STATE OF NORTH CAROLINA
# DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

July 27, 2021

U.S. Army Corps of Engineers
Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, North Carolina 28801

ATTN: Ms. Lori Beckwith
NCDOT Coordinator

Subject: **Request for Modification to Section 404 Individual Permit and 401 Water Quality Certification** for the proposed Rutherfordton Bypass, US 221 south of US 74 Business to North of SR 1366 (Roper Loop Road), Federal Aid Project No. STBG-0024(083), Division 13, TIP Nos. R-2233BB & BA. Debit $570 from WBS 34400.1.S5.

Reference: Section 404 Individual Permit, Action ID: SAW-2008-02857, issued December 4, 2020
401 Water Quality Certification, NCDWR Project No. 20200362, issued June 10, 2020

Dear Madam:

The purpose of the request for modification of the above project is a change in project section boundaries between R-2233BB and R-2233BA which will result in significant cost savings in fill material. The designs of Project R-2233BB are being extended 1,335 LF onto project R-2233BA to take advantage of over 400,000 cubic yards of earthwork in the BA section (that currently does not let to construction until 2027) that otherwise would have been wasted.

R-2233BB is a borrow fill (fill needed) project and R-2233BA is a waste (excess material) project - this extension would allow for a more balanced fill budget for R-2233BB and the reduction of tax dollar expenditure with an estimated savings of $1.4 million.

Grading will be the primary construction activity occurring in the extension. This action will not violate NCDOT's compliance with any Section 106 commitments nor impact any cultural resources sites. In addition, the extension will not affect any residential or business relocations.

This section boundary shift does not result in additional impacts for the overall project. However, it does shift Permit Sites 15 and 16 from the BA section, and places them in the BB section to be included with current construction activities. As such, they have been re-numbered to Sites 19 and 20 to match the BB site number scheme.

Revised permit drawings have been provided to include these new sites, as well as revised preliminary permit drawings for R-2233BA which now no longer include BA Sites 15 and 16, though a phased permit modification for that section will not be pursued until it reaches final design.

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

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

*Location:*
1000 BIRCH RIDGE DRIVE
RALEIGH NC 27610

| Permit Site | Stream Name/ NRTR ID | Status/ Class | Perm. Channel Impacts | Bank Stabilization | Temp. Channel Impacts | ACOE Required Mitigation | DWR Required Mitigation | Impacts Description |
|---|---|---|---|---|---|---|---|---|
| 19 | UT to Stonecutter Creek/SP | Perennial C | 879 | -- | 30 | 879 | 879 | Stream SP will be relocated into a 10‘x 8’ RCBC with impacts from roadway fill to the original streambed. |

| Permit Site | NRTR Site | NC WAM Classification | Wetland Size | Permanent Fill in Wetlands | Excavation in Wetlands | Mechanized Clearing | Hand Clearing | Impact Description |
|---|---|---|---|---|---|---|---|---|
| 20 | WB | Bottomland Hardwood Forest | <0.01 | -- | <0.01 | -- | -- | Roadway fill |

This modification increases the permanent stream impacts in R-2233BB from 4,736 lf to **5,615 lf.**

The preliminary stream impacts in R-2233BA reduced from 5,413 lf to **4,534 lf**.

There will be no Utility impacts in the extension for R-2233BB.

Mitigation has already been secured for R-2233BB and R-2233BA from NCDMS. Since there are no new impacts in the extension, no new mitigation will be requested for this modification.

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Jeff Hemphill at jhemphill@ncdot.gov or (919) 219-8581. A copy of this application and distribution list will also be posted on the NCDOT website at: https://xfer.services.ncdot.gov/pdea/PermApps/.

Sincerely,

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

cc:
NCDOT Permit Application Standard Distribution List.

# Project Submittal Interim Form

Updated September 4, 2020

*Please note: fields marked with a red asterisk * below are required. You will not be able to submit the form until all mandatory questions are answered.*

**Project Type:***

- ○ For the Record Only (Courtesy Copy)
- ○ New Project
- ◉ Modification/New Project with Existing ID
- ○ More Information Response
- ○ Other Agency Comments
- ○ Pre-Application Submittal
- ○ Re-Issuance\Renewal Request
- ○ Stream or Buffer Appeal

## Pre-Filing Meeting Information

Before submitting this form please ensure you have submitted the Pre-Filing Meeting Request Form as we will not be able to accept your application without this important first step. The Pre-Filing Meeting Request Form is used in accordance with 40 C.F.R. Section 121.4(a) "At least 30 days prior to submitting a certification request, the project proponent shall request a pre-filing meeting with the certifying agency" and in accordance with 40 C.F.R. Section 121.5(b)(7), and (c)(5) all certification requests shall include documentation that a pre-filing meeting request was submitted to the certifying authority at least 30 days prior to submitting the certification request. Click **here** to read more information on when this form is needed prior to application submission or **here** to view the form.

**Attach documentation of Pre-Filing Meeting Request here:*** No Prefiling Required 26.21.. Note.pdf

**Date for Meeting Request*** 7/27/2021

**ID#** 20200362 **Version** 1

## Project Contact Information

**Name:** Michael Turchy
Who is submitting the information?

**Email Address:*** maturchy@ncdot.gov

## Project Information

**Existing ID #:***
20200362
20170001 (no dashes)

**Existing Version:***
1
1

**Project Name:*** R-2233 BA and BB

**Is this a public transportation project?***

- (●) Yes
- ( ) No

**Is this a DOT project?** *

- (●) Yes
- ( ) No

**Is the project located within a NC DCM Area of Environmental Concern (AEC)?** *

( ) Yes (●) No ( ) Unknown

| **TIP#:** | **WBS#:** |
|---|---|
| R-2233 BB and BA | 34400.1.S5<br>(Applies to DOT projects only) |

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**County (ies)** *

Rutherford

**Please upload all files that need to be submited.**

Click the upload button or drag and drop files here to attach document

R-2233 BB BA Rutherford Modification July 27 2021.pdf 29.87MB

Only pdf or kmz files are accepted.

**Describe the attachments or add comments:**

* ☑ By checking the box and signing box below, I certify that:

- I, the project proponent, hereby certifies that all information contained herein is true, accurate, and complete to the best of my knowledge and belief.
- I, the project proponent, hereby requests that the certifying authority review and take action on this CWA 401 certification request within the applicable reasonable period of time.
- I agree that submission of this online form is a “transaction” subject to Chapter 66, Article 40 of the NC General Statutes (the “Uniform Electronic Transactions Act”);
- I agree to conduct this transaction by electronic means pursuant to Chapter 66, Article 40 of the NC General Statutes (the “Uniform Electronic Transactions Act”);
- I understand that an electronic signature has the same legal effect and can be enforced in the same way as a written signature; AND
- I intend to electronically sign and submit the online form.

**Signature:** *

Michael Turchy

**Submittal Date:** Is filled in automatically once submitted.

**North Carolina Department of Transportation**

**Highway Stormwater Program**

**STORMWATER MANAGEMENT PLAN**

**FOR NCDOT PROJECTS**

(Version 2.07; Released October 2016)

**WBS Element:** 34400.1.S5 **TIP No.:** R-2233BB **County(ies):** Rutherford 

## General Project Information

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **WBS Element:** | 34400.1.S5 | **TIP Number:** | R-2233BB | **Project Type:** | New Location | **Date:** | 5/27/2021 |
| **NCDOT Contact:** | Matthew York, PE Hydraulics Unit | | | **Contractor / Designer:** | Steven Bondor, PE Dewberry Engineers Inc | | |
| **Address:** | NCDOT Hydraulics Unit<br>1020 Birch Ridge Road<br>Raleigh, NC 27610 | | | **Address:** | Dewberry Engineers Inc.<br>2610 Wycliff Road, Suite 410<br>Raleigh, NC 27607 | | |
| **Phone:** | 919-707-6765 | | | **Phone:** | 919-636-6334 | | |
| **Email:** | mjyork@ncdot.gov | | | **Email:** | sbondor@deqwberry.com | | |
| **City/Town:** | Rutherfordton | | | **County(ies):** | Rutherford | | |
| **River Basin(s):** | Broad | | | **CAMA County?** | No | | |
| **Wetlands within Project Limits?** | Yes | | | | | | |

## Project Description

| | | | |
|---|---|---|---|
| **Project Length (lin. miles or feet):** | 5.01 miles | **Surrounding Land Use:** | Residential, light industrial, rural undeveloped |
| | **Proposed Project** | | **Existing Site** |
| **Project Built-Upon Area (ac.)** | 139 (proposed pavement) ac. | | 60.0 ac. |
| **Typical Cross Section Description:** | The R-2233BB project is new alignment approximately 5 miles long and includes two interchanges. Typical section is four lane divided highway with 46' grass median, paved shoulders and median ditches. | | Two lane shoulder section along existing alignment that will be widened. |
| **Annual Avg Daily Traffic (veh/hr/day):** | Design/Future: 13,300 / 14,500 Year: 2020/2040 | | Existing: 7000 Year: 2016 |
| **General Project Narrative: (Description of Minimization of Water Quality Impacts)** | Roadway runoff flows to grass shouders in fill sections and is collected in median and grass side ditches in cut sections to pipe systems. Pipe systems include riprap pads or energy dissipator basins at outfalls. Two locations include dry detention ponds to reduce post construction runoff to the preconstruction discharge. Ditches include riprap lining where sheat stress exceeds allowable for grass. | | |

## Waterbody Information

| | | | | | |
|---|---|---|---|---|---|
| **Surface Water Body (1):** | Cleghorn Creek Trib 11 | **NCDWR Stream Index No.:** | n/a | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Class C | | |
| | | **Supplemental Classification:** | | | |
| **Other Stream Classification:** | | | | | |
| **Impairments:** | | | | | |
| **Aquatic T&E Species?** | Comments: | | | | |
| **NRTR Stream ID:** | | | | **Buffer Rules in Effect:** | N/A |
| **Project Includes Bridge Spanning Water Body?** | No | **Deck Drains Discharge Over Buffer?** | N/A | **Dissipator Pads Provided in Buffer?** | N/A |
| **Deck Drains Discharge Over Water Body?** | N/A | (If yes, provide justification in the General Project Narrative) | | (If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative) | |
| (If yes, provide justification in the General Project Narrative) | | | | | |



## Additional Waterbody Information

| | | | | | |
|---|---|---|---|---|---|
| **Surface Water Body (2):** | Cleghorn Creek Trib 12 | **NCDWR Stream Index No.:** | | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Class C | | |
| | | **Supplemental Classification:** | | | |
| **Other Stream Classification:** | | | | | |
| **Impairments:** | | | | | |
| **Aquatic T&E Species?** | Comments: | | | | |
| **NRTR Stream ID:** | | | | **Buffer Rules in Effect:** | N/A |
| **Project Includes Bridge Spanning Water Body?** | No | **Deck Drains Discharge Over Buffer?** | N/A | **Dissipator Pads Provided in Buffer?** | N/A |
| **Deck Drains Discharge Over Water Body?** | N/A | (If yes, provide justification in the General Project Narrative) | | (If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative) | |
| (If yes, provide justification in the General Project Narrative) | | | | | |

**North Carolina Department of Transportation**

**Highway Stormwater Program**

**STORMWATER MANAGEMENT PLAN**

**FOR NCDOT PROJECTS**

(Version 2.07; Released October 2016)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **WBS Element:** | 34400.1.S5 | **TIP No.:** | R-2233BB | **County(ies):** | Rutherford | **Page** | **2** | **of** | **4** |

**Additional Waterbody Information**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Surface Water Body (2):** | Cleghorn Creek Trib 12 | | **NCDWR Stream Index No.:** | n/a | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Class C | | | |
| | | **Supplemental Classification:** | | | | |
| **Other Stream Classification:** | | | | | | |
| **Impairments:** | | | | | | |
| **Aquatic T&E Species?** | | Comments: | | | | |
| **NRTR Stream ID:** | | | | **Buffer Rules in Effect:** | N/A | |
| **Project Includes Bridge Spanning Water Body?** | No | **Deck Drains Discharge Over Buffer?** | N/A | **Dissipator Pads Provided in Buffer?** | N/A | |
| **Deck Drains Discharge Over Water Body?** | N/A | (If yes, provide justification in the General Project Narrative) | | (If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative) | | |
| (If yes, provide justification in the General Project Narrative) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Surface Water Body (3):** | Cleghorn Creek | | **NCDWR Stream Index No.:** | 9-26-(0.5) | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Class C | | | |
| | | **Supplemental Classification:** | | | | |
| **Other Stream Classification:** | | | | | | |
| **Impairments:** | | | | | | |
| **Aquatic T&E Species?** | | Comments: | | | | |
| **NRTR Stream ID:** | | | | **Buffer Rules in Effect:** | N/A | |
| **Project Includes Bridge Spanning Water Body?** | No | **Deck Drains Discharge Over Buffer?** | N/A | **Dissipator Pads Provided in Buffer?** | N/A | |
| **Deck Drains Discharge Over Water Body?** | N/A | (If yes, provide justification in the General Project Narrative) | | (If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative) | | |
| (If yes, provide justification in the General Project Narrative) | | | | | | |

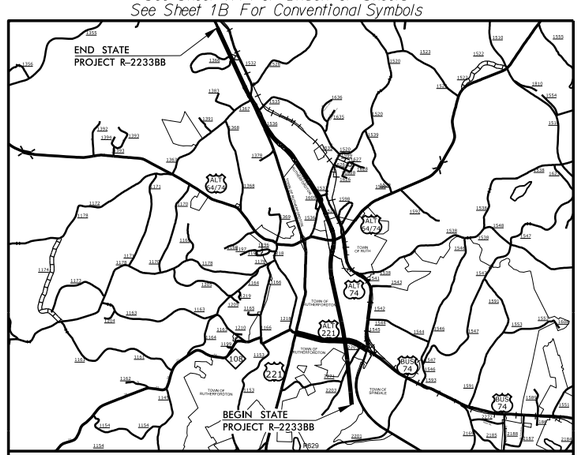
| | | | | | | |
|---|---|---|---|---|---|---|
| **Surface Water Body (4):** | Hollands Creek | | **NCDWR Stream Index No.:** | 9-41-13-7-(1) | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Water Supply V (WS-V) | | | |
| | | **Supplemental Classification:** | | | | |
| **Other Stream Classification:** | | | | | | |
| **Impairments:** | | | | | | |
| **Aquatic T&E Species?** | | Comments: | | | | |
| **NRTR Stream ID:** | | | | **Buffer Rules in Effect:** | N/A | |
| **Project Includes Bridge Spanning Water Body?** | No | **Deck Drains Discharge Over Buffer?** | N/A | **Dissipator Pads Provided in Buffer?** | N/A | |
| **Deck Drains Discharge Over Water Body?** | N/A | (If yes, provide justification in the General Project Narrative) | | (If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative) | | |
| (If yes, provide justification in the General Project Narrative) | | | | | | |

09/08/99

TIP PROJECT: R-2233BB

CONTRACT: C204397

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols




VICINITY MAP

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

# RUTHERFORD COUNTY

PERMIT DRAWING
SHEET 1 OF 37

Revised
7/1/2021

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | R-2233BB | 1 | |

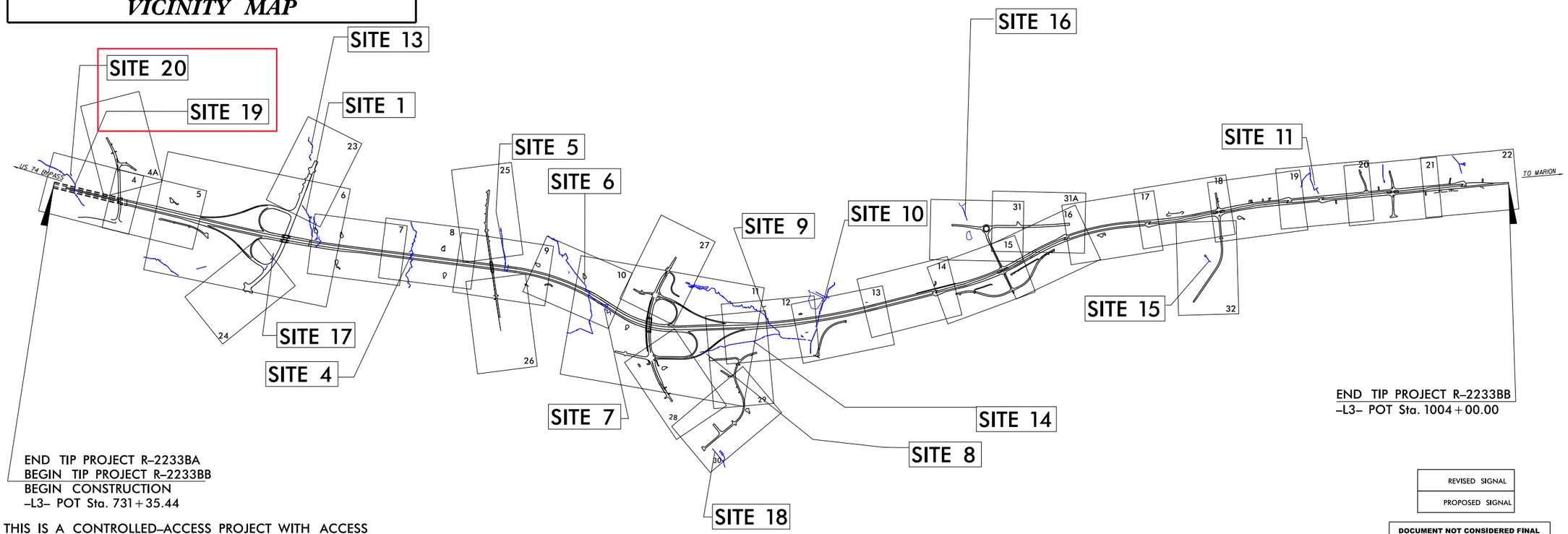
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 34400.1.S5 | | PE |
| 34400.2.5 | | R/W |
| 34400.2.7 | | UTIL. |
| 34400.3.4 | | CONST. |

*LOCATION: US 221 SOUTH OF US 74 BUSINESS (CHARLOTTE ROAD) TO NORTH OF SR 1366 (ROPER LOOP ROAD)*

*TYPE OF WORK: GRADING, DRAINAGE, PAVING, RETAININ AND STRUCTURES*

WETLAND AND SURFACE WATER IMPACTS PERMIT

NAD 83/NA 2011




END TIP PROJECT R-2233BA
BEGIN TIP PROJECT R-2233BB
BEGIN CONSTRUCTION
–L3– POT Sta. 731+35.44

END TIP PROJECT R-2233BB
–L3– POT Sta. 1004+00.00

| REVISED SIGNAL |
|---|
| PROPOSED SIGNAL |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

THIS IS A CONTROLLED–ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.
THIS IS A PARTIAL CONTROLLED–ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

NCDOT CONTACT: NATHAN ADIMA, P.E.

## 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 2020 = 13300
ADT 2040 = 14500
K = 9 %
D = 60 %
T = 9 % *
V = 70 MPH
* TTST 5% DUAL 4%
FUNC CLASS =
ARTERIAL
REGIONAL TIER

## PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2233BB = 5.140 MILES
LENGTH STRUCTURE TIP PROJECT R-2233BB = 0.026 MILES
TOTAL LENGTH TIP PROJECT R-2233BB = 5.166 MILES

STRUCTURE LENGTH BASED ON –L3– NB STATIONING.

## PLANS PREPARED FOR NCDOT BY:

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

*2018 STANDARD SPECIFICATIONS*

*RIGHT OF WAY DATE:*
JULY 28, 2017

*LETTING DATE:*
DECEMBER 21, 2021

DENNIS J. MORY, P.E.
*PROJECT ENGINEER*

BRYAN LAMBETH, P.E.
*PROJECT DESIGN ENGINEER*

*HYDRAULICS ENGINEER*

*SIGNATURE:* *P.E.*

*ROADWAY DESIGN ENGINEER*

*SIGNATURE:* *P.E.*

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

10/25/2017
DEWBERRY
R2233BB_Permit Drawings_20171025.pdf

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

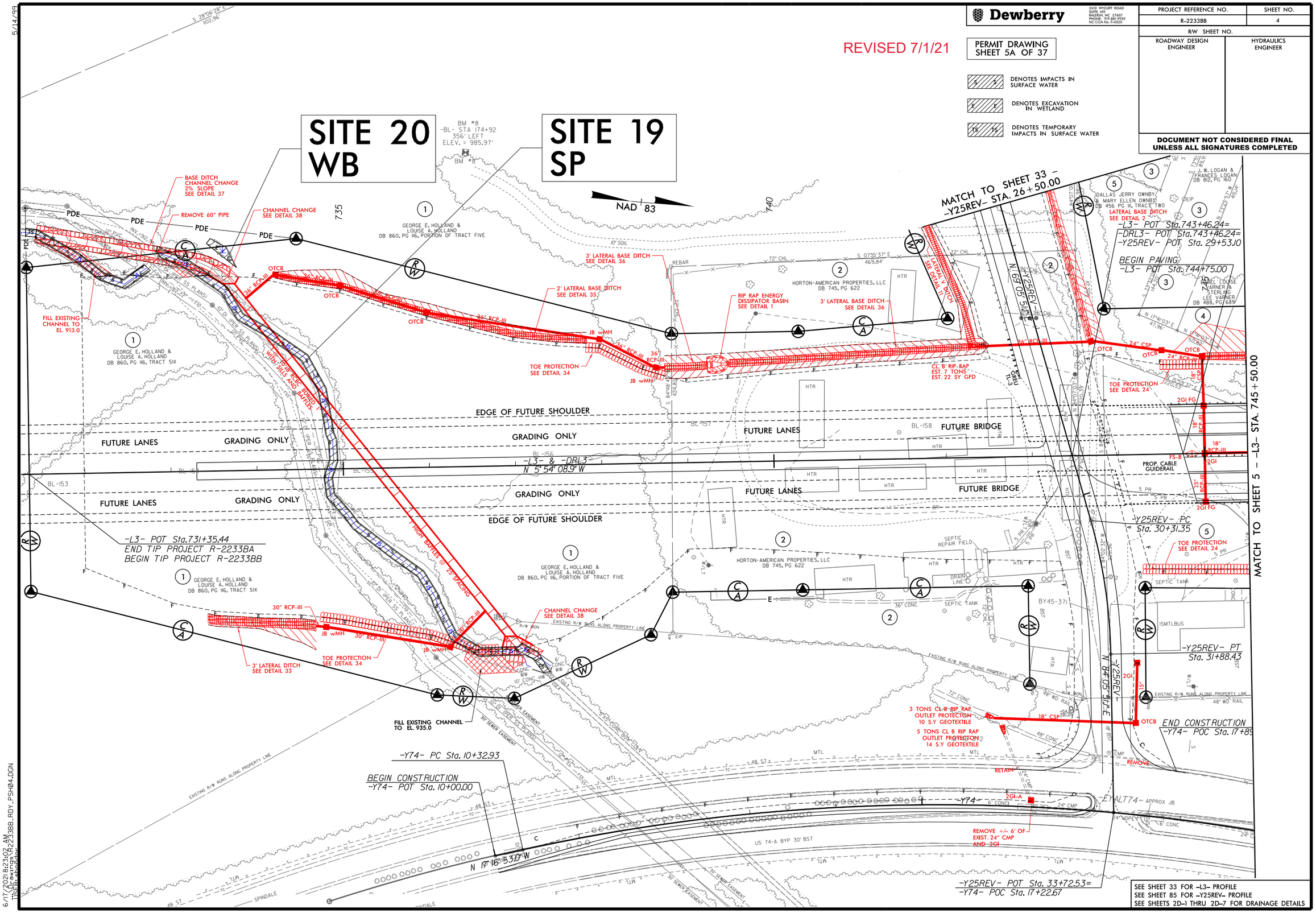
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 4 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

REVISED 7/1/21

PERMIT DRAWING
SHEET 5A OF 37

S S — DENOTES IMPACTS IN SURFACE WATER
E E — DENOTES EXCAVATION IN WETLAND
TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER




SEE SHEET 33 FOR -L3- PROFILE
SEE SHEET 85 FOR -Y25REV- PROFILE
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS

5/14/99
6/17/2021 8:23:02 AM
R-2233BB_RDY_PSH04.DGN

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

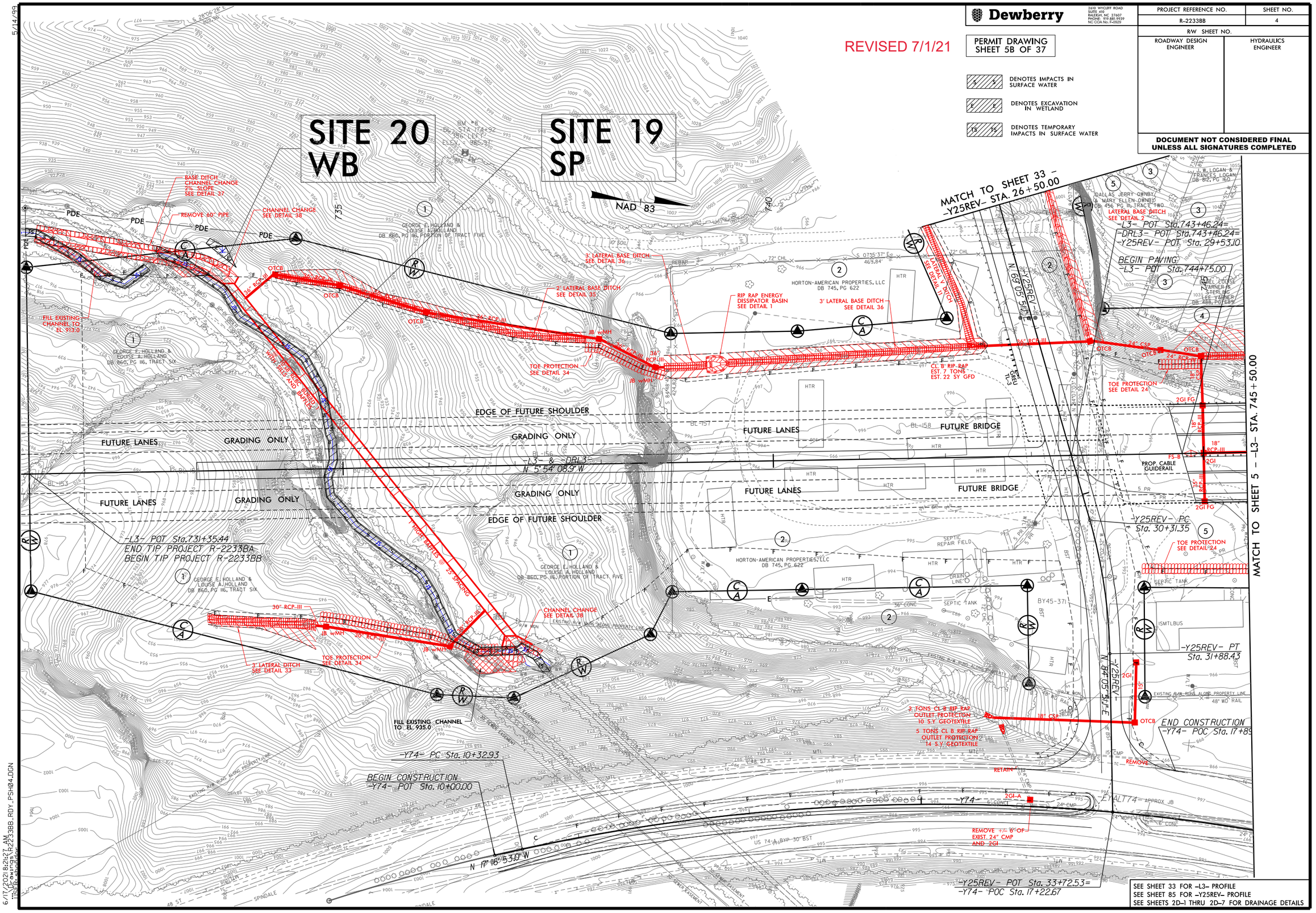
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 4 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

REVISED 7/1/21

PERMIT DRAWING
SHEET 5B OF 37

S S — DENOTES IMPACTS IN SURFACE WATER
E E — DENOTES EXCAVATION IN WETLAND
TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER




5/14/99

6/17/2021 8:26:27 AM
R2233BB_RDY_PSH04.DGN
USER: swinegar

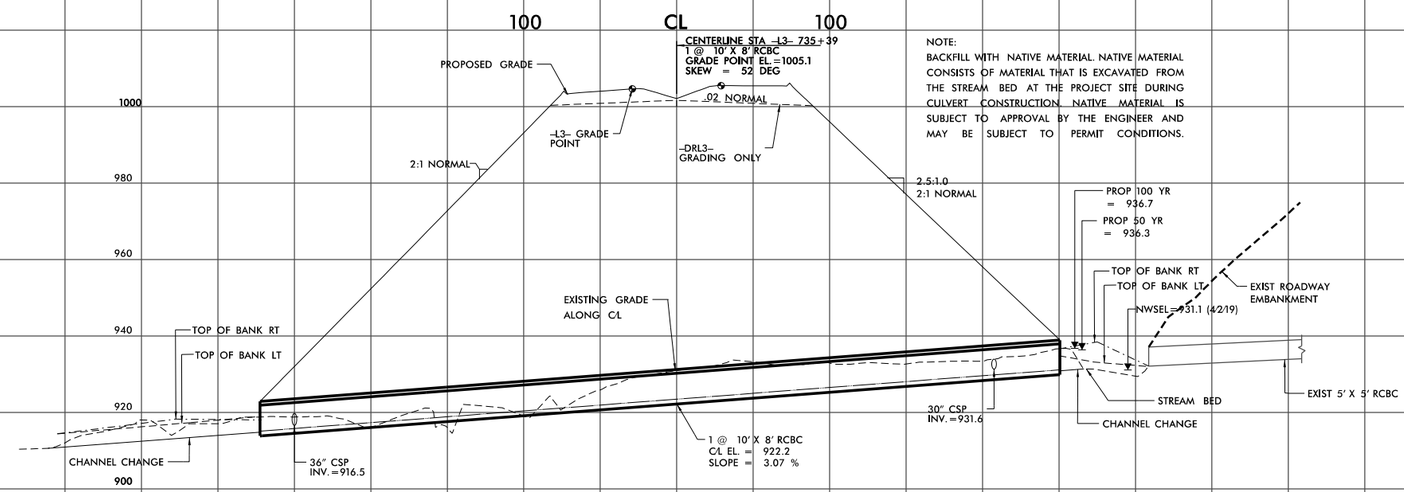
5/14/99

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

# PERMIT DRAWING SHEET 5C OF 37

REVISED 7/1/21

## SITE 19 SP




NOTE:
BACKFILL WITH NATIVE MATERIAL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

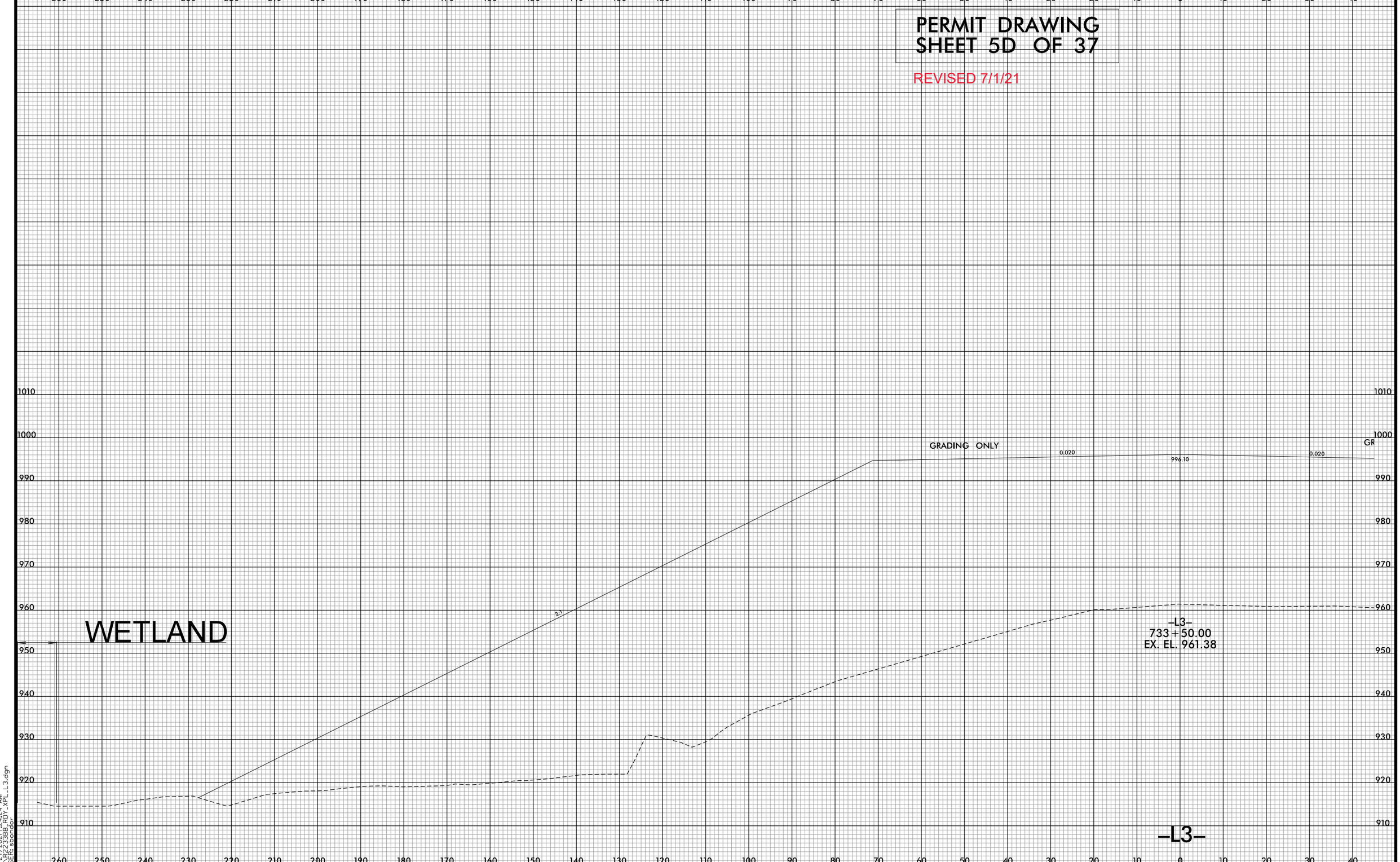
6/23/16

| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | X-4B |

0 5 10

# PERMIT DRAWING
# SHEET 5D OF 37

REVISED 7/1/21




5/27/2021 7:24:24 AM
USER: ASCOTT
DGN: 2388_RD1_XPL_L3.dgn

## WETLAND AND SURACE WATER IMPACTS SUMMARY

| | | | | WETLAND IMPACTS | | | | | SURFACE WATER IMPACTS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site No. | JD ID | 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 | SN | L3 778+97 TO 779+40 LT | ROADWAY FILL | | | | | | < 0.01 | < 0.01 | 43 | 34 | |
| 1 | SN | Y2 22+05 LT | 48" Pipe | | | | | | < 0.01 | < 0.01 | 24 | 14 | |
| 4 | SL | L3 797+64 TO 798+03 LT | CHANNEL REALIGNMENT | | | | | | 0.01 | < 0.01 | 96 | 18 | |
| 4 | SL/SM | L3 797+66 | 10' X 7' RCBC | | | | | | 0.09 | | 766 | | |
| 4 | SL | L 797+63 TO 798+0 RT | CHANNEL REALIGNMENT | | | | | | < 0.01 | | 43 | | |
| 4 | SL | L3 797+63 TO 797+70 RT | V DITCH | | | | | | < 0.01 | < 0.01 | 10 | 7 | |
| 5 | SK | L3 814+76 LT TO 814+87 LT | BANK STABILIZATION | | | | | | < 0.01 | < 0.01 | 10 | 17 | |
| 5 | SK | L3 814+76 LT TO 815+43 RT | ROADWAY FILL/30" CSP | | | | | | 0.02 | | 112 | | |
| 5 | SJ | L3 815+11 TO 815+46LT | ROADWAY FILL | | | | | | < 0.01 | < 0.01 | 28 | 21 | |
| 6 | SI | L3 828+19 TO 828+28 LT | BANK STABILIZATION | | | | | | < 0.01 | < 0.01 | 11 | 9 | |
| 6 | SI | L3 830+00 | 8' X 6' RCBC | | | | | | 0.06 | | 670 | | |
| 6 | SI | L3 832+25 TO 832+56 RT | CL. II RIPRAP ON BANKS | | | | | | < 0.01 | < 0.01 | 34 | 18 | |
| 7 | SH | L3 831+35 TO 836+42 RT | ROADWAY FILL | | | | | | 0.11 | | 832 | | |
| 8 | SG | RPD 22+04 RT TO 18+22 LT | ROADWAY FILL | | | | | | 0.05 | | 445 | | |
| 8 | WA | RPD 17+38 TO 22+04 LT | ROADWAY FILL | 0.11 | | | | | | | | | |
| 8 | SG | RPD 18+26 TO 18+08 LT | 36" PIPE | | | | | | < 0.01 | | 32 | | |
| 8 | SG | RPD 18+08 TO 17+76 LT | CL. II RIPRAP ON BANKS | | | | | | < 0.01 | < 0.01 | 25 | 20 | |
| 9 | SF | L3 864+92 LT | BANK STABILIZATION | | | | | | < 0.01 | < 0.01 | 14 | 8 | |
| 9 | SF | L3 866+00 | 54" RCP-V | | | | | | 0.01 | | 140 | | |
| 9 | SF | L3 867+00 TO 867+28 RT | RIIP RAP ENERGY DISSIPATOR BASIN/CL. I RIP RAP IN CHANNEL | | | | | | < 0.01 | < 0.01 | 55 | 7 | |
| 10 | SE | L3 875+24 LT | FLOODPLAIN BENCH | | | | | | 0.01 | < 0.01 | 72 | 19 | |
| 10 | SE | L3 874+42 | 3 - 10' X 10' RCBC | | | | | | 0.05 | | 217 | | |
| 10 | SE | L3 874+16 RT | FLOODPLAIN BENCH | | | | | | 0.01 | | 45 | | |
| 10 | SE | L3 873+90 RT | REMOVAL OF EXISTING CULVERT | | | | | | | 0.01 | | 51 | |
| 11 | SB | L3 968+69 TO 968+88 LT | BANK STABILIZATION | | | | | | < 0.01 | < 0.01 | 10 | 27 | |
| 11 | SB | L3 968+64 | 36" STEEL PIPE | | | | | | < 0.01 | | 151 | | |
| 13 | SO | Y2 15+24 RT | CL. II RIPRAP | | | | | | 0.02 | < 0.01 | 35 | 19 | |
| 14 | SG | Y6 10+23 RT | BANK STABILIZATION | | | | | | < 0.01 | < 0.01 | 10 | 24 | |
| 15 | SC | Y11 22+50 LT | BANK STABILIZATION | | | | | | < 0.01 | < 0.01 | 22 | 14 | |
| 15 | SC | Y11 22+80 | 42" CSP | | | | | | 0.05 | | 506 | | |
| 15 | SC | Y11 19+88 RT | LATERAL V DITCH | | | | | | < 0.01 | < 0.01 | 14 | 19 | |
| 16 | SD | Y8 17+18 LT | RIP RAP ENEGY DISSIPATOR/CL. B RIPRAP LINING CHANNEL | | | | | | < 0.01 | < 0.01 | 52 | 10 | |
| 16 | SD | Y8 18+04 | 60" PIPE | | | | | | < 0.01 | | 38 | | |
| 16 | SD | Y10 15+63 RT | LATERAL V DITCH | | | | | | < 0.01 | < 0.01 | 18 | 12 | |
| 17 | SO | Y2 33+41 TO 34+50 RT | ROADWAY FILL | | | | | | 0.01 | | 143 | | |
| 18 | N/A | Y6 32+02 TO 32+09 LT | BANK STABILIZATION | | | | | | < 0.01 | < 0.01 | 13 | 12 | |
| 19 | SP | L3 733+34 LT TO 736+81 RT | 10' X 8' RCBC | | | | | | 0.14 | | 605 | | |
| 19 | SP | L3 731+47 TO 732+16 LT | CHANNEL REALIGNMENT | | | | | | 0.02 | | 92 | | |
| 19 | SP | L3 732+16 TO 732+71 LT | ROADWAY FILL | | | | | | 0.01 | | 60 | | |
| 19 | SP | L3 732+71 TO 733+34 LT | CHANNEL REALIGNMENT | | | | | | 0.02 | | 76 | | |
| 19 | SP | L3 731+22 TO 731+47 LT | CHANNEL REALIGNMENT | | | | | | | < 0.01 | | 12.0 | |
| 19 | SP | L3 736+81 TO 737+26 RT | CHANNEL REALIGNMENT | | | | | | 0.01 | | 46 | | |
| 19 | SP | L3 737+26 TO 737+36 RT | CHANNEL REALIGNMENT | | | | | | | < 0.01 | | 18.0 | |
| 20 | WB | L3 733+46 LT TO 733+80 LT | CHANNEL REALIGNMENT | | | < 0.01 | | | | | | | |
| TOTALS*: | | | | 0.11 | | < 0.01 | | | 0.77 | 0.06 | 5615 | 411 | 0 |

*Rounded totals are sum of actual impacts

NOTES:
Site 4 SL/SM is comprised of both the main jurisdictional stream and a trib to the left of the main stem.
Site 7 begin on sheet 16 of 37. The stream is completely covered by roadway. The drainage that would have gone to the stream is being picked up in the proposed lateral V ditch to the right of L3.
Site 17 is a small area between piped streams that has been covered up by the roadway.
Site 2,3, and 12 have been removed due to those sites not being jurisdictional.
Site 18 was not in the original JD file, therefore it never received a JD ID. During the 4C meeting, it was agreed upon to keep the impact site.

Revised 2016 09 09

NC DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS
6/25/2021
RUTHERFORD
R-2233BB



REVISED 7/1/21

# R-2233 BA Revised Preliminary Permit Drawings

*Sites 15 & 16 removed*

**North Carolina Department of Transportation**

**Highway Stormwater Program**

**STORMWATER MANAGEMENT PLAN**

**FOR NCDOT PROJECTS**

(Version 2.07; Released October 2016)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **WBS Element:** | 34400.1.S5 | **TIP No.:** | R-2233BA | **County(ies):** | Rutherford | **Page** | 1 | **of** | 4 |

## General Project Information

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **WBS Element:** | 34400.1.S5 | **TIP Number:** | R-2233BA | **Project Type:** | New Location | **Date:** | 6/14/2021 |
| **NCDOT Contact:** | Michelle Berry, PE Hydraulics Unit | | | **Contractor / Designer:** | Steven Bondor, PE Dewberry Engineers Inc | | |
| **Address:** | NCDOT Hydraulics Unit<br>1000 Birch Ridge Road<br>Raleigh, NC 27610 | | | **Address:** | Dewberry Engineers Inc.<br>2610 Wycliff Road, Suite 410<br>Raleigh, NC 27607 | | |
| **Phone:** | 919-707-6719 | | | **Phone:** | 919-636-6334 | | |
| **Email:** | mgberry@ncdot.gov | | | **Email:** | sbondor@dewberry.com | | |
| **City/Town:** | Rutherfordton | | | **County(ies):** | Rutherford | | |
| **River Basin(s):** | Broad | | | **CAMA County?** | No | | |
| **Wetlands within Project Limits?** | Yes | | | | | | |

## Project Description

| | | | |
|---|---|---|---|
| **Project Length (lin. miles or feet):** | 3.8 miles | **Surrounding Land Use:** | Residential, light industrial, rural undeveloped |

| | **Proposed Project** | **Existing Site** |
|---|---|---|
| **Project Built-Upon Area (ac.)** | 40 (proposed pavement) ac. | 12.0 ac. |
| **Typical Cross Section Description:** | The R-2233BA project is new alignment approximately 3.8 miles long and includes one interchange. Typical section is four lane divided highway with grass median, paved shoulders, and median ditches. | Existing alignment to be widened includes four lane divided and two lane shoulder sections. Existing Y lines crossing the project corridor are shoulder sections. |
| **Annual Avg Daily Traffic (veh/hr/day):** | Design/Future: 10,400 / 12,900 Year: 2022/2040 | Existing: 7000 Year: 2016 |

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

Roadway runoff flows to grass shouders in fill sections and is collected in median and grass side ditches in cut sections to pipe systems. Pipe systems include riprap pads at outfalls. Two locations include dry detention ponds to reduce post construction runoff to the preconstruction discharge. Ditches include riprap lining where shear stress exceeds allowable for grass. The project inlcudes four box culverts and one bridge that cross jurisdictional streams. Pipe systems were minimized in length and riprap ditches were utilized to maximum extent possible t oavoide direct discharge from pipe systems. Fill slopes 2:1 used to minimize wetland impact.

## Waterbody Information

| | | | | | |
|---|---|---|---|---|---|
| **Surface Water Body (1):** | LONG BRANCH | **NCDWR Stream Index No.:** | 9-37-1 | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Class C | | |
| | | **Supplemental Classification:** | | | |
| **Other Stream Classification:** | | | | | |
| **Impairments:** | | | | | |
| **Aquatic T&E Species?** | | Comments: | | | |
| **NRTR Stream ID:** | | | **Buffer Rules in Effect:** | N/A | |
| **Project Includes Bridge Spanning Water Body?** | No | **Deck Drains Discharge Over Buffer?** | N/A | **Dissipator Pads Provided in Buffer?** | N/A |
| **Deck Drains Discharge Over Water Body?** | N/A | (If yes, provide justification in the General Project Narrative) | | (If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative) | |
| (If yes, provide justification in the General Project Narrative) | | | | | |

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

| WBS Element: | 34400.1.S5 | TIP No.: | R-2233BA | County(ies): | Rutherford | Page | 2 | of | 4 |
|---|---|---|---|---|---|---|---|---|---|

## Additional Waterbody Information

| | | | | | | |
|---|---|---|---|---|---|---|
| **Surface Water Body (2):** | Cleghorn Creek | | **NCDWR Stream Index No.:** | 9-26-(0.5) | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Class C | | | |
| | | **Supplemental Classification:** | | | | |
| **Other Stream Classification:** | | | | | | |
| **Impairments:** | | | | | | |
| **Aquatic T&E Species?** | | Comments: | | | | |
| **NRTR Stream ID:** | | | | **Buffer Rules in Effect:** | N/A | |
| **Project Includes Bridge Spanning Water Body?** | No | **Deck Drains Discharge Over Buffer?** | N/A | **Dissipator Pads Provided in Buffer?** | N/A | |
| **Deck Drains Discharge Over Water Body?** | N/A | (If yes, provide justification in the General Project Narrative) | | (If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative) | | |
| (If yes, provide justification in the General Project Narrative) | | | | | | |

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

| | | | | | | |
|---|---|---|---|---|---|---|
| **Surface Water Body (4):** | STONECUTTER CREEK | | **NCDWR Stream Index No.:** | 9-26-1 | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Class C | | | |
| | | **Supplemental Classification:** | | | | |
| **Other Stream Classification:** | | | | | | |
| **Impairments:** | | | | | | |
| **Aquatic T&E Species?** | | Comments: | | | | |
| **NRTR Stream ID:** | | | | **Buffer Rules in Effect:** | N/A | |
| **Project Includes Bridge Spanning Water Body?** | Yes | **Deck Drains Discharge Over Buffer?** | N/A | **Dissipator Pads Provided in Buffer?** | N/A | |
| **Deck Drains Discharge Over Water Body?** | No | (If yes, provide justification in the General Project Narrative) | | (If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative) | | |
| (If yes, provide justification in the General Project Narrative) | | | | | | |

North Carolina Department of Transportation

Highway Stormwater Program

**STORMWATER MANAGEMENT PLAN**

**FOR NCDOT PROJECTS**

(Version 2.07; Released October 2016)

**WBS Element:** **TIP No.:** R-2233BA **County(ies):** Rutherford 

## Preformed Scour Holes and Energy Dissipators

| Sheet No. | Station & Coordinates (Road and Non Road Projects) | Surface Water Body | Energy Dissipator Type | Riprap Type | Drainage Area (ac) | Conveyance Structure | Pipe/Structure Dimensions (in) | Q10 (cfs) | V10 (fps) | BMP Associated w/ Buffer Rules? |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | L3 555+70 RT<br>35.312211/ -81.925566 | (1)UT to LONG BRANCH | Riprap Energy Dissipator Basin | Class I | 9.7 | Ditch | 3' BASE LAT DITCH | 28.0 | 2.2 | No |
| 14 | L3 688+50 LT<br>35.3411112/ -81.945020 | (4)STONECUTTER CREEK | Riprap Energy Dissipator Basin | Class I | 9.0 | Pipe | 30" RCP | 23.0 | 2.0 | No |
| 15 | L3 688+50 LT<br>35.345175/ -81.944245 | (4)STONECUTTER CREEK | Riprap Energy Dissipator Basin | Class I | 10.4 | Pipe | 30" RCP | 36.0 | 2.4 | No |
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**Additional Comments**

* Refer to the NCDOT Best Management Practices Toolbox (2014), NCDOT Standards, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and criteria.

North Carolina Department of Transportation

Highway Stormwater Program

**STORMWATER MANAGEMENT PLAN**

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

**WBS Element:** 34400.1.S5 **TIP No.:** R-2233BA **County(ies):** Rutherford 

## Other Best Management Practices

| Sheet No. | Station & Coordinates (Road and Non Road Projects) | Surface Water Body | BMP Type | Drainage Area (ac) | New Built-Upon Area (ac) | Volume Treated (ac-ft) | Precipitation Depth Treated over NBUA (in) | BMP Associated w/ Buffer Rules? |
|---|---|---|---|---|---|---|---|---|
| 10 | L 622+35 RT<br>35.323142/ -81.942072 | (2)UT to Cleghorn Creek | Dry Detention Basin | 12.5 | 3.6 | 0.3 | 1.05 | No |
| 12 | SR1 17+80 RT<br>35.335175/ -81.944949 | (3)UT to STONECUTTE | Dry Detention Basin | 8.7 | 1.8 | 0.17 | 1.19 | No |
| | | | | | | | | |
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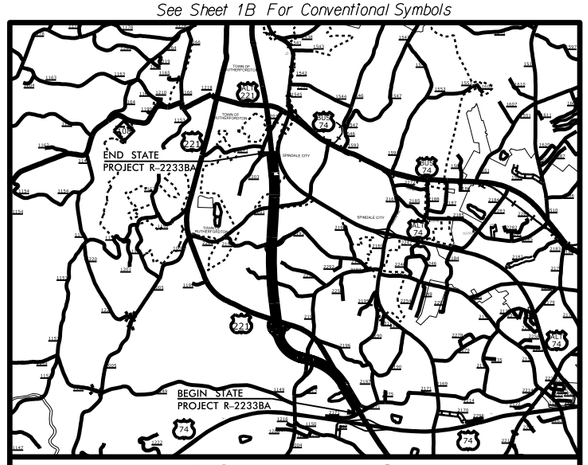
**Additional Comments**

TIP PROJECT: R-2233BA

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols




VICINITY MAP

ROW PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

# RUTHERFORD COUNTY

PERMIT DRAWING
SHEET 1 OF 26

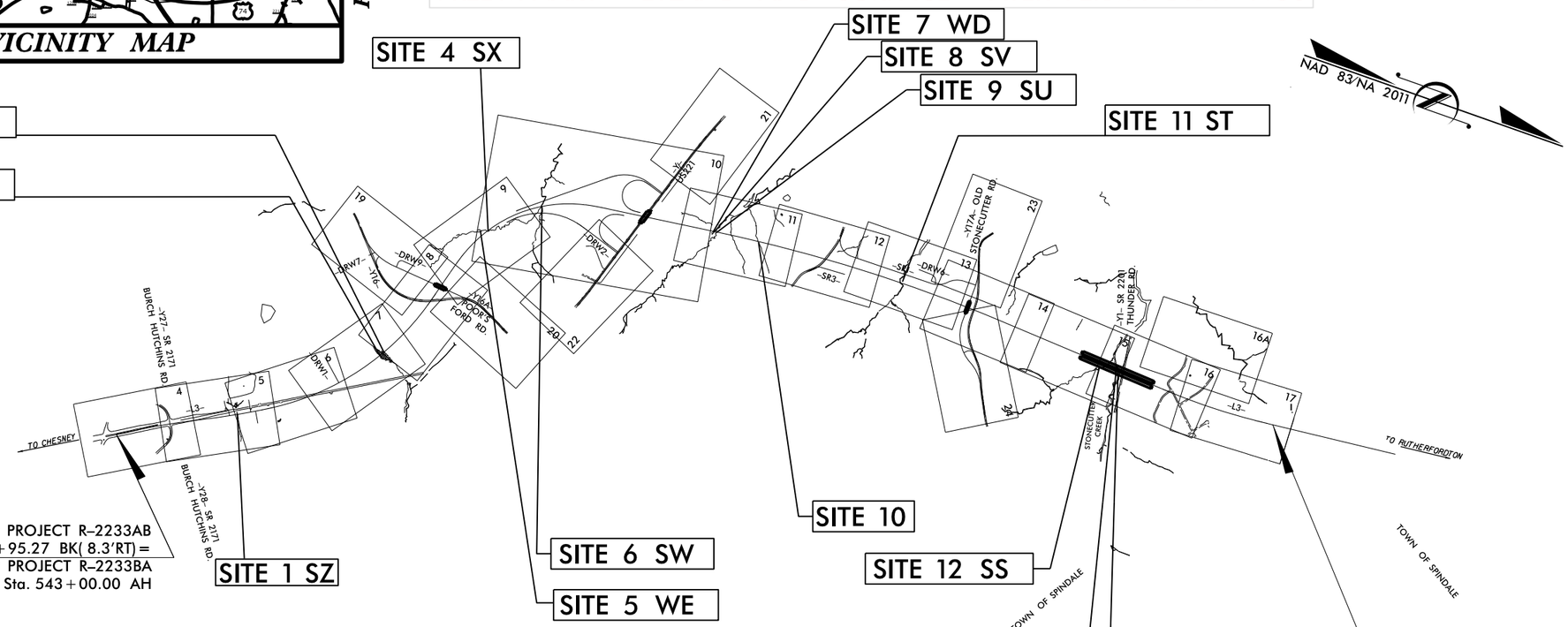
| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | R-2233BA | 1 | |

| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 34400.1.S5 | | PE |
| 34400.2.S5 | | R/W & UTIL |

LOCATION: RUTHERFORDTON BYPASS FROM US 74 BYPASS TO US 221 SOUTH OF US 74 BUSINESS (CHARLOTTE ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURES

PRELIMINARY WETLAND AND SURFACE WATER PERMIT DRAWINGS




END TIP PROJECT R-2233AB
-L- POT Sta. 565+95.27 BK( 8.3'RT) =
BEGIN TIP PROJECT R-2233BA
-L3- POT Sta. 543+00.00 AH

-L3- POT Sta. 731+35.44
END TIP PROJECT R-2233BA
BEGIN TIP PROJECT R-2233BB

A PORTION OF THIS PROJECT IS FULL CONTROLLED-ACCESS WITH ACCESS BEING LIMITED TO INTERCHANGES.
A PORTION OF THIS PROJECT IS PARTIAL CONTROLLED-ACCESS WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.
A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF SPINDALE.

**INCOMPLETE PLANS**
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NCDOT CONTACT: NATHAN ADIMA, P.E.

CONTRACT:

**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 2022 = 10400
ADT 2040 = 12900
K = 8 %
D = 55 %
T = 7 % *
V = 70 MPH
* TTST 2% DUAL 5%
FUNC CLASS =
ARTERIAL
REGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT R-2233BA = 3.616 MILES
LENGTH STRUCTURE TIP PROJECT R-2233BA = 0.205 MILES
TOTAL LENGTH TIP PROJECT R-2233BA = 3.821 MILES

STRUCTURE LENGTH BASED ON -L3- NB STATIONING.

**PLANS PREPARED FOR NCDOT BY:**

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
DECEMBER 18, 2020

LETTING DATE:
JUNE 21, 2022

DENNIS J. MORY, P.E.
PROJECT ENGINEER

BRYAN LAMBETH, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

09/08/99

5/26/2020
DWBERRY
R2233BA_Permit Drawings_20200526.pdf

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | 5 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

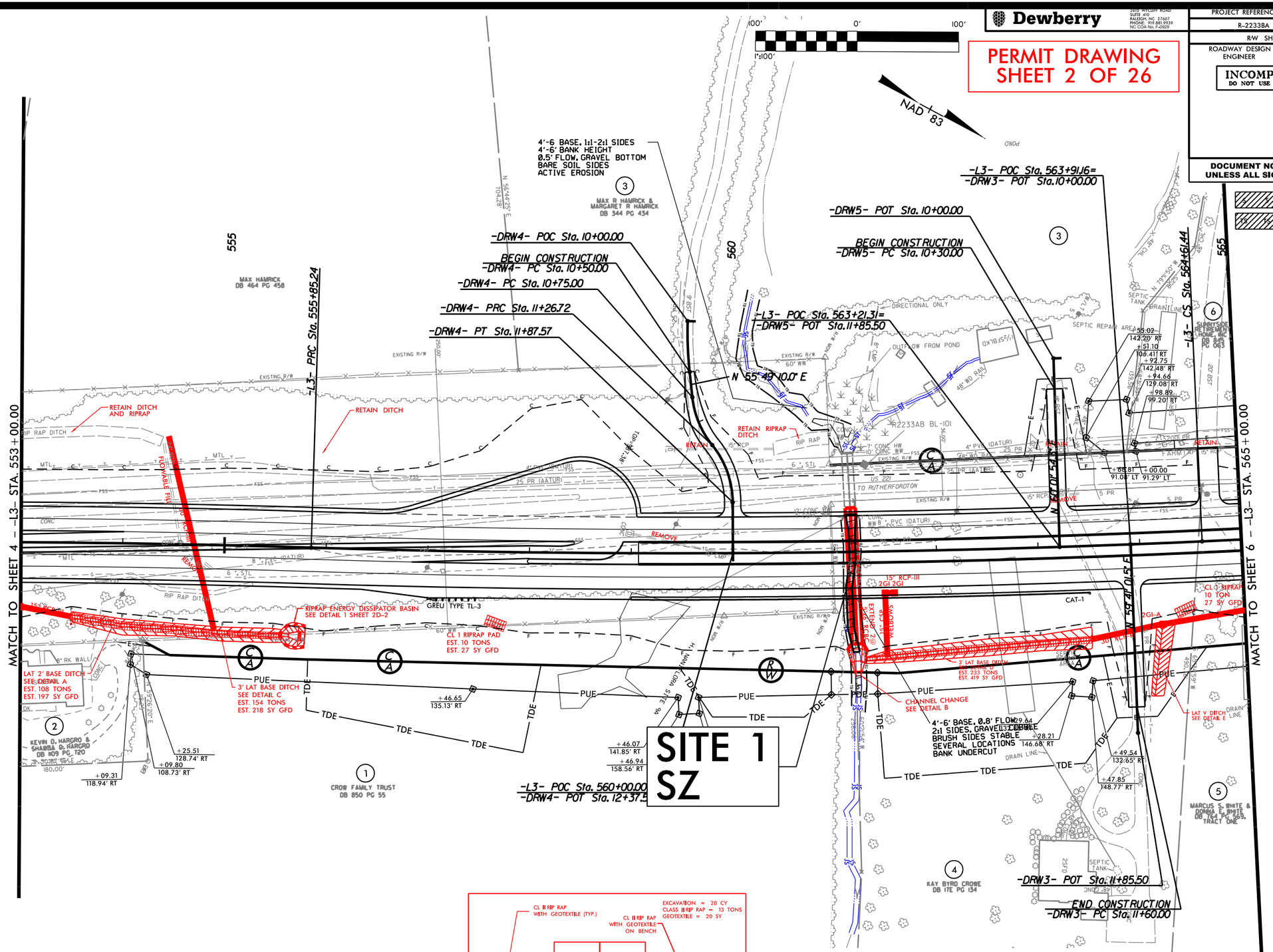
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

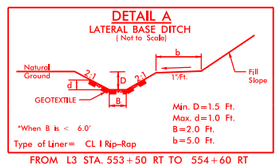
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 2 OF 26

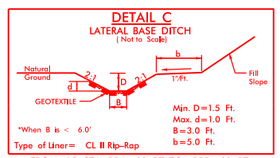
DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

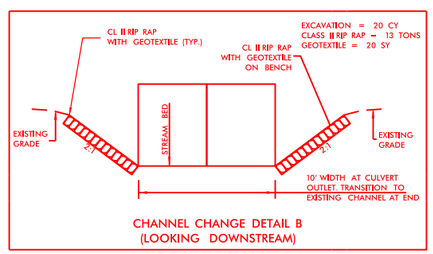


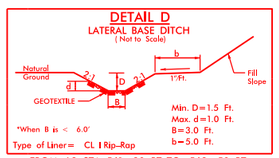




FROM L3 STA. 553+50 RT TO 554+60 RT

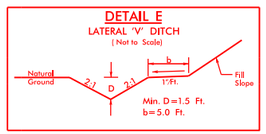



FROM L3 STA. 554+60 RT TO 555+60 RT




FROM L3 STA. 561+30 RT TO 563+50 RT




FROM DRW3 STA. 10+80 LT TO 11+50 LT


SEE SHEET 26 FOR –L3– PROFILE
SEE SHEET 51 FOR –DRW3– PROFILE
SEE SHEET 52 FOR –DRW4– PROFILE
SEE SHEET 52 FOR –DRW5– PROFILE
SEE SHEET 2B-2 FOR INTERSECTION DETAILS


5/14/99

5/26/2020
Dewberry
R2233BA Permit Drawings 20200526.pdf

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | 5 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 3 OF 26

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

1"=100'

NAD 83

4'-6' BASE, 1:1-2:1 SIDES
4'-6' BANK HEIGHT
0.5' FLOW, GRAVEL BOTTOM
BARE SOIL SIDES
ACTIVE EROSION

-L3- POC Sta. 563+91.16=
-DRW3- POT Sta. 10+00.00

-DRW5- POT Sta. 10+00.00

BEGIN CONSTRUCTION
-DRW5- PC Sta. 10+30.00

-DRW4- POC Sta. 10+00.00

BEGIN CONSTRUCTION
-DRW4- PC Sta. 10+50.00

-DRW4- PC Sta. 10+75.00

-DRW4- PRC Sta. 11+26.72

-DRW4- PT Sta. 11+87.57

-L3- POC Sta. 563+21.31=
-DRW5- POT Sta. 11+85.50

-L3- PRC Sta. 555+85.24

-L3- CS Sta. 564+61.44

N 55° 49' 10.0" E

MATCH TO SHEET 4 – -L3- STA. 553+00.00

MATCH TO SHEET 6 – -L3- STA. 565+00.00

RETAIN DITCH AND RIPRAP

RETAIN DITCH

RETAIN RIPRAP DITCH

REMOVABLE FILL

REMOVE

RIPRAP ENERGY DISSIPATOR BASIN
SEE DETAIL 1 SHEET 2D-2

GREU TYPE TL-3

CL I RIPRAP PAD
EST. 10 TONS
EST. 27 SY GFD

LAT 2' BASE DITCH
SEE DETAIL A
EST. 108 TONS
EST. 197 SY GFD

3' LAT BASE DITCH
SEE DETAIL C
EST. 154 TONS
EST. 218 SY GFD

3' LAT BASE DITCH
EST. 233 TONS
EST. 419 SY GFD

CHANNEL CHANGE
SEE DETAIL B

4'-6' BASE, 0.8' FLOW
2:1 SIDES, GRAVEL BOTTOM
BRUSH SIDES STABLE
SEVERAL LOCATIONS
BANK UNDERCUT

CL II RIPRAP
10 TON
27 SY GFD

LAT Y DITCH
SEE DETAIL E

15" RCP-III
2GI 2GI

2GI-A

CAT-1

SITE 1
SZ

-L3- POC Sta. 560+00.00
-DRW4- POT Sta. 12+37.5

-DRW3- POT Sta. 11+85.50

END CONSTRUCTION
-DRW3- PC Sta. 11+60.00

KEVIN D. HARGRO & SHAWNA D. HARGRO
DB 1109 PG 720

CROOR FAMILY TRUST
DB 850 PG 55

MAX HAMRICK
DB 464 PG 458

MAXER HAMRICK & MARGARET R HAMRICK
DB 344 PG 434

KAY BYRD CROBE
DB 1TE PG 134

MARCUS S. WHITE & DONNA S. WHITE
DB 1164 PG 594
TRACT ONE

SEPTIC REPAIR AREA

SEPTIC TANK

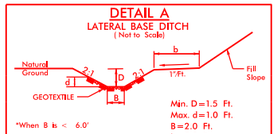
DRAIN LINE

R-2233AB BL-101

US 221
TO RUTHERFORDTON

S 19°40'46" E

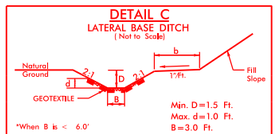
## DETAIL A
LATERAL BASE DITCH
( Not to Scale)




*When B is < 6.0'
Min. D=1.5 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.
Type of Liner= CL I Rip-Rap

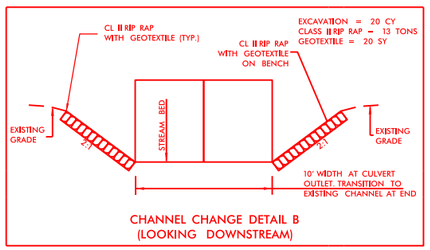
FROM L3 STA. 553+50 RT TO 554+60 RT

## DETAIL C
LATERAL BASE DITCH
( Not to Scale)



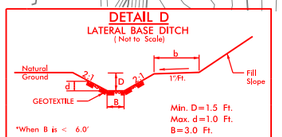

*When B is < 6.0'
Min. D=1.5 Ft.
Max. d=1.0 Ft.
B=3.0 Ft.
b=5.0 Ft.
Type of Liner= CL II Rip-Rap

FROM L3 STA. 554+60 RT TO 555+60 RT




CHANNEL CHANGE DETAIL B
(LOOKING DOWNSTREAM)

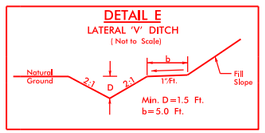
## DETAIL D
LATERAL BASE DITCH
( Not to Scale)




*When B is < 6.0'
Min. D=1.5 Ft.
Max. d=1.0 Ft.
B=3.0 Ft.
b=5.0 Ft.
Type of Liner= CL I Rip-Rap

FROM L3 STA. 561+30 RT TO 563+50 RT

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




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

FROM DRW3 STA. 10+80 LT TO 11+50 LT

SEE SHEET 26 FOR –L3– PROFILE
SEE SHEET 51 FOR –DRW3– PROFILE
SEE SHEET 52 FOR –DRW4– PROFILE
SEE SHEET 52 FOR –DRW5– PROFILE
SEE SHEET 2B-2 FOR INTERSECTION DETAILS

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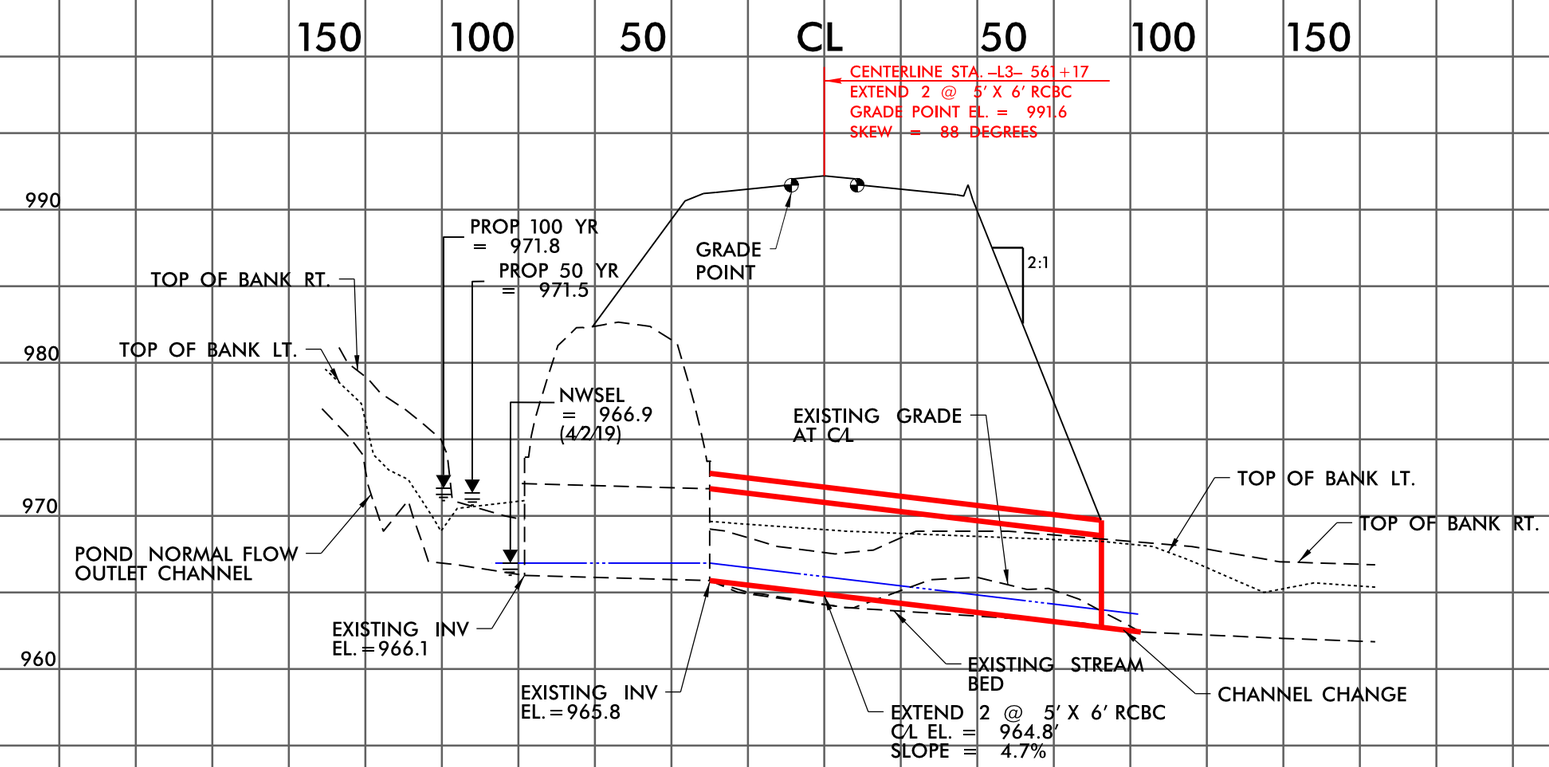
5/26/2020
DWBERRY
R2233BA_Permit Drawings_20200526.pdf

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

# SITE 1 SZ

PERMIT DRAWING
SHEET 4 OF 26

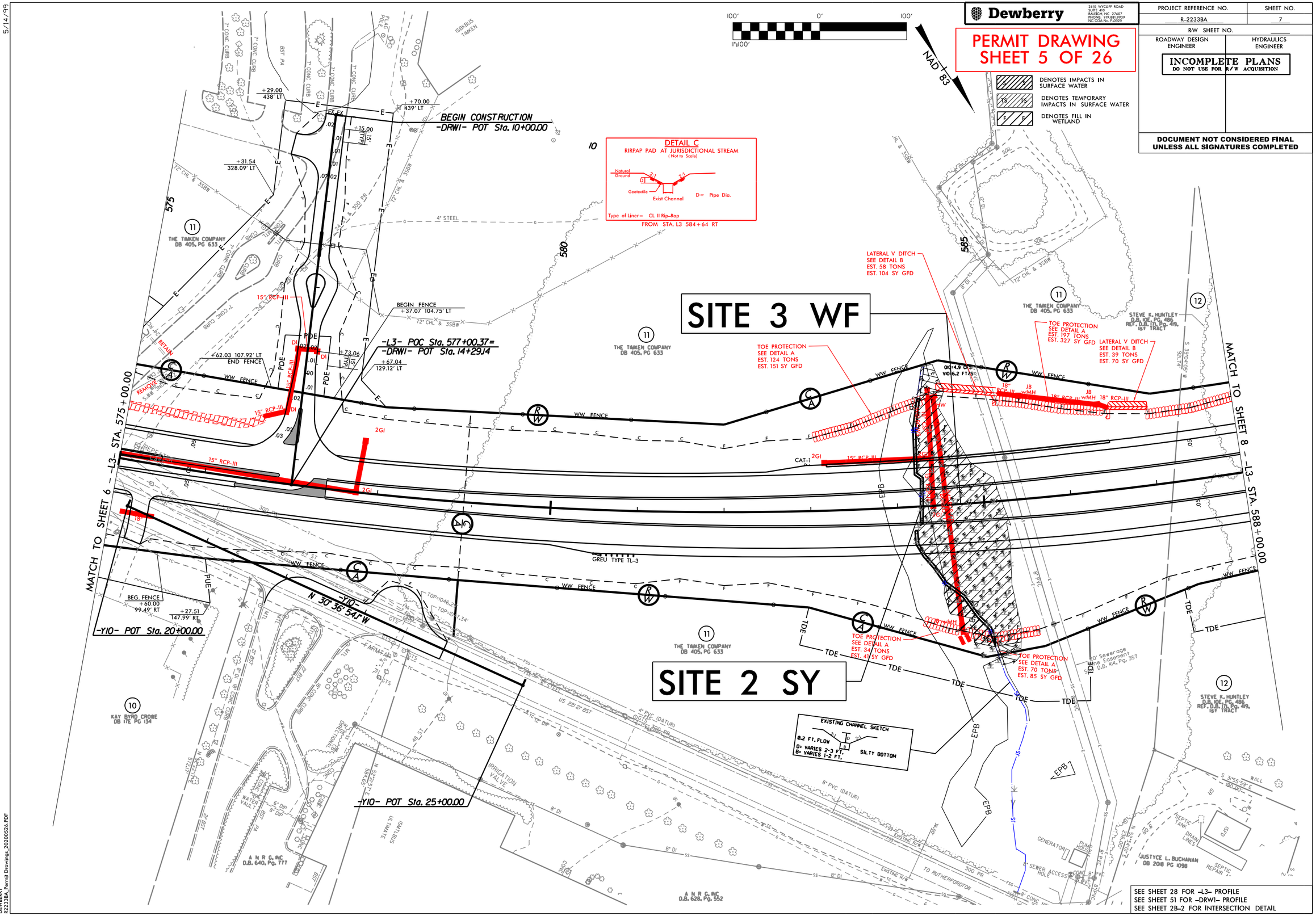



5/14/99

5262020
DEWBERRY

5/14/99

ROW REV. – November 13, 2020 – Parcel 10 – Added PUE (DJM)




5/24/2020
DJMcMahon
R2233BA_Permit Drawings_20200526.PDF

5/14/99

ROW REV. – November 13, 2020 – Parcel 10 – Added PUE (DJM)

**Dewberry**
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919 881 9929
NC COA No. F-0929

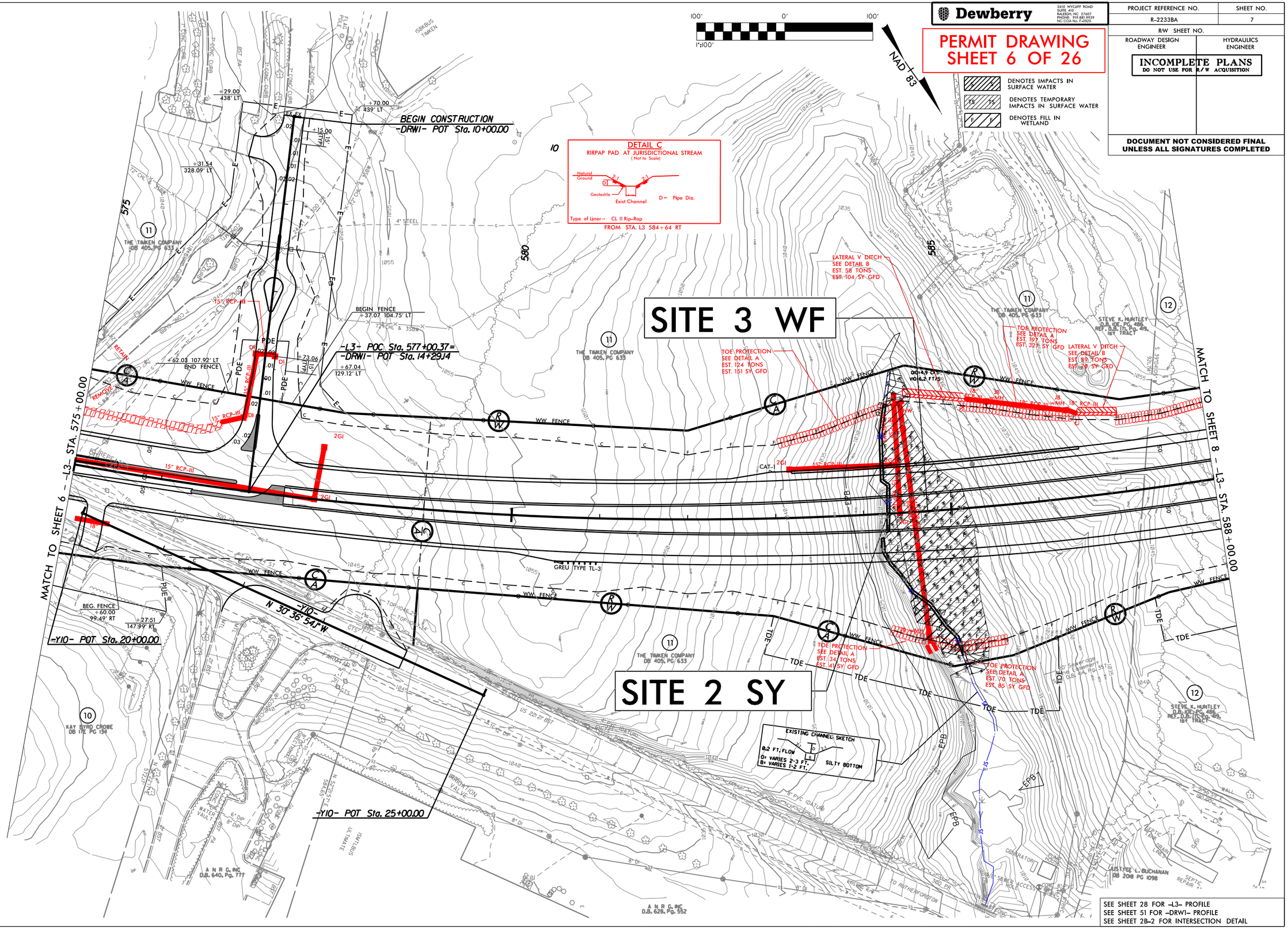
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | 7 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

