# Pre-Construction Notification (PCN) Form

**For Nationwide Permits and Regional General Permits**

**(along with corresponding Water Quality Certifications)**

**January 31, 2018 Ver 2.3**

*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.*

*Also, if at any point you wish to print a copy of the E-PCN, all you need to do is right-click on the document and you can print a copy of the form.*

Below is a link to the online help file.

https://edocs.deq.nc.gov/WaterResources/0/edoc/624704/PCN%20Help%20File%202018-1-30.pdf

## A. Processing Information

**County (or Counties) where the project is located:***

**Brunswick**

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

(•) Yes ( ) No

This is any publicly funded by municipal,state or federal funds road, rail, airport transportation project.

**Is this a NCDOT Project?***

(•) Yes ( ) No

**(NCDOT only) T.I.P. or state project number:**

R-5021

**WBS #**

41582.1.1

(for NCDOT use only)

**1a. Type(s) of approval sought from the Corps:***

- [x] Section 404 Permit (wetlands, streams and waters, Clean Water Act)
- [ ] Section 10 Permit (navigable waters, tidal waters, Rivers and Harbors Act)

**1b. What type(s) of permit(s) do you wish to seek authorization?***

- [ ] Nationwide Permit (NWP)
- [x] Regional General Permit (RGP)
- [ ] Standard (IP)

This form may be Corps to initiate the standard/individual permit process. Please contact your Corps representative for submittal of standard permits.

All required items that are not provided in the E-PCN and be added to the miscellaneous upload located at the bottom of this form.

**Regional General Permit (RGP) Number:** **198200031 - NCDOT Bridges, Widening Projects 2015**

**RGP Number Other:**

List all RGP numbers you are applying for not on the drop down list.

**1c. Type(s) of approval sought from the DWR:***

check all that apply

- [x] 401 Water Quality Certification - Regular
- [ ] 401 Water Quality Certification - Express
- [ ] Non-404 Jurisdictional General Permit
- [ ] Riparian Buffer Authorization
- [ ] Individual Permit

**1d. Is this notification solely for the record because written approval is not required?** *

**For the record only for DWR 401 Certification:** ○ Yes ◉ No

**For the record only for Corps Permit:** ○ Yes ◉ No

**1e. Is payment into a mitigation bank or in-lieu fee program proposed for mitigation of impacts?**

If so, attach the acceptance letter from mitigation bank or in-lieu fee program

◉ Yes ○ No

**Acceptance Letter Attachment**

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

R-5021 - STR - RW - NRW - CF 05 & LU 07.pdf 69.88KB

FILE TYPE MUST BE PDF

**1f. Is the project located in any of NC's twenty coastal counties?** *

◉ Yes ○ No

**1g. Is the project located within a NC DCM Area of Environmental Concern (AEC)?** *

○ Yes ◉ No ○ Unknown

**1h. Is the project located in a designated trout watershed?** *

○ Yes ◉ No

Link to trout information: http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/Trout.aspx

# B. Applicant Information

**1a. Who is the Primary Contact?** *

Amy James (NCDOT)

**1b. Primary Contact Email:** *

ajames10@ncdot.gov

**1c. Primary Contact Phone:** *

(xxx)xxx-xxxx

(919)707-6129

**1d. Who is applying for the permit?**

- [x] Owner
- [x] Applicant (other than owner)
- [ ] Agent/Consultant

(Check all that apply)

## 2. Owner Information

**2a. Name(s) on recorded deed:**

**2b. Deed book and page no.:**

**2c. Responsible party:**

(for Corporations)

**2d. Address**

Street Address

Address Line 2

City

State / Province / Region

Postal / Zip Code

Country

**2e. Telephone Number:**

(xxx)xxx-xxxx

**2f. Fax Number:**

(xxx)xxx-xxxx

**2g. Email Address:** *

pharris@ncdot.gov

## 3. Applicant Information (if different from owner)

**3a. Applicant is:**

- ○ Agent
- ◉ Other Secondary NCDOT Contact

If other please specify.

**3b. Name:**

Mason Herndon

**3c. Business Name:**

(if applicable)

**3d. Address**

Street Address

Address Line 2

City

State / Province / Region

Postal / Zip Code

Country

**3e. Telephone Number:**

(910)341-2036

(xxx)xxx-xxxx

**3f. Fax Number:**

(xxx)xxx-xxxx

**3g. Email Address:** *

tmherndon@ncdot.gov

# C. Project Information and Prior Project History

# 1. Project Information

**1a. Name of project:** *

NC 211 from west of NC 906 (Midway Rd.) to east of NC 87- R-5021 Division

**1b. Subdivision name:**

(if appropriate)

**1c. Nearest municipality / town:** *

Southport

**1d. Driving directions** *

If it is a new project and can not easily be found in a GPS mapping system. Please provide directions.

33.963129 N, -78.093207 W

# 2. Project Identification

**2a. Property Identification Number:**

(tax PIN or parcel ID)

**2b. Property size:**

(in acres)

**2c. Project Address**

Street Address

Address Line 2

City

State / Province / Region

Postal / Zip Code

Country

**2d. Site coordinates in decimal degrees**

Please collect site coordinates in decimal degrees. Use between 4-6 digits (unless you are using a survey-grade GPS device) after the decimal place as appropriate, based on how the location was determined. (For example, most mobile phones with GPS provide locational precision in decimal degrees to map coordinates to 5 or 6 digits after the decimal place.)

**Latitude:** *

**33.963129 N**

ex: 34.208504

**Longitude:** *

**-78.093207 W**

-77.796371

## 3. Surface Waters

**3a. Name of the nearest body of water to proposed project:** *

River Swamp, Beaverdam Swamp, Jump and Run Creek, Dutchman Creek

**3b. Water Resources Classification of nearest receiving water:** *

River Swamp (C;Sw), Beaverdam Swamp & Dutchman Creek (SC;Sw;HQW),
Jump and Run Creek (SC;Sw)

Surface Water Lookup

**3c. What river basin(s) is your project located in?** *

**Lumber**

**Cape Fear**

River Basin Lookup

## 4. Project Description

**4a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application:** *

Undeveloped shrub/scrub and forestland interspersed with residential and commercial development.

**4b. Attach an 8 1/2 X 11 excerpt from the most recent version of the USGS topographic map indicating the location of the project site. (for DWR)**

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

File type must be pdf

**4c. Attach an 8 1/2 X 11 excerpt from the most recent version of the published County NRCS Soil Survey map depicting the project site. (for DWR)**

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

File type must be pdf

**4d. List the total estimated acreage of all existing wetlands on the property:**

20 acres

**4e. List the total estimated linear feet of all existing streams on the property:**

(intermittent and perennial)

2,850 linear ft.

**4f. Explain the purpose of the proposed project:** *

To improve traffic operations along NC 211 near Southport.

**4g. Describe the overall project in detail, including indirect impacts and the type of equipment to be used:** *

The project involves widening the existing roadway from 2 lanes to 4 with a raised median, and adding grade-separated interchanges at NC 906 (Midway/Middleton Rd.) and NC 133 (Long Beach Rd.). The project also includes replacing the bridge at Dutchman Creek as well as culverts along the project. Standard road building equipment, such as trucks, cranes, and bulldozers will be used.

**4h. Please upload project drawings for the proposed project.**

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

| | |
|---|---|
| R-5021_Permit package_2018-05-17.pdf | 37.78MB |
| R-5021_Ut_Env_Permit_Full_UE 06 27 2018.pdf | 9.41MB |
| R-5021_RDY_PLFI_REVISEDprint.pdf | 26.88MB |

File type must be pdf

## 5. Jurisdictional Determinations

**5a. Have the wetlands or streams been delineated on the property or proposed impact areas?** *

- (•) Yes
- ( ) No
- ( ) Unknown

**Comments:**

Also includes features delineated as part of R-3324 (constructed) and R-3434 (not constructed)

**5b. If the Corps made a jurisdictional determination, what type of determination was made?** *

- (•) Preliminary
- ( ) Approved
- ( ) Unknown
- ( ) N/A

**Corps AID Number:**

Example: SAW-2017-99999

2007 3647

**5c. If 5a is yes, who delineated the jurisdictional areas?**

**Name (if known):**

**Agency/Consultant Company:** **EcoScience (2007), Kimley Horn (2014)**

**Other:** **Separate approved landowner JD's exist in the project corridor**

**5d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation.**

The Corps visited the site in 2008, 2010, and 2015.

**5d1. Jurisdictional determination upload**

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

File type must be PDF

## 6. Project History

**6a. Have permits or certifications been requested or obtained for this project (including all prior phases) in the past?** *

- ( ) Yes
- (•) No
- ( ) Unknown

## 7. Future Project Plans

**7a. Is this a phased project?** *

○ Yes ◉ No

**Are any other NWP(s), regional general permit(s), or individual permits(s) used, or intended to be used, to authorize any part of the proposed project or related activity? This includes other separate and distant crossing for linear projects that require Department of the Army authorization but don't require pre-construction notification.**

# D. Proposed Impacts Inventory

## 1. Impacts Summary

**1a. Where are the impacts associated with your project? (check all that apply):**

- [x] Wetlands
- [x] Streams-tributaries
- [ ] Buffers
- [x] Open Waters
- [ ] Pond Construction

## 2. Wetland Impacts

If there are wetland impacts proposed on the site, then complete this question for each wetland area impacted.

| 2a. Site # - Reason for impact * | 2b. Impact type * | 2c. Type of wetland * | 2d. Wetland name * | 2e. Forested * | 2f. Type of Jurisdicition * | 2g. Impact area * |
|---|---|---|---|---|---|---|
| **1 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WB** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.170**<br>(acres) |
| **2 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WB** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.040**<br>(acres) |
| **2 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WB** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.120**<br>(acres) |
| **3 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WB** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.670**<br>(acres) |
| **3 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WB** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.130**<br>(acres) |
| **3 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WB** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.030**<br>(acres) |
| **4 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Headwater Forest** | **WD** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.910**<br>(acres) |
| **4 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Headwater Forest** | **WD** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.210**<br>(acres) |
| **4 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Headwater Forest** | **WD** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.070**<br>(acres) |
| **5 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Headwater Forest** | **WC** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.160**<br>(acres) |
| **5 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Headwater Forest** | **WC** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.040**<br>(acres) |

| | | | | | | |
|---|---|---|---|---|---|---|
| **6 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Headwater Forest** | **WE** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.150**<br>(acres) |
| **6 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Headwater Forest** | **WE** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.030**<br>(acres) |
| **9 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WH** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **1.190**<br>(acres) |
| **9 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WH** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.150**<br>(acres) |
| **10 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WL** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.980**<br>(acres) |
| **10 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WL** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.270**<br>(acres) |
| **11 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WO** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.100**<br>(acres) |
| **11 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WO** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.050**<br>(acres) |
| **13 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Headwater Forest** | **WQ** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.040**<br>(acres) |
| **13 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Headwater Forest** | **WQ** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.020**<br>(acres) |
| **14 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Headwater Forest** | **WR** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.050**<br>(acres) |
| **14 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Headwater Forest** | **WR** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **14 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Headwater Forest** | **WR** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.007**<br>(acres) |
| **15 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Small-Basin Wetland** | **WS** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.020**<br>(acres) |
| **15 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Small-Basin Wetland** | **WS** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.020**<br>(acres) |
| **16 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Riverine Swamp Forest** | **WT** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.300**<br>(acres) |
| **16 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Riverine Swamp Forest** | **WT** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.008**<br>(acres) |
| **16 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Riverine Swamp Forest** | **WT** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.020**<br>(acres) |
| **17 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Non-Tidal Freshwater Marsh** | **WU** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.020**<br>(acres) |
| **17 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Non-Tidal Freshwater Marsh** | **WU** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.130**<br>(acres) |

| | | | | | | |
|---|---|---|---|---|---|---|
| **17 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Non-Tidal Freshwater Marsh** | **WU** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.010**<br>(acres) |
| **18 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WV** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.540**<br>(acres) |
| **18 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WV** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.040**<br>(acres) |
| **19 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WX** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **5.350**<br>(acres) |
| **19 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WX** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.300**<br>(acres) |
| **20 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WY** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **2.210**<br>(acres) |
| **20 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WY** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.120**<br>(acres) |
| **21 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WZ** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.080**<br>(acres) |
| **22 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WZ** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.090**<br>(acres) |
| **23 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WAA** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **2.560**<br>(acres) |
| **23 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WAA** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.170**<br>(acres) |
| **28 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Headwater Forest** | **WAB** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.010**<br>(acres) |
| **28 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Headwater Forest** | **WAB** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.040**<br>(acres) |
| **29 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Riverine Swamp Forest** | **WAC** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.280**<br>(acres) |
| **29 - Mechanized Clearin**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Riverine Swamp Forest** | **WAC** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.070**<br>(acres) |
| **30 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Riverine Swamp Forest** | **WAC** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.490**<br>(acres) |
| **30 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Riverine Swamp Forest** | **WAC** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.070**<br>(acres) |
| **32 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Riverine Swamp Forest** | **WAD** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **32 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Riverine Swamp Forest** | **WAD** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **36 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Riverine Swamp Forest** | **WA (R-3434)** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.003**<br>(acres) |

| | | | | | | |
|---|---|---|---|---|---|---|
| **37 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WA (R-3324)** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.220**<br>(acres) |
| **37 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WA (R-3324)** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.050**<br>(acres) |
| **38 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WA (R-3324)** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.060**<br>(acres) |
| **38 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WA (R-3324)** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.009**<br>(acres) |
| **38 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WA (R-3324)** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.030**<br>(acres) |
| **39 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WB (R-3324)** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.010**<br>(acres) |
| **39 - Mechanized Clearing**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WB (R-3324)** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.020**<br>(acres) |
| **42 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WA (R-3324)** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-1 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WB** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-2 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **T**<br>Permanent (P) or Temporary (T) | **Headwater Forest** | **WD** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.070**<br>(acres) |
| **UE- 3 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WO** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE- 4 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WO** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-5 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WO** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.030**<br>(acres) |
| **UE-6 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WO** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-7 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WO** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-8 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WO** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-9 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WO** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-10 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WO** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-11 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WO** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-12 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Non-Tidal Freshwater Marsh** | **WU** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |

| | | | | | | |
|---|---|---|---|---|---|---|
| **UE - 13 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Non-Tidal Freshwater Marsh** | **WU** | **No** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-14 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WZ** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.010**<br>(acres) |
| **UE-15 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **T**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WX** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.002**<br>(acres) |
| **UE-15 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WX** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-16- Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WX** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-16 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **T**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WX** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.002**<br>(acres) |
| **UE-17 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WZ** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-18 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WZ** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-19 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WAA** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-20 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **T**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WAA** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.002**<br>(acres) |
| **UE-20 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Pine Flat** | **WAA** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-21 - Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Riverine Swamp Forest** | **WAC** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-22 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Riverine Swamp Forest** | **WAC** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.001**<br>(acres) |
| **UE-22- Fill**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **T**<br>Permanent (P) or Temporary (T) | **Riverine Swamp Forest** | **WAC** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.002**<br>(acres) |
| **UE-23 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Riverine Swamp Forest** | **WAC** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.002**<br>(acres) |
| **UE- 24 - Excavation**<br>Map label (e.g. Road Crossing 1 - Culvert, dewatering, etc) | **P**<br>Permanent (P) or Temporary (T) | **Riverine Swamp Forest** | **WAC** | **Yes** | **Corps**<br>(404, 10) or DWR (401, other) | **0.004**<br>(acres) |

**2g. Total Temporary Wetland Impact**

0.078

**2g. Total Permanent Wetland Impact**

19.006

**2g. Total Wetland Impact**

19.084

**2h. Comments:**

Any potential ditch draw-down impacts have been included in the total; There will also be 0.02 acre for hand-clearing impacts.

## 3. Stream Impacts

If there are perennial or intermittent stream impacts (including temporary impacts) proposed on the site, then complete this question for all stream sites impacted.

| | 3a. Reason for impact * | 3b.Impact type * | 3c. Type of impact * | 3d. Stream name * | 3e. Stream Type * | 3f. Type of Jurisdiction * | 3g. Stream width * | 3h. Impact length * |
|---|---|---|---|---|---|---|---|---|
| S1 | 5<br>Map label (e.g. Road Crossing 1) | P<br>Permanent (P) or Temporary (T) | Culvert | River Swamp | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 20<br>Average (feet) | 82<br>(linear feet) |
| S2 | 5<br>Map label (e.g. Road Crossing 1) | T<br>Permanent (P) or Temporary (T) | Dewatering | River Swamp | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 20<br>Average (feet) | 14<br>(linear feet) |
| S3 | 6<br>Map label (e.g. Road Crossing 1) | P<br>Permanent (P) or Temporary (T) | Culvert | SF | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 3<br>Average (feet) | 91<br>(linear feet) |
| S4 | 6<br>Map label (e.g. Road Crossing 1) | T<br>Permanent (P) or Temporary (T) | Dewatering | SF | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 3<br>Average (feet) | 9<br>(linear feet) |
| S5 | 7<br>Map label (e.g. Road Crossing 1) | P<br>Permanent (P) or Temporary (T) | Culvert | Midway Branch | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 5<br>Average (feet) | 133<br>(linear feet) |
| S6 | 7<br>Map label (e.g. Road Crossing 1) | T<br>Permanent (P) or Temporary (T) | Dewatering | Midway Branch | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 5<br>Average (feet) | 13<br>(linear feet) |
| S7 | 13<br>Map label (e.g. Road Crossing 1) | P<br>Permanent (P) or Temporary (T) | Culvert | SB | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 10<br>Average (feet) | 153<br>(linear feet) |
| S8 | 13<br>Map label (e.g. Road Crossing 1) | T<br>Permanent (P) or Temporary (T) | Dewatering | SB | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 10<br>Average (feet) | 19<br>(linear feet) |
| S9 | 14<br>Map label (e.g. Road Crossing 1) | P<br>Permanent (P) or Temporary (T) | Culvert | SB | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 10<br>Average (feet) | 16<br>(linear feet) |
| S10 | 14<br>Map label (e.g. Road Crossing 1) | T<br>Permanent (P) or Temporary (T) | Dewatering | SB | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 10<br>Average (feet) | 15<br>(linear feet) |
| S11 | 16<br>Map label (e.g. Road Crossing 1) | P<br>Permanent (P) or Temporary (T) | Culvert | Beaverdam Swamp | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 10<br>Average (feet) | 150<br>(linear feet) |
| S12 | 16<br>Map label (e.g. Road Crossing 1) | T<br>Permanent (P) or Temporary (T) | Dewatering | Beaverdam Swamp | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 10<br>Average (feet) | 10<br>(linear feet) |
| S13 | 17<br>Map label (e.g. Road Crossing 1) | P<br>Permanent (P) or Temporary (T) | Culvert | Beaverdam Swamp | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 20<br>Average (feet) | 59<br>(linear feet) |
| S14 | 17<br>Map label (e.g. Road Crossing 1) | T<br>Permanent (P) or Temporary (T) | Dewatering | Beaverdam Swamp | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 20<br>Average (feet) | 10<br>(linear feet) |
| S15 | 25<br>Map label (e.g. Road Crossing 1) | P<br>Permanent (P) or Temporary (T) | Culvert | SD (Jump and Run Creek) | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 15<br>Average (feet) | 85<br>(linear feet) |
| S16 | 25<br>Map label (e.g. Road Crossing 1) | T<br>Permanent (P) or Temporary (T) | Dewatering | SD (Jump and Run Creek) | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 15<br>Average (feet) | 24<br>(linear feet) |
| S17 | 25A<br>Map label (e.g. Road Crossing 1) | P<br>Permanent (P) or Temporary (T) | Culvert | SH | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 3<br>Average (feet) | 107<br>(linear feet) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| S18 | 26<br>Map label (e.g. Road Crossing 1) | P<br>Permanent (P) or Temporary (T) | Culvert | SD (Jump and Run Creek) | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 15<br>Average (feet) | 116<br>(linear feet) |
| S19 | 26<br>Map label (e.g. Road Crossing 1) | T<br>Permanent (P) or Temporary (T) | Dewatering | SD (Jump and Run Creek) | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 15<br>Average (feet) | 24<br>(linear feet) |
| S20 | 31<br>Map label (e.g. Road Crossing 1) | P<br>Permanent (P) or Temporary (T) | Bank Stabilization | Dutchman Creek | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 20<br>Average (feet) | 18<br>(linear feet) |
| S21 | 31<br>Map label (e.g. Road Crossing 1) | T<br>Permanent (P) or Temporary (T) | Bank Stabilization | Dutchman Creek | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 20<br>Average (feet) | 29<br>(linear feet) |
| S22 | 34<br>Map label (e.g. Road Crossing 1) | P<br>Permanent (P) or Temporary (T) | Culvert | SE | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 12<br>Average (feet) | 73<br>(linear feet) |
| S23 | 34<br>Map label (e.g. Road Crossing 1) | T<br>Permanent (P) or Temporary (T) | Dewatering | SE | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 12<br>Average (feet) | 8<br>(linear feet) |
| S24 | 40<br>Map label (e.g. Road Crossing 1) | P<br>Permanent (P) or Temporary (T) | Culvert | Price Creek | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 12<br>Average (feet) | 26<br>(linear feet) |
| S25 | 40<br>Map label (e.g. Road Crossing 1) | T<br>Permanent (P) or Temporary (T) | Dewatering | Price Creek | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 12<br>Average (feet) | 10<br>(linear feet) |
| S26 | 41<br>Map label (e.g. Road Crossing 1) | P<br>Permanent (P) or Temporary (T) | Culvert | Price Creek | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 12<br>Average (feet) | 40<br>(linear feet) |
| S27 | 41<br>Map label (e.g. Road Crossing 1) | T<br>Permanent (P) or Temporary (T) | Dewatering | Price Creek | Perennial<br>Perennial (PER) or intermittent (INT) | Both | 12<br>Average (feet) | 10<br>(linear feet) |

** All Perennial or Intermittent streams must be verified by DWR or delegated local government.

**3i. Total jurisdictional ditch impact in square feet:**

0

**3i. Total permanent stream impacts:**

1,149

**3i. Total temporary stream impacts:**

195

**3i. Total stream and tributary impacts:**

1344

**3j. Comments:**

## 4. Open Water Impacts

If there are proposed impacts to lakes, ponds, estuaries, tributaries, sounds, the Atlantic Ocean, or any other open water of the U.S. then individually list all open water impacts below.

| 4a. Site # - Reason for impact * | 4b. Impact type * | 4c. Name of waterbody * | 4d. Activity type * | 4e. Waterbody type * | 4f. Impact area * |
|---|---|---|---|---|---|
| 2<br>Map label (e.g. Road Crossing 1) | P<br>Permanent (P) or Temporary (T) | OWE<br>(if applicable) | Fill | Tributary | 0.29<br>(acres) |
| 12<br>Map label (e.g. Road Crossing 1) | P<br>Permanent (P) or Temporary (T) | PE<br>(if applicable) | Fill | Pond | 0.24<br>(acres) |

| | | | | | |
|---|---|---|---|---|---|
| **12**<br>Map label (e.g. Road Crossing 1) | **T**<br>Permanent (P) or Temporary (T) | **PE**<br>(if applicable) | **Fill** | **Pond** | **0.14**<br>(acres) |
| **24**<br>Map label (e.g. Road Crossing 1) | **P**<br>Permanent (P) or Temporary (T) | **PM and PN**<br>(if applicable) | **Drainage** | **Pond** | **0.06**<br>(acres) |
| **35**<br>Map label (e.g. Road Crossing 1) | **P**<br>Permanent (P) or Temporary (T) | **OWF**<br>(if applicable) | **Fill** | **Tributary** | **0.07**<br>(acres) |
| **35**<br>Map label (e.g. Road Crossing 1) | **T**<br>Permanent (P) or Temporary (T) | **OWF**<br>(if applicable) | **Dewatering** | **Tributary** | **0.01**<br>(acres) |
| **37**<br>Map label (e.g. Road Crossing 1) | **P**<br>Permanent (P) or Temporary (T) | **R-3324 Tributary**<br>(if applicable) | **Culverts** | **Tributary** | **0.31**<br>(acres) |
| **37**<br>Map label (e.g. Road Crossing 1) | **T**<br>Permanent (P) or Temporary (T) | **R-3324 Tributary**<br>(if applicable) | **Dewatering** | **Tributary** | **0.01**<br>(acres) |
| **38**<br>Map label (e.g. Road Crossing 1) | **P**<br>Permanent (P) or Temporary (T) | **R-3324 Tributary**<br>(if applicable) | **Culverts** | **Tributary** | **0.29**<br>(acres) |
| **38**<br>Map label (e.g. Road Crossing 1) | **T**<br>Permanent (P) or Temporary (T) | **R-3324 Tributary**<br>(if applicable) | **Dewatering** | **Tributary** | **0.01**<br>(acres) |

**4g. Total temporary open water Impacts:**

0.17

**4g. Total permanent open water impacts:**

1.26

**4g. Total open water impacts:**

1.43

**4h. Comments:**

# E. Impact Justification and Mitigation

## 1. Avoidance and Minimization

**1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing the project:** *

Use of 3:1 slopes in wetlands, where feasible; culverts will be buried 1 ft. and backfilled with native material to encourage aquatic organism passage; cleared ROW limited to 200 ft. or less, where possible

**1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques:** *

Primary Nursery Area in-water work moratorium for Dutchman's Creek from 4/1-9/30; sediment and erosion control devices will be used where appropriate; use of 'Modified Method 3' clearing, which decreases mechanized clearing impacts.

## 2. Compensatory Mitigation for Impacts to Waters of the U.S. or Waters of the State

**2a. Does the project require Compensatory Mitigation for impacts to Waters of the U.S. or Waters of the State?**

◉ Yes ○ No

**2c. If yes, mitigation is required by (check all that apply):**

☑ DWR ☑ Corps

**2d. If yes, which mitigation option(s) will be used for this project?**

☐ Mitigation bank ☑ Payment to in-lieu fee program ☐ Permittee Responsible Mitigation

## 4. Complete if Making a Payment to In-lieu Fee Program

**4a. Approval letter from in-lieu fee program is attached.**

☑ Yes

**4b. Stream mitigation requested:**

(linear feet)

1,131 linear ft.

**4c. If using stream mitigation, what is the stream temperature:**

warm

NC Stream Temperature Classification Maps can be found under the Mitigation Concepts tab on the Wilmington District's RIBITS website.

**4d. Buffer mitigation requested (DWR only):**

(square feet)

**4e. Riparian wetland mitigation requested:**

(acres)

3.2 acres

**4f. Non-riparian wetland mitigation requested:**

(acres)

15.9 acres

**4g. Coastal (tidal) wetland mitigation requested:**

(acres)

**4h. Comments**

## 6. Buffer mitigation (State Regulated Riparian Buffer Rules) - required by DWR

**6a. Will the project result in an impact within a protected riparian buffer that requires buffer mitigation? If yes, you must fill out this entire form - please contact DWR for more information.**

○ Yes ○ No

# F. Stormwater Management and Diffuse Flow Plan (required by DWR)

*** Recent changes to the stormwater rules have required updates to this section .***

## 1. Diffuse Flow Plan

**1a. Does the project include or is it adjacent to protected riparian buffers identified within one of the NC Riparian Buffer Protection Rules?**

○ Yes ◉ No

For a list of options to meet the diffuse flow requirements, click here.

**If no, explain why:**

## 2. Stormwater Management Plan

**2a. Is this a NCDOT project subject to compliance with NCDOT's Individual NPDES permit NCS000250?** *

◉ Yes ○ No

# G. Supplementary Information

## 1. Environmental Documentation

**1a. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land?** *

- [x] Yes
- [ ] No

**1b. If you answered "yes" to the above, does the project require preparation of an environmental document pursuant to the requirements of the National or State (North Carolina) Environmental Policy Act (NEPA/SEPA)?** *

- [x] Yes
- [ ] No

**1c. If you answered "yes" to the above, has the document review been finalized by the State Clearing House? (If so, attach a copy of the NEPA or SEPA final approval letter.)** *

- [x] Yes
- [ ] No

**NEPA or SEPA Final Approval Letter**

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

FILE TYPE MUST BE PDF

## 2. Violations (DWR Requirement)

**2a. Is the site in violation of DWR Water Quality Certification Rules (15A NCAC 2H .0500), Isolated Wetland Rules (15A NCAC 2H .1300), or DWR Surface Water or Wetland Standards or Riparian Buffer Rules (15A NCAC 2B .0200)?** *

- [ ] Yes
- [x] No

**2b. Is this an after-the-fact permit application?** *

- [ ] Yes
- [x] No

## 3. Cumulative Impacts (DWR Requirement)

**3a. Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality?** *

- [ ] Yes
- [x] No

**3b. If you answered "no," provide a short narrative description.**

An indirect and/or cumulative effects study was not completed for this project. The St. James and Southport communities are already undergoing substantial amounts of development along the NC 211 corridor. While the proposed project could contribute to cumulative impacts to environmental resources in the study area, significant changes in land use stemming exclusively from this project are not expected. Therefore, indirect and cumulative effects to environmental resources beyond those discussed here are expected to be low.

## 4. Sewage Disposal (DWR Requirement)

**4a. Is sewage disposal required by DWR for this project?** *

- [ ] Yes
- [ ] No
- [x] N/A

## 5. Endangered Species and Designated Critical Habitat (Corps Requirement)

**5a. Will this project occur in or near an area with federally protected species or habitat?** *

- [x] Yes
- [ ] No

**5b. Have you checked with the USFWS concerning Endangered Species Act impacts?** *

- [x] Yes
- [ ] No

**5c. If yes, indicate the USFWS Field Office you have contacted.**

Raleigh

**5d. Is another Federal agency involved?** *

- [ ] Yes
- [x] No
- [ ] Unknown

**5e. Is this a DOT project located within Division's 1-8?** *

◉ Yes ○ No

**5j. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat?** *

Field surveys (2007, 2014, 2016 [for RCW only]); NC Natural Heritage Program data; endangered species lists maintained by the USFWS and NMFS.

## 6. Essential Fish Habitat (Corps Requirement)

**6a. Will this project occur in or near an area designated as an Essential Fish Habitat?** *

○ Yes ◉ No

**6b. What data sources did you use to determine whether your site would impact an Essential Fish Habitat?** *

Essential Fish Habitat Mapper

## 7. Historic or Prehistoric Cultural Resources (Corps Requirement)

Link to the State Historic Preservation Office Historic Properties Map (does not include archaeological data: http://gis.ncdcr.gov/hpoweb/

**7a. Will this project occur in or near an area that the state, federal or tribal governments have designated as having historic or cultural preservation status (e.g., National Historic Trust designation or properties significant in North Carolina history and archaeology)?** *

○ Yes ◉ No

**7b. What data sources did you use to determine whether your site would impact historic or archeological resources?** *

NEPA Documentation

**7c. Historic or Prehistoric Information Upload**

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

File must be PDF

## 8. Flood Zone Designation (Corps Requirement)

**Link to the FEMA Floodplain Maps:** https://msc.fema.gov/portal/search

**8a. Will this project occur in a FEMA-designated 100-year floodplain?** *

◉ Yes ○ No

**8b. If yes, explain how project meets FEMA requirements:**

NCDOT Hydraulics Unite coordination with FEMA

**8c. What source(s) did you use to make the floodplain determination?** *

FEMA Maps

# Miscellaneous

**Miscellaneous attachments not previously requested.**

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

| | |
|---|---|
| 20160919_letter_Service to NCDOT_R-5021.pdf | 39.66KB |
| R-5021_Interagencyminutes4B_Final.pdf | 194.9KB |
| R5021_Interagencyminutes 4C_Final.pdf | 337.76KB |

File must be PDF or KMZ

# Signature

*

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

- I have given true, accurate, and complete information on this form;
- I agree that submission of this PCN 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 PCN form.

**Full Name:** *

Mack Christopher Rivenbark III

**Signature**

Mack C. Rivenbark, III

**Date**

7/23/2018

**Subject:** Final Minutes from CP-4B Hydraulic Design Review Meeting on August 21, 2014 for R-5021 in Brunswick County

**Date:** September 22, 2014

**Team Members:**

| | |
|---|---|
| Brad Shaver - USACE | (present) |
| Ron Lucas - FHWA | (present) |
| Mason Herndon - NCDWR | (present) |
| Cynthia Van Der Wiele - USEPA | (present) |
| Gary Jordan - USFWS | (present) |
| Steve Sollod - NCDCM | (present) |

**Participants:**
Paul Atkinson, NCDOT Hydraulics
Gary Lovering, NCDOT Roadway Design
Susan Lancaster, NCDOT Roadway Design
Emily Murray, NCDOT SMU
Greg Dickey, NCDOT SMU
Wayne Currie, NCDOT Division 3
Phil Harris, NCDOT NES
Tyler Stanton, NCDOT NES
Jay McInnis, NCDOT PDEA
Jamie Byrd, HNTB
Ben Henegar, HNTB
Ben Carroll, HNTB

The subject project will widen a portion of existing NC 211 (Southport Supply Rd.) from west of SR 1500 (Midway Rd.) to east of NC 87 (River Rd.) from a mostly 2-lane open shoulder section roadway to a 4-lane median divided section with predominantly open shoulders. The project contains five (5) box culvert crossings and two (2) bridge crossings. One of the culvert crossings is a FEMA Limited Detailed Study Stream and one bridge crossing is a FEMA Detailed Study Stream.

The meeting began at 1:15pm.

**General Notes / Comments**

- HNTB advised that one of the primary design issues it needs guidance on involves the replacement of existing ditches through wetland areas. HNTB added that a majority of these existing ditches have little or no grade and are currently holding water.
    - USACE and NCDWR advised that ditches through wetlands are not preferred but may be necessary in certain situations. USACE and NCDWR added that if ditches are constructed in wetlands, "drawdown" of adjacent wetlands should be computed.
    - USACE and NCDWR questioned if proposed impacts have been minimized by using 3:1 slopes in wetland areas?
        - NCDOT NES commented that 3:1 slopes in wetland areas were a commitment at CP 4A but they were not included on the Project Green Sheets.
        - Additional discussion on this issue noted that 4:1 slopes in wetland areas may result in lesser impacts than 3:1 slopes with guardrail and berms.
        - The general consensus was that the designs should incorporate whichever slope results in the least amount of impacts where practical.
    - USACE added that there is an overall concern with the lack of groundwater in the area and that it may be due to drawdown from wells.

- USACE and NCDWR advised that the project ***does not*** have a Final Jurisdictional Determination (JD) and that currently shown wetlands and streams may fall out.
    - NCDOT NES advised that Kimley-Horn & Associates (KHA) is performing final surveys and that a Final JD is expected by the end of September 2014.
    - HNTB advised that this time frame will not allow for incorporation of Final JD calls into either Drainage Package #1 or #2 designs since they are due to Hydraulics on September 19, 2014 and October 3, 2014 respectively.
    - Hydraulics commented that any required revisions for incorporation of Final JD calls will be incorporated once they are received.
- Additional Comments received from NCDWR.
    - Details for all RCBC inlet & outlet channel improvements are required to be shown on the plans.
    - Temporary stream and/or wetland impacts associated with the required dewatering activities to construct culvert & channel improvements are required to be shown and accounted for.
    - Mechanized clearing is the preferred method of clearing in wooded areas. Discussions with several resident engineers and contractors on this subject all prefer Method II Clearing (mechanized clearing 5 ft. beyond the toe of fill) rather than hand clearing in these areas.

**Sheet 4**

- Relocated roadside channel right of -L- "may" need to account for drawdown of adjacent wetlands.

**Sheet 5**

- HNTB questioned whether the "JS" call through the existing 1 @ 10' x 5' RCBC (Private) downstream of the 1 @ 6' x 4' RCBC was accurate?
    - USACE noted that it is a stream but the JS call through the existing RCBC should be removed.
    - HNTB advised that a portion of the existing 1 @ 10' x 5' RCBC would be removed so that the private RCBC is located outside the NCDOT R/W.
- After some discussion on the alignment of the proposed RCBC, it was agreed that the inlet be relocated line ahead off the existing RCBC. It was noted that this revision will assist in construction phasing of the crossing.
- HNTB advised that the existing roadside JS feature right of -L- would be replaced with Special Lateral Base Ditches to maintain current drainage patterns.

**Sheet 6**

- HNTB advised that the existing roadside JS feature right of -L- would be replaced with a Special Lateral Base Ditch to maintain current drainage patterns.
- HNTB advised that the existing 1 @ 10' x 8' RCBC would be removed and replaced with a 2 @ 7' x 7' RCBC at the same location.
    - HNTB added that the proposed RCBC inverts will be higher than the existing RCBC inverts due to existing downstream channel elevations that are approximately 3.0' higher than the inverts.
    - HNTB also added that the proposed RCBC will utilize a normal flow barrel and a high flow barrel with concrete sills.

**Sheet 6 (Cont.)**

- A variable width base ditch left of -L- Sta. 86+50 will be constructed to minimize ditch velocities into the existing wetland.
    - The target 10-yr velocity is 2.0fps.

**Sheet 7**

- No comments.

**Sheet 8**

- The outfall pipe left of -L- Sta. 106+50 is aligned to outlet into the existing linear wetland.
- Drawdown effects of the proposed ditch through the wetland right of -L- Sta. 110+00 may need to be evaluated if the proposed ditch is deeper than existing ditch.

**Sheet 9**

- USACE and NCDWR advised that riprap is not required for the equalizer pipe outlets unless outlet velocities exceed 2.0fps. This comment applies to all equalizer pipes.
- The existing pond right of -L- Sta. 124+00 does not have an outlet.

**Sheet 10**

- No comments.

**Sheet 11**

- Drawdown effects of the proposed ditch right of -L- Sta. 147+00 may need to be evaluated.
- A variable width base ditch left of -L- Sta. 152+50 will be constructed to minimize ditch velocities into the existing wetland.

**Sheet 12**

- USACE and NCDWR advised that riprap is not required for the equalizer pipe outlets unless outlet velocities exceed 2.0fps. This comment applies to all equalizer pipes.

**Sheet 13**

- No comments.

**Sheet 14**

- HNTB will field verify existence of ditch left of -L- Sta. 195+00.

**Sheet 15**

- HNTB will field verify existence of drive left of -L- Sta. 203+50.
- HNTB advised that the impacts to the St. James Plantation Pond left of -L- Sta. 212+00 are unavoidable.
    - NCDWR advised that if the pond was constructed to meet stormwater permitting requirements, the lost volume must be replaced either by the project or property owner so that the property stays in compliance.

**Sheet 16**

- HNTB advised that the impacts to the St. James Plantation Pond left of -L- Sta. 213+50 are unavoidable.
    - A review of the project aerial indicated that sufficient area to reconfigure the pond to the north appears to exist.
- HNTB advised that the pond outfall will be relocated to the toe of the proposed fill slope and tie downstream to the UT to Beaverdam Swamp.
- HNTB advised that the existing 1 @ 48" RCP is actually a 1 @ 4' x 4' RCBC that has been extended with 48" RCP segments upstream and downstream.
    - HNTB added that the existing crossing will be removed and replaced with a 2 @ 6' x 6' RCBC.
    - HNTB also added that the proposed RCBC will utilize a normal flow barrel and a high flow barrel with concrete sills.
    - The existing ditches along the St. James Plantation a maintenance access driver right of -L- Sta. 218+00 will be revised to flow towards Beaverdam Swamp.
- The existing 1 @ 19'-8' bridge crossing at -L- Sta. 226+00 (Beaverdam Swamp) will be removed and replaced with a 2 @ 11' x 9' RCBC.
    - HNTB added that the RCBC will have normal flow and high flow barrels and incorporate step channels upstream and downstream.
    - 2.0' concrete sills will be constructed in the high flow barrel and the barrel will be backfilled in accordance with current Hydraulics Unit guidelines for native material.

**Sheet 17**

- A variable width base ditch left of -L- Sta. 228+00 will be constructed to minimize ditch velocities into the existing wetland.
- HNTB advised that the impacts to the existing stormwater ponds of -L- Stas. 236+00 and 237+50 are unavoidable.
- NCDWR reiterated its concerns that the properties maintain stormwater permit compliance.
- USACE advised that the Conservation Easement left of -L- Sta. 239+00 be indicated on the plans.

**Sheet 18**

- USACE and NCDWR reiterated their position that ditches through wetlands should be eliminated if they're not required.

**Sheet 19**

- HNTB advised that the ditch right of -L- will need to be replaced since the existing pipe right of -L- Sta. 257+50 is a 36" RCP.

**Sheet 20**

- USFWS advised that this plan sheet includes a Red-cockaded Woodpecker (RCW) Partition.
    - USFWS added that the maximum clearing width through this area (-L- Sta. 281+00 - 282+00) should be no greater than 200' from proposed tree line to existing/proposed tree line in order to maintain connectivity.
    - USFWS also stated that a minimum of 75 acres is required for suitable habitat and that if connectivity is not maintained, it may result in "take and adverse effect".
- NCDOT Roadway Design advised that the RCW requirements for this area were provided to HNTB Roadway for incorporation.
- After additional discussion and review of the design plans, it was determined that the RCW criteria could be met if no proposed ditch were constructed left of -L-.

**Sheet 21**

- The RCW Partition exists on this sheet in the vicinity of -L- Sta. 290+00.

**Sheet 22**

- HNTB advised that the ditch right of -L- will need to be replaced since the existing drive pipe sizes right of -L- are 42" & 48" respectively.

**Sheet 23**

- HNTB advised that the existing 2 @ 6' x 4' RCBC at -L- Sta. 316+60 would be removed and replaced with a 2 @ 7' x 7' RCBC.
- After some discussion concerning the outlet of the proposed RCBC, it was decided that the outlet end should be shifted to the east to better align with the existing channel.

**Sheet 24**

- No environmental impacts.

**Sheet 25**

- No environmental impacts.

**Sheet 26**

- No environmental impacts.

**Sheet 27**

- HNTB advised that the existing JS left of -L- Sta. 366+00 would be relocated at the proposed toe of fill in a lateral base ditch.
    - USACE and NCDWR advised that they will revisit this site in the field to verify the JS call.

**Sheet 27 (Cont.)**

- HNTB advised that the existing 1 @ 37.5' bridge over Dutchman Creek would be removed and replaced with dual 3-span 140' bridges.
    - HNTB added that the bridge lengths were a commitment from CP 4A.
    - HNTB also added that Dutchman Creek is a FEMA Detailed Study stream and that it would be designed to meet MOA criteria.
- HNTB advised that a review of plans for the Sacred Heart Catholic Church Pond indicated that no runoff from the church is discharged into the pond left of -L- Sta. 375+00 and that the pond is not connected to the pond left of -L- Sta. 375+50.

**Sheet 28**

- HNTB advised that the existing bridge over the Duke Energy Canal would be retained and retrofitted to meet current barrier requirements and guidelines.
    - NCDOT SMU acknowledged that this was their design goal but noted that it may not be possible.
- HNTB advised that the proposed westbound bridge crossing would closely match the existing bridge length and span layout of the eastbound bridge.
    - HNTB added that per discussions with NCDWR, deck drains would be allowed to discharge directly into the canal.

**Sheet 29**

- No environmental impacts.

**Sheet 30**

- No environmental impacts.

**Sheet 31**

- HNTB advised that the majority of drainage on this plan sheet is discharged left of -L- Sta. 428+50 into a JS.

**Sheet 32**

- No environmental impacts.

**Sheet 33**

- HNTB advised that a variable width base ditch would be utilized left of -Y- Sta. 7+75 to minimize velocities into the existing wetland.

**Sheet 34**

- No environmental impacts.

**Sheet 35**

- HNTB advised that the existing wetland boundaries left of -Y- Sta. 37+00 do not appear to extend to their extents towards the project.
    - After some additional discussion about this area, it was determined that this area is a conservation easement that ***"cannot be impacted"*** by the project.
    - NCDOT Roadway Design commented that there appears to be an additional lane shown that may not be required.
    - HNTB advised that it would review with HNTB Roadway Design.

**Sheet 36**

- HNTB advised that the existing 30" RCP at -Y23- Sta. will be removed and replaced with a 48" RCP buried 1.0' due to the JS classification.
    - NCDWR commented that construction is currently ongoing is this area.
    - HNTB advised that it would review the proposed plans for the project and visit the site to verify the proposed crossing size.

**Sheet 37**

- No environmental impacts.

**Sheet 38**

- No environmental impacts.

There were no closing comments and the meeting adjourned at 3:15pm.

**Subject:** **Final** Minutes from CP-4C Hydraulic Design Review Meeting on January 10, 2018 for R-5021 in Brunswick County

**Team Members:**

| | |
|---|---|
| Brad Shaver – USACE | (present) |
| Joanne Steenhuis – NCDWR | (present) |
| Cathy Brittingham – NCDCM | (present) |
| Stephen Lane – NCDCM | (Telephone) |
| Fritz Rohde – NMFS | (Telephone) |

**Participants:**
Mason Herndon – NCDOT Division 3
Michael Bass – NCDOT Division 3
Mark Staley – NCDOT REU
Chris Rivenbark – NCDOT ECAP
Kim Gillespie – NCDOT CPDT
Allen Serkin – Cape Fear RPO
Doug Wheatley – HNTB
Matt Foster – HNTB
Adam Archual – HNTB
Jamie Byrd – HNTB

The meeting began at 1:00pm in the Hydraulics Conference Room.

**GENERAL NOTES / COMMENTS**

- HNTB advised that the 4B Meeting for the project was held on August 21, 2014, and provided Meeting Minutes from the meeting.
- There were no comments on the Stormwater Management Plan (SMP).
- USACE requested that draw down impacts be computed and reported for all ditches in/or adjacent to wetlands unless the existing and proposed ditches are the same depth or the proposed ditch is less than 1.5' (18") in depth.
- Draw down impacts should be addressed in the permit application, and appear as a note on the plans. *DWR, USACE and NCDOT Div. 3 discussed and came to a resolution regarding the ditches and identified where drainage effects need to be accounted for and this will be addressed in the permit application.*
    - Draw down impacts are not required to be shown in the Impact Summary Table.
    - The permit application should note whether the draw down impacts occur in a riparian or non-riparian wetland system.
- DWR asked why no impacts were shown beyond the cut lines within jurisdictional features.
    - It was noted that "Safety Fence" will be placed along the existing or proposed R/W to discourage impacts to jurisdictional resources outside of NCDOT's R/W.
    - Division noted that the safety fence would be installed by hand.
    - After some discussions, it was agreed that no impacts would be shown or computed beyond the cut limits.
- It was requested that property lines, parcel owner names and parcel numbers will be added to the permit drawings.
- DCM requested that the Control of Access (C/A) and Conservation Easement be depicted on the R-5021 permit drawings in the same way it was depicted in the R-2245 drawings.
    - The C/A in the MOA is located on both sides of Middleton Boulevard. The same note from the R-2245 drawings will be placed on the R-5021 drawings (DCM provided the note to HNTB at the meeting).
    - DCM also requested that the Conservation Easement be labeled on the permit drawings.
    - NCDOT noted that the C/A inside Quadrant C (southwest quadrant) will be removed and that this area may be utilized in the future by the Town of Oak Island for a Fire/Rescue Station.

**Sheet 1**

- Update Let Date to December 18, 2018.

**Sheet 2 (Site 1):**

- DWR questioned whether the Access Break right of -L- Station 55+00 could be relocated so that it doesn't promote access directly into the wetland.
  - HNTB advised that it would investigate and advise.
- HNTB added that the Access Break was added as a condition during ROW negotiations. *DWR, USACE and NCDOT Div. 3 discussed and agreed that any driveway proposed where one did not previously exist should not be shown on the plans, only a break in access should be dedicated.*

**Sheet 5 (Site 2):**

- USACE advised that the JS currently shown on the plans left of -L- Station 64+00 between the existing RCBCs does not exist.
  - HNTB will remove the JS designation from this feature in the FS File.
- NCDOT advised HNTB to remove the proposed drive right of -L- Sta. 66+50 since no drive currently exists.
  - NCDOT added that proposed drives should only be shown on the plans if there is an existing drive.
  - USACE expressed a general concern regarding driveways and pipes adjacent to wetlands. NCDOT acknowledged the concern and requested the topic be addressed at the next Division meeting.

**Sheet 12:**

- USACE and DCM requested a note be added to the permit drawing indicating 1 foot of native material will be placed in the RCBC.
  - HNTB advised that it would add the Std. Note that's shown on the Culvert Survey Report (CSR).
  - This comment will be incorporated at all applicable RCBC locations.

**Sheet 15 (Site 7 & Site 8):**

- HNTB advised that the base mapping left of -L- Sta. 109+00 was not current as a result of the Pine Forest Development.
  - HNTB added that Location & Surveys was in the process of updating the base mapping and that the revised permit drawings would be up-to date.

**Sheet 20 (Site 9):**

- DWR questioned the purpose of the proposed 36" RCP since there was not a wetland right of -L-.
  - HNTB advised that the RCP's purpose is to allow flows from left of -L- into the wetland right of -L-.
- DWR requested that "Fill" impacts be shown around the end of the proposed 36" RCP beyond the slope/stake limit.
  - HNTB advised that the requested impacts would be added.

**Sheet 23 (Site 10):**

- USACE requested clarification on the width of Mechanized Clearing left of -L- Sta. 130+50.
  - HNTB & NCDOT advised that Clearing Method "Modified Method 3" results in 5 feet Mechanized Clearing impacts for fill heights of 0-9 feet while fill heights of 10 feet or greater result in 10 feet of Mechanized Clearing impacts.

**Sheet 31 (Site 15 & Site 16):**

Site 15

- DWR requested that this Site be shown as a total take.
  - NCDOT noted that typically total takes are not shown in permit drawings.
  - NCDOT advised that impacts from utilities are not shown on the Roadway Plan Permit Drawings and will appear in a separate permit package.
  - It was noted that Hand Clearing (HC) associated with utility relocations is temporary.
  - It is agreed that since the impact is less than 0.25 acres, Site 15 will be considered a Total Take.
  - Mechanized clearing will be removed from this site. The Total Take will not be shown on the drawing, but will be noted in the permit application and enumerated in comments on impact summary.
- NCDOT-EAU asked USACE whether there was agreement on 1:1 mitigation ratio for Total Takes.
  - USACE responded that it seemed reasonable. EAU will provide USACE with examples.

Site 16

- Extend Excavation in Wetlands limits to include area left of -L- Sta. 225+35 that is currently omitted.

**Sheet 41 (Site 18):**

- USACE will check the permit to determine if this is a Conservation Easement or a declaration of covenant is present.
  - HNTB will also inquire with R/W acquisition agent (CLA) about any protections on this parcel. *HNTB contacted CLA who investigated this parcel and did not find any dedications or restrictions. The USACE also investigated the parcel for a conservation easement and could not find any easements.*

**Sheet 46 (Site 19):**

- USACE asked whether the driveway left of -L- Sta. 259+50 could be moved back station so that it does not direct traffic into the wetland.
  - HNTB advised that the drive was placed at this location to avoid potential turning conflicts associated with Regency Crossing left-over.
- DWR questioned the need for the proposed Toe Protection left of -L- Sta. 256+00 around the U-turn bulb and the 2 @ 30" RCPs left of -L- Sta. 266+00.
  - HNTB advised that the Toe Protection was to protect the embankment from surface flow against the toe of fill slope.

**Sheet 49 (Site 21 & Site 22):**

- DWR asked about the proposed drainage around the utility poles and whether pipes could be utilized towards the roadway side of the poles, as opposed to in the current proposed ditches on the wetlands side of the poles.
  - HNTB advised that the decision to use a ditch was based on capacity; the ditches will convey more water than pipes would.
  - HNTB added that there is a need to convey more water in these locations than in other areas where pipes have been utilized.
  - HNTB confirmed that the BEMC has evaluated the proposed conditions and that the proposed designs will not adversely affect the existing concrete utility poles.

**Sheet 59 (Site 25):**

- USACE questioned the use of sills in both barrels of the proposed RCBC.
  - HNTB advised that sills in both barrels were required by Hydraulics due to the slope of the proposed RCBC.
  - After some discussion, it was agreed that the RCBC would be backfilled with a combination of riprap native material and noted as such on the applicable permit drawings.

**Sheet 64 (Site 27):**

- USACE advised that the feature is not included in the PJD.
  - HNTB will remove the feature from the FS File
  - The removal of this Site will not require that the remaining sites be renumbered; this site will be noted as eliminated.

**Sheet 70 (Site 30):**

- USACE questioned the width of Mechanized Clearing left of -L- Sta. 371+00 and was advised by HNTB that it was the result of fill height.
- USACE also asked whether the drive left of -L- Sta. 372+30 leading into the wetland could be eliminated.
  - NCDOT advised HNTB to remove the drive from the Plans since there was not an existing drive at this location. *DWR, USACE and NCDOT Div. 3 discussed and agreed that any driveway proposed where one did not previously exist should not be shown on the plans, only a break in access should be dedicated.*
  - HNTB advised that the church is engaged with the state Attorney General's Office regarding impacts to their property and that removal of the drive may become a bigger issue.

**Sheet 84 (Site 4):**

- DCM reiterated its request to have the Conservation Easement labeled.
- DWR requested that the Mechanized Clearing limits be extended and tied into the fill slope line near -YREV- Sta. 46+50 LT.

**Sheet 87 (Site 30 & Site 37):**

Site 30

- USACE requested that the Site #'s be verified; it should be Site 37.

Site 37

- NCDOT noted that the impact here is an open water (Surface Water) impact, not a stream impact.
  - NCDOT added that this should be revised to a "JS Non Mit" line.
  - The Impact Summary Table will be modified for the appropriate type of impact.

**Sheet 89 (Site 37 & Site 38):**

Site 37

- NCDOT noted that the impact here is an open water (Surface Water) impact, not a stream impact.
  - The Impact Summary Table will be modified for the appropriate type of impact.

Site 38

  - DWR advised that the small omitted area left of -Y14A Sta. 65+50 be included as an impact.

**Sheet 93 (Site 39):**

- DWR asked about the use of the 4:1 slopes in this area. If this condition were to remain, justification would have to be provided in the cover letter transmitting the permit application.
    - HNTB advised that that the 4:1 slope was used to avoid the need for guardrail.
    - HNTB added that the additional of guardrail would require widening the shoulder 3 feet.
    - HNTB will revisit this are to determine if the fill slope can be steepened to match the existing slopes.

**Impact Summary Tables**

- NCDOT-EAU advised that stream impacts should be reported in whole numbers only.

**Closing Statements**

- NCDOT advised that USACE General Permit (GP) 31 would be used for this project.
- *The project does not require a CAMA permit because it does not impact any CAMA Areas of Environmental Concern, and the project does not require a determination of consistency with the N.C. Coastal Management Program because USACE GP 31 contains the following Special Condition b: " If the project will not impact a designated "Area of Environmental Concern" (AEC) in the twenty (20) counties of North Carolina covered by the North Carolina Coastal Area Management Act (CAMA), then a consistency submission is not required…."*

The meeting adjourned at 3:30pm.

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

September 19, 2016

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

Dear Mr. Harris:

This letter is in response to your letter of September 15, 2016 which provided the U.S. Fish and Wildlife Service (Service) with the biological conclusion of the North Carolina Department of Transportation that the proposed widening of NC 211 from SR 1500 (Midway Road) to NC 87 in Brunswick County (TIP No. R-5021) may affect, but is not likely to adversely affect the federally endangered red-cockaded woodpecker (RCW, *Picoides borealis*). These comments are provided in accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

According to information provided, helicopter and ground surveys were conducted for RCW cavity trees in March 2016 within the 0.5 mile radius of the 7.3 mile project corridor between Midway and Southport. No active RCW cavity trees were observed. Of greatest concern was the previously active RCW cluster BRU 75. This RCW cluster was last known to be active in 2010. The cluster was observed to be inactive in 2015 and 2016.

Based on the survey results and other available information, the Service concurs with your conclusion that the proposed project may affect, but is not likely to adversely affect the RCW. We believe that the requirements of Section 7(a)(2) of the ESA have been satisfied. We remind you that obligations under Section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

The Service appreciates the opportunity to review this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

Sincerely,

Gary Jordan

for Pete Benjamin
Field Supervisor

Electronic copy:

Tyler Stanton, NCDOT, Raleigh, NC
Brad Shaver, USACE, Wilmington, NC
Travis Wilson, NCWRC, Creedmoor, NC

Environmental Quality

ROY COOPER
Governor

July 5, 2018

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

Dear Mr. Harris:

Subject: Mitigation Acceptance Letter:

**R-5021,** NC 211 from SR 1500 (Midway Road) to NC 87, Brunswick County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the stream and wetland mitigation for the subject project. Based on the information supplied by you on June 28, 2018, impacts are located in CU 03030005 of the Cape Fear River basin and CU 03040207 of the Lumber River basin in the Southern Outer Coastal Plain (SOCP) Eco-Region, and are as follows:

| Stream and Wetlands | River Basin | CU Location | Eco-Region | Stream | | | Wetlands | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Cold | Cool | Warm | Riparian | Non-Riparian | Coastal Marsh |
| Impacts | Cape Fear | 03030005 | SOCP | 0 | 0 | 825.0 | 1.60 | 12.1 | 0 |
| Impacts | Lumber | 03040207 | SOCP | 0 | 0 | 306.0 | 1.60 | 3.80 | 0 |

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

The impacts and associated mitigation needs were under projected by the NCDOT in the 2018 impact data. DMS commits to implement sufficient compensatory stream and wetland mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies using the delivery timeline listed in Section F.3.c.iii of the In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from DMS

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

Sincerely,

James B. Stanfill
DMS Asset Management Supervisor

Cc: Mr. Monte Matthews, USACE – Raleigh Regulatory Field Office
Ms. Amy Chapman, NC Division of Water Resources
File: R-5021

**North Carolina Department of Transportation**

**Highway Stormwater Program**
**STORMWATER MANAGEMENT PLAN**
**FOR NCDOT PROJECTS**

(Version 2.08; Released April 2018)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **WBS Element:** | 41582.1.1 | **TIP No.:** | R-5021 | **County(ies):** | Brunswick | **Page** 1 | **of** 6 |

## General Project Information

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **WBS Element:** | 41582.1.1 | **TIP Number:** | R-5021 | **Project Type:** | Roadway Widening | **Date:** | 5/8/2018 |
| **NCDOT Contact:** | Mason Herndon | | | **Contractor / Designer:** | HNTB North Carolina, P.C. / James A. Byrd, PE | | |
| **Address:** | 5501 Barbados Blvd.<br>Castle Hayne, NC 28429 | | | **Address:** | 343 E. Six Forks Road<br>Suite 200<br>Raleigh, NC 27609 | | |
| **Phone:** | (910) 341-2036 | | | **Phone:** | (919) 424-0437 | | |
| **Email:** | tmherndon@ncdot.gov | | | **Email:** | jabyrd@hntb.com | | |
| **City/Town:** | St. James / Southport | | | **County(ies):** | Brunswick | | |
| **River Basin(s):** | Cape Fear | | | **CAMA County?** | Yes | | |
| **Wetlands within Project Limits?** | Yes | | | | | | |

## Project Description

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project Length (lin. miles or feet):** | 7.26 | **Surrounding Land Use:** | Rural | | | | |
| | **Proposed Project** | | | **Existing Site** | | | |
| **Project Built-Upon Area (ac.)** | 162.0 | ac. | | 114.4 | ac. | | |
| **Typical Cross Section Description:** | 4-lane divided roadway facility consisting of 12' travel lanes with curb and gutter. | | | 5-lane divided facility with 11' lanes and curb and gutter. | | | |
| **Annual Avg Daily Traffic (veh/hr/day):** | Design/Future: | 44000 | Year: 2018 | Existing: | 44000 | Year: | 2038 |
| **General Project Narrative:**<br>**(Description of Minimization of Water Quality Impacts)** | R-5021 involves the altercation of NC 211 from a 2-lane undivided facility to a 4-lane divided facility from west of NC 209 to east of NC 87. Typical section of existing roadway is a 2-lane undivided facility consisting of 12' travel lanes. Existing roadway will be replaced with 4-lane divided facility consisting of 12' travel lanes with raised median. Wetlands and jurisdictional streams are present within project limit. Roadway improvements will require the existing closed drainage system to be replaced and new roadway ditches. Rip Rap pads were used at pipes outlets throughout the project to reduce velocities into wetlands. | | | | | | |

## Waterbody Information

| | | | | | | |
|---|---|---|---|---|---|---|
| **Surface Water Body (1):** | UT to Beaverdam Creek | | **NCDWR Stream Index No.:** | 18-88-9-1-(0.5) | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Class SC | | | |
| | | **Supplemental Classification:** | Swamp Waters (Sw) | (HQW) | | |
| **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?** | 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 2.08; Released April 2018)

| **WBS Element:** | 41582.1.1 | **TIP No.:** | R-5021 | **County(ies):** | Brunswick | **Page** | **2** | **of** | **6** |
|---|---|---|---|---|---|---|---|---|---|

**Additional Waterbody Information**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Surface Water Body (2):** | Beaverdam Creek | | **NCDWR Stream Index No.:** | 18-88-9-1-(0.5) | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Class C | | | |
| | | **Supplemental Classification:** | Swamp Waters (Sw) | (HQW) | | |
| **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?** | No | (If yes, provide justification in the General Project Narrative) | | (If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative) | | |
| (If yes, provide justification in the General Project Narrative) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Surface Water Body (3):** | UT to Jump and Run Creek | | **NCDWR Stream Index No.:** | 18-88-9-3-2 | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Class SC | | | |
| | | **Supplemental Classification:** | Swamp Waters (Sw) | | | |
| **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?** | No | (If yes, provide justification in the General Project Narrative) | | (If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative) | | |
| (If yes, provide justification in the General Project Narrative) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Surface Water Body (4):** | Dutchman Creek | | **NCDWR Stream Index No.:** | 18-88-9-3-(1) | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Class SC | | | |
| | | **Supplemental Classification:** | Swamp Waters (Sw) | (HQW) | | |
| **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) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Surface Water Body (5):** | UT to Dutchman Creek | | **NCDWR Stream Index No.:** | 18-88-9-3-(1) | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Class SC | | | |
| | | **Supplemental Classification:** | Swamp Waters (Sw) | (HQW) | | |
| **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?** | 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 2.08; Released April 2018)

| WBS Element: | 41582.1.1 | TIP No.: | R-5021 | County(ies): | Brunswick | Page | 3 | of | 6 |
|---|---|---|---|---|---|---|---|---|---|

## Additional Waterbody Information

| | | | | | |
|---|---|---|---|---|---|
| **Surface Water Body (6):** | Price Creek | **NCDWR Stream Index No.:** | 18-88-3 | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Class SC | | |
| | | **Supplemental Classification:** | Swamp Waters (Sw) | | |
| **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?** | No | (If yes, provide justification in the General Project Narrative) | | (If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative) | |
| (If yes, provide justification in the General Project Narrative) | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Surface Water Body (7):** | UT to Price Creek | **NCDWR Stream Index No.:** | 18-88-3 | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Class C | | |
| | | **Supplemental Classification:** | Swamp Waters (Sw) | | |
| **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?** | No | (If yes, provide justification in the General Project Narrative) | | (If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative) | |
| (If yes, provide justification in the General Project Narrative) | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Surface Water Body (8):** | UT to River Swamp | **NCDWR Stream Index No.:** | 15-25-1-6 | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Class C | | |
| | | **Supplemental Classification:** | Swamp Waters (Sw) | | |
| **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?** | No | (If yes, provide justification in the General Project Narrative) | | (If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative) | |
| (If yes, provide justification in the General Project Narrative) | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Surface Water Body (9):** | Midway Branch | **NCDWR Stream Index No.:** | 15-25-1-6-1 | | |
| **NCDWR Surface Water Classification for Water Body** | | **Primary Classification:** | Class C | | |
| | | **Supplemental Classification:** | Swamp Waters (Sw) | | |
| **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?** | 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) | | | | | |

09/08/99

TIP PROJECT: R-5021

CONTRACT:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | R-5021 | 1 | |

| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 41582.1.1 | STP-0211(21) | PE |
| 41582.2.2 | STP-0211(21) | UTILITIES |
| 41582.2.3 | STP-0211(21) | R/W |

PERMIT DRAWING
SHEET 1 OF 95

# BRUNSWICK COUNTY

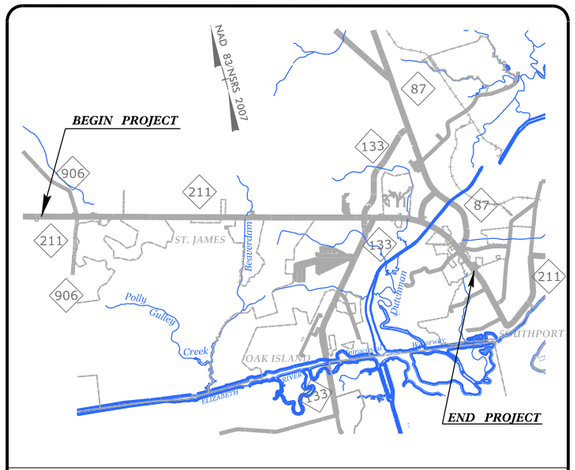
**LOCATION: NC 211 FROM WEST OF NC 906 (MIDWAY ROAD) TO EAST OF NC 87**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERTS & SIGNALS**

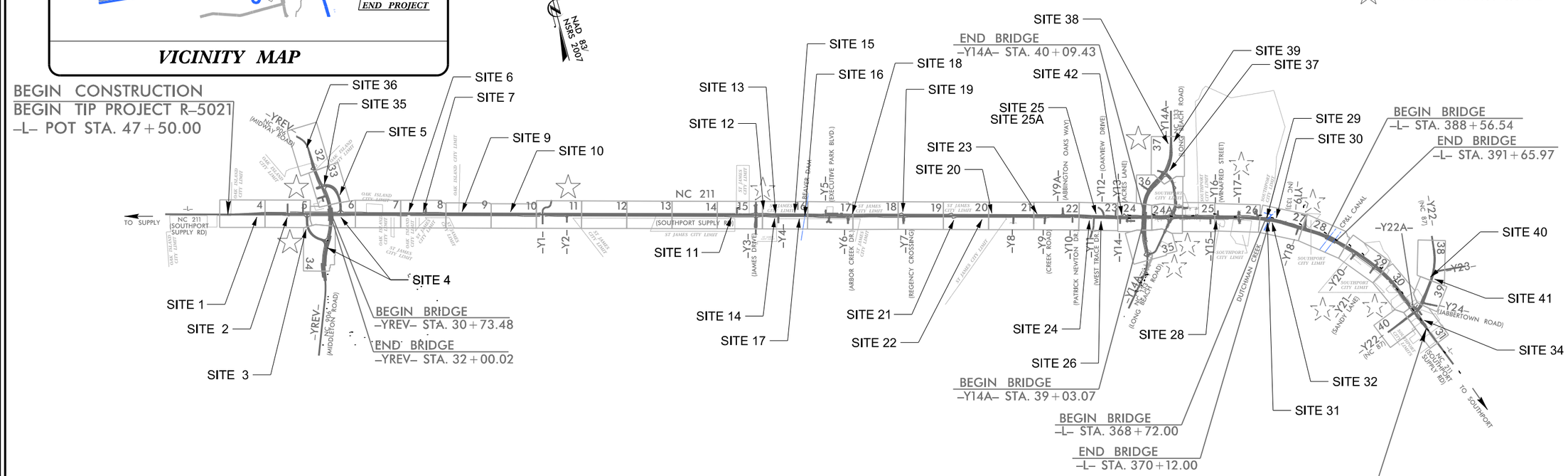
## WETLAND AND SURFACE WATER IMPACTS PERMIT

EXISTING TRAFFIC SIGNAL

PROPOSED TRAFFIC SIGNAL




VICINITY MAP




NOTES:

1. This is a partial controlled-access project with access being limited to points as shown on the plans.
2. A portion of this project is within the municipal boundaries of Oak Island, St. James, and Southport.
3. Clearing on this project shall be performed to the limits established by Modified Method III.

**GRAPHIC SCALES**

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

**DESIGN DATA**

ADT 2018 = 28,000
ADT 2038 = 44,000
K = 8 %
D = 55 %
T = 6 % *
V = 40-60 MPH
* (TTST 2% + DUAL 4%)
FUNC CLASS =
RURAL MAJOR COLLECTOR
REGIONAL TIER

**PROJECT LENGTH**

LENGTH OF ROADWAY T.I.P. PROJECT R-5021 = 7.178 MILES
LENGHT OF STRUCTURES T.I.P. PROJECT R-5021 = 0.085 MILES
TOTAL LENGTH OF T.I.P. PROJECT R-5021 = 7.263 MILES

ALL LENGTH BASED ON -L- CENTERLINE

Prepared in the Office of:
**HNTB NORTH CAROLINA, P.C.**
343 E. Six Forks Road, Raleigh NC, 27609

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 28, 2016

LETTING DATE:
DECEMBER 18, 2018

DOUG WHEATLEY, PE
PROJECT ENGINEER

ANDY HALL, EI
PROJECT DESIGN ENGINEER

DAVID LEONARD, PE
NCDOT ROADWAY PROJECT ENGINGEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

5/15/2018
...\R-5021_HYD_PERMIT_DRAWINGS_PSHL1 of 95_TSH.dgn
HNTB

5/14/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 4 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

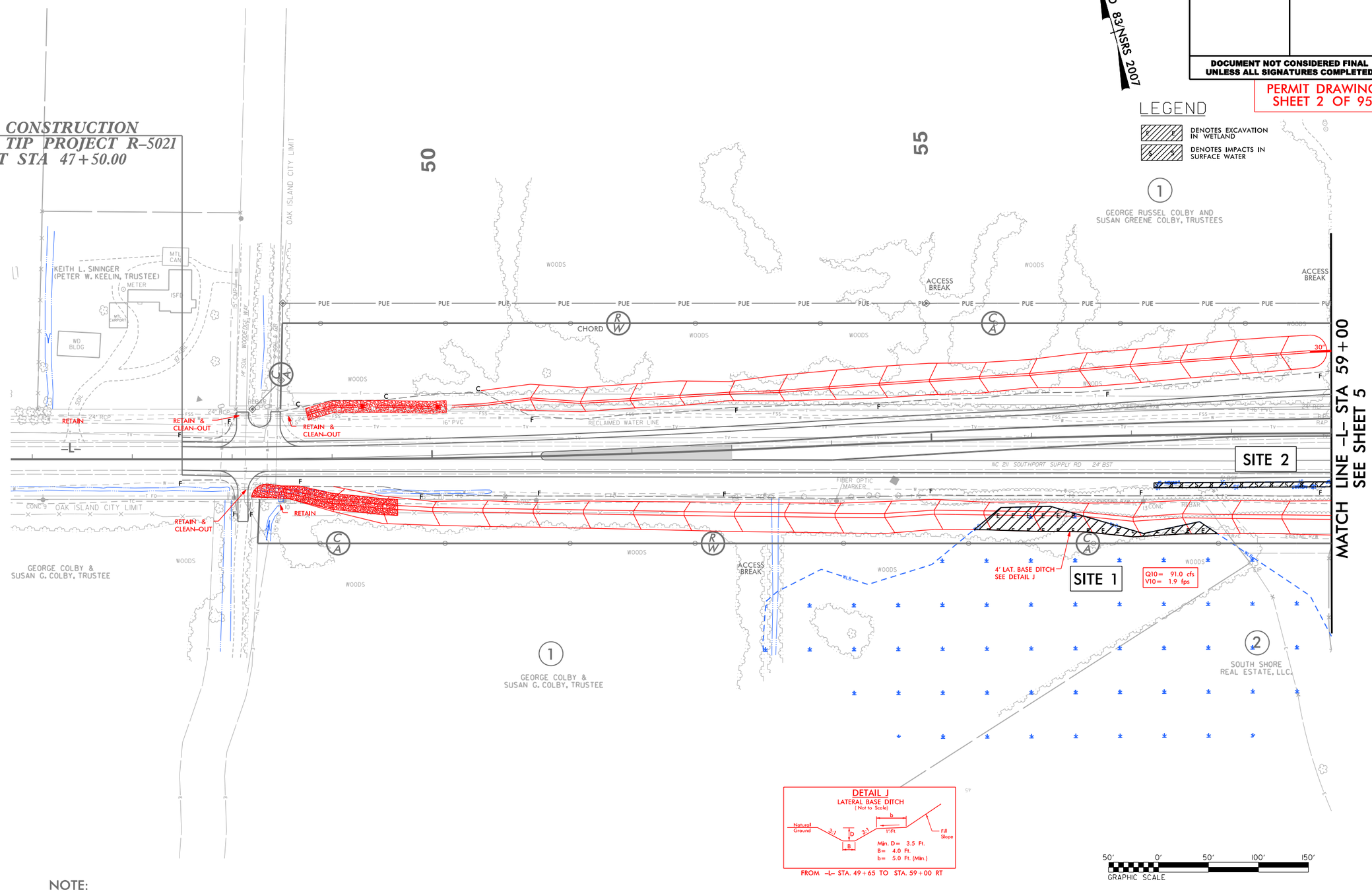
PERMIT DRAWING
SHEET 2 OF 95

NAD 83/NSRS 2007

LEGEND

DENOTES EXCAVATION IN WETLAND

DENOTES IMPACTS IN SURFACE WATER




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 41
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/8/2008
R-5021_HYD_PERMIT_DRAWINGS_PSH4_2 of 95.dgn
HNTB

5/14/99

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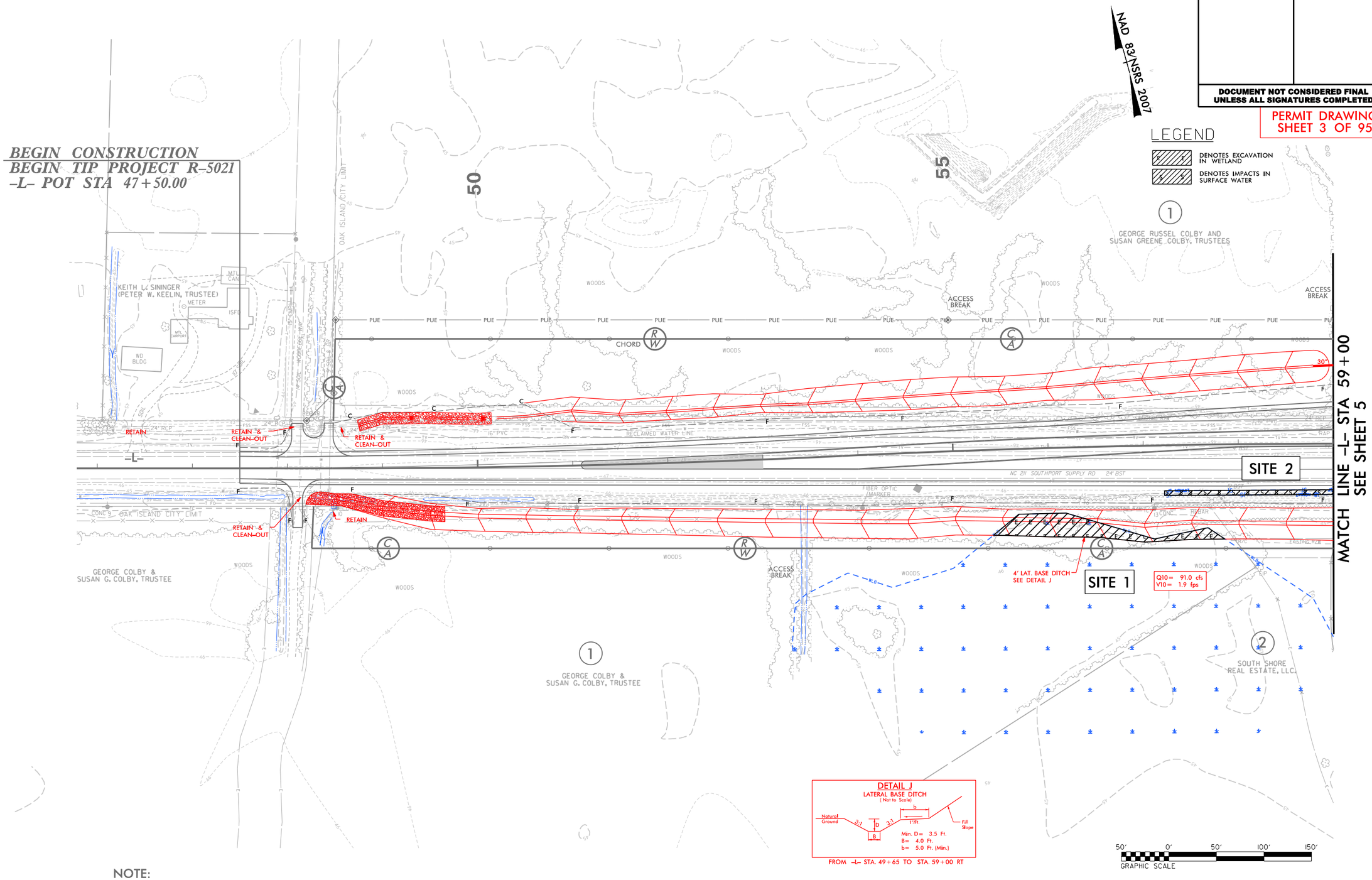
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 4 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 3 OF 95




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 41
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/8/2008
R-5021_HYD_PERMIT_DRAWINGS_PSH4_3 of 95.dgn
HNTB

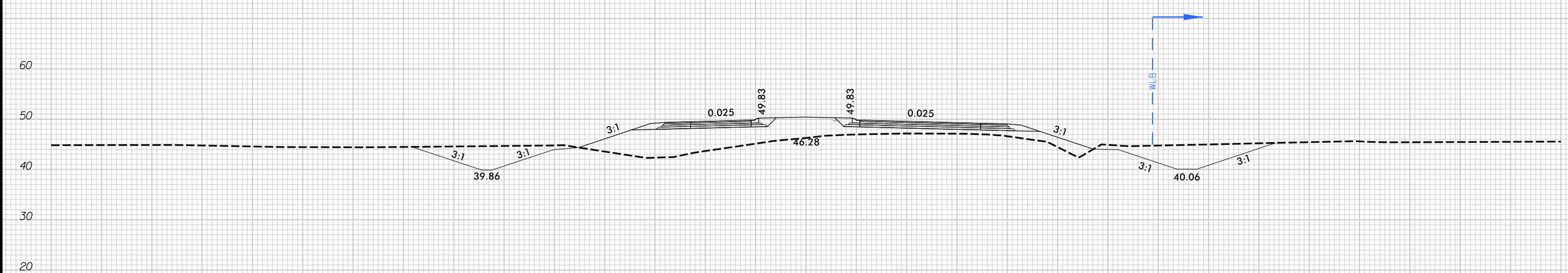
| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |

PERMIT DRAWING
SHEET 4 OF 95

# WETLAND CROSS SECTIONS

## SITE 1

–L– 56+00.00




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 5 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

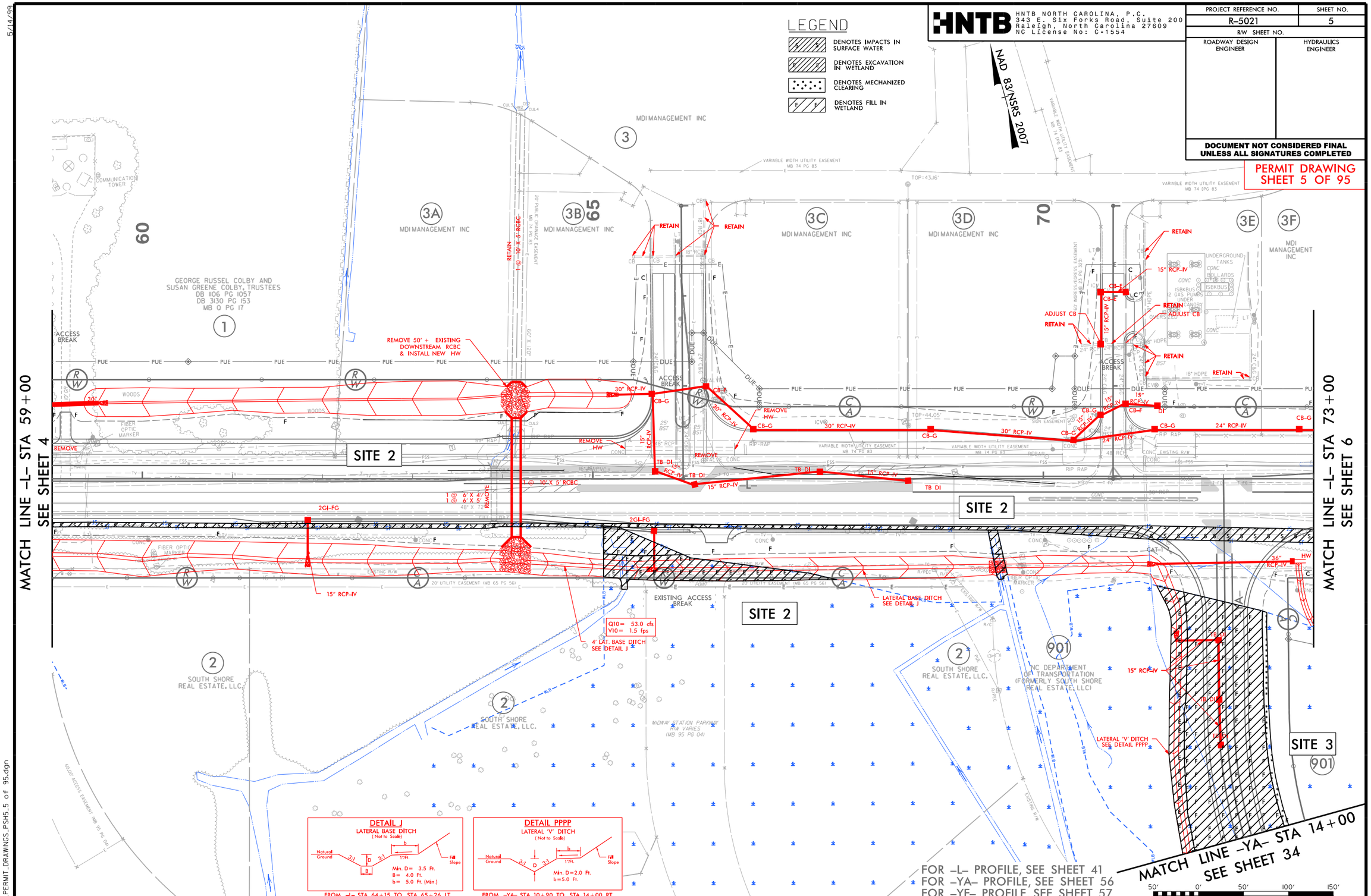
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

PERMIT DRAWING
SHEET 5 OF 95

## LEGEND

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

NAD 83/NSRS 2007




FOR -L- PROFILE, SEE SHEET 41
FOR -YA- PROFILE, SEE SHEET 56
FOR -YE- PROFILE, SEE SHEET 57
FOR -YF- PROFILE, SEE SHEET 58
FOR -YE- DIRECTIONAL CROSSOVER DETAIL, SEE SHEET 2B-1
FOR RIGHT OF WAY DETAIL ON PARCEL 901, SEE SHEETS 2B-4 AND 2B-5
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

NOTE:
1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

5/14/99
5/15/2008
INTS 5021_HYD_PERMIT_DRAWINGS_PSH5.5 of 95.dgn

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 5 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

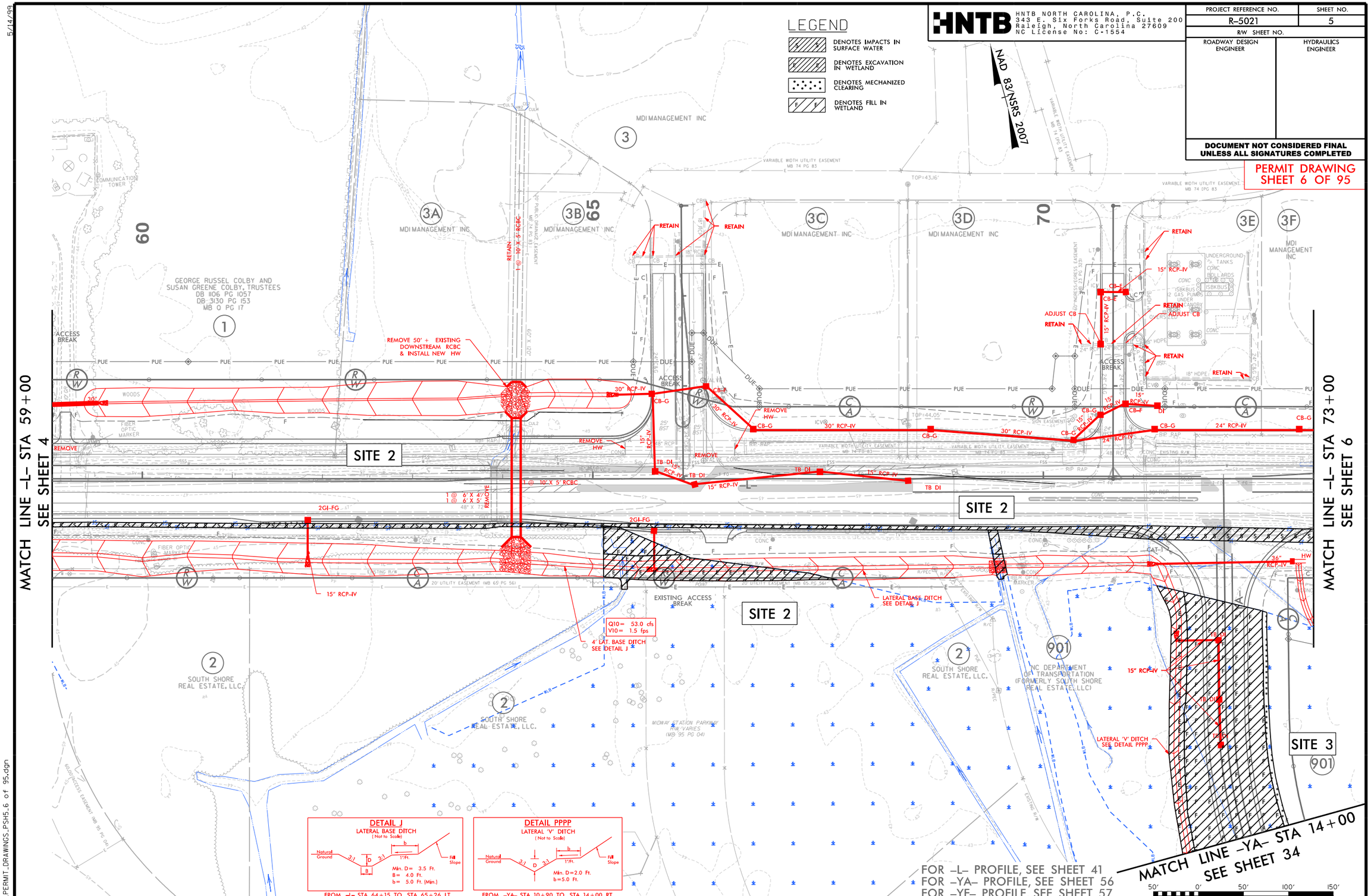
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

PERMIT DRAWING
SHEET 6 OF 95

LEGEND

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

NAD 83/NSRS 2007




FOR -L- PROFILE, SEE SHEET 41
FOR -YA- PROFILE, SEE SHEET 56
FOR -YE- PROFILE, SEE SHEET 57
FOR -YF- PROFILE, SEE SHEET 58
FOR -YE- DIRECTIONAL CROSSOVER DETAIL, SEE SHEET 2B-1
FOR RIGHT OF WAY DETAIL ON PARCEL 901, SEE SHEETS 2B-4 AND 2B-5
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

NOTE:
1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

5/14/99

5/15/2008
INTS 5021_HYD_PERMIT_DRAWINGS_PSH5.6 of 95.dgn

6/23/16

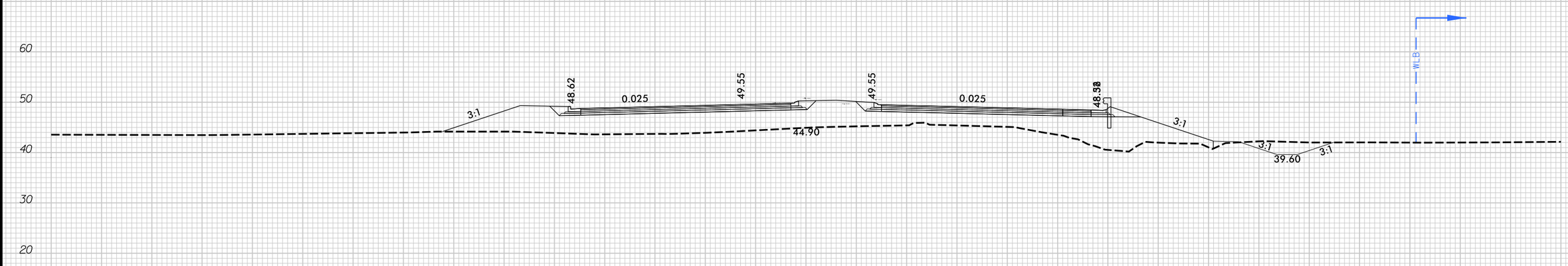
| 5 10 | PROJ. REFERENCE NO. | SHEET NO. |
|---|---|---|
| | R-5021 | |

PERMIT DRAWING
SHEET 7 OF 95

# WETLAND CROSS SECTIONS

## SITE 2

–L– 70+50.00




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

5/15/2018
HNTB
Drawings\r5021_hyd_prm_xpl.dgn

# WETLAND CROSS SECTIONS

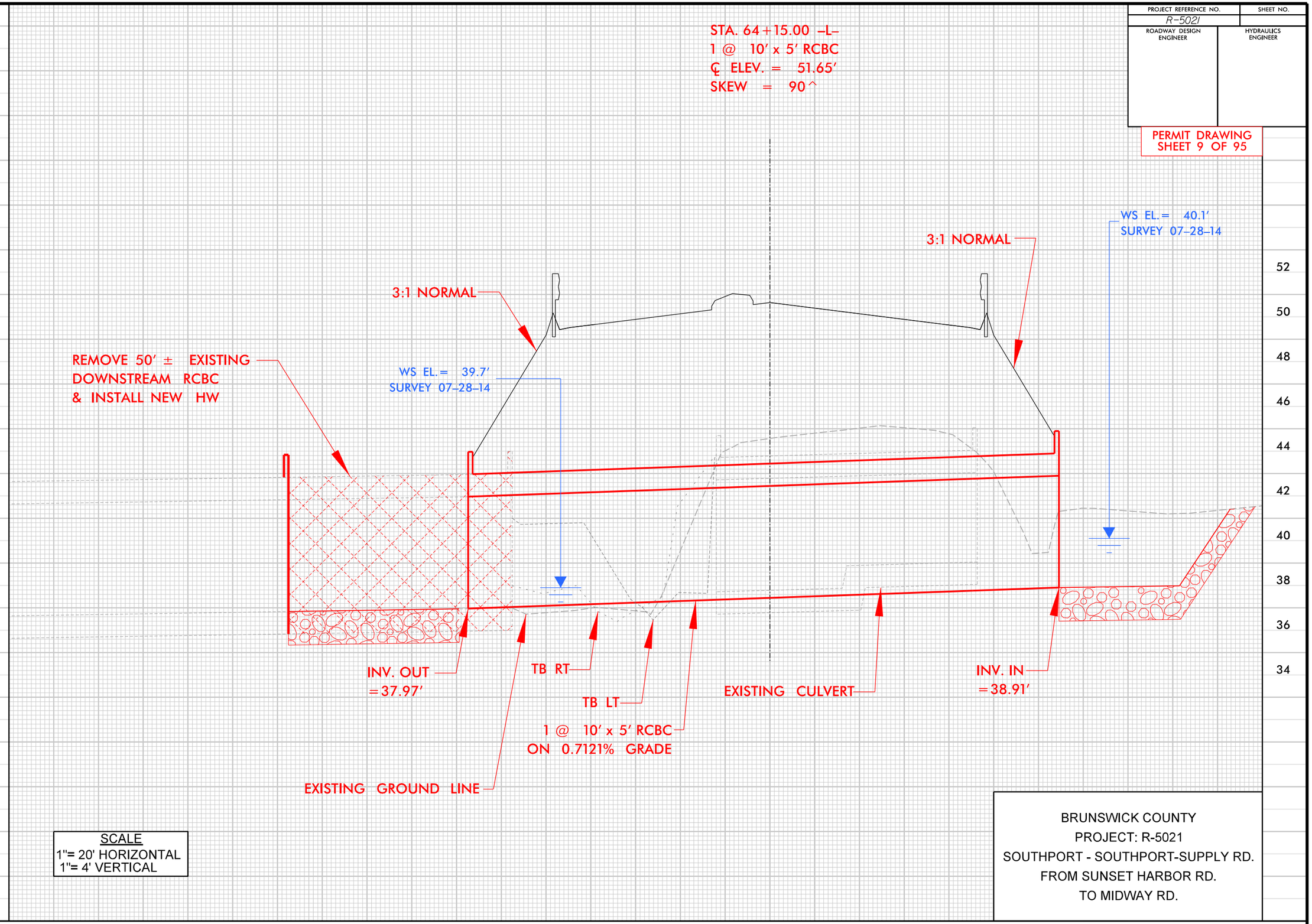
## SITE 3
–YA– 12+50.00


SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

PERMIT DRAWING
SHEET 9 OF 95




BRUNSWICK COUNTY
PROJECT: R-5021
SOUTHPORT - SOUTHPORT-SUPPLY RD.
FROM SUNSET HARBOR RD.
TO MIDWAY RD.

5/14/99

5/8/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH5_9 of 95_Cul_PFL.dgn
jnlb

5/14/99

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Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 6 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 10 OF 95

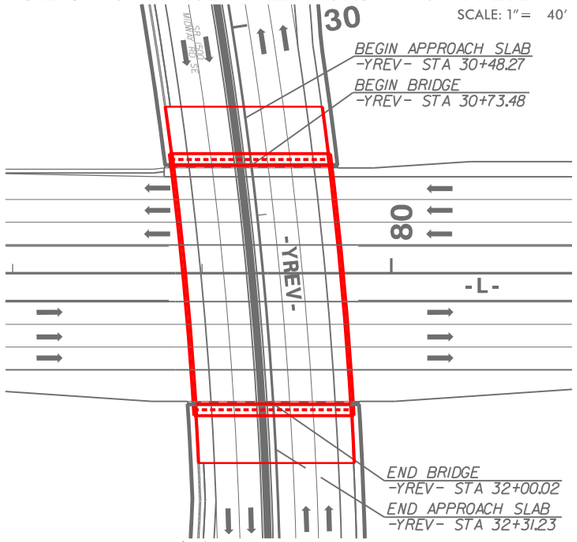
## LEGEND

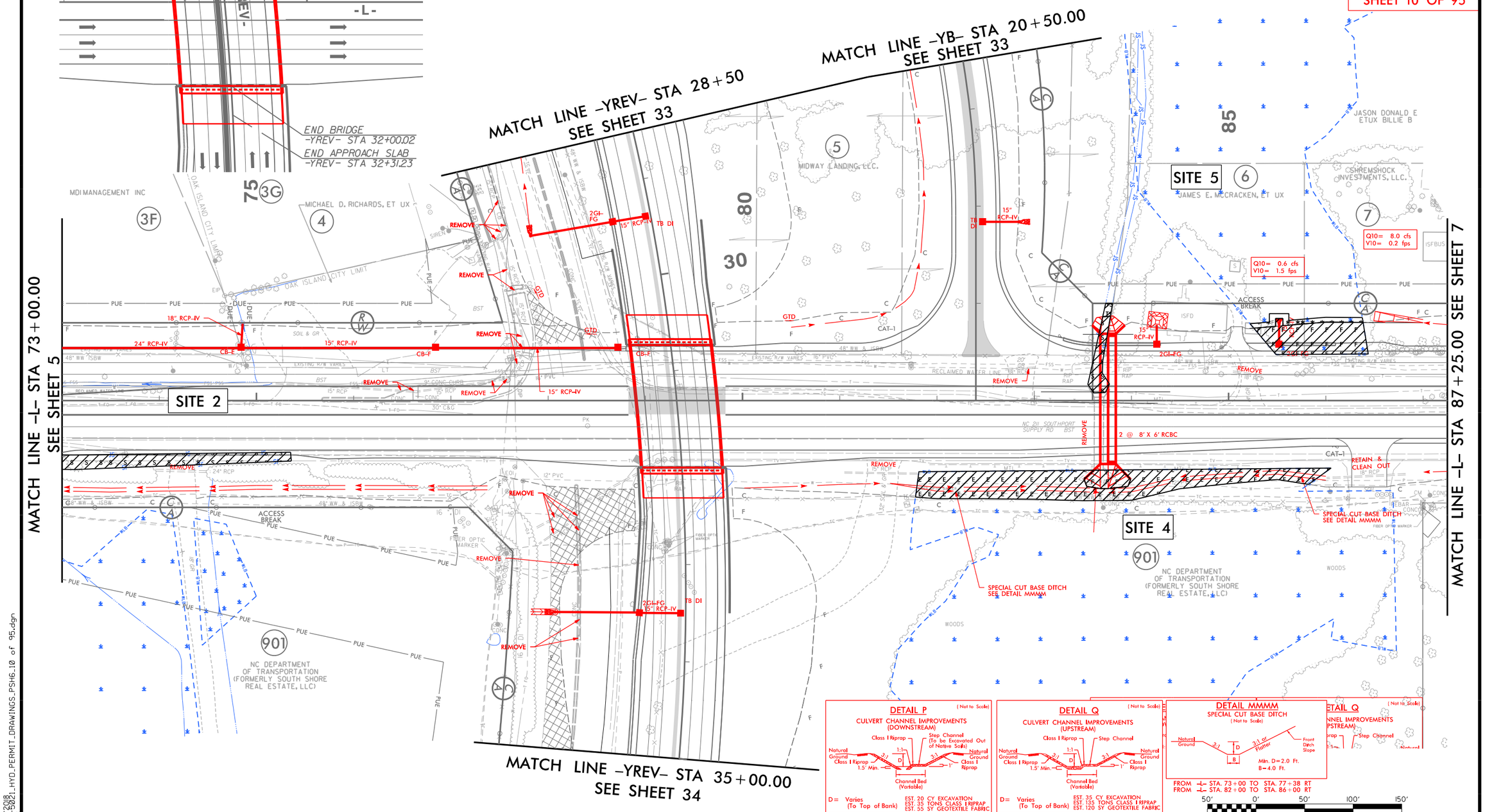
- DENOTES FILL IN WETLAND
- DENOTES EXCAVATION IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/NSRS 2007

## SKETCH OF BRIDGE IN RELATIONSHIP TO PAVEMENT

SCALE: 1" = 40'




### DETAIL P

(Not to Scale)

CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM)




D= Varies (To Top of Bank)

EST. 20 CY EXCAVATION
EST. 35 TONS CLASS I RIPRAP
EST. 55 SY GEOTEXTILE FABRIC

### DETAIL Q

(Not to Scale)

CULVERT CHANNEL IMPROVEMENTS (UPSTREAM)




D= Varies (To Top of Bank)

EST. 35 CY EXCAVATION
EST. 135 TONS CLASS I RIPRAP
EST. 120 SY GEOTEXTILE FABRIC

### DETAIL MMMM

SPECIAL CUT BASE DITCH

(Not to Scale)




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

FROM -L- STA. 73+00 TO STA. 77+38 RT
FROM -L- STA. 82+00 TO STA. 86+00 RT

### DETAIL Q

(Not to Scale)

CULVERT CHANNEL IMPROVEMENTS (UPSTREAM)

Step Channel

50' 0' 50' 100' 150'
GRAPHIC SCALE

5/15/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH6.10 of 95.dgn
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5/14/99

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NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 6 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 11 OF 95

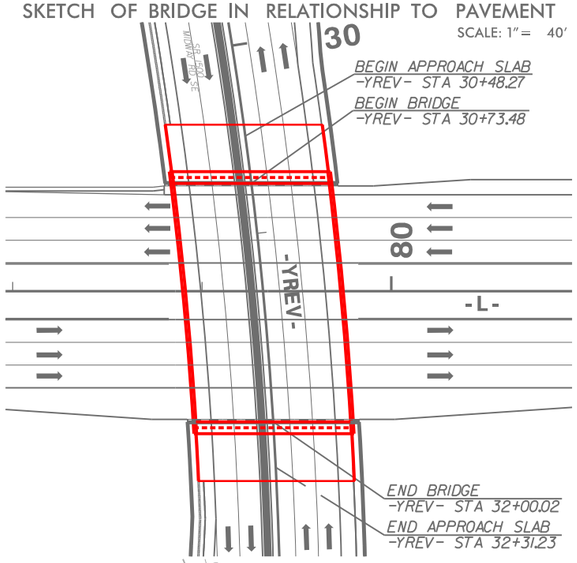
## LEGEND

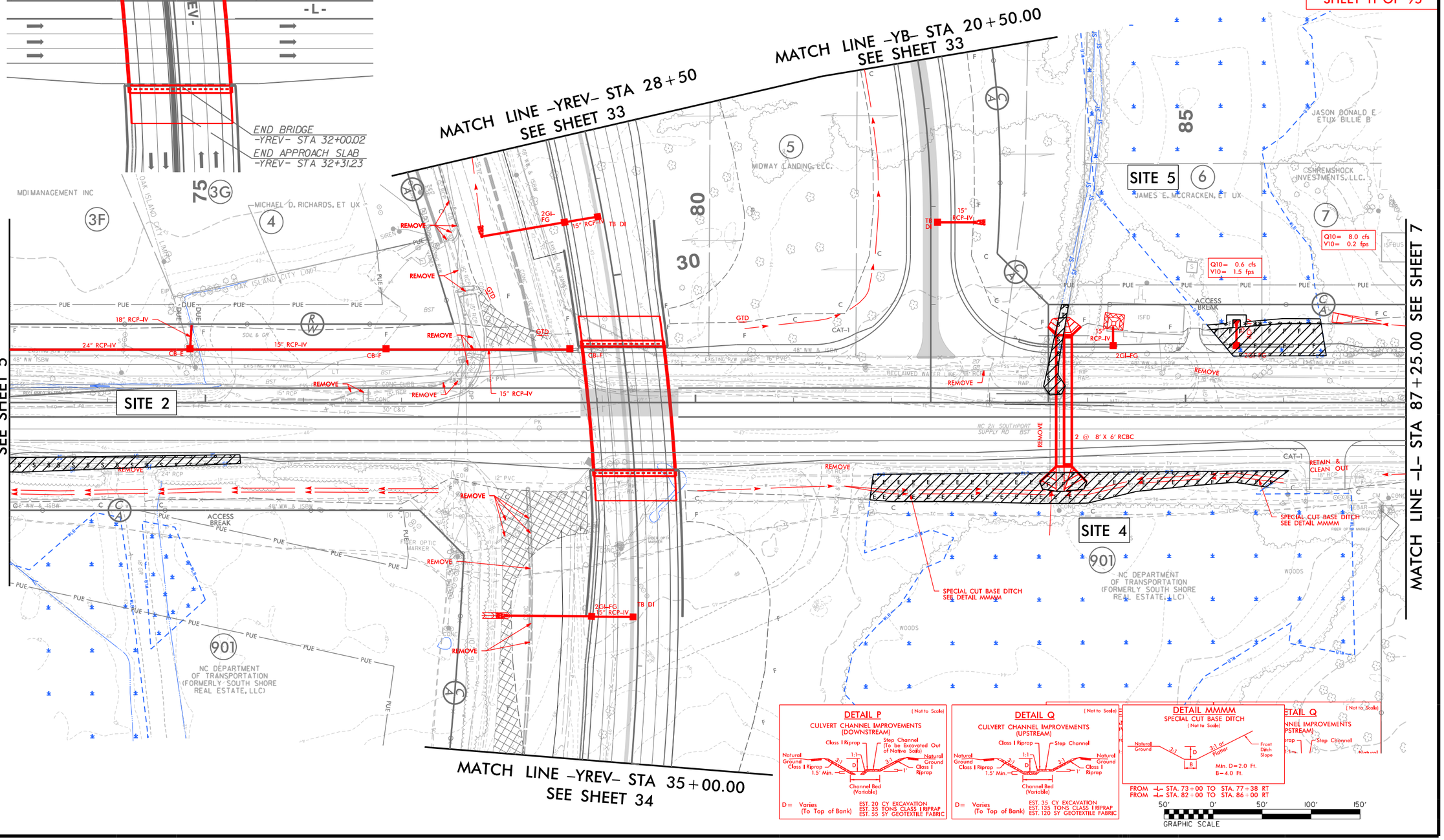
- DENOTES FILL IN WETLAND
- DENOTES EXCAVATION IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/NSRS 2007

## SKETCH OF BRIDGE IN RELATIONSHIP TO PAVEMENT

SCALE: 1" = 40'



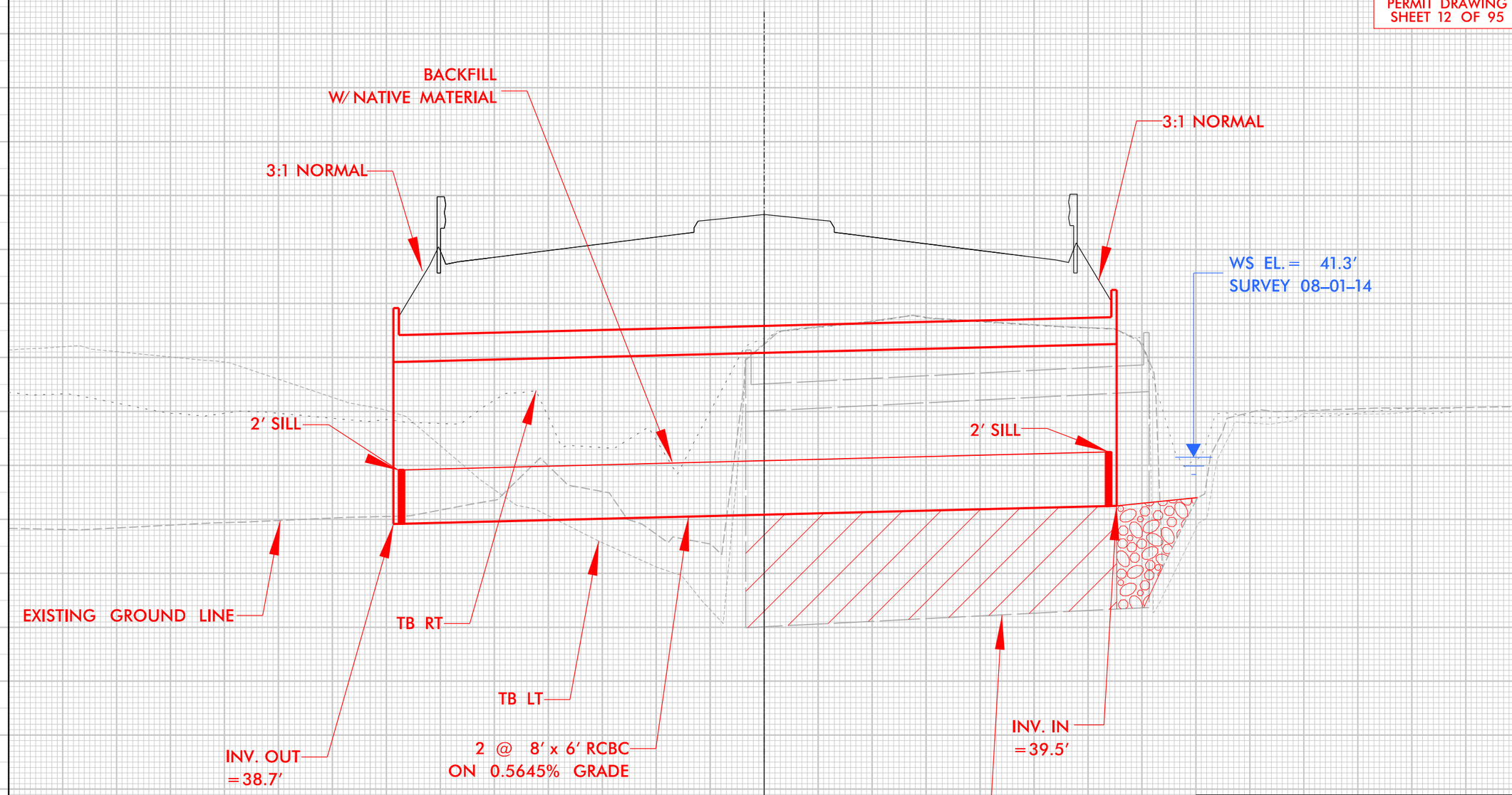




5/25/2018
R5021_HYD_PERMIT_DRAWINGS.PSH6.11 of 95.dgn

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

PERMIT DRAWING
SHEET 12 OF 95

STA. 83+76.00 -L-
2 @ 8' x 6' RCBC
℄ ELEV. = 49.94'
SKEW = 90^




SCALE
1"= 20' HORIZONTAL
1"= 4' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
SOUTHPORT - SOUTHPORT-SUPPLY RD.
FROM SUNSET HARBOR RD.
TO MIDWAY RD.

5/14/99

5/14/2008
R5021_HYD_PERMIT_DRAWINGS_PSH6.12 of 95.Cul.PFL.dgn

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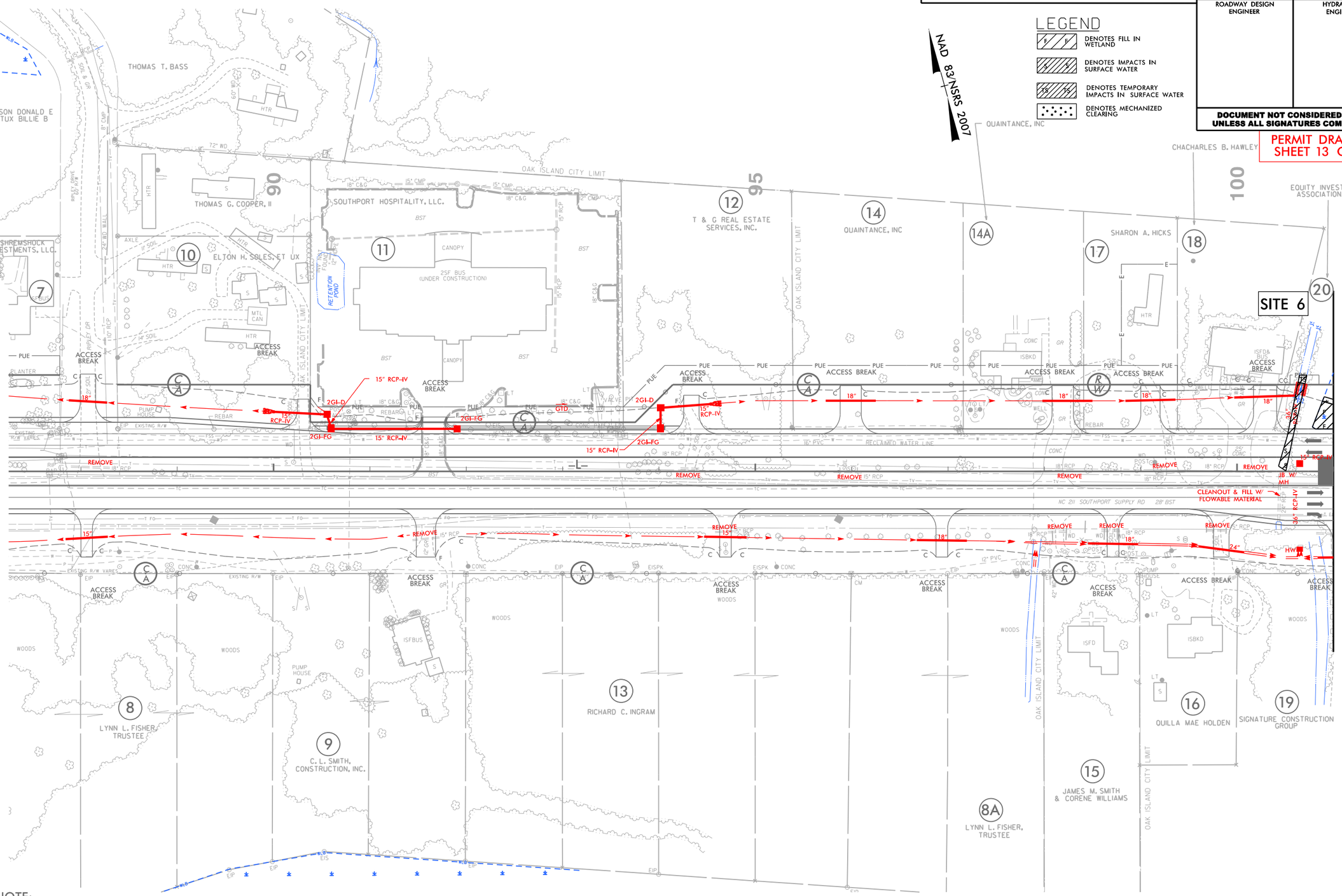
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 7 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 13 OF 95




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 42
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/14/99

5/15/2008
R-5021_HYD_PERMIT_DRAWINGS_PSH7_13 of 95.dgn

5/14/99

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 7 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

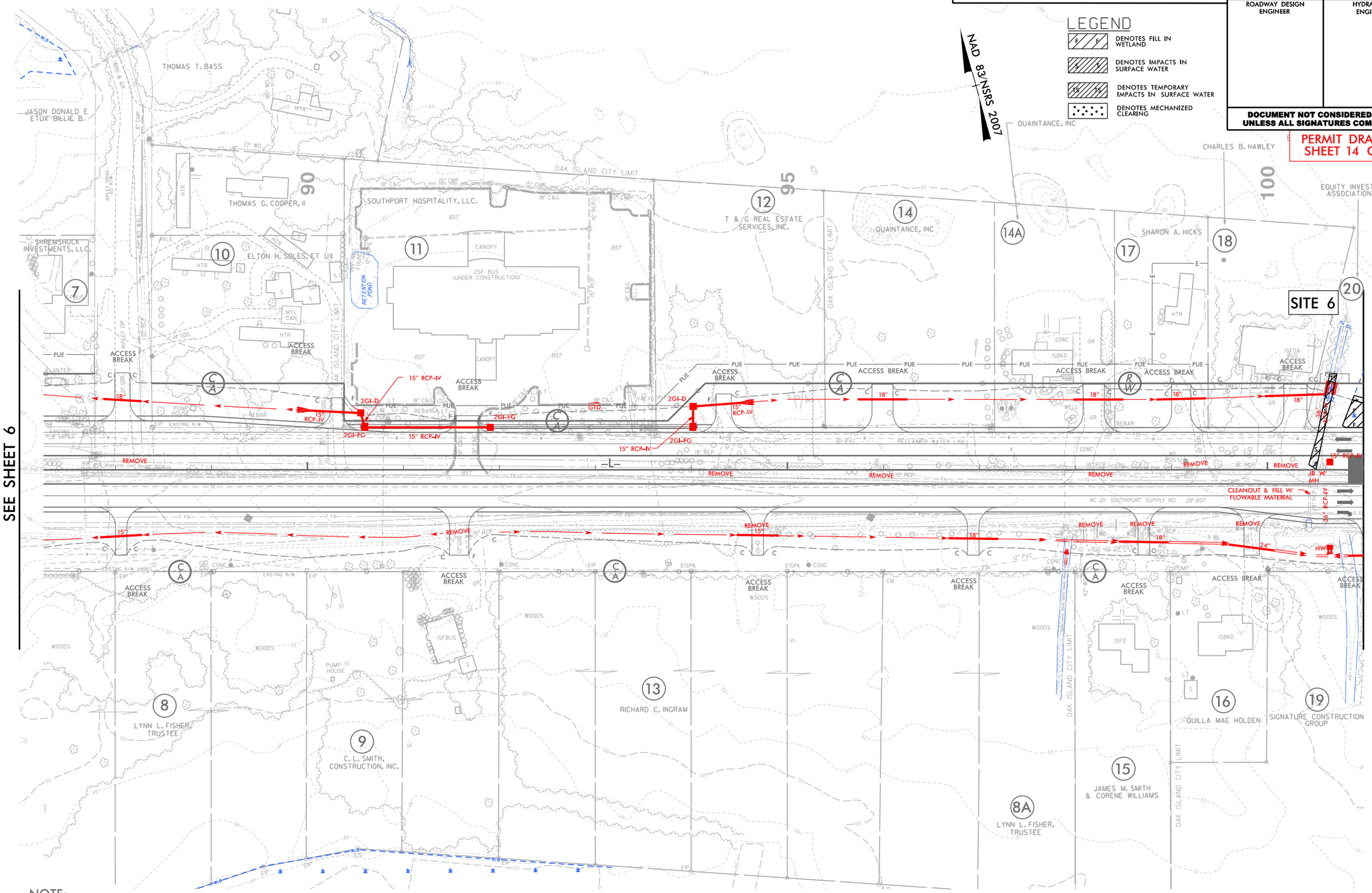
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

PERMIT DRAWING
SHEET 14 OF 95

LEGEND

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

NAD 83/NSRS 2007




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 42
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/15/2008
R-5021_HYD_PERMIT_DRAWINGS_PSH7_14 of 95.dgn
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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 8 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

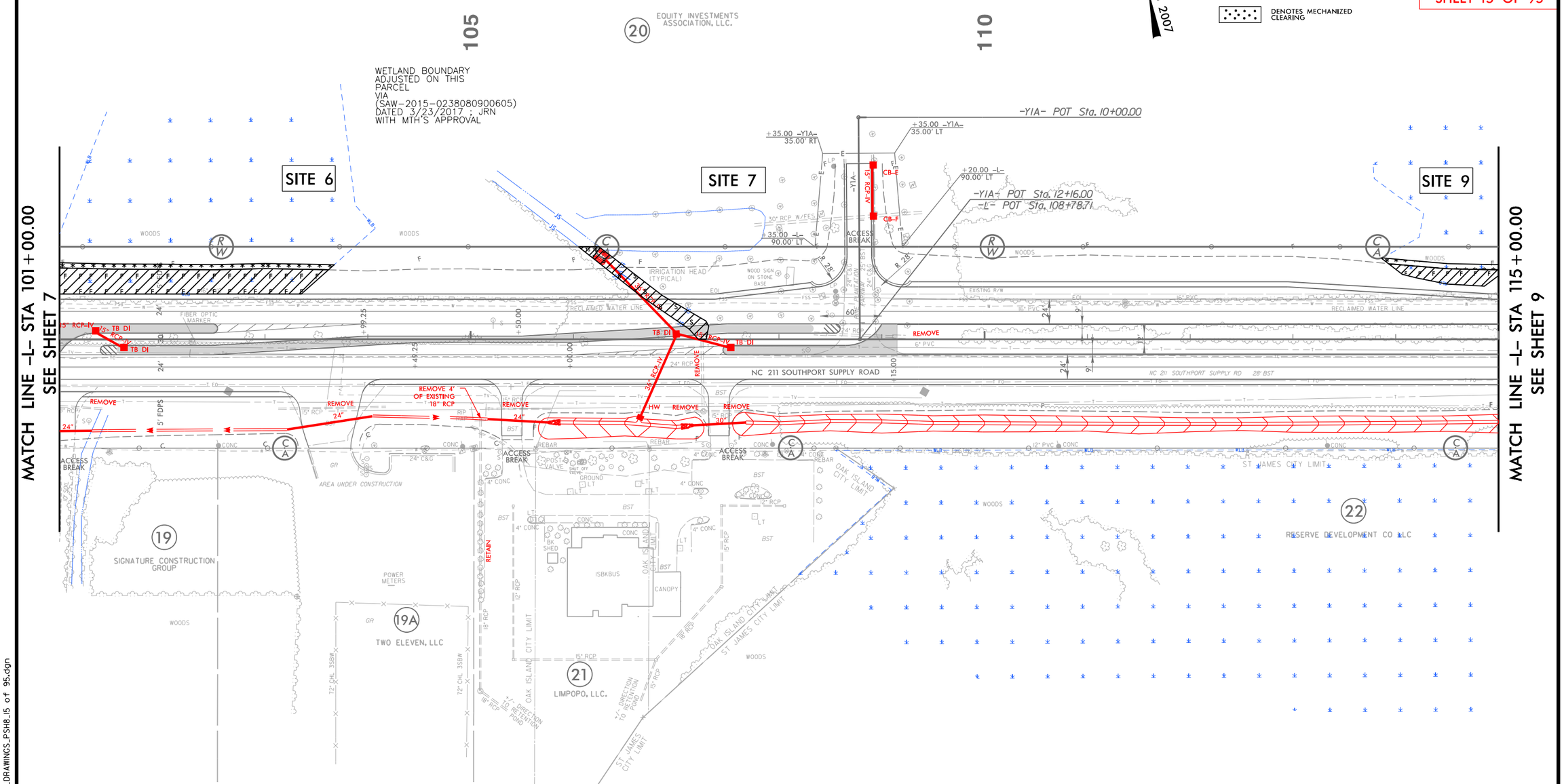
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

PERMIT DRAWING
SHEET 15 OF 95

## LEGEND

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

NAD 83/NSRS 2007




5/15/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH8.15 of 95.dgn
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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 8 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

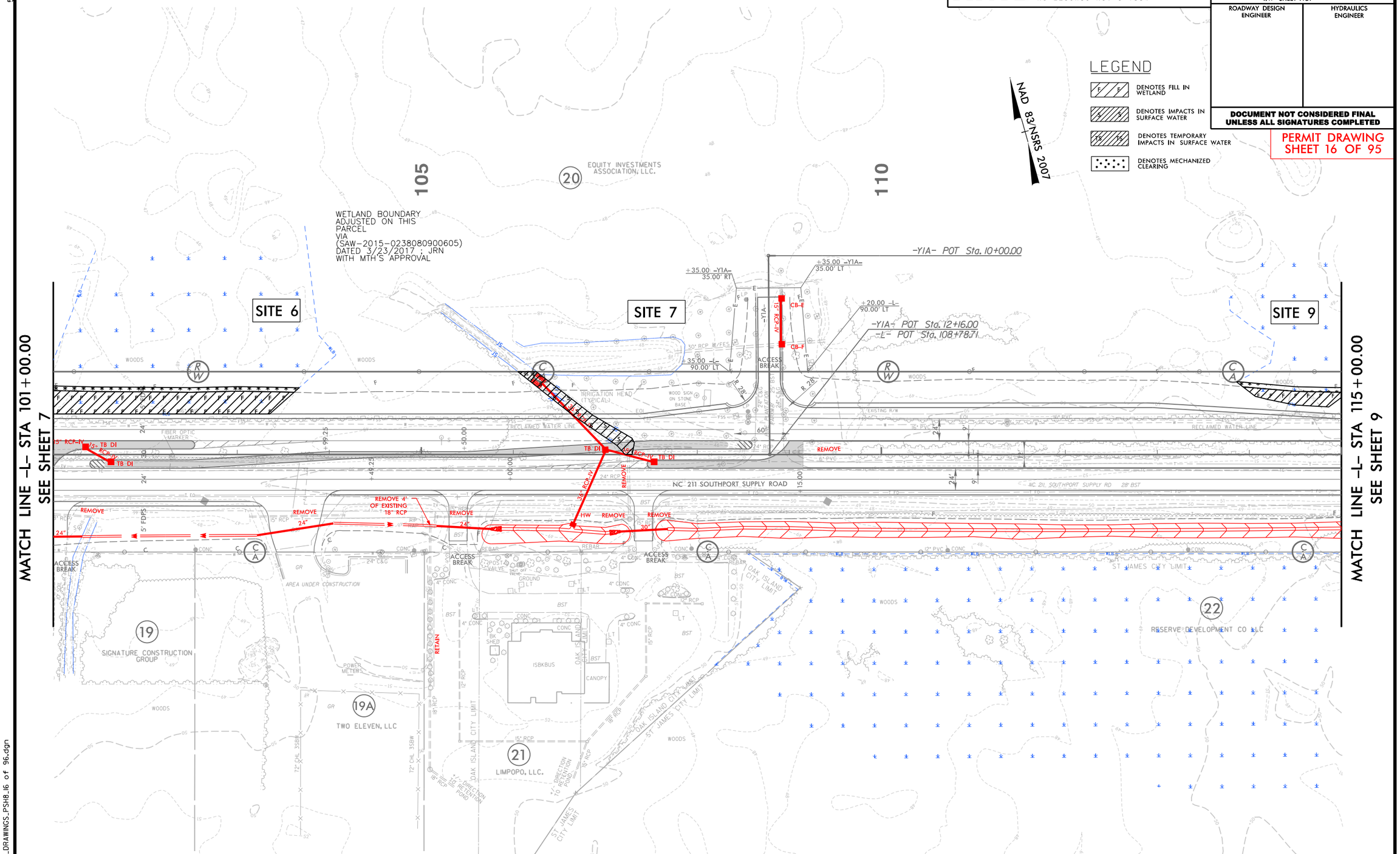
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

PERMIT DRAWING
SHEET 16 OF 95

## LEGEND

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

NAD 83/NSRS 2007




5/14/99

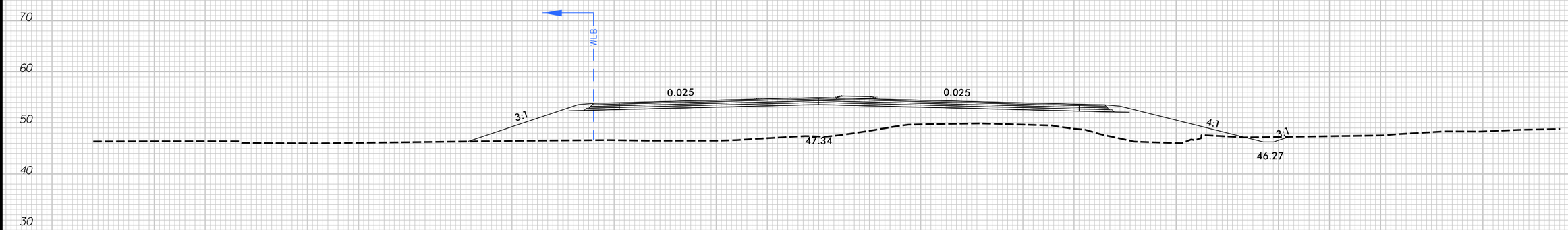
5/15/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH8.16 of 96.dgn

| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |

PERMIT DRAWING
SHEET 17 OF 95

# WETLAND CROSS SECTIONS

## SITE 6
–L– 103+00.00




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

6/23/16

5/15/2018
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Drawings\r5021_hyd_prm_xpl.dgn

5/14/99

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NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 9 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

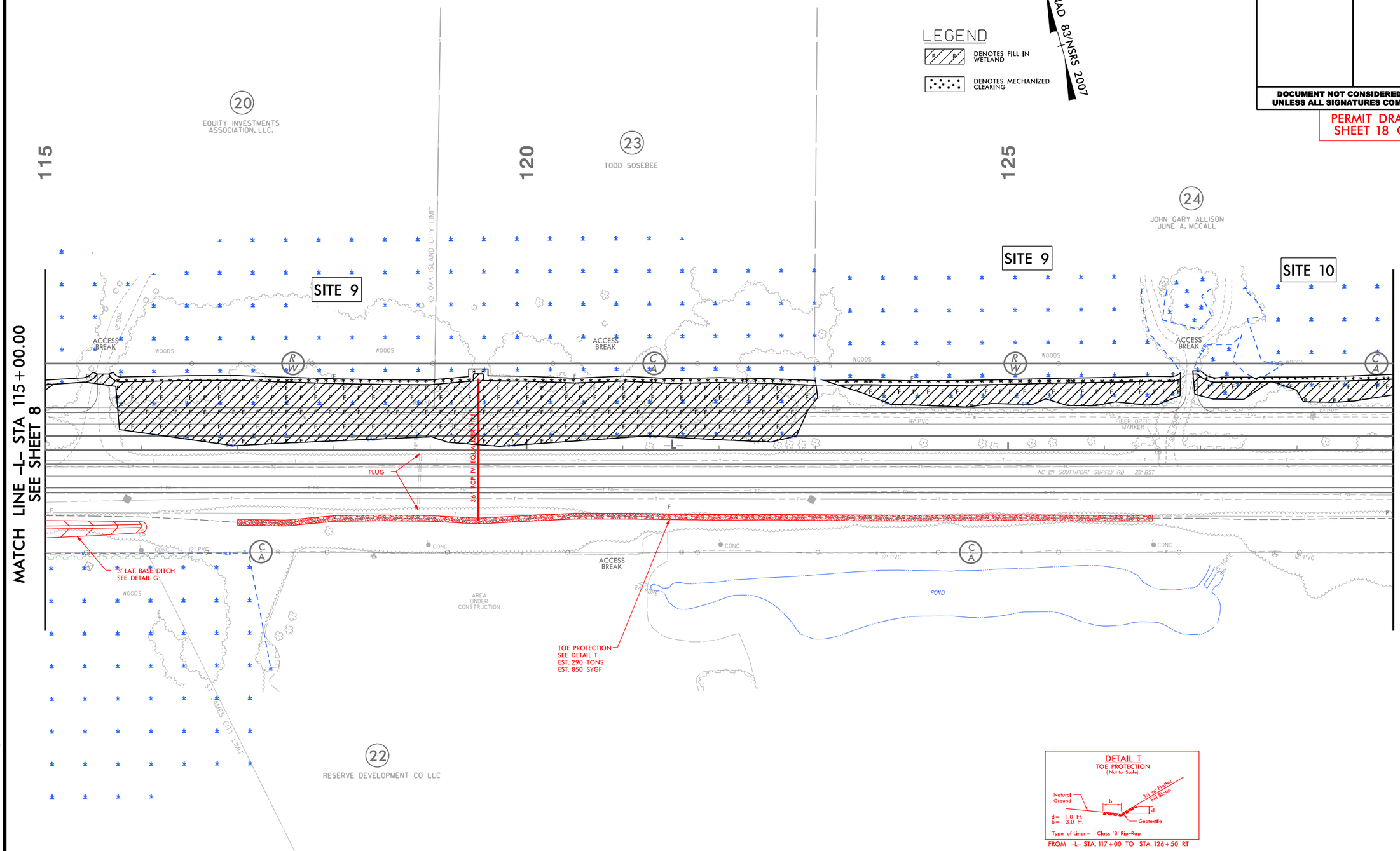
PERMIT DRAWING
SHEET 18 OF 95

LEGEND

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83/NSRS 2007




DETAIL T
TOE PROTECTION
( Not to Scale)




d= 1.0 Ft.
b= 3.0 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM -L- STA. 117+00 TO STA. 126+50 RT

NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

50' 0' 50' 100' 150'
GRAPHIC SCALE

FOR -L- PROFILE, SEE SHEET 43

FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/8/2008
R-5021_HYD_PERMIT_DRAWINGS_PSH9.18 of 95.dgn
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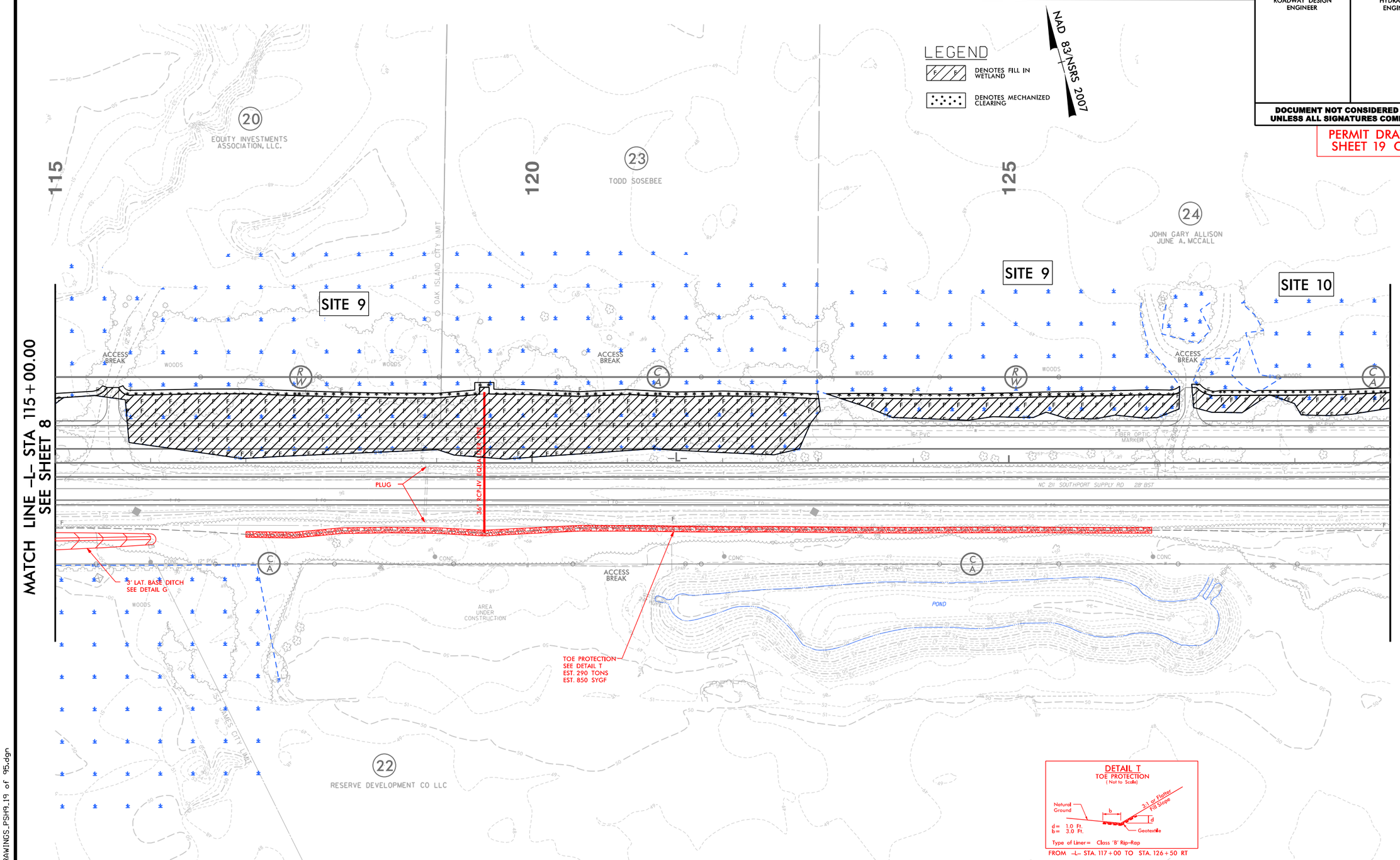
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 9 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 19 OF 95




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 43
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/8/2008
R-5021_HYD_PERMIT_DRAWINGS_PSH9_19 of 95.dgn
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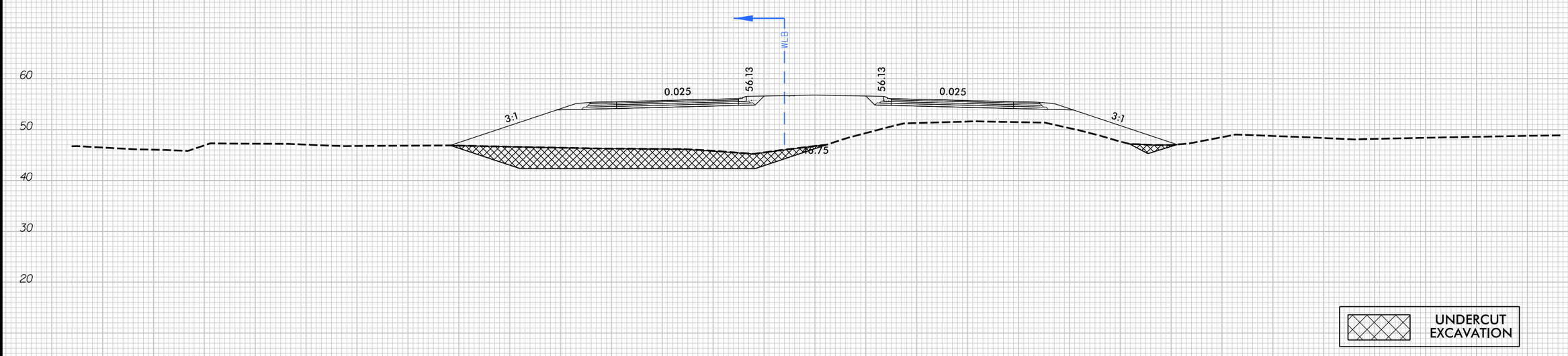
# WETLAND CROSS SECTIONS

## SITE 9

–L– 120+00.00




UNDERCUT EXCAVATION

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

5/14/99

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Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 10 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

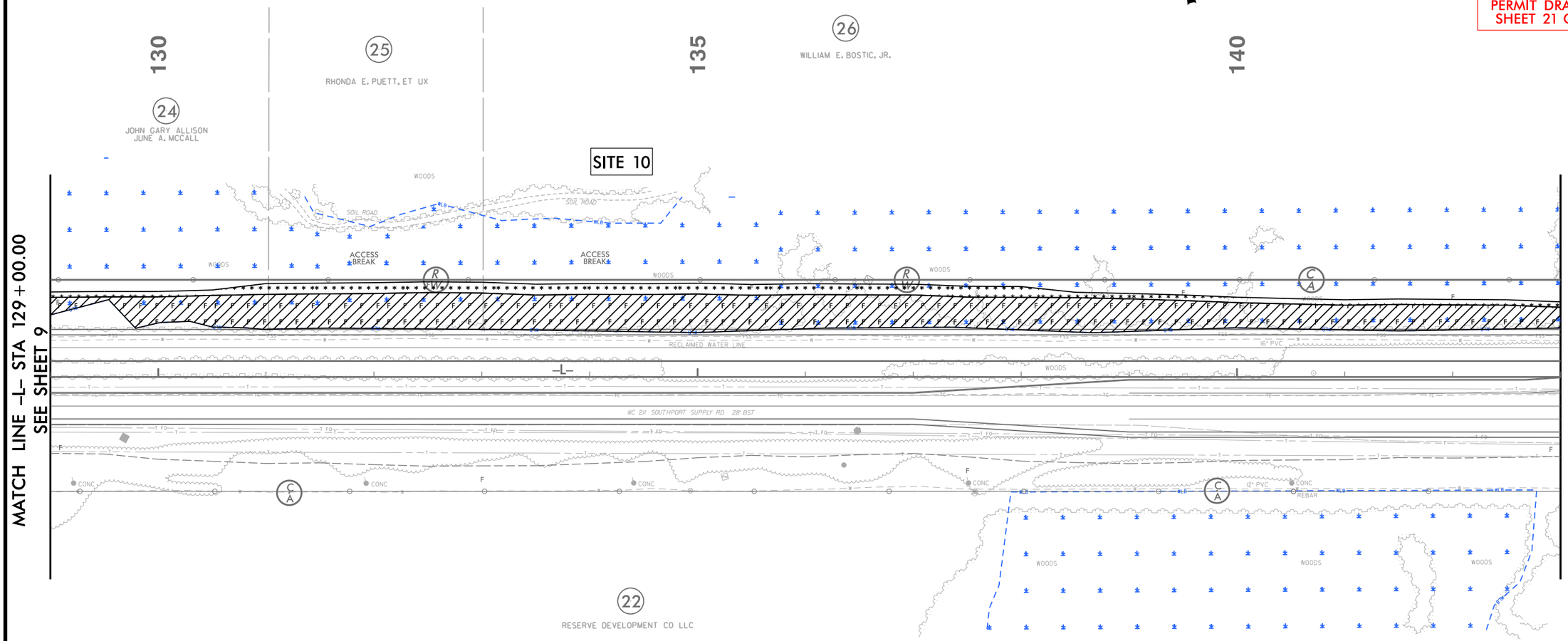
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

PERMIT DRAWING
SHEET 21 OF 95

NAD 83/NSRS 2007

LEGEND

- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

50' 0' 50' 100' 150'
GRAPHIC SCALE

FOR -L- PROFILE, SEE SHEET 44
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/8/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH10_21 of 95.dgn
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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 10 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

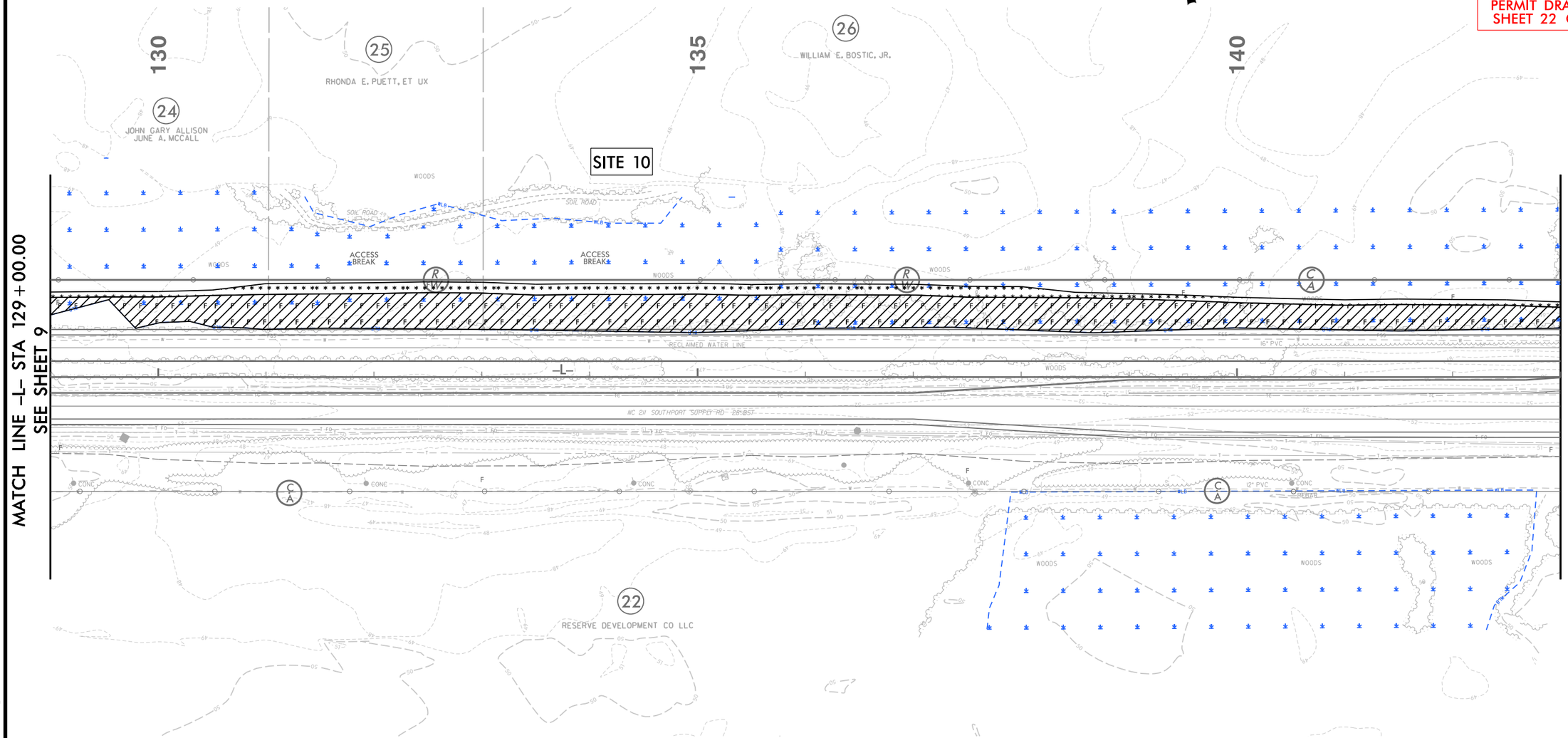
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

PERMIT DRAWING
SHEET 22 OF 95

NAD 83/NSRS 2007

LEGEND

- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

50' 0' 50' 100' 150'
GRAPHIC SCALE

FOR -L- PROFILE, SEE SHEET 44
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/18/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH10_22 of 95.dgn
HNTB

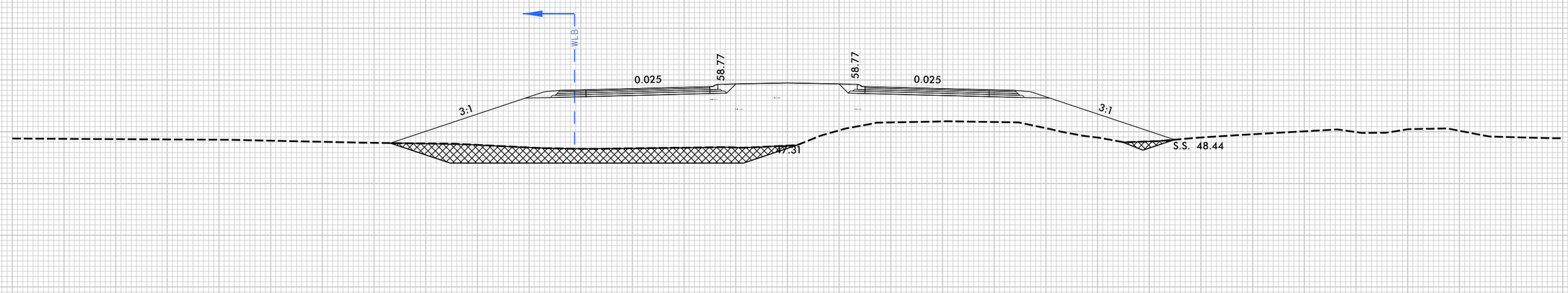
| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |

PERMIT DRAWING
SHEET 23 OF 95

# WETLAND CROSS SECTIONS

## SITE 10

–L– 135+00.00




UNDERCUT EXCAVATION

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 11 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

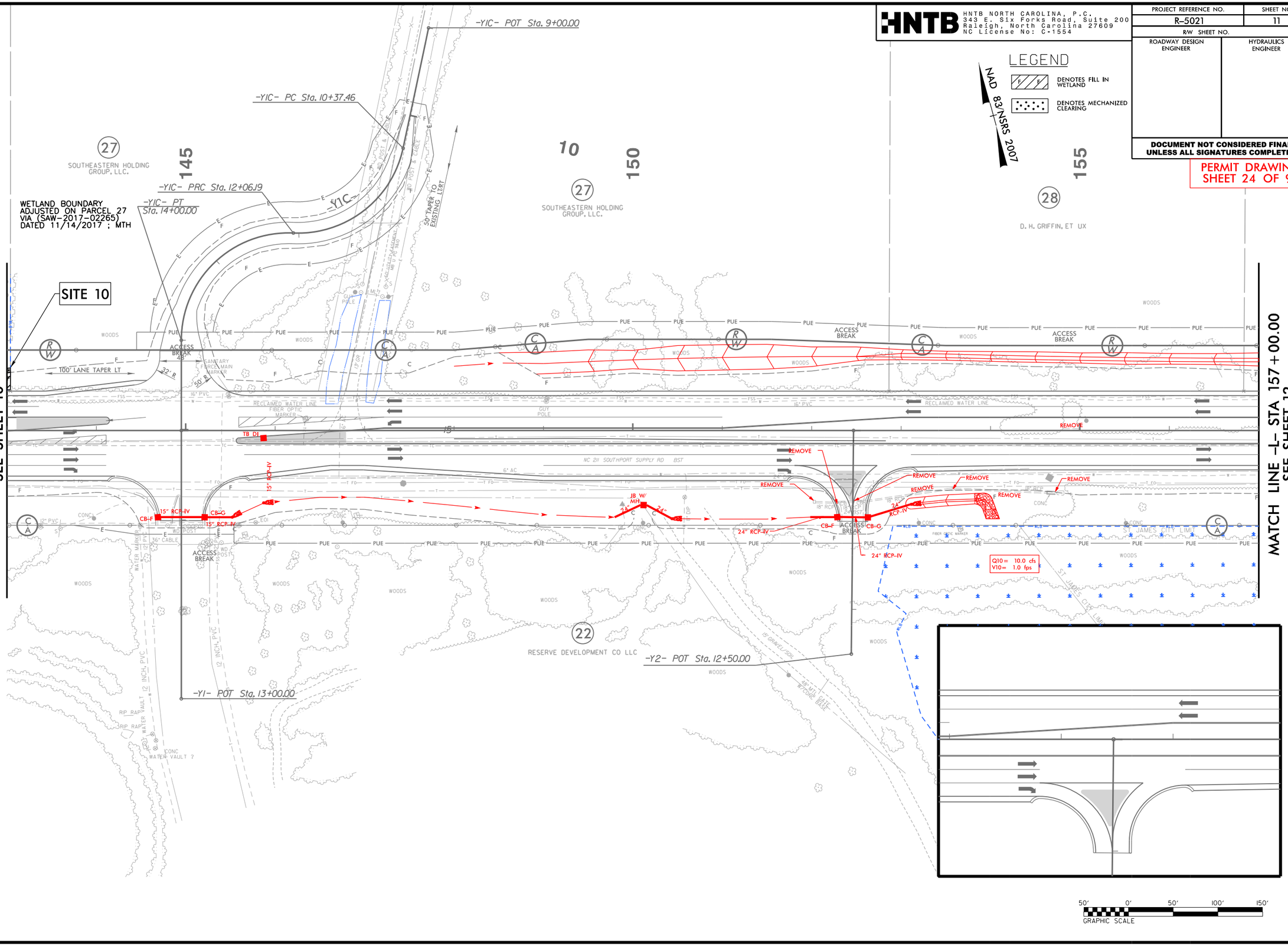
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

PERMIT DRAWING
SHEET 24 OF 95

LEGEND

- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING

NAD 83/NSRS 2007




5/14/99

5/15/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH11_24 of 95.dgn
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NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 11 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

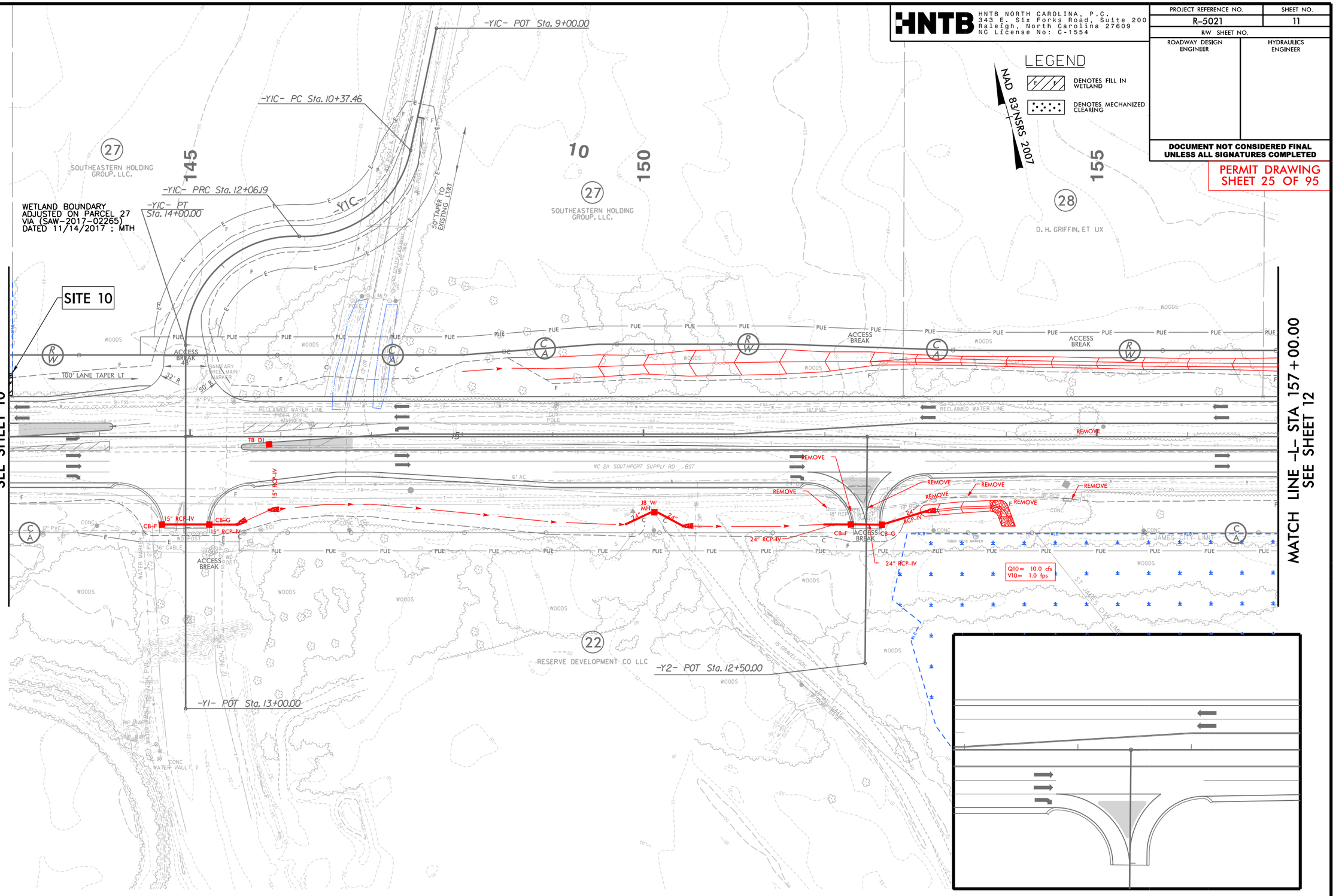
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

PERMIT DRAWING
SHEET 25 OF 95

LEGEND

- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING

NAD 83/NSRS 2007




5/14/99

5/15/2018
R-5021_HYD_PERMIT_DRAWINGS.PSH11.25 of 95.dgn
HNTB

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NC License No: C-1554

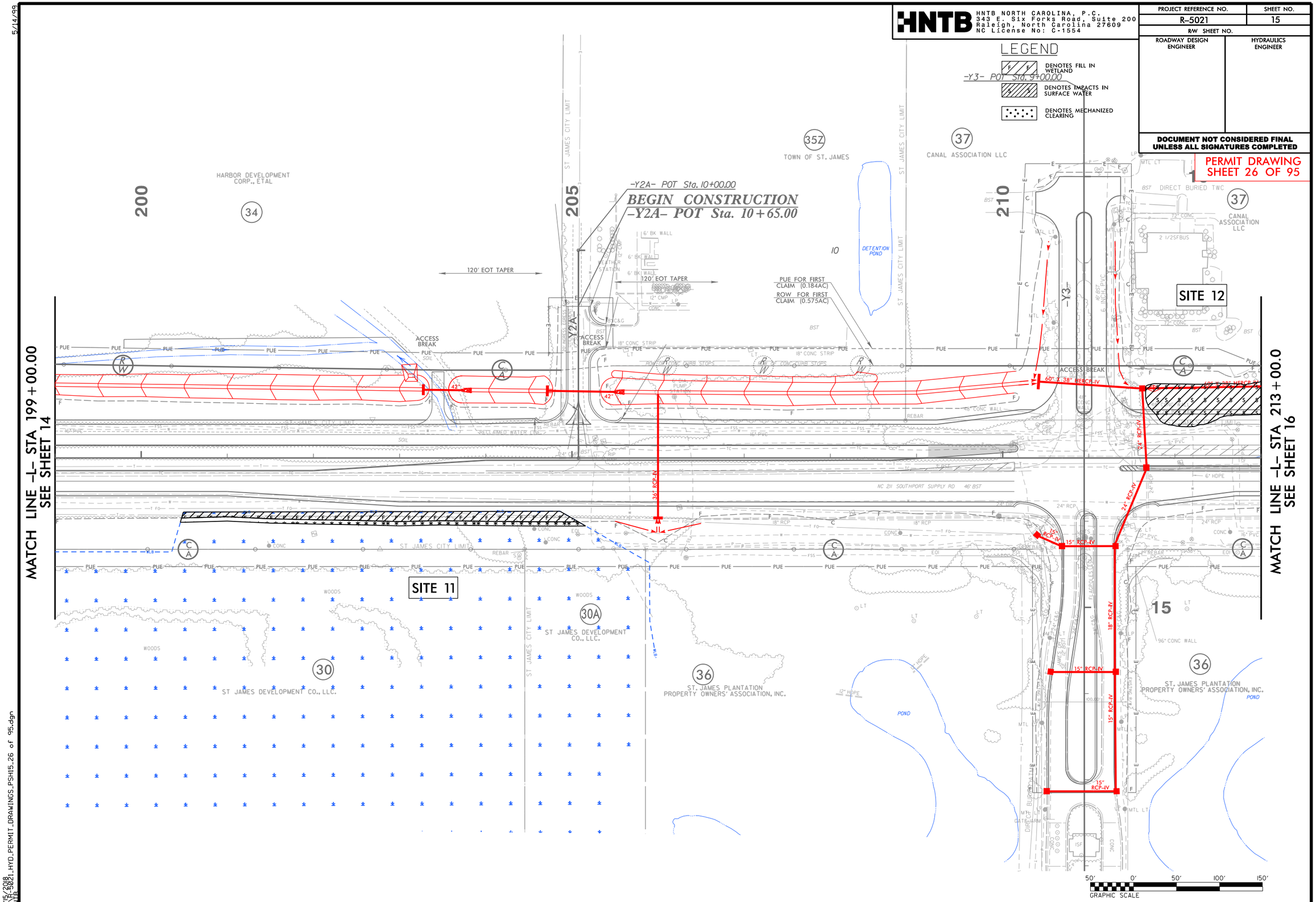
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 15 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 26 OF 95

## LEGEND

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




5/14/99

5/15/2008
R-5021_HYD_PERMIT_DRAWINGS_PSH15_26 of 95.dgn

HNTB NORTH CAROLINA, P.C.
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Raleigh, North Carolina 27609
NC License No: C-1554

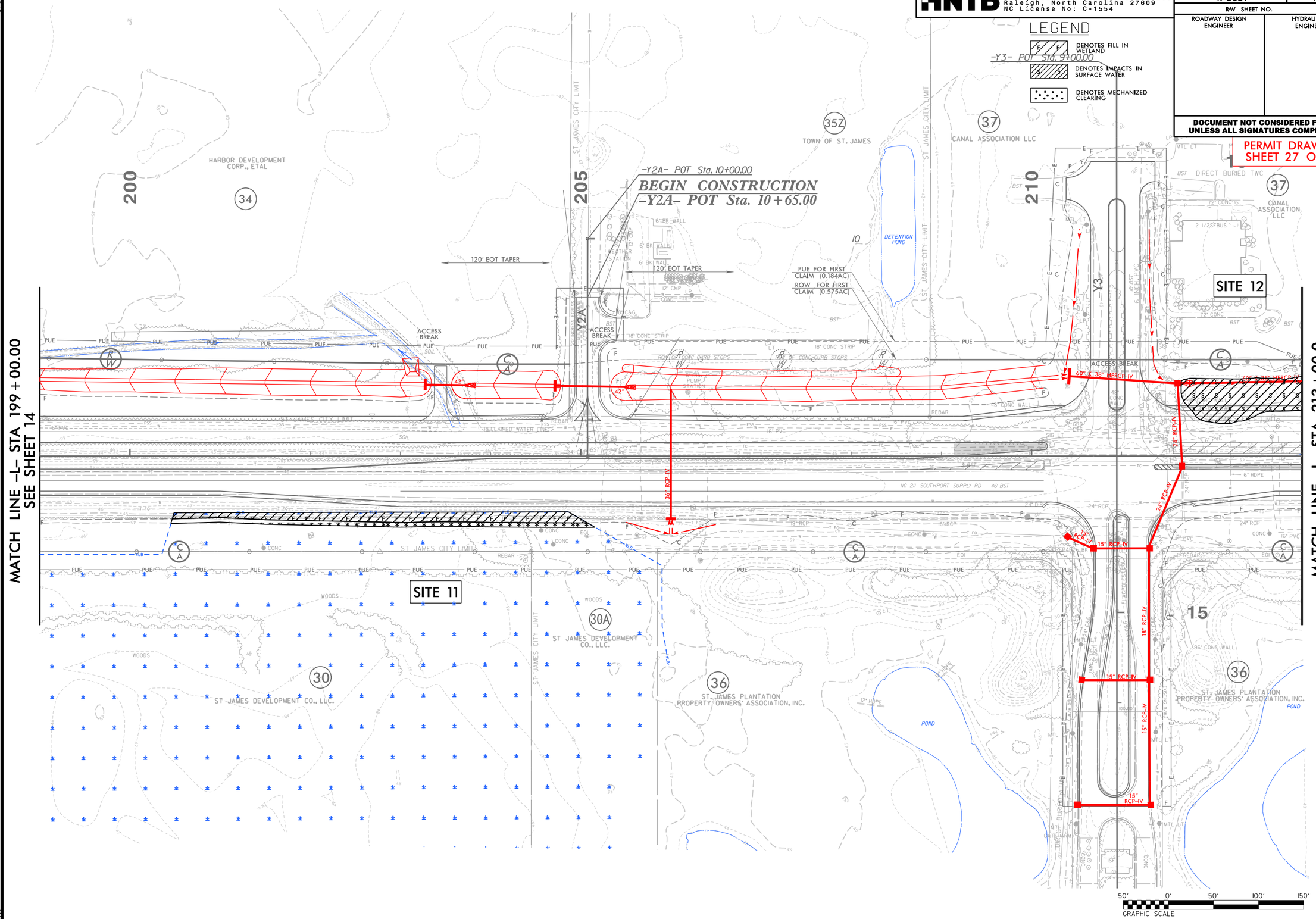
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 15 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 27 OF 95

## LEGEND

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




5/14/99

5/15/2008
HNTB
R5021_HYD_PERMIT_DRAWINGS_PSH15_27 of 95.dgn

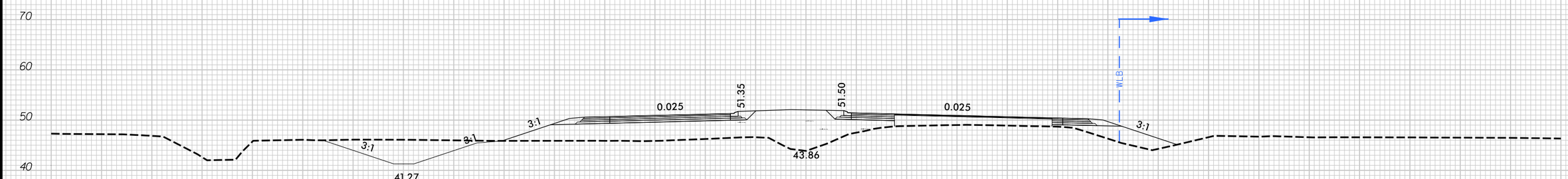
| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |

PERMIT DRAWING
SHEET 28 OF 95

# WETLAND CROSS SECTIONS

## SITE 11

-L- 203+00.00




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

6/23/16

5/15/2018
HNTB
Drawings\r5021_hyd_prm_xpl.dgn

5/14/99

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Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 16 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

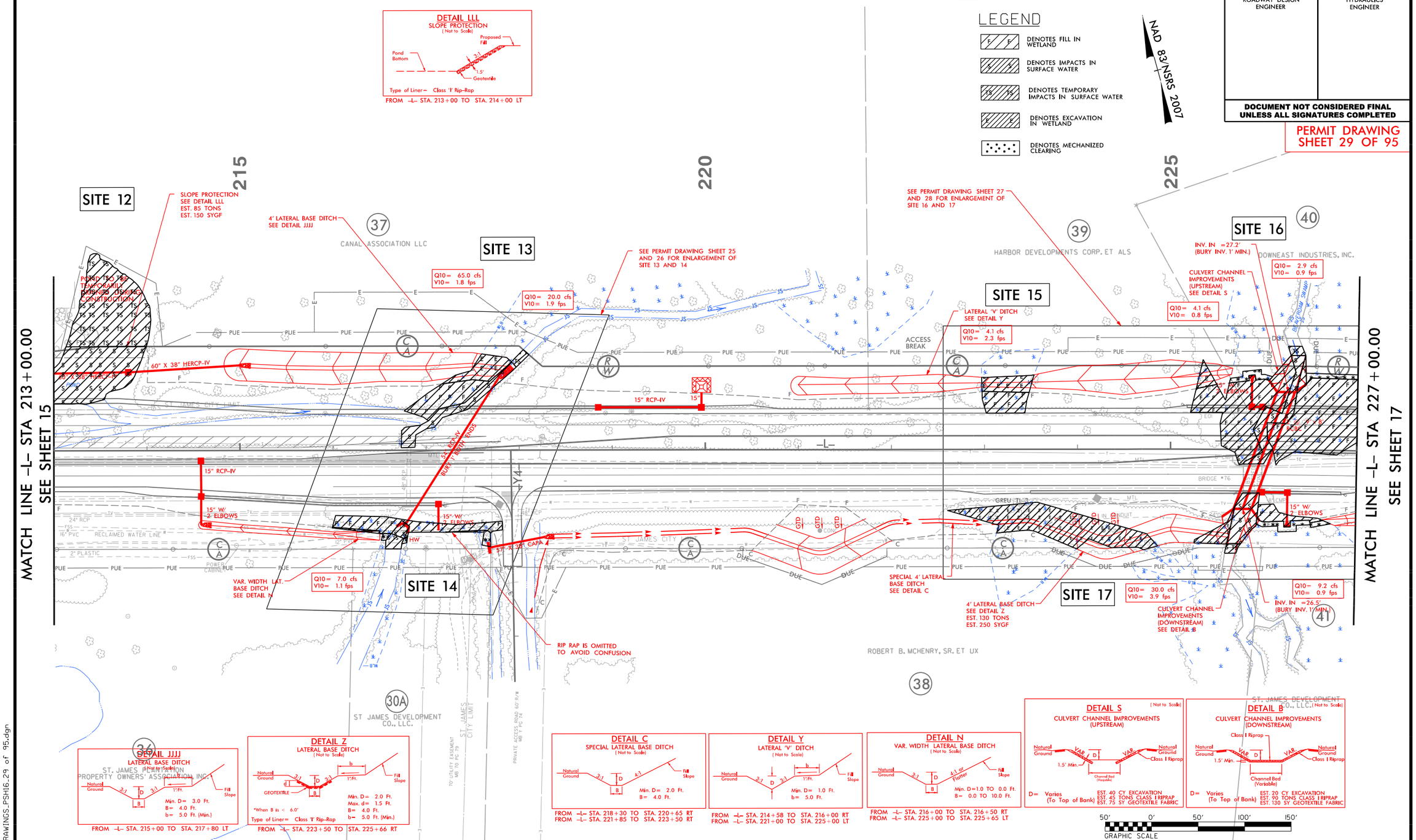
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

PERMIT DRAWING
SHEET 29 OF 95

## LEGEND

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

NAD 83/NSRS 2007




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR –L– PROFILE, SEE SHEET 47
FOR –Y4– PROFILE, SEE SHEET 58
FOR INTERSECTION DETAIL, SEE SHEET 2B-2
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/15/2018
R-5021_HYD_PERMIT_DRAWINGS.PSH16.29 of 95.dgn
HNTB

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 16 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

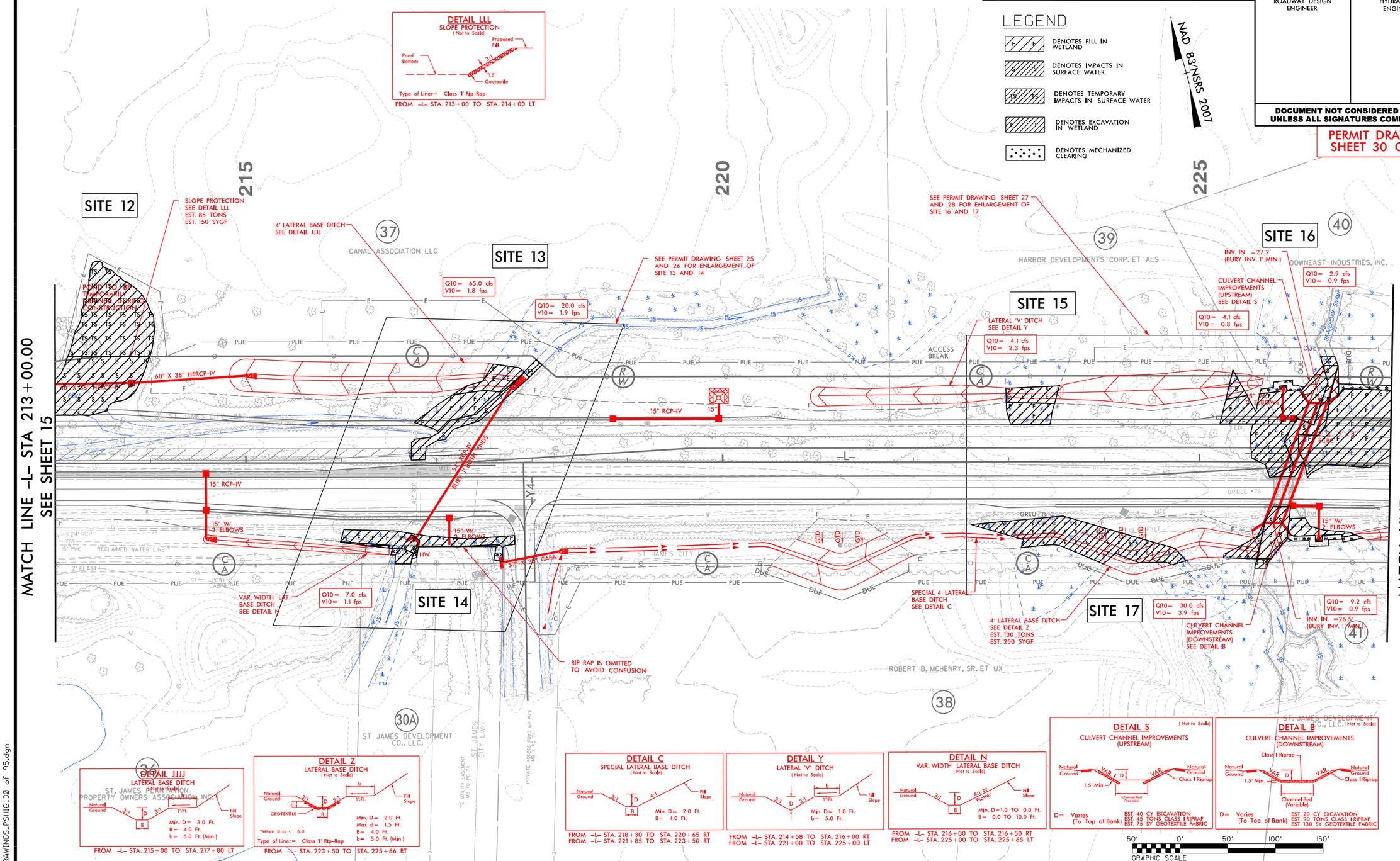
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

PERMIT DRAWING
SHEET 30 OF 95

## LEGEND

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

NAD 83/NSRS 2007




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 47
FOR -Y4- PROFILE, SEE SHEET 58
FOR INTERSECTION DETAIL, SEE SHEET 2B-2
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/14/99

5/15/2008
R-5021_HYD_PERMIT_DRAWINGS.PSH16.30 of 95.dgn
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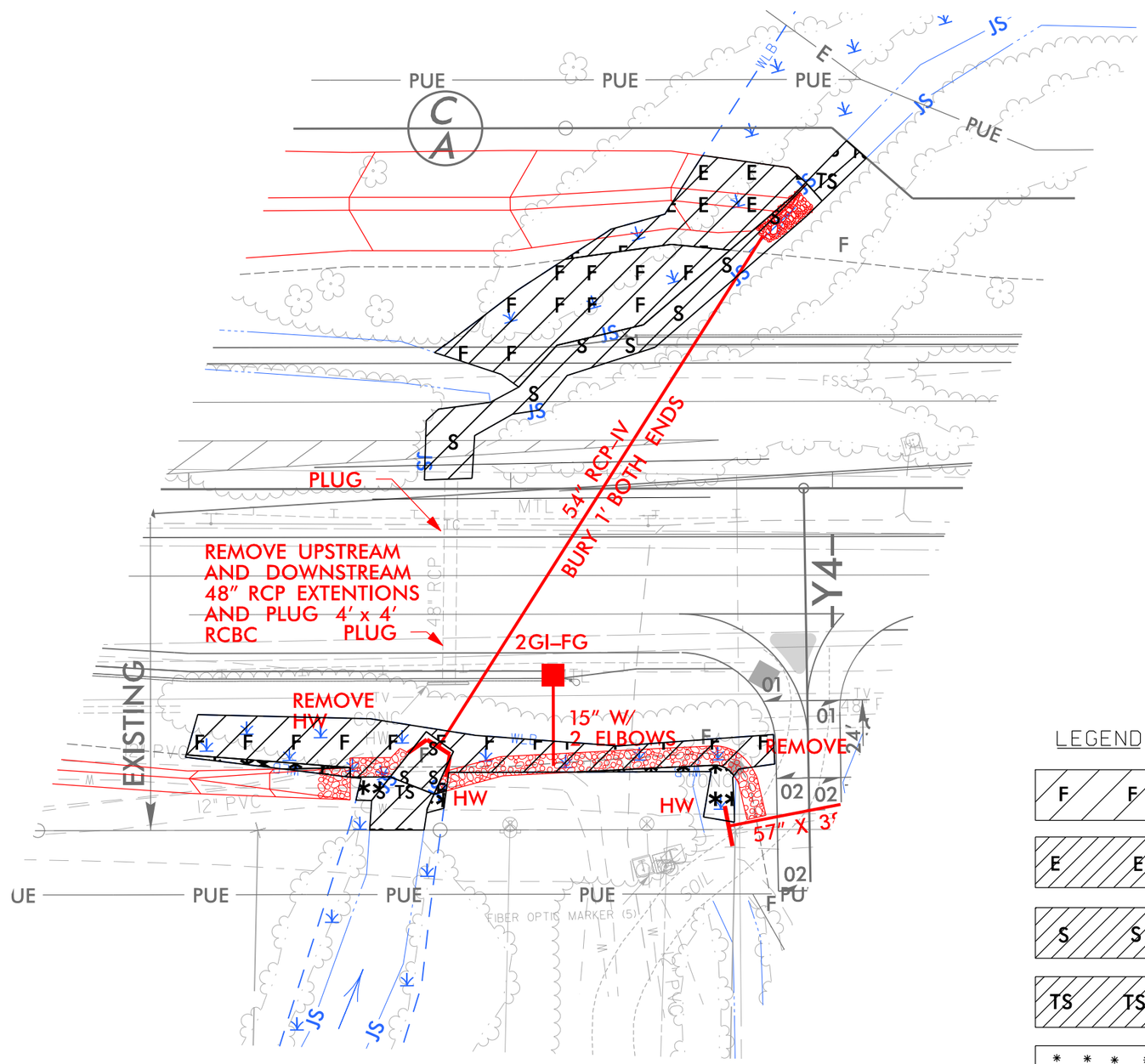
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 31 OF 95

NAD 83/NSRS 2007

# SITE 13




# SITE 14

LEGEND

| | |
|---|---|
| F F | DENOTES FILL IN WETLAND |
| E E | DENOTES EXCAVATION IN WETLAND |
| S S | DENOTES IMPACTS IN SURFACE WATER |
| TS TS | DENOTES TEMPORARY IMPACTS IN SURFACE WATER |
| * * * | DENOTES MECHANIZED CLEARING |

40' 0' 40' 80' 120'
GRAPHIC SCALE

5/14/99

5/15/2008
R-5021_HYD_PERMIT_DRAWINGS_PSH16.31 of 95_SITE_13&14.dgn
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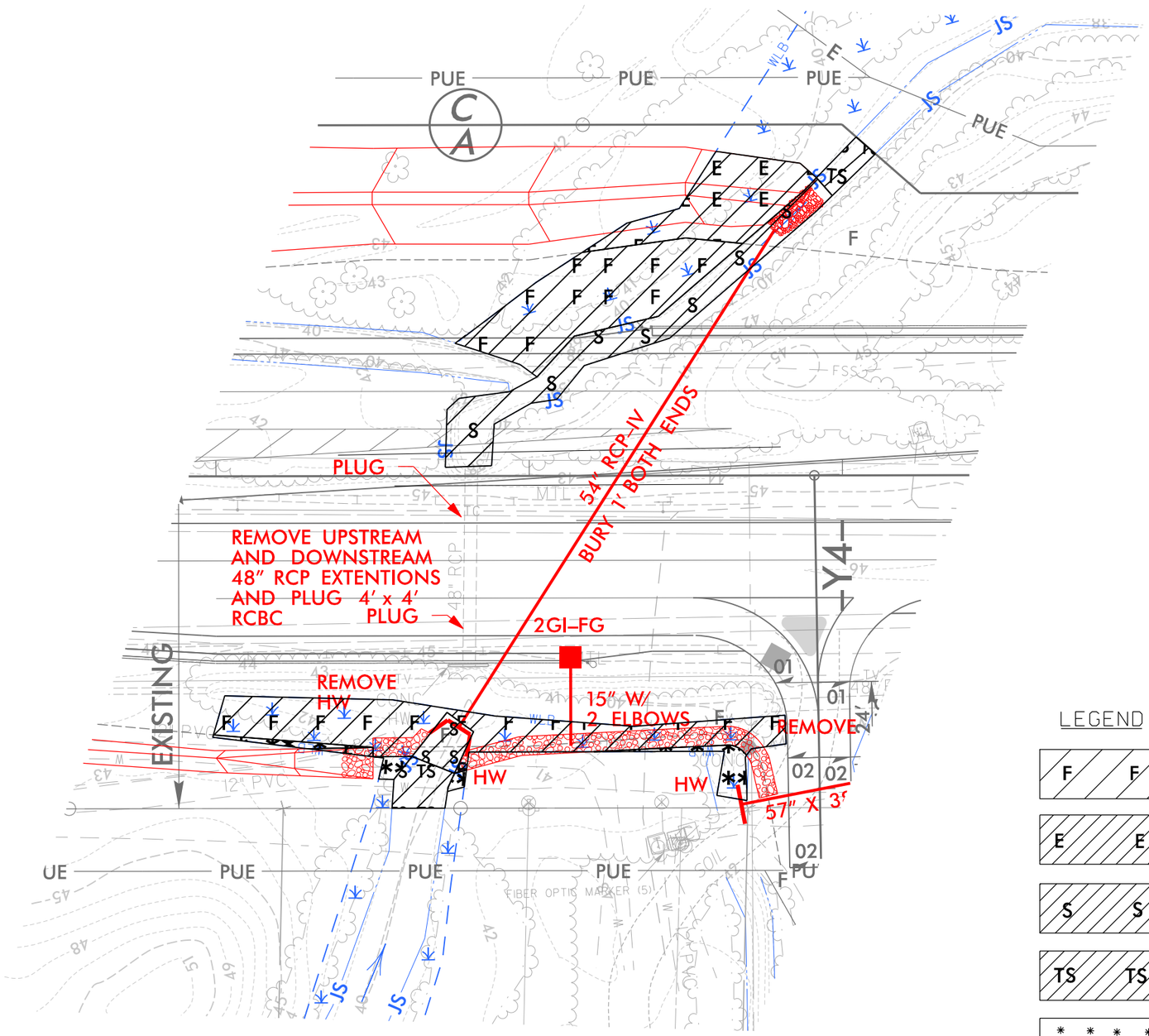
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 32 OF 95

NAD 83/NSRS 2007

# SITE 13




# SITE 14

LEGEND

| | |
|---|---|
| F / F | DENOTES FILL IN WETLAND |
| E / E | DENOTES EXCAVATION IN WETLAND |
| S / S | DENOTES IMPACTS IN SURFACE WATER |
| TS / TS | DENOTES TEMPORARY IMPACTS IN SURFACE WATER |
| * * * | DENOTES MECHANIZED CLEARING |

40' 0' 40' 80' 120'
GRAPHIC SCALE

5/14/99

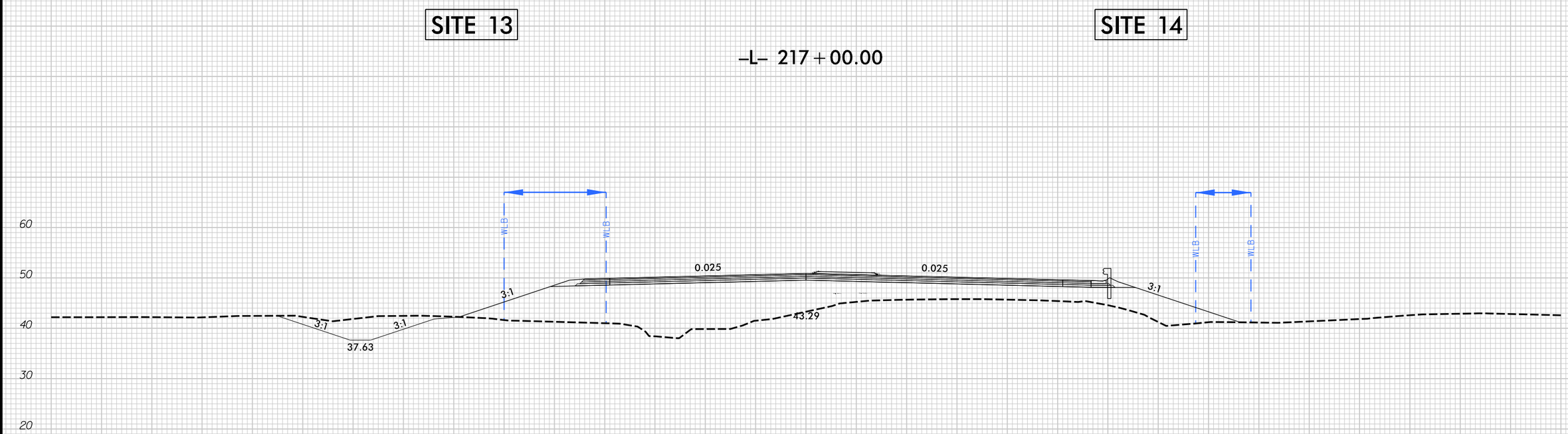
5/15/2008
R-5021_HYD_PERMIT_DRAWINGS_PSH16.32 of 95_SITE_13&14.dgn
HNTB

6/23/16

| 5 10 | PROJ. REFERENCE NO. | SHEET NO. |
|---|---|---|
| | R-5021 | |

PERMIT DRAWING
SHEET 33 OF 95

# WETLAND CROSS SECTIONS




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

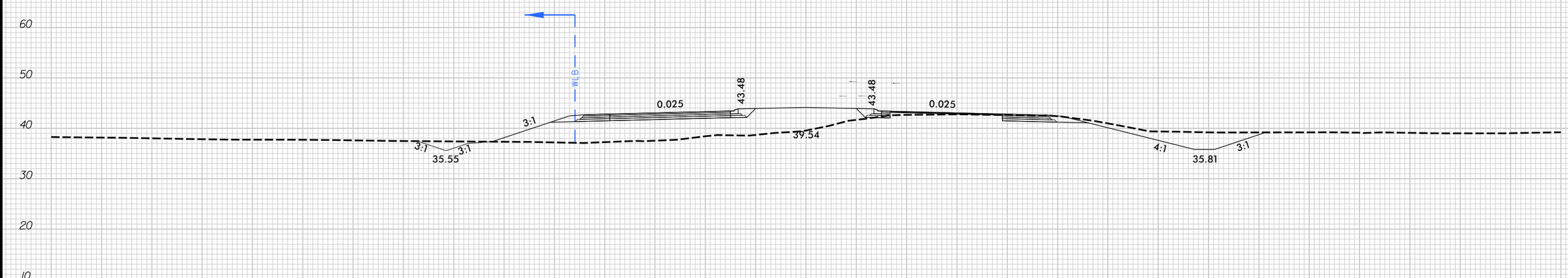
BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

5/15/2018
HNTB
Drawings\r5021_hyd_prm_xpl.dgn

# WETLAND CROSS SECTIONS

## SITE 15

–L– 223+00.00




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

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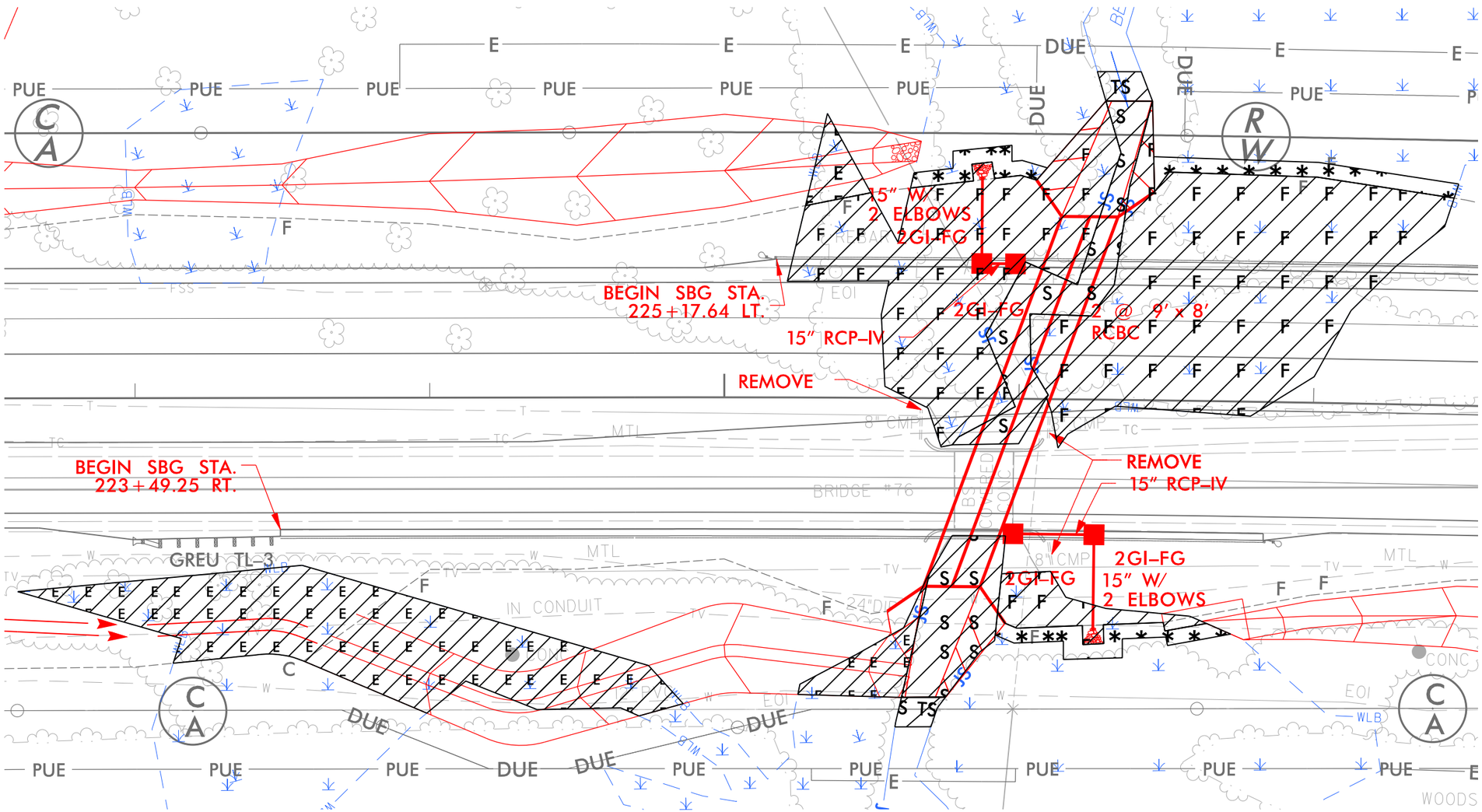
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 35 OF 95

# SITE 16




# SITE 17

LEGEND

| | |
|---|---|
| F F | DENOTES FILL IN WETLAND |
| E E | DENOTES EXCAVATION IN WETLAND |
| S S | DENOTES IMPACTS IN SURFACE WATER |
| TS TS | DENOTES TEMPORARY IMPACTS IN SURFACE WATER |
| * * * | DENOTES MECHANIZED CLEARING |

40' 0' 40' 80' 120'
GRAPHIC SCALE

5/14/99

5/15/2008
HNTB
R-5021_HYD_PERMIT_DRAWINGS_PSH16_35 of 95_SITE_16&17.dgn

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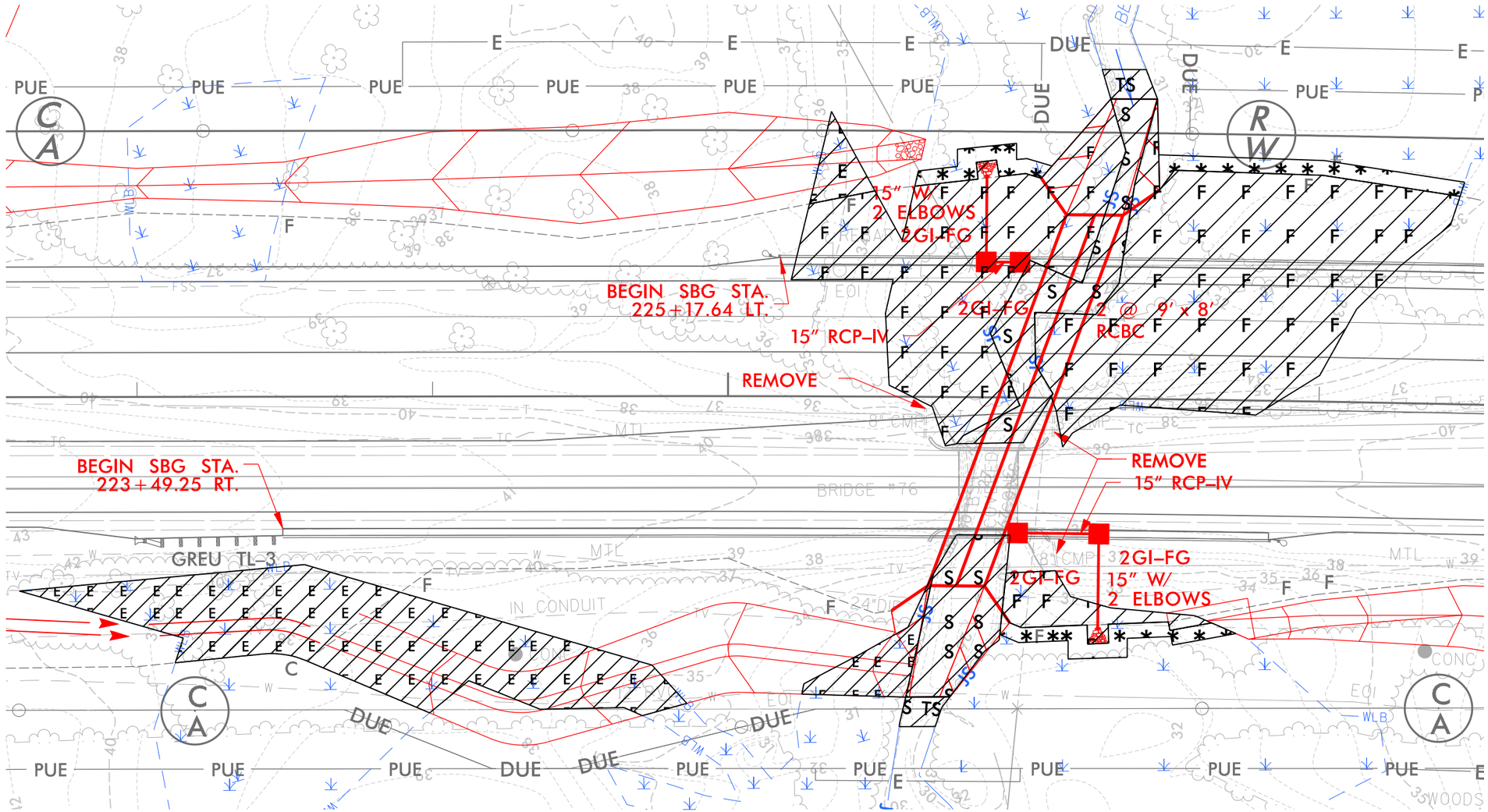
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 36 OF 95

# SITE 16




# SITE 17

LEGEND

| | |
|---|---|
| F F | DENOTES FILL IN WETLAND |
| E E | DENOTES EXCAVATION IN WETLAND |
| S S | DENOTES IMPACTS IN SURFACE WATER |
| TS TS | DENOTES TEMPORARY IMPACTS IN SURFACE WATER |
| * * * | DENOTES MECHANIZED CLEARING |

40' 0' 40' 80' 120'
GRAPHIC SCALE

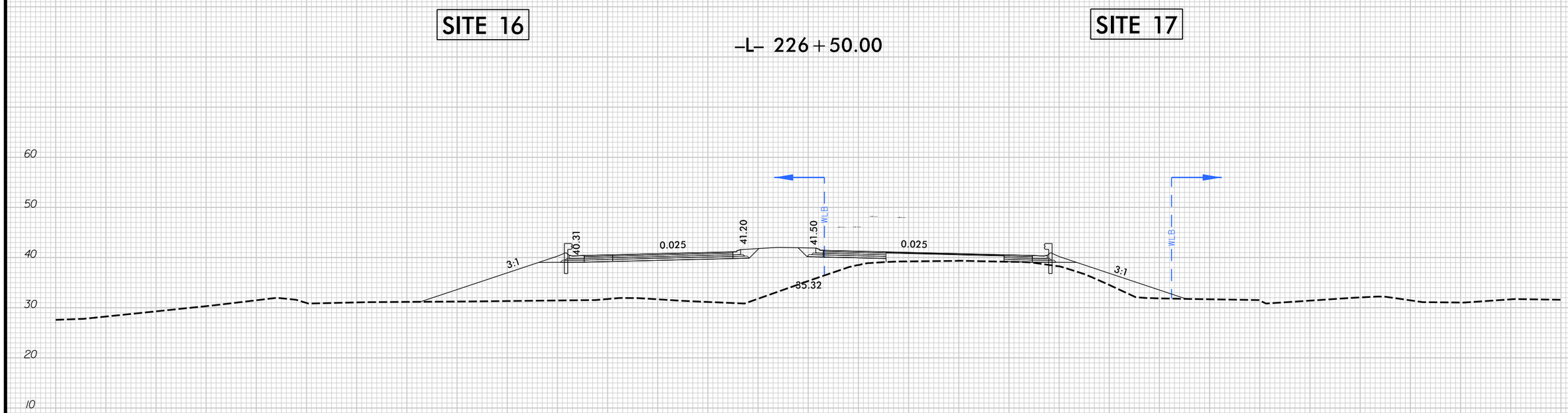
5/14/99

5/15/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH16_36 of 95_SITE_16&17.dgn
HNTB

| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |

PERMIT DRAWING
SHEET 37 OF 95

# WETLAND CROSS SECTIONS




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

6/23/16

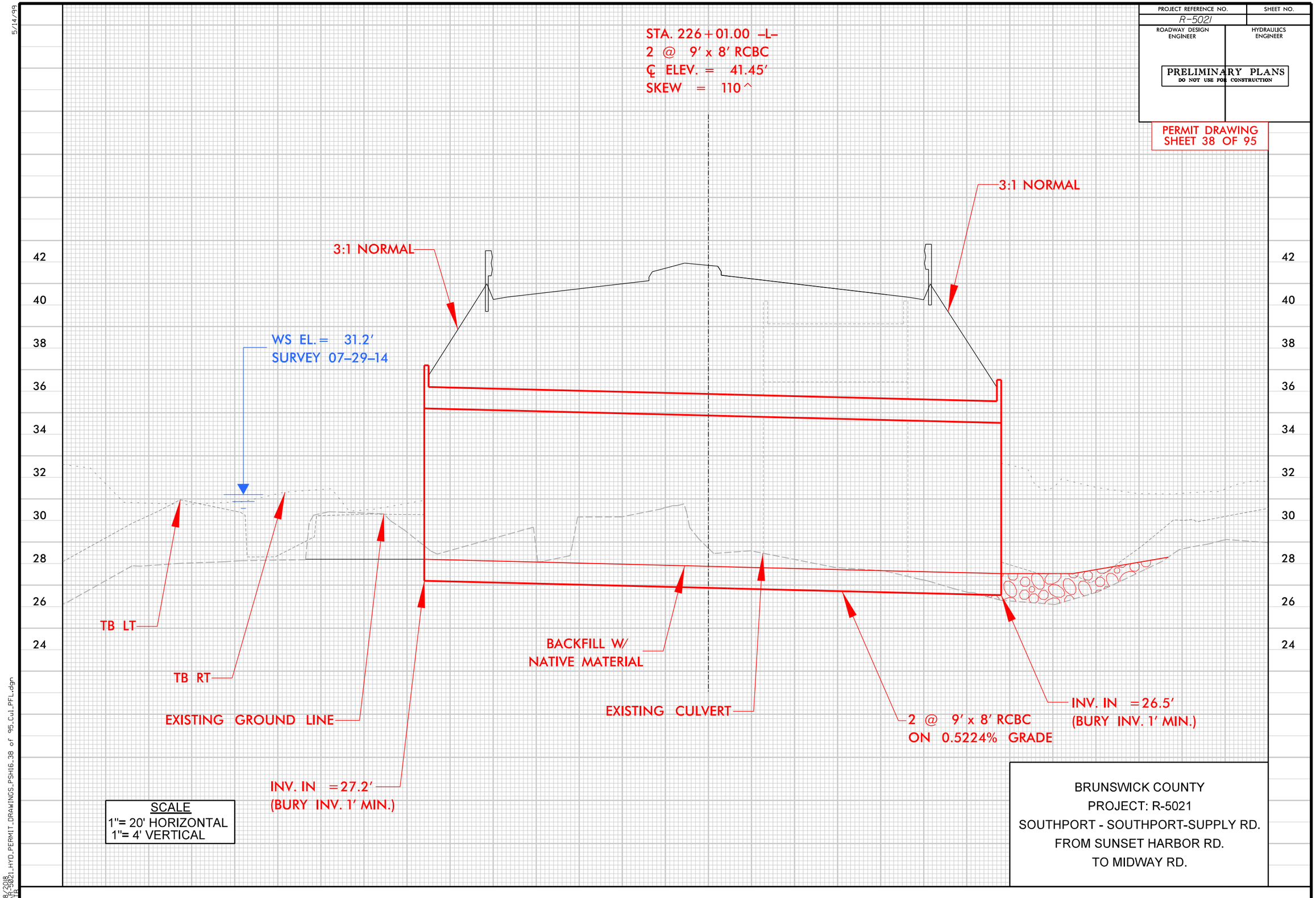
5/15/2018
HNTB
Drawings\r5021_hyd_prm_xpl.dgn

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING
SHEET 38 OF 95

STA. 226+01.00 -L-
2 @ 9' x 8' RCBC
℄ ELEV. = 41.45'
SKEW = 110^




SCALE
1"= 20' HORIZONTAL
1"= 4' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
SOUTHPORT - SOUTHPORT-SUPPLY RD.
FROM SUNSET HARBOR RD.
TO MIDWAY RD.

5/14/99
5/8/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH16_38 of 95_Cu1_PFL.dgn
HNTB

5/14/99

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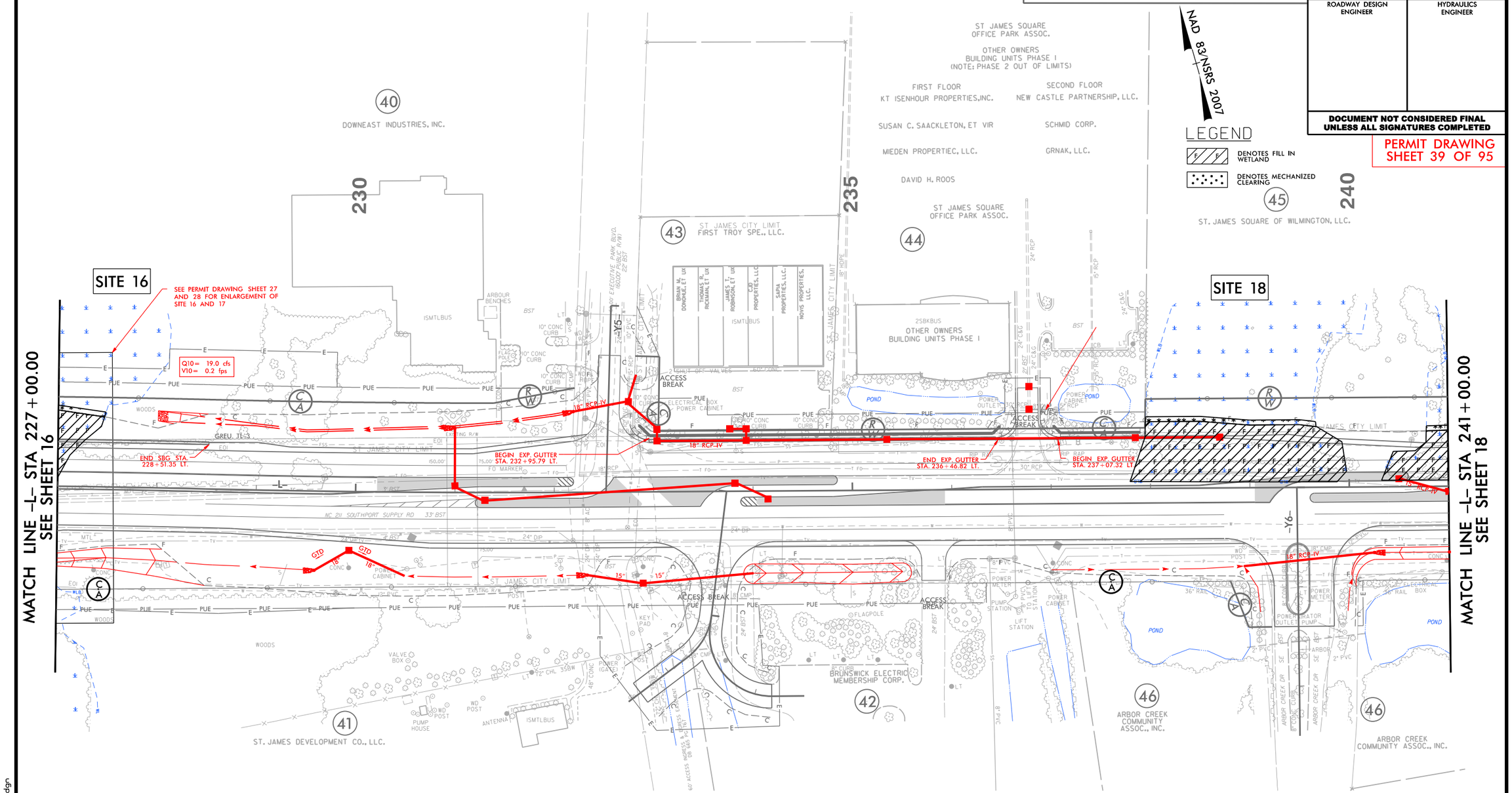
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 17 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 39 OF 95




50' 0' 50' 100' 150'
GRAPHIC SCALE

NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 47
FOR -Y5- & -Y6- PROFILES, SEE SHEET 58
FOR -Y5- & -Y6- INTERSECTION DETAILS, SEE SHEET 2B-2
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/15/2018
R-5021_HYD_PERMIT_DRAWINGS.PSH17_39 of 95.dgn
HNTB

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Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 17 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

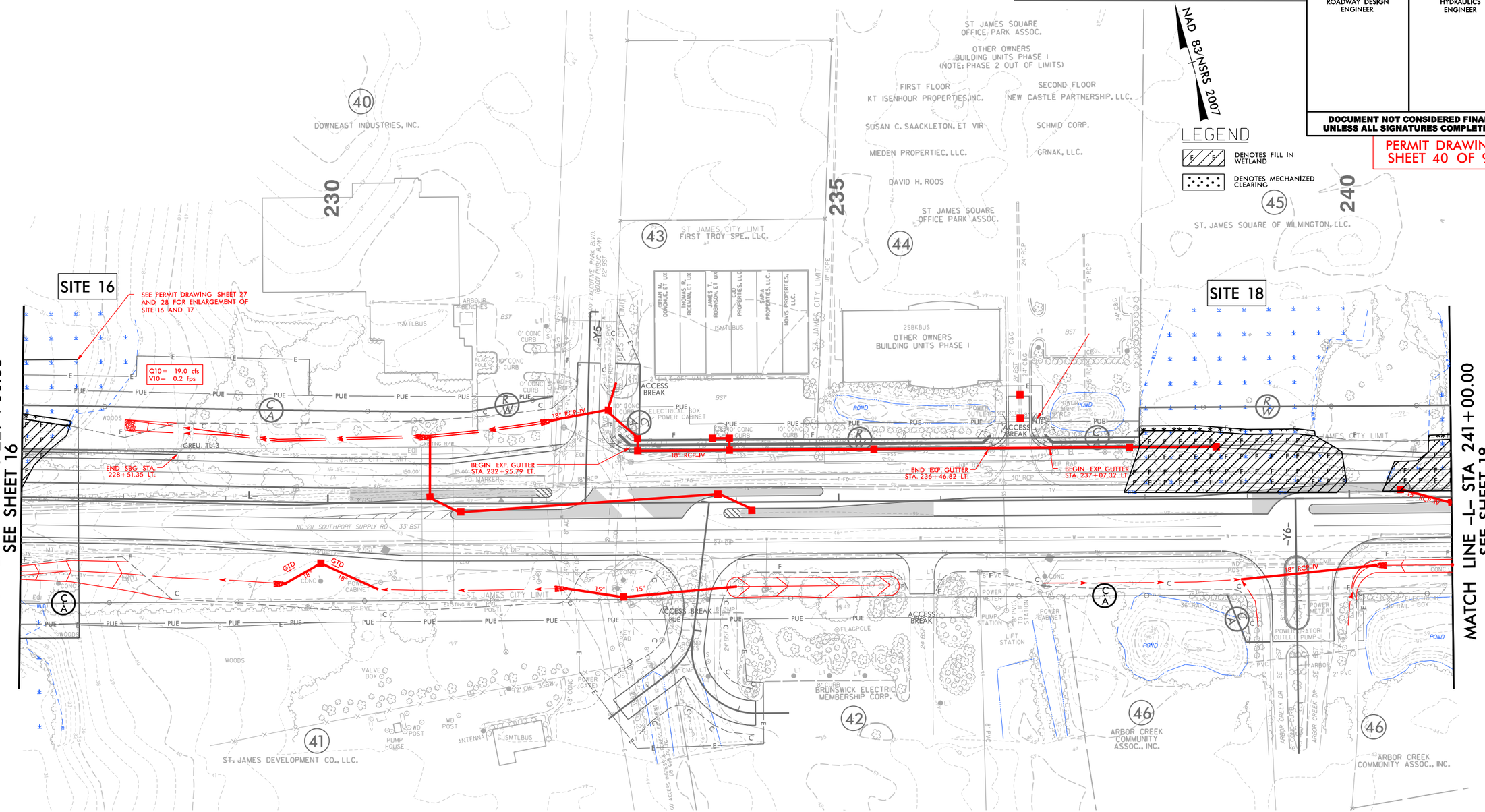
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

PERMIT DRAWING
SHEET 40 OF 95

NAD 83/NSRS 2007

LEGEND

- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING




50' 0' 50' 100' 150'
GRAPHIC SCALE

NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 47
FOR -Y5- & -Y6- PROFILES, SEE SHEET 58
FOR -Y5- & -Y6- INTERSECTION DETAILS, SEE SHEET 2B-2
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/14/99

5/15/2018
R-5021_HYD_PERMIT_DRAWINGS.PSH17.40 of 95.dgn
HNTB

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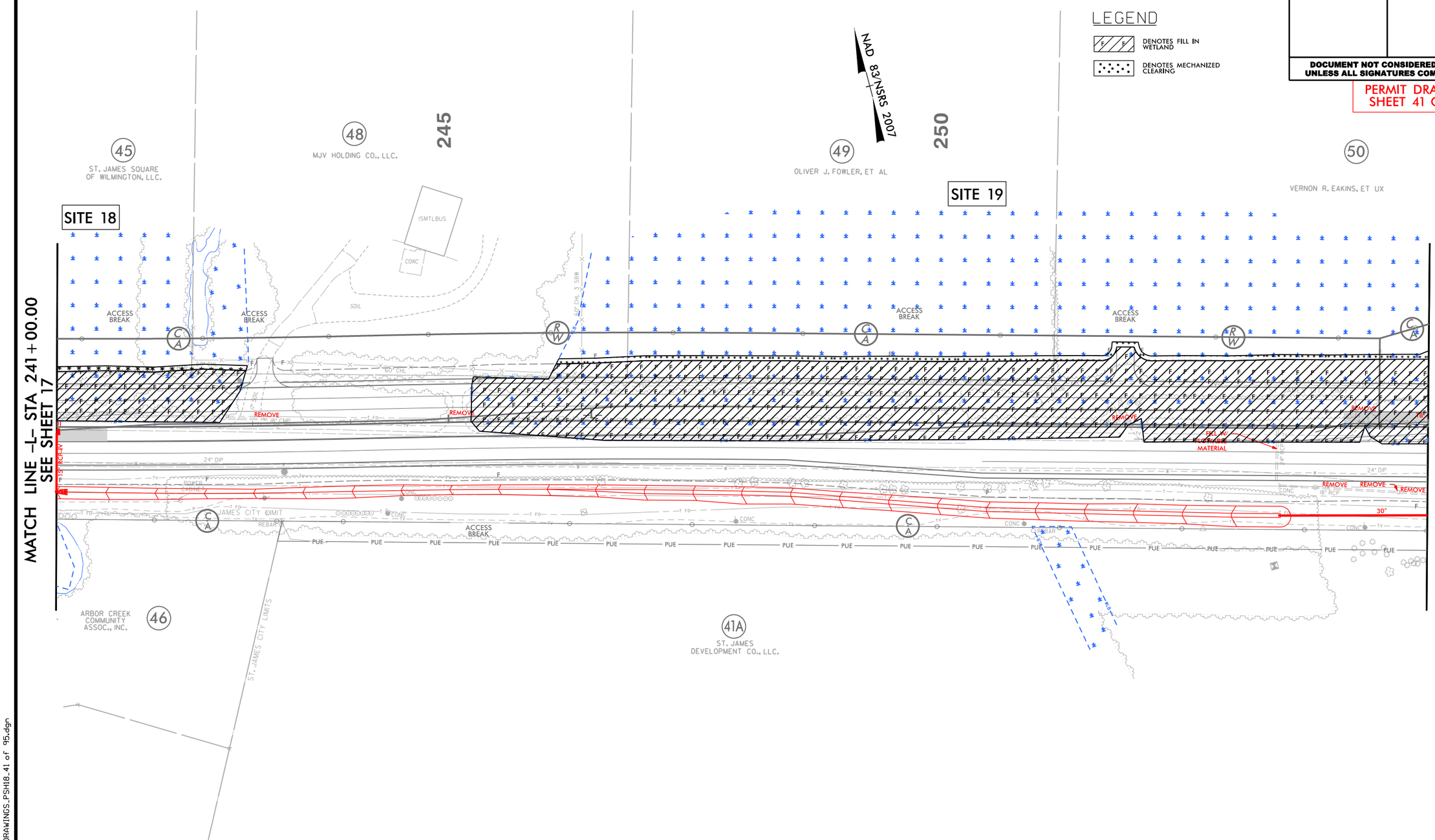
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 18 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 41 OF 95




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

50' 0' 50' 100' 150'
GRAPHIC SCALE

FOR -L- PROFILE, SEE SHEET 48

FOR DETAIL FOR DIRECTIONAL CROSS OVER, SEE SHEET 2B-2

FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/14/99

5/8/2008
R-5021_HYD_PERMIT_DRAWINGS_PSH18_41 of 95.dgn
HNTB

5/14/99

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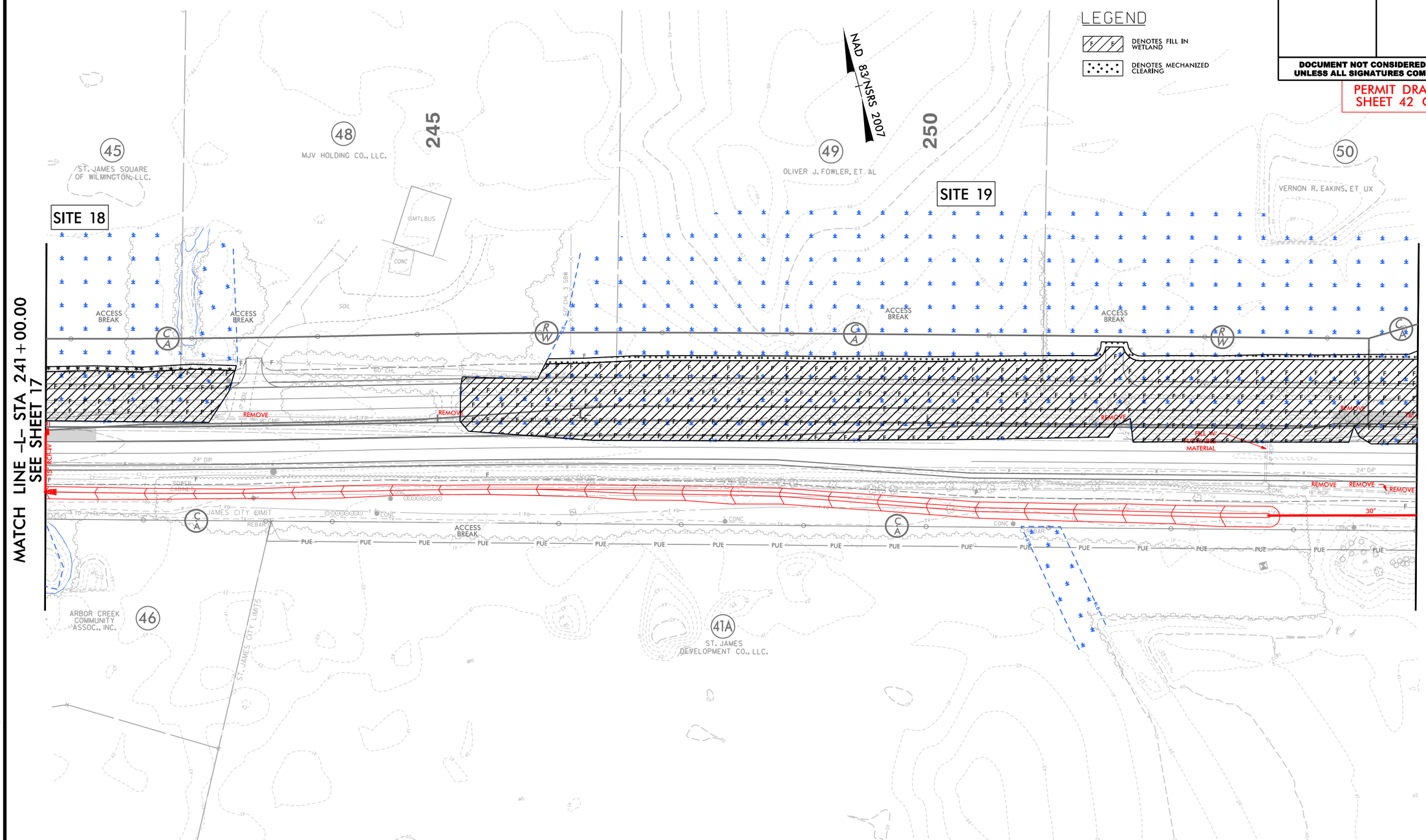
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 18 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 42 OF 95




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 48

FOR DETAIL FOR DIRECTIONAL CROSS OVER, SEE SHEET 2B-2

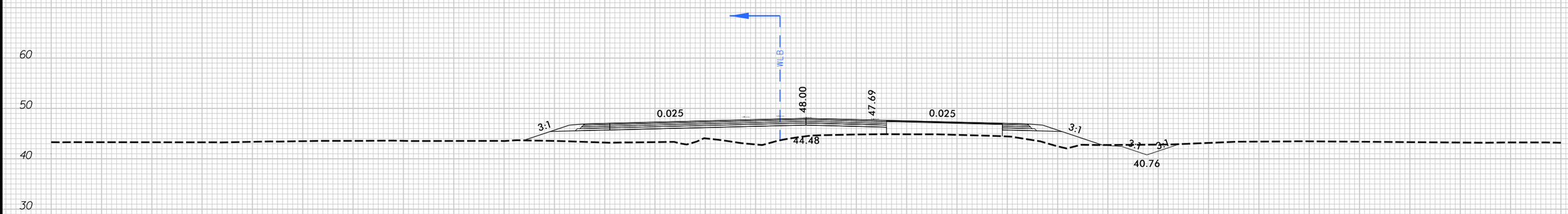
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/8/2008
R-5021_HYD_PERMIT_DRAWINGS_PSH18_42 of 95.dgn
HNTB

# WETLAND CROSS SECTIONS

**SITE 18**

–L– 242+00.00




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

HNTB
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Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 19 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

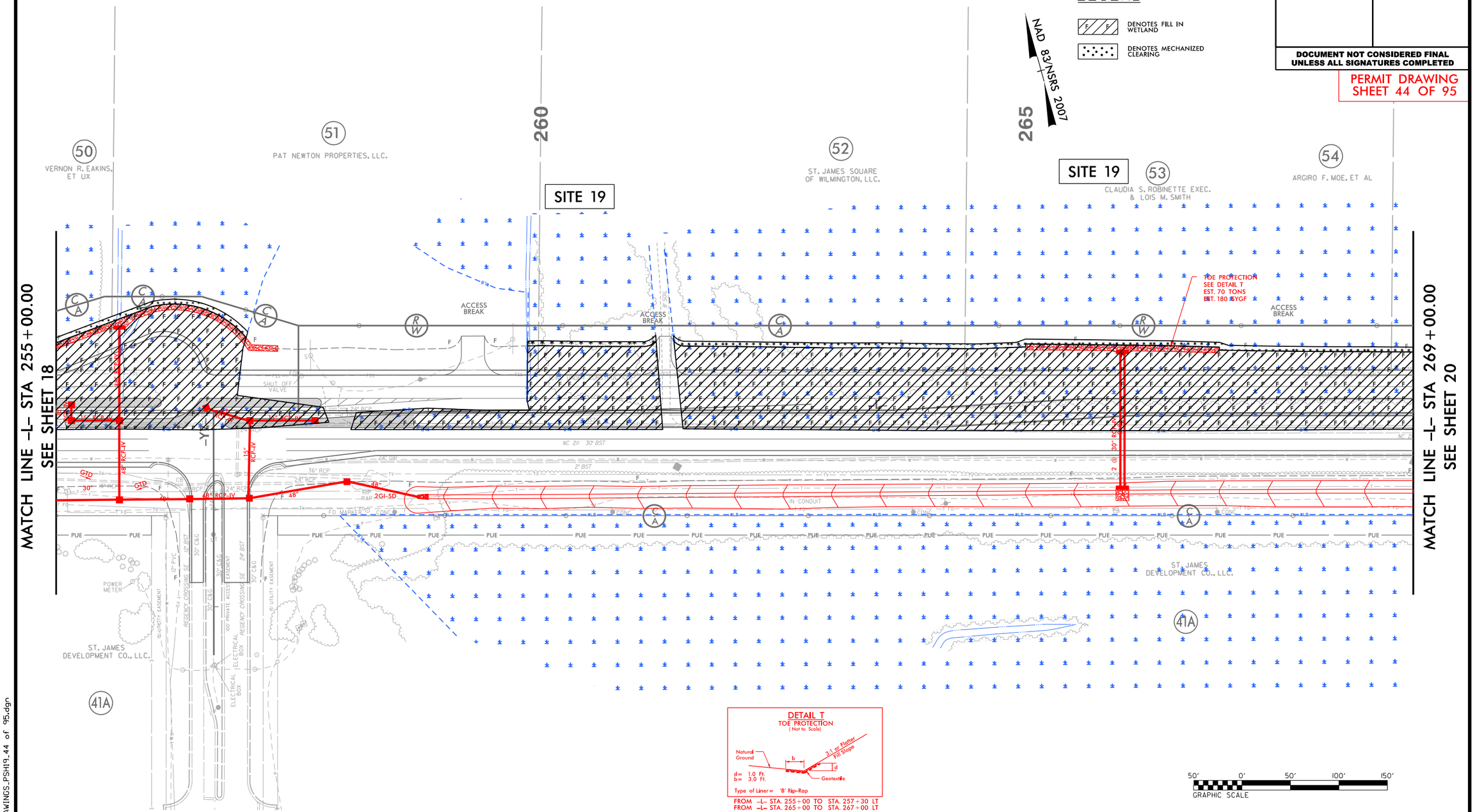
PERMIT DRAWING
SHEET 44 OF 95

LEGEND

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83/NSRS 2007




**DETAIL T**
TOE PROTECTION
( Not to Scale)




Type of Liner= 'B' Rip-Rap

FROM -L- STA. 255+00 TO STA. 257+30 LT
FROM -L- STA. 265+00 TO STA. 267+00 LT

NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 48
FOR -Y7- PROFILE, SEE SHEET 58
FOR INTERSECTION DETAIL AND DIRECTIONAL CROSS OVER, SEE SHEET 2B-2
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/14/99
5/8/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH19_44 of 95.dgn
HNTB

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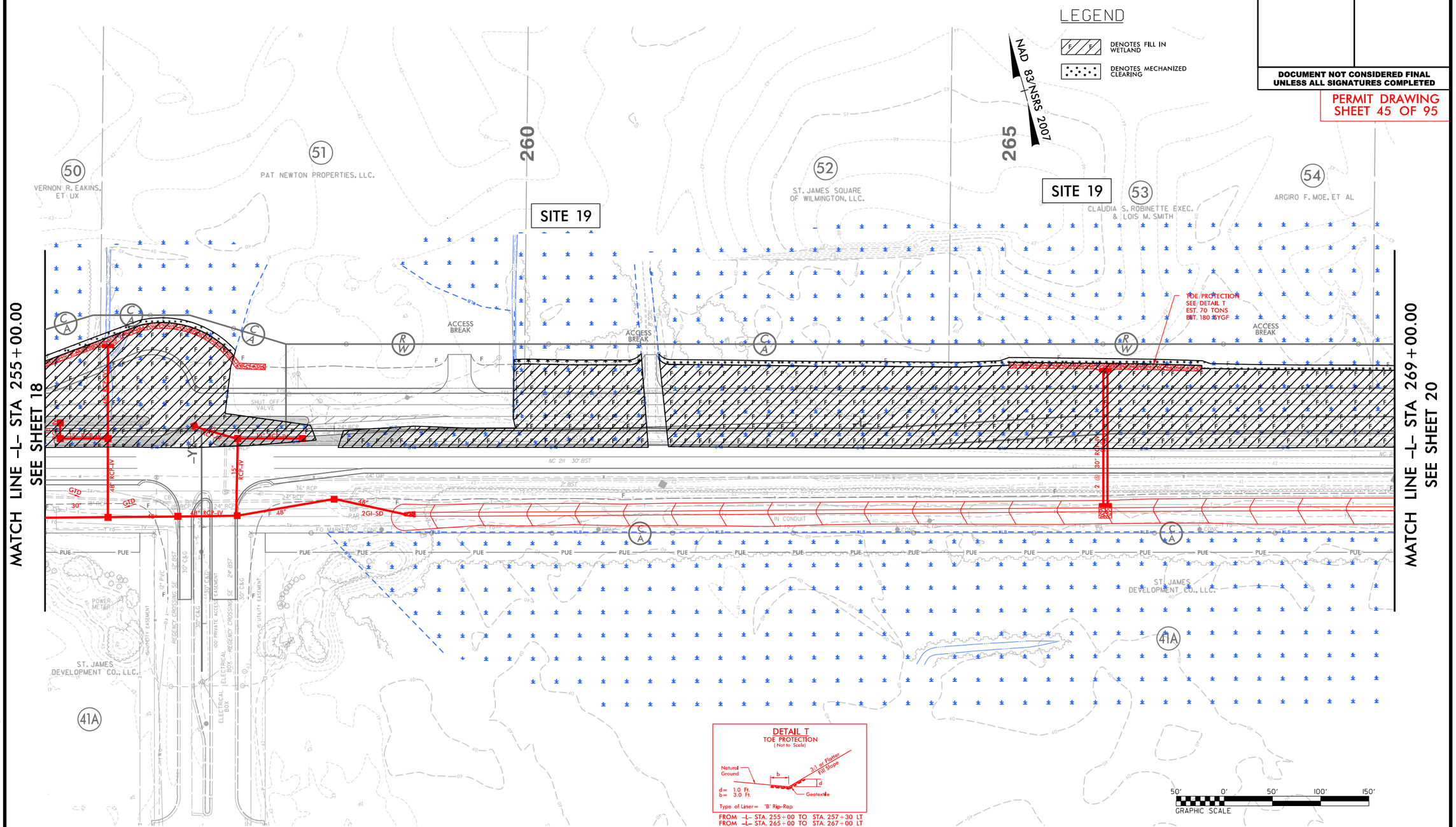
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 19 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 45 OF 95




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 48
FOR -Y7- PROFILE, SEE SHEET 58
FOR INTERSECTION DETAIL AND DIRECTIONAL CROSS OVER, SEE SHEET 2B-2
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/14/99

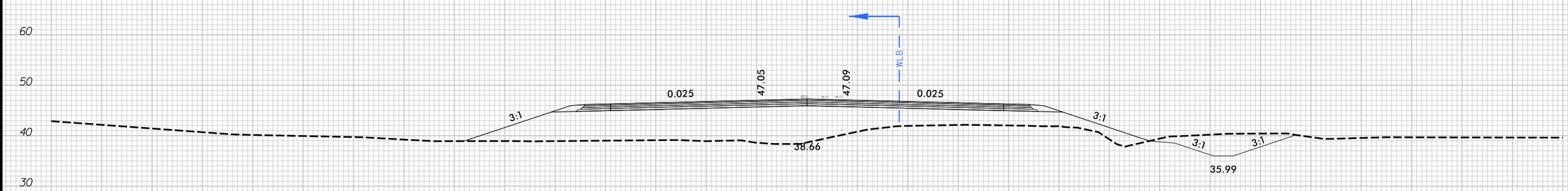
5/8/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH19_45 of 95.dgn
HNTB

| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |

PERMIT DRAWING
SHEET 46 OF 95

# WETLAND CROSS SECTIONS

## SITE 19
–L– 265+00.00




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

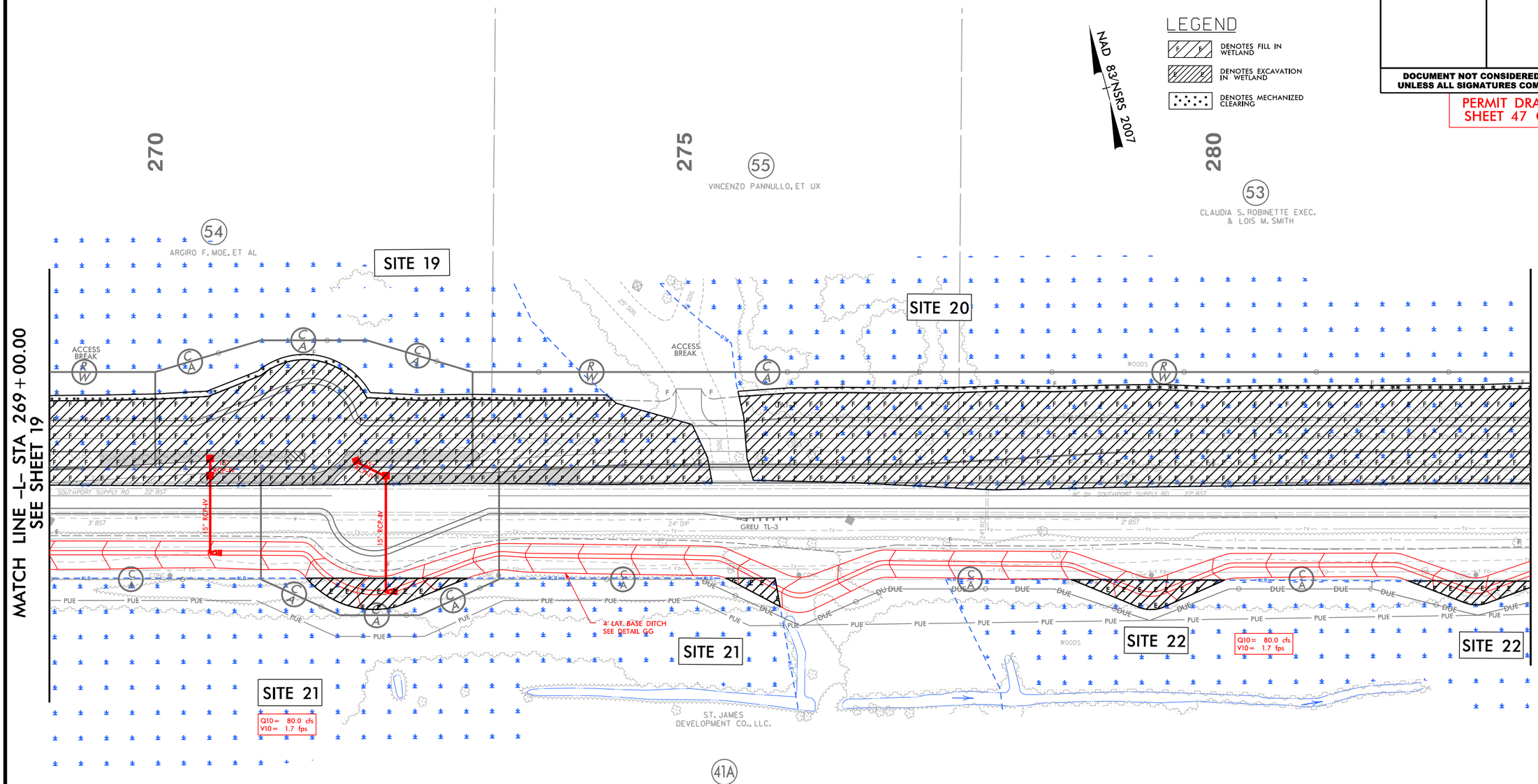
5/14/99

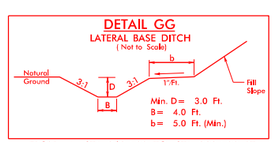
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 20 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 47 OF 95




50' 0' 50' 100' 150'
GRAPHIC SCALE

NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 49
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/8/2008
R-5021_HYD_PERMIT_DRAWINGS.PSH20_47 of 95.dgn
HNTB

HNTB
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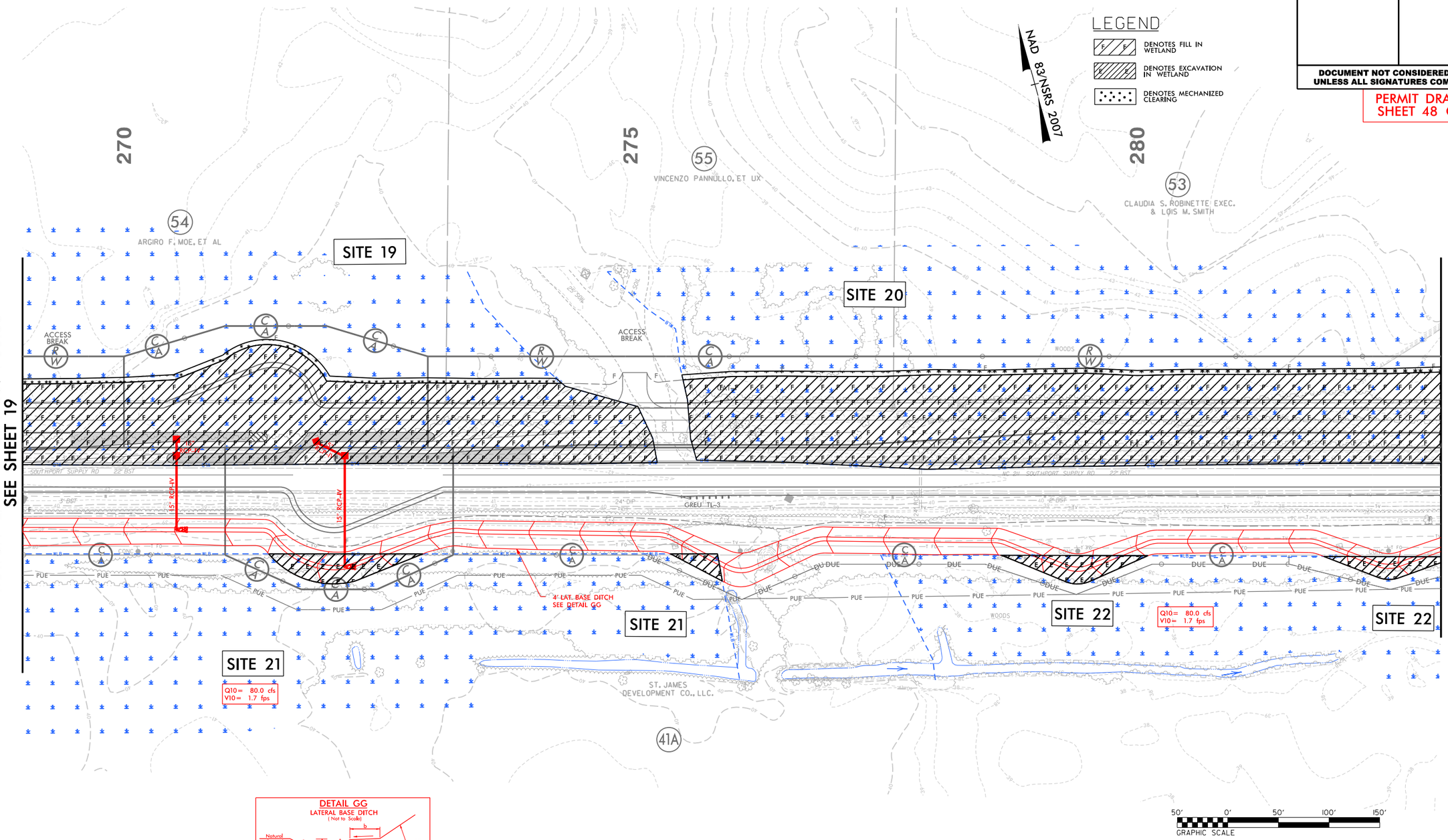
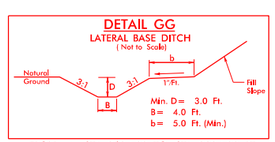
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 20 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 48 OF 95




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 49
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

6/23/16

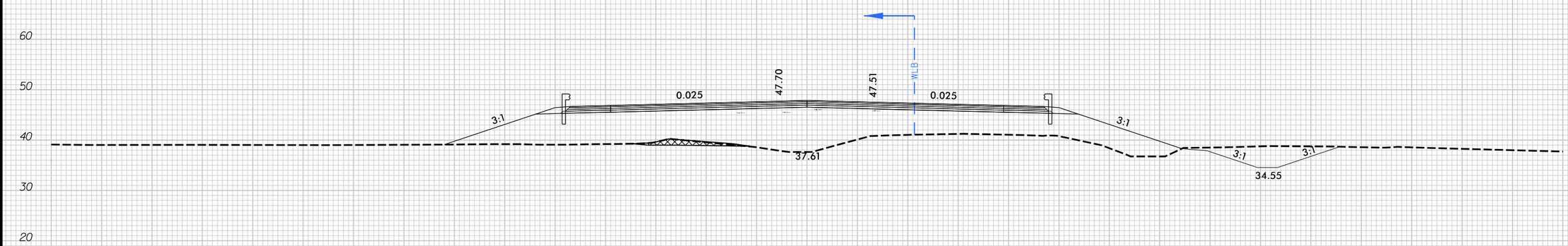
| 5 10 | PROJ. REFERENCE NO. | SHEET NO. |
|---|---|---|
| | R-5021 | |

PERMIT DRAWING
SHEET 49 OF 95

# WETLAND CROSS SECTIONS

**SITE 20**

–L– 278+00.00




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

5/15/2018
HNTB
Drawings\r5021.hyd_prm_xpl.dgn

6/23/16

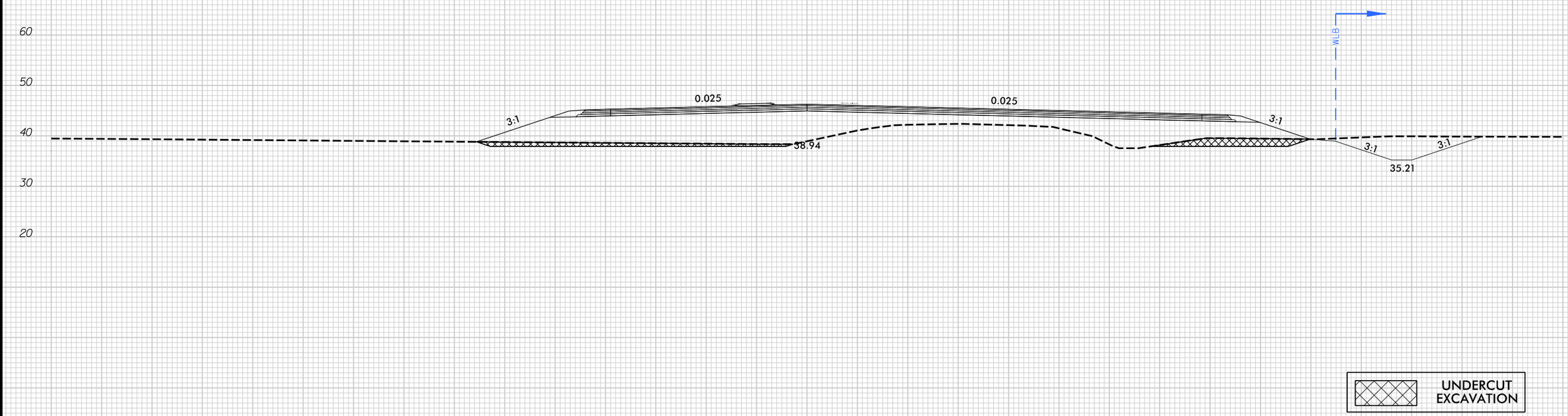
| 5 10 | PROJ. REFERENCE NO. | SHEET NO. |
|---|---|---|
| | R-5021 | |

PERMIT DRAWING
SHEET 50 OF 95

# WETLAND CROSS SECTIONS

## SITE 21

–L– 272+00.00




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

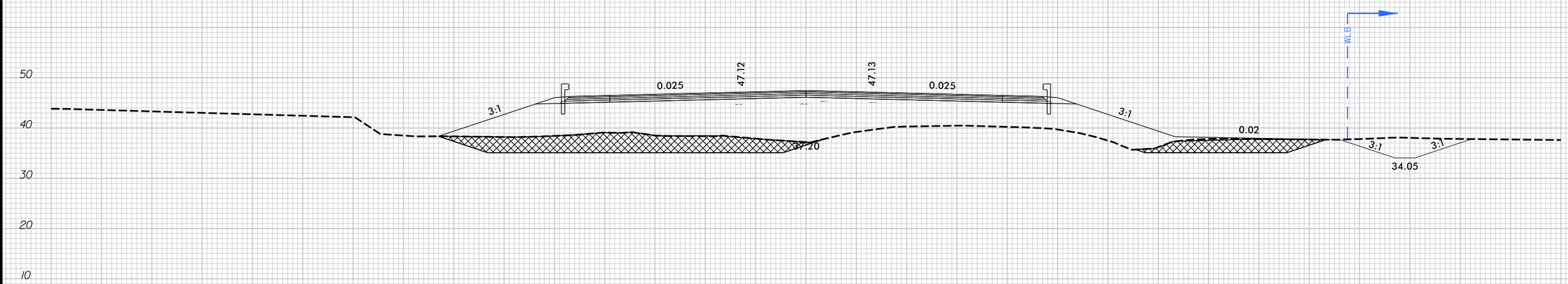
BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

5/15/2018
HNTB

# WETLAND CROSS SECTIONS

## SITE 22

–L– 282+50.00




UNDERCUT EXCAVATION

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

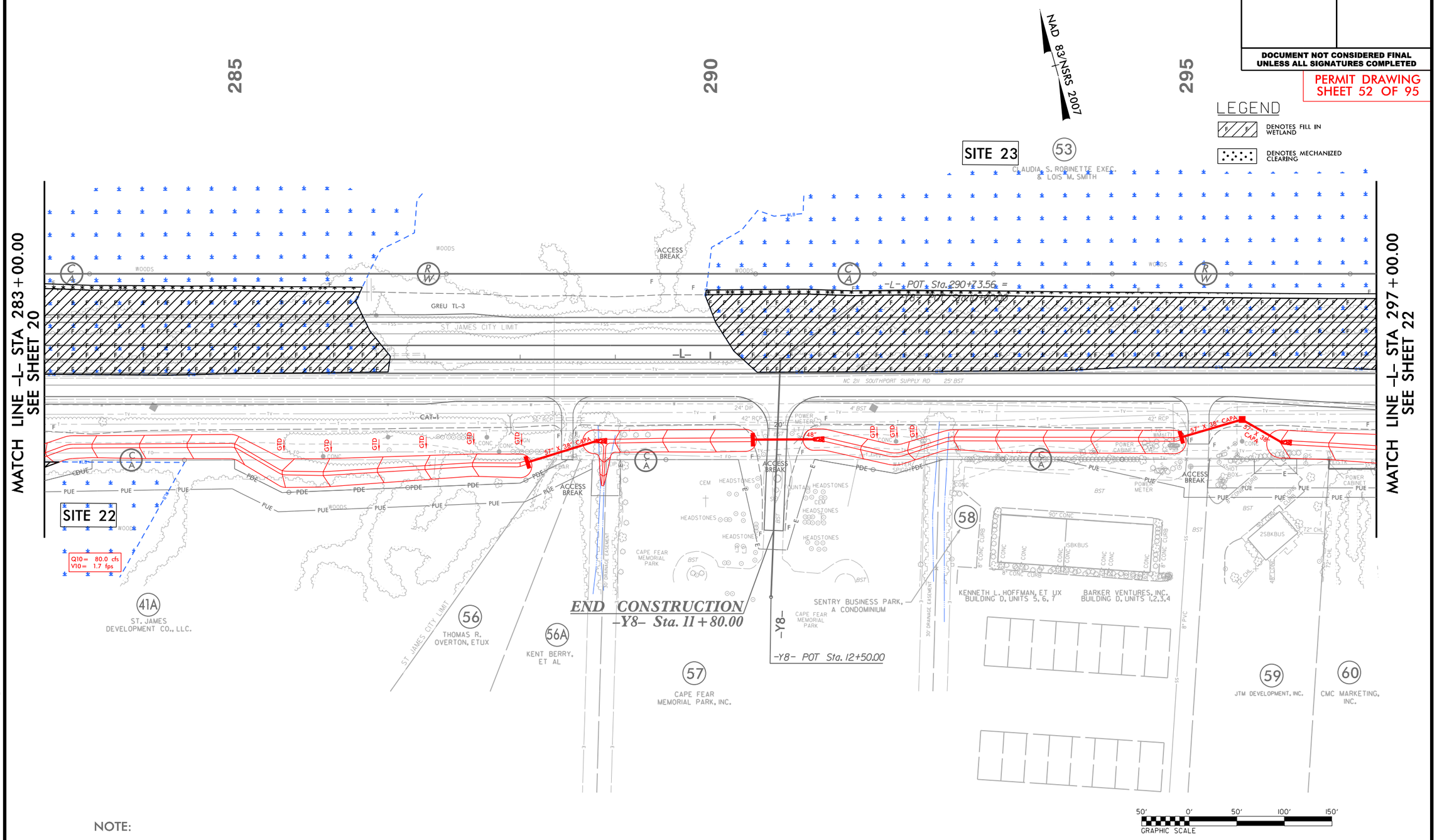
5/14/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 21 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 52 OF 95




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 49
FOR -Y8- PROFILE, SEE SHEET 59
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/8/2008
R-5021_HYD_PERMIT_DRAWINGS_PSH21.52 of 95.dgn
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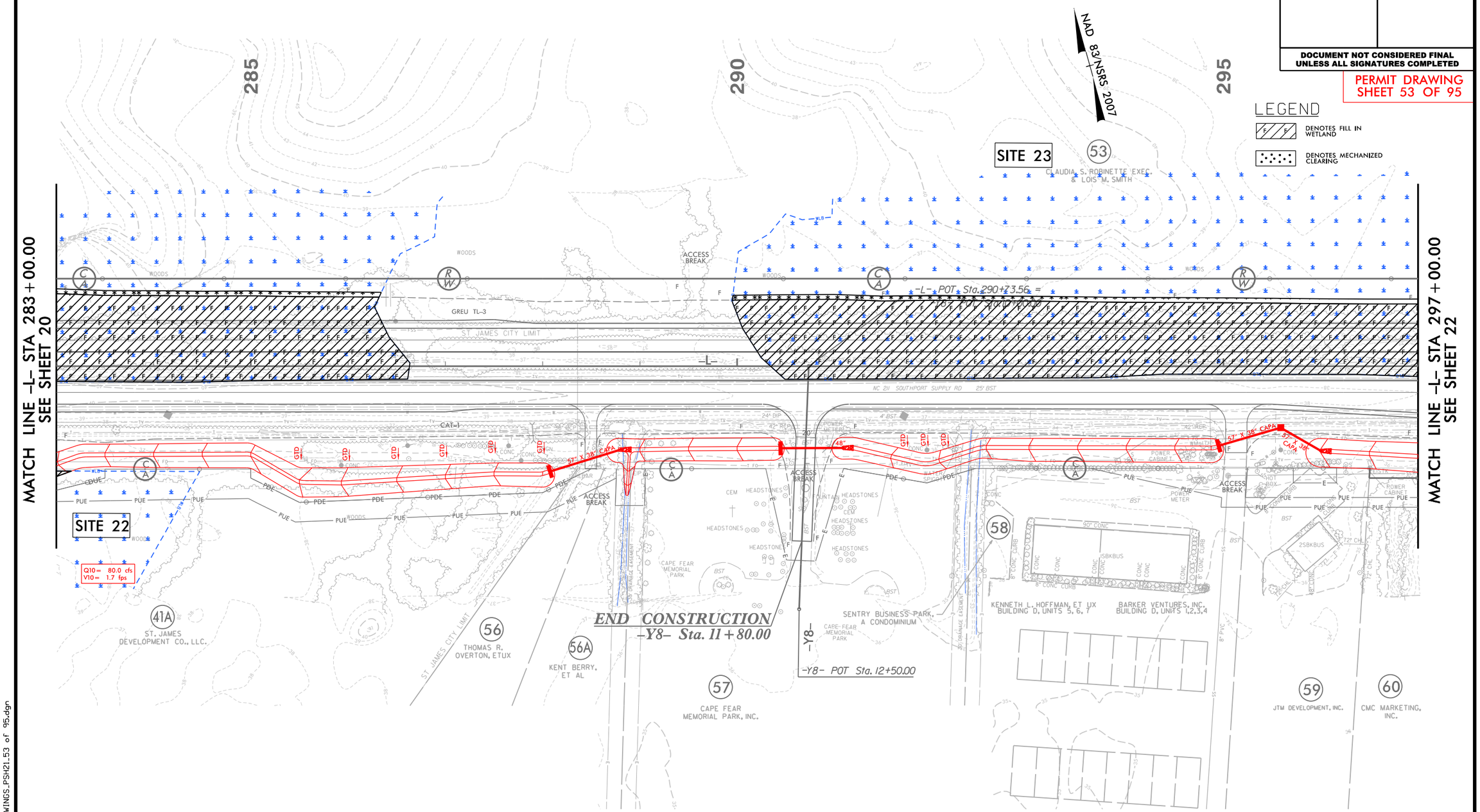
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 21 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 53 OF 95




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 49
FOR -Y8- PROFILE, SEE SHEET 59
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/8/2008
R-5021_HYD_PERMIT_DRAWINGS.PSH21.53 of 95.dgn
HNTB

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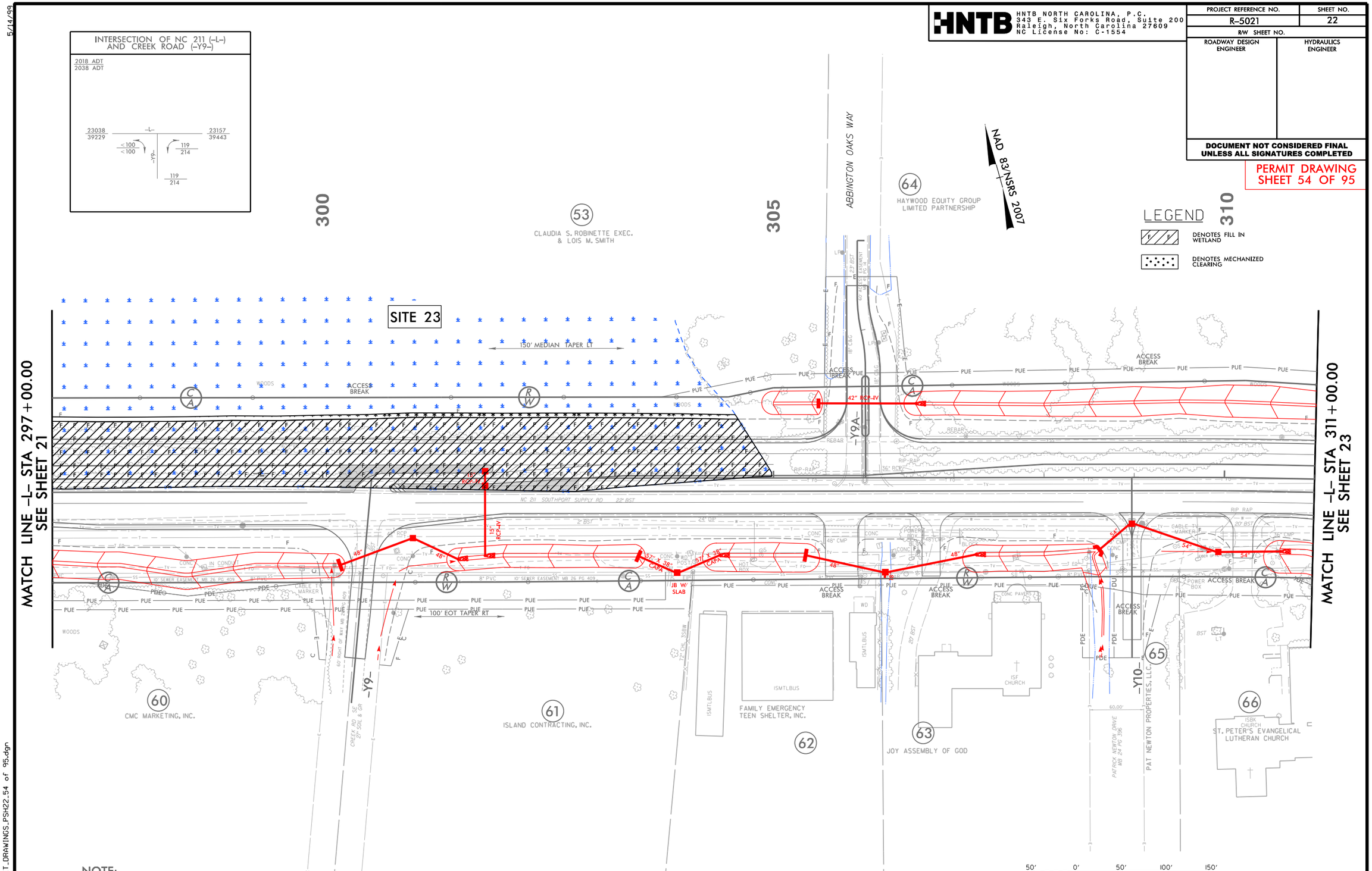
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 22 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 54 OF 95




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 50
FOR -Y9- & -Y10- PROFILES, SEE SHEET 59
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/14/99

5/15/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH22_54 of 95.dgn

5/14/99

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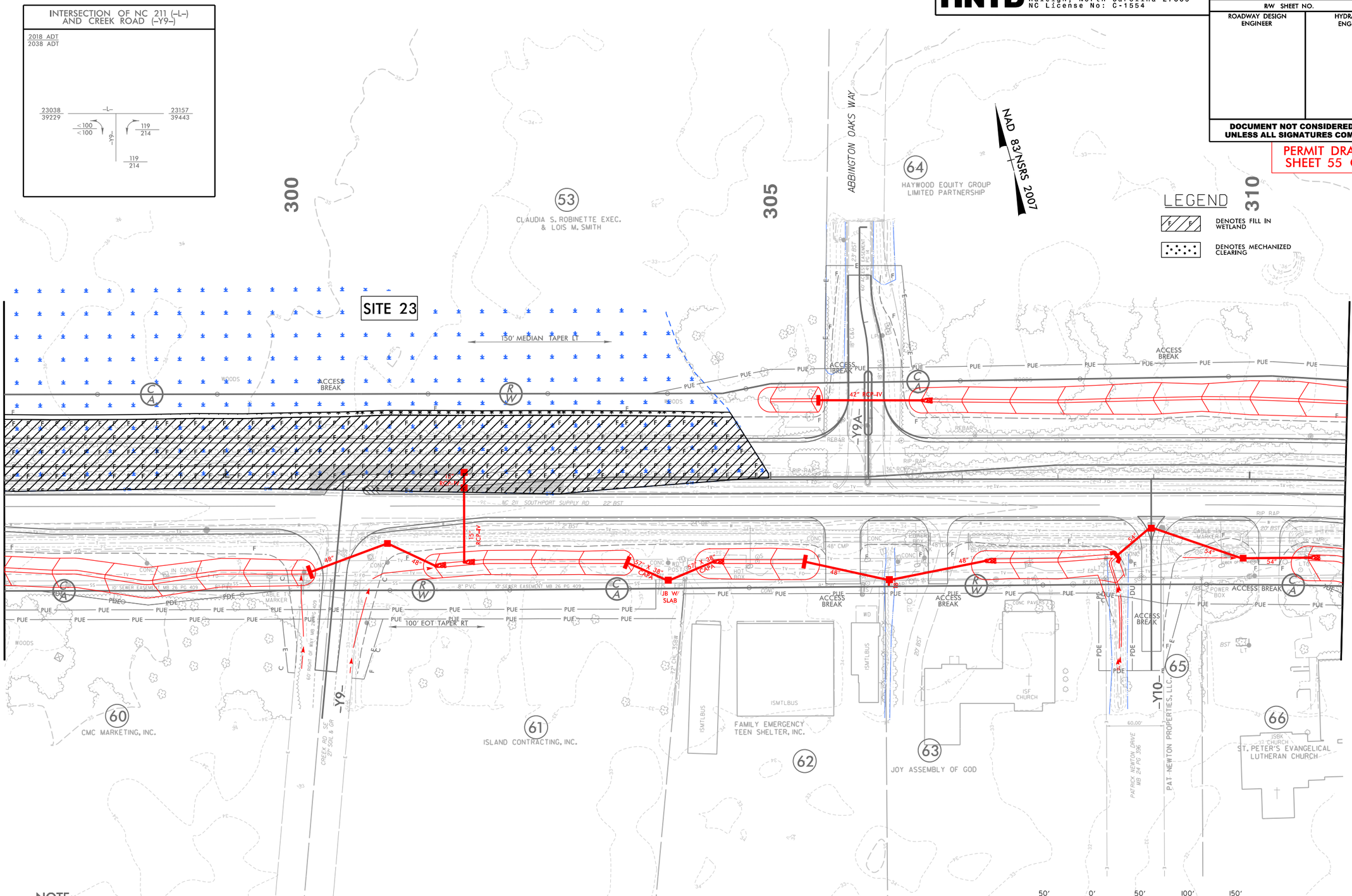
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 22 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 55 OF 95




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 50
FOR -Y9- & -Y10- PROFILES, SEE SHEET 59
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/15/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH22.55 of 95.dgn
HNTB

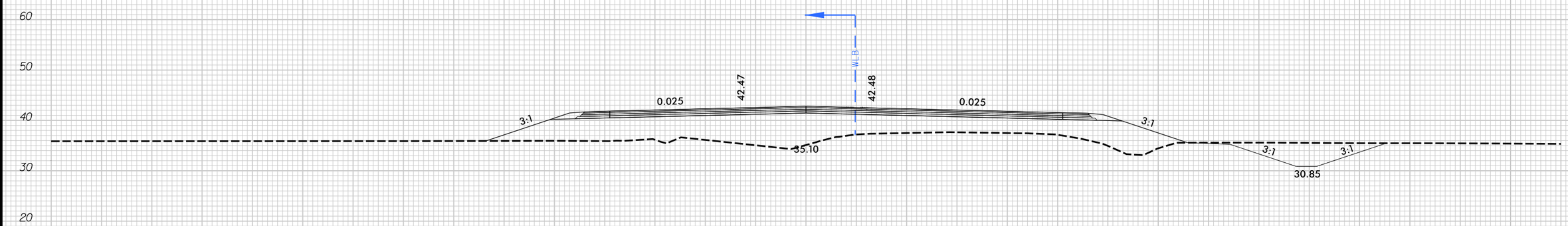
| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |

PERMIT DRAWING
SHEET 56 OF 95

# WETLAND CROSS SECTIONS

## SITE 23

–L– 298+00.00




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

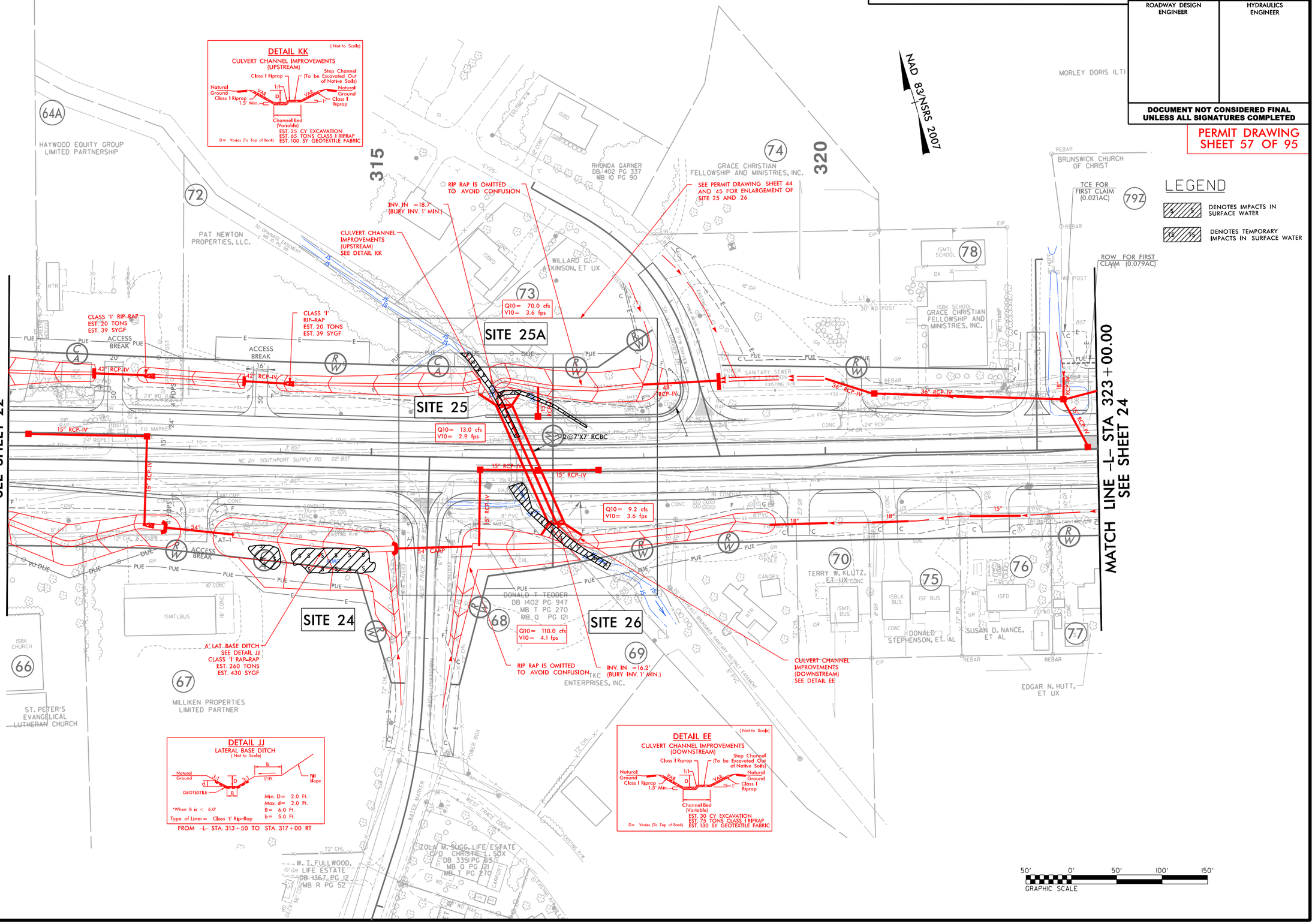
5/14/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 23 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

**PERMIT DRAWING SHEET 57 OF 95**




5/8/2008
R-5021_HYD_PERMIT_DRAWINGS.PSH23_57 of 95.dgn
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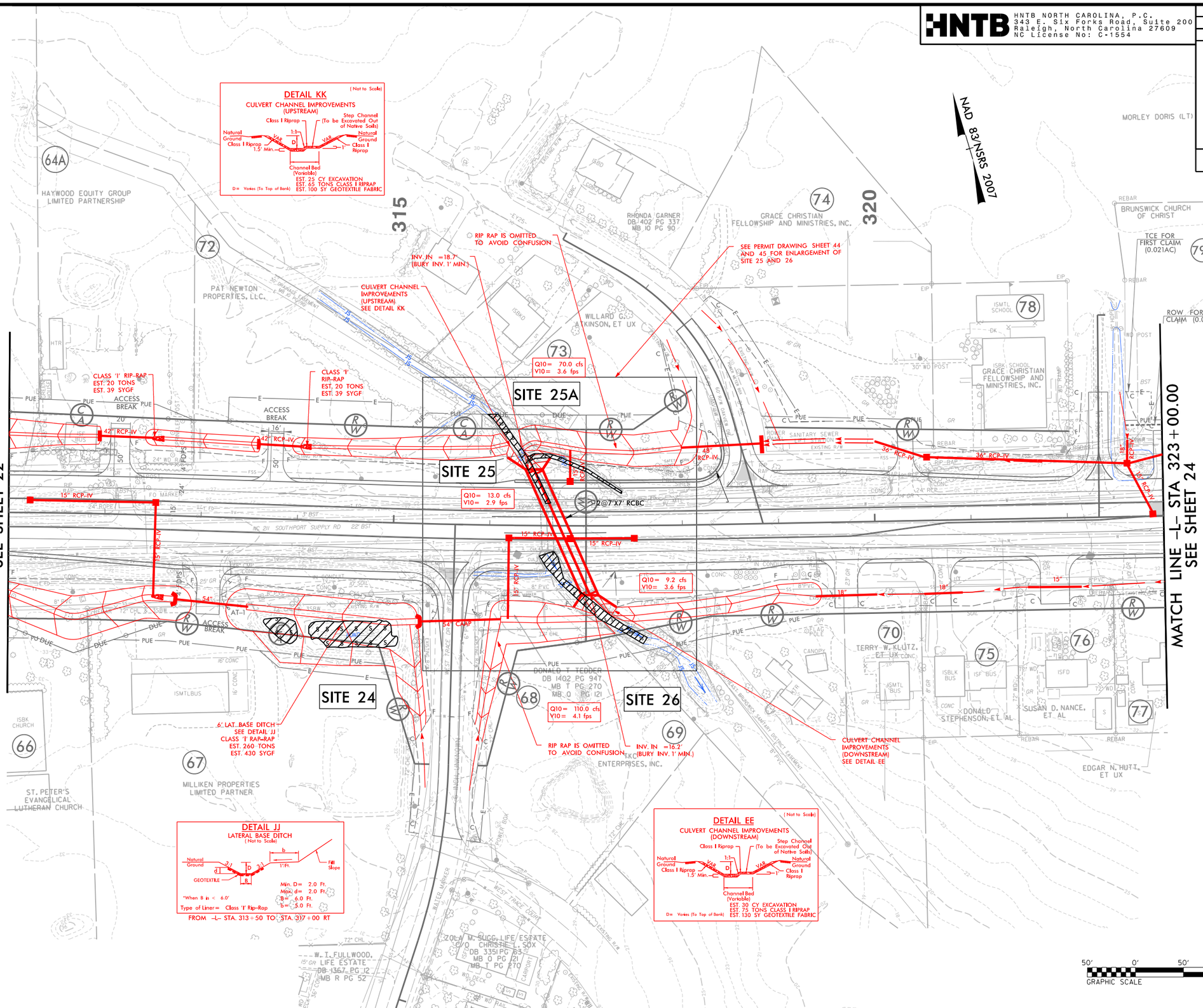
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 23 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

**PERMIT DRAWING SHEET 58 OF 95**




5/14/99

5/8/2008
R-5021_HYD_PERMIT_DRAWINGS.PSH23_58 of 95.dgn
HNTB

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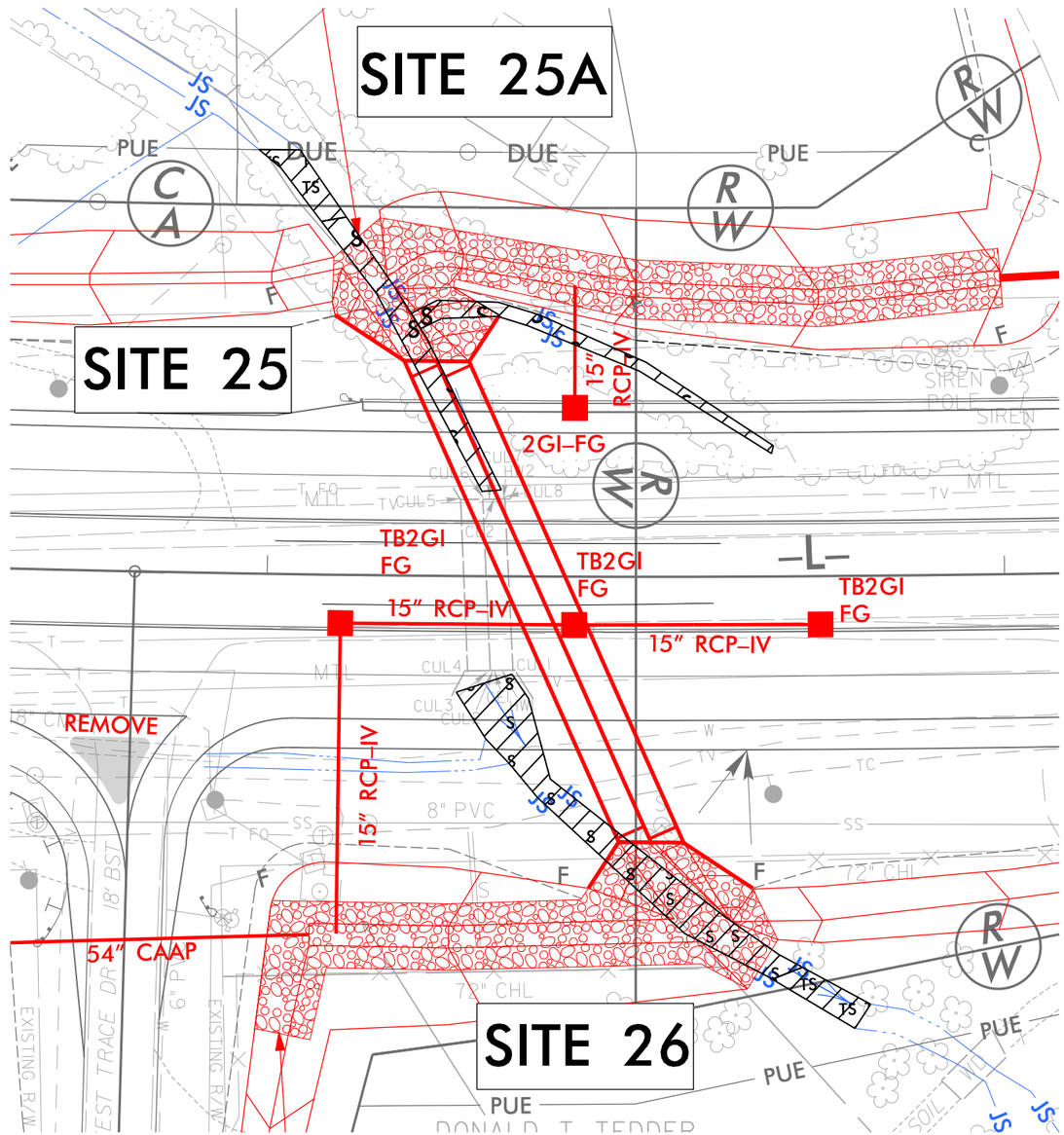
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 59 OF 95

NAD 83/NSRS 2007




LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

40' 0' 40' 80' 120'
GRAPHIC SCALE

5/14/99

5/15/2008
R-5021_HYD_PERMIT_DRAWINGS.PSH23.59 of 95_SITE_25&26.dgn
HNTB

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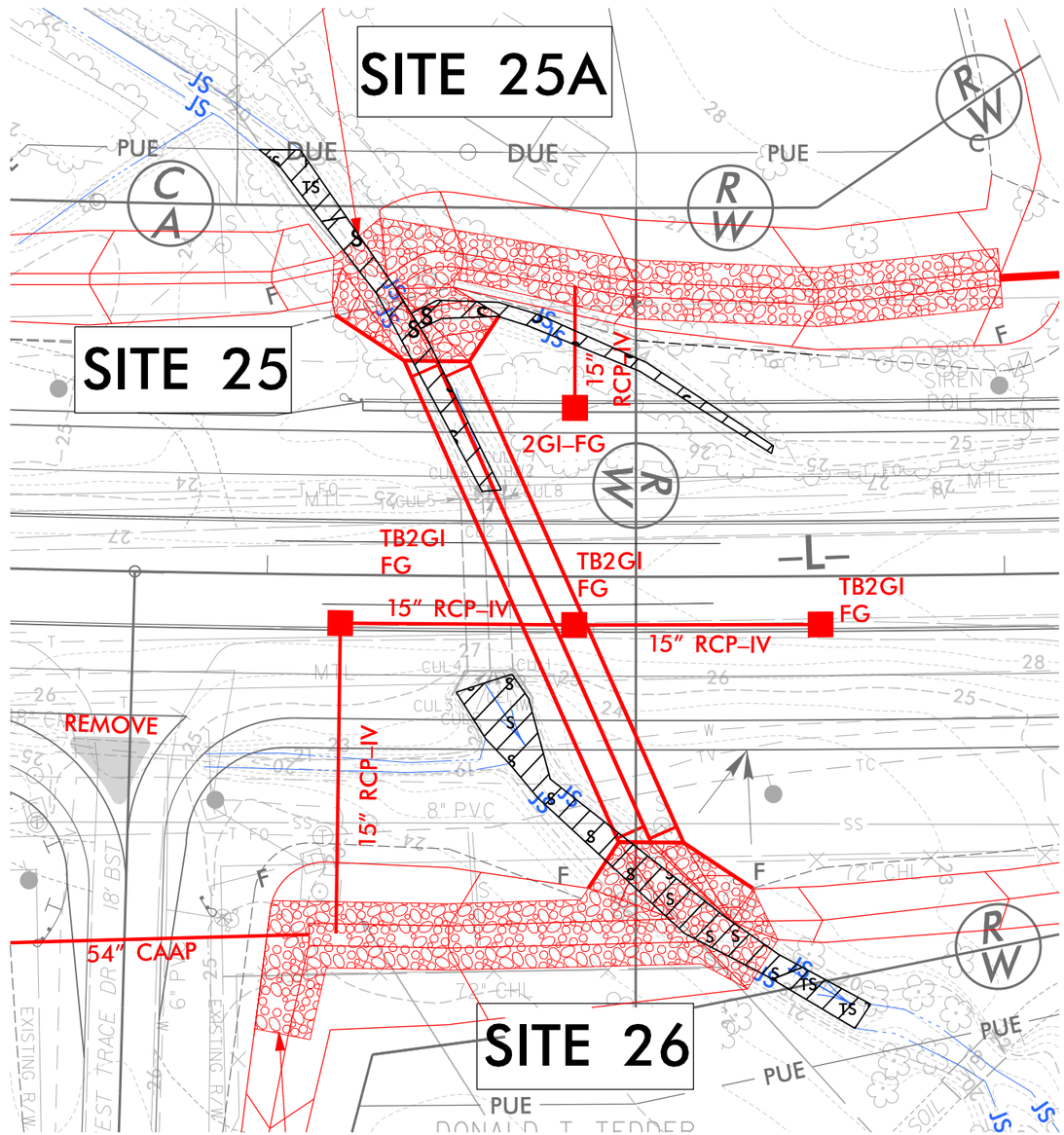
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 60 OF 95

NAD 83/NSRS 2007




LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

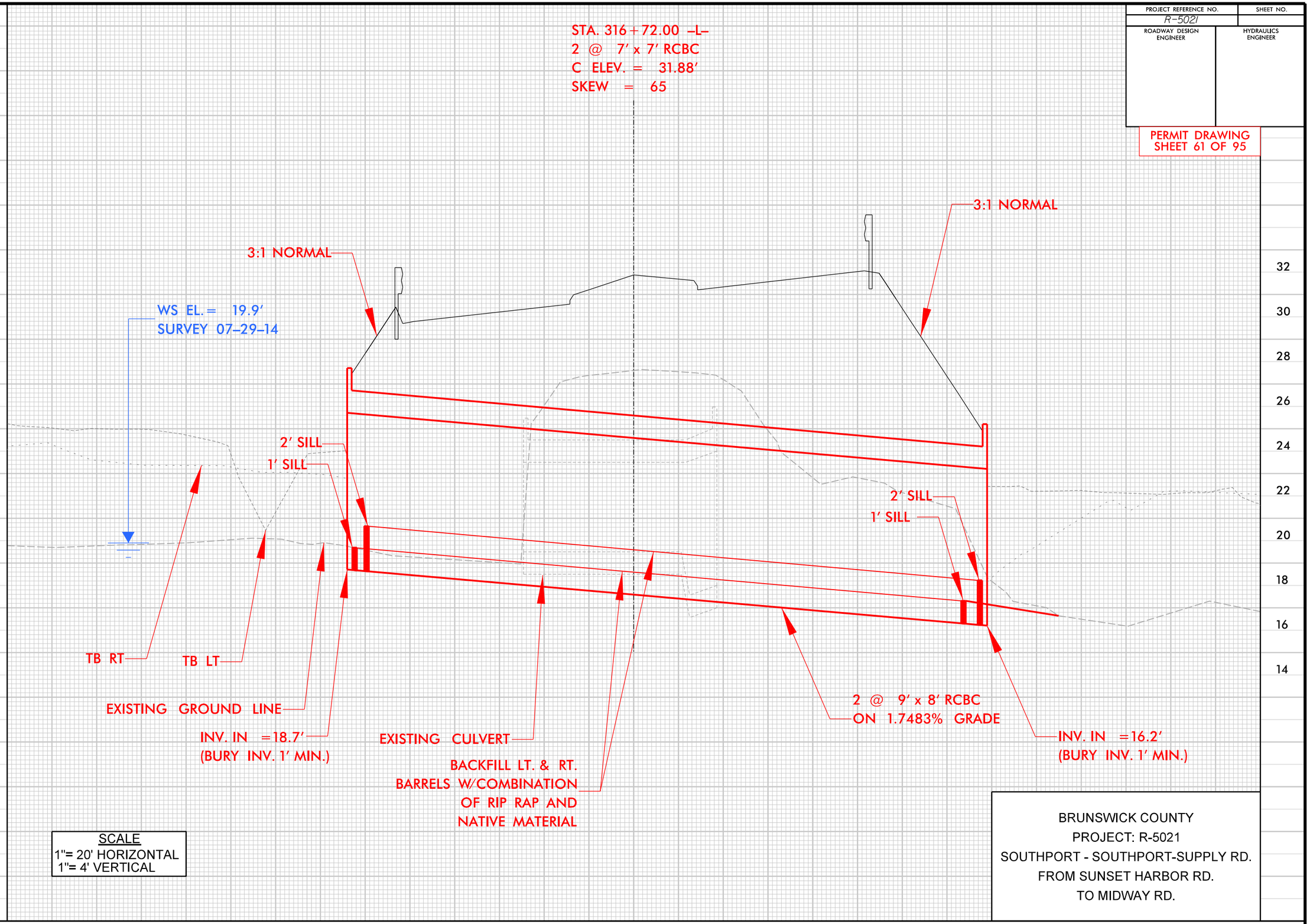
40' 0' 40' 80' 120'
GRAPHIC SCALE

5/14/99

5/15/2008
R-5021_HYD_PERMIT_DRAWINGS.PSH23.60 of 95.SITE_25&26.dgn
HNTB

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

PERMIT DRAWING
SHEET 61 OF 95




BRUNSWICK COUNTY
PROJECT: R-5021
SOUTHPORT - SOUTHPORT-SUPPLY RD.
FROM SUNSET HARBOR RD.
TO MIDWAY RD.

5/14/99

5/8/2018
R5021_HYD_PERMIT_DRAWINGS_PSH23.61 of 95.Cu1.PFL.dgn
HNTB

5/14/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 24 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 62 OF 95

NAD 83/NSRS 2007

MATCH LINE -Y14A- STA 43+50.00
SEE SHEET 36

MATCH LINE -L- STA 323+00.00
SEE SHEET 23

MATCH LINE -L- STA 333+50.00
SEE SHEET 24A

MATCH LINE -Y14A- STA 35+50.00
SEE SHEET 35

SITE 42

Q10= 50.0 cfs
V10= 4.5 fps

STANDARD 2' BASE DITCH
SEE DETAIL QQQ
S = 3.8%
EST. 80 TONS
EST. 140 SYGF

SPECIAL LAT. 4' BASE DITCH SEE DETAIL C

STANDARD 'V' DITCH
SEE DETAIL XXX
S=0.8%
DDE =5 CY

SPECIAL CUT DITCH
SEE DETAIL PP

STANDARD 'V' DITCH
SEE DETAIL SSS
S = 1.25%
EST. 30 TONS
EST. 80 SYGF

150' MEDIAN BAY TAPER LT
100' EOT TAPER LT
450' LANE SHIFT
NC 211 SOUTHPORT SUPPLY RD
NC HIGHWAY 133 LONG BEACH ROAD SE

MDI MANAGEMENT, LLC.
BRUNSWICK CHURCH OF CHRIST
SOUTHPORT MARKETPLACE I, LLC.
STEPHENS, STOKER & THOMAS, LLC.
GATEWAY HOSPITALITY SOUTHPORT, LLC
BELLAMY PROPERTIES, LLC.
J B F INVESTMENTS, LLC
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DB 3150 PG 111, DB 2181 PG 1314, MB 25 PG 212

## LEGEND

DENOTES EXCAVATION IN WETLAND

## SKETCH OF BRIDGE IN RELATIONSHIP TO PAVEMENT

SCALE: 1"= 40'

END SBG STA. 41+45.72
END APPROACH SLAB -Y14A- STA 40+40.63
BEGIN SBG STA. 40+39.00
BEGIN MSE WALL STA. 40+07.61
END PROP. RETAINING WALL +11.17 39.625' RT
END BRIDGE -Y14A- STA 40+09.43
BEGIN SBG STA. 40+42.28
BEGIN MSE WALL STA. 40+11.24
END MSE WALL STA. 39+01.26
END SBG STA. 38+70.16
END MSE WALL STA. 39+04.89
END SBG STA. 38+73.44
BEGIN BRIDGE -Y14A- STA 39+03.07
BEGIN APPROACH SLAB -Y14A- STA 38+71.81
PROP. 5" MONOLITHIC CONC. ISLAND (SURFACE MOUNTED)

5/25/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH24.62 of 95.dgn

5/14/99

HNTB

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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 24 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 63 OF 95

NAD 83/NSRS 2007

MATCH LINE -Y14A- STA 43+50.00
SEE SHEET 36

MATCH LINE -L- STA 323+00.00
SEE SHEET 23

MATCH LINE -L- STA 333+50.00
SEE SHEET 24A

MATCH LINE -Y14A- STA 35+50.00
SEE SHEET 35

SITE 42

Q10= 50.0 cfs
V10= 4.5 fps

STANDARD 2' BASE DITCH
SEE DETAIL QQQ
S = 3.8%
EST. 80 TONS
EST. 140 SYGF

SPECIAL LAT.
4' BASE DITCH
SEE DETAIL C

STANDARD 'V' DITCH
SEE DETAIL XXX
S=0.8%
DDE =5 CY

STANDARD 'V' DITCH
SEE DETAIL SSS
S = 1.25%
EST. 30 TONS
EST. 80 SYGF

SPECIAL CUT DITCH
SEE DETAIL PP

150' MEDIAN BAY TAPER LT
100' EOT TAPER LT
450' LANE SHIFT
100' MEDIAN BAY TAPER LT

MDI MANAGEMENT, LLC.
BRUNSWICK CHURCH OF CHRIST
SOUTHPORT MARKETPLACE I, LLC.
STEPHENS, SOOKER & THOMAS, LLC.
GATEWAY HOSPITALITY SOUTHPORT, LLC
BELLAMY PROPERTIES, LLC.
J B F INVESTMENTS, LLC
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DB 3150 PG 111, DB 2181 PG 1314, MB 2.5 - PG 212

NC 211 SOUTHPORT SUPPLY RD
NC HIGHWAY 133 LONG BEACH ROAD SE

## LEGEND

DENOTES EXCAVATION IN WETLAND

## SKETCH OF BRIDGE IN RELATIONSHIP TO PAVEMENT

SCALE: 1"= 40'

END SBG STA. 41+45.72
END APPROACH SLAB -Y14A- STA 40+40.63
BEGIN SBG STA. 40+39.00
BEGIN MSE WALL STA. 40+07.61
END PROP. RETAINING WALL +11.17 39.625' RT
END BRIDGE -Y14A- STA 40+09.43
BEGIN SBG STA. 40+42.28
BEGIN MSE WALL STA. 40+11.24
END MSE WALL STA. 39+01.26
END SBG STA. 38+70.16
END MSE WALL STA. 39+04.89
END SBG STA. 38+73.44
BEGIN BRIDGE -Y14A- STA 39+03.07
BEGIN APPROACH SLAB -Y14A- STA 38+71.81
PROP. 5" MONOLITHIC CONC. ISLAND (SURFACE MOUNTED)

5/25/2018
HNTB R-5021_HYD_PERMIT_DRAWINGS_PSH24.63 of 95.dgn

6/23/16

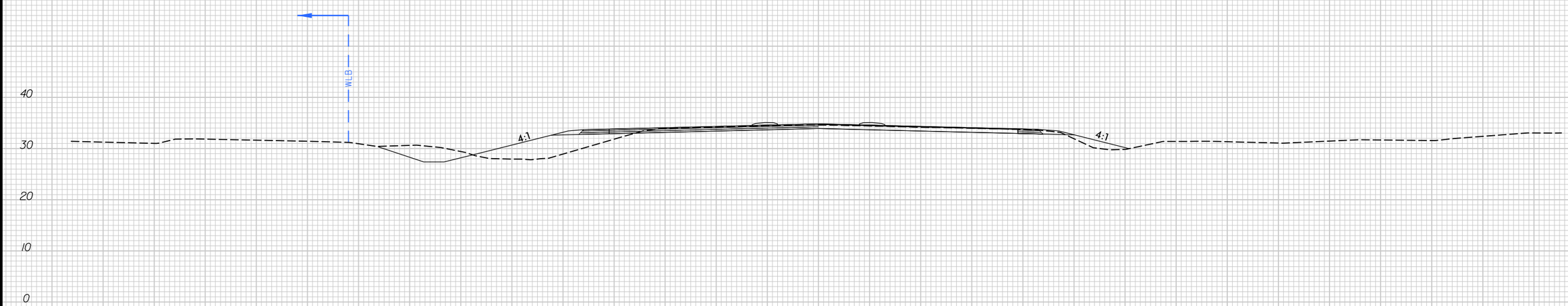
| 5 10 | PROJ. REFERENCE NO. | SHEET NO. |
|---|---|---|
| | R-5021 | |

PERMIT DRAWING
SHEET 64 OF 95

# WETLAND CROSS SECTIONS

**SITE 42**

-L- 324+24.00




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

5/15/2018
HNTB
...\Drawings\r-5021_hyd_prm_xpl.dgn

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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 26 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 65 OF 95

## LEGEND

- DENOTES FILL IN WETLAND
- DENOTES EXCAVATION IN WETLAND
- DENOTES MECHANIZED CLEARING

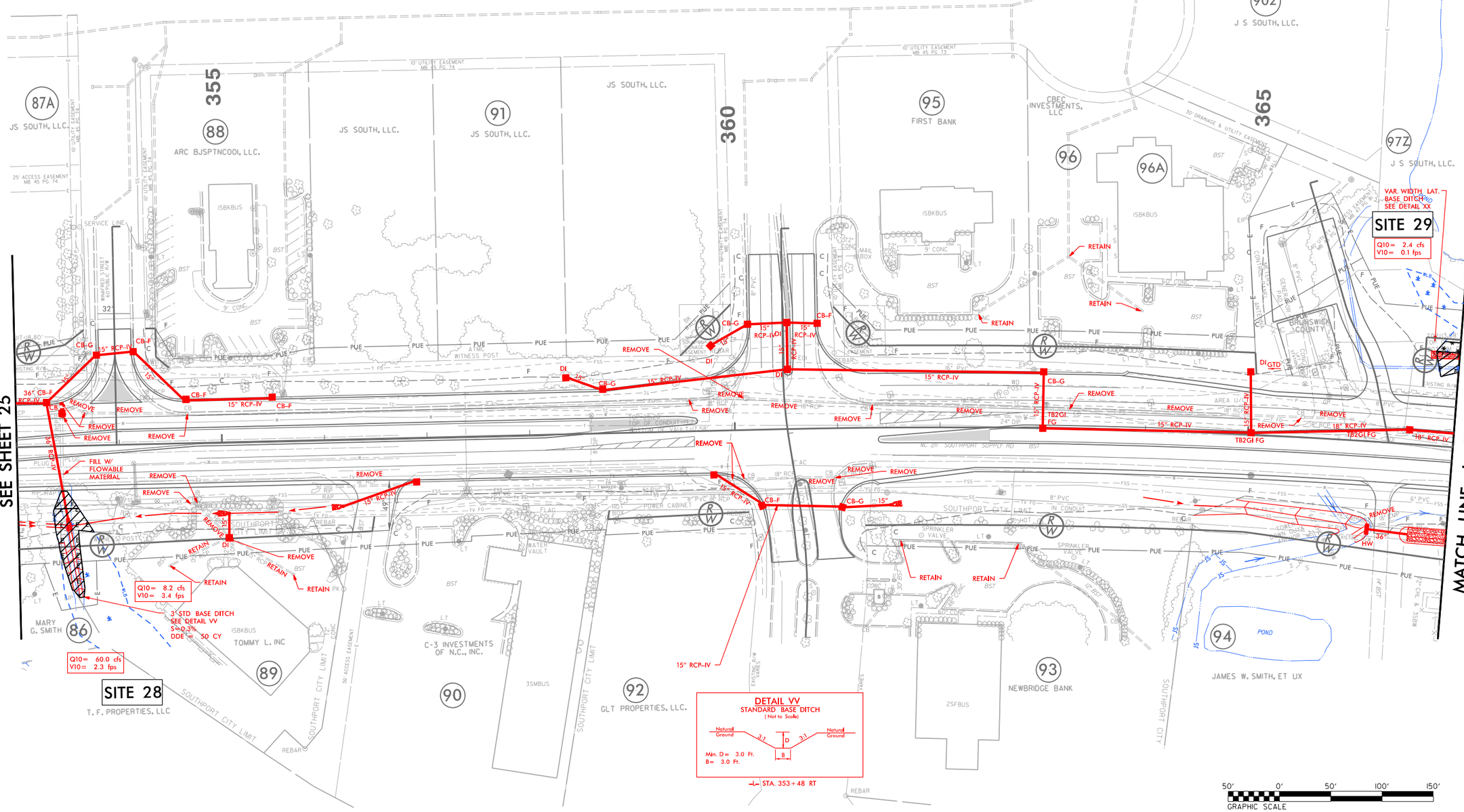
NAD 83/NSRS 2007

**DETAIL XX**
VAR. WIDTH LATERAL BASE DITCH
( Not to Scale)

Natural Ground, 3:1, D, B, 3:1, b, 1'Ft., Fill Slope

Min. D= 1.0 to 0.0 Ft.
B= 2.0 to 10.0 Ft.
b= 5.0 Ft.

FROM -L- STA. 366+50 TO STA. 366+90 LT




**DETAIL VV**
STANDARD BASE DITCH
( Not to Scale)

Natural Ground, 3:1, D, 3:1, Natural Ground, B

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

-L- STA. 353+48 RT

5/14/99

5/18/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH26.65 of 95.dgn
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|---|---|
| R-5021 | 26 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 66 OF 95

## LEGEND

- DENOTES FILL IN WETLAND
- DENOTES EXCAVATION IN WETLAND
- DENOTES MECHANIZED CLEARING

NAD 83/NSRS 2007

### DETAIL XX
VAR. WIDTH LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 3:1, D, B, 3:1, b, 1'Ft., Fill Slope

Min. D= 1.0 to 0.0 Ft.
B= 2.0 to 10.0 Ft.
b= 5.0 Ft.

FROM -L- STA. 366+50 TO STA. 366+90 LT

### DETAIL VV
STANDARD BASE DITCH
(Not to Scale)

Natural Ground, 3:1, D, B, 3:1, Natural Ground

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

-L- STA. 353+48 RT

MATCH LINE -L- STA 353+00.00
SEE SHEET 25

MATCH LINE -L- STA 367+00.00
SEE SHEET 27

SITE 28
T. F. PROPERTIES, LLC
Q10= 60.0 cfs
V10= 2.3 fps

SITE 29
Q10= 2.4 cfs
V10= 0.1 fps

VAR. WIDTH LAT. BASE DITCH SEE DETAIL XX

3' STD BASE DITCH SEE DETAIL VV
S=0.3%
DDE= 50 CY

Q10= 8.2 cfs
V10= 3.4 fps

FILL W/ FLOWABLE MATERIAL

87A JS SOUTH, LLC.
88 ARC BJSPTNCOOL, LLC.
355
91 JS SOUTH, LLC.
JS SOUTH, LLC.
360
95 FIRST BANK
CBEC INVESTMENTS, LLC
96
96A
365
902 J S SOUTH, LLC.
97Z J S SOUTH, LLC.
86 MARY C. SMITH
89 TOMMY L. INC
90 C-3 INVESTMENTS OF N.C., INC.
92 GLT PROPERTIES, LLC.
93 NEWBRIDGE BANK
94 JAMES W. SMITH, ET UX

50' 0' 50' 100' 150'
GRAPHIC SCALE

5/14/99

5/15/2018
HNTB R5021_HYD_PERMIT_DRAWINGS_PSH26.66 of 95.dgn

6/23/16

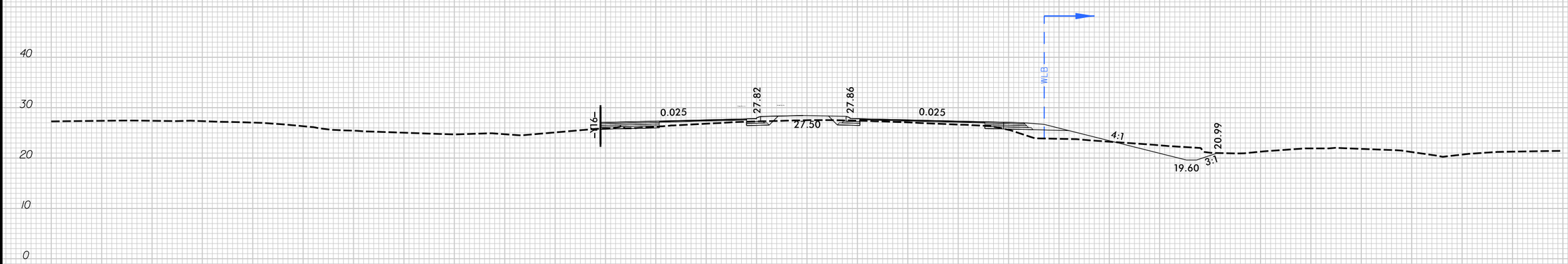
| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | |

PERMIT DRAWING
SHEET 67 OF 95

# WETLAND CROSS SECTIONS

**SITE 28**

–L– 353+50.00

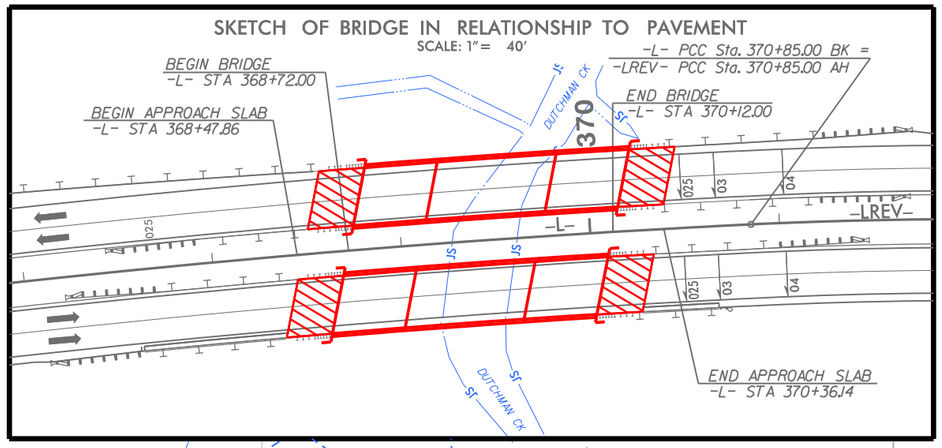


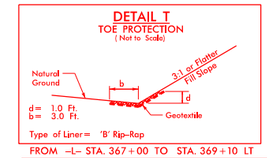

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

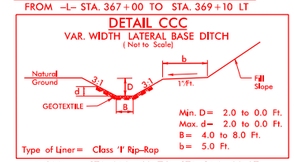
5/15/2018
HNTB

5/14/99




FROM -L- STA. 367+00 TO STA. 369+10 LT




FROM -L- STA. 373+60 TO STA. 374+00 LT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NC License No: C-1554


| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 27 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

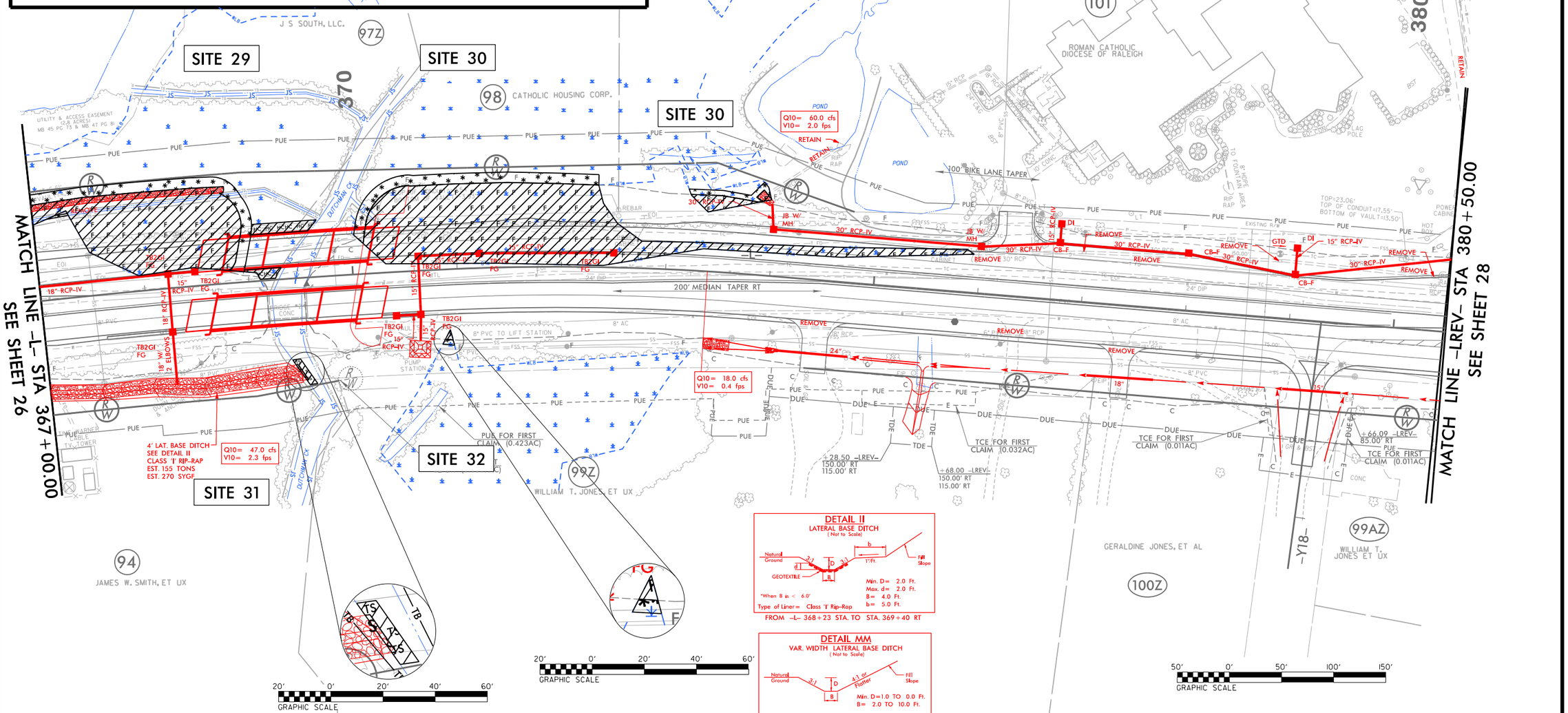
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

PERMIT DRAWING
SHEET 68 OF 95

NAD 83/NSRS 2007

## LEGEND

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







FROM -L- 368+23 STA. TO STA. 369+40 RT




FROM -LREV- STA. 373+40 TO STA. 374+00 RT

NOTE:
1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 52
FOR -Y18- PROFILE, SEE SHEET 63
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3
FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-__

5/15/2008
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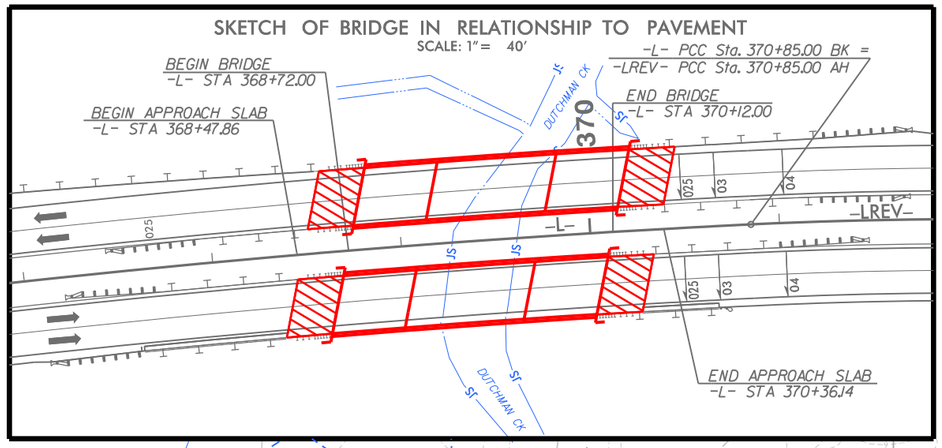
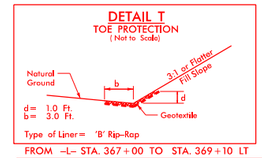
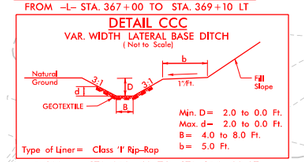
R-5021_HYD_PERMIT_DRAWINGS_PSH27.68 of 95.dgn

5/14/99





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NC License No: C-1554

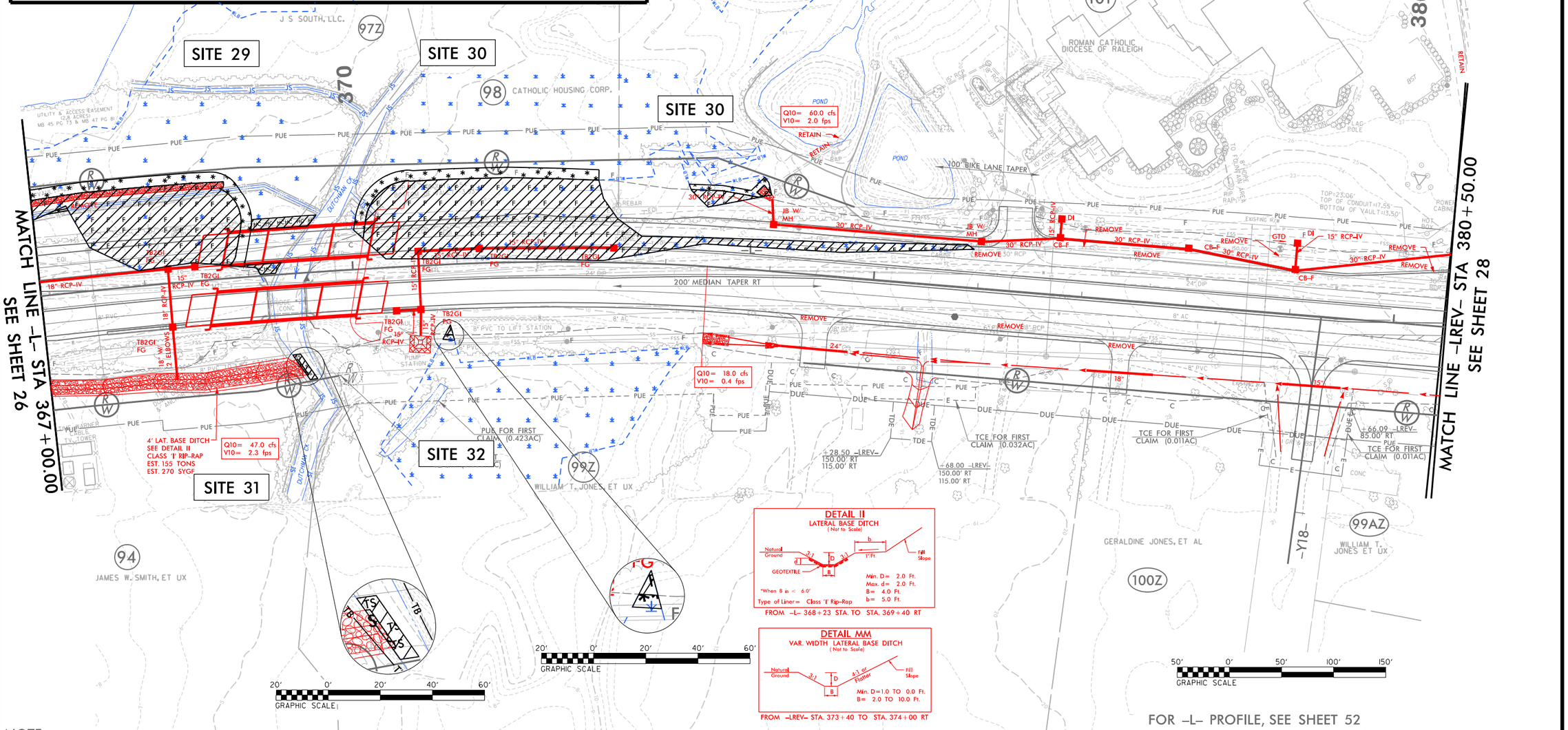

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 27 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 69 OF 95

## LEGEND

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









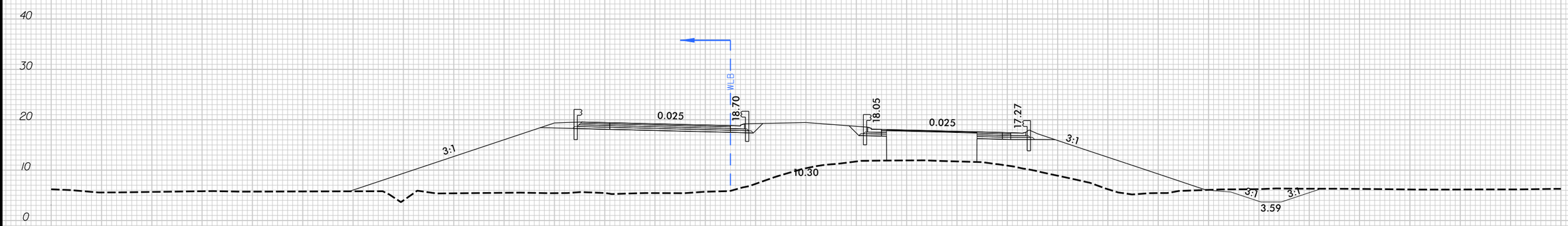

NOTE:
1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 52
FOR -Y18- PROFILE, SEE SHEET 63
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3
FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-__

5/15/2008
HNTB R-5021_HYD_PERMIT_DRAWINGS_PSH27_69 of 95.dgn

# WETLAND CROSS SECTIONS

## SITE 29
-L- 368+00.00




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

6/23/16
5/15/2018
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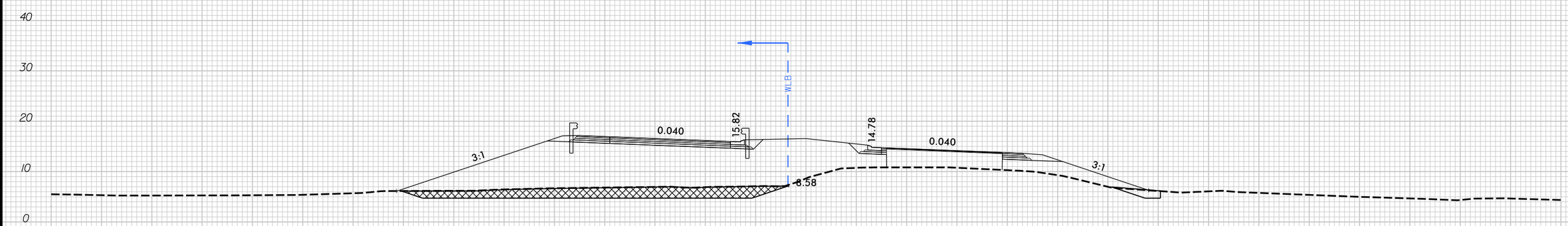
| 5 10 | PROJ. REFERENCE NO. | SHEET NO. |
|---|---|---|
| | R-5021 | |

PERMIT DRAWING
SHEET 71 OF 95

# WETLAND CROSS SECTIONS

## SITE 30
–L– 371+50



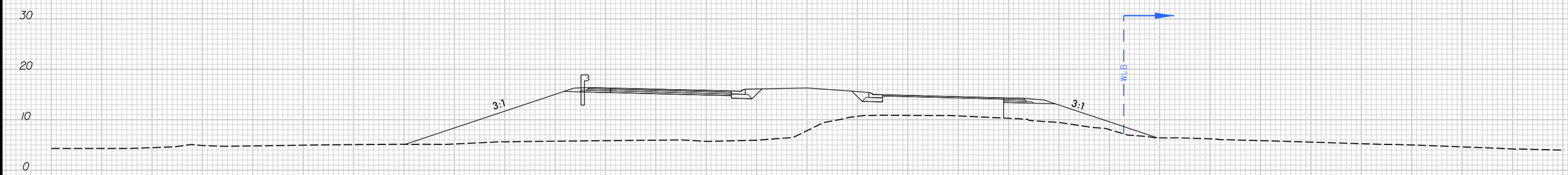

UNDERCUT EXCAVATION

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

# WETLAND CROSS SECTIONS

**SITE 32**
–L– 370+88




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

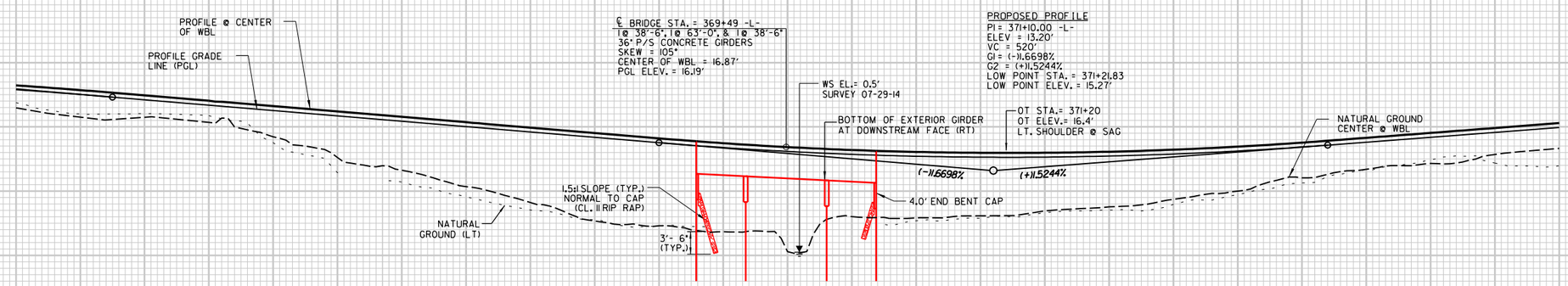
BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

5/14/99

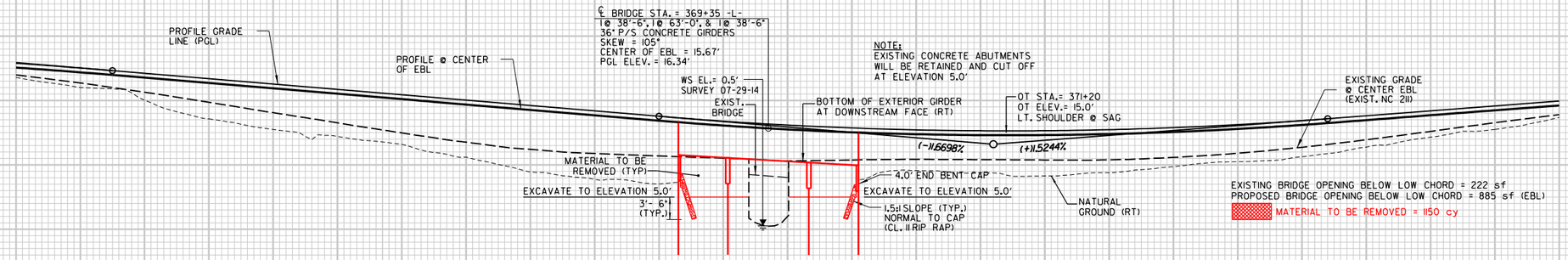
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| | |

| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
|---|---|
| | |

PERMIT DRAWING
SHEET 73 OF 95




## WBL PROFILE




## EBL PROFILE

SCALE
1"= 100' HORIZONTAL
1"= 5' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
SOUTHPORT - SOUTHPORT-SUPPLY RD.
FROM SUNSET HARBOR RD.
TO MIDWAY RD.

5/8/2018
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|---|---|
| R-5021 | 31 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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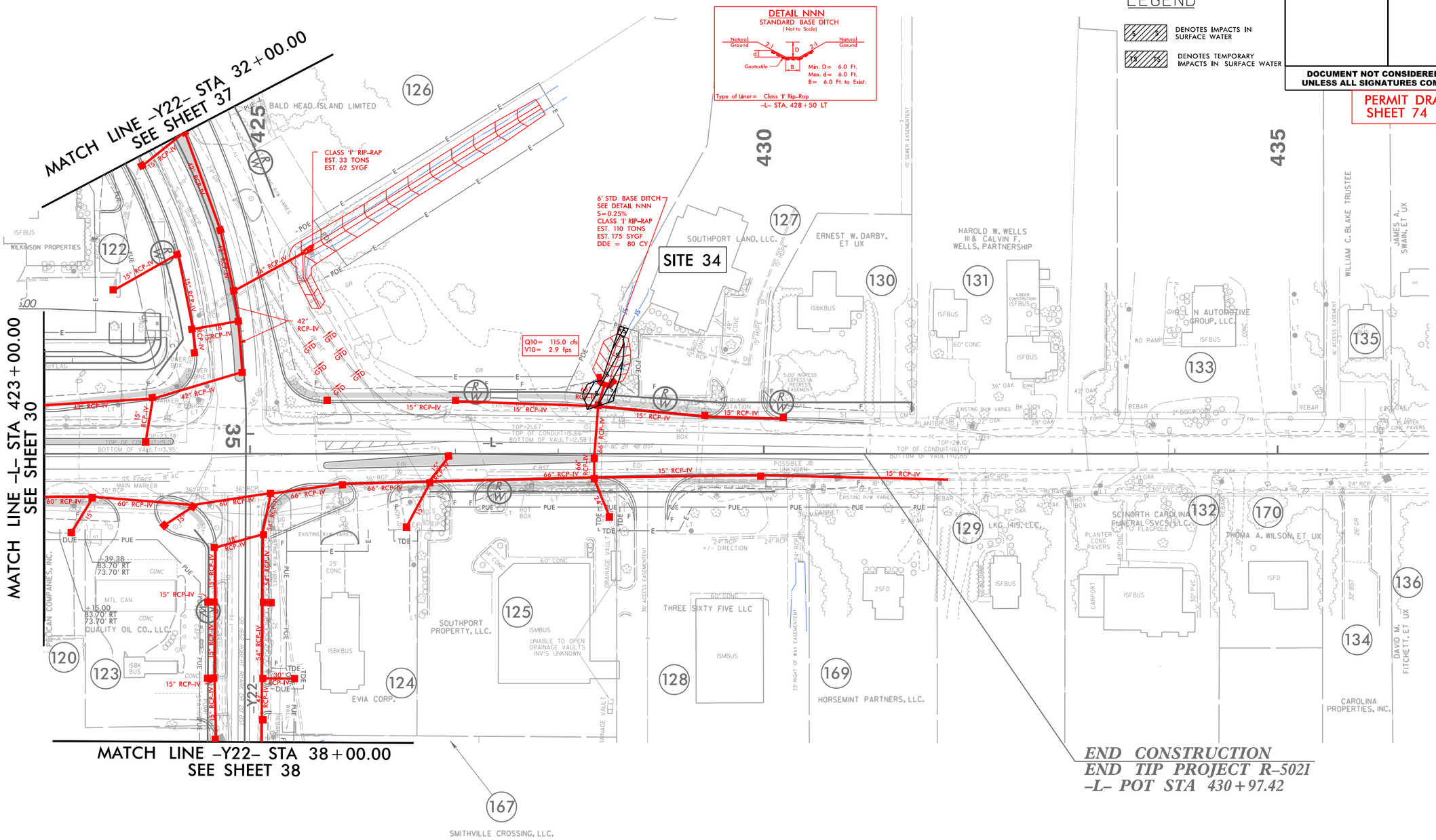
PERMIT DRAWING
SHEET 74 OF 95

## LEGEND

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




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 54
FOR -Y22- PROFILE, SEE SHEET 66
FOR INTERSECTION DETAIL, SEE SHEET 2B-3
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/15/2008
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|---|---|
| R-5021 | 31 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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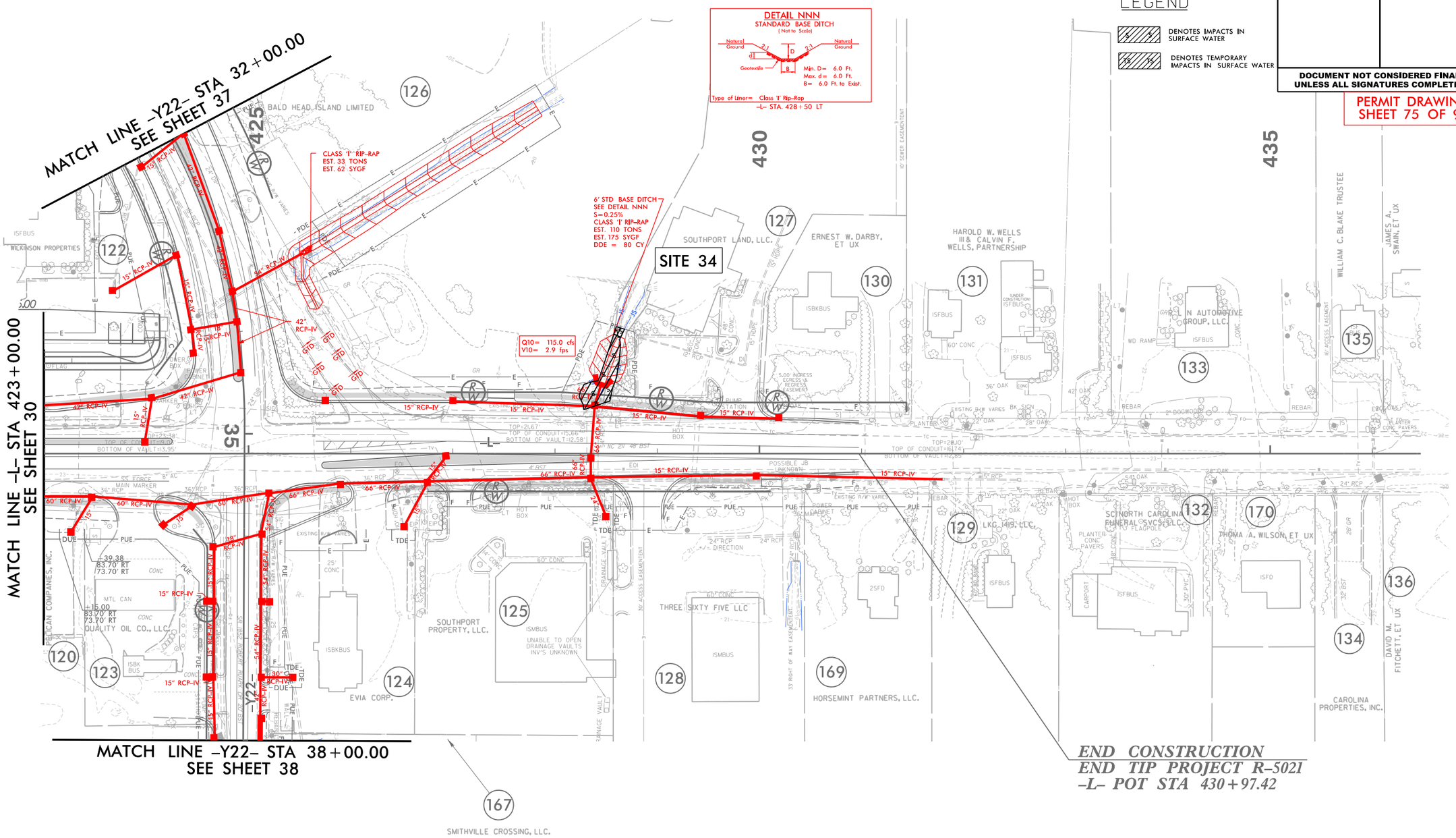
PERMIT DRAWING
SHEET 75 OF 95

## LEGEND

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




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 54
FOR -Y22- PROFILE, SEE SHEET 66
FOR INTERSECTION DETAIL, SEE SHEET 2B-3
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 32 |
| R/W SHEET NO. | 33 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

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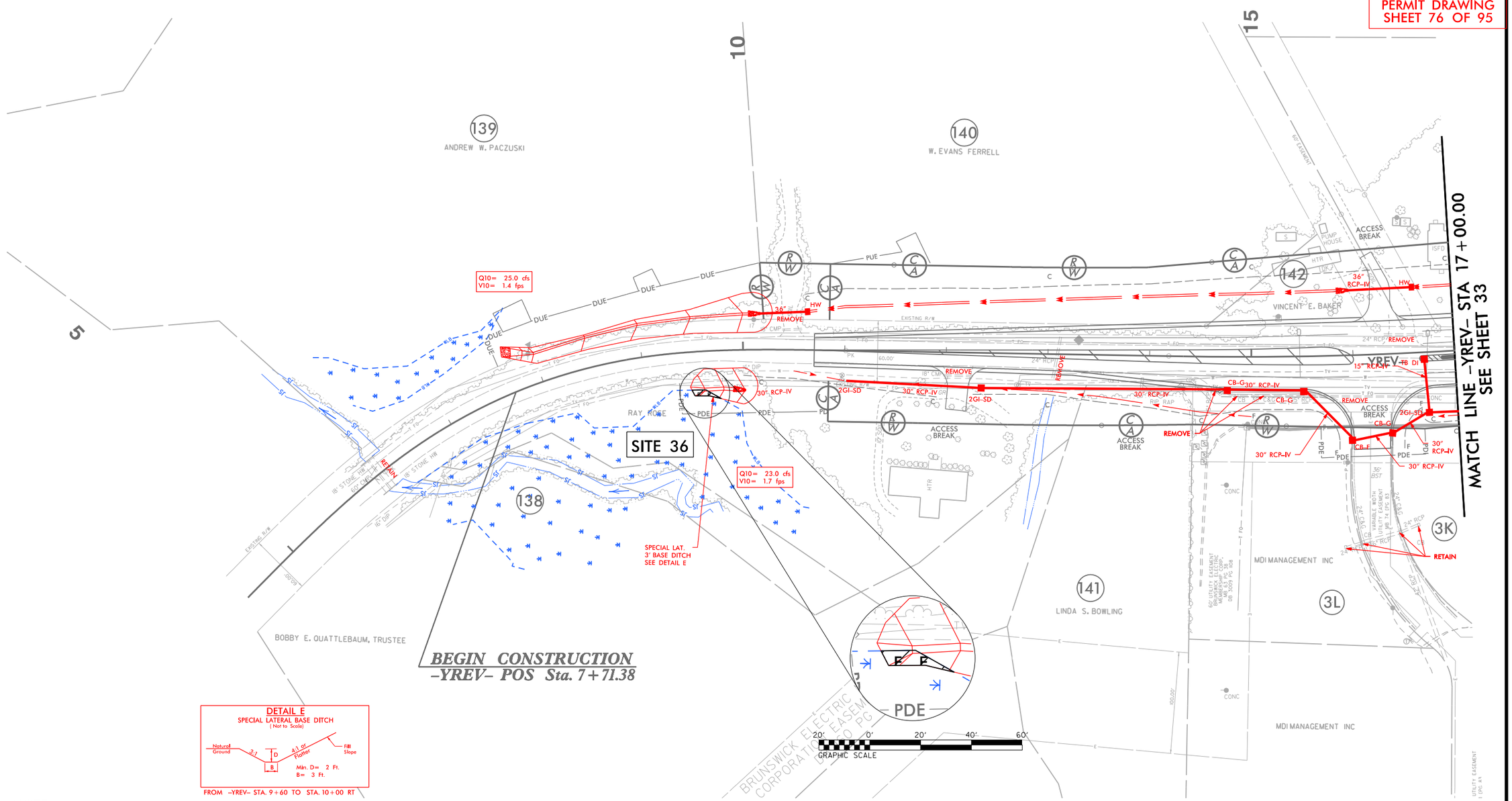
SHEET 76 OF 95

NAD 83/NSRS 2007

LEGEND

DENOTES EXCAVATION IN WETLAND




**DETAIL E**
SPECIAL LATERAL BASE DITCH
( Not to Scale)




FROM -YREV- STA. 9+60 TO STA. 10+00 RT

NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -YREV- PROFILE, SEE SHEET 55
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/14/99

5/15/2008
R-5021_HYD_PERMIT_DRAWINGS.PSH32_76 of 95.dgn
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NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 32 |
| R/W SHEET NO. | 33 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

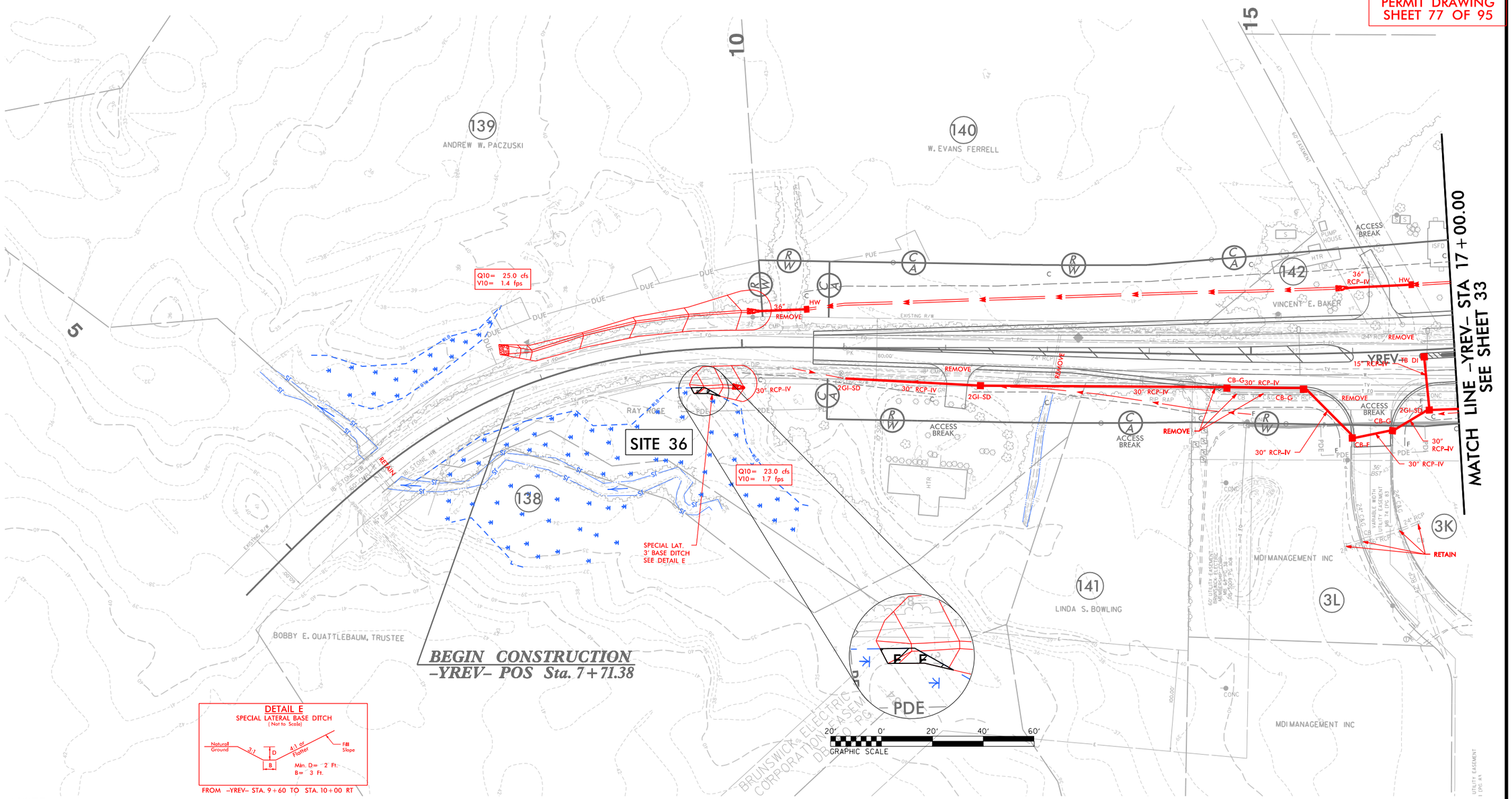
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

PERMIT DRAWING
SHEET 77 OF 95

NAD 83/NSRS 2007

LEGEND

DENOTES EXCAVATION IN WETLAND




DETAIL E
SPECIAL LATERAL BASE DITCH
(Not to Scale)




FROM -YREV- STA. 9+60 TO STA. 10+00 RT

NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -YREV- PROFILE, SEE SHEET 55
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/14/99

5/15/2008
R-5021_HYD_PERMIT_DRAWINGS_PSH32_77 of 95.dgn
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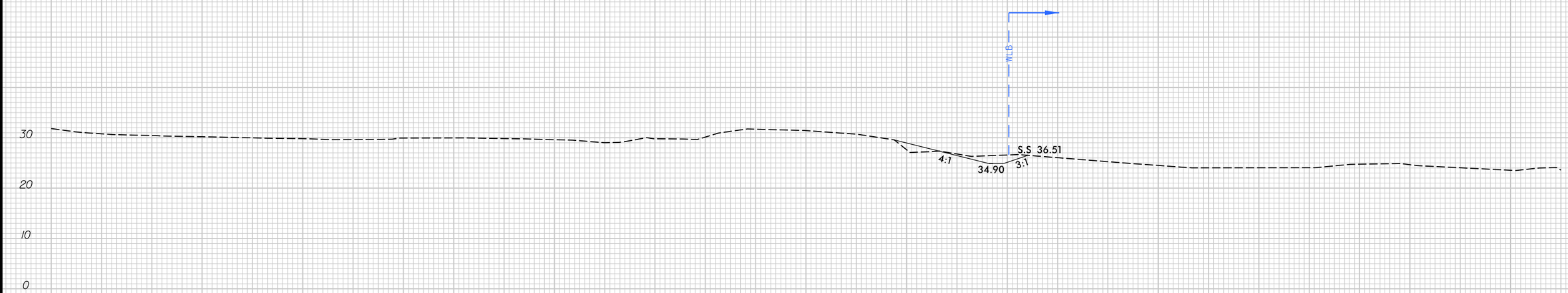
# WETLAND CROSS SECTIONS

**SITE 36**

–YREV– 9+65.00




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

NOTE:
1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

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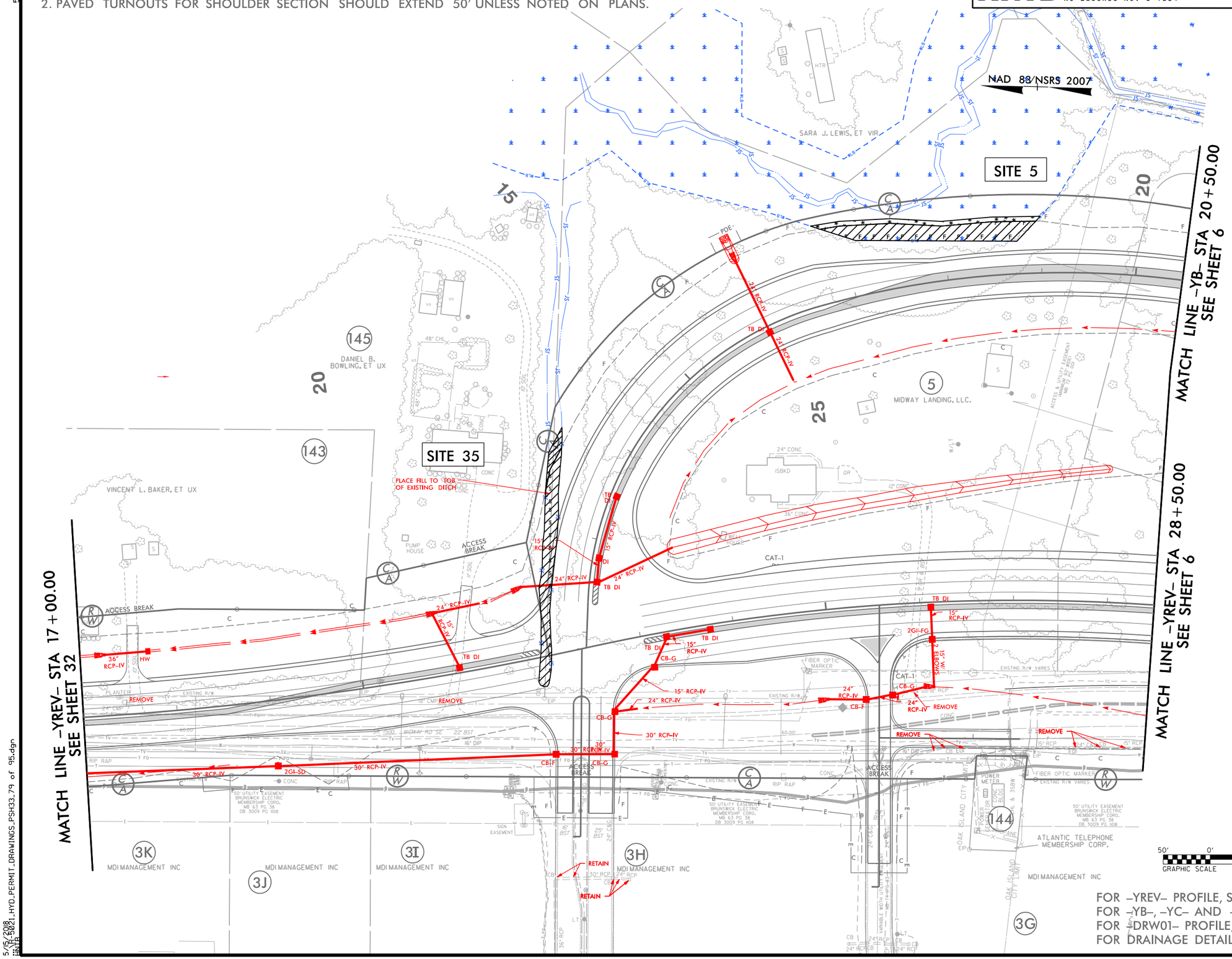
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 33 |
| R/W SHEET NO. | 34 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 79 OF 95




LEGEND

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

FOR -YREV- PROFILE, SEE SHEET 55
FOR -YB-, -YC- AND -YD- PROFILES, SEE SHEET 57
FOR -DRW01- PROFILE, SEE SHEET 58
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/14/99

5/18/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH33_79 of 95.dgn
HNTB

NOTE:
1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

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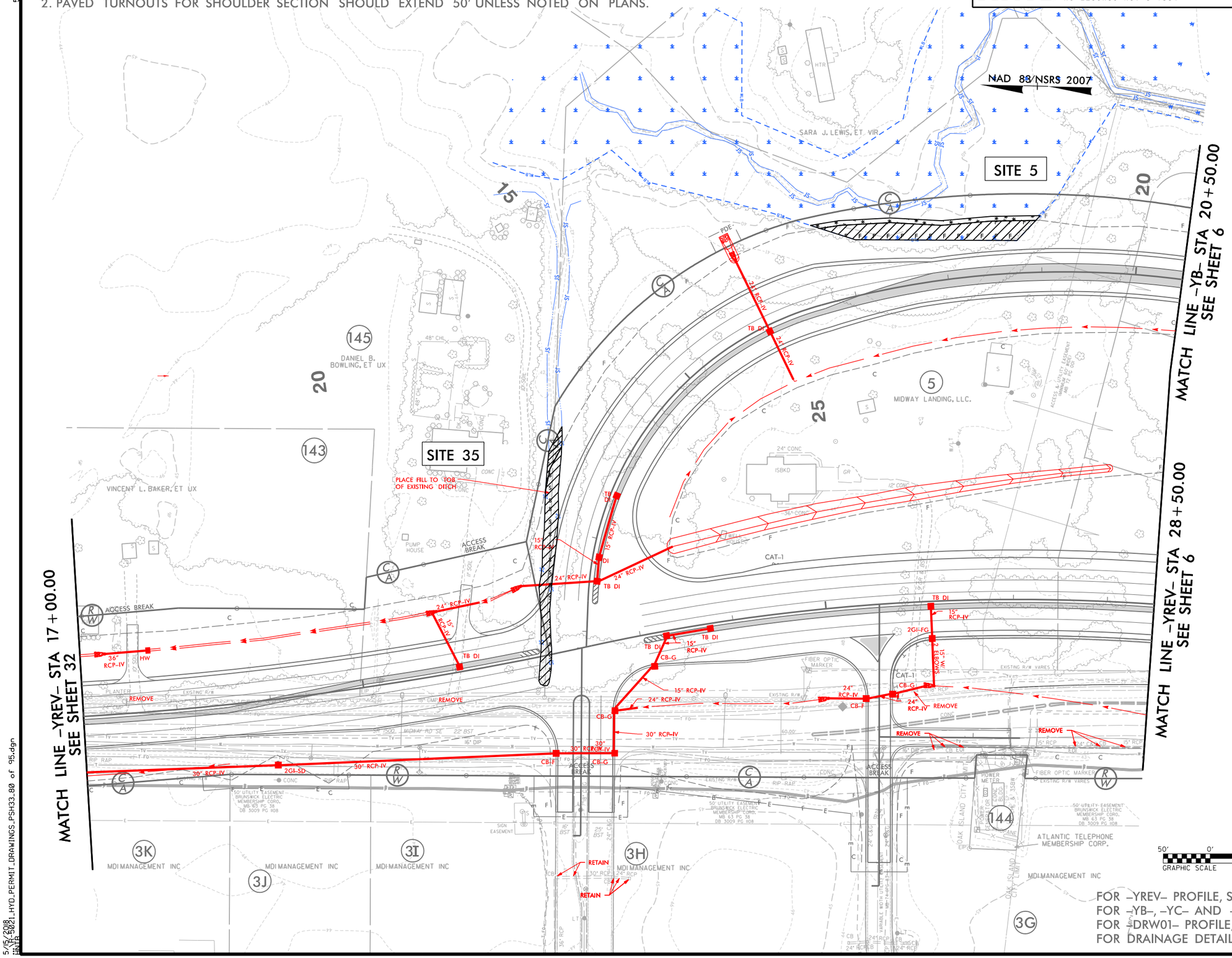
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 33 |
| R/W SHEET NO. | 34 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 80 OF 95




## LEGEND

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

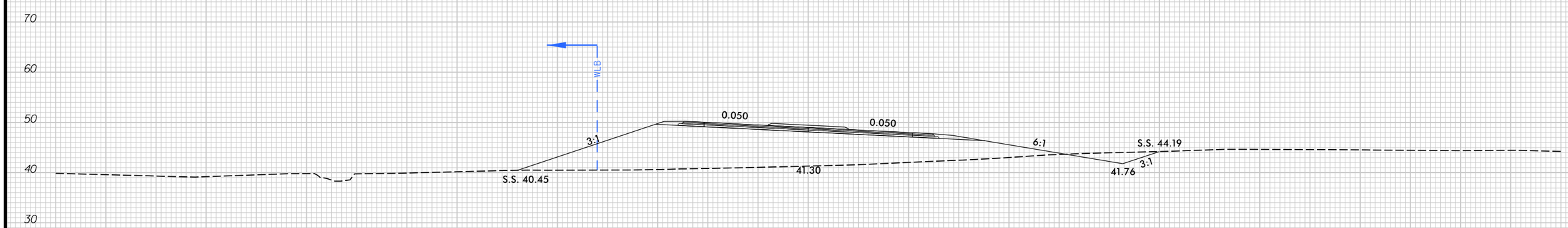
FOR -YREV- PROFILE, SEE SHEET 55
FOR -YB-, -YC- AND -YD- PROFILES, SEE SHEET 57
FOR -DRW01- PROFILE, SEE SHEET 58
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/14/99

5/18/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH33.80 of 95.dgn
HNTB

# WETLAND CROSS SECTIONS

## SITE 5
–YB– 18+00.00




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 34 |
| R/W SHEET NO. | 35 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

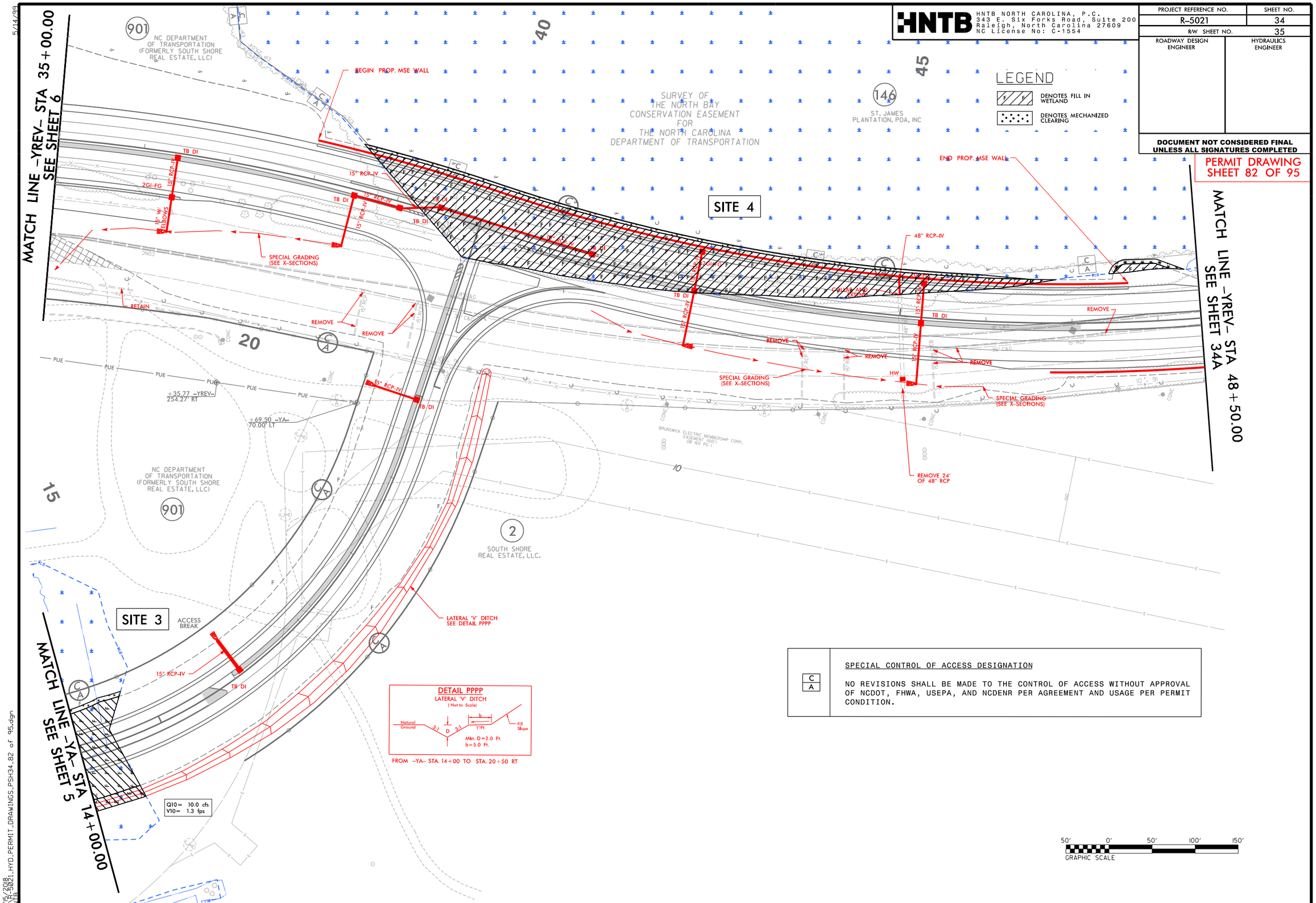
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 82 OF 95

LEGEND

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING




| C/A | SPECIAL CONTROL OF ACCESS DESIGNATION<br><br>NO REVISIONS SHALL BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, FHWA, USEPA, AND NCDENR PER AGREEMENT AND USAGE PER PERMIT CONDITION. |
|---|---|

5/14/99

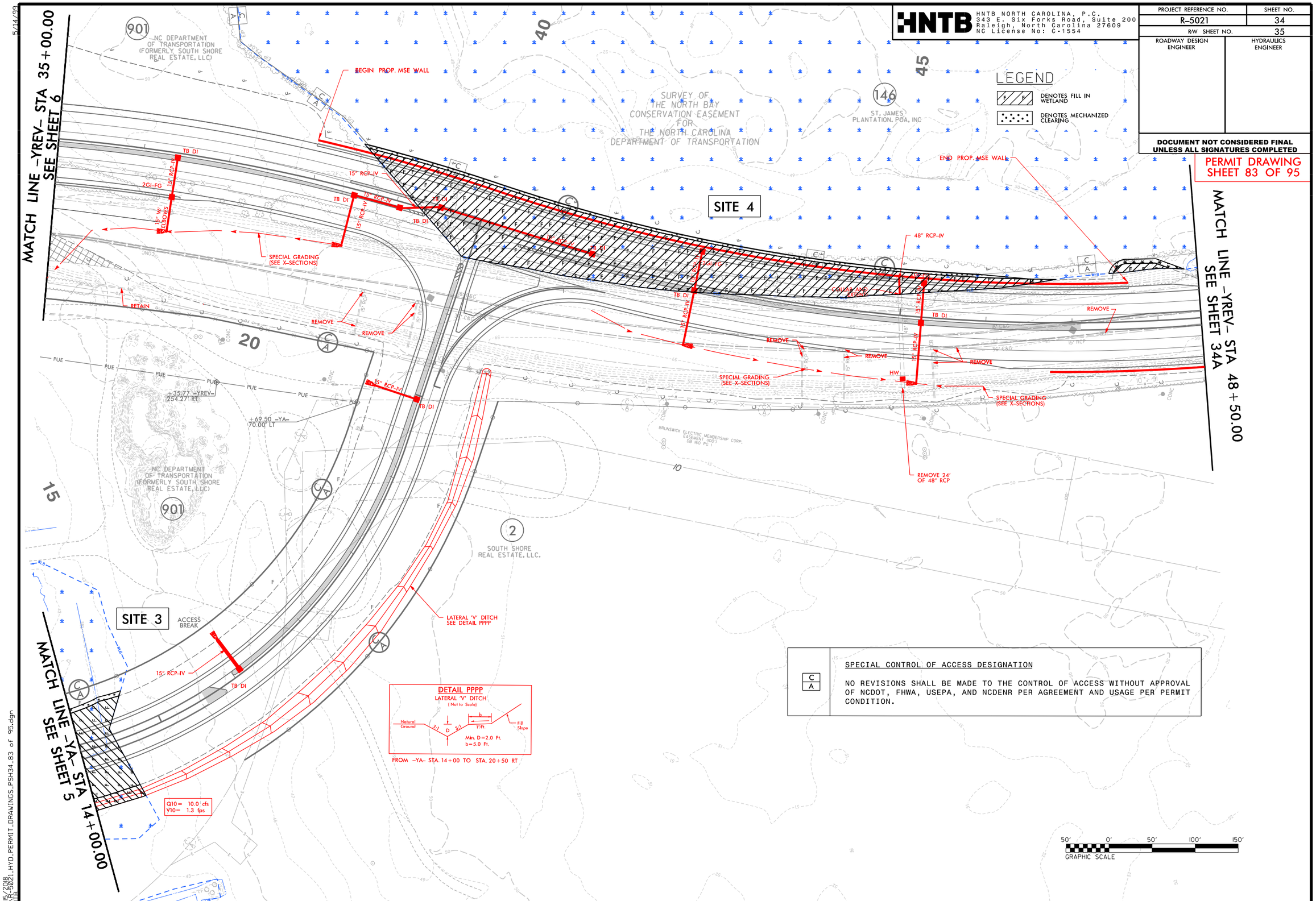
5/15/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH34_82 of 95.dgn
HNTB

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 34 |
| R/W SHEET NO. | 35 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 83 OF 95




C A

SPECIAL CONTROL OF ACCESS DESIGNATION

NO REVISIONS SHALL BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, FHWA, USEPA, AND NCDENR PER AGREEMENT AND USAGE PER PERMIT CONDITION.

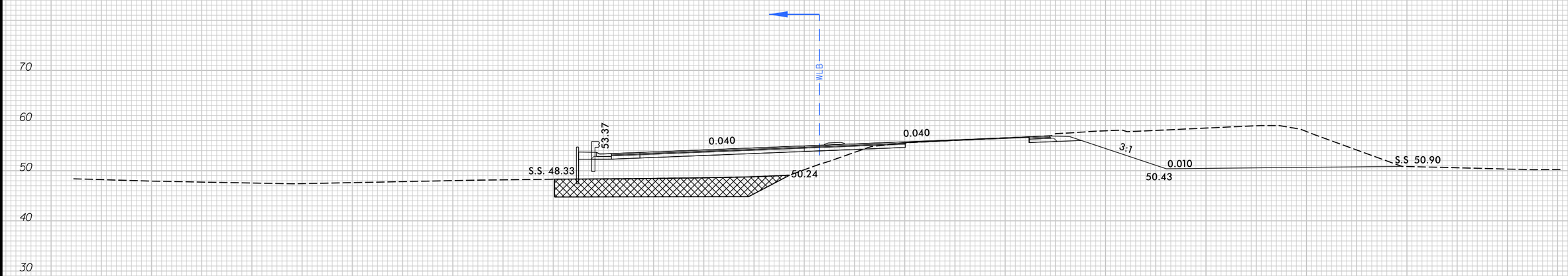
5/14/99

5/15/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH34.83 of 95.dgn
HNTB

# WETLAND CROSS SECTIONS

## SITE 4

–YREV– 43+00.00




UNDERCUT EXCAVATION

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

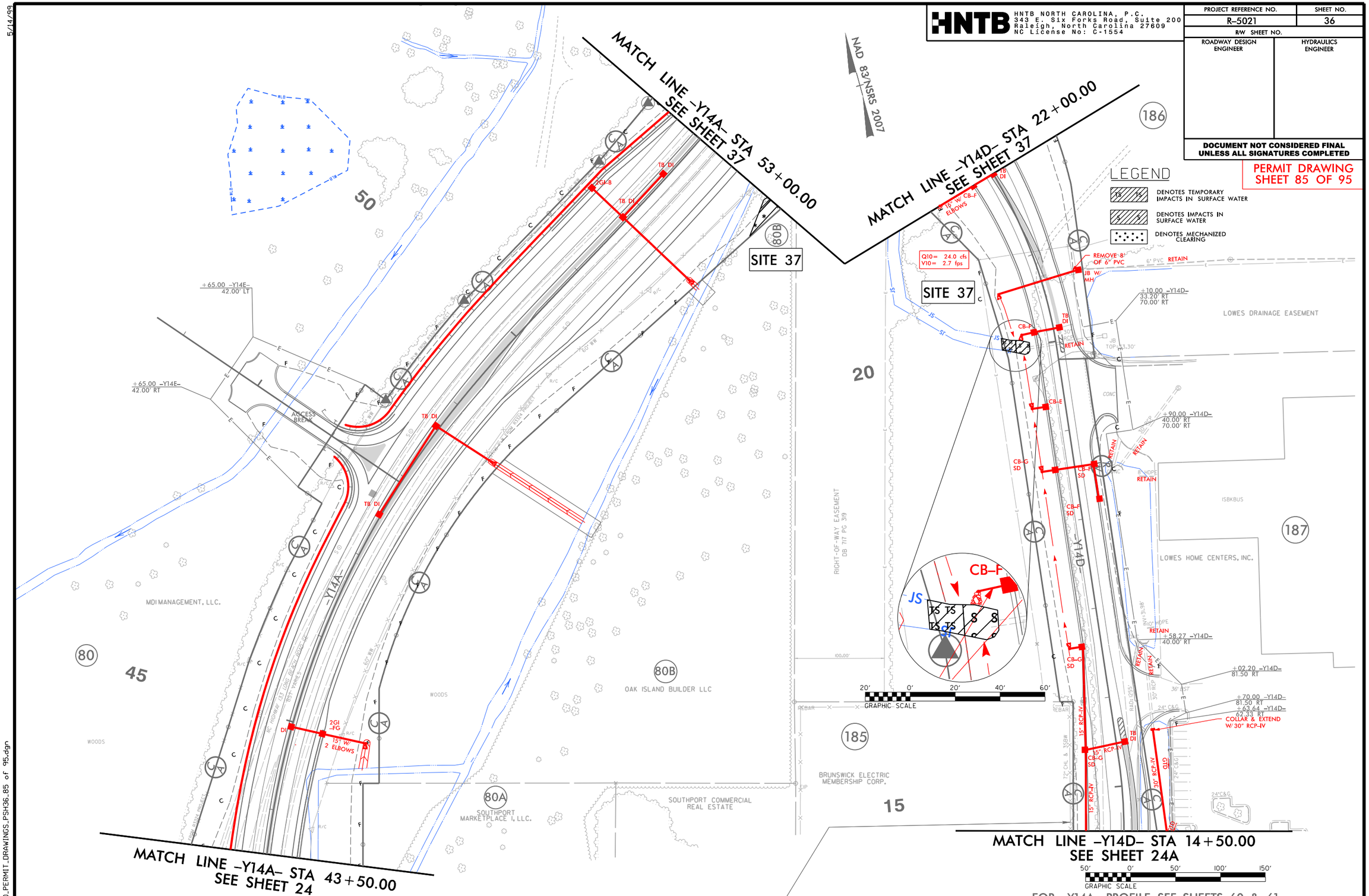
5/14/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 36 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 85 OF 95




NOTE: 1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

DO NOT DISTURB FENCE AROUND BRUNSWICK ELECTRIC PARCEL

FOR -Y14A- PROFILE, SEE SHEETS 60 & 61
FOR -Y14D- PROFILE, SEE SHEET 62
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

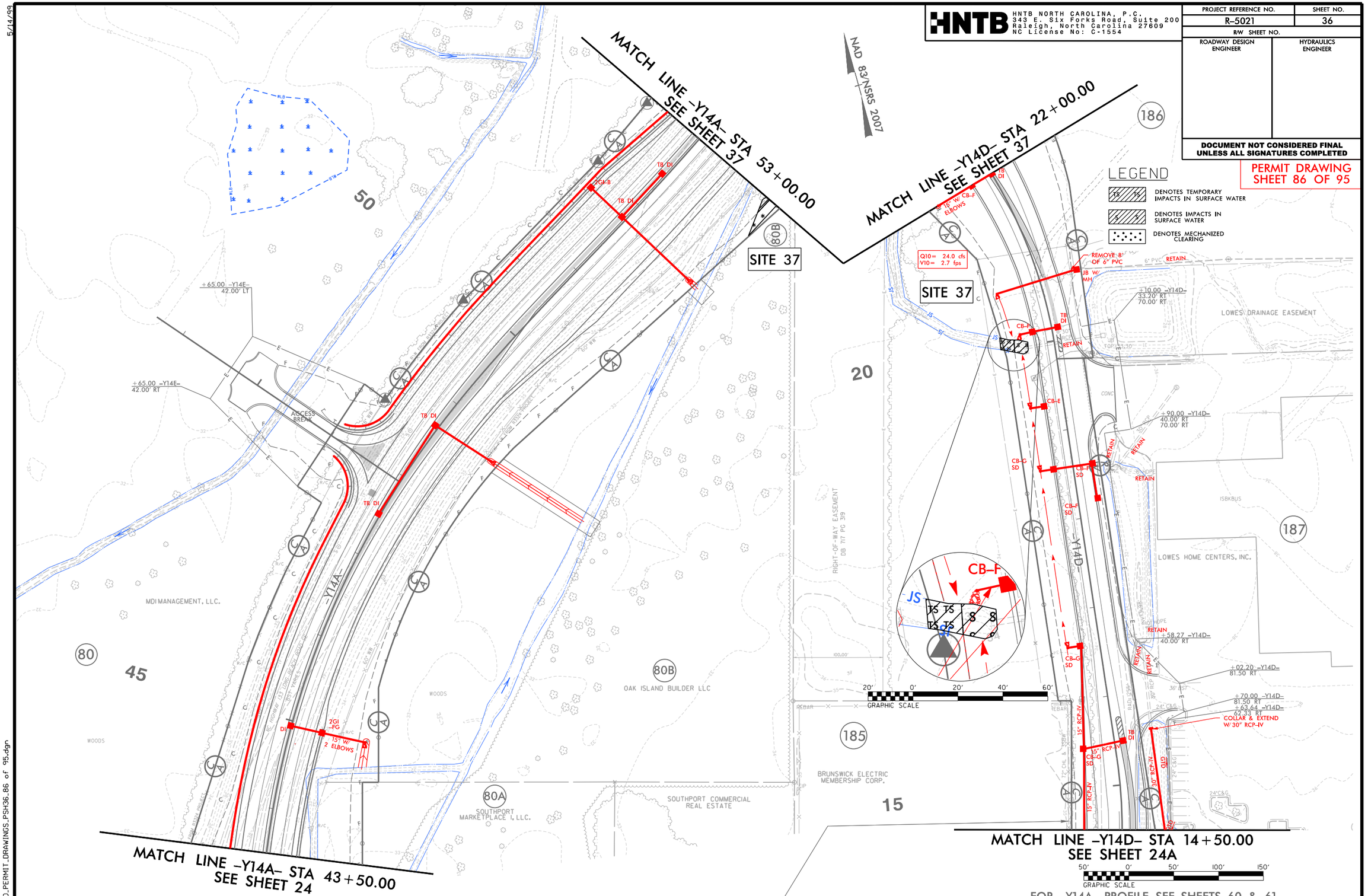
5/15/2008
R5021_HYD_PERMIT_DRAWINGS.PSH36.85 of 95.dgn
HNTB

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 36 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 86 OF 95




NOTE: 1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
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DO NOT DISTURB FENCE AROUND BRUNSWICK ELECTRIC PARCEL

FOR -Y14A- PROFILE, SEE SHEETS 60 & 61
FOR -Y14D- PROFILE, SEE SHEET 62
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/14/99

5/15/2008
R-5021_HYD_PERMIT_DRAWINGS.PSH36.86 of 95.dgn
HNTB

5/14/99

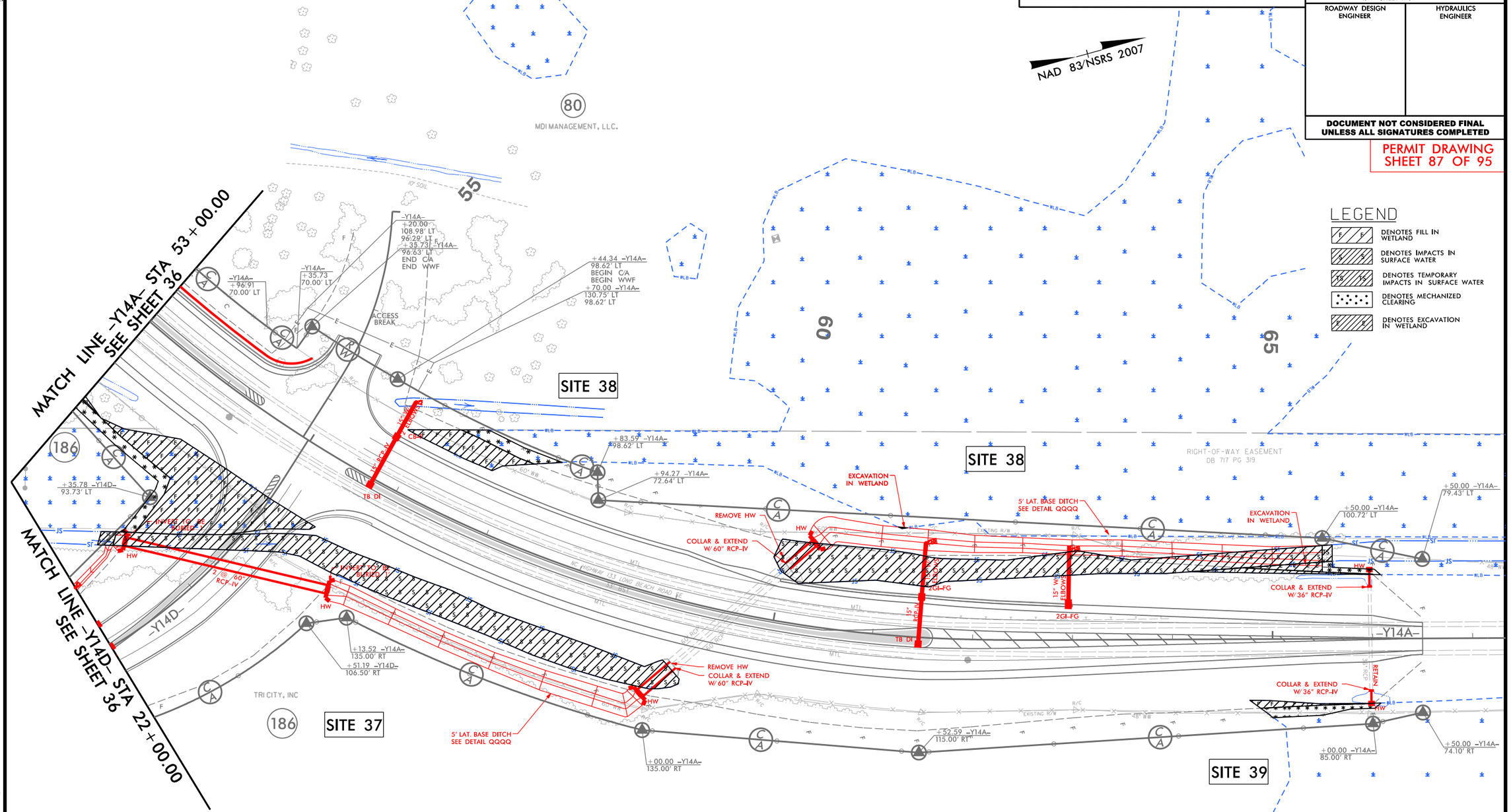
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 37 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 87 OF 95

NAD 83/NSRS 2007




## LEGEND

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

**DETAIL QQQQ**
5' LATERAL BASE DITCH
( Not to Scale)


-14A- FROM STA. 55+82 TO STA. 58+90 RT
-14A- FROM STA. 60+24 TO STA. 65+50 LT

**DETAIL QQQQ**
5' LATERAL BASE DITCH
( Not to Scale)


-14A- FROM STA. 55+82 TO STA. 58+90 RT
-14A- FROM STA. 60+24 TO STA. 65+50 LT

NOTE:

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2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -Y14A- PROFILE, SEE SHEET 61
FOR -Y14D- PROFILE, SEE SHEET 63 AND 64
FOR -Y14F- PROFILE, SEE SHEET 64
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/17/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH37_87 of 95.dgn
HNTB

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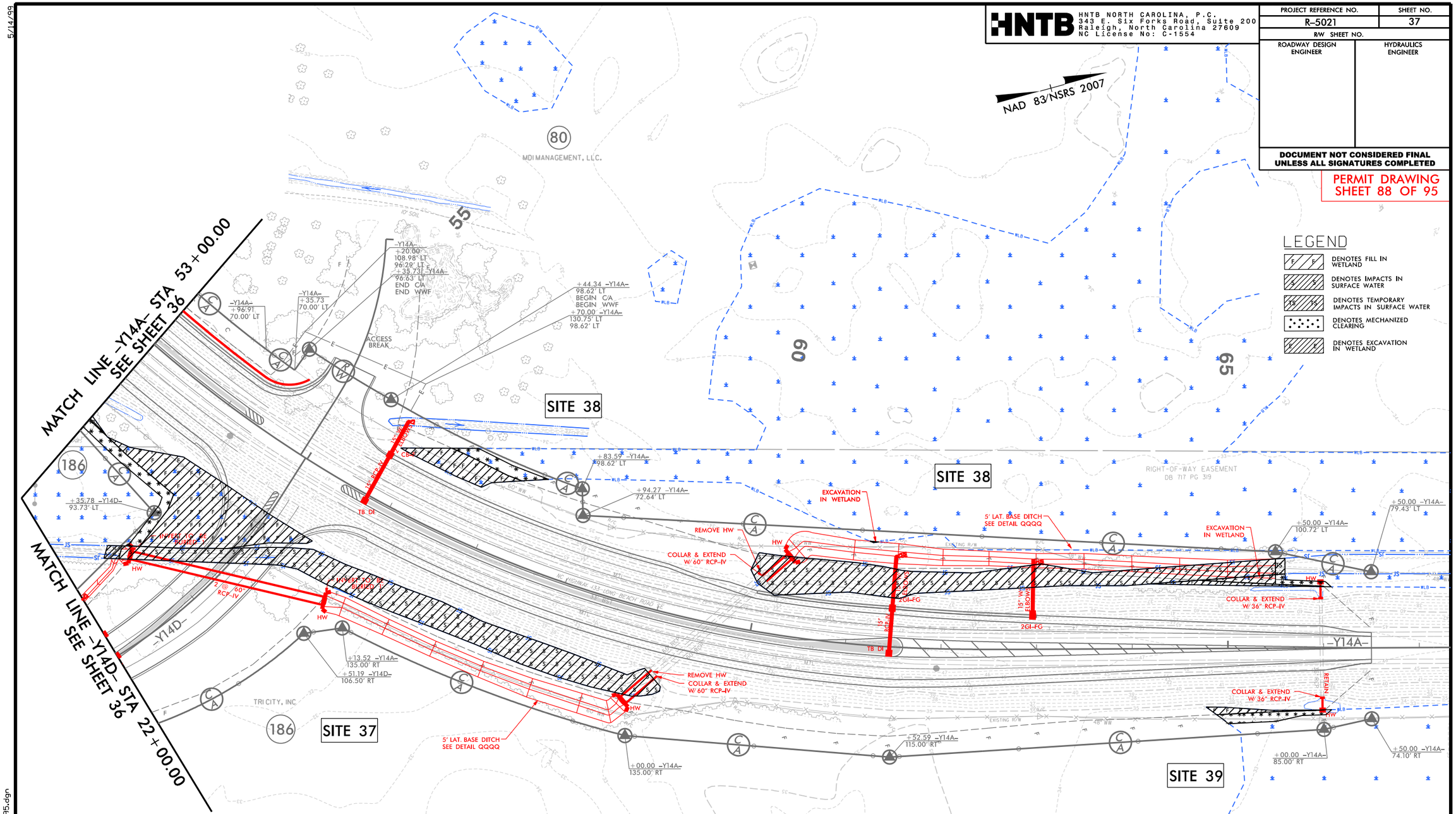
NC License No: C-1554

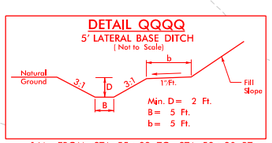
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 37 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

PERMIT DRAWING
SHEET 88 OF 95




**DETAIL QQQQ**
5' LATERAL BASE DITCH
( Not to Scale)




-14A- FROM STA. 55+82 TO STA. 58+90 RT
-14A- FROM STA. 60+24 TO STA. 65+50 LT

**DETAIL QQQQ**
5' LATERAL BASE DITCH
( Not to Scale)


-14A- FROM STA. 55+82 TO STA. 58+90 RT
-14A- FROM STA. 60+24 TO STA. 65+50 LT

NOTE:

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FOR -Y14A- PROFILE, SEE SHEET 61
FOR -Y14D- PROFILE, SEE SHEET 63 AND 64
FOR -Y14F- PROFILE, SEE SHEET 64
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

6/23/16

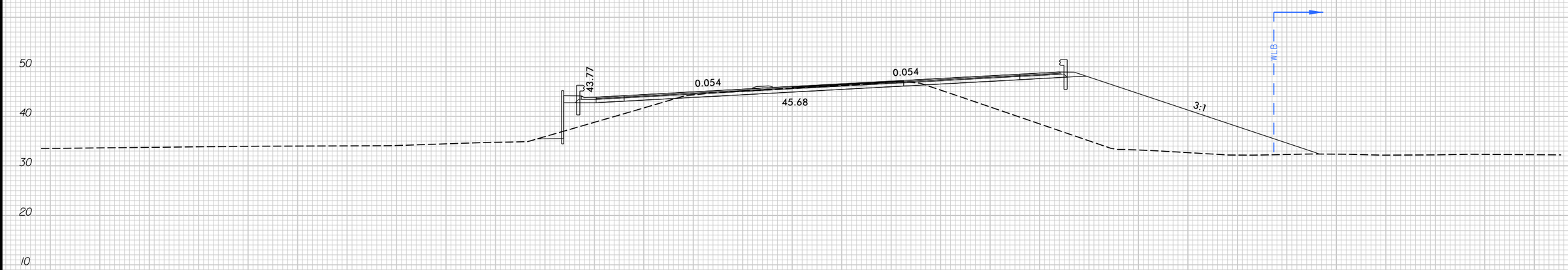
| 5 10 | PROJ. REFERENCE NO. | SHEET NO. |
|---|---|---|
| | R-5021 | |

PERMIT DRAWING
SHEET 89 OF 95

# WETLAND CROSS SECTIONS

**SITE 37**

–Y14A– 53+50.00




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

5/15/2018
HNTB
Drawings\r5021_hyd_prm_xpl.dgn

6/23/16

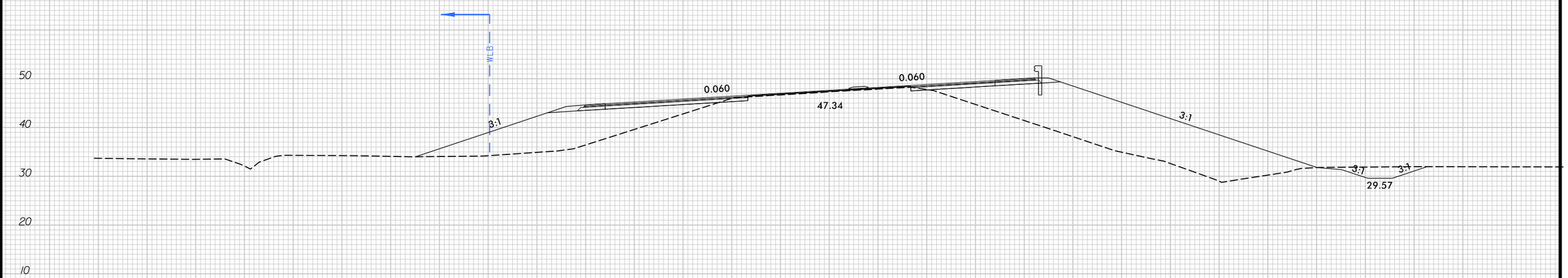
| 5 10 | PROJ. REFERENCE NO. | SHEET NO. |
|---|---|---|
| | R-5021 | |

PERMIT DRAWING
SHEET 90 OF 95

# WETLAND CROSS SECTIONS

## SITE 38

–Y14A– 56+50.00




SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

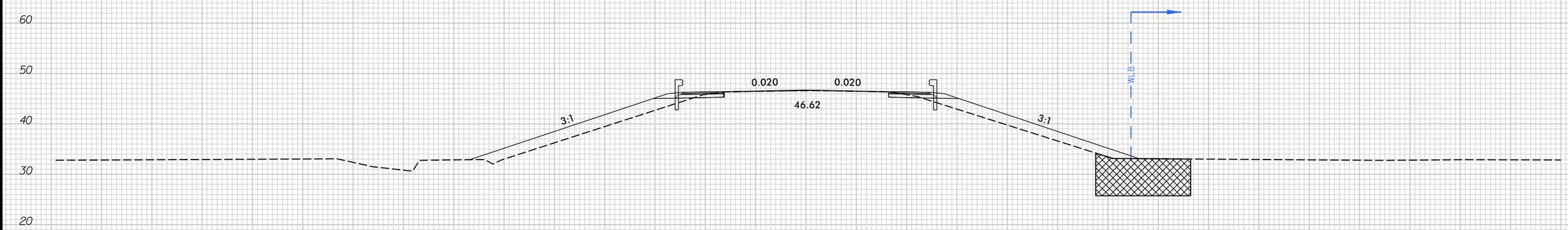
BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
TO NC 87

5/15/2018
HNTB
...Drawings\r-5021_hyd_prm_xpl.dgn

# WETLAND CROSS SECTIONS

**SITE 39**

–Y14A– 65 + 50.00




UNDERCUT EXCAVATION

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BRUNSWICK COUNTY
PROJECT: R-5021
NC 211
FROM SR 1500 (MIDWAY RD.)
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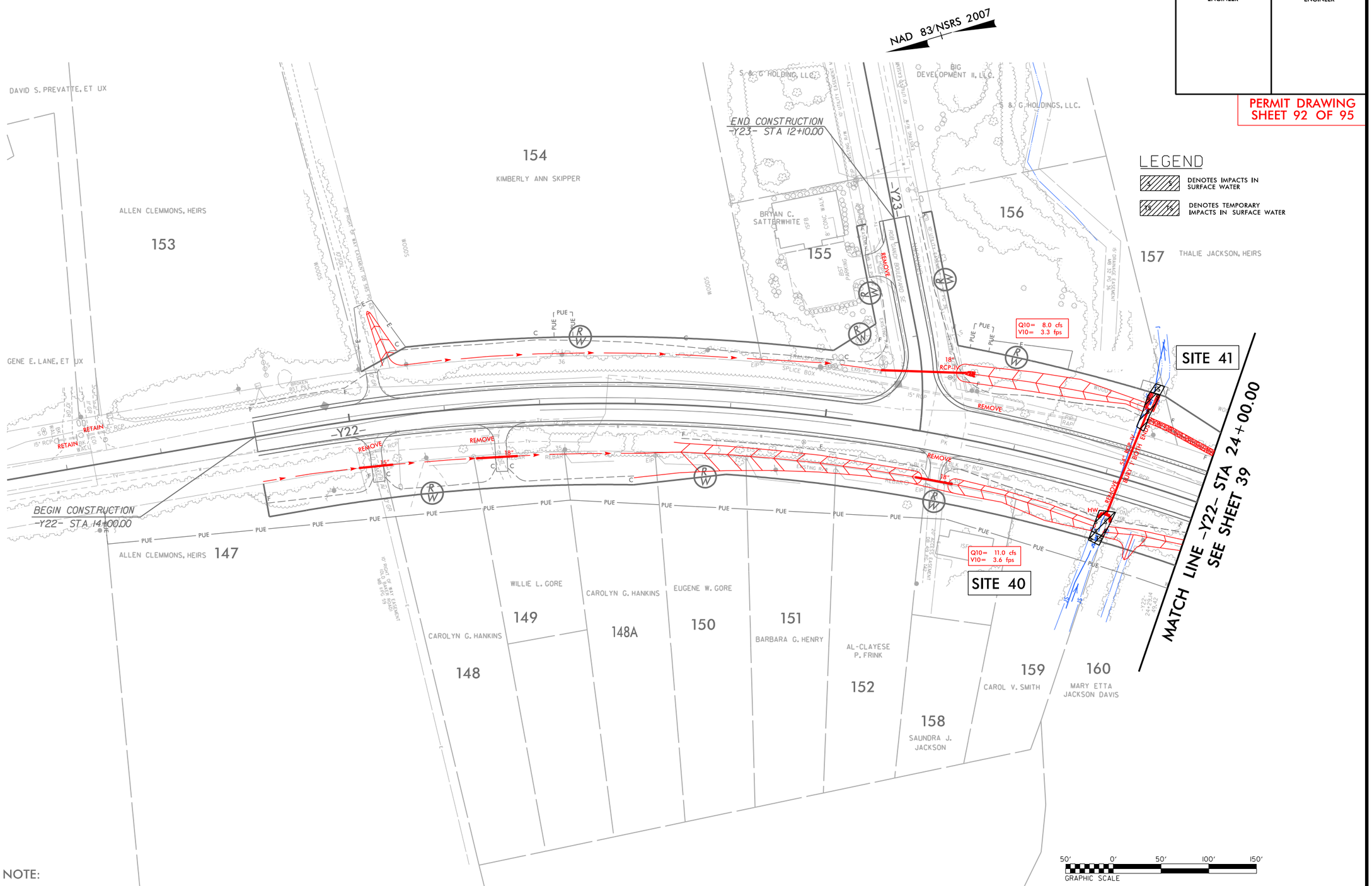
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 38 |
| R/W SHEET NO. | 36 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

PERMIT DRAWING
SHEET 92 OF 95




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -Y22- PROFILE, SEE SHEET 66
FOR -Y23- PROFILE, SEE SHEET 68
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/14/99

5/8/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH38_92 of 95.dgn
HNTB

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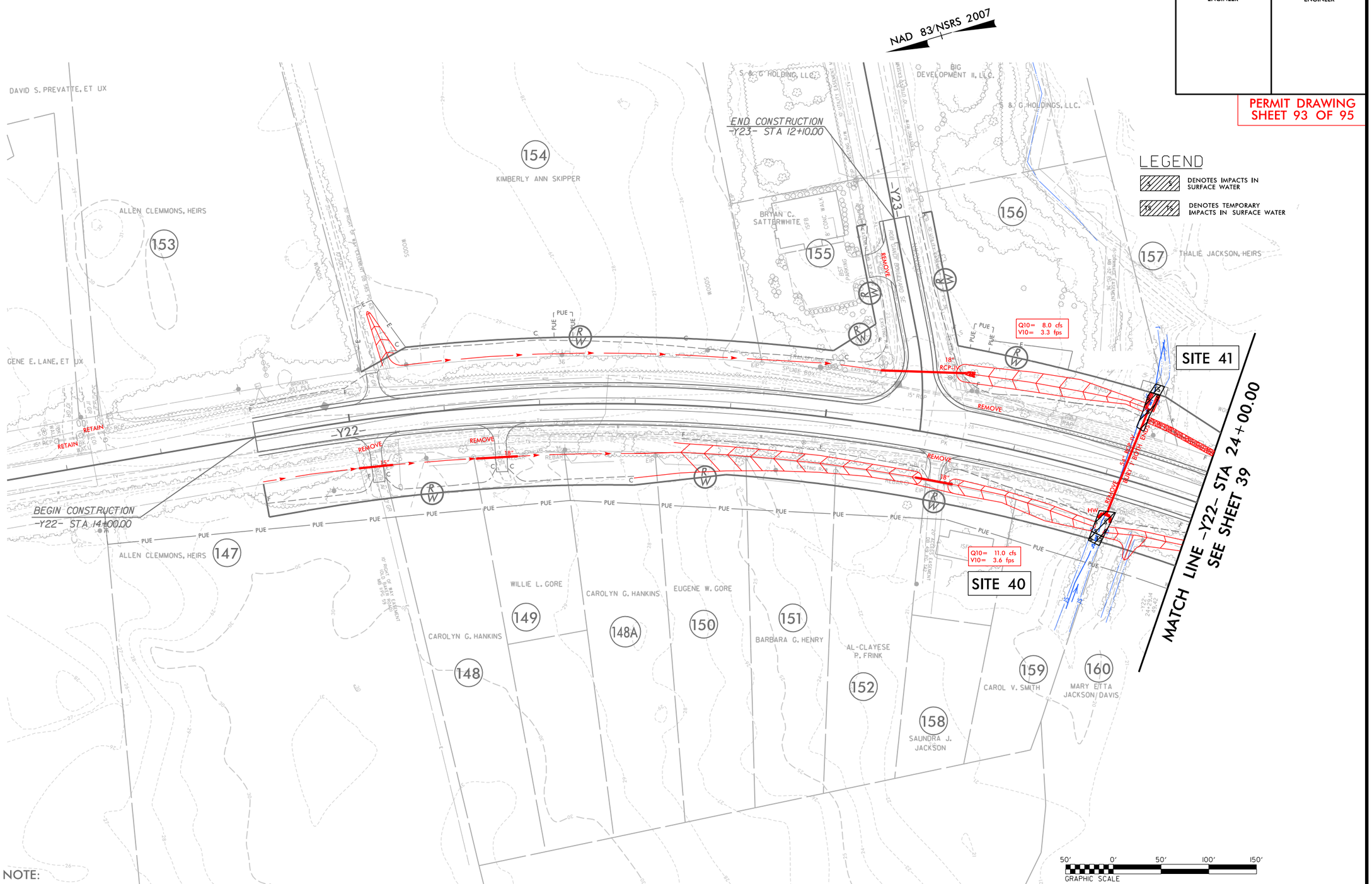
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 38 |
| R/W SHEET NO. | 36 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

PERMIT DRAWING
SHEET 93 OF 95




NOTE:

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FOR -Y22- PROFILE, SEE SHEET 66
FOR -Y23- PROFILE, SEE SHEET 68
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/14/99

5/8/2018
R-5021_HYD_PERMIT_DRAWINGS_PSH38_93 of 95.dgn
HNTB

## WETLAND AND SURACE WATER IMPACTS SUMMARY

| | | | WETLAND IMPACTS | | | | | SURFACE WATER IMPACTS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site No. | Station (From/To) | Structure Size / Type | Permanent Fill In Wetlands (ac) | Temp. Fill In Wetlands (ac) | Excavation in Wetlands (ac) | Mechanized Clearing in Wetlands (ac) | Hand Clearing in Wetlands (ac) | Permanent SW impacts (ac) | Temp. SW impacts (ac) | Existing Channel Impacts Permanent (ft) | Existing Channel Impacts Temp. (ft) | Natural Stream Design (ft) |
| 1 | -L- 55+39 - 57+85 RT | 4' Base Ditch | | | 0.17 | | | | | | | |
| 2 | -L- 57+22 - 75+36 RT | Roadway Fill | | | | | | 0.29 | | | | |
| 2 | -L- 65+12 - 69+60 RT | Base Ditch / Roadway Fill | 0.04 | | 0.12 | | | | | | | |
| 3 | -YA- 11+18 - 14+70 RT/LT | Base Ditch / Roadway Fill / 15" RCP | 0.67 | | 0.13 | 0.03 | | | | | | |
| 4 | -YREV- 38+47 - 48+34 LT | 15" & 48" RCP / Roadway Fill | 0.91 | | | 0.07 | | | | | | |
| 4 | -L- 81+78 - 86+05 RT | Special Cut Ditch | | | 0.21 | | | | | | | |
| 5 | -L- 85+22 - 86+44 LT | 15" RCP / Roadway Fill | 0.08 | | | 0.02 | | | | | | |
| 5 | -L- 83+55 - 83+84 LT | 2 @ 8' X 6' RCBC | | | | | | 0.02 | < 0.01 | 82 | 14 | |
| 5 | -YB- 16+72 - 19+00 LT | Roadway Fill | 0.08 | | | 0.02 | | | | | | |
| 6 | -L- 100+43 - 100+73 LT | 36" RCP | | | | | | 0.01 | < 0.01 | 91 | 9 | |
| 6 | -L- 100+78 - 103+67 LT | Roadway Fill | 0.15 | | | 0.03 | | | | | | |
| 7 | -L- 106+05 - 107+32 LT | 36' RCP | | | | | | 0.41 | < 0.01 | 133 | 13 | |
| 9 | -L- 113+86 - 126+79 LT | Roadway Fill | 1.19 | | | 0.15 | | | | | | |
| 10 | -L- 126+92 - 144+52 LT | Roadway Fill | 0.98 | | | 0.27 | | | | | | |
| 11 | -L- 200+46 - 205+16 RT | Roadway Fill | 0.10 | | | 0.05 | | | | | | |
| 12 | -L- 211+66 - 214+04 LT | 60" X 38" HERCP / Roadway Fill (Pond) | | | | | | 0.24 | 0.14 | | | |
| 13 | -L- 216+73 - 218+28 LT | 54" RCP | | | | | | 0.03 | < 0.01 | 153 | 19 | |
| 13 | -L- 216+76 - 217+92 LT | Roadway Fill / 4' Lateral Base Ditch | 0.04 | | 0.02 | | | | | | | |
| 14 | -L- 216+53 - 216+82 RT | 54" RCP | | | | | | < 0.01 | < 0.01 | 16 | 15 | |
| 14 | -L- 215+99 - 217+82 RT | Roadway Fill / Lateral 'V' Ditch | 0.05 | | < 0.01 | < 0.01 | | | | | | |
| 15 | -L- 222+97 - 223+54 LT | Roadway Fill / 'V' Ditch | 0.02 | | 0.02 | | | | | | | |
| 16 | -L- 225+77 - 226+44 LT | 2 @ 9' X 8' RCBC | | | | | | 0.04 | < 0.01 | 150 | 10 | |
| 16 | -L- 225+21 - 227+48 LT | Roadway Fill / Var. Width Base Ditch | 0.30 | | < 0.01 | 0.02 | | | | | | |
| 17 | -L- 225+59 - 225+92 RT | 2 @ 9' X 8' RCBC | | | | | | 0.03 | < 0.01 | 59 | 10 | |
| 17 | -L- 222+60 - 226+73 RT | 4' Base Ditch | 0.02 | | 0.13 | 0.01 | | | | | | |
| SUBTOTALS*: | | | 4.62 | | 0.82 | 0.68 | | 1.08 | 0.16 | 684 | 90 | |

*Rounded totals are sum of actual impacts

NOTES: Site 1: The Total Site Impact of 0.17 acres includes 0.10 acres of drainage effect from ditching.
Site 8 has been eliminated.
Site 15 is a total take. Total Site Impact of 0.08 acres includes 0.04 acres of direct impacts and 0.04 acres of indirect impacts.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5/15/2018
Brunswick County
R-5021



Revised 2016 09 09

## WETLAND AND SURACE WATER IMPACTS SUMMARY

| | | | WETLAND IMPACTS | | | | | SURFACE WATER IMPACTS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site No. | Station (From/To) | Structure Size / Type | Permanent Fill In Wetlands (ac) | Temp. Fill In Wetlands (ac) | Excavation in Wetlands (ac) | Mechanized Clearing in Wetlands (ac) | Hand Clearing in Wetlands (ac) | Permanent SW impacts (ac) | Temp. SW impacts (ac) | Existing Channel Impacts Permanent (ft) | Existing Channel Impacts Temp. (ft) | Natural Stream Design (ft) |
| 18 | -L- 237+79 - 242+95 LT | Roadway Fill | 0.54 | | | 0.04 | | | | | | |
| 19 | -L- 245+23 - 275+27 LT | Roadway Fill | 5.35 | | | 0.30 | | | | | | |
| 20 | -L- 275+51 - 286+64 LT | Roadway Fill | 2.21 | | | 0.12 | | | | | | |
| 21 | -L- 271+43 - 275+91 RT | 4' Base Ditch | | | 0.08 | | | | | | | |
| 22 | -L- 278+65 - 283+16 RT | 4' Base Ditch | | | 0.09 | | | | | | | |
| 23 | -L- 289+94 - 304+98 LT | Roadway Fill | 2.56 | | | 0.17 | | | | | | |
| 24 | -L- 313+81 - 314+96 RT | 6' Base Ditch (Pond) | | | | | | 0.06 | | | | |
| 25 | -L- 315+96 - 316+63 LT | 2 @ 7' X 7' RCBC | | | | | | 0.01 | <0.01 | 85 | 24 | |
| 25A | -L- 316+38 - 317+38 LT | Roadway Fill | | | | | | 0.01 | | 107 | | |
| 26 | -L- 316+52 - 317+84 RT | 2 @ 7' X 7' RCBC | | | | | | 0.02 | <0.01 | 116 | 24 | |
| 42 | -L- 324+23 - 324.26 LT | 2' Base Ditch | | | <0.01 | | | | | | | |
| 28 | -L- 353+34 - 353+73 RT | Special 'V' Ditch / 3' base Ditch | 0.01 | | | 0.04 | | | | | | |
| 29 | -L- 366+77 - 369+06 LT | Roadway Fill | 0.28 | | | 0.07 | 0.02 | | | | | |
| 30 | -L- 370+03 - 375+93 LT | Roadway Fill / Var. Base Ditch | 0.49 | | | 0.07 | | | | | | |
| 31 | -L- 369+37 - 369+59 RT | Bank Stabilization | | | | | | <0.01 | <0.01 | 18 | 29 | |
| 32 | -L- 370+83 - 370+94 RT | Roadway Fill | <0.01 | | | <0.01 | | | | | | |
| 34 | -L- 428+24 - 428+68 LT | 66" RCP | | | | | | 0.03 | <0.01 | 73 | 8 | |
| 35 | -YB- 11+41 - 13+72 LT | Roadway Fill | | | | | | 0.07 | <0.01 | | | |
| 36 | -YREV- 9+47 - 9+77 RT | 3' Base Ditch | | | <0.01 | | | | | | | |
| 37 | -Y14D- 19+91 - 20+15 LT | Special 'V' Ditch | | | | | | <0.01 | <0.01 | | | |
| 37 | -Y14A- 52+57 - 59+22 RT | 2 @ 60" RCP EXT. / Roadway Fill | 0.22 | | | 0.05 | | 0.31 | <0.01 | | | |
| 38 | -Y14A- 55+80 - 66+12 LT | 2 @ 60" RCP EXT. / Roadway Fill | 0.06 | | <0.01 | 0.03 | | 0.29 | <0.01 | | | |
| 39 | -Y14A- 64+77 - 66+24 RT | Roadway Fill | 0.01 | | | 0.02 | | | | | | |
| 40 | -Y22- 23+04 - 23+21 RT | 54" RCP | | | | | | 0.01 | <0.01 | 26 | 10 | |
| 41 | -Y22- 23+17 - 23+32 LT | 54" RCP | | | | | | 0.01 | <0.01 | 40 | 10 | |
| SUBTOTALS*: | | | 11.72 | | 0.18 | 0.90 | 0.02 | 0.83 | 0.04 | 465 | 105 | |
| FINAL TOTALS*: | | | 16.34 | | 1.00 | 1.59 | 0.02 | 1.91 | 0.20 | 1149 | 195 | |

*Rounded totals are sum of actual impacts

NOTES: Site 27 has been eliminated.
Site 33 has been eliminated.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5/15/2018
Brunswick County
R-5021

Revised 2016 09 09

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. |
|---|---|---|
| N.C. | R-5021 | UE-01 |

| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 41582.1.1 | STP-0211(21) | PE |
| 41582.2.2 | STP-0211(21) | UTILITIES |
| 41582.2.3 | STP-0211(21) | R/W |

SHEET 1 OF 22

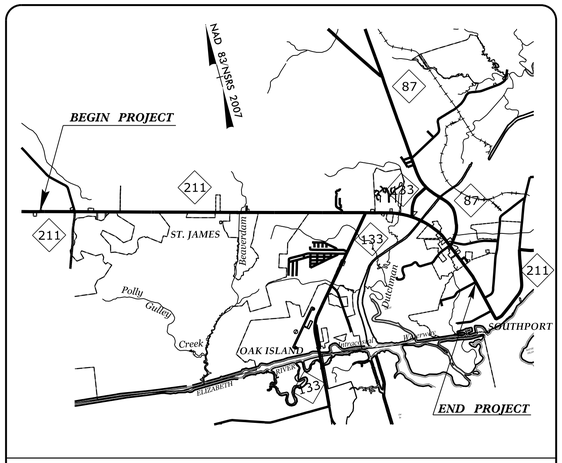
# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

# EAU PERMIT DRAWING PLANS

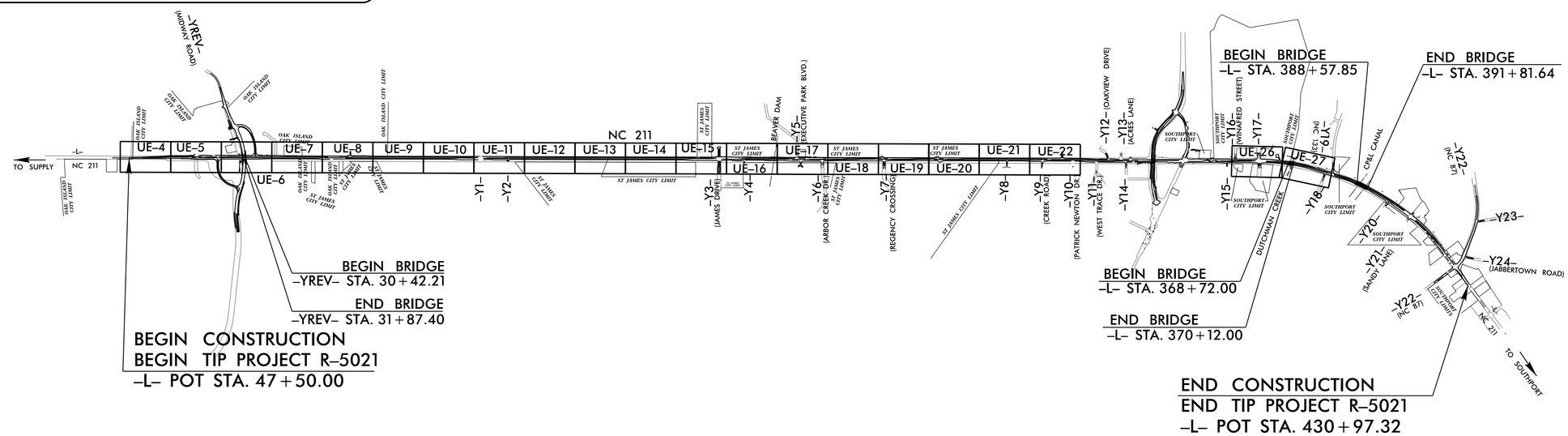
# BRUNSWICK COUNTY

**LOCATION: NC 211 FROM WEST OF SR 1500 (MIDWAY ROAD) TO EAST OF NC 87**

**TYPE OF WORK: RELOCATION OF UTILITIES**




VICINITY MAP




NOTES:

1. This is a partial controlled-access project with access being limited to points as shown on the plans.
2. A portion of this project is within the municipal boundaries of Oak Island, St. James, and Southport.
3. Clearing on this project shall be performed to the limits established by Method III.

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**GRAPHIC SCALE**

50 25 0 50 100
PLANS

**INDEX OF SHEETS**

| SHEET NO.: | DESCRIPTION: |
|---|---|
| UE-01 | TITLE SHEET |
| UE-04 THRU UE-22, UE-26 & UE-27 | PLAN SHEETS |

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 28, 2016

LETTING DATE:
JUNE 19, 2018

PREPARED IN THE OFFICE OF:

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|---|---|
| Howard Woodall, PE | UTILITY PROJECT MANAGER |
| Mark Lawson | PROJECT UTILITY COORDINATOR |
| Nate Harris | PROJECT UTILITY CADD DESIGNER |

DIVISION OF HIGHWAYS
UTILITIES UNIT
1020 BIRCH RIDGE DRIVE
RALEIGH, NC 27610

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| Bo Hemphill, PE | EASTERN UTILITIES MANAGER |
| Nabil S. Hamdan | REGIONAL UTILITIES ENGINEER |
| Ashley B. Cox, Jr, LG | UTILITIES ENGINEER |
| Chris Rivenbark | ECAP REGIONAL MANAGER |

TIP PROJECT: R-5021

CONTRACT:

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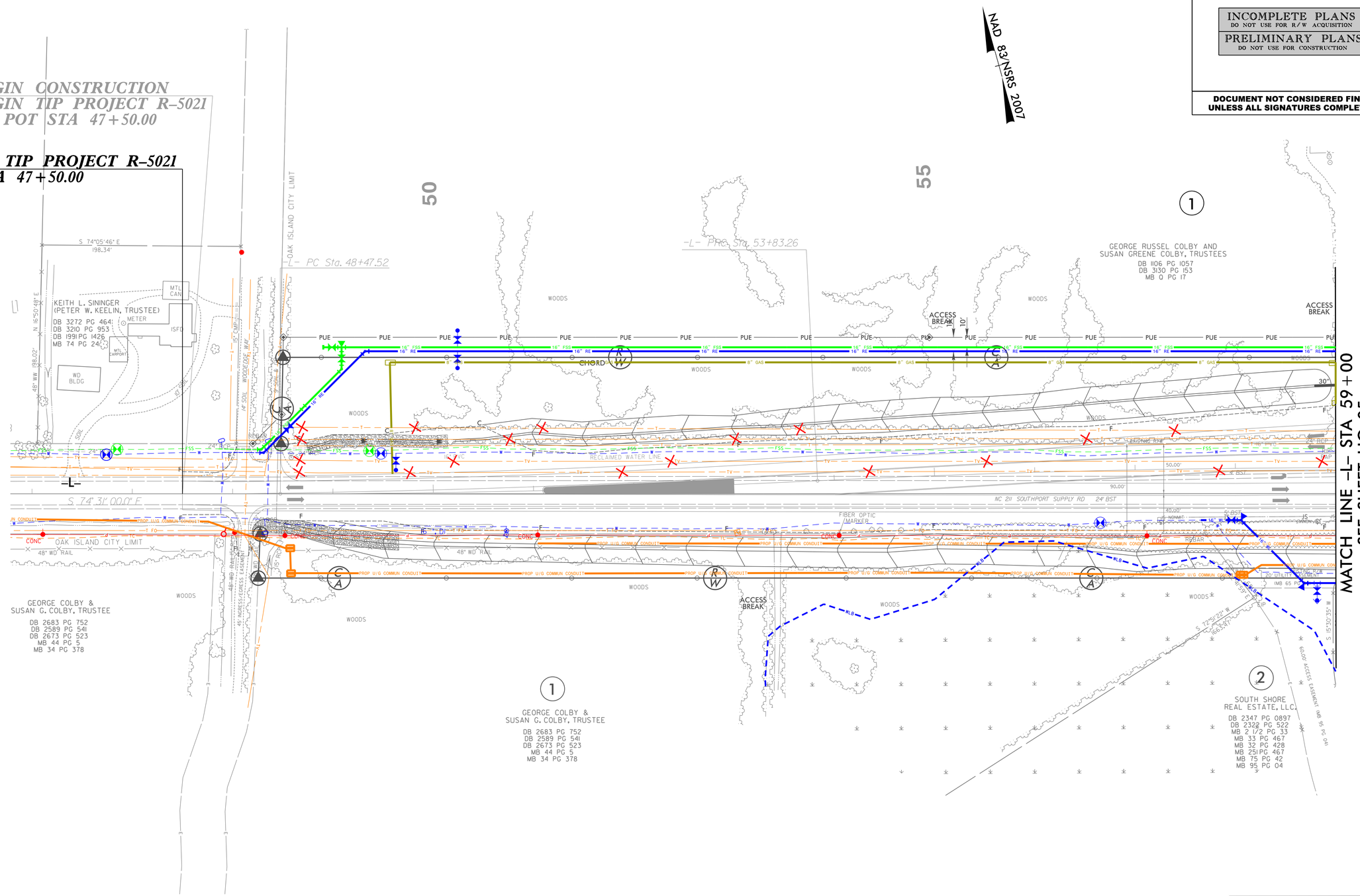


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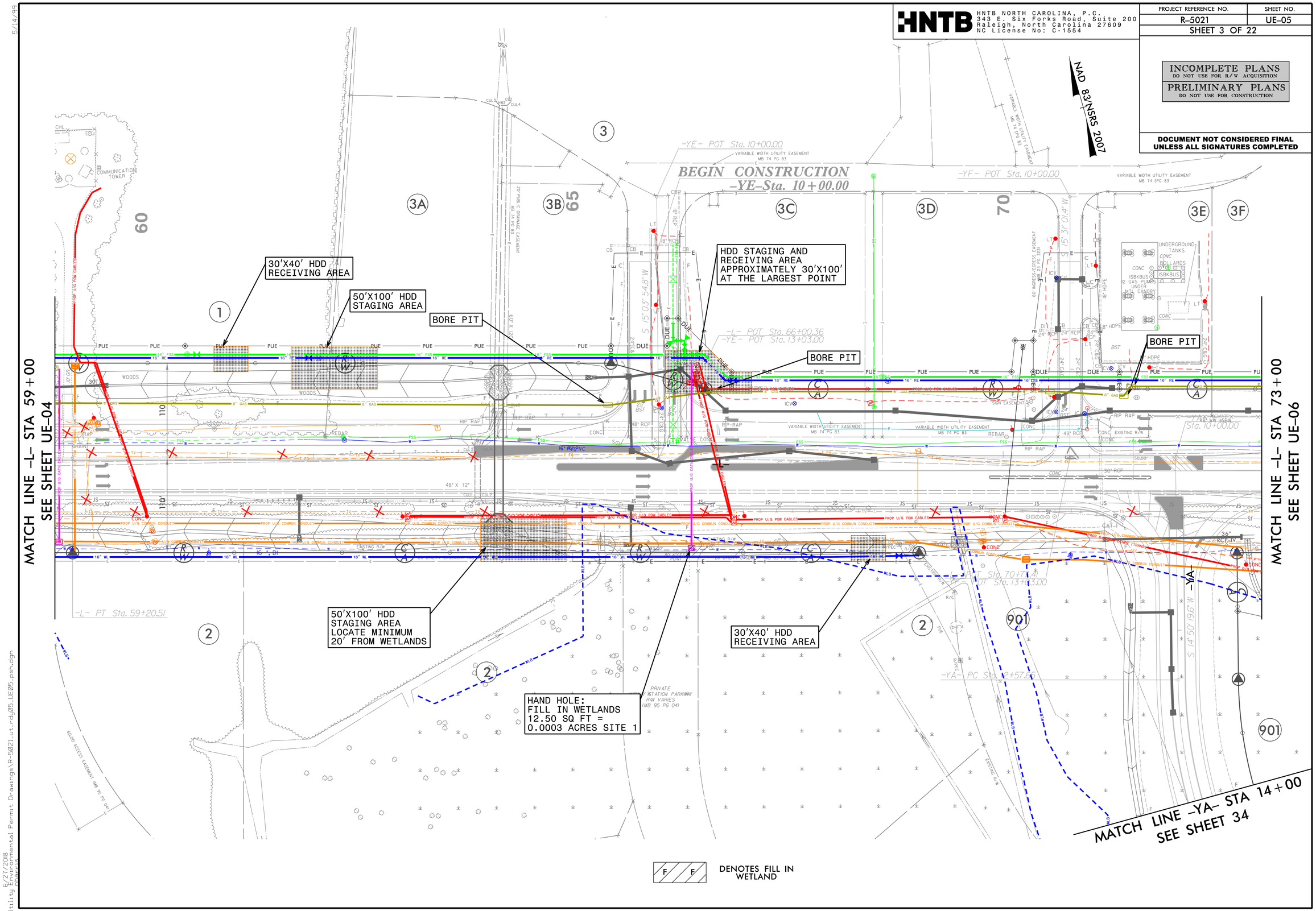


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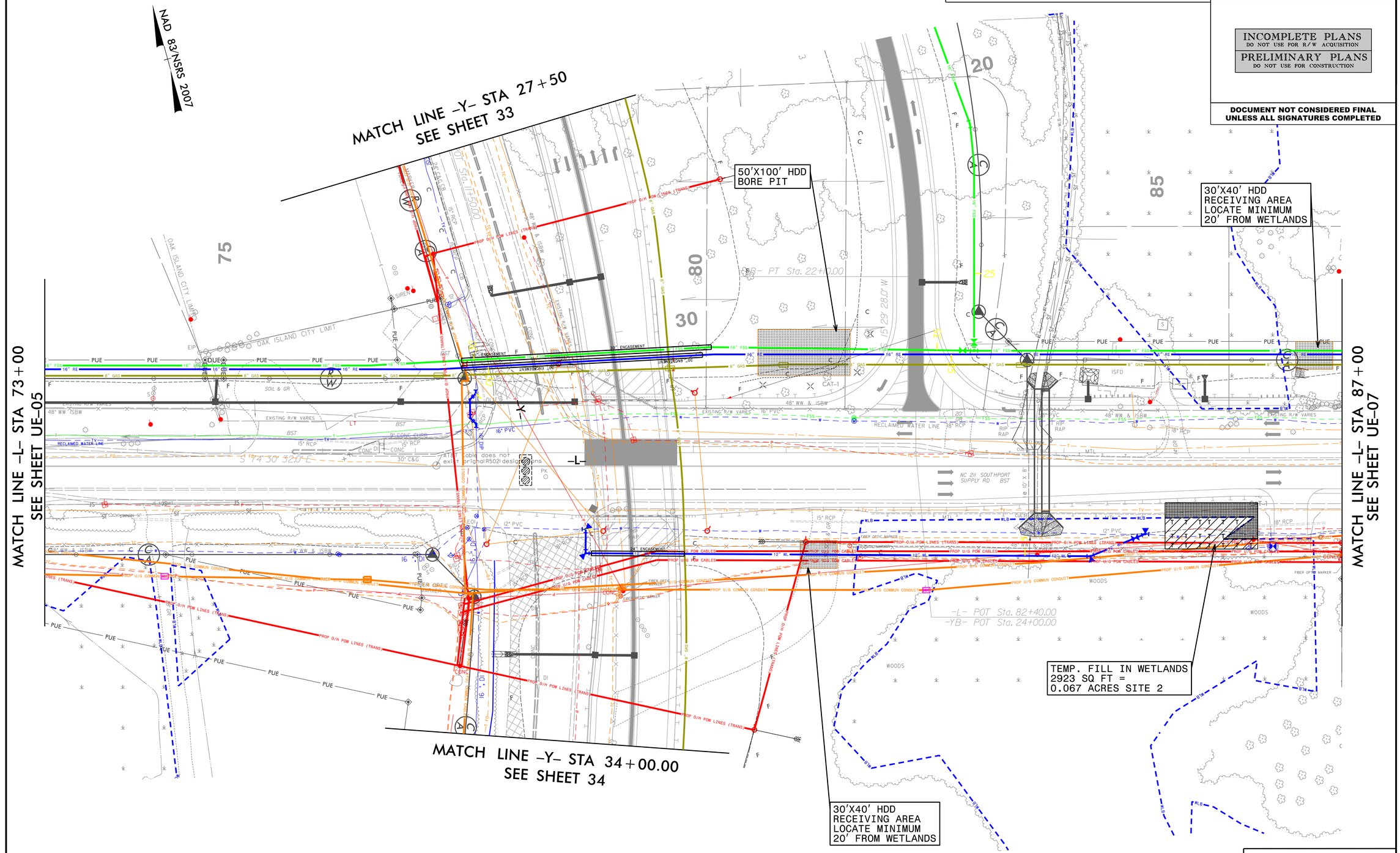


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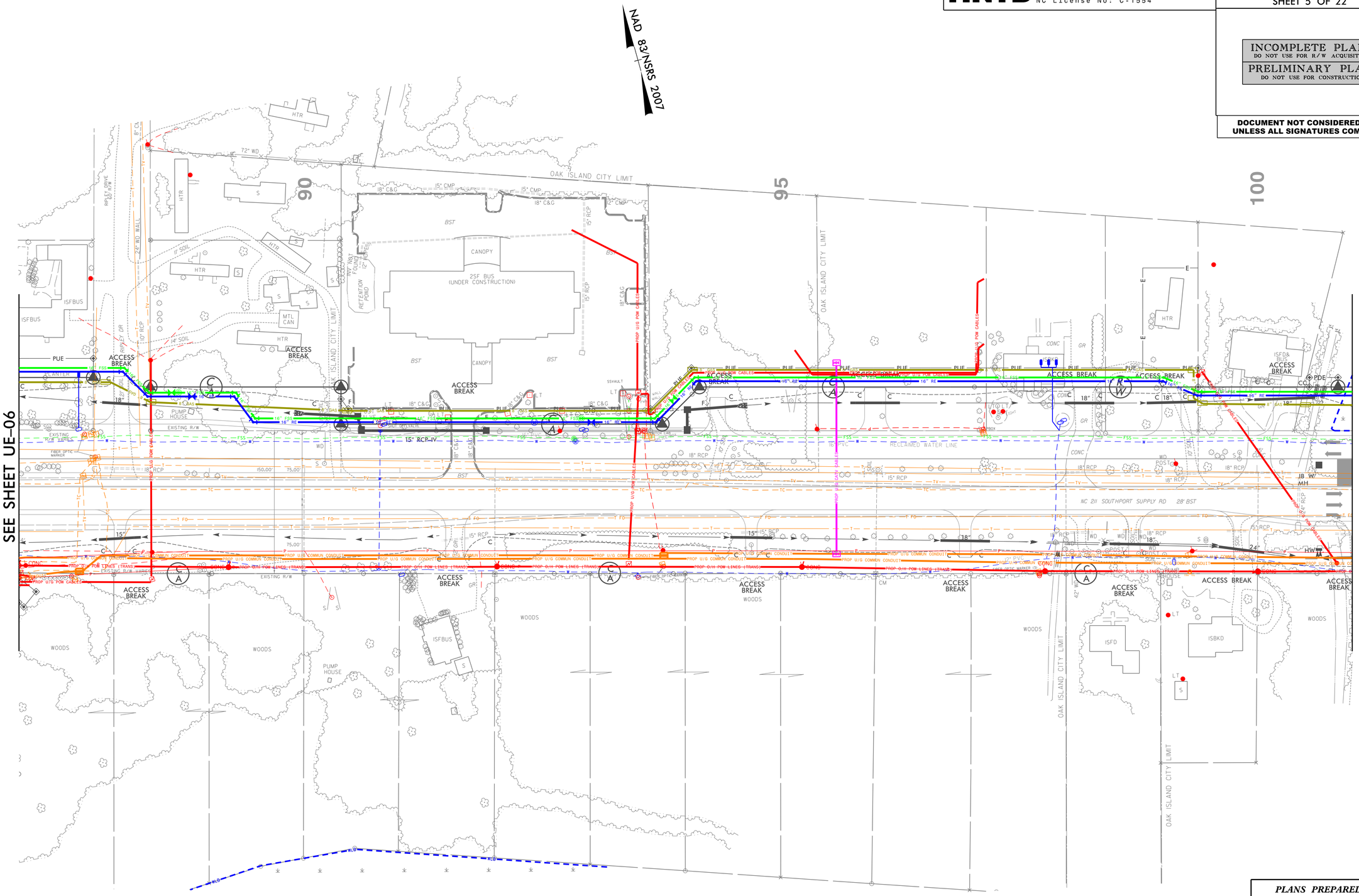


MATCH LINE -L- STA 101+00.00
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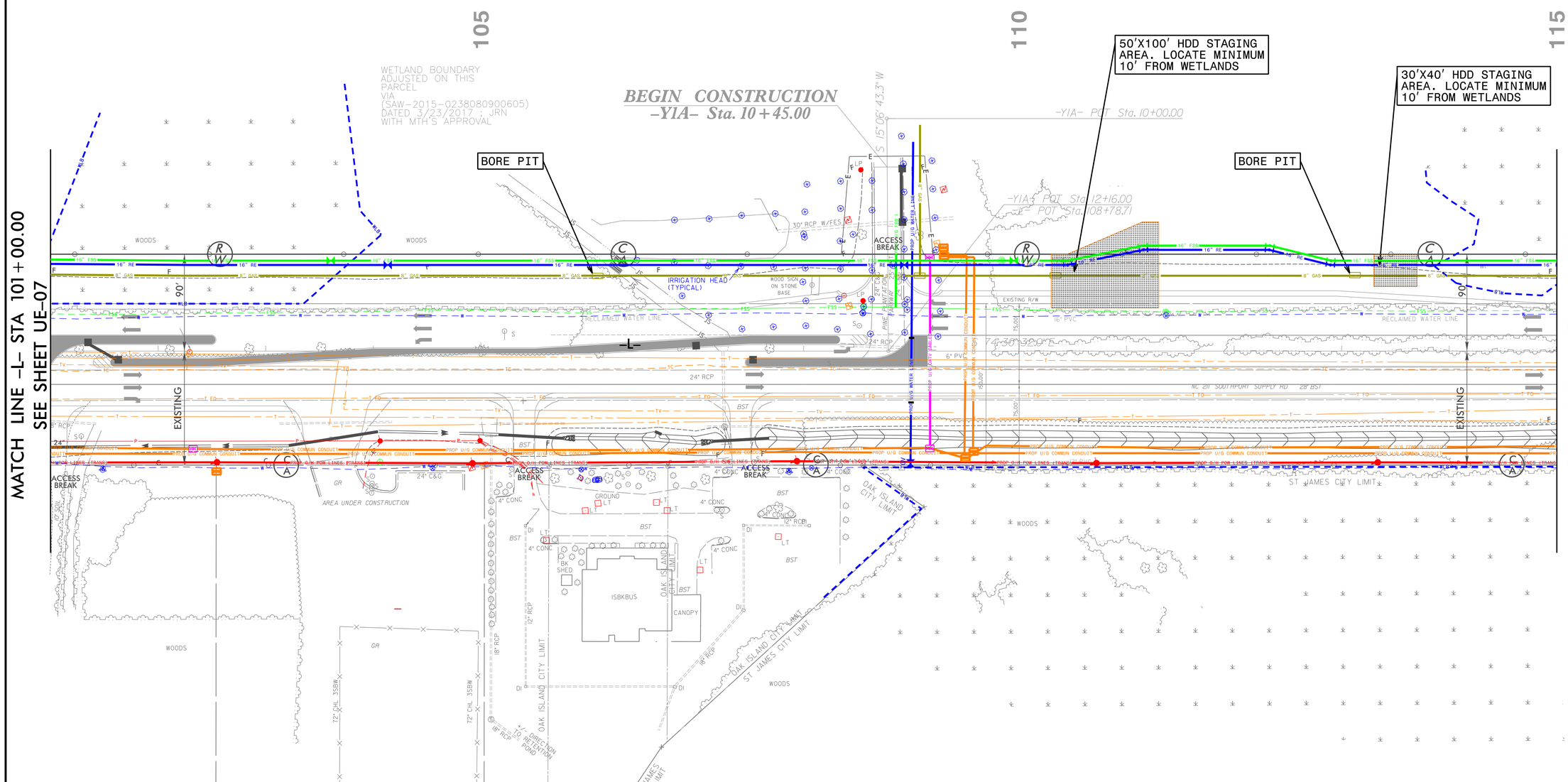


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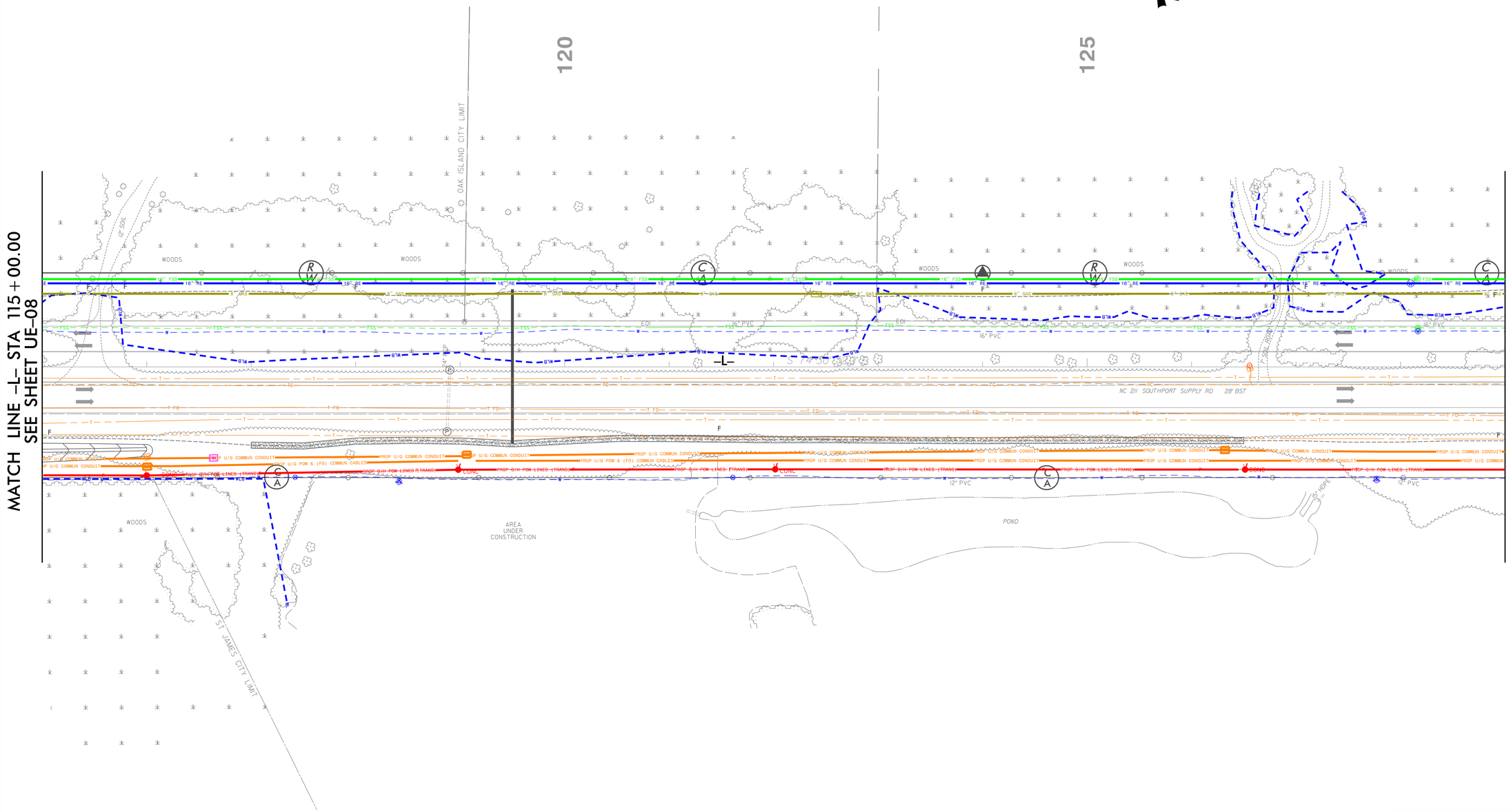


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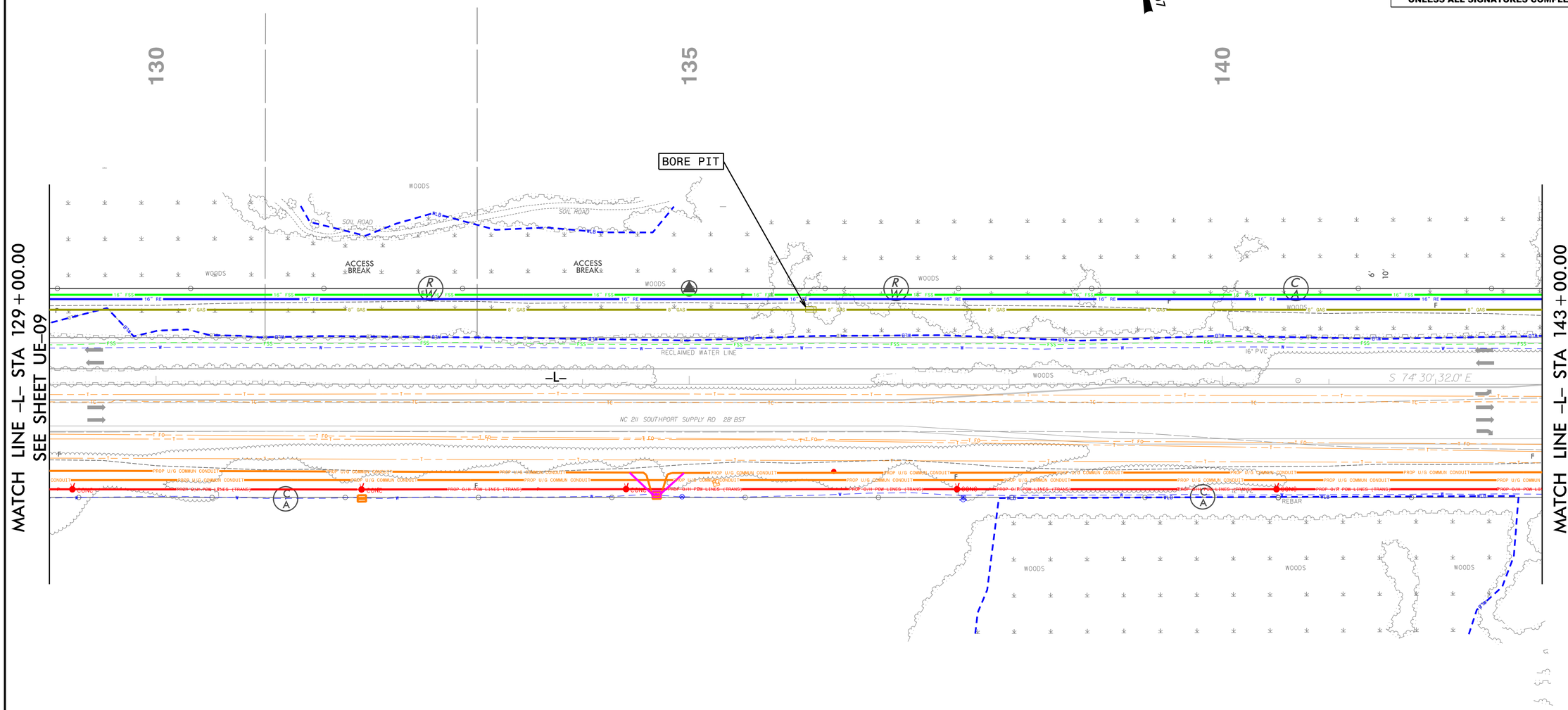


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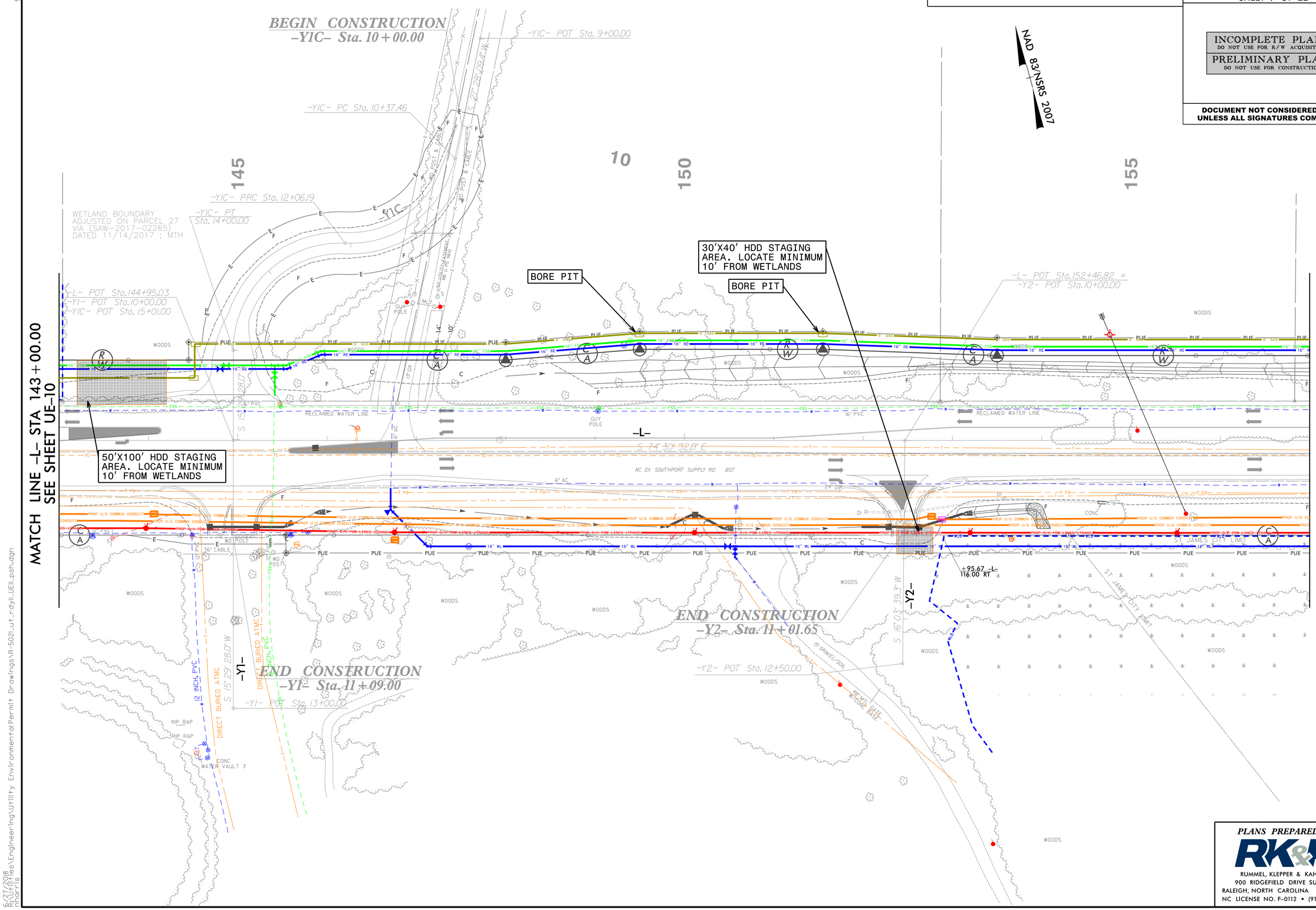


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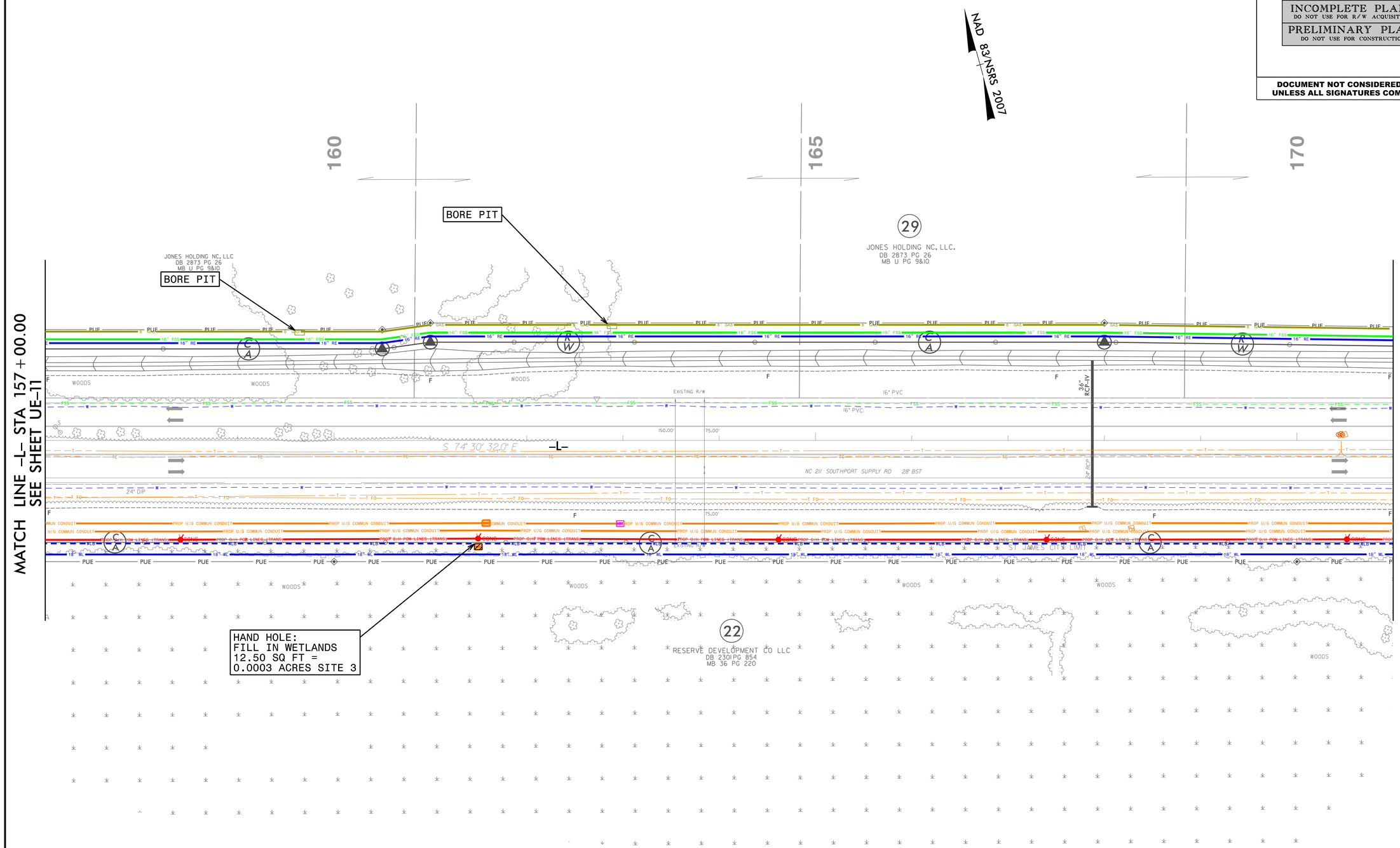


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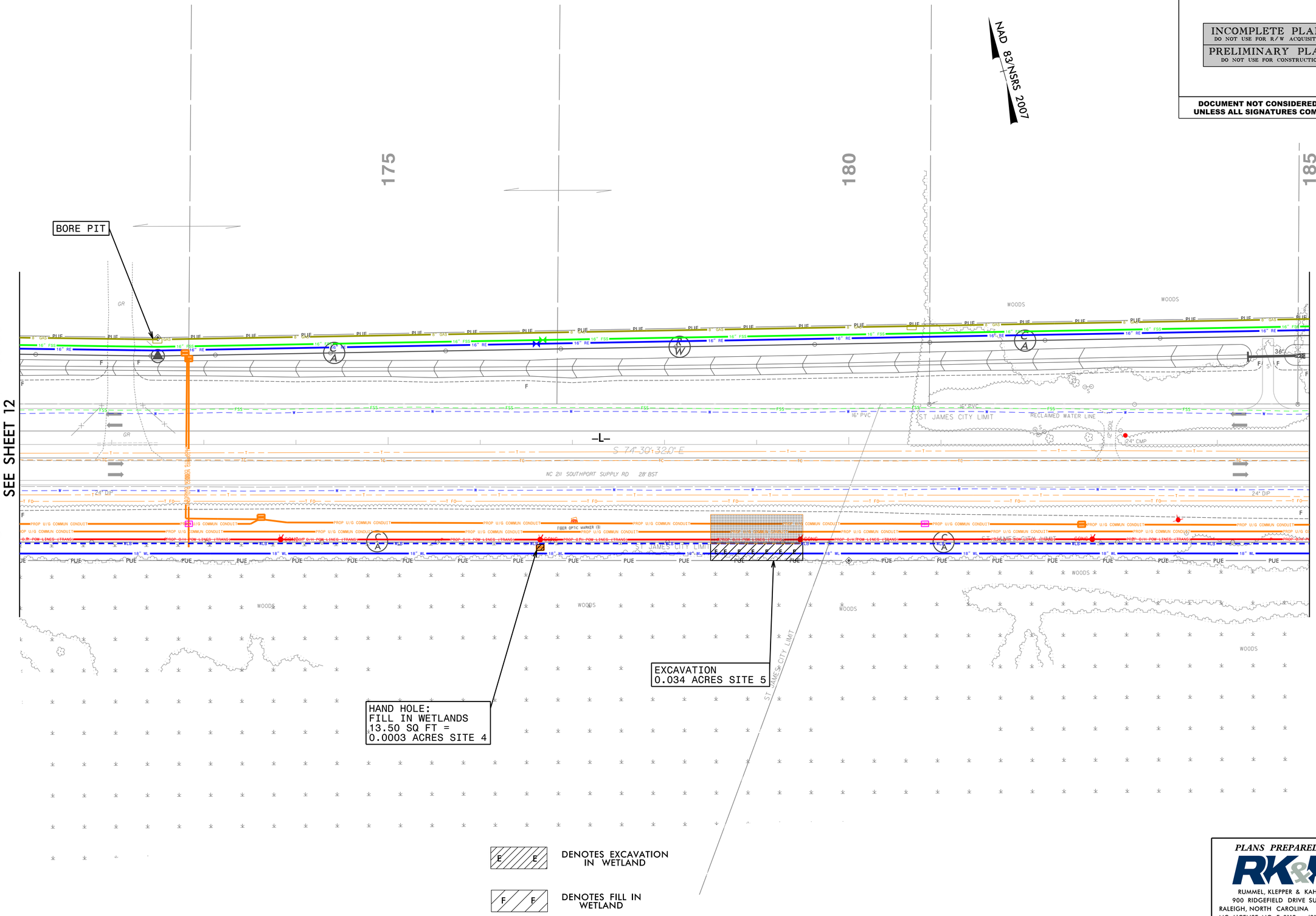


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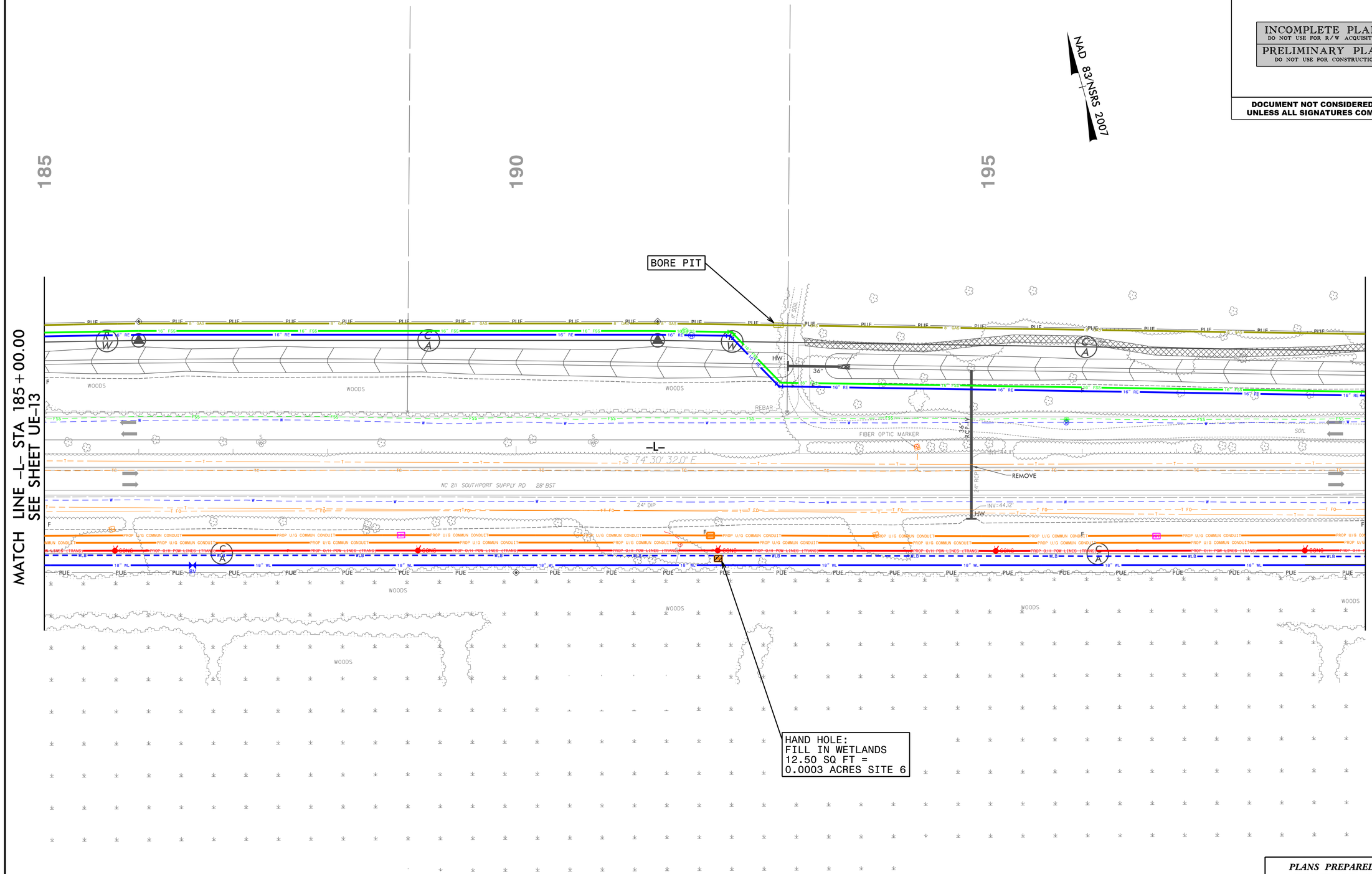


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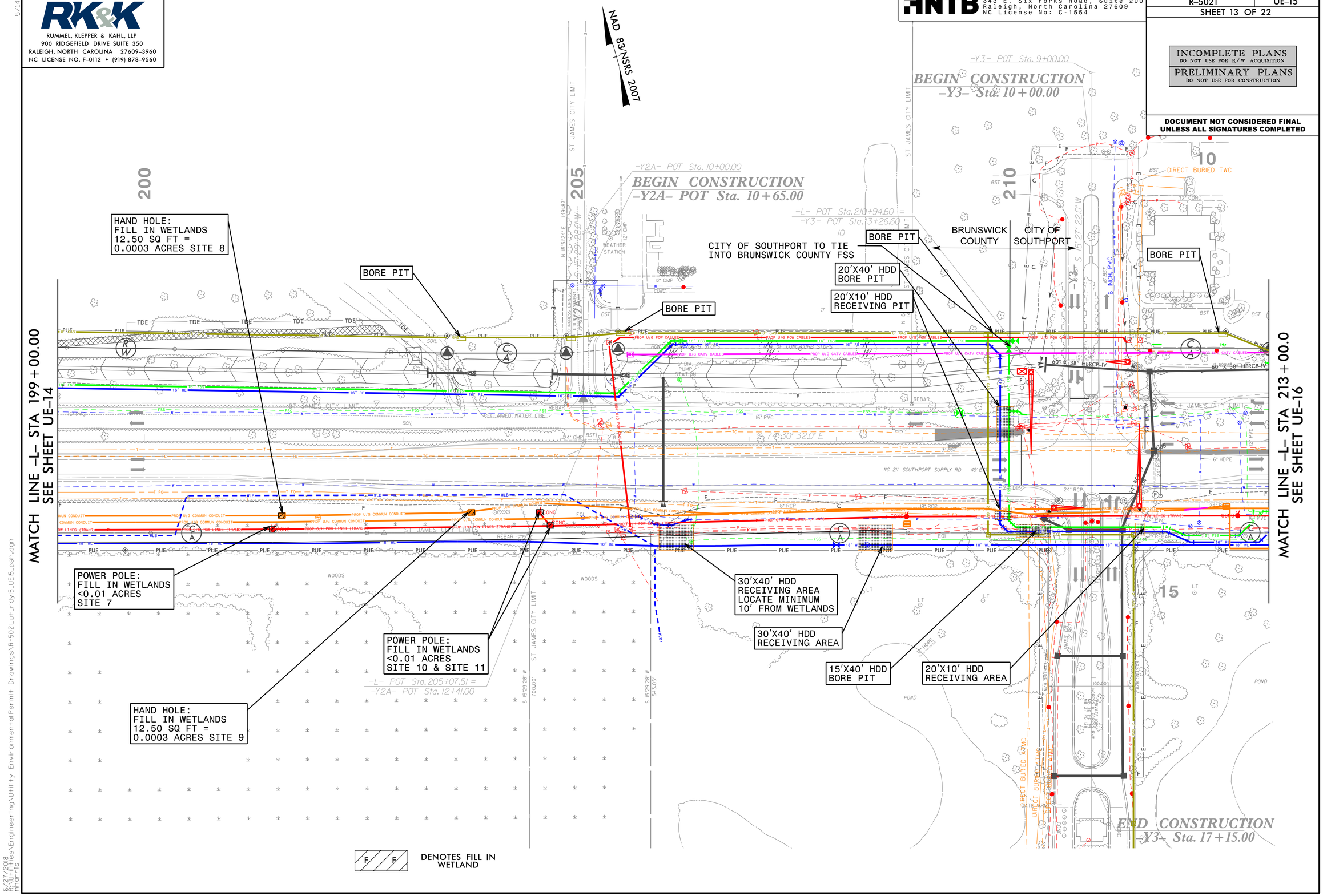


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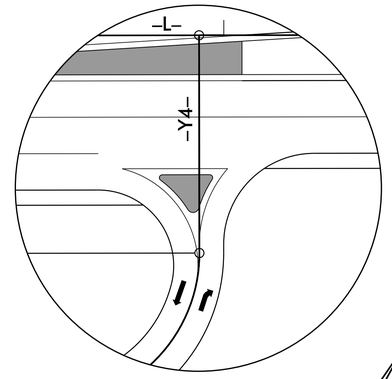


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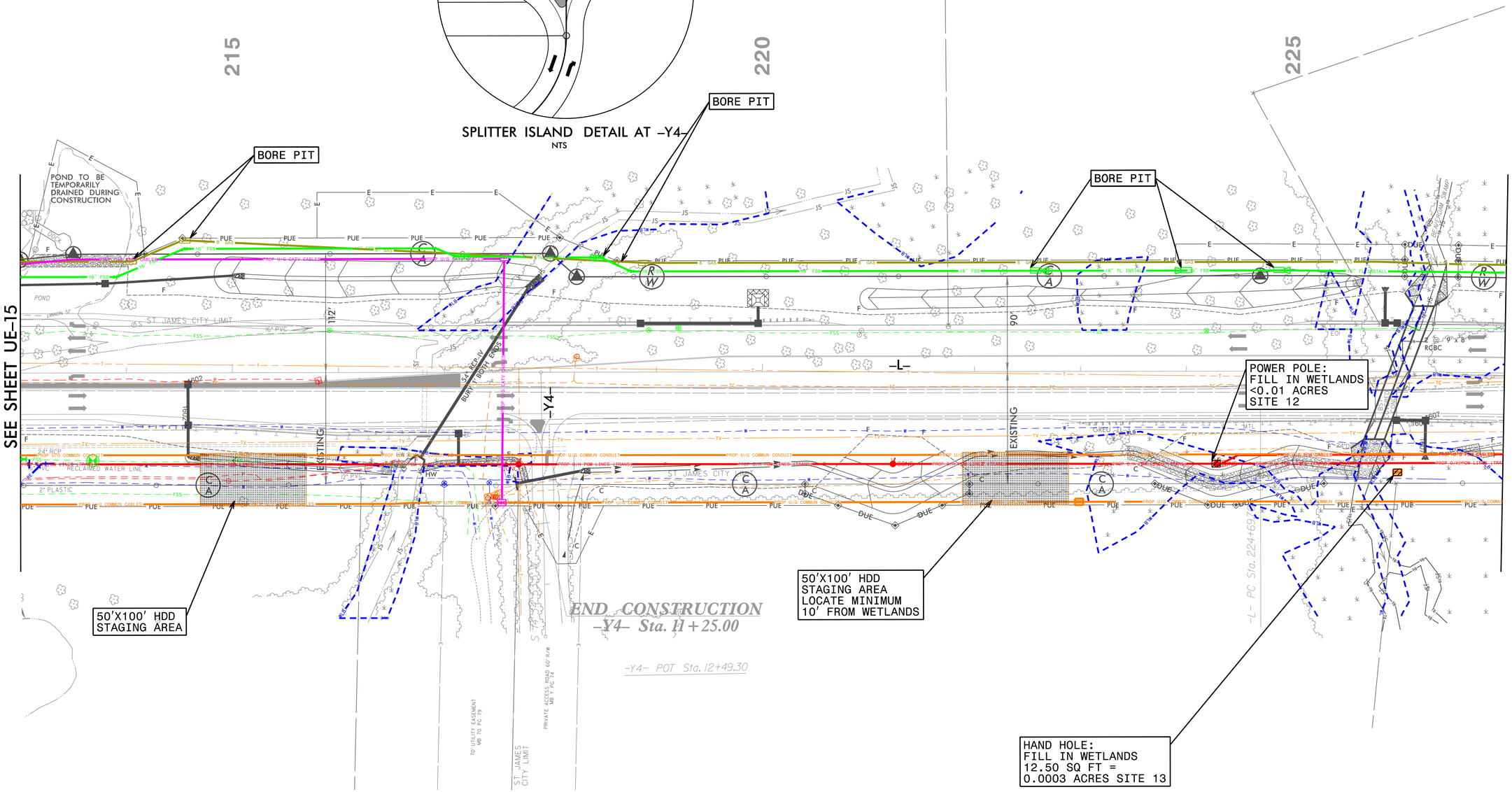


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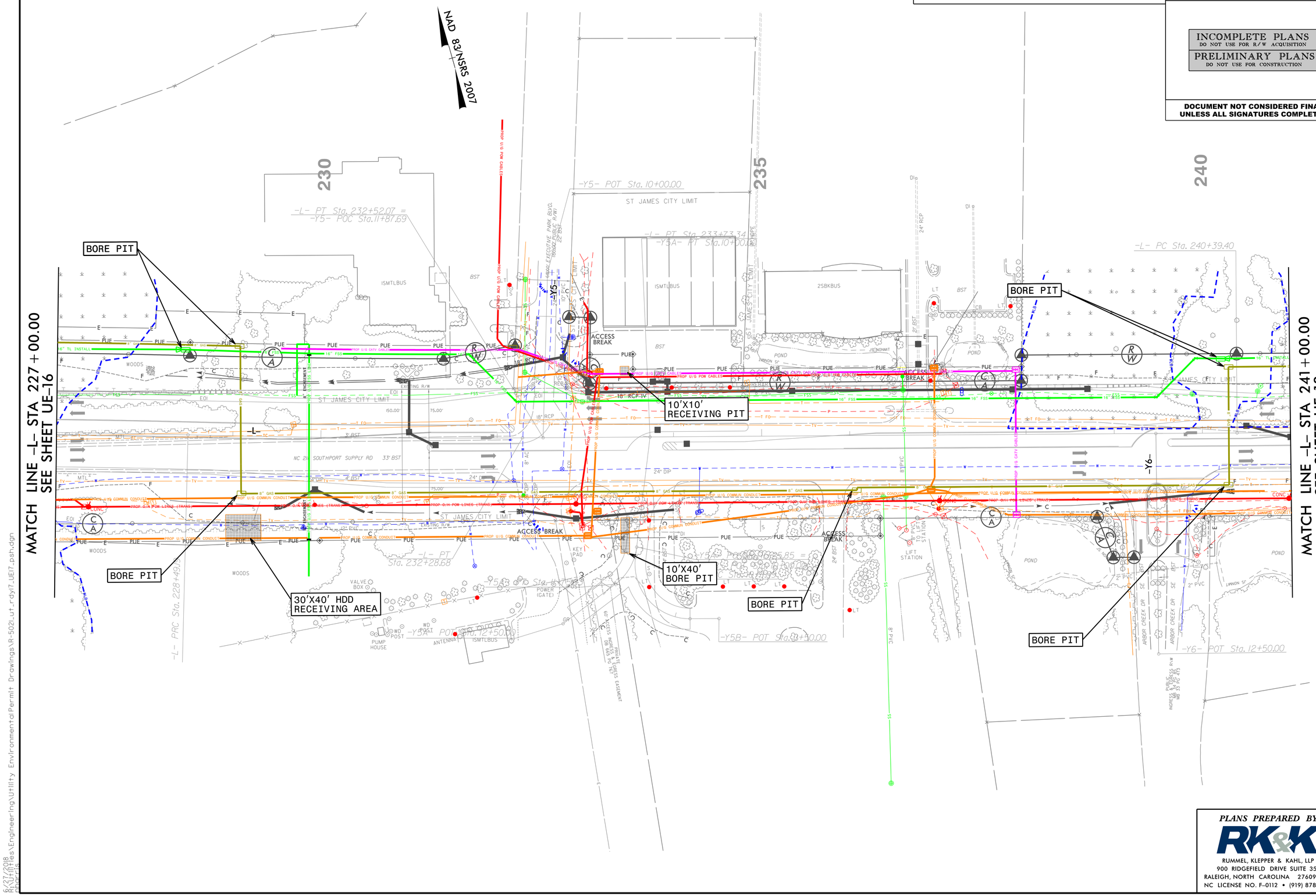


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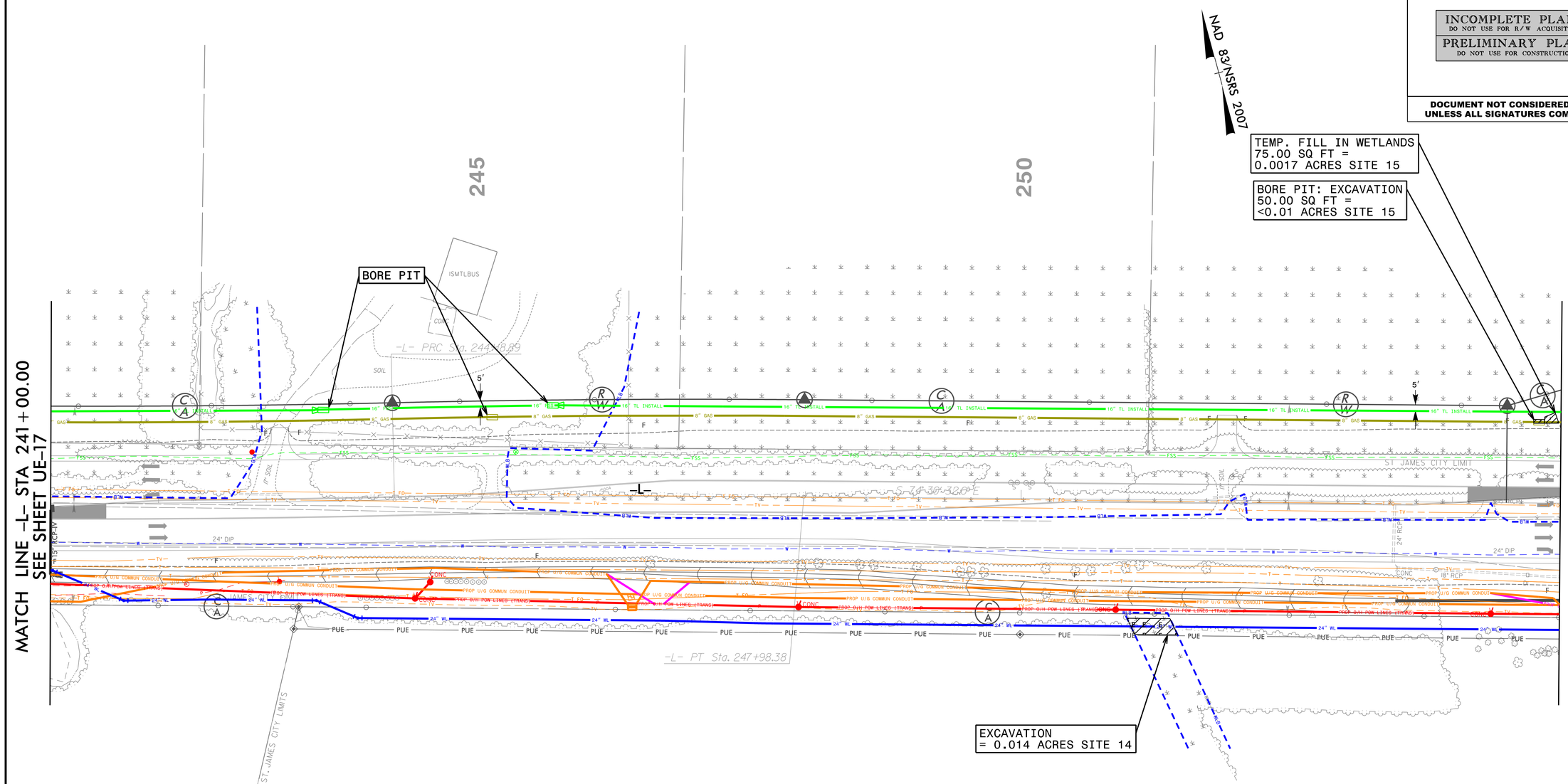


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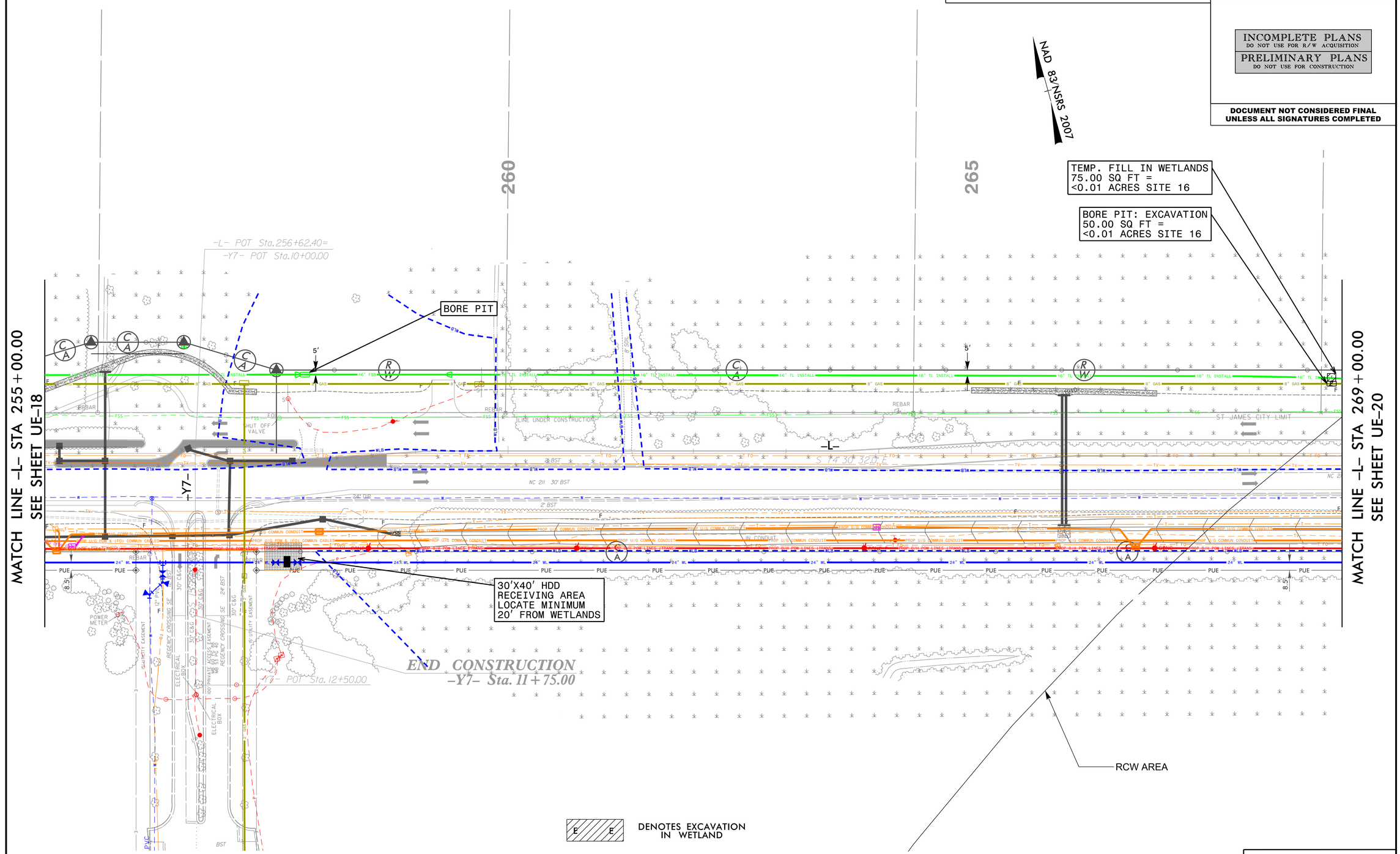


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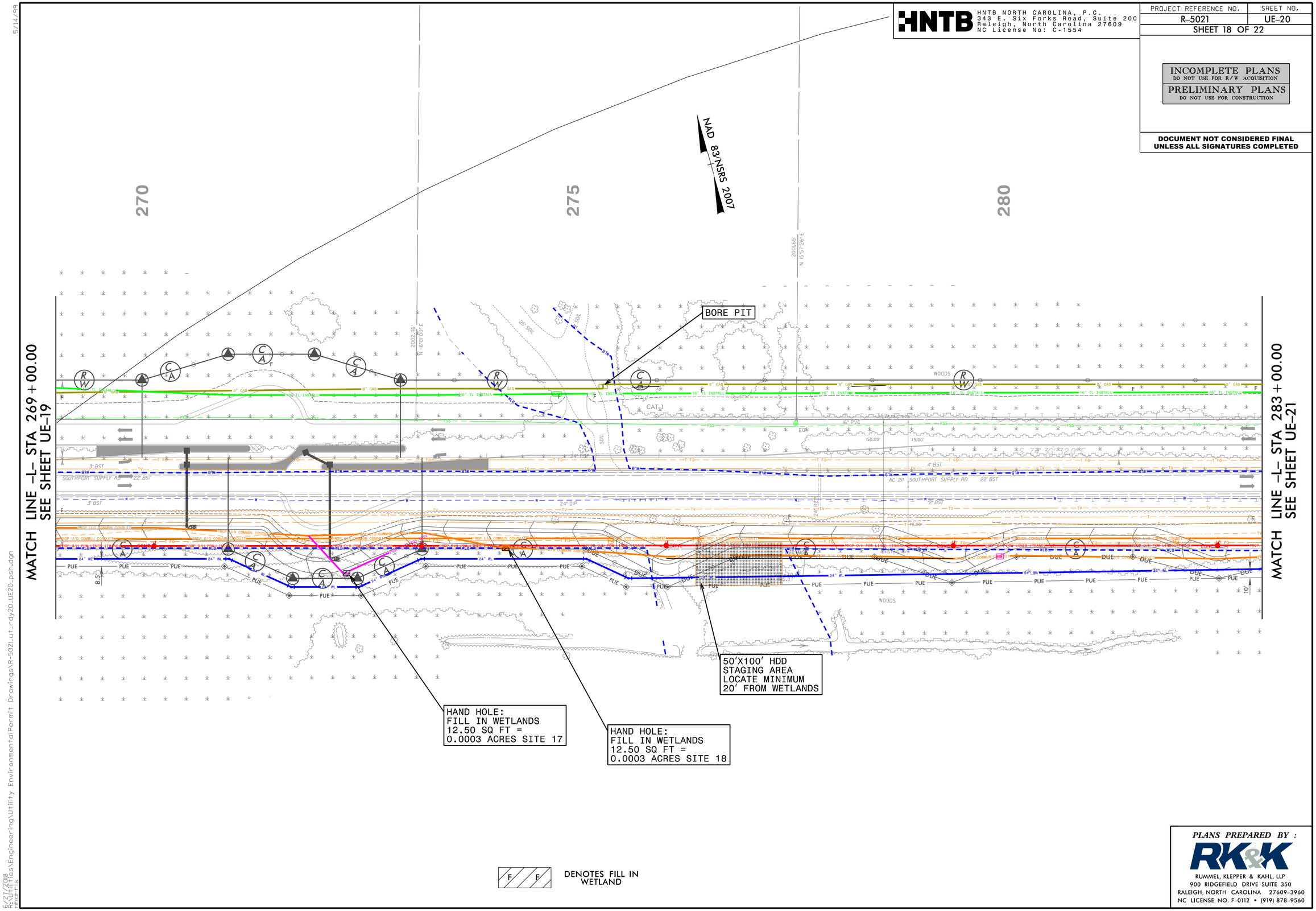


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NC LICENSE NO. F-0112 • (919) 878-9560

5/14/99

6/27/2018
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aharris

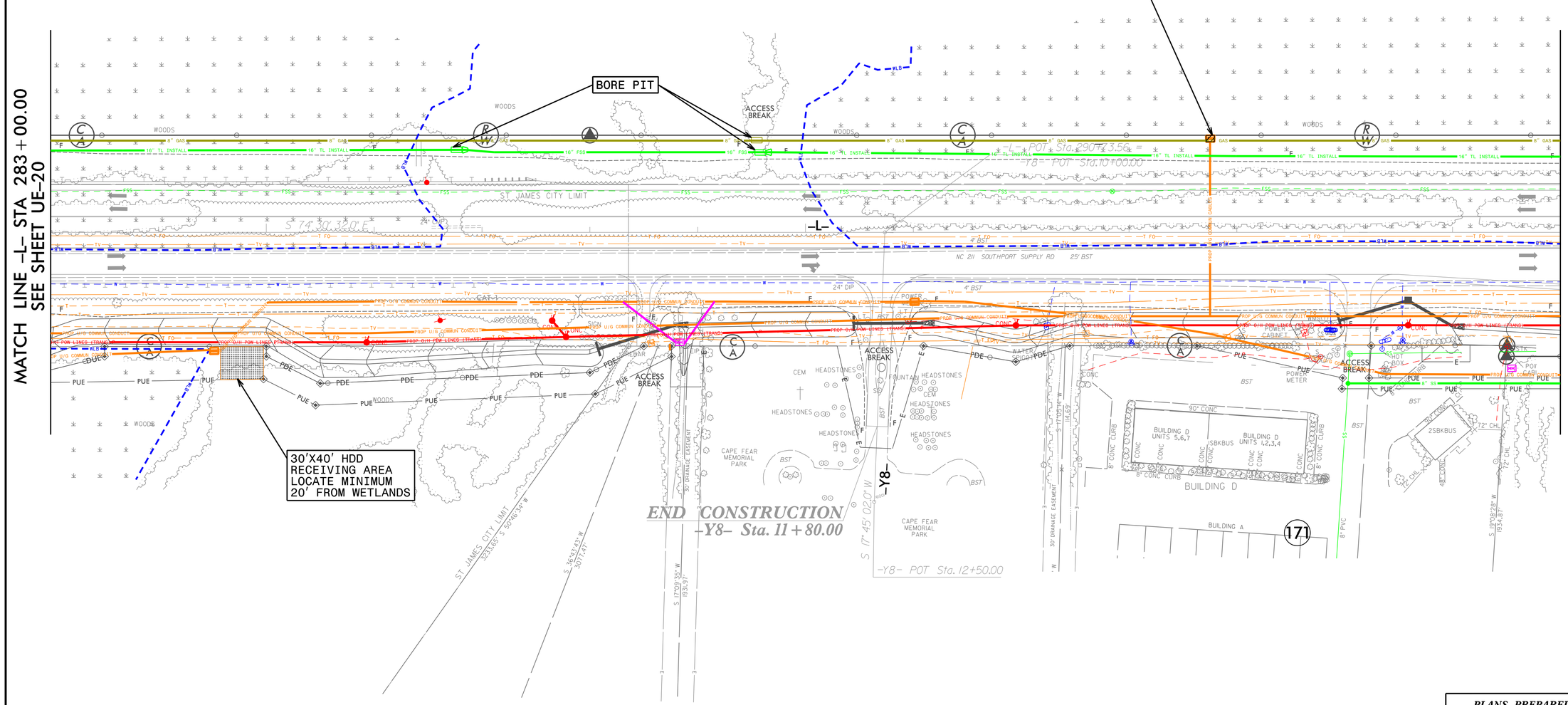
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | UE-21 |
| SHEET 19 OF 22 | |

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NSRS 2007




F F DENOTES FILL IN WETLAND

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
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RALEIGH, NORTH CAROLINA 27609-3960
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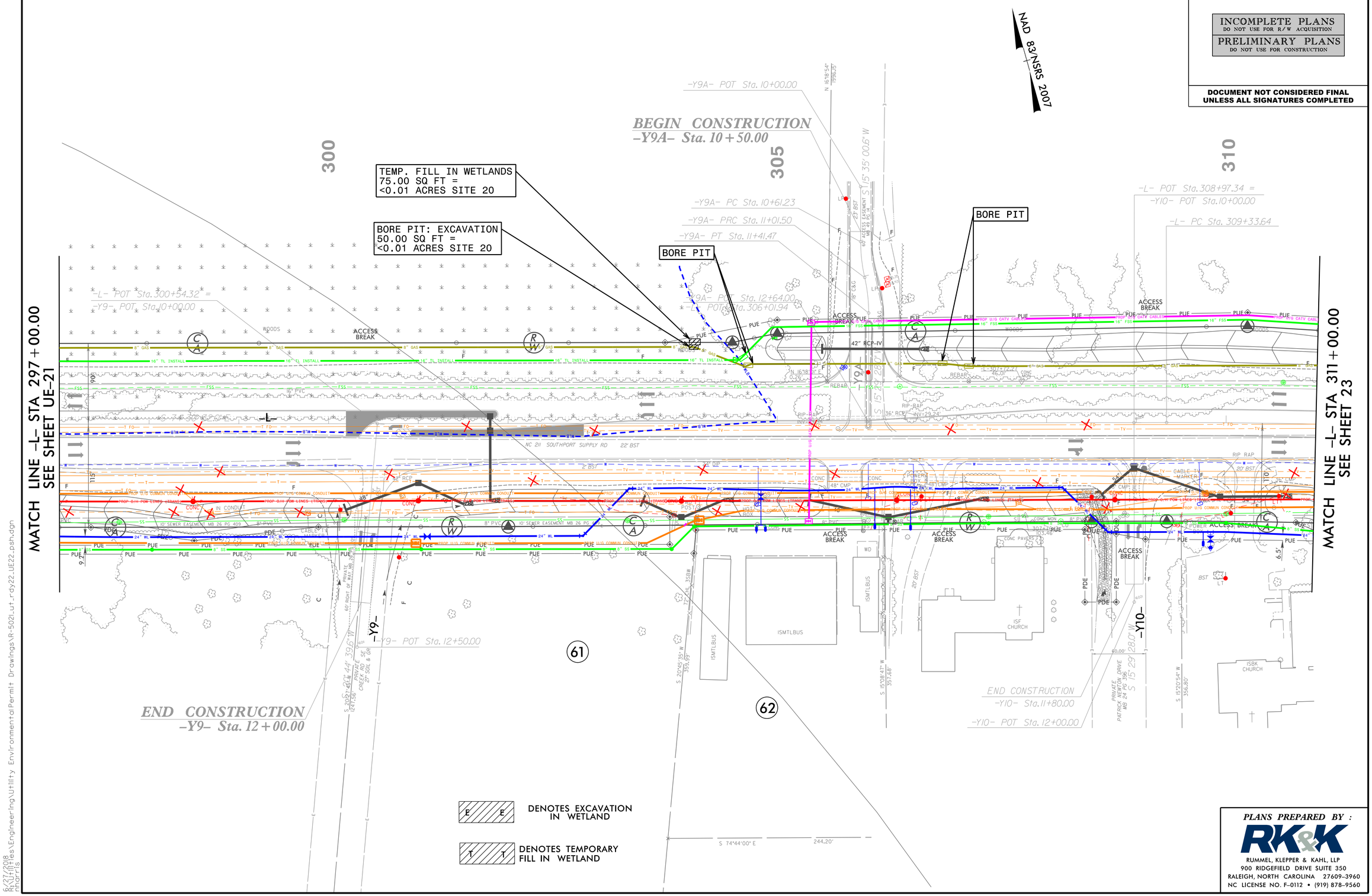
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | UE-22 |
| SHEET 20 OF 22 | |

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

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




E E DENOTES EXCAVATION IN WETLAND

T T DENOTES TEMPORARY FILL IN WETLAND

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
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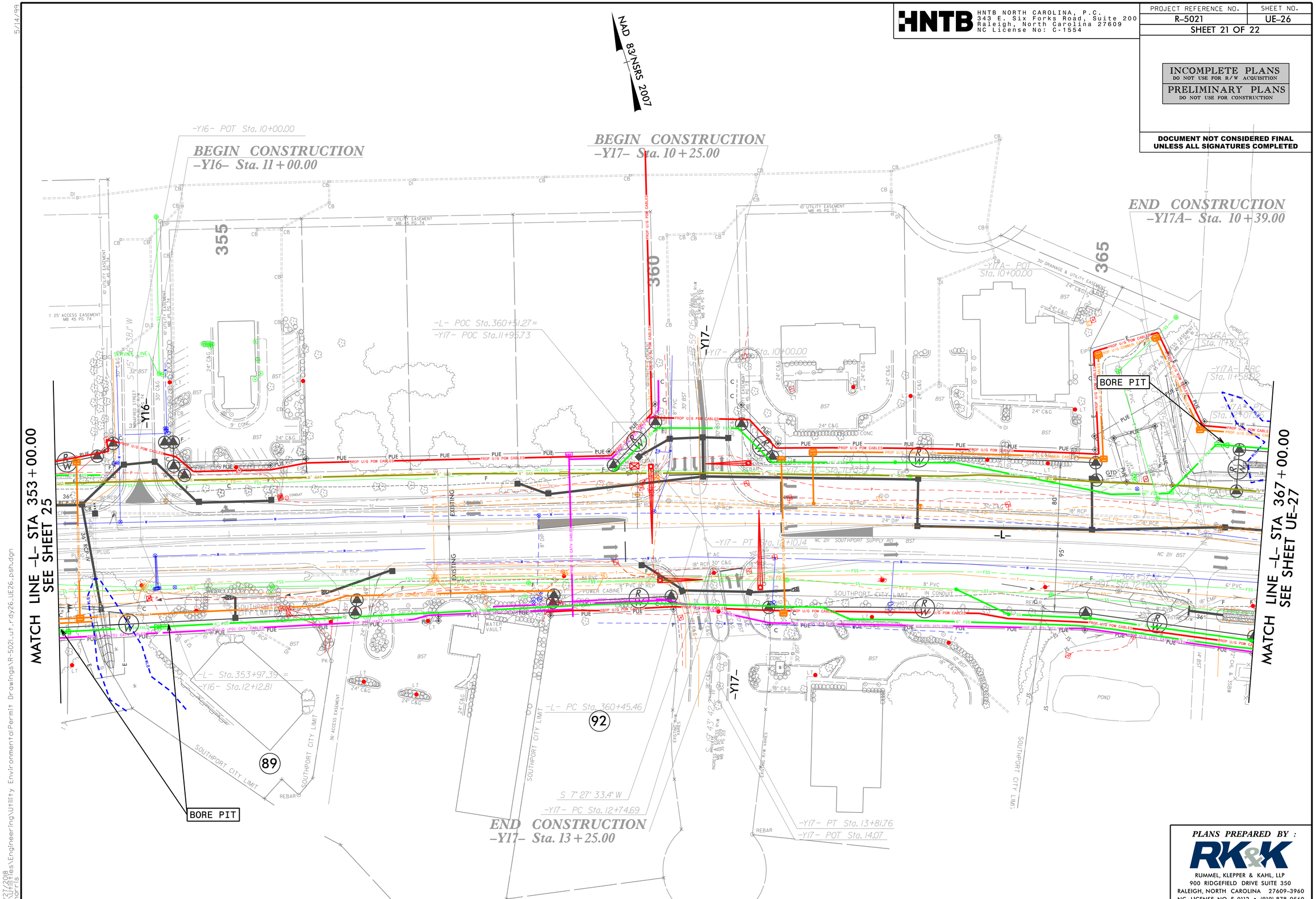
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | UE-26 |
| SHEET 21 OF 22 | |

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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




PLANS PREPARED BY :
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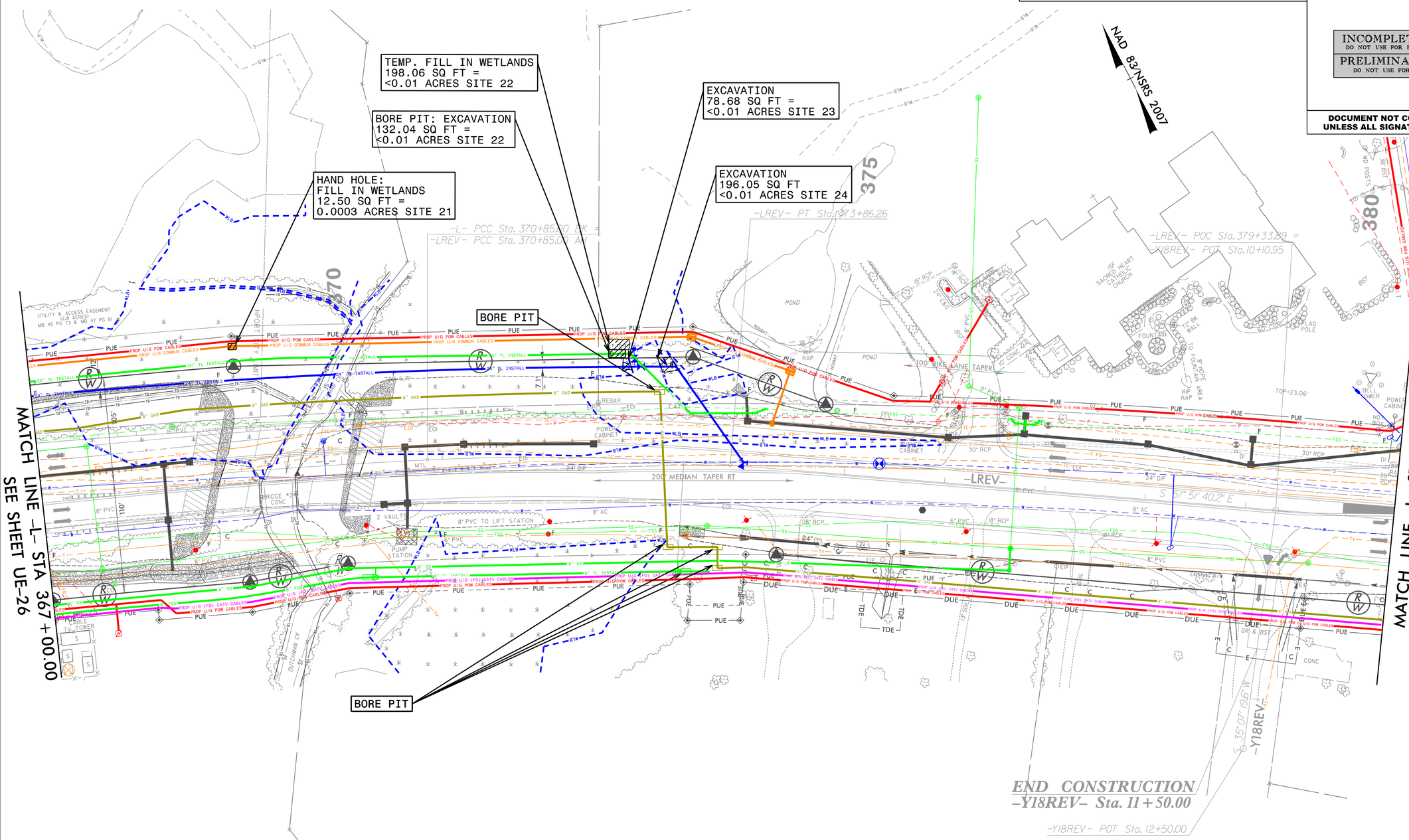
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | UE-27 |
| SHEET 22 OF 22 | |

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

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




E E DENOTES EXCAVATION IN WETLAND

F F DENOTES FILL IN WETLAND

T T DENOTES TEMPORARY FILL IN WETLAND

PLANS PREPARED BY :
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900 RIDGEFIELD DRIVE SUITE 350
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5/14/99

6/27/2018
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nharris

## WETLAND PERMIT IMPACT SUMMARY

| | | | WETLAND IMPACTS | | | | | SURFACE WATER IMPACTS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site No. | Station (From/To) | Structure Size / Type | Permanent Fill In Wetlands (ac) | Temp. Fill In Wetlands (ac) | Excavation in Wetlands (ac) | Mechanized Clearing in Wetlands (ac) | Hand Clearing in Wetlands (ac) | Permanent SW impacts (ac) | Temp. SW impacts (ac) | Existing Channel Impacts Permanent (ft) | Existing Channel Impacts Temp. (ft) | Natural Stream Design (ft) |
| 1 | -L- 66+34.66 RT | Hand Hole | <0.01 | | | | | | | | | |
| | (Sheet UE-05) | | | | | | | | | | | |
| 2 | -L- 85+09.00 to -L- 86+09.00 RT | Staging Area | | 0.07 | | | | | | | | |
| | (Sheet UE-06) | | | | | | | | | | | |
| 3 | -L- 161+45.80 RT | Hand Hole | <0.01 | | | | | | | | | |
| | (Sheet UE-12) | | | | | | | | | | | |
| 4 | -L- 176+61.17 RT | Hand Hole | <0.01 | | | | | | | | | |
| | (Sheet UE-13) | | | | | | | | | | | |
| 5 | -L- 178+50 to -L- 179+50 RT | Water Line | | | 0.03 | | | | | | | |
| | (Sheet UE-13) | | | | | | | | | | | |
| 6 | -L- 192+10.26 RT | Hand Hole | <0.01 | | | | | | | | | |
| | (Sheet UE-14) | | | | | | | | | | | |
| 7 | -L- 201+48.42 RT | Power Pole | <0.01 | | | | | | | | | |
| | (Sheet UE-15) | | | | | | | | | | | |
| 8 | -L- 201+54.98 RT | Hand Hole | <0.01 | | | | | | | | | |
| | (Sheet UE-15) | | | | | | | | | | | |
| 9 | -L- 203+74.13 RT | Hand Hole | <0.01 | | | | | | | | | |
| | (Sheet UE-15) | | | | | | | | | | | |
| 10 | -L- 204+56.36 RT | Power Pole | <0.01 | | | | | | | | | |
| | (Sheet UE-15) | | | | | | | | | | | |
| 11 | -L- 204+69.62 RT | Power Pole | <0.01 | | | | | | | | | |
| | (Sheet UE-15) | | | | | | | | | | | |
| 12 | -L- 224+23.88 RT | Power Pole | <0.01 | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Sheet UE-16) | | | | | | | | | | | |
| 13 | -L- 225+95.94 RT | Hand Hole | <0.01 | | | | | | | | | |
| | (Sheet UE-16) | | | | | | | | | | | |
| 14 | -L- 250+99 to 251+46 RT | Water Line | | | 0.01 | | | | | | | |
| | (Sheet UE-18) | | | | | | | | | | | |
| 15 | -L- 254+74.74 to -L- 254+84.74 LT | PNG Bore Pit | | <0.01 | <0.01 | | | | | | | |
| | (Sheet UE-18) | | | | | | | | | | | |
| 16 | -L- 268+83.69 to -L- 268+93.69 LT | PNG Bore Pit | | <0.01 | <0.01 | | | | | | | |
| | (Sheet UE-19) | | | | | | | | | | | |
| 17 | -L- 272+33.48 RT | Hand Hole | <0.01 | | | | | | | | | |
| | (Sheet UE-20) | | | | | | | | | | | |
| 18 | -L- 274+18.12 RT | Hand Hole | <0.01 | | | | | | | | | |
| | (Sheet UE-20) | | | | | | | | | | | |
| 19 | -L- 293+71.35 LT | Hand Hole | <0.01 | | | | | | | | | |
| | (Sheet UE-21) | | | | | | | | | | | |
| 20 | -L- 304+01.84 to -L- 304+11.84 LT | PNG Bore Pit | | <0.01 | <0.01 | | | | | | | |
| | (Sheet UE-22) | | | | | | | | | | | |
| 21 | -L- 368+96.43 LT | Hand Hole | <0.01 | | | | | | | | | |
| | (Sheet UE-27) | | | | | | | | | | | |
| 22 | -L- 372+57.91 to -L- 372+67.91 LT | PNG Bore Pit | | <0.01 | <0.01 | | | | | | | |
| | (Sheet UE-27) | | | | | | | | | | | |
| 23 | -L- 372+81 to -L- 372+90 LT | Water Line | | | <0.01 | | | | | | | |
| | (Sheet UE-27) | | | | | | | | | | | |
| 24 | -L- 373+14 to -L- 373+36 LT | Water Line | | | <0.01 | | | | | | | |
| | (Sheet UE-27) | | | | | | | | | | | |
| TOTALS: | | | 0.01 | 0.07 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Note : 50 sq. ft. (Each) bore pit excavation = 75 sq. ft. (Each) temporary fill in the wetlands
Total : 200 sq. ft. bore pit excavation = 300 sq. ft. temporary fill in wetlands

Note : 2923 sq. ft. temporary fill in the wetlands from staging area = 0.07 ac

Note : 4 sq. ft. (Each) = 0.0001 ac (Each) permanent impact in the wetlands from pole installation.
Total: 16 sq. ft

Note : 12.5 sq. ft. (Each) = 0.0003 ac (Each) permanent fill in the wetlands from hand hole installation.
Total: 137.5 sq. ft

Note : 2365.73 sq. ft. excavation in wetlands for water line.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
TIP PROJECT (R-5021)

09/08/99

TIP PROJECT: R-5021

CONTRACT: C204123

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols
See Sheet 1C-1 thru 1C-10 For Survey Control Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

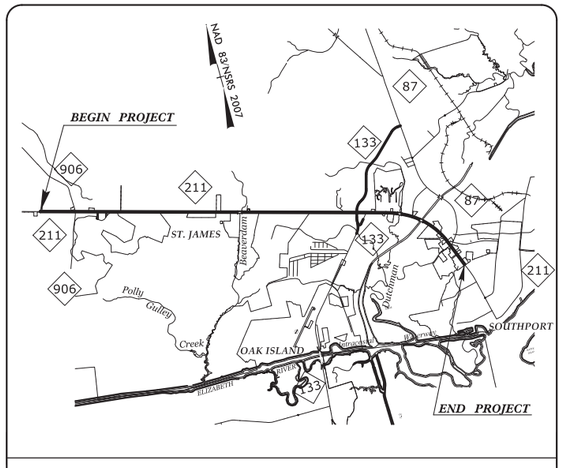
# BRUNSWICK COUNTY

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | R-5021 | 1 | |

| STATE PROJ. NO. | F. A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 41582.1.1 | STP-0211(021) | PE |
| 41582.2.2 | STP-0211(021) | UTILITIES |
| 41582.2.3 | STP-0211(021) | R/W |
| 41582.3.1 | STP-0211(021) | CONSTRUCTION |

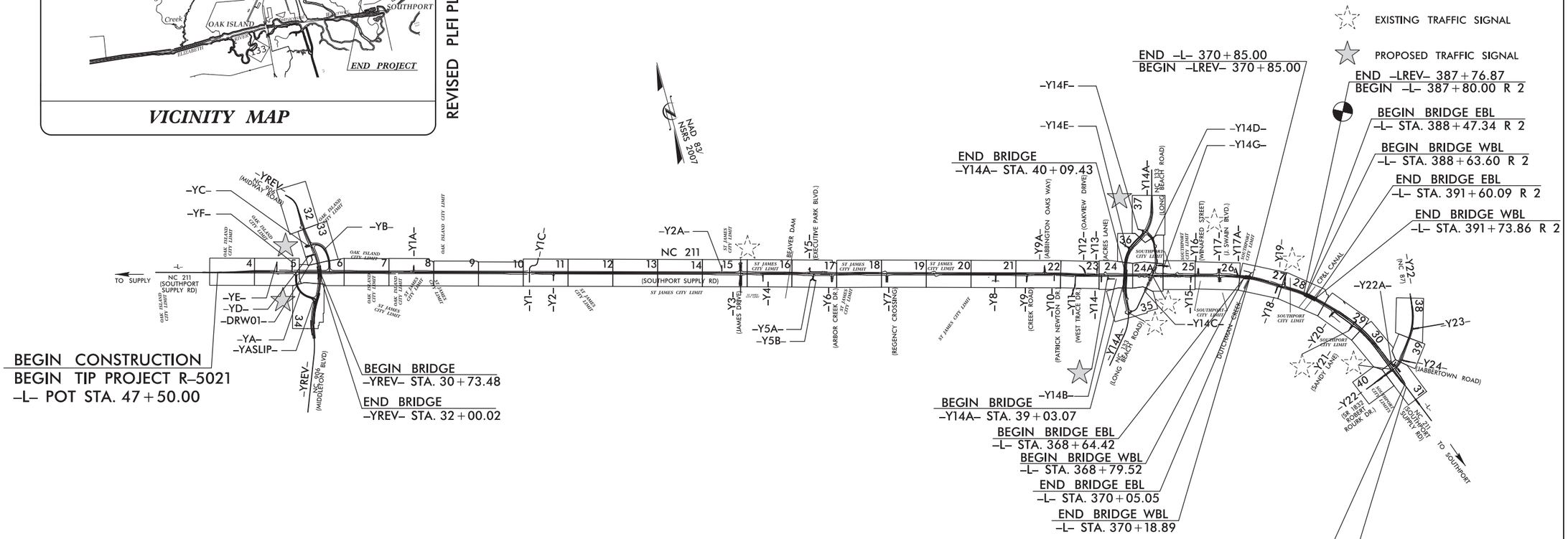
**LOCATION: NC 211 FROM WEST OF NC 906 (MIDWAY ROAD) TO EAST OF NC 87**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERTS & SIGNALS**




VICINITY MAP

REVISED PLFI PLANS SUBMITTAL




NOTES:

1. THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.
2. A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF OAK ISLAND, ST. JAMES AND SOUTHPORT.
3. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III, MODIFIED.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

**GRAPHIC SCALES**

50 25 0 50 100 — PLANS

50 25 0 50 100 — PROFILE (HORIZONTAL)

10 5 0 10 20 — PROFILE (VERTICAL)

**DESIGN DATA**

ADT 2018 = 28,000
ADT 2038 = 44,000
K = 8 %
D = 55 %
T = 6 % *
V = 40-60 MPH
* (TTST 2% + DUAL 4%)
FUNC CLASS =
RURAL MAJOR COLLECTOR
REGIONAL TIER

**PROJECT LENGTH**

LENGTH OF ROADWAY T.I.P. PROJECT R-5021 = 7.176 MILES
LENGTH OF STRUCTURES T.I.P. PROJECT R-5021 = 0.086 MILES
TOTAL LENGTH OF T.I.P. PROJECT R-5021 = 7.262 MILES
ALL LENGTH BASED ON -L- CENTERLINE
STRUCTURES LENGTH BASED ON EBL

Prepared In the Office of:
**HNTB NORTH CAROLINA, P.C.**
343 E. Six Forks Road, Raleigh NC, 27609

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 28, 2016

LETTING DATE:
DECEMBER 18, 2018

DOUGLAS M. WHEATLEY, PE
PROJECT ENGINEER

ANDREW HALL, EI
PROJECT DESIGN ENGINEER

MICHAEL BASS
NCDOT ROADWAY PROJECT ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

08-JUN-2018 11:23
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HNTB

12/2/2016

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 1B |

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

*Note: Not to Scale* **S.U.E. = Subsurface Utility Engineering*

## BOUNDARIES AND PROPERTY:

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

## BUILDINGS AND OTHER CULTURE:

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

## HYDROLOGY:

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

## RAILROADS:

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

## RIGHT OF WAY & PROJECT CONTROL:

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

## ROADS AND RELATED FEATURES:

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

## VEGETATION:

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

## EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

## UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

6/2/99

## PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

| | |
|---|---|
| C1 | PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. |
| C2 | PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS. |
| C3 | PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.5″ IN DEPTH OR GREATER THAN 2″ IN DEPTH. |
| C4 | PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. |
| C5 | PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS. |
| C6 | PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.5″ IN DEPTH OR GREATER THAN 2″ IN DEPTH. |
| D1 | PROP. APPROX. 2.5″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD. |
| D2 | PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. |
| D3 | PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2.5″ IN DEPTH OR GREATER THAN 4″ IN DEPTH. |
| E1 | PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. |
| E2 | PROP. APPROX. 4.5″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD. |
| E3 | PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3″(*) IN DEPTH OR GREATER THAN 5.5″ IN DEPTH. (*)NOTE: FOR B25.0C PLACED ON UNSTABLIZED SUBGRADE, MINIMUM LIFT THICKNESS IS 4″. |
| J1 | PROP. 6″ AGGREGATE BASE COURSE |
| J2 | PROP. 8″ AGGREGATE BASE COURSE |
| J3 | VARIABLE DEPTH ABC |
| K | PROP. 5″ CLASS IV AGGREGATE STABILIZATION |
| P | PRIME COAT, 0.35 GAL/SY |
| R1 | 2′-6″ CONCRETE CURB AND GUTTER. |
| R2 | 2′-9″ CONCRETE CURB AND GUTTER. |
| R3 | 1′-6″ CONCRETE CURB AND GUTTER. (STD MOUNTABLE) |
| R4 | 5″ MONOLITHIC CONCRETE ISLAND |
| R5 | SHOULDER BERM GUTTER |
| R6 | EXPRESSWAY GUTTER |
| R7 | 8″x18″ CURB |
| R8 | 1′-6″ CONCRETE CURB AND GUTTER. (SP 1′PAN-6″GUTTER) |
| S1 | 4″ CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT |
| W1 | VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL SHOWING METHOD OF WEDGING No. 1) |
| W2 | VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL SHOWING METHOD OF WEDGING No. 2) |

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

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NC License No: C-1554

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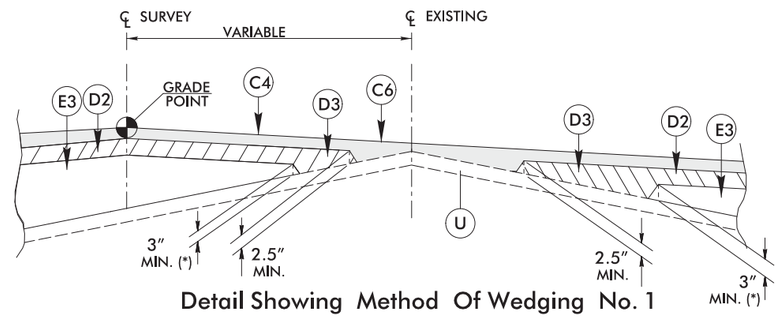
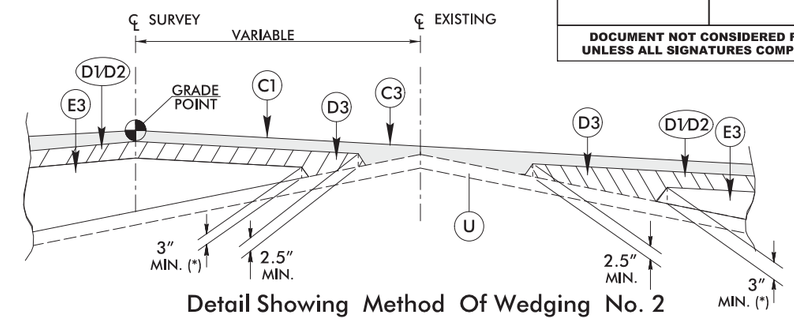
|---|---|
| R-5021 | 2A-1 |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

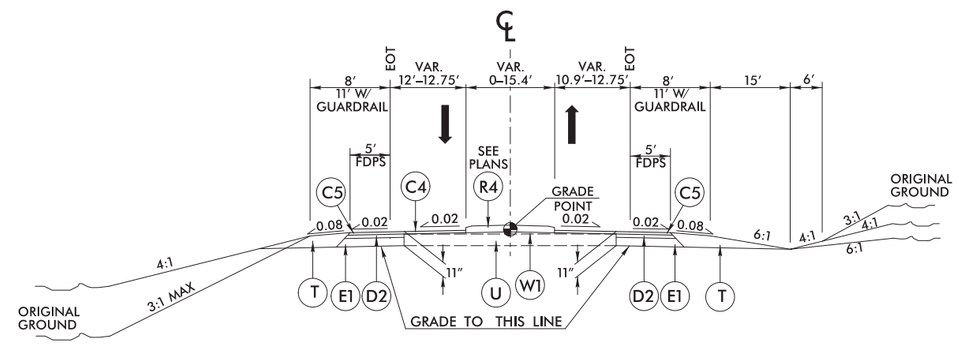
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**




Detail Showing Method Of Wedging No. 1




Detail Showing Method Of Wedging No. 2

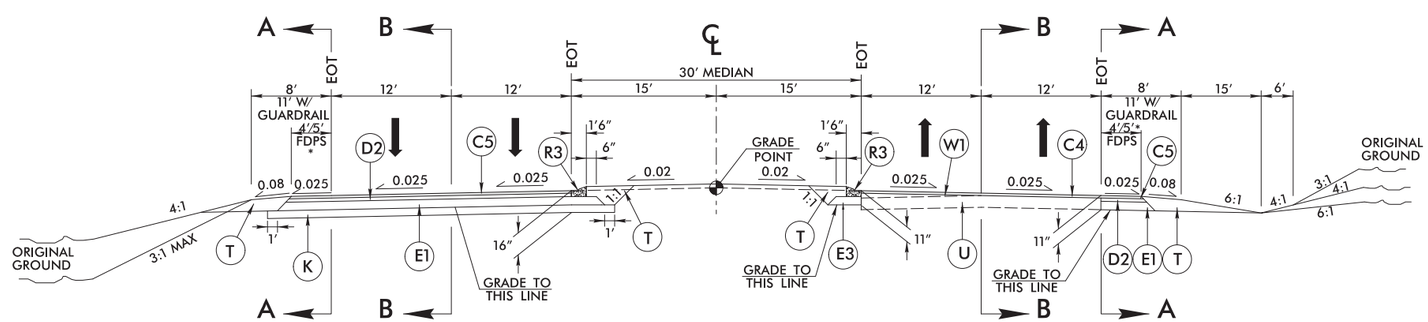



## TYPICAL SECTION NO. 1

–L– STA. 47+50.00 TO STA. 53+00.00

TRANSITION TYPICAL SECTION NO. 1 TO TYPICAL SECTION NO. 3

–L– STA. 53+00.00 TO STA. 59+00.00




## TYPICAL SECTION NO. 2

–L– STA. 53+00.00 TO 54+50.00
–L– STA. 318+50.00 TO STA. 322+85.00

*NOTE: USE 5′ FULL DEPTH PAVED SHOULDERS FROM –L– STA 47+50.00 TO STA 300+54.32

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## PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

| | |
|---|---|
| C1 | PROP. APPROX. 1.5" ACSC, TYPE S9.5B |
| C2 | PROP. APPROX. 3" ACSC, TYPE S9.5B |
| C3 | PROP. VAR. DEPTH ACSC, TYPE S9.5B |
| C4 | PROP. APPROX. 1.5" ACSC, TYPE S9.5C |
| C5 | PROP. APPROX. 3" ACSC, TYPE S9.5C |
| C6 | PROP. VAR. DEPTH ACSC, TYPE S9.5C |
| D1 | PROP. APPROX. 2.5" ACIC, TYPE I19.0C |
| D2 | PROP. APPROX. 4" ACIC, TYPE I19.0C |
| D3 | PROP. VAR. DEPTH ACIC,TYPE I19.0C |
| E1 | PROP. APPROX. 4" ACBC, TYPE B25.0C |
| E2 | PROP. APPROX. 4.5" ACBC, TYPE B25.0C |
| E3 | PROP. VAR. DEPTH ACBC, TYPE B25.0C |
| J1 | PROP. 6" ABC |
| J2 | PROP. 8" ABC |
| J3 | VARIABLE DEPTH ABC |
| K | PROP. 5" CLASS IV AGGREGATE STABILIZATION |
| P | PRIME COAT |
| R1 | 2'-6" CONCRETE CURB AND GUTTER. |
| R2 | 2'-9" CONCRETE CURB AND GUTTER. |
| R3 | 1'-6" CONCRETE CURB AND GUTTER. (STD MOUNTABLE) |
| R4 | 5" MONOLITHIC CONCRETE ISLAND |
| R5 | SHOULDER BERM GUTTER |
| R6 | EXPRESSWAY GUTTER |
| R7 | 8"x18" CURB |
| R8 | 1'-6" CONCRETE CURB AND GUTTER. (SP 1'PAN-6"GUTTER) |
| S1 | 4" CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT. |
| W1 | WEDGING METHOD NO. 1 - SEE SHEET 2A-1 |
| W2 | WEDGING METHOD NO. 2 - SEE SHEET 2A-1 |

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

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|---|---|
| R-5021 | 2A-2 |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

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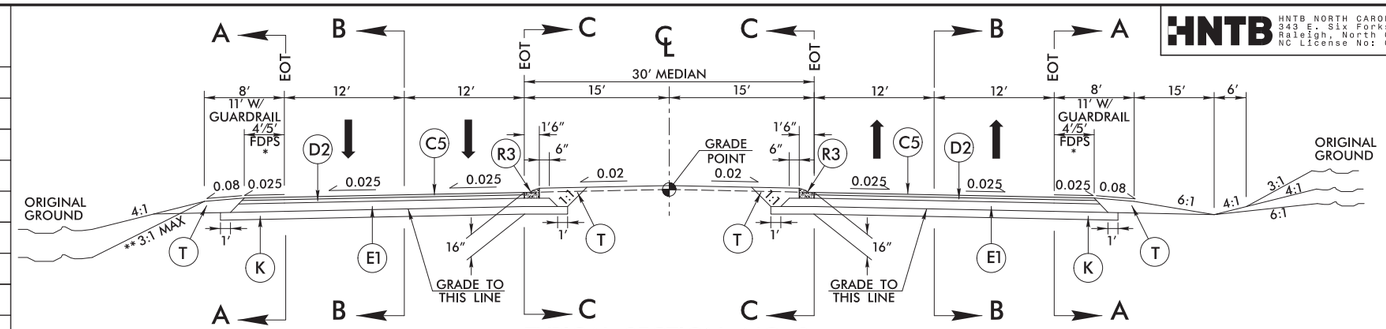
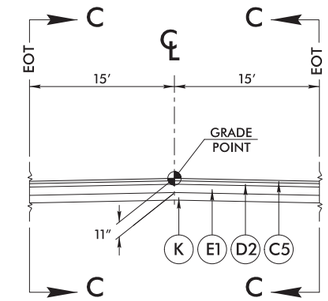



## TYPICAL SECTION NO. 3

-L- STA. 54+50.00 TO STA. 63+86.05
-L- STA. 68+55.00 TO STA. 71+75.00
-L- STA. 72+32.00 TO STA. 78+82.50
-L- STA. 79+82.50 TO STA. 100+84.25
-L- STA. 109+15.00 TO STA. 143+10.70
-L- STA. 146+79.35 TO STA. 209+13.67
-L- STA. 217+15.00 TO STA. 230+21.52
-L- STA. 235+93.06 TO STA. 239+05.00
-L- STA. 241+51.50 TO STA. 254+13.96
-L- STA. 258+69.00 TO STA. 269+47.04
-L- STA. 274+02.09 TO STA. 300+19.32
-L- STA. 302+84.32 TO STA. 318+50.00

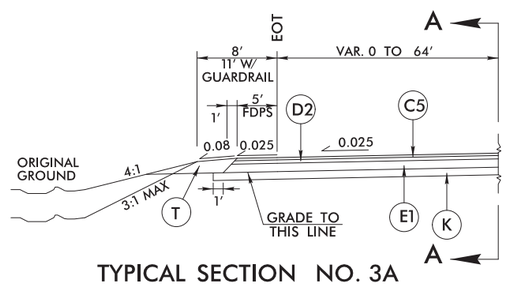
TRANSITION 5' FULL DEPTH PAVED SHOULDERS TO 4' FULL DEPTH PAVED SHOULDERS FROM -L- STA. 300+54.32 TO STA. 300+94.32. CONTINUE 4' FULL DEPTH PAVED SHOULDERS FROM -L- STA. 300+94.32 TO -L- STA. 399+33.24 R 2




## TYPICAL SECTION NO. 3D
UNDIVIDED MEDIAN LOCATIONS

USE TYPICAL SECTION NO. 3D IN CONJUNCTION WITH TYPICAL SECTION NO. 2, 3 & 4

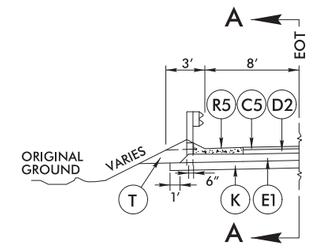
-L- STA. 144+10.68 TO STA. 145+59.48
-L- STA. 210+13.64 TO STA. 211+59.10
-L- STA. 338+30.00 TO STA. 340+85.00
-L- STA. 359+60.70 TO STA. 361+42.69
-L- STA. 380+96.94 TO STA. 381+89.54
-L- STA. 405+24.79 R 2 TO STA. 406+70.21 R 2
-L- STA. 424+22.24 R 2 TO STA 425+74.65 R 2




## TYPICAL SECTION NO. 3A
U-TURN BULB LOCATIONS

USE TYPICAL SECTION NO. 3A IN CONJUNCTION WITH TYPICAL SECTION NO. 2 & 3

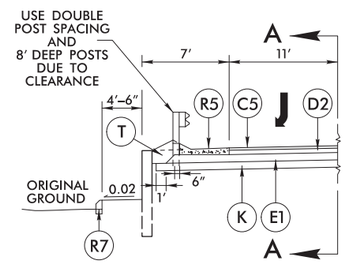
SEE PLANS FOR LOCATIONS




## TYPICAL SECTION NO. 3B
SHOULDER BERM GUTTER LOCATIONS

USE TYPICAL SECTION NO. 3B IN CONJUNCTION WITH TYPICAL SECTION NO. 2 & 3

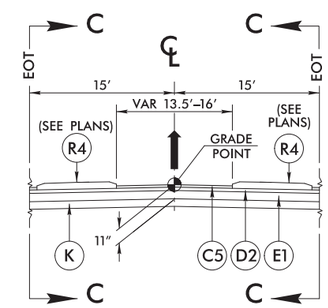
SEE PLANS FOR LOCATIONS




## TYPICAL SECTION NO. 3C
RETAINING WALL LOCATION 1 & 2

USE TYPICAL SECTION NO. 3C IN CONJUNCTION WITH TYPICAL SECTION NO. 3

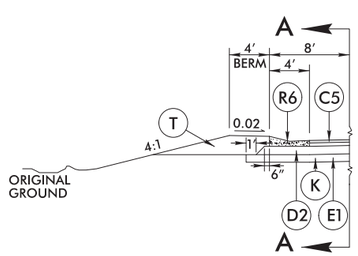
-L- STA. 232+85.84 TO STA. 236+48.52
-L- STA. 237+02.93 TO STA. 237+90.00




## TYPICAL SECTION NO. 3i
MONOLITHIC ISLAND LOCATIONS

USE TYPICAL SECTION NO. 3i IN CONJUNCTION WITH TYPICAL SECTION NO. 2, 3 & 4

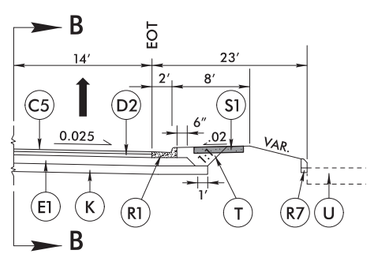
-L- STA. 63+86.05 TO STA. 68+55.00
-L- STA. 71+75.00 TO STA. 72+32.00
-L- STA. 78+82.50 TO STA. 79+82.50
-L- STA. 100+84.25 TO STA. 109+15.00
-L- STA. 143+10.70 TO STA. 144+10.68
-L- STA. 145+59.48 TO STA. 146+79.35
-L- STA. 209+13.67 TO STA. 210+13.64
-L- STA. 211+59.10 TO STA. 217+15.00
-L- STA. 230+21.56 TO STA. 235+93.06
-L- STA. 239+05.00 TO STA. 241+51.50
-L- STA. 254+14.00 TO STA. 258+69.00
-L- STA. 269+47.04 TO STA. 274+02.09
-L- STA. 300+19.32 TO STA. 302+84.32
-L- STA. 322+85.00 TO STA. 338+30.00
-L- STA. 340+85.00 TO STA. 349+83.39
-L- STA. 358+58.75 TO STA. 359+60.70
-L- STA. 361+42.69 TO STA. 362+48.21
-L- STA. 379+96.97 TO STA. 380+96.94
-L- STA. 403+83.44 R 2 TO STA. 405+24.79 R 2
-L- STA. 406+70.21 R 2 TO STA. 407+89.93 R 2
-L- STA. 416+87.50 R 2 TO STA. 424+22.24 R 2
-L- STA 425+74.65 R 2 TO STA. 428+37.02 R 2




## TYPICAL SECTION NO. 3E
EXPRESSWAY GUTTER LOCATIONS

USE TYPICAL SECTION NO. 3E IN CONJUNCTION WITH TYPICAL SECTION NO. 2 & 3

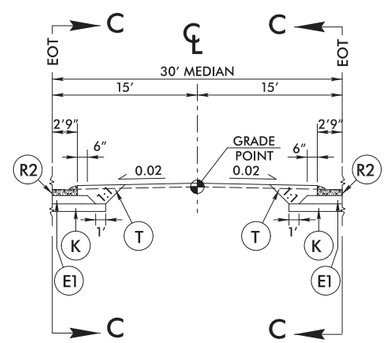
-L- STA. 90+55.53 TO STA. 94+05.63




## TYPICAL SECTION NO. 3F
CHANNELIZATION WITH 8"x18" CURB

USE TYPICAL SECTION NO. 3F IN CONJUNCTION WITH TYPICAL SECTION NO. 2 & 3

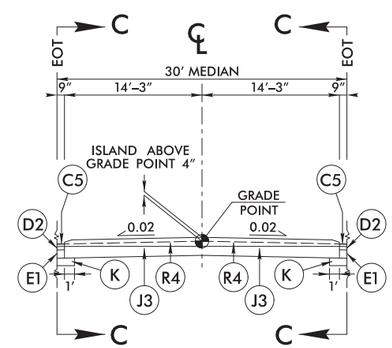
SEE PLANS FOR LOCATIONS




## TYPICAL SECTION NO. 3G
2'-9" CONCRETE MEDIAN CURBING

USE TYPICAL SECTION NO. 3G IN CONJUNCTION WITH TYPICAL SECTION NO. 3

-L- STA. 349+83.39 TO STA. 358+58.75
-L- STA. 362+48.21 TO BEG BRIDGE STA. 368+72.00
-L- END BRIDGE STA. 370+12.00 TO STA. 379+96.97
-L- STA. 381+89.54 TO BEG BRIDGE STA. 388+55.50 R 2
-L- END BRIDGE STA. 391+67.00 R 2 TO STA. 399+33.24 R 2




## TYPICAL SECTION NO. 3H
CONCRETE MEDIAN UNDERNEATH MIDWAY BRIDGE

USE TYPICAL SECTION NO. 3H IN CONJUNCTION WITH TYPICAL SECTION NO. 3

-L- STA. 78+82.50 TO STA. 79+82.50

NOTE: SEE PLANS FOR SUPERELEVATIONS, TURN LANES, AUXILIARY LANES, MONOLITHIC ISLANDS, CURB & GUTTER, AND LANE TAPER LOCATIONS.

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## PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

| | |
|---|---|
| C1 | PROP. APPROX. 1.5" ACSC, TYPE S9.5B |
| C2 | PROP. APPROX. 3" ACSC, TYPE S9.5B |
| C3 | PROP. VAR. DEPTH ACSC, TYPE S9.5B |
| C4 | PROP. APPROX. 1.5" ACSC, TYPE S9.5C |
| C5 | PROP. APPROX. 3" ACSC, TYPE S9.5C |
| C6 | PROP. VAR. DEPTH ACSC, TYPE S9.5C |
| D1 | PROP. APPROX. 2.5" ACIC, TYPE I19.0C |
| D2 | PROP. APPROX. 4" ACIC, TYPE I19.0C |
| D3 | PROP. VAR. DEPTH ACIC,TYPE I19.0C |
| E1 | PROP. APPROX. 4" ACBC, TYPE B25.0C |
| E2 | PROP. APPROX. 4.5" ACBC, TYPE B25.0C |
| E3 | PROP. VAR. DEPTH ACBC, TYPE B25.0C |
| J1 | PROP. 6" ABC |
| J2 | PROP. 8" ABC |
| J3 | VARIABLE DEPTH ABC |
| K | PROP. 5" CLASS IV AGGREGATE STABILIZATION |
| P | PRIME COAT |
| R1 | 2'-6" CONCRETE CURB AND GUTTER. |
| R2 | 2'-9" CONCRETE CURB AND GUTTER. |
| R3 | 1'-6" CONCRETE CURB AND GUTTER. (STD MOUNTABLE) |
| R4 | 5" MONOLITHIC CONCRETE ISLAND |
| R5 | SHOULDER BERM GUTTER |
| R6 | EXPRESSWAY GUTTER |
| R7 | 8"x18" CURB |
| R8 | 1'-6" CONCRETE CURB AND GUTTER. (SP 1'PAN-6"GUTTER) |
| S1 | 4" CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT. |
| W1 | WEDGING METHOD NO. 1 - SEE SHEET 2A-1 |
| W2 | WEDGING METHOD NO. 2 - SEE SHEET 2A-1 |

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

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|---|---|
| R-5021 | 2A-3 |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

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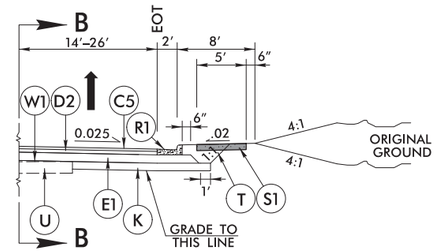
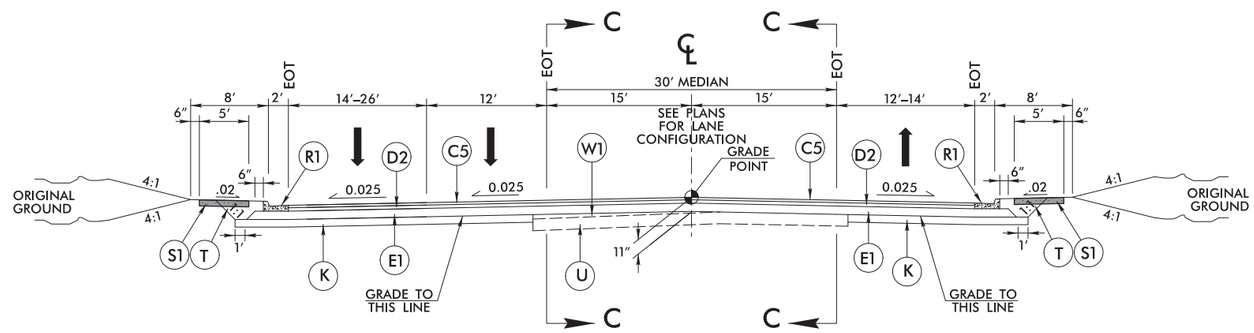



## TYPICAL SECTION NO. 3J

2'-6" CURB AND GUTTER LOCATIONS

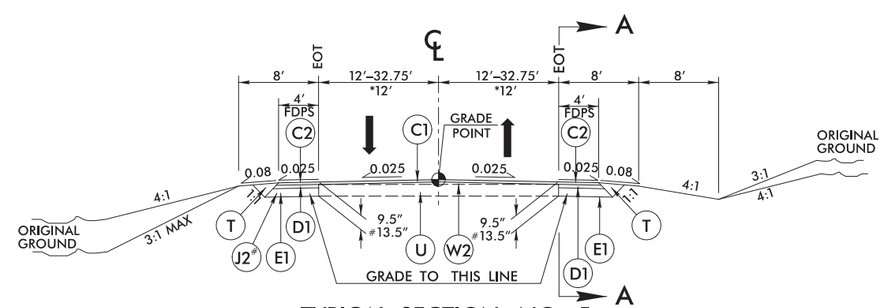
USE TYPICAL SECTION NO. 3J IN CONJUNCTION WITH TYPICAL SECTION NO. 2 & 3

SEE PLANS FOR LOCATIONS




## TYPICAL SECTION NO. 4

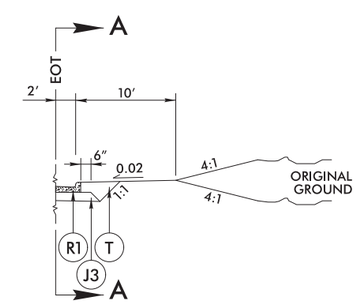
-L- STA. 425+00.00 TO STA. 430+97.42




## TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5

# -YREV- STA. 10+70.00 (EXISTING) TO STA. 11+60.00
-YREV- STA. 11+60.00 TO STA. 15+70.00
* -Y23- STA. 10+24.74 TO STA. 12+25.00




## TYPICAL SECTION NO. 5A

2'-6" CURB AND GUTTER LOCATIONS

USE TYPICAL SECTION NO. 5A IN CONJUNCTION WITH TYPICAL SECTION NO. 5 & 6

-YREV- STA. 14+67.55 TO STA. 18+53.55 RT

NOTE: SEE PLANS FOR SUPERELEVATIONS, TURN LANES, AUXILIARY LANES, MONOLITHIC ISLANDS, CURB & GUTTER, AND LANE TAPER LOCATIONS.

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## PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

| | |
|---|---|
| C1 | PROP. APPROX. 1.5" ACSC, TYPE S9.5B |
| C2 | PROP. APPROX. 3" ACSC, TYPE S9.5B |
| C3 | PROP. VAR. DEPTH ACSC, TYPE S9.5B |
| C4 | PROP. APPROX. 1.5" ACSC, TYPE S9.5C |
| C5 | PROP. APPROX. 3" ACSC, TYPE S9.5C |
| C6 | PROP. VAR. DEPTH ACSC, TYPE S9.5C |
| D1 | PROP. APPROX. 2.5" ACIC, TYPE I19.0C |
| D2 | PROP. APPROX. 4" ACIC, TYPE I19.0C |
| D3 | PROP. VAR. DEPTH ACIC,TYPE I19.0C |
| E1 | PROP. APPROX. 4" ACBC, TYPE B25.0C |
| E2 | PROP. APPROX. 4.5" ACBC, TYPE B25.0C |
| E3 | PROP. VAR. DEPTH ACBC, TYPE B25.0C |
| J1 | PROP. 6" ABC |
| J2 | PROP. 8" ABC |
| J3 | VARIABLE DEPTH ABC |
| K | PROP. 5" CLASS IV AGGREGATE STABILIZATION |
| P | PRIME COAT |
| R1 | 2'-6" CONCRETE CURB AND GUTTER. |
| R2 | 2'-9" CONCRETE CURB AND GUTTER. |
| R3 | 1'-6" CONCRETE CURB AND GUTTER. (STD MOUNTABLE) |
| R4 | 5" MONOLITHIC CONCRETE ISLAND |
| R5 | SHOULDER BERM GUTTER |
| R6 | EXPRESSWAY GUTTER |
| R7 | 8"x18" CURB |
| R8 | 1'-6" CONCRETE CURB AND GUTTER. (SP 1'PAN-6"GUTTER) |
| S1 | 4" CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT. |
| W1 | WEDGING METHOD NO. 1 - SEE SHEET 2A-1 |
| W2 | WEDGING METHOD NO. 2 - SEE SHEET 2A-1 |

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

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Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 2A-4 |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

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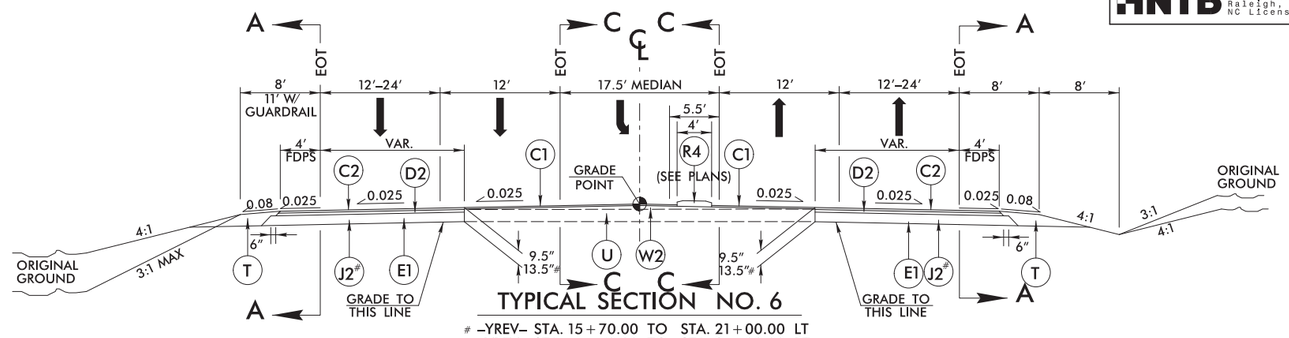
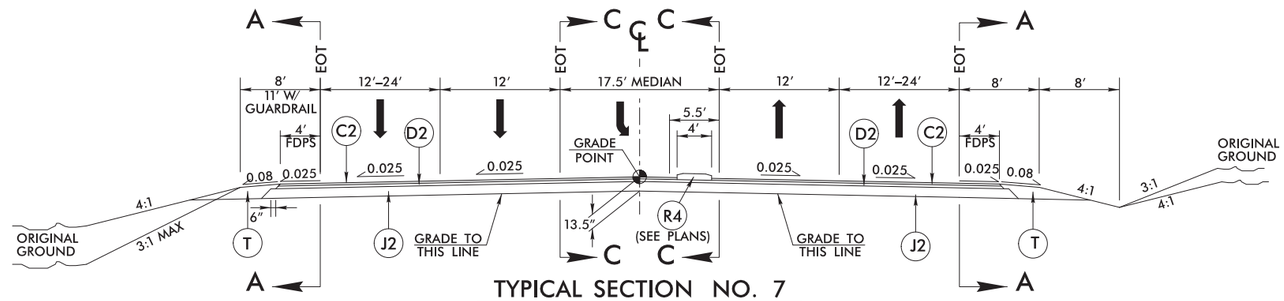


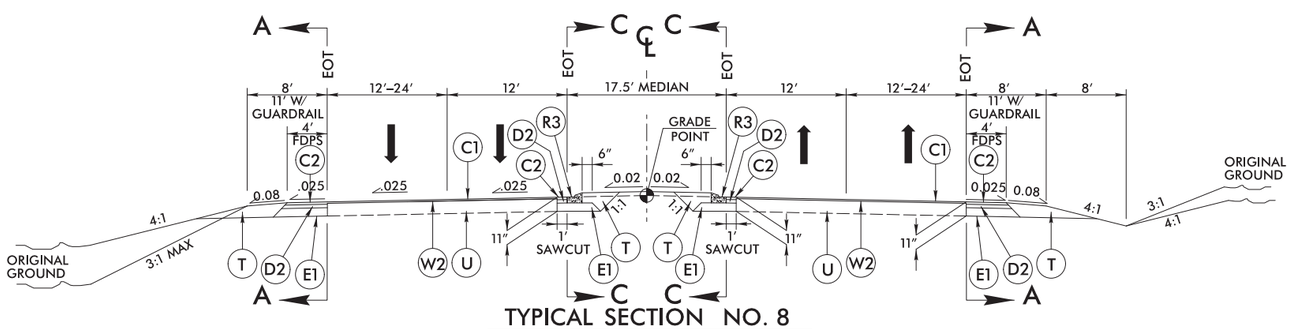

## TYPICAL SECTION NO. 6

# –YREV– STA. 15+70.00 TO STA. 21+00.00 LT
–YREV– STA. 15+70.00 TO STA. 21+00.00 RT



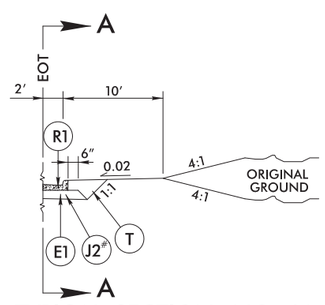

## TYPICAL SECTION NO. 7

–YREV– STA. 21+00.00 TO STA. 30+73.48 (BEGIN BRIDGE)
–YREV– STA. 32+00.00 (END BRIDGE) TO STA. 47+10.11




## TYPICAL SECTION NO. 8

–YREV– STA. 47+10.11 TO STA. 52+25.00

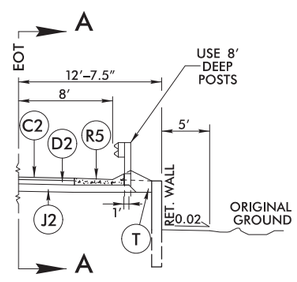



## TYPICAL SECTION NO. 6A

2'-6" CURB AND GUTTER LOCATIONS

USE TYPICAL NO. 6A IN CONJUNCTION WITH TYPICAL SECTION NO. 6 & 7

–YREV– STA. 18+53.55 TO STA. 25+50.00 RT

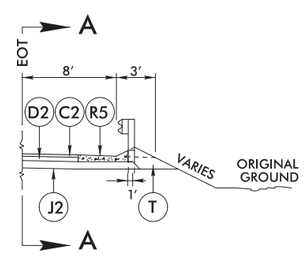



## TYPICAL SECTION NO. 7A

RETAINING WALL LOCATIONS

USE TYPICAL NO. 7A IN CONJUNCTION WITH TYPICAL SECTION NO. 7 & 8

–YREV– STA. 29+65.69 TO STA. 30+36.44 RT
–YREV– STA. 32+22.10 TO STA. 32+99.27 RT
–YREV– STA. 37+75.00 TO STA. 47+20.00 LT

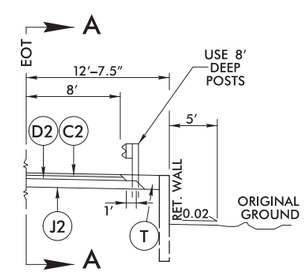



## TYPICAL SECTION NO. 7B

SHOULDER BERM GUTTER LOCATIONS

USE TYPICAL NO. 7B IN CONJUNCTION WITH TYPICAL SECTION NO. 7 & 8

–YREV– STA. 25+50.00 TO STA. 29+65.90 RT
–YREV– STA. 32+99.27 TO STA. 36+50.00 RT

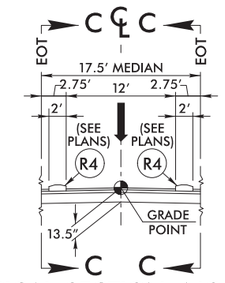



## TYPICAL SECTION NO. 7C

RETAINING WALL LOCATIONS

USE TYPICAL NO. 7C IN CONJUNCTION WITH TYPICAL SECTION NO. 7 & 8

–YREV– STA. 29+80.87 TO STA. 30+53.61 LT
–YREV– STA. 32+26.07 TO STA. 33+45.00 LT

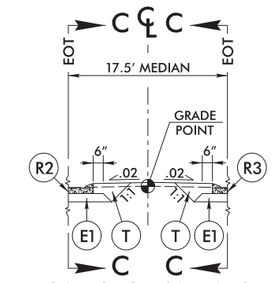



## TYPICAL SECTION NO. 7D

GREEN-T MEDIAN ACCELERATION LANE

USE TYPICAL NO. 7D IN CONJUNCTION WITH TYPICAL SECTION NO. 7

–YREV– STA. 38+42.67 TO STA. 41+41.48




## TYPICAL SECTION NO. 8A

MEDIAN CURB TO MATCH EXISTING

USE TYPICAL NO. 8A IN CONJUNCTION WITH TYPICAL SECTION NO. 8

–YREV– STA. 50+00.30 TO STA. 52+25.00

NOTE: SEE PLANS FOR SUPERELEVATIONS, TURN LANES, AUXILIARY LANES, MONOLITHIC ISLANDS, CURB & GUTTER, AND LANE TAPER LOCATIONS.

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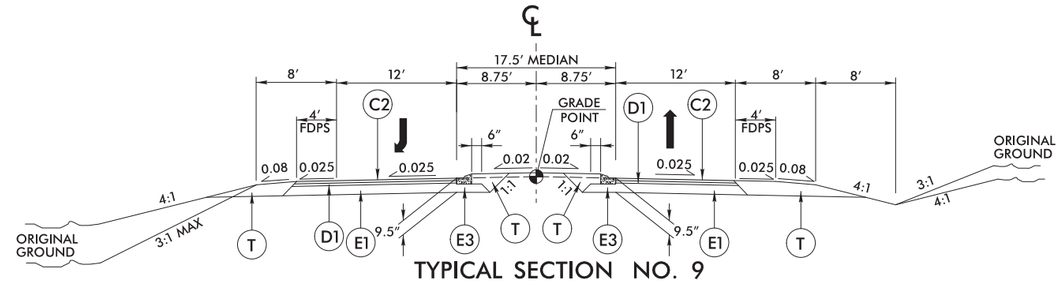
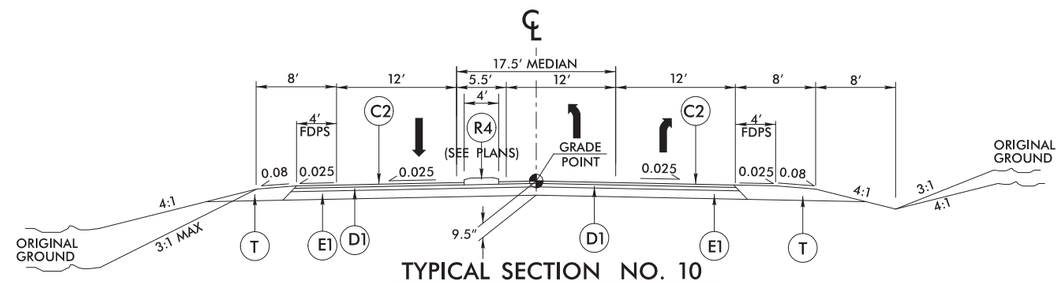
## PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

| | |
|---|---|
| C1 | PROP. APPROX. 1.5" ACSC, TYPE S9.5B |
| C2 | PROP. APPROX. 3" ACSC, TYPE S9.5B |
| C3 | PROP. VAR. DEPTH ACSC, TYPE S9.5B |
| C4 | PROP. APPROX. 1.5" ACSC, TYPE S9.5C |
| C5 | PROP. APPROX. 3" ACSC, TYPE S9.5C |
| C6 | PROP. VAR. DEPTH ACSC, TYPE S9.5C |
| D1 | PROP. APPROX. 2.5" ACIC, TYPE I19.0C |
| D2 | PROP. APPROX. 4" ACIC, TYPE I19.0C |
| D3 | PROP. VAR. DEPTH ACIC,TYPE I19.0C |
| E1 | PROP. APPROX. 4" ACBC, TYPE B25.0C |
| E2 | PROP. APPROX. 4.5" ACBC, TYPE B25.0C |
| E3 | PROP. VAR. DEPTH ACBC, TYPE B25.0C |
| J1 | PROP. 6" ABC |
| J2 | PROP. 8" ABC |
| J3 | VARIABLE DEPTH ABC |
| K | PROP. 5" CLASS IV AGGREGATE STABILIZATION |
| P | PRIME COAT |
| R1 | 2'-6" CONCRETE CURB AND GUTTER. |
| R2 | 2'-9" CONCRETE CURB AND GUTTER. |
| R3 | 1'-6" CONCRETE CURB AND GUTTER. (STD MOUNTABLE) |
| R4 | 5" MONOLITHIC CONCRETE ISLAND |
| R5 | SHOULDER BERM GUTTER |
| R6 | EXPRESSWAY GUTTER |
| R7 | 8"x18" CURB |
| R8 | 1'-6" CONCRETE CURB AND GUTTER. (SP 1'PAN-6"GUTTER) |
| S1 | 4" CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT. |
| W1 | WEDGING METHOD NO. 1 - SEE SHEET 2A-1 |
| W2 | WEDGING METHOD NO. 2 - SEE SHEET 2A-1 |

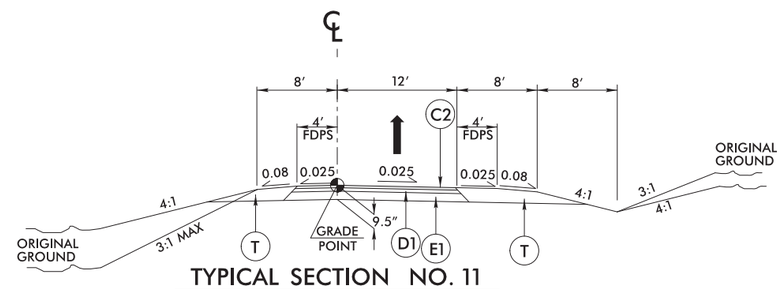
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



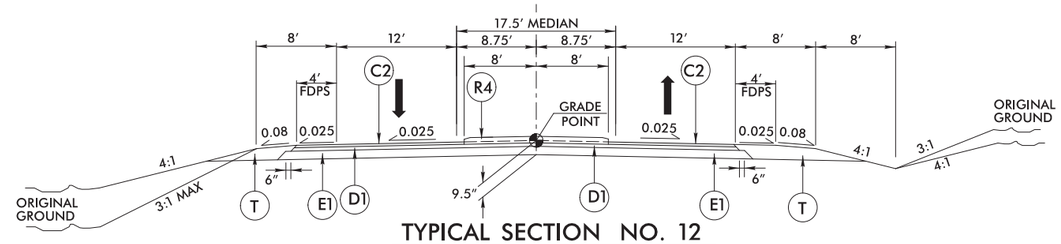

## TYPICAL SECTION NO. 9
–YA– STA. 10+39.00 TO STA. 15+89.95



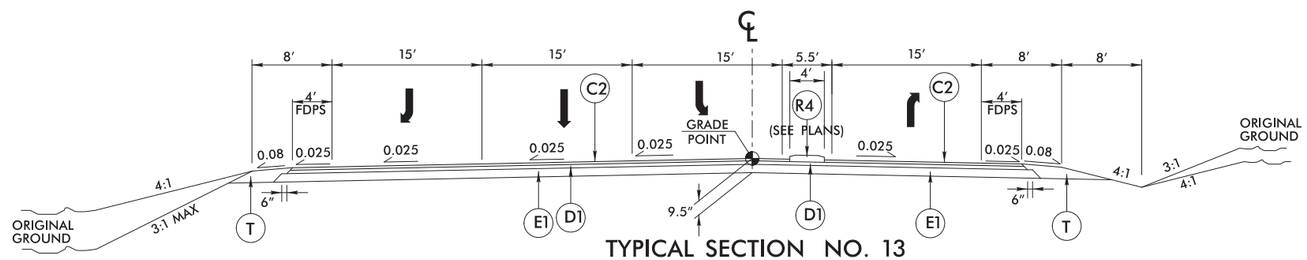

## TYPICAL SECTION NO. 10
–YA– STA. 15+89.95 TO STA. 21+60.25




## TYPICAL SECTION NO. 11
–YASLIP– STA. 10+00.00 TO STA. 12+48.91




## TYPICAL SECTION NO. 12
–YB– STA. 17+24.94 TO STA. 23+61.00




## TYPICAL SECTION NO. 13
–YB– STA. 12+17.29 TO STA. 17+24.94

NOTE: SEE PLANS FOR SUPERELEVATIONS, TURN LANES, AUXILIARY LANES, MONOLITHIC ISLANDS, CURB & GUTTER, AND LANE TAPER LOCATIONS.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|---|---|
| R-5021 | 2A-5 |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

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## PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

| | |
|---|---|
| C1 | PROP. APPROX. 1.5" ACSC, TYPE S9.5B |
| C2 | PROP. APPROX. 3" ACSC, TYPE S9.5B |
| C3 | PROP. VAR. DEPTH ACSC, TYPE S9.5B |
| C4 | PROP. APPROX. 1.5" ACSC, TYPE S9.5C |
| C5 | PROP. APPROX. 3" ACSC, TYPE S9.5C |
| C6 | PROP. VAR. DEPTH ACSC, TYPE S9.5C |
| D1 | PROP. APPROX. 2.5" ACIC, TYPE I19.0C |
| D2 | PROP. APPROX. 4" ACIC, TYPE I19.0C |
| D3 | PROP. VAR. DEPTH ACIC,TYPE I19.0C |
| E1 | PROP. APPROX. 4" ACBC, TYPE B25.0C |
| E2 | PROP. APPROX. 4.5" ACBC, TYPE B25.0C |
| E3 | PROP. VAR. DEPTH ACBC, TYPE B25.0C |
| J1 | PROP. 6" ABC |
| J2 | PROP. 8" ABC |
| J3 | VARIABLE DEPTH ABC |
| K | PROP. 5" CLASS IV AGGREGATE STABILIZATION |
| P | PRIME COAT |
| R1 | 2'-6" CONCRETE CURB AND GUTTER. |
| R2 | 2'-9" CONCRETE CURB AND GUTTER. |
| R3 | 1'-6" CONCRETE CURB AND GUTTER. (STD MOUNTABLE) |
| R4 | 5" MONOLITHIC CONCRETE ISLAND |
| R5 | SHOULDER BERM GUTTER |
| R6 | EXPRESSWAY GUTTER |
| R7 | 8"x18" CURB |
| R8 | 1'-6" CONCRETE CURB AND GUTTER. (SP 1'PAN-6"GUTTER) |
| S1 | 4" CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT. |
| W1 | WEDGING METHOD NO. 1 - SEE SHEET 2A-1 |
| W2 | WEDGING METHOD NO. 2 - SEE SHEET 2A-1 |

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

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|---|---|
| R-5021 | 2A-6 |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

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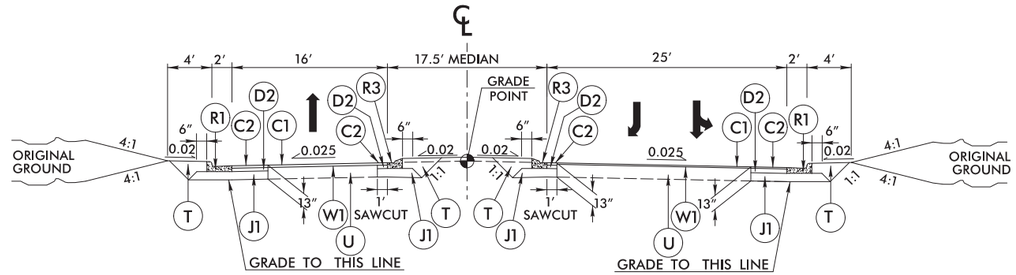
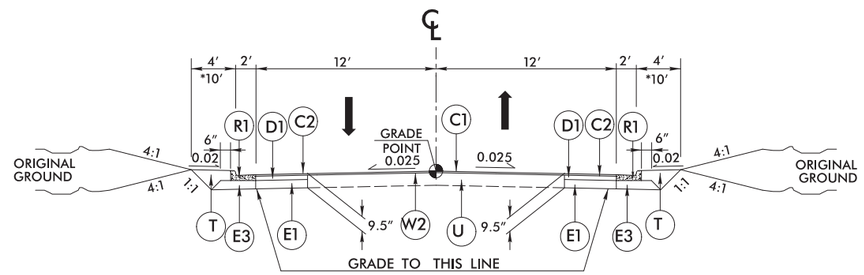


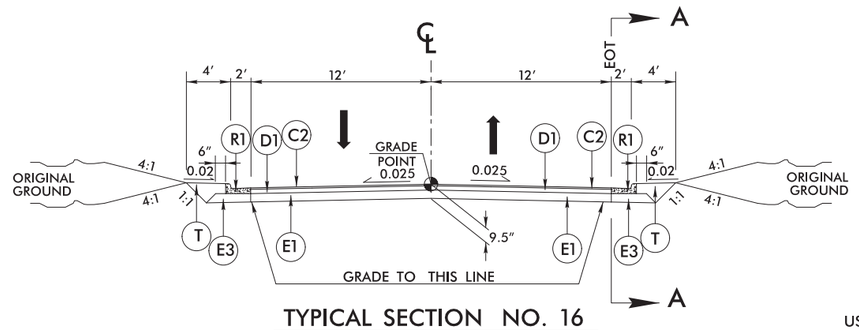

## TYPICAL SECTION NO. 14

–YC– STA. 10+25.00 TO STA. 11+66.44



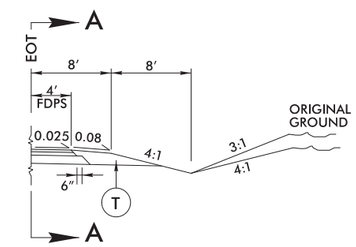

## TYPICAL SECTION NO. 15

–YD– STA. 10+25.00 TO STA. 10+95.00
*–Y14B– STA. 10+39.40 TO STA. 12+39.27
–Y14G– STA. 10+31.98 TO STA. 12+00.00




## TYPICAL SECTION NO. 16

–YD– STA. 10+95.00 TO STA. 12+67.17
–Y14F– STA. 11+38.00 TO STA. 12+00.00
–Y14G– STA. 12+00.00 TO STA. 13+50.00

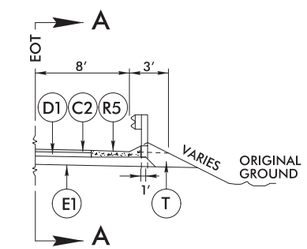



## TYPICAL SECTION NO. 16A

8' SHOULDER LOCATION

USE TYPICAL SECTION NO. 16A IN CONJUNCTION WITH TYPICAL SECTION NO. 16

–YD– STA. 11+75.00 TO STA. 12+20.66 RT

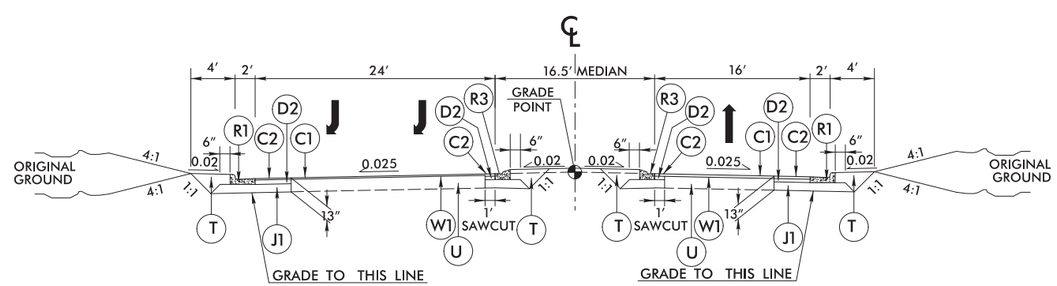



## TYPICAL SECTION NO. 16B

SHOULDER BERM GUTTER LOCATIONS

USE TYPICAL SECTION NO. 16B IN CONJUNCTION WITH TYPICAL SECTION NO. 16

–YD– STA. 12+20.66 TO STA. 12+67.17 RT




## TYPICAL SECTION NO. 17

–YE– STA. 10+75.00 TO STA. 12+50.00

NOTE: SEE PLANS FOR SUPERELEVATIONS, TURN LANES, AUXILIARY LANES, MONOLITHIC ISLANDS, CURB & GUTTER, AND LANE TAPER LOCATIONS.

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## PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

| | |
|---|---|
| C1 | PROP. APPROX. 1.5" ACSC, TYPE S9.5B |
| C2 | PROP. APPROX. 3" ACSC, TYPE S9.5B |
| C3 | PROP. VAR. DEPTH ACSC, TYPE S9.5B |
| C4 | PROP. APPROX. 1.5" ACSC, TYPE S9.5C |
| C5 | PROP. APPROX. 3" ACSC, TYPE S9.5C |
| C6 | PROP. VAR. DEPTH ACSC, TYPE S9.5C |
| D1 | PROP. APPROX. 2.5" ACIC, TYPE I19.0C |
| D2 | PROP. APPROX. 4" ACIC, TYPE I19.0C |
| D3 | PROP. VAR. DEPTH ACIC,TYPE I19.0C |
| E1 | PROP. APPROX. 4" ACBC, TYPE B25.0C |
| E2 | PROP. APPROX. 4.5" ACBC, TYPE B25.0C |
| E3 | PROP. VAR. DEPTH ACBC, TYPE B25.0C |
| J1 | PROP. 6" ABC |
| J2 | PROP. 8" ABC |
| J3 | VARIABLE DEPTH ABC |
| K | PROP. 5" CLASS IV AGGREGATE STABILIZATION |
| P | PRIME COAT |
| R1 | 2'-6" CONCRETE CURB AND GUTTER. |
| R2 | 2'-9" CONCRETE CURB AND GUTTER. |
| R3 | 1'-6" CONCRETE CURB AND GUTTER. (STD MOUNTABLE) |
| R4 | 5" MONOLITHIC CONCRETE ISLAND |
| R5 | SHOULDER BERM GUTTER |
| R6 | EXPRESSWAY GUTTER |
| R7 | 8"x18" CURB |
| R8 | 1'-6" CONCRETE CURB AND GUTTER. (SP 1'PAN-6"GUTTER) |
| S1 | 4" CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT. |
| W1 | WEDGING METHOD NO. 1 - SEE SHEET 2A-1 |
| W2 | WEDGING METHOD NO. 2 - SEE SHEET 2A-1 |

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

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| R-5021 | 2A-7 |
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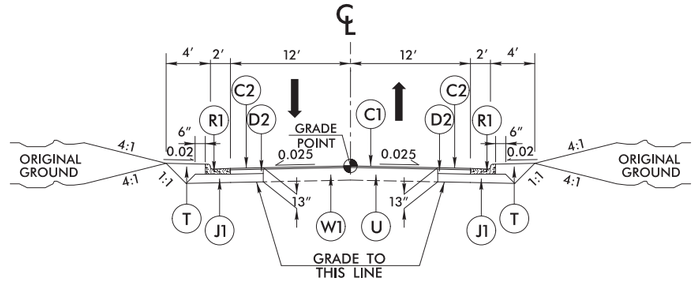
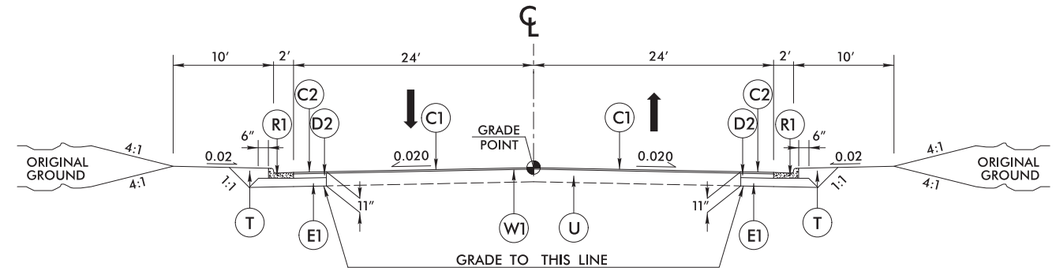
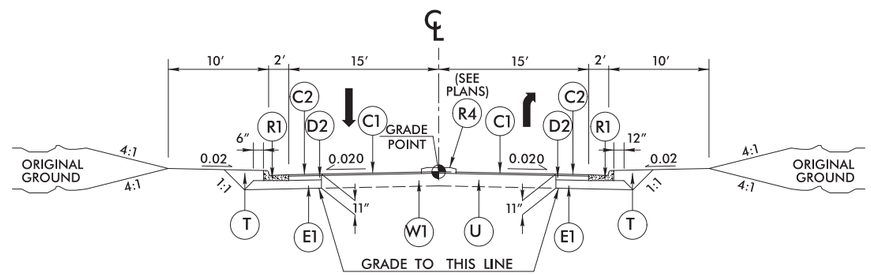


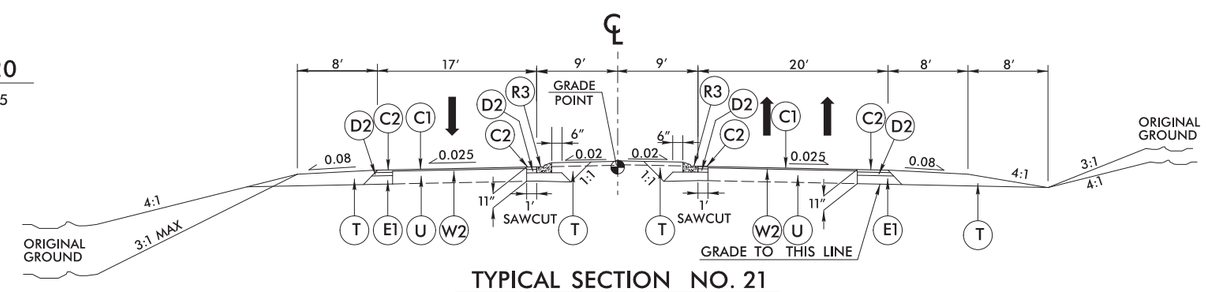

## TYPICAL SECTION NO. 18
–YF– STA. 10+75.00 TO STA. 12+50.00



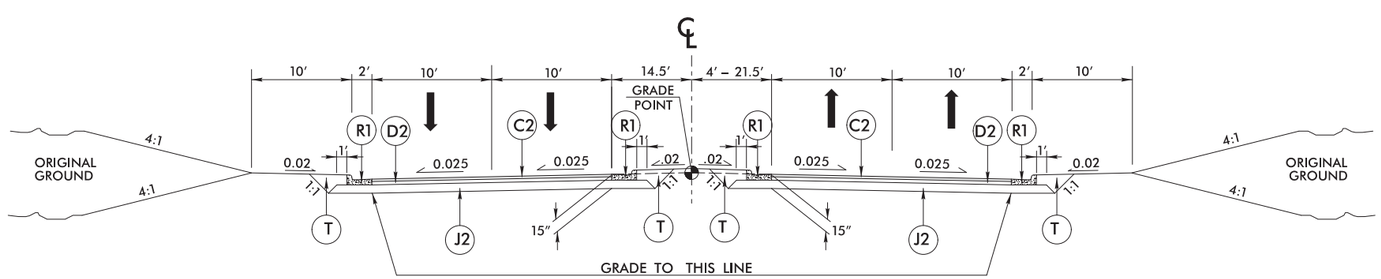

## TYPICAL SECTION NO. 19
–Y1– STA. 10+51.00 TO STA. 11+01.00




## TYPICAL SECTION NO. 20
–Y2– STA. 10+51.00 TO STA. 11+01.65




## TYPICAL SECTION NO. 21
–Y3– STA. 10+00.00 TO STA. 12+87.60




## TYPICAL SECTION NO. 22
–Y3– STA. 13+78.00 TO STA. 16+30.23

NOTE: SEE PLANS FOR SUPERELEVATIONS, TURN LANES, AUXILIARY LANES, MONOLITHIC ISLANDS, CURB & GUTTER, AND LANE TAPER LOCATIONS.

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## PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

| | |
|---|---|
| C1 | PROP. APPROX. 1.5" ACSC, TYPE S9.5B |
| C2 | PROP. APPROX. 3" ACSC, TYPE S9.5B |
| C3 | PROP. VAR. DEPTH ACSC, TYPE S9.5B |
| C4 | PROP. APPROX. 1.5" ACSC, TYPE S9.5C |
| C5 | PROP. APPROX. 3" ACSC, TYPE S9.5C |
| C6 | PROP. VAR. DEPTH ACSC, TYPE S9.5C |
| D1 | PROP. APPROX. 2.5" ACIC, TYPE I19.0C |
| D2 | PROP. APPROX. 4" ACIC, TYPE I19.0C |
| D3 | PROP. VAR. DEPTH ACIC,TYPE I19.0C |
| E1 | PROP. APPROX. 4" ACBC, TYPE B25.0C |
| E2 | PROP. APPROX. 4.5" ACBC, TYPE B25.0C |
| E3 | PROP. VAR. DEPTH ACBC, TYPE B25.0C |
| J1 | PROP. 6" ABC |
| J2 | PROP. 8" ABC |
| J3 | VARIABLE DEPTH ABC |
| K | PROP. 5" CLASS IV AGGREGATE STABILIZATION |
| P | PRIME COAT |
| R1 | 2'-6" CONCRETE CURB AND GUTTER. |
| R2 | 2'-9" CONCRETE CURB AND GUTTER. |
| R3 | 1'-6" CONCRETE CURB AND GUTTER. (STD MOUNTABLE) |
| R4 | 5" MONOLITHIC CONCRETE ISLAND |
| R5 | SHOULDER BERM GUTTER |
| R6 | EXPRESSWAY GUTTER |
| R7 | 8"x18" CURB |
| R8 | 1'-6" CONCRETE CURB AND GUTTER. (SP 1'PAN-6"GUTTER) |
| S1 | 4" CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT. |
| W1 | WEDGING METHOD NO. 1 - SEE SHEET 2A-1 |
| W2 | WEDGING METHOD NO. 2 - SEE SHEET 2A-1 |

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

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| R-5021 | 2A-8 |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

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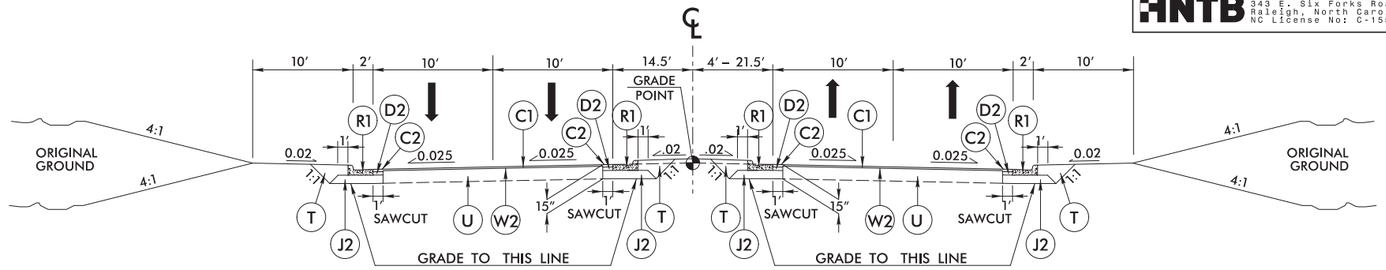
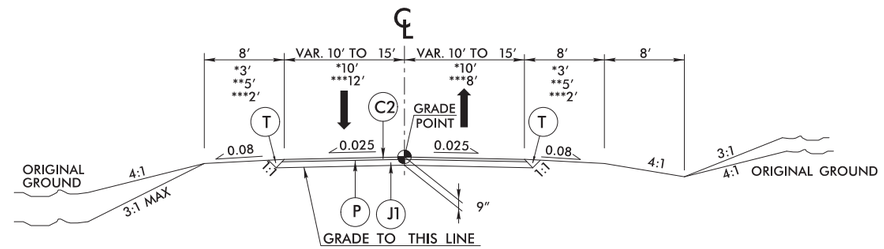


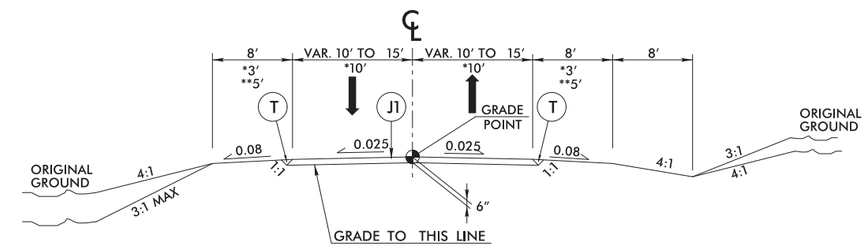

## TYPICAL SECTION NO. 23

–Y3– STA. 16+30.23 TO STA. 17+15.00



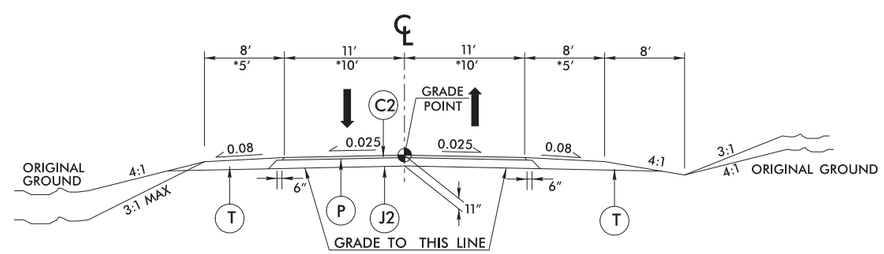

## TYPICAL SECTION NO. 24

*–Y4– STA. 10+51.01 TO STA. 10+85.00
–Y10– STA. 10+39.00 TO STA. 10+75.00
**–Y13– STA. 11+35.00 TO STA. 11+71.05
–Y14– STA. 10+37.10 TO STA. 10+75.00
–Y15– STA. 10+51.00 TO STA. 10+85.00
***–Y17A– STA. 11+20.00 TO STA. 12+20.86



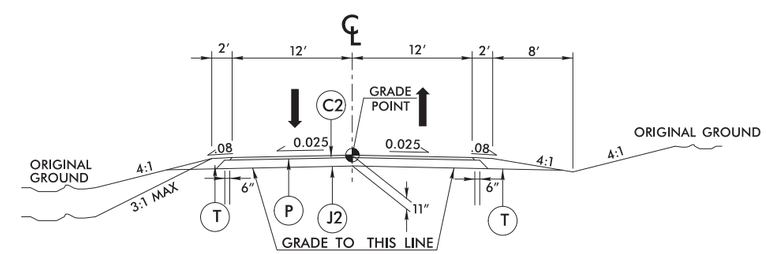

## TYPICAL SECTION NO. 25

*–Y4– STA. 10+85.00 TO STA. 11+25.00
–Y9– STA. 10+51.62 TO STA. 12+00.00
–Y10– STA. 10+75.00 TO STA. 11+80.00
**–Y13– STA. 10+80.00 TO STA. 11+35.00
–Y14– STA. 10+75.00 TO STA. 11+50.00
–Y15– STA. 10+85.00 TO STA. 11+50.00
–Y18REV– STA. 10+75.00 TO STA. 11+50.00



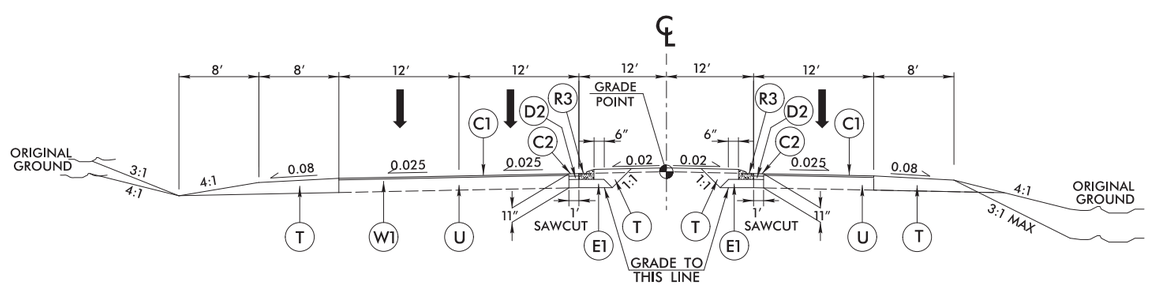

## TYPICAL SECTION NO. 26

–Y5– STA. 10+50.00 TO STA. 11+36.66
*–Y11– STA 10+51.00 TO STA 13+25.00




## TYPICAL SECTION NO. 27

–Y5A– STA. 10+51.00 TO STA. 11+35.00
–Y5B– STA 10+34.08 TO STA 11+17.17




## TYPICAL SECTION NO. 28

–Y6– STA. 10+51.00 TO STA. 11+40.00

NOTE: SEE PLANS FOR SUPERELEVATIONS, TURN LANES, AUXILIARY LANES, MONOLITHIC ISLANDS, CURB & GUTTER, AND LANE TAPER LOCATIONS.

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## PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

| | |
|---|---|
| C1 | PROP. APPROX. 1.5" ACSC, TYPE S9.5B |
| C2 | PROP. APPROX. 3" ACSC, TYPE S9.5B |
| C3 | PROP. VAR. DEPTH ACSC, TYPE S9.5B |
| C4 | PROP. APPROX. 1.5" ACSC, TYPE S9.5C |
| C5 | PROP. APPROX. 3" ACSC, TYPE S9.5C |
| C6 | PROP. VAR. DEPTH ACSC, TYPE S9.5C |
| D1 | PROP. APPROX. 2.5" ACIC, TYPE I19.0C |
| D2 | PROP. APPROX. 4" ACIC, TYPE I19.0C |
| D3 | PROP. VAR. DEPTH ACIC,TYPE I19.0C |
| E1 | PROP. APPROX. 4" ACBC, TYPE B25.0C |
| E2 | PROP. APPROX. 4.5" ACBC, TYPE B25.0C |
| E3 | PROP. VAR. DEPTH ACBC, TYPE B25.0C |
| J1 | PROP. 6" ABC |
| J2 | PROP. 8" ABC |
| J3 | VARIABLE DEPTH ABC |
| K | PROP. 5" CLASS IV AGGREGATE STABILIZATION |
| P | PRIME COAT |
| R1 | 2'-6" CONCRETE CURB AND GUTTER. |
| R2 | 2'-9" CONCRETE CURB AND GUTTER. |
| R3 | 1'-6" CONCRETE CURB AND GUTTER. (STD MOUNTABLE) |
| R4 | 5" MONOLITHIC CONCRETE ISLAND |
| R5 | SHOULDER BERM GUTTER |
| R6 | EXPRESSWAY GUTTER |
| R7 | 8"x18" CURB |
| R8 | 1'-6" CONCRETE CURB AND GUTTER. (SP 1'PAN-6"GUTTER) |
| S1 | 4" CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT. |
| W1 | WEDGING METHOD NO. 1 - SEE SHEET 2A-1 |
| W2 | WEDGING METHOD NO. 2 - SEE SHEET 2A-1 |

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

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NC License No: C-1554

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|---|---|
| R-5021 | 2A-9 |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

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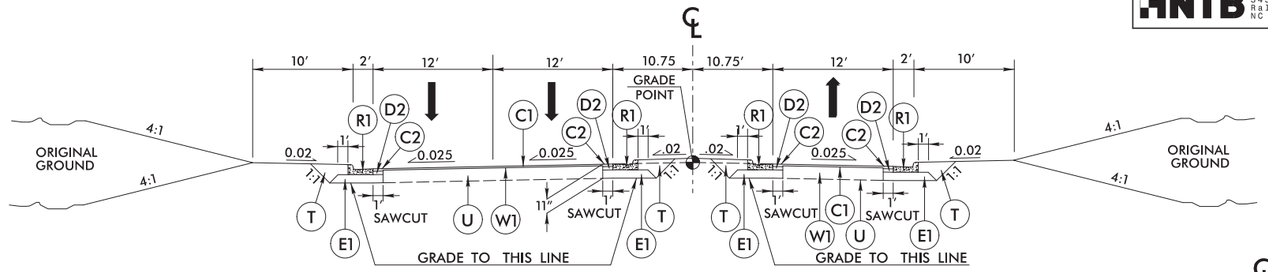
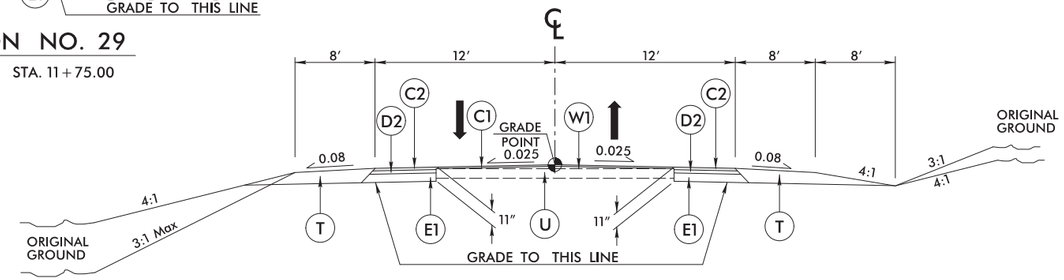


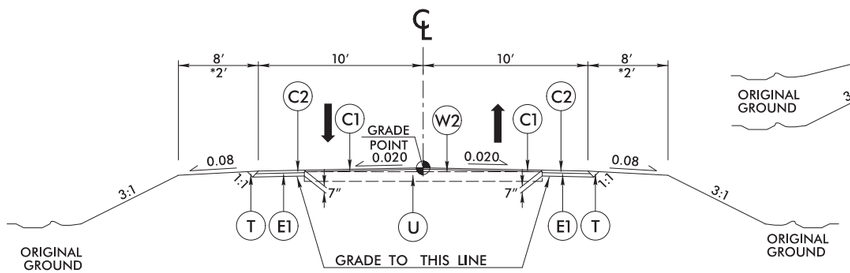

## TYPICAL SECTION NO. 29

–Y7– STA. 10+51.00 TO STA. 11+75.00




## TYPICAL SECTION NO. 31

–Y12– STA. 12+25.00 TO STA. 13+21.07

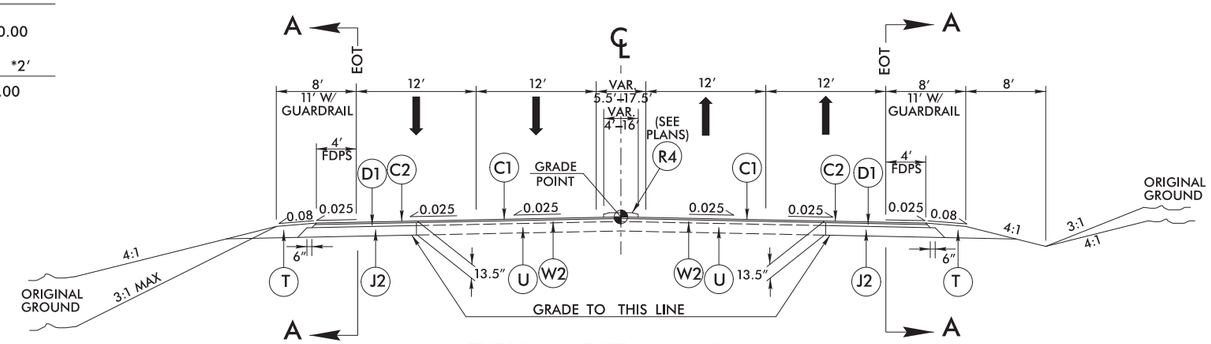



## TYPICAL SECTION NO. 30

–Y8– STA. 10+39.03 TO STA. 11+80.00

TRANSITION SHOULDER FROM 8' TO *2'

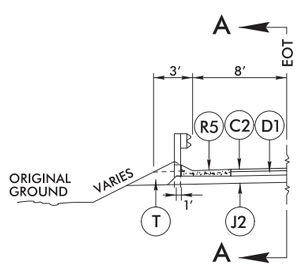
–Y8– STA. 10+70.00 TO STA. 11+20.00




## TYPICAL SECTION NO. 32

–Y14A– STA. 27+20.00 TO STA. 30+75.05 RT
–Y14A– STA. 45+00.00 TO STA. 61+60.00 RT

–Y14A– STA. 27+20.00 TO STA. 29+50.00 LT
–Y14A– STA. 30+82.42 TO STA. 34+50.00 LT
–Y14A– STA. 47+78.73 TO STA. 61+60.00 LT



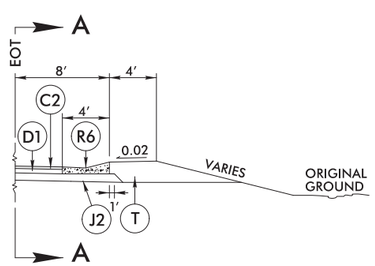

## TYPICAL SECTION NO. 32A

SHOULDER BERM GUTTER LOCATIONS

USE TYPICAL SECTION NO. 32A IN CONJUNCTION WITH TYPICAL SECTION NO. 32

–Y14A– STA. 41+11.17 TO STA. 45+00.00 RT

–Y14A– STA. 29+50.00 TO STA. 30+80.42 LT

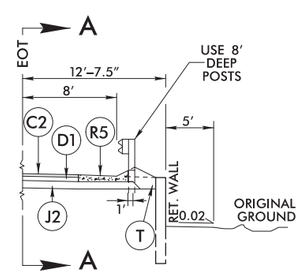



## TYPICAL SECTION NO. 32B

EXPRESSWAY GUTTER LOCATIONS

USE TYPICAL SECTION NO. 32B IN CONJUNCTION WITH TYPICAL SECTION NO. 32

–Y14A– STA. 30+75.05 TO STA. 31+50.02 RT

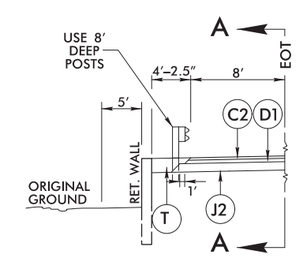



## TYPICAL SECTION NO. 32C

RETAINING WALL WITH SHOULDER BERM GUTTER LOCATIONS

USE TYPICAL SECTION NO. 32C IN CONJUNCTION WITH TYPICAL SECTION NO. 32

–Y14A– STA. 32+50.02 TO STA. 38+79.66 RT
–Y14A– STA. 40+36.06 TO STA. 41+11.17 RT
–Y14A– STA. 36+92.52 TO STA. 38+76.44 LT
–Y14A– STA. 40+32.85 TO STA. 41+45.72 LT




## TYPICAL SECTION NO. 32D

RETAINING WALL LOCATIONS

USE TYPICAL SECTION NO. 32D IN CONJUNCTION WITH TYPICAL SECTION NO. 32

–Y14A– STA. 34+50.00 TO STA. 36+92.52 LT
–Y14A– STA. 41+45.72 TO STA. 47+78.73 LT

NOTE: SEE PLANS FOR SUPERELEVATIONS, TURN LANES, AUXILIARY LANES, MONOLITHIC ISLANDS, CURB & GUTTER, AND LANE TAPER LOCATIONS.

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## PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

| | |
|---|---|
| C1 | PROP. APPROX. 1.5" ACSC, TYPE S9.5B |
| C2 | PROP. APPROX. 3" ACSC, TYPE S9.5B |
| C3 | PROP. VAR. DEPTH ACSC, TYPE S9.5B |
| C4 | PROP. APPROX. 1.5" ACSC, TYPE S9.5C |
| C5 | PROP. APPROX. 3" ACSC, TYPE S9.5C |
| C6 | PROP. VAR. DEPTH ACSC, TYPE S9.5C |
| D1 | PROP. APPROX. 2.5" ACIC, TYPE I19.0C |
| D2 | PROP. APPROX. 4" ACIC, TYPE I19.0C |
| D3 | PROP. VAR. DEPTH ACIC,TYPE I19.0C |
| E1 | PROP. APPROX. 4" ACBC, TYPE B25.0C |
| E2 | PROP. APPROX. 4.5" ACBC, TYPE B25.0C |
| E3 | PROP. VAR. DEPTH ACBC, TYPE B25.0C |
| J1 | PROP. 6" ABC |
| J2 | PROP. 8" ABC |
| J3 | VARIABLE DEPTH ABC |
| K | PROP. 5" CLASS IV AGGREGATE STABILIZATION |
| P | PRIME COAT |
| R1 | 2'-6" CONCRETE CURB AND GUTTER. |
| R2 | 2'-9" CONCRETE CURB AND GUTTER. |
| R3 | 1'-6" CONCRETE CURB AND GUTTER. (STD MOUNTABLE) |
| R4 | 5" MONOLITHIC CONCRETE ISLAND |
| R5 | SHOULDER BERM GUTTER |
| R6 | EXPRESSWAY GUTTER |
| R7 | 8"x18" CURB |
| R8 | 1'-6" CONCRETE CURB AND GUTTER. (SP 1'PAN-6"GUTTER) |
| S1 | 4" CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT. |
| W1 | WEDGING METHOD NO. 1 - SEE SHEET 2A-1 |
| W2 | WEDGING METHOD NO. 2 - SEE SHEET 2A-1 |

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

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| R-5021 | 2A-10 |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

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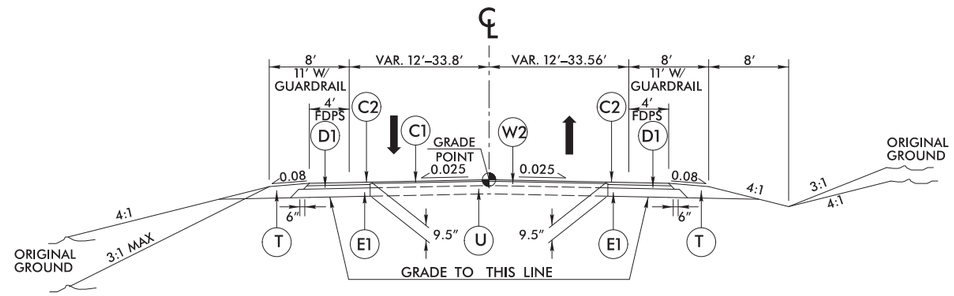
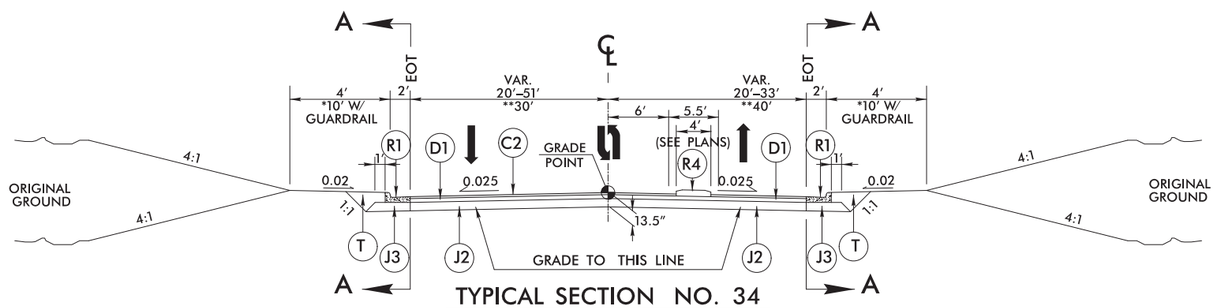



## TYPICAL SECTION NO. 33

-Y14A- STA. 61+60.00 TO STA. 66+50.00

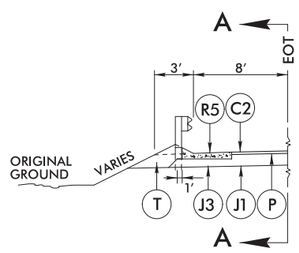



## TYPICAL SECTION NO. 34

-Y14D- STA. 10+32.00 TO STA. 21+52.57 RT
*-Y14D- STA. 21+52.57 TO STA. 24+42.63 RT

-Y14D- STA. 10+32.00 TO STA. 13+62.69 LT
*-Y14D- STA. 13+62.69 TO STA. 16+12.75 LT
-Y14D- STA. 16+12.75 TO STA. 22+43.36 LT
*-Y14D- STA. 22+43.36 TO STA. 24+42.63 LT

**-Y14C- STA. 23+38.64 TO STA. 24+73.85

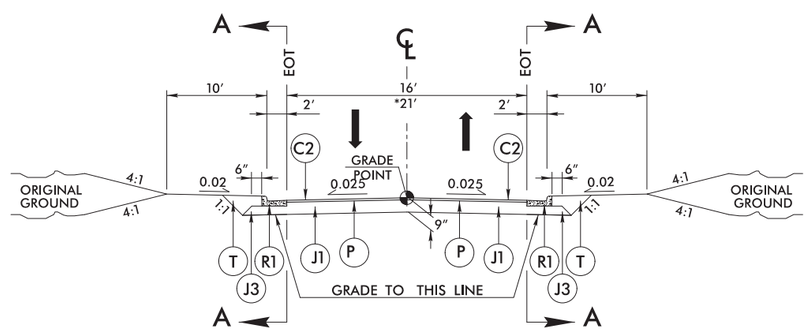



## TYPICAL SECTION NO. 35A

SHOULDER BERM GUTTER LOCATIONS

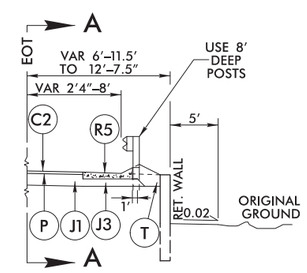
USE TYPICAL SECTION NO. 35A IN CONJUNCTION WITH TYPICAL SECTION NO. 35

-Y14E- STA. 10+81.10 TO STA. 11+50.00 LT




## TYPICAL SECTION NO. 35

-DRW01- STA. 10+12.00 TO STA. 11+40.00
*-Y14E- STA. 9+75.00 TO STA. 10+97.97 RT
*-Y14E- STA. 9+75.00 TO STA. 10+81.10 LT




## TYPICAL SECTION NO. 35B

RETAINING WALL WITH SHOULDER BERM GUTTER LOCATIONS

USE TYPICAL SECTION NO. 35B IN CONJUNCTION WITH TYPICAL SECTION NO. 35

-Y14E- STA. 10+97.97 TO STA. 11+50.00 RT

NOTE: SEE PLANS FOR SUPERELEVATIONS, TURN LANES, AUXILIARY LANES, MONOLITHIC ISLANDS, CURB & GUTTER, AND LANE TAPER LOCATIONS.

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## PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

| | |
|---|---|
| C1 | PROP. APPROX. 1.5" ACSC, TYPE S9.5B |
| C2 | PROP. APPROX. 3" ACSC, TYPE S9.5B |
| C3 | PROP. VAR. DEPTH ACSC, TYPE S9.5B |
| C4 | PROP. APPROX. 1.5" ACSC, TYPE S9.5C |
| C5 | PROP. APPROX. 3" ACSC, TYPE S9.5C |
| C6 | PROP. VAR. DEPTH ACSC, TYPE S9.5C |
| D1 | PROP. APPROX. 2.5" ACIC, TYPE I19.0C |
| D2 | PROP. APPROX. 4" ACIC, TYPE I19.0C |
| D3 | PROP. VAR. DEPTH ACIC,TYPE I19.0C |
| E1 | PROP. APPROX. 4" ACBC, TYPE B25.0C |
| E2 | PROP. APPROX. 4.5" ACBC, TYPE B25.0C |
| E3 | PROP. VAR. DEPTH ACBC, TYPE B25.0C |
| J1 | PROP. 6" ABC |
| J2 | PROP. 8" ABC |
| J3 | VARIABLE DEPTH ABC |
| K | PROP. 5" CLASS IV AGGREGATE STABILIZATION |
| P | PRIME COAT |
| R1 | 2'-6" CONCRETE CURB AND GUTTER. |
| R2 | 2'-9" CONCRETE CURB AND GUTTER. |
| R3 | 1'-6" CONCRETE CURB AND GUTTER. (STD MOUNTABLE) |
| R4 | 5" MONOLITHIC CONCRETE ISLAND |
| R5 | SHOULDER BERM GUTTER |
| R6 | EXPRESSWAY GUTTER |
| R7 | 8"x18" CURB |
| R8 | 1'-6" CONCRETE CURB AND GUTTER. (SP 1'PAN-6"GUTTER) |
| S1 | 4" CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT. |
| W1 | WEDGING METHOD NO. 1 - SEE SHEET 2A-1 |
| W2 | WEDGING METHOD NO. 2 - SEE SHEET 2A-1 |

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

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| R-5021 | 2A-11 |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

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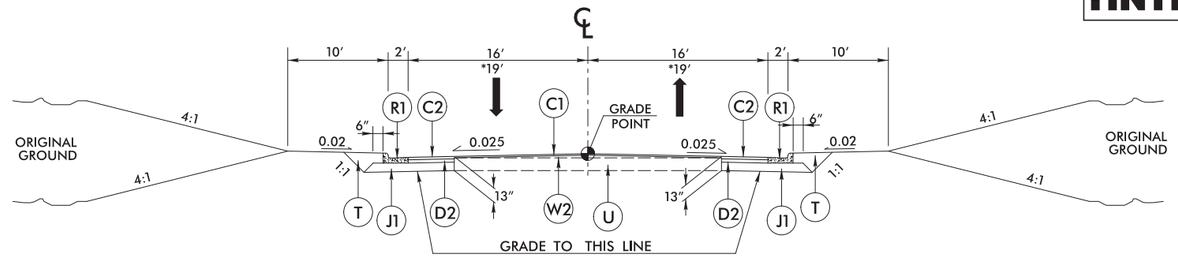
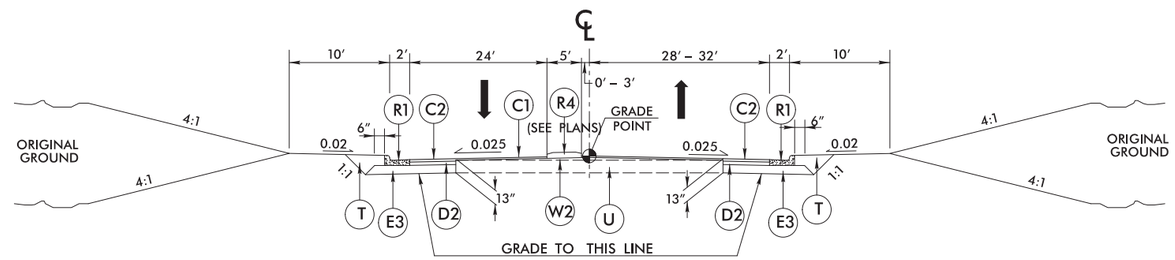


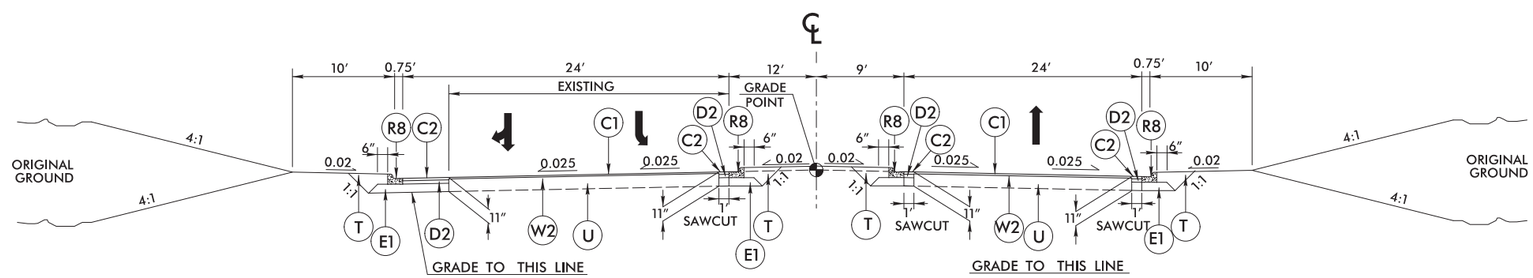

## TYPICAL SECTION NO. 36

-Y16- STA. 11+00.00 TO STA. 11+71.81
*-Y20- STA. 10+51.41 TO STA. 11+60.00



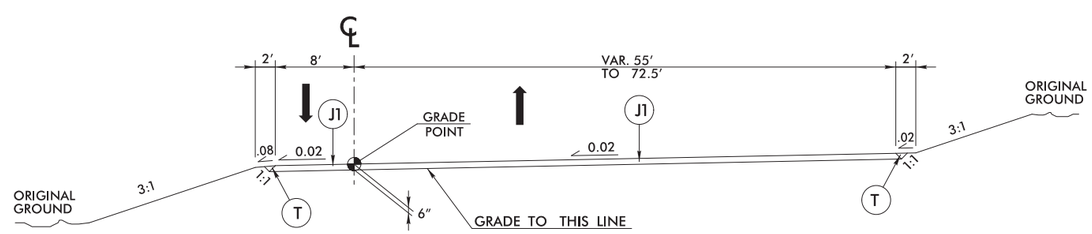

## TYPICAL SECTION NO. 37

-Y17- STA. 10+25.00 TO STA. 11+44.61




## TYPICAL SECTION NO. 38

-Y17- STA. 12+41.57 TO STA. 13+25.00




## TYPICAL SECTION NO. 39

-Y17A- STA. 10+39.00 TO STA. 11+21.54

NOTE: SEE PLANS FOR SUPERELEVATIONS, TURN LANES, AUXILIARY LANES, MONOLITHIC ISLANDS, CURB & GUTTER, AND LANE TAPER LOCATIONS.

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## PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

| | |
|---|---|
| C1 | PROP. APPROX. 1.5" ACSC, TYPE S9.5B |
| C2 | PROP. APPROX. 3" ACSC, TYPE S9.5B |
| C3 | PROP. VAR. DEPTH ACSC, TYPE S9.5B |
| C4 | PROP. APPROX. 1.5" ACSC, TYPE S9.5C |
| C5 | PROP. APPROX. 3" ACSC, TYPE S9.5C |
| C6 | PROP. VAR. DEPTH ACSC, TYPE S9.5C |
| D1 | PROP. APPROX. 2.5" ACIC, TYPE I19.0C |
| D2 | PROP. APPROX. 4" ACIC, TYPE I19.0C |
| D3 | PROP. VAR. DEPTH ACIC,TYPE I19.0C |
| E1 | PROP. APPROX. 4" ACBC, TYPE B25.0C |
| E2 | PROP. APPROX. 4.5" ACBC, TYPE B25.0C |
| E3 | PROP. VAR. DEPTH ACBC, TYPE B25.0C |
| J1 | PROP. 6" ABC |
| J2 | PROP. 8" ABC |
| J3 | VARIABLE DEPTH ABC |
| K | PROP. 5" CLASS IV AGGREGATE STABILIZATION |
| P | PRIME COAT |
| R1 | 2'-6" CONCRETE CURB AND GUTTER. |
| R2 | 2'-9" CONCRETE CURB AND GUTTER. |
| R3 | 1'-6" CONCRETE CURB AND GUTTER. (STD MOUNTABLE) |
| R4 | 5" MONOLITHIC CONCRETE ISLAND |
| R5 | SHOULDER BERM GUTTER |
| R6 | EXPRESSWAY GUTTER |
| R7 | 8"x18" CURB |
| R8 | 1'-6" CONCRETE CURB AND GUTTER. (SP 1'PAN-6"GUTTER) |
| S1 | 4" CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT. |
| W1 | WEDGING METHOD NO. 1 - SEE SHEET 2A-1 |
| W2 | WEDGING METHOD NO. 2 - SEE SHEET 2A-1 |

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

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Raleigh, North Carolina 27609
NC License No: C-1554

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| R-5021 | 2A-12 |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

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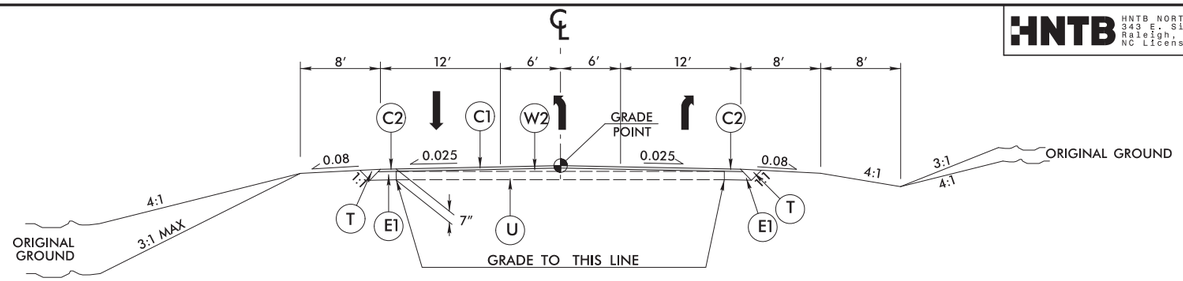
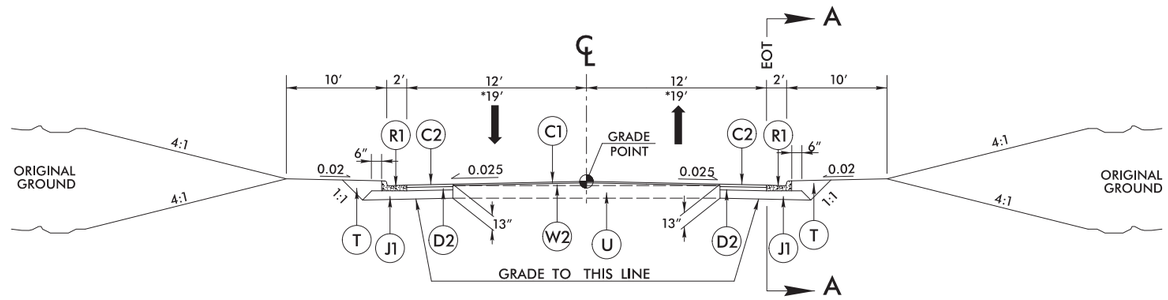


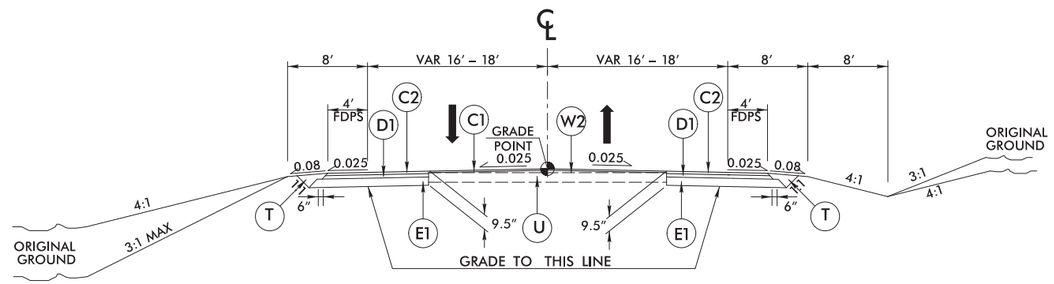

## TYPICAL SECTION NO. 40

–Y19REV– STA. 11+75.00 TO STA. 12+40.20



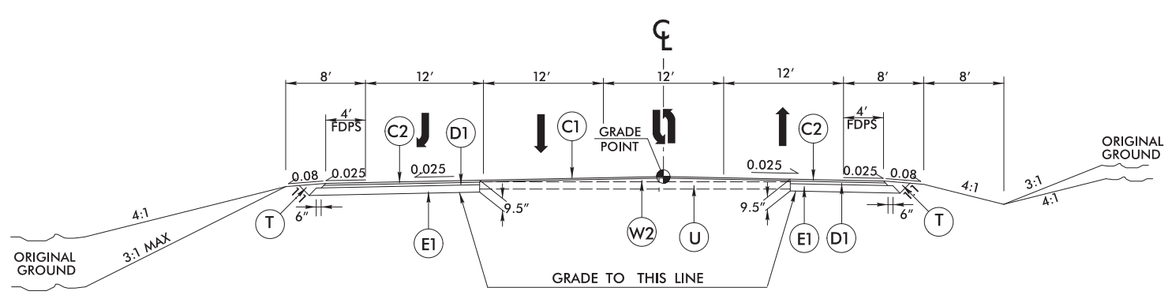

## TYPICAL SECTION NO. 41

–Y21– STA. 10+25.00 TO STA. 10+93.75
*–Y21– STA. 11+83.76 TO STA. 12+40.00




## TYPICAL SECTION NO. 42

–Y22– STA. 14+00.00 (EXISTING) TO STA. 17+00.00
–Y22– STA. 17+00.00 TO STA. 21+50.00




## TYPICAL SECTION NO. 43

–Y22– STA. 21+50.00 TO STA. 25+50.00

TRANSITION FROM TYPICAL SECTION NO. 41 TO TYPICAL SECTION NO. 42

–Y22– STA. 25+50.00 TO STA. 30+00.00

NOTE: SEE PLANS FOR SUPERELEVATIONS, TURN LANES, AUXILIARY LANES, MONOLITHIC ISLANDS, CURB & GUTTER, AND LANE TAPER LOCATIONS.

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## PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

| | |
|---|---|
| C1 | PROP. APPROX. 1.5" ACSC, TYPE S9.5B |
| C2 | PROP. APPROX. 3" ACSC, TYPE S9.5B |
| C3 | PROP. VAR. DEPTH ACSC, TYPE S9.5B |
| C4 | PROP. APPROX. 1.5" ACSC, TYPE S9.5C |
| C5 | PROP. APPROX. 3" ACSC, TYPE S9.5C |
| C6 | PROP. VAR. DEPTH ACSC, TYPE S9.5C |
| D1 | PROP. APPROX. 2.5" ACIC, TYPE I19.0C |
| D2 | PROP. APPROX. 4" ACIC, TYPE I19.0C |
| D3 | PROP. VAR. DEPTH ACIC,TYPE I19.0C |
| E1 | PROP. APPROX. 4" ACBC, TYPE B25.0C |
| E2 | PROP. APPROX. 4.5" ACBC, TYPE B25.0C |
| E3 | PROP. VAR. DEPTH ACBC, TYPE B25.0C |
| J1 | PROP. 6" ABC |
| J2 | PROP. 8" ABC |
| J3 | VARIABLE DEPTH ABC |
| K | PROP. 5" CLASS IV AGGREGATE STABILIZATION |
| P | PRIME COAT |
| R1 | 2'-6" CONCRETE CURB AND GUTTER. |
| R2 | 2'-9" CONCRETE CURB AND GUTTER. |
| R3 | 1'-6" CONCRETE CURB AND GUTTER. (STD MOUNTABLE) |
| R4 | 5" MONOLITHIC CONCRETE ISLAND |
| R5 | SHOULDER BERM GUTTER |
| R6 | EXPRESSWAY GUTTER |
| R7 | 8"x18" CURB |
| R8 | 1'-6" CONCRETE CURB AND GUTTER. (SP 1'PAN-6"GUTTER) |
| S1 | 4" CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT. |
| W1 | WEDGING METHOD NO. 1 - SEE SHEET 2A-1 |
| W2 | WEDGING METHOD NO. 2 - SEE SHEET 2A-1 |

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

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|---|---|
| R-5021 | 2A-13 |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

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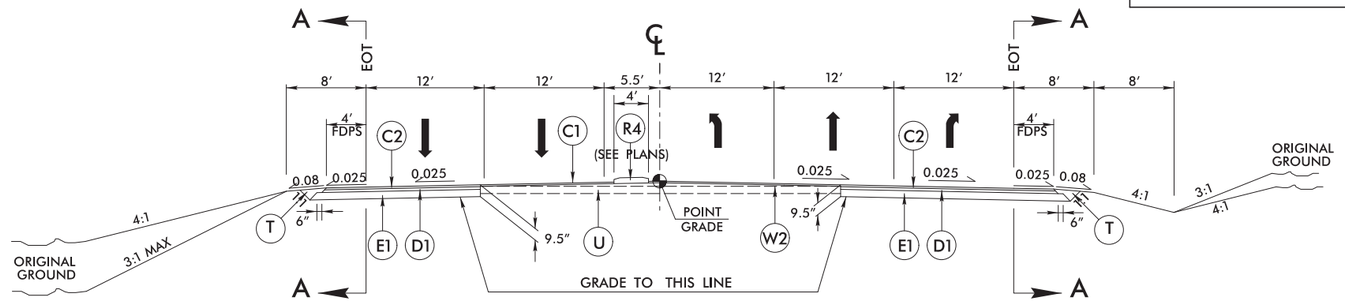
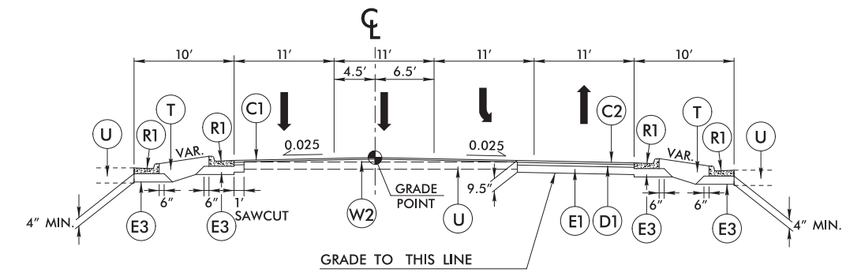
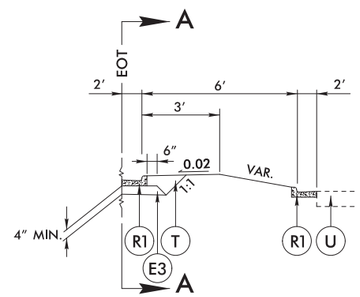



## TYPICAL SECTION NO. 44
–Y22– STA. 30+00.00 TO STA. 31+50.00



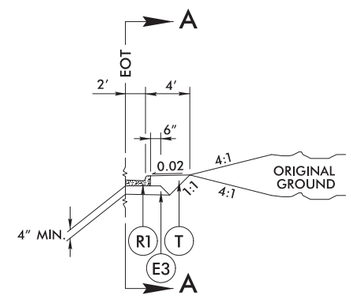

## TYPICAL SECTION NO. 45
–Y22– STA. 35+60.27 TO STA. 37+50.00




## TYPICAL SECTION NO. 42=4A
CHANNELIZATION WITH 2'-6" CURB AND GUTTER

USE TYPICAL SECTION NO. 44A IN CONJUNCTION WITH TYPICAL SECTION NO. 44

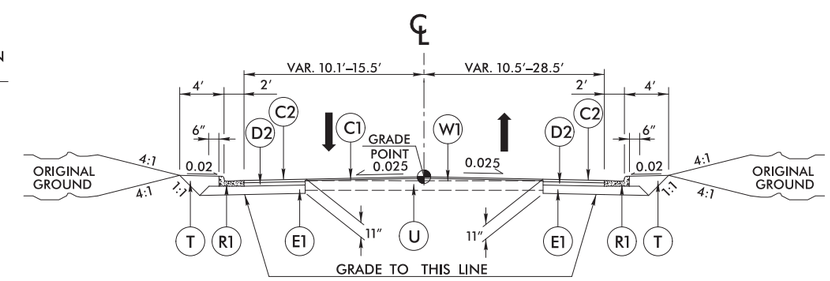
–Y22– STA. 31+68.29 TO STA. 33+43.43 RT



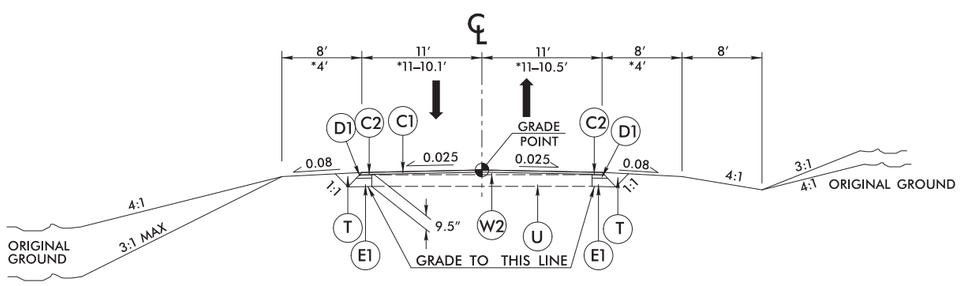

## TYPICAL SECTION NO. 44B
2'-6" CURB AND GUTTER LOCATIONS

USE TYPICAL SECTION NO. 44B IN CONJUNCTION WITH TYPICAL SECTION NO. 44

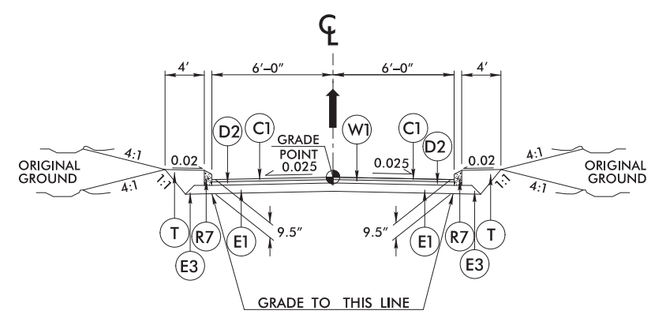
–Y22– STA. 31+50.00 TO STA. 31+68.29 RT
–Y22– STA. 31+50.00 TO STA. 34+66.65 LT
–Y22– STA. 33+43.43 TO STA. 34+66.65 RT




## TYPICAL SECTION NO. 46
–Y22– STA. 37+50.00 TO STA. 41+66.00




## TYPICAL SECTION NO. 47
–Y23– STA. 10+24.74 TO STA. 12+25.00
*–Y22– STA. 41+66.00 TO STA. 42+50.00




## TYPICAL SECTION NO. 48
–Y22A– STA. 10+25.00 TO STA. 12+01.92

NOTE: SEE PLANS FOR SUPERELEVATIONS, TURN LANES, AUXILIARY LANES, MONOLITHIC ISLANDS, CURB & GUTTER, AND LANE TAPER LOCATIONS.

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## PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

| | |
|---|---|
| C1 | PROP. APPROX. 1.5" ACSC, TYPE S9.5B |
| C2 | PROP. APPROX. 3" ACSC, TYPE S9.5B |
| C3 | PROP. VAR. DEPTH ACSC, TYPE S9.5B |
| C4 | PROP. APPROX. 1.5" ACSC, TYPE S9.5C |
| C5 | PROP. APPROX. 3" ACSC, TYPE S9.5C |
| C6 | PROP. VAR. DEPTH ACSC, TYPE S9.5C |
| D1 | PROP. APPROX. 2.5" ACIC, TYPE I19.0C |
| D2 | PROP. APPROX. 4" ACIC, TYPE I19.0C |
| D3 | PROP. VAR. DEPTH ACIC,TYPE I19.0C |
| E1 | PROP. APPROX. 4" ACBC, TYPE B25.0C |
| E2 | PROP. APPROX. 4.5" ACBC, TYPE B25.0C |
| E3 | PROP. VAR. DEPTH ACBC, TYPE B25.0C |
| J1 | PROP. 6" ABC |
| J2 | PROP. 8" ABC |
| J3 | VARIABLE DEPTH ABC |
| K | PROP. 5" CLASS IV AGGREGATE STABILIZATION |
| P | PRIME COAT |
| R1 | 2'-6" CONCRETE CURB AND GUTTER. |
| R2 | 2'-9" CONCRETE CURB AND GUTTER. |
| R3 | 1'-6" CONCRETE CURB AND GUTTER. (STD MOUNTABLE) |
| R4 | 5" MONOLITHIC CONCRETE ISLAND |
| R5 | SHOULDER BERM GUTTER |
| R6 | EXPRESSWAY GUTTER |
| R7 | 8"x18" CURB |
| R8 | 1'-6" CONCRETE CURB AND GUTTER. (SP 1'PAN-6"GUTTER) |
| S1 | 4" CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT. |
| W1 | WEDGING METHOD NO. 1 - SEE SHEET 2A-1 |
| W2 | WEDGING METHOD NO. 2 - SEE SHEET 2A-1 |

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

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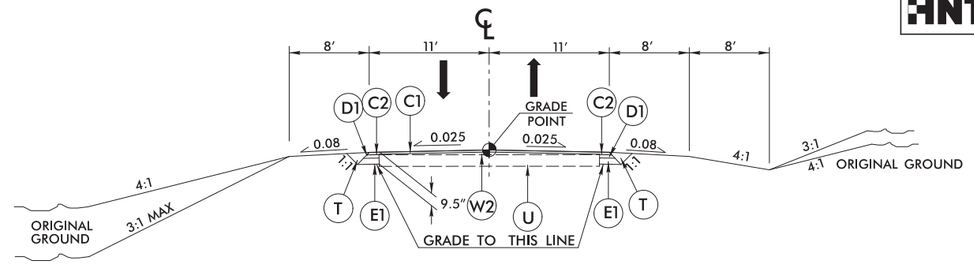
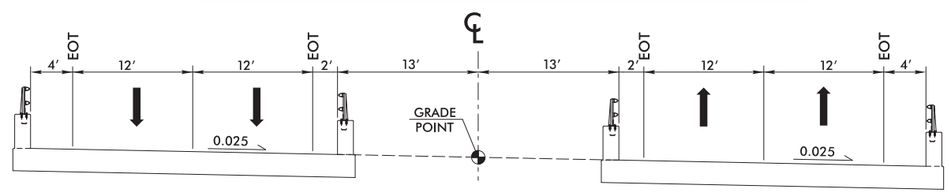
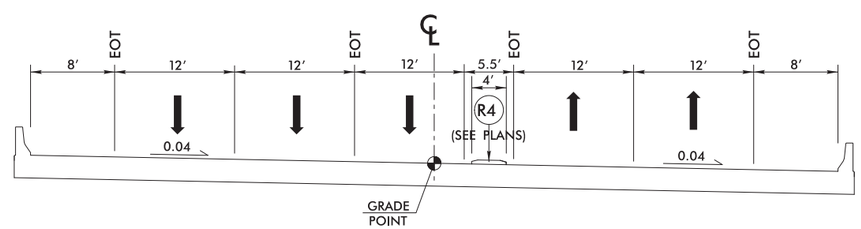



## TYPICAL SECTION NO. 49
–Y24– STA. 10+35.43 TO STA. 12+81.87

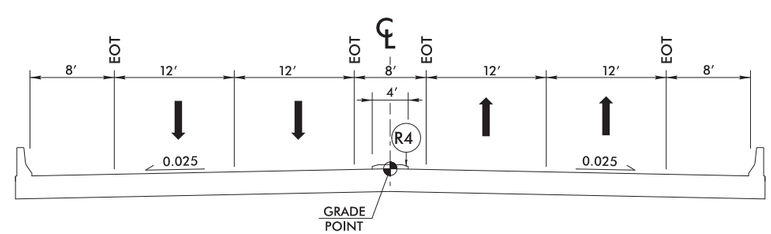
## BRIDGE TYPICALS




## BRIDGE TYPICAL NO. 1
–L– STA. 368+72.00 TO STA. 370+12.00
–L– STA. 388+55.50 TO STA. 391+67.00




## BRIDGE TYPICAL NO. 2
–YREV– STA. 30+66.39 TO STA. 32+07.06




## BRIDGE TYPICAL NO. 3
–Y14A– STA. 38+95.97 TO STA. 40+16.47

NOTE: SEE PLANS FOR SUPERELEVATIONS, TURN LANES, AUXILIARY LANES, MONOLITHIC ISLANDS, CURB & GUTTER, AND LANE TAPER LOCATIONS.

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# INTERSECTION DETAIL AND DIRECTIONAL CROSSOVER INTO MDI MANAGEMENT, INC –L– STA 66+00.00

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|---|---|
| R–5021 | 2B–1 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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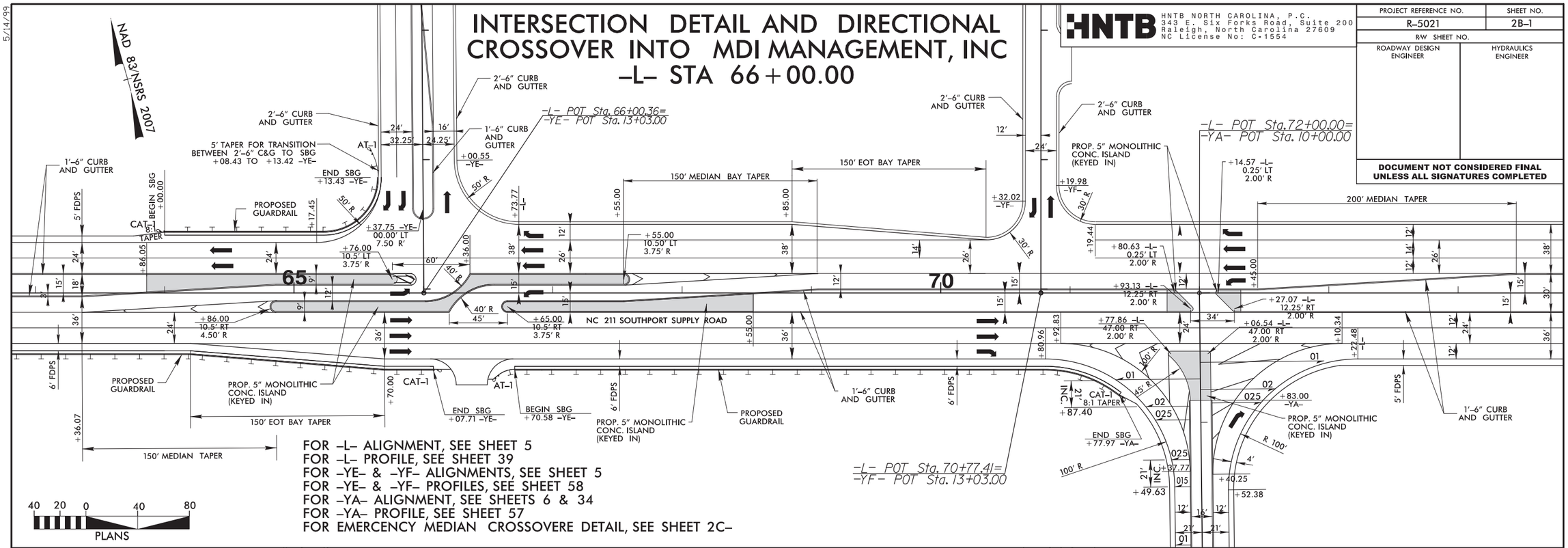
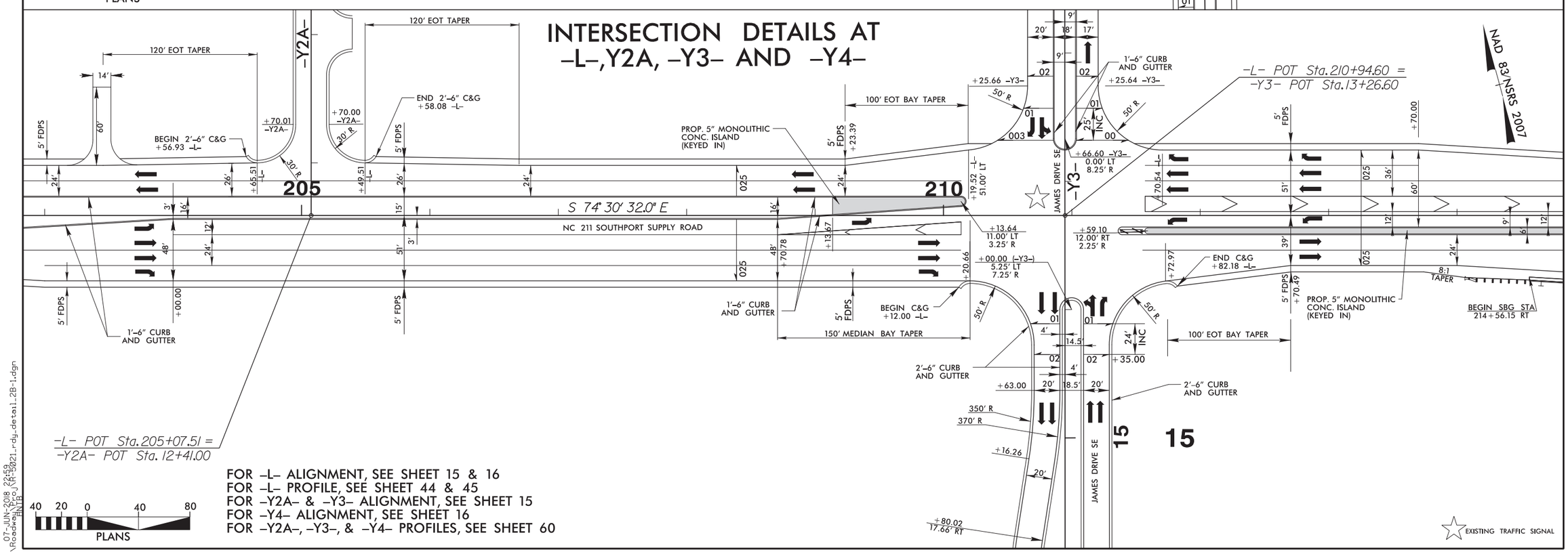



# INTERSECTION DETAILS AT –L–,Y2A, –Y3– AND –Y4–

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# INTERSECTION DETAIL AT –L–, –Y5–, –Y5A–,–Y5B– AND –Y6–

**BEGIN CONSTRUCTION –Y5– Sta. 10+50.00**

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| R–5021 | 2B–2 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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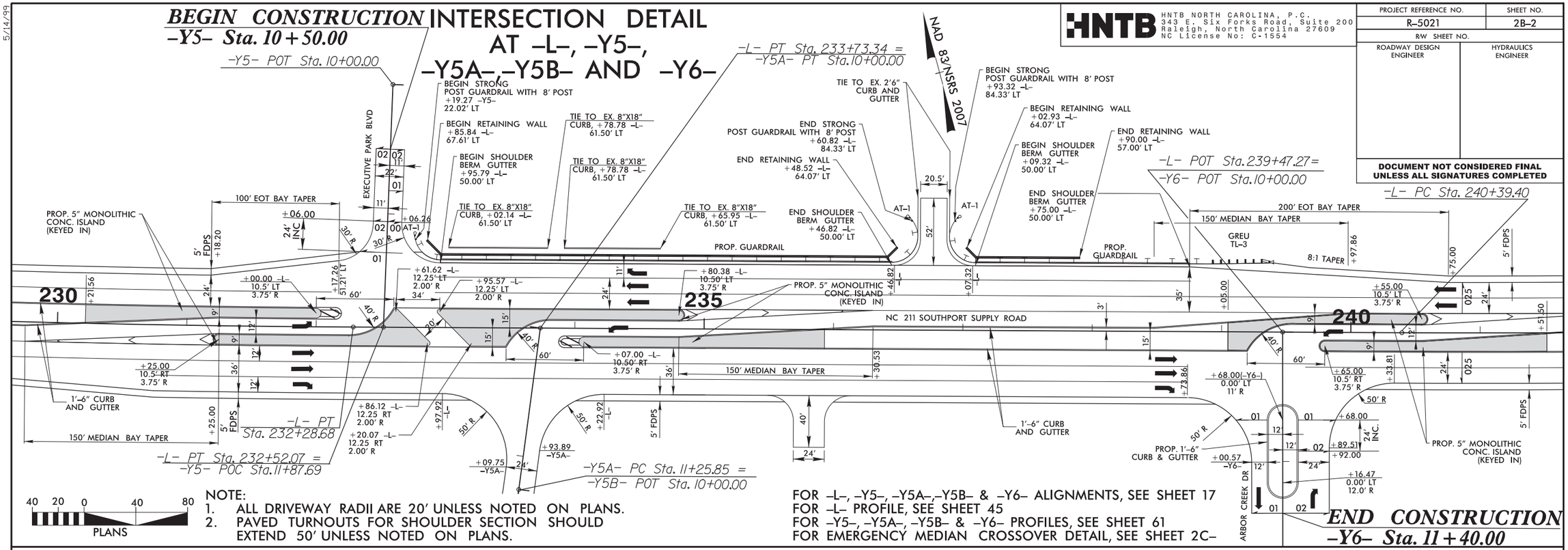


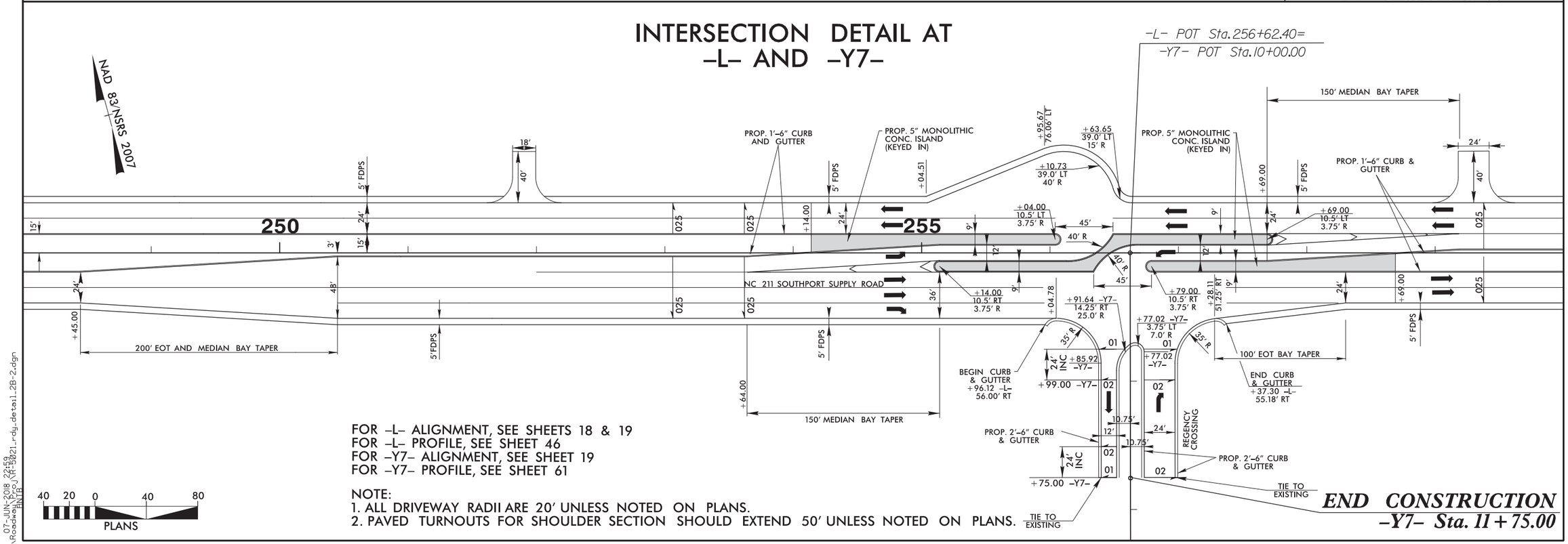

NOTE:
1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

40 20 0 40 80
PLANS

FOR –L–, –Y5–, –Y5A–,–Y5B– & –Y6– ALIGNMENTS, SEE SHEET 17
FOR –L– PROFILE, SEE SHEET 45
FOR –Y5–, –Y5A–, –Y5B– & –Y6– PROFILES, SEE SHEET 61
FOR EMERGENCY MEDIAN CROSSOVER DETAIL, SEE SHEET 2C–

**END CONSTRUCTION –Y6– Sta. 11+40.00**

# INTERSECTION DETAIL AT –L– AND –Y7–




FOR –L– ALIGNMENT, SEE SHEETS 18 & 19
FOR –L– PROFILE, SEE SHEET 46
FOR –Y7– ALIGNMENT, SEE SHEET 19
FOR –Y7– PROFILE, SEE SHEET 61

NOTE:
1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

40 20 0 40 80
PLANS

**END CONSTRUCTION –Y7– Sta. 11+75.00**

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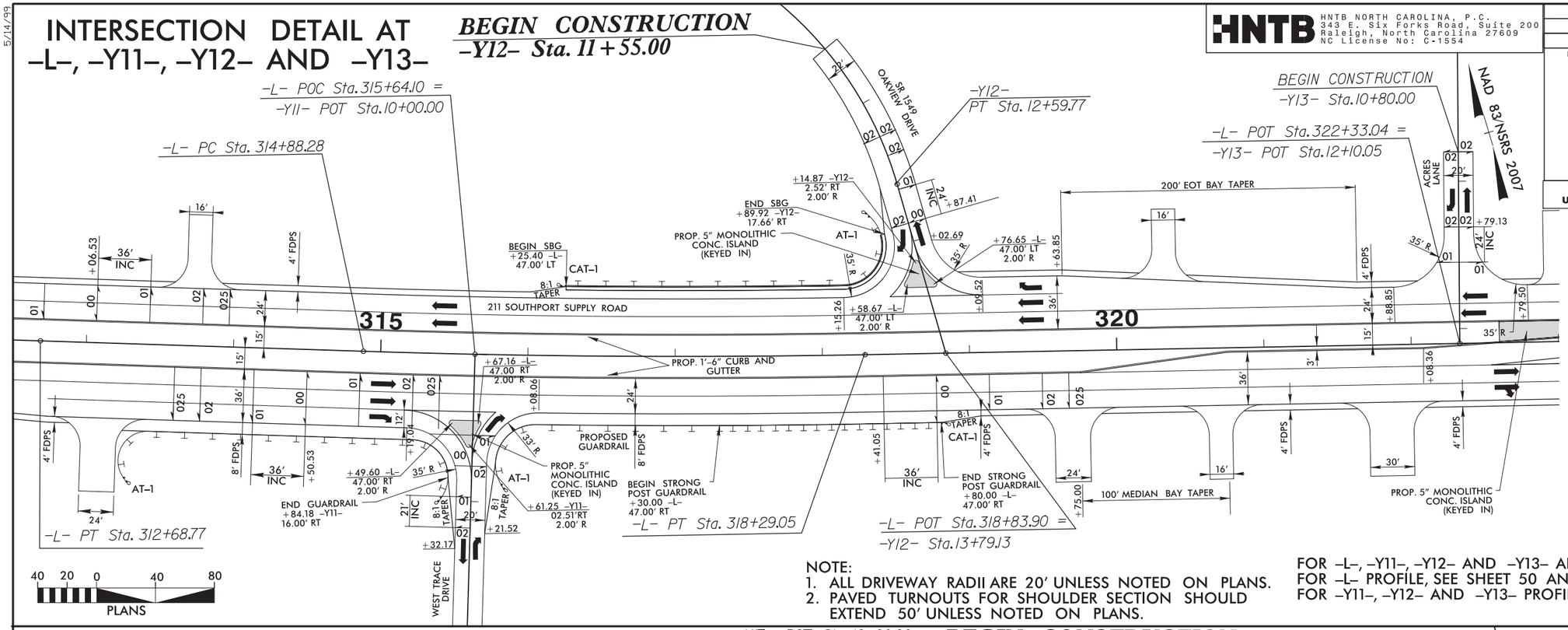
# INTERSECTION DETAIL AT –L–, –Y11–, –Y12– AND –Y13–





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|---|---|
| R–5021 | 2B–3 |
| R/W SHEET NO. | |
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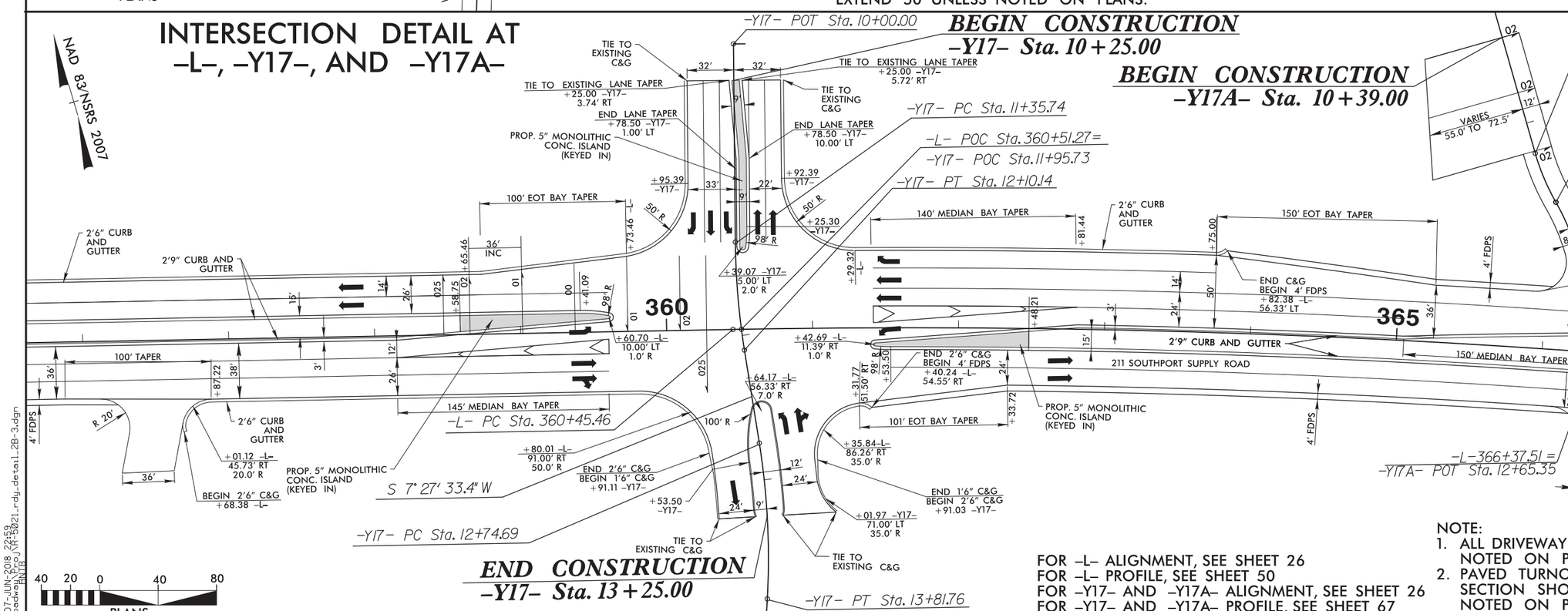
NOTE:
1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.


FOR –L–, –Y11–, –Y12– AND –Y13– ALIGNMENTS, SEE SHEET 23
FOR –L– PROFILE, SEE SHEET 50 AND 51
FOR –Y11–, –Y12– AND –Y13– PROFILES, SEE SHEET 62


# INTERSECTION DETAIL AT –L–, –Y17–, AND –Y17A–




NOTE:
1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.


FOR –L– ALIGNMENT, SEE SHEET 26
FOR –L– PROFILE, SEE SHEET 50
FOR –Y17– AND –Y17A– ALIGNMENT, SEE SHEET 26
FOR –Y17– AND –Y17A– PROFILE, SEE SHEET 67



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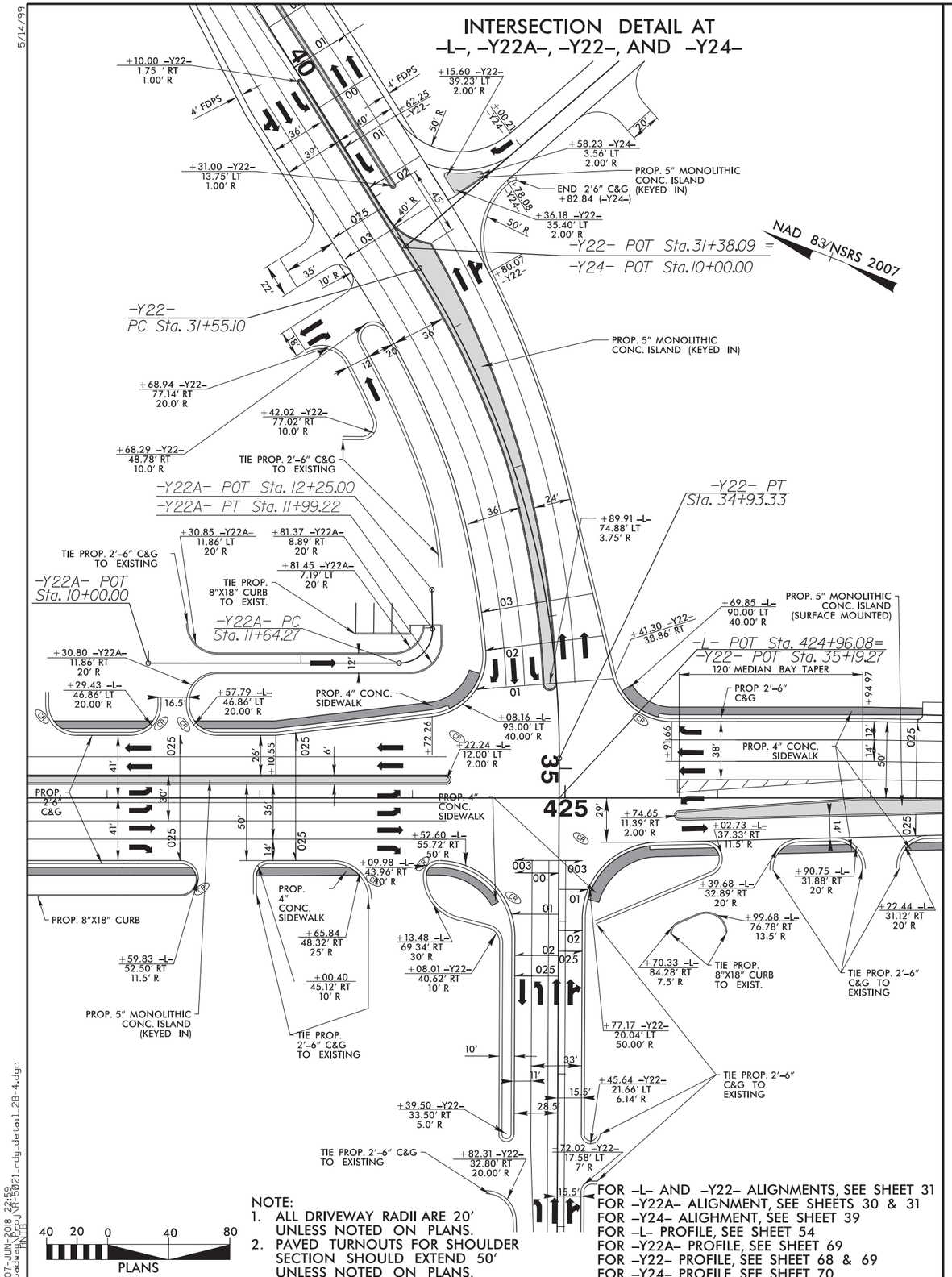
# INTERSECTION DETAIL AT –L–, –Y22A–, –Y22–, AND –Y24–




NOTE:
1. ALL DRIVEWAY RADII ARE 20′ UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50′ UNLESS NOTED ON PLANS.

FOR –L– AND –Y22– ALIGNMENTS, SEE SHEET 31
FOR –Y22A– ALIGNMENT, SEE SHEETS 30 & 31
FOR –Y24– ALIGNMENT, SEE SHEET 39
FOR –L– PROFILE, SEE SHEET 54
FOR –Y22A– PROFILE, SEE SHEET 69
FOR –Y22– PROFILE, SEE SHEET 68 & 69
FOR –Y24– PROFILE, SEE SHEET 70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|---|---|
| R–5021 | 2B–4 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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|---|---|
| R-5021 | 2B-5 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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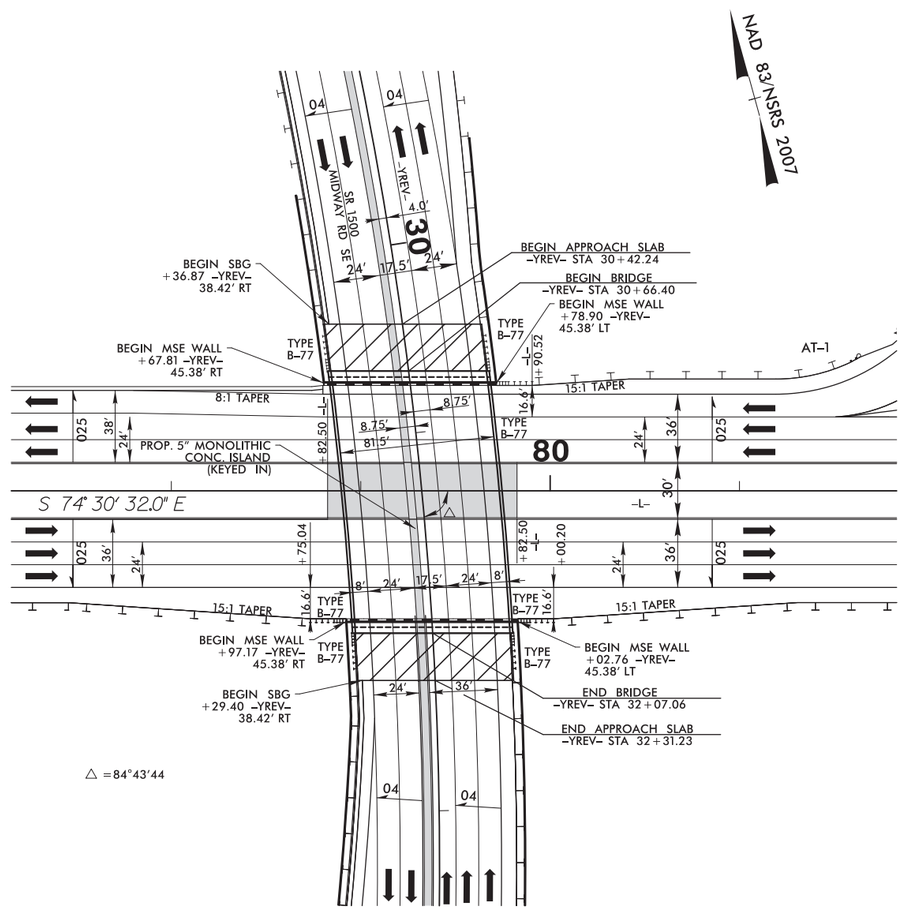
## BRIDGE DETAIL AT INTERSECTION OF -L- AND -YREV-

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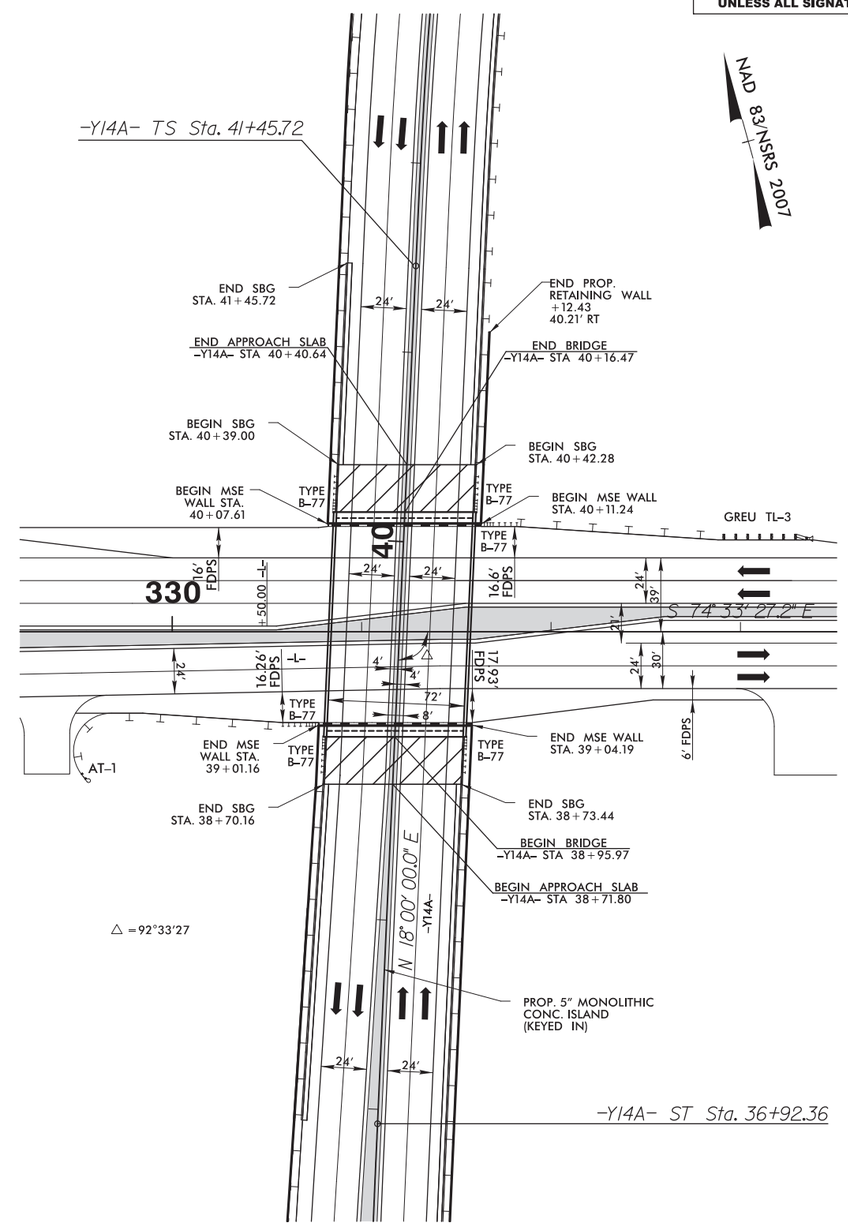
PLANS

FOR -L- AND -YREV- ALIGNMENTS, SEE SHEET 6
FOR -L- PROFILE, SEE SHEET 42
FOR -YREV- PROFILE, SEE SHEET 55 AND 56
FOR STRUCTURE PLANS, SEE SHEET S-_ THRU S-_
FOR RETAINING WALL PLANS, SEE SHEETS W-_ THRU W-_

## BRIDGE DETAIL AT INTERSECTION OF -L- AND -Y14A-




40 20 0 40 80
PLANS

FOR -L- AND -Y14A- ALIGNMENTS, SEE SHEET 26
FOR -L- PROFILE, SEE SHEET 51
FOR -Y14A- PROFILE, SEE SHEETS 63 AND 64
FOR STRUCTURE PLANS, SEE SHEET S-_ THRU S-_
FOR RETAINING WALL PLANS, SEE SHEETS W-_ THRU W-_

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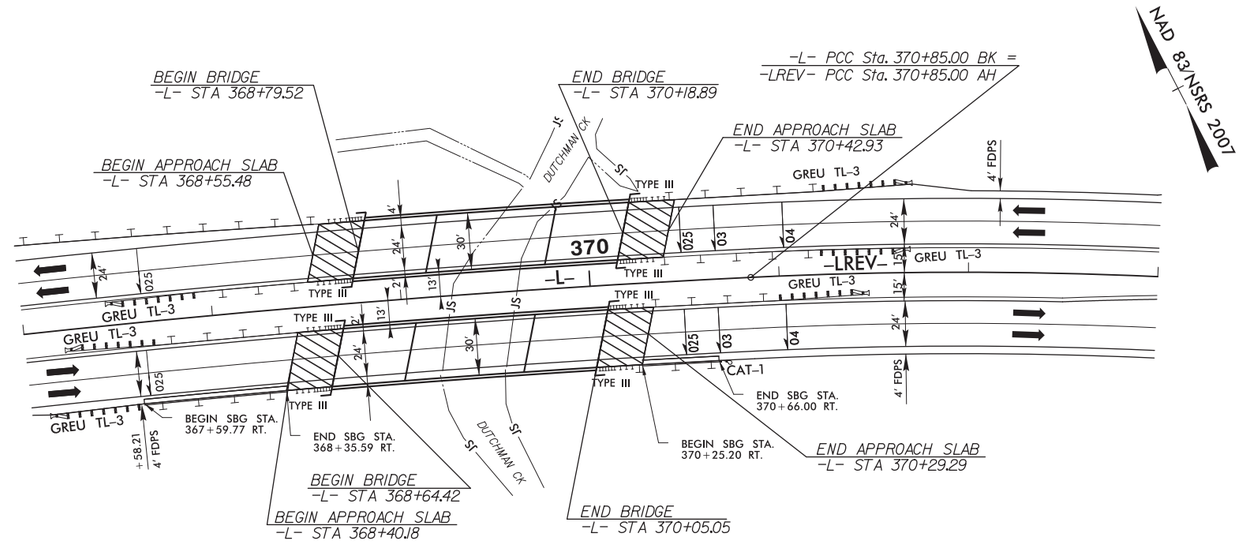
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 2B-6 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

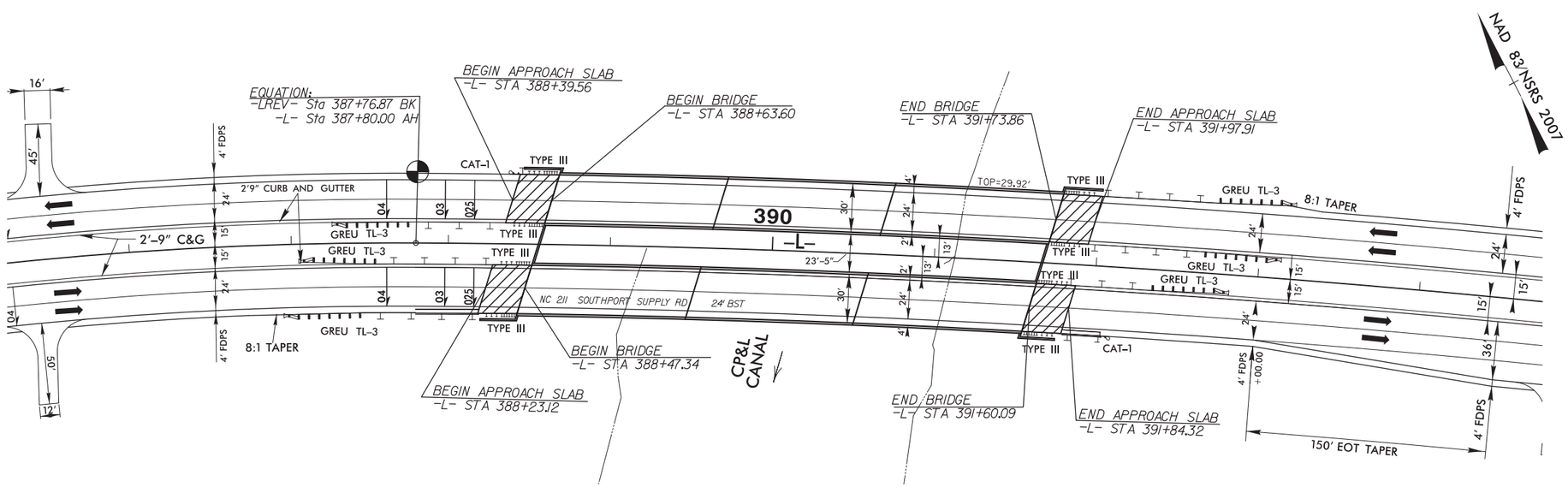
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

## BRIDGE DETAIL AT -L- AND DUTCHMAN CREEK




FOR -L- ALIGNMENT, SEE SHEET 27
FOR -L- PROFILE, SEE SHEET 52
FOR STRUCTURE PLANS, SEE SHEET S-_ THRU S-_

## BRIDGE DETAIL AT -L- AND CP&L CANAL




FOR -L- ALIGNMENT, SEE SHEET 28
FOR -L- PROFILE, SEE SHEET 53
FOR STRUCTURE PLANS, SEE SHEET S-_ THRU S-_

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HNTB

REVISIONS

# MIDWAY RD./MIDDLETON BLVD. INTERCHANGE OVERVIEW SHEET

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 2B-7 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

☆ PROPOSED TRAFFIC SIGNAL

-YREV-

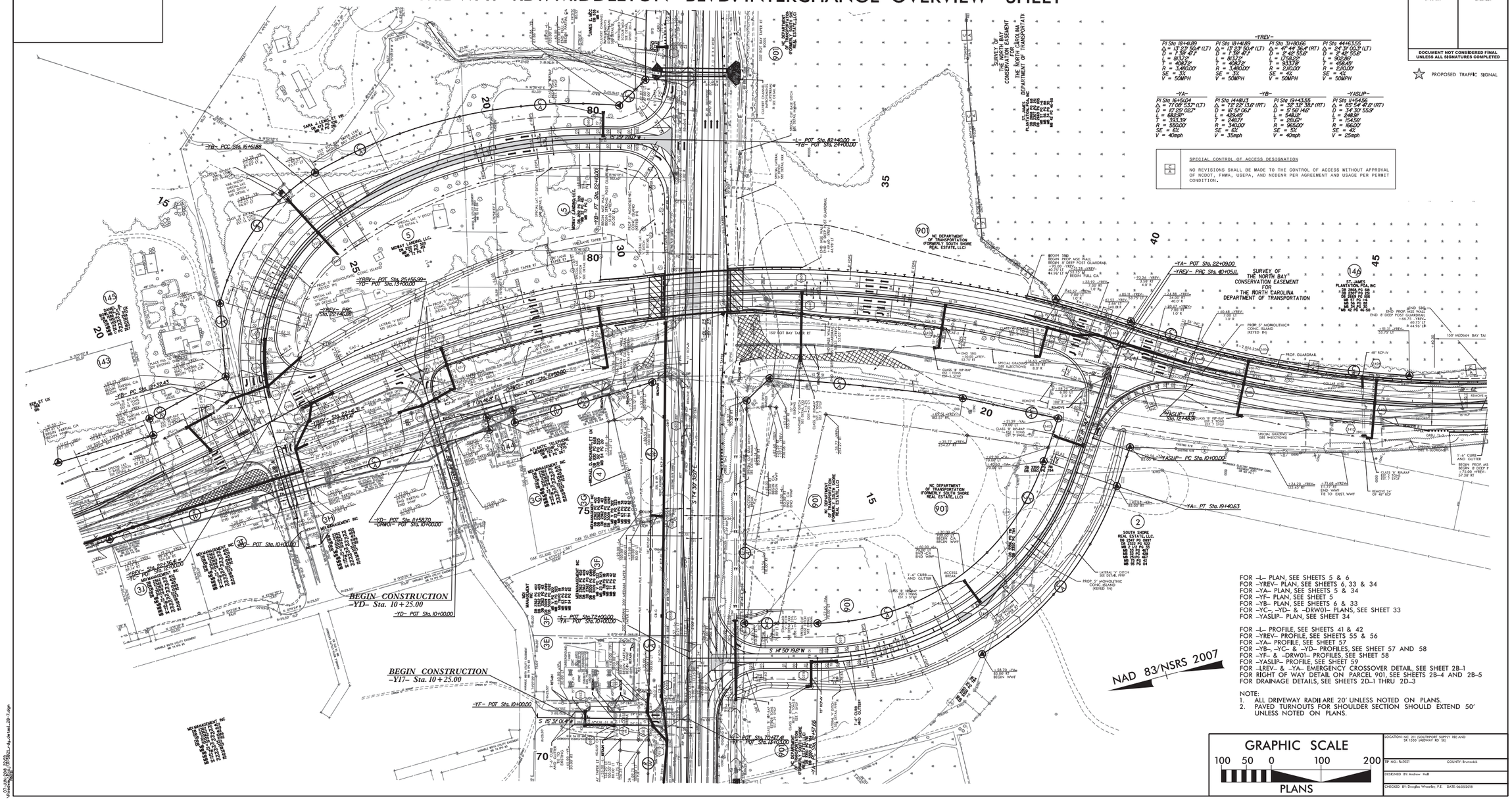
| | | | |
|---|---|---|---|
| PI Sta 18+41.89 | PI Sta 18+41.89 | PI Sta 31+80.66 | PI Sta 44+63.55 |
| Δ = 13° 23' 52.4" (LT) | Δ = 13° 23' 52.4" (LT) | Δ = 47° 44' 36.4" (RT) | Δ = 34° 31' 00.3" (LT) |
| D = 1° 59' 47.2" | D = 1° 59' 47.2" | D = 7° 42' 55.6" | D = 2° 42' 55.6" |
| L = 813.77' | L = 813.77' | L = 1,754.29' | L = 902.86' |
| T = 409.72' | T = 409.72' | T = 933.79' | T = 458.45' |
| R = 3,480.00' | R = 3,480.00' | R = 2,110.00' | R = 2,110.00' |
| SE = 3% | SE = 3% | SE = 4% | SE = 4% |
| V = 50MPH | V = 50MPH | V = 50MPH | V = 50MPH |

-YA- -YB- -YASUP-

| | | | |
|---|---|---|---|
| PI Sta 16+51.04 | PI Sta 14+81.13 | PI Sta 19+43.55 | PI Sta 11+54.56 |
| Δ = 77° 08' 53.7" (LT) | Δ = 112° 22' 13.8" (RT) | Δ = 32° 32' 38.1" (RT) | Δ = 34° 30' 55.9" |
| D = 47° 29' 00.2" | D = 16° 51' 06.1" | D = 2° 50' 14.2" | D = 3° 30' 55.9" |
| L = 682.91' | L = 429.49' | L = 548.11' | L = 248.91' |
| T = 393.39' | T = 248.71' | T = 281.07' | T = 154.56' |
| R = 550.00' | R = 340.00' | R = 965.00' | R = 166.00' |
| SE = 6% | SE = 6% | SE = 5% | SE = 4% |
| V = 40mph | V = 35mph | V = 40mph | V = 25mph |

C A — SPECIAL CONTROL OF ACCESS DESIGNATION

NO REVISIONS SHALL BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, FHWA, USEPA, AND NCDENR PER AGREEMENT AND USAGE PER PERMIT CONDITION.




FOR –L– PLAN, SEE SHEETS 5 & 6
FOR –YREV– PLAN, SEE SHEETS 6, 33 & 34
FOR –YA– PLAN, SEE SHEETS 5 & 34
FOR –YF– PLAN, SEE SHEET 5
FOR –YB– PLAN, SEE SHEETS 6 & 33
FOR –YC–, –YD– & –DRW01– PLANS, SEE SHEET 33
FOR –YASLIP– PLAN, SEE SHEET 34

FOR –L– PROFILE, SEE SHEETS 41 & 42
FOR –YREV– PROFILE, SEE SHEETS 55 & 56
FOR –YA– PROFILE, SEE SHEET 57
FOR –YB–, –YC– & –YD– PROFILES, SEE SHEET 57 AND 58
FOR –YF– & –DRW01– PROFILES, SEE SHEET 58
FOR –YASLIP– PROFILE, SEE SHEET 59
FOR –LREV– & –YA– EMERGENCY CROSSOVER DETAIL, SEE SHEET 2B–1
FOR RIGHT OF WAY DETAIL ON PARCEL 901, SEE SHEETS 2B–4 AND 2B–5
FOR DRAINAGE DETAILS, SEE SHEETS 2D–1 THRU 2D–3

NOTE:
1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

GRAPHIC SCALE
100 50 0 100 200
PLANS

LOCATION: NC 211 (SOUTHPORT SUPPLY RD) AND SR 1500 (MIDWAY RD SE)

TIP NO.: R-5021 COUNTY: Brunswick

DESIGNED BY: Andrew Hall

CHECKED BY: Douglas Wheatley, P.E. DATE: 06/05/2018

| REVISIONS |
|---|
| |

**HNTB** HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

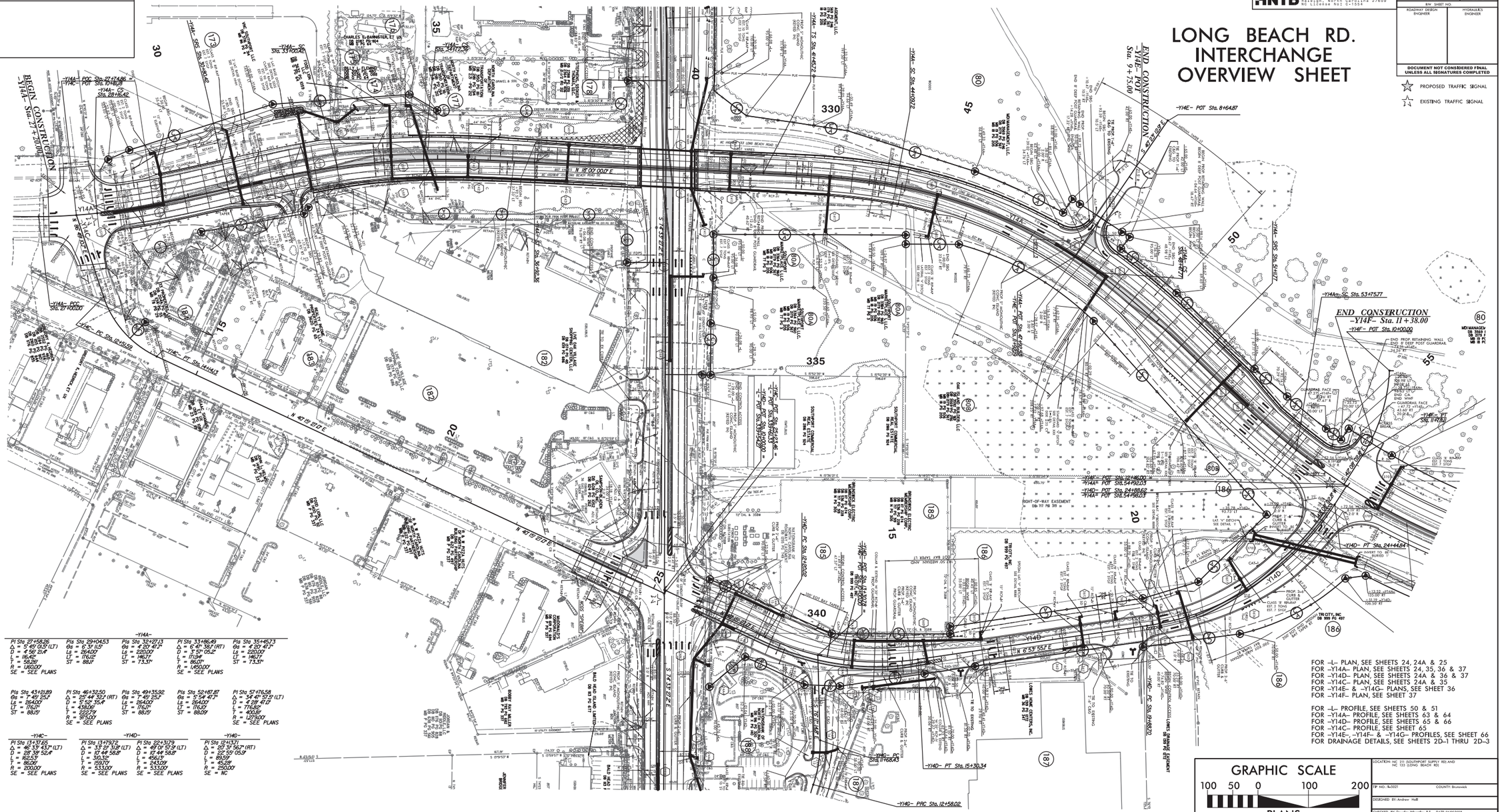
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R 5021 | 2B-8 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

# LONG BEACH RD. INTERCHANGE OVERVIEW SHEET

☆ PROPOSED TRAFFIC SIGNAL

☆ EXISTING TRAFFIC SIGNAL



-Y14A-

PI Sta 27+58.26
△ = 5° 45' 01.5" (LT)
D = 4° 56' 21.4"
L = 116.42'
T = 58.26'
R = 1,160.00'
SE = SEE PLANS

PIs Sta 29+04.53
Θs = 6° 31' 11.5"
Ls = 264.00'
LT = 176.12'
ST = 88.11'

PIs Sta 32+27.13
Θs = 4° 20' 47.7"
Ls = 220.00'
LT = 146.71'
ST = 73.37'

PI Sta 33+86.49
△ = 6° 47' 38.1" (RT)
D = 3° 57' 05.2"
L = 171.94'
T = 86.07'
R = 1,450.00'
SE = SEE PLANS

PIs Sta 35+45.73
Θs = 4° 20' 47.7"
Ls = 220.00'
LT = 146.71'
ST = 73.37'

PIs Sta 43+21.89
Θs = 7° 45' 25.1"
Ls = 264.00'
LT = 176.17'
ST = 88.15'

PI Sta 46+32.50
△ = 25° 44' 32.1" (RT)
D = 5° 52' 35.4"
L = 438.06'
T = 222.79'
R = 975.00'
SE = SEE PLANS

PIs Sta 49+35.92
Θs = 7° 45' 25.1"
Ls = 264.00'
LT = 176.17'
ST = 88.15'

PIs Sta 52+87.87
Θs = 5° 54' 47.7"
Ls = 264.00'
LT = 176.10'
ST = 88.09'

PI Sta 57+76.58
△ = 34° 47' 57.5" (LT)
D = 4° 28' 47.0"
L = 776.82'
T = 400.81'
R = 1,279.00'
SE = SEE PLANS

-Y14C-

PI Sta 13+37.65
△ = 46° 33' 43.7" (LT)
D = 28° 38' 52.4"
L = 162.53'
T = 86.06'
R = 200.00'
SE = SEE PLANS

-Y14D-

PI Sta 13+79.72
△ = 33° 21' 31.8" (LT)
D = 10° 44' 58.8"
L = 310.32'
T = 159.70'
R = 533.00'
SE = SEE PLANS

PI Sta 22+31.79
△ = 49° 01' 57.9" (LT)
D = 10° 44' 58.8"
L = 456.13'
T = 243.09'
R = 533.00'
SE = SEE PLANS

-Y14G-

PI Sta 12+13.71
△ = 20° 31' 56.7" (RT)
D = 22° 55' 05.9"
L = 89.59'
T = 45.28'
R = 250.00'
SE = NC

FOR -L- PLAN, SEE SHEETS 24, 24A & 25
FOR -Y14A- PLAN, SEE SHEETS 24, 35, 36 & 37
FOR -Y14D- PLAN, SEE SHEETS 24A & 36 & 37
FOR -Y14C- PLAN, SEE SHEETS 24A & 35
FOR -Y14E- & -Y14G- PLANS, SEE SHEET 36
FOR -Y14F- PLAN, SEE SHEET 37

FOR -L- PROFILE, SEE SHEETS 50 & 51
FOR -Y14A- PROFILE, SEE SHEETS 63 & 64
FOR -Y14D- PROFILE, SEE SHEETS 65 & 66
FOR -Y14C- PROFILE, SEE SHEET 65
FOR -Y14E-, -Y14F- & -Y14G- PROFILES, SEE SHEET 66
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

GRAPHIC SCALE
100 50 0 100 200
PLANS

LOCATION: NC 211 (SOUTHPORT SUPPLY RD) AND
NC 133 (LONG BEACH RD)

TIP NO.: R-5021 COUNTY: Brunswick

DESIGNED BY: Andrew Hall

CHECKED BY: Douglas Wheatley, P.E. DATE: 06/05/2018

07-JUN-2018 22:59
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HNTB

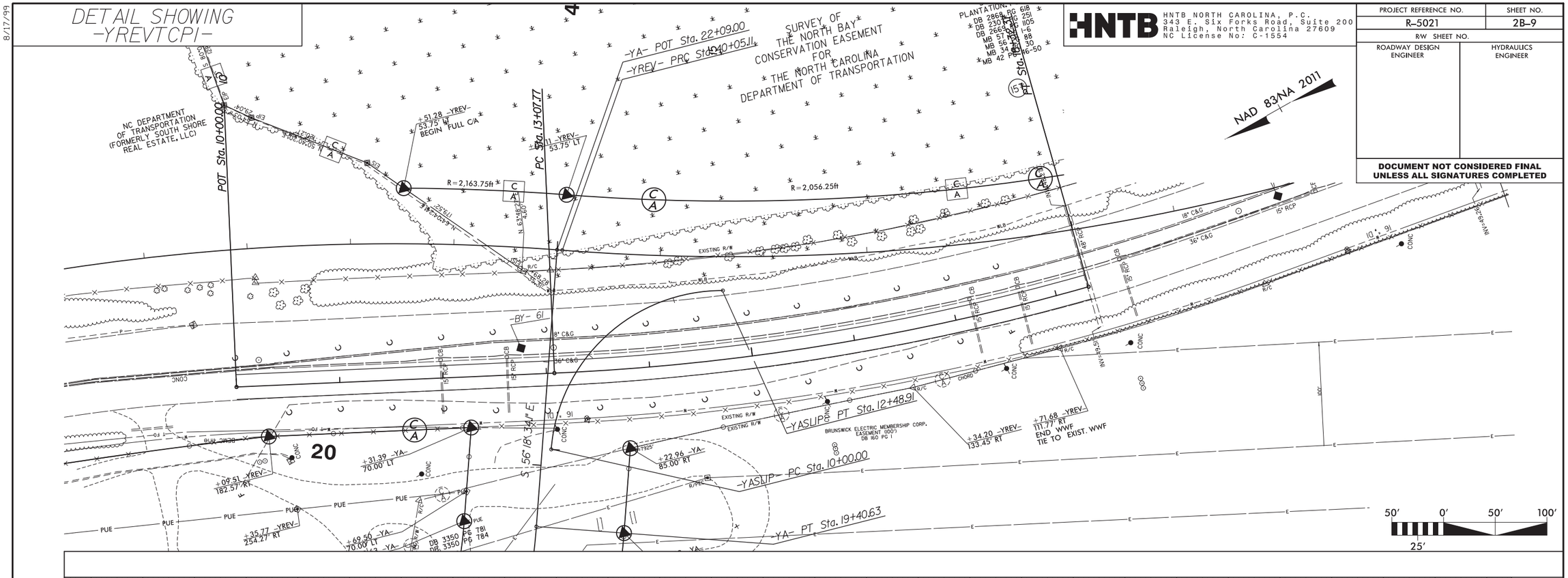
8/17/99

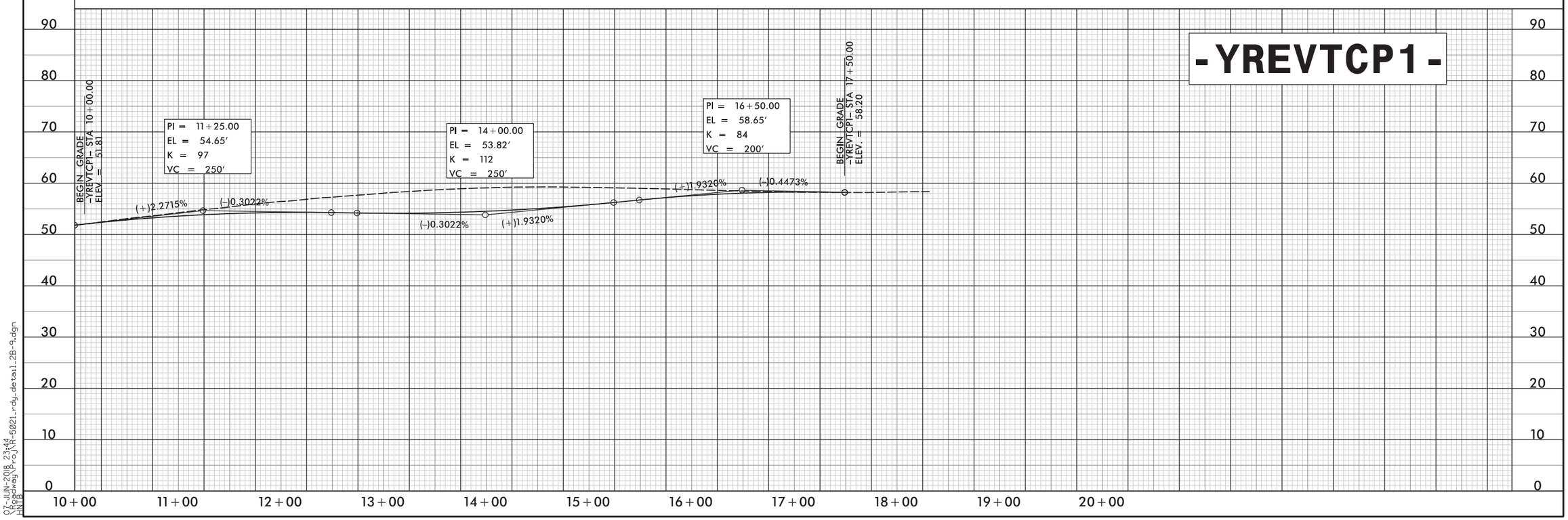
# DETAIL SHOWING -YREVTCP1-

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 2B-9 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

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5/14/99

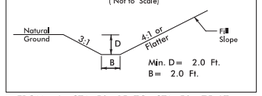
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 2D-1 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

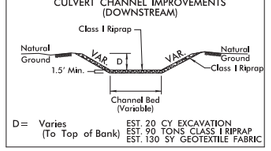
# DRAINAGE DETAILS

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



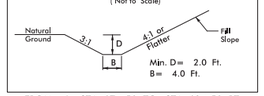

FROM –L– STA. 50+15 TO STA. 50+75 LT
FROM –YREV– STA. 8+00 TO STA. 17+00 LT
FROM –YREV– STA. 17+00 TO STA. 21+88 LT

## DETAIL B
( Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
(DOWNSTREAM)



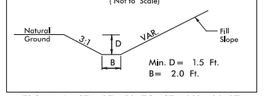

D= Varies (To Top of Bank)
EST. 20 CY EXCAVATION
EST. 90 TONS CLASS I RIPRAP
EST. 130 SY GEOTEXTILE FABRIC

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



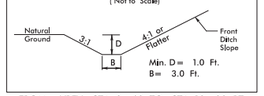

FROM –L– STA. 67+50 TO STA. 69+50 RT
FROM –L– STA. 70+30 TO STA. 77+65 RT
FROM –L– STA. 218+30 TO STA. 220+65 RT
FROM –L– STA. 221+85 TO STA. 223+50 RT
FROM –L– STA. 320+50 TO STA. 327+60 LT
FROM –Y– STA. 8+00 TO STA. 30+00 LT
FROM –Y– STA. 32+20 TO STA. 34+00 RT

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



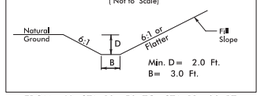

FROM –L– STA. 97+50 TO STA. 101+00 RT
FROM –L– STA. 101+00 TO STA. 103+25 RT
FROM –L– STA. 385+80 TO STA. 388+50 LT
FROM –L– STA. 391+85 TO STA. 394+65 RT
FROM –L– STA. 397+85 TO STA. 399+45 LT
FROM –L– STA. 404+50 TO STA. 408+50 RT
FROM –L– STA. 408+25 TO STA. 413+00 LT
FROM –Y22– STA. 27+80 TO STA. 30+85 RT

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



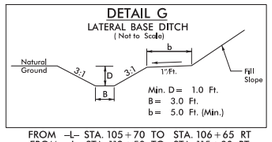

FROM –YREV– STA. 9+60 TO STA. 10+00 RT

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



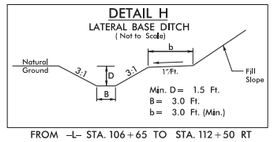

FROM –Y– STA. 10+50 TO STA. 12+00 RT

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



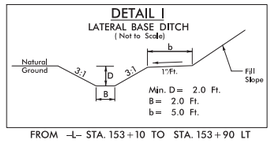

FROM –L– STA. 105+70 TO STA. 106+65 RT
FROM –L– STA. 112+50 TO STA. 115+00 RT
FROM –L– STA. 115+00 TO STA. 116+00 RT

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



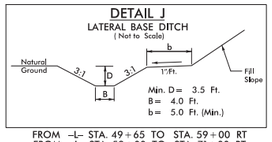

FROM –L– STA. 106+65 TO STA. 112+50 RT

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



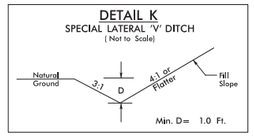

FROM –L– STA. 153+10 TO STA. 153+90 LT

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



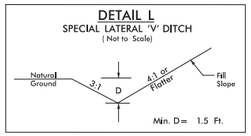

FROM –L– STA. 49+65 TO STA. 59+00 RT
FROM –L– STA. 59+00 TO STA. 71+00 RT
FROM –L– STA. 59+00 TO STA. 64+15 LT
FROM –L– STA. 64+15 TO STA. 65+26 LT

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



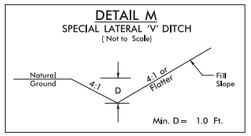

FROM –L– STA. 80+75 TO STA. 81+80 RT
FROM –L– STA. 87+00 TO STA. 90+00 RT
FROM –L– STA. 94+54 TO STA. 100+65 RT
FROM –L– STA. 205+50 TO STA. 206+50 RT
FROM –L– STA. 237+00 TO STA. 238+93 RT
FROM –L– STA. 228+00 TO STA. 232+30 RT
FROM –L– STA. 309+36 TO STA. 309+92 RT
FROM –YREV– STA. 16+72 TO STA. 17+00 RT
FROM –YREV– STA. 12+36 TO STA. 15+00 RT
FROM –YREV– STA. 10+50 TO STA. 11+90 RT
FROM –YREV– STA. 17+00 TO STA. 16+00 LT
FROM –YB– STA. 13+50 TO STA. 18+50 LT
FROM –Y4– STA. 10+95 TO STA. 11+75 LT
FROM –Y6– STA. 10+75 TO STA. 11+25 LT
FROM –Y6– STA. 10+75 TO STA. 11+25 RT
FROM –Y11– STA. 12+25 TO STA. 12+75 LT
FROM –Y11– STA. 12+25 TO STA. 12+75 RT
FROM –Y12– STA. 11+55 TO STA. 13+00 LT
FROM –Y12– STA. 11+55 TO STA. 12+80 RT
FROM –Y13– STA. 10+80 TO STA. 11+38 LT
FROM –Y15– STA. 10+75 TO STA. 11+50 LT
FROM –Y15– STA. 10+75 TO STA. 11+50 RT
FROM –Y18– STA. 10+66 TO STA. 11+50 LT
FROM –Y18– STA. 10+70 TO STA. 11+50 RT
FROM –Y19– STA. 11+00 TO STA. 12+25 LT
FROM –Y22– STA. 15+50 TO STA. 20+50 LT
FROM –Y22– STA. 14+00 TO STA. 18+00 RT
FROM –Y22– STA. 24+50 TO STA. 30+75 LT
FROM –Y22– STA. 25+50 TO STA. 27+50 RT
FROM –Y24– STA. 11+00 TO STA. 13+00 RT

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



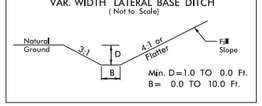

FROM –L– STA. 92+00 TO STA. 97+50 RT
FROM –L– STA. 148+00 TO STA. 148+70 LT
FROM –L– STA. 395+15 TO STA. 396+50 RT
FROM –L– STA. 400+00 TO STA. 400+50 LT
FROM –L– STA. 400+00 TO STA. 404+50 RT
FROM –L– STA. 402+50 TO STA. 405+50 LT
FROM –L– STA. 407+00 TO STA. 408+25 LT
FROM –YB– STA. 16+00 TO STA. 20+50 LT
FROM –YB– STA. 20+50 TO STA. 23+00 RT

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



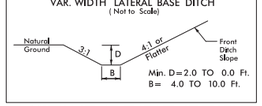

FROM –L– STA. 90+50 TO STA. 91+65 LT
FROM –L– STA. 211+62 TO STA. 213+00 LT
FROM –L– STA. 213+00 TO STA. 213+80 LT

## DETAIL N
VAR. WIDTH LATERAL BASE DITCH
( Not to Scale)



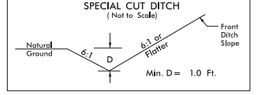

FROM –L– STA. 86+50 TO STA. 87+00 LT
FROM –L– STA. 216+00 TO STA. 216+50 RT
FROM –L– STA. 225+00 TO STA. 225+65 LT

## DETAIL O
VAR. WIDTH LATERAL BASE DITCH
( Not to Scale)



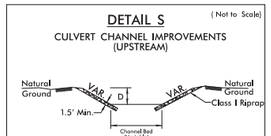

FROM –YREV– STA. 7+70 TO STA. 8+00 LT

## DETAIL R
SPECIAL CUT DITCH
( Not to Scale)



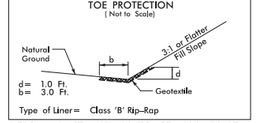

FROM –L– STA. 87+00 TO STA. 91+50 RT
FROM –L– STA. 381+00 TO STA. 381+50 RT

## DETAIL S
( Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
(UPSTREAM)




D= Varies (To Top of Bank)
EST. 40 CY EXCAVATION
EST. 45 TONS CLASS I RIPRAP
EST. 75 SY GEOTEXTILE FABRIC

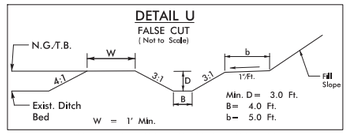
## DETAIL T
TOE PROTECTION
( Not to Scale)




d= 1.0 Ft.
b= 3.0 Ft.
Type of Liner= Class 'B' Rip-Rap

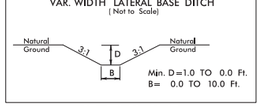
FROM –L– STA. 117+00 TO STA. 126+50 RT
FROM –L– STA. 226+50 TO STA. 226+75 RT
FROM –L– STA. 255+00 TO STA. 257+30 LT
FROM –L– STA. 265+00 TO STA. 267+00 LT
FROM –L– STA. 353+50 TO STA. 356+00 RT
FROM –L– STA. 366+70 TO STA. 369+10 LT
FROM –Y22– STA. 23+25 TO STA. 24+00 LT

## DETAIL U
FALSE CUT
( Not to Scale)



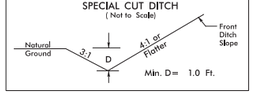

FROM –L– STA. 205+50 TO STA. 209+00 LT

## DETAIL V
VAR. WIDTH LATERAL BASE DITCH
( Not to Scale)



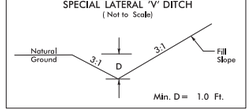

–YB– STA. 16+00 LT.

## DETAIL W
SPECIAL CUT DITCH
( Not to Scale)



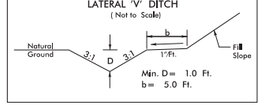

FROM –Y3– STA. 11+75 TO STA. 12+36 RT
FROM –Y3– STA. 11+75 TO STA. 12+56 LT

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



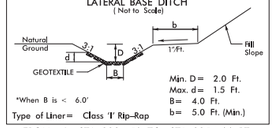

FROM –L– STA. 300+95 TO STA. 301+50 RT
FROM –Y9– STA. 10+90 TO STA. 12+00 LT
FROM –Y9– STA. 11+00 TO STA. 12+00 RT
FROM –Y24– STA. 11+25 TO STA. 12+72 LT

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




FROM –L– STA. 214+58 TO STA. 216+00 RT
FROM –L– STA. 221+00 TO STA. 225+00 LT
FROM –L– STA. 227+50 TO STA. 228+25 RT
FROM –L– STA. 233+25 TO STA. 235+50 RT
FROM –L– STA. 317+25 TO STA. 319+40 RT
FROM –Y11– STA. 11+02 TO STA. 12+25 LT
FROM –Y11– STA. 11+07 TO STA. 12+25 RT
FROM –Y22– STA. 21+35 TO STA. 23+23 LT
FROM –Y22– STA. 18+00 TO STA. 23+10 RT
FROM –Y22– STA. 23+14 TO STA. 25+00 RT

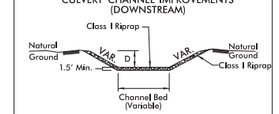
## DETAIL Z
LATERAL BASE DITCH
( Not to Scale)




*When B is < 6.0'
Type of Liner= Class 'I' Rip-Rap

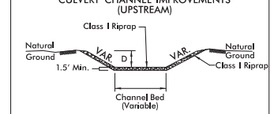
FROM –L– STA. 223+50 TO STA. 225+66 RT
FROM –L– STA. 246+00 TO STA. 253+50 RT

## DETAIL AA
( Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
(DOWNSTREAM)



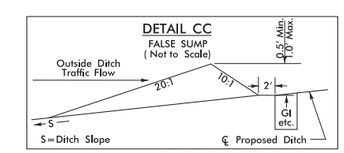

D= Varies (To Top of Bank)
EST. 95 CY EXCAVATION
EST. 125 TONS CLASS I RIPRAP
EST. 160 SY GEOTEXTILE FABRIC

## DETAIL BB
( Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
(UPSTREAM)




D= Varies (To Top of Bank)
EST. 85 CY EXCAVATION
EST. 90 TONS CLASS I RIPRAP
EST. 140 SY GEOTEXTILE FABRIC

## DETAIL CC
FALSE SUMP
( Not to Scale)




–L– STA. 211+75

07-JUN-2018 23:00
\Roadway\Proj\R-5021_RDY_PSH2D_Ditch_Details.dgn
HNTB

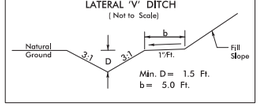
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 2D-2 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

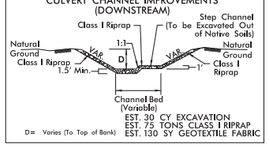
# DRAINAGE DETAILS

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

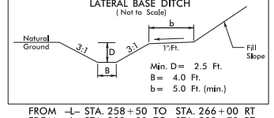



FROM –L– STA. 148+70 TO STA. 152+50 LT
FROM –L– STA. 242+50 TO STA. 246+00 RT
FROM –YREV– STA. 23+50 TO STA. 28+00 LT

## DETAIL EE
( Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
(DOWNSTREAM)

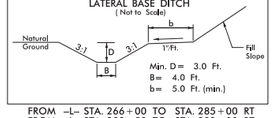



## DETAIL FF
LATERAL BASE DITCH
( Not to Scale)



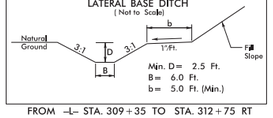

FROM –L– STA. 258+50 TO STA. 266+00 RT
FROM –L– STA. 292+00 TO STA. 308+70 RT

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



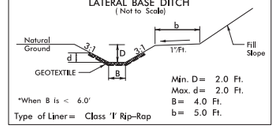

FROM –L– STA. 266+00 TO STA. 285+00 RT
FROM –L– STA. 288+50 TO STA. 292+00 RT

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



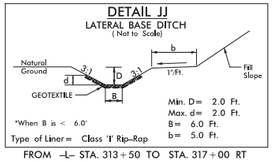

FROM –L– STA. 309+35 TO STA. 312+75 RT

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



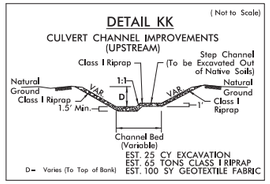

FROM –L– STA. 316+25 TO STA. 318+00 LT
FROM –L– 368+23 STA. TO STA. 369+40 RT

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

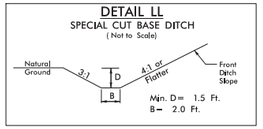



FROM –L– STA. 313+50 TO STA. 317+00 RT

## DETAIL KK
( Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
(UPSTREAM)

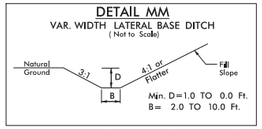



## DETAIL LL
SPECIAL CUT BASE DITCH
( Not to Scale)



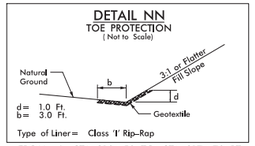

FROM –L– STA. 229+00 TO STA. 232+20 LT

## DETAIL MM
VAR. WIDTH LATERAL BASE DITCH
( Not to Scale)



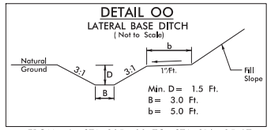

FROM –L– STA. 153+90 TO STA. 154+00 RT
FROM –L– STA. 228+00 TO STA. 229+00 LT

## DETAIL NN
TOE PROTECTION
( Not to Scale)



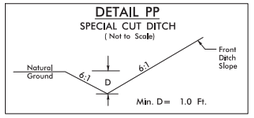

FROM –L– STA. 216+50 TO STA. 217+70 RT
FROM –L– STA. 382+70 TO STA. 383+00 LT

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



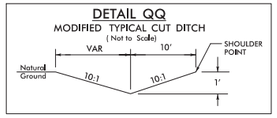

FROM –L– STA. 305+00 TO STA. 316+25 LT

## DETAIL PP
SPECIAL CUT DITCH
( Not to Scale)



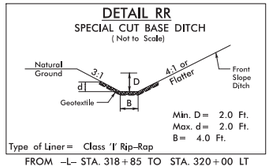

FROM –L– STA. 320+00 TO STA. 323+25 RT
FROM –L– STA. 324+00 TO STA. 326+60 RT

## DETAIL QQ
MODIFIED TYPICAL CUT DITCH
( Not to Scale)



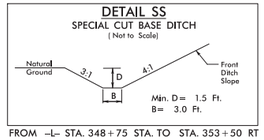

FROM –L– STA. 327+25 TO STA. 328+35 RT

## DETAIL RR
SPECIAL CUT BASE DITCH
( Not to Scale)



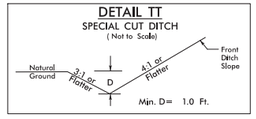

FROM –L– STA. 318+85 TO STA. 320+00 LT

## DETAIL SS
SPECIAL CUT BASE DITCH
( Not to Scale)



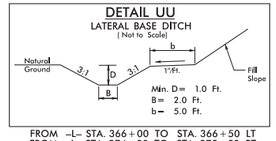

FROM –L– STA. 348+75 STA. TO STA. 353+50 RT

## DETAIL TT
SPECIAL CUT DITCH
( Not to Scale)



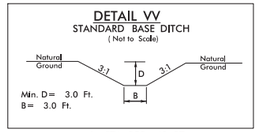

FROM –L– STA. 353+50 TO STA. 356+00 RT
FROM –L– STA. 375+50 TO STA. 381+00 RT
FROM –L– STA. 382+50 TO STA. 385+00 RT

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



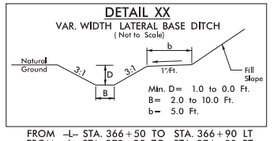

FROM –L– STA. 366+00 TO STA. 366+50 LT
FROM –L– STA. 374+00 TO STA. 375+50 RT

## DETAIL VV
STANDARD BASE DITCH
( Not to Scale)



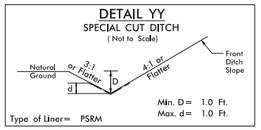

–L– STA. 353+48 RT

## DETAIL XX
VAR. WIDTH LATERAL BASE DITCH
( Not to Scale)



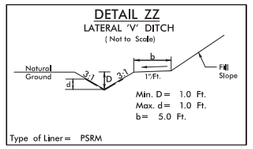

FROM –L– STA. 366+50 TO STA. 366+90 LT
FROM –L– STA. 373+25 TO STA. 374+00 RT

## DETAIL YY
SPECIAL CUT DITCH
( Not to Scale)



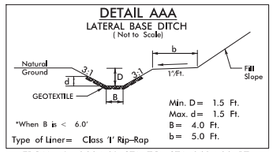

FROM –L– STA. 364+00 TO STA. 364+75 RT

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



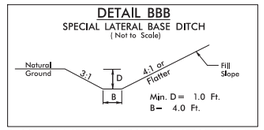

FROM –L– STA. 364+75 TO STA. 366+21 RT

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



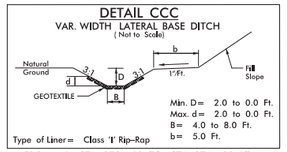

FROM –L– 366+60 STA. TO STA. 368+23 RT

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



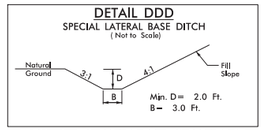

FROM –YREV– STA. 26+00 TO STA. 28+50 RT
FROM –YREV– STA. 28+50 TO STA. 29+00 RT

## DETAIL CCC
VAR. WIDTH LATERAL BASE DITCH
( Not to Scale)



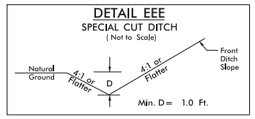

FROM –L– STA. 373+60 TO STA. 374+00 LT

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



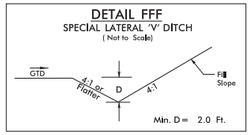

FROM –L– STA. 381+55 TO STA. 382+75 LT
FROM –L– STA. 409+00 TO STA. 413+00 RT
FROM –L– STA. 413+00 TO STA. 417+70 LT
FROM –Y22– STA. 38+05 TO STA. 42+00 RT

## DETAIL EEE
SPECIAL CUT DITCH
( Not to Scale)



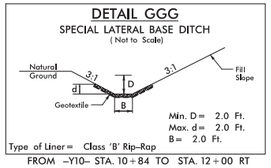

FROM –L– STA. 386+00 TO STA. 388+45 RT
FROM –L– STA. 396+50 TO STA. 398+00 RT
FROM –L– STA. 400+00 TO STA. 403+50 RT

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



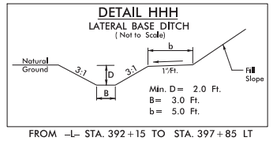

FROM –YREV– STA. 22+83 TO STA. 24+93 RT

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



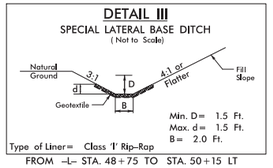

FROM –Y10– STA. 10+84 TO STA. 12+00 RT

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



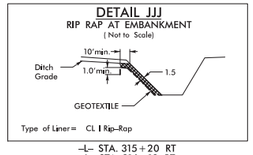

FROM –L– STA. 392+15 TO STA. 397+85 LT

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



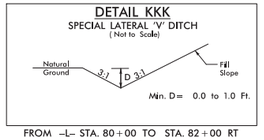

FROM –L– STA. 48+75 TO STA. 50+15 LT

## DETAIL JJJ
RIP RAP AT EMBANKMENT
( Not to Scale)



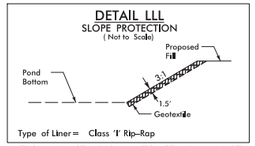

–L– STA. 315+20 RT
–L– STA. 316+12 RT
–Y22– STA. 23+00 RT
–Y22– STA. 23+15 RT

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




FROM –L– STA. 80+00 TO STA. 82+00 RT

## DETAIL LLL
SLOPE PROTECTION
( Not to Scale)




FROM –L– STA. 213+00 TO STA. 214+00 LT

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 2D-3 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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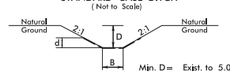
# DRAINAGE DETAILS

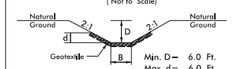
## DETAIL MMM
STANDARD BASE DITCH
( Not to Scale)




Type of Liner= PSRM

–L– STA. 416+60 RT

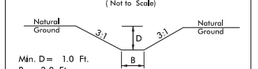
## DETAIL NNN
STANDARD BASE DITCH
( Not to Scale)




Type of Liner= Class 'I' Rip-Rap

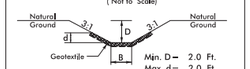
–L– STA. 428+50 LT

## DETAIL OOO
STANDARD BASE DITCH
( Not to Scale)




–L– STA. 97+92 RT
–L– STA. 288+89 RT
–L– STA. 375+50 RT
–L– STA. 392+20 RT
–L– STA. 397+95 LT
–L– STA. 408+25 LT
FROM –Y22– STA. 33+40 TO STA. 33+90 LT

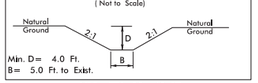
## DETAIL QQQ
STANDARD BASE DITCH
( Not to Scale)




Type of Liner= Class 'I' Rip-Rap

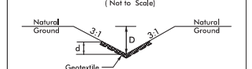
–L– STA. 324+30 LT

## DETAIL RRR
STANDARD BASE DITCH
( Not to Scale)




–Y22– STA. 33+40 LT

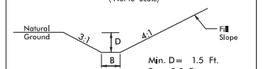
## DETAIL SSS
STANDARD 'V' DITCH
( Not to Scale)




Type of Liner= Class 'B' Rip-Rap

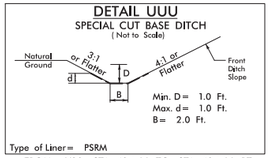
–L– STA. 324+00 RT

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




FROM –L– STA. 408+50 TO STA. 409+00 RT

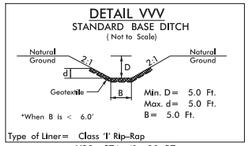
## DETAIL UUU
SPECIAL CUT BASE DITCH
( Not to Scale)




Type of Liner= PSRM

FROM –Y22– STA. 42+00 TO STA. 43+00 RT

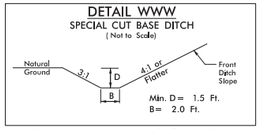
## DETAIL VVV
STANDARD BASE DITCH
( Not to Scale)




Type of Liner= Class 'I' Rip-Rap

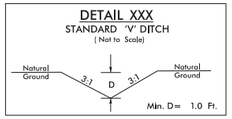
–Y22– STA. 41+80 RT

## DETAIL WWW
SPECIAL CUT BASE DITCH
( Not to Scale)



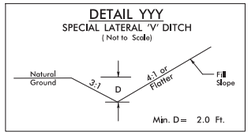

FROM –Y22– STA. 38+25 TO STA. 40+50 LT

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



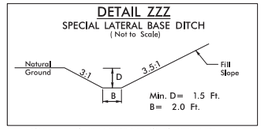

–L– STA. 410+35 LT
–L– STA. 412+85 LT
–L– STA. 418+40 LT
–YA– STA. 11+00 TO 11+63.12 LT
–YREV– STA. 33+50 RT
–Y22– STA. 15+50 LT

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



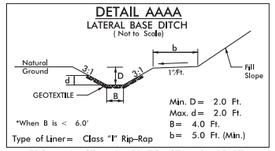

FROM –L– STA. 145+50 TO STA. 152+00 RT

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




FROM –L– STA. 104+00 TO STA. 105+15 RT

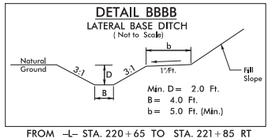
## DETAIL AAAA
LATERAL BASE DITCH
( Not to Scale)




Type of Liner= Class 'II' Rip-Rap

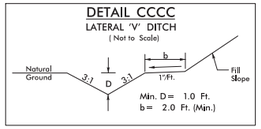
FROM –L– STA. 48+50 TO STA. 49+65 RT

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



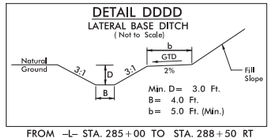

FROM –L– STA. 220+65 TO STA. 221+85 RT

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



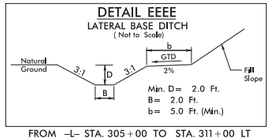

FROM –L– STA. 241+00 TO STA. 242+50 RT

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



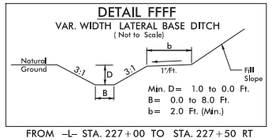

FROM –L– STA. 285+00 TO STA. 288+50 RT

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



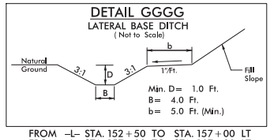

FROM –L– STA. 305+00 TO STA. 311+00 LT

## DETAIL FFFF
VAR. WIDTH LATERAL BASE DITCH
( Not to Scale)



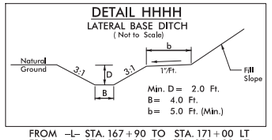

FROM –L– STA. 227+00 TO STA. 227+50 RT

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



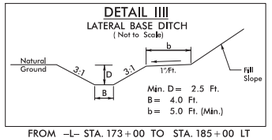

FROM –L– STA. 152+50 TO STA. 157+00 LT
FROM –L– STA. 157+00 TO STA. 167+90 LT

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



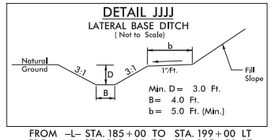

FROM –L– STA. 167+90 TO STA. 171+00 LT
FROM –L– STA. 171+00 TO STA. 173+00 LT

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



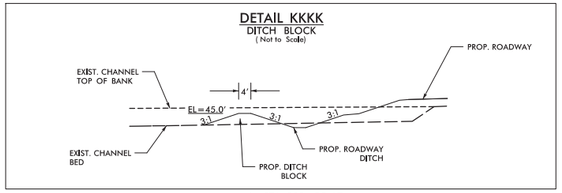

FROM –L– STA. 173+00 TO STA. 185+00 LT

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



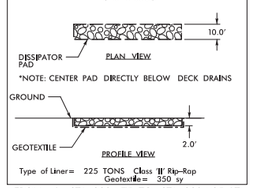

FROM –L– STA. 185+00 TO STA. 199+00 LT
FROM –L– STA. 199+00 TO STA. 205+50 LT
FROM –L– STA. 209+00 TO STA. 210+50 LT
FROM –L– STA. 215+00 TO STA. 217+80 LT

## DETAIL KKKK
DITCH BLOCK
( Not to Scale)




–L– STA. 203+25 LT

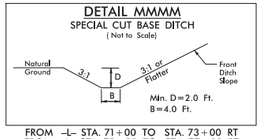
## DETAIL LLLL
DECK DRAIN DISSIPATOR PAD
( Not to Scale)




Type of Liner= 225 TONS Class 'II' Rip-Rap
Geotextile= 350 sy

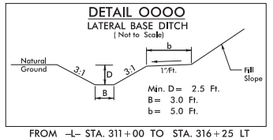
FROM –L– STA. 388+75 TO STA. 389+35 LT
FROM –L– STA. 388+70 TO STA. 389+20 RT
FROM –L– STA. 391+05 TO STA. 391+55 LT
FROM –L– STA. 390+95 TO STA. 391+40 RT

## DETAIL MMMM
SPECIAL CUT BASE DITCH
( Not to Scale)



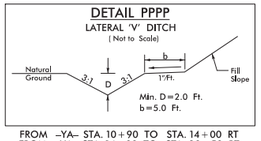

FROM –L– STA. 71+00 TO STA. 73+00 RT
FROM –L– STA. 73+00 TO STA. 77+00 RT
FROM –L– STA. 82+00 TO STA. 86+00 RT

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



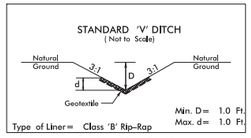

FROM –L– STA. 311+00 TO STA. 316+25 LT

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




FROM –YA– STA. 10+90 TO STA. 14+00 RT
FROM –YA– STA. 14+00 TO STA. 20+50 RT

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




Type of Liner= Class 'B' Rip-Rap

–L– STA. 324+00 RT

07-JUN-2018 23:00
\Roadway\Proj\R-5021_RDY_PSH2D_Ditch_Details.dgn
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NC License No: C-1554

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|---|---|
| R-5021 | 2D-4 |
| R/W SHEET NO. | |
| | HYDRAULICS ENGINEER |

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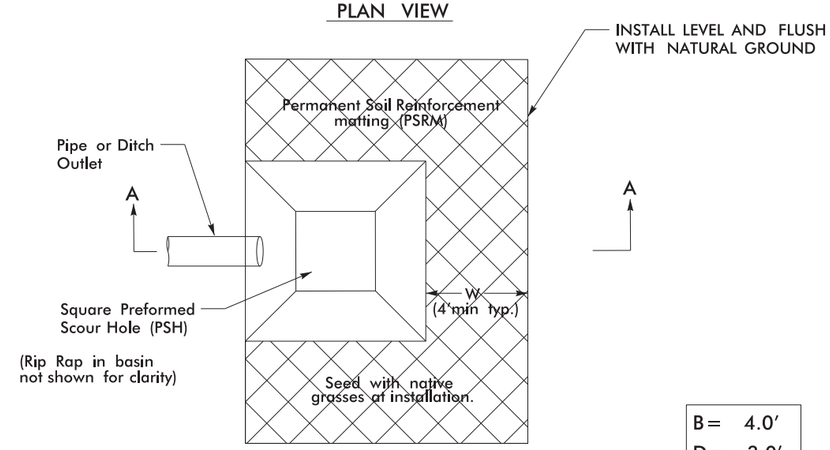
# PREFORMED SCOUR HOLE

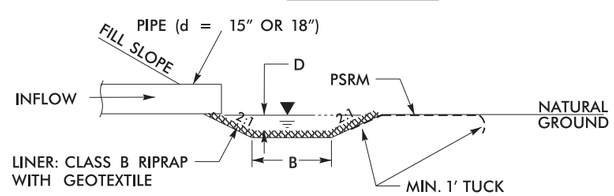
*NOT TO SCALE

## PLAN VIEW




| | |
|---|---|
| B = | 4.0' |
| D = | 3.0' |
| W = | 4.0' |

## SECTION A–A




3/08

–L– STA. 84+26 LT
–L– STA. 219+96 LT
–L– STA. 370+62 RT

5/14/99
27-JAN-2017 15:57
R:\Roadway\Proj\R-5021_RDY_DRAINAGE_DETAIL_2D4.dgn
HNTB

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 2G-1 |

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 45898 ENGINEER JOSHUA M. NORRIS

DocuSigned by: Josh Norris 2/23/2018

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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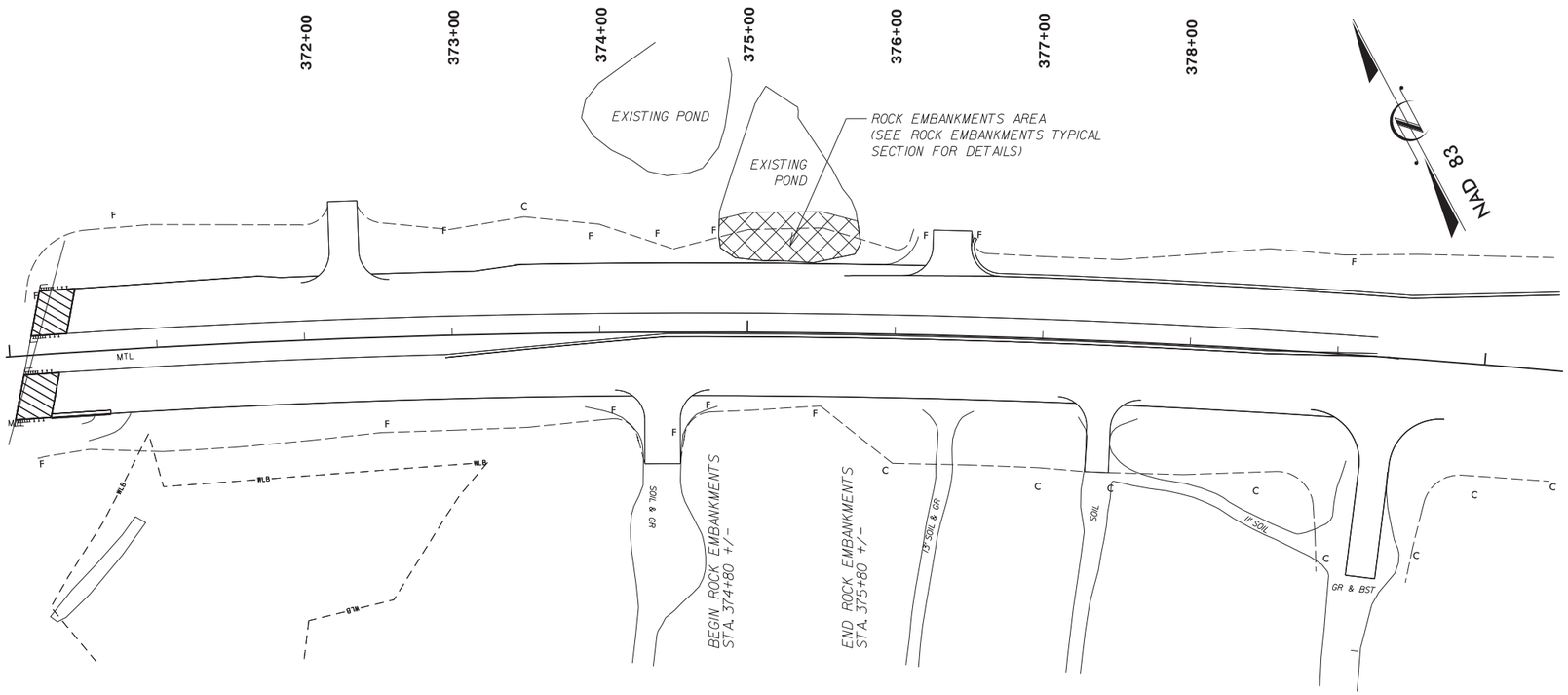
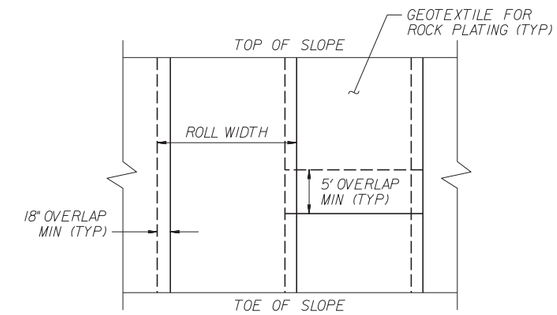



## ROCK EMBANKMENTS LOCATION PLAN

NOT TO SCALE




## GEOTEXTILE OVERLAP DETAIL

(PLAN VIEW)

ROCK EMBANKMENTS

FOR ROCK EMBANKMENTS, SEE ROCK EMBANKMENTS SPECIAL PROVISION.

USE ROCK EMBANKMENTS AT FOLLOWING LOCATIONS:

| -LINE- | APPROX. BEGINNING STATION | APPROX. ENDING STATION | LOCATION LT/RT |
|---|---|---|---|
| -L- | 374+80 +/- -L- | 375+80 +/- -L- | LEFT |

CONSTRUCT ROCK EMBANKMENTS TO THE ELEVATION SHOWN IN THE ROCK EMBANKMENTS TYPICAL SECTION. ABOVE THE NORMAL WATER SURFACE AND ACCORDING TO THE ROCK EMBANKMENTS SPECIAL PROVISION.

FILL VOIDS IN THE TOP OF ROCK EMBANKMENTS WITH CLASS B AND CLASS A RIP RAP.

PLACE *57 STONE (SELECT MATERIAL, CLASS VI) UP TO 1 FT. ABOVE ROCK EMBANKMENTS AS SHOWN IN THE PLAN.

CONSTRUCT ROCK PLATING ABOVE ROCK EMBANKMENTS FROM ELEVATION SHOWN IN THE ROCK EMBANKMENTS TYPICAL SECTION. ABOVE THE NORMAL WATER SURFACE TO THE SHOULDER HINGE POINT AND ACCORDING TO THE SECTION 275 OF THE STANDARD SPECIFICATIONS.

INSTALL GEOTEXTILE ON TOP OF NO. 57 STONE IN ACCORDANCE WITH THE ARTICLE 270-3 OF THE STANDARD SPECIFICATIONS.

ESTIMATED MATERIAL QUANTITIES FOR ROCK EMBANKMENTS

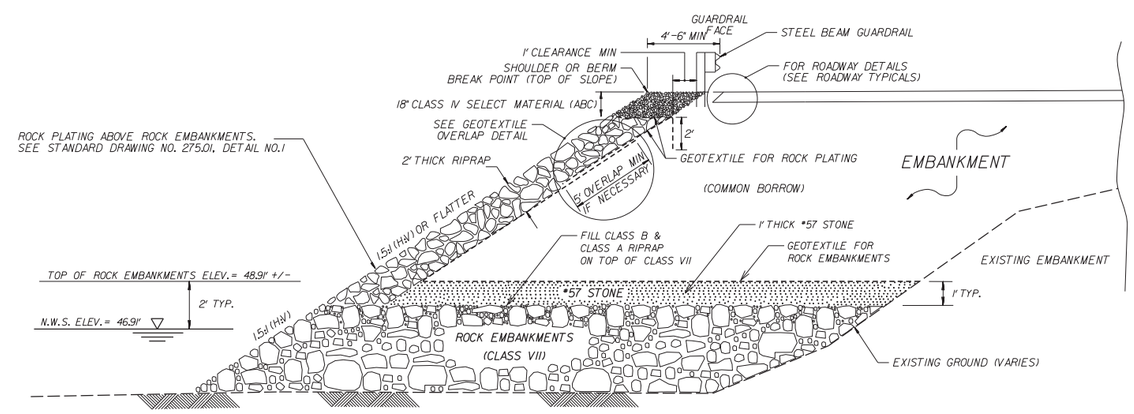
ROCK EMBANKMENTS (SELECT MATERIAL, CLASS VIII) = 275 TONS

RIP RAP CLASS A = 40 TONS

RIP RAP CLASS B = 40 TONS

*57 STONE (SELECT MATERIAL, CLASS VI) = 80 TONS

GEOTEXTILE FOR ROCK EMBANKMENTS = 125 SY




## ROCK EMBANKMENTS TYPICAL SECTION

NOT TO SCALE

| | |
|---|---|
| PREPARED BY: JOSHUA M. NORRIS, PE | DATE: 02-15-18 |
| REVIEWED BY: BEN D. LACKEY JR, PE | DATE: 02-15-18 |

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

**GEOTECHNICAL ENGINEERING UNIT**

ROCK EMBANKMENTS DETAILS

REVISIONS

| NO. | BY | DATE | NO. | BY | DATE |
|---|---|---|---|---|---|
| 1 | - | - | 3 | - | - |
| 2 | - | - | 4 | - | - |

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| R-5021 | 4 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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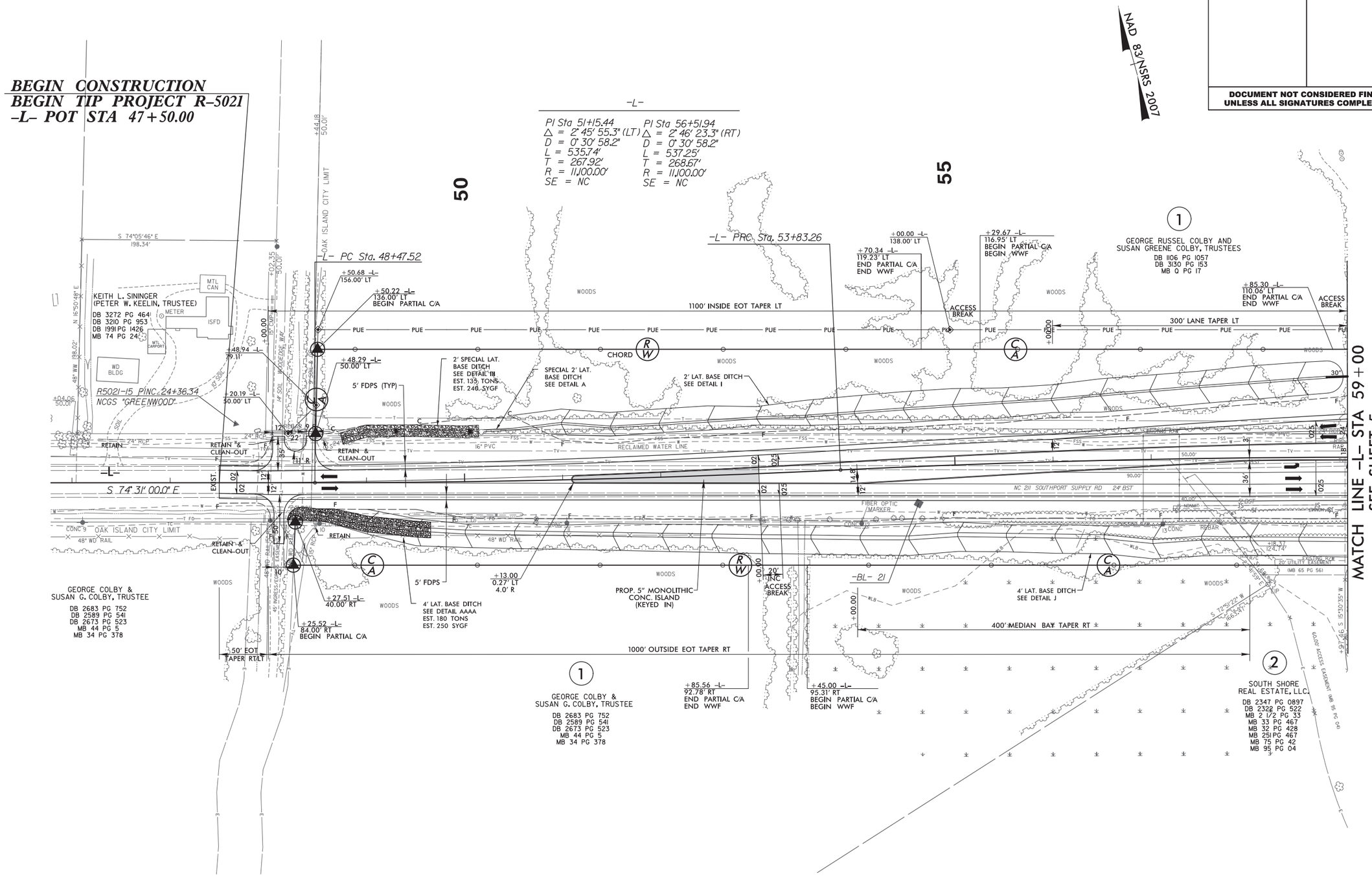
REVISIONS

5/14/99

02-13-2017 - ADDED ACCESS BREAKS ON PARCEL 1 DMW
04-18-2018 - MOVED ACCESS BREAK ON PARCEL 1 OUT OF THE WETLAND AREA. DMW




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 41
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 5 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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


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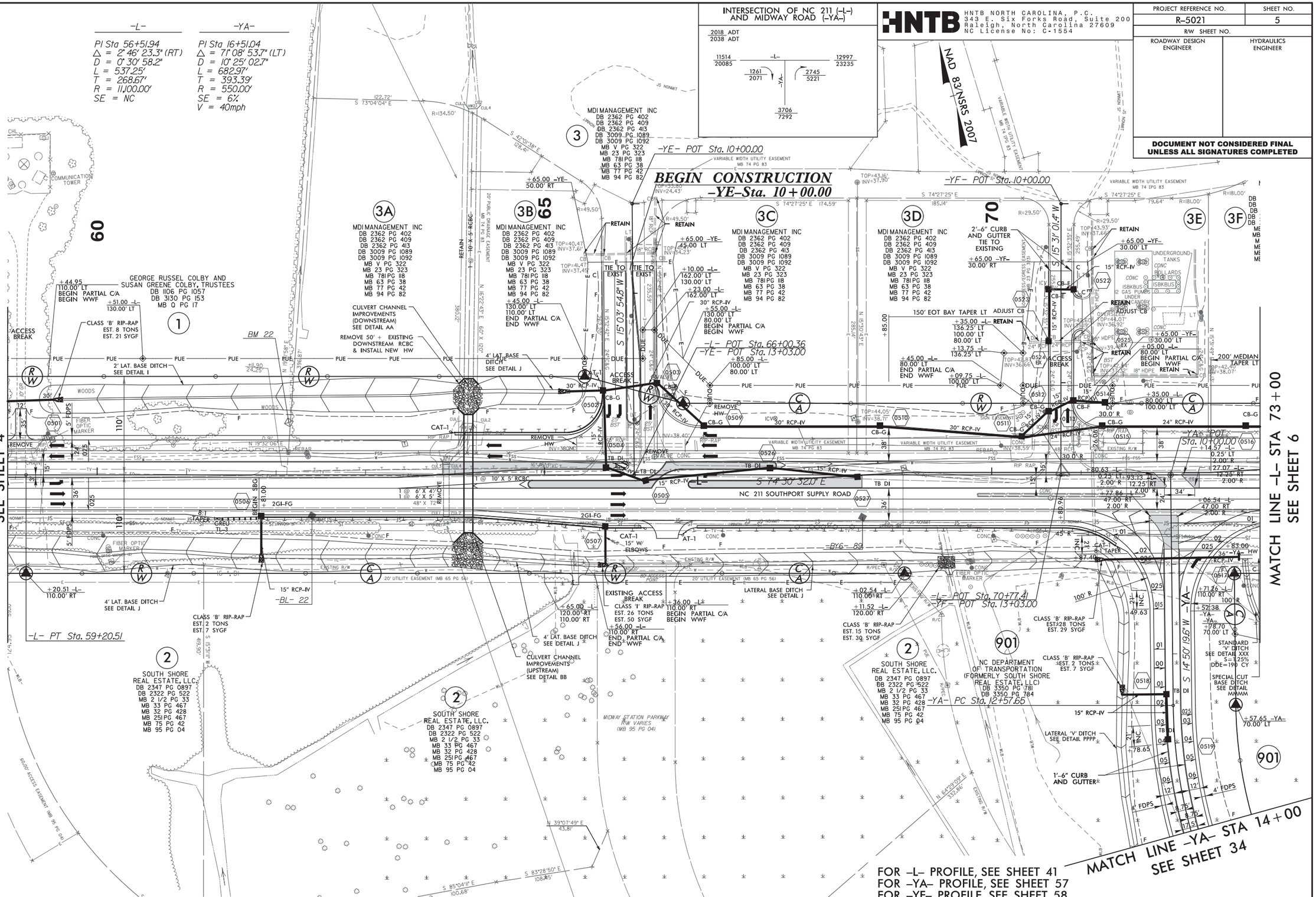
5/14/99

REVISIONS

02-13-2017 - REVISED ACCESS BREAKS ON PARCEL 1. DWW
08-02-2017 - REVISED TCE TO PARCEL 3 SUBDIVIDED & ADDED TCE ON PARCELS 3B,3C,3E AND 3D. DWW
02-09-2018 - ADDED CONTROL OF ACCESS ON PARCEL 3D. DWW
04-18-2018 - REVISED TCE & DUE ON PARCEL 3B.REVISED TCE,PUE & DUE ON PARCEL 3C. DWW




NOTE:
1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 41
FOR -YA- PROFILE, SEE SHEET 57
FOR -YE- PROFILE, SEE SHEET 58
FOR -YF- PROFILE, SEE SHEET 58
FOR -YE- DIRECTIONAL CROSSOVER DETAIL, SEE SHEET 2B-1
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

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FOR INTERCHANGE OVERVIEW, SEE SHEET 2B–7
FOR BRIDGE SKETCH, SEE SHEET 2B–5
FOR –L– PROFILE, SEE SHEET 42
FOR –YREV– PROFILE, SEE SHEET 55 & 56
FOR –YB– PROFILE, SEE SHEET 57
FOR DRAINAGE DETAILS, SEE SHEETS 2D–1 THRU 2D–3
FOR RETAINING WALL PLANS, SEE SHEETS WALL 3 AND WALL 4
FOR STRUCTURE PLANS, SEE SHEET S–_ AND S–_


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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R–5021 | 6 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

INTERSECTION OF NC 211 (–L–) AND MIDWAY ROAD (–YB–)

2018 ADT
2038 ADT

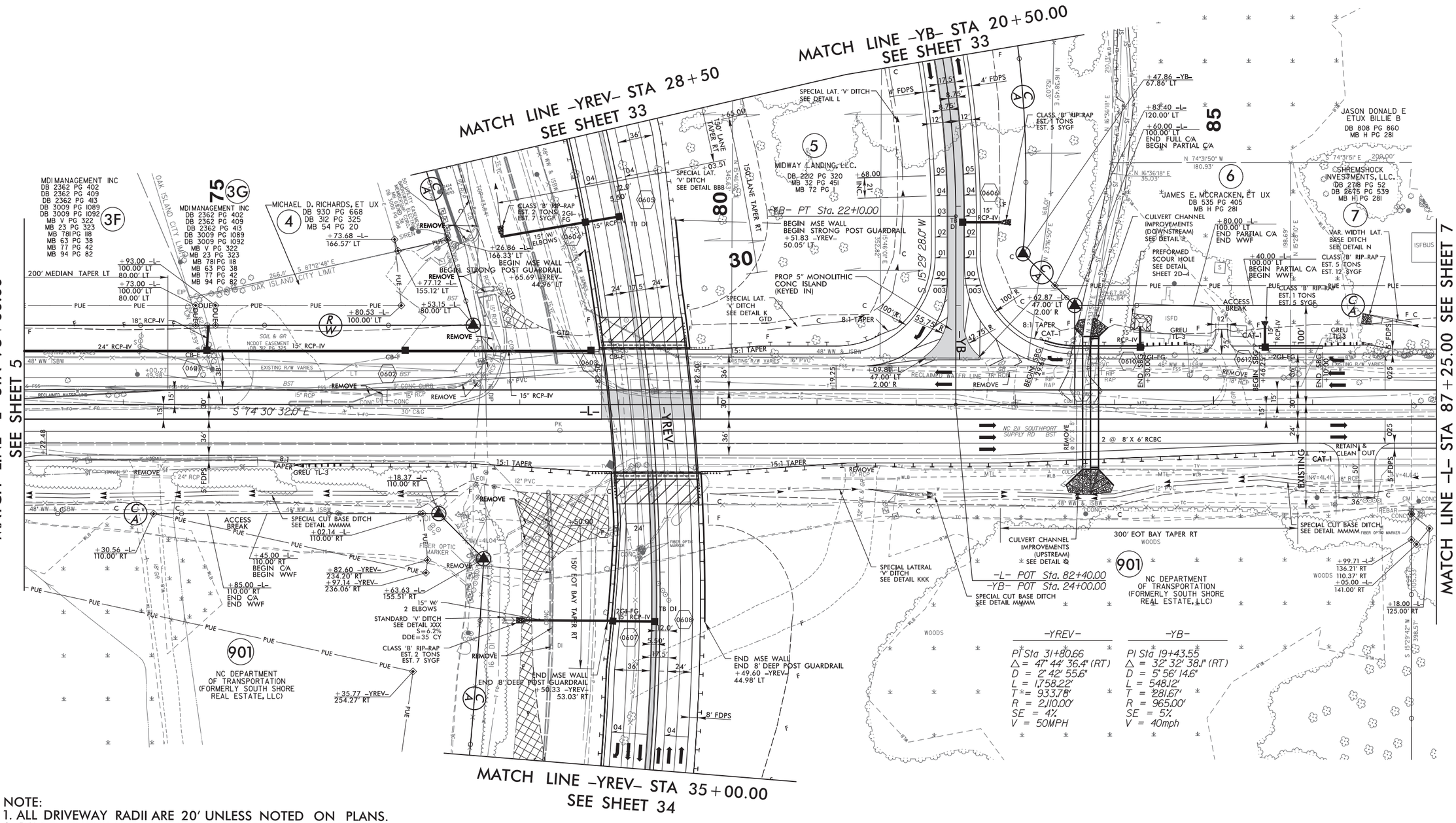
3706 / 7292 –YB–
1262 / 2071 –L–
2745 / 5221
12997 / 23235
14480 / 26385
NC 211

NAD 83/NSRS 2007

REVISIONS

06-16-2016 – Replaced Easement with PUE on Parcel 914. MJD
08-02-2017 – Parcels 3 & 4 Revised ROW, Removed PUE & Added DUE on Parcels 3 & 4. Revised ROW, Removed Access Break & Added PUