEE SHEET 12



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

RIGHT OF WAY REVISION 03-13-15 EAD;
 -158,810.00, BT. Adjusted, easement marker symbology, and then added additional easement marker at the proposed right of way line
 Wagon & Valley LLC

RIGHT OF WAY REVISION 03-13-15 EAD:

5/1/2015
Ipinus
R:\Hydraulics\Permits_Environmental\2014C PERMIT 2015 drawings\Surface

REVISIONS

8/17/99

NAD 83/NSRS 2007

135

140
SITE

SITE 5

SITE 5A

MAILCHLINE -L- SIA 145+00 SEE SHEET 12



ENGLISH

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

RIGHT OF WAY REVISION 03-13-15 EAD:

RIGHT OF WAY REVISION 03-13-15 EAD:

[illegible]

REVISIONS

8/17/99

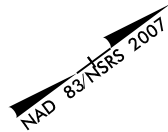
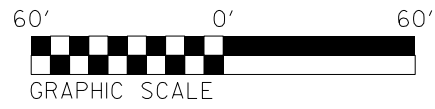
NAD 83/NSRS 2007

135

140
UE
PUE
S

SITE 5

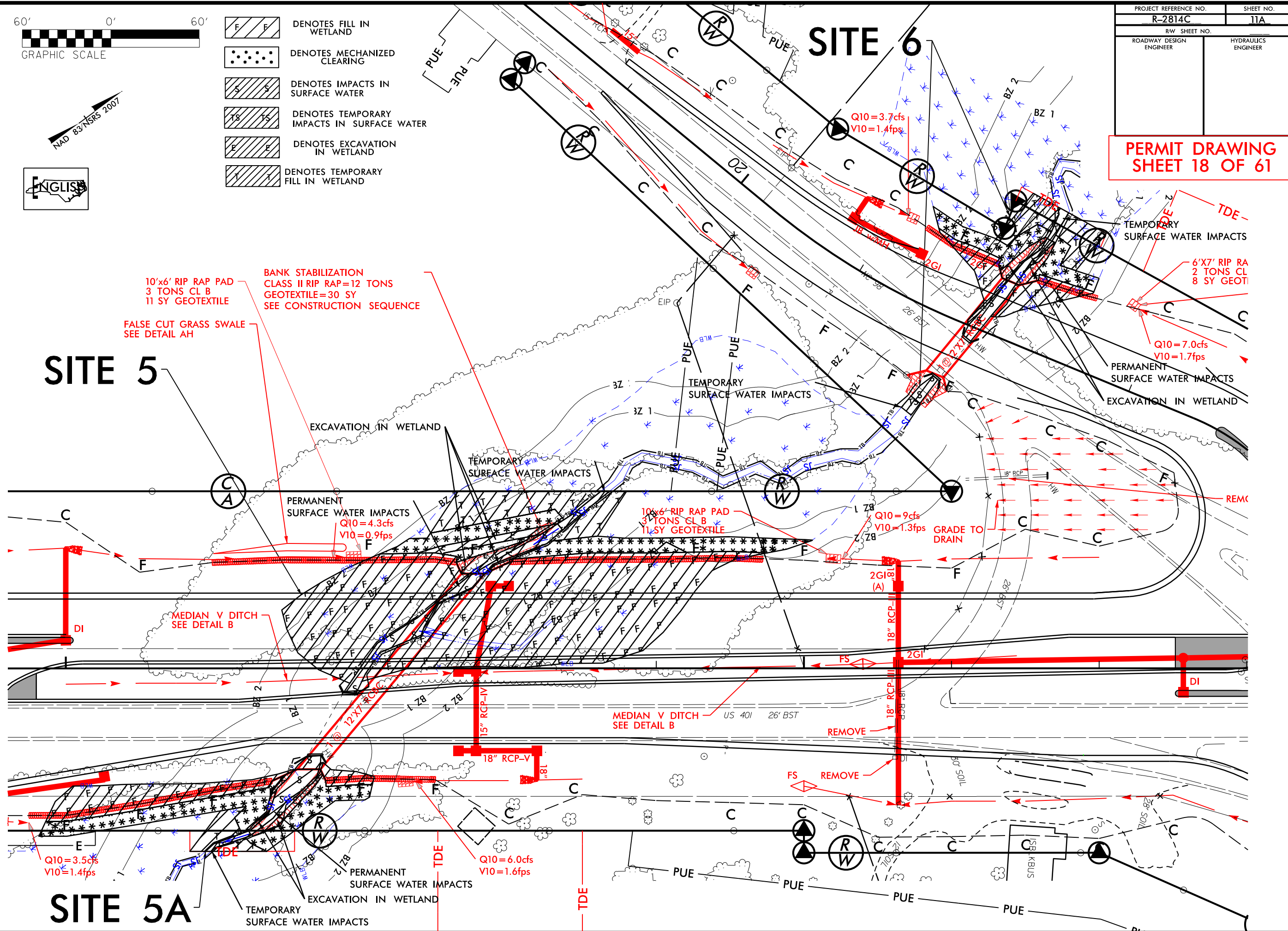
SITE 5A



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

PROJECT REFERENCE NO.	SHEET NO.
R-2814C	11A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 18 OF 61

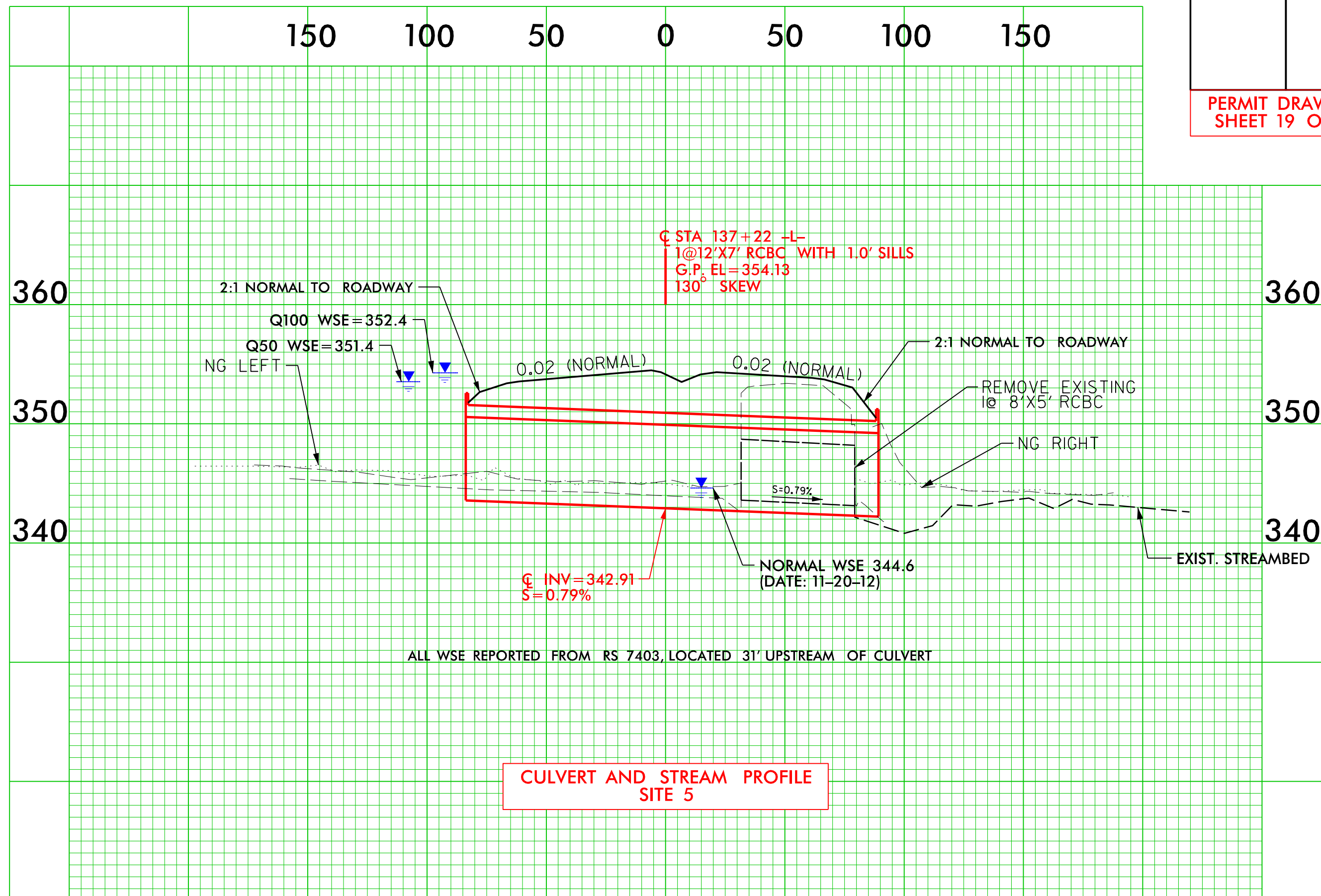


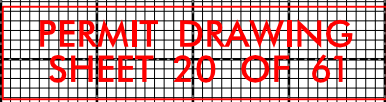
REVISIONS

5/1/2015
R:\Hydraulics\Permits Environmental\R2814C PERMIT 2015\Drawings Surface Water & Wetland - TP R2814C Hyd_prm_wet_psh11 Zoom.dgn

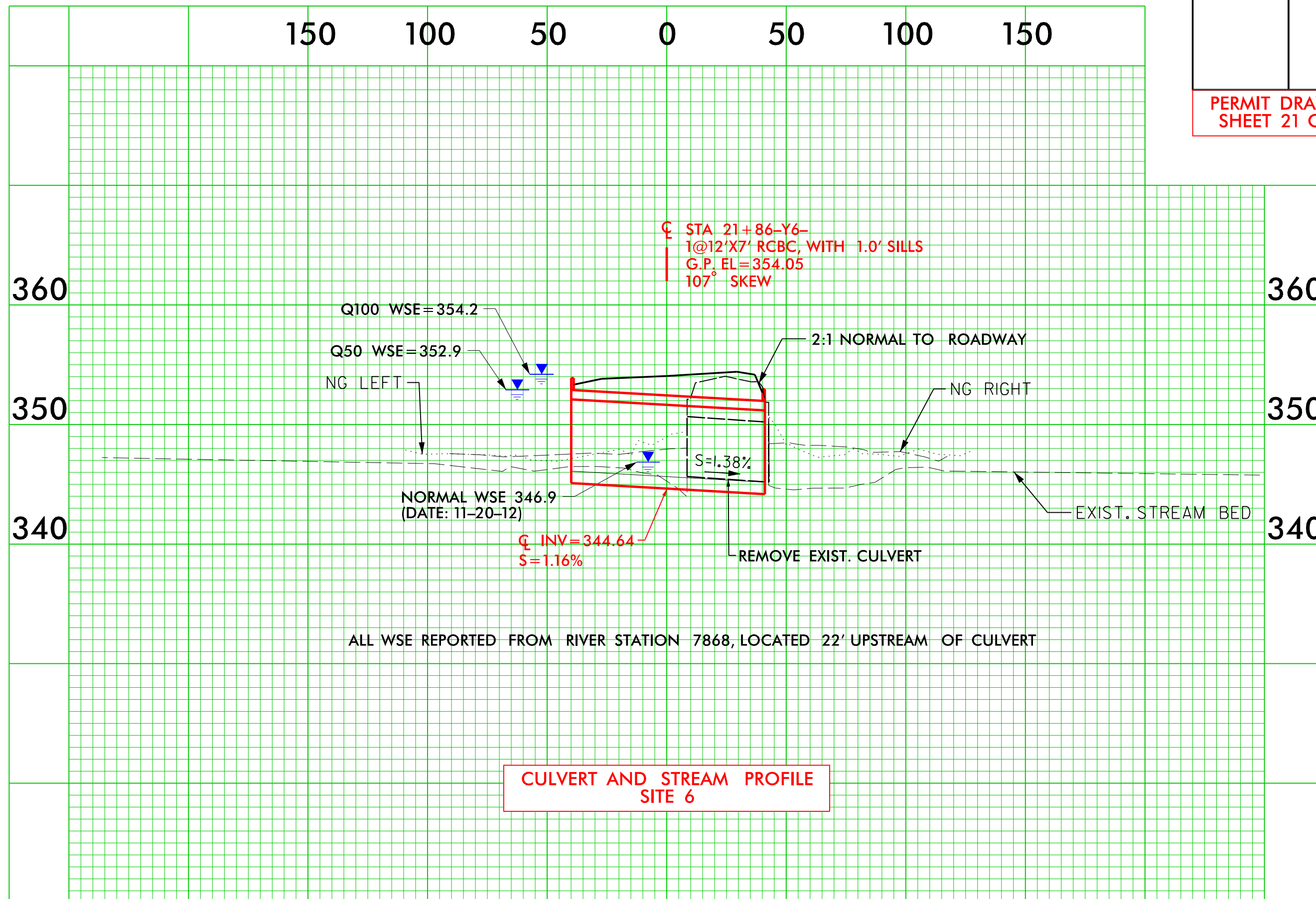
5/1/2015
R:\Hydraulics\Permits Environmental\R2814C PERMIT 2015\Drawings Surface Water & Wetland - TP R2814C Hyd_prm_wet_psh11 Zoom.dgn

PERMIT DRAWING
SHEET 19 OF 61



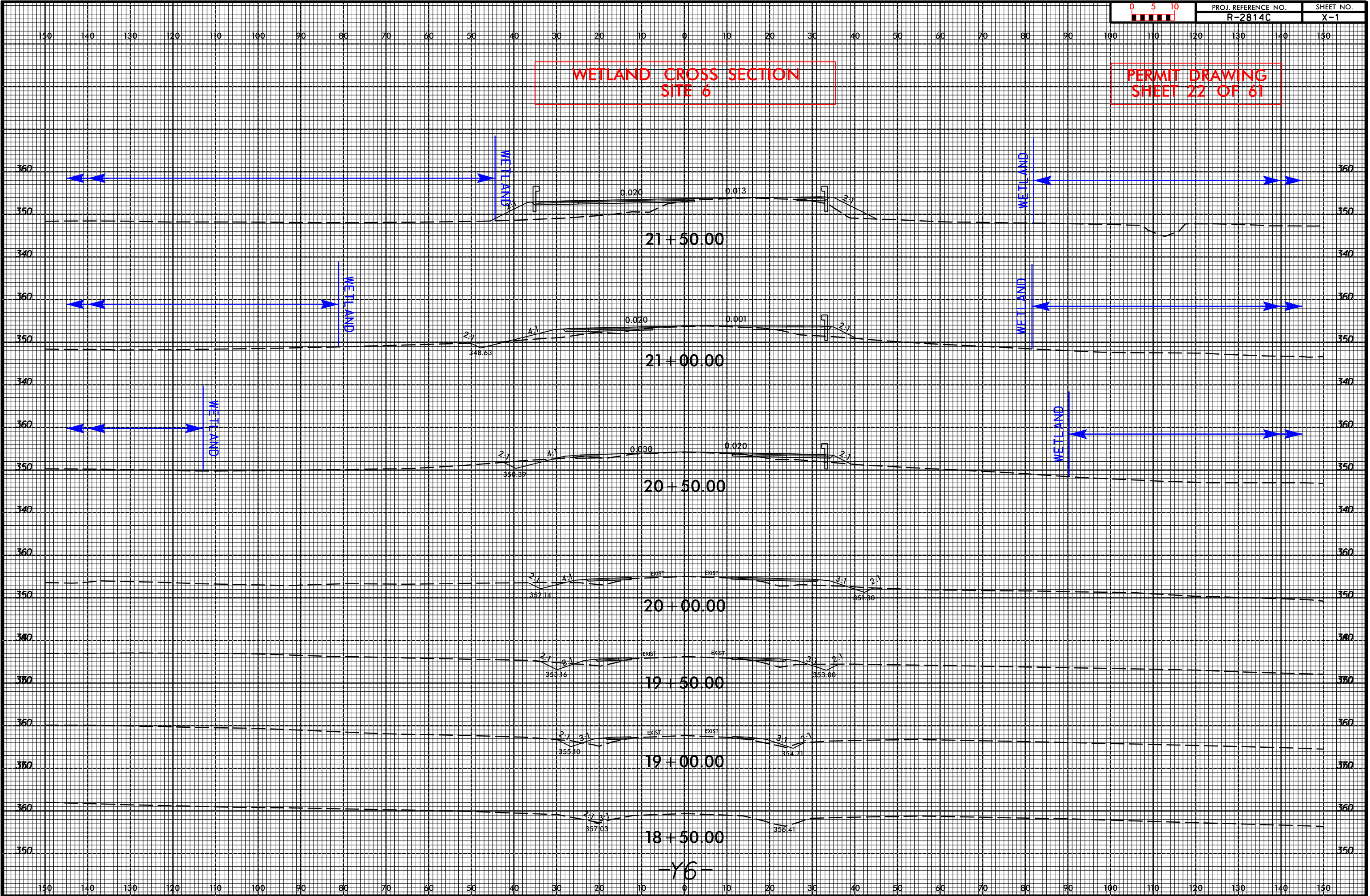


PERMIT DRAWING
SHEET 21 OF 61



5/11/2015
I:\projects\Permitting\Environmental\R2814C PERMIT 2015\Drawings\Surface Water & Wetland - TP\Cross Sections\R2814C XPL Y6 R2814C Hyd_xpl_Y6_cm_1.dgn
\$\$\$\$\$USER\$\$\$\$\$
\$\$\$\$\$USER\$\$\$\$\$

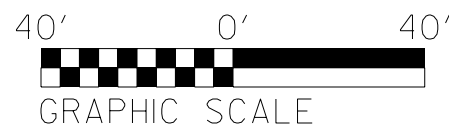
8/23/99



NAD 83/NSRS 2007

REVISIONS

SITE 7



DENOTES MECHANIZED
CLEARING

DENOTES FILL IN
WETLAND

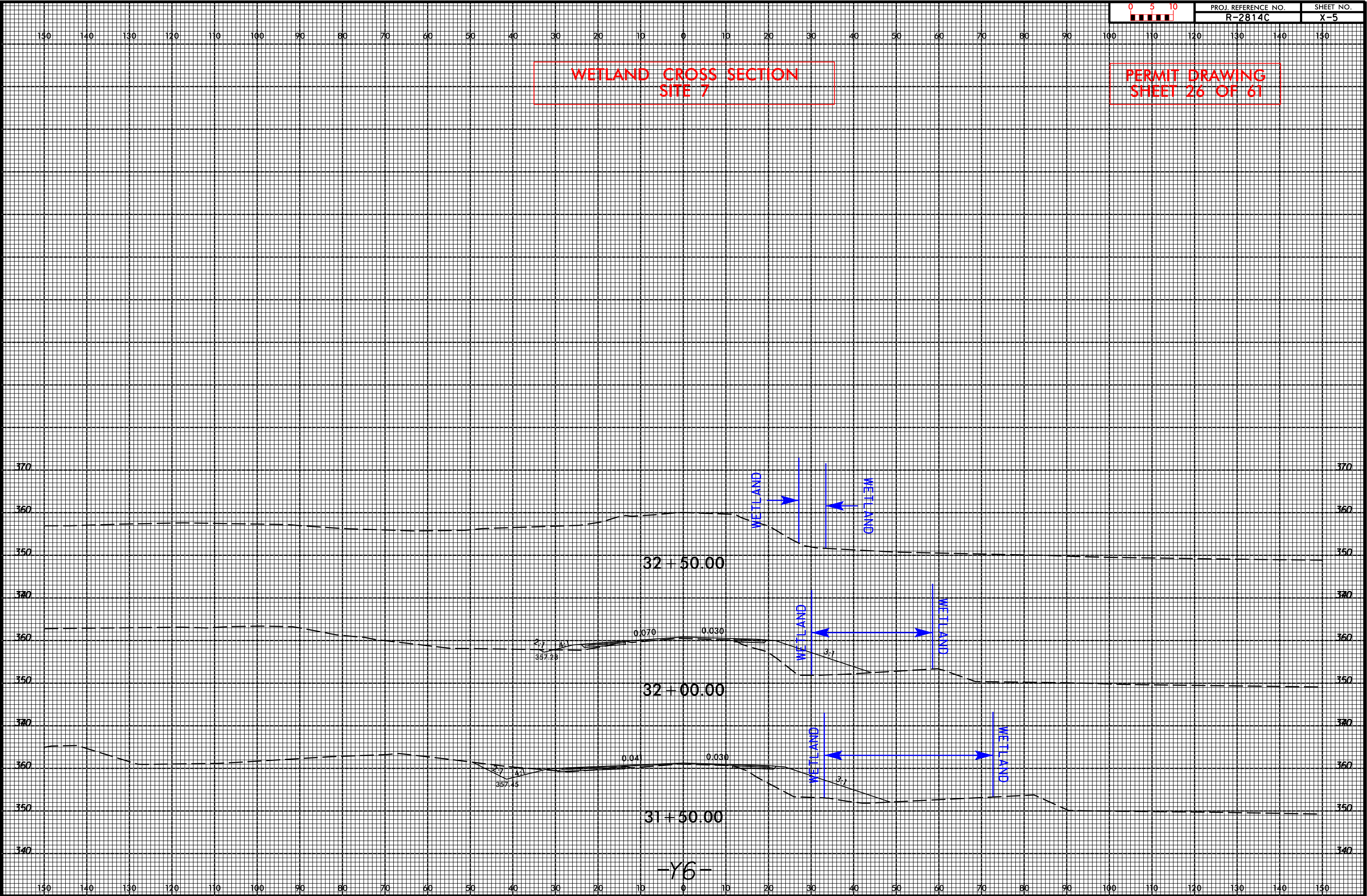
— 6'X7' RIP RAP PAD
2 TONS CL B
8 SY GEOTEXTILE

TOE PROTECTION
SEE DETAIL J

5/1/2015
tpincus
R: \Hydrau

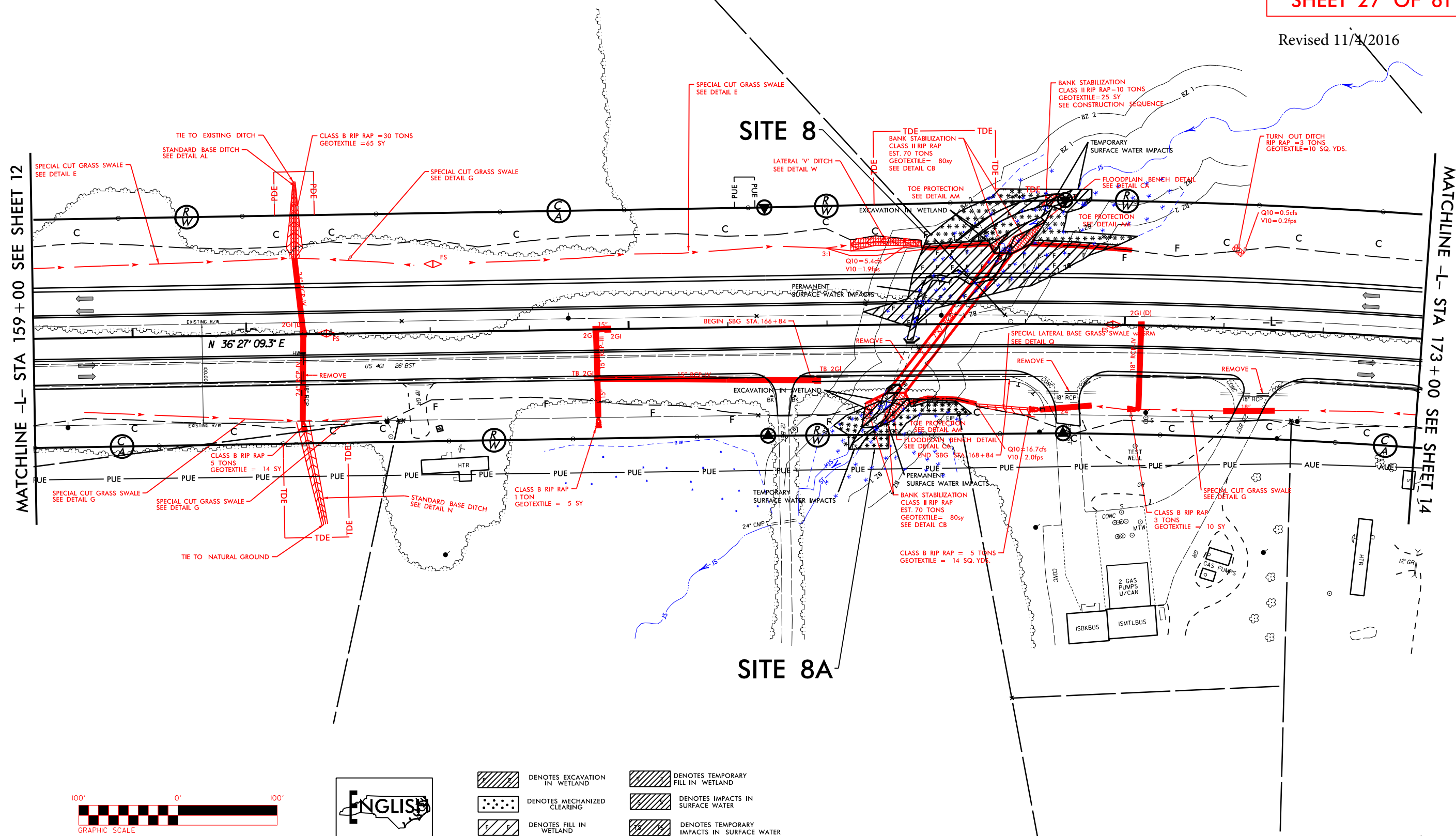
5/1/2015
I:\projects\2015\Drawings\Surface Water & Wetland - TP\Cross Sections\R2814C_XPL_V6\R2814C_Hyd_xpl_V6_cm_3.dgn
R:\HydroQuals\Permitting\Environmental\R2814C_PERMIT_2015\Drawings\Surface Water & Wetland - TP\Cross Sections\R2814C_XPL_V6\R2814C_Hyd_xpl_V6_cm_3.dgn
\$\$\$\$\$USERNAME\$\$\$\$\$

8/23/99



PROJECT REFERENCE NO.	SHEET NO.
R-2814C	13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Revised 11/4/2016



MATCHLINE -L- STA 173+00 SEE SHEET 14

SITE 8

SITE 8A

100' 0' 100'

GRAPHIC SCALE



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

REVISIONS

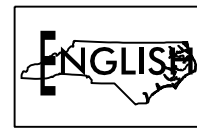
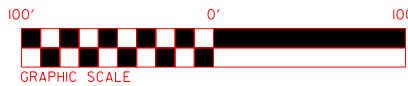
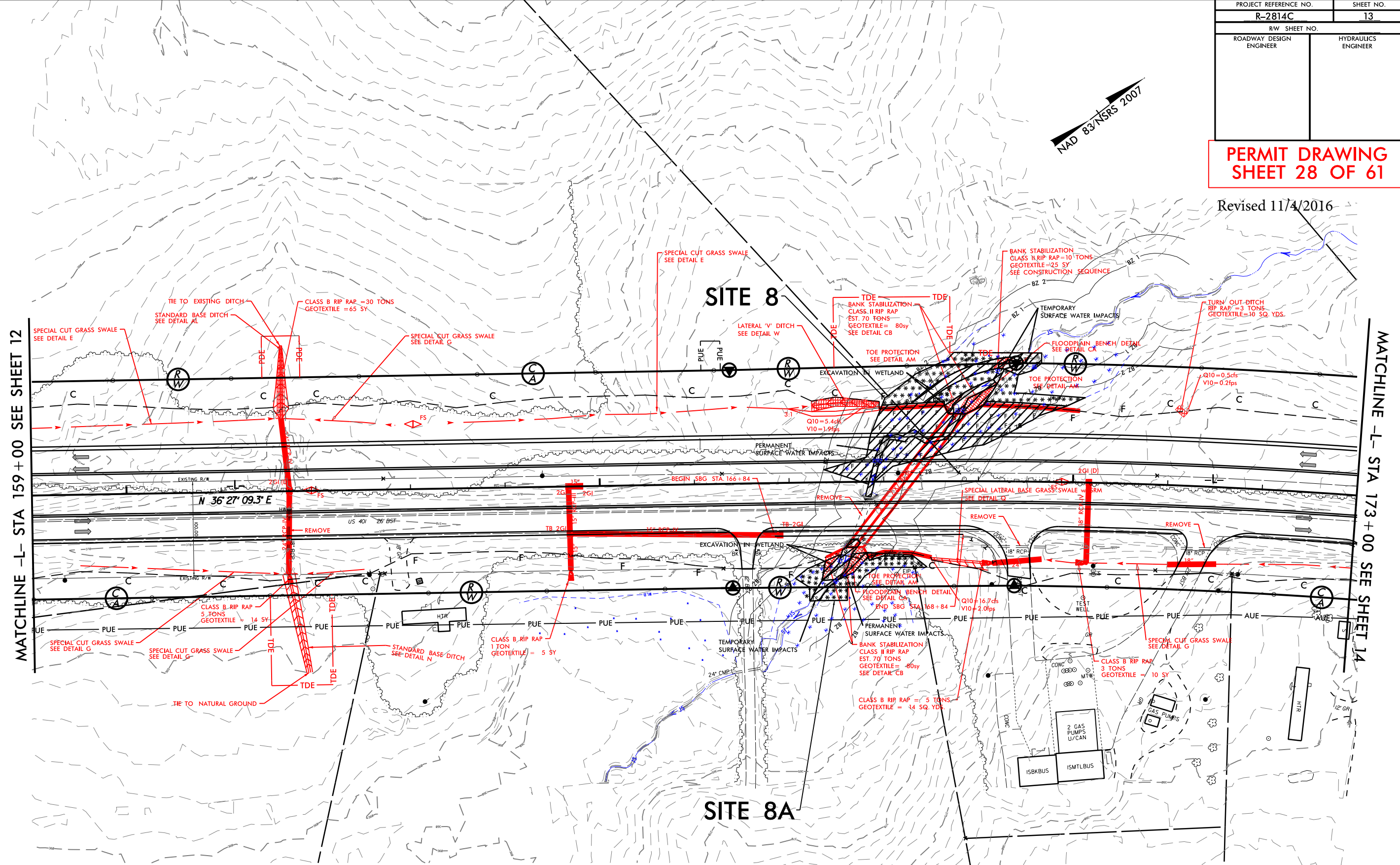
1/4/2016 11:42 AM R:\Hydraulics\Permits_Environmental\22814C_FEMT 2015 drawings\Surface Water & Wetland - working\22814C_Hyd_pym_wet_psh1.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2814C	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 28 OF 61

Revised 11/4/2016

NAD 83/NSRS 2007



- Denotes excavation in wetland
- Denotes temporary fill in wetland
- Denotes mechanized clearing
- Denotes impacts in surface water
- Denotes fill in wetland
- Denotes temporary impacts in surface water

REVISIONS

11/4/2016
English
R: Hydraulic Permits, Environmental (R2814C PERMIT 2015 drawings) Surface Water & Wetland - working (R2814C_Hyd_perm_wet_pah13.dgn)
\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$DESIGN\$\$\$\$\$
\$\$\$\$\$CADD\$\$\$\$\$
\$\$\$\$\$CHECK\$\$\$\$\$
\$\$\$\$\$DRAWING\$\$\$\$\$

8/17/99

REVISIONS

11/4/2016
R:\Hydraulics\Permits Environmental\R2814C PERMIT 2015 Drawings\Surface Water & Wetland - working\R2814C_Hyd_prm_wet_psh13_Zoom.dgn

11/4/2016

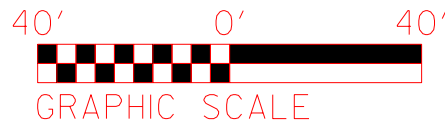
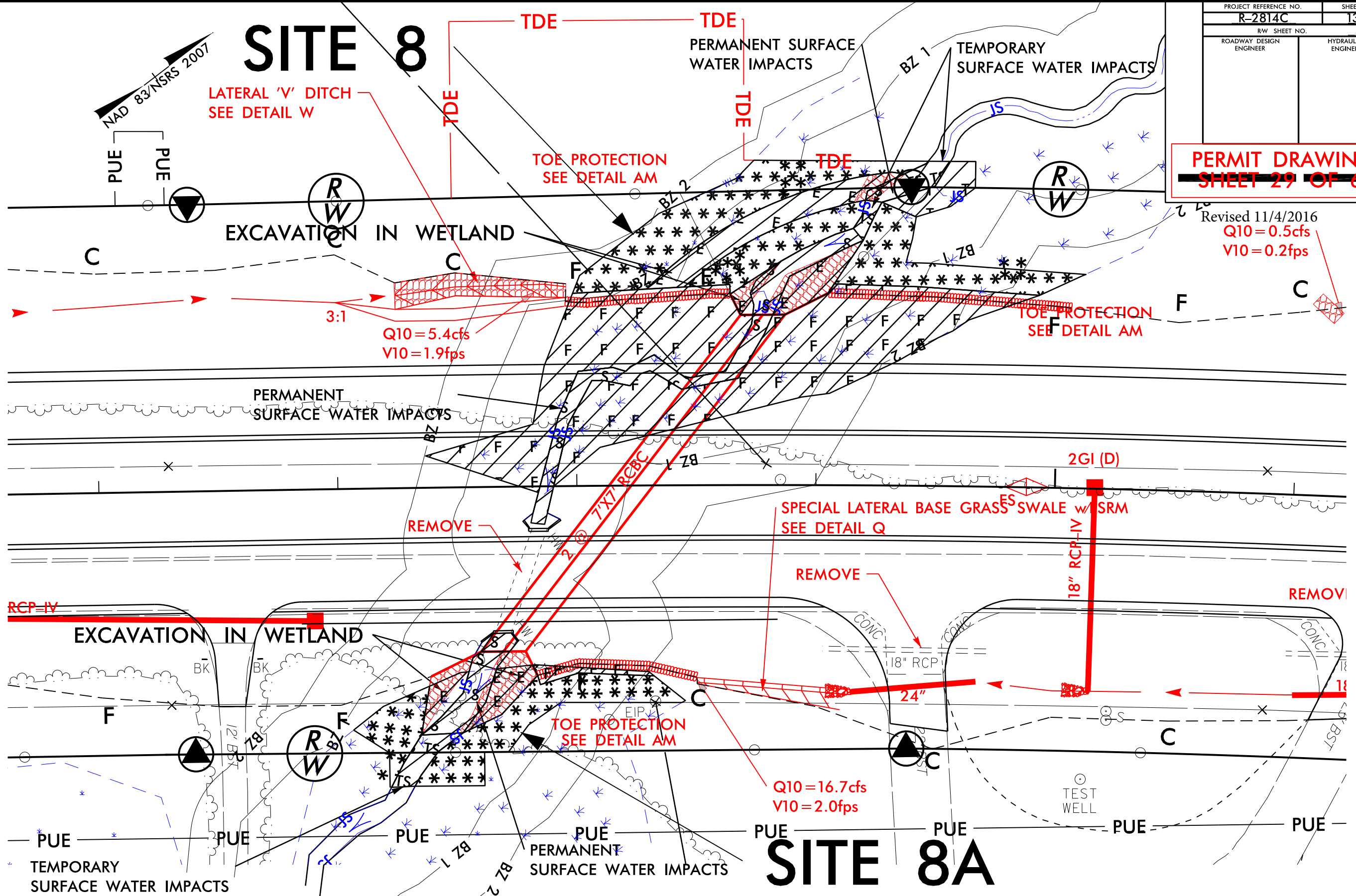
Imjoins

R:\Hydraulics\Permits Environmental\R2814C PERMIT 2015 Drawings\Surface Water & Wetland - working\R2814C_Hyd_prm_wet_psh13_Zoom.dgn

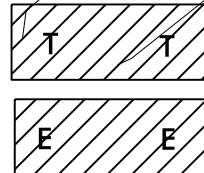
PROJECT REFERENCE NO.	SHEET NO.
R-2814C	13A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 29 OF 61

Revised 11/4/2016
Q10 = 0.5cfs
V10 = 0.2fps

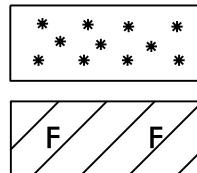


GRAPHIC SCALE



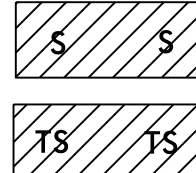
T DENOTES TEMPORARY
FILL IN WETLAND

E DENOTES EXCAVATION
IN WETLAND



* * * * * DENOTES MECHANIZED
CLEARING

F DENOTES FILL IN
WETLAND

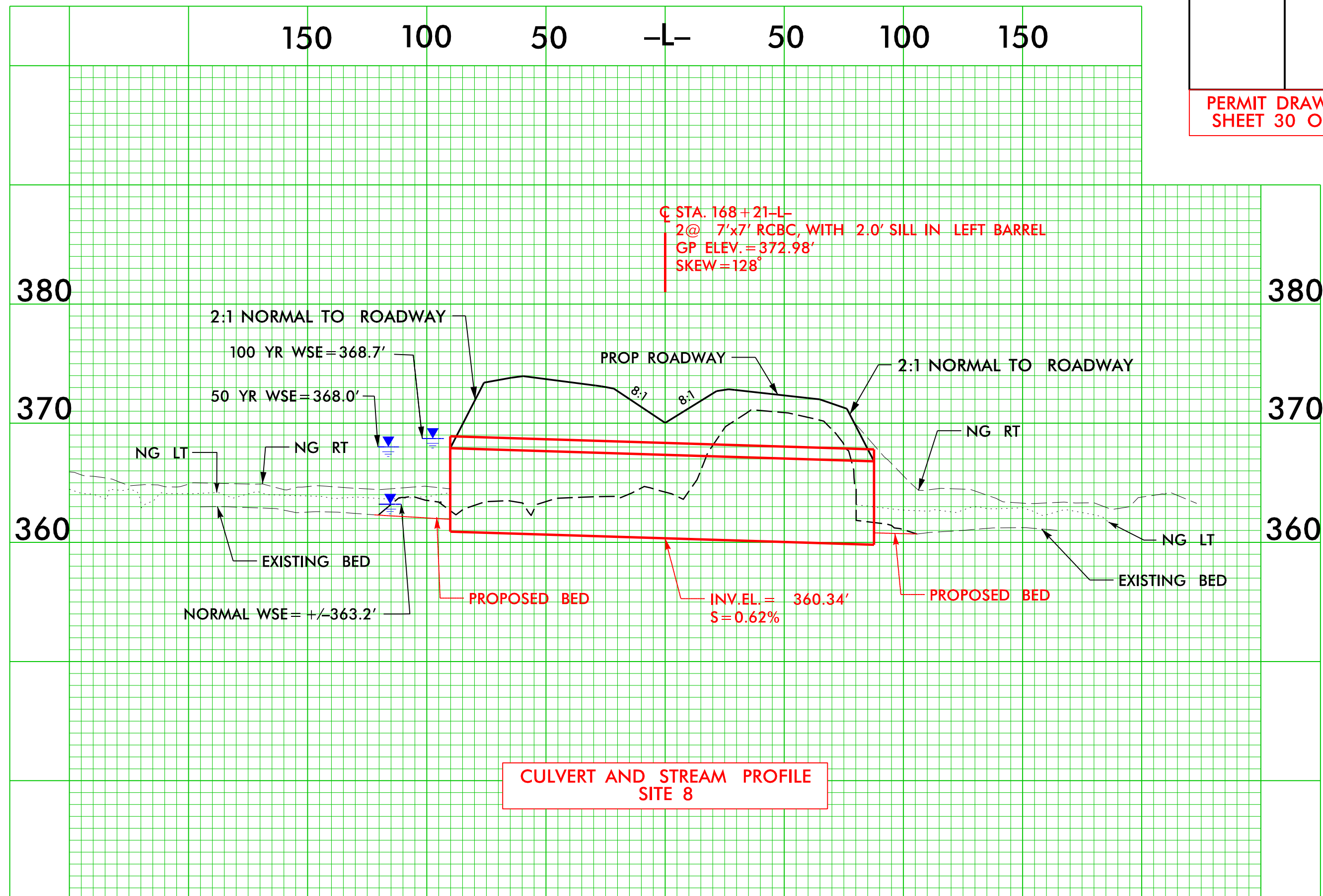


S DENOTES IMPACTS IN
SURFACE WATER

TS DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

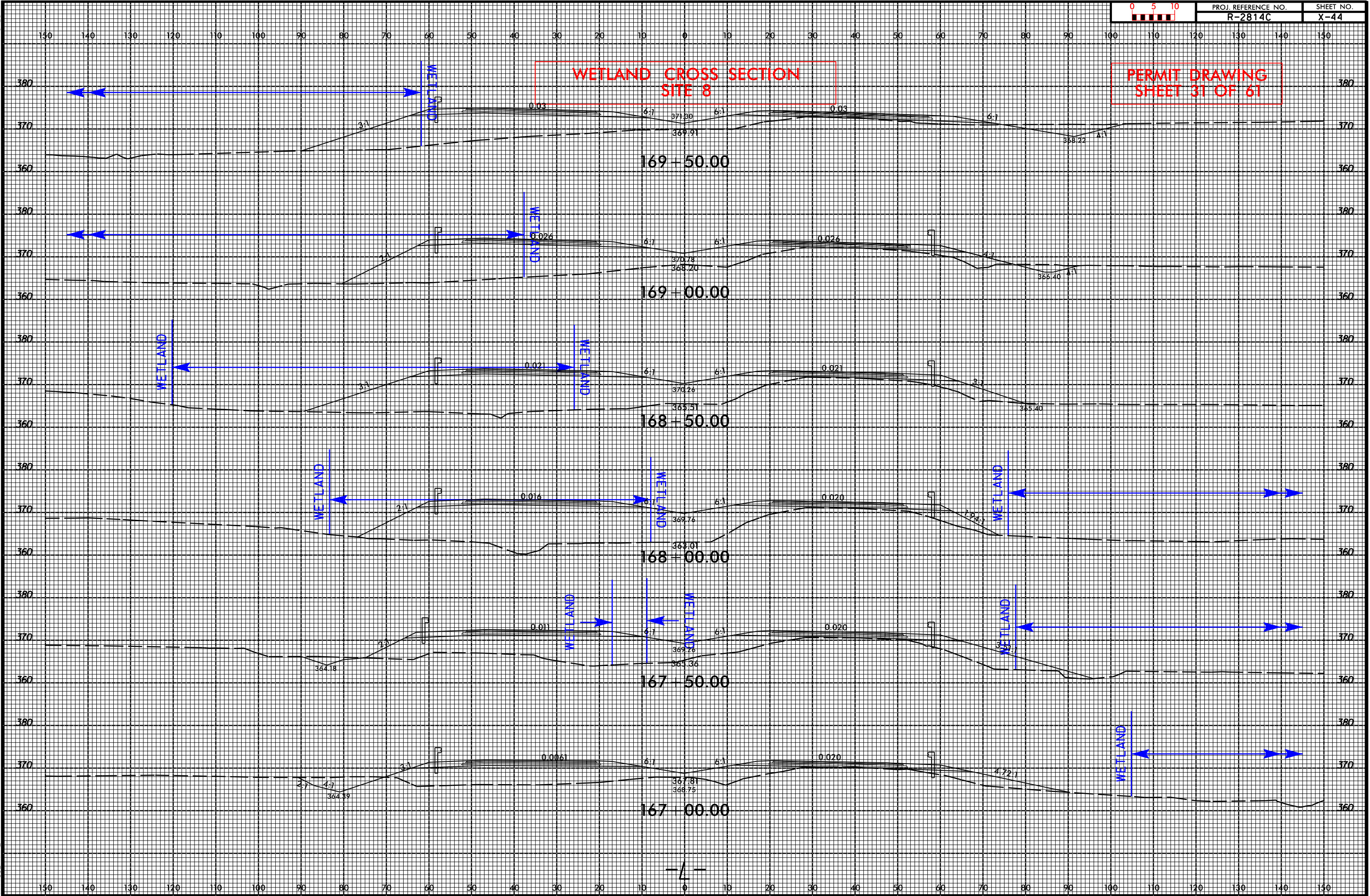
GEOTEXTILE = 10 BY

PERMIT DRAWING
SHEET 30 OF 61



5/11/2015
I:\projects\2015\Drawings\2015\Drawings\Surface Water & Wetland - TP\Cross Sections\R2814C_Hyd_vpl_cm_11.dgn
R:\projects\2015\Drawings\2015\Drawings\Surface Water & Wetland - TP\Cross Sections\R2814C_Hyd_vpl_cm_11.dgn
\$\$\$\$\$USERNAME\$\$\$\$\$