**INCOMPLETE PLANS**
DO NOT USE FOR R/W ACQUISITION

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

# PERMIT DRAWING SHEET 6 OF 26

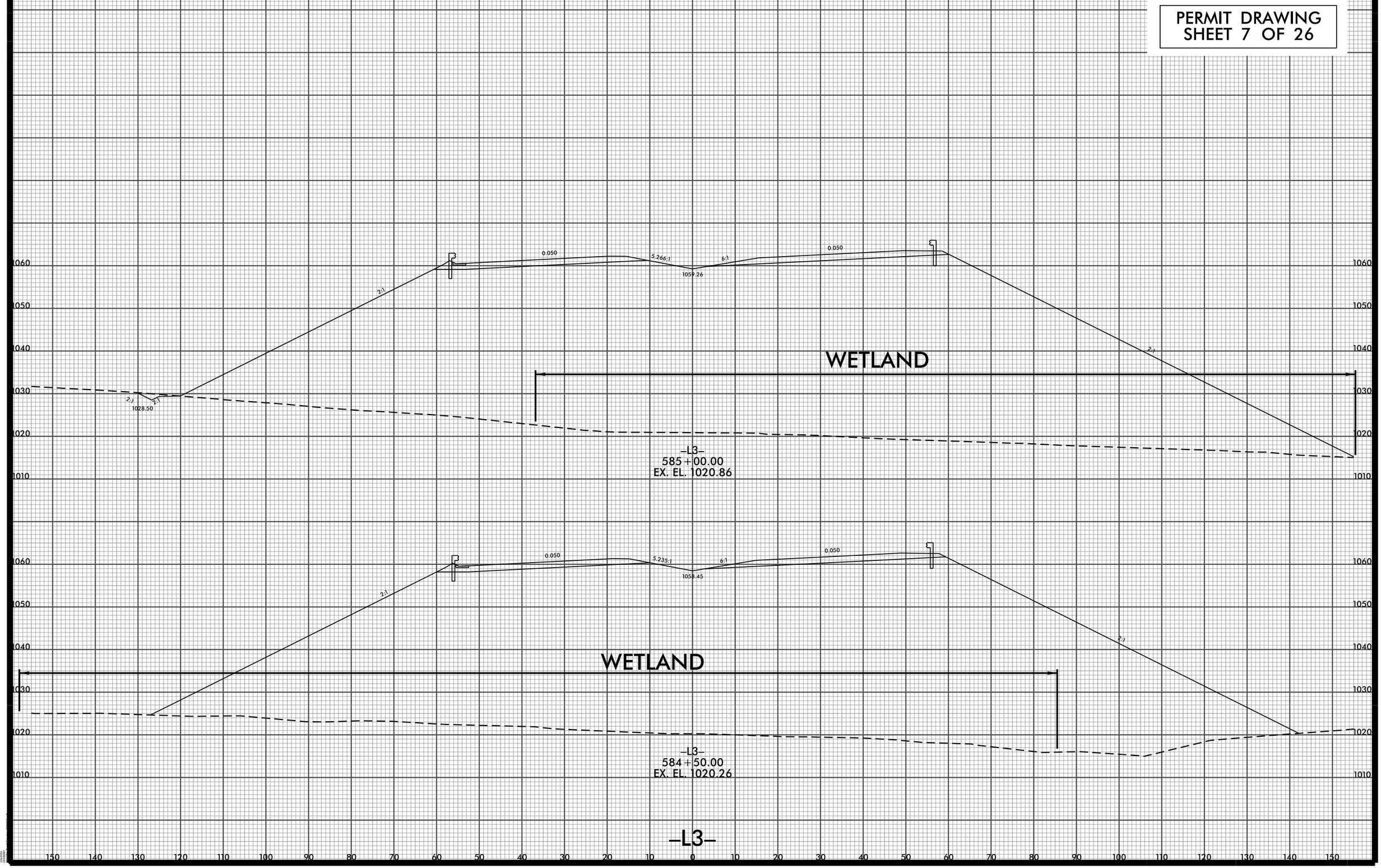
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND




5/24/2020
D:\Dewberry
R2233BA_Permit Drawings_20200526.PDF

| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | X-19 |

PERMIT DRAWING
SHEET 7 OF 26



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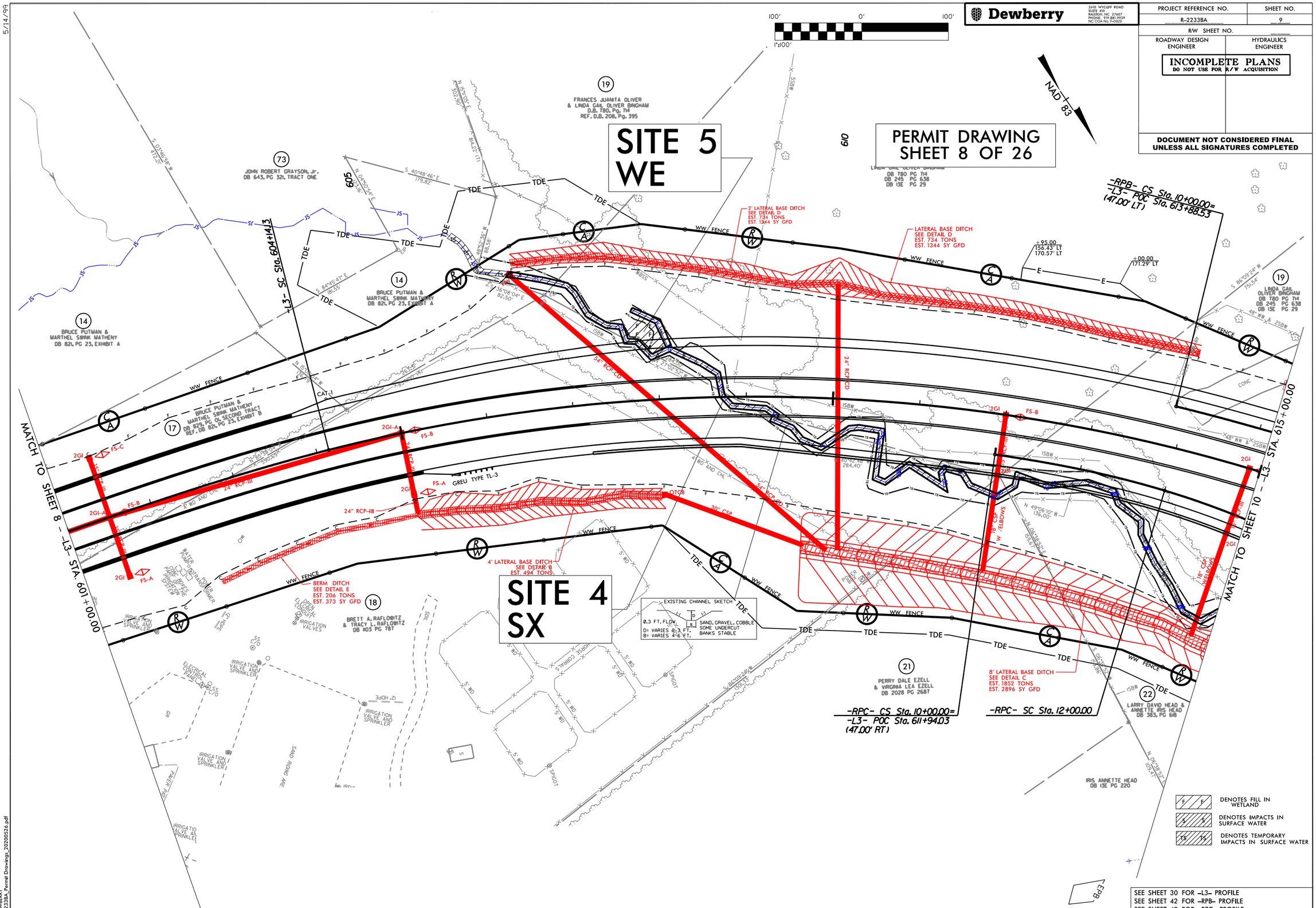
Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | 9 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

**INCOMPLETE PLANS**
DO NOT USE FOR R/W ACQUISITION

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




SEE SHEET 30 FOR –L3– PROFILE
SEE SHEET 42 FOR –RPB– PROFILE
SEE SHEET 43 FOR –RPC– PROFILE

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R2233BA_Permit Drawings_20200526.pdf

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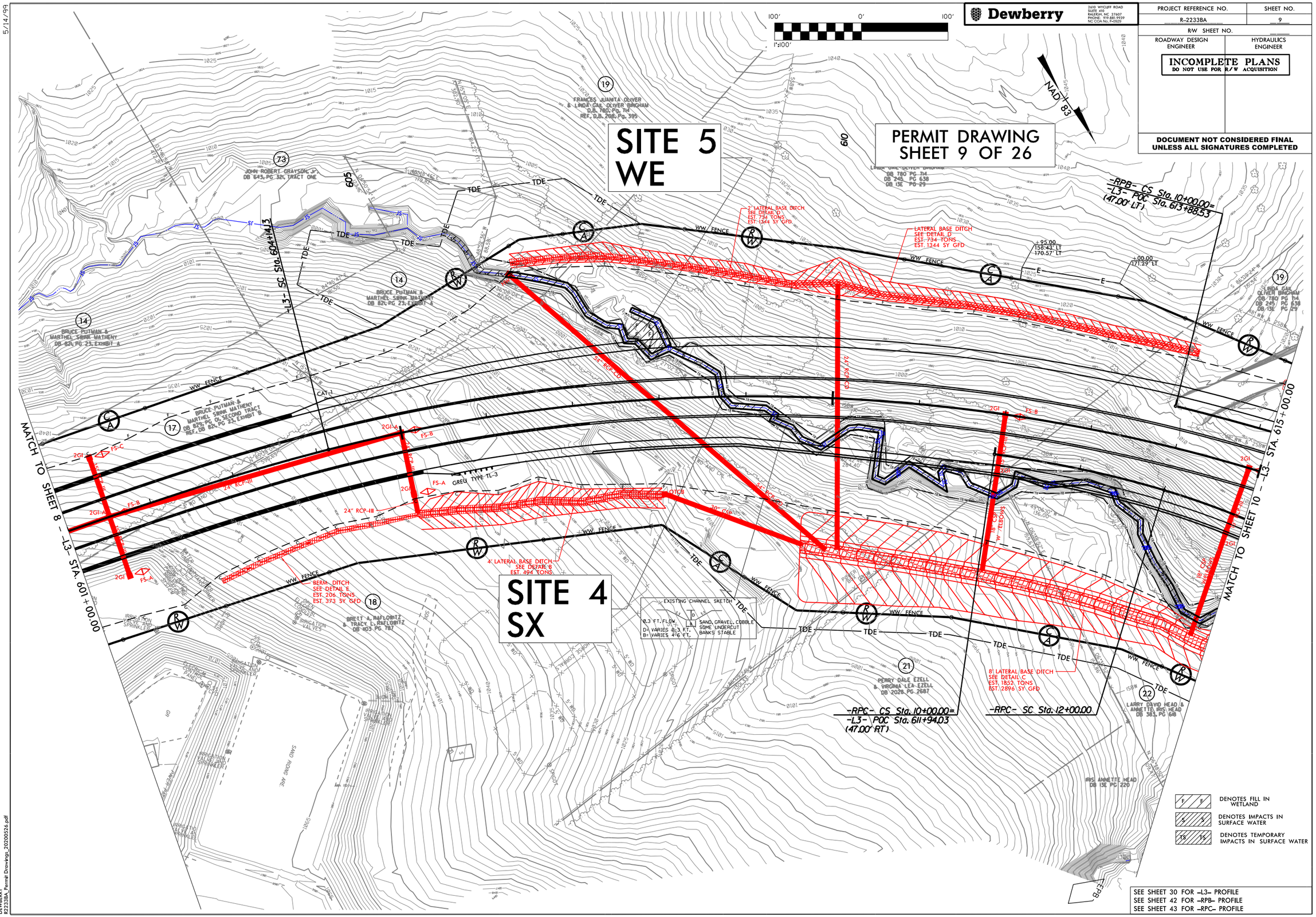
Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | 9 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

**INCOMPLETE PLANS**
DO NOT USE FOR R/W ACQUISITION

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




SEE SHEET 30 FOR -L3- PROFILE
SEE SHEET 42 FOR -RPB- PROFILE
SEE SHEET 43 FOR -RPC- PROFILE

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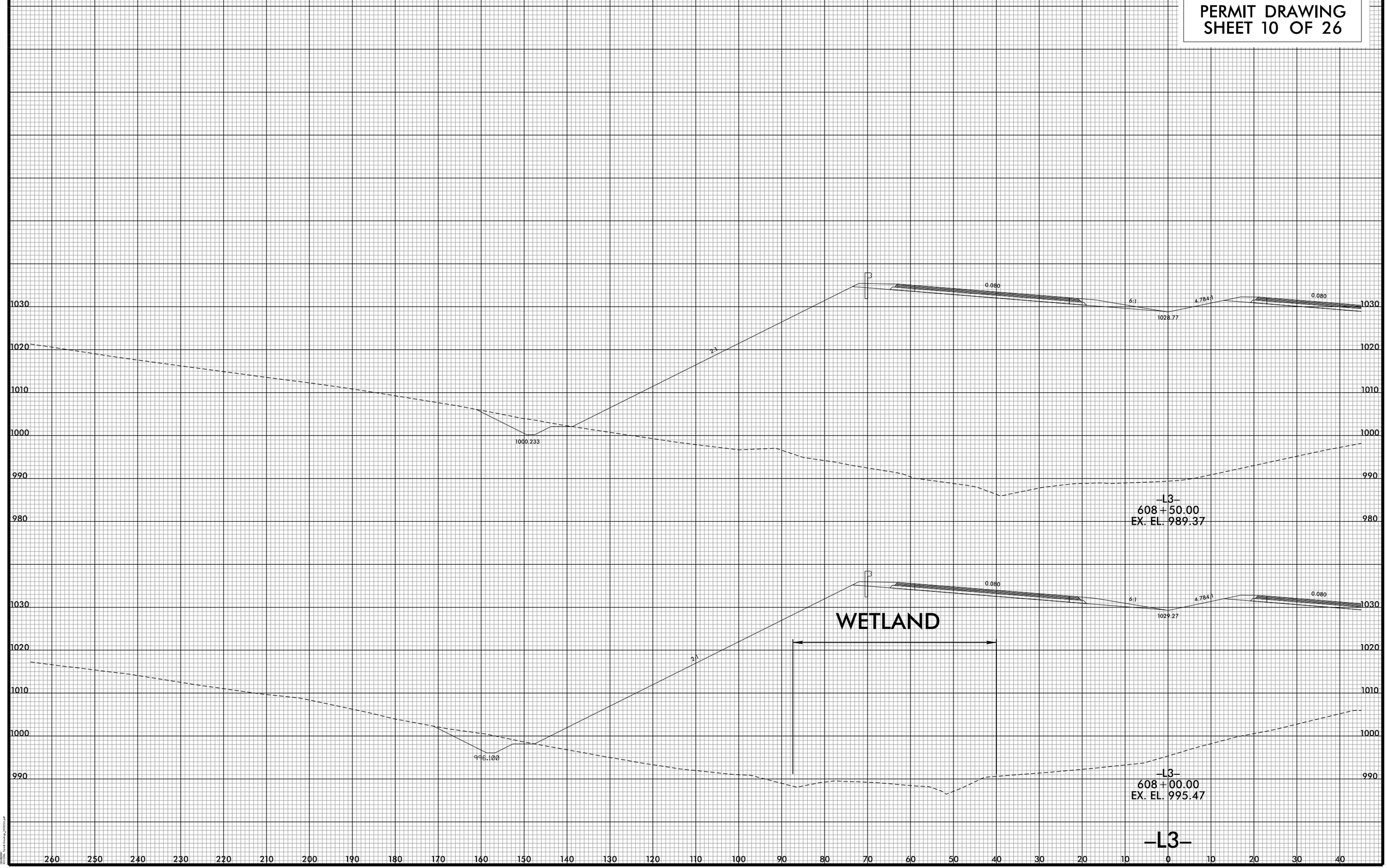
DEWBERRY
R2233BA_Permit Drawings_20200526.pdf

6/23/16

| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | X-34 |

0 5 10

# PERMIT DRAWING
# SHEET 10 OF 26



6/2/99

REVISIONS

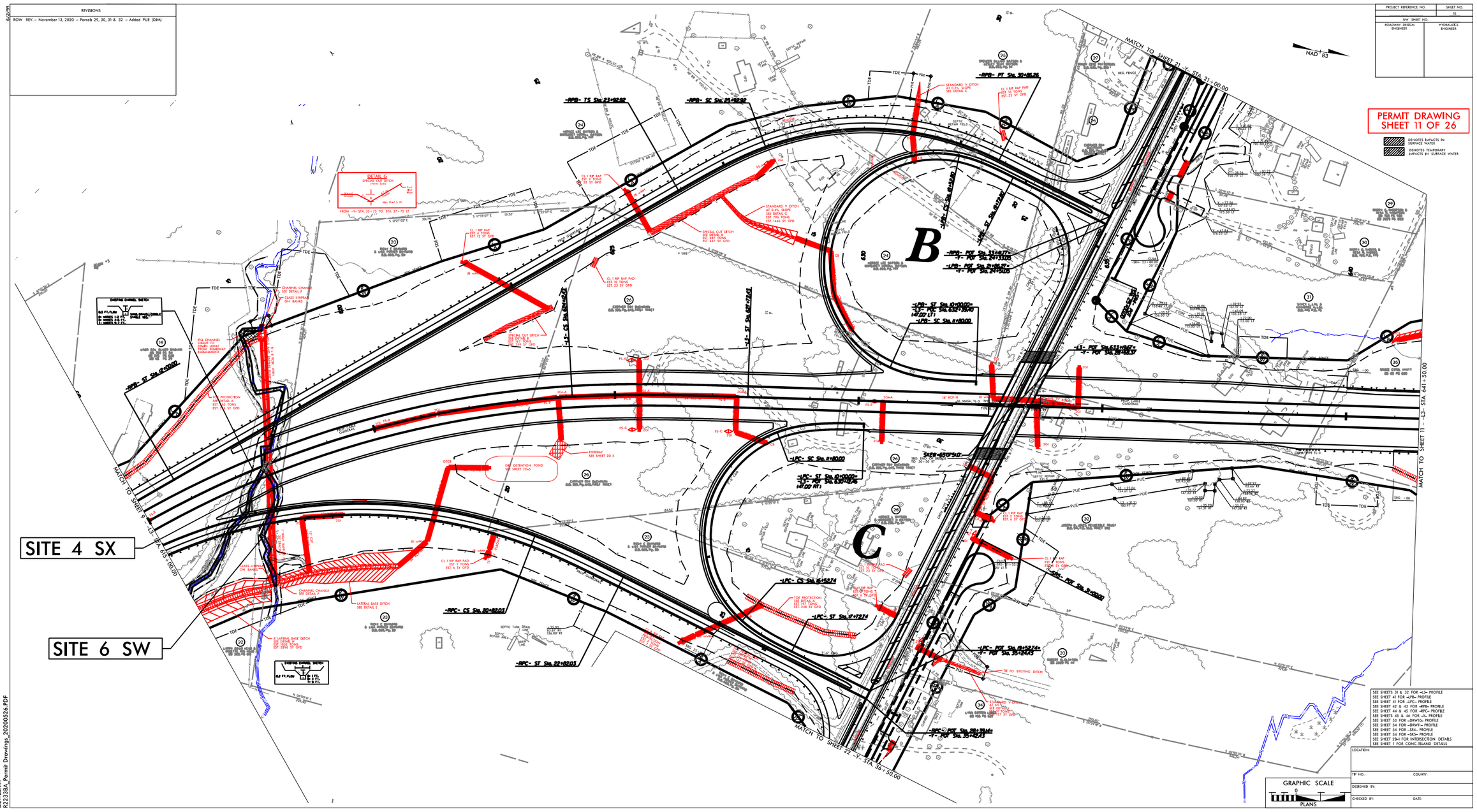
ROW REV. – November 13, 2020 – Parcels 29, 30, 31 & 32 – Added PUE (DJM)

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
|  | 10 |
| R/W SHEET NO. |  |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

**PERMIT DRAWING**
**SHEET 11 OF 26**

▨ DENOTES IMPACTS IN SURFACE WATER

▨ DENOTES TEMPORARY IMPACTS IN SURFACE WATER



SEE SHEETS 31 & 32 FOR –L3– PROFILE
SEE SHEET 41 FOR –LPB– PROFILE
SEE SHEET 41 FOR –LPC– PROFILE
SEE SHEET 42 & 43 FOR –RPB– PROFILE
SEE SHEET 44 & 45 FOR –RPC– PROFILE
SEE SHEETS 45 & 46 FOR –Y– PROFILE
SEE SHEET 53 FOR –DRW10– PROFILE
SEE SHEET 54 FOR –DRW11– PROFILE
SEE SHEET 54 FOR –SR4– PROFILE
SEE SHEET 54 FOR –SR5– PROFILE
SEE SHEET 2B-1 FOR INTERSECTION DETAILS
SEE SHEET ? FOR CONC. ISLAND DETAILS

GRAPHIC SCALE
0
PLANS

LOCATION:

TIP NO.: COUNTY:

DESIGNED BY:

CHECKED BY: DATE:

05/26/2020
DEWBERRY
R2233BA_Permit Drawings_20200526.PDF

6/2/99

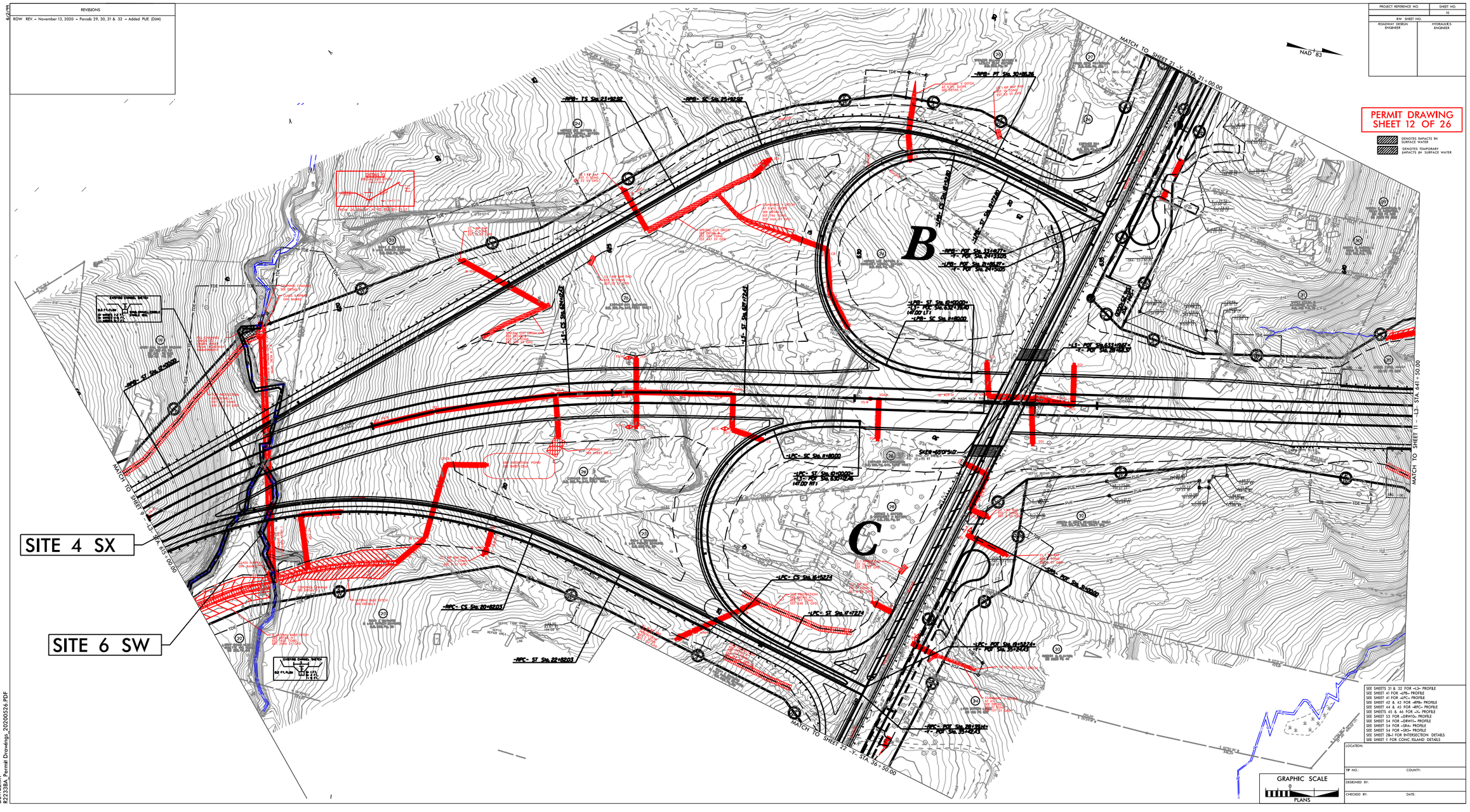
| REVISIONS |
|---|
| ROW REV. – November 13, 2020 – Parcels 29, 30, 31 & 32 – Added PUE (DJM) |

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
|  | 10 |
| R/W SHEET NO. |  |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

# PERMIT DRAWING SHEET 12 OF 26

▨ DENOTES IMPACTS IN SURFACE WATER

▨ DENOTES TEMPORARY IMPACTS IN SURFACE WATER



SEE SHEETS 31 & 32 FOR –L3– PROFILE
SEE SHEET 41 FOR –LPB– PROFILE
SEE SHEET 41 FOR –LPC– PROFILE
SEE SHEET 42 & 43 FOR –RPB– PROFILE
SEE SHEET 44 & 45 FOR –RPC– PROFILE
SEE SHEETS 45 & 46 FOR –Y– PROFILE
SEE SHEET 53 FOR –DRW10– PROFILE
SEE SHEET 54 FOR –DRW11– PROFILE
SEE SHEET 54 FOR –SR4– PROFILE
SEE SHEET 54 FOR –SR5– PROFILE
SEE SHEET 2B–1 FOR INTERSECTION DETAILS
SEE SHEET ? FOR CONC. ISLAND DETAILS

GRAPHIC SCALE
0
PLANS

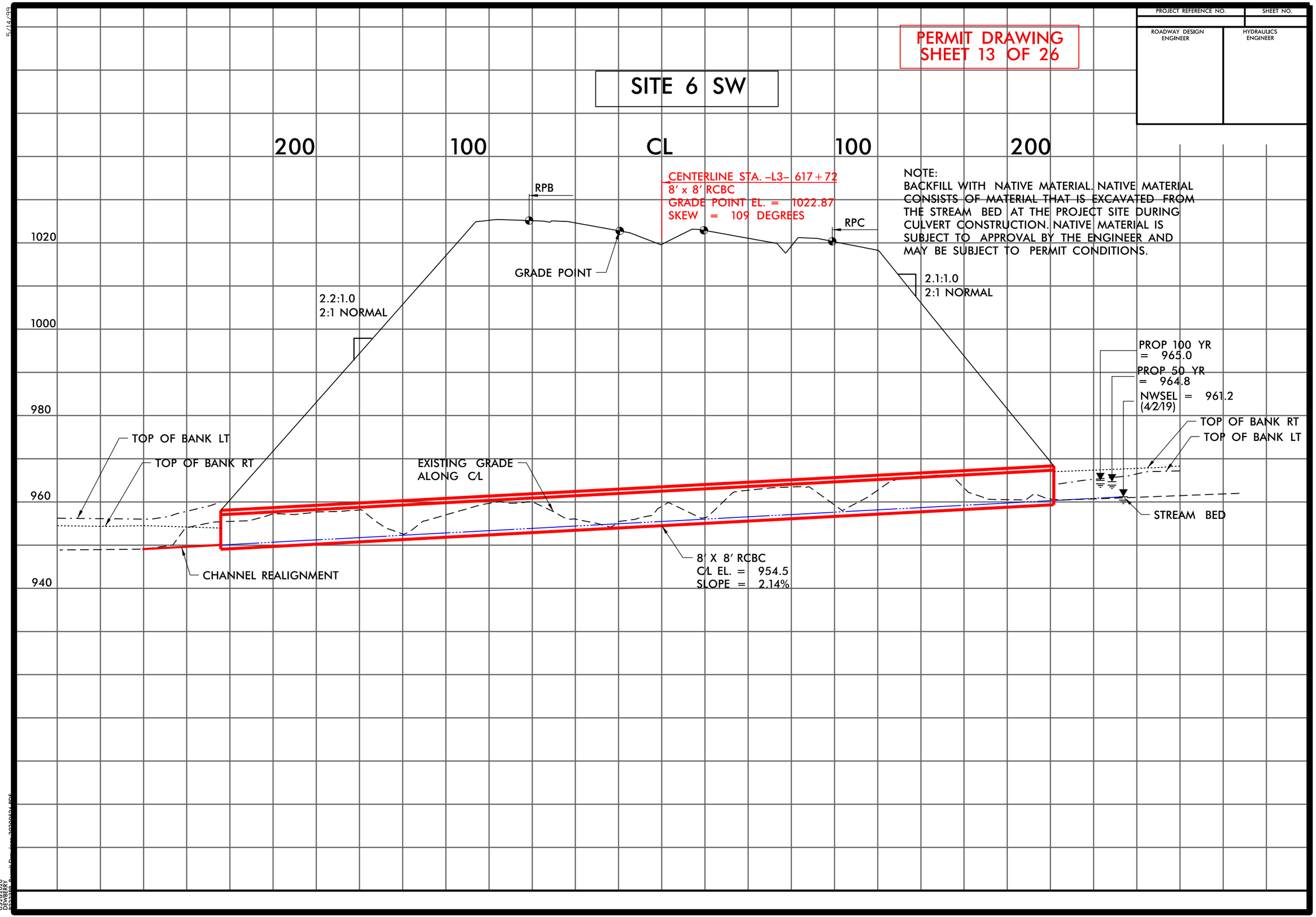
|  |  |
|---|---|
| LOCATION: |  |
| TIP NO.: | COUNTY: |
| DESIGNED BY: |  |
| CHECKED BY: | DATE: |

05/26/2020
DEWBERRY
R2233BA_Permit Drawings_20200526.PDF

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

PERMIT DRAWING
SHEET 13 OF 26

# SITE 6 SW




NOTE:
BACKFILL WITH NATIVE MATERIAL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

5/14/99

**Dewberry**
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | 11 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

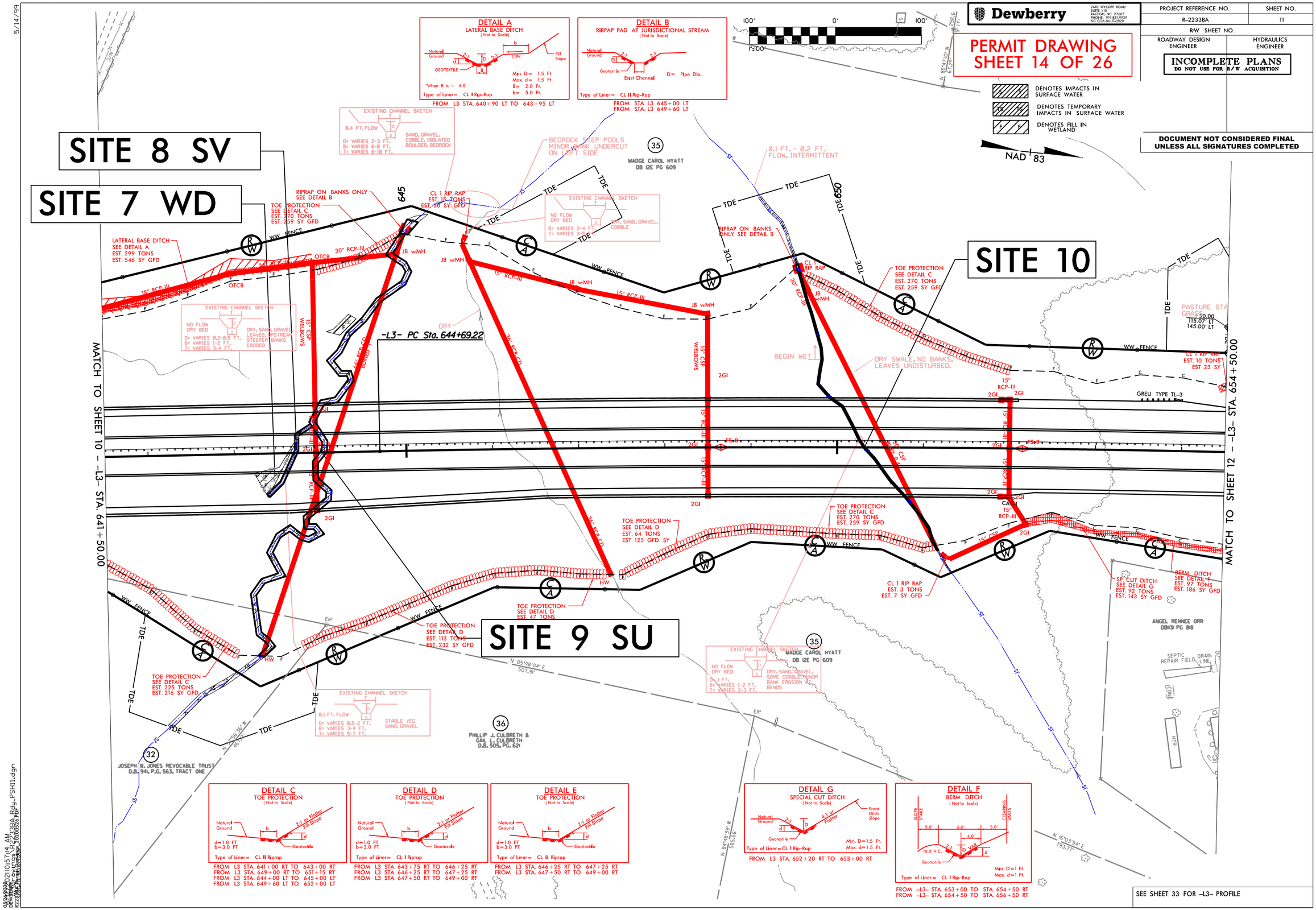
**INCOMPLETE PLANS**
DO NOT USE FOR R/W ACQUISITION

# PERMIT DRAWING SHEET 14 OF 26

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

NAD 83

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




06/08/2009 2:10:57 PM
DRIVEWAY_2233BA_Rdy_PSH11.dgn
R2233BA_Rdwy_Driveway_20060526.pdf

5/14/99

**Dewberry**
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919 881 9929
NC COA No. F-0929

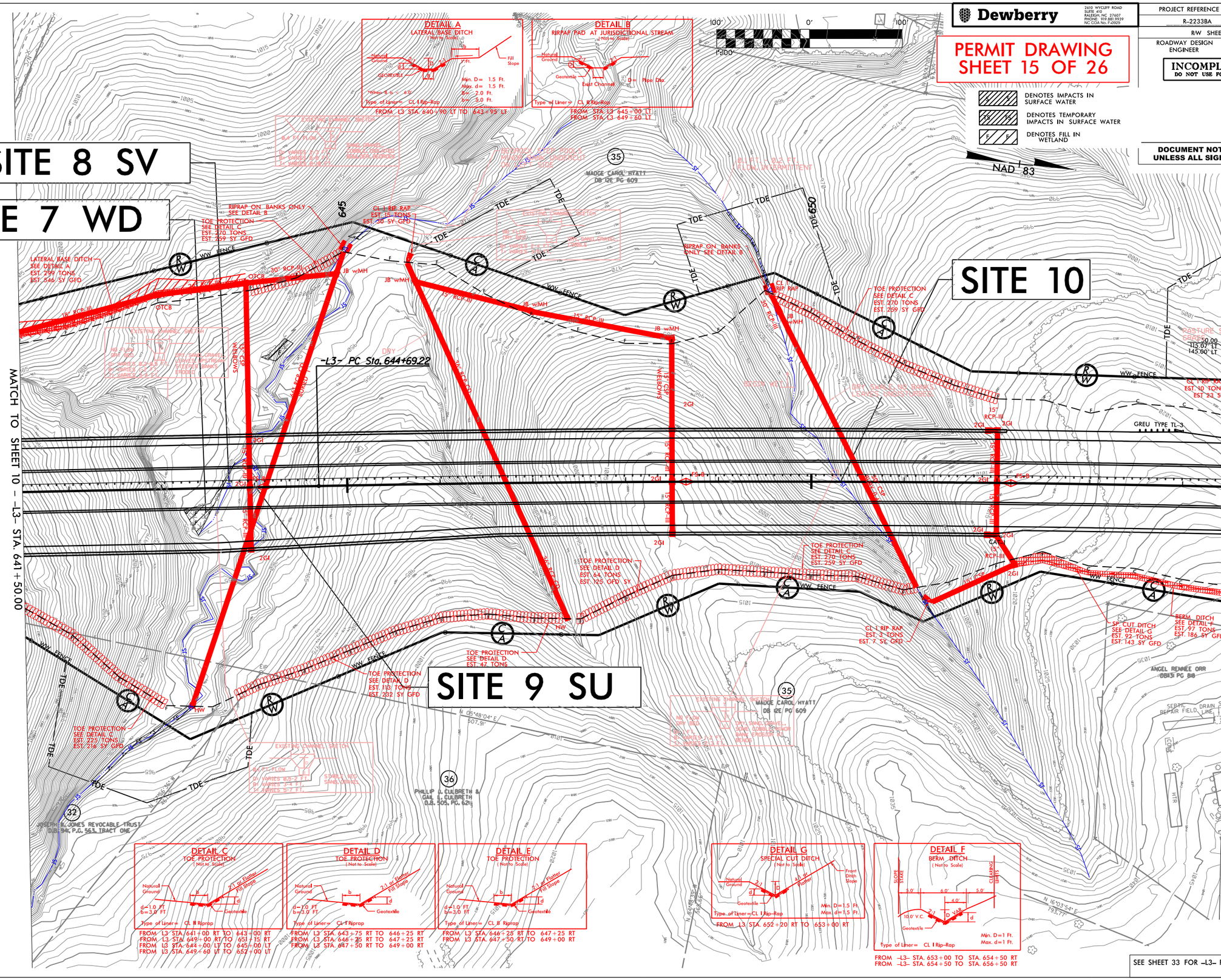
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | 11 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

**INCOMPLETE PLANS**
DO NOT USE FOR R/W ACQUISITION

# PERMIT DRAWING SHEET 15 OF 26

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

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

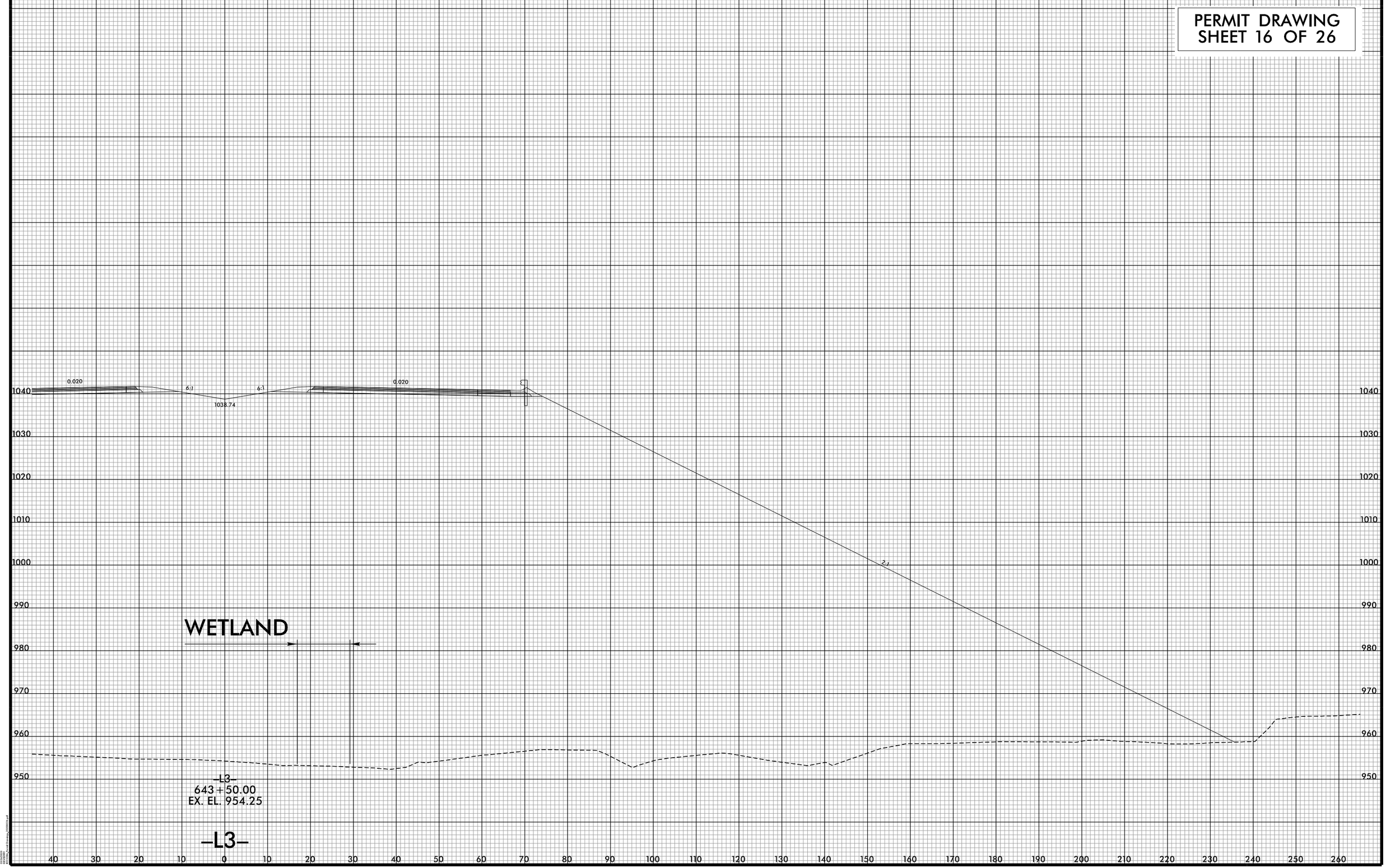



SEE SHEET 33 FOR –L3– PROFILE

6/23/16

| 0 5 10 | PROJ. REFERENCE NO. | SHEET NO. |
|---|---|---|
| | R-2233BA | X-63A |

PERMIT DRAWING
SHEET 16 OF 26



PERMIT DRAWING
SHEET 17 OF 26

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | 13 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

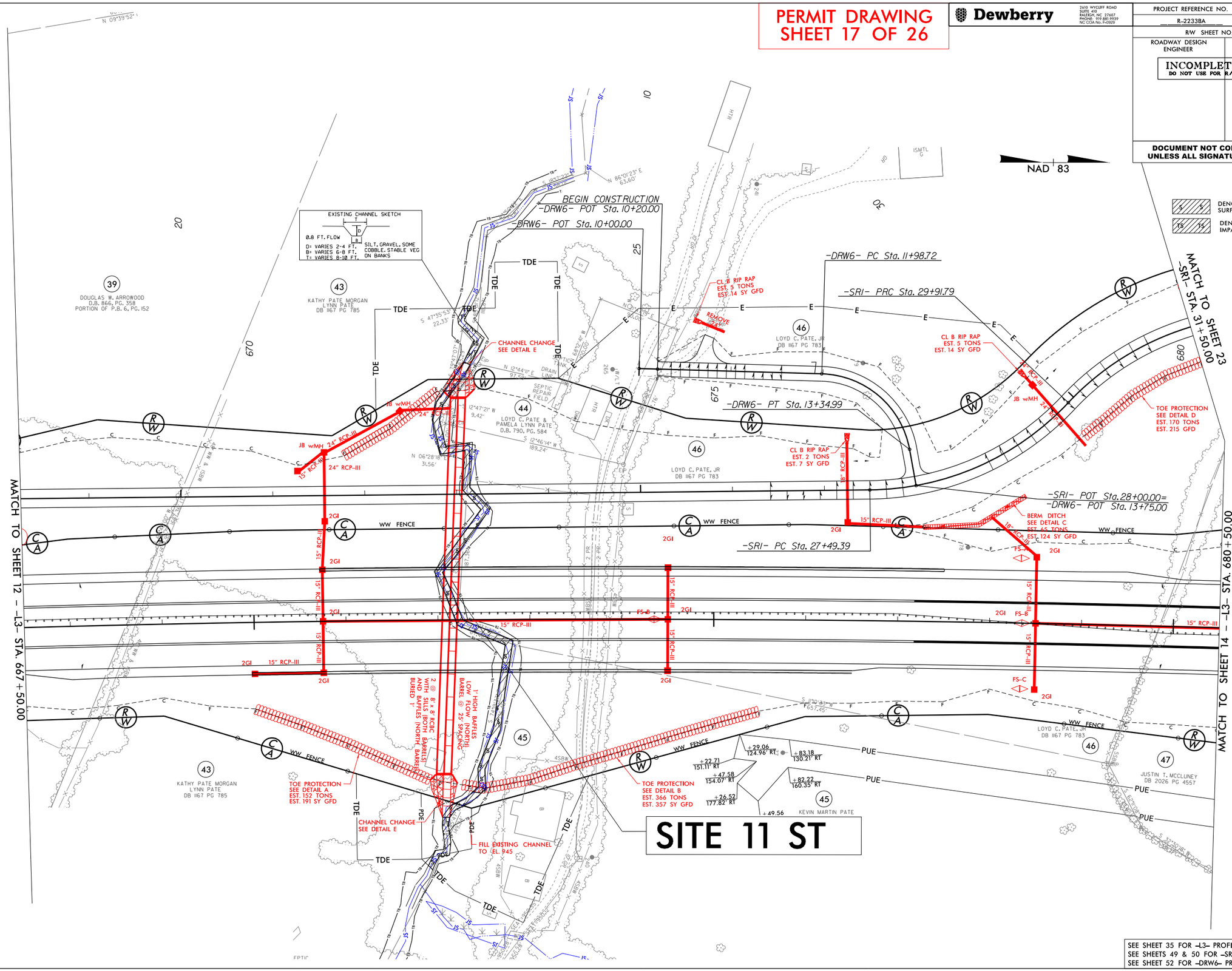
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER




SEE SHEET 35 FOR -L3- PROFILE
SEE SHEETS 49 & 50 FOR -SR1- PROFILE
SEE SHEET 52 FOR -DRW6- PROFILE

ROW REV. - November 13, 2020 - Parcels 45 & 47 - Added PUE (DJM)

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PERMIT DRAWING
SHEET 18 OF 26

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | 13 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

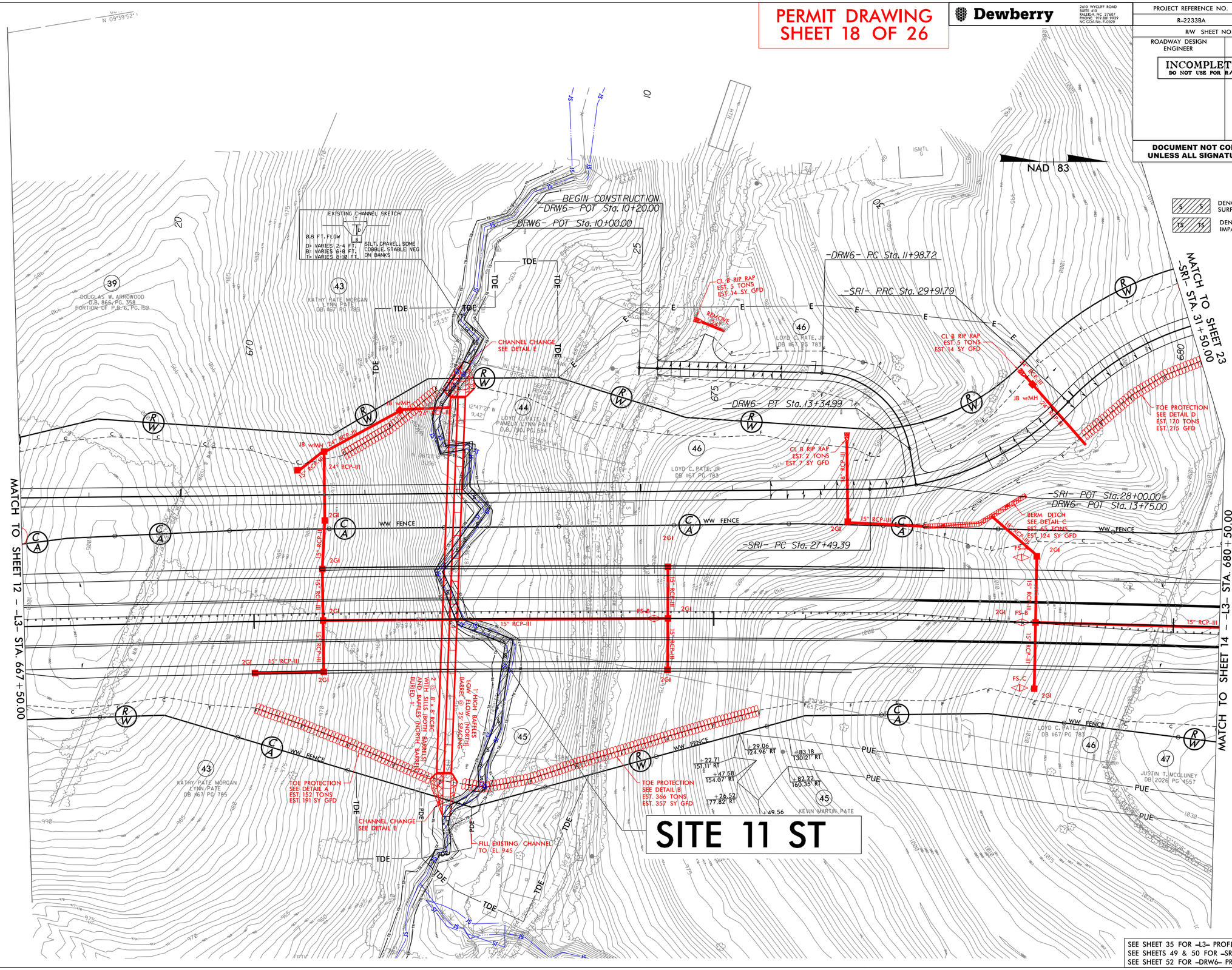
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

NAD 83

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER




SEE SHEET 35 FOR -L3- PROFILE
SEE SHEETS 49 & 50 FOR -SRI- PROFILE
SEE SHEET 52 FOR -DRW6- PROFILE

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ROW REV. – November 13, 2020 – Parcels 45 & 47 – Added PUE (DJM)

05/26/2020
DEWBERRY
R2233BA_Permit Drawings_20200526.pdf

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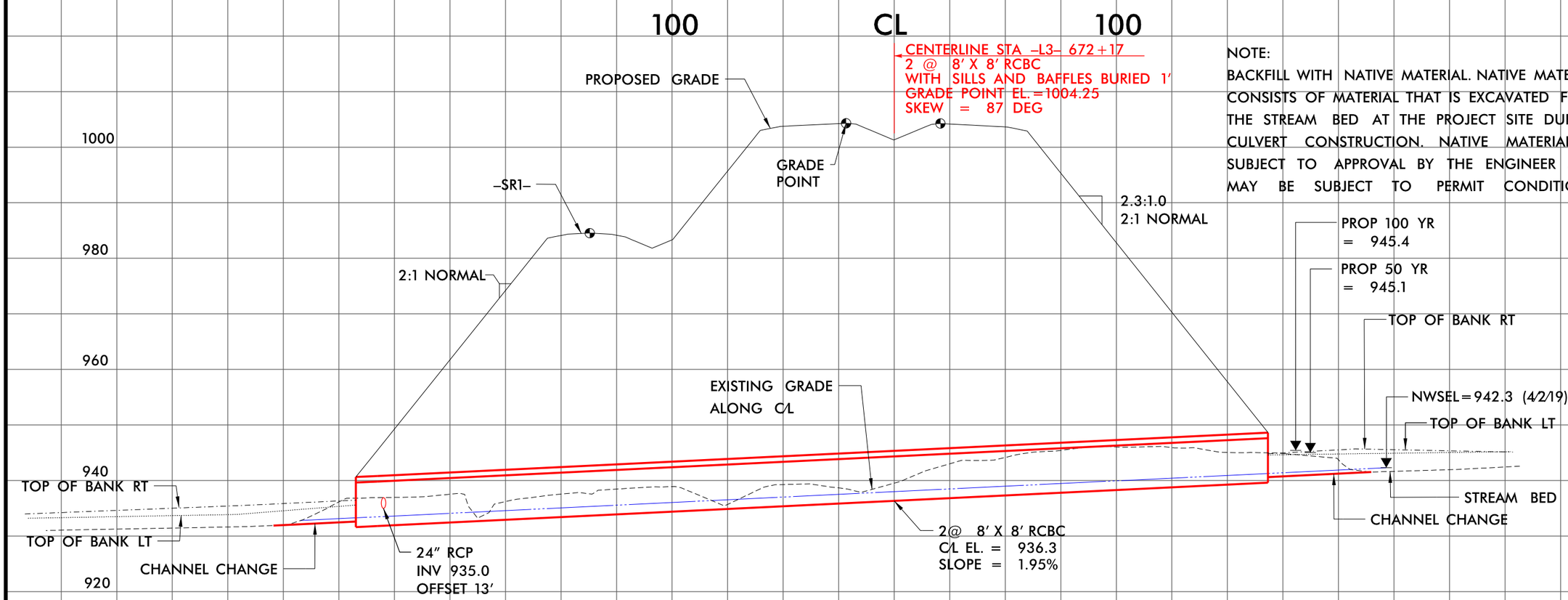
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

# SITE 11 ST

PERMIT DRAWING
SHEET 19 OF 26




NOTE:
BACKFILL WITH NATIVE MATERIAL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

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DEWBERRY
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Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919-881-9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | 15 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

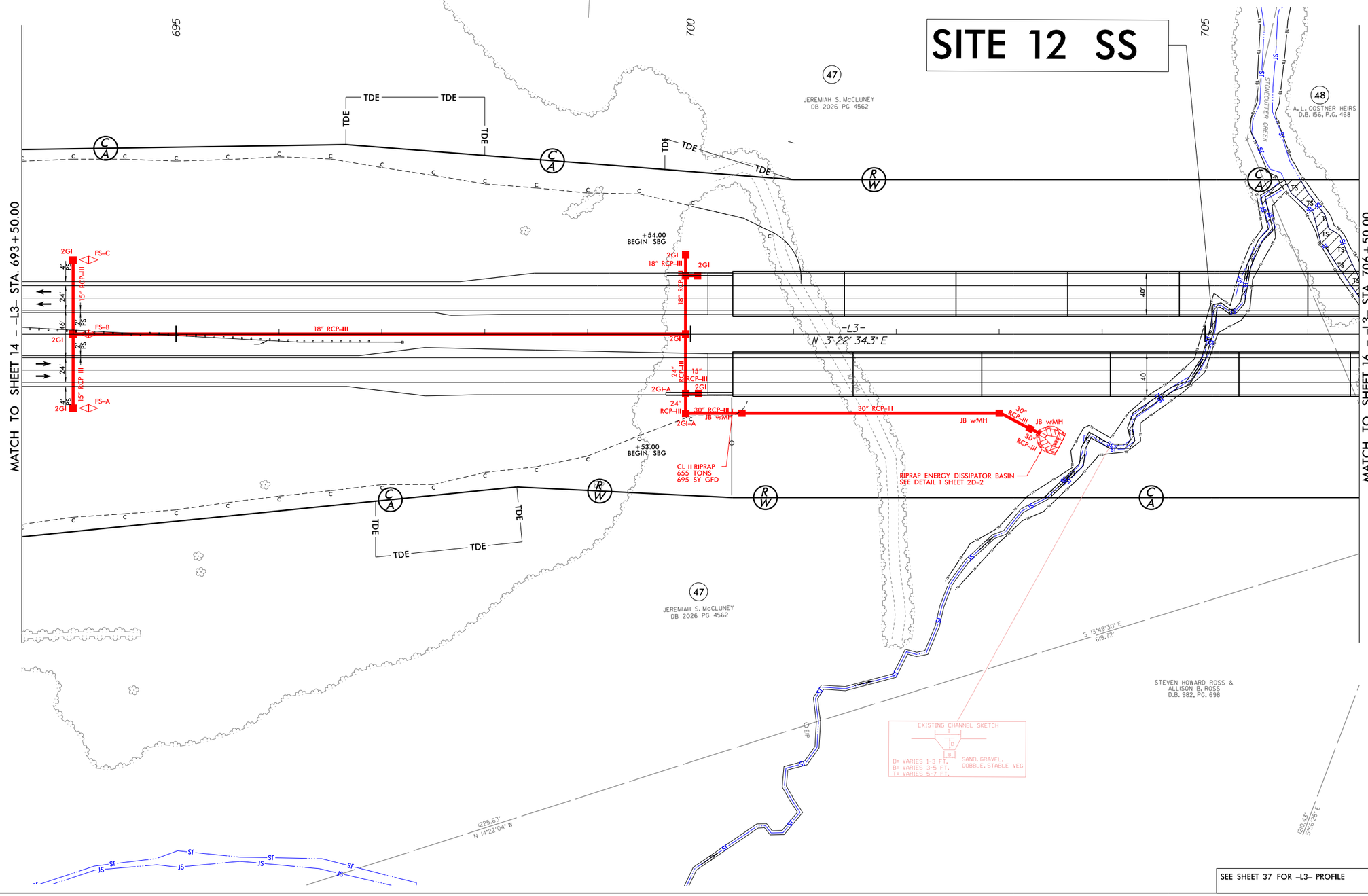
DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 20 OF 26

NAD 83

# SITE 12 SS




SEE SHEET 37 FOR –L3– PROFILE

5/26/2020
DEWBERRY
R2233BA_Permit Drawings_20200526.PDF

5/14/99

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919-881-9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | 15 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 21 OF 26

NAD 83

# SITE 12 SS

MATCH TO SHEET 14 – –L3– STA. 693+50.00

MATCH TO SHEET 16 – –L3– STA. 706+50.00

BM 1

695

700

705

TDE

JEREMIAH S. McCLUNEY
DB 2026 PG 4562

47

48

C/A

R/W

+54.00
BEGIN SBG

2GI

FS-C

FS-B

FS-A

15" RCP-III

18" RCP-III

N 3°22'34.3" E

-L3

2GI-A

24" RCP-III

30" RCP-III

JB w/MH

+53.00
BEGIN SBG

CL II RIPRAP
655 TONS
695 SY GFD

RIPRAP ENERGY DISSIPATOR BASIN
SEE DETAIL 1 SHEET 2D-2

JS

TS

STEVEN HOWARD ROSS &
ALLISON B. ROSS
D.B. 982, PG. 888

SEE SHEET 37 FOR –L3– PROFILE

5/26/2020
DEWBERRY
R2233BA_Permit Drawings_20200526.PDF

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Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | 16 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

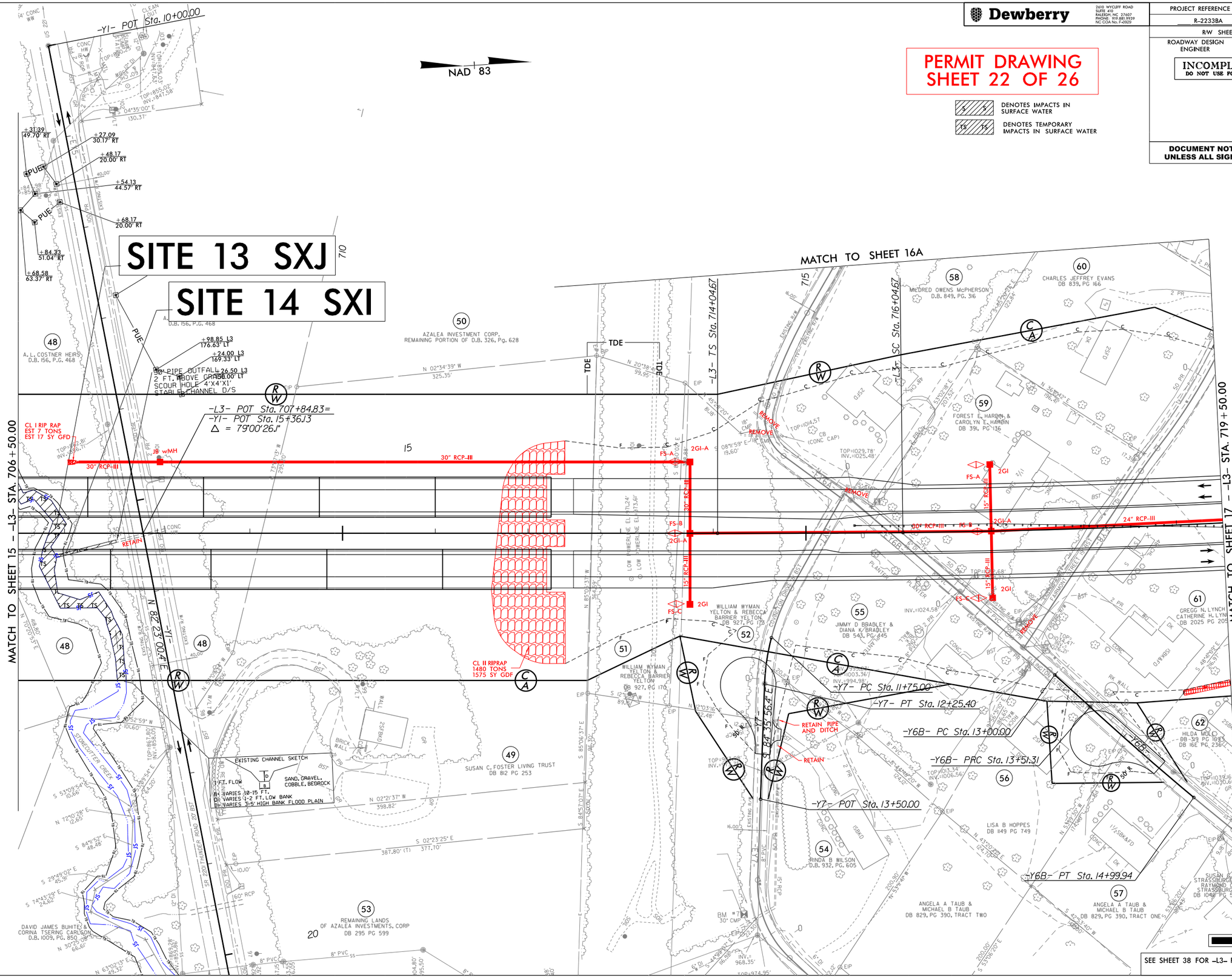
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 22 OF 26

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER




SEE SHEET 38 FOR –L3– PROFILE

ROW REV. – November 13, 2020 – Parcel 48 – Added PUE (DJM)

05262020
DOWNBERRY
R2233BA_Permit Drawings_20200526.PDF

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**Dewberry**
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

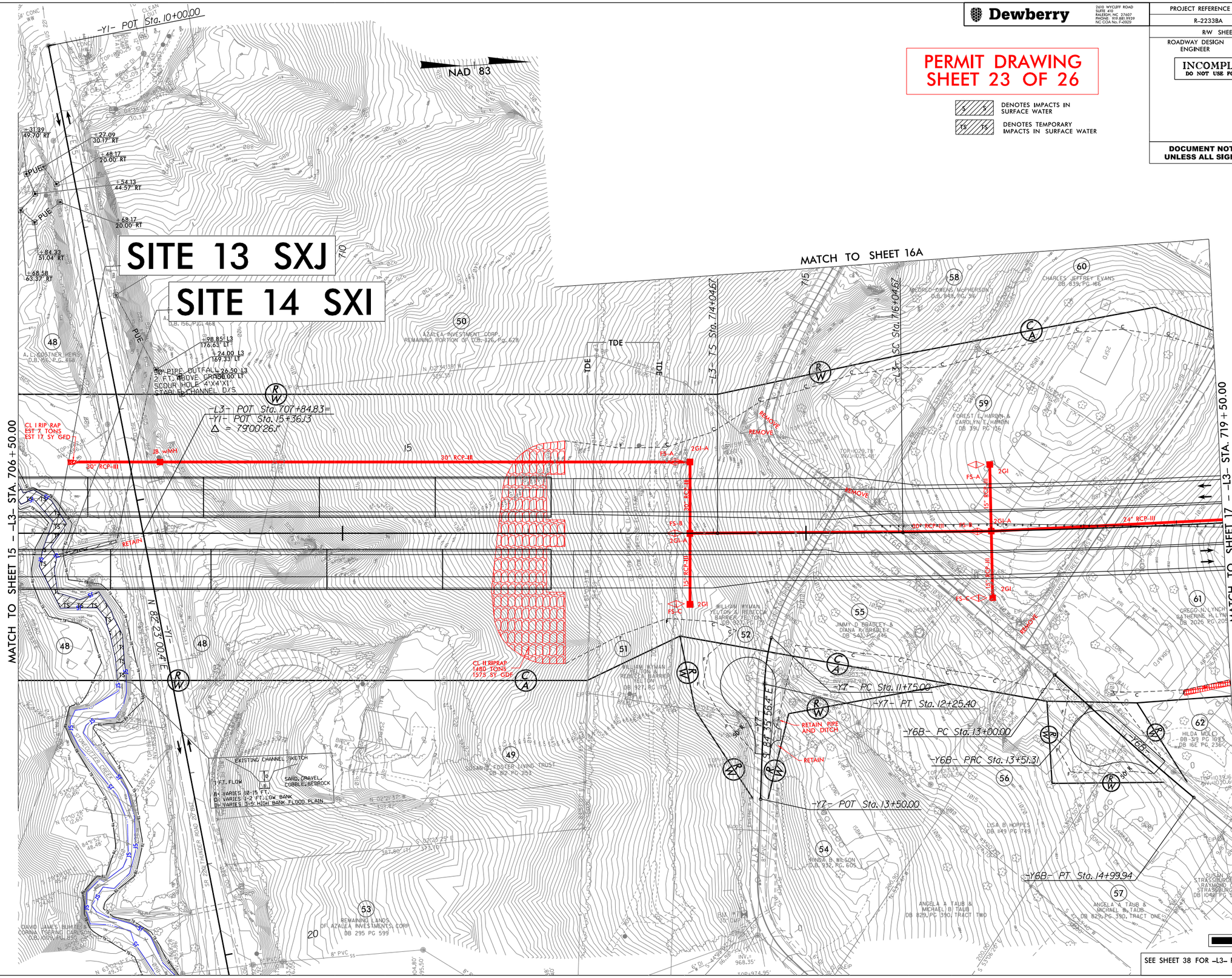
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | 16 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

**INCOMPLETE PLANS**
DO NOT USE FOR R/W ACQUISITION

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

**PERMIT DRAWING**
**SHEET 23 OF 26**

S S — DENOTES IMPACTS IN SURFACE WATER
TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER




SEE SHEET 38 FOR –L3– PROFILE

ROW REV. – November 13, 2020 – Parcel 48 – Added PUE (DJM)

05262020
DJOHNSON
R2233BA_Permit Drawings_20200526.PDF

5/14/99

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919 881 9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | 37 |

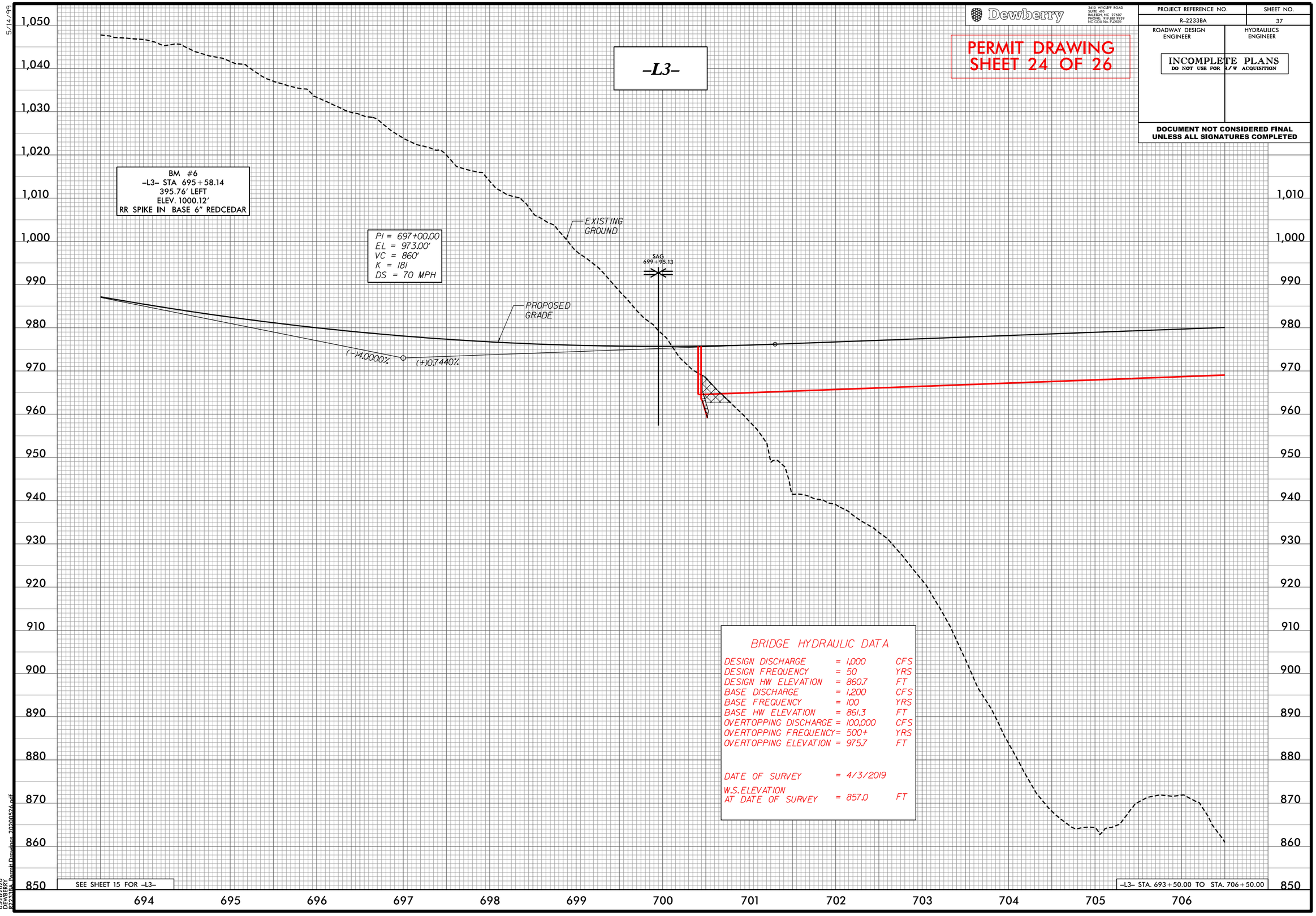
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 24 OF 26




BRIDGE HYDRAULIC DATA

| | | |
|---|---|---|
| DESIGN DISCHARGE | = 1,000 | CFS |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN HW ELEVATION | = 860.7 | FT |
| BASE DISCHARGE | = 1,200 | CFS |
| BASE FREQUENCY | = 100 | YRS |
| BASE HW ELEVATION | = 861.3 | FT |
| OVERTOPPING DISCHARGE | = 100,000 | CFS |
| OVERTOPPING FREQUENCY | = 500+ | YRS |
| OVERTOPPING ELEVATION | = 975.7 | FT |
| DATE OF SURVEY | = 4/3/2019 | |
| W.S. ELEVATION AT DATE OF SURVEY | = 857.0 | FT |

05262020
DEWBERRY
R:\Active Permit Drawings 20200526.pdf

5/14/99

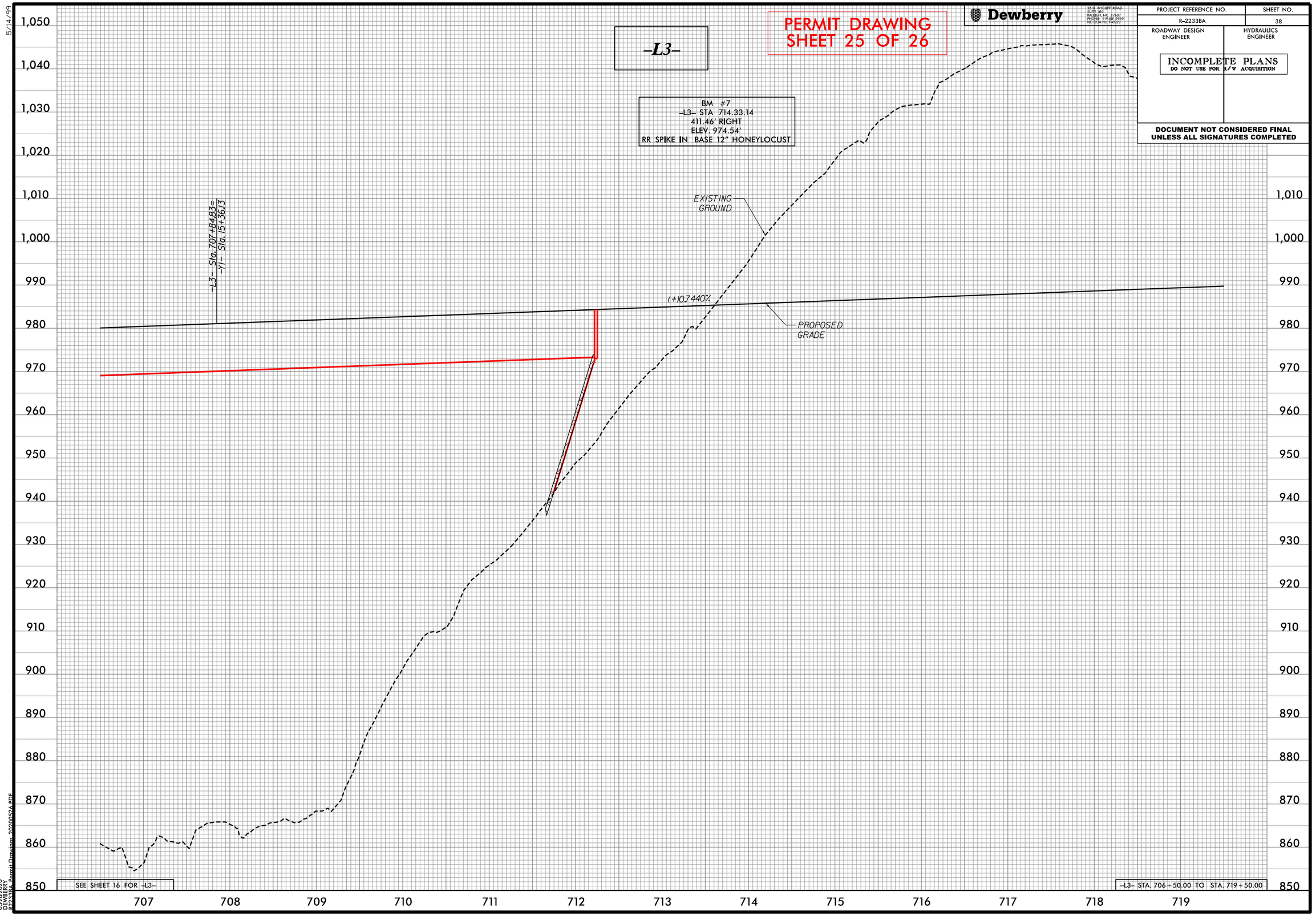
PERMIT DRAWING
SHEET 25 OF 26

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BA | 38 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED




05/26/2020
DSXR6920
R2233BA_Permit Drawings_20200526.PDF

## WETLAND AND SURACE WATER IMPACTS SUMMARY

| | | | | WETLAND IMPACTS | | | | | SURFACE WATER IMPACTS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site No. | JD ID | 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 | SZ | L3 561+11 TO 561+24 RT | 2 -5' x 6' RCBC | | | | | | 0.02 | | 136 | | |
| 1 | SZ | L3 561+24 RT | CHANNEL REALIGNMENT | | | | | | < 0.01 | < 0.01 | 24 | 18 | |
| 2 | SY | L3 584+19 TO 585+04 | 54" RCP | | | | | | 0.03 | < 0.01 | 323 | 60 | |
| 3 | WF | L3 584+16 TO 585+35 | ROADWAY FILL | 0.47 | | | 0.02 | | | | | | |
| 3 | WF | L3 584+16 TO 585+35 | TEMPORARY BYPASS CHANNEL | | | 0.01 | | | | | | | |
| 4 | SX | L3 606+50 TO 617+50 | 54" RCP / LAT BASE DITCH | | | | | | 0.21 | 0.01 | 1509 | 88 | |
| 5 | WE | L3 607+66 TO 608+22 LT | ROADWAY FILL | 0.02 | | | | | | | | | |
| 6 | SW | L3 616+76 LT TO 618+60 RT | 8' X 8' RCBC | | | | | | 0.09 | | 583 | | |
| 6 | SW | L3 617+00 RT | CHANNEL REALIGNMENT | | | | | | < 0.01 | < 0.01 | 21 | 48 | |
| 6 | SW | L3 618+58 LT | CHANNEL REALIGNMENT | | | | | | 0.01 | < 0.01 | 75 | 18 | |
| 7 | WD | L3 643+23 RT TO 643+80 RT | ROADWAY FILL | 0.02 | | | | | | | | | |
| 8 | SV | L3 643+38 RT TO 643+91 LT | ROADWAY FILL | | | | | | < 0.01 | | 102 | | |
| 9 | SU | L3 643+13 RT TO 645+10 LT | 66" RCP | | | | | | 0.10 | 0.02 | 702 | 136 | |
| 9 | SU | L3 645+10 LT | CL II RIPRAP ON BANKS | | | | | | < 0.01 | < 0.01 | 20 | 10 | |
| 10 | | L3 649+55 LT TO 651+18 RT | 30" RCP | | | | | | 0.02 | < 0.01 | 369 | 29 | |
| 10 | | L3 649+55 LT | CL II RIPRAP ON BANKS | | | | | | < 0.01 | < 0.01 | 8 | 91 | |
| 11 | ST | L3 671+97 LT TO 672+82 RT | 2 @ 8' x 8' RCBC | | | | | | 0.10 | | 582 | | |
| 11 | ST | L3 672+08 RT | CHANNEL REALIGNMENT | | | | | | < 0.01 | 0.01 | 44 | 66 | |
| 11 | ST | L3 672+34 LT | CHANNEL REALIGNMENT | | | | | | < 0.01 | 0.01 | 36 | 70 | |
| 12 | SS | L3 703+45 RT TO 705+77 LT | TEMPORARY WORK BRIDGE | | | | | | | 0.04 | | 457 | |
| 13 | SXJ | L3 705+79 RT TO 707+66 RT | TEMPORARY WORK BRIDGE | | | | | | | 0.11 | | 410 | |
| 14 | SXI | L3 706+90 RT TO 707+54 RT | TEMPORARY STREAM CROSSING | | | | | | | < 0.01 | | 67 | |
| TOTALS*: | | | | 0.51 | | 0.01 | 0.02 | | 0.60 | 0.23 | 4534 | 1568 | 0 |

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS
6/14/2021
RUTHERFORD
R-2233BA
34400.1.S5



Revised 2016 09 09

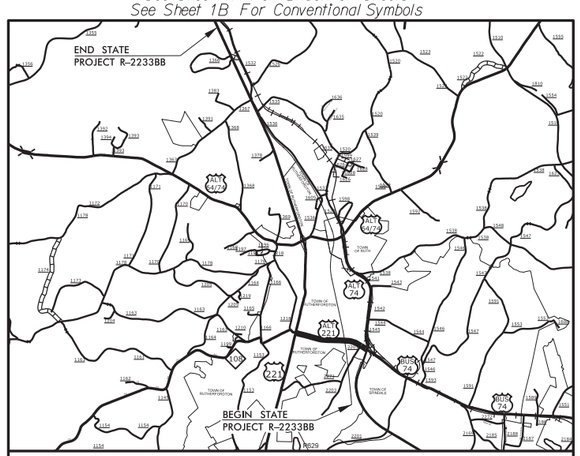
# R-2233 BB Roadway Planset

09/08/99

TIP PROJECT: R-2233BB

CONTRACT: C204397

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols




VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

# RUTHERFORD COUNTY

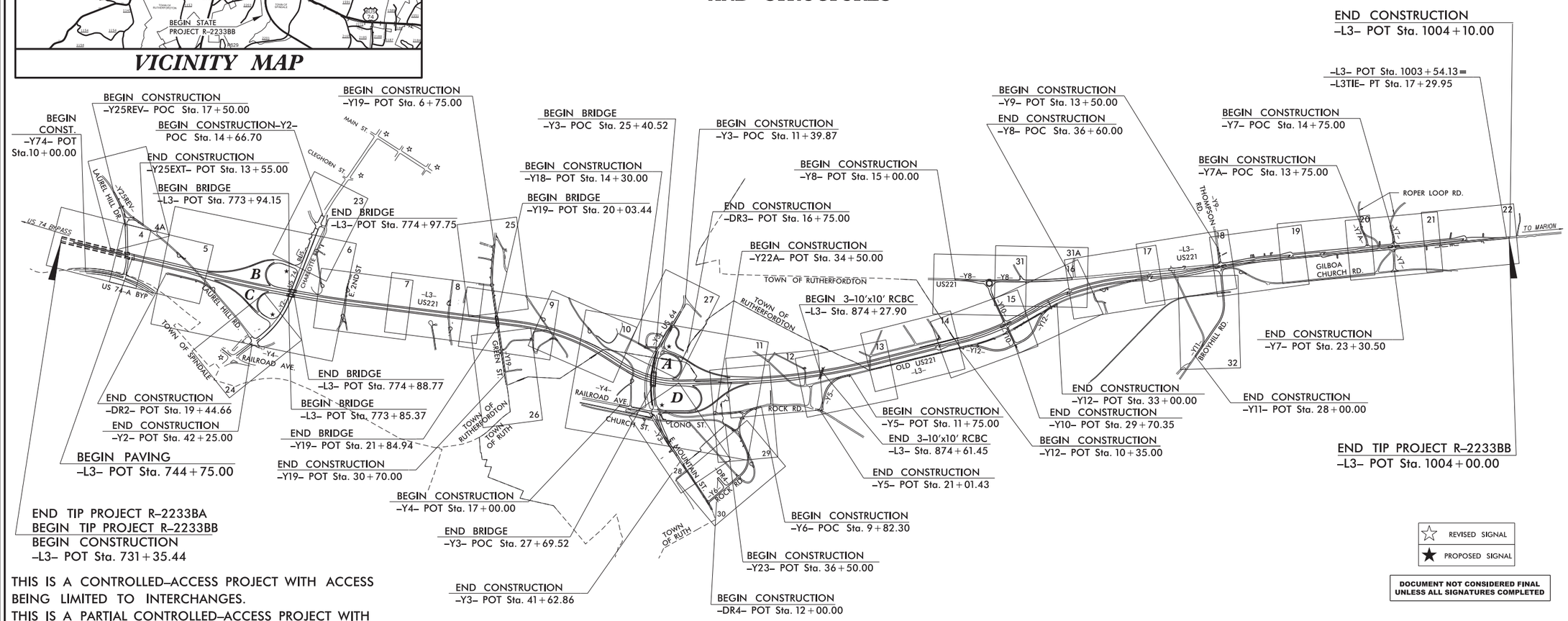
**LOCATION: US 221 SOUTH OF US 74 BUSINESS (CHARLOTTE ROAD) TO NORTH OF SR 1366 (ROPER LOOP ROAD)**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, RETAINING WALL AND STRUCTURES**

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | R-2233BB | 1 | |

| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 34400.1.S5 | | PE |
| 34400.2.5 | | R/W |
| 34400.2.7 | | UTIL. |
| 34400.3.4 | | CONST. |

REVISED 7/21/2021




END TIP PROJECT R-2233BA
BEGIN TIP PROJECT R-2233BB
BEGIN CONSTRUCTION
-L3- POT Sta. 731+35.44

THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.
THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

☆ REVISED SIGNAL
★ PROPOSED SIGNAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NCDOT CONTACT: NATHAN ADIMA, P.E.

