STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

February 15, 2012
Revised March 15, 2012

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

ATTN: Mr. Andy Williams
NCDOT Coordinator

SUBJECT: **Application for Section 404 Individual Permit, Section 401 Individual Water Quality Certification, and Randleman Lake Buffer Authorization** for the proposed improvement of Greensboro-High Point Road (SR 1486-SR 4121) from US 311 Bypass (future I-74) in High Point to Hilltop Road in Greensboro, Guilford County, Division 7. Federal Aid Project No. STP-4121(1), State Project No. 8.2491602, WBS Element No. 34802.1.1, TIP No. U-2412A&B/U-2524AE.

Debit $570.00 from WBS Element No. 34802.1.1

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to improve Greensboro-High Point Road (SR 1486-SR 4121 from US 311 Bypass (future I-74) 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.

In addition to this cover letter, the application package for each project consists of an ENG Form 4345, North Carolina Ecosystem Enhancement Program (NCEEP) acceptance letter, Interagency Hydraulic Design Review meeting minutes for U-2412B/U-2524AE (Concurrence Points 4B and 4C), Stormwater Management Plan, permit drawings, and half-size roadway plan sheets.

PROJECT SCHEDULE

For construction purposes, the Greensboro-High Point Road improvement project has been broken down into two sections. The U-2524AE section of the proposed Greensboro Western Urban Loop is the interchange with Greensboro-High Point Road (part of Section U-2412B). Since the U-2524AE interchange was not completed with the rest of the Greensboro Western Urban Loop and the fact that the U-2524AE impacts are covered in the U-2412 NEPA

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documentation, Section U-2524AE has been combined with U-2412B for permitting and construction purposes. Table 1 reflects the project breakdown and section termini.

Table 1. Description of Project Sections for Construction Purposes

Section	Project Termini	Let Date
U-2412B/ U-2524AE	West of Vickrey Chapel Road to Hilltop Road (4.4 miles)	August 21, 2012
U-2412A	US 311 Bypass to west of SR 1480 (Vickrey Chapel Road) (3.5 miles)	Post-year

Permit drawings for the proposed project have been prepared based on final design for U-2412B/U-2524AE and preliminary design for U-2412A. The NCDOT will apply for any relevant permit modifications for U-2412A when final design is complete for that section. Construction will not commence on U-2412A until permit modifications have been received based on final designs.

This project calls for a letting date of August 21, 2012 and a review date of July 3, 2012 for Section U-2412B/U-2524AE. The letting date for Section U-2412A is post year. However, the letting date may advance as additional funds become available.

PURPOSE AND NEED

The purposes of the proposed project are (1) increase the traffic carrying capacity and improve current and future level-of-service along the Greensboro-High Point Road corridor; (2) enhance connectivity between US 311 Bypass, the Greensboro Western Urban Loop, and the entire transportation network in the Southwest Guilford County area; and (3) improve access between High Point, Jamestown, and Greensboro.

NEPA DOCUMENT STATUS

A Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) for U-2412 (includes Section U-2524AE) were approved on May 15, 2006 and December 30, 2006, respectively, and have been provided to the appropriate agencies. A Right of Way Consultation to update the U-2412 FEIS was approved on January 22, 2009. Additional copies will be provided upon request.

INDEPENDENT UTILITY

The subject project is in compliance with 23 CFR Part 771.111(f), which lists the Federal Highway Administration (FHWA) characteristics of independent utility of a project:

(1) The project connects logical termini and is of sufficient length to address environmental matters on a broad scope;
(2) The project is usable and a reasonable expenditure due to both sections being constructed at the same time;
(3) The project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

RESOURCE STATUS

Wetland delineations within the U-2412/U-2524AE construction footprint followed the field delineation method outlined in the *1987 Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987). Stream identification and classification followed the *Identification Methods for the Origins of Intermittent and Perennial Streams* (North Carolina Division of Water Quality [NCDWQ], 2005).

Within the U-2412/U-2524AE construction footprint, fifteen streams and eight wetlands were identified. Jurisdictional areas were initially verified by USACE Regulatory Specialist Jean Manuel on February 20, 2002 (USACE Action ID No. 200021876). Jurisdictional features were re-verified by USACE Regulatory Specialist Andy Williams and NCDWQ representative Amy Euliss on September 19, 2008. A packet for the final Jurisdictional Determination (JD) was submitted to the USACE on June 14, 2011. No written JD was received from the USACE for the re-verification.

IMPACTS TO WATERS OF THE UNITED STATES

This project lies within the Piedmont Physiographic Province in the Cape Fear River Basin [Hydrologic Unit Code (HUC) 03030003]. Jurisdictional features within the U-2412B/U-2524AE construction footprint that will be impacted include five unnamed tributaries (UT) to Reddicks Creek [NCDWQ Classification WS-IV; NCDWQ Index No. 17-8-(0.5)] and two riparian wetlands.

Jurisdictional features within the U-2412A construction footprint that will be impacted include eight UTs to the Deep River [NCDWQ Classification WS-IV; CA; NCDWQ Index No. 17-(3.7)] and two UTs to Bull Run Creek [NCDWQ Classification WS-IV; NCDWQ Index No 17-5-(1)]. Deep River and Bull Run Creek are within the construction footprint but will be bridged with no anticipated impacts to these waters. Six riparian wetlands will be impacted within the U-2412A project area.

There are no designated Outstanding Resource Waters (ORW), High Quality Waters (HQW), Water Supply I (WS-I), or Water Supply II (WS-II) waters within 1.0 mile of the project area. None of the streams within the project area or within a mile of the project area are listed on the 2010 303(d) Final List of Impaired Waters of North Carolina.

Utility Impacts

There will be no impacts from utilities to jurisdictional sites or buffers on Section U-2412B/U-2524AE of this project. Utility impacts for Section U-2412A will be evaluated during the permit modification process.

Surface Waters

U-2412B/U-2524AE

Total surface water impacts for U-2412B/U-2524AE are 1,932 linear feet of permanent stream impacts and 140 linear feet of temporary stream impacts. Tables 2-3 below list the site number, reference number, stream name, amount of permanent and temporary impacts, and amount of mitigation required.

Table 2. U-2412B/U-2524AE Streams Impacted and Their Descriptions

Permit Site No.	Stream ID in FEIS	JD Package ID	Stream Name	Classification
1	UT1 Lake 2	UT1 Lake 2	UT to Reddicks Creek	Perennial
2	UT5 Reddicks	UT5 Redd	UT to Reddicks Creek	Perennial
3	UT7 Reddicks	UT7 Redd	UT to Reddicks Creek	Perennial
4	UT3 Reddicks	UT3 Redd	UT to Reddicks Creek	Perennial
5	UT4 Reddicks	UT4 Redd	UT to Reddicks Creek	Perennial
6	UT5 Reddicks	UT5 Redd	UT to Reddicks Creek	Perennial

Table 3. U-2412B/U-2524AE Surface Water Impacts (Final)

Permit Site No.	Impact Type	Permanent Impact Length (ft)	Proposed Mitigation Ratio[1]	Temporary Impact Length (ft)
1	48" RCP	241	2:1	51
	Bank Stabilization	24	0[2]	
2	9' x 6' RCBC	267	2:1	20
	Bank Stabilization	28	0[2]	
3	54" RCP	173	2:1	7
	30" RCP	330	2:1	
4	42" RCP	331	2:1	19
5	60" RCP	445	2:1	33
	Bank Stabilization	10	0[2]	
6	48" RCP	68	2:1	10
	Bank Stabilization	15	0[2]	
Total Impacts		**1,932**		**140**

[1]Ratios from USACE during verification site visit on September 19, 2008. [2]Mitigation for bank stabilization not required by USACE and NCDWQ mitigation requirement met under the USACE 2:1 ratio for stream mitigation.

U-2412A

Total preliminary surface water impacts for U-2412A are 2,885 linear feet of permanent stream impacts and 636 linear feet of temporary stream impacts. There may also be 3.65 acres of surface water impacts to four ponds. Tables 4-5 below list the site number, reference number, stream name, amount of preliminary permanent and temporary impacts, and mitigation ratios agreed upon at the aforementioned September 19, 2008 field meeting.

Table 4. U-2412A Streams Impacted and Their Descriptions

Permit Site No.	Stream ID in FEIS	JD Package ID	Stream Name	Classification
1	UT1 Lake 1	UT1 Lake 1	UT to Deep River	Perennial
2	UT1 Lake 1	UT1 Lake 1	UT to Deep River	Perennial
2	Lake 1	Lake 1	UT to Deep River	Pond
3A	Not Identified	UT1a Deep	UT to Deep River	Intermittent
3B	UT1 Deep	UT1 Deep	UT to Deep River	Intermittent
4	UT2 Deep	UT2 Deep	UT to Deep River	Perennial
6	Not Identified	UT4 Deep	UT to Deep River	Perennial
7A	Not Identified	UT5 Deep	UT to Deep River	Perennial
7B	Not Identified	UT6 Deep	UT to Deep River	Intermittent
8	UT3 Deep	UT3 Deep	UT to Deep River	Perennial
10A	Not Identified	UT1 Bull Run	UT to Bull Run Creek	Intermittent
10A	UT1 Bull Pond	UT1 Bull Run Pond	UT to Bull Run Creek	Pond
10B	UT1 Bull	UT1 Bull Run	UT to Bull Run Creek	Perennial
11	UT3 Bull*	UT3 Bull Run	UT to Bull Run Creek	Perennial
11	UT7 Bull*	UT7 Bull Run	UT to Bull Run Creek	Perennial
11	UT3 Bull Lake	UT3 Bull Run Lake	UT to Bull Run Creek	Pond
12	UT3 Bull	UT3 Bull Run	UT to Bull Run Creek	Perennial
13	UT3 Bull	UT3 Bull Run	UT to Bull Run Creek	Perennial
13	UT5 Bull Lake 1	UT5 Bull Run Lake 1	UT to Bull Run Creek	Perennial
14	UT2 Lake 1	UT2 Lake 1	UT to Deep River	Perennial

*UT3 Bull (upstream of pond) and UT7 Bull (downstream of pond) are the same stream.

Table 5. U-2412A Surface Water Impacts (Preliminary)

Permit Site No.	Permanent Impact Length (ft)	Pond Impact Area (acres)	Proposed Mitigation Ratio[1]	Temporary Impact Length (ft)
1				34
2	353		2:1	106
2		0.60		
3A	213		0[2]	11
3B	307		1:1	64
4	336		2:1	17
6	242		2:1	21
6	41		1:1[3]	
7A	418		1:1	33
7B	208		1:1 (minus 40 feet)[4]	
8				215
10A	100		1:1	
10A		0.18		
10B	40		2:1	40
11	492		2:1	55
11		1.31		
12	82		2:1	
13	24		2:1	40
13		1.56		
14	29		2:1	
Total Impacts	**2,885**	**3.65**		**636**

[1]Ratios from USACE during verification site visit on September 19, 2008. [2]Stream deemed unimportant by the USACE. [3]41 foot stream section within utility corridor that was determined 1:1 ratio by USACE. [4]40 foot stream section within utility corridor deemed unimportant by the USACE and no mitigation required.

Wetlands

U-2412B/U-2524AE

There will be a total of 0.63 acres of permanent riparian wetland impacts associated with this section. These impacts will result from 0.48 acres of permanent fill, 0.14 acres of excavation, and 0.01 acres of mechanized clearing. Wetland impacts are summarized below in Table 6.

Table 6. U-2412B/U-2524AE Wetland Impacts (Final)

Permit Site No.	Wetland ID in FEIS	JD Package ID	Impact Type	Permanent Impacts (ac)
2	Not Identified	Wetlands K & L	Permanent Fill	0.07
			Mechanized Clearing	0.01
6	Wetland H	Wetland H	Permanent Fill	0.41
			Excavation	0.14
			Mechanized Clearing	<0.01
Total Impacts				**0.63***

*Total impacts due to rounding.

U-2412A

There will be a total of 0.99 acres of permanent riparian wetland impacts associated with this section. These impacts will result from 0.81 acres of permanent fill and 0.18 acres of mechanized clearing. Additionally, 0.19 acres of hand clearing will result from this project. Wetland impacts are summarized below in Table 7.

Table 7. U-2412A Wetland Impacts (Preliminary)

Permit Site No.	Wetland ID in FEIS	JD Package ID	Impact Type	Permanent Impacts (ac)
2	Not Identified	Wetland AA	Permanent Fill	0.22
			Mechanized Clearing	0.05
4	Not Identified	Wetlands AB & AC	Permanent Fill	0.03
7A	Wetland A	Wetland A1	Permanent Fill	0.45
			Mechanized Clearing	0.04
8	Wetlands B & I	Wetlands B & I	Permanent Fill	0.02
			Mechanized Clearing	0.04
11	Wetland E (Wetland G not identified)	Wetlands E & G	Permanent Fill	0.08
			Mechanized Clearing	0.04
12	Not Identified	Wetland M	Permanent Fill	0.01
			Mechanized Clearing	0.01
Total Impacts				**0.99***

*Total impacts due to rounding.

Randleman Lake Water Supply Watershed Buffers

This project impacts buffers in the Randleman Lake water supply watershed. Section U-2412B/U-2524AE has final design impacts and Section U-2412A has preliminary impacts. Buffer impacts are summarized in Tables 8–9 for U-2412B/U-2524AE and in Tables 10–11 for U-2412A below. Wetlands are present within the impacted buffer areas. The wetland acreages within the mitigable buffer areas have been subtracted out. Buffer impacts in these areas will be covered by the wetland mitigation.

Table 8. U-2412B/U-2524AE Randleman Lake Watershed Buffer Impacts (Final)

	Road Crossing	Road Crossing	Impacts Other Than Road Crossings*
Zone 1 Impact (sq ft)	6,359	*102,209*	*53*
Zone 2 Impact (sq ft)	5,751	*61,577*	*44*
Mitigation requirements (exempt, allowable or allowable with mitigation)	Allowable (impacts less than 150 linear feet or one-third of an acre)	Allowable with mitigation	*Allowable*

*Due to stormwater conveyance impact through buffers.
Note: Revisions are italicized March 15, 2012.

Table 9. U-2412B/U-2524AE Total Buffer Impacts Requiring Mitigation (Final)

	Zone 1 Impacts (sq ft)	Zone 2 Impacts (sq ft)
Buffer Impacts requiring mitigation	*102,209*	*61,577*
Wetlands in mitigable buffers	3,122	30
Total Buffer Impacts requiring mitigation	***99,087***	***61,547***

Note: Revisions are italicized March 15, 2012.

Table 10. U-2412A Randleman Lake Watershed Buffer Impacts (Preliminary)

	Bridge	Road Crossing	Impacts Other Than Road Crossings*
Zone 1 Impact (sq ft)	52,600	289,705	50,668
Zone 2 Impact (sq ft)	35,609	152,157	198,130
Mitigation requirements (exempt, allowable or allowable with mitigation)	Allowable	Allowable with mitigation	Allowable with mitigation

*Due to parallel stream impacts from road and bridge impacts beyond end pier bent.

Table 11. U-2412A Total Buffer Impacts Requiring Mitigation (Preliminary)

	Zone 1 Impacts (sq ft)	Zone 2 Impacts (sq ft)
Buffer Impacts requiring mitigation	340,373	350,287
Wetlands in mitigable buffers	28,793	7,666
Total Buffer Impacts requiring mitigation	**311,580**	**342,621**

FEDERALLY PROTECTED SPECIES

Plants and animals with a Federal classification of Endangered (E) or Threatened (T) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act (ESA) of 1973, as amended. As of September 22, 2010, the U.S. Fish and Wildlife Service (USFWS) list one federally protected species for Guilford County: Small whorled pogonia (*Isotria medeoloides)*. A species description and biological conclusion for the small whorled pogonia was not stated in the FEIS because the species was added to the USFWS county list of protected species after the documents were completed. A survey was done by NCDOT biologists on May 25, 2010 and a biological conclusion of "No Effect" was given for small whorled pogonia. A search of the North Carolina Natural Heritage Database (NCNHP; updated May 2011) revealed no known occurrences of any federally protected species within 1.0 mile of the limits of this section.

Since the FEIS the bald eagle has been delisted for Guilford County. The bald eagle has been delisted as of August 2007 and is not subject to Section 7 consultation and a biological conclusion is not required. However, the bald eagle remains protected by the Bald and Golden Eagle Protection Act. Habitat in the vicinity of U-2412A is limited to areas surrounding High Point Lake and the Deep River. Surveys conducted on May 1 and June 26, 2008 and May 25, 2010 found no nests within 660 feet of the project limits. No habitat exists for bald eagle in the vicinity of U-2412B/U-2524AE.

CULTURAL RESOURCES

A concurrence form for assessment of effects was signed by NCDOT, The North Carolina Department of Cultural Resources, State Historic Preservation Office (HPO), and Federal Highway Administration (FHWA) on January 11, 2005 (see FEIS Appendix A). The only identified property within the area of potential effect is the Oakdale Cotton Mill Village Historic District (specifically Oakdale United Methodist Church). The Oakdale Cotton Mill Village Historic District is listed on the National Register of Historic Places (NRHP). However, it was concluded during a merger meeting on January 11, 2005 that this project will have no adverse effect on the Oakdale Cotton Mill Village Historic District.

At the request of HPO (letter and memo dated August 7, 1992 and June 5, 2000, respectively), NCDOT conducted additional archeological surveys to determine the eligibility of 3 archaeological sites discovered during the initial 1990 survey. NCDOT prepared and submitted to HPO an archaeological survey report on September 4, 2001 of the findings. A response letter dated October 4, 2001 stated that HPO concurred with NCDOT's finding that two of the NRHP eligible archaeological sites will not be affected by the proposed road improvements and that the other site was not NRHP eligible (see FEIS Appendix A). No additional investigations were recommended.

FEMA COMPLIANCE

There are streams within the project limits that are within Federal Emergency Management Agency (FEMA)-designated flood zones. Coordination between the NCDOT Hydraulics Unit and FEMA will occur prior to Let to ensure that NCDOT is in full compliance with applicable floodplain ordinances.

INDIRECT AND CUMULATIVE EFFECTS

An Indirect and Cumulative Effects (ICE) report was completed for U-2412. The report details the potential socioeconomic, and ecological effects that may result from U-2412 and other past, present, and reasonably foreseeable future development activities in the region. It was completed in April 2006 and distributed shortly thereafter. The ICE report is summarized in the U-2412 FEIS. Additional copies of the ICE report are available upon request.

Based upon the ICE report, a majority of the study area is urban and suburban in character, and most of the area already has access to an established road network. The project's individual effects on land use and natural resources are minor. The proposed project will not open any large undeveloped areas to new development. The provisions contained in the Water Supply Watershed rules that are in effect and are stringently enforced by the local governments will control and limit development within the watershed areas in the project study area. The potential indirect effects identified in the ICE report are consistent with all local jurisdictions' land use and transportation plans. Current land use and transportation policies contained in the local plans support the proposed project.

WILD AND SCENIC RIVERS

This project will not impact any designated Wild and Scenic Rivers or any rivers included in the list of study rivers (Public Law 90-542, as amended) or North Carolina Natural and Scenic Rivers.

ESSENTIAL FISH HABITAT

The project will not impact any essential fish habitat afforded protection under the Magnuson-Stevens Act of 1996 (16 U.S.C 1801 *et seq.*).

MITIGATION OPTIONS

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

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

Avoidance and Minimization

Avoidance and minimization has been employed in the project area to the maximum extent practicable. The following measures were implemented for the project:

U-2412A&B/U-2524AE Minimization Measures

- NCDOT's Best Management Practices (BMPs) for the Protection of Surface Waters will be enforced;
- Use of Design Standards in Sensitive Watersheds through entire project;
- Impacts to wetlands and surface waters were minimized using 2:1 side slopes where practicable;
- Wetland impacts have been kept to a minimum by avoiding ditching and channelization through wetlands. Existing drainage patterns to the wetlands have been kept to maintain the hydrology feeding the wetlands;
- A flat and wide tail ditch with rip-rap will be used to dissipate energy from storm drain outlet to provide a non-erosive sheet flow before entering wetlands/buffers at Station – RAMPB-14+00 LT;
- Bank stabilization activities will not place rip-rap on the stream bottom;
- Grass swales will be utilized at 12 Buffer locations along the project;
- Box culvert at Permit Site 2 will be buried one foot at upstream end and 1.5 feet at downstream end;
- For minor crossings, pipes will be buried 20 percent of the pipe diameter below the natural streambed up to a maximum of 1 foot;
- For minor crossings at stations –L-397+73, -L-409+45, -RAMPB-17+57, -Y35B-12+80, and -Y35B-18+20, channel realignment at upstream and/or downstream end will be implemented to prevent erosion;
- For minor crossings at stations –L-397+73, -L-409+45, -RAMPB-17+57, -L432+52, and -Y35B-18+20, junction boxes will be used to dissipate energy from storm drain outlet pipes and to eliminate potential erosion to the upstream and downstream channels due to the pipe outlets to the stream;
- Pre-formed scour holes with level spreaders will be constructed at three locations:–L- 288+30 RT, –RAMPB-16+50LT, and –Y18-15+40 RT;
- Elimination of stream impacts at Permit Sites 5 and 9 of Section U-2412A due to bridging.

For additional avoidance/minimization for U-2412B/U-2524AE see attached Stormwater Management Plan. Despite these best efforts of NCDOT, permitted stream impacts (4,817 linear feet) for U-2412/U-2524AE did increase from the impacts reported in the FEIS (2,782 linear feet). This increase is mainly due to new streams (4 streams totaling 1,122 linear feet) and additional jurisdictional stream sections to the FEIS listed streams (approximately 900 linear feet) found within the project area that were not included in the FEIS. Overall wetland impacts decreased from 1.8 acres reported in the FEIS to 1.62 recorded in this permit application.

Compensatory Mitigation

Compensatory mitigation requirements for stream, wetland, and buffer impacts are summarized below in Table 12 for U-2412B/U-2524AE. Due to the status of Section U-2412A being currently unfunded and letting more than 5 years out, NCDOT is not proposing mitigation for Section U-2412A at this time. The U-2412B/U-2524AE section will permanently impact a total of 1,932 feet of warm water streams. Of these 1,932 feet, there are 77 feet of bank stabilization that do not require mitigation by the USACE, resulting in 1,855 feet of stream impacts requiring USACE mitigation.

The USACE is requiring 2:1 mitigation for 1,855 feet and the NCDWQ is requiring 1:1 mitigation for 1,917 feet. The 3,710 feet of mitigation provided by the NCEEP for permanent impacts to warm water streams covers all stream mitigation requirements for U-2412B/U-2524AE. NCEEP will also provide mitigation for the 0.63 acres (2:1 ratio) of permanent riparian wetland impacts resulting from roadway fill, excavation, and mechanized clearing, 99,140 square feet (3:1 ratio) for Buffer Zone 1 impacts, and 61,591 square feet (1.5

ratio) for Buffer Zone 2 impacts. The FEIS stated that NCDOT will require a "general" major variance from the Randleman Lake Watershed Water Supply Buffer Rules. Since the FEIS completion, the revised version of the Randleman Lake Watershed Water Supply Buffer Rules has been enacted. Based on the new Randleman Lake buffer rules, this project is in compliance and therefore will not need a major variance.

Table 12. U-2412B/U-2524AE Required Compensatory Mitigation Summary

	Stream Impacts in Length (ft)	Riparian Wetland Impacts (ac)	Buffer Zone 1 Impacts (sq ft)	Buffer Zone 2 Impacts (sq ft)
Impacts Requiring Mitigation	1,855	0.63	*99,087*	*61,547*
Required Mitigation	1,855 @ 2:1	0.63 @ 2:1	*99,087 @ 3:1*	*61,547 @ 1.5:1*
Total Mitigation	**3,710**	**1.26**	***297,261***	***92,321***

Note: Revisions are italicized March 15, 2012.

REGULATORY APPROVALS

Application is hereby made for a Department of the Army Section 404 Individual Permit as required for the above-described activities for the proposed T.I.P. Project U-2412/U-2524AE. The NCDOT understands that a permit modification will be required for Section U-2412A after final design is complete and prior to construction.

We are also hereby requesting a Section 401 Individual Water Quality Certification and Randleman Lake Riparian Buffer Authorization from NCDWQ. 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. We are providing five copies of this application to the North Carolina Department of Environment and Natural Resources (NCDENR), NCDWQ, for their review and approval.

A copy of this permit application and its distribution list will be posted on the NCDOT website at http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html. Thank you for your time and assistance with this project. Please contact Greg Price at either gwprice@ncdot.gov or (919) 707-6148 if you have any questions or need additional information.

Sincerely,

E. L. Lusk

for Gregory J. Thorpe, Ph.D., Manager
Project Development and Environmental Analysis Unit

Cc:
NCDOT Permit Application Standard Distribution List

U.S. ARMY CORPS OF ENGINEERS

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

(33 CFR 325)

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

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

PRIVACY ACT STATEMENT

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

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

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

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Gregory Middle - J. Last - Thorpe	First - Middle - Last -
Company - NCDOT-PDEA	Company -
E-mail Address -	E-mail Address -
6. APPLICANT'S ADDRESS:	9. AGENT'S ADDRESS:
Address-	Address-
City - State - Zip - Country -	City - State - Zip - Country -
7. APPLICANT'S PHONE NOs. w/AREA CODE	10. AGENTS PHONE NOs. w/AREA CODE
a. Residence b. Business 919-707-6111 c. Fax	a. Residence b. Business c. Fax

STATEMENT OF AUTHORIZATION

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

_____ _____
SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
U-2412/U-2524AE

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
UTs to Reddicks Cr, Deep River, Bull Run Cr., and their UTs	Address
15. LOCATION OF PROJECT Latitude: °N 36.0085 Longitude: °W 79.9021	City - State- Zip-

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

17. DIRECTIONS TO THE SITE

Please see attached vicinity map and cover letter.

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

U-2412/U-2524AE proposes to improve Greensboro-High Point Road (SR 1486-SR 4121 from US 311 Bypass (future I-74) 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.

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

The purposes of U-2412/U-2524AE are (1) increase the traffic carrying capacity and improve current and future level-of-service along the Greensboro-High Point Road corridor; (2) enhance connectivity between US 311 Bypass, the Greensboro Western Urban Loop, and the entire transportation network in the Southwest Guilford County area; and (3) improve access between High Point, Jamestown, and Greensboro.

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

20. Reason(s) for Discharge

Impacts will result from widening the roadway and shoulders, construction of roadway on new location, and bridge construction.

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

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
See attached cover letter.		

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

Acres See attached cover letter.

or

Linear Feet See attached cover letter.

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

See attached cover letter.

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

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

a. Address- See attached permit drawings.

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

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

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

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

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

E. L. Lusk for Gregory J. Thorpe, PhD — Feb 15, 2012

SIGNATURE OF APPLICANT — DATE — SIGNATURE OF AGENT — DATE

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

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

Ecosystem Enhancement PROGRAM

February 7, 2012

Mr. Gregory J. Thorpe, Ph.D.
Environmental Management Director
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

U-2412B, SR 4121 (Greensboro / High Point Road) from SR 4228 (Vickrey Chapel Road) to SR 1424, Guilford County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the stream and riparian wetland mitigation and buffer mitigation for the subject project. Based on the information supplied by you on February 6, 2012, the impacts are located in CU 03030003 of the Cape 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	1,855	0.63	0	0

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 additional buffer mitigation will be provided in the agreed upon method of fund transfer. Upon receipt of the NCDWQ's Buffer Authorization Certification, EEP will transfer funds from NCDOT ILF Fund into the Riparian Buffer ILF Fund. Upon completion of transfer payment, NCDOT will have completed its riparian buffer mitigation responsibility for U-2412B. Subsequently, EEP will conduct a review of current NCDOT ILF mitigation projects in the river basin to determine if available buffer mitigation credits exist. If there are buffer mitigation credits available, then the Riparian Buffer ILF Fund will purchase the appropriate amount of buffer mitigation credits from NCDOT ILF Fund. The buffer impacts and anticipated buffer mitigation credits needed are as follows:

Buffer	River Basin	CU Location	Eco-Region	Buffer		
				Zone 1	Zone 2	TOTAL
Impacts	Cape Fear	03030003	CP	99,140.0	61,591.0	160,731.0

This mitigation acceptance letter replaces the mitigation acceptance letter issued on December 20, 2011. EEP commits to implementing sufficient compensatory stream and riparian wetland mitigation credits and buffer mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies in accordance with the N.C. Department of Environment and Natural Resources' Ecosystem Enhancement Program 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 EEP.

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

Sincerely,

Michael Ellison
EEP Deputy Director

Cc: Mr. Andy Williams, USACE – Raleigh Regulatory Field Office
Mr. Brian Wrenn, NC Division of Water Quality
File: U-2412B Revised

Subject: Minutes from Interagency 4B Hydraulic Design Review Meeting On July 23, 2008 for U-2412B in Guilford County

Team Members:

Andrew Williams-USACOE	(present)
Gary Jordan-USFWS	(not present)
Travis Wilson-NCWRC	(present)
Amy Euliss-NCDWQ	(present)
Kathy Matthews-EPA	(present)
Donnie Brew-FHWA	(not present)
David Harris-REU	(not present)
Doug Taylor-Roadway	(not present)
Roy Girolami-Structures	(present)
Derrick Weaver-PDEA	(not present)
Rachelle Beauregard-NEU	(present)
Patty Eason-Division 7	(present)

Participants:

Marshall Clawson, NCDOT Hydraulics
Dan Duffield, NCDOT Hydraulics
David Fuh, Ko & Associates
Stacey Bailey, Ko & Associates
Herbert Turner, Ko & Associates
David Wainwright-NCDWQ
Alan Ray, NCDOT Roadway
David Bailey, NCDOT NEU

General Comments:

Marshall Clawson began the meeting with introductions and stated that today's meeting would review project impacts to jurisdictional waters and wetlands. A separate meeting for review of stream buffer impacts would be held in the near future. He then turned the meeting over the David Fuh. One handout was provided – Table "U-2412B: Jurisdictional Sites". This handout is provided as an attachment to these minutes.

The project is located outside the one-half mile limit from the water supply critical area; therefore, hazardous spill detention basins are not required. The main project commitment on planning document green sheets that would affect hydraulics design is compliance with the Stormwater regulations set forth by the Randleman Dam Watershed Nutrient Management Strategy (Randleman Rules).

Plan Sheet Comments:

To comply with the Randleman Rules, the hydraulic design criteria for this project are:

1. To provide sheet flow through buffers, where practical.
2. To reduce pollutant loading prior to entering jurisdictional streams.
3. To provide stormwater treatment with no direct discharge of pavement runoff to jurisdictional streams.
4. To minimize or prevent stream erosion due to stormwater runoff.

All jurisdictional streams and pond in the vicinity of this project are buffered.

All discharges into wetlands will be at a non-erosive velocity. Within wetlands, riprap outlet pads are specified at culvert to dissipate outlet velocities, as required. For jurisdictional stream

crossings, the inverts of all proposed box and pipe culverts are buried 20% of structure depth up to one foot below the channel bed.

General discussion was held regarding identifying or designating jurisdiction waters on the roadway plans. Jurisdictional waters will be designated with a "JS" line style. NEU will coordinate with Location Surveys to assure that the appropriate "JS" line style is designated and legible on the 1" = 100' plan sheets.

Plan Sheet 4:

- Flow line shown on the plan sheet is non-jurisdictional.

- There are no impacts to a jurisdictional stream, UT 1 to Reddick Cr, which begins approximately 280' right of -L- Sta 264+80.

Plan Sheet 5:

- There are no impacts to a jurisdictional stream, UT 15 to Deep River, which begins approximately 430' right of -L- Sta 249+88.

- All other flow lines shown on the plan sheet are non-jurisdictional.

Plan Sheet 6:

- Impacts occur to jurisdictional pond, UT 2 Reddick Pond, within footprint of the proposed roadway. Based on Ko's field review, this pond is dry and dam has been breached. A second larger pond located approximately 300' right of -L- 275+50 is not impacted. NEU will review both sites with agencies to clarify the jurisdictional and buffer calls.

- This pond previously outlet to a jurisdictional stream, UT 2 to Reddick Creek. Per the Concurrence Point 4A packet, "UT 2 to Reddicks Creek has been destroyed by extensive grading operations by private developers. Therefore, impacts to UT 2 to Reddicks Creek are no longer included in project totals".

Plan Sheets 7-9:

- All flow lines shown on these plan sheets are non-jurisdictional.

Plan Sheet 10:

- No impacts to wetland and jurisdictional stream, UT 6 to Bull Run, which begins approximately 290' left of -L- Sta 315+47.

Plan Sheet 11:

- No impacts to jurisdictional stream, UT 4 to Reddick Creek, which begins approximately 185' right of -Y19- Sta 11+90 (Scotland Rd).

Plan Sheet 13:

- No impacts to jurisdictional pond, Suttonwood Pond, which begins approximately 60' left of -Y22- Sta 13+50 (Suttonwood Rd). This site is a stormwater basin for the Walgreen's development. NEU will review site with agencies to clarify the jurisdictional and buffer calls.

Plan Sheet 15:

- No impacts to wetland, Wetland-K, which begins approximately 320' left of -L- Sta 371+60. Wetland drains toward the West under railroad. No jurisdictional stream has been determined at this site.

Plan Sheet 17:

- -L- Sta 397+70: Impacts occur to jurisdictional stream, UT 1 to Lake 2, from proposed crossing – 48" pipe buried 0.8' with approximately 30 LF of channel realignment at the inlet and approximately 30 LF of bank stabilization at outlet.

- Project has stormwater runoff from the SW, NE and SE quadrants. Level spreaders are not appropriate in these quadrants; therefore, stormwater is treated via grassed swales prior to discharging to the jurisdictional stream.

Plan Sheet 18:

- -L- Sta 409+50: Impacts occur to jurisdictional stream, UT 3 to Reddick Creek, from proposed crossing – 60" pipe buried 1.0' with approximately 30 LF and 40 LF of channel improvements at the inlet and outlet, respectively.

- -RAMPB- 15+50: Impacts occur to jurisdictional stream, UT 5 to Reddick Creek, and associated wetland from the extension of the existing crossing – (1) 9'x5' box culvert with approximately 50 LF of channel improvements at the inlet and outlet, respectively. NEU will verify jurisdictional status for short swale located near -RAMPC- Sta 12+50 right.

- -RAMPB- 17+50: Impacts occur to jurisdictional stream, UT 7 to Reddick Creek from the outlet extension of the existing 54" pipe and approximately 40 LF of channel improvements.

- -RAMPC- 23+00: Impacts occur to jurisdictional stream, UT 7 to Reddick Creek, from the proposed roadway fill. These impacts occur to the upstream jurisdictional limits. Discharge is collected in enclosed drainage system via 48" pipe.

Plan Sheet 19:

- -L- 432+50: Impacts occur to jurisdictional stream, UT 4 to Reddick Creek, from proposed crossing – 60" pipe buried 1.0' with approximately 20 LF of channel improvement at the outlet. The slope of the proposed pipe is approximately 3%. For pipe culverts with slopes of 5% or greater, USACE stated that burying the inverts was not recommended. The bed material would not be retained inside the culvert.

- -Y35B- 13+50: Impacts occur to jurisdictional stream, UT 4 to Reddick Creek, from proposed crossing – 60" pipe buried 1.0' with approximately 40 LF and 20 LF of channel improvements at the inlet and outlet, respectively.

Plan Sheets 19-20:

- -L- 438+00: Impacts occur to entire wetland, Wetland-H. Per the Concurrence Point 4A packet, "the proposed roadway was realigned in the vicinity of Roland Road (SR 1581) to minimize the wetland impacts. The revision lessened the footprint impact on Wetland H; however, the function of the wetland was still anticipated to be compromised. Therefore, the wetland is still counted as a total take."

- -Y35B- 18+00: Impacts occur to jurisdictional stream, UT 5 to Reddick Creek, from replacement of the existing 36" pipe with a proposed 42" pipe with approximately 40 LF of channel improvements at the inlet and outlet, respectively. Jurisdictional limits begin approximately 40 LF upstream of the existing pipe.

Plan Sheets 21-35:

- No jurisdictional sites.

Separate meeting with DWQ for review of buffer impacts was tentatively scheduled for the afternoon of September 20th.

End of Meeting

The primary goals of the Randleman Lake Buffer Rules are:

1 to provide sheet flow, no concentrated flow through buffer
2 pollutant loading should be reduced before entering stream
3 For roadway project: no direct discharge of pavement runoff, need treatment
4 minimize or prevent erosion
5 existing ditches/swales and storm systems are exempt from this rule

U-2412B: Jurisdictional Sites:

Sheet	Site	Approximate Station	Juris. Type		Reference Name	Comments
4-5	---	-L- 249+88; +430' RT	Stream		UT 15 to Deep Rv	No impact
5	---	-L- 264+80; +280' RT	Stream		UT 1 to Reddick Cr.	No impact
6	1	-L- 274+50	Pond		UT 2 Reddick Pond	Pond Removal / Verify JD
6	---	-L- 275+50; +300' RT	Pond		UT 2 Reddick Pond	No impact
10	---	-L- 315+47; +290' LT	Wetland / Stream		UT 6 to Bull Run	No impact
11	---	-L- 323+85; +285' RT / -Y19- 11+90; +185' RT	Stream		UT 4 to Reddick Cr.	No impact
13	---	-Y22- 13+50; -60' LT	SW Pond?		Suttonwood Pond	No impact / Verify JD
15	---	-L- 371+60; -320' LT	Wetland		Wetland K	No impact
17	2	-L- 397+70	Stream		UT 1 to Lake 2	Pr 48" RCP, Buried 0.8'
18	3	-L- 409+50	Stream		UT3 to Reddick Cr	Pr 60" RCP, Buried 1.0'
18	4	-RAMPB- 15+50	Stream / Wetland		UT5 to Reddick Cr	Extensions of 9'x5' RCBC
18	5	-RAMPB- 17+50	Stream		UT7 to Reddick Cr	Extension of 54" RCP
18	6	-RAMPC- 23+00	Stream		UT7 to Reddick Cr	Pr 48" RCP system
19	7	-L- 432+50	Stream		UT4 to Reddick Cr	Pr 60" RCP, Buried 1.0'
19	8	-Y35B- 13+50	Stream		UT4 to Reddick Cr	Pr 60" RCP, Buried 1.0'
19	9	-Y35B- 18+00	Stream		UT5 to Reddick Cr	Pr 42" RCP
20	10	-L- 438+00	Wetland		Wetland H	Rdwy Cut - Total Take

Subject: Minutes from Interagency 4B Hydraulic Design Buffer Review Meeting On Sept 24, 2008 for U-2412B in Guilford County

Meeting held in Hydraulics Conf Rm at 1:00 pm

Attendees:
David Fuh, Stacey Bailey, and Herb Turner - Ko & Associates, PC
Marshall Clawson and Dan Duffield - Hydraulics Unit
Rachelle Beauregard - NEU
Amy Euliss – NCDWQ
David Wainwright - NCDWQ

General Comments:

DWQ stated that under current Randleman Buffer Rules, man-made channels draining to Jurisdictional Stream are buffered in the Randleman Watershed. DWQ has requested that buffer limits be extended along the man-made channels draining to Jurisdictional Stream within the project limits.

A revised interpretation of rules is anticipated by NCDOT prior to construction; therefore, Hydraulics Unit has directed Ko NOT to extend buffer along the man-made channels. Ko should contact NCDOT regarding buffer rule status prior to preparing permit impact drawings.

Plan Sheet Comments:

Sht 6 - Ponds are have been determined to be non-jurisdictional; therefore, NO BUFFERS.

Sht 17 -

1. Proposed Crossing is 48" RCP with buried inverts.
2. Roadway drainage through the buffer zone - Quadrant buffer zone has a 16% slope; therefore, too steep for level spreader.
3. DWQ - Document on Permit Drawing why Level Spreader is NOT used.
4. Roadway drainage is treated via grass swales prior to buffer.

Sht 18:

1. Extension of existing cross pipe - Provided description of proposed drainage layout and treatment.
2. Extension of existing box culvert - Provided description of proposed drainage layout and treatment.
3. Further discussion of buffers along man-made channels draining to Jurisdictional Stream, i.e. Ramp ditches

Sht 19:
Site 7 - no comment noted.
Site 8 - All fill => No concentrated flow.

Sht 19-20:
Site 9 - no comment noted.

Subject: Minutes from Interagency 4C Permit Review Meeting
On March 16, 2011 for U-2412B in Guilford County

Attendees:
Marshall Clawson, NCDOT Hydraulics Unit
Amy Euliss, NCDWQ
Andrew Williams, USACE
Chris Militscher, USEPA
Greg Price, NCDOT NEU
Rachelle Beauregard, NCDOT NEU
Felix Davila, FHWA
Patty Eason, NCDOT Division 7
Jennifer Parish. NCDOT REU
Mark Staley, NCDOT REU
Derrick Weaver, NCDOT PDEA
Herb Turner, Florence & Hutcheson (F&H)
David Fuh, Florence & Hutcheson (F&H)
Alex Snider, Florence & Hutcheson (F&H)
David Gourley, PB
Charles Heafner, PB

General Comments:

1. When stream impacts for road crossing are along the same stream, label all the impacts as one Site so that stream site numbers will be consistent with buffer sites.

Specific Comments:

Site 1, Plan Sheet 17
no comments

Site 2 & Site 4, Plan Sheet 18

1. Combine Site 2 with Site 4 and label as Site 2 since they are along the same stream.

Site 3 & Site 5, Plan Sheet 18

1. Combine Site 3 with Site 5 and label as Site 3 since they are along the same stream.
2. For Site 5, provide a larger scale drawing in the area to show clarity.

Site 6, Plan Sheet 18

1. Label Site 6 as Site 4.

Site 7 & 8, Plan Sheet 19

1. Combine Site 7 with Site 8 and label as Site 5 since they are along the same stream.
2. For Site 8, team discussed the best way to provide stability for erosion & sediment control to construct the stream relocation along SR 1584 (Fairfax Road) and at the same time, maintain continuity of stream features during construction.
3. For Site 8, NCDOT proposes to remove trees only as necessary to install the cross pipe, associated tail ditch and the new driveway pipe. Team discussed the best way to convey this to the Contractor.
4. For site 8, the bank stabilization item is missing on impact summary

Site 9 & 10, Plan Sheet 19

1. Combine Site 9 with Site 10 and label as Site 6 since they are along the same stream.

Subject: Minutes from Interagency 4C Buffer Review Meeting
On November 17, 2010 for U-2412B in Guilford County

Meeting held in Division 7 small conference room at 10:30 am

Attendees:
Amy Euliss, NCDWQ
Greg Price, NEU
Marshall Clawson, Hydraulics Unit
Dan Duffield, Hydraulics Unit
Herb Turner, Florence & Hutcheson (F&H)
David Fuh, Florence & Hutcheson (F&H)

General Comments:

1. NCDOT will use the new Randleman Lake Buffer Rules for this project. Diffused flow should be maintained in the buffer (rule item (8)). F&H should follow step-by-step the Table of Uses (rule item (9)) to determine the applied condition. On the storm water management plan (SWMP) and buffer permit drawings, F&H should provide additional documentation or explanation for "No Practical Alternatives" when impacts are designated as allowable or allowable with mitigation (mitigable) to address all topography and right-of-way constraints.

2. When buffer impacts for road crossing are along the same stream, label all the impacts as one Site. Although a Site may have allowable impacts, i.e. 40'< road crossing < 150' or <1/3 acre, mitigation of stormwater conveyance, i.e. a pipe draining through buffer, is required per new Randleman Lake Buffer Rules. The impacts should be broken down in the impact summary table.

Specific Comments:

Site 1, Plan Sheet 17

1. For the lower portion of the grass swale (L 399+00 to 403+00 LT) at NE quadrant, roadway has super to the right and no onsite pavement runoff is collected. Its main function is to convey the offsite runoff. The upper portion of the grass swale (L 403+00 to 406+00 LT) does not collect any offsite drainage and provides treatment for onsite pavement runoff (with 100' per acre criterion satisfied). DWQ indicated that the treatment for offsite runoff is not required.

2. Provide additional documentation or explanation regarding stormwater conveyance through buffer on SWMP and buffer drawings.

3. All pipes for stormwater conveyance through buffers are considered mitigable impacts.

Site 2 & Site 4, Plan Sheet 18

1. Combine Site 2 with Site 4 and label as Site 2 since they are along the same stream.
2. As indicated in SWMP for BMP at -RAMPB- 14+00 LT, F&H explained that the storm drain outlet pipe cannot daylight without a tail ditch. This tail ditch (0%) with rip rap (width from 5' to 15') will dissipate energy to provide a non-erosive diffused flow before entering wetland and buffer.
3. For Site 4, the buffer impact for the 30" pipe to the box culvert is mitigable.

Site 3 & Site 5, Plan Sheet 18

1. Combine Site 3 with Site 5 and label as Site 3 since they are along the same stream.
2. For Site 5, provide more documentation and explanation for treatment of runoff to the inlet pipes.

Site 6, Plan Sheet 18

1. Label Site 6 as Site 4.
2. F&H shows impacts that are needed for construction (10' from slope stake line). It is not necessary to show impacts to proposed right-of-way.

Site 7 & 8, Plan Sheet 19

1. Combine Site 7 with Site 8 and label as Site 5 since they are along the same stream.
2. For Site 8, F&H should coordinate with Hydraulics Unit to verify if the existing gravel road (Fairfax Road) is NCDOT maintained transportation facility to determine if buffer limits end at existing road's toe of fill.

Site 9, Plan Sheet 19

1. Label Site 9 as Site 6
2. The storm drain pipe through the buffer is a mitigable impact. The impact for road crossing is allowable; thus, a breakdown in impact summary is needed.

Site 7 & 8, Plan Sheet 19

1. Combine Site 7 with Site 8 and label as Site 5 since they are along the same stream.

2. For Site 8, team discussed the best way to provide stability for erosion & sediment control to construct the stream relocation along SR 1584 (Fairfax Road) and at the same time, maintain continuity of stream features during construction.

3. For Site 8, NCDOT proposes to remove trees only as necessary to install the cross pipe, associated tail ditch and the new driveway pipe. ~~Team discuss the best way to convey this to the Contractor~~. After discussion with Construction, it has been determined it's better not to drain the pond but access the driveway pipe parallel the drive on the downstream side. A note will be added to the plans-"Do not disturb existing weir". Water can be pumped around while the pipe work is being done. The TDE and impacts to the buffers around the pond will be removed.

4. For site 8, the bank stabilization item is missing on impact summary

Site 9 & 10, Plan Sheet 19

1. Combine Site 9 with Site 10 and label as Site 6 since they are along the same stream.

RECEIVED
DEC 1 2011
DIVISION OF HIGHWAYS
PDEA-OFFICE OF NATURAL ENVIRONMENT

STORMWATER MANAGEMENT PLAN

TIP No. U-2412B
Project: 34802.1.1
Guilford County

ROADWAY DESCRIPTION

The project proposes to improve Greensboro-High Point Road (SR 4121) from west of Vickery Chapel Road to Hilltop Road in Greensboro. Improvements will consist of a combination of widening existing High Point Road and building a roadway on new location. The overall length of the project is approximately 4.4 miles. The major stream crossing that require conveyances 72" pipe or larger in diameter are shown in Table 1 below. The project drainage design consists of cross pipes, grated inlets with associated pipe systems, tail ditches, lateral stormwater ditches, and grass swales.

Table 1 - Major Stream Crossing

Location	Stream Name	Drainage Area	Proposed Structure	Bury Depth
-GWL-149+50	Reddicks Creek UT 5	111 Ac	Extend with 9'x6' RCBC	1'@ upstream face 1.5'@downstream face

ENVIROMENTAL DESCRIPTION

The project is located in the Cape Fear River Basin. The stream listed in Table 1 has been classified as jurisdictional stream. In addition, seven minor stream crossings are subject to the stream impacts. Surface waters in the project area are classified as WS-IV, and Randleman Lake Buffer Rules apply. All stream crossing are subject to the buffer impacts. In order to comply with buffer rule item (8): Diffuse Flow Requirement and Item (9): Table of Uses, our Hydraulics Design Documentations are included in Appendix A. When road crossings are along the same stream, we label all the impacts as one site, therefore, there are six buffer impact sites. According to the NCDWQ's 303(d) Impaired Waters List, all impacted streams are not identified as impaired.

There are two wetland sites that will be impacted by the proposed project. Wetland impact have been kept to a minimum by avoid ditching and channelization through wetlands. Existing drainage patterns to the wetlands have been kept to maintain the hydrology feeding the wetlands.

BEST MANAGEMENT PRACTICES (BMP's)

The primary goal of Best Management Practices (BMP) is to prevent degradation of the state's surface waters through the location, construction and operation of the highway system. BMP's are activities, practices and procedures undertaken to prevent or reduce stormwater pollution.

The BMP's and measures that have been used on this project for the roadside drainage are as follows:

GRASS SWALES

Grass swales have been used at buffer sites. Grass Swale Summary Tables are included in Appendix B. The explanation as to why a level spreader can not be used are shown in Appendix A. Grass swale is a type of biofilter because the vegetation on the swale takes up some pollutants and helps filter sediment and other solid particles out of the runoff. They convey stormwater and provide stormwater management by retarding peak flow rates, lowering velocities of runoff and by infiltrating runoff water into the soil. The grass swale provides treatment for the discharge before entering the stream.

PREFORMED SCOUR HOLES with LEVEL SPREADER

Preformed scour holes with level spreader have been provided at the following locations:

-L- 288+30 RT -RAMPB- 16+50 LT -Y18- 15+40 RT

A preformed scour hole with level spreader is utilized at these locations in an effort to diffuse the concentrated flow from the storm drain outlet pipe into non-erosive sheet flow to the surrounding natural ground, wetlands, or buffers.

FLAT AND WIDE TAIL DITCH WITH RIP RAP

This will dissipate energy from storm drain outlet pipes to provide a non-erosive sheet flow before entering wetlands/buffers at the following location:

-RAMPB- 14+00 LT

The BMP's and measures that have been used on this project for the major stream crossings are as follows:

-GWL- 149+50, extend with 9'x6' RCBC

The culvert extension upstream and downstream will be buried 1' and 1.5' respectively to provide a natural stream bed. The culvert extension plan view is aligned with stream channel. The riprap for outlet protection will be placed on banks only and will not be placed in streambed. A 30" storm drain outlet pipe will tie to box culvert to dissipate energy from outlet pipe and to eliminate potential erosion to the upstream channel due to the pipe outlet. The normal functioning of sediment transport during bankfull discharge can be maintained and the stream will not degrade or aggrade. The crossing will accommodate the natural stream channel with minimum disruption to the ecosystem and values unique to the floodplain.

The BMP's and measures for the minor stream crossings have been used in this project are as follows:

1. The culvert will be buried 20% of the pipe diameter below the natural streambed up to a maximum of 1 foot.
2. The riprap for outlet protection will be placed on banks only and will not be placed in streambed.
3. The crossings will accommodate the natural stream channel with minimum disruption to the ecosystem and values unique to the floodplain.

They are at the followings locations:

-L- 397+73: Provide proposed 48" RCP. Channel realignment at inlet end to prevent erosion. Use junction box at cross pipe inlet end to dissipate energy from storm drain outlet pipe and to eliminate potential erosion to the upstream channel due to the pipe outlet to the stream.

-L- 409+45: Provide proposed 42" RCP. Channel realignment at outlet end to prevent erosion. Use junction box at cross pipe inlet end to dissipate energy from storm drain outlet pipes and to eliminate potential erosion to the upstream channel due to the pipe outlets to the stream.

-RAMPB- 17+57: Extend 54" RCP with a junction box. Channel realignment at outlet end to prevent erosion.

-L- 432+52: replace existing 48" pipe with 60" RCP. Use junction boxes at cross pipe inlet and outlet ends to dissipate energy from storm drain outlet pipes and to eliminate potential erosion to the upstream and downstream channels due to the pipe outlets to the stream.

-Y35B- 12+80: replace existing 24" pipe with 60" RCP. Channel realignment at downstream end to prevent erosion. Rip rap at embankment at inlet end to provide a stable bank.

-Y35B- 18+20: replace existing 36" pipe with 48" RCP. Channel realignment at inlet and outlet ends to prevent erosion. Use junction box at cross pipe outlet end to dissipate energy from storm drain outlet pipe and to eliminate potential erosion to the downstream channel due to the pipe outlet to the stream.

APPEDIX A: HYDRAULICS DESIGN DOCUMENTATION FOR BUFFER RULE ITEM (8):DIFFUSE FLOW REQUIREMENT & ITEM (9):TABLE OF USES

			IMPACT				EXPLANATION
			TYPE		ALLOWABLE	MITIGABLE	
BUFFER SITE NO	STRUCTURE SIZE / TYPE	STATION/ QUADRANT	ROAD CROSSING	NEW STORMWATER CONVEYANCE			
1	48" RCP	-L- 397+73	X			X	LENGTH >150' AND AREA>1/3 ACRE
		NW					DIFFUSE FLOW PROVIDED
	30" RCP	NE		X		X	LEVEL SPREADER NOT USED DUE TO TOPOGRAPHY CONSTRAINTS (CAN NOT DAYLIGHT UNTIL STREAM). GRASS SWALE USED TO CONTROL NITROGEN
	15" RCP	SW		X		X	LEVEL SPREADER NOT USED DUE TO TOPOGRAPHY CONSTRAINTS (WOODED, S=16% > 6%). GRASS SWALE USED TO CONTROL NITROGEN
	18" RCP	SE		X		X	LEVEL SPREADER NOT USED DUE TO TOPOGRAPHY CONSTRAINTS (WOODED, S=10% > 6%). GRASS SWALE USED TO CONTROL NITROGEN
2	EXTEND W/ 9' x 6' RCBC	-GWL- 149+50	X			X	LENGTH >150' AND AREA >1/3 ACRE
		NW					DIFFUSE FLOW PROVIDED
	30" RCP	NE		X		X	LEVEL SPREADER NOT USED DUE TO TOPOGRAPHY CONSTRAINTS (WOODED, S=15% > 6%) GRASS SWALE USED TO CONTROL NITROGEN
		SW					PREFORMED SCOUR HOLE USED TO PROVIDE DIFFUSE FLOW
		SE					TAIL DITCH (0% SLOPE, WIDTH FROM 5' TO 15') WITH RIP RAP TO DISSIPATE ENERGY TO PROVIDE DIFFUSE FLOW
3	EXTEND WITH 54" RCP	-RAMP B- 17+57	X			X	LENGTH >150' AND AREA >1/3 ACRE
		SW					DIFFUSE FLOW PROVIDED
		SE					PREFORMED SCOUR HOLE USED TO PROVIDE DIFFUSE FLOW
3	30" RCP	-RAMP C- 23+09	X			X	LENGTH >150' AND AREA >1/3 ACRE
		SW					DIFFUSE FLOW PROVIDED
		SE					DIFFUSE FLOW PROVIDED
	18" CLASS IV RCP	NW NE		X		X	DIFFUSE/SHEET FLOW PROVIDED BEFORE ENTERING THE PIPE TO DRAIN AREA INSIDE INTERCHANE
4	42" RCP	-L- 409+45	X			X	LENGTH >150' AND AREA >1/3 ACRE
	15" RCP	NW		X		X	LEVEL SPREADER NOT USED DUE TO TOPOGRAPHY CONSTRAINTS (WOODED, S=15% > 6%). GRASS SWALE USED TO CONTROL NITROGEN
	15" RCP	NE		X		X	LEVEL SPREADER NOT USED DUE TO TOPOGRAPHY CONSTRAINTS (WOODED, S=12% > 6%). GRASS SWALE USED TO CONTROL NITROGEN
	15" RCP	SW		X		X	LEVEL SPREADER NOT USED DUE TO TOPOGRAPHY CONSTRAINTS (WOODED, S=15% > 6%). GRASS SWALE USED TO CONTROL NITROGEN
		SE					DIFFUSE FLOW PROVIDED
5	60" RCP	-L- 432+52	X			X	LENGTH >150' AND AREA >1/3 ACRE
	18" RCP	NW		X		X	LEVEL SPREADER NOT USED DUE TO TOPOGRAPHY CONSTRAINTS (WOODED, S=12% > 6%). GRASS SWALE USED TO CONTROL NITROGEN
	18" RCP	NE		X		X	LEVEL SPREADER NOT USED DUE TO TOPOGRAPHY CONSTRAINTS (CAN NOT DAYLIGHT UNTIL TOP OF BANK). FOR OFFSITE DRAINAGE ONLY, TREATMENT NOT REQUIRED
	15" RCP	SW		X		X	LEVEL SPREADER NOT USED DUE TO TOPOGRAPHY CONSTRAINTS (WOODED, S=25% > 6%) GRASS SWALE USED TO CONTROL NITROGEN
		SE				X	DIFFUSE FLOW PROVIDED
6	48" RCP	-Y358- 18+20	X		X		LENGTH < 150' AND AREA < 1/3 ACRE
		NW					DIFFUSE FLOW PROVIDED
		NE					DIFFUSE FLOW PROVIDED
		SW					DIFFUSE FLOW PROVIDED
	24" RCP	SE		X		X	LEVEL SPREADER NOT USED DUE TO TOPOGRAPHY CONSTRAINTS (CAN NOT DAYLIGHT UNTIL ZONE 1) GRASS SWALE USED TO CONTROL NITROGEN.

APPENDIX B, GRASS SWALE SUMMARY TABLE

U-2412B: GUILFORD COUNTY Co. Affected Buffer Areas
Discharge is considered to be treated if it meets the following criteria:
100 ft. of grass swale for every 1 acre of drainage area. AND
2 yr. velocity is less than or equal to 2 ft./sec.

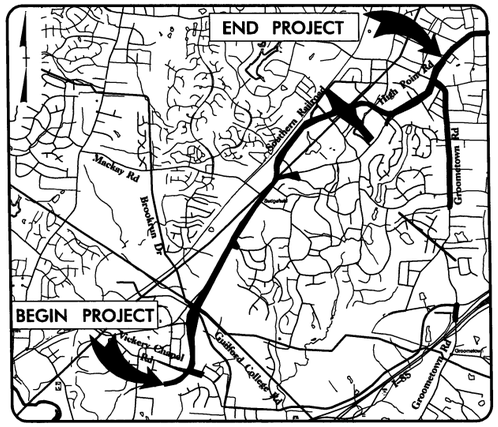
I(2) = 3.7 in/hr.
I(10) = 5.5 in/hr.

Date: 12/17/2010
Dsn. By: ADS
Check: DSF

BUFFER SITE	SHT.	Align	Station	Side	Drainage Area	Rational	Required length for treatment	Total Actual Length	Channel Slope	Channel Base	Side Slopes	Discharge Treated?	Q2	V2	Q10	V10	Treatment Provided
					Ac	C	(ft.)	(ft)	(ft/ft)	(ft)			cfs	fps	cfs	fps	
1	17	L	396+35	RT	1.80	0.55	180	470	0.010	0	5	YES	3.7	1.1	5.4	1.2	Grass Swale
1	17	L	398+50	RT	1.30	0.6	130	690	0.005	0	5	YES	2.9	0.8	4.3	0.9	Grass Swale
1	17	L	400+50	LT	1.07	0.5	107	520	0.003	0	4	YES	2.0	0.6	2.9	0.7	Grass Swale
2	18	RAMPB	13+00	LT	1.05	0.7	105	280	0.011	0	6	YES	2.7	0.7	4.0	0.8	Grass Swale
2	18	RAMPC	14+80	RT	10.70	0.5	1070	1810	0.005	5	4	YES	19.8	1.4	29.4	1.6	Grass Swale
4	18	L	408+50	LT	0.77	0.65	77	225	0.003	0	6	YES	1.9	0.5	2.8	0.6	Grass Swale
4	18	L	409+00	RT	1.63	0.5	163	300	0.003	0	6	YES	3.0	0.8	4.5	0.7	Grass Swale
4	18	L	410+00	LT	0.30	0.65	30	130	0.041	0	4	YES	0.7	1.2	1.1	1.4	Grass Swale
5	19	L	431+80	LT	1.00	0.35	100	220	0.005	0	4	YES	1.3	0.7	1.9	0.7	Grass Swale
5	19	L	431+50	RT	2.26	0.61	226	710	0.004	0	4	YES	5.1	0.8	7.6	0.9	Grass Swale
5	20	Y35B	19+00	LT	0.20	0.55	20	420	0.050	0	3	YES	0.4	1.4	0.6	1.5	Grass Swale
6	20	Y35B	18+70	RT	0.30	0.7	30	270	0.025	2	3	YES	0.8	1.0	1.2	1.2	Grass Swale

CONTRACT: TIP PROJECTS: U-2412B & U-2524AE

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2412B & U-2524AE	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34802.1.1	STP-4121(1)	P.E.
34802.2.3	STP-4121(4)	RW
34820.2.17		RW

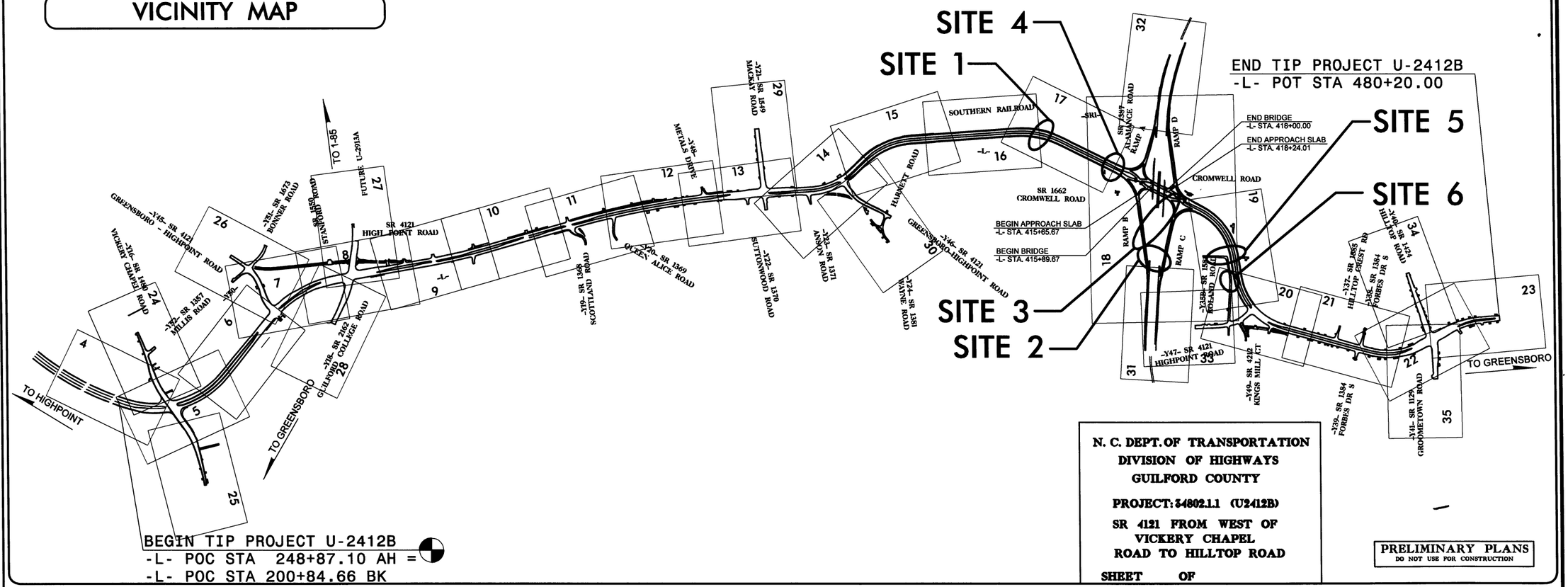
LOCATION: *SR 4121 (GREENSBORO /HIGH POINT ROAD) FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, CULVERT EXTENSION, STRUCTURES, SIGNING AND SIGNALS*

Permit Drawing
Sheet 1 of 16

NAD 83

WETLAND & STREAM IMPACTS



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U2412B)

SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET OF

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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 2006 = 22,900
ADT 2030 = 37,900
DHV = 11 %
D = 60 %
T = 5 % *
V = 50 MPH
* (TTST 2% + DUAL 3%)
FUNC CLASS URBAN ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2412B =	4.198 MILES
LENGTH STRUCTURE TIP PROJECT U-2412B =	0.040 MILES
TOTAL LENGTH TIP PROJECT U-2412B =	4.198 MILES

NCDOT CONTACT: K. ZAK HAMIDI, P.E.
PROJECT ENGINEER ROADWAY DESIGN

Prepared In the Office of:
PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC LIC. NO. F-0165
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 20, 2009

LETTING DATE:
AUGUST 21, 2012

CHRIS DAVIS, P.E.
PROJECT ENGINEER

DAVID B. GOURLEY, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA
STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION
P.E.
STATE HIGHWAY DESIGN ENGINEER

11/28/2011
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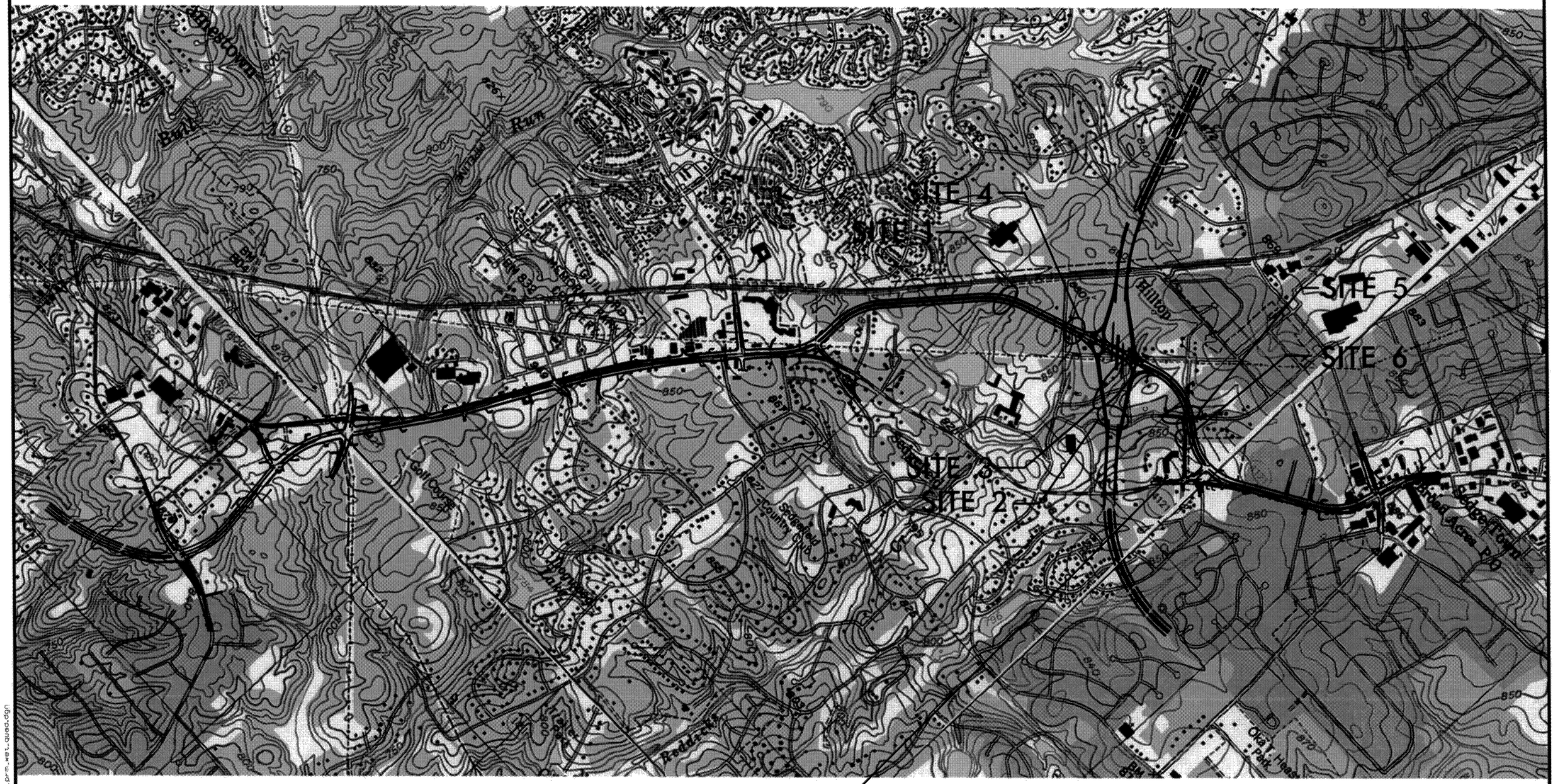
Florence & Hutcheson, Inc.



WETLAND & STREAM IMPACTS
TOPO MAP

SCALE: 1" = 1500'

NAD 83

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)

SR 4121 FROM WEST OF
VICKERY CHAPEL
ROAD TO HILLTOP ROAD

SHEET 2 OF 16

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

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

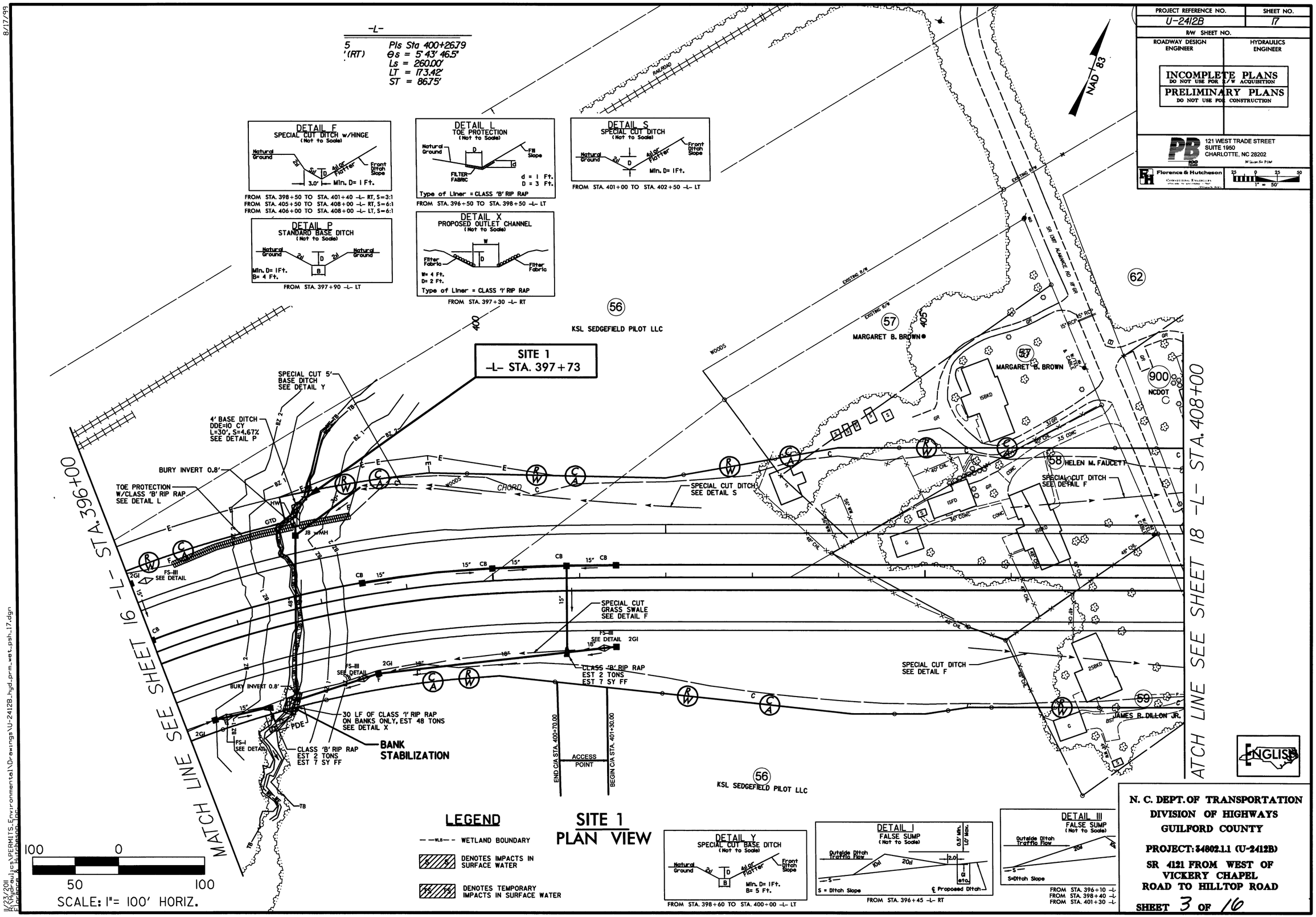
PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

Florence & Hutcheson
Consulting Engineers

1" = 50'

-L-

5 Pls Sta 400+26.79
'(RT) Θs = 5° 43' 46.5"
Ls = 260.00'
LT = 173.42'
ST = 86.75'



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)

SR 4121 FROM WEST OF
VICKERY CHAPEL
ROAD TO HILLTOP ROAD

SHEET 3 OF 16

8/17/99

11/23/2011
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8/17/99

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

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

Florence & Hutcheson
CONSULTING ENGINEERS

25 0 25 50
1" = 50'

-L-

5 Pls Sta 400+26.79
'(RT) Θs = 5° 43' 46.5"
Ls = 260.00'
LT = 173.42'
ST = 86.75'

NAD 83

DETAIL F
SPECIAL CUT DITCH w/HINGE
(Not to Scale)

FROM STA. 398+50 TO STA. 401+40 -L- RT, S=3:1
FROM STA. 405+50 TO STA. 408+00 -L- RT, S=6:1
FROM STA. 406+00 TO STA. 408+00 -L- LT, S=6:1

DETAIL L
TOE PROTECTION
(Not to Scale)

Type of Liner = CLASS 'B' RIP RAP
FROM STA. 396+50 TO STA. 398+50 -L- LT

DETAIL S
SPECIAL CUT DITCH
(Not to Scale)

FROM STA. 401+00 TO STA. 402+50 -L- LT

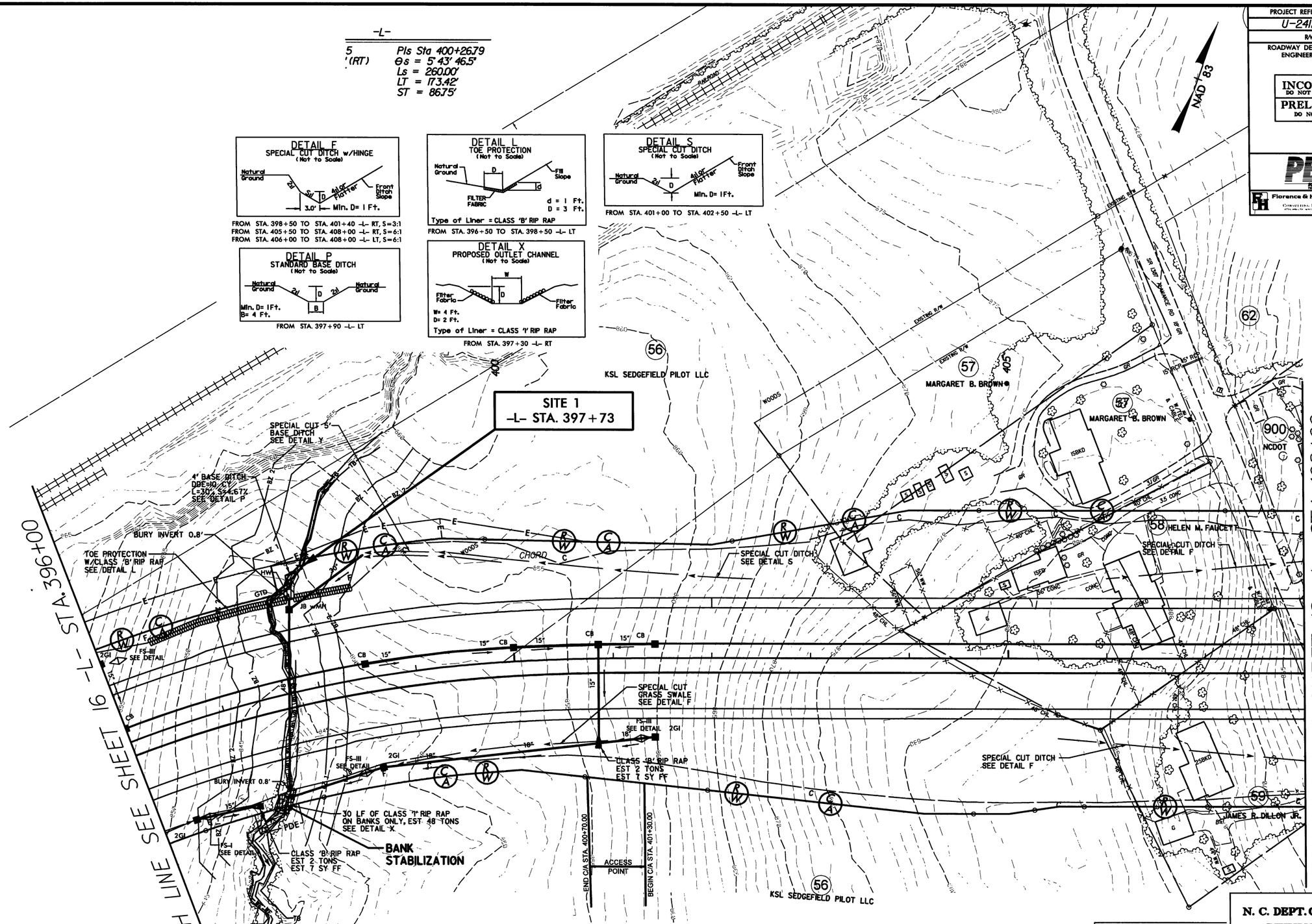
DETAIL P
STANDARD BASE DITCH
(Not to Scale)

FROM STA. 397+90 -L- LT

DETAIL X
PROPOSED OUTLET CHANNEL
(Not to Scale)

Type of Liner = CLASS 'I' RIP RAP
FROM STA. 397+30 -L- RT

SITE 1
-L- STA. 397+73



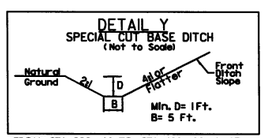
100 0
50 100
SCALE: 1"= 100' HORIZ.

LEGEND

- WETLAND BOUNDARY
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

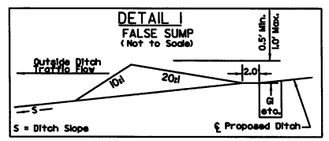
SITE 1
PLAN VIEW

DETAIL Y
SPECIAL CUT BASE DITCH
(Not to Scale)



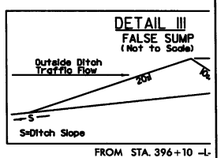
FROM STA. 398+60 TO STA. 400+00 -L- LT

DETAIL I
FALSE SUMP
(Not to Scale)



FROM STA. 396+45 -L- RT

DETAIL III
FALSE SUMP
(Not to Scale)



FROM STA. 396+10 -L-
FROM STA. 398+40 -L-
FROM STA. 401+30 -L-

ENGLISH

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)

SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 4 OF 16

11/23/2011
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Florence & Hutcheson, Inc.

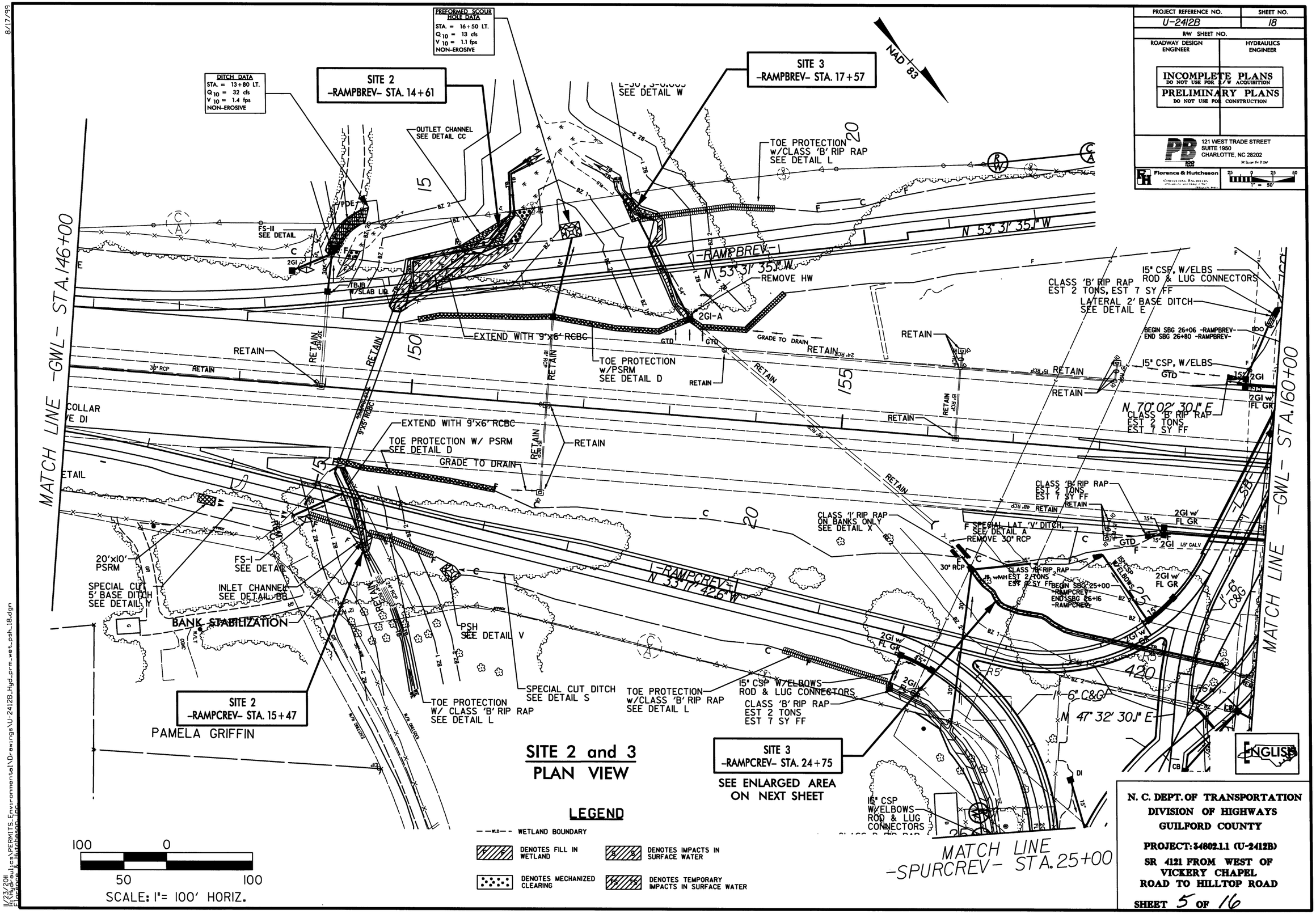
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson

1" = 50'



SITE 2 and 3
PLAN VIEW

LEGEND

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

100 0 50 100
SCALE: 1"= 100' HORIZ.

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)

SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 5 OF 16

8/17/99

11/23/2011
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Florence & Hutcheson, Inc.

8/17/99

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

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
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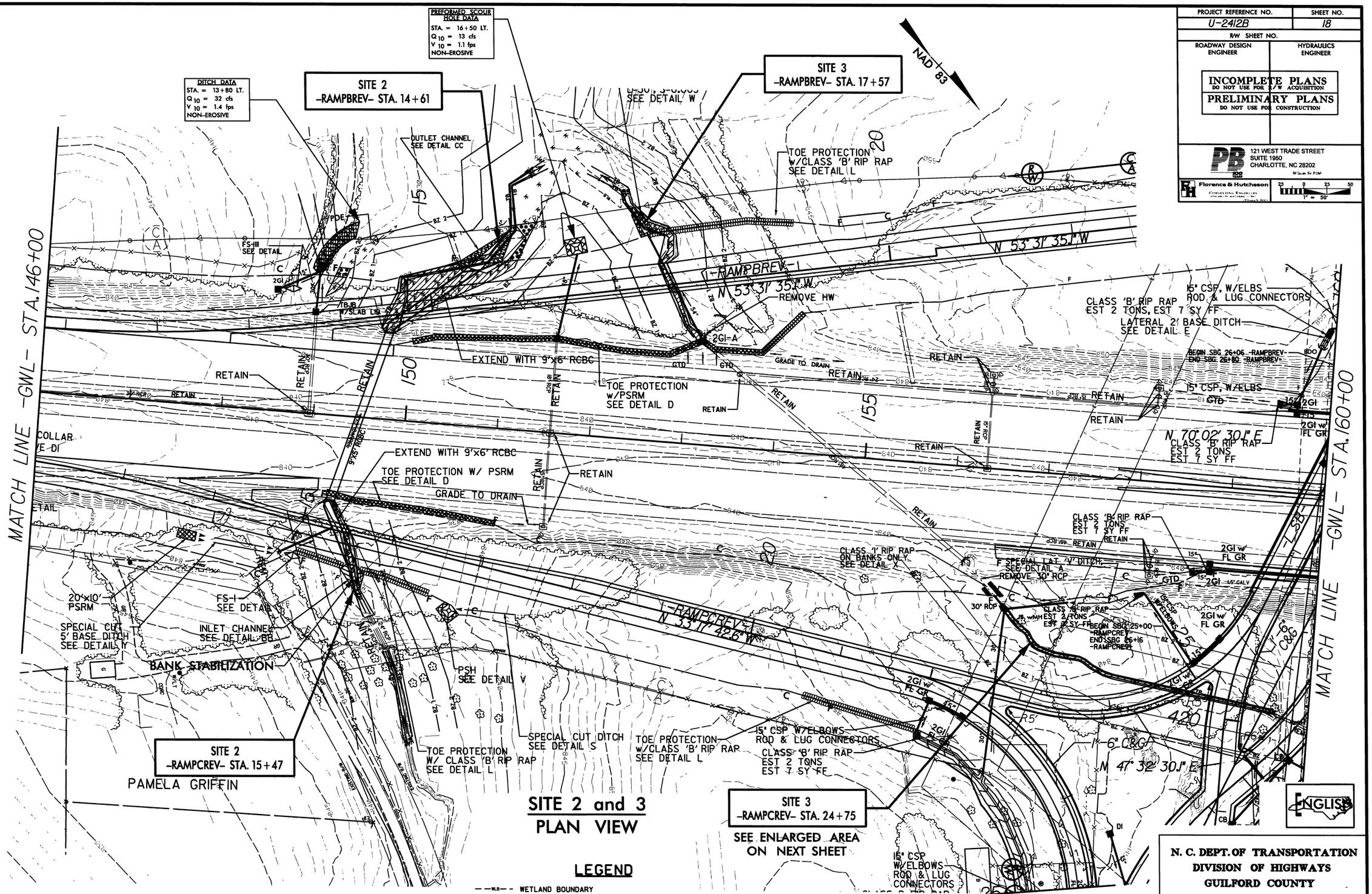
PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson

1" = 50'



SITE 2 and 3
PLAN VIEW

LEGEND

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

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)

SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 6 OF 16

11/23/2011
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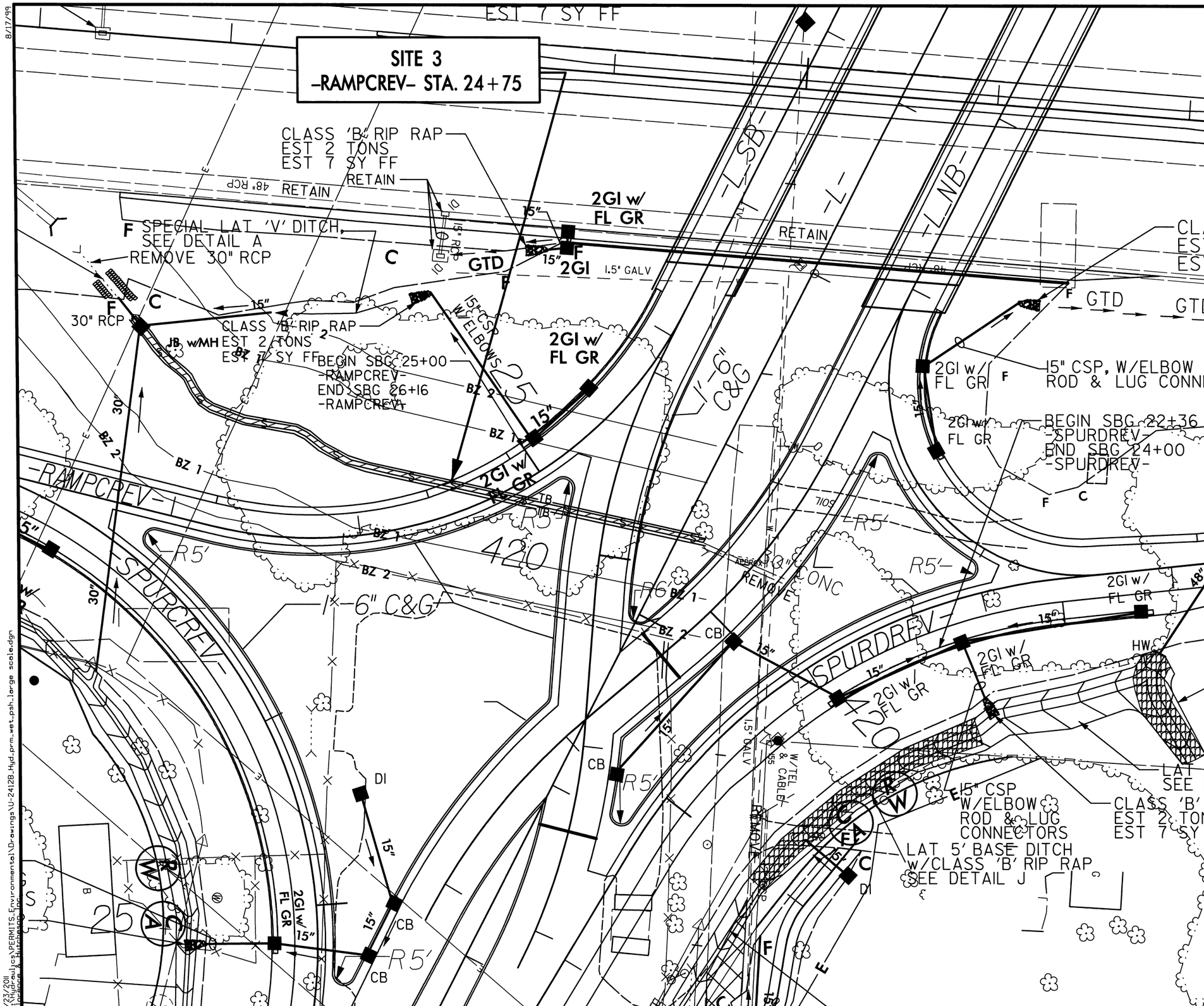
Florence & Hutcheson, Inc.

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

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

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
Florence & Hutcheson

1" = 50'



SITE 3
ENLARGED AREA

LEGEND

DENOTES IMPACTS IN SURFACE WATER

50 0 25 50
SCALE: 1"= 50' HORIZ.

ENGLISH

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)

SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 7 OF 16

8/17/99

11/23/2011
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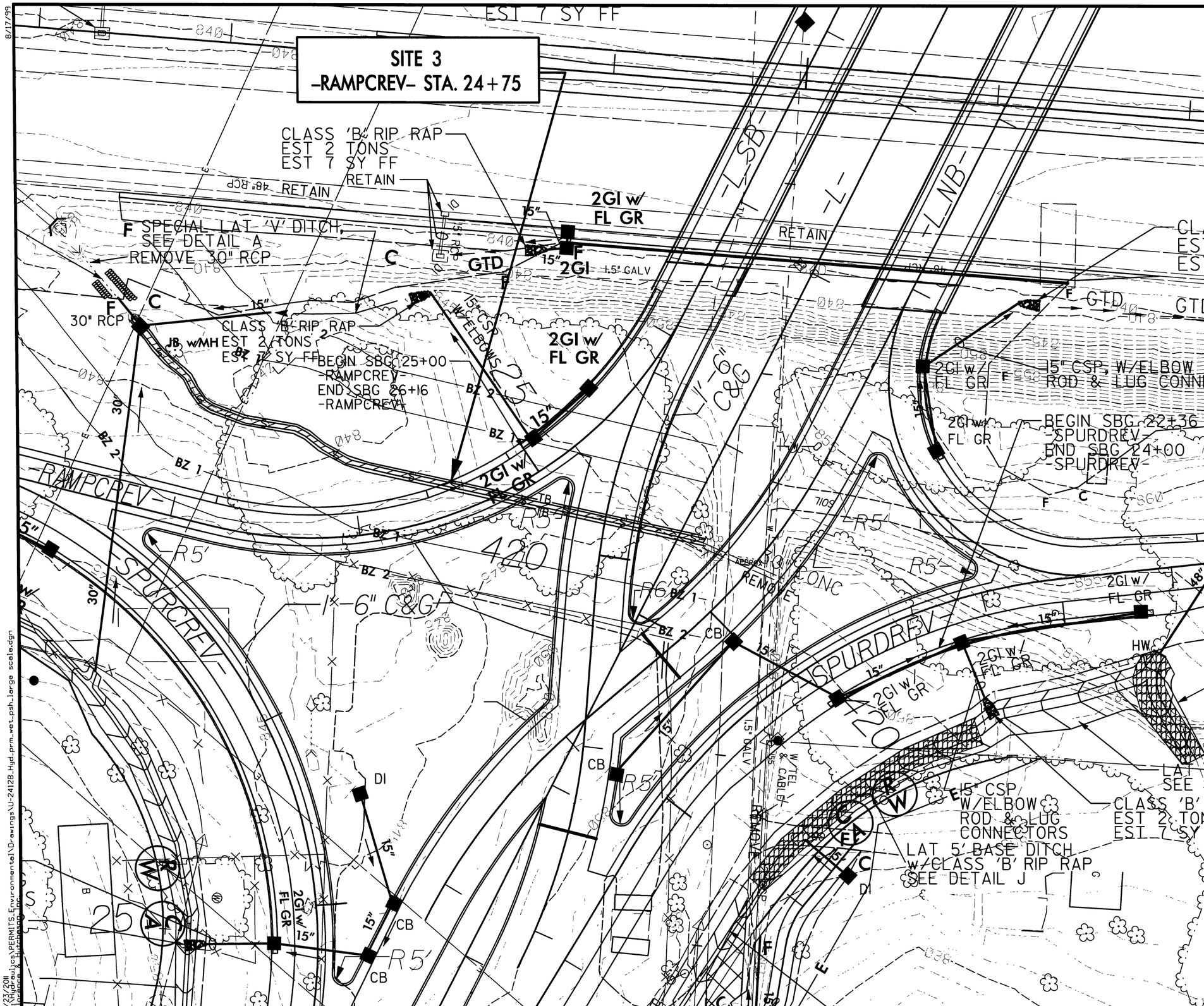
Florence & Hutcheson, Inc.

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

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

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
Florence & Hutcheson
CONSULTING ENGINEERS



SITE 3
ENLARGED AREA

LEGEND

DENOTES IMPACTS IN SURFACE WATER

50 0 25 50
SCALE: 1"= 50' HORIZ.

ENGLISH

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)

SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 8 OF 16

8/17/99

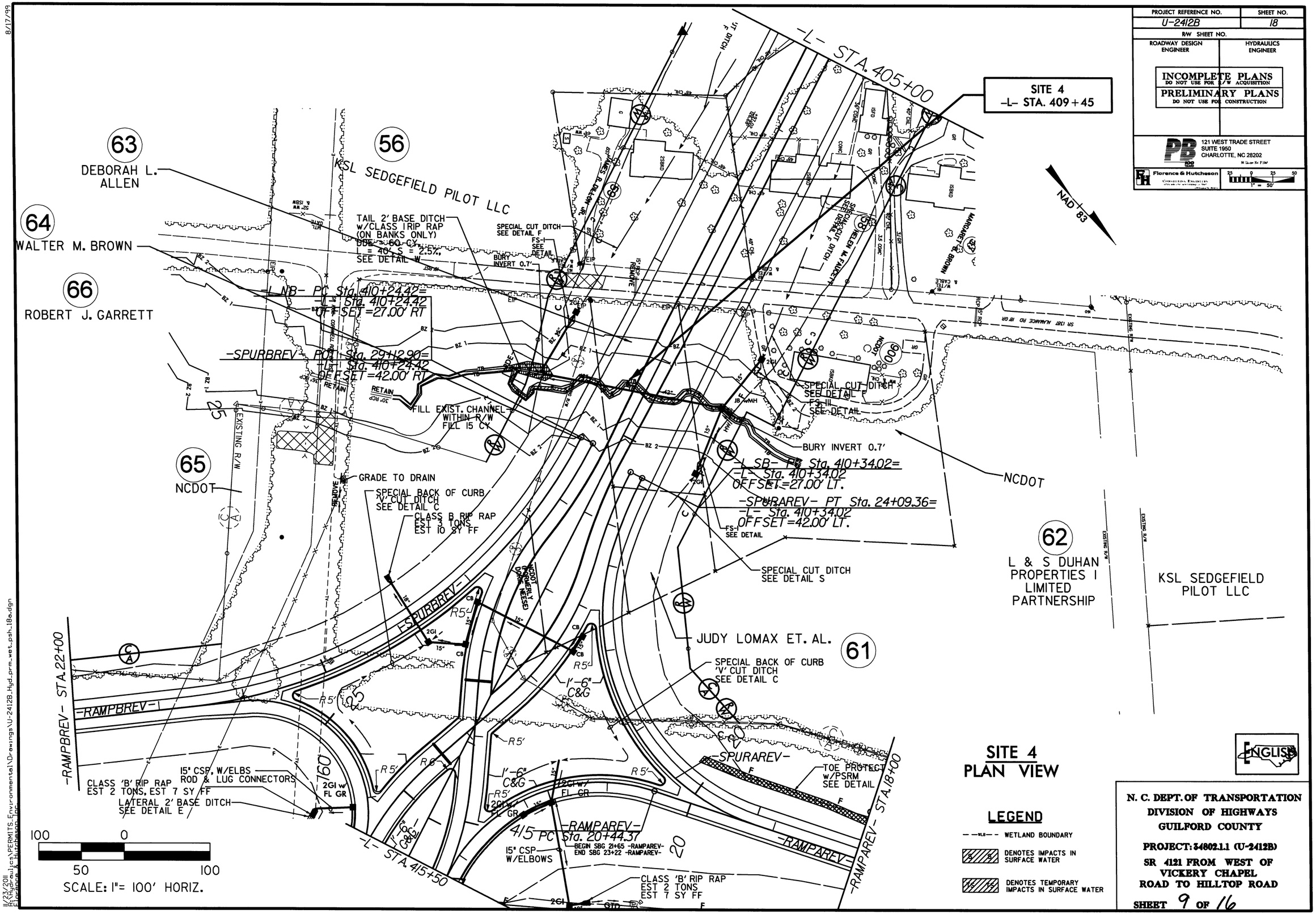
11/23/2011
R:\Hydraulics\PERMITS\Environmental\Drawings\U-2412B_Hyd_prm_wet_psh_large scale.dgn
Florence & Hutcheson, Inc.

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

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

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson Consulting Engineers



SITE 4
PLAN VIEW

LEGEND

- WLB WETLAND BOUNDARY
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ENGLISH

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)

SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 9 OF 16

8/17/99

11/23/2011
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Florence & Hutcheson, Inc.

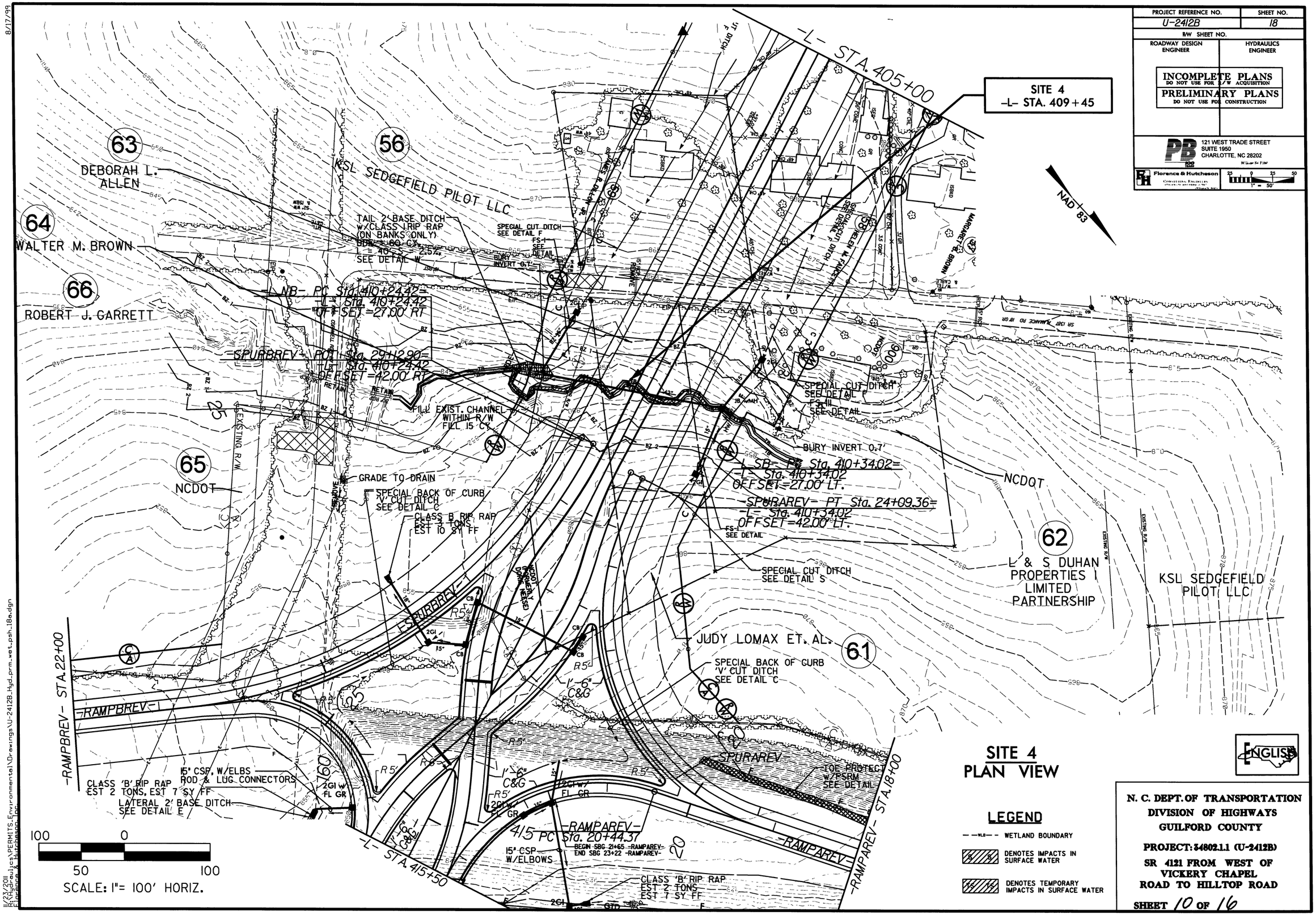
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

Florence & Hutcheson
CONSULTING ENGINEERS

1" = 50'



SITE 4
PLAN VIEW

LEGEND

- WETLAND BOUNDARY
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ENGLISH

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)

SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 10 OF 16

8/17/99

11/23/2011
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Florence & Hutcheson, Inc.

8/17/99

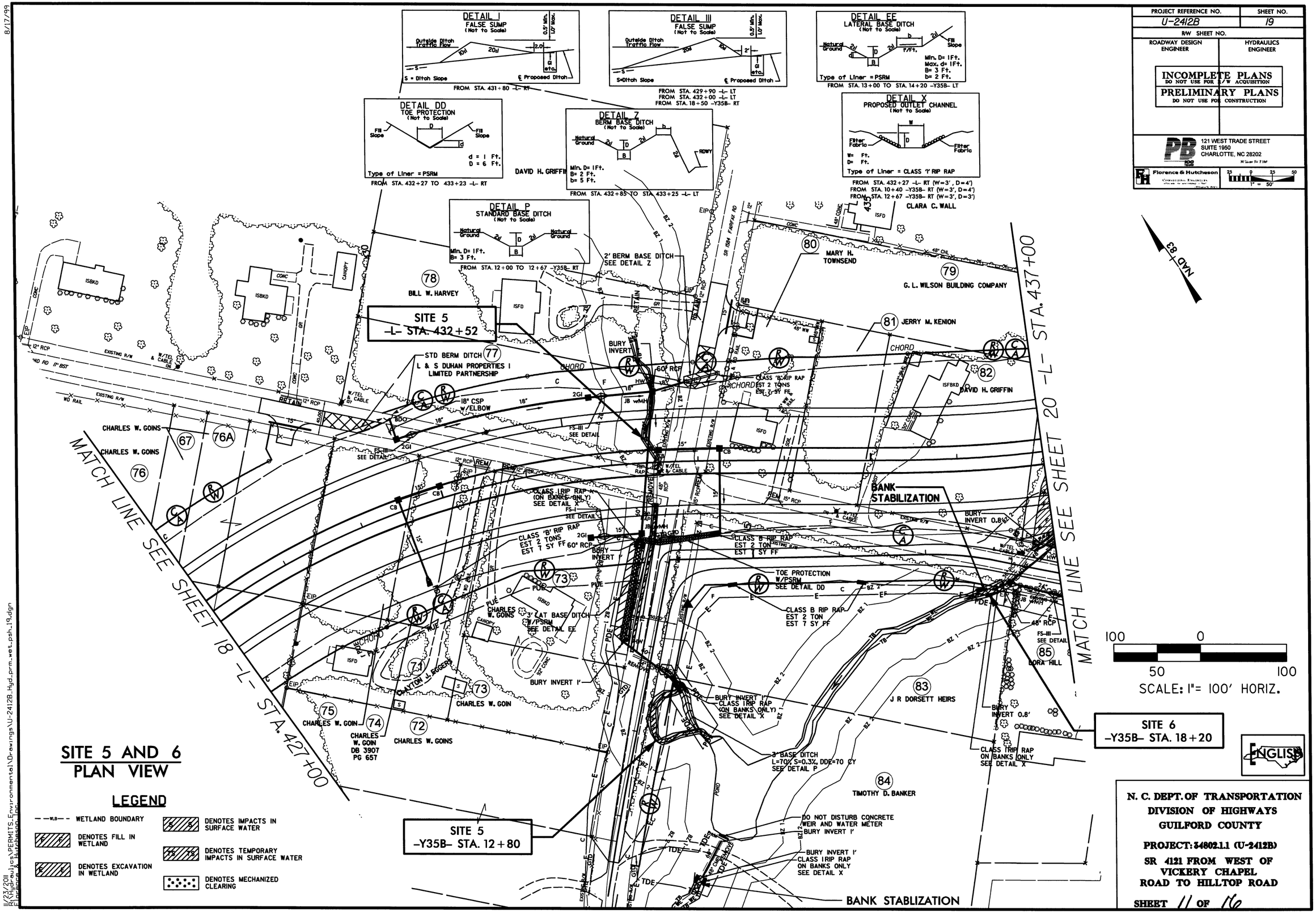
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

Florence & Hutcheson
CONSULTING ENGINEERS

25 0 25 50
1" = 50'



SITE 5 AND 6
PLAN VIEW

LEGEND

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

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)

SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 11 OF 16

11/23/2011
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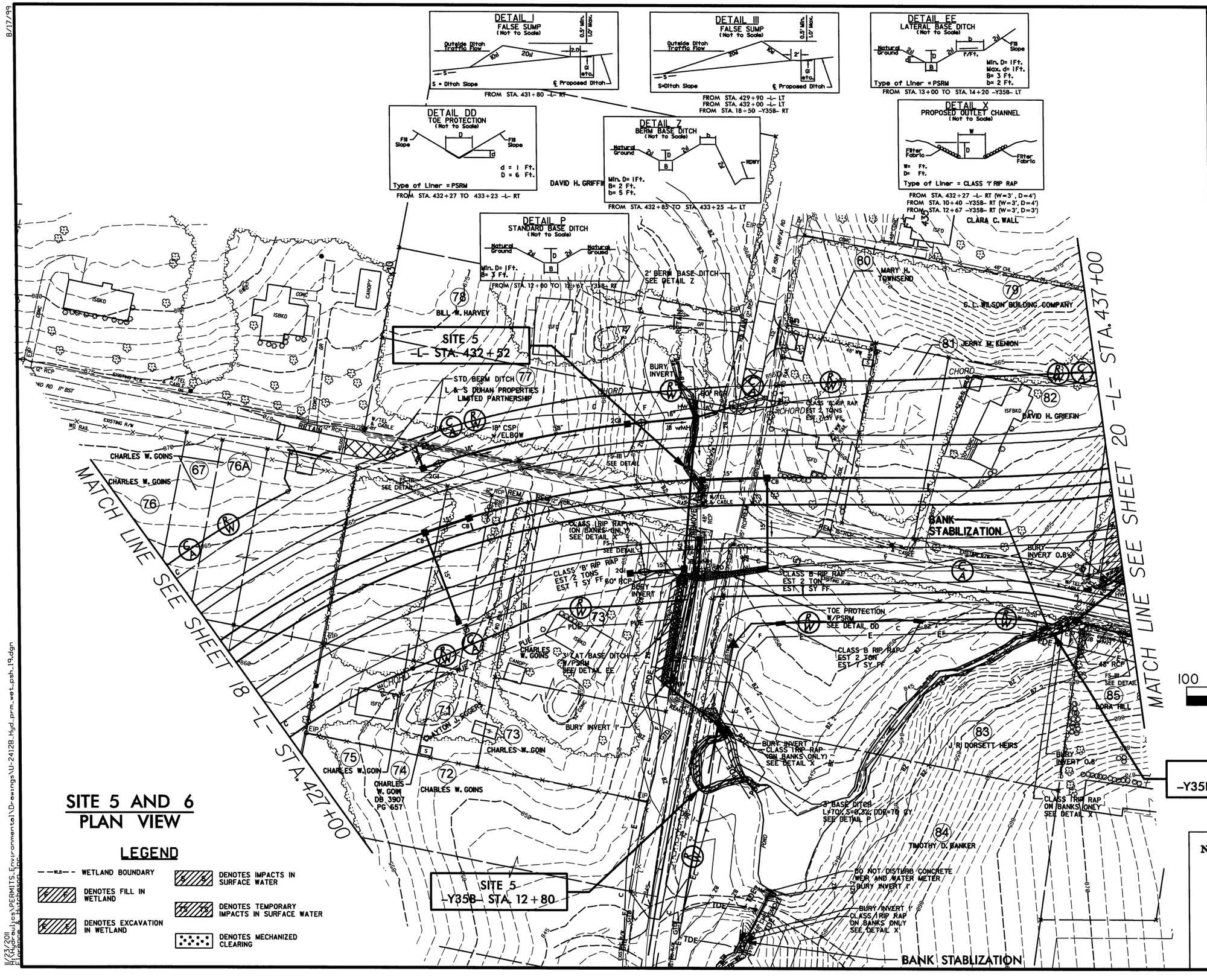
Florence & Hutcheson Inc.



SITE 5 AND 6
PLAN VIEW

LEGEND

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

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

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

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

Florence & Hutcheson
CONSULTING ENGINEERS

25 0 25 50
1" = 50'

ENGLISH

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)
SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 12 OF 16

8/17/99

11/23/2011
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Florence & Hutcheson, Inc.

8/17/99

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

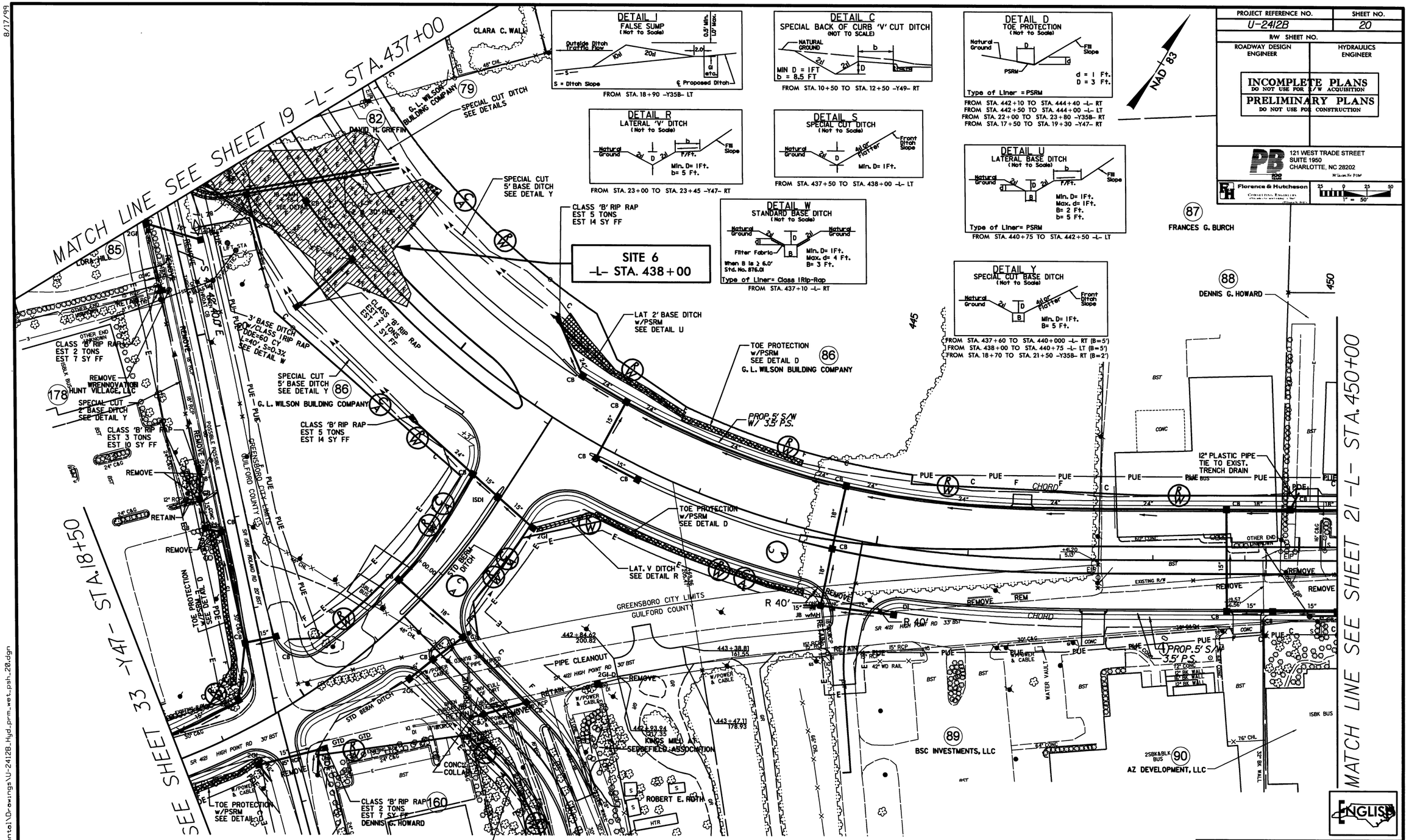
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

Florence & Hutcheson
CONSULTING ENGINEERS

25 0 25 50
1" = 50'



100 0 50 100
SCALE: 1"= 100' HORIZ.

SITE 6
PLAN VIEW

LEGEND

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

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)

SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 13 OF 16

11/23/2011
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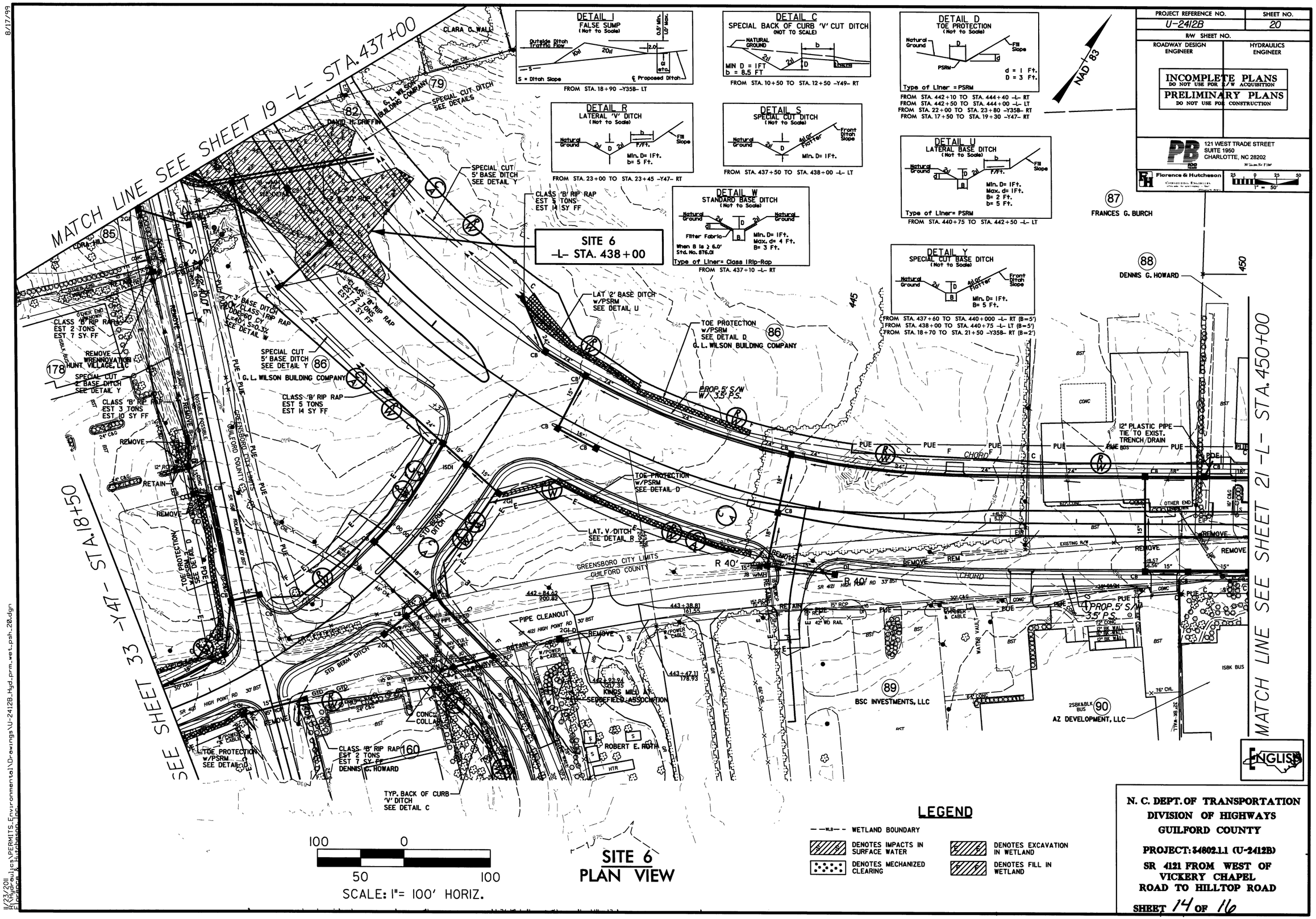
Florence & Hutcheson, Inc.



PROJECT REFERENCE NO.
U-2412B
SHEET NO.
20
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
Florence & Hutcheson
DETAIL I
FALSE SUMP
(Not to Scale)
FROM STA. 18+90 -Y35B- LT
DETAIL C
SPECIAL BACK OF CURB 'V' CUT DITCH
(NOT TO SCALE)
MIN D = 1FT
b = 8.5 FT
FROM STA. 10+50 TO STA. 12+50 -Y49- RT
DETAIL D
TOE PROTECTION
(Not to Scale)
d = 1 Ft.
D = 3 Ft.
Type of Liner = PSRM
FROM STA. 442+10 TO STA. 444+40 -L- RT
FROM STA. 442+50 TO STA. 444+00 -L- LT
FROM STA. 22+00 TO STA. 23+80 -Y35B- RT
FROM STA. 17+50 TO STA. 19+30 -Y47- RT
DETAIL R
LATERAL 'V' DITCH
(Not to Scale)
Min. D= 1Ft.
b= 5 Ft.
FROM STA. 23+00 TO STA. 23+45 -Y47- RT
DETAIL S
SPECIAL CUT DITCH
(Not to Scale)
Min. D= 1Ft.
FROM STA. 437+50 TO STA. 438+00 -L- LT
DETAIL U
LATERAL BASE DITCH
(Not to Scale)
Min. D= 1Ft.
Max. d= 1Ft.
B= 2 Ft.
b= 5 Ft.
Type of Liner= PSRM
FROM STA. 440+75 TO STA. 442+50 -L- LT
DETAIL W
STANDARD BASE DITCH
(Not to Scale)
Filter Fabric
When B is ≥ 6.0'
Std. No. 876.01
Min. D= 1Ft.
Max. d= 4 Ft.
B= 3 Ft.
Type of Liner= Class 1Rip-Rap
FROM STA. 437+10 -L- RT
DETAIL Y
SPECIAL CUT BASE DITCH
(Not to Scale)
Min. D= 1Ft.
B= 5 Ft.
FROM STA. 437+60 TO STA. 440+000 -L- RT (B=5')
FROM STA. 438+00 TO STA. 440+75 -L- LT (B=5')
FROM STA. 18+70 TO STA. 21+50 -Y35B- RT (B=2')
NAD 83
MATCH LINE SEE SHEET 19 -L- STA. 437+00
MATCH LINE SEE SHEET 21 -L- STA. 450+00
SEE SHEET 33 -Y47- STA. 18+50
SITE 6
-L- STA. 438+00
CLARA C. WALL
DAVID H. GRIFFIN
G. L. WILSON BUILDING COMPANY
SPECIAL CUT DITCH SEE DETAILS
SPECIAL CUT 5' BASE DITCH SEE DETAIL Y
CLASS 'B' RIP RAP EST 5 TONS EST 14 SY FF
LAT 2' BASE DITCH w/PSRM SEE DETAIL U
TOE PROTECTION w/PSRM SEE DETAIL D
PROP. 5' S/W W/ 3.5' P.S.
LAT. V DITCH SEE DETAIL R
GREENSBORO CITY LIMITS
GUILFORD COUNTY
PIPE CLEANOUT
KINGS MILL AT SEDGEFIELD ASSOCIATION
ROBERT E. ROTH
CLASS 'B' RIP RAP EST 2 TONS EST 7 SY FF
DENNIS G. HOWARD
TYP. BACK OF CURB 'V' DITCH SEE DETAIL C
12" PLASTIC PIPE TIE TO EXIST. TRENCH DRAIN
FRANCES G. BURCH
DENNIS G. HOWARD
BSC INVESTMENTS, LLC
AZ DEVELOPMENT, LLC
HUNT VILLAGE, LLC
REMOVE WRENNOVATION
SPECIAL CUT 2' BASE DITCH SEE DETAIL Y
CLASS 'B' RIP RAP EST 3 TONS EST 10 SY FF
CLASS 'B' RIP RAP EST 2 TONS EST 7 SY FF
REMOVE
RETAIN
STD BERM DITCH
CONC. COLLAR
R 40'
100 0 50 100
SCALE: 1"= 100' HORIZ.
SITE 6
PLAN VIEW
LEGEND
WETLAND BOUNDARY
DENOTES IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
DENOTES EXCAVATION IN WETLAND
DENOTES FILL IN WETLAND
ENGLISH
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34802.1.1 (U-2412B)
SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD
SHEET 14 OF 16

WETLAND IMPACTS
SUMMARY OF AFFECTED PROPERTY OWNERS

TRACT NO.	PROPERTY OWNER	ADDRESS	SITE NO.
56	KSL SEDGEFIELD PILOT LLC	5790 FLEET STREET, SUITE 300 CARLSBAD CA 92008	1
	NCDOT		2
	NCDOT		3
	NCDOT		4
	NCDOT		5
64	WALTER M. BROWN	6210 ROBLYN ROAD GREENSBORO N.C. 27410	6
63	DEBORAH L. ALLEN	500 ARROWHEAD DRIVE GREENSBORO N.C. 27410	6
900	NCDOT		6
77	L & S DUHAN PROPERTIES I LIMITED PARTNERSHIP	503 HOBBS ROAD GREENSBORO N.C. 27403	7
73	CHARLES W. GOIN	3015 ALAMANCE ROAD GREENSBORO N.C. 27407	8
83	J. R. DORSETT HEIRS	29458 WARMSPRINGS DRIVE MENIFEE CA 92584	8,9
84	TIMOTHY D. BANKER	2905 FAIRFAX ROAD GREENSBORO NC 27407	8
85	LORA HILL	2708 ROLAND ROAD GREENSBORO NC 27407	9
86	G. L. WILSON BUILDING COMPANY	190 WILSON PARK STATESVILLE NC 28625	9,10

ENGLISH

NCDOT

DIVISION OF HIGHWAYS
GUILFORD COUNTY
PROJECT: 34802.1.1 (U-2412B)
SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 15 OF 16

11/23/2011
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WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- STA. 397+73	48" RCP						0.02	< 0.01	241	51	
1	-L- STA. 397+73	BANK STABILIZATION						< 0.01		24		
2	-RAMPBREV- STA.14+61	EXTEND WITH 9' x 6' RCBC	0.07			0.01		0.02	< 0.01	195	10	
2	-RAMPCREV- STA. 15+47	EXTEND WITH 9' x 6' RCBC						0.01	< 0.01	72	10	
2	-RAMPCREV- STA. 15+47	BANK STABILIZATION						< 0.01		28		
3	-RAMPBREV- STA. 17+57	EXTEND WITH 54" RCP						0.02	< 0.01	173	7	
3	-RAMPCREV- STA. 24+75	30" RCP						0.02		330		
4	-L- STA. 409+45	42" RCP						0.03	< 0.01	331	19	
5	-L- STA. 432+52	60" RCP						0.01	< 0.01	107	10	
5	-Y35B- STA. 12+80	60" RCP						0.03	< 0.01	338	23	
5	-Y35B- STA. 10+45	BANK STABILIZATION						< 0.01		10		
6	-Y35B- STA. 18+20	48" RCP						0.01	< 0.01	68	10	
6	-Y35B- STA. 18+20	BANK STABILIZATION						< 0.01		15		
6	-L- STA. 438+00	(2) 30" RCP	0.41		0.14	< 0.01						
TOTALS:			0.48	0.00	0.14	0.01	0.00	0.18	0.02	1932	140	0

ATN Revised 3/31/05

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILFORD COUNTY
Project - 34802.1.1 (U-2412B)
11/23/2011

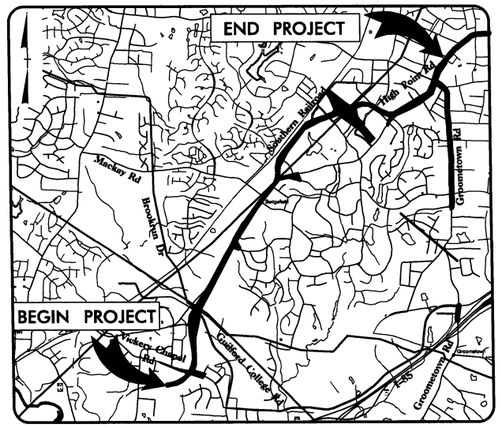
SHEET 16 OF 16

SHT OF

09/08/99

CONTRACT: TIP PROJECTS: U-2412B & U-2524AE

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2412B & U-2524AE	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34802.1.1	STP-4121(1)	P.E.
34802.2.3	STP-4121(4)	RW
34820.2.17		RW

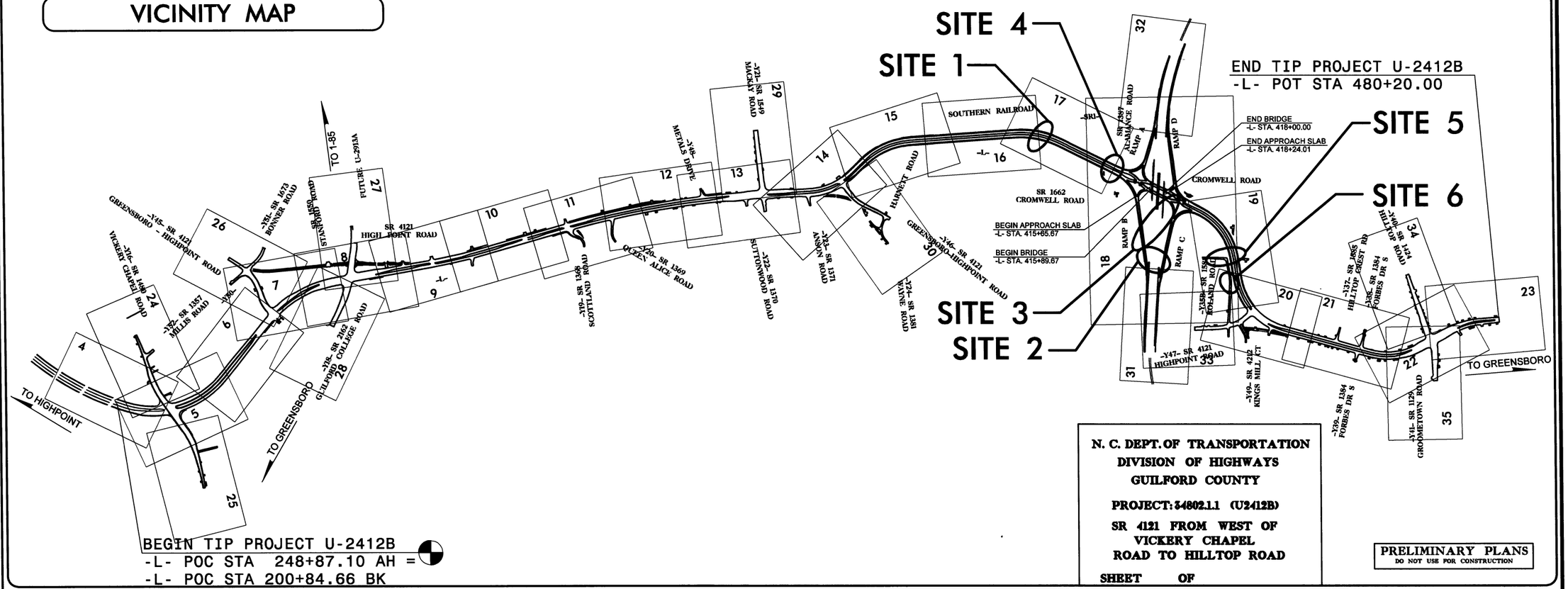
LOCATION: *SR 4121 (GREENSBORO /HIGH POINT ROAD) FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, CULVERT EXTENSION, STRUCTURES, SIGNING AND SIGNALS*

BUFFER IMPACTS

Buffer Drawing Sheet 1 of 8

NAD 83



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U2412B)

SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET OF

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2006 = 22,900
ADT 2030 = 37,900
DHV = 11 %
D = 60 %
T = 5 % *
V = 50 MPH
* (TTST 2% + DUAL 3%)
FUNC CLASS URBAN ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2412B = 4.198 MILES
LENGTH STRUCTURE TIP PROJECT U-2412B = 0.040 MILES
TOTAL LENGTH TIP PROJECT U-2412B = 4.198 MILES

NCDOT CONTACT: K. ZAK HAMIDI, P.E.
PROJECT ENGINEER ROADWAY DESIGN

Prepared in the Office of:
PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC LIC. NO. F-0165
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: FEBRUARY 20, 2009

LETTING DATE: AUGUST 21, 2012

CHRIS DAVIS, P.E.
PROJECT ENGINEER

DAVID B. GOURLEY, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

11/28/2011
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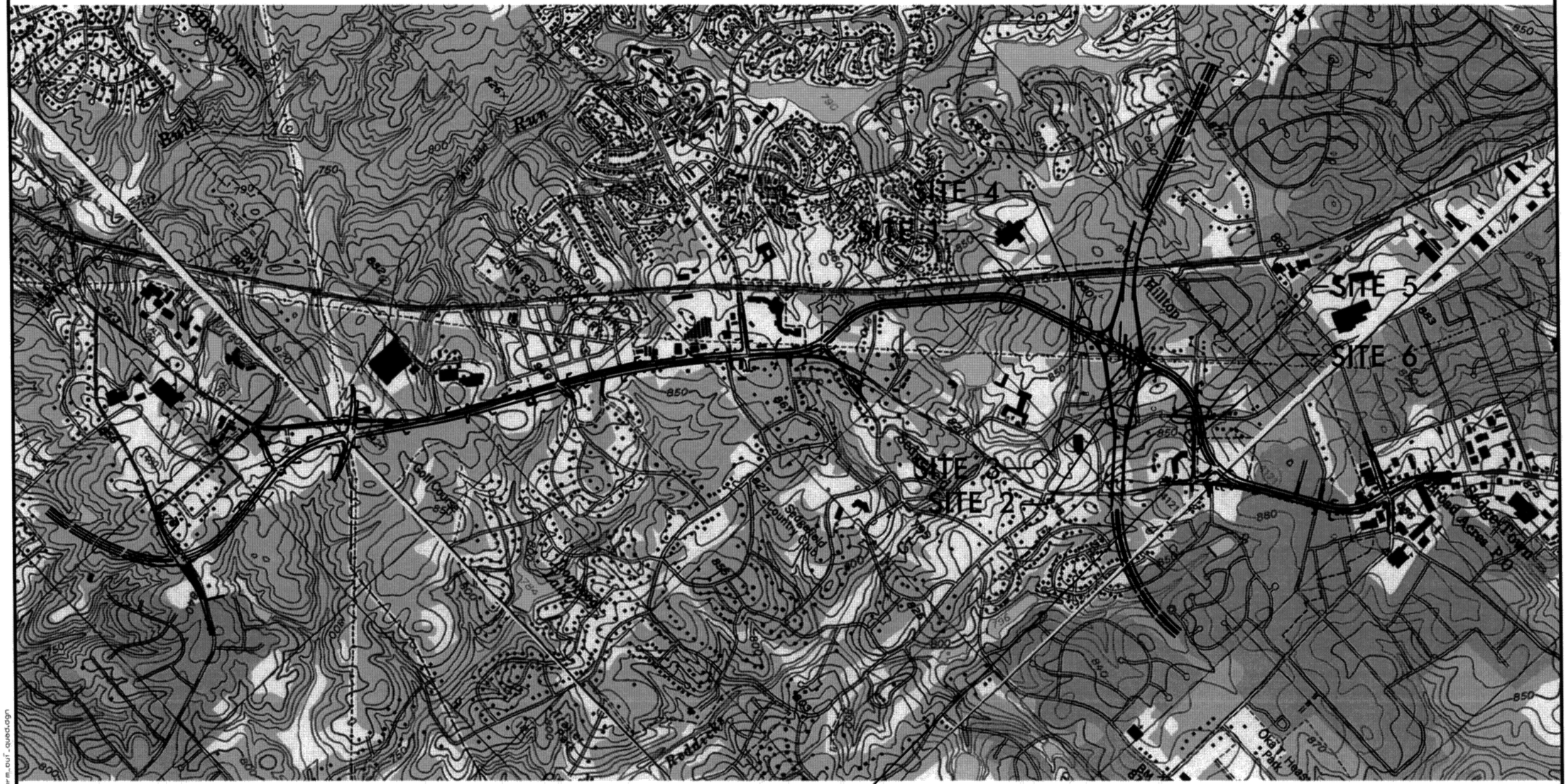
Florence & Hutcheson, Inc.



