STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

February 27, 2018

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

ATTN: Mr. David E. Bailey
NCDOT Coordinator

Subject: **Application for Modification of the Section 404 Individual Permit, Section 401 Water Quality Certification, and Riparian Buffer Certification** for the Continuation of Greensboro-High Point Road (SR 4121) on New Location in Guilford County, Federal Aid Project No. STP-4121(1), Division 7, TIP No. U-2412 A, Debit $570 from WBS 34802.1.1.

Reference: Individual 404 Permit, 401, and Buffer Certification Application, dated February 15, 2012, revised March 15, 2012,
Individual 404 Permit (Action ID SAW-2000-21876) dated July 18, 2012,
Individual 401 and Riparian Buffer Certification (No. 003924) dated June 4, 2012.

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to continue the next and final phase of Greensboro-High Point Road (SR 1486-SR 4121) from the US 311 Bypass in High Point to Hilltop Road in Greensboro. The proposed improvements consist of a combination of widening improvements to existing High Point Road and construction on new location, including an interchange with the US 311 Bypass in High Point and the Greensboro Western Urban Loop, for a total distance of 7.9 miles.

NCDOT submitted a Phased Individual Permit application on February 15, 2012, revised March 15, 2012, and received an Individual 404 Permit on July 18, 2012, and an Individual 401 and Buffer Certification on June 4, 2012. At that time, the A section was presented and permitted as preliminary, and the B section was permitted as final design. The A section design is now final, and this application presents those impacts as well cumulative impacts for the entire project.

Please see the enclosed Division of Mitigation Services (DMS) mitigation acceptance letter, permit drawing review (4C) meeting minutes, State Stormwater Management Plan (SMP), permit drawings, buffer drawings, and design plans.

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

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

Location:
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

RESOURCE STATUS

Wetland and stream determinations within U-2412 A were conducted using the field delineation method outlined in the 1987 Corps of Engineers Wetland Delineation Manual and subsequent guidance including the Eastern Mountains and Piedmont Regional Supplement. Mr. David Bailey of the U.S. Army Corps of Engineers (USACE) and April Norton of the North Carolina Division of Water Resources (DWR) updated the previous jurisdictional delineation on November 9, 2017.

Jurisdictional features within the U-2412 A construction footprint are all within the Cape Fear River Basin Hydrologic Unit Code 03030003. They include:
Deep River and unnamed tributaries to Deep River [NCDWR Classification WS-IV, and WS-IV CA; Index No. 17-(3.7)]
Bull Run and unnamed tributaries to Bull Run [NCDWR Classification WS-IV; Index No 17-5-(1)].

None of the streams within the project area or within a mile of the project area are listed on the 303(d) Final List of Impaired Waters of North Carolina.

IMPACTS TO WATERS OF THE U.S.

Tables 1-4 provide impact values and descriptions of jurisdictional water resources for U-2412 A. Site numbers correspond with the permit (hydraulic) drawings included in this application.

Table 1 – U-2412 A Wetland Impacts (values in acres)

Permit Site	NRTR Site	NC WAM Classification	Wetland Size	Permanent Fill in Wetlands	Mechanized Clearing	Hand Clearing	Impact Description
1	WA	Headwater Forest	0.02	0.02	--	--	Roadway fill
1A	Added at JD	Headwater Forest	0.02	0.02	--	--	Roadway fill
2	WB	Headwater Forest	0.29	0.29	--	--	Roadway fill
5A	AB	Headwater Forest	0.03	0.03	--	--	Roadway fill
5B	AC	Headwater Forest	<0.01	<0.01	--	--	Roadway fill
8	WC	Non-tidal freshwater marsh	0.7	0.51	0.04	--	Roadway fill
9		Non-tidal freshwater marsh		0.02	0.02	--	Roadway fill
10	WD	Bottomland hardwood forest	0.8	0.02	0.19	0.09	Bridge fill results in 0.2 acre of permanent fill, bridging over the wetland results in 0.19 acre of mechanized and 0.09 acre of hand clearing.
12	Added at JD	Non-tidal freshwater marsh	0.05	0.05	--	--	Roadway fill
13A	WE	Seep	0.1	0.01	0.11	--	Roadway fill
13	WF	Non-tidal freshwater marsh	0.2	0.03	0.08	--	Roadway fill
14		Non-tidal freshwater marsh		0.01	< 0.01	--	Roadway fill
			Total Wetland Impacts:	**1.01**	**0.45**	**0.09**	
			Total Loss of Water Impacts	**1.46**			
			Total Wetland Impacts Requested from DMS:	**1.46**			

Table 2 – U-2412 A Pond Impacts (values in acres)

Permit Site	NRTR Site	Pond Size	Impact Size	Impact Description
2	PA (Owen's Lake)	1.3	0.61	Roadway fill
12	PB	0.13	0.13	Roadway fill
13	PC	1.33	1.33	Roadway fill
16	PD	1.57	1.57	Roadway fill
		Total Pond Impacts:	**3.64**	

Table 3 – U-2412 A Stream Impacts (values in linear feet)

Permit Site	Stream Name/ NRTR ID	Status/ Class	Permanent		Temporary Channel Impacts	ACOE Required Mitigation	DWR Required Mitigation	Impact Description
			Channel Impacts	Bank Stabilization				
1 & 1A	*Wetland & Buffer Only*		--	--	--	--	--	--
2	UT to Deep River SA	Perennial WS-IV	316	--	10	316	316	A 60" RCP will convey UT to Deep River under the new roadway facility.
3	UT to Deep River SB	Intermittent WS-IV	110	--	--	110	0	A 36" RCP will convey UT to Deep River under the new roadway facility.
4	UT to Deep River SC	Perennial WS-IV	279	28	20	279	0	A 54" RCP will convey UT to Deep River under the new roadway facility.
5	UT to Deep River SD	Perennial WS-IV	431	35	20	431	431	A 36" RCP will convey UT to Deep River under the new roadway facility.
6	UT to Deep River SG	Perennial WS-IV	--	--	--	--	--	A bridge will completely span UT to Deep River. There are no 404/401 impacts at this site. (Buffer only.)
7	UT to Deep River SH	Intermittent WS-IV	283	--	21	283	0	A 42" RCP will convey UT to Deep River under the new roadway facility.
8	UT to Deep River SI	Perennial WS-IV CA	445	--	55	445	445	A 66" RCP will convey UT to Deep River under the new roadway facility.
9	UT to Deep River Added at JD	Intermittent WS-IV CA	211	--	--	211 @ 1:1	--	A 24" RCP will convey UT to Deep River under the new roadway facility.
10	Deep River	Perennial WS-IV CA	--	171	20	0	0	A temporary work pad is required to construct the completely spanning bridge over Deep River.
11	Bull Run	Perennial WS-IV	--	--	--	--	--	A bridge will completely span Bull Run. There are no 404/401 impacts at this site. (Buffer only.)
12	UT to Bull Run SK	Perennial WS-IV	99	--	10	99	0	A 36" RCP will convey UT to Bull Run under the new roadway facility.
13	UT to Bull Run SL	Perennial WS-IV	494	--	27	494	494	A 6'x 6' single barrel RCBC will convey UT to Bull Run under the new roadway facility.
14	UT to Bull Run SL	Perennial WS-IV	69	10	4	69	69	An existing 42" RCP carrying UT to Bull Run under -Y10- will be extended to accommodate the wider roadway approaching a new intersection of the new roadway facility.
15	UT to Bull Run SM	Intermittent WS-IV	270	--	16	270	0	The widening of -Y- 10 as it approaches the intersection with the new roadway facility will have a parallel impact to UT to Bull Run.
16	UT to Bull Run SL	Perennial WS-IV	66	--	--	66	66	Draining of Pond PC will dewater this seep.
Total Stream Impacts:			**3.073**	**244**	203	**3,073**	**1,821**	
			3,317					
Total Stream Impact Requested from DMS:						**3,073**		

Table 4 – U-2412 A Total Riparian Buffer Impacts (values in square feet)

Bridge/Allowable			Road Crossing/ Mitigable		
Zone 1	**Zone 2**	**Total**	**Zone 1**	**Zone 2**	**Total**
84,588	50,136	134,724	284,840	192,073	476,913
Minus Wetlands in Buffer:			- 49,502	- 15,309	
Total Buffer Mitigation requested from DMS:			**235,338**	**176,764**	

At the time the previous section was permitted, the A Section of this project was only in preliminary design and impacts were estimated. Below is a summary of the impacts provided in the 2012 application versus today's final design.

Table 5 – U-2412 A Preliminary vs Final Wetland Impacts (acres)

Site No. from Preliminary Design	Site No. from Current Permit Drawings	Permanent Impacts from Preliminary Design	Permanent Impacts from Permit Drawings	Difference	Difference Remarks
--	1	--	0.02	+ 0.02	Previous delineation did not identify as a wetland. Impact footprint remained the same.
--	1A	--	0.02	+ 0.02	Added at November 9, 2017 site visit.
2	2	0.27	0.29	+ 0.02	At 4C meeting, determination made to count wetland as total take. Impact footprint remained the same.
4	5A & 5B	0.03	0.03 & <0.01	same	
7A	8	0.49	0.55	+ 0.06	Wetland shape changed (enlarged), impact footprint remained approximately the same.
--	9	--	0.04	+ 0.04	Impact shown in preliminary design, but not accounted for.
8	10	0.06	0.21	+ 0.15	Wetland shape changed (enlarged), bent arrangement modified to completely span Deep River, but now bent in wetland. Impact footprint remains the same.
10A	12	--	0.05	+ 0.05	Fringe wetland added to pond.
11	13	0.12	0.11	+ 0.11	Larger fringe wetlands and total take of WE. Roadway centerline is the same, but larger impact footprint due to stormwater structures.
	13A		0.12		This wetland not separated from Site 11 in previous application.
12	14	0.02	0.02	same	
Total:		**0.99**	**1.2**	**+ 0.47**	

Table 6 – U-2412 A Preliminary vs Final Stream Impacts (feet)

Site No. from 2012 Phased App. / Permits	Site No. from Current Permit Drawings	Permanent Impacts from 2012 Phased App. / Permits	Permanent Impacts from Permit Drawings		Difference	Difference Remarks
			Permanent Loss of Waters	Bank Stabilization		
1	1	--	--	--	--	2012 Application: Site 1 was Buffer Impacts only. 2018 Application: Site 1 is for Wetlands & Buffers only.
2	2	353	316	--	-37	
3A	3	213	110	--	-103	
3B	4	307	279	28	-28	
4	5	336	431	35	+95	Upstream jurisdictionally increased. Project footprint is the same.
--	6	Bridge	Bridge	--	--	
6	7	242	283	--	no change	
6		41				
7A	8	418	445	--	+27	Position of stream in wetland appears to be different. Project footprint is the same.
7B	9	208	211	--	+3	Upstream jurisdictionally increased. Project footprint is the same.
8	10	0	0	171	no change	Bridge at Deep River. Bank stabilization only.
10A	12	100	99	--	-1	
10B	12	40	0	--	-40	Avoided this stream in 2018 application.
11	13	492	494	--	+2	Impact appears identical.
12	14	82	69	10	-13	
--	15	--	270	--	+270	Identified as "non-jurisdictional but buffered" in 2012.
13	16	24	66	--	+42	2012 calculated as 24 permanent and 40 temporary (total 64), and did not account for the breaching of the dam, conveyance of water in the pond footprint, and the need for stormwater devices (dry detention basin).
14	17	29	0	--	-29	Now Buffer impact only.
Totals:		**2,885**	**3,073**	244	**+188**	

Table 7 – U-2412 Cumulative Impacts

Impact Type		U-2412 B	U-2412 A	U-2412 Total
Wetlands *acres*	Fill	0.48	1.01	1.49
	Excavation	0.14	zero	0.14
	Mechanized Clearing	0.01	0.45	0.46
	Total Mitigable	**0.63**	**1.46**	**2.09**
	Temporary	zero	zero	zero
	Hand Clearing	zero	0.09	0.09
Streams *linear feet*	Permanent Loss of Water Intermittent	zero	874	874
	Permanent Loss of Water Perennial	1,932	2,199	4,131
	Total Mitigable	**1,932**	**3,073**	**5,005**
	Bank Stabilization Intermittent	zero	zero	zero
	Bank Stabilization Perennial	zero	244	244
	Total Permanent Impact	**1,932**	**3,317**	**5,249**
	Temporary Intermittent	zero	37	37
	Temporary Perennial	140	166	306
	Total Temporary Impact	140	203	343
Open Water	Permanent (acres)	zero	3.64	3.64
	Temporary (acres)	zero	zero	zero
Buffer *square feet*	Allowable Zone 1	52,600	84,588	137,188
	Mitigable Zone 1	340,373	284,840	623,323
	Minus Zone 1 Wetlands	-31,773	-49,502	
	Total Mitigatable Zone 1	**361,200**	**235,338**	**596,538**
	Allowable Zone 2	35,609	50,136	85,745
	Mitigable Zone 2	350,991	192,073	543,064
	Minus Zone 2 Wetlands	-12,058	-15,309	
	Total Mitigatable Zone 2	**374,542**	**176,764**	**551,306**

FEDERALLY PROTECTED SPECIES

Plants and animals with Federal classification of Endangered (E) or Threatened (T) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of March 25, 2015, the USFWS lists one federally protected species for Guilford County, small whorled pogonia.

Walking visual surveys of all areas of potential habitat were conducted in April 2013, and June 1, 2017. No individuals of this species have been identified within the project and there are no known occurrences within 1.0 mile of the project.

AVOIDANCE AND MINIMIZATION

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, at all stages of a project, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts.

Overall avoidance and minimization measures include:

All three major stream crossings will be bridged.

The proposed bridges have been designed either without deck drains or with closed deck drain systems where necessary. No direct discharge from bridge decks will occur to streams or buffers.

Grassed swales were used for treatment when BMP design standards could be met. These grassed swales were used to reduce flow velocity, reduce sedimentation, increase infiltration and attenuate runoff. Velocities at jurisdictional features are non-erosive.

Hazardous spill/dry detention basins have been proposed at all locations feasible to provide pre/post peak discharge attenuation and stormwater quality treatment.

2:1 (horizontal to vertical) slopes, or steeper, have been specified at all jurisdictional stream/wetland crossings.

Pipe inverts will be buried below the stream bed when pipe slopes are less than 4%.

Specific avoidance and minimization measures include:

Site 6: Avoidance: The proposed structure over UT to Deep River is a 667 feet-long multi-span dual bridge. No direct discharge from bridge decks will occur to streams or buffers.

Minimization: A 1.5:1 slope (with slope protection armoring) has been specified to reduce buffer impacts to UT Deep River.

Site 7: Avoidance: A 1.7:1 slope (with slope protection armoring) has been specified to avoid buffer impacts to UT to Deep River.

Site 10: Minimization: The proposed structure over the Deep River is a 400 feet-long multi-span dual bridge. No direct discharge from bridge decks will occur to streams or buffers. A 1.5:1 slope (with slope protection armoring) has been specified to limit permanent impacts from bank stabilization to Deep River, as well as to reduce buffer impacts.

Site 11: Avoidance: The proposed structure over Bull Run is a 305 feet-long multi-span dual bridge. No direct discharge from bridge decks will occur to streams or buffers. A 1.5:1 slope (with slope protection armoring) has been specified to avoid all jurisdictional impacts at this site.

Site 11: Minimization: A hazardous spill basin has been designed to capture highway stormwater at this site, reduce flow velocity, sedimentation, increase infiltration and attenuate runoff. Upon exiting the basin, it will enter the stream within the 36” pipe, allowing the structure to reduce the stormwater velocity, thus decreasing the amount of bank stabilization/permanent impact to the stream.

Site 13: Minimization: The box culvert will be buried 1' and will contain sills at the inlet and outlet, and baffles within.

MITIGATION

NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent practicable as described above. Tables 1-4 display the describe the wetland and stream impacts for each section of this project and summarize the mitigation as proposed for the project. Table 7 summarizes the cumulative impacts for U-2412.

Please see the attached mitigation acceptance letter from DMS.

REGULATORY APPROVALS

Section 404: Application is hereby made for a modification to the USACE Individual 404 Permit as required for the above-described activities.

Section 401 and Randleman Lake Riparian Buffer Authorization: We are hereby requesting a modification to the 401 Water Quality Certification from the N. C. Division of Water Resources. In compliance with Section 143 215.3D(e) of the NCAC, we will provide $570.00 to act as payment for processing the Section 401 permit application previously noted in this application (see Subject line).

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Michael Turchy at maturchy@ncdot.gov or (919) 707-6157. A copy of this application and distribution list will also be posted on the NCDOT website at:
http://connect.ncdot.gov/resources/Environmental/Pages.

Sincerely,

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

cc: NCDOT Permit Application Standard Distribution List

Environmental Quality

ROY COOPER
Governor

February 26, 2018

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: DMS Mitigation Acceptance Letter:

U-2412A, Improve SR 1486 / SR 4121 (Greensboro-High Point Road), Guilford County

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 February 26, 2018, the impacts are located in CU 03030003 of the Cap Fear 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	Cape Fear	03030003	CP	0	0	3,073.0	1.46	0	0

*Some of the 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 U-2412A. 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.

Buffer	River Basin	CU	Eco-Region	Buffer Impacts		
				Zone 1	Zone 2	TOTAL
Impacts	Cape Fear	03030003	CP	235,338.0	176,764.0	412,102.0

The impacts and associated mitigation needs were under projected by the NCDOT in the 2018 impact data. DMS commits to implement sufficient compensatory stream, wetland and buffer 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 Asset Management Supervisor

Cc: Mr. David Bailey, USACE – Raleigh Regulatory Field Office
Ms. Amy Chapman, NC Division of Water Resources
File: U-2412A

Minutes from the Interagency 4C Permit Drawing Review Meeting
U-2412A in Guilford County
September 21, 2017
NCDOT Century Center
10:00 AM – 12:00 PM

Agency Members:

April Norton, NCDEQ-DWR
Rob Ridings, NCDEQ-DWR
David Bailey, USACE

Participants:

Craig Lee, NCDOT Hydraulics
Piotr Stojda, NCDOT Roadway
Carla Dagnino, NCDOT EAU
Karen Reynolds, NCDOT CPD
Patty Eason, NCDOT Division 7
Jeremy Goodwin, NCDOT REU
Josh Dalton, Sungate Design Group
Brad Smith, Sungate Design Group

Wet/Stream Impacts – U-2412A:

- Corps will field verify wetland/stream delineations.

Site 1 (Plan Sheet 5):

- Remove ephemeral stream line.

Site 2 (Plan Sheet 6):

- The proposed 60" pipe is on a flat slope (0.65%). 60" pipe inverts will match at the junction boxes and will not be drop boxes. Keep inlet invert for the 60" RCP buried.
- Wetland is considered a total take.
  - Note on summary sheet with * and a footnote;
  - Don't hatch outside of easement.
  - "Label as total take, accounted for in impact summary…"
  - Easement limited by historic property.

Site 3 (Plan Sheet 7):

- JS is non-mitigable. Do not change permit drawings. Leave the stream hatched, just note that it is non-mitigable in the permit application.

Site 4 (Plan Sheet 7):

- No comments.

Site 5 (Plan Sheet 9):

- The 36” cross pipe is on a steep slope (6.1%). The junction box has been designed as a drop box to dissipate energy. The inlet and outlet pipe inverts will not be buried. The outlet channel bed will have rip rap lining.
- There is a second JS at this site. Break it out as Site 5A on the drawings and summary.

Site 6 (Plan Sheet 10):

- The structural design of the bridge is currently in progress. The span arrangement and bent locations may change during the design; however, no bents will be located in the stream. Any temporary impact necessary for bridge construction will be verified prior to submitting the permit application to avoid a permit modification.

Site 7 (Plan Sheet 11):

- No comments.
- The 42” cross pipe slope is steep (4.5%). The junction box has been designed as a drop box to dissipate energy. The inlet and outlet pipe inverts will not be buried. The outlet channel bed will have rip rap lining.

Site 8 (Plan Sheet 12):

- There is a second JS at this site. Break it out as Site 8A on the drawings and summary.
- Show mechanized clearing of wetlands to ROW line on upstream side.
- Take rip rap all the way to the stream from the outlet of the 24” pipe left of station 121+90 -L-. If possible, back pipe outlet away from stream but stay off steep slope.

Site 9 (Plan Sheet 12):

- Corps will check delineation for wetland as it appears to cross the existing greenway trail.
- Corps will confirm status of the JS non-mitigable. The line can be turned off in the permit drawings if it is confirmed non-mitigable.

Site 10 (Plan Sheet 13):

- The structural design of the bridge is currently in progress. The span arrangement and bent locations may change during the design. The new span arrangement avoids placing a bent in the stream. Due to the close proximity of the bent to the stream bank, rip rap bank stabilization will be included to avoid any potential scour issues. Any temporary impact necessary for bridge construction will be verified prior to submitting the permit application to avoid a permit modification. If bents are located in the stream, the area for the drilled shafts will be included in the impact summary as a permanent impact with a footnote.

- Include 10’ offset for mechanized clearing around rip rap abutments.

Site 11 (Plan Sheet 14):

- No Comments.
- The structural design of the bridge is currently in progress. The span arrangement and bent locations may change during the design; however, no bents will be located in the stream. Any temporary impact necessary for bridge construction will be verified prior to submitting the permit application to avoid a permit modification.

Site 12 (Plan Sheet 15):

- Preliminary JD showed a stream upstream of the pond. Corps will determine if it is JS or not and impacts will be revised accordingly.

Site 13 (Plan Sheet 16):

- There is a separate wetland located near the outlet of the box culvert. Add Site 13A and include impacts separately in the summary.

Site 14 (Plan Sheet 17):

- Add note to impact summary “Sites 13 & 14 on same JS”.

Site 15 (Plan Sheet 17):

- The ROW adjacent to Parcels 129 (Bryant) & 130 (Flemming) is currently shown as Controlled Access. The Division (Patty Eason) will investigate if the ROW should be revised to all Partial Controlled Access. Driveway pipes will need to be added if access is allowed.
- Corps to investigate status of the JS. It was shown as intermittent on 2017 JD.

Site 16 (Plan Sheets 17 and 18):

- Corps to investigate if stream at pond outlet is JS or not. If considered JS, impacts will be added.

Buffer Impacts – U-2412A:

General:

- Everything intermittent/perennial should be buffered. Ephemeral streams are not buffered.
- Renumber buffer sites to match wetland/stream sites. Impact numbers can be skipped for sites that do not have stream buffers. Add note in summary for skipped numbers.

Site 1 (Plan Sheet 5):

- Site number will remain #1.
- DOT to verify stream type (ephemeral or intermittent).
- Stream is ephemeral, leave as is unless instructed differently.

Site 2: (Plan Sheet 6):

- No comments. Site number will remain #2.

Site 3 (Plan Sheet 7):

- Site number will be changed to Sites 3 and 4 to match wetland/stream impact site numbers.
- Count buffer of main channel (Site 4) first. Remaining buffer impacts on Site 3 will be considered allowable impacts.

Site 4 (Plan Sheet 9):

- Site number will be changed to Sites 5 and 5A to match wetland/stream impact site numbers.
- Buffer impacts to Site 5A will be considered allowable impacts.

Site 5 (Plan Sheet 10):

- Site number will be changed to Site 6 to match wetland/stream impact site numbers.
- Reduce buffer impacts to 30’ outside bridge except for impacts adjacent to the sloping rip rap abutment on the northeast corner of the bridge.

Site 6 (Plan Sheet 11):

- Site number will be changed to Site 7 to match wetland/stream impact site numbers.

Site 7 (Plan Sheet 12):

- Site number will be changed to Sites 8, 8A, and 9 to match wetland/stream impact site numbers.
- Site 9 is not a buffered stream.

Site 8 (Plan Sheet 13):

- Site number will be changed to Site 10 to match wetland/stream impact site numbers.
- No comments. Leave buffers as shown around the ponded area adjacent to Deep River.

Site 9 (Plan Sheet 14):

- Site number will be changed to Site 11 to match wetland/stream impact site numbers.
- Reduce buffer impacts to 30' from bridge where possible (southeast quadrant and entire north side of bridge).

Site 10 (Plan Sheet 15):

- Site number will be changed to Site 12 to match wetland/stream impact site numbers.
- Corps & DWR will determine if JS and buffers are applicable at this site.

Site 11 (Plan Sheet 16):

- Site number will be changed to Sites 13 and 13A to match wetland/stream impact site numbers. Site 13A will not have buffer impacts since it is a wetland.
- Include hatching and impacts for Buffer Zone 2 to ROW right of station 171+50 -L- at the outlet of RCBC to allow for construction access.

Site 12 (Plan Sheet 17):

- Site number will be changed to Site 14 to match wetland/stream impact site numbers.
- No comments.

Site 13 (Plan Sheet 17):

- Site number will be changed to Site 15 to match wetland/stream impact site numbers.
- No comments.

Site 14 (Plan Sheet 17 & 18):

- Site number will be changed to Site 16 to match wetland/stream impact site numbers.

- Discussions occurred about whether buffers for new the channel should receive credit. DWR agreed that if a planting plan is provided, the buffer impacts would be allowable. The pond will be planted with native wetland grasses.
- Do not show impacts outside TDE.

Site 15 (Plan Sheet 20):

- Sungate will be notified by Corps/DWR to determine stream jurisdictional status and if buffers apply. If this remains a site, it will be Site 17.

Meeting adjourned.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element:	34802.1.1	**TIP No.:**	U-2412A	**County(ies):**	Guilford	**Page**	1	**of**	8

General Project Information

WBS Element:	34802.1.1	**TIP Number:**	U-2412A	**Project Type:**	New Location	**Date:**	8/8/2017
NCDOT Contact:	Bill Elam, PE			**Contractor / Designer:**	Joshua G. Dalton, PE		
Address:	NCDOT Hydraulics Unit 1590 Mail Service Raleigh, NC 27699-1590			**Address:**	Sungate Design Group, P.A. 905 Jones Franklin Road Raleigh, NC 27606		
Phone:	919-707-6718			**Phone:**	919-859-2243 ext. 201		
Email:	belam@ncdot.gov			**Email:**	jdalton@sungatedesign.com		
City/Town:	High Point and Jamestown			**County(ies):**	Guilford		
River Basin(s):	Cape Fear			**CAMA County?**	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	3.74 miles	**Surrounding Land Use:**	Commercial, Medium Density Residential
	Proposed Project		**Existing Site**
Project Built-Upon Area (ac.)	79.8 ac.		16.6 ac.
Typical Cross Section Description:	Grassed ditch median with 6:1 side slopes. 4 paved lanes (total 48' wide). 14' shoulder on each side (17' with guardrail). 12' paved shoulder. Varying fill and cut slopes (see project XSC's for detailed information).		C.F. Felix Harvey Pkwy: open shoulder section, 4 paved lanes (total 48') with grassed ditch median, 4.5' paved shoulder on each side; NC HWY 11: open shoulder section, 4 paved lanes (total 48') with grassed ditch median, 3' paved shoulder on each side.
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 45160	Year: 2039	Existing: 36,330 Year: 2019

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

The North Carolina Department of Transportation (NCDOT) proposes to construct an extension for Greensboro/High Point Road from US 311 Bypass to west of SR 1480 (Vickrey Chapel Road). There are three proposed major structures involved with the construction of the project which will all be constructed at new stream crossing locations. The proposed structure over Deep River Tributary 1 is a 667 feet-long multi-span dual bridge. The proposed structure over the Deep River is a 400 feet-long multi-span dual bridge. The proposed structure over Bull Run is a 305 feet-long mulit-span dual bridge. The proposed bridges have been designed without deck drains or with closed deck drain systems where necessary. No direct discharge from bridge decks will occur to streams or buffers.

Grassed swales were used for treatment when BMP design standards could be met. These grassed swales were used to reduce flow velocity, promote sedimentation, infilitration and runoff attenuation. Velocities at jurisdictional features are non-erosive.

Hazardous spill/dry detention basins have been proposed at all locations feasible to provide pre/post peak discharge attenuation and stormwater quality treatment.

2:1 (horizontal to vertical) slopes have been specified at all jursidictional stream/wetland crossings. A 1.5:1 slope (with slope protection armoring) has been specified left of station 104+00 to 105+00 -L- to reduce buffer impacts to UT Deep River.

Pipe inverts will be buried below the stream bed when pipe slopes are less than 4%. The box culvert at station 173+50 -L- will be buried 1' with sills at the inlet and outlet.

Waterbody Information

Surface Water Body (1):	Deep River		**NCDWR Stream Index No.:**	17-(3.7)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Water Supply IV (WS-IV)	Critical Area		
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	Deep River			**Buffer Rules in Effect:**	Randleman Lake	
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

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WBS Element:	34802.1.1	**TIP No.:**	U-2412A	**County(ies):**	Guilford	**Page**	**2**	**of**	**8**

Additional Waterbody Information

Surface Water Body (2):	Bull Run		**NCDWR Stream Index No.:**	17-5-(2)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Water Supply IV (WS-IV)	Critical Area		
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	Bull Run			**Buffer Rules in Effect:**	Randleman Lake	
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element: 34802.1.1 **TIP No.:** U-2412A **County(ies):** Guilford

Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
4	15+50 -L- RT 19+00 -L- RT	UT to Triangle	0.0	6.0	6.0	1.2	124	350	1.00%	4.0	1.9	5.3	2.0	No	Yes
4/5	20+50 -L- LT 23+00 -L- LT	UT to Triangle	0.0	6.0	6.0	0.2	19	250	1.00%	0.3	1.0	0.4	1.1	No	Yes
5	24+50 -L- RT 28+00 -L- RT	UT to Triangle	0.0	6.0	6.0	1.0	102	350	1.00%	3.0	1.7	3.9	1.9	No	Yes
5	26+50 -L- M 28+00 -L- M	UT to Triangle	0.0	6.0	6.0	0.3	29	150	2.40%	1.0	1.8	1.3	2.0	No	Yes
5	28+00 -L- RT 31+00 -L- RT	UT to Triangle	0.0	6.0	6.0	0.9	86	300	1.90%	1.8	2.0	2.4	2.1	No	Yes
5	31+00 -L- M 34+25 -L- M	UT to Triangle	0.0	6.0	6.0	0.5	53	325	2.60%	1.3	2.0	1.7	2.2	No	Yes
5/6	34+25 -L- M 37+33 -L- M	UT to Triangle	0.0	6.0	6.0	0.3	32	308	2.20%	0.5	1.5	0.6	1.6	No	Yes
6	37+33 -L- M 41+00 -L- M	UT to Triangle	0.0	6.0	6.0	0.4	42	367	0.60%	3.9	1.5	5.1	1.6	No	Yes
6	41+00 -L- M 45+00 -L- M	UT to Triangle	0.0	5.7	5.7	0.6	63	400	0.80%	1.5	1.4	2.0	1.5	No	Yes
6/7	45+00 -L- M 49+50 -L- M	UT to Triangle	0.0	5.5	5.5	0.7	73	450	0.70%	1.8	1.4	2.3	1.5	No	Yes
6/7	45+50 -L- LT 50+50 -L- LT	UT to Triangle	0.0	6.0	6.0	1.5	150	500	0.60%	3.9	1.5	5.1	1.6	No	Yes
7	51+55 -L- M 55+50 -L- M	UT to Triangle	0.0	5.5	5.5	0.6	57	395	0.50%	1.5	1.2	1.9	1.2	No	Yes
7	55+50 -L- RT 58+50-L- RT	UT to Triangle	0.0	6.0	6.0	0.8	80	300	0.60%	2.2	1.3	3.0	1.4	No	Yes
7	55+50 -L- M 58+00 -L- M	UT to Triangle	0.0	4.8	4.8	0.5	51	250	1.30%	1.6	1.7	2.1	1.9	No	Yes
7	55+50 -L- LT 58+50 -L- LT	UT to Triangle	0.0	6.0	6.0	0.4	40	300	0.80%	0.8	1.2	1.1	1.3	No	Yes
7	59+47 -L- LT 61+16 -L- LT	UT to Triangle	0.0	6.0	6.0	1.7	170	170	0.80%	3.7	1.7	4.9	1.8	No	Yes
7	60+17 -L- M 61+16 -L- M	UT to Triangle	0.0	6.0	6.0	0.2	21	99	0.30%	0.7	0.8	0.9	0.8	No	Yes
7	61+16 -L- M 65+50 -L- M	UT to Triangle	0.0	8.0	8.0	0.7	73	434	0.30%	2.0	0.9	2.6	1.0	No	No
7/8	61+16 -L- LT 64+00 -L- LT	UT to Triangle	0.0	6.0	6.0	1.5	150	284	1.00%	3.0	1.7	4.0	1.9	No	Yes

Additional Comments

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element: 34802.1.1 **TIP No.:** U-2412A **County(ies):** Guilford

Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
7/8	61+20 -L- RT 65+50 -L- RT	UT to Triangle	0.0	6.0	6.0	1.3	130	430	0.40%	2.9	1.2	3.9	1.3	No	Yes
8	71+65 -L- M 75+00 -L- M	UT to Deep River	0.0	4.6	4.6	0.5	52	335	1.60%	1.3	1.8	1.7	1.9	No	Yes
8	72+00 -L- LT 75+00 -L LT	UT to Deep River	0.0	6.0	6.0	0.3	30	300	2.70%	0.8	1.8	1.0	1.9	No	Yes
8/9	75+00 -L- M 77+95 -L- M	UT to Deep River	0.0	6.1	6.1	0.5	54	295	1.60%	1.7	1.8	2.2	1.9	No	Yes
9	81+50 -L- M 83+75 -L- M	UT to Deep River	0.0	5.9	5.9	0.4	36	225	2.00%	1.0	1.7	1.3	1.8	No	Yes
9	83+75 -L- M 86+75 -L- M	UT to Deep River	0.0	5.7	5.7	0.5	47	300	1.70%	1.1	1.7	1.5	1.8	No	Yes
9/10	86+75 -L- M 89+27 -L- M	UT to Deep River	0.0	5.6	5.6	0.4	40	252	2.70%	1.0	2.0	1.3	2.1	No	No
10	97+10 -L- M 101+50 -L- M	UT to Deep River	0.0	6.0	6.0	0.7	65	440	0.80%	1.4	1.3	1.9	1.4	No	Yes
10/11	100+50 -L- RT 103+75 -L- RT	UT to Deep River	0.0	6.0	6.0	0.9	90	325	0.60%	2.0	1.3	2.6	1.4	No	Yes
11	101+50 -L- M 102+53 -L- M	UT to Deep River	0.0	5.9	5.9	0.3	26	103	0.30%	0.5	0.7	0.6	0.7	No	Yes
11	102+53 -L- M 103+75 -L- M	UT to Deep River	0.0	5.6	5.6	0.5	54	122	1.50%	1.3	1.7	1.7	1.8	No	Yes
11	104+24 -L- M 110+92 -L- M	UT to Deep River	0.0	4.7	4.7	0.3	26	668	1.30%	1.0	1.6	1.3	1.7	No	Yes
11	112+50 -L- RT 115+00 -L- RT	UT to Deep River	0.0	6.0	6.0	1.3	130	250	1.50%	2.7	2.0	3.6	2.1	No	Yes
12	119+00 -L- M 121+35 -L- M	UT to Deep River	0.0	5.0	5.0	0.3	31	235	3.10%	0.8	2.0	1.0	2.1	No	Yes
12	121+35 -L- M 123+75 -L- M	UT to Deep River	0.0	5.5	5.5	0.4	37	240	2.60%	0.9	1.9	1.2	2.0	No	Yes
12	123+75 -L- M 126+37 -L- M	UT to Deep River	0.0	5.5	5.5	0.4	35	262	2.60%	0.8	1.8	1.1	2.0	No	Yes
12/13	126+37 -L- M 130+50 -L- M	Deep River	0.0	5.8	5.8	0.7	70	413	2.00%	1.7	2.0	2.2	2.1	No	Yes
12/13	128+50 -L- LT 130+00 -L- LT	Bull Run	0.0	6.0	6.0	0.9	90	150	1.50%	2.4	1.9	3.1	2.1	No	Yes
13	130+50 -L- M 133+50 -L- M	Deep River	0.0	5.8	5.8	0.5	48	300	1.10%	1.1	1.4	1.5	1.5	No	Yes

Additional Comments

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Swales

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13	132+00 -L- RT 133+50 -L- RT	Bull Run	0.0	6.0	6.0	0.6	60	150	1.10%	1.4	1.5	1.9	1.6	No	Yes
14	148+50 -L- LT 150+22 -L- LT	Bull Run	0.0	6.0	6.0	0.3	32	172	1.50%	0.7	1.4	0.9	1.5	No	Yes
14	148+50 -L- RT 150+22 -L- RT	Bull Run	0.0	6.0	6.0	0.2	22	172	1.50%	0.6	1.4	0.8	1.5	No	Yes
14	148+50 -L- M 150+22 -L- M	Deep River	0.0	5.8	5.8	0.9	86	172	2.00%	0.5	1.5	0.7	1.6	No	Yes
14	150+22 -L- M 152+95 -L- M	Deep River	0.0	5.8	5.8	0.5	46	273	1.30%	1.1	1.5	1.4	1.6	No	Yes
15	157+00 -L- M 160+00 -L- M	UT to Bull Run	0.0	5.8	5.8	0.5	47	300	0.30%	1.1	0.9	1.5	0.9	No	Yes
15	160+00 -L- M 161+00 -L- M	UT to Bull Run	0.0	5.8	5.8	0.2	16	100	0.30%	0.4	0.7	0.5	0.7	No	Yes
15	161+00 -L- M 165+58 -L- M	UT to Bull Run	0.0	5.8	5.8	0.7	67	458	0.30%	1.4	0.9	1.9	1.0	No	Yes
15	161+00 -L- LT 165+58 -L- LT	UT to Bull Run	0.0	6.0	6.0	0.7	72	458	0.80%	1.5	1.4	2.0	1.5	No	Yes
15	161+50 -L- RT 165+58 -L- RT	UT to Bull Run	0.0	6.0	6.0	1.2	120	408	0.30%	2.7	1.1	3.6	1.2	No	Yes
15	165+58 -L- LT 169+50 -L- LT	UT to Bull Run	0.0	6.0	6.0	1.0	97	392	1.00%	2.3	1.6	3.0	1.7	No	Yes
15	165+58 -L- RT 169+50 -L- RT	UT to Bull Run	0.0	6.0	6.0	1.1	105	392	1.00%	2.4	1.7	3.2	1.8	No	Yes
15	165+58 -L- M 169+50 -L- M	UT to Bull Run	0.0	6.0	6.0	0.4	41	392	1.00%	0.8	1.3	1.1	1.4	No	Yes
16	169+50 -L- LT 174+00 -L- LT	UT to Bull Run	0.0	6.0	6.0	1.3	133	450	1.30%	3.0	1.9	3.9	2.1	No	Yes
16	169+50 -L- RT 171+00 -L- RT	UT to Bull Run	0.0	6.0	6.0	0.5	53	150	1.30%	1.3	1.6	1.8	1.7	No	Yes
15/16	169+50 -L- M 174+00 -L- M	UT to Bull Run	0.0	6.0	6.0	0.5	48	450	1.30%	0.9	1.4	1.2	1.5	No	Yes
16	174+00 -L- M 175+50 -L- M	UT to Bull Run	0.0	6.0	6.0	0.2	16	150	1.30%	0.3	1.1	0.4	1.2	No	Yes
16	175+50 -L- M 178+17 -L- M	UT to Bull Run	0.0	6.0	6.0	0.2	24	267	1.40%	0.5	1.3	0.6	1.3	No	Yes
16	176+35 -L- RT 178+17 -L- RT	UT to Bull Run	0.0	6.0	6.0	0.5	47	182	1.20%	1.4	1.5	1.9	1.7	No	Yes

Additional Comments

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Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
17	183+02 -L- M 183+75 -L- M	UT to Bull Run	0.0	4.6	4.6	0.1	12	73	2.60%	0.4	1.6	0.5	1.7	No	Yes
18	200+50 -L- M 202+00 -L- M		0.0	6.0	6.0	0.3	30	150	1.14%	0.5	1.2	0.7	1.3	No	No
18/19	202+00 -L- M 205+50 -L- M		0.0	6.0	6.0	0.4	40	350	1.14%	0.9	1.4	1.2	1.5	No	No
19	205+50 -L- M 206+50 -L- M		0.0	6.0	6.0	0.4	41	100	1.14%	1.1	1.4	1.4	1.5	No	No
19	206+50 -L- M 207+43 -L- M		0.0	6.0	6.0	0.2	17	93	1.14%	0.5	1.2	0.6	1.2	No	No

Additional Comments

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element: 34802.1.1 **TIP No.:** U-2412A **County(ies):** Guilford

Level Spreaders, Hazardous Spill Basins, and Forebays

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Level Spreader, Hazardous Spill Basin, or Forebay?	Drainage Area (ac)	New Built-Upon Area (ac)	Required / Minimum Treatment			Treatment Achieved		BMP Associated w/ Buffer Rules?
15	159+00 -L- RT N: 35.9845818 E: -79.9607181	UT to Bull Run	Hazardous Spill Basin	9.40	2.60	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	7760.0	cf	14239.0	cf	Yes

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

Additional Comments

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

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WBS Element: 34802.1.1 **TIP No.:** U-2412A **County(ies):** Guilford

Other Best Management Practices

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	BMP Type	Drainage Area (ac)	New Built-Upon Area (ac)	Volume Treated (ac-ft)	Precipitation Depth Treated over NBUA (in)	BMP Associated w/ Buffer Rules?
7	51+00 -L- RT N: 35.9845818 E: -79.9607181	UT to Triangle Creek	Dry Detention Basin	11.9	4.8	0.514	1.35	Yes
7	54+00 -L- RT N: 35.9849847 E: -79.9598493	UT to Triangle Creek	Dry Detention Basin	8.1	2.4	0.38	2.00	Yes
9	84+00 -L- LT N: 35.9855979 E: -79.9501562	UT to Deep River	Dry Detention Basin	5.6	2.9	0.282	1.23	Yes
10	101+00 -L- LT N: 35.9853466 E: -79.9446180	UT to Deep River	Dry Detention Basin	7.5	4.1	0.3	0.92	Yes
12	126+00 -L- LT N: 35.9855699 E: -79.9361831	UT to Deep River	Dry Detention Basin	5.6	2.6	0.203	0.99	Yes
13	137+00 -L- RT N: 35.9860793 E: -79.9319036	Deep River	Dry Detention Basin	6.0	2.2	0.235	1.35	Yes
13/14	142+50 -L- LT N: 35.9871567 E: -79.9308643	Deep River	Dry Detention Basin	6.1	2.1	0.192	1.15	Yes
16	174+00 -L- RT N: 35.9877500 E: -79.9201212	UT to Bull Run	Dry Detention Basin	9.2	3.7	0.329	1.12	Yes
17	192+00 -L- LT N: 35.9893546 E: -79.9144569	UT to Bull Run	Dry Detention Basin	4.9	2.6	0.247	1.20	Yes

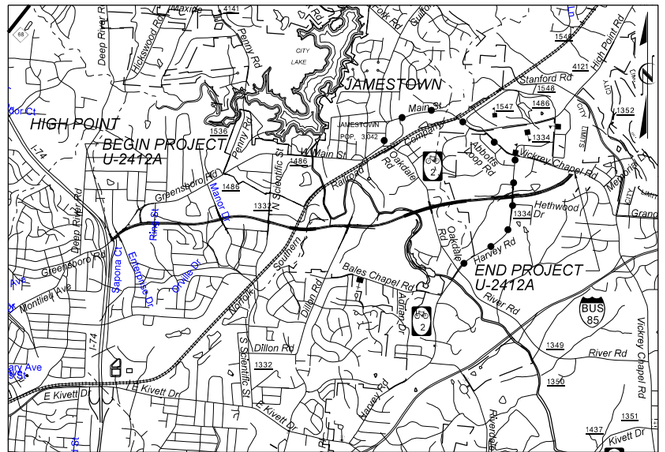
Additional Comments

09/08/99

TIP PROJECT: U-2412A

CONTRACT: C204103

SEE SHEET 1A FOR INDEX OF SHEETS
SEE SHEET 1B FOR CONVENTIONAL SYMBOLS



VICINITY MAP

DETOUR FOR OAKDALE ROAD BRIDGE CONSTRUCTION

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

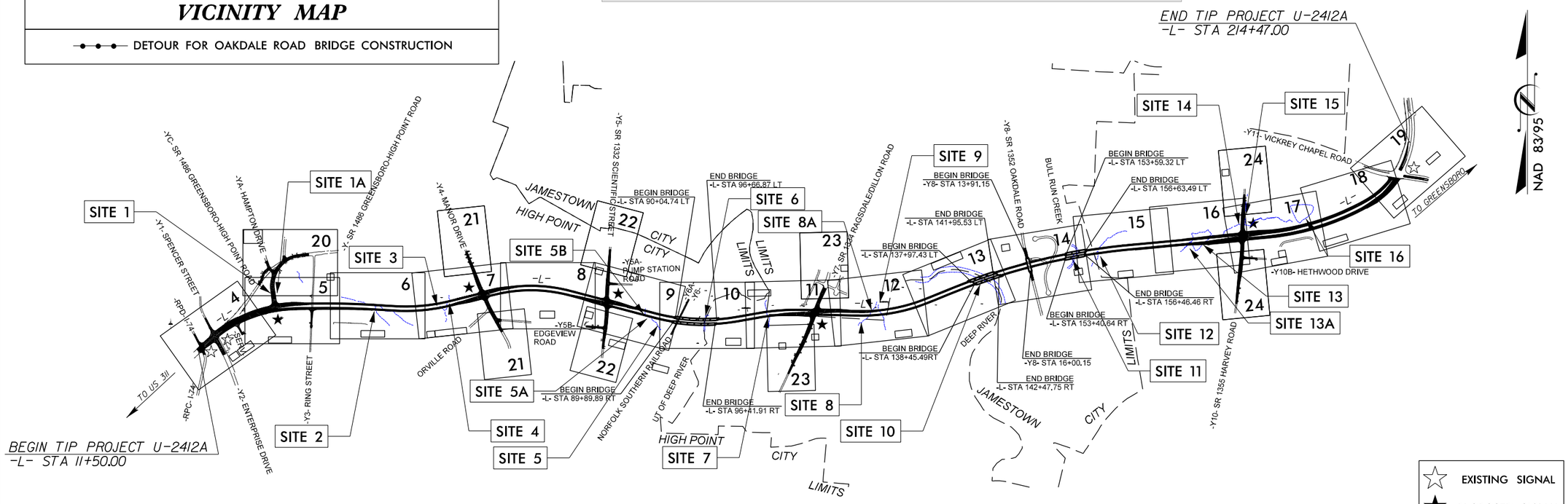
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2412A	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34802.1.1	STP-4121(3)	PE
34802.2.2	STP-4121(3)	R/W & UTL.

LOCATION: SR-1486 /SR-4121 (JAMESTOWN PARKWAY) FROM I-74 TO WEST OF SR 1480 (VICKREY CHAPEL ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERT, & SIGNALS

WETLAND AND SURFACE WATER IMPACTS PERMIT



THIS IS A CONTROLLED ACCESS FACILITY WITH ACCESS BEING LIMITED TO INTERSECTIONS.
NCDOT CONTACT: TATIA WHITE, PE, PLS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2018 = 35,880
ADT 2038 = 44,720
K = 9 %
D = 55 %
T = 4 % *
V = 60 MPH
* TTST =1% DUAL 3%
FUNC CLASS =
URBAN ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT	U-2412A	=	3.586	MILES
LENGTH STRUCTURES TIP PROJECT	U-2412A	=	.258	MILES
TOTAL LENGTH OF TIP PROJECT	U-2412A	=	3.844	MILES

PLANS PREPARED FOR THE NCDOT BY:
MOTT MACDONALD
PO Box 700
Fuquay-Varina, NC 27526
(919) 552-2253
(919) 552-2254 (Fax)
www.mottmac.com/americas
LICENSE NO. F-0669
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 20, 2009

LETTING DATE:
JUNE 19, 2018

MICHAEL PEKAREK, PE
PROJECT ENGINEER

BRIAN PHILLIPS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2/23/2018
U2412A_Hyd_prm_wet_psh_01.dgn
jharvey

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	2D-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of:
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SUNGATE DESIGN GROUP, P.A.
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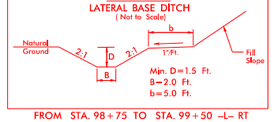
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-490

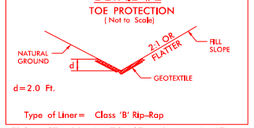
DETAIL #1
LATERAL BASE DITCH
(Not to Scale)



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

FROM STA. 98+75 TO STA. 99+50 –L– RT

DETAIL #2
TOE PROTECTION
(Not to Scale)

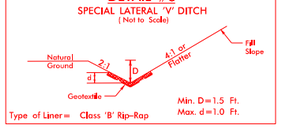


d=2.0 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM STA. 38+00 TO STA. 42+50 –L– LT
FROM STA. 40+50 TO STA. 42+00 –L– RT
FROM STA. 52+50 TO STA. 54+00 –L– LT
FROM STA. 85+00 TO STA. 86+50 –L– LT
FROM STA. 87+00 TO STA. 87+85 –L– RT
FROM STA. 104+50 TO STA. 106+00 –L– RT
FROM STA. 118+00 TO STA. 124+00 –L– RT
FROM STA. 131+25 TO STA. 131+75 –L– RT
FROM STA. 133+75 TO STA. 135+60 –L– LT
FROM STA. 158+00 TO STA. 159+50 –L– LT
FROM STA. 189+00 TO STA. 191+00 –L– RT

DETAIL #3
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

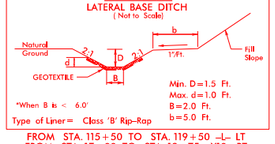


Min. D=1.5 Ft.
Max. d=1.0 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM STA. 35+00 TO STA. 36+00 –L– RT
FROM STA. 70+00 TO STA. 72+00 –L– LT
FROM STA. 10+00 TO STA. 12+50 –Y5B– RT
FROM STA. 16+60 TO STA. 17+00 –Y10– RT

DETAIL #4
LATERAL BASE DITCH
(Not to Scale)



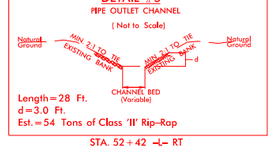
Min. D=1.5 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

*When B is < 6.0'

Type of Liner= Class 'B' Rip-Rap

FROM STA. 115+50 TO STA. 119+50 –L– LT
FROM STA. 17+00 TO STA. 18+75 –Y10– RT
FROM STA. 84+65 TO STA. 86+50 –L– RT

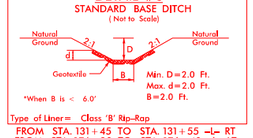
DETAIL #5
PIPE OUTLET CHANNEL
(Not to Scale)



Length=28 Ft.
d=3.0 Ft.
Est.=54 Tons of Class 'II' Rip-Rap

STA. 52+42 –L– RT

DETAIL #6
STANDARD BASE DITCH
(Not to Scale)



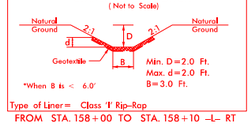
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=2.0 Ft.

*When B is < 6.0'

Type of Liner= Class 'B' Rip-Rap

FROM STA. 131+45 TO STA. 131+55 –L– RT
FROM STA. 176+20 TO STA. 176+40 –L– LT

DETAIL #7
STANDARD BASE DITCH
(Not to Scale)



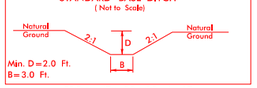
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=3.0 Ft.

*When B is < 6.0'

Type of Liner= Class 'I' Rip-Rap

FROM STA. 158+00 TO STA. 158+10 –L– RT

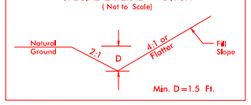
DETAIL #8
STANDARD BASE DITCH
(Not to Scale)



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

FROM STA. 38+00 –L– LT

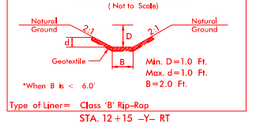
DETAIL #9
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D=1.5 Ft.

FROM STA. 10+10 TO STA. 11+50 –Y4– RT
FROM STA. 23+50 TO STA. 24+00 –Y5– RT
FROM STA. 29+50 TO STA. 32+00 –Y10– LT
FROM STA. 201+00 TO STA. 204+00 –L– LT
FROM STA. 205+00 TO STA. 207+50 –L– LT

DETAIL #10
STANDARD BASE DITCH
(Not to Scale)



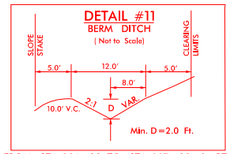
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.

*When B is < 6.0'

Type of Liner= Class 'B' Rip-Rap

STA. 12+15 –Y– RT

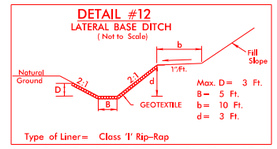
DETAIL #11
BERM DITCH
(Not to Scale)



Min. D=2.0 Ft.

FROM STA. 164+00 TO STA. 167+00 –L– RT
FROM STA. 109+25 TO STA. 111+20 –L– RT
FROM STA. 112+50 TO STA. 114+00 –L– RT

DETAIL #12
LATERAL BASE DITCH
(Not to Scale)

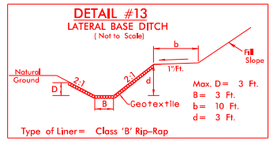


Max. D= 3 Ft.
B= 5 Ft.
b= 10 Ft.
d= 3 Ft.

Type of Liner= Class 'I' Rip-Rap

FROM STA. 174+55 TO STA. 176+50 –L– LT

DETAIL #13
LATERAL BASE DITCH
(Not to Scale)

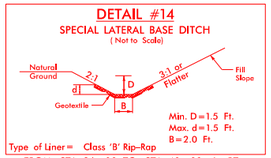


Max. D= 3 Ft.
B= 3 Ft.
b= 10 Ft.
d= 3 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM STA. 176+50 TO STA. 179+00 –L– LT

DETAIL #14
SPECIAL LATERAL BASE DITCH
(Not to Scale)

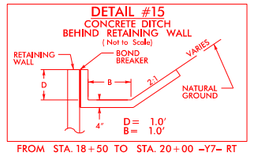


Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=2.0 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM STA. 36+00 TO STA. 40+00 –L– RT

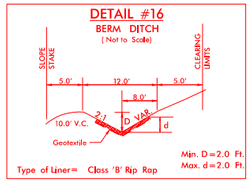
DETAIL #15
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)



D= 1.0'
B= 1.0'

FROM STA. 18+50 TO STA. 20+00 –Y7– RT

DETAIL #16
BERM DITCH
(Not to Scale)



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

Type of Liner= Class 'B' Rip Rap

FROM STA. 114+00 TO STA. 115+50 –L– RT
FROM STA. 177+75 TO STA. 180+50 –L– RT

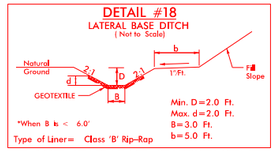
DETAIL #17
STANDARD BASE DITCH
(Not to Scale)

Min. D= 2 Ft.
B= 2 Ft.

Type of Liner= Coir Fiber Matting
Install Matting to Top of Bank

FROM STA. 19+40 TO STA. 19+50 –Y10– LT
FROM STA. 189+60 TO STA. 193+90 –L– LT

DETAIL #18
LATERAL BASE DITCH
(Not to Scale)



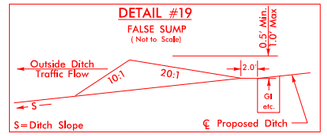
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=3.0 Ft.
b=5.0 Ft.

*When B is < 6.0'

Type of Liner= Class 'B' Rip-Rap

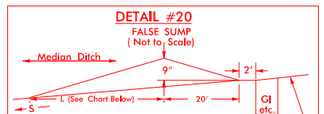
FROM STA. 15+75 TO STA. 19+40 –Y10– LT

DETAIL #19
FALSE SUMP
(Not to Scale)



STA. 20+35 –L– LT
STA. 28+15 –L– RT
STA. 34+15 –L– RT
STA. 55+35 –L– LT
STA. 61+00 –L– LT
STA. 78+00 –L– RT
STA. 103+90 –L– RT
STA. 115+15 –L– RT
STA. 130+65 –L– RT
STA. 133+65 –L– RT
STA. 135+00 –L– RT
STA. 144+45 –L– LT
STA. 160+85 –L– LT
STA. 165+45 –L– LT
STA. 169+35 –L– LT
STA. 183+60 –L– LT
STA. 185+85 –L– LT
STA. 195+35 –L– LT
STA. 15+65 –Y– RT

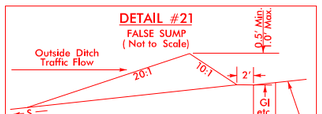
DETAIL #20
FALSE SUMP
(Not to Scale)



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

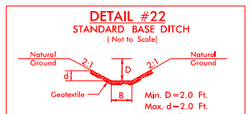
STA. 28+15 –L– MED
STA. 31+15 –L– MED
STA. 34+40 –L– MED
STA. 37+50 –L– MED
STA. 41+15 –L– MED
STA. 45+15 –L– MED
STA. 49+65 –L– MED
STA. 51+40 –L– MED
STA. 55+35 –L– MED
STA. 61+00 –L– MED
STA. 71+80 –L– MED
STA. 75+15 –L– MED
STA. 81+65 –L– MED
STA. 83+90 –L– MED
STA. 86+90 –L– MED
STA. 89+40 –L– MED
STA. 101+65 –L– MED
STA. 103+60 –L– MED
STA. 107+10 –L– MED
STA. 115+75 –L– MED
STA. 119+15 –L– MED
STA. 121+50 –L– MED
STA. 123+90 –L– MED
STA. 126+50 –L– MED
STA. 130+65 –L– MED
STA. 133+65 –L– MED
STA. 142+85 –L– MED
STA. 148+35 –L– MED
STA. 150+05 –L– MED
STA. 156+85 –L– MED
STA. 159+85 –L– MED
STA. 160+85 –L MED
STA. 165+45 –L– MED
STA. 169+35 –L– MED
STA. 173+85 –L– MED
STA. 175+35 –L– MED
STA. 178+02 –L– MED
STA. 182+85 –L– MED
STA. 183+60 –L– MED
STA. 185+85 –L– MED
STA. 188+85 –L– MED
STA. 191+35 –L– MED
STA. 195+35 –L– MED
STA. 202+15 –L– MED

DETAIL #21
FALSE SUMP
(Not to Scale)



STA. 30+65 –L– LT
STA. 55+35 –L– RT
STA. 61+05 –L– RT
STA. 75+15 –L– LT
STA. 107+10 –L– RT
STA. 110+85 –L– RT
STA. 130+15 –L– LT
STA. 143+10 –L– RT
STA. 161+35 –L– RT
STA. 165+45 –L– RT
STA. 169+35 –L– RT
STA. 176+20 –L– RT
STA. 178+02 –L– RT

DETAIL #22
STANDARD BASE DITCH
(Not to Scale)



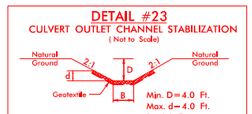
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=4.0 Ft.

*When B is < 6.0'

Type of Liner= Class 'II' Rip-Rap

STA. 104+65 –L– LT
STA. 122+18 –L– LT

DETAIL #23
CULVERT OUTLET CHANNEL STABILIZATION
(Not to Scale)



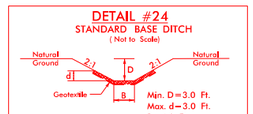
Min. D=4.0 Ft.
Max. d=4.0 Ft.
B=6.0 Ft.