**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 2020 = 13300
ADT 2040 = 14500
K = 9 %
D = 60 %
T = 9 % *
V = 70 MPH
* TTST 5% DUAL 4%
FUNC CLASS =
ARTERIAL
REGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT R-2233BB = 5.140 MILES
LENGTH STRUCTURE TIP PROJECT R-2233BB = 0.026 MILES
TOTAL LENGTH TIP PROJECT R-2233BB = 5.166 MILES

STRUCTURE LENGTH BASED ON -L3- NB STATIONING.

**PLANS PREPARED FOR NCDOT BY:**

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JULY 28, 2017

LETTING DATE:
DECEMBER 21, 2021

DENNIS J. MORY, P.E.
PROJECT ENGINEER

BRYAN LAMBETH, P.E.
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR P.E.

SIGNATURE:

**ROADWAY DESIGN ENGINEER**

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY P.E.

SIGNATURE:

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

8/17/2021 4:22:53 PM
...\Proj\R2233BB_Rdy_TSH.dgn
USER: dmory

12/2/2016

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 1B |

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

*Note: Not to Scale*

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

## *BOUNDARIES AND PROPERTY:*

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

## *BUILDINGS AND OTHER CULTURE:*

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

## *HYDROLOGY:*

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

## *RAILROADS:*

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

## *RIGHT OF WAY & PROJECT CONTROL:*

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

## *ROADS AND RELATED FEATURES:*

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

## *VEGETATION:*

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

## *EXISTING STRUCTURES:*

MAJOR:

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

MINOR:

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

## *UTILITIES:*

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

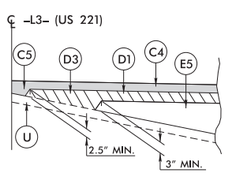
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

MISCELLANEOUS:

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

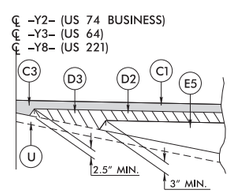
# PAVEMENT SCHEDULE (FINAL)

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|---|---|---|---|---|---|
| A1 | 7″ CONCRETE TRUCK APRON | E4 | PROP. APPROX. 5.0″ ASPHALT CONCRETE BASE COURSE,TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YARD. | R4 | PROPOSED 2′-0″ MODIFIED VALLEY GUTTER |
| C1 | PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YARD. | E5 | PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER 1″ DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3″ OR GREATER THAN 5.5″ IN DEPTH. | R5 | PROPOSED 8″ x 12″ CONCRETE CURB |
| C2 | PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YARD IN EACH OF TWO LAYERS. | J1 | PROP. 6″ AGGREGATE BASE COURSE | R6 | PROPOSED CONCRETE EXPRESSWAY GUTTER |
| C3 | PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YARD PER 1″ IN DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1.5″ IN DEPTH. | J2 | PROP. 8″ AGGREGATE BASE COURSE | S | 4″ CONCRETE SIDEWALK |
| C4 | PROP. APPROX. 3.0″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD IN EACH OF TWO LAYERS. | K1 | PROP. CHEMICAL STABILIZATION (SOIL-CEMENT BASE/LIME-TREATED SOIL). BASE TREATED WITH CEMENT AT A RATE OF 56 LBS. PER SQ. YARD @ 7″ DEPTH OR SOIL TREATED WITH LIME AT A RATE OF 24 LBS. PER SQ. YARD @ 8″ DEPTH. | T | EARTH |
| C5 | PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YARD PER 1″ IN DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 2″ IN DEPTH. | K2 | PROP. 8″ CLASS IV SUBGRADE STABILIZATION | U | EXISTING PAVEMENT |
| D1 | PROP. APPROX. 2.5″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YARD. | N1 | GEOTEXTILE FOR SOIL STABILIZATION | V1 | INCIDENTAL MILLING (SEE MILLING DETAIL V1) |
| D2 | PROP. APPROX. 4.0″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD. | N2 | GEOTEXTILE FOR PAVEMENT STABILIZATION | V2 | INCIDENTAL MILLING (SEE MILLING DETAIL V2) |
| D3 | PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER 1″ DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5″ OR GREATER THAN 4″ IN DEPTH. | P | PRIME COAT AT THE NORMAL APPLICATION RATE OF 0.35 GAL. PER SQ. YARD | V3 | 1.5 ″ PAVEMENT MILLING |
| E1 | PROP. APPROX. 3.0″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YARD. | R1 | 2′-6″ CONCRETE CURB AND GUTTER | V4 | 0″ TO 3″ PAVEMENT MILLING |
| E2 | PROP. APPROX. 4.0″ ASPHALT CONCRETE BASE COURSE,TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD. | R2 | SHOULDER BERM GUTTER (SBG) | Z | MILLED RUMBLE STRIP |
| E3 | PROP. APPROX. 4.5″ ASPHALT CONCRETE BASE COURSE,TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YARD. | R3 | 5″ MONOLITHIC CONCRETE ISLAND (KEYED IN) | W1 / W2 / W3 | VARIABLE DEPTH ASPHALT (SEE WEDGING DETAILS ON THIS SHEET) |



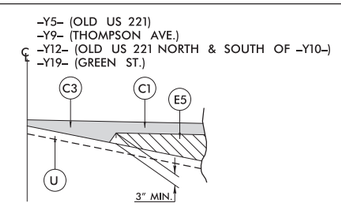

WEDGING DETAIL – W1

USE IN CONJUNCTION WITH TS Nos. 5 & 5A



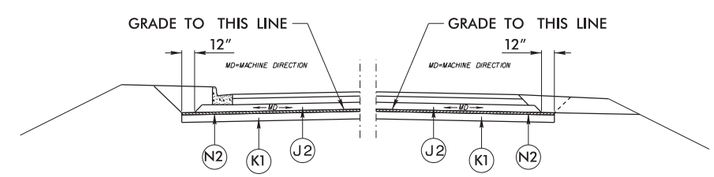

WEDGING DETAIL – W2

USE IN CONJUNCTION WITH TS Nos. 6, 7A, & 19A



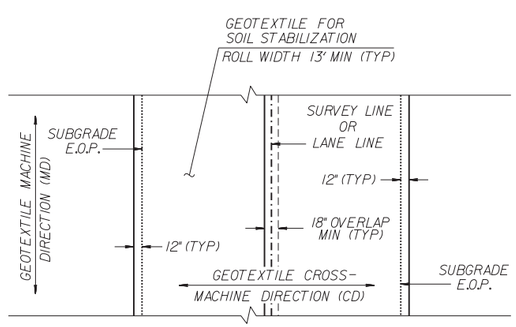

WEDGING DETAIL – W3

USE IN CONJUNCTION WITH TS No. 8A, 15 & 20



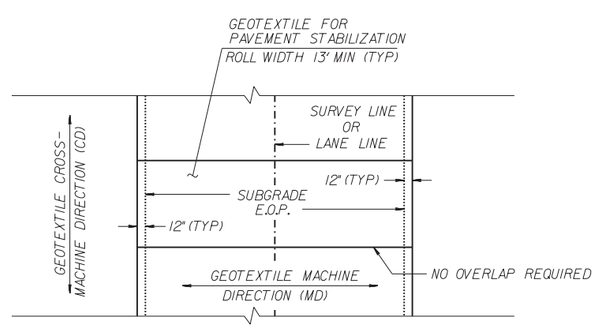

DETAIL FOR CHEMICAL STABILIZATION–GEOTEXTILE FOR PAVEMENT STABLIZATION WITH ABC

USE IN CONJUNCTION WITH TYPICAL SECTIONS No.1, 5, 13, & 14 WHERE GEOTEXTILE IS REQUIRED. FOR LOCATIONS SEE SHEET 3G–1.



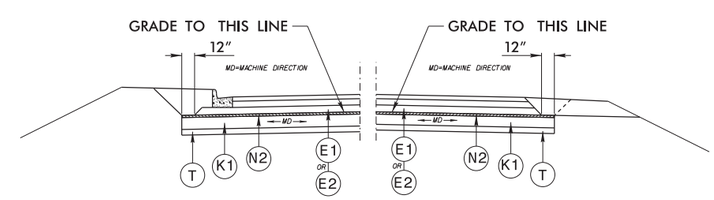

GEOTEXTILE FOR SOIL STABILIZATION PLACEMENT (PLAN VIEW)

(100% COVERAGE REQUIRED)




GEOTEXTILE FOR PAVEMENT STABILIZATION PLACEMENT (PLAN VIEW)

(100% COVERAGE REQUIRED)




DETAIL FOR CHEMICAL STABILIZATION–GEOTEXTILE FOR PAVEMENT STABLIZATION WITH ASPHALT BASE

USE IN CONJUNCTION WITH TYPICAL SECTIONS No. 7, 7A, 8, 9, 9A, 9B, 10, 12, 15, 16, 17, 18 19, 19A, 21, 22 & 23 WHERE GEOTEXTILE IS REQUIRED. FOR LOCATIONS SEE SHEET 3G–1.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 2A–1 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 024964 ENGINEER JOSEPH T. HOLLAND

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**


Dewberry
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SUITE 410
RALEIGH, NC 27607
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NC COA No. P-0929

NC DEPARTMENT OF TRANSPORTATION
PAVEMENT MANAGEMENT UNIT
1593 MAIL SERVICE CENTER
RALEIGH, NC 27699-1593


NOTES:

1. ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.
2. USE 4:1 MAX SLOPES ON THE INSIDE OF INTERCHANGE AREAS.
3. SEE PLANS FOR LOCATION OF ACCELERATION AND DECELERATION LANES.
4. SEE PLANS FOR LOCATION OF TURN LANE AND INTERSECTION TURNOUTS.
5. SEE PLANS FOR LOCATION OF ALL PAVEMENT TAPERS.
6. ALL DRIVEWAY RADII ARE 10′ UNLESS SHOWN OTHERWISE ON PLANS.


6/2/99
8/17/2021 4:23:03 PM
r:\r-2233bb_rdy_typ_2a-1.dgn
USER: smorris

6/2/99

# PAVEMENT SCHEDULE (FINAL)

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | 7" CONCRETE | C4 | 3" S9.5C | D3 | VAR DEPTH I19.0C | E4 | 5" B25.0C | K1 | CHEMICAL STABILIZATION: 7" SOIL-CEMENT BASE OR 8"LIME-TREATED SOIL | R1 | 2'-6" CONCRETE CURB & GUTTER | R5 | 8"x12" CONCRETE CURB | U | EXIST. PAVEMENT |
| C1 | 1.5" S9.5B | C5 | VAR DEPTH S9.5C | E1 | 3" B25.0C | E5 | VAR DEPTH B25.0C | K2 | 8" CLASS IV SUBGRADE STABILIZATION | R2 | SHOULDER BERM GUTTER | R6 | CONCRETE EXPRESSWAY GUTTER | Z | MILLED RUMBLE STRIP |
| C2 | 3" S9.5B | D1 | 2.5" I19.0C | E2 | 4" B25.0C | J1 | 6" ABC | N1 | GEOTEXTILE FOR SOIL STABILIZATION | R3 | 5" CONC. ISLAND | S | 4" CONC. SIDEWALK | V1 | V2 | V3 | V4 | PAVEMENT MILLING |
| C3 | VAR DEPTH S9.5B | D2 | 4" I19.0C | E3 | 4.5" B25.0C | J2 | 8" ABC | N2 | GEOTEXTILE FOR PAVEMENT STABILIZATION | P | PRIME COAT | R4 | 2' MODIFIED VALLEY GUTTER | T | EARTH | W1 | W2 | W3 | VARIABLE DEPTH PAVEMENT WEDGING |

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 2A-2 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 024964 ENGINEER JOSEPH T. HOLLAND

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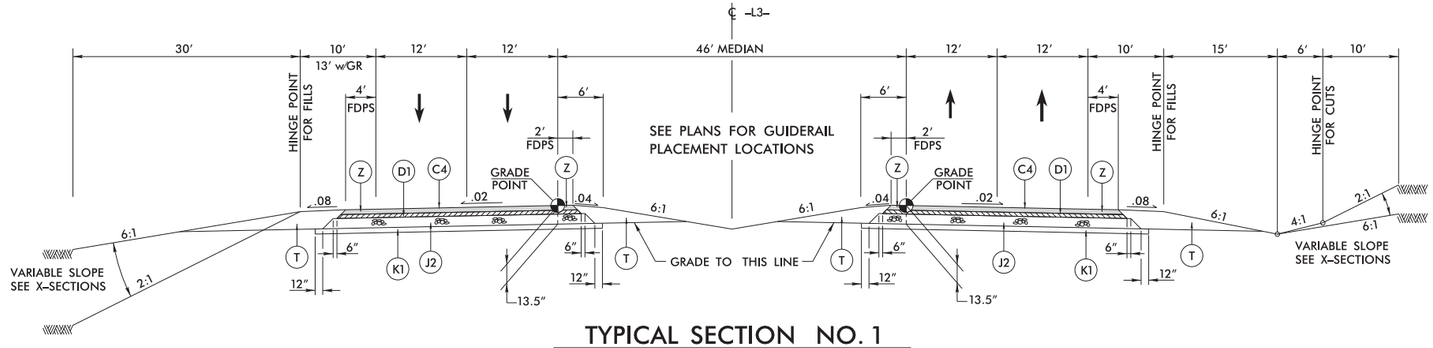
NC DEPARTMENT OF TRANSPORTATION
PAVEMENT MANAGEMENT UNIT
1593 MAIL SERVICE CENTER
RALEIGH, NC 27699-1593


## TYPICAL SECTION NO. 1

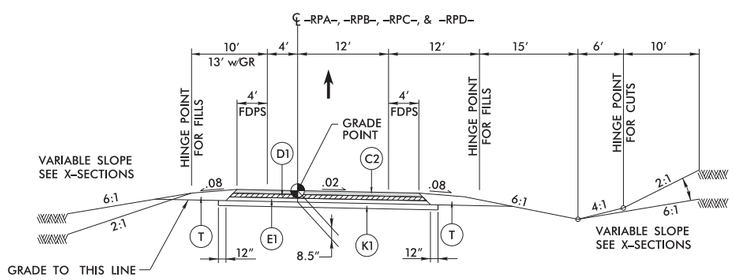
NOTE: SEE SHEET 2A-9 FOR THE GRADING ONLY
TYPICAL SECTION FROM -L3- 732+00.00 TO -L3- 743+00

### SOUTHBOUND LANES

-L3- 744+75.00 TO -L3- 773+94.15 (BRIDGE)
-L3- 774+97.75 (BRIDGE) TO -L3- 948+00.00

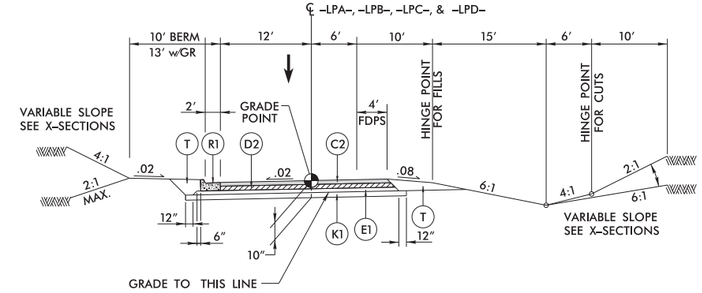
### NORTHBOUND LANES

-L3- 744+75.00 TO -L3- 773+85.37 (BRIDGE)
-L3- 774+88.77 (BRIDGE) TO -L3- 955+00.00




## TYPICAL SECTION NO. 2

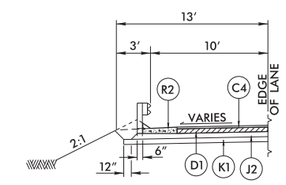
-RPA- 14+53.78 TO -RPA- 23+94.24 -RPB- 13+70.55 TO -RPB- 25+50.13
-RPC- 14+56.68 TO -RPC- 23+71.04 -RPD- 13+36.43 TO -RPD- 24+00.00




NOTE: USE -L3- PAVEMENT DESIGN IN ALL GORE AREAS

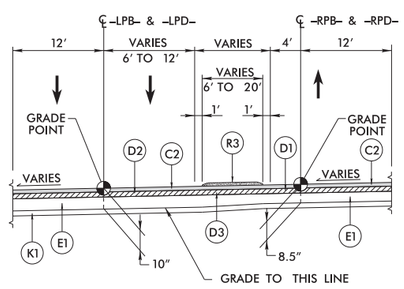
## TYPICAL SECTION NO. 3

-LPA- 11+61.84 TO -LPA- 16+31.16 -LPB- 12+89.84 TO -LPB- 17+01.04
-LPC- 11+83.18 TO -LPC- 16+33.37 -LPD- 15+12.97 TO -LPD- 19+71.53



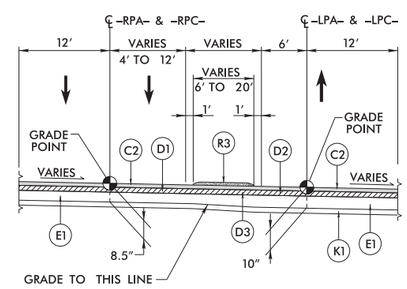

## DETAIL FOR SHOULDER BERM GUTTER

USE IN CONJUNCTION WITH -L3- TYPICAL SECTION No.1



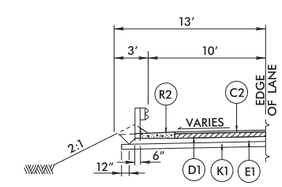

## TYPICAL SECTION NO. 4

-LPB- 17+01.04 TO -LPB- 21+72.55 -LPD- 19+71.53 TO -LPD- 26+53.27
-RPB- 25+50.13 TO -RPB- 30+40.47 -RPD- 24+00.00 TO -RPD- 30+87.27




## TYPICAL SECTION NO. 4A

-LPC- 16+33.37 TO -LPC- 19+61.65 -LPA- 16+31.16 TO -LPA- 19+53.84
-RPC- 23+71.04 TO -RPC- 27+03.60 -RPA- 23+94.24 TO -RPA- 27+23.95




## DETAIL FOR SHOULDER BERM GUTTER

USE IN CONJUNCTION WITH -RPD- TYPICAL SECTION No. 2

8/17/2016 4:23:05 PM
USER: jdoggett

6/2/99

# PAVEMENT SCHEDULE (FINAL)

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | 7" CONCRETE | C4 | 3" S9.5C | D3 | VAR DEPTH I19.0C | E4 | 5" B25.0C | K1 | CHEMICAL STABILIZATION: 7" SOIL-CEMENT BASE OR 8"LIME-TREATED SOIL | R1 | 2'-6" CONCRETE CURB & GUTTER | R5 | 8"x12" CONCRETE CURB | U | EXIST. PAVEMENT |
| C1 | 1.5" S9.5B | C5 | VAR DEPTH S9.5C | E1 | 3" B25.0C | E5 | VAR DEPTH B25.0C | K2 | 8" CLASS IV SUBGRADE STABILIZATION | R2 | SHOULDER BERM GUTTER | R6 | CONCRETE EXPRESSWAY GUTTER | Z | MILLED RUMBLE STRIP |
| C2 | 3" S9.5B | D1 | 2.5" I19.0C | E2 | 4" B25.0C | J1 | 6" ABC | N1 | GEOTEXTILE FOR SOIL STABILIZATION | R3 | 5" CONC. ISLAND | S | 4" CONC. SIDEWALK | V1 | PAVEMENT MILLING |
| C3 | VAR DEPTH S9.5B | D2 | 4" I19.0C | E3 | 4.5" B25.0C | J2 | 8" ABC | N2 | GEOTEXTILE FOR PAVEMENT STABILIZATION | P | PRIME COAT | R4 | 2' MODIFIED VALLEY GUTTER | T | EARTH |
| | | | | | | | | | | | | | | V2 | |
| | | | | | | | | | | | | | | V3 | |
| | | | | | | | | | | | | | | V4 | |
| | | | | | | | | | | | | | | W1 | |
| | | | | | | | | | | | | | | W2 | |
| | | | | | | | | | | | | | | W3 | |

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 2A-3 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 024964 ENGINEER JOSEPH T. HOLLAND

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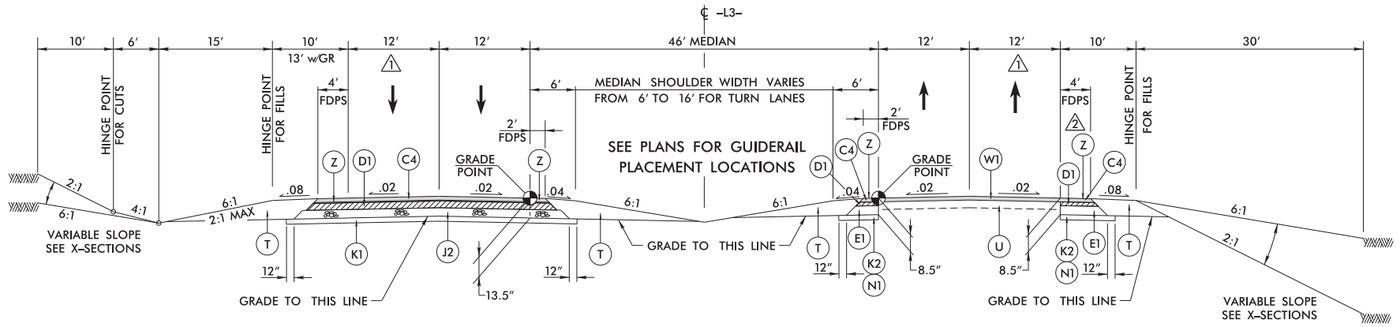
RALEIGH, NC 27699-1593


1 PAVEMENT WIDTH VARIES FROM 12′ TO 30′ FOR SUPERSTREET BULB-OUTS.

2 PAVEMENT WIDENING WIDTH VARIES FROM 4′ TO 22′ FOR SUPERSTREET BULB-OUTS.

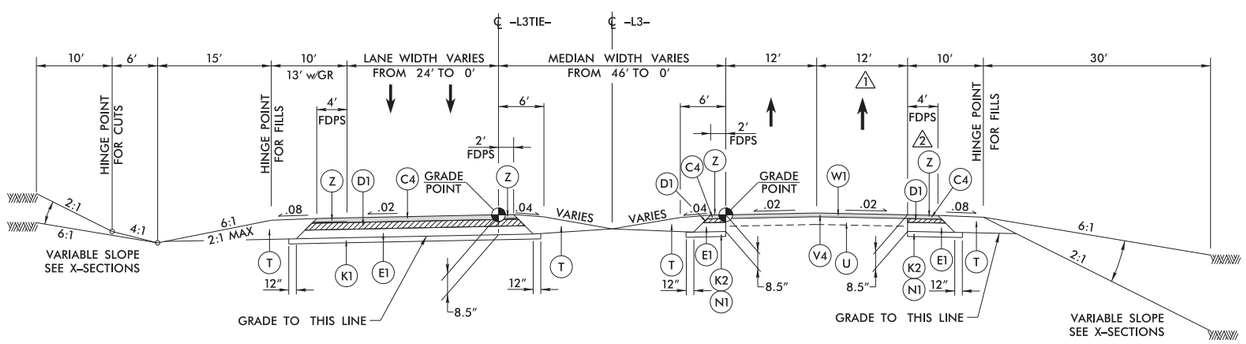
## TYPICAL SECTION NO. 5

**SOUTHBOUND LANES**

-L3- 948+00.00 TO -L3- 952+00.00
(PAVEMENT WEDGING FROM 0′ TO 24′)
-L3- 952+00.00 TO -L3- 996+27.26
(FULL DEPTH PAVEMENT)

**NORTHBOUND LANES**

-L3- 955+00.00 TO -L3- 996+27.26



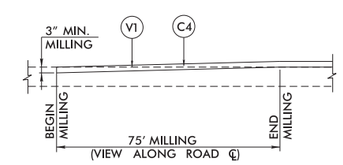

## TYPICAL SECTION NO. 5A

**SOUTHBOUND LANES**

-L3TIE- 10+00.00 TO -L3TIE- 17+29.95

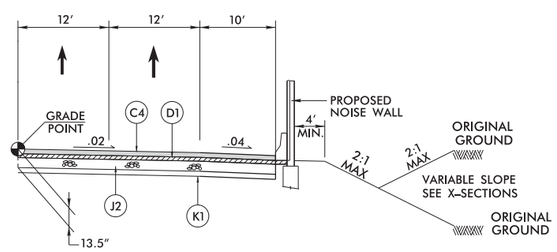
**NORTHBOUND LANES**

-L3- 996+27.26 TO -L3- 1004+00.00



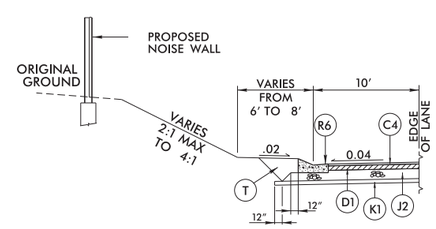

## INCIDENTAL MILLING DETAIL – V1

USE IN CONJUNCTION WITH TYPICAL SECTION No. 5A
-L3- 1003+25.00 TO -L3- 1004+00.00



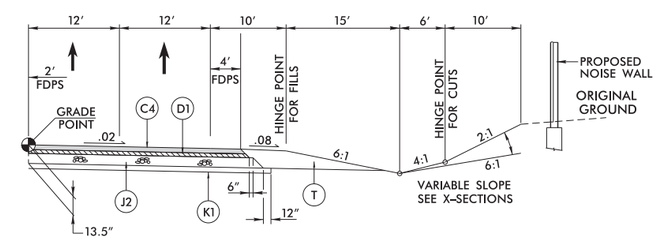

## DETAIL NO. 1 FOR NOISE WALLS

USE IN CONJUNCTION WITH -L3- TYPICAL SECTION No.1




## DETAIL NO. 2 FOR NOISE WALLS

USE IN CONJUNCTION WITH -L3- TYPICAL SECTION No.1




## DETAIL NO. 3 FOR NOISE WALLS

USE IN CONJUNCTION WITH -L3- TYPICAL SECTION No.1

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USER: dmory

6/2/99

# PAVEMENT SCHEDULE (FINAL)

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | 7" CONCRETE | C4 | 3" S9.5C | D3 | VAR DEPTH I19.0C | E4 | 5" B25.0C | K1 | CHEMICAL STABILIZATION: 7" SOIL-CEMENT BASE OR 8"LIME-TREATED SOIL | R1 | 2'-6" CONCRETE CURB & GUTTER | R5 | 8"x12" CONCRETE CURB | U | EXIST. PAVEMENT |
| C1 | 1.5" S9.5B | C5 | VAR DEPTH S9.5C | E1 | 3" B25.0C | E5 | VAR DEPTH B25.0C | K2 | 8" CLASS IV SUBGRADE STABILIZATION | R2 | SHOULDER BERM GUTTER | R6 | CONCRETE EXPRESSWAY GUTTER | Z | MILLED RUMBLE STRIP |
| C2 | 3" S9.5B | D1 | 2.5" I19.0C | E2 | 4" B25.0C | J1 | 6" ABC | N1 | GEOTEXTILE FOR SOIL STABILIZATION | R3 | 5" CONC. ISLAND | S | 4" CONC. SIDEWALK | V1 | PAVEMENT MILLING |
| C3 | VAR DEPTH S9.5B | D2 | 4" I19.0C | E3 | 4.5" B25.0C | J2 | 8" ABC | N2 | GEOTEXTILE FOR PAVEMENT STABILIZATION | P | PRIME COAT | R4 | 2' MODIFIED VALLEY GUTTER | T | EARTH |

| ITEM | DESCRIPTION |
|---|---|
| V2 | PAVEMENT MILLING |
| V3 | VARIABLE DEPTH PAVEMENT WEDGING |
| W1 | |
| W2 | |
| W3 | |

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 2A-4 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 024964 ENGINEER JOSEPH T. HOLLAND

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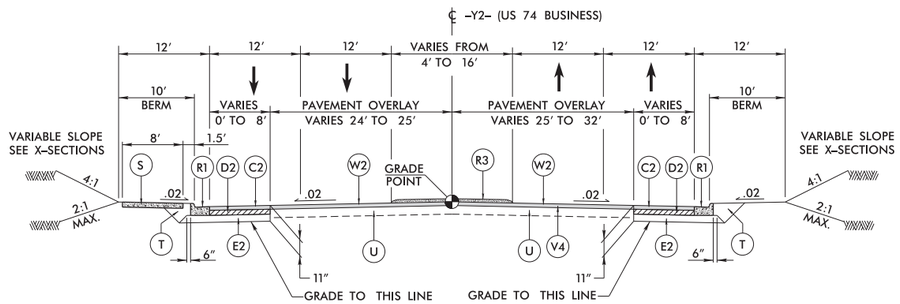
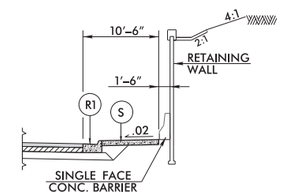


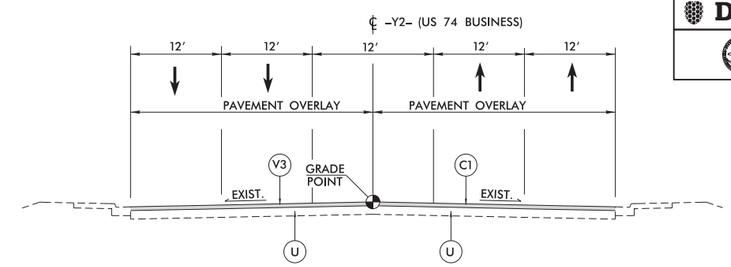

## TYPICAL SECTION NO. 6

-Y2- 17+25.00 TO -Y2- 42+25.00



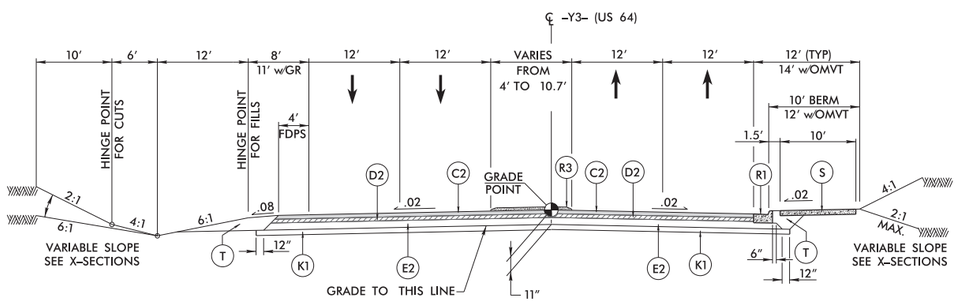

## PROPOSED RETAINING WALL

-Y2- 27+67+/- TO -Y2- 31+45+/- - EASTBOUND
-Y2- 28+41+/- TO -Y2- 30+91+/- - WESTBOUND
NOTE: SIDEWALK ON WESTBOUND SIDE ONLY.
SEE BRIDGE PLANS FOR WALL LOCATION & DETAILS




## TYPICAL SECTION NO. 6A

-Y2- 14+66.70 TO -Y2- 17+25.00
-Y2- 40+49.83 TO -Y2- 42+25.00



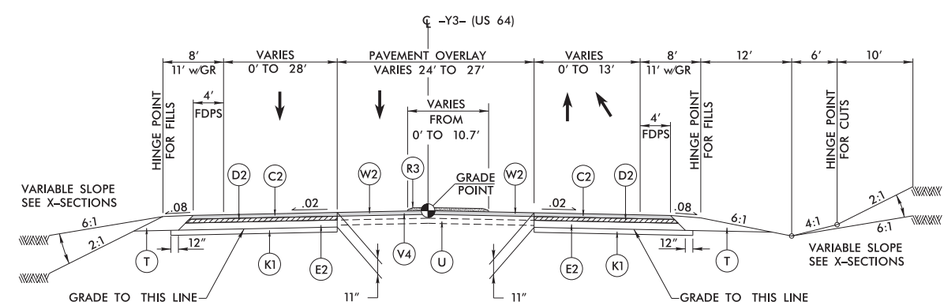

## TYPICAL SECTION NO. 7

### WESTBOUND LANES

-Y3- 14+75.00 TO -Y3- 25+40.52 BRIDGE
-Y3- 27+69.52 BRIDGE TO -Y3- 37+25.00

### EASTBOUND LANES

-Y3- 14+75.00 TO -Y3- 25+40.52 BRIDGE
-Y3- 27+69.52 BRIDGE TO -Y3- 32+05.00
(SEE DETAIL FOR OMVT THIS SHEET)



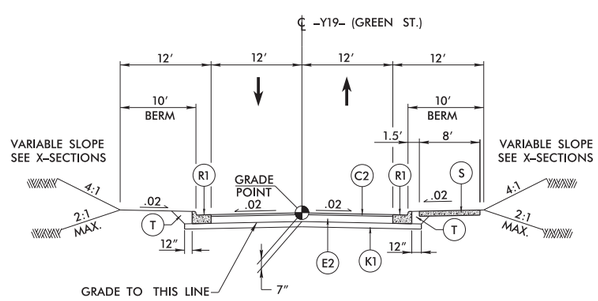

## TYPICAL SECTION NO. 7A

### WESTBOUND LANES

-Y3- 13+10.00 TO -Y3- 14+75.00
-Y3- 37+25.00 TO -Y3- 41+50.00

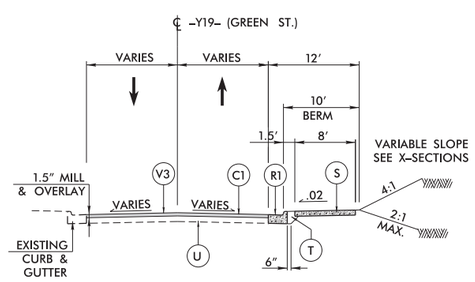
### EASTBOUND LANES

-Y3- 13+10.00 TO -Y3- 14+75.00
-Y3- 33+96.00 TO -Y3- 39+88.56
-Y3- 40+67.67 TO -Y3- 41+50.00



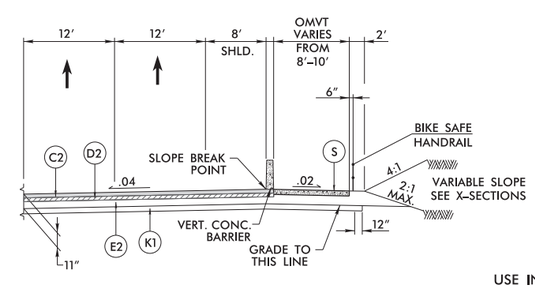

## TYPICAL SECTION NO. 8

-Y19- 12+75.00 TO -Y19- 20+03.44 (BRIDGE)
-Y19- 21+84.94 (BRIDGE) TO -Y19- 28+50.00




## TYPICAL SECTION NO. 8A

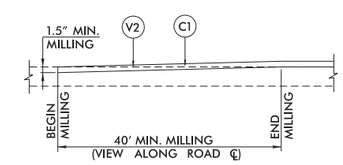
-Y19- 6+75.00 TO -Y19- 12+75.00 SIDEWALK - RIGHT
-Y19- 28+50.00 TO -Y19- 30+20.73 CURB & GUTTER /NO SIDEWALK - LEFT




## OVER MOUNTAIN VICTORY TRAIL (OMVT)

### -Y3- EASTBOUND LANES

-Y3- 21+60.55 TO -Y3- 25+40.52 BRIDGE
-Y3- 27+69.52 BRIDGE TO -Y3- 32+05.00




## INCIDENTAL MILLING DETAIL - V2

USE INCONJUNCTION WITH ALL -Y- LINE TIE-INS
-Y3- 13+10.00 TO -Y3- 13+50.00
-Y3- 41+10.00 TO -Y3- 41+50.00

USE INCONJUNCTION WITH TS No. 7
-Y3- 21+53.59 TO -Y3- 31+35.00 (CONCRETE VERTICAL BARRIER)
-Y3- 22+00.00 TO -Y3- 25+40.52 BRIDGE (BIKE SAFE HANDRAIL-RIGHT)
-Y3- 27+69.52 BRIDGE TO -Y3- 31+35.00 (BIKE SAFE HANDRAIL-RIGHT)
-Y3- 24+50.00 TO -Y3- 25+00.00 WIDTH VARIES FROM 10' TO 8'
-Y3- 28+00.00 TO -Y3- 28+50.00 WIDTH VARIES FROM 8' TO 10'
SIDEWALK WIDTH IS 8' ON THE PROPOSED BRIDGE.
SEE CROSS SECTIONS & BRIDGE PLANS.

8/17/2021 4:23:31 PM
8:\TP\2021\R2233BB_RDY_TYP_2A-4.DGN
USER: JDOBIE

6/2/99

# PAVEMENT SCHEDULE (FINAL)

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | 7" CONCRETE | C4 | 3" S9.5C | D3 | VAR DEPTH I19.0C | E4 | 5" B25.0C | K1 | CHEMICAL STABILIZATION: 7" SOIL-CEMENT BASE OR 8"LIME-TREATED SOIL | R1 | 2'-6" CONCRETE CURB & GUTTER | R5 | 8"x12" CONCRETE CURB | U | EXIST. PAVEMENT |
| C1 | 1.5" S9.5B | C5 | VAR DEPTH S9.5C | E1 | 3" B25.0C | E5 | VAR DEPTH B25.0C | K2 | 8" CLASS IV SUBGRADE STABILIZATION | R2 | SHOULDER BERM GUTTER | R6 | CONCRETE EXPRESSWAY GUTTER | Z | MILLED RUMBLE STRIP |
| C2 | 3" S9.5B | D1 | 2.5" I19.0C | E2 | 4" B25.0C | J1 | 6" ABC | N1 | GEOTEXTILE FOR SOIL STABILIZATION | R3 | 5" CONC. ISLAND | S | 4" CONC. SIDEWALK | V1 | PAVEMENT MILLING |
| C3 | VAR DEPTH S9.5B | D2 | 4" I19.0C | E3 | 4.5" B25.0C | J2 | 8" ABC | N2 | GEOTEXTILE FOR PAVEMENT STABILIZATION | P | PRIME COAT | R4 | 2' MODIFIED VALLEY GUTTER | T | EARTH |

| ITEM | DESCRIPTION |
|---|---|
| V2 | VARIABLE DEPTH PAVEMENT WEDGING |
| W1 | |
| W2 | |
| W3 | |

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 2A-5 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 024964 ENGINEER JOSEPH T. HOLLAND

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**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NC COA No. F-0929

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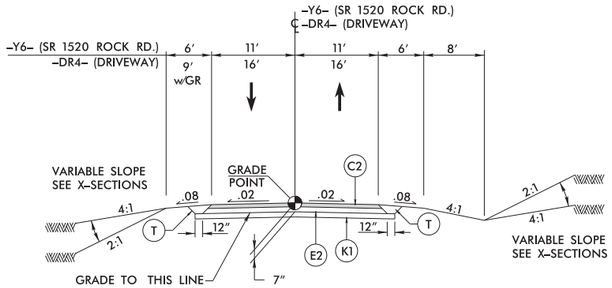
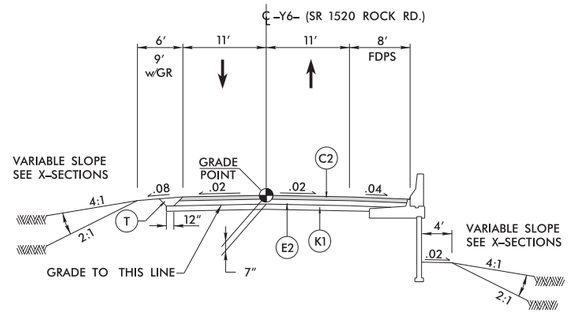
PAVEMENT MANAGEMENT UNIT
1593 MAIL SERVICE CENTER
RALEIGH, NC 27699-1593

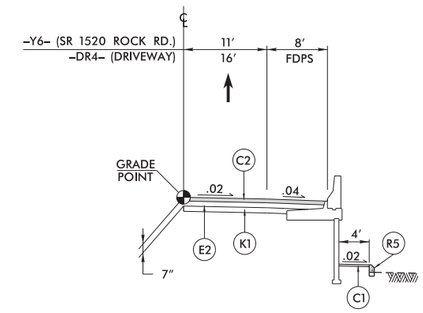

## TYPICAL SECTION NO. 9

-Y6- 10+00.00 TO -Y6- 25+92.57
-Y6- 26+12.41 TO -Y6- 33+21.90
-DR4- 12+00.00 TO -DR4- 14+17.87
NOTE - STABILIZATION NOT REQUIRED FOR DRIVEWAY -DR4-



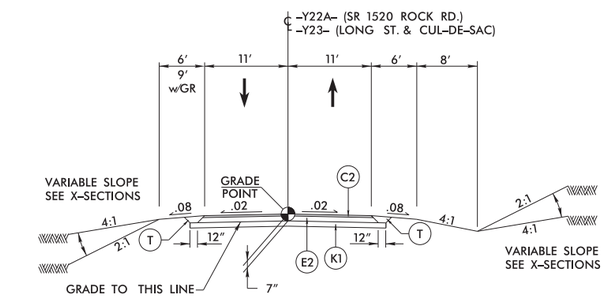

## TYPICAL SECTION NO. 9A

-Y6- 26+60.00 TO -Y6- 27+11.00 - RIGHT
-Y6- 26+25.06 TO -Y6- 26+64.31 (FDPS - RIGHT)



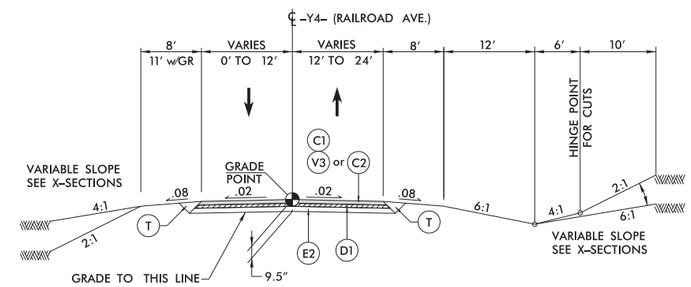

## TYPICAL SECTION NO. 9B

-Y6- 27+11.00 TO -Y6- 26+60.00 - RIGHT
-DR4 13+14.00 TO 13+97.10 - LEFT
NOTE - STABILIZATION NOT REQUIRED FOR DRIVEWAY -DR4-



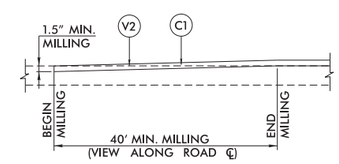

## TYPICAL SECTION NO. 10

-Y22A- 34+50.00 TO -Y22A- 40+24.15
-Y23- 36+60.00 TO -Y23- 39+33.33



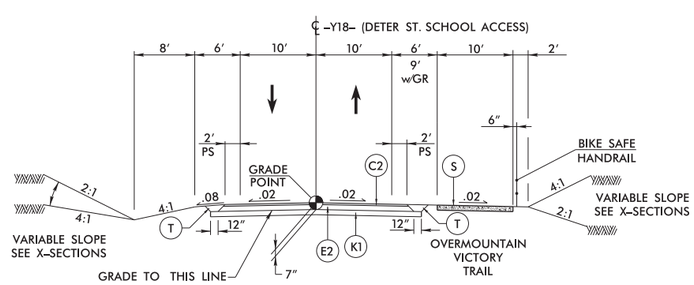

## TYPICAL SECTION NO. 11

-Y4- 17+00.00 TO -Y4- 18+50.00 - LEFT (MILL & OVERLAY)
-Y4- 18+50.00 TO -Y4- 23+45.84



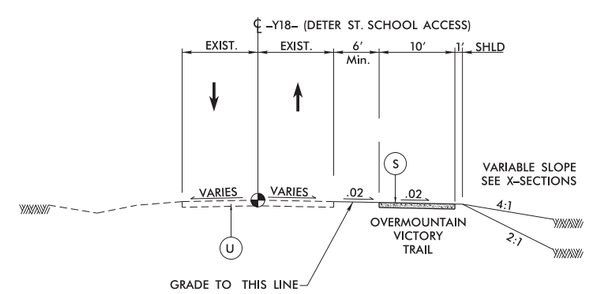

## INCIDENTAL MILLING DETAIL - V2

USE INCONJUNCTION WITH ALL -Y- LINE TIE-INS
-Y23- 36+60.00 TO -Y23- 37+00.00




## TYPICAL SECTION NO. 12

-Y18- 14+30.00 TO -Y18- 18+11.97
-Y18- 15+50.00 TO -Y18- 16+50.00 - RIGHT w/HANDRAIL




## TYPICAL SECTION NO. 12A

-Y18- 10+30.42 TO -Y18- 14+30.00

8/17/2021 4:23:41 PM
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USER: JJONES

6/2/99

# PAVEMENT SCHEDULE (FINAL)

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | 7" CONCRETE | C4 | 3" S9.5C | D3 | VAR DEPTH I19.0C | E4 | 5" B25.0C | K1 | CHEMICAL STABILIZATION: 7" SOIL-CEMENT BASE OR 8"LIME-TREATED SOIL | R1 | 2'-6" CONCRETE CURB & GUTTER | R5 | 8"x12" CONCRETE CURB | U | EXIST. PAVEMENT |
| C1 | 1.5" S9.5B | C5 | VAR DEPTH S9.5C | E1 | 3" B25.0C | E5 | VAR DEPTH B25.0C | K2 | 8" CLASS IV SUBGRADE STABILIZATION | R2 | SHOULDER BERM GUTTER | R6 | CONCRETE EXPRESSWAY GUTTER | Z | MILLED RUMBLE STRIP |
| C2 | 3" S9.5B | D1 | 2.5" I19.0C | E2 | 4" B25.0C | J1 | 6" ABC | N1 | GEOTEXTILE FOR SOIL STABILIZATION | R3 | 5" CONC. ISLAND | S | 4" CONC. SIDEWALK | V1 | V2 |
| C3 | VAR DEPTH S9.5B | D2 | 4" I19.0C | E3 | 4.5" B25.0C | J2 | 8" ABC | N2 | GEOTEXTILE FOR PAVEMENT STABILIZATION | P | PRIME COAT | R4 | 2' MODIFIED VALLEY GUTTER | T | EARTH |

| ITEM | | | | DESCRIPTION |
|---|---|---|---|---|
| | | | U | EXIST. PAVEMENT |
| | | | Z | MILLED RUMBLE STRIP |
| V3 | V4 | | | PAVEMENT MILLING |
| | W1 | W2 | W3 | VARIABLE DEPTH PAVEMENT WEDGING |

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 2A-6 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 024964 ENGINEER JOSEPH T. HOLLAND

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**


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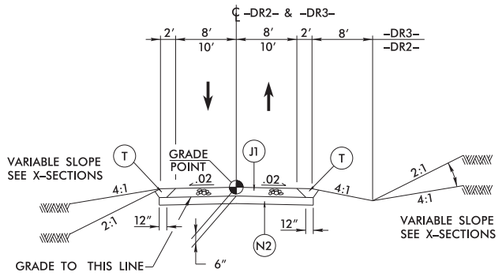
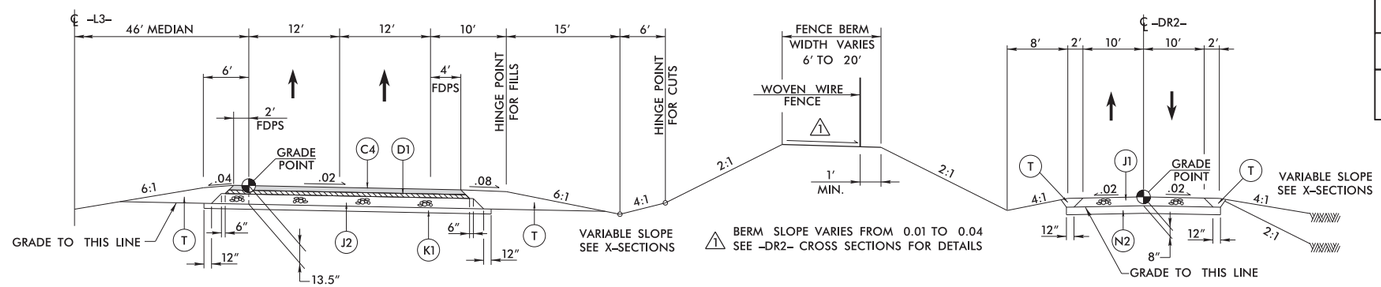
RALEIGH, NC 27699-1593


## TYPICAL SECTION NO. 13

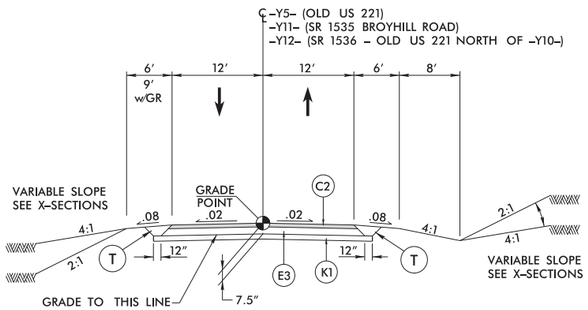
-DR2- 9+67.72 TO -DR2- 19+44.66
-DR3- 10+25.16 TO -DR3- 16+75.00




## TYPICAL SECTION 14

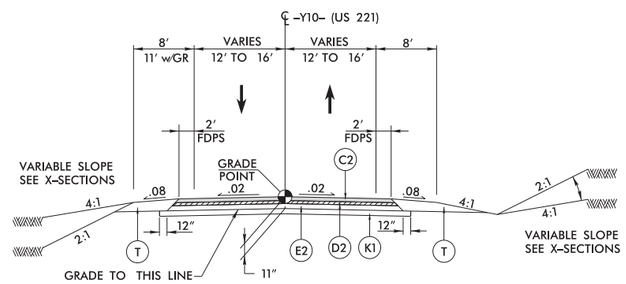
### WOVEN WIRE FENCE BERM DETAIL

-L3- 751+20.89 TO -L3- 759+00.00 NORTHBOUND LANES
-DR2- 11+80.00 TO -DR2- 19+44.00



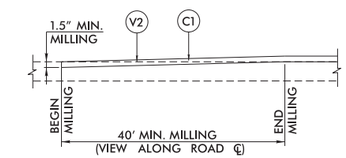

## TYPICAL SECTION NO. 15

-Y5- 11+75.00 TO -Y5- 21+01.44
-Y11- 10+47.29 TO -Y11- 28+00.00
-Y12- 11+25.00 TO -Y12- 33+00.00



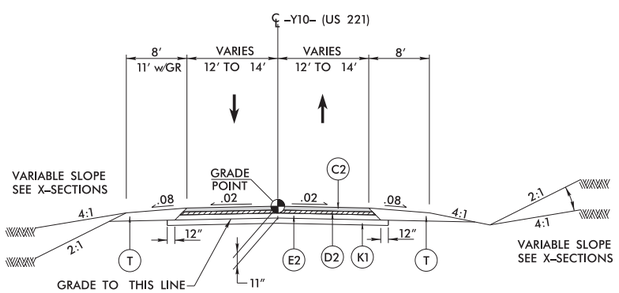

## TYPICAL SECTION NO. 16

-Y10- 20+58.96 TO -Y10- 24+81.26 - LEFT
-Y10- 20+58.96 TO -Y10- 24+81.26 - RIGHT



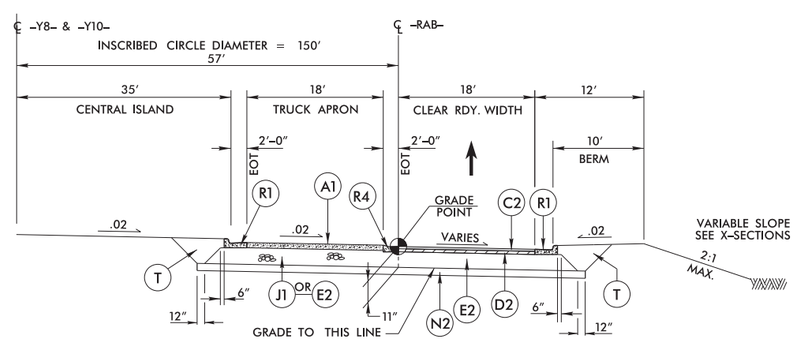

## INCIDENTAL MILLING DETAIL - V2

USE INCONJUNCTION WITH ALL -Y- LINE TIE-INS
-Y5- 11+75.00 TO -Y5- 12+15.00
-Y12- 11+25.00 TO -Y12- 11+65.00
-Y12- 32+60.00 TO -Y12- 33+00.00



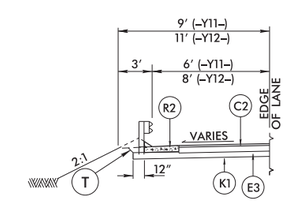

## TYPICAL SECTION NO. 17

-Y10- 26+75.30 TO -Y10- 29+70.35 - RIGHT
-Y10- 26+75.66 TO -Y10- 29+70.35 - LEFT



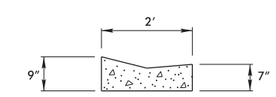

## TYPICAL SECTION NO. 18

ROUNDABOUT -RAB-
-RAB- STA 0+00.00 TO -RAB- STA 3+58.14




## DETAIL FOR SHOULDER BERM GUTTER

USE IN CONJUNCTION WITH TYPICAL SECTION No. 15




## DETAIL FOR MODIFIED VALLEY GUTTER

USE IN CONJUNCTION WITH TYPICAL SECTION No. 18
FOR ROUNDABOUT TRUCK APRON

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USER: gmorris

6/2/99

# PAVEMENT SCHEDULE (FINAL)

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | 7" CONCRETE | C4 | 3" S9.5C | D3 | VAR DEPTH I19.0C | E4 | 5" B25.0C | K1 | CHEMICAL STABILIZATION: 7" SOIL-CEMENT BASE OR 8"LIME-TREATED SOIL | R1 | 2'-6" CONCRETE CURB & GUTTER | R5 | 8"x12" CONCRETE CURB | U | EXIST. PAVEMENT |
| C1 | 1.5" S9.5B | C5 | VAR DEPTH S9.5C | E1 | 3" B25.0C | E5 | VAR DEPTH B25.0C | K2 | 8" CLASS IV SUBGRADE STABILIZATION | R2 | SHOULDER BERM GUTTER | R6 | CONCRETE EXPRESSWAY GUTTER | Z | MILLED RUMBLE STRIP |
| C2 | 3" S9.5B | D1 | 2.5" I19.0C | E2 | 4" B25.0C | J1 | 6" ABC | N1 | GEOTEXTILE FOR SOIL STABILIZATION | R3 | 5" CONC. ISLAND | S | 4" CONC. SIDEWALK | V1 | PAVEMENT MILLING |
| C3 | VAR DEPTH S9.5B | D2 | 4" I19.0C | E3 | 4.5" B25.0C | J2 | 8" ABC | N2 | GEOTEXTILE FOR PAVEMENT STABILIZATION | P | PRIME COAT | R4 | 2' MODIFIED VALLEY GUTTER | T | EARTH |

| ITEM | DESCRIPTION |
|---|---|
| V2 | VARIABLE DEPTH PAVEMENT WEDGING |
| W1 | |
| W2 | |
| W3 | |

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 2A-7 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 024964 ENGINEER JOSEPH T. HOLLAND

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**


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NC COA No. P-0929

NC DEPARTMENT OF TRANSPORTATION
PAVEMENT MANAGEMENT UNIT
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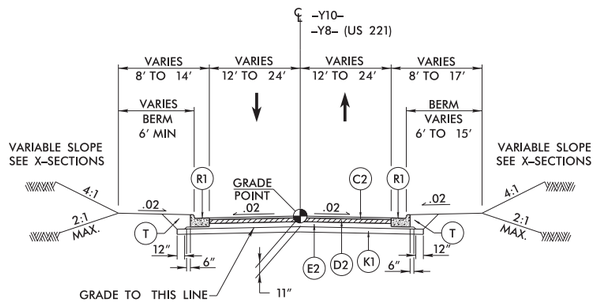
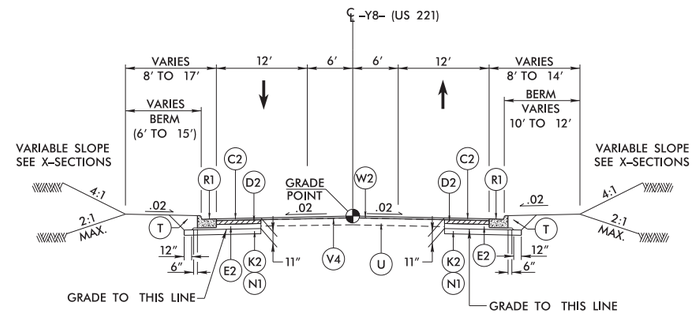
RALEIGH, NC 27699-1593

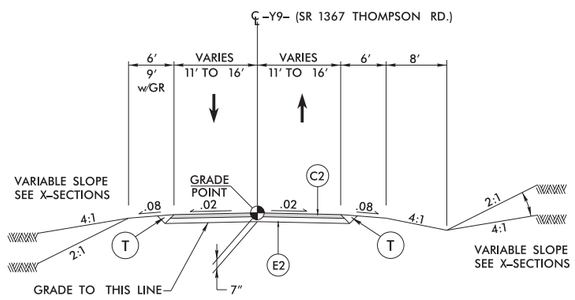

## TYPICAL SECTION NO. 19

-Y8- 15+00.00 TO -Y8- 20+57.13
-Y10- 18+30.59 TO -Y10- 20+58.16



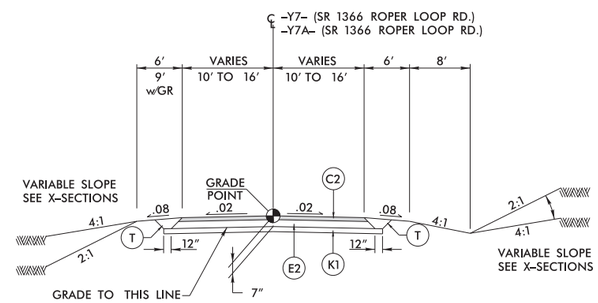

## TYPICAL SECTION NO. 19A

-Y8- 22+07.13 TO -Y8- 36+60.00



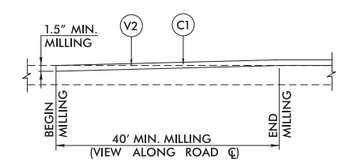

## TYPICAL SECTION NO. 20

-Y9- 13+50.00 TO -Y9- 16+53.96



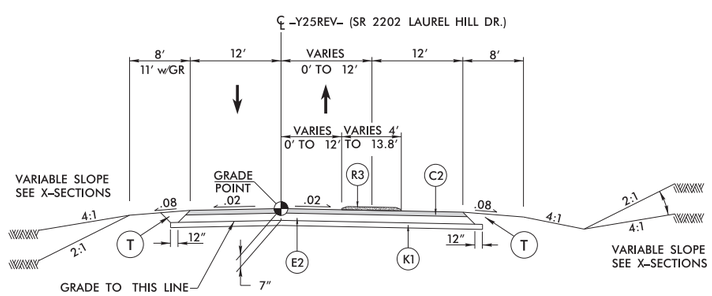

## TYPICAL SECTION NO. 21

-Y7- 14+75.00 TO -Y7- 23+08.78
-Y7A- 13+75.00 TO -Y7A- 17+98.84



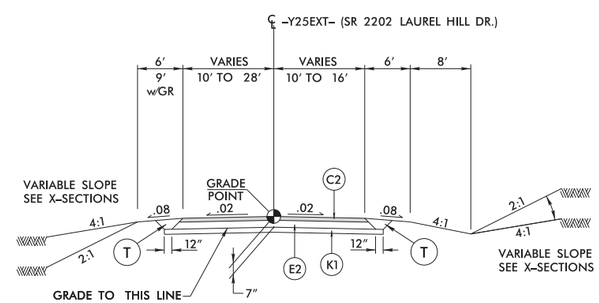

## INCIDENTAL MILLING DETAIL – V2

USE INCONJUNCTION WITH ALL -Y- LINE TIE-INS
-Y7- 14+75.00 TO -Y7- 15+15.00
-Y7A- 13+75.00 TO -Y7A- 14+15.00
-Y8- 15+00.00 TO -Y8- 15+40.00
-Y8- 36+20.00 TO -Y8- 36+60.00
-Y9- 13+50.00 TO -Y9- 13+90.00
-Y25EXT- 13+00.00 TO -Y25EXT- 13+55.00




## TYPICAL SECTION NO. 22

-Y25REV- 17+50.00 TO -Y25REV- 33+28.28




## TYPICAL SECTION NO. 23

-Y25EXT- 10+12.00 TO -Y25EXT- 13+00.00

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USER: dmory
R-2233BB_RDY_TYP_2A-7.DGN

6/2/99

# PAVEMENT SCHEDULE (FINAL)

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | | | | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | 7" CONCRETE | C4 | 3" S9.5C | D3 | VAR DEPTH I19.0C | E4 | 5" B25.0C | K1 | CHEMICAL STABILIZATION: 7" SOIL-CEMENT BASE OR 8"LIME-TREATED SOIL | R1 | 2'-6" CONCRETE CURB & GUTTER | R5 | 8"x12" CONCRETE CURB | | | | U | EXIST. PAVEMENT |
| C1 | 1.5" S9.5B | C5 | VAR DEPTH S9.5C | E1 | 3" B25.0C | E5 | VAR DEPTH B25.0C | K2 | 8" CLASS IV SUBGRADE STABILIZATION | R2 | SHOULDER BERM GUTTER | R6 | CONCRETE EXPRESSWAY GUTTER | | | | Z | MILLED RUMBLE STRIP |
| C2 | 3" S9.5B | D1 | 2.5" I19.0C | E2 | 4" B25.0C | J1 | 6" ABC | N1 | GEOTEXTILE FOR SOIL STABILIZATION | R3 | 5" CONC. ISLAND | S | 4" CONC. SIDEWALK | V1 | V2 | V3 | V4 | PAVEMENT MILLING |
| C3 | VAR DEPTH S9.5B | D2 | 4" I19.0C | E3 | 4.5" B25.0C | J2 | 8" ABC | N2 | GEOTEXTILE FOR PAVEMENT STABILIZATION | P | PRIME COAT | R4 | 2' MODIFIED VALLEY GUTTER | T | EARTH | W1 | W2 | W3 | VARIABLE DEPTH PAVEMENT WEDGING |

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 2A-8 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 024964 ENGINEER JOSEPH T. HOLLAND

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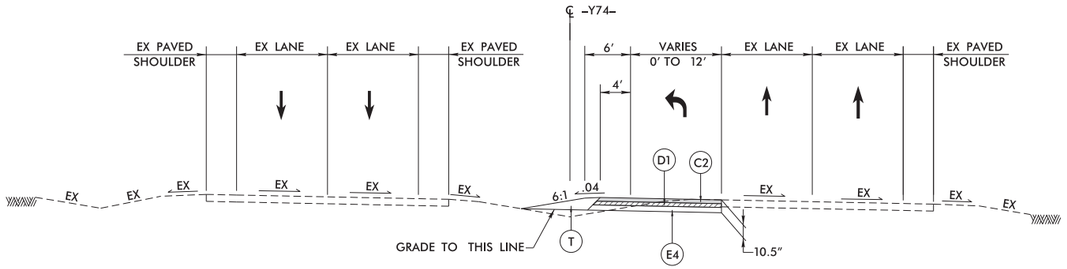
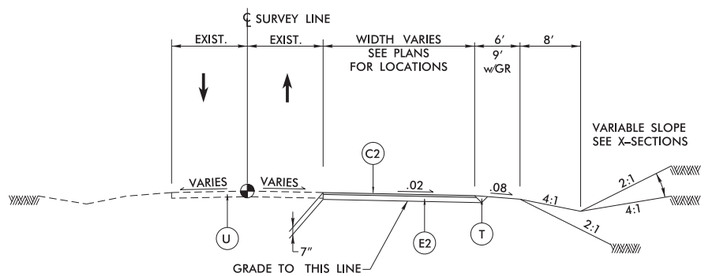
RALEIGH, NC 27699-1593

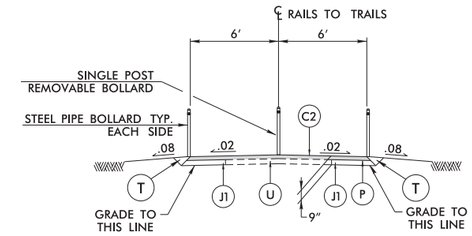

## TYPICAL SECTION NO. 24

-Y74- 10+00.00 TO -Y74- 17+89.51

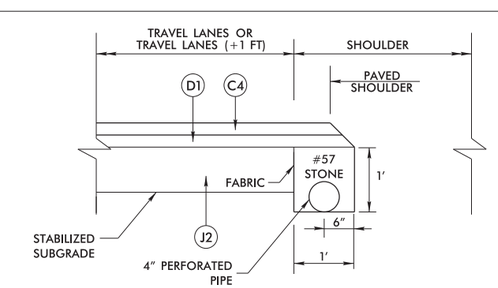



## TYPICAL SECTION NO. 25

CUL-DE-SACS & STREET CONNECTIONS

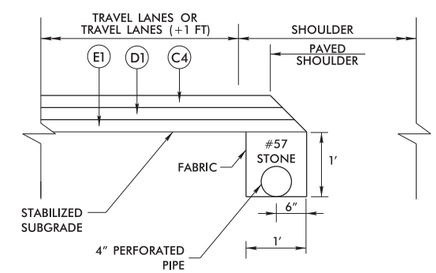



| RAILS TO TRAILS PAVEMENT CONNECTIONS | | | |
|---|---|---|---|
| LOCATION | DESCRIPTION | PAVING LENGTH | BOLLARD LOCATIONS |
| -Y6- 14+11 LT. | EXISTING TRAIL IS 7' GRAVEL | LENGTH = 30' | PLACE 38' LT. |
| -Y6- 14+48 RT. | EXISTING TRAIL IS 7' GRAVEL | LENGTH = 24' | PLACE 32' RT. |
| -Y11- 14+82 RT. | EXISTING TRAIL IS 12' PAVED | LENGTH = 21' | PLACE 35' RT. |
| -Y11- 14+82 LT. | EXISTING TRAIL IS 12' PAVED | LENGTH = 21' | PLACE 35' LT. |
| -TR1- | EXISTING TRAIL IS 12' PAVED | LENGTH = 176' | SEE SHEET 11 |
| -TR2- | EXISTING TRAIL IS 7' GRAVEL | LENGTH = 150' | SEE SHEET 11 |




## SHOULDER DRAIN DETAIL WITH ABC

NOT TO SCALE




## SHOULDER DRAIN DETAIL B25.0C

NOT TO SCALE

NOTE: SEE SHEET 3B-4 FOR STATION LOCATIONS AND QUANTITY SUMMARY.

| CUL-DE-SACS | | | |
|---|---|---|---|
| LABEL | STREET | CENTER | PAVING LIMITS |
| -CUL1- | LAUREL HILL RD. | -Y25- 15+70.10 (20.25' RT.) | -Y25- 15+00.65 |
| -CUL2- | LAUREL HILL RD. | -DR2- 10+34.38 (23.69' RT.) | -Y25- 25+16.69 |
| -CUL3- | EAST 2ND ST. | -Y16- 13+03.91 (20.92' LT.) | -Y16- 12+32.17 |
| -CUL4- | EAST 2ND ST. | -Y16- 17+82.39 (19.25' RT.) | -Y16- 18+55.84 |
| -CUL5- | COLLETT ST. | -Y17- 13+21.98 (20.16' RT.) | -Y17- 12+52.47 |
| -CUL6- | COLLETT ST. | -Y17- 17+78.13 (17.44' LT) | -Y17- 18+50.00 |
| -CUL7- | REESE ST. | -Y20- 11+92.83 (20.91' LT.) | -Y20- 11+23.32 |
| -CUL8- | SOUTHERN ST. | -Y21- 17+36.58 (22.04' RT.) | -Y21- 16+64.63 |
| -CUL9- | LONG ST. | -Y23- 25+93.98 (22.00' RT.) | -Y23- 26+64.82 |
| -CUL10- | ROCK RD. | -Y22A- 34+80.00 (19.00' LT.) | -Y22A- 39+96.06 |
| -CUL13- | GILBOA CHURCH RD. | -Y42- 14+45.32 (21.36' RT.) | -Y42- 15+46.08 |
| -CUL14- | SOUTHERN ST. | -L3- 839+94.99 (150.79' RT.) | -L3- 840+01.33 (211.66' RT) |
| -CUL11- | OLD US 221 | -Y12- 41+97.56 (21.19' LT) | -Y12- 41+28.01 |
| -CUL15- | LONG ST. | -Y23A- 45+53.87 (21.00' RT.) | -Y23A- 46+28.28 |
| -CUL16- | OLD CHARLOTTE RD. | -L3- 779+79.91 (226.59' LT.) | -L3- 779+38.74 (289.42' LT.) |

| STREET CONNECTIONS | | |
|---|---|---|
| LABEL | DESCRIPTION | LOCATION |
| -STCON1- | OAK ST. TO REECE ST. | -Y20- 13+72.71 TO -Y20- 16+56.66 |
| -STCON2- | HILDERBRAND DR. TO HUDGEN'S LAKE DR. | -L3- 871+07.28 (131.42' LT.) TO -L3- 871+55.28 (147.40' LT.) |
| -STCON3- | SASAFFRAS DR. TO RIDGELAND DR. | -L3- 896+53.63 (129.30' LT.) TO -L3- 896+89.24 (185.15' LT.) |
| -STCON4- | CHURCH ST. TO SANDY WOODS LN. | -Y23- 21+23.17 TO -Y23- 21+52.30 (43.68' RT.) |
| -STCON5- | US 221 TO GOLD HILL MISSIONARY BAPTIST CHURCH | -L3- 941+22.37 (127.71' LT.) TO -L3- 944+44.60 (129.15' LT.) |

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USER: cjones

6/2/99

## PAVEMENT SCHEDULE (FINAL)

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | 7″ CONCRETE | C4 | 3″ S9.5C | D3 | VAR DEPTH I19.0C | E4 | 5″ B25.0C | K1 | CHEMICAL STABILIZATION: 7″ SOIL-CEMENT BASE OR 8″LIME-TREATED SOIL | R1 | 2′-6″ CONCRETE CURB & GUTTER | R5 | 8″x12″ CONCRETE CURB | U | EXIST. PAVEMENT |
| C1 | 1.5″ S9.5B | C5 | VAR DEPTH S9.5C | E1 | 3″ B25.0C | E5 | VAR DEPTH B25.0C | K2 | 8″ CLASS IV SUBGRADE STABILIZATION | R2 | SHOULDER BERM GUTTER | R6 | CONCRETE EXPRESSWAY GUTTER | Z | MILLED RUMBLE STRIP |
| C2 | 3″ S9.5B | D1 | 2.5″ I19.0C | E2 | 4″ B25.0C | J1 | 6″ ABC | N1 | GEOTEXTILE FOR SOIL STABILIZATION | R3 | 5″ CONC. ISLAND | S | 4″ CONC. SIDEWALK | V1 | PAVEMENT MILLING |
| C3 | VAR DEPTH S9.5B | D2 | 4″ I19.0C | E3 | 4.5″ B25.0C | J2 | 8″ ABC | N2 | GEOTEXTILE FOR PAVEMENT STABILIZATION | P | PRIME COAT | R4 | 2′ MODIFIED VALLEY GUTTER | T | EARTH |

| ITEM | DESCRIPTION |
|---|---|
| V2 | VARIABLE DEPTH PAVEMENT WEDGING |
| V3 | |
| V4 | |
| W1 | |
| W2 | |
| W3 | |

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 2A-9 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