8/23/99

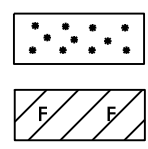
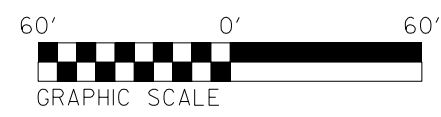
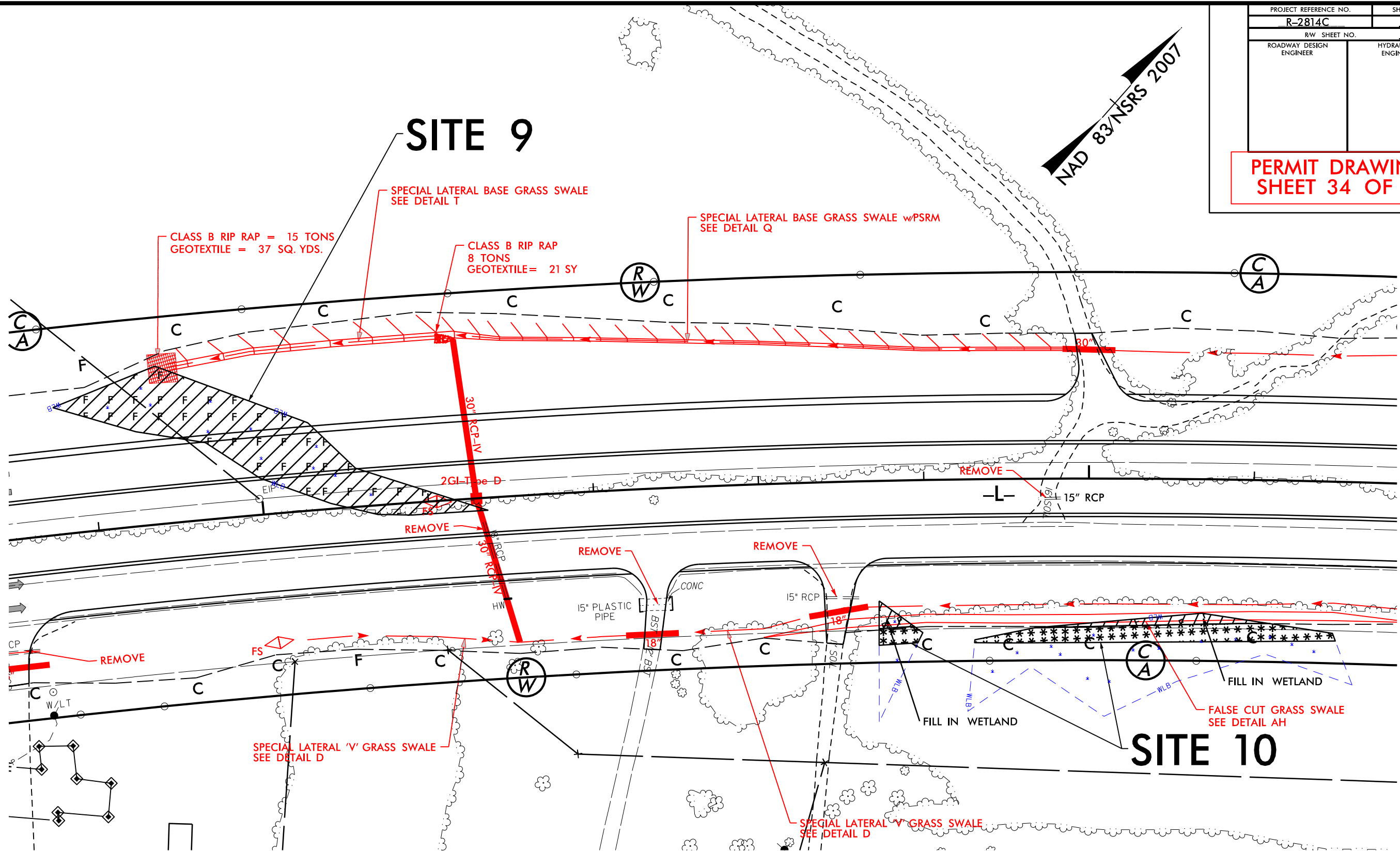


5/1/2015
R:\Hydraulics\Permits_Environmental\R2814C
PERMIT 2015\Drawings\Surface Water & Wetland - TP\R2814C_Hyd_prm_wet_psh14_Zoom.dgn
8/17/99

REVISIONS

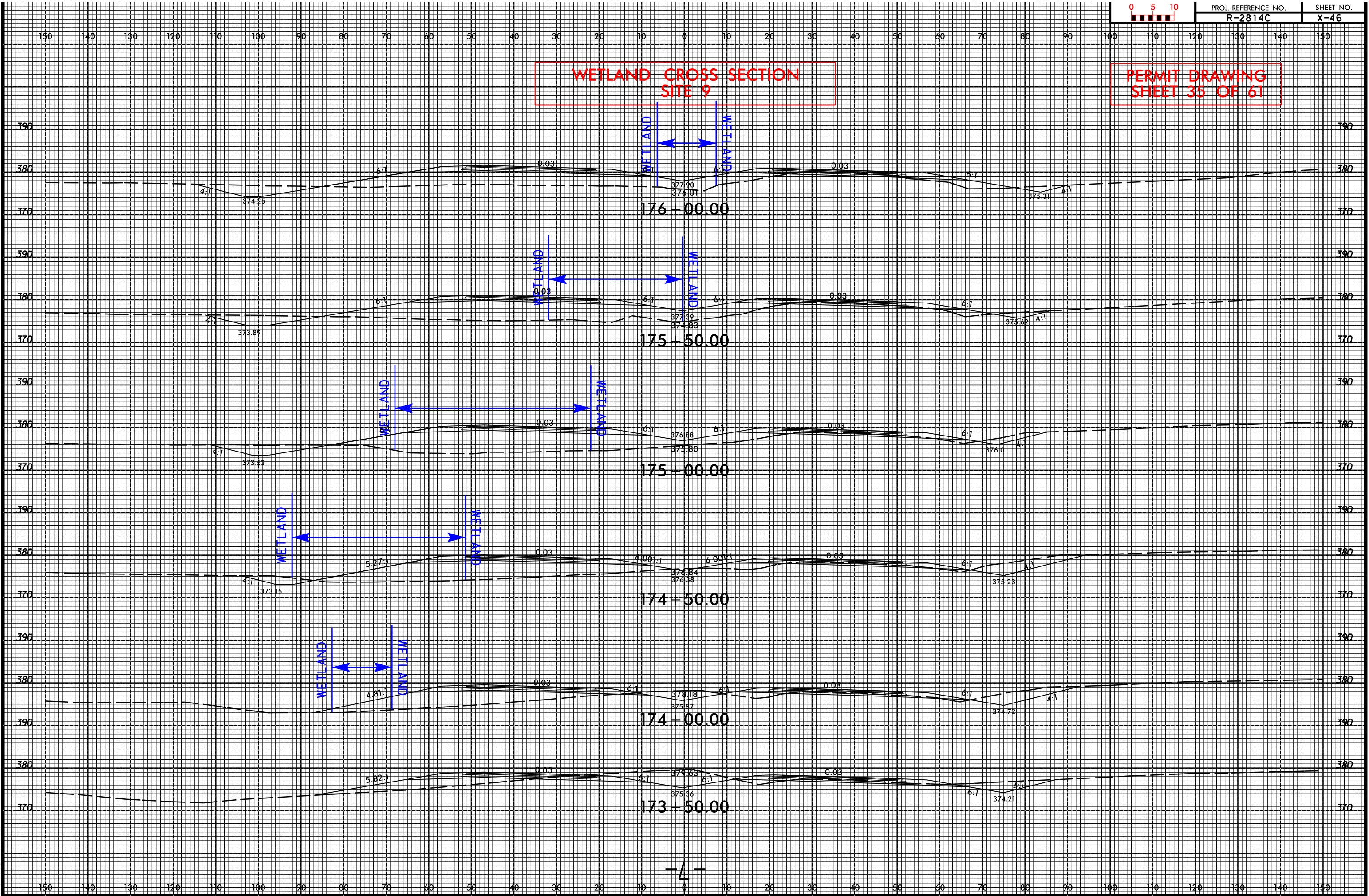
PROJECT REFERENCE NO.	SHEET NO.
R-2814C	14A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 34 OF 61



DENOTES MECHANIZED
CLEARING

DENOTES FILL IN
WETLAND

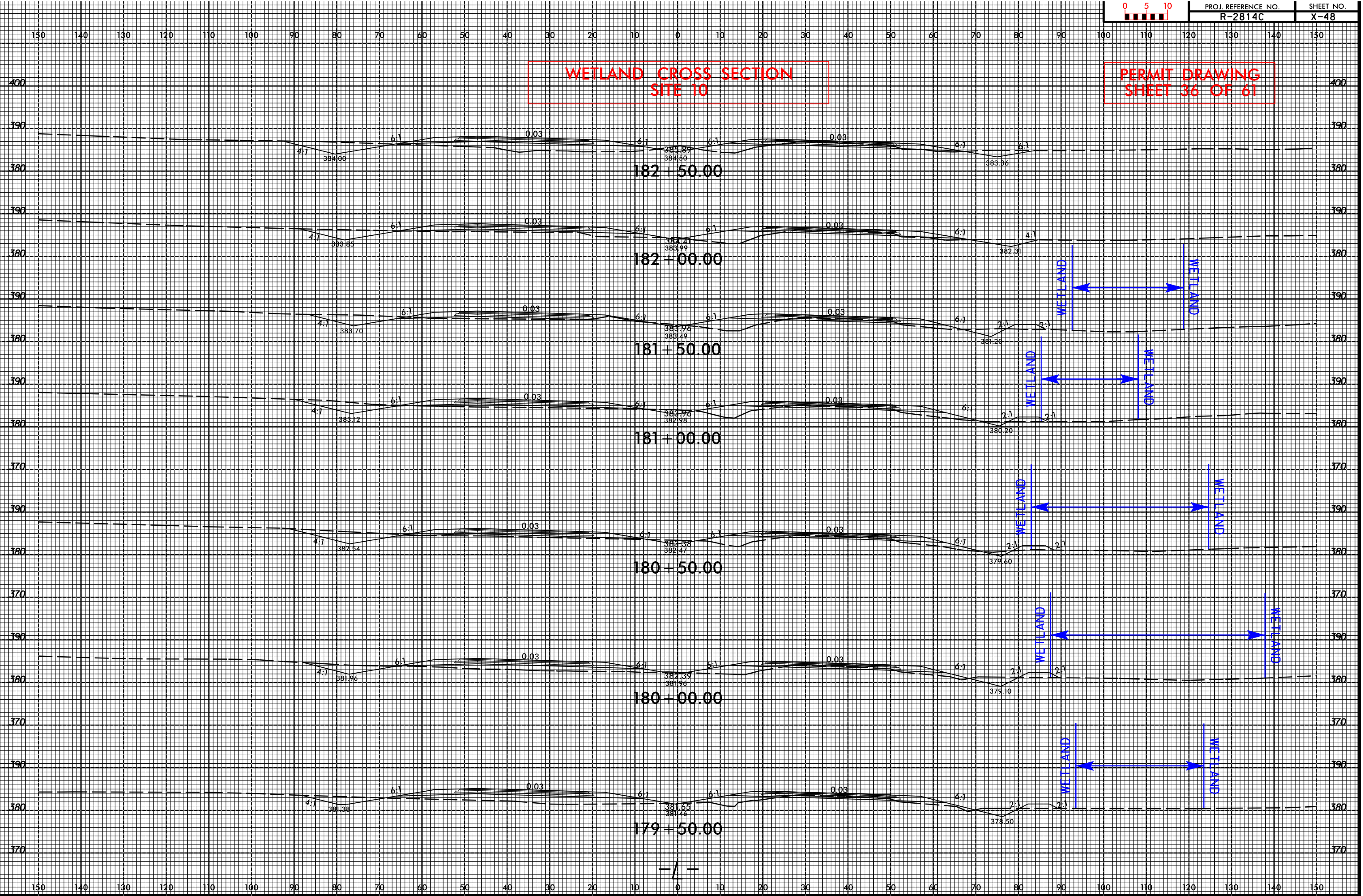


5/12/2015

\\pcus01\projects\Environmental\R2814C PERMIT 2015\Drawings\Surface Water & Wetland - TP\Cross Sections\R2814C_Hyd_xpl_cm_14.dgn

\$\$\$\$\$USERNAME\$\$\$\$\$

8/23/99



WETLAND CROSS SECTION
SITE 10

PERMIT DRAWING
SHEET 36 OF 61

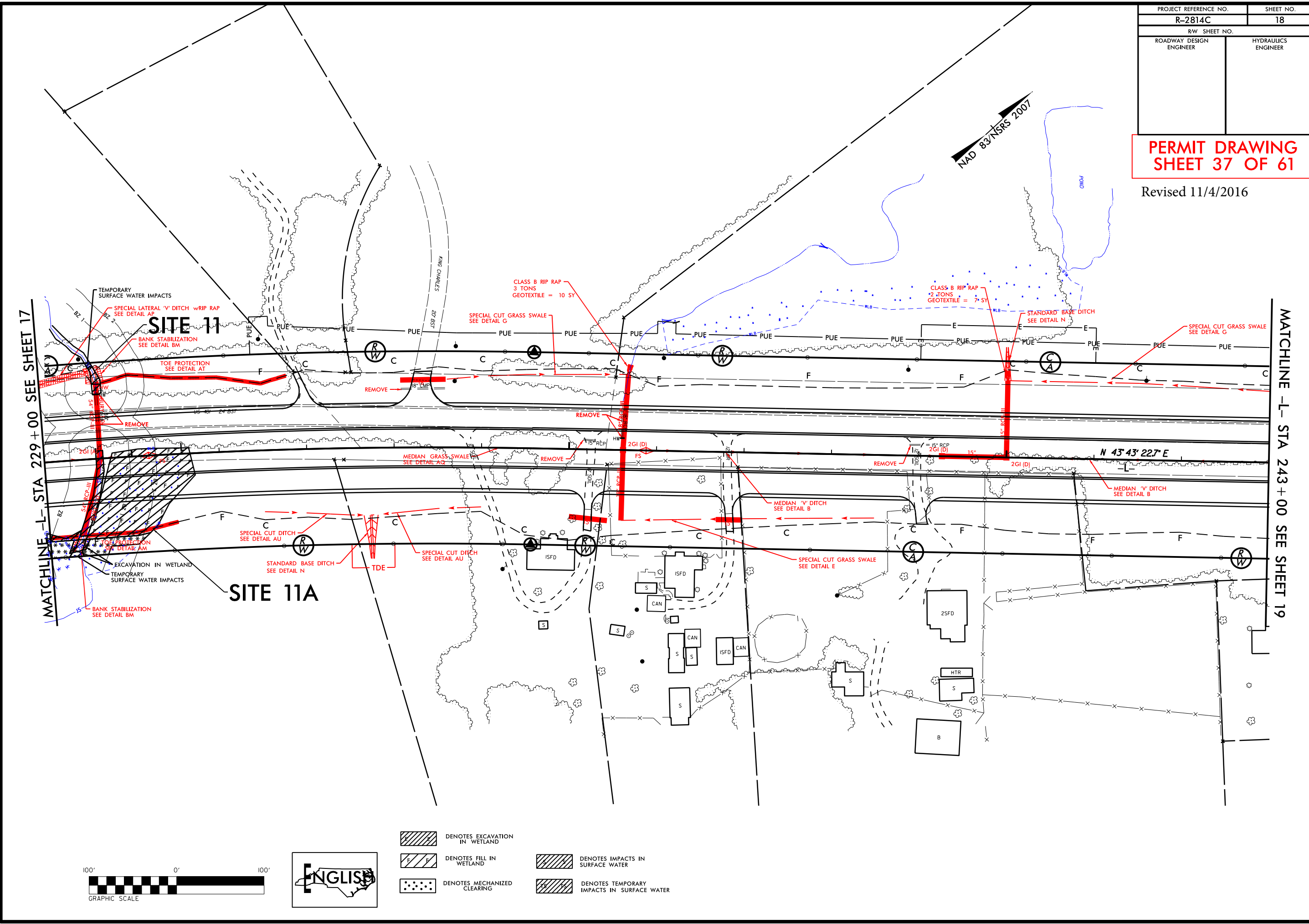


PROJ. REFERENCE NO.	SHEET NO.
R-2814C	X-48

PROJECT REFERENCE NO.	SHEET NO.
R-2814C	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

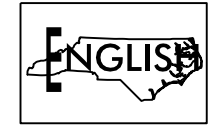
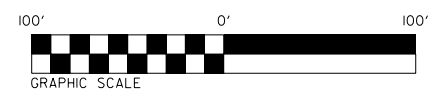
PERMIT DRAWING
SHEET 37 OF 61

Revised 11/4/2016



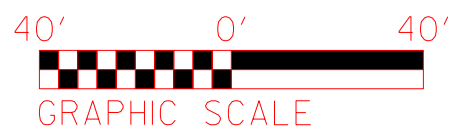
REVISIONS

11/4/2016
R:\Hydraulics\Permits\Environmental\R2814C PERMIT 2015\drawings\Surface Water & Wetland - working\R2814C_Hyd_perm_wet_psh18.dgn
\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$DESIGNED\$\$\$\$\$
\$\$\$\$\$DRAWN\$\$\$\$\$
\$\$\$\$\$CHECKED\$\$\$\$\$
\$\$\$\$\$APPROVED\$\$\$\$\$



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

Revised 11/4/2016



NAD 83/NRS 2007

— BZ 2 — STA 229 + 00 SEE SHEET 11

SITE 11

— BANK STABILIZATION
SEE DETAIL BM

TOE PROTECTION
SEE DETAIL AT

— SPECIAL LATERAL 'V' DITCH w/RIP RAP
➤ SEE DETAIL AP

REMOVE

MEDIAN GRASS SWALE
SEE DETAIL AQ

SPECIAL CUT DITCH
SEE DETAIL AU

SPECIAL CUT DITCH -
SEE DETAIL AU

STANDARD BASE DITCH
SEE DETAIL N

TOE PROTECTION
SEE DETAIL AM

**BANK STABILIZATION
SEE DETAIL BM**

EXCAVATION IN WETLAND
TEMPORARY
SURFACE WATER IMPACTS

SITE 11A



DENOTES EXCAVATION
IN WETLAND

DENOTES MECHANIZED
CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN
SURFACE WATER

DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

REVISIONS

ings\Surface Water & Welland - working\B2814C_Hyd_prm_wet_psh18_Zoom.dgn

```
11/4/2016
Injoints
R:\Hydraulics\Permits_Environmental\R2814C_PERMIT 2015.d
$$$SYTIME$$$
$$$DON$$$
$$$DISNAME$$$
```



SITE 12

NAD 83/NSRS 2007

WATCH.

STA 285 + 00 SEE SHEET 22

SPECIAL LATERAL V DITCH
WITH RIP RAP
SEE DETAIL D

DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

TEMPORARY SURFACE WATER IMPACTS

40' 0' 40'



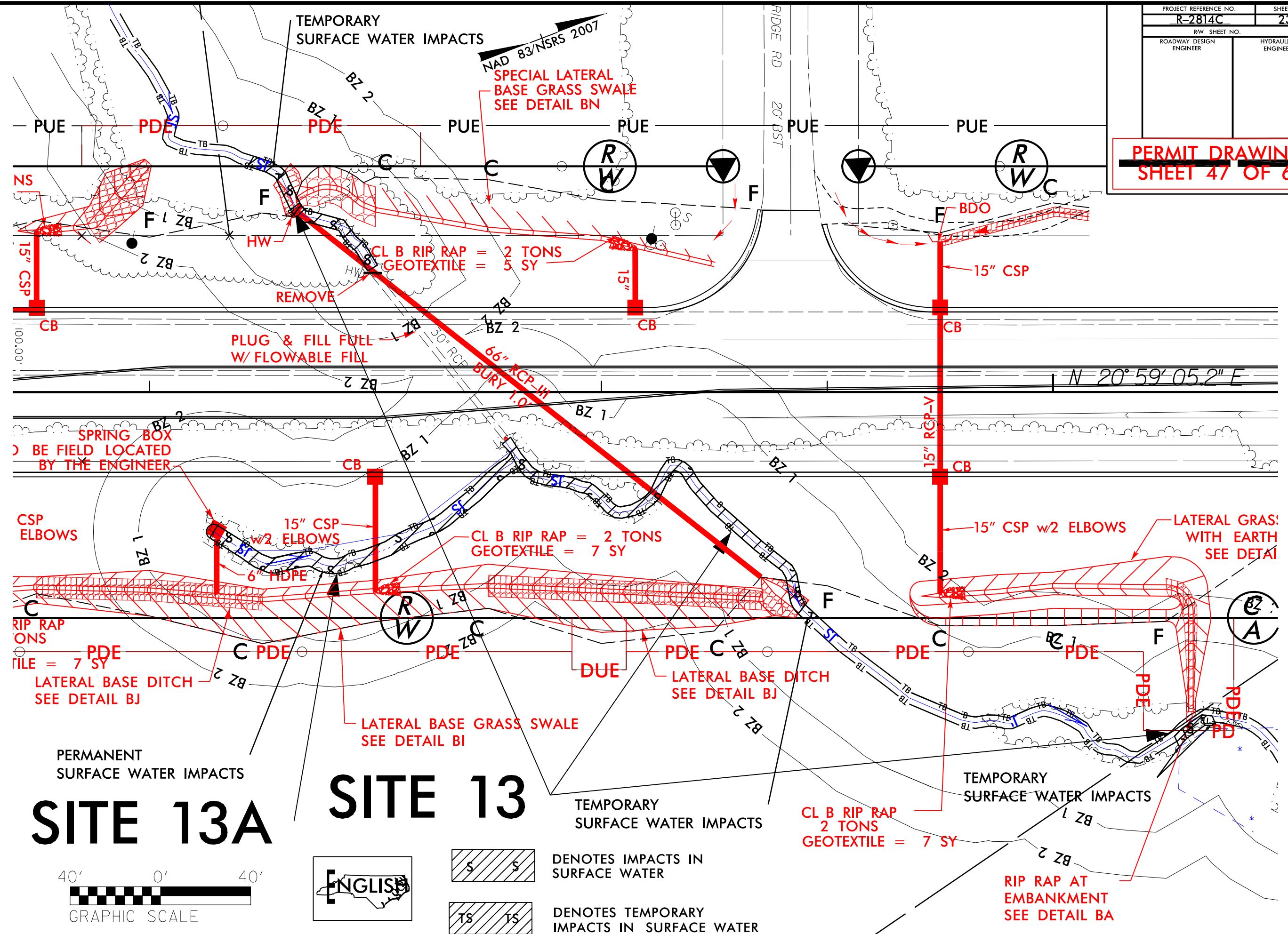
GRAPHIC SCALE



REVISIONS

		05/11/2015	Permit R2814C Hyd prj_wet_psh21 Zoom.dgn R2814C Hyd prj_wet_psh21 Zoom.dgn Hydraulics Permits Environmental R2814C Water & Wetland - TPI_R2814C_Hyd_prj_wet_psh21_Zoom.dgn Surface Water & Wetland - TPI_R2814C_Hyd_prj_wet_psh21_Zoom.dgn
--	--	------------	--

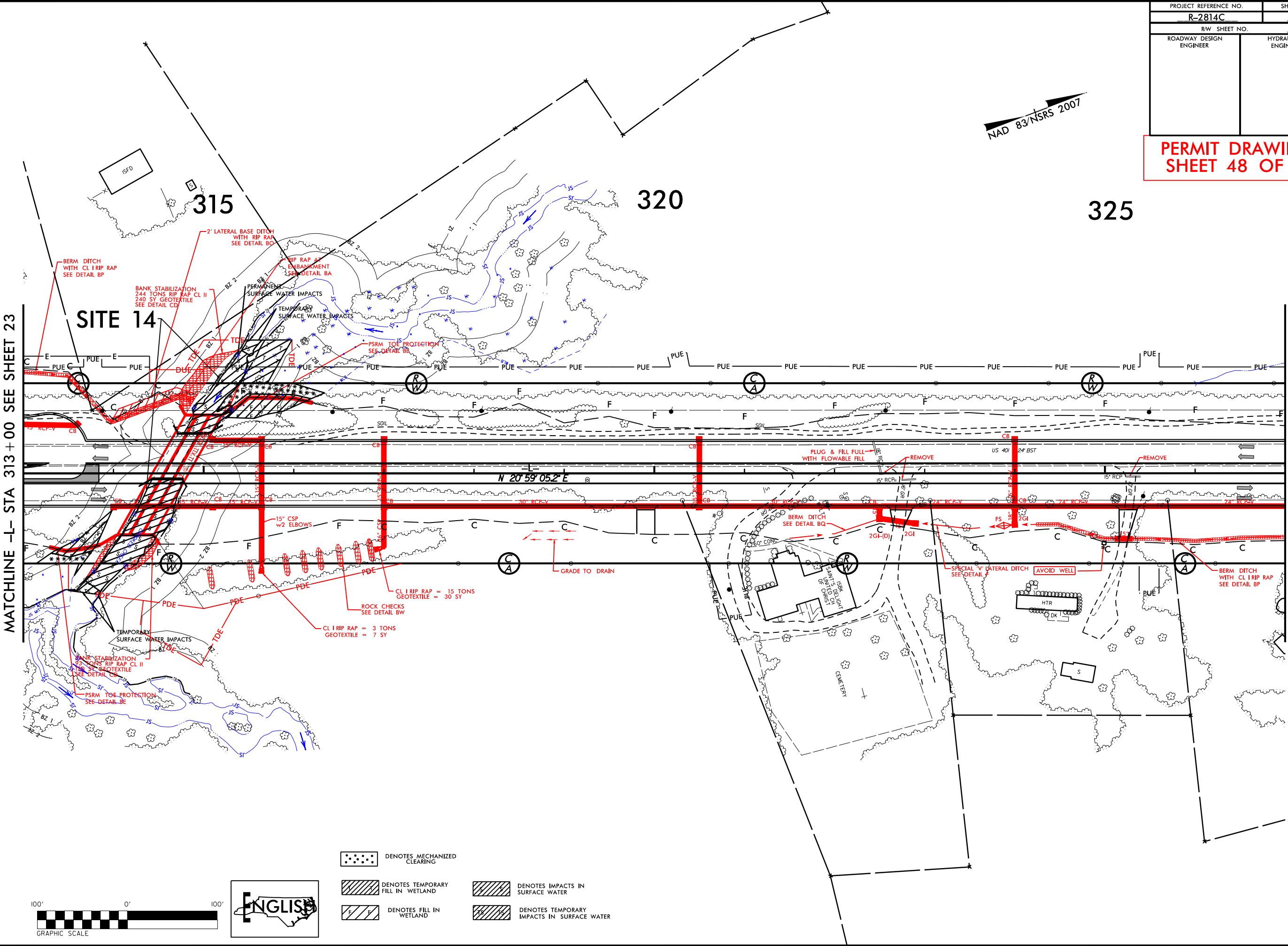
5/1/2015



PROJECT REFERENCE NO.	SHEET NO.
R-2814C	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 48 OF 61

NAD 83/NSRS 2007



REVISIONS

Water & Wetland - TP (2814C_Hyd.grm_wet.pdf)24.dgn

5/12/2015

R:\Hydraulics\Permits\Environmental\2814C PERMIT 2015\drawings\Surface

\$\$\$\$\$SYTIME\$\$\$\$\$

\$\$\$\$\$SYTIME\$\$\$\$\$

\$\$\$\$\$SYTIME\$\$\$\$\$

\$\$\$\$\$SYTIME\$\$\$\$\$

\$\$\$\$\$SYTIME\$\$\$\$\$

\$\$\$\$\$SYTIME\$\$\$\$\$

\$\$\$\$\$SYTIME\$\$\$\$\$

\$\$\$\$\$SYTIME\$\$\$\$\$

\$\$\$\$\$SYTIME\$\$\$\$\$

\$\$\$\$\$SYTIME\$\$\$\$\$

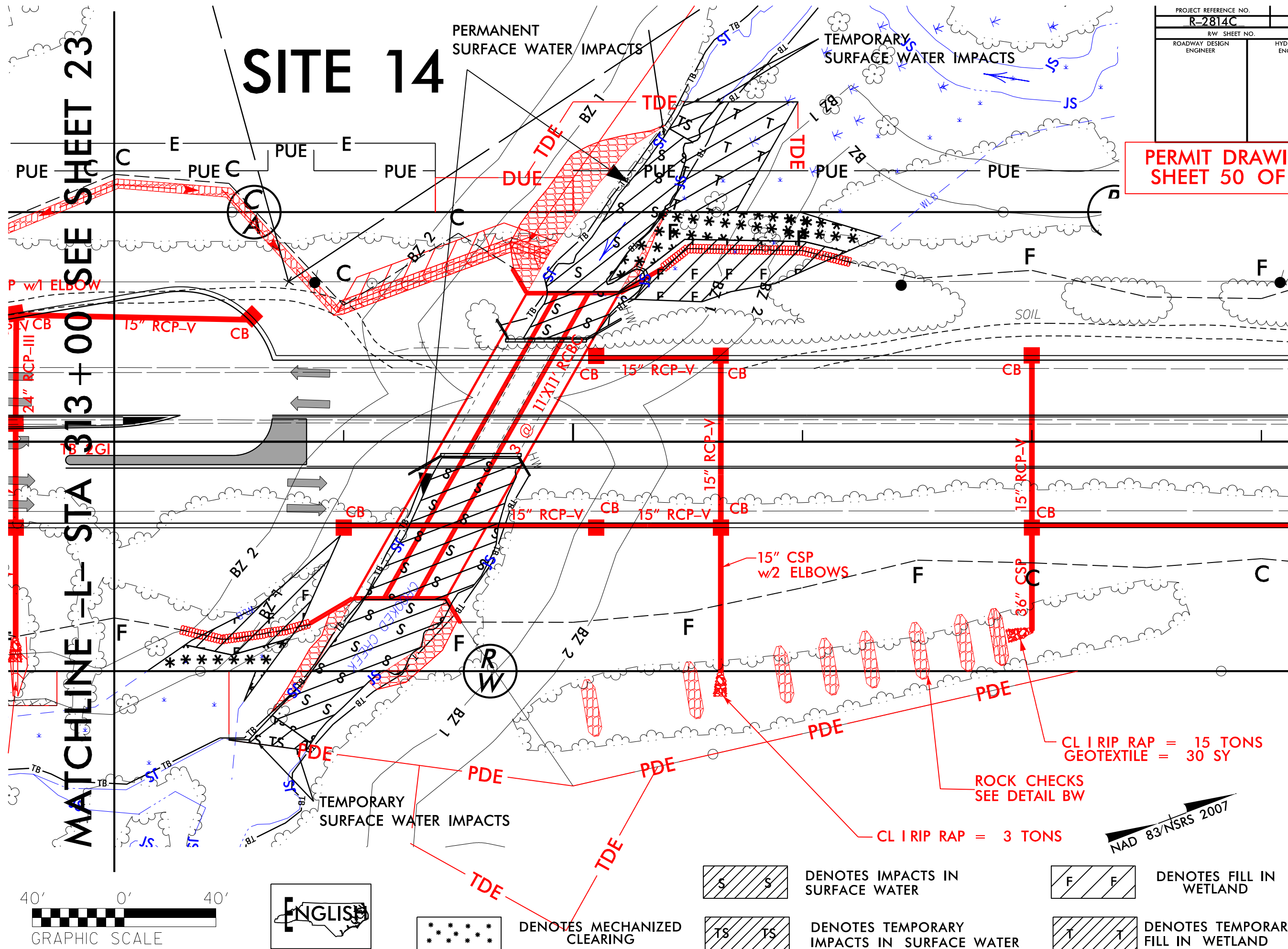
\$\$\$\$\$SYTIME\$\$\$\$\$

\$\$\$\$\$SYTIME\$\$\$\$\$

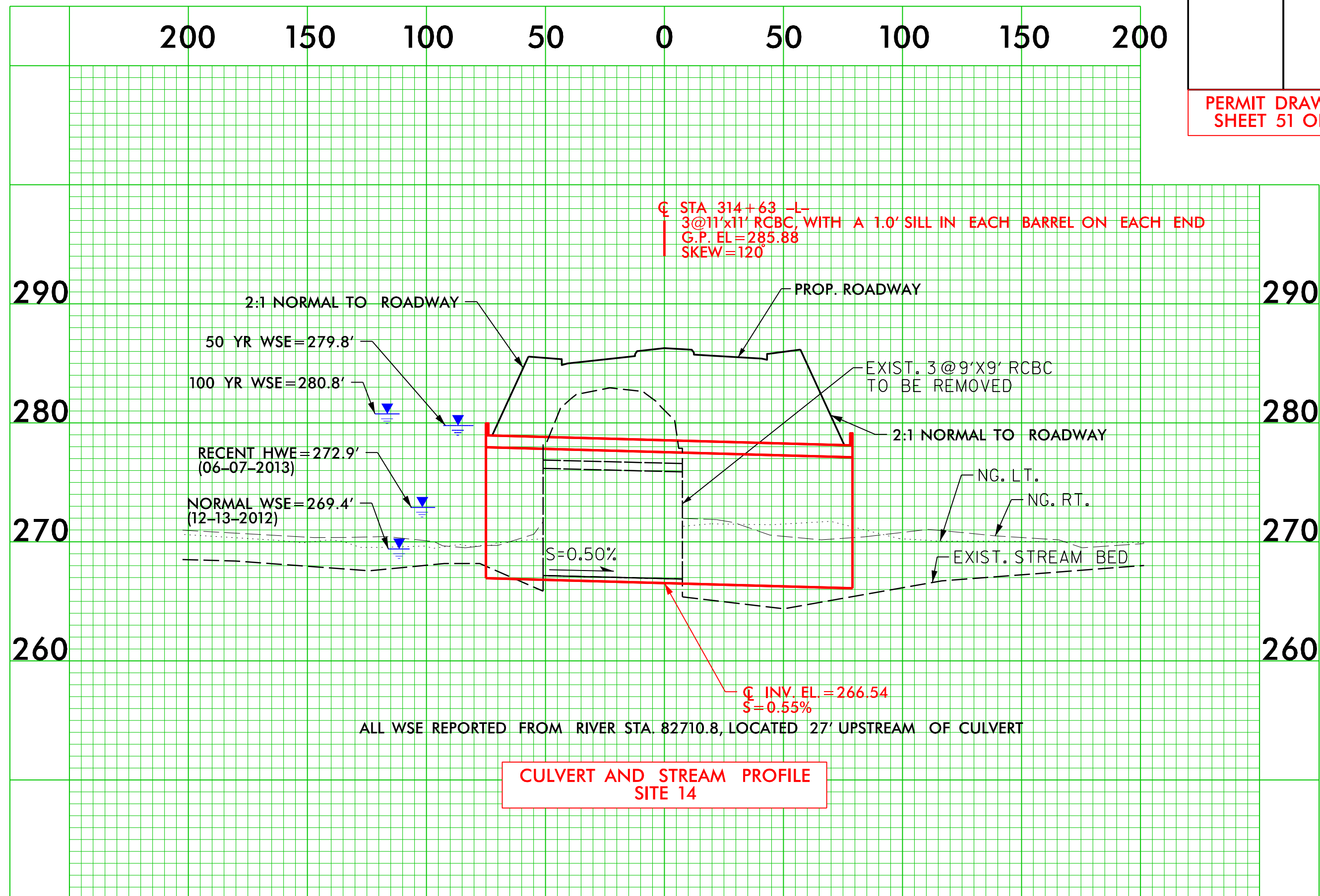
PERMIT DRAWING
SHEET 50 OF 61

SITE 14

MATCHLINE -L- STA 13+00 SEE SHEET 23

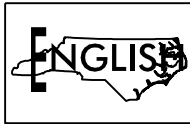
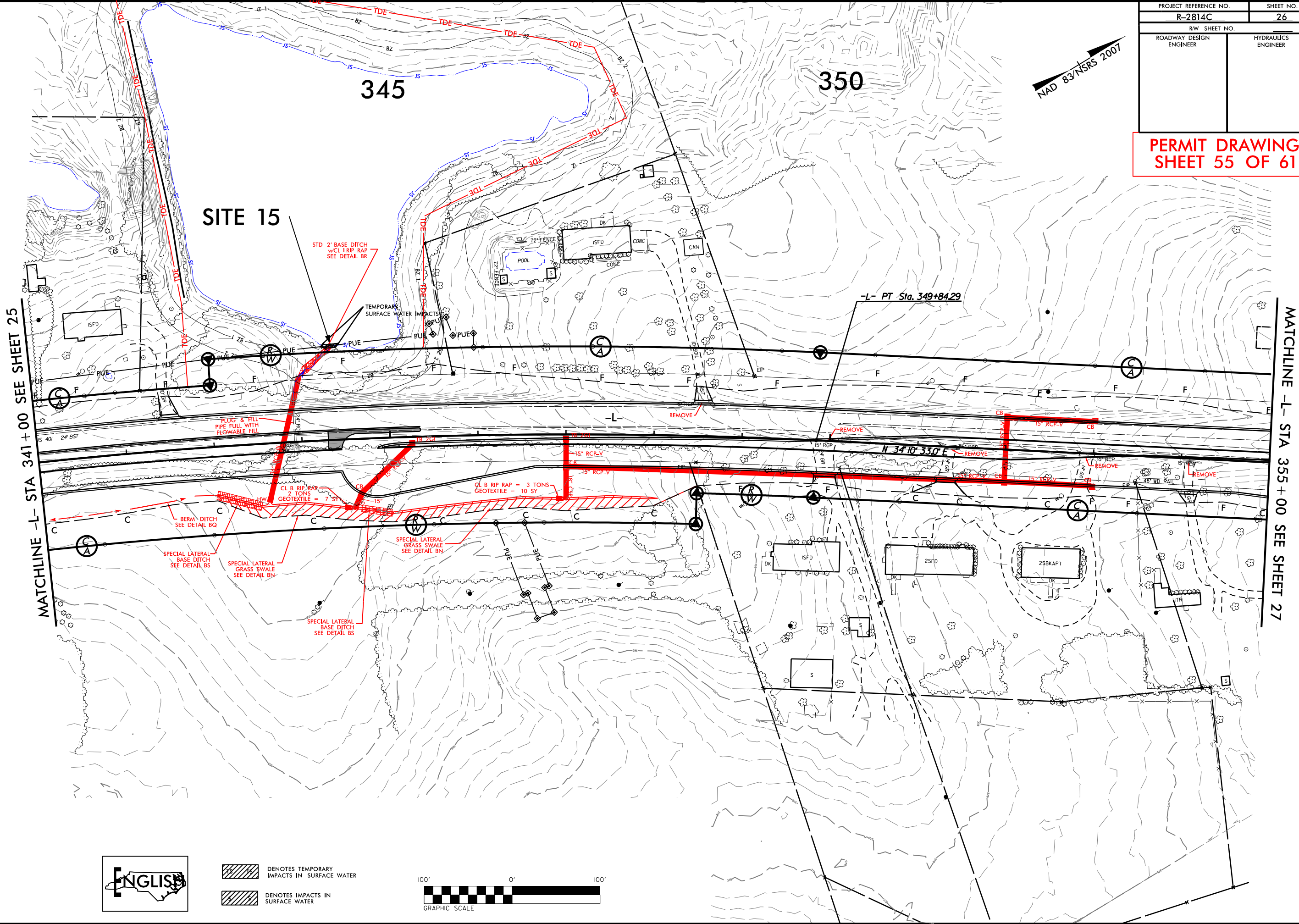
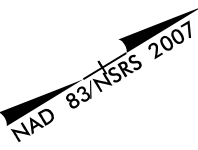