Length = 50'

Type of Liner= Est. 95 Tons Class II Rip-Rap

STA. 172+08 –L– RT

DETAIL #24
STANDARD BASE DITCH
(Not to Scale)



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

*When B is < 6.0'

Type of Liner= Class 'II' Rip-Rap

STA. 87+85 –L– RT

DETAIL #25
PIPE OUTLET CHANNEL
(Not to Scale)

Length=10 Ft.
d=3.0 Ft.
Est.=13 Tons of Class 'II' Rip-Rap

STA. 19+40 –Y10– RT

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	2D-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of:
MOTT MACDONALD
PO Box 700
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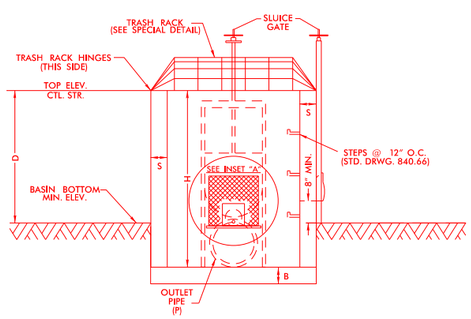
www.mottmac.com/omaecos
LICENSE NO. F-0669

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

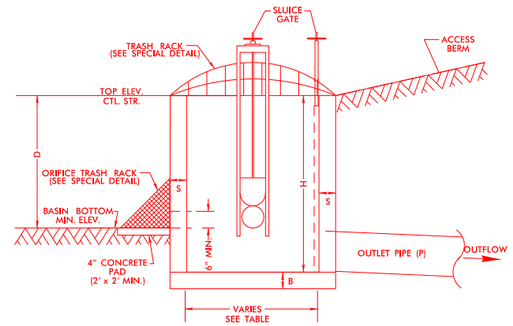
DETAIL #26

DRY DETENTION/HAZARDOUS SPILL BASIN DRAWDOWN STRUCTURE

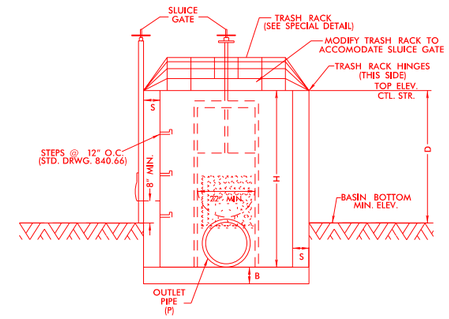
NOT TO SCALE



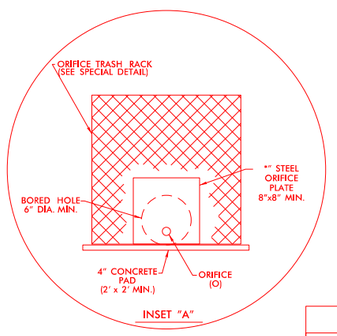
SIDE 1



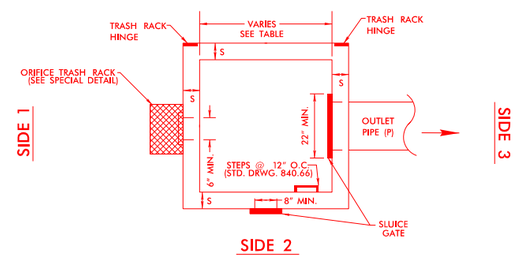
SIDE 2



SIDE 3



INSET "A"



SIDE 2

PLAN VIEW

TRASH RACK NOT SHOWN FOR CLARITY

NOTES:
1. THE BASIN SHOULD BE DESIGNED TO HOLD THE HAZARDOUS SPILL VOLUME ABOVE THE WATER QUALITY VOLUME (WQv) ELEVATION.
2. TOP ELEVATION OF CONTROL STRUCTURE (WEIR ELEVATION) SHOULD BE SET AT THE WQv ELEVATION.
3. 15" MINIMUM DIAMETER FOR OUTLET PIPE.
4. 2" MINIMUM DIAMETER ORIFICE. IF ORIFICE IS GREATER THAN 6", A STEEL PLATE IS NOT REQUIRED.
5. NO BEDDING MATERIAL TO BE USED. THEREFORE, DO NOT FOLLOW STANDARD DRAWINGS FOR METHOD OF PIPE INSTALLATION FOR OUTLET PIPE THROUGH EMBANKMENT.
6. 8" MIN. SLUICE GATE IS FOR MAINTENANCE AND SHOULD REMAIN CLOSED DURING NORMAL OPERATION. A GATE VALVE MAY BE USED IN LIEU OF THE 8" SLUICE GATE.
7. 22" MIN. SLUICE GATE AT THE OUTLET PIPE IS FOR SPILL CONTAINMENT AND SHOULD REMAIN OPEN DURING NORMAL OPERATION.
8. SLUICE GATE SHALL PROVIDE WATERTIGHT SEAL. PROVIDE ADEQUATE CLEARANCE FOR GATE OPERATION AND FOR PROPER SEATING OF GATE OVER PIPE.
9. SELECT BOX STANDARD AS REQUIRED TO ACCOMMODATE SLUICE GATE AND ORIFICE TRASH RACK WIDTH.
10. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATES.
11. ADJUST FOOTER DIMENSIONS AS NEEDED FOR ANTI-FLOTATION.
12. PAYMENT FOR TRASH RACKS IS INCIDENTAL TO BASIN DRAWDOWN STRUCTURE.

MINIMUM DIMENSIONS FOR DRY DETENTION/HAZARDOUS SPILL BASIN DRAWDOWN STRUCTURE

STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	MAX. STORAGE DEPTH(D) FEET	INV. ELEV. CTL. STR.	CTL. STR. DIMENSIONS (W x L x H)	ORIFICE DIAMETER (O) INCHES	ORIFICE INV. ELEV.	OUTLET PIPE DIAMETER(P) INCHES
50+00 -L- RT	713	6	18	827.0	830.5	3.5	824.0	5 x 5 x 6.5	6	827.0	36
54+00 -L- RT	711	6	15	828.0	833.5	5.5	828.0	5 x 5 x 5.5	22	828.0	30
83+00 -L- LT	909	6	15	798.5	804.0	5.5	798.5	5 x 5 x 5.5	17	798.5	24
100+00 -L- LT	1015	6	18	728.0	732.0	4.0	725.0	5 x 5 x 7	2	728.0	30
143+00 -L- LT	1320	6	15	733.0	736.5	3.5	730.0	5 x 5 x 6.5	4.5	733.0	24
175+00 -L- RT	1613	6	18	768.0	772.5	4.5	765.0	5 x 5 x 7.5	8	768.0	30
192+00 -L- LT	1725	6	12	812.0	815.0	3.0	810.0	5 x 5 x 5	2	812.0	24

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jbarvin

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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	2D-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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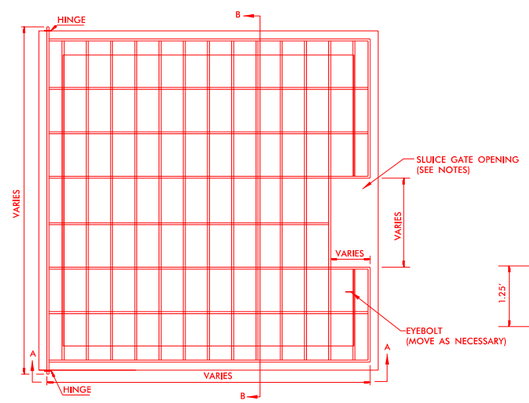
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

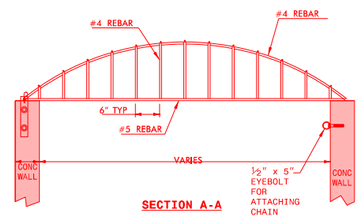
DETAIL #27

REMOVABLE ORIFICE TRASH RACK

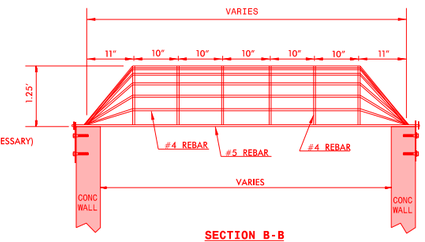
NOT TO SCALE



PLAN



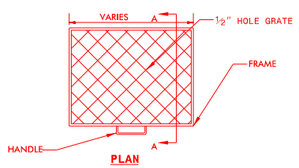
SECTION A-A



SECTION B-B

REBAR TRASH RACK
NOT TO SCALE

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



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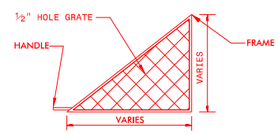


SECTION A-A

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

DETAIL #28

(NOT TO SCALE)

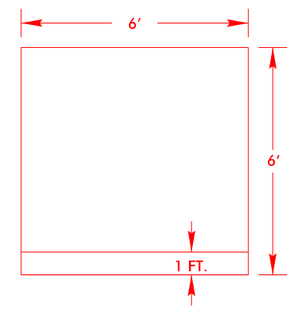
SINGLE BARREL CULVERT SKEWED LOW FLOW CHANNEL AND SILLS

*NOTES:

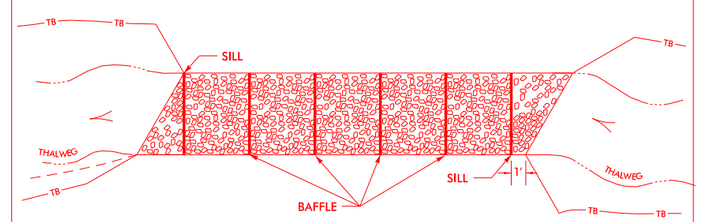
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT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

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

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



SILLS AT INLET AND OUTLET



NUMBER OF BAFFLES = 6
ON 40 FT CENTERS FROM DOWNSTREAM SILL

9/13

STA. 173 + 47 –L–

2/27/2018
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jbarvey

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-490

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83/95

MATCHLINE SEE SHEET 20
-Y3- STA 13+00.00

MATCHLINE SEE SHEET 20
-Y- STA 12+50.00

MATCHLINE SEE SHEET 6
-L- STA 35+00.00

MATCHLINE SEE SHEET 4
-L- STA 22+00.00

SITE 1

SITE 1A

NC EAST DISTRICT WESLEYAN CHURCH

J P & D FINANCIAL, INC.

24" CLASS IV RCP

REMOVE EXIST. 24" RCP

TAIL DITCH W/ CLASS 'B' RIP RAP SEE DETAIL #10 SEE SHEET 20-21 DDE 126 CY EST. 41 TONS EST. 83 SY GEO

CLASS 'B' RIP RAP EST 5 TONS EST 14 SY GEO

ALVIN M. & CORNILLA W. EDWARDS

GILBERT W. JACOBS

DP REALTY, LLC.

LARRY D. & REBECCA L. HICKS

EVELYN H. BOWERS

BONITA WORKMAN

ROBERT J. & SALLIE W. BROWN

BOBBIE GILLESPIE

KENNETH W. EADS

MICHAEL T. DUNN ,SR. & WILLIE DEAN McFFADDEN

THE 1999 CHARLES RICHARD VAUGHN SR IRREVOCABLE TRUST

THOMAS C. & VALERIE M. NELSON

NCDOT

N 89° 29' 50.3" E

15" RCP-IV

18" RCP-III

24" RCP-III

18" RCP-IV

DENOTES FILL IN WETLAND

★ PROP. TRAFFIC SIGNAL

-L- PFL SEE SHEET 25
-Y- PFL SEE SHEET 34
-Y3- PFL SEE SHEET 35

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2/23/2018
U2412A_hyd_prm_wet_psh_05.dgn
DRAFT

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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TEL (919) 859-2243
ENG FIRM LICENSE NO. C-490

SCALE: 1" = 100'

NAD 83/95

MATCHLINE SEE SHEET 20 -Y- STA 12+50.00

MATCHLINE SEE SHEET 20 -Y3- STA 13+00.00

MATCHLINE SEE SHEET 6 -L- STA 35+00.00

MATCHLINE SEE SHEET 4 -L- STA 22+00.00

SITE 1

SITE 1A

NC EAST DISTRICT WESLEYAN CHURCH

J P & D FINANCIAL, INC.

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THE 1999 CHARLES RICHARD VAUGHN SR IRREVOCABLE TRUST

THOMAS C. & VALERIE M. NELSON

NCDOT

NCDOT TDE

NCDOT PDE

NCDOT TCE

REMOVE EXIST 24" RCP

TAIL DITCH W/ CLASS 'B' RIP RAP SEE DETAIL #10, SEE SHEET 20 DDE 125 CY EST. 41 TONS EST. 83 SY GEO

CLASS 'B' RIP RAP EST. 5 TONS EST. 14 SY GEO

24" CLASS IV RCP

15" RCP-IV

15" RCP-III

18" RCP-IV

18" RCP-III

24" RCP-III

15" RCP-IV

PLAY GROUND

DENOTES FILL IN WETLAND

★ PROP. TRAFFIC SIGNAL

-L- PFL SEE SHEET 25
-Y- PFL SEE SHEET 34
-Y3- PFL SEE SHEET 35

8/17/99

2/23/2018
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bpowell

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	5b
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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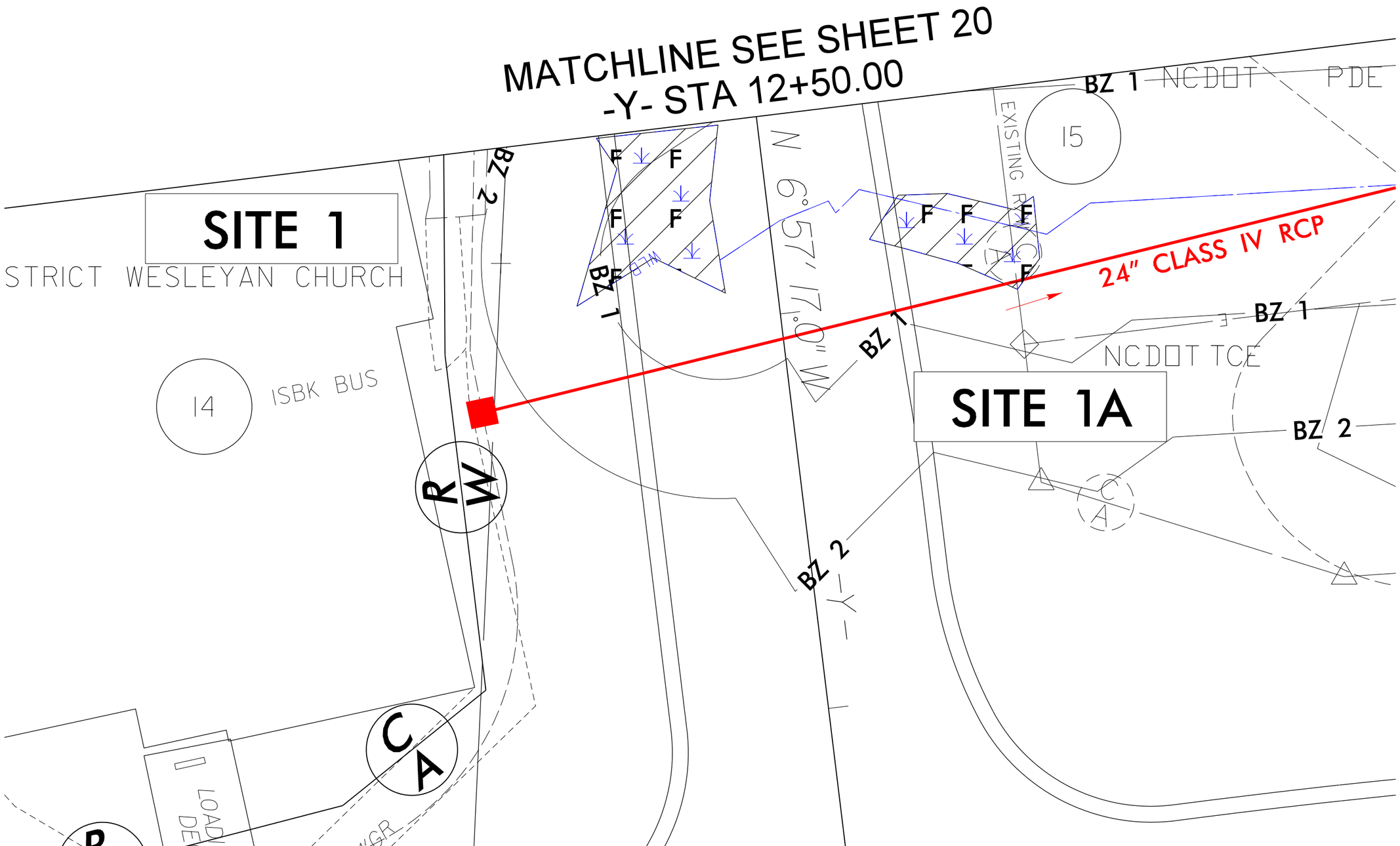
F F DENOTES FILL IN WETLAND

12.5' 6.25' 0 12.5' 25'
SCALE: 1"=25'



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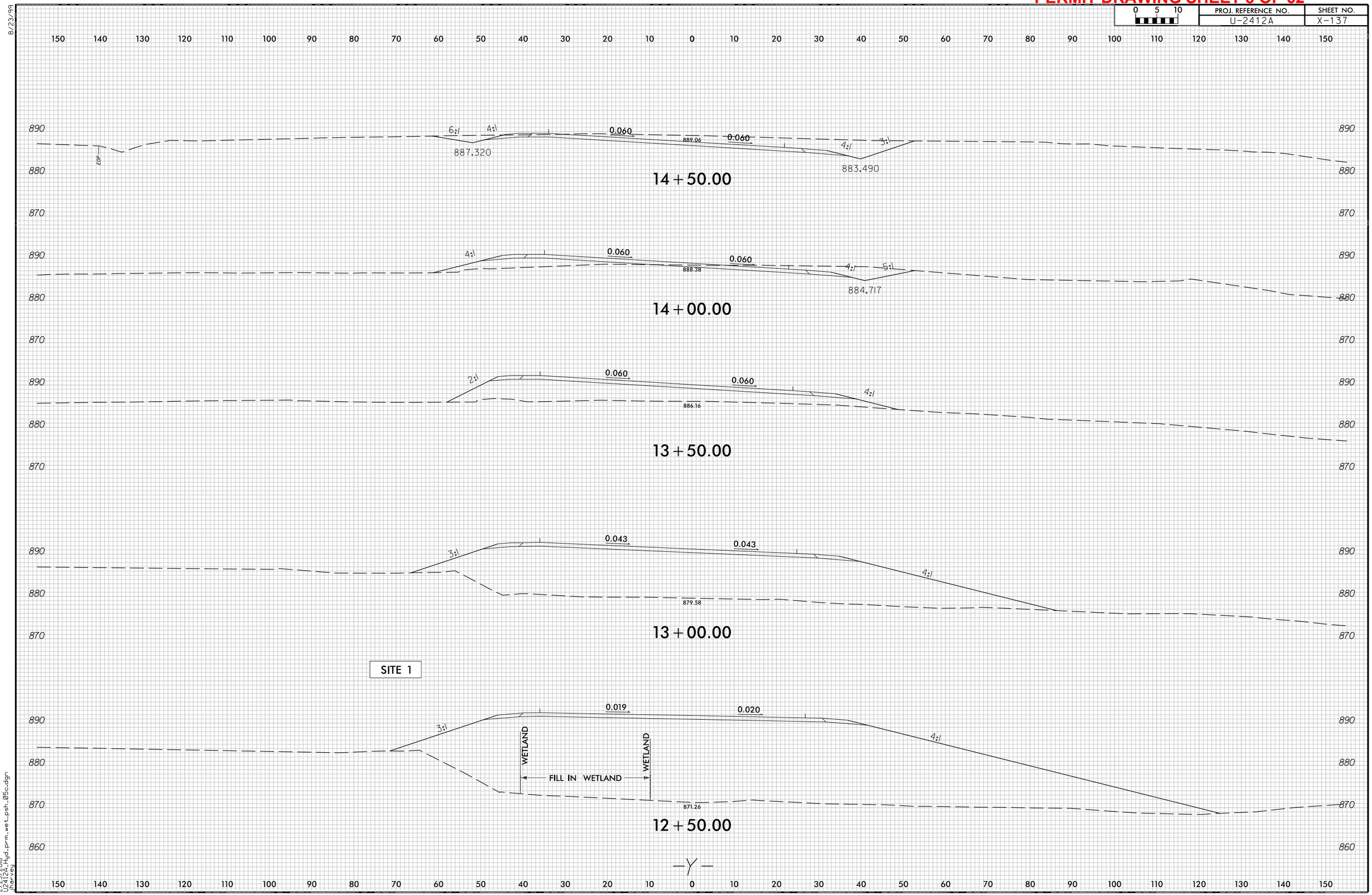
U2412A_hyd_prm_wet_psh_05b.dgn
jbarker

PERMIT DRAWING SHEET 8 OF 62

PROJ. REFERENCE NO.	SHEET NO.
U-2412A	X-137



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U2412A_hgd_prm_wet_psh_05c.dgn
jharvey

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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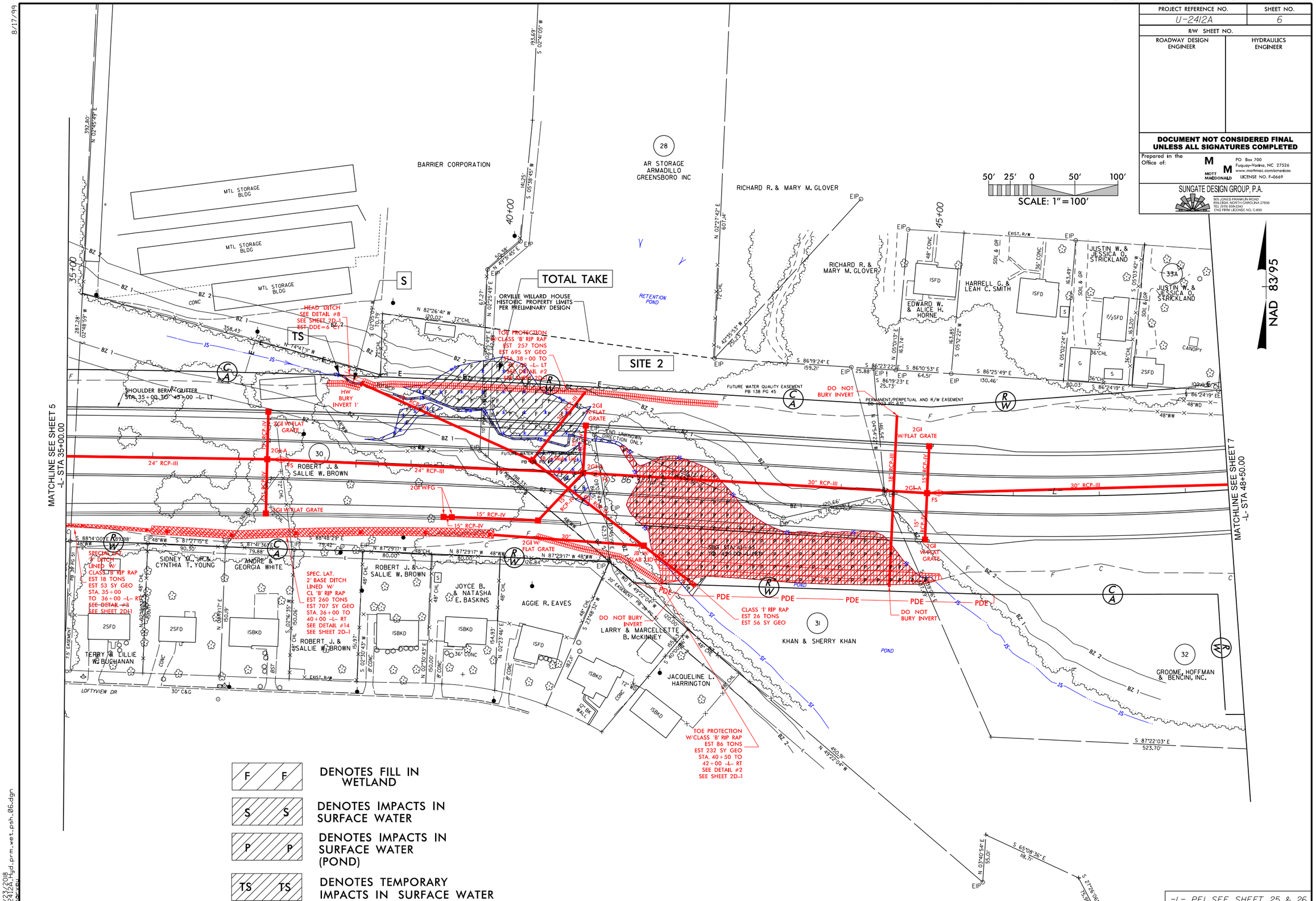

F F	DENOTES FILL IN WETLAND
S S	DENOTES IMPACTS IN SURFACE WATER
P P	DENOTES IMPACTS IN SURFACE WATER (POND)
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

8/17/99

2/23/2018
U2412A_Hyd_prm_wet_psh_06.dgn
lbarvin

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	6
R/W SHEET NO.	
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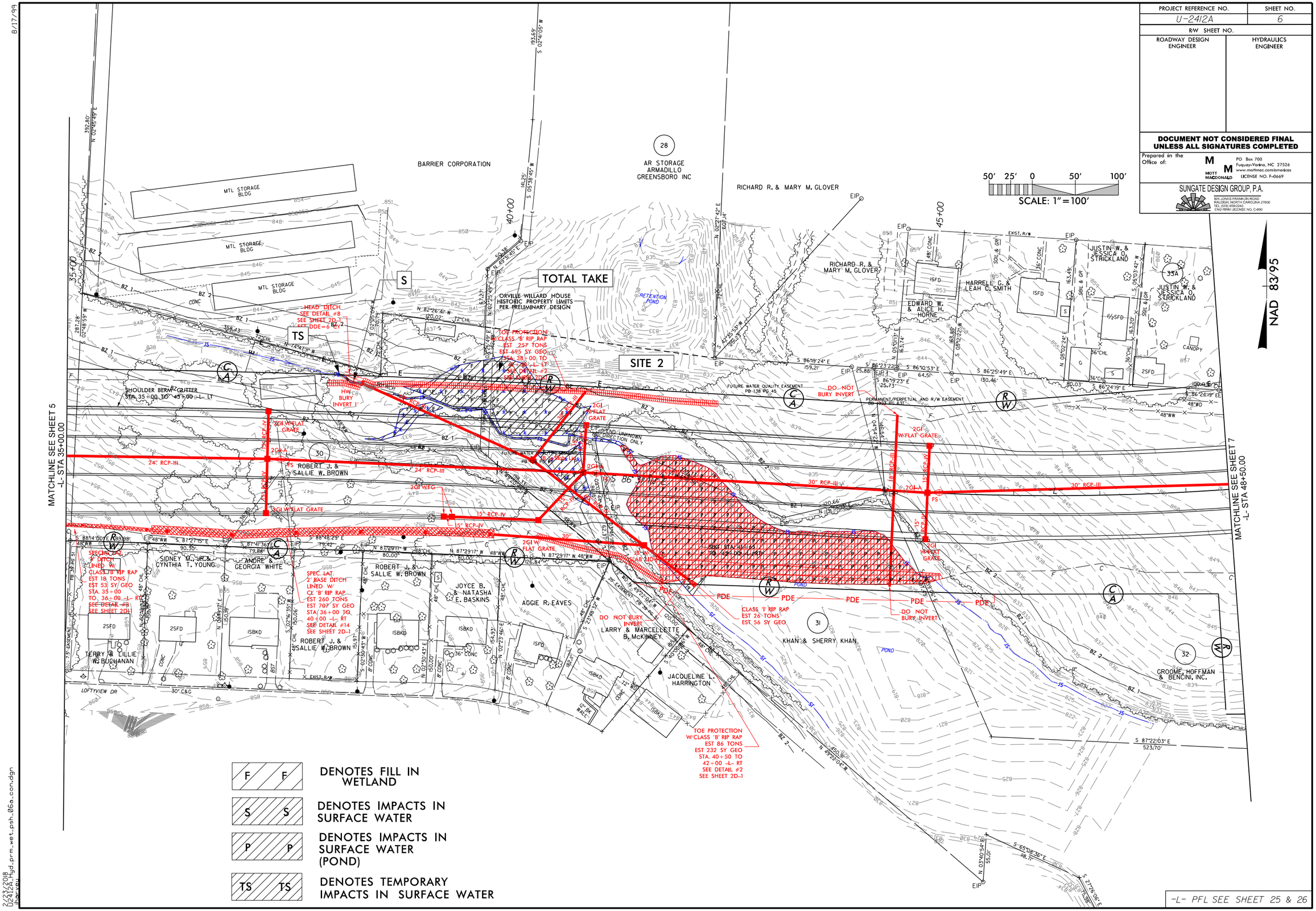

F / F	DENOTES FILL IN WETLAND
S / S	DENOTES IMPACTS IN SURFACE WATER
P / P	DENOTES IMPACTS IN SURFACE WATER (POND)
TS / TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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2/27/2018
U2412A_hydd_prm_wet_psh_06a_con.dgn
jbarkley

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	6b
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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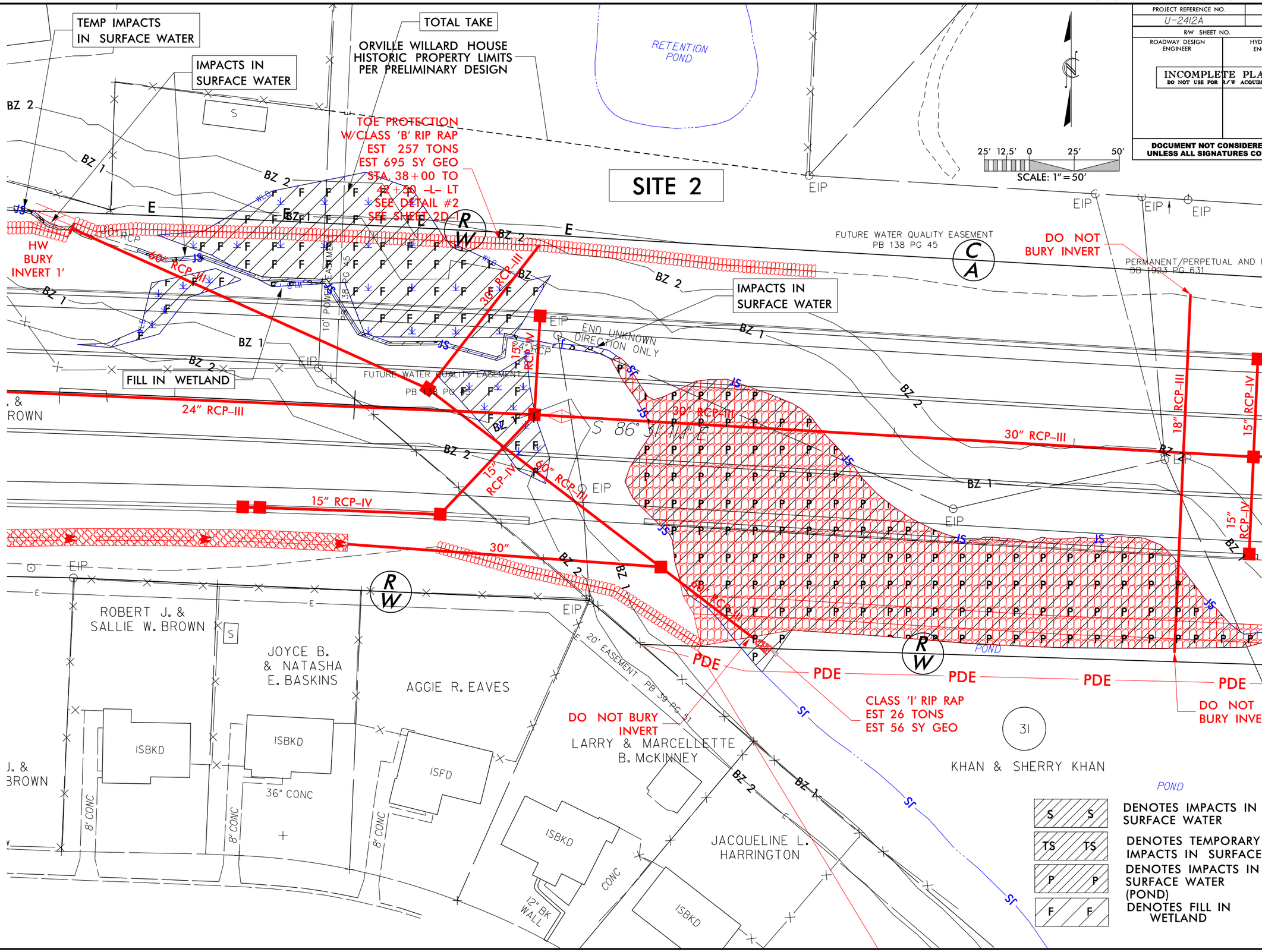
SCALE: 1" = 50'



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jbarvell

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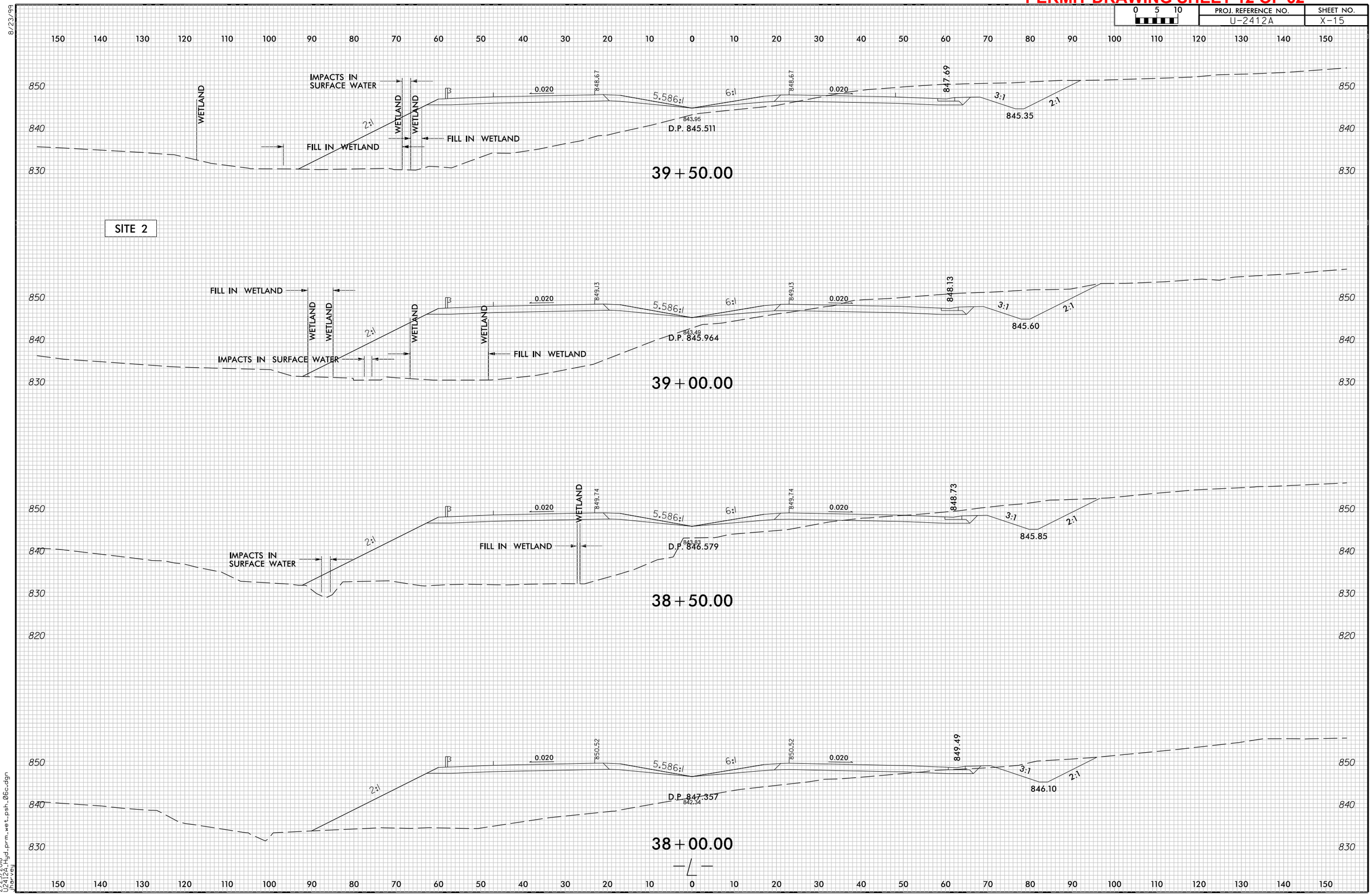

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jharvey

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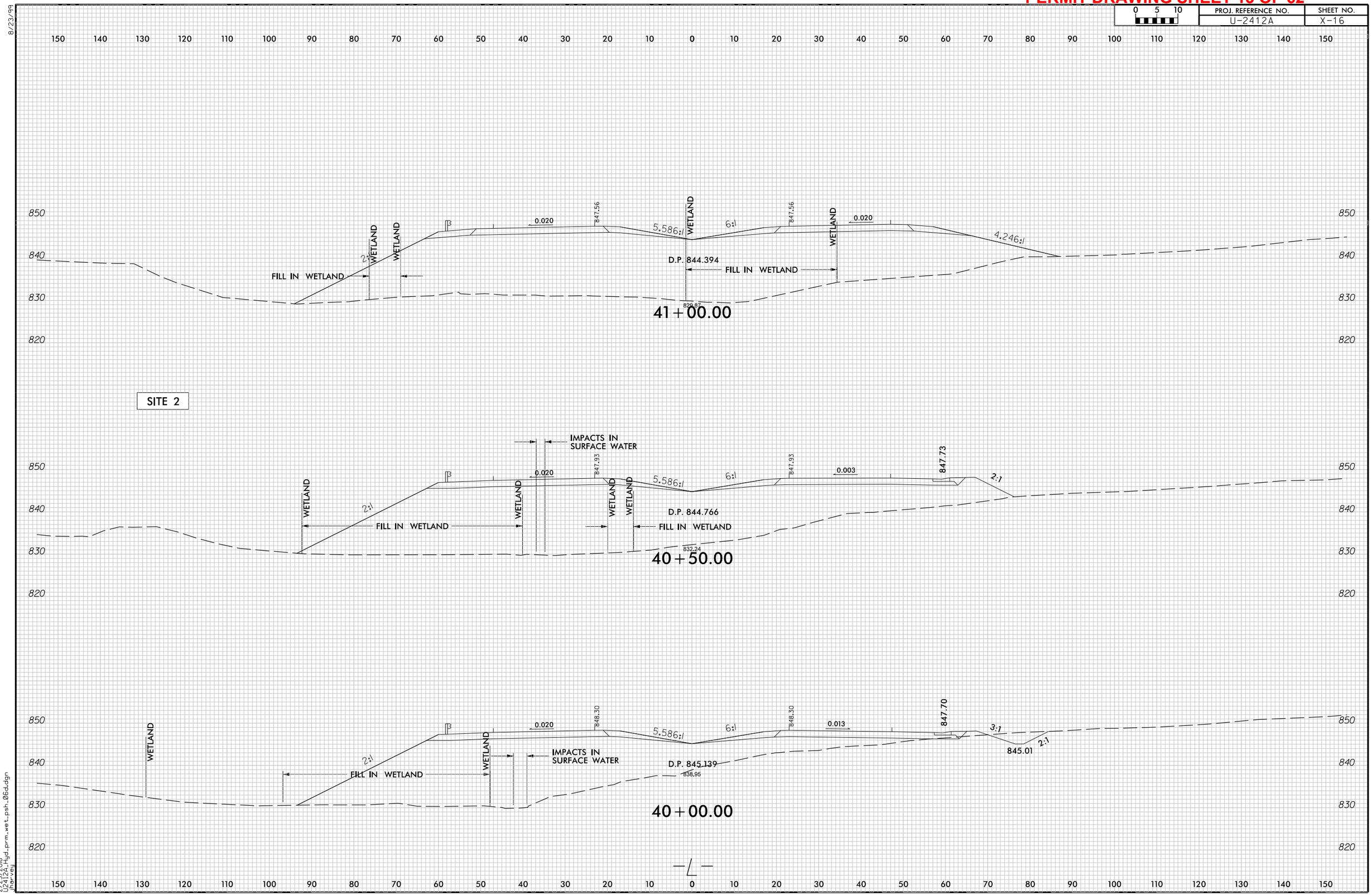

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2/23/2018
U2412A
jhorvey
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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	6e
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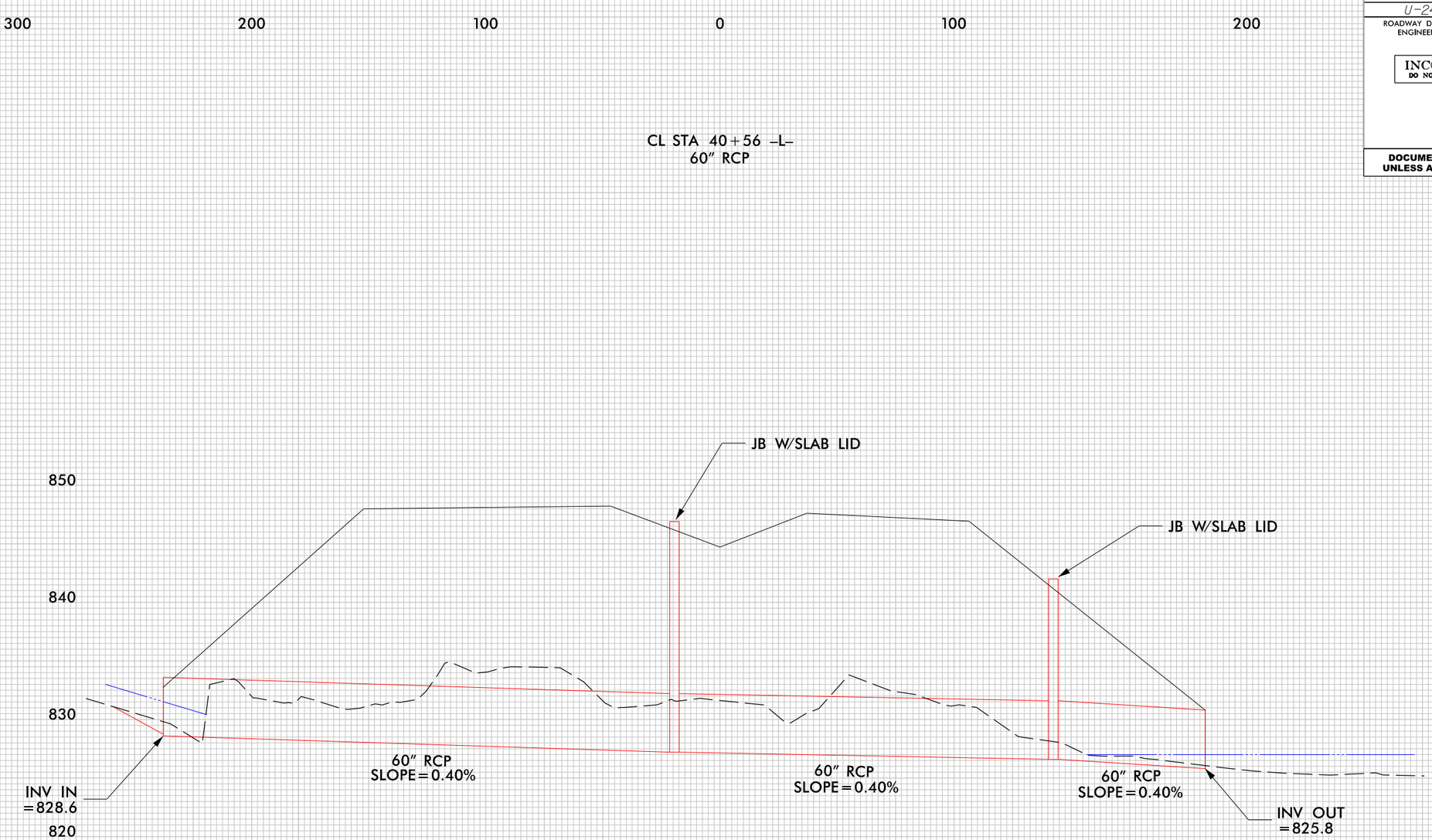

5/14/99

2/23/2018
bpowell
hydraulics_prm_wet_psh_06e_sec.dgn

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	7
R/W SHEET NO.	
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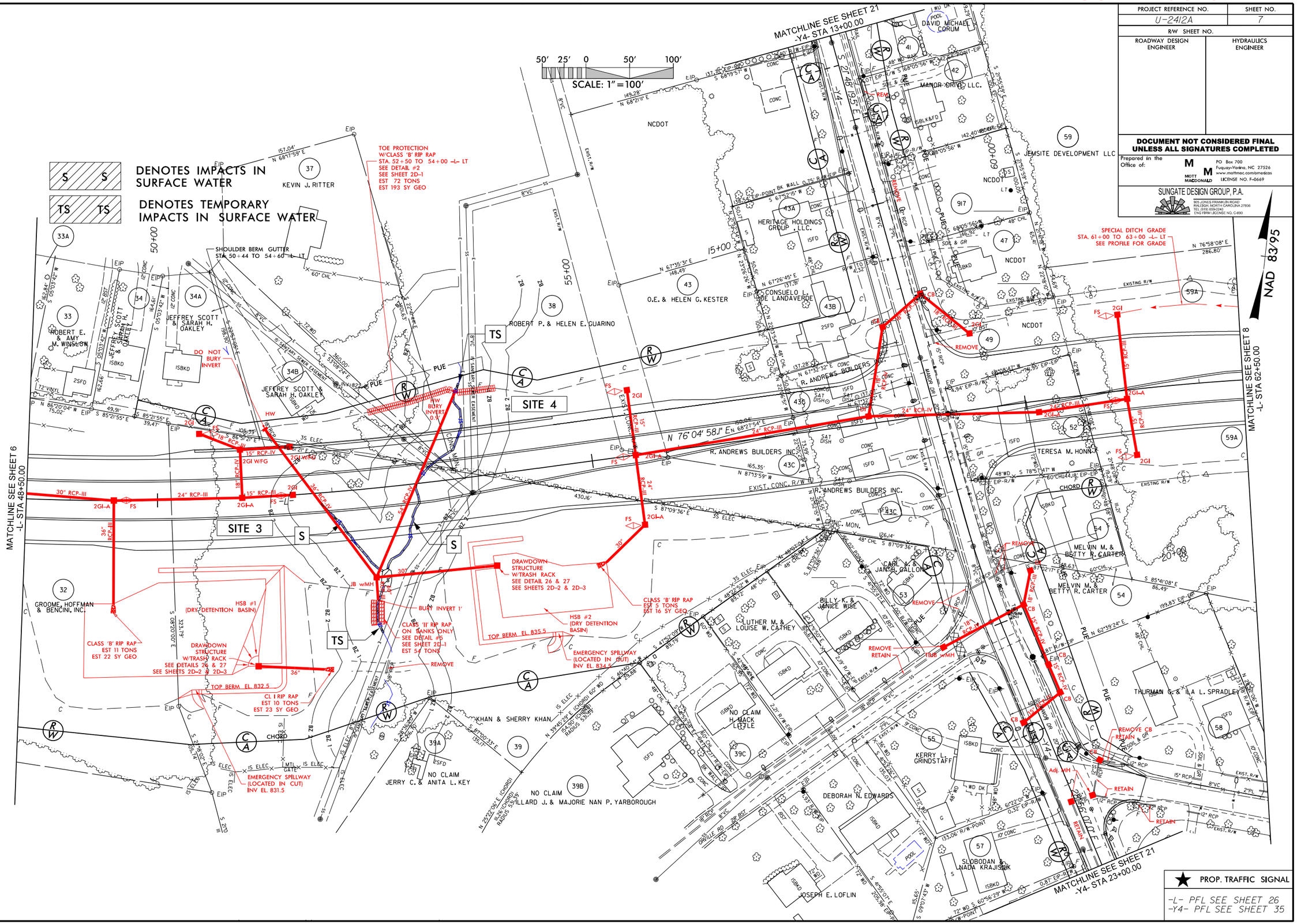

2/23/2018
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	7
R/W SHEET NO.	
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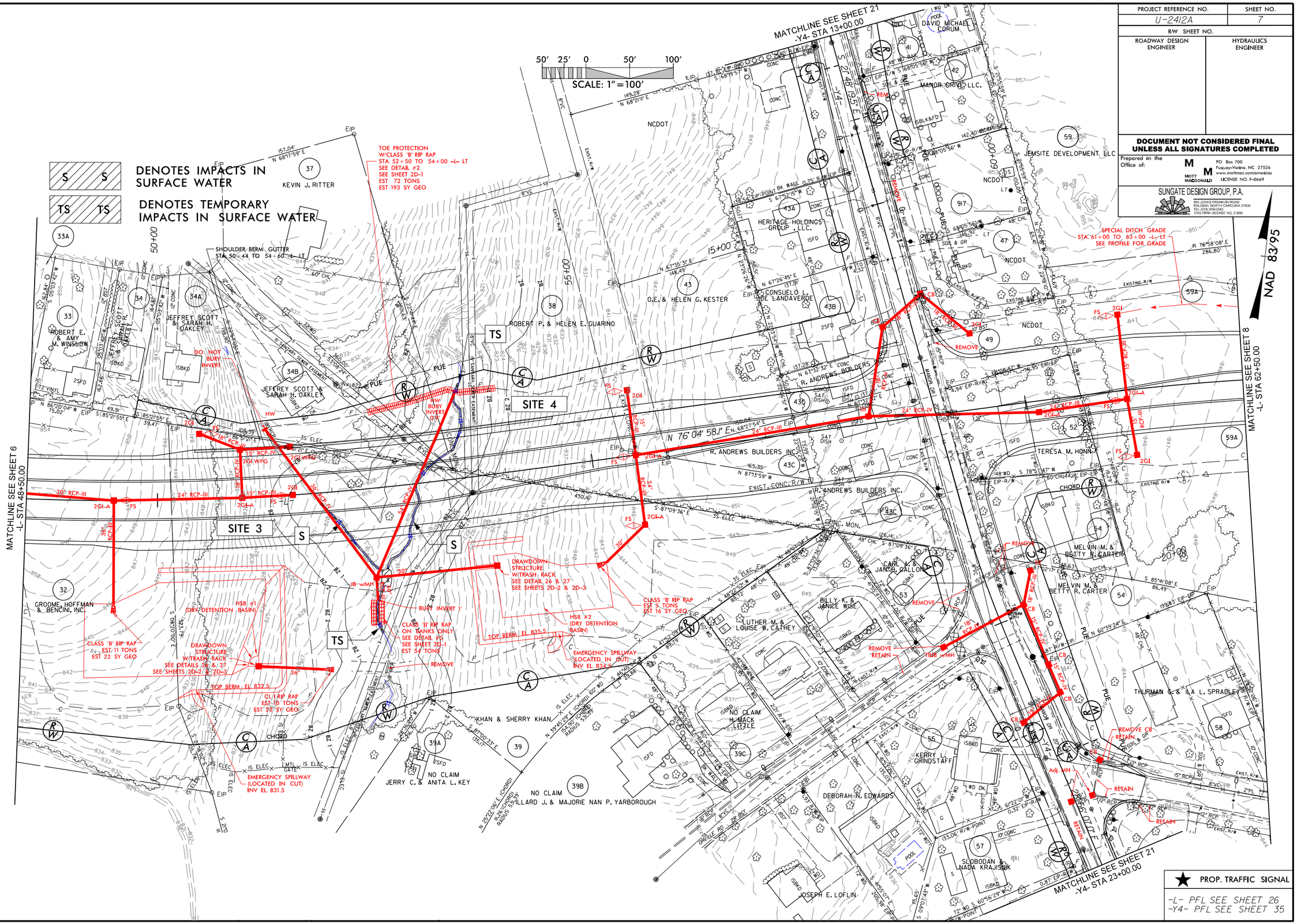

2/23/2018
U2412A_hyd_prm_wet_psh_07a_con.dgn
bpriddy

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	7b
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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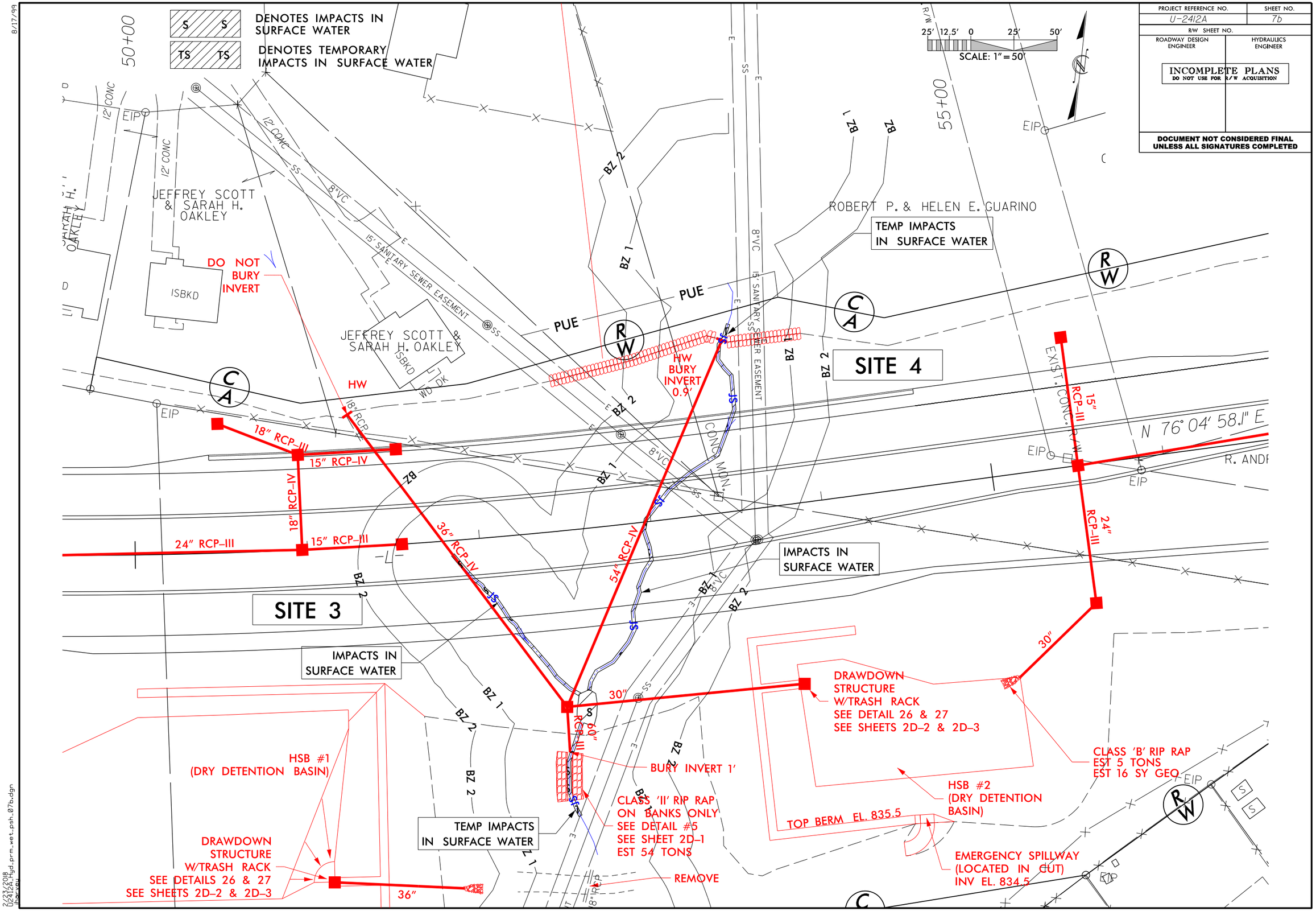

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5/28/99

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ENG FIRM LICENSE NO. C-490

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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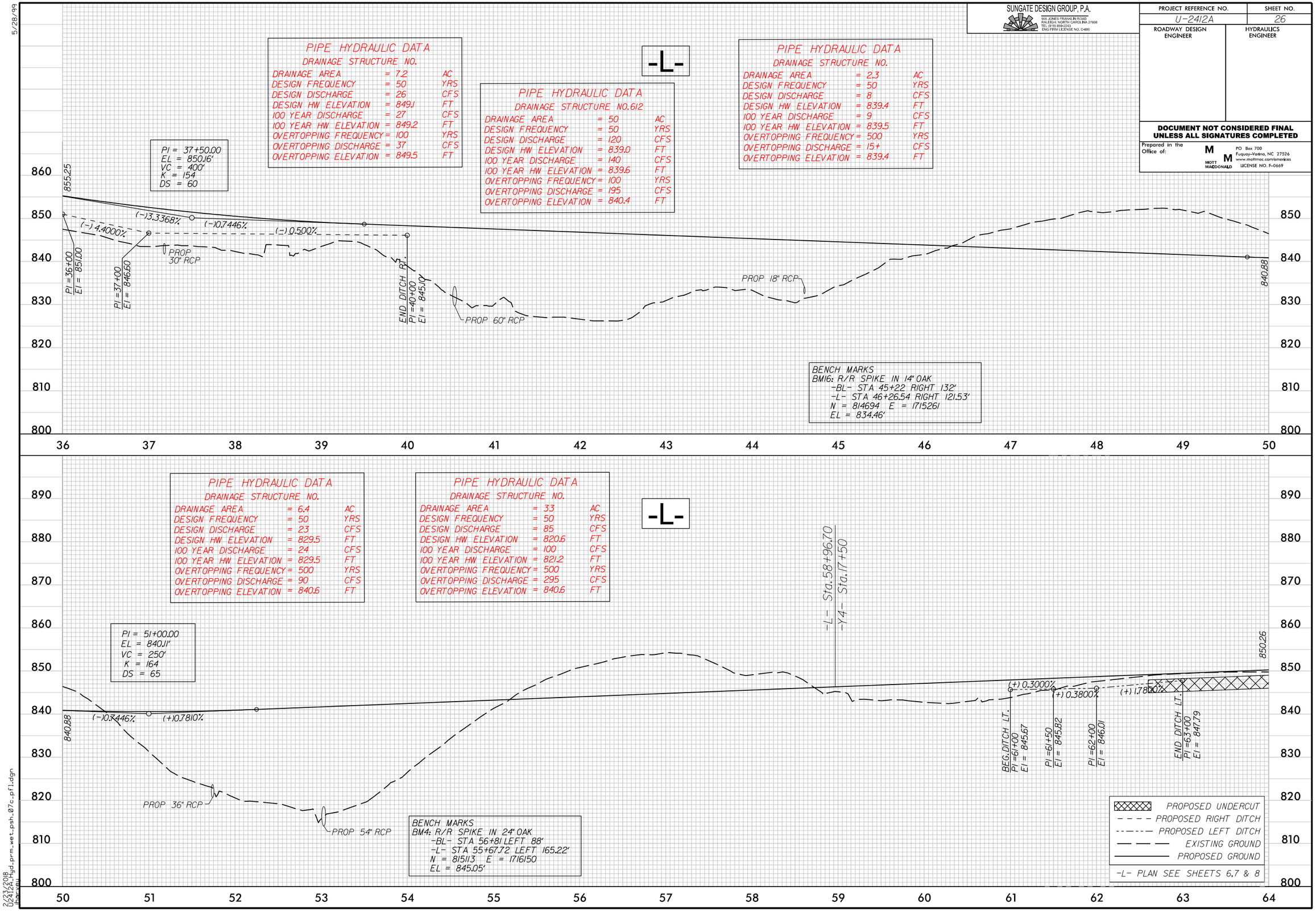

2/23/2018
U2412A_hyd_prm_wet_psh_07c_pfl.dgn
jbarker

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	9
R/W SHEET NO.	
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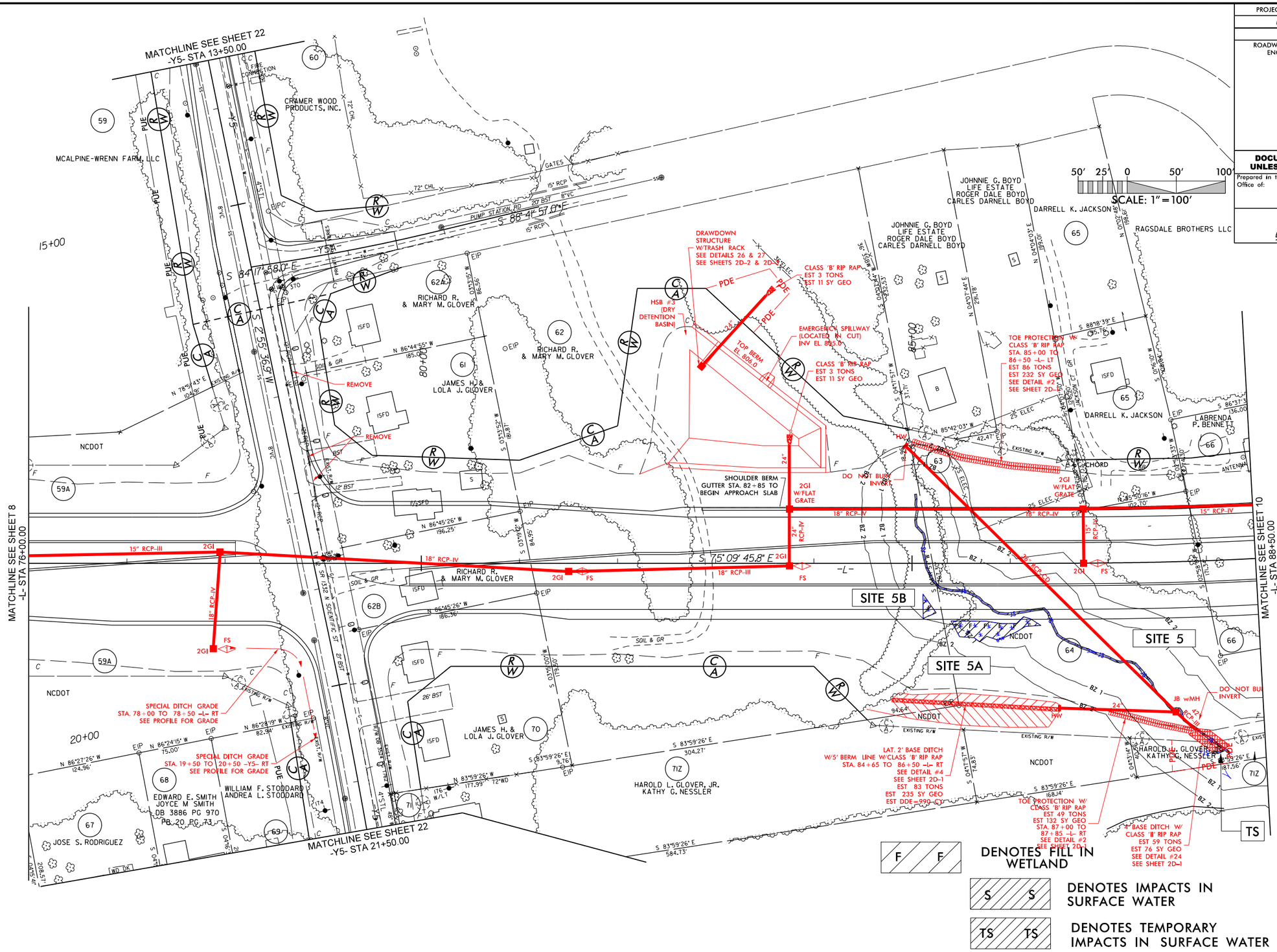
SCALE: 1" = 100'

NAD 83/99



★ PROP. TRAFFIC SIGNAL

-L- PFL SEE SHEET 27
-Y5- PFL SEE SHEET 36
-Y5A- PFL SEE SHEET 37

8/17/99

2/23/2018
U2412A_sd_prm_wet_psh_09.dgn
jhorvath

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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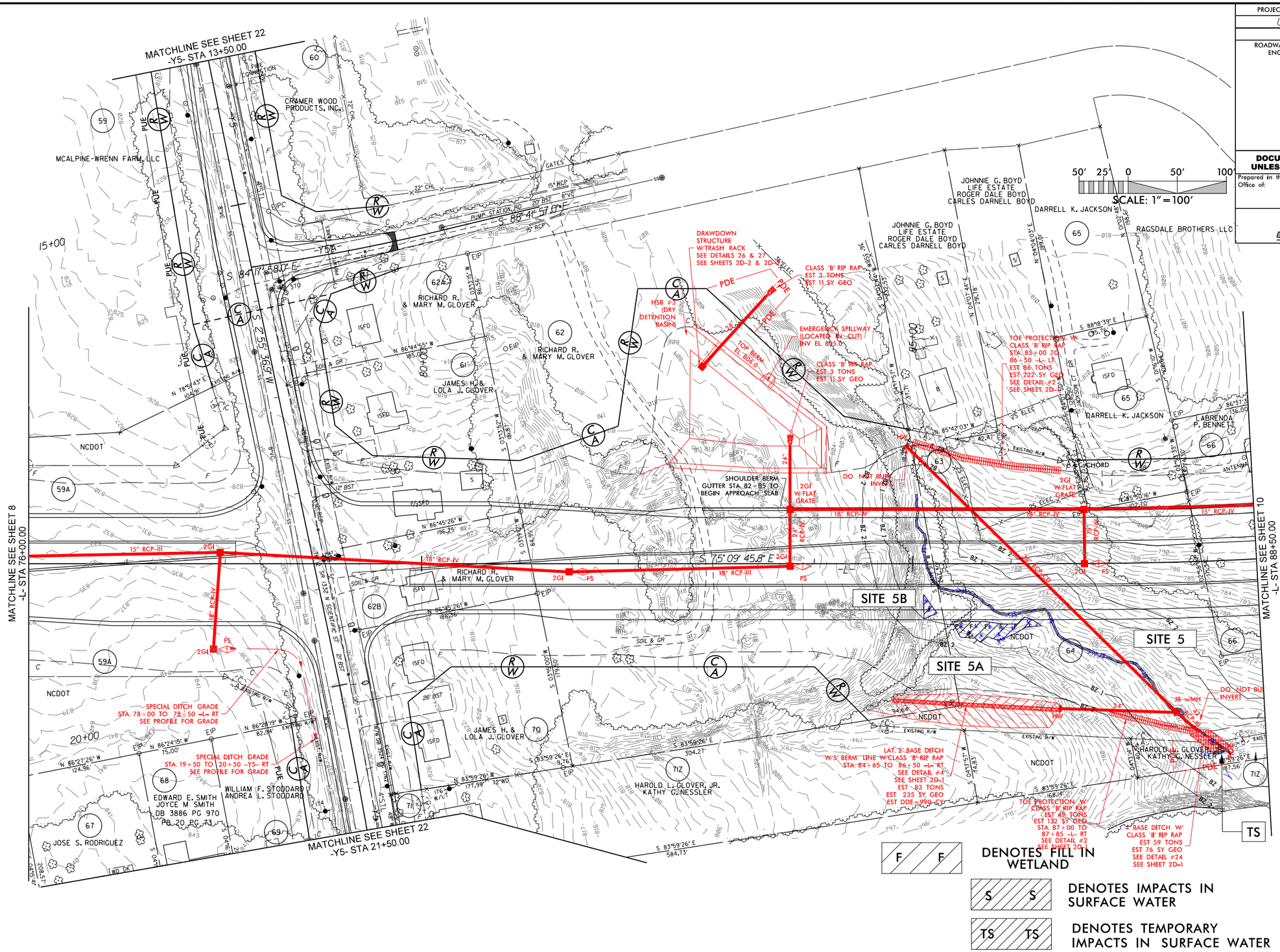
PO Box 700
Fuquay-Varina, NC 27526
www.mottmac.com/americas
LICENSE NO. F-0669

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-690



★ PROP. TRAFFIC SIGNAL

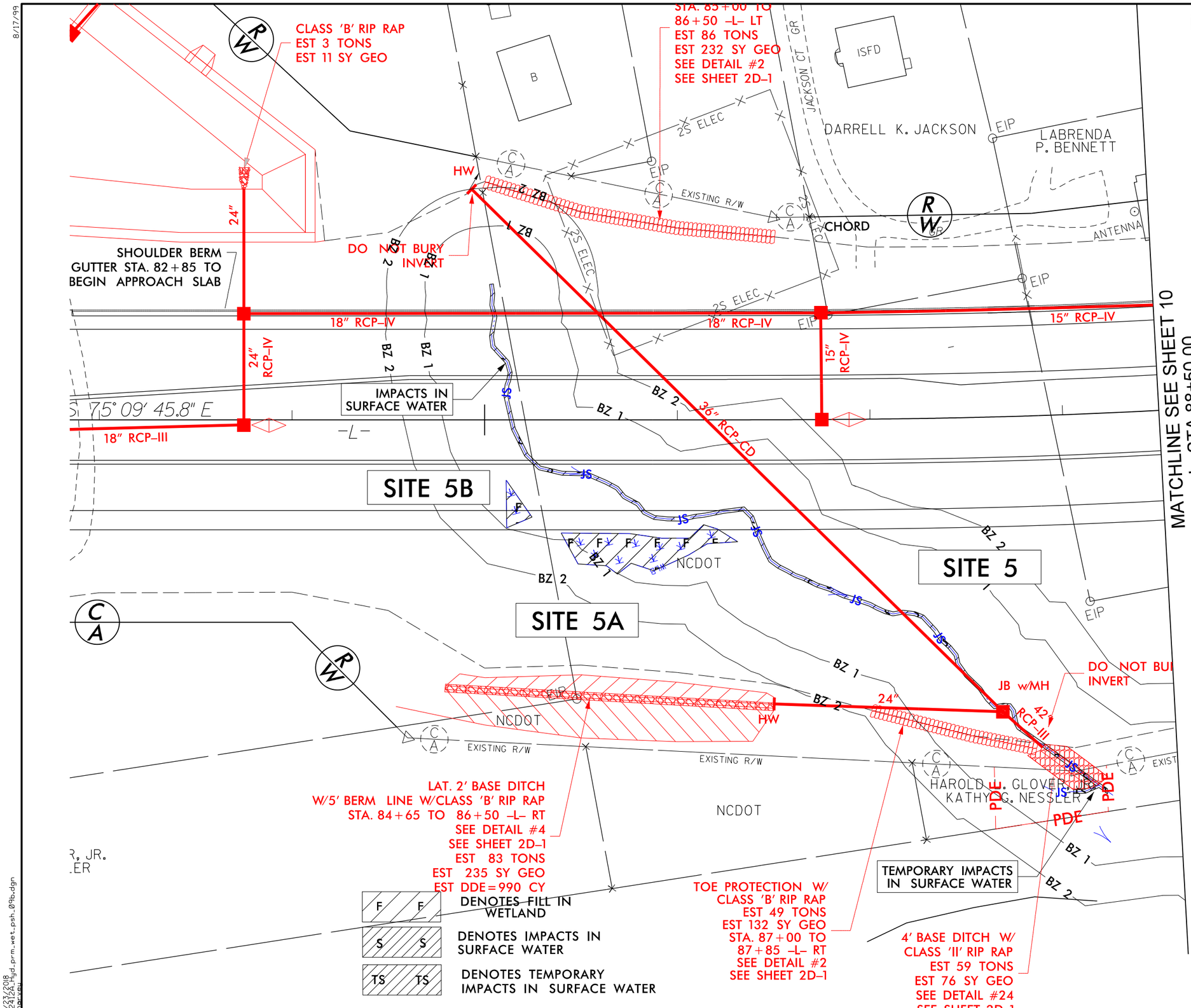
-L- PFL SEE SHEET 27
-Y5- PFL SEE SHEET 36
-Y5A- PFL SEE SHEET 37

8/27/2018
U2412A_Hyd_prm_wet_psh_09a_con.dgn
harvey

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	9b
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

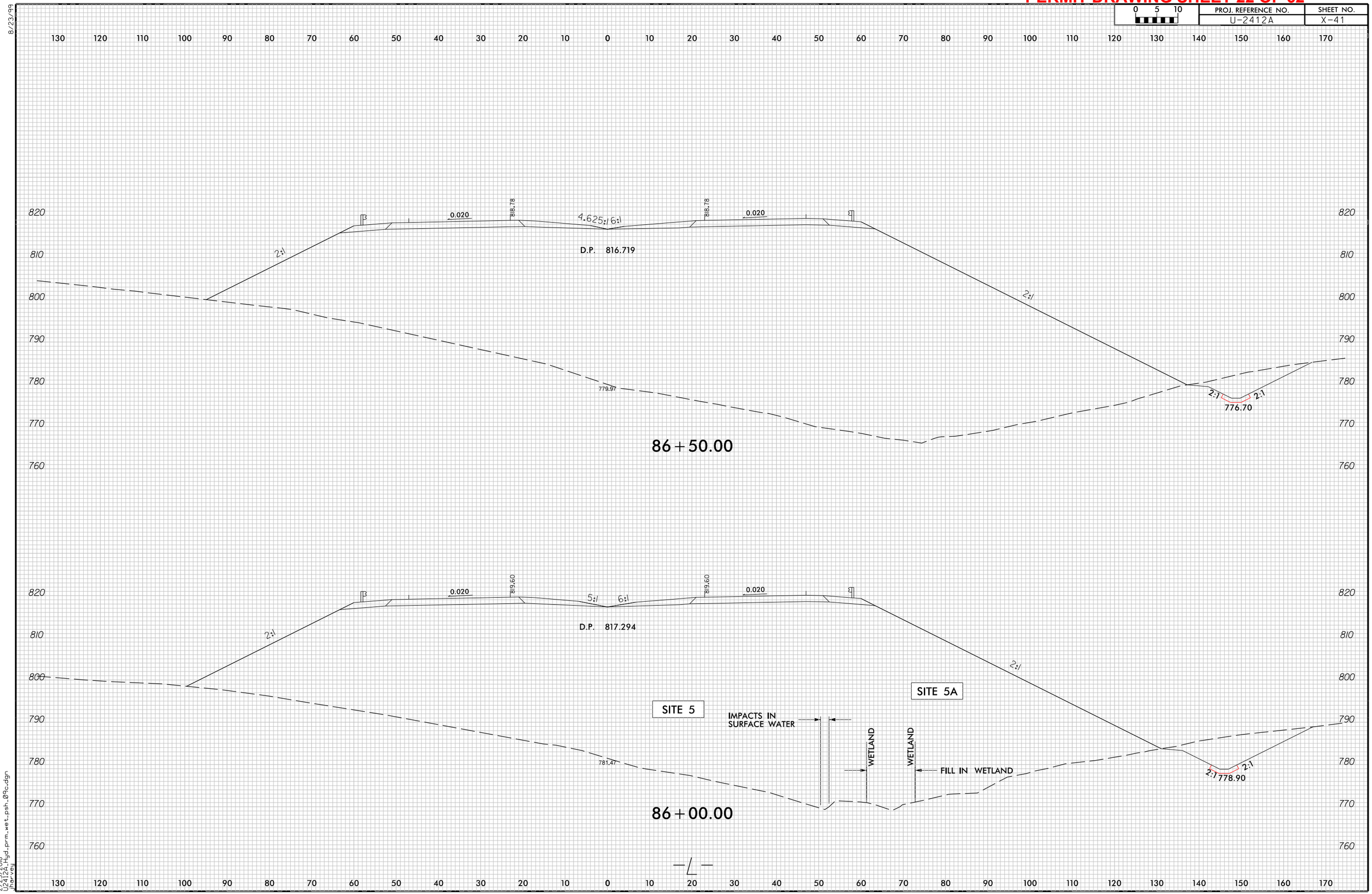


25' 12.5' 0 25' 50'
SCALE: 1"=50'

8/17/99

2/23/2018
U2412C_9gd_prm_wet_psh_09b.dgn
harvey

PROJ. REFERENCE NO.	SHEET NO.
U-2412A	X-41



PROJECT REFERENCE NO.	SHEET NO.
U-2412A	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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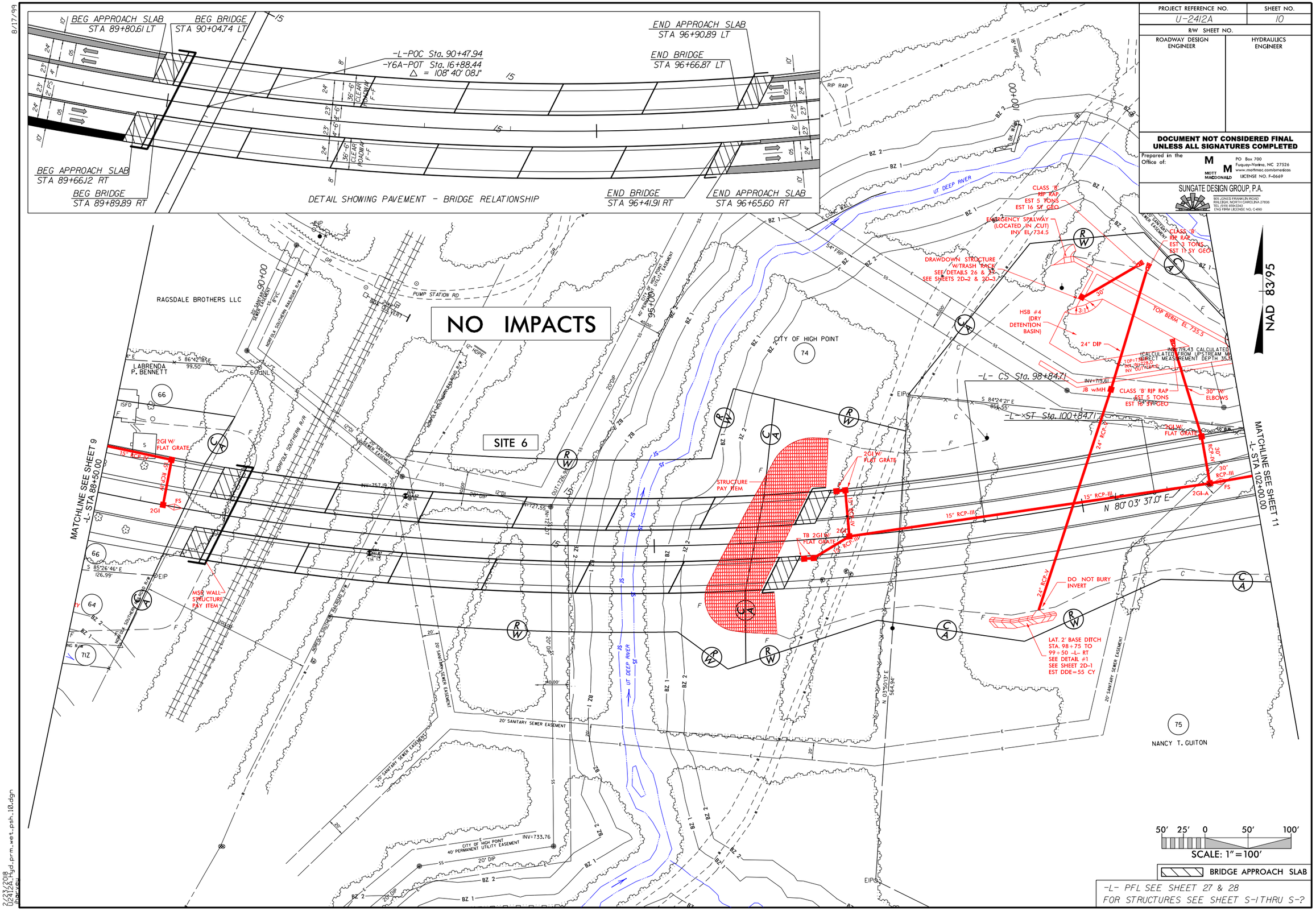
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-690



-L- PFL SEE SHEET 27 & 28
FOR STRUCTURES SEE SHEET S-1 THRU S-?

8/17/99

2/23/2018
U2412A_Hyd_prm_wet_psh_10.dgn
lbarwell

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-690

8/17/99

BEG APPROACH SLAB STA 89+80.61 LT
BEG BRIDGE STA 90+04.74 LT
-L-POC Sta. 90+47.94
-Y6A-POT Sta. 16+88.44
△ = 108° 40' 08.1"
END APPROACH SLAB STA 96+90.89 LT
END BRIDGE STA 96+66.87 LT
BEG APPROACH SLAB STA 89+66.12 RT
BEG BRIDGE STA 89+89.89 RT
END BRIDGE STA 96+41.91 RT
END APPROACH SLAB STA 96+65.60 RT

DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP

NO IMPACTS

SITE 6

NAD 83/95

RAGSDALE BROTHERS LLC
LABRENDA P. BENNETT
CITY OF HIGH POINT
NANCY T. GUITON
UT DEEP RIVER
PUMP STATION RD
NORFOLK SOUTHERN RAILROAD R/W
MATCHLINE SEE SHEET 9 -L- STA 88+50.00
MATCHLINE SEE SHEET 11 -L- STA 102+00.00
-L- CS Sta. 98+84.71
-L- ST Sta. 100+84.71
N 80°03' 37.0" E
S 86°42'16" E
S 84°24'21" E
S 85°26'46" E
N 03°50'13" E
20' SANITARY SEWER EASEMENT
40' PERMANENT UTILITY EASEMENT
CITY OF HIGH POINT
INV=733.76
INV=757.19
INV=779.43 CALCULATED (CALCULATED FROM UPSTREAM MH DIRECT MEASUREMENT DEPTH 35.8)
INV=779.61
JB w/MH
CLASS 'B' RIP RAP EST 5 TONS EST 16 SY GEO
CLASS 'B' RIP RAP EST 3 TONS EST 11 SY GEO
CLASS 'B' RIP RAP EST 5 TONS EST 16 SY GEO
EMERGENCY SPILLWAY (LOCATED IN CUT) INV. EL 734.5
DRAWDOWN STRUCTURE W/TRASH RACK SEE DETAILS 2G & 3G SEE SHEETS 2D-2 & 2D-3
HSB #4 (DRY DETENTION BASIN)
TOP BERM EL 735.5
24" DIP
30" 90° ELBOWS
2GI W/ FLAT GRATE
STRUCTURE PAY ITEM
MSE WALL STRUCTURE PAY ITEM
DO NOT BURY INVERT
LAT-2 BASE DITCH STA 98+75 TO 99+50 -L- RT SEE DETAIL #1 SEE SHEET 2D-1 EST DDE=55 CY

50' 25' 0 50' 100'
SCALE: 1"=100'

BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 27 & 28
FOR STRUCTURES SEE SHEET S-1 THRU S-?

2/23/2018
U2412A_Hyd_prm_wet_psh_10a_con.dgn
lbarnes

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL: (919) 859-2243
ENG FIRM LICENSE NO. C-0490

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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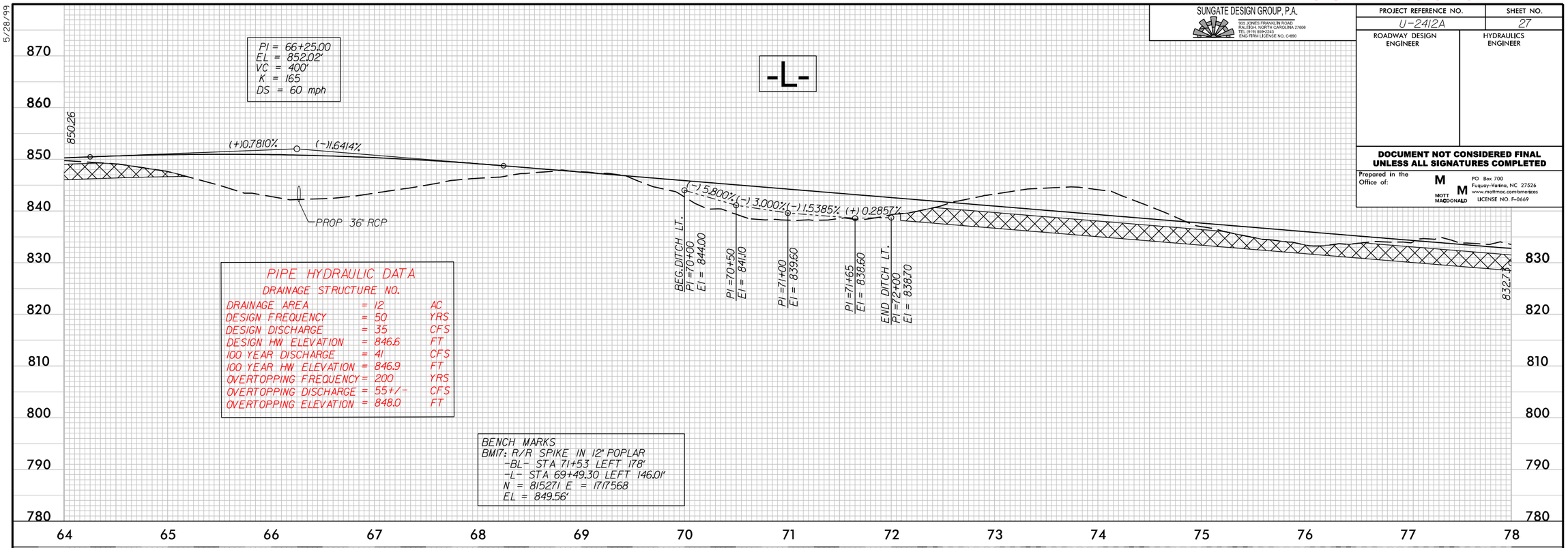

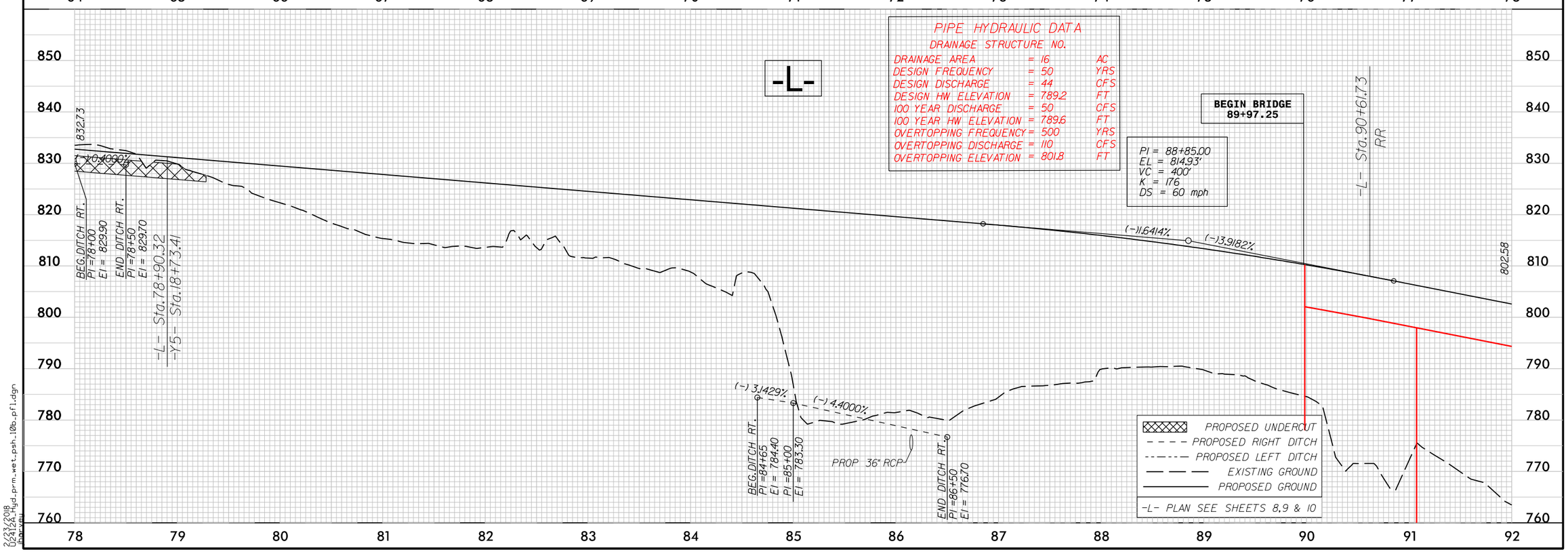

5/28/99

2/23/2018
D2412A_hyd_prm_wet_psh_10b_pfl.dgn
bgravely

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL: (919) 859-2243
ENG FIRM LICENSE NO. C-490

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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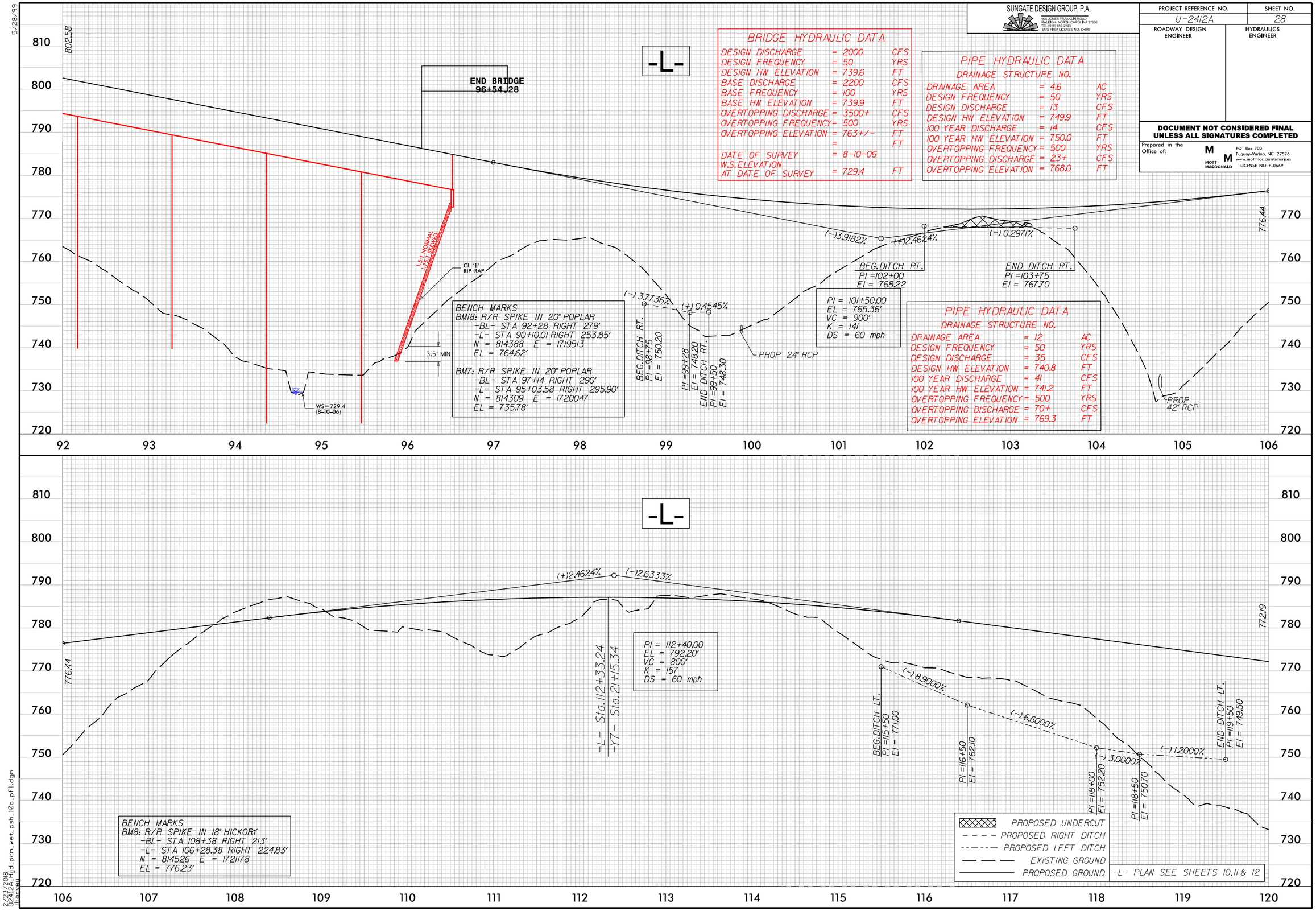

5/28/99

2/23/2018
02412A_hyd_prm_wet_psh_10c_pfl.dgn
jbarker

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-690

SCALE: 1" = 100'

NAD 83/95

MATCHLINE SEE SHEET 23 -Y7- STA 18+00.00

MATCHLINE SEE SHEET 10 -L- STA 102+00.00

MATCHLINE SEE SHEET 12 -L- STA 115+50.00

MATCHLINE SEE SHEET 23 -Y7- STA 26+00.00

SITE 7

TS

S

4' BASE DITCH W/ CLASS 'II' RIP RAP EST 21 TONS EST 47 SY GEO SEE DETAIL #22 SEE SHEET 2D-1

DO NOT BURY INVERT

FILL SLOPE 1:1 W/ROCK FLATTING STA 104+00 TO 105+00-L-LT

SHOULDER BERM GUTTER END BRIDGE TO STA. 103+66 -L- LT

2GI W/ FLAT GRATE

SHOULDER BERM GUTTER STA. 103+66 TO 106+25 -L- RT

SPECIAL DITCH GRADE STA. 102+00 TO 103+75 -L- RT SEE PROFILE FOR GRADE

TOE PROTECTION W/ CLASS 'B' RIP RAP STA. 104+50 TO 106+00 -L- RT SEE DETAIL #7 SEE SHEET 2D-1 EST 85 TONS EST 231 SY GEO

BERM DITCH STA. 109+25 TO 111+20 -L- RT SEE DETAIL #11 SEE SHEET 2D-1

BERM DITCH W/ CLASS 'B' RIP RAP STA. 114+00 TO 115+50 -L- RT SEE DETAIL #16 SEE SHEET 2D-1 EST 86 TONS EST 232 SY GEO

BERM DITCH STA. 112+50 TO 114+00 -L- RT SEE DETAIL #11 SEE SHEET 2D-1

SHOULDER BERM GUTTER STA. 18+25 TO 20+00 -Y7- RT

BERM DITCH SEE DETAIL #15 SEE SHEET 2D-1

STA. 18+50 TO 20+00 -Y7- RT

UT DEEP RIVER

RIVER WALK WEST TOWNHOME OWNERS ASSOC.

RIVER WALK I, LLC

CITY OF HIGH POINT

NCDOT

ALAN G. BRUTON
DEBORAH K. BRUTON

KENNETH M. WILLARD
KATHY L. SMITH

OAK HOLLOW BUILDERS, INC.

CAROLYN S. DILLON

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

★ PROP. TRAFFIC SIGNAL

-Y7- PFL SEE SHEET 37 & 38
-L- PFL SEE SHEET 28
RETAINING WALL #1 SEE SHEET 2-F

8/17/99

2/23/2018
U2412A_hyd_prm_wet_psh_11.dgn
jbarker

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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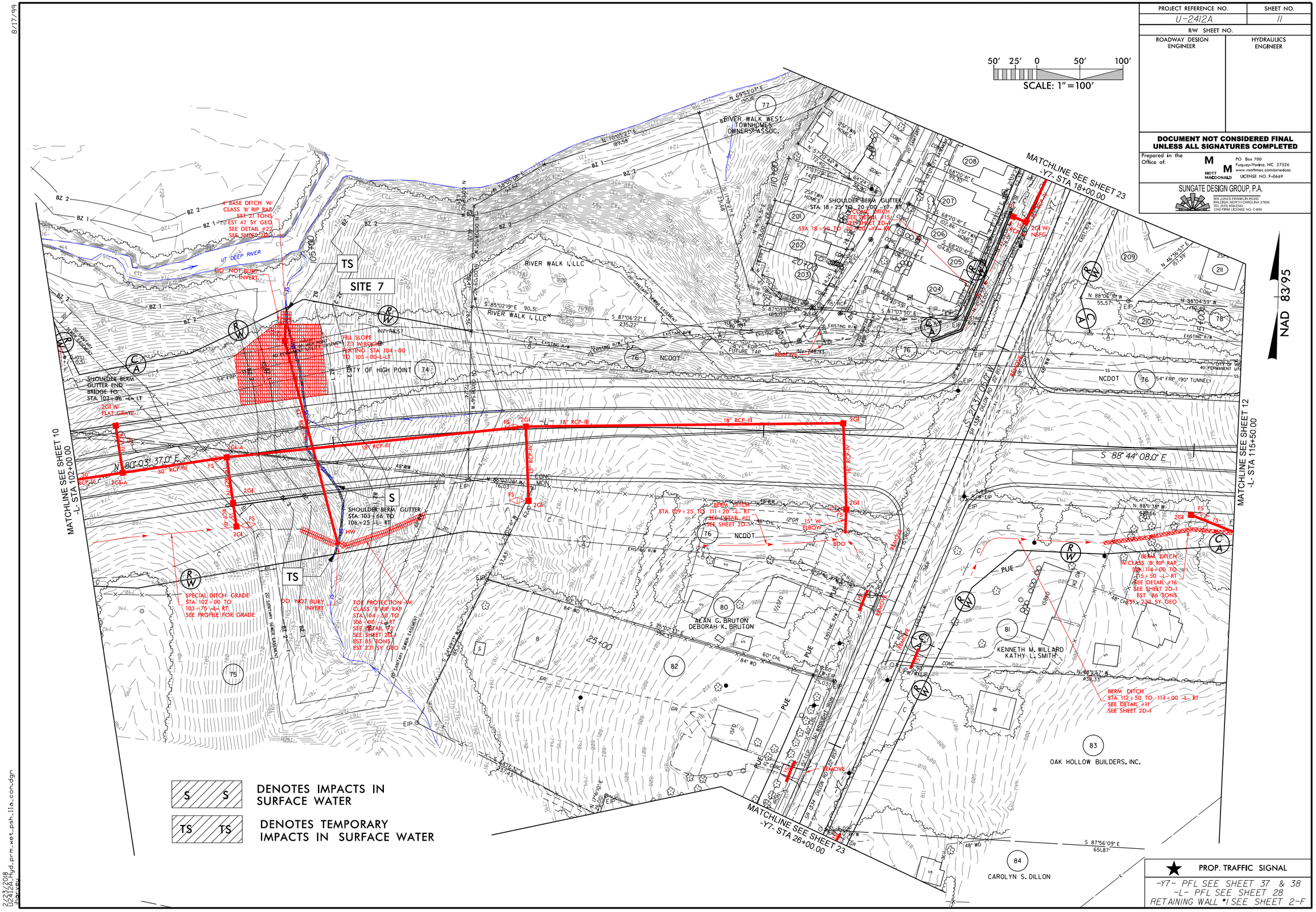
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-690



2/23/2018
U2412A_hydd_prm_wet_psh_11a_con.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	11b
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SCALE: 1" = 50'

SITE 7

TEMPORARY IMPACTS IN SURFACE WATER

4' BASE DITCH W/ CLASS 'II' RIP RAP
EST 21 TONS
EST 47 SY GEO
SEE DETAIL #22
SEE SHEET 2D-1

DO NOT BURY INVERT

UT DEEP RIVER

RIVER WALK

RIVER WALK I, LLC

CITY OF HIGH POINT

FILL SLOPE 1.7:1 W/ROCK PLATING STA 104+00 TO 105+00-L-LT

54" RCP-III

JB w/MH

FILL OF HIGH POINT 40' PERMANENT UTILITY EASEMENT

54" FRP

42" RCP-CD

18" RCP-III

30" RCP-III

15" RCP-IV

15" RCP-III

N 80° 03' 37.0" E

IMPACTS IN SURFACE WATER

TEMPORARY IMPACTS IN SURFACE WATER

HW

20' SANITARY SEWER EASEMENT

MATCHLINE SEE SHEET 10 -L- STA 102+00.00

SPECIAL DITCH GRADE
STA. 102+00 TO
103+75 -L- RT
SEE PROFILE FOR GRADE

DO NOT BURY INVERT

TOE PROTECTION W/
CLASS 'B' RIP RAP
STA. 104+50 TO
106+00 -L- RT
SEE DETAIL #2
SEE SHEET 2D-1
EST 85 TONS
EST 231 SY GEO

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

EXISTING R/W

CONC MON

EIP

8/17/99

8/23/2018
u2412a_hyd_prm_wet_psh_11b.dgn
hbarvell

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-690

SCALE: 1" = 100'

NAD 83/95

MATCHLINE SEE SHEET 11 -L- STA 115+50.00

MATCHLINE SEE SHEET 13 -L- STA 129+00.00

-L- PFL SEE SHEET 28 & 29

SITE 8 — TS

SITE 9 — S

LAT. 2' BASE DITCH W/5.0' BERM LINED W/CLASS 'B' RIP RAP EST 180 TONS EST 508 ST GEO STA. 115+50 TO 119+50 -L- LT SEE DETAIL #4 SEE SHEET 2D-1 EST DDE=420 CY

CLASS 'I' RIP RAP EST 11 TONS EST 30 SY GEO

CLASS 'II' RIP RAP EST 32 TONS EST 67 SY GEO SEE DETAIL #2 SEE SHEET 2D-1

CLASS 'B' RIP RAP EST 3 TONS EST 11 SY GEO

HSB #5 BOTTOM EL. 738.0 TOP BERM EL. 744.5

HW W/SLUICE GATE

CLASS 'B' RIP RAP EST 5 TONS EST 16 SY GEO

CLASS 'B' RIP RAP EST 1 TONS EST 5 SY GEO

TOE PROTECTION W/ CLASS 'B' RIP RAP STA. 118+00 TO 124+00 -L- RT SEE DETAIL #2 SEE SHEET 2D-1 EST 343 TONS EST 925 SY GEO

BURY INVERT 1' REMOVE

DO NOT BURY INVERT

SHOULDER BERM GUTTER STA. 115+50 TO 126+42 -L- LT

24" W/ELBOWS

30" W/ ELBOWS

2GI W/ FLAT GRATE

15" RCP-IV

18" RCP-III

24" RCP-III

30" RCP-IV

54" FRP

20' SANITARY SEWER EASEMENT

DUKE POWER R/W

EXISTING R/W

NCDOT PUE

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

8/17/99

2/27/2018
U2412A_Hyd_prm_wet_psh_12.dgn
DRAWN BY:

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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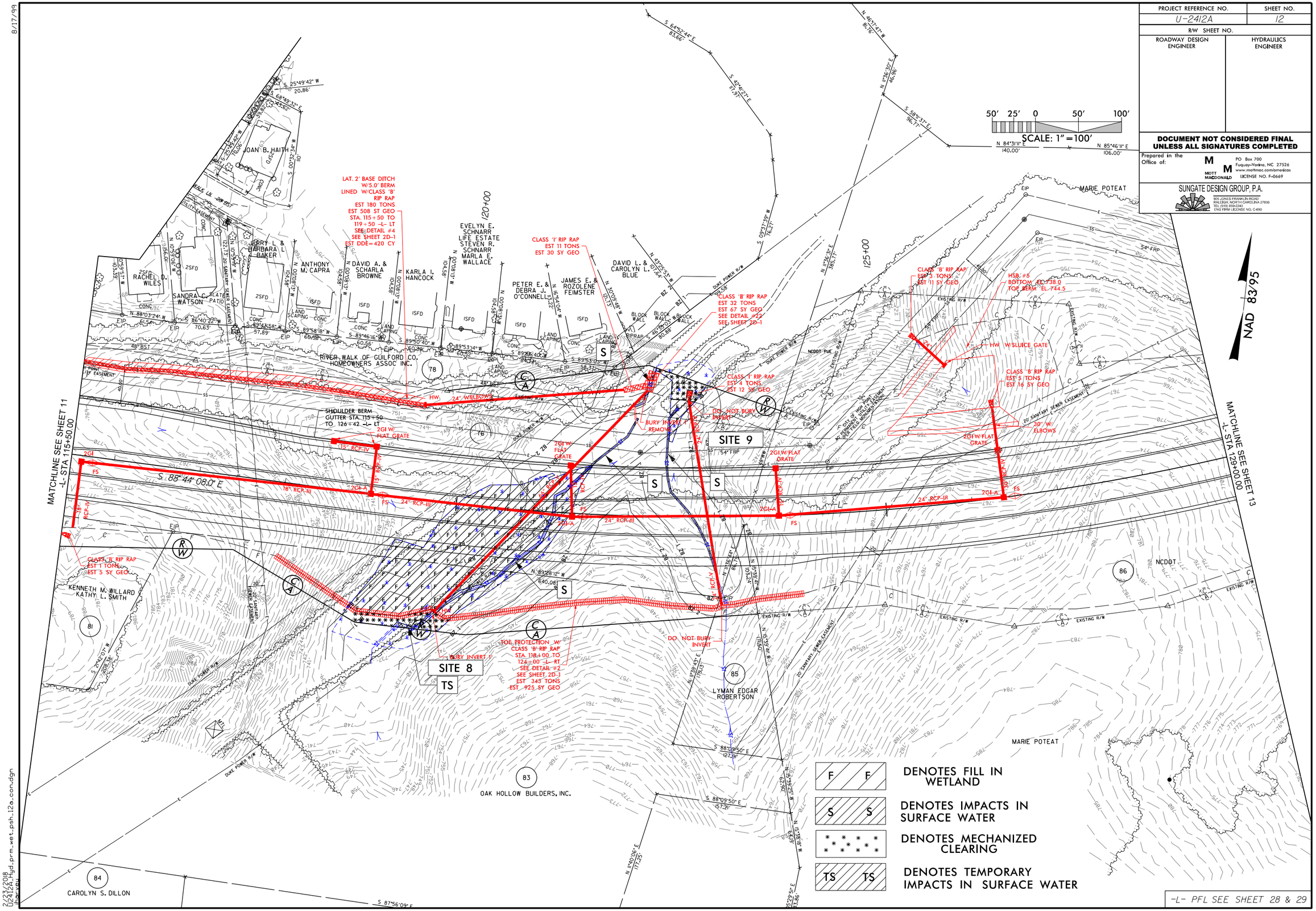
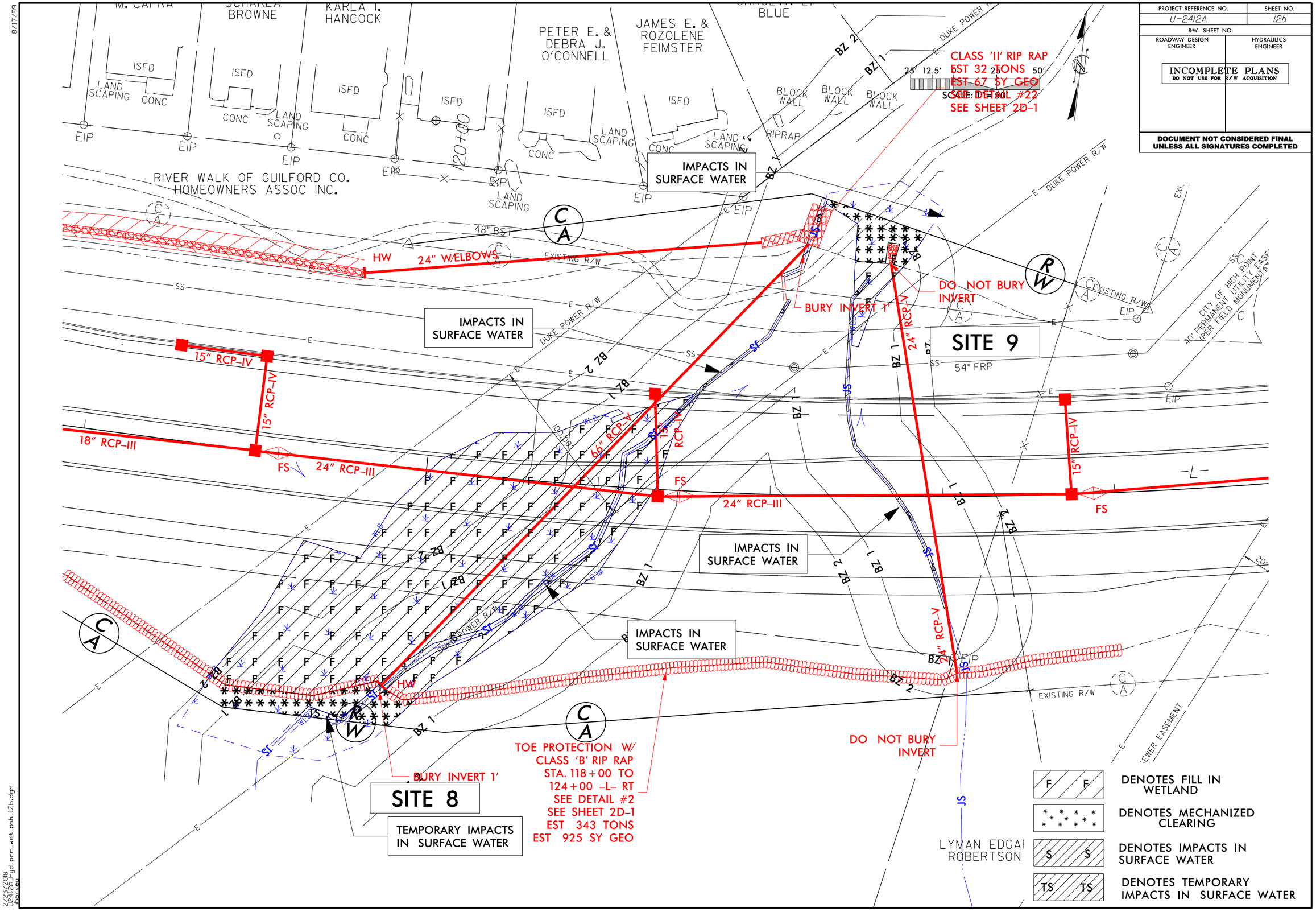


2/27/2018
U2412A_hyd_prm_wet_psh_12a_con.dgn
harvey

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	12b
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

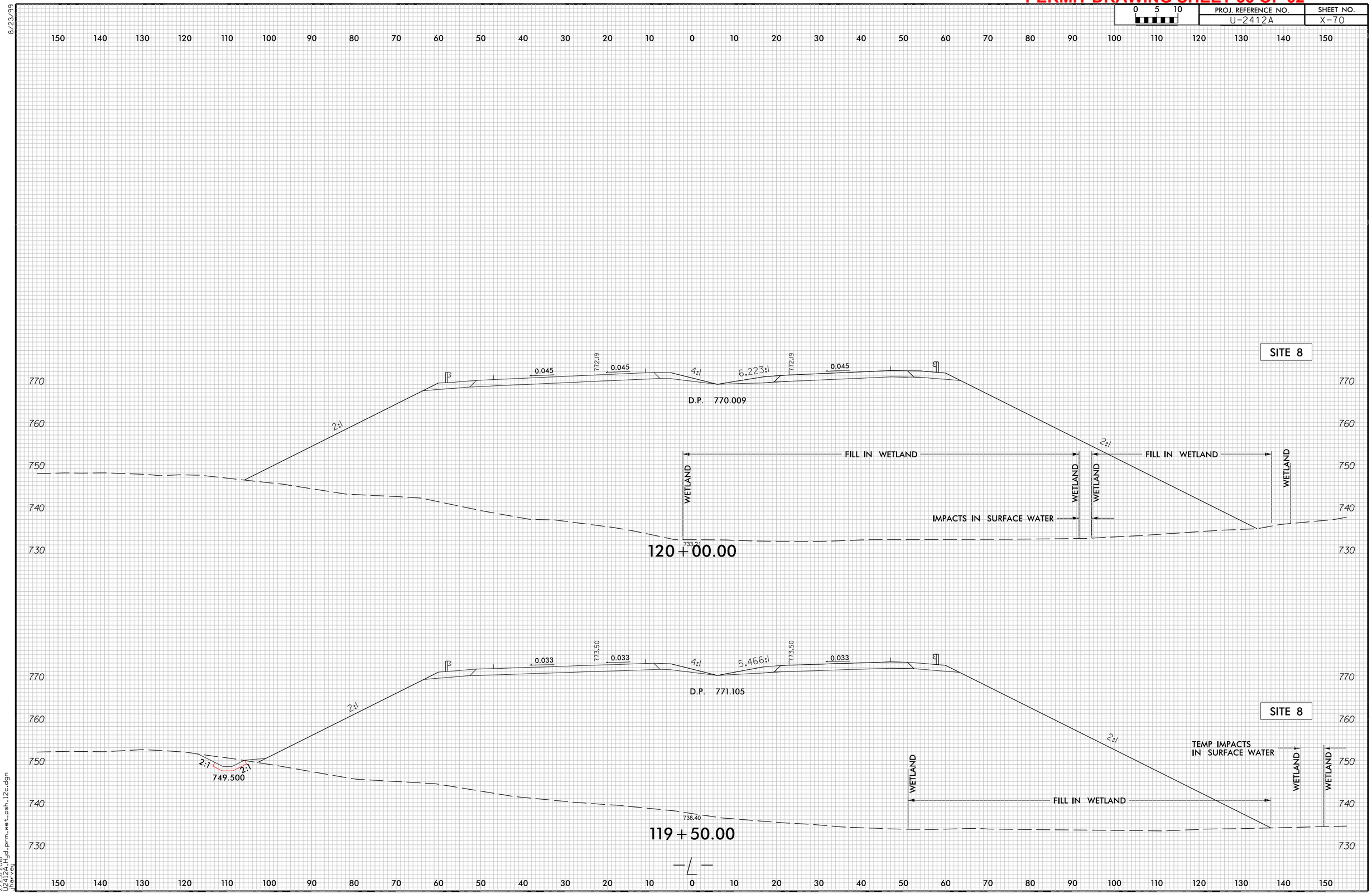
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



8/17/99

2/23/2018
U2412A_hyd_prm_wet_psh_12b.dgn
bhaney

PROJ. REFERENCE NO.	SHEET NO.
U-2412A	X-70



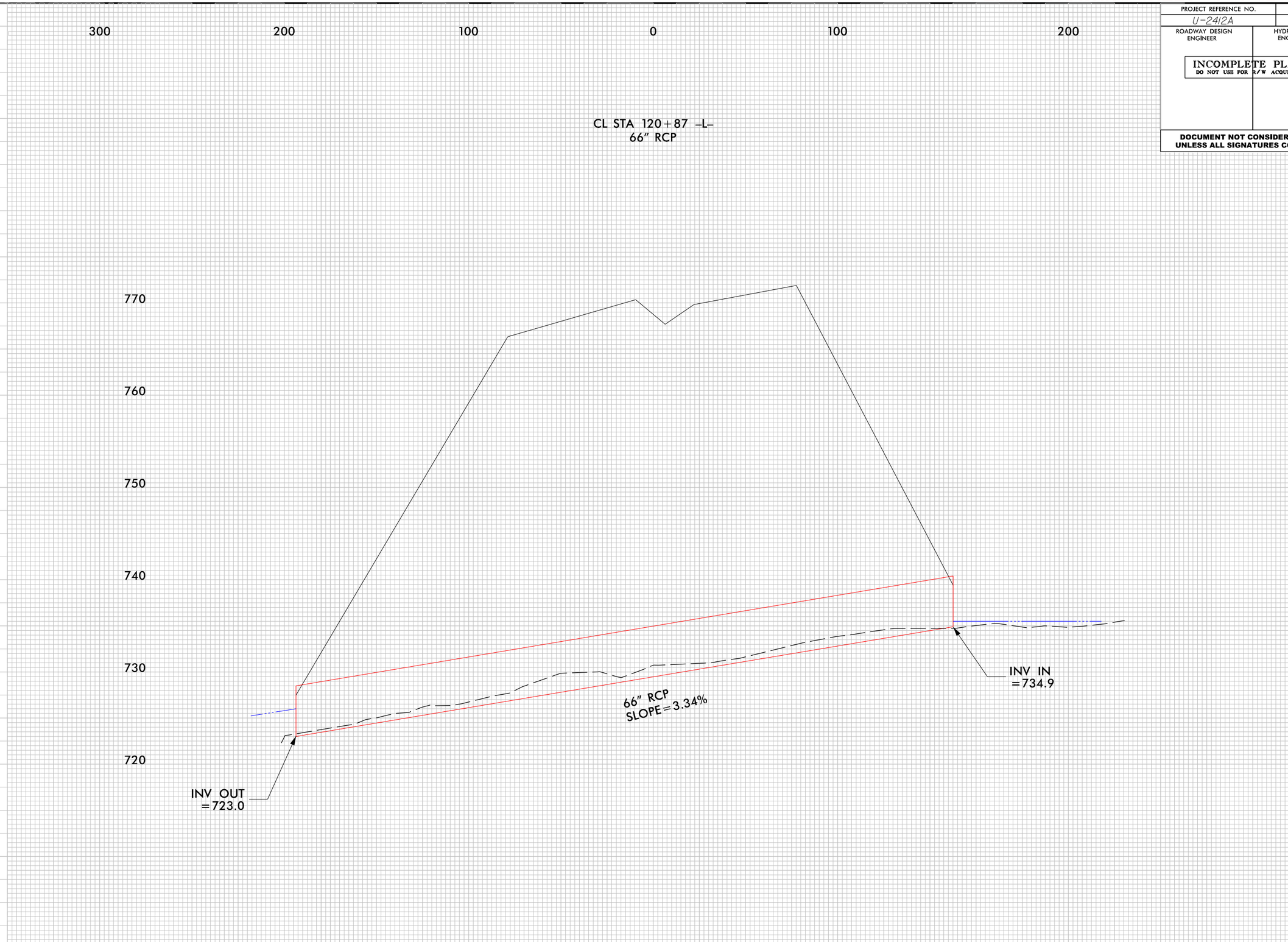
8/23/99

2/23/2018
U2412A_hyd_prm_wet_psh_12c.dgn
jharvey

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	12c
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



5/14/99

2/23/2018
12:26:29 PM
hydd_prm_wet_psh_12d_sec.dgn

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ENG FIRM LICENSE NO. C-690

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

SCALE: 1" = 50'

NAD 83/95

MATCHLINE SEE SHEET 12
-L- STA 129+00.00

MATCHLINE SEE SHEET 14
-L- STA 142+50.00

MARIE POTEAT

OAKDALE COTTON MILLS

NCDOT

SITE 10
STREAMBANK STABILIZATION W/CLASS 'II' RIP RAP EST 160 TONS

TOE PROTECTION W/ CLASS 'B' RIP RAP STA. 133+75 TO 135+60 -L- LT SEE DETAIL #2 SEE SHEET 2D-1 EST 105 TONS EST 285 SY GEO

CLASS 'I' RIP RAP EST 4 TONS EST 5 SY GEO

DO NOT BURY INVERT

CLASS 'B' RIP RAP EST 2 TONS EST 7 SY GEO DO NOT BURY INVERT

STRUCTURE PAY ITEM

SHOULDER BERM GUTTER STA. 136+97 TO BEGIN APPROACH SLAB -L- LT

EMERGENCY SPILLWAY (LOCATED IN CUT) INV EL. 737.5

DRAWDOWN STRUCTURE W/TRASH RACK SEE DETAILS 26 & 27 SEE SHEETS 2D-2 & 2D-3

CLASS 'I' RIP RAP EST 4 TONS EST 12 SY GEO

24" W ELBOWS

TOP BERM EL. 728.5

2GI 18" RCP-III N 67°56'33.6" E 2GI-A 24" RCP-III 2GI-A W/FG 30" RCP-IV 2GI-A W/FG

SBG STA. 136+46 TO BEG APPROACH SLAB -L- RT

30" W ELBOWS

CLASS 'I' RIP RAP EST 7 TONS EST 17 SY GEO

HW W/SLUICE GATE

TOP BERM EL. 729.5

HSB #4 (DRY DETENTION BASIN)

TOE PROTECTION W/ CLASS 'B' RIP RAP STA. 131+25 TO 131+75 -L- RT SEE DETAIL #2 SEE SHEET 2D-1 EST 28 TONS EST 77 SY GEO

2' BASE HEAD DITCH LINE W/CLASS 'B' RIP RAP EST 20 CY SEE DETAIL #2 SEE SHEET 2D-1 EST 28 TONS EST 74 SY GEO EST DDE=20 CY

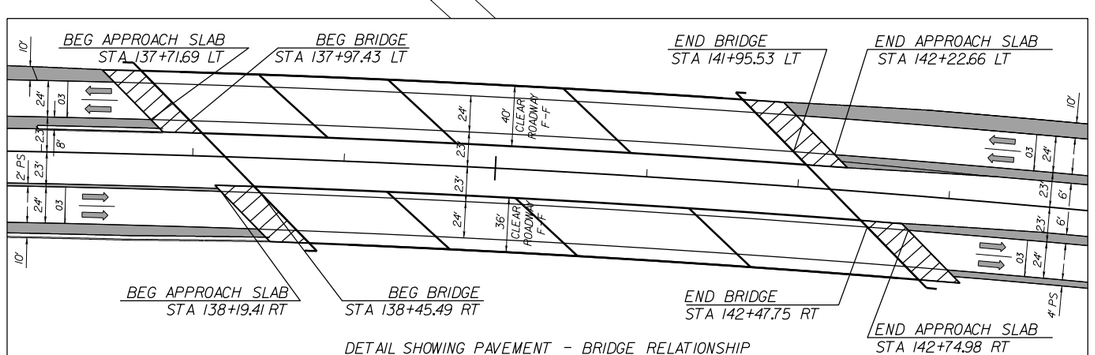
CITY OF HIGH POINT 40' PERMANENT UTILITY EASEMENT (PER FIELD MONUMENTATION)

20' SANITARY SEWER EASEMENT

NORTHPOINT FAMILY LIMITED PARTNERSHIP

BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 29
FOR STRUCTURES SEE SHEET S-1 THRU S-?



DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP

2/23/2018
U2412A_hyd_prm_wet_psh_13.dgn
jhorvath

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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LICENSE NO. F-0669

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL: (919) 859-2243
ENG FIRM LICENSE NO. C-690

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

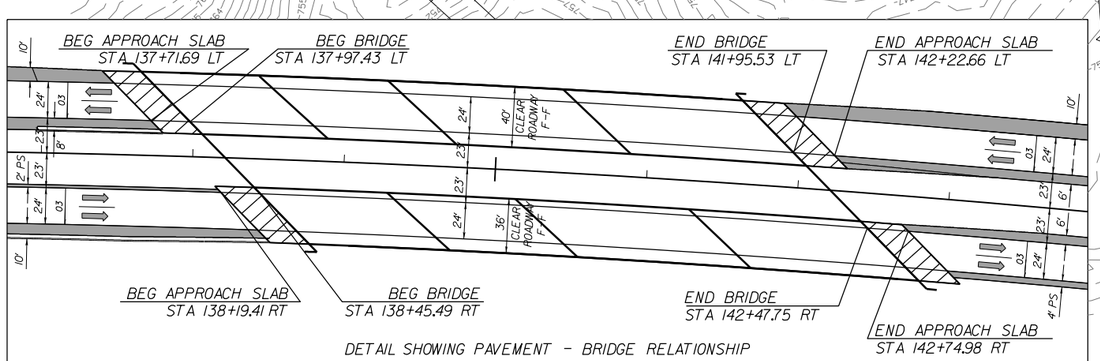
50' 25' 0 50' 100'
SCALE: 1" = 50'

NAD 83/95

MATCHLINE SEE SHEET 12
-L- STA 129+00.00

MATCHLINE SEE SHEET 14
-L- STA 142+50.00

MARIE POTEAT
OAKDALE COTTON MILLS
NCDOT
SITE 10
STREAMBANK STABILIZATION W/CLASS II RIP RAP EST 160 TONS
STRUCTURE PAY ITEM
TOE PROTECTION W/ CLASS B RIP RAP STA 131+25 TO 131+75 -L- LT SEE DETAIL A2 SEE SHEET 2D-1 EST 105 TONS EST 285 SY GEO
CLASS B RIP RAP EST 2 TONS EST 7 SY GEO DO NOT BURY INVERT
CLASS II RIP RAP EST 4 TONS EST 5 SY GEO
DO NOT BURY INVERT
SHOULDER BERM GUTTER STA 136+97 TO BEGIN APPROACH SLAB -L- LT
EMERGENCY SPILLWAY (LOCATED IN CUT) INV EL 737.5
DRAWDOWN STRUCTURE W/TRASH RACK SEE DETAILS 26 & 27 SEE SHEETS 2D-2 & 2D-3
CLASS II RIP RAP EST 4 TONS EST 12 SY GEO
24" W ELBOWS
TOP BERM EL 729.5
N 67°56'33.6" E
-L-
18" RCP-III
24" RCP-III
30" RCP-IV
SBG STA. 136+46 TO BEG APPROACH SLAB -L- RT
30" W ELBOWS
CLASS I RIP RAP EST 7 TONS EST 17 SY GEO
HW W/SLUICE GATE
HSB #1 (DRY DETENTION BASIN)
2' BASE HEAD DITCH LINE W/CLASS B RIP RAP EST 20 CY SEE DETAIL A2 SEE SHEET 2D-1 EST 28 TONS EST 74 SY GEO EST DDE=20 CY
TOE PROTECTION W/ CLASS B RIP RAP STA 131+25 TO 131+75 -L- RT SEE DETAIL A2 SEE SHEET 2D-1 EST 28 TONS EST 77 SY GEO
CITY OF HIGH POINT 40' PERMANENT UTILITY EASEMENT (PER FIELD MONUMENTATION)
20' SANITARY SEWER EASEMENT
NORTHPOINT FAMILY LIMITED PARTNERSHIP



DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP

BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 29
FOR STRUCTURES SEE SHEET S-1 THRU S-?

2/23/2018
02412A_hyd_prm_wet_psh_13a_con.dgn
bhorvat

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

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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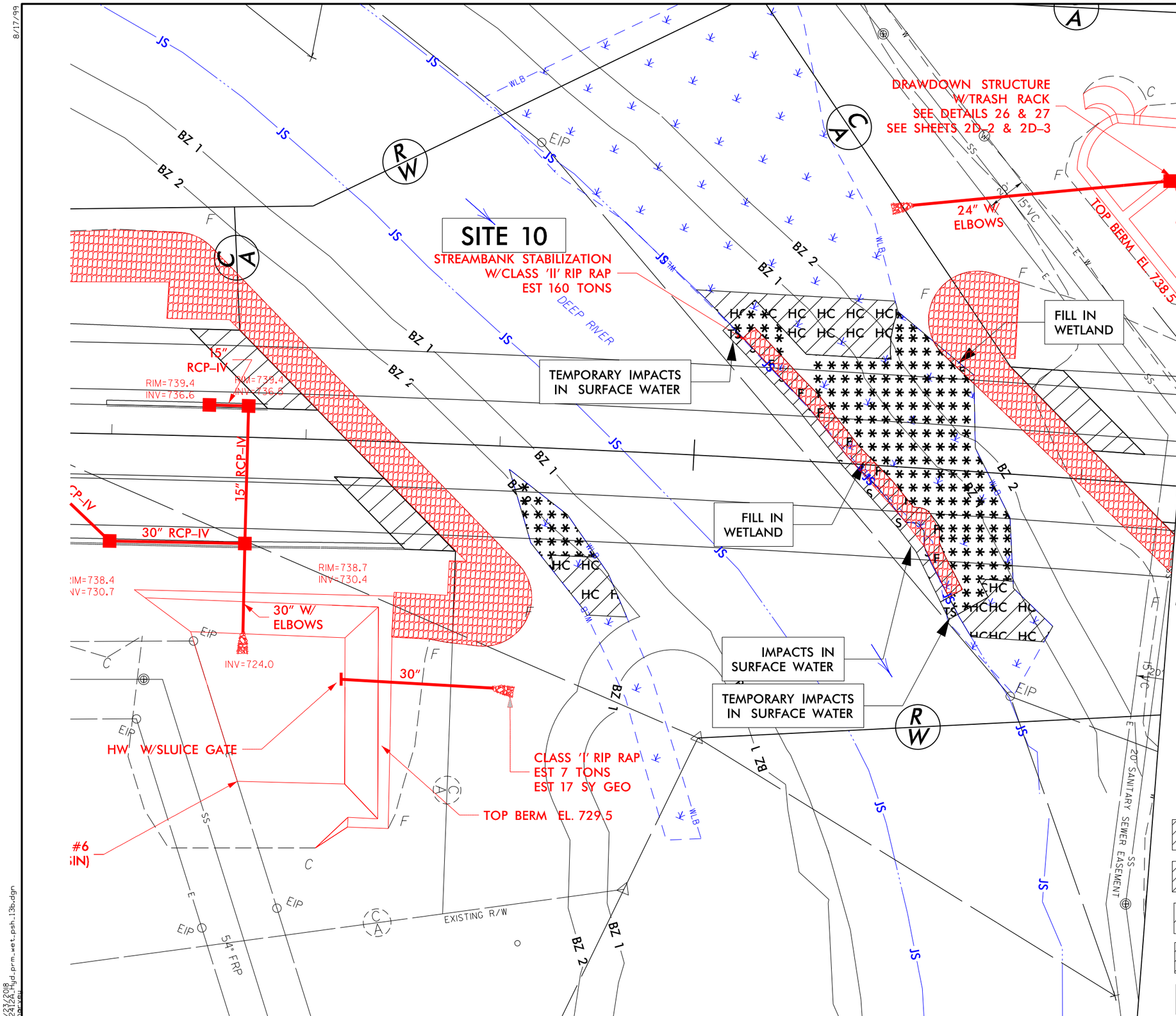
25' 12.5' 0 25' 50'
SCALE: 1" = 50'



8/17/99

2/27/2018
02412.4 hydd_prm_wet_psh_13b.dgn
jbarvey

SUNGATE DESIGN GROUP, P.A.
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RALEIGH, NORTH CAROLINA 27606
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ENG FIRM LICENSE NO. C-490

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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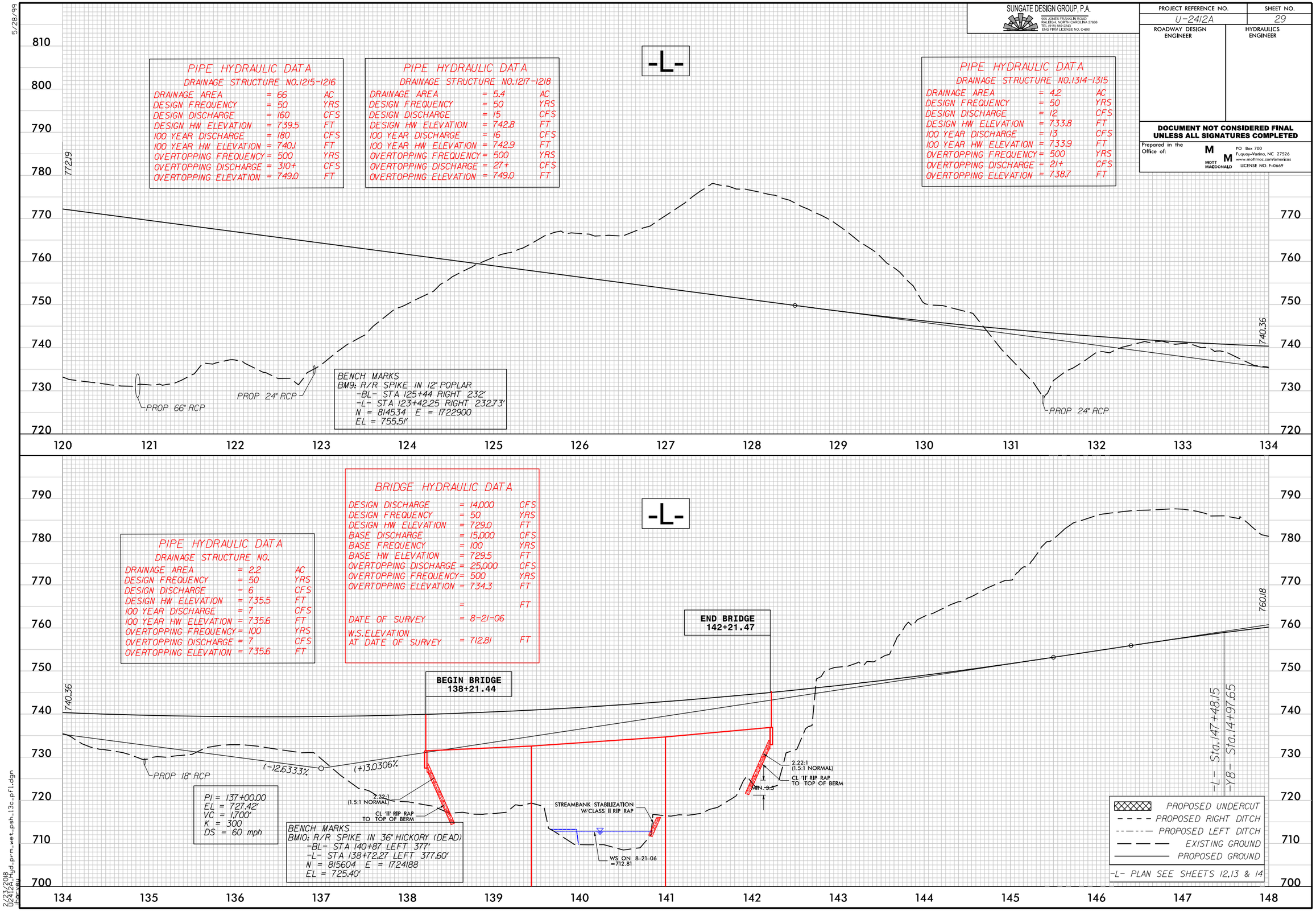


PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1215-1216

DRAINAGE AREA	= 66	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 160	CFS
DESIGN HW ELEVATION	= 739.5	FT
100 YEAR DISCHARGE	= 180	CFS
100 YEAR HW ELEVATION	= 740.1	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 310+	CFS
OVERTOPPING ELEVATION	= 749.0	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1217-1218

DRAINAGE AREA	= 5.4	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 15	CFS
DESIGN HW ELEVATION	= 742.8	FT
100 YEAR DISCHARGE	= 16	CFS
100 YEAR HW ELEVATION	= 742.9	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 27+	CFS
OVERTOPPING ELEVATION	= 749.0	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1314-1315

DRAINAGE AREA	= 4.2	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 12	CFS
DESIGN HW ELEVATION	= 733.8	FT
100 YEAR DISCHARGE	= 13	CFS
100 YEAR HW ELEVATION	= 733.9	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 21+	CFS
OVERTOPPING ELEVATION	= 738.7	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

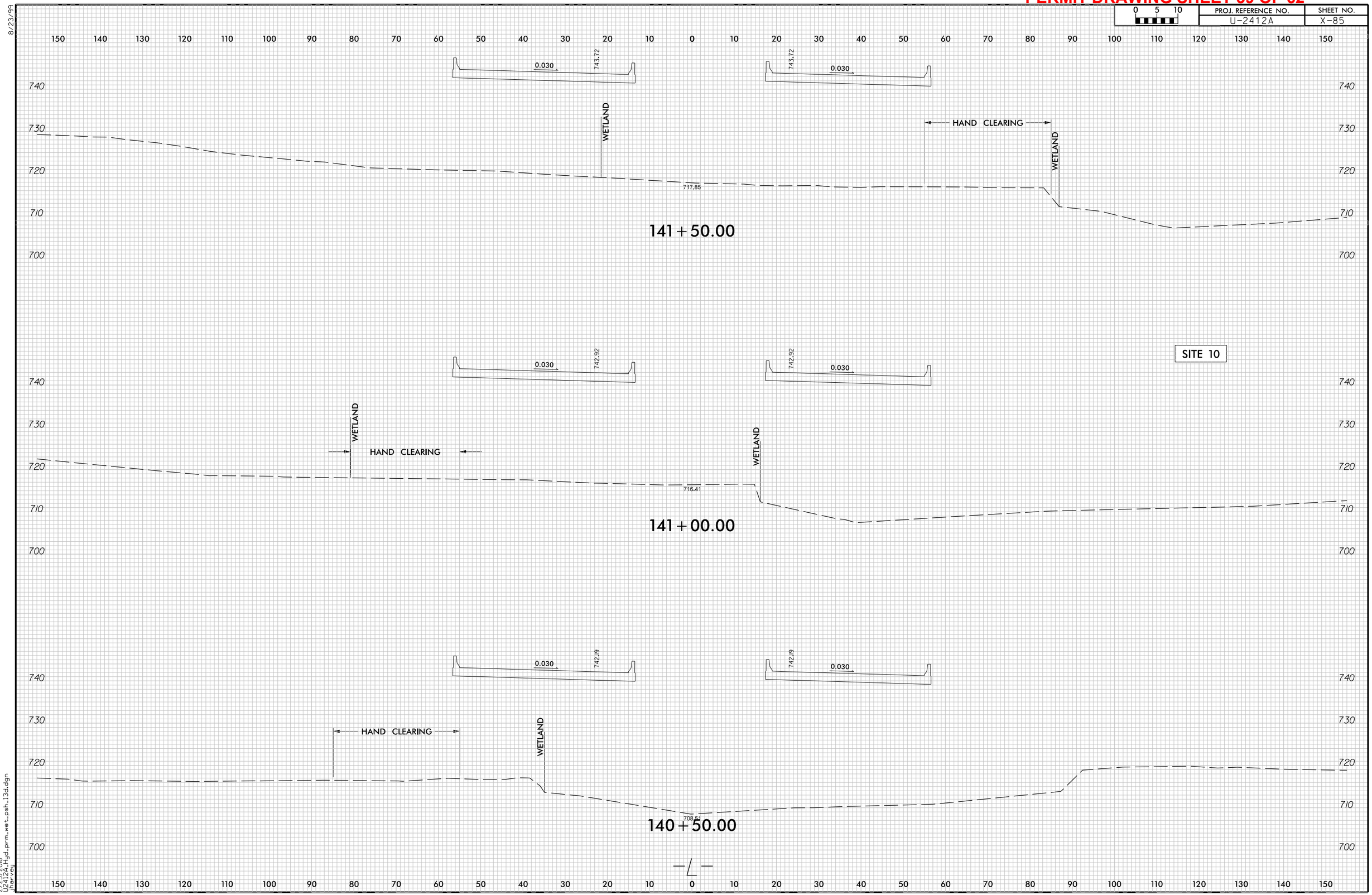
DRAINAGE AREA	= 2.2	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 6	CFS
DESIGN HW ELEVATION	= 735.5	FT
100 YEAR DISCHARGE	= 7	CFS
100 YEAR HW ELEVATION	= 735.6	FT
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 7	CFS
OVERTOPPING ELEVATION	= 735.6	FT

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 14,000	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 729.0	FT
BASE DISCHARGE	= 15,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 729.5	FT
OVERTOPPING DISCHARGE	= 25,000	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 734.3	FT
	=	FT
DATE OF SURVEY	= 8-21-06	
W.S.ELEVATION AT DATE OF SURVEY	= 712.81	FT

2/23/2018
02412A_hyd_prm_wet_psh_13c_pfl.dgn
lbarnes

PROJ. REFERENCE NO.	SHEET NO.
U-2412A	X-85



8/23/99

2/23/2018
U2412A_hyd_prm_wet_psh_13d.dgn
jharvey

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-690

SCALE: 1" = 50'

NAD 83/95

MATCHLINE SEE SHEET 13 -L- STA 142+50.00

MATCHLINE SEE SHEET 15 -L- STA 156+00.00

SITE 11

NO IMPACTS

DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP

-L-POT Sta. 147+48.15
-Y8-POT Sta. 14+97.65
Δ = 90° 20' 28.3"

BEG BRIDGE STA 13+91.15

END BRIDGE STA 16+00.15

BEG APPROACH SLAB STA 13+76.98

END APPROACH SLAB STA 16+14.32

BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 29 & 30
-Y8- PFL SEE SHEET 38
-L- PAVEMENT/BRIDGE SKETCH SEE SHEET 15
FOR STRUCTURES SEE SHEET S-1 THRU S-?

8/17/99

2/23/2018
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bpowell

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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SCALE: 1" = 50'

NAD 83/95

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MATCHLINE SEE SHEET 15 -L- STA 156+00.00

SITE 11

NO IMPACTS

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-Y8-POT Sta. 14+97.65
Δ = 90° 20' 28.3"

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END BRIDGE STA 16+00.15

BEG APPROACH SLAB STA 13+76.98

END APPROACH SLAB STA 16+14.32

BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 29 & 30
-Y8- PFL SEE SHEET 38
-L- PAVEMENT/BRIDGE SKETCH SEE SHEET 15
FOR STRUCTURES SEE SHEET S-1 THRU S-?

2/23/2018
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bpowell

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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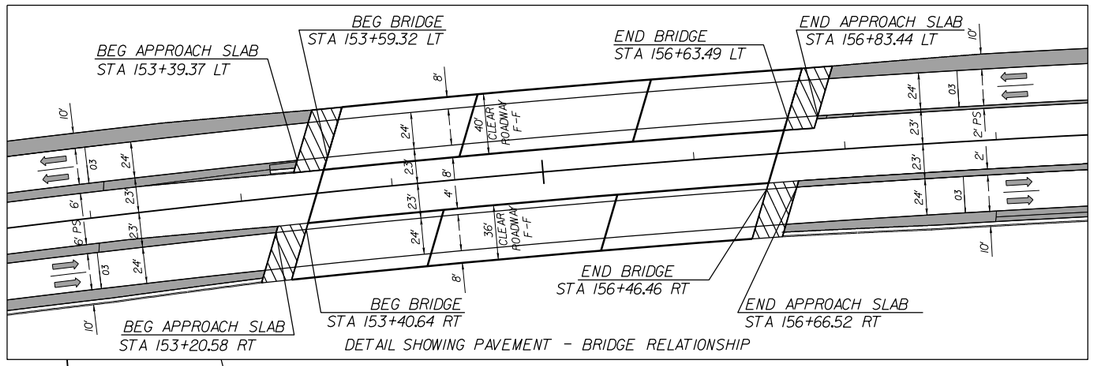

DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP

F F — DENOTES FILL IN WETLAND

P P — DENOTES IMPACTS IN SURFACE WATER (POND)

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83/95

MATCHLINE SEE SHEET 14 -L- STA 156+00.00

MATCHLINE SEE SHEET 16 -L- STA 169+50.00

126 CREEK RUN LLC

127 SHELBA A. & MITCHELL P. WATSON

127B SHERRILL L. AUMAN & KITSIE GLORIA AUMAN

SITE 12

STRUCTURE PAY ITEM

TOE PROTECTION W/ CLASS 'B' RIP RAP STA. 158+00 TO 159+50 -L- LT SEE DETAIL #2 SEE SHEET 2D-1 EST 86 TONS EST 232 SY GEO

DO NOT BURY INVERT

3' BASE TAIL DITCH LINED W/CLASS 1' RIP RAP EST 43 TONS EST 112 SY GEO EST DDE 40 CY SEE DETAIL #7 SEE SHEET 2D-1

2GI W/ FLAT GRATE

2GI W/FLAT GRATE

30" W/ ELBOWS

HW W/ SLUICE GATE

CLASS 'B' RIP RAP EST 5 TONS EST 16 SY GEO

HSB #8 BOTTOM EL. 753.0 TOP BERM EL. 759.5

CLASS 'B' RIP RAP EST 1 TONS EST 5 SY GEO

SHOULDER BERM GUTTER END APPROACH SLAB TO STA. 162+51 -L- RT

15" W/ ELBOWS

15" W/ ELBOW

BERM DITCH STA. 164+00 TO 167+00 -L- RT SEE DETAIL #11 SEE SHEET 2D-1

-L- N 84° 38' 41.0" E

BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 30
FOR STRUCTURES SEE SHEET S-1 THRU S-?

2/23/2018
U2412A_hyd_prm_wet_psh_15.dgn
lbarvey

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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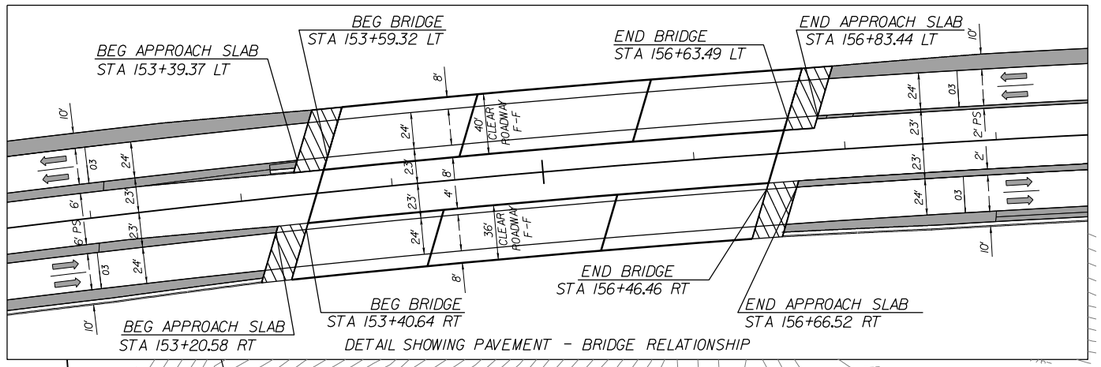
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-690



DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP

F F — DENOTES FILL IN WETLAND

P P — DENOTES IMPACTS IN SURFACE WATER (POND)

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TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83/95

MATCHLINE SEE SHEET 14
-L- STA 156+00.00

MATCHLINE SEE SHEET 16
-L- STA 169+50.00

-L- N 84° 38' 41.0" E

SITE 12

CREEK RUN LLC

SHELBA A. & MITCHELL P. WATSON

SHERRILL L. AUMAN & KITSIE GLORIA AUMAN

TOE PROTECTION W/ CLASS 'B' RIP RAP
STA. 158+00 TO 159+50 -L- LT
SEE DETAIL #2
SEE SHEET 2D-1
EST 86 TONS
EST 232 SY GEO

STRUCTURE PAY ITEM

DO NOT BURY INVERT

3' BASE/TAIL DITCH LINED W/CLASS 'I' RIP RAP
EST. 43 TONS
EST 112 SY GEO
EST DDE 40 CY
SEE DETAIL #7
SEE SHEET 2D-1

30" W/ ELBOWS

HW W/ SLUICE GATE

CLASS 'B' RIP RAP
EST 5 TONS
EST 16 SY GEO

HSB #8
BOTTOM EL. 753.0
TOP BERM EL. 759.5

SHOULDER BERM GUTTER
END APPROACH SLAB TO
STA. 162+51 -L- RT

CLASS 'B' RIP RAP
EST 1 TONS
EST 5 SY GEO

15" W/ ELBOWS

15" W/ ELBOW

BERM DITCH
STA. 164+00 TO 167+00 -D- RT
SEE DETAIL #11
SEE SHEET 2D-1

2GI W/ FLAT GRATE

15" RCP-III

24" RCP-III

30" RCP-III

DRAIN POND

POND WE 773.8'

SOIL POND

GAZEBO

GATE

BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 30
FOR STRUCTURES SEE SHEET S-1 THRU S-?

2/23/2018
U2412A_hyd_prm_wet_psh_15a_con.dgn
harvey

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	15b
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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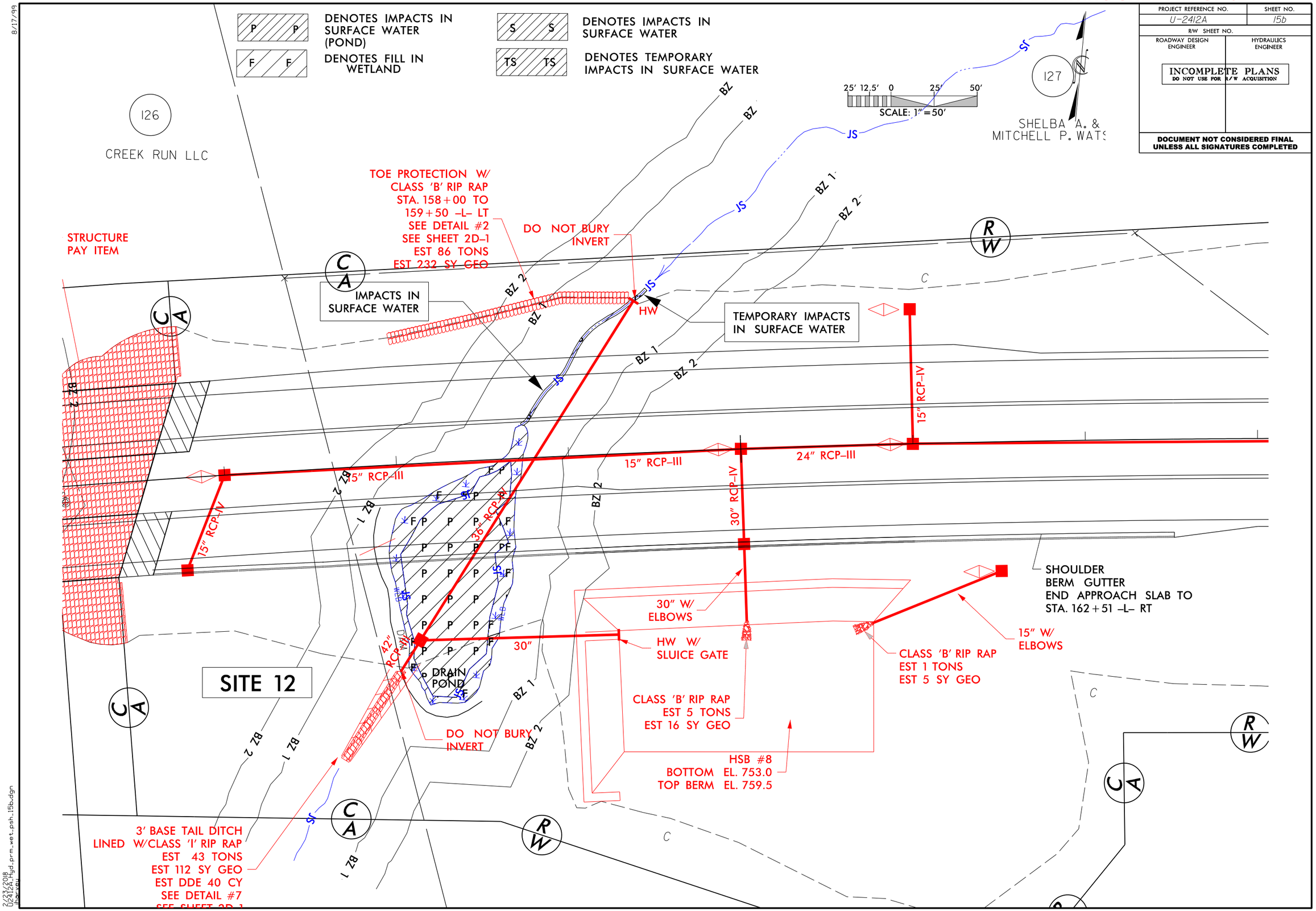

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harvey

5/28/99

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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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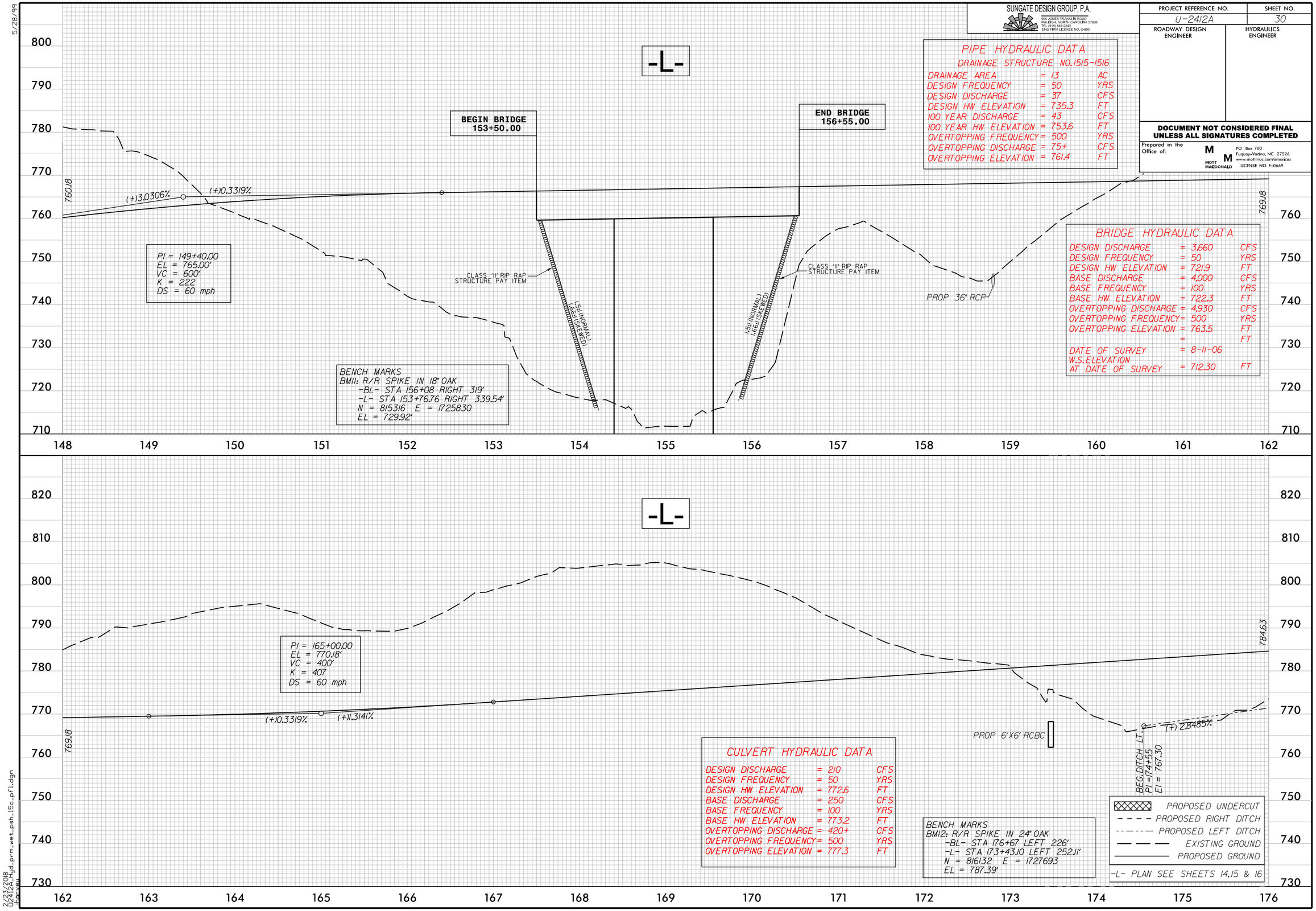

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.1515-1516

DRAINAGE AREA	=	1.3	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	37	CFS
DESIGN HW ELEVATION	=	735.3	FT
100 YEAR DISCHARGE	=	43	CFS
100 YEAR HW ELEVATION	=	753.6	FT
OVERTOPPING FREQUENCY	=	500	YRS
OVERTOPPING DISCHARGE	=	75+	CFS
OVERTOPPING ELEVATION	=	761.4	FT

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	3,660	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	721.9	FT
BASE DISCHARGE	=	4,000	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	722.3	FT
OVERTOPPING DISCHARGE	=	4,930	CFS
OVERTOPPING FREQUENCY	=	500	YRS
OVERTOPPING ELEVATION	=	763.5	FT
	=		FT
DATE OF SURVEY	=	8-11-06	
W.S. ELEVATION AT DATE OF SURVEY	=	712.30	FT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	210	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	772.6	FT
BASE DISCHARGE	=	250	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	773.2	FT
OVERTOPPING DISCHARGE	=	420+	CFS
OVERTOPPING FREQUENCY	=	500	YRS
OVERTOPPING ELEVATION	=	777.3	FT

2/23/2018
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jbarnes

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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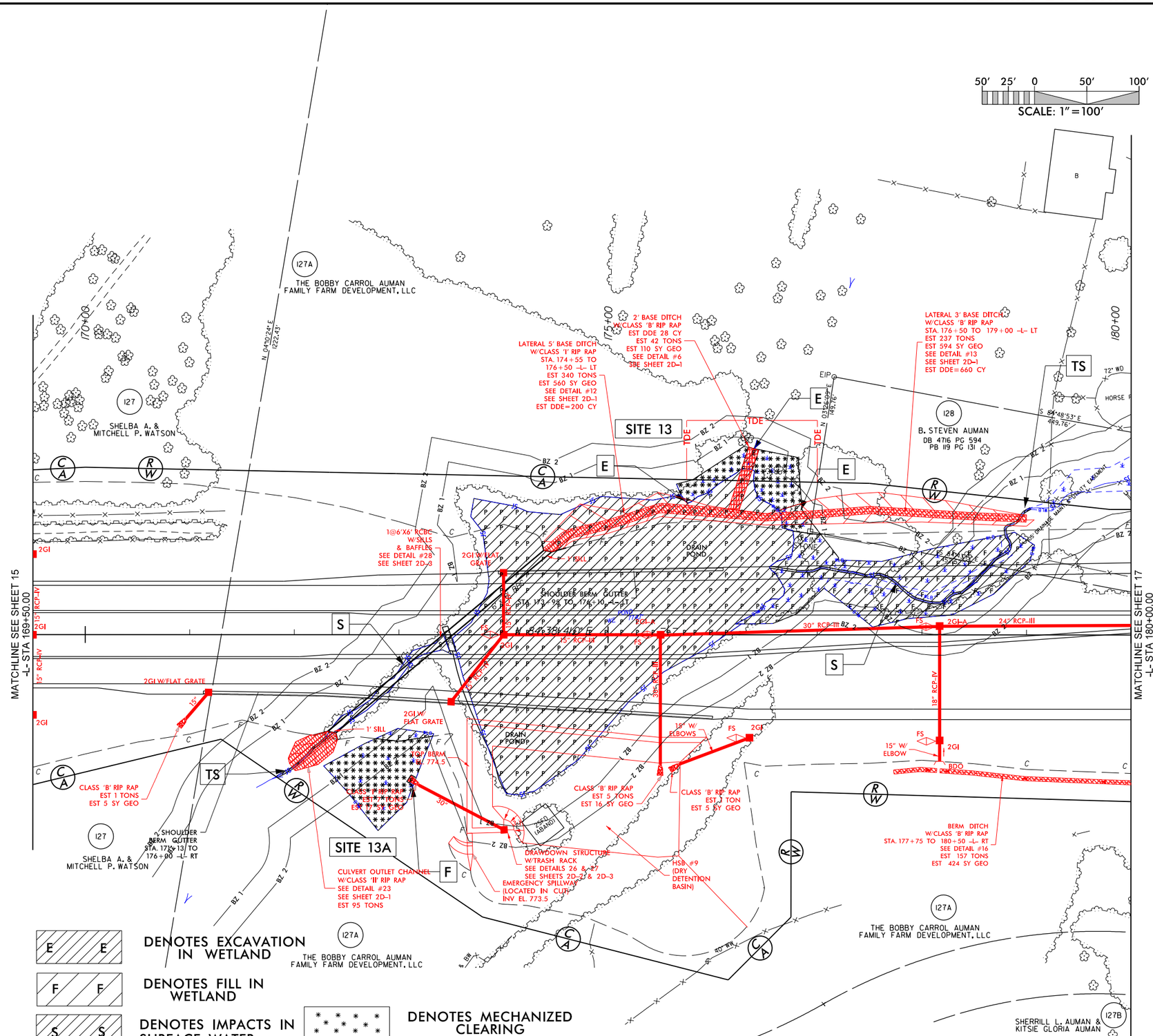
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890



-L- PFL SEE SHEET 30 & 31

FOR CULVERT PLANS SEE SHEETS C-1 THRU C-2

8/17/99

2/23/2018
U2412A_hyd_prm_wet_psh_16.dgn
bpowell

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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RALEIGH, NORTH CAROLINA 27606
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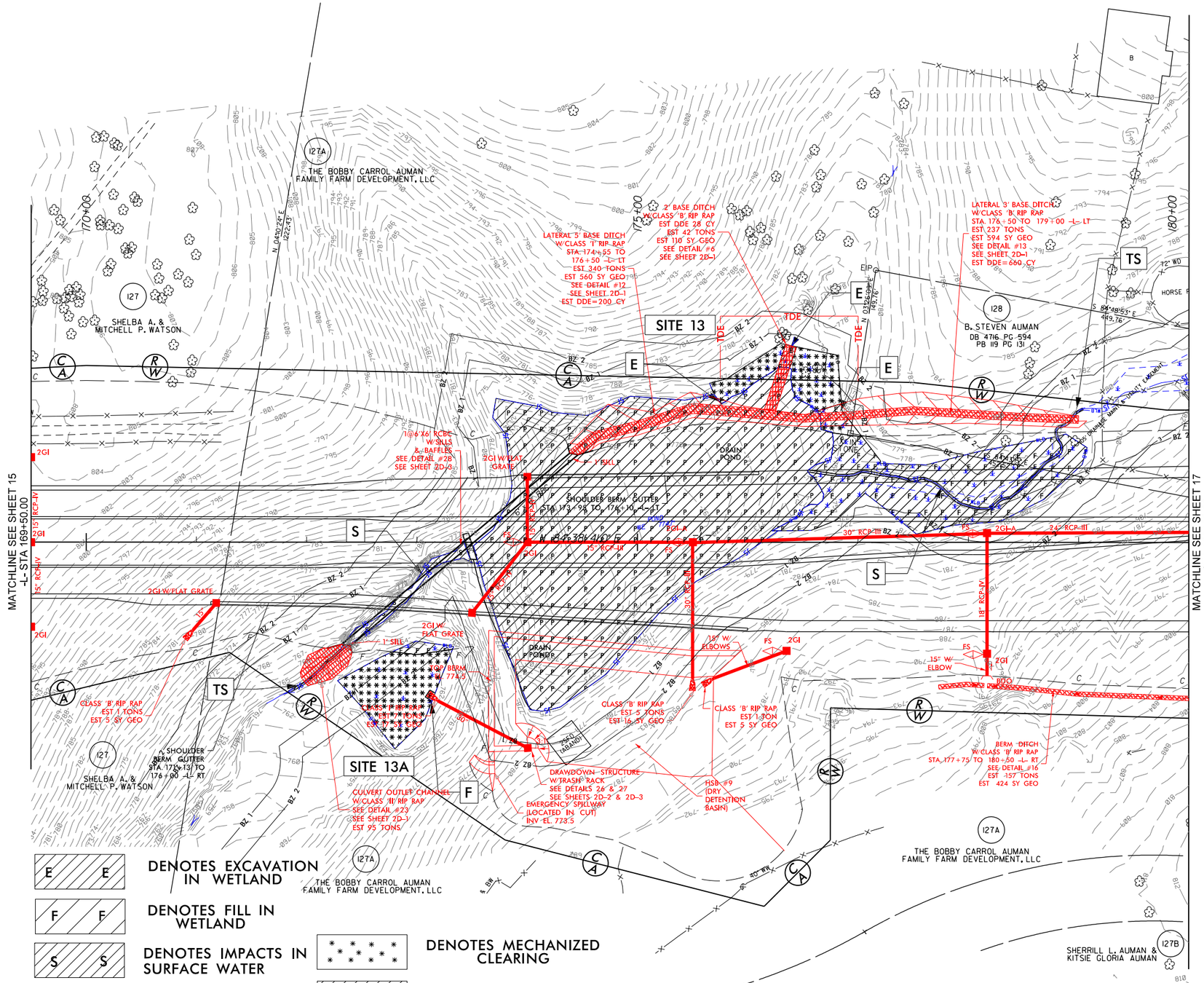
ENG FIRM LICENSE NO. C-490

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83/95



-L- PFL SEE SHEET 30 & 31

FOR CULVERT PLANS SEE SHEETS C-1 THRU C-2

8/17/99

2/23/2018
U2412A_hyd_prm_wet_psh_16a_con.dgn
bpowell

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	16b
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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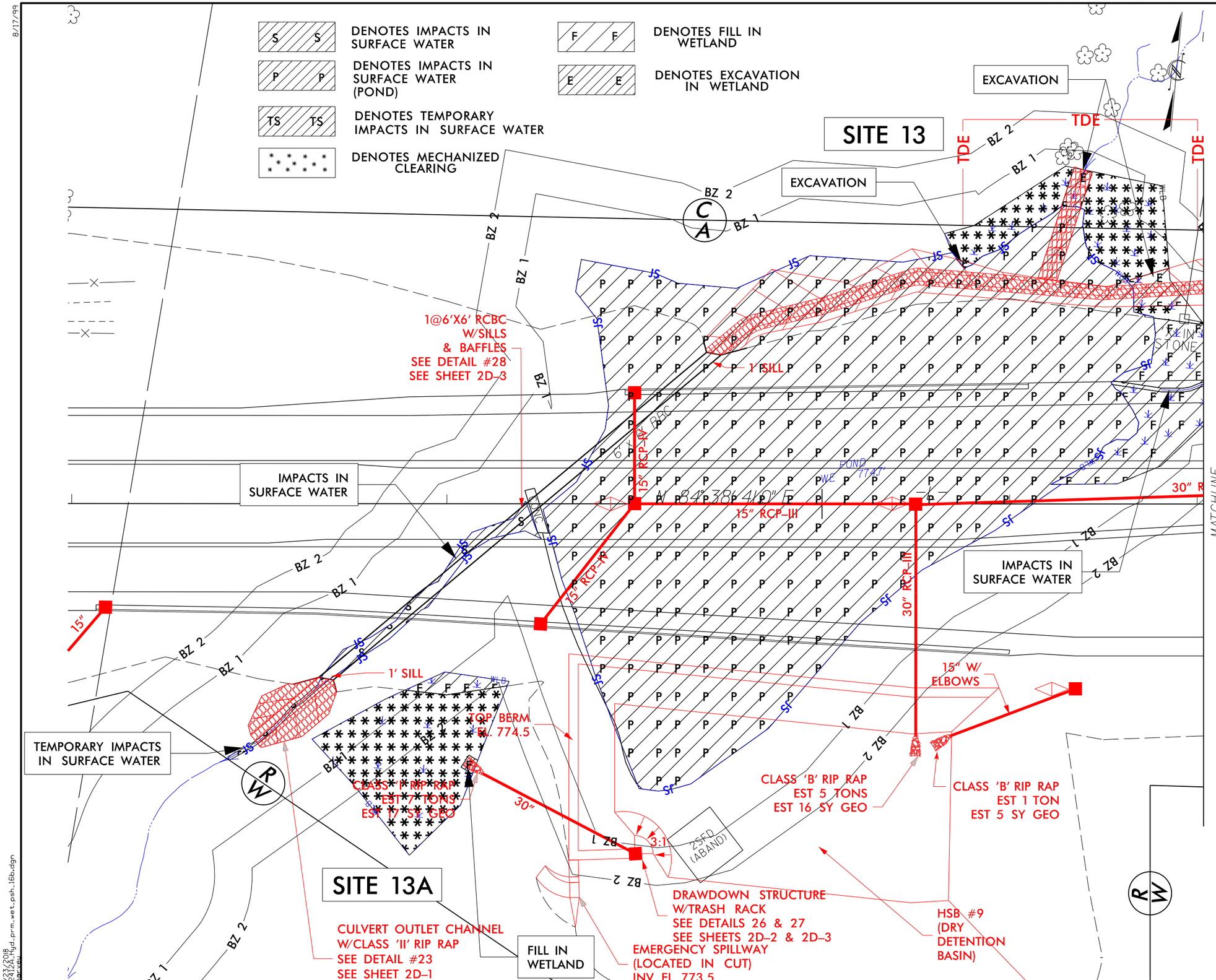


8/17/99

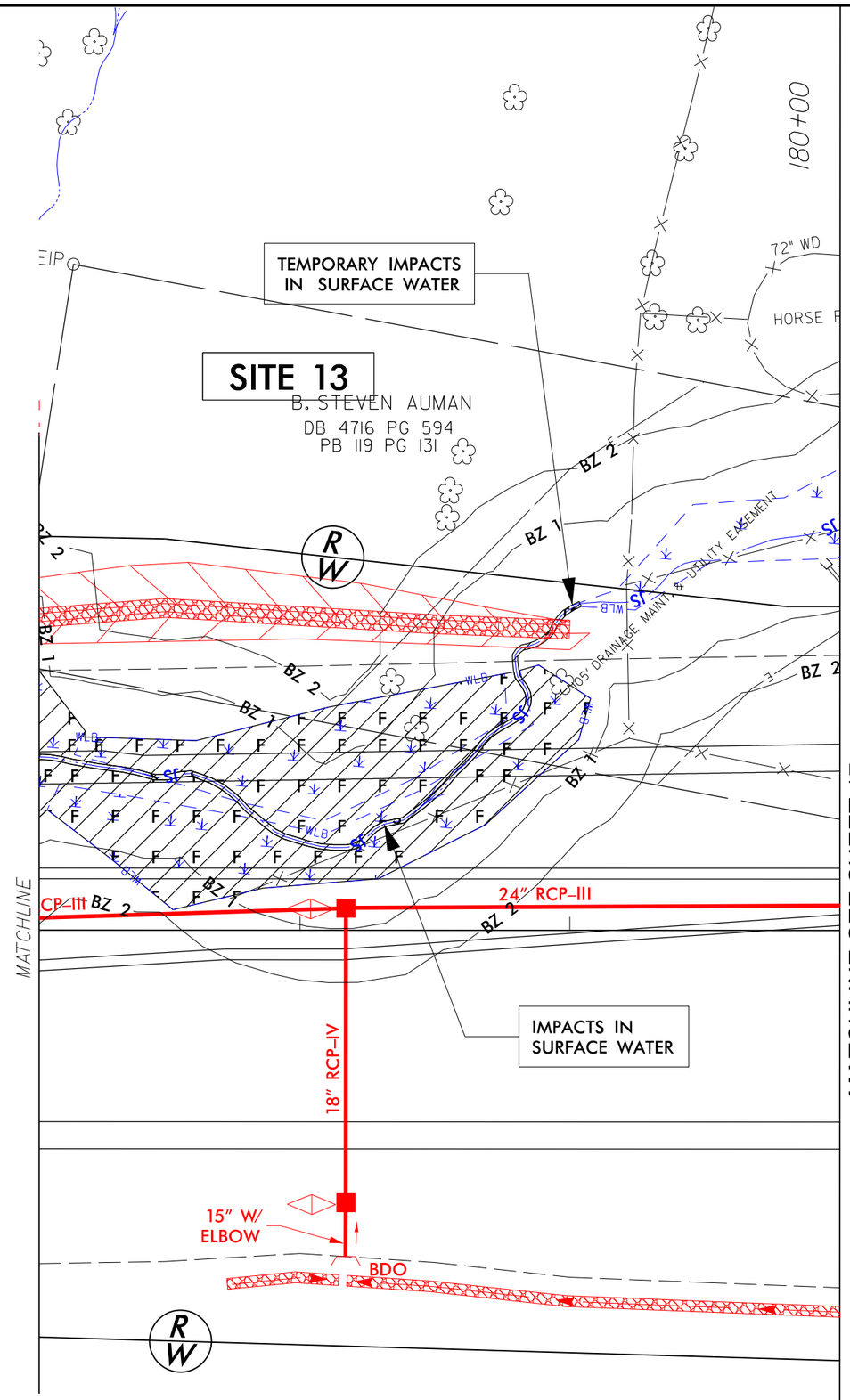
2/23/2018
U2412A_hyd_prm_wet_psh_16b.dgn
jbarker

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	16c
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

25' 12.5' 0 25' 50'
SCALE: 1" = 50'



S S DENOTES IMPACTS IN SURFACE WATER

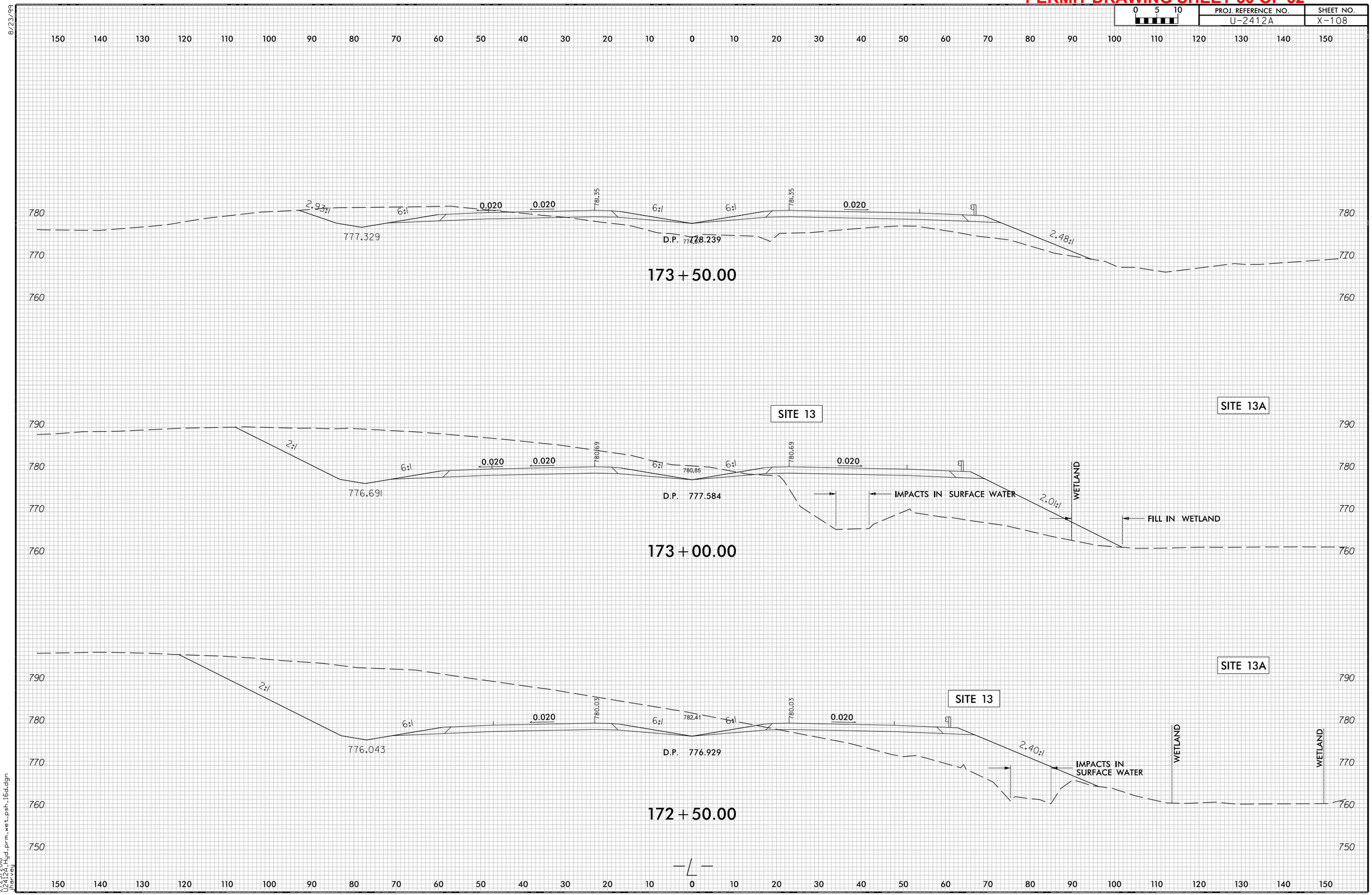
F F DENOTES FILL IN WETLAND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

8/17/99

2/23/2018
U2412A_hyd_prm_wet_psh_16c.dgn
jbarvau

PROJ. REFERENCE NO.	SHEET NO.
U-2412A	X-108



8/23/99

2/23/2018
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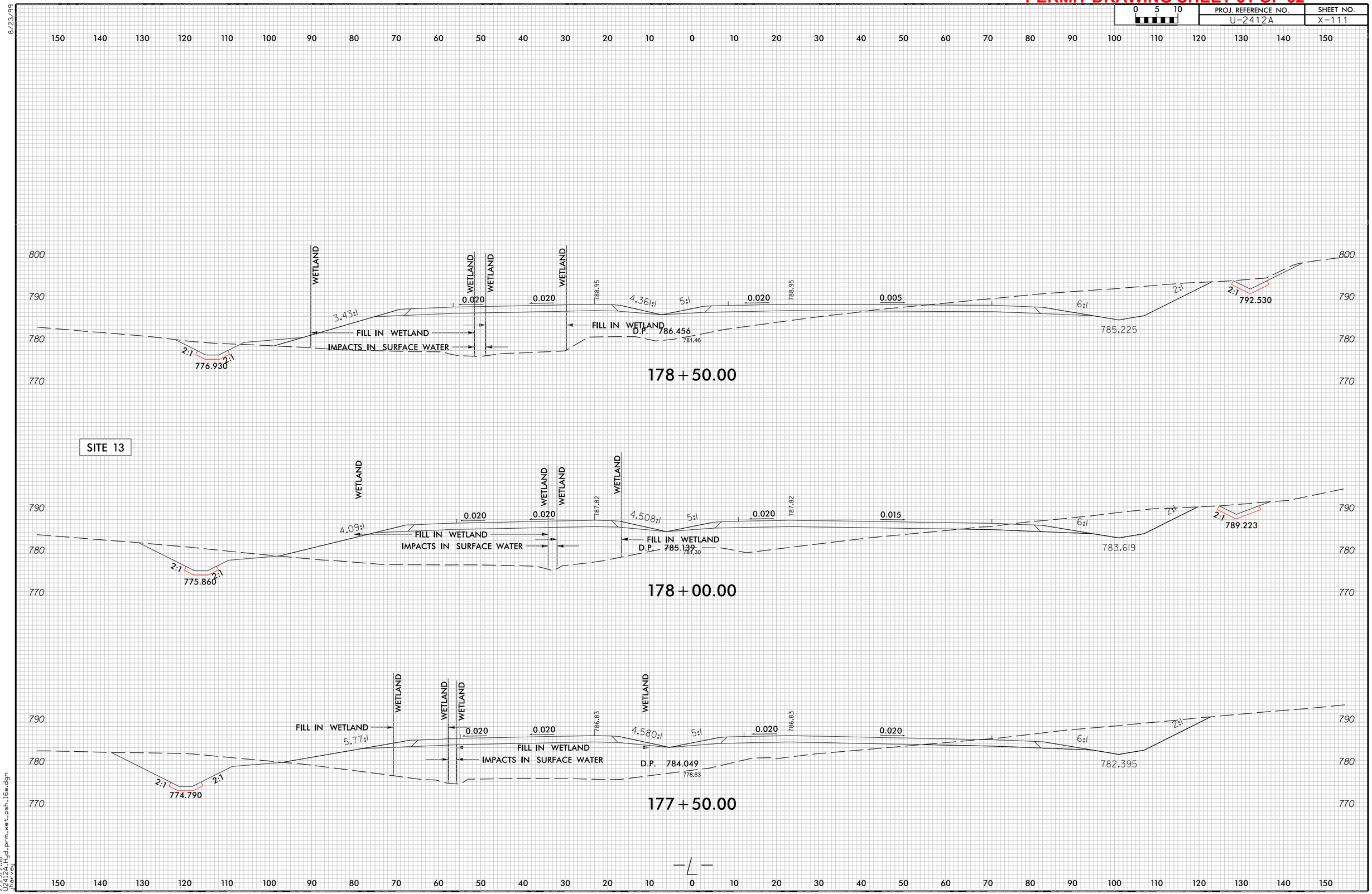
jharvey

PROJ. REFERENCE NO.	SHEET NO.
U-2412A	X-111



8/23/99

2/23/2018
U2412A_hyd_prm_wet_psh_16e.dgn
jharvey

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	16f
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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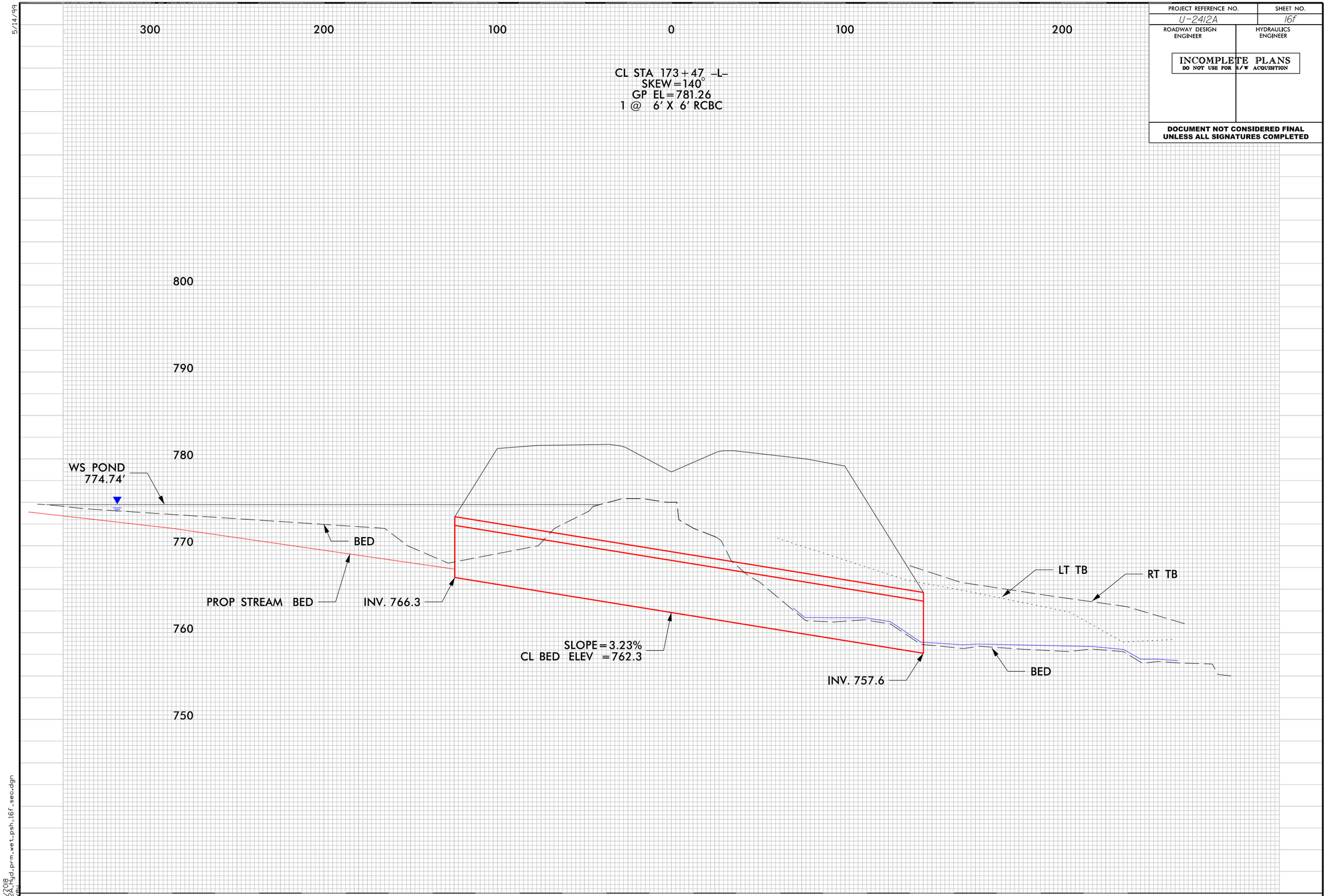

5/14/99

2/23/2018
U2412A_hyd_prm_wet_psh_16f_sec.dgn
bgravel

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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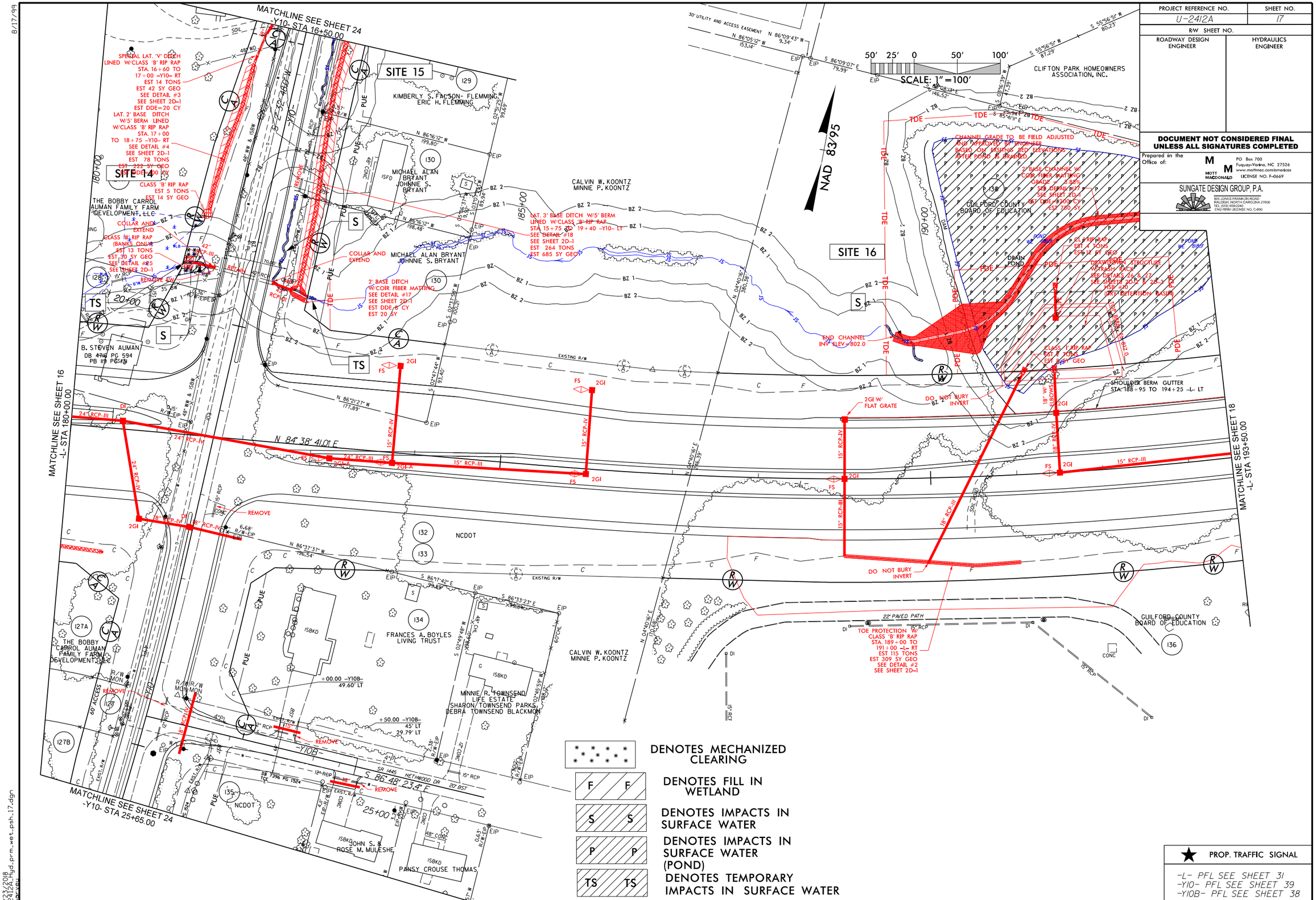
www.mottmac.com/americas
LICENSE NO. F-0669

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-690



8/17/99

2/23/2018
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bgravell

PERMIT DRAWING SHEET 54 OF 62

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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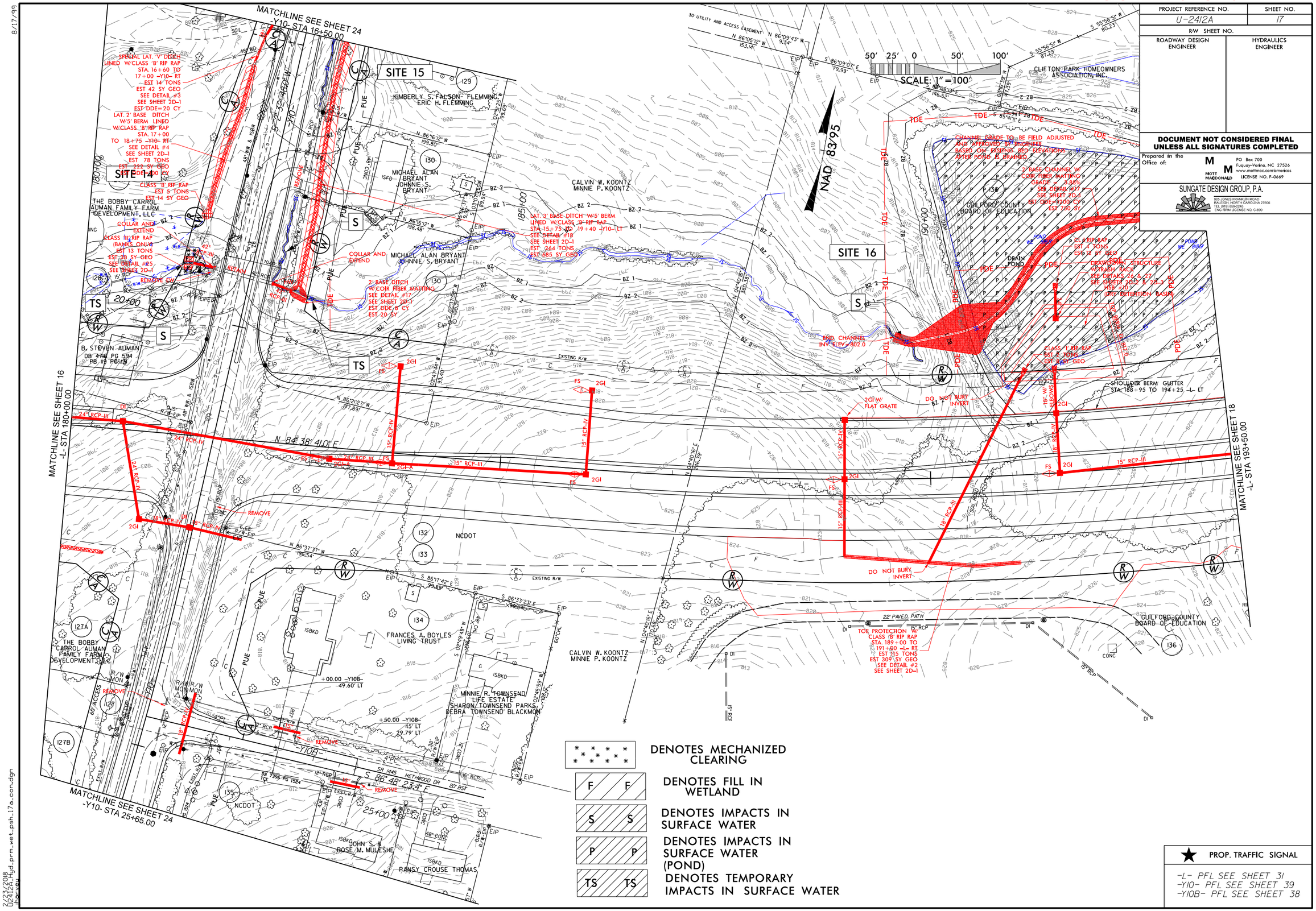

8/17/99

2/23/2018
02412A_hyd_prm_wet_psh_17a_con.dgn
bgravell

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	16b
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

MATCHLINE SEE SHEET 24
-Y10- STA 16+50.00

MATCHLINE SEE SHEET 16
-L- STA 180+00.00

SITE 15

KIMBERLY S. FALSON- FLEMMING
ERIC H. FLEMMING

IMPACTS IN SURFACE WATER

SITE 14

MECHANIZED CLEARING

FILL IN WETLAND

CLASS 'B' RIP RAP
EST 5 TONS
EST 14 SY GEO

THE BOBBY CARROL AUMAN FAMILY FARM DEVELOPMENT, LLC

CLASS III RIP RAP (BANKS ONLY)
EST 13 TONS
EST 30 SY GEO
SEE DETAIL #25
SEE SHEET 2D-1

42" RCP-III

RETAIN

REMOVE

MICHAEL ALAN BRYANT
JOHNNIE S. BRYANT

IMPACTS IN SURFACE WATER

CALVIN W. KO
MINNIE P. KO

MICHAEL ALAN BRYANT
JOHNNIE S. BRYANT

TEMPORARY IMPACTS IN SURFACE WATER

B. STEVEN AUMAN
DB 4716 PG 594
PB 119 PG 171

TEMPORARY IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

EXISTING R/W

8/17/99

2/23/2018
U2412A_hyd_prm_wet_psh_17b.dgn
bpowell

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
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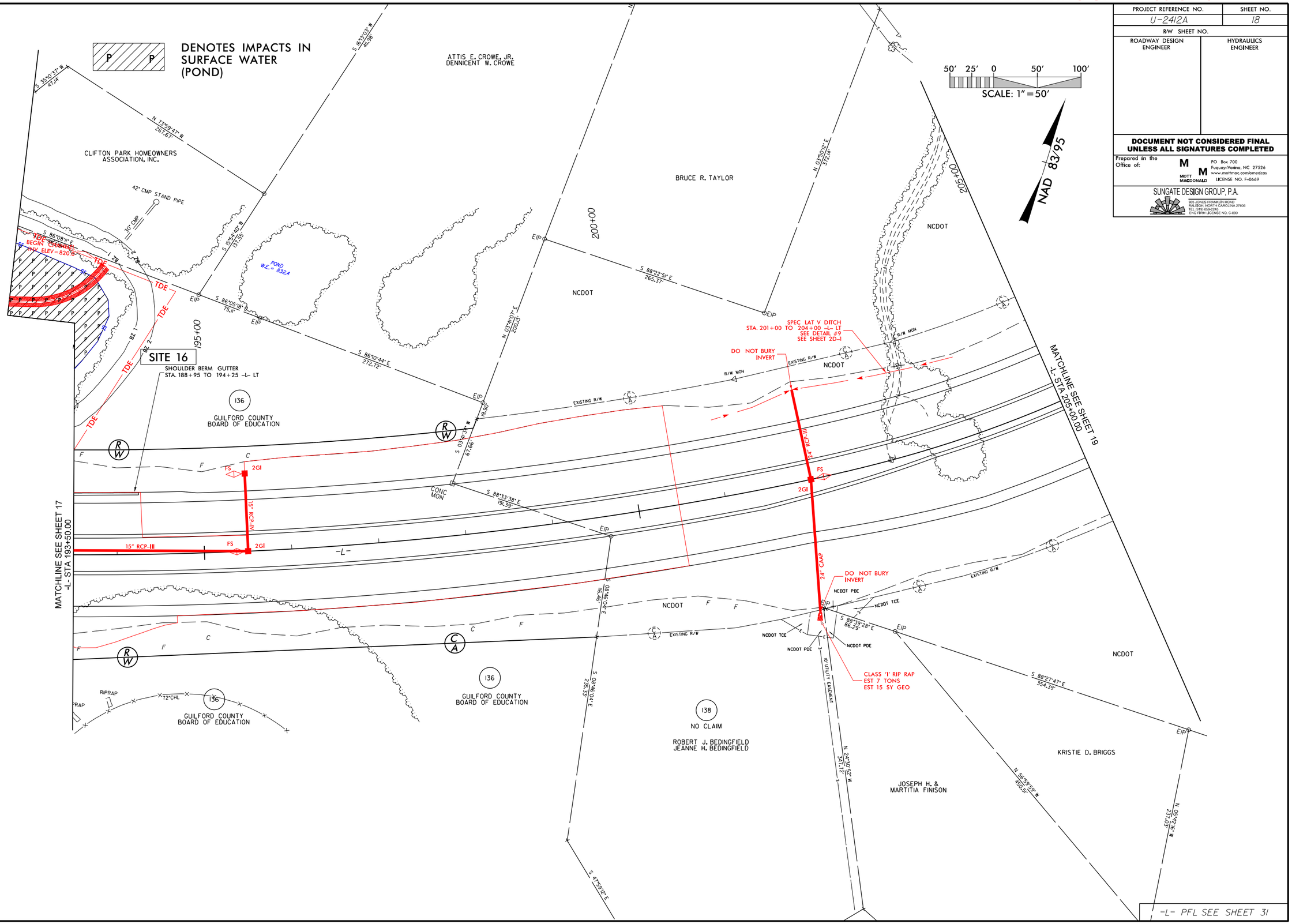
ENG FIRM LICENSE NO. C-490



2/27/2018
b2412a_hyd_prm_wet_psh_18.dgn
bhargau

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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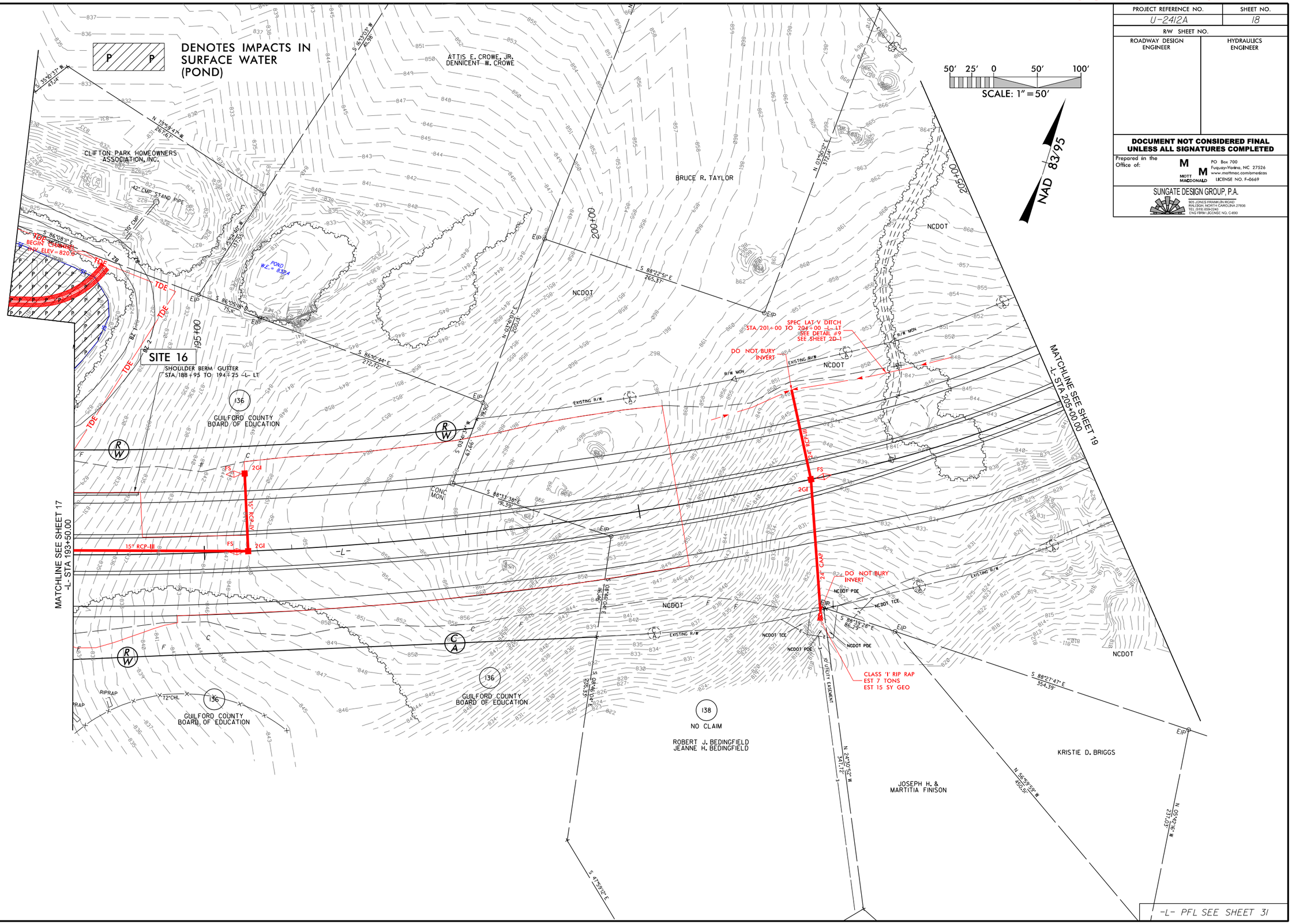

2/27/2018
U2412A_hyd_prm_wet_psh_18a_con.dgn
bhaney

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	24
R/W SHEET NO.	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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8/17/99

NAD 83/95

SCALE: 1" = 100'

PEGGY K. WEAVER

WALTER K. BURTON
JOYCE A. BURTON

HENRY A. SCOTT, JR.
GILDA F. SCOTT

-Y10- POT Sta. 10+00.00

BRENDA KENNEDY

GEORGE J. TAYLOR HEIRS

GEORGE J. TAYLOR HEIRS

-Y10- PC Sta. 13+61.20

GEORGE J. TAYLOR

GEORGE J. TAYLOR HEIRS

BEGIN CONSTRUCTION
-Y10- POC Sta. 14+65.00

THE BOBBY CARROLL AUMAN FAMILY FARM DEVELOPMENT LLC

-Y10- PT Sta. 16+31.68

MATCHLINE SEE SHEET 17
-Y10- STA 16+50.00

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

STEPHEN EDWARD BENOIT
LEIGH ANNE BENOIT

DORIS JACKSON

SITE 15

CLIFTON PARK HOMEOWNERS ASSOCIATION, INC.

KIMBERLY S. WILSON-FLEMMING
ERIC H. FLEMMING

BEG WW FENCE

LAT. 3' BASE DITCH W/5' BERM LINED W/CLASS 'B' RIP RAP
STA. 15+75 TO 19+40 -Y10- LT
SEE DETAIL #18
SEE SHEET 2D-1
SEE SHEET 17 FOR QUANTITIES
EST DDE=540 CY

REMOVE

-Y10- PFL SEE SHEET 39

MATCHLINE SEE SHEET 17
-Y10- STA 25+65.00

SHERRILL L. AUMAN & KITSIE GLORIA AUMAN

END WW FENCE

ROSE M. MULESHE

PANSY CROUSE THO

BEG WW FENCE

DONALD HETHCOX

THOMAS J. RANDO

WALTER A. & SYLVIA C. LIPPARD, JR

JEFFREY TYLER RUSH

WILLIAM L. SANDRIDGE

CLASS 'B' RIP RAP
EST 2 TONS
EST 7 SY GEO

SPECIAL LAT. 'V' DITCH
STA. 29+50 TO 32+00 -Y10- LT
SEE DETAIL #9

RETAIN

END CONSTRUCTION
-Y10- POT Sta. 32+00.00

-Y10- PFL SEE SHEET 39

2/27/2018
U2412A_hyd_prm_wet_psh_24.dgn
jbarvell

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	24
R/W SHEET NO.	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL: (919) 859-2243
ENG FIRM LICENSE NO. C-690

SCALE: 1" = 100'

NAD 83/95

PEGGY K. WEAVER

WALTER K. BURTON
JOYCE A. BURTON

HENRY A. SCOTT, JR.
GILDA F. SCOTT

-Y10- POT Sta. 10+00.00

BRENDA KENNEDY

GEORGE J. TAYLOR HEIRS

GEORGE J. TAYLOR HEIRS

-Y10- PC Sta. 13+61.20

GEORGE J. TAYLOR

GEORGE J. TAYLOR HEIRS

BEGIN CONSTRUCTION
-Y10- POC Sta. 14+65.00

THE BOBBY CARROLL AUMAN FAMILY FARM DEVELOPMENT LLC

-Y10- PT Sta. 16+31.68

MATCHLINE SEE SHEET 17
-Y10- STA 16+50.00

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

STEPHEN EDWARD BENOIT
LEIGH ANNE BENOIT

DORIS JACKSON

SITE 15

CLIFTON PARK HOMEOWNERS ASSOCIATION, INC.

KIMBERLY S. WILSON-FLEMMING
ERIC H. FLEMMING

LAT. 3' BASE DITCH W/5' BERM LINED W/CLASS 'B' RIP RAP
STA. 15+75 TO 19+40 -Y10- LT
SEE DETAIL #18
SEE SHEET 20-1
SEE SHEET 17 FOR QUANTITIES
EST DDE = 340 CY

-Y10- PFL SEE SHEET 39

NAD 83/95

MATCHLINE SEE SHEET 17
-Y10- STA 25+65.00

SHERRILL L. AUMAN & KITSIE GLORIA AUMAN

ROSE M. MULESHE

PANSY CROUSE THO

DONALD HETHCOX

THOMAS J. RANDO

WALTER A. & SYLVIA C. LIPPARD, JR

JEFFREY TYLER RUSH

WILLIAM L. SANDRIDGE

CLASS 'B' RIP RAP
EST 2 TONS
EST 7 SY GEO

SPECIAL LAT. 'V' DITCH
STA. 29+50 TO 32+00 -Y10- LT
SEE DETAIL #9

END CONSTRUCTION
-Y10- POT Sta. 32+00.00

-Y10- PFL SEE SHEET 39

2/23/2018
U2412A_hydd_prm_wet_psh_24a_con.dgn
jbarwell

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	24b
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

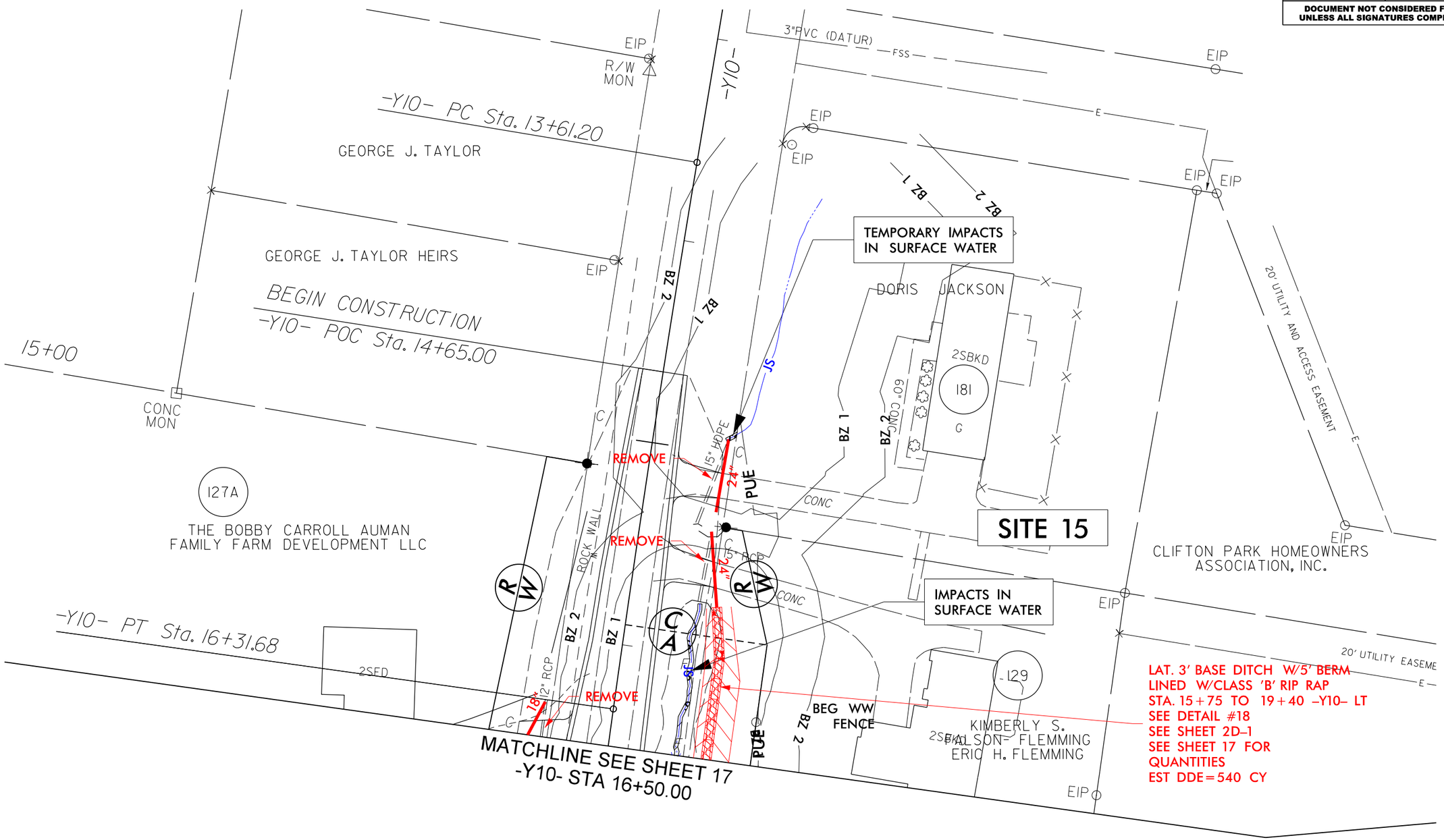
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

25' 12.5' 0 25' 50'
SCALE: 1" = 50'



8/17/99

8/23/2018
U2412A_hyd_prm_wet_psh_24b.dgn
hbarwell

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	12+08 to 12+49 -Y- LT	ROADWAY	0.02									
1A	11+99 to 12+26-Y-RT	ROADWAY	0.02									
2	38+07 to 45+13 -L-	60" RCP	0.29					0.02	< 0.01	316	10	
		POND						0.61				
3	51+84 to 52+53 -L- RT	36" RCP						< 0.01		110		
4	52+53 to 53+57 -L-	54" RCP						0.01	< 0.01	279	20	
		BANK STABILIZATION						< 0.01		28		
5	85+21 to 87+99 -L- RT	36" RCP						0.02	< 0.01	431	20	
		BANK STABILIZATION						< 0.01		35		
5A	85+40 to 86+32-L-RT	ROADWAY	0.03									
5B	85+11 to 85+25-L-RT	ROADWAY	< 0.01									
6	94+72 -L-	BRIDGE										
7	104+69 -L-	42" RCP						0.01	< 0.01	283	21	
8	118+87 to 122+54 -L-	66" RCP	0.51			0.04		0.03	< 0.01	445	55	
9	122+54 to 123+03 -L-	24" RCP	0.02			0.02		0.01		211		
10	139+10 to 141+77 -L-	RIP RAP/ BRIDGE	0.02			0.19	0.09					
	140+22 to 141+33 -L-	BANK STABILIZATION						0.02	< 0.01	171	20	
11	155+00 -L-	BRIDGE										
12	157+53 to 159+50 -L-	36" RCP	0.05					< 0.01	< 0.01	99	10	
		POND						0.13				
			0.96			0.25	0.09	0.87	0.01	2408	156	0

*Rounded totals are sum of actual impacts

NOTES:
Site 2: All of wetlands impacted are considered a total take.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
2/23/18
GUILFORD COUNTY
U-2412A
34802.2.2

Revised 2016 09 09

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
13	171+90 to 179+08 -L-	ROADWAY/ RCBC	0.03			0.08		0.02	< 0.01	494	27	
		POND						1.33				
13A	172+38 to 173+33 -L-RT	ROADWAY	0.01			0.11						
14	19+42 -Y10-	42" RCP	0.01			< 0.01		< 0.01	< 0.01	69	4	
		BANK STABILIZATION						< 0.01		10		
15	15+75 to 19+42 -Y10- LT	ROADWAY						< 0.01	< 0.01	270	16	
16	189+59 to 193+92 -L- LT	POND						1.57				
		DITCH						< 0.01		66		
		PAGE TWO TOTALS	0.05			0.20		2.93	0.01	909	47	0
		PAGE ONE TOTALS	0.96			0.25	0.09	0.87	0.01	2408	156	
		PROJECT TOTALS	1.01			0.45	0.09	3.80	0.02	3317	203	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
2/23/18
GUILFORD COUNTY
U-2412A
34802.2.2

Revised 2016 09 09

BUFFER DRAWING SHEET 1 OF 21

09/08/99

TIP PROJECT: U-2412A

CONTRACT: C204103

SEE SHEET 1A FOR INDEX OF SHEETS
SEE SHEET 1B FOR CONVENTIONAL SYMBOLS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2412A	1	

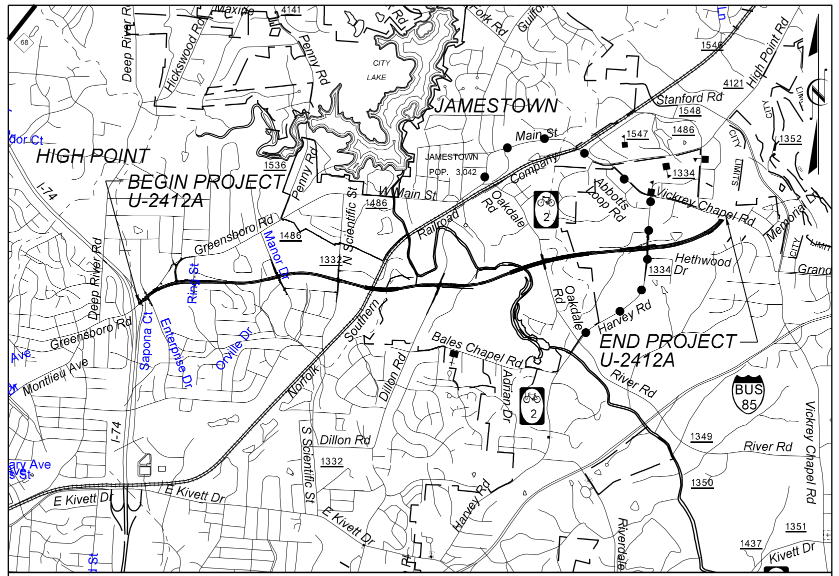
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34802.1.1	STP-4121(3)	PE
34802.2.2	STP-4121(3)	R/W & UTL.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

LOCATION: SR-1486 /SR-4121 (JAMESTOWN PARKWAY) FROM I-74 TO WEST OF SR 1480 (VICKREY CHAPEL ROAD)

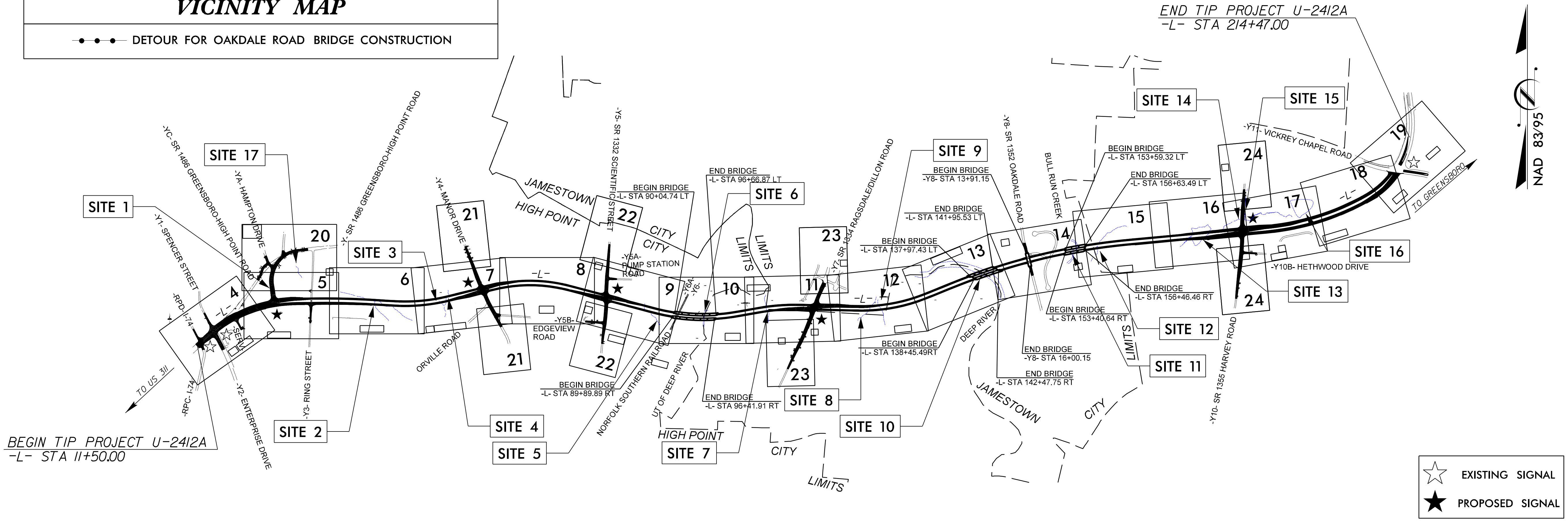
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERT, & SIGNALS



VICINITY MAP

DETOUR FOR OAKDALE ROAD BRIDGE CONSTRUCTION

BUFFER IMPACTS PERMIT



THIS IS A CONTROLLED ACCESS FACILITY WITH ACCESS BEING LIMITED TO INTERSECTIONS.
NCDOT CONTACT: TATIA WHITE, PE, PLS

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GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2018 = 35,880
ADT 2038 = 44,720
K = 9 %
D = 55 %
T = 4 % *
V = 60 MPH
* TTST =1% DUAL 3%
FUNC CLASS = URBAN ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT	U-2412A	=	3.586	MILES
LENGTH STRUCTURES TIP PROJECT	U-2412A	=	.258	MILES
TOTAL LENGTH OF TIP PROJECT	U-2412A	=	3.844	MILES

PLANS PREPARED FOR THE NCDOT BY:

MOTT MACDONALD
PO Box 700
Fuquay-Varina, NC 27526
(919) 552-2253
(919) 552-2254 (Fax)
www.mottmac.com/americas
LICENSE NO. F-0669

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905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 20, 2009

LETTING DATE:
JUNE 19, 2018

MICHAEL PEKAREK, PE
PROJECT ENGINEER

BRIAN PHILLIPS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

2/23/2018
U2412A_Hyd_prm_buf_psh_01.dgn
jharvey

BUFFER DRAWING SHEET 2 OF 21

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	2D-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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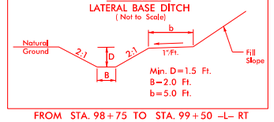
ENG FIRM LICENSE NO. C-490

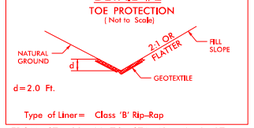
DETAIL #1
LATERAL BASE DITCH
(Not to Scale)



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

FROM STA. 98+75 TO STA. 99+50 –L– RT

DETAIL #2
TOE PROTECTION
(Not to Scale)

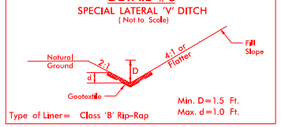


d=2.0 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM STA. 38+00 TO STA. 42+50 –L– LT
FROM STA. 40+50 TO STA. 42+00 –L– RT
FROM STA. 52+50 TO STA. 54+00 –L– LT
FROM STA. 85+00 TO STA. 86+50 –L– LT
FROM STA. 87+00 TO STA. 87+85 –L– RT
FROM STA. 104+50 TO STA. 106+00 –L– RT
FROM STA. 118+00 TO STA. 124+00 –L– RT
FROM STA. 131+25 TO STA. 131+75 –L– RT
FROM STA. 133+75 TO STA. 135+60 –L– LT
FROM STA. 158+00 TO STA. 159+50 –L– LT
FROM STA. 189+00 TO STA. 191+00 –L– RT

DETAIL #3
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

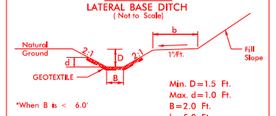


Min. D=1.5 Ft.
Max. d=1.0 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM STA. 35+00 TO STA. 36+00 –L– RT
FROM STA. 70+00 TO STA. 72+00 –L– LT
FROM STA. 10+00 TO STA. 12+50 –Y5B– RT
FROM STA. 16+60 TO STA. 17+00 –Y10– RT

DETAIL #4
LATERAL BASE DITCH
(Not to Scale)



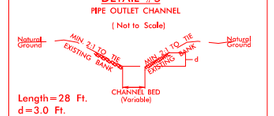
Min. D=1.5 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

*When B is < 6.0'

Type of Liner= Class 'B' Rip-Rap

FROM STA. 115+50 TO STA. 119+50 –L– LT
FROM STA. 17+00 TO STA. 18+75 –Y10– RT
FROM STA. 84+65 TO STA. 86+50 –L– RT

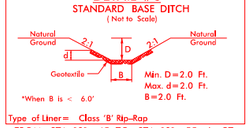
DETAIL #5
PIPE OUTLET CHANNEL
(Not to Scale)



Length=28 Ft.
d=3.0 Ft.
Est.=54 Tons of Class 'II' Rip-Rap

STA. 52+42 –L– RT

DETAIL #6
STANDARD BASE DITCH
(Not to Scale)



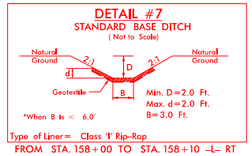
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=2.0 Ft.

*When B is < 6.0'

Type of Liner= Class 'B' Rip-Rap

FROM STA. 131+45 TO STA. 131+55 –L– RT
FROM STA. 176+20 TO STA. 176+40 –L– LT

DETAIL #7
STANDARD BASE DITCH
(Not to Scale)



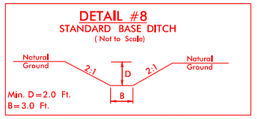
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=3.0 Ft.

*When B is < 6.0'

Type of Liner= Class 'I' Rip-Rap

FROM STA. 158+00 TO STA. 158+10 –L– RT

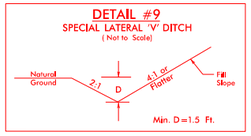
DETAIL #8
STANDARD BASE DITCH
(Not to Scale)



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

FROM STA. 38+00 –L– LT

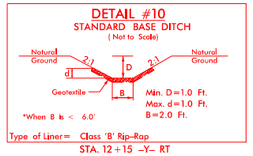
DETAIL #9
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D=1.5 Ft.

FROM STA. 10+10 TO STA. 11+50 –Y4– RT
FROM STA. 23+50 TO STA. 24+00 –Y5– RT
FROM STA. 29+50 TO STA. 32+00 –Y10– LT
FROM STA. 201+00 TO STA. 204+00 –L– LT
FROM STA. 205+00 TO STA. 207+50 –L– LT

DETAIL #10
STANDARD BASE DITCH
(Not to Scale)



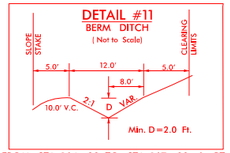
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.

*When B is < 6.0'

Type of Liner= Class 'B' Rip-Rap

STA. 12+15 –Y– RT

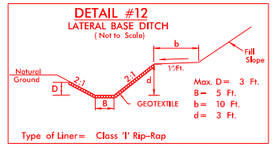
DETAIL #11
BERM DITCH
(Not to Scale)



Min. D=2.0 Ft.

FROM STA. 164+00 TO STA. 167+00 –L– RT
FROM STA. 109+25 TO STA. 111+20 –L– RT
FROM STA. 112+50 TO STA. 114+00 –L– RT

DETAIL #12
LATERAL BASE DITCH
(Not to Scale)

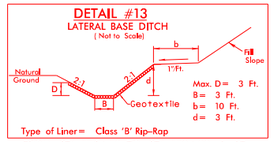


Max. D= 3 Ft.
B= 5 Ft.
b= 10 Ft.
d= 3 Ft.

Type of Liner= Class 'I' Rip-Rap

FROM STA. 174+55 TO STA. 176+50 –L– LT

DETAIL #13
LATERAL BASE DITCH
(Not to Scale)

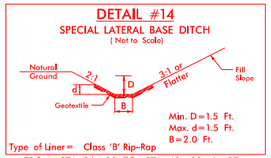


Max. D= 3 Ft.
B= 3 Ft.
b= 10 Ft.
d= 3 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM STA. 176+50 TO STA. 179+00 –L– LT

DETAIL #14
SPECIAL LATERAL BASE DITCH
(Not to Scale)

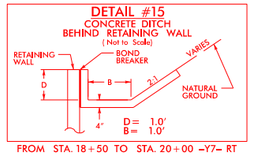


Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=2.0 Ft.

Type of Liner= Class 'B' Rip-Rap

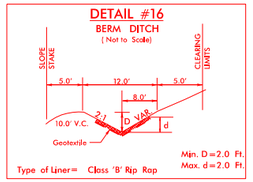
FROM STA. 36+00 TO STA. 40+00 –L– RT

DETAIL #15
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)



FROM STA. 18+50 TO STA. 20+00 –Y7– RT

DETAIL #16
BERM DITCH
(Not to Scale)



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

Type of Liner= Class 'B' Rip Rap

FROM STA. 114+00 TO STA. 115+50 –L– RT
FROM STA. 177+75 TO STA. 180+50 –L– RT

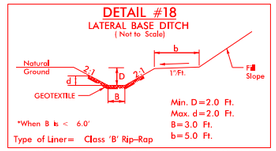
DETAIL #17
STANDARD BASE DITCH
(Not to Scale)

Min. D= 2 Ft.
B= 2 Ft.

Type of Liner= Coir Fiber Matting
Install Matting to Top of Bank

FROM STA. 19+40 TO STA. 19+50 –Y10– LT
FROM STA. 189+60 TO STA. 193+90 –L– LT

DETAIL #18
LATERAL BASE DITCH
(Not to Scale)



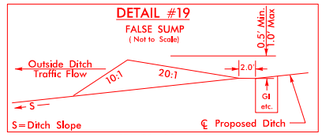
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=3.0 Ft.
b=5.0 Ft.

*When B is < 6.0'

Type of Liner= Class 'B' Rip-Rap

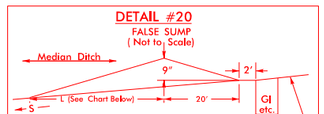
FROM STA. 15+75 TO STA. 19+40 –Y10– LT

DETAIL #19
FALSE SUMP
(Not to Scale)



STA. 20+35 –L– LT
STA. 28+15 –L– RT
STA. 34+15 –L– RT
STA. 55+35 –L– LT
STA. 61+00 –L– LT
STA. 78+00 –L– RT
STA. 103+90 –L– RT
STA. 115+15 –L– RT
STA. 130+65 –L– RT
STA. 133+65 –L– RT
STA. 135+00 –L– RT
STA. 144+45 –L– LT
STA. 160+85 –L– LT
STA. 165+45 –L– LT
STA. 169+35 –L– LT
STA. 183+60 –L– LT
STA. 185+85 –L– LT
STA. 195+35 –L– LT
STA. 15+65 –Y– RT

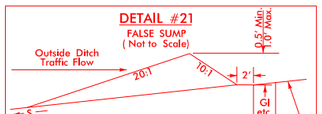
DETAIL #20
FALSE SUMP
(Not to Scale)



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

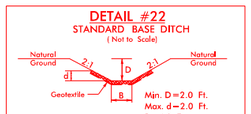
STA. 28+15 –L– MED
STA. 31+15 –L– MED
STA. 34+40 –L– MED
STA. 37+50 –L– MED
STA. 41+15 –L– MED
STA. 45+15 –L– MED
STA. 49+65 –L– MED
STA. 51+40 –L– MED
STA. 55+35 –L– MED
STA. 61+00 –L– MED
STA. 71+80 –L– MED
STA. 75+15 –L– MED
STA. 81+65 –L– MED
STA. 83+90 –L– MED
STA. 86+90 –L– MED
STA. 89+40 –L– MED
STA. 101+65 –L– MED
STA. 103+60 –L– MED
STA. 107+10 –L– MED
STA. 115+75 –L– MED
STA. 119+15 –L– MED
STA. 121+50 –L– MED
STA. 123+90 –L– MED
STA. 126+50 –L– MED
STA. 130+65 –L– MED
STA. 133+65 –L– MED
STA. 142+85 –L– MED
STA. 148+35 –L– MED
STA. 150+05 –L– MED
STA. 156+85 –L– MED
STA. 159+85 –L– MED
STA. 160+85 –L MED
STA. 165+45 –L– MED
STA. 169+35 –L– MED
STA. 173+85 –L– MED
STA. 175+35 –L– MED
STA. 178+02 –L– MED
STA. 182+85 –L– MED
STA. 183+60 –L– MED
STA. 185+85 –L– MED
STA. 188+85 –L– MED
STA. 191+35 –L– MED
STA. 195+35 –L– MED
STA. 202+15 –L– MED

DETAIL #21
FALSE SUMP
(Not to Scale)



STA. 30+65 –L– LT
STA. 55+35 –L– RT
STA. 61+05 –L– RT
STA. 75+15 –L– LT
STA. 107+10 –L– RT
STA. 110+85 –L– RT
STA. 130+15 –L– LT
STA. 143+10 –L– RT
STA. 161+35 –L– RT
STA. 165+45 –L– RT
STA. 169+35 –L– RT
STA. 176+20 –L– RT
STA. 178+02 –L– RT

DETAIL #22
STANDARD BASE DITCH
(Not to Scale)



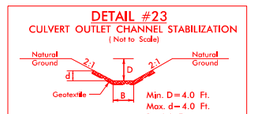
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=4.0 Ft.

*When B is < 6.0'

Type of Liner= Class 'II' Rip-Rap

STA. 104+65 –L– LT
STA. 122+18 –L– LT

DETAIL #23
CULVERT OUTLET CHANNEL STABILIZATION
(Not to Scale)



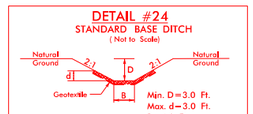
Min. D=4.0 Ft.
Max. d=4.0 Ft.
B=6.0 Ft.

Length = 50'

Type of Liner= Est. 95 Tons Class II Rip-Rap

STA. 172+08 –L– RT

DETAIL #24
STANDARD BASE DITCH
(Not to Scale)



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

*When B is < 6.0'

Type of Liner= Class 'II' Rip-Rap

STA. 87+85 –L– RT

DETAIL #25
PIPE OUTLET CHANNEL
(Not to Scale)

Length=10 Ft.
d=3.0 Ft.
Est.=13 Tons of Class 'II' Rip-Rap

STA. 19+40 –Y10– RT

2/23/2018
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jbarnett

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	2D-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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RALEIGH, NORTH CAROLINA 27606
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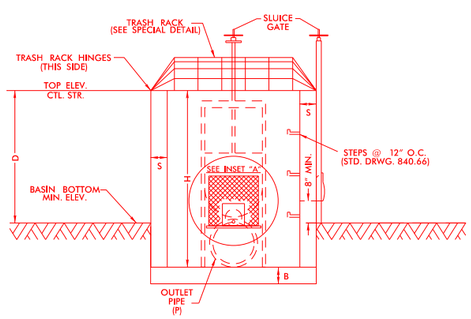
ENG FIRM LICENSE NO. C-890

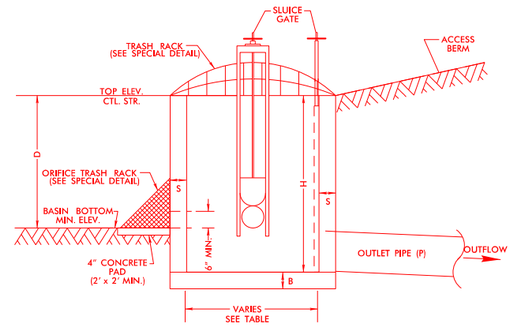
DETAIL #26

DRY DETENTION/HAZARDOUS SPILL BASIN DRAWDOWN STRUCTURE

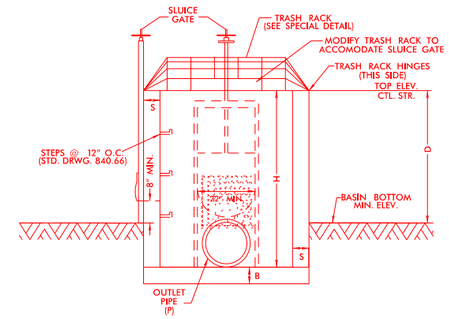
NOT TO SCALE



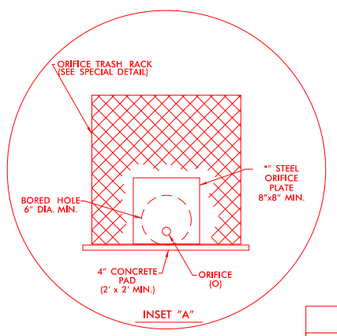
SIDE 1



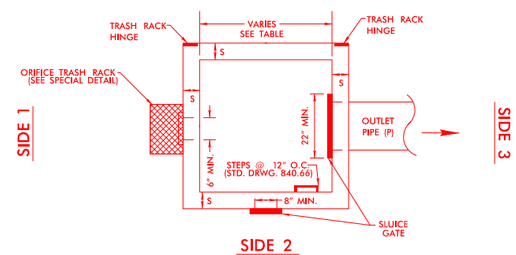
SIDE 2



SIDE 3



INSET "A"



SIDE 2

PLAN VIEW

TRASH RACK NOT SHOWN FOR CLARITY

NOTES:
1. THE BASIN SHOULD BE DESIGNED TO HOLD THE HAZARDOUS SPILL VOLUME ABOVE THE WATER QUALITY VOLUME (WQv) ELEVATION.
2. TOP ELEVATION OF CONTROL STRUCTURE (WEIR ELEVATION) SHOULD BE SET AT THE WQv ELEVATION.
3. 15" MINIMUM DIAMETER FOR OUTLET PIPE.
4. 2" MINIMUM DIAMETER ORIFICE. IF ORIFICE IS GREATER THAN 6", A STEEL PLATE IS NOT REQUIRED.
5. NO BEDDING MATERIAL TO BE USED. THEREFORE, DO NOT FOLLOW STANDARD DRAWINGS FOR METHOD OF PIPE INSTALLATION FOR OUTLET PIPE THROUGH EMBANKMENT.
6. 8" MIN. SLUICE GATE IS FOR MAINTENANCE AND SHOULD REMAIN CLOSED DURING NORMAL OPERATION. A GATE VALVE MAY BE USED IN LIEU OF THE 8" SLUICE GATE.
7. 22" MIN. SLUICE GATE AT THE OUTLET PIPE IS FOR SPILL CONTAINMENT AND SHOULD REMAIN OPEN DURING NORMAL OPERATION.
8. SLUICE GATE SHALL PROVIDE WATERTIGHT SEAL. PROVIDE ADEQUATE CLEARANCE FOR GATE OPERATION AND FOR PROPER SEATING OF GATE OVER PIPE.
9. SELECT BOX STANDARD AS REQUIRED TO ACCOMMODATE SLUICE GATE AND ORIFICE TRASH RACK WIDTH.
10. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATES.
11. ADJUST FOOTER DIMENSIONS AS NEEDED FOR ANTI-FLOTATION.
12. PAYMENT FOR TRASH RACKS IS INCIDENTAL TO BASIN DRAWDOWN STRUCTURE.

MINIMUM DIMENSIONS FOR DRY DETENTION/HAZARDOUS SPILL BASIN DRAWDOWN STRUCTURE

STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	MAX. STORAGE DEPTH(D) FEET	INV. ELEV. CTL. STR.	CTL. STR. DIMENSIONS (W x L x H)	ORIFICE DIAMETER (O) INCHES	ORIFICE INV. ELEV.	OUTLET PIPE DIAMETER(P) INCHES
50+00 -L- RT	713	6	18	827.0	830.5	3.5	824.0	5 x 5 x 6.5	6	827.0	36
54+00 -L- RT	711	6	15	828.0	833.5	5.5	828.0	5 x 5 x 5.5	22	828.0	30
83+00 -L- LT	909	6	15	798.5	804.0	5.5	798.5	5 x 5 x 5.5	17	798.5	24
100+00 -L- LT	1015	6	18	728.0	732.0	4.0	725.0	5 x 5 x 7	2	728.0	30
143+00 -L- LT	1320	6	15	733.0	736.5	3.5	730.0	5 x 5 x 6.5	4.5	733.0	24
175+00 -L- RT	1613	6	18	768.0	772.5	4.5	765.0	5 x 5 x 7.5	8	768.0	30
192+00 -L- LT	1725	6	12	812.0	815.0	3.0	810.0	5 x 5 x 5	2	812.0	24

2/23/2018
U2412A_hyd_prm_buf_psh_02D2.dgn
jbarvin

8/17/99

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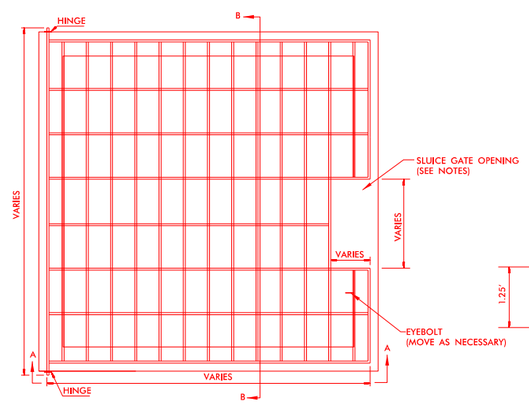
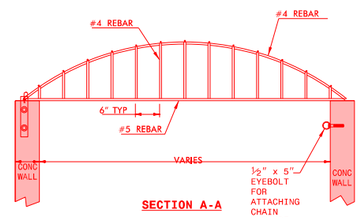
DETAIL #27

REMOVABLE ORIFICE TRASH RACK

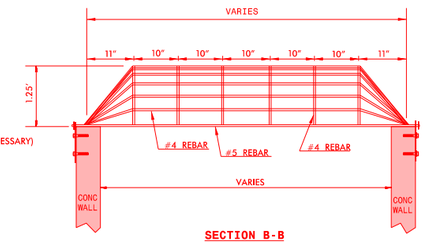
NOT TO SCALE



PLAN



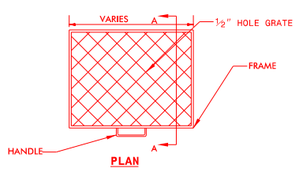
SECTION A-A



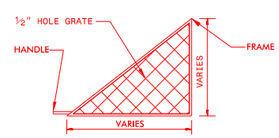
SECTION B-B

REBAR TRASH RACK
NOT TO SCALE

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



PLAN



SECTION A-A

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

DETAIL #28

(NOT TO SCALE)

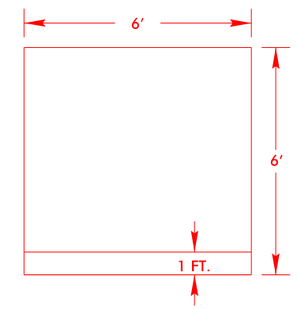
SINGLE BARREL CULVERT SKEWED LOW FLOW CHANNEL AND SILLS

*NOTES:

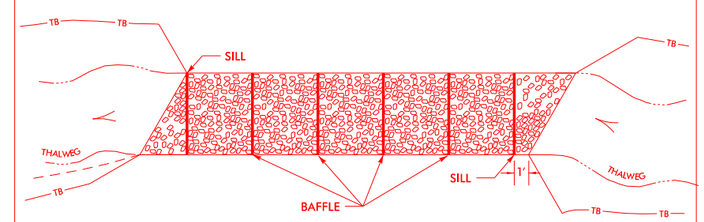
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT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

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

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



SILLS AT INLET AND OUTLET



NUMBER OF BAFFLES = 6
ON 40 FT CENTERS FROM DOWNSTREAM SILL

9/13

STA. 173 + 47 –L–

2/27/2018
U2412A_hyd_prm_buf_psh_02D3.dgn
jbarvey

BUFFER DRAWING SHEET 5 OF 21

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
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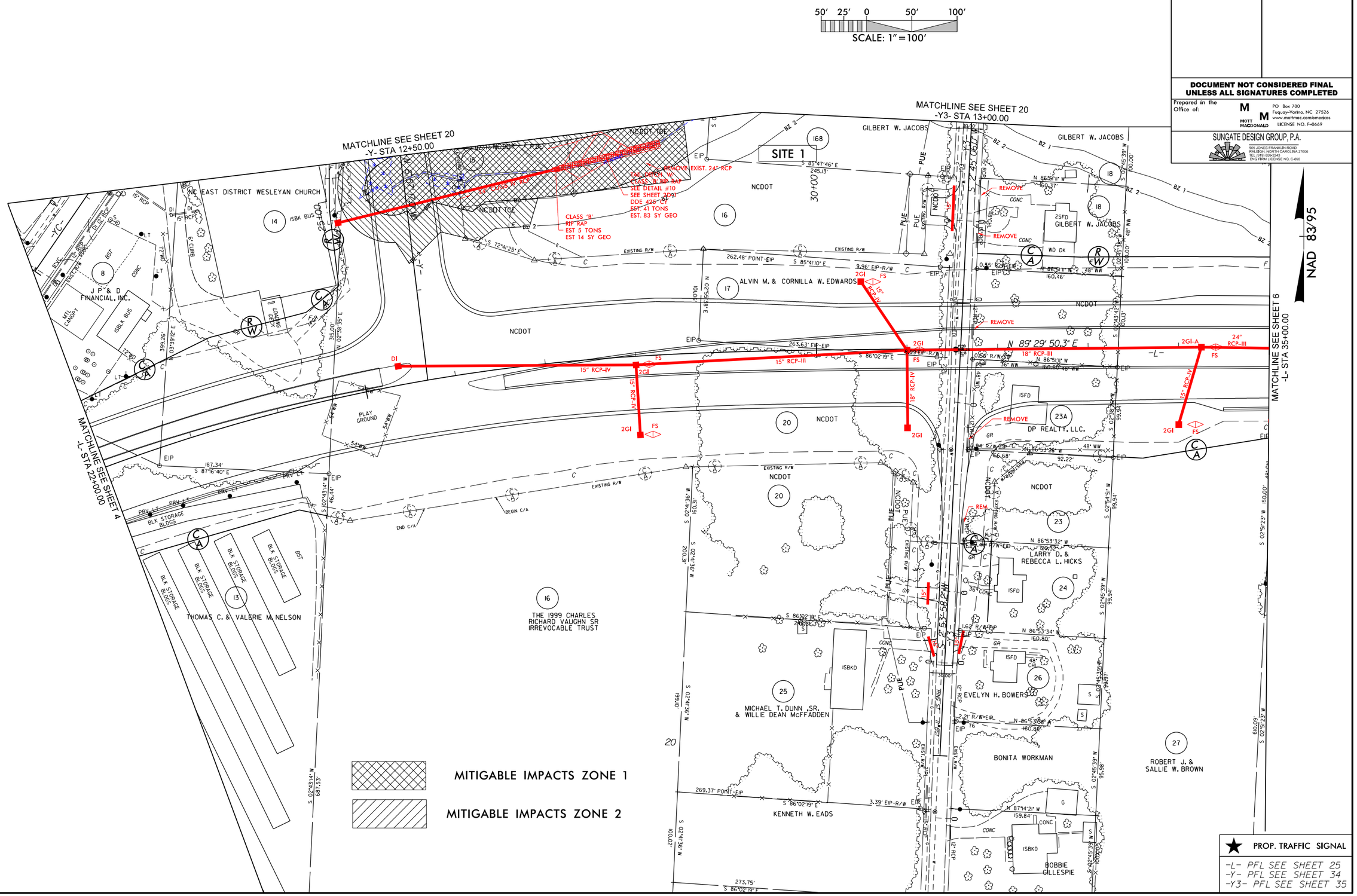

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2/23/2018
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BUFFER DRAWING SHEET 6 OF 21