BUFFER IMPACTS TOPO MAP

SCALE: 1" = 1500'

NAD 83

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)

SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 2 OF 8

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

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

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson

SCALE: 1" = 100' HORIZ.

NAD 83

-L-
PI Sta 397+27.55
Δ = 18° 54' 14.2" (RT)
D = 4° 24' 26.5"
L = 428.92'
T = 216.43'
R = 1,300.00'
e = 0.04
DS = 50 MPH

PIs Sta 400+26.79
Θs = 5° 43' 46.5"
Ls = 260.00'
LT = 173.42'
ST = 86.75'

DETAIL F
SPECIAL CUT DITCH w/HINGE
(Not to Scale)
Natural Ground, 2d, D, 5d, 4d or Flatter, Front Ditch Slope, 3.0', Min. D= 1 Ft.
FROM STA. 398+50 TO STA. 401+40 -L- RT, S=3:1
FROM STA. 405+50 TO STA. 408+00 -L- RT, S=6:1
FROM STA. 406+00 TO STA. 408+00 -L- LT, S=6:1

DETAIL L
TOE PROTECTION
(Not to Scale)
Natural Ground, D, Fill Slope, d, FILTER FABRIC
d = 1 Ft.
D = 3 Ft.
Type of Liner = CLASS 'B' RIP RAP
FROM STA. 396+50 TO STA. 398+50 -L- LT

DETAIL S
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground, 2d, D, 4d or Flatter, Front Ditch Slope
Min. D= 1 Ft.
FROM STA. 401+00 TO STA. 402+50 -L- LT

DETAIL P
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 2d, D, 2d, Natural Ground, B
Min. D= 1 Ft.
B= 4 Ft.
FROM STA. 397+90 -L- LT

DETAIL X
PROPOSED OUTLET CHANNEL
(Not to Scale)
W, D, Filter Fabric, Filter Fabric
W= 4 Ft.
D= 2 Ft.
Type of Liner = CLASS 'I' RIP RAP
FROM STA. 397+30 -L- RT

NEW STORMWATER CONVEYANCE, MITIGABLE. LEVEL SPREADER NOT USED DUE TO TOPOGRAPHY CONSTRAINTS (CAN NOT DAYLIGHT UNTIL STREAM). GRASS SWALE USED TO CONTROL NITROGEN.

GRASS SWALE FOR ONSITE DRAINAGE

GRASS SWALE DATA
DA= 1.07 AC
SLOPE= 0.003
L REQ.= 107'
L PRO.= 520'
Q2= 2.0 CFS
V2= 0.6 FPS
Q10= 2.9 CFS
V10= 0.7 FPS

SITE 1
-L- STA. 397+73

GRASS SWALE FOR OFFSITE DRAINAGE AND FOR PREVIOUSLY TREATED ONSITE DRAINAGE

SPECIAL CUT 5' BASE DITCH SEE DETAIL Y

4' BASE DITCH DDE=10 CY L=30', S=4.67% SEE DETAIL P

DIFFUSE FLOW PROVIDED AT THIS QUADRANT

BURY INVERT 0.8'

TOE PROTECTION W/CLASS 'B' RIP RAP SEE DETAIL L

SPECIAL CUT DITCH SEE DETAIL S

ROAD CROSSING, L>150' AND A>1/3 ACRE, MITIGABLE

SPECIAL CUT GRASS SWALE SEE DETAIL F

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

30 LF OF CLASS 'I' RIP RAP ON BANKS ONLY, EST 48 TONS SEE DETAIL X

NEW STORMWATER CONVEYANCE, MITIGABLE. LEVEL SPREADER NOT USED DUE TO TOPOGRAPHY CONSTRAINTS (WOODED, S=16% >6%).GRASS SWALE USED TO CONTROL NITROGEN.

GRASS SWALE DATA
DA= 1.80 AC
SLOPE= 0.01
L REQ.= 180'
L PRO.= 470'
Q2= 3.7 CFS
V2= 1.1 FPS
Q10= 5.4 CFS
V10= 1.2 FPS

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

NEW STORMWATER CONVEYANCE, MITIGABLE. LEVEL SPREADER NOT USED DUE TO TOPOGRAPHY CONSTRAINTS (WOODED, S=10% >6%).GRASS SWALE USED TO CONTROL NITROGEN.

GRASS SWALE DATA
DA= 1.3 AC
SLOPE= 0.005
L REQ.= 130'
L PRO.= 690'
Q2= 2.9 CFS
V2= 0.8 FPS
Q10= 4.3 CFS
V10= 0.9 FPS

END C/A STA. 400+70.00
ACCESS POINT
BEGIN C/A STA. 401+30.00

-L- ST Sta. 402+00.04

-L- N 70°02'30.1" E

56 KSL SEDGEFIELD PILOT LLC

57 MARGARET B. BROWN

58 HELEN M. FAUCETT

59 JAMES R. DILLON JR.

62

900 NCDOT

MATCH LINE SEE SHEET 16 -L- STA. 396+00

MATCH LINE SEE SHEET 18 -L- STA. 408+00

SITE 1
PLAN VIEW

LEGEND

- BZ 1 — RIPARIAN BUFFER ZONE 1 (30')
- BZ 2 — RIPARIAN BUFFER ZONE 2 (20')
- MITIGABLE IMPACTS ZONE 1
- MITIGABLE IMPACTS ZONE 2

DETAIL Y
SPECIAL CUT BASE DITCH
(Not to Scale)
Natural Ground, 2d, D, 4d or Flatter, Front Ditch Slope, B, Min. D= 1 Ft., B= 5 Ft.
FROM STA. 398+60 TO STA. 400+00 -L- LT

DETAIL I
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow, 10d, 20d, 2.0, 0.5' Min., 1.0' Max., 2d, 6'±, S = Ditch Slope, ℄ Proposed Ditch
FROM STA. 396+45 -L- RT

DETAIL III
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow, 20d, 10d, S, S=Ditch Slope
FROM STA. 396+10 -L-
FROM STA. 398+40 -L-
FROM STA. 401+30 -L-

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)

SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 3 OF 8

8/17/95

11/23/2011
R:\Hydraulics\PERMITS_Environmental\Drawings\U-2412B_hyd_prm_buf_psh_17.dgn
Florence & Hutcheson Inc

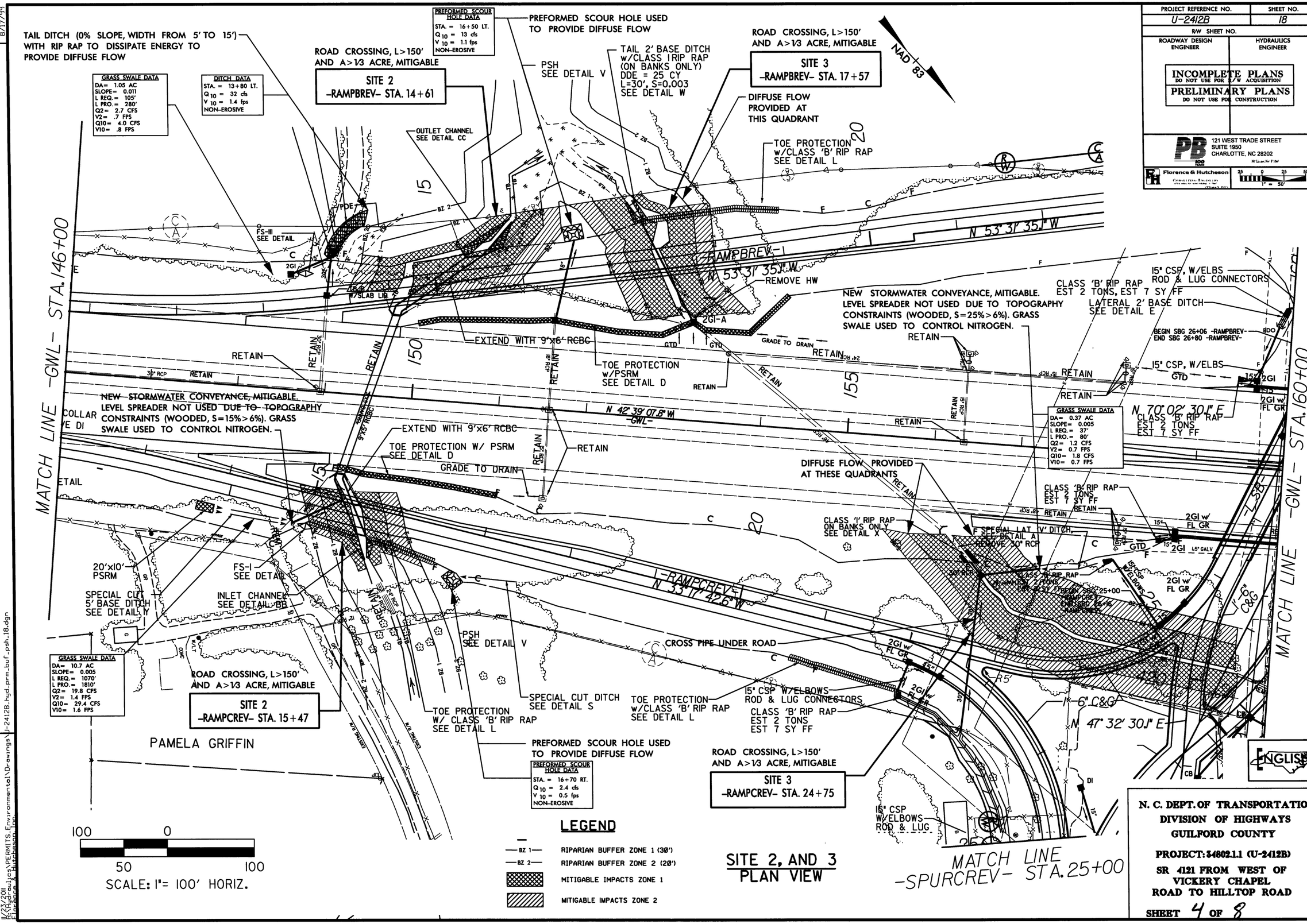
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson

1" = 50'



LEGEND

- BZ 1 — RIPARIAN BUFFER ZONE 1 (30')
- BZ 2 — RIPARIAN BUFFER ZONE 2 (20')
- MITIGABLE IMPACTS ZONE 1
- MITIGABLE IMPACTS ZONE 2

SITE 2, AND 3
PLAN VIEW

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)

SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 4 OF 8

REVISIONS 8/17/99

11/23/2011
R:\Hydraulics\PERMITS_Environmental\Drawings\U-2412B_hyd_prm_buf_psh_18.dgn
Florence & Hutcheson, Inc.

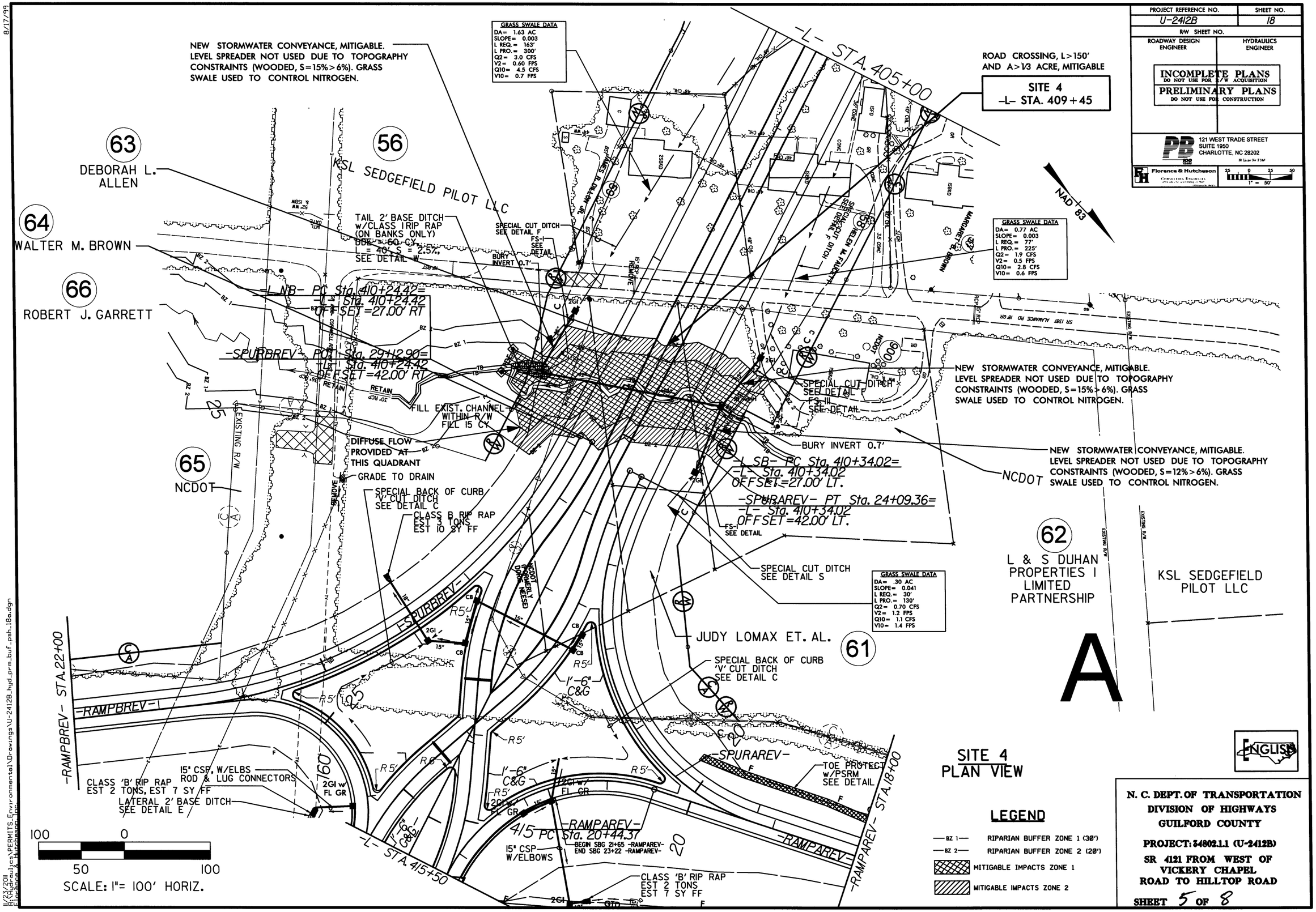
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson

1" = 50'



SITE 4
PLAN VIEW

ENGLISH

LEGEND

- BZ 1 — RIPARIAN BUFFER ZONE 1 (30')
- BZ 2 — RIPARIAN BUFFER ZONE 2 (20')
- MITIGABLE IMPACTS ZONE 1
- MITIGABLE IMPACTS ZONE 2

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)

SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 5 OF 8

8/17/99

11/23/2011
R:\Hydraulics\PERMITS_Environmental\Drawings\U-2412B_hyd_prm_buf_psh_18a.dgn
Florence & Hutcheson, Inc.

8/17/99

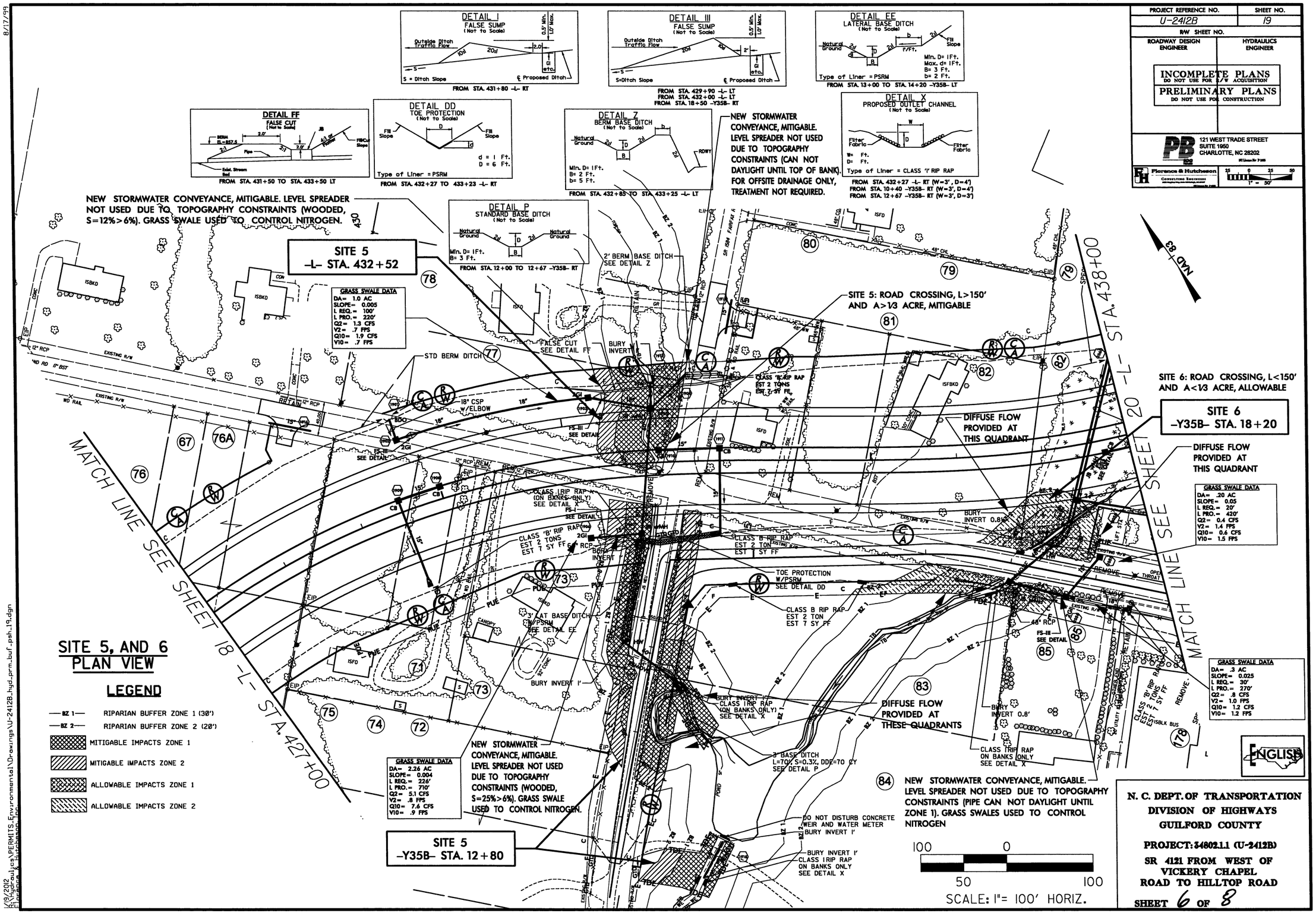
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No. F-0891

Florence & Hutcheson
Consulting Engineers

1" = 50'



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412B)

SR 4121 FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

SHEET 6 OF 8

1/19/2012
R:\Hydraulics\PERMITS_Environmental\Drawings\U-2412B_hyd_prm_buf_psh_19.dgn
Florence & Hutcheson, Inc.

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	48" RCP	-L- 397+73	X						17804	11396	29200		
2	EXTEND WITH 9' x 6' RCBC	-RAMPBREV- 14+61	X						8190	4450	12640		
2	EXTEND WITH 9' x 6' RCBC	-RAMPCREV- 15+47	X						4332	2844	7176		
3	EXTEND WITH 54" RCP	-RAMPBREV- 17+57	X						9486	5952	15438		
3	30" RCP	-RAMPCREV- 24+75	X						22378	15287	37665		
4	42" RCP	-L- 409+45	X						18850	11157	30007		
5	60" RCP	-L- 432+52	X						6834	2686	9520		
5	60" RCP	-Y35B- 12+80	X						14335	7805	22140		
6	48" RCP	-Y35B- 18+20	X			6359	5751	12110					
6	24" RCP*	-Y35B- 18+40 RT							53	44	97		
TOTAL:						6359	5751	12110	102262	61621	163883		

* New stormwater conveyance per buffer rule item (9), Table of Uses - Mitigable impacts are defined by pipe diameter of 2-ft x pipe length through each buffer zone.

NOTE: There is a net decrease in the BUFFER IMPACTS SUMMARY resulting from design change from SPUI to DDI.

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILFORD COUNTY
PROJECT: 34802.1.1 (U-2412B)

01-19-2012
SHEET 7 OF 8

Rev. May 2006

WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)		WETLANDS IN BUFFERS ZONE 1 (ft^2)	WETLANDS IN BUFFERS ZONE 2 (ft^2)
2	-RAMPBREV- STA. 14+61		3122	30
6	-Y35B- 18+20		1161	1116
TOTAL:			4283	1146

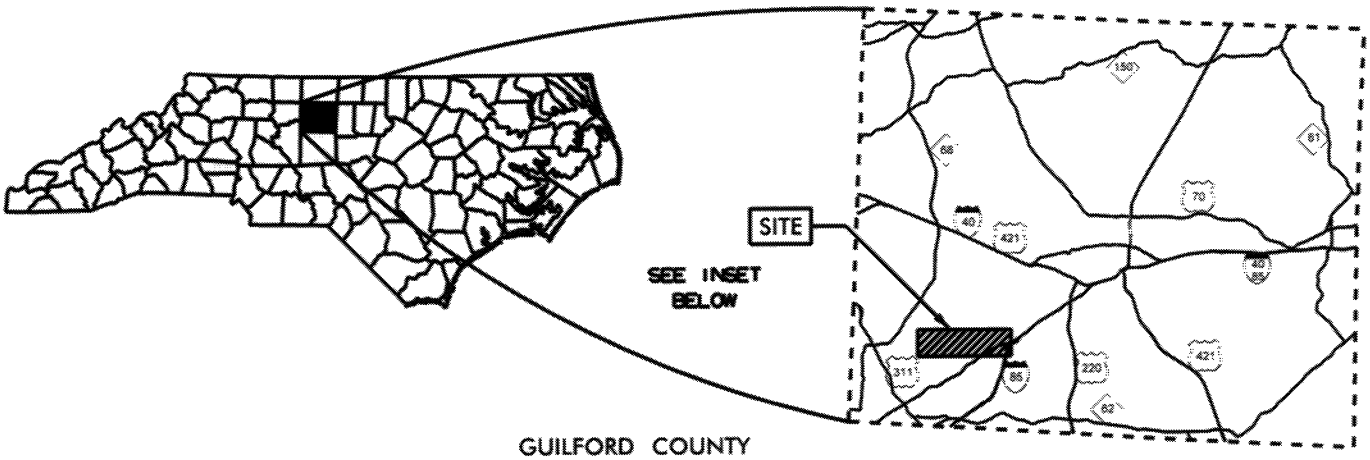
N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILFORD COUNTY
WBS - 34802.1.1 (U-2412B)

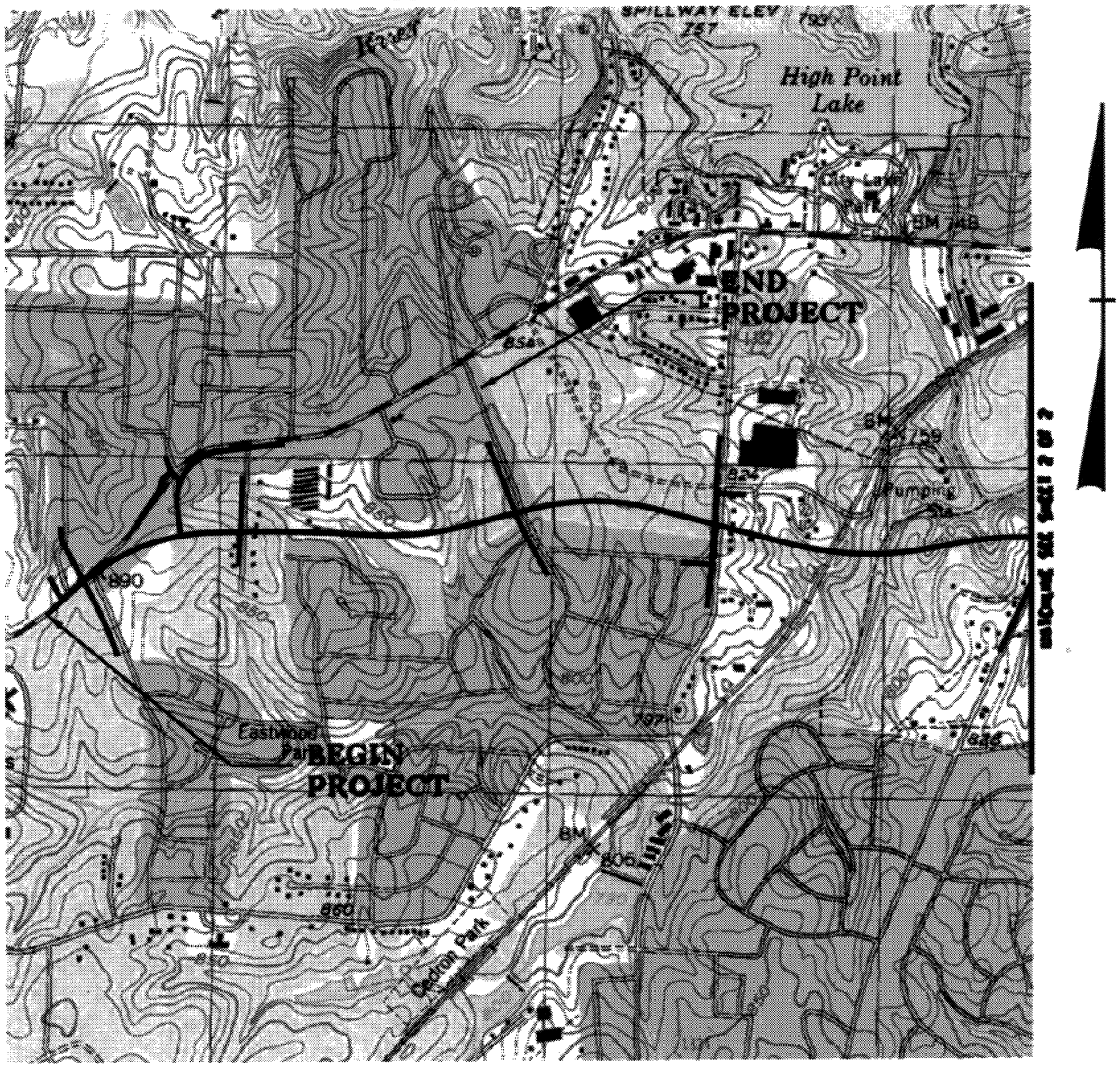
11/23/2011

SHEET 8 OF 8

Rev. Jan 2009



GUILFORD COUNTY



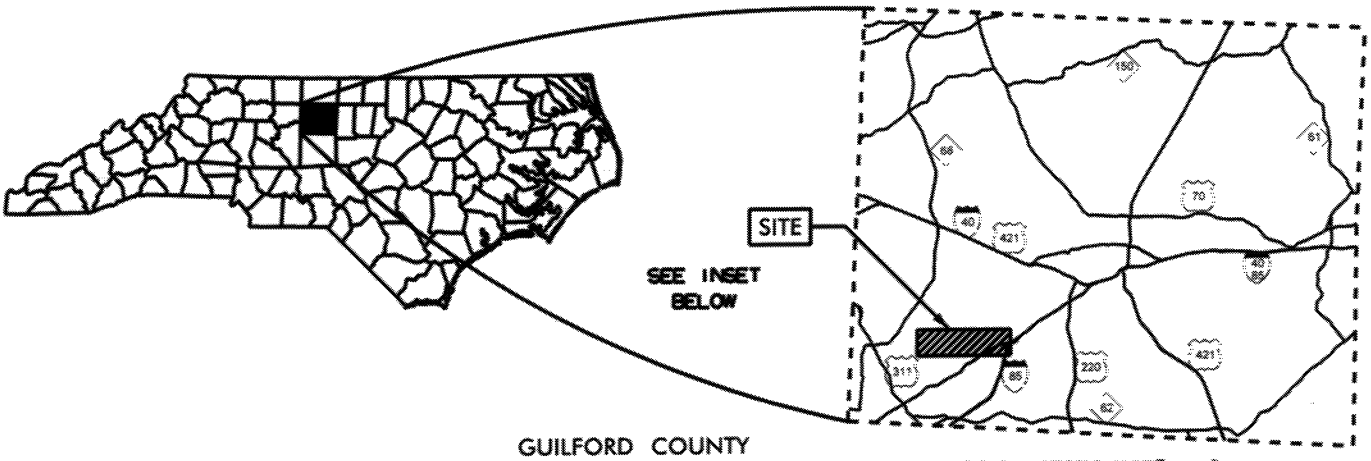
Permit Drawing
Sheet 1 of 31

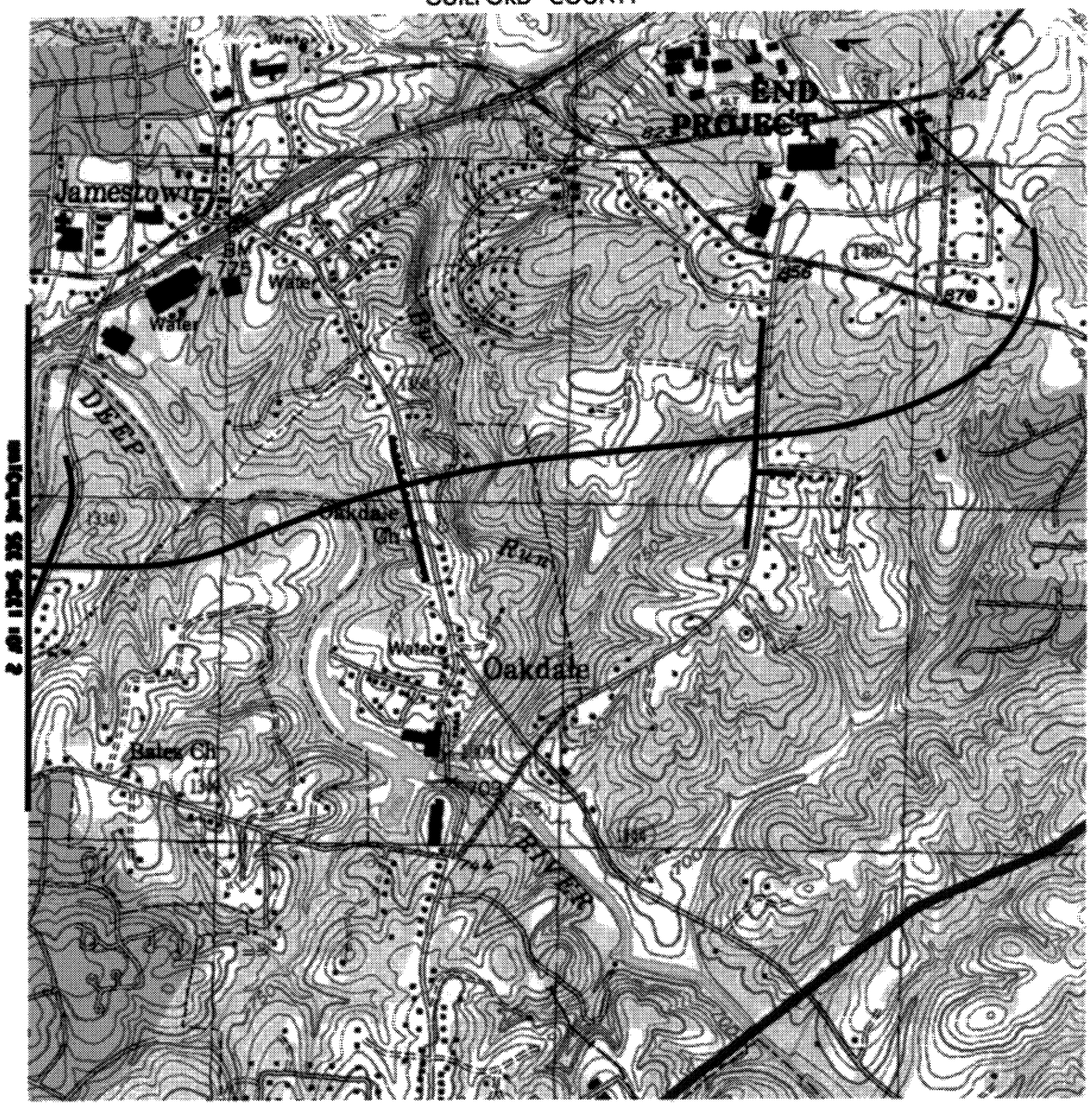
WETLAND/STREAM IMPACTS

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412A)
GREENSBORO/HIGH POINT ROAD
FROM PROPOSED US 311 BYPASS
TO WEST OF SR 1480 (VICKREY
CHAPEL ROAD)

SHEET 1 OF 2 1-25-11





Permit Drawing
Sheet 2 of 31

WETLAND/STREAM IMPACTS

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412A)
GREENSBORO/HIGH POINT ROAD
FROM PROPOSED US 311 BYPASS
TO WEST OF SR 1480 (VICKREY
CHAPEL ROAD)

SHEET 2 OF 2 1-25-11

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
16	RICHARD VAUGHN TRUST	PO BOX 1468 MOUNT AIRY, NC 27030
28	ARMADILLO HOLDINGS LLC	PO BOX 1796 HIGH POINT, NC 27261
30	ROBERT J BROWN	1129 PENNYWOOD DR HIGH POINT, NC 27265
31	KHAN & SHERRY KHAN	124 ORVILLE DR HIGH POINT, NC 27265
32	GROOME HOFFMAN & BENCINI INC	PO BOX 827 HIGH POINT, NC 27261
34	JEFFERY SCOTT & SARAH H OAKLEY	4003 TESA CT HIGHT POINT, NC 27265
37	KEVEN J RITTER	242 CRESTWOOD CIR HIGH POINT, NC 27260
38	HELEN GUARINO	PO BOX 4850 EMERALD ISLE, NC 28594
39	KHAN & SHERRY KHAN	124 ORVILLE DR HIGH POINT, NC 27265
62	RICHARD R GLOVER	108 BRAMBLE DR JAMESTOWN, NC 27282

WETLAND/STREAM IMPACTS

NCDOT

DIVISION OF HIGHWAYS

GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412A)

GREENSBORO/HIGH POINT ROAD
FROM PROPOSED US 311 BYPASS
TO WEST OF SR 1480
(VICKREY CHAPEL ROAD)

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
64	JOHNNIE BOYD REUBEN BOYD	4022 PUMP STATION RD HIGH POINT, NC 27260
73	NORFOLK SOUTHERN RR	1105 MERRITT DRIVE GREENSBORO, NC 27407
74	CITY OF HIGH POINT	PO BOX 230 HIGH POINT, NC 27261
75	NANCY T GUITON	3437 DILLON RD JAMESTOWN, NC 27282
76	RIVER WALK I LLC	PO BOX 49514 GREENSBORO, NC 27419
78	RIVER WALK OF GUILFORD CO HOMEOWNERS ASSOC INC	PO BOX 9415 GREENSBORO, NC 27429
83	OAK HOLLOW BUILDERS INC	140 FRAZIER STREET HIGH POINT, NC 27263
87	OAKDALE COTTON MILLS	PO BOX 787 JAMESTOWN, NC 27282
126	GREENSBORO REAL ESTATE	37316 SCHOENHERR RD STERLING, MI 48312
127	DORIS M AUMAN SHERRILL L AUMAN SHELBA A WATSON B STEVEN AUMAN	PO BOX 553 HUDSON, NC 28638

WETLAND/STREAM IMPACTS

NCDOT

DIVISION OF HIGHWAYS

GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412A)

GREENSBORO/HIGH POINT ROAD
FROM PROPOSED US 311 BYPASS
TO WEST OF SR 1480
(VICKREY CHAPEL ROAD)

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
128	B STEVEN AUMAN	PO BOX 1588 JAMESTOWN, NC 27282
130	MICHAEL ALAN BRYANT JOHNNIE S BRYANT	4719 HARVEY RD JAMESTOWN, NC 27282
136	GUILFORD COUNTY BOARD OF EDUCATION	712 N. EUGENE ST GREENSBORO, NC 27401
147	OTIS WALLACE	714 W. WILLIS AVE HIGH POINT, NC 27260
	NCDOT DIVISION 7	PO BOX 14996 GREENSBORO, NC 27415

WETLAND/STREAM IMPACTS

NCDOT

DIVISION OF HIGHWAYS

GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412A)

GREENSBORO/HIGH POINT ROAD
FROM PROPOSED US 311 BYPASS
TO WEST OF SR 1480
(VICKREY CHAPEL ROAD)

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	12+00 -Y- RT								0.01		34	
2	37+10/45+14 -L-		0.22			0.05		0.63	0.01	353	106	
3A	51+19/52+50 -L-							0.01	<.01	213	11	
3B	52+50/53+62 -L-							0.03	<.01	307	64	
4	85+11/88+05 -L-		0.03					0.03	<.01	336	17	
5	89+51/96+16 -L-		IMPACTS MINIMIZED RESULTING IN NO IMPACTS AT THIS SITE									
6	104+57/105+06 -L-							0.02	<0.01	283	21	
7A	118+83/122+90 -L-		0.45			0.04		0.03	<0.01	418	33	
7B	122+50/122+95 -L-							0.01		208		
8	138+21/142+21 -L-		0.02			0.04	0.19		0.16		215	
9	153+50/156+55 -L-		IMPACTS MINIMIZED RESULTING IN NO IMPACTS AT THIS SITE									
10A	157+95/159+42 -L-							0.19		100		
10B	157+33/157+80 -L-							<0.01	<0.01	40	40	
11	171+80/179+34 -L-	Pond						1.31				
		US of Pond	0.08					<0.01	<0.01	296	38	
		DS of Pond	<0.01			0.04		0.03	<0.01	196	17	
12	15+74/19+58 -Y10-		0.01			0.01		<0.01		82		
13	189+48/193+86 -L-							1.56	<0.01	24	40	
14	19+00 -Y- RT							<0.01		29		
TOTALS:			0.81			0.18	0.19	3.85	0.180	2885	636	

* Site 2 - Impacts to Surface Waters (Pond) = 0.60 ac (out of 0.63 ac total)
* Site 10 - Impacts to Surface Waters (Pond) = 0.18 ac (out of 0.19 ac total)
* Site 11 - Impacts to Surface Waters (Pond) = 1.31 ac (out of 1.34 ac total)
* Site 13 - Impacts to Surface Waters (Pond) = 1.56 ac

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

COUNTY

WBS - 34802.1.1 (U-2412A)

SHEET 6 of 31 1/19/2012

ATN Revised 3/31/05

TIP PROJECT: U-2412A

CONTRACT:

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(1)	PE
34802.2.2	STP-4121(3)	R/W & UTL.

ENGLISH

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

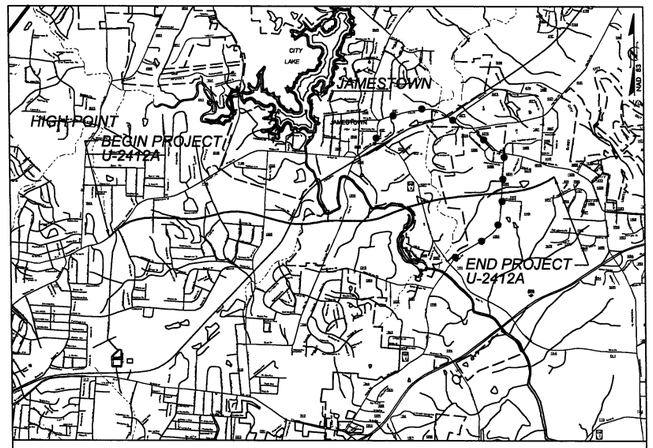
GUILFORD COUNTY

Permit Drawing
Sheet 7 of 31

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

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, STRUCTURES, SIGNALS AND GUARDRAIL*

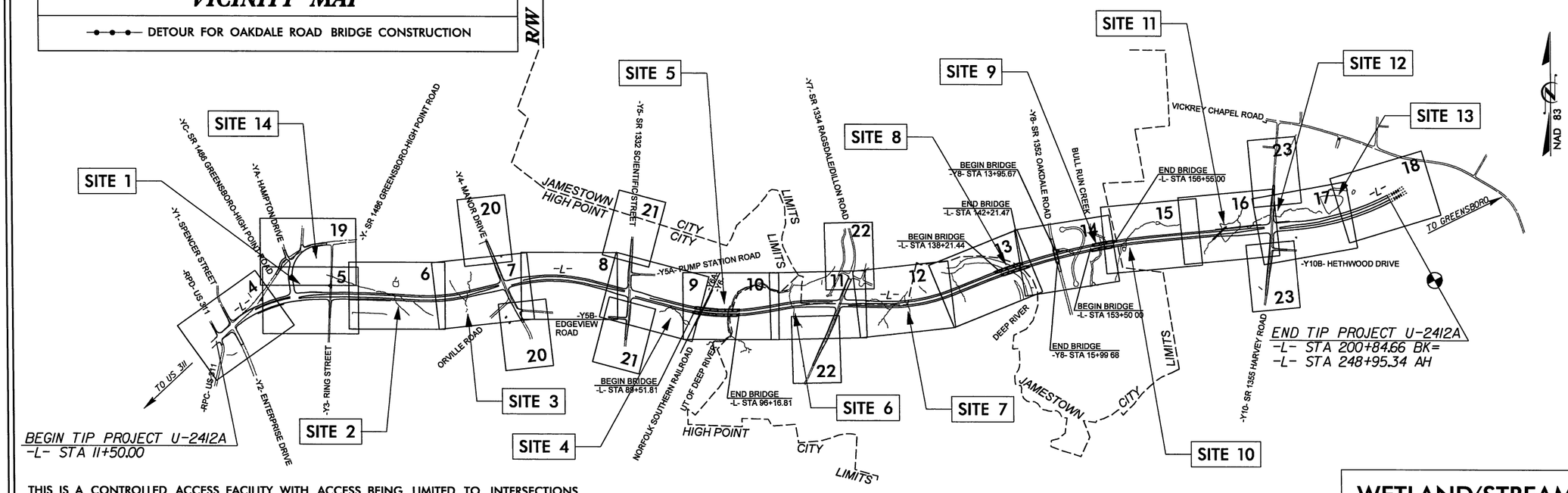
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



VICINITY MAP

DETOUR FOR OAKDALE ROAD BRIDGE CONSTRUCTION

R/W SUBMITTAL



THIS IS A CONTROLLED ACCESS FACILITY WITH ACCESS BEING LIMITED TO INTERSECTIONS.
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF HIGH POINT AND JAMESTOWN.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II
NCDOT CONTACT: B. DOUG TAYLOR, P.E. ENGINEERING COORDINATION, ROADWAY DESIGN UNIT

WETLAND/STREAM IMPACTS

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 2011	=	31,530
ADT 2031	=	48,870
DHV	=	11%
D	=	55%
T	=	3% *
V	=	60 MPH

* (TTST 1% + DUAL 2%)

FUNC CLASS: ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT	U-2412A	=	3.327	MILES
LENGTH STRUCTURES TIP PROJECT	U-2412A	=	.259	MILES
TOTAL LENGTH OF TIP PROJECT	U-2412A	=	3.586	MILES

Prepared In the Office of:
GIBSON ENGINEERS, PC
PO BOX 700
FUQUAY VARINA, N.C. 27526
PHONE 919-552-2253
FAX 919-552-2254
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 20, 2009

LETTING DATE:
JUNE 24, 2022

GLENDA M. GIBSON, PE
PROJECT ENGINEER

MICHAEL PEKAREK, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

$$DATE$$
$$SYSTIME$$
$$DGN$$
$$USERNAME$$

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

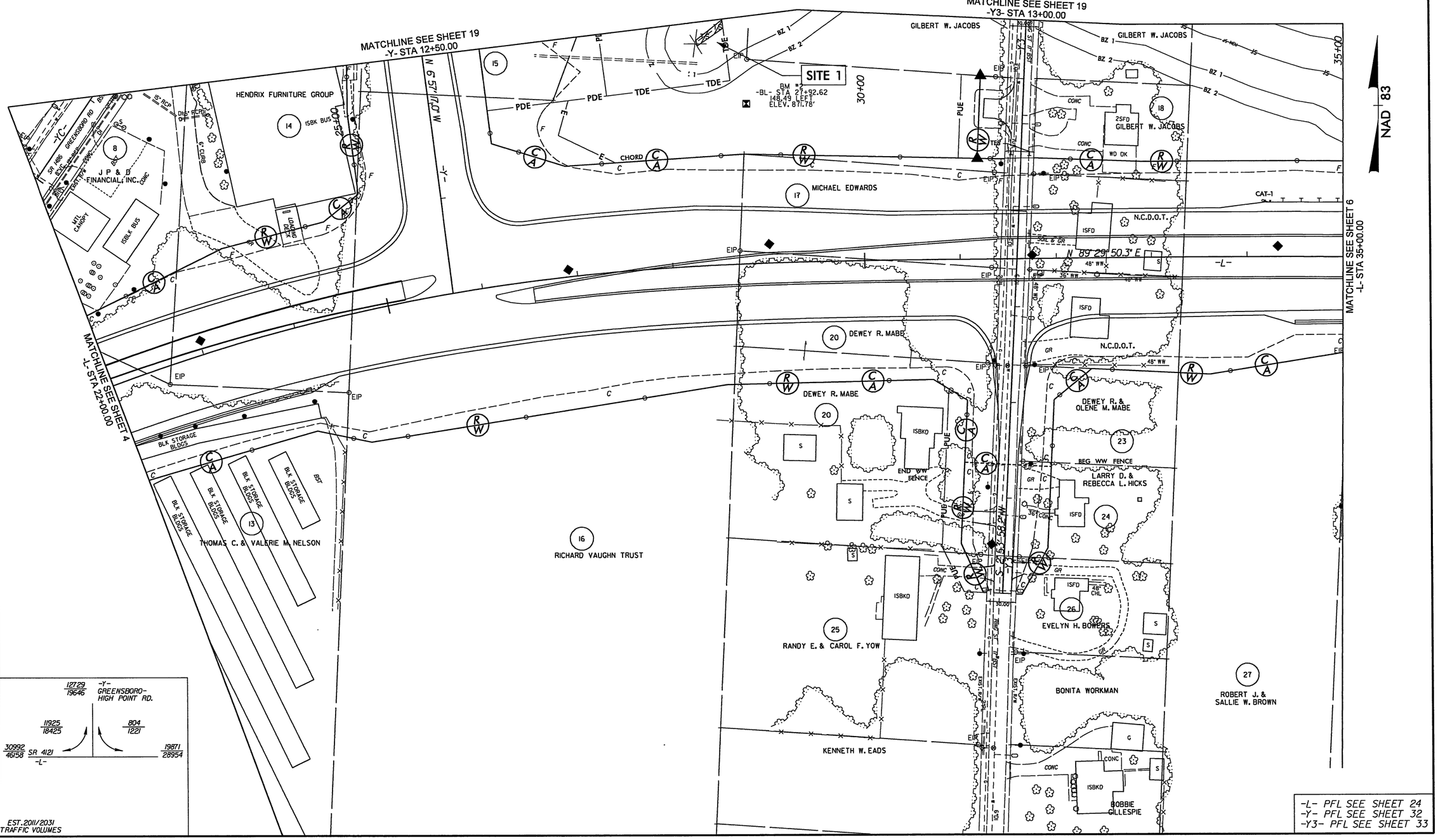
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ENGLISH

Permit Drawing
Sheet 8 of 31



-L- PFL SEE SHEET 24
-Y- PFL SEE SHEET 32
-Y3- PFL SEE SHEET 33

REVISIONS

REVISED OWNER FOR PARCELS 14,15,16, & 17-REVISED PARCEL 22 TO 20 -- REVISED 6-24-09

$$DATE$$
$$SYSTIME$$
$$USERNAME$$
$$DGN$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

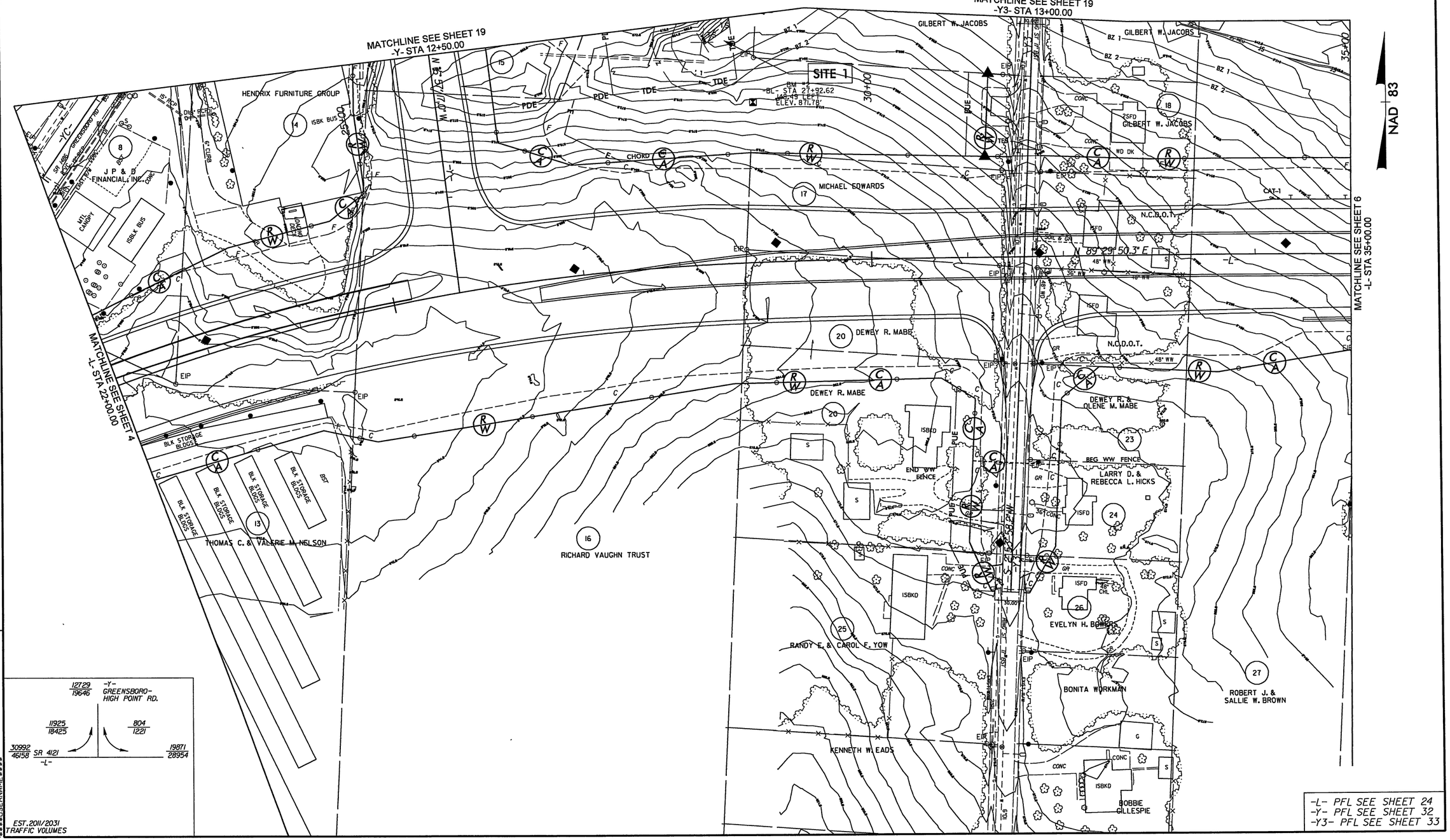
Prepared in the Office of: GIBSON ENGINEERS, PC

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ENGLISH

Permit Drawing
Sheet 9 of 31

442/608 -Y3- RING ST.
221/304 221/304
19871/28954 SR 4121 -L- 19871/28954
221/304 221/304
EST. 2011/2031 TRAFFIC VOLUMES 442/608 -Y3- RING ST.



-L- PFL SEE SHEET 24
-Y- PFL SEE SHEET 32
-Y3- PFL SEE SHEET 33

REVISIONS
REVISED OWNER FOR PARCELS 14,15,16, & 17; REVISED PARCEL 22 TO 20 - REVISED 6-24-09

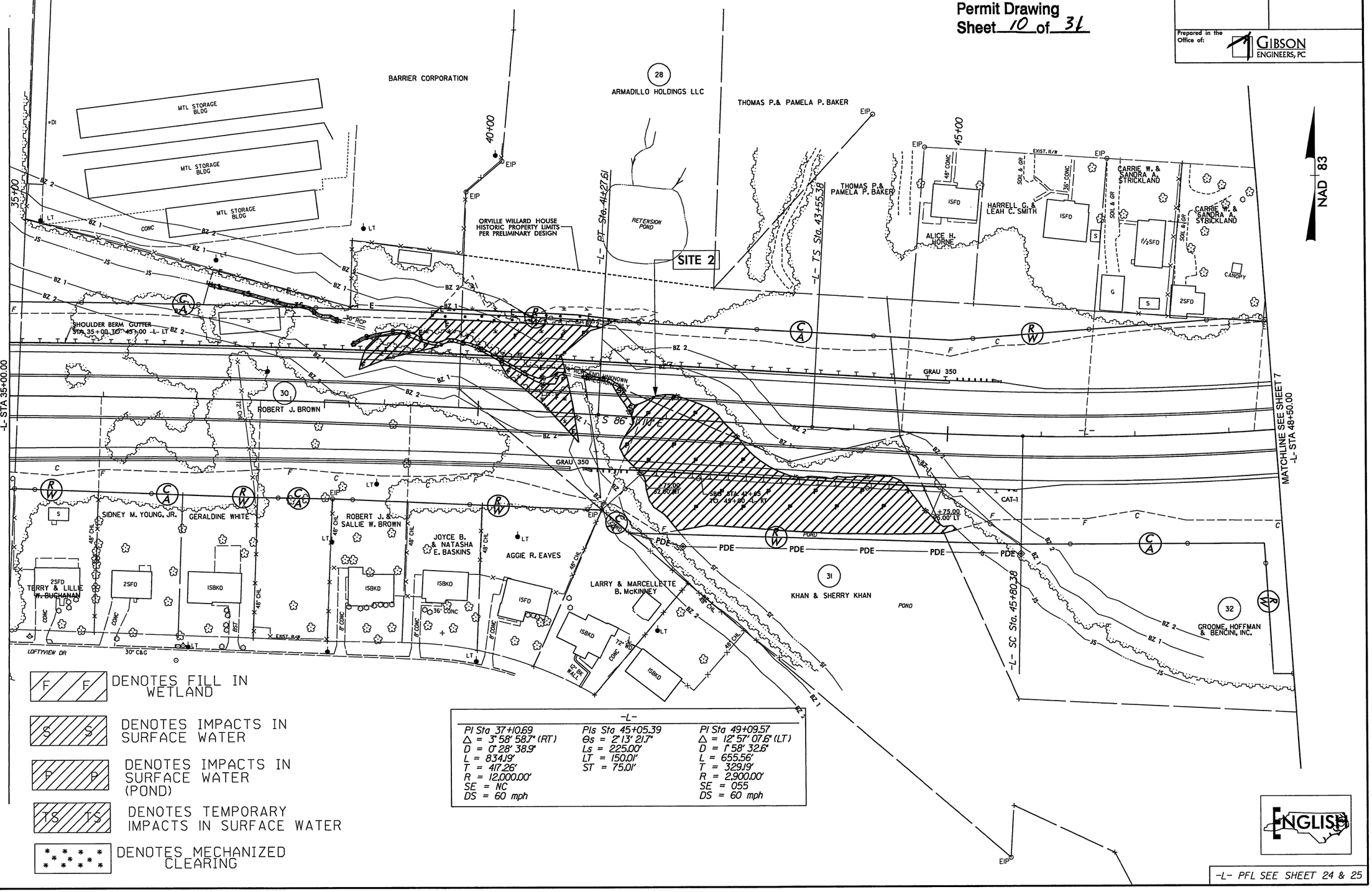
$$$$DATE$$$$
$$$$TIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

Permit Drawing
Sheet 10 of 34



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

DENOTES MECHANIZED CLEARING

-L-		
PI Sta 37+10.69	PIs Sta 45+05.39	PI Sta 49+09.57
Δ = 3° 58' 58.7" (RT)	Θs = 2° 13' 21.7"	Δ = 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

ENGLISH

REVISIONS
REVISED OWNER FOR PARCEL 29. REVISED ROW AND PDE. MONUMENT TO SC STA.45+80.38 RT. - REVISED 6-24-09

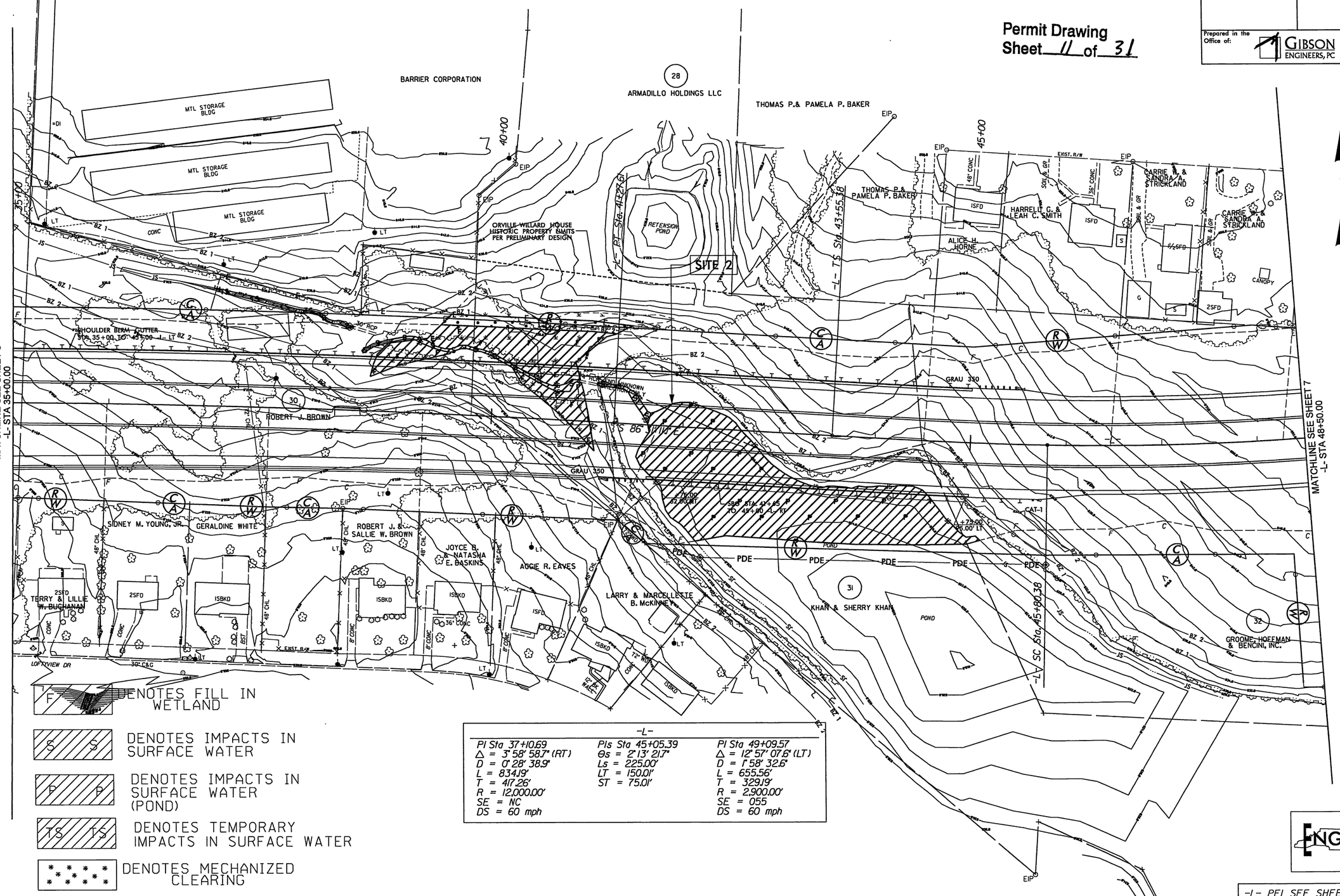
$$DATE$$
$$TIME$$
$$DGN$$
$$USERNAME$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

Permit Drawing
Sheet 11 of 31



REVISIONS
REVISED OWNER FOR PARCEL 29. REVISED ROW AND PDE MONUMENT TO SC STA.45+80.38 RT - REVISED 6-24-09

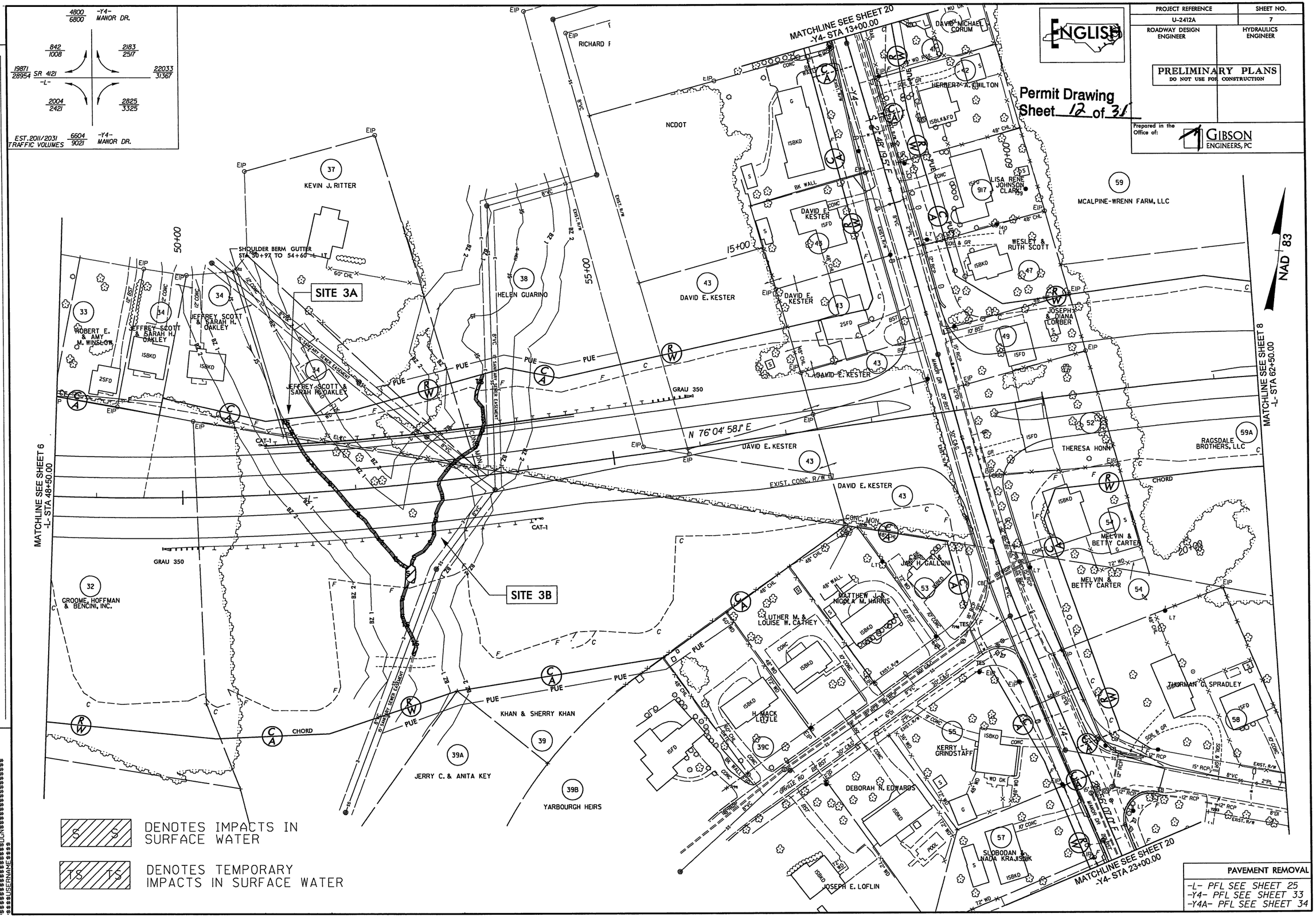
$$DATE$$
$$SYSTIME$$
$$DGNS$$
$$USERNAME$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

Permit Drawing
Sheet 12 of 31



PAVEMENT REMOVAL

-L- PFL SEE SHEET 25
-Y4- PFL SEE SHEET 33
-Y4A- PFL SEE SHEET 34

REVISIONS

BEVISED PARCEL 35 & 36 TO 34;44;46;48;50 & 51 TO 43;56 TO 54;45 TO 91; REVISED OWNER FOR PARCEL 39B;40;52;55 & 59; ADDED PARCEL 59A; REVISED 6-24-09

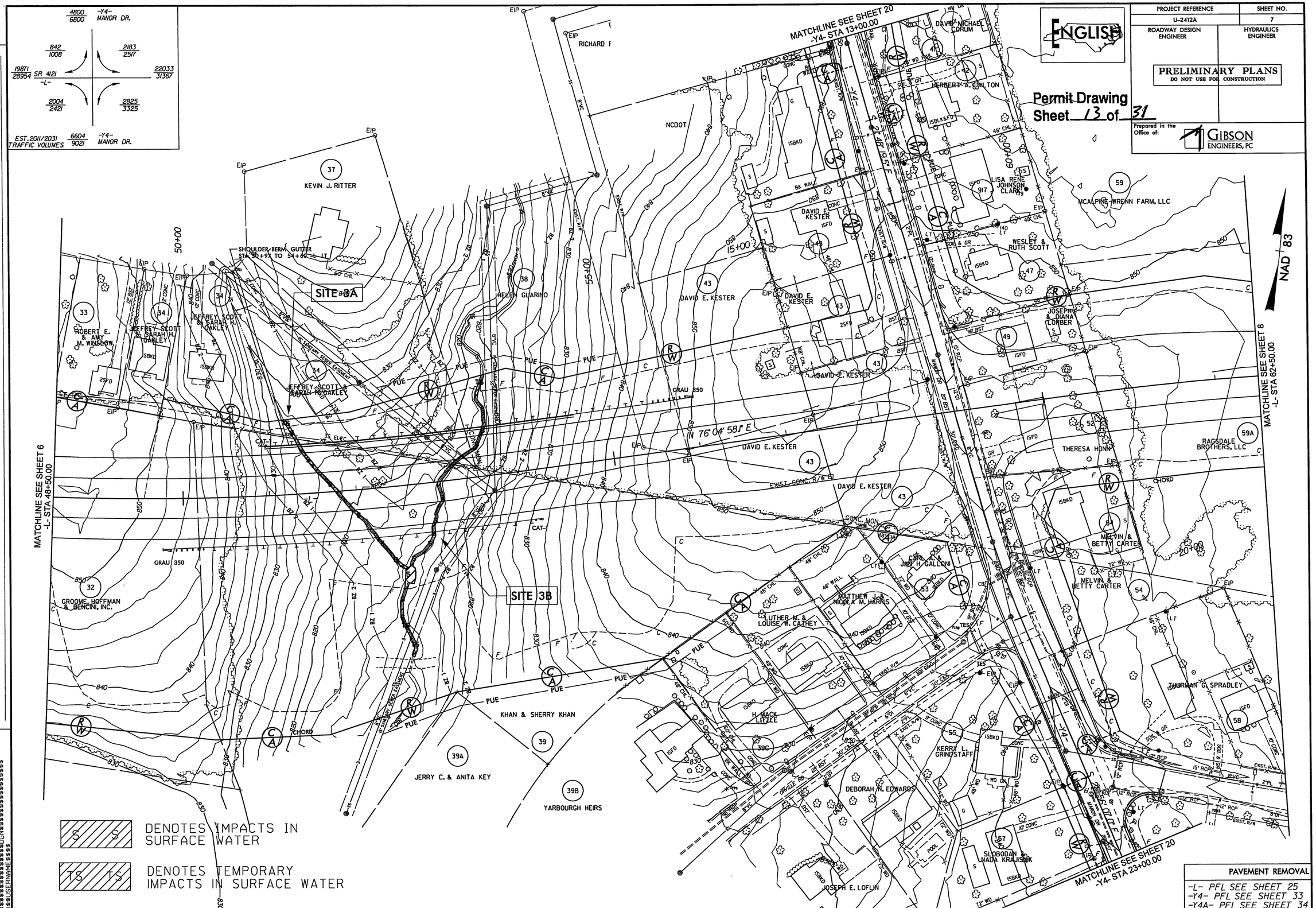
$$DATE$$
$$$$$$$$$TIME$$$$$$$$
$$$$$$$$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

Permit Drawing
Sheet 13 of 31



PAVEMENT REMOVAL
-L- PFL SEE SHEET 25
-Y4- PFL SEE SHEET 33
-Y4A- PFL SEE SHEET 34

REVISIONS

REVISED PARCEL 35 & 36 TO 34,44,46,49,50 & 51 TO 43,56 TO 54,45 TO 91; REVISED OWNER FOR PARCEL 39B,40,52,55 & 59; ADDED PARCEL 59A; REVISED 6-24-09

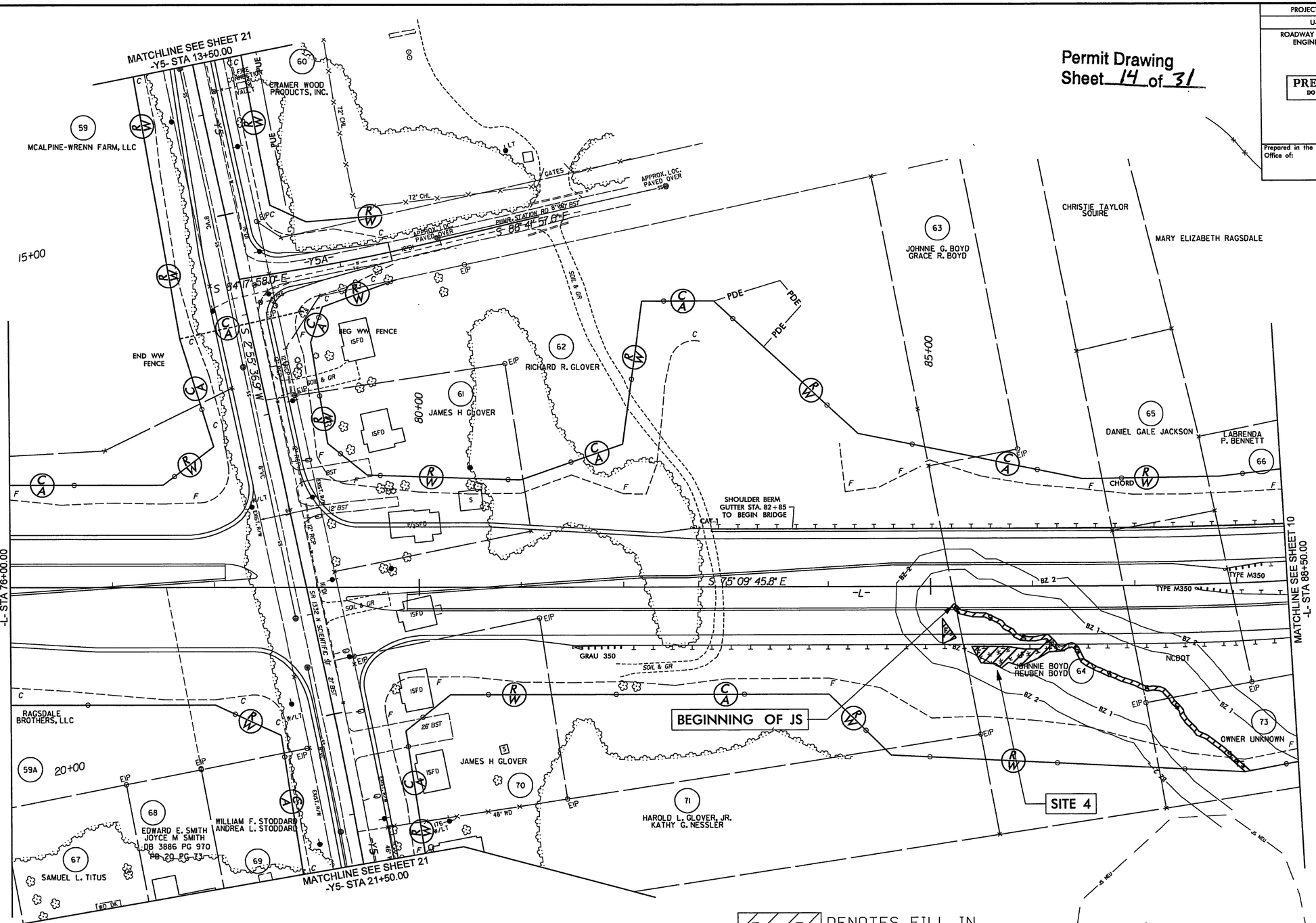
$$DATE$$
$$TIME$$
$$DGN$$
$$USERNAME$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

Permit Drawing
Sheet 14 of 31



F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ENGLISH

-L- PFL SEE SHEET 26
-Y5- PFL SEE SHEET 34
-Y5A- PFL SEE SHEET 35

REVISIONS

REVISED OWNER FOR PARCEL 59 & 72; ADDED PARCEL 59A - REVISED 6-24-09

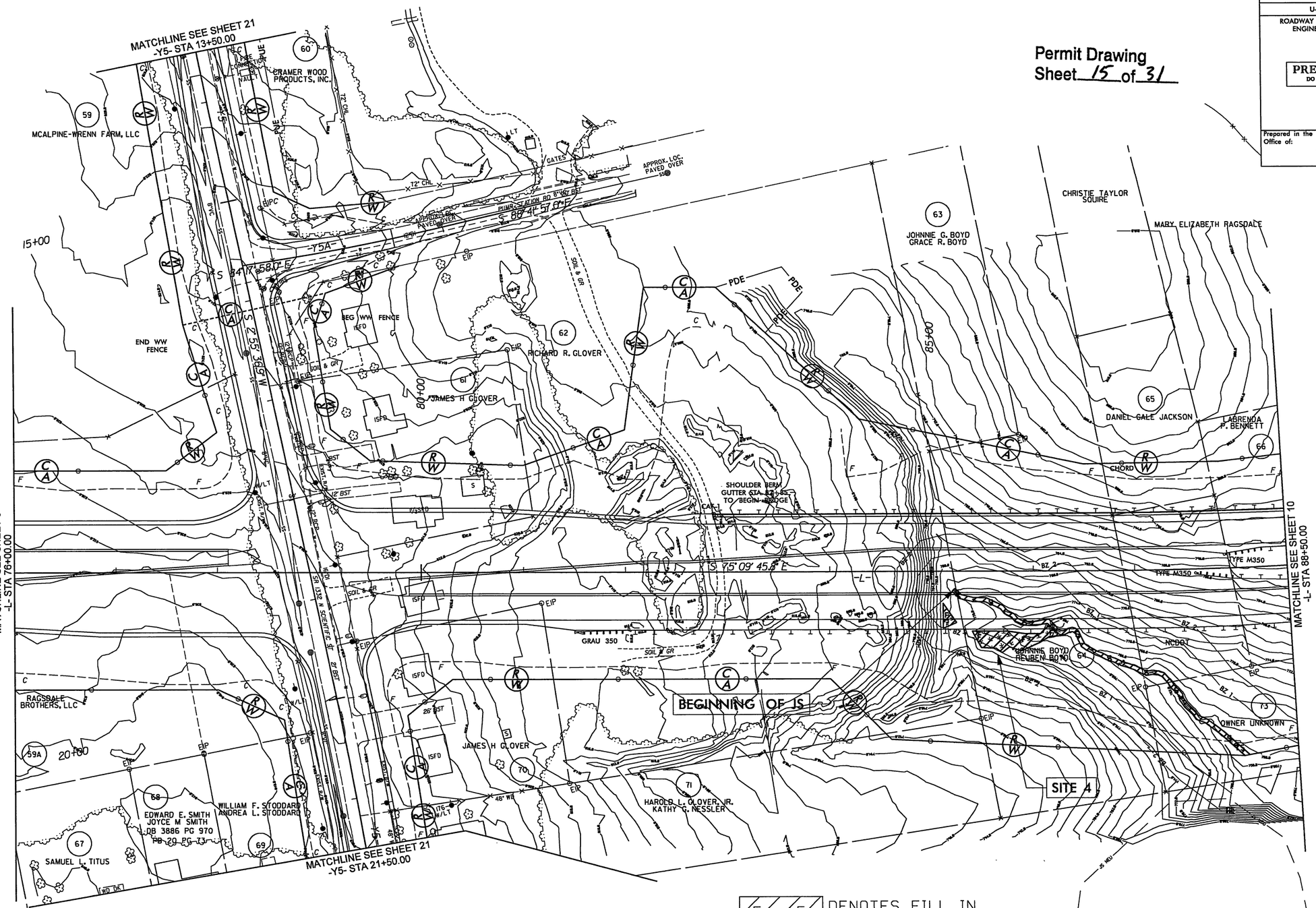
$$DATE$$
$$SYSTIME$$
$$DGN$$
$$USERNAME$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

Permit Drawing
Sheet 15 of 31



F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ENGLISH

-L- PFL SEE SHEET 26
-Y5- PFL SEE SHEET 34
-Y5A- PFL SEE SHEET 35

REVISIONS

REVISED OWNER FOR PARCEL 59 & 72; ADDED PARCEL 59A - REVISED 6-24-09

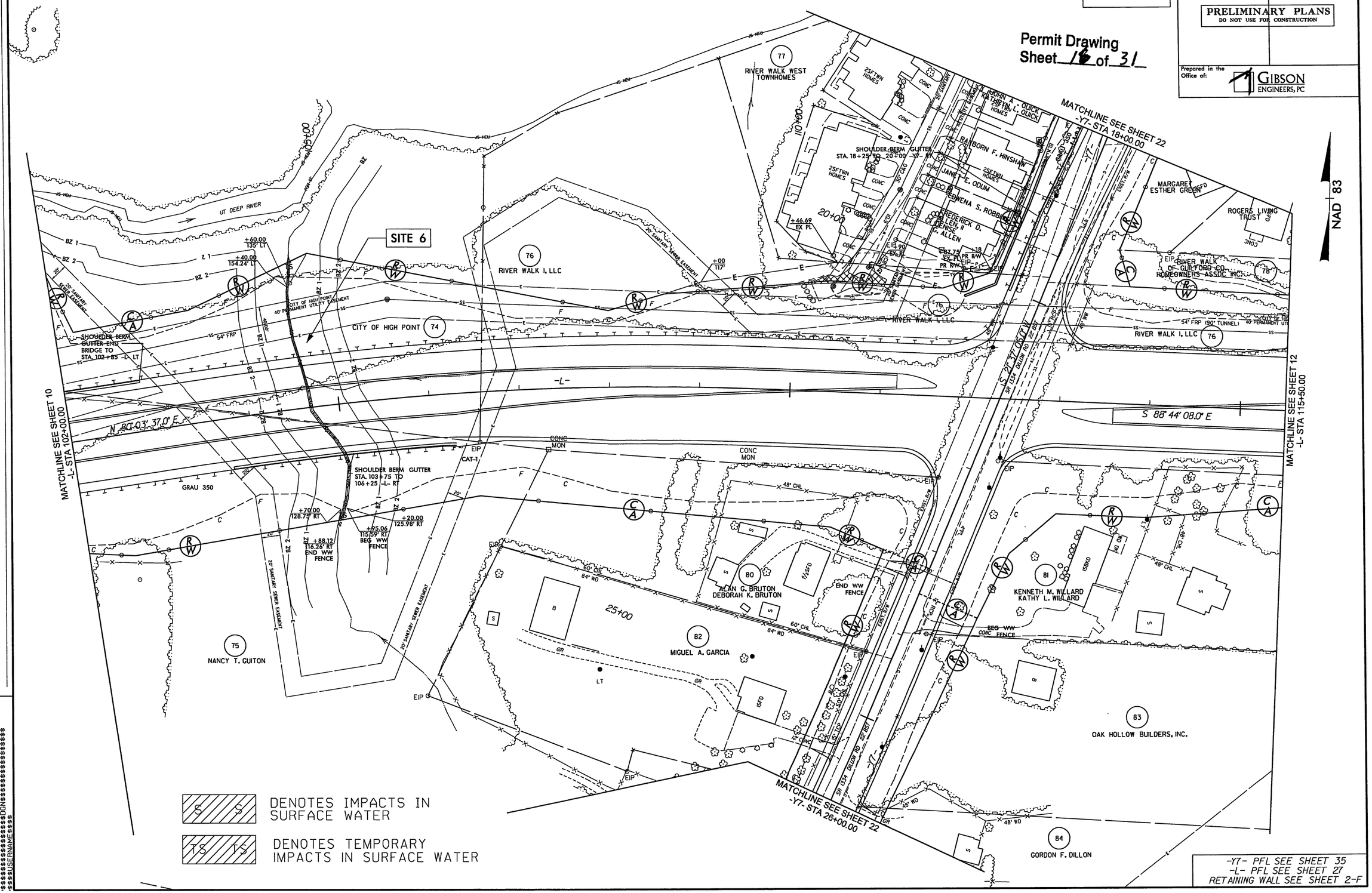
$$$$DATE$$$$
$$$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

Permit Drawing
Sheet 18 of 31



-Y7- PFL SEE SHEET 35
-L- PFL SEE SHEET 27
RETAINING WALL SEE SHEET 2-F

REVISIONS

REVISED PARCEL T7 & T8 TO T6 - REVISED 6-24-09
REVISED ROW ON PARCEL T6 - REVISED 12-22-09

$$DATE$$
$$$$$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

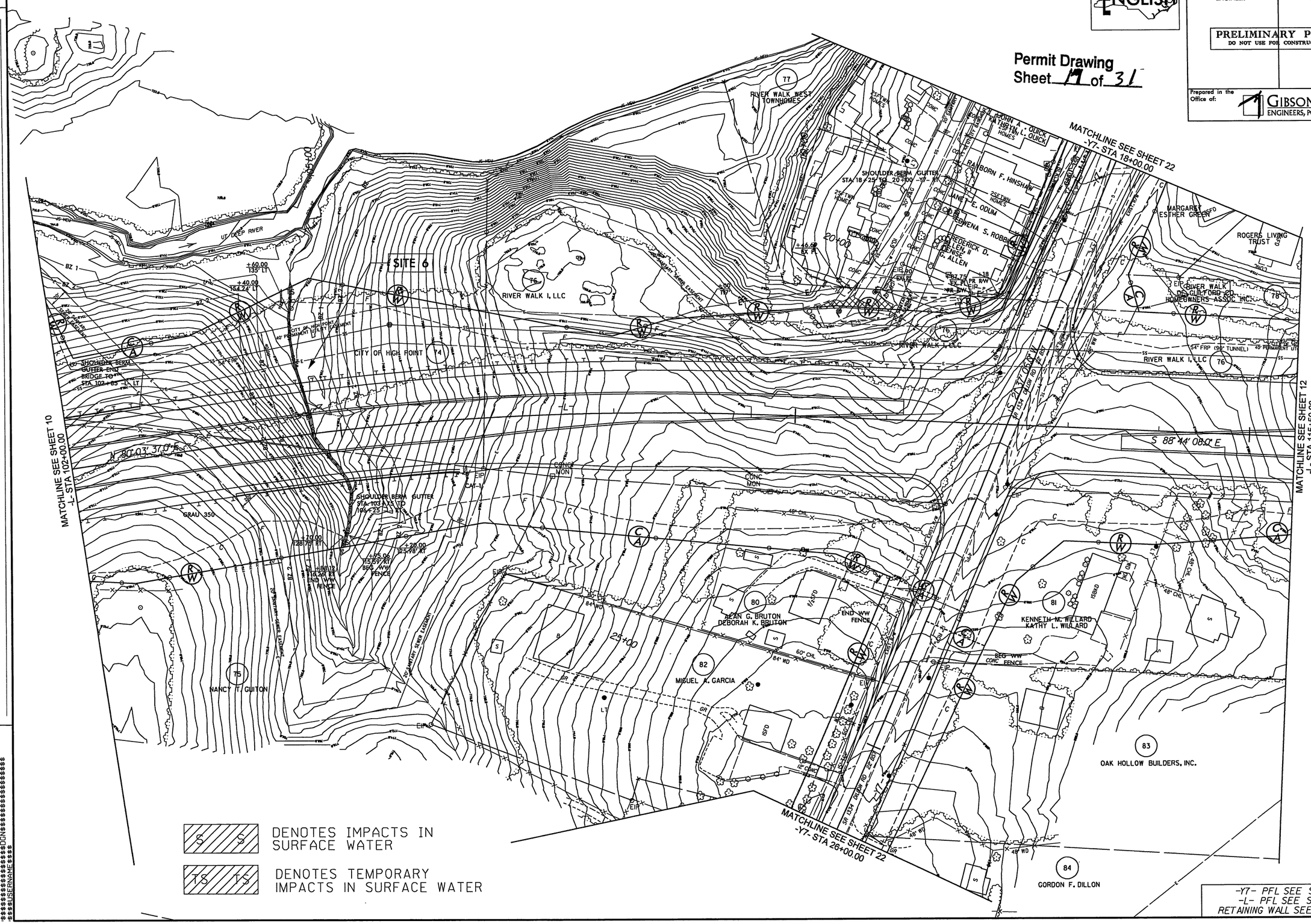
PROJECT REFERENCE	SHEET NO.
U-2412A	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

ENGLISH

Permit Drawing
Sheet 17 of 31



-Y7- PFL SEE SHEET 35
-L- PFL SEE SHEET 27
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

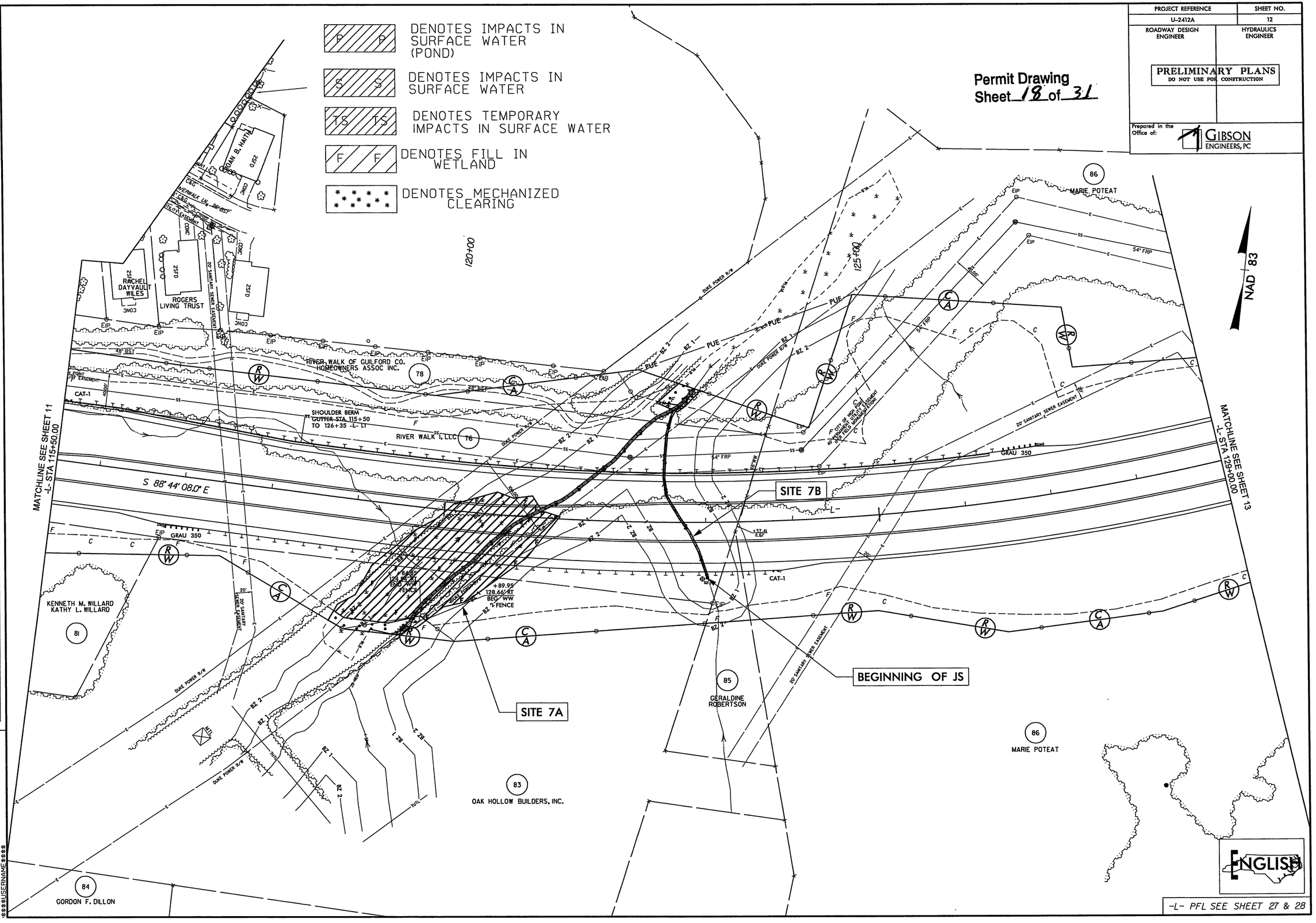
$$$$DATE$$$$SYSTIME$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$$$$$USERNAME$$$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

Permit Drawing
Sheet 18 of 31



REVISIONS

BEVISED PARCEL79 TO 76;REVISED OWNER OF PARCEL 85 AND 86 -- REVISED 6-24-09

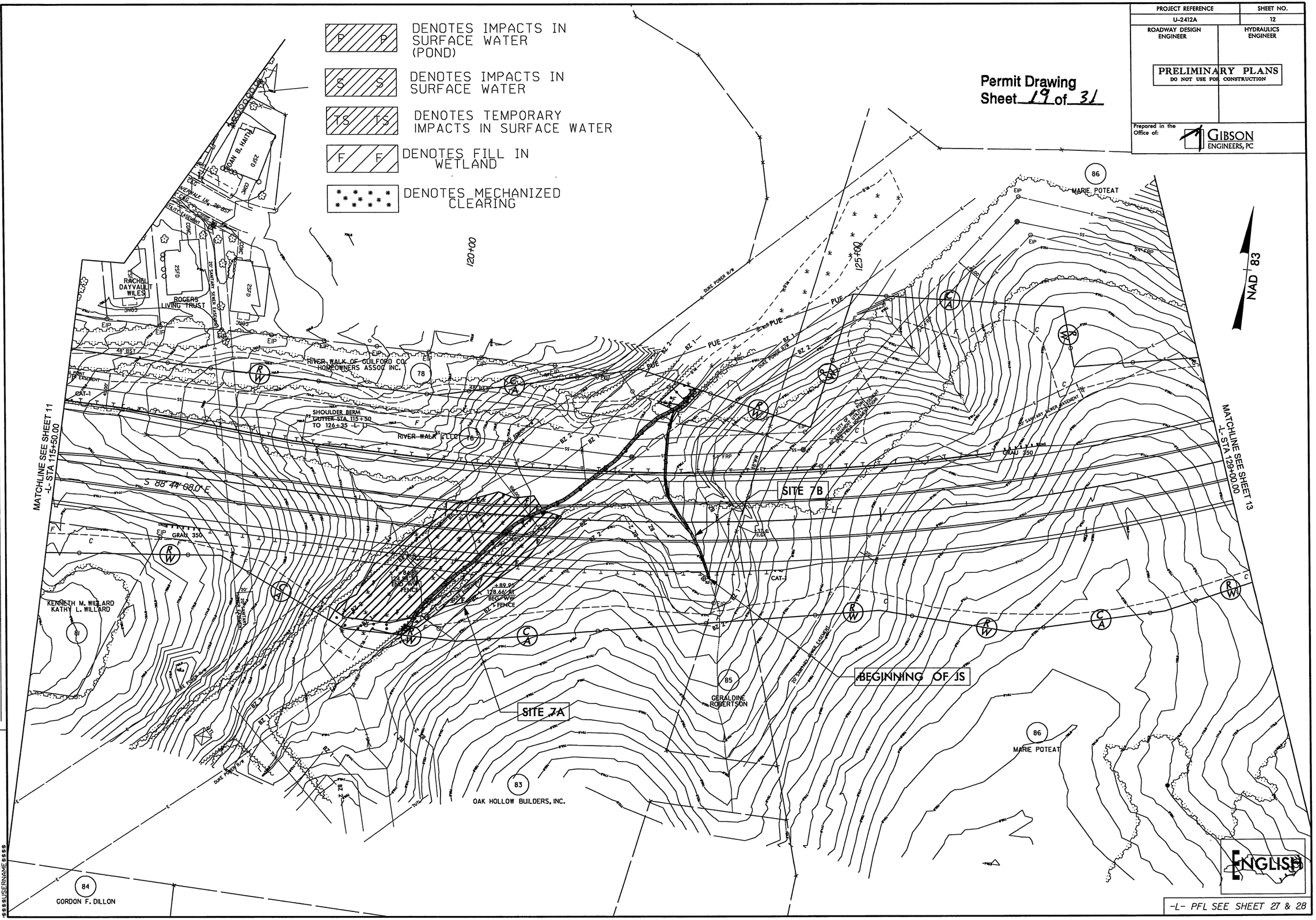
$$DATE$$
$$SYSTIME$$
$$DGN$$
$$USERNAME$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

Permit Drawing
Sheet 19 of 31



REVISIONS

REVISED PARCEL 79 TO 76; REVISED OWNER OF PARCEL 85 AND 86 - REVISED 6-24-09

$$DATE$$
$$SYSTIME$$
$$DGN$$
$$USERNAME$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

ENGLISH

NAD 83

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

HC HC DENOTES HAND CLEARING

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

Permit Drawing Sheet 20 of 31

TEMP. WORKPAD #1

SITE 8

TEMP. WORKPAD #2

NCDOT

POND W.E.= 721

AREA UNDER CONSTRUCTION

86 MARIE POTEAT

87 OAKDALE COTTON MILLS

130+00

135+00

140+00

MATCHLINE SEE SHEET 12 -L- STA 129+00.00

MATCHLINE SEE SHEET 14 -L- STA 142+50.00

N 67° 56' 33.6" E

-L-

GRAU 350

TYPE M350

TYPE B-77

SBG STA. 137+00 TO BEG BRIDGE -L- RT

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

20' SANITARY SEWER EASEMENT

54" FRP

CAT-I

PDE

BZ 1

BZ 2

BEG BRIDGE STA 138+21.44

END APPROACH SLAB STA 142+45.55

BEG APPROACH SLAB STA 137+97.44

END BRIDGE STA 142+21.51

+59.77 BEG WW FENCE

+79.30 END WW FENCE

+84.31 BEG WW FENCE

CLEAR ROADWAY F-F

DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP

BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 28

REVISIONS

REVISED OWNERS FOR PARCEL 86 AND 88 - REVISED 6-24-09

$$$$DATE$$ $$$$SYSTIME$$$$$ $$$$DGN$$$$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

ENGLISH

NAD 83

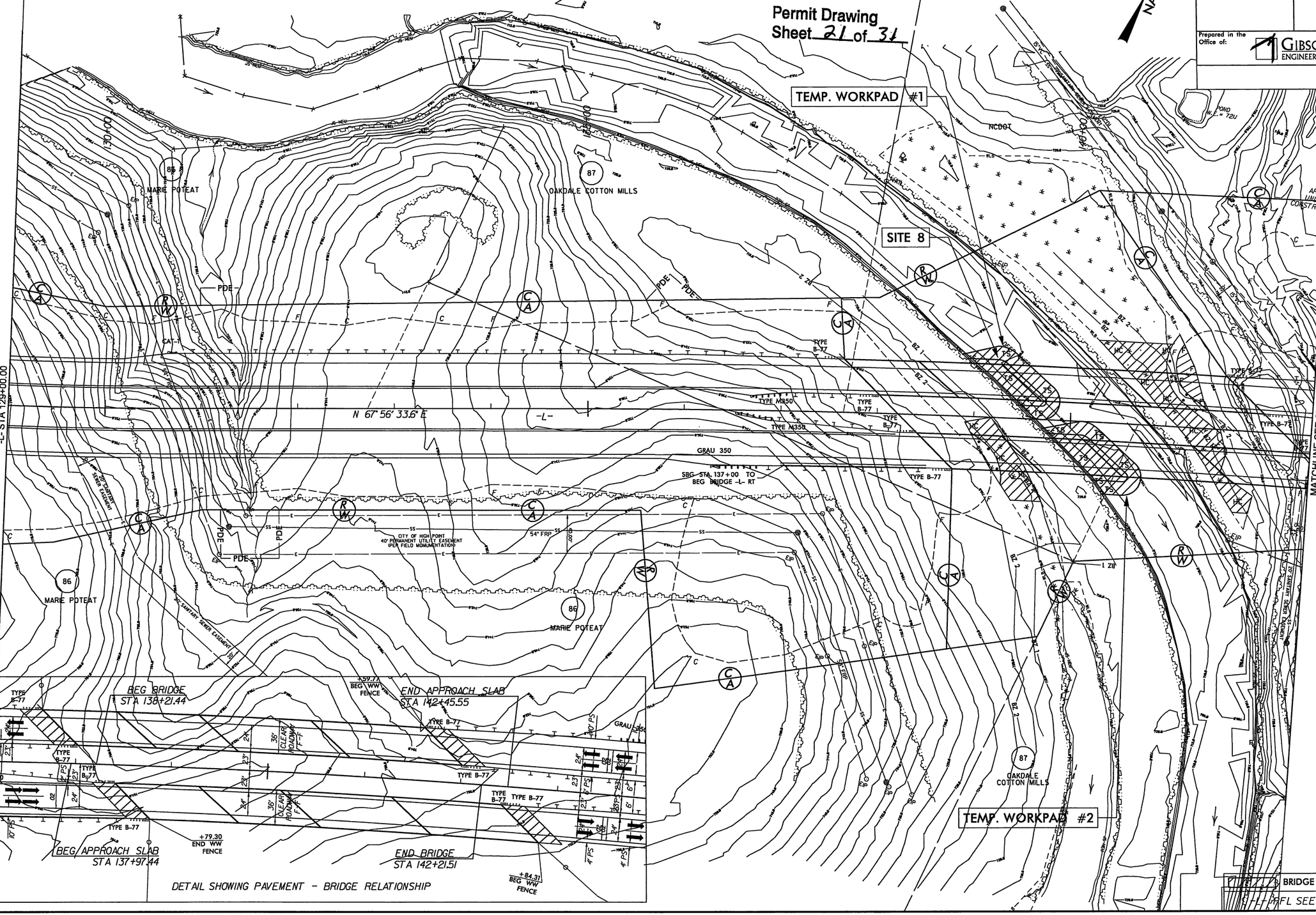
F/F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

HC/HC DENOTES HAND CLEARING

TS/TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

Permit Drawing
Sheet 21 of 31



REVISIONS

REVISED OWNERS FOR PARCEL 86 AND 88 - REVISED 6-24-09

$$DATE$$
$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

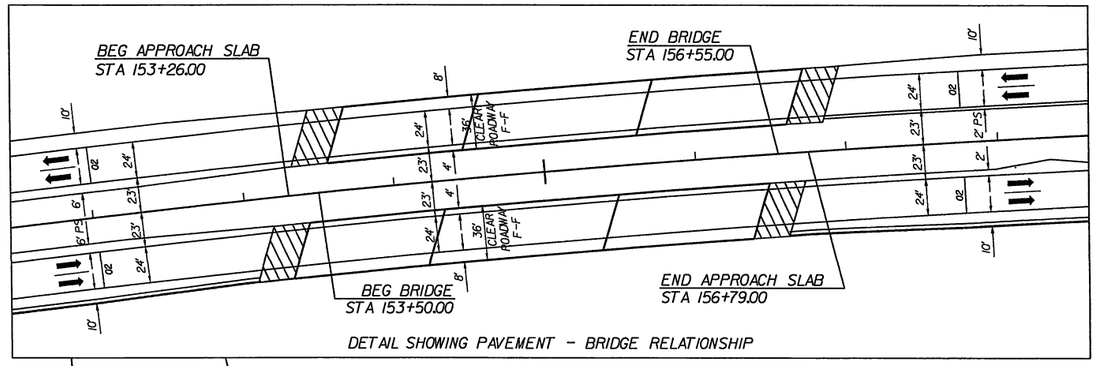
PROJECT REFERENCE	SHEET NO.
U-2412A	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

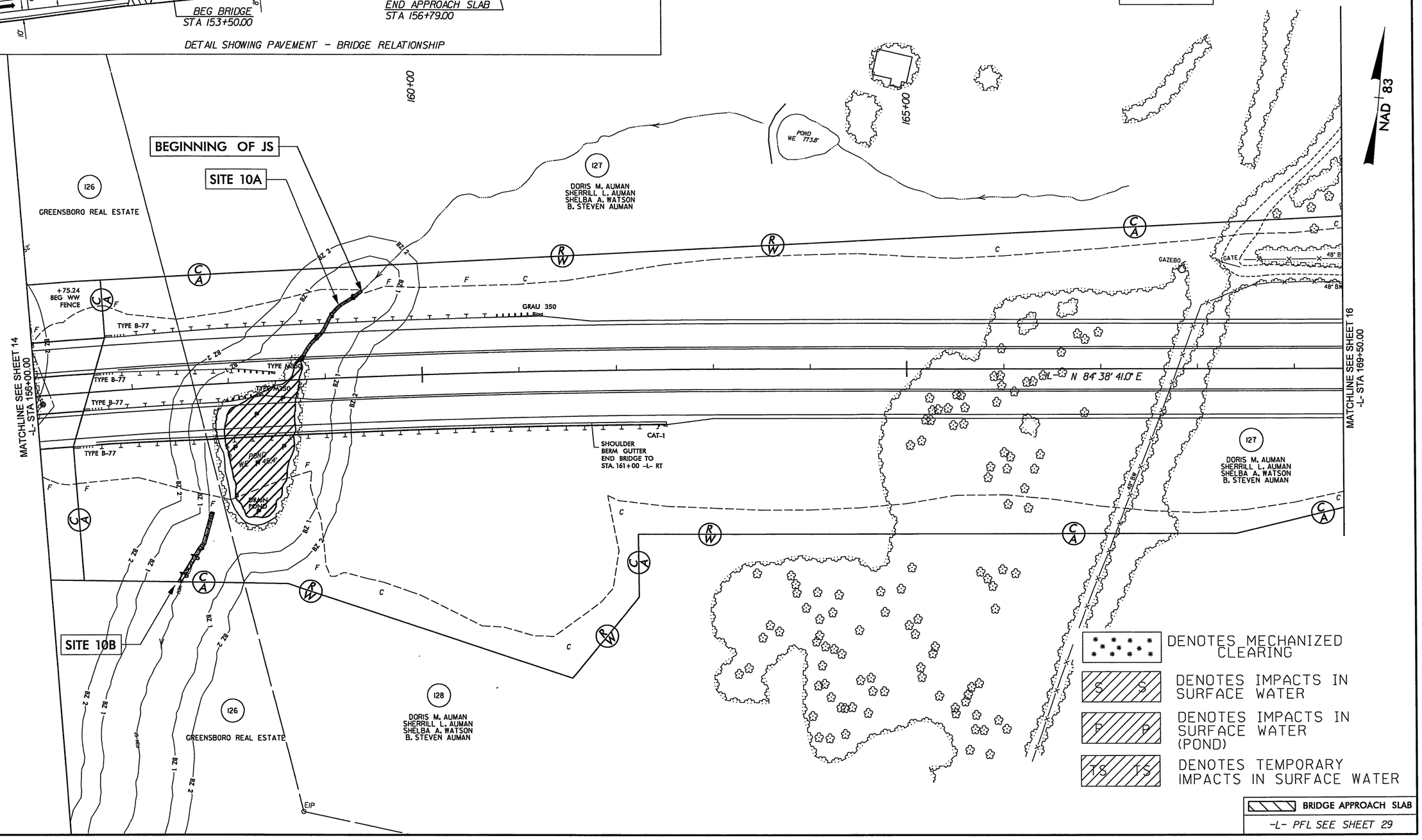
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

Permit Drawing
Sheet 22 of 31

ENGLISH





REVISIONS

REVISED OWNER FOR PARCEL 126 - REVISED 6-24-09

$$DATE$$
$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$USERNAME$$$$

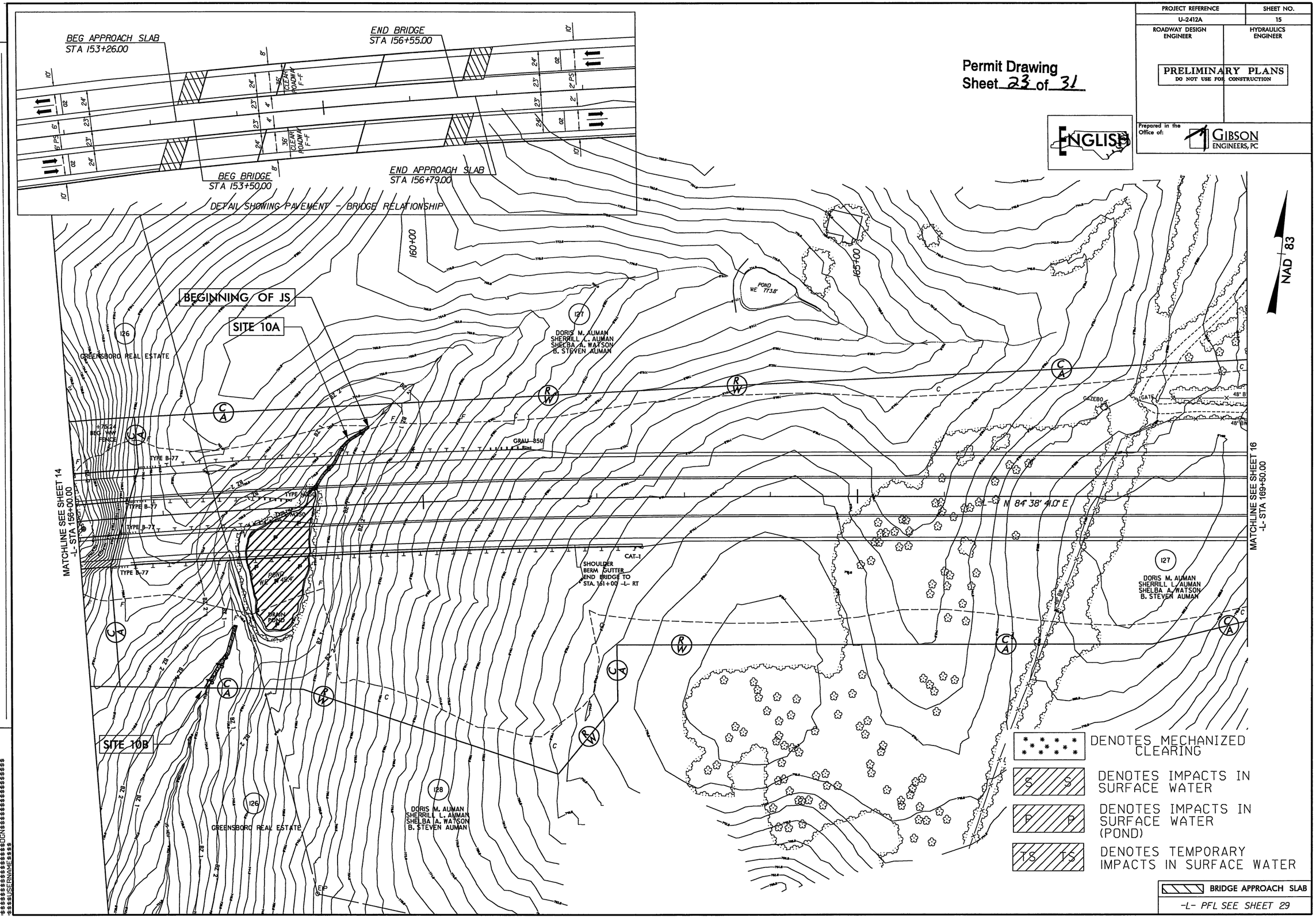
PROJECT REFERENCE	SHEET NO.
U-2412A	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

Permit Drawing
Sheet 23 of 31

ENGLISH



REVISIONS

REVISED OWNER FOR PARCEL 126 - REVISED 6-24-09

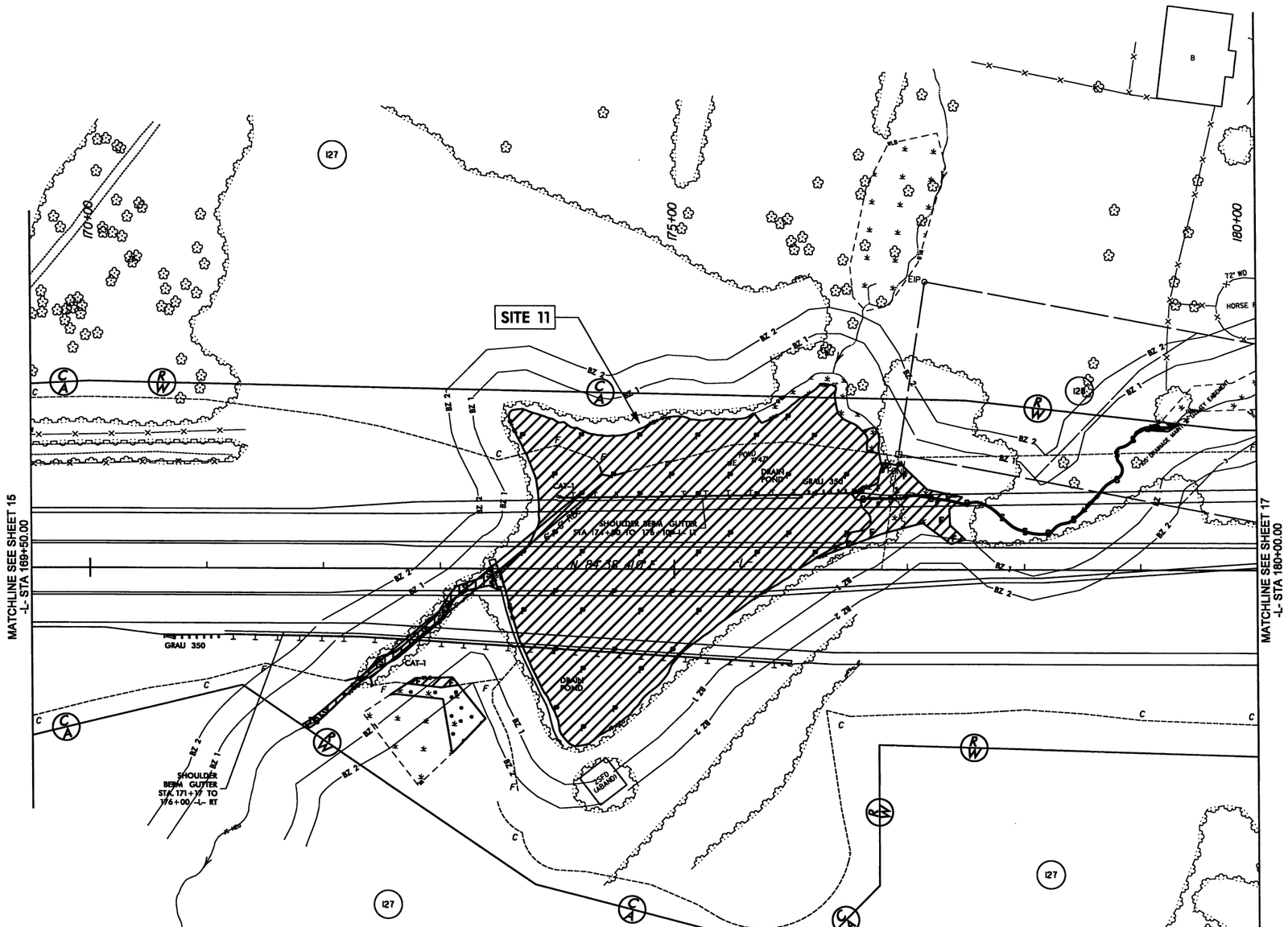
$$DATE$$
$$$$SYSTIME$$$$
$$$$SYSTIME$$$$
$$$$USERNAME$$$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

Permit Drawing
Sheet 24 of 31



-L- PFL SEE SHEET 29 & 30

$$DATE$$
$$$$SYSTIME$$$$
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

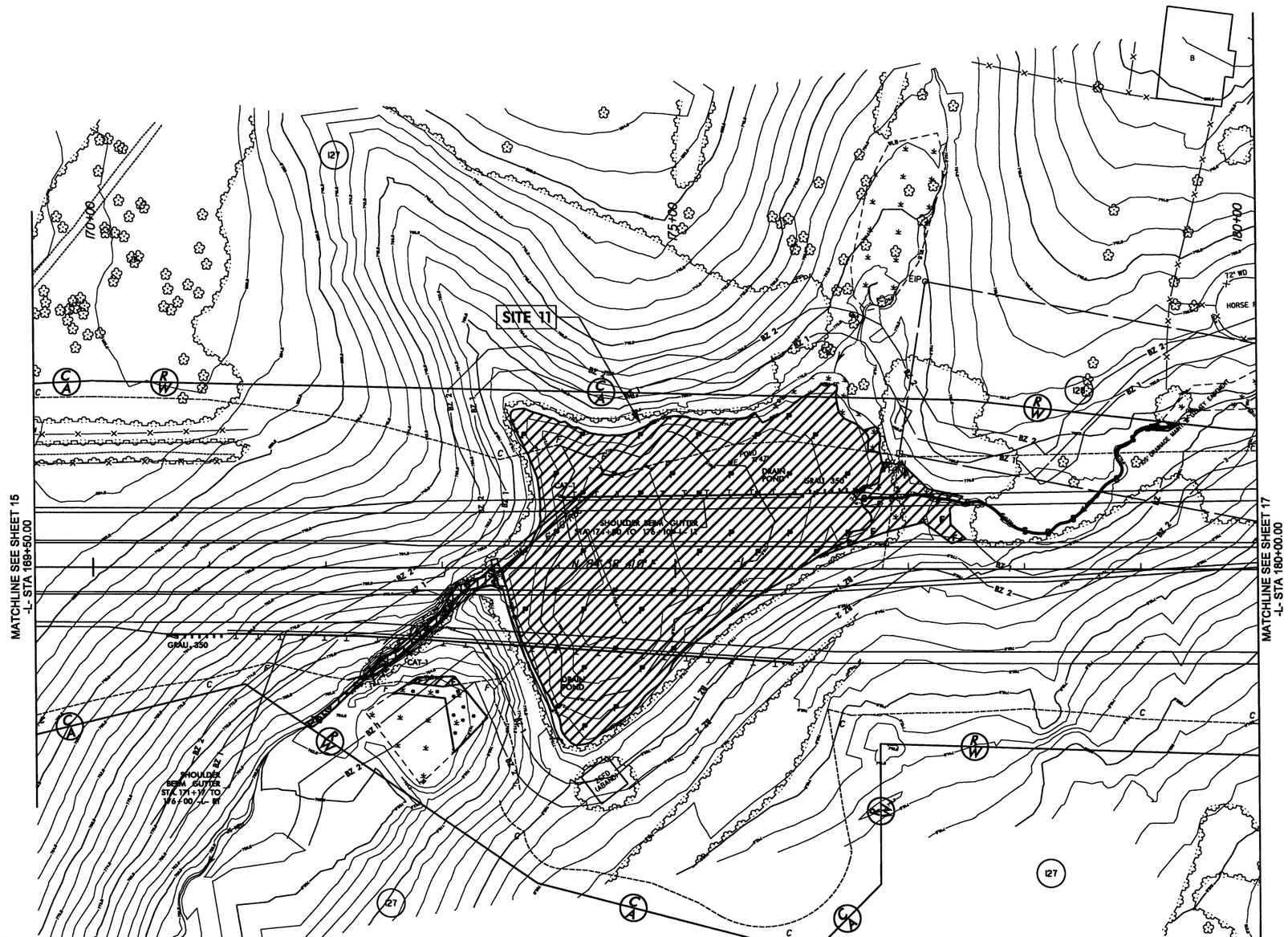
PROJECT REFERENCE	SHEET NO.
U-2412A	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

Permit Drawing
Sheet 25 of 31

NAD 83



DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

-L- PFL SEE SHEET 29 & 30

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

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

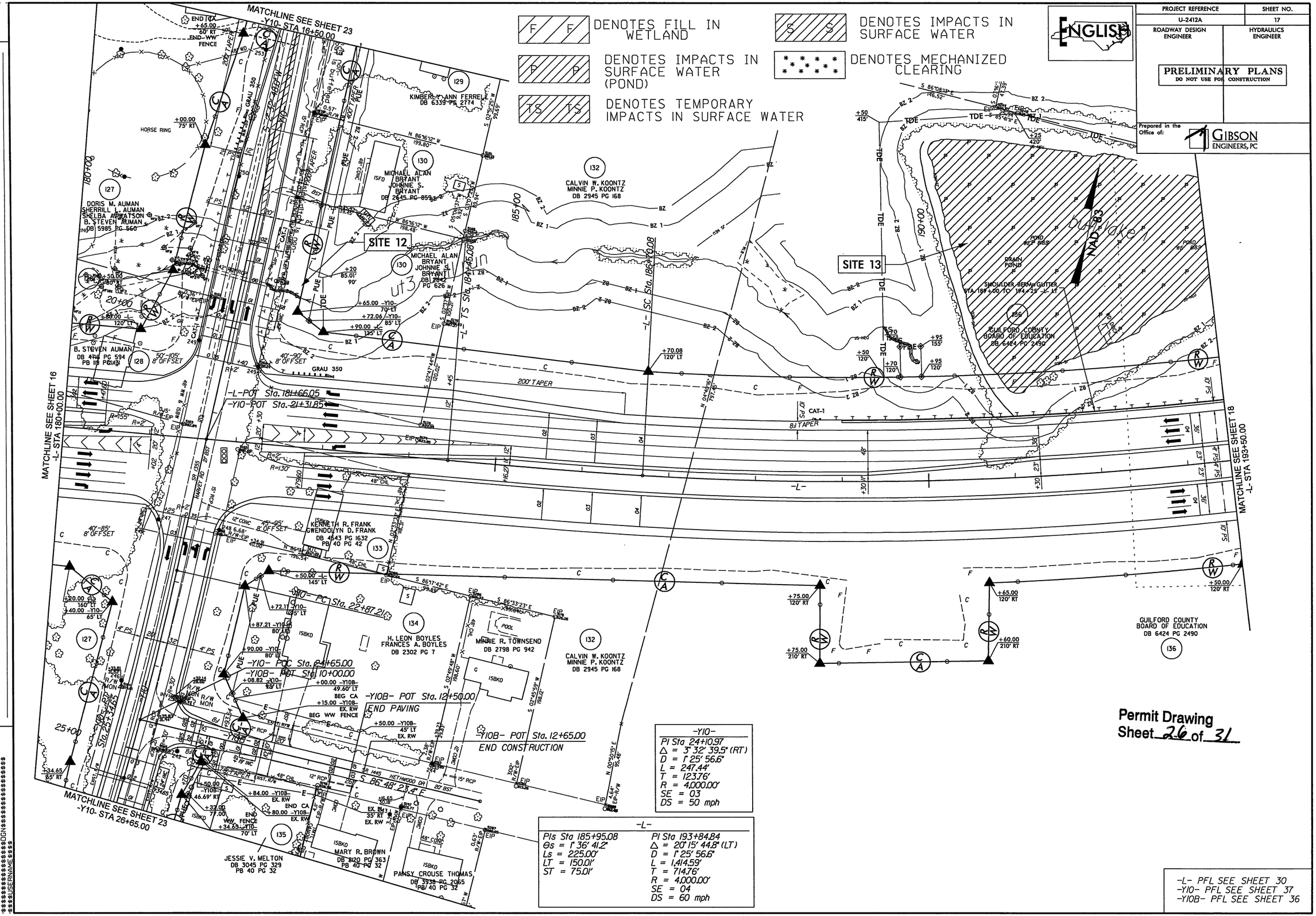
F F DENOTES FILL IN WETLAND

P P DENOTES IMPACTS IN SURFACE WATER (POND)

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING



-Y10-
PI Sta 24+10.97
Δ = 3° 32' 39.5" (RT)
D = 1° 25' 56.6"
L = 247.44'
T = 123.76'
R = 4,000.00'
SE = 03
DS = 50 mph

-L-	
PIs Sta 185+95.08	PI Sta 193+84.84
Θs = 1° 36' 41.2"	Δ = 20° 15' 44.8" (LT)
Ls = 225.00'	D = 1° 25' 56.6"
LT = 150.01'	L = 1,414.59'
ST = 75.01'	T = 714.76'
	R = 4,000.00'
	SE = 04
	DS = 60 mph

Permit Drawing
Sheet 26 of 31

-L- PFL SEE SHEET 30
-Y10- PFL SEE SHEET 37
-Y10B- PFL SEE SHEET 36

REVISIONS

REVISED OWNER FOR PARCEL 123 & 136 - REVISED 6-24-09

$$DATE$$
$$SYSTIME$$
$$DGN$$
$$USERNAME$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