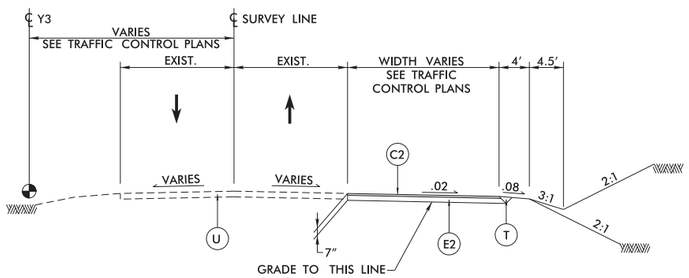
PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 024964 ENGINEER JOSEPH T. HOLLAND

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

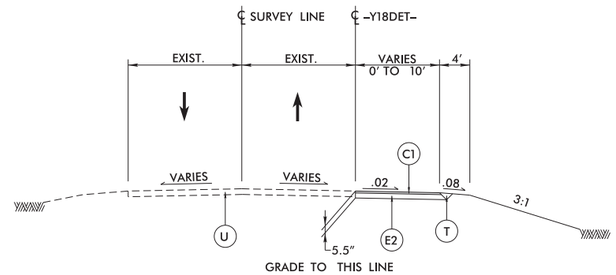

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. P-0929

NC DEPARTMENT OF TRANSPORTATION
PAVEMENT MANAGEMENT UNIT
1593 MAIL SERVICE CENTER
RALEIGH, NC 27699-1593

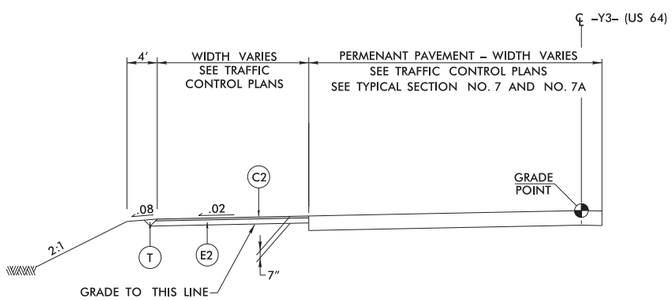

## TYPICAL SECTION NO. 26

TEMPORARY PAVEMENT FROM
–Y3– 13+75.00 TO 23+00.00 RT



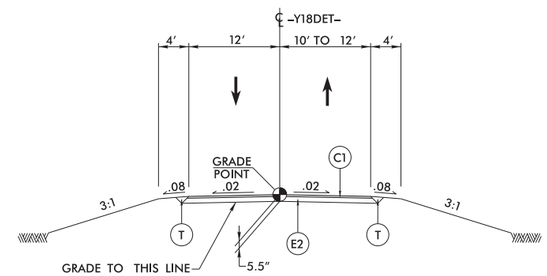

## TYPICAL SECTION NO. 28

TEMPORARY PAVEMENT FROM
–Y18DET– 10+00.00 TO 10.76.97



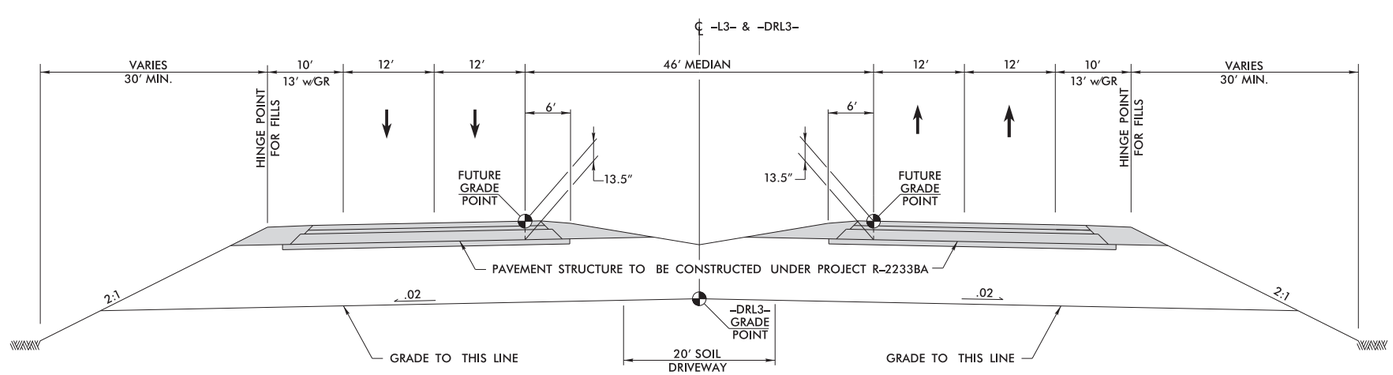

## TYPICAL SECTION NO. 27

TEMPORARY PAVEMENT FROM
–Y3– 12+50.00 TO 19+50.00




## TYPICAL SECTION NO. 29

TEMPORARY PAVEMENT FROM
–Y18DET– 10+76.97 TO 13+80.03




## TYPICAL SECTION NO. 30

GRADING ONLY

**SOUTHBOUND LANES**

–L3– 733+30.00 TO –L3– 743+21.39

**NORTHBOUND LANES**

–L3– 733+30.00 TO –L3– 743+21.39

8/17/2021 4:23:25 PM
USER: dmorry
FILE: R-2233BB_PDY_TYP_2A-9.DGN

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

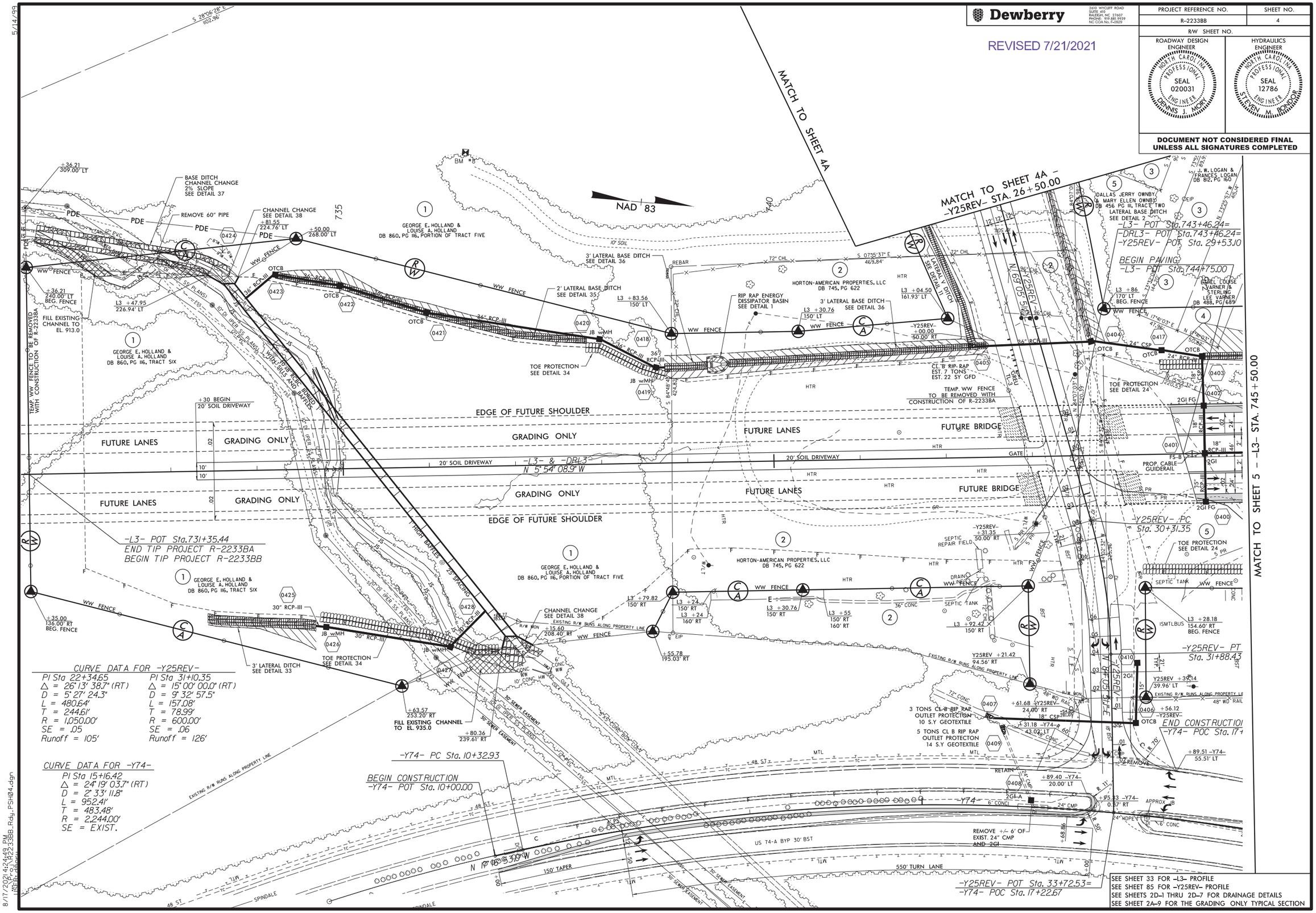
REVISED 7/21/2021

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 4 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORAN

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

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USER: CWUZ
R-2233BB_Rdy_PSH04.dgn
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5/14/99

**Dewberry**
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 4A |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDS

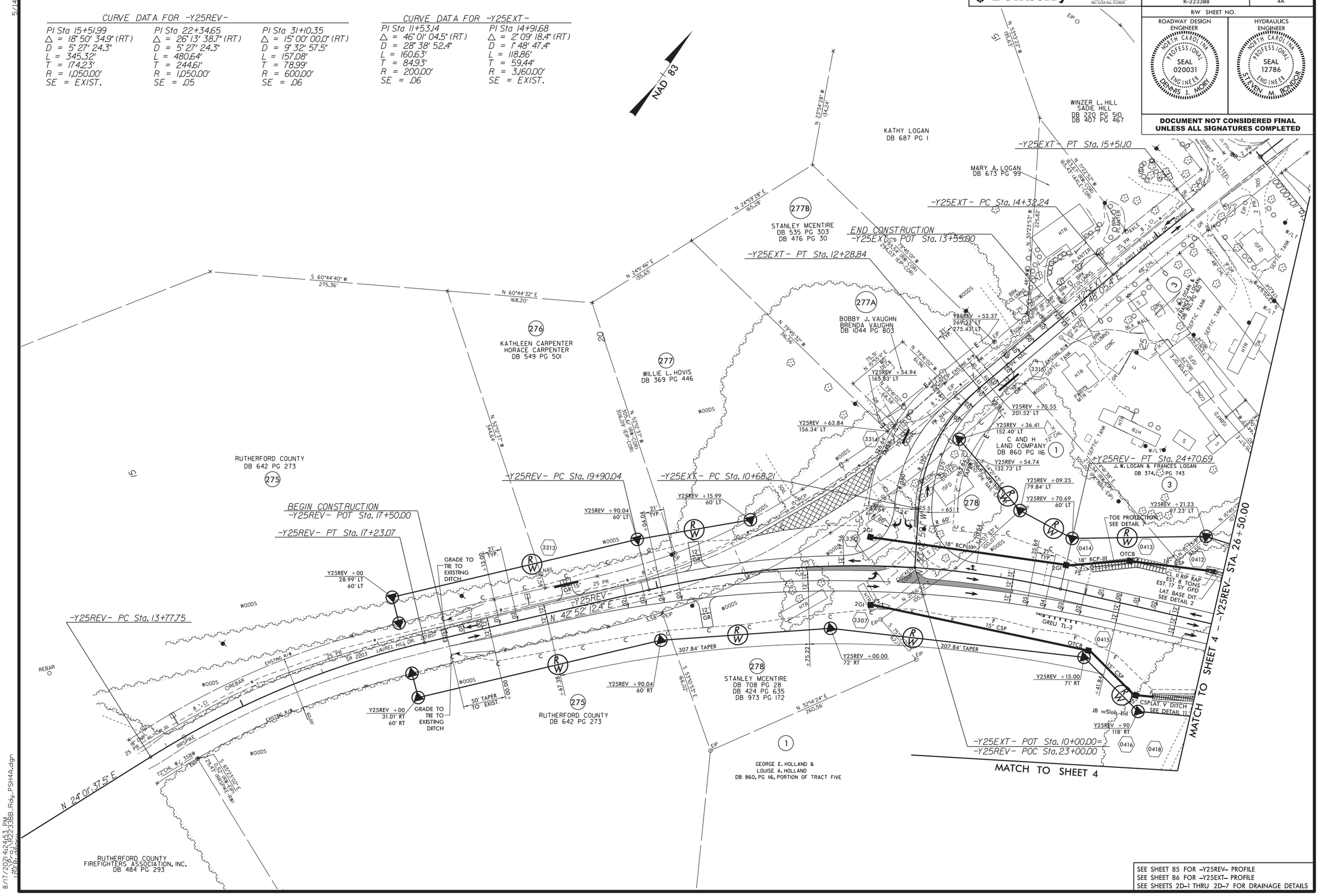
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

CURVE DATA FOR -Y25REV-

| PI Sta 15+51.99 | PI Sta 22+34.65 | PI Sta 31+10.35 |
|---|---|---|
| △ = 18° 50' 34.9" (RT) | △ = 26° 13' 38.7" (RT) | △ = 15° 00' 00.0" (RT) |
| D = 5° 27' 24.3" | D = 5° 27' 24.3" | D = 9° 32' 57.5" |
| L = 345.32' | L = 480.64' | L = 157.08' |
| T = 174.23' | T = 244.61' | T = 78.99' |
| R = 1,050.00' | R = 1,050.00' | R = 600.00' |
| SE = EXIST. | SE = .05 | SE = .06 |

CURVE DATA FOR -Y25EXT-

| PI Sta 11+53.14 | PI Sta 14+91.68 |
|---|---|
| △ = 46° 01' 04.5" (RT) | △ = 2° 09' 18.4" (RT) |
| D = 28° 38' 52.4" | D = 1° 48' 47.4" |
| L = 160.63' | L = 118.86' |
| T = 84.93' | T = 59.44' |
| R = 200.00' | R = 3,160.00' |
| SE = .06 | SE = EXIST. |




SEE SHEET 85 FOR -Y25REV- PROFILE
SEE SHEET 86 FOR -Y25EXT- PROFILE
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS

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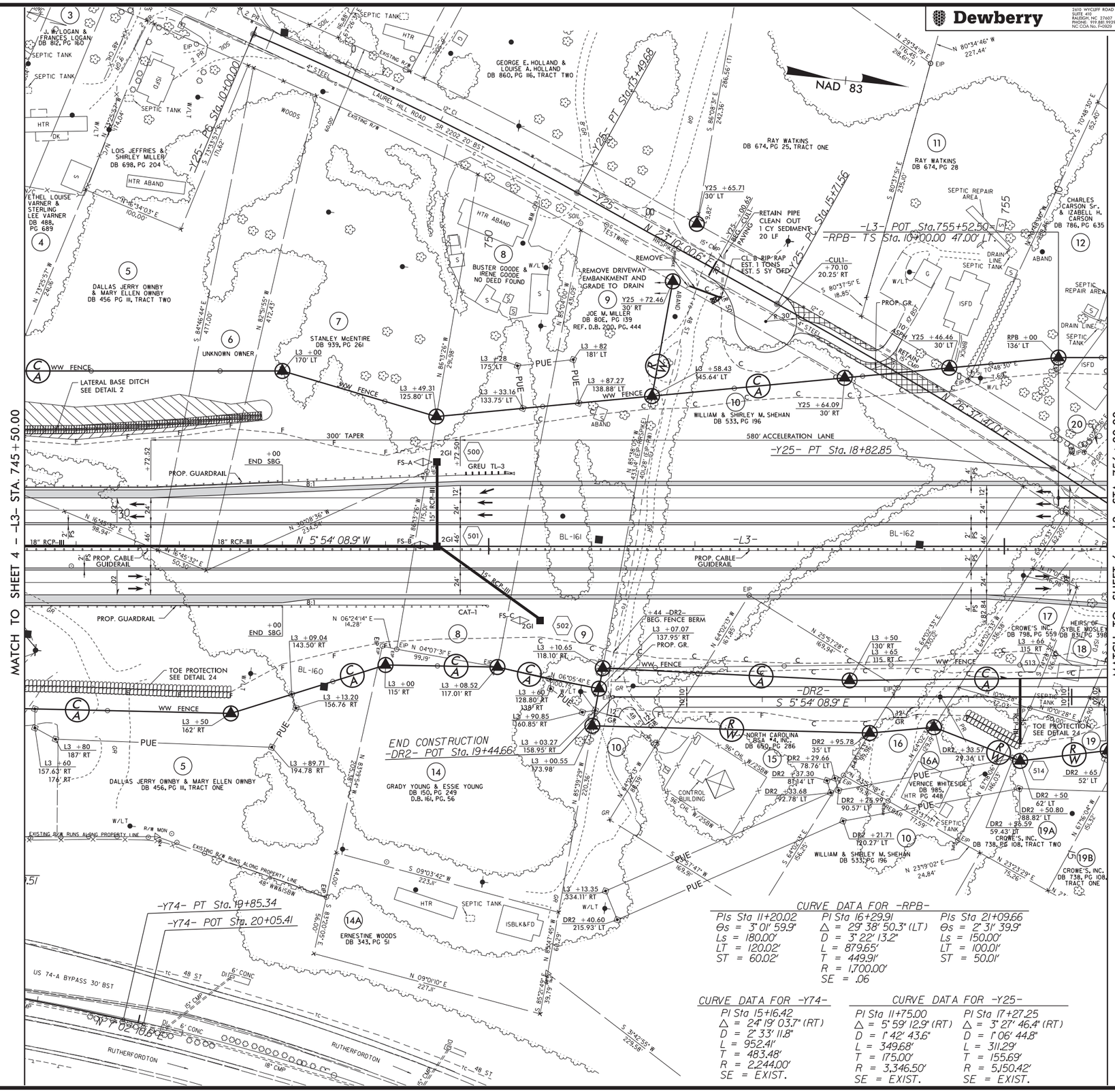
R-2233BB_Rdy_PSH4A.dgn

5/14/99




| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 5 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDS

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

CURVE DATA FOR -RPB-

| PI Sta 11+20.02 | PI Sta 16+29.91 | PI Sta 21+09.66 |
|---|---|---|
| Θs = 3° 01' 59.9" | Δ = 29° 38' 50.3" (LT) | Θs = 2° 31' 39.9" |
| Ls = 180.00' | D = 3° 22' 13.2" | Ls = 150.00' |
| LT = 120.02' | L = 879.65' | LT = 100.01' |
| ST = 60.02' | T = 449.91' | ST = 50.01' |
| | R = 1,700.00' | |
| | SE = .06 | |

CURVE DATA FOR -Y74-

PI Sta 15+16.42
Δ = 24° 19' 03.7" (RT)
D = 2° 33' 11.8"
L = 952.41'
T = 483.48'
R = 2,244.00'
SE = EXIST.

CURVE DATA FOR -Y25-

| PI Sta 11+75.00 | PI Sta 17+27.25 |
|---|---|
| Δ = 5° 59' 12.9" (RT) | Δ = 3° 27' 46.4" (RT) |
| D = 1° 42' 43.6" | D = 1° 06' 44.8" |
| L = 349.68' | L = 311.29' |
| T = 175.00' | T = 155.69' |
| R = 3,346.50' | R = 5,150.42' |
| SE = EXIST. | SE = EXIST. |


SEE SHEET 34 FOR -L3- PROFILE
SEE SHEET 56 FOR -RPB- PROFILE
SEE SHEET 85 FOR -Y25REV- PROFILE
SEE SHEET 86 FOR -DR2- PROFILE
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS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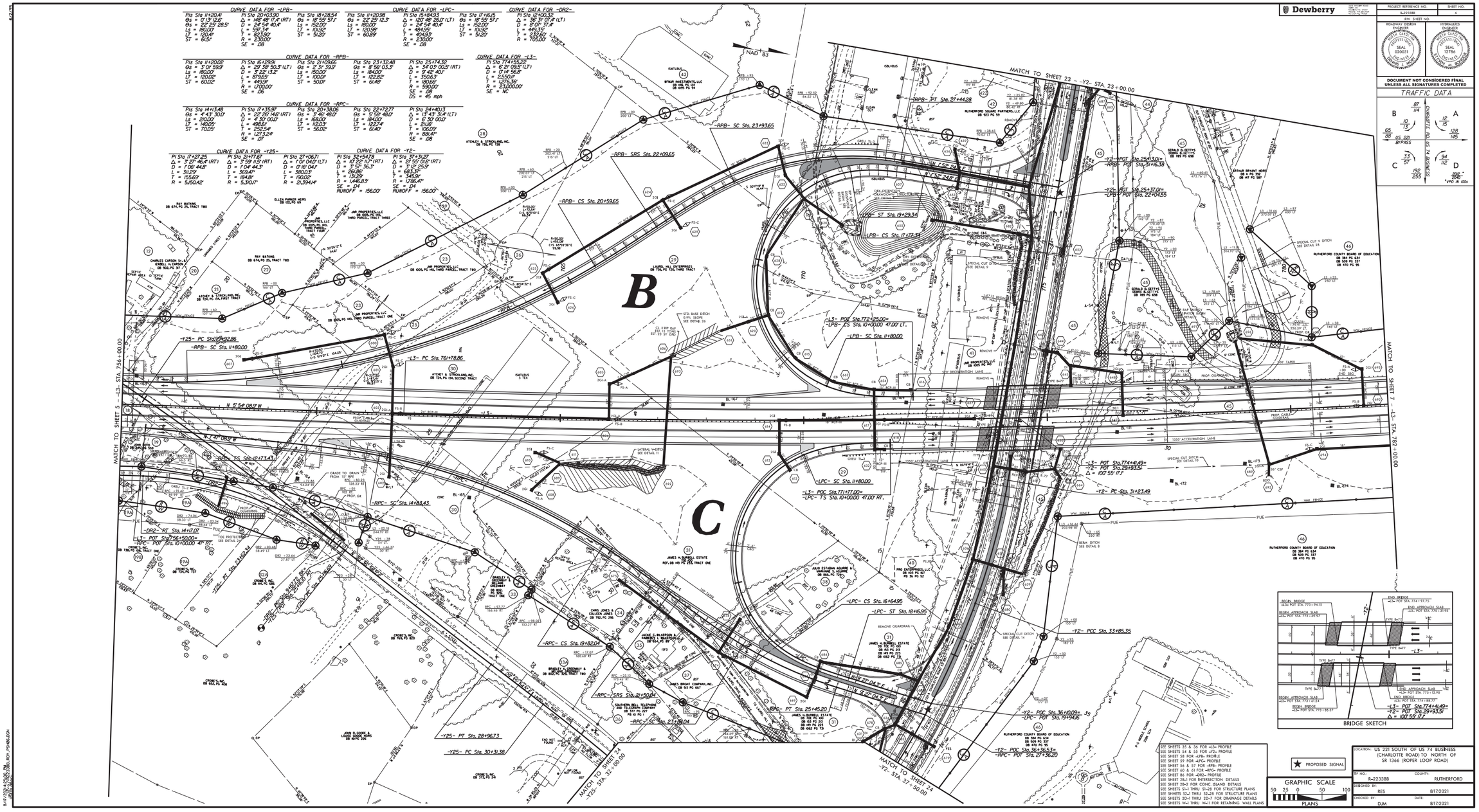
ISFP: ...2233BB_RDY_PSH05.DGN


Dewberry
PROJECT REFERENCE NO.
R-2233BB
SHEET NO.
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
SEAL 020031
SEAL 12786
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
TRAFFIC DATA
CHARLOTTE RD. US 74 BUSINESS
US 221 BYPASS
*VPD IN 100s
CURVE DATA FOR -LPB-
CURVE DATA FOR -LPC-
CURVE DATA FOR -DR2-
CURVE DATA FOR -RPB-
CURVE DATA FOR -L3-
CURVE DATA FOR -RPC-
CURVE DATA FOR -Y25-
CURVE DATA FOR -Y2-
MATCH TO SHEET 23 -Y2- STA. 23+00.00
MATCH TO SHEET 7 -L3- STA. 782+00.00
MATCH TO SHEET 5 -L3- STA. 756+00.00
MATCH TO SHEET 24 -Y25- STA. 32+00.00
MATCH TO SHEET 24 -Y2- STA. 37+50.00
NAD 83
B
C
-RPB- SC Sta. 23+93.65
-RPB- SRS Sta. 22+09.65
-RPB- CS Sta. 20+59.65
-Y25- PC Sta. 29+92.86
-RPB- SC Sta. 11+80.00
-L3- PC Sta. 761+78.86
-L3- SC Sta. 756+00.00
-RPC- SC Sta. 14+83.43
-DR2- RT Sta. 14+17.17
-L3- POT Sta. 756+50.00= -RPC- POT Sta. 10+00.00 47.17 RT.
-Y25- PT Sta. 21+19.34
-Y25- PC Sta. 21+67.34
-Y25- PT Sta. 28+96.73
-Y25- PC Sta. 30+31.38
-RPC- CS Sta. 19+82.04
-RPC- SRS Sta. 21+50.04
-RPC- SC Sta. 21+79.04
-RPC- PT Sta. 25+45.20
-LPC- SC Sta. 11+80.00
-L3- POC Sta. 771+77.00= -LPC- TS Sta. 10+00.00 47.00 RT.
-LPC- CS Sta. 16+64.95
-LPC- ST Sta. 18+16.95
-L3- POC Sta. 772+25.00= -LPB- CS Sta. 10+00.00 47.00 LT.
-LPB- SC Sta. 11+80.00
-LPB- ST Sta. 19+29.54
-LPB- CS Sta. 17+77.54
-RPB- PT Sta. 27+44.28
-Y2- POT Sta. 25+13.01= -RPB- POT Sta. 51+16.38
-Y2- POT Sta. 25+37.01= -LPB- POT Sta. 22+04.55
-L3- POT Sta. 774+41.49= -Y2- POT Sta. 29+93.51 Δ = 100°55'17"
-Y2- PC Sta. 31+23.49
-Y2- PCC Sta. 33+85.35
-Y2- POC Sta. 36+10.05= -LPC- POT Sta. 19+34.16
-Y2- POC Sta. 36+36.53= -RPC- POT Sta. 27+36.20
BRIDGE SKETCH
SEE SHEETS 35 & 35 FOR -L3- PROFILE
SEE SHEETS 54 & 55 FOR -Y2- PROFILE
SEE SHEET 58 FOR -LPB- PROFILE
SEE SHEET 59 FOR -LPC- PROFILE
SEE SHEET 56 & 57 FOR -RPB- PROFILE
SEE SHEET 60 & 61 FOR -RPC- PROFILE
SEE SHEET 86 FOR -DR2- PROFILE
SEE SHEET 28-1 FOR INTERSECTION DETAILS
SEE SHEET 28-2 FOR CONC. ISLAND DETAILS
SEE SHEETS 51-1 THRU 51-28 FOR STRUCTURE PLANS
SEE SHEETS 52-1 THRU 52-28 FOR STRUCTURE PLANS
SEE SHEETS 20-1 THRU 20-7 FOR DRAINAGE DETAILS
SEE SHEETS W4-1 THRU W4-11 FOR RETAINING WALL PLANS
PROPOSED SIGNAL
GRAPHIC SCALE
50 25 0 50 100
PLANS
LOCATION: US 221 SOUTH OF US 74 BUSINESS (CHARLOTTE ROAD) TO NORTH OF SR 1366 (ROPER LOOP ROAD)
TIP NO.: R-2233BB
COUNTY: RUTHERFORD
DESIGNED BY: RES
8/17/2021
CHECKED BY: DJM
DATE: 8/17/2021

5/14/99

**Dewberry**

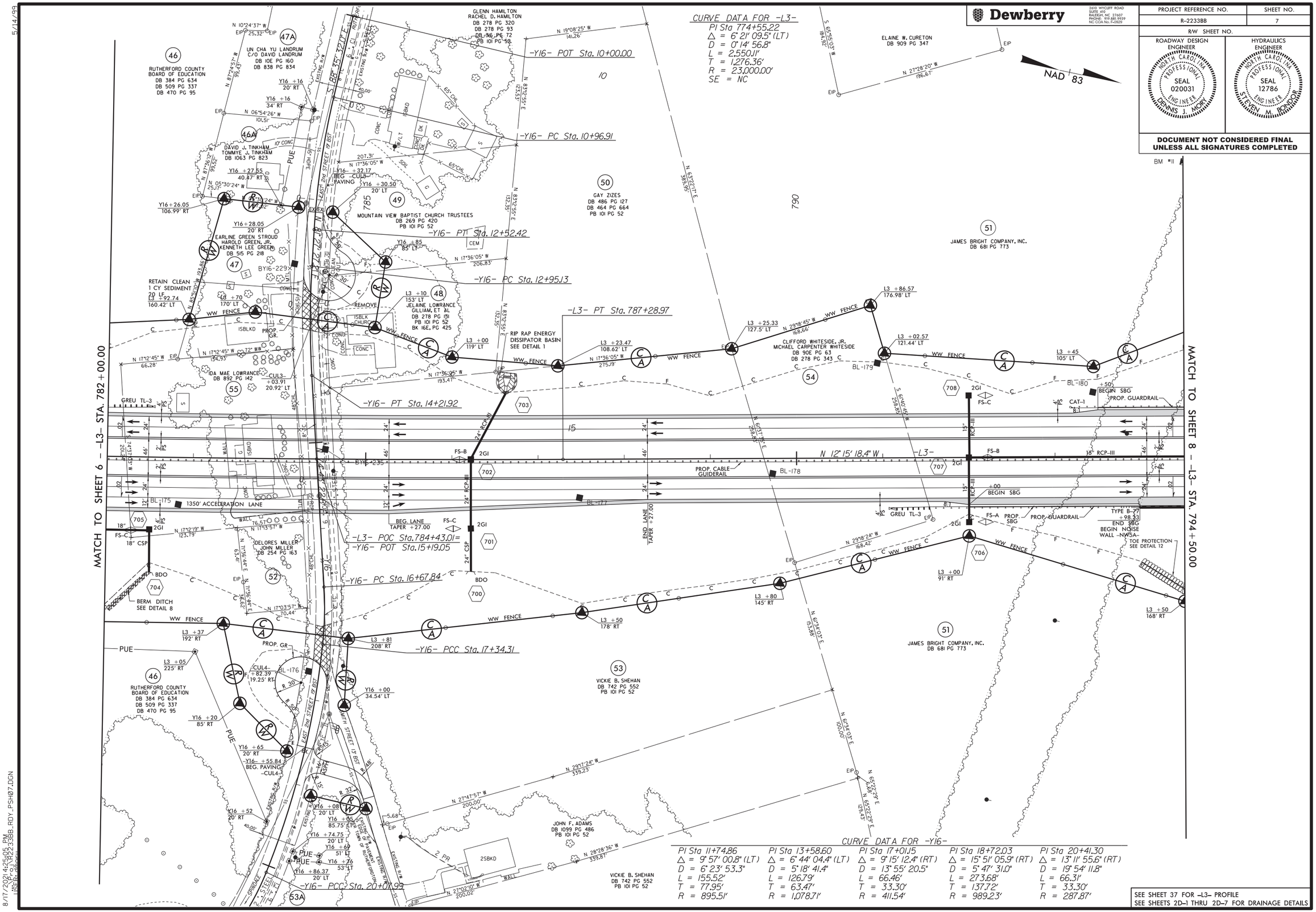
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 7 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




SEE SHEET 37 FOR –L3– PROFILE
SEE SHEETS 2D–1 THRU 2D–7 FOR DRAINAGE DETAILS

8/17/2021 4:25:05 PM
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5/14/99

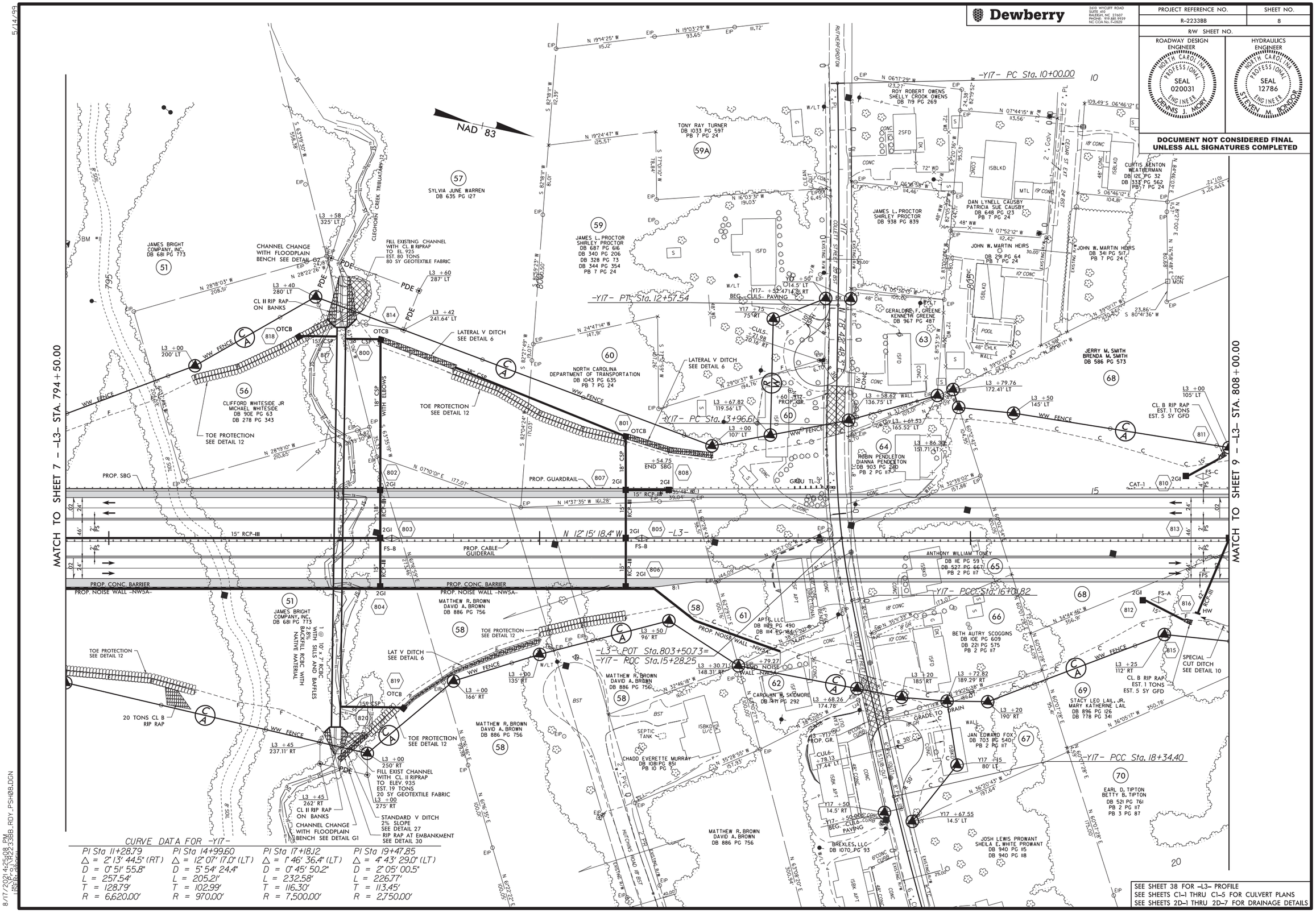
Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 8 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORRY

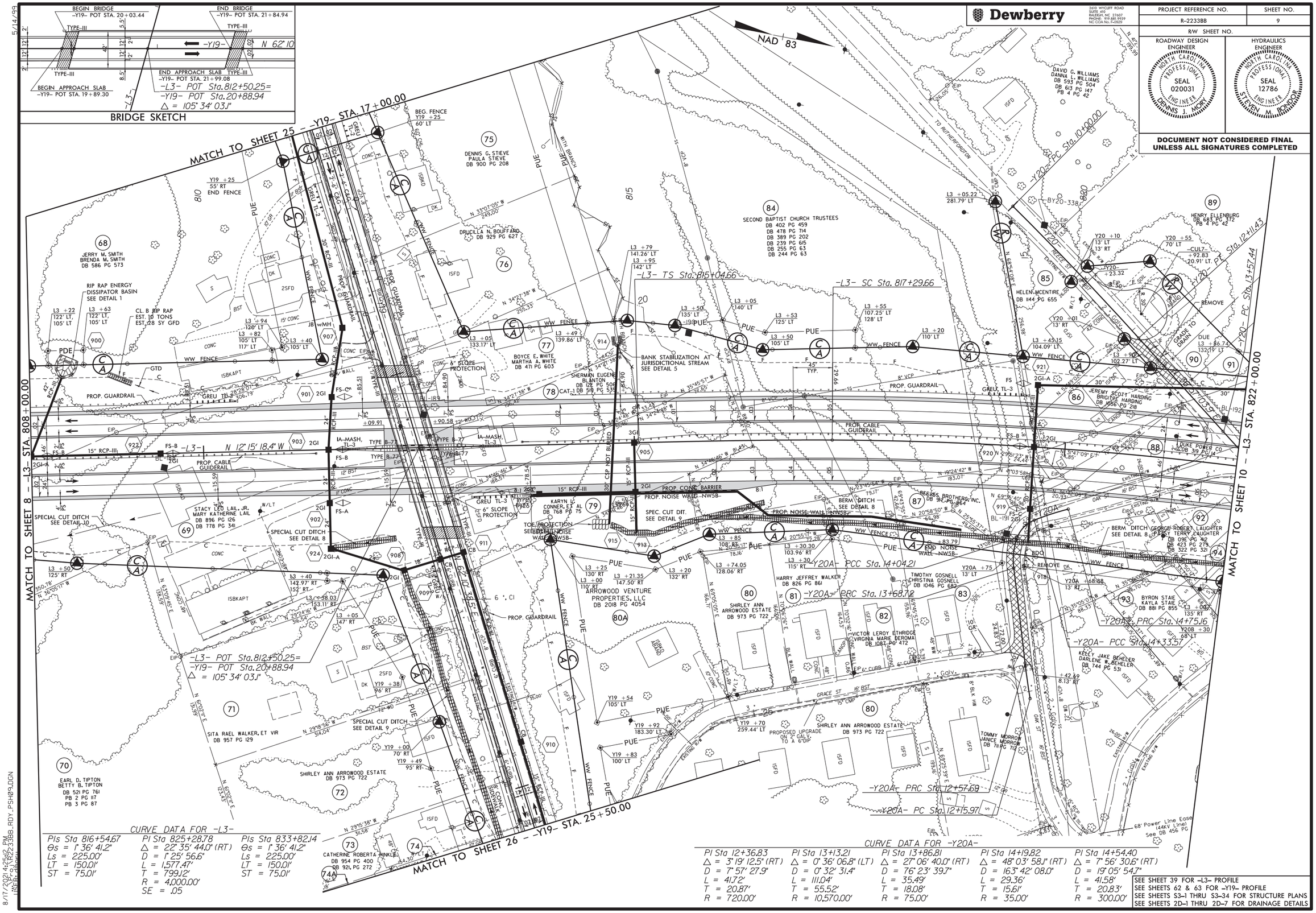
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




SEE SHEET 38 FOR –L3– PROFILE
SEE SHEETS C1–1 THRU C1–5 FOR CULVERT PLANS
SEE SHEETS 2D–1 THRU 2D–7 FOR DRAINAGE DETAILS

8/17/2021 4:56:08 PM
R-2233BB_RDY_PSH08.DGN
USER: cbrown




Dewberry
2610 WYCLIFF ROAD
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RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 9 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORRY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDS

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

SEE SHEET 39 FOR -L3- PROFILE
SEE SHEETS 62 & 63 FOR -Y19- PROFILE
SEE SHEETS S3-1 THRU S3-34 FOR STRUCTURE PLANS
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS

5/14/99

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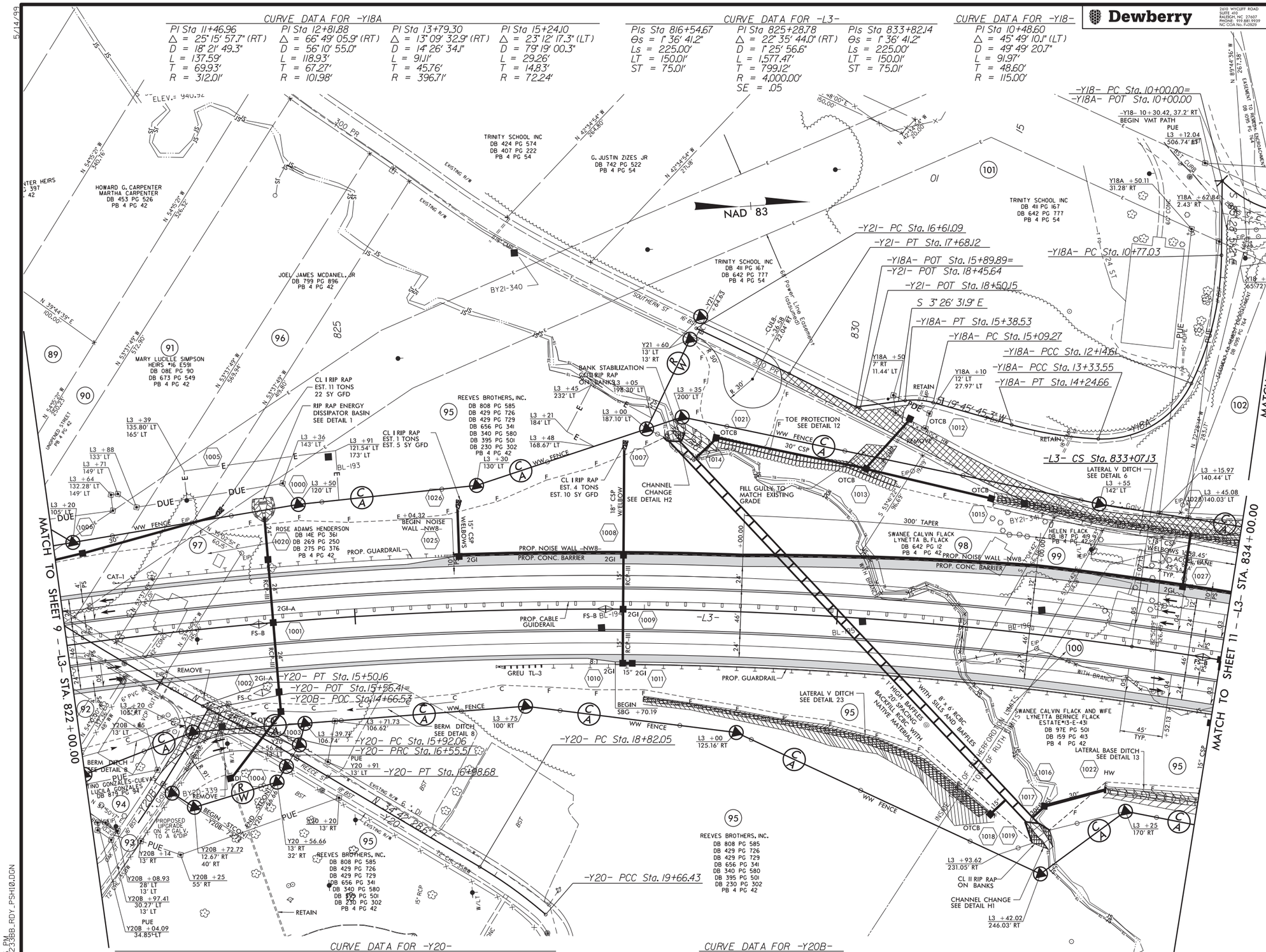
ISER: dgnuser
FILE: R-2233BB_RDY_PSH09.DGN

5/14/99




CURVE DATA FOR –Y18A

| PI Sta 11+46.96 | PI Sta 12+81.88 | PI Sta 13+79.30 | PI Sta 15+24.10 |
|---|---|---|---|
| Δ = 25° 15' 57.7" (RT) | Δ = 66° 49' 05.9" (RT) | Δ = 13° 09' 32.9" (RT) | Δ = 23° 12' 17.3" (LT) |
| D = 18° 21' 49.3" | D = 56° 10' 55.0" | D = 14° 26' 34.1" | D = 79° 19' 00.3" |
| L = 137.59' | L = 118.93' | L = 91.11' | L = 29.26' |
| T = 69.93' | T = 67.27' | T = 45.76' | T = 14.83' |
| R = 312.01' | R = 101.98' | R = 396.71' | R = 72.24' |

CURVE DATA FOR –L3–

| PIs Sta 816+54.67 | PI Sta 825+28.78 | PIs Sta 833+82.14 |
|---|---|---|
| Θs = 1° 36' 41.2" | Δ = 22° 35' 44.0" (RT) | Θs = 1° 36' 41.2" |
| Ls = 225.00' | D = 1° 25' 56.6" | Ls = 225.00' |
| LT = 150.01' | L = 1,577.47' | LT = 150.01' |
| ST = 75.01' | T = 799.12' | ST = 75.01' |
| | R = 4,000.00' | |
| | SE = .05 | |

CURVE DATA FOR –Y18–

| PI Sta 10+48.60 |
|---|
| Δ = 45° 49' 10.1" (LT) |
| D = 49° 49' 20.7" |
| L = 91.97' |
| T = 48.60' |
| R = 115.00' |

CURVE DATA FOR –Y20–

| PI Sta 14+53.86 | PI Sta 16+23.79 | PI Sta 16+77.10 | PI Sta 19+24.35 |
|---|---|---|---|
| Δ = 5° 05' 18.8" (LT) | Δ = 3° 01' 45.6" (RT) | Δ = 0° 11' 02.1" (LT) | Δ = 10° 17' 09.7" (RT) |
| D = 2° 38' 25.3" | D = 4° 46' 28.7" | D = 0° 25' 33.6" | D = 12° 11' 26.1" |
| L = 192.72' | L = 63.45' | L = 43.18' | L = 84.38' |
| T = 96.42' | T = 31.73' | T = 21.59' | T = 42.30' |
| R = 2,170.00' | R = 1,200.00' | R = 13,450.00' | R = 470.00' |

CURVE DATA FOR –Y20B–

| PI Sta 13+53.77 |
|---|
| Δ = 7° 38' 04.0" (LT) |
| D = 3° 22' 49.0" |
| L = 225.85' |
| T = 113.09' |
| R = 1,695.00' |


Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929


| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 10 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDS

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**


SEE SHEET 40 FOR –L3– PROFILE
SEE SHEET 74 FOR –Y18– PROFILE
SEE SHEETS C2-1 THRU C2-5 FOR CULVERT PLANS
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS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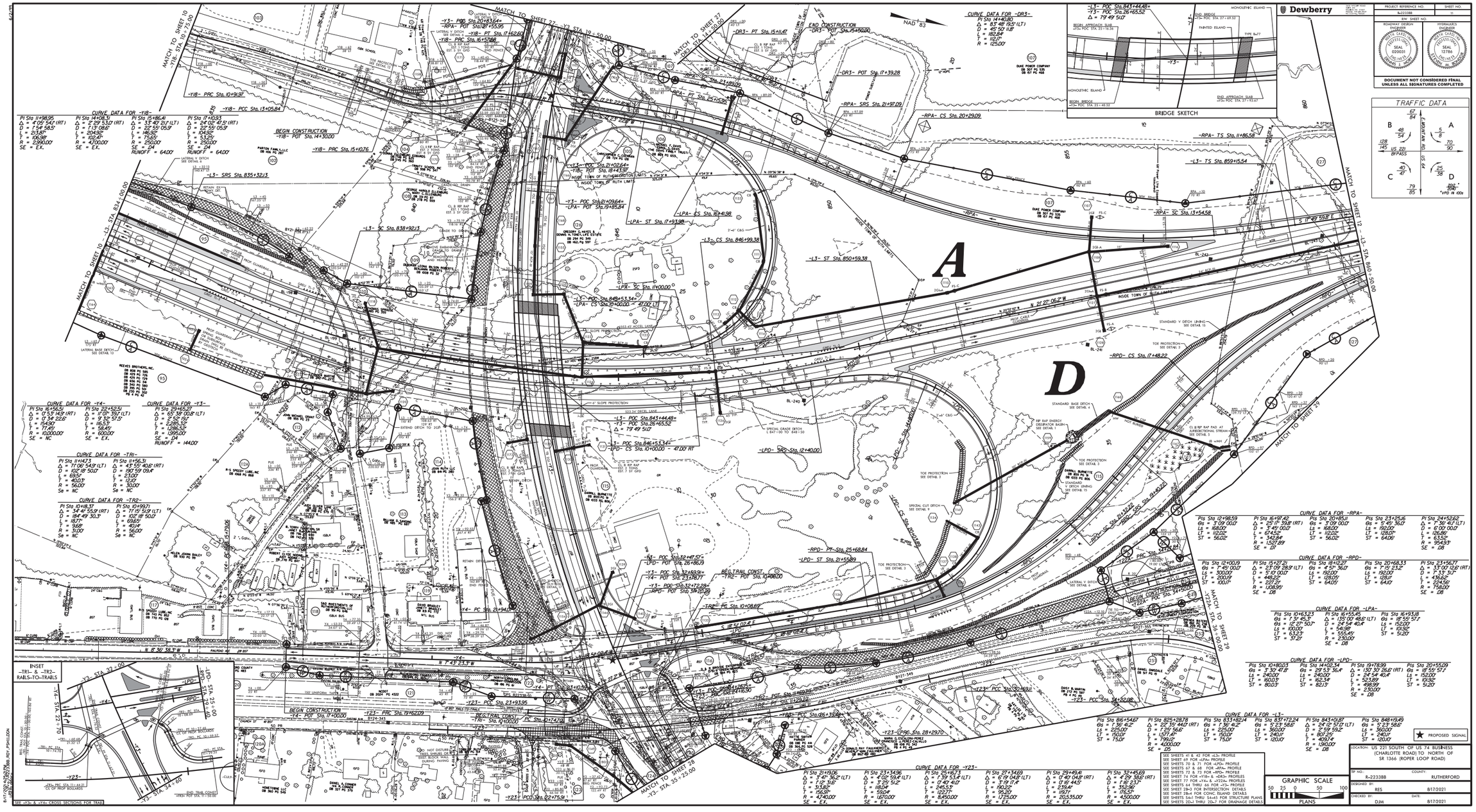
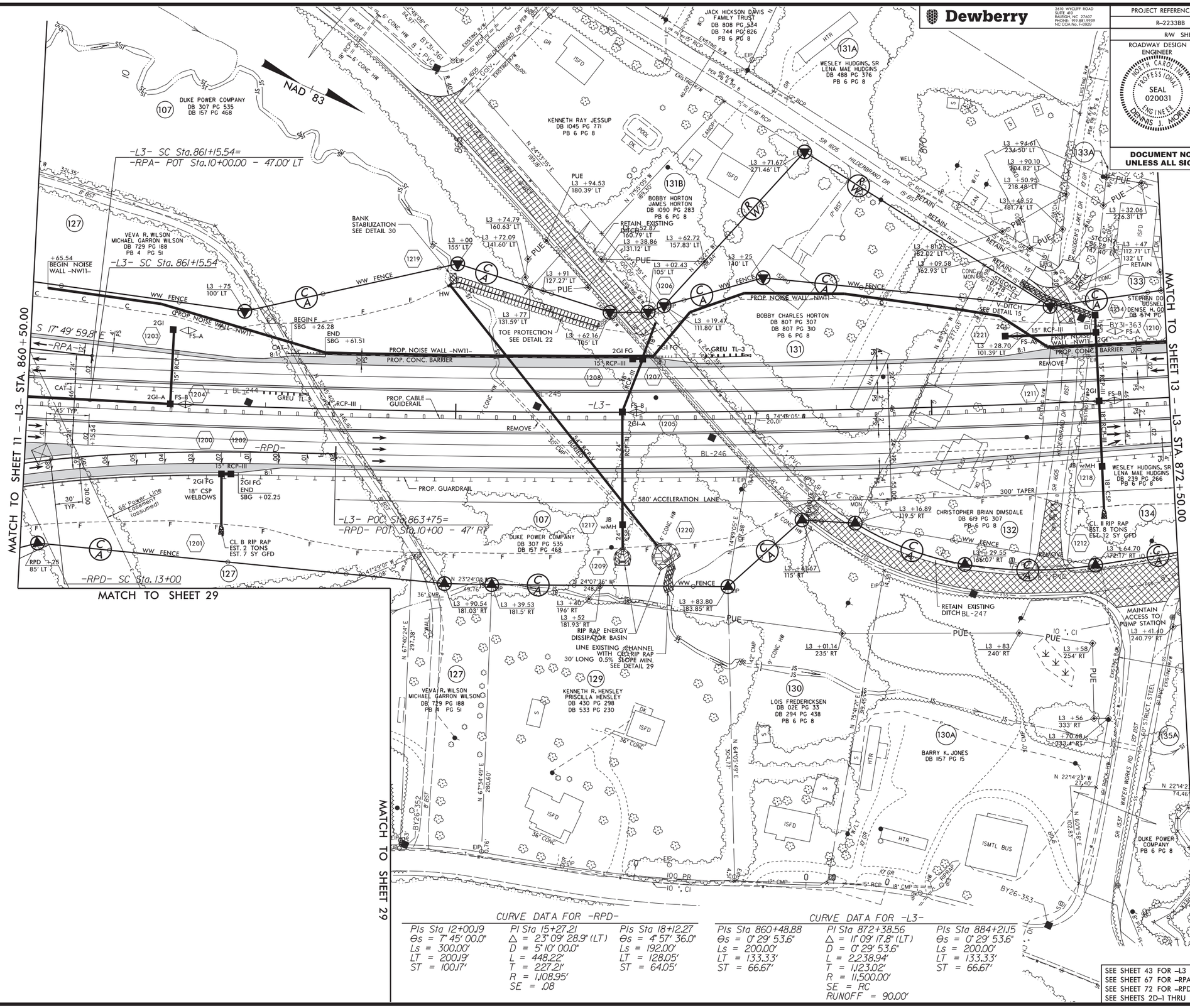

MATCH TO SHEET 10
MATCH TO SHEET 27
MATCH TO SHEET 12
MATCH TO SHEET 29
MATCH TO SHEET 28
MATCH TO SHEET 23
NAD 83
A
D
BEGIN CONSTRUCTION
END CONSTRUCTION
BEG TRAIL CONST.
BRIDGE SKETCH
TRAFFIC DATA
INSET
-TR1- & -TR2-
RAILS-TO-TRAILS
CURVE DATA FOR -Y8-
CURVE DATA FOR -Y4-
CURVE DATA FOR -Y3-
CURVE DATA FOR -TR1-
CURVE DATA FOR -TR2-
CURVE DATA FOR -RPA-
CURVE DATA FOR -RPD-
CURVE DATA FOR -LPA-
CURVE DATA FOR -LPD-
CURVE DATA FOR -L3-
CURVE DATA FOR -DR3-
DUKE POWER COMPANY
DB 307 PG 535
DB 67 PG 468
SEE <Y3> & <Y4> CROSS SECTIONS FOR TRAIL
PROPOSED SIGNAL
GRAPHIC SCALE
PLANS
Dewberry
PROJECT REFERENCE NO.
SHEET NO.
R-2233BB
11
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
SEAL 020031
SEAL 12786
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
LOCATION: US 221 SOUTH OF US 74 BUSINESS (CHARLOTTE ROAD) TO NORTH OF SR 1366 (ROPER LOOP ROAD)
TIP NO.: R-2233BB
COUNTY: RUTHERFORD
DESIGNED BY: RES 8/17/2021
CHECKED BY: DJM
DATE: 8/17/2021

5/14/99




**Dewberry**

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 12 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDS

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

CURVE DATA FOR -RPD-

| PIs Sta 12+00.19 | PI Sta 15+27.21 | PIs Sta 18+12.27 |
|---|---|---|
| Θs = 1° 45' 00.0" | Δ = 23° 09' 28.9" (LT) | Θs = 4° 57' 36.0" |
| Ls = 300.00' | D = 5° 10' 00.0" | Ls = 192.00' |
| LT = 200.19' | L = 448.22' | LT = 128.05' |
| ST = 100.17' | T = 227.21' | ST = 64.05' |
| | R = 1,108.95' | |
| | SE = .08 | |

CURVE DATA FOR -L3-

| PIs Sta 860+48.88 | PI Sta 872+38.56 | PIs Sta 884+21.15 |
|---|---|---|
| Θs = 0° 29' 53.6" | Δ = 11° 09' 17.8" (LT) | Θs = 0° 29' 53.6" |
| Ls = 200.00' | D = 0° 29' 53.6" | Ls = 200.00' |
| LT = 133.33' | L = 2,238.94' | LT = 133.33' |
| ST = 66.67' | T = 1,123.02' | ST = 66.67' |
| | R = 11,500.00' | |
| | SE = RC | |
| | RUNOFF = 90.00' | |

SEE SHEET 43 FOR -L3 PROFILE
SEE SHEET 67 FOR -RPA- PROFILE
SEE SHEET 72 FOR -RPD- PROFILE
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS

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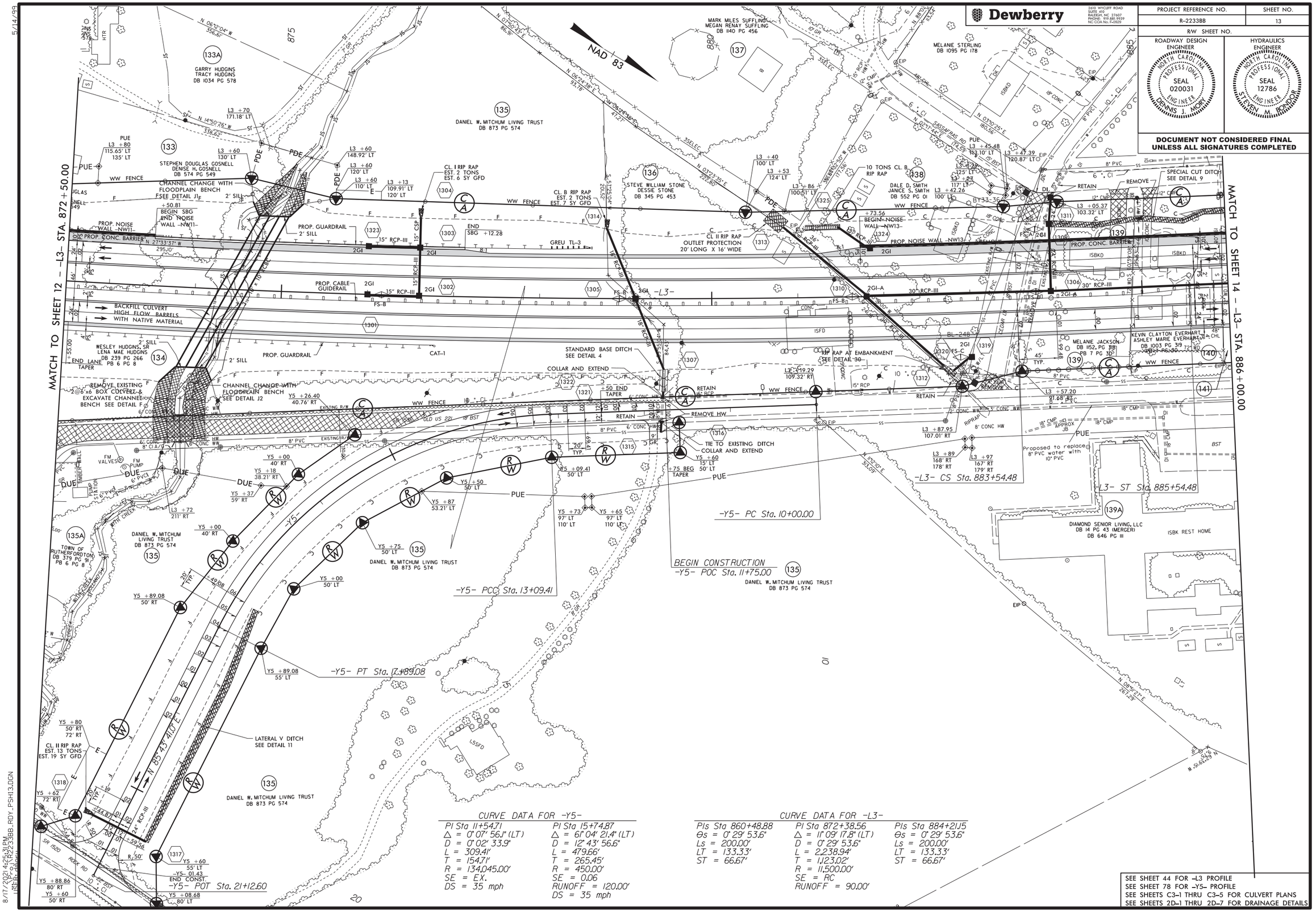
Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 13 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDS

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




CURVE DATA FOR -Y5-

| | |
|---|---|
| PI Sta 11+54.71 | PI Sta 15+74.87 |
| Δ = 0° 07' 56.1" (LT) | Δ = 61° 04' 21.4" (LT) |
| D = 0° 02' 33.9" | D = 12° 43' 56.6" |
| L = 309.41' | L = 479.66' |
| T = 154.71' | T = 265.45' |
| R = 134,045.00' | R = 450.00' |
| SE = EX. | SE = 0.06 |
| DS = 35 mph | RUNOFF = 120.00' |
| | DS = 35 mph |

CURVE DATA FOR -L3-

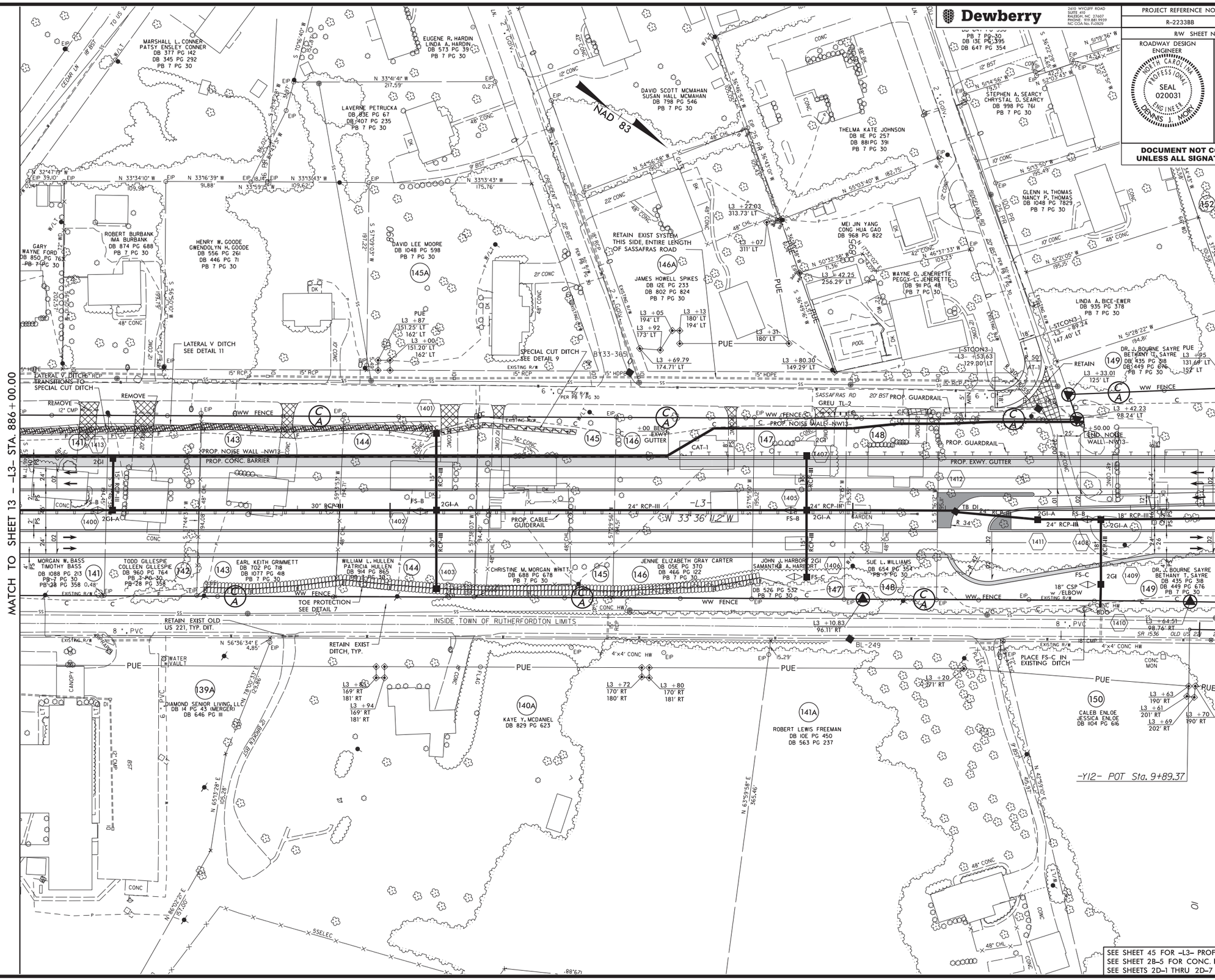
| | | |
|---|---|---|
| PIs Sta 860+48.88 | PI Sta 872+38.56 | PIs Sta 884+21.15 |
| Θs = 0° 29' 53.6" | Δ = 11° 09' 17.8" (LT) | Θs = 0° 29' 53.6" |
| Ls = 200.00' | D = 0° 29' 53.6" | Ls = 200.00' |
| LT = 133.33' | L = 2,238.94' | LT = 133.33' |
| ST = 66.67' | T = 1,123.02' | ST = 66.67' |
| | R = 11,500.00' | |
| | SE = RC | |
| | RUNOFF = 90.00' | |

SEE SHEET 44 FOR -L3 PROFILE
SEE SHEET 78 FOR -Y5- PROFILE
SEE SHEETS C3-1 THRU C3-5 FOR CULVERT PLANS
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS

5/14/99

8/17/2021 4:25:31 PM
R2233BB_RDY_PSH13.DGN
USER: gbowden

5/14/99




**Dewberry**
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 14 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDS

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8/17/2021 4:25:35 PM
USER: cdavis
R-2233BB_RDY_PSH14.DGN

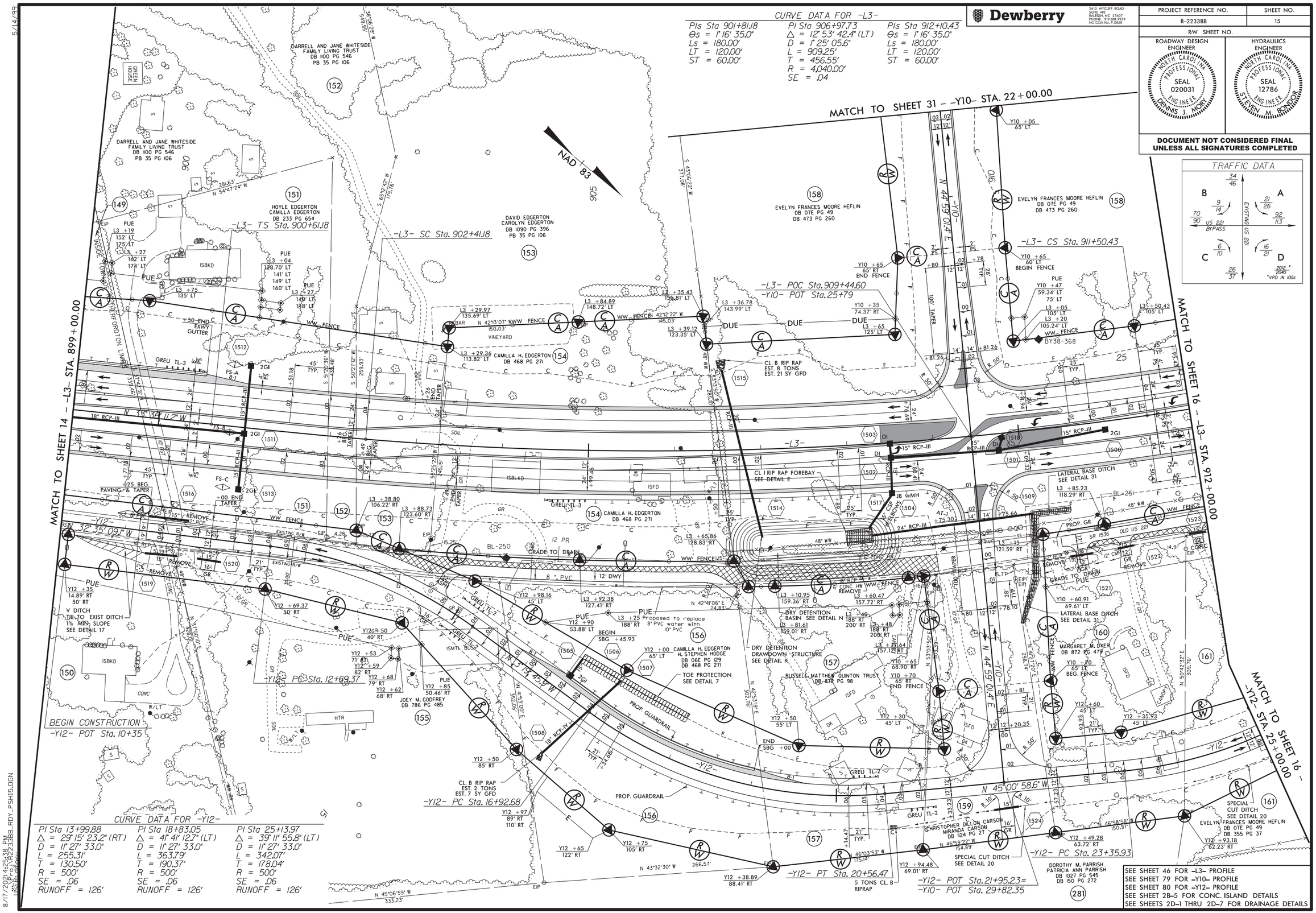
Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 15 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDS

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




CURVE DATA FOR -L3-

| | | |
|---|---|---|
| PIs Sta 901+81.18 | PI Sta 906+97.73 | PIs Sta 912+10.43 |
| Θs = 1° 16' 35.0" | Δ = 12° 53' 42.4" (LT) | Θs = 1° 16' 35.0" |
| Ls = 180.00' | D = 1° 25' 05.6" | Ls = 180.00' |
| LT = 120.00' | L = 909.25' | LT = 120.00' |
| ST = 60.00' | T = 456.55' | ST = 60.00' |
| | R = 4,040.00' | |
| | SE = .04 | |

CURVE DATA FOR -Y12-

| | | |
|---|---|---|
| PI Sta 13+99.88 | PI Sta 18+83.05 | PI Sta 25+13.97 |
| Δ = 29° 15' 23.2" (RT) | Δ = 41° 41' 12.7" (LT) | Δ = 39° 11' 55.8" (LT) |
| D = 11° 27' 33.0" | D = 11° 27' 33.0" | D = 11° 27' 33.0" |
| L = 255.31' | L = 363.79' | L = 342.07' |
| T = 130.50' | T = 190.37' | T = 178.04' |
| R = 500' | R = 500' | R = 500' |
| SE = .06 | SE = .06 | SE = .06 |
| RUNOFF = 126' | RUNOFF = 126' | RUNOFF = 126' |

5/14/99

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USER: cbrock
FILE: R-2233BB_RDY_PSH15.DGN

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 16 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

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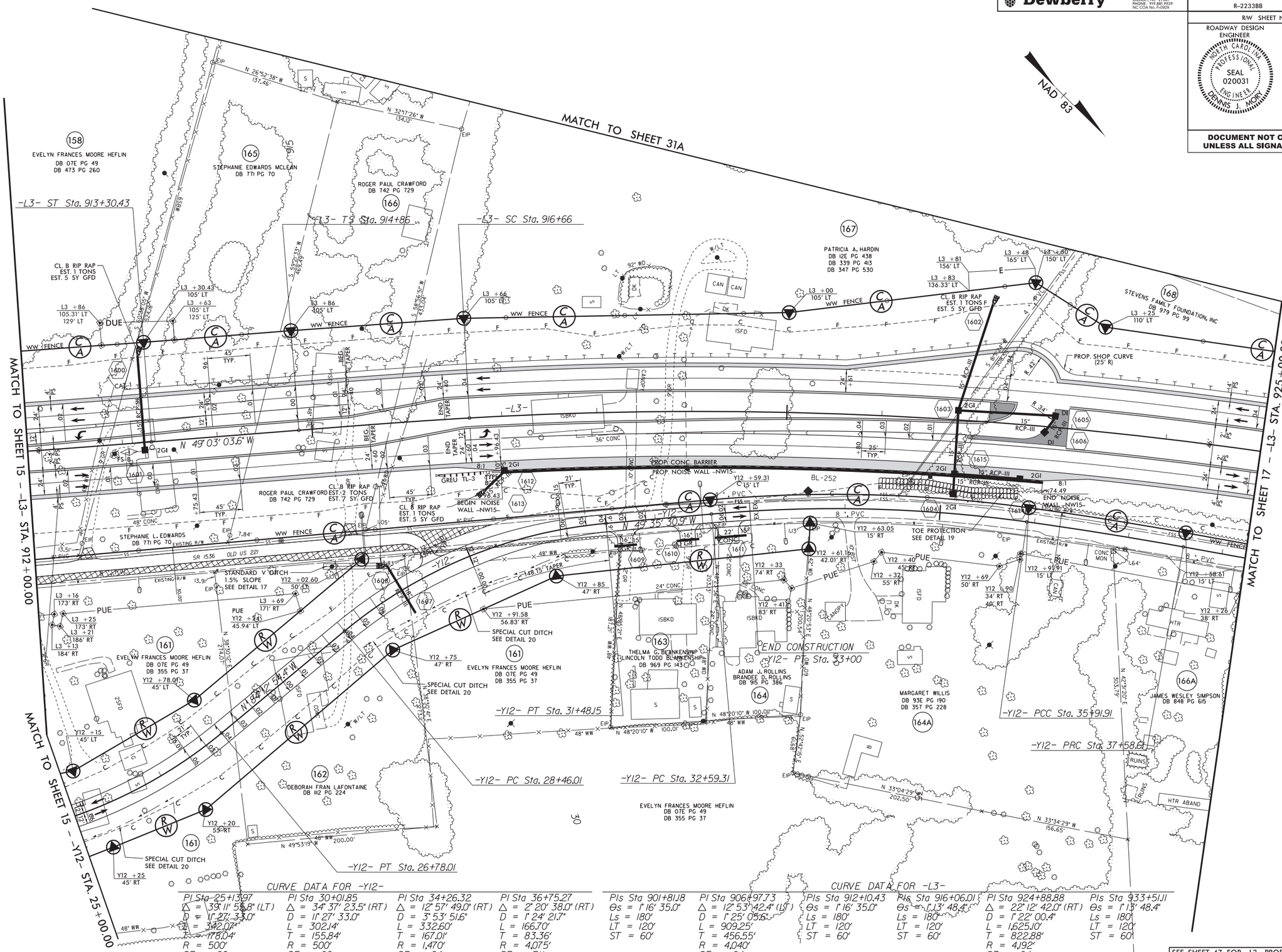



CURVE DATA FOR -Y12-

| PI Sta 25+13.97 | PI Sta 30+01.85 | PI Sta 34+26.32 | PI Sta 36+75.27 |
|---|---|---|---|
| Δ = 39° 11' 58.8" (LT) | Δ = 34° 37' 23.5" (RT) | Δ = 12° 57' 49.0" (RT) | Δ = 2° 20' 38.0" (RT) |
| D = 11° 27' 33.0" | D = 11° 27' 33.0" | D = 3° 53' 51.6" | D = 1° 24' 21.7" |
| L = 342.07' | L = 302.14' | L = 332.60' | L = 166.70' |
| T = 178.04' | T = 155.84' | T = 167.01' | T = 83.36' |
| R = 500' | R = 500' | R = 1,470' | R = 4,075' |
| SE = .06 | SE = .06 | SE = .04 | SE = EX. |
| RUNOFF = 126' | RUNOFF = 126' | RUNOFF = 84' | |

CURVE DATA FOR -L3-

| PIs Sta 901+81.18 | PI Sta 906+97.73 | PIs Sta 912+10.43 | PIs Sta 916+06.01 | PI Sta 924+88.88 | PIs Sta 933+51.11 |
|---|---|---|---|---|---|
| θs = 1° 16' 35.0" | Δ = 12° 53' 42.4" (LT) | θs = 1° 16' 35.0" | θs = 1° 13' 48.4" | Δ = 22° 12' 42.0" (RT) | θs = 1° 13' 48.4" |
| Ls = 180' | D = 1° 25' 05.6" | Ls = 180' | Ls = 180' | D = 1° 22' 00.4" | Ls = 180' |
| LT = 120' | L = 909.25' | LT = 120' | LT = 120' | L = 1,625.10' | LT = 120' |
| ST = 60' | T = 456.55' | ST = 60' | ST = 60' | T = 822.88' | ST = 60' |
| | R = 4,040' | | | R = 4,192' | |
| | SE = .04 | | | SE = .04 | |

SEE SHEET 47 FOR -L3- PROFILE
SEE SHEET 80 FOR -Y12- PROFILE
SEE SHEET 2B-5 FOR CONC. ISLAND DETAILS
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS



8/17/2021 4:25:42 PM
USER: dbondor
FILE: R-2233BB_RDY_PSH16.DGN

5/14/99

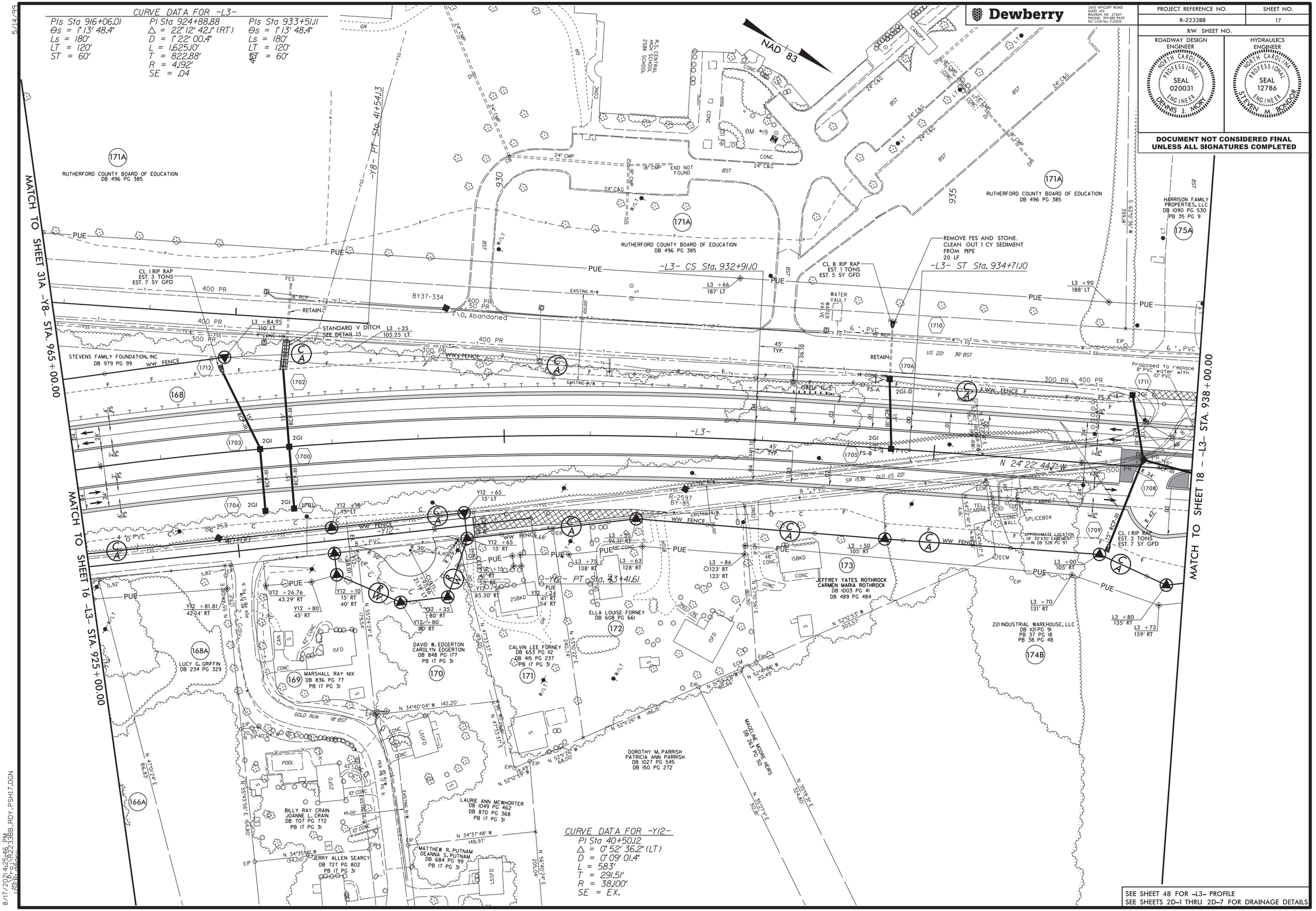
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 17 |
| R/W SHEET NO. | |

**Dewberry**
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




SEE SHEET 48 FOR -L3- PROFILE
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS

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USER: CWILLIAMS
R-2233BB_RDY_PSH17.DGN

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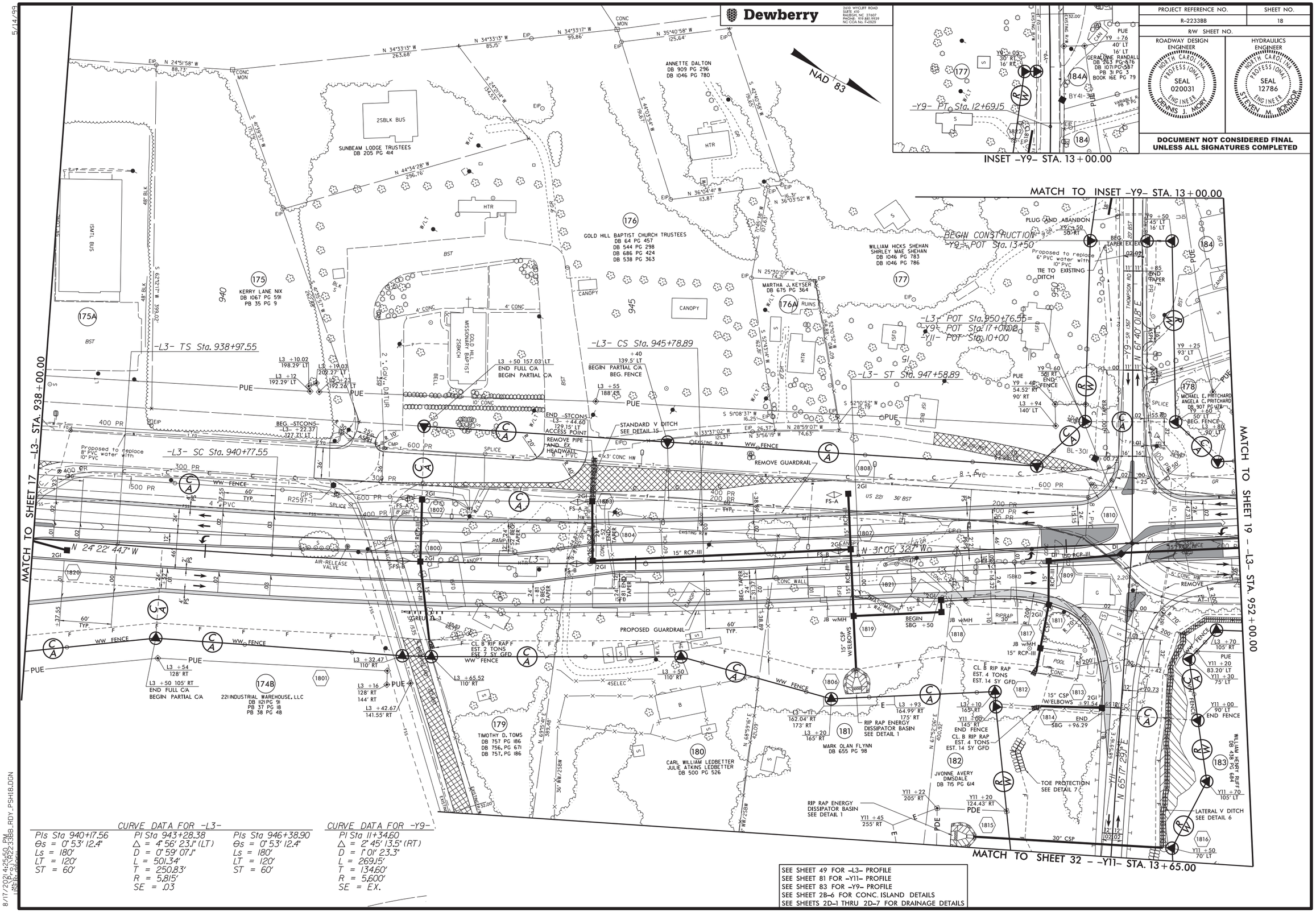
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 18 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORRY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDS

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




CURVE DATA FOR –L3–

| | | |
|---|---|---|
| PIs Sta 940+17.56 | PI Sta 943+28.38 | PIs Sta 946+38.90 |
| Θs = 0° 53' 12.4" | Δ = 4° 56' 23.1" (LT) | Θs = 0° 53' 12.4" |
| Ls = 180' | D = 0° 59' 07.1" | Ls = 180' |
| LT = 120' | L = 501.34' | LT = 120' |
| ST = 60' | T = 250.83' | ST = 60' |
| | R = 5,815' | |
| | SE = .03 | |

CURVE DATA FOR –Y9–

PI Sta 11+34.60
Δ = 2° 45' 13.5" (RT)
D = 1° 01' 23.3"
L = 269.15'
T = 134.60'
R = 5,600'
SE = EX.

SEE SHEET 49 FOR –L3– PROFILE
SEE SHEET 81 FOR –Y11– PROFILE
SEE SHEET 83 FOR –Y9– PROFILE
SEE SHEETS 2B–6 FOR CONC. ISLAND DETAILS
SEE SHEETS 2D–1 THRU 2D–7 FOR DRAINAGE DETAILS

5/14/99

8/17/2021 4:25:50 PM
USER: dmorry
R-2233BB_RDY_PSH18.DGN

5/14/99

**Dewberry**
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 19 |
| R/W SHEET NO. | |

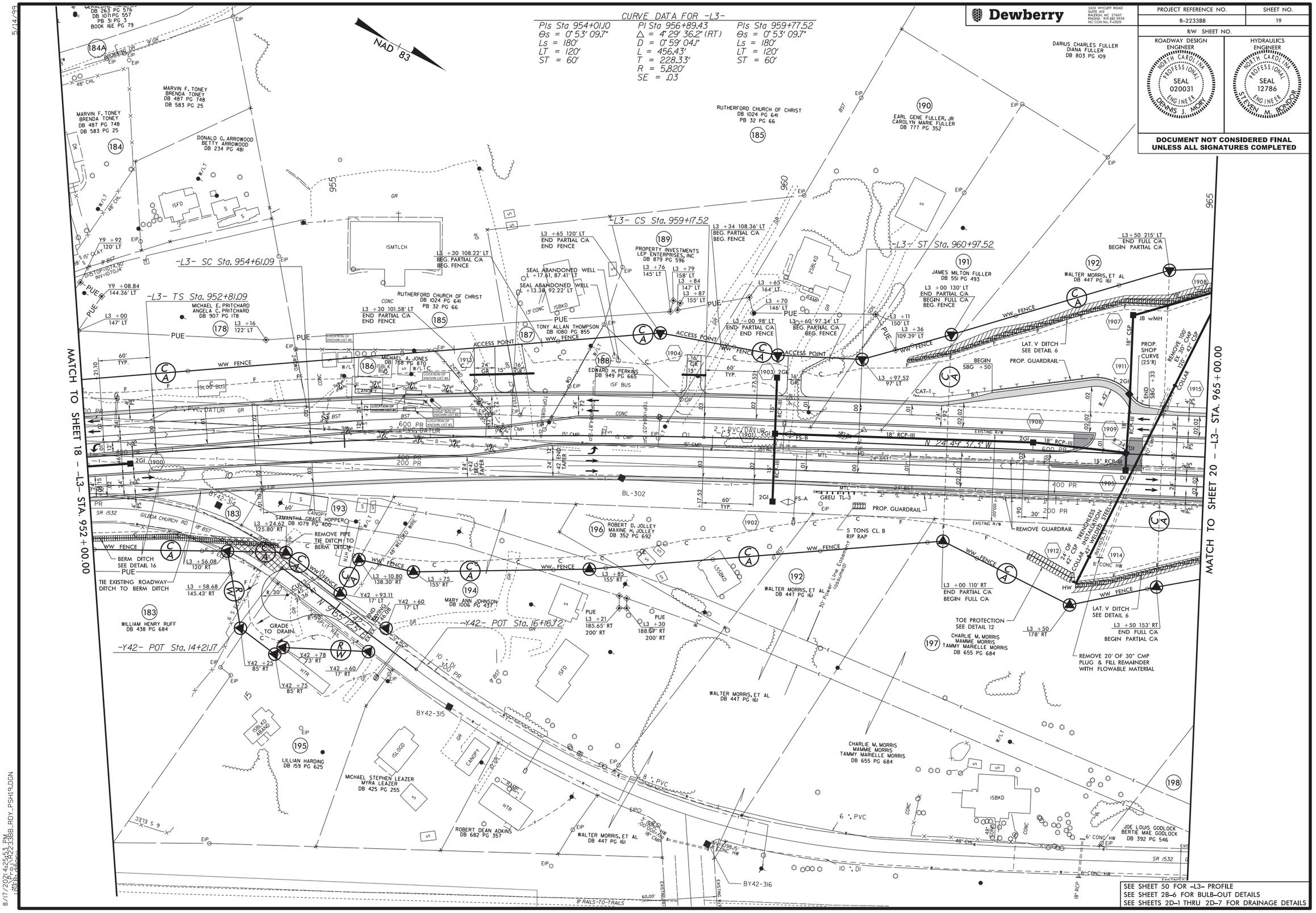
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDS

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

CURVE DATA FOR -L3-

| PIs Sta 954+01.10 | PI Sta 956+89.43 | PIs Sta 959+77.52 |
|---|---|---|
| Θs = 0° 53' 09.7" | Δ = 4° 29' 36.2" (RT) | Θs = 0° 53' 09.7" |
| Ls = 180' | D = 0° 59' 04.1" | Ls = 180' |
| LT = 120' | L = 456.43' | LT = 120' |
| ST = 60' | T = 228.33' | ST = 60' |
| | R = 5,820' | |
| | SE = .03 | |




SEE SHEET 50 FOR -L3- PROFILE
SEE SHEET 2B-6 FOR BULB-OUT DETAILS
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS

8/17/2021 4:25:53 PM
USER: dpm
R2233BB_RDY_PSH19.DGN

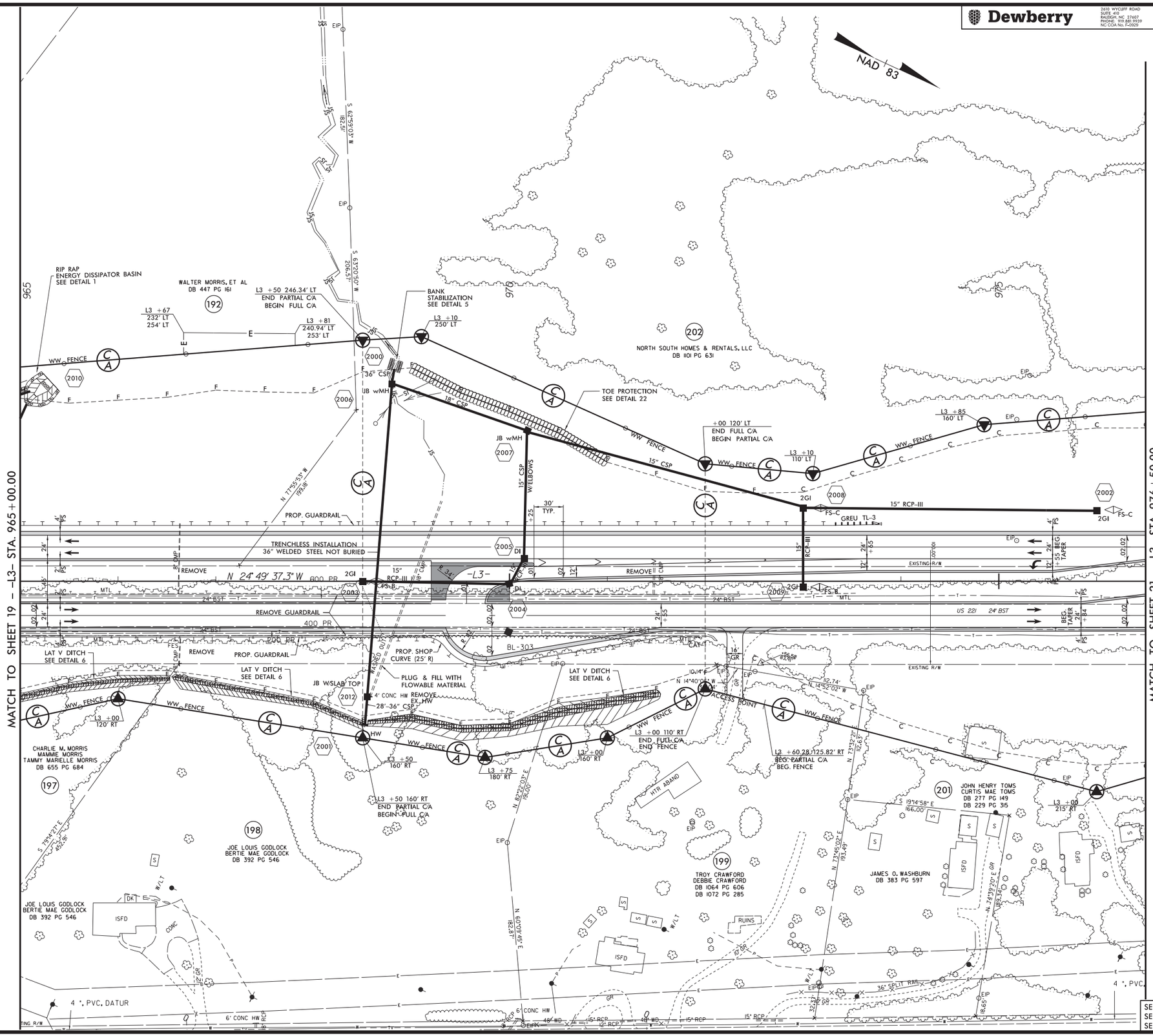
Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 20 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORAN

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




SEE SHEET 51 FOR –L3– PROFILE
SEE SHEET 2B-7 FOR BULB-OUT DETAILS
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS

5/14/99

8/17/2021 4:25:57 PM
C:\PW_WORK\dot\r2233bb_rdy_psh20.dgn
USER: cpoole

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 21 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORRY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

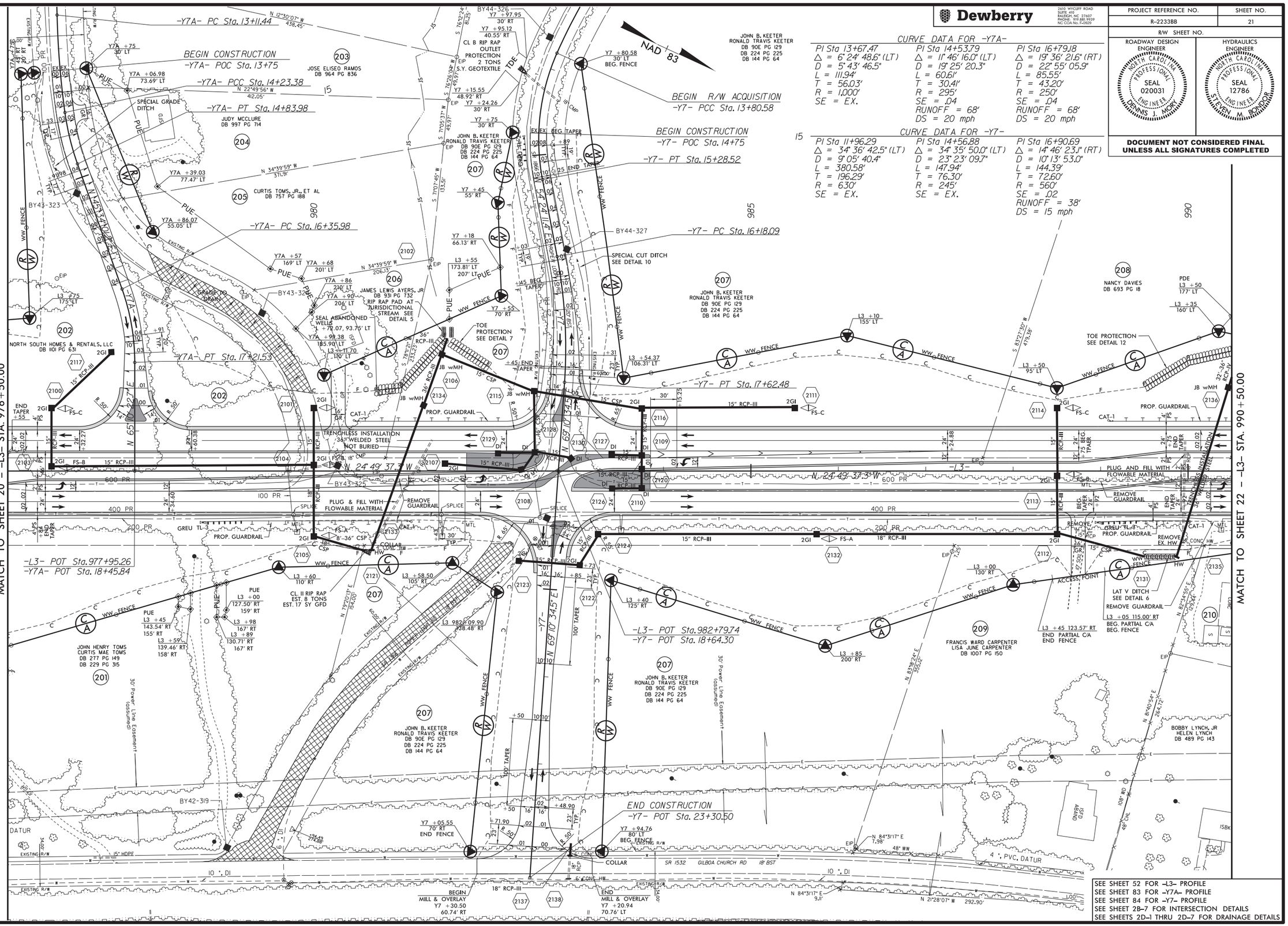
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

CURVE DATA FOR -Y7A-

| PI Sta 13+67.47 | PI Sta 14+53.79 | PI Sta 16+79.18 |
|---|---|---|
| △ = 6° 24' 48.6" (LT) | △ = 11° 46' 16.0" (LT) | △ = 19° 36' 21.6" (RT) |
| D = 5° 43' 46.5" | D = 19° 25' 20.3" | D = 22° 55' 05.9" |
| L = 111.94' | L = 60.61' | L = 85.55' |
| T = 56.03' | T = 30.41' | T = 43.20' |
| R = 1,000' | R = 295' | R = 250' |
| SE = EX. | SE = .04 | SE = .04 |
| | RUNOFF = 68' | RUNOFF = 68' |
| | DS = 20 mph | DS = 20 mph |

CURVE DATA FOR -Y7-

| PI Sta 11+96.29 | PI Sta 14+56.88 | PI Sta 16+90.69 |
|---|---|---|
| △ = 34° 36' 42.5" (LT) | △ = 34° 35' 50.0" (LT) | △ = 14° 46' 23.1" (RT) |
| D = 9° 05' 40.4" | D = 23° 23' 09.7" | D = 10° 13' 53.0" |
| L = 380.58' | L = 147.94' | L = 144.39' |
| T = 196.29' | T = 76.30' | T = 72.60' |
| R = 630' | R = 245' | R = 560' |
| SE = EX. | SE = EX. | SE = .02 |
| | | RUNOFF = 38' |
| | | DS = 15 mph |

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USER: gbondor

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 22 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

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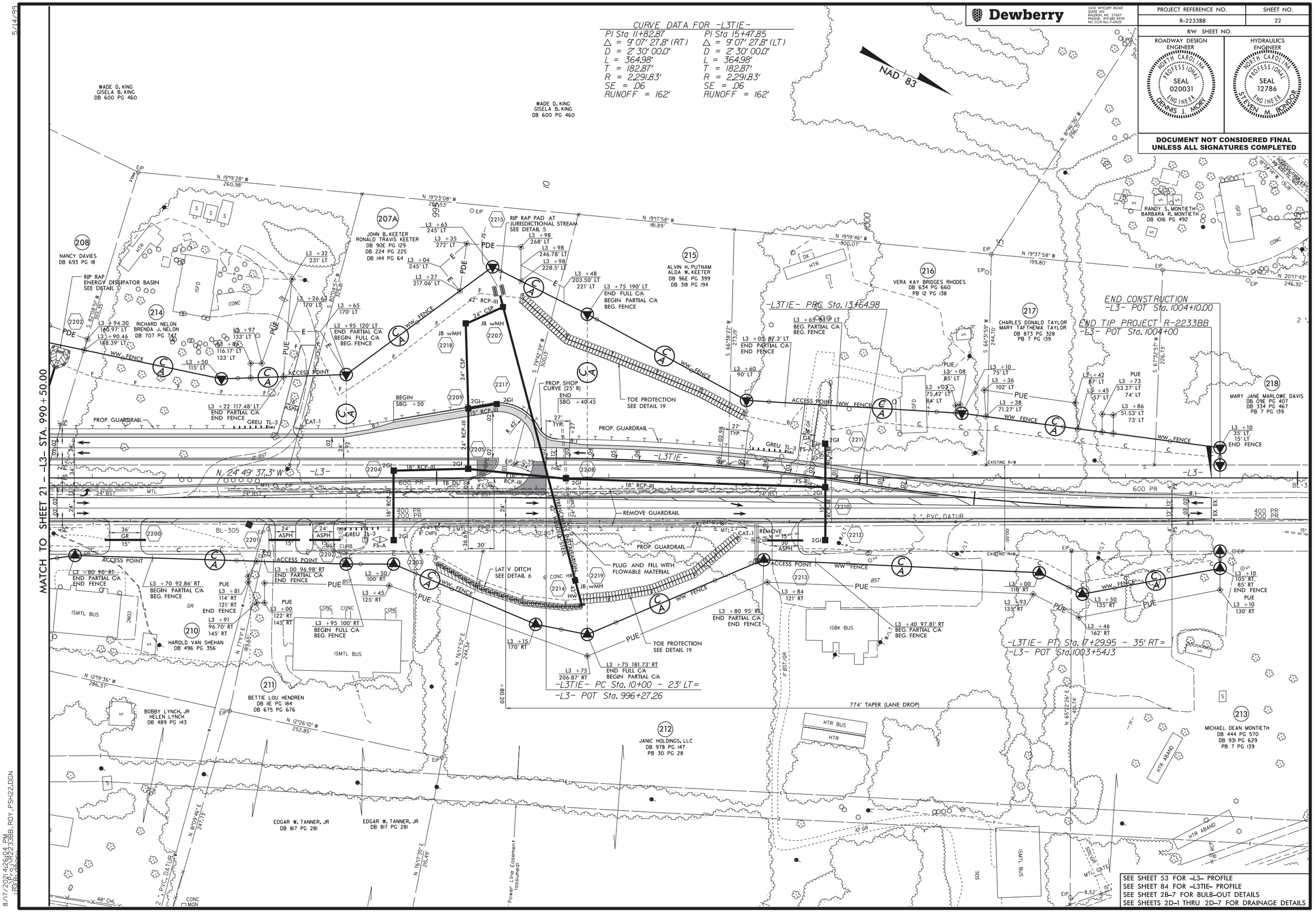

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 23 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

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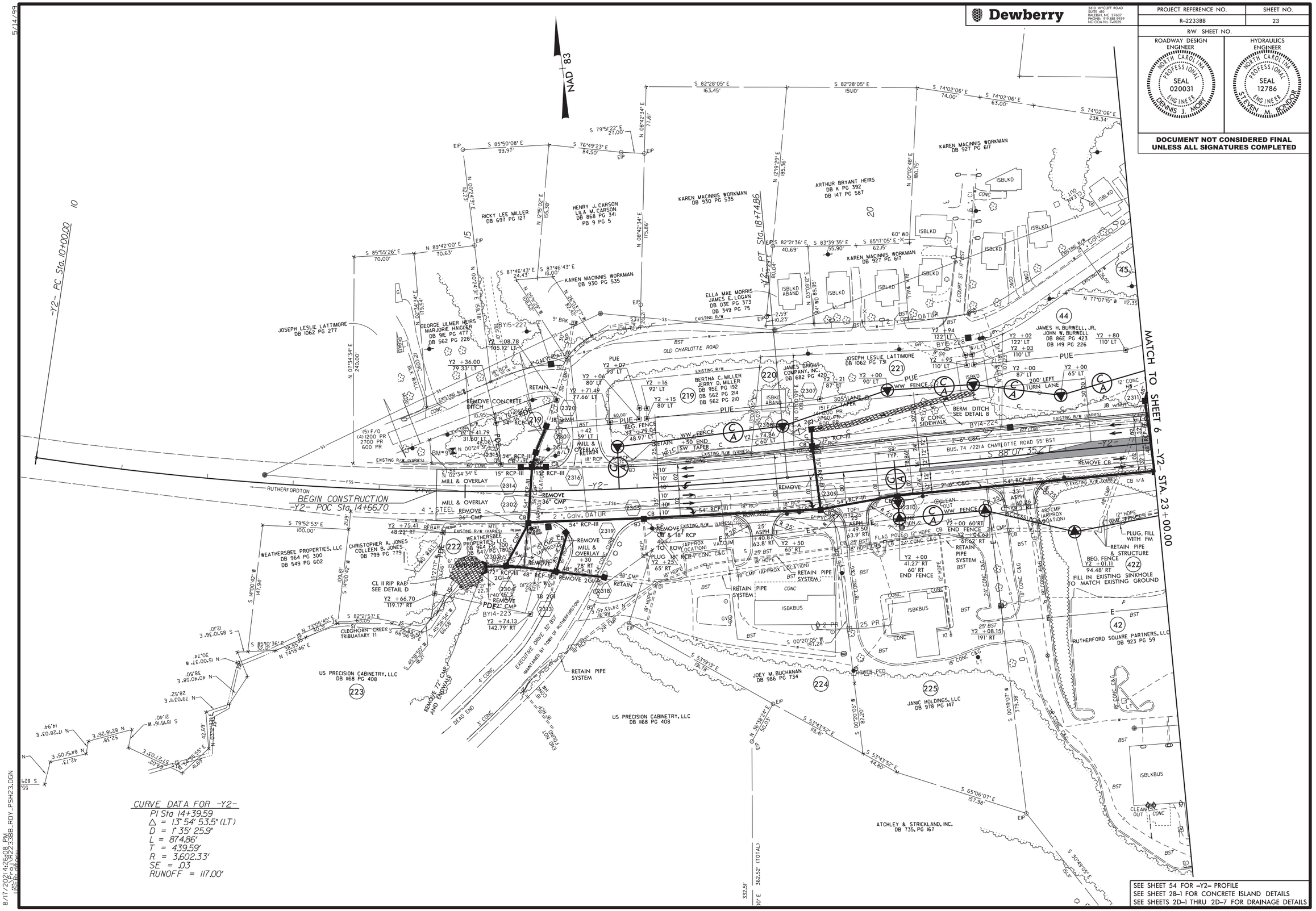


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USER: cbondor
FILE: R-2233BB_RDY_PSH23.DGN

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 24 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

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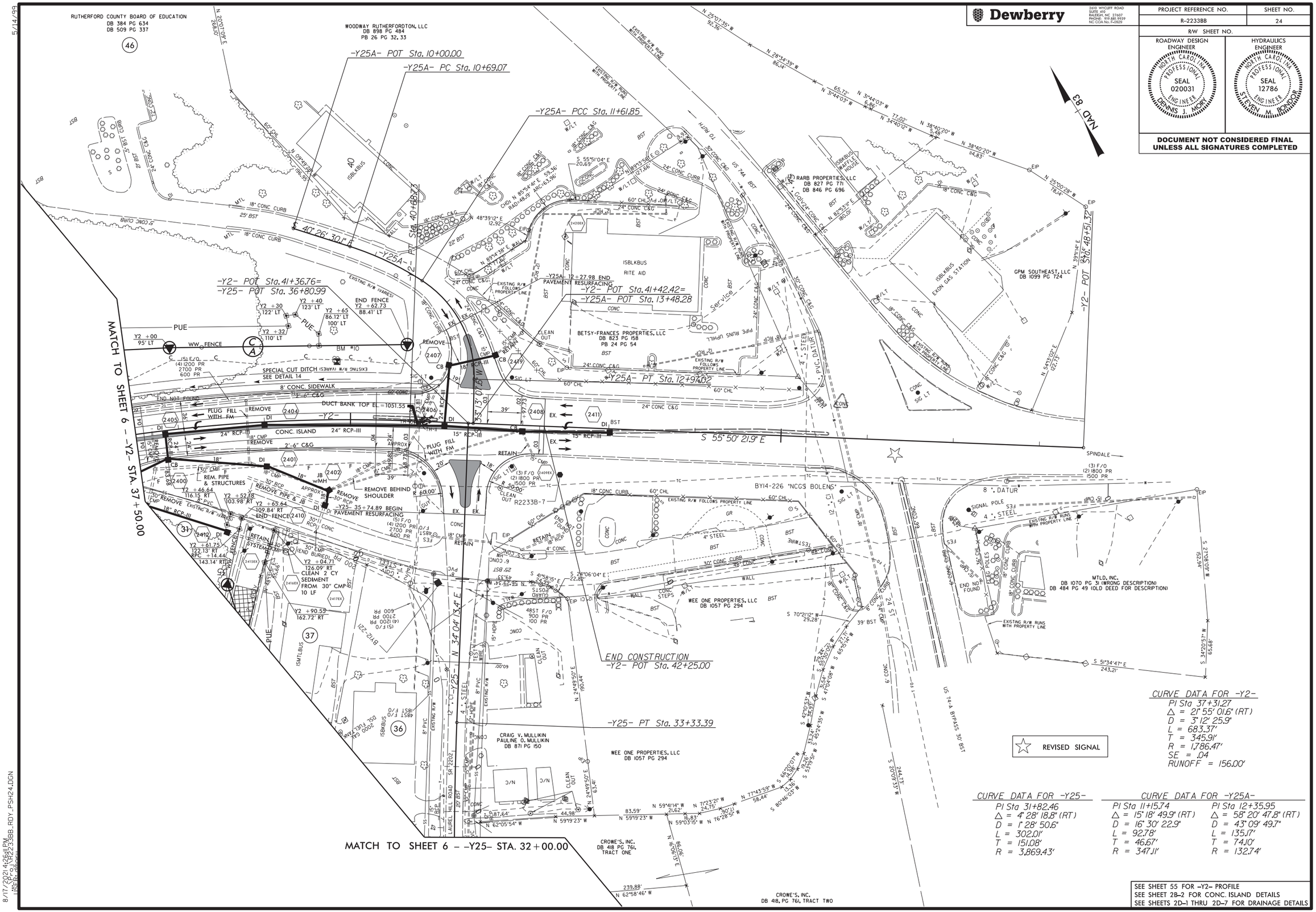


REVISED SIGNAL

CURVE DATA FOR -Y2-
PI Sta 37+31.27
Δ = 21° 55' 01.6" (RT)
D = 3° 12' 25.9"
L = 683.37'
T = 345.91'
R = 1,786.47'
SE = .04
RUNOFF = 156.00'

CURVE DATA FOR -Y25-
PI Sta 31+82.46
Δ = 4° 28' 18.8" (RT)
D = 1° 28' 50.6"
L = 302.01'
T = 151.08'
R = 3,869.43'

CURVE DATA FOR -Y25A-

| PI Sta 11+15.74 | PI Sta 12+35.95 |
|---|---|
| Δ = 15° 18' 49.9" (RT) | Δ = 58° 20' 47.8" (RT) |
| D = 16° 30' 22.9" | D = 43° 09' 49.7" |
| L = 92.78' | L = 135.17' |
| T = 46.67' | T = 74.10' |
| R = 347.11' | R = 132.74' |

SEE SHEET 55 FOR -Y2- PROFILE
SEE SHEET 2B-2 FOR CONC. ISLAND DETAILS
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS

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8/17/2021 4:26:11 PM
R-2233BB_RDY_PSH24.DGN
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SUITE 410
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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 25 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
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NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

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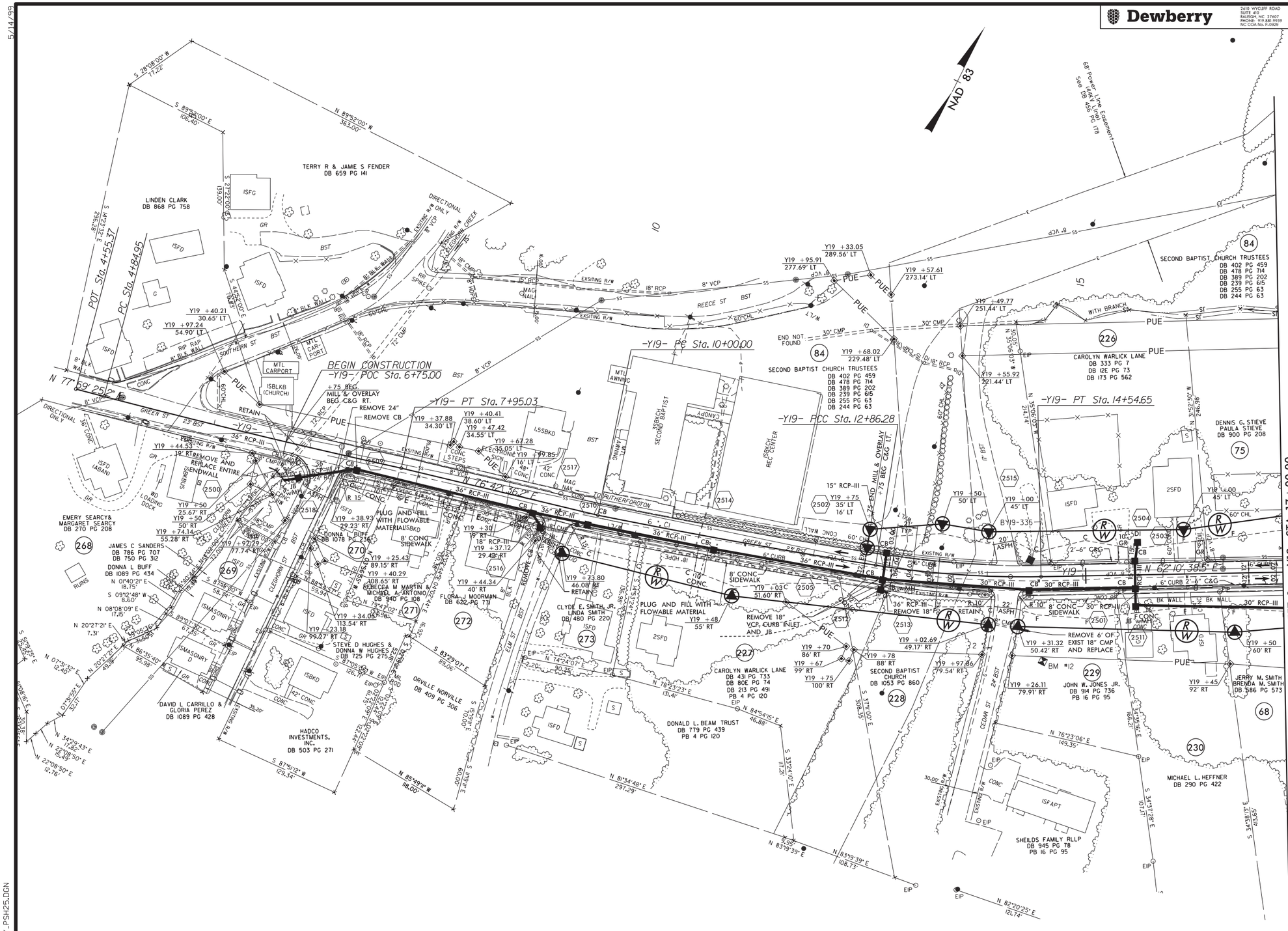


CURVE DATA FOR -Y19-

| | | |
|---|---|---|
| PI Sta 6+40.01 | PI Sta 11+43.16 | PI Sta 13+70.68 |
| Δ = 2° 22' 07.7" (LT) | Δ = 2° 20' 35.7" (LT) | Δ = 10° 06' 04.4" (LT) |
| D = 0° 45' 50.2" | D = 0° 49' 06.6" | D = 5° 59' 58.4" |
| L = 310.08' | L = 286.28' | L = 168.37' |
| T = 155.06' | T = 143.16' | T = 84.40' |
| R = 7,500.00' | R = 7,000.00' | R = 955.00' |
| SE = EX. | SE = EX. | SE = EX. |

SEE SHEET 62 FOR -Y19- PROFILE
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS

8/17/2021 4:26:25 PM
R2233BB_RDY_PSH25.DGN
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PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 26 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

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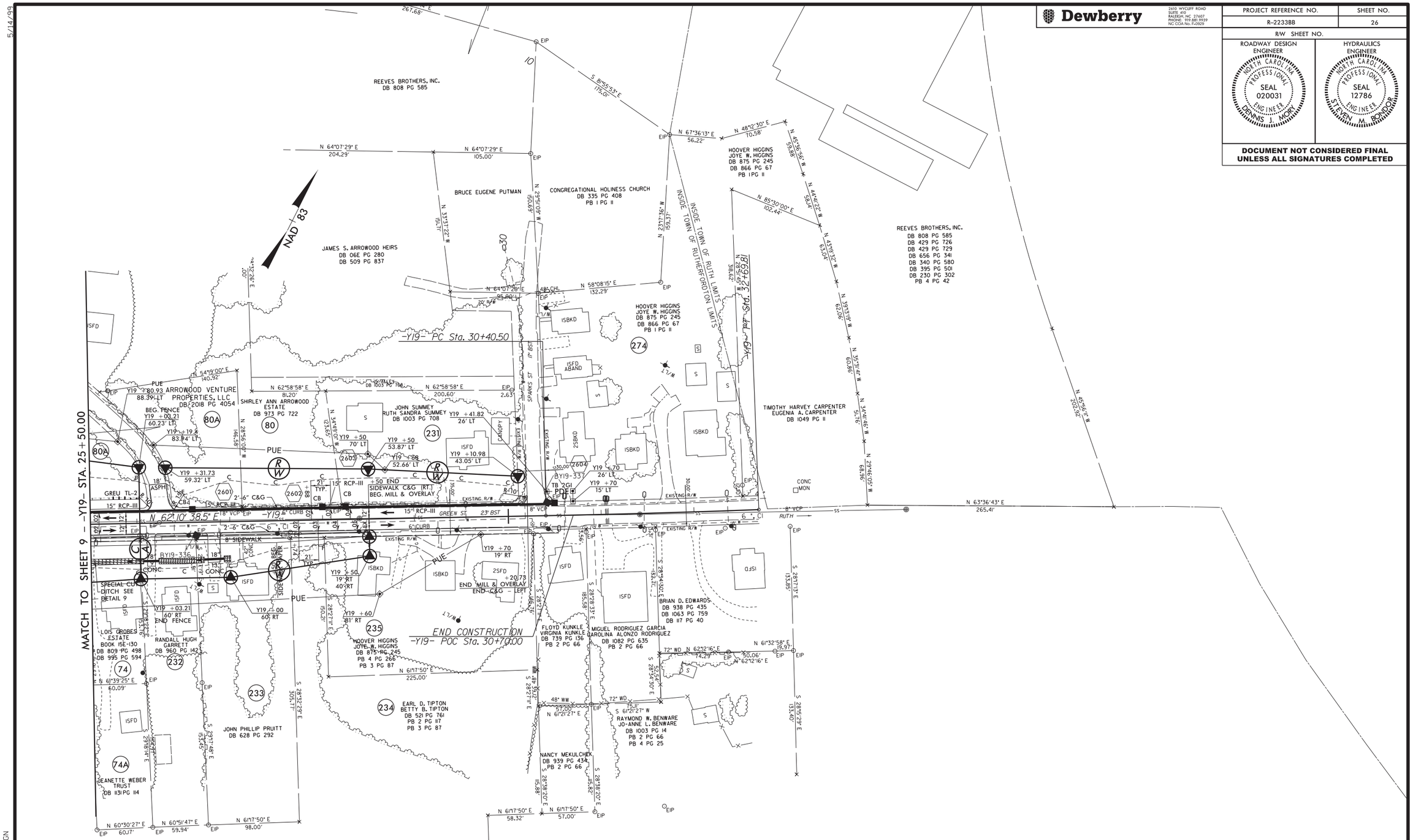


CURVE DATA FOR -Y19-
PI Sta 31+55.16
Δ = 1° 05' 41.6" (LT)
D = 0° 28' 38.9"
L = 229.31'
T = 114.66'
R = 12,000.00'
SE = NC

SEE SHEET 63 FOR -Y19- PROFILE
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS

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2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 27 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

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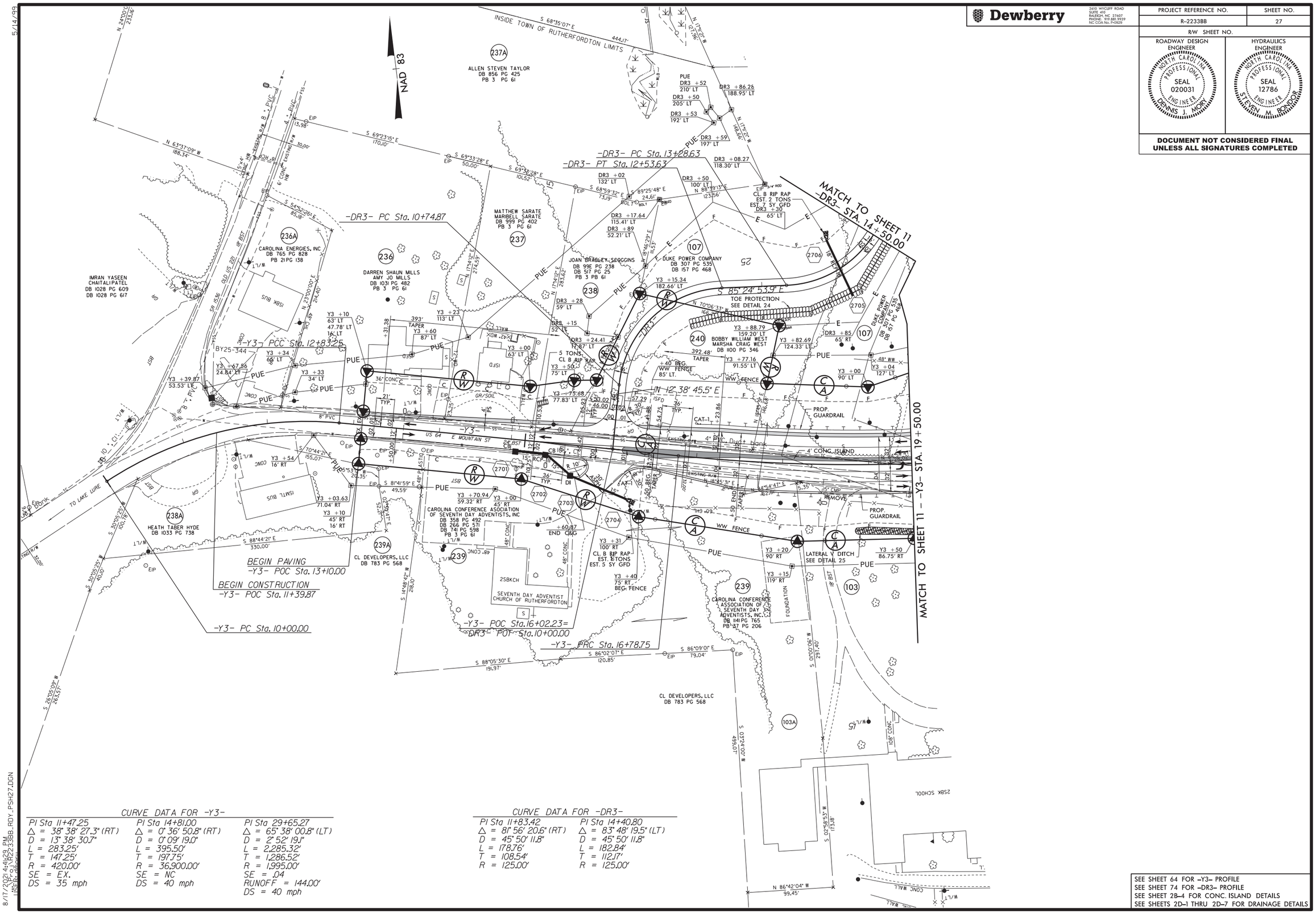


CURVE DATA FOR -Y3-

| | | |
|---|---|---|
| PI Sta 11+47.25 | PI Sta 14+81.00 | PI Sta 29+65.27 |
| Δ = 38° 38' 27.3" (RT) | Δ = 0° 36' 50.8" (RT) | Δ = 65° 38' 00.8" (LT) |
| D = 13° 38' 30.7" | D = 0° 09' 19.0" | D = 2° 52' 19.1" |
| L = 283.25' | L = 395.50' | L = 2,285.32' |
| T = 147.25' | T = 197.75' | T = 1,286.52' |
| R = 420.00' | R = 36,900.00' | R = 1,995.00' |
| SE = EX. | SE = NC | SE = .04 |
| DS = 35 mph | DS = 40 mph | RUNOFF = 144.00' |
| | | DS = 40 mph |

CURVE DATA FOR -DR3-

| | |
|---|---|
| PI Sta 11+83.42 | PI Sta 14+40.80 |
| Δ = 81° 56' 20.6" (RT) | Δ = 83° 48' 19.5" (LT) |
| D = 45° 50' 11.8" | D = 45° 50' 11.8" |
| L = 178.76' | L = 182.84' |
| T = 108.54' | T = 112.17' |
| R = 125.00' | R = 125.00' |

SEE SHEET 64 FOR -Y3- PROFILE
SEE SHEET 74 FOR -DR3- PROFILE
SEE SHEET 2B-4 FOR CONC. ISLAND DETAILS
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS

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USER: cbarnes

5/14/99

CURVE DATA FOR -Y3-
PI Sta 29+65.27
△ = 65° 38' 00.8" (LT)
D = 2° 52' 19.1"
L = 2,285.32'
T = 1,286.52'
R = 1,995.00'
SE = .04
RUNOFF = 144.00'


Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 28 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORAN

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDS

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R2233BB_PROJ_2-33BB_RDY_PSH28.DGN
USER: dpowell

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 29 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORRY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

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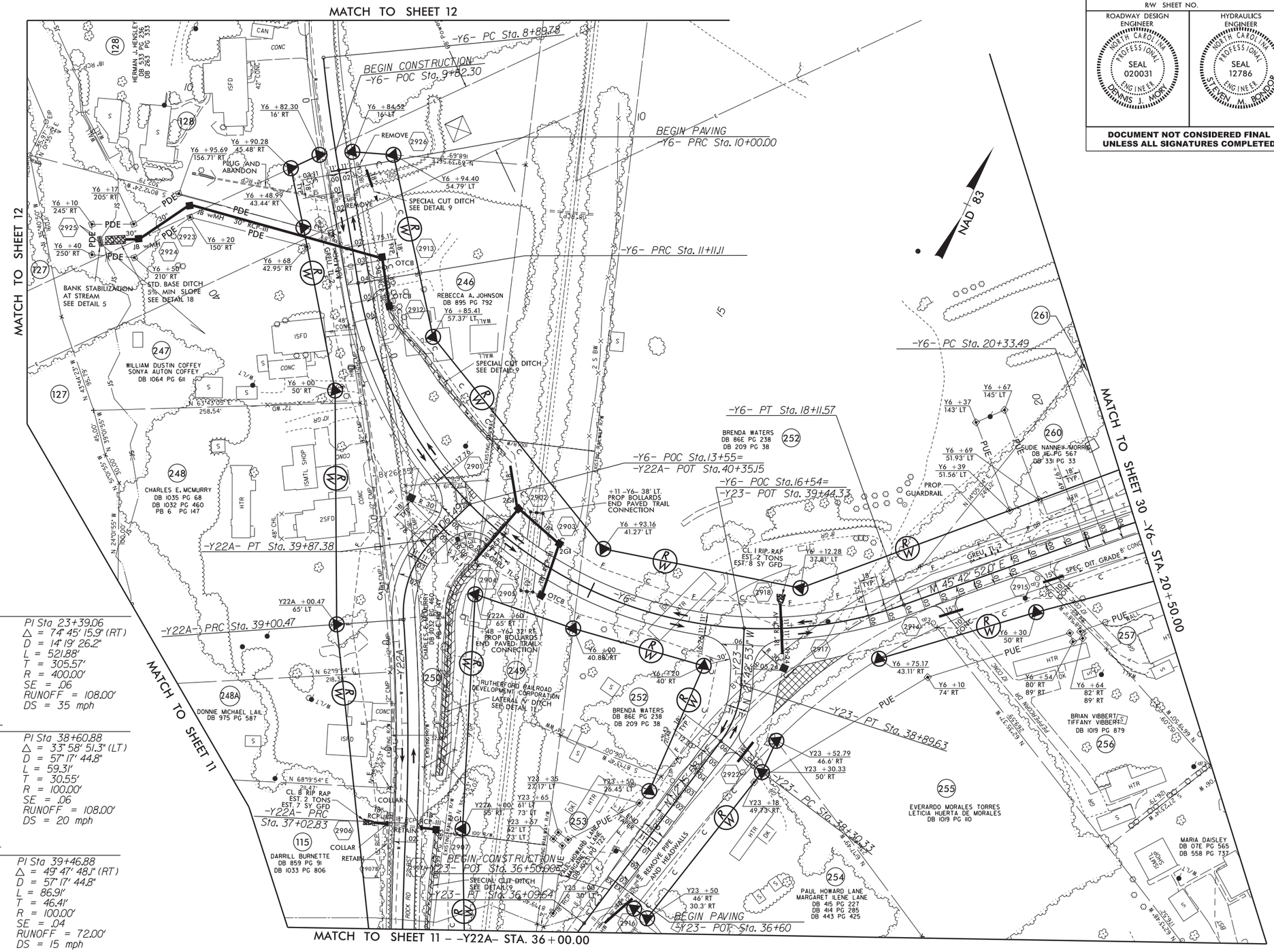


CURVE DATA FOR -Y6-

| PI Sta 10+55.56 | PI Sta 15+90.64 | PI Sta 23+39.06 |
|---|---|---|
| △ = 0° 45' 51.3" (RT) | △ = 100° 20' 01.8" (LT) | △ = 74° 45' 15.9" (RT) |
| D = 0° 41' 16.2" | D = 14° 19' 26.2" | D = 14° 19' 26.2" |
| L = 111.11' | L = 700.46' | L = 521.88' |
| T = 55.56' | T = 479.53' | T = 305.57' |
| R = 8,330.00' | R = 400.00' | R = 400.00' |
| SE = EX. | SE = .06 | SE = .06 |
| DS = 35 mph | RUNOFF = 108.00' | RUNOFF = 108.00' |
| | DS = 35 mph | DS = 35 mph |

CURVE DATA FOR -Y23-

| PI Sta 32+45.69 | PI Sta 35+18.06 | PI Sta 38+60.88 |
|---|---|---|
| △ = 4° 29' 38.6" (RT) | △ = 30° 01' 05.5" (RT) | △ = 33° 58' 51.3" (LT) |
| D = 1° 16' 23.7" | D = 16° 00' 15.9" | D = 57° 17' 44.8" |
| L = 352.96' | L = 187.56' | L = 59.31' |
| T = 176.57' | T = 95.99' | T = 30.55' |
| R = 4,500.00' | R = 358.00' | R = 100.00' |
| SE = EX. | SE = EX. | SE = .06 |
| DS = 35 mph | DS = 20 mph | RUNOFF = 108.00' |
| | | DS = 20 mph |

CURVE DATA FOR -Y22A-

| PI Sta 35+65.41 | PI Sta 38+01.76 | PI Sta 39+46.88 |
|---|---|---|
| △ = 4° 35' 36.2" (RT) | △ = 6° 44' 25.9" (LT) | △ = 49° 47' 48.1" (RT) |
| D = 1° 40' 13.6" | D = 3° 24' 37.7" | D = 57° 17' 44.8" |
| L = 274.98' | L = 197.64' | L = 86.91' |
| T = 137.56' | T = 98.94' | T = 46.41' |
| R = 3,430.00' | R = 1,680.00' | R = 100.00' |
| SE = EX. | SE = EX. | SE = .04 |
| DS = 35 mph | DS = 35 mph | RUNOFF = 72.00' |
| | | DS = 15 mph |

CURVE DATA FOR -Y23A-

| PI Sta 44+55.25 | PI Sta 45+75.10 | PI Sta 46+84.50 | PI Sta 48+15.42 |
|---|---|---|---|
| △ = 1° 32' 38.7" (RT) | △ = 6° 33' 34.4" (RT) | △ = 19° 55' 51.0" (RT) | △ = 35° 04' 00.6" (RT) |
| D = 1° 09' 35.4" | D = 6° 09' 39.0" | D = 17° 54' 17.8" | D = 23° 52' 23.7" |
| L = 133.13' | L = 106.47' | L = 111.31' | L = 146.89' |
| T = 66.57' | T = 53.29' | T = 56.23' | T = 75.83' |
| R = 4,940.00' | R = 930.00' | R = 320.00' | R = 240.00' |
| SE = EX. | SE = EX. | SE = EX. | SE = EX. |

SEE SHEETS 75 & 76 FOR -Y6- PROFILE
SEE SHEET 77 FOR -Y22A- PROFILE
SEE SHEET 77 FOR -Y23- PROFILE
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS

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R2233BB_RDY_PSH29.DGN
USER: cwolf

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 30 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORRY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

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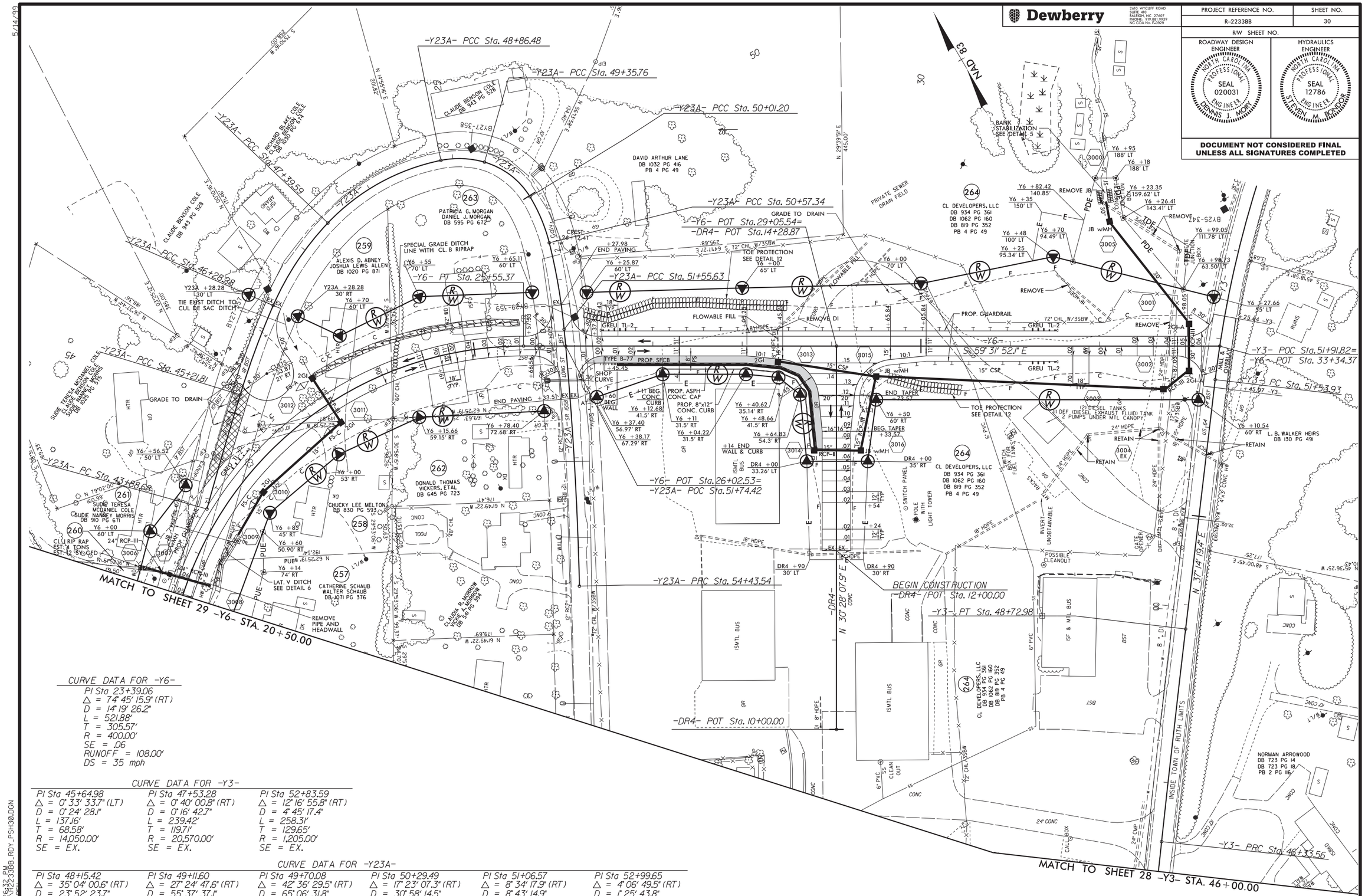


CURVE DATA FOR -Y6-

PI Sta 23+39.06
△ = 74° 45' 15.9" (RT)
D = 14° 19' 26.2"
L = 521.88'
T = 305.57'
R = 400.00'
SE = .06
RUNOFF = 108.00'
DS = 35 mph

CURVE DATA FOR -Y3-

| PI Sta 45+64.98 | PI Sta 47+53.28 | PI Sta 52+83.59 |
|---|---|---|
| △ = 0° 33' 33.7" (LT) | △ = 0° 40' 00.8" (RT) | △ = 12° 16' 55.8" (RT) |
| D = 0° 24' 28.1" | D = 0° 16' 42.7" | D = 4° 45' 17.4" |
| L = 137.16' | L = 239.42' | L = 258.31' |
| T = 68.58' | T = 119.71' | T = 129.65' |
| R = 14,050.00' | R = 20,570.00' | R = 1,205.00' |
| SE = EX. | SE = EX. | SE = EX. |

CURVE DATA FOR -Y23A-

| PI Sta 48+15.42 | PI Sta 49+11.60 | PI Sta 49+70.08 | PI Sta 50+29.49 | PI Sta 51+06.57 | PI Sta 52+99.65 |
|---|---|---|---|---|---|
| △ = 35° 04' 00.6" (RT) | △ = 27° 24' 47.6" (RT) | △ = 42° 36' 29.5" (RT) | △ = 17° 23' 07.3" (RT) | △ = 8° 34' 17.9" (RT) | △ = 4° 06' 49.5" (RT) |
| D = 23° 52' 23.7" | D = 55° 37' 37.1" | D = 65° 06' 31.8" | D = 30° 58' 14.5" | D = 8° 43' 14.9" | D = 1° 25' 43.8" |
| L = 146.89' | L = 49.28' | L = 65.44' | L = 56.13' | L = 98.29' | L = 287.91' |
| T = 75.83' | T = 25.12' | T = 34.32' | T = 28.28' | T = 49.24' | T = 144.02' |
| R = 240.00' | R = 103.00' | R = 88.00' | R = 185.00' | R = 657.00' | R = 4,010.00' |
| SE = EX. | SE = EX. | SE = EX. | SE = EX. | SE = EX. | SE = EX. |

SEE SHEET 76 FOR -DR4- PROFILE
SEE SHEETS 75 & 76 FOR -Y6- PROFILE
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS
SEE SHEETS W-1 THRU W-11 FOR RETAINING WALL PLANS

5/14/99
8/17/2021 4:06:33 PM
ISE-R-2233BB_RDY_PSH30.DGN

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 31 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

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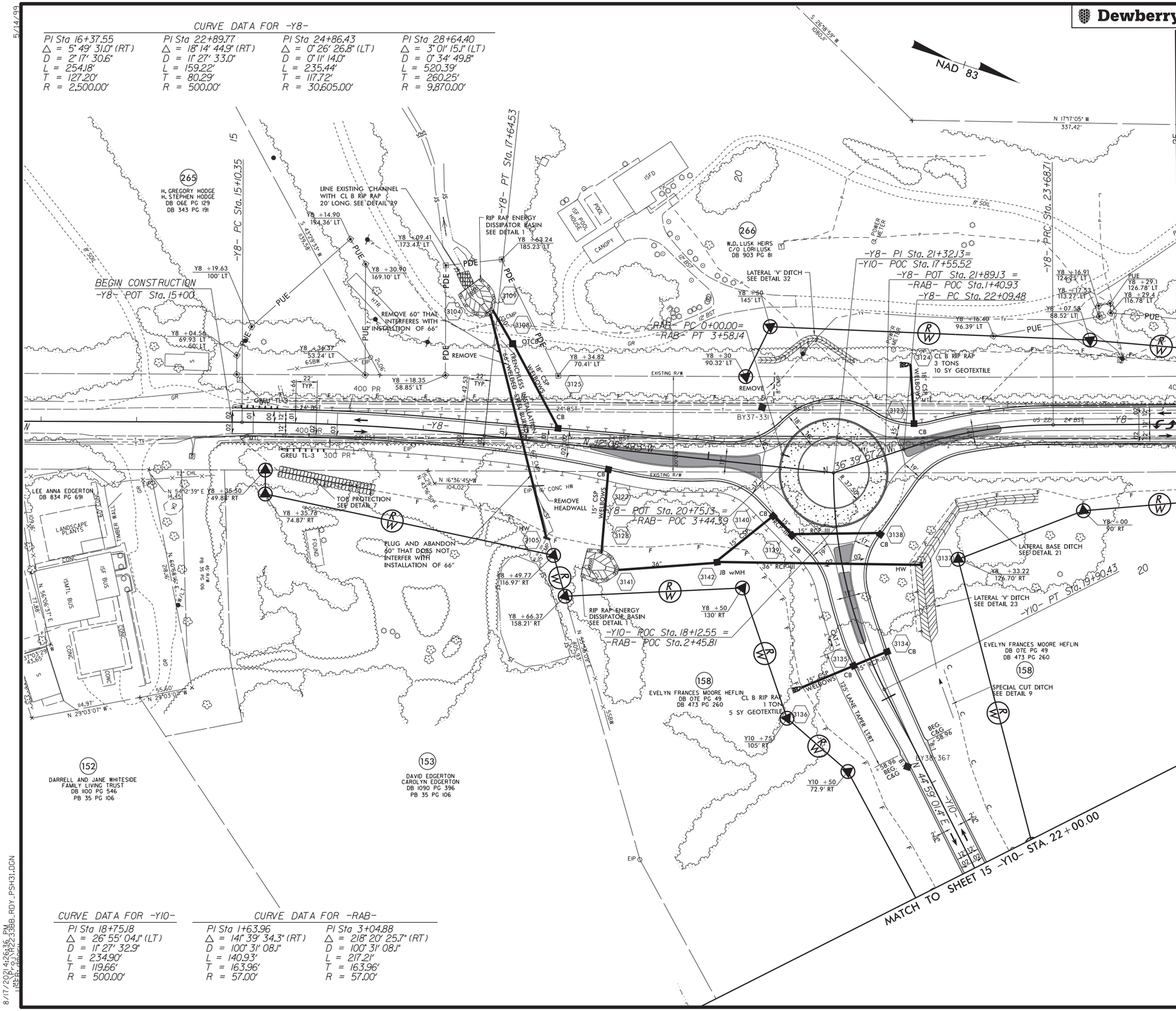


CURVE DATA FOR -Y8-

| PI Sta 16+37.55 | PI Sta 22+89.77 | PI Sta 24+86.43 | PI Sta 28+64.40 |
|---|---|---|---|
| Δ = 5° 49' 31.0" (RT) | Δ = 18° 14' 44.9" (RT) | Δ = 0° 26' 26.8" (LT) | Δ = 3° 01' 15.1" (LT) |
| D = 2° 17' 30.6" | D = 11° 27' 33.0" | D = 0° 11' 14.0" | D = 0° 34' 49.8" |
| L = 254.18' | L = 159.22' | L = 235.44' | L = 520.39' |
| T = 127.20' | T = 80.29' | T = 117.72' | T = 260.25' |
| R = 2,500.00' | R = 500.00' | R = 30,605.00' | R = 9,870.00' |

CURVE DATA FOR -Y10-

| PI Sta 18+75.18 |
|---|
| Δ = 26° 55' 04.1" (LT) |
| D = 11° 27' 32.9" |
| L = 234.90' |
| T = 119.66' |
| R = 500.00' |

CURVE DATA FOR -RAB-

| PI Sta 1+63.96 | PI Sta 3+04.88 |
|---|---|
| Δ = 141° 39' 34.3" (RT) | Δ = 218° 20' 25.7" (RT) |
| D = 100° 31' 08.1" | D = 100° 31' 08.1" |
| L = 140.93' | L = 217.21' |
| T = 163.96' | T = 163.96' |
| R = 57.00' | R = 57.00' |

SEE SHEET 78 & 79 FOR -Y8- PROFILE
SEE SHEET 79 FOR -Y10- PROFILE
SEE SHEET 79 FOR -RAB- PROFILE
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS

5/14/99
8/17/2021 4:26:36 PM
USER: SCHEN
R-2233BB_RDY_PSH31.DGN

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Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 31A |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORRY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

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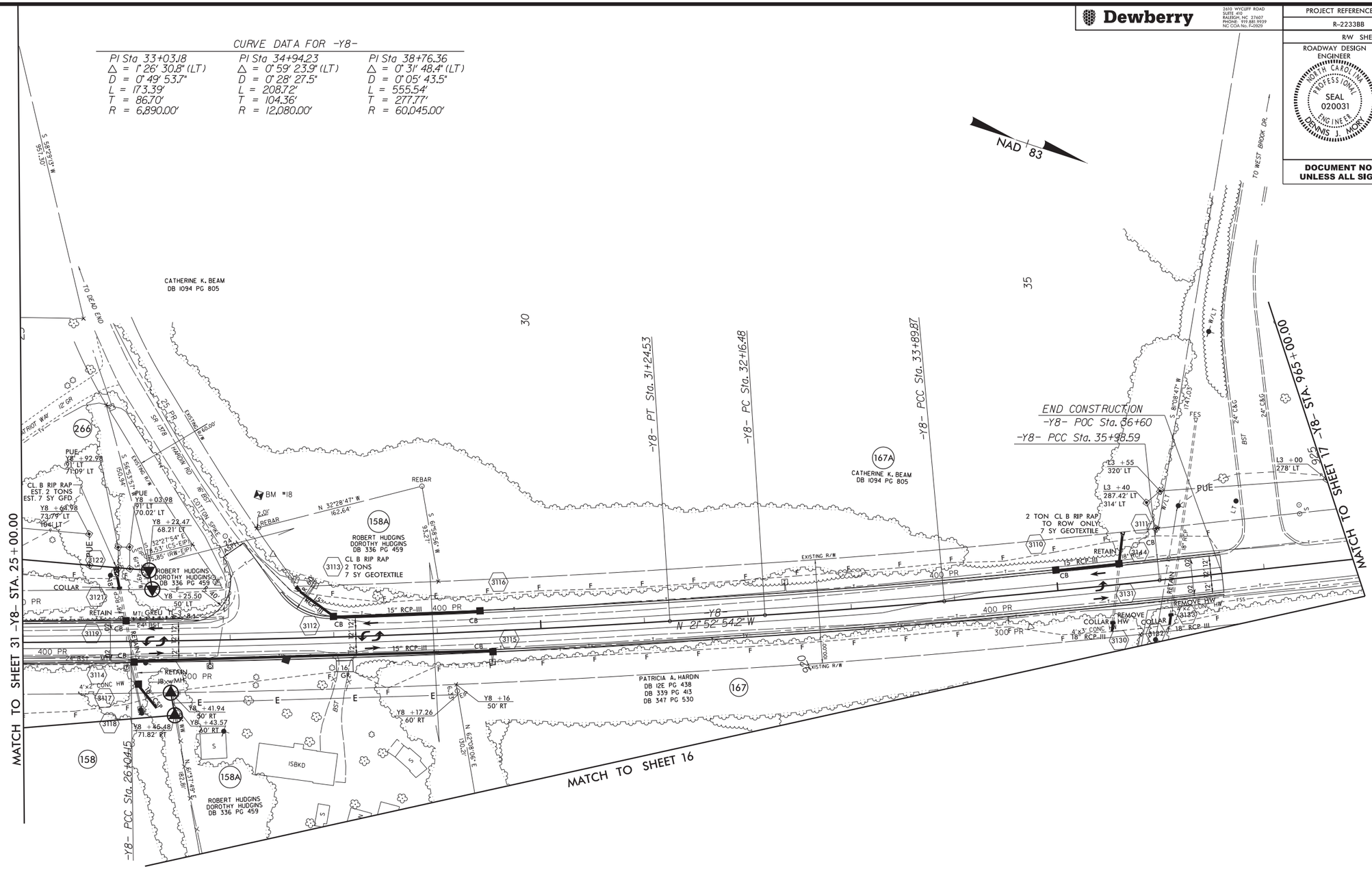
CURVE DATA FOR -Y8-

| PI Sta 33+03.18 | PI Sta 34+94.23 | PI Sta 38+76.36 |
|---|---|---|
| △ = 1° 26' 30.8" (LT) | △ = 0° 59' 23.9" (LT) | △ = 0° 31' 48.4" (LT) |
| D = 0° 49' 53.7" | D = 0° 28' 27.5" | D = 0° 05' 43.5" |
| L = 173.39' | L = 208.72' | L = 555.54' |
| T = 86.70' | T = 104.36' | T = 277.77' |
| R = 6,890.00' | R = 12,080.00' | R = 60,045.00' |




SEE SHEETS 78 & 79 FOR -Y8- PROFILE
SEE SHEETS 2D-1 THRU 2D-7 FOR DRAINAGE DETAILS

8/17/2021 4:06:33 PM
R-2233BB_RDY_PSH31A.DGN
USER: cjones

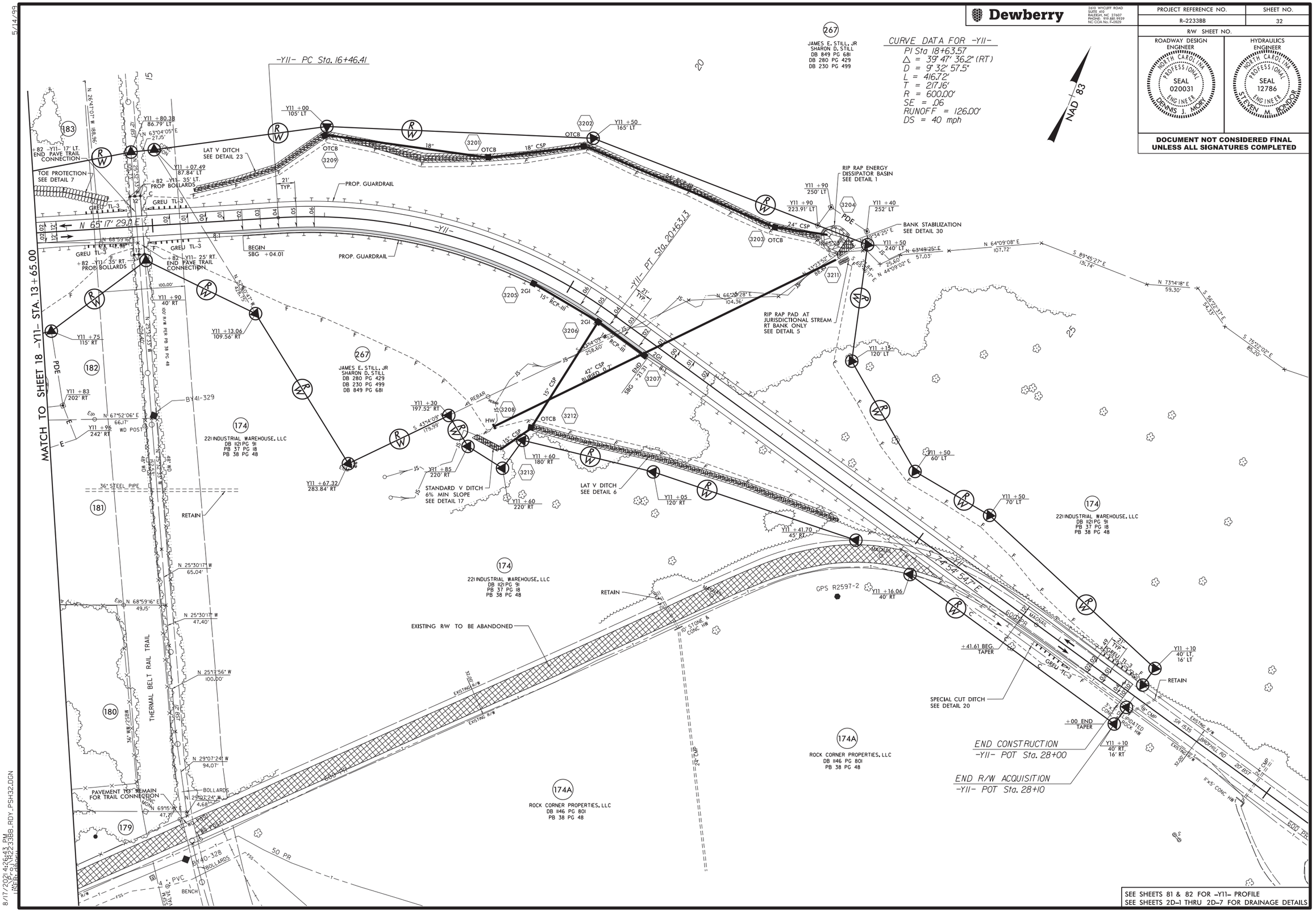
Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 32 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORRY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

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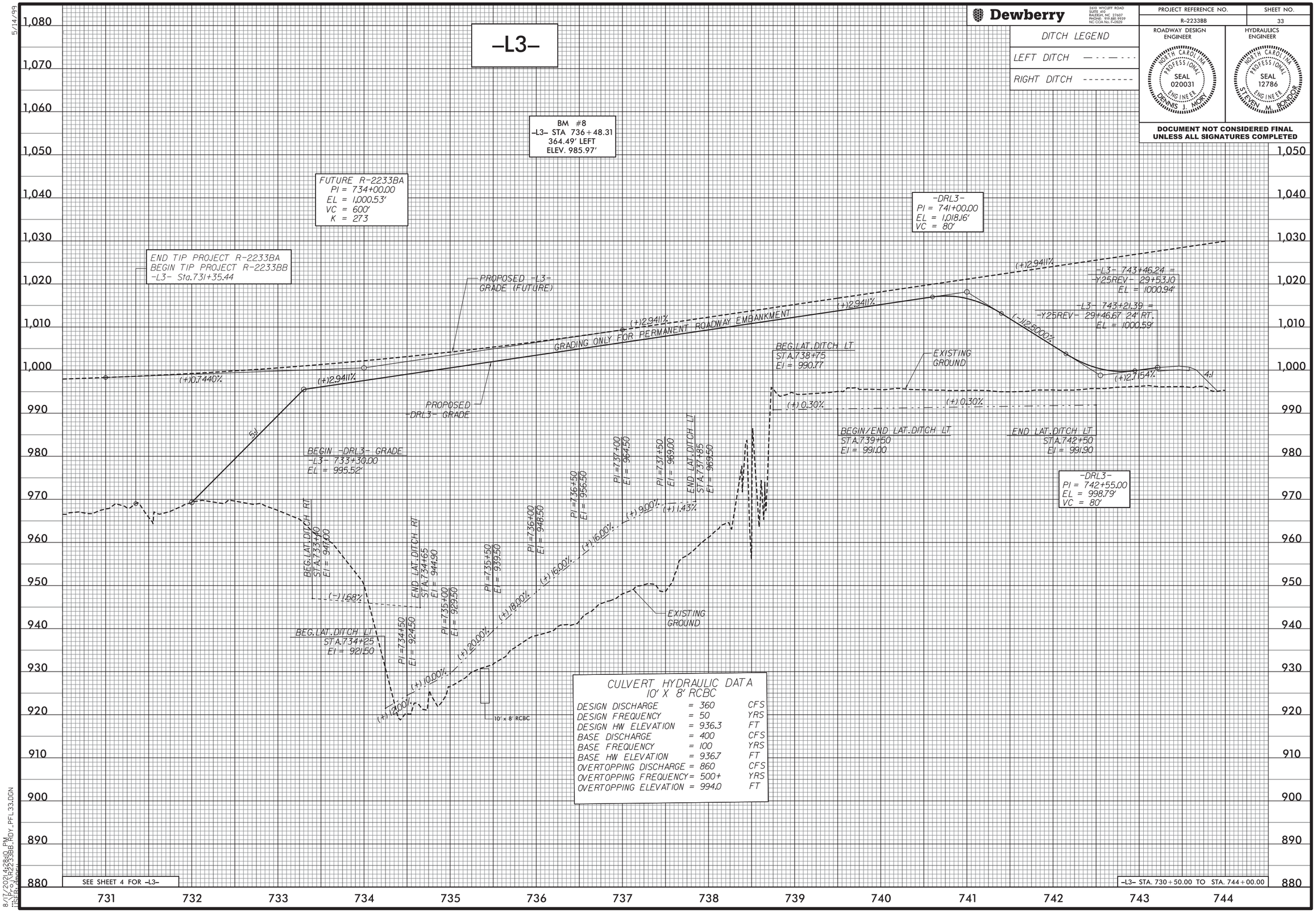
5/14/99

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2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| DITCH LEGEND | |
|---|---|
| LEFT DITCH | — · · — · · — |
| RIGHT DITCH | - - - - - - - - - |

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 33 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

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USER: smorris

5/14/99

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 34 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

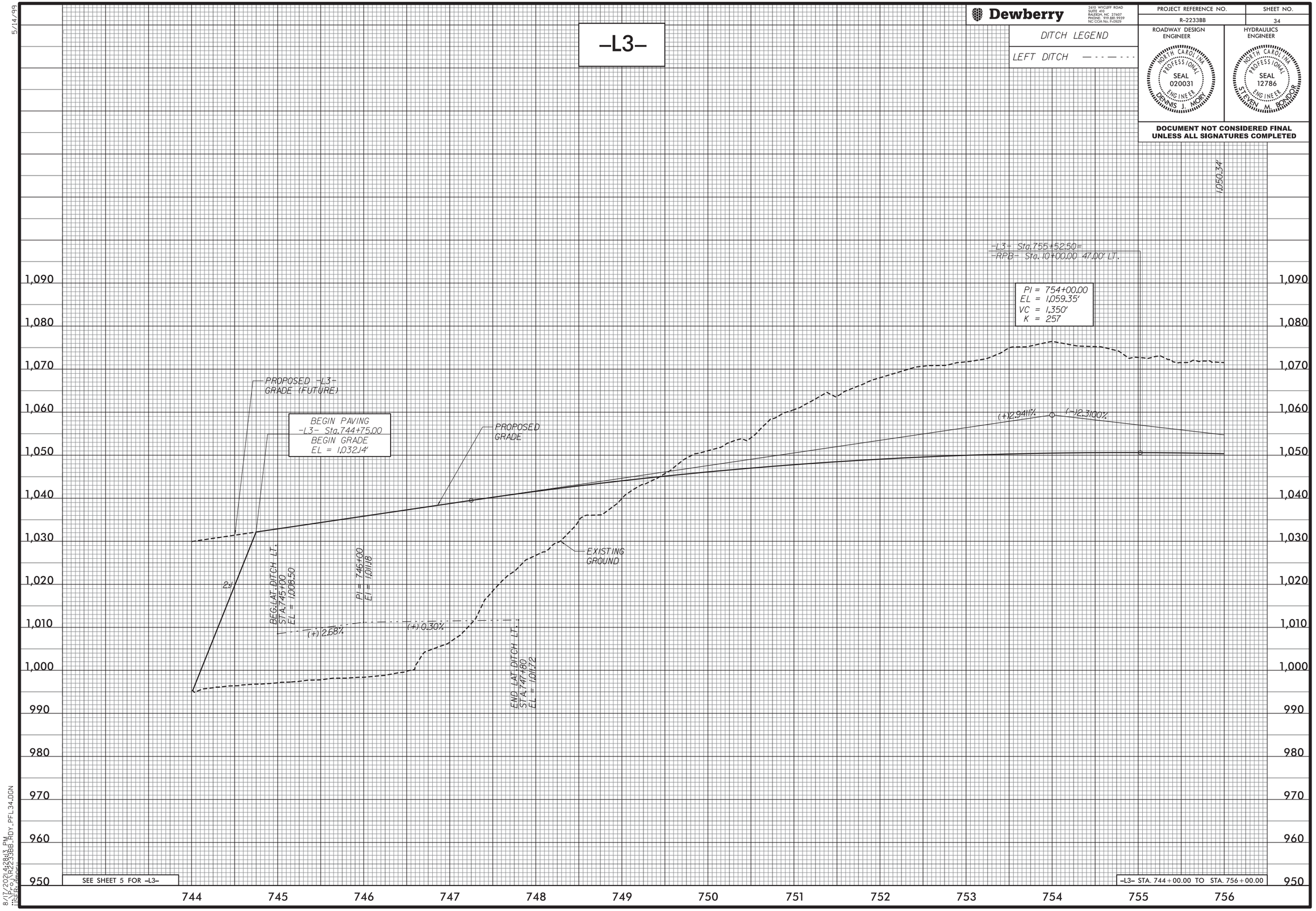
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND

LEFT DITCH — - - — - - -

# –L3–




SEE SHEET 5 FOR –L3–

–L3– STA. 744+00.00 TO STA. 756+00.00

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R:\Projects\R2233BB_RDY_PFL34.DGN
USER: dmorry

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2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 35 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

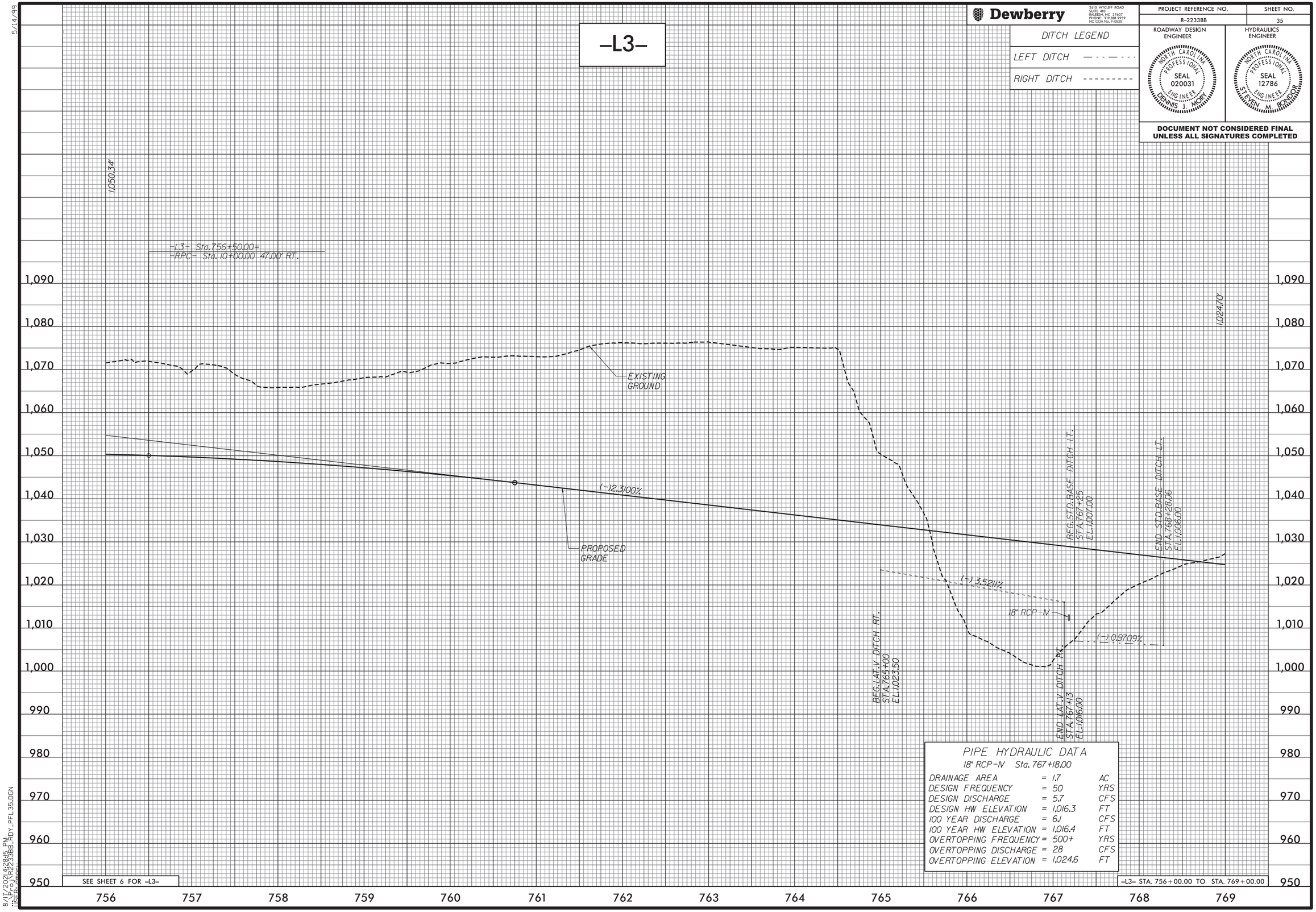
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND

LEFT DITCH — - - — - - -

RIGHT DITCH - - - - - - - - -

# –L3–




PIPE HYDRAULIC DATA
18" RCP-IV Sta. 767+18.00

| | | | |
|---|---|---|---|
| DRAINAGE AREA | = | 1.7 | AC |
| DESIGN FREQUENCY | = | 50 | YRS |
| DESIGN DISCHARGE | = | 5.7 | CFS |
| DESIGN HW ELEVATION | = | 1,016.3 | FT |
| 100 YEAR DISCHARGE | = | 6.1 | CFS |
| 100 YEAR HW ELEVATION | = | 1,016.4 | FT |
| OVERTOPPING FREQUENCY | = | 500+ | YRS |
| OVERTOPPING DISCHARGE | = | 28 | CFS |
| OVERTOPPING ELEVATION | = | 1,024.6 | FT |

SEE SHEET 6 FOR –L3–

–L3– STA. 756+00.00 TO STA. 769+00.00

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USER: smoyer

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2610 WYCLIFF ROAD
SUITE 410
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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 36 |

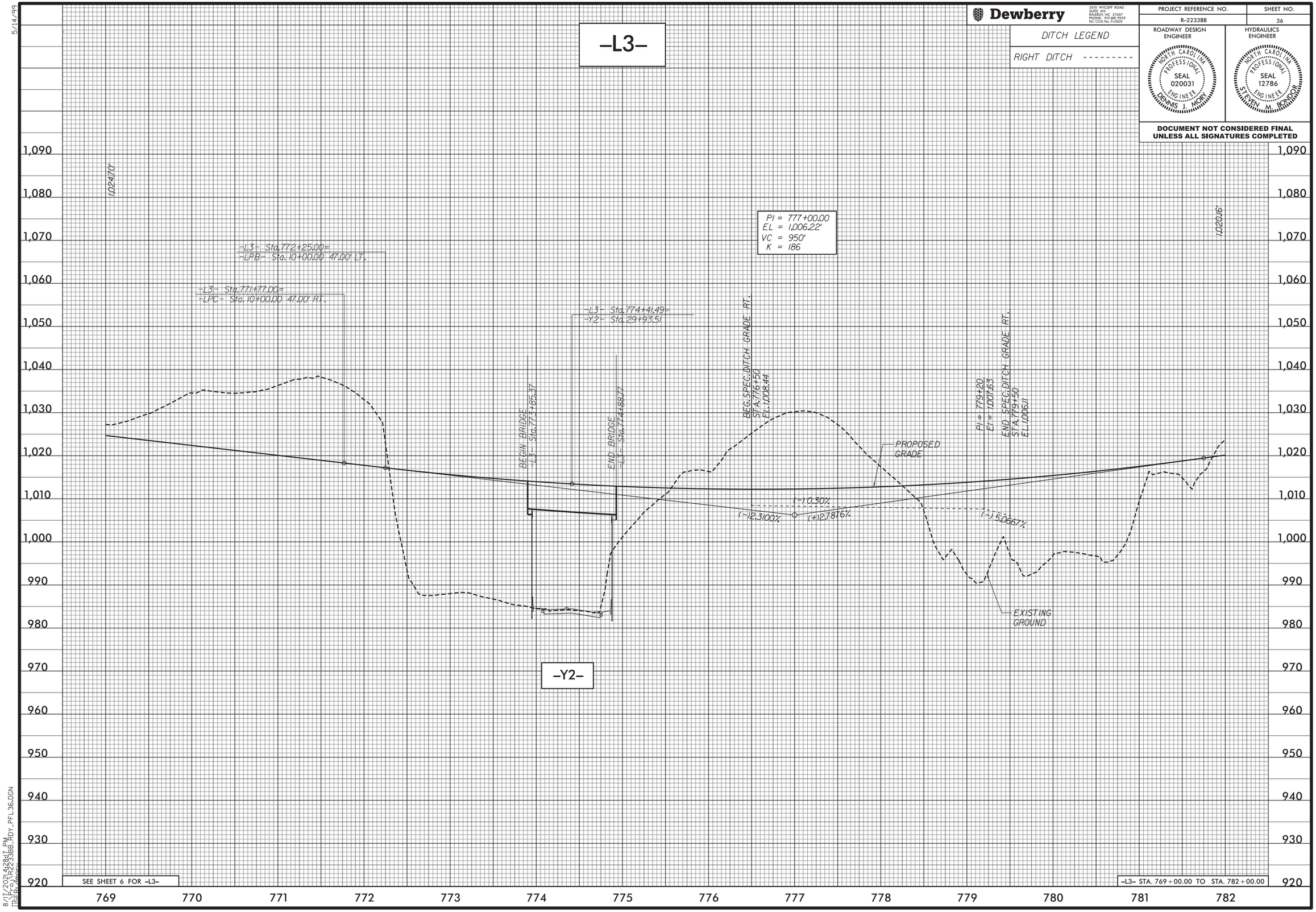
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND

RIGHT DITCH ---------




SEE SHEET 6 FOR -L3-

-L3- STA. 769+00.00 TO STA. 782+00.00

8/17/2021 4:28:17 PM
USER: smorris

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Dewberry

2610 WYCLIFF ROAD
SUITE 410
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PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 37 |

ROADWAY DESIGN ENGINEER

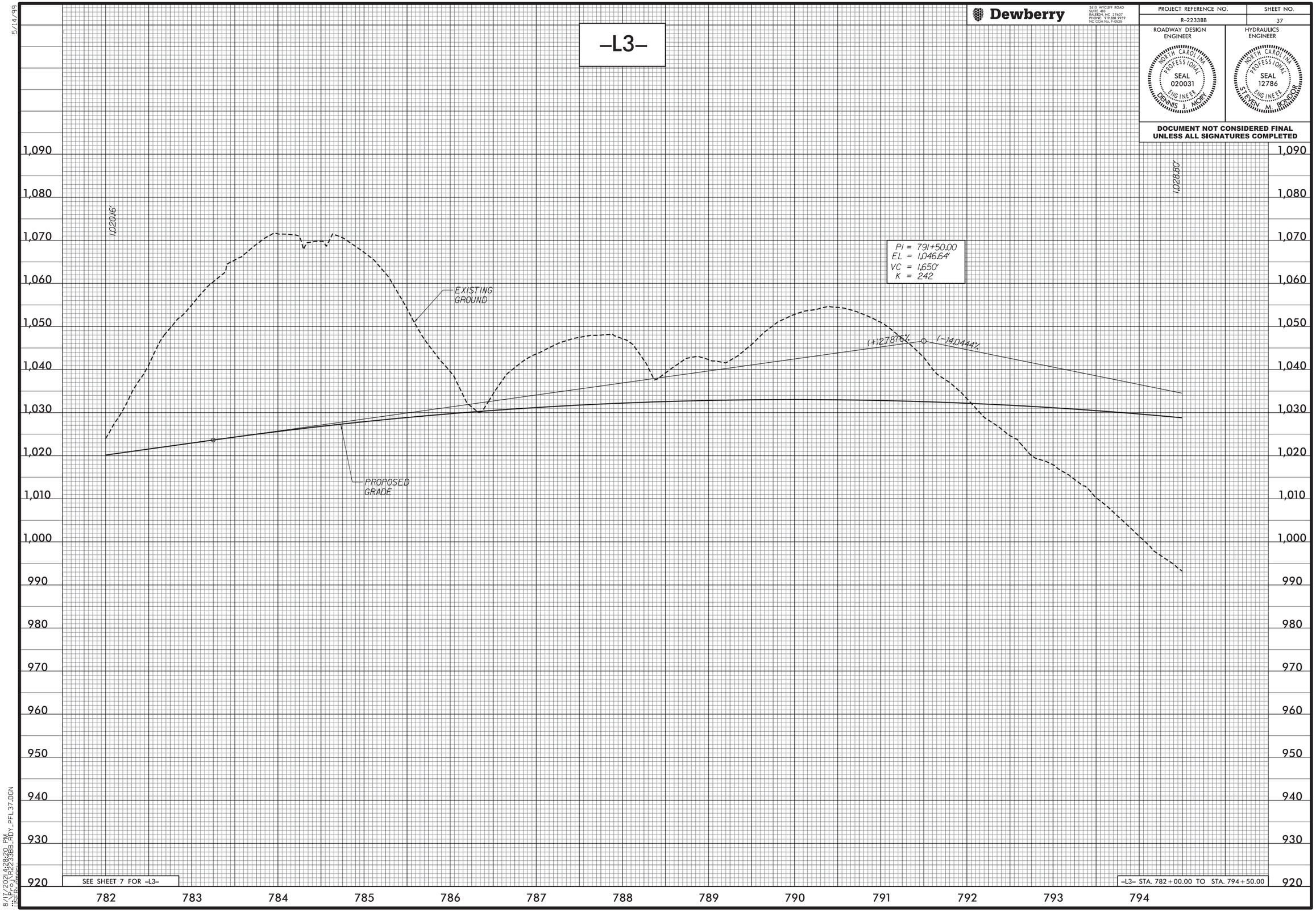
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

# –L3–




SEE SHEET 7 FOR –L3–

–L3– STA. 782+00.00 TO STA. 794+50.00

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R-2233BB_RDY_PFL37.DGN

5/14/99

**Dewberry**

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 38 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

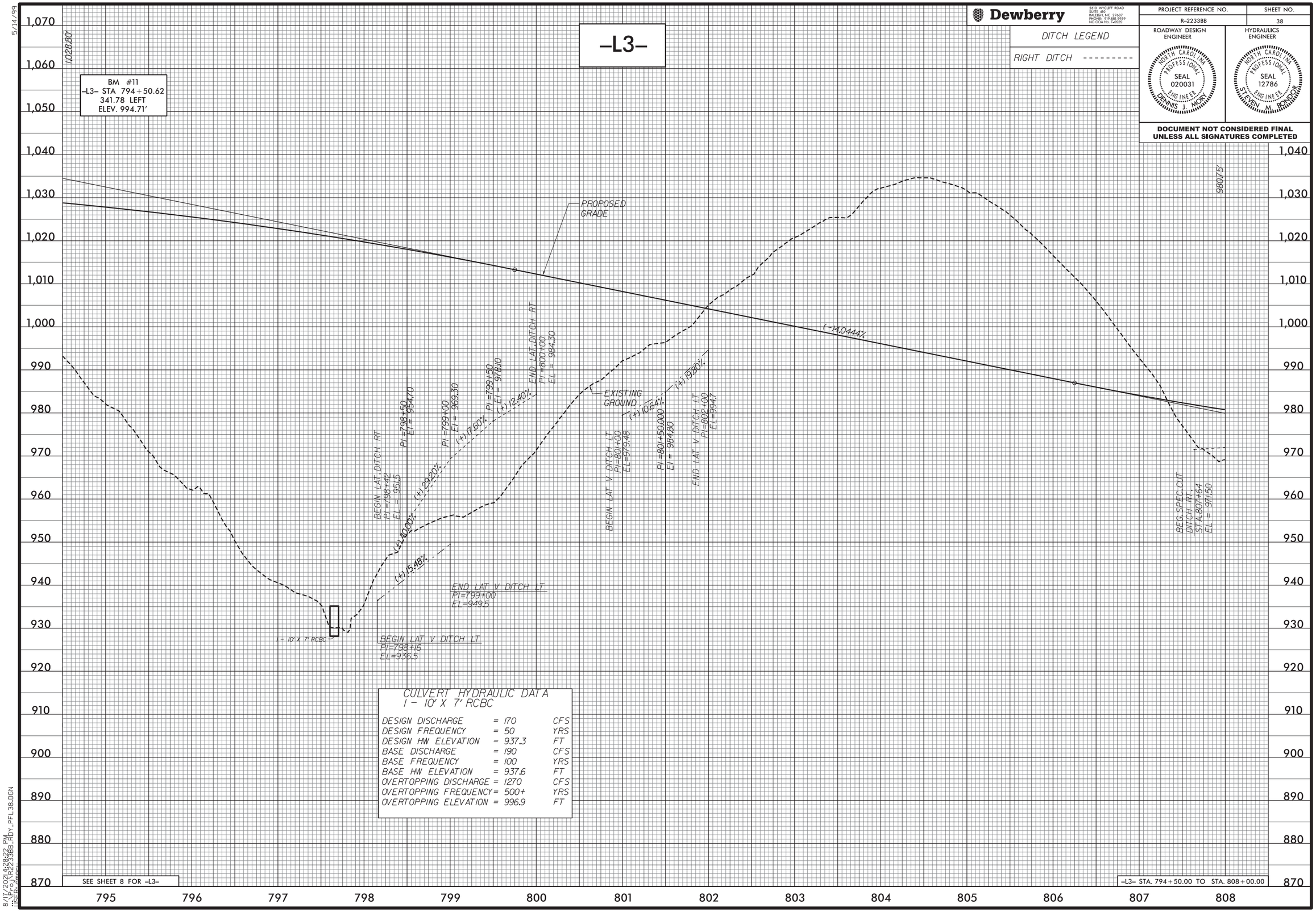
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND

RIGHT DITCH ---------

# –L3–




## CULVERT HYDRAULIC DATA
## 1 - 10' X 7' RCBC

| | | | |
|---|---|---|---|
| DESIGN DISCHARGE | = | 170 | CFS |
| DESIGN FREQUENCY | = | 50 | YRS |
| DESIGN HW ELEVATION | = | 937.3 | FT |
| BASE DISCHARGE | = | 190 | CFS |
| BASE FREQUENCY | = | 100 | YRS |
| BASE HW ELEVATION | = | 937.6 | FT |
| OVERTOPPING DISCHARGE | = | 1270 | CFS |
| OVERTOPPING FREQUENCY | = | 500+ | YRS |
| OVERTOPPING ELEVATION | = | 996.9 | FT |

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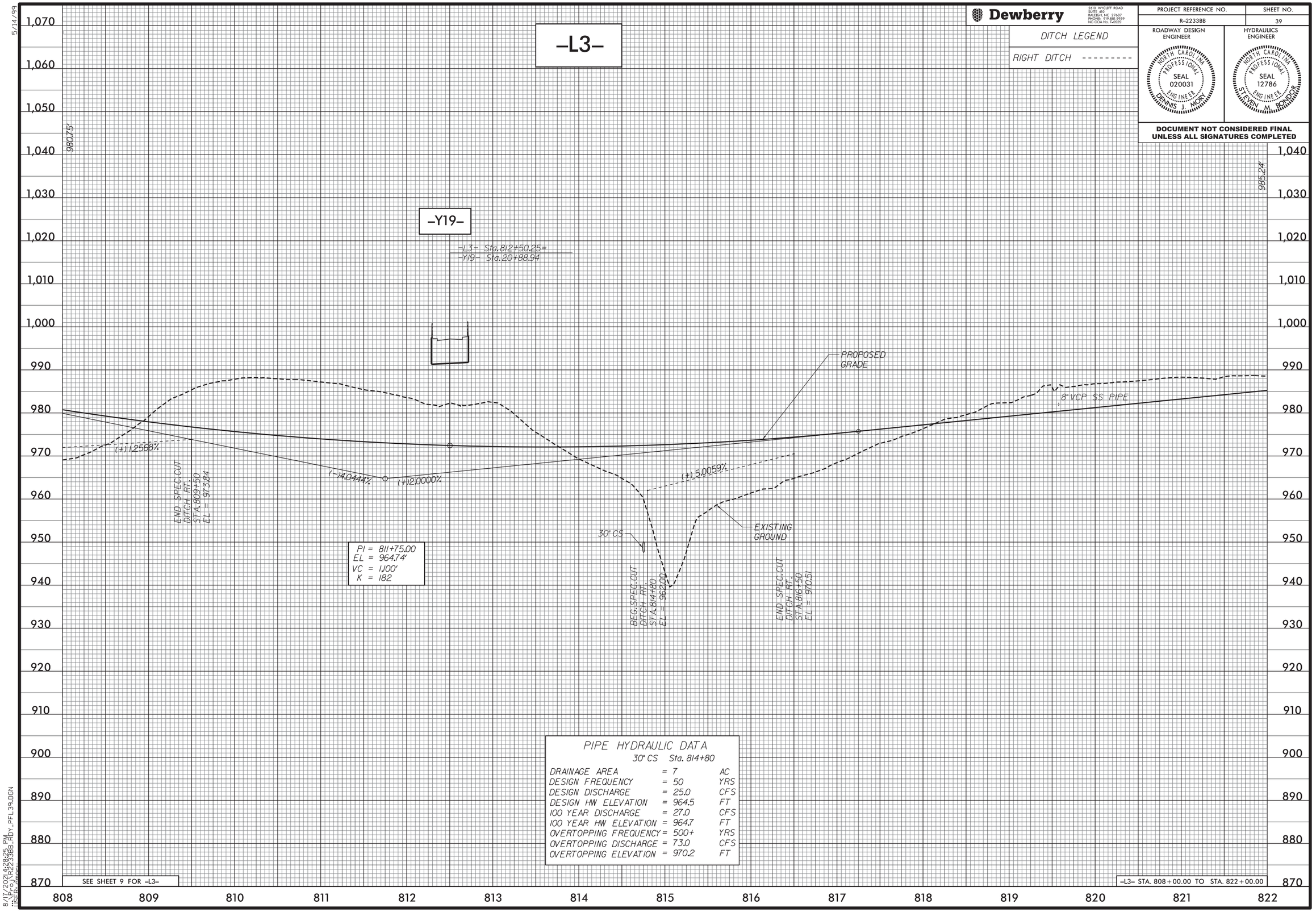
R-2233BB_RDY_PFL38.DGN

5/14/99




PIPE HYDRAULIC DATA

30" CS Sta. 814+80

| | | | |
|---|---|---|---|
| DRAINAGE AREA | = | 7 | AC |
| DESIGN FREQUENCY | = | 50 | YRS |
| DESIGN DISCHARGE | = | 25.0 | CFS |
| DESIGN HW ELEVATION | = | 964.5 | FT |
| 100 YEAR DISCHARGE | = | 27.0 | CFS |
| 100 YEAR HW ELEVATION | = | 964.7 | FT |
| OVERTOPPING FREQUENCY | = | 500+ | YRS |
| OVERTOPPING DISCHARGE | = | 73.0 | CFS |
| OVERTOPPING ELEVATION | = | 970.2 | FT |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SUITE 410
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PHONE: 919.881.9929
NC COA No. F-0929


| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 39 |

DITCH LEGEND

RIGHT DITCH ---------

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

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USER: JDOBIE

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2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 40 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

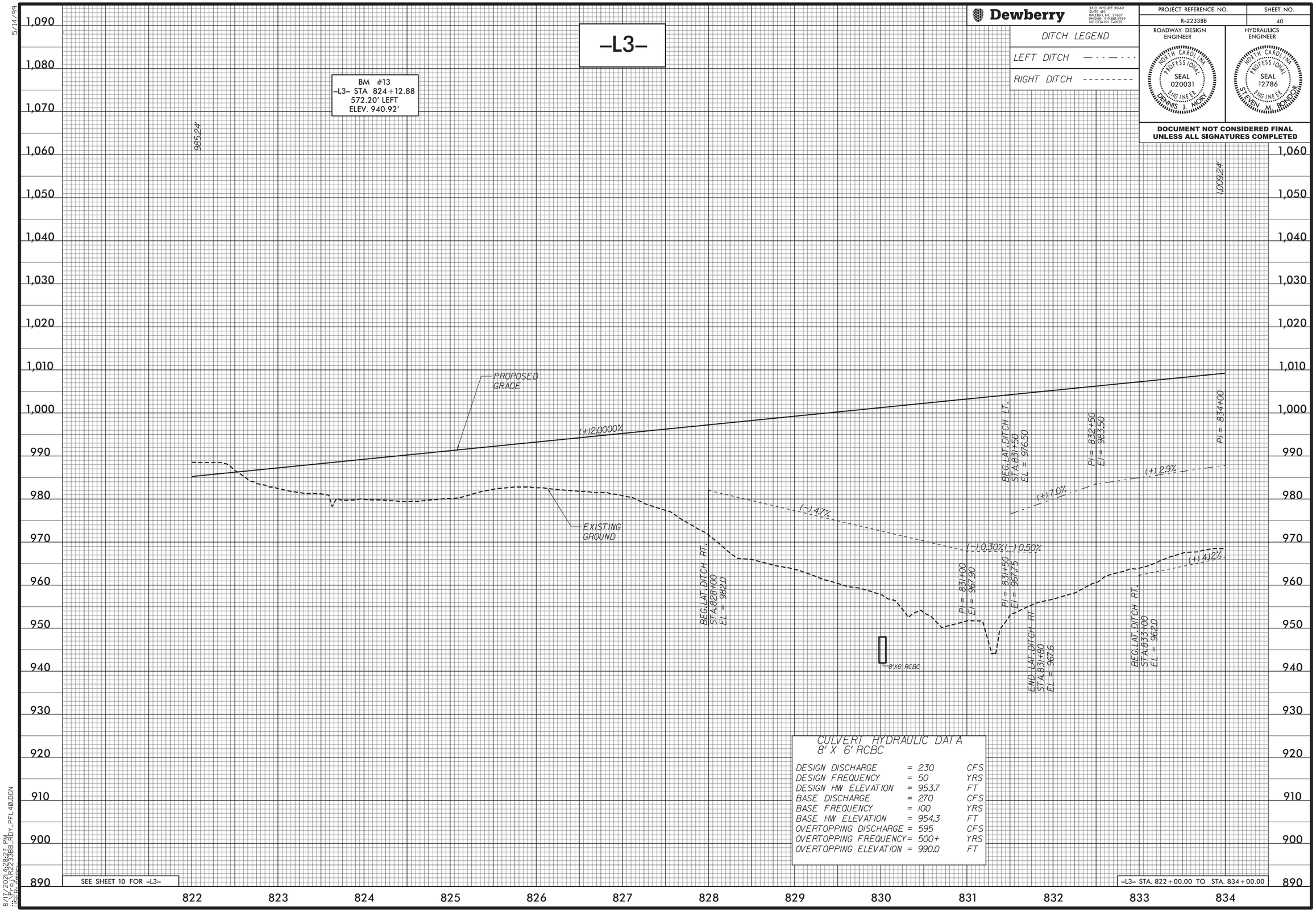
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND

LEFT DITCH — - - — - -

RIGHT DITCH - - - - - - - - -

# -L3-




CULVERT HYDRAULIC DATA
8' X 6' RCBC

| | | | |
|---|---|---|---|
| DESIGN DISCHARGE | = | 230 | CFS |
| DESIGN FREQUENCY | = | 50 | YRS |
| DESIGN HW ELEVATION | = | 953.7 | FT |
| BASE DISCHARGE | = | 270 | CFS |
| BASE FREQUENCY | = | 100 | YRS |
| BASE HW ELEVATION | = | 954.3 | FT |
| OVERTOPPING DISCHARGE | = | 595 | CFS |
| OVERTOPPING FREQUENCY | = | 500+ | YRS |
| OVERTOPPING ELEVATION | = | 990.0 | FT |

SEE SHEET 10 FOR -L3-

-L3- STA. 822+00.00 TO STA. 834+00.00

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FILE: R-2233BB_RDY_PFL_40.DGN

5/14/99

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 41 |

DITCH LEGEND

RIGHT DITCH ---------

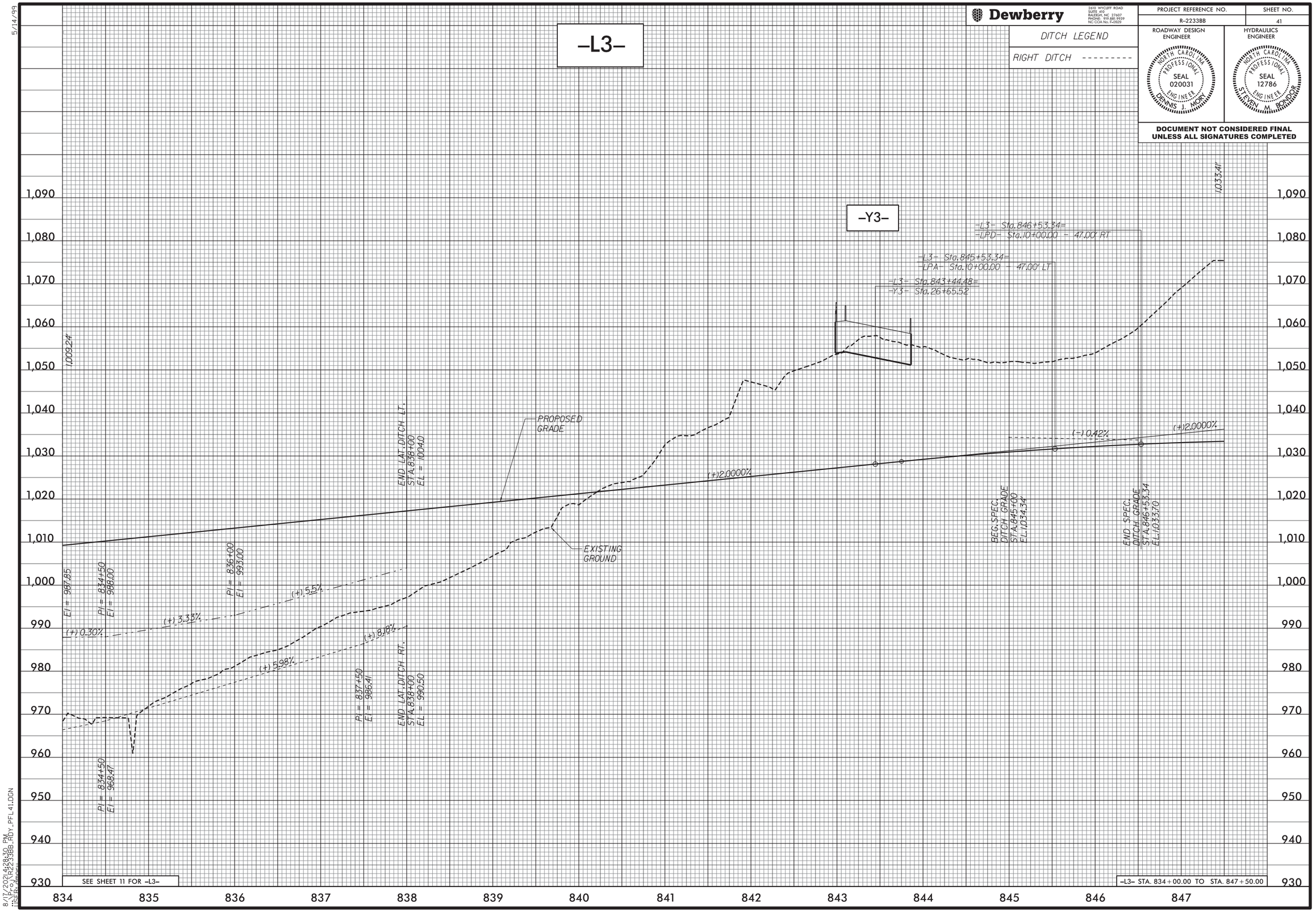
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

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R-2233BB_RDY_PFL41.DGN

5/14/99

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 42 |

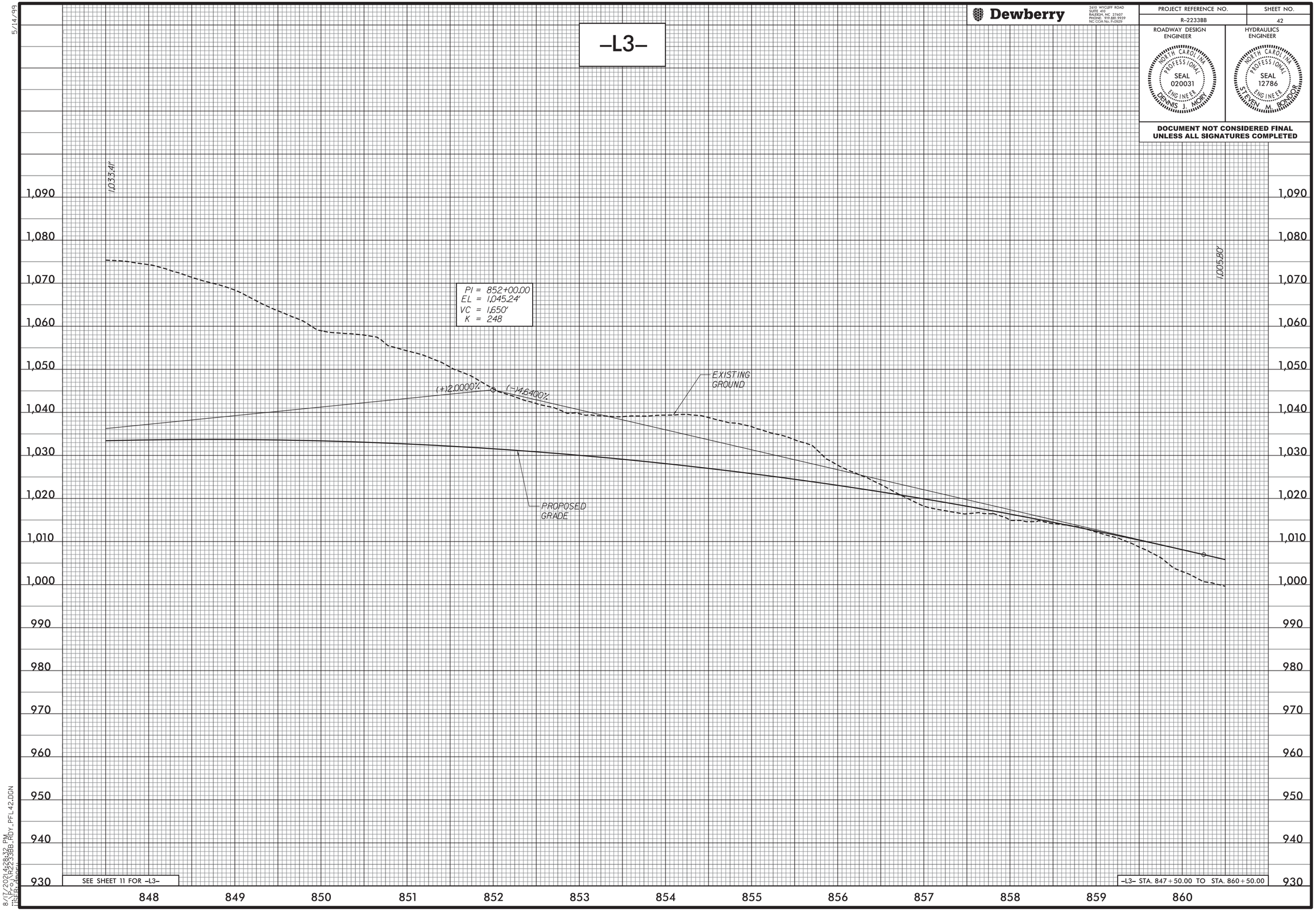
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

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2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 43 |

ROADWAY DESIGN ENGINEER

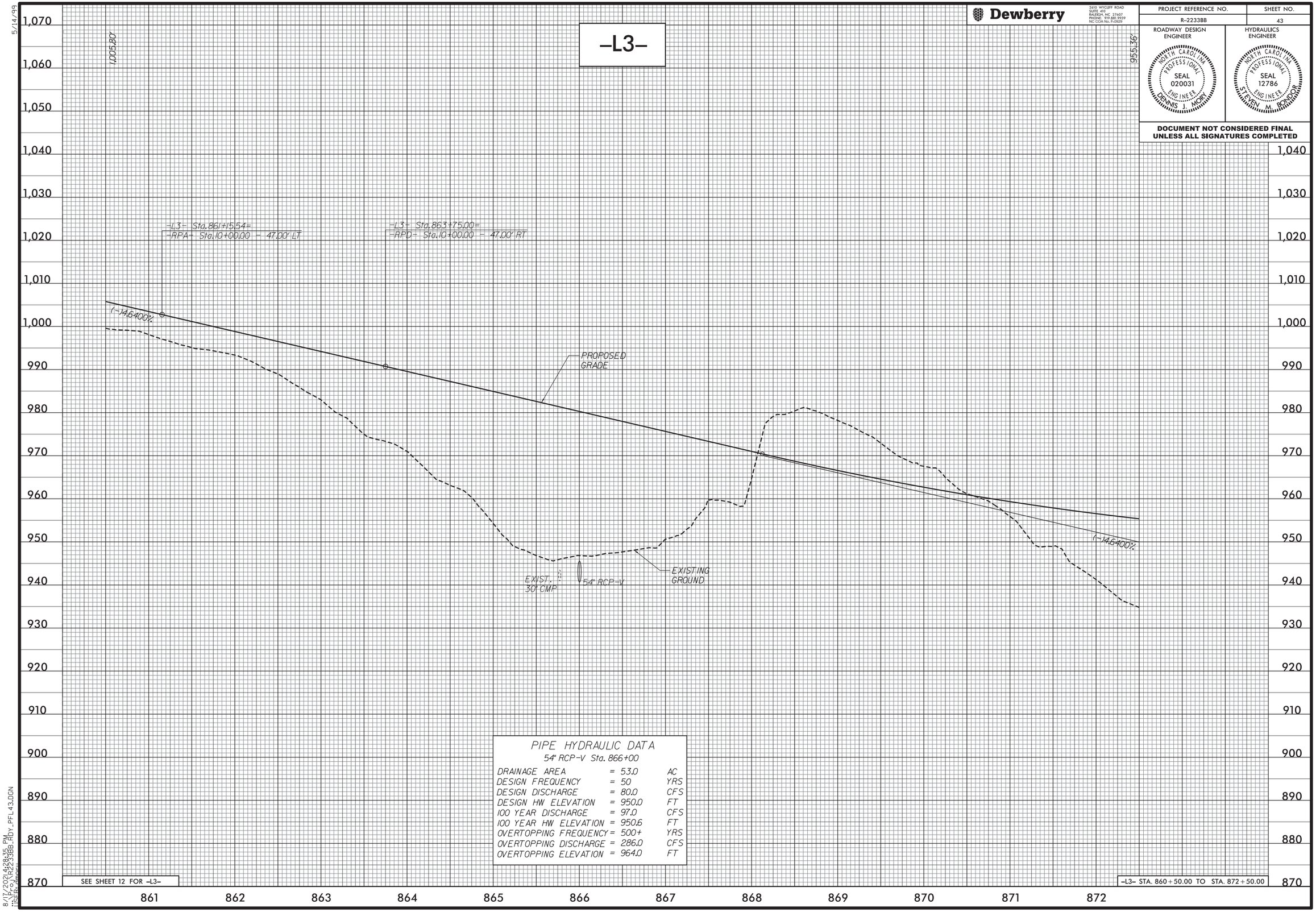
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

# -L3-




## PIPE HYDRAULIC DATA

54" RCP-V Sta. 866+00

| | | | |
|---|---|---|---|
| DRAINAGE AREA | = | 53.0 | AC |
| DESIGN FREQUENCY | = | 50 | YRS |
| DESIGN DISCHARGE | = | 80.0 | CFS |
| DESIGN HW ELEVATION | = | 950.0 | FT |
| 100 YEAR DISCHARGE | = | 97.0 | CFS |
| 100 YEAR HW ELEVATION | = | 950.6 | FT |
| OVERTOPPING FREQUENCY | = | 500+ | YRS |
| OVERTOPPING DISCHARGE | = | 286.0 | CFS |
| OVERTOPPING ELEVATION | = | 964.0 | FT |

SEE SHEET 12 FOR -L3-

-L3- STA. 860+50.00 TO STA. 872+50.00

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USER: smoore

5/14/99

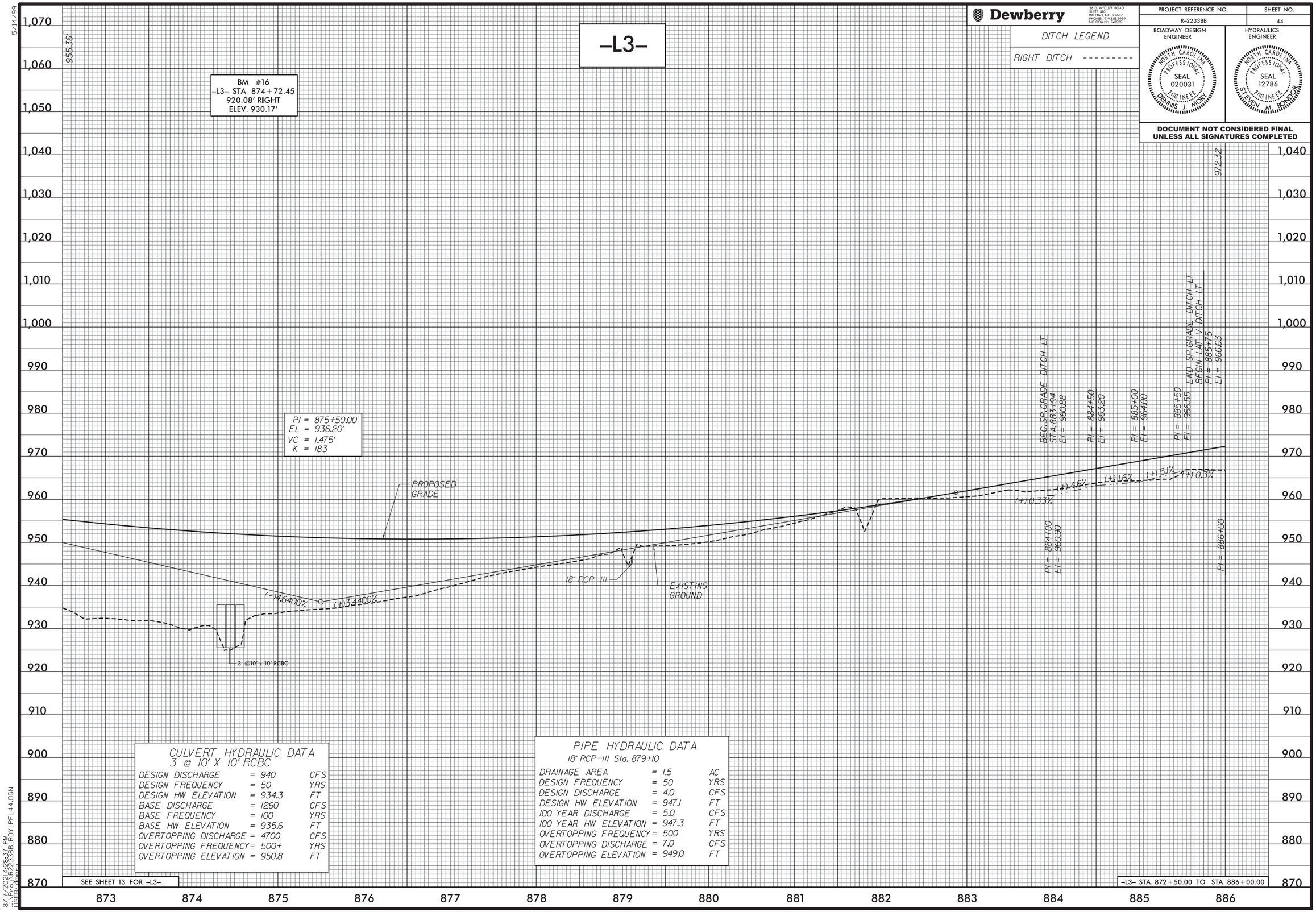
Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 44 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




## CULVERT HYDRAULIC DATA
3 @ 10' X 10' RCBC

| | | | |
|---|---|---|---|
| DESIGN DISCHARGE | = | 940 | CFS |
| DESIGN FREQUENCY | = | 50 | YRS |
| DESIGN HW ELEVATION | = | 934.3 | FT |
| BASE DISCHARGE | = | 1260 | CFS |
| BASE FREQUENCY | = | 100 | YRS |
| BASE HW ELEVATION | = | 935.6 | FT |
| OVERTOPPING DISCHARGE | = | 4700 | CFS |
| OVERTOPPING FREQUENCY | = | 500+ | YRS |
| OVERTOPPING ELEVATION | = | 950.8 | FT |

## PIPE HYDRAULIC DATA
18" RCP-III Sta. 879+10

| | | | |
|---|---|---|---|
| DRAINAGE AREA | = | 1.5 | AC |
| DESIGN FREQUENCY | = | 50 | YRS |
| DESIGN DISCHARGE | = | 4.0 | CFS |
| DESIGN HW ELEVATION | = | 947.1 | FT |
| 100 YEAR DISCHARGE | = | 5.0 | CFS |
| 100 YEAR HW ELEVATION | = | 947.3 | FT |
| OVERTOPPING FREQUENCY | = | 500 | YRS |
| OVERTOPPING DISCHARGE | = | 7.0 | CFS |
| OVERTOPPING ELEVATION | = | 949.0 | FT |

SEE SHEET 13 FOR –L3–

–L3– STA. 872+50.00 TO STA. 886+00.00

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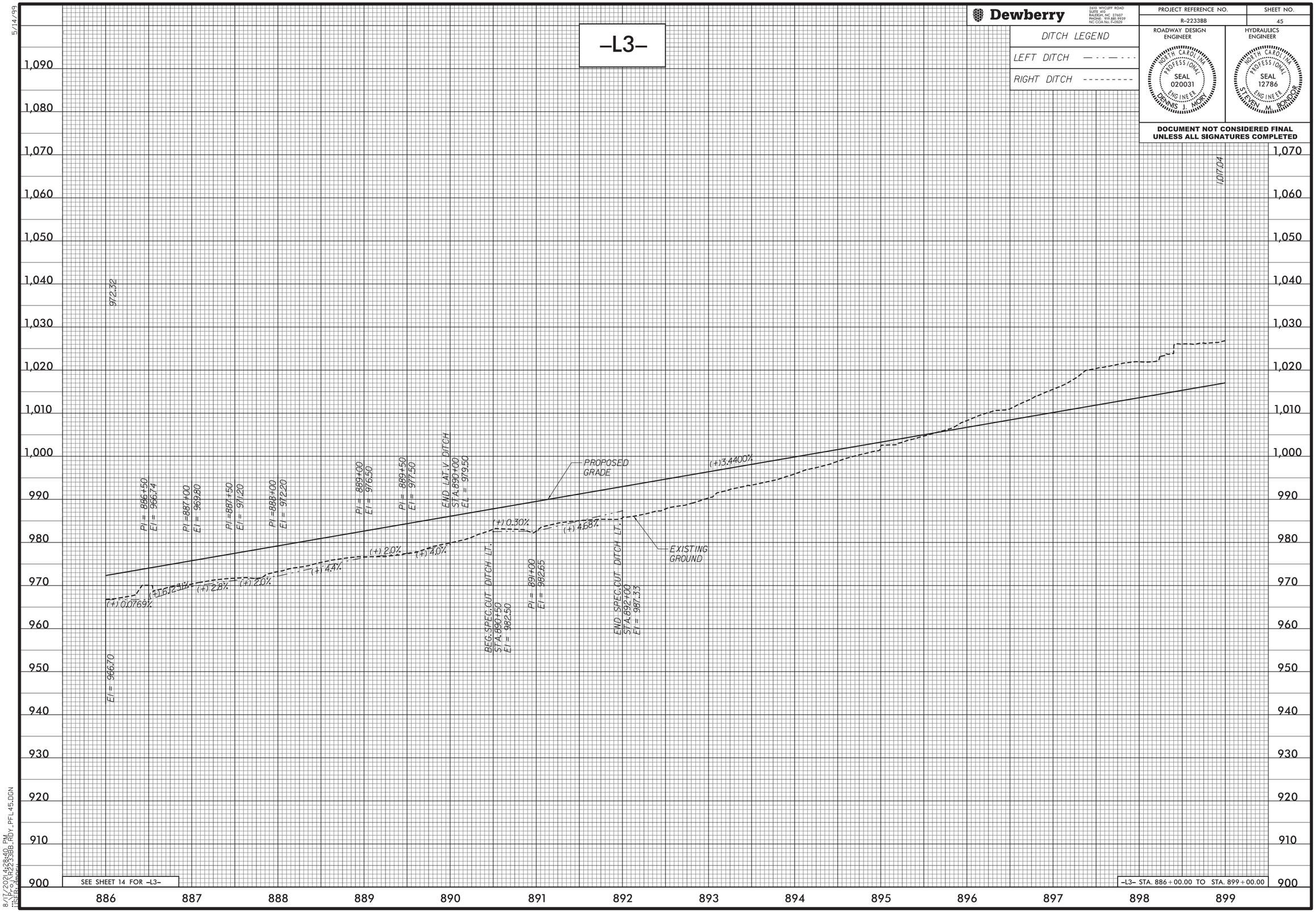


Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

DITCH LEGEND

LEFT DITCH — - - — - - -

RIGHT DITCH - - - - - - - - -

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 45 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

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8/17/2021 14:28:40 PM
USER: smoreil

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2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 46 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

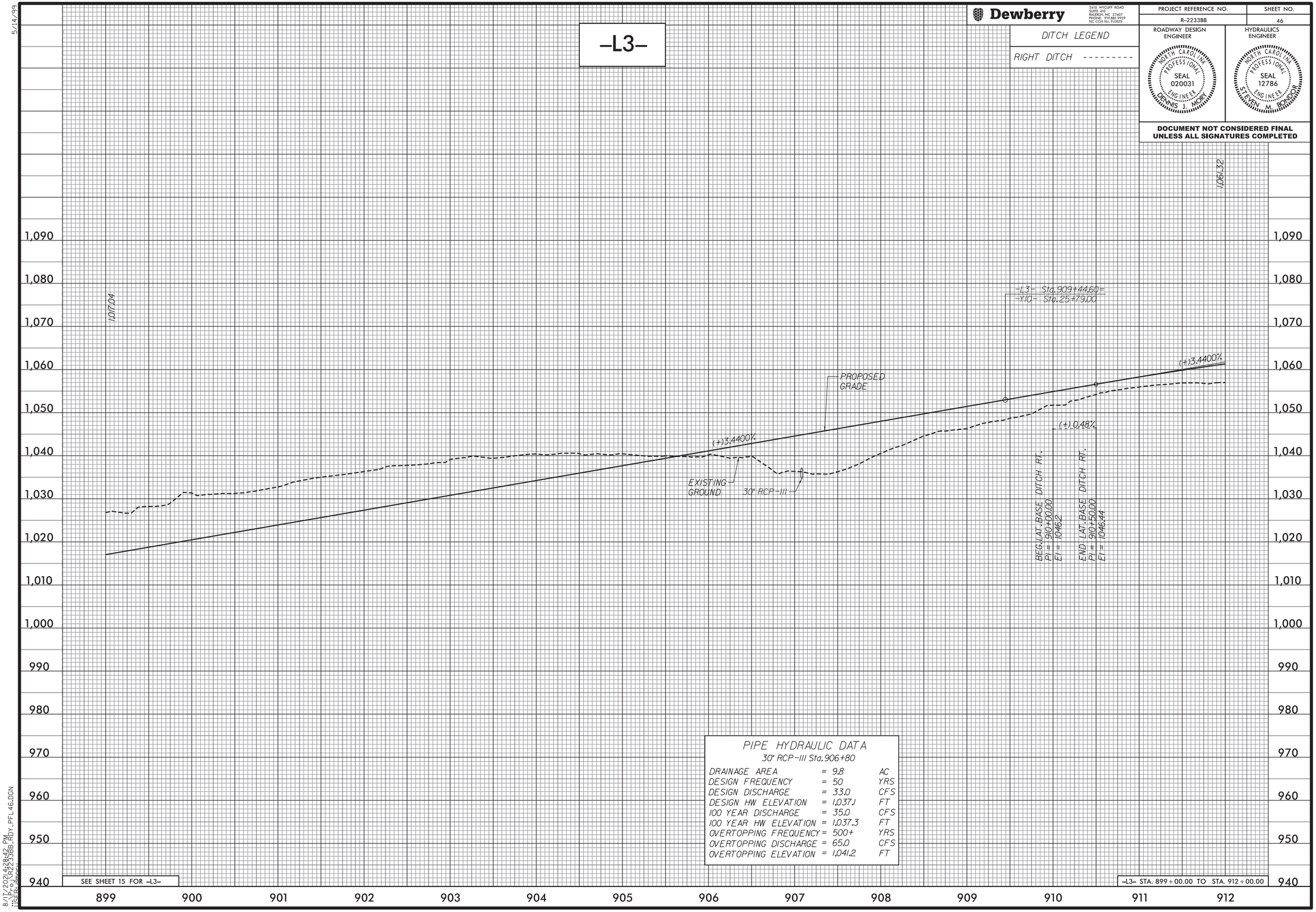
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

# –L3–

DITCH LEGEND

RIGHT DITCH ---------




PIPE HYDRAULIC DATA

30" RCP–III Sta. 906+80

| | | | |
|---|---|---|---|
| DRAINAGE AREA | = | 9.8 | AC |
| DESIGN FREQUENCY | = | 50 | YRS |
| DESIGN DISCHARGE | = | 33.0 | CFS |
| DESIGN HW ELEVATION | = | 1,037.1 | FT |
| 100 YEAR DISCHARGE | = | 35.0 | CFS |
| 100 YEAR HW ELEVATION | = | 1,037.3 | FT |
| OVERTOPPING FREQUENCY | = | 500+ | YRS |
| OVERTOPPING DISCHARGE | = | 65.0 | CFS |
| OVERTOPPING ELEVATION | = | 1,041.2 | FT |

SEE SHEET 15 FOR –L3–

–L3– STA. 899+00.00 TO STA. 912+00.00

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USER: smorris

5/14/99

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 47 |

ROADWAY DESIGN ENGINEER

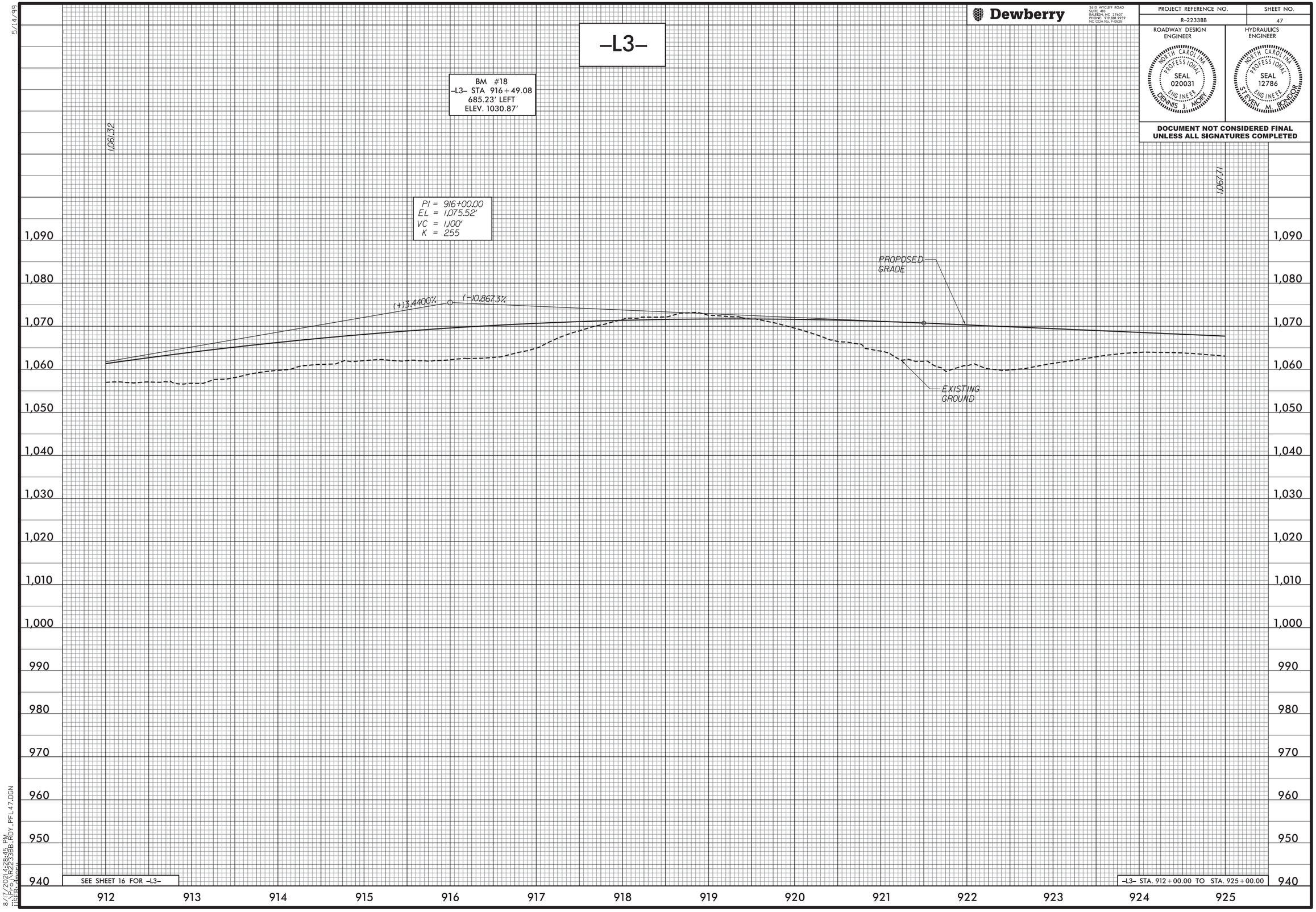
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

# –L3–




SEE SHEET 16 FOR –L3–

–L3– STA. 912+00.00 TO STA. 925+00.00

8/18/2021 2:28:45 PM
R-2233BB_RDY_PFL47.DGN
USER: Q00EU

5/14/99

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 48 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

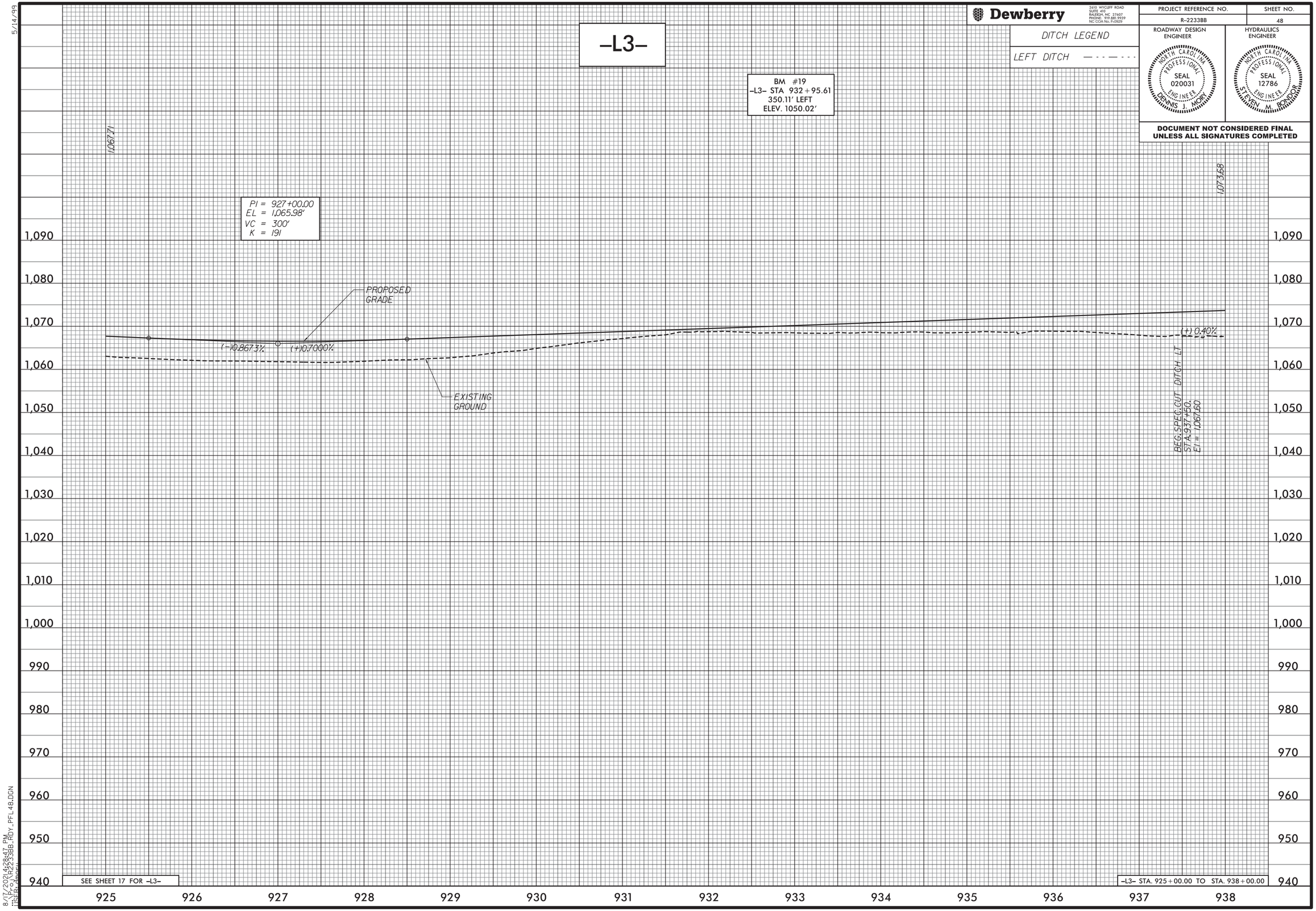
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND

LEFT DITCH — - - — - - -

# –L3–

BM #19
–L3– STA 932+95.61
350.11' LEFT
ELEV. 1050.02'




SEE SHEET 17 FOR –L3–

–L3– STA. 925+00.00 TO STA. 938+00.00

8/17/2021 2:28:47 PM
R-2233BB_RDY_PFL48.DGN
USER: 0900EJ

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Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 49 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND

LEFT DITCH — - - — - - -

# -L3-

1,073.68

1,068.38'

PI = 944+50.00
EL = 1,078.23'
VC = 200'
K = 286

-L3- Sta. 950+76.55=
-Y9- Sta. 17+01.02
-Y11- Sta. 10+00.00

PROPOSED GRADE

(+) 0.40%

(+) 5.0%

(-)0.7000%

(+)1.3990%

(+)1.3990%

EXISTING GROUND

PI =941+00
EI = 1,069.00

END SPEC.CUT DITCH LT
STA.941+50
EI = 1,071.50

1,090 1,080 1,070 1,060 1,050 1,040 1,030 1,020 1,010 1,000 990 980 970 960 950 940

938 939 940 941 942 943 944 945 946 947 948 949 950 951 952

SEE SHEET 18 FOR -L3-

-L3- STA. 938+00.00 TO STA. 952+00.00

8/17/2021 4:28:49 PM
R-2233BB_RDY_PFL49.DGN
USER: Q.NGEU

5/14/99

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 50 |

ROADWAY DESIGN ENGINEER

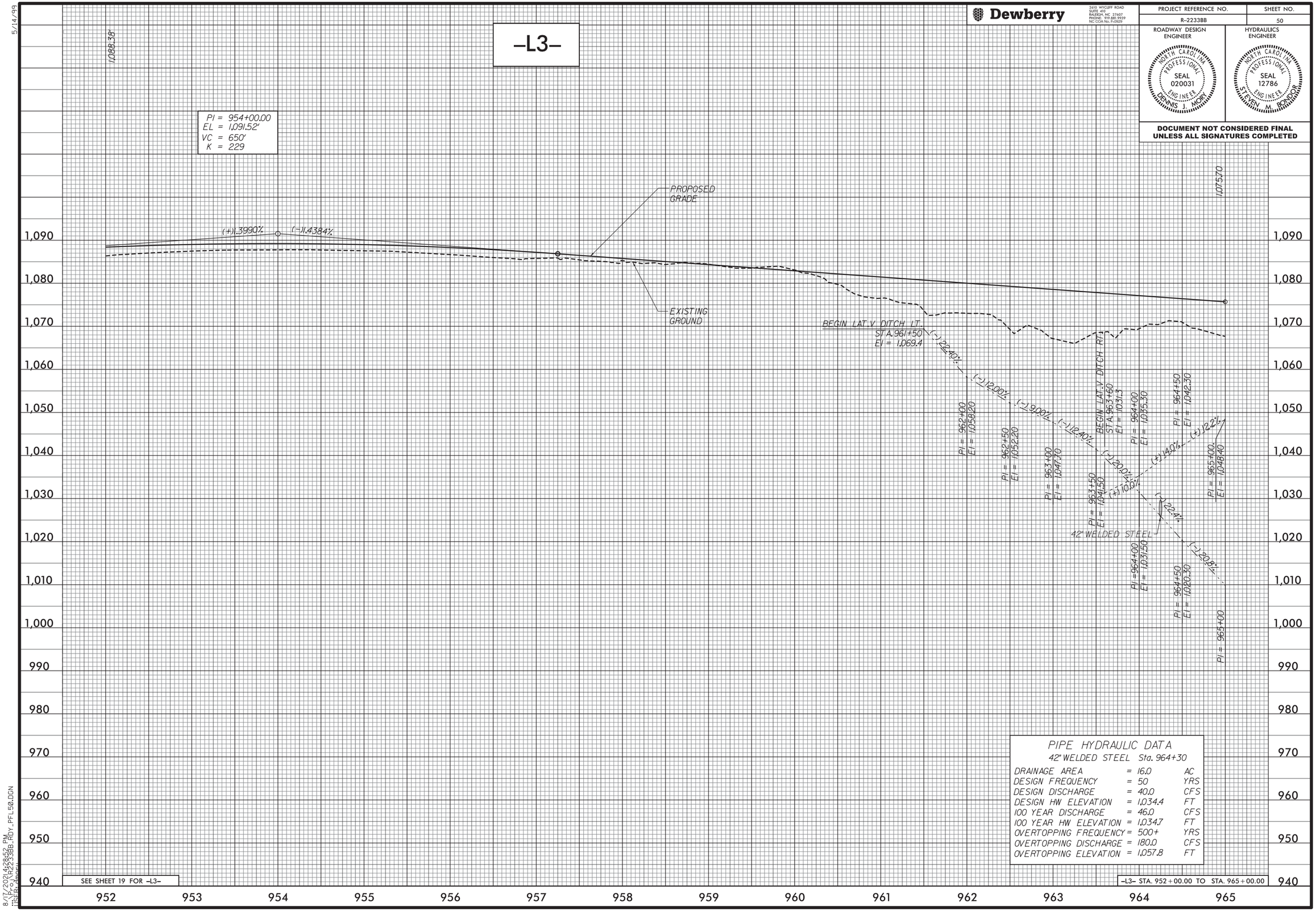
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

# -L3-




PIPE HYDRAULIC DATA

42" WELDED STEEL Sta. 964+30

| | | | |
|---|---|---|---|
| DRAINAGE AREA | = | 16.0 | AC |
| DESIGN FREQUENCY | = | 50 | YRS |
| DESIGN DISCHARGE | = | 40.0 | CFS |
| DESIGN HW ELEVATION | = | 1,034.4 | FT |
| 100 YEAR DISCHARGE | = | 46.0 | CFS |
| 100 YEAR HW ELEVATION | = | 1,034.7 | FT |
| OVERTOPPING FREQUENCY | = | 500+ | YRS |
| OVERTOPPING DISCHARGE | = | 180.0 | CFS |
| OVERTOPPING ELEVATION | = | 1,057.8 | FT |

SEE SHEET 19 FOR -L3-

-L3- STA. 952+00.00 TO STA. 965+00.00

8/17/2021 4:29:52 PM
{RP:0,R2233BB_RDY_PFL_50.DGN
USER: JJONES

5/14/99

**Dewberry**

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 51 |

DITCH LEGEND

RIGHT DITCH ---------

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

# –L3–

BM #21
–L3– STA 971+03.46
501.07' LEFT
ELEV. 1083.30'

PI = 966+00.00
EL = 1,074.26'
VC = 200'
K = 710

PI = 969+00.00
EL = 1,069.10'
VC = 200'
K = 256

PI = 972+00.00
EL = 1,066.28'
VC = 250'
K = 543

1,075.70

1,069.98

PROPOSED GRADE

(–)1.4384% (–)1.7200% (–)1.7200% (–)0.9400% (–)0.9400% (–)1.4000%

BEGIN LAT.V DITCH RT.
STA.996+54
El = 1055.74

END LAT.V DITCH
STA.968+53
EL = 1,028.6

EXISTING GROUND

(–)8.27% (–)0.3237% (–)0.8% (–)12.2% (–)22.0% (+)9.8% (+)4.1% (+)0.30% (+)6.0% (+)10.0% (+)3.4% (+)6.6% (+)0.40%

PI = 965+00.00
El = 1,048.40

PI = 965+50
El = 1,053.30

PI = 966+00
El = 1,055.35

STA.966+50 El = 1,055.50

STA.966+69 El = 1,054.45

PI = 967+00
El = 1,051.30

PI = 967+50
El = 1,045.90

PI = 968+00
El = 1,039.80

PI = 969+00
El = 1,031.20

PI = 969+50
El = 1,036.20

PI = 970+00
El = 1,037.90

PI = 970+50
El = 1,041.20

END LAT.V DITCH RT.
STA.971+50
El = 1,041.60

END LAT.V DITCH RT.
STA.966+53
El = 1,055.01

END LAT.V DITCH LT.
STA.965+10
El = 1,009.0

BEG.LAT.V DITCH RT.
STA.968+55
El = 1,028.50

EXIST. 18" CMP

36" WELDED STEEL

(–)9.0%

El = 1,009.90

## PIPE HYDRAULIC DATA

36" WELDED STEEL Sta. 968+64

| | | | |
|---|---|---|---|
| DRAINAGE AREA | = | 14.0 | AC |
| DESIGN FREQUENCY | = | 50 | YRS |
| DESIGN DISCHARGE | = | 29.0 | CFS |
| DESIGN HW ELEVATION | = | 1031.6 | FT |
| 100 YEAR DISCHARGE | = | 35.0 | CFS |
| 100 YEAR HW ELEVATION | = | 1,032.1 | FT |
| OVERTOPPING FREQUENCY | = | 500+ | YRS |
| OVERTOPPING DISCHARGE | = | 122.0 | CFS |
| OVERTOPPING ELEVATION | = | 1,057.6 | FT |

1,090 1,080 1,070 1,060 1,050 1,040 1,030 1,020 1,010 1,000 990 980 970 960 950 940

965 966 967 968 969 970 971 972 973 974 975 976

SEE SHEET 20 FOR –L3–

–L3– STA. 965+00.00 TO STA. 976+50.00

8/17/2021 4:28:54 PM
R-2233BB_KHA_MDY_PFL51.DGN
USER: smcurrin

5/14/99

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 52 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

# -L3-

BM #22
-L3- STA 983+16.40
621.23' LEFT
ELEV. 990.41'

1,059.98

1,040.59

PI = 989+00.00
EL = 1,042.48'
VC = 200'
K = 1429

-L3- Sta.977+95.26=
-Y7A- Sta. 18+45.84

-L3- Sta.982+79.74=
-Y7- Sta. 18+64.30

PROPOSED GRADE

EXISTING GROUND

(-)1.4000%

(-)1.2600%

(-)3.0769%

BEGIN LAT.V DITCH RT.
STA.989+50
El = 1028.1

END LAT.V DITCH RT.
STA.989+89
El = 1,023.0

36" WELDED STEEL

36" WELDED STEEL

1,090 1,080 1,070 1,060 1,050 1,040 1,030 1,020 1,010 1,000 990 980 970 960 950 940

977 978 979 980 981 982 983 984 985 986 987 988 989 990

## PIPE HYDRAULIC DATA
36" WELDED STEEL Sta.981+00

| | | |
|---|---|---|
| DRAINAGE AREA | = 9.0 | AC |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN DISCHARGE | = 26 | CFS |
| DESIGN HW ELEVATION | = 1,037.6 | FT |
| 100 YEAR DISCHARGE | = 28.0 | CFS |
| 100 YEAR HW ELEVATION | = 1,037.7 | FT |
| OVERTOPPING FREQUENCY | = 500+ | YRS |
| OVERTOPPING DISCHARGE | = 102.0 | CFS |
| OVERTOPPING ELEVATION | = 1,050.5 | FT |