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	6
R/W SHEET NO.	
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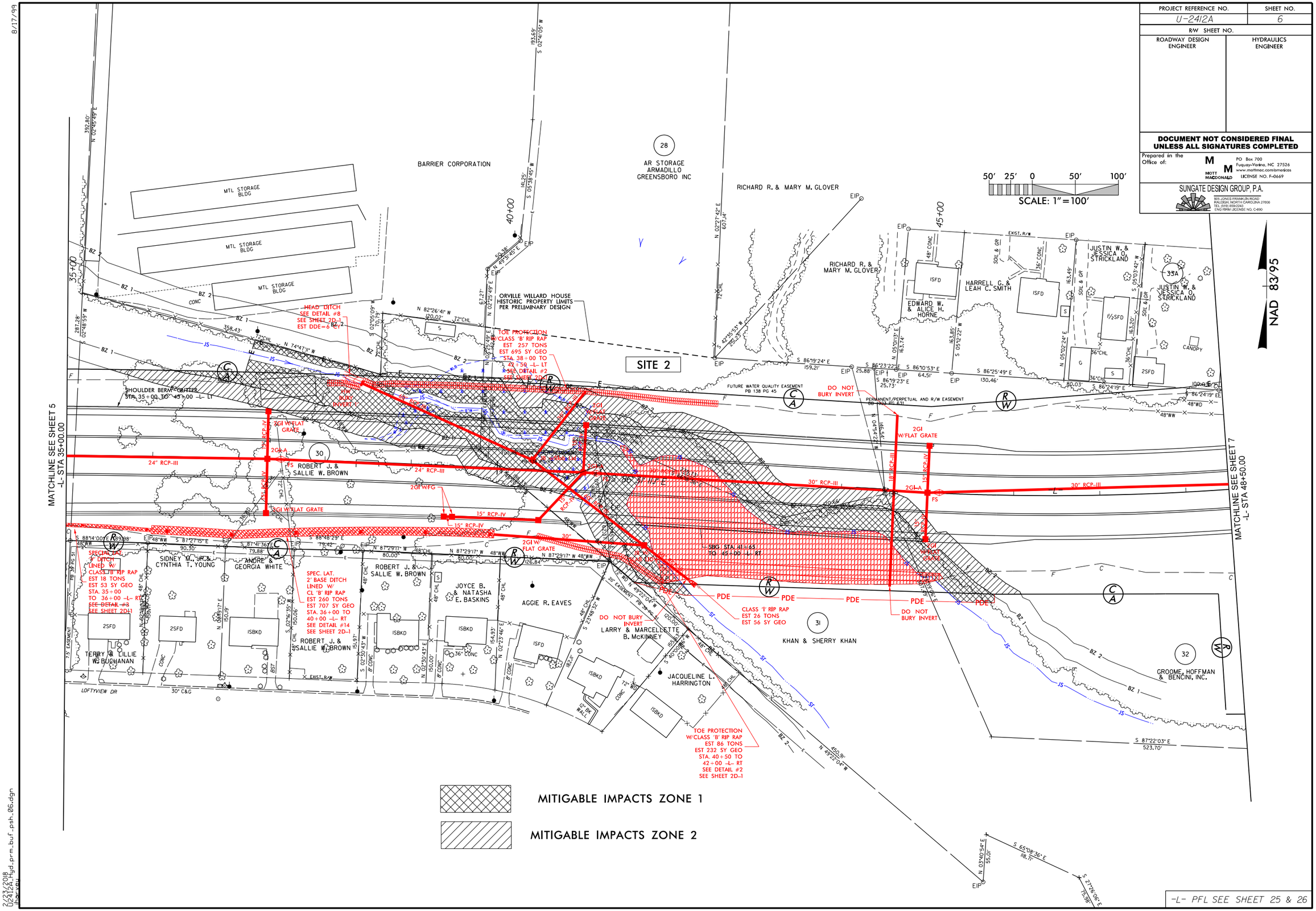
SCALE: 1" = 100'

NAD 83/95



-L- PFL SEE SHEET 25 & 26

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U2412A_hyd_prm_buf_psh_06.dgn
jbarvau

BUFFER DRAWING SHEET 7 OF 21

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	7
R/W SHEET NO.	
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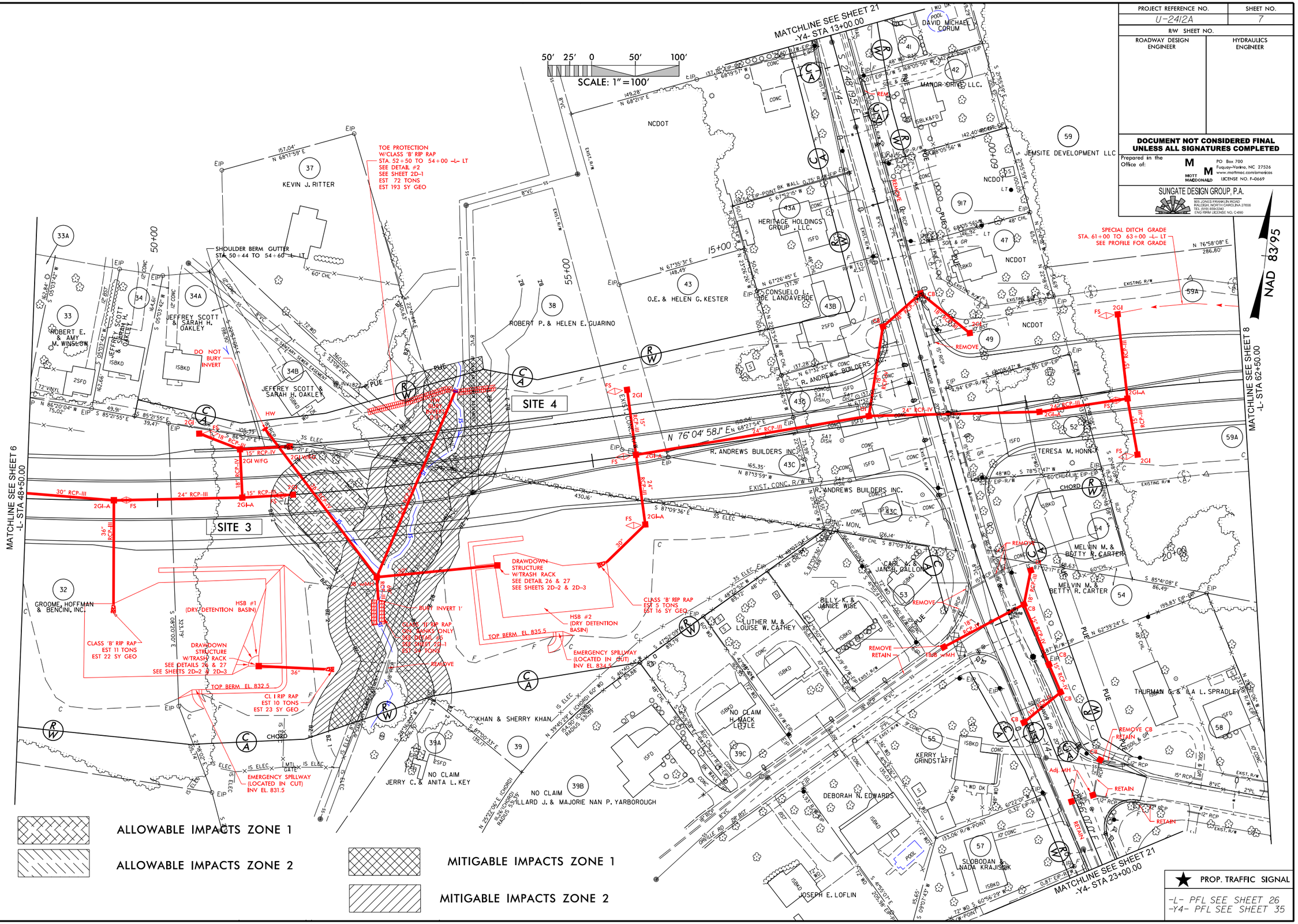

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2/23/2018
U2412A_hyd_prm_buf_psh_07.dgn
hbarley

BUFFER DRAWING SHEET 8 OF 21

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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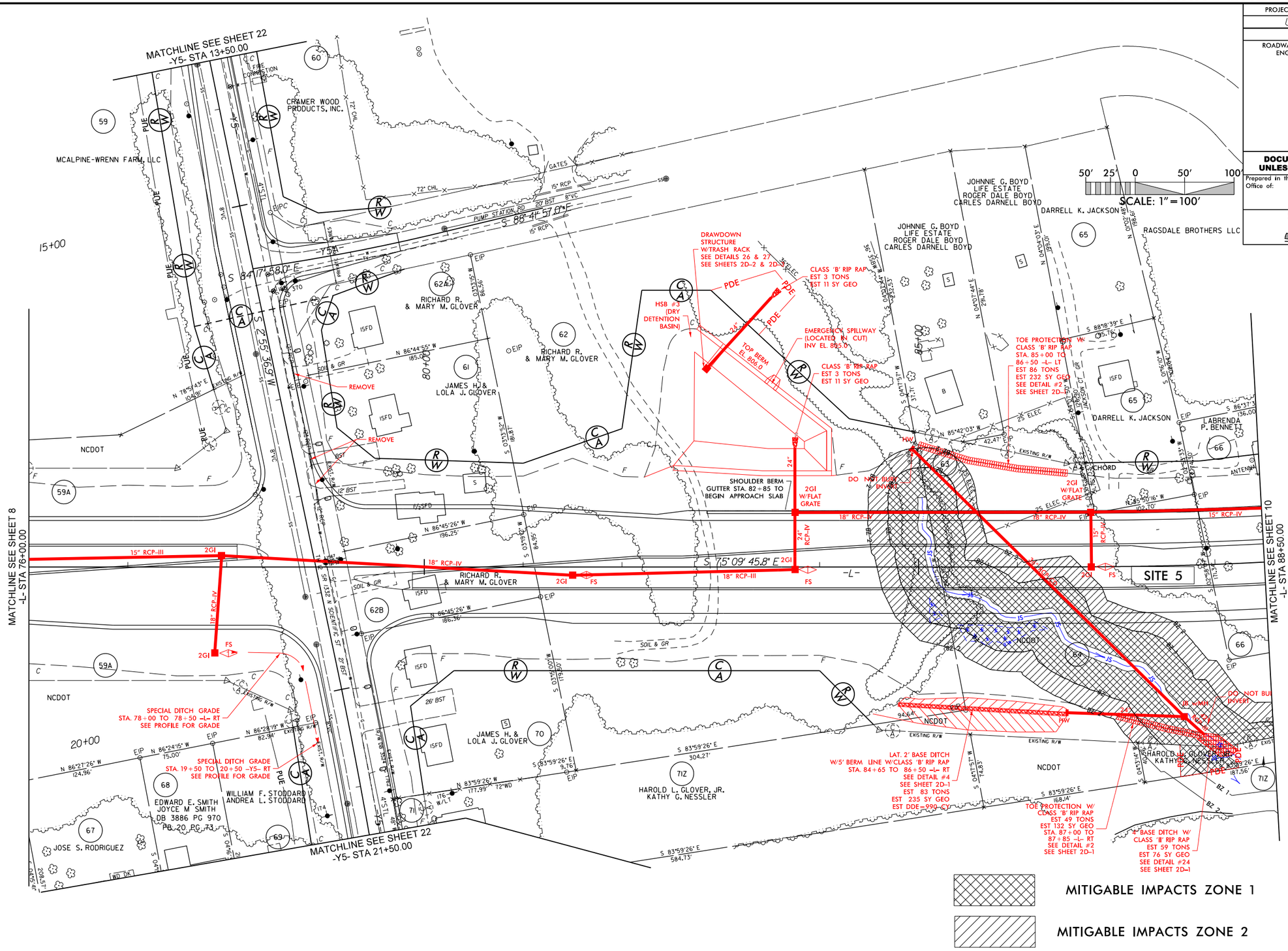
SCALE: 1" = 100'

NAD 83/99



★ PROP. TRAFFIC SIGNAL

-L- PFL SEE SHEET 27
-Y5- PFL SEE SHEET 36
-Y5A- PFL SEE SHEET 37

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2/23/2018
U2412A_sgd_prm_buf_psh_09.dgn
jhorvat

BUFFER DRAWING SHEET 9 OF 21

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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BEG APPROACH SLAB STA 89+80.61 LT
BEG BRIDGE STA 90+04.74 LT
-L-POC Sta. 90+47.94
-Y6A-POT Sta. 16+88.44
△ = 108° 40' 08.1"
END APPROACH SLAB STA 96+90.89 LT
END BRIDGE STA 96+66.87 LT
BEG APPROACH SLAB STA 89+66.12 RT
BEG BRIDGE STA 89+89.89 RT
DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP
END BRIDGE STA 96+41.91 RT
END APPROACH SLAB STA 96+66.60 RT

NAD 83/95

MATCHLINE SEE SHEET 9 -L- STA 88+50.00

MATCHLINE SEE SHEET 11 -L- STA 102+00.00

RAGSDALE BROTHERS LLC

LABRENDA P. BENNETT

CITY OF HIGH POINT

NANCY T. GUITON

UT DEEP RIVER

-L- CS Sta. 98+84.71

-L- ST Sta. 100+84.71

N 80° 03' 37.0" E

15" RCP-III

24" RCP-IV

30" RCP-III

CLASS 'B' RIP RAP EST 5 TONS EST 16 SY GEO

EMERGENCY SPILLWAY (LOCATED IN CUT) INV. EL. 734.5

DRAWDOWN STRUCTURE W/TRASH RACK SEE DETAILS 26 & 27 SEE SHEETS 2D-2 & 2D-3

HSB #4 (DRY DETENTION BASIN)

TOP BERM EL 735.5

24" DIP

INV=719.43 CALCULATED (CALCULATED FROM UPSTREAM MH DIRECT MEASUREMENT DEPTH 35.8)

JB w/MH

CLASS 'B' RIP RAP EST 5 TONS EST 19 SY GEO

30" W/ ELBOWS

2GI W/ FLAT GRATE

TB 2GI W/ FLAT GRATE

STRUCTURE PAY ITEM

MSE WALL STRUCTURE PAY ITEM

DO NOT BURY INVERT

LAT. 2' BASE DITCH STA. 98+75 TO 99+50 -L- RT SEE DETAIL #1 SEE SHEET 2D-1 EST DDE=55 CY

SITE 5

SITE 6

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 27 & 28

FOR STRUCTURES SEE SHEET S-1 THRU S-?

50' 25' 0 50' 100'

SCALE: 1"=100'

2/23/2018
U2412A_Hyd_prm_buf_psh_10.dgn
lbarnes

BUFFER DRAWING SHEET 10 OF 21

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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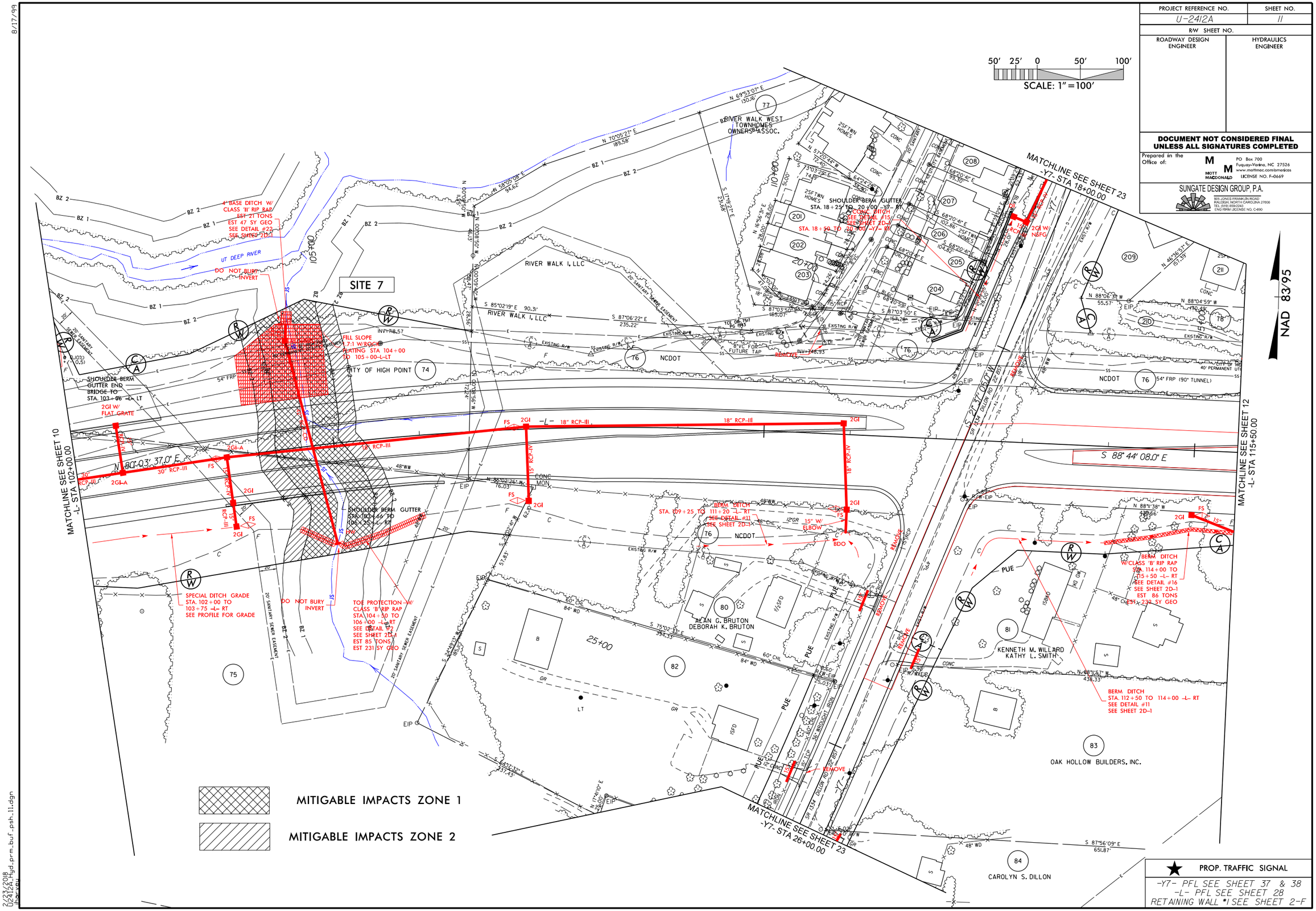

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2/23/2018
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jbarker

BUFFER DRAWING SHEET 11 OF 21

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	12
R/W SHEET NO.	
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SCALE: 1" = 100'

NAD 83/95

MATCHLINE SEE SHEET 11 -L- STA 115+50.00

MATCHLINE SEE SHEET 13 -L- STA 129+00.00

SITE 8

SITE 9

HW 24" W/ELBOWS

SHOULDER BERM GUTTER STA. 115+50 TO 126+42 -L- LT

LAT. 2' BASE DITCH W/5.0' BERM LINED W/CLASS 'B' RIP RAP EST 180 TONS EST 508 ST GEO STA. 115+50 TO 119+50 -L- LT SEE DETAIL #4 SEE SHEET 2D-1 EST DDE=420 CY

CLASS 'I' RIP RAP EST 11 TONS EST 30 SY GEO

CLASS 'II' RIP RAP EST 32 TONS EST 67 SY GEO SEE DETAIL #2 SEE SHEET 2D-1

CLASS 'B' RIP RAP EST 3 TONS EST 11 SY GEO

HSB #5 BOTTOM EL. 738.0 TOP BERM EL. 744.5

HW W/SLUICE GATE

CLASS 'B' RIP RAP EST 5 TONS EST 16 SY GEO

CLASS 'B' RIP RAP EST 1 TONS EST 5 SY GEO

TOE PROTECTION W/ CLASS 'B' RIP RAP STA. 118+00 TO 124+00 -L- RT SEE DETAIL #2 SEE SHEET 2D-1 EST 343 TONS EST 925 SY GEO

DO NOT BURY INVERT

BURY INVERT 1'

2GI W/ FLAT GRATE

15" RCP-IV

18" RCP-III

24" RCP-III

30" RCP-IV

S 88°44'08.0" E

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

-L- PFL SEE SHEET 28 & 29

2/27/2018
U2412A_Hyd_prm_buf_psh_12.dgn
bpowell

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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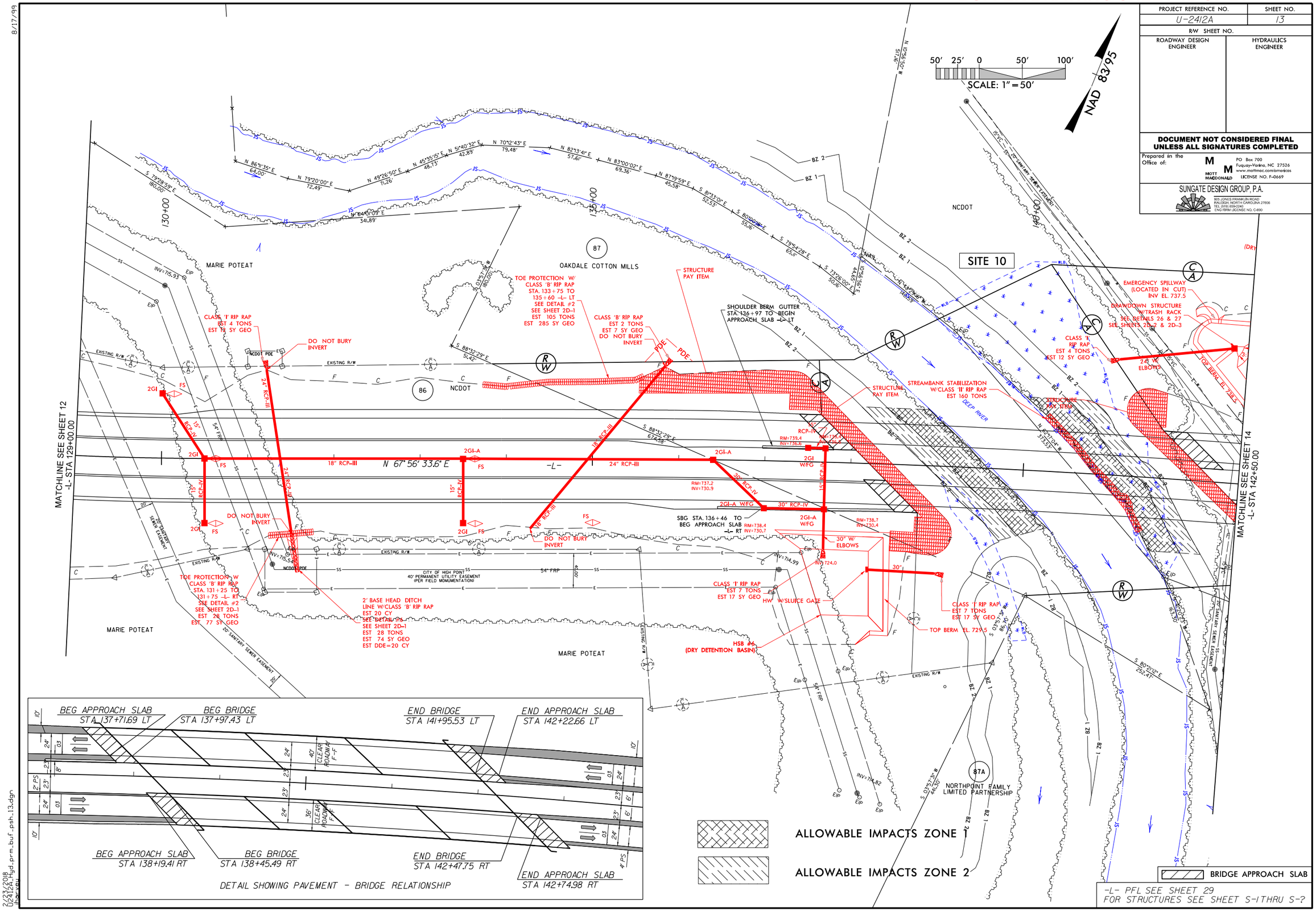

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2/23/2018
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bgravely

BUFFER DRAWING SHEET 13 OF 21

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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ENG FIRM LICENSE NO. C-690

SCALE: 1" = 50'

NAD 83/95

SITE 11

MATCHLINE SEE SHEET 13 -L- STA 142+50.00

MATCHLINE SEE SHEET 15 -L- STA 156+00.00

WAYNE LEE HATCHEL
LUCRETIA A. DALTON
ROBERT E. & LOIS W. SMITH
JACKIE LEE & BARBARA M. CAMPBELL
MARY OAK PLAZA, LLC.
GUS & FOTINI ANDY
CREEK RUN LLC
NCDOT
RICK LYLES DALLAS A. COLLINS
BULL RUN VILLAGE LLC.
NORTHPOINT FAMILY LIMITED PARTNERSHIP
OAKDALE COTTON MILL VILLAGE HISTORIC DISTRICT
OAKDALE METHODIST CHURCH

HSB #7 DETENTION BASIN)
TOP BERM EL 738.5
BERM DITCH
CLASS 'B' RIP RAP EST 3 TONS EST 11 SY GEO
CLASS 'B' RIP RAP EST 1 TONS EST 5 SY GEO
15" W/ ELBOW
15" W/ ELBOWS
18" RCP-III
15" RCP-III
48" CONC
24" CSP
REMOVE
RETAIN
2GI W/ FLAT GRATE
STRUCTURE PAY ITEM
SBG STA. 150+14 TO BEGIN BRIDGE -L- RT
SHOULDER BERM GUTTER
BM II

DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP

-L-POT Sta. 147+48.15
-Y8-POT Sta. 14+97.65
△ = 90° 20' 28.3"
BEG BRIDGE STA 13+91.15
END BRIDGE STA 16+00.15
BEG APPROACH SLAB STA 13+76.98
END APPROACH SLAB STA 16+14.32

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 29 & 30
-Y8- PFL SEE SHEET 38
-L- PAVEMENT/BRIDGE SKETCH SEE SHEET 15
FOR STRUCTURES SEE SHEET S-1 THRU S-?

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2/23/2018
U2412A_
hydraulic_bridge_prm_buf_psh_14.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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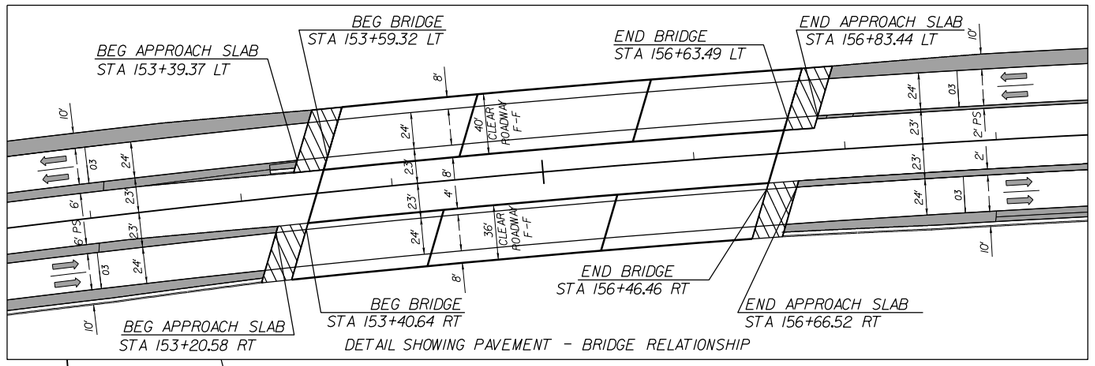
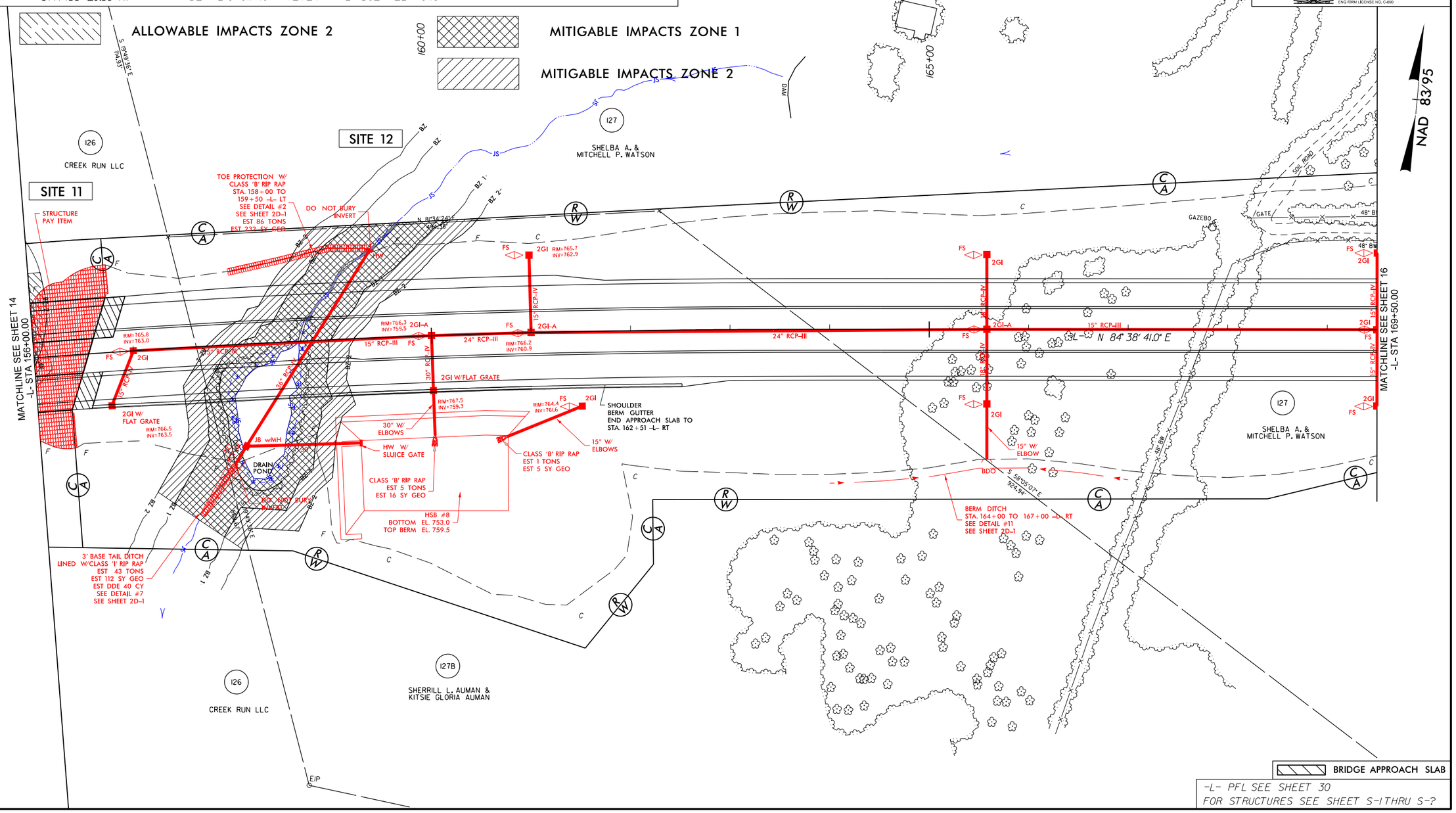
SCALE: 1" = 100'



DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP



BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 30
FOR STRUCTURES SEE SHEET S-1 THRU S-?

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2/23/2018
U2412A_hyd_prm_buf_psh_15.dgn
lbarnes

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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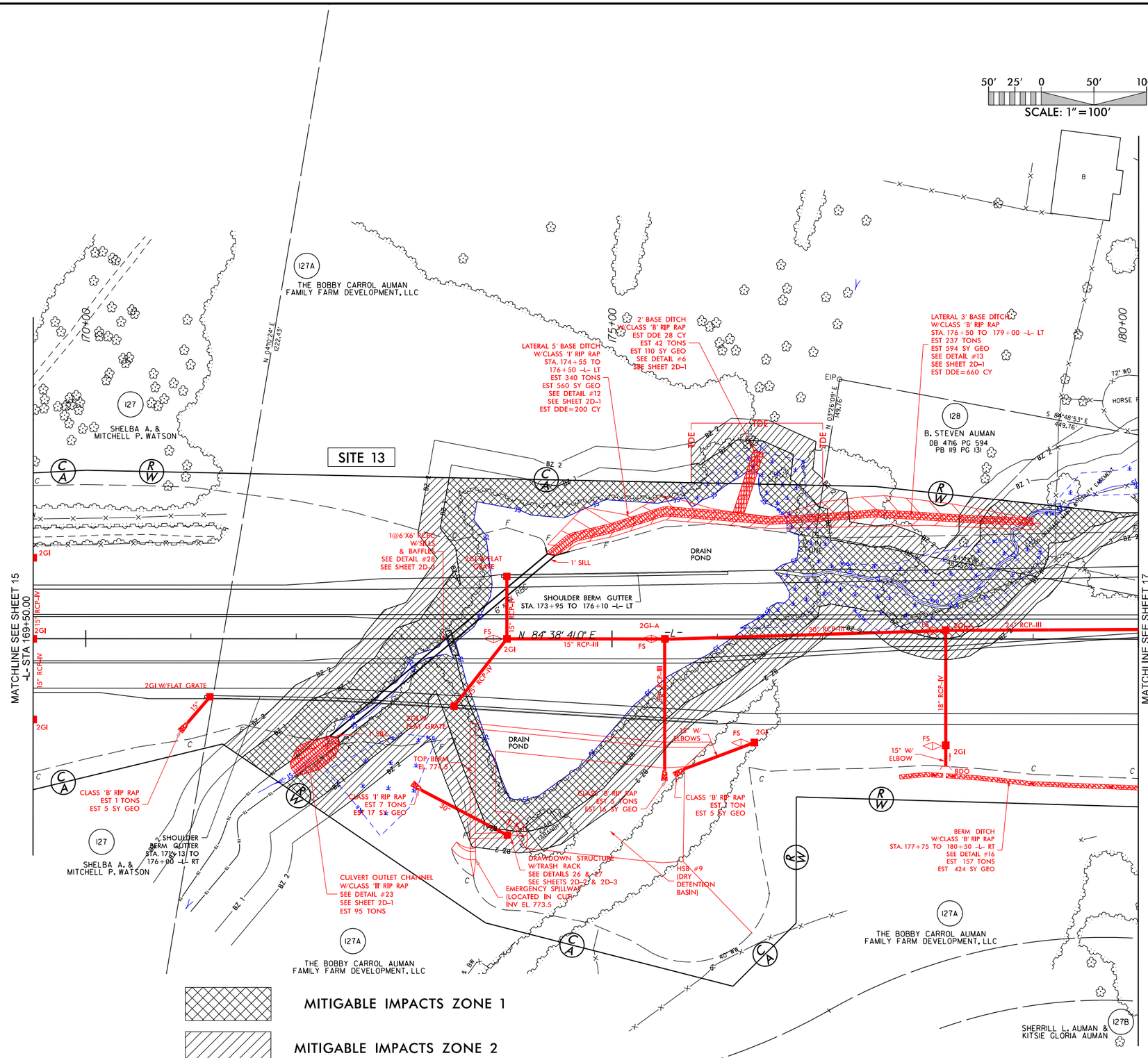

-L- PFL SEE SHEET 30 & 31

FOR CULVERT PLANS SEE SHEETS C-1 THRU C-2

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2/23/2018
U2412A_hyd_prm_buf_psh_16.dgn
bpr:Eu

BUFFER DRAWING SHEET 16 OF 21

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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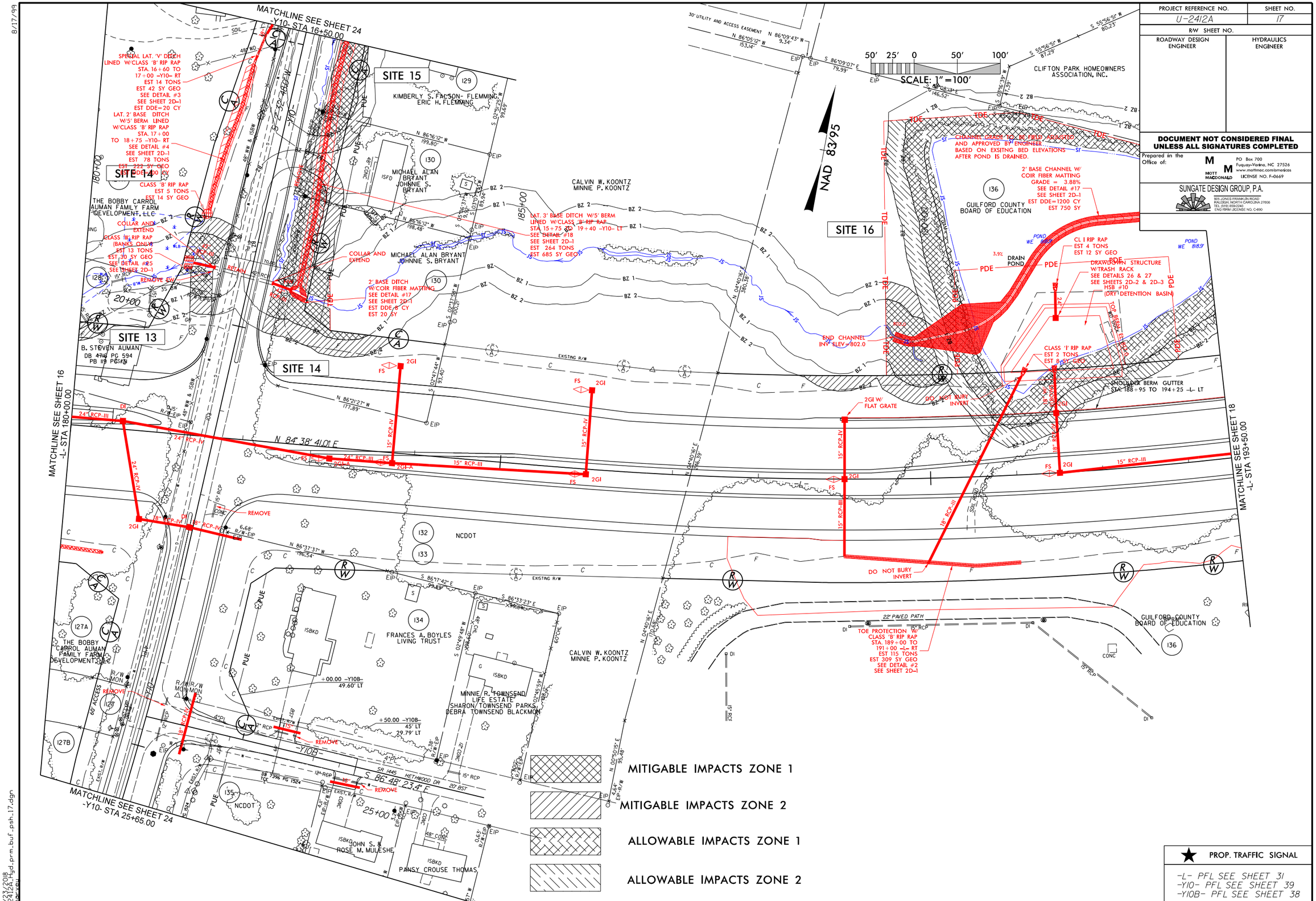

★ PROP. TRAFFIC SIGNAL

-L- PFL SEE SHEET 31
-Y10- PFL SEE SHEET 39
-Y10B- PFL SEE SHEET 38

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2/23/2018
U2412_hydd_prm_buf_psh_17.dgn
bbryan

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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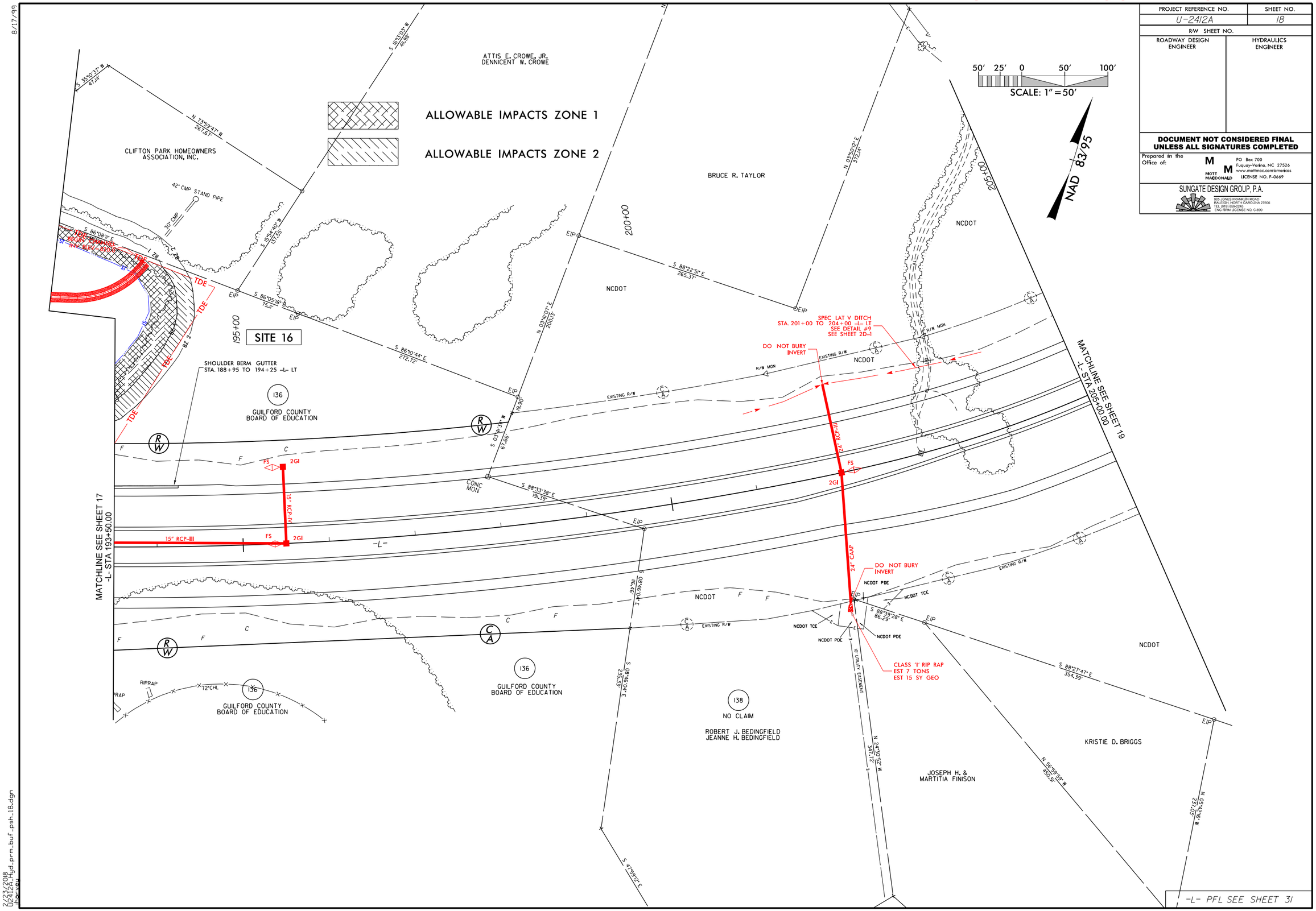

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2/23/2018
U2412A_hyd_prm_buf_psh_18.dgn
harvey

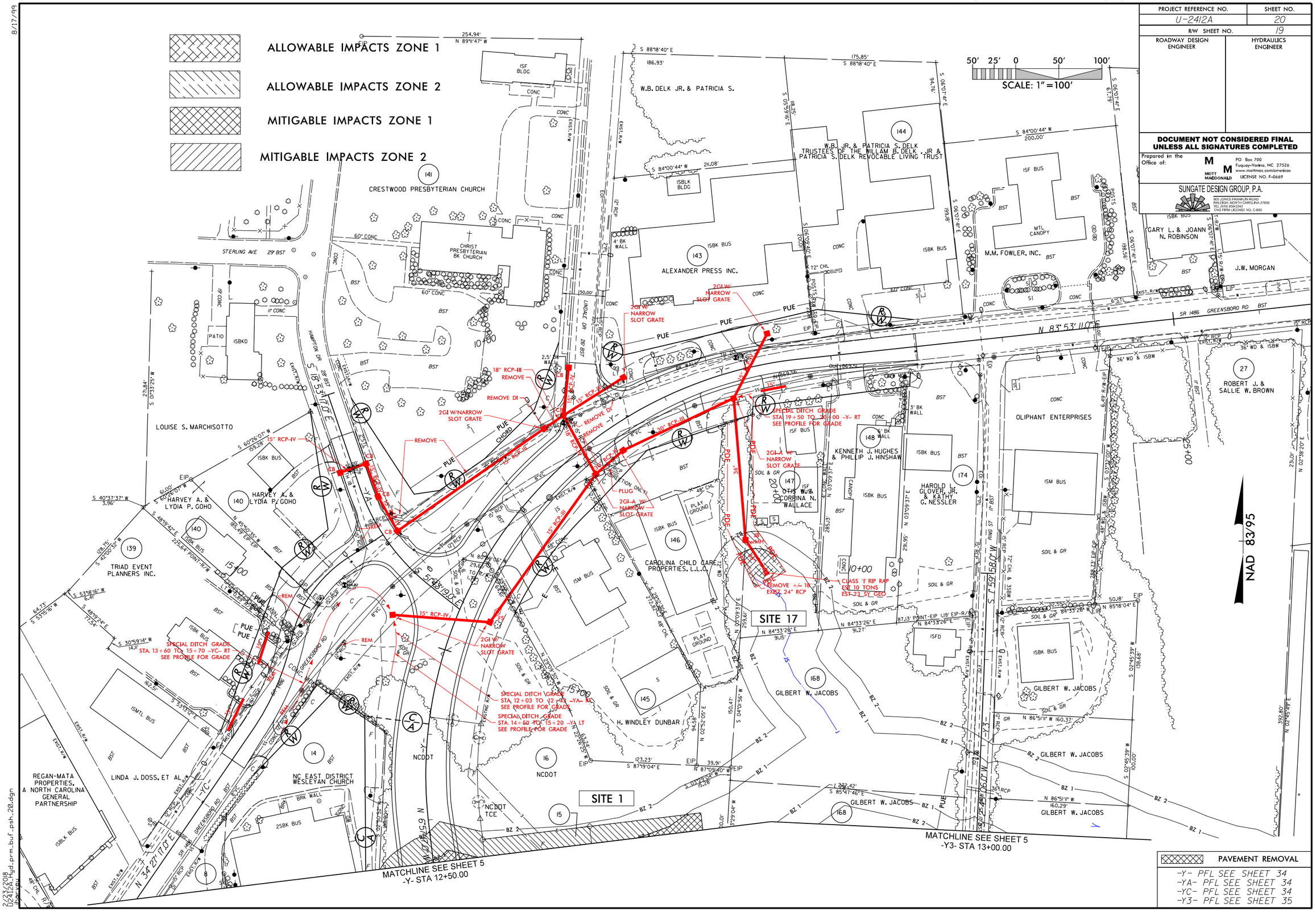
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	20
R/W SHEET NO.	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of: MOTT MACDONALD
PO Box 700
Fuquay-Varina, NC 27526
www.mottmac.com/americas
LICENSE NO. F-0669

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-690



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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-690

8/17/99

NAD 83/95

PEGGY K. WEAVER

WALTER K. BURTON
JOYCE A. BURTON

HENRY A. SCOTT, JR.
GILDA F. SCOTT

-Y10- POT Sta. 10+00.00

BRENDA KENNEDY

GEORGE J. TAYLOR HEIRS

GEORGE J. TAYLOR HEIRS

-Y10- PC Sta. 13+61.20

GEORGE J. TAYLOR

GEORGE J. TAYLOR HEIRS

BEGIN CONSTRUCTION
-Y10- POC Sta. 14+65.00

THE BOBBY CARROLL AUMAN FAMILY FARM DEVELOPMENT LLC

-Y10- PT Sta. 16+31.68

MATCHLINE SEE SHEET 17
-Y10- STA 16+50.00

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

STEPHEN EDWARD BENOIT
LEIGH ANNE BENOIT

DORIS JACKSON

SITE 15

CLIFTON PARK HOMEOWNERS ASSOCIATION, INC.

KIMBERLY S. WILSON-FLEMMING
ERIC H. FLEMMING

BEG WW FENCE

LAT. 3' BASE DITCH W/5' BERM LINED W/CLASS 'B' RIP RAP
STA. 15+75 TO 19+40 -Y10- LT
SEE DETAIL #18
SEE SHEET 2D-1
SEE SHEET 17 FOR QUANTITIES
EST DDE=540 CY

REMOVE

-Y10- PFL SEE SHEET 39

NAD 83/95

MATCHLINE SEE SHEET 17
-Y10- STA 25+65.00

SHERRILL L. AUMAN & KITSIE GLORIA AUMAN

END WW FENCE

ROSE M. MULESHE

PANSY CROUSE THO

BEG WW FENCE

DONALD HETHCOX

THOMAS J. RANDO

WALTER A. & SYLVIA C. LIPPARD, JR

JEFFREY TYLER RUSH

WILLIAM L. SANDRIDGE

END CONSTRUCTION
-Y10- POT Sta. 32+00.00

CLASS 'B' RIP RAP
EST 2 TONS
EST 7 SY GEO

REMOVE

SPECIAL LAT. 'V' DITCH
STA. 29+50 TO 32+00 -Y10- LT
SEE DETAIL #9

RETAIN

-Y10- PFL SEE SHEET 39

2/23/2018
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jbarwell

RIPARIAN BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	DITCH	27+94 to 28+68 -L- LT	X						21,406	18,009	39,415		
2	ROADWAY FILL	35+76 to 46+10 -L-	X						45,276	27,771	73,047		
3	36" RCP	51+06 to 51+57 -L-	X			5,208	4,972	10,180					
4	54" RCP	52+57 to 53+13-L-	X						26,140	20,878	47,018		
5	36" RCP	84+49 to 89+08 -L-	X						30,129	20,878	51,007		
6	BRIDGE	94+06 to 96+23-L-		X		11,465	7,451	18,916					
7	42" RCP	104+19 to 105+56-L-	X						17,689	11,782	29,471		
8	66" RCP	118+97 to 121+07-L-	X						26,549	17,359	43,908		
9	24" RCP	121+07 to 123+41 -L-	X						10,559	9,478	20,037		
10	BRIDGE	138+21 to 141+21 -L-		X		12,930	4,784	17,714					
11	BRIDGE	152+69 to 156+16-L-		X		22,336	15,050	37,386					
12	36" RCP/POND	157+16 to 160+51-L-	X						23,818	15,825	39,643		
13	6'x6' RCBC/POND	171+31 to 180+44-L-	X						61,627	35,903	97,530		
14	ROADWAY FILL	17+86 to 20+09-Y10-	X						6,068	4,602	10,670		
15	ROADWAY FILL	15+25 to 17+79-Y10-LT			X				11,181	5,682	16,863		
16	POND	188+45 to 194+47-L-LT	X			31,329	17,159	48,488	4,398	3,906	8,304		
17	36" RCP	19+00 to 19+80-Y-RT	X			1,320	720	2,040					
TOTAL:						84,588	50,136	134,724	284,840	192,073	476,913	0	0

NOTE:
Site 13 and 14 are on same stream

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILFORD COUNTY
PROJECT: 34802.2.2
U-2412A

2/23/2018
SHEET 20 OF 21

Rev. SEP 2016

WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)		WETLANDS IN BUFFERS ZONE 1 (ft^2)	WETLANDS IN BUFFERS ZONE 2 (ft^2)
1	27+94 to 28+68 -L- LT		1,369	246
2	35+76 to 46+10 -L-		8,080	2,321
5	84+49 to 89+08 -L-		1,214	103
8	118+97 to 121+07-L-		12,301	6,564
9	121+07 to 123+41 -L-		27	13
10	138+21 to 141+21 -L-		6,844	3,479
12	157+16 to 160+51-L-		2,265	0
13	171+31 to 180+44-L-		16,929	2,516
14	17+86 to 20+09-Y10-		473	67
TOTAL:			49,502	15,309

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

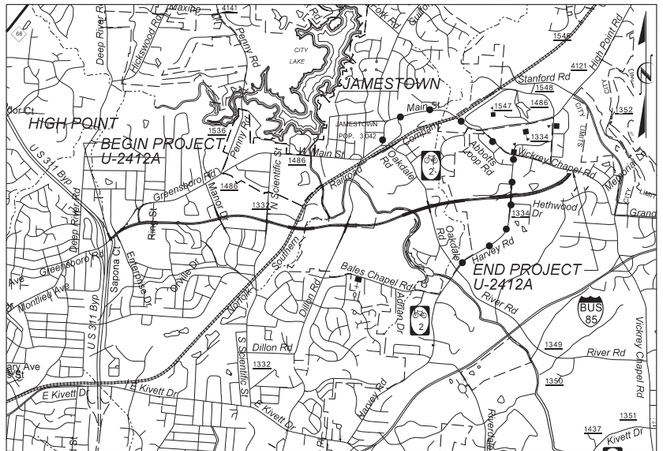
GUILFORD COUNTY
PROJECT: 34802.2.2
U-2412A

2/23/2018
SHEET 21 OF 21

TIP PROJECT: U-2412A

CONTRACT:

SEE SHEET 1A FOR INDEX OF SHEETS
SEE SHEET 1B FOR CONVENTIONAL SYMBOLS



VICINITY MAP

DETOUR FOR OAKDALE ROAD BRIDGE CONSTRUCTION

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

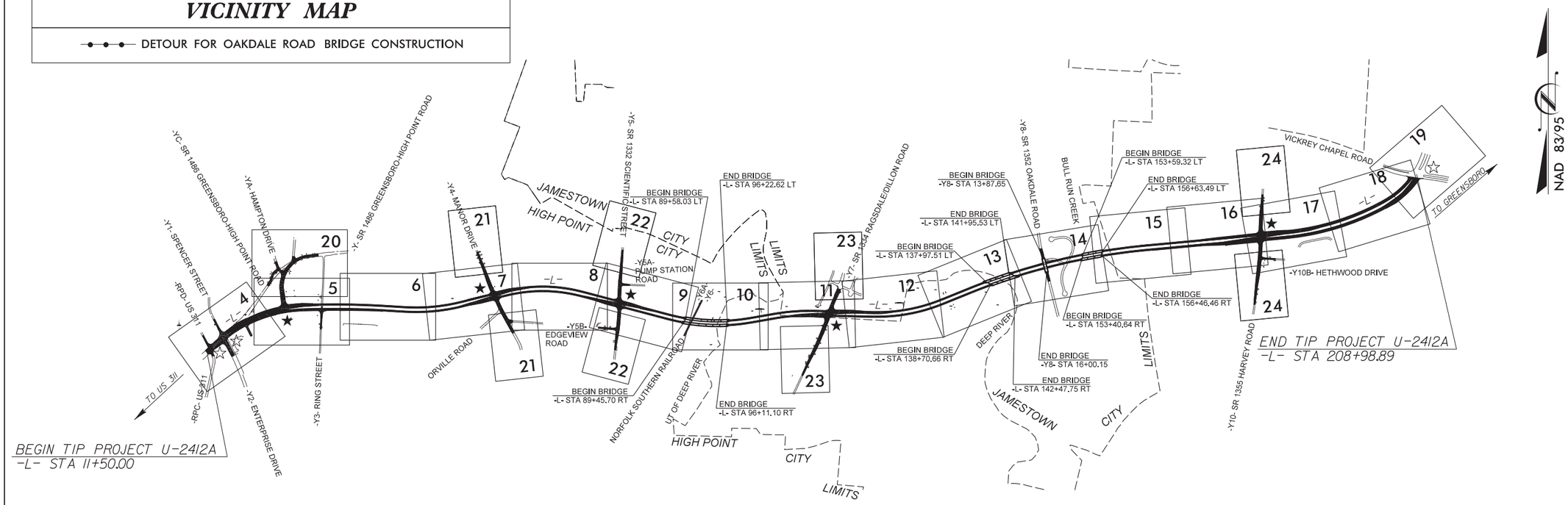
GUILFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2412A	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34802.1.1	STP-4121(3)	PE
34802.2.2	STP-4121(3)	RW & UTL.

LOCATION: SR-1486 /SR-4121 (GREENSBORO/HIGH POINT ROAD) FROM PROPOSED US 311 BYPASS TO WEST OF SR 1480 (VICKREY CHAPEL ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERT, & SIGNALS



THIS IS A CONTROLLED ACCESS FACILITY WITH ACCESS BEING LIMITED TO INTERSECTIONS.

NCDOT CONTACT: TATIA WHITE, PE, PLS, CPM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2018 = 35,880
ADT 2038 = 44,720
K = 9 %
D = 55 %
T = 4 % *
V = 60 MPH
* TTST =1% DUAL 3%
FUNC CLASS =
URBAN ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT	U-2412A	=	3.481	MILES
LENGTH STRUCTURES TIP PROJECT	U-2412A	=	.259	MILES
TOTAL LENGTH OF TIP PROJECT	U-2412A	=	3.740	MILES

PLANS PREPARED FOR THE NCDOT BY:

MOTT MACDONALD
PO Box 700
Fuquay-Varina, NC 27526
(919) 552-2253
(919) 552-2254 (Fax)
www.mottmac.com/americas
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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 20, 2009

LETTING DATE:
JUNE 19, 2018

MICHAEL PEKAREK, PE
PROJECT ENGINEER

BRIAN PHILLIPS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

09/08/06

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PROJECT REFERENCE	SHEET NO.
U-2412A	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

**S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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MOTT MACDONALD
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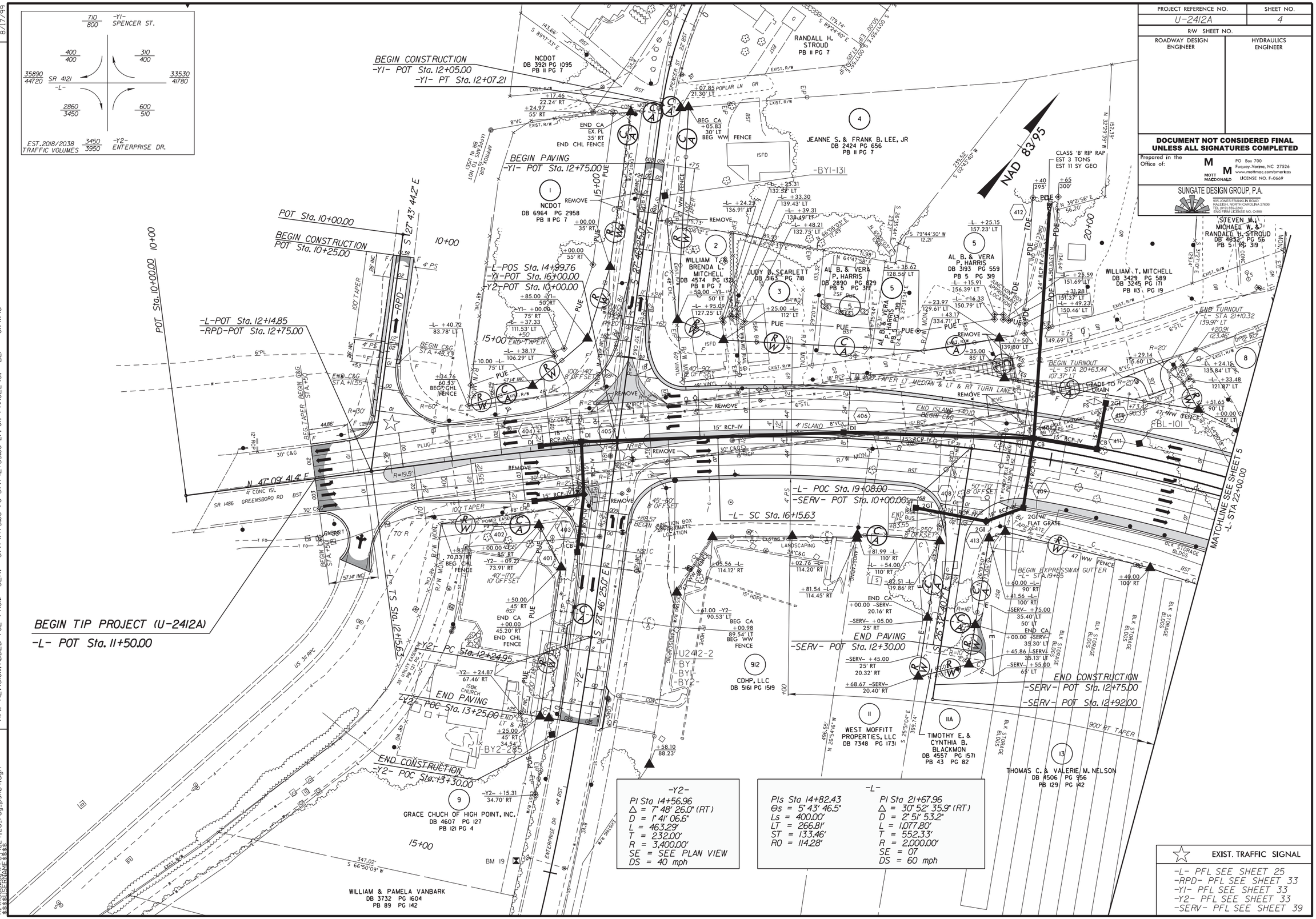
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-0243
ENG FIRM LICENSE NO. C-890

REVISIONS

REVISED PARCEL 6 & 7 TO 5; PARCEL10 TO 912; PARCEL 12 TO 11 - REVISED 6-24-09
R/W REVISION; UPDATED PROPERTY OWNER NAMES AND/OR DEED REFERENCES ON PARCELS 1,4,5 AND 11; UPDATED EXISTING R/W AND C/A TO REFLECT THE ADVANCED ACQUISITION ON PARCEL 912; REVISED ONE TRACT OF PARCEL 11A; ADJUSTED C/A ON PARCEL 9; UPDATED PROPERTY LINE BETWEEN PARCELS 11 AND 912; ADJUSTED PROPOSED R/W ON PARCEL 1; ADJUSTED PUE ON PARCELS 1 THROUGH 3,5 AND 9; ADDED PUE ON PARCEL 8. - TEM - 05/26/17
R/W REVISION; REVISED PROPOSED R/W AND C/A FROM -L- STA. 18+82.51 TO STA. 19+60.00 ON PARCELS 11A AND 13; ADDED TCE ON PARCEL 11. - BLP - 11/14/17
R/W REVISION; REVISED PUE ON PARCEL 1. - BLP - 12/11/17
R/W REVISION; ADDED TCE FROM -SERV- STA 11+75.00 TO STA 12+55.00 LT. ON PARCEL 13. - BLP - 01/11/18



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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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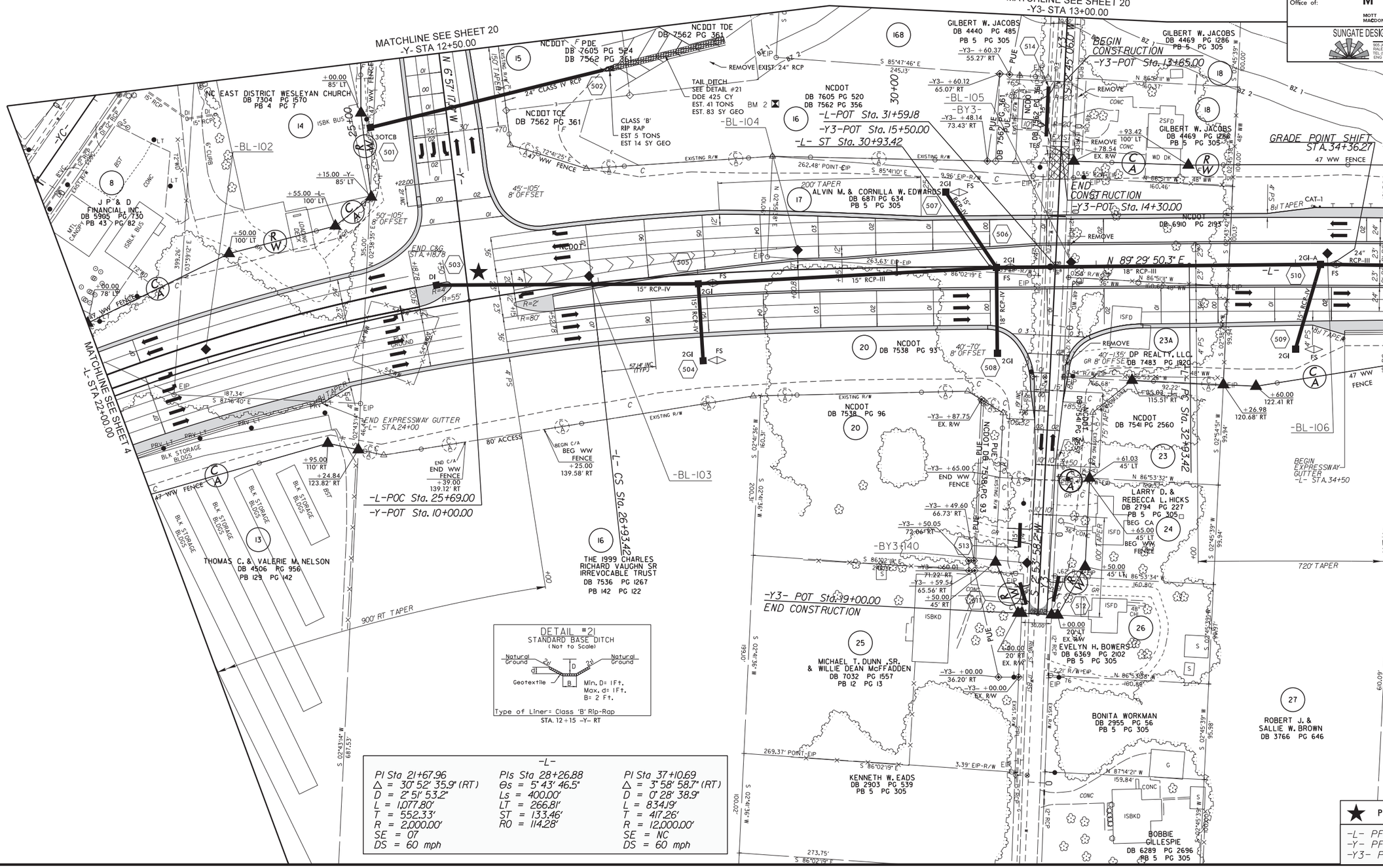
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

REVISIONS

8/17/99 REVISED OWNER FOR PARCELS 14,15,16,& 17; REVISED PARCEL 22 TO 20 - REVISED 6-24-09
ADDED 80' ACCESS BREAK IN CA FOR PARCEL 16 REVISED 9-9-11
1/25/16 R/W REV: ADDED PARCEL 23A AND CORRECTED ITS PROPERTY OWNER AND DEED REFERENCE - TLW
R/W REVISION: CREATED PARCEL 168; UPDATED PROPERTY OWNER NAMES AND/OR DEED REFERENCES ON PARCELS 14 THROUGH 17, 20, 23 AND 25; UPDATED EXISTING R/W, C/A AND PDE TO REFLECT AN ACQUISITION ON PARCELS 15, 16, 20 AND 23; ADJUSTED PUE ON PARCELS 16, 20 AND 25; ADDED PUE ON PARCEL 168. - TEM - 05/26/17
R/W REVISION: UPDATED SURVEYS TO SHOW ADJOINING PROPERTY AS COMBINED WITH PARCEL 18. - BLP - 12/11/17



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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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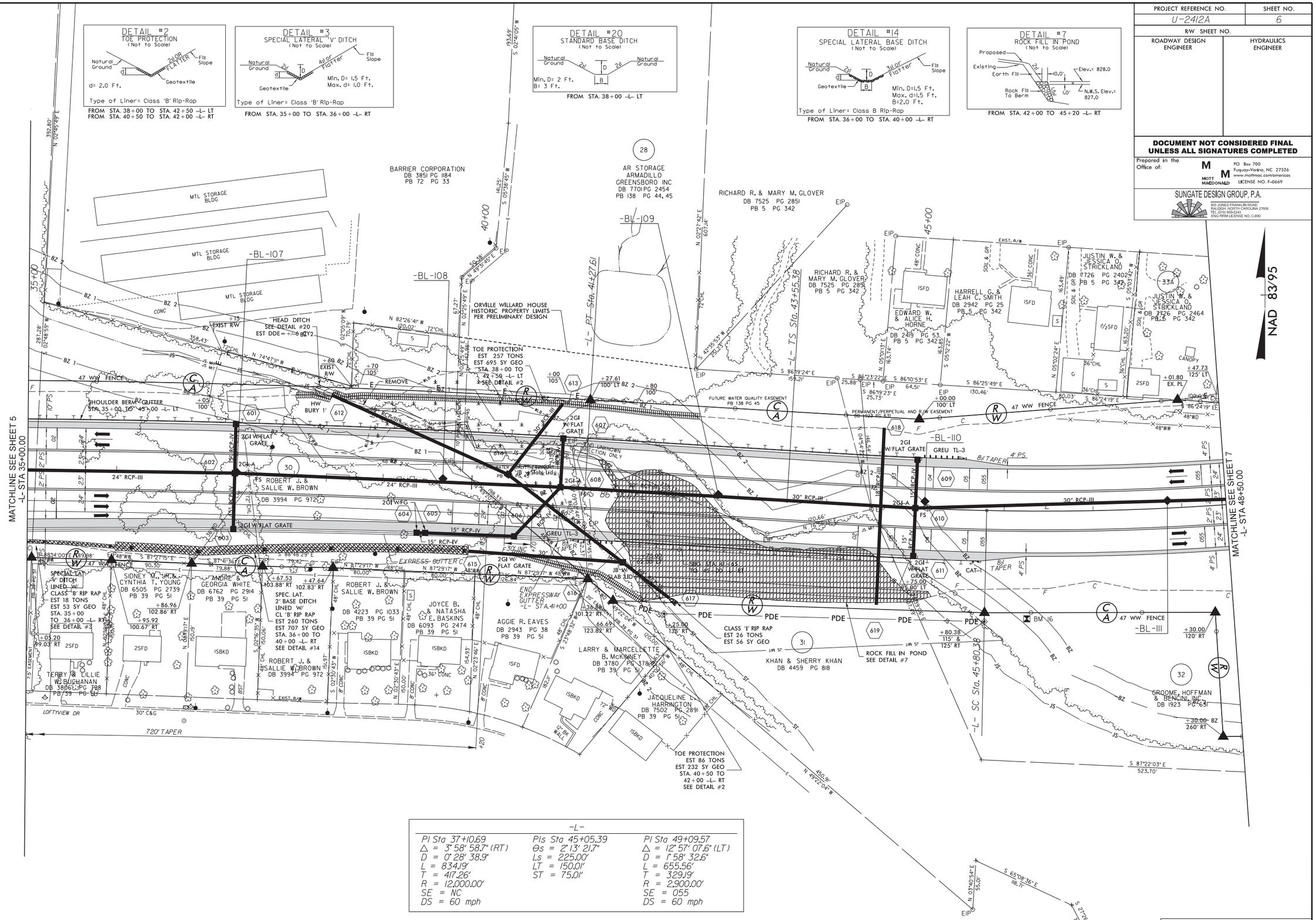
REVISIONS

8/17/99

REVISED OWNER FOR PARCEL 29-REVISED ROW AND PDE MONUMENT TO SC STA.45+80.38 RT - REVISED 6-24-09
R/W REVISION-CREATED PARCEL 33A-ADDED TCE ON PARCEL 33A-UPDATED PROPERTY OWNER NAMES AND/OR DEED REFERENCES ON PARCELS 28 AND 30;UPDATED PROPOSED R/W AND C/A ON PARCEL 30. - TEM - 05-26-11



-L-

PI Sta 37+10.69	PIs Sta 45+05.39	PI Sta 49+09.57
△ = 3° 58' 58.7" (RT)	Θs = 2° 13' 21.7"	△ = 12° 57' 07.6" (LT)
D = 0° 28' 38.9"	Ls = 225.00'	D = 1° 58' 32.6"
L = 834.19'	LT = 150.01'	L = 655.56'
T = 417.26'	ST = 75.01'	T = 329.19'
R = 12,000.00'		R = 2,900.00'
SE = NC		SE = 055
DS = 60 mph		DS = 60 mph

2:19:05 PM
21-Jan-2026
C:\pwworking\proj\U2412A_rdy_psh06.dgn
dhunter

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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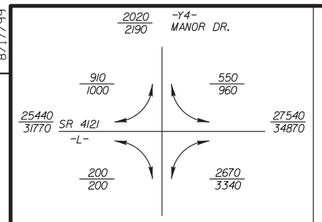
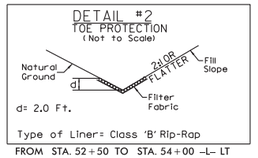
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

REVISIONS

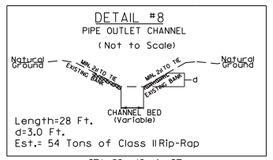
8/17/99

REVISED PARCEL 35 & 36 TO 34;44,46,48,50 & 51TO 43;56 TO 54;45 TO 9/7;REVISED OWNER FOR PARCEL 39B,40,52,55,& 59;ADDED PARCEL 59A;REVISED 6-24-09
R/W REVISION:UPDATED PROPOSED R/W AND C/A ON PARCEL 34 TO PARCELS 34A AND 34B;REVISED THREE TRACTS OF PARCEL 43
TO PARCELS 43A,43B AND 43C;ADJUSTED C/A AND ADDED A 20' DRIVEWAY AT -Y4- STA 21+47 RT ON PARCEL 55;
UPDATED EXISTING R/W AND C/A TO REFLECT AN ACQUISITION ON PARCELS 47,49,59A AND 9/7;UPDATED PROPERTY OWNER NAMES AND/OR DEED REFERENCES
ON PARCELS 37,38,39B,42,43,43A,43B,43C,47,49,58,59 AND 9/7;ADJUSTED PUE ON PARCELS 41,42,47 AND 9/7;ADDED PUE ON PARCELS 53,54 AND 58;REMOVED
PUE ON PARCELS 34B,37 THROUGH 39,39A THROUGH 39C;CORRECTED STA/OFF AT -L- STA 60+00 RT ON PARCEL 54;ADDED NO CLAIM ON PARCELS 39A
THROUGH 39C;- TEM - 05/26/17
R/W REVISION:ADDED PUE ON PARCELS 34B,37 AND 38;- BLP - 12/11/17

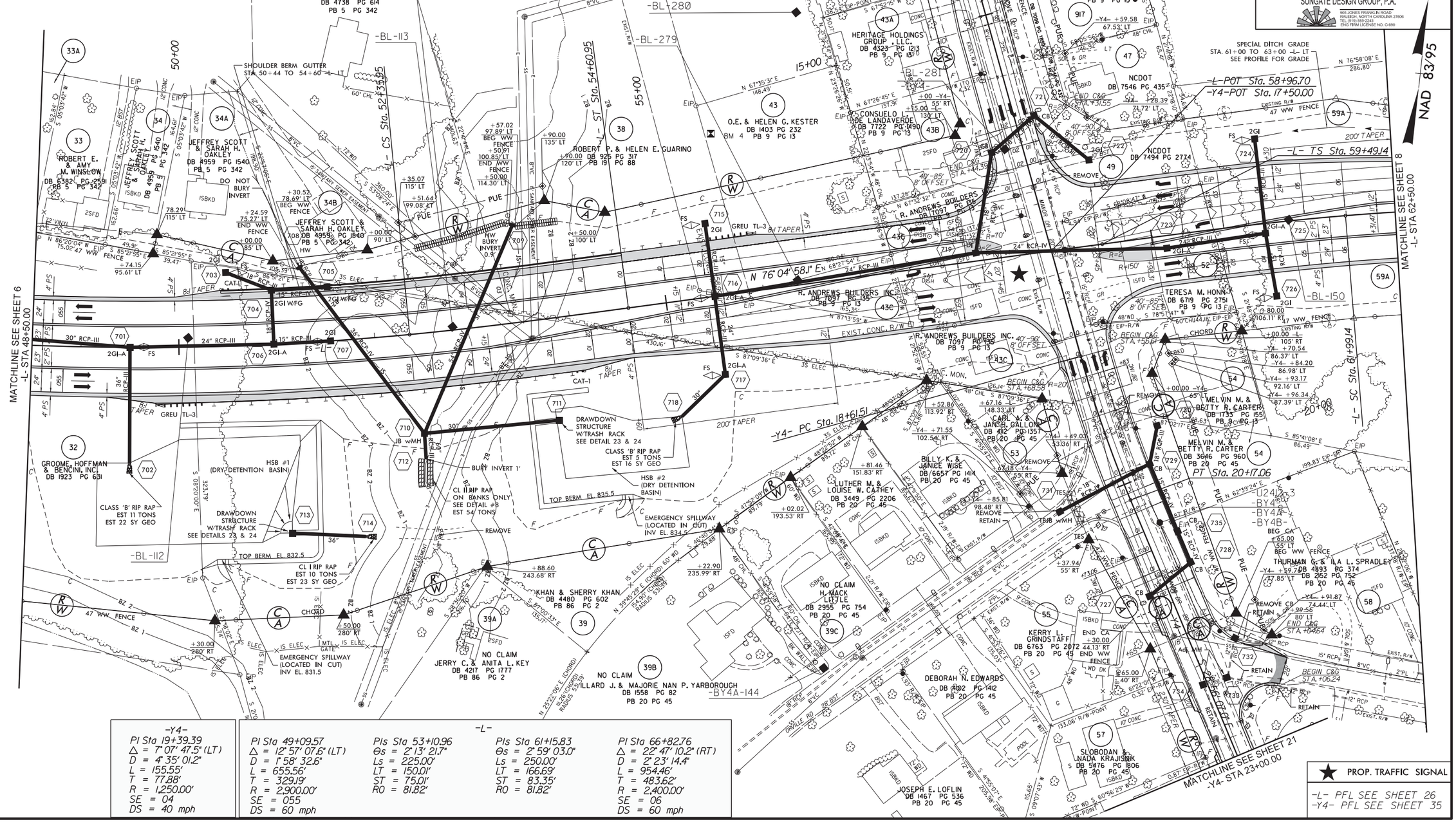




FROM STA. 52+50 TO STA. 54+00 -L- LT



STA. 52+42 -L- RT



-Y4-

PI Sta 19+39.39	
Δ = 7° 07' 47.5" (LT)	
D = 4° 35' 01.2"	
L = 155.55'	
T = 77.88'	
R = 1,250.00'	
SE = 04	
DS = 40 mph	

-L-

PI Sta 49+09.57	PIs Sta 53+10.96	PIs Sta 61+15.83	PI Sta 66+82.76
Δ = 12° 57' 07.6" (LT)	Θs = 2° 13' 21.7"	Θs = 2° 59' 03.0"	Δ = 2° 23' 14.4"
D = 1° 58' 32.6"	Ls = 225.00'	Ls = 250.00'	D = 2° 23' 14.4"
L = 655.56'	LT = 150.01'	LT = 166.69'	L = 954.46'
T = 329.19'	ST = 75.01'	ST = 83.35'	T = 483.62'
R = 2,900.00'	R0 = 81.82'	R0 = 81.82'	R = 2,400.00'
SE = 055			SE = 06
DS = 60 mph			DS = 60 mph

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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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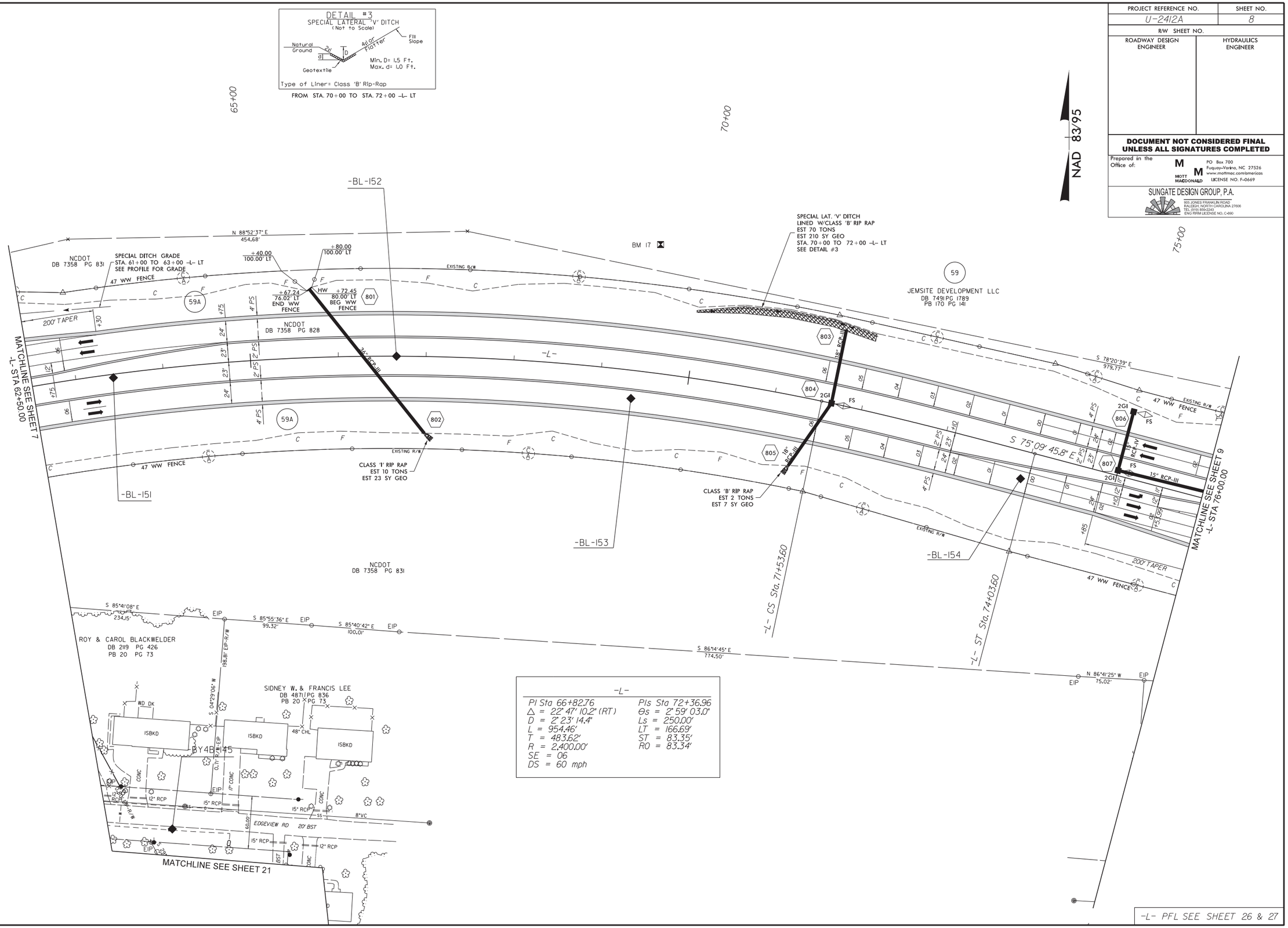
RALEIGH, NORTH CAROLINA 27606
TEL: (919) 859-2243
ENG FIRM LICENSE NO. C-690

8/17/99

REVISIONS

ADDED PARCEL 59A, REVISED OWNER FOR PARCEL 59 - REVISED 6-24-09
R/W REVISION: UPDATED EXISTING R/W AND C/A TO REFLECT AN ACQUISITION ON PARCEL 59A; UPDATED PROPERTY OWNER NAMES AND/OR DEED REFERENCES ON PARCELS 59 AND 59A - TEM - 05/26/17



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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	9
R/W SHEET NO.	
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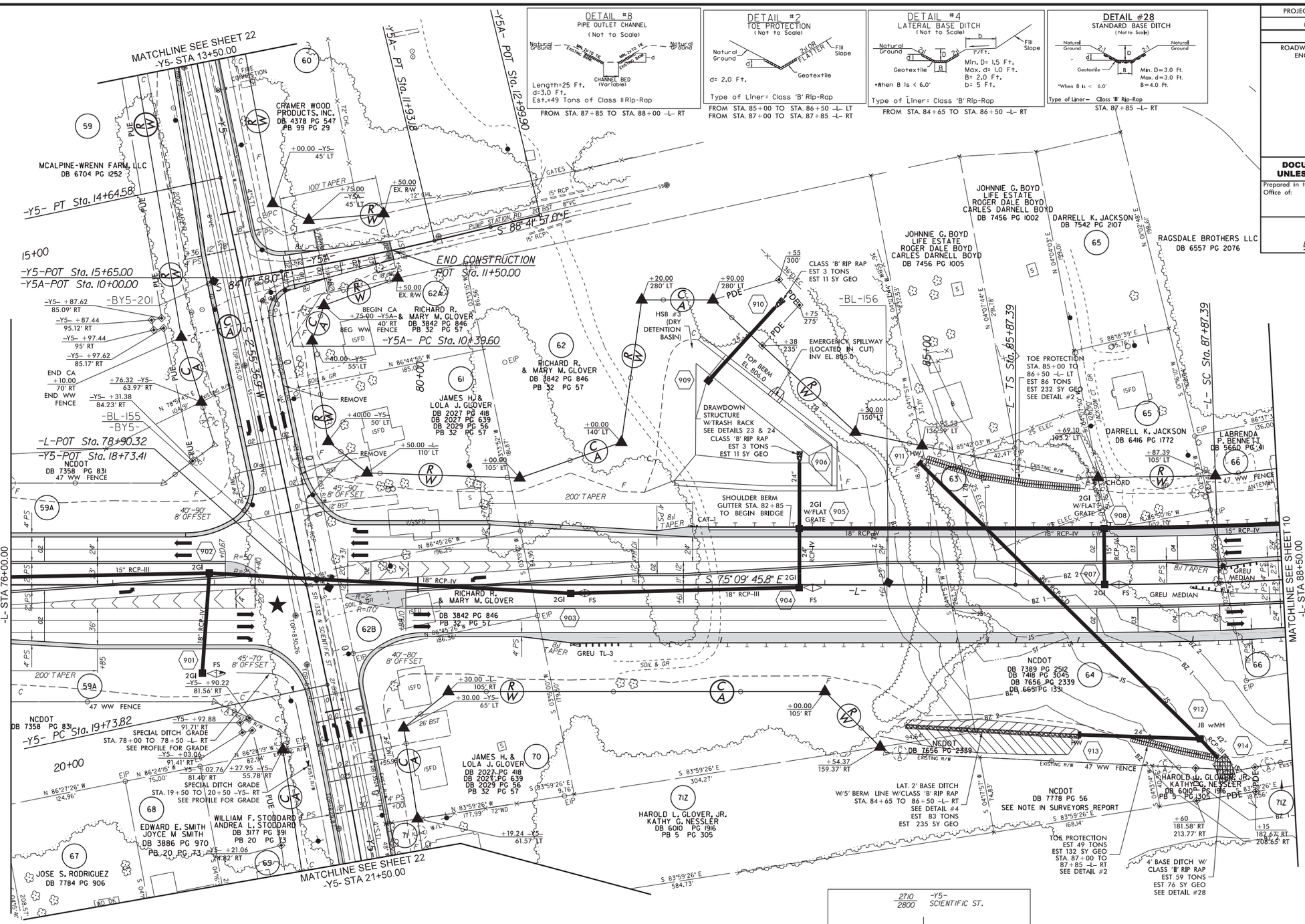
8/17/99

REVISIONS

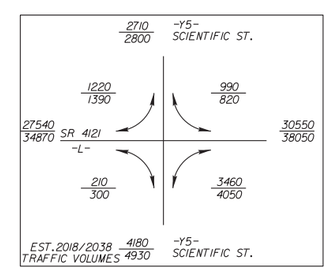
REVISED OWNER FOR PARCEL 59 & 72; ADDED PARCEL 59A - REVISED 6-24-09
10/07/14 - R/W REVISION: COMBINING PARCELS 71 AND 73 INTO PARCEL 71; AND CORRECTING THE PROPERTY LINES BETWEEN PARCELS 64 AND 71. - TLW
R/W REVISION: CREATED PARCEL 71Z; ADDED PDE ON PARCEL 71Z; SUBDIVIDED PARCEL 62 INTO PARCELS 62.62A AND 62B; UPDATED EXISTING R/W AND C/A TO REFLECT AN ACQUISITION ON PARCELS 59A,63,64,71 AND 71Z; UPDATED PROPERTY OWNER NAMES AND/OR DEED REFERENCES ON PARCELS 59,59A,61 THROUGH 65,67 AND 70; ADDED PUE ON PARCELS 59,59A,69,70 AND 71Z; REMOVED PUE ON PARCEL 60; CORRECTED STA/OFF AT -Y5A- STA 10+75 RT ON PARCEL 62A. - TEM - 05/26/17
R/W REVISION: UPDATED SURVEYS TO SHOW AN ADJOINING PROPERTY AS COMBINED WITH PARCEL 65; UPDATED PROPERTY OWNER NAME AND DEED INFORMATION ON PARCEL 65; REMOVED PUE ON PARCEL TO AND 71Z. - BLP - 12/11/17



-Y5-	
PI Sta 13+54.60	PI Sta 21+18.69
Δ = 1° 15' 37.1" (LT)	Δ = 3° 19' 09.3" (RT)
D = 0° 34' 22.6"	D = 1° 08' 45.3"
L = 219.97'	L = 289.66'
T = 109.99'	T = 144.87'
R = 10,000.00'	R = 5,000.00'
SE = NC	SE = SEE PLAN VIEW
DS = 50 mph	DS = 50 mph

-Y5A-
PI Sta 11+16.43
Δ = 4° 23' 59.0" (LT)
D = 2° 51' 53.2"
L = 153.58'
T = 76.83'
R = 2,000.00'
SE = SEE PLAN VIEW
DS = 30 mph

-L-	
PIs Sta 87+20.73	PI Sta 93+42.25
Θs = 1° 54' 35.5"	Δ = 20° 57' 26.2" (LT)
Ls = 200.00'	D = 1° 54' 35.5"
LT = 133.34'	L = 1,097.32'
ST = 66.67'	T = 554.86'
	R = 3,000.00'
	SE = 05
	DS = 60 mph



★ PROP. TRAFFIC SIGNAL

-L- PFL SEE SHEET 27
-Y5- PFL SEE SHEET 36
-Y5A- PFL SEE SHEET 37

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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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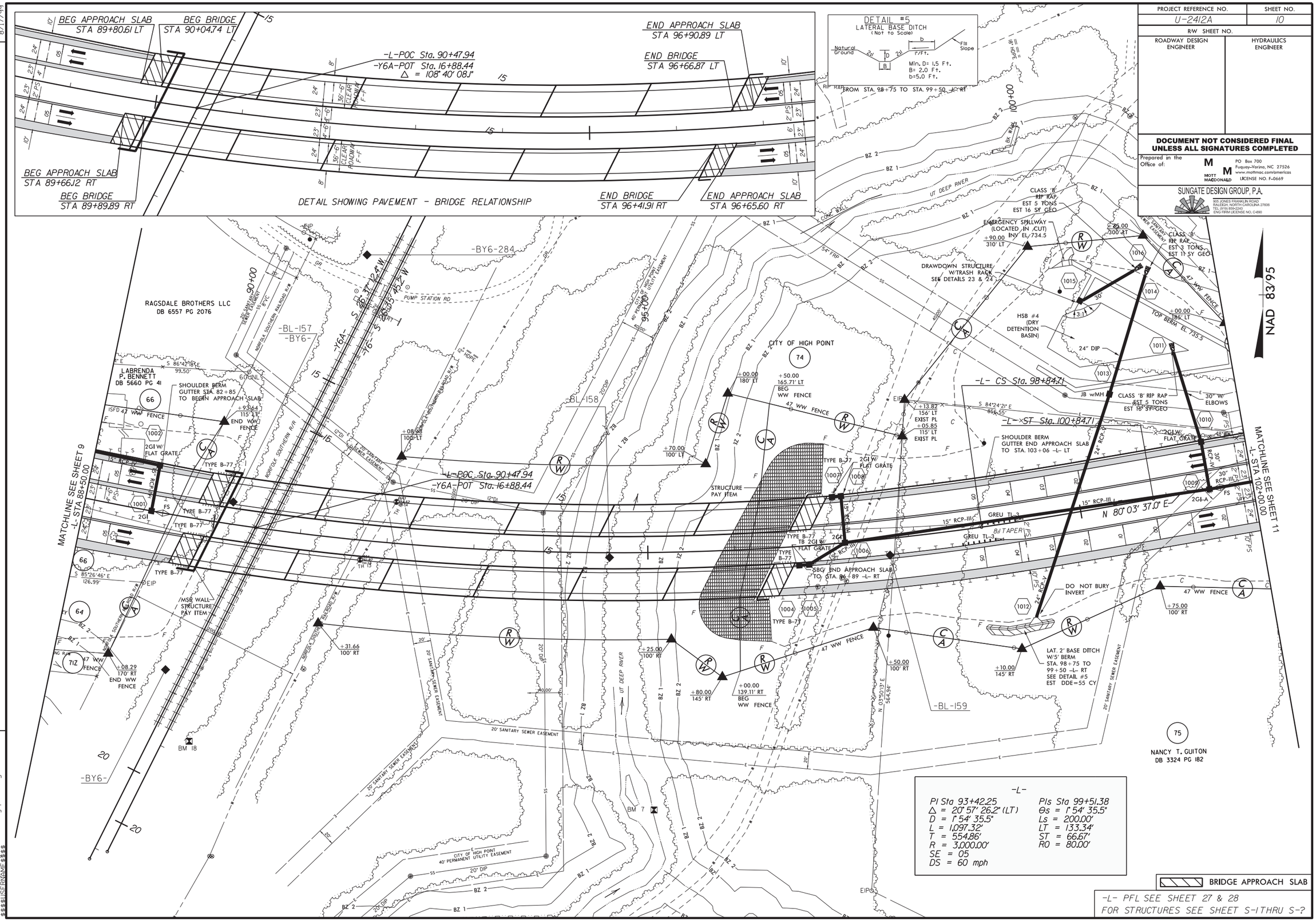
REVISIONS

10/07/14 - R/W REVISION: COMBINING PARCELS 71 AND 73 INTO PARCEL 71.- TLW
R/W REVISION:UPDATED EXISTING R/W AND C/A TO REFLECT AN ACQUISITION ON PARCEL 71Z. - TEM - 05/26/17

8/17/99



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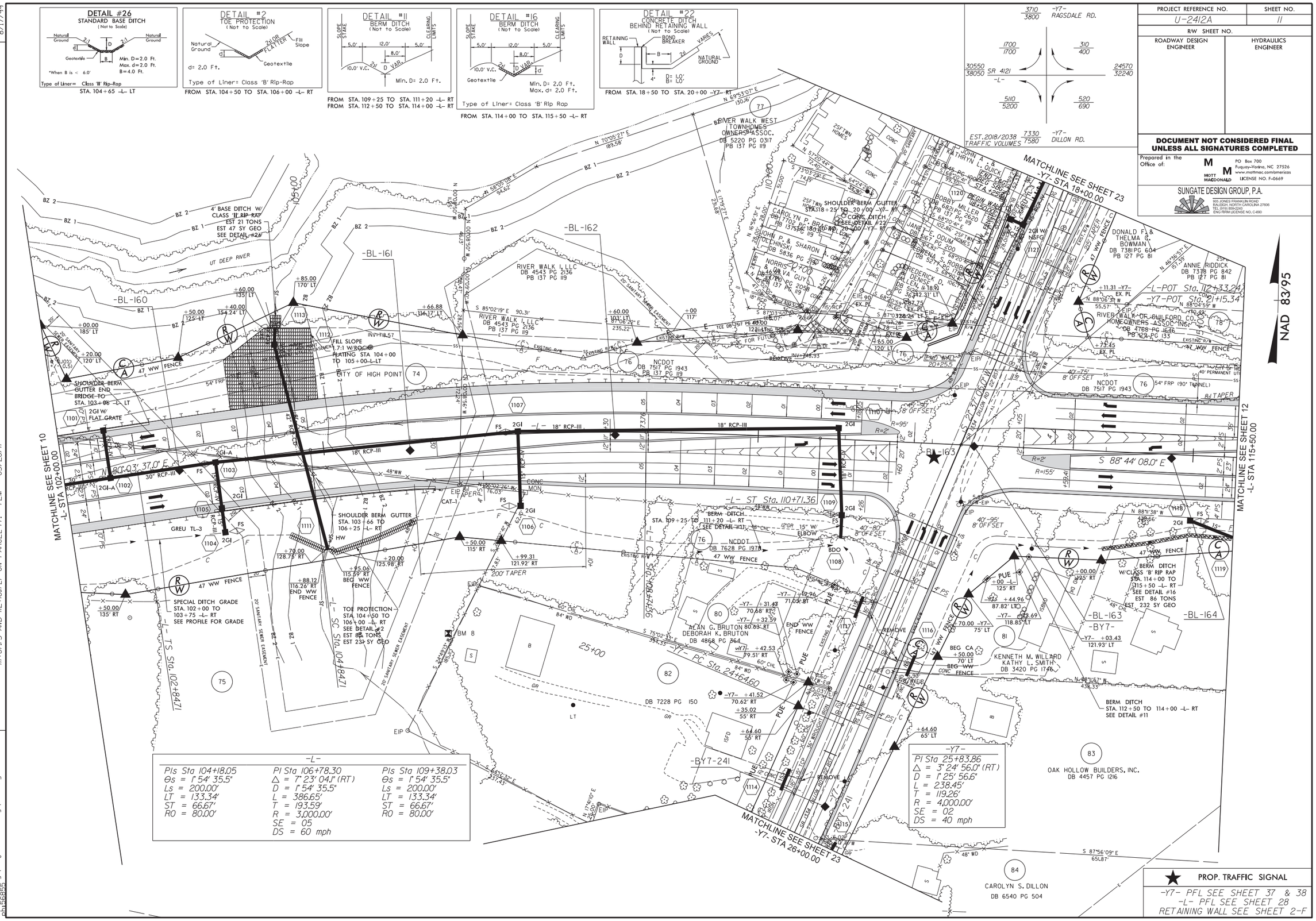
DETAIL #26
STANDARD BASE DITCH
(Not to Scale)
Natural Ground
Geotextile
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=4.0 Ft.
*When B is < 6.0'
Type of Liner= Class 'B' Rip-Rap
STA. 104+65 -L- LT
DETAIL #2
TOE PROTECTION
(Not to Scale)
Natural Ground
2:1 OR FLATTER
Fill Slope
Geotextile
d= 2.0 Ft.
Type of Liner= Class 'B' Rip-Rap
FROM STA. 104+50 TO STA. 106+00 -L- RT
DETAIL #11
BERM DITCH
(Not to Scale)
SLOPE STAKE
CLEARING LIMITS
10.0' V.C.
Min. D= 2.0 Ft.
FROM STA. 109+25 TO STA. 111+20 -L- RT
FROM STA. 112+50 TO STA. 114+00 -L- RT
DETAIL #16
BERM DITCH
(Not to Scale)
Geotextile
Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
Type of Liner= Class 'B' Rip Rap
FROM STA. 114+00 TO STA. 115+50 -L- RT
DETAIL #22
CONCRETE DITCH
BEHIND RETAINING WALL
(Not to Scale)
RETAINING WALL
BOND BREAKER
NATURAL GROUND
D= 1.0'
B= 1.0'
FROM STA. 18+50 TO STA. 20+00 -Y7- RT
3710 -Y7- 3800 RAGSDALE RD.
1700 1700
310 400
30550 38050 SR 4121 -L-
24570 32240
5110 5200
520 690
EST.2018/2038 TRAFFIC VOLUMES 7330 7580 -Y7- DILLON RD.
PROJECT REFERENCE NO. U-2412A
SHEET NO. 11
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
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905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-690
MATCHLINE SEE SHEET 23 -Y7- STA 18+00.00
MATCHLINE SEE SHEET 10 -L- STA 102+00.00
MATCHLINE SEE SHEET 12 -L- STA 115+50.00
MATCHLINE SEE SHEET 23 -Y7- STA 26+00.00
NAD 83/95
RIVER WALK WEST TOWNHOMES OWNERS ASSOC. DB 5220 PG 0317 PB 137 PG 119
RIVER WALK I, LLC DB 4543 PG 2136 PB 137 PG 119
RIVER WALK I, LLC DB 4543 PG 2136 PB 137 PG 119
NCDOT DB 7517 PG 1943 PB 137 PG 119
NCDOT DB 7517 PG 1943
NCDOT DB 7628 PG 1978
CITY OF HIGH POINT
UT DEEP RIVER
4' BASE DITCH W/ CLASS 'II' RIP-RAP EST 21 TONS EST 47 SY GEO SEE DETAIL #26
FILL SLOPE 1.7:1 W/ROCK PLATING STA 104+00 TO 105+00 -L- LT
SHOULDER BERM GUTTER END BRIDGE TO STA. 103+66 -L- LT
2GI W/ FLAT GRATE
SHOULDER BERM GUTTER STA. 103+66 TO 106+25 -L- RT
SPECIAL DITCH GRADE STA. 102+00 TO 103+75 -L- RT SEE PROFILE FOR GRADE
TOE PROTECTION STA. 104+50 TO 106+00 -L- RT SEE DETAIL #2 EST 88 TONS EST 231 SY GEO
BERM DITCH STA. 109+25 TO 111+20 -L- RT SEE DETAIL #11
BERM DITCH W/CLASS 'B' RIP RAP STA. 114+00 TO 115+50 -L- RT SEE DETAIL #16 EST 86 TONS EST 232 SY GEO
BERM DITCH STA. 112+50 TO 114+00 -L- RT SEE DETAIL #11
-L- PC Sta. 24+64.60
-L- TS Sta. 102+84.71
-L- SC Sta. 104+84.71
-L- ST Sta. 110+71.36
-L- POT Sta. 112+33.24
-Y7- POT Sta. 21+15.34
-Y7- PC Sta. 24+64.60
-L- PI Sta 104+18.05 Θs = 1° 54' 35.5" Ls = 200.00' LT = 133.34' ST = 66.67' RO = 80.00'
-L- PI Sta 106+78.30 Δ = 7° 23' 04.1" (RT) D = 1° 54' 35.5" L = 386.65' T = 193.59' R = 3,000.00' SE = 05 DS = 60 mph
-L- PI Sta 109+38.03 Θs = 1° 54' 35.5" Ls = 200.00' LT = 133.34' ST = 66.67' RO = 80.00'
-Y7- PI Sta 25+83.86 Δ = 3° 24' 56.0" (RT) D = 1° 25' 56.6" L = 238.45' T = 119.26' R = 4,000.00' SE = 02 DS = 40 mph
PROP. TRAFFIC SIGNAL
-Y7- PFL SEE SHEET 37 & 38
-L- PFL SEE SHEET 28
RETAINING WALL SEE SHEET 2-F
REVISIONS
REVISED PARCEL 77 & 78 TO 76 - REVISED 6-24-09
REVISED ROW ON PARCEL 76 - REVISED 12-22-09
R/W REVISION:UPDATED EXISTING R/W AND C/A TO REFLECT AW ACQUISITION ON PARCELS 76,82 AND 84;CORRECTED NAMES AND/OR DEED REFERENCES ON PARCELS 76,82 AND 84;CORRECTED STA/OFF AT -L- STA 113+00 RT ON PARCEL 81;CORRECTED STA/OFF AT -L- STA 111+87.75 AND 112+18.31 LT ON PARCEL 77; - TEM - 05/26/17
REVISED PARCEL 77 & 78 TO 76 AND 80; ADDED PUE ON PARCELS 80 THROUGH 82;UPDATED PROPERTY OWNER
8/17/99
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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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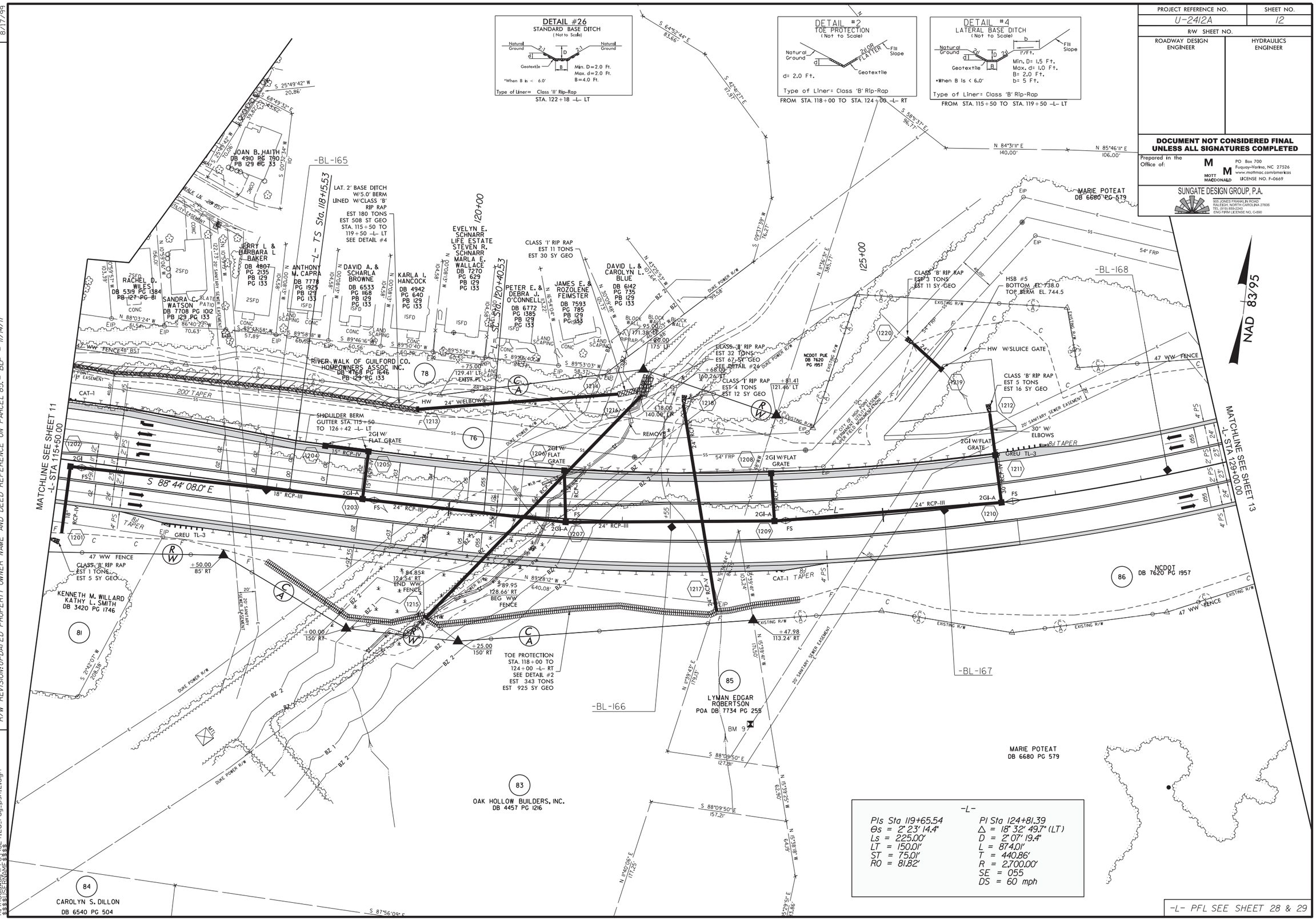
ENG FIRM LICENSE NO. C-890

REVISIONS

8/17/99

REVISED PARCEL 79 TO 76; REVISED OWNER OF PARCEL 85 AND 86 - REVISED 6-24-09
R/W REVISION; UPDATED EXISTING R/W AND C/A TO REFLECT AN ACQUISITION ON PARCEL 86;
REMOVED PUE ON PARCEL 78; UPDATED PROPERTY OWNER NAMES AND/OR DEED REFERENCES ON PARCELS 76 AND 84 - TEM - 05/26/17
R/W REVISION; UPDATED PROPERTY OWNER NAME AND DEED REFERENCE ON PARCEL 85 - BLP - 11/14/17



-L-

PIs Sta 119+65.54	PI Sta 124+81.39
Θs = 2° 23' 14.4"	Δ = 18° 32' 49.7" (LT)
Ls = 225.00'	D = 2° 07' 19.4"
LT = 150.01'	L = 874.01'
ST = 75.01'	T = 440.86'
RO = 81.82'	R = 2,700.00'
	SE = 055
	DS = 60 mph

-L- PFL SEE SHEET 28 & 29

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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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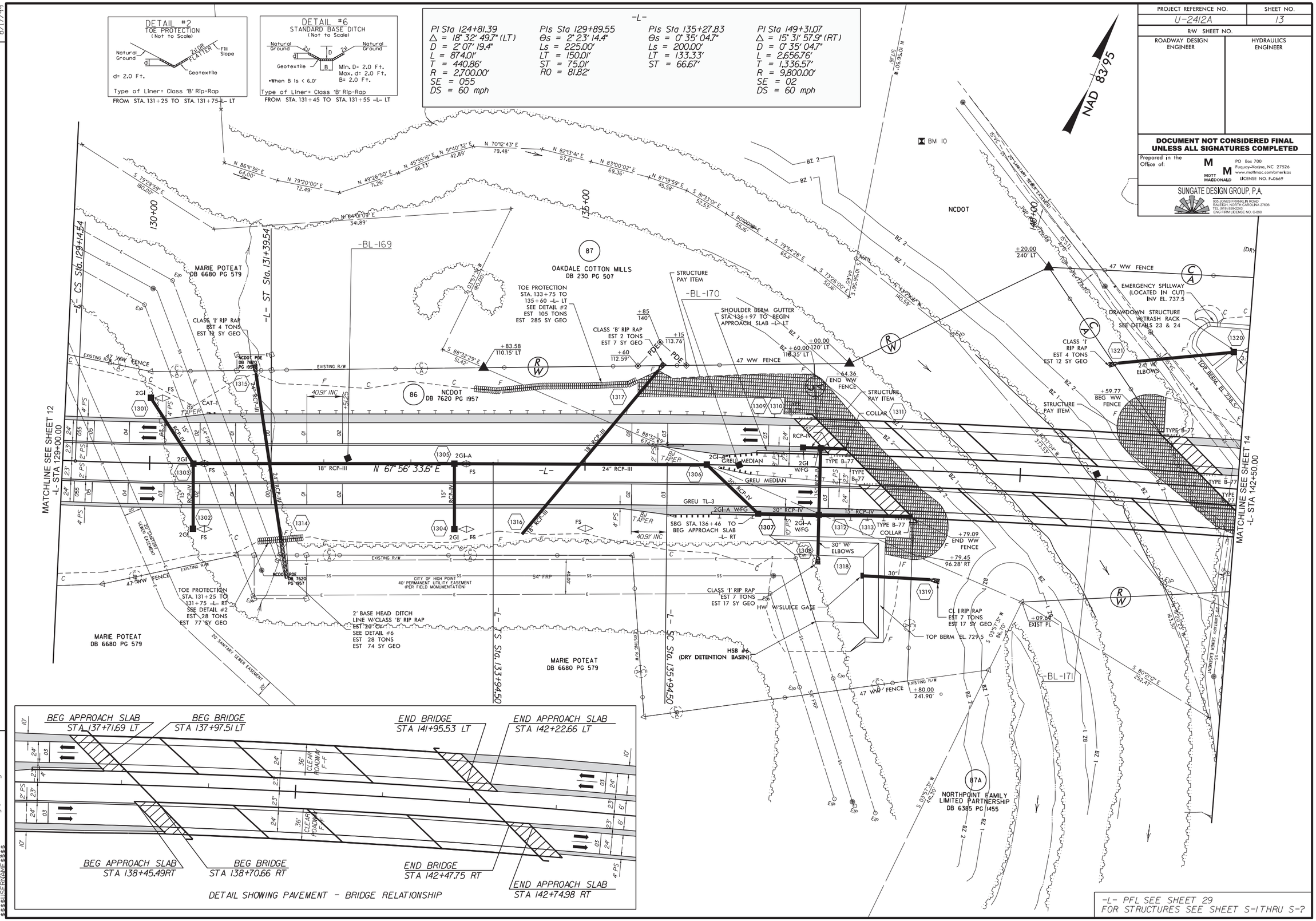
8/17/99

REVISIONS

REVISED OWNERS FOR PARCEL 86 AND 88 - REVISED 6-24-09
R/W REVISION: UPDATED EXISTING R/W.C/A AND PDE TO REFLECT AN ACQUISITION ON PARCEL 86; UPDATED PROPERTY OWNER NAME AND/OR DEED REFERENCE ON PARCEL 87. - TEM - 05/26/17
R/W REVISION: UPDATED PROPERTY OWNER NAME AND DEED REFERENCE ON PARCEL 87; SUBDIVIDED PARCEL 87 TO PARCELS 87 AND 87A. - BLP - 11/14/17



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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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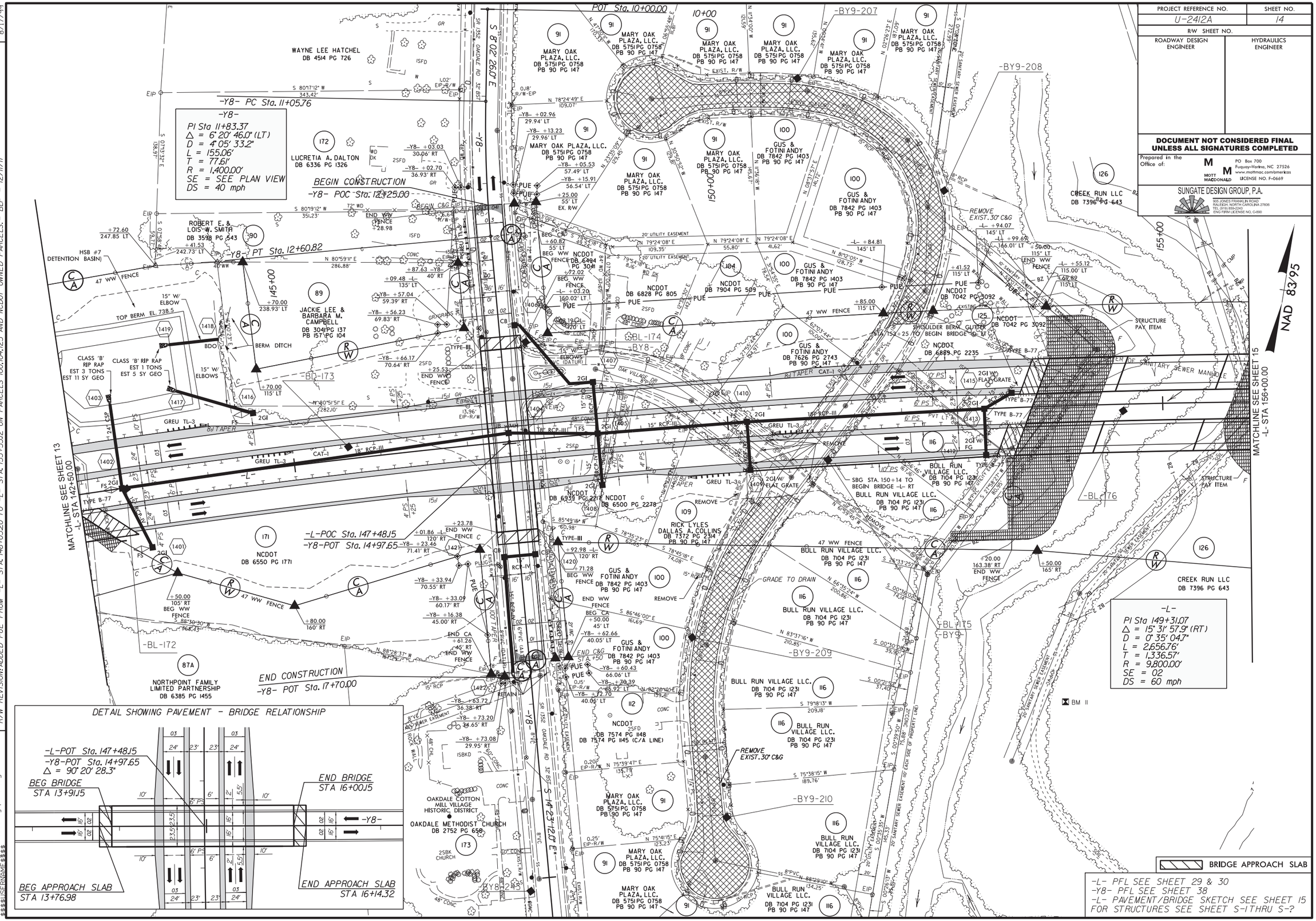
REVISIONS

REVISED OWNER OF PARCEL 88,89,91;105,106,107,108,124,& 126; REVISED PARCELS 92,93,94,95,96,97,98,99;113,114,& 115 TO 91; PARCELS 117,118,119,120,121,122,123 TO 116; PARCELS 110 & 111 TO 101; PARCEL 102 TO 100 - REVISED 6-24-09
REVISED -Y8- BRIDGE APPROACH SLABS 10-05-09
R/W REVISION: REVISED SUBDIVISION PARCEL NUMBERS AS FOLLOWS; 91 TO REFLECT 91 AND 91; THROUGH 91K, 100 TO 100 AND 100A, 101 TO 101, 101A AND 101B, 116 TO 116, 116A THROUGH 116G; CREATED PARCELS 171 AND 173; UPDATED EXISTING R/W AND C/A TO REFLECT AN ACQUISITION ON PARCELS 90 AND 125; CORRECTED STA./OFF AT -L- STA 153+50 LT ON PARCEL 125; UPDATED PROPERTY OWNER NAMES AND/OR DEED REFERENCES ON PARCELS 89, 91, 91A THROUGH 91K, 100, 100A, 101, 101A, 101B, 103, 104, 109, 112, 116, 116A THROUGH 116G, 125 AND 126; ADDED PUE ON PARCELS 89 THROUGH 91, 101 AND 171 THROUGH 173; CORRECTED STA./OFF AT -L- STA 147+92.98 RT ON PARCEL 101; - TEM - 05/26/17
R/W REVISION: RENUMBERED PARCELS 91A THROUGH 91K TO PARCEL 91; RENUMBERED PARCELS 100A, 101, 101A, 101B AND 103 TO PARCEL 100; RENUMBERED PARCELS 116A THROUGH 116G TO PARCEL 116. - MDP - 08-10-17
R/W REVISION: UPDATED PROPERTY OWNER NAME AND DEED REFERENCE ON PARCEL 87A - BLP - 11/14/17
R/W REVISION: ADDED PUE FROM -L- STA. 148+03.20 TO -L- STA. 153+55.12 ON PARCELS 100, 104, 125 AND NCDOT OWNED PARCELS. - BLP - 12/11/17

8/17/99



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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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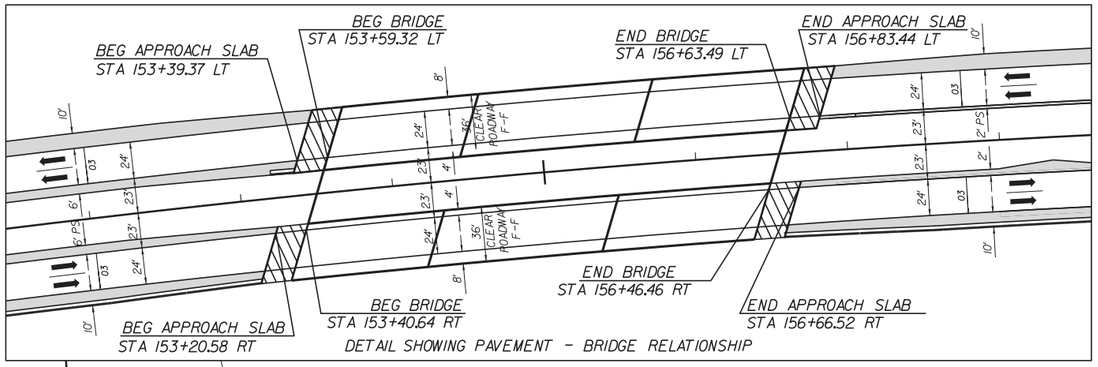
ENG FIRM LICENSE NO. C-890

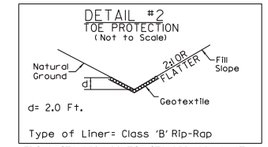
REVISIONS

8/17/99

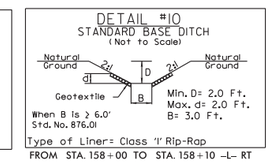
REVISED OWNER FOR PARCEL 126 - REVISED 6-24-09
R/W REVISION:CREATED PARCEL 127B;SUBDIVIDED PARCEL 127 INTO PARCELS 127 AND 127B;UPDATED PROPERTY OWNER NAMES AND/OR DEED REFERENCES ON PARCELS 126 THRU 127B. - TEM - 05/26/17
R/W REVISION:UPDATED PROPERTY OWNER NAME AND DEED REFERENCE ON PARCEL 127B. - BLP - 11/14/17



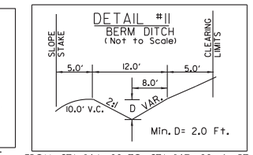
DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP



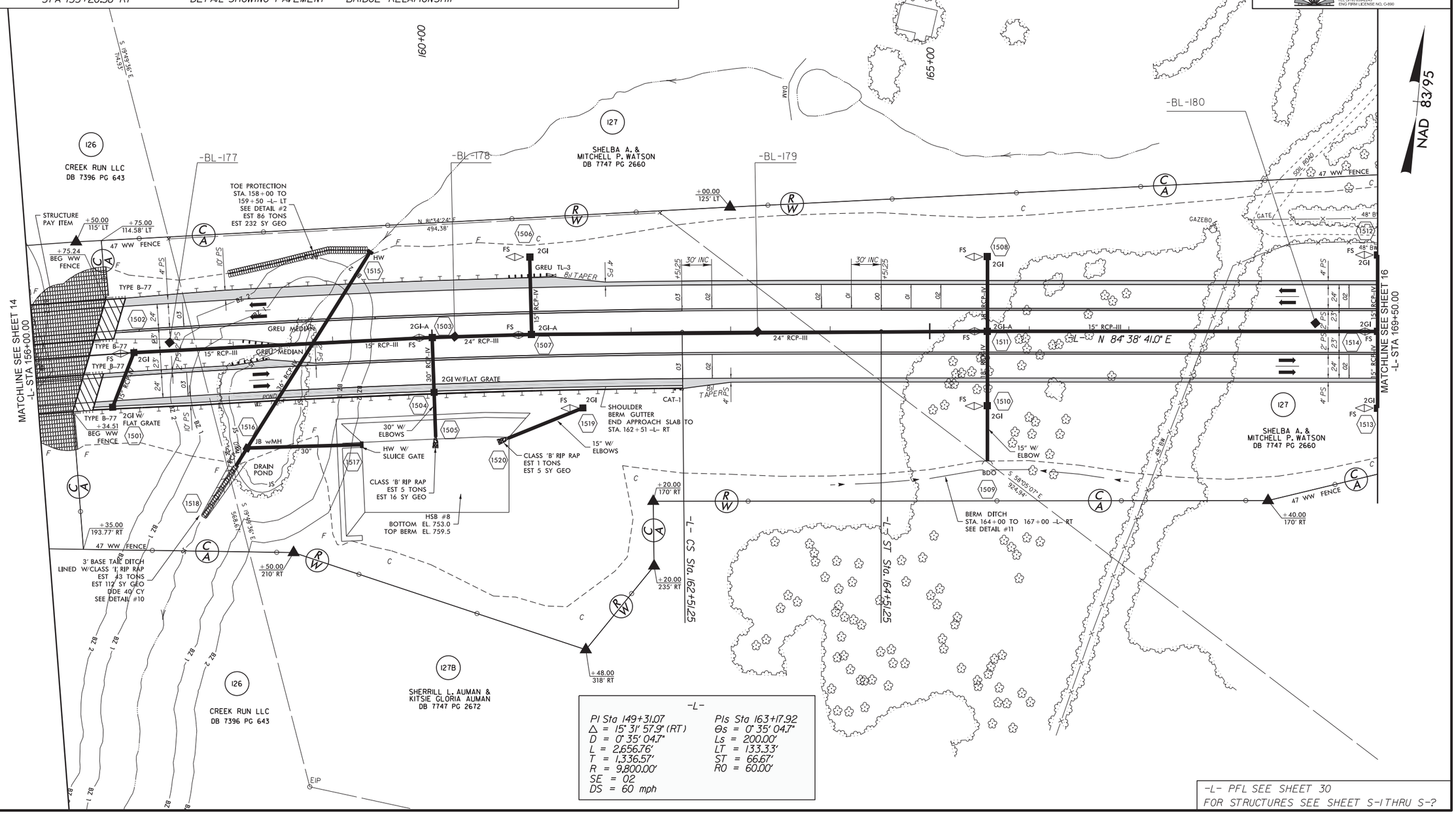
FROM STA. 158+00 TO STA. 158+10 -L- LT



FROM STA. 158+00 TO STA. 158+10 -L- RT



FROM STA. 164+00 TO STA. 167+00 -L- RT



12-DEC-2017 12:20
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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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LICENSE NO. F-0669

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

NAD 83/95

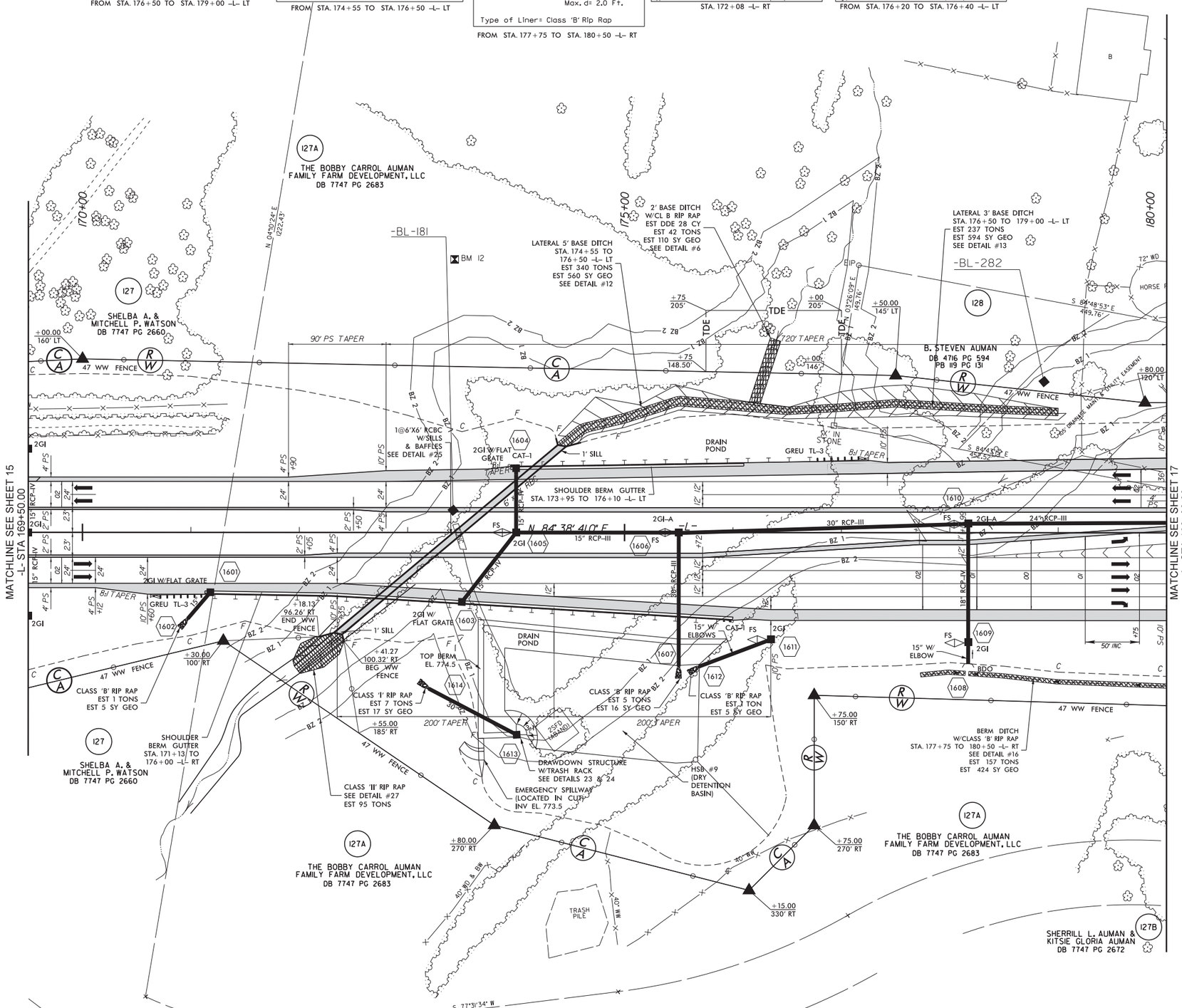
DETAIL #13
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 2:1, D, d, B, b, 1'/Ft., Fill Slope, Geotextile
Max. D= 3 Ft.
B= 3 Ft.
b= 10 Ft.
d= 3 Ft.
Type of Liner= Class 'B' Rip-Rap
FROM STA. 176+50 TO STA. 179+00 -L- LT

DETAIL #12
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 2:1, D, d, B, b, 1'/Ft., Fill Slope, Geotextile
Max. D= 3 Ft.
B= 5 Ft.
b= 10 Ft.
d= 3 Ft.
Type of Liner= Class 'I' Rip-Rap
FROM STA. 174+55 TO STA. 176+50 -L- LT

DETAIL #16
BERM DITCH
(Not to Scale)
SLOPE STAKE, CLEARING LIMITS, 5.0', 12.0', 5.0', 8.0', 2:1, D, VAR., d, 10.0' V.C., Geotextile
Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
Type of Liner= Class 'B' Rip Rap
FROM STA. 177+75 TO STA. 180+50 -L- RT

DETAIL #27
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 2:1, D, d, B, Geotextile
Min. D=4.0 Ft.
Max. d=4.0 Ft.
B=6.0 Ft.
Length = 50'
Type of Liner= Est. 95 Tons Class II Rip-Rap
STA. 172+08 -L- RT

DETAIL #6
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 2:1, D, d, B, Geotextile
Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
B= 2.0 Ft.
*When B Is < 6.0'
Type of Liner= Class 'B' Rip-Rap
FROM STA. 176+20 TO STA. 176+40 -L- LT



-L- PFL SEE SHEET 30 & 31

REVISIONS

R/W REVISION: CREATED PARCEL 127A-SUBDIVIDED PARCEL 127 INTO PARCELS 127 AND 127A-REMOVED AN ERRANT STA/OFF AT -L- STA 171+50 LT ON PARCEL 127 - TEM - 05/26/17
R/W REVISION: UPDATED PROPERTY OWNER NAME AND DEED REFERENCE ON PARCEL 127B - BLP - 11/14/17
R/W REVISION: ADDED TDE FROM -L- STA 175+75.00 TO -L- STA 177+00.00 LT. ON PARCEL 127A - BLP - 01/11/18

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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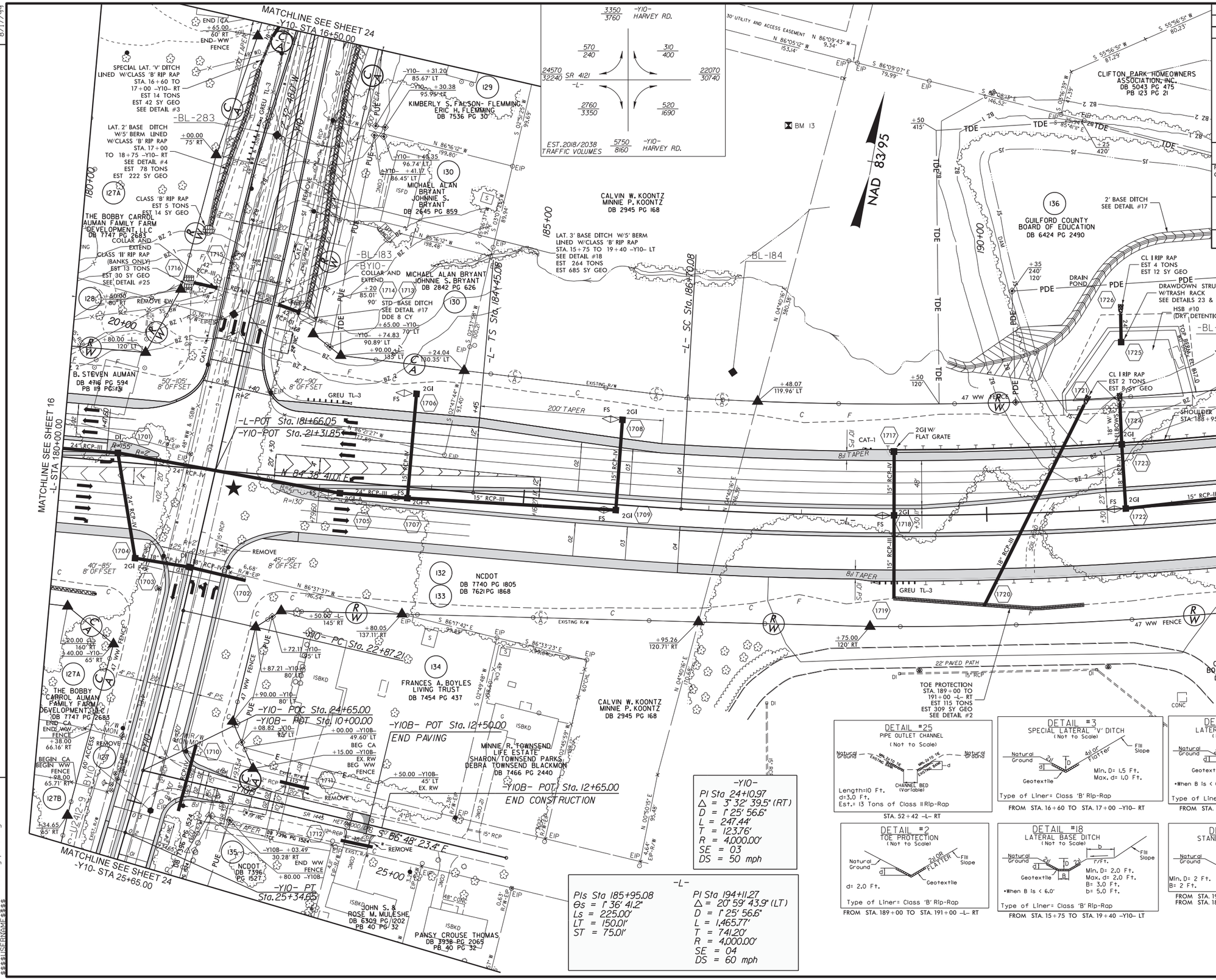
REVISIONS

8/17/99

REVISED OWNER FOR PARCEL 129 & 136 - REVISED 6-24-09
REVISED PUE AND TCE TIE TO PUE ON PARCEL 135 - REVISED 5-21-12
R/W REVISION: ADJUSTED PROPOSED R/W,C/A,PDE AND TDE ON PARCEL 136;UPDATED EXISTING R/W AND C/A TO REFLECT AN ACQUISITION ON PARCELS 132,133 AND 135; UPDATED PROPERTY OWNER NAMES AND/OR DEED REFERENCES ON PARCELS 127A,129,133 THROUGH 135;ADJUSTED PUE ON PARCELS 129,130 AND 135;REMOVED PUE ON PARCEL 134;CORRECTED STA/OFF AT -L- STA 180+20 RT AND -Y10- STA 23+40 RT ON PARCEL 127A;CORRECTED STA/OFF AT -L- STA 182+50 RT ON PARCEL 134. - TEM - 05/26/17
R/W REVISION: ADDED AN ACCESS POINT FROM -Y10- STA. 24+38.00 TO STA. 24+98.00 ON PARCEL 127. - BLP - 11/14/17
R/W REVISION: ADDED PUE ON PARCEL 134. - BLP - 12/11/17



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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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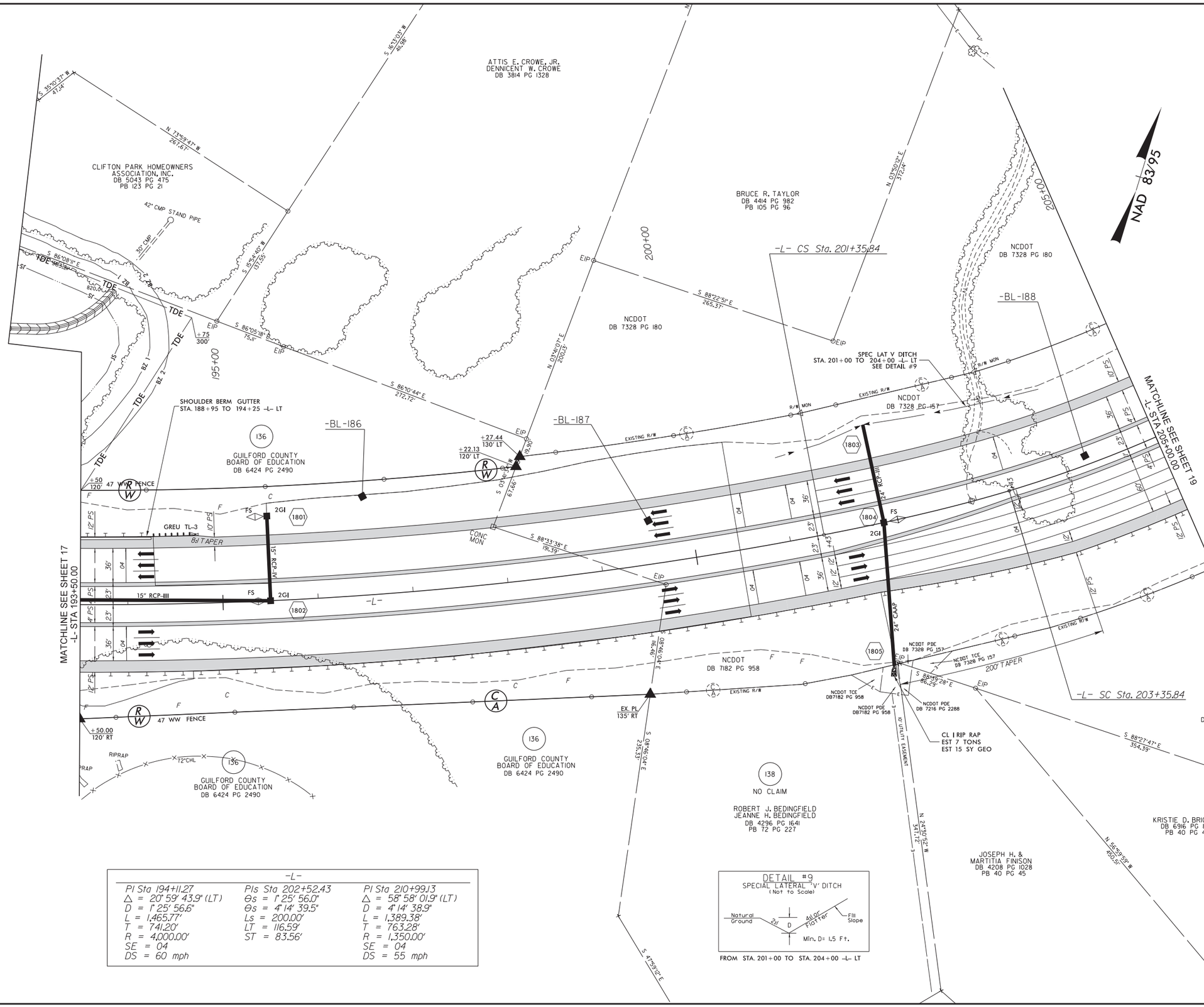
8/17/99

REVISIONS

REVISED OWNER FOR PARCEL 136 & 137 - REVISED 6-24-09
R/W REVISION: REMOVED A PROPERTY LINE ON PARCEL 136; ADJUSTED PROPOSED R/W AT -L- STA 198+27.44, 130' LT AND TDE ON PARCEL 136; UPDATED EXISTING R/W AND C/A TO REFLECT AN ACQUISITION ON PARCEL 138; ADDED "NO CLAIM" ON PARCEL 138. - TEM - 05/28/17



-L-		
PI Sta 194+11.27	PIs Sta 202+52.43	PI Sta 210+99.13
Δ = 20° 59' 43.9" (LT)	Θs = 1° 25' 56.0"	Δ = 58° 58' 01.9" (LT)
D = 1° 25' 56.6"	Θs = 4° 14' 39.5"	D = 4° 14' 38.9"
L = 1,465.77'	Ls = 200.00'	L = 1,389.38'
T = 741.20'	LT = 116.59'	T = 763.28'
R = 4,000.00'	ST = 83.56'	R = 1,350.00'
SE = 04		SE = 04
DS = 60 mph		DS = 55 mph

DETAIL #9
SPECIAL LATERAL "V" DITCH
(Not to Scale)

FROM STA. 201+00 TO STA. 204+00 -L- LT

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ch15855

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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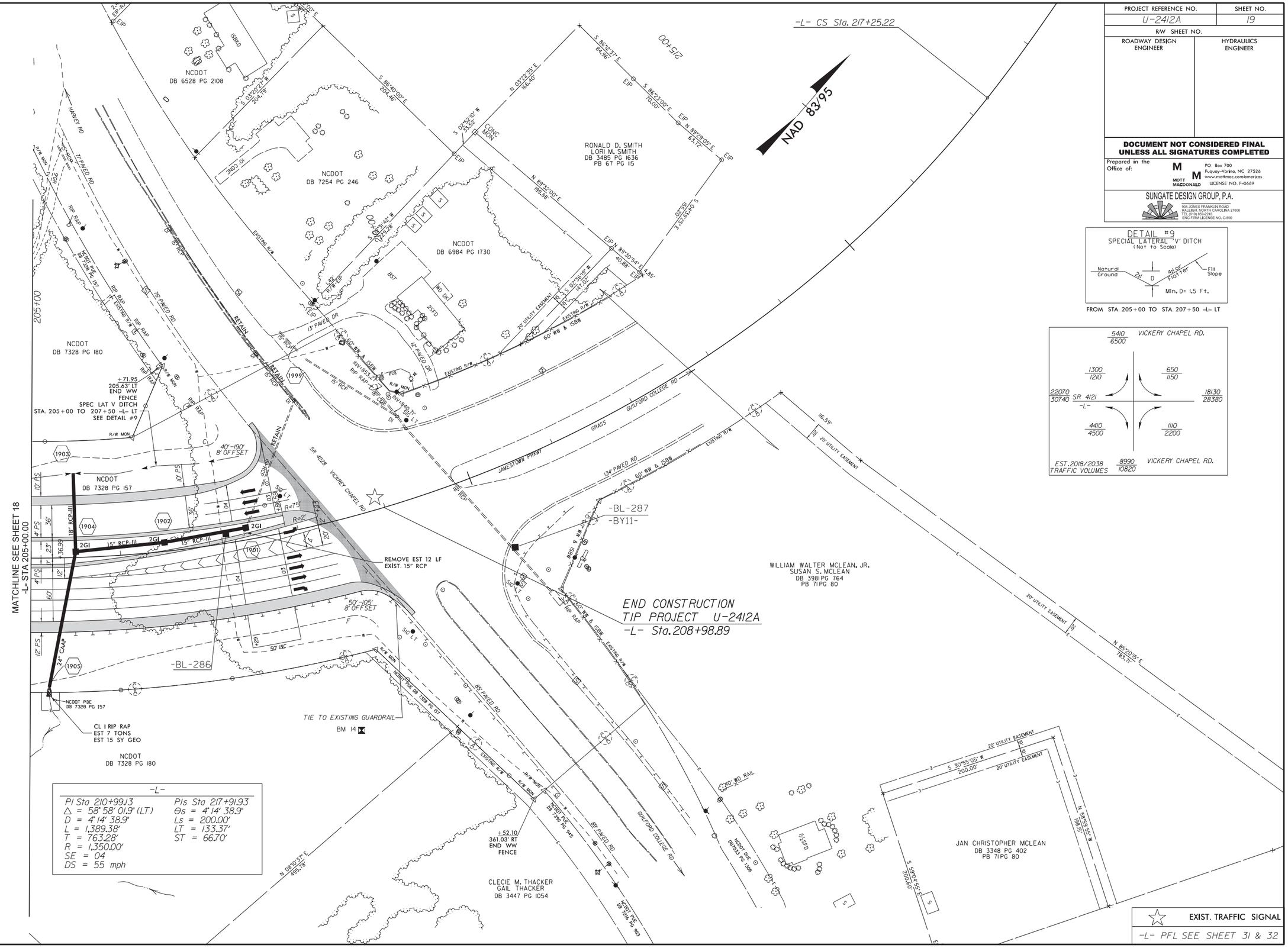

DETAIL #9
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 205+00 TO STA. 207+50 -L- LT

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pw:\\mmgnc.bentleyonline.com:pw01\proj\u2412a_rdy_psh19.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	20
R/W SHEET NO.	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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ENG FIRM LICENSE NO. C-0890

-Y-

PI Sta 17+86.26
△ = 90° 50' 28.0" (RT)
D = 11° 48' 48.8"
L = 768.96'
T = 492.17'
R = 485.00'
SE = 06
DS = 40 mph

-YA-

PI Sta 11+85.92
△ = 32° 50' 02.0" (LT)
D = 22° 55' 05.9"
L = 143.26'
T = 73.66'
R = 250.00'
SE = SEE PLAN VIEW
DS = 30 mph

-YC-

PI Sta 14+00.19
△ = 22° 15' 26.6" (LT)
D = 19° 05' 54.9"
L = 116.54'
T = 59.01'
R = 300.00'
SE = SEE PLAN VIEW
DS = 25 mph

PI Sta 15+19.13
△ = 44° 32' 05.6" (RT)
D = 38° 11' 49.9"
L = 116.59'
T = 61.42'
R = 150.00'
SE = SEE PLAN VIEW
DS = 25 mph

-Y3-

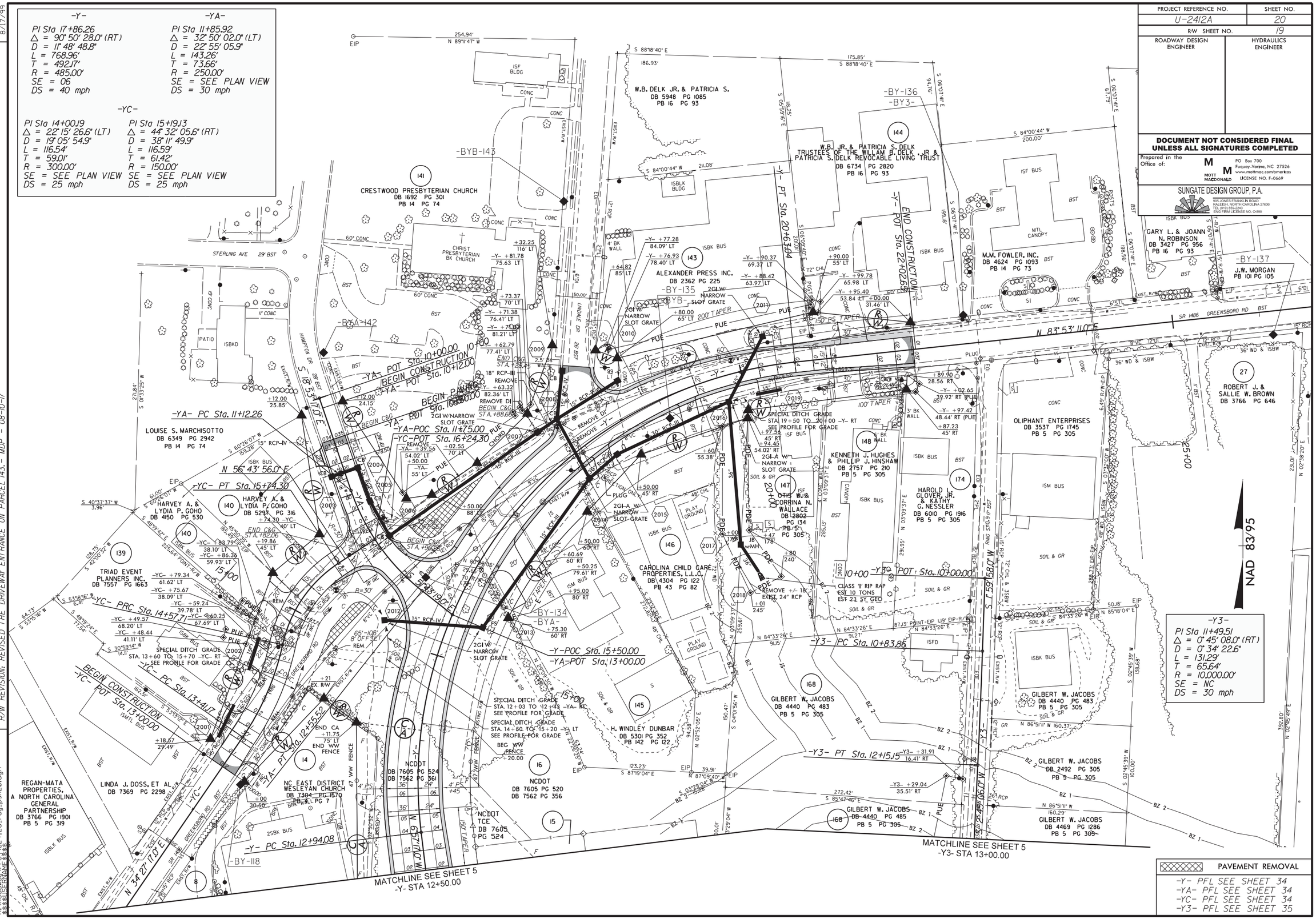
PI Sta 11+49.51
△ = 0° 45' 08.0" (RT)
D = 0° 34' 22.6"
L = 131.29'
T = 65.64'
R = 10,000.00'
SE = NC
DS = 30 mph

NAD 83/95

REVISIONS

8/17/99

REVISED OWNER FOR PARCEL 14,15,& 16; REVISED PARCEL 142 TO 140 - REVISED 6-24-09
REVISED SHEET NUMBER FROM 19 TO 20 - REVISED 10-20-2016
R/W REVISION: CREATED PARCEL 174; UPDATED EXISTING R/W, C/A AND PERMANENT EASEMENT TO REFLECT AN ACQUISITION ON PARCELS 15 AND 16; UPDATED PROPERTY OWNER NAMES AND/OR DEED REFERENCES ON PARCELS 14 THROUGH 16, 139, 143, THROUGH 145 AND 147; ADJUSTED PUE ON PARCELS 139 THROUGH 141 AND 143; ADDED PUE ON PARCELS 168 AND 174; REMOVED PUE ON PARCEL 144. - TEM - 05/26/17
REVISED PUE FROM -Y- STA.18+76.93 TO 20+95.40 LT. ON PARCELS 143 AND 144. - MDP - 7-12-2017
R/W REVISION: REVISED THE DRIVEWAY ENTRANCE ON PARCEL 143. - MDP - 08-10-17



PAVEMENT REMOVAL

-Y- PFL SEE SHEET 34
-YA- PFL SEE SHEET 34
-YC- PFL SEE SHEET 34
-Y3- PFL SEE SHEET 35

24-FEB-2018 10:58
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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	21
R/W SHEET NO.	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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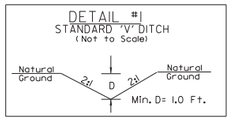
REVISIONS

REVISED OWNER FOR PARCEL 151 & 152; ADDED PARCEL 151A & 152A - REVISED 6-24-09
REVISED SHEET NUMBER FROM 20 TO 21 - REVISED 10-20-2016
R/W REVISION: CREATED PARCEL 176; UPDATED EXISTING R/W AND/OR DEED REFERENCES ON PARCELS 150, 151A AND 156; REVISED PROPOSED R/W ON PARCELS 151 AND 152A; ADDED PDE ON PARCELS 152A AND 176; ADJUSTED PUE ON PARCEL 41; REMOVED PUE ON PARCELS 152, 152A, 153 AND 176 - TEM - 05/26/17

8/17/99

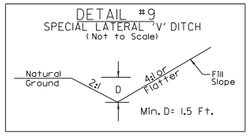
NAD 83/95

DETAIL #1
STANDARD 'V' DITCH
(Not to Scale)

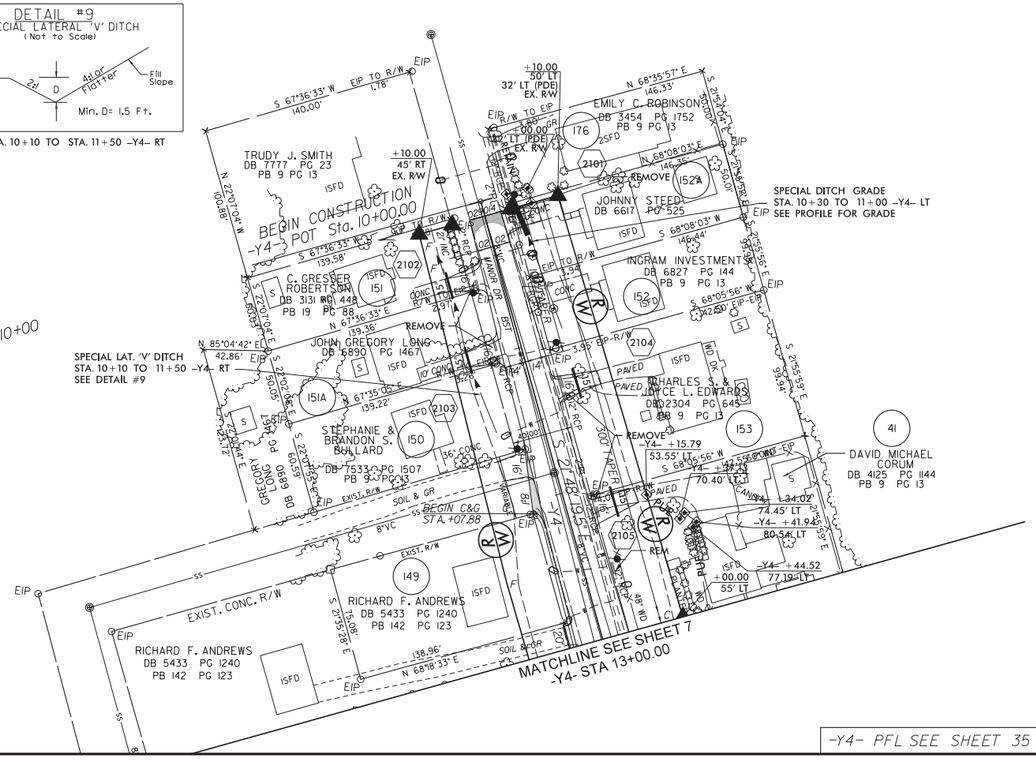


FROM STA. 10+30 TO STA. 11+00 -Y4- LT

DETAIL #9
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

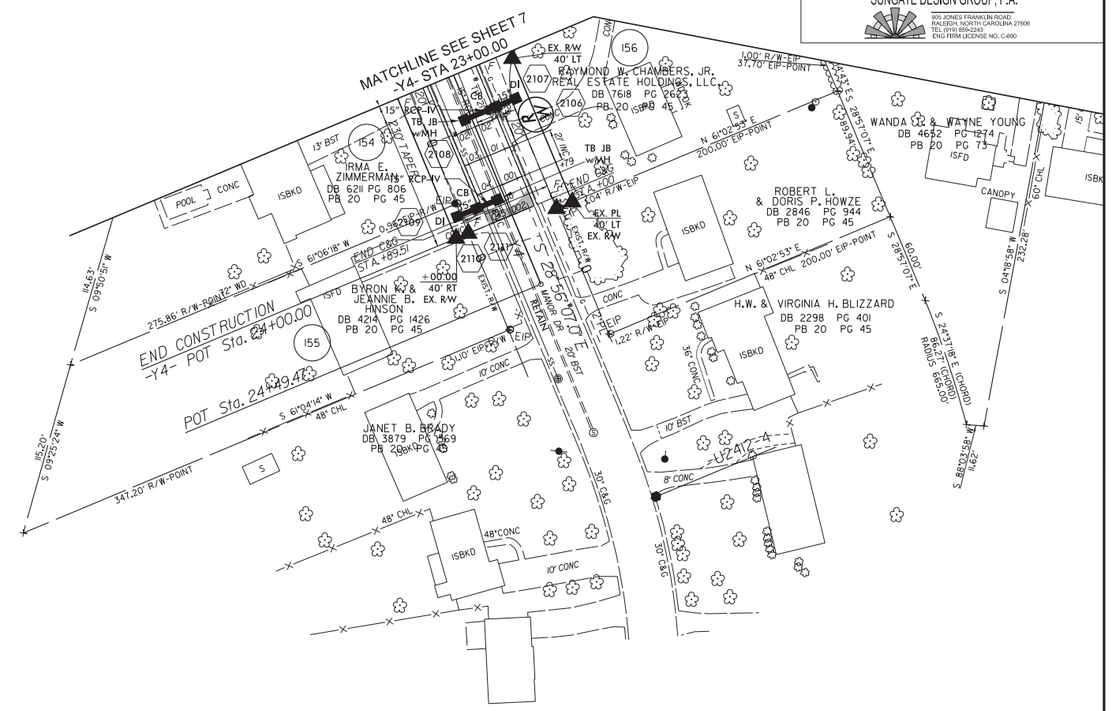


FROM STA. 10+10 TO STA. 11+50 -Y4- RT



-Y4- PFL SEE SHEET 35

NAD 83/95



PROJECT REFERENCE NO.	SHEET NO.
U-2412A	22
R/W SHEET NO.	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

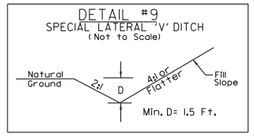
REVISIONS

8/17/99 REVISED OWNER FOR PARCEL 59 - REVISED 6-24-09
REVISED SHEET NUMBER FROM 21 TO 22 - REVISED 10-20-2016
R/W REVISION: CREATED PARCELS 177 AND 178, UPDATED PROPERTY OWNER NAMES AND/OR DEED REFERENCES ON PARCELS 59, 67 AND 157; ADJUSTED PUE ON PARCEL 60; ADDED PUE ON PARCELS 59, 69, 158, 159, 177 AND 178; CORRECTED STA/OFF AT -Y5- STA 23+80 AND 24+30 LT ON PARCEL 160. - TEM - 05/26/17
R/W REVISION: CORRECTED STA/OFF AT -Y5- STA 12+20 RT ON PARCEL 69; CORRECTED STA/OFF AT -Y5B- STA 12+33.41 RT. ON PARCEL 59. - BLP - 12/11/17
R/W REVISION: REVISED PUE FROM -Y5- STA. 10+10.16 TO STA. 12+33.41 RT. ON PARCEL 59. - BLP - 12/11/17

NAD 83/95

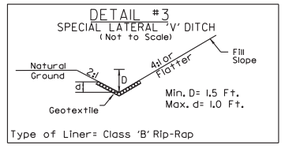
-BY5-200

DETAIL #9
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



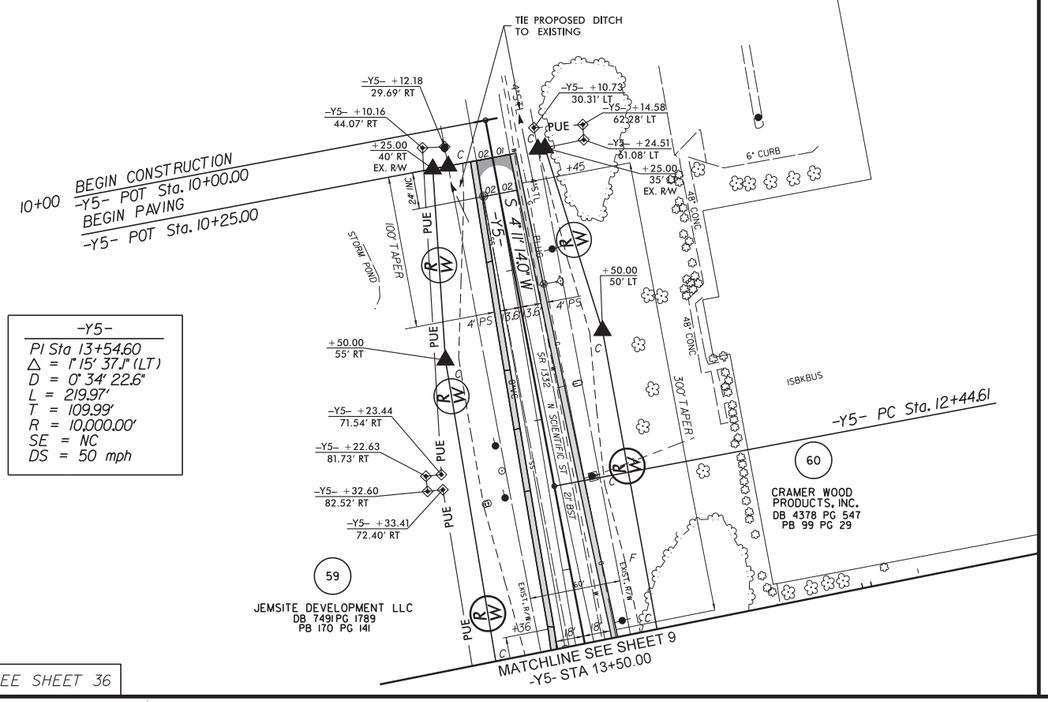
FROM STA. 23+50 TO STA. 24+00 -Y5- RT

DETAIL #3
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= Class 'B' Rip-Rap

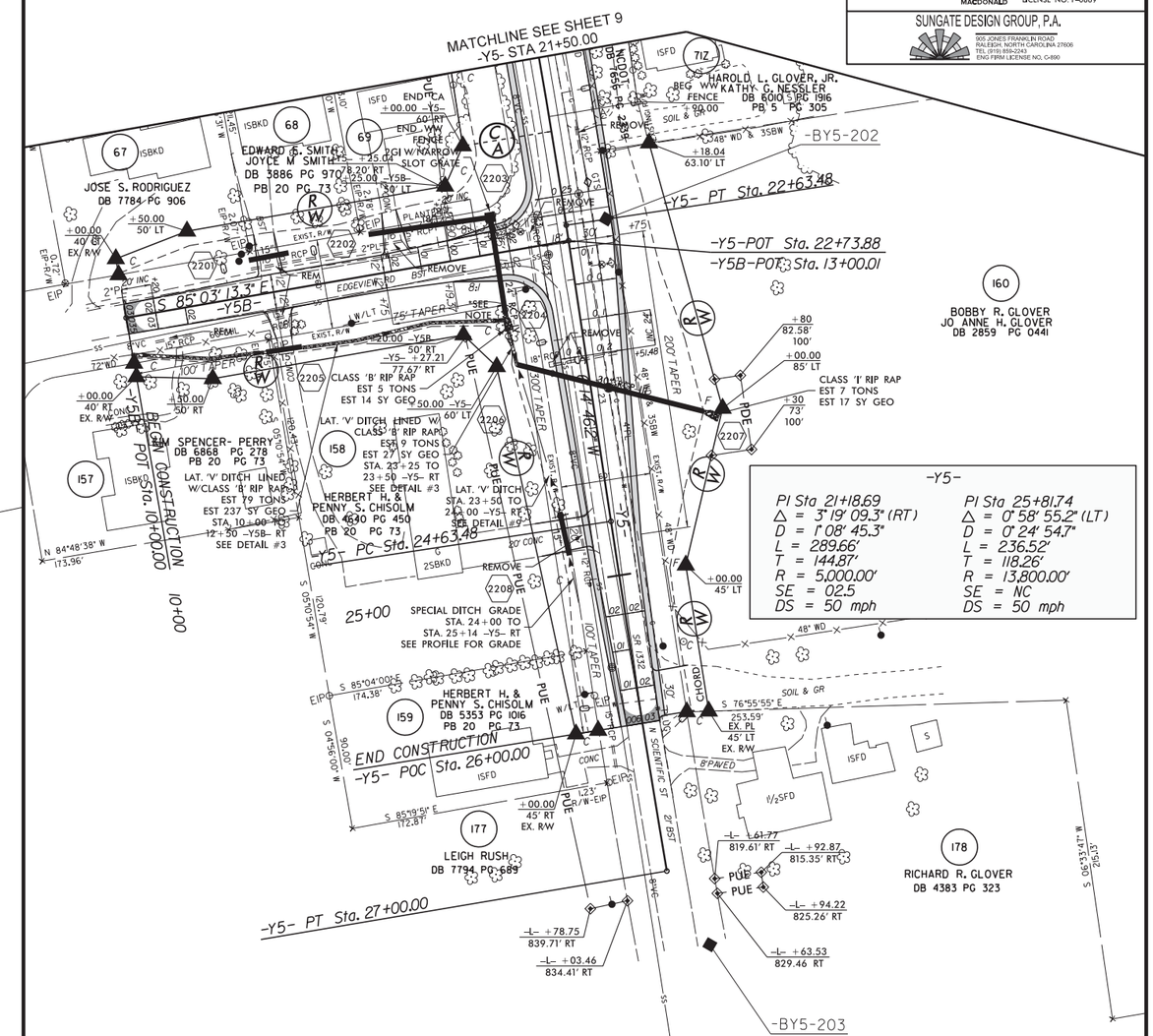
FROM STA. 10+00 TO STA. 12+50 -Y5B- RT



-Y5-
PI Sta 13+54.60
△ = 1° 15' 37.1" (LT)
D = 0° 34' 22.6"
L = 219.97'
T = 109.99'
R = 10,000.00'
SE = NC
DS = 50 mph

-Y5- PFL SEE SHEET 36

NAD 83/95



-Y5-
PI Sta 21+18.69
△ = 3° 19' 09.3" (RT)
D = 1° 08' 45.3"
L = 289.66'
T = 144.87'
R = 5,000.00'
SE = 02.5
DS = 50 mph

PI Sta 25+81.74
△ = 0° 58' 55.2" (LT)
D = 0° 24' 54.7"
L = 236.52'
T = 118.26'
R = 13,800.00'
SE = NC
DS = 50 mph

-Y5- PFL SEE SHEET 36
-Y5B- PFL SEE SHEET 37

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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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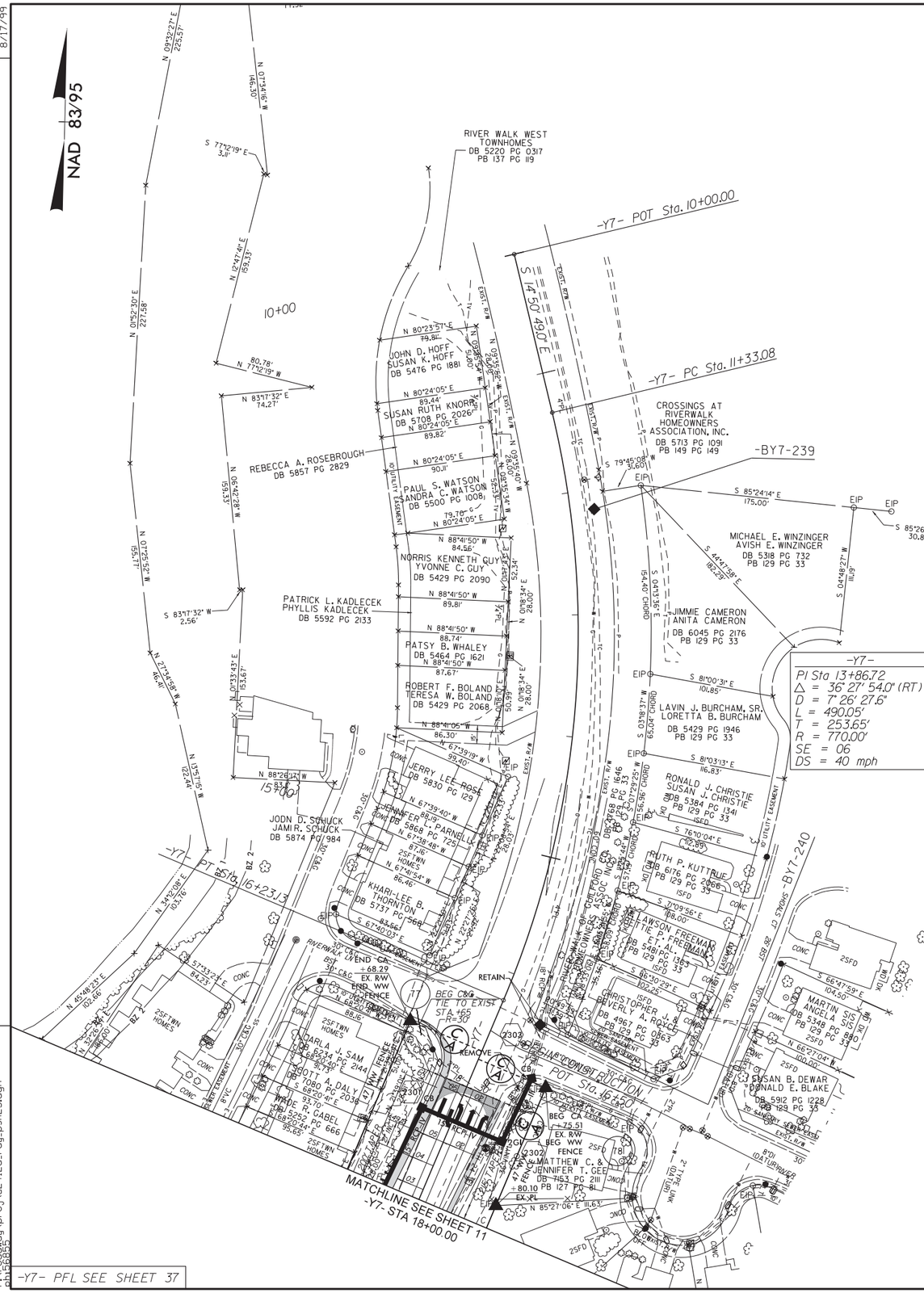
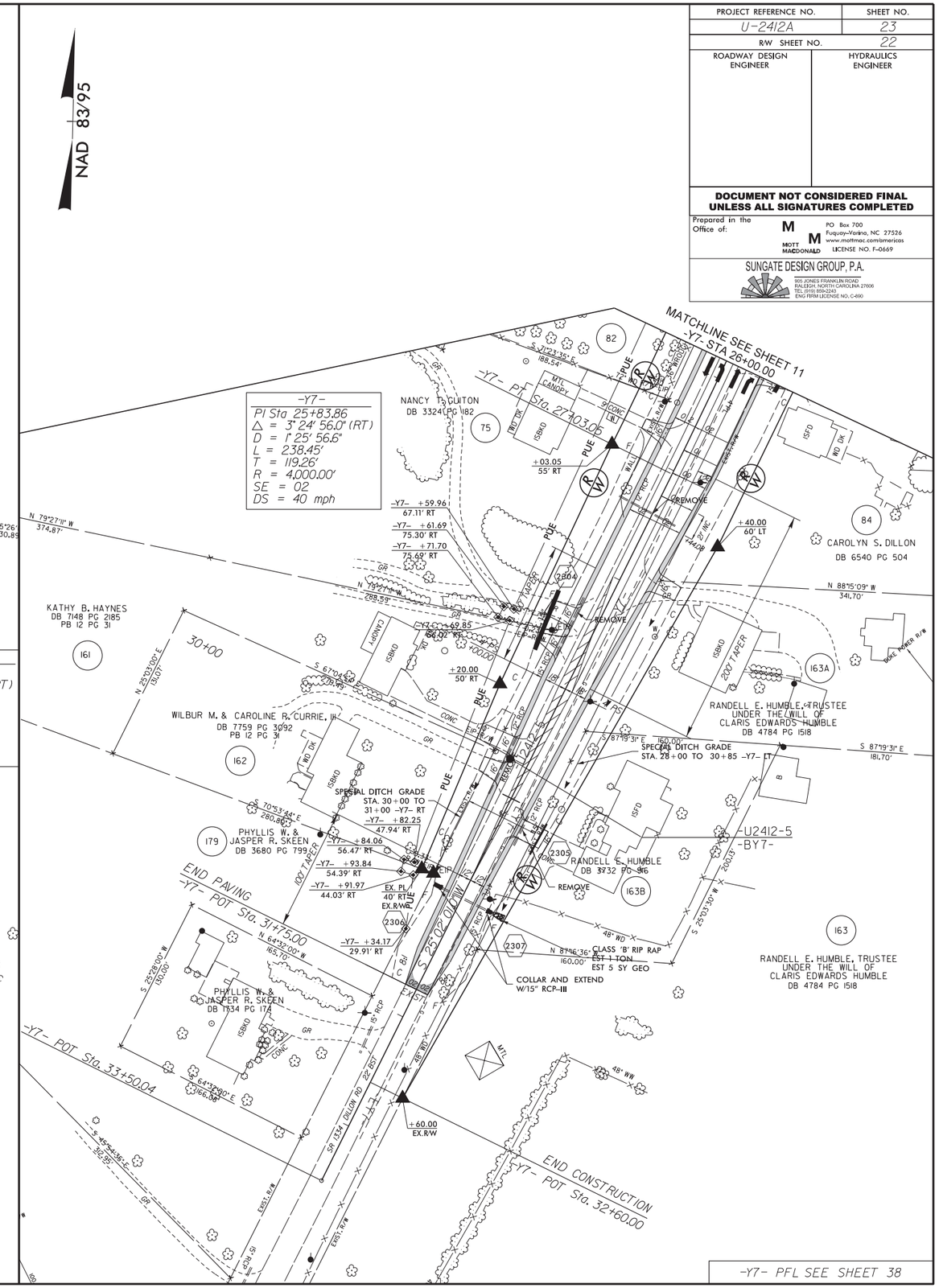
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-690

REVISIONS

8/17/99

REVISED SHEET NUMBER FROM 22 TO 23 - REVISED 10-20-2016
R/W REVISION: CREATED PARCELS 163B AND 179; SUBDIVIDED PARCEL 163 INTO PARCELS 163A AND 163B; UPDATED PROPERTY OWNER NAMES AND/OR DEED REFERENCES ON PARCELS 78,84, AND 161 THROUGH 163; ADDED PUE ON PARCELS 84,163 AND 163B.- TEM - 05/26/17
PARCELS 75,82,161,162 AND 179; REMOVED PUE ON PARCELS 84,163 AND 163B.- TEM - 05/26/17





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PROJECT REFERENCE NO.	SHEET NO.
U-2412A	24
R/W SHEET NO.	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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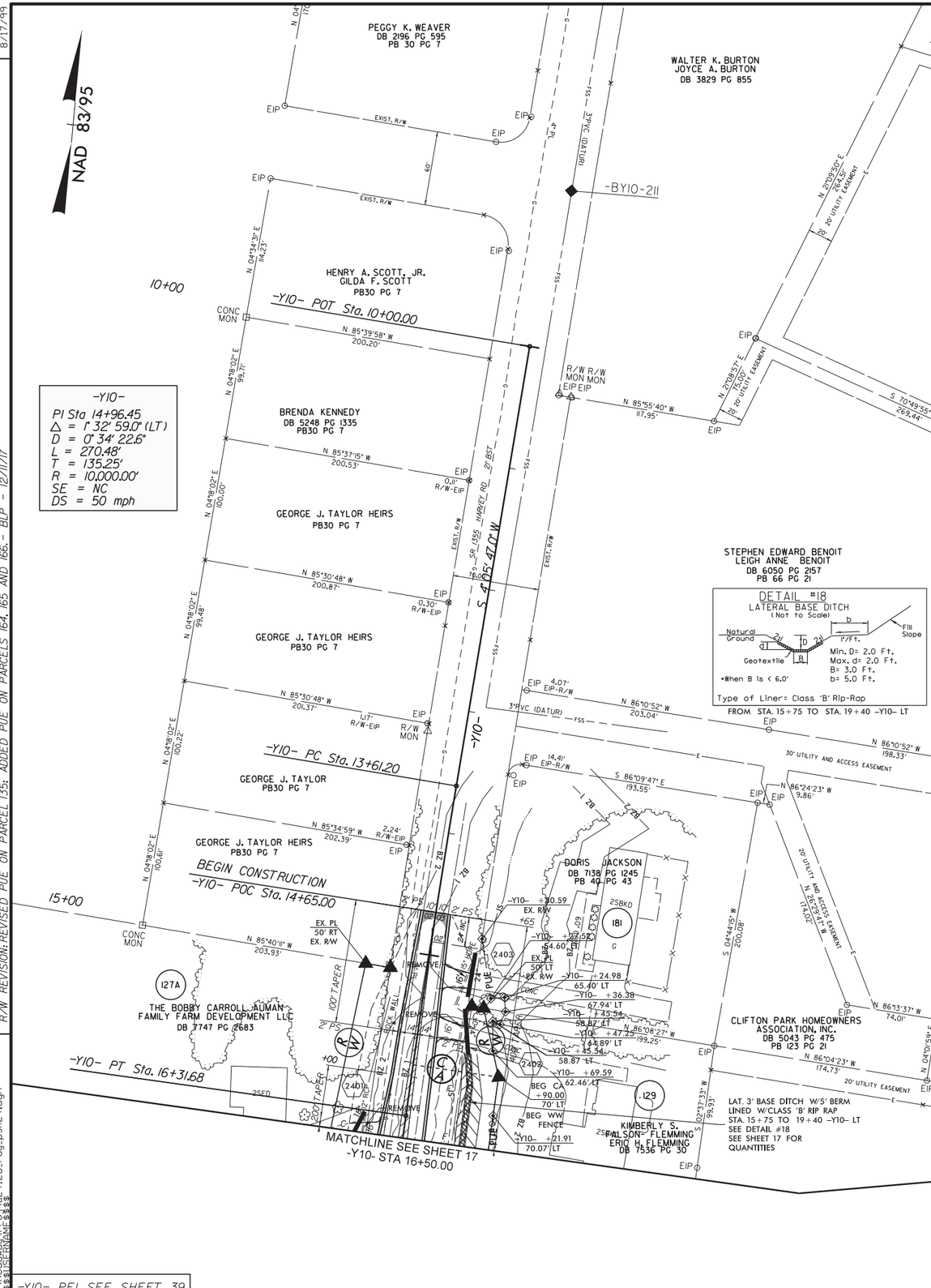
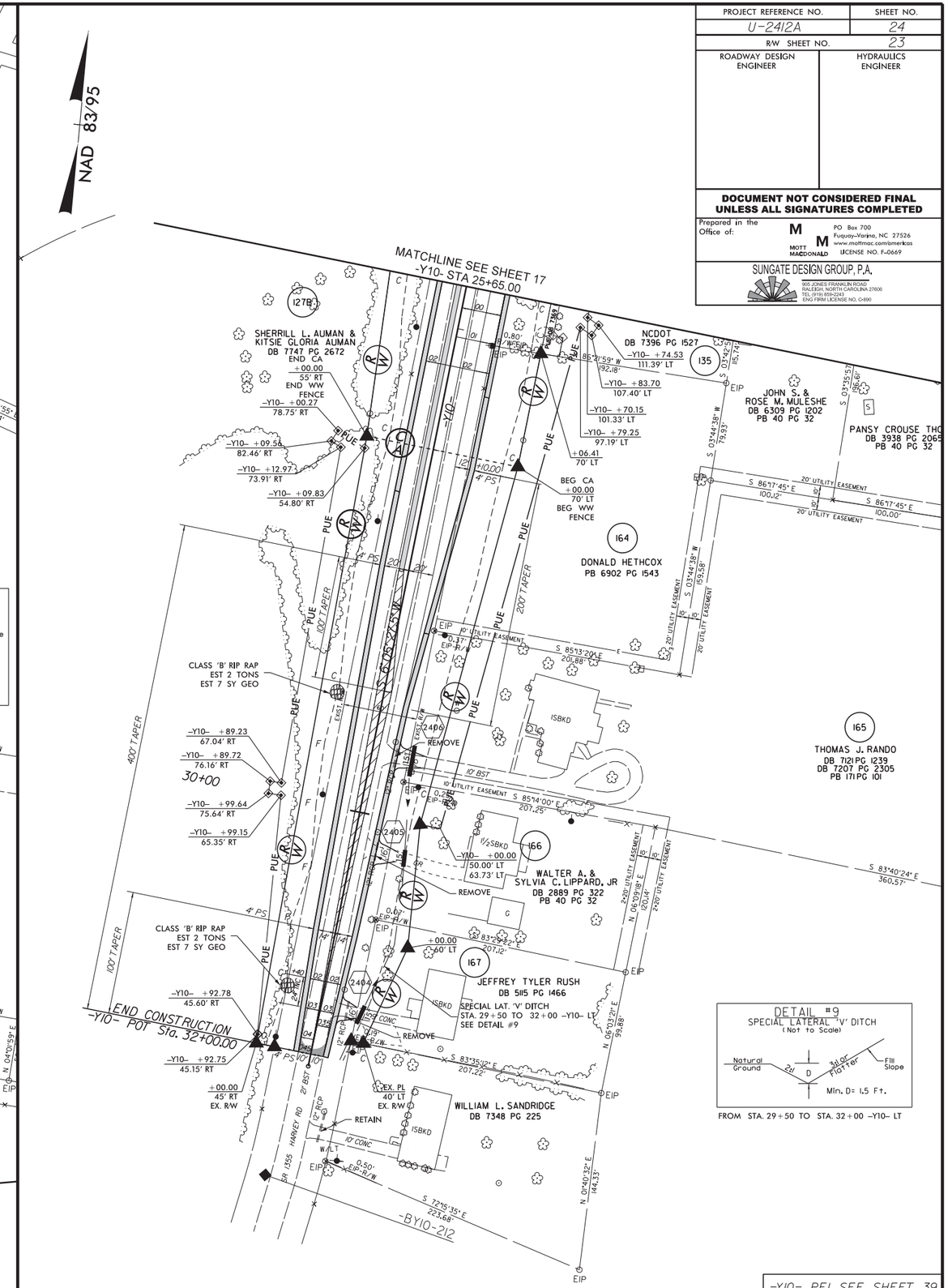
REVISIONS

REVISED OWNER FOR PARCEL 129 & 164 - REVISED 6-24-09
REVISED PUE AND TCE TIE TO PUE ON PARCEL 135 - REVISED 5-21-12
REVISED SHEET NUMBER FROM 23 TO 24 - REVISED 10-20-2016
R/W REVISION:CREATED PARCEL 181;UPDATED PARCEL 127 TO 127A;UPDATED PROPERTY OWNER NAME AND DEED REFERENCE ON PARCEL 127A, 129, 135 AND 165;
ADJUSTED PUE ON PARCELS 129 AND 135;ADDED PUE ON PARCEL 127B. BLP - 11/14/17
R/W REVISION:CORRECTED PARCEL 127 TO 127B, UPDATED PROPERTY OWNER NAME AND DEED REFERENCE ON PARCEL 127B. BLP - 11/14/17
R/W REVISION:REVISED PUE ON PARCEL 135; ADDED PUE ON PARCELS 164, 165 AND 166. - BLP - 12/11/17

8/17/99





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