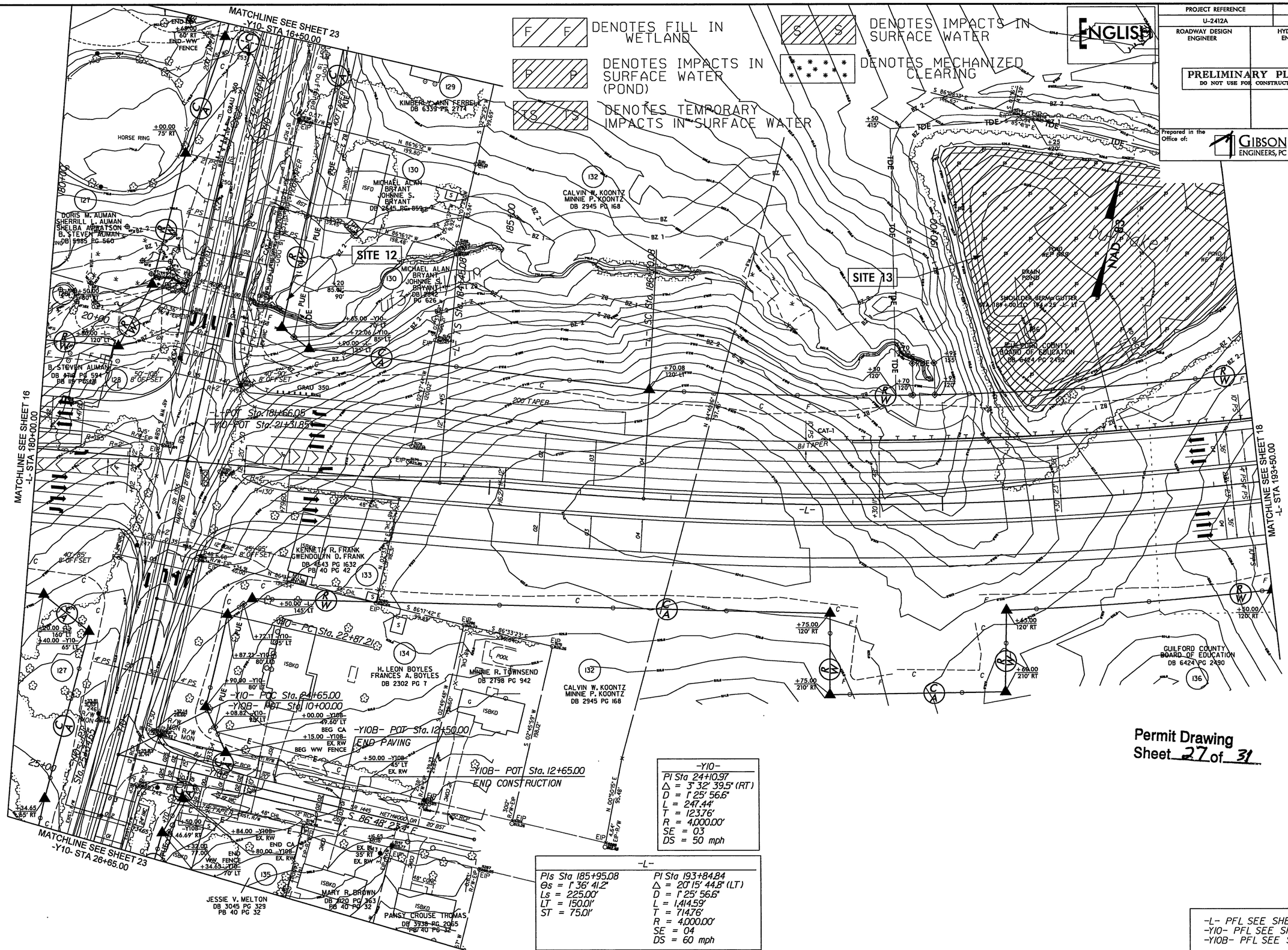
F F DENOTES FILL IN WETLAND

P P DENOTES IMPACTS IN SURFACE WATER (POND)

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING



-Y10-
PI Sta 24+10.97
Δ = 3° 32' 39.5" (RT)
D = 1° 25' 56.6"
L = 247.44'
T = 123.76'
R = 4,000.00'
SE = 03
DS = 50 mph

-L-	
PIs Sta 185+95.08	PI Sta 193+84.84
Θs = 1° 36' 41.2"	Δ = 20° 15' 44.8" (LT)
Ls = 225.00'	D = 1° 25' 56.6"
LT = 150.01'	L = 1,414.59'
ST = 75.01'	T = 714.76'
	R = 4,000.00'
	SE = 04
	DS = 60 mph

Permit Drawing
Sheet 27 of 31

-L- PFL SEE SHEET 30
-Y10- PFL SEE SHEET 37
-Y10B- PFL SEE SHEET 36

REVISIONS

REVISED OWNER FOR PARCEL 129 & 136 -- REVISED 6-24-09

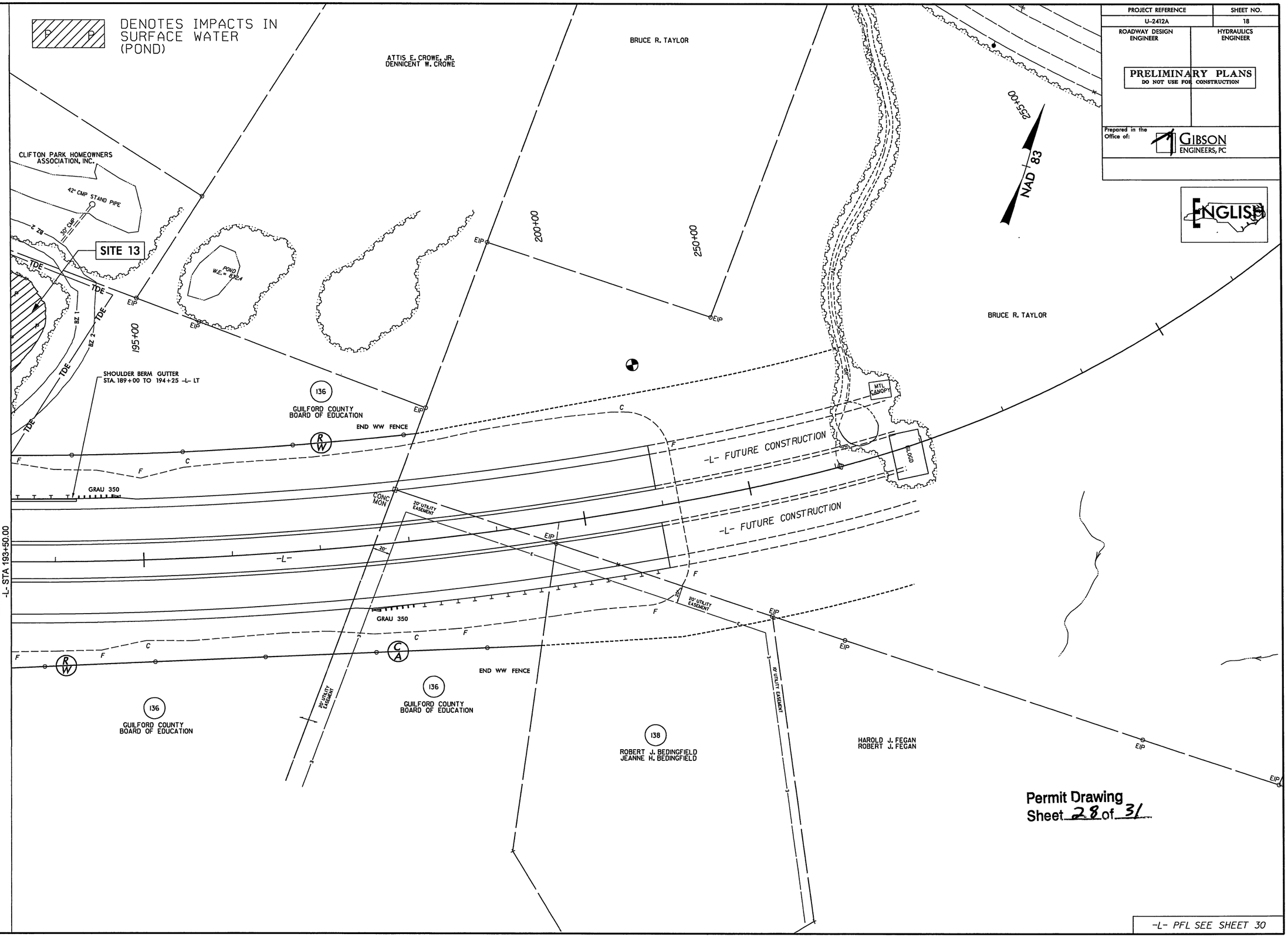
$$DATE$$
$$SYSTIME$$
$$DGN$$
$$USERNAME$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

ENGLISH



Permit Drawing
Sheet 28 of 31

REVISIONS

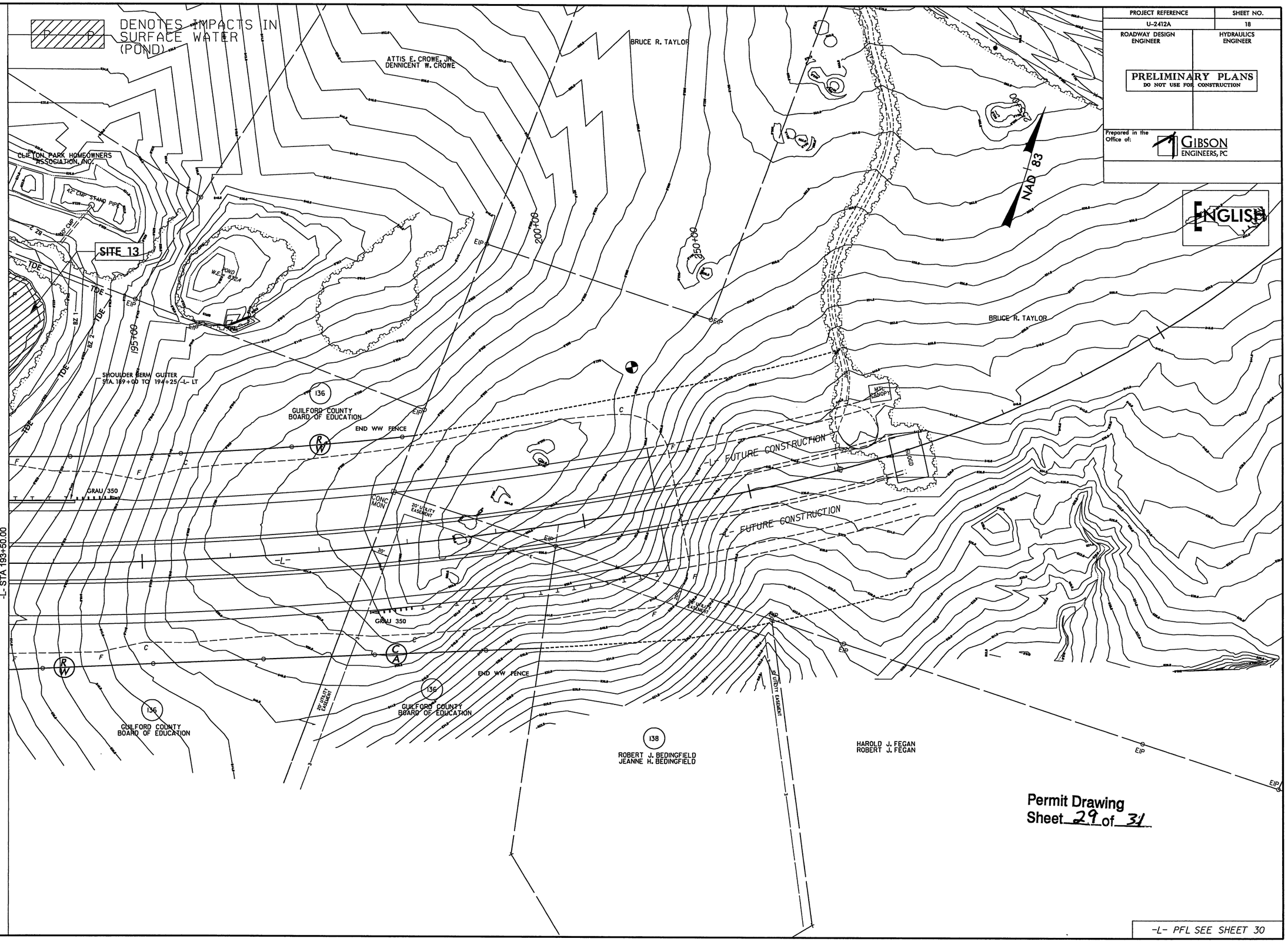
REVISED OWNER FOR PARCEL 136 & 137 - REVISED 6-24-09

$$DATE$$
$$SYSTIME$$
$$DGNS$$
$$USERNAME$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

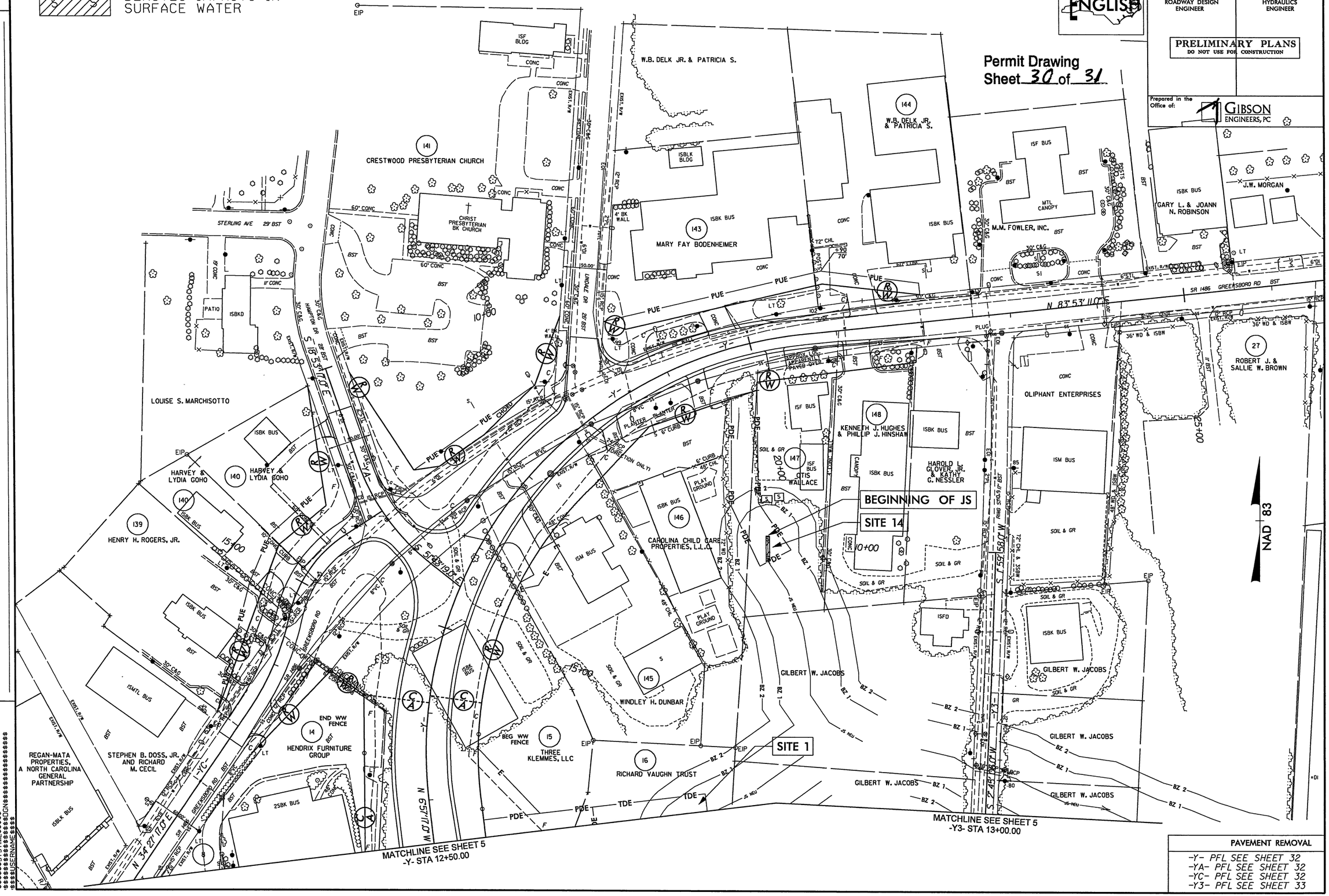


Permit Drawing
Sheet 29 of 31

REVISIONS

REVISED OWNER FOR PARCEL 136 & 137 - REVISED 6-24-09

$$DATE$$
$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$



DENOTES IMPACTS IN SURFACE WATER
ENGLISH
PROJECT REFERENCE
U-2412A
SHEET NO.
19
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Prepared in the Office of:
GIBSON ENGINEERS, PC
Permit Drawing
Sheet 30 of 31
REVISIONS
REVISED OWNER FOR PARCEL 14,15 & 16; REVISED PARCEL 142 TO 140 - REVISED 6-24-09
CRESTWOOD PRESBYTERIAN CHURCH
CHRIST PRESBYTERIAN BK CHURCH
W.B. DELK JR. & PATRICIA S.
MARY FAY BODENHEIMER
M.M. FOWLER, INC.
GARY L. & JOANN N. ROBINSON
J.W. MORGAN
ROBERT J. & SALLIE W. BROWN
OLIPHANT ENTERPRISES
KENNETH J. HUGHES & PHILLIP J. HINSHAW
HAROLD L. GLOVER, JR. & KATHY G. NESSLER
OTIS WALLACE
CAROLINA CHILD CARE PROPERTIES, L.L.C.
WINDLEY H. DUNBAR
THREE KLEMMES, LLC
RICHARD VAUGHN TRUST
HENDRIX FURNITURE GROUP
STEPHEN B. DOSS, JR. AND RICHARD M. CECIL
REGAN-MATA PROPERTIES, A NORTH CAROLINA GENERAL PARTNERSHIP
LOUISE S. MARCHISOTTO
HARVEY & LYDIA GOHO
HENRY H. ROGERS, JR.
GILBERT W. JACOBS
BEGINNING OF JS
SITE 14
SITE 1
NAD 83
MATCHLINE SEE SHEET 5 -Y- STA 12+50.00
MATCHLINE SEE SHEET 5 -Y3- STA 13+00.00
PAVEMENT REMOVAL
-Y- PFL SEE SHEET 32
-YA- PFL SEE SHEET 32
-YC- PFL SEE SHEET 32
-Y3- PFL SEE SHEET 33

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

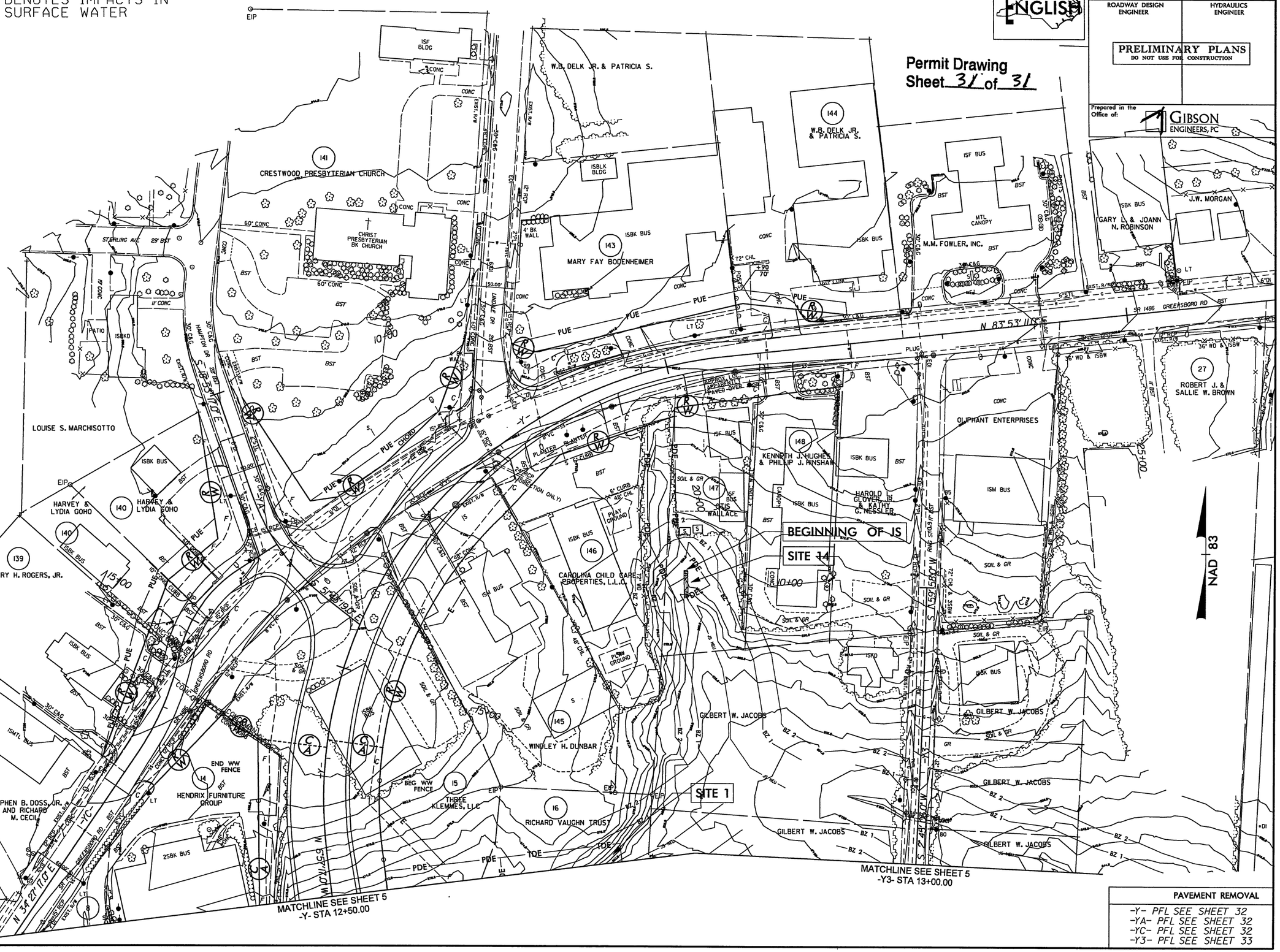
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

ENGLISH

Permit Drawing
Sheet 31 of 31

S S DENOTES IMPACTS IN SURFACE WATER

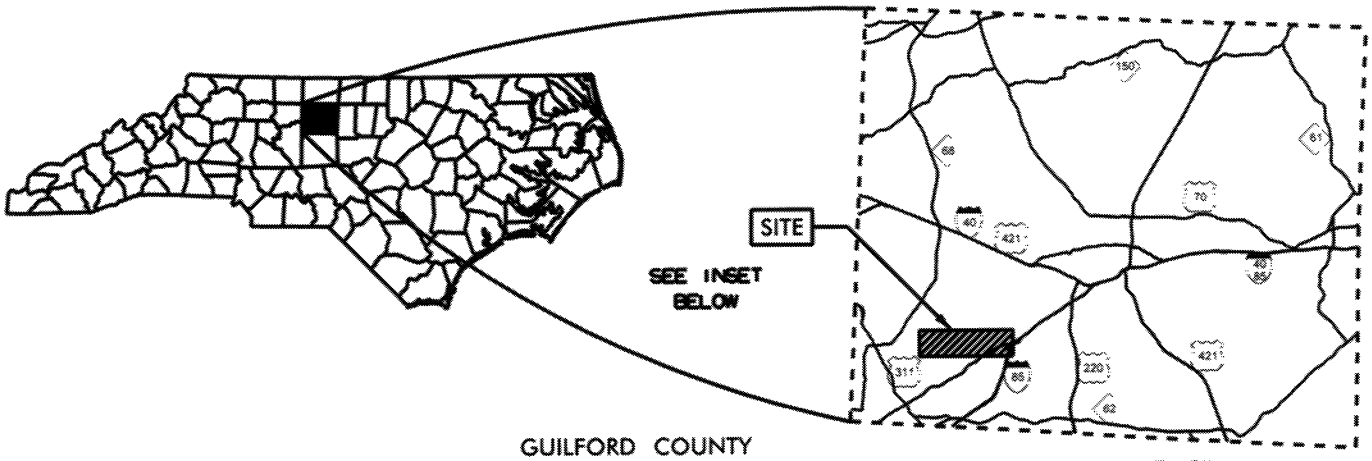


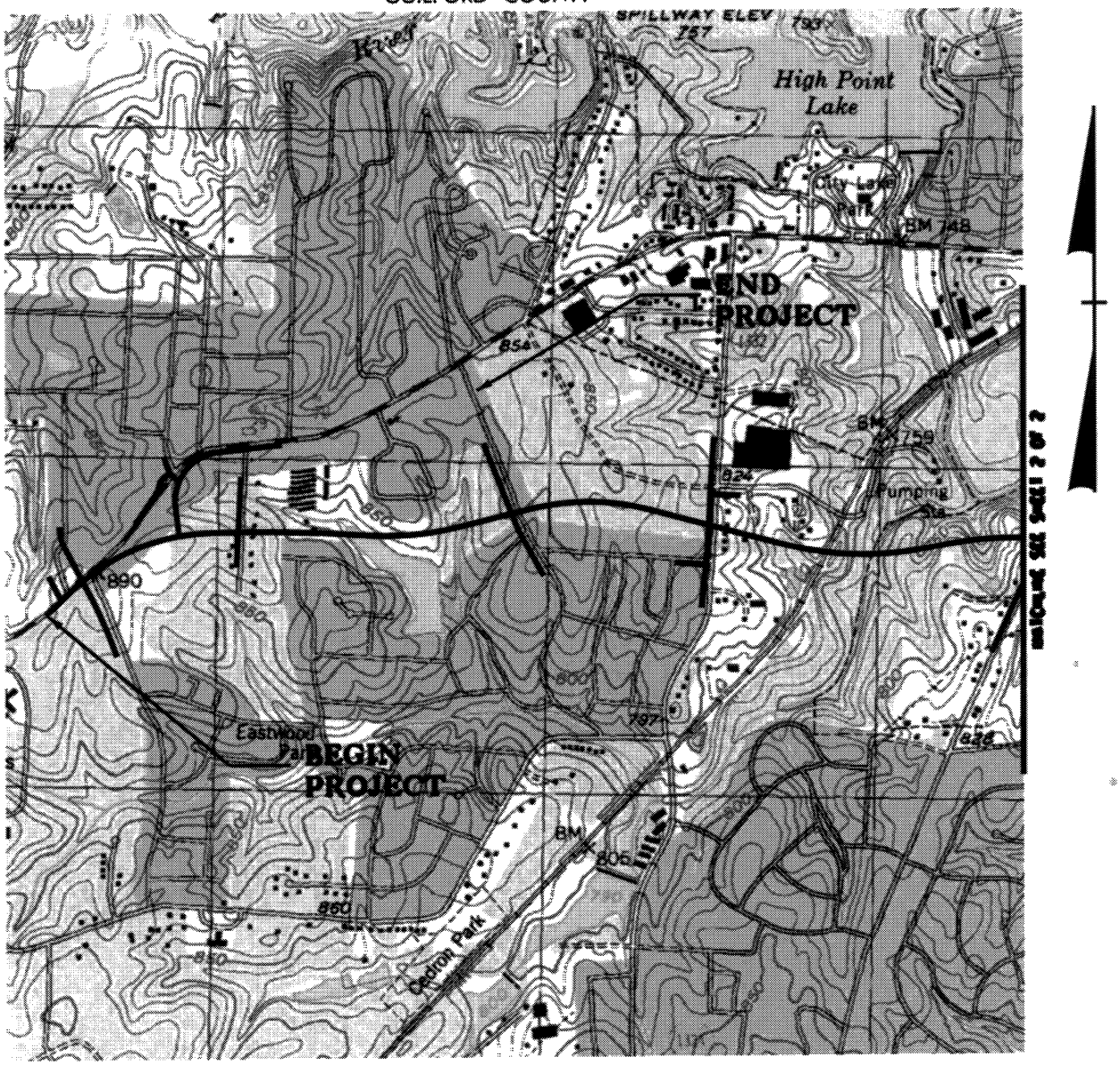
PAVEMENT REMOVAL
-Y- PFL SEE SHEET 32
-YA- PFL SEE SHEET 32
-YC- PFL SEE SHEET 32
-Y3- PFL SEE SHEET 33

REVISIONS

REVISED OWNER FOR PARCEL 14,15,& 16. REVISED PARCEL 142 TO 140 - REVISED 6-24-09

$$DATE$$
$$SYSTIME$$
$$DGN$$
$$USERNAME$$





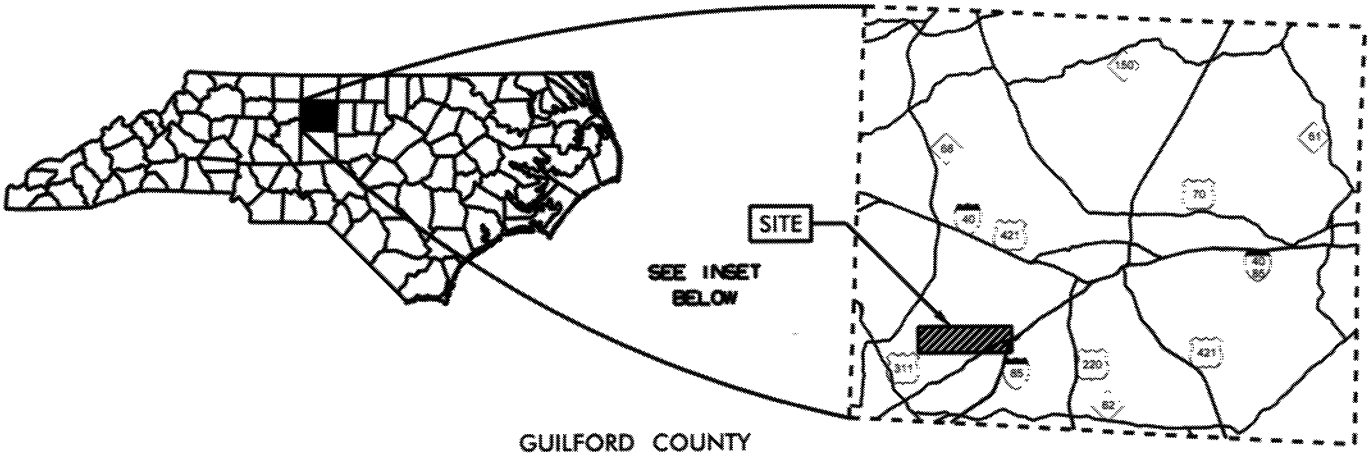
Buffer Drawing
Sheet 1 of 20

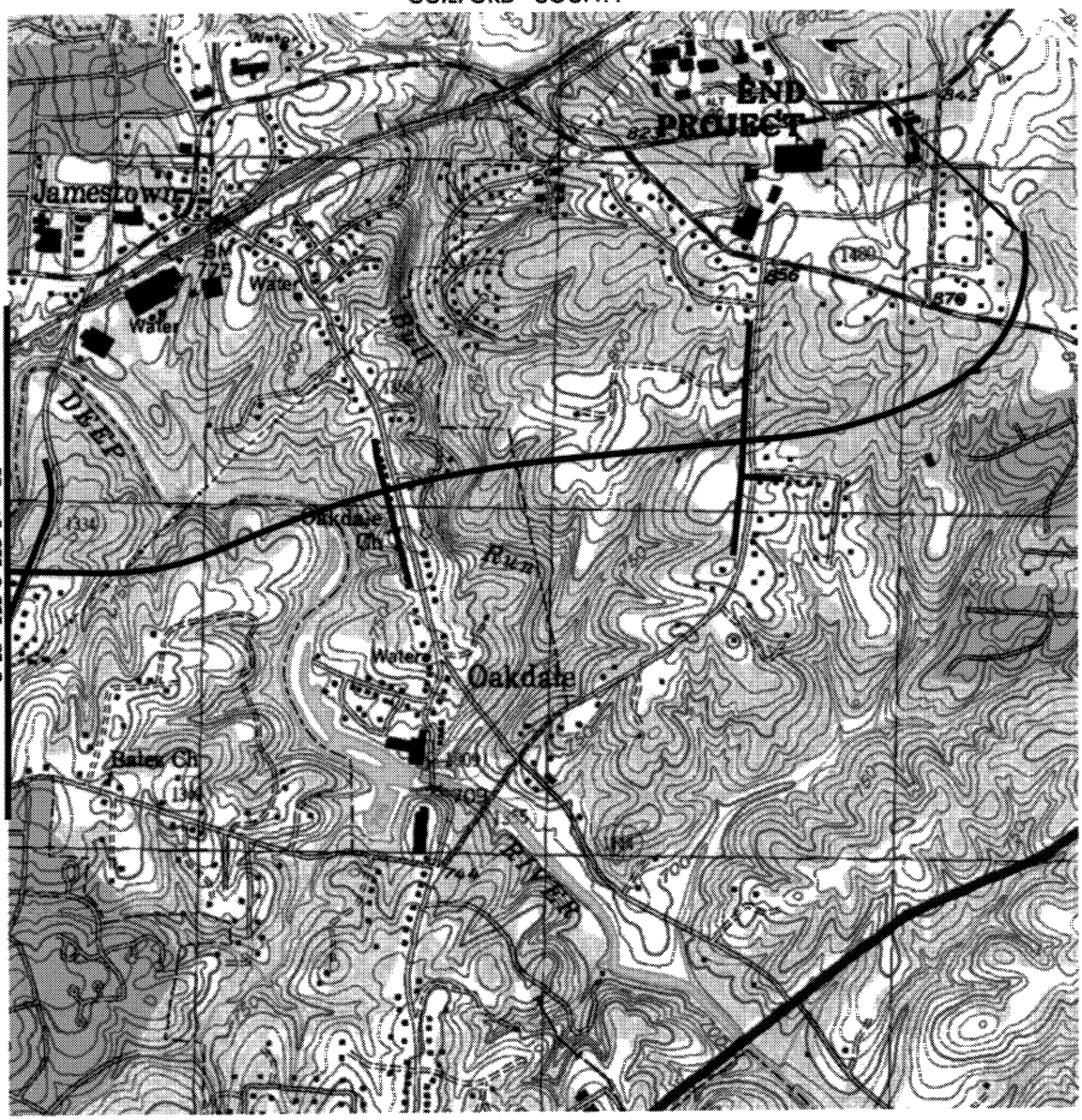
BUFFER
IMPACTS

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412A)
GREENSBORO/HIGH POINT ROAD
FROM PROPOSED US 311 BYPASS
TO WEST OF SR 1480 (VICKREY
CHAPEL ROAD)

SHEET 1 OF 2 1-25-11





Buffer Drawing
Sheet 2 of 20

BUFFER
IMPACTS

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT: 34802.1.1 (U-2412A)
GREENSBORO/HIGH POINT ROAD
FROM PROPOSED US 311 BYPASS
TO WEST OF SR 1480 (VICKREY
CHAPEL ROAD)

SHEET 2 OF 2 1-25-11

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		12+00 -Y- RT			X				5622	3253	8875		
2		37+10/45+14 -L-	X						49439	26456	75895		
3		51+19/53+62 -L-	X						42000	22048	64048		
4		85+11/88+05 -L-	X						24840	16144	40984		
5		89+51/96+16 -L-		X		13912	10267	24179	30	1376	1406		
6		104+57/105+06 -L-	X						20445	11763	32208		
7		118+83/122+95 -L-	X						42395	23822	66217		
8		138+21/142+21 -L-		X		16108	10647	26755					
9		153+50/156+55 -L-		X		22580	14695	37275		704	704		
10		157+33/159+42 -L-	X						29383	16667	46050		
11		171+80/179+34 -L-	X						61508	29610	91118		
12		15+74/19+58 -Y10-	X						19695	5647	25342		
13		189+48/193+86 -L-			X				43041	192821	235862		
14		19+00 -Y- RT			X				1975	680	2655		
TOTAL:						52600	35609	88209	340373	350991	691364		

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILFORD COUNTY
PROJECT: 34802.1.1 (U-2412A)

1/19/2012
SHEET 3 OF 20

Rev. May 2006

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	12+00 -Y- RT		0	0
2	37+10/45+14 -L-		8770	2301
3	51+19/53+62 -L-		0	0
4	85+11/88+05 -L-		1254	35
5	89+51/96+16 -L-		0	0
6	104+57/105+06 -L-		0	0
7	118+83/122+95 -L-		13883	4811
8	138+21/142+21 -L-		2980	4392
9	153+50/156+55 -L-		0	0
10	157+33/159+42 -L-		0	0
11	171+80/179+34 -L-		4190	519
12	15+74/19+58 -Y10-		696	0
13	189+48/193+86 -L-		0	0
14	19+00 -Y- RT		0	0
TOTAL:			31773	12058

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILFORD COUNTY
PROJECT: 34802.1.1 (U-2412A)

1/19/2012
SHEET 4 OF 20

Rev. Jan 2009

TIP PROJECT: U-2412A

CONTRACT:

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(1)	PE
34802.2.2	STP-4121(3)	R/W & UTL.

ENGLISH

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

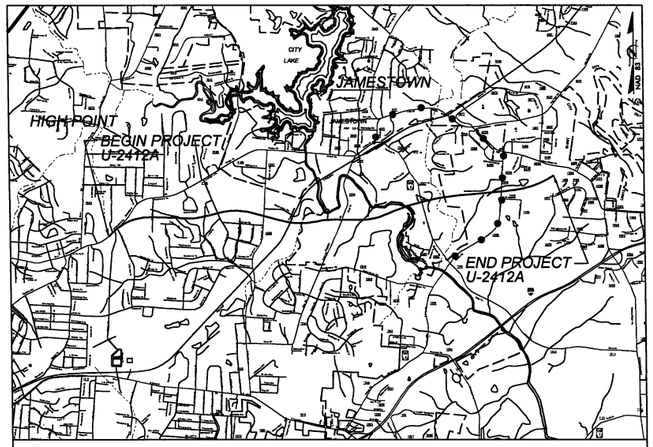
GUILFORD COUNTY

Buffer Drawing Sheet 5 of 20

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

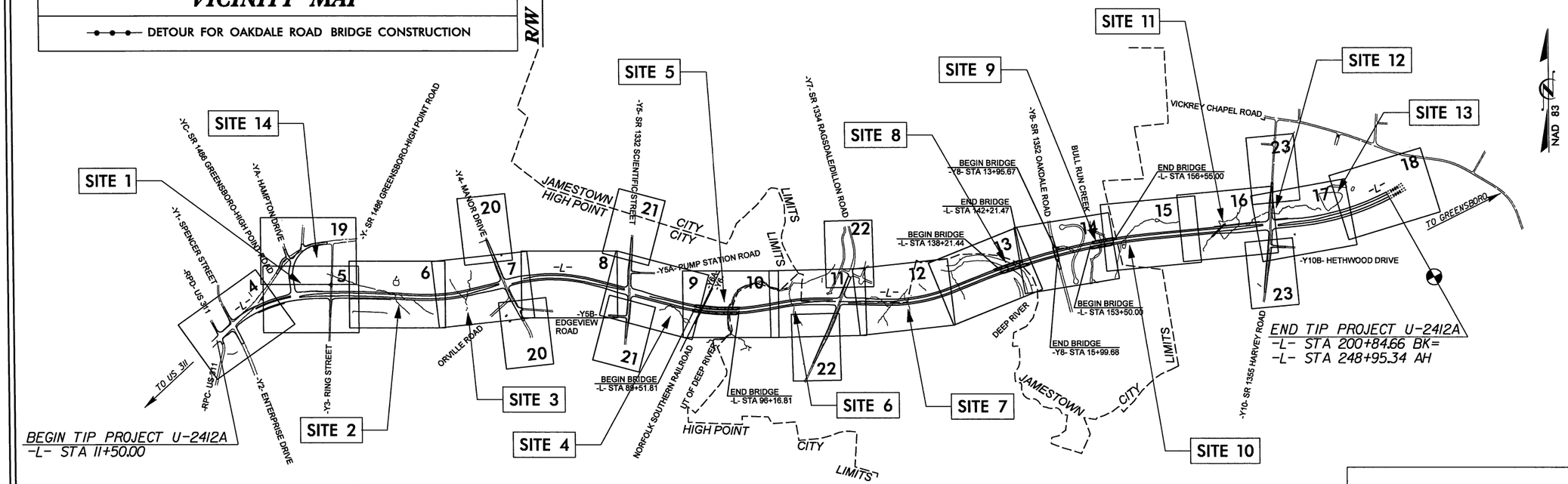
TYPE OF WORK: ***GRADING, DRAINAGE, PAVING, STRUCTURES, SIGNALS AND GUARDRAIL***



VICINITY MAP

DETOUR FOR OAKDALE ROAD BRIDGE CONSTRUCTION

R/W SUBMITTAL



THIS IS A CONTROLLED ACCESS FACILITY WITH ACCESS BEING LIMITED TO INTERSECTIONS.
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF HIGH POINT AND JAMESTOWN.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II
NCDOT CONTACT: B. DOUG TAYLOR, P.E. ENGINEERING COORDINATION, ROADWAY DESIGN UNIT

BUFFER IMPACTS

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 2011	=	31,530
ADT 2031	=	48,870
DHV	=	11%
D	=	55%
T	=	3% *
V	=	60 MPH

* (TTST 1% + DUAL 2%)

FUNC CLASS: ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT	U-2412A	=	3.327	MILES
LENGTH STRUCTURES TIP PROJECT	U-2412A	=	.259	MILES
TOTAL LENGTH OF TIP PROJECT	U-2412A	=	3.586	MILES

Prepared In the Office of:
GIBSON ENGINEERS, PC
PO BOX 700
FUQUAY VARINA, N.C. 27526
PHONE 919-552-2253
FAX 919-552-2254
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GIBSON ENGINEERS, PC

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 20, 2009

LETTING DATE:
JUNE 24, 2022

GLENDA M. GIBSON, PE
PROJECT ENGINEER

MICHAEL PEKAREK, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER *P.E.*

$$DATE$$
$$$$$$SYSTIME$$$$$
$$$$$$SYSTIME$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

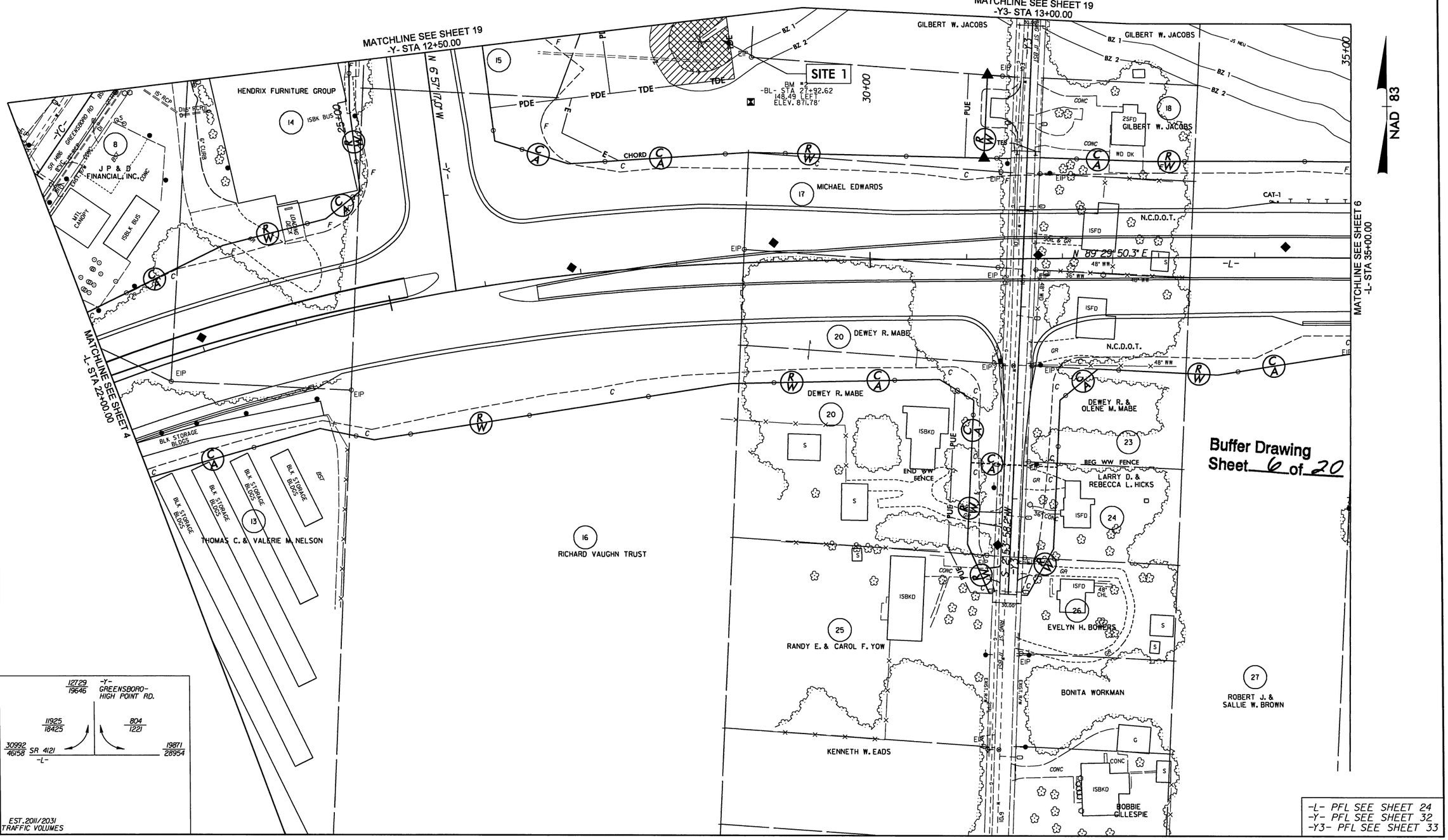
ENGLISH

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

442/608 -Y3- RING ST.
221/304 221/304
19871/28954 SR 4121 -L- 19871/28954
221/304 221/304
EST. 2011/2031 TRAFFIC VOLUMES 442/608 -Y3- RING ST.



12729/19646 -Y- GREENSBORO-HIGH POINT RD.
11925/18425 804/1221
30992/46158 SR 4121 -L- 19871/28954
EST. 2011/2031 TRAFFIC VOLUMES

-L- PFL SEE SHEET 24
-Y- PFL SEE SHEET 32
-Y3- PFL SEE SHEET 33

REVISIONS

REVISED OWNER FOR PARCELS 14,15,16,& 17. REVISED PARCEL 22 TO 20 - REVISED 6-24-09

$$DATE$$
$$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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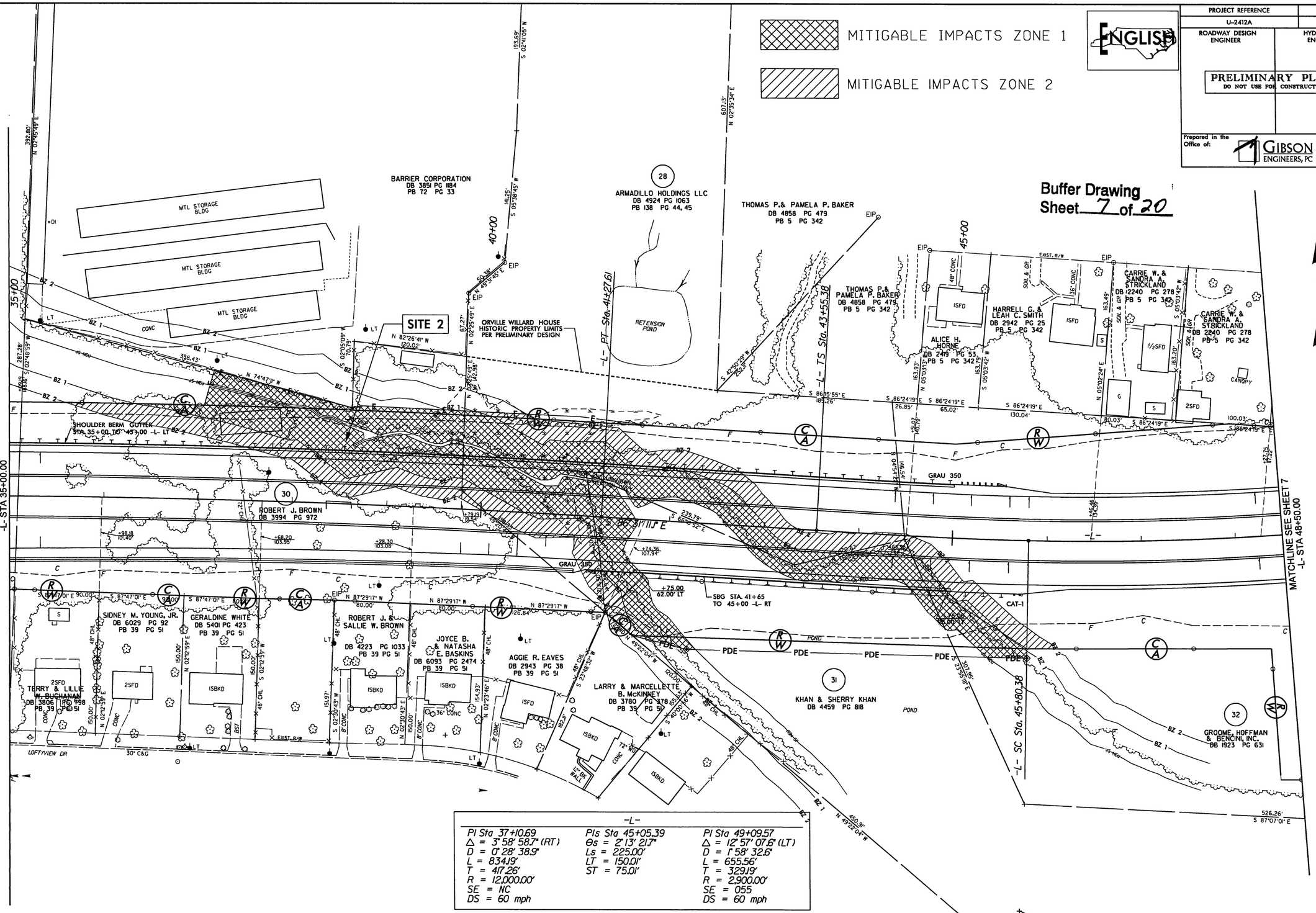
MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

Buffer Drawing Sheet 7 of 20

NAD 83



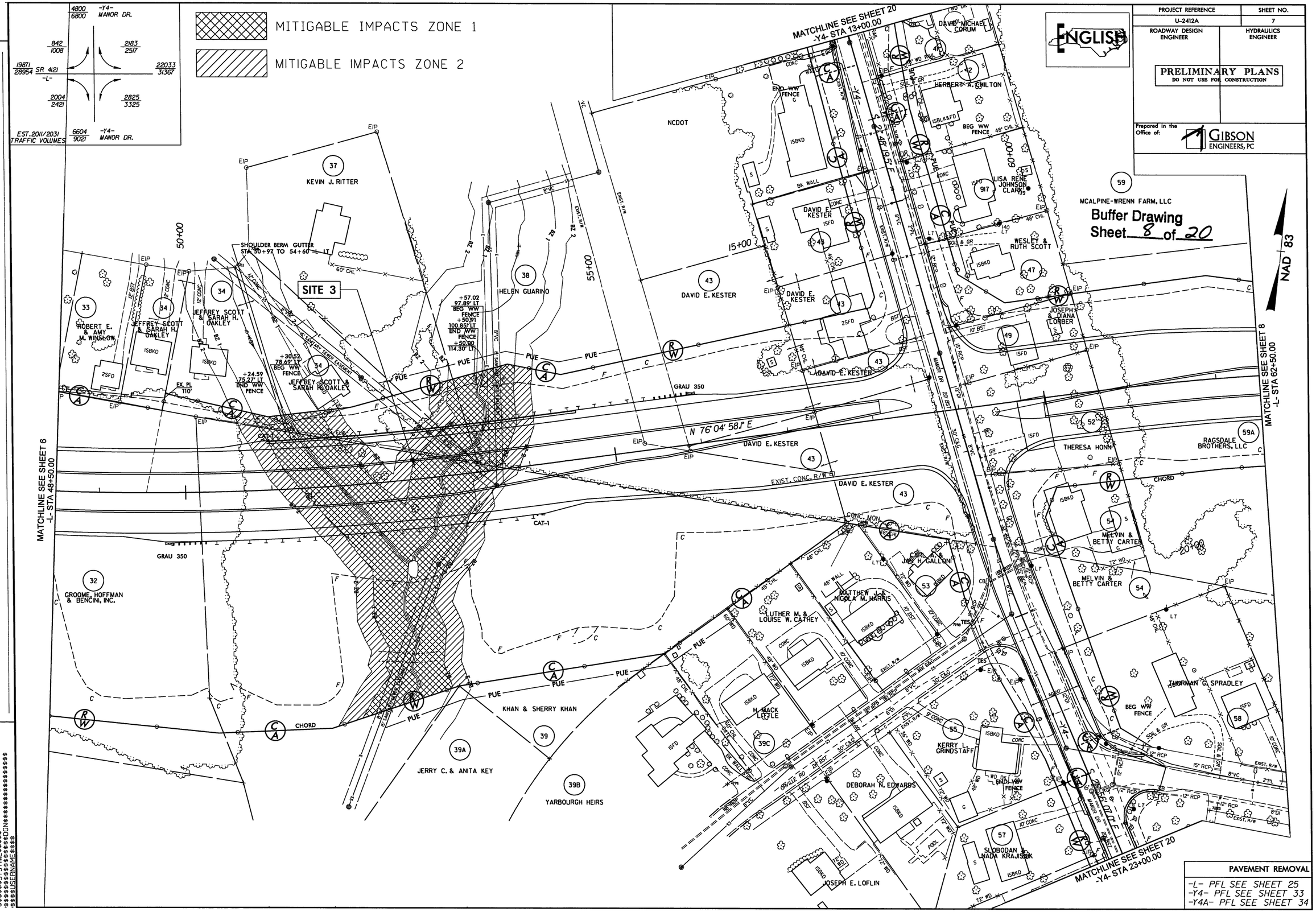
-L-		
PI Sta 37+10.69	PIs Sta 45+05.39	PI Sta 49+09.57
Δ = 3° 58' 58.7" (RT)	Θs = 2° 13' 21.7"	Δ = 12° 57' 07.6" (LT)
D = 0° 28' 38.9"	Ls = 225.00'	D = 1° 58' 32.6"
L = 834.19'	LT = 150.01'	L = 655.56'
T = 417.26'	ST = 75.01'	T = 329.19'
R = 12,000.00'		R = 2,900.00'
SE = NC		SE = 055
DS = 60 mph		DS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

-L- PFL SEE SHEET 24 & 25

REVISIONS

REVISED OWNER FOR PARCEL 29; REVISED ROW AND PDE MONUMENT TO SC STA 45+80.38 RT. - REVISED 6-24-09

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



ENGLISH

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

Buffer Drawing
Sheet 8 of 20

REVISIONS

REVISED PARCEL 35 & 36 TO 34,44,46,48.50 & 51 TO 43.56 TO 54.45 TO 917; REVISED OWNER FOR PARCEL 39B,40,52,55 & 59; ADDED PARCEL 59A; REVISED 6-24-09

$$DATE$$
$$SYSTIME$$
$$DGN$$
$$USERNAME$$

PAVEMENT REMOVAL

-L- PFL SEE SHEET 25
-Y4- PFL SEE SHEET 33
-Y4A- PFL SEE SHEET 34

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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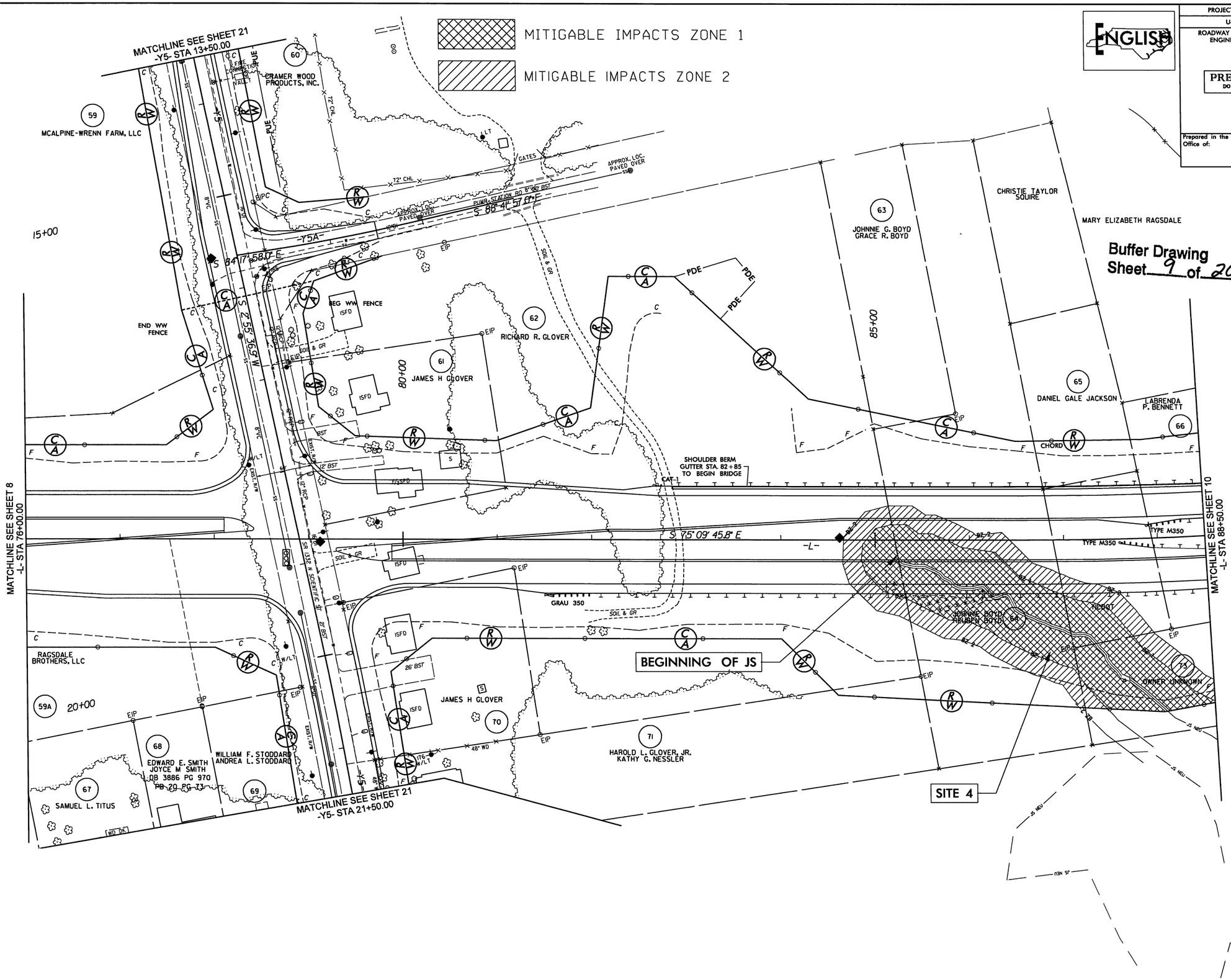

Buffer Drawing
Sheet 9 of 20

-L- PFL SEE SHEET 26
-Y5- PFL SEE SHEET 34
-Y5A- PFL SEE SHEET 35

REVISIONS

REVISED OWNER FOR PARCEL 59 & 72 ADDED PARCEL 59A - REVISED 6-24-09

$$DATE$$
$$$

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

ENGLISH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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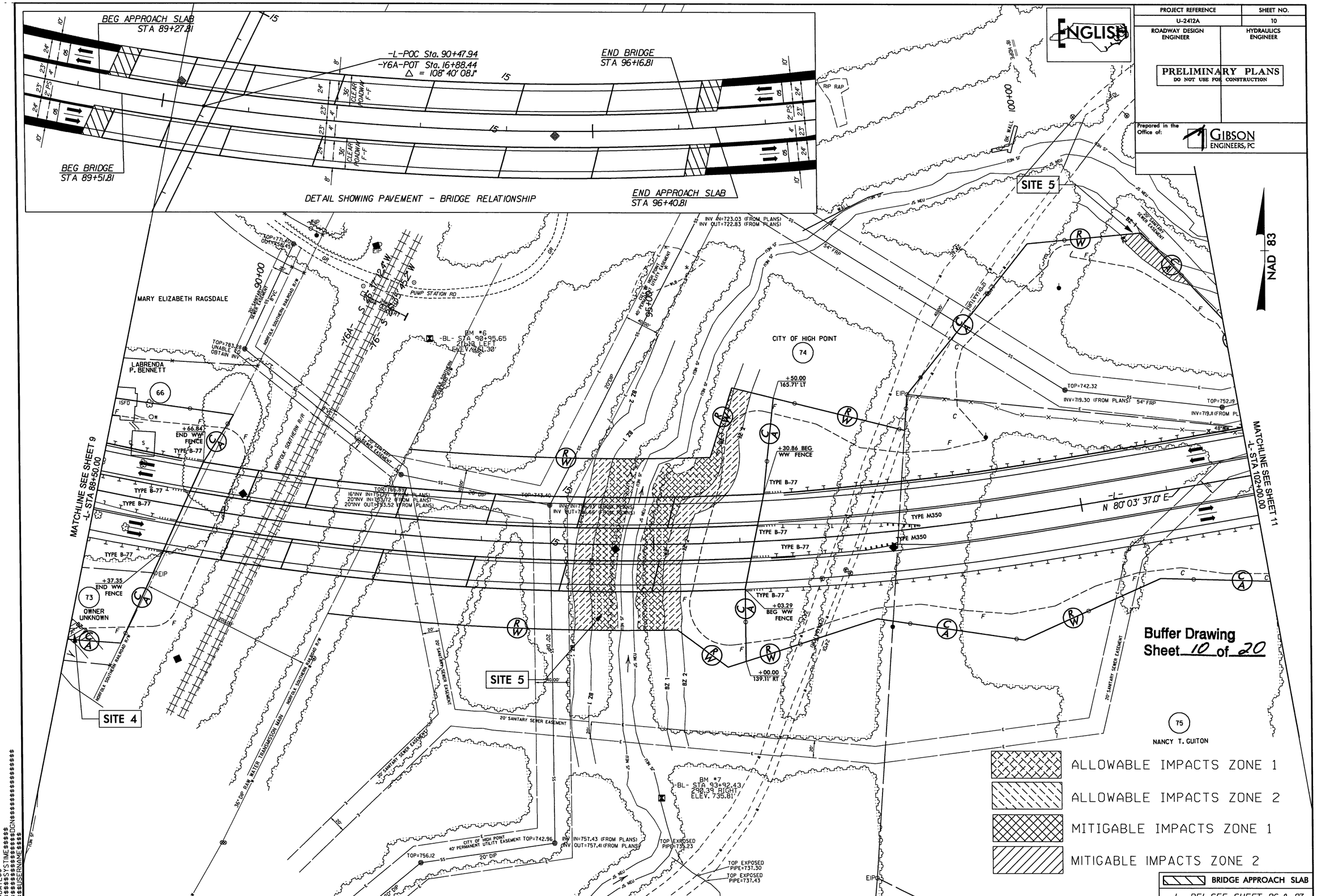

$$DATE$$
$$TIME$$
$$DGN$$
$$USERNAME$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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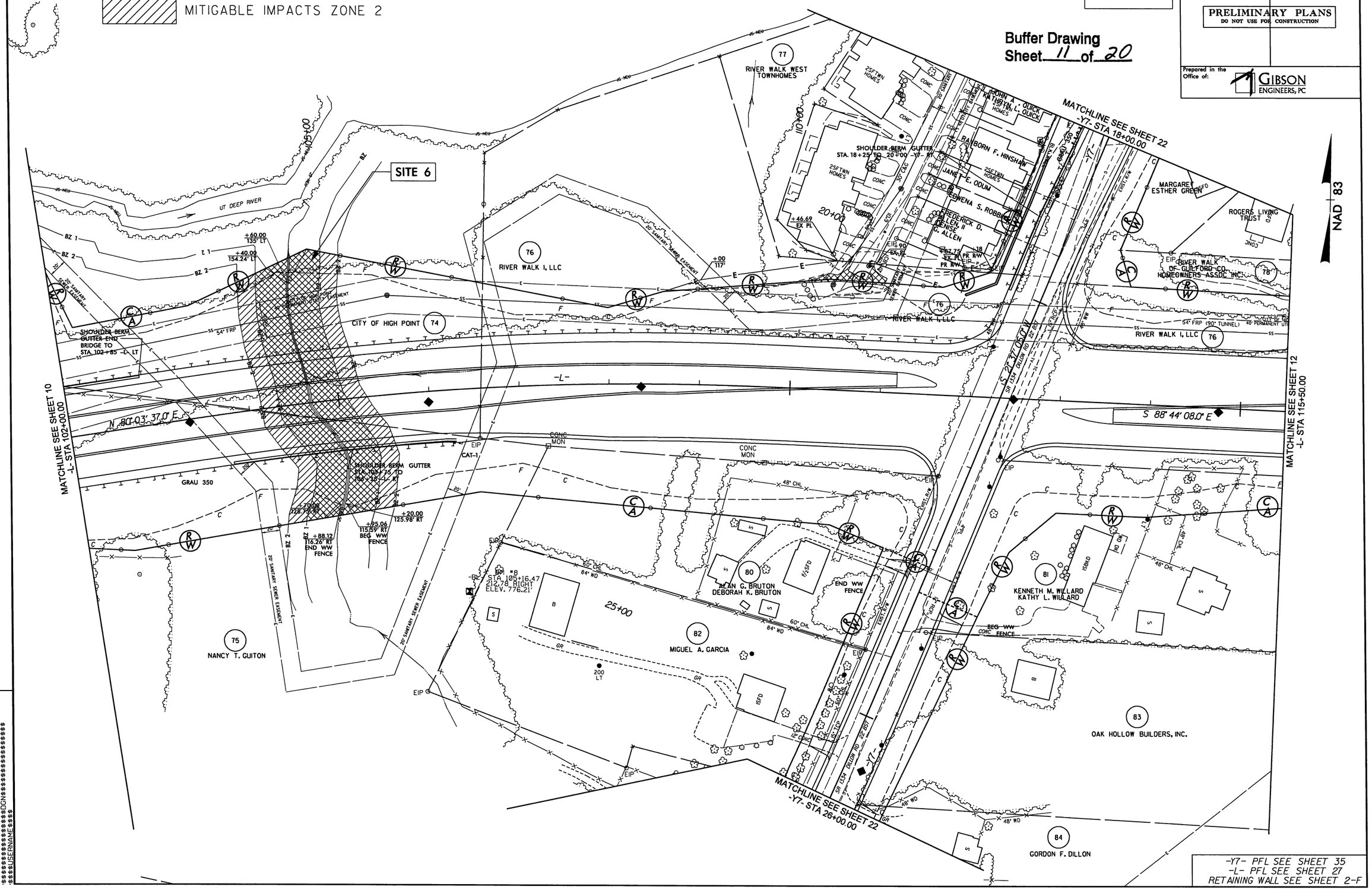
ENGLISH

Buffer Drawing
Sheet 11 of 20

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

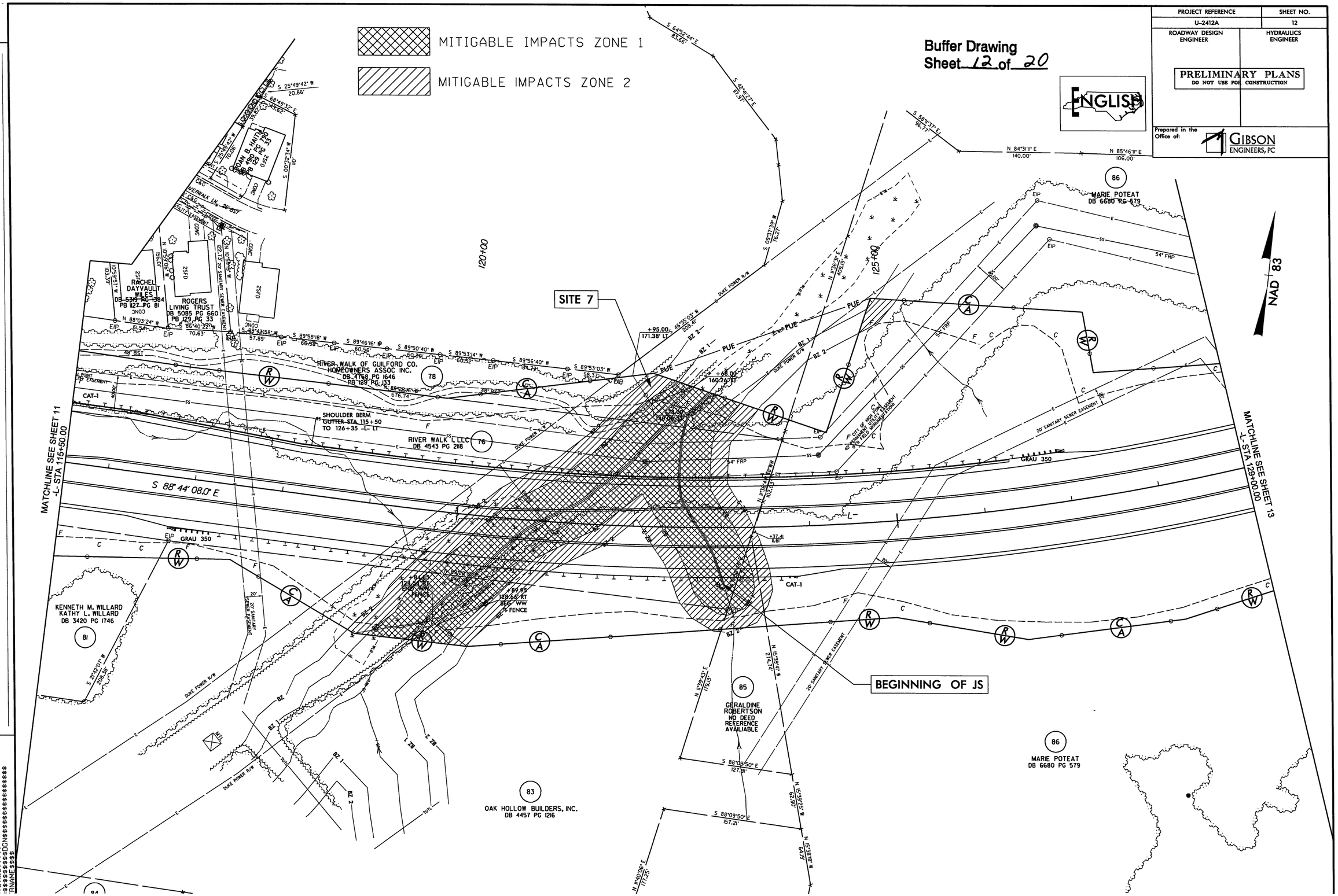


-Y7- PFL SEE SHEET 35
-L- PFL SEE SHEET 27
RETAINING WALL SEE SHEET 2-F

REVISIONS

REVISED PARCEL 77 & 78 TO 76 - REVISED 6-24-09
REVISED ROW ON PARCEL 76 - REVISED 12-22-09

$$DATE$$
$$SYSTIME$$
$$DGN$$
$$USERNAME$$



REVISIONS

REVISED PARCEL 79 TO 76; REVISED OWNER OF PARCEL 85 AND 86 - REVISED 6-24-09

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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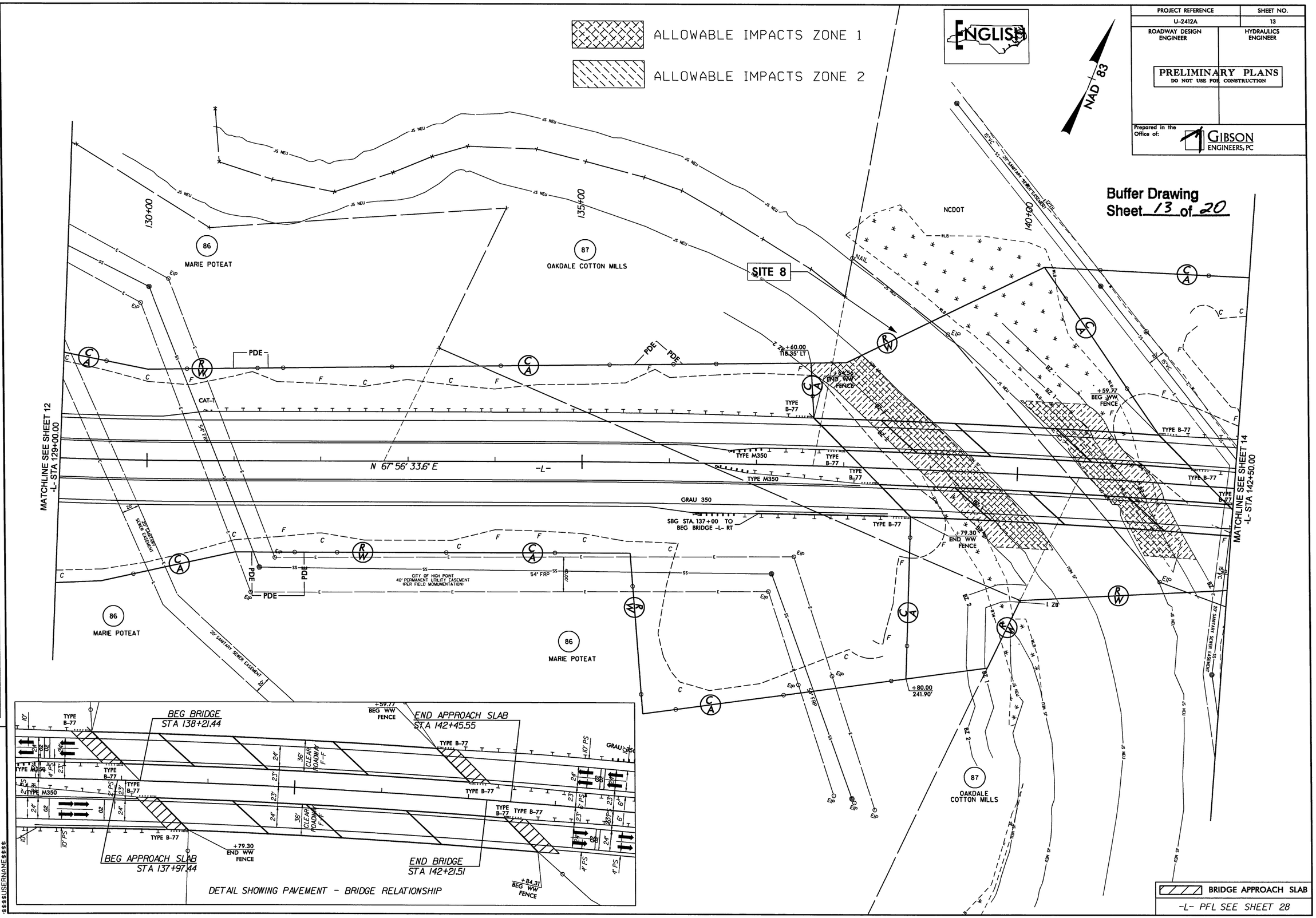

REVISIONS

REVISED OWNERS FOR PARCEL 86 AND 88 - REVISED 6-24-09

$$DATE$$
$$SYSTIME$$
$$USERNAME$$

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

ENGLISH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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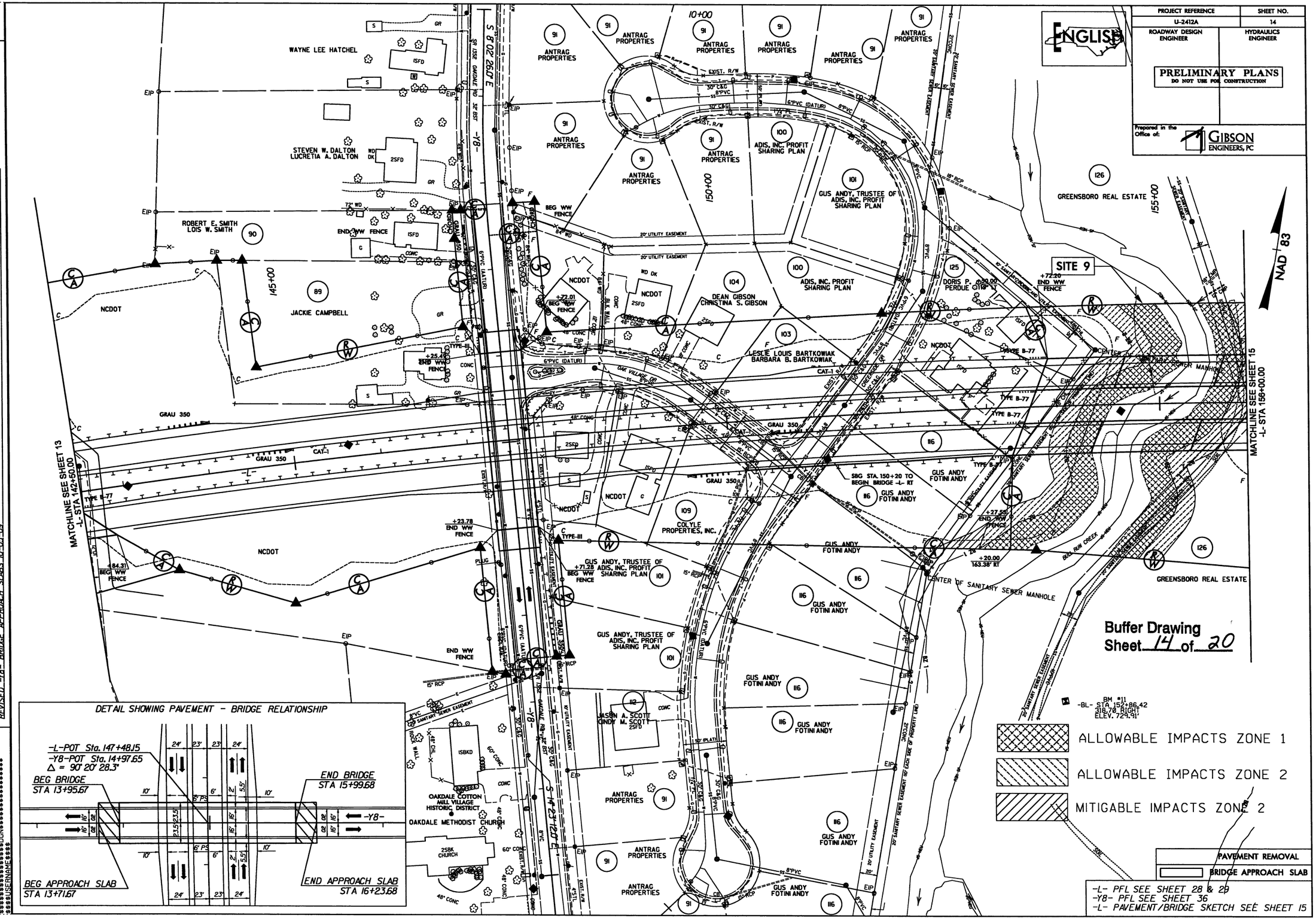

REVISIONS

REVISED OWNER OF PARCEL 88,89,91,105,106,107,108,124 & 126; REVISED PARCELS 92,93,94,95,96,97,98,99,113,14 & 115 TO 91; PARCELS 117,118,119,120,121,122,123 TO 116.
REVISED -Y8- BRIDGE APPROACH SLABS 10-05-09

$$DATE$$
$$SYSTIME$$
$$USERNAME$$ $$DGN$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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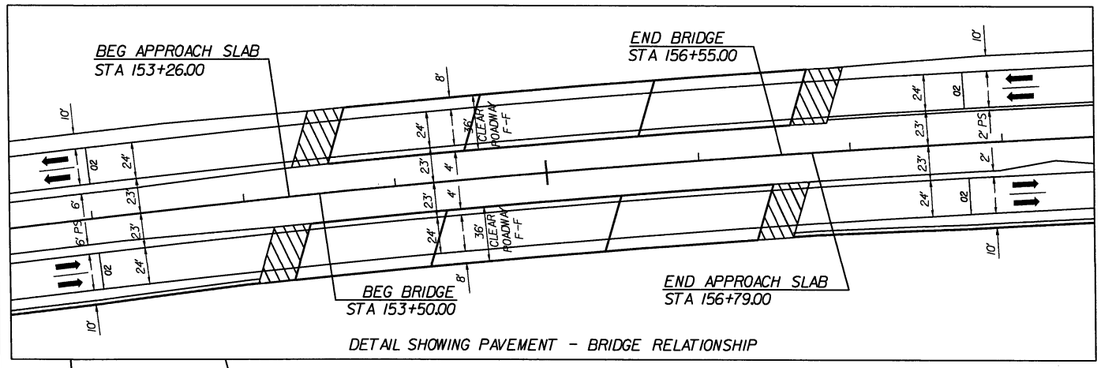
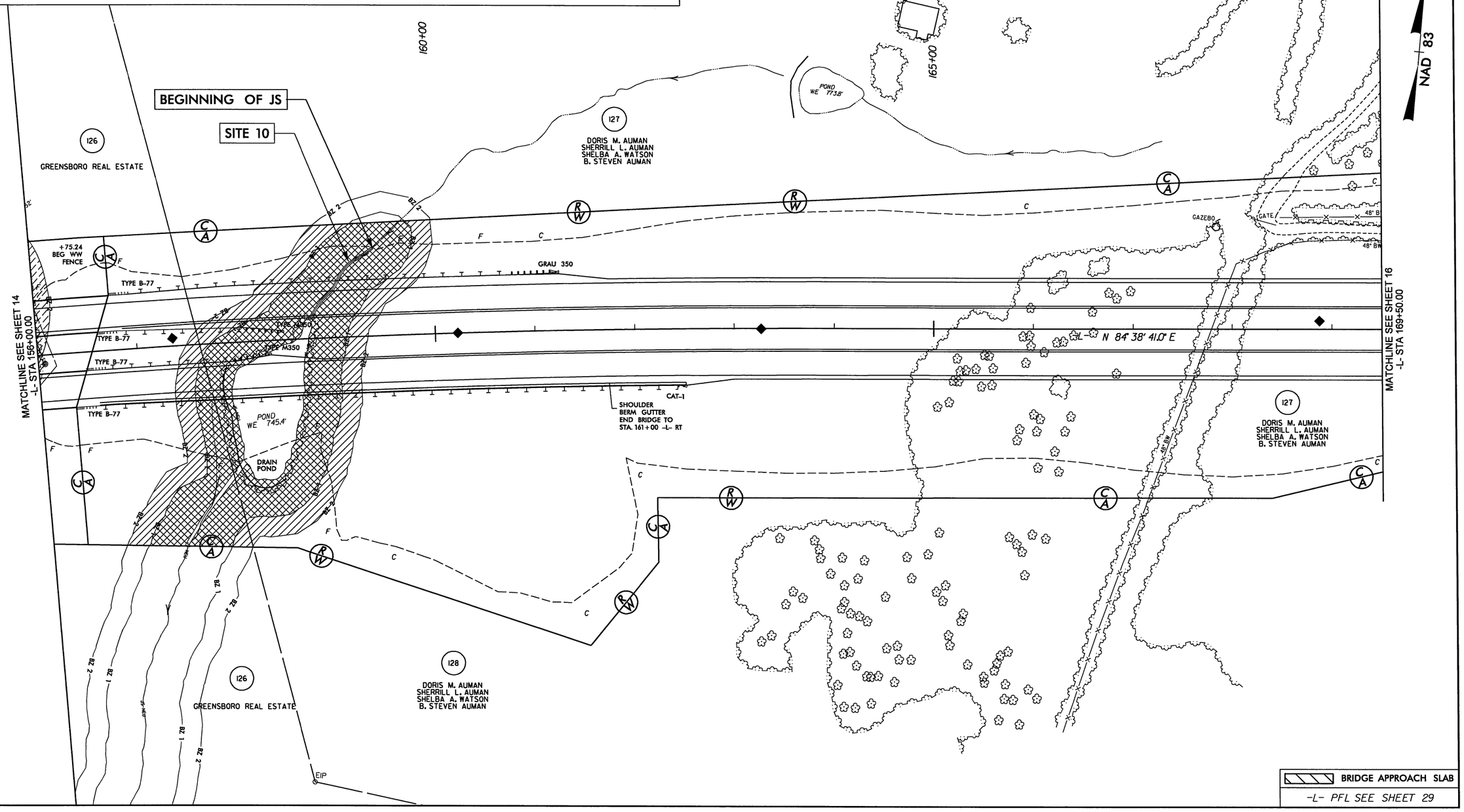
MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

ALLOWABLE IMPACTS ZONE 2

Buffer Drawing
Sheet 15 of 20





BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 29

REVISIONS

REVISED OWNER FOR PARCEL 126 - REVISED 6-24-09

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

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

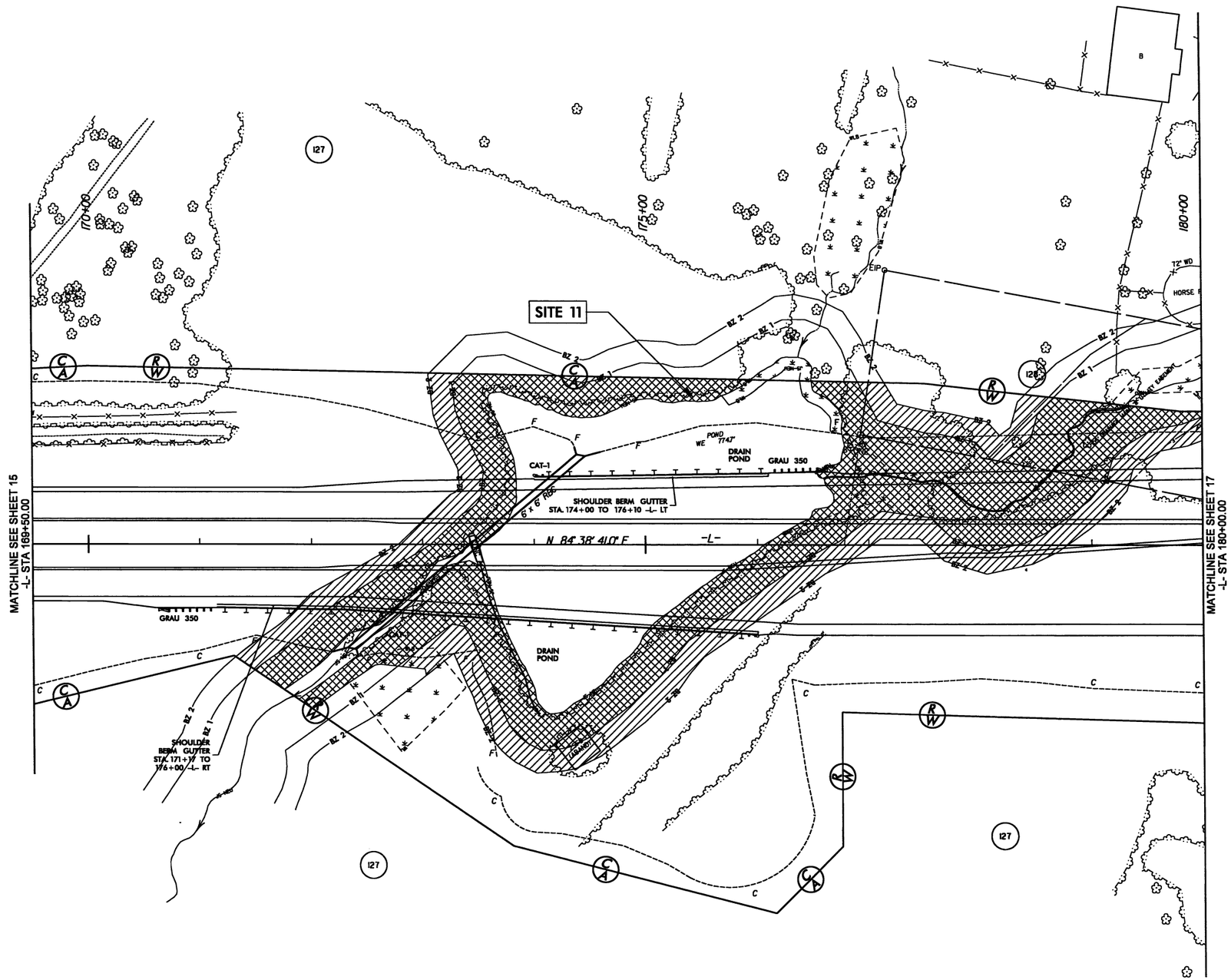
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

Buffer Drawing
Sheet 16 of 20

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2



-L- PFL SEE SHEET 29 & 30

$$DATE$$
$$$

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

ENGLISH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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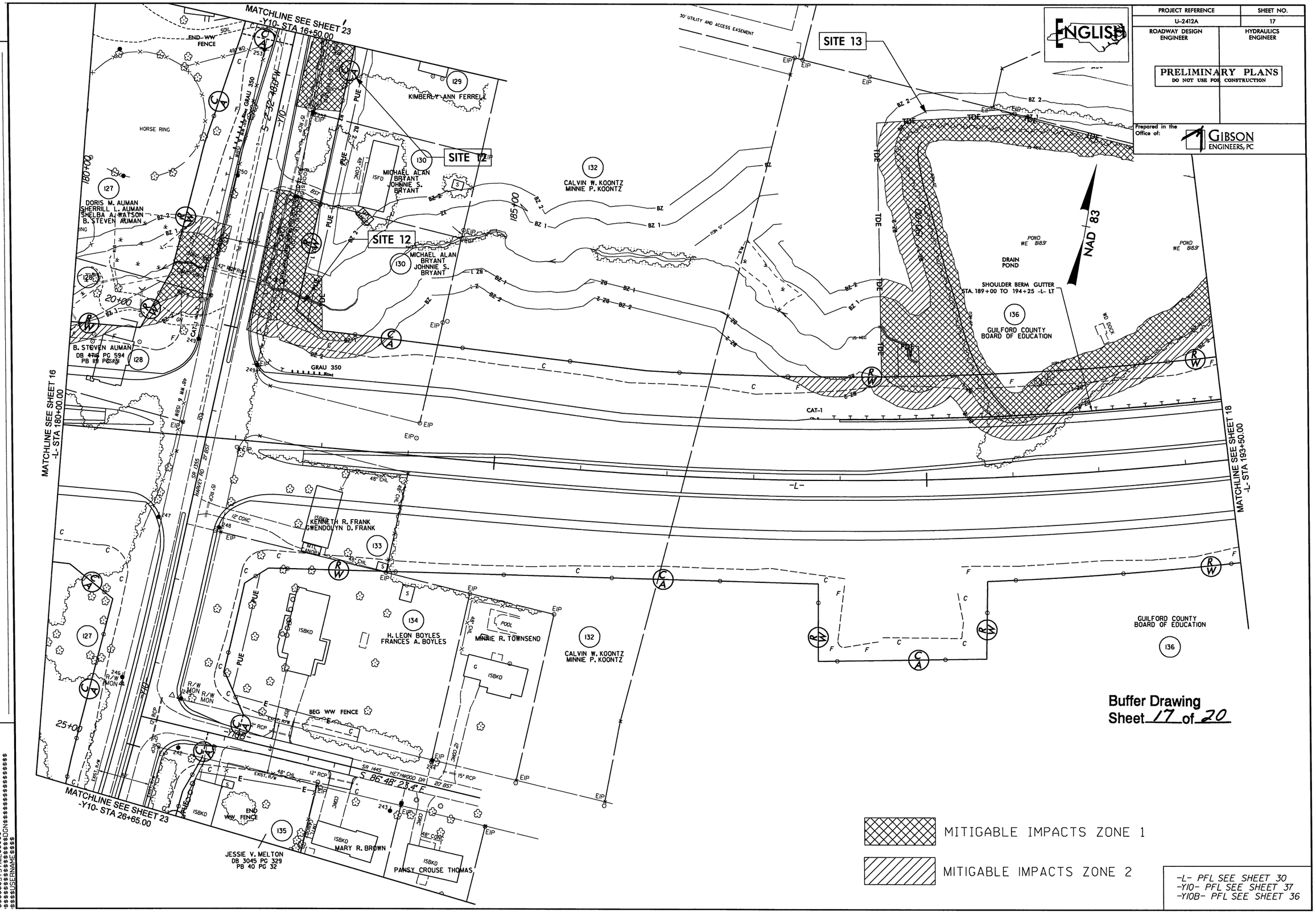


Buffer Drawing
Sheet 17 of 20

-L- PFL SEE SHEET 30
-Y10- PFL SEE SHEET 37
-Y10B- PFL SEE SHEET 36

REVISIONS

REVISED OWNER FOR PARCEL 129 & 136 - REVISED 6-24-09

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

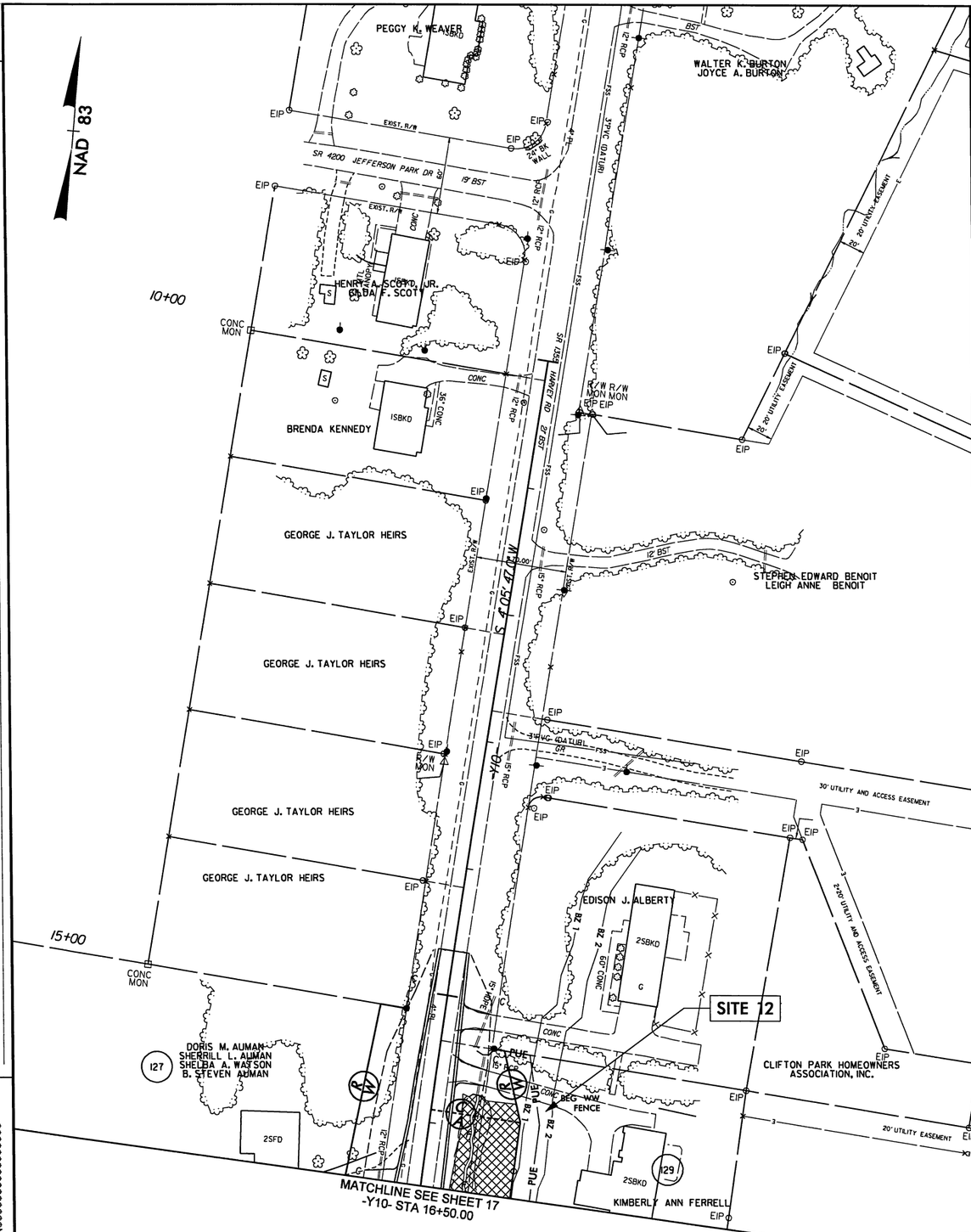
PROJECT REFERENCE	SHEET NO.
U-2412A	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ENGLISH

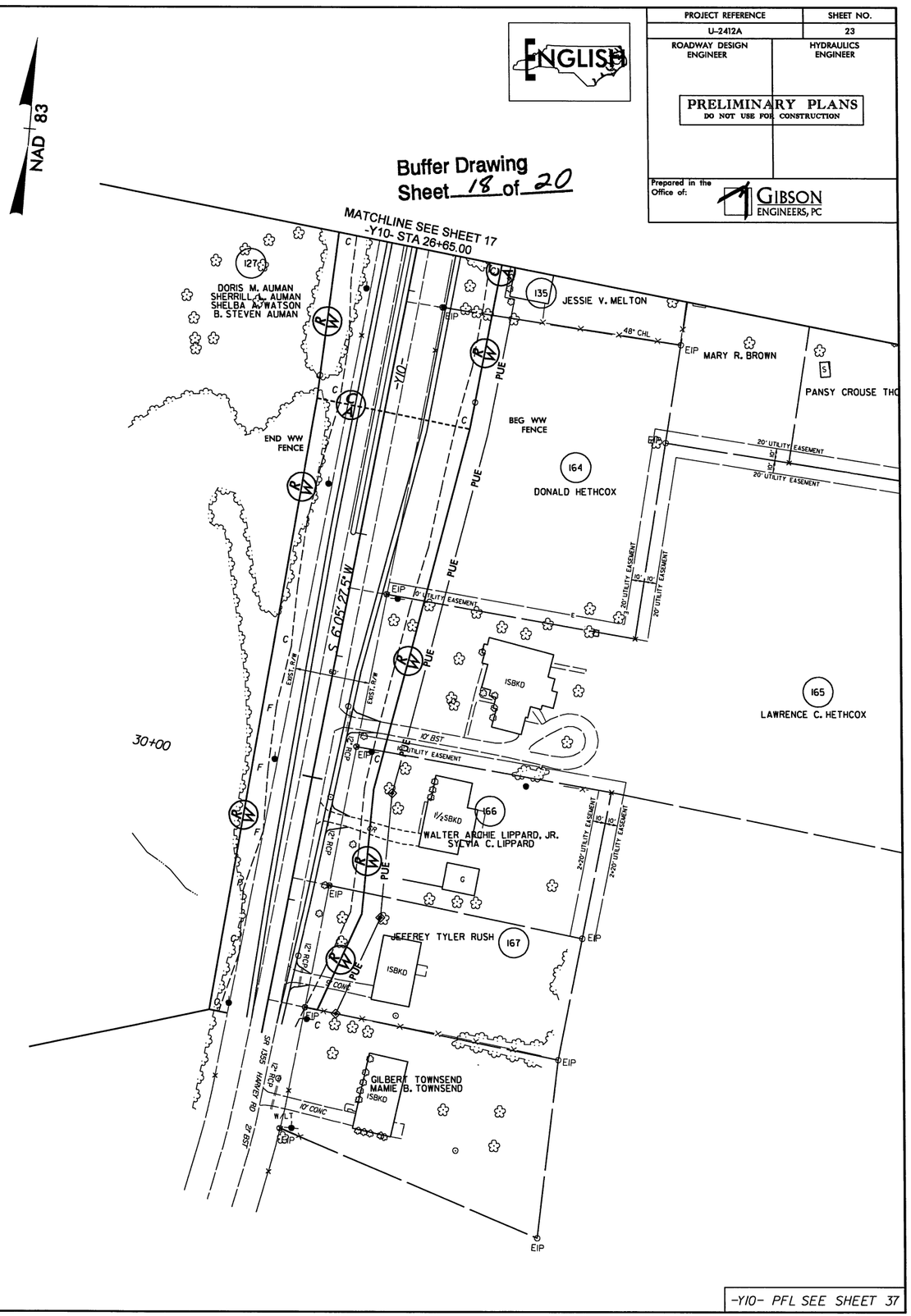
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

Buffer Drawing
Sheet 18 of 20



MITIGABLE IMPACTS ZONE 1



REVISIONS

REVISED OWNER FOR PARCEL 129 & 164 - REVISED 6-24-09

-Y10- PFL SEE SHEET 37

-Y10- PFL SEE SHEET 37

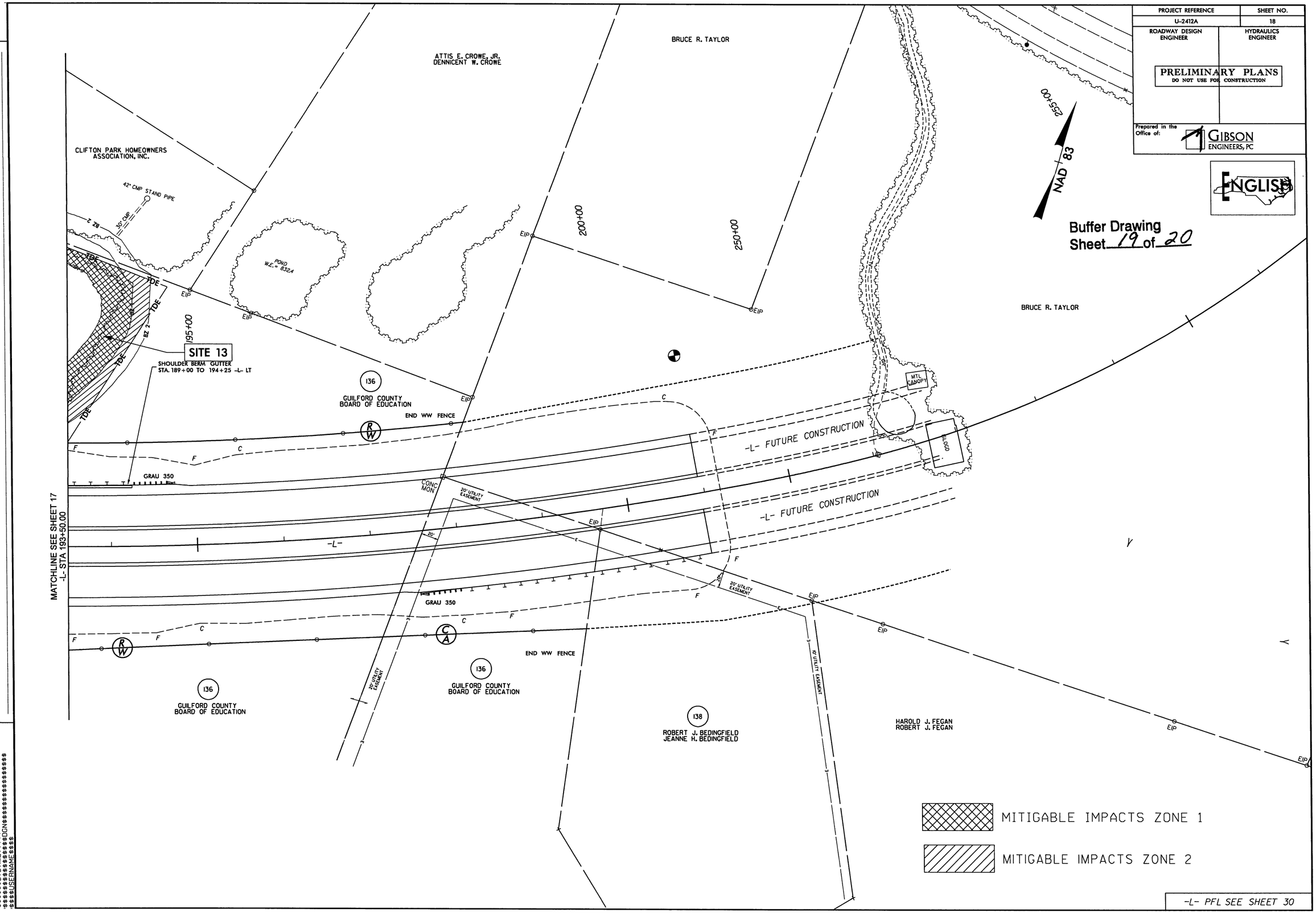
PROJECT REFERENCE	SHEET NO.
U-2412A	18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

ENGLISH

Buffer Drawing
Sheet 19 of 20



-L- PFL SEE SHEET 30

REVISIONS

REVISED OWNER FOR PARCEL 136 & 137 -- REVISED 6-24-09

$$DATE$$
$$SYSTIME$$
$$DGN$$
$$USERNAME$$

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

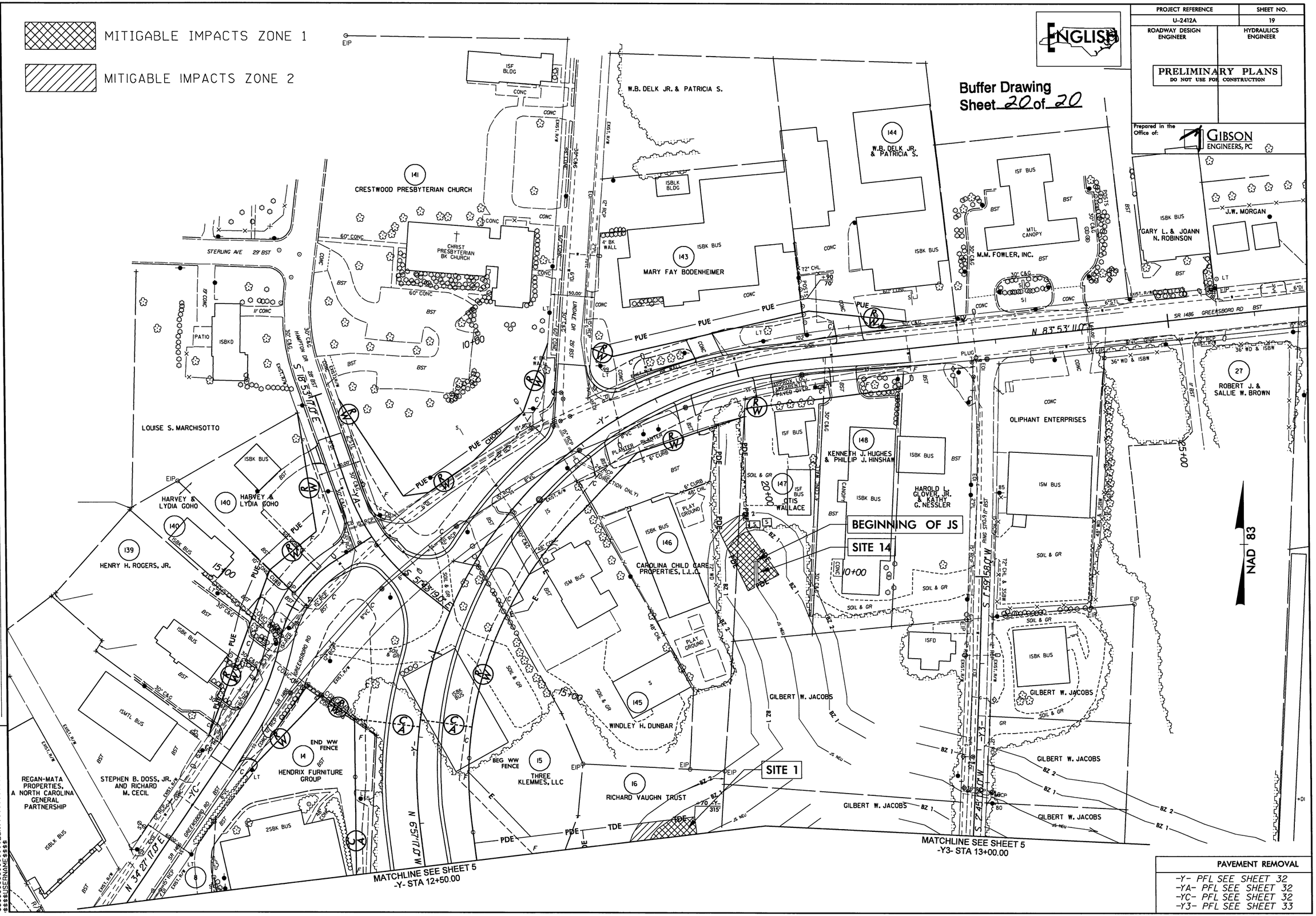
Prepared in the Office of: GIBSON ENGINEERS, PC

ENGLISH

Buffer Drawing
Sheet 20 of 20

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2



PAVEMENT REMOVAL
-Y- PFL SEE SHEET 32
-YA- PFL SEE SHEET 32
-YC- PFL SEE SHEET 32
-Y3- PFL SEE SHEET 33

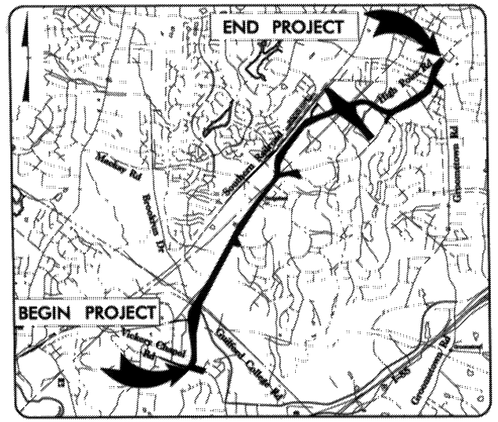
REVISIONS

REVISED OWNER FOR PARCEL 14,15,& 16.REVISED PARCEL 142 TO 140 - REVISED 6-24-09

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

CONTRACT: TIP PROJECTS: U-2412B & U-2524AE

See Sheet 1-A For Index of Sheets



VICINITY MAP N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

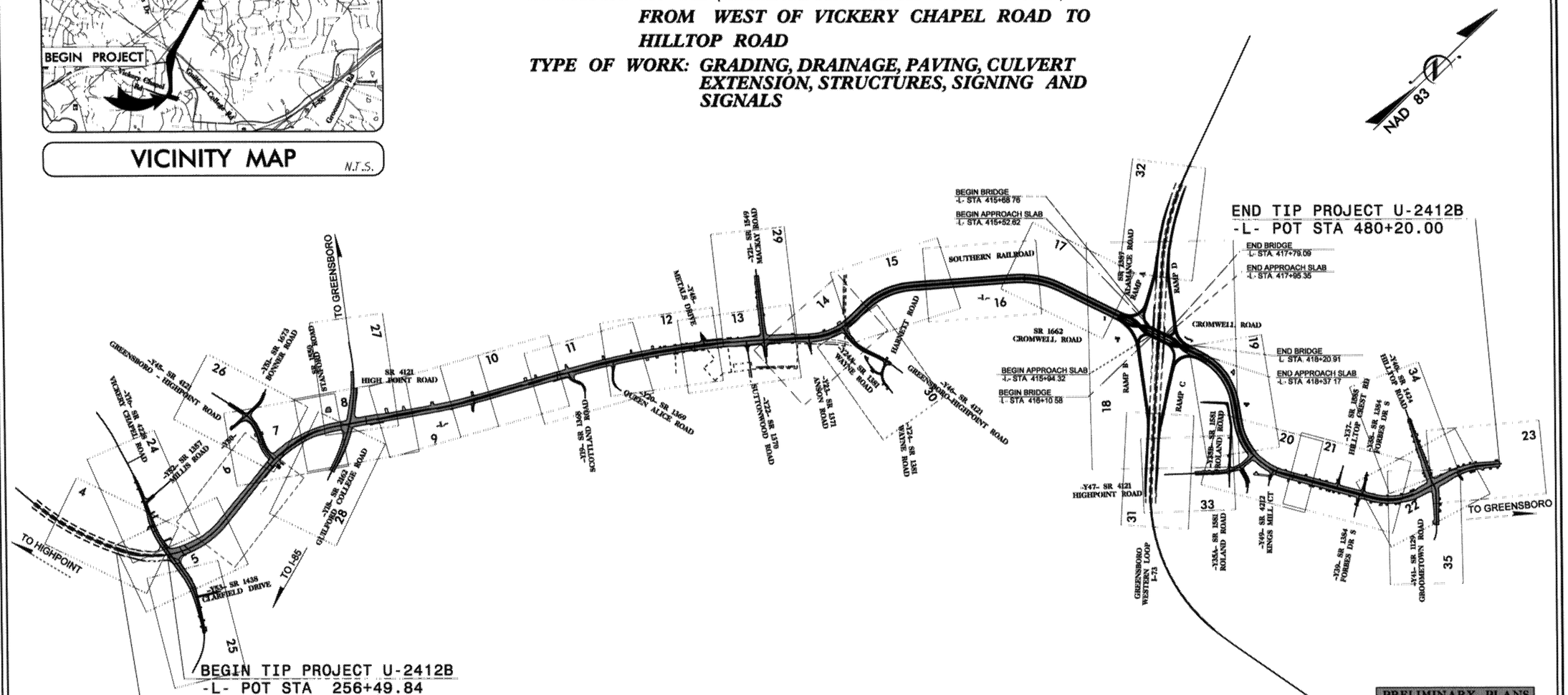
GUILFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2412B & U-2524AE	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34802.1.1	STP-4121(1)	P.E.
34802.2.3	STP-4121(4)	RW
34820.2.17		RW

LOCATION: SR 4121 (GREENSBORO /HIGH POINT ROAD) FROM WEST OF VICKERY CHAPEL ROAD TO HILLTOP ROAD

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERT EXTENSION, STRUCTURES, SIGNING AND SIGNALS


NAD 83
END TIP PROJECT U-2412B
-L- POT STA 480+20.00
BEGIN TIP PROJECT U-2412B
-L- POT STA 256+49.84
-L- POC STA 248+95.34 AH =
-L- POC STA 200+84.66 BK (U-2412A)
TO GREENSBORO
TO HIGHPOINT
TO I-85
TO GREENSBORO
-Y47- SR 4121 HIGHPOINT ROAD
-Y46- SR 4121 GREENSBORO-HIGHPOINT ROAD
-Y45- SR 4121 GREENSBORO - HIGHPOINT ROAD
-Y44- SR 4121 VICKERY CHAPEL ROAD
-Y43- SR 1357 WILLIS ROAD
-Y42- SR 1438 CLARFIELD DRIVE
-Y41- SR 1129 GROOMETOWN ROAD
-Y40- SR 1421 HILLTOP ROAD
-Y39- SR 4212 KENOS MILL CT
-Y38- SR 1581 ROLAND ROAD
-Y37- SR 1585 HILLTOP CREST RD
-Y36- SR 1584 FORBES DR S
-Y35- SR 1584 FORBES DR S
-Y34- SR 1581 ROLAND ROAD
-Y33- SR 1581 WAYNE ROAD
-Y32- SR 1581 WAYNE ROAD
-Y31- SR 1571 ANSON ROAD
-Y30- SR 1570 SUTTONWOOD ROAD
-Y29- SR 1569 QUEEN ALICE ROAD
-Y28- SR 1568 SCOTTLAND WAY
-Y27- SR 2662 GUILFORD COLLEGE ROAD
-Y26- SR 1573 BONNER ROAD
-Y25- SR 1549 JACKSON ROAD
-Y24- SR 1550 WAYNE ROAD
-Y23- SR 1549 METALS DRIVE
-Y22- SR 1549 METALS DRIVE
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-Y19- SR 1549 METALS DRIVE
-Y18- SR 1549 METALS DRIVE
-Y17- SR 1549 METALS DRIVE
-Y16- SR 4121 GREENSBORO-HIGHPOINT ROAD
-Y15- SR 1549 METALS DRIVE
-Y14- SR 1549 METALS DRIVE
-Y13- SR 1549 METALS DRIVE
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-C0- SR 1549 METALS DRIVE
-B9- SR 1549 METALS DRIVE
-B8- SR 1549

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	1A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No. F-1106

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, STANDARD DRAWINGS, GENERAL NOTES
1B	COVENTIONAL PLAN SHEET SYMBOLS
1C-1E	SURVEY CONTROL SHEET
2, 2A-2F	TYPICAL SECTIONS
2G-2L	INTERSECTION DETAIL SHEETS
2M	SOIL DETAIL
2N	INTERCHANGE DETAIL SHEET
2O	CURVE DATA AND DRAINAGE DETAILS SHEETS
2P-S	RIGHT OF WAY SHEETS
3AC-3AD	PARCEL INDEX SHEETS
4 THRU 35	PLAN SHEETS
36 THRU 62	PROFILE SHEETS

GENERAL NOTES

GRADING AND SURFACING:
THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN

SAFETY CLEARING:
THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE AREAS IN THE PLANS DESIGNATED SAFETY CLEARING. THE LIMITS ARE AS SHOWN AND THE CLEARING AND GRUBBING IS CONSIDERED A PART OF THE LUMP SUM ITEM FOR "CLEARING AND GRUBBING"

SUPERELEVATION:
ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS

SHOULDER CONSTRUCTION:
ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.

SIDE ROADS:
THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

BERM DITCHES:
BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

UNDERDRAINS:
UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER

SHOULDER DRAINS:
SHOULDER DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 816.03 AND DETAILS IN PLANS AT LOCATIONS DIRECTED BY THE ENGINEER.

DRIVEWAYS:
DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.03 AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:
STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

GUARDRAIL:
THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL

TEMPORARY SHORING:
SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING"

SUBSURFACE PLANS:
NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

END BENTS:
THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS

RIGHT-OF-WAY MARKERS:
ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT

WHEELCHAIR RAMPS:
WHEELCHAIR RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. THE CONSTRUCTION OF ALL WHEELCHAIR RAMPS SHALL BE IN ACCORDANCE WITH STD. NO. 848.06

ROADWAY STANDARD DRAWINGS

2006 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation Raleigh, N. C., Dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
200.03	Method of Clearing - Method III
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.02	Guide for Grading Subgrade - Secondary and Local
225.03	Deceleration and Acceleration Lanes
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.05	Method of Obtaining Superelevation - Divided Highways
225.06	Method of Grading Sight Distance at Intersections
225.07	Grading for False Cut at Grade Separations
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
310.02	Parallel Pipe End Section - Precast Concrete Section for 15" to 24" Pipe
310.03	Cross Pipe End Section - Precast Concrete Section for 18" to 30" Pipe
310.04	Parallel Pipe End Section - Prefabricated Steel Section for 15" to 24" Pipe
310.05	Cross Pipe End Section - Prefabricated Steel Section for 18" to 30" Pipe
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.01	Guide for Paving Shoulders Under Bridges - Method I
654.01	Pavement Repairs
665.01	Milled Rumble Strips - Asphalt Pavements
DIVISION 7 - CONCRETE PAVEMENTS AND SHOULDERS	
700.02	Expansion Joint Layout - for Rigid Doweled Pavement at Bridges
700.04	Concrete Pavement Header Board
700.05	Tying Proposed Pavement to Existing
710.01	Concrete Pavement - Station Marking
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
816.01	Concrete Pads - for Shoulder Drain Installation
816.02	Aggregate Shoulder Drain
816.04	Markers for Drainage Structure and Concrete Pad
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.13	Concrete Bridge Approach Drop Inlet - 12" thru 24" Pipe
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.30	Driveway Drop Inlet
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.33	Angled Vane Grates and Frames
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.36	Traffic Bearing Grated Drop Inlet - for Steel (840.37) Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.51	Brick Manhole - 12" thru 36" Pipe
840.53	Precast Manhole with Masonry Base - 12" thru 42" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.01	Concrete Sidewalk
848.03	Driveway Turnout - Drop Curb Type
848.04	Street Turnout
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
850.11	Guide for Berm Drainage Outlet - 24" and 30" Pipe
852.01	Concrete Islands
852.04	Method for Placement of Drop Inlets in Grassed Median - Using 1'-6" Curb and Gutter
852.05	Median Curb for Catch Basin - for Use with 1'-6" Curb and Gutter
852.06	Method for Placement of Drop Inlets in Concrete Islands
852.10	Median Construction - with Curb and Gutter
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.03	Woven Wire Fence - with Steel Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.03	Drainage Ditches with Class 'A' Rip Rap
876.04	Drainage Ditches with Class 'B' Rip Rap

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Dgnset: A1 W-ANSI 24x36x2B

3/15/06

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	1B

Note: Not to Scale

S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Wheel Chair Ramp — WCR
- 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 — HH
- H-Frame Pole
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

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

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

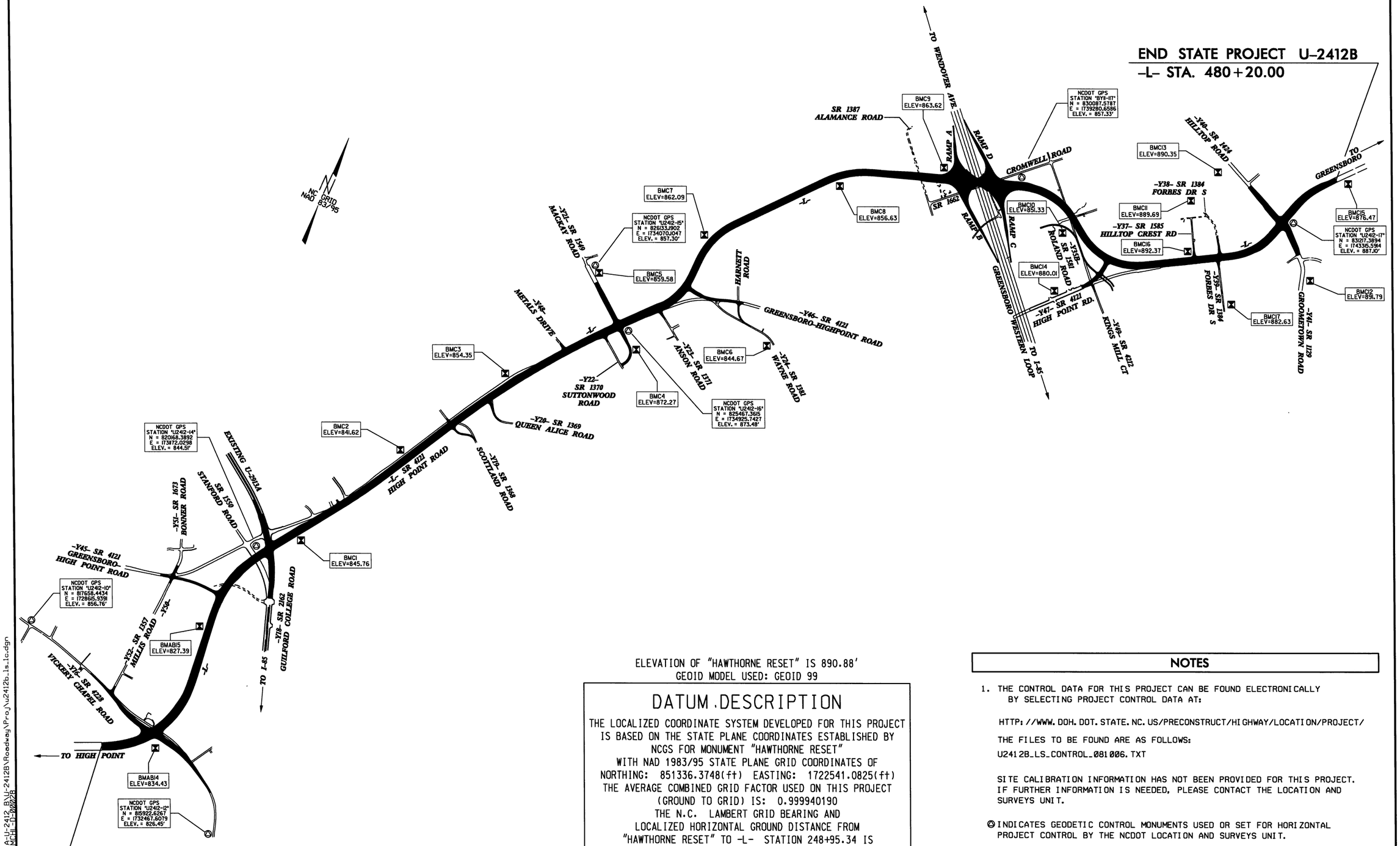
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	1C
Location and Surveys	

U-2412B SURVEY CONTROL SHEET



ELEVATION OF "HAWTHORNE RESET" IS 890.88'
GEOID MODEL USED: GEOID 99

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "HAWTHORNE RESET" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 851336.3748(ft) EASTING: 1722541.0825(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999940190 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "HAWTHORNE RESET" TO -L- STATION 248+95.34 IS S 12 ° 39' 27" E 35,785.4038(ft) ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTES

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:

   HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   THE FILES TO BE FOUND ARE AS FOLLOWS:

   U2412B_LS_CONTROL_081006.TXT

   SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

   ⊘ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

   PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM FROM EXISTING NCGS MONUMENTATION.