## PIPE HYDRAULIC DATA
36" WELDED STEEL Sta. 990+18

| | | |
|---|---|---|
| DRAINAGE AREA | = 10.3 | AC |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN DISCHARGE | = 34.0 | CFS |
| DESIGN HW ELEVATION | = 1,026.2 | FT |
| 100 YEAR DISCHARGE | = 37.0 | CFS |
| 100 YEAR HW ELEVATION | = 1,026.5 | FT |
| OVERTOPPING FREQUENCY | = 500+ | YRS |
| OVERTOPPING DISCHARGE | = 100.0 | CFS |
| OVERTOPPING ELEVATION | = 1,037.7 | FT |

SEE SHEET 21 FOR -L3-

-L3- STA. 976+50.00 TO STA. 990+50.00

8/17/2021 4:28:57 PM
R:\Projects\R2233BB_RDY_PFL52.DGN
USER: JJONES

5/14/99

1,040.59

# –L3–

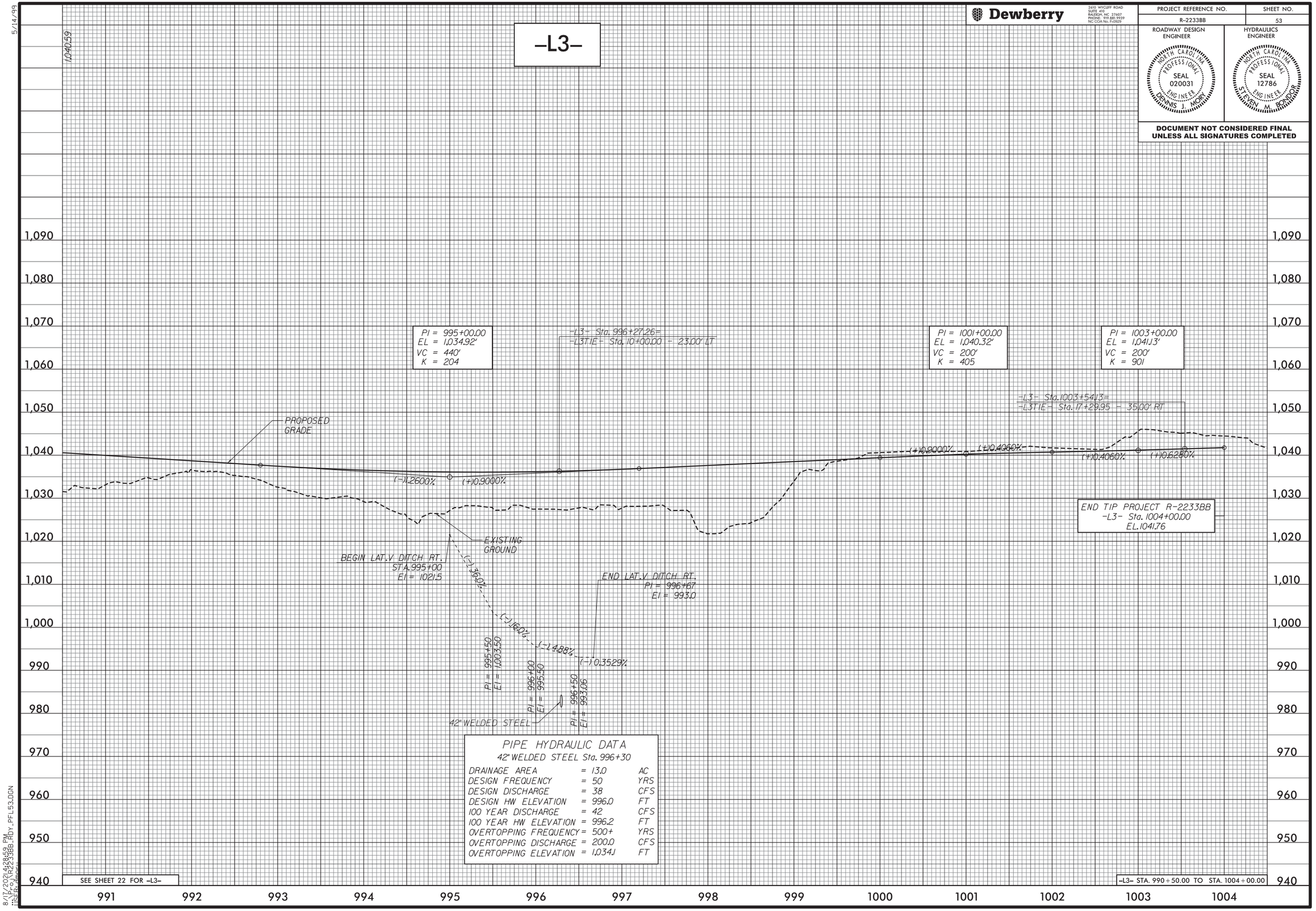
Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 53 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




## PIPE HYDRAULIC DATA

42" WELDED STEEL Sta. 996+30

| | | | |
|---|---|---|---|
| DRAINAGE AREA | = | 13.0 | AC |
| DESIGN FREQUENCY | = | 50 | YRS |
| DESIGN DISCHARGE | = | 38 | CFS |
| DESIGN HW ELEVATION | = | 996.0 | FT |
| 100 YEAR DISCHARGE | = | 42 | CFS |
| 100 YEAR HW ELEVATION | = | 996.2 | FT |
| OVERTOPPING FREQUENCY | = | 500+ | YRS |
| OVERTOPPING DISCHARGE | = | 200.0 | CFS |
| OVERTOPPING ELEVATION | = | 1,034.1 | FT |

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USER: dmorr

5/14/99

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 54 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

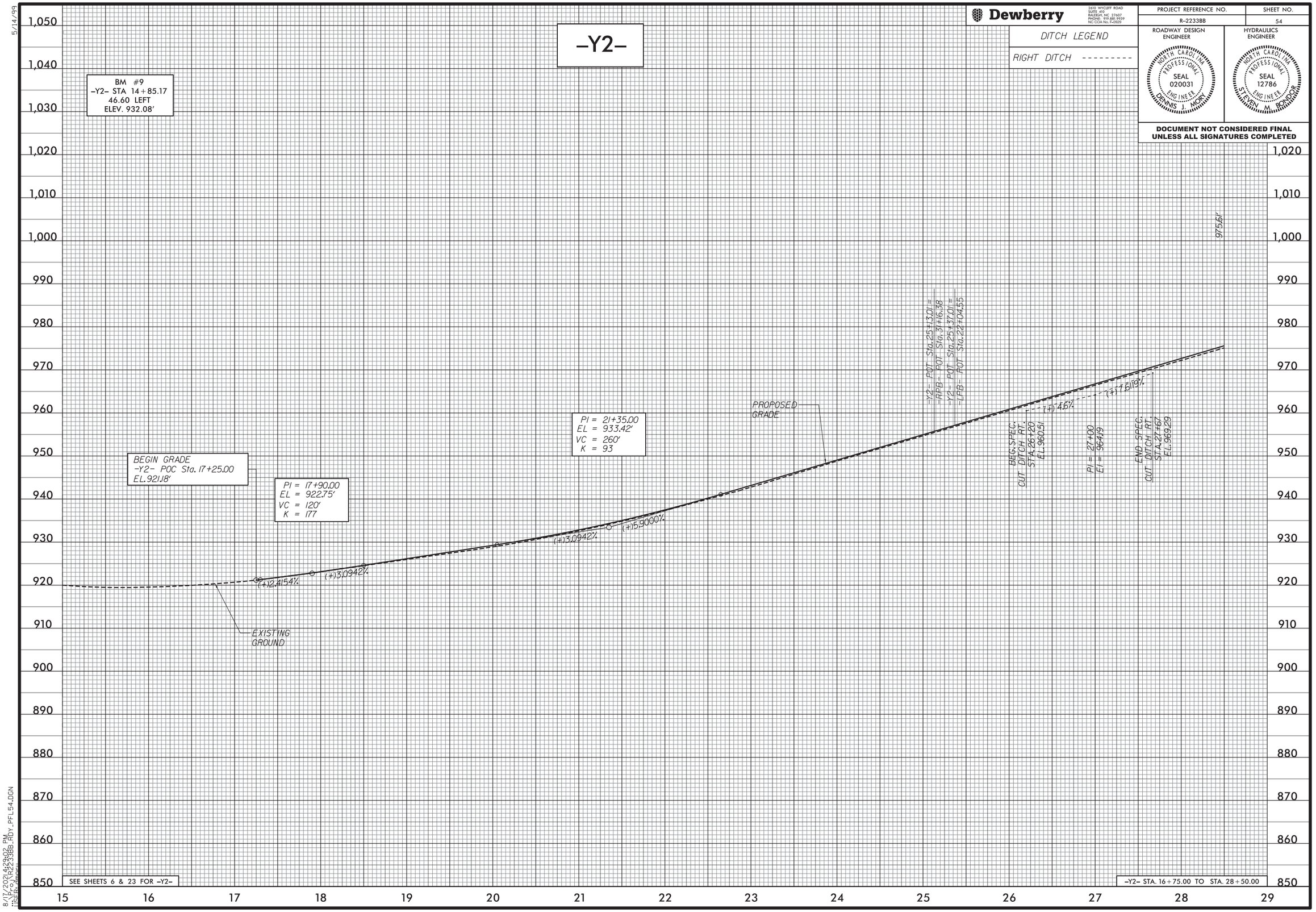
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND

RIGHT DITCH ---------

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USER: JJONES

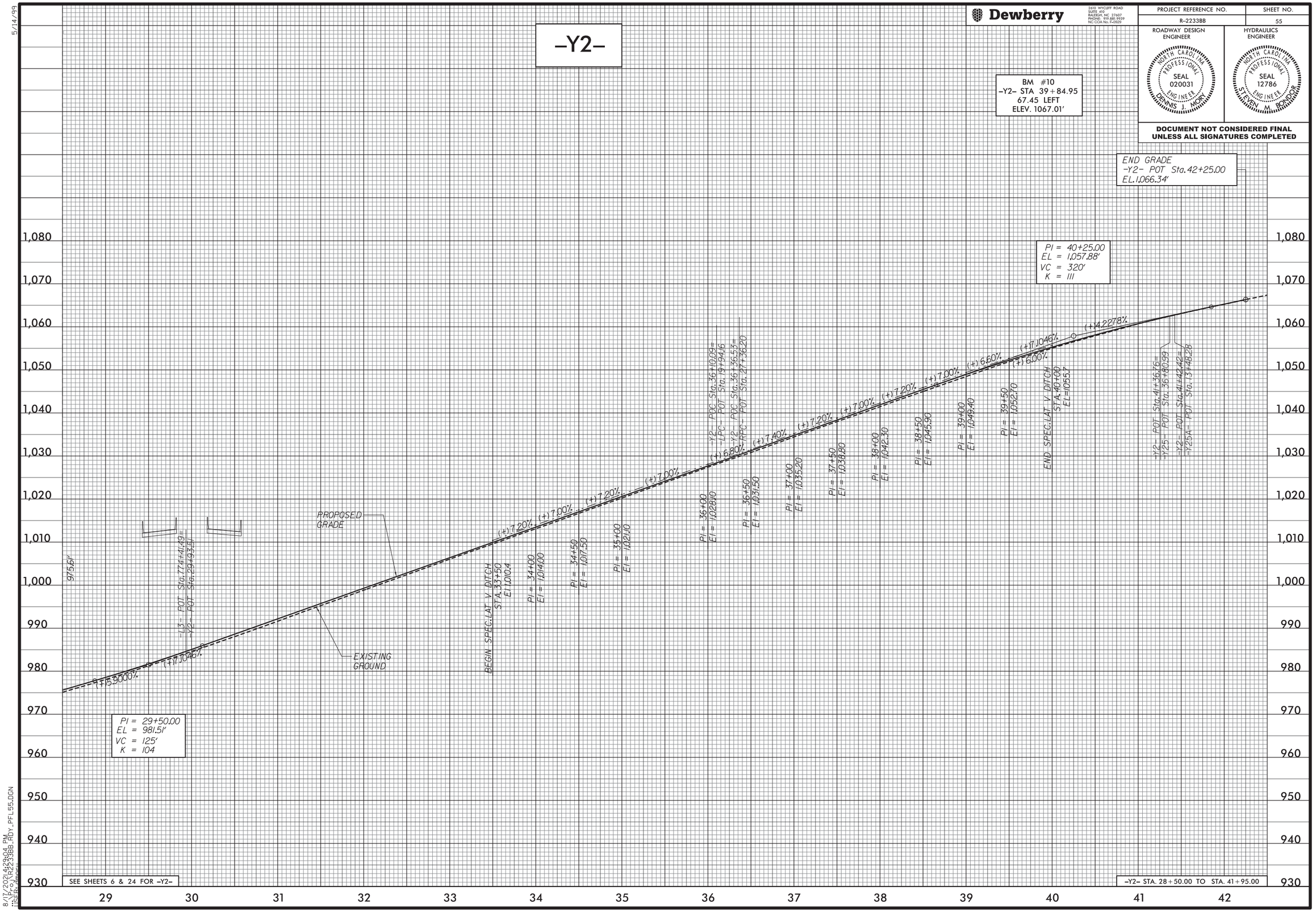
Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 55 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




SEE SHEETS 6 & 24 FOR -Y2-

-Y2- STA. 28+50.00 TO STA. 41+95.00

5/14/99

8/17/2021 4:29:04 PM
R:\Roadway\Proj\R2233BB_RDY_PFL55.DGN
USER: cjones

5/14/99

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 56 |

ROADWAY DESIGN ENGINEER

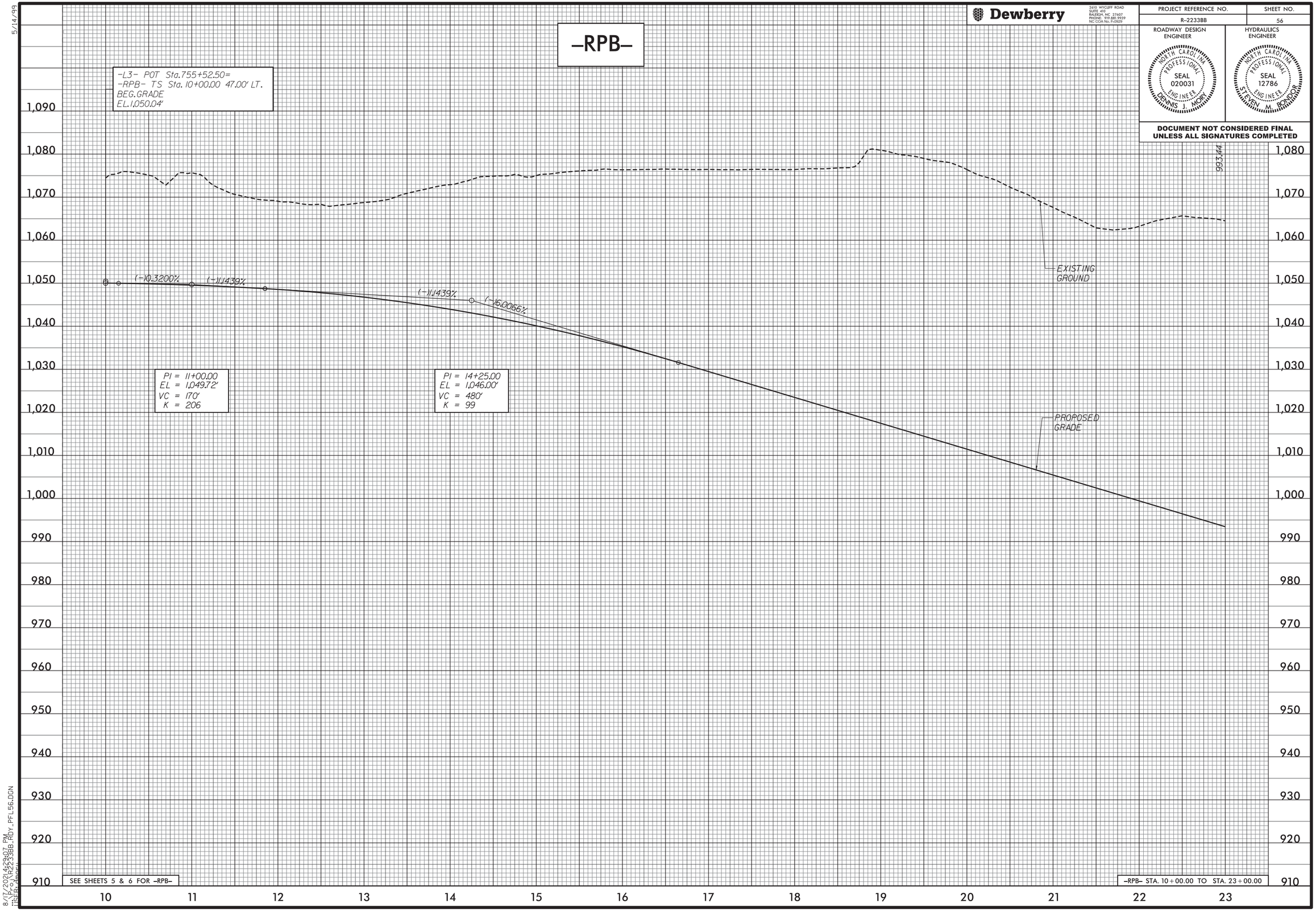
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

# –RPB–




SEE SHEETS 5 & 6 FOR –RPB–

–RPB– STA. 10+00.00 TO STA. 23+00.00

8/17/2021 3:07 PM
R-2233BB_RDY_PFL56.DGN
USER: 4900EU

5/14/99

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 57 |

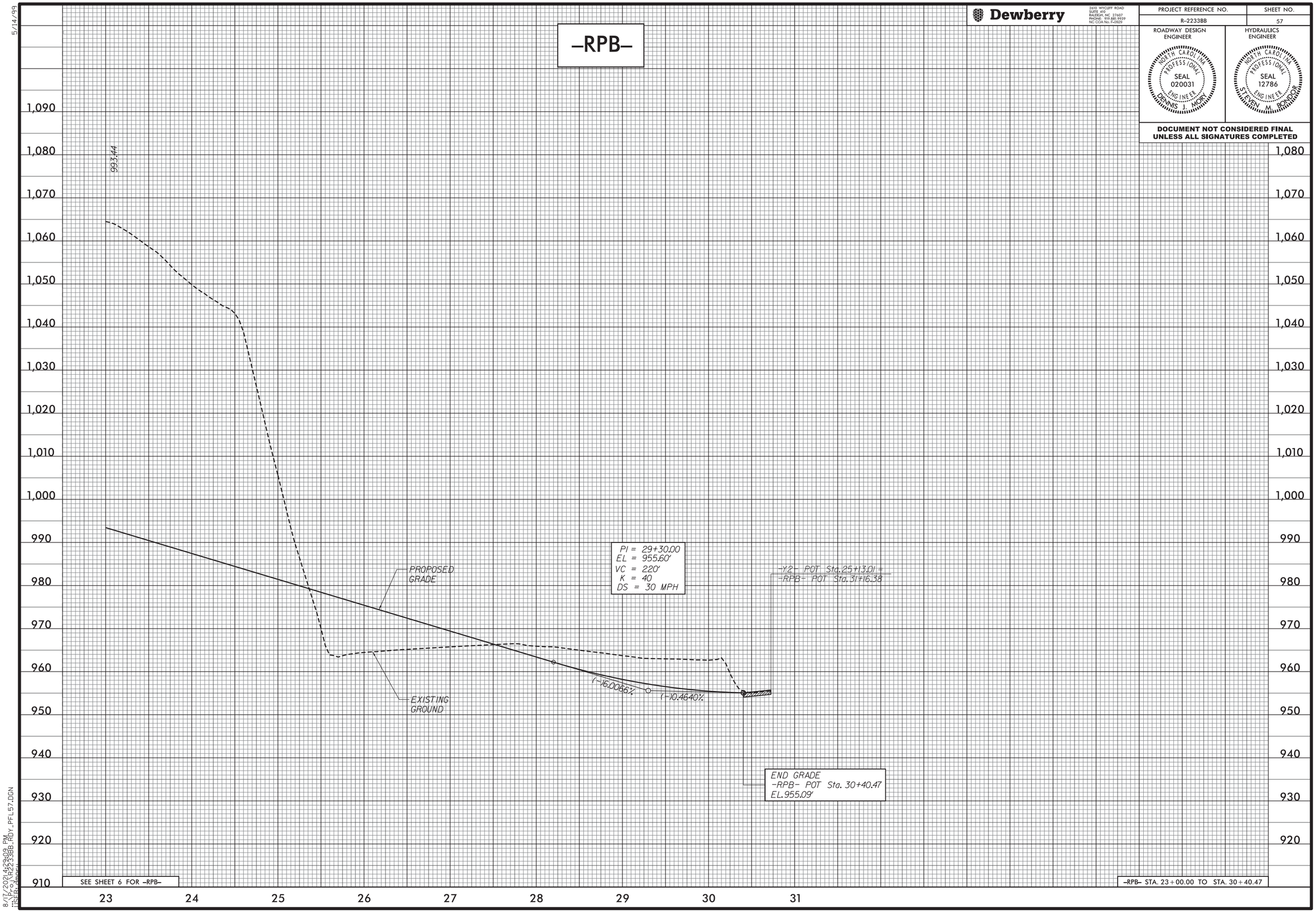
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

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USER: gmoreu

5/14/99

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 58 |

ROADWAY DESIGN ENGINEER

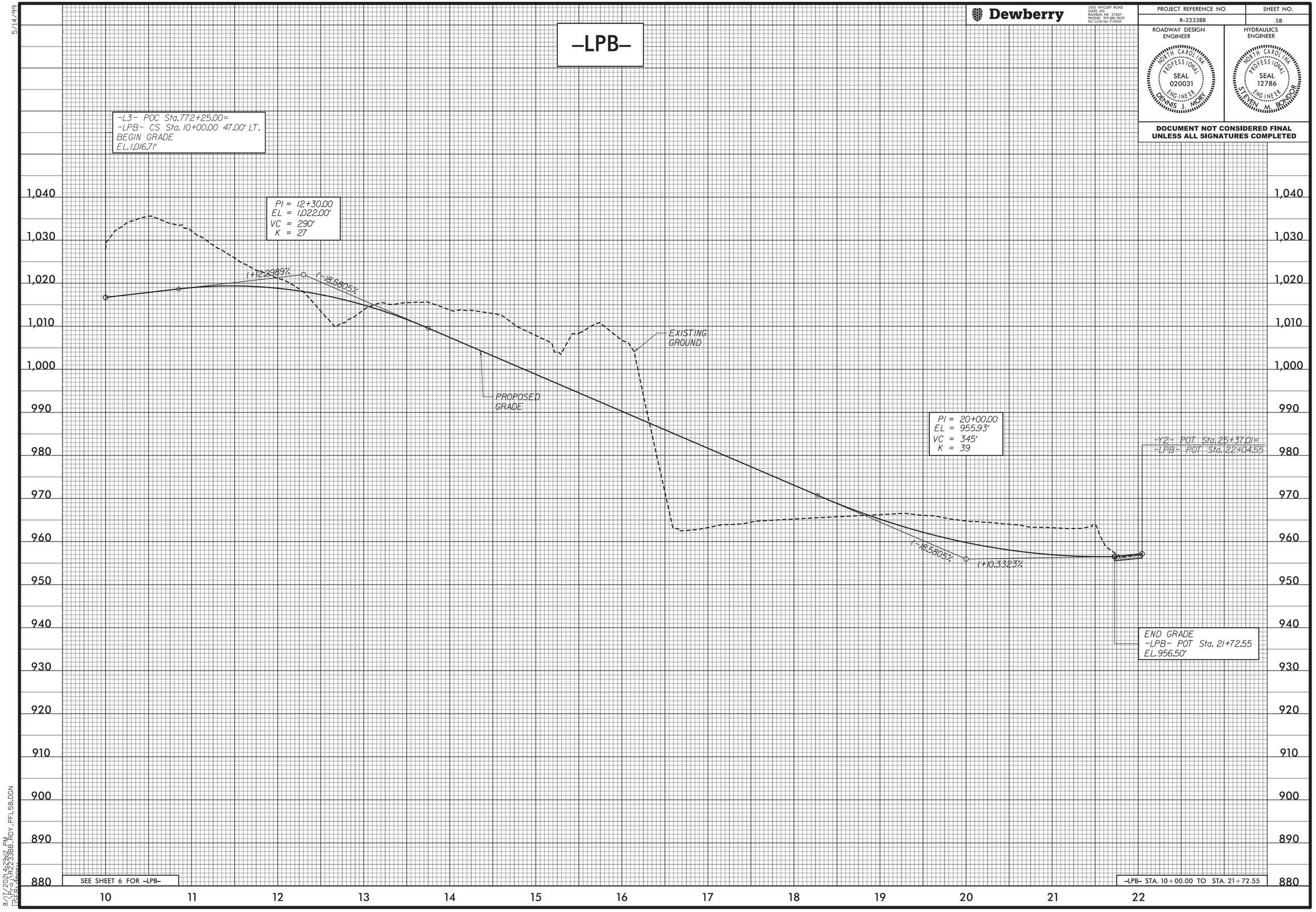
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

# -LPB-




SEE SHEET 6 FOR -LPB-

-LPB- STA. 10+00.00 TO STA. 21+72.55

8/17/2021 2:23:2 PM
R-2233BB_HDY_PFL58.DGN
USER: Q.ADEU

5/14/99

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 59 |

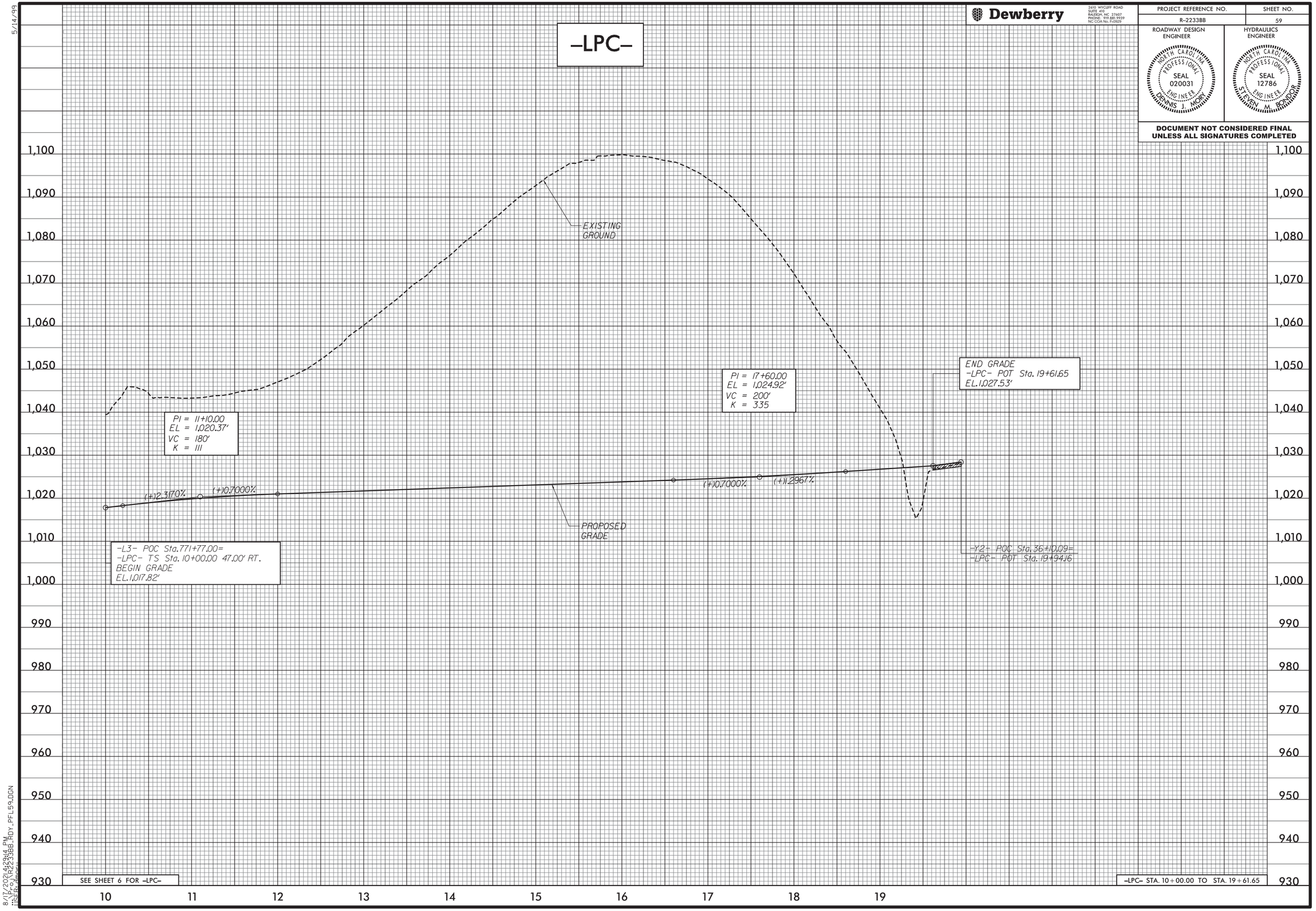
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

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R-2233BB_RDY_PFL59.DGN
USER: 4900EJ

5/14/99

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 60 |

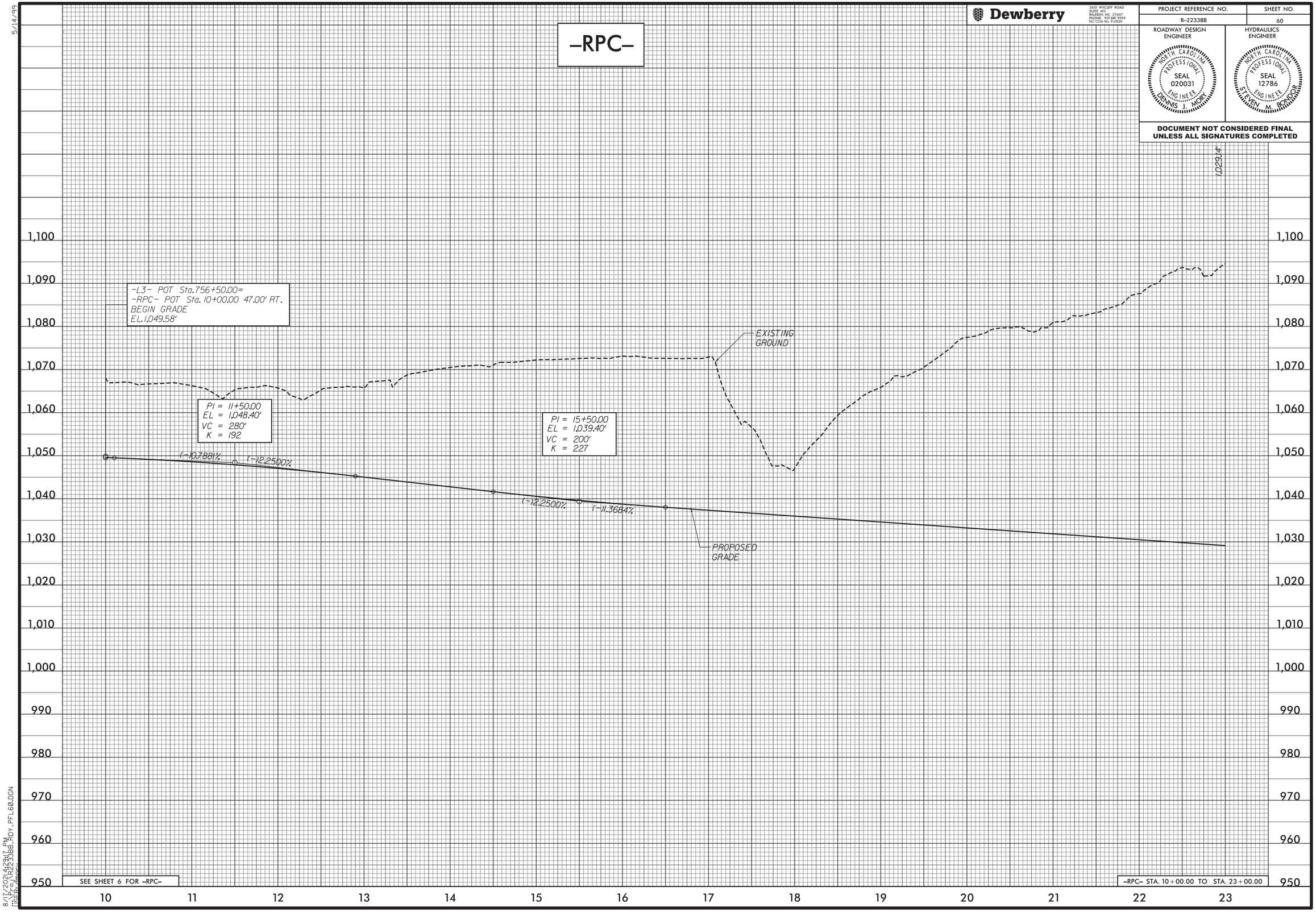
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




SEE SHEET 6 FOR -RPC-

-RPC- STA. 10+00.00 TO STA. 23+00.00

8/17/2021 4:23:17 PM
c:\pwworking\dot\d0233bb\dgn\dot_pfl60.dgn
USER: smoore

5/14/99

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 61 |

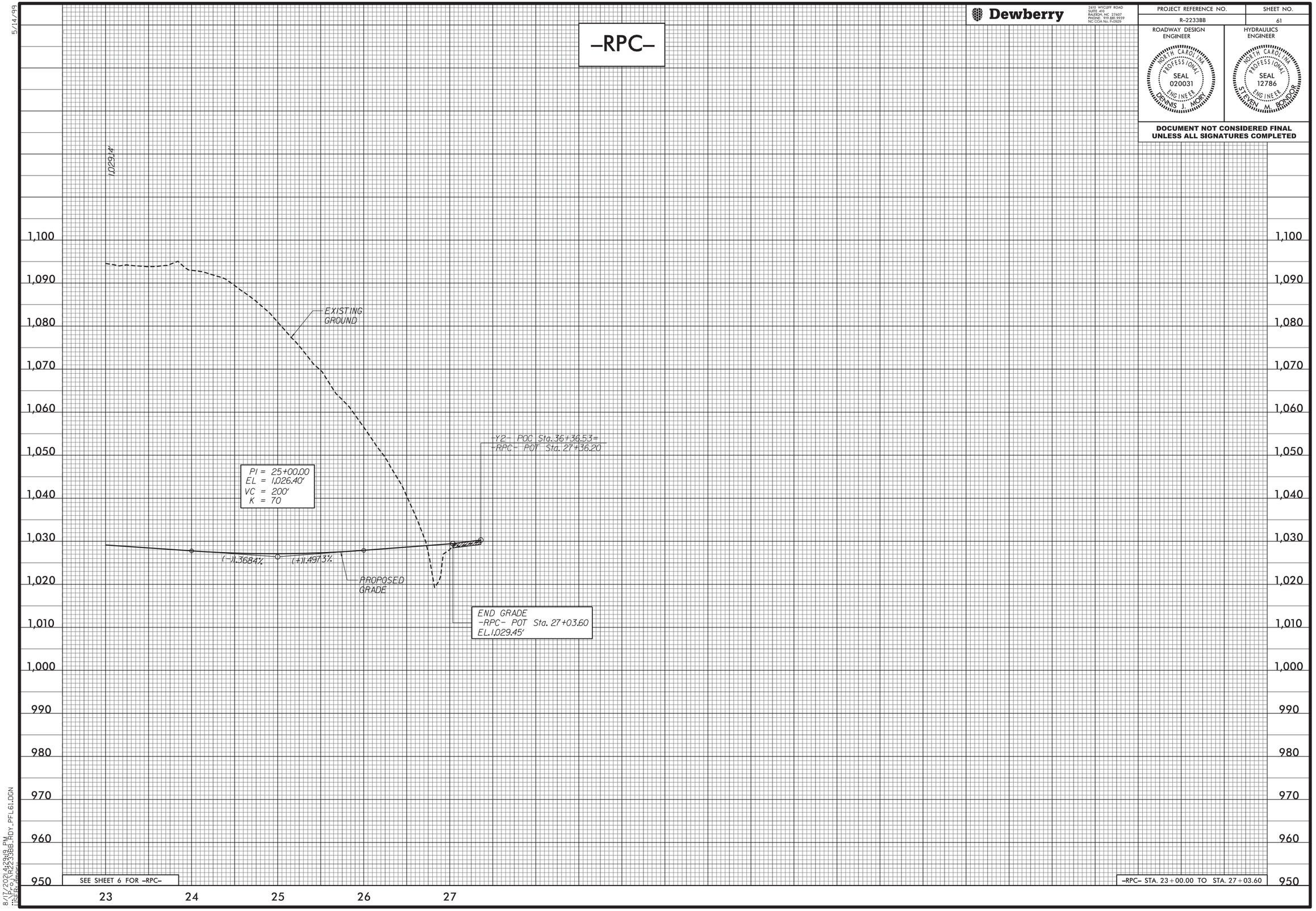
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




SEE SHEET 6 FOR -RPC-

-RPC- STA. 23+00.00 TO STA. 27+03.60

8/18/2021 2:33 PM
R-2233BB_RDY_PFL61.DGN
USER: gmoreu

5/14/99

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 62 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

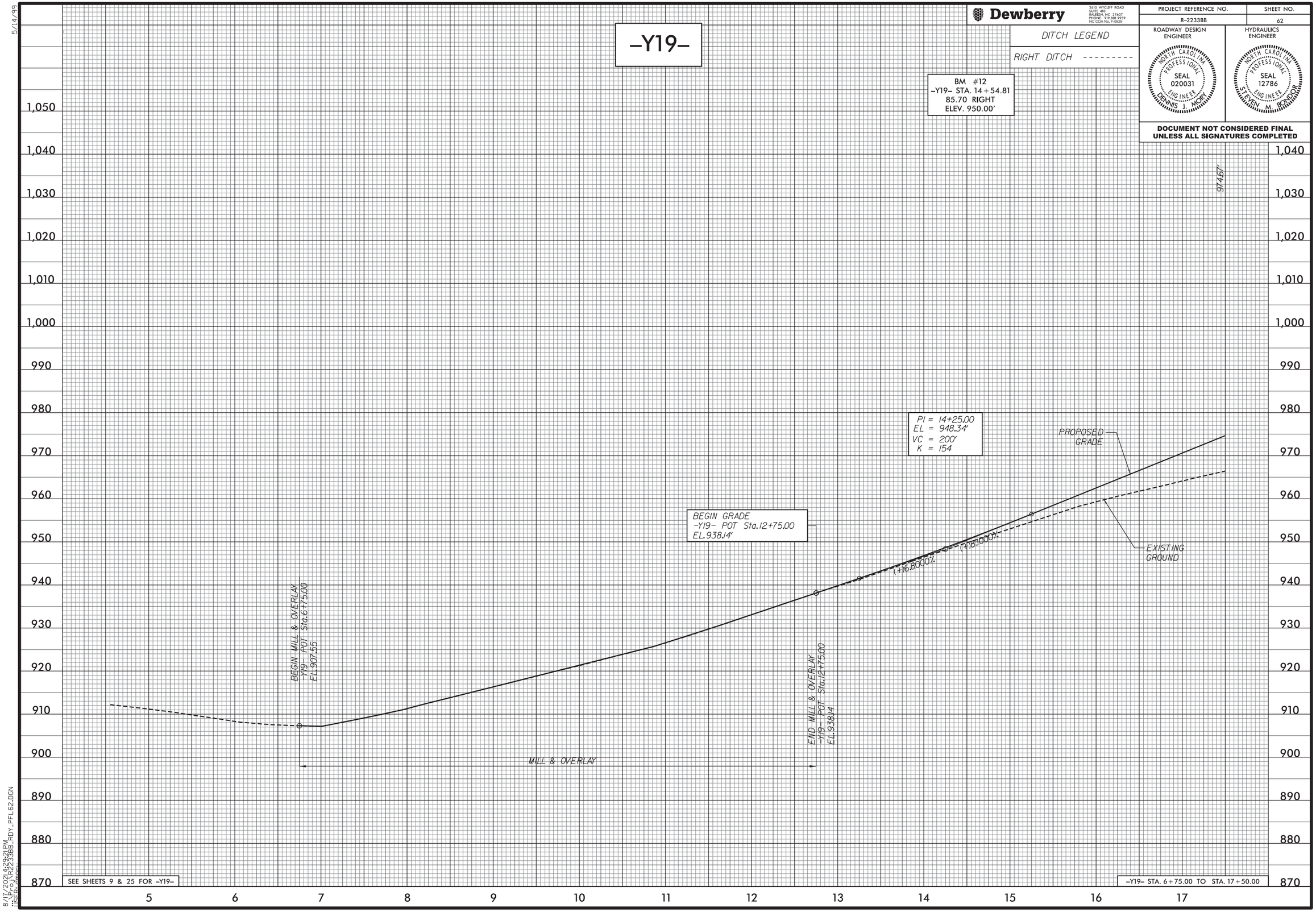
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DITCH LEGEND

RIGHT DITCH ---------

# -Y19-

BM #12
-Y19- STA. 14+54.81
85.70 RIGHT
ELEV. 950.00'




SEE SHEETS 9 & 25 FOR -Y19-

-Y19- STA. 6+75.00 TO STA. 17+50.00

8/17/2021 2:29:21 PM
c:\pwworking\dot\d0313\R2233BB_RDY_PFL62.DGN
USER: 4906

5/14/99

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 63 |

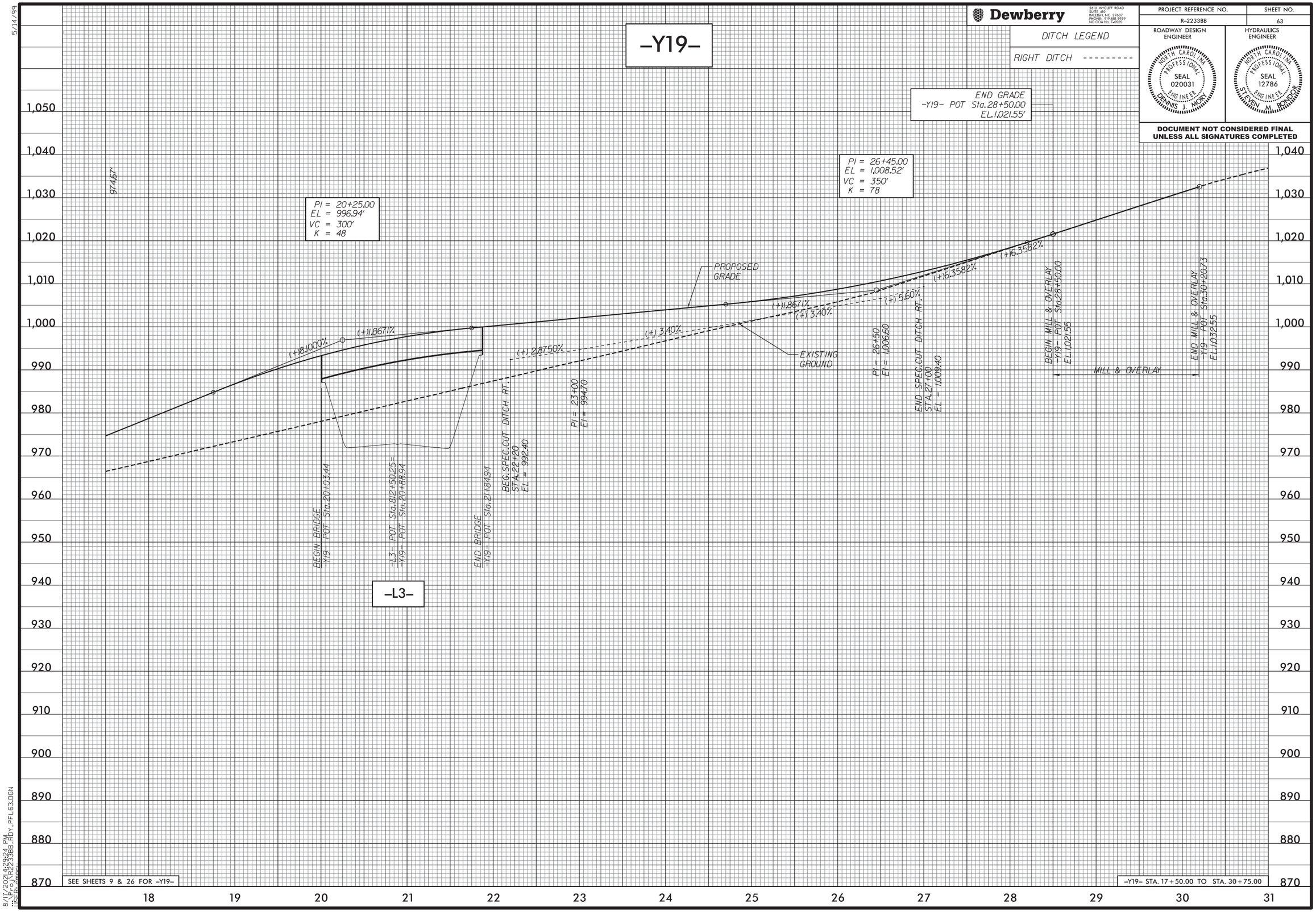
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND

RIGHT DITCH ---------




SEE SHEETS 9 & 26 FOR -Y19-

-Y19- STA. 17+50.00 TO STA. 30+75.00

8/17/2021 4:29:24 PM
USER: smorris

5/14/99

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 64 |

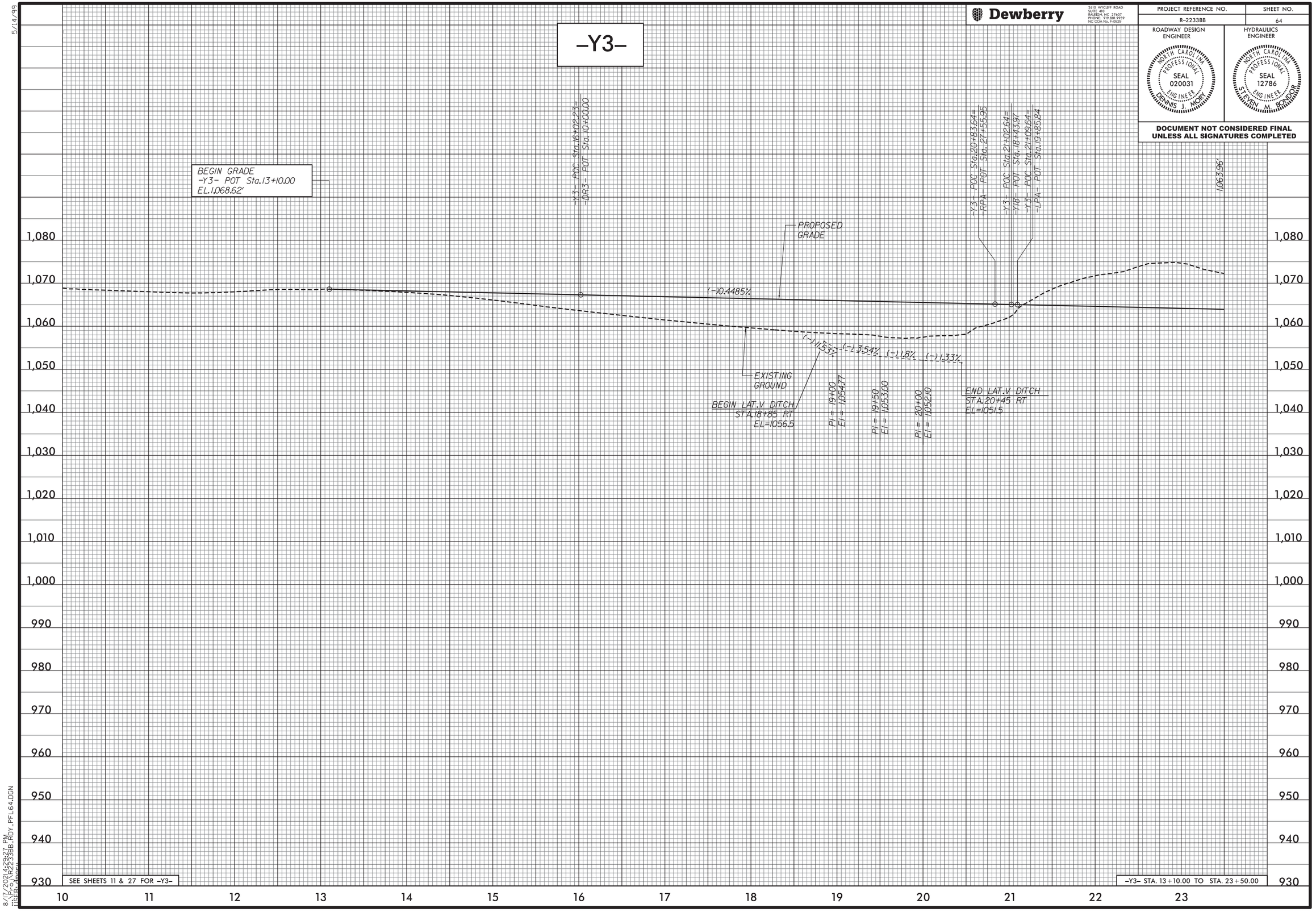
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

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USER: Q00EU

5/14/99

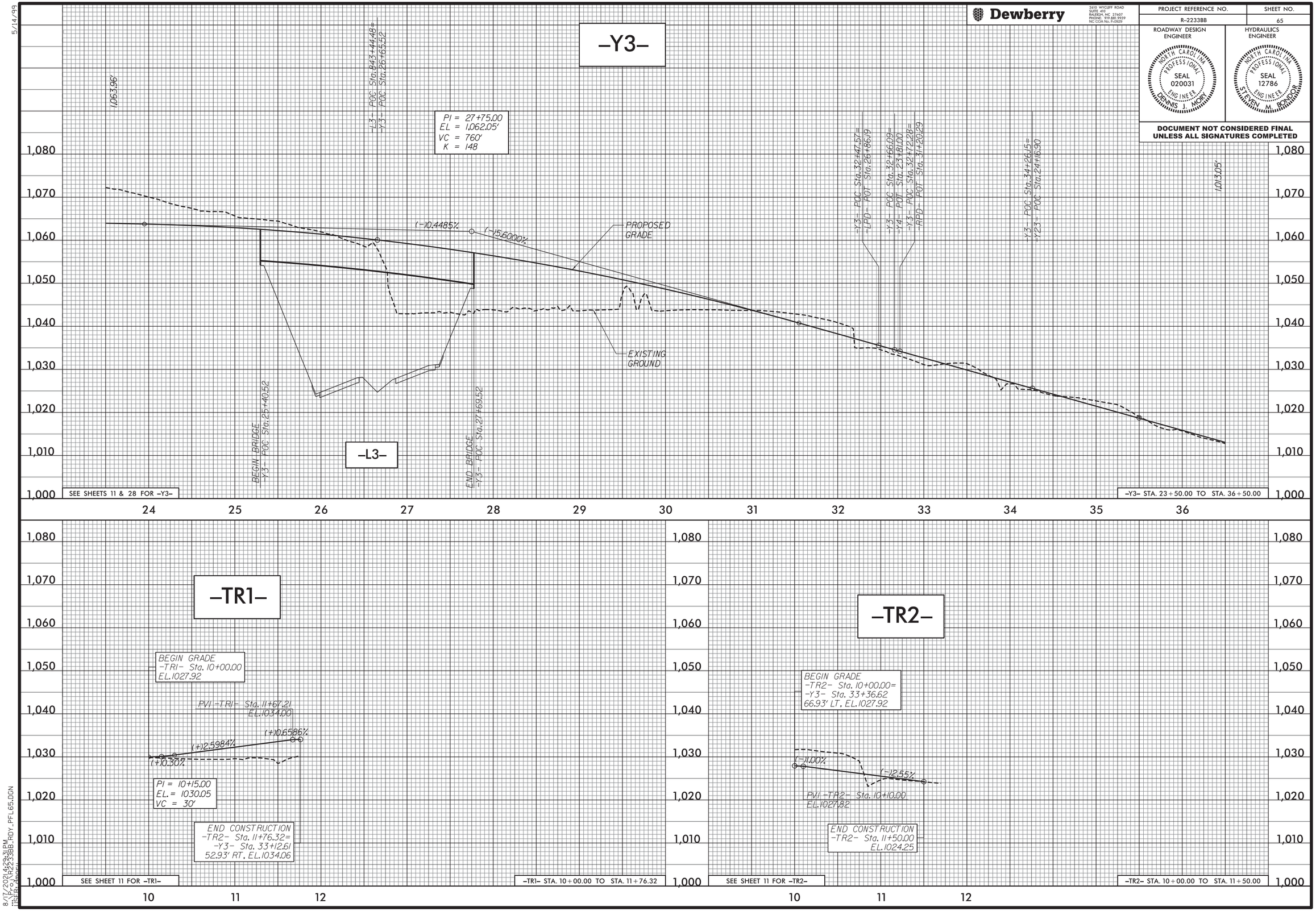
Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 65 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

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USER: dmory

5/14/99

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 66 |

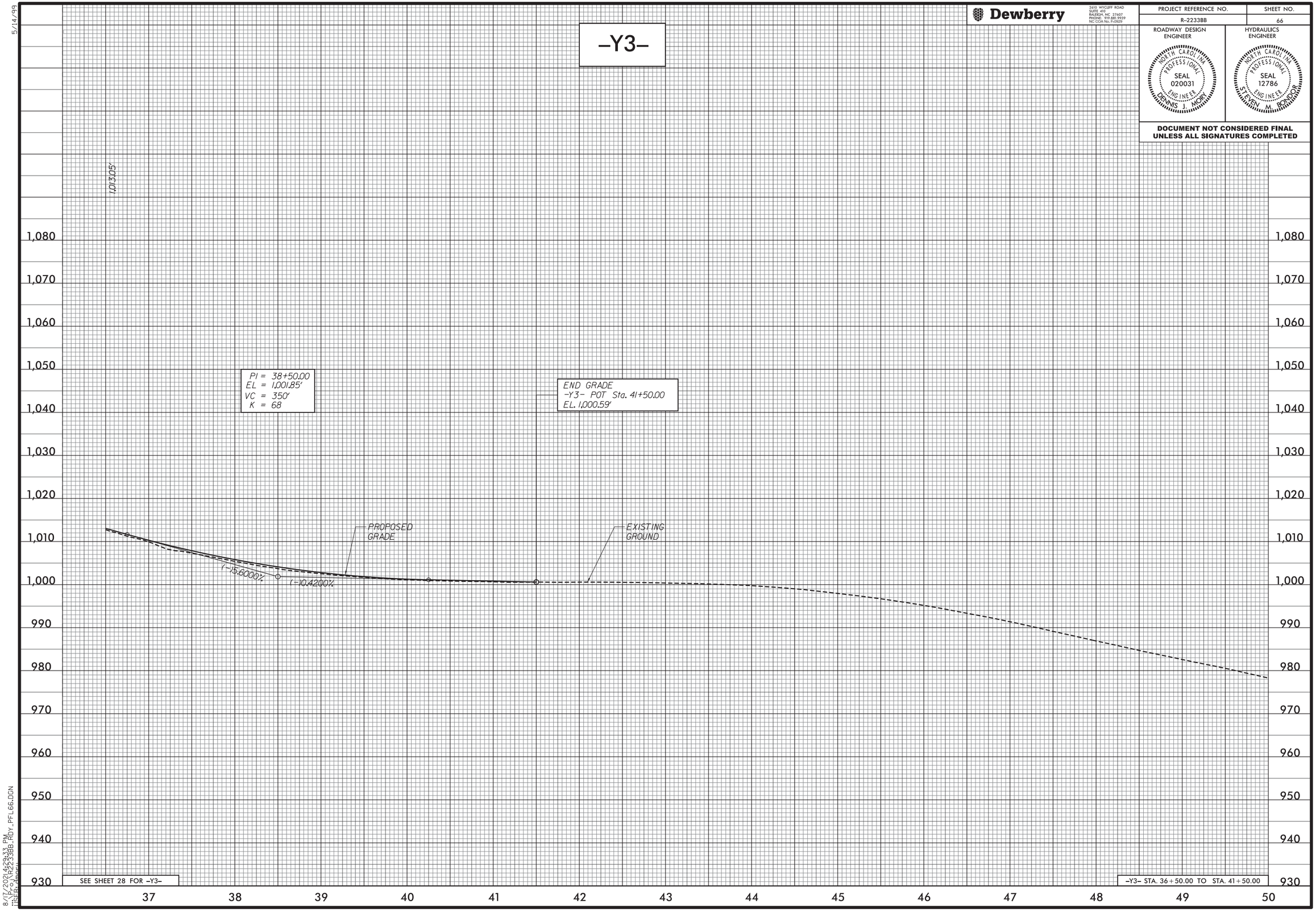
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

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R-2233BB_RDY_PFL66.DGN
USER: Q00EU

5/14/99

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 67 |

ROADWAY DESIGN ENGINEER

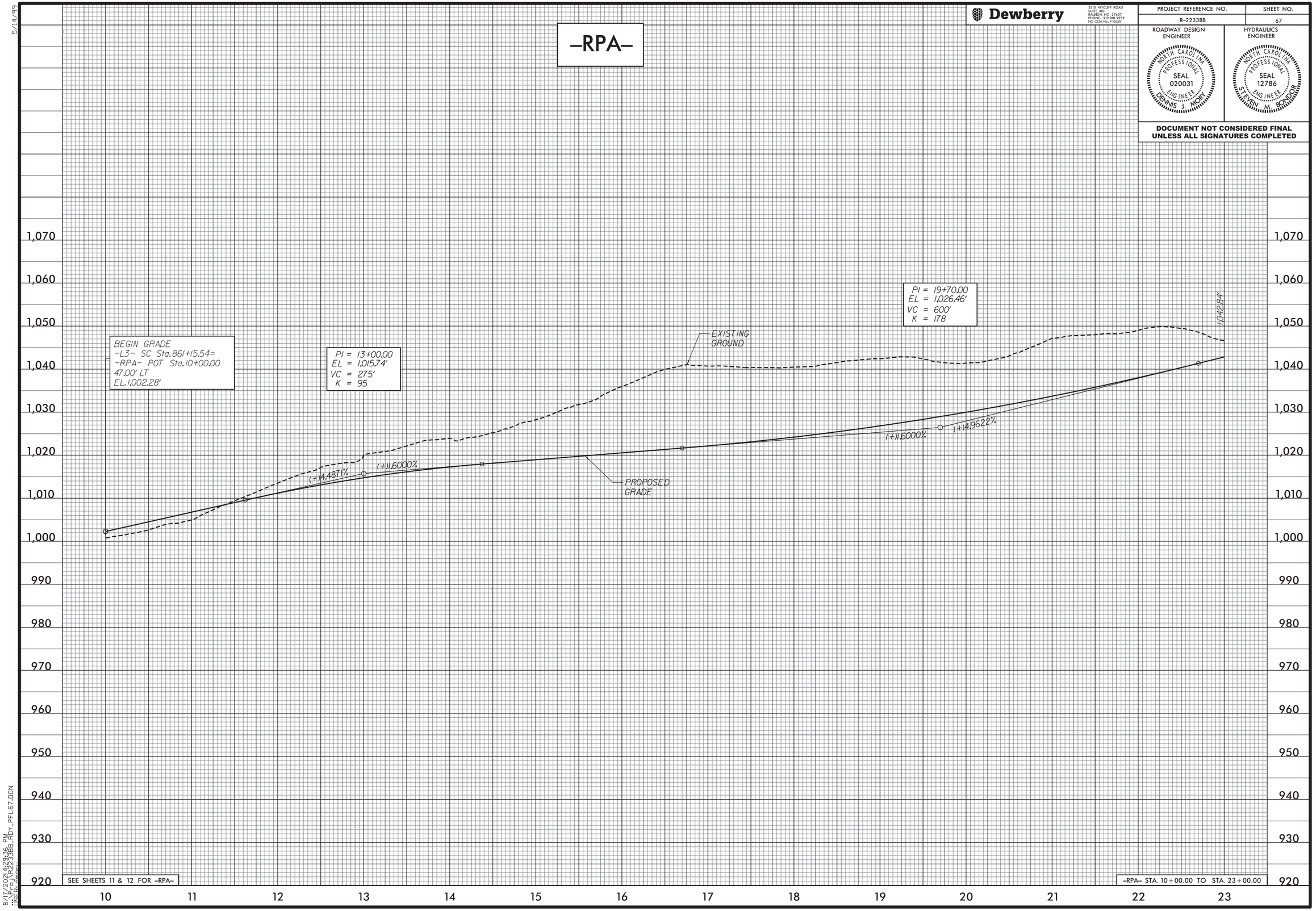
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

# -RPA-




SEE SHEETS 11 & 12 FOR -RPA-

-RPA- STA. 10+00.00 TO STA. 23+00.00

8/17/2021 2:23:36 PM
R-2233BB_RDY_PFL67.DGN
USER: gadeu

5/14/99

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 68 |

ROADWAY DESIGN ENGINEER

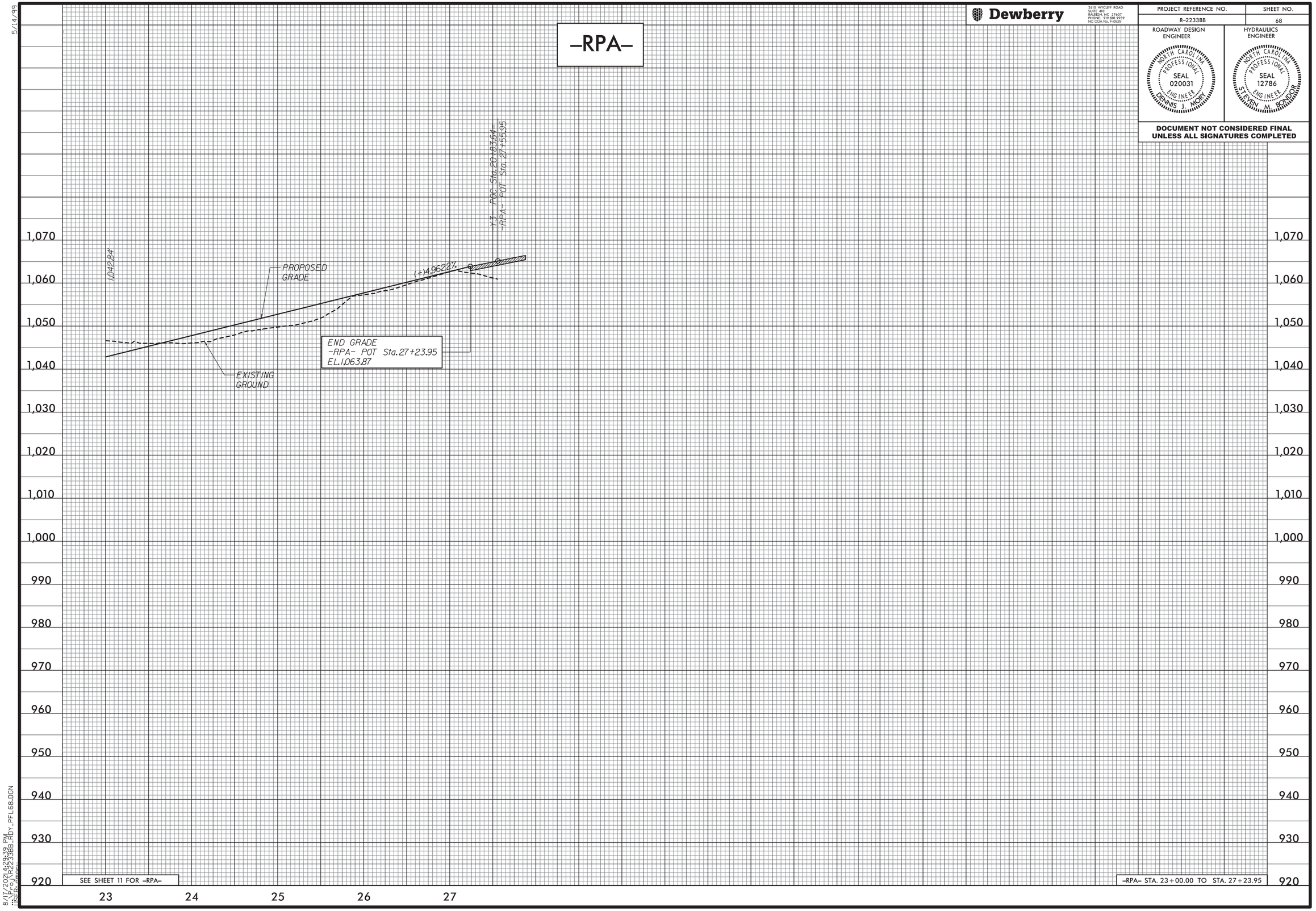
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

# -RPA-

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USER: Q00EU

5/14/99

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 69 |

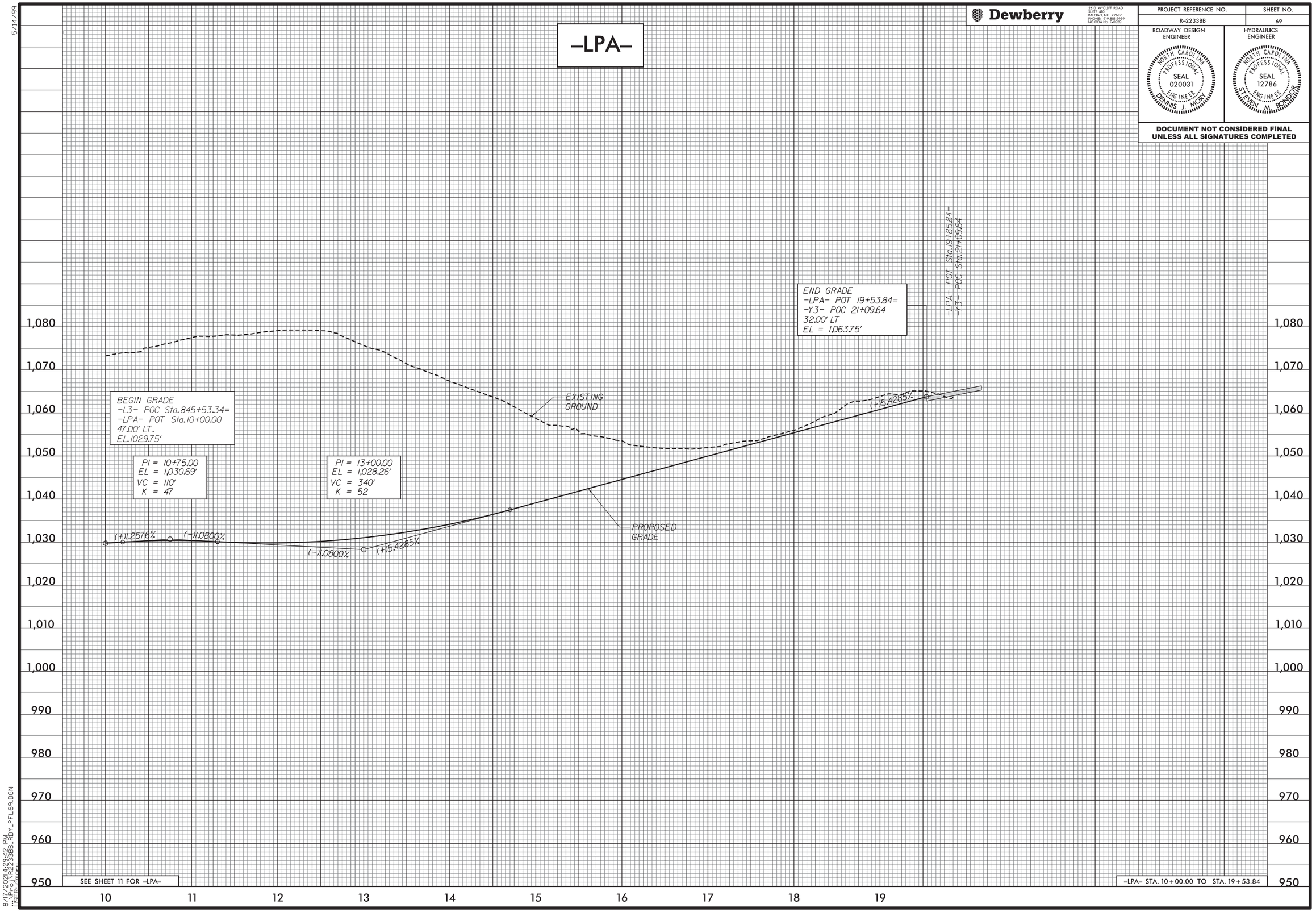
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




SEE SHEET 11 FOR -LPA-

-LPA- STA. 10+00.00 TO STA. 19+53.84

8/17/2021 4:29:42 PM
R:\Roadway\Proj\2233BB_RDY_PFL69.DGN
USER: JJONES

5/14/99

# -LPD-

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 70 |

DITCH LEGEND

RIGHT DITCH ---------

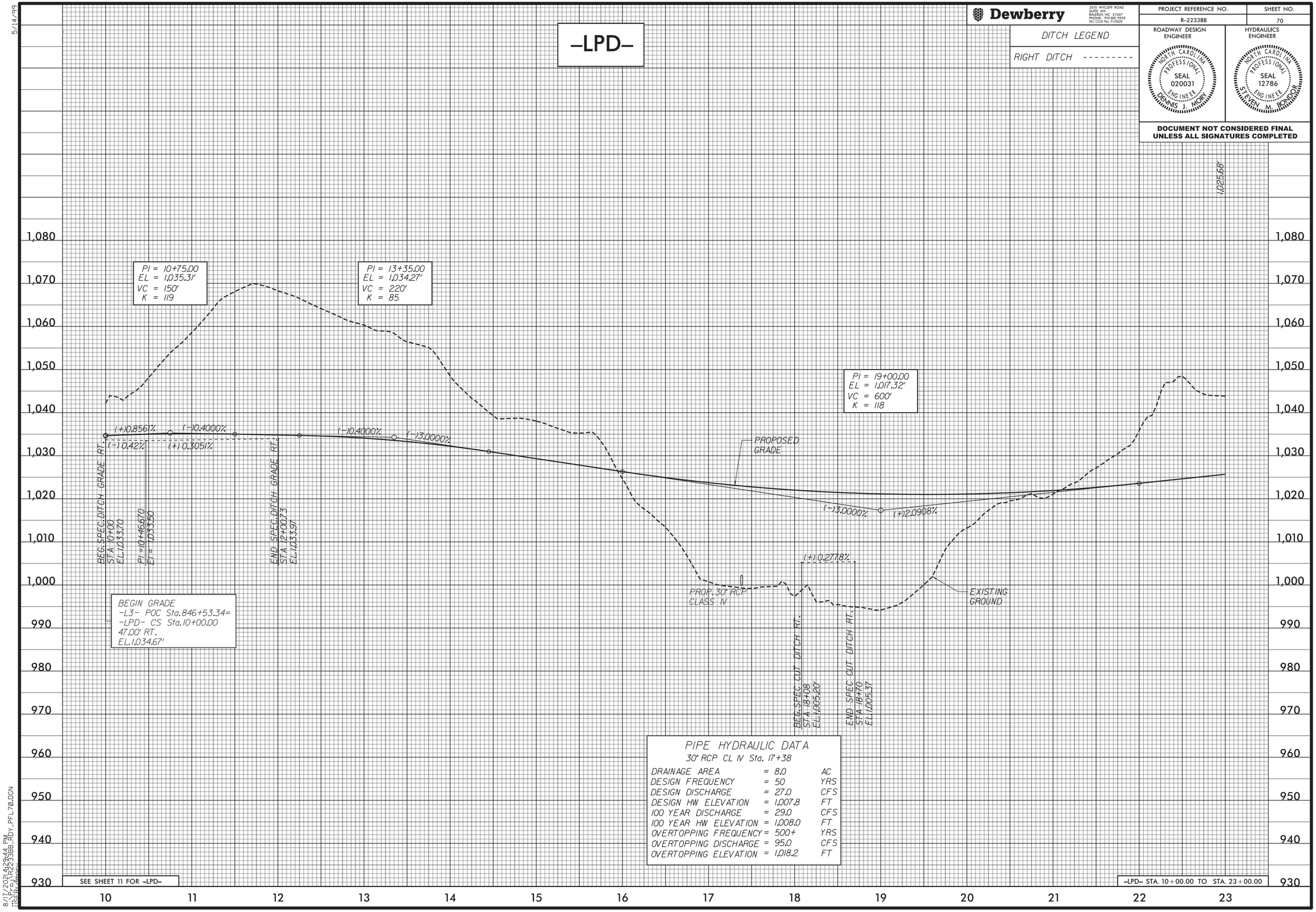
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




PIPE HYDRAULIC DATA
30" RCP CL IV Sta. 17+38

| | | | |
|---|---|---|---|
| DRAINAGE AREA | = | 8.0 | AC |
| DESIGN FREQUENCY | = | 50 | YRS |
| DESIGN DISCHARGE | = | 27.0 | CFS |
| DESIGN HW ELEVATION | = | 1,007.8 | FT |
| 100 YEAR DISCHARGE | = | 29.0 | CFS |
| 100 YEAR HW ELEVATION | = | 1,008.0 | FT |
| OVERTOPPING FREQUENCY | = | 500+ | YRS |
| OVERTOPPING DISCHARGE | = | 95.0 | CFS |
| OVERTOPPING ELEVATION | = | 1,018.2 | FT |

SEE SHEET 11 FOR -LPD-

-LPD- STA. 10+00.00 TO STA. 23+00.00

8/17/2021 4:29:44 PM
R-2233BB_RDY_PFL70.DGN
USER: jmorris

5/14/99

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 71 |

ROADWAY DESIGN ENGINEER

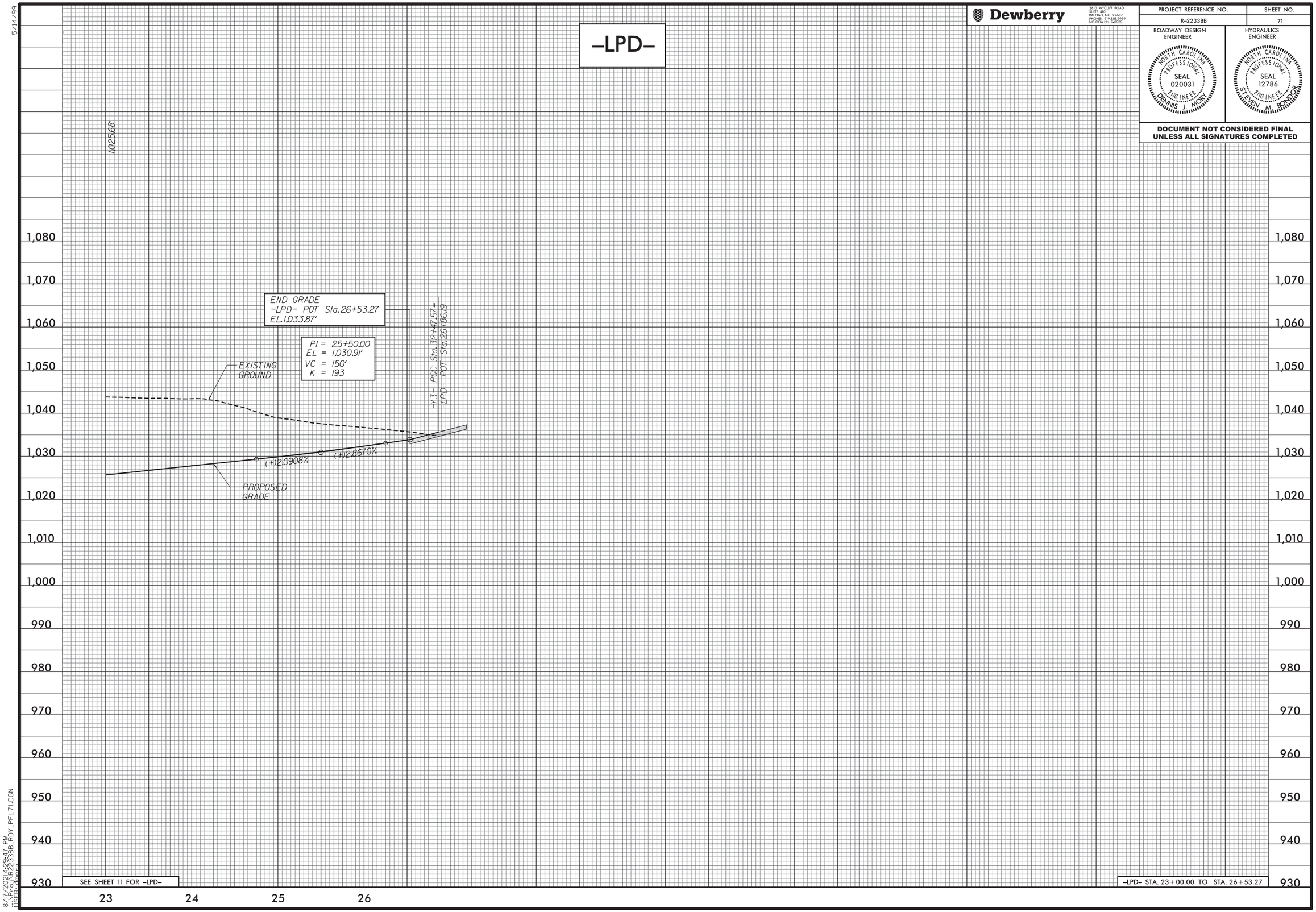
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

# -LPD-




SEE SHEET 11 FOR -LPD-

-LPD- STA. 23+00.00 TO STA. 26+53.27

8/17/2021 4:29:47 PM
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USER: J.Mory