PERMIT DRAWING
SHEET 51 OF 61

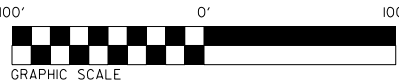


PROJECT REFERENCE NO.	SHEET NO.
R-2814C	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 55 OF 61



- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER



SITE 15

STD 2' BASE DITCH
w/CL I RIP RAP
SEE DETAIL BR

TEMPORARY SURFACE WATER IMPACTS

**PLUG & FILL-
PIPE FULL WITH
FLOWABLE FILL**

— BERM DITCH
SEE DETAIL BQ

**SPECIAL LATERAL-
BASE DITCH
SEE DETAIL BS**

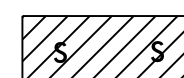
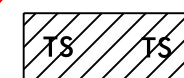
**SPECIAL LATERAL
GRASS SWALE
SEE DETAIL BN**

CL B RIP RAP
2 TONS
GEOTEXTILE = 7 SY

**SPECIAL LATERAL
GRASS SWALE
SEE DETAIL BN**

CL B RIP RAP = 3 TONS-
GEOTEXTILE = 10 SY

DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

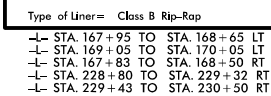
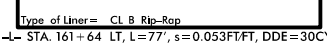
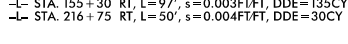
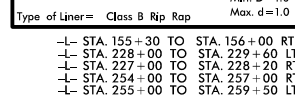
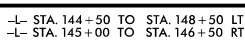
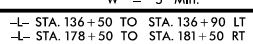
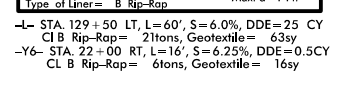
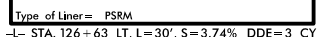
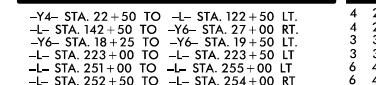
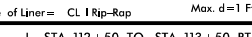
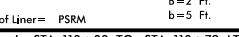
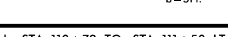
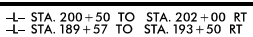
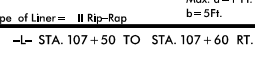
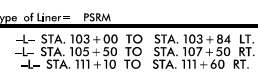
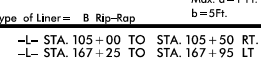
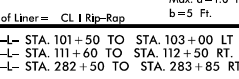
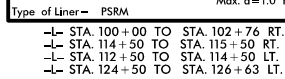
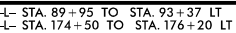
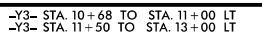
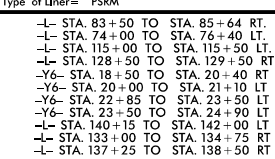
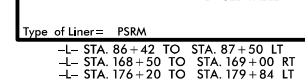
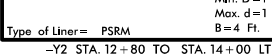
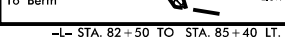
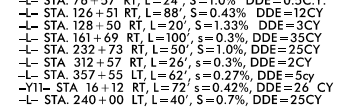
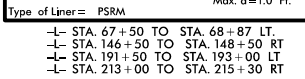
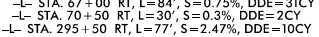
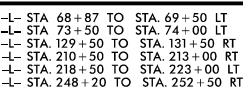
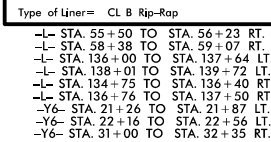
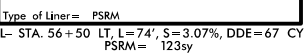
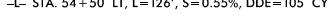
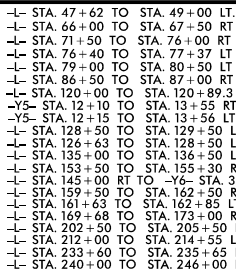
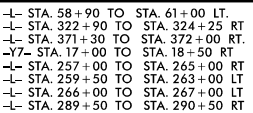
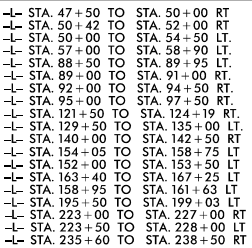
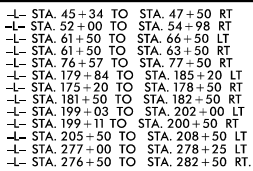
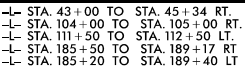
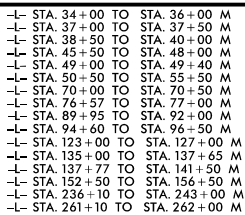
DENOTES IMPACTS IN
SURFACE WATER

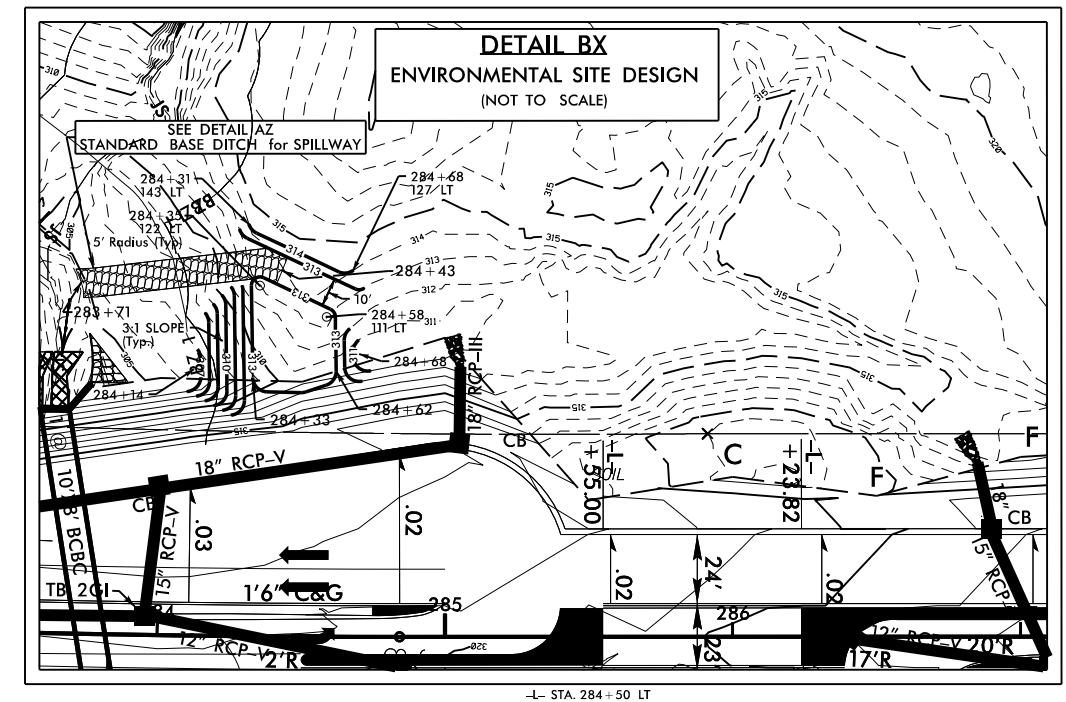
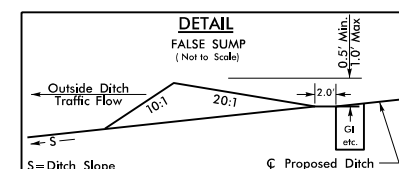
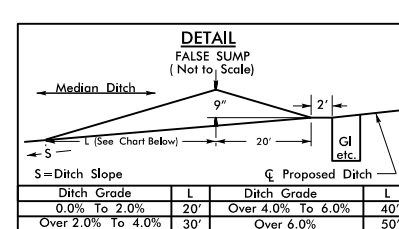
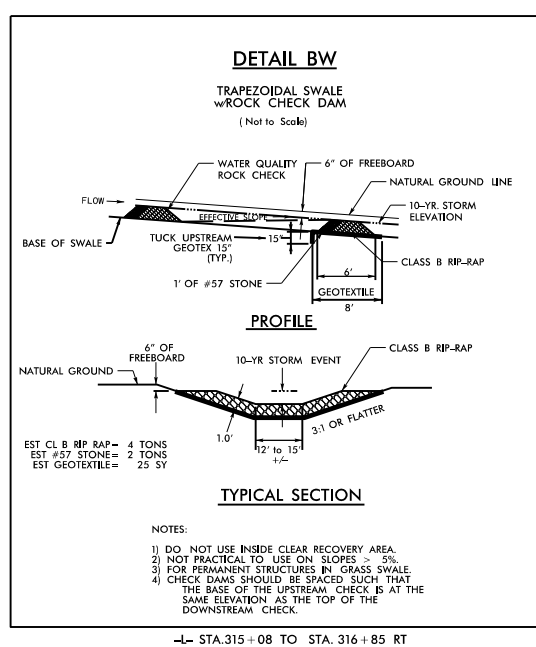
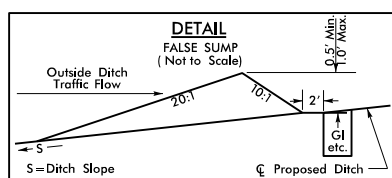
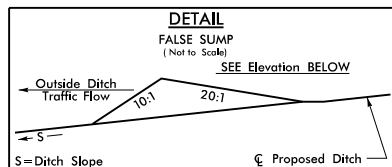
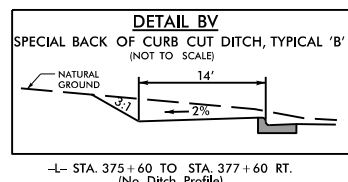
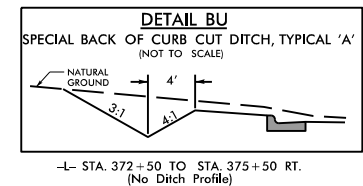
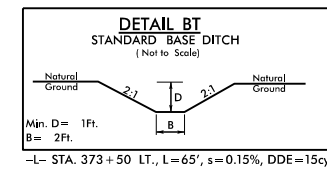
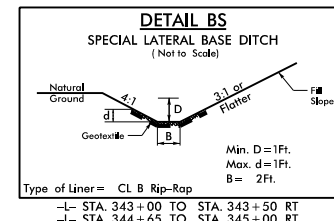
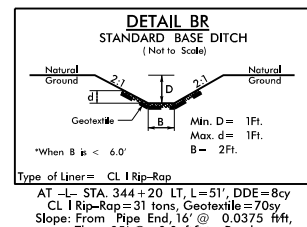
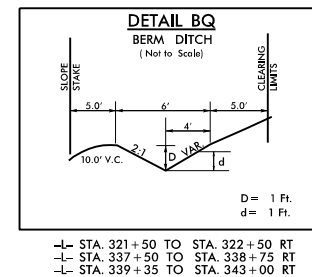
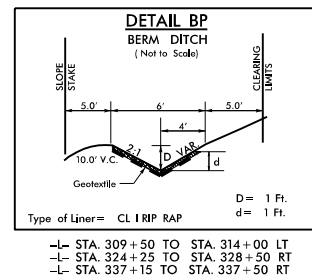
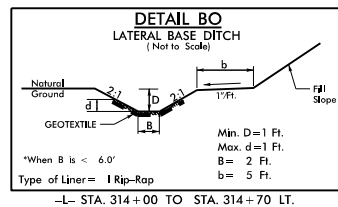
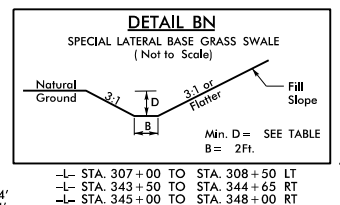
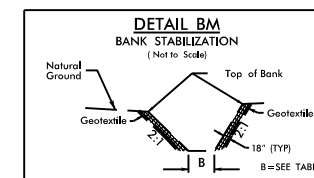
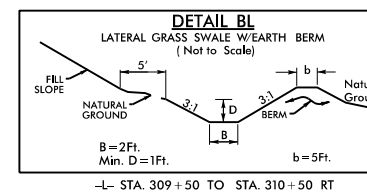
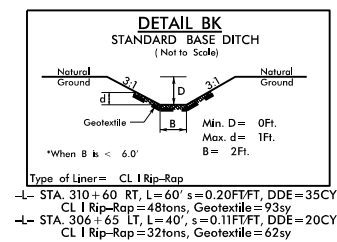
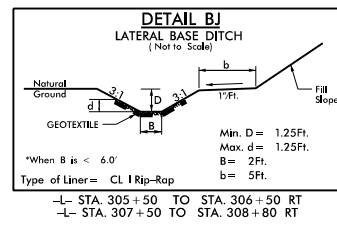
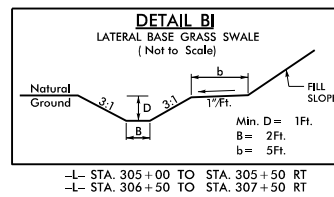
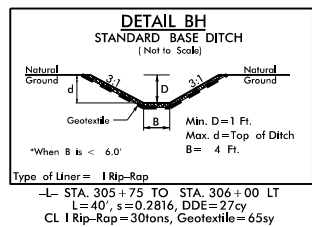
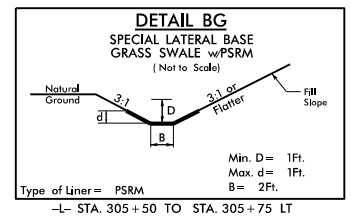
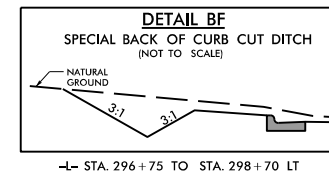
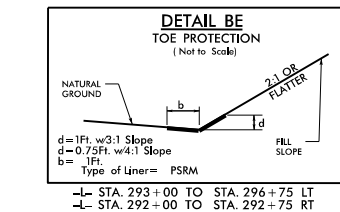
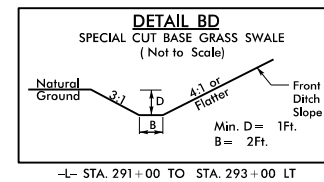
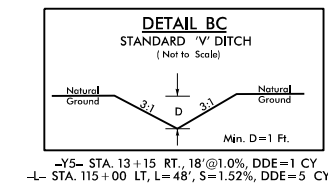
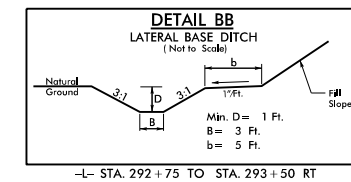
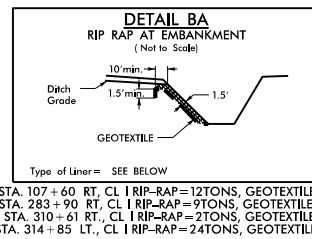
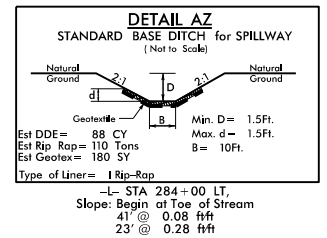
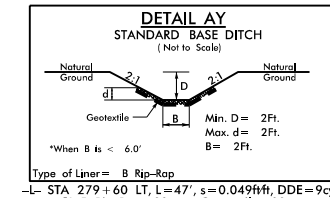
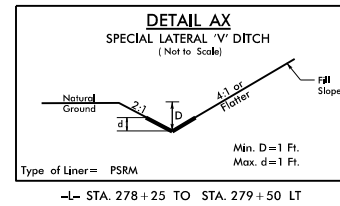
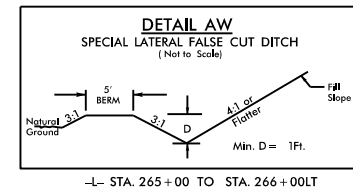
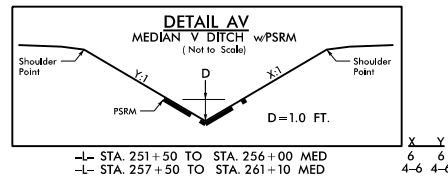
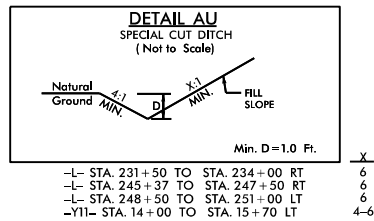
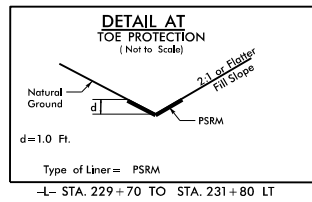
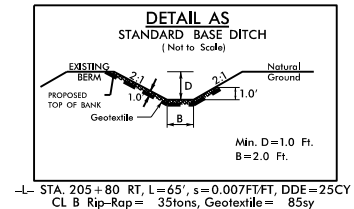
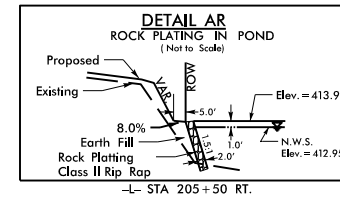
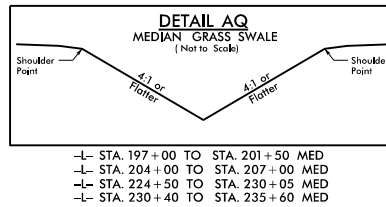
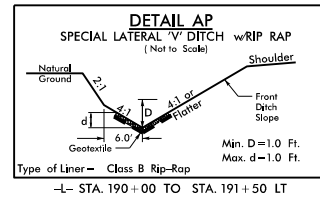
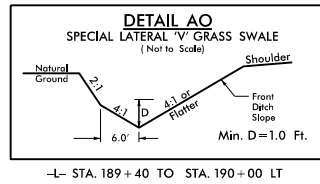
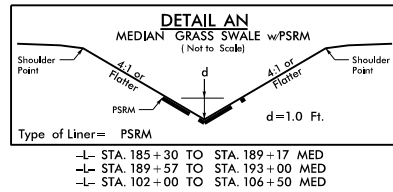
ENGLISH

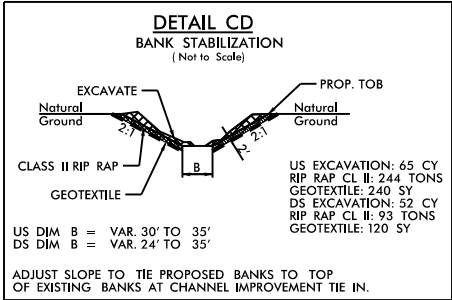
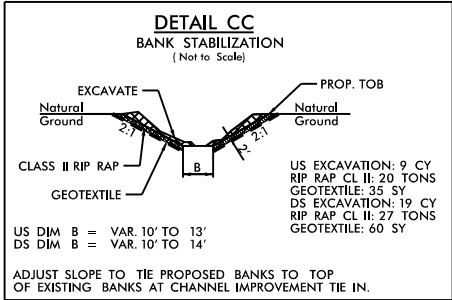
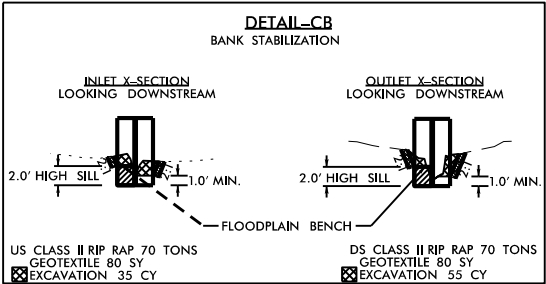
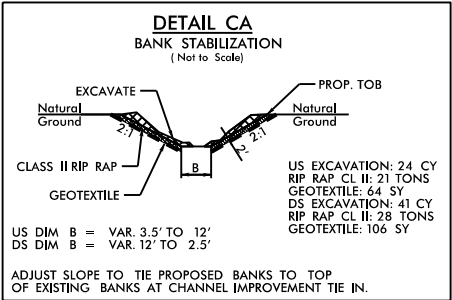
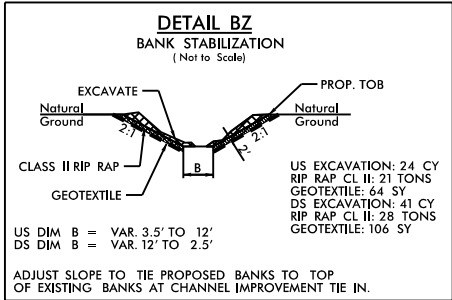
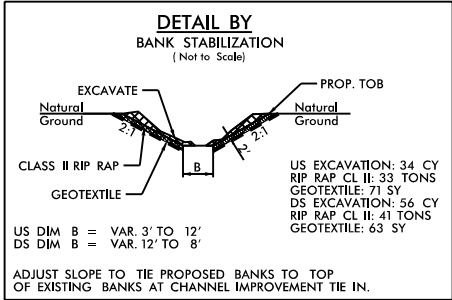
REVISIONS

3/14/2015	Drawings\Surface Water & Wetland - TP\R2814C_Hyd_prm_wet_psh26_Zoom.dgn
-----------	---

--	--







WETLAND PERMIT IMPACT SUMMARY												
			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 55+75 RT	36" RCP	0.04			< 0.01						
1A	-L- 55+75 LT	36" RCP			0.03							
2	-L- 58+80 RT	24" RCP	0.04			0.01						
3	-L- 67+45 LT	Pond						0.28				
3	-L- 67+45 RT	Bank Stabilization				< 0.01		< 0.01	< 0.01	10	10	
4	-L- 107+88 RT<	3@12'X11' RCBC	0.37	0.09		0.10						
5	-L- 137+22 LT	1@12'X7' RCBC	0.42	0.06	0.02	0.07		0.02		123		
5	-L- 137+22 LT	Bank Stabilization						< 0.01	< 0.01	64	39	
5A	-L- 137+22 RT	1@12'X7' RCBC	0.06	0.02	< 0.01	0.07		< 0.01		12		
5A	-L- 137+22 RT	Bank Stabilization						0.01	< 0.01	60	31	
6	-Y6- 21+86 RT	1@12'X7' RCBC	0.04	0.03	0.01	0.03		< 0.01		49		
6	-Y6- 21+86 RT	Bank Stabilization						< 0.01	< 0.01	59	33	
7	-Y6- 31+75 RT	Road/Toe Protection	0.04			0.03						
8 **	-L- 168+21 LT	2@7'X7' RCBC	0.19	< 0.01	0.04	0.10		0.02		161		
8	-L- 168+21 LT	Bank Stabilization						0.01	< 0.01	75	31	
8A	-L- 168+21 RT	2@7'X7' RCBC	< 0.01		0.01	0.05		< 0.01		10		
8A	-L- 168+21 RT	Bank Stabilization						0.01	< 0.01	42	28	
9	-L- 175+00 LT	Roadway Fill	0.17									
10	-L- 180+25 RT	"False cut" Ditch fill	0.01			0.05						
11	-L- 229+60 LT	54" RCP						< 0.01		11		
11 ***	-L- 229+60 LT	Bank Stabilization						< 0.01	< 0.01	21	6	
11A	-L- 229+60 RT	54" RCP	0.20		< 0.01	0.03		0.02		100		
11A	-L- 229+60 RT	Bank Stabilization						< 0.01	< 0.01	19	6	
SHEET SUBTOTALS*:			1.58	0.20	0.11	0.56		0.40	0.02	816	184	

*Rounded totals are sum of actual impacts

NOTES:

- ** Rev 11-2-16 Site 8: Fill slope adjusted. Permanent Fill in Wetlands was 0.20 ac and is now 0.19ac. Mech. Clearing in Wetlands was 0.11 ac and is now 0.10 ac.
- *** Rev 11-4-16 Site 11 Ditch alignment adjustment. Increased Permanent Surface Water Impacts (Bank Stabilization) by 3', reduced Temporary Surface Water Impacts by 3'.

PERMIT DRAWING
SHEET 1 OF 23

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2814C	1	
STATE PROJ.NO.	F.A.PROJ.NO.	DESCRIPTION	
34506.1.4	STP-401(249)	PE	
34506.2.FR7	STP-401(249)	R/W	
34506.2.FRU7	STP-401(249)	UTILITIES	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	

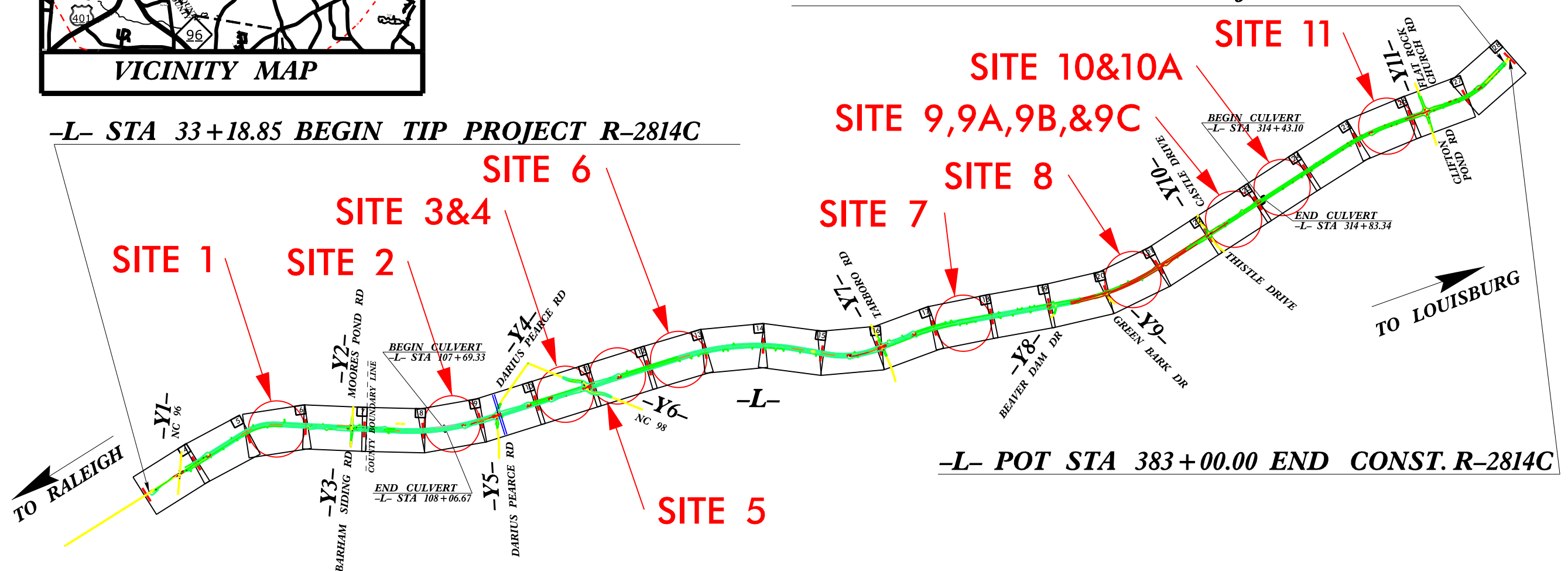


LOCATION: US 401 FROM NC 96 TO NORTH OF SR 1103 (FLAT ROCK CHURCH RD/CLIFTON POND RD.)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CURB AND GUTTER, CULVERTS, AND SIGNALS

BUFFER IMPACTS

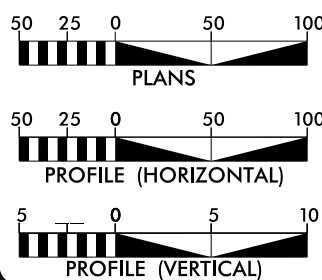
-L- STA 381+40.55 END TIP PROJECT R-2814C



THIS IS A FULL AND PARTIAL CONTROL OF ACCESS PROJECT WITH ACCESS POINTS SHOWN ON THE PLANS.
THIS PROJECT IS NOT WITHIN THE LIMITS OF MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION

DESIGN DATA



ADT 2016 = 10,892
ADT 2036 = 15,848
K = 10 %
D = 65 %
T = 6 % *
V = 60 MPH
* TTST = 2% DUAL = 4%
FUNC CLASS =
MAJOR COLLECTOR
STATEWIDE TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2814C	= 6.580 MILES
LENGTH STRUCTURES TIP PROJECT R-2814C	= 0.015 MILES
TOTAL LENGTH OF TIP PROJECT R-2814C	= 6.595 MILES

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 28, 2015

LETTING DATE:
PY

KEVIN E. MOORE, PE
PROJECT ENGINEER

NATHAN N. ADIMA, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

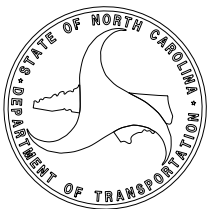
P.E.

SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.

SIGNATURE: _____



CONTRACT:

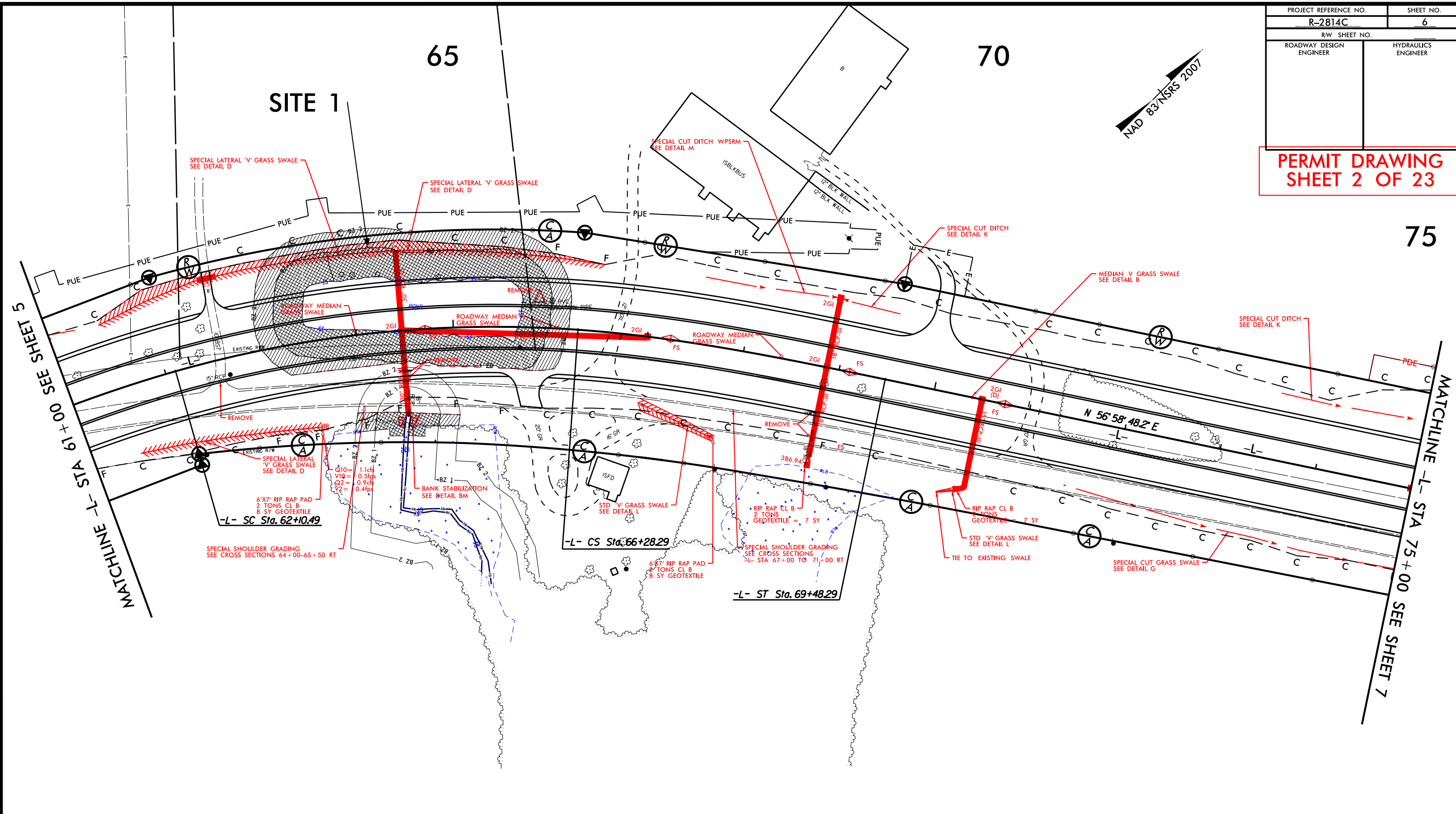
```

7/16/2015
c:\ee
R:\Hydraulics\Permits_Environmental\R2814C_PERMIT 2015\drawings\R2814C_Hyd_tsh_buf.dgn
$$$$SYTIME$$$$
$$$$$$$$DGN$$$$$$$$
$$$$$USERNAME$$$$

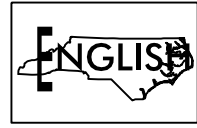
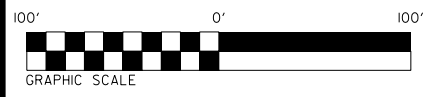
```


PROJECT REFERENCE NO.	SHEET NO.
R-2814C	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 2 OF 23



RIGHT OF WAY REVISION:
REVISED FROM W/GRAD TO A CHORD ON PARCEL 12, BDK 02-12-2015.
TIED PUE TO ROW CHORD AND ADJUSTED OFFSET LABEL ON PARCEL 12, BDK 02-12-2015.



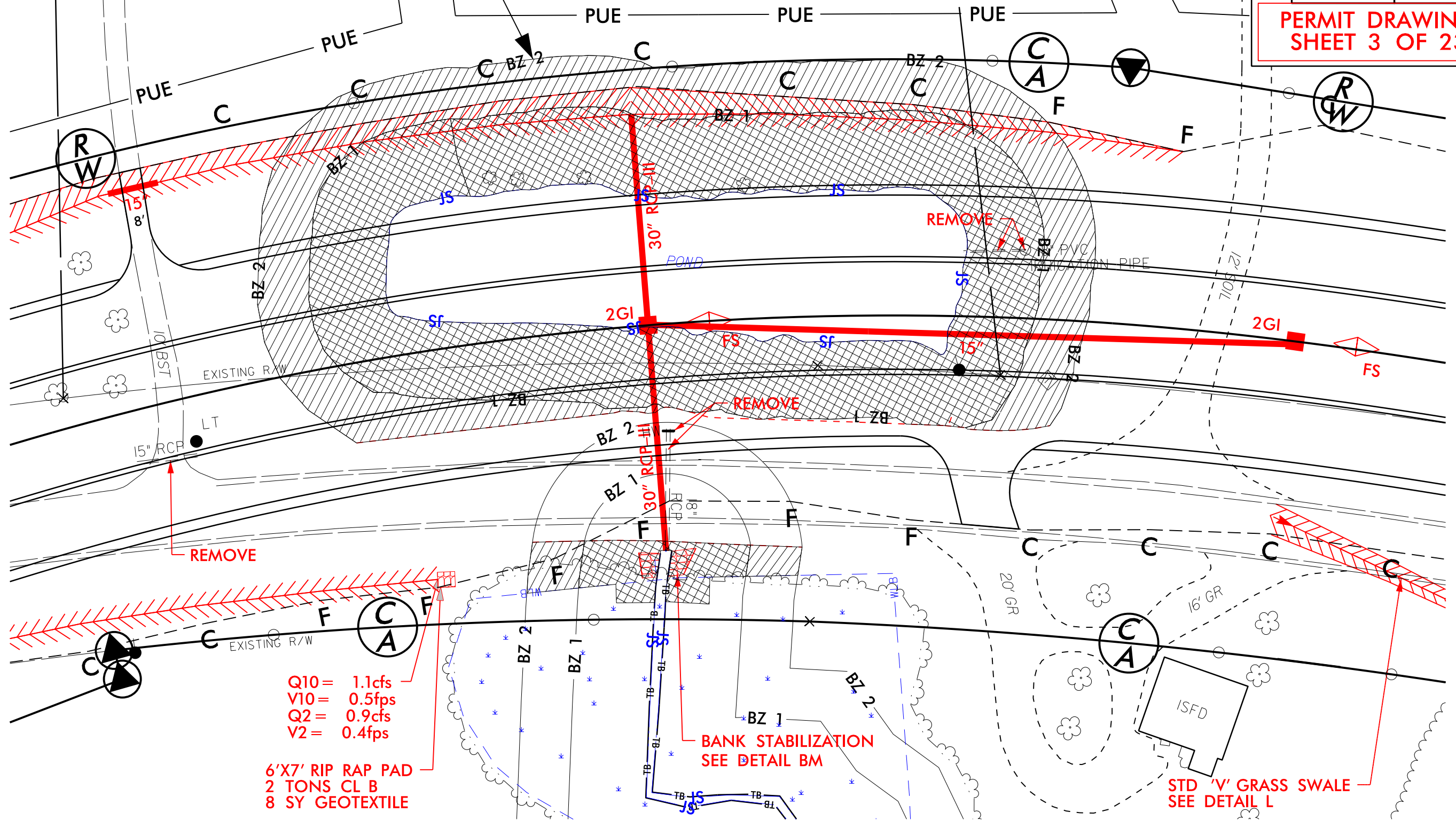
- MITIGABLE IMPACTS ZONE 2
- MITIGABLE IMPACTS ZONE 1

4/20/2015
R:\Hydraulics\Permits\Environmental\2814C PERMIT 2015\Drawings\Buffer\Zoning\2814C\2814C-02-12-2015.dwg

SITE 1

PROJECT REFERENCE NO.	SHEET NO.
<u>R-2814C</u>	<u>6A</u>
RW SHEET NO. _____	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 3 OF 23



40' 0' 40'



GRAPHIC SCALE



MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

REVISIONS

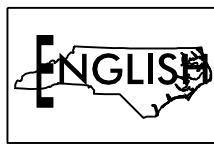
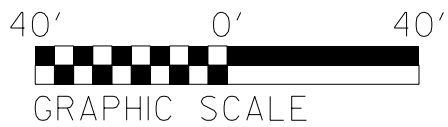
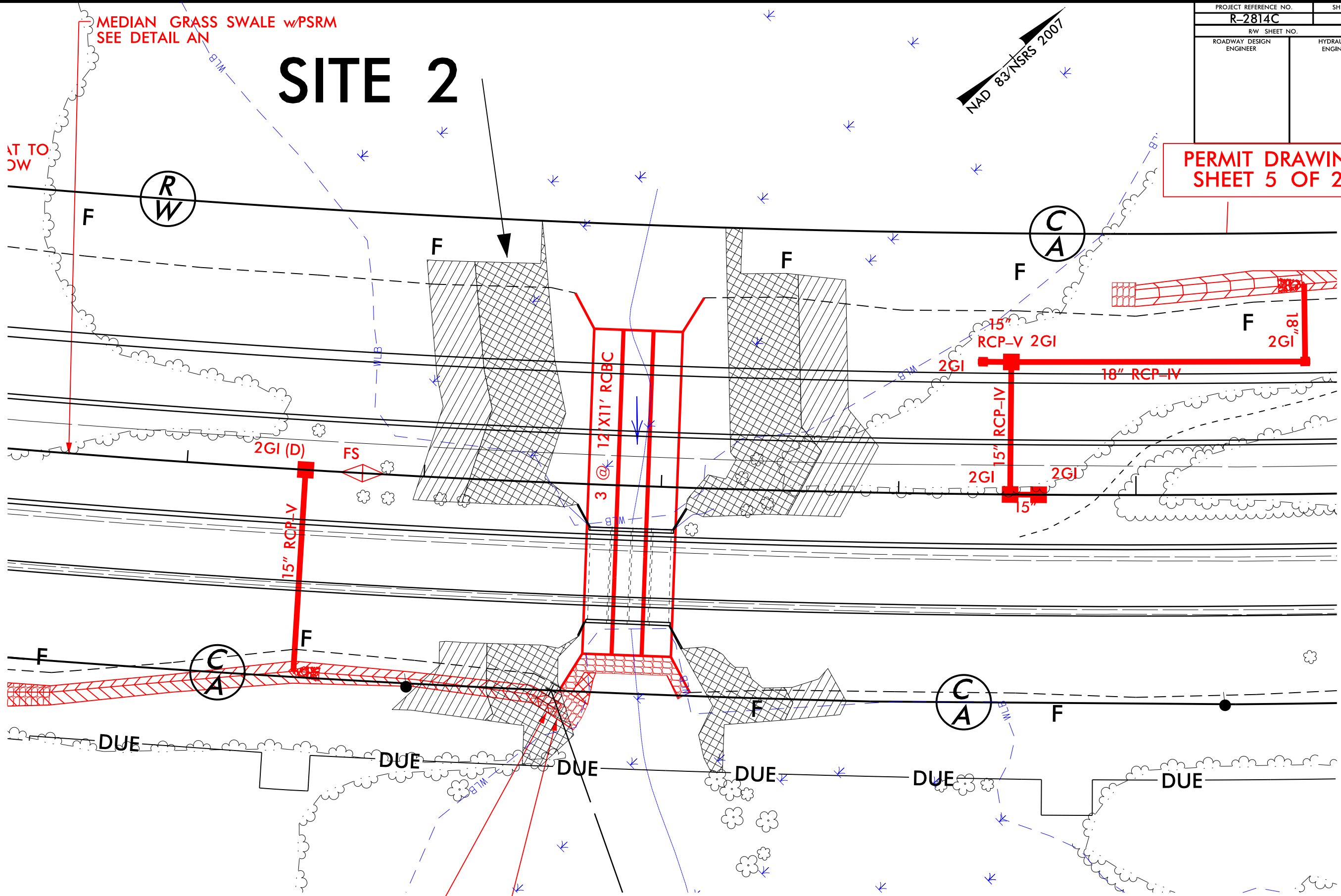
ings\Buffer Zone\R2814C Hyd_prm wet_psh06 Zoom.dgn