NOTE: DRAWING NOT TO SCALE

12/01/2005

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PROJECT REFERENCE NO.	SHEET NO.
U-2412B	1D
Location and Surveys	

U-2412B SURVEY CONTROL SHEET

BASELINE DATA

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
C1014	U2412-14	820168.3892	1731172.0298	844.46	289+27.60	207.57 LT
C1	BL-1	820539.1699	1731430.8151	851.51	293+76.45	196.97 LT
C2	BL-2	821089.5101	1731956.9647	852.47	301+26.12	63.94 LT
C3	BL-3	821778.6021	1732376.5490	848.86	309+38.24	74.85 LT
C4	BL4	822458.6252	1732736.1364	845.31	317+09.66	77.57 LT
C5	BL-5	823157.1765	1733102.7179	848.48	324+97.89	79.88 LT
C6	BL-6	823824.3202	1733474.9794	856.93	332+57.13	89.88 LT
C7	BL-7	824296.8397	1733777.2195	856.30	338+14.35	90.86 LT
C8	BL-8	824749.9691	1734201.6512	864.68	344+27.14	5.08 LT
C9	BL-9	825347.3848	1734637.0472	870.11	351+65.06	30.49 LT
C1016	U2412-16	825467.3615	1734925.7427	873.48	354+43.92	112.52 RT
C10	BL-10	826035.1018	1735263.7698	868.94	360+94.64	2.61 LT
C11	BL-11	826553.2286	1735477.5506	863.11	366+69.47	17.89 LT
C12	BL-12	826889.4690	1735519.0872	861.22	370+08.23	14.46 RT
C13	BL-13	827313.1385	1735617.5201	866.46	374+55.35	42.33 RT
C14	BL-14	827548.9835	1735719.5404	864.98	377+20.11	23.36 RT
C15	BL-15	827986.2577	1735968.4806	860.53	382+17.94	57.29 LT
C16	BL-16	828321.3207	1736340.7572	863.19	387+13.51	15.30 RT
C17	BL-17	828559.9413	1736738.7750	860.22	391+51.29	169.27 RT
C18	BL-18	828734.0182	1737066.4577	839.09	395+29.12	301.70 RT
C19	BL-19	828952.6329	1737453.2663	856.45	401+00.12	315.13 RT
C20	BL-20	829172.5965	1737885.1066	883.70	405+85.76	256.24 RT
C21	BL-21	829336.6642	1738171.7811	860.00	409+11.22	199.88 RT
C22	BL-22	829568.1700	1738639.0174	862.16	414+29.42	141.76 RT
C52	BL-52	829730.0321	1738851.8609	859.42	416+84.73	62.27 RT
C217	BY11-117	830087.5787	1739280.6586	857.33	422+09.82	127.44 LT
C23	BL-23	830039.5027	1739956.7128	859.31	428+63.25	25.93 RT
C24	BL-24	829838.3566	1740422.9701	856.84	433+84.92	12.58 RT
C25	BL-25	829629.2012	1740781.4190	851.80	437+99.17	5.71 RT
C26	BL-26	829567.6443	1741168.7078	862.03	441+92.71	1.41 RT
C27	BL-27	829661.9731	1741627.8524	874.98	446+54.91	41.54 RT
C28	BL-28	830090.9252	1742283.7858	889.45	454+36.56	9.69 RT
C29	BL-29	830289.9082	1742618.9469	882.10	458+26.33	11.59 RT
C30	BL-30	830673.6987	1743035.7583	876.99	464+01.24	21.37 LT
C1017	U2412-17	831217.3894	1743315.5914	887.10	470+13.73	45.00 RT
C31	BL-31	831744.3188	1743388.9890	881.33	475+31.38	53.11 LT
C32	BL-32	832201.7156	1743734.4783	874.63	OUTSIDE PROJECT LIMITS	

BY11

POINT	DESC.	NORTH	EAST	ELEVATION	Y16 STATION	OFFSET
A10	U2412-10	817658.4434	1728615.9391	856.76	OUTSIDE PROJECT LIMITS	
247	BY11-247	817423.6832	1729628.9730	857.40	19+41.35	20.54 LT
248	BY11-248	817265.9093	1730157.2518	867.04	24+87.11	52.76 LT
249	BY11-249	817034.7522	1730616.1139	867.50	30+03.58	25.20 LT
A189	BL-189	816963.0692	1731049.4044	849.13	34+47.75	36.71 LT
250	BY11-250	816961.8958	1731363.0598	838.99	37+57.63	81.54 LT
251	BY11-251	816768.9486	1731744.0854	833.20	41+65.21	18.96 LT
252	BY11-252	816325.5721	1732339.5316	833.79	49+05.21	20.90 LT
12	U2412-12	815922.6267	1732467.6079	826.45	OUTSIDE PROJECT LIMITS	

BY12

POINT	DESC.	NORTH	EAST	ELEVATION	Y19 STATION	OFFSET
254	BY12-254	819106.2511	1730024.7167	842.68	14+85.51	5286.11 RT
255	BY12-255	819211.6402	1730329.2234	839.93	14+63.27	5005.50 LT
256	BY12-256	819717.4644	1730747.3487	853.16	14+63.27	4349.35 RT
A14	U2412-14	820168.3892	1731172.0298	844.51	14+63.27	3730.64 RT

BY13

POINT	DESC.	NORTH	EAST	ELEVATION	Y20 STATION	OFFSET
257	BY13-257	821086.7343	1730603.9139	835.76	OUTSIDE PROJECT LIMITS	
B194	BL-194	820470.0493	1731442.2379	853.87	12+74.25	3762.16 RT
258	BY13-258	819984.2246	1731651.8339	853.00	12+96.35	4051.70 RT
259	BY13-259	819138.0558	1731905.3982	813.79	13+23.51	4695.58 RT

BY14

POINT	DESC.	NORTH	EAST	ELEVATION	Y22 STATION	OFFSET
CA9	BL-9	825347.3848	1734637.0472	870.11	OUTSIDE PROJECT LIMITS	
C103	BY14-103	824977.4881	1735136.4511	861.58	15+93.46	11.55 LT

BY15

POINT	DESC.	NORTH	EAST	ELEVATION	Y21 STATION	OFFSET
C1015	U2412-15	826133.1902	1734070.1047	857.30	10+90.60	34.08 LT
CA1016	U2412-16	825467.3615	1734925.7427	873.48	21+74.78	31.30 LT

BY16

POINT	DESC.	NORTH	EAST	ELEVATION	Y23 STATION	OFFSET
CA10	BL-10	826035.1018	1735263.7698	868.94	OUTSIDE PROJECT LIMITS	
C104	BY16-104	825659.7549	1735800.3136	863.61	OUTSIDE PROJECT LIMITS	

BY17

POINT	DESC.	NORTH	EAST	ELEVATION	Y46 STATION	OFFSET
CA11	BL-11	826553.2286	1735477.5506	863.11	OUTSIDE PROJECT LIMITS	
C105	BY17-105	826462.0116	1735843.7071	860.94	13+62.68	5.28 LT
C106	BY17-106	826664.2544	1736489.3990	861.70	20+38.76	21.87 LT

BY18

POINT	DESC.	NORTH	EAST	ELEVATION	Y24 STATION	OFFSET
CA105	BY17-105	826462.0116	1735843.7071	860.94	OUTSIDE PROJECT LIMITS	
C107	BY18-107	826393.6360	1736218.5389	853.80	11+45.46	164.54 RT
C108	BY18-108	826360.7508	1736613.8353	852.42	14+40.22	12.24 LT
C109	BY18-109	826304.7455	1736990.8451	846.34	OUTSIDE PROJECT LIMITS	

BY19

POINT	DESC.	NORTH	EAST	ELEVATION	Y47 STATION	OFFSET
CA27	BL-27	829661.9731	1741627.8524	874.98	OUTSIDE PROJECT LIMITS	
C110	BY19-110	829162.7147	1741031.4689	876.85	19+96.16	10.87 RT
C111	BY19-111	828749.6932	1740703.6796	882.48	14+70.32	15.01 RT

BY19

POINT	DESC.	NORTH	EAST	ELEVATION	Y47 STATION	OFFSET
CA27		829661.9731	1741627.8524	874.98	OUTSIDE PROJECT LIMITS	
C110	BY19-110	829162.7147	1741031.4689	876.85	19+96.16	10.87 RT
C111	BY19-111	828749.6932	1740703.6796	882.48	14+70.32	15.01 RT

BY20

POINT	DESC.	NORTH	EAST	ELEVATION	Y35A STATION	OFFSET
C112	BY20-112	828856.7189	1741316.9351	879.02	OUTSIDE PROJECT LIMITS	
CA110	BY19-110	829162.7147	1741031.4689	876.85	10+01.74	31.53 LT

BY21

POINT	DESC.	NORTH	EAST	ELEVATION	Y37 STATION	OFFSET
C113	BY21-113	830680.6735	1741989.7566	896.96	OUTSIDE PROJECT LIMITS	
CA28	BL-28	830090.9252	1742283.7858	889.45	OUTSIDE PROJECT LIMITS	

BY22

POINT	DESC.	NORTH	EAST	ELEVATION	Y39 STATION	OFFSET
CB29	BL-29	830289.9082	1742618.9469	882.10	10+11.76	17.43 LT
C114	BY22-114	829754.0543	1742941.5337	881.49	OUTSIDE PROJECT LIMITS	

BY23

POINT	DESC.	NORTH	EAST	ELEVATION	Y38 STATION	OFFSET
C115	BY23-115	830912.0206	1741956.9597	890.56	OUTSIDE PROJECT LIMITS	
C116	BY23-116	830702.4338	1742376.7720	893.41	OUTSIDE PROJECT LIMITS	
CA29	BL-29	830289.9082	1742618.9469	882.10	OUTSIDE PROJECT LIMITS	

BY24

POINT	DESC.	NORTH	EAST	ELEVATION	Y40 STATION	OFFSET
C117	BY24-117	831607.0198	1742218.9672	881.63	10+68.83	29.63 RT
C118	BY24-118	831376.4833	1742737.2164	864.27	16+36.04	28.78 RT
CA1017	U2412-17	831217.3894	1743315.5914	887.10	OUTSIDE PROJECT LIMITS	

BY25

POINT	DESC.	NORTH	EAST	ELEVATION	Y41 STATION	OFFSET
CB1017	U2412-17	831217.3894	1743315.5914	887.10	10+43.43	45.37 LT
C1018	U2412-18	830601.1866	1743893.3987	890.85	OUTSIDE PROJECT LIMITS	

ELEVATION OF "HAWTHORNE RESET" IS 890.88'
GEOID MODEL USED: GEOID 99

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "HAWTHORNE RESET"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF
NORTHING: 851336.3748(ft) EASTING: 1722541.0825(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999940190
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "HAWTHORNE RESET" TO -L- STATION 248+95.34 IS
S 12 ° 39' 27" E 35,785.4038(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:

   HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   THE FILES TO BE FOUND ARE AS FOLLOWS:

   U2412B_LS_CONTROL_081006.TXT

   SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

   PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM FROM EXISTING NCGS MONUMENTATION.

21-NOV-2011 16:54
G:\Projects\2011\A-U-2412 BY\U-2412B\Roadway\Proj\u2412b_ls_1d.dgn
Documents: BY WAMCH_J1_00028

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	1E
Location and Surveys	

U-2412B SURVEY CONTROL SHEET

BENCHMARK DATA

BMAB14 ELEVATION - 834.43
N 816740 E 1731135
L STATION 256+28 234 RIGHT
BM #14 - U2412A&B, R/R SPIKE SET IN 12 INCH SWEET GUM

BMAB15 ELEVATION - 827.39
N 818699 E 1730976
L STATION 275+24 113 LEFT
BM #14 - U2412A&B, R/R SPIKE SET IN 24 INCH SWEET GUM

BMC1 ELEVATION - 845.76
N 820559 E 1731746
L STATION 295+68 54 RIGHT
BM #1 - U2412C, R/R SPIKE SET IN 10 INCH OAK

BMC2 ELEVATION - 841.62
N 822411 E 1732613
L STATION 316+10 164 LEFT
BM #2 - U2412C, R/R SPIKE SET IN 12 INCH PINE

BMC3 ELEVATION - 854.35
N 824111 E 1733604
L STATION 335+66 133 LEFT
BM #3 - U2412C, R/R SPIKE SET IN 16 INCH CEDAR

BMC4 ELEVATION - 872.27
N 825305 E 1735110
Y21 STATION 24+19 16 LEFT
BM #4 - U2412C, R/R SPIKE SET IN 18 INCH WHITE OAK

BMC5 ELEVATION - 859.58
N 826176 E 1734104
Y21 STATION 10+91 89 LEFT
BM #5 - U2412C, R/R SPIKE SET IN 15 INCH CEDAR

BMC6 ELEVATION - 844.67
N 826256 E 1737015
Y24 STATION 15+35
S 74° 16' 50.6" E DIST 319.04
BM #6 - U2412C, R/R SPIKE SET IN 16 INCH CEDAR

BMC7 ELEVATION - 862.09
N 827292 E 1735466
L STATION 373+88 94 LEFT
BM #7 - U2412C, R/R SPIKE SET IN 15 INCH WHITE OAK

BMC8 ELEVATION - 856.63
N 828881 E 1736900
L STATION 395+09 80 RIGHT
BM #8 - U2412C, R/R SPIKE SET IN 24 INCH WHITE OAK

BMC9 ELEVATION - 863.62
N 829659 E 1738455
L STATION 412+87 6 LEFT
BM #9 - U2412C, R/R SPIKE SET IN 12 INCH CEDAR

BMC10 ELEVATION - 851.33
N 829708 E 1740315
Y35B STATION 14+90 11 RIGHT
BM #10 - U2412C, R/R SPIKE SET IN 11 INCH HICKORY

BMC11 ELEVATION - 889.69
N 830915 E 1741858
Y38 STATION 10+00
N 61° 25' 41.3" W DIST 657.44
BM #11 - U2412C, R/R SPIKE SET IN 30 INCH WHITE OAK

BMC12 ELEVATION - 891.79
N 830540 E 1743927
Y41 STATION 18+39
S 41° 07' 32.3" E DIST 104.22
BM #12 - U2412C, R/R SPIKE SET IN 24 INCH OAK

BMC13 ELEVATION - 890.35
N 831460 E 1742065
Y40 STATION 10+00
S 27° 02' 48.3" W DIST 226.96
BM #13 - U2412C, R/R SPIKE SET IN 30 INCH OAK

BMC14 ELEVATION - 880.01
N 828751 E 1740620
Y47 STATION 14+16 48 LEFT
BM #14 - U2412C, R/R SPIKE SET IN 17 INCH CEDAR

BMC15 ELEVATION - 876.47
N 832173 E 1743831
L STATION 480+50
N 67° 59' 58.1" E DIST 95.52
BM #15 - U2412C, R/R SPIKE SET IN 12 INCH CHERRY

BMC16 ELEVATION - 892.37
N 830166 E 1742175
L STATION 453+82 111 LEFT
BM #16 - U2412C, R/R SPIKE SET IN 14 INCH MAGNOLIA

BMC17 ELEVATION - 882.63
N 829697 E 1743037
L STATION 458+80 735 RIGHT
BM #17 - U2412C, R/R SPIKE SET IN 12 INCH CEDAR

BMC17 ELEVATION - 882.63
N 829697 E 1743037
Y37 STATION 13+50
S 60° 53' 54.7" E DIST 848.16
BM #17 - U2412C, R/R SPIKE SET IN 12 INCH CEDAR

ELEVATION OF "HAWTHORNE RESET" IS 890.88'
GEOID MODEL USED: GEOID 99

DATUM DESCRIPTION

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   PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM FROM EXISTING NCGS MONUMENTATION.

21-NOV-2011 16:54
S:\PROJECTS\U2412A-U-2412_BY\U-2412B\Roadway\Proj\u2412b_ls_1e.dgn
bburgess AT W-AMCHI-D-00028

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

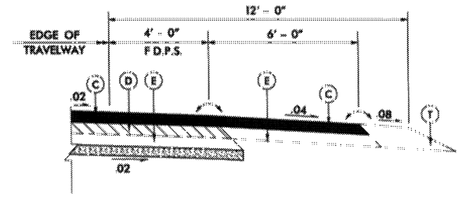
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

PAVEMENT SCHEDULE

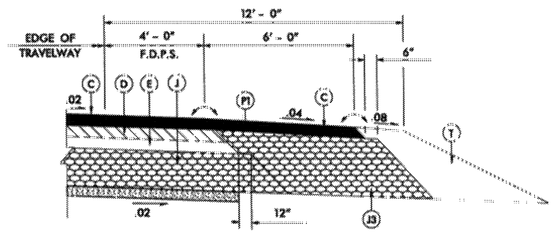
A	PROP. APPROX. 11.5" JOINTED CONCRETE PAVEMENT WITH DOWELS.
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
C3	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D3	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
D4	PROP. APPROX. 3.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.
D5	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2¼" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 3.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
E2	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E3	PROP. APPROX. 4.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
E4	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E5	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E6	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J1	PROP. 8" AGGREGATE BASE COURSE.
J2	PROP. 10" AGGREGATE BASE COURSE.
J3	PROP. VARIABLE DEPTH AGGREGATE BASE COURSE.
K	SUBGRADE STABILIZATION
P1	PRIMECOAT AT THE RATE OF .50 GAL. PER SQ. YARD.
R1	2'-6" CONC. CURB AND GUTTER
R2	1'-8" CONC. CURB AND GUTTER
R3	5" MONOLITHIC CONCRETE ISLAND (KEYED IN)
S	CONCRETE SIDEWALK
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

NOTE: ALL PAVEMENT SLOPES ARE 1:1 UNLESS NOTED OTHERWISE



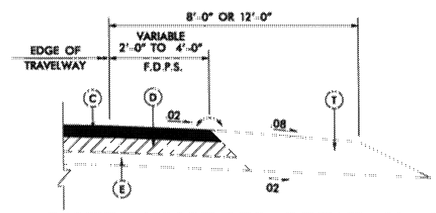
PAVED SHOULDER DETAIL No. 1

USE IN CONJUNCTION WITH
TYPICAL SECTION No. 1, 2, 5, 30 (OUTSIDE), & 31(OUTSIDE)



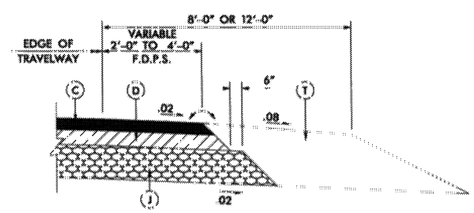
PAVED SHOULDER DETAIL No. 2

USE IN CONJUNCTION WITH
TYPICAL SECTION No. 1, 2, 5, 30 (OUTSIDE), & 31(OUTSIDE)
(ALT PAVEMENT DESIGN)



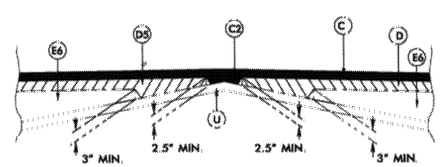
PAVED SHOULDER DETAIL No. 3

USE IN CONJUNCTION WITH
TYPICAL SECTION NO. 8, 9, 21, 22, 23, 24,
25, 30 (INSIDE) & 31(INSIDE)

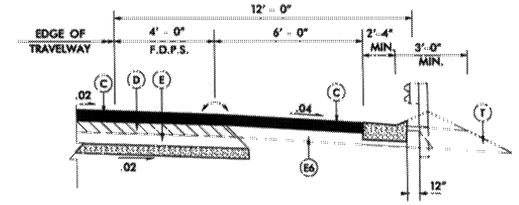


PAVED SHOULDER DETAIL No. 4

USE IN CONJUNCTION WITH
TYPICAL SECTION NO. 8, 9, 21, 22, 23, 24,
25, 30 (INSIDE) & 31(INSIDE)
(ALT PAVEMENT DESIGN)

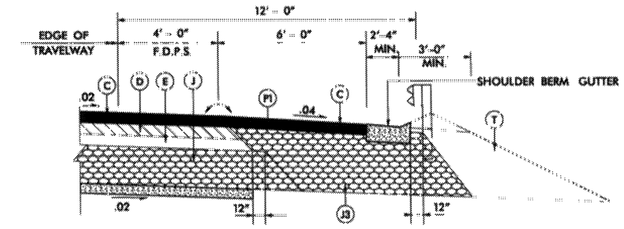


DETAIL SHOWING METHOD OF WEDGING No. 5



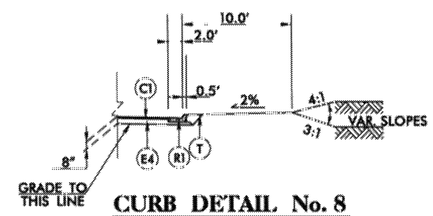
SHOULDER BERM GUTTER DETAIL No. 6

USE IN CONJUNCTION WITH
TYPICAL SECTION NO. 5 & 30



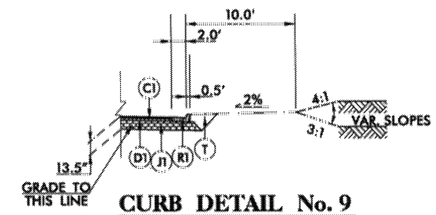
SHOULDER BERM GUTTER DETAIL No. 7

USE IN CONJUNCTION WITH
TYPICAL SECTION NO. 5 & 30
(ALT PAVEMENT DESIGN)



CURB DETAIL No. 8

USE CURB DETAIL FOR THE FOLLOWING
-Y35B- STA. 21+67.20 TO STA. 23+96.94 (RT)



CURB DETAIL No. 9

USE CURB DETAIL FOR THE FOLLOWING
Y35B STA. 21+67.20 TO STA. 23+96.94 (RT)
(ALT PAVEMENT DESIGN)

PAVEMENT DESIGN FOR DETAILS

LINE	SURFACE	INTERMEDIATE	BASE	ABC
L	C1	D2	E1	- -
L (PDPS), Y19, Y20, Y23, Y48, Y24, Y24A, Y37, Y38, Y39, Y49	C1	- - - - -	E2	- - - - -
Y16, RAMPS A,B,C,D, & SPUR A,B,C,D	C1	D3	E4	- - - - -
Y50, Y52	C1	- - - - -	E5	- - - - -
Y45, Y51, Y46	C1	D3	E2	- - - - -
Y18, Y21, Y47	C1	D2	E2	- - - - -
Y22	C1	- - - - -	E3	- - - - -
Y35A, Y35B	C1	- - - - -	E4	- - - - -
Y40, Y41	C1	D2	E3	- - - - -
ALTERNATE PAVEMENT DESIGN				
L, Y16, Y47, Y49	C1	D2	- - - - -	J1
L (PDPS)	C1	- - - - -	- - - - -	J3
RAMPS A,B,C,D, & SPUR A,B,C,D	C1	D4	- - - - -	J2
Y45, Y46	C1	D3	- - - - -	J1
Y19	C1	- - - - -	- - - - -	J2
Y23, Y48	C1	- - - - -	- - - - -	J1
Y35B	C1	D1		J1

6/2/99
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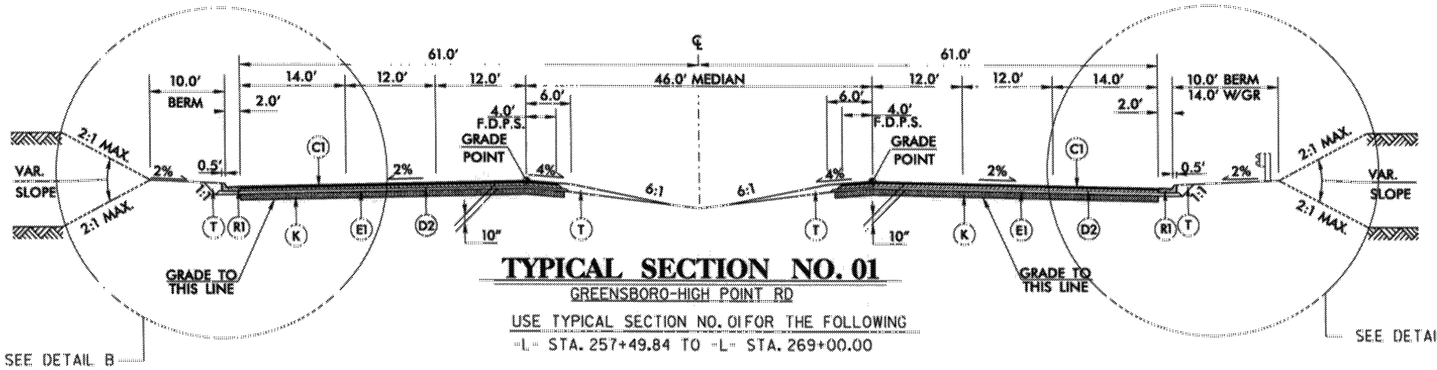
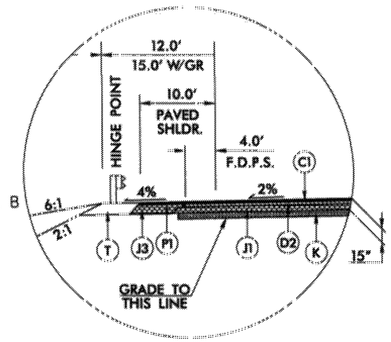


TYPICAL SECTION NO. 01

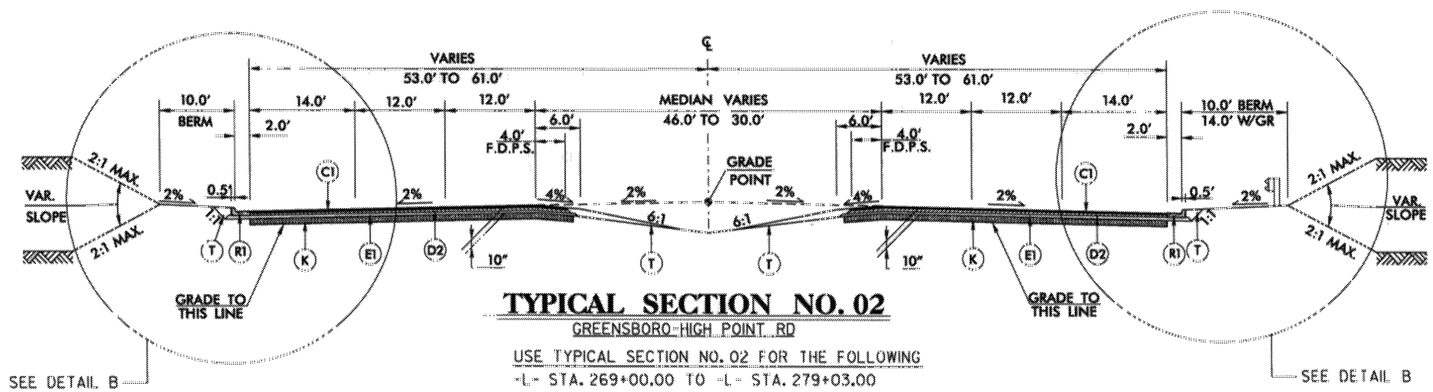
GREENSBORO-HIGH POINT RD

USE TYPICAL SECTION NO. 01 FOR THE FOLLOWING

-L- STA. 257+49.84 TO -L- STA. 269+00.00



ALTERNATE PAVEMENT DESIGN
DETAIL A

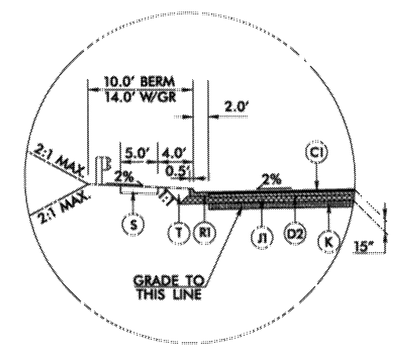


TYPICAL SECTION NO. 02

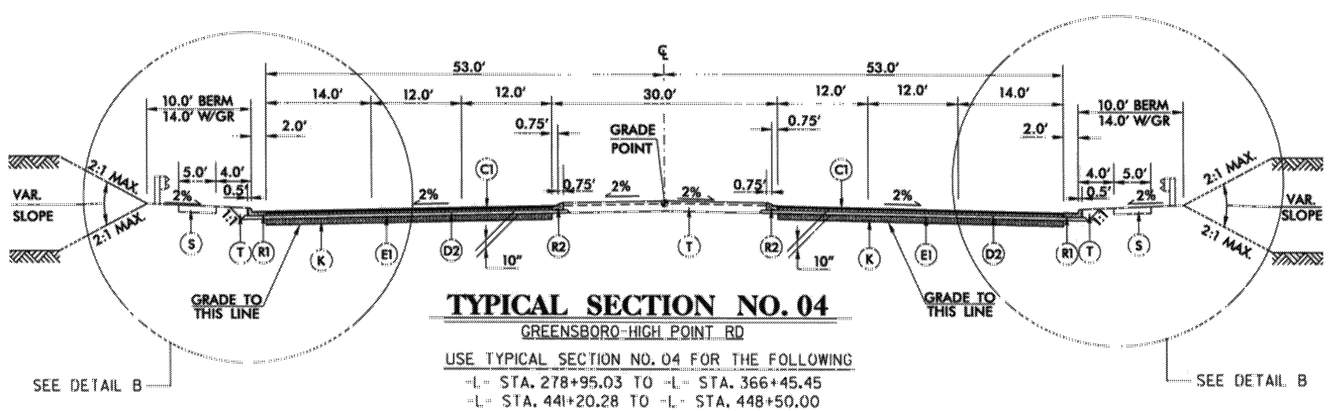
GREENSBORO-HIGH POINT RD

USE TYPICAL SECTION NO. 02 FOR THE FOLLOWING

-L- STA. 269+00.00 TO -L- STA. 279+03.00



ALTERNATE PAVEMENT DESIGN
DETAIL B



TYPICAL SECTION NO. 04

GREENSBORO-HIGH POINT RD

USE TYPICAL SECTION NO. 04 FOR THE FOLLOWING

-L- STA. 278+95.03 TO -L- STA. 366+45.45

-L- STA. 441+20.28 TO -L- STA. 448+50.00

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

A	11.5" JOINTED CONC. W/ DOWELS.
C1	3" TYPE S9.5B
C2	VARIABLE DEPTH TYPE S9.5B
C3	1.5" TYPE S9.5B,
D1	2.5" TYPE I19.0B
D2	4" TYPE I19.0B
D3	3" TYPE I19.0B
D4	3.5" TYPE I19.0B
D5	VARIABLE DEPTH TYPE I19.0B
E1	3" TYPE B25.0B
E2	4" TYPE B25.0B
E3	4.5" TYPE B25.0B
E4	5" TYPE B25.0B
E5	5.5" TYPE B25.0B
E6	VARIABLE DEPTH TYPE B25.0B
J1	8" ABC
J2	10" ABC
J3	VARIABLE DEPTH ABC
K	SUBGRADE STABILIZATION
P1	PRIMECOAT
R1	2'-6" CONC. CURB AND GUTTER
R2	1'-6" CONC. CURB AND GUTTER
R3	5" MONOLITHIC CONCRETE ISLAND (KEYED IN)
S	CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT SEE WEDGING DETAILS

NOTE: ALL PAVEMENT SLOPES ARE 1:1 UNLESS NOTED OTHERWISE

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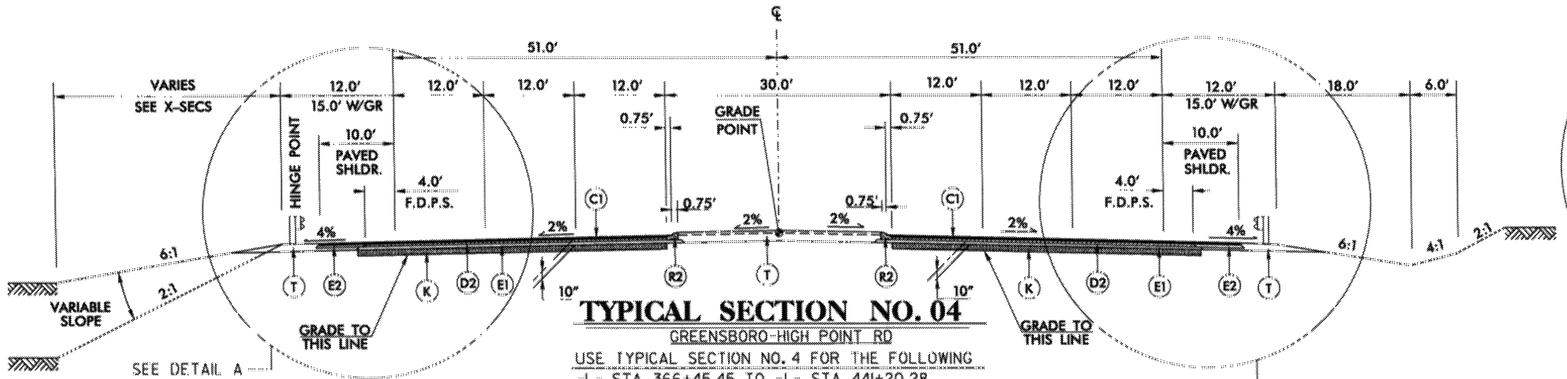
Transport. Bldg. W.Bacon, P.Bowden



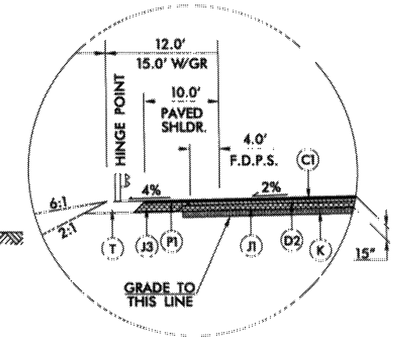
TYPICAL SECTION NO. 04

GREENSBORO-HIGH POINT RD

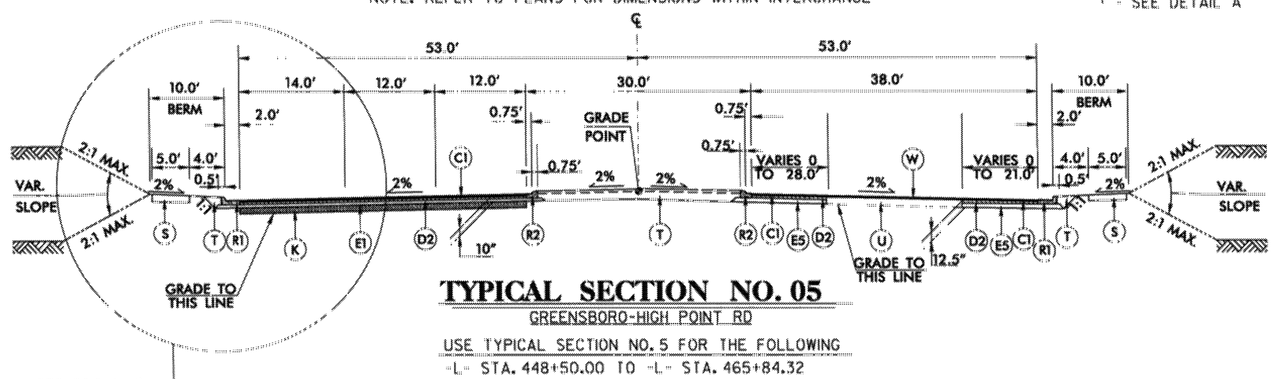
USE TYPICAL SECTION NO. 4 FOR THE FOLLOWING

-L- STA. 366+45.45 TO -L- STA. 441+20.28

NOTE: REFER TO PLANS FOR DIMENSIONS WITHIN INTERCHANGE



ALTERNATE PAVEMENT DESIGN
DETAIL A

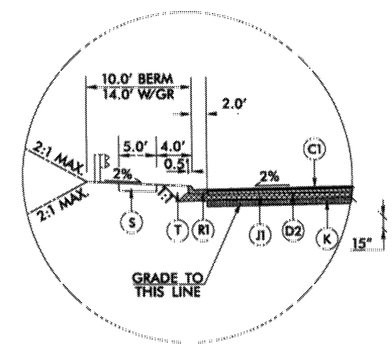


TYPICAL SECTION NO. 05

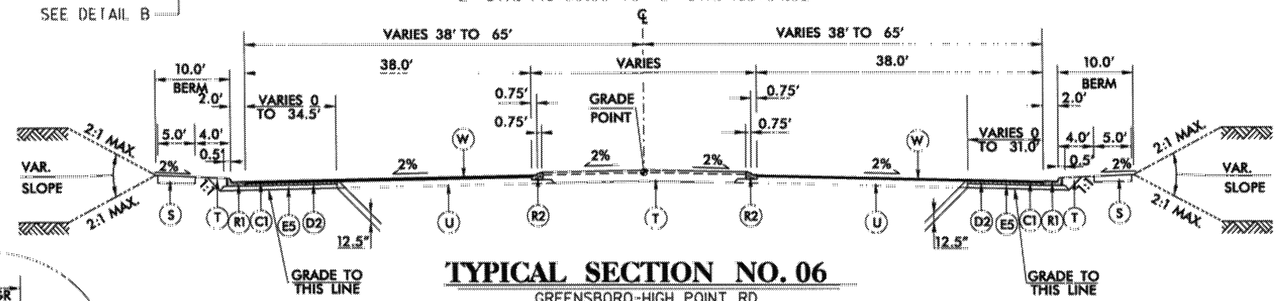
GREENSBORO-HIGH POINT RD

USE TYPICAL SECTION NO. 5 FOR THE FOLLOWING

-L- STA. 448+50.00 TO -L- STA. 465+84.32



ALTERNATE PAVEMENT DESIGN
DETAIL B

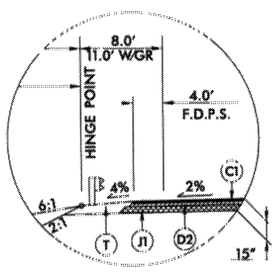


TYPICAL SECTION NO. 06

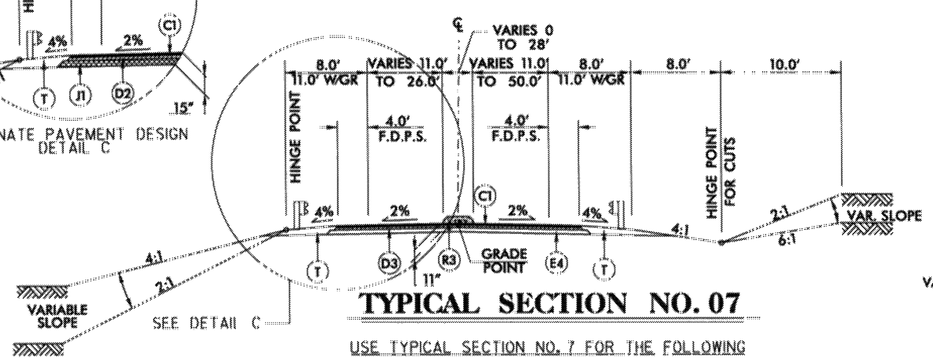
GREENSBORO-HIGH POINT RD

USE TYPICAL SECTION NO. 6 FOR THE FOLLOWING

-L- STA. 465+84.32 TO -L- STA. 480+20.00



ALTERNATE PAVEMENT DESIGN
DETAIL C

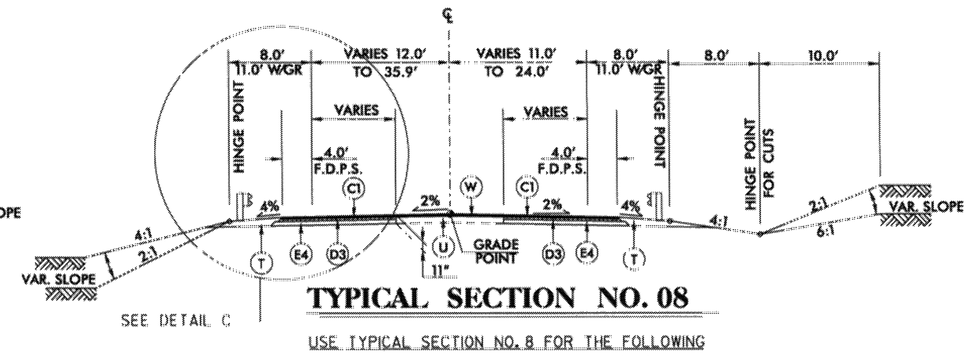


TYPICAL SECTION NO. 07

USE TYPICAL SECTION NO. 7 FOR THE FOLLOWING

-Y16- STA. 25+00.00 TO STA. 32+62.76

-Y16- STA. 35+30.72 TO STA. 41+10.00



TYPICAL SECTION NO. 08

USE TYPICAL SECTION NO. 8 FOR THE FOLLOWING

-Y16- STA. 21+79.00 TO STA. 25+00.00

-Y16- STA. 41+10.00 TO STA. 46+80.00

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	2-B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

A	11.5" JOINTED CONC. W/ DOWELS.
C1	3" TYPE S9.5B
C2	VARIABLE DEPTH TYPE S9.5B
C3	1.5" TYPE S9.5B,
D1	2.5" TYPE I19.0B
D2	4" TYPE I19.0B
D3	3" TYPE I19.0B
D4	3.5" TYPE I19.0B
D5	VARIABLE DEPTH TYPE I19.0B
E1	3" TYPE B25.0B
E2	4" TYPE B25.0B
E3	4.5" TYPE B25.0B
E4	5" TYPE B25.0B
E5	5.5" TYPE B25.0B
E6	VARIABLE DEPTH TYPE B25.0B
J1	8" ABC
J2	10" ABC
J3	VARIABLE DEPTH ABC
K	SUBGRADE STABILIZATION
P1	PRIMECOAT
R1	2' 6" CONC. CURB AND GUTTER
R2	1' 6" CONC. CURB AND GUTTER
R3	5" MONOLITHIC CONCRETE ISLAND (KEYED IN)
S	CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT SEE WEDGING DETAILS

NOTE: ALL PAVEMENT SLOPES ARE 1:1 UNLESS NOTED OTHERWISE

5/2/90
21-NOV-2011 6:54
pb-jacobs\70101\u-2412_ftg\U-2412B\Roadway\P-ej\U-2412B_Ftg_typ_02B.dgn
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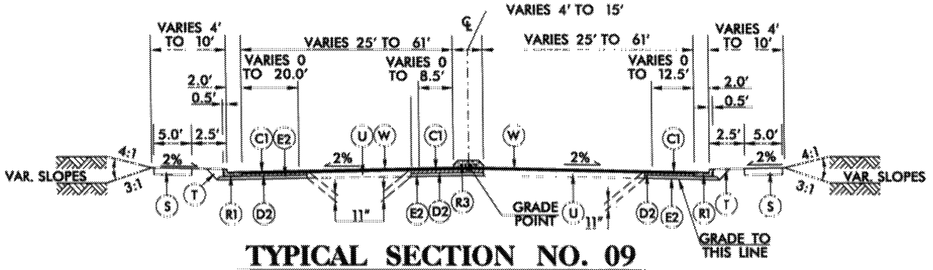
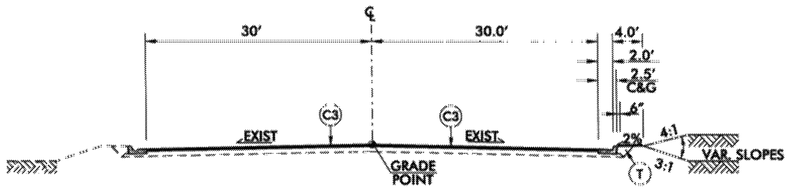


TYPICAL SECTION NO. 09

USE TYPICAL SECTION NO. 09 FOR THE FOLLOWING

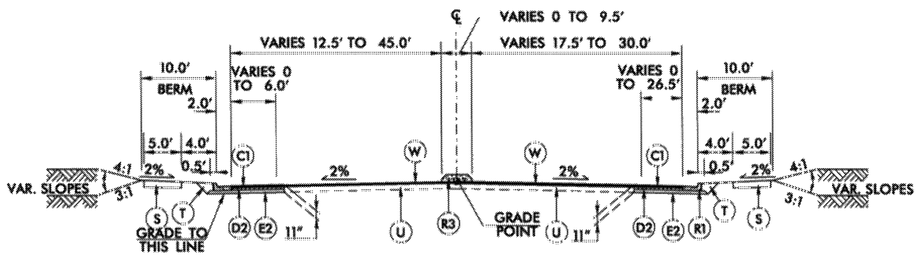
-Y18- STA. 14+50.00 TO STA. 21+77.68
-Y18- STA. 22+90.95 TO STA. 29+85.75



TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 10 FOR THE FOLLOWING

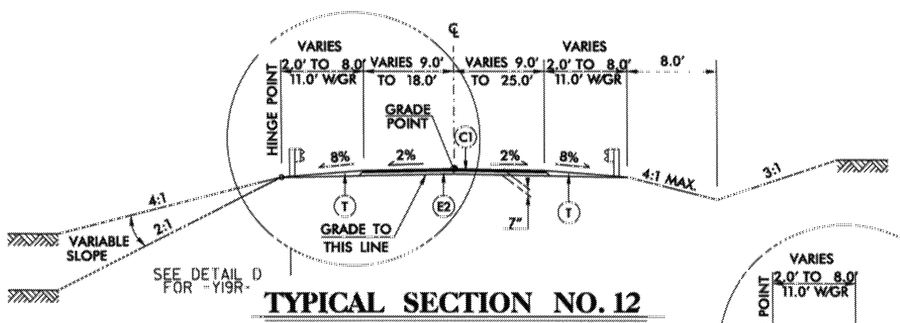
-Y21- STA. 11+00.00 TO STA. 13+30.00



TYPICAL SECTION NO. 11

USE TYPICAL SECTION NO. 11 FOR THE FOLLOWING

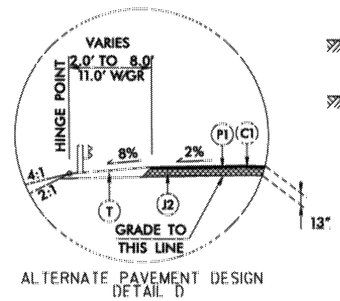
-Y21- STA. 13+30.00 TO STA. 20+07.40
-Y21- STA. 21+25.55 TO STA. 23+10.00



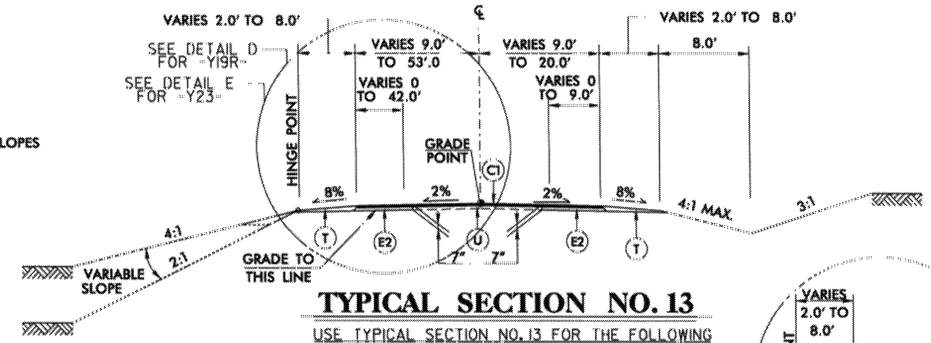
TYPICAL SECTION NO. 12

USE TYPICAL SECTION NO. 12 FOR THE FOLLOWING

-Y19R- STA. 10+53.66 TO STA. 13+37.76
-Y20- STA. 10+54.98 TO STA. 11+50.00
-Y24- STA. 10+18.40 TO STA. 13+50.00
-Y24A- STA. 10+11.00 TO STA. 11+10.00
-Y37- STA. 11+00.00 TO STA. 12+98.98
-Y38- STA. 10+30.00 TO STA. 10+70.00
-Y53- STA. 10+23.21 TO STA. 13+25.00



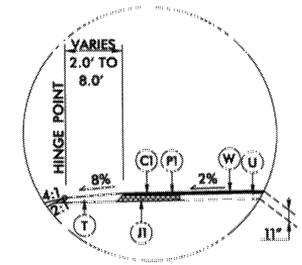
ALTERNATE PAVEMENT DESIGN DETAIL D



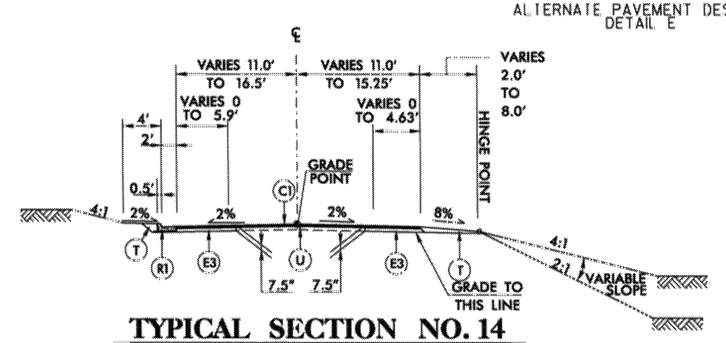
TYPICAL SECTION NO. 13

USE TYPICAL SECTION NO. 13 FOR THE FOLLOWING

-Y19R- STA. 13+37.76 TO STA. 13+97.76
-Y20- STA. 11+50.00 TO STA. 14+00.00
-Y23- STA. 10+67.08 TO STA. 12+00.00
-Y39- STA. 10+53.00 TO STA. 11+79.80



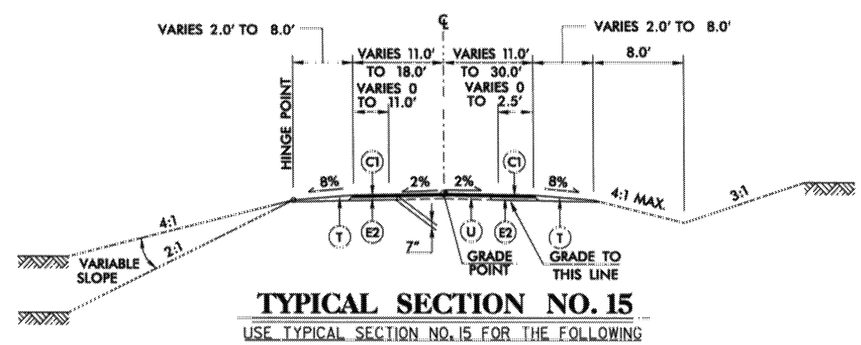
ALTERNATE PAVEMENT DESIGN DETAIL E



TYPICAL SECTION NO. 14

USE TYPICAL SECTION NO. 14 FOR THE FOLLOWING

-Y22- STA. 10+65.54 TO STA. 11+52.30



TYPICAL SECTION NO. 15

USE TYPICAL SECTION NO. 15 FOR THE FOLLOWING

-Y24- STA. 13+50.00 TO STA. 14+50.00
-Y24A- STA. 11+10.00 TO STA. 12+09.84
TURN AROUND 1, 2, & 3

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	2-C
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

A	11.5" JOINTED CONC. W/ DOWELS.
C1	3" TYPE S9.5B
C2	VARIABLE DEPTH TYPE S9.5B
C3	1.5" TYPE S9.5B,
D1	2.5" TYPE I19.0B
D2	4" TYPE I19.0B
D3	3" TYPE I19.0B
D4	3.5" TYPE I19.0B
D5	VARIABLE DEPTH TYPE I19.0B
E1	3" TYPE B25.0B
E2	4" TYPE B25.0B
E3	4.5" TYPE B25.0B
E4	5" TYPE B25.0B
E5	5.5" TYPE B25.0B
E6	VARIABLE DEPTH TYPE B25.0B
J1	8" ABC
J2	10" ABC
J3	VARIABLE DEPTH ABC
K	SUBGRADE STABILIZATION
P1	PRIMECOAT
R1	2'-6" CONC. CURB AND GUTTER
R2	1'-6" CONC. CURB AND GUTTER
R3	5" MONOLITHIC CONCRETE ISLAND (KEYED IN)
S	CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT SEE WEDGING DETAILS

NOTE: ALL PAVEMENT SLOPES ARE 1:1 UNLESS NOTED OTHERWISE

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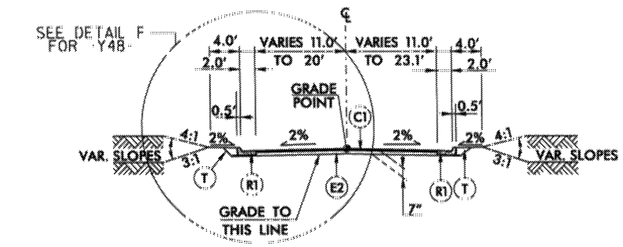
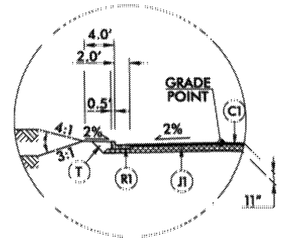
Pennest



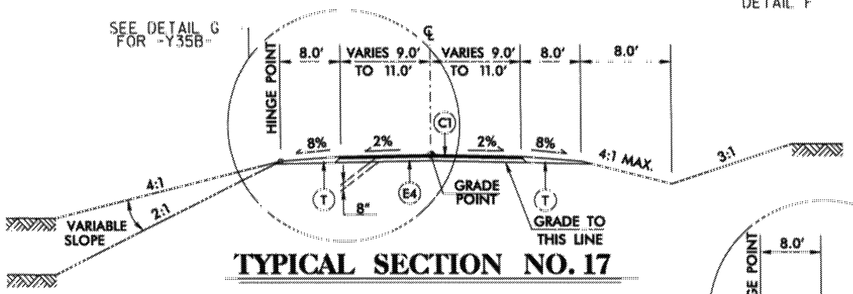
TYPICAL SECTION NO. 16

USE TYPICAL SECTION NO. 16 FOR THE FOLLOWING

-Y38- STA. 10+70.00 TO STA. 12+98.84
-Y48- STA. 10+30.00 TO STA. 11+46.13



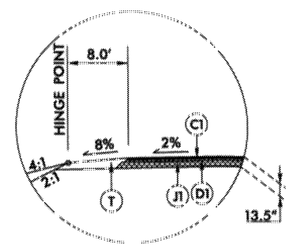
ALTERNATE PAVEMENT DESIGN DETAIL F



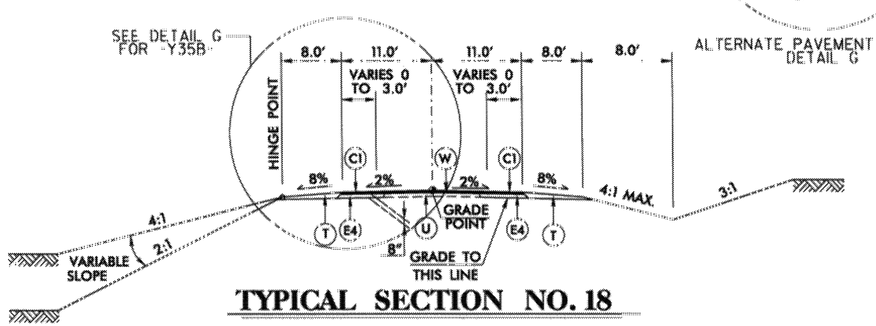
TYPICAL SECTION NO. 17

USE TYPICAL SECTION NO. 17 FOR THE FOLLOWING

-Y35A- STA. 10+20.76 TO STA. 10+50.00
-Y35B- STA. 10+45.77 TO STA. 17+50.00
-Y35B- STA. 21+50.00 TO STA. 23+84.81



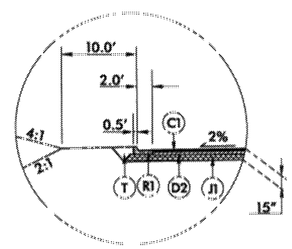
ALTERNATE PAVEMENT DESIGN DETAIL G



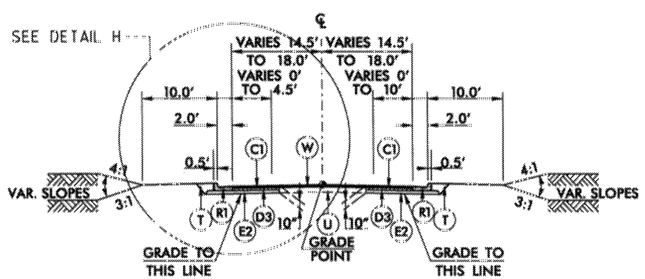
TYPICAL SECTION NO. 18

USE TYPICAL SECTION NO. 18 FOR THE FOLLOWING

-Y35A- STA. 10+50.00 TO STA. 11+55.00
-Y35B- STA. 17+50.00 TO STA. 21+50.00



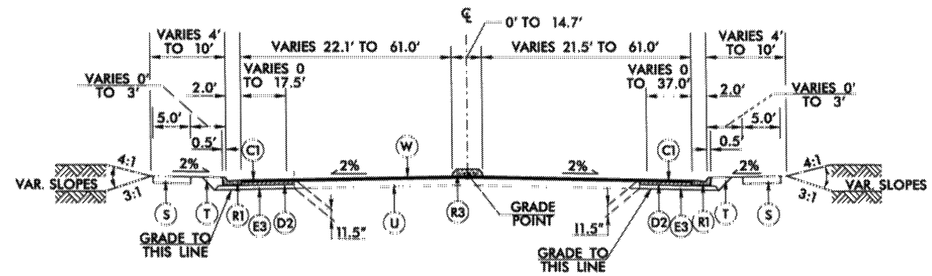
ALTERNATE PAVEMENT DESIGN DETAIL H



TYPICAL SECTION NO. 19

USE TYPICAL SECTION NO. 19 FOR THE FOLLOWING

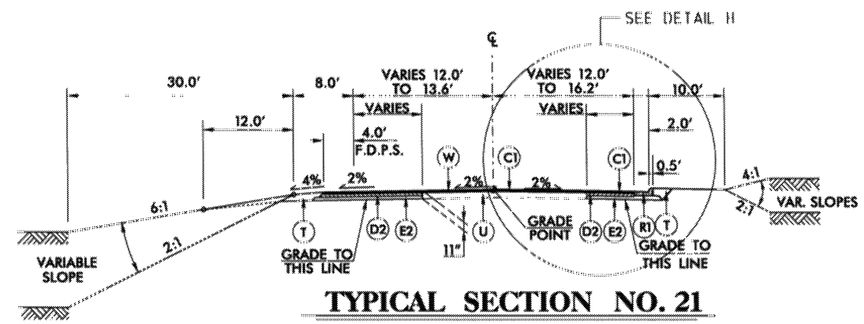
-Y51- STA. 9+63.60 TO STA. 11+75.00



TYPICAL SECTION NO. 20

USE TYPICAL SECTION NO. 20 FOR THE FOLLOWING

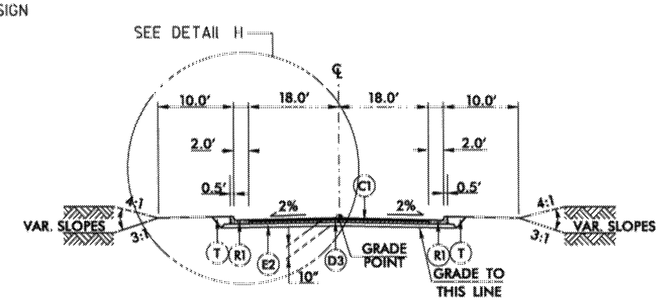
-Y40- STA. 11+50.00 TO STA. 21+26.42
-Y41- STA. 10+65.10 TO STA. 16+05.00
NOTE: CONSTRUCT S/W BETWEEN -Y41- STA. 10+63.96 TO STA. 16+05.00



TYPICAL SECTION NO. 21

USE TYPICAL SECTION NO. 21 FOR THE FOLLOWING

-Y50- STA. 10+18.00 TO STA. 13+17.65



TYPICAL SECTION NO. 22

USE TYPICAL SECTION NO. 22 FOR THE FOLLOWING

-Y51- STA. 11+75.00 TO STA. 13+70.33

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	2-D
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

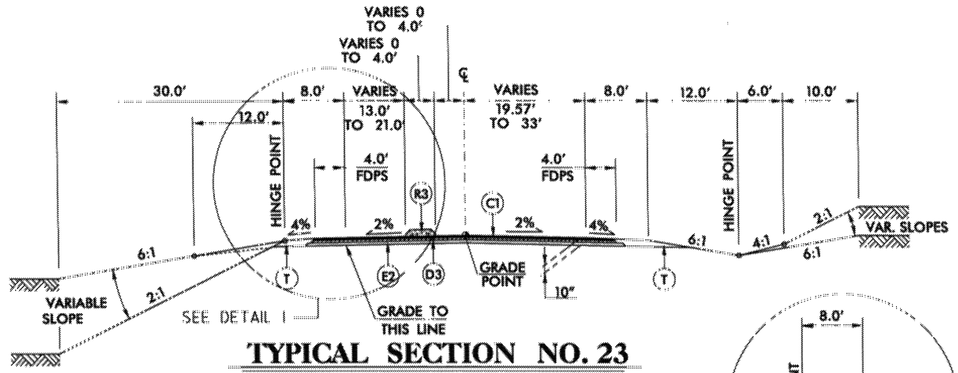
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

A	11.5" JOINTED CONC. W/ DOWELS.
C1	3" TYPE S9.5B
C2	VARIABLE DEPTH TYPE S9.5B
C3	1.5" TYPE S9.5B,
D1	2.5" TYPE I19.0B
D2	4" TYPE I19.0B
D3	3" TYPE I19.0B
D4	3.5" TYPE I19.0B
D5	VARIABLE DEPTH TYPE I19.0B
E1	3" TYPE B25.0B
E2	4" TYPE B25.0B
E3	4.5" TYPE B25.0B
E4	5" TYPE B25.0B
E5	5.5" TYPE B25.0B
E6	VARIABLE DEPTH TYPE B25.0B
J1	8" ABC
J2	10" ABC
J3	VARIABLE DEPTH ABC
K	SUBGRADE STABILIZATION
P1	PRIMECOAT
R1	2'-6" CONC. CURB AND GUTTER
R2	1'-6" CONC. CURB AND GUTTER
R3	5" MONOLITHIC CONCRETE ISLAND (KEYED IN)
S	CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT SEE WEDGING DETAILS

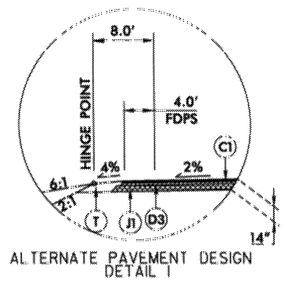
NOTE: ALL PAVEMENT SLOPES ARE 1:1 UNLESS NOTED OTHERWISE

6/2/99
21-NOV-2016 16:54
S:\Proj\U-2412B\Roadway\Proc\U-2412B_Rdy_typ_0220.dgn
U-2412B_TYP_SECTS_20-21-22
USERNAME = SCHEFFLER
DESIGN SIZE = 36.000 BY 24.000

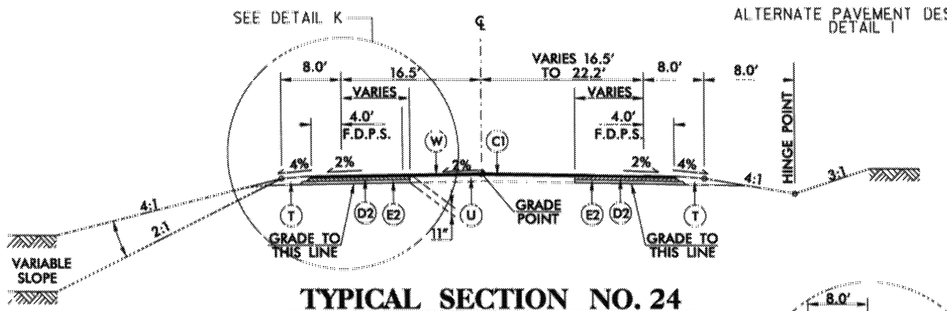


TYPICAL SECTION NO. 23

USE TYPICAL SECTION NO. 23 FOR THE FOLLOWING
-Y46- STA. 10+53.00 TO STA. 15+00.00

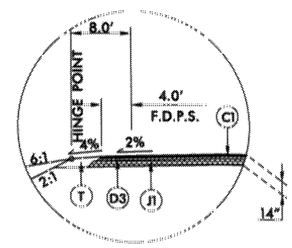


ALTERNATE PAVEMENT DESIGN
DETAIL I

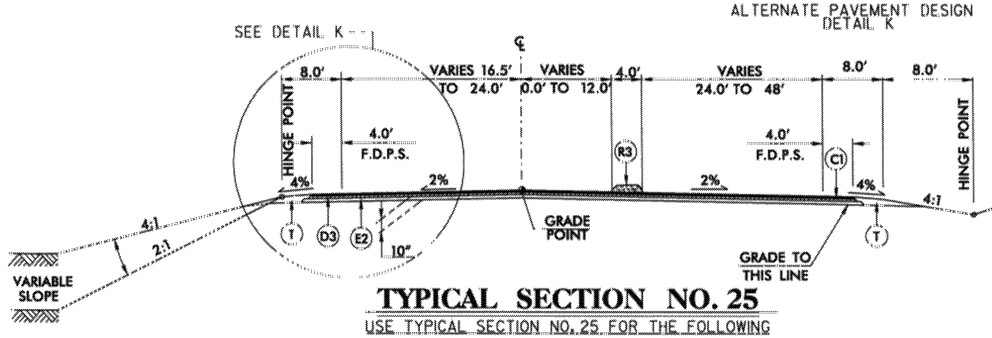


TYPICAL SECTION NO. 24

USE TYPICAL SECTION NO. 24 FOR THE FOLLOWING
-Y45R- STA. 13+00.00 TO STA. 15+00.00

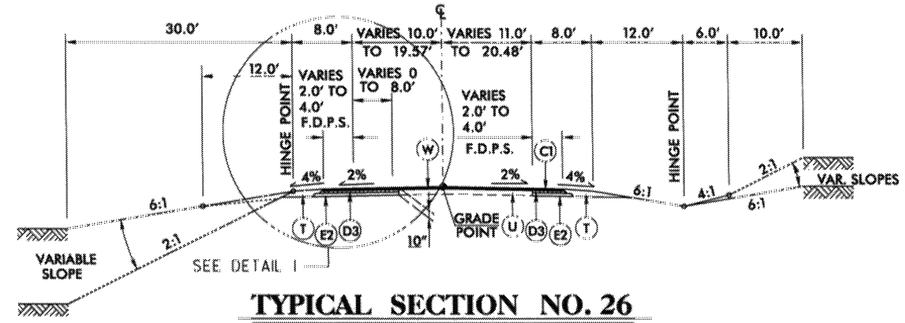


ALTERNATE PAVEMENT DESIGN
DETAIL K



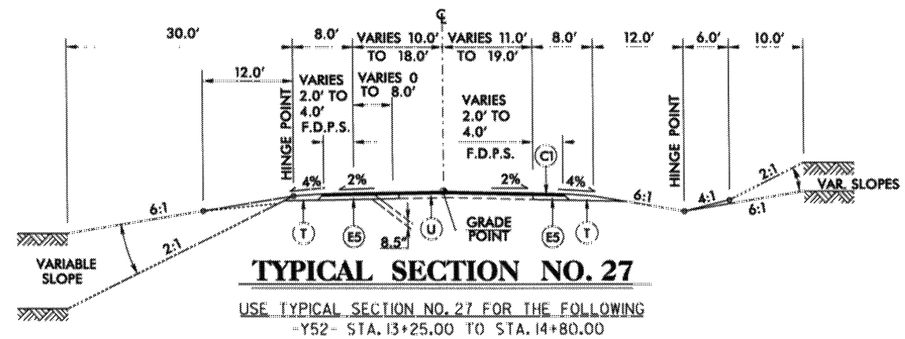
TYPICAL SECTION NO. 25

USE TYPICAL SECTION NO. 25 FOR THE FOLLOWING
-Y45R- STA. 15+00.00 TO STA. 23+00.00



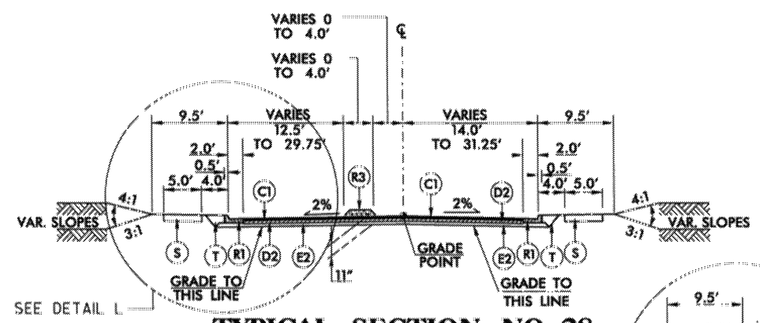
TYPICAL SECTION NO. 26

USE TYPICAL SECTION NO. 26 FOR THE FOLLOWING
-Y46- STA. 15+00.00 TO STA. 19+20.00



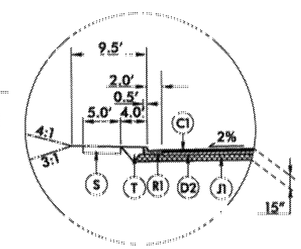
TYPICAL SECTION NO. 27

USE TYPICAL SECTION NO. 27 FOR THE FOLLOWING
-Y52- STA. 13+25.00 TO STA. 14+80.00

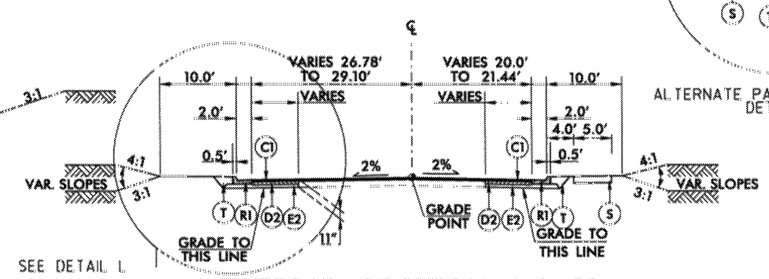


TYPICAL SECTION NO. 28

USE TYPICAL SECTION NO.28 FOR THE FOLLOWING
-Y47- STA. 19+00.00 TO STA. 23+57.67



ALTERNATE PAVEMENT DESIGN
DETAIL L



TYPICAL SECTION NO. 29

USE TYPICAL SECTION NO.29 FOR THE FOLLOWING
-Y47- STA. 14+60.00 TO STA. 19+00.00

PROJECT REFERENCE NO.	SHEET NO
U-2412B	2-E
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

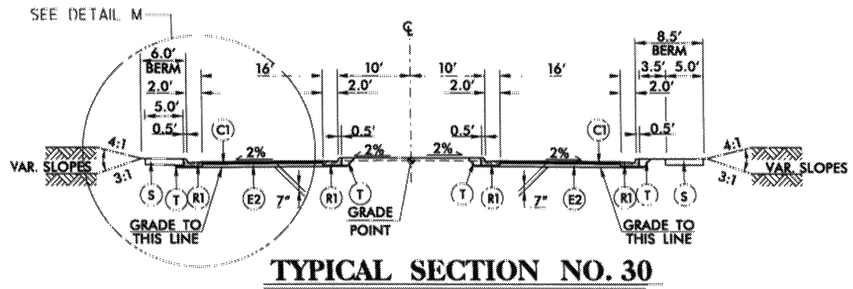
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No. F-1199

A	11.5" JOINTED CONC. W/ DOWELS.
C1	3" TYPE S9.5B
C2	VARIABLE DEPTH TYPE S9.5B
C3	1.5" TYPE S9.5B,
D1	2.5" TYPE I19.0B
D2	4" TYPE I19.0B
D3	3" TYPE I19.0B
D4	3.5" TYPE I19.0B
D5	VARIABLE DEPTH TYPE I19.0B
E1	3" TYPE B25.0B
E2	4" TYPE B25.0B
E3	4.5" TYPE B25.0B
E4	5" TYPE B25.0B
E5	5.5" TYPE B25.0B
E6	VARIABLE DEPTH TYPE B25.0B
J1	8" ABC
J2	10" ABC
J3	VARIABLE DEPTH ABC
K	SUBGRADE STABILIZATION
P1	PRIMECOAT
R1	2'-6" CONC. CURB AND GUTTER
R2	1'-6" CONC. CURB AND GUTTER
R3	5" MONOLITHIC CONCRETE ISLAND (KEYED IN)
S	CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT SEE WEDGING DETAILS

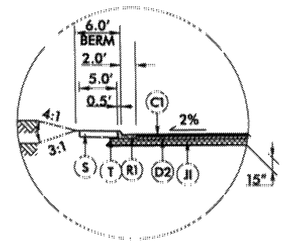
NOTE: ALL PAVEMENT SLOPES ARE 1:1 UNLESS NOTED OTHERWISE

5/2/96
21-NOV-2011 16:54
C:\Projects\2010\U-2412_B\U-2412B\Roadway\Proj\U-2412B_Rdy_typ_02E.dgn
pawrest
W-2MPH 11.2000/22

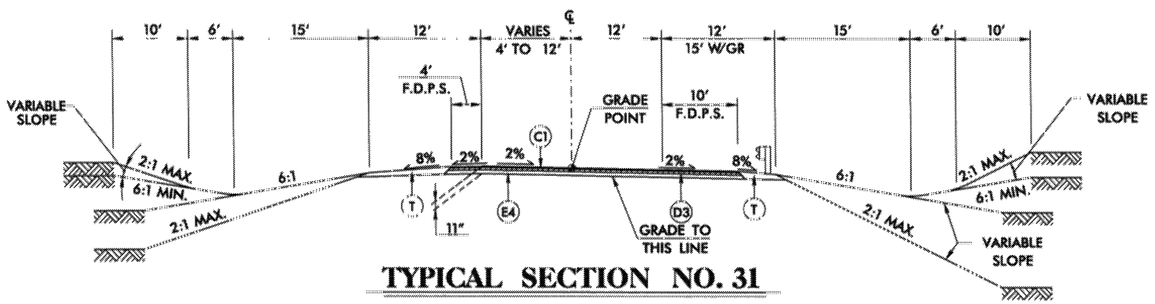


TYPICAL SECTION NO. 30

USE TYPICAL SECTION NO. 30 FOR THE FOLLOWING
-Y49- STA. 10+31.22 TO STA. 13+34.42

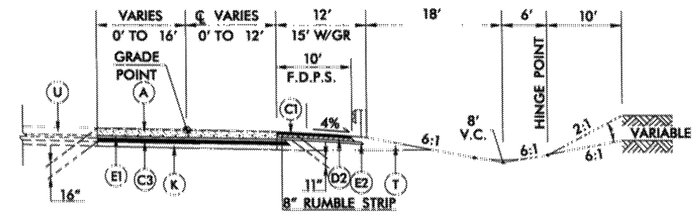


ALTERNATE PAVEMENT DESIGN
DETAIL M



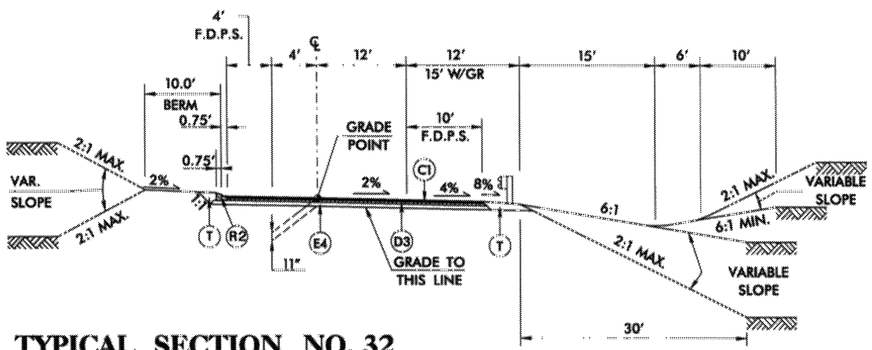
TYPICAL SECTION NO. 31

USE TYPICAL SECTION NO. 31 FOR THE FOLLOWING
-RAMPAREV- STA. 15+38.83 TO 19+22.33
SEE PLANS FOR DIM. FROM 15+10.16 TO STA. 15+38.83
-RAMPBREV- STA. 13+90.04 TO STA. 23+36.72 (INVERT TYPICAL)
-RAMPCREV- STA. 14+60.35 TO STA. 21+73.90
SEE PLANS FOR DIM. FROM STA 14+40.41 TO STA 14+60.35
-RAMPDREV- STA. 15+22.08 TO STA. 22+36.12 (INVERT TYPICAL)



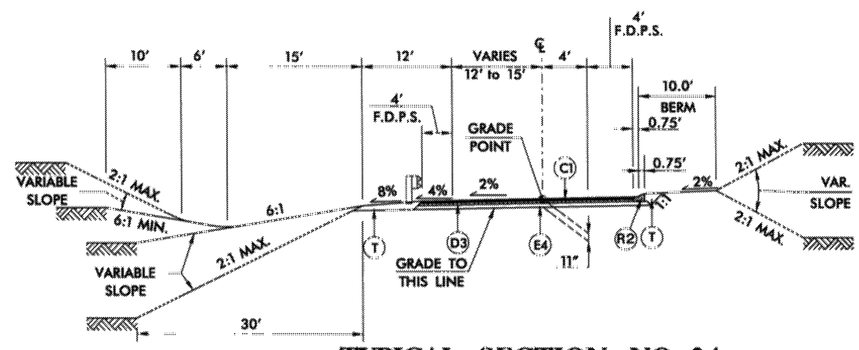
TYPICAL SECTION NO. 33

USE TYPICAL SECTION NO. 33 FOR THE FOLLOWING
-RAMPAREV- STA. 10+00.00 TO STA. 15+10.16
-RAMPBREV- STA. 10+00.00 TO STA. 13+90.04 (INVERT TYPICAL)
-RAMPCREV- STA. 10+00.00 TO STA. 14+40.41
-RAMPDREV- STA. 10+00.00 TO STA. 15+22.08 (INVERT TYPICAL)
GWL STA. 136+50.00 TO STA. 145+25.00 (LEFT SIDE ONLY)
GWL STA. 137+50.00 TO STA. 144+00.00 (RIGHT SIDE ONLY)
GWL STA. 174+05.00 TO STA. 180+50.00 (LEFT SIDE ONLY)
GWL STA. 174+00.00 TO STA. 183+00.00 (RIGHT SIDE ONLY)



TYPICAL SECTION NO. 32

USE TYPICAL SECTION NO. 32 FOR THE FOLLOWING
-SPURAREV- STA. 20+39.68 TO STA. 22+27.11
SEE PLANS FOR DIM. FROM STA. 19+22.33 TO STA. 20+39.68 & STA. 22+27.11 TO STA. 23+26.14
-SPURBREV- STA. 24+60.13 TO STA 26+97.83 (INVERT TYPICAL)
SEE PLANS FOR DIM. FROM STA. 23+36.72 TO STA.24+60.13 & STA. 26+97.83 TO STA. 27+98.80
SPURCREV- STA. 22+92.47 TO STA. 25+34.89
SEE PLANS FOR DIM. STA. 21+73.90 TO STA. 22+92.47 & STA. 25+34.89 TO STA. 27+97.59
-SPURDREV- STA. 23+04.48 TO STA. 25+20.28 (INVERT TYPICAL)
SEE PLANS FOR DIM. FROM STA. 22+36.12 TO STA. 23+04.48 & STA. 25+20.28 TO STA. 26+70.29



TYPICAL SECTION NO. 34

USE TYPICAL SECTION NO. 34 FOR THE FOLLOWING
-RAMPAREV- STA. 20+41.86 TO STA. 22+37.13
SEE PLANS FOR DIM. FROM STA. 19+22.33 TO STA. 20+41.86 & STA. 22+37.13 TO STA. 22+72.37
-RAMPBREV- STA. 24+58.01 TO STA. 25+90.83 (INVERT TYPICAL)
SEE PLANS FOR DIM. FROM STA. 23+36.72 TO STA. 24+58.01 & STA. 25+90.83 TO STA. 26+20.41
-RAMPCREV- STA. 22+94.56 TO STA. 25+05.37
SEE PLANS FOR DIM. FROM STA. 21+73.90 TO STA. 22+94.56 & STA. 25+05.37 TO STA. 25+42.23
-RAMPDREV- STA. 23+02.59 TO STA. 23+65.93 (INVERT TYPICAL)
SEE PLANS FOR DIM. FROM STA. 22+36.12 TO STA. 23+02.59 & STA. 23+65.93 TO STA. 23+95.72

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	2-F
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

A	11.5" JOINTED CONC. W/ DOWELS.
C1	3" TYPE S9.5B
C2	VARIABLE DEPTH TYPE S9.5B
C3	1.5" TYPE S9.5B,
D1	2.5" TYPE I19.0B
D2	4" TYPE I19.0B
D3	3" TYPE I19.0B
D4	3.5" TYPE I19.0B
D5	VARIABLE DEPTH TYPE I19.0B
E1	3" TYPE B25.0B
E2	4" TYPE B25.0B
E3	4.5" TYPE B25.0B
E4	5" TYPE B25.0B
E5	5.5" TYPE B25.0B
E6	VARIABLE DEPTH TYPE B25.0B
J1	8" ABC
J2	10" ABC
J3	VARIABLE DEPTH ABC
K	SUBGRADE STABILIZATION
P1	PRIMECOAT
R1	2' 6" CONC. CURB AND GUTTER
R2	1' 6" CONC. CURB AND GUTTER
R3	5" MONOLITHIC CONCRETE ISLAND (KEYED IN)
S	CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT SEE WEDGING DETAILS

NOTE: ALL PAVEMENT SLOPES ARE 1:1 UNLESS NOTED OTHERWISE

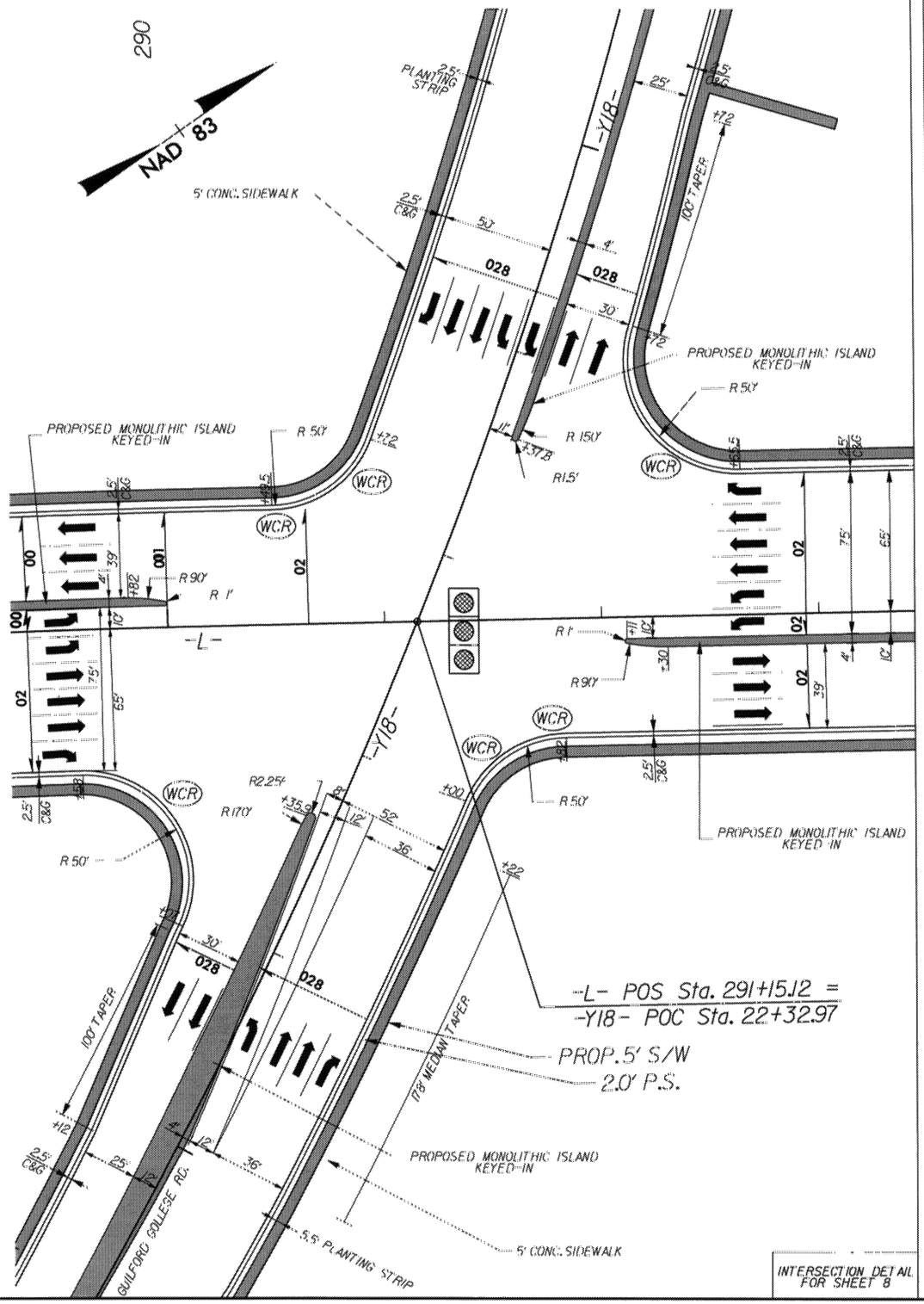
21-NOV-2016 16:54
S:\Projects\70101B-U-2412_BJ\U-2412B\Roadway\P-as\U-2412B_Ray_typ_02F.dgn
21-NOV-2016 16:54

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	2-G
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

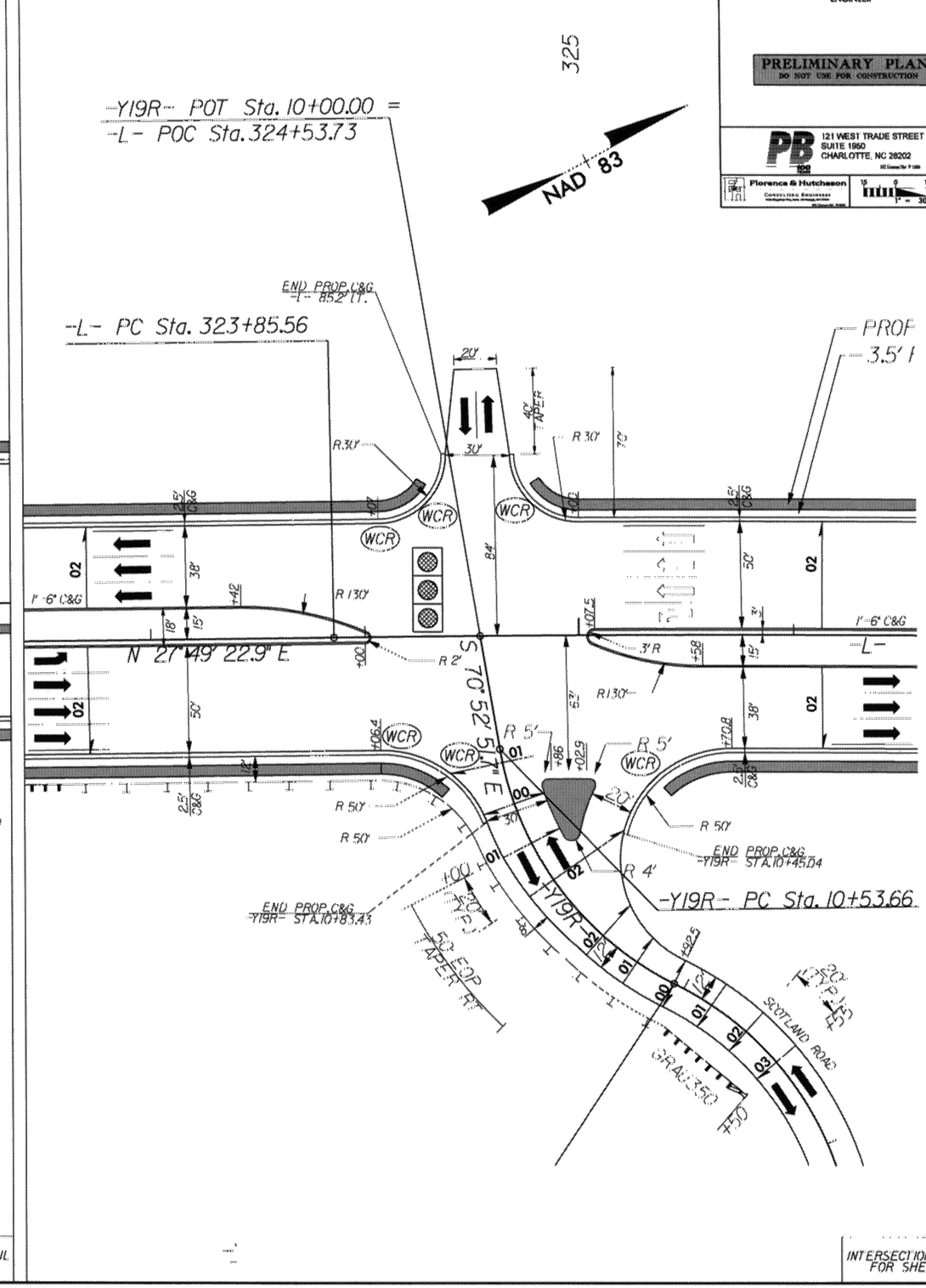
PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
Florence & Hutcheson
CONSULTING ENGINEERS

INTERSECTION DETAIL NO.1



INTERSECTION DETAIL FOR SHEET 8

INTERSECTION DETAIL NO.2



INTERSECTION DETAIL FOR SHEET 11

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	2-H

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

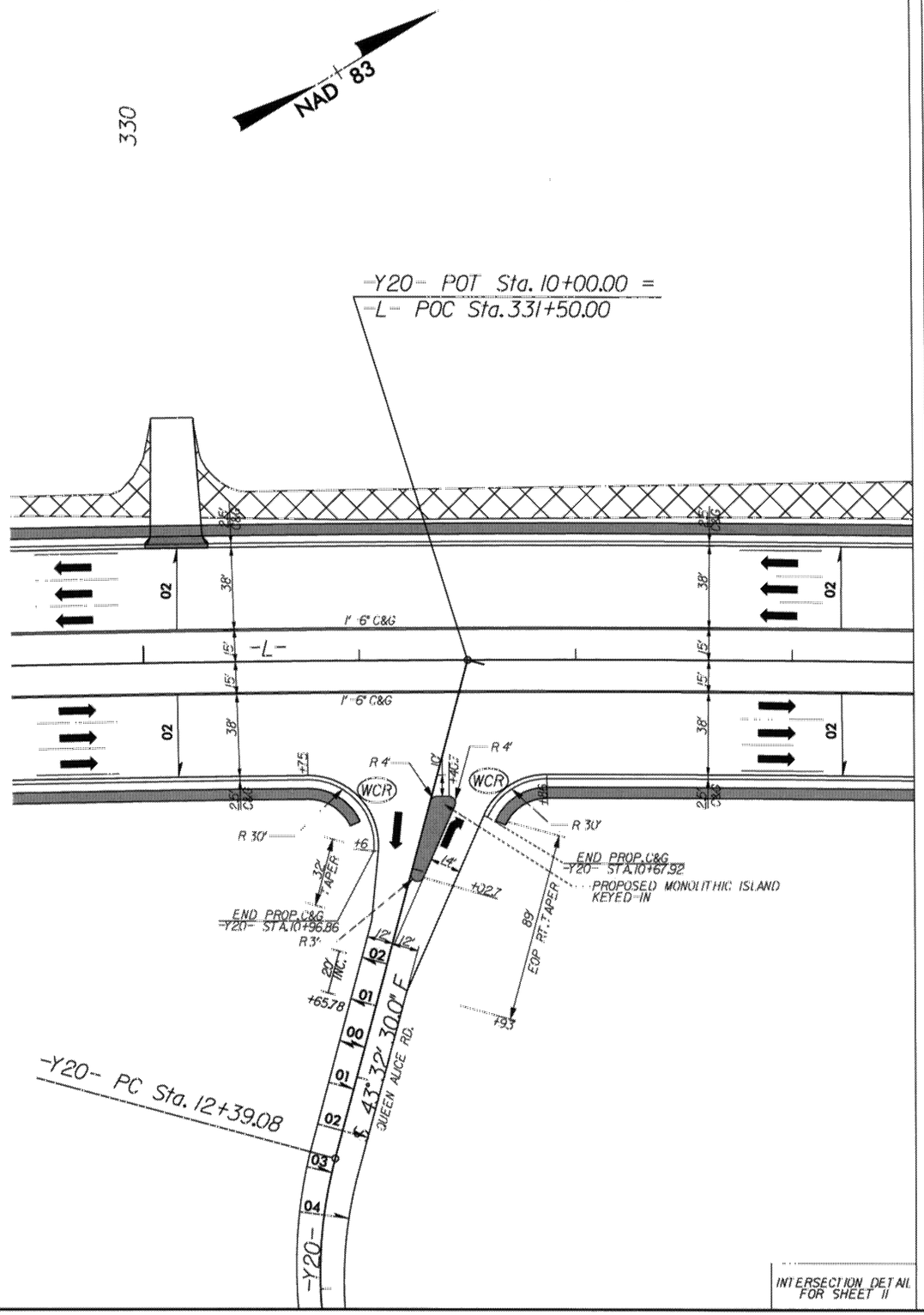
PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

Florence & Hutcheson
Consulting Engineers

1" = 30'

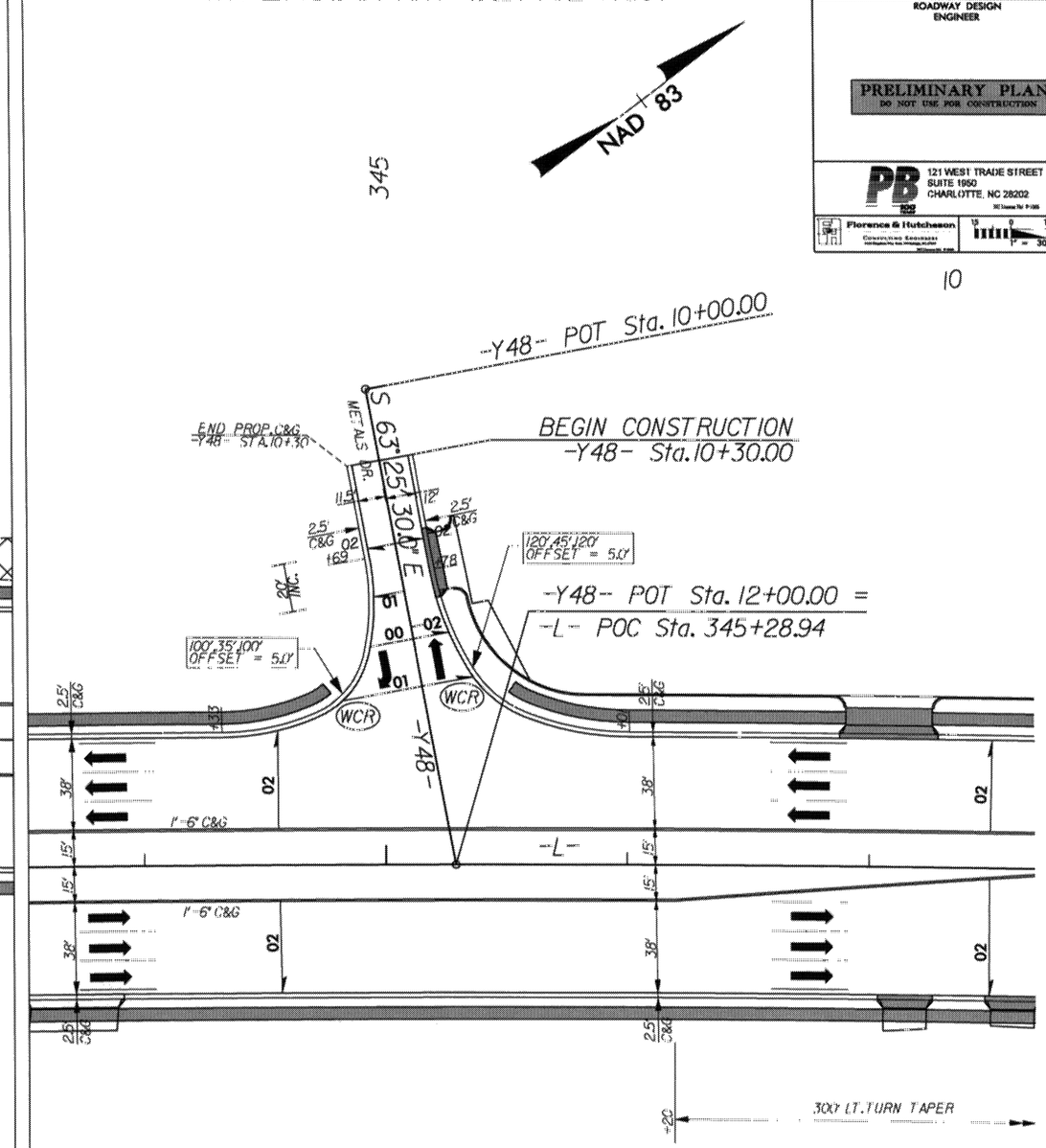
10

INTERSECTION DETAIL NO.3



INTERSECTION DETAIL FOR SHEET 11

INTERSECTION DETAIL NO.4



INTERSECTION DETAIL FOR SHEET 13

21-NOV-2011 16:54
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Pentesi, A. W. Sheet 12 of 22

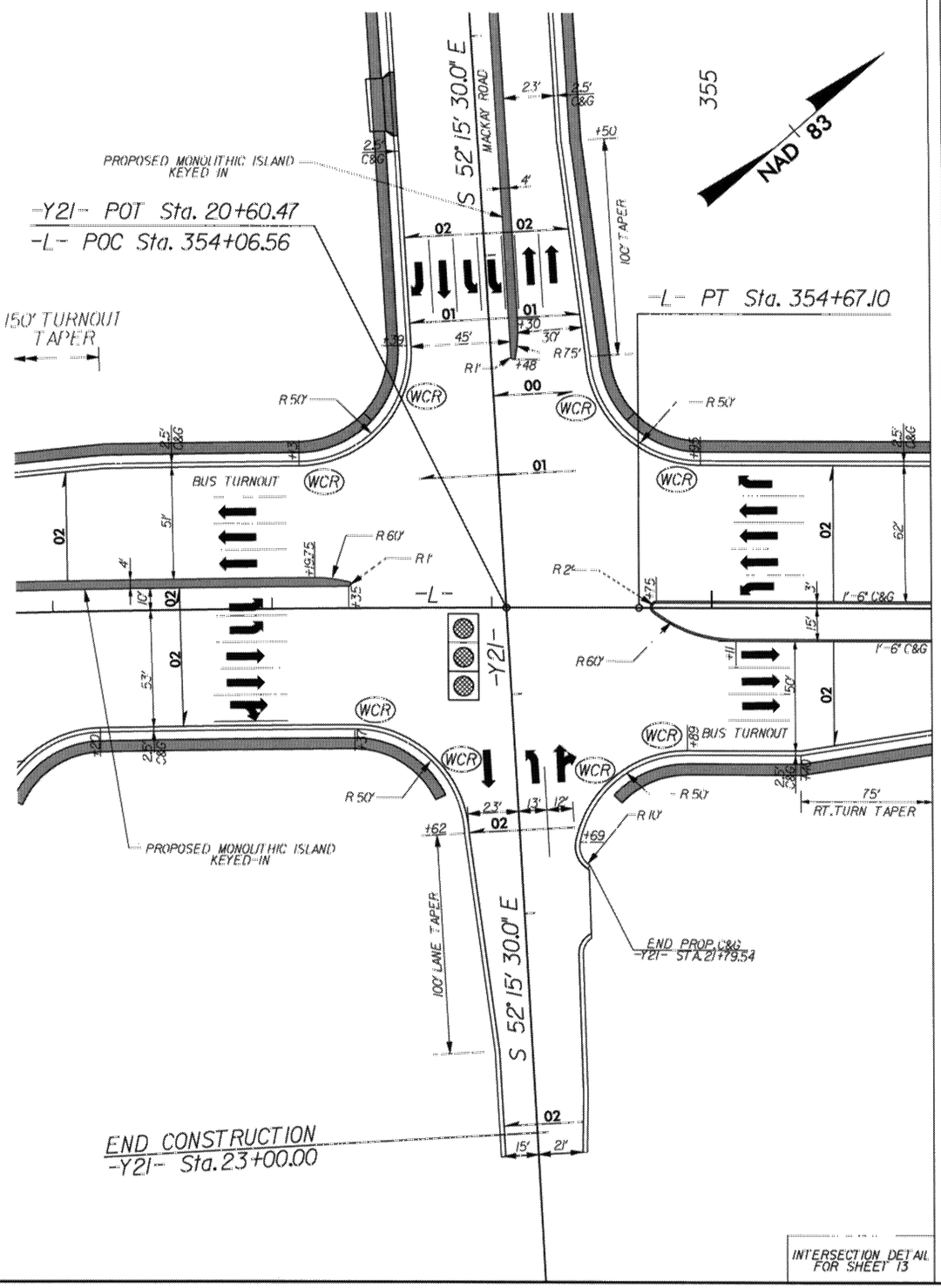
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	2-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No. F-1085

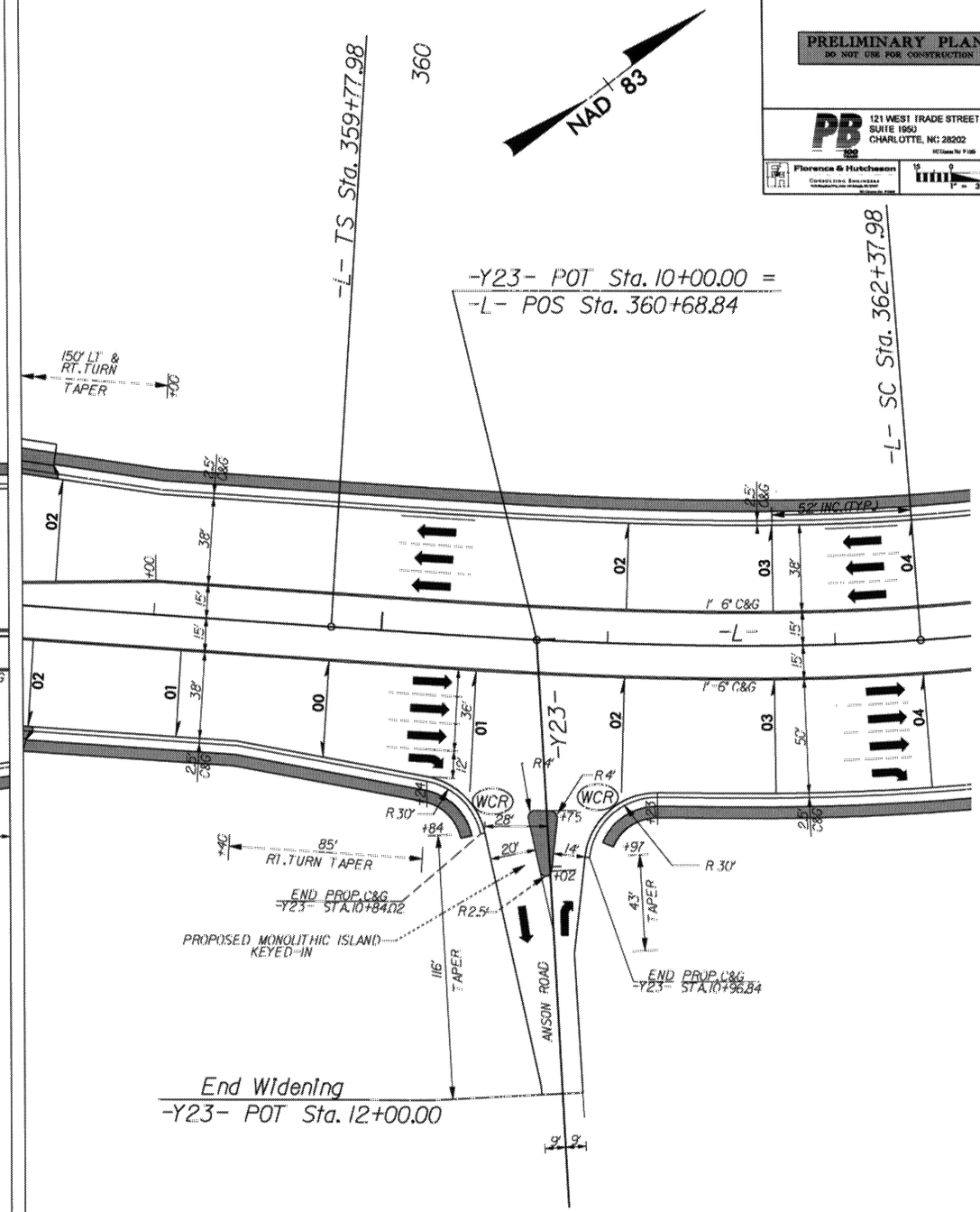
Florence & Hutcheson
CONSULTING ENGINEERS

INTERSECTION DETAIL NO.5



INTERSECTION DETAIL FOR SHEET 13

INTERSECTION DETAIL NO.6



INTERSECTION DETAIL FOR SHEET 14

21-NOV-2016 16:54
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pmcast AT WSDOT-TPB\PB

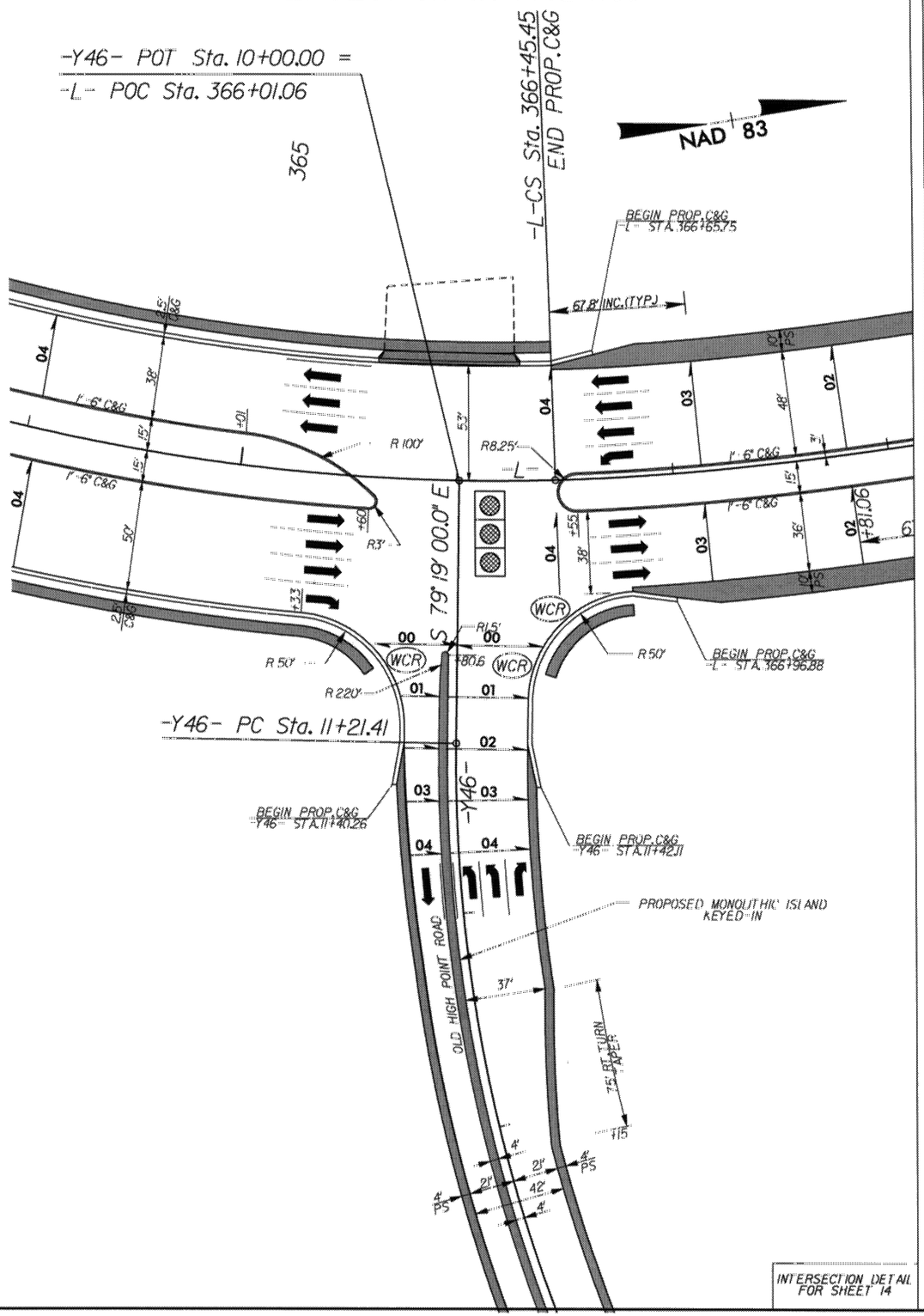
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	2-J
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

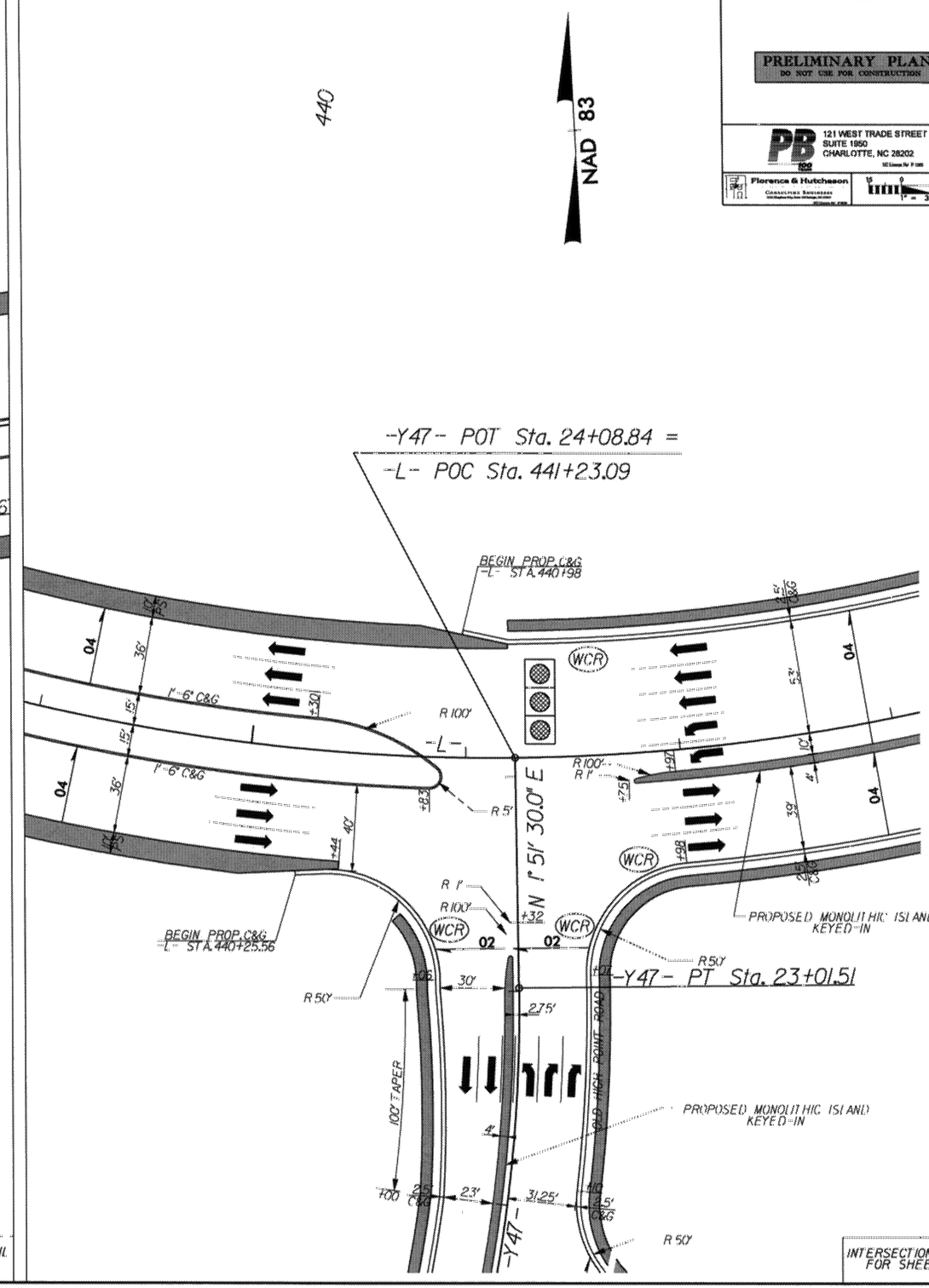
Florence & Hutcheson

INTERSECTION DETAIL NO.7



INTERSECTION DETAIL FOR SHEET 14

INTERSECTION DETAIL NO.8



INTERSECTION DETAIL FOR SHEET 20

21-NOV-2016 16:55
G:\Projects\701014-U-2412_BNK-2412B\Roadway\Proj\U-2412B_Rdy_psh_int_04.dgn
Dgnset: AT W-ASHE-PC-20128

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	2-K
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No P-105

Florence & Hutchason
Consulting Engineers

INTERSECTION DETAIL NO.9

NAD 83

END PROP C&G
-Y35B- STA.22+11.09

-Y35B- POT Sta. 24+16.28=
-Y47- POC Sta. 19+63.98

-Y35- PT Sta. 21+61.58

S 42° 38' 18.0" E

ROLAND ROAD

-Y35B-

60' TAPER

16' TAPER

R 30'

OLD HIGH POINT ROAD

65' LT & RT TAPER

-Y49- POT Sta. 10+00.00 =
-Y47- POC Sta. 21+38.69

PROPOSED MONOLITHIC ISLAND
KEYED-IN

100' TAPER

END PROP C&G
-Y35B- STA.23+31.22

-Y47-

R 2'

R 30'

WCR

END PROP C&G
-Y35A- STA.10+63.44

-Y35A-

ROLAND ROAD

75' RT TURN
TAPER

END PROP C&G
-Y35A- STA.10+63.66

-Y35A- POT Sta. 10+00.00 =
-Y47- POC Sta. 19+66.73

S 75° 05' 39.0" E

-Y49-

2'-6" C&G

2.5' C&G

5' CONC. SIDEWALK

-Y49- PC Sta. 11+88.30

S 45° 32' 00.0" E

-Y35A- POT Sta. 12+42.86

End Construction
-Y49- POC Sta. 13+34.42

INTERSECTION DETAIL
FOR SHEETS 20

INTERSECTION DETAIL NO.10

-Y37- POT Sta. 10+00.00

455

Begin Construction
-Y37- POT Sta. 11+00.00

HILLTOP FOREST CT

S 29° 22' 30.0" E

-Y37-

NAD 83

PROPOSED MONOLITHIC ISLAND
KEYED-IN

96' TAPER

67' TAPER

END PROP C&G
-Y37- STA.12+71.42

END PROP C&G
-Y37- STA.12+68.83

R 30'

R 4'

WCR

1'-6" C&G

Y37- POT Sta. 13+50.00 =
-L- POT Sta. 454+56.52

INTERSECTION DETAIL
FOR SHEET 21

21-NOV-2011 16:55
d:\Projects\70101A-U-2412_B\U-2412B\Roadway\P-o_\U-2412B_Rdy_sah_int_05.dgn
Jamesst, A. W.Smith, III

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	2-L

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

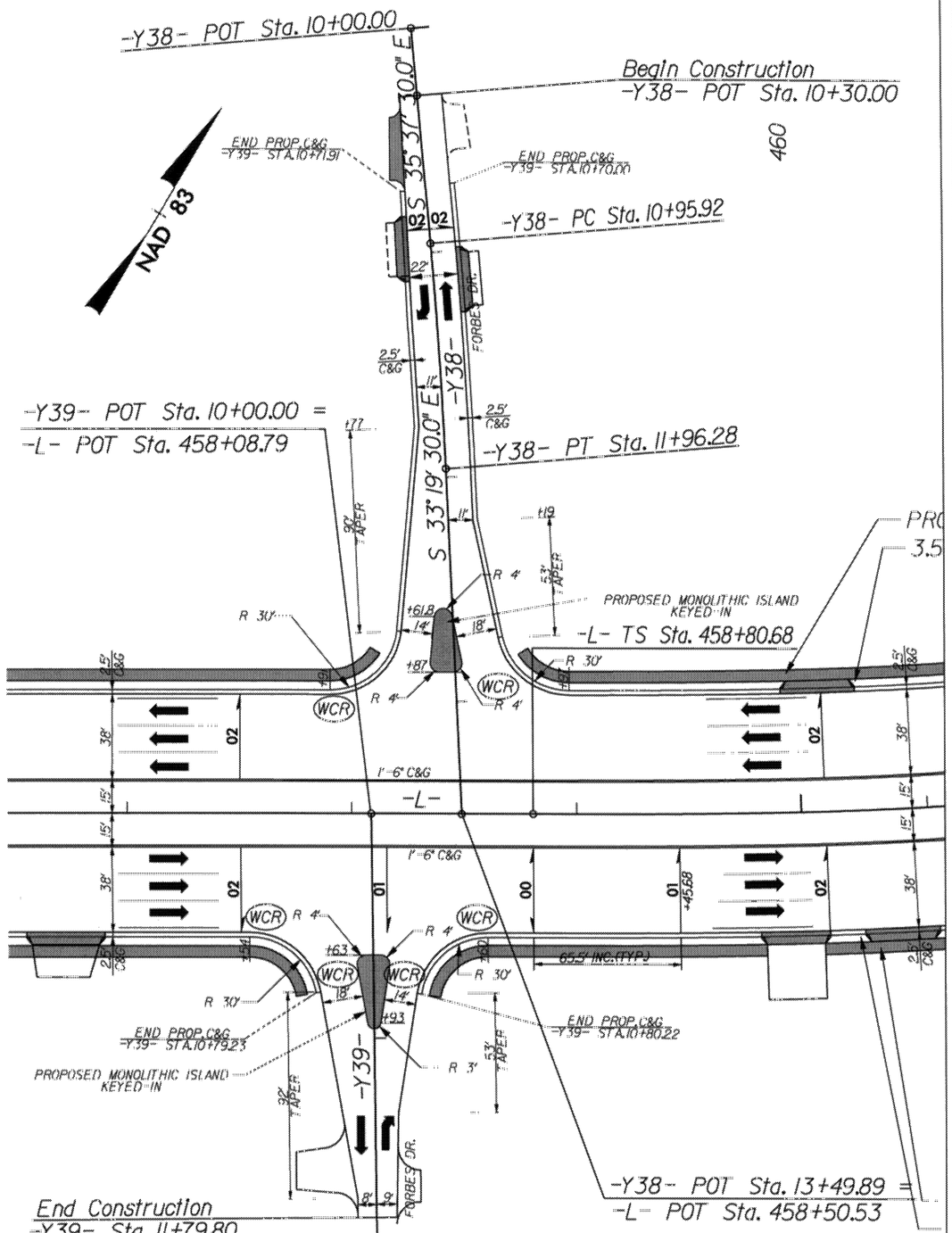
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

Florence & Hutcheson

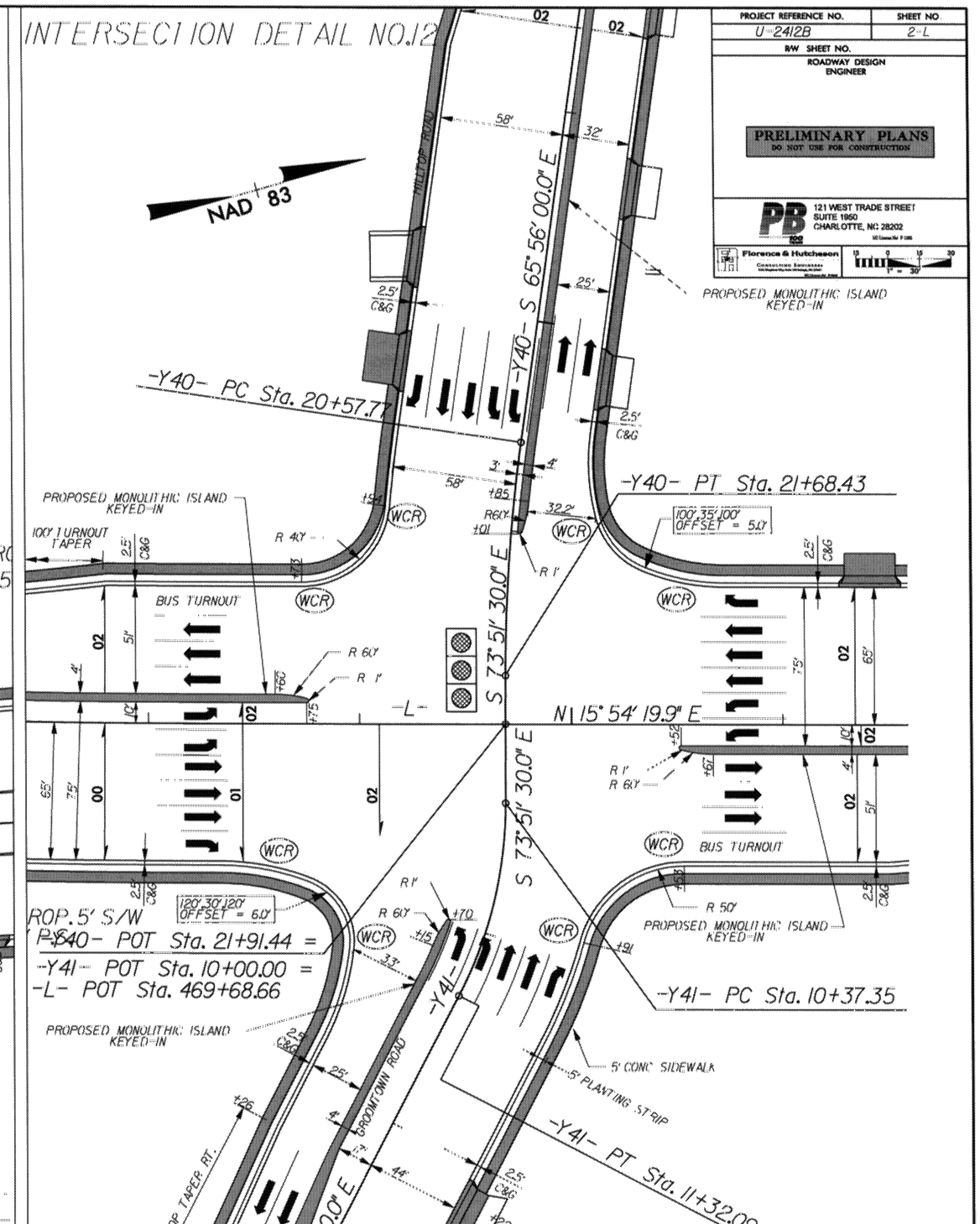
1" = 30'

INTERSECTION DETAIL NO.11



INTERSECTION DETAIL FOR SHEET 21

INTERSECTION DETAIL NO.12



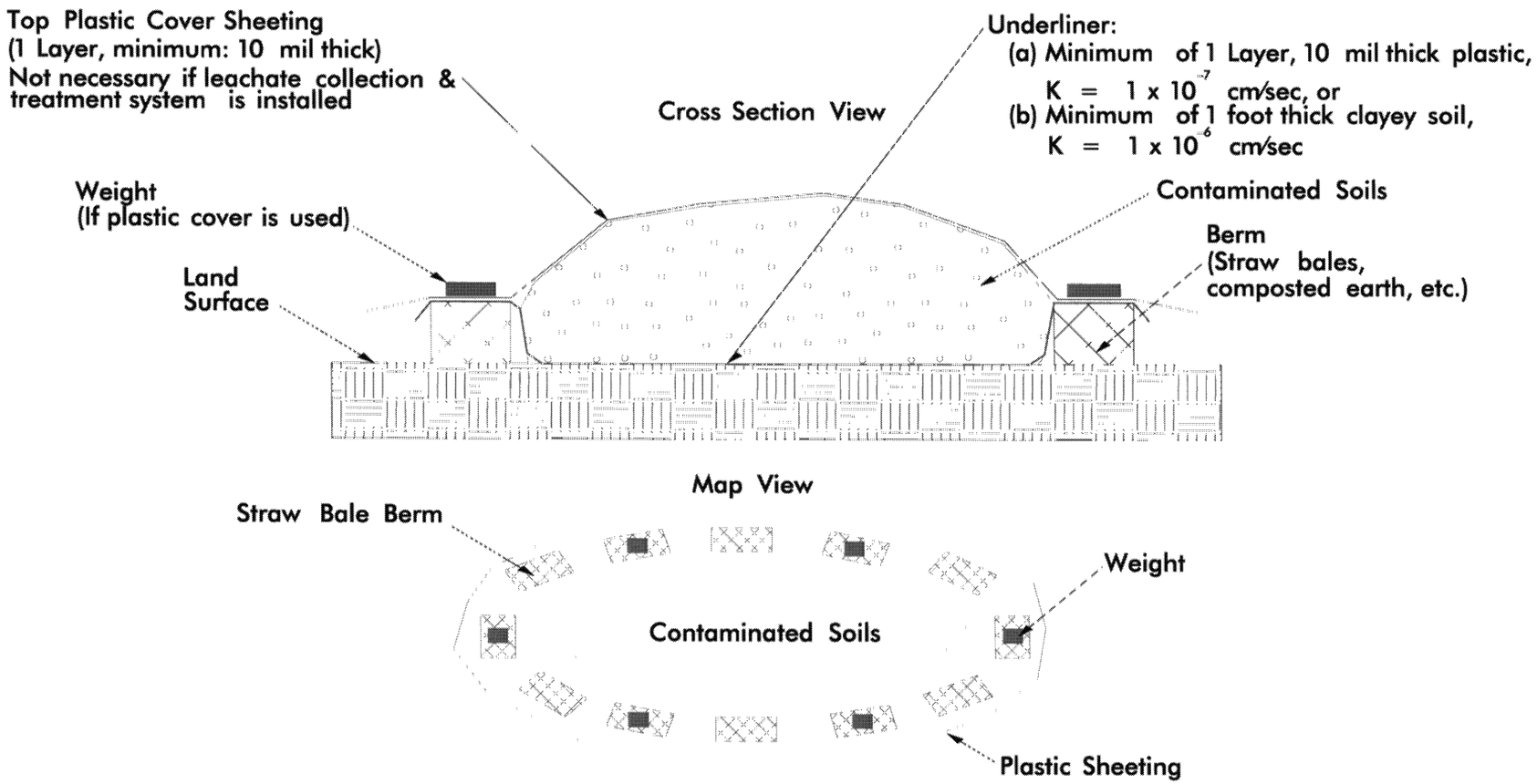
INTERSECTION DETAIL FOR SHEET 22

21-NOV-2016 16:55
d:\Projects\70110-U-2412_BU-2412B\Roadway\Plans\U-2412B_Rdy_psn_int_06.dgn
pwrasst, B1, K-AMPCS, 13.00.00.23

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	2-M
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

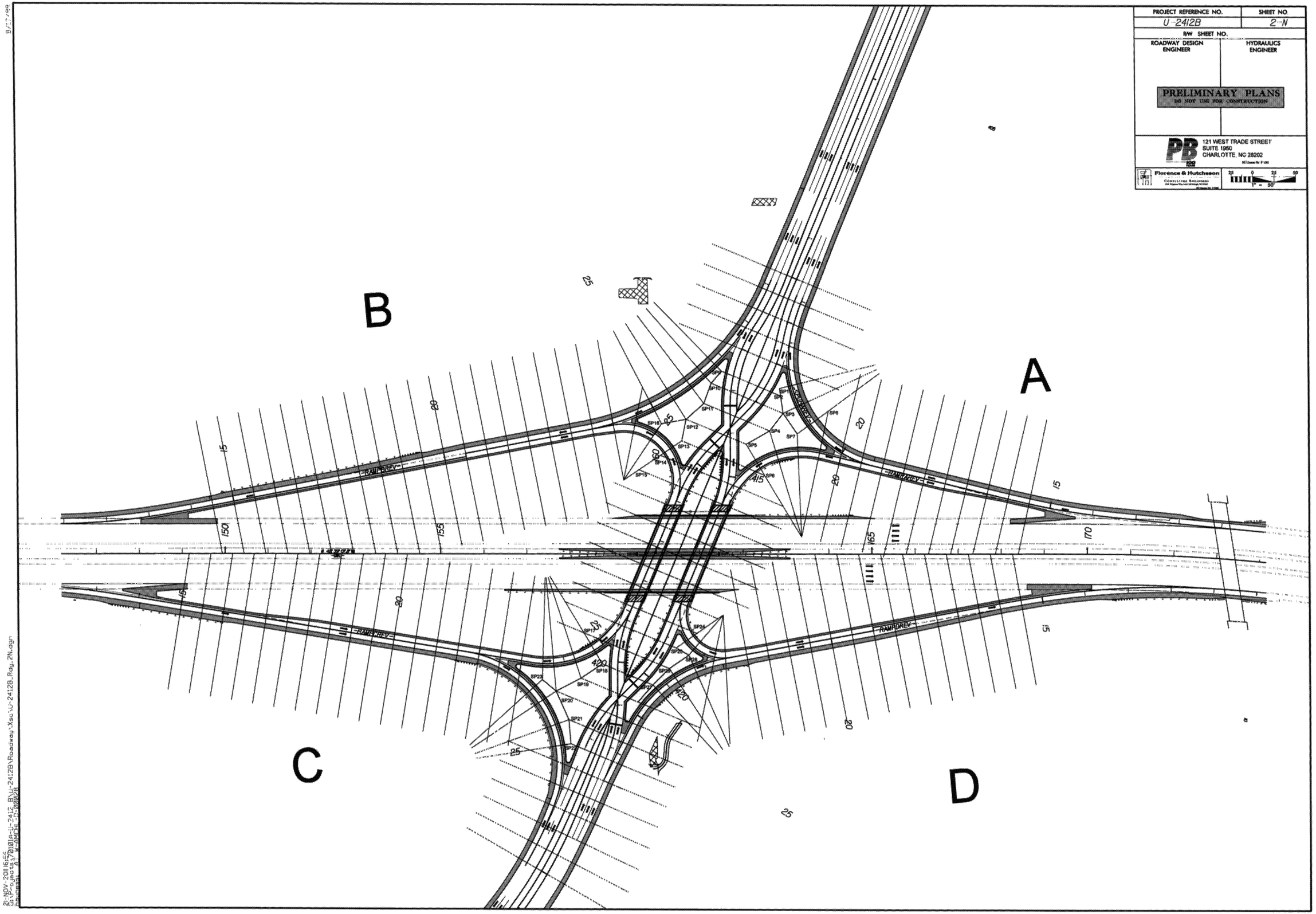
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202



SOIL DETAIL

DETAIL FOR TEMPORARY CONTAINMENT OF PETROLEUM CONTAMINATED SOIL



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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

Florence & Hutcheson
Consulting Engineers

25 0 25 50
1" = 50'

21-NOV-2011 16:55
G:\P-projects\70101A-U-2412_B\U-2412B\Roadway\Xsc\U-2412B_Rdy_2N.dgn

CURVE DATA & DRAINAGE DETAILS (SHEET 18 ONLY)

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	2-0
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
Florence & Hutcheson
CONSULTING ENGINEERS

-L_NB-
PI Sta 410+83.12
Δ = 11° 10' 29.0" (RT)
D = 9° 32' 57.5"
L = 117.02'
T = 58.70'
R = 600.00'
DS = 30 MPH
e = 0.02

-L_NB-
PI Sta 412+42.22
Δ = 33° 40' 29.0" (LT)
D = 17° 12' 21.4"
L = 195.72'
T = 100.78'
R = 333.00'
DS = 30 MPH
e = 0.02

-L_NB-
PI Sta 415+18.35
Δ = 22° 30' 00.0" (RT)
D = 17° 12' 21.4"
L = 130.77'
T = 66.24'
R = 333.00'
DS = 30 MPH
e = 0.02

-L_NB-
PI Sta 419+57.43
Δ = 22° 30' 00.0" (RT)
D = 17° 12' 21.4"
L = 130.77'
T = 66.24'
R = 333.00'
DS = 30 MPH
e = 0.02

-L_NB-
PI Sta 421+56.94
Δ = 22° 30' 00.0" (LT)
D = 17° 12' 21.4"
L = 130.77'
T = 66.24'
R = 333.00'
DS = 30 MPH
e = 0.02

-L_SB-
PI Sta 410+90.55
Δ = 10° 45' 56.1" (LT)
D = 9° 32' 57.5"
L = 112.74'
T = 56.53'
R = 600.00'
DS = 30 MPH
e = 0.02

-L_SB-
PI Sta 412+46.24
Δ = 33° 15' 56.1" (RT)
D = 17° 12' 21.4"
L = 193.34'
T = 99.48'
R = 333.00'
DS = 30 MPH
e = 0.02

-L_SB-
PI Sta 415+17.98
Δ = 22° 30' 00.0" (LT)
D = 17° 12' 21.4"
L = 130.77'
T = 66.24'
R = 333.00'
DS = 30 MPH
e = 0.02

-L_SB-
PI Sta 419+57.06
Δ = 22° 30' 00.0" (LT)
D = 17° 12' 21.4"
L = 130.77'
T = 66.24'
R = 333.00'
DS = 30 MPH
e = 0.02

-L_SB-
PI Sta 421+56.56
Δ = 22° 30' 00.0" (RT)
D = 17° 12' 21.4"
L = 130.77'
T = 66.24'
R = 333.00'
DS = 30 MPH
e = 0.02

-L-
PIs Sta 424+21.78
Θs = 7° 57' 58.5"
Ls = 260.00'
LT = 173.51'
ST = 86.83'

-L-
PI Sta 428+41.89
Δ = 39° 16' 25.0" (RT)
D = 6° 07' 40.4"
L = 640.90'
T = 333.62'
R = 935.00'
DS = 50 MPH
e = 0.04

-GWL-
PIs Sta 170+95.92
Θs = 2° 40' 02.0"
Ls = 354.33'
LT = 236.25'
ST = 118.13'

-RAMPAREV-
PIs Sta 13+80.01
Θs = 2° 45' 16.6"
Ls = 150.00'
LT = 100.01'
ST = 50.01'

-RAMPAREV-
PI Sta 14+67.62
Δ = 2° 45' 45.6" (RT)
D = 3° 40' 22.1"
L = 75.22'
T = 37.62'
R = 1,560.00'
DS = 50 MPH
e = 0.06

-RAMPAREV-
PIs Sta 15+55.23
Θs = 2° 45' 16.6"
Ls = 150.00'
LT = 100.01'
ST = 50.01'

-RAMPAREV-
PI Sta 22+15.55
Δ = 81° 07' 06.5" (LT)
D = 28° 38' 52.4"
L = 283.16'
T = 171.17'
R = 200.00'
DS = 25 MPH
e = 0.02

-SPURAREV-
PI Sta 21+80.60
Δ = 90° 43' 51.4" (RT)
D = 22° 28' 08.2"
L = 403.81'
T = 258.27'
R = 255.00'
DS = 30 MPH
e = 0.02

-SPURAREV-
PI Sta 23+67.82
Δ = 8° 09' 02.2" (RT)
D = 9° 47' 38.9"
L = 83.22'
T = 41.68'
R = 585.00'
DS = 30 MPH
e = 0.02

-RAMPBREV-
PIs Sta 11+00.01
Θ = 2° 45' 16.6"
Ls = 150.00'
LT = 100.01'
ST = 50.01'

-RAMPBREV-
PI Sta 12+23.09
Δ = 5° 21' 54.2" (LT)
D = 3° 40' 22.1"
L = 146.08'
T = 73.09'
R = 1,560.00'
DS = 50 MPH
e = 0.06

-RAMPBREV-
PIs Sta 13+46.09
Θs = 2° 45' 16.6"
Ls = 150.00'
LT = 100.01'
ST = 50.01'

-RAMPBREV-
PI Sta 26+41.00
Δ = 123° 34' 05.2" (RT)
D = 44° 04' 25.2"
L = 280.37'
T = 242.29'
R = 130.00'
DS = 20 MPH
e = 0.02

-SPURBREV-
PI Sta 26+50.60
Δ = 56° 25' 54.8" (LT)
D = 9° 47' 38.9"
L = 576.18'
T = 313.88'
R = 585.00'
DS = 30 MPH
e = 0.02

-RAMPCREV-
PIs Sta 11+00.01
Θs = 2° 45' 16.6"
Ls = 150.00'
LT = 100.01'
ST = 50.01'

-RAMPCREV-
PI Sta 12+02.40
Δ = 3° 50' 52.0" (RT)
D = 3° 40' 22.1"
L = 104.76'
T = 52.40'
R = 1,560.00'
DS = 50 MPH
e = 0.06

-RAMPCREV-
PIs Sta 13+04.77
Θs = 2° 45' 16.6"
Ls = 150.00'
LT = 100.01'
ST = 50.01'

-RAMPCREV-
PI Sta 24+95.27
Δ = 76° 39' 47.3" (LT)
D = 26° 02' 36.7"
L = 294.37'
T = 173.94'
R = 220.00'
DS = 25 MPH
e = 0.02

-SPURCREV-
PI Sta 24+87.17
Δ = 100° 37' 02.8" (RT)
D = 22° 02' 12.6"
L = 456.59'
T = 313.27'
R = 260.00'
DS = 30 MPH
e = 0.02

-SPURCREV-
PI Sta 27+14.28
Δ = 10° 41' 08.4" (RT)
D = 6° 23' 40.6"
L = 167.10'
T = 83.79'
R = 896.00'
DS = 30 MPH
e = 0.02

-RAMPDREV-
PIs Sta 10+83.34
Θs = 1° 09' 01.1"
Θs = 2° 17' 52.8"
Ls = 150.00'
LT = 83.34'
ST = 66.70'

-RAMPDREV-
PI Sta 13+17.91
Δ = 10° 15' 42.2" (LT)
D = 3° 03' 50.2"
L = 334.92'
T = 167.91'
R = 1,870.00'
DS = 50 MPH
e = 0.06

-RAMPDREV-
PIs Sta 15+34.93
Θs = 2° 17' 52.7"
Ls = 150.00'
LT = 100.01'
ST = 50.01'

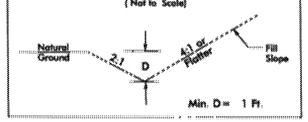
-RAMPDREV-
PI Sta 24+21.20
Δ = 123° 14' 04.2" (RT)
D = 57° 17' 44.8"
L = 215.08'
T = 185.08'
R = 100.00'
DS = 20 MPH
e = 0.02

-SPURDREV-
PI Sta 24+07.03
Δ = 52° 45' 55.8" (LT)
D = 19° 05' 54.9"
L = 276.28'
T = 148.81'
R = 300.00'
DS = 30 MPH
e = 0.02

-DI00-
PI Sta 10+34.17
Δ = 83° 10' 19.4" (LT)
D = 190° 59' 09.4"
L = 43.55'
T = 26.62'
R = 30.00'

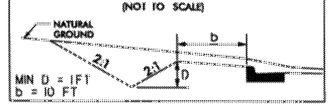
-DI00-
PI Sta 10+89.82
Δ = 29° 56' 52.1" (RT)
D = 127° 19' 26.2"
L = 23.52'
T = 12.04'
R = 45.00'

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



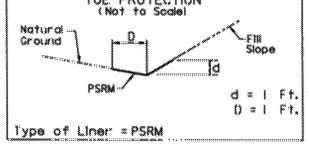
FROM STA. 23+30 TO STA. 25+03 -RAMPCREV- LT

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



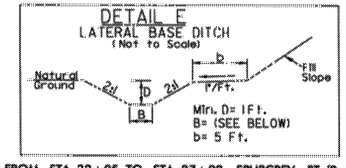
FROM STA. 20+80 TO STA. 21+50 -SPURAREV- LT
FROM STA. 20+80 TO STA. 22+00 -RAMPAREV- RT
FROM STA. 24+85 TO STA. 25+50 -RAMPBREV- LT
FROM STA. 25+00 TO STA. 26+40 -SPURBREV- RT

DETAIL D
TOE PROTECTION
(Not to Scale)



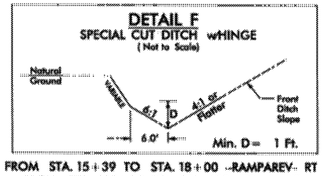
FROM STA. 18+00 TO STA. 20+00 -RAMPAREV- RT
FROM STA. 14+75 TO STA. 19+00 -RAMPBREV- RT
FROM STA. 15+17 TO STA. 17+00 -RAMPCREV- LT
FROM STA. 15+30 TO STA. 17+00 -RAMPDREV- RT

DETAIL F
LATERAL BASE DITCH
(Not to Scale)



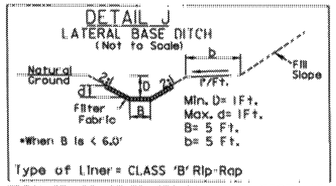
FROM STA. 22+05 TO STA. 27+90 -SPURCREV- RT (B=2')
FROM STA. 22+36.12 TO STA. 23+25 -SPURDREV- LT (B=5')
FROM STA. 25+00 TO STA. 25+90 -SPURDREV- LT (B=2')
FROM STA. 22+10 TO STA. 22+36.12 -RAMPDREV- LT (B=5')
FROM STA. 415+50 TO STA. 415+75 -L- RT (B=2')

DETAIL F
SPECIAL CUT DITCH wHINGE
(Not to Scale)



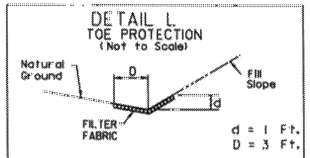
FROM STA. 15+39 TO STA. 18+00 -RAMPAREV- RT
FROM STA. 408+00 TO STA. 408+50 -L- LT
FROM STA. 408+00 TO STA. 409+00 -L- RT

DETAIL J
LATERAL BASE DITCH
(Not to Scale)



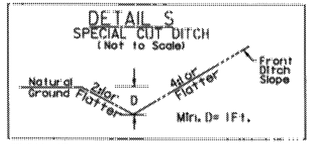
FROM STA. 23+25 TO STA. 25+00 -SPURDREV- LT

DETAIL L
TOE PROTECTION
(Not to Scale)



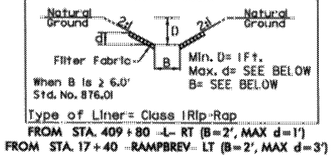
FROM STA. 17+45 TO STA. 19+00 -RAMPBREV- LT
FROM STA. 15+00 TO STA. 15+50 -RAMPCREV- RT
FROM STA. 15+75 TO STA. 16+50 -RAMPCREV- RT
FROM STA. 20+70 TO STA. 21+95 -RAMPCREV- RT
FROM STA. 421+75 TO STA. 426+25 -L- LT

DETAIL S
SPECIAL CUT DITCH
(Not to Scale)



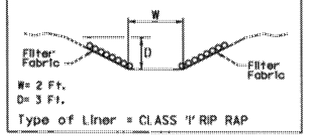
FROM STA. 410+00 TO STA. 410+50 -L- LT
FROM STA. 16+70 TO STA. 17+50 -RAMPCREV- RT

DETAIL W
STANDARD BASE DITCH
(Not to Scale)



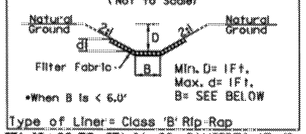
FROM STA. 409+80 -L- RT (B=2', MAX d=1')
FROM STA. 17+40 -RAMPBREV- LT (B=2', MAX d=3')

DETAIL X
PROPOSED OUTLET CHANNEL
(Not to Scale)



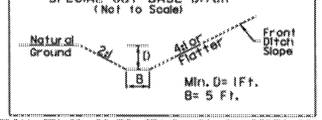
FROM STA. 22+50 -RAMPCREV- LT

DETAIL H
STANDARD BASE DITCH
(Not to Scale)



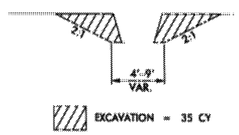
FROM STA. 13+85 TO STA. 14+30 -RAMPBREV- LT (B=5'-15')
FROM STA. 22+15 -RAMPDREV- LT (B=5')

DETAIL Y
SPECIAL CUT BASE DITCH
(Not to Scale)



FROM STA. 13+80 TO STA. 14+80 -RAMPCREV- RT

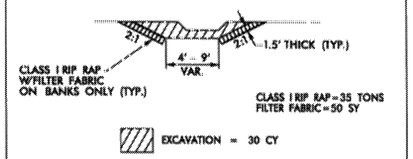
DETAIL BB



INLET CHANNEL L=30'
(LOOKING DOWNSTREAM)

FROM STA. 15+70 -RAMPCREV- RT

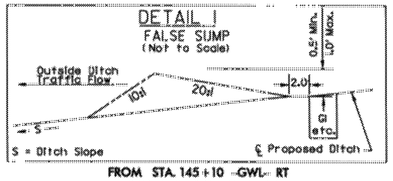
DETAIL CC



OUTLET CHANNEL L=60'
(LOOKING DOWNSTREAM)

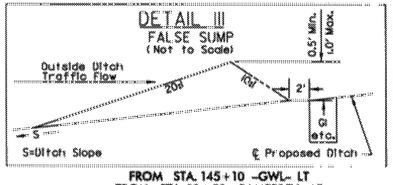
FROM STA. 15+50 -RAMPBREV- LT

DETAIL I
FALSE SUMP
(Not to Scale)



FROM STA. 145+10 -GWL- RT
FROM STA. 409+10 -L- RT
FROM STA. 409+90 -L- LT
FROM STA. 11+15 RAMPCREV- RT
FROM STA. 19+90 -RAMPDREV- RT
FROM STA. 15+15 -RAMPDREV- LT

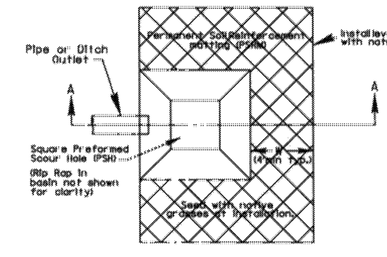
DETAIL III
FALSE SUMP
(Not to Scale)



FROM STA. 145+10 -GWL- LT
FROM STA. 13+50 -RAMPBREV- LT
FROM STA. 408+50 -L- LT

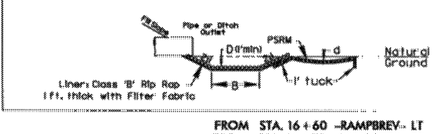
DETAIL V
PREFORMED SCOUR HOLE

PLAN VIEW



B= 5 Ft.
D= 2 Ft.
W= 4 Ft.
d= 1Ft.

SECTION A-A



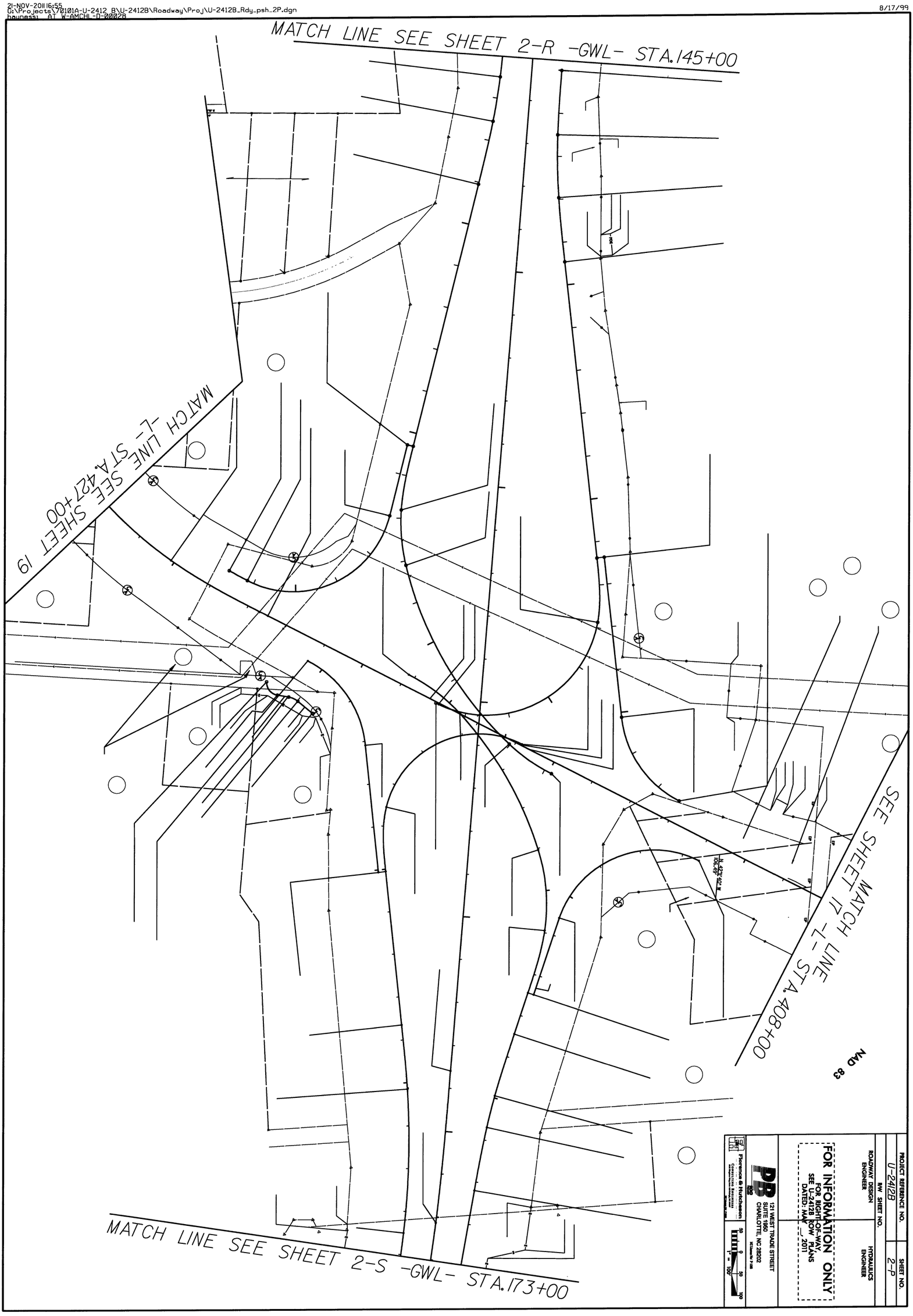
5/05

FROM STA. 16+60 -RAMPBREV- LT
FROM STA. 16+70 -RAMPCREV- RT

28-NOV-2011 16:16
G:\Projects\70101A-U-2412_B\U-2412B\Roadway\P-01\U-2412B_Rdy_psh_02_0.dgn
cawilson

21-NOV-2011 16:55
G:\Projects\70101A-U-2412_B\U-2412B\Roadway\Proj\U-2412B_Rdy_psh_2P.dgn
hauness1 AT W-AMCHL-D-00028

8/17/99



CURVE DATA (SHEET 2-P ONLY)

-L-
PIs Sta 424+21.78
Θs = 7° 57' 58.5"
Ls = 260.00'
LT = 173.51'
ST = 86.83'

-L-
PI Sta 428+41.89
Δ = 39° 16' 25.0" (RT)
D = 6° 07' 40.4"
L = 640.90'
T = 333.62'
R = 935.00'

-GWL-
PIs Sta 170+95.92
Θs = 2° 40' 02.0"
Ls = 354.33'
LT = 236.25'
ST = 118.13'

-RAMPA-
PIs Sta 13+80.01
Θs = 2° 45' 16.6"
Ls = 150.00'
LT = 100.01'
ST = 50.01'

-RAMPA-
PI Sta 14+67.62
Δ = 2° 45' 45.6" (RT)
D = 3° 40' 22.1"
L = 75.22'
T = 37.62'
R = 1,560.00'
E = 0.06
DS = 50 MPH

-RAMPA-
PIs Sta 15+55.23
Θs = 2° 45' 16.6"
Ls = 150.00'
LT = 100.01'
ST = 50.01'

-RAMPA-
PIs Sta 18+55.38
Θs = 10° 06' 39.7"
Ls = 150.00'
LT = 100.16'
ST = 50.15'

-RAMPA-
PI Sta 20+02.56
Δ = 25° 48' 00.3" (LT)
D = 13° 28' 52.9"
L = 191.38'
T = 97.34'
R = 425.00'
E = 0.04
DS = 30 MPH

-RAMPA-
PI Sta 22+83.02
Δ = 24° 44' 27.5" (LT)
D = 6° 44' 26.4"
L = 367.04'
T = 186.43'
R = 850.00'

-RAMPA-
PI Sta 25+40.36
Δ = 20° 27' 59.0" (LT)
D = 13° 28' 52.9"
L = 151.81'
T = 76.72'
R = 425.00'
DS = 30 MPH

-SPURA-
PI Sta 22+12.35
Δ = 98° 52' 53.5" (RT)
D = 24° 54' 40.4"
L = 396.94'
T = 268.73'
R = 230.00'
E = 0.04
DS = 30 MPH

-RAMPB-
PIs Sta 11+00.01
Θs = 2° 45' 16.6"
Ls = 150.00'
LT = 100.01'
ST = 50.01'

-RAMPB-
PI Sta 12+23.09
Δ = 5° 21' 54.2" (LT)
D = 3° 40' 22.1"
L = 146.08'
T = 73.09'
R = 1,560.00'
E = 0.06
DS = 50 MPH

-RAMPB-
PIs Sta 13+46.09
Θs = 2° 45' 16.6"
Ls = 150.00'
LT = 100.01'
ST = 50.01'

-RAMPB-
PIs Sta 22+37.99
Θs = 16° 31' 39.5"
Ls = 150.00'
LT = 100.44'
ST = 50.40'

-RAMPB-
PI Sta 26+39.18
Δ = 107° 02' 25.8" (RT)
D = 22° 02' 12.6"
L = 485.73'
T = 351.63'
R = 260.00'
E = 0.04
DS = 30 MPH

-SPURB-
PI Sta 26+45.77
Δ = 56° 25' 54.8" (LT)
D = 22° 55' 05.9"
L = 246.23'
T = 134.14'
R = 250.00'
E = 0.04
DS = 30 MPH

-RAMPC-
PIs Sta 11+00.01
Θs = 2° 45' 16.6"
Ls = 150.00'
LT = 100.01'
ST = 50.01'

-RAMPC-
PI Sta 12+02.40
Δ = 3° 50' 52.0" (RT)
D = 3° 40' 22.1"
L = 104.76'
T = 52.40'
R = 1,560.00'
E = 0.06
DS = 50 MPH

-RAMPC-
PIs Sta 13+04.77
Θs = 2° 45' 16.6"
Ls = 150.00'
LT = 100.01'
ST = 50.01'

-RAMPC-
PIs Sta 21+30.78
Θs = 10° 06' 39.7"
Ls = 150.00'
LT = 100.16'
ST = 50.15'

-RAMPC-
PI Sta 22+45.84
Δ = 17° 27' 02.1" (LT)
D = 13° 28' 52.9"
L = 129.44'
T = 65.23'
R = 425.00'
E = 0.04
DS = 30 MPH

-RAMPC-
PI Sta 25+60.64
Δ = 32° 51' 04.5" (LT)
D = 6° 44' 26.4"
L = 487.36'
T = 250.58'
R = 850.00'
E = 0.02
DS = 30 MPH

-RAMPC-
PI Sta 28+58.09
Δ = 16° 15' 01.0" (LT)
D = 13° 28' 52.9"
L = 120.54'
T = 60.68'
R = 425.00'
E = 0.02
DS = 30 MPH

-SPURC-
PI Sta 24+92.98
Δ = 103° 48' 53.0" (RT)
D = 24° 54' 40.4"
L = 416.74'
T = 293.41'
R = 230.00'
E = 0.04
DS = 30 MPH

-SPURC-
PI Sta 26+40.35
Δ = 1° 30' 49.4" (RT)
D = 3° 08' 59.5"
L = 48.06'
T = 24.03'
R = 1,819.00'
E = 0.02
DS = 30 MPH

-RAMPD-
PIs Sta 10+83.34
Θs = 1° 09' 01.1"
Θs = 2° 17' 52.8"
Ls = 150.00'
LT = 83.34'
ST = 66.70'

-RAMPD-
PI Sta 13+17.91
Δ = 10° 15' 42.2" (LT)
D = 3° 03' 50.2"
L = 334.92'
T = 167.91'
R = 1,870.00'
E = 0.06
DS = 50 MPH

-RAMPD-
PIs Sta 15+34.93
Θs = 2° 17' 52.7"
Ls = 150.00'
LT = 100.01'
ST = 50.01'

-RAMPD-
PIs Sta 20+95.27
Θs = 19° 31' 57.5"
Ls = 150.00'
LT = 100.62'
ST = 50.56'

-RAMPD-
PI Sta 24+24.73
Δ = 103° 42' 06.6" (RT)
D = 26° 02' 36.7"
L = 398.19'
T = 280.08'
R = 220.00'
E = 0.04
DS = 30 MPH

-SPURD-
PI Sta 24+25.90
Δ = 56° 45' 55.8" (LT)
D = 22° 55' 05.9"
L = 247.69'
T = 135.08'
R = 250.00'
E = 0.04
DS = 30 MPH

-DI00-
PI Sta 10+34.17
Δ = 83° 10' 19.4" (LT)
D = 190° 59' 09.4"
L = 43.55'
T = 26.62'
R = 30.00'

-DI00-
PI Sta 10+89.82
Δ = 29° 56' 52.1" (RT)
D = 127° 19' 26.2"
L = 23.52'
T = 12.04'
R = 45.00'

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

FOR INFORMATION ONLY
FOR RIGHT-OF-WAY,
SEE U-2412B ROW PLANS
DATED: MAY __, 2011

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No P-1055

Florence & Hutcheson
CONSULTING ENGINEERS

25 0 25 50
1" = 50'

8/17/99

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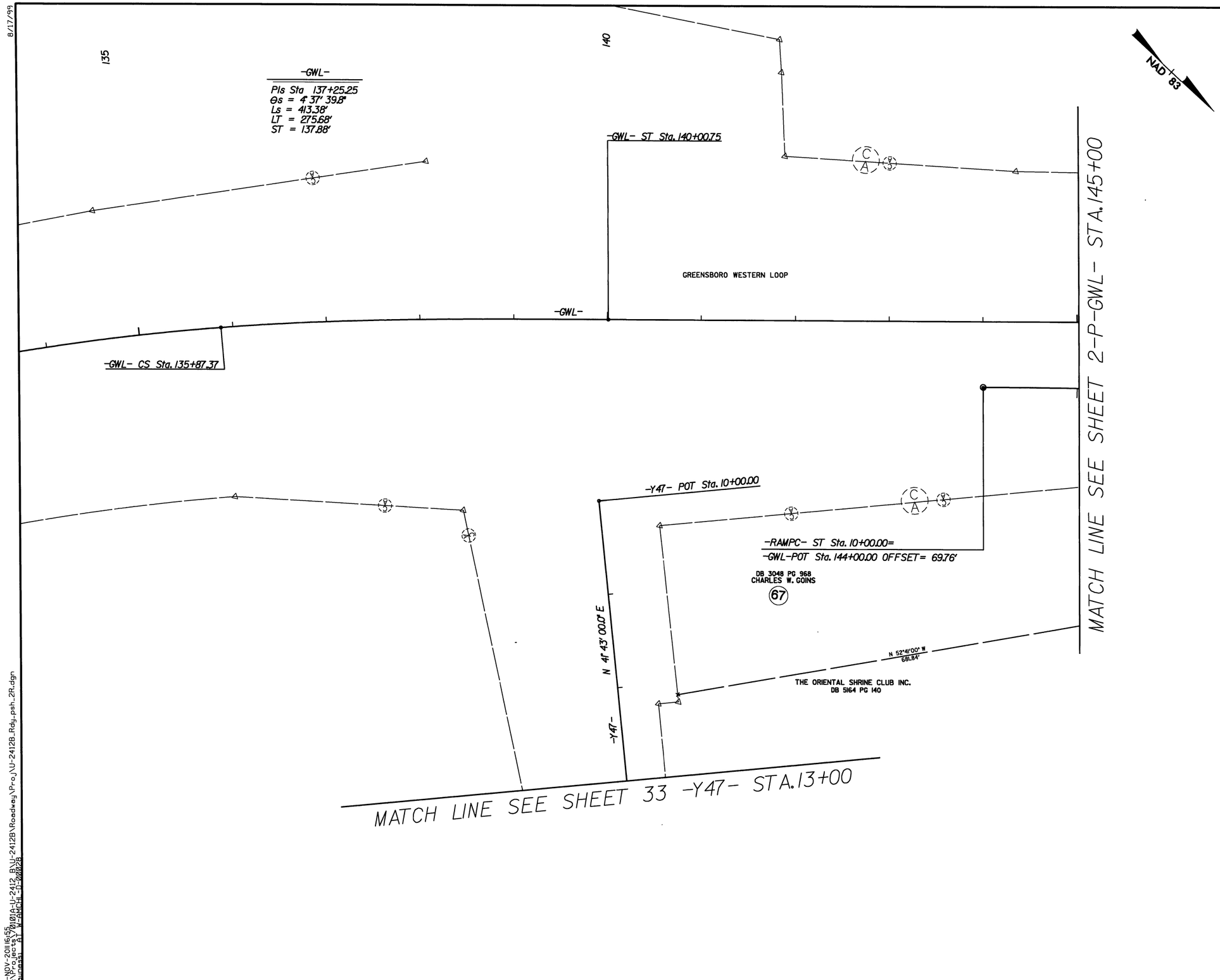

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	2-R
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FOR INFORMATION ONLY
FOR RIGHT-OF-WAY,
SEE U-2412B ROW PLANS
DATED: MAY __, 2011

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

Florence & Hutcheson
CONSULTING ENGINEERS

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1" = 50'

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

FOR INFORMATION ONLY
FOR RIGHT-OF-WAY,
SEE U-2412B ROW PLANS
DATED: MAY _, 2011

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No. F-1085

Florence & Hutcheson
CONSULTING ENGINEERS
NC License No. F-0893

1" = 50'

NAD 83

-GWL-

PI Sta 177+71.99
Δ = 16° 40' 55.3" (RT)
D = 1° 30' 19.8"
L = 1,108.07'
T = 557.98'
R = 3,805.77'
e = 0.06
DS = 70 MPH

PIs Sta 184+40.21
Θs = 2° 40' 02.0"
Ls = 354.33'
LT = 236.25'
ST = 118.13'

MATCH LINE SEE SHEET 2-P -GWL- STA.173+00

175

180

EXISTING NCDOT R/W

+51.71 -RAMPA- EXIST R/W

-RAMPA- POT Sta. 10+00.00=
-GWL-POC Sta. 174+05.00 OFFSET= 70.209832'

+94.28 -RAMPA- EXIST R/W

GREENSBORO WESTERN LOOP

-GWL-

-RAMPD-ST Sta. 10+00.00=
-GWL-POC Sta. 174+00.00 OFFSET= 70.209832'

+82.41 -GWL- Exist. R/W

+40.42 -GWL- Exist. R/W

+02.06 -GWL- 201.74' RT

+02.01 -GWL- 201.98' RT

+75.36 -GWL- Exist. R/W

CS Sta. 183+22.08

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PROJECT REFERENCE NO.	SHEET NO.
U-2412B	3AC

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAME
1	4,5,24	BRUCE R. TAYLOR
2	4	ROBERT J. BEDINGFIELD AND JEANNE H. BEDINGFIELD
3	5,24	JOSEPH A. NORMAN AND VICKY D. NORMAN
4	5,25	CLECIE M. THACKER AND GAIL THACKER
5	5	THOMAS H. TAYLOR, JR. AND BARBARA B. TAYLOR
6	5,25	WILLIAM WALTER MCLEAN, JR. AND SUSAN S. MCLEAN
7	5,6,7,8,26	KOURY VENTURES LIMITED PARTNERSHIPS
8	8,9	KOURY VENTURES LIMITED PARTNERSHIPS
8A	9	STATE EMPLOYEES CREDIT UNION
9	8,27	OAKDALE VILLAGE LLC
10	8,9,27	AZAS, LLC
11	9,10	ALBERDINGK BOLEY, INC
12	9,10	SEDGEFIELD CLASSIC LIVING, LLC
14	10	MORGAN PROPERTIES INC
15	10,11	SEDGEFIELD BAPTIST CHURCH
16	10,11,12	GUILFORD MEMORIAL PARK INC
18	11	DAVID W. MITCHAM
19	11	DAVID W. MITCHAM
20	11	RUTH F. THOMPSON
21	11,12	KBG, LLC
22	12	WILLIAM C. AVERY
23	12	THE LESTER GROUP, INC.
24	12	THE LESTER GROUP, INC.
25	12,13	SPRING REPAIR SERVICE INC
26	12	SUSAN ASHLEY MARION
27	12	MARK T. MOORE
28	12	CHUBBS, LLC
29	12	BLACK DOGS, LLC
30	12,13	THE MOSES H. CONE MEMORIAL HOSPITAL
31	13	THOMAS J. BIVENS, JR.
32	13	C. RICHARD BRUNNING, IV
33	13	CECIL LITTLE
34	13	JOE S. BYERLY AND BETSY C. BYERLY
35	13	TRUETT A. GRANTS
36	13	GARY A. REGAN AND JEAN C. REGAN
37	13	GARY A. REGAN AND JEAN C. REGAN
38	13	SOUTHSTAR HOLDINGS, ADAMS FARM, LLC
39	13	SOUTHSTAR HOLDINGS, NEW BERN ET. AL.
40	13	CARTER BANK & TRUST CO. (BY MERGER)
41	13,14	E&A INVESTMENTS, LLC
42	13,14	MCDONALDS CORPORATION
43	13,14,29	INLAND SOUTHEAST GREENBORO, LLC
44	29	AUTOBELL CAR WASH, INC
45	14	IINLAND AMERICAN ST. PORTFOLIO LLC
46	14	RICHARD GARRETT ET. AL.
47	14	ROBERT V. REGISTER
48	14	MMG PROPERTIES LLC
49	14	THURSTON H. REEDER, JR.
50	14,15,30	M. WILLARD TUCKER & BARRY S. SIEGAL
51	14,15	MARVIN A. LAW
52	14	MILDRED S. MITCHELL
53	14,15,30	WILLIAM W. MITCHELL
54	15	JANO SHOE JENKINS AND HUSBAND, SIDNEY MALCOLM JENKINS, JT/RS
55	15	THE JOHN AND LOU ANN MOTHERSHEAD FAMILY TRUST – TRUST B
56	15,16,17,18	KSL SEDGEFIELD PILOT LLC
57	17	MARGARET B. BROWN
58	17	HELEN M. FAUCETT
59	17	JAMES R. DILLON JR.

PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAME
61	18	JUDY LOMAX ET. AL. BY INTESTATE
62	18	L&S DUHAN PROPERTIES I LIMITED PARTNERSHIP
63	18	DEBORAH L. ALLEN
64	18	WALTER M. BROWN
65	18	NCDOT
66	18	ROBERT J. GARRETT
67	18,19,31	CHARLES W. GOINS
68	18	RONALD A. WOODY
69	18	VICKIE WHITE, ET AL
70	18	CHARLES W. GOINS
71	19	CLAYTON J. EGGERS
72	19	CHARLES W. GOINS
73	19	CHARLES W. GOINS
74	19	CHARLES W. GOINS
75	19	CHARLES W. GOINS
76	18,19	CHARLES W. GOINS
76A	19	CHARLES W. GOINS
77	19	L&S DUHAN PROPERTIES I LIMITED PARTNERSHIP
78	19	BILL W. HARVEY
79	19,20	G.L. WILSON BUILDING COMPANY
80	19	MARY H. TOWNSEND
81	19	JERRY M. KENION
82	19,20	DAVID H. GRIFFIN
83	19	J R DORSETT HEIRS
84	19	TIMOTHY D. BANKER
85	19,20	LORA HILL
86	20	G.L. WILSON BUILDING COMPANY
87	20	FRANCES G. BURCH
88	20,21	DENNIS G. HOWARD
89	20	BSC INVESTMENTS, LLC
90	20,21	AZ DEVELOPMENT, LLC
91	21	WILLIAM T. POLLARD, SUSAN P. DAVIS, J.M. POLLARD JR.
92	21	SUSAN P. DAVIS, ET. AL.
93	21	JOHN M. POLLARD, SUSAN P. DAVIS, WILLIAM T. POLLARD, MADELINE P. POLLARD
94	21	WILLIAM T. POLLARD ET AL
95	21	BOYLES PROPERTIES TWO LLC
96	21	BOYLES PROPERTIES LLC
97	21	R.W. RENTAL PROPERTIES, LLC
98	21	JP&D FINANCIAL INC.
99	21	PATRICIA P. TAYLOR
100	21	TIMOTHY D. BANKER
101	21	WHITE FAMILY FARMS, LLC
102	21,22	KENNETH D. GREEN AND SHELIA M. GREEN
103	21	TERRY CURTIS WELBORN, JR.
104	21	WILLIAM E. WALKER AND DORIS J. WALKER
105	21	DAWN S. CHANEY
106	21	THOMAS H. ALLGOOD
107	21,22	MARIA C. ROBERTSON
108	22	KILOP PROPERTIES LLC
109	22	FIRST CITIZENS BANK
110	22	ILESH J. SHAH
111	22	NEESE INCORPORATED
112	22,34	SOVRAN ACQUISITION
113	22,35	JOSEPH RUSSELL FRANKLIN AND SANDRA M. FRANKLIN
114	22	STOP & SHOP INC
116	22,34	SUZANNE GINGERICH
117	22	BURGER KING CORPORATION
118	22	SAU LIN TSANG

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PROJECT REFERENCE NO.	SHEET NO.
U-2412B	3AD

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAME
119	22,35	EDWIN F. NEESE ET. AL.
120	22,23,35	NORTHEAST ENTERPRISES, INC
121	22,34	POLYTRENDS, INC
122	22	BERNICE I. GOINS
123	22,23	MOHAMED A. KHALID
124	23	CHARLES W. GOINS
125	23	SELF STORAGE ONE-HIGH POINT RD. LLC
126	23	MCCARTY AUTOMOTIVE INC
127	23	SHARON P. WALKER
128	23	HINSHAW MEMORIAL METHODIST CHURCH
131	24	WILLIE L. REID, JR.
132	24,26	GUILFORD COUNTY BOARD OF EDUCATION
133	24	ATTIS E. CROWE, JR. AND DENNICENT W. CROWE
134	24	JERRY H. FUQUA AND JUANITA B. FUQUA
135	24	BRUCE R. TAYLOR
136	24	WILLIAM ROBERT GLASGOW AND JUDITH LORRAINE GLASGOW
137	25	SHARI A. UPSTILL AND LEIGH A. RAMSEY
138	25	WILLIAM WALTER MCLEAN, JR. AND SUSAN S. MCLEAN
139	25	THUIN Y AND WIFE, YOR H
140	25	WALTER I. BATISTA AND NOEL D. BATISTA
141	25	CLYDE DAVID DEATON AND MARGARET D. DEATON
142	25	NCDOT
143	25	CHAS S. WILLIAMS AND NANCY V. WILLIAMS
144	25	TODD A. MCNEAL AND LESLIE J. MCNEAL
145	26	GUILFORD TECHNICAL COMMUNITY COLLEGE
146	29	BANK OF AMERICA
147	29	MIYE & LESLIE INVESTMENTS PROPERTIES, LLC
148	29	JETER T. GUTHRIE
149	30	SEYED MEHDI AGHILI & WIFE MITRA SHANDIZ AGHILI
150	30	TRANG THIEN DAO

PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAME
151	30	HPR PROPERTIES INC
152	30	LINCOLN FINANCIAL SERVICES
153	30	IMOGENE R. GOLDSTON
155	30	JEAN M. DAVIES, TRUSTEE OF THE JEAN M. DAVIES TRUST
156	30	MARSHA PRICE
157	30	DOUGLAS L. YOUNTS, SR. AND WIFE, KAREN W. YOUNTS
158	33	WILLIAM A. RYALS
159	20,33	NCDOT
160	20	DENNIS G. HOWARD
161	20	KINGS MILL AT SEDGEFIELD ASSOCIATION
162	34	PEGGY ANN MICHAEL
163	34	PEGGY ANN MICHAEL
164	34	SHIRLEY C. HALL
165	34	DAVID H. GRIFFIN, SR. & MARYLENE F. GRIFFIN
166	34	D. H. GRIFFIN FAMILY LIMITED PTNR
167	34	PRICE FINANCIAL SOLUTIONS LLC
168	34	ANN Q. VO
169	34	ABDULLAH M. ALSHANTEER ET AL
170	34	ABDULLAH M. ALSHANTEER & AYMAN G. NABULSI
171	34	JAMES A. DEGRAPHENRIED
172	34	STANWYN A. GINGERICH
173	34	STANWYN A. GINGERICH
174	11	DAVID MITCHAM
175	4	FINISON, JOSEPH H. AND WIFE, MARTITIA D.
176	13	WILLIAM GUY RAY
177	12	PRIME INVESTMENT PARTNERS, LLC
178	20,33	HUNT VILLAGE, LLC
179	25	JAN CHRISTOPHER MCLEAN
180	12	TERRY CURTIS WELBORN, JR.
900	18	NCDOT

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PROJECT REFERENCE NO.	SHEET NO.
U-2412B	04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No P-1055

Florence & Hutcheson
CONSULTING ENGINEERS

25 0 25 50
1" = 50'

NAD 83

-L- (U-2412A)

PI Sta 193+84.84
Δ = 20° 15' 44.8" (LT)
D = 1° 25' 56.6"
L = 1,414.59'
T = 714.76'
R = 4,000.00'
e = 0.04
DS = 60 MPH

-L-

PI Sta 249+20.93
Δ = 0° 43' 59.1" (LT)
D = 1° 25' 56.6"
L = 51.18'
T = 25.59'
R = 4,000.00'
e = 0.04
DS = 60 MPH

PIs Sta 250+63.11
θs = 1° 25' 56.0"
θs = 4° 14' 39.5"
Ls = 200.00'
LT = 116.59'
ST = 83.56'

PI Sta 259+09.81
Δ = 58° 58' 01.9" (LT)
D = 4° 14' 38.9"
L = 1,389.38'
T = 763.28'
R = 1,350.00'
e = 0.04
DS = 50 MPH

ATTIS E. CROWE, JR.
DENNICENT W. CROWE
DB 3814 PG 1328

CLIFTON PARK HOMEOWNERS ASSOCIATION, INC.
DB 5043 PG 475
PB 123 PG 21

42" CMP STAND PIPE

BRUCE R. TAYLOR
DB 4414 PG 982
PB 105 PG 96

BRUCE R. TAYLOR
DB 3530 PG 1632

-BL-185 PINC 192+15.59 =
-L- POT Sta. 192+74.81 151.11' LT.

-BL-186 PINC 195+88.41 =
-L- POT Sta. 196+53.80 103.65' LT.

-BL-187 PINC 198+86.82 =
-L- POS Sta. 199+55.30 45.75' LT.

-BL-188 PINC 203+50.34 =
-L- POC Sta. 252+35.75 9.58' LT.

-L- SC Sta. 251+46.52

-L- PCC Sta. 248+95.34 AH =
-L- PCC Sta. 200+84.66 BK

MATCH LINE SEE SHEET 5 -L- STA. 253+00

FUTURE PROJECT U-2412A

JNS PROPERTIES, LLC
DB 5620 PG 394

JNS PROPERTIES, LLC
DB 5620 PG 394
PB 72 PG 227

20' UTILITY EASEMENT

-L- CS Sta. 249+46.52

ROBERT J. BEDINGFIELD
JEANNE H. BEDINGFIELD
DB 4296 PG 1641
PB 72 PG 227

FINISON, JOSEPH H. AND WIFE, MARTITIA D.
DB 4208 PG 1028

BRUCE R. TAYLOR
DB 3530 PG 1632

SEE SHEET 36 FOR -L- PROFILE

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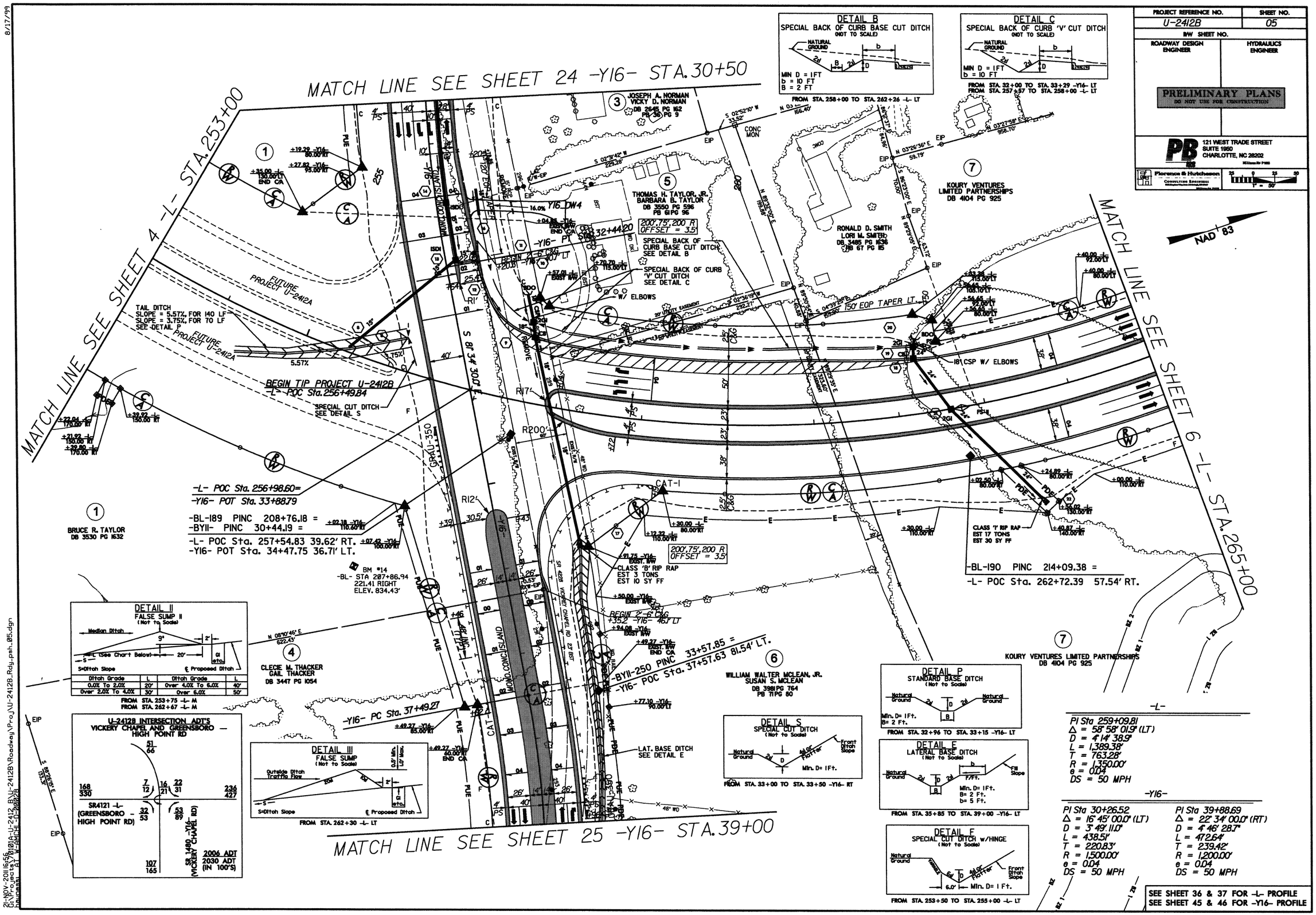
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	05
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202
Florence & Hutcheson Consulting Engineers
1" = 50'



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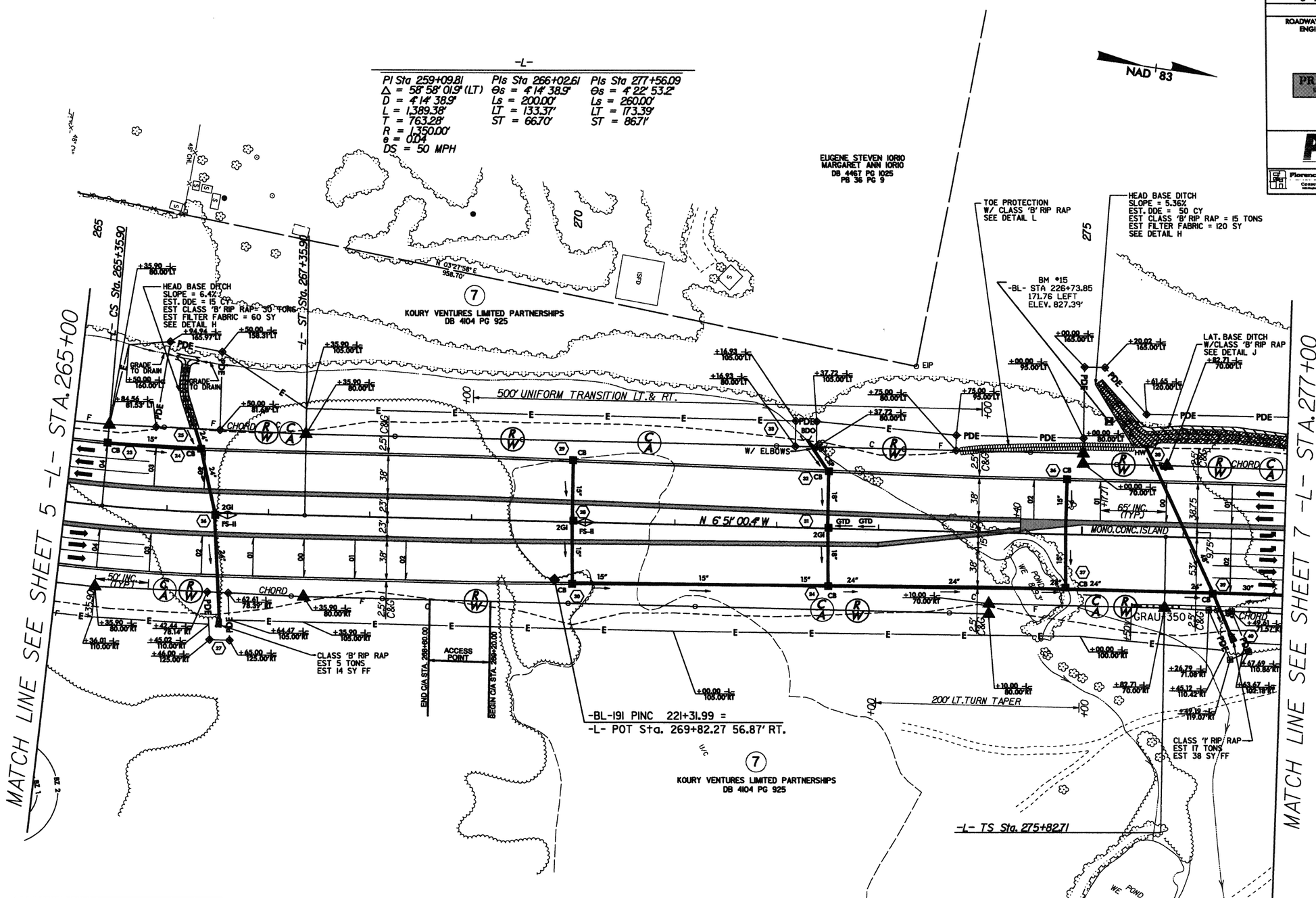
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	06
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

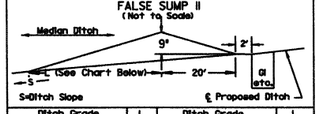
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
Florence & Hutcheson
CONSULTING ENGINEERS

1" = 50'



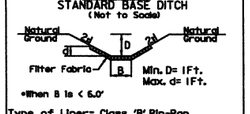
DETAIL II
FALSE SUMP II
(Not to Scale)



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'

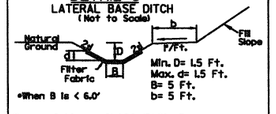
FROM STA. 266+50 -L- M
FROM STA. 270+00 -L- M

DETAIL H
STANDARD BASE DITCH
(Not to Scale)



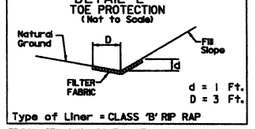
Type of Liner= Class 'B' Rip-Rap
FROM STA. 266+14 TO STA. 266+24 -L- LT, B=2 FT
FROM STA. 275+12 TO STA. 275+61 -L- LT, B=5 FT

DETAIL J
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= CLASS 'B' Rip-Rap
FROM STA. 275+61 TO STA. 277+00 -L- LT

DETAIL L
TOE PROTECTION
(Not to Scale)



Type of Liner = CLASS 'B' RIP RAP
FROM STA. 273+80 TO STA. 275+61 -L- LT

SEE SHEET 37 FOR -L- PROFILE

8/17/99
21-NOV-2011 16:56
G:\Projects\70101A-U-2412_B\U-2412B\Roadway\Proj\U-2412B_Rdy_psh_06.dgn
bauness1 AT W-AMCHI-D-00028

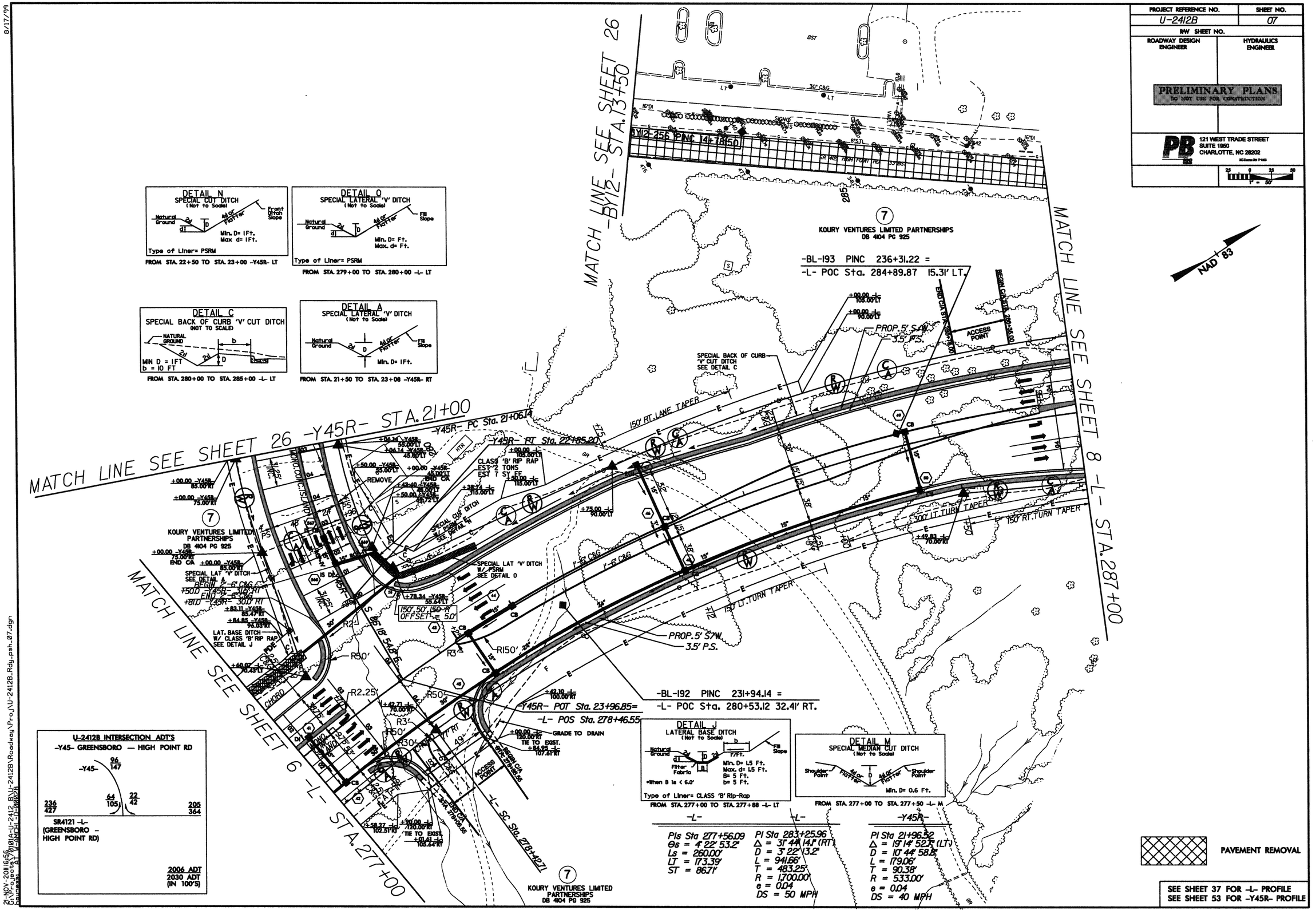
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	07
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No P-1439

1" = 50'

8/17/99



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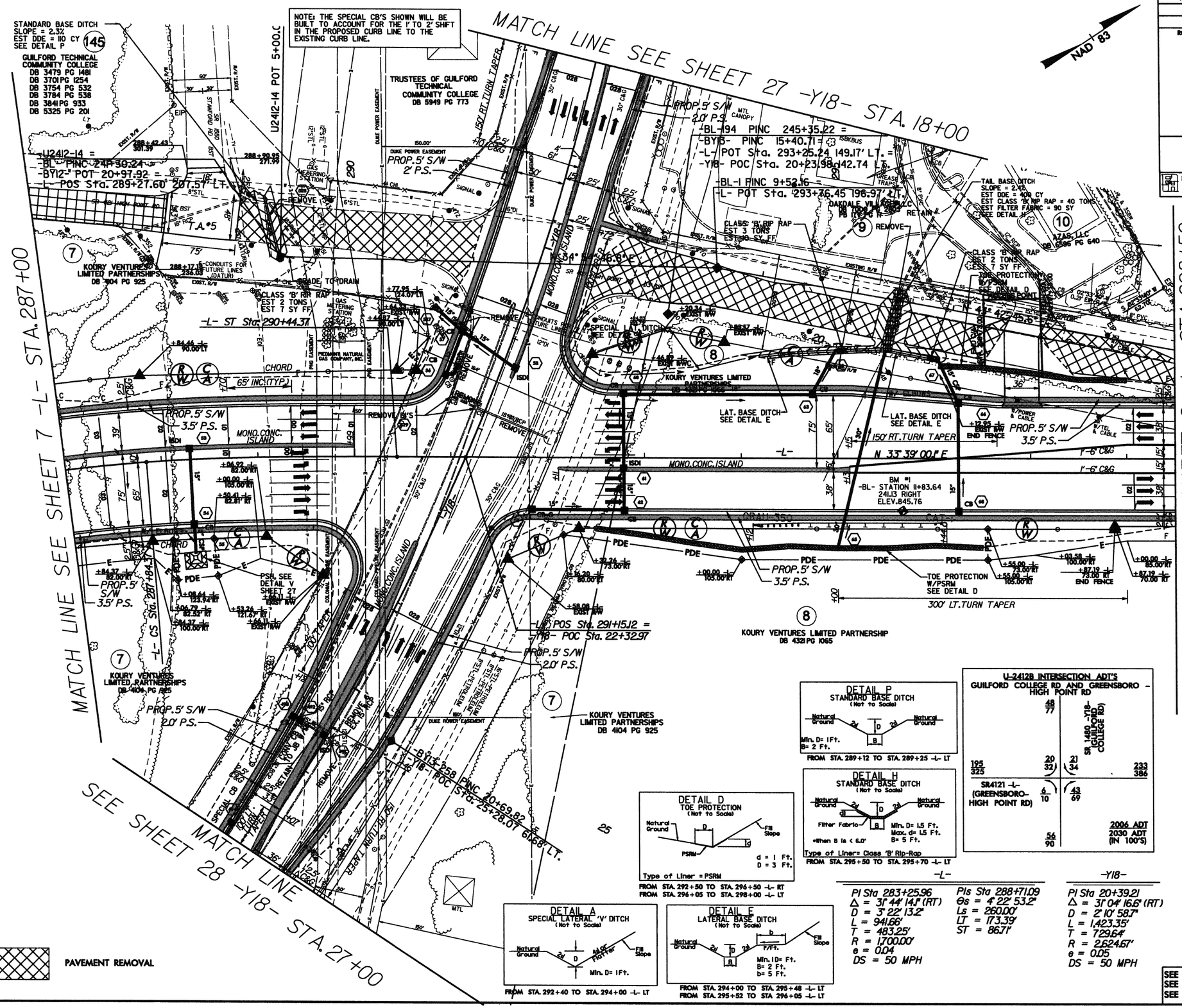
Pennessi AT Yadkin, LLP-PWD28

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	08
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No F-1220
Florence & Hutcheson
Consulting Engineers

1" = 50'



DETAIL P
STANDARD BASE DITCH
(Not to Scale)

Min. D= 1 Ft.
B= 2 Ft.

FROM STA. 289+12 TO STA. 289+25 -L- LT

DETAIL H
STANDARD BASE DITCH
(Not to Scale)

Filter Fabric
Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 5 Ft.
*When B is < 5.0'

Type of Liner= Class 'B' Rip-Rap

FROM STA. 295+50 TO STA. 295+70 -L- LT

DETAIL D
TOE PROTECTION
(Not to Scale)

Type of Liner = PSRM

d = 1 Ft.
D = 3 Ft.

FROM STA. 292+50 TO STA. 296+50 -L- RT
FROM STA. 296+05 TO STA. 298+00 -L- LT

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

Min. D= 1 Ft.

FROM STA. 292+40 TO STA. 294+00 -L- LT

DETAIL E
LATERAL BASE DITCH
(Not to Scale)

Min. D= 1 Ft.
B= 2 Ft.
b= 5 Ft.

FROM STA. 294+00 TO STA. 295+48 -L- LT
FROM STA. 295+52 TO STA. 296+05 -L- LT

U-2412B INTERSECTION ADT'S
GUILFORD COLLEGE RD AND GREENSBORO - HIGH POINT RD

SR 1480 -Y18- (GUILFORD COLLEGE RD)
48/77
195/325
20/32
21/34
233/386
SR 4121 -L- (GREENSBORO-HIGH POINT RD)
6/10
43/69
56/90

2006 ADT
2030 ADT
(IN 100'S)

-L-

PI Sta 283+25.96
Δ = 31° 44' 14.1" (RT)
D = 3° 22' 13.2"
L = 941.66'
T = 483.25'
R = 1,700.00'
e = 0.04
DS = 50 MPH

PIs Sta 288+71.09
Θs = 4° 22' 53.2"
Ls = 260.00'
LT = 173.39'
ST = 86.71'

-Y18-

PI Sta 20+39.21
Δ = 31° 04' 16.6" (RT)
D = 2° 10' 58.7"
L = 1,423.35'
T = 729.64'
R = 2,624.67'
e = 0.05
DS = 50 MPH

SEE SHEET 2-G FOR INTERSECTION DETAIL
SEE SHEET 37 & 38 FOR -L- PROFILE
SEE SHEET 47 FOR -Y18- PROFILE

8/17/99

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Pennoyer, Al Walden, Jr.

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	09
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

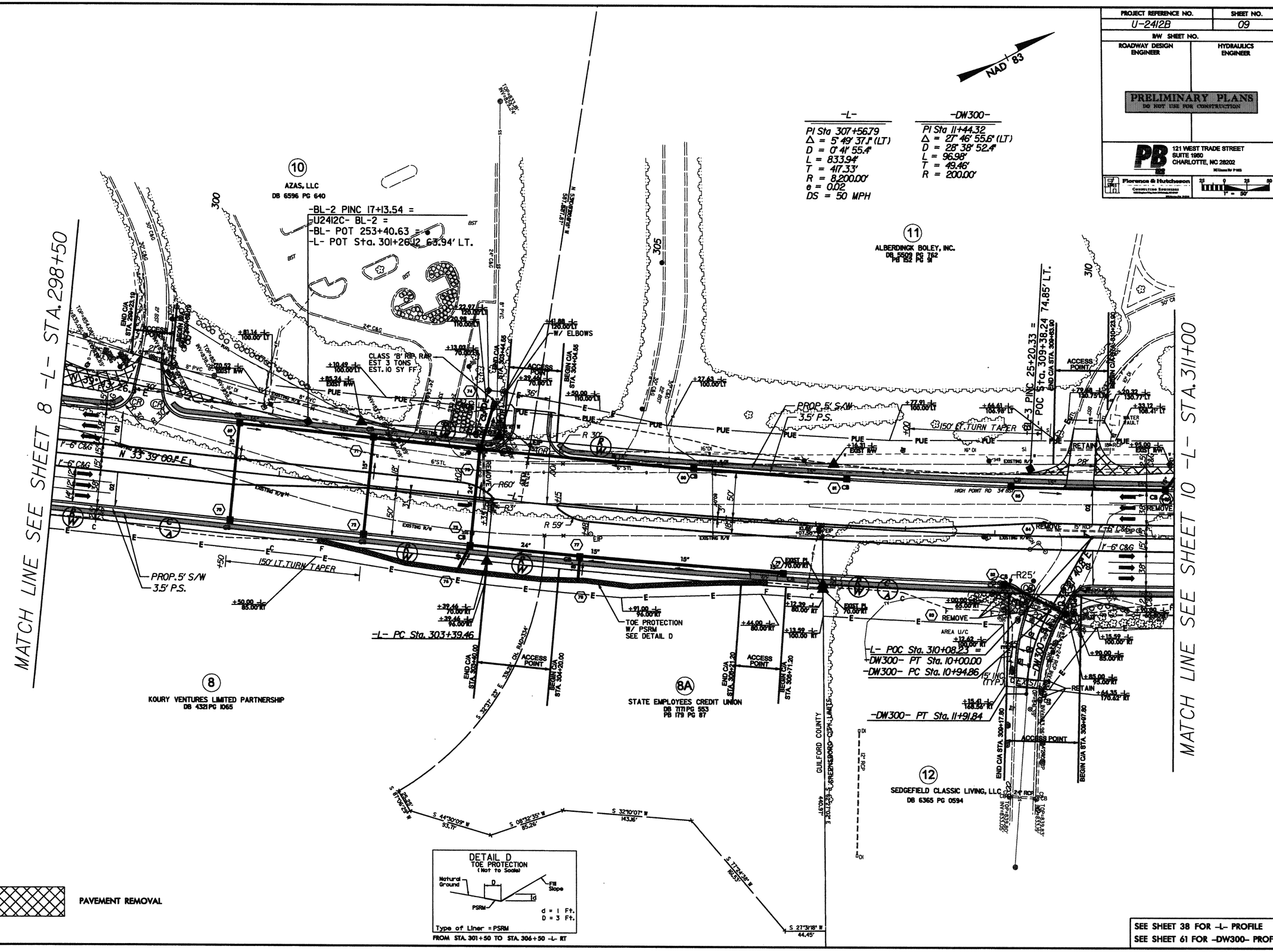
PB
121 WEST TRADE STREET
SUITE 1960
CHARLOTTE, NC 28202
NC License No. F-1003

Florence & Hutcheson
CONSULTING ENGINEERS

1" = 50'

NAD 83

-L-	-DW300-
PI Sta 307+56.79	PI Sta 11+44.32
Δ = 5° 49' 37.1" (LT)	Δ = 27° 46' 55.6" (LT)
D = 0° 41' 55.4"	D = 28° 38' 52.4"
L = 833.94'	L = 96.98'
T = 417.33'	T = 49.46'
R = 8,200.00'	R = 200.00'
e = 0.02	
DS = 50 MPH	



SEE SHEET 38 FOR -L- PROFILE
SEE SHEET 61 FOR -DW300- PROFILE

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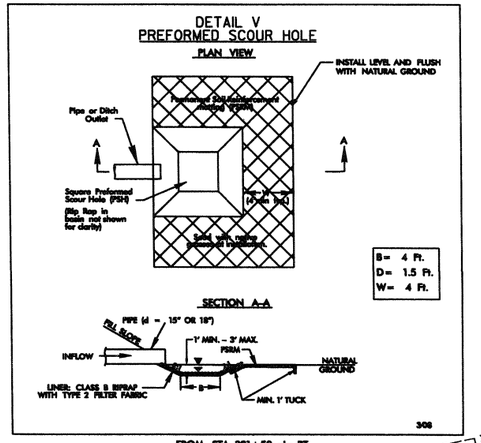
Dwnness, Jill W.

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

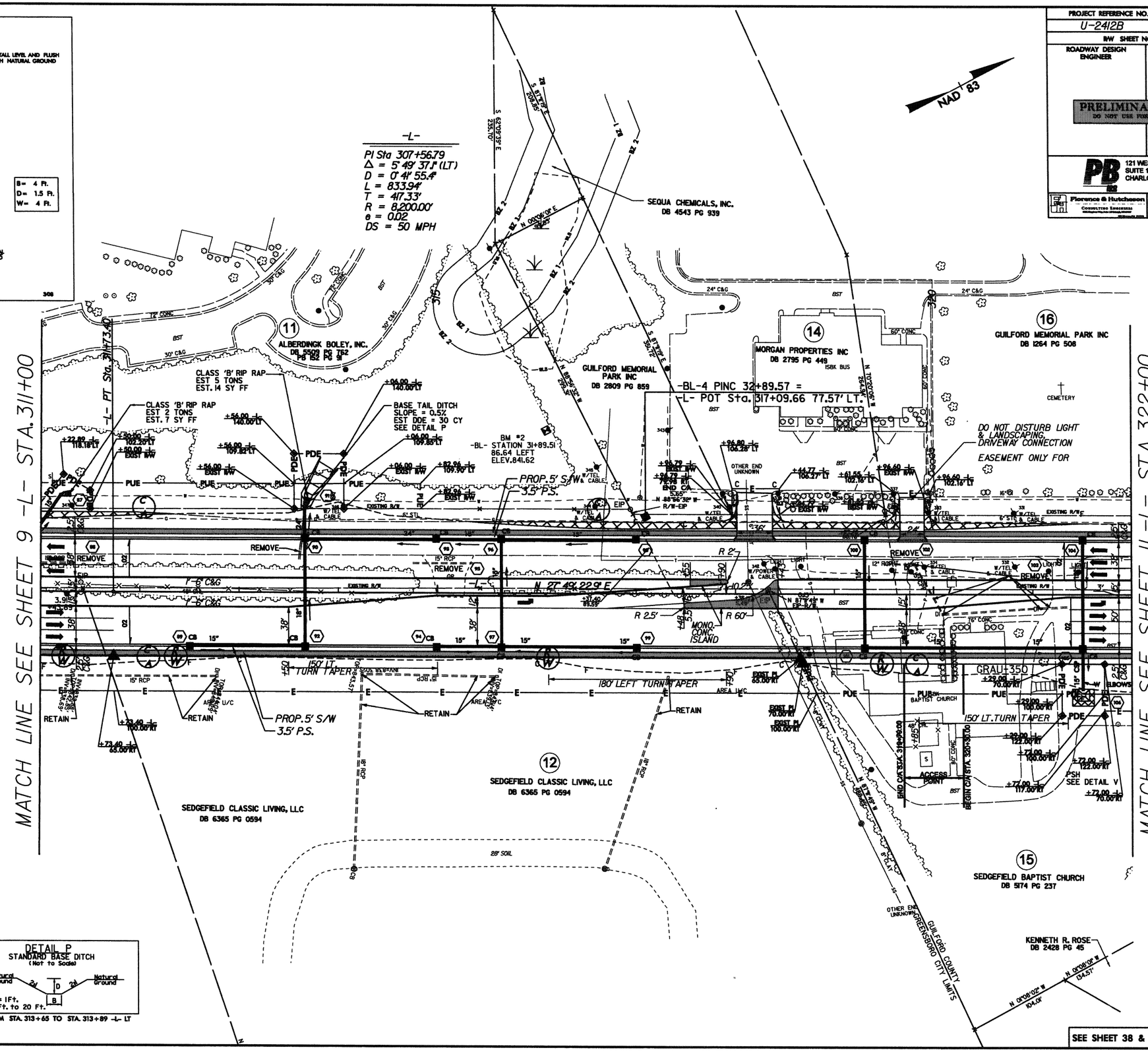
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
Florence & Hutcheson
CONSULTING ENGINEERS

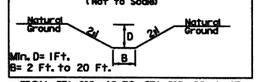
1" = 50'



FROM STA. 321+50 -L- RT



DETAIL P
STANDARD BASE DITCH
(Not to Scale)



FROM STA. 313+65 TO STA. 313+89 -L- LT

SEE SHEET 38 & 39 FOR -L- PROFILE

8/17/99

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bpinnas AT W-CAMPH-TI-PW02B

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

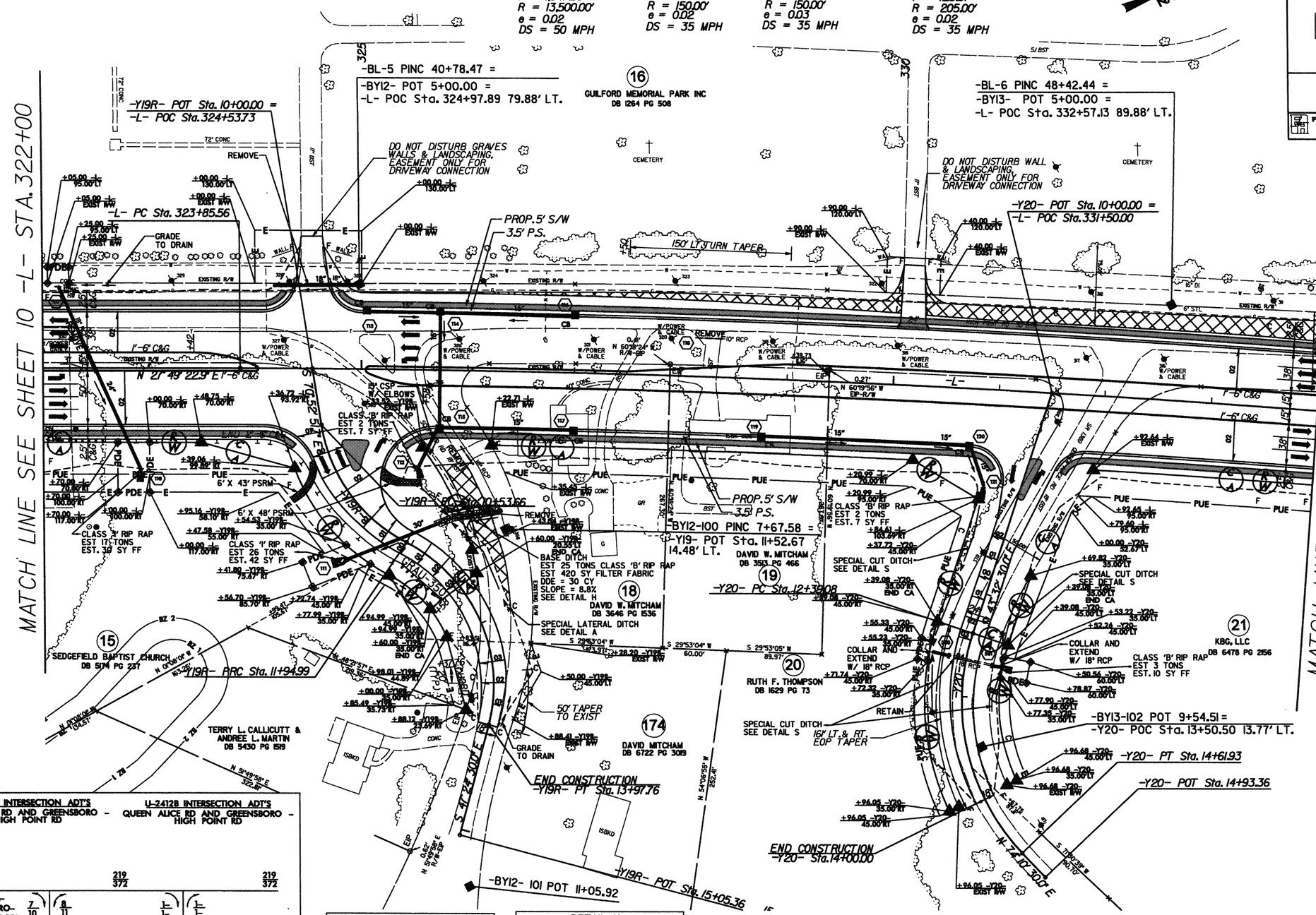
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson Consulting Engineers

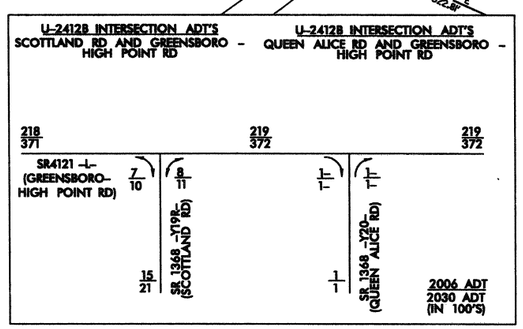
1" = 50'

-L-	-Y19R-		-Y20-
PI Sta 339+33.05	PI Sta 11+30.06	PI Sta 13+15.28	PI Sta 13+62.95
Δ = 13° 04' 42.6" (RT)	Δ = 53° 58' 53.7" (LT)	Δ = 77° 27' 15.4" (RT)	Δ = 62° 17' 00.0" (LT)
D = 0° 25' 27.9"	D = 38° 11' 49.9"	D = 38° 11' 49.9"	D = 27° 56' 57.0"
L = 3,081.55'	L = 141.32'	L = 202.77'	L = 222.85'
T = 1,547.50'	T = 76.40'	T = 120.29'	T = 123.87'
R = 13,500.00'	R = 150.00'	R = 150.00'	R = 205.00'
e = 0.02	e = 0.02	e = 0.03	e = 0.02
DS = 50 MPH	DS = 35 MPH	DS = 35 MPH	DS = 35 MPH

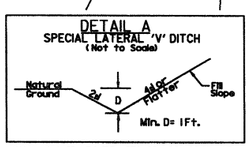


U-2412B INTERSECTION ADT'S
SCOTTLAND RD AND GREENSBORO - HIGH POINT RD

U-2412B INTERSECTION ADT'S
QUEEN ALICE RD AND GREENSBORO - HIGH POINT RD

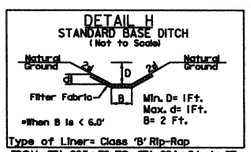


DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 11+54 TO STA. 13+00 -Y19R- LT

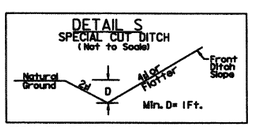
DETAIL H
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class 'B' Rip-Rap

FROM STA. 325+72 TO STA. 326+34 -L- RT

DETAIL S
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 11+00 TO STA. 13+15 -Y20- RT
FROM STA. 12+00 TO STA. 13+15 -Y20-LT

PAVEMENT REMOVAL

SEE SHEETS 2-G AND 2-H FOR INTERSECTION DETAILS
SEE SHEET 39 FOR -L- PROFILE
SEE SHEET 48 FOR -Y19R- PROFILE
SEE SHEET 48 FOR -Y20- PROFILE

8/17/99

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bpugsley AT W-BMCH-TT-PW28

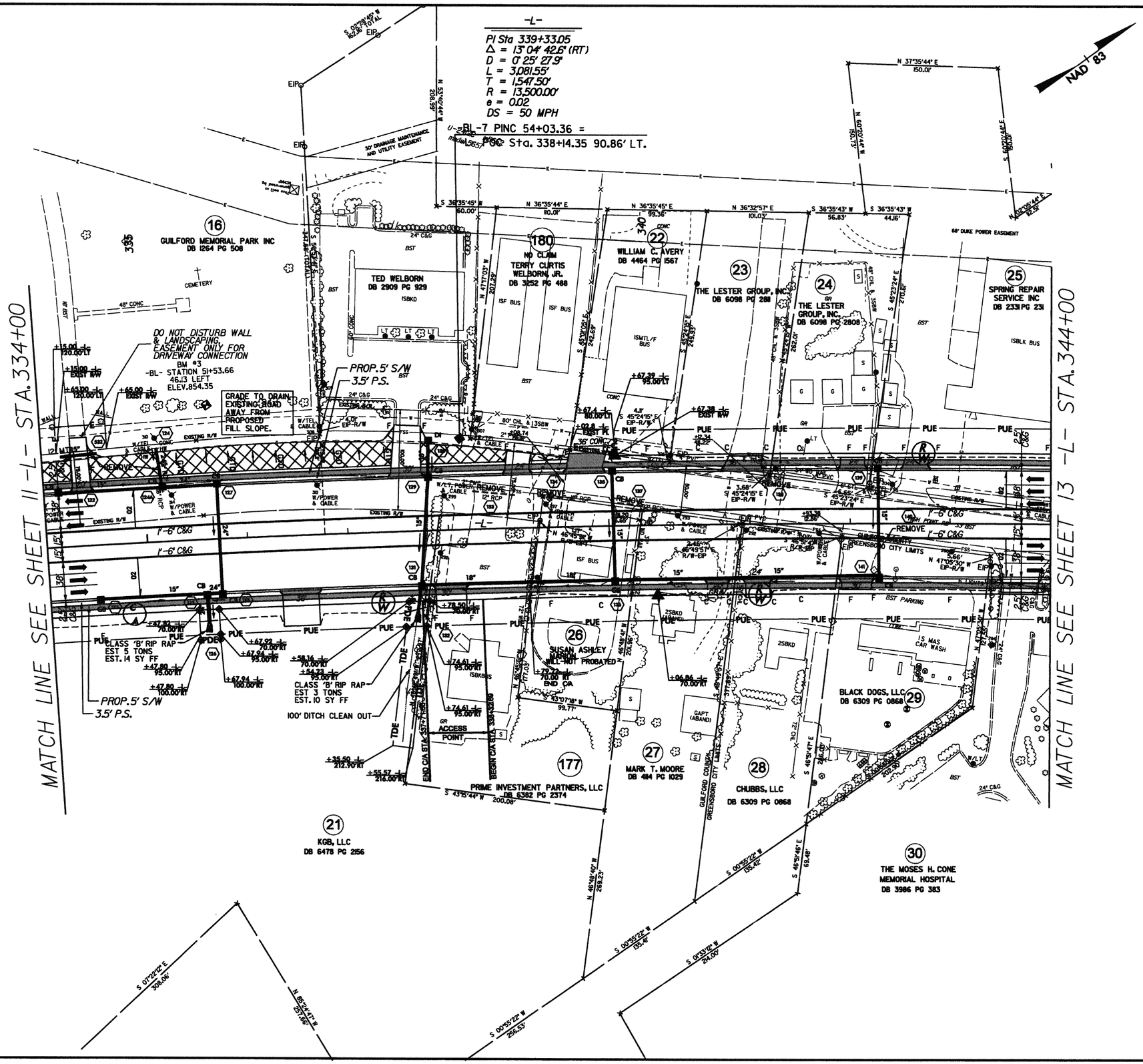
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202

Florence & Hutcheson
CONSULTING ENGINEERS

1" = 50'



SEE SHEET 2-G FOR ACCESS POINTS IN PARTIAL CONTROL
SEE SHEET 39 FOR -L- PROFILE

8/17/99

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Pauwasai ATWZ-SHEET 15-09/09/28

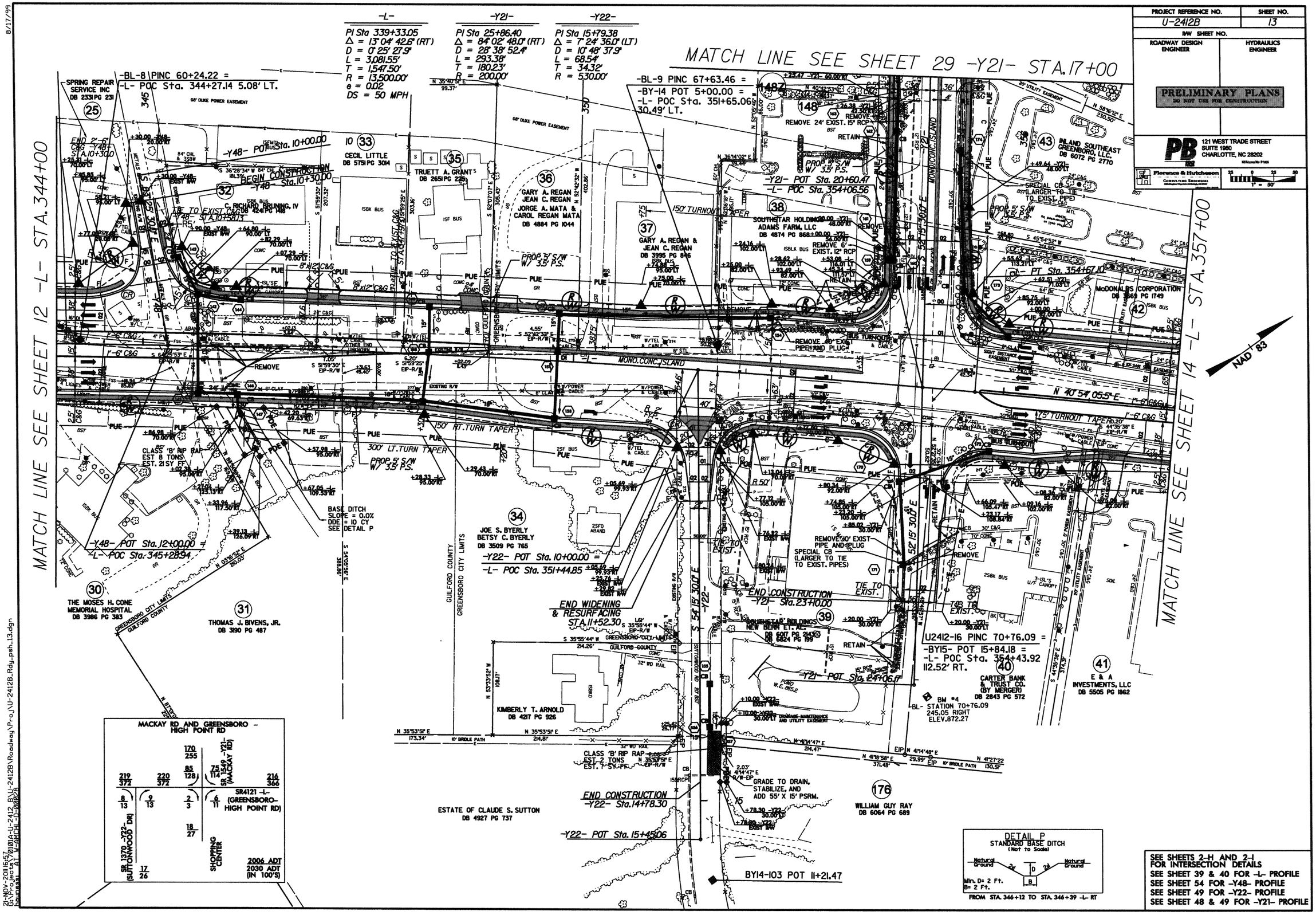
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson Consulting Engineers

1" = 50'



SEE SHEETS 2-H AND 2-I FOR INTERSECTION DETAILS
SEE SHEET 39 & 40 FOR -L- PROFILE
SEE SHEET 54 FOR -Y48- PROFILE
SEE SHEET 49 FOR -Y22- PROFILE
SEE SHEET 48 & 49 FOR -Y21- PROFILE

8/17/99

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bowness ATT W-BACH, FS-2000/03

8/17/99

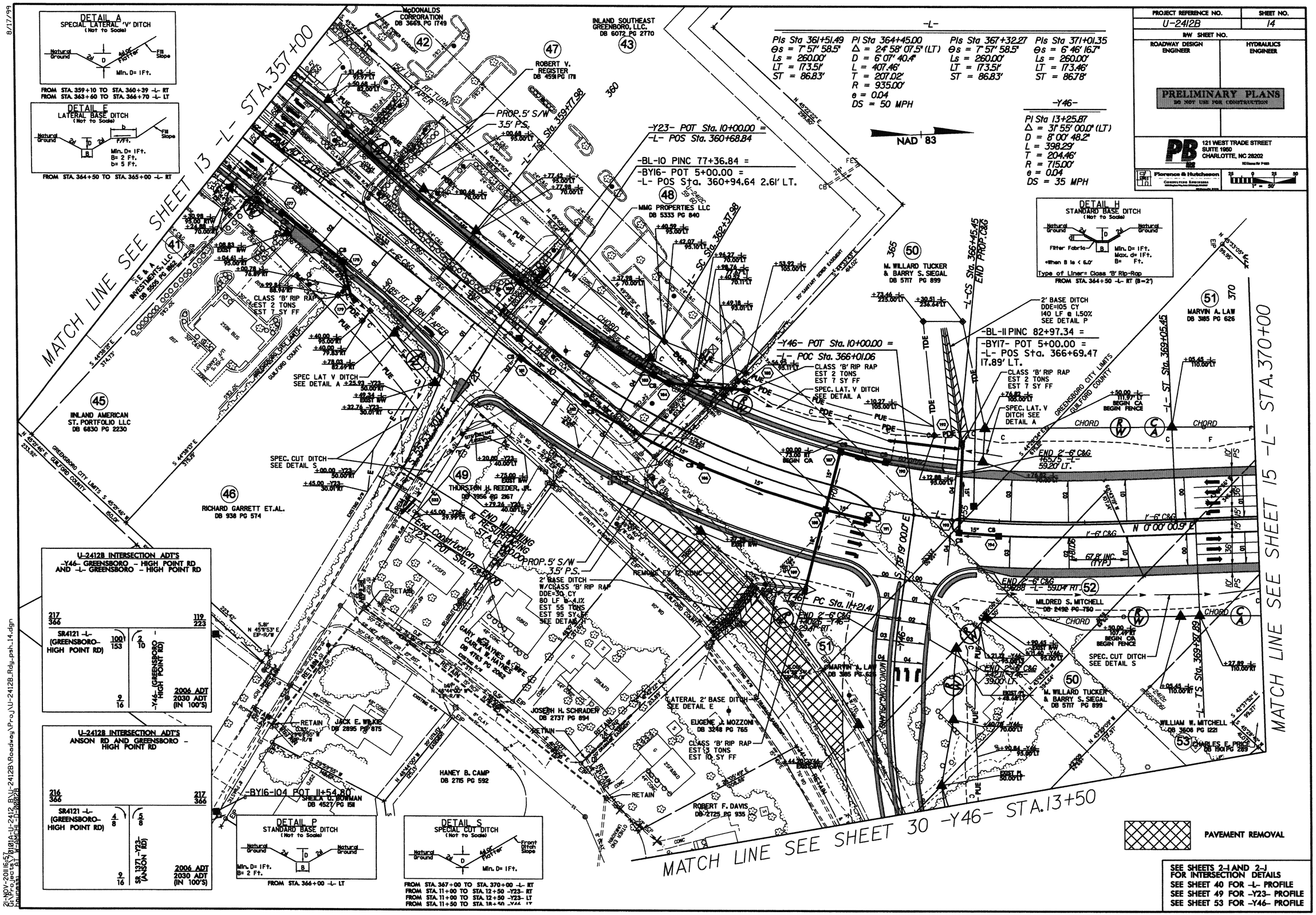
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No. F-1083

Florence & Hutcheson
CONSULTING ENGINEERS
NC License No. C-0205

1" = 50'



SEE SHEETS 2-I AND 2-J
FOR INTERSECTION DETAILS
SEE SHEET 40 FOR -L- PROFILE
SEE SHEET 49 FOR -Y23- PROFILE
SEE SHEET 53 FOR -Y46- PROFILE

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Journeyst, BT W:24CHF-1520/0728

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No. F-1253

Florence & Hutcheson
CONSULTING ENGINEERS
NC License No. F-0112

1" = 50'

NAD 83

-L-

PIs Sta 371+01.35	PI Sta 374+43.22	PIs Sta 377+76.44
θs = 6°46'16.7"	Δ = 26°08'08.5" (RT)	θs = 6°46'16.7"
Ls = 260.00'	D = 5°12'31.3"	Ls = 260.00'
LT = 173.46'	L = 501.77'	LT = 173.46'
ST = 86.78'	T = 255.33'	ST = 86.78'
	R = 1,100.00'	
	e = 0.04	
	DS = 50 MPH	

DETAIL E
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 2y, D, 2:1, b, B, Fill Slope, F/Ft.
Min. D= 1Ft.
B= 2 Ft.
b= 5 Ft.
FROM STA. 370+00 TO STA. 372+00 -L- RT

DETAIL H
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 2y, D, 2:1, d, B, Natural Ground, Filter Fabric
Min. D= 1Ft.
Max. d= 1Ft.
B= Ft.
*When B is < 6.0'
Type of Liner= Class 'B' Rip-Rap
FROM STA. 371+40 -L- RT (B=2')
FROM STA. 380+75 -L- RT (B=2')

DETAIL J
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 2y, D, 2:1, b, B, F/Ft., Fill Slope, d, Filter Fabric
Min. D= 1Ft.
Max. d= 1Ft.
B= 2 Ft.
b= 5 Ft.
*When B is < 6.0'
Type of Liner= CLASS 'B' Rip-Rap
FROM STA. 378+50 TO STA. 381+50 -L- RT

DETAIL L
TOE PROTECTION
(Not to Scale)
Natural Ground, D, Fill Slope, d, FILTER FABRIC
d = 1 Ft.
D = 3 Ft.
Type of Liner = CLASS 'B' RIP RAP
FROM STA. 379+75 TO STA. 381+20 -L- LT

DETAIL S
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground, 2y, D, 4:1 or Flatter, Front Ditch Slope
Min. D= 1Ft.
FROM STA. 375+73 TO STA. 378+00 -L- RT

50 M. WILLARD TUCKER & BARRY S. SIEGAL DB 5717 PG 899

56 KSL SEDGEFIELD PILOT LLC DB 6920 PG 1579

-BL-12 PINC 86+36.13 =
-L- POC Sta. 370+08.23
14.46' RT.

-BL-13 PINC 90+71.09 =
-L- POC Sta. 374+55.35 42.33' RT.

-BL-14 PINC 93+28.05 =
-L- POS Sta. 377+20.11 23.36' RT.

-BL- 15 PINC 98+31.22 =
-L- POT Sta. 382+17.94 57.29' LT.

-L- CS Sta. 376+89.66

-L- ST Sta. 379+49.66

-L- SC Sta. 371+87.89

BM #7
-BL- STATION 90+16.59
142.41 LEFT
ELEV. 862.09

END C/A STA. 375+00 — ACCESS POINT — BEGIN C/A STA. 376+00

51 MARVIN A. LAW DB 3185 PG 626

CLASS 'I' RIP RAP
EST 26 TONS
EST 42 SY FF

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

SPEC CUT DITCH
SEE DETAIL S

LATERAL 2' BASE DITCH
SEE DETAIL E

2' BASE DITCH
W/CLASS 'B' RIP RAP
40 LF @ 14.5%
DDE=6 CY
EST 27 TONS
EST 47 SY FF
SEE DETAIL H

50 AMERICAN FLAG - ADAMS FARM LLC DB 4681 PG 1337

53 WILLIAM W. MITCHELL DB 3608 PG 122

54 JANO SHOE, JENKINS AND HUSBAND, SIDNEY MALCOLM JENKINS, JR. DB 6264 PG 0127

CHARLES E. PRICE DB 1901 PG 289

KATHY A. GOHSMAN DB 4232 PG 635

56 JEFFERSON - PILOT LIFE INSURANCE COMPANY DB 2401 PG 394

H. C. PURCELL DB 2096 PG 214

55 THE JOHN AND LOU ANN MOTHERSHEAD FAMILY TRUST - TRUST B DB 7059 PG 317

LATERAL 2' BASE DITCH
W/CLASS 'B' RIP RAP
SEE DETAIL J

2' BASE DITCH
W/CLASS 'B' RIP RAP
40 LF @ 8.75%
DDE=6 CY
EST 27 TONS
EST 47 SY FF
SEE DETAIL H

CLASS 'I' RIP RAP
EST 26 TONS
EST 42 SY FF

TOE PROTECTION
W/CLASS 'B' RIP RAP
SEE DETAIL L

CLASS 'B' RIP RAP
EST 1 TON
EST 5 SY FF

15" CSP W/ELBOW

MATCH LINE SEE SHEET 14 -L- STA. 370+00

MATCH LINE SEE SHEET 16 -L- STA. 383+00

DETAIL I
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow, 10:1, 20:1, 2.0', 0.5' Min., 1.0' Max., S = Ditch Slope, ℄ Proposed Ditch
FROM STA. 378+00 -L- RT

DETAIL III
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow, 20:1, 10:1, 2', 0.5' Min., 1.0' Max., S=Ditch Slope, ℄ Proposed Ditch
FROM STA. 372+50 -L- RT

SEE SHEET 40 & 41 FOR -L- PROFILE

8/17/99

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(Roadway) AT W-AMCH-D-0002B

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No F-1183

Florence & Hutcheson
CONSULTING ENGINEERS

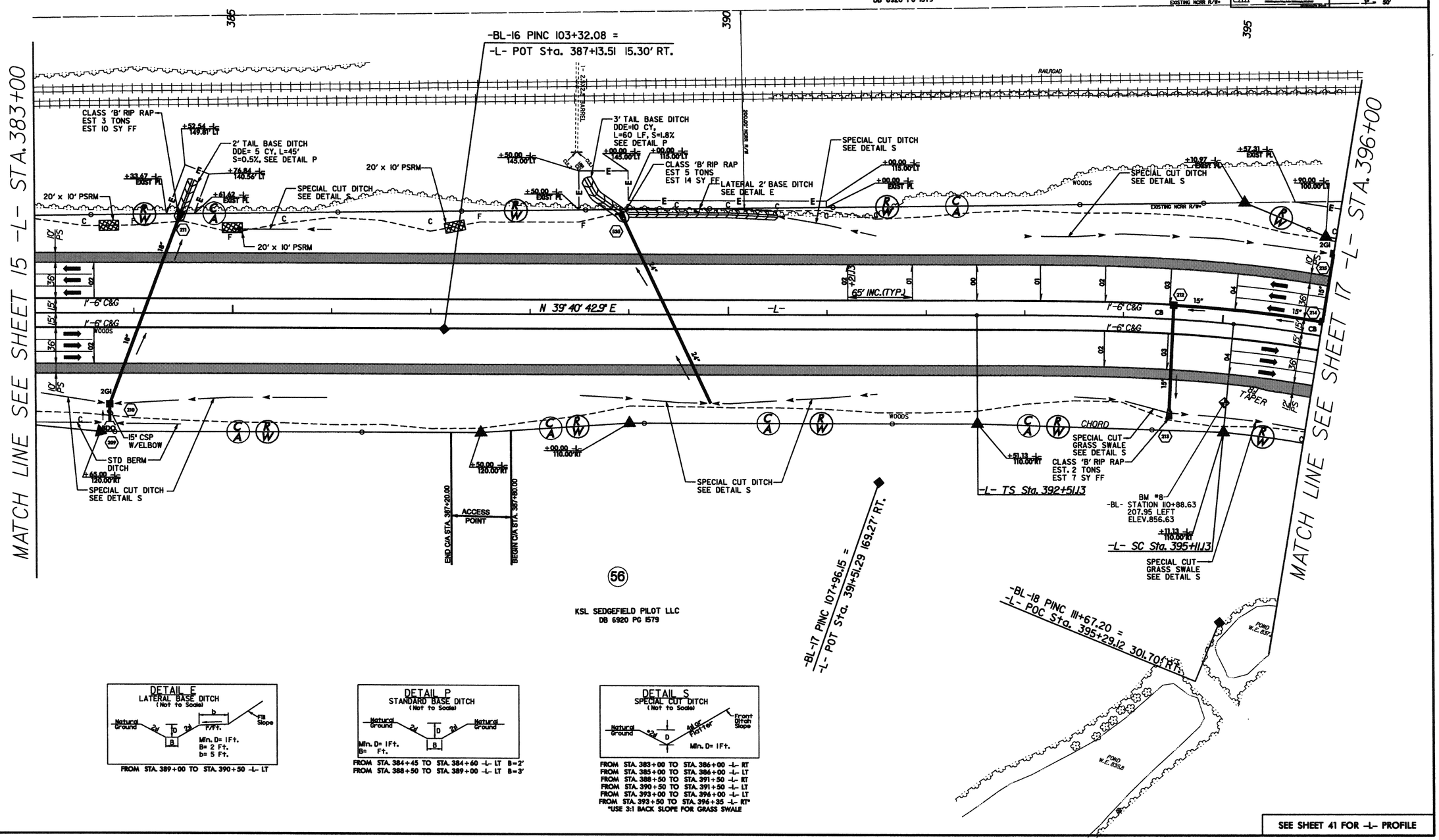
25 0 25 50
1" = 50'

-L-

PIs Sta 394+24.55
Θs = 5° 43' 46.5"
Ls = 260.00'
LT = 173.42'
ST = 86.75'

PI Sta 397+27.55
Δ = 18° 54' 14.2" (RT)
D = 4° 24' 26.5"
L = 428.92'
T = 216.43'
R = 1,300.00'
e = 0.04
DS = 50 MPH

NAD 83



DETAIL E
LATERAL BASE DITCH
(Not to Scale)

FROM STA. 389+00 TO STA. 390+50 -L- LT

DETAIL P
STANDARD BASE DITCH
(Not to Scale)

FROM STA. 384+45 TO STA. 384+60 -L- LT B=2'
FROM STA. 388+50 TO STA. 389+00 -L- LT B=3'

DETAIL S
SPECIAL CUT DITCH
(Not to Scale)

FROM STA. 383+00 TO STA. 386+00 -L- RT
FROM STA. 385+00 TO STA. 386+00 -L- LT
FROM STA. 388+50 TO STA. 391+50 -L- RT
FROM STA. 390+50 TO STA. 391+50 -L- LT
FROM STA. 393+00 TO STA. 396+00 -L- LT
FROM STA. 393+50 TO STA. 396+35 -L- RT*
*USE 3:1 BACK SLOPE FOR GRASS SWALE

SEE SHEET 41 FOR -L- PROFILE

8/17/99
21-NOV-2011 16:57
G:\Projects\70101A-U-2412_B\U-2412B\Roadway\Proj\U-2412B_Rdy_psh_16.dgn
Bentley Systems, Inc. V8 XM (08.11.07.443)

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1960
CHARLOTTE, NC 28202
NC License No P-1955

Florence & Hutcheson
CONSULTING ENGINEERS

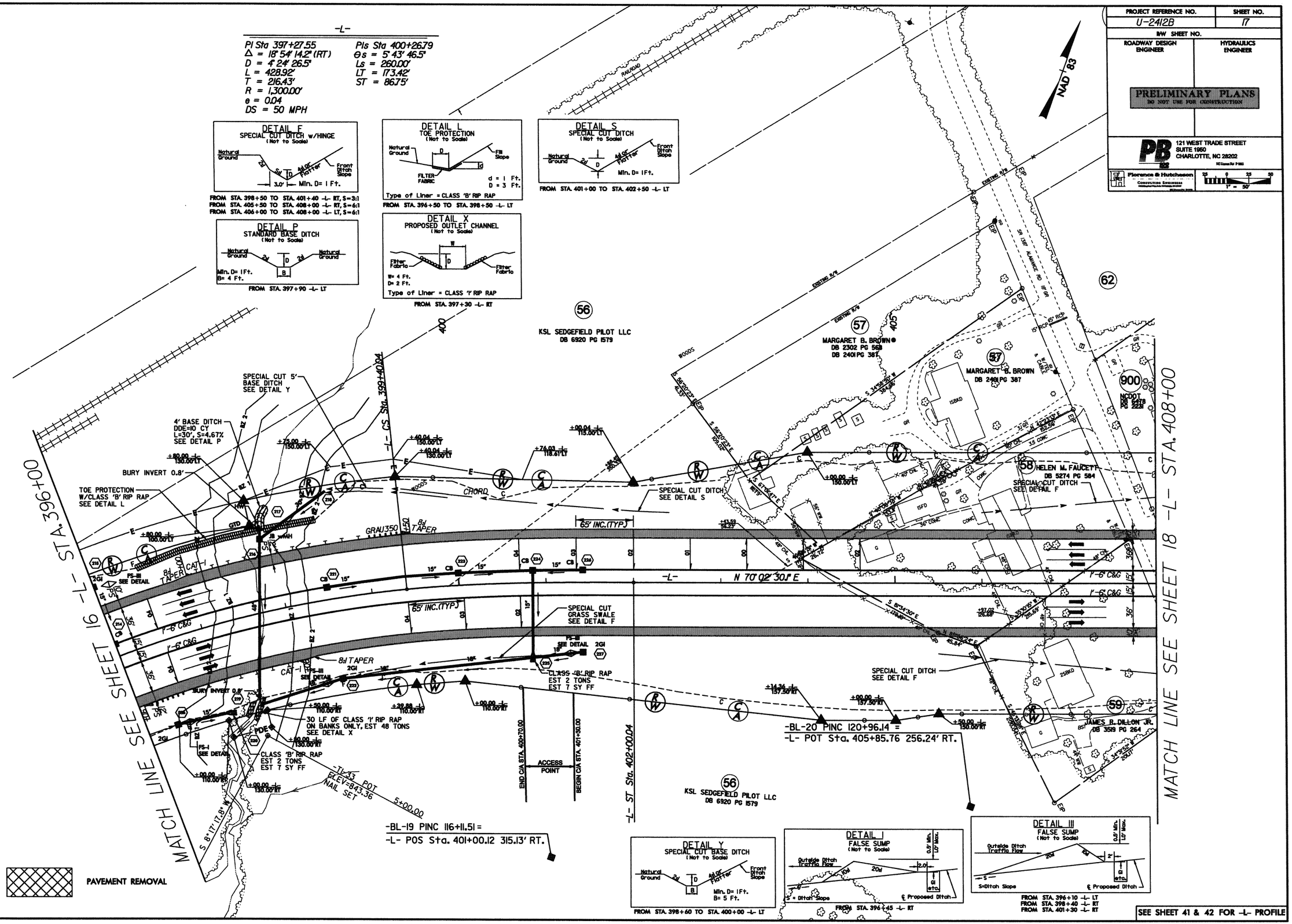
1" = 50'

8/17/99

-L-

PI Sta 397+27.55
Δ = 18° 54' 14.2" (RT)
D = 4° 24' 26.5"
L = 428.92'
T = 216.43'
R = 1,300.00'
e = 0.04
DS = 50 MPH

PIs Sta 400+26.79
Θs = 5° 43' 46.5"
Ls = 260.00'
LT = 173.42'
ST = 86.75'



SEE SHEET 41 & 42 FOR -L- PROFILE

21-NOV-2011 16:57
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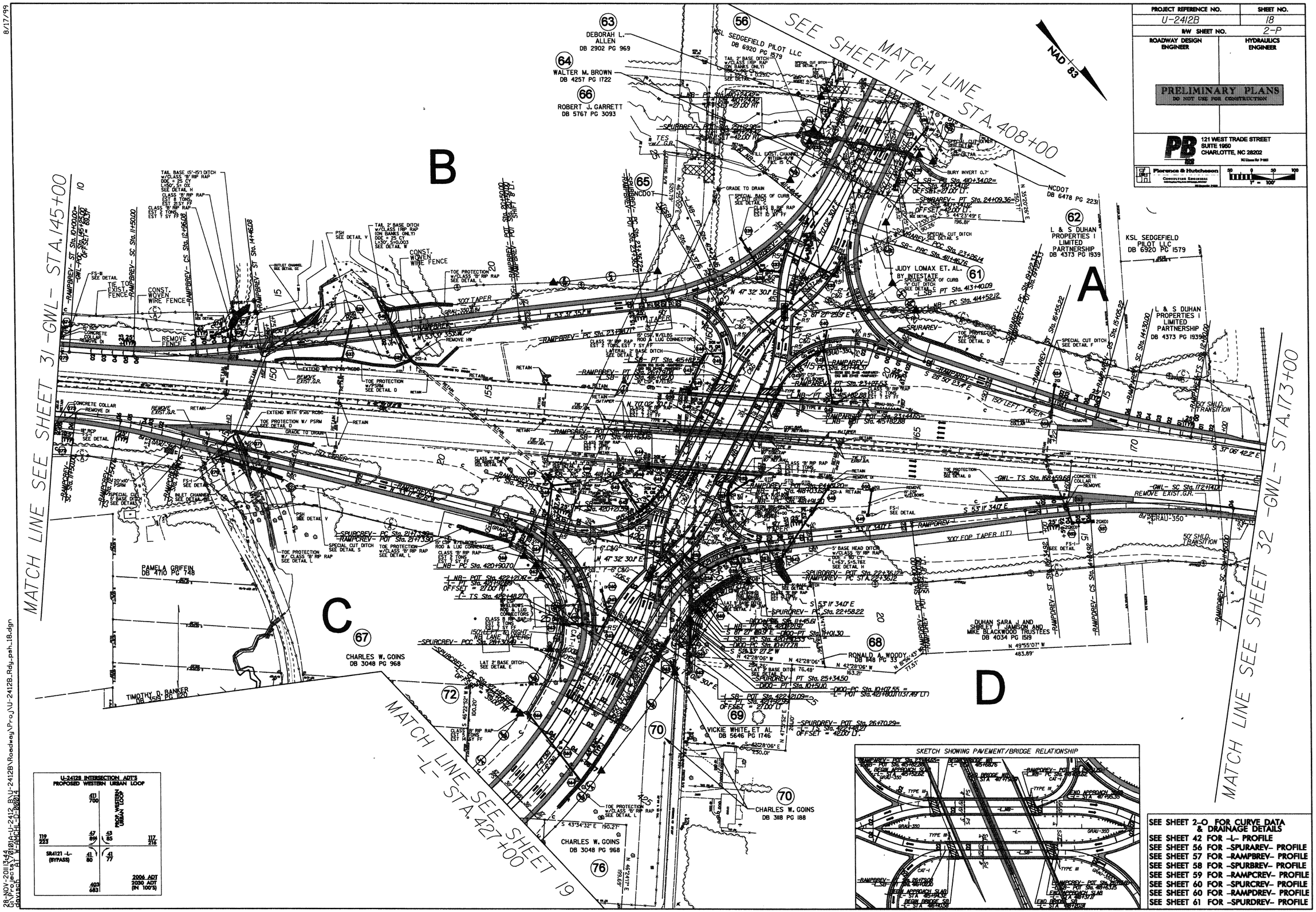
(pruness) AT W-AMCH-D-00028



8/17/99

28-NOV-2011 13:44
Projects\70101A-U-2412 B\U-2412B\Roadway\Proj\U-2412B_Rdy_psh_18.dgn
dsvsch AT W-AMCHL-D-00014

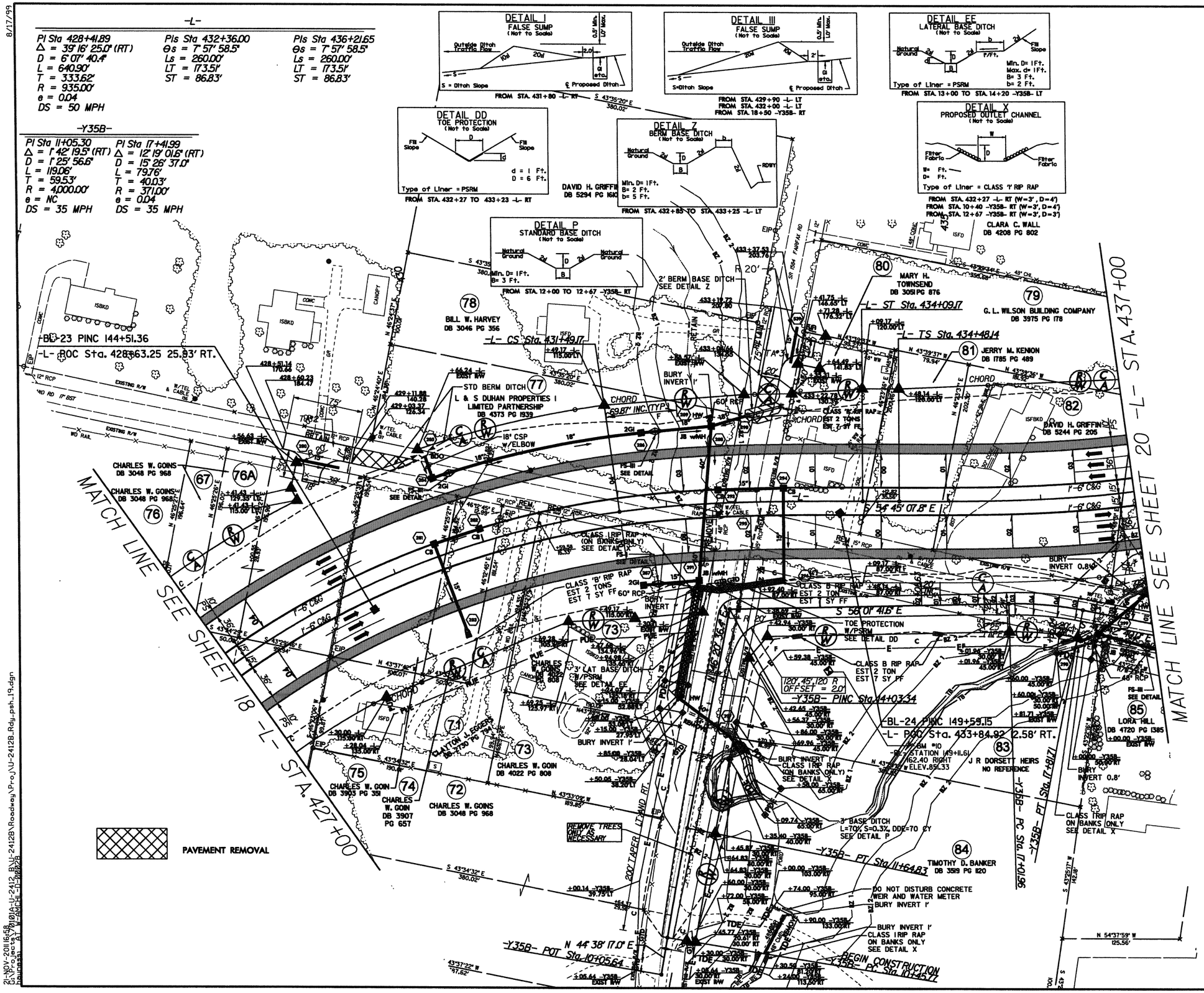
8/17/99

-L-

PI Sta 428+41.89	PIs Sta 432+36.00	PIs Sta 436+21.65
Δ = 39° 16' 25.0" (RT)	Θs = 7° 57' 58.5"	Θs = 7° 57' 58.5"
D = 6° 07' 40.4"	Ls = 260.00'	Ls = 260.00'
L = 640.90'	LT = 173.51'	LT = 173.51'
T = 333.62'	ST = 86.83'	ST = 86.83'
R = 935.00'		
e = 0.04		
DS = 50 MPH		

-Y35B-

PI Sta 11+05.30	PI Sta 17+41.99
Δ = 1° 42' 19.5" (RT)	Δ = 12° 19' 01.6" (RT)
D = 1° 25' 56.6"	D = 15° 26' 37.0"
L = 119.06'	L = 79.76'
T = 59.53'	T = 40.03'
R = 4,000.00'	R = 371.00'
e = NC	e = 0.04
DS = 35 MPH	DS = 35 MPH



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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No P1055

Florence & Hutcheson
CONSULTING ENGINEERS

25 0 25 50
1" = 50'

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S:\PROJECTS\2010\10-U-2412_B\U-2412B\Roadway\Proj\U-2412B_Rdy_psh_19.dgn
USER: AT W-ANCH-D-00028

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Pierce & Hutcheson Consulting Engineers

25 0 25 50
1" = 50'

8/17/99

-L-
PI Sta 441+47.04
Δ = 50° 17' 30.5" (LT)
D = 6° 07' 40.4"
L = 820.70'
T = 438.90'
R = 935.00'
e = 0.04
Ds = 50 mph

PIs Sta 446+15.67
Θs = 7° 57' 58.5"
Ls = 260.00'
LT = 173.51'
ST = 86.83'

-Y53-
PI Sta 11+29.99
Δ = 14° 28' 05.9" (RT)
D = 22° 49' 37.2"
L = 63.38'
T = 31.86'
R = 251.00'

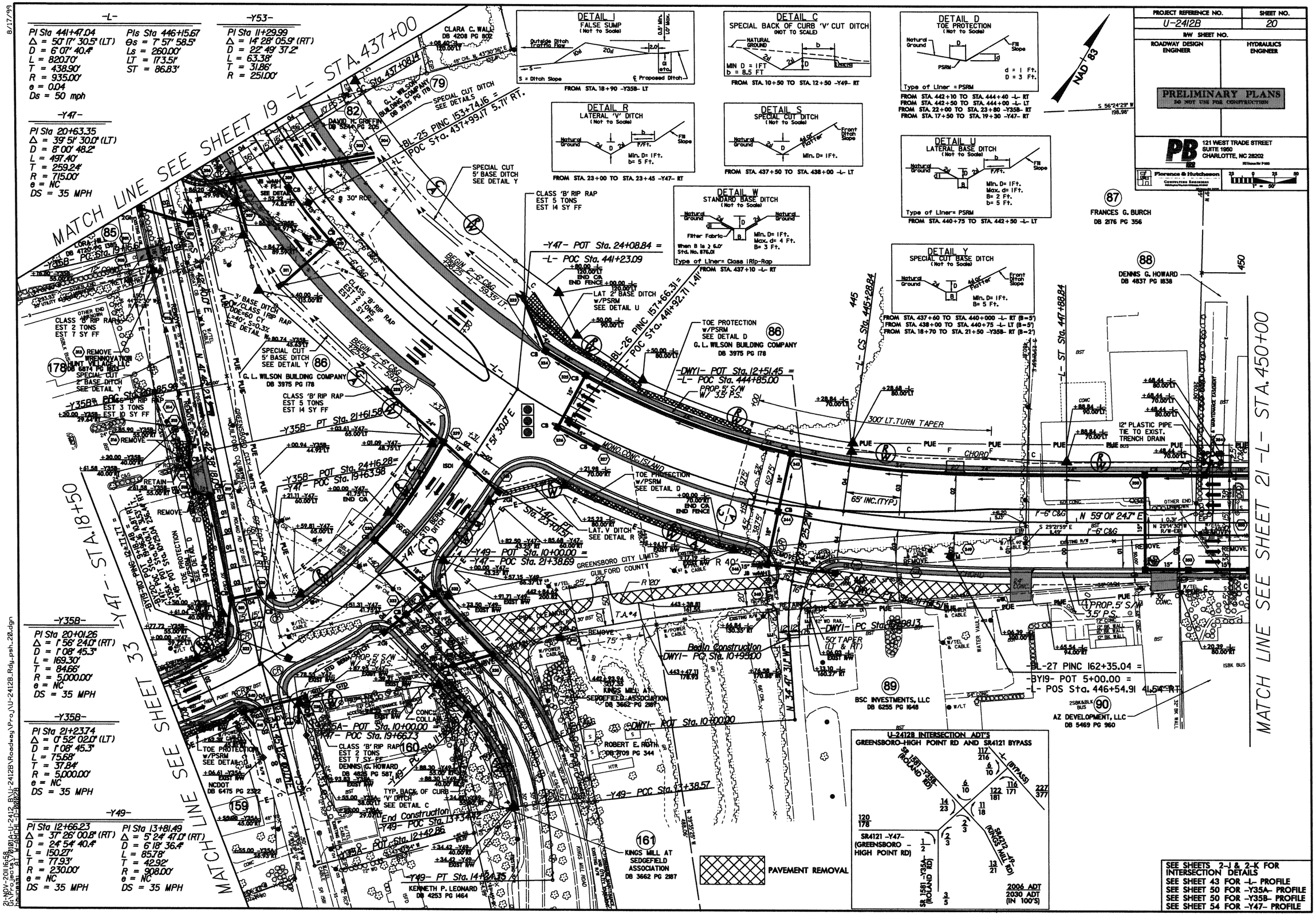
-Y47-
PI Sta 20+63.35
Δ = 39° 51' 30.0" (LT)
D = 8° 00' 48.2"
L = 497.40'
T = 259.24'
R = 715.00'
e = NC
DS = 35 MPH

-Y35B-
PI Sta 20+01.26
Δ = 1° 56' 24.0" (RT)
D = 1° 08' 45.3"
L = 169.30'
T = 84.66'
R = 5,000.00'
e = NC
DS = 35 MPH

-Y35B-
PI Sta 21+23.74
Δ = 0° 52' 02.0" (LT)
D = 1° 08' 45.3"
L = 75.68'
T = 37.84'
R = 5,000.00'
e = NC
DS = 35 MPH

-Y49-
PI Sta 12+66.23
Δ = 37° 26' 00.8" (RT)
D = 24° 54' 40.4"
L = 150.27'
T = 77.93'
R = 230.00'
e = NC
DS = 35 MPH

PI Sta 13+81.49
Δ = 5° 24' 47.0" (RT)
D = 6° 18' 36.4"
L = 85.78'
T = 42.92'
R = 908.00'
e = NC
DS = 35 MPH



SEE SHEETS 2-J & 2-K FOR INTERSECTION DETAILS
SEE SHEET 43 FOR -L- PROFILE
SEE SHEET 50 FOR -Y35A- PROFILE
SEE SHEET 50 FOR -Y35B- PROFILE
SEE SHEET 54 FOR -Y47- PROFILE

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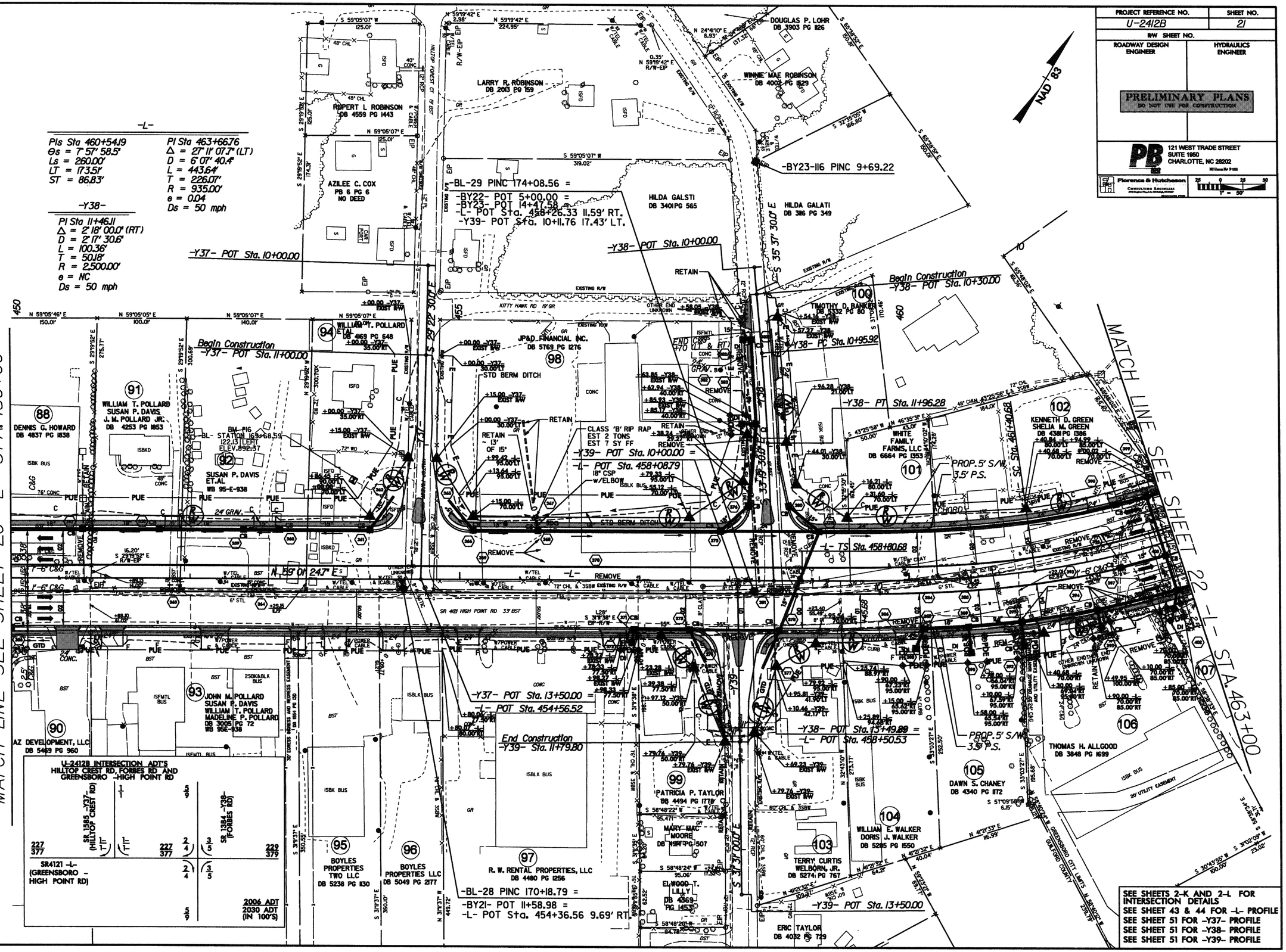
Pierce&Hutcheson



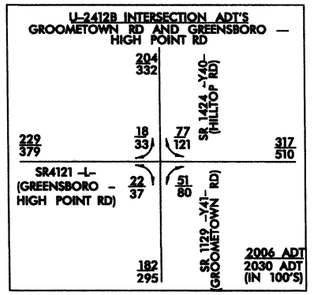
PROJECT REFERENCE NO.
U-2412B
SHEET NO.
21
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
Florence & Hutcheson
CONSULTING ENGINEERS
NAD 83
-L-
PIs Sta 460+54.19
Θs = 7° 57' 58.5"
Ls = 260.00'
LT = 173.51'
ST = 86.83'
PI Sta 463+66.76
Δ = 27° 11' 07.7" (LT)
D = 6° 07' 40.4"
L = 443.64'
T = 226.07'
R = 935.00'
e = 0.04
Ds = 50 mph
-Y38-
PI Sta 11+46.11
Δ = 2° 18' 00.0" (RT)
D = 2° 17' 30.6"
L = 100.36'
T = 50.18'
R = 2,500.00'
e = NC
Ds = 50 mph
MATCH LINE SEE SHEET 20 -L- STA. 450+00
MATCH LINE SEE SHEET 22 -L- STA. 463+00
-BL-29 PINC 174+08.56 =
-BY22- POT 5+00.00 =
-BY23- POT 14+47.58 =
-L- POT Sta. 458+26.33 11.59' RT.
-Y39- POT Sta. 10+11.76 17.43' LT.
-BY23-116 PINC 9+69.22
-Y37- POT Sta. 10+00.00
-Y38- POT Sta. 10+00.00
Begin Construction
-Y38- POT Sta. 10+30.00
Begin Construction
-Y37- POT Sta. 11+00.00
-Y38- PC Sta. 10+95.92
-Y38- PT Sta. 11+96.28
-Y39- POT Sta. 10+00.00 =
-L- POT Sta. 458+08.79
-L- TS Sta. 458+80.68
-Y37- POT Sta. 13+50.00 =
-L- POT Sta. 454+56.52
End Construction
-Y39- Sta. 11+79.80
-Y38- POT Sta. 13+49.89 =
-L- POT Sta. 458+50.53
-Y39- POT Sta. 13+50.00
-BL-28 PINC 170+18.79 =
-BY21- POT 11+58.98 =
-L- POT Sta. 454+36.56 9.69' RT.
U-2412B INTERSECTION ADT'S
HILLTOP CREST RD, FORBES RD AND GREENSBORO -HIGH POINT RD
SR 1585 -Y37- (HILLTOP CREST RD)
SR 1384 -Y38- (FORBES RD)
SR4121 -L- (GREENSBORO - HIGH POINT RD)
2006 ADT
2030 ADT
(IN 100'S)
SEE SHEETS 2-K AND 2-L FOR INTERSECTION DETAILS
SEE SHEET 43 & 44 FOR -L- PROFILE
SEE SHEET 51 FOR -Y37- PROFILE
SEE SHEET 51 FOR -Y38- PROFILE
SEE SHEET 51 FOR -Y39- PROFILE

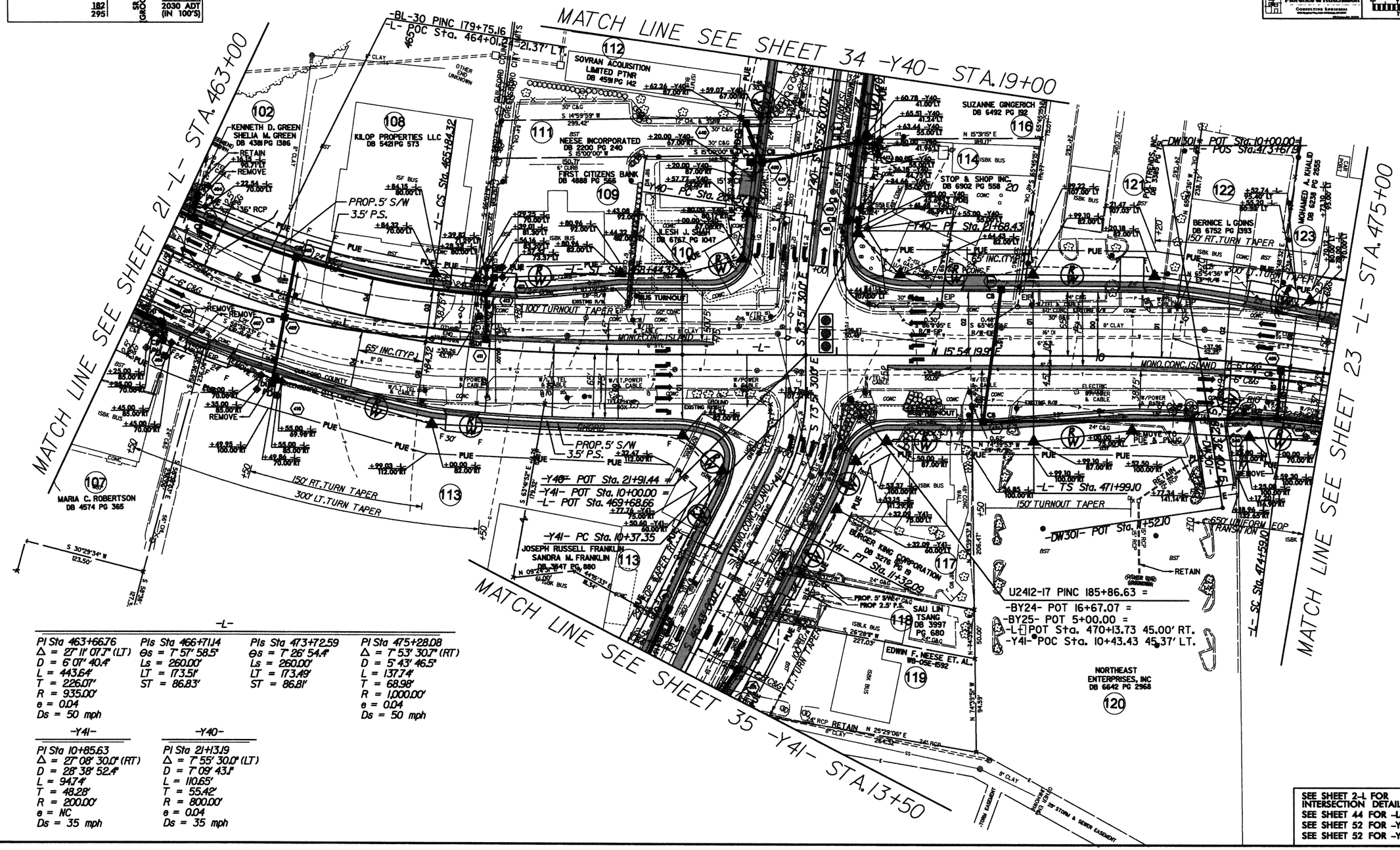
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
Florence & Hutcheson
CONSULTING ENGINEERS

NAD 83





-L-

PI Sta 463+66.76	PIs Sta 466+71.14	PIs Sta 473+72.59	PI Sta 475+28.08
Δ = 27° 11' 07.7" (LT)	Θs = 7° 57' 58.5"	Θs = 7° 26' 54.4"	Δ = 7° 53' 30.7" (RT)
D = 6° 07' 40.4"	Ls = 260.00'	Ls = 260.00'	D = 5° 43' 46.5"
L = 443.64'	LT = 173.51'	LT = 173.49'	L = 137.74'
T = 226.07'	ST = 86.83'	ST = 86.81'	T = 68.98'
R = 935.00'			R = 1,000.00'
e = 0.04			e = 0.04
Ds = 50 mph			Ds = 50 mph

-Y41-

PI Sta 10+85.63
Δ = 27° 08' 30.0" (RT)
D = 28° 38' 52.4"
L = 94.74'
T = 48.28'
R = 200.00'
e = NC
Ds = 35 mph

-Y40-

PI Sta 21+13.19
Δ = 7° 55' 30.0" (LT)
D = 7° 09' 43.1"
L = 110.65'
T = 55.42'
R = 800.00'
e = 0.04
Ds = 35 mph

SEE SHEET 2-L FOR INTERSECTION DETAILS
SEE SHEET 44 FOR -L- PROFILE
SEE SHEET 52 FOR -Y40- PROFILE
SEE SHEET 52 FOR -Y41- PROFILE

8/17/99
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G:\Projects\70101A-U-2412_B\U-2412B\Roadway\Proj\U-2412B_Rdy_psh_22.dgn
dayasch AT W-ANCHI-D-00014

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No. F-1553

Florence & Hutcheson
CONSULTING ENGINEERS

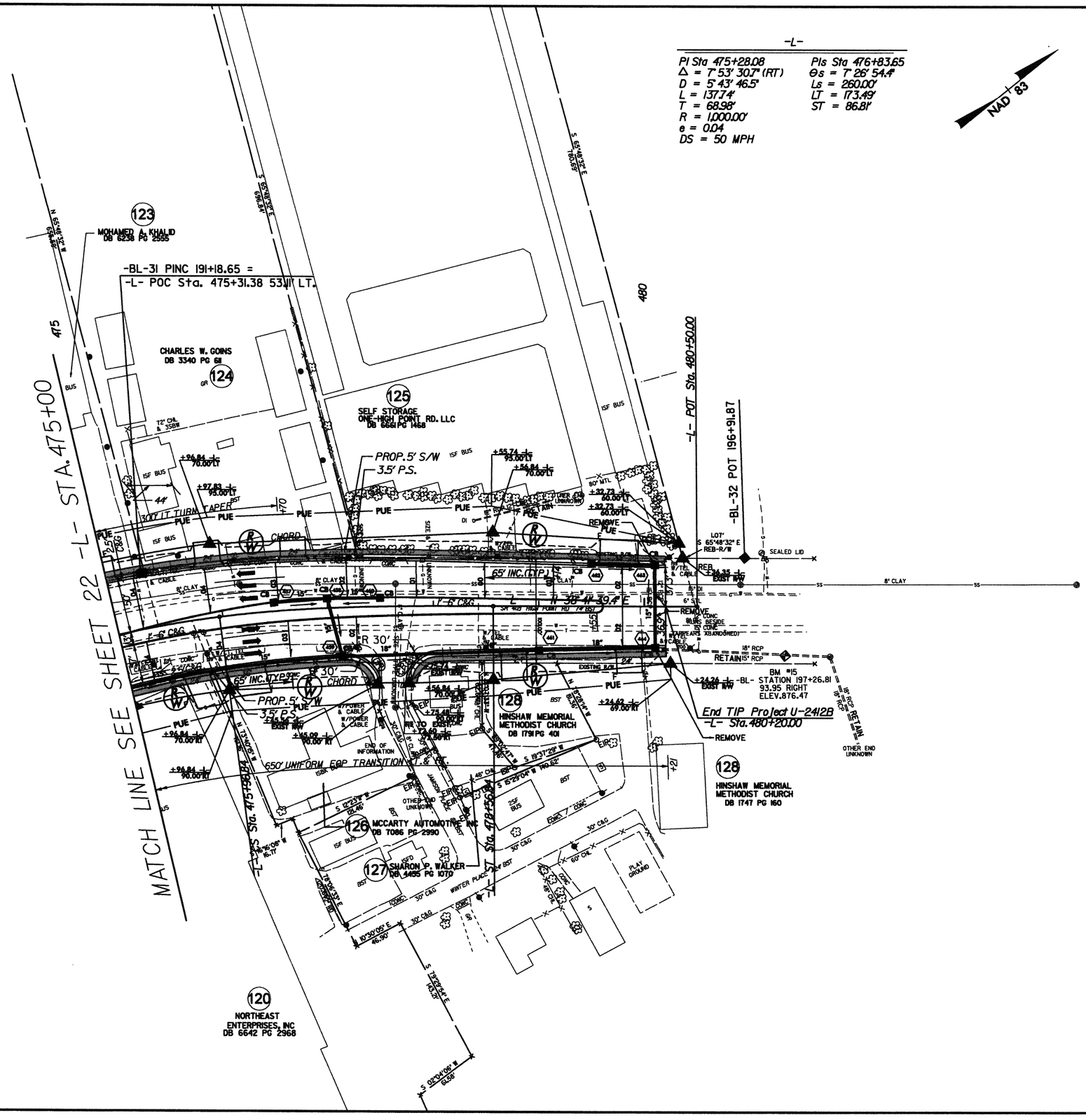
1" = 50'

-L-

PI Sta 475+28.08
Δ = 7° 53' 30.7" (RT)
D = 5° 43' 46.5"
L = 137.74'
T = 68.98'
R = 1,000.00'
e = 0.04
DS = 50 MPH

PIs Sta 476+83.65
Θs = 7° 26' 54.4"
Ls = 260.00'
LT = 173.49'
ST = 86.81'

NAD 83



SEE SHEET 44 FOR -L- PROFILE

8/17/99

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dovasch AT W-CADCHI_D-96014

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
Florance & Hutcheson
CONSULTING ENGINEERS

1" = 50'

-Y16-

PI Sta 22+64.29	PI Sta 30+26.52
Δ = 8° 56' 30.0" (RT)	Δ = 16° 45' 00.0" (LT)
D = 1° 30' 00.0"	D = 3° 49' 11.0"
L = 596.11'	L = 438.51'
T = 298.66'	T = 220.83'
R = 3,819.72'	R = 1,500.00'
e = 0.03	e = 0.04
DS = 50 MPH	DS = 50 MPH

-Y16_DW2-

PI Sta 10+69.91
Δ = 11° 03' 05.9" (LT)
D = 114° 35' 29.6"
L = 9.64'
T = 4.84'
R = 50.00'

-Y16_DW6-

PI Sta 10+75.85
Δ = 55° 41' 01.8" (LT)
D = 286° 28' 44.0"
L = 19.44'
T = 10.56'
R = 20.00'

-BYII-248 PINC 20+91.22 =
-Y16- POC Sta. 24+87.11 52.76' LT. =
-Y52- POT Sta. 14+33.10 27.21' RT.

-BYII-249 PINC 26+05.01 =
-Y16- POC Sta. 30+03.58 25.20' LT.

-Y52- POT Sta. 10+00.00

Begin Construction
-Y52- Sta. 13+25.00

Begin Widening
-Y16- Sta. 21+79.00

Begin Construction
-Y16- PC Sta. 19+65.63

-Y52- POT Sta. 15+00.60
-Y16- POC Sta. 25+36.08

-Y16- PT Sta. 25+61.74

-Y16- PC Sta. 23+05.69

-Y16_DW2-PC Sta. 10+65.29

-Y16_DW6-POT Sta. 11+16.55

-Y16_DW6- POT Sta. 10+00.00 =
-Y16- POC Sta. 28+87.50

-Y16_DW6- PT Sta. 10+84.73

SHEET 5 -Y16- STA. 30+50

MATCH LINE SEE SHEET 6

NAD 83

SR 1449 ROUNDTABLE RD 18' BST

SR 4228 VICKERY CHAPEL RD 24' BST

MILLS RD

MONO. CONC. ISLAND

800' EOP TRANSITION LT. AND RT.

100' RT. TURN TAPER

300' LT. TURN TAPER

ACCEPTABLE GRADE ON DRIVEWAY NOT POSSIBLE

SPECIAL CUT DITCH SEE DETAIL S

EUGENE STEVEN IORIO
MARGARET ANN IORIO
DB 4467 PG 1025
PB 36 PG 9

FREDDY JOE COMINS
DB 5470 PG 1632
PB 36 PG 78

JERRY H. FUQUA
JUANITA B. FUQUA
DB 3279 PG 295
PB 36 PG 9

WILLIAM ROBERT GLASGOW
JUDITH LORRAINE GLASGOW
DB 2948 PG 183

JOSEPH A. NORMAN
VICKY D. NORMAN
DB 2645 PG 162
PB 36 PG 9

GUILFORD COUNTY BOARD OF EDUCATION
DB 2232 PG 632
PB102 PG 92

CLIFTON PARK HOMEOWNERS ASSOCIATION, INC.
DB 5043 PG 475
PB 123 PG 21

PATRICIA C. PERKINS
DB 5680 PG 0642
PB 123 PG 21

KENNETH MARK MCLAMB
DB 5592 PG 80
PB 123 PG 21

RONALD J. HICKS
PAMELA H. HICKS
DB 5755 PG 1221
PB 123 PG 21

DONALD R. WHITE
MELISSA A. WHITE
DB 4933 PG 567
PB 123 PG 21

WILLIE L. REID, JR.
LENA H. REID
DB 5554 PG 567
PB 66 PG 21

ATTIS E. CROWE, JR.
DENNICENT W. CROWE
DB 3814 PG 1328

BRUCE R. TAYLOR
DB 484 PG 982
PB 105 PG 96

BRUCE R. TAYLOR
DB 3530 PG 1632

S 73° 46' 00.0" E

S 33° 38' 01.9" E

S 22° 01' 59.9" W

S 73° 46' 00.0" E

S 73° 39' 30.0" E

U-2412B INTERSECTION ADT'S
MILLS RD AND VICKERY CHAPEL RD

-Y16- (VICKERY CHAPEL RD)	-Y52- SR 1357 MILLS RD.
35/45	32/50
16/25	16/25
51/66	

2006 ADT
2030 ADT
(IN 100'S)

DETAIL S
SPECIAL CUT DITCH
(Not to Scale)

Natural Ground — 2:1 — D — 4:1 or flatter — Front Ditch Slope

Min. D= 1 Ft.

FROM STA. 13+00 TO STA. 14+00 -Y52- RT
FROM STA. 13+00 TO STA. 14+00 -Y52- LT
FROM STA. 19+50 TO STA. 24+00 -Y16- LT

SEE SHEET 45 FOR -Y16- PROFILE
SEE SHEET 55 FOR -Y52- PROFILE

8/17/99
21-NOV-2011 17:00
C:\Projects\Y2010\U-2412_B\U-2412B\Roadway\Proj\U-2412B_Rdy_psh_24.dgn
Rdwyuser AT W-SMITH-TI-PW128

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson Consulting Engineers

25 0 25 50
1" = 50'

NAD 83

-Y16-

PI Sta 39+88.69
Δ = 22° 34' 00.0" (RT)
D = 4° 46' 28.7"
L = 472.64'
T = 239.42'
R = 1,200.00'
e = 0.04
DS = 50 MPH

PI Sta 48+50.41
Δ = 40° 32' 00.0" (RT)
D = 7° 15' 00.0"
L = 559.08'
T = 291.81'
R = 790.29'
e = 0.04
DS = 50 MPH

-BYII-251 PINC 37+84.94 =
-Y16- POC Sta. 41+65.21 18.96' LT.

-BYII-252 PINC 45+27.33 =
-Y16- POC Sta. 49+05.21 20.90' LT.

-Y53- POT Sta. 13+75.00

End Construction
-Y53- Sta. 13+25.00

End Widening
-Y16- Sta. 46+80.00

End Construction
-Y16- Sta. 47+45.00

-Y53- POT Sta. 10+00.00 =
-Y16- POC Sta. 41+38.48

-Y16- PC Sta. 45+54.60

-Y16- PT Sta. 42+21.90

-Y16- PT Sta. 51+17.68

-Y16- POT Sta. 53+09.06

-U2412B-12 PI Sta. 4+50.44

MATCH LINE SEE SHEET 5 -Y16- STA. 39+00

179 JAN CHRISTOPHER MCLEAN DB 3348 PG 402

137 SHARI A. UPSTILL, LEIGH A. RAMSEY DB 5944 PG 1623 PB 32 PG 53

6 WILLIAM WALTER MCLEAN, JR. SUSAN S. MCLEAN DB 3981 PG 764 PB 11 PG 80

138 WILLIAM WALTER MCLEAN, JR. SUSAN S. MCLEAN DB 3981 PG 764 PB 32 PG 53

139 THUIN Y AND WIFE, YOR H DB 6844 PG 2491

140 WALTER L BATISTA NOEL D. BATISTA DB 2813 PG 667 PB 32 PG 53

141 CLYDE DAVID DEATON MARGARET D. DEATON DB 3758 PG 290 PB 32 PG 53

ROBERT M. BRYAN DB 2394 PG 533 PB 32 PG 53

T. G. MADISON, JR. AVIS M. MADISON DB 2528 PG 539 PB 26 PG 25

TYRE G. MADISON, JR. AVIS M. MADISON DB 2430 PG 667 PB 26 PG 25

ROBERT E. PARKER DB 2430 PG 667 PB 26 PG 25

ELIZABETH B. MILLER DB 2938 PG 220 PB 26 PG 25

FRANK ADAM WEAVER ANNE H. WEAVER DB 3060 PG 716 PB 26 PG 25

4 CLECIE M. THACKER GAIL THACKER DB 3447 PG 1054

142 NCDOT DB 6453 PG 2766

143 CHAS. S. WILLIAMS NANCY V. WILLIAMS DB 2151 PG 73

144 TODD A. MCNEAL LESLIE J. MCNEAL DB 3240 PG 820

MELINDA DIANE REYNOLDS DB 4697 PG 1354

DON W. JARRELL SHIRLEY ANN JARRELL DB 4022 PG 1759

DONALD R. JOHNSON BRENDA M. JOHNSON DB 2945 PG 314

DONALD R. JOHNSON BRENDA M. JOHNSON DB 2312 PG 443

HAROLD J. FEGAN ROBERT J. FEGAN DB 5170 PG 1377 PB 40 PG 45

ROCK A. TURNER DONNA S. TURNER DB 5964 PG 2270

BAYNARD JAMES L. BAYNARD, JR. JANICE P. BAYNARD DB 3120 PG 581

DETAIL R
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 2d, D, 2d, b, F/Ft., Fill Slope
Min. D= 1Ft.
b= 5 Ft.
FROM STA. 41+82 TO STA. 42+50 -Y16- LT

DETAIL AA
CUT DITCH
(Not to Scale)
Natural Ground, 3d, d, D, 3d, Front Ditch Slope
Min. D= 1Ft.
Max. d= 1Ft.
Type of Liner= PSRM
FROM STA. 12+50 TO STA. 13+64 -Y53- LT

DETAIL E
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 2d, D, B, 2d, b, F/Ft., Fill Slope
Min. D= 1Ft.
B= 2 Ft.
b= 5 Ft.
FROM STA. 39+00 TO STA. 39+80 -Y16- LT

DETAIL U
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 2d, d, D, B, 2d, b, F/Ft., Fill Slope
Min. D= 1Ft.
Max. d= 1Ft.
B= 5 Ft.
b= 5 Ft.
Type of Liner= PSRM
FROM STA. 39+80 TO STA. 41+00 -Y16- LT
FROM STA. 10+50 TO STA. 12+00 -Y53- LT
FROM STA. 10+50 TO STA. 13+00 -Y53- RT

DETAIL S
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground, 2d, D, Major Flatter, Front Ditch Slope
Min. D= 1Ft.
FROM STA. 40+50 TO STA. 42+50 -Y16- RT
FROM STA. 42+50 TO STA. 43+00 -Y16- LT
FROM STA. 46+00 TO STA. 46+50 -Y16- LT
FROM STA. 12+00 TO STA. 12+50 -Y16- LT

SEE SHEET 46 FOR -Y16- PROFILE

21-NOV-2011 17:00
G:\Projects\Y2010\U-2412 B\U-2412B\Roadway\Proj\U-2412B_Rdy_psh_25.dgn
pwmass, AT W-2BCH, 17:00:28

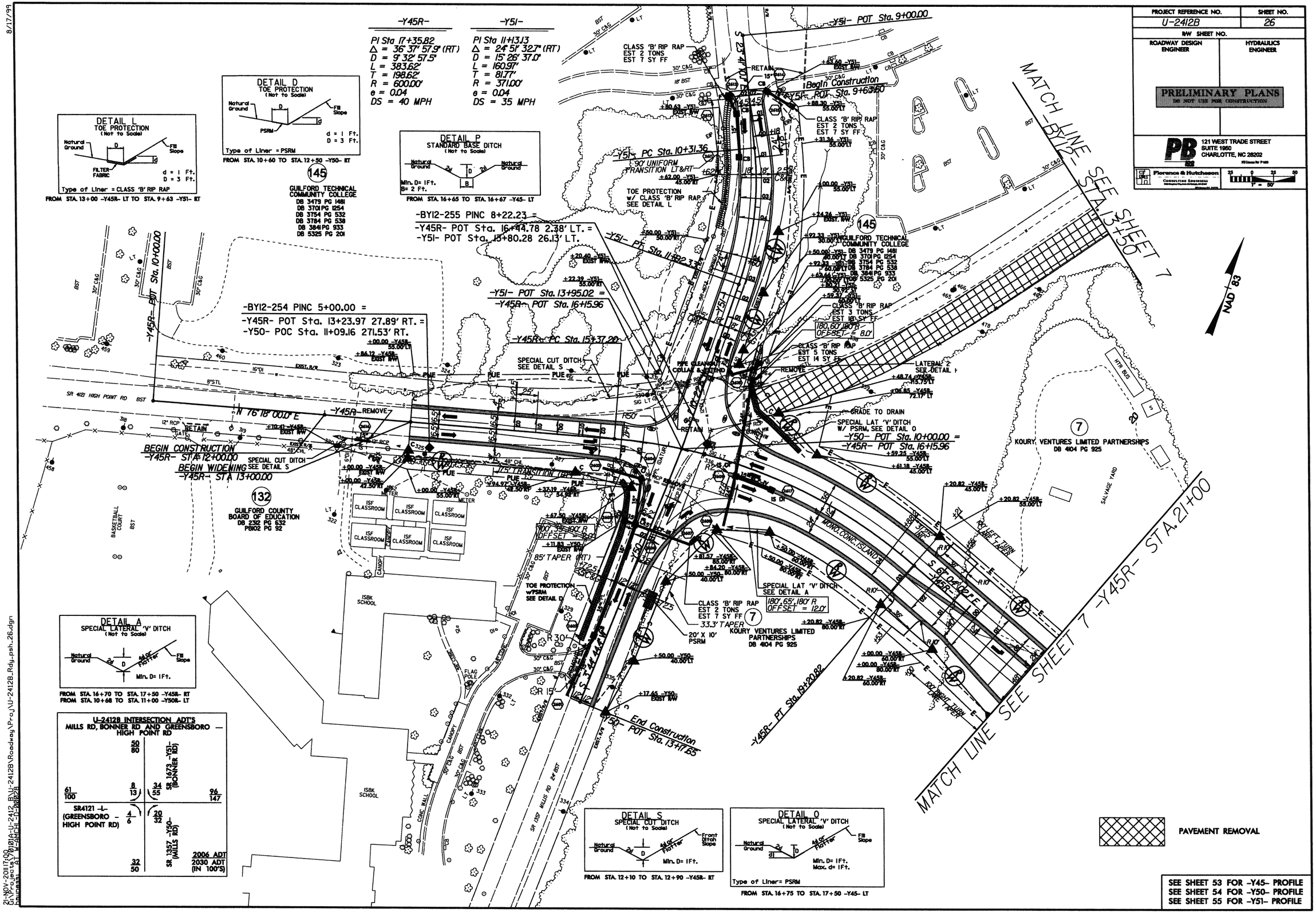
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No P-0881

Florence & Hutcheson
CONSULTING ENGINEERS
Charlotte, North Carolina, 28202
NC License No. F-0112

25 0 25 50
1" = 50'



SEE SHEET 53 FOR -Y45- PROFILE
SEE SHEET 54 FOR -Y50- PROFILE
SEE SHEET 55 FOR -Y51- PROFILE

8/17/99

21-NOV-2011 17:00
C:\Projects\2012\U-2412 B\U-2412B\Roadway\Proj\U-2412B_Rdy_psh_26.dgn
mwasil AT WSDOT-PDP00128

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No P-1085

Florence & Hutcheson
CONSULTING ENGINEERS

1" = 50'

NAD 83

-Y18-

PIs Sta 12+33.03	PI Sta 20+39.21
Θs = 2° 30' 24.2"	Δ = 31° 04' 16.6" (RT)
Ls = 229.66'	D = 2° 10' 58.7"
LT = 153.12'	L = 1,423.35'
ST = 76.57'	T = 729.64'
	R = 2,624.67'
	e = 0.028
	Ds = 50 mph

-BY13-257 POT 5+00.00 =
-Y18- POT Sta. 10+14.55 42.19' LT.

-Y18- TS Sta. 10+79.90

-Y18- POT Sta. 10+00.00

-Y18- SC Sta. 13+09.56

-Y18- STA. 18+00

MATCH LINE SEE SHEET 8

10

AZAS, LLC
DB 6596 PG 640

15

OAKDALE VILLAGE, LLC
DB 7000 PG 2803
DB 177 PG 17

9

OAKDALE VILLAGE, LLC
DB 7000 PG 2803
DB 177 PG 17

OAKDALE VILLAGE, LLC
DB 7000 PG 2803
DB 177 PG 17

GUILFORD TECHNICAL
COMMUNITY COLLEGE
DB 5957 PG 933

KELLY AND BETTY SIZEMORE
DB 2259 PG 779

COLONIAL PIPELINE EASEMENT

60' COLONIAL PIPELINE EASEMENT

16"STL-PETROLEUM
8"STL-PETROLEUM
8"STL-PETROLEUM

EXIST. R/W

48"CHL

150' RT TURN TAPER

PROP. 5' S/W
PROP. 2' P.S.

S 55° 42' 46.1" E

RETAIN

CAT-I

TIE TO
EXIST.G.R.

Begin Construction
-Y18- Sta. 14+50.00

PSH
SEE DETAIL V

EXTEND 8' W/ 15' CSP
AND ELBOWS

ADJUST CB

SPECIAL CB

REMOVE
EXIST G.R.

PROP. 5' S/W
PROP. 2' P.S.

150' RT
TURN TAPER

DETAIL V
PREFORMED SCOUR HOLE

PLAN VIEW

INSTALL LEVEL AND FLUSH WITH NATURAL GROUND

Pipe or Ditch Outlet

Square Preformed Scour Hole (PSH)

Rip Rap in holes not shown for clarity)

B= 4 Ft.
D= 1.5 Ft.
W= 4 Ft.
d= 0.5 Ft.

SECTION A-A

PIPE (d = 15" OR 18")

FILL SLOPE

1' MIN. - 3' MAX.

PSRM

INFLOW

NATURAL GROUND

LINER: CLASS B RIPRAP WITH TYPE 2 FILTER FABRIC

MIN. 1' TUCK

308

FROM STA. 15+40 -Y18- RT
FROM STA. 288+30 -L- RT

SEE SHEET 47 FOR -Y18- PROFILE

8/17/99

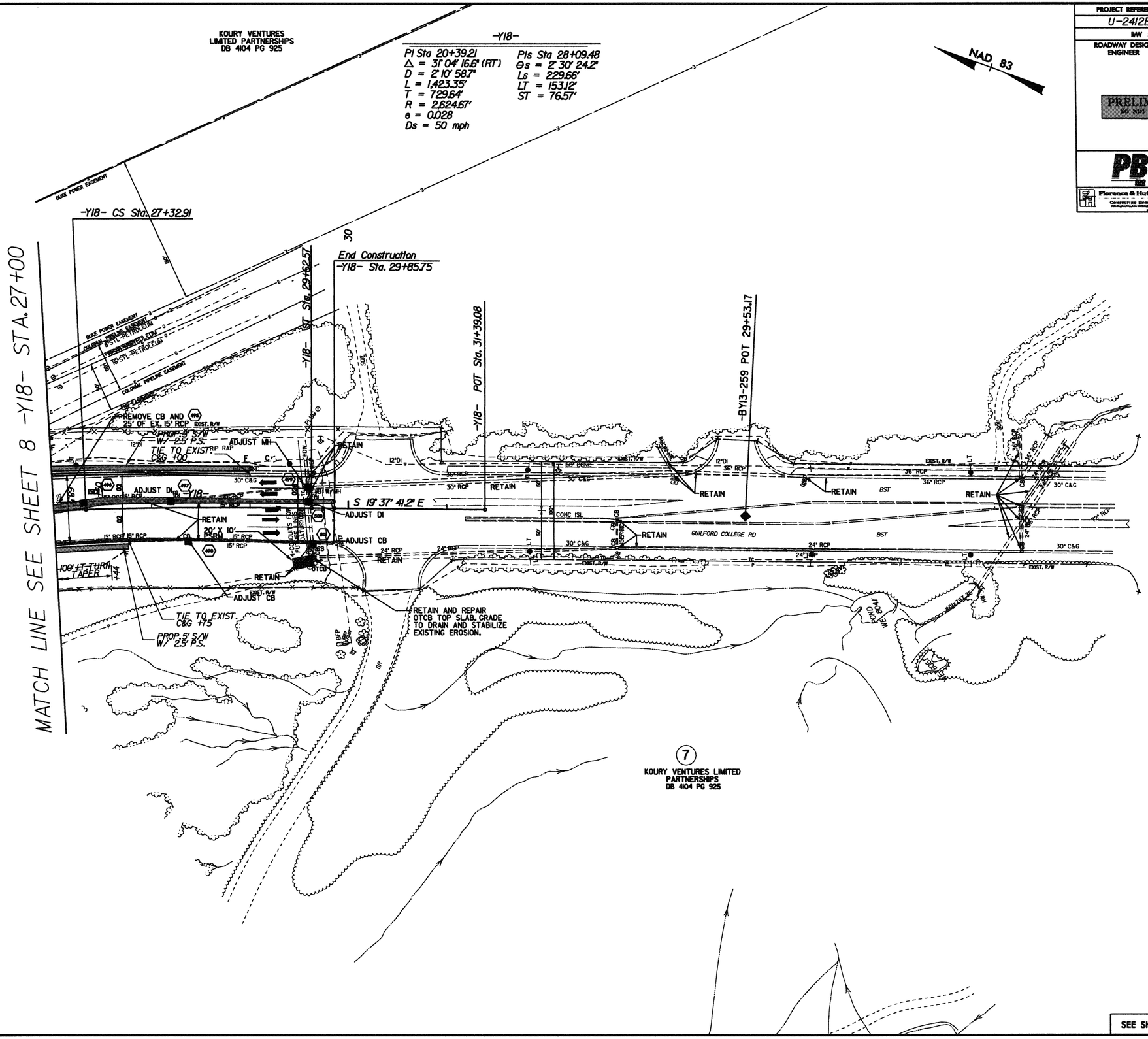
21-NOV-2011 7:00
G:\Projects\7101A_U-2412_B\U-2412B\Roadway\Proj\U-2412B_Rdy_psh_27.dgn
bpuryear
A1 W-ANCH-11-PW28

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
Florence & Hutcheson
CONSULTING ENGINEERS

1" = 50'



SEE SHEET 47 FOR -Y18- PROFILE

8/17/99
21-NOV-2011 17:00
G:\Projects\701\01A-U-2412 B\U-2412B\Roadway\Proj\U-2412B_Rdy_psh_28.dgn
bauness1 AT W-AMCHI-D-00028

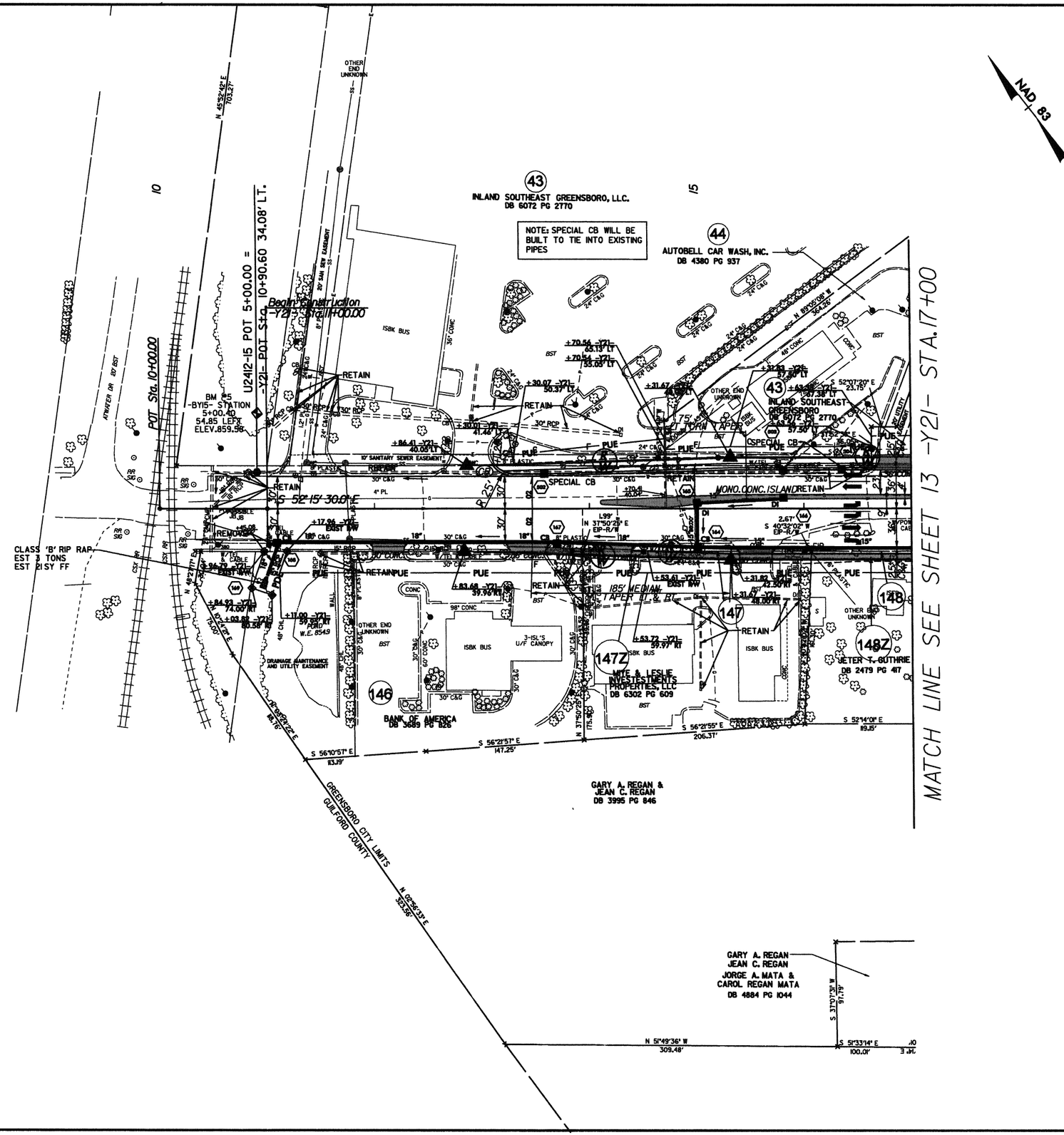
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1960
CHARLOTTE, NC 28202
NC License No F-0893

Florence & Hutcheson
CONSULTING ENGINEERS

25 0 25 50
1" = 50'



SEE SHEET 48 & 49 FOR -Y21- PROFILE

8/17/99

21-NOV-2011 7:00
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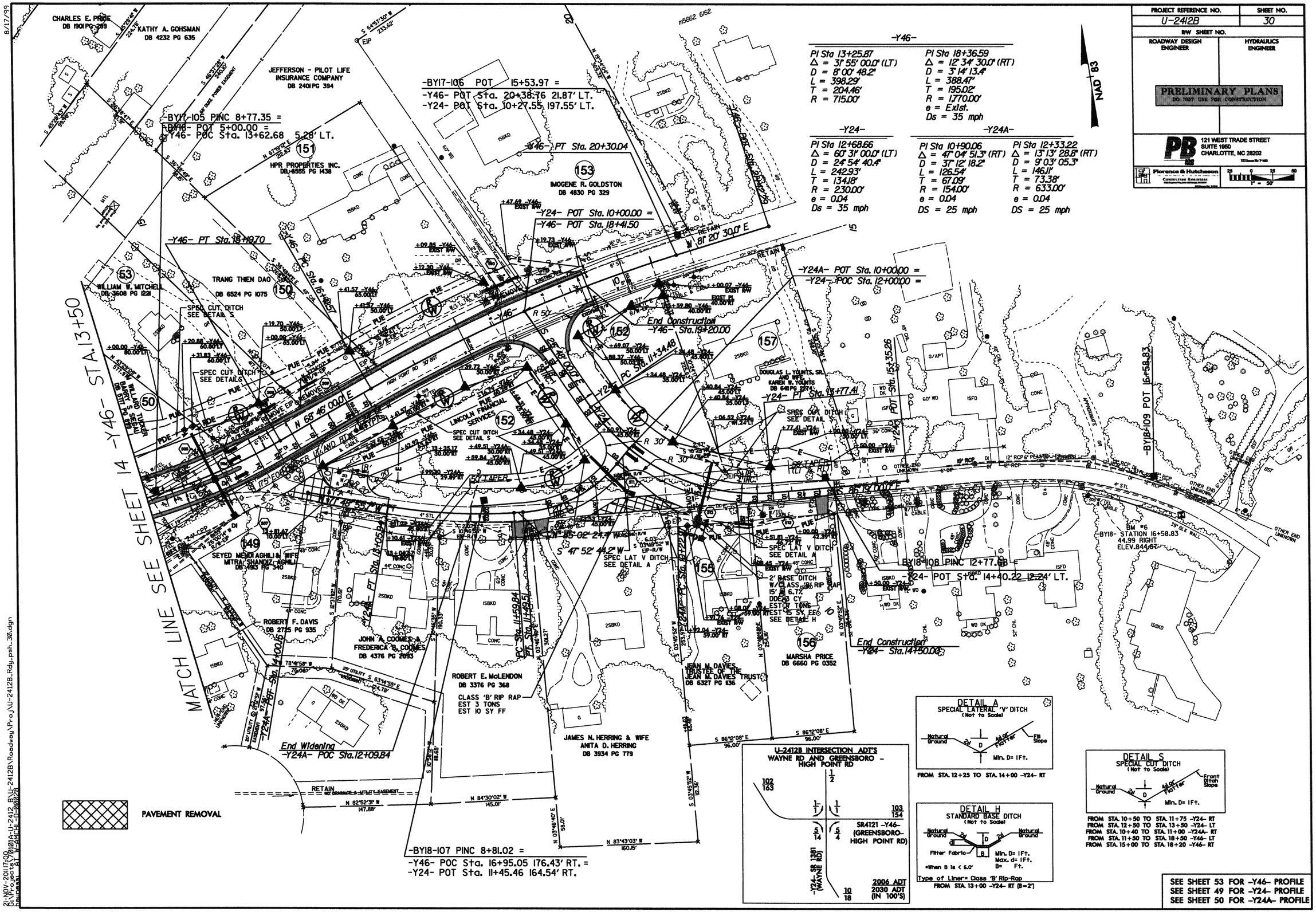
Laurenzi, Jr. W-Mich 13-09/28

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No F-1055
Florence & Hutcheson
CONSULTING ENGINEERS
1" = 50'

NAD 83



SEE SHEET 53 FOR -Y46- PROFILE
SEE SHEET 49 FOR -Y24- PROFILE
SEE SHEET 50 FOR -Y24A- PROFILE

8/17/99

21-NOV-2011 7:00
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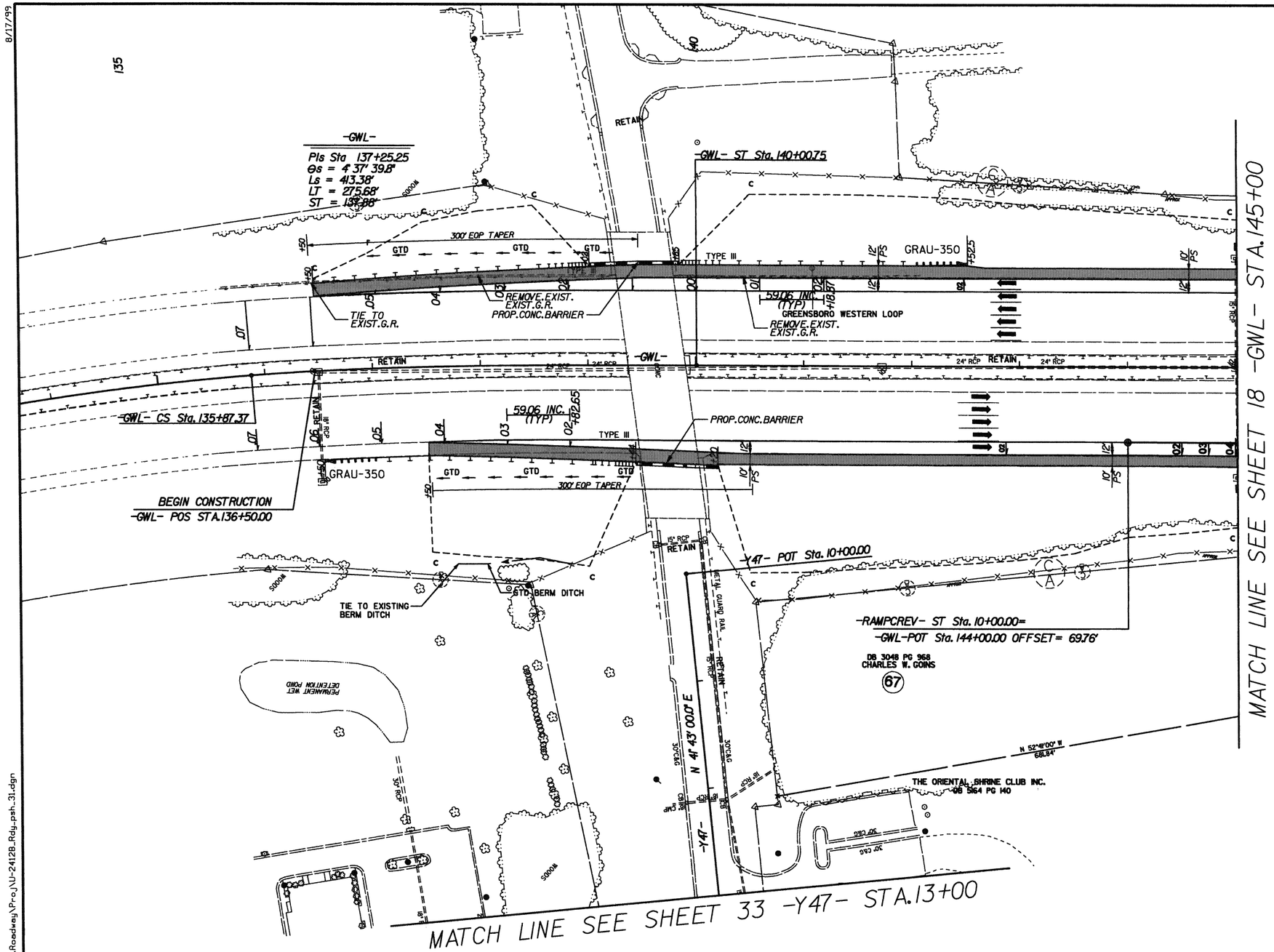
bwagoner

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	31
R/W SHEET NO.	2-R
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License for F-1055

Florence & Hutcheson
CONSULTING ENGINEERS
1 in = 50'



SEE SHEET 54 FOR -Y47- PROFILE

8/17/99
21-NOV-2011 17:09
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Bureau: ATV-GHCH: 0-20022B

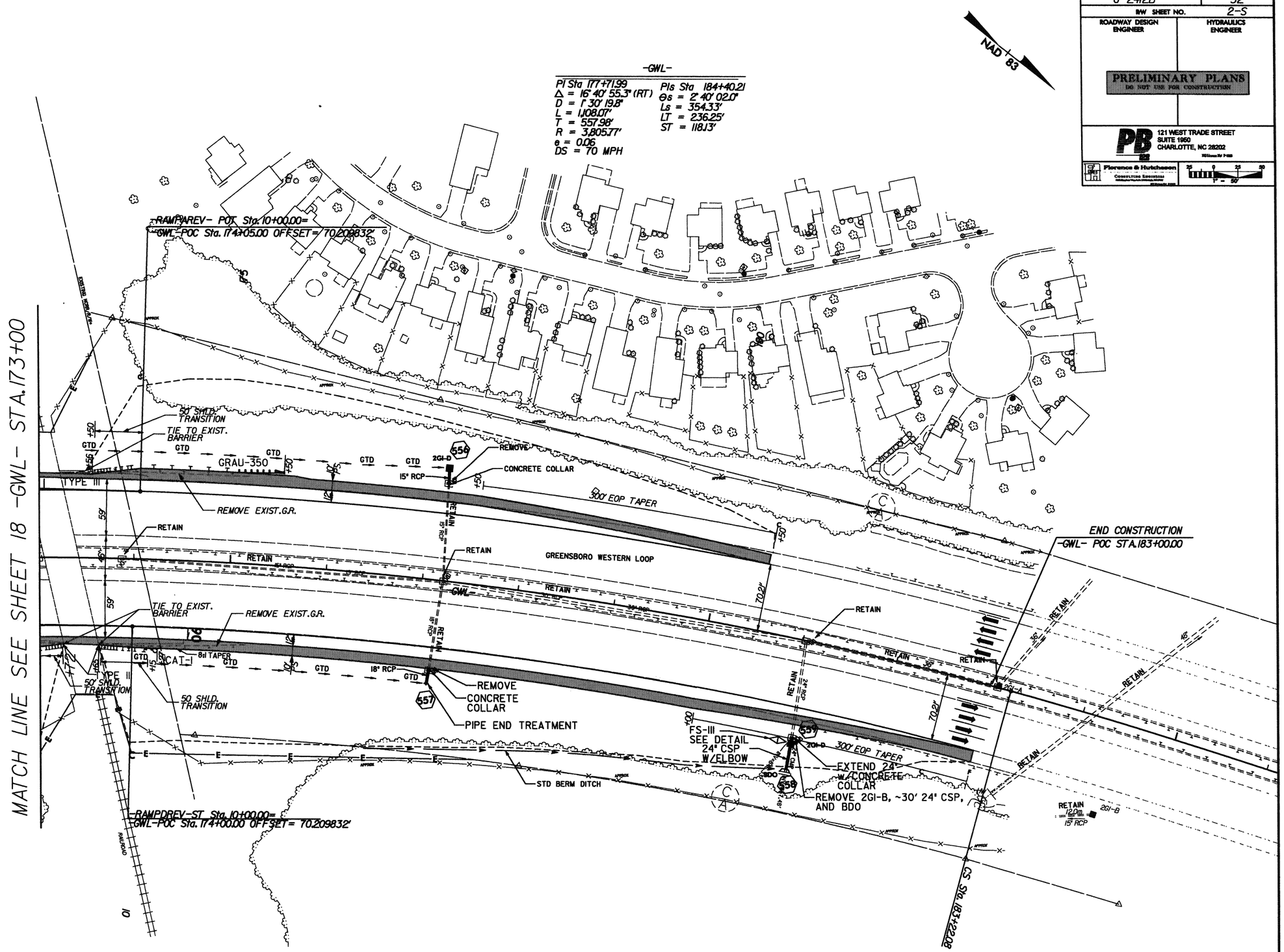
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	32
R/W SHEET NO.	2-S
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No. F-1336

Florence & Hutcheson
CONSULTING ENGINEERS

1" = 50'



SEE SHEET 56 FOR -RPAREV- PROFILE
SEE SHEET 60 FOR -RPD- PROFILE

8/17/99

21-NOV-2011 17:00
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Downsteg, Jill W.SHCH_FL2000.cfg

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	33
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

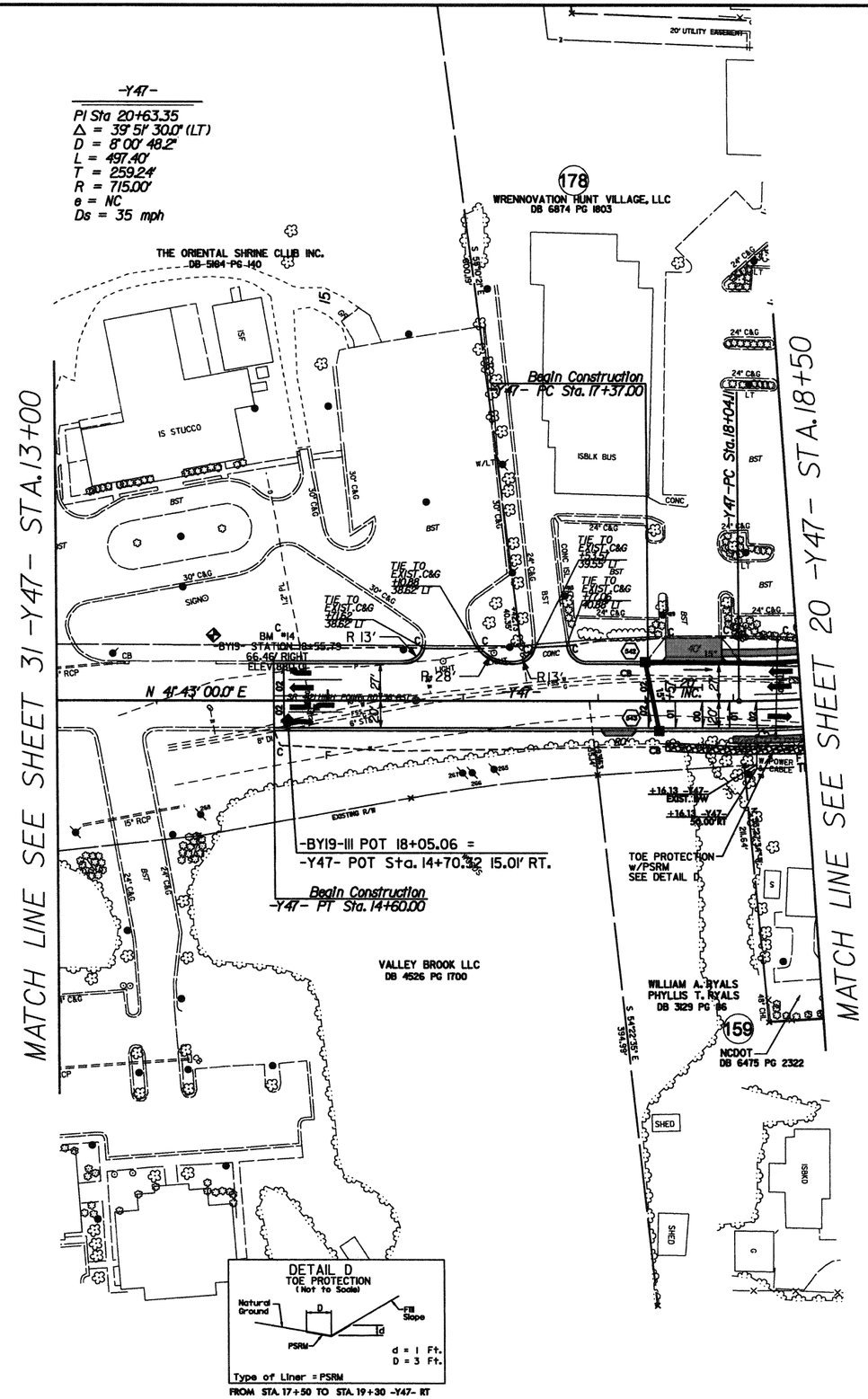
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
NC License No. F-1336

Florence & Hutcheson
Consulting Engineers
NC License No. C-1269

1" = 50'

NAD 83



SEE SHEET 54 FOR -Y47- PROFILE

8/17/99

21-NOV-2011 17:01
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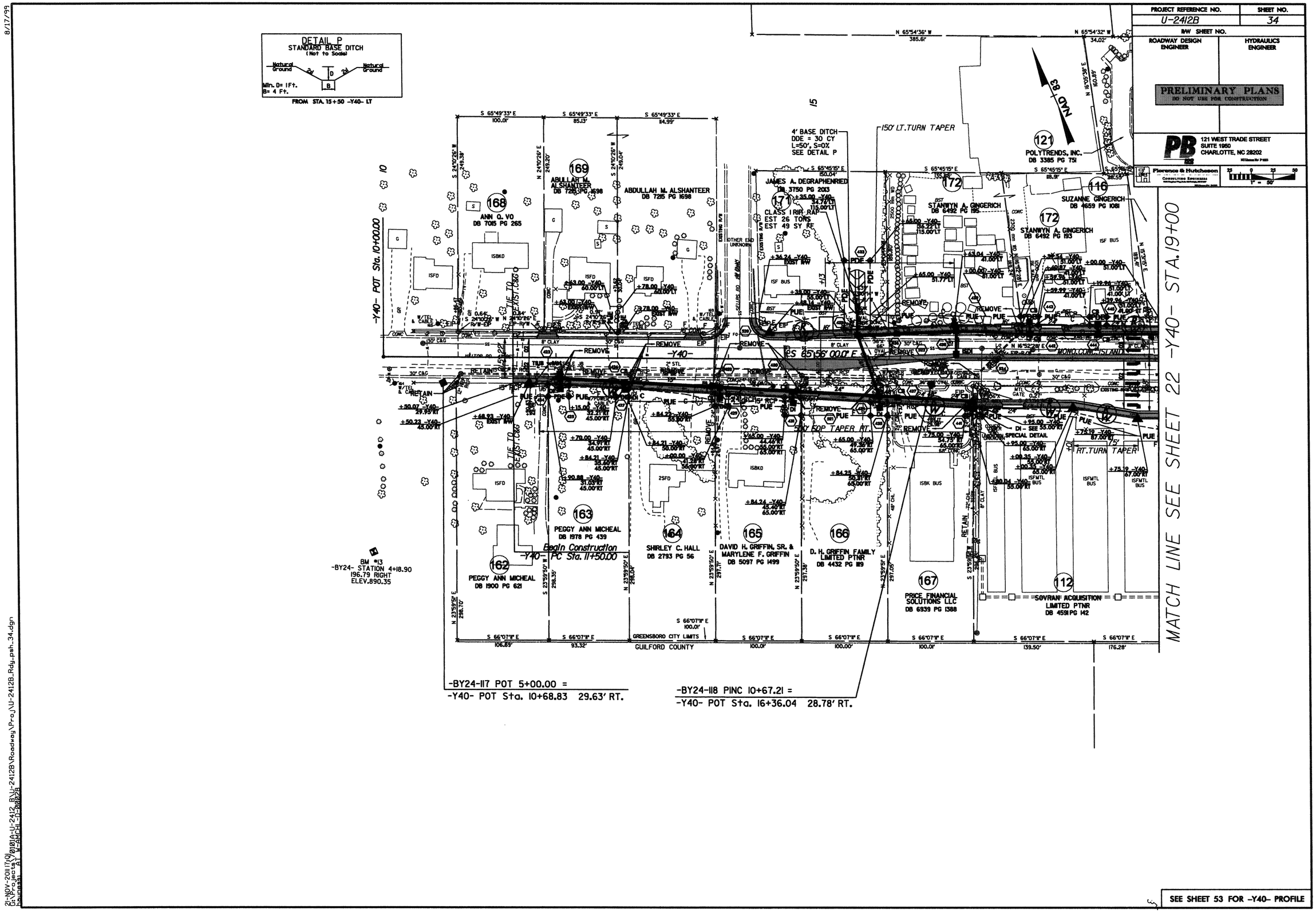
bauneast ST W-SMCH -01-000028



8/17/99

21-NOV-2011 17:01
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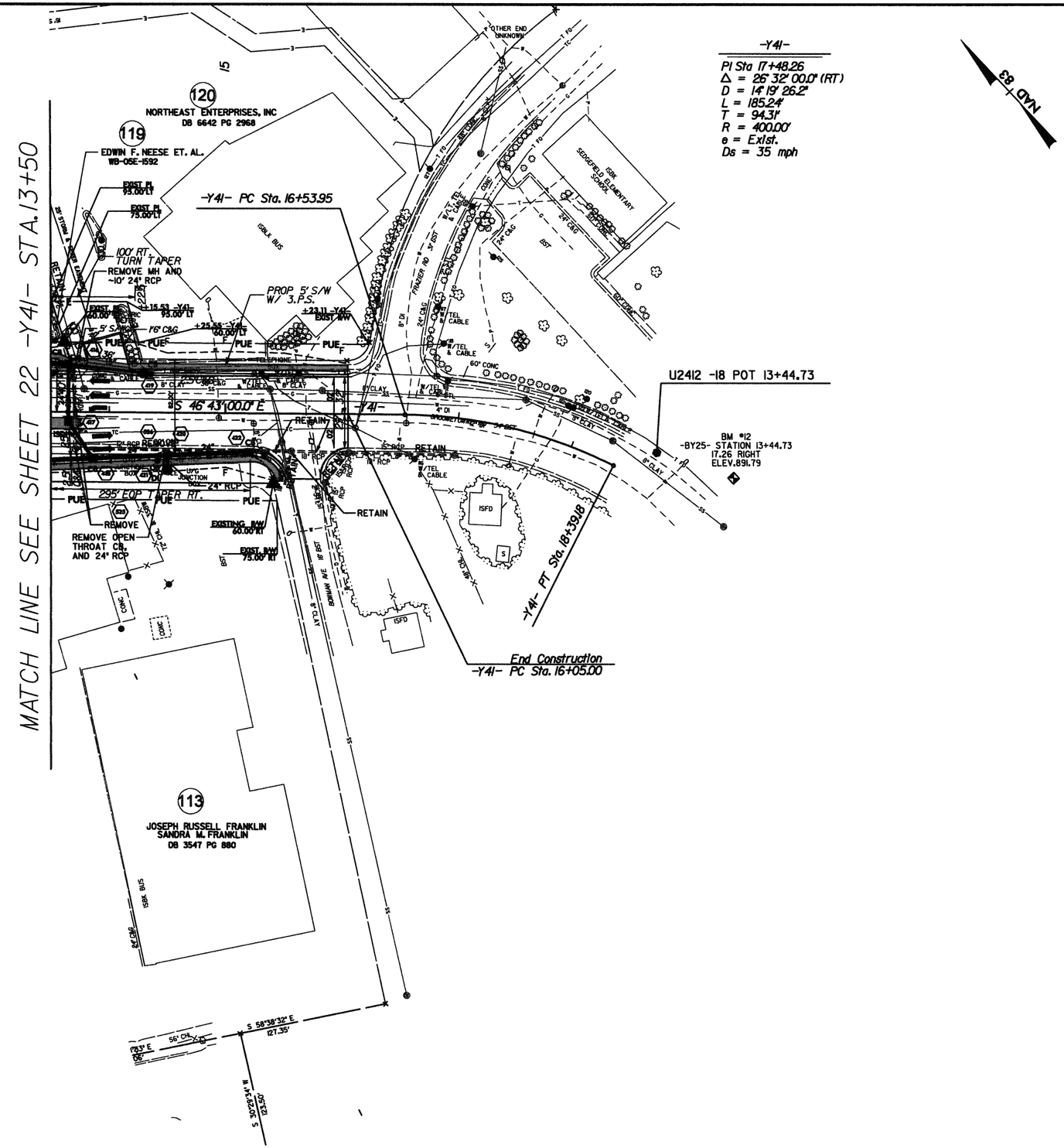
bauness AT W-AMCHI-D-000028

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	35
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
Florence & Hutcheson
CONSULTING ENGINEERS



SEE SHEET 52 FOR -Y41- PROFILE

8/17/99

21-NOV-2011 17:01
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bauness AT W-AMCHL-D-00028

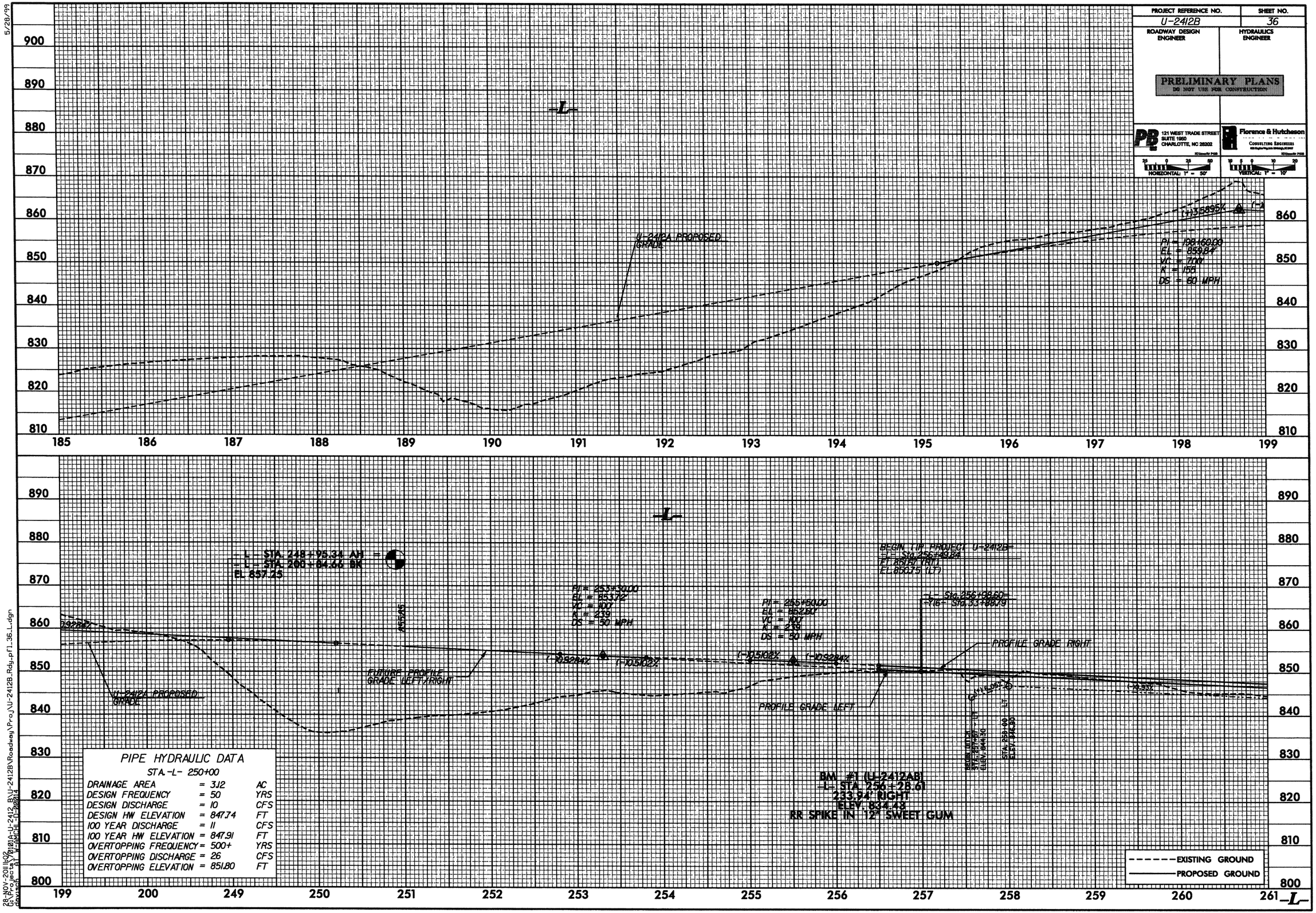
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1900 CHARLOTTE, NC 28202

Florance & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'
VERTICAL: 1" = 10'



PIPE HYDRAULIC DATA

STA.-L- 250+00

DRAINAGE AREA	= 3.12	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 10	CFS
DESIGN HW ELEVATION	= 847.74	FT
100 YEAR DISCHARGE	= 11	CFS
100 YEAR HW ELEVATION	= 847.91	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 26	CFS
OVERTOPPING ELEVATION	= 851.80	FT

5/28/99

28-NOV-2011 11:02
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pwsmith, pwsmith, pw0004

5/28/99

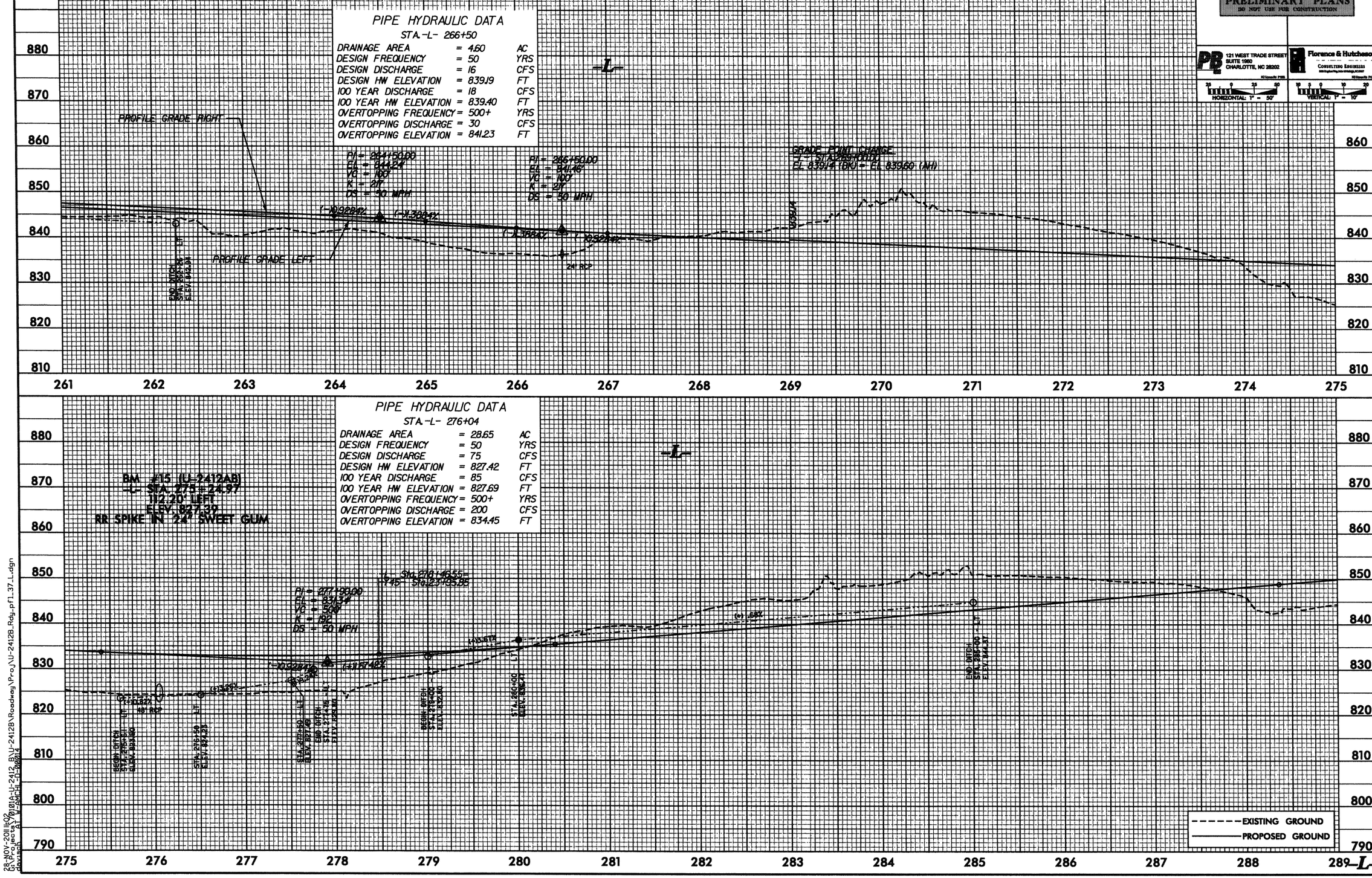
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1960 CHARLOTTE, NC 28202 NC License No. F-1083

Florence & Hutcheson CONSULTING ENGINEERS 3836 Sharon Rd., Suite 115 Charlotte, NC 28211 NC License No. F-0893

HORIZONTAL: 1" = 50' VERTICAL: 1" = 10'



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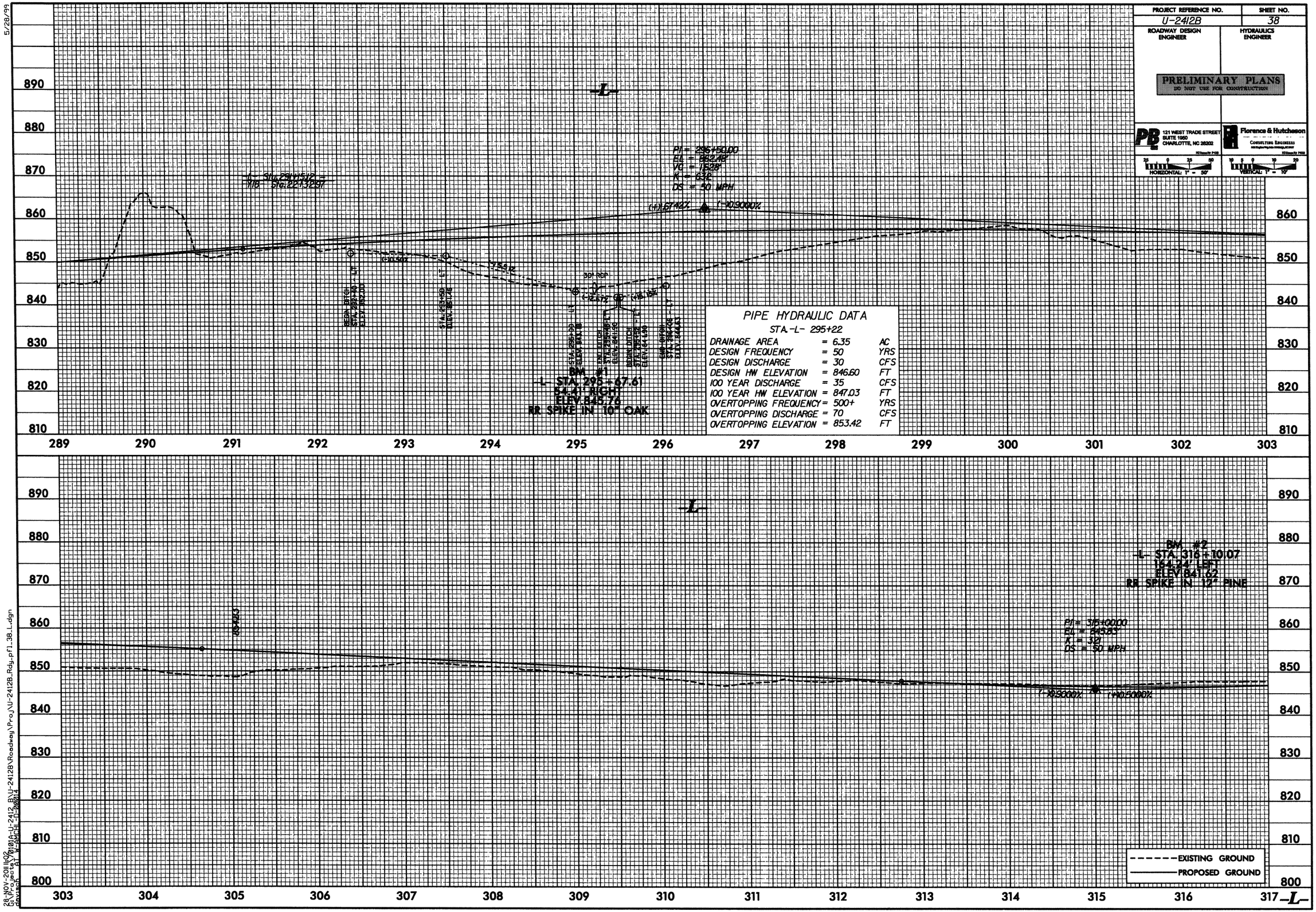
Groups: 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40,

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	38
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202
Florence & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'
VERTICAL: 1" = 10'



5/28/99

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davisch A1 W 24inch 1:50/10:1

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	39

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

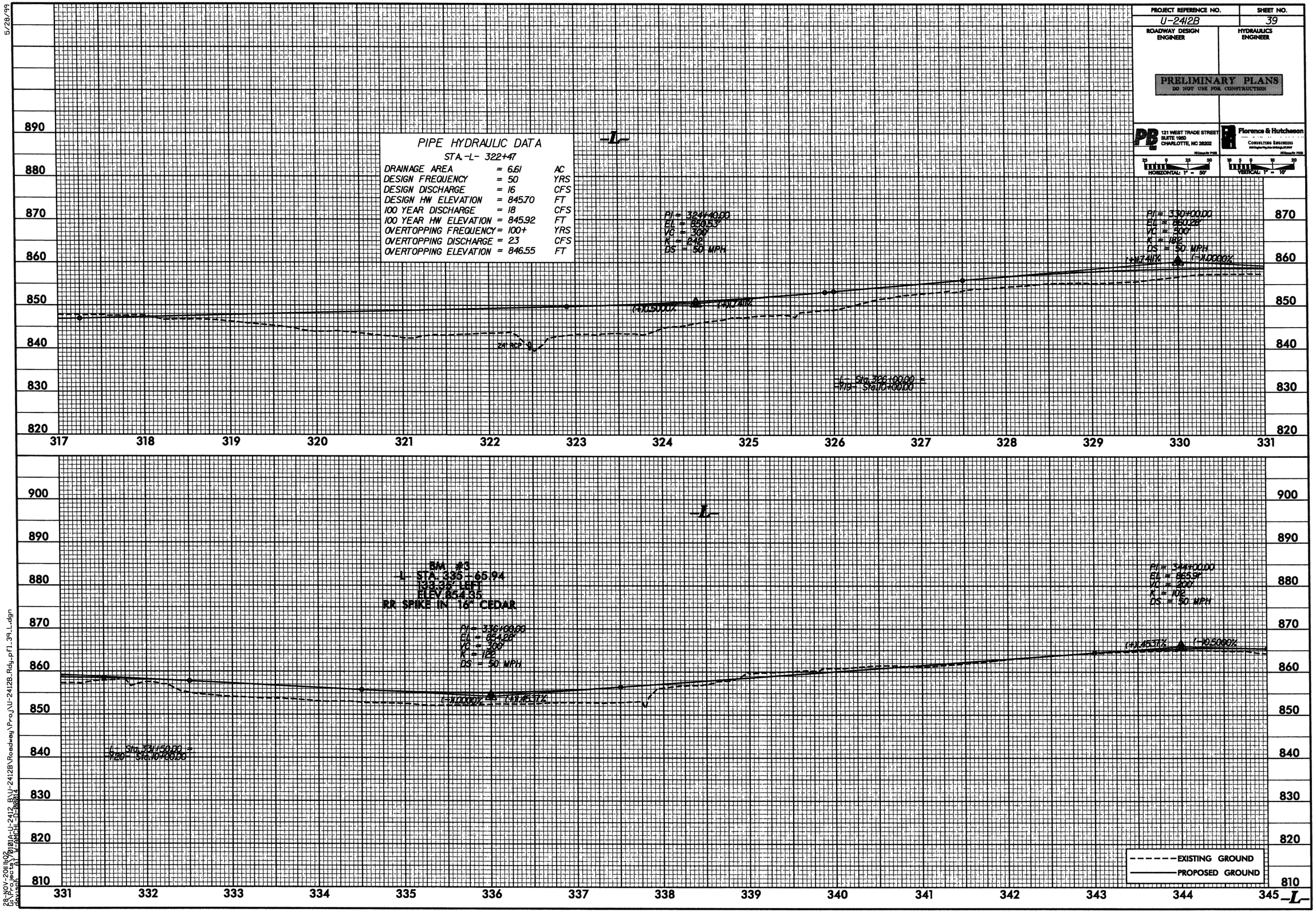
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'

VERTICAL: 1" = 10'



5/28/99

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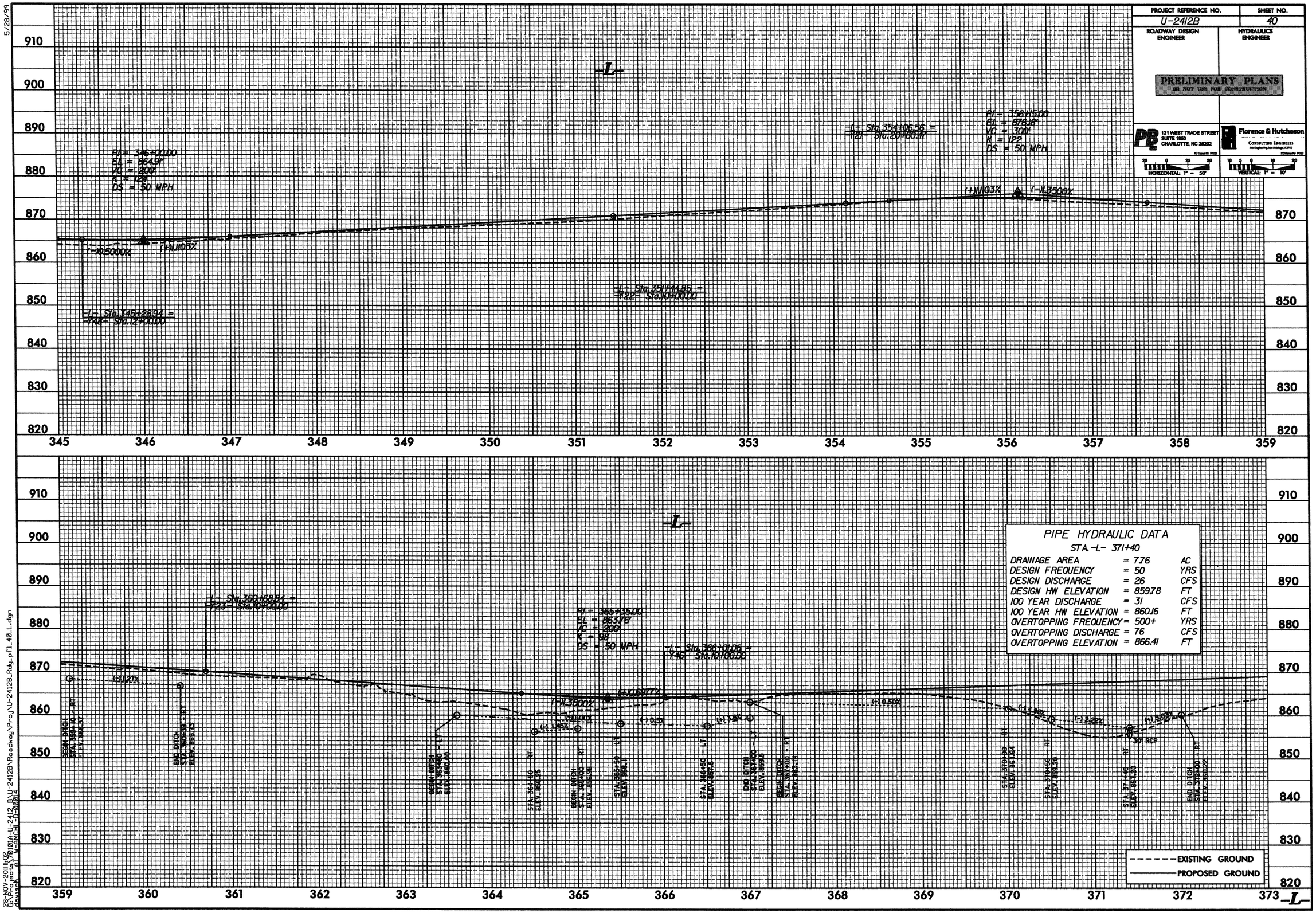
davisch AT W-AMCHL-D-00014



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davisch AT W-AMCHI-D-00014

5/28/99

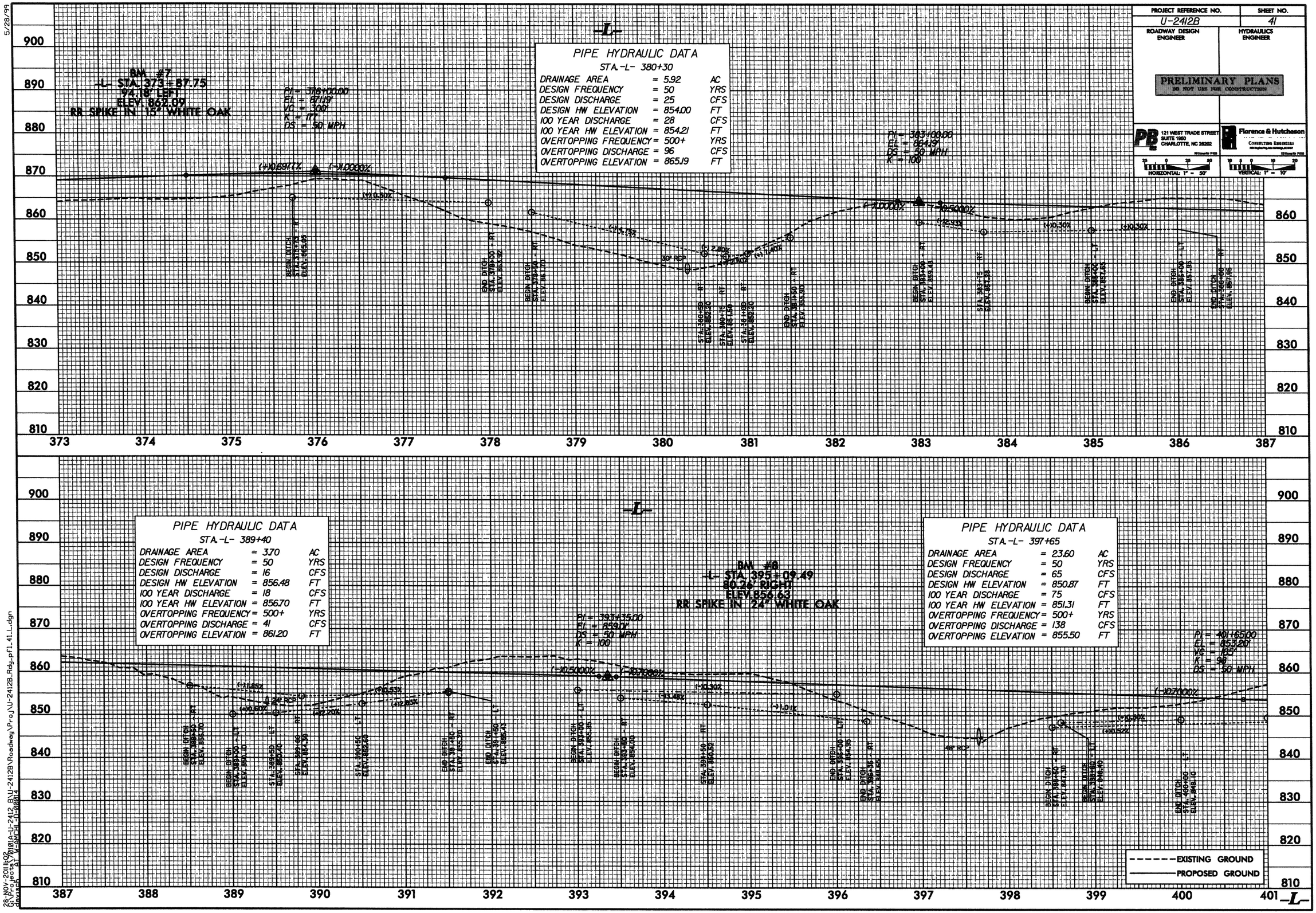
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1900 CHARLOTTE, NC 28202

Florence & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'
VERTICAL: 1" = 10'



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davisch ST_V8MCH_D-9001.4

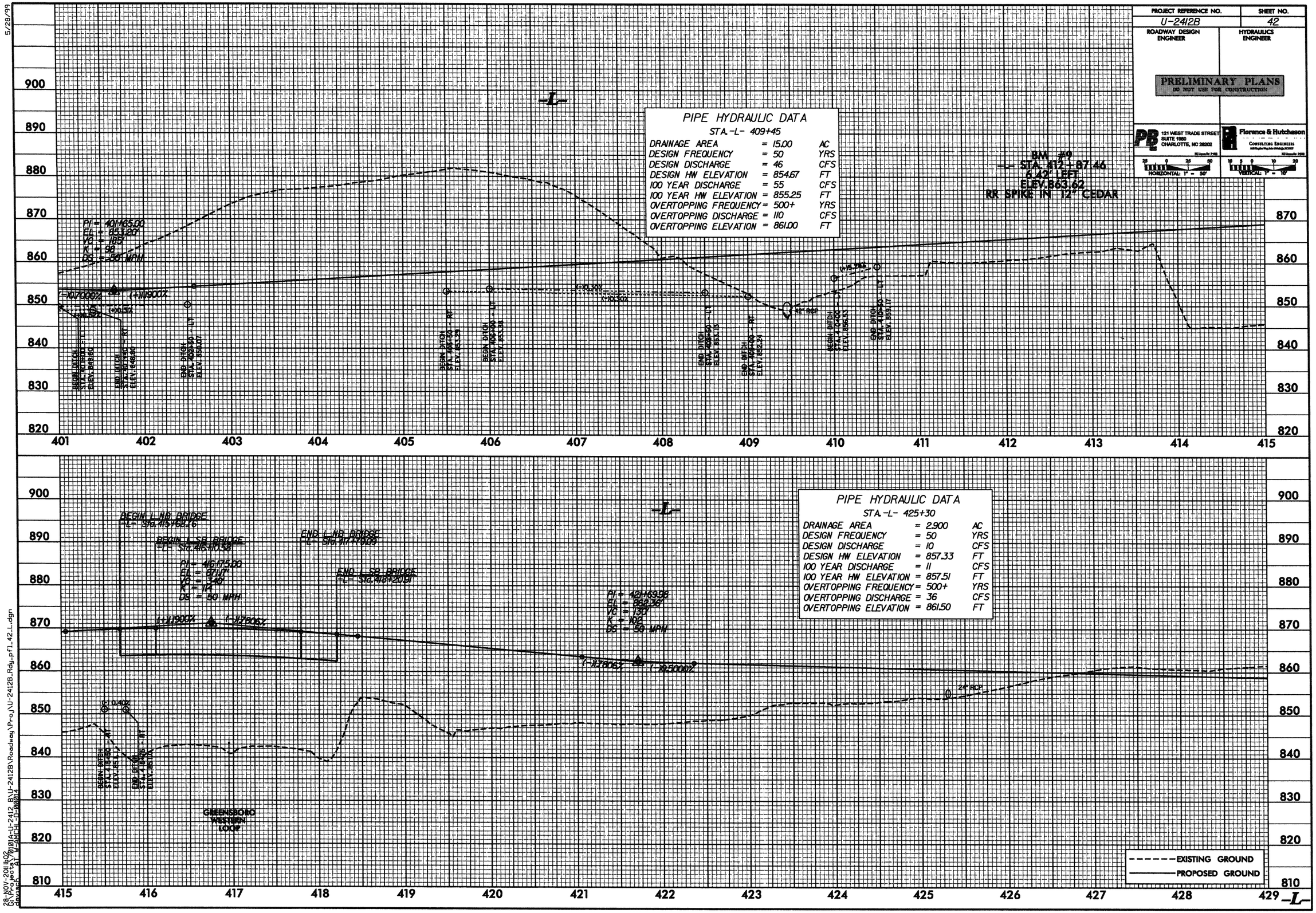
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	42
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1980 CHARLOTTE, NC 28202
Florence & Hutchison CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'
VERTICAL: 1" = 10'



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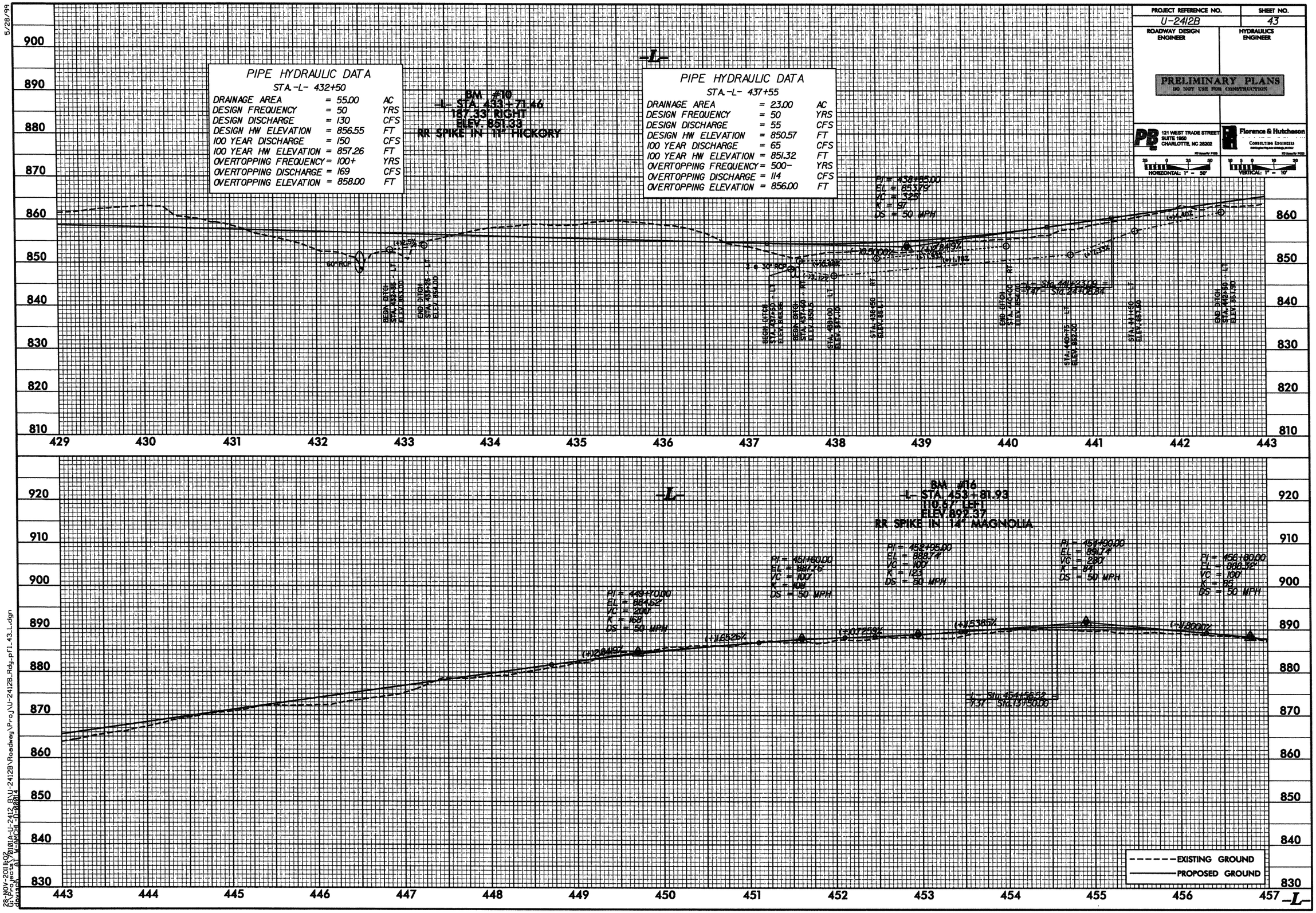
dmusgrove
WBS CH_PROFILE

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202
Florence & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'
VERTICAL: 1" = 10'



5/28/99

28-NOV-2011 11:02
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pwadcd1 WADCD 1.0 08/14

5/28/99

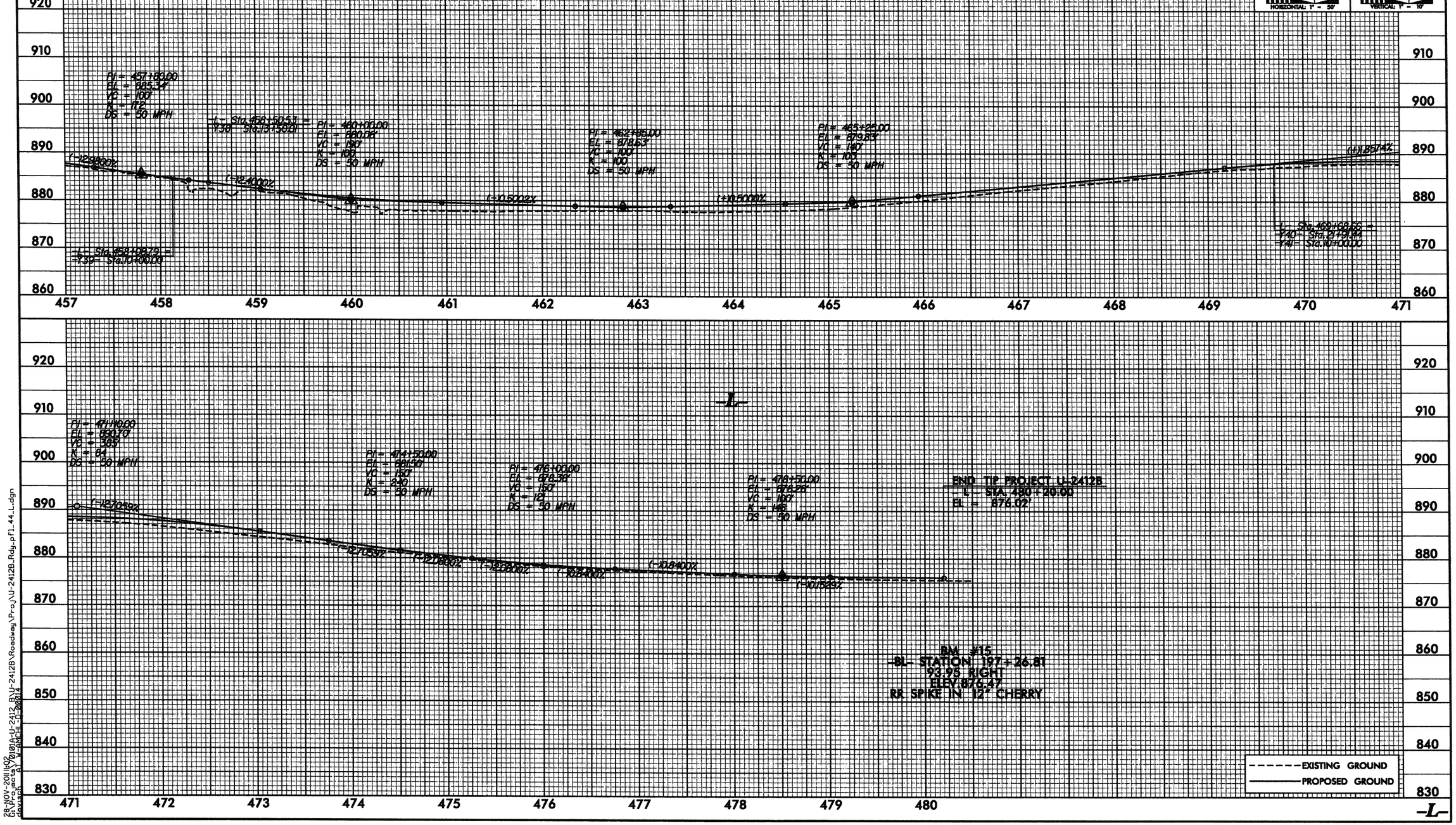
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	44
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'
VERTICAL: 1" = 10'



28-NOV-2011 11:02
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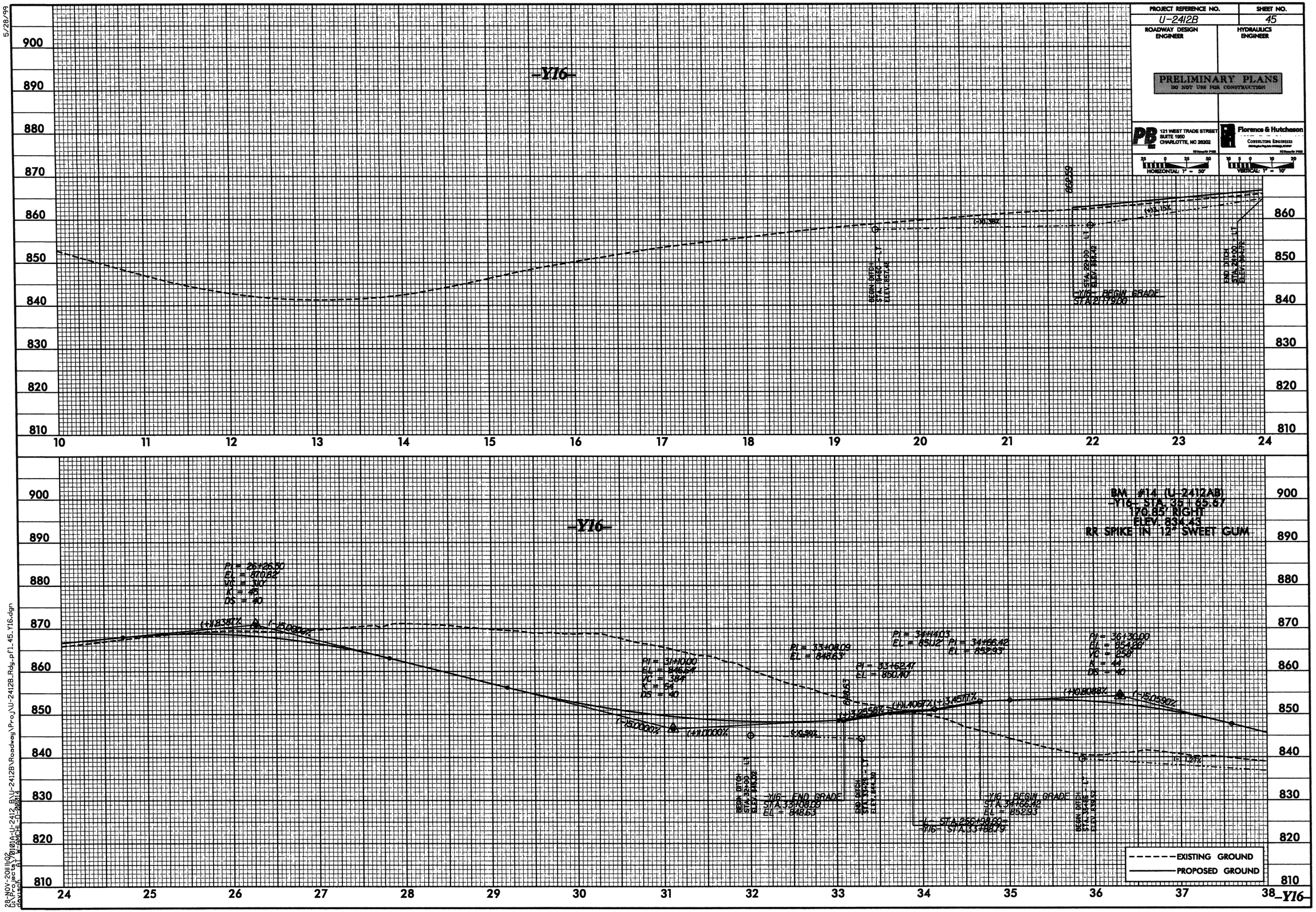
pwseth, pwseth, pwseth



PROJECT REFERENCE NO.
U-2412B
SHEET NO.
45
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
121 WEST TRADE STREET
SUITE 1950
CHARLOTTE, NC 28202
Florence & Hutcheson
CONSULTING ENGINEERS
HORIZONTAL: 1" = 50'
VERTICAL: 1" = 10'
-Y16-
BEGIN DITCH
STA. 9+60 - LT
ELEV. 857.48
-Y16- BEGIN GRADE
STA. 21+79.00
END DITCH
STA. 24+00 - LT
ELEV. 864.72
BM #14 (U-2412AB)
-Y16- STA. 35+65.67
170.85' RIGHT
ELEV. 834.43
RR SPIKE IN 12" SWEET GUM
PI = 26+26.50
EL = 870.82'
VC = 310'
K = 45
DS = 40
(+)1.8387%
(-)5.0000%
PI = 31+10.00
EL = 846.64'
VC = 384'
K = 64
DS = 40
(-)5.0000%
(+)1.0000%
PI = 33+08.09
EL = 848.63'
PI = 33+62.47
EL = 850.40'
PI = 34+14.03
EL = 851.12'
PI = 34+66.42
EL = 852.93'
PI = 36+30.00
EL = 854.26'
VC = 258'
K = 44
DS = 40
(+)0.8088%
(-)5.0590%
(+)3.4577%
(+)1.4067%
(+)3.2558%
(-)0.50%
(-)1.27%
-Y16- END GRADE
STA. 33+08.09
EL = 848.63
-Y16- BEGIN GRADE
STA. 34+66.42
EL = 852.93
-L- STA. 256+98.60 =
-Y16- STA. 33+88.79
EXISTING GROUND
PROPOSED GROUND

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	46

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson CONSULTING ENGINEERS

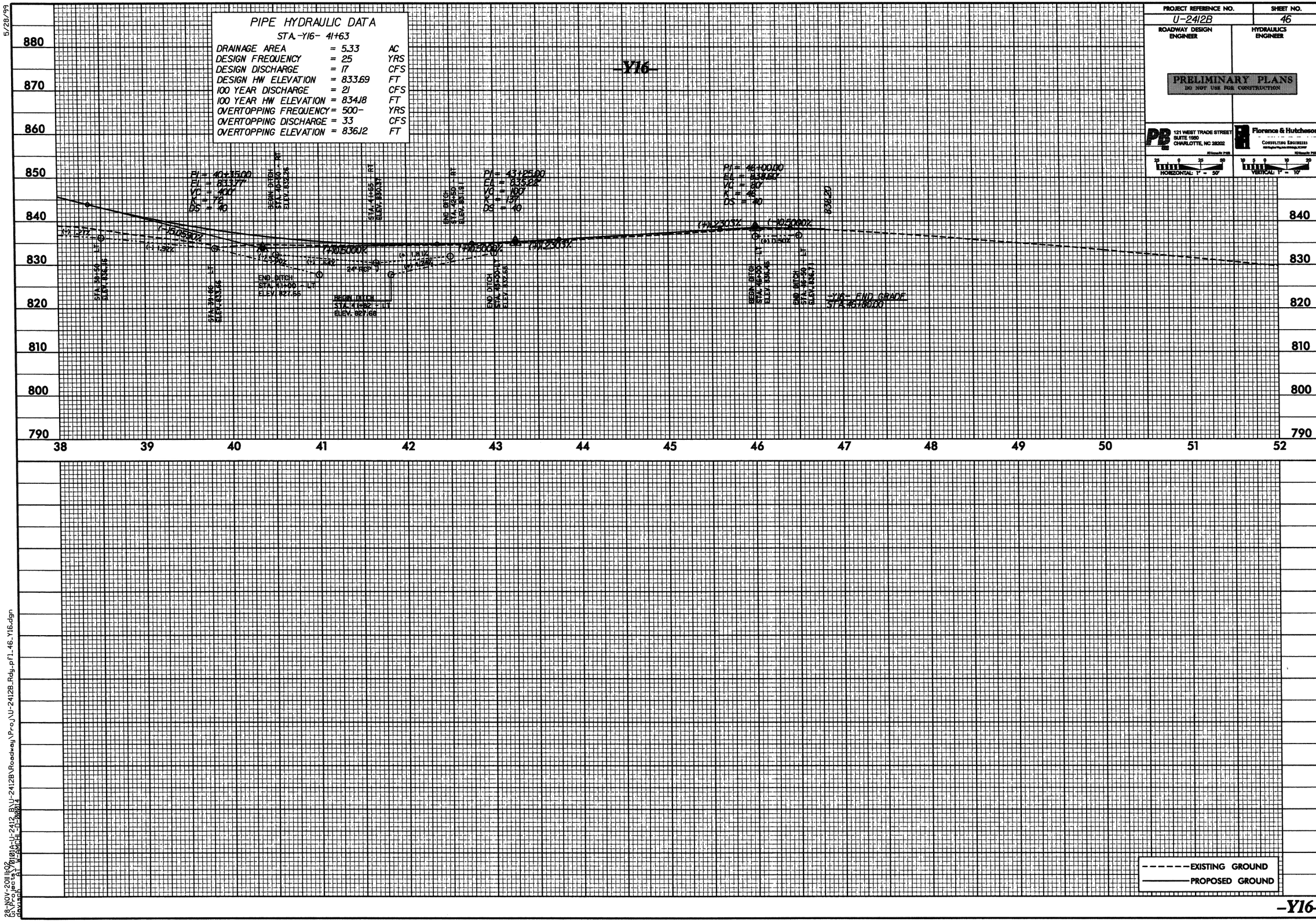
HORIZONTAL: 1" = 50'

VERTICAL: 1" = 10'

PIPE HYDRAULIC DATA

STA.-Y16- 41+63

DRAINAGE AREA	= 5.33	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 17	CFS
DESIGN HW ELEVATION	= 833.69	FT
100 YEAR DISCHARGE	= 21	CFS
100 YEAR HW ELEVATION	= 834.18	FT
OVERTOPPING FREQUENCY	= 500-	YRS
OVERTOPPING DISCHARGE	= 33	CFS
OVERTOPPING ELEVATION	= 836.12	FT



-Y16-

5/28/99

28-NOV-2011 11:02
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davisch AT W-AMCHI-D-00014

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	47

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

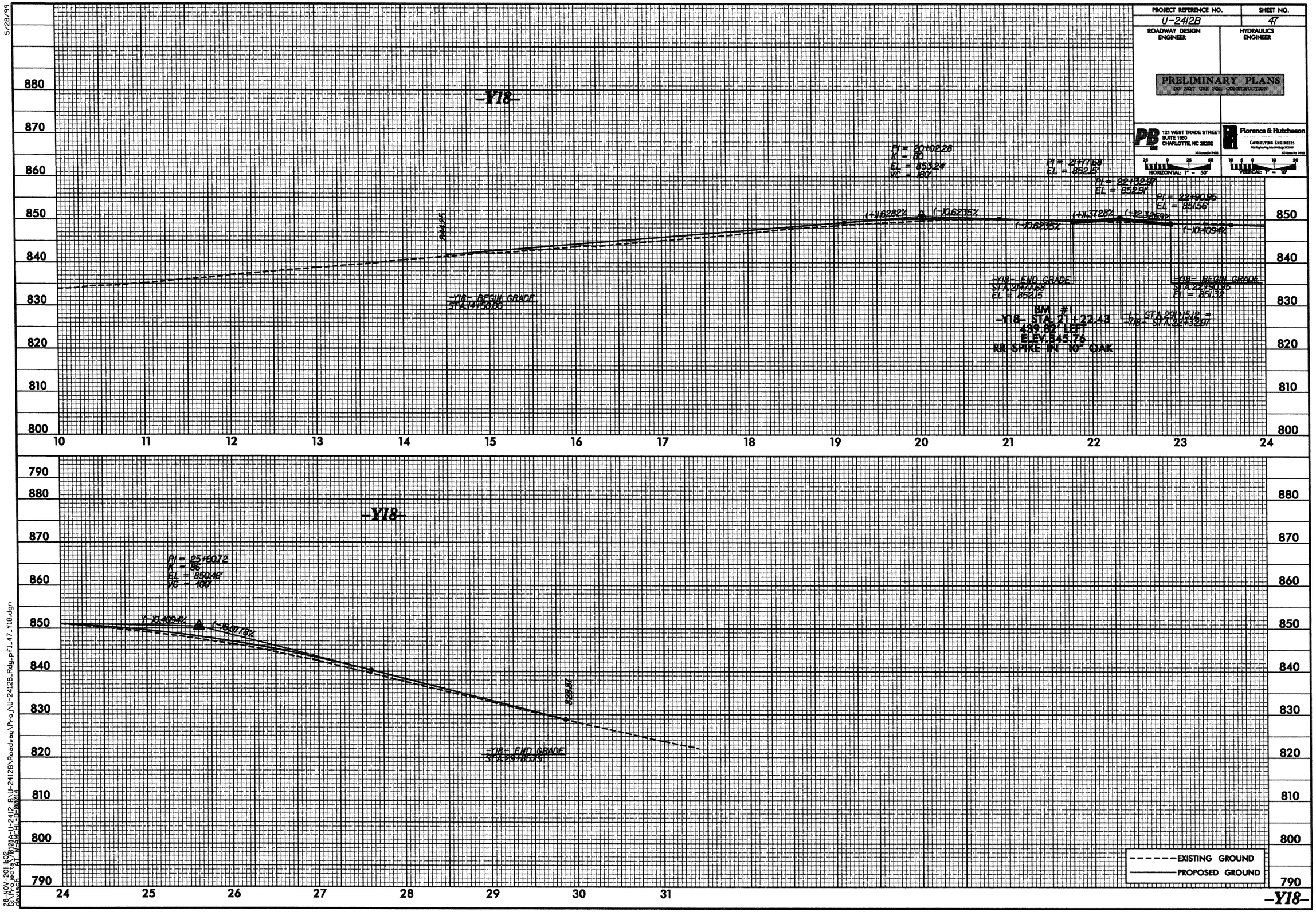
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'

VERTICAL: 1" = 10'



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davisch AT W-AMCHI-D-00014

5/28/99

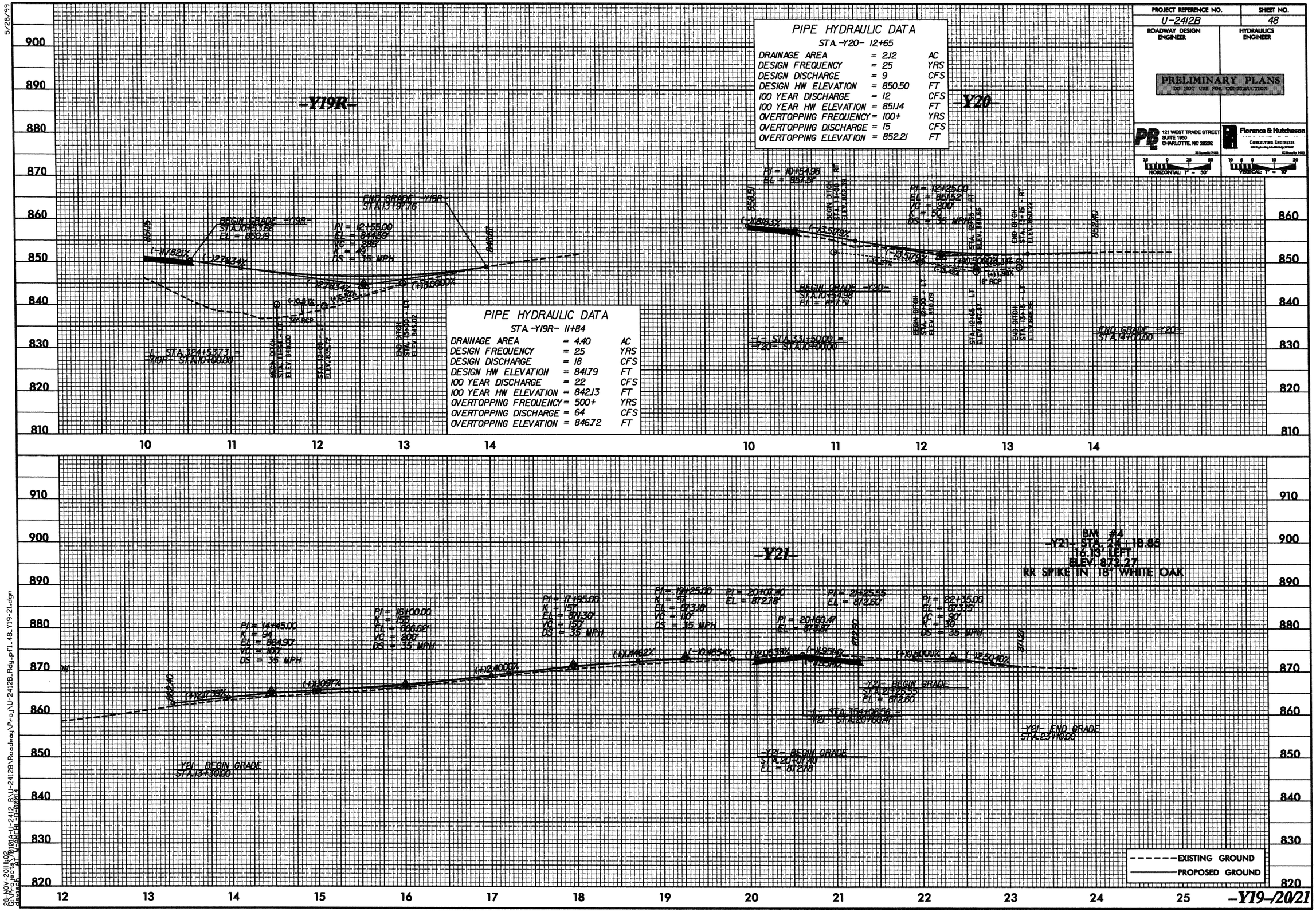
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	48
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50' VERTICAL: 1" = 10'



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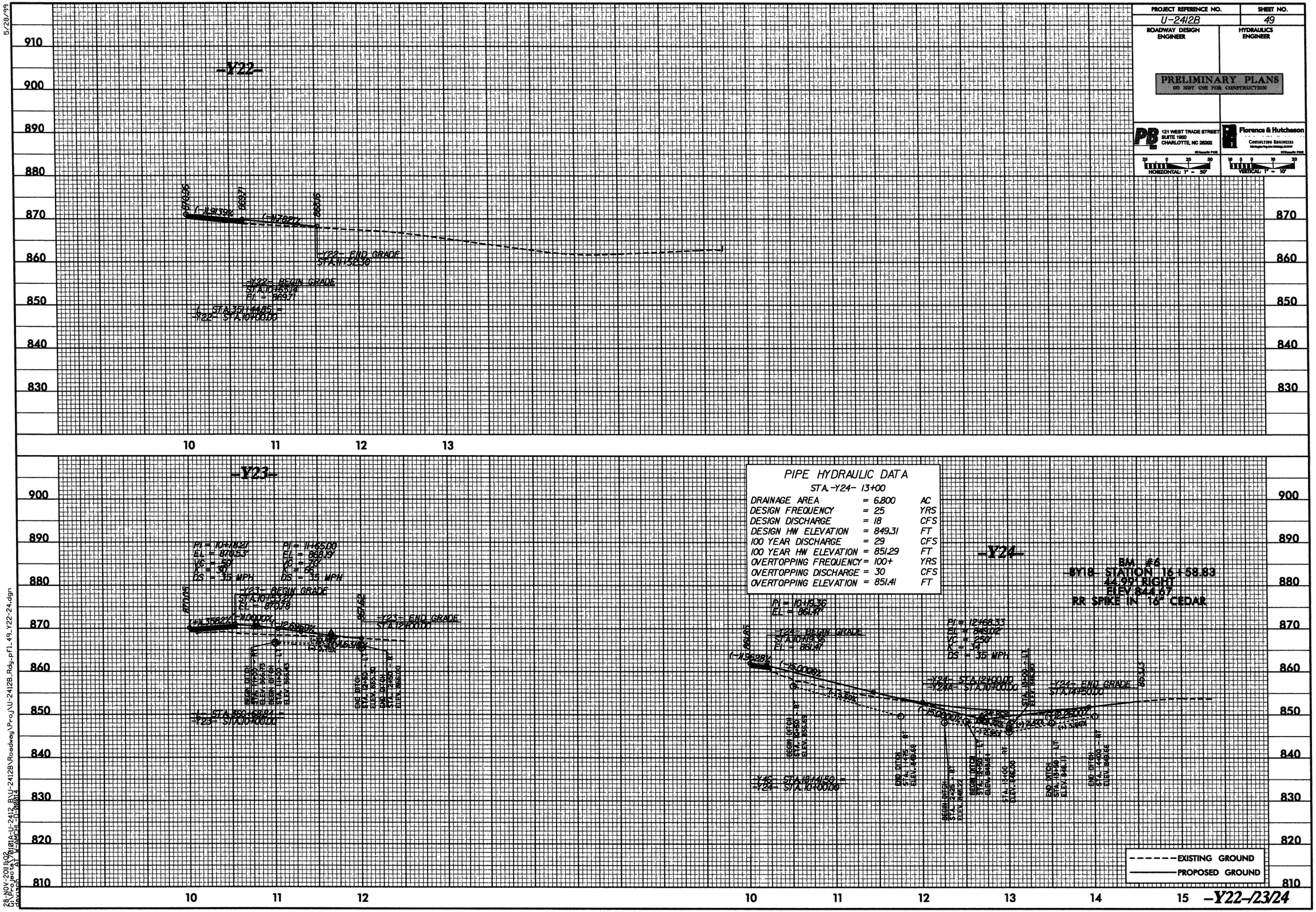
davsch at WSACH 1:9.0014

-Y19-/20/21



5/28/99

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davisch AT W-AMCHI-D-00014

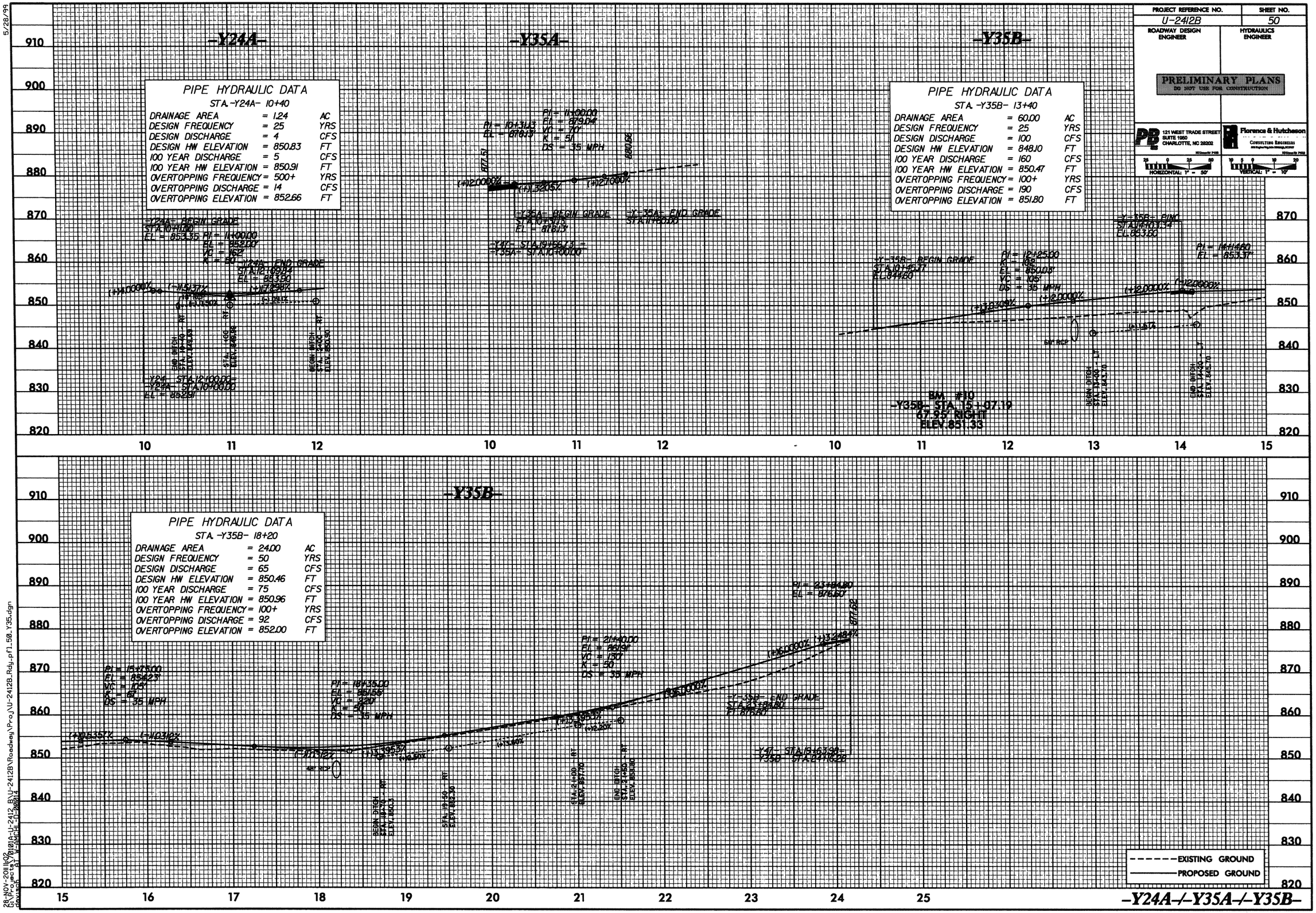
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	50
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutchison CONSULTING ENGINEERS

HORIZONTAL: 1" = 50' VERTICAL: 1" = 10'



5/28/99

28-NOV-2011 11:02
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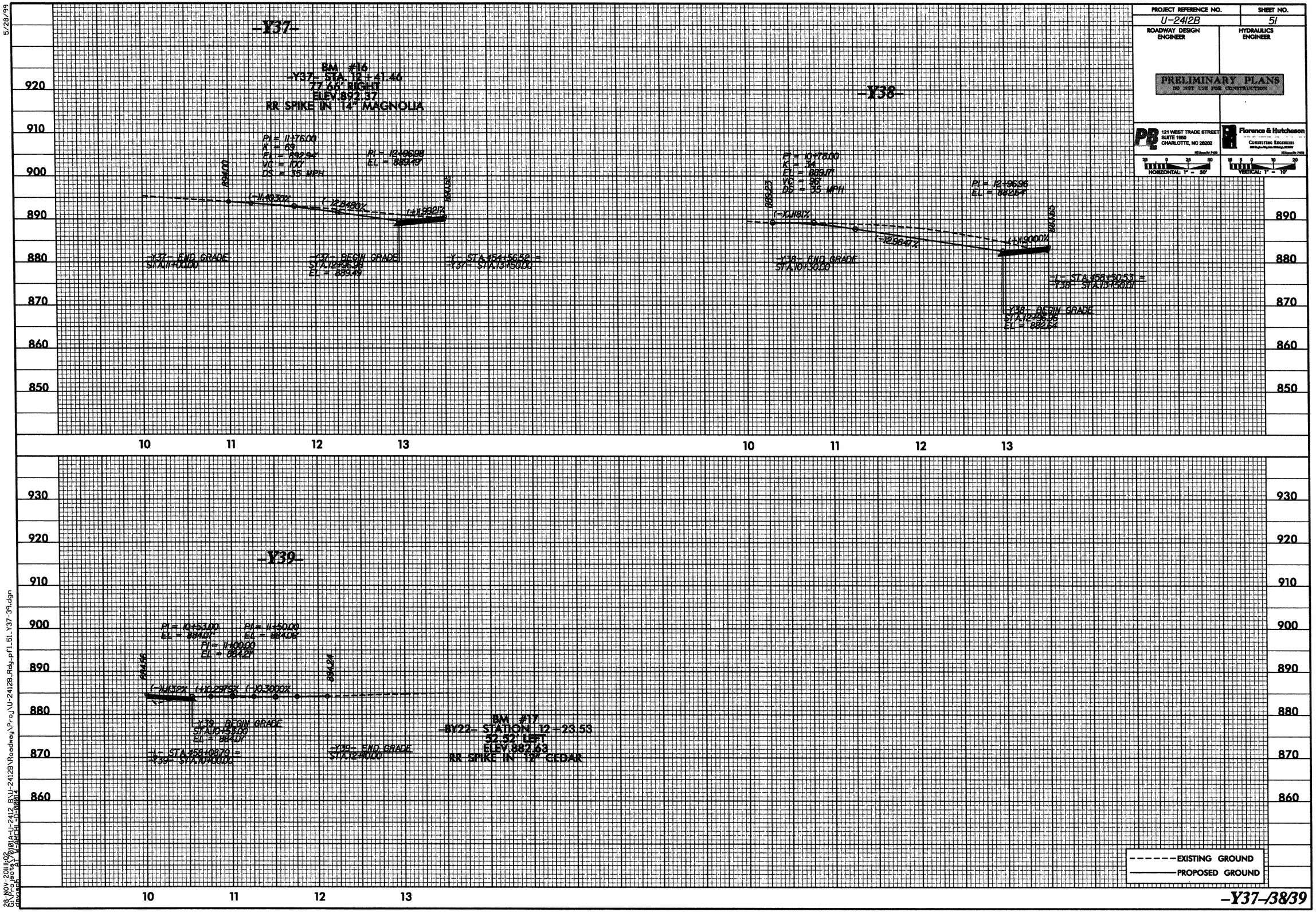
davisch

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	51
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202
Florance & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'
VERTICAL: 1" = 10'



-Y37-/38/39

5/28/99

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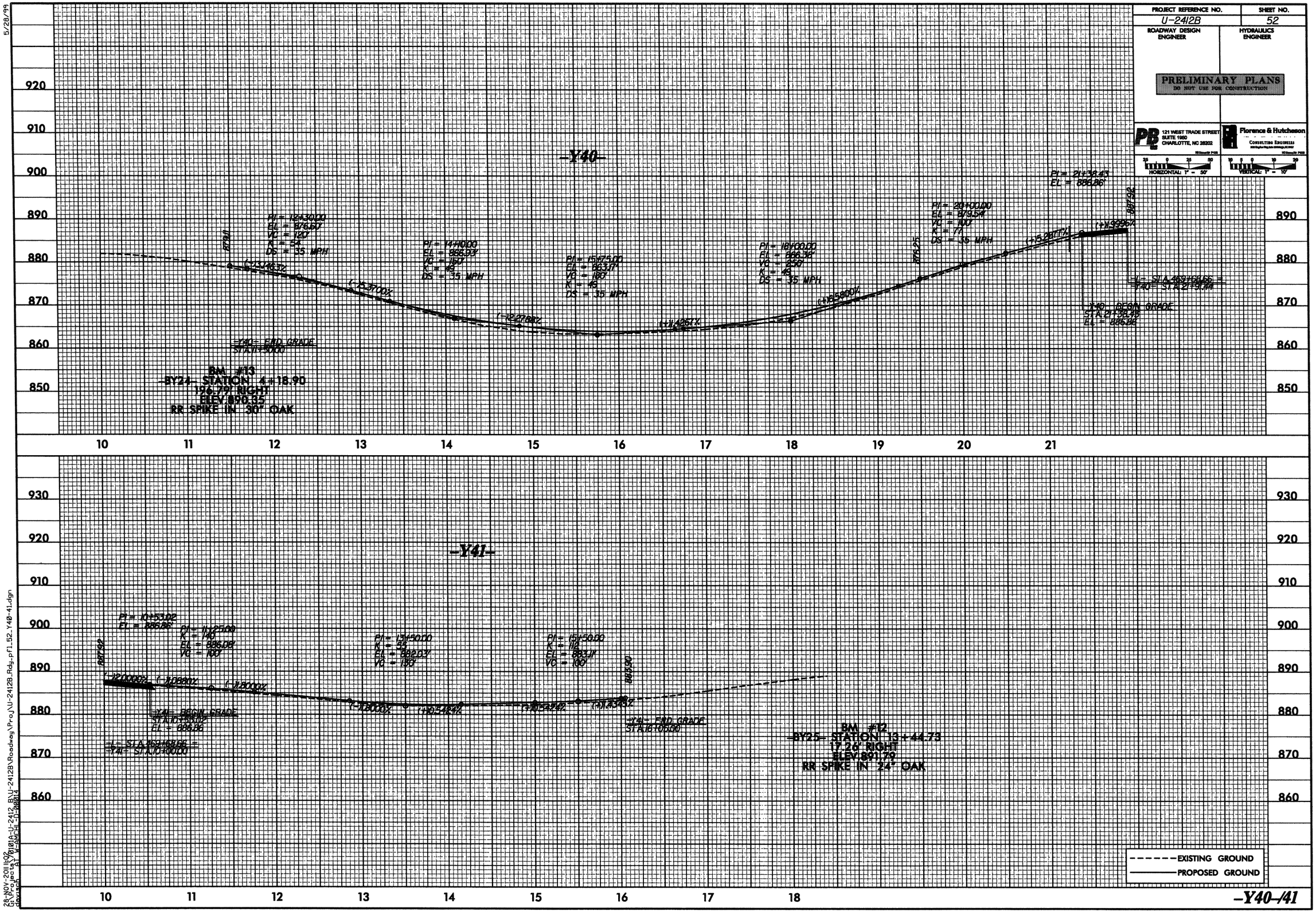
davisch
at W-2MCH_D-06014



5/28/99

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davisch AT W-AMCHI-D-00014

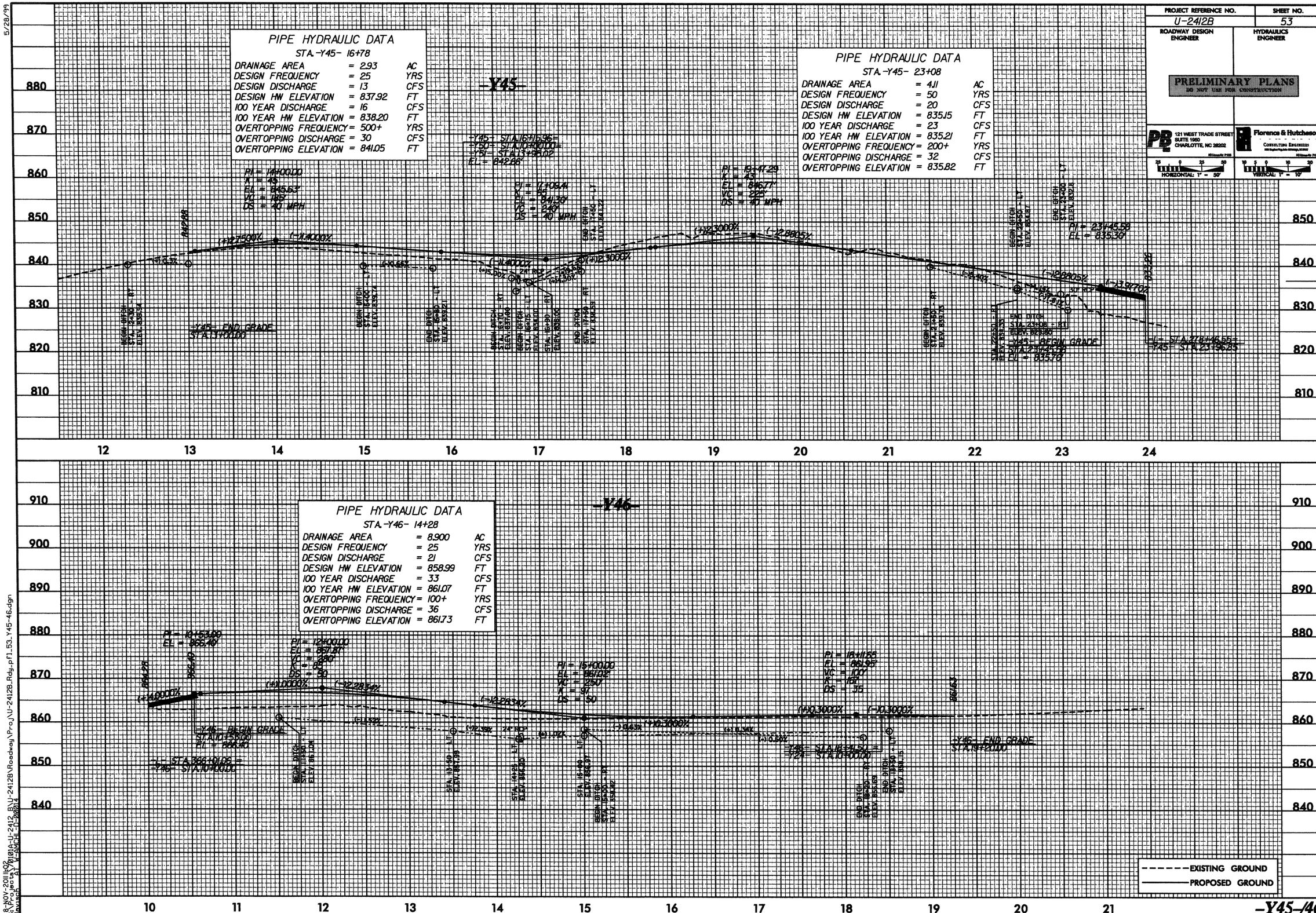
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	53
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'
VERTICAL: 1" = 10'



5/28/99

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davisch AT W-AMCHI-D-00014

5/28/99

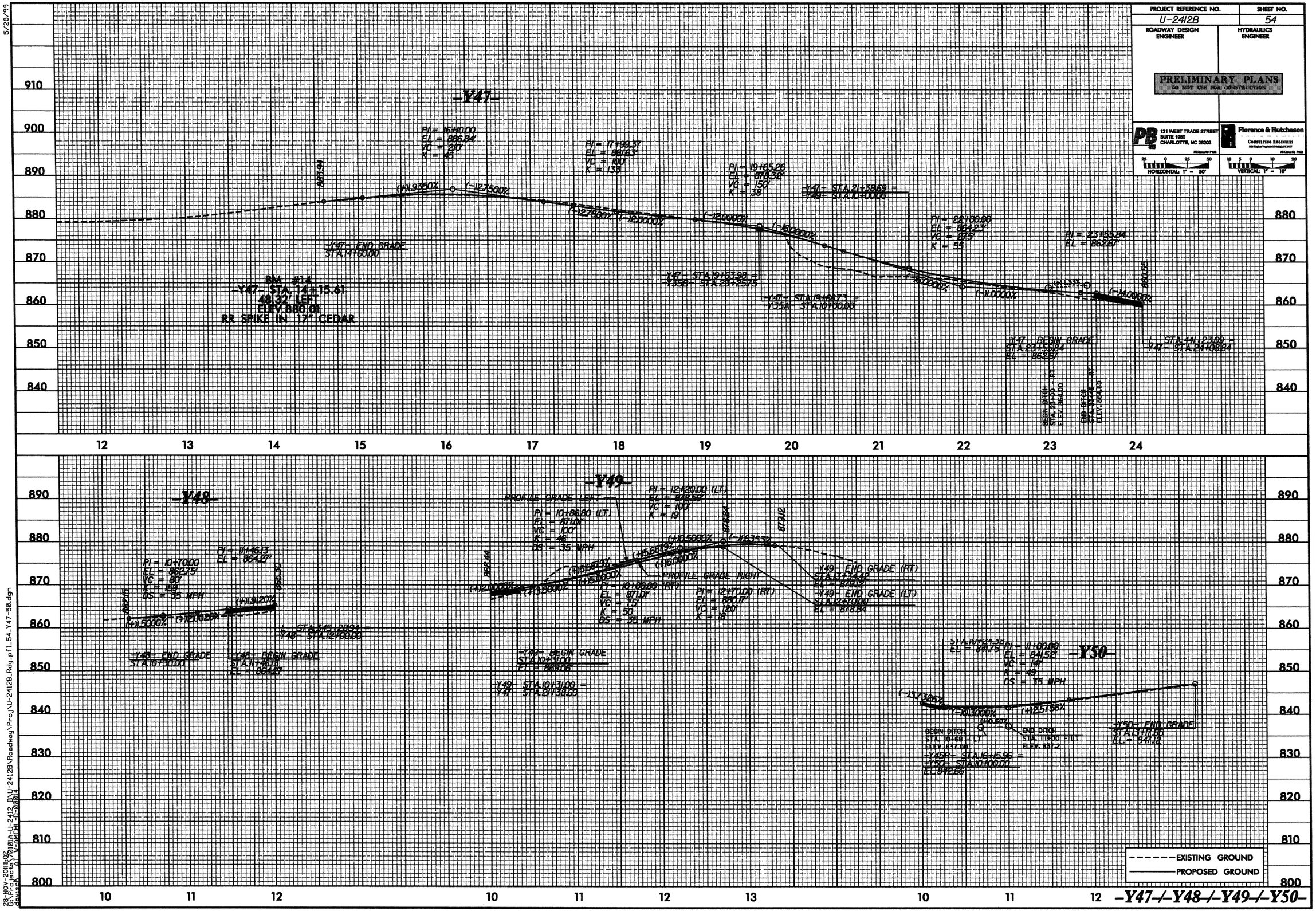
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	54
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'
VERTICAL: 1" = 10'



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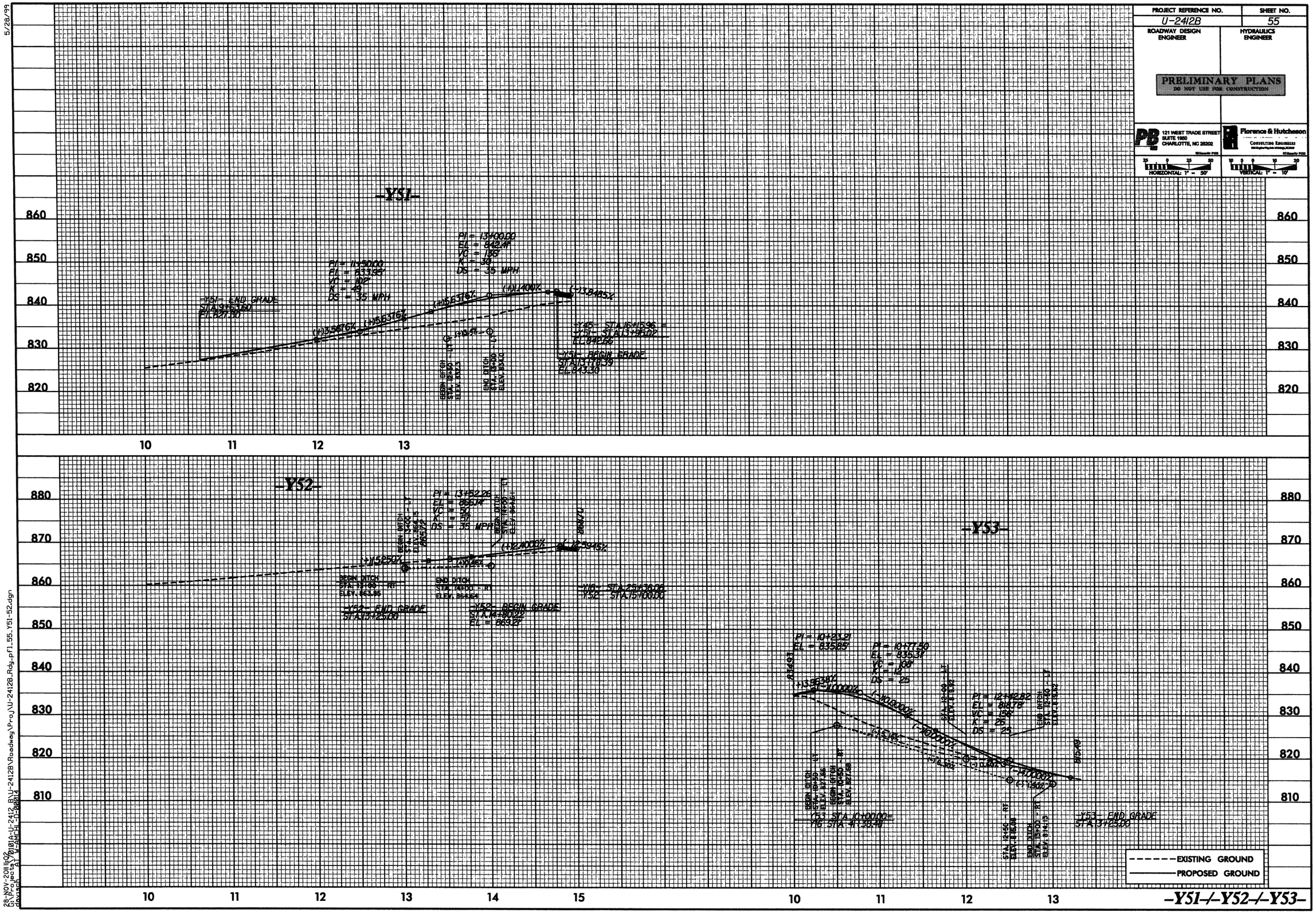
davisch A1 Y-scale: 1:1000

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	55
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1900 CHARLOTTE, NC 28202
Florence & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'
VERTICAL: 1" = 10'


-Y51-
PI = 13+00.00
EL = 842.4'
VC = 195'
K = 39
DS = 35 MPH
PI = 11+50.00
EL = 833.95'
VC = 100'
K = 49
DS = 35 MPH
-Y51- END GRADE
STA 9+50.00
EL 827.30'
(+)1.40%
(-)3.84%
(+)5.57%
(+)5.57%
(+)3.26%
-Y51- STA 15+10.96 =
-Y51- STA 11+95.02
EL 842.66
-Y51- BEGIN GRADE
STA 11+78.39
EL 841.90
BEGIN DITCH
STA. 10+50 - LT
ELEV. 835.25
END DITCH
STA. 14+00 - LT
ELEV. 835.40
-Y52-
PI = 13+52.26
EL = 866.4'
VC = 50
K = 57
DS = 35 MPH
(+)2.40%
(-)2.94%
(+)1.52%
BEGIN DITCH
STA. 11+00 - RT
ELEV. 861.95
END DITCH
STA. 14+00 - RT
ELEV. 864.64
-Y52- END GRADE
STA 13+25.00
-Y52- BEGIN GRADE
STA 14+80.22
EL = 863.21'
-Y0- STA 25+30.06 =
-Y52- STA 15+00.00
-Y53-
PI = 10+23.21
EL = 835.85'
PI = 10+77.50
EL = 835.31'
VC = 100
K = 15
DS = 25
PI = 12+42.82
EL = 838.78'
VC = 100
K = 25
DS = 25
(-)1.00%
(-)1.00%
(-)1.00%

5/28/99

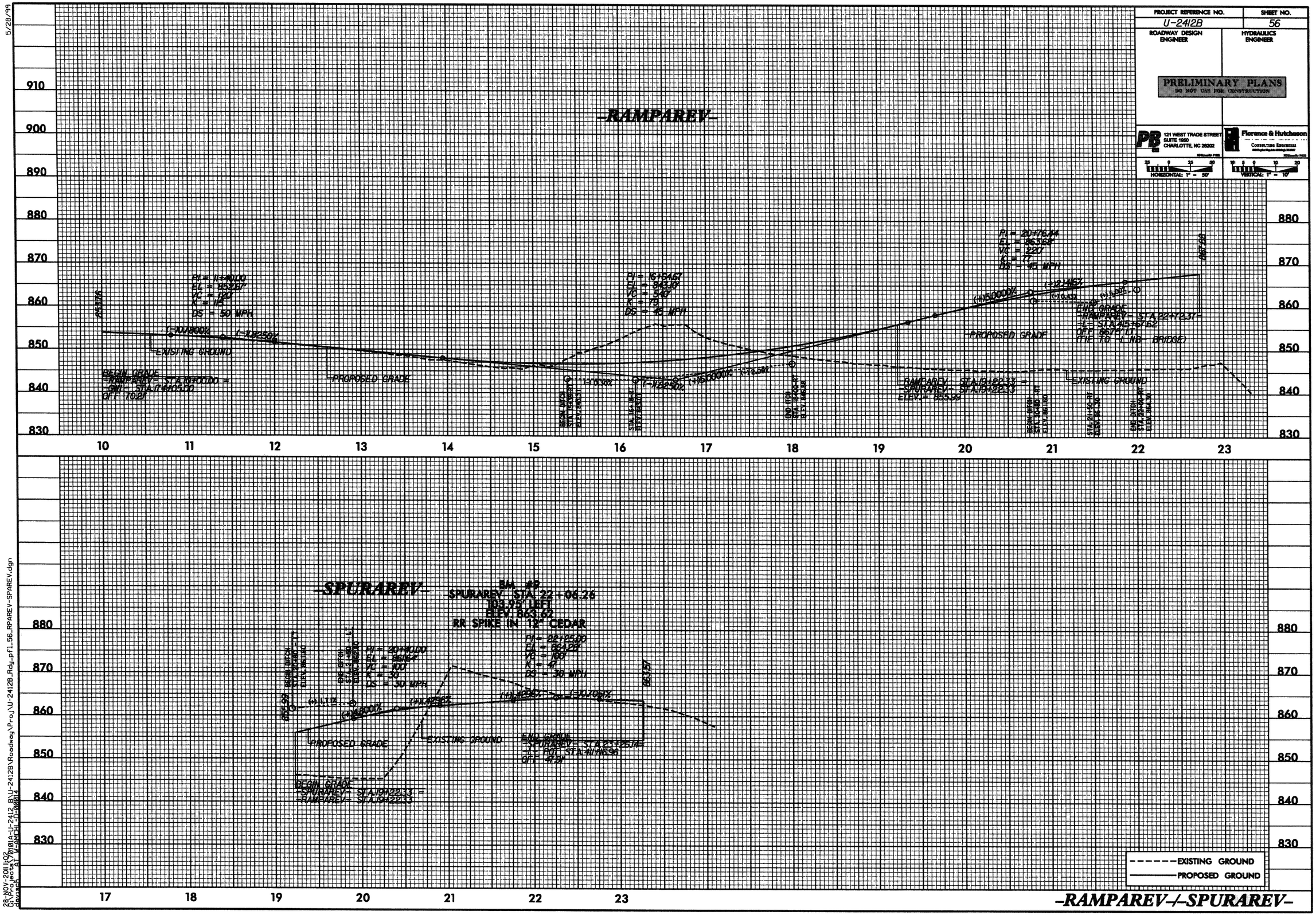
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	56
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1930 CHARLOTTE, NC 28202

Florence & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'
VERTICAL: 1" = 10'



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Groups: 01 02 03 04 CHL 01-06014

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	57

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

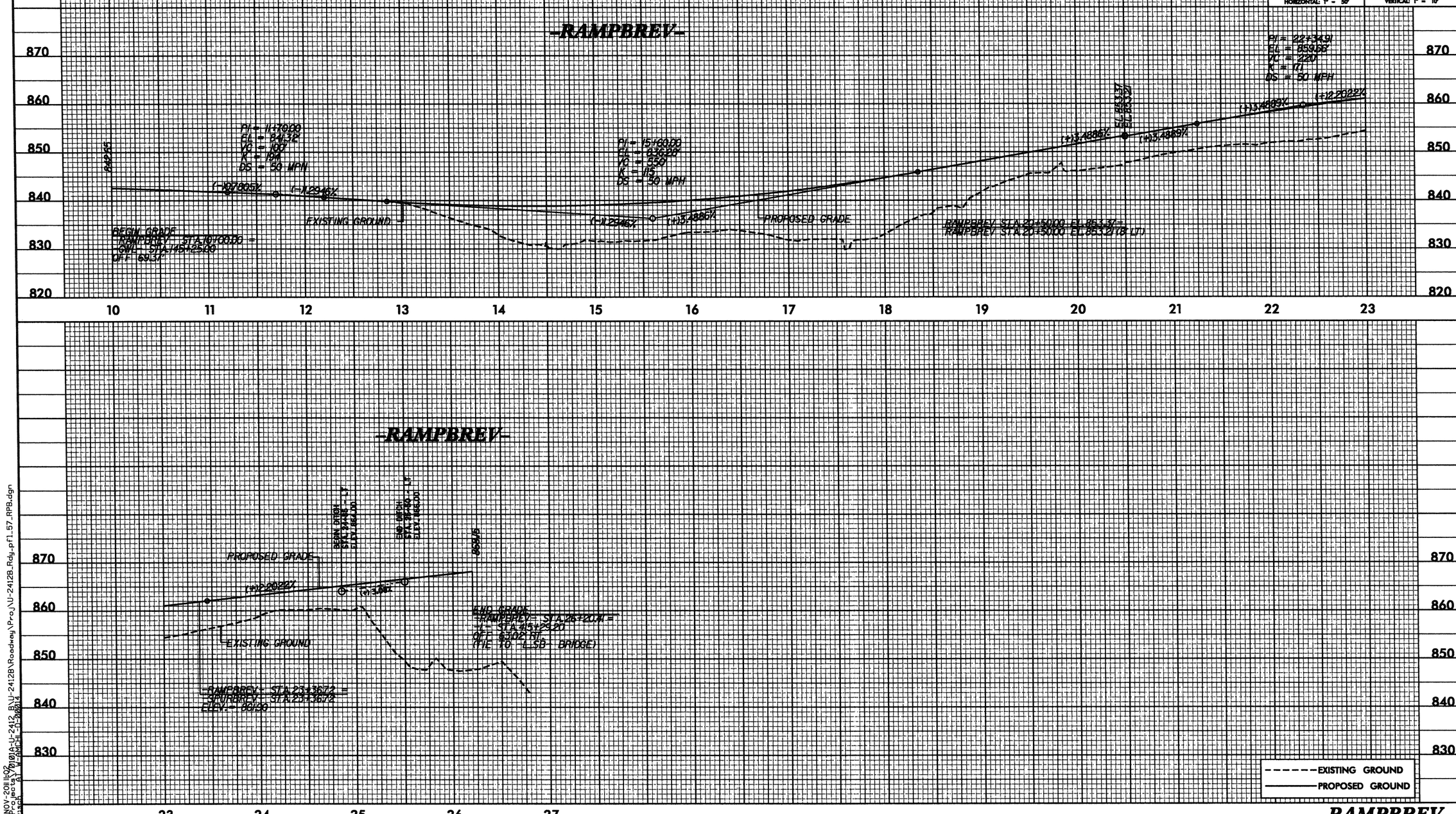
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'

VERTICAL: 1" = 10'



5/28/99

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davisch AT W-AMCHI-D-00014

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	58

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

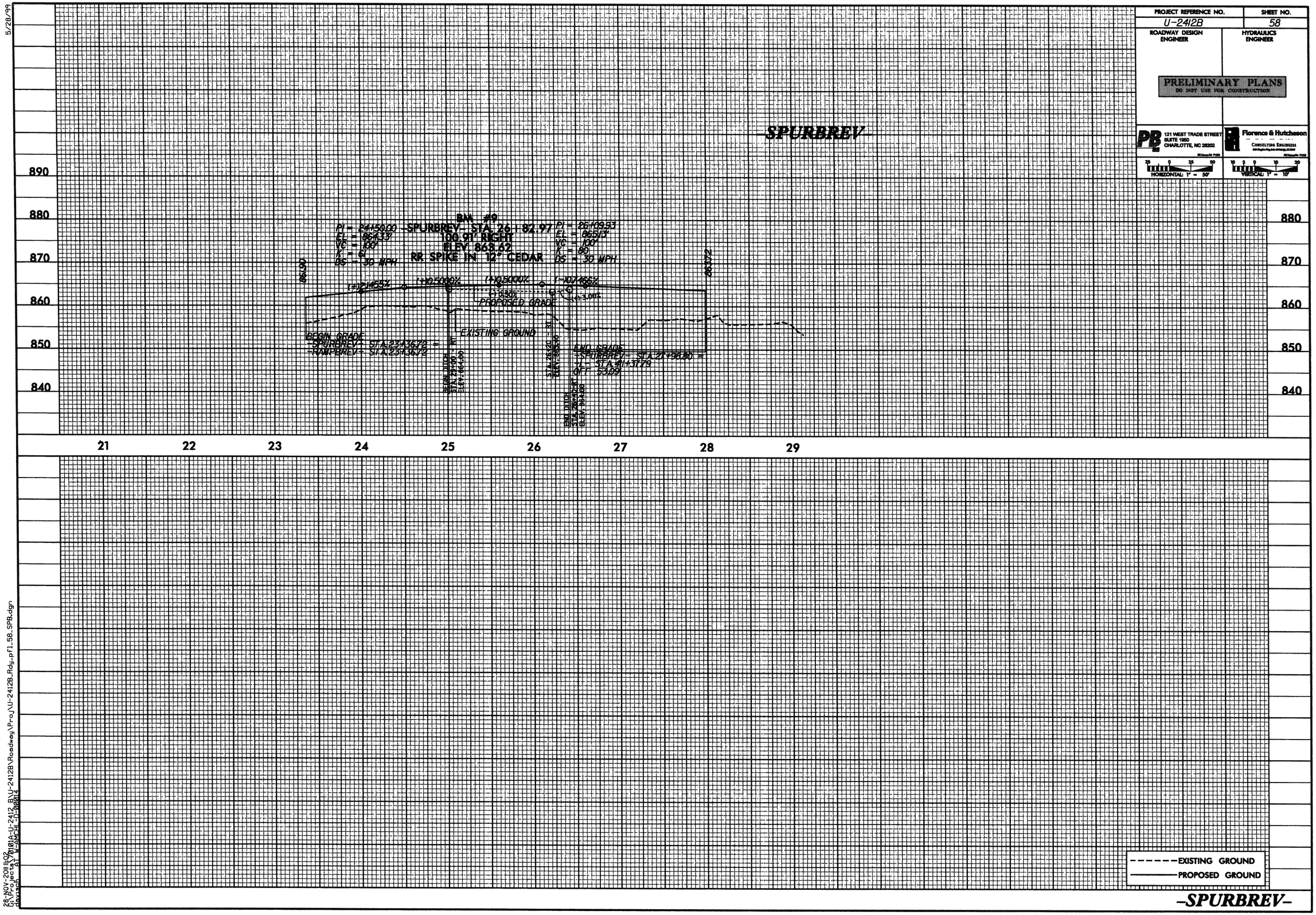
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'

VERTICAL: 1" = 10'



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davisch AT W-AMCHI-D-00014

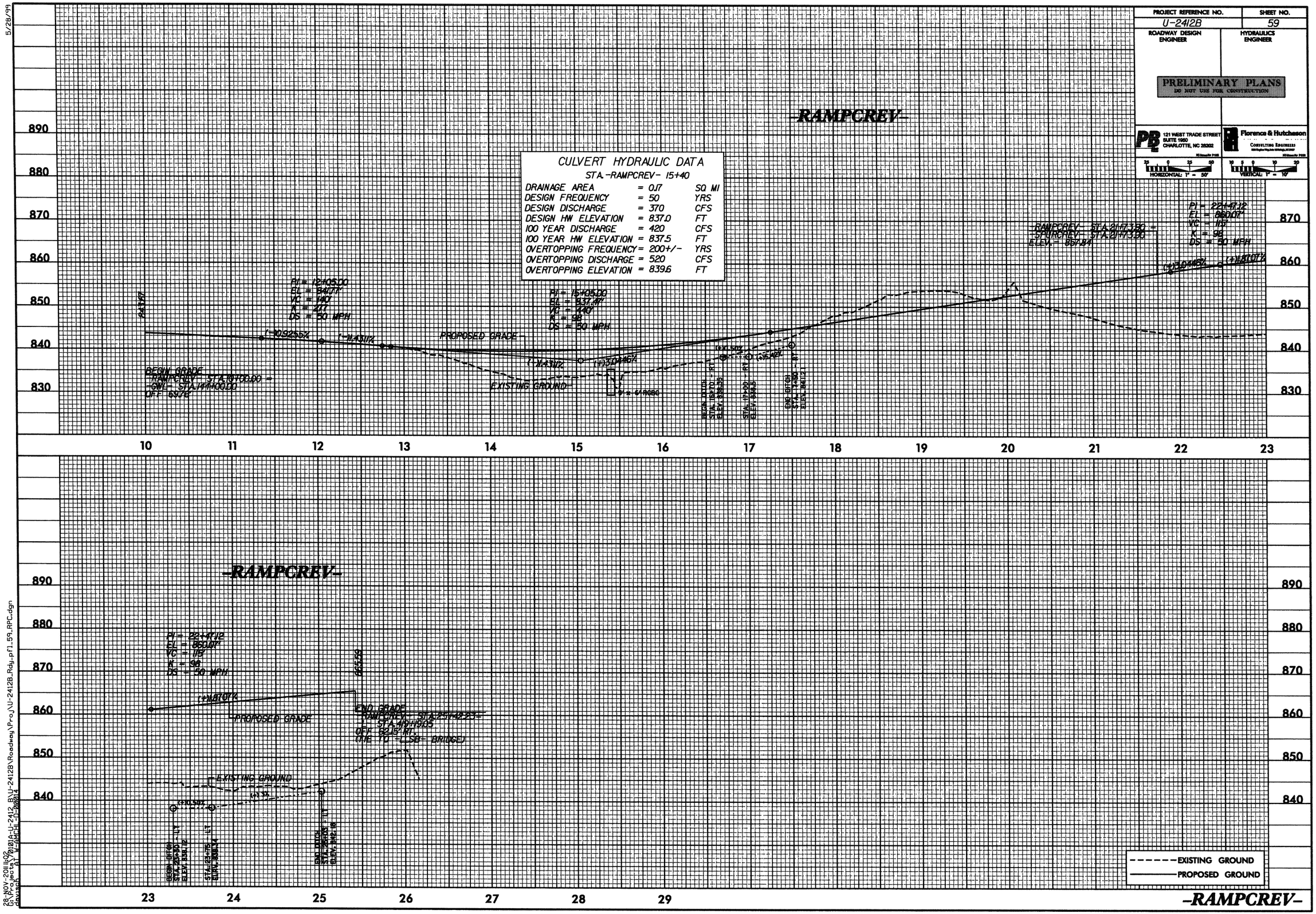
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	59
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1900 CHARLOTTE, NC 28202

Florence & Hutchison Consulting Engineers

HORIZONTAL: 1" = 50'
VERTICAL: 1" = 10'



5/28/99

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davisch V-2.8.CH_11.06.14

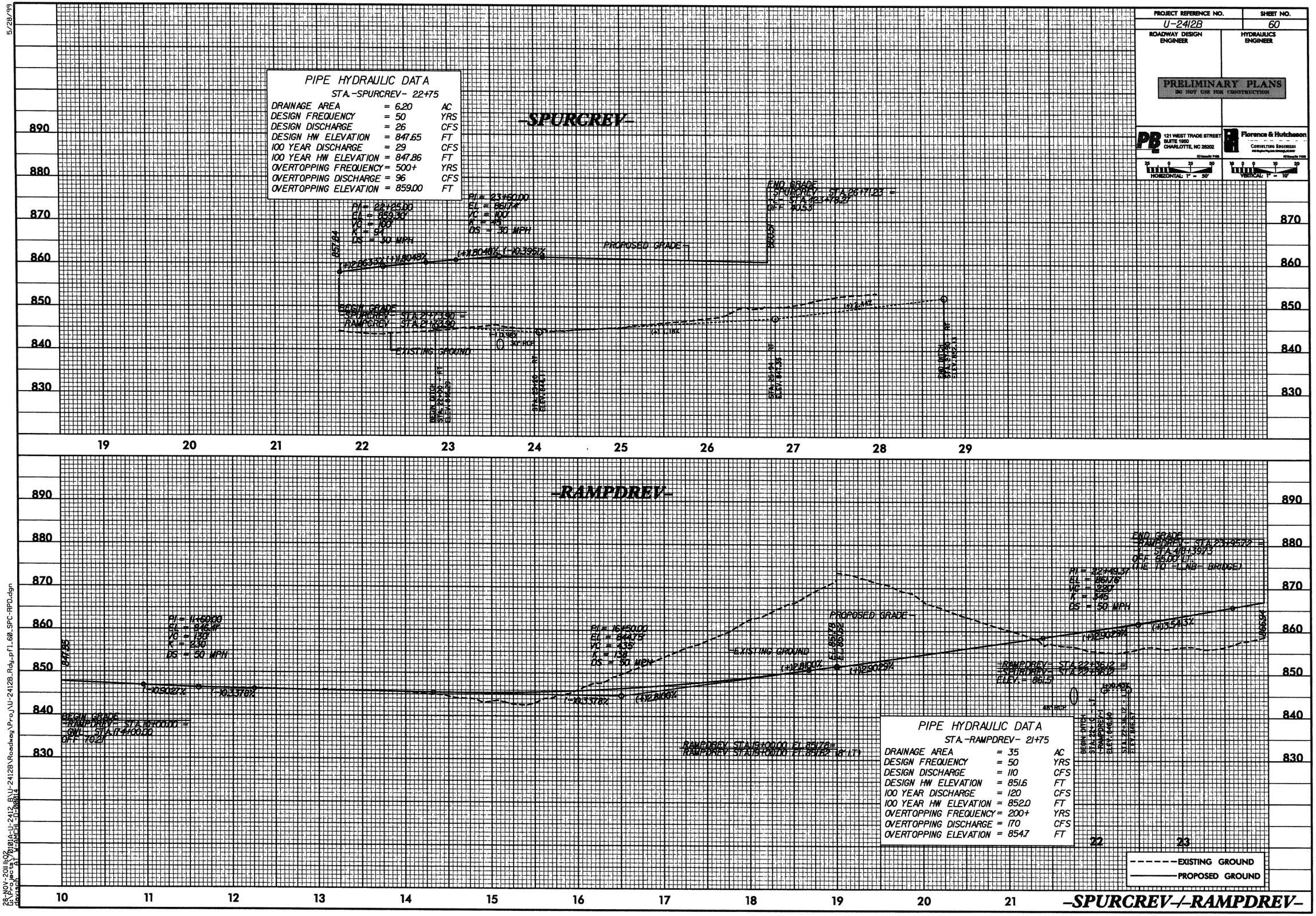
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	60
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202
Florence & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'
VERTICAL: 1" = 10'



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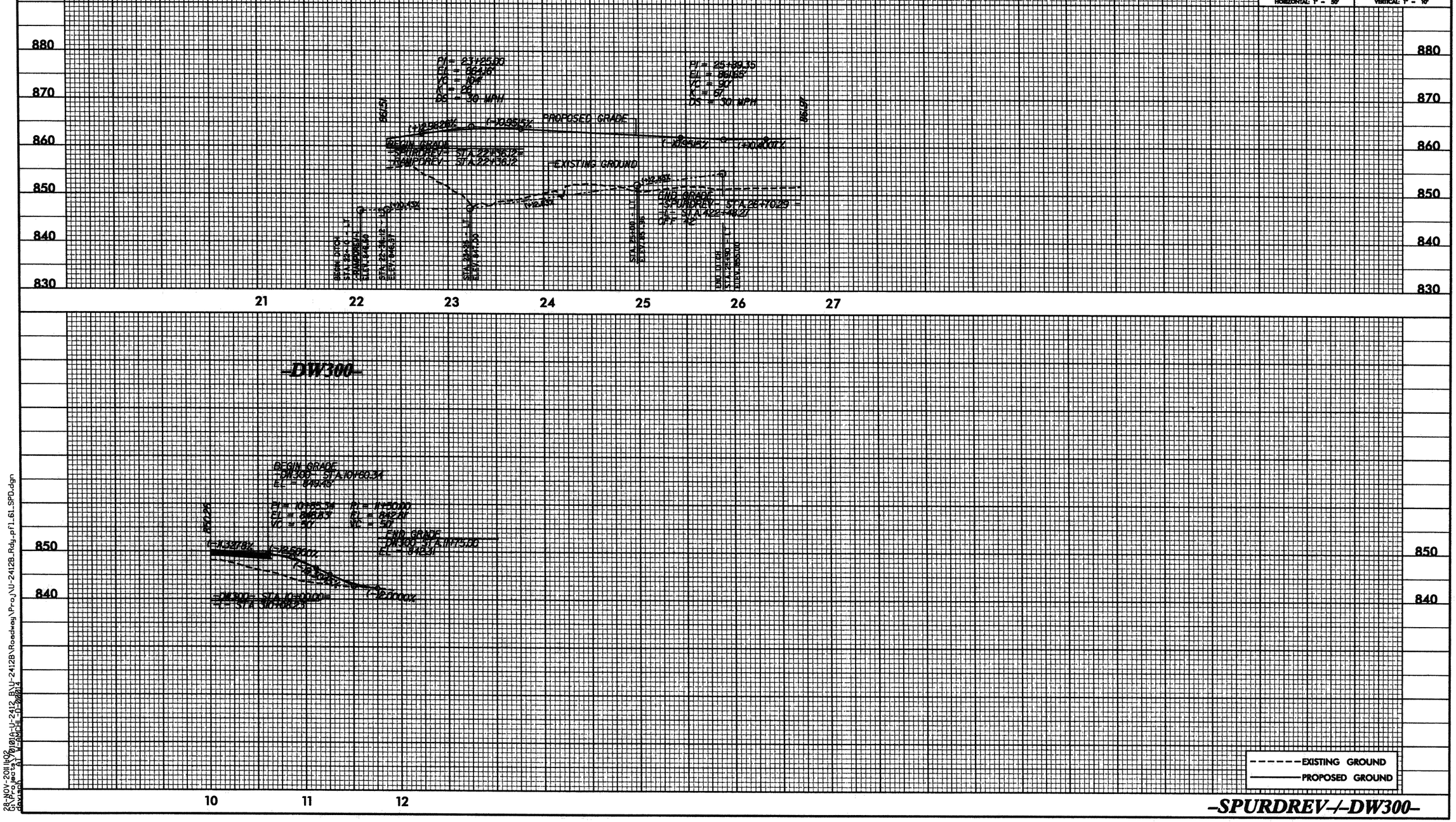
PROJECT REFERENCE NO.	SHEET NO.
U-2412B	61
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202

Florence & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50' VERTICAL: 1" = 10'



-SPURDREV-/-DW300-

5/28/99

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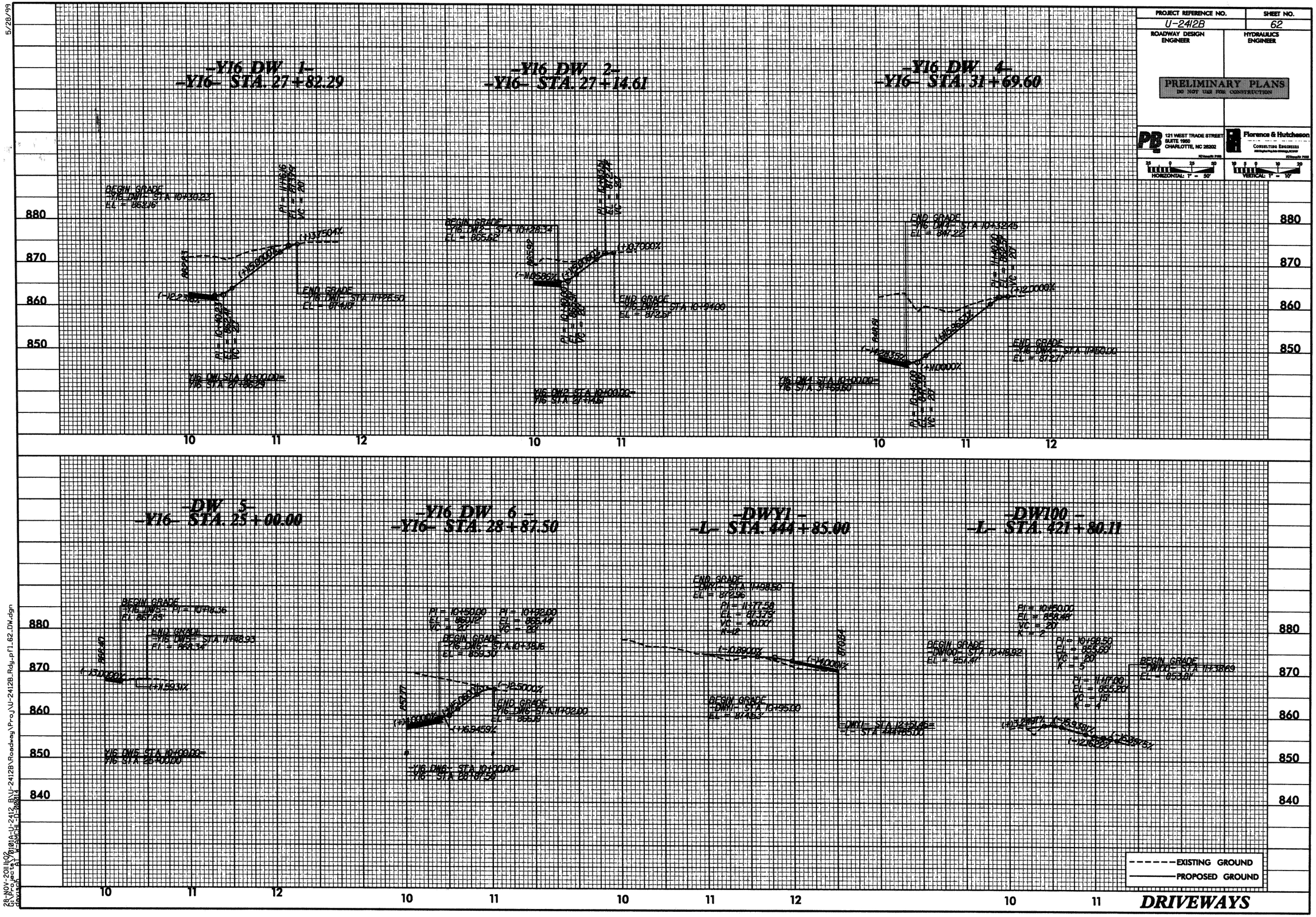
davisch AT W-AMCHL-D-00014

PROJECT REFERENCE NO.	SHEET NO.
U-2412B	62
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PB 121 WEST TRADE STREET SUITE 1950 CHARLOTTE, NC 28202
Florence & Hutcheson CONSULTING ENGINEERS

HORIZONTAL: 1" = 50'
VERTICAL: 1" = 10'



5/28/99

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devisch AT W-AMCHI-D-00014

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

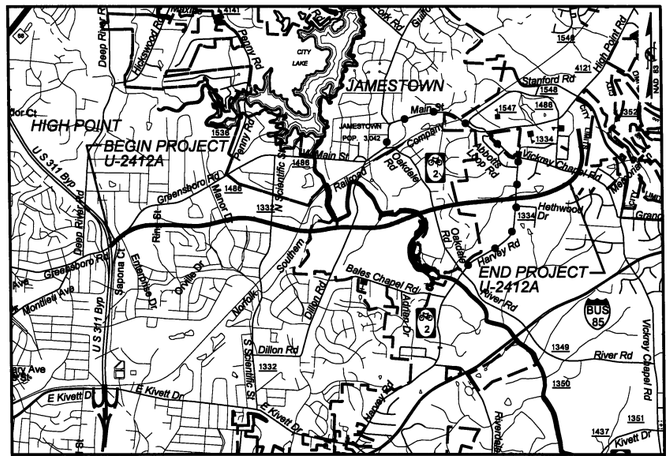
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34802.1.1	STP-4121(1)	PE
34802.2.2	STP-4121(3)	R/W & UTL.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

TIP PROJECT: U-2412A

CONTRACT:



VICINITY MAP

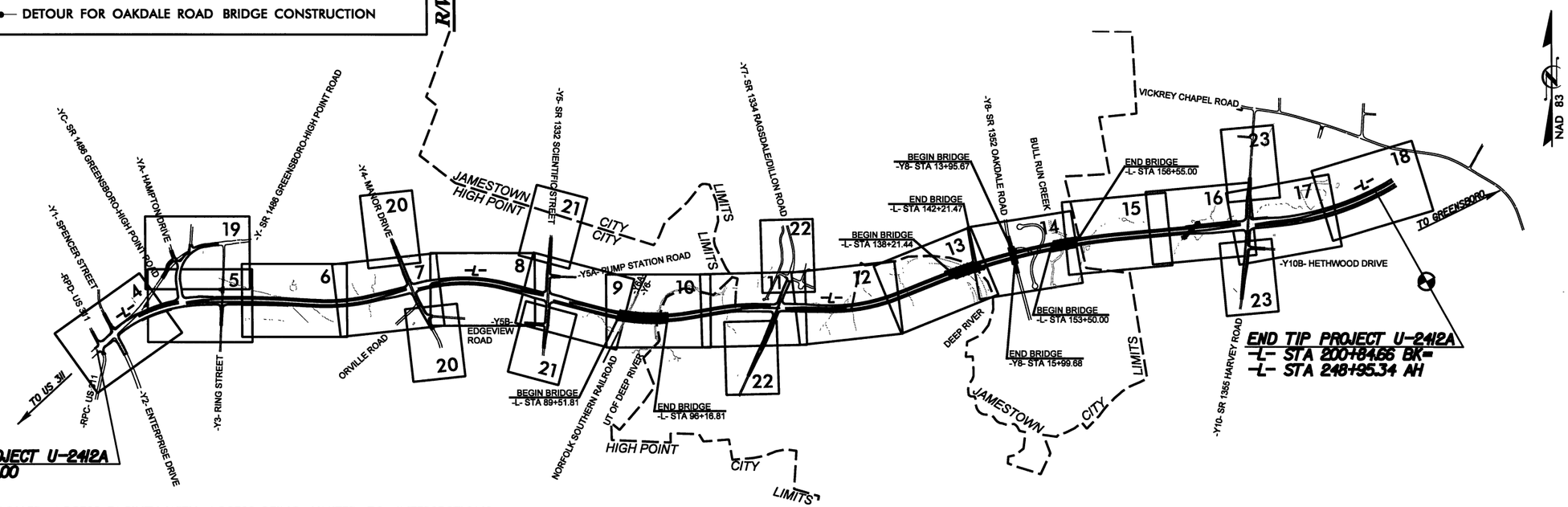
—•—•— DETOUR FOR OAKDALE ROAD BRIDGE CONSTRUCTION

R/W SUBMITTAL

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

TYPE OF WORK: ***GRADING, DRAINAGE, PAVING, STRUCTURES, SIGNALS AND GUARDRAIL***

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



THIS IS A CONTROLLED ACCESS FACILITY WITH ACCESS BEING LIMITED TO INTERSECTIONS.
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF HIGH POINT AND JAMESTOWN.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II
NCDOT CONTACT: B. DOUG TAYLOR, P.E. ENGINEERING COORDINATION, ROADWAY DESIGN UNIT

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 2011	=	31,530
ADT 2031	=	48,870
DHV	=	11%
D	=	55%
T	=	3% *
V	=	60 MPH

* (TTST 1% + DUAL 2%)

FUNC CLASS: ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT	U-2412A	=	3.327	MILES
LENGTH STRUCTURES TIP PROJECT	U-2412A	=	.259	MILES
TOTAL LENGTH OF TIP PROJECT	U-2412A	=	3.586	MILES

Prepared In the Office of:
GIBSON ENGINEERS, PC
PO BOX 700
FUQUAY VARINA, N.C. 27526
PHONE 919-552-2253
FAX 919-552-2254

GIBSON ENGINEERS, PC

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 20, 2009

LETTING DATE:
JUNE 24, 2022

GLENDA M. GIBSON, PE
PROJECT ENGINEER

MICHAEL PEKAREK, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER *P.E.*

7/15/2011
3:30:56 AM
:\roadway\proj\u2412a_rdy_tsh.dgn
ps:5.5B52

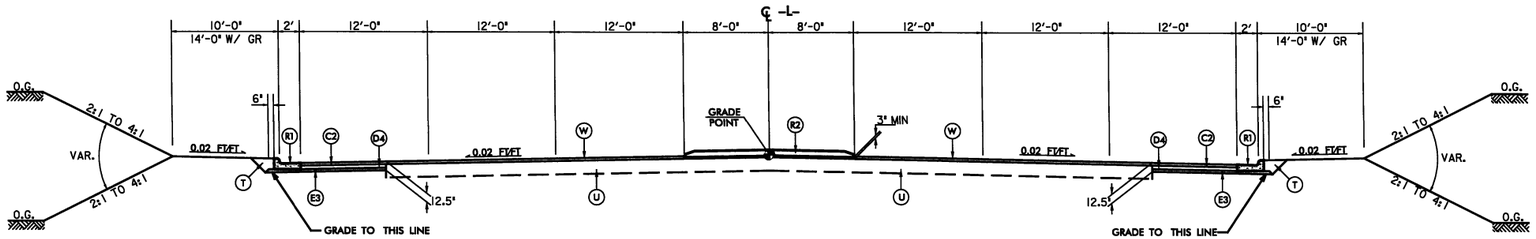
PROJECT REFERENCE	SHEET NO.
U-2412A	2

ROADWAY DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

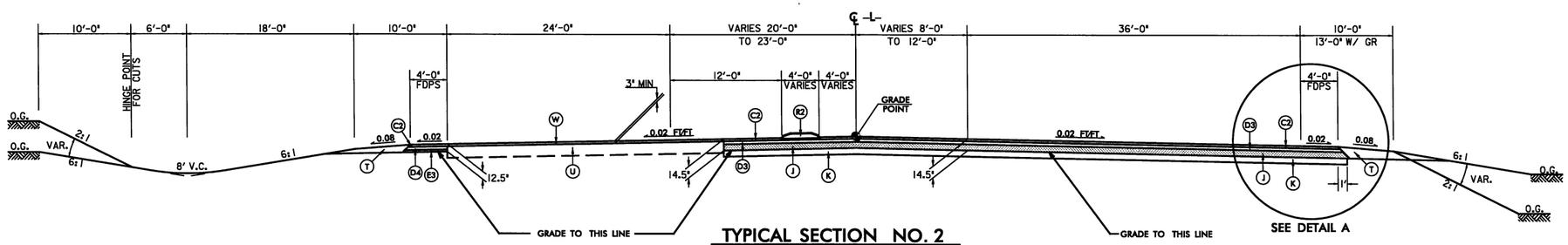
Prepared in the Office of: GIBSON ENGINEERS, PC

NOTE: FOR VARIABLE SLOPES SEE CROSS SECTIONS
FOR TAPERS AND AUXILLARY LANES SEE PLAN VIEW



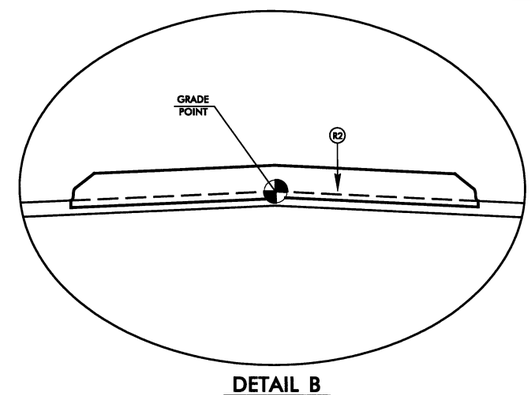
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1:
-L- STA 11+50.00 TO 15+00.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2:
-L- STA 15+00.00 TO 19+65.00



DETAIL B

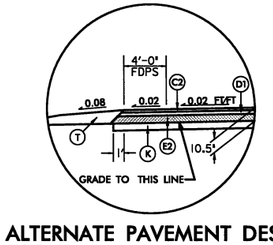
USE IN CONJUNCTION WITH TYPICAL SECTION NOS. 1 & 2
-L- STA 11+50.00 TO 19+44.00

PAVEMENT SCHEDULE

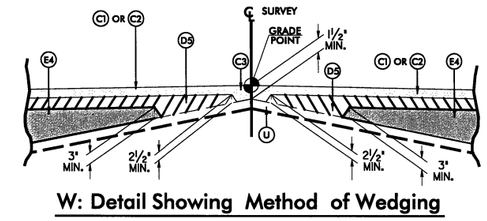
(FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E4	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS	J	PROP. 8" AGGREGATE BASE COURSE
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH	K	PROP. 8" SOIL LIME SUBBASE MIX AT THE RATE OF 20 LBS. PER SQ. YD. OR PROP. 7" SOIL CEMENT SUBBASE MIX AT THE RATE OF 20 LBS. PER SQ. YD. LOCATIONS AND TYPE AS DIRECTED BY THE ENGINEER.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE BINDER COURSE. TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R1	2'-6" CONCRETE CURB AND GUTTER
D2	PROP. APPROX. 3" ASPHALT CONCRETE BINDER COURSE. TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	R2	5" MONOLITHIC CONCRETE ISLAND (KEYED IN)
D3	PROP. APPROX. 3.5" ASPHALT CONCRETE BINDER COURSE. TYPE I19.0B, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.	R3	EXPRESSWAY GUTTER
D4	PROP. APPROX. 4" ASPHALT CONCRETE BINDER COURSE. TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R4	1'-6" CONCRETE CURB AND GUTTER
D5	PROP. VAR. DEPTH ASPHALT CONCRETE BINDER COURSE. TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	R5	SHOULDER BERM GUTTER
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL
E2	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	U	EXISTING PAVEMENT
E3	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.	W	WEDGING (SEE DETAIL SHOWING METHOD OF WEDGING ON THIS SHEET.)

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



ALTERNATE PAVEMENT DESIGN DETAIL A



W: Detail Showing Method of Wedging

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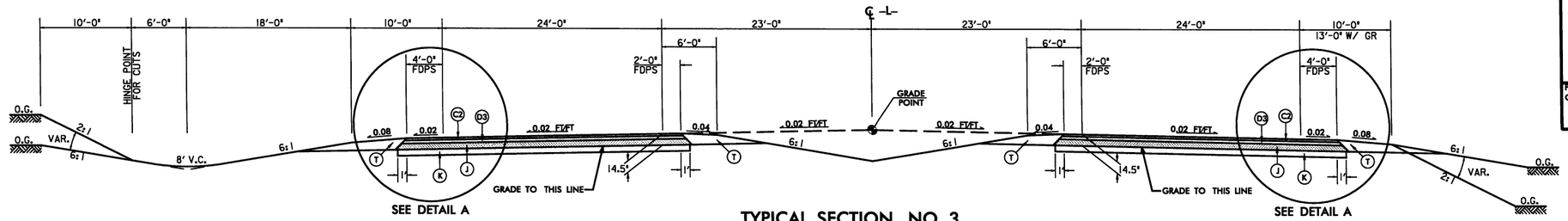
PROJECT REFERENCE	SHEET NO.
U-2412A	2-A
ROADWAY DESIGN ENGINEER	

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

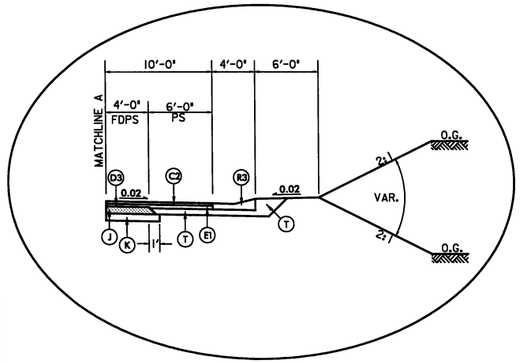
NOTE: FOR VARIABLE SLOPES SEE CROSS SECTIONS
FOR TAPERS AND AUXILLARY LANES SEE PLANVIEW



TYPICAL SECTION NO. 3

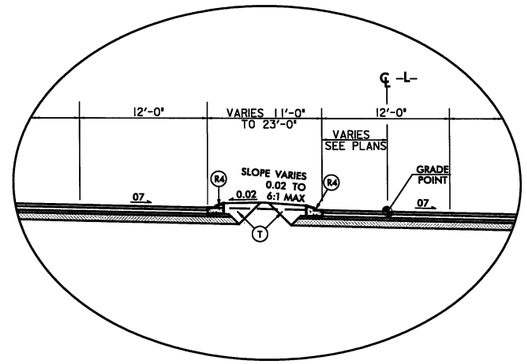
USE TYPICAL SECTION NO. 3:

-L- STA 19+65.00 TO 34+36.27



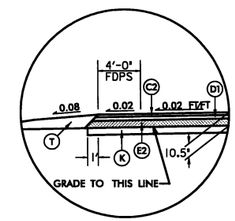
DETAIL C

USE IN CONJUNCTION WITH TYPICAL SECTION NOS. 2, 3 & 4
-L- STA 19+50.00 TO 24+00.00 RT
-L- STA 34+50.00 TO 41+00.00 RT

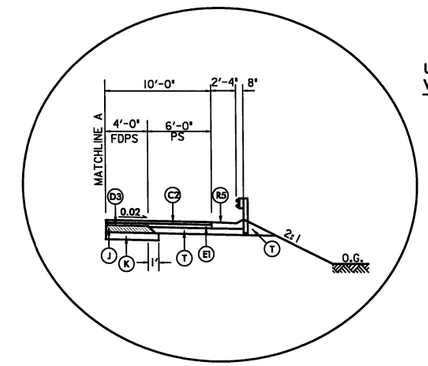


DETAIL D

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 3
-L- STA 19+65.00 TO 25+17.30



ALTERNATE PAVEMENT DESIGN DETAIL A

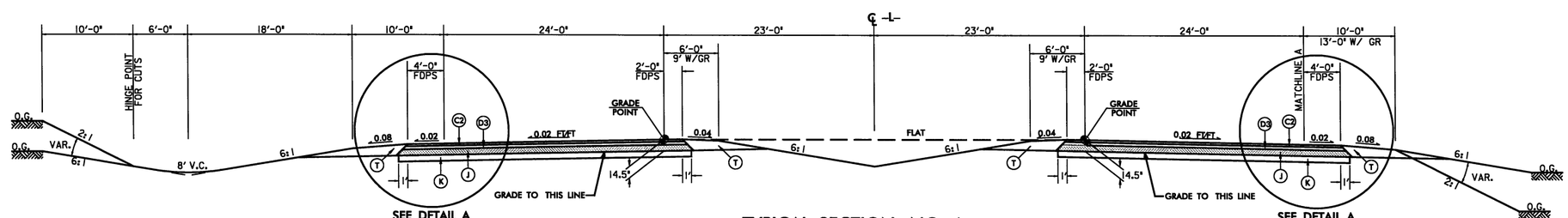


DETAIL E

USE DETAIL E IN CONJUNCTION
WITH TYPICAL SECTION NOS. 4 & 5

-L- STA 35+00.00 TO 45+00.00 LT
-L- STA 41+65.00 TO 45+00.00 RT
-L- STA 50+97.00 TO 54+60.00 LT
-L- STA 82+85.00 TO 89+41.54 LT
-L- STA 96+35.07 TO 96+65.00 RT
-L- STA 96+55.33 TO 102+85.00 LT
-L- STA 103+75.00 TO 106+25.00 RT
-L- STA 115+50.00 TO 126+35.00 LT
-L- STA 137+00.00 TO 138+52.36 RT
-L- STA 150+20.00 TO 153+04.66 RT
-L- STA 156+58.67 TO 161+00.00 RT
-L- STA 171+17.00 TO 176+00.00 RT
-L- STA 174+00.00 TO 176+10.00 LT
-L- STA 189+00.00 TO 194+25.00 LT

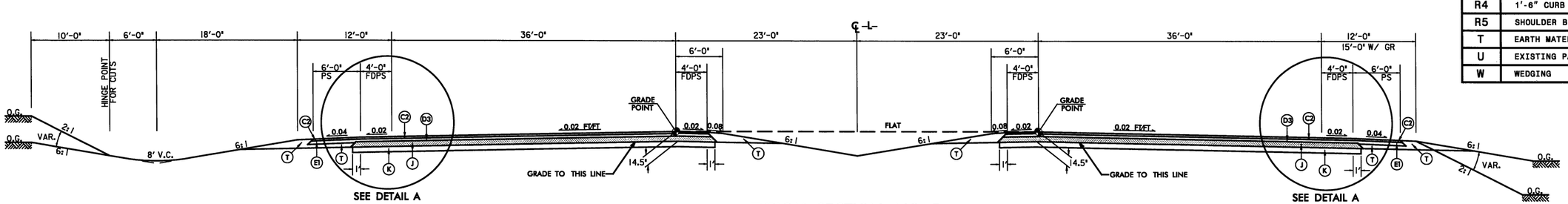
C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. DEPTH S9.5B
D1	2.5" I19.0B
D2	3" I19.0B
D3	3.5" I19.0B
D4	4" I19.0B
D5	VAR. DEPTH I19.0B
E1	4" B25.0B
E2	5" B25.0B
E3	5.5" B25.0B
E4	VAR. DEPTH B25.0B
J	8" AGGREGATE BASE COURSE
K	8" SOIL LIME SUBBASE OR 7" SOIL CEMENT SUBBASE
R1	2'-6" CURB AND GUTTER
R2	MONOLITHIC CONCRETE ISLAND
R3	EXPRESSWAY GUTTER
R4	1'-6" CURB AND GUTTER
R5	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4:

-L- STA 34+36.27 TO 89+51.81 (BEG BRIDGE)
-L- STA 96+16.81 (END BRIDGE) TO 138+21.44 (BEG BRIDGE)
-L- STA 142+21.51 (END BRIDGE) TO 153+50.00 (BEG BRIDGE)
-L- STA 156+55.00 (END BRIDGE) TO 172+35.00



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5:

-L- STA 172+35.00 TO 200+84.66

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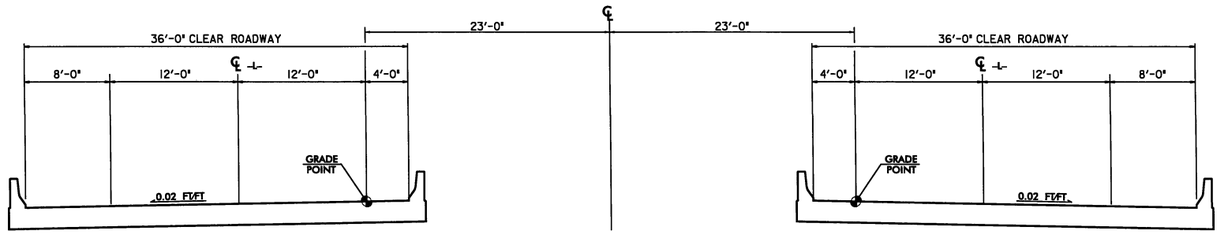
PROJECT REFERENCE	SHEET NO.
U-2412A	2-B

ROADWAY DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

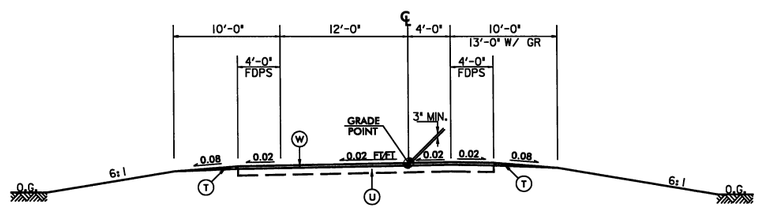
Prepared in the Office of: GIBSON ENGINEERS, PC

NOTE: FOR VARIABLE SLOPES SEE CROSS SECTIONS
FOR TAPERS AND AUXILLARY LANES SEE PLANVIEW



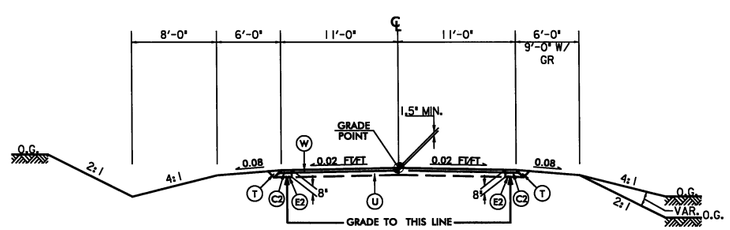
TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6:
-L- STA 89+51.81 (BEG BRIDGE) TO 96+16.81 (END BRIDGE)
-L- STA 138+21.44 (BEG BRIDGE) TO 142+21.51 (END BRIDGE)
-L- STA 153+50.00 (BEG BRIDGE) TO 156+55.00 (END BRIDGE)



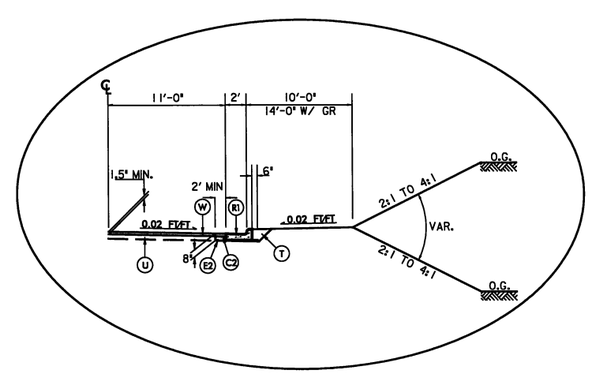
TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7:
-RPD- STA 10+25.00 TO 12+34.38



TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8:
-Y1- STA 12+75.00 TO 15+42.74



DETAIL F
USE IN CONJUNCTION WITH TYPICAL SECTION NO. 8
-Y1- STA 14+54.00 TO 15+42.74 RT

C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. DEPTH S9.5B
D1	2.5" I19.0B
D2	3" I19.0B
D3	3.5" I19.0B
D4	4" I19.0B
D5	VAR. DEPTH I19.0B
E1	4" B25.0B
E2	5" B25.0B
E3	5.5" B25.0B
E4	VAR. DEPTH B25.0B
J	8" AGGREGATE BASE COURSE
K	8" SOIL LIME SUBBASE OR 7" SOIL CEMENT SUBBASE
R1	2'-6" CURB AND GUTTER
R2	MONOLITHIC CONCRETE ISLAND
R3	EXPRESSWAY GUTTER
R4	1'-6" CURB AND GUTTER
R5	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

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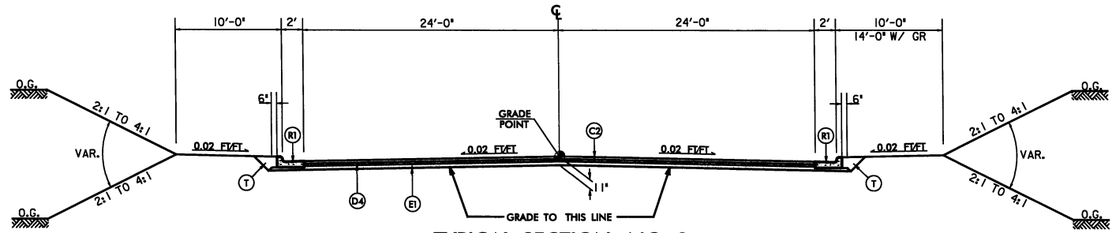
PROJECT REFERENCE	SHEET NO.
U-2412A	2-C

ROADWAY DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

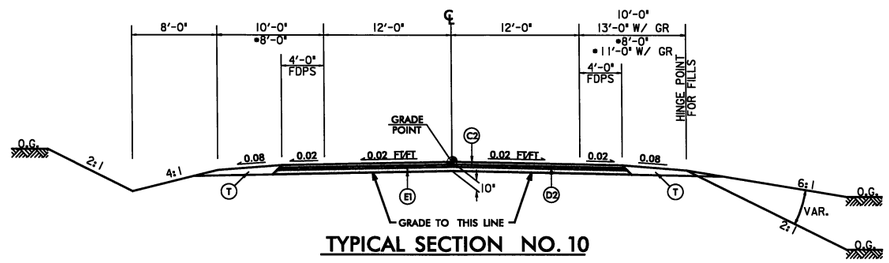
Prepared in the Office of: GIBSON ENGINEERS, PC

NOTE: FOR VARIABLE SLOPES SEE CROSS SECTIONS
FOR TAPERS AND AUXILLARY LANES SEE PLANVIEW



TYPICAL SECTION NO. 9

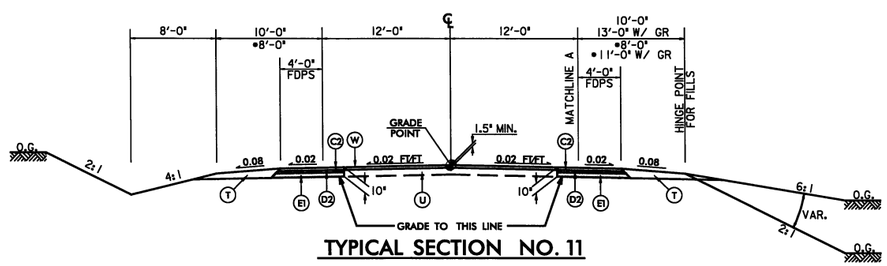
USE TYPICAL SECTION NO. 9:
-Y2- STA 10+57.32 TO 13+25.00



TYPICAL SECTION NO. 10

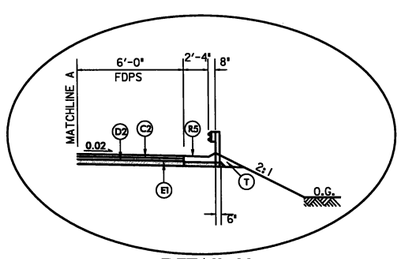
USE TYPICAL SECTION NO. 10:
-Y- STA 10+51.62 TO 17+00.00
*-Y7- STA 21+71.88 TO 31+75.00

C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. DEPTH S9.5B
D1	2.5" I19.0B
D2	3" I19.0B
D3	3.5" I19.0B
D4	4" I19.0B
D5	VAR. DEPTH I19.0B
E1	4" B25.0B
E2	5" B25.0B
E3	5.5" B25.0B
E4	VAR. DEPTH B25.0B
J	8" AGGREGATE BASE COURSE
K	8" SOIL LIME SUBBASE OR 7" SOIL CEMENT SUBBASE
R1	2'-6" CURB AND GUTTER
R2	MONOLITHIC CONCRETE ISLAND
R3	EXPRESSWAY GUTTER
R4	1'-6" CURB AND GUTTER
R5	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



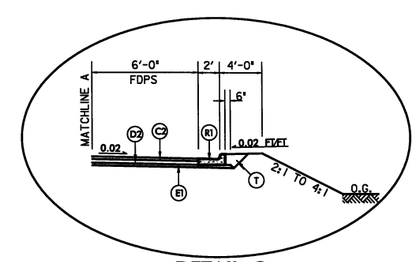
TYPICAL SECTION NO. 11

USE TYPICAL SECTION NO. 11:
-Y- STA 17+00.00 TO 22+00.00
*-Y5- STA 10+25.00 TO 18+17.62
*-Y5- STA 19+29.13 TO 26+00.00
*-Y7- STA 17+00.00 TO 20+58.78



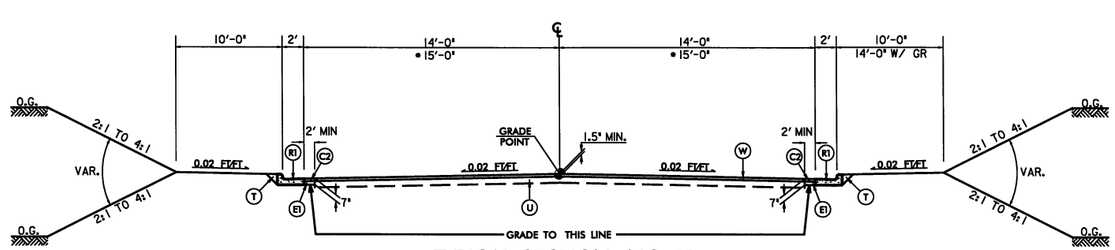
DETAIL H

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 11
-Y7- STA 18+25.00 TO 20+00.00 RT



DETAIL G

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 11
-Y7- STA 16+65.00 TO 18+25.00 RT



TYPICAL SECTION NO. 12

USE TYPICAL SECTION NO. 12:
-YA- STA 10+50.00 TO 12+63.86

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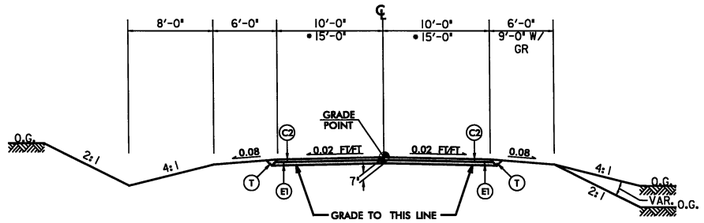
PROJECT REFERENCE	SHEET NO.
U-2412A	2-D

ROADWAY DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

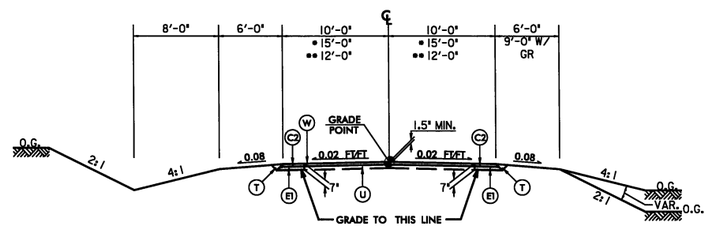
Prepared in the Office of: GIBSON ENGINEERS, PC

NOTE: FOR VARIABLE SLOPES SEE CROSS SECTIONS
FOR TAPERS AND AUXILLARY LANES SEE PLANVIEW



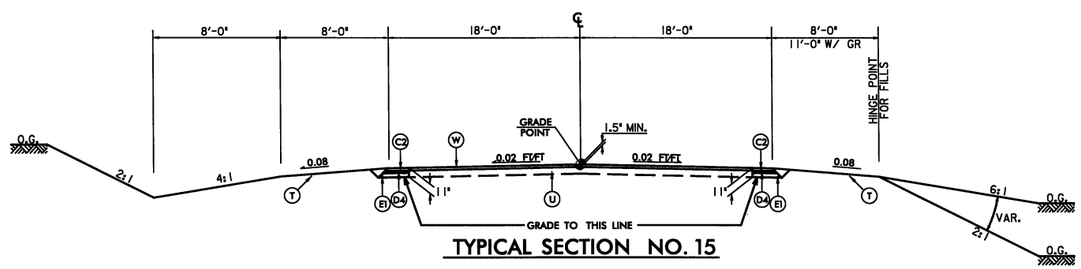
TYPICAL SECTION NO. 13

USE TYPICAL SECTION NO. 13:
*-YC- STA 13+00.00 TO 16+10.30
-Y3- STA 16+09.10 TO 19+00.00
-Y10B- STA 10+31.77 TO 12+50.00



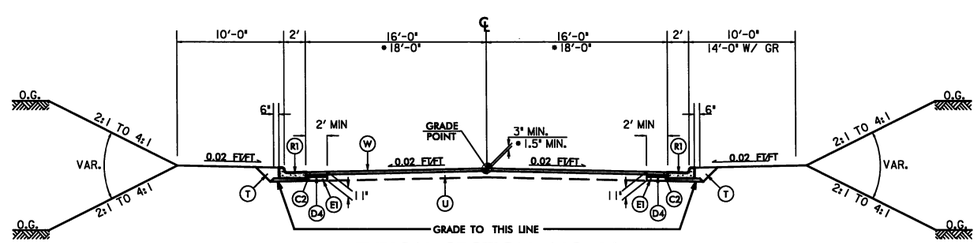
TYPICAL SECTION NO. 14

USE TYPICAL SECTION NO. 14:
*-Y5A- STA 10+18.02 TO 11+50.00
**-Y5B- STA 10+00.00 TO 12+82.00



TYPICAL SECTION NO. 15

USE TYPICAL SECTION NO. 15:
-Y4- STA 10+10.00 RT TO 12+07.88 RT
-Y4- STA 10+10.00 LT TO 13+10.00 LT



TYPICAL SECTION NO. 16

USE TYPICAL SECTION NO. 16:
*-Y4- STA 12+07.88 RT TO 16+94.95 RT
*-Y4- STA 13+10.00 LT TO 16+94.95 LT
*-Y4- STA 18+05.07 TO 24+00.00
-Y8- STA 12+25.00 TO 13+95.67 (BEG BRIDGE)
-Y8- STA 15+99.68 (END BRIDGE) TO 17+50.00

C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. DEPTH S9.5B
D1	2.5" I19.0B
D2	3" I19.0B
D3	3.5" I19.0B
D4	4" I19.0B
D5	VAR. DEPTH I19.0B
E1	4" B25.0B
E2	5" B25.0B
E3	5.5" B25.0B
E4	VAR. DEPTH B25.0B
J	8" AGGREGATE BASE COURSE
K	8" SOIL LIME SUBBASE OR 7" SOIL CEMENT SUBBASE
R1	2'-6" CURB AND GUTTER
R2	MONOLITHIC CONCRETE ISLAND
R3	EXPRESSWAY GUTTER
R4	1'-6" CURB AND GUTTER
R5	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

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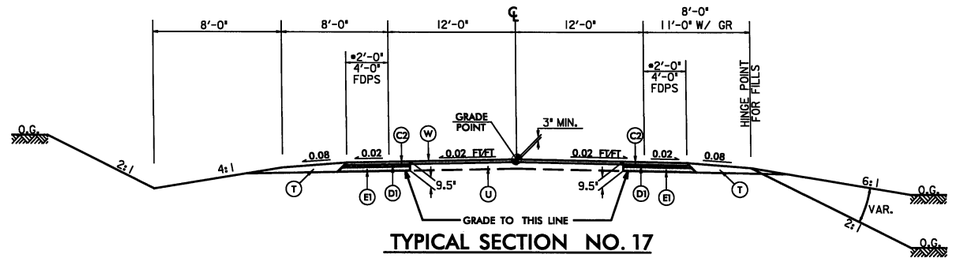
PROJECT REFERENCE	SHEET NO.
U-2412A	2-E
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

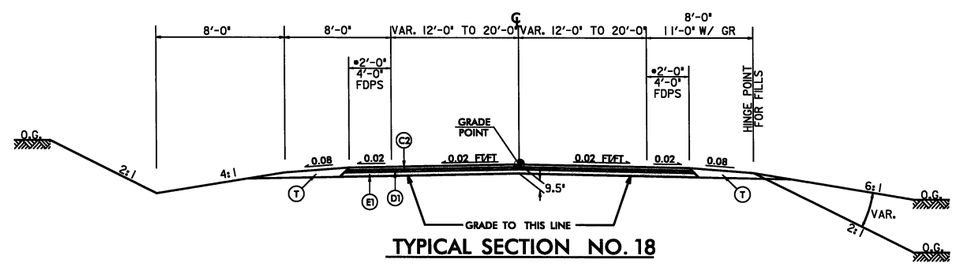
Prepared in the Office of: GIBSON ENGINEERS, PC

NOTE: FOR VARIABLE SLOPES SEE CROSS SECTIONS
FOR TAPERS AND AUXILLARY LANES SEE PLAN VIEW



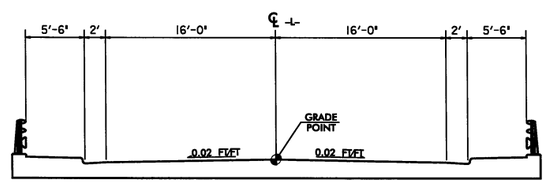
TYPICAL SECTION NO. 17

USE TYPICAL SECTION NO. 17:
*-Y10- STA 14+65.00 TO 16+75.00
-Y10- STA 27+00.00 TO 32+00.00



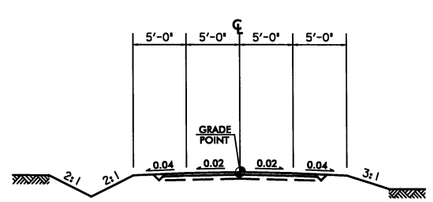
TYPICAL SECTION NO. 18

USE TYPICAL SECTION NO. 18:
*-Y10- STA 16+75.00 TO 20+65.24
-Y10- STA 21+98.64 TO 27+00.00



TYPICAL SECTION NO. 19

USE TYPICAL SECTION NO. 19:
-Y8- STA 13+95.67 (BEG BRIDGE) TO 15+99.68 (END BRIDGE)



GREENWAY TYPICAL SECTION

TYPICAL SHOWN FOR REFERENCE ONLY.
HORIZONTAL ALLOWANCE FOR GREENWAY TYPICAL HAS BEEN PROVIDED FOR UNDER -L-BRIDGE OVER BULL RUN CREEK.
DESIGN AND CONSTRUCTION TO BE COMPLETED BY OTHERS.

C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. DEPTH S9.5B
D1	2.5" I19.0B
D2	3" I19.0B
D3	3.5" I19.0B
D4	4" I19.0B
D5	VAR. DEPTH I19.0B
E1	4" B25.0B
E2	5" B25.0B
E3	5.5" B25.0B
E4	VAR. DEPTH B25.0B
J	8" AGGREGATE BASE COURSE
K	8" SOIL LIME SUBBASE OR 7" SOIL CEMENT SUBBASE
R1	2'-6" CURB AND GUTTER
R2	MONOLITHIC CONCRETE ISLAND
R3	EXPRESSWAY GUTTER
R4	1'-6" CURB AND GUTTER
R5	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

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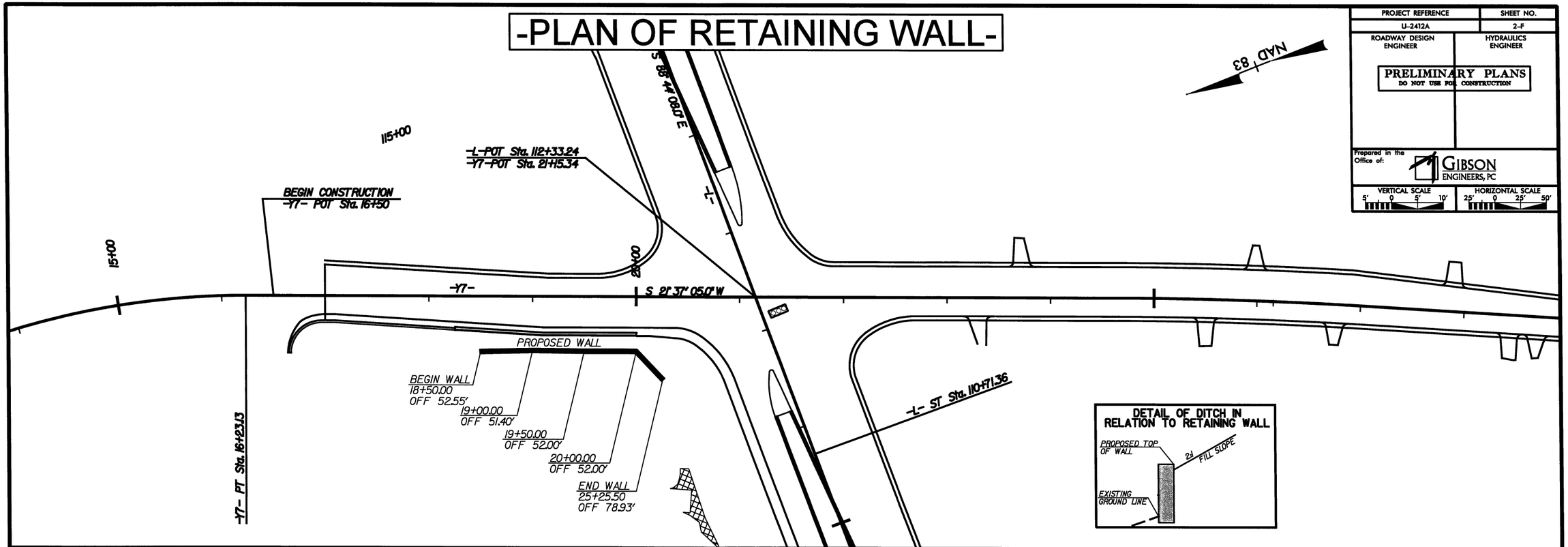
-PLAN OF RETAINING WALL-

PROJECT REFERENCE	SHEET NO.
U-2412A	2-F
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

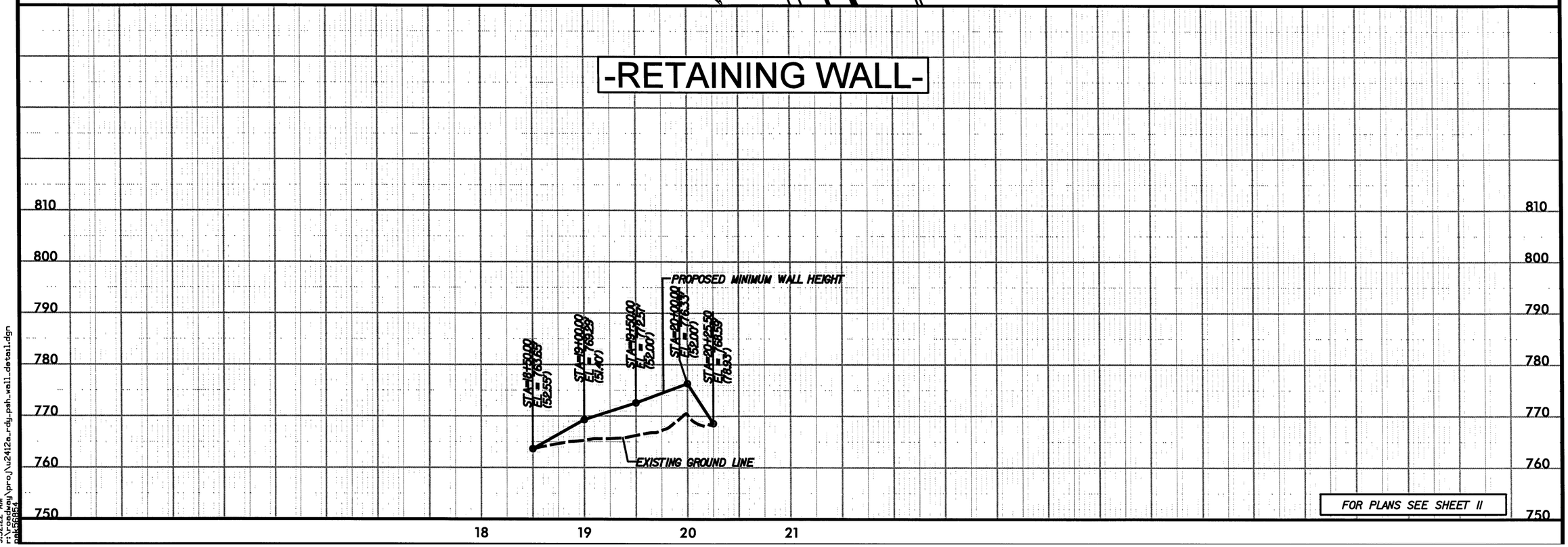
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

VERTICAL SCALE 5' 0 5' 10'
HORIZONTAL SCALE 25' 0 25' 50'



-RETAINING WALL-



FOR PLANS SEE SHEET 11

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COMPUTED BY: BLP DATE: 10-6-2008
CHECKED BY: BDS DATE: 10-6-2008

PROJECT REFERENCE NO.	SHEET NO.
U-2412A	3-A

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L- 11+50.00 TO 41+50.00	73096		45240		27829
-RPD- 10+25.00 TO 12+34.38	159		89		70
-Y1- 12+75.00 TO 15+42.74	10		1146	1136	
-Y2- 10+57.32 TO 13+25.00	1121		26		1095
-Y- 10+51.62 TO 22+00.00	3210		22877	19667	
-YA- 10+50.00 TO 12+63.86	129		203	74	
-YC- 13+00.00 TO 16+10.30	207		412	205	
-Y3- 16+09.10 TO 19+00.00	1155		2		1153
SUBTOTAL #1	79060		69995	21082	30147
-L- 41+50.00 TO 71+50.00	52045		96718	44673	
-Y4- 10+10.00 TO 16+94.95	492		1088	596	
-Y4- 18+05.07 TO 24+00.00	136		1566	1430	
SUBTOTAL #2	52673		99372	46699	
-L- 71+50.00 TO 89+51.81	12818		161450	148632	
-Y5- 10+25.00 TO 18+17.62	842		1774	932	
-Y5- 19+29.13 TO 26+00.00	1225		3551	2326	
-Y5A- 10+18.02 TO 11+50.00	84		108	24	
-Y5B- 10+00.00 TO 12+82.00	444		367		77
SUBTOTAL #3	15413		167250	151914	77
-L- 94+16.81 TO 126+00.00	26457		338135	311678	
-Y7- 17+00.00 TO 20+58.78	248		1999	1751	
-Y7- 21+71.88 TO 31+75.00	5205		420		
SUBTOTAL #4	31910		340554	313429	
-L- 126+00.00 TO 138+21.44	65179		35341		29838
SUBTOTAL #5	65179		35341		29838

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L- 142+21.51 TO 153+50.00	90945		40630		50315
-Y8- 12+25.00 TO 13+95.67	158		276	118	
-Y8- 15+99.68 TO 17+50.00	28		152	124	
SUBTOTAL #6	91131		41058	242	50315
-L- 156+55.00 TO 200+84.66	281720		142656		139064
-Y10- 14+65.00 TO 20+65.24	377		7266	6889	
-Y10- 21+98.61 TO 32+00.00	9398		293		9105
-Y10B- 10+31.77 TO 12+50.00	923		7266	6343	
SUBTOTAL #7	292418		157481	13232	148169
SUBTOTAL #1 THRU #7	627784		911051	546598	263331
ROCK & UNDERCUT PER GEOTECH RECOMMENDATIONS			-80625		28600
LOST DUE TO CLEARING AND GRUBBING	-20000				-20000
WASTE IN LIEU OF BORROW				-165331	-165331
TOTAL	607784		830426	381267	106600
ESTIMATED 5% TO REPLACE TOPSOIL ON BORROW PITS				19063	
GRANDTOTAL	607784		830426	400330	106600
SAY	669000		914000	441000	

DDE: SAY 4300 CY

EST. UNDERCUT: SAY 28600 CY

SELECT GRANULAR MATERIAL: SAY 25800 CY

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

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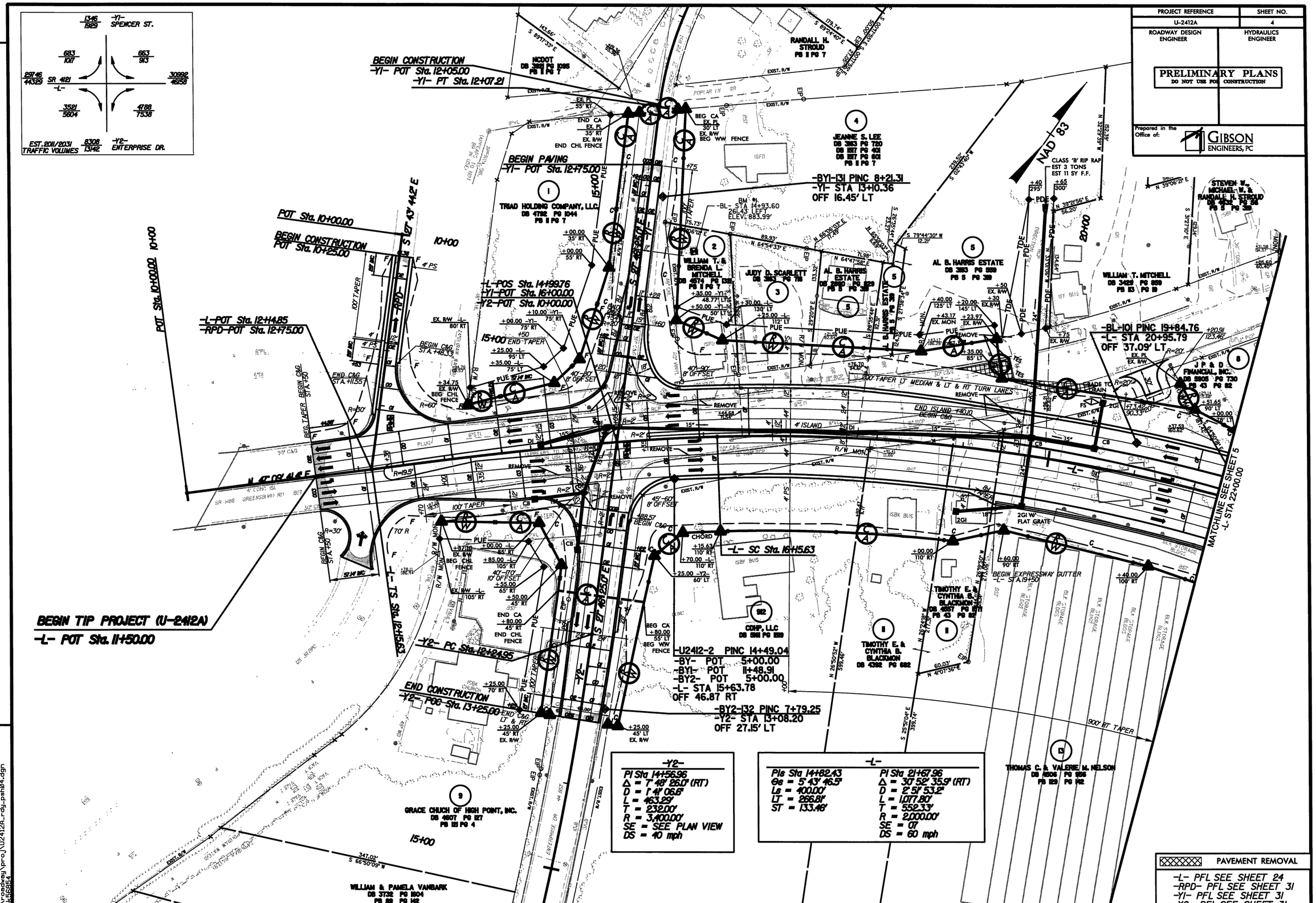

PROJECT REFERENCE
U-2412A
SHEET NO.
4
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Prepared in the Office of:
GIBSON ENGINEERS, PC
-Y1- SPENCER ST.
-Y2- ENTERPRISE DR.
EST. 2011/2031 TRAFFIC VOLUMES
BEGIN CONSTRUCTION
-Y1- POT Sta. 12+05.00
-Y1- PT Sta. 12+07.21
BEGIN PAVING
-Y1- POT Sta. 12+75.00
POT Sta. 10+00.00
BEGIN CONSTRUCTION
POT Sta. 10+25.00
-L-POS Sta. 14+99.76
-Y1-POT Sta. 16+00.00
-Y2-POT Sta. 10+00.00
-L-POT Sta. 12+14.85
-RPD-POT Sta. 12+75.00
BEGIN TIP PROJECT (U-2412A)
-L- POT Sta. 11+50.00
-Y2- PC Sta. 12+24.95
END CONSTRUCTION
-Y2- POC Sta. 13+25.00
-L- SC Sta. 16+15.63
-BY1-131 PINC 8+21.31
-Y1- STA 13+10.36
OFF 16.45' LT
-BL-101 PINC 19+84.76
-L- STA 20+95.79
OFF 37.09' LT
-U2412-2 PINC 14+49.04
-BY- POT 5+00.00
-BY1- POT 11+48.91
-BY2- POT 5+00.00
-L- STA 15+63.78
OFF 46.87 RT
-BY2-132 PINC 7+79.25
-Y2- STA 13+08.20
OFF 27.15' LT
NAD 83
MATCHLINE SEE SHEET 5
-L- STA 22+00.00
TRIAD HOLDING COMPANY, LLC
JEANNE S. LEE
WILLIAM T. & BRENDA L. MITCHELL
JUDY D. SCARLETT
AL B. HARRIS ESTATE
WILLIAM T. MITCHELL
STEVEN W., MICHAEL W. & RANDALL H. STROUD
J P & D FINANCIAL, INC.
TIMOTHY E. & CYNTHIA B. BLACKMON
COHP, LLC
THOMAS C. & VALERIE M. NELSON
GRACE CHUCH OF HIGH POINT, INC.
WILLIAM & PAMELA VANBARK
-Y2-
PI Sta 14+56.96
Δ = 7° 48' 26.0" (RT)
D = 1° 41' 06.6"
L = 463.29'
T = 232.00'
R = 3,400.00'
SE = SEE PLAN VIEW
DS = 40 mph
-L-
PIs Sta 14+82.43
Θs = 5° 43' 46.5"
Ls = 400.00'
LT = 266.81'
ST = 133.46'
PI Sta 21+67.96
Δ = 30° 52' 35.9" (RT)
D = 2° 51' 53.2"
L = 1,077.80'
T = 552.33'
R = 2,000.00'
SE = 07
DS = 60 mph
PAVEMENT REMOVAL
-L- PFL SEE SHEET 24
-RPD- PFL SEE SHEET 31
-Y1- PFL SEE SHEET 31
-Y2- PFL SEE SHEET 31
REVISIONS
REVISED PARCEL 6 & 7 TO 5; PARCEL 10 TO 9/2; PARCEL 12 TO 11 - REVISED 6-24-09
7/15/2011
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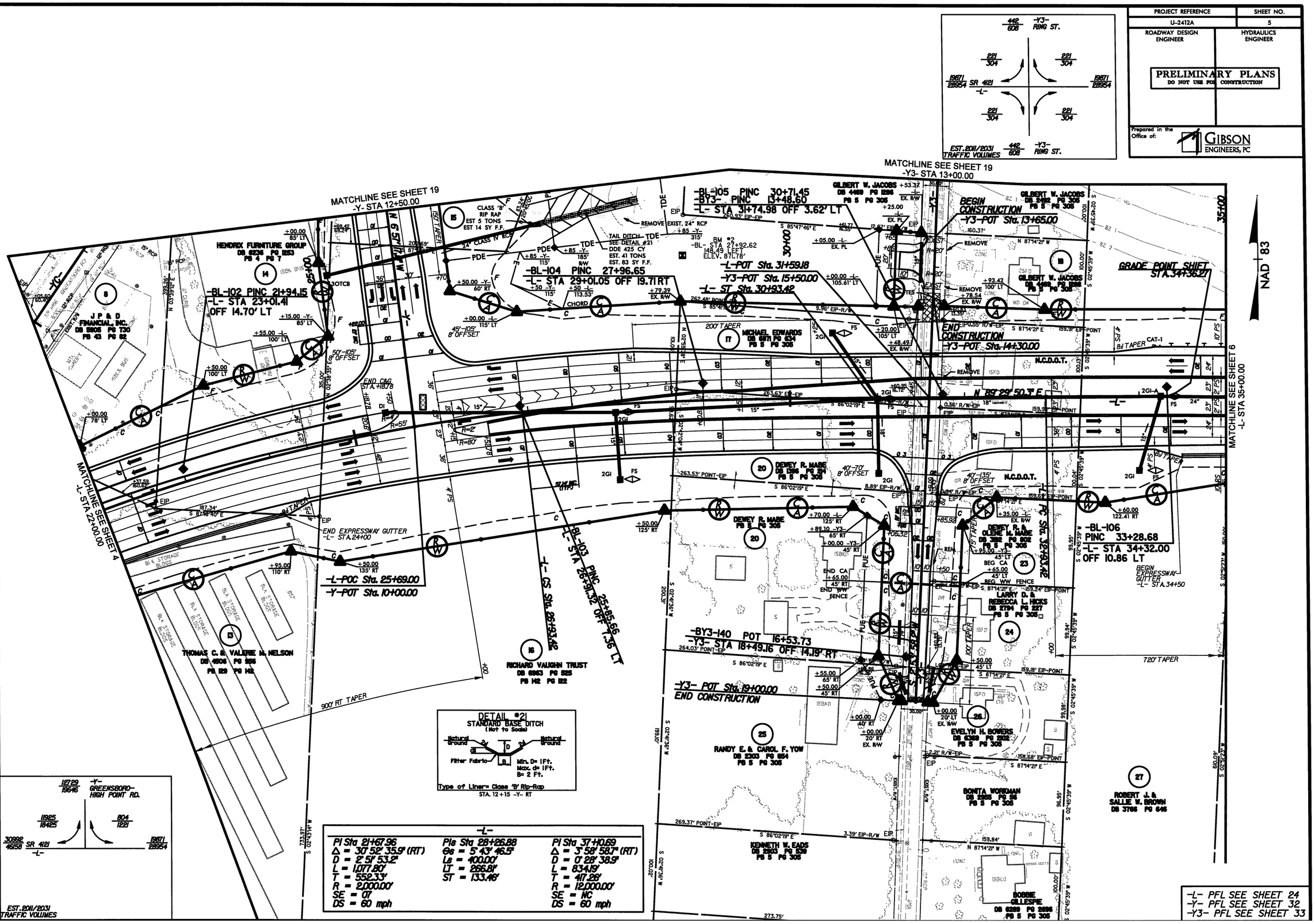
PROJECT REFERENCE	SHEET NO.
U-2412A	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

REVISIONS

REVISED OWNER FOR PARCELS 14,15,16, & 17; REVISED PARCEL 22 TO 20 – REVISED 6-24-09



DETAIL #21
STANDARD BASE DITCH
(Not to Scale)

Natural ground — Natural ground — Filter Fabric — Min. D= 1Ft. Max. d= 1Ft. B= 2 Ft.

Type of Liner= Class 'B' Rip-Rap

STA. 12+15 -Y- RT

-L-

PI Sta 21+67.96	PIs Sta 28+26.88	PI Sta 37+10.69
Δ = 30° 52' 35.9" (RT)	Δs = 5° 43' 46.5"	Δ = 3° 58' 58.7" (RT)
D = 2° 51' 53.2"	Ls = 400.00'	D = 0° 28' 38.9"
L = 1,077.80'	LT = 266.81'	L = 834.19'
T = 552.33'	ST = 133.46'	T = 417.26'
R = 2,000.00'		R = 12,000.00'
SE = 0%		SE = NC
DS = 60 mph		DS = 60 mph

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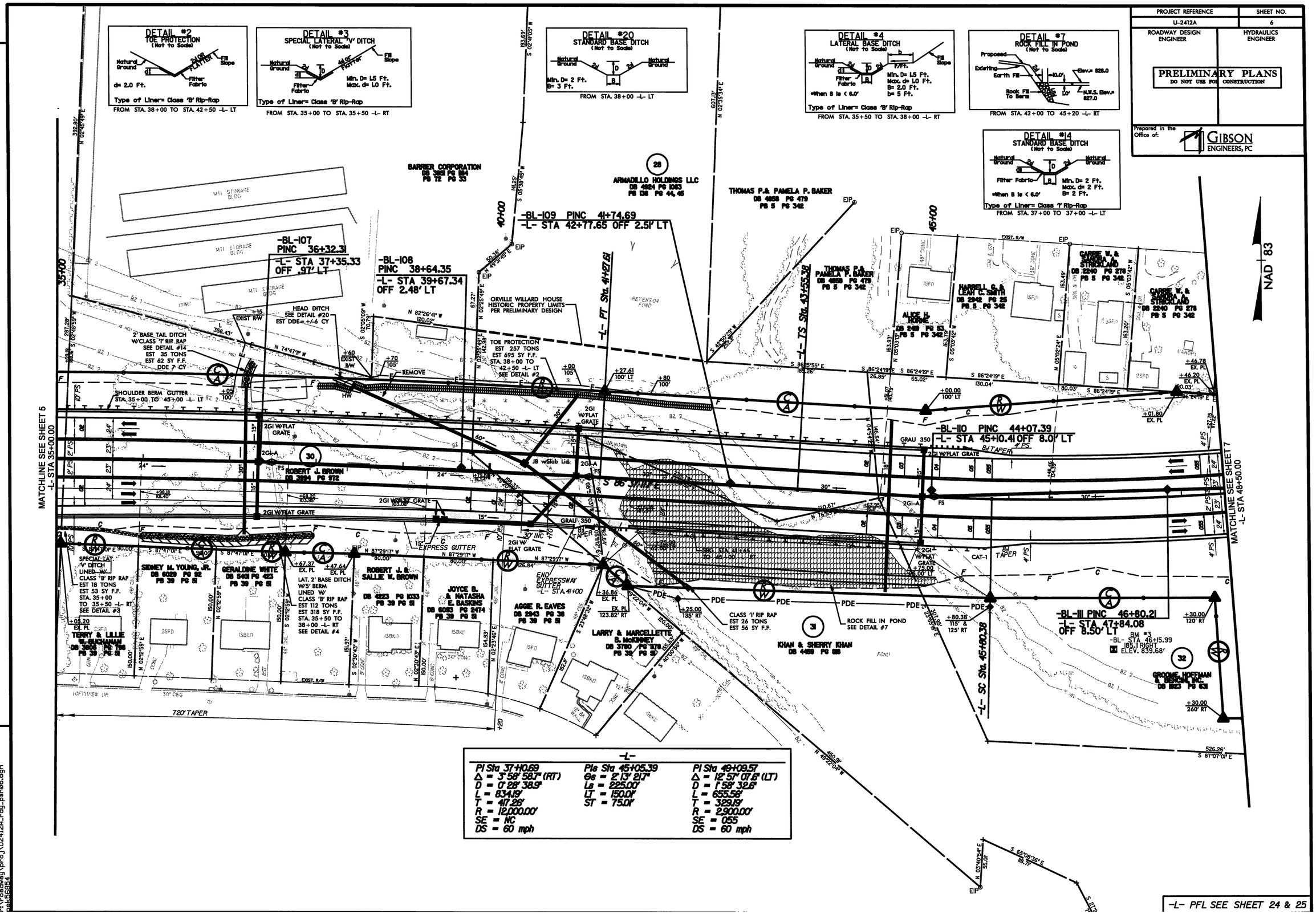
PROJECT REFERENCE	SHEET NO.
U-2412A	6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

REVISIONS

REVISED OWNER FOR PARCEL 29, REVISED ROW AND PDE MONUMENT TO SC STA.45+80.38 RT - REVISED 6-24-09



-L-

PI Sta 37+10.69	PIs Sta 45+05.39	PI Sta 49+09.57
Δ = 3° 58' 58.7" (RT)	Θs = 2° 13' 21.7"	Δ = 12° 57' 07.8" (LT)
D = 0° 28' 38.9"	Ls = 225.00'	D = 1° 58' 32.6"
L = 834.19'	LT = 150.01'	L = 655.58'
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

-L- PFL SEE SHEET 24 & 25

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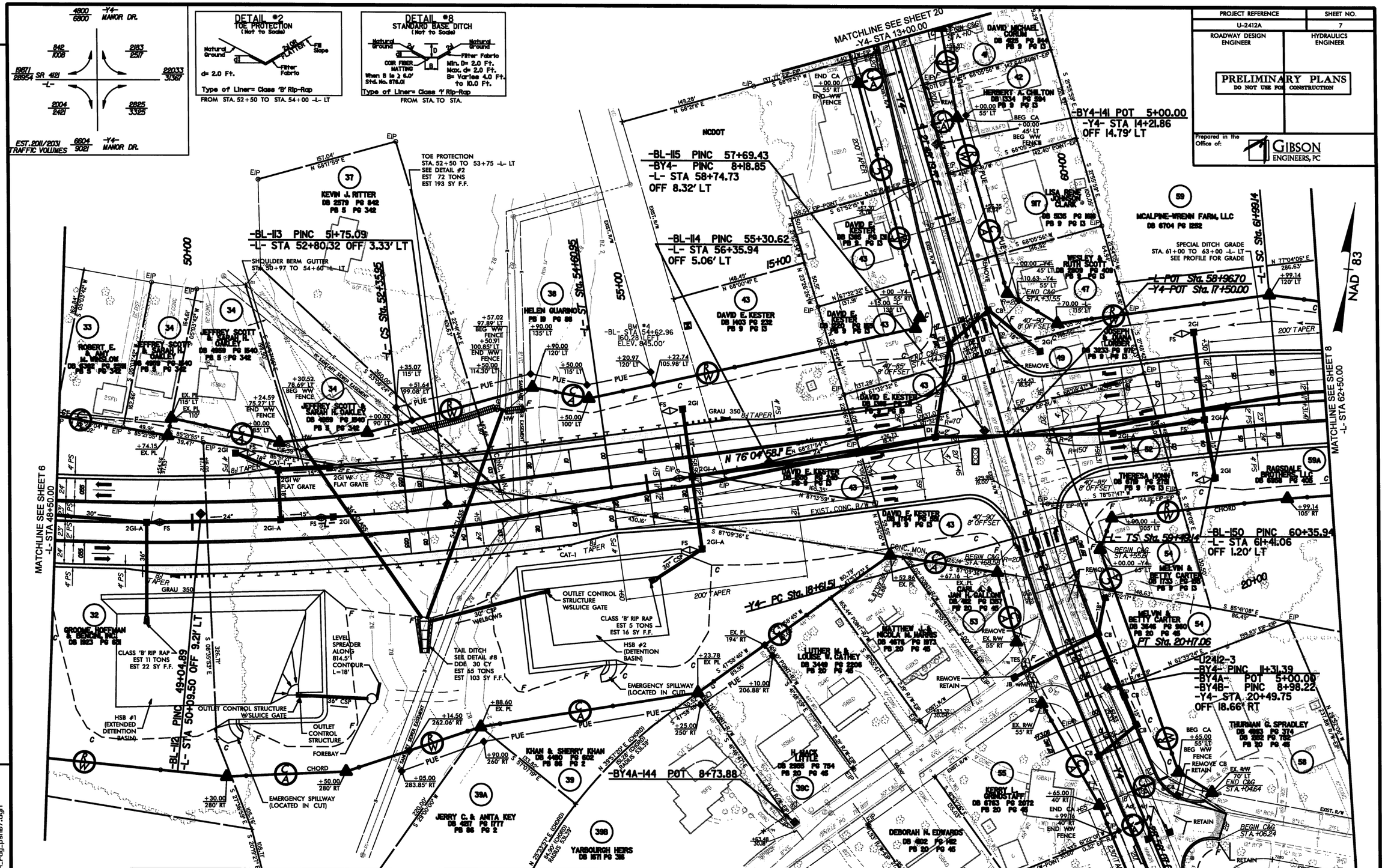
PROJECT REFERENCE	SHEET NO.
U-2412A	7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

REVISIONS

REVISED PARCEL 35 & 36 TO 34,44,46,48,50 & 51 TO 43,56 TO 54,45 TO 91, REVISED OWNER FOR PARCEL 39B,40,52,55,& 59; ADDED PARCEL 59A; REVISED 6-24-09



-Y4-

PI Sta 19+39.39
Δ = 7° 01' 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 = 22° 41' 10.2" (RT)
D = 1° 58' 32.8"	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'			R = 2,400.00'
SE = 055			SE = 06
DS = 60 mph			DS = 60 mph

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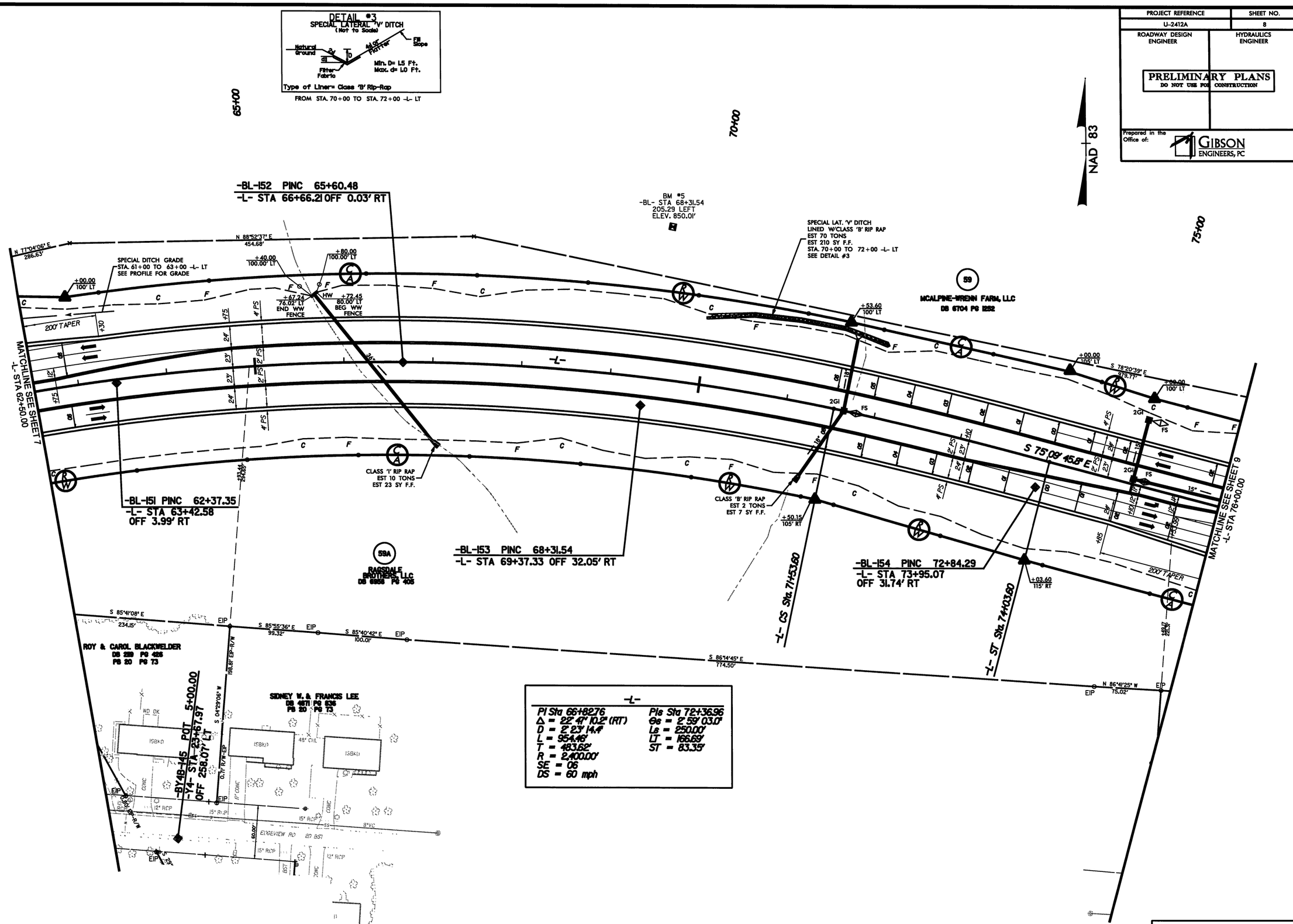
PROJECT REFERENCE	SHEET NO.
U-2412A	8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC



-L-

PI Sta 66+82.76	PIs Sta 72+36.96
Δ = 22° 47' 10.2" (RT)	Θs = 2° 59' 03.0"
D = 2° 23' 14.4"	Ls = 250.00'
L = 954.46'	LT = 166.69'
T = 483.62'	ST = 83.35'
R = 2,400.00'	
SE = 06	
DS = 60 mph	

-L- PFL SEE SHEET 25 & 26

REVISIONS

ADDED PARCEL 59A, REVISED OWNER FOR PARCEL 59 - REVISED 6-24-09

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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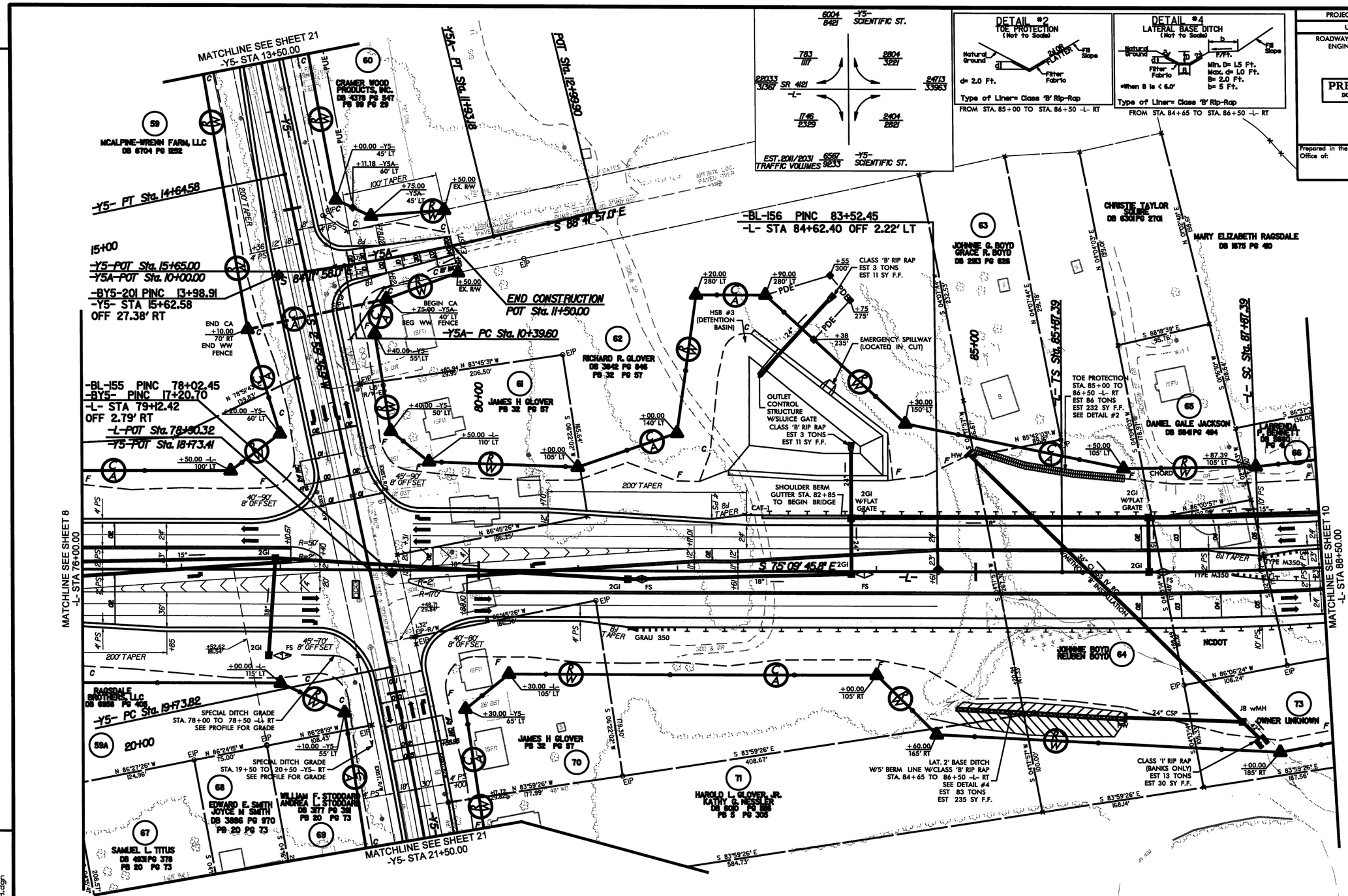

-Y5-	
PI Sta 13+54.60	PI Sta 21+18.69
Δ = 1° 15' 37.1" (LT)	Δ = 3° 19' 09.3" (RT)
D = 0° 34' 22.6"	D = 1° 08' 45.3"
L = 219.97'	L = 289.66'
T = 109.99'	T = 144.87'
R = 10,000.00'	R = 5,000.00'
SE = NC	SE = SEE PLAN VIEW
DS = 50 mph	DS = 50 mph

-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-	
Pls 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

-L- PFL SEE SHEET 26
-Y5- PFL SEE SHEET 34
-Y5A- PFL SEE SHEET 35

REVISIONS
REVISED OWNER FOR PARCEL 59 & 72, ADDED PARCEL 59A - REVISED 6-24-09

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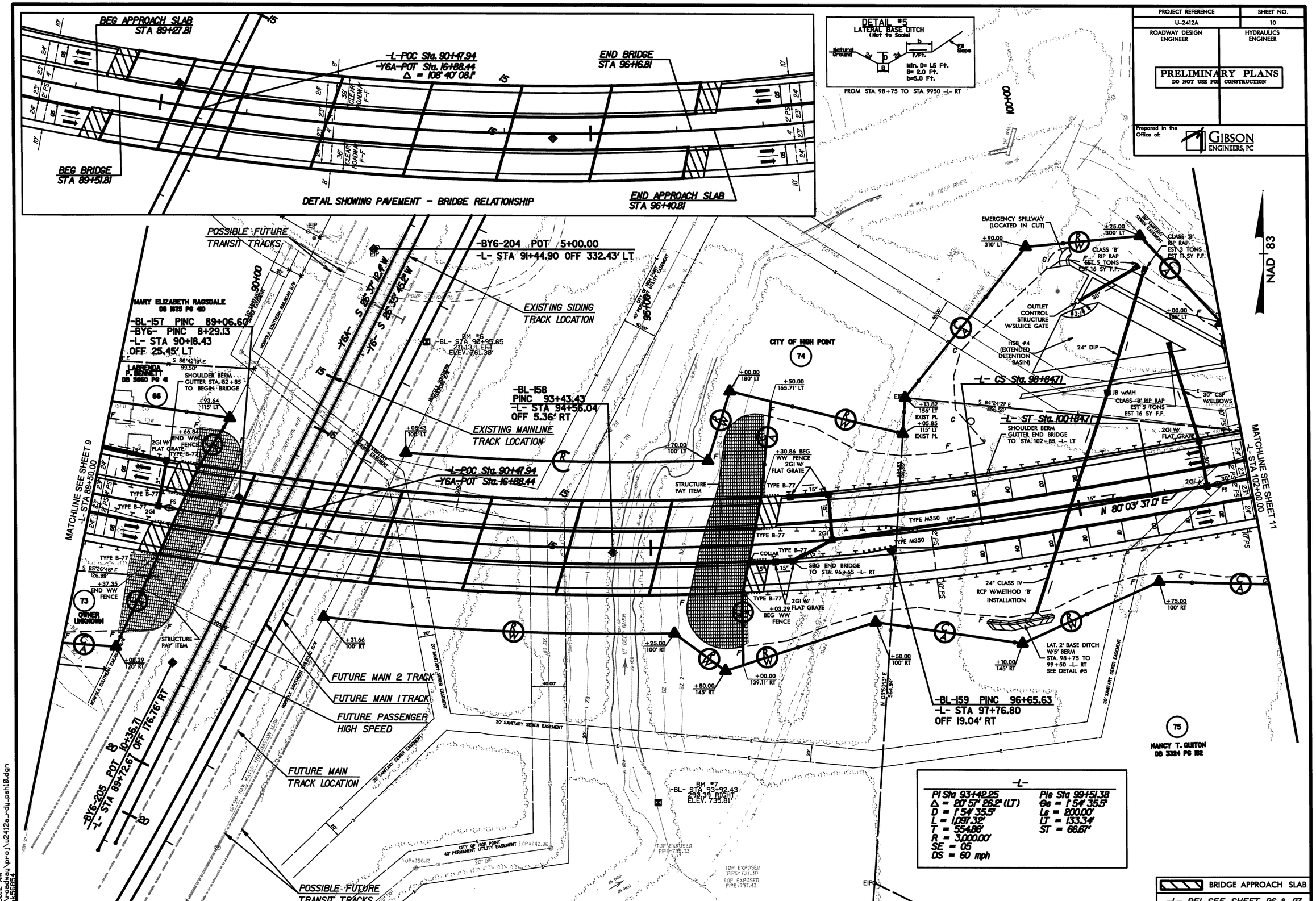
PROJECT REFERENCE	SHEET NO.
U-2412A	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC



-L-

PI Sta 93+42.25	PIs Sta 99+51.38
Δ = 20° 57' 26.2" (LT)	Θs = 1° 54' 35.5"
D = 1° 54' 35.5"	Ls = 200.00'
L = 1,097.32'	LT = 133.34'
T = 554.86'	ST = 66.67'
R = 3,000.00'	
SE = 05	
DS = 60 mph	

BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 26 & 27

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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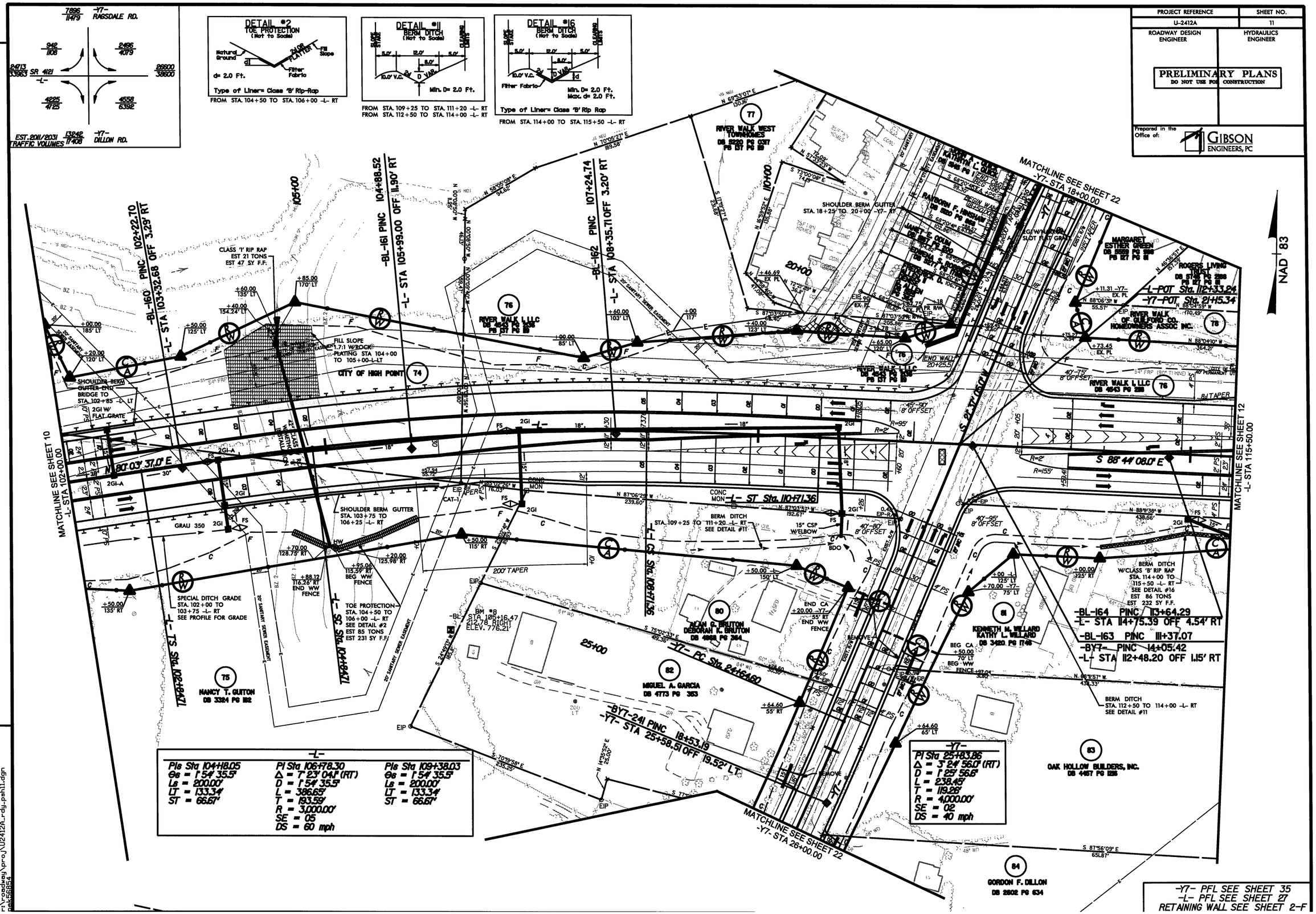

REVISIONS

REVISED PARCEL 77 & 78 TO 76 - REVISED 6-24-09
REVISED ROW ON PARCEL 76 - REVISED 12-22-09

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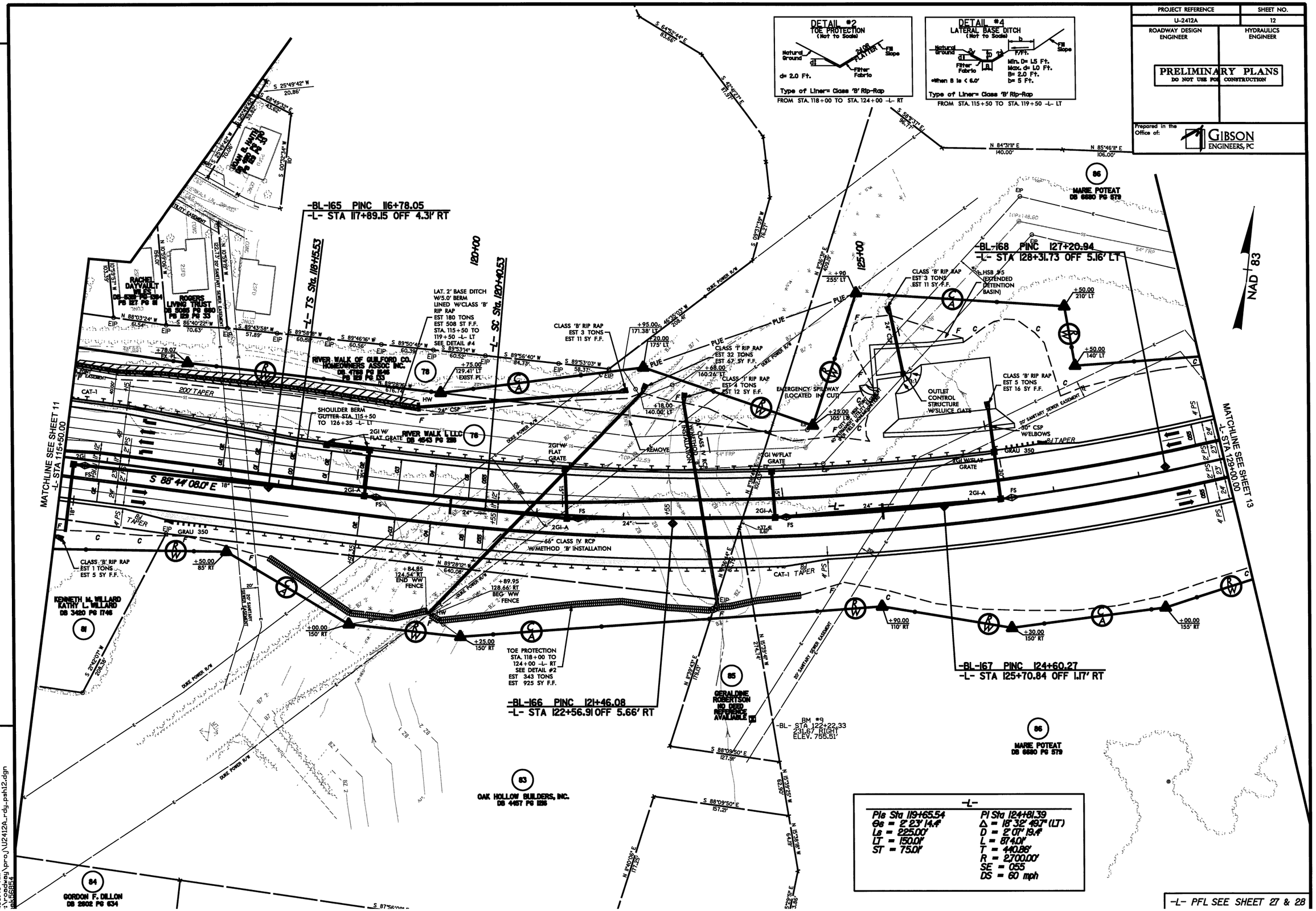
PROJECT REFERENCE	SHEET NO.
U-2412A	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

REVISIONS

REVISED PARCEL79 TO 76, REVISED OWNER OF PARCEL 85 AND 86 – REVISED 6-24-09



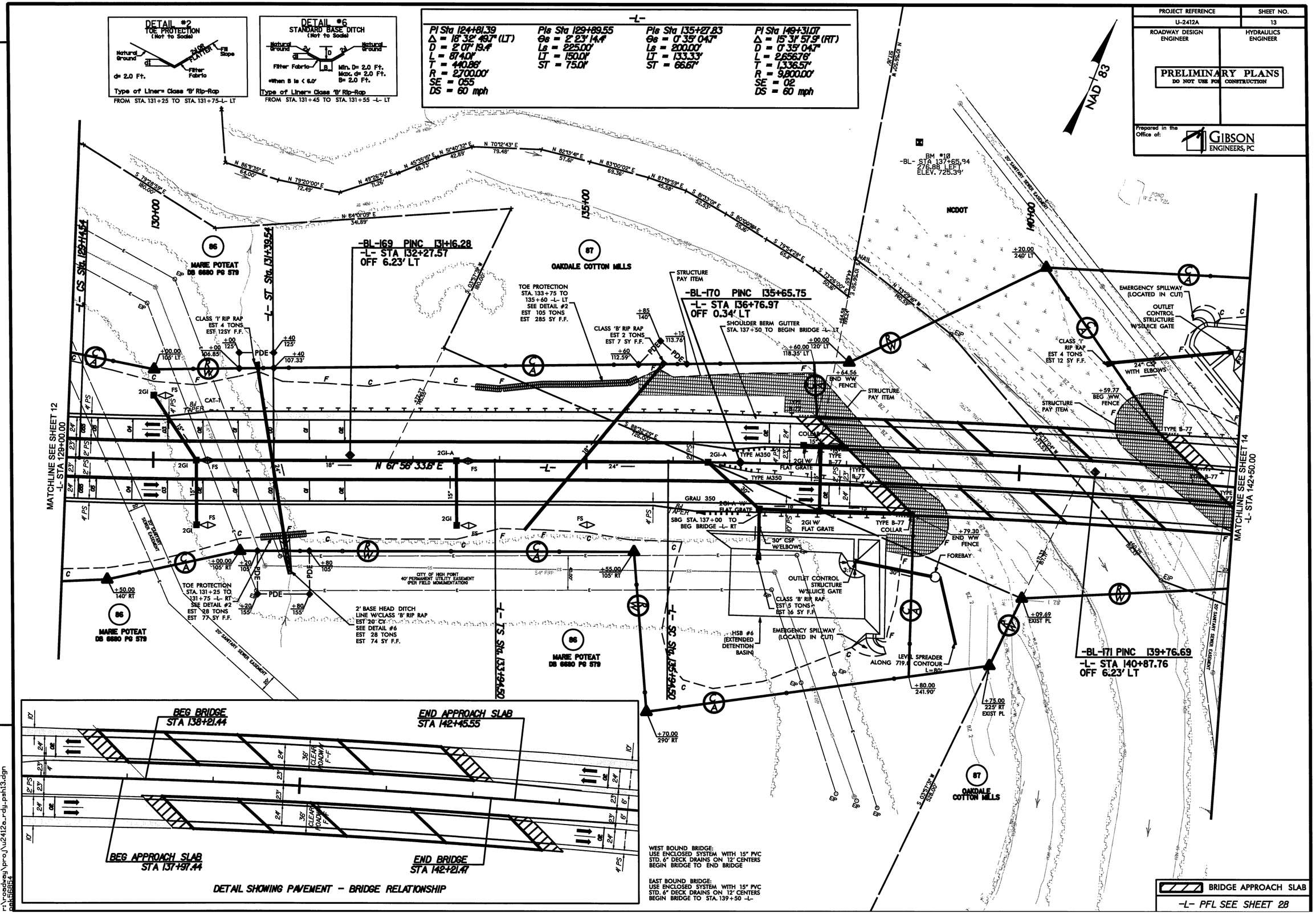
PROJECT REFERENCE	SHEET NO.
U-2412A	13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

REVISIONS

REVISED OWNERS FOR PARCEL 86 AND 88 - REVISED 6-24-09



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

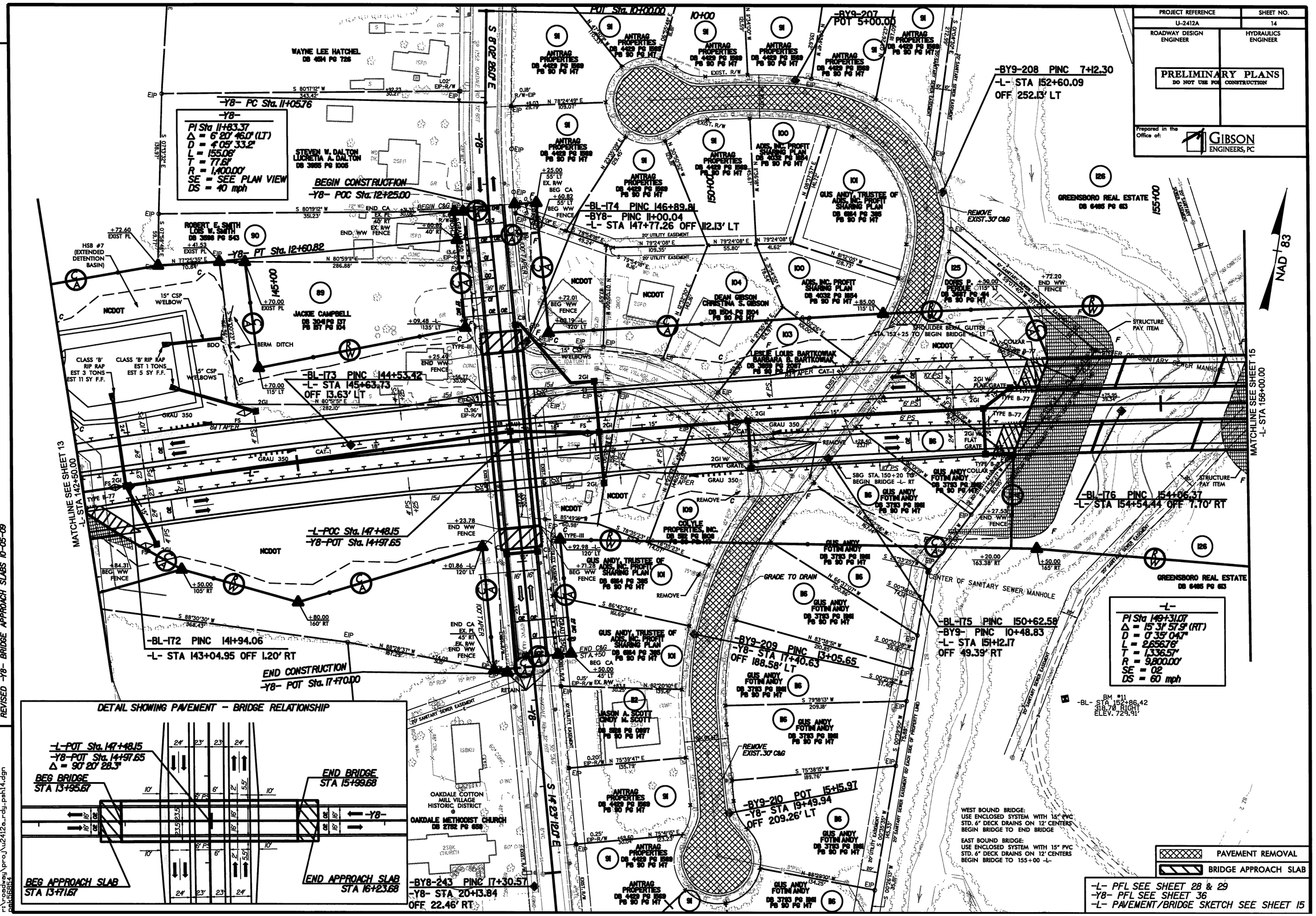
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

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



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psk5884

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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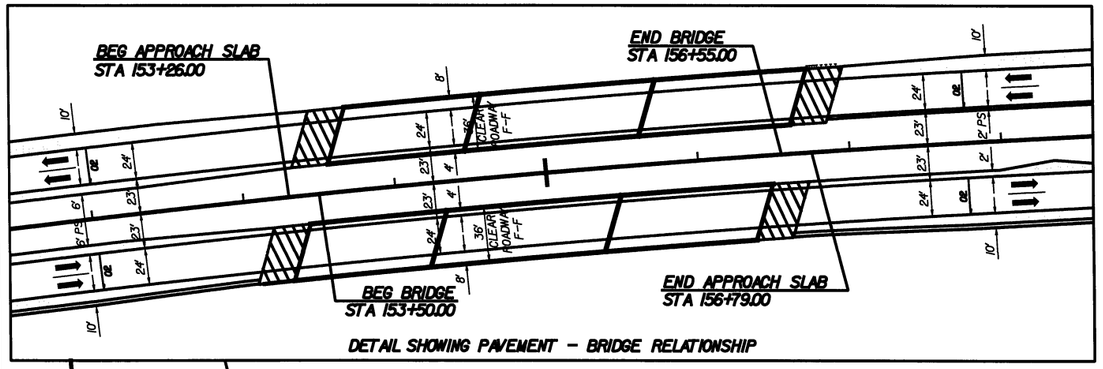

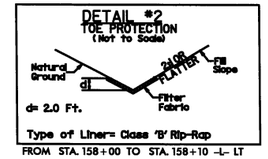

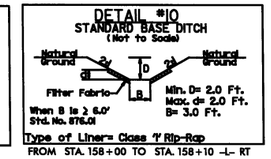

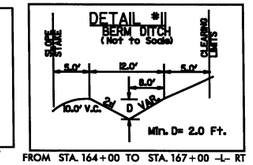

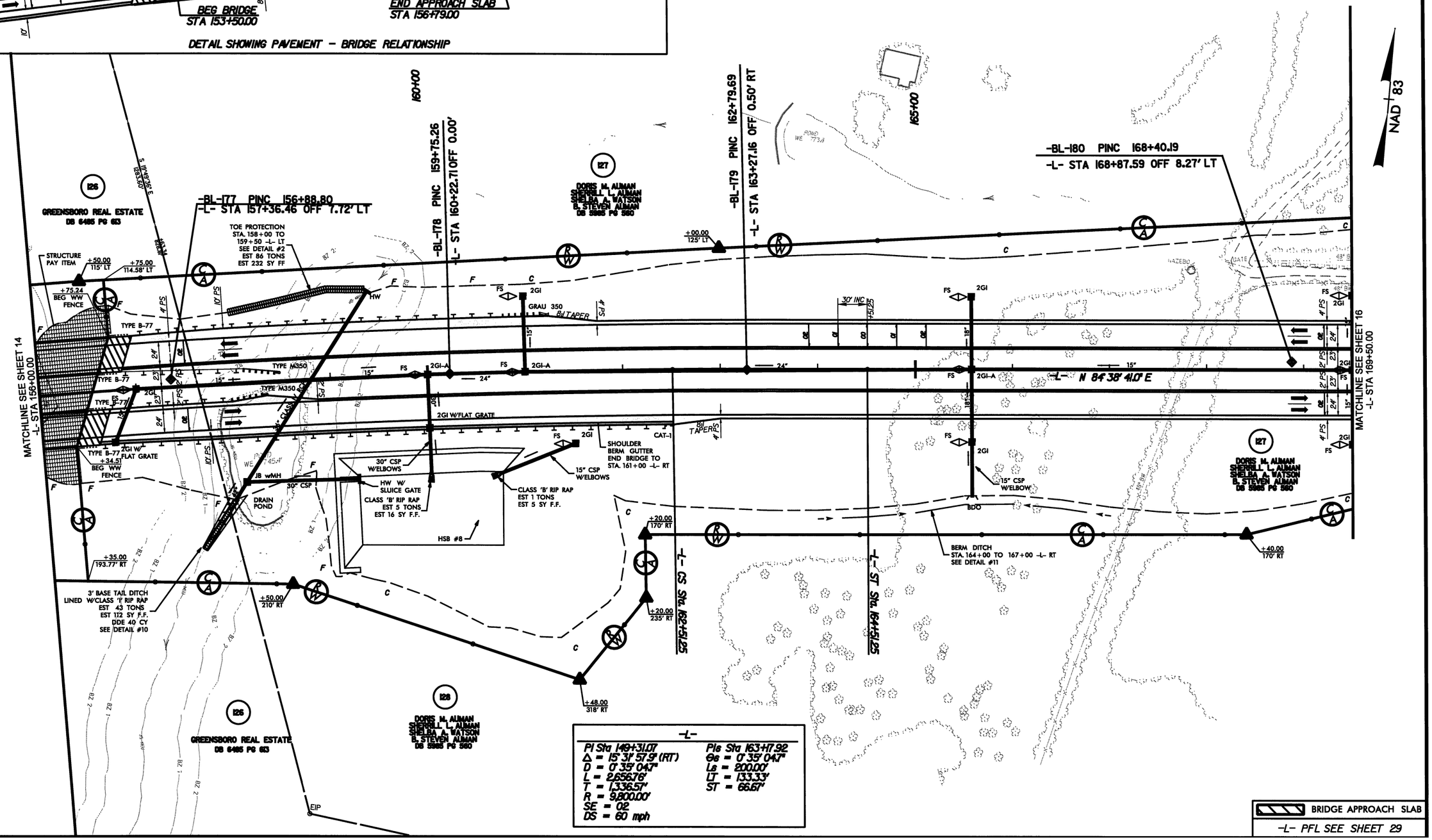

-L-	
PI Sta 149+31.07	PIs Sta 163+17.92
Δ = 15° 31' 57.9" (RT)	θs = 0° 35' 04.7"
D = 0° 35' 04.7"	Ls = 200.00'
L = 2,656.76'	LT = 133.33'
T = 1,336.57'	ST = 66.67'
R = 9,800.00'	
SE = 02	
DS = 60 mph	

BRIDGE APPROACH SLAB

-L- PFL SEE SHEET 29

REVISIONS

REVISED OWNER FOR PARCEL 126 - REVISED 6-24-09

7/15/2011
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psk56654

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

PRELIMINARY PLANS
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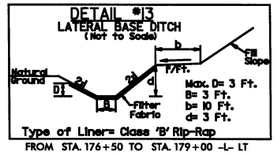
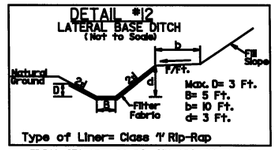
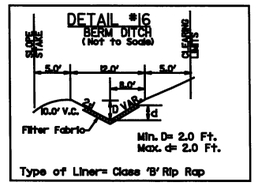


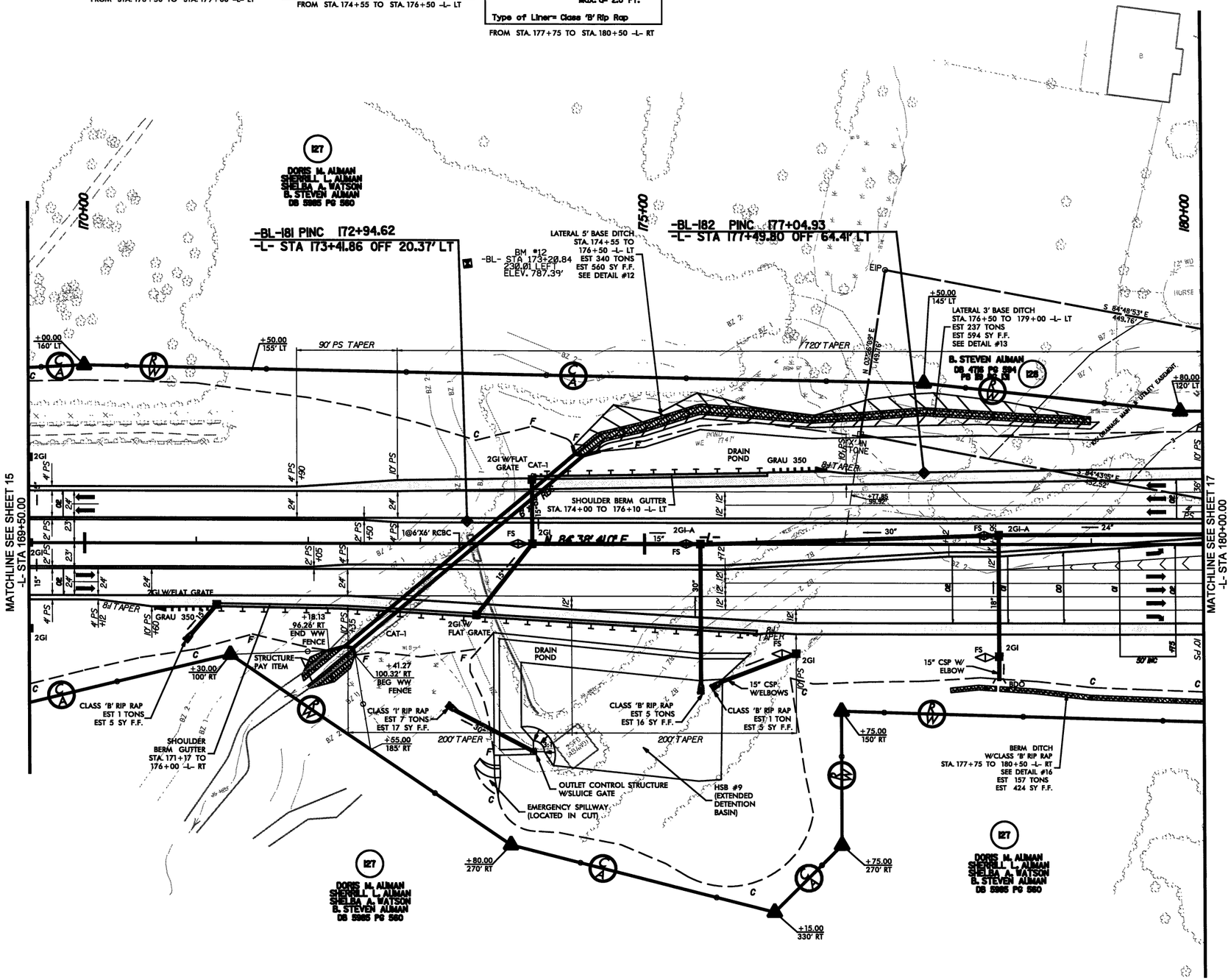
FROM STA. 176+50 TO STA. 179+00 -L- LT



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



FROM STA. 177+75 TO STA. 180+50 -L- RT



-L- PFL SEE SHEET 29 & 30

7/15/2011
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pak56854

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

PRELIMINARY PLANS
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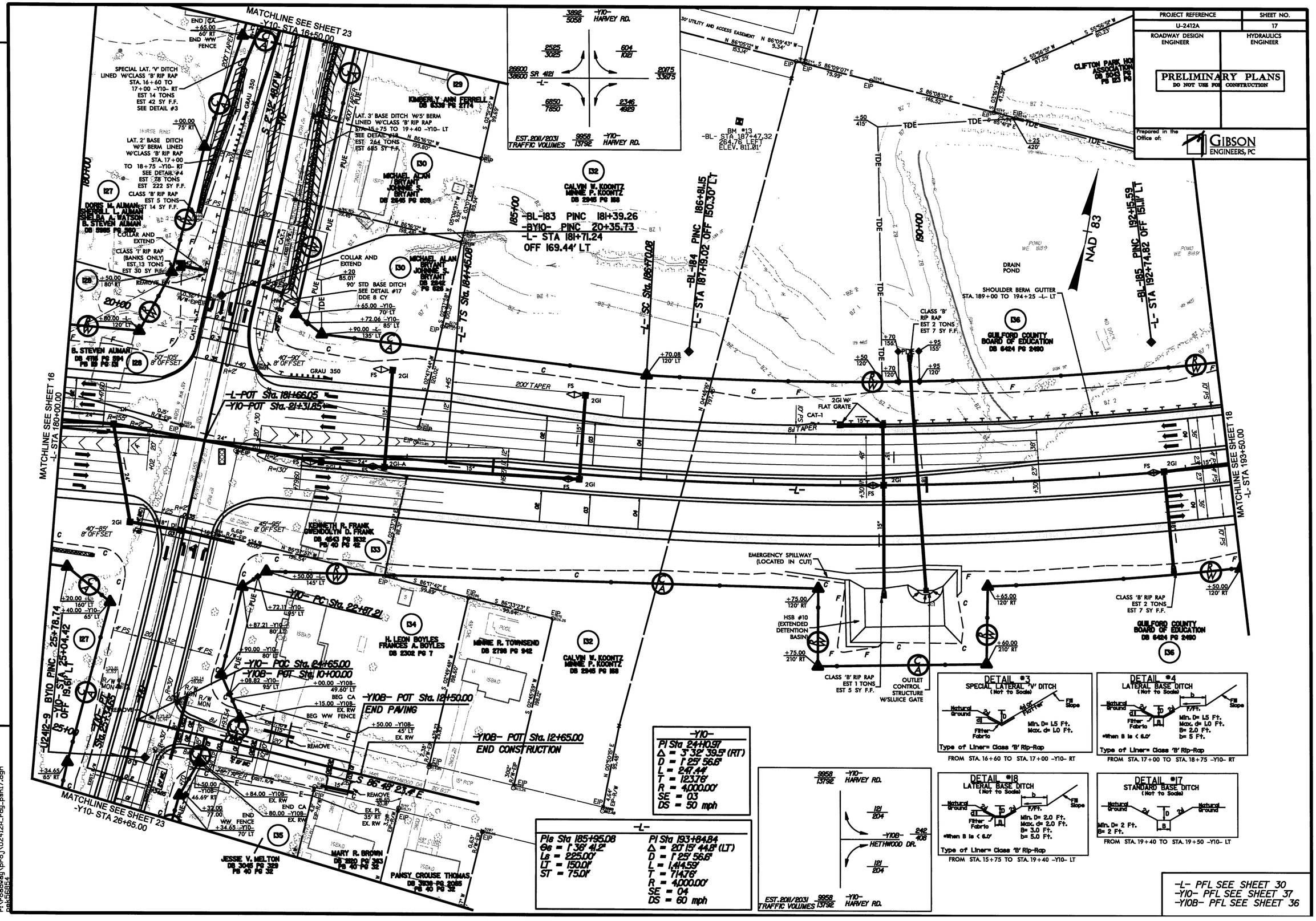

-L- PFL SEE SHEET 30
-Y10- PFL SEE SHEET 37
-Y10B- PFL SEE SHEET 36

REVISIONS

REVISED OWNER FOR PARCEL 129 & 136 - REVISED 6-24-09

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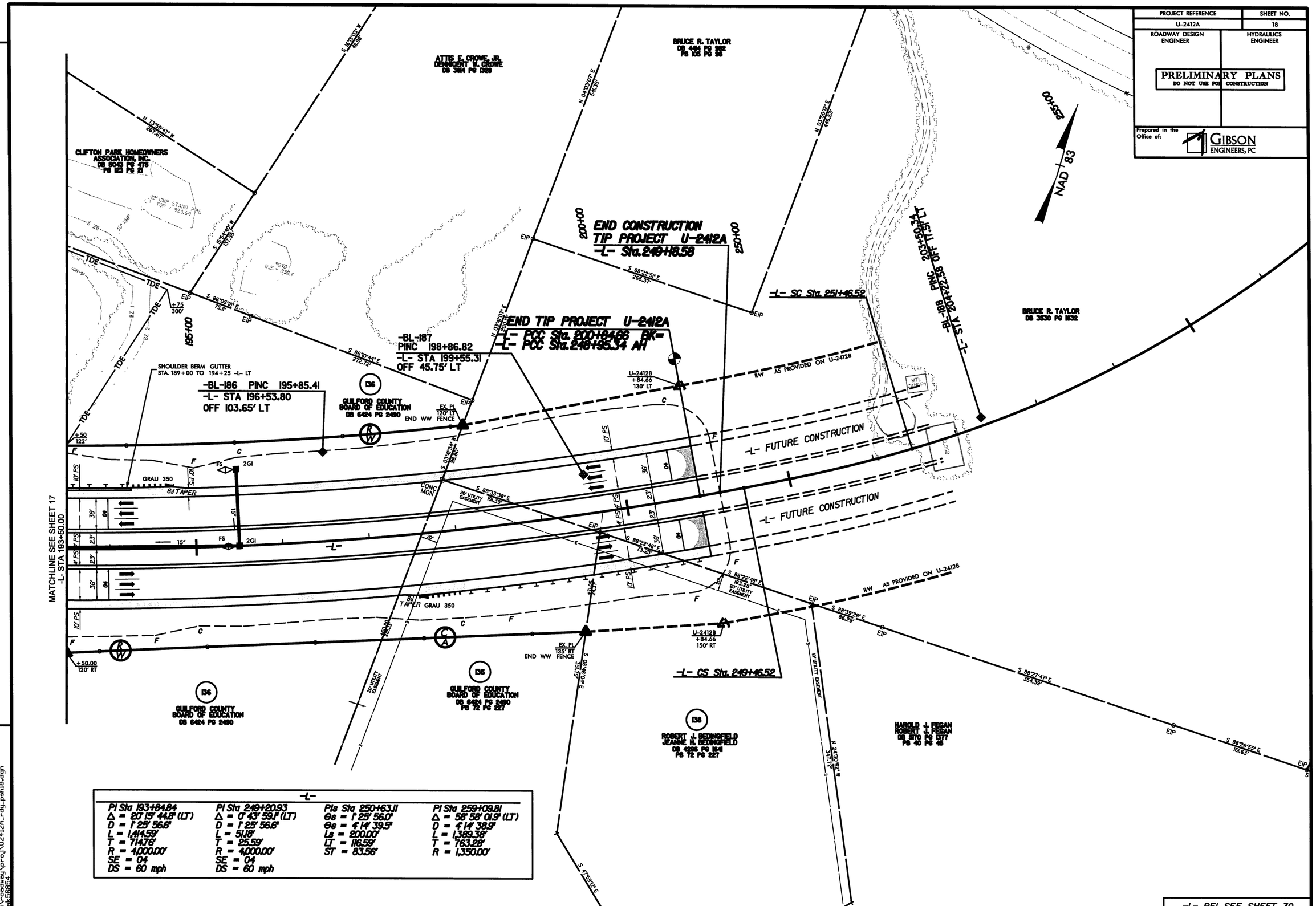
PROJECT REFERENCE	SHEET NO.
U-2412A	18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC



-L-			
PI Sta 193+84.84	PI Sta 249+20.93	PIs Sta 250+63.11	PI Sta 259+09.81
Δ = 20° 15' 44.8" (LT)	Δ = 0° 43' 59.1" (LT)	Θs = 1° 25' 56.0"	Δ = 58° 58' 01.9" (LT)
D = 1° 25' 56.6"	D = 1° 25' 56.6"	Θs = 4° 14' 39.5"	D = 4° 14' 38.9"
L = 1,414.59'	L = 51.18'	Ls = 200.00'	L = 1,389.38'
T = 714.76'	T = 25.59'	LT = 116.59'	T = 763.28'
R = 4,000.00'	R = 4,000.00'	ST = 83.56'	R = 1,350.00'
SE = 04	SE = 04		
DS = 60 mph	DS = 60 mph		

REVISIONS

REVISED OWNER FOR PARCEL 136 & 137 - REVISED 6-24-09

7/15/2011
9:44:25 AM
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pek56854

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

REVISIONS

REVISED OWNER FOR PARCEL 141,15,& 16; REVISED PARCEL 142 TO 140 - REVISED 6-24-09

-Y-
PI Sta 17+86.26
Δ = 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
Δ = 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
Δ = 22° 15' 25.6" (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
Δ = 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
Δ = 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

DETAIL #19
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, Filter Fabric, Min. D= 2 Ft., Max. d= 2 Ft., B= 3 Ft.
*When B is < 6.0'
Type of Liner= Class 'I' Rip-Rap
FROM STA. 19+50 TO STA. 20+00 -Y- RT

-BYB-143 POT 5+00.00
-BYA-142 POT 5+00.00
-BY-136 PINC 25+26.86
-BY3- POT 5+00.00
-Y- STA 22+61.34
OFF 33.13' LT
-BY-135 PINC 21+69.33
-BYB- POT 7+77.68
-Y- STA 19+02.69
OFF 23.86 RT
-BY-137 POT 28+84.10
-BY-134 PINC 18+34.10
-BYA- POT 7+84.02
-Y- STA 12+49.03
OFF 14.69' LT
-BY-118 PINC 15+14.24
-YC- STA 12+94.54
OFF 28.79' RT

-Y- PT Sta. 20+63.04
POT Sta. 10+00.00 BEGIN CONSTRUCTION 10+00
-YA- POT Sta. 10+12.00
BEGIN PAVING Sta. 10+50.00
-YA- POC Sta. 11+75.00
-YC- POT Sta. 16+24.30
PC Sta. 11+12.26
N 56° 43' 56.0" E
PT Sta. 15+74.30
PRC Sta. 14+57.71
PC Sta. 13+41.17
BEGIN CONSTRUCTION -YC- POT Sta. 13+00.00
-Y- POC Sta. 15+50.00
-YA- POT Sta. 13+00.00
-Y- PC Sta. 12+94.08
-Y3- PC Sta. 10+83.86
-Y3- PT Sta. 12+15.15
END CONSTRUCTION POT Sta. 22+00.00
N 83° 53' 11.0" E
N 34° 27' 11.0" E
S 18° 53' 17.0" E
S 1° 59' 58.0" W
S 2° 45' 08.0" W
10+00 -Y3- POT Sta. 10+09.00
CLASS 'I' RIP RAP EST. 10 TONS EST. 23 SY F.F.
REMOVE +/- 18" EXIST. 24" RCP
SPECIAL DITCH GRADE STA. 19+50 TO 20+00 -Y- RT SEE PROFILE FOR GRADE
SPECIAL DITCH GRADE STA. 13+60 TO 15+70 -YC- RT SEE PROFILE FOR GRADE
SPECIAL DITCH GRADE STA. 12+03 TO 12+43 -YA- RT SEE PROFILE FOR GRADE
SPECIAL DITCH GRADE STA. 14+50 TO 15+20 -Y3- LT SEE PROFILE FOR GRADE
200' TAPER
100' TAPER
600' TAPER
2GI W/NARROW SLOT GRATE
PLUG
EST. 2011/2031 TRAFFIC VOLUMES
SR 4121 -Y-
-YA- HAMPTON DR.
SR 1486 GREENSBORO RD
NAD 83

MATCHLINE SEE SHEET 5 -Y- STA 12+50.00

MATCHLINE SEE SHEET 5 -Y3- STA 13+00.00

139	HENRY H. ROGERS, JR. DB 3461 PG 1578
140	HARVEY & LYDIA GOHO DB 4250 PG 530
140	HARVEY & LYDIA GOHO DB 5297 PG 315
141	CRESTWOOD PRESBYTERIAN CHURCH DB 1882 PG 301 PB 14 PG 74
142	LOUISE S. MARCHISOTTO DB 6349 PG 2942 PB 14 PG 74
143	MARY FAY BODENHEIMER PB 15 PG 93
144	W.B. DELK JR. & PATRICIA S. DB 5948 PG 1085 PB 15 PG 93
145	WINDLEY H. DUNBAR DB 5301 PG 352 PB 142 PG 122
146	CAROLINA CHILD CARE PROPERTIES, L.L.C. DB 4304 PG 122 PB 43 PG 82
147	OTIS WALLACE DB 4903 PG 134 PB 5 PG 305
148	KENNETH J. HUGHES & PHILLIP J. HINSHAW DB 2757 PG 220 PB 5 PG 305
15	THREE KLEMMES, LLC DB 6867 PG 1355 PB 43 PG 82
16	RICHARD VAUGHN TRUST DB 6963 PG 525 PB 142 PG 122
14	HENDRIX FURNITURE GROUP DB 5236 PG 1853 PB 4 PG 7
27	ROBERT J. & SALLIE W. BROWN DB 3766 PG 646
8	REGAN-MATA PROPERTIES, A NORTH CAROLINA GENERAL PARTNERSHIP DB 3766 PG 1901 PB 5 PG 319
8	STEPHEN B. DOSS, JR. AND RICHARD M. CECIL DB 3766 PG 1901
	W.B. DELK JR. & PATRICIA S. DB 5948 PG 1085 PB 15 PG 93
	GARY L. & JOANN N. ROBINSON DB 3427 PG 356 PB 15 PG 93
	J.W. MORGAN PB 121 PG 105
	M.M. FOWLER, INC. DB 4824 PG 1083 PB 14 PG 73
	OLIPHANT ENTERPRISES DB 3637 PG 1745 PB 5 PG 305
	HAROLD L. GLOVER, JR. & WANDA G. NESSLER DB 6030 PG 885 PB 5 PG 305
	GILBERT W. JACOBS DB 4440 PG 483 PB 5 PG 305
	GILBERT W. JACOBS DB 2492 PG 305 PB 5 PG 305
	GILBERT W. JACOBS DB 4469 PG 1286 PB 5 PG 305

PAVEMENT REMOVAL
-Y- PFL SEE SHEET 32
-YA- PFL SEE SHEET 32
-YC- PFL SEE SHEET 32
-Y3- PFL SEE SHEET 33

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PROJECT REFERENCE	SHEET NO.
U-2412A	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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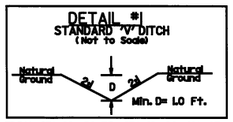
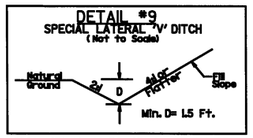
REVISIONS

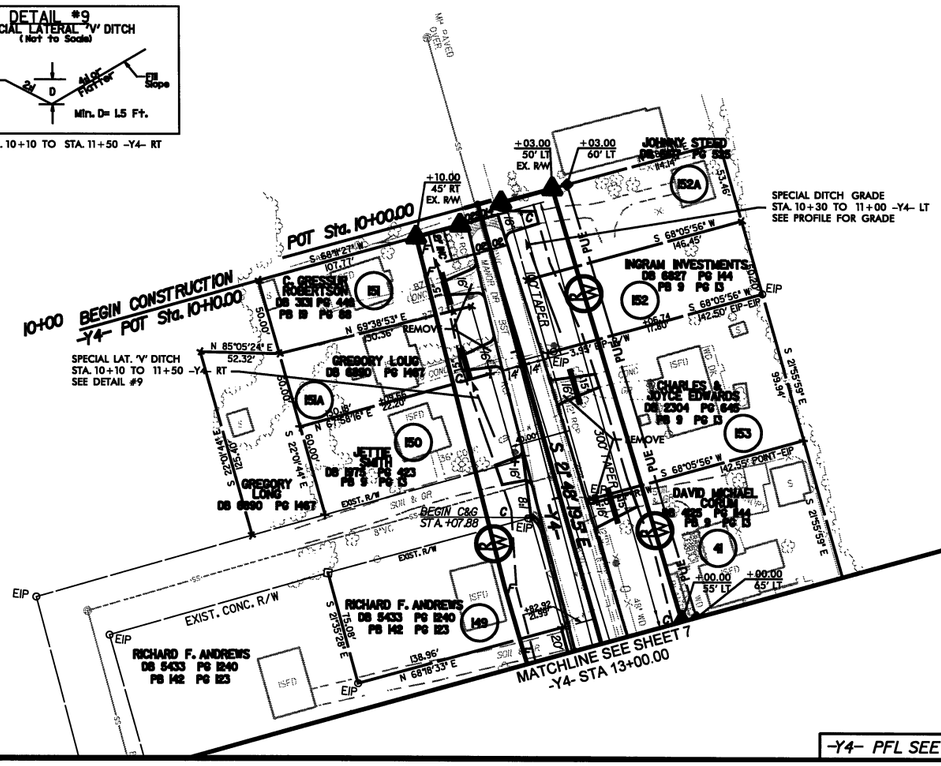
REVISED OWNER FOR PARCEL 151 & 152; ADDED PARCEL 151A & 152A - REVISED 6-24-09



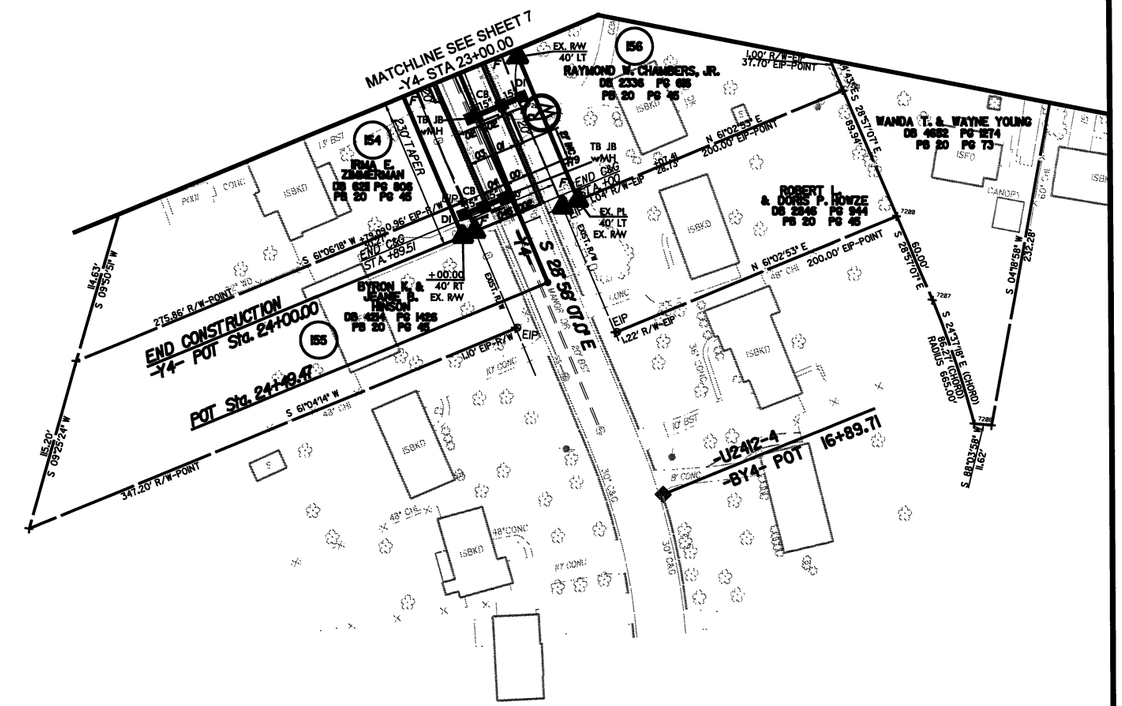
FROM STA. 10+30 TO STA. 11+00 -Y4- LT



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



-Y4- PFL SEE SHEET 33



-Y4- PFL SEE SHEET 33

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PROJECT REFERENCE	SHEET NO.
U-2412A	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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REVISIONS

REVISED OWNER FOR PARCEL 59 - REVISED 6-24-09

NAD 83

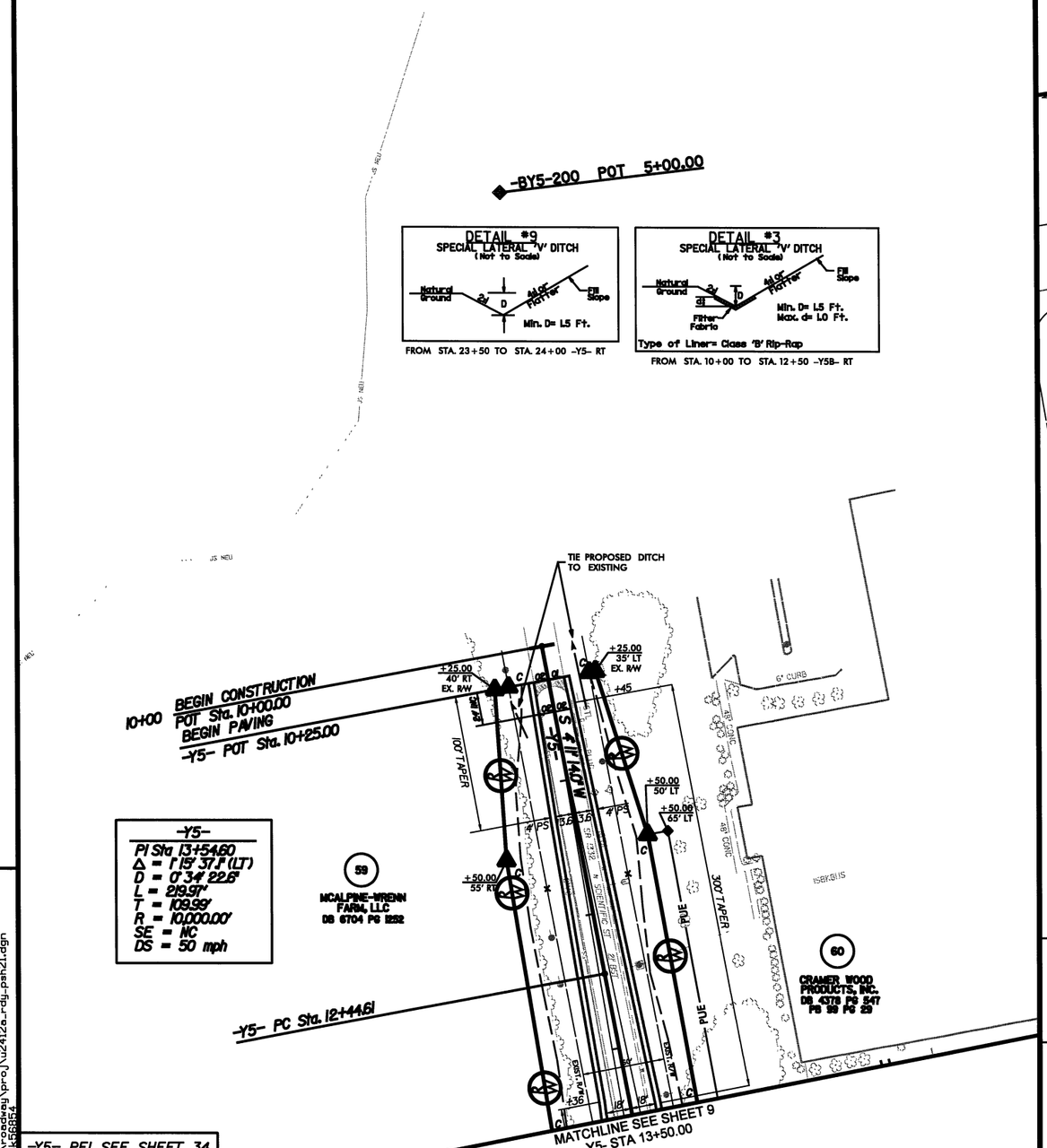
-BY5-200 POT 5+00.00

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)

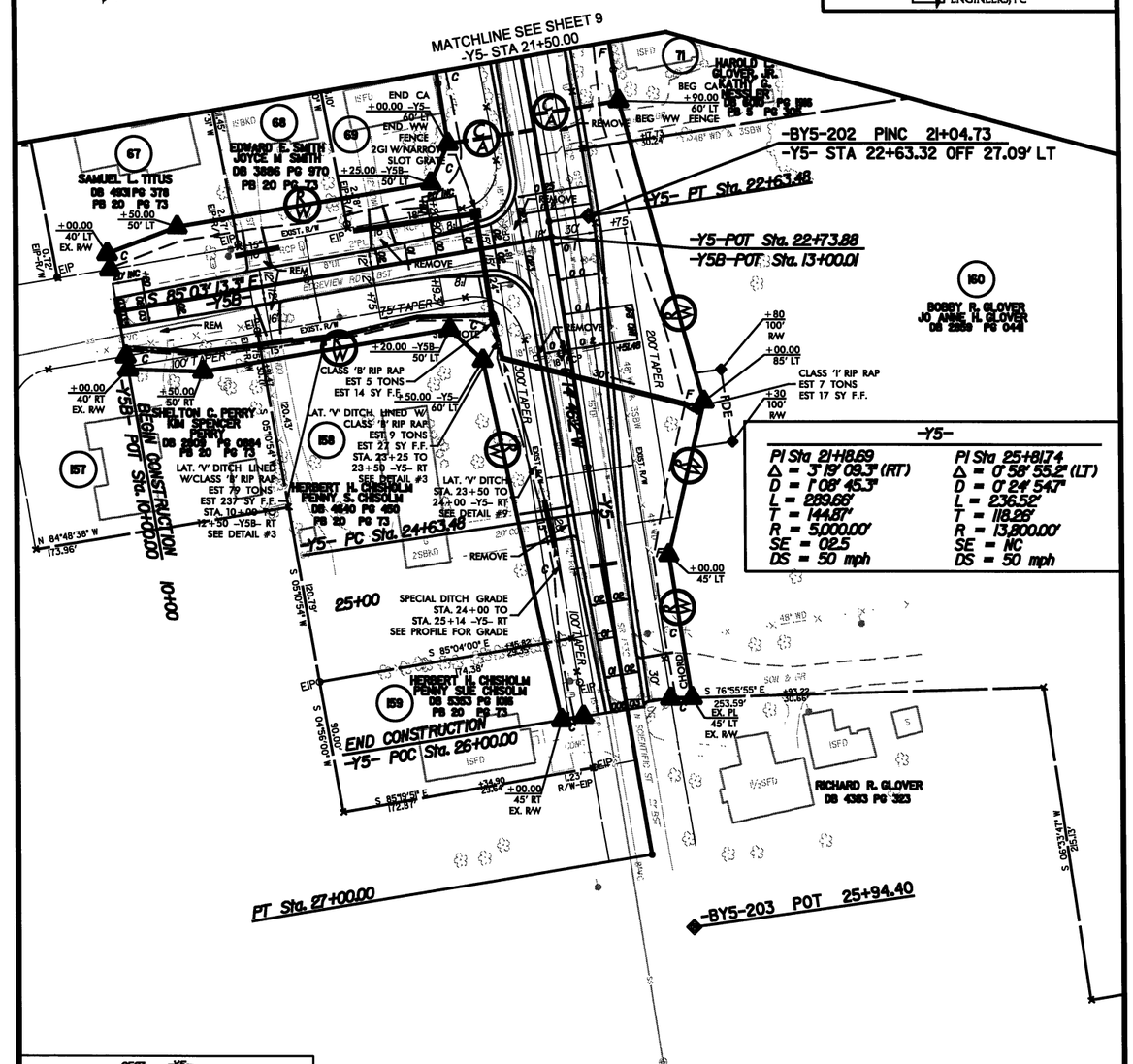
FROM STA. 10+00 TO STA. 12+50 -Y5B- RT



-Y5-
PI Sta 13+54.60
Δ = 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

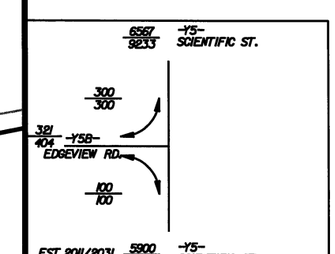
-Y5- PFL SEE SHEET 34

NAD 83



-Y5-

PI Sta 21+18.69	PI Sta 25+81.74
Δ = 3° 19' 09.3" (RT)	Δ = 0° 58' 55.2" (LT)
D = 1° 08' 45.3"	D = 0° 24' 54.7"
L = 289.66'	L = 236.52'
T = 144.87'	T = 118.26'
R = 5,000.00'	R = 13,800.00'
SE = 0.25	SE = NC
DS = 50 mph	DS = 50 mph



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PROJECT REFERENCE	SHEET NO.
U-2412A	22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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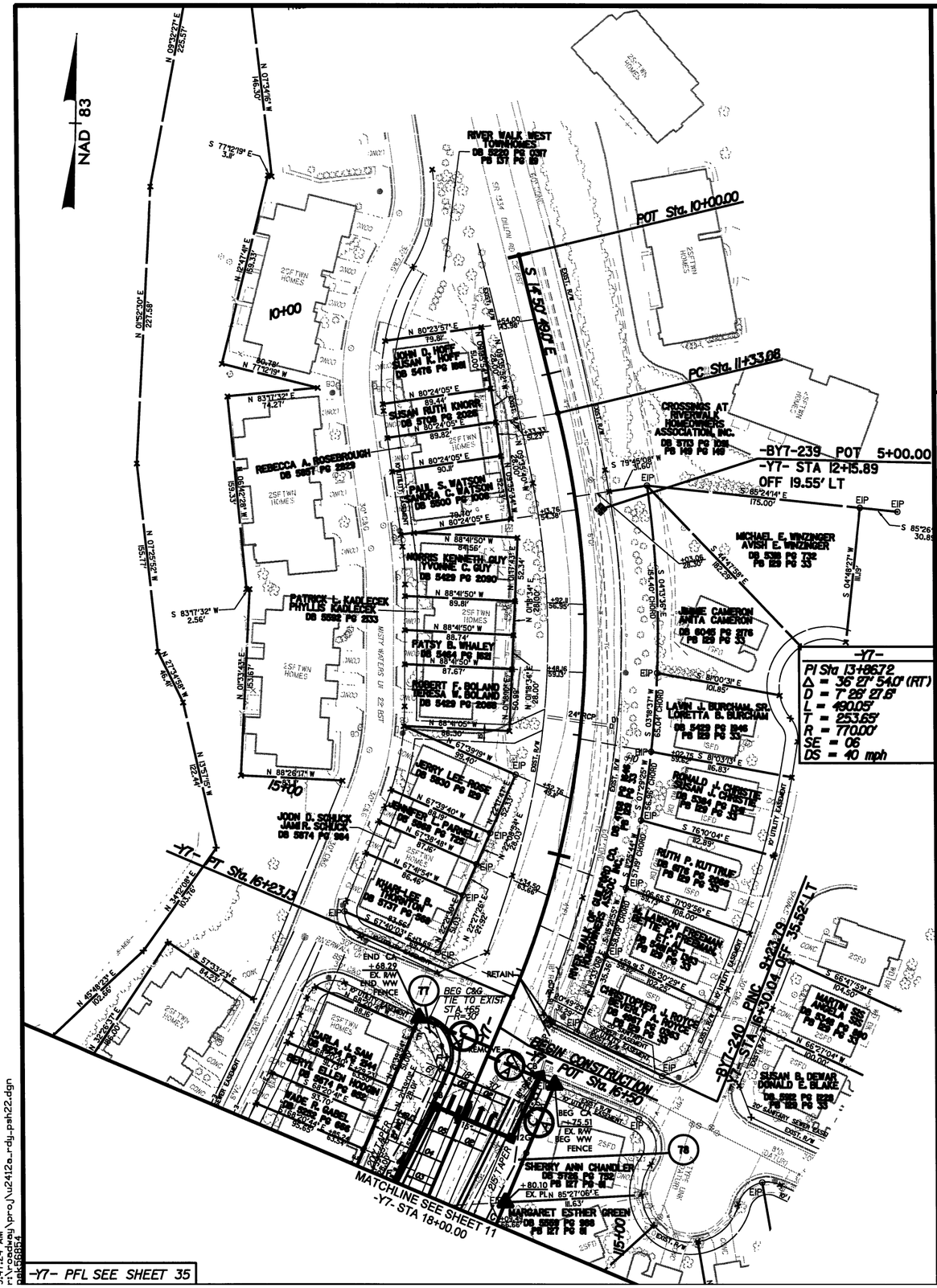

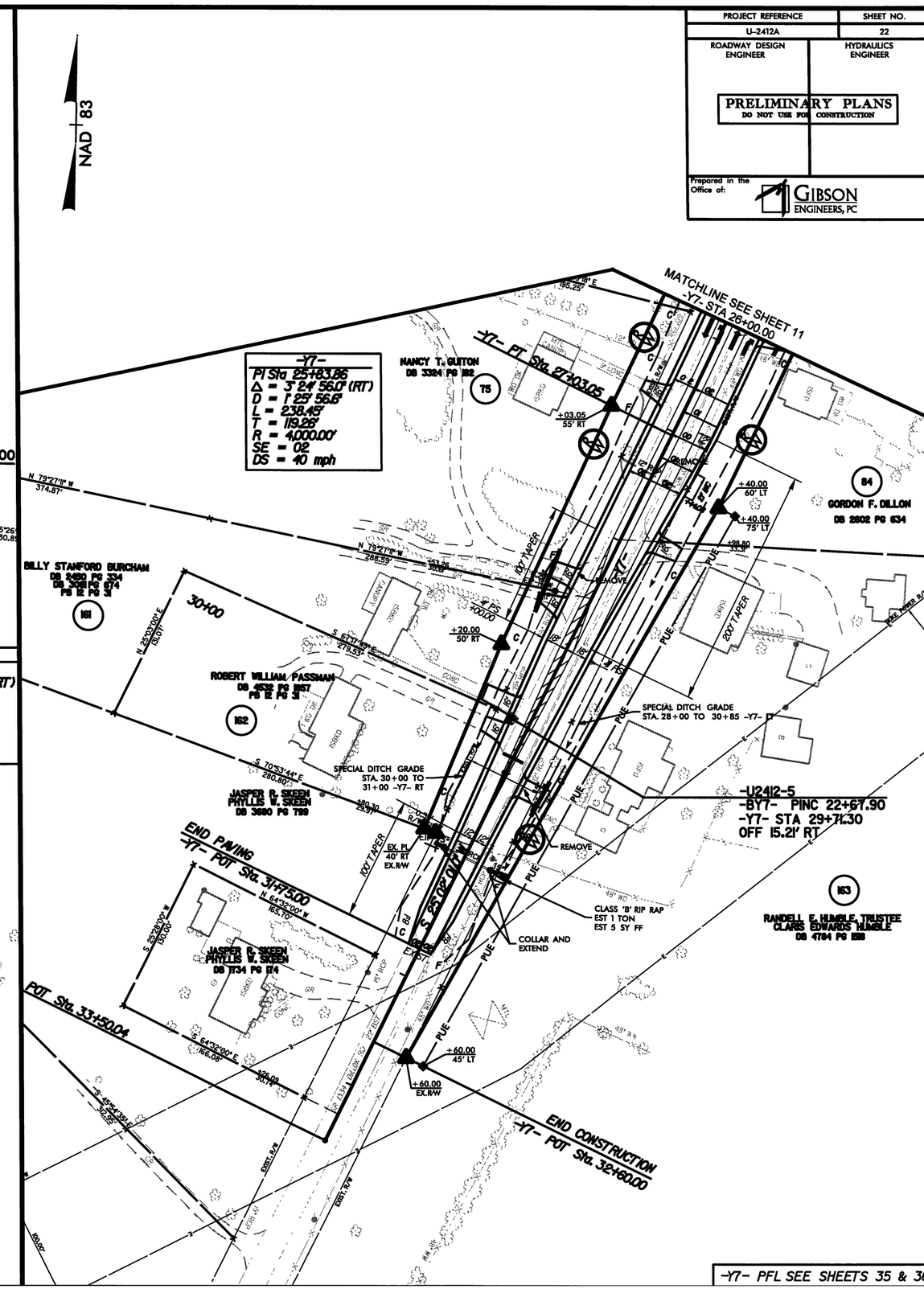

-Y7- PFL SEE SHEET 35

-Y7- PFL SEE SHEETS 35 & 36

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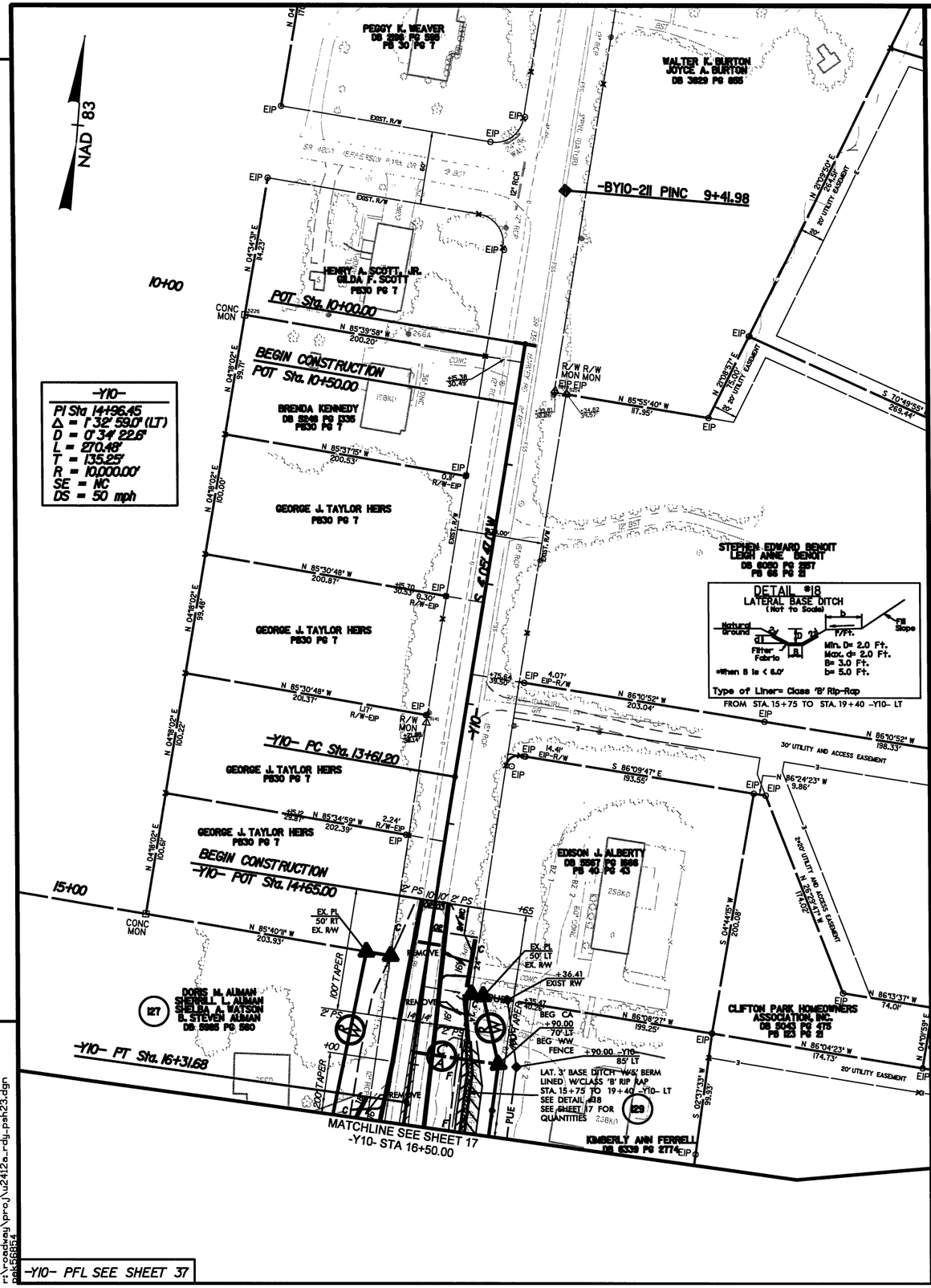
PROJECT REFERENCE	SHEET NO.
U-2412A	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

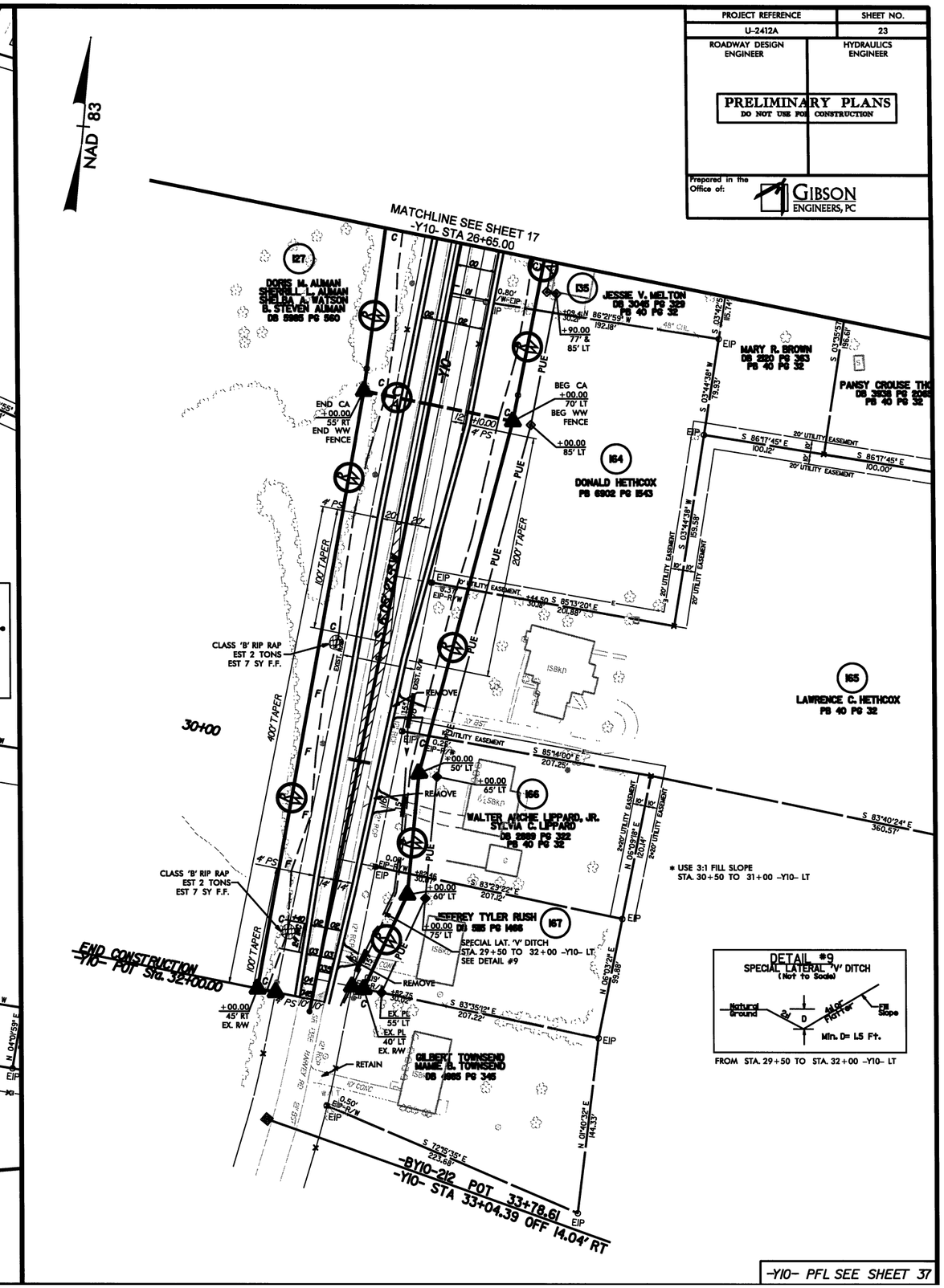
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

REVISIONS

REVISED OWNER FOR PARCEL 129 & 164 - REVISED 6-24-09





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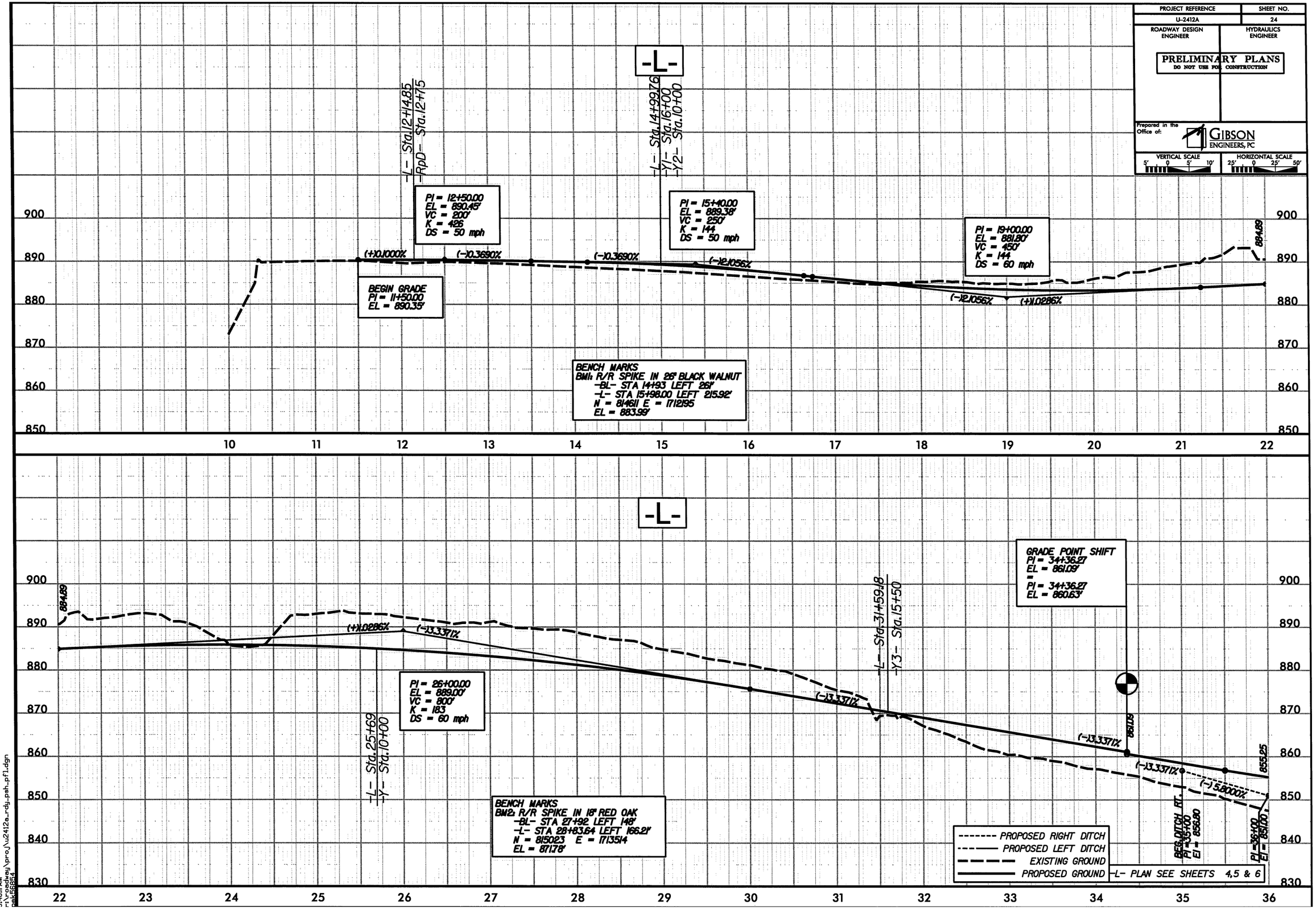
PROJECT REFERENCE
U-2412A
SHEET NO.
24
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Prepared in the Office of:
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VERTICAL SCALE
HORIZONTAL SCALE
-L-
-L- Sta.12+14.85
-RpD- Sta.12+75
-L- Sta.14+99.76
-Y1- Sta.16+00
-Y2- Sta.10+00
PI = 12+50.00
EL = 890.45'
VC = 200'
K = 426
DS = 50 mph
PI = 15+40.00
EL = 889.38'
VC = 250'
K = 144
DS = 50 mph
PI = 19+00.00
EL = 881.80'
VC = 450'
K = 144
DS = 60 mph
(+)0.1000%
(-)0.3690%
(-)0.3690%
(-)2.1056%
(-)2.1056%
(+)1.0286%
884.89
BEGIN GRADE
PI = 11+50.00
EL = 890.35'
BENCH MARKS
BM1: R/R SPIKE IN 26" BLACK WALNUT
-BL- STA 14+93 LEFT 261'
-L- STA 15+98.00 LEFT 215.92'
N = 814611 E = 1712195
EL = 883.99'
-L-
GRADE POINT SHIFT
PI = 34+36.27
EL = 861.09'
=
PI = 34+36.27
EL = 860.63'
884.89
(+)1.0286%
(-)3.3371%
-L- Sta.31+59.18
-Y3- Sta.15+50
PI = 26+00.00
EL = 889.00'
VC = 800'
K = 183
DS = 60 mph
-L- Sta.25+69
-Y- Sta.10+00
(-)3.3371%
(-)3.3371%
(-)3.3371%
(-)5.8000%
861.09
855.25
BENCH MARKS
BM2: R/R SPIKE IN 18" RED OAK
-BL- STA 27+92 LEFT 148'
-L- STA 28+83.64 LEFT 166.21'
N = 815023 E = 1713514
EL = 871.78'
BEG.DITCH RT.
PI = 35+00
EL = 856.80
PI = 36+00
EL = 851.00
PROPOSED RIGHT DITCH
PROPOSED LEFT DITCH
EXISTING GROUND
PROPOSED GROUND
-L- PLAN SEE SHEETS 4,5 & 6
7/15/2011
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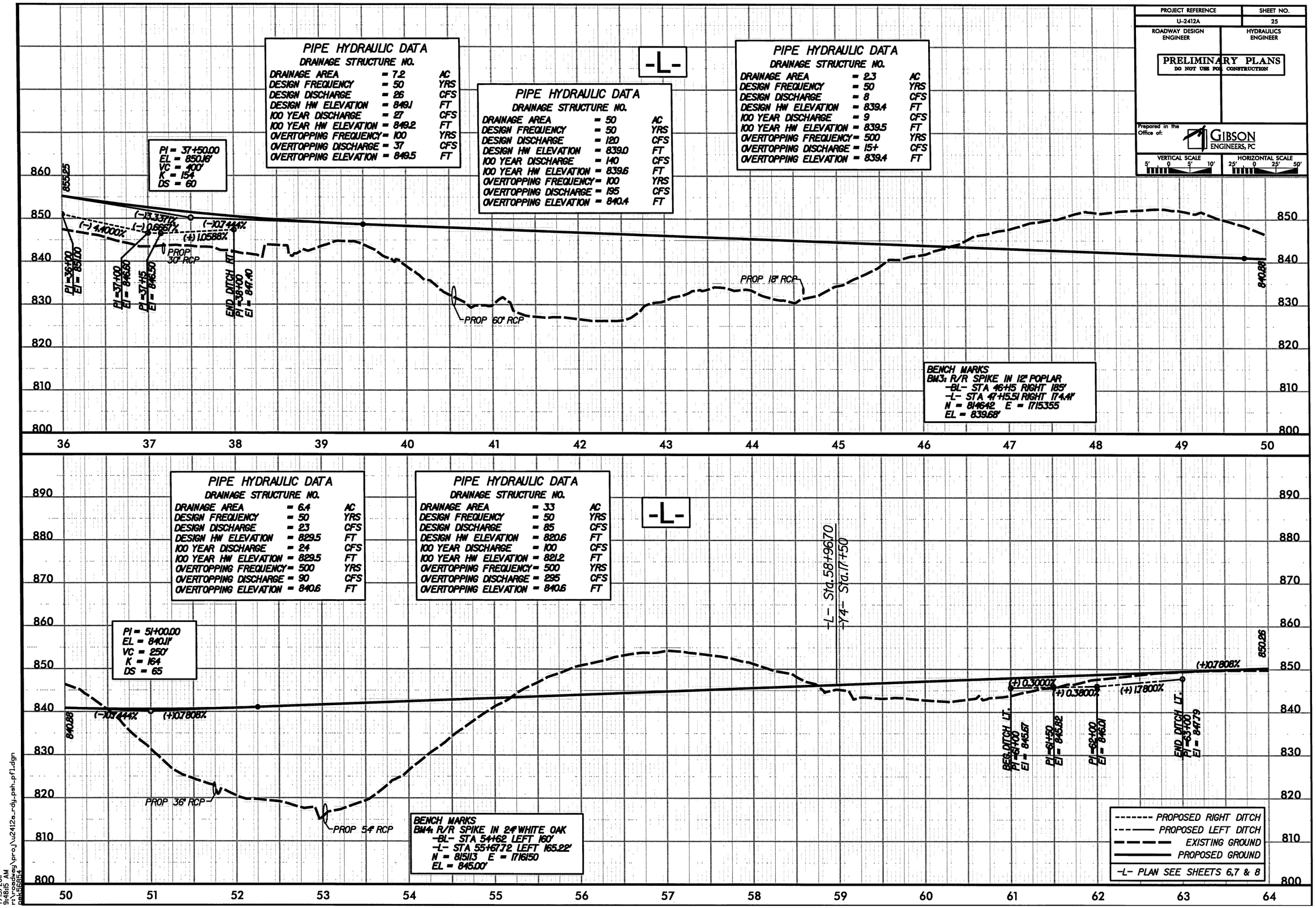
PROJECT REFERENCE	SHEET NO.
U-2412A	25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Prepared in the Office of: GIBSON ENGINEERS, PC

VERTICAL SCALE 5' 0 5' 10'
HORIZONTAL SCALE 25' 0 25' 50'



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 7.2	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 26	CFS
DESIGN HW ELEVATION	= 849.1	FT
100 YEAR DISCHARGE	= 27	CFS
100 YEAR HW ELEVATION	= 849.2	FT
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 37	CFS
OVERTOPPING ELEVATION	= 849.5	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 50	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 120	CFS
DESIGN HW ELEVATION	= 839.0	FT
100 YEAR DISCHARGE	= 140	CFS
100 YEAR HW ELEVATION	= 839.6	FT
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 195	CFS
OVERTOPPING ELEVATION	= 840.4	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 2.3	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 8	CFS
DESIGN HW ELEVATION	= 839.4	FT
100 YEAR DISCHARGE	= 9	CFS
100 YEAR HW ELEVATION	= 839.5	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 15+	CFS
OVERTOPPING ELEVATION	= 839.4	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 6.4	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 23	CFS
DESIGN HW ELEVATION	= 829.5	FT
100 YEAR DISCHARGE	= 24	CFS
100 YEAR HW ELEVATION	= 829.5	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 90	CFS
OVERTOPPING ELEVATION	= 840.6	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 33	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 85	CFS
DESIGN HW ELEVATION	= 820.6	FT
100 YEAR DISCHARGE	= 100	CFS
100 YEAR HW ELEVATION	= 821.2	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 295	CFS
OVERTOPPING ELEVATION	= 840.6	FT

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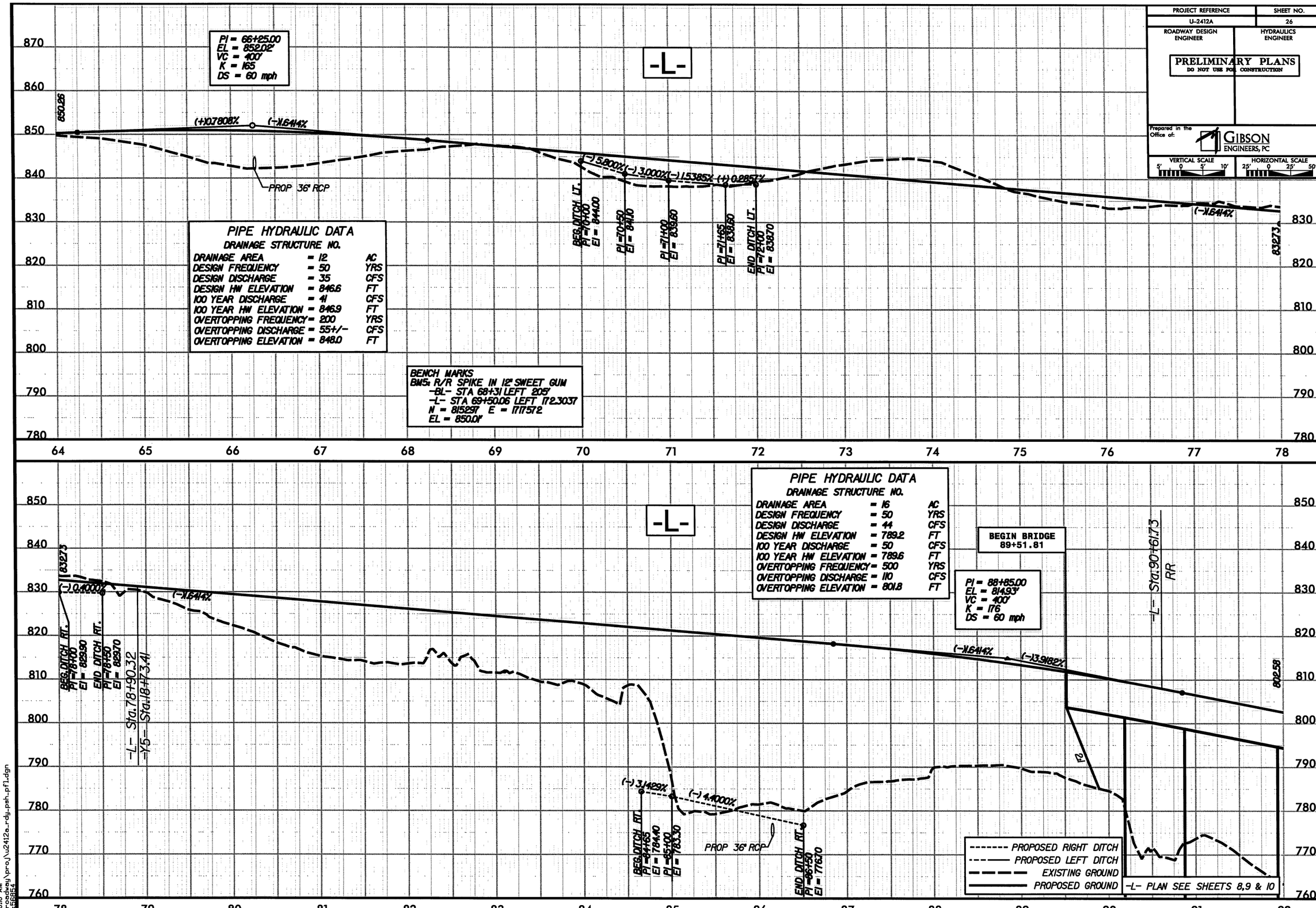

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PROJECT REFERENCE	SHEET NO.
U-2412A	27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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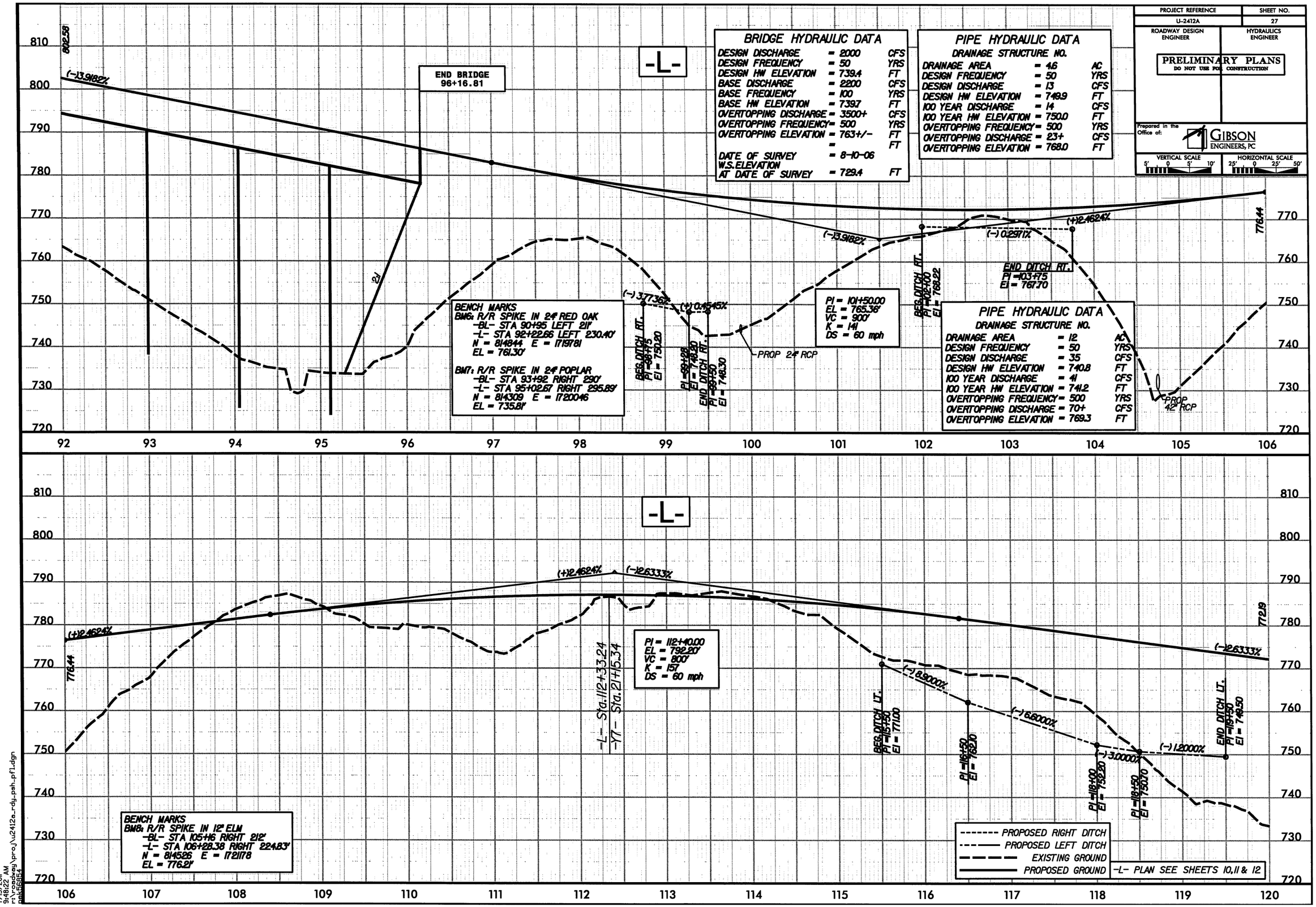

BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	= 2000	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 739.4	FT
BASE DISCHARGE	= 2200	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 739.7	FT
OVERTOPPING DISCHARGE	= 3500+	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 763+/-	FT
	=	FT
DATE OF SURVEY	= 8-10-06	
W.S. ELEVATION AT DATE OF SURVEY	= 729.4	FT

PIPE HYDRAULIC DATA DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 4.6	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 13	CFS
DESIGN HW ELEVATION	= 749.9	FT
100 YEAR DISCHARGE	= 14	CFS
100 YEAR HW ELEVATION	= 750.0	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 23+	CFS
OVERTOPPING ELEVATION	= 768.0	FT

PIPE HYDRAULIC DATA DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 12	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 35	CFS
DESIGN HW ELEVATION	= 740.8	FT
100 YEAR DISCHARGE	= 41	CFS
100 YEAR HW ELEVATION	= 741.2	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 70+	CFS
OVERTOPPING ELEVATION	= 769.3	FT

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

PRELIMINARY PLANS
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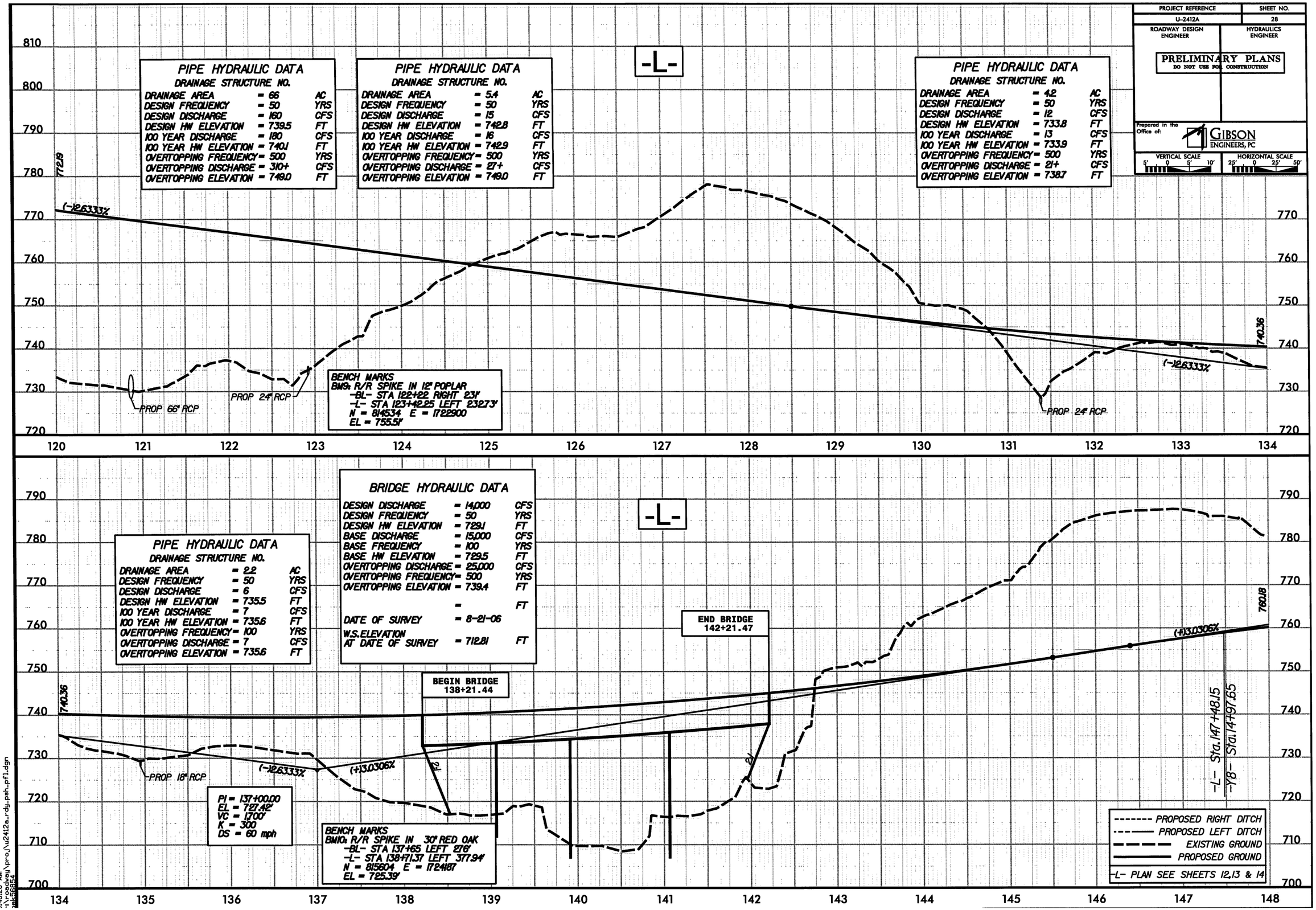
VERTICAL SCALE 5' 0 5' 10'
HORIZONTAL SCALE 25' 0 25' 50'



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

PRELIMINARY PLANS
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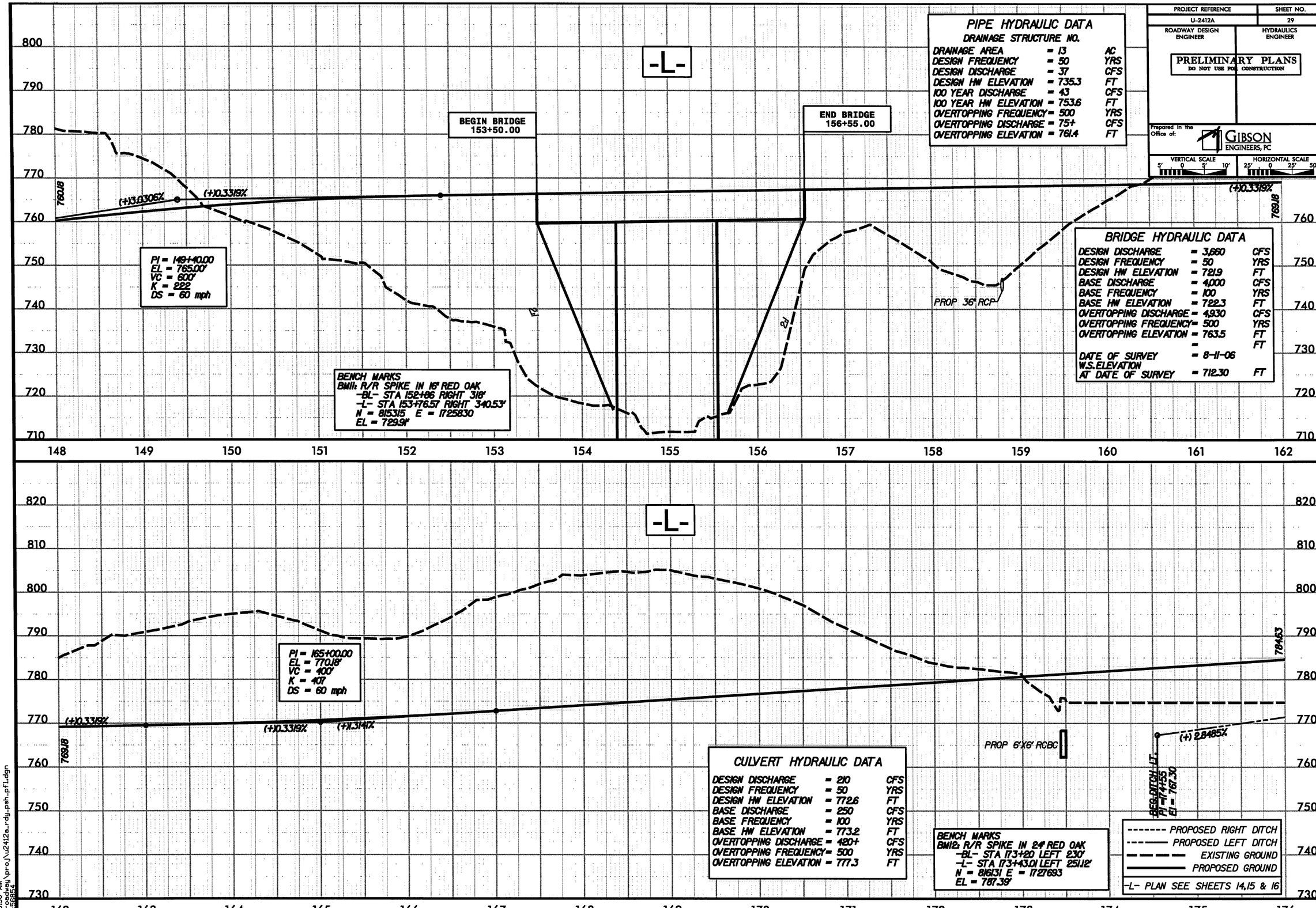
VERTICAL SCALE 5' 0 5' 10'
HORIZONTAL SCALE 25' 0 25' 50'



PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 13	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

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

PRELIMINARY PLANS
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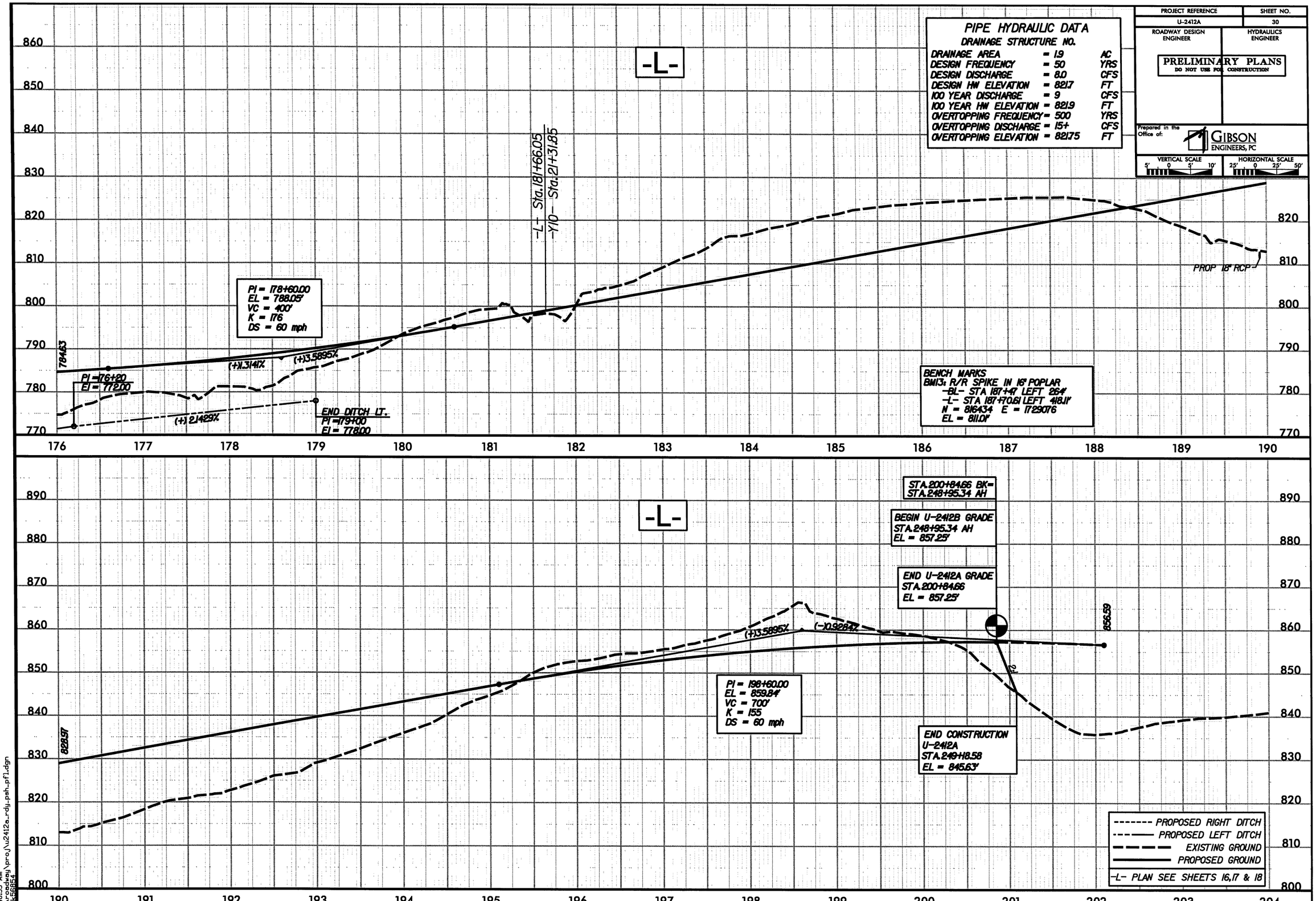
VERTICAL SCALE 5' 0 5' 10'
HORIZONTAL SCALE 25' 0 25' 50'

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 1.9	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 8.0	CFS
DESIGN HW ELEVATION	= 821.7	FT
100 YEAR DISCHARGE	= 9	CFS
100 YEAR HW ELEVATION	= 821.9	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 15+	CFS
OVERTOPPING ELEVATION	= 821.75	FT



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PROJECT REFERENCE	SHEET NO.
U-2412A	31
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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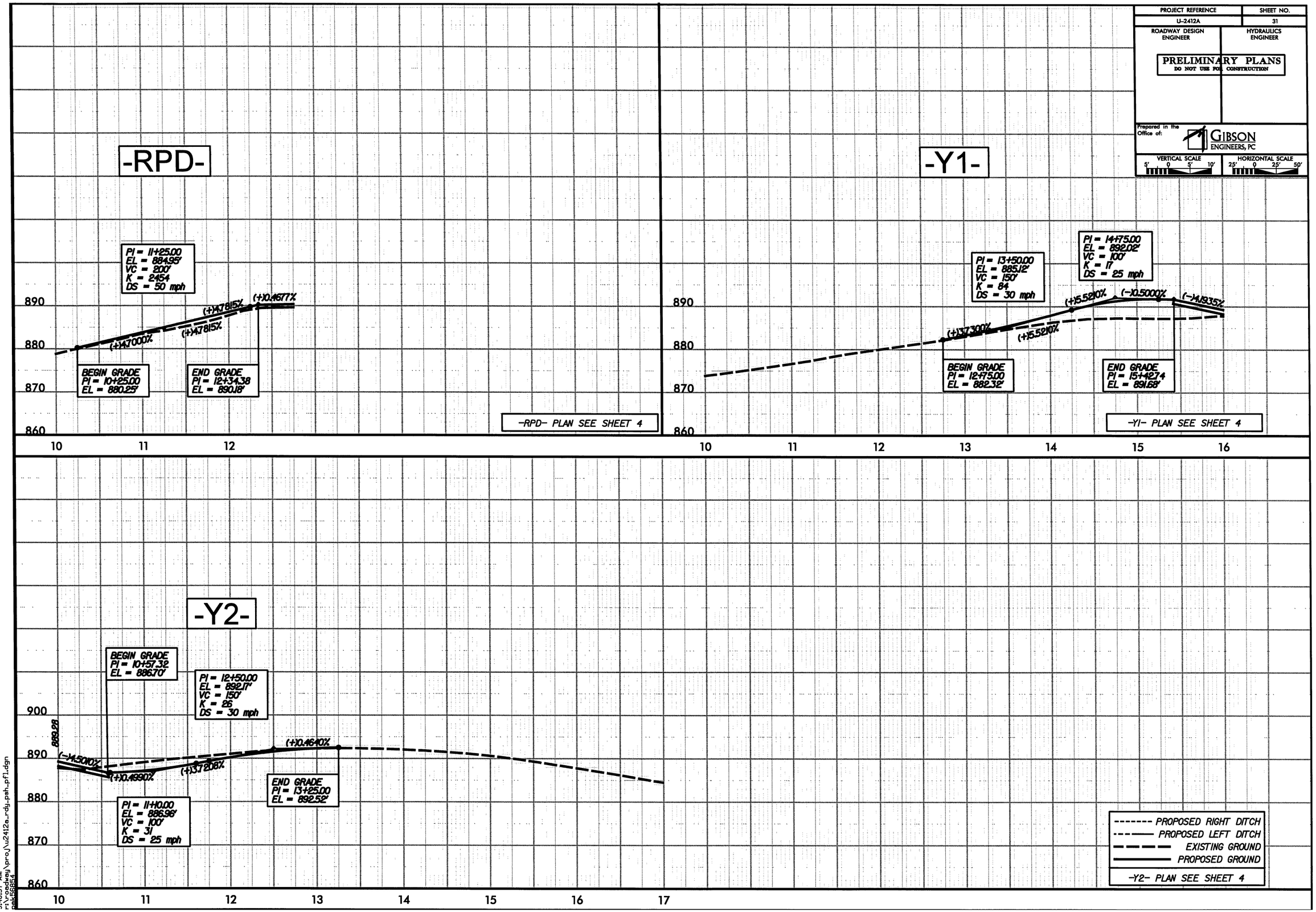

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PROJECT REFERENCE	SHEET NO.
U-2412A	32
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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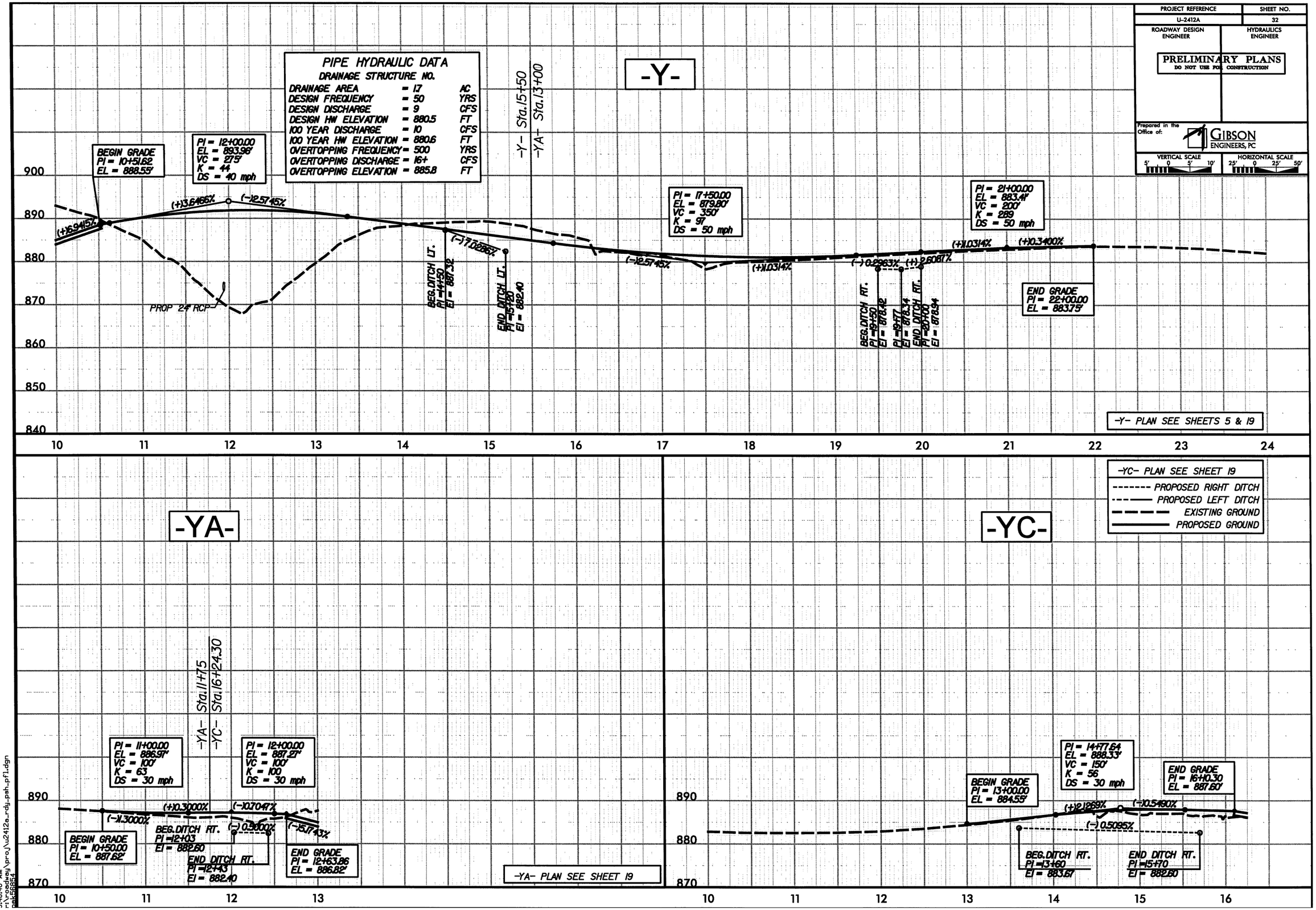

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PROJECT REFERENCE	SHEET NO.
U-2412A	33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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VERTICAL SCALE 5' 0 5' 10' | HORIZONTAL SCALE 25' 0 25' 50'

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PROJECT REFERENCE	SHEET NO.
U-2412A	34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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VERTICAL SCALE 5' 0 5' 10'
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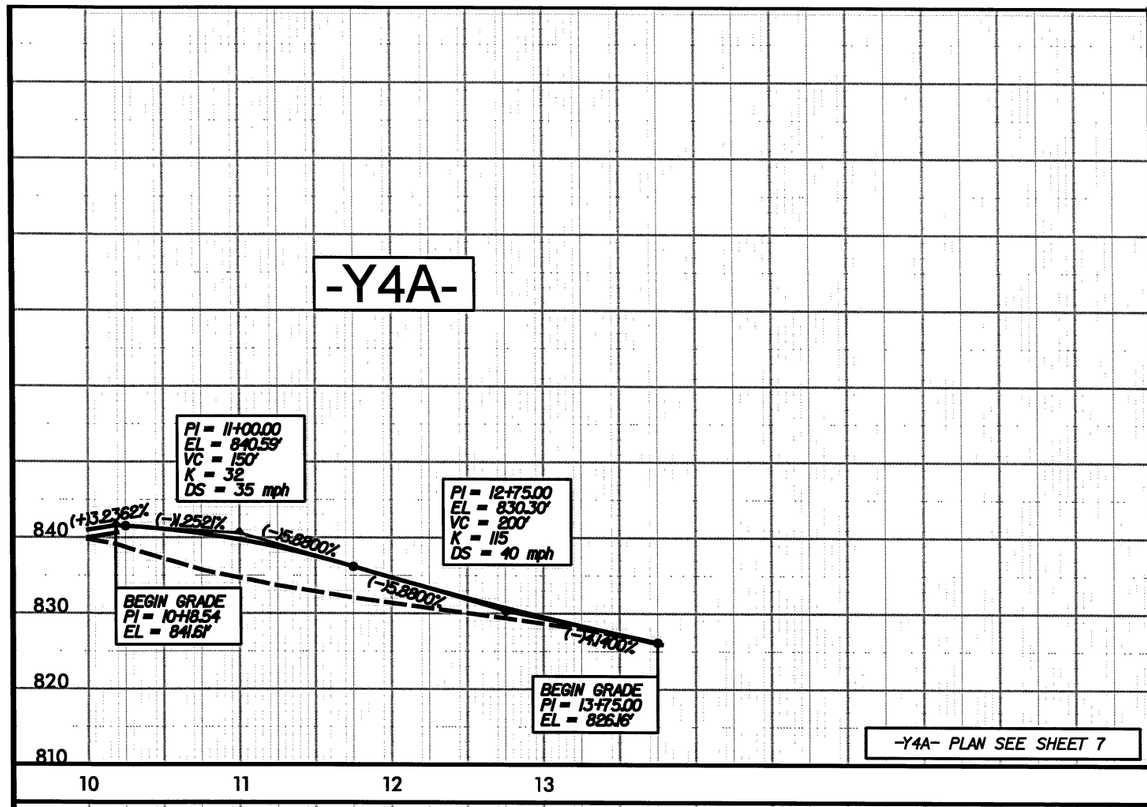

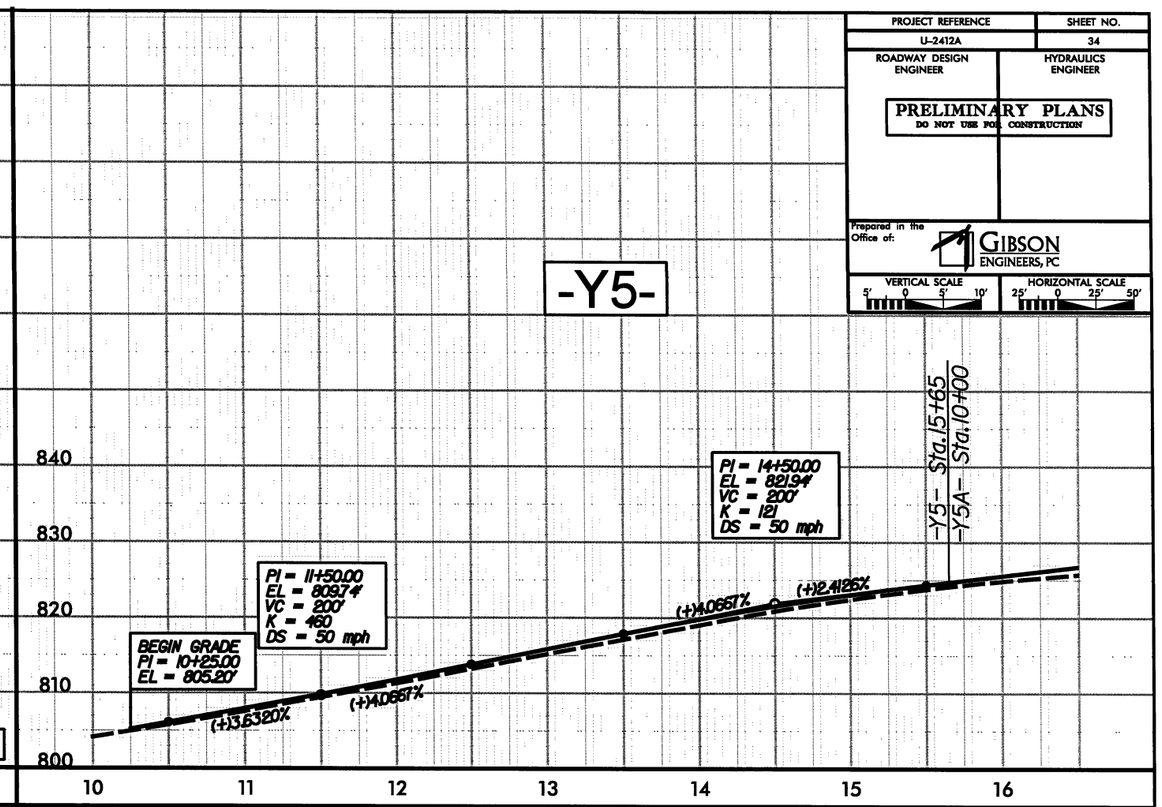

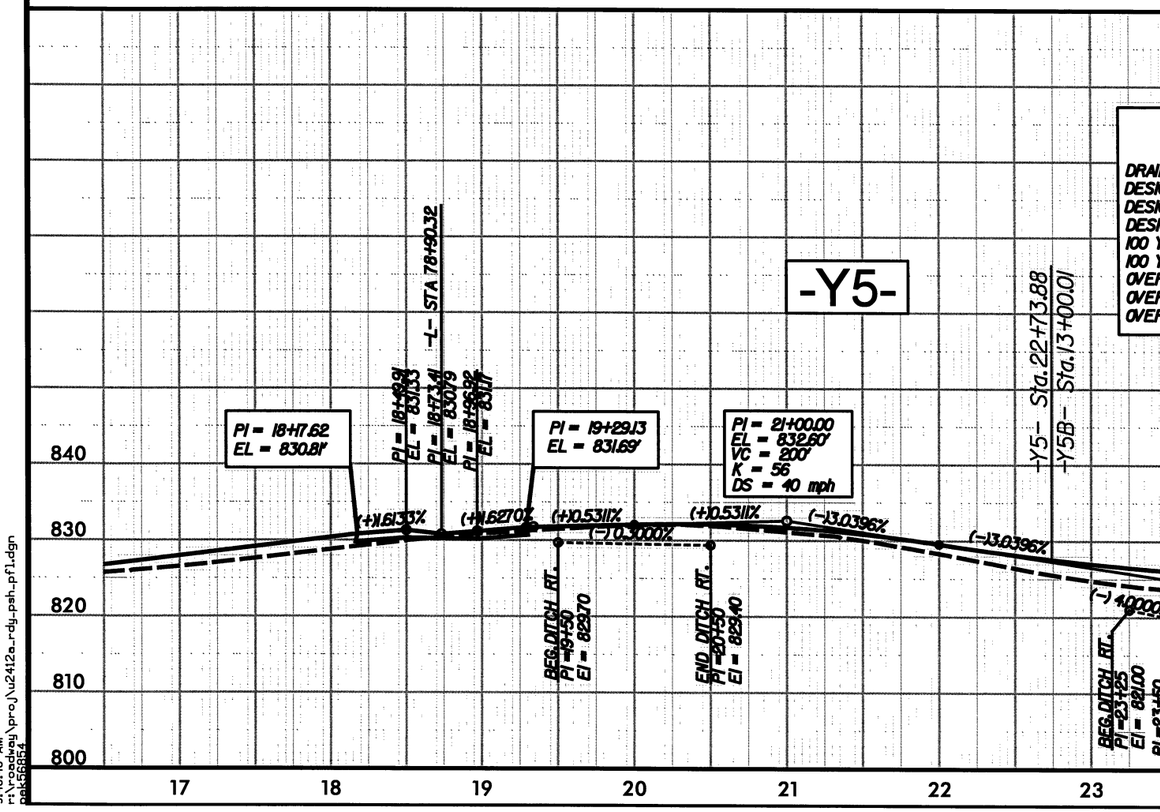

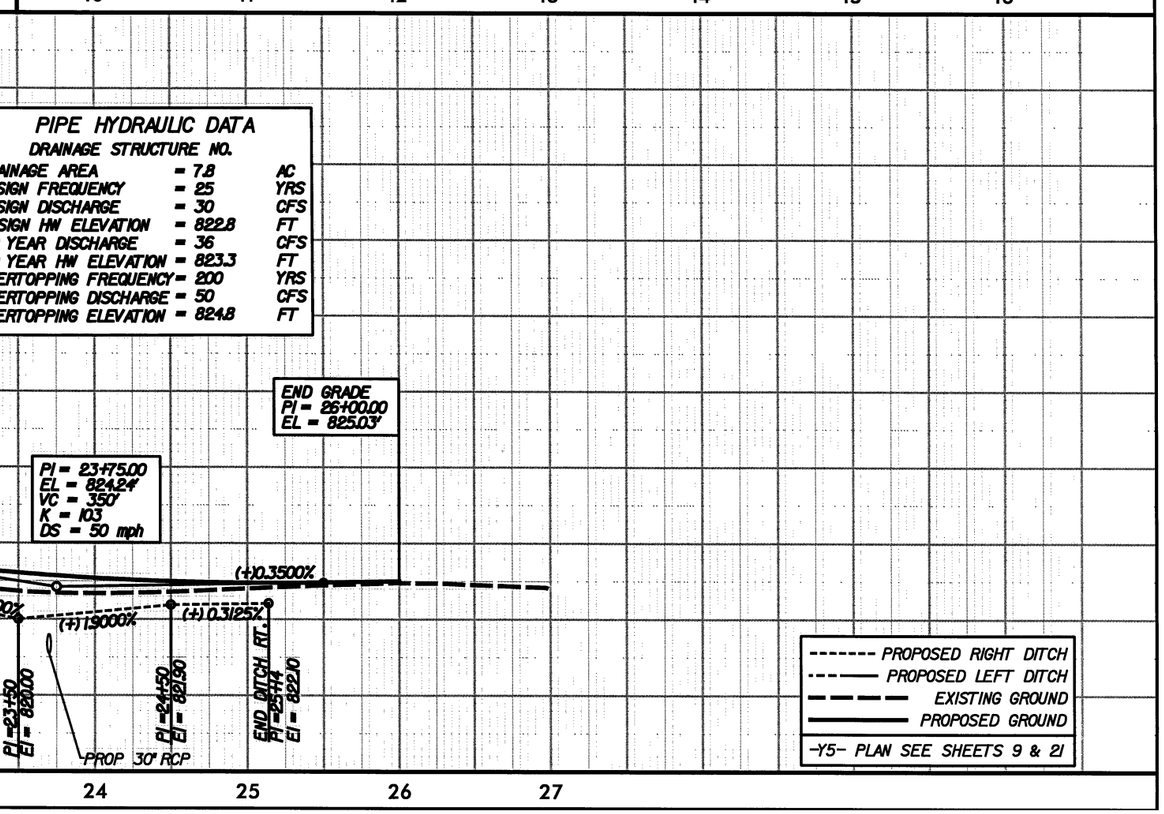

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 7.8	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 30	CFS
DESIGN HW ELEVATION	= 822.8	FT
100 YEAR DISCHARGE	= 36	CFS
100 YEAR HW ELEVATION	= 823.3	FT
OVERTOPPING FREQUENCY	= 200	YRS
OVERTOPPING DISCHARGE	= 50	CFS
OVERTOPPING ELEVATION	= 824.8	FT

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PROJECT REFERENCE	SHEET NO.
U-2412A	35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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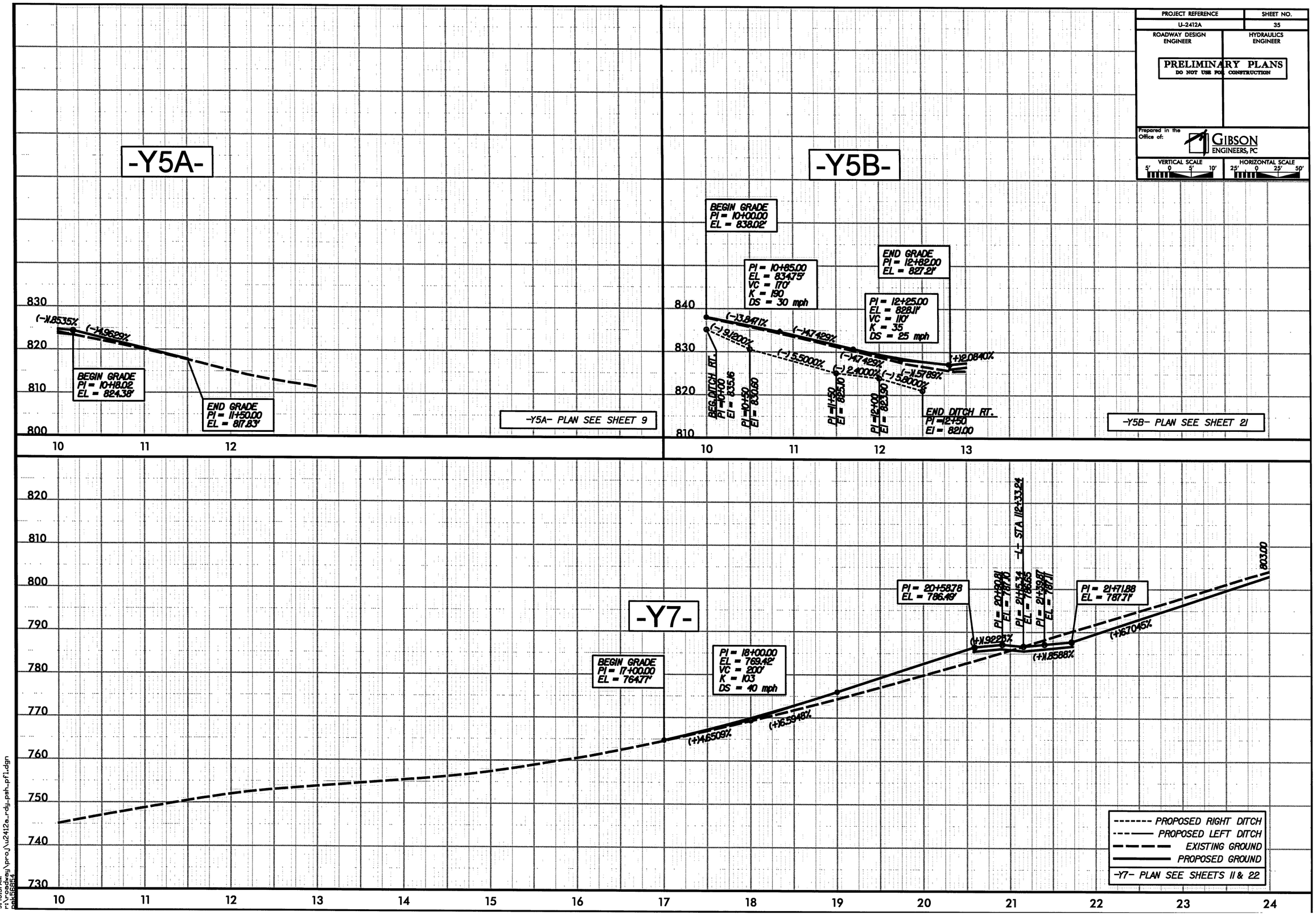

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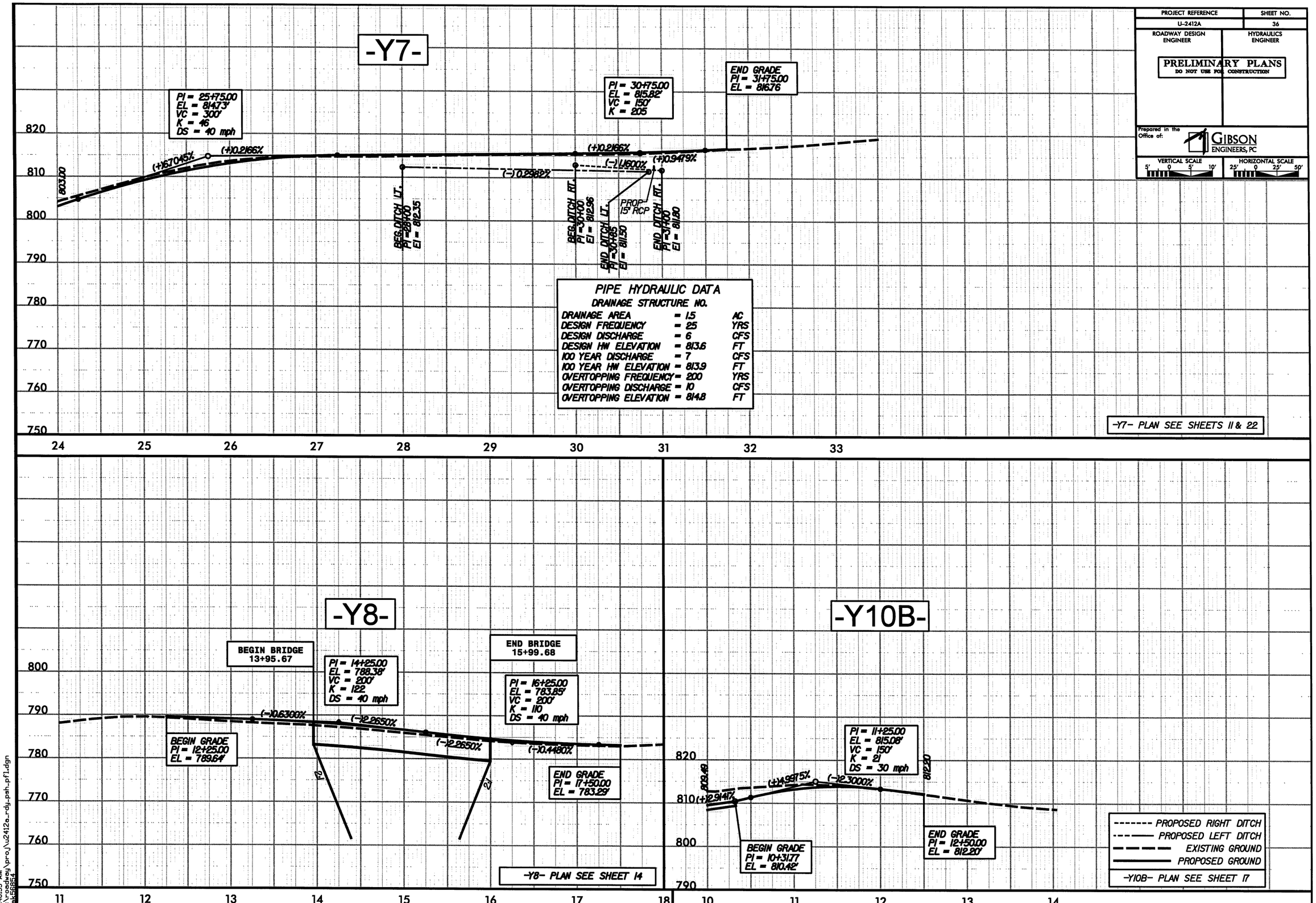

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PROJECT REFERENCE	SHEET NO.
U-2412A	37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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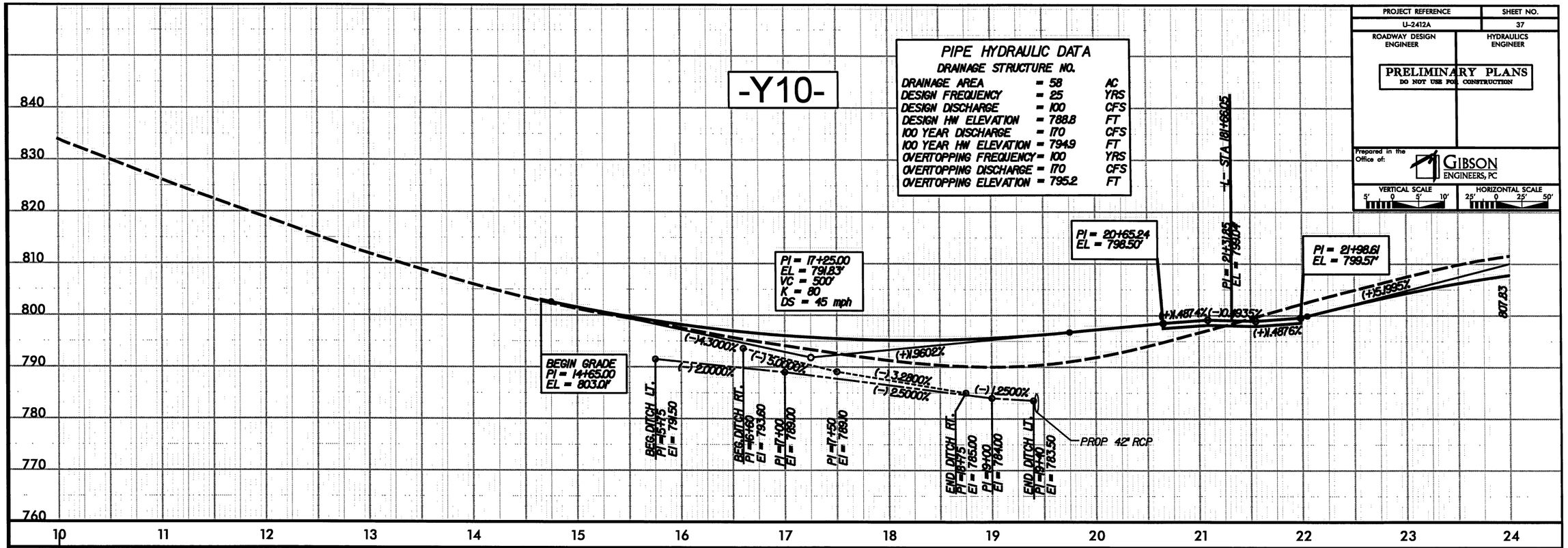
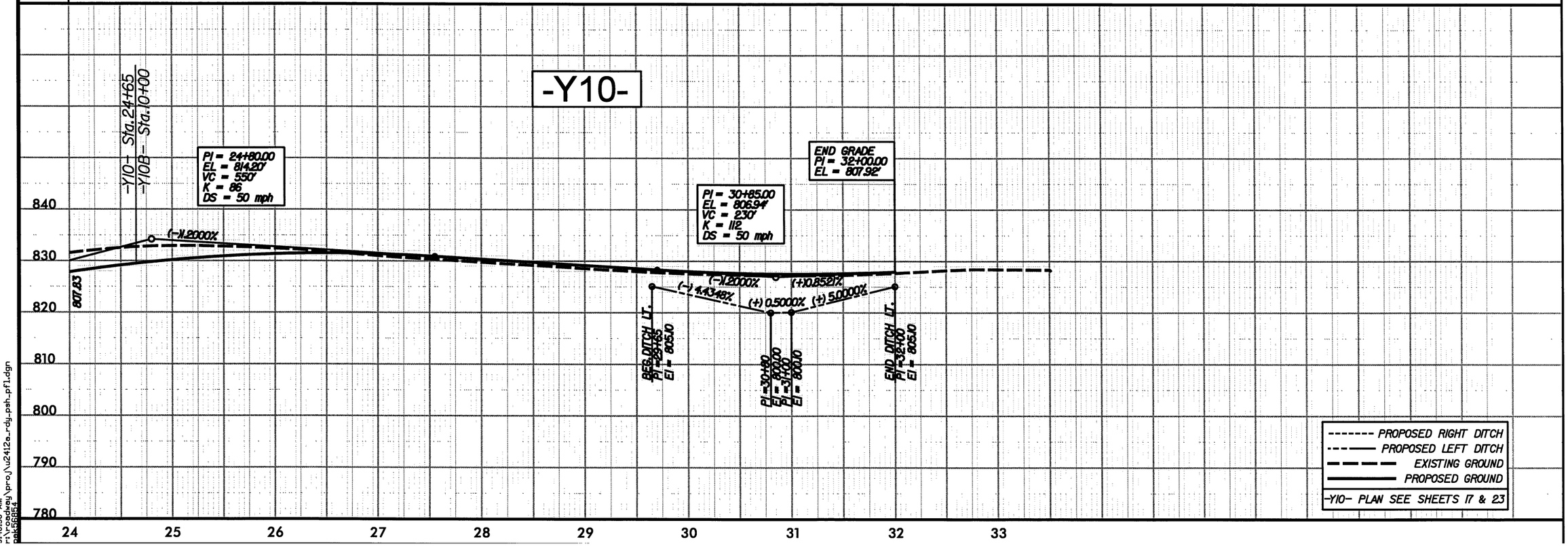
VERTICAL SCALE 5' 0 5' 10'
HORIZONTAL SCALE 25' 0 25' 50'

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 58	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 100	CFS
DESIGN HW ELEVATION	= 788.8	FT
100 YEAR DISCHARGE	= 170	CFS
100 YEAR HW ELEVATION	= 794.9	FT
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 170	CFS
OVERTOPPING ELEVATION	= 795.2	FT





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