5/14/99

# –RPD–

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 72 |

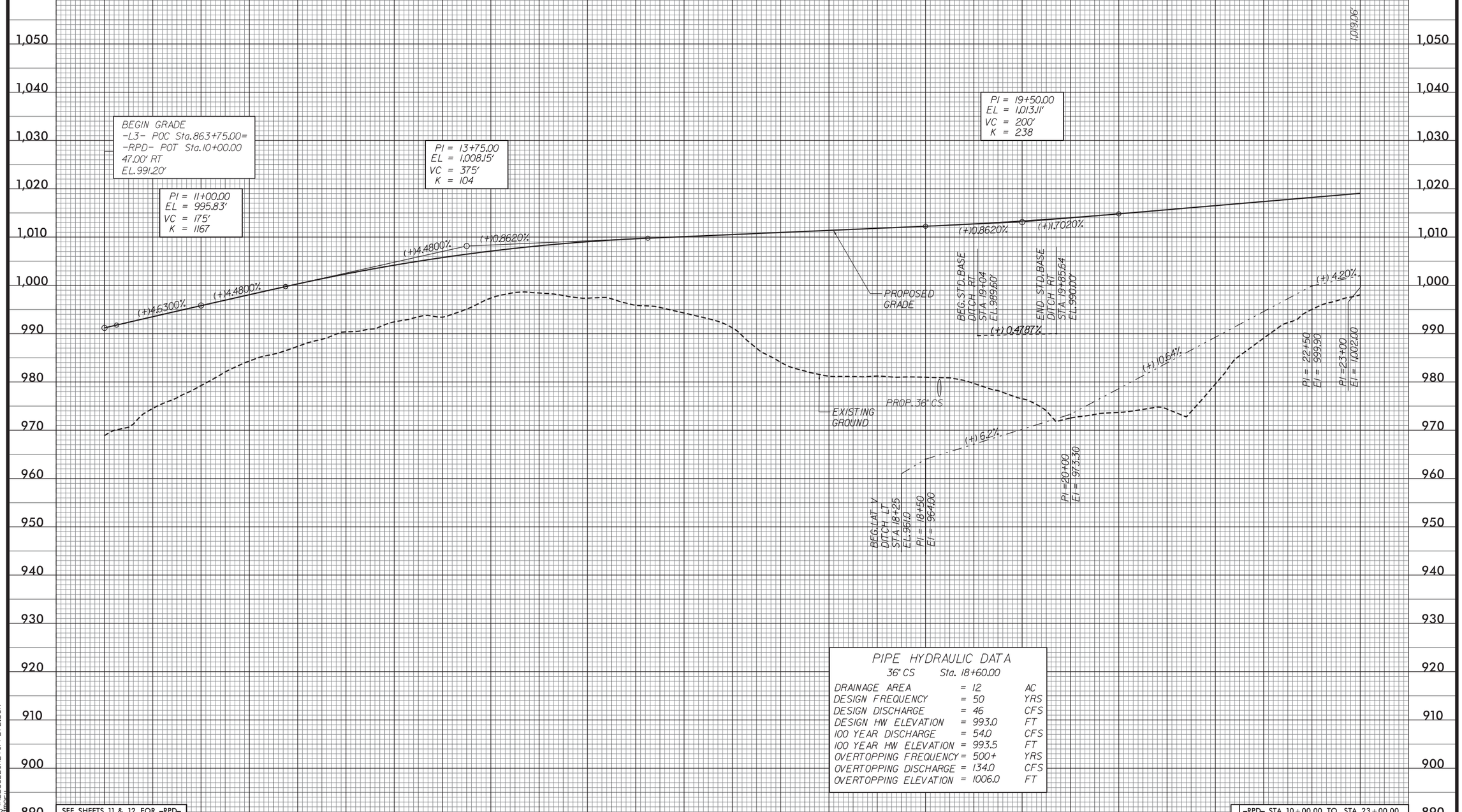
ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND

RIGHT DITCH ---------




PIPE HYDRAULIC DATA

36" CS Sta. 18+60.00

| | | | |
|---|---|---|---|
| DRAINAGE AREA | = | 12 | AC |
| DESIGN FREQUENCY | = | 50 | YRS |
| DESIGN DISCHARGE | = | 46 | CFS |
| DESIGN HW ELEVATION | = | 993.0 | FT |
| 100 YEAR DISCHARGE | = | 54.0 | CFS |
| 100 YEAR HW ELEVATION | = | 993.5 | FT |
| OVERTOPPING FREQUENCY | = | 500+ | YRS |
| OVERTOPPING DISCHARGE | = | 134.0 | CFS |
| OVERTOPPING ELEVATION | = | 1006.0 | FT |

SEE SHEETS 11 & 12 FOR –RPD–

–RPD– STA. 10+00.00 TO STA. 23+00.00

8/17/2021 2:35:50 PM
R-2233BB_RDY_PFL_72.DGN
USER: Q00EU

5/14/99

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 73 |

ROADWAY DESIGN ENGINEER

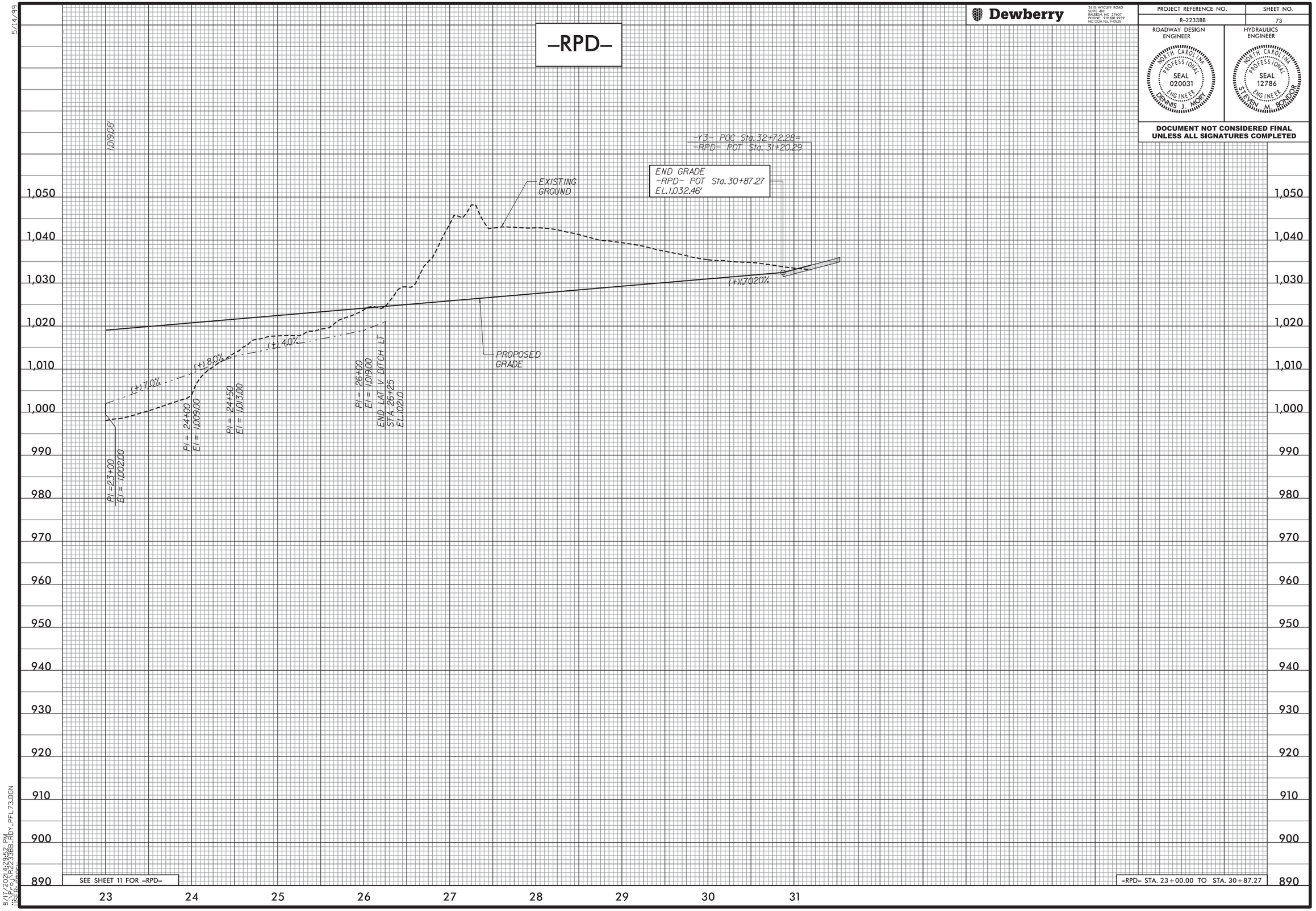
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

# -RPD-




SEE SHEET 11 FOR -RPD-

-RPD- STA. 23+00.00 TO STA. 30+87.27

8/17/2021 3:52 PM
R-2233BB_RDY_PFL_73.DGN
USER: 4900EU

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 74 |

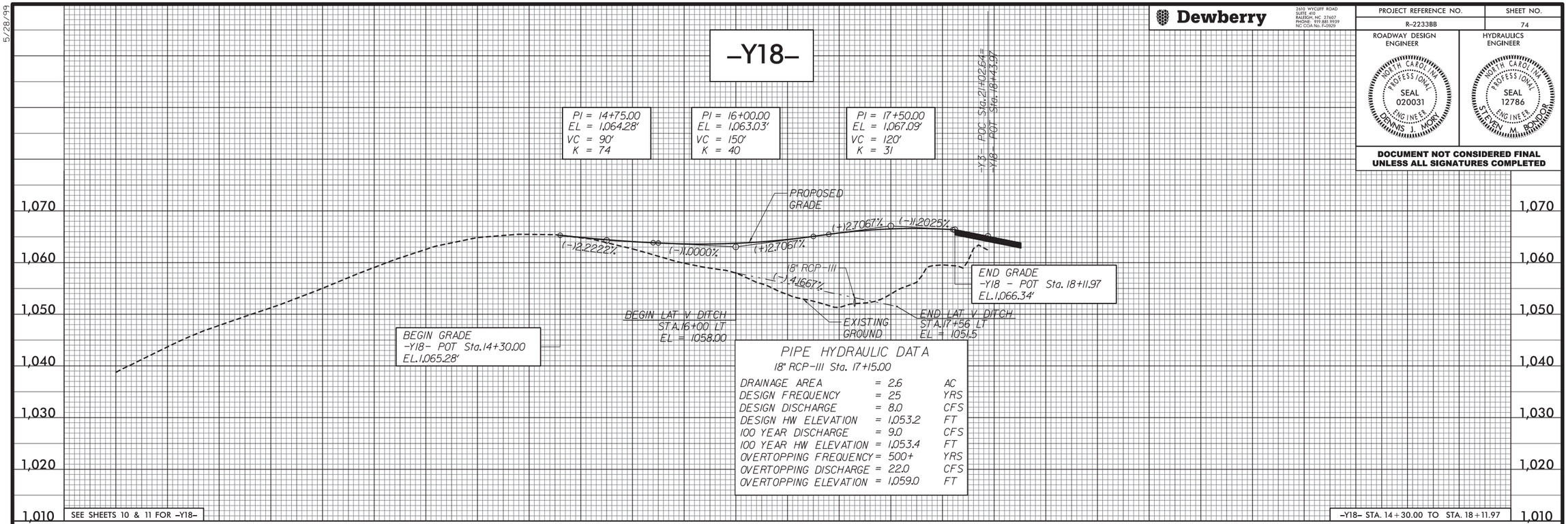
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORIN

HYDRAULICS ENGINEER

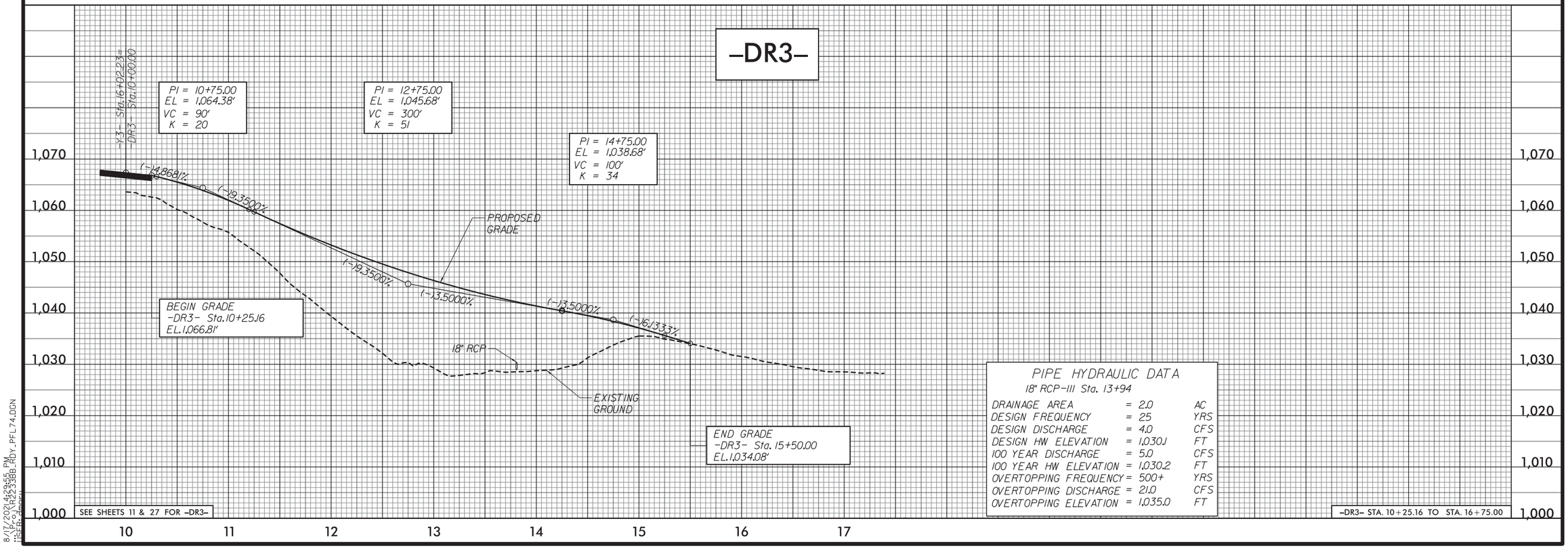
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




SEE SHEETS 10 & 11 FOR -Y18-

-Y18- STA. 14+30.00 TO STA. 18+11.97




SEE SHEETS 11 & 27 FOR -DR3-

-DR3- STA. 10+25.16 TO STA. 16+75.00

5/28/99
8/17/2021 4:29:55 PM
R-2233BB_RDY_PFL74.DGN
USER: smorin

5/14/99

# –Y6–

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

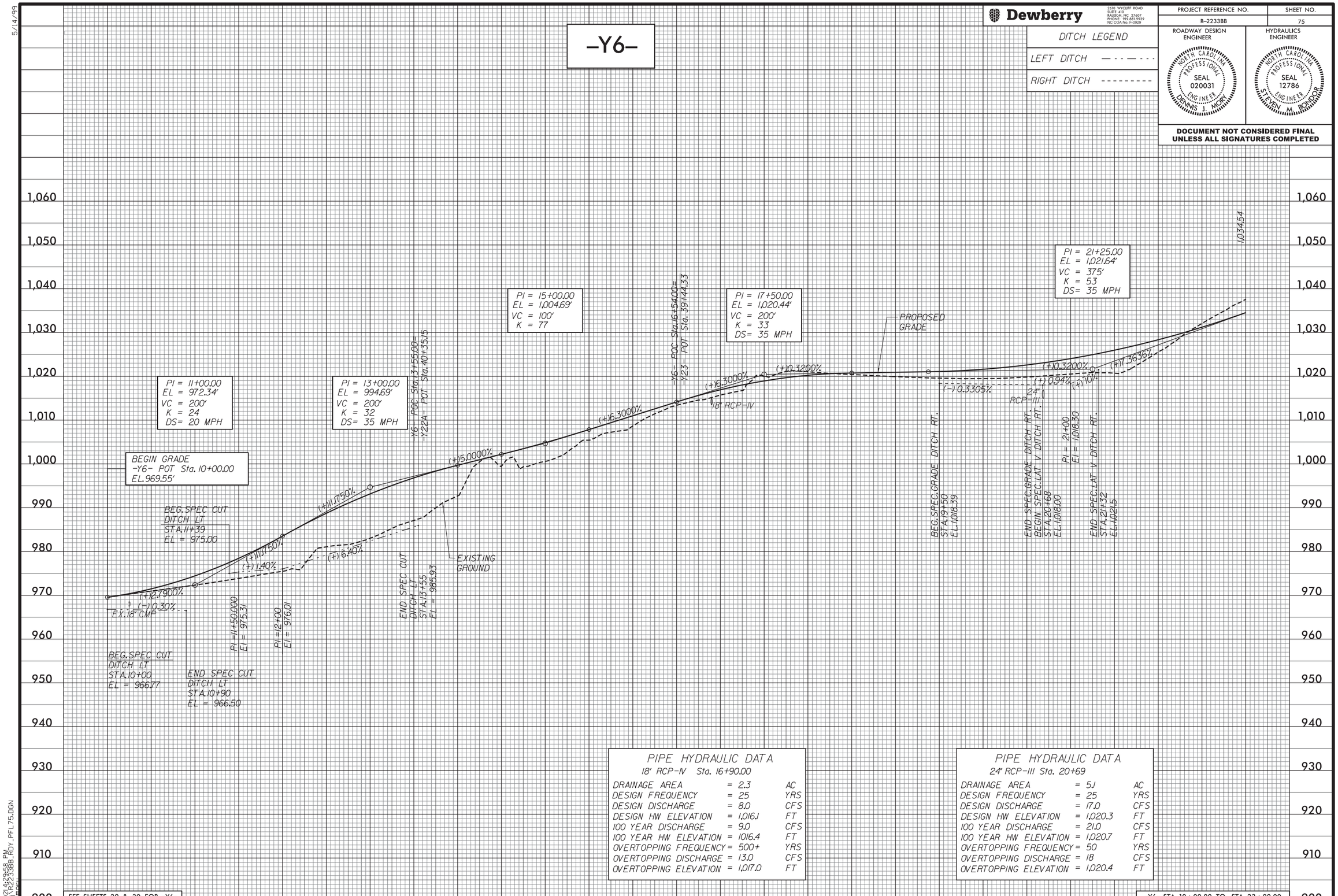
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 75 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND
LEFT DITCH — · · — · · —
RIGHT DITCH - - - - - - - - -




PIPE HYDRAULIC DATA
18" RCP-IV Sta. 16+90.00

| | | | |
|---|---|---|---|
| DRAINAGE AREA | = | 2.3 | AC |
| DESIGN FREQUENCY | = | 25 | YRS |
| DESIGN DISCHARGE | = | 8.0 | CFS |
| DESIGN HW ELEVATION | = | 1,016.1 | FT |
| 100 YEAR DISCHARGE | = | 9.0 | CFS |
| 100 YEAR HW ELEVATION | = | 1016.4 | FT |
| OVERTOPPING FREQUENCY | = | 500+ | YRS |
| OVERTOPPING DISCHARGE | = | 13.0 | CFS |
| OVERTOPPING ELEVATION | = | 1,017.0 | FT |

PIPE HYDRAULIC DATA
24" RCP-III Sta. 20+69

| | | | |
|---|---|---|---|
| DRAINAGE AREA | = | 5.1 | AC |
| DESIGN FREQUENCY | = | 25 | YRS |
| DESIGN DISCHARGE | = | 17.0 | CFS |
| DESIGN HW ELEVATION | = | 1,020.3 | FT |
| 100 YEAR DISCHARGE | = | 21.0 | CFS |
| 100 YEAR HW ELEVATION | = | 1,020.7 | FT |
| OVERTOPPING FREQUENCY | = | 50 | YRS |
| OVERTOPPING DISCHARGE | = | 18 | CFS |
| OVERTOPPING ELEVATION | = | 1,020.4 | FT |

SEE SHEETS 29 & 30 FOR –Y6–

–Y6– STA. 10+00.00 TO STA. 23+00.00

8/17/2021 4:23:58 PM
R:\Roadway\Proj\2233bb_Rdy_PFL_75.DGN
USER: SDOBELL

5/14/99

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 76 |

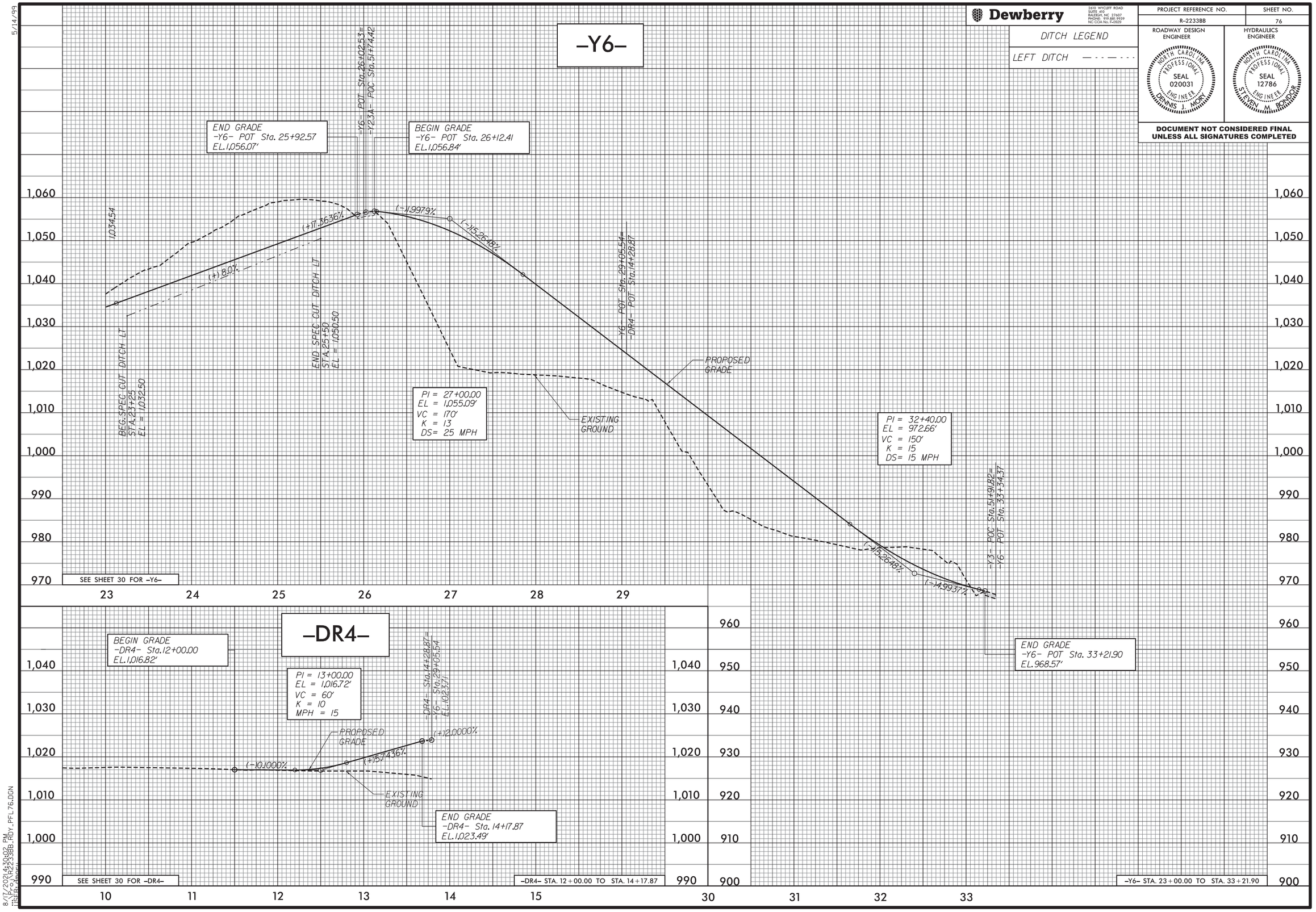
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND

LEFT DITCH — - - — - - -




8/17/2021 4:33:02 PM
USER: SMBondurant
FILE: R-2233BB_RDY_PFL_76.DGN

5/28/99

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 77 |

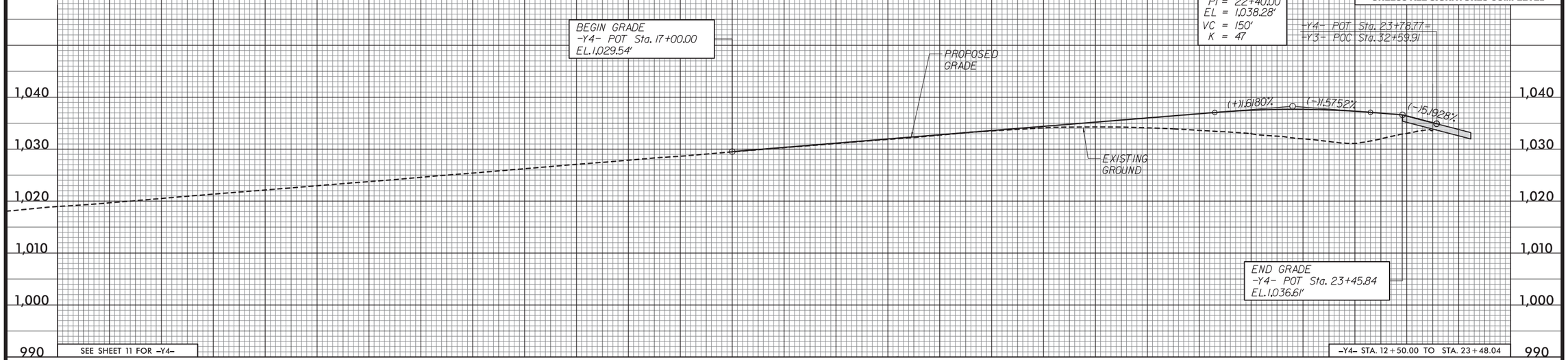
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORIN

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND
LEFT DITCH — · · — · · —
RIGHT DITCH - - - - - - - - -

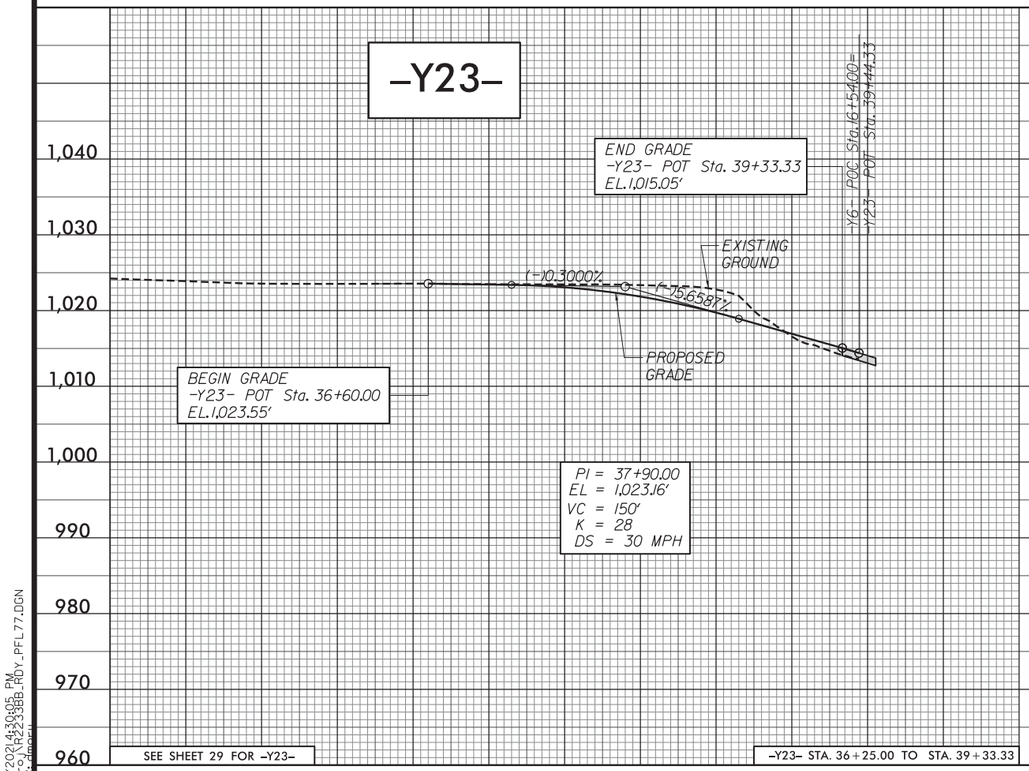
## -Y4-




SEE SHEET 11 FOR -Y4-

-Y4- STA. 12+50.00 TO STA. 23+48.04

## -Y23-

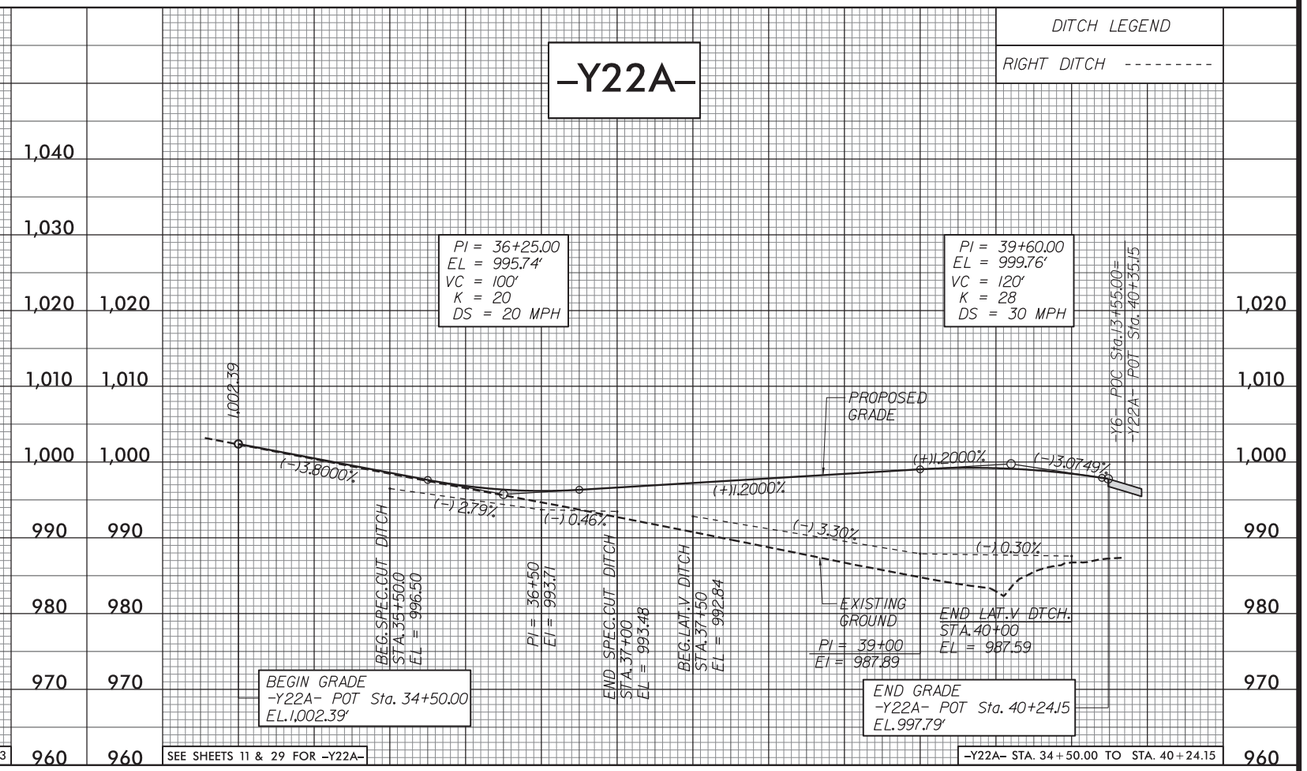



SEE SHEET 29 FOR -Y23-

-Y23- STA. 36+25.00 TO STA. 39+33.33

## -Y22A-

DITCH LEGEND
RIGHT DITCH - - - - - - - - -




SEE SHEETS 11 & 29 FOR -Y22A-

-Y22A- STA. 34+50.00 TO STA. 40+24.15

8/17/2021 4:33:05 PM
USER: Jmorin

5/28/99

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 78 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORIN

HYDRAULICS ENGINEER

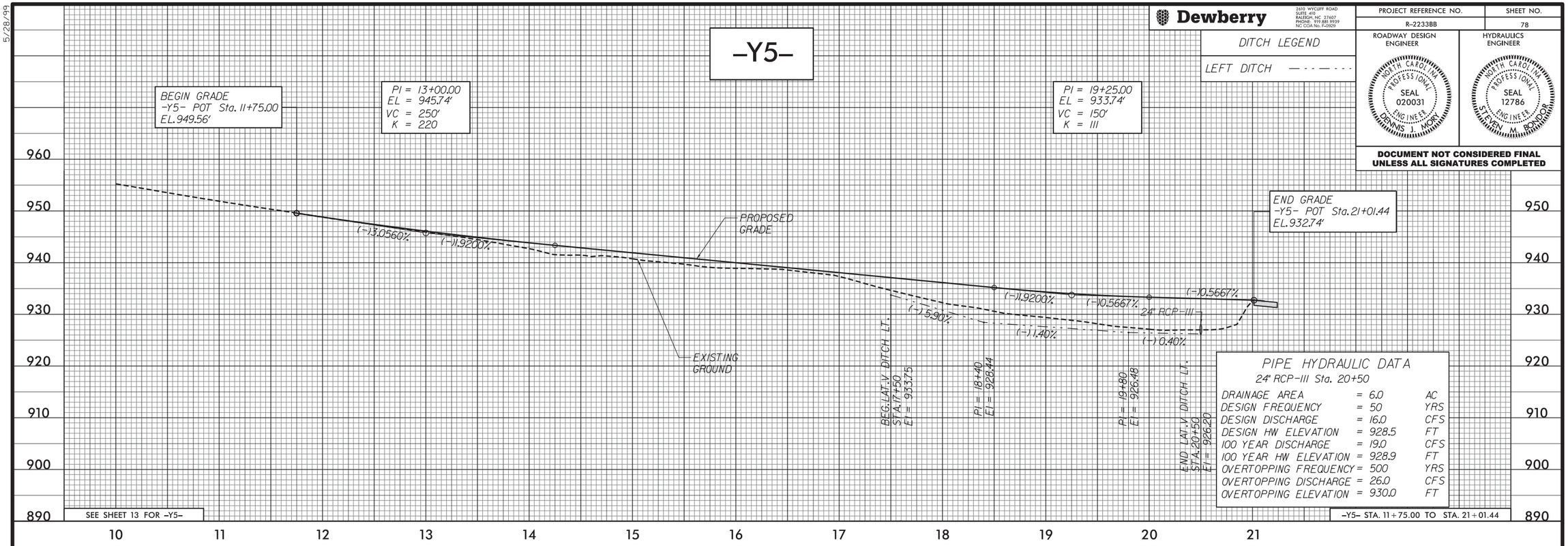
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND

LEFT DITCH — - - — - - -

# -Y5-




PIPE HYDRAULIC DATA

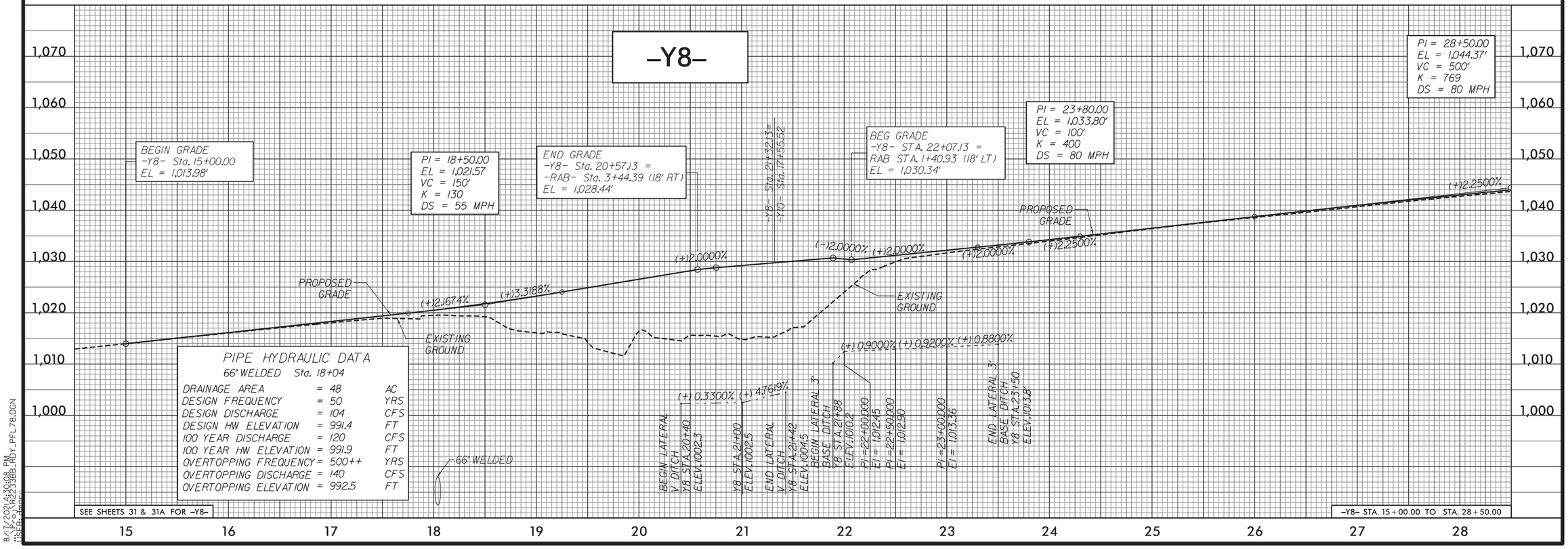
24" RCP-III Sta. 20+50

| | | | |
|---|---|---|---|
| DRAINAGE AREA | = | 6.0 | AC |
| DESIGN FREQUENCY | = | 50 | YRS |
| DESIGN DISCHARGE | = | 16.0 | CFS |
| DESIGN HW ELEVATION | = | 928.5 | FT |
| 100 YEAR DISCHARGE | = | 19.0 | CFS |
| 100 YEAR HW ELEVATION | = | 928.9 | FT |
| OVERTOPPING FREQUENCY | = | 500 | YRS |
| OVERTOPPING DISCHARGE | = | 26.0 | CFS |
| OVERTOPPING ELEVATION | = | 930.0 | FT |

SEE SHEET 13 FOR -Y5-

-Y5- STA. 11+75.00 TO STA. 21+01.44

# -Y8-




PIPE HYDRAULIC DATA

66" WELDED Sta. 18+04

| | | | |
|---|---|---|---|
| DRAINAGE AREA | = | 48 | AC |
| DESIGN FREQUENCY | = | 50 | YRS |
| DESIGN DISCHARGE | = | 104 | CFS |
| DESIGN HW ELEVATION | = | 991.4 | FT |
| 100 YEAR DISCHARGE | = | 120 | CFS |
| 100 YEAR HW ELEVATION | = | 991.9 | FT |
| OVERTOPPING FREQUENCY | = | 500++ | YRS |
| OVERTOPPING DISCHARGE | = | 140 | CFS |
| OVERTOPPING ELEVATION | = | 992.5 | FT |

SEE SHEETS 31 & 31A FOR -Y8-

-Y8- STA. 15+00.00 TO STA. 28+50.00

8/17/2021 4:33:08 PM
C:\PROJECTS\R-2233BB_RDY_PFL78.DGN
USER: smorin

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 79 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORA

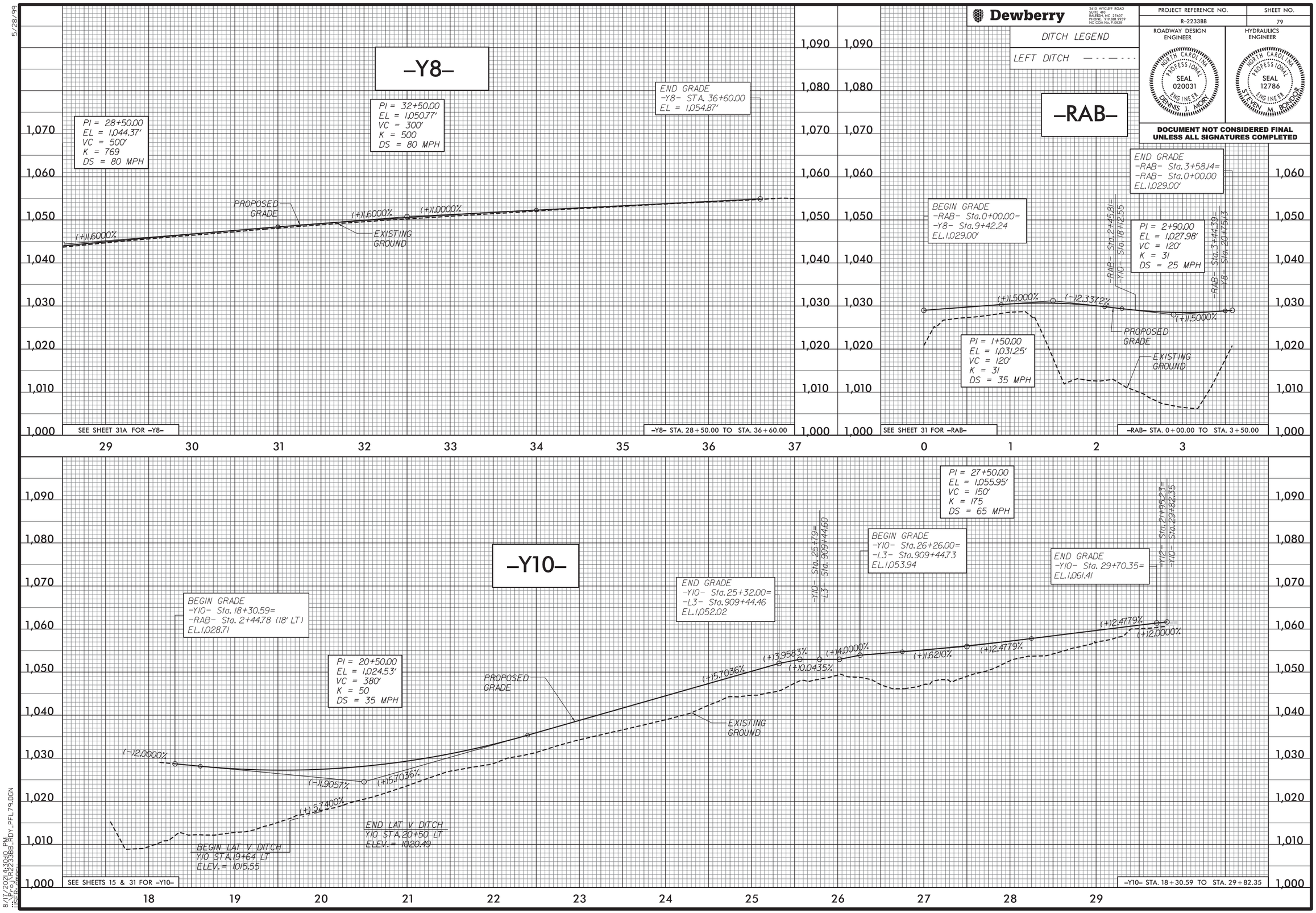
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND

LEFT DITCH — - - — - - -




5/28/99

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USER: smorris

5/28/99

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

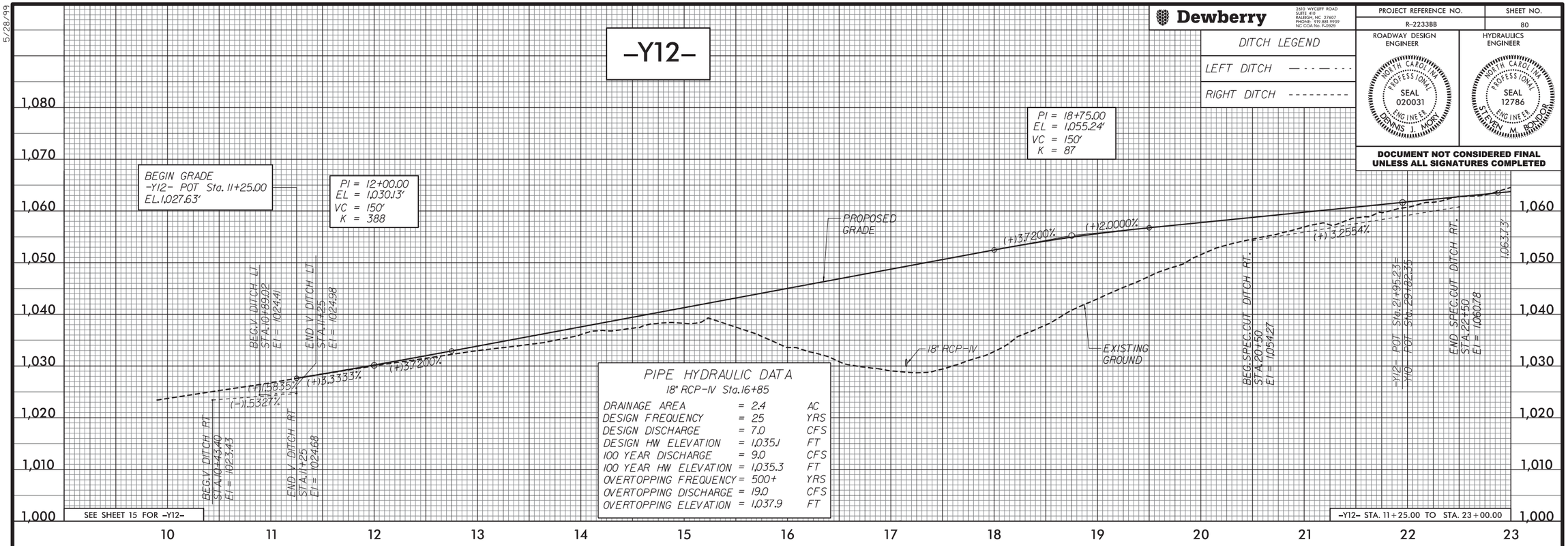
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 80 |

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORIN

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND
LEFT DITCH — · · — · · —
RIGHT DITCH - - - - - - - - -

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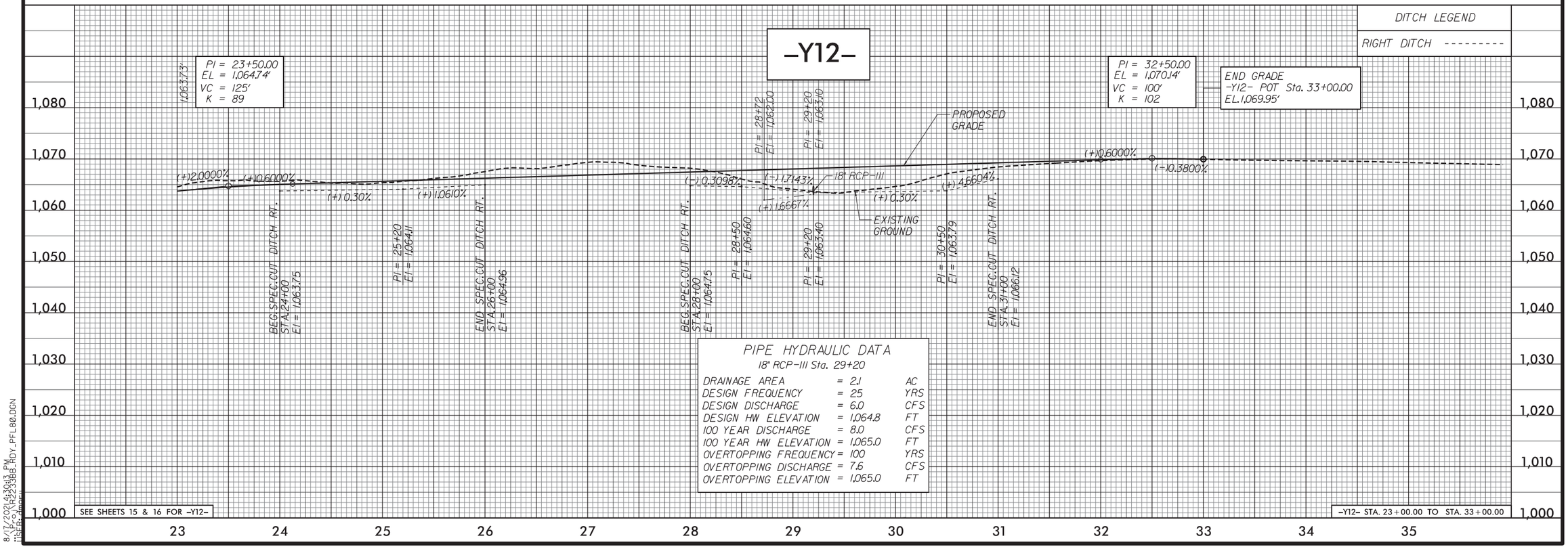


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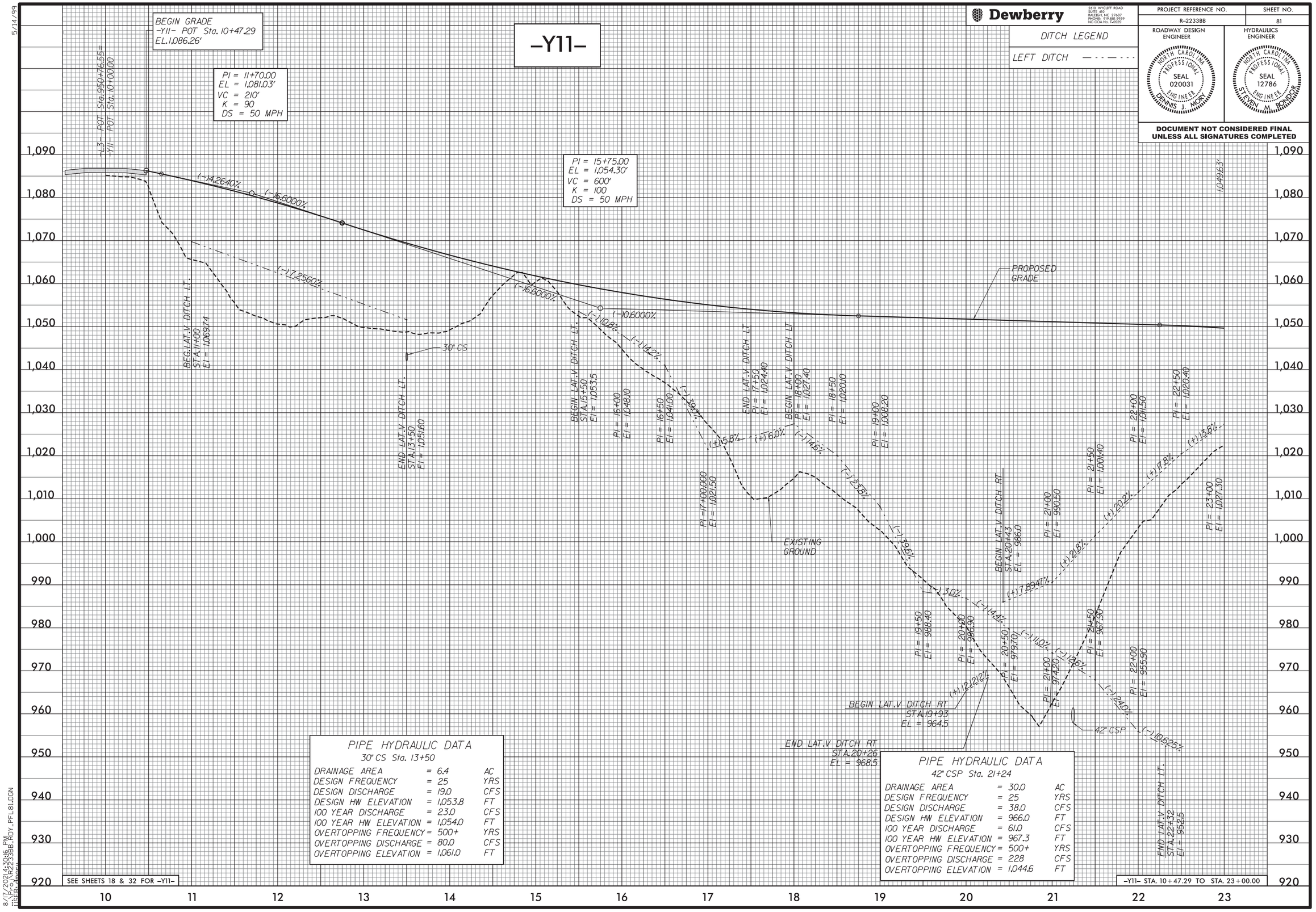
5/14/99




**Dewberry**
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

DITCH LEGEND

LEFT DITCH — - - — - - -

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 81 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

## PIPE HYDRAULIC DATA
30" CS Sta. 13+50

| | | |
|---|---|---|
| DRAINAGE AREA | = 6.4 | AC |
| DESIGN FREQUENCY | = 25 | YRS |
| DESIGN DISCHARGE | = 19.0 | CFS |
| DESIGN HW ELEVATION | = 1,053.8 | FT |
| 100 YEAR DISCHARGE | = 23.0 | CFS |
| 100 YEAR HW ELEVATION | = 1,054.0 | FT |
| OVERTOPPING FREQUENCY | = 500+ | YRS |
| OVERTOPPING DISCHARGE | = 80.0 | CFS |
| OVERTOPPING ELEVATION | = 1,061.0 | FT |

## PIPE HYDRAULIC DATA
42" CSP Sta. 21+24

| | | |
|---|---|---|
| DRAINAGE AREA | = 30.0 | AC |
| DESIGN FREQUENCY | = 25 | YRS |
| DESIGN DISCHARGE | = 38.0 | CFS |
| DESIGN HW ELEVATION | = 966.0 | FT |
| 100 YEAR DISCHARGE | = 61.0 | CFS |
| 100 YEAR HW ELEVATION | = 967.3 | FT |
| OVERTOPPING FREQUENCY | = 500+ | YRS |
| OVERTOPPING DISCHARGE | = 228 | CFS |
| OVERTOPPING ELEVATION | = 1,044.6 | FT |

SEE SHEETS 18 & 32 FOR -Y11-

-Y11- STA. 10+47.29 TO STA. 23+00.00

8/17/2021 4:30:46 PM
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USER: dmory

5/14/99

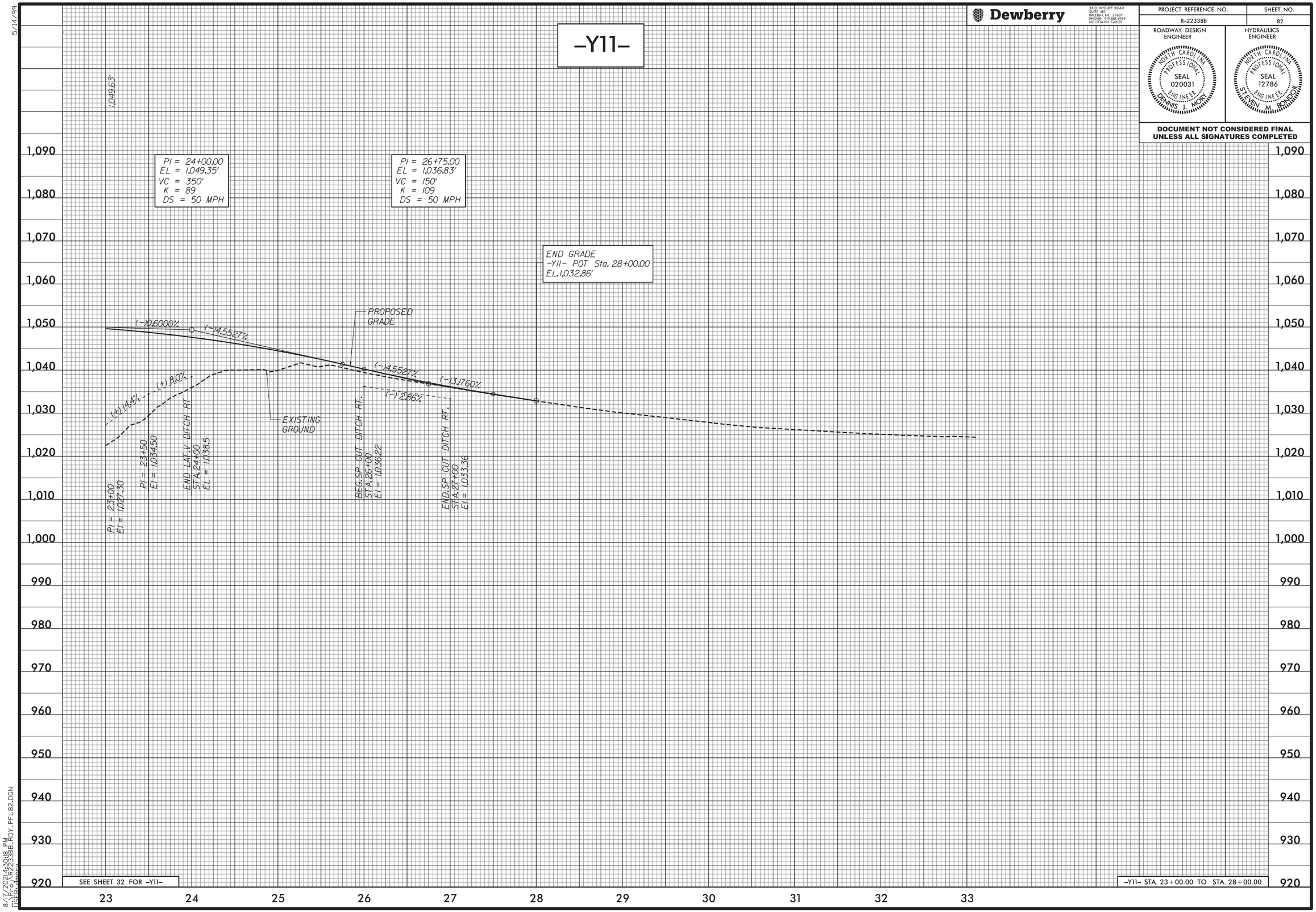
Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 82 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDURANT

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

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USER: cjones

5/28/99

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

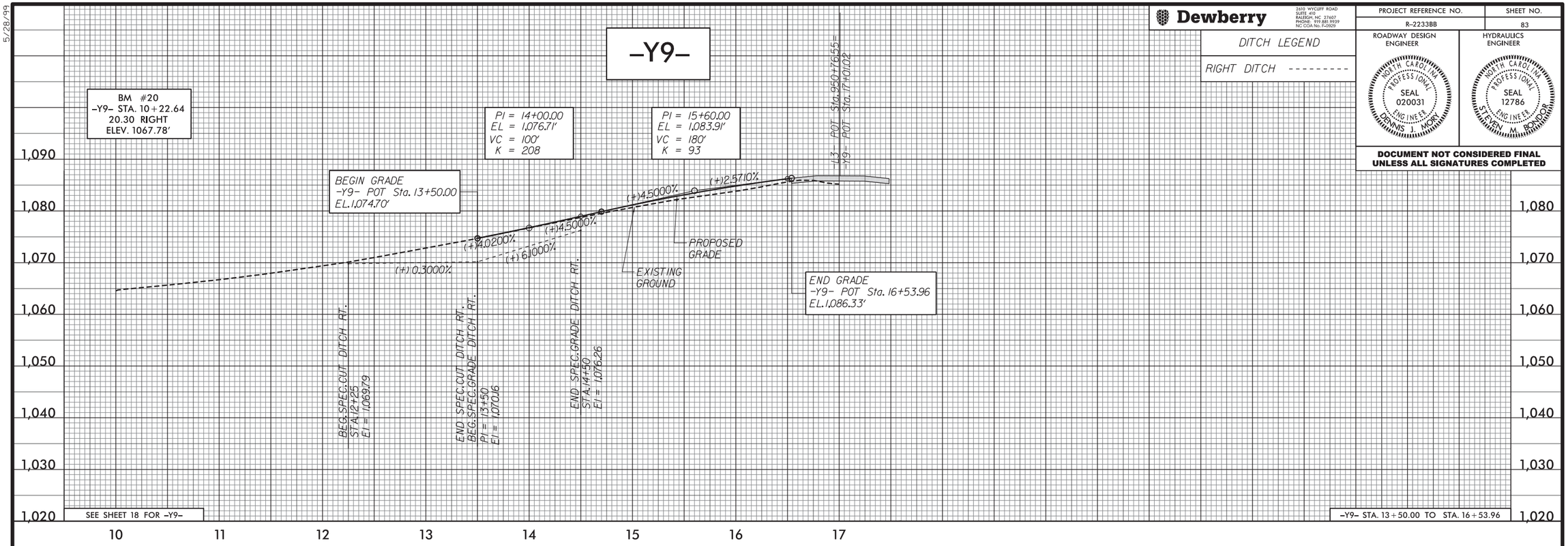
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 83 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORIN

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

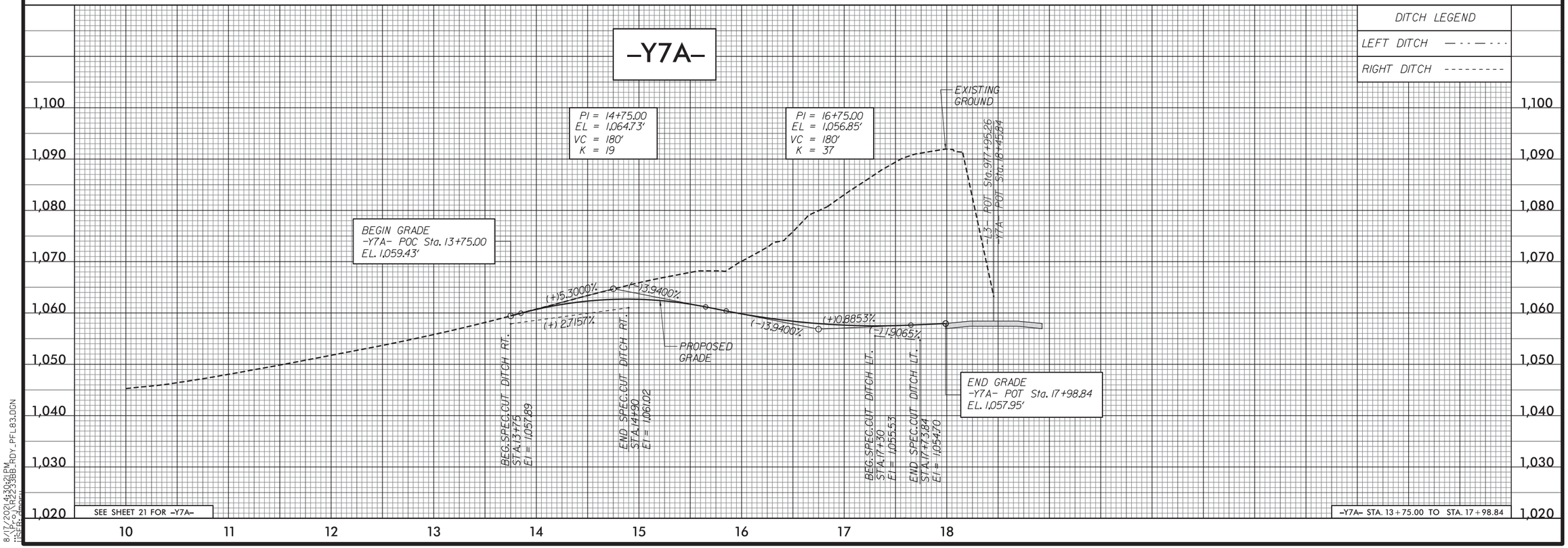
DITCH LEGEND
RIGHT DITCH ---------




SEE SHEET 18 FOR -Y9-

-Y9- STA. 13+50.00 TO STA. 16+53.96

DITCH LEGEND
LEFT DITCH — - - — - - -
RIGHT DITCH ---------




SEE SHEET 21 FOR -Y7A-

-Y7A- STA. 13+75.00 TO STA. 17+98.84

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USER: jmorin

5/28/99

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

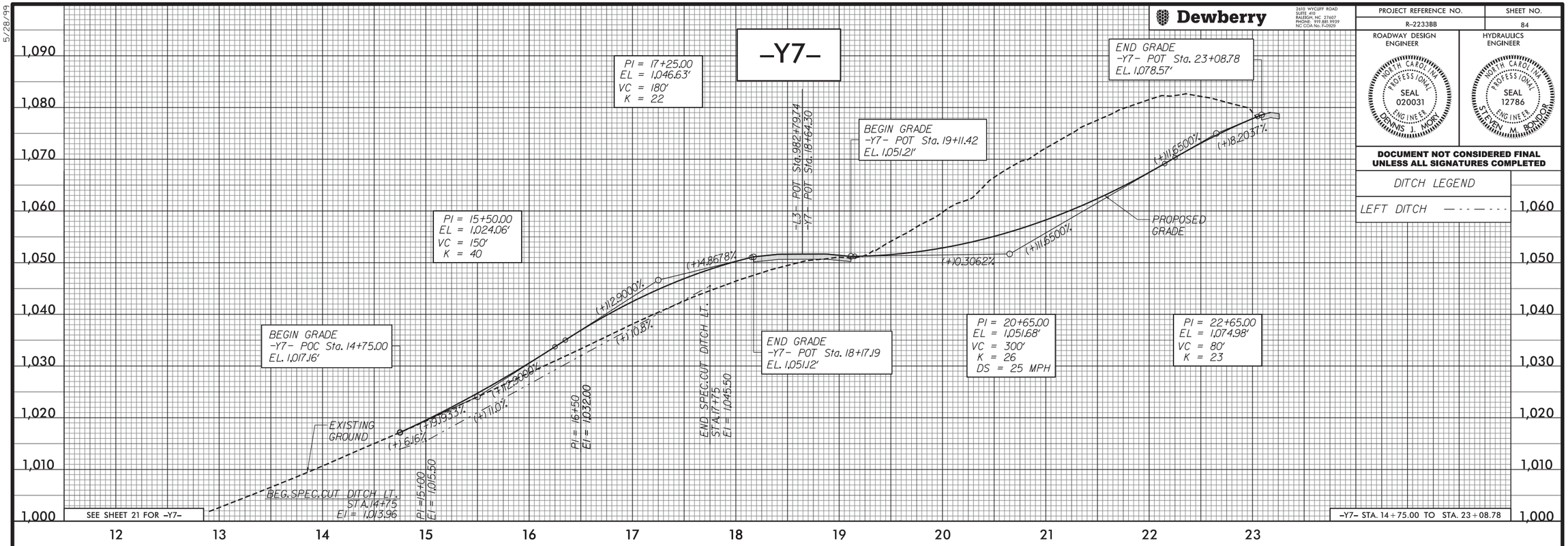
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 84 |

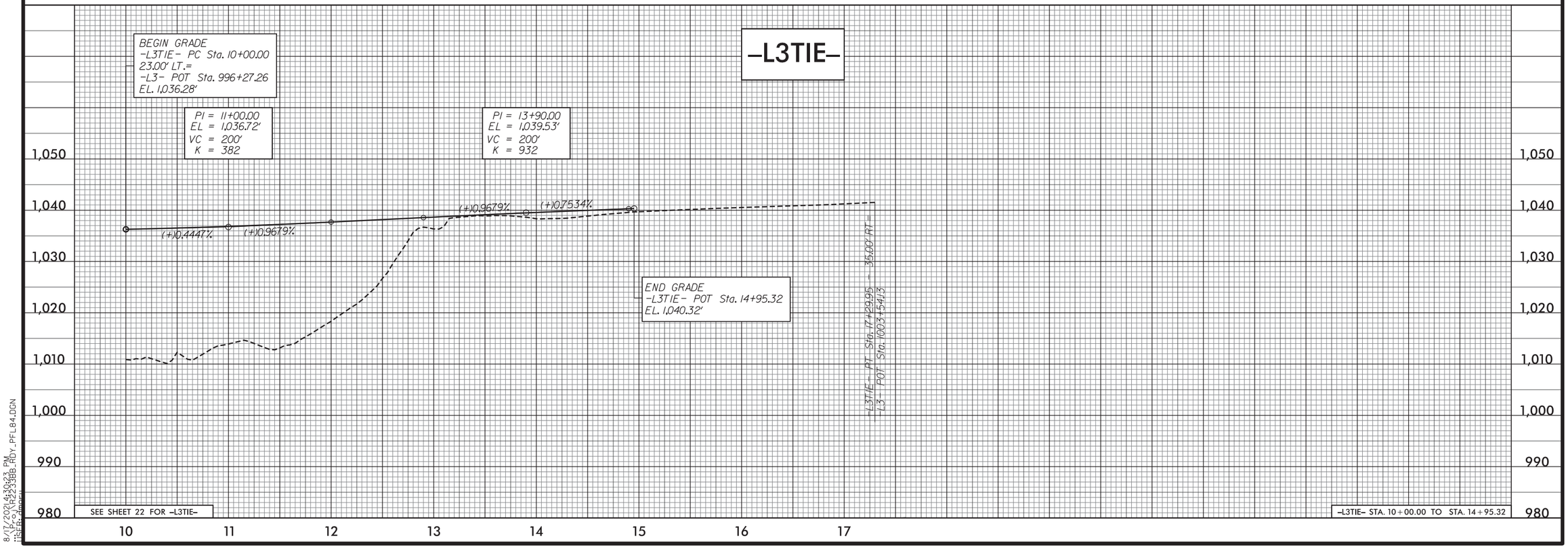
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORIN

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND
LEFT DITCH — - - — - - -




8/17/2021 4:30:23 PM
USER: smorin

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 85 |

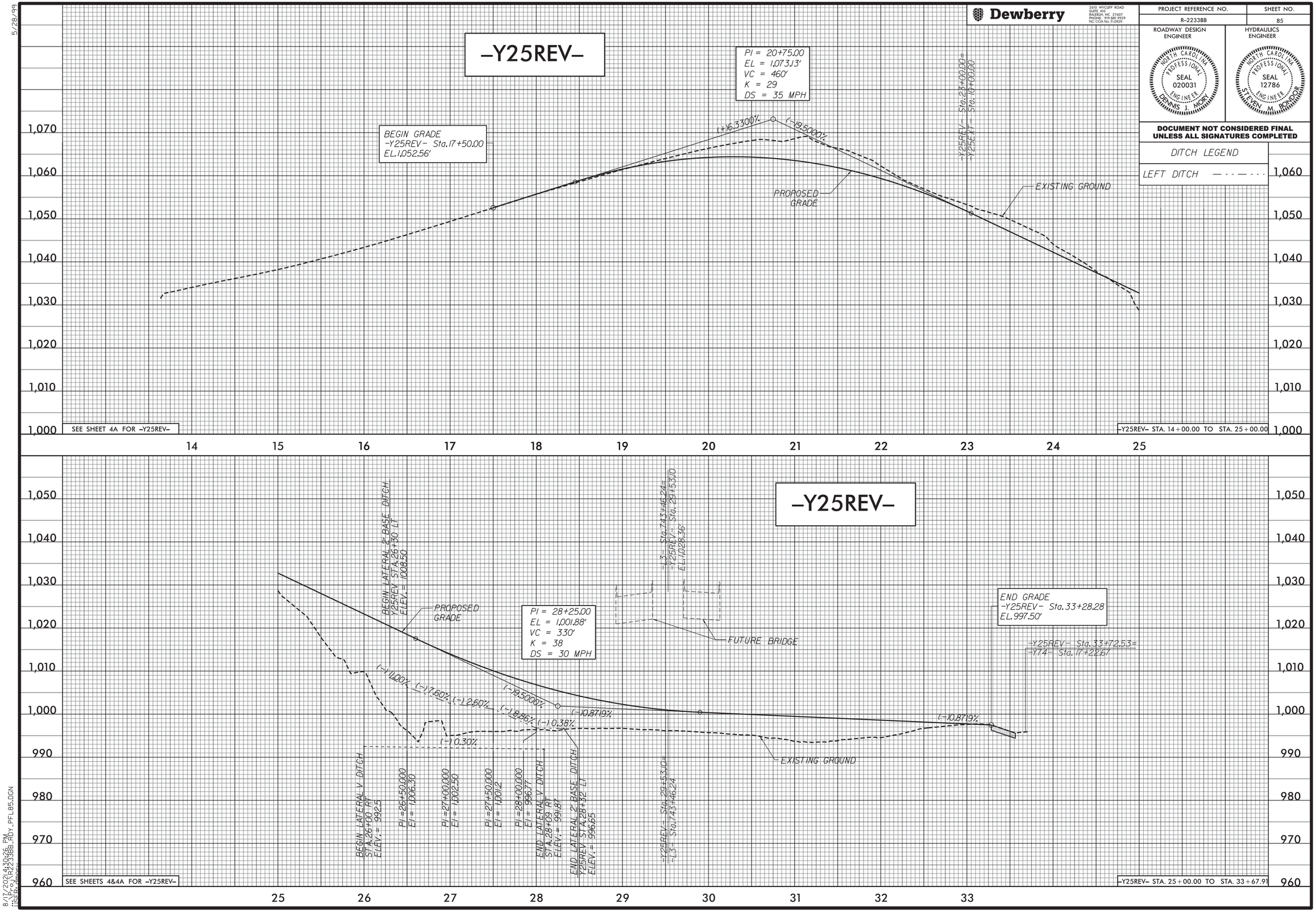
ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORI

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DITCH LEGEND

LEFT DITCH — - - — - - -




5/28/99

8/17/2021 4:33:26 PM
R-2233BB_PROJ_PFL85.DGN
USER: smorris

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-2233BB | 86 |

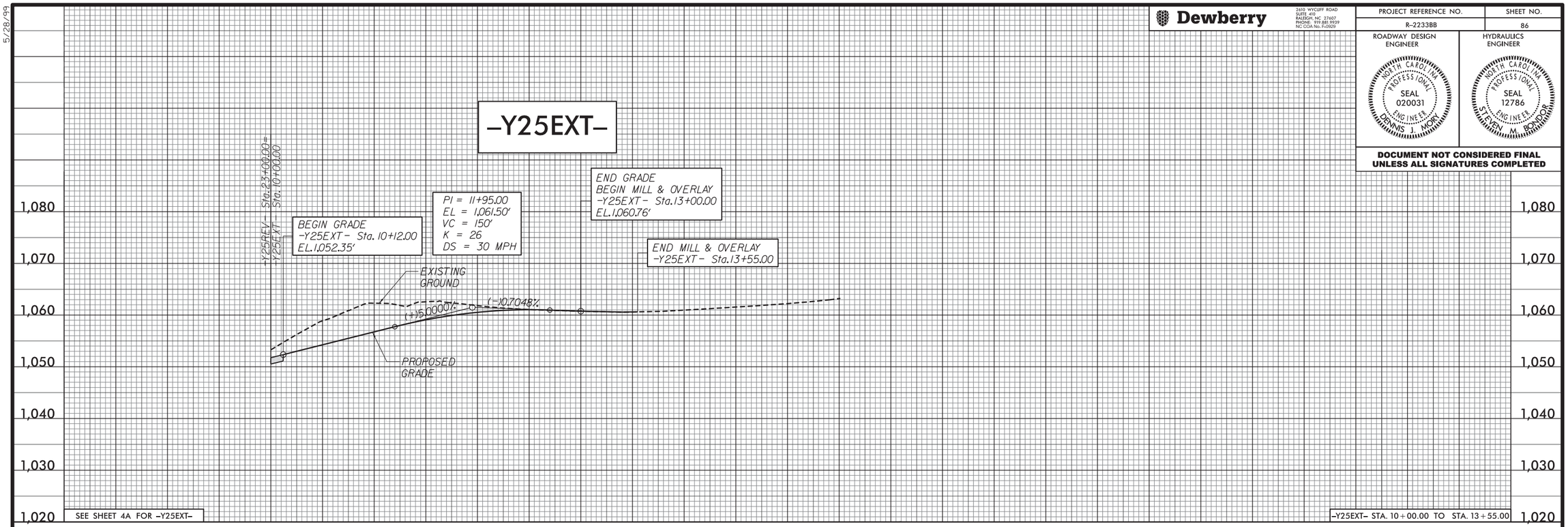
ROADWAY DESIGN ENGINEER

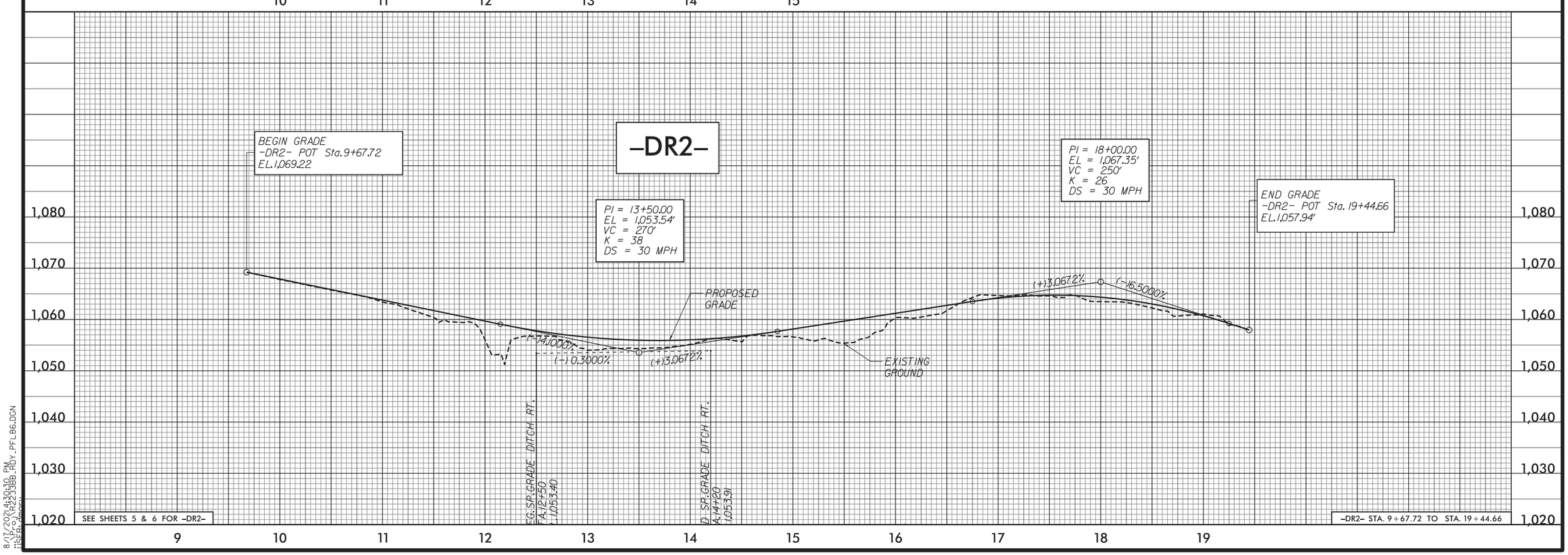
NORTH CAROLINA PROFESSIONAL SEAL 020031 ENGINEER DENNIS J. MORR

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 12786 ENGINEER STEVEN M. BONDOR

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

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USER: jmorr