4302015
clee
R:\Hydraulics\Permits Environmental\R2814C PERMIT 2015

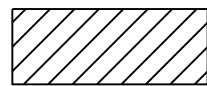
PROJECT REFERENCE NO.	SHEET NO.
R-2814C	9A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 5 OF 23

SITE 2



MITIGABLE IMPACTS ZONE 1



MITIGABLE IMPACTS ZONE 2

REVISIONS

10/6/2016
R:\Hydraulics\Permits Environmental\R2814C PERMIT 2015\Drawings\Buffer Zone\R2814C_Hyd_prm_wet_psh09_Zoom.dgn
mkelly
\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$DGN\$\$\$\$\$
\$\$\$\$\$DATE\$\$\$\$\$

MATCHLINE -L- STA 145+00 SEE SHEET 12

SITE 4

140

5/6/2015
cilee
R:\Hydraul



ALLOWABLE IMPACTS ZONE 2

ALLOWABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

MITIGABLE IMPACTS ZONE 1

NAD 83/NSRS 2007

SITE 4

SITE 3

10'x6' RIP RAP PAD
3 TONS CL B
11 SY GEOTEXTILE

BANK STABILIZATION
CLASS II RIP RAP=12 TONS
GEOTEXTILE=30 SY
SEE CONSTRUCTION SEQUENCE

FALSE CUT GRASS SWALE
SEE DETAIL AH

Q10 = 4.3cfs
V10 = 0.9fps
Q2 = 3.3cfs
V10 = 0.8fps

TOE PROTECTION
SEE DETAIL J

10'x6' RIP RAP PAD
3 TONS CL B
11 SY GEOTEXTILE

— TOE PROTECTION
SEE DETAIL J

Q10 = 9.0 cfs
V10 = 1.3 fps
Q2 = 7.0 cfs
V10 = 1.2 fps

~~Q10 = 7.0 cfs
V10 = 1.7 fps
Q2 = 5.0 cfs
V10 = 1.5 fps~~

— REMOVE

MEDIAN V DITCH
SEE DETAIL B

MEDIAN V DITCH — US 401 26' BST
SEE DETAIL B

Q10 = 6.0 cfs
V10 = 1.8 fps
Q2 = 4.5 cfs
V10 = 1.6 fps

— TOE PROTECTION
SEE DETAIL 100

60' 0' 60'

GRAPHIC SCALE

ALLOWABLE IMPACTS ZONE 2

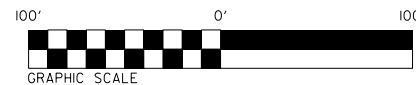
ALLOWABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

MITIGABLE IMPACTS ZONE 1



ALLOWABLE IMPACTS ZONE 2



155

NAD 83/NSRS 2007

150

MATCHLINE -L- STA 145+00 SEE SHEET 11

MATCHLINE -L- STA 159+00 SEE SHEET 13

SITE 5

35

REVISIONS

82814C Hyd orm wet osh12 dan

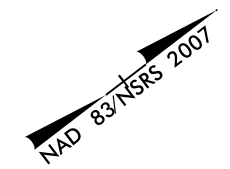
5/6/2015

```
5/6/2015
dlee
R:\Hydraulics\Permits_Environmental\R2814C PERMIT 2015\drawing
```

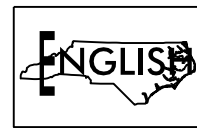
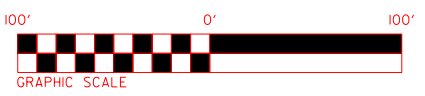
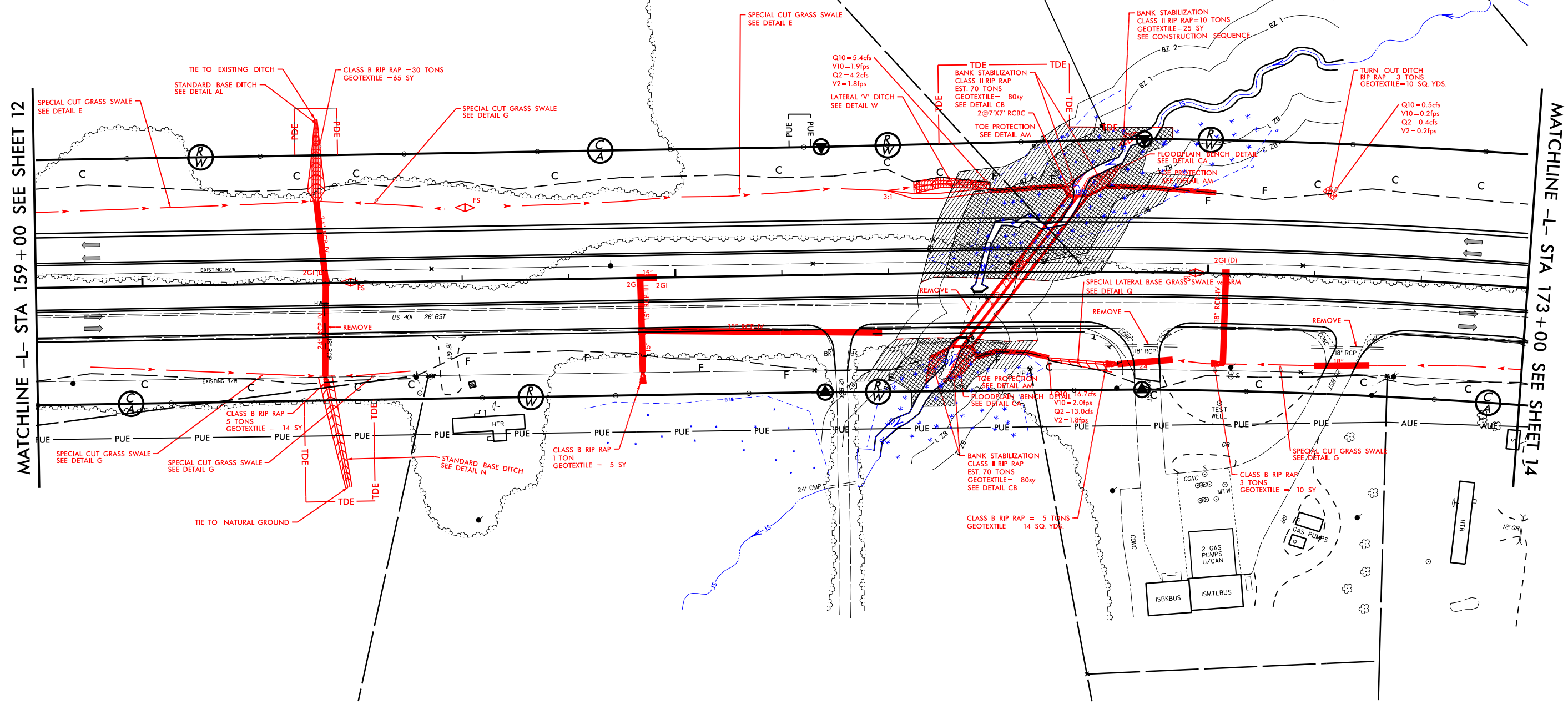

PROJECT REFERENCE NO.	SHEET NO.
R-2814C	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 10 OF 23

Revised 11/4/2016



SITE 6



- MITIGABLE IMPACTS ZONE 2
- MITIGABLE IMPACTS ZONE 1

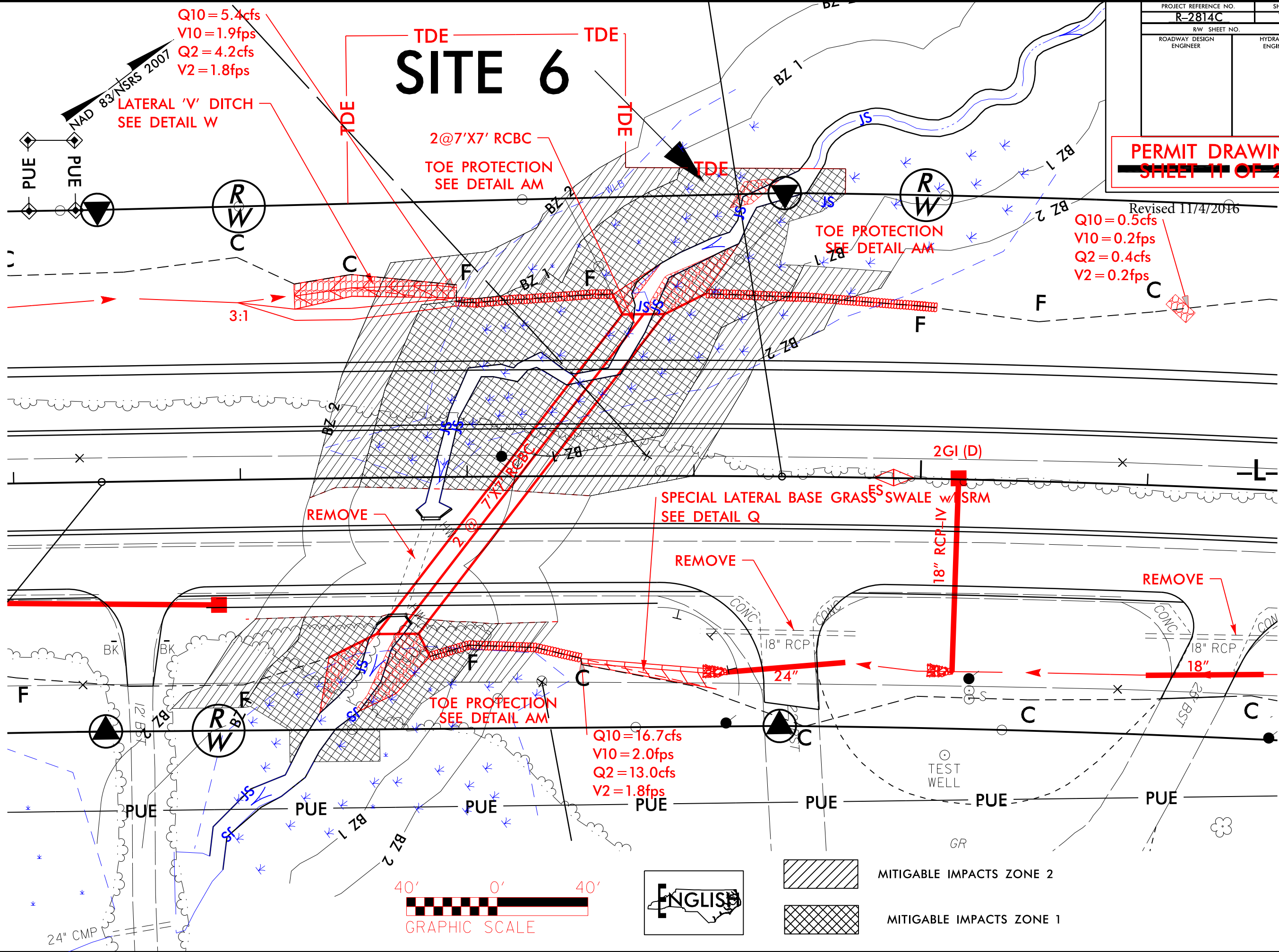
REVISIONS

11/4/2016
R:\Hydraulics\Permits_Environmental\R2814C PERMIT 2015\Drawings\Buffer\Zone\2814C_Hyd_gm_vet_pah13.dgn
\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$DESIGN\$\$\$\$\$
\$\$\$\$\$DRAWING\$\$\$\$\$

8/17/99

REVISIONS

11/4/2016
Imjoins
R:\Hydraulics\Permits_Environmental\K2814C PERMIT 2015 drawings\Buffer Zone\K2814C_Hyd_prm_wet_psh13_Zoom.dgn
\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$LSDGN\$\$\$\$\$
\$\$\$\$\$\$\$\$\$\$



PROJECT REFERENCE NO.	SHEET NO.
R-2814C	13A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

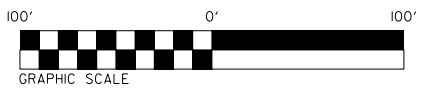
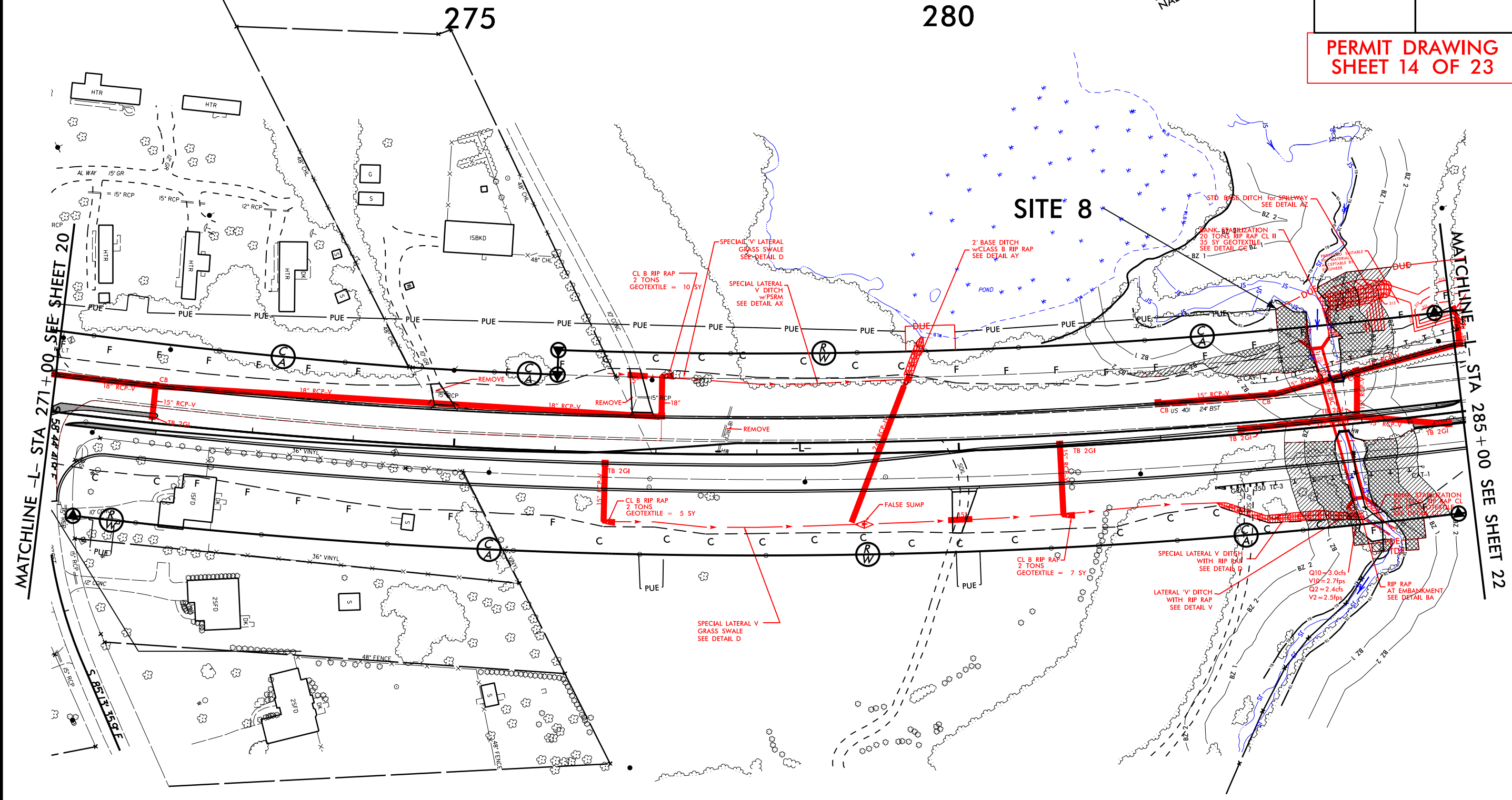
**PERMIT DRAWING
SHEET 11 OF 23**

Revised 11/4/2016

PROJECT REFERENCE NO.	SHEET NO.
R-2814C	21
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 14 OF 23

NAD 83/NSRS 2007



- MITIGABLE IMPACTS ZONE 2
- MITIGABLE IMPACTS ZONE 1

REVISIONS

5/6/2015
R:\Hydro\Projects\Permits\Environmental\2814C PERMIT 2015\Drawings\Buffer Zone\2814C Hyd perm wsl p1421.dgn
\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$LAYOUT\$\$\$\$\$
\$\$\$\$\$CADD\$\$\$\$\$
\$\$\$\$\$PRINT\$\$\$\$\$

NAD 83/NSRS 2007

BANK STABILIZATION
20 TONS RIP RAP CL II
35 SY GEOTEXTILE
SEE DETAIL CC

PROPOSED SUITABLE
FILL MATERIAL,
ACCEPTABLE BY
ENGINEER

MATCHLINE

STA 285 + 00 SEE SHEET 22

— BANK STABILIZATION
27 TONS RIP RAP CL II
60 SY GEOTEXTILE
SEE DETAIL CC

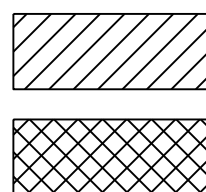
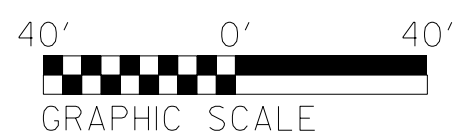
**RIP RAP
AT EMBANKMENT
SEE DETAIL BA**

SPECIAL LATERAL V DITCH
WITH RIP RAP
SEE DETAIL D

Q10 = 3.0 cfs
V10 = 2.7 fps
Q2 = 2.4 cfs
V2 = 2.5 fps

MITIGABLE IMPACTS ZONE 2

MITIGABLE IMPACTS ZONE 1



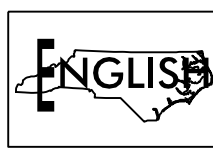
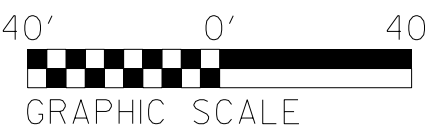
REVISIONS

ings\Buffer Zone\R2814C_Hyd_prm_wet_psh21_Zoom.dgn

```
5/6/2015
clee
R:\Hydraulics\Permits Environmental\R2814C PERMIT 2010
$$$SYTIME$$$$$
$$$SYSDGN$$$$$
$$$EBAVE$$$$$
```


NAD 83/NSRS 2007

SITE 9



MITIGABLE IMPACTS ZONE 2

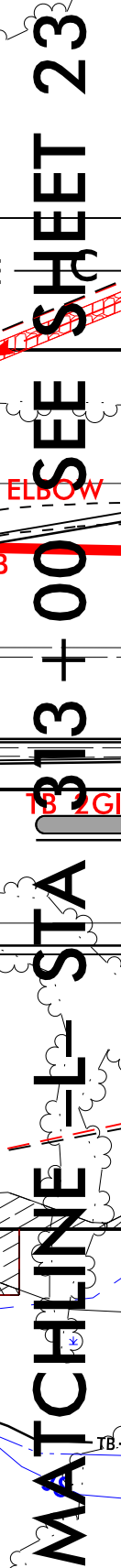
MITIGABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

ALLOWABLE IMPACTS ~~ZONE 1~~

RIP RAP AT
EMBANKMENT
SEE DETAIL BA

STD. 2'
w/CLIF



SITE 10 — **SITE 10A**

 ALLOWABLE IMPACTS ZONE 2
 MITIGABLE IMPACTS ZONE 2
 MITIGABLE IMPACTS ZONE 1

5/6/2015
 R:\Hydraulics\Permits_Environmental\2814C PERMIT 2015.dgn
 awings\Buffer Zone\2814C_Hyd_prm_wel_rsh24_Zoom.dgn

SITE 11

STD 2' BASE DITCH
w/CL I RIP RAP
SEE DETAIL BR

Q10 = 20 cfs
V10 = 3.4 fps

NAD 83/NSRS 2007

-L-

**PLUG & FILL-
PIPE FULL WITH
FLOWABLE FILL**

TB 2GI

TB 2GI

← 15" RCP-V

CB

15" RCP-V

18" CSP

CL B RIP RAP
2 TONS
GEOTEXTILE = 7 SY

CL B RIP RAP = 3 TONS-
GEOTEXTILE = 10 SY

— BERM DITCH
SEE DETAIL BQ

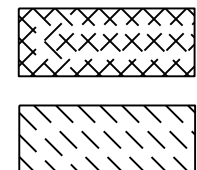
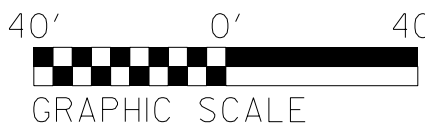
**SPECIAL LATERAL
GRASS SWALE
SEE DETAIL BN**

**SPECIAL LATERAL -
GRASS SWALE
SEE DETAIL BN**

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

ENGLISH



BUFFER IMPACTS SUMMARY	
------------------------	--

[illegible]

* Site 6: Revision 11-4-16: Fill slope adjustment: Reduced BZ 2 Impacts by 127 sf.

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE AND FRANKLIN COUNTIES
PROJECT: 34506.1.4 (R-2814C)

September 1, 2016, Rev November 4, 2016
SHEET 22 OF 23

WETLANDS IN BUFFER IMPACTS SUMMARY

			WETLANDS IN BUFFERS	
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ZONE 1	ZONE 2
			(ft ²)	(ft ²)
1	30" RCP	-L- 64+50 RT<	289	
2	3@ 12'X11' RCBC	-L- 107+88 RT<	4,620	2,972
3	1@ 12'X7' RCBC	-L- 137+22 RT<	12,958	7,299
4	1@ 12'X7' RCBC	-Y- 21+86 RT<	2,661	527
5	TOE PROTECTION	-Y- 31+25 RT	786	
6	2@ 7'X7' RCBC	-L- 168+21 RT<	12,827	3,693
7	54" RCP	-L- 229+60 RT<	4,090	3,432
10	3@ 11'x11' RCBC	-L- 314+63 RT<	2,258	1,371
TOTAL:			40,489	19,294

* Site 6: Revision 11-4-16: Fill slope adjustment: Reduced BZ 2 Impacts by 127 sf.

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

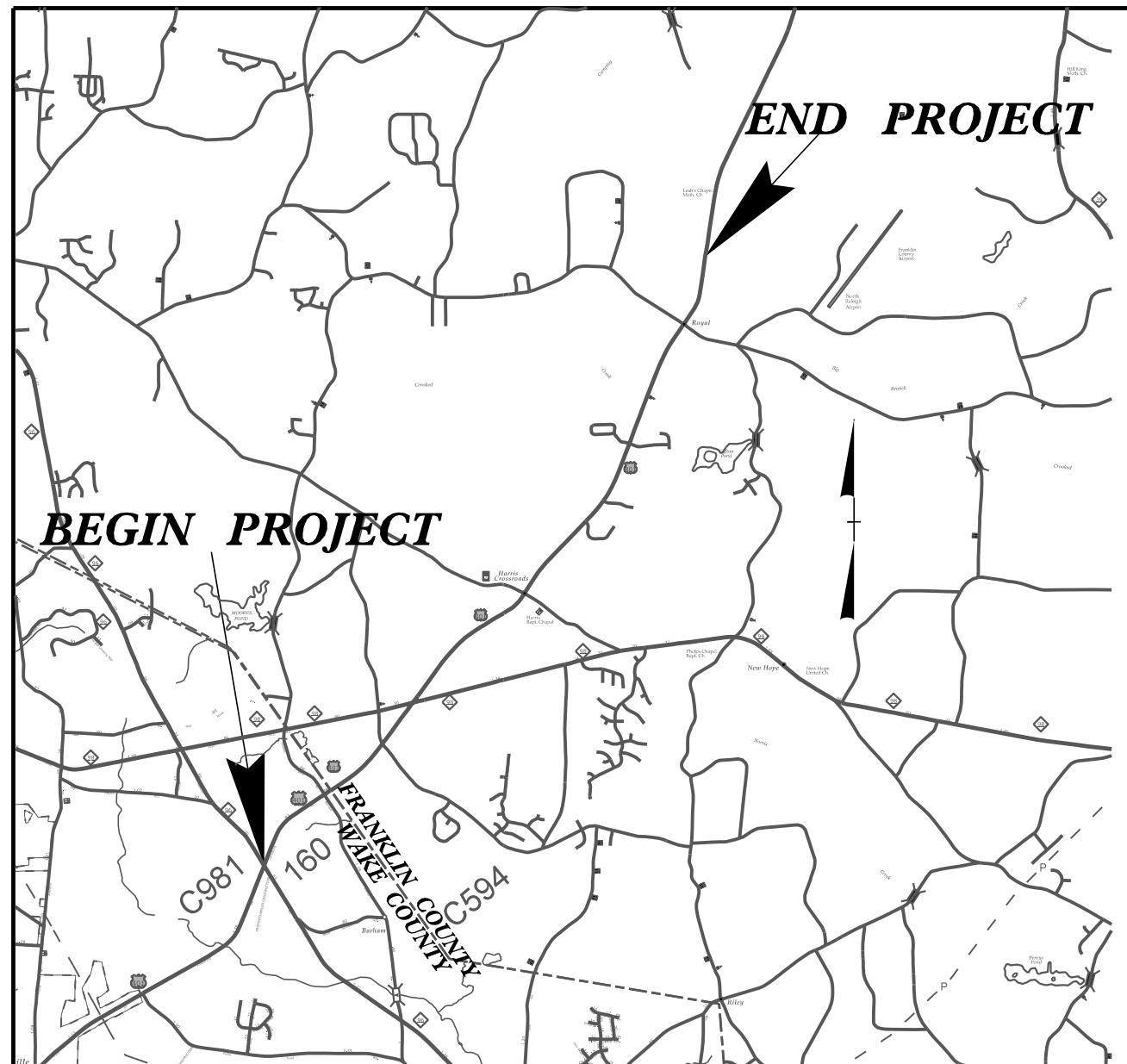
WAKE AND FRANKLIN COUNTIES
PROJECT: 34506.1.4 (R-2814C)

September 1, 2016, Rev November 4, 2016
SHEET 23 OF 23

09/08/99

TIP PROJECT: R-2814C

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY PERMIT DRAWINGS
WAKE /FRANKLIN COUNTY

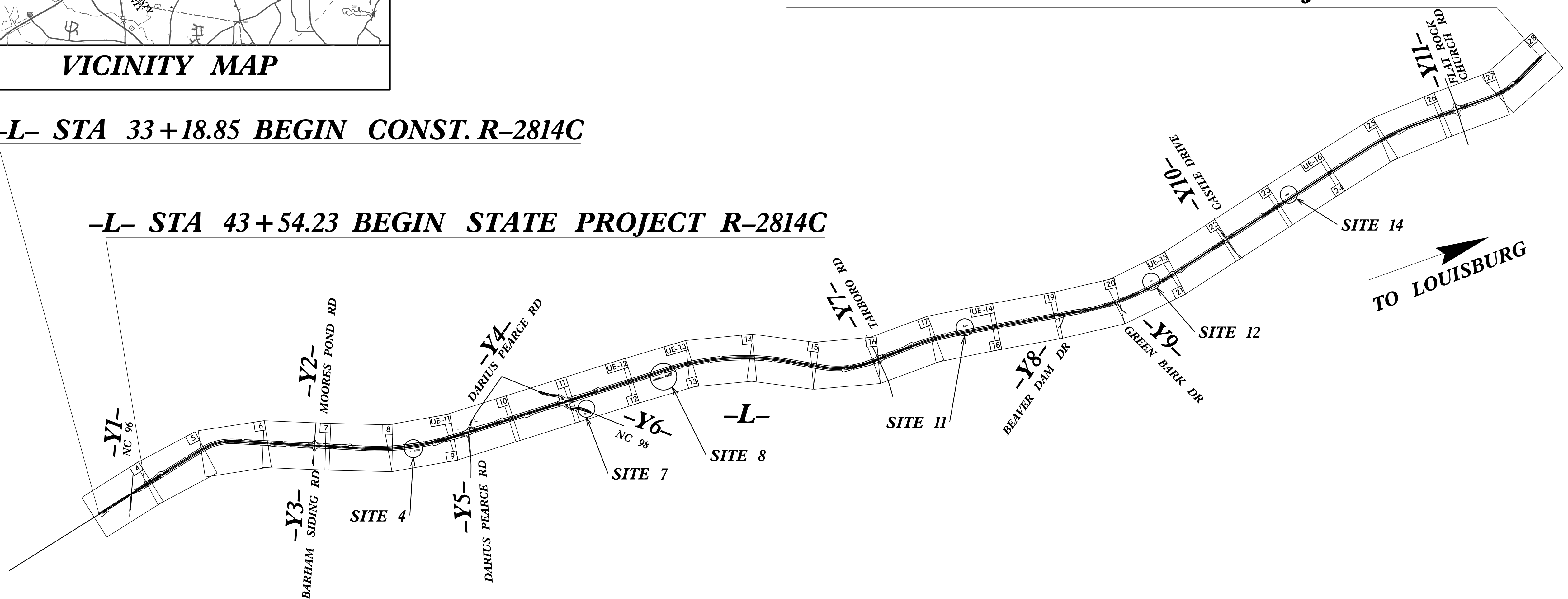
LOCATION: US 401 FROM NC 96 TO SR 1103

WETLAND IMPACTS

-L- STA 381+40.55 END STATE PROJECT R-2814C

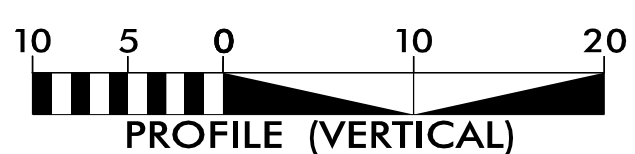
-L- STA 33+18.85 BEGIN CONST. R-2814C

-L- STA 43+54.23 BEGIN STATE PROJECT R-2814C



THIS IS A PARTIALLY CONTROLLED ACCESS PROJECT WITH ACCESS POINTS SHOWN ON THE PLANS.
THIS PROJECT IS NOT WITHIN THE LIMITS OF MUNICIPAL BOUNDARIES
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

GRAPHIC SCALES



INDEX OF SHEETS

SHEET NO.:

DESCRIPTION:

UE-1	BUFFER IMPACTS TITLE SHEET
UE-2 THRU UE-9	UTILITY BUFFER IMPACTS
UE-10	WETLAND IMPACTS TITLE SHEET
UE-11 THRU UE-16	UTILITY WETLAND IMPACTS

UTILITY OWNERS WITH CONFLICTS

- (A) POWER DISTRIBUTION - WAKE EMC
- (B) POWER DISTRIBUTION - DUKE ENERGY
- (C) CATV - TIME WARNER CABLE
- (D) WATER - AQUA NC, INC
- (E) TELEPHONE - CENTURYLINK

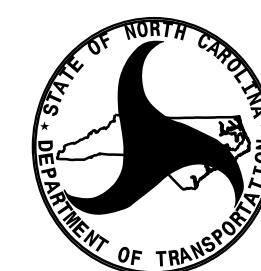
PREPARED IN THE OFFICE OF:



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

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

John D. Schriener, PLS PROJECT UTILITY COORDINATOR



DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1555
PHONE (919) 707-5690
FAX (919) 250-4151

Donna Jackson, PE	UTILITIES REGIONAL ENGINEER
Donald Proper	UTILITIES ENGINEER
Ed Reams, Jr.	UTILITIES AREA COORDINATOR
Ed Reams, Jr.	UTILITIES COORDINATOR

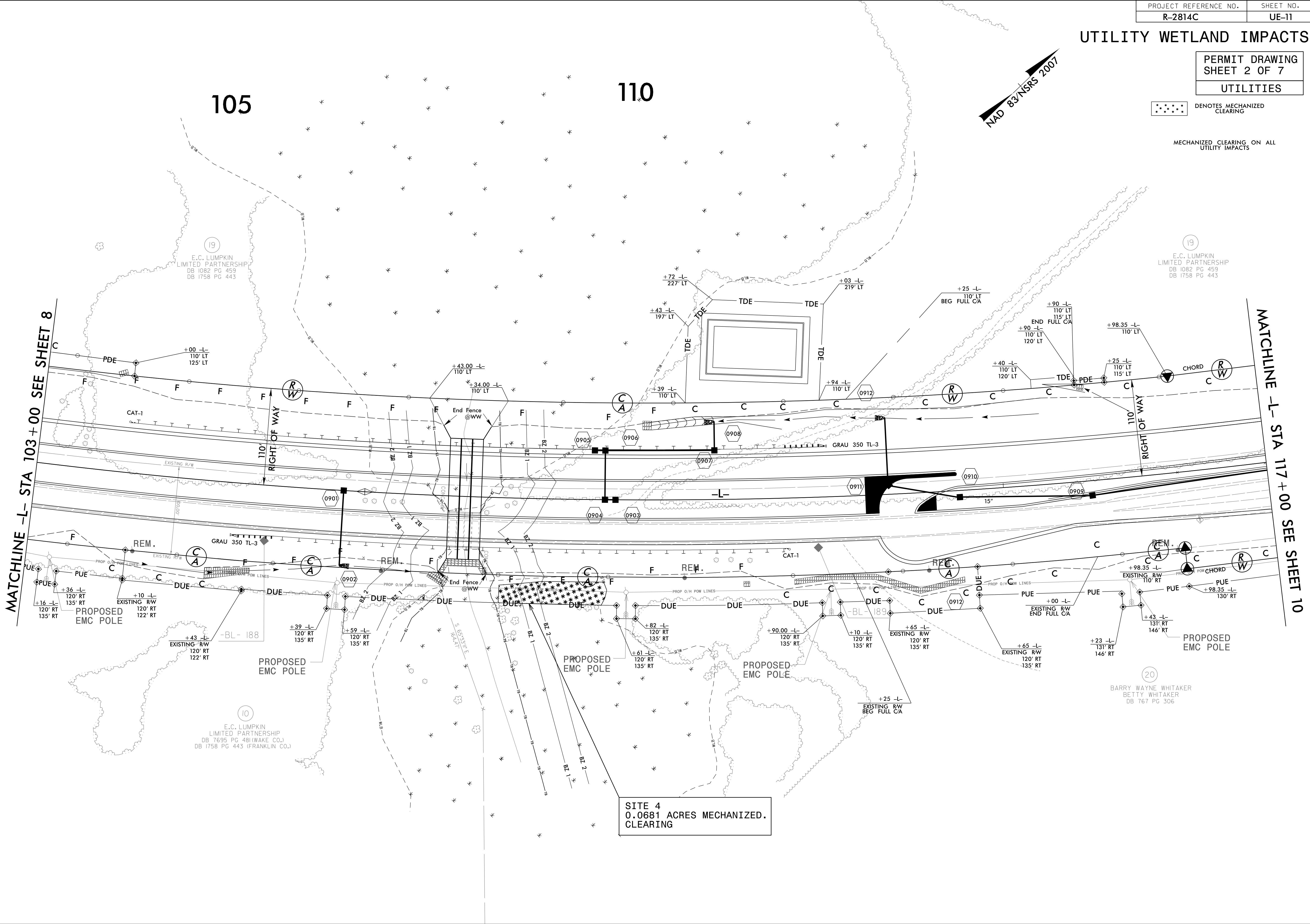
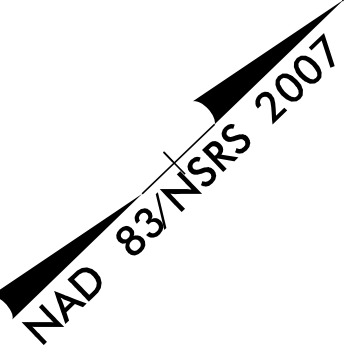
UTILITY WETLAND IMPACTS

PERMIT DRAWING
SHEET 2 OF 7

UTILITIES

..... DENOTES MECHANIZED
CLEARING

MECHANIZED CLEARING ON ALL
UTILITY IMPACTS



SITE 4
0.0681 ACRES MECHANIZED.
CLEARING

UTILITY WETLAND IMPACTS

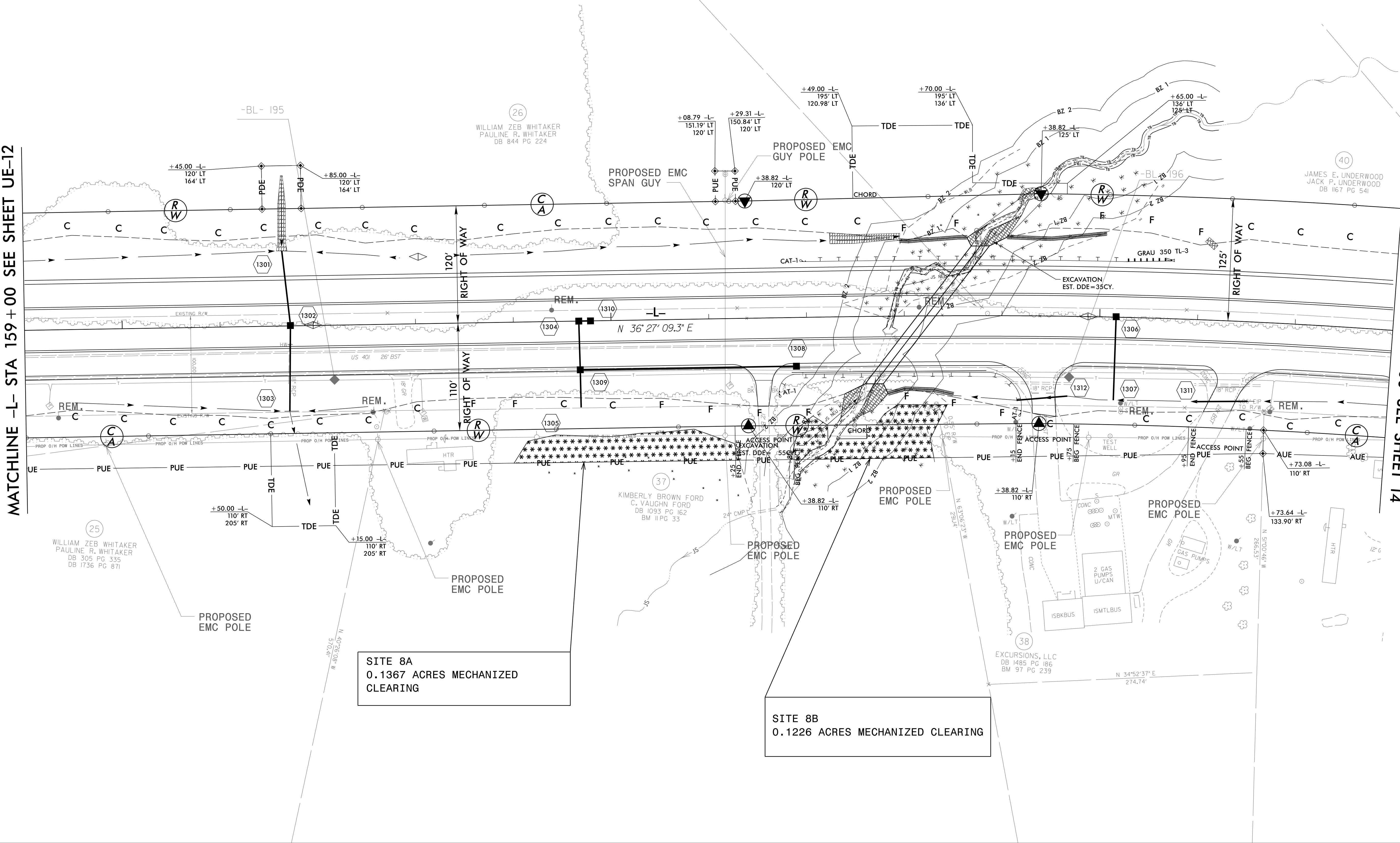
PERMIT DRAWING
SHEET 4 OF 7
UTILITIES

..... DENOTES MECHANIZED CLEARING

MECHANIZED CLEARING ON ALL
UTILITY IMPACTS

MATCHLINE -L- STA 159+00 SEE SHEET UE-12

MATCHLINE -L- STA 173+00 SEE SHEET 14



REVISIONS

5/14/99

\\20058 AM Drawings\R2814C\ut_r\dlj13_ue13.phydgn
10:00 PM 5/14/99
dlj

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 4	-L- 107+39 to 109+50 RT	Aerial Lines				0.07						
SITE 7	-Y6- 30+98 to 31+69 RT	Aerial Lines				0.03						
SITE 8A	-L- 163+98 to 166+29 RT	Aerial Lines				0.14						
SITE 8B	-L- 166+81 to 168+44 RT	Aerial Lines				0.12						
SITE 11	-L- 236+03 to 236+98 LT	Aerial Lines				0.03						
SITE 12	-L- 279+62 to 280+20 LT	Aerial Lines				< 0.01						
SITE 14	-L- 315+70 to 316+71 LT	Aerial Lines				0.04						
TOTALS*:						0.43				0	0	0

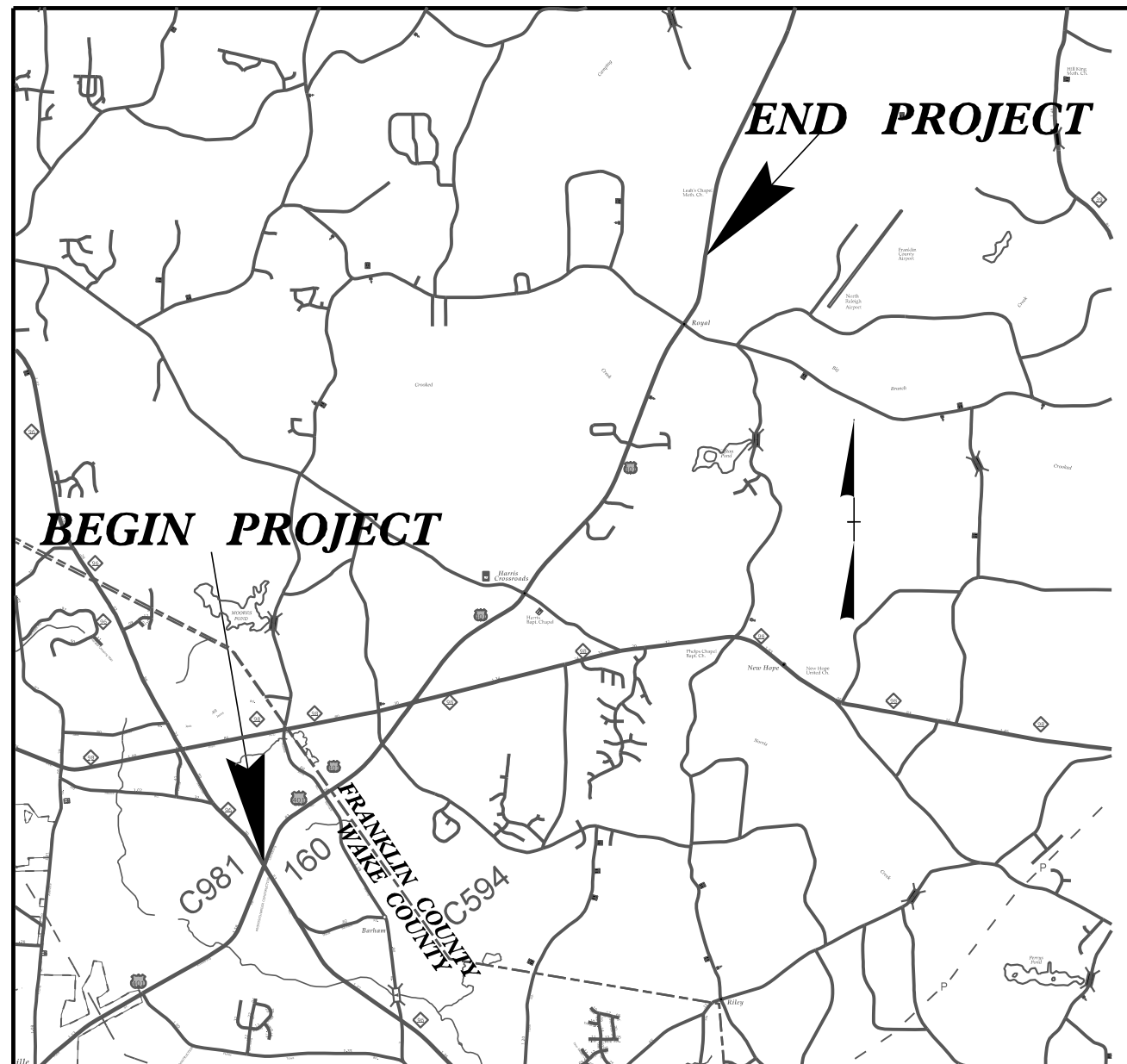
NOTES:

SHEET
1
OF
1

09/08/99

TIP PROJECT: R-2814C

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY PERMIT DRAWINGS
WAKE /FRANKLIN COUNTY

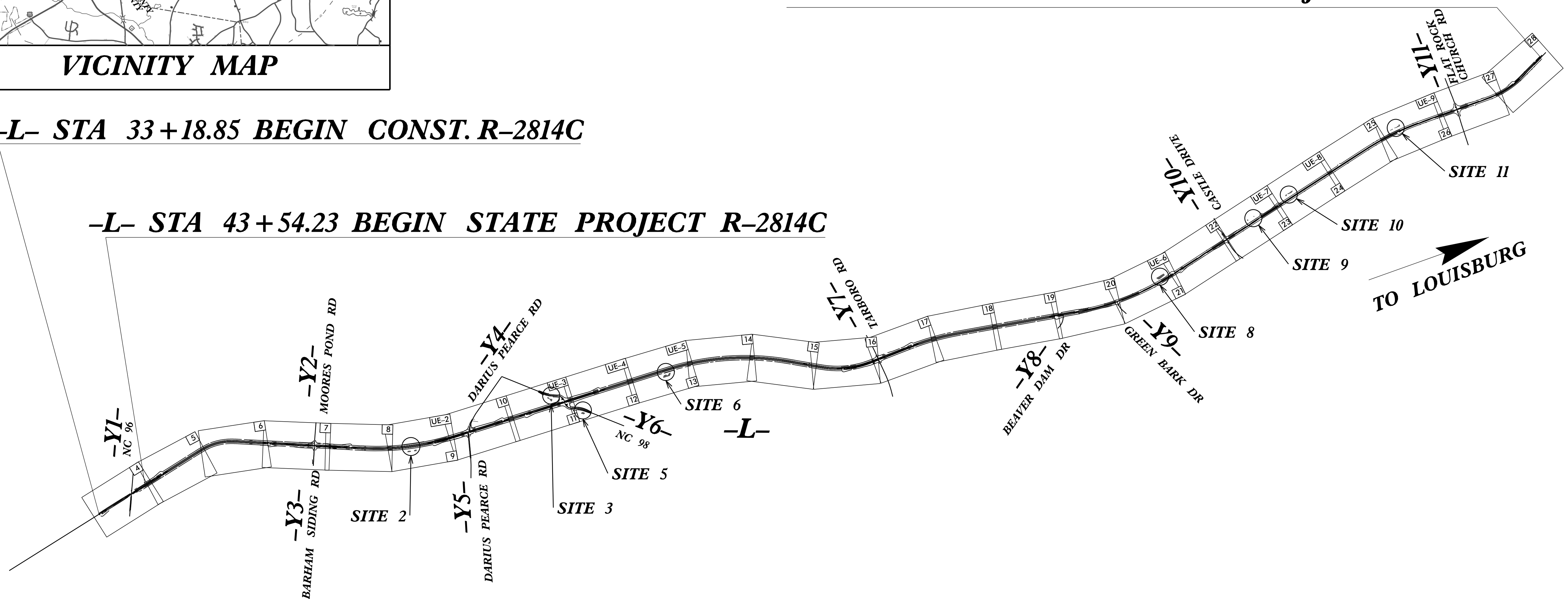
LOCATION: US 401 FROM NC 96 TO SR 1103

BUFFER IMPACTS

-L- STA 381+40.55 END STATE PROJECT R-2814C

-L- STA 33+18.85 BEGIN CONST. R-2814C

-L- STA 43+54.23 BEGIN STATE PROJECT R-2814C



THIS IS A PARTIALLY CONTROLLED ACCESS PROJECT WITH ACCESS POINTS SHOWN ON THE PLANS.
THIS PROJECT IS NOT WITHIN THE LIMITS OF MUNICIPAL BOUNDARIES
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

GRAPHIC SCALES



INDEX OF SHEETS

SHEET NO.:

DESCRIPTION:

UE-1	BUFFER IMPACTS TITLE SHEET
UE-2 THRU UE-9	UTILITY BUFFER IMPACTS
UE-10	WETLAND IMPACTS TITLE SHEET
UE-11 THRU UE-16	UTILITY WETLAND IMPACTS

UTILITY OWNERS WITH CONFLICTS

- (A) POWER DISTRIBUTION - WAKE EMC
- (B) POWER DISTRIBUTION - DUKE ENERGY
- (C) CATV - TIME WARNER CABLE
- (D) WATER - AQUA NC, INC
- (E) TELEPHONE - CENTURYLINK

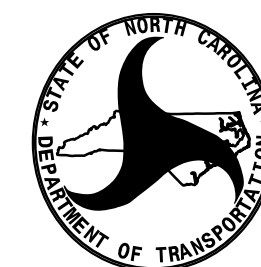
PREPARED IN THE OFFICE OF:



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

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

John D. Schriener, PLS PROJECT UTILITY COORDINATOR



DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1555
PHONE (919) 707-5690
FAX (919) 250-4151

Donna Jackson, PE	UTILITIES REGIONAL ENGINEER
Donald Proper	UTILITIES ENGINEER
Ed Reams, Jr.	UTILITIES AREA COORDINATOR
Ed Reams, Jr.	UTILITIES COORDINATOR

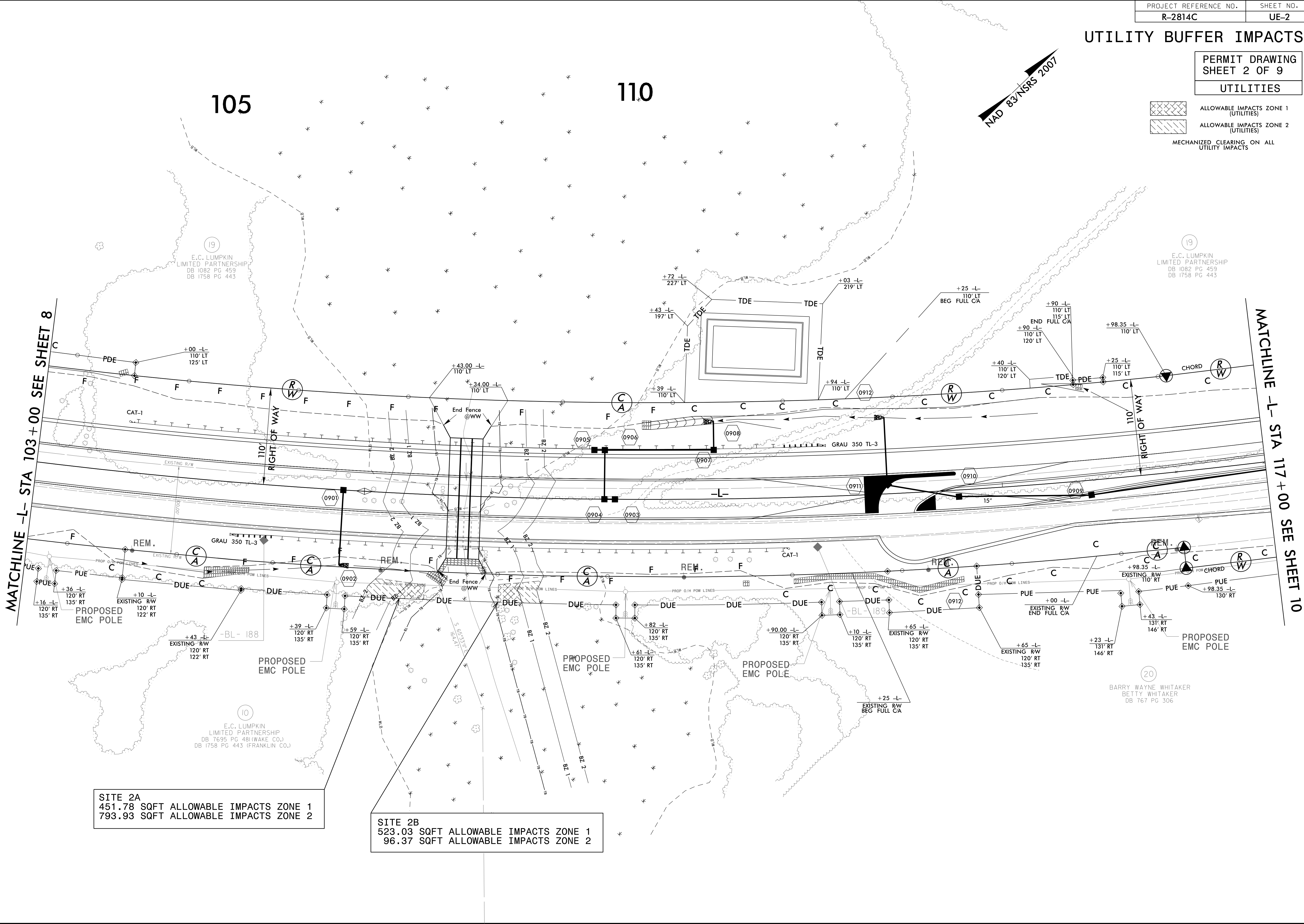
UTILITY BUFFER IMPACTS

PERMIT DRAWING
SHEET 2 OF 9

UTILITIES

- ALLOWABLE IMPACTS ZONE 1
(UTILITIES)
- ALLOWABLE IMPACTS ZONE 2
(UTILITIES)
- MECHANIZED CLEARING ON ALL
UTILITY IMPACTS

NAD 83 NRS 2007



SITE 2A
451.78 SQFT ALLOWABLE IMPACTS ZONE 1
793.93 SQFT ALLOWABLE IMPACTS ZONE 2

SITE 2B
523.03 SQFT ALLOWABLE IMPACTS ZONE 1
96.37 SQFT ALLOWABLE IMPACTS ZONE 2

5/14/99

2:45:53 PM
C:\Users\RDy\OneDrive\Drawings\NR2814C\ut-rdy\UE2.psh.dgn
5/14/2010

UTILITY BUFFER IMPACTS

PERMIT DRAWING
SHEET 5 OF 9
UTILITIES

ALLOWABLE IMPACTS ZONE 1
(UTILITIES)

ALLOWABLE IMPACTS ZONE 2
(UTILITIES)

MECHANIZED CLEARING ON ALL
UTILITY IMPACTS

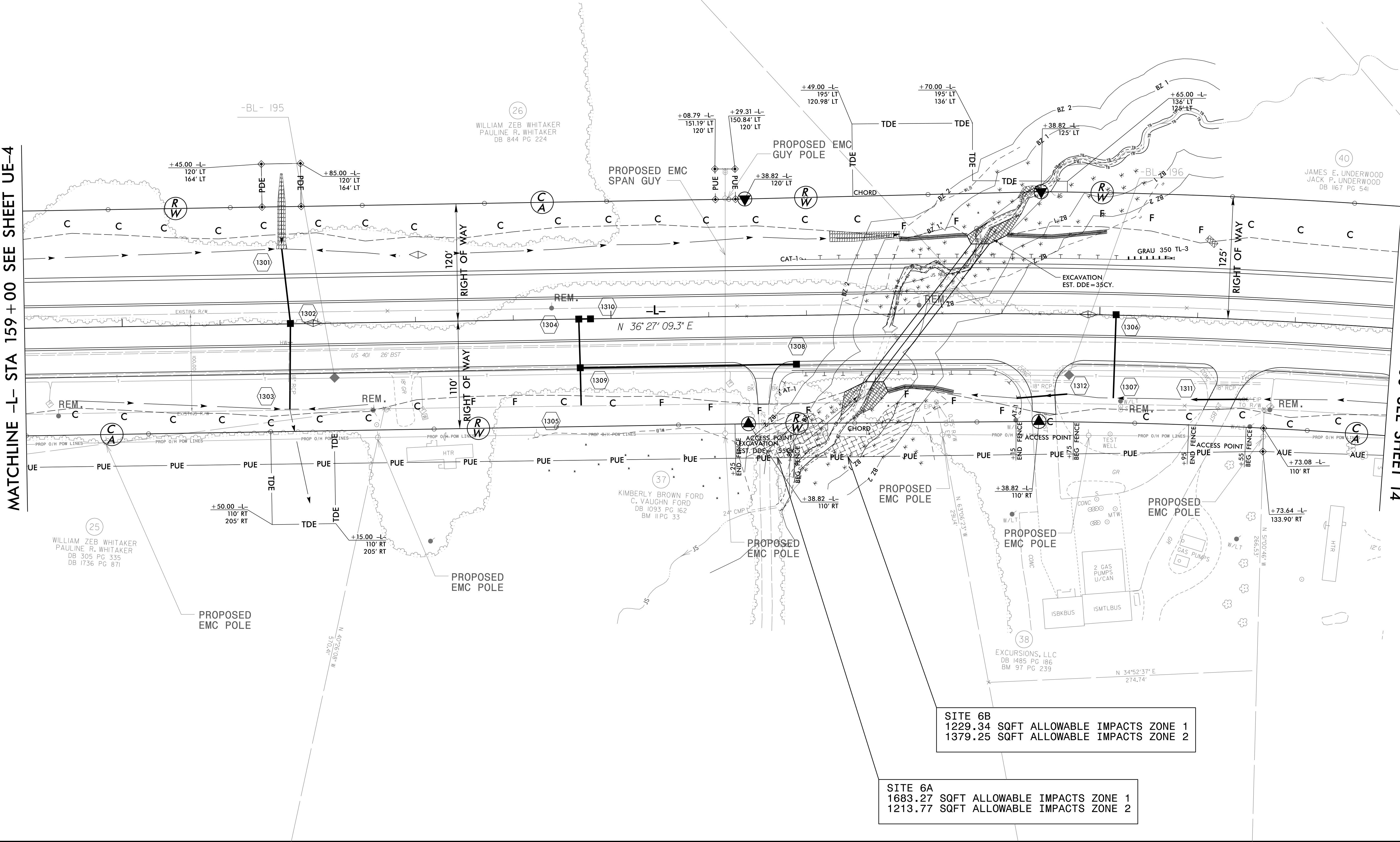
NAD 83/NSRS 2007
170

160

165

MATCHLINE -L- STA 159+00 SEE SHEET UE-4

MATCHLINE -L- STA 173+00 SEE SHEET 14



SITE 6B
1229.34 SQFT ALLOWABLE IMPACTS ZONE 1
1379.25 SQFT ALLOWABLE IMPACTS ZONE 2

SITE 6A
1683.27 SQFT ALLOWABLE IMPACTS ZONE 1
1213.77 SQFT ALLOWABLE IMPACTS ZONE 2

(25)
WILLIAM ZEB WHITAKER
PAULINE R. WHITAKER
DB 305 PG 335
DB 1736 PG 871

(26)
WILLIAM ZEB WHITAKER
PAULINE R. WHITAKER
DB 844 PG 224

(40)
JAMES E. UNDERWOOD
JACK P. UNDERWOOD
DB 1167 PG 541

(37)
KIMBERLY BROWN FORD
C. VAUGHN FORD
DB 1093 PG 162
BM 11 PG 33

(38)
EXCURSIONS, LLC
DB 1485 PG 186
BM 97 PG 239

REVISIONS

5/14/99

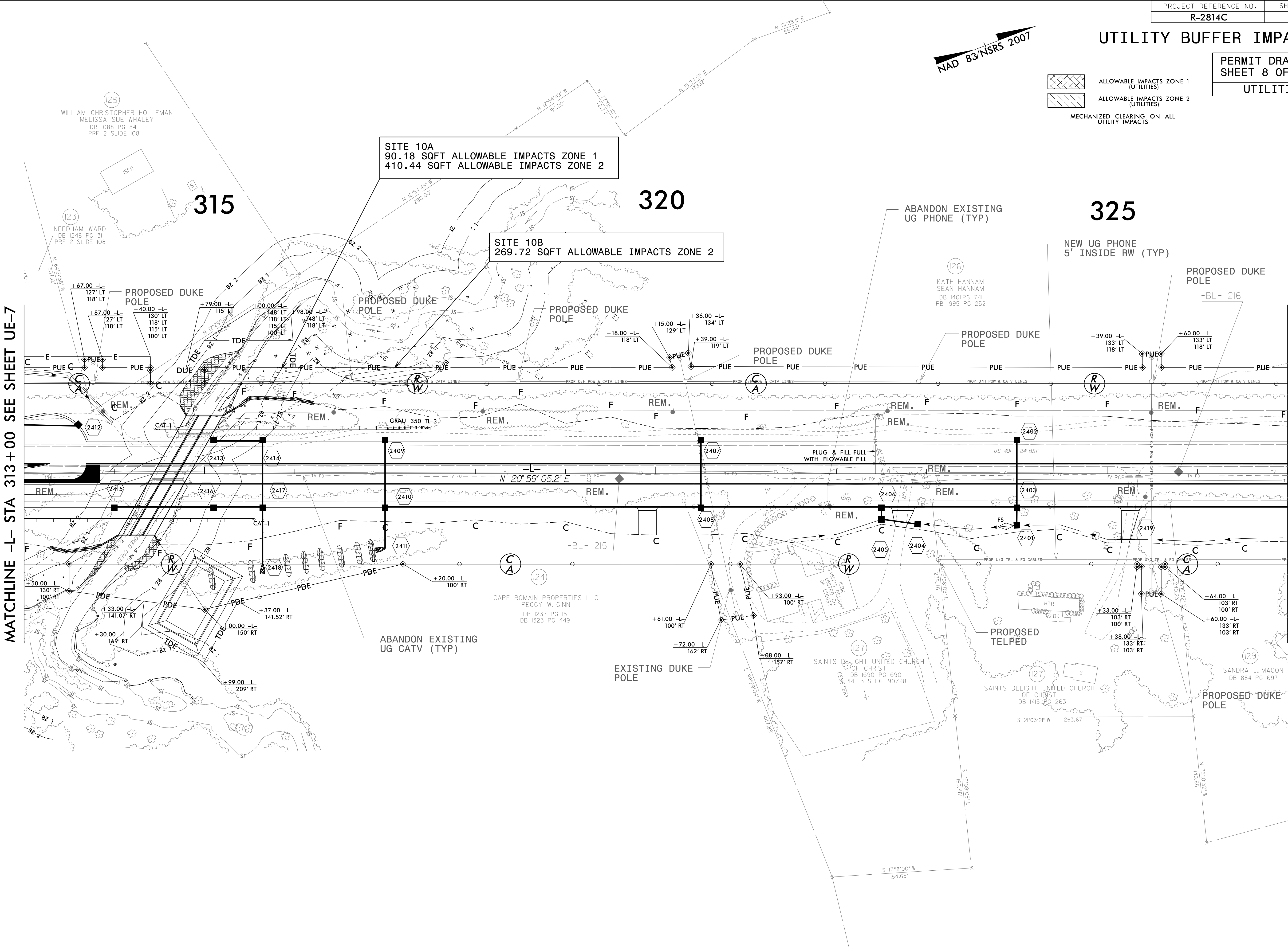
2:50:25 PM
C:\Users\pwhitaker\OneDrive\Documents\Drawings\R2814C\ut_r_dj13_UE5.psh.dgn
11/10/2016

UTILITY BUFFER IMPACTS

PERMIT DRAWING
SHEET 8 OF 9
UTILITIES

- ALLOWABLE IMPACTS ZONE 1
(UTILITIES)
- ALLOWABLE IMPACTS ZONE 2
(UTILITIES)
- MECHANIZED CLEARING ON ALL
UTILITY IMPACTS

NAD 83/NSRS 2007



MATCHLINE -L- STA 313+00 SEE SHEET UE-7

MATCHLINE -L- STA 327+00 SEE SHEET 25

UTILITY BUFFER IMPACTS

PERMIT DRAWING
SHEET 9 OF 9

UTILITIES

ALLOWABLE IMPACTS ZONE 1
(UTILITIES)

ALLOWABLE IMPACTS ZONE 2
(UTILITIES)

MECHANIZED CLEARING ON ALL
UTILITY IMPACTS

NAD 83/NSRS 2007

SITE 11A
145.97 SQFT ALLOWABLE IMPACTS ZONE 2

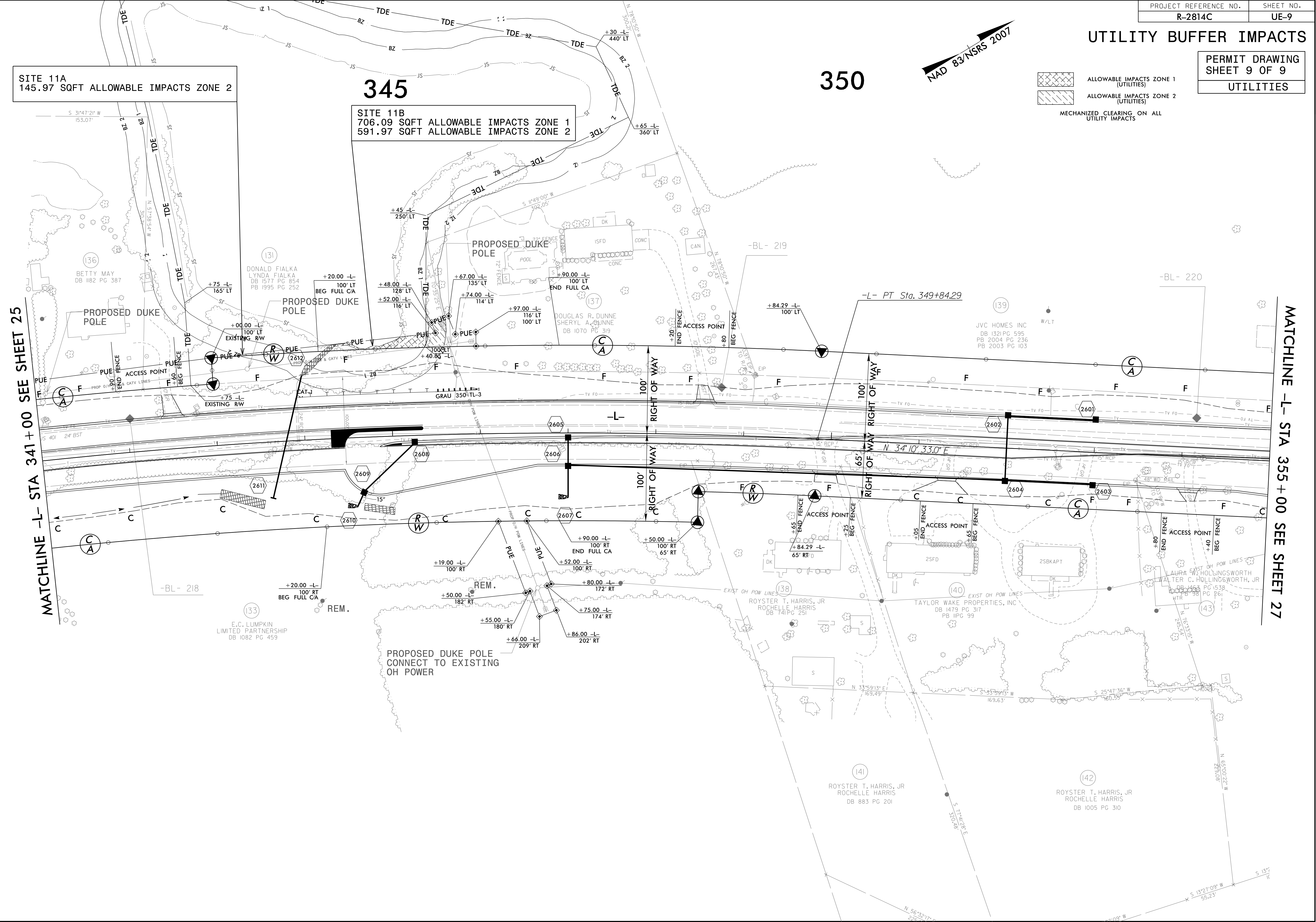
345

SITE 11B
706.09 SQFT ALLOWABLE IMPACTS ZONE 1
591.97 SQFT ALLOWABLE IMPACTS ZONE 2

350

MATCHLINE -L- STA 341+00 SEE SHEET 25

MATCHLINE -L- STA 355+00 SEE SHEET 27



5/14/99

2:55:14 PM
C:\p01\Drawings\R2814C\ut_r.dwg,26,UE9,psd,dgn
10/10/2007

UTILITY BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	TYPE			ALLOWABLE			MITIGABLE			ZONE 1 (ft²)	ZONE 2 (ft²)
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft²)	ZONE 2 (ft²)	TOTAL (ft²)	ZONE 1 (ft²)	ZONE 2 (ft²)	TOTAL (ft²)		
SITE 2A	Aerial Line	-L- 106+78 To 107+47 RT				451.8	793.9	1245.7					
SITE 2B	Aerial Line	-L- 108+29 To 108+77 RT				523.0	96.4	619.4					
SITE 3A	Aerial Line	-Y6- 21+17 To 21+57 RT				323.9	372.2	696.1					
SITE 3B	Aerial Line	-Y6- 21+70 To 22+07 RT				654.9	769.9	1424.8					
SITE 5	Aerial Line	-Y6- 30+25 To 31+12 RT				959.0	867.9	1827.0					
SITE 6A	Aerial Line	-L- 166+35 To 167+21 RT				1683.3	1213.8	2897.0					
SITE 6B	Aerial Line	-L- 167+05 To 168+18 RT				1229.3	1379.3	2608.6					
SITE 8	Aerial Line	-L- 281+31 To 283+26 LT				5680.6	2482.7	8163.4					
SITE 9A	Aerial Line	-L- 305+53 To 305+70 LT				0.0	267.1	267.1					
SITE 9B	Aerial Line	-L- 307+20 To 307+32 LT				0.0	72.6	72.6					
SITE 9C	Aerial Line	-L- 307+98 To 308+28 RT				0.0	642.6	642.6					
SITE 10A	Aerial Line	-L- 316+32 To 316+63 LT				90.2	410.4	500.6					
SITE 10B	Aerial Line	-L- 315+75 To 316+08 LT				0.0	269.7	269.7					
SITE 11A	Aerial Line	-L- 343+29 To 343+90 LT				0.0	146.0	146.0					
SITE 11B	Aerial Line	-L- 344+37 To 345+64 LT				706.1	592.0	1298.1					
								0.0					
								0.0					
								0.0					
								0.0					
								0.0					
TOTAL:						12302.2	10376.4	22678.6	0.0	0.0	0.0		

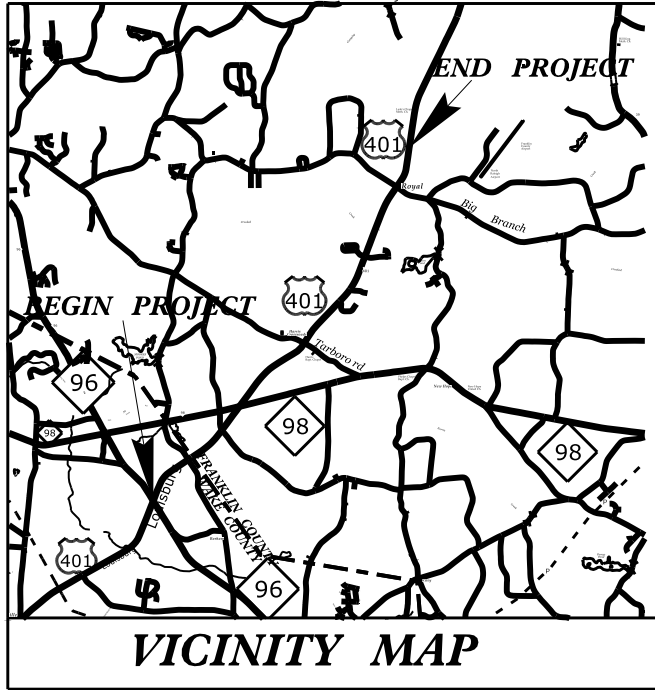
N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE/FRANKLIN COUNTY
PROJECT: R-2814C

28/Sep/2016
SHEET 1 OF 1

09/08/99

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols
See Sheet 1C-1 thru 1C-6 For Survey Control Sheets



VICINITY MAP

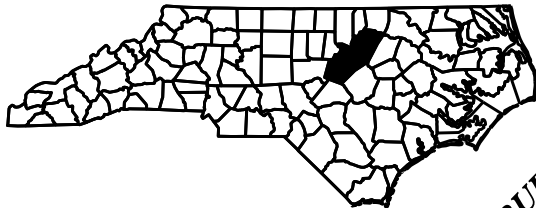
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE & FRANKLIN COUNTY

LOCATION: US 401 FROM NC 96 TO NORTH OF SR 1103 (FLAT ROCK CHURCH RD/CLIFTON POND RD)

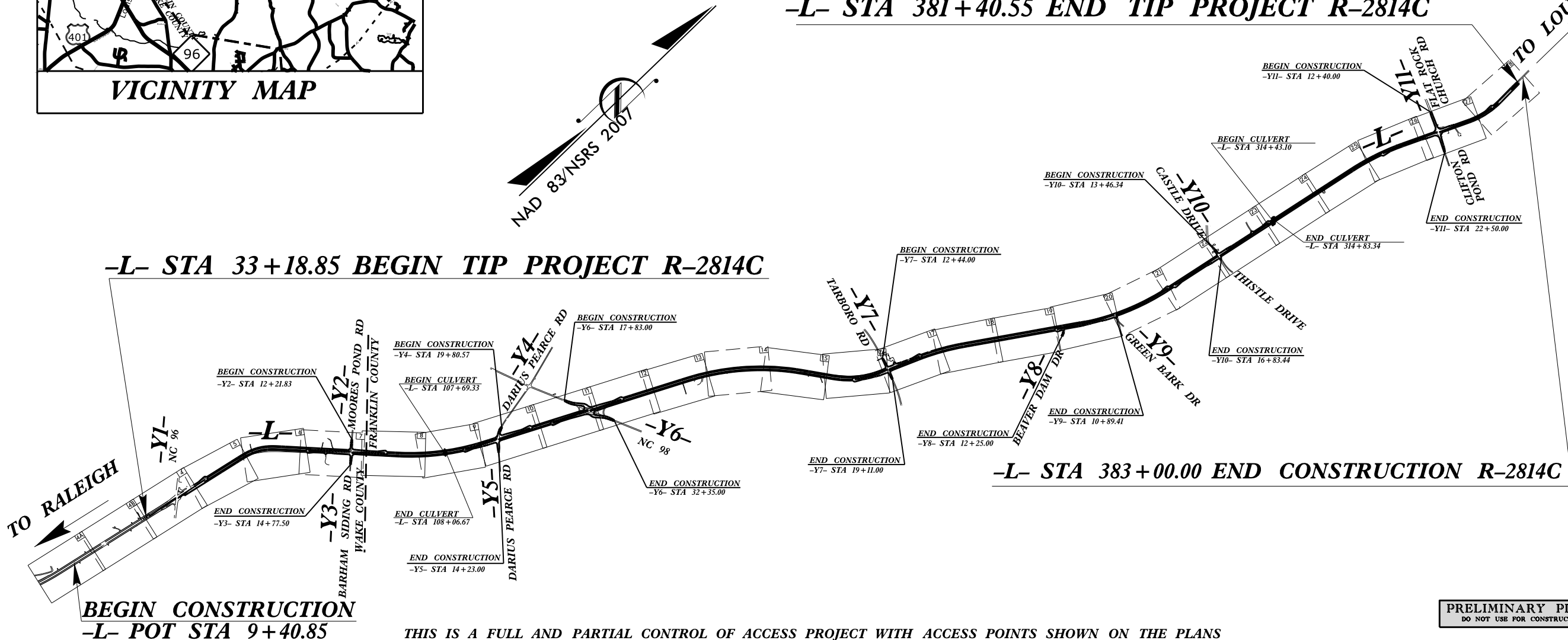
TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERTS, AND SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2814C	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34506.1.4	STP-401(249)	PE	
34506.2.FR7	STP-401(249)	R/W	
34506.2.FRU7	STP-401(249)	UTILITIES	
34506.3.FR6	STP-401(249)	CONSTR	



-L- STA 381+40.55 END TIP PROJECT R-2814C

-L- STA 33+18.85 BEGIN TIP PROJECT R-2814C



BEGIN CONSTRUCTION
-L- POT STA 9+40.85

-L- STA 383+00.00 END CONSTRUCTION R-2814C

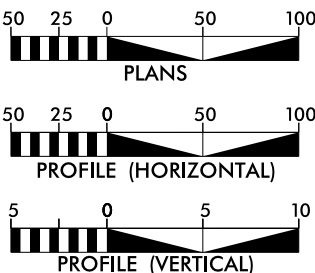
THIS IS A FULL AND PARTIAL CONTROL OF ACCESS PROJECT WITH ACCESS POINTS SHOWN ON THE PLANS

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:

TIP PROJECT: R-2814C

GRAPHIC SCALES



DESIGN DATA

ADT 2016 = 10,892
ADT 2036 = 15,848
K = 10 %
D = 65 %
T = 6 % *
V = 60 MPH
* TTST = 2% DUAL = 4%
FUNC CLASS =
MAJOR COLLECTOR
STATEWIDE TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2814C = 6.580 MILES
LENGTH STRUCTURES TIP PROJECT R-2814C = 0.015 MILES
TOTAL LENGTH OF TIP PROJECT R-2814C = 6.595 MILES

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 28, 2015

LETTING DATE:
JANUARY 15, 2019

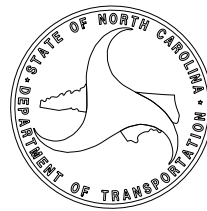
KEVIN E. MOORE, PE
PROJECT ENGINEER

NATHAN N. ADIMA, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.
ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

04-OCT-2016 12:32
R:\Roadway\Proj\R2814C_Rdy_tsh.dgn
\$\$\$\$\$USERNAME\$\$\$\$\$

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	-----
Switch	-----
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite R/W Marker	-----
Proposed Control of Access Line with Concrete C/A Marker	-----
Existing Control of Access	-----
Proposed Control of Access	-----
Existing Easement Line	-----
Proposed Temporary Construction Easement	-----
Proposed Temporary Drainage Easement	-----
Proposed Permanent Drainage Easement	-----
Proposed Permanent Drainage / Utility Easement	-----
Proposed Permanent Utility Easement	-----
Proposed Temporary Utility Easement	-----
Proposed Aerial Utility Easement	-----
Proposed Permanent Easement with Iron Pin and Cap Marker	-----

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-----
Proposed Slope Stakes Fill	-----
Proposed Curb Ramp	-----
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	-----
VEGETATION:	
Single Tree	☼
Single Shrub	☼
Hedge	-----
Woods Line	-----

Orchard	☼ ☼ ☼ ☼
Vineyard	-----

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	-----
Bridge Wing Wall, Head Wall and End Wall	-----
MINOR:	
Head and End Wall	-----
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	-----
Paved Ditch Gutter	-----
Storm Sewer Manhole	-----
Storm Sewer	-----

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊗
Power Transformer	⊗
U/G Power Cable Hand Hole	-----
H-Frame Pole	-----
U/G Power Line LOS B (S.U.E.*)	-----
U/G Power Line LOS C (S.U.E.*)	-----
U/G Power Line LOS D (S.U.E.*)	-----

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Pedestal	⊕
Telephone Cell Tower	⊕
U/G Telephone Cable Hand Hole	-----
U/G Telephone Cable LOS B (S.U.E.*)	-----
U/G Telephone Cable LOS C (S.U.E.*)	-----
U/G Telephone Cable LOS D (S.U.E.*)	-----
U/G Telephone Conduit LOS B (S.U.E.*)	-----
U/G Telephone Conduit LOS C (S.U.E.*)	-----
U/G Telephone Conduit LOS D (S.U.E.*)	-----
U/G Fiber Optics Cable LOS B (S.U.E.*)	-----
U/G Fiber Optics Cable LOS C (S.U.E.*)	-----
U/G Fiber Optics Cable LOS D (S.U.E.*)	-----

WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
U/G Water Line LOS B (S.U.E.*)	-----
U/G Water Line LOS C (S.U.E.*)	-----
U/G Water Line LOS D (S.U.E.*)	-----
Above Ground Water Line	-----

TV:

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

GAS:

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

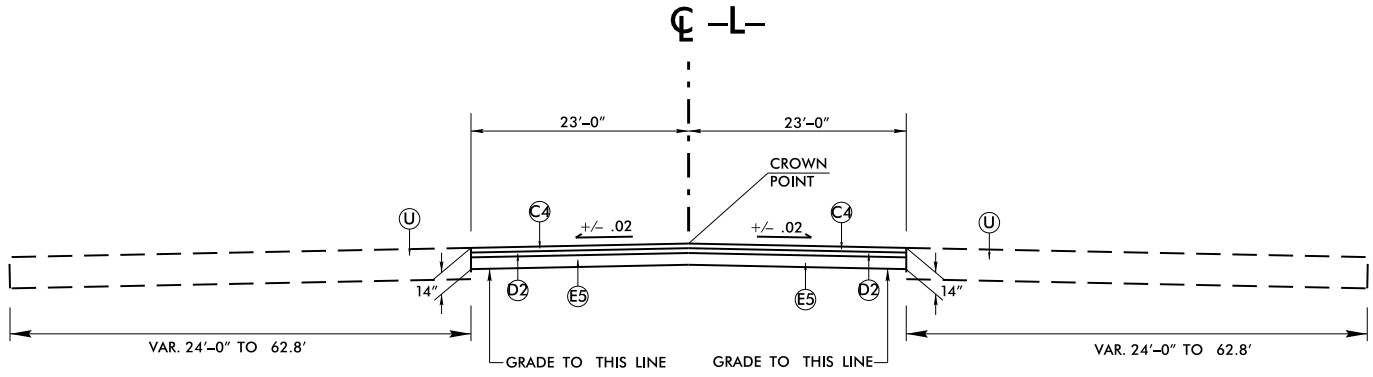
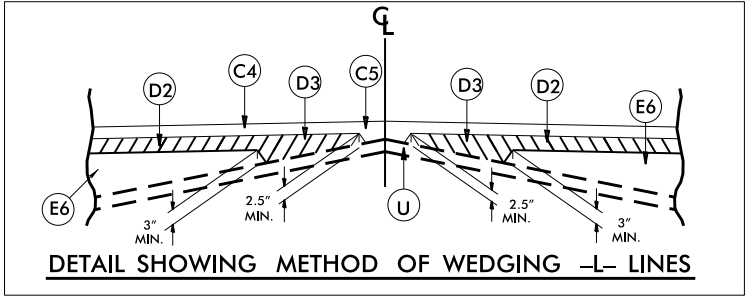
SANITARY SEWER:

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

MISCELLANEOUS:

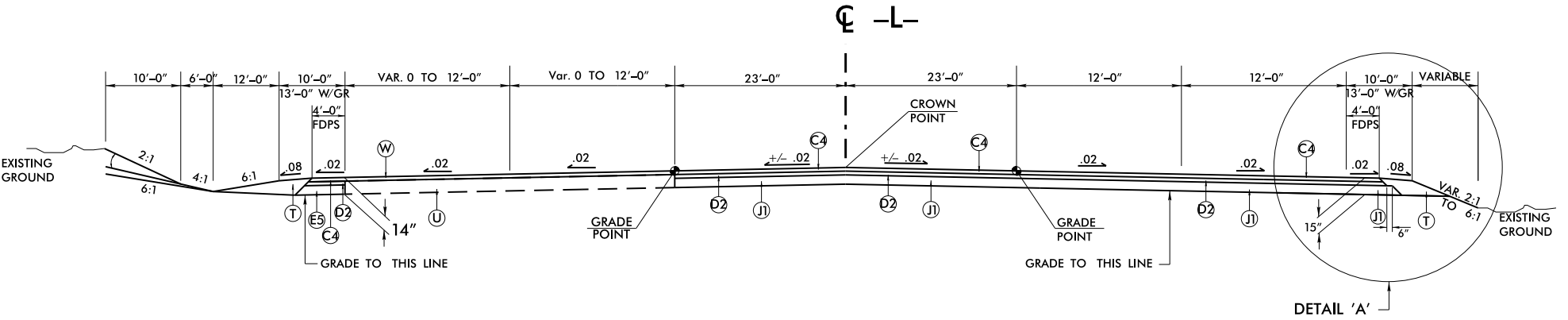
Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line LOS B (S.U.E.*)	-----
U/G Tank; Water, Gas, Oil	-----
Underground Storage Tank, Approx. Loc.	-----
A/G Tank; Water, Gas, Oil	-----
Geoenvironmental Boring	⊕
U/G Test Hole LOS A (S.U.E.*)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

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF 2 LAYERS
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.
C4	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF 2 LAYERS
C5	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D3	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2.5" IN DEPTH OR GREATER THAN 4" IN DEPTH.
D4	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2.5" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 3.5" ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.
E2	PROP. APPROX. 4" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E3	PROP. APPROX. 4.5" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
E4	PROP. APPROX. 5.5" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E5	PROP. APPROX. 7.0" ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD. IN EACH OF THE 2 LAYERS
E6	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT GREATER THAN 5.5" IN DEPTH OR LESS THAN 3" IN DEPTH
E7	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT GREATER THAN 5.5" IN DEPTH OR LESS THAN 3" IN DEPTH
J1	PROP. 8" AGGREGATE BASE COURSE.
R1	2'-6" CONCRETE CURB AND GUTTER.
R2	1'-6" CONCRETE CURB AND GUTTER.
R3	2'-9" CONCRETE CURB AND GUTTER.
R4	EXPRESSWAY GUTTER
R5	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL BELOW, RIGHT)



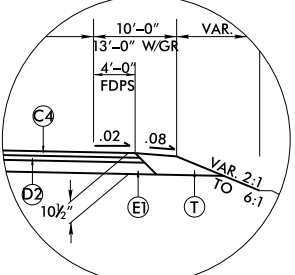
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 FROM:
-L- STA. 33+18.85 TO -L- STA. 43+54.23



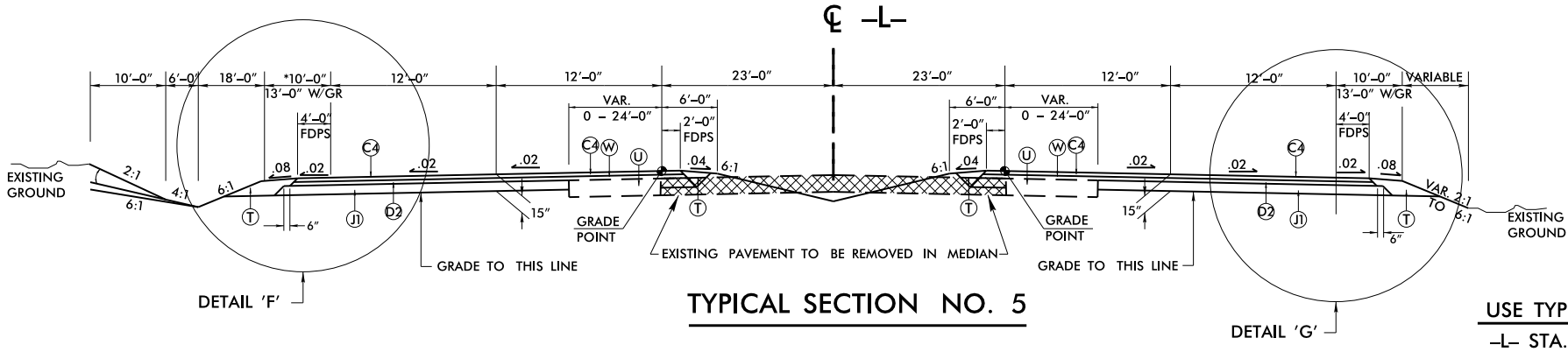
TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2 FROM:
-L- STA. 43+54.23 TO -L- STA. 50+40.85



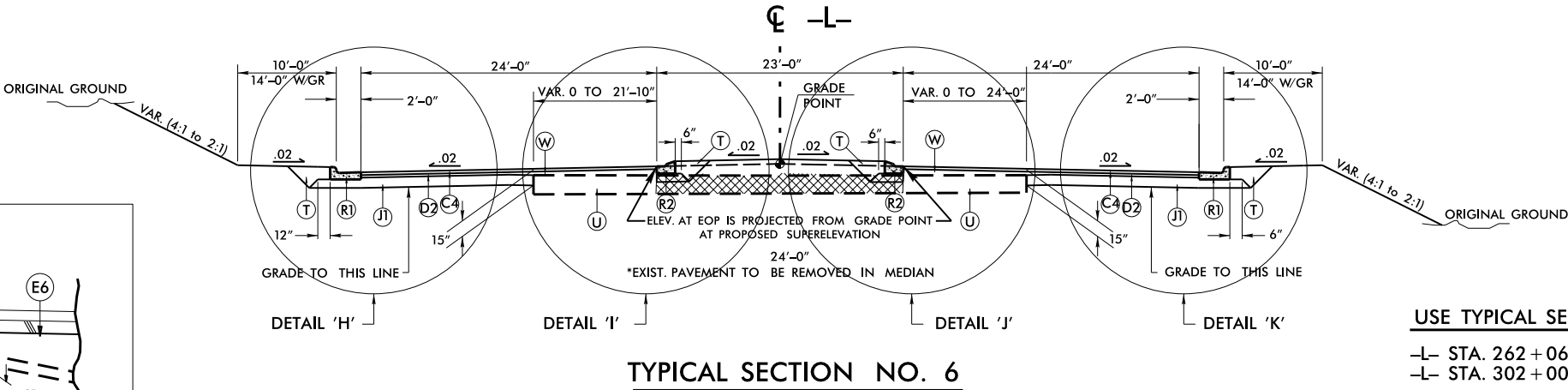
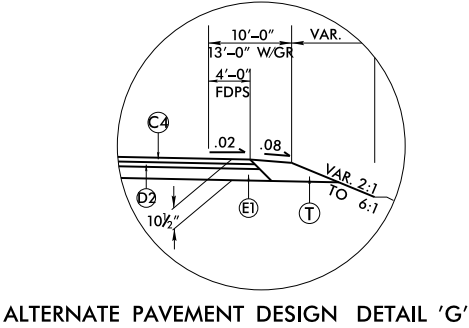
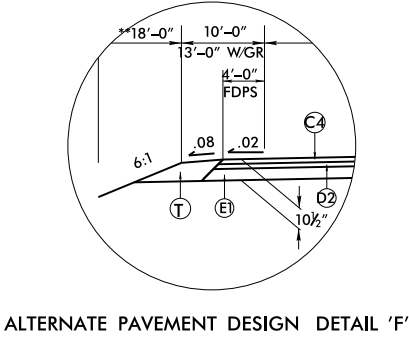
ALTERNATE PAVEMENT DESIGN DETAIL 'A'

C4	3" TYPE S9.5C
C5	VAR. TYPE SF9.5A
D2	4" TYPE I19.0C
D3	VAR TYPE I19.0C
E1	3.5" TYPE B25.0C
E6	VAR TYPE B25.0C
J1	8" ABC
R1	2'-6" CONCRETE CURB AND GUTTER
R2	1'-6" CONCRETE CURB AND GUTTER
R3	2'-9" CONCRETE CURB AND GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

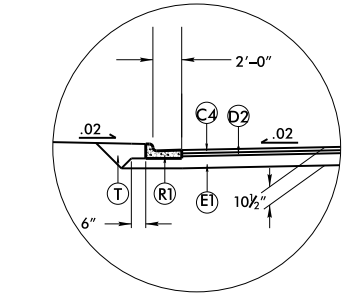
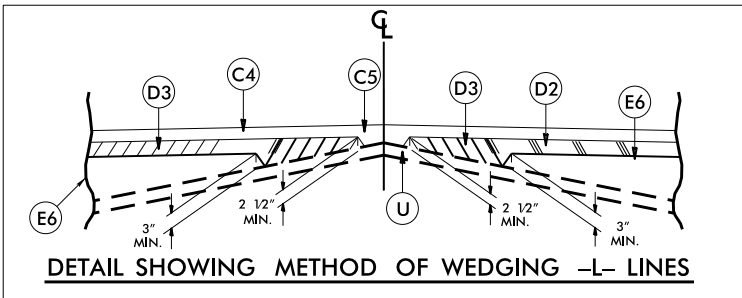


PROJECT REFERENCE NO. R-2814C	SHEET NO. 2A-3
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

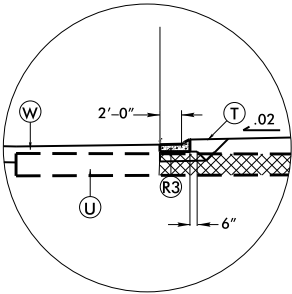
USE TYPICAL SECTION NO. 5 FROM:
-L- STA. 193+07 TO -L- STA. 201+34



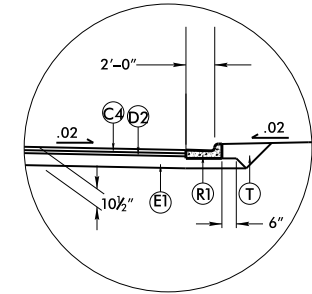
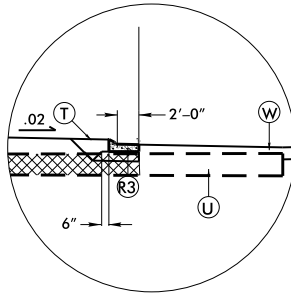
USE TYPICAL SECTION NO. 6 FROM:
-L- STA. 262+06 TO -L- STA. 296+50
-L- STA. 302+00 TO -L- STA. 373+40



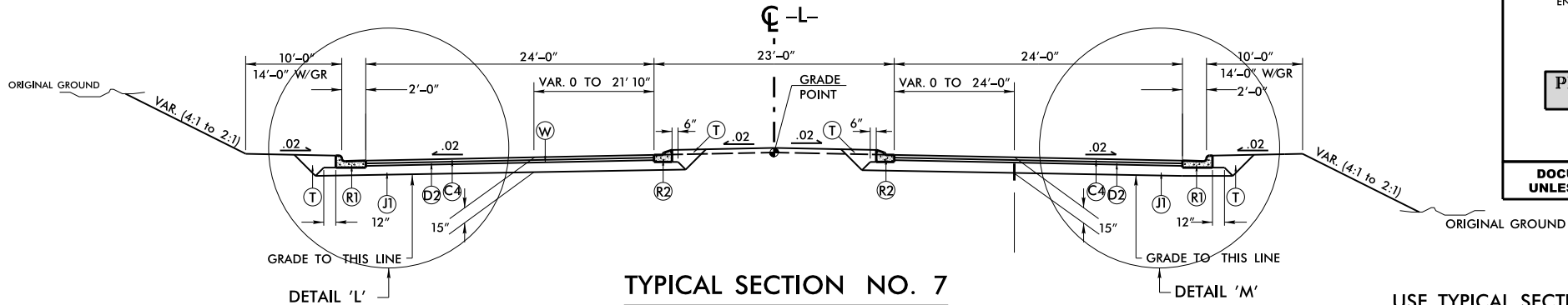
USE DETAIL 'I' IN CONJUNCTION WITH TYPICAL 6
-L- STA. 335+16 TO -L- STA. 351+60



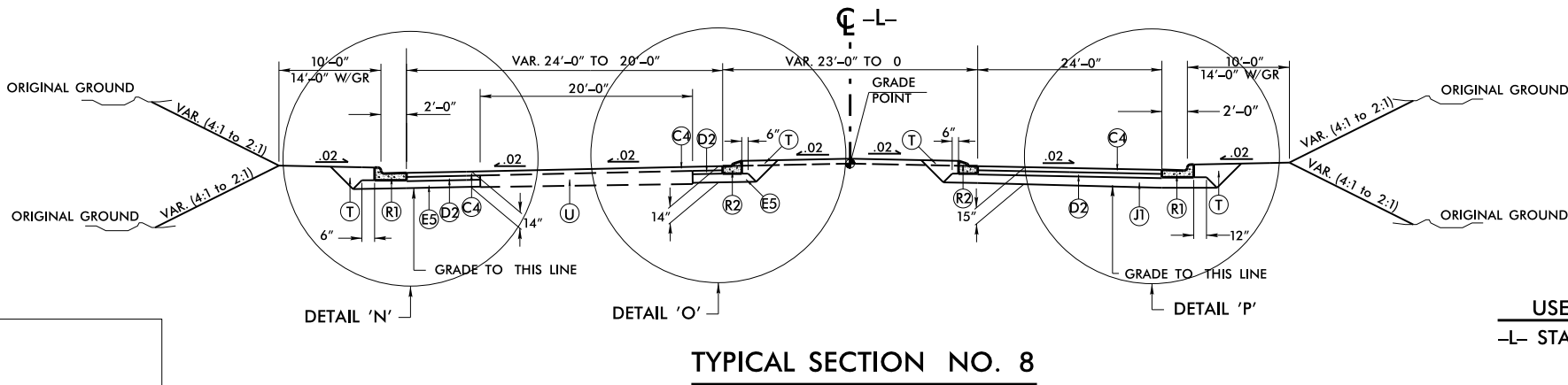
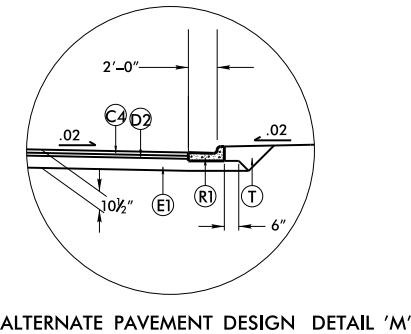
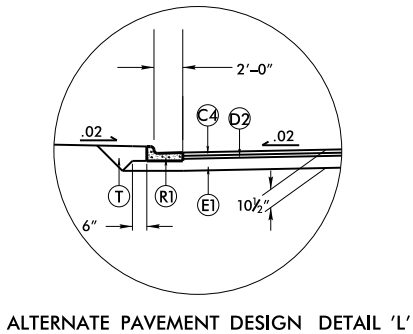
USE DETAIL 'J' IN CONJUNCTION WITH TYPICAL 6
-L- STA. 262+06 TO -L- STA. 269+95
-L- STA. 272+05 TO -L- STA. 284+25



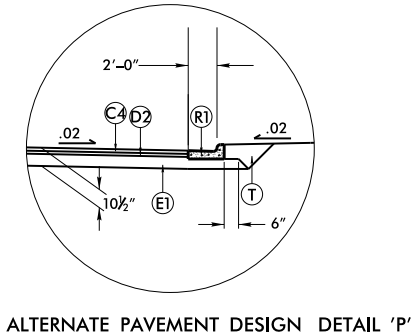
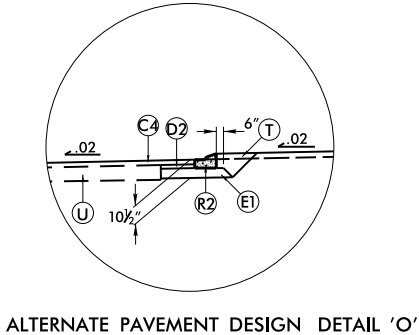
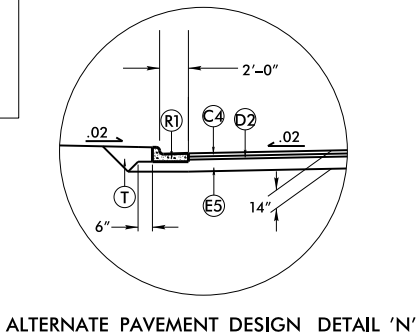
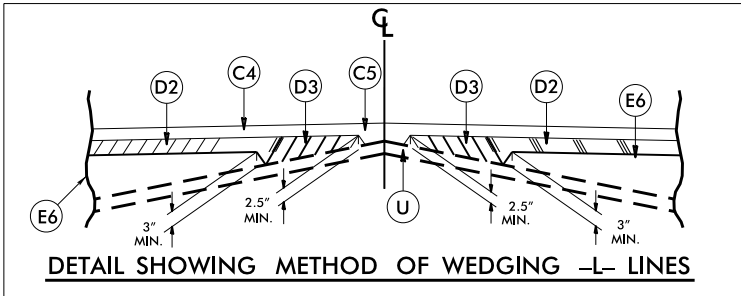
C4	3" TYPE S9.5C
C5	VAR. TYPE SF9.5A
D2	4" TYPE I19.0C
D3	VAR TYPE I19.0C
E1	3.5" TYPE B25.0C
E5	7" TYPE B25.0C
E6	VAR TYPE B25.0C
J1	8" ABC
R1	2'-6" CONCRETE CURB AND GUTTER
R2	1'-6" CONCRETE CURB AND GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



USE TYPICAL SECTION NO. 7 FROM:
-L- STA. 296+50 TO -L- STA. 302+00

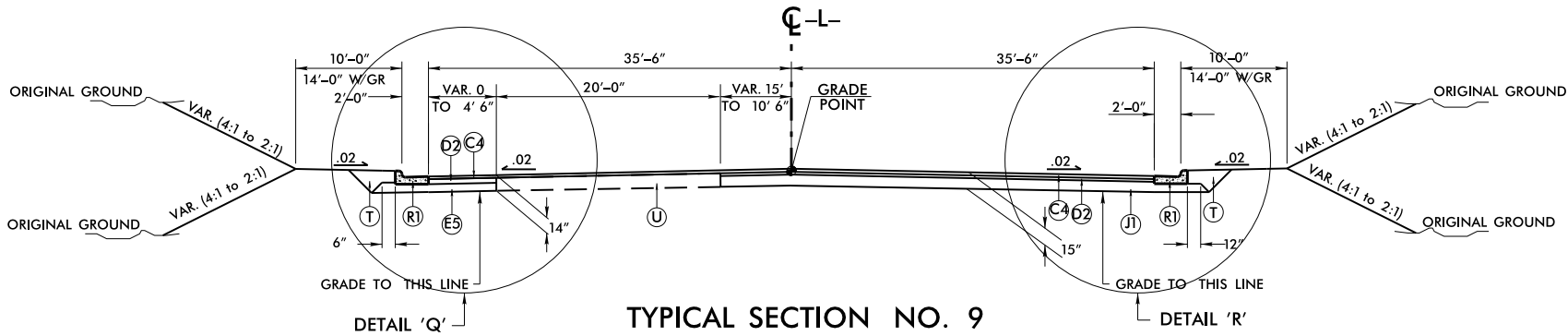


USE TYPICAL SECTION NO. 8 FROM:
-L- STA. 373+40 TO -L- STA. 374+64.96



6/2/99

C4	3" TYPE S9.5C
C5	VAR. TYPE SF9.5A
D2	4" TYPE I19.0C
D3	VAR TYPE I19.0C
E1	3.5" TYPE B25.0C
E5	7" TYPE B25.0C
E6	VAR TYPE B25.0C
J1	8" ABC
R1	2'-6" CONCRETE CURB AND GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

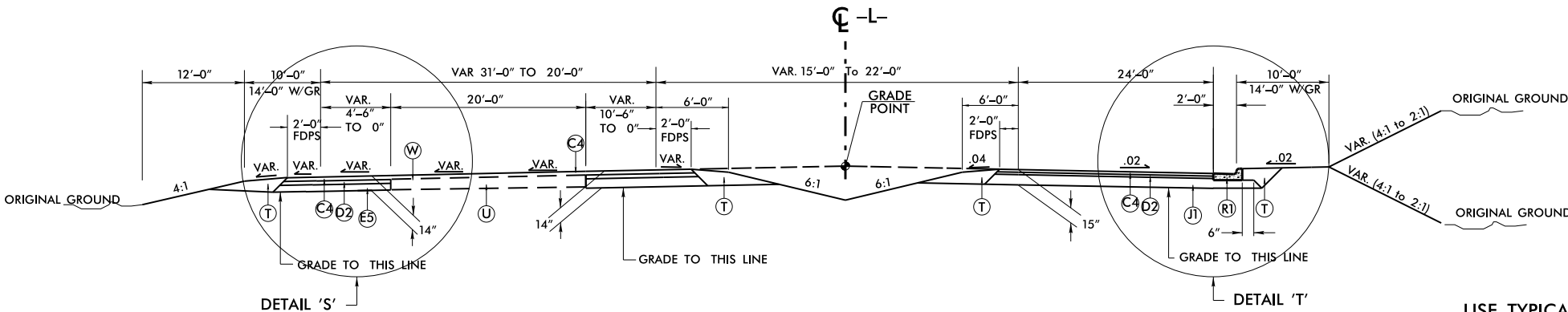


TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 9 FROM:
-L- STA. 374+64.96 TO -L- STA. 379+13.50

ALTERNATE PAVEMENT DESIGN DETAIL 'Q'

ALTERNATE PAVEMENT DESIGN DETAIL 'R'

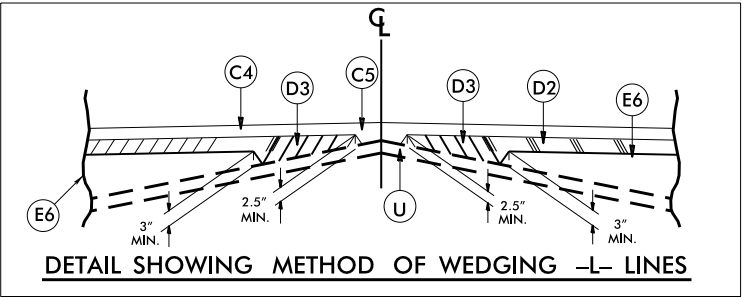


TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 10 FROM:
-L- STA. 379+13.50 TO -L- STA. 381+40.55

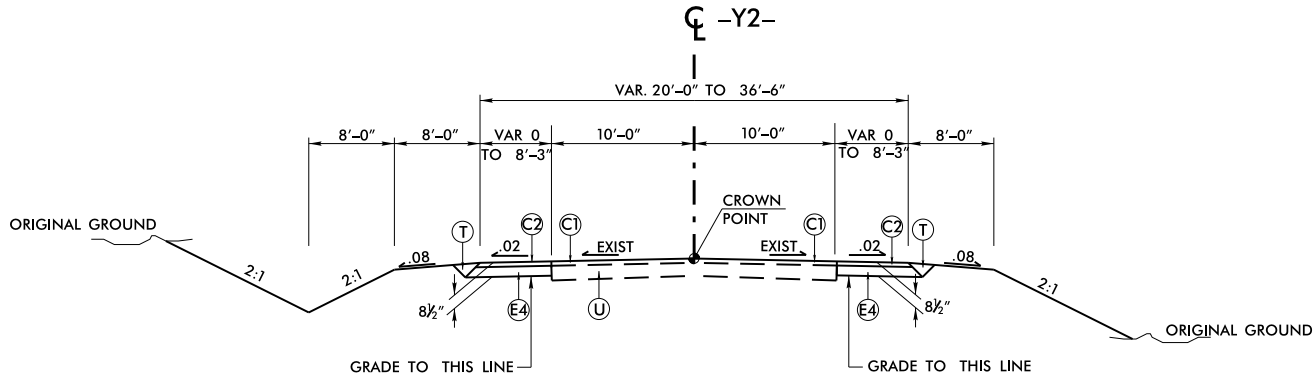
ALTERNATE PAVEMENT DESIGN DETAIL 'S'

ALTERNATE PAVEMENT DESIGN DETAIL 'T'

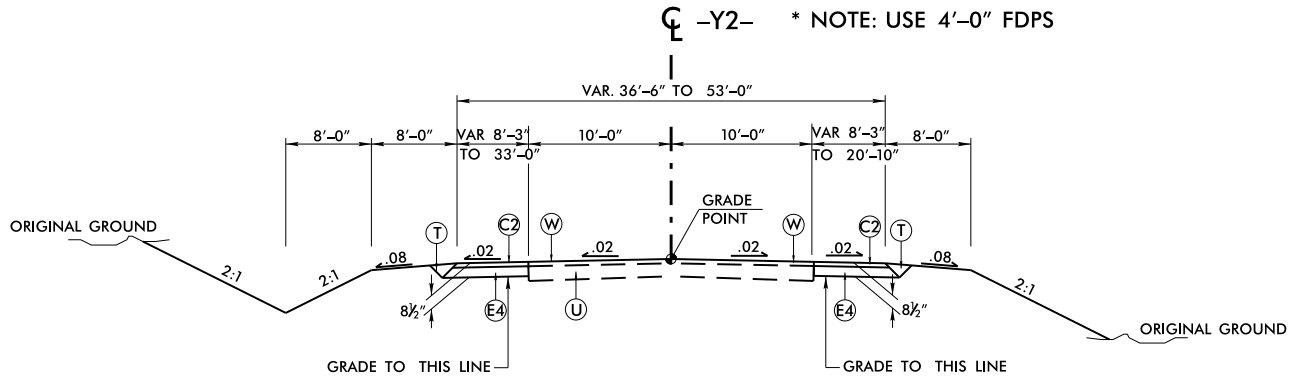


DETAIL SHOWING METHOD OF WEDGING -L- LINES

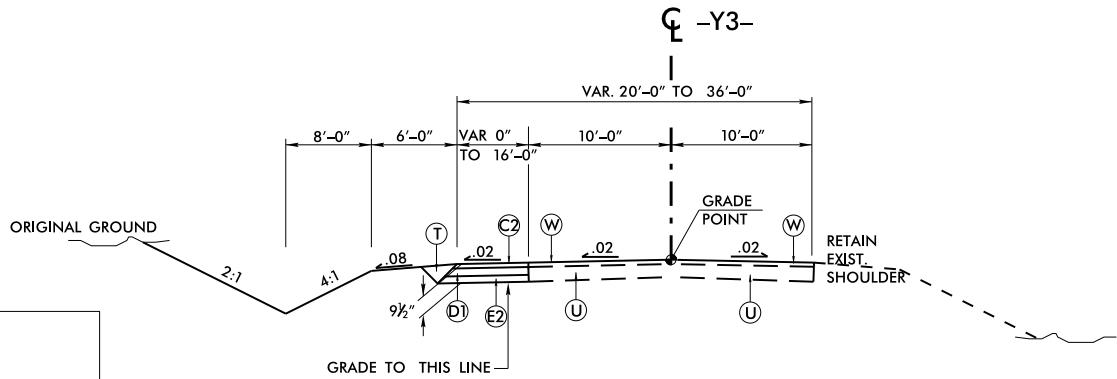
C1	1.5" TYPE SF9.5A
C2	3" TYPE SF9.5A
C3	VAR. DEPTH TYPE SF9.5A
C4	3" TYPE S9.5C
C5	VAR. DEPTH TYPE S9.5C
D1	2.5" TYPE I19.0B
D4	VAR. DEPTH I19.0B
E2	4" TYPE B25.0B
E4	5½" TYPE B25.0B
E7	VAR. DEPTH TYPE B25.0B
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



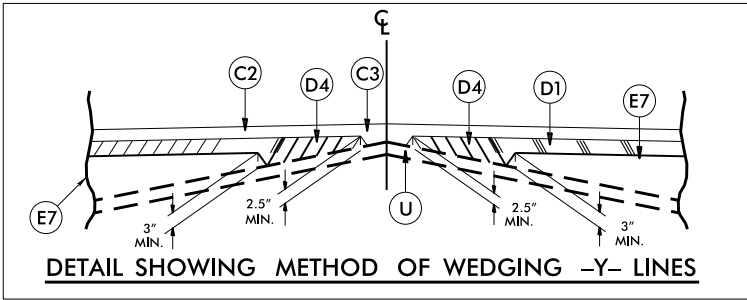
TYPICAL SECTION NO. 11



TYPICAL SECTION NO. 12



TYPICAL SECTION NO. 13



DETAIL SHOWING METHOD OF WEDGING -Y- LINES

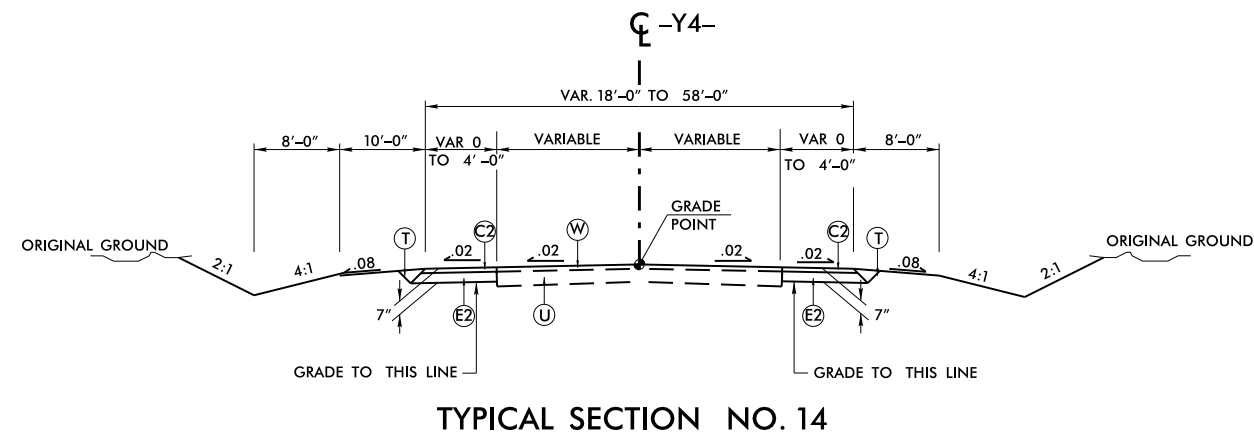
PROJECT REFERENCE NO.	SHEET NO.
R-2814C	2A-6
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

USE TYPICAL SECTION NO. 11 FROM:
-Y2- STA. 12+21.83 TO -Y2- STA. 13+50

USE TYPICAL SECTION NO. 12 FROM:
-Y2- STA. 13+50 TO -Y2- STA. 14+00
*-Y2- STA. 14+00 TO -Y2- STA. 14+74.65

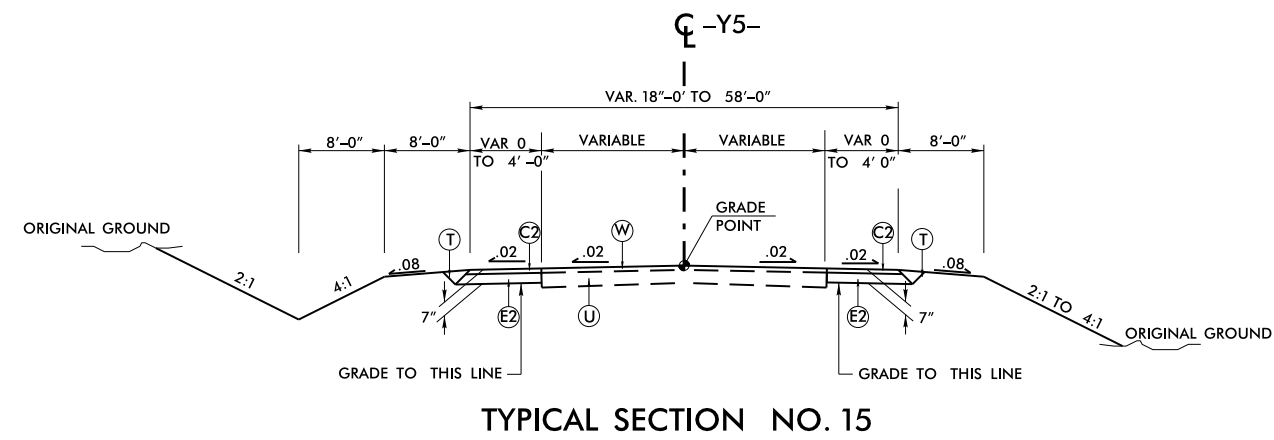
USE TYPICAL SECTION NO. 13 FROM:
-Y3- STA. 10+33.27 TO -Y3- STA. 12+86.28

C1	1.5" TYPE SF9.5A
C2	3" TYPE SF9.5A
C3	VAR. DEPTH TYPE SF9.5A
C4	3" TYPE S9.5C
C5	VAR. DEPTH TYPE S9.5C
D1	2.5" TYPE I19.0B
D4	VAR. DEPTH I19.0B
E2	4" TYPE B25.0B
E4	5½" TYPE B25.0B
E7	VAR. DEPTH TYPE B25.0B
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



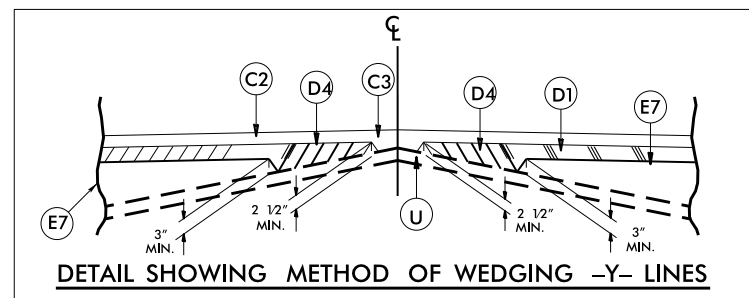
USE TYPICAL SECTION NO. 14 FROM:

-Y4- STA. 21+60.45 TO -Y4- STA. 24+06.97

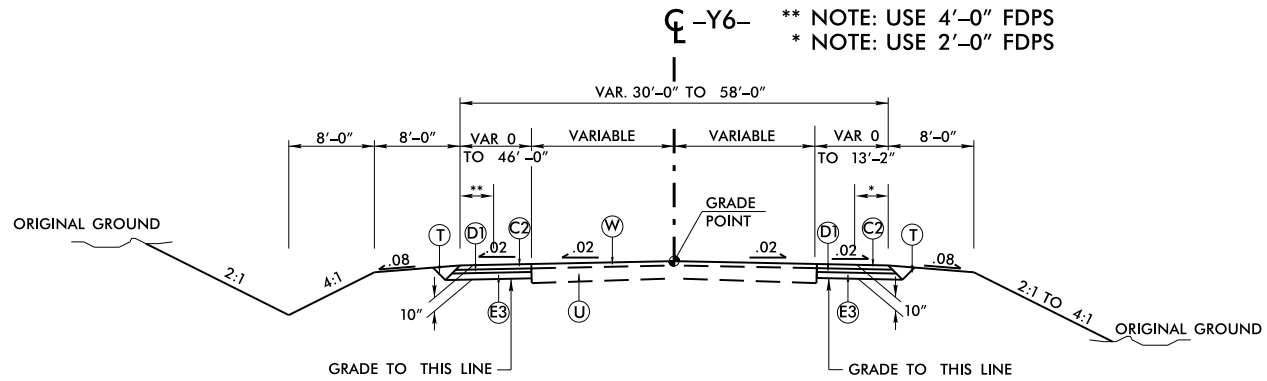


USE TYPICAL SECTION NO. 15 FROM:

-Y5- STA. 10+48.09 TO -Y5- STA. 13+20.20



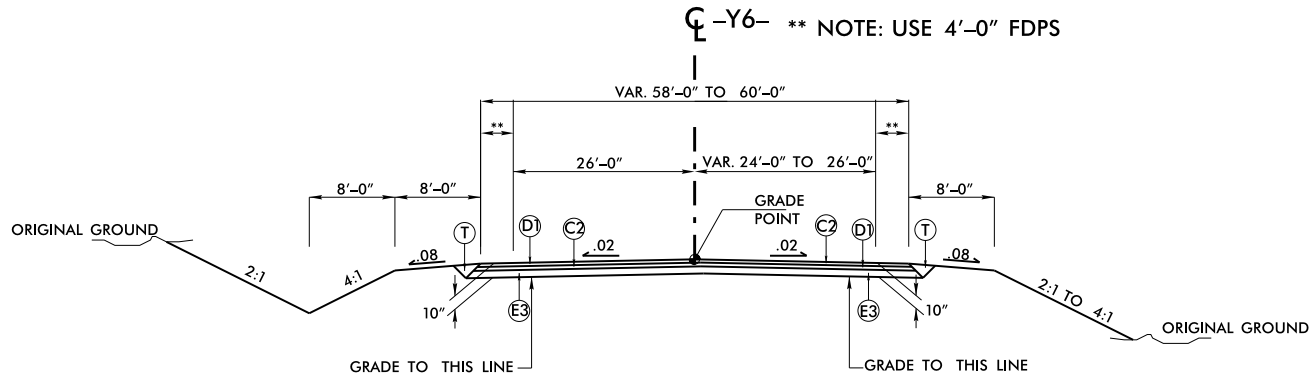
C2	3" TYPE SF9.5A
D1	2.5" TYPE I19.0B
D4	VAR. DEPTH I19.0B
E3	4.5" TYPE B25.0B
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 16

USE TYPICAL SECTION NO. 16 FROM:

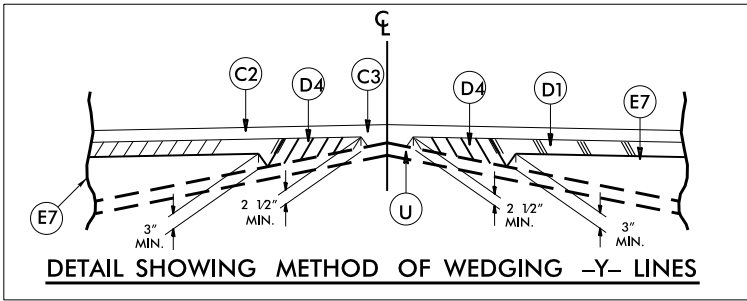
-Y6- STA. 20+27.06 TO -Y6- STA. 22+11
 ** -Y6- STA. 29+58 TO -Y6- STA. 32+30
 * -Y6- STA. 18+88 TO -Y6- STA. 19+88



TYPICAL SECTION NO. 17

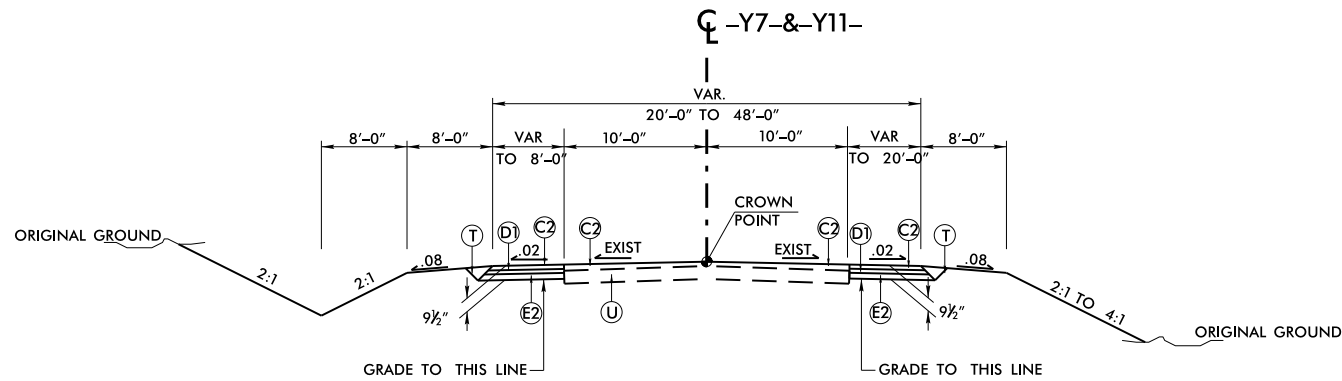
USE TYPICAL SECTION NO. 17 FROM:

-Y6- STA. 22+11 TO -Y6- STA. 25+08.10
 -Y6- STA. 26+20.47 TO -Y6- STA. 29+58

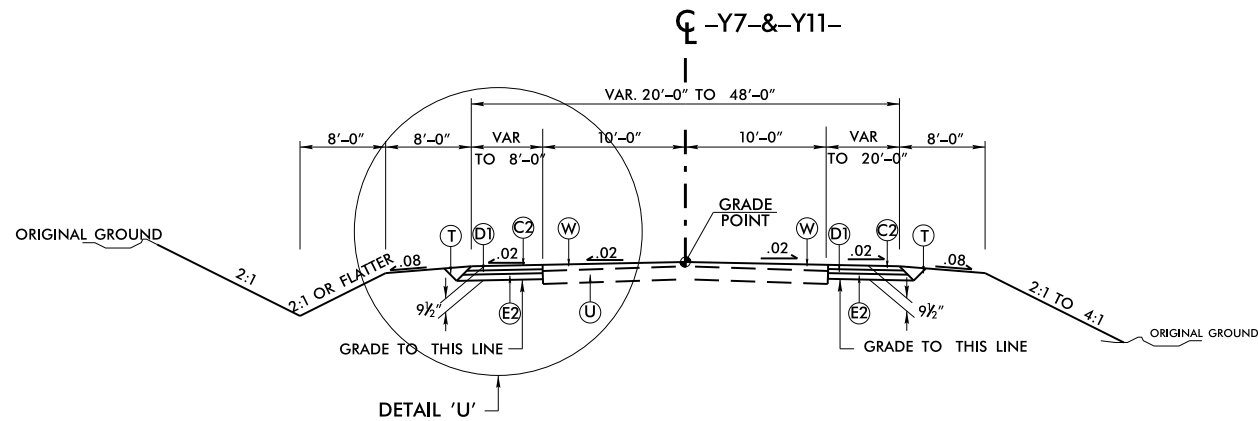


6/2/99

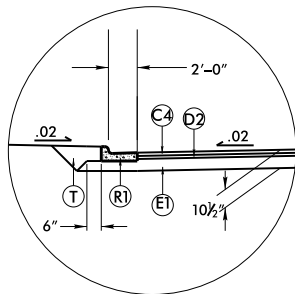
C2	3" TYPE SF9.5A
C4	3" TYPE S9.5C
D1	2.5" TYPE I19.0B
D2	4" TYPE I19.0C
D4	VAR. DEPTH I19.0B
E1	3.5" TYPE B25.0C
E2	4" TYPE B25.0B
R1	2'-6" CONCRETE CURB AND GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 18

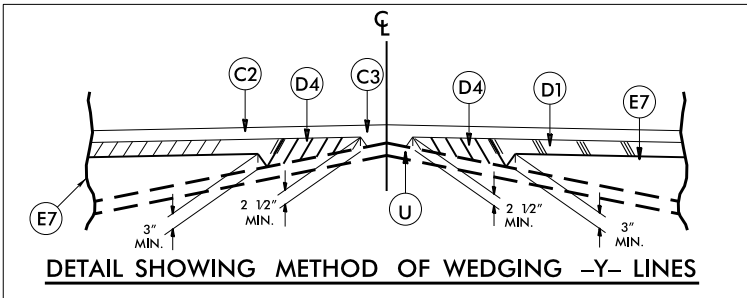


TYPICAL SECTION NO. 19



USE DETAIL 'U' IN CONJUNCTION WITH TYPICAL 19

-Y11- STA. 16+00 TO 17+14.96 LT & RT
-Y11- STA. 17+85.96 TO 19+04.66 LT & RT



DETAIL SHOWING METHOD OF WEDGING -Y- LINES

PROJECT REFERENCE NO.	SHEET NO.
R-2814C	2A-9
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

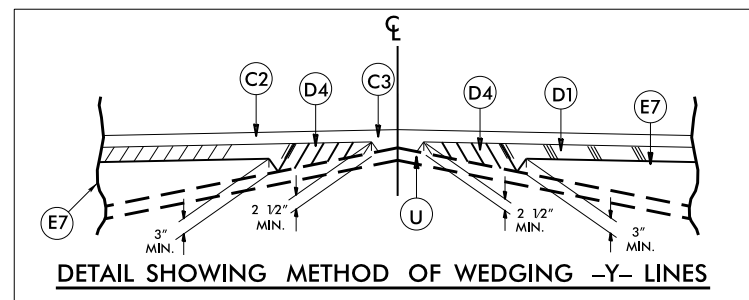
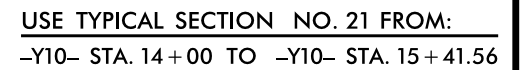
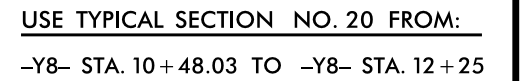
USE TYPICAL SECTION NO. 18 FROM:

-Y7- STA. 13+11.91 TO -Y7- STA. 14+30
-Y7- STA. 18+00 TO -Y7- STA. 18+55
-Y11- STA. 12+50 TO -Y11- STA. 16+00
-Y11- STA. 19+50 TO -Y11- STA. 22+50

USE TYPICAL SECTION NO. 19 FROM:

-Y7- STA. 14+30 TO -Y7- STA. 15+45
-Y7- STA. 16+55 TO -Y7- STA. 18+00
-Y11- STA. 16+00 TO -Y11- STA. 17+14.96
-Y11- STA. 17+85.96 TO -Y11- STA. 19+50

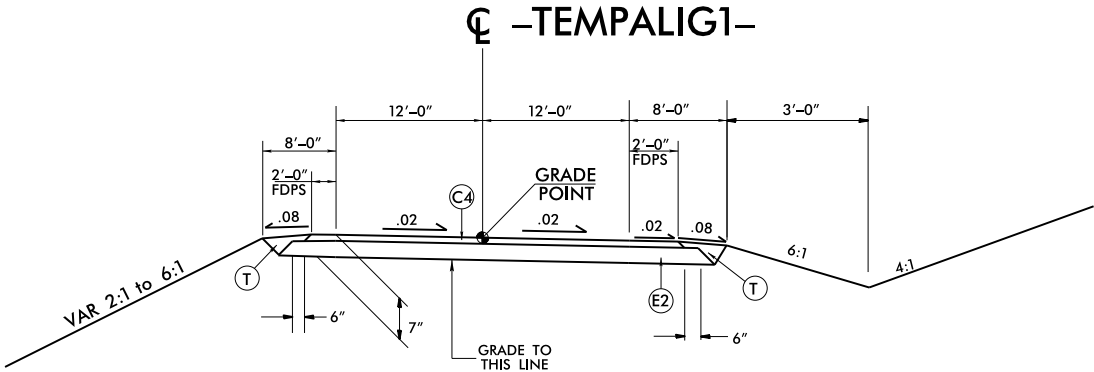
PROJECT REFERENCE NO.		SHEET NO.	
R-2814C		2A-10	
ROADWAY DESIGN ENGINEER		PAVEMENT DESIGN ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



6/2/99

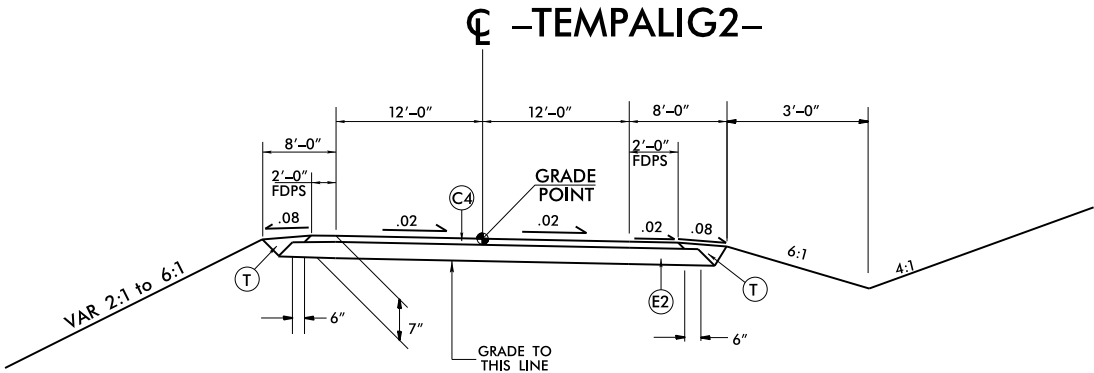
04-OCT-2016 12:25
R:\Roadway\Projects\2814C_Rdy.typ.dgn
\$\$\$\$\$

C4	3" TYPE S9.5C
E2	4" TYPE B25.0B
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



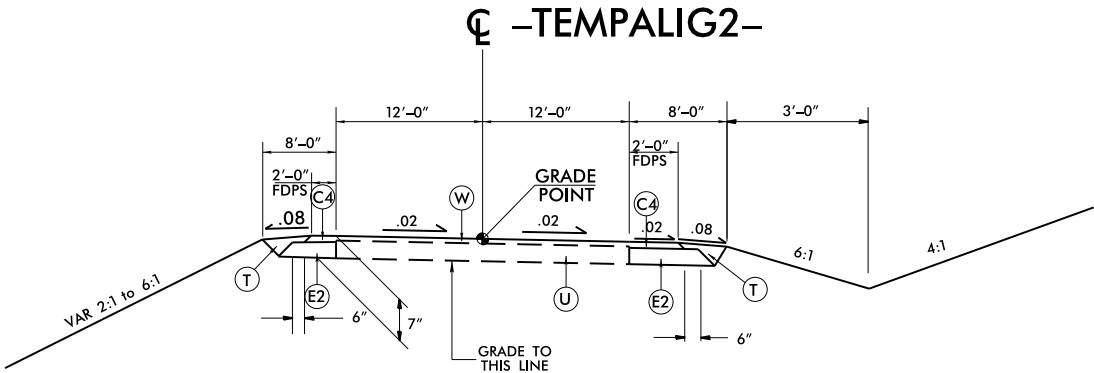
TYPICAL SECTION NO. 22

USE TYPICAL SECTION NO. 22 FROM:
-TEMPALIG1- STA. 13 + 84.06 TO -TEMPALIG1- STA. 15 + 59.74



TYPICAL SECTION NO. 23

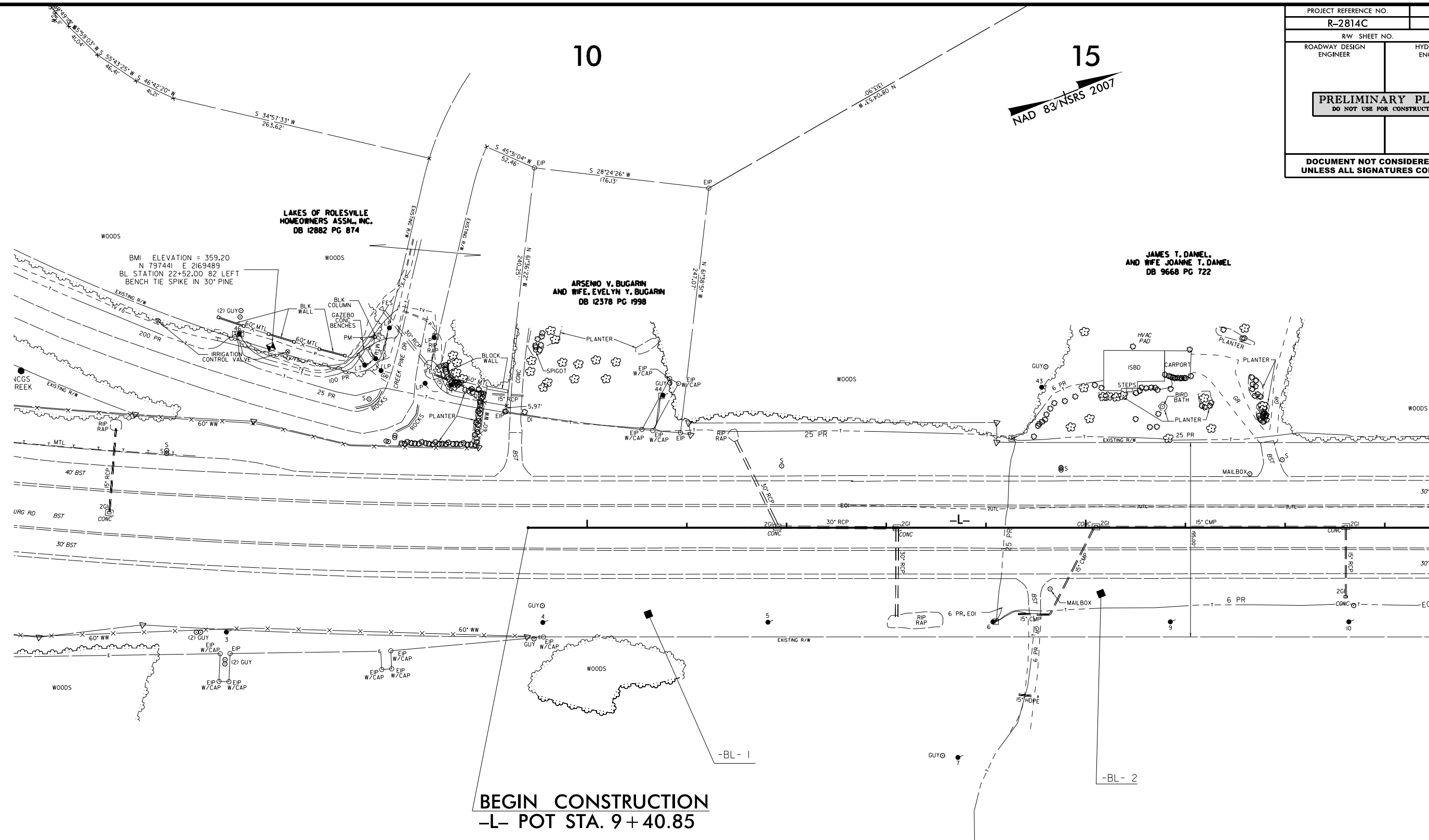
USE TYPICAL SECTION NO. 23 FROM:
-TEMPALIG2- STA. 12 + 50.00 TO -TEMPALIG2- STA. 18 + 61.21



TYPICAL SECTION NO. 24

USE TYPICAL SECTION NO. 24 FROM:
-TEMPALIG2- STA. 18 + 61.21 TO -TEMPALIG2- STA. 19 + 16.88

PROJECT REFERENCE NO.	SHEET NO.
R-2814C	2A-II
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



MATCHLINE -L- STA 18+50 SEE SHEET 4B

REVISIONS

04-OCT-2016 14:29
R:\Roadway\Proj\R2814C-psh-s4A.dgn
\$\$\$\$\$USERNAME\$\$\$\$\$

45

-YI- POT Sta. 10+00.00

$$\frac{-L- POT Sta. 41+77.19}{-YI- POT Sta. 15+42.33}$$

-YI- POT Sta. 10+00.00

MATCHLINE -L- STA 47+00 SEE SHEET 5

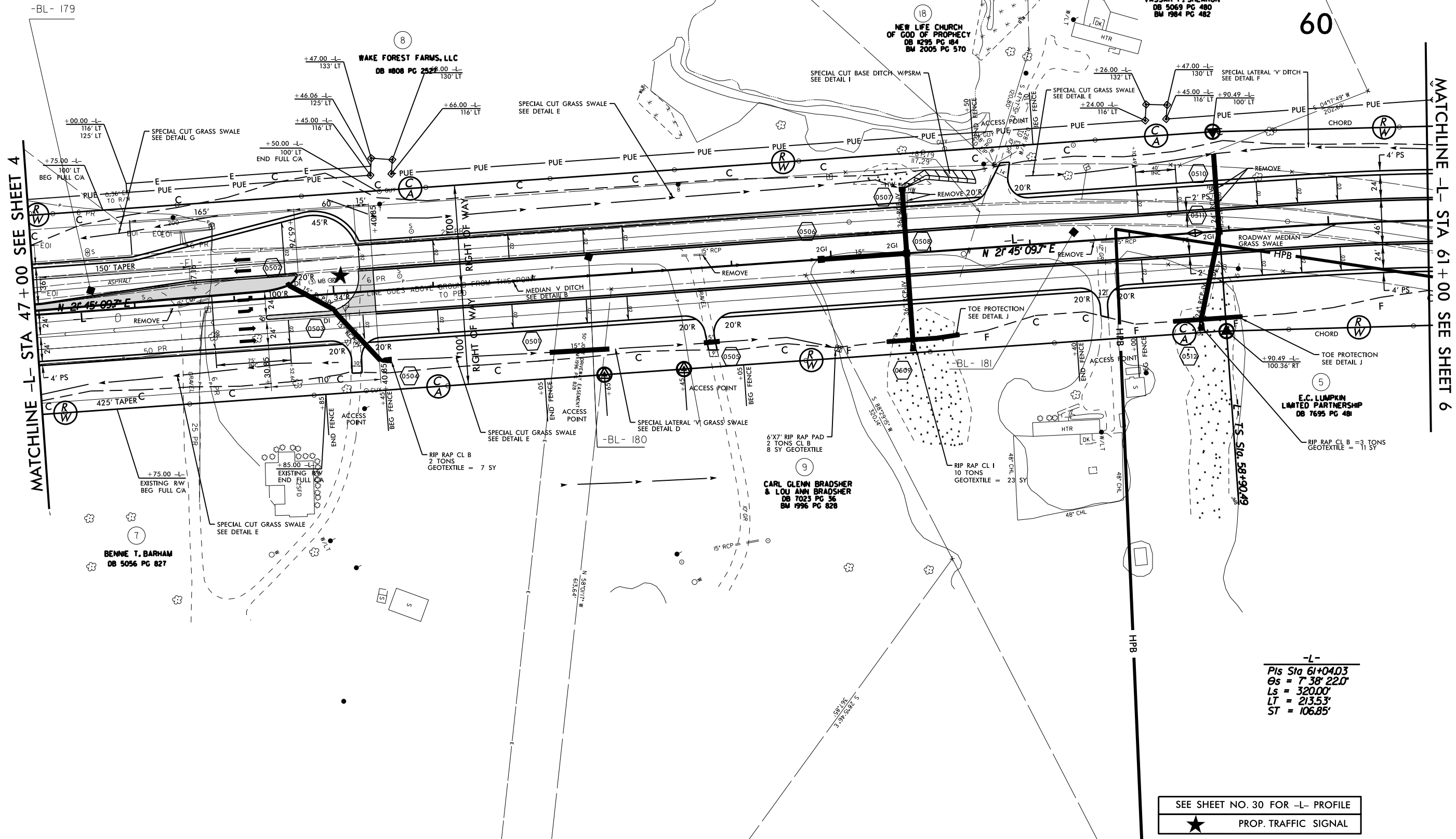
-YI- POT Sta. 20+49.54

★ PROP. TRAFFIC SIGNAL
SEE SHEET NO. 29 FOR -L- PROFILE
☆ EXISTING TRAFFIC SIGNAL TO BE REVISED

05-OCT-2016 08:45
 N:\Roadwork\Proj\VP2814C_psh.s4.dgn
 \$\$\$USERNAME\$\$\$
 8/17/99

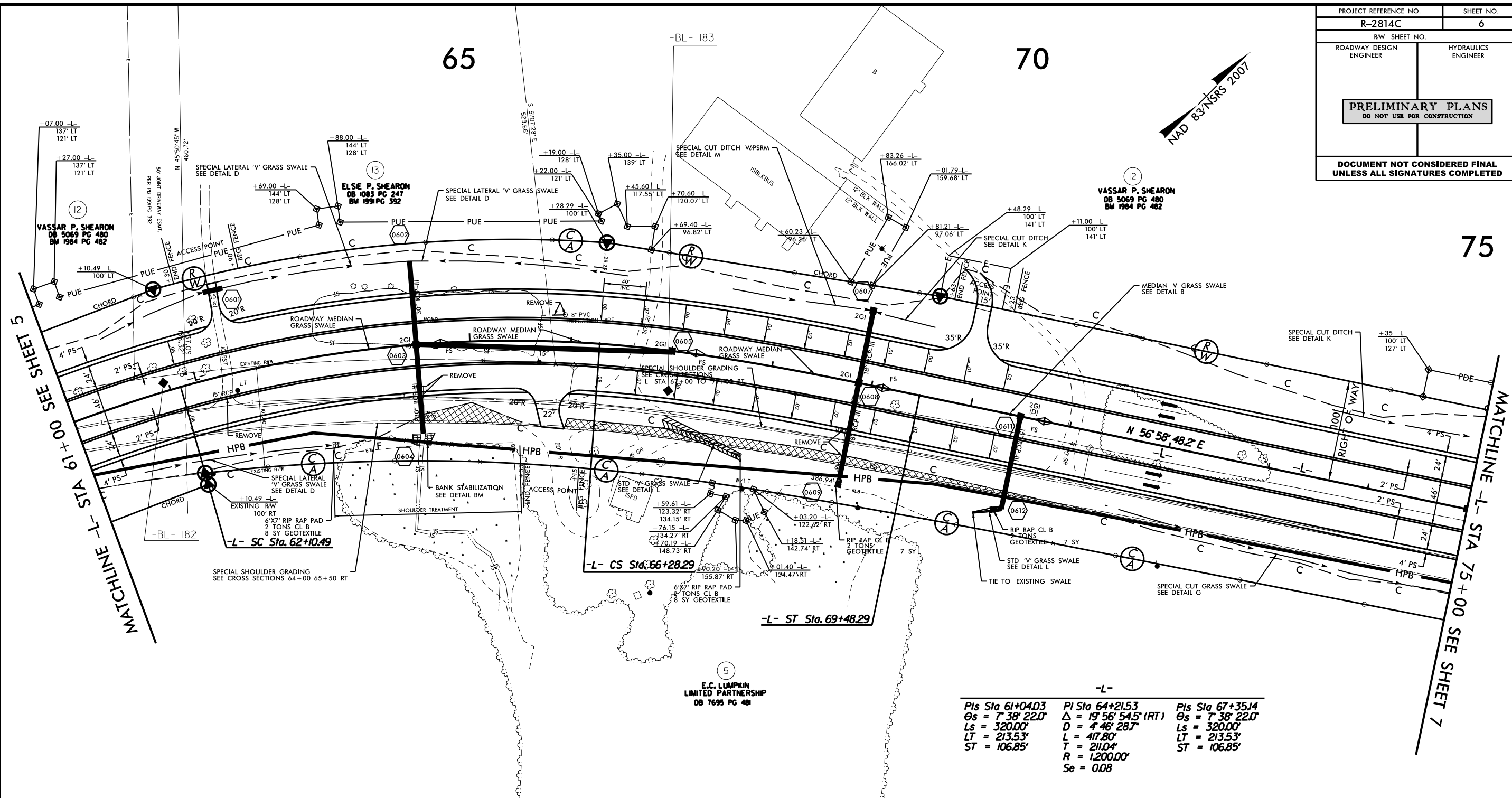
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2814C	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



REVISIONS

04-OCT-2016 12:33
R:\Roadway\Proj\R2814C.psh.s5.dgn
S:\SHEETNAME



SEE SHEET NO. 30 & 31 FOR -L- PROFILE

 PAVEMENT REMOVAL

75

80

85

PROJECT REFERENCE NO.	SHEET NO.
R-2814C	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

MATCHLINE -L- STA 75+00 SEE SHEET 6

MATCHLINE -L- STA 89+00 SEE SHEET 8

SR 2057 MOORES POND RD.	
10,892 15,848 PROP US401	635 809 1,305 1,826 -100 -100 10,457 15,240
2016 ADT 2036 ADT	335 509 1,540 2,235

BEGIN CONST
-Y2- STA 12+21.83

-L- POT Sta.86+02.00=
-Y3- POT Sta.9+86.27
-L- POT Sta.85+96.31=
-Y2- POT Sta.15+21.60

RODNEY PRIVETTE
DB 1265 PG 582
DB 1997 PG 1506

JAMES AL PRIVETTE
DB 1624 PG 581
DB 1756 PG 443

E.C. LUMPKIN
LIMITED PARTNERSHIP
DB 444 PG 343
DB 1987 PG 1678

E.C. LUMPKIN
LIMITED PARTNERSHIP
DB 7695 PG 481

E.C. LUMPKIN
LIMITED PARTNERSHIP
DB 7695 PG 481

JACKIE E. THOMPSON, SR.
DONNA YOUNG
DB 9329 PG 279

SEE SHEET NO. 31 FOR -L- PROFILE
SEE SHEET NO. 43 FOR -Y2- & -Y3- PROFILE

-Y3- POT Sta.14+91.27

END CONST
-Y3- STA 14+77.50

8/17/99

REVISIONS

04-OCT-2016 12:33
R:\Roadway\Projects\2814C\psh_s8.dgn
\$\$\$\$SYTIME\$\$\$\$

MATCHLINE -L- STA 89+00 SEE SHEET 7

-BL- 186

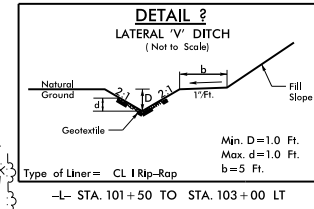
90

95

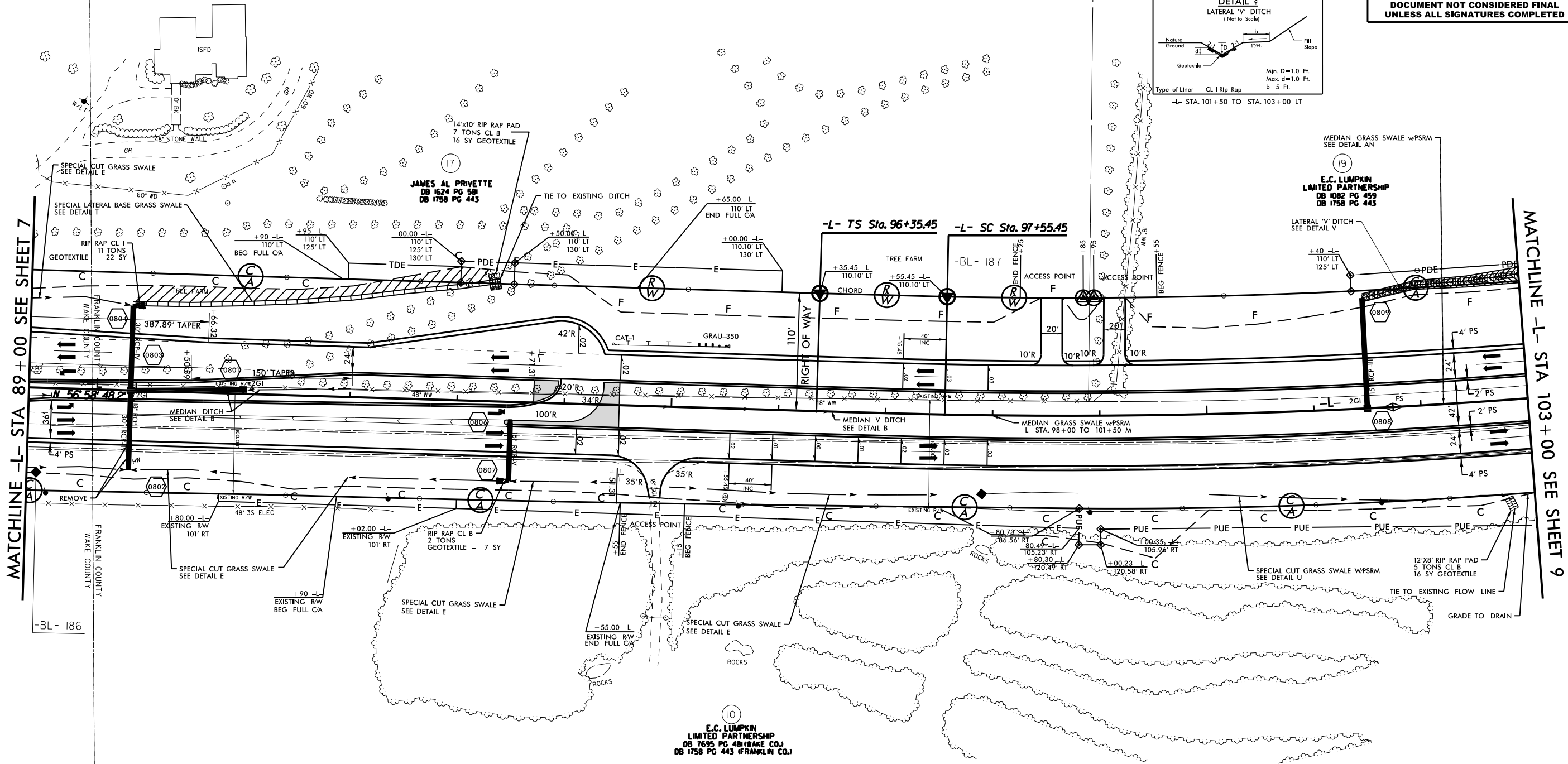
100

-L-
Pls Sta 97+15.45
Os = 0° 35' 59.8"
Ls = 120.00'
LT = 80.00'
ST = 40.00'
PI Sta 106+84.92
Δ = 18° 25' 39.5" (LT)
D = 0° 59' 59.7"
L = 1,842.90'
T = 929.48'
R = 5,730.00'
Se = 0.03

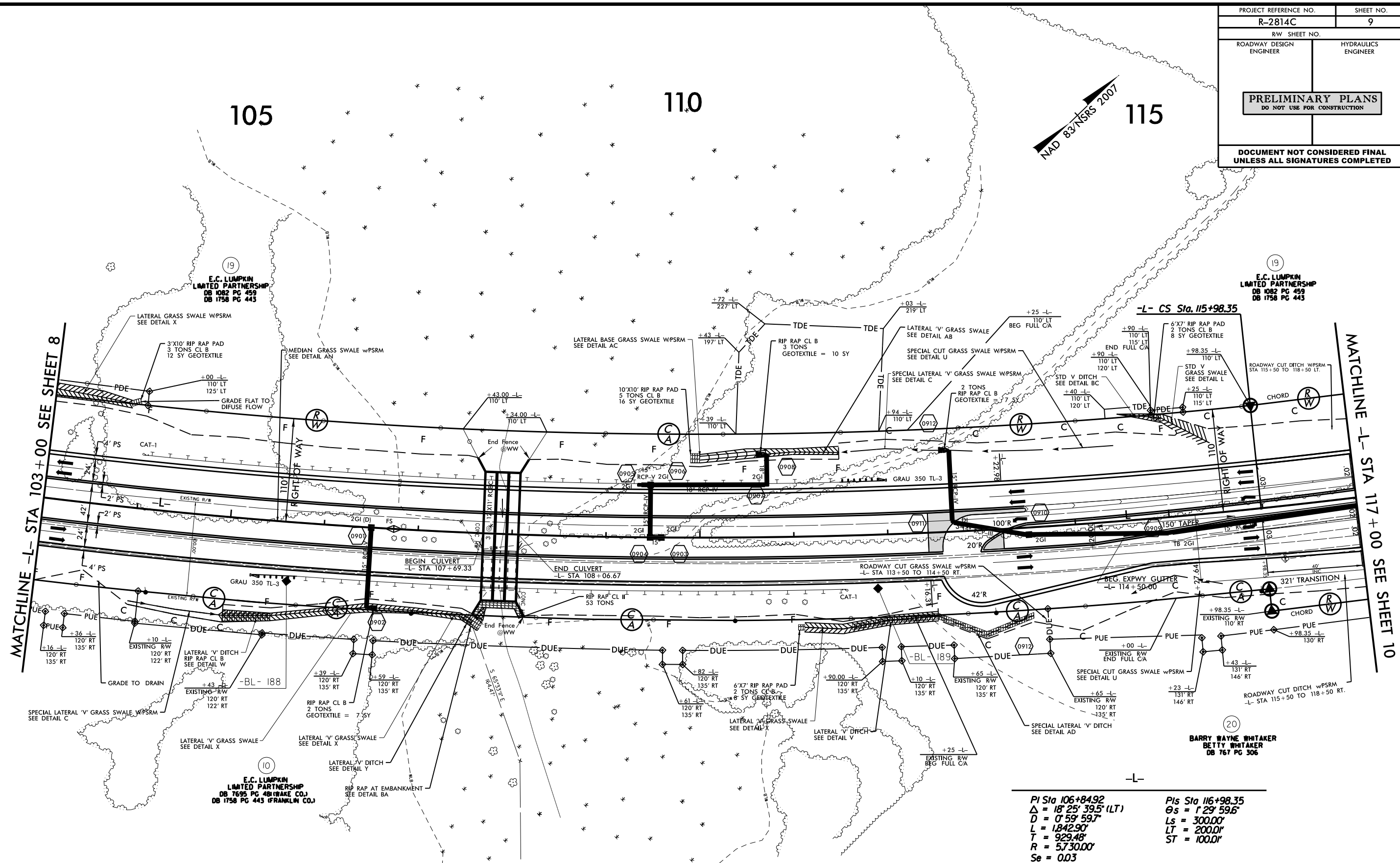
NAD 83 N55° 20' 07"



PROJECT REFERENCE NO.		SHEET NO.
R-2814C		8
R/W SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		



SEE SHEET NO. 31 & 32 FOR -L- PROFILE

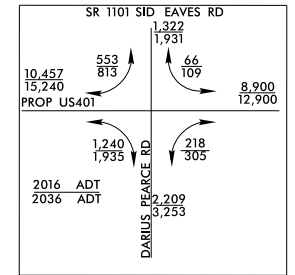


SEE SHEET NO. 32 FOR -L- PROFILE
SEE SHEET C-1 THRU C-? FOR CULVERT PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-2814C	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

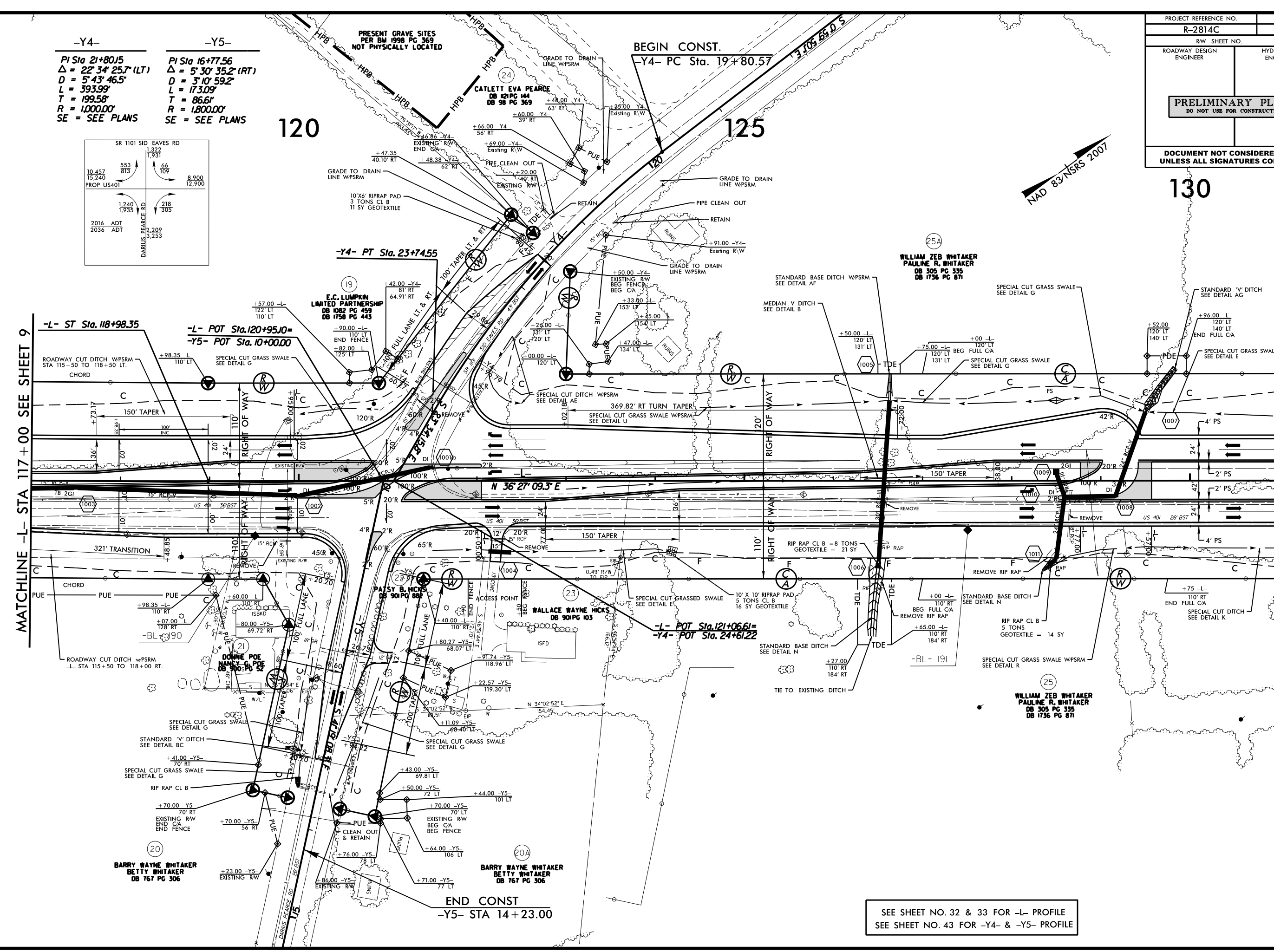
-Y4-
PI Sta 21+80.15
 $\Delta = 22^\circ 34' 25.7" (LT)$
 $D = 5^\circ 43' 46.5"$
 $L = 393.99'$
 $T = 199.58'$
 $R = 1,000.00'$
SE = SEE PLANS

-Y5-
PI Sta 16+77.56
 $\Delta = 5^\circ 30' 35.2" (RT)$
 $D = 3^\circ 10' 59.2"$
 $L = 173.09'$
 $T = 86.61'$
 $R = 1,800.00'$
SE = SEE PLANS



MATCHLINE -L- STA 117+00 SEE SHEET 9

MATCHLINE -L- STA 131+00 SEE SHEET 11



SEE SHEET NO. 32 & 33 FOR -L- PROFILE
SEE SHEET NO. 43 FOR -Y4- & -Y5- PROFILE

8/17/99
05-OCT-2016 08:46
R:\Roadway\Projects\R2814C\psh_310.dgn
\$\$\$\$\$SYTIME\$\$\$\$\$

145

150

155

-Y6-

PI Sta 30+00.39
 $\Delta = 18^\circ 29' 11.6''$ (RT)
 $D = 11^\circ 27' 33.0''$
 $L = 161.33'$
 $T = 81.37'$
 $R = 500.00'$
SE = SEE PLANS

NAD 83/NSRS 2007

MATCHLINE -L- STA 145+00 SEE SHEET 11

MATCHLINE -L- STA 159+00 SEE SHEET 13

	PAVEMENT REMOVAL
SEE SHEET NO. 33 & 34 FOR -L- PROFILE SEE SHEET NO. 44 FOR -Y6- PROFILE	

04-OCT-2016 12:33
R:\Roadway\Proj\R2814C-psb-sl2.dgn

PROJECT REFERENCE NO.		SHEET NO.
R-2814C		13
R/W SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

160

165

170

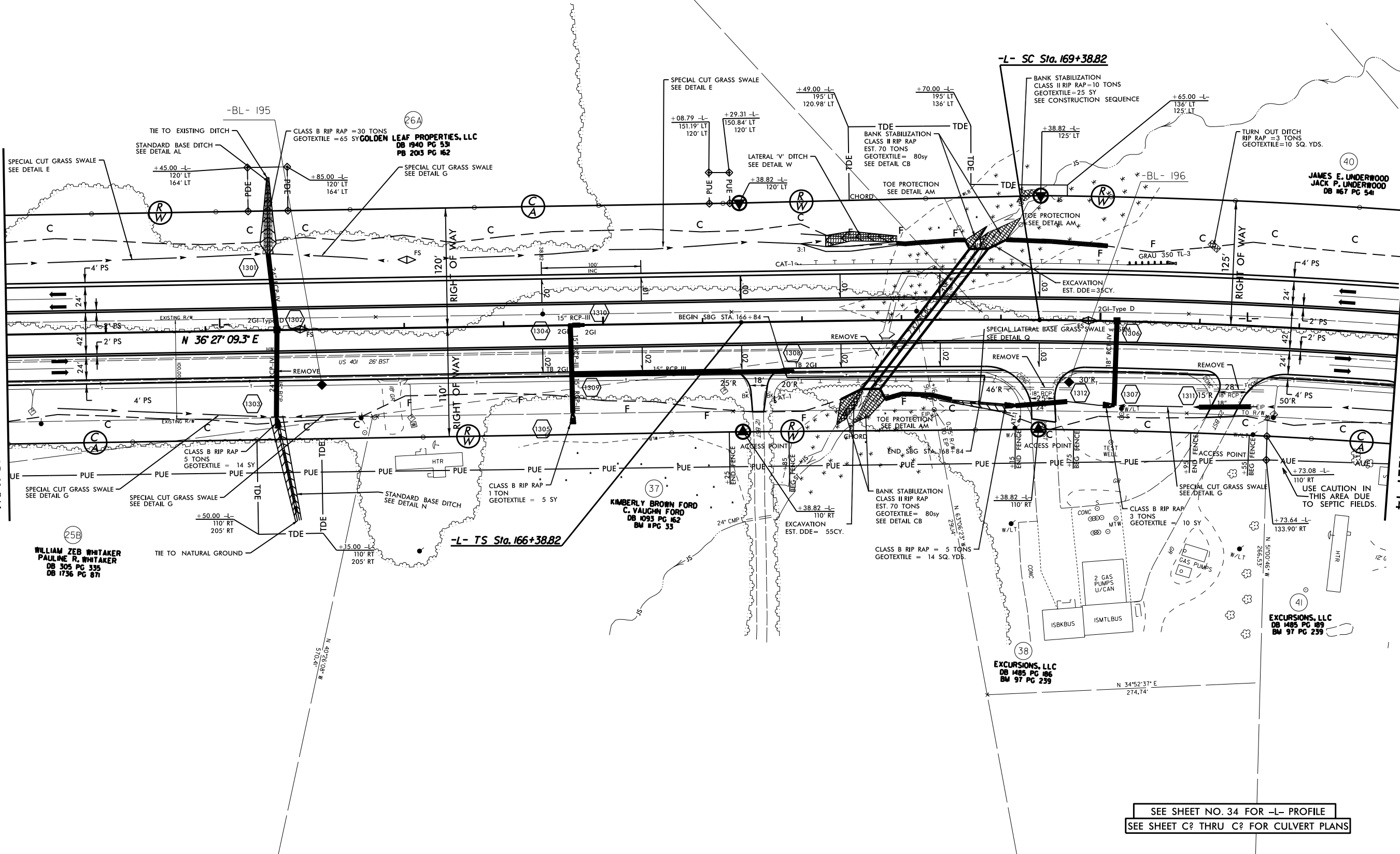
Pls Sta 168+38.83
Os = 1' 29' 59.6"
Ls = 300.00'
LT = 200.01'
ST = 100.01'
SE = SEE PLANS

PI Sta 181+74.04
Δ = 24' 19' 49" (RT)
D = 0' 59' 59.7"
L = 2,433.21'
T = 1,235.22'
R = 5,730.00'
SE = SEE PLANS

NAD 83/NSRS 2007

MATCHLINE -L- STA 159+00 SEE SHEET 12

MATCHLINE -L- STA 173+00 SEE SHEET 14



SEE SHEET NO. 34 FOR -L- PROFILE
SEE SHEET C? THRU C? FOR CULVERT PLANS

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2814C	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

175

180

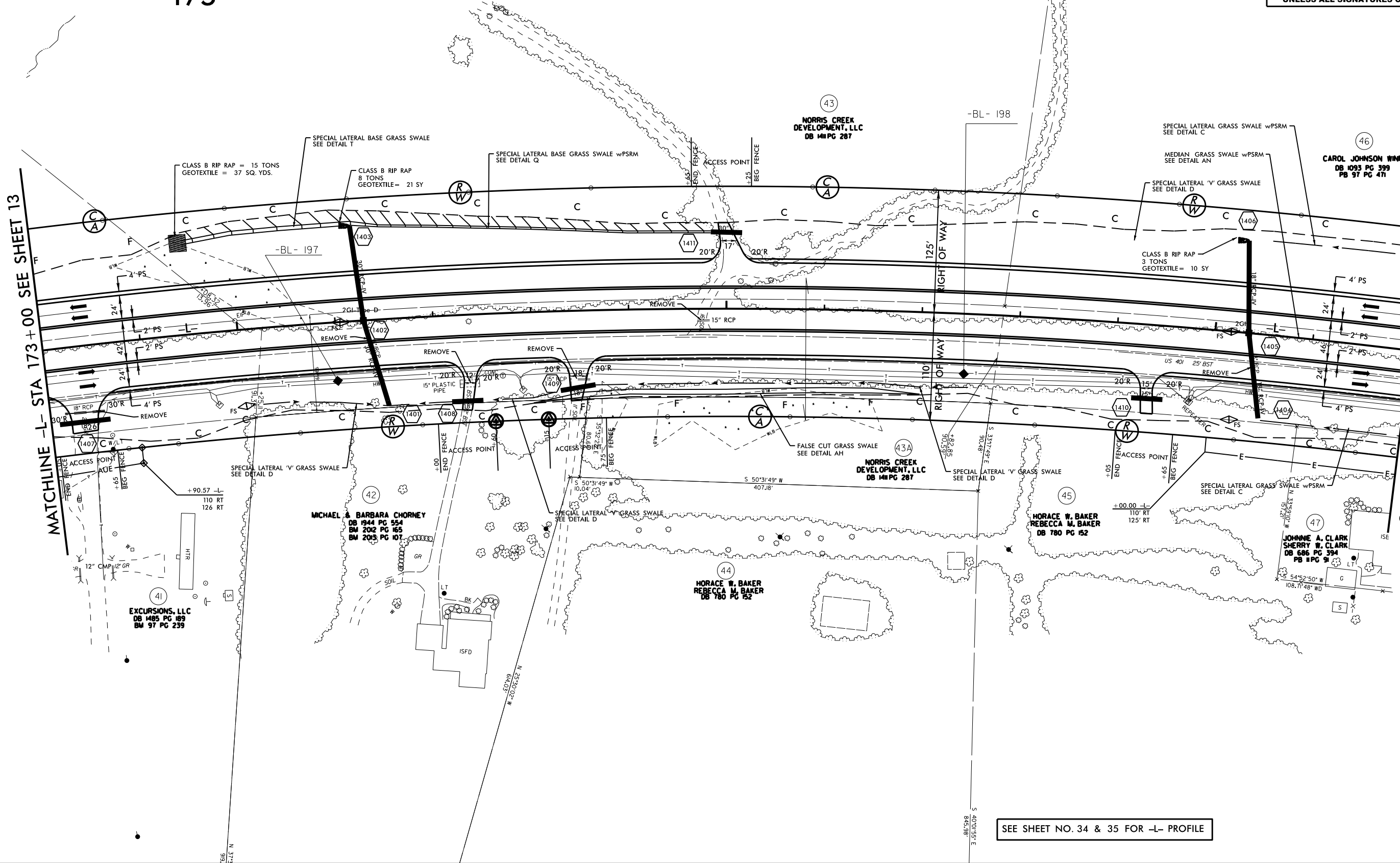
185

-L-
PI Sta 181+74.04
 $\Delta = 24' 19' 49"$ (RT)
 $D = 0' 59' 59.7"$
 $L = 2,433.2'$
 $T = 1,235.22'$
 $R = 5,730.00'$
SE = SEE PLANS



MATCHLINE -L- STA 173+00 SEE SHEET 13

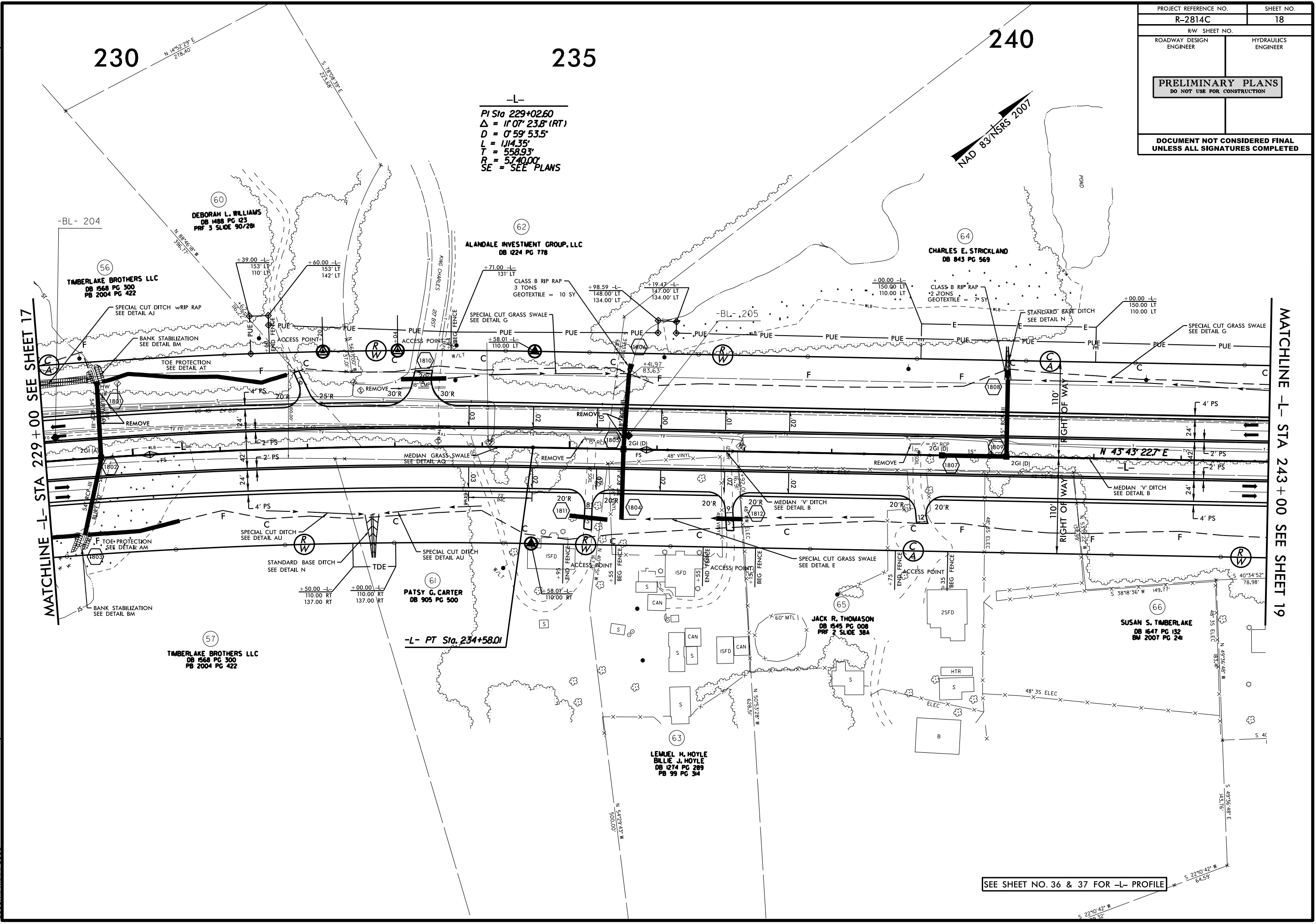
MATCHLINE -L- STA 187+00 SEE SHEET 15



SEE SHEET NO. 34 & 35 FOR -L- PROFILE

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2814C	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-L-
PI Sta 229+02.60
 $\Delta = 11' 07'' 23.8'' (RT)$
 $D = 0' 59'' 53.5''$
 $L = 1114.35'$
 $T = 558.93'$
 $R = 5740.00'$
SE = SEE PLANS

SEE SHEET NO. 36 & 37 FOR -L- PROFILE

REVISIONS

04-OCT-2016 12:34
R:\Roadway\Projects\R2814C\psh_al8.dgn
S:\S1\STATE\NAME\818

8/17/99

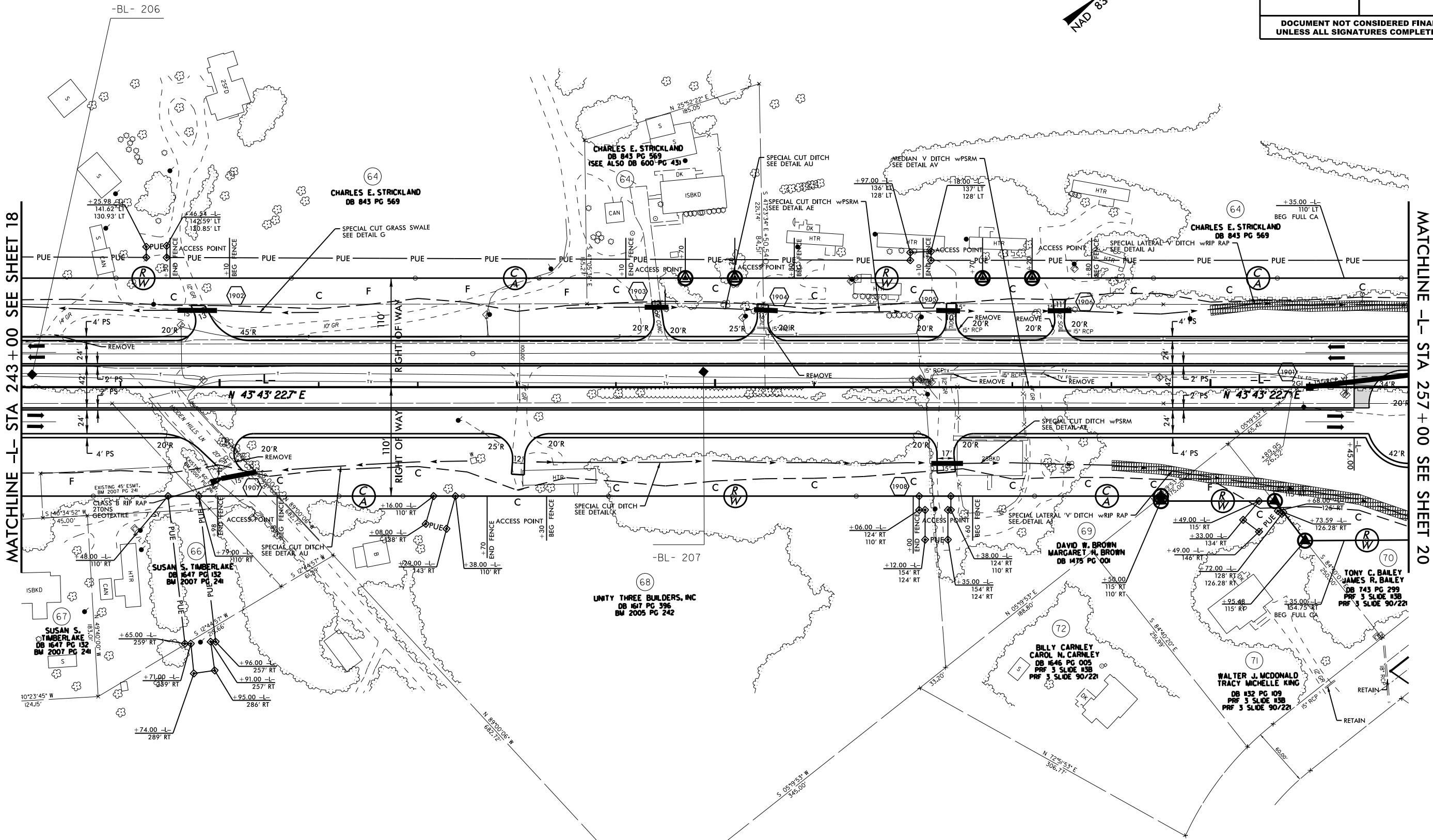
PROJECT REFERENCE NO.	SHEET NO.
R-2814C	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

245

250

255

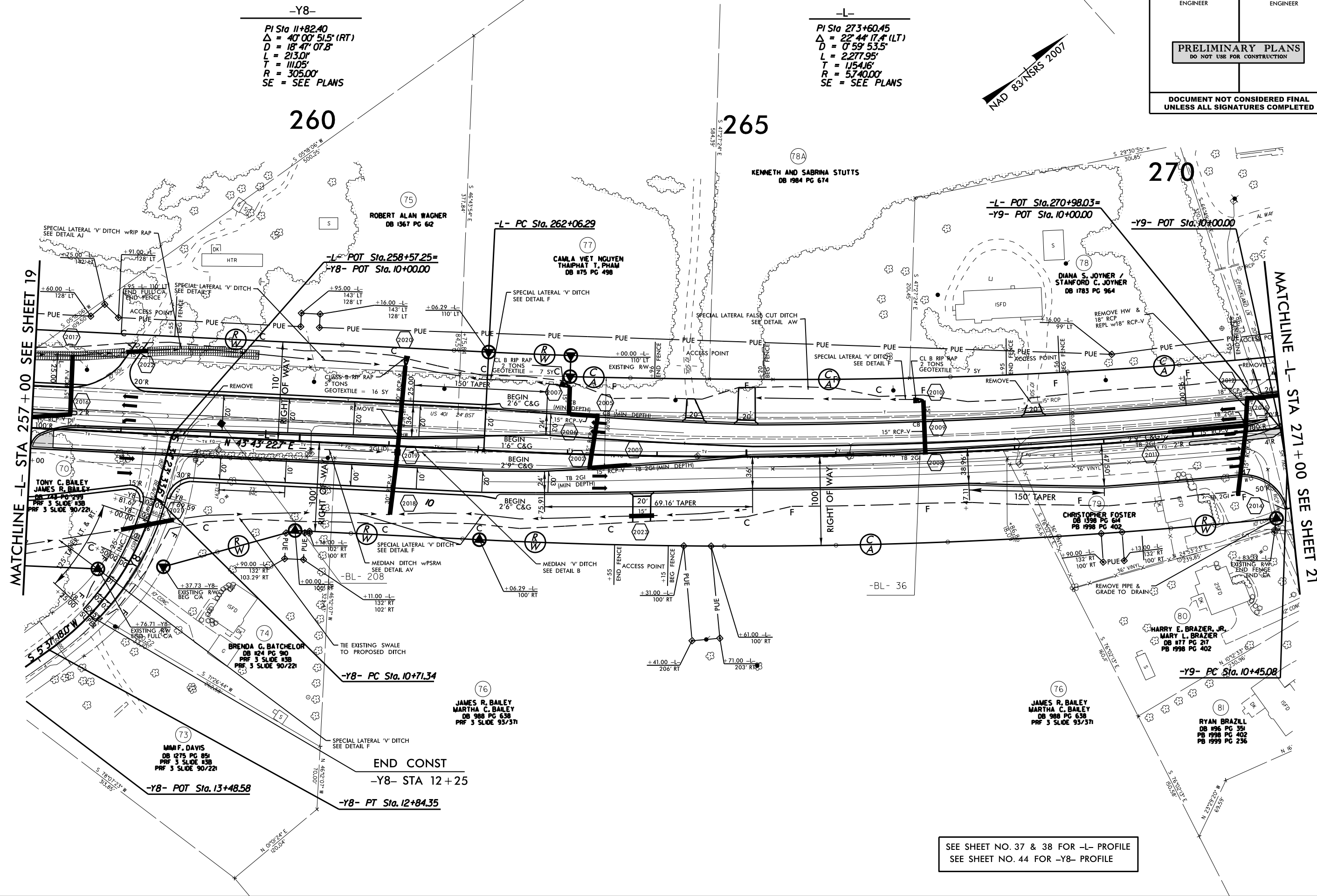
NAD 83/NSR 2007



SEE SHEET NO. 37 FOR -L- PROFILE

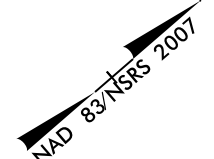
REVISIONS

04-OCT-2016 12:34
R:\Roadway\Projects\R2814C.psh_al9.dgn
SSS\JSTANAME



-Y8-
PI Sta 11+82.40
 $\Delta = 40' 00'' 51.5''$ (RT)
D = 18' 47' 07.8"
L = 213.0'
T = 111.05'
R = 305.00'
SE = SEE PLANS

-L-
PI Sta 273+60.45
 $\Delta = 22' 44'' 17.4''$ (LT)
D = 0' 59' 53.5"
L = 2,277.95'
T = 1,154.16'
R = 5740.00'
SE = SEE PLANS

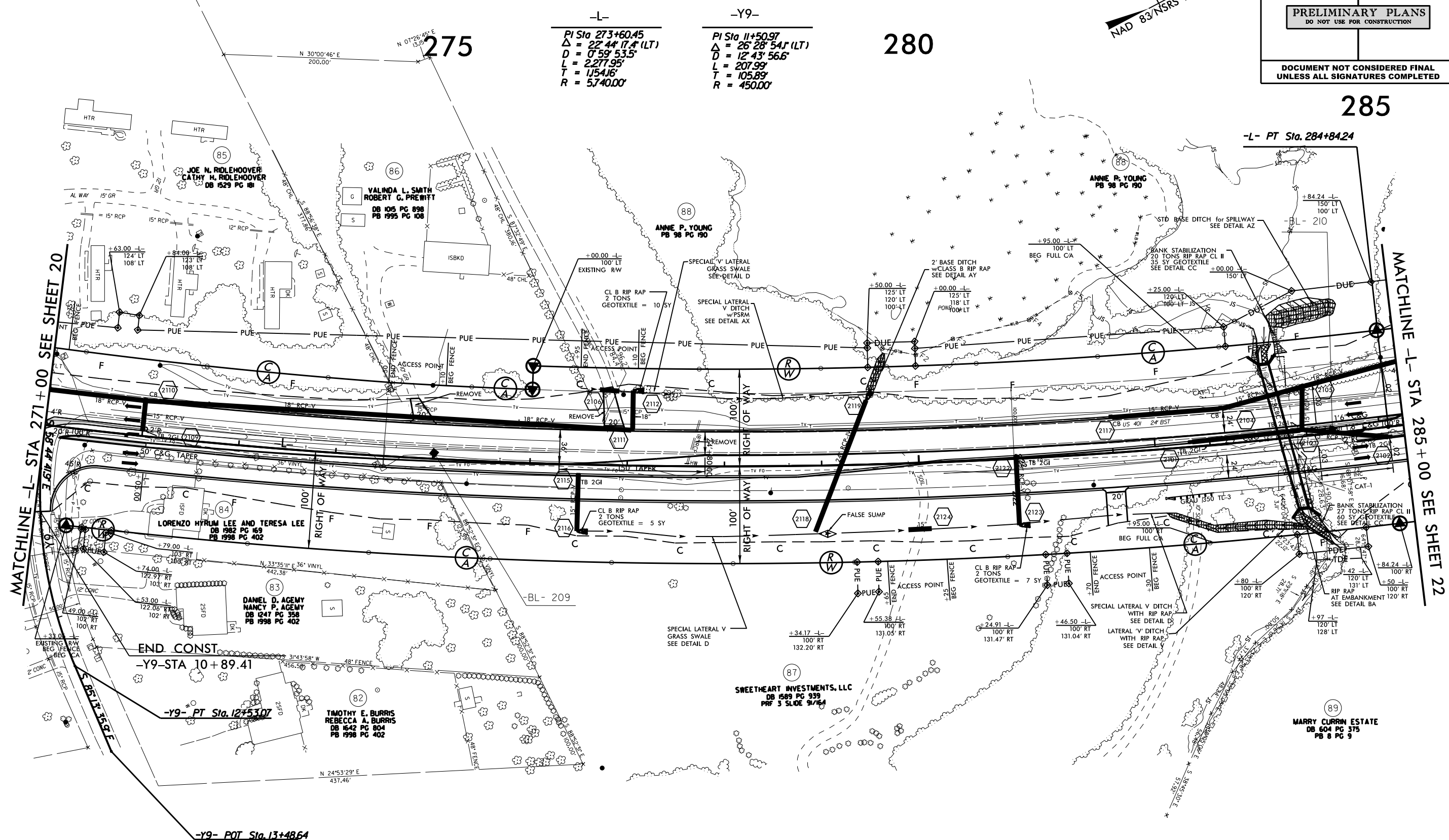


SEE SHEET NO. 37 & 38 FOR -L- PROFILE
SEE SHEET NO. 44 FOR -Y8- PROFILE

REVISIONS

05-OCT-2016_08:46
R:\Roadway\Proj\R2814C.psh_s20.dgn
\$\$\$\$SYSTRANAME\$\$\$\$

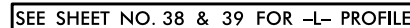
PROJECT REFERENCE NO.	SHEET NO.
R-2814C	21
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



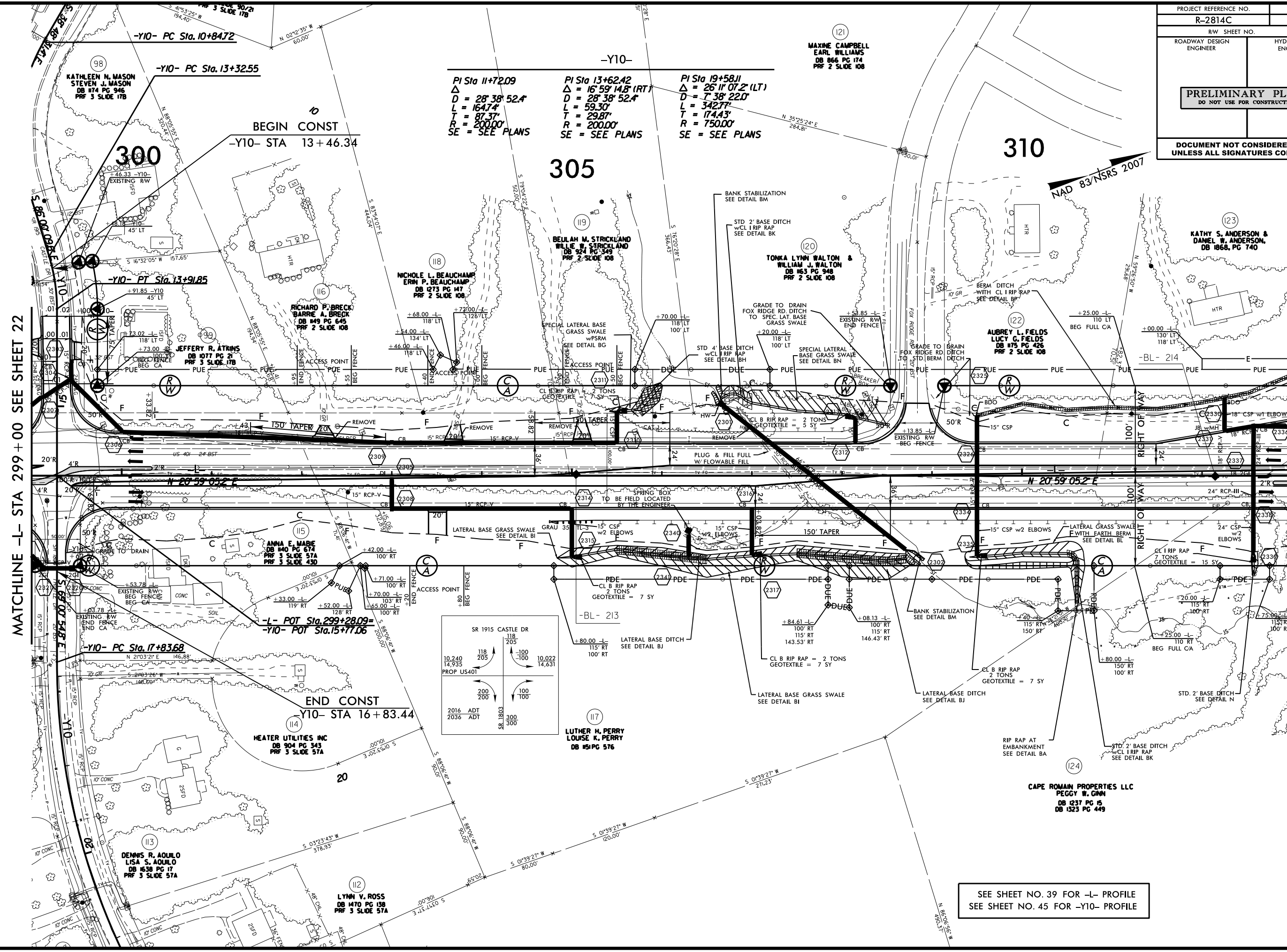
SEE SHEET NO. 38 FOR -L- PROFILE SEE SHEET NO. 44 FOR -Y9- PROFILE
SEE SHEET C? TO C? FOR CULVERT PLANS

295

MATCHLINE -L- STA 299+00 SEE SHEET 23



PROJECT REFERENCE NO.	SHEET NO.
R-2814C	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



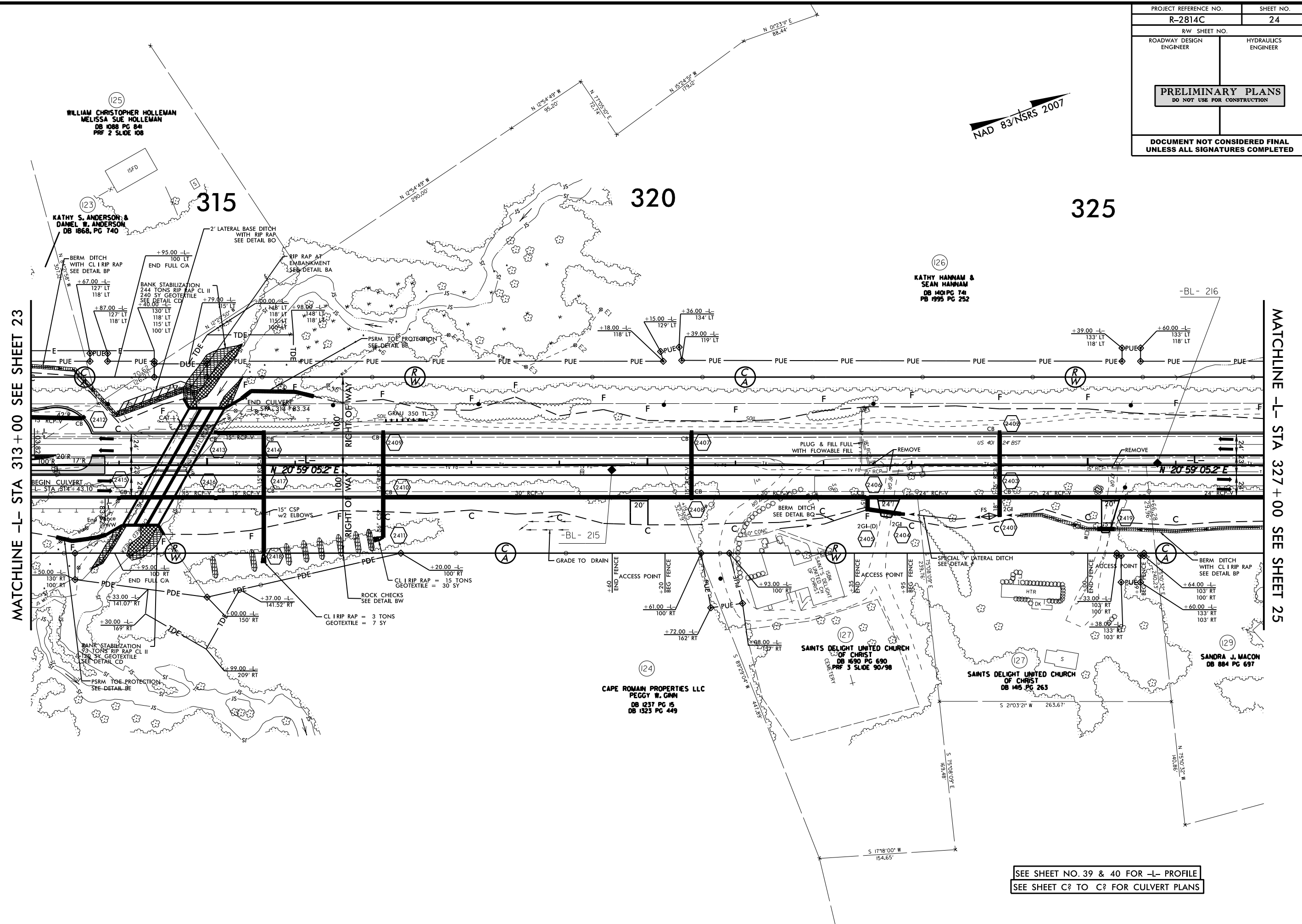
MATCHLINE -L- STA 299+00 SEE SHEET 22

MATCHLINE -L- STA 313+00 SEE SHEET 24

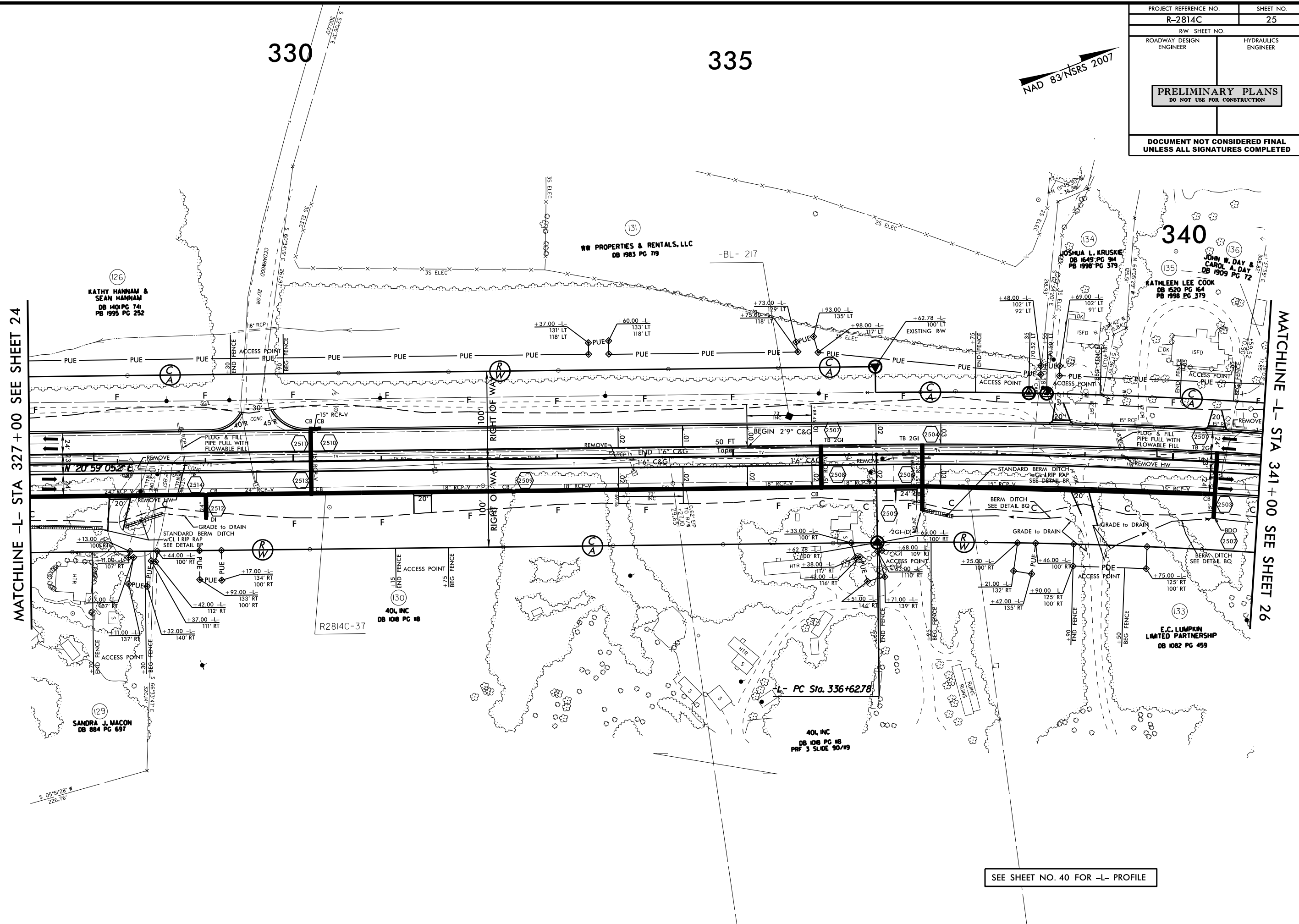
PI Sta 11+72.09 Δ = 28° 38' 52.4" D = 164.74' L = 87.37' R = 200.00' SE = SEE PLANS	PI Sta 13+62.42 Δ = 16° 59' 14.8" (RT) D = 28° 38' 52.4" L = 59.30' T = 29.87' R = 200.00' SE = SEE PLANS	PI Sta 19+58.11 Δ = 26° 11' 07.2" (LT) D = 7° 38' 22.0" L = 342.77' T = 174.43' R = 750.00' SE = SEE PLANS
--	---	--

SEE SHEET NO. 39 FOR -L- PROFILE
SEE SHEET NO. 45 FOR -Y10- PROFILE

8/17/199
04-OCT-2016 12:34
R:\Roadway\Projects\R2814C\psh.s23.dgn
R:\Roadway\Projects\R2814C\psh.s23.dgn
R:\Roadway\Projects\R2814C\psh.s23.dgn



SEE SHEET NO. 39 & 40 FOR -L- PROFILE
SEE SHEET C? TO C? FOR CULVERT PLANS



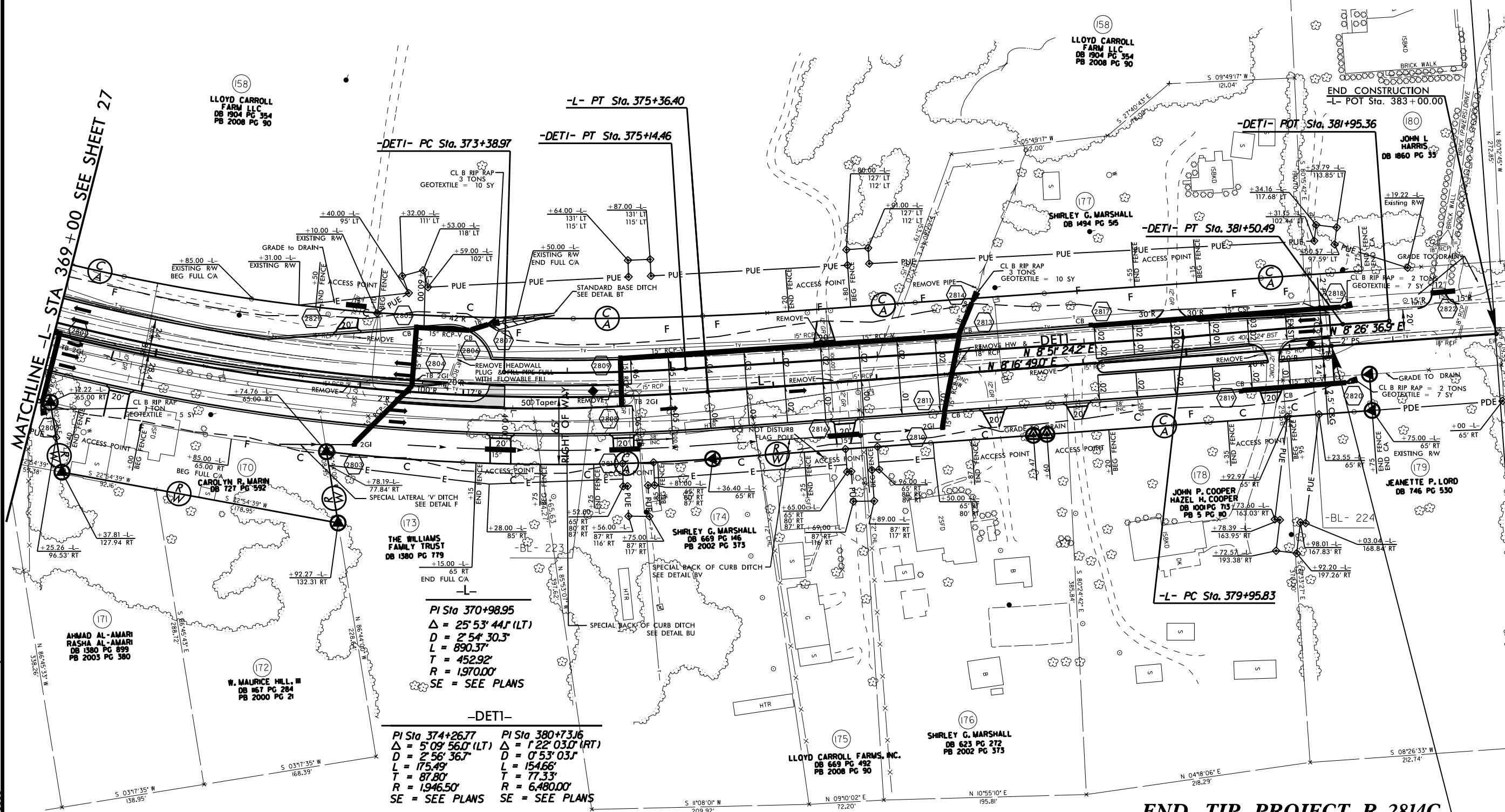
SEE SHEET NO. 40 FOR -L- PROFILE

370

375

380

NAD 83/NSRS 2007



END TIP PROJECT R-2814C
-L- STA 381+40.55

SEE SHEET NO. 41 & 42 FOR -L- PROFILE

8/17/99

REVISIONS

04-OCT-2016 12:35
Y:\Roadway\Proj\R2814C-psh-s28.dgn
\$\$\$\$\$USERNAME\$\$\$\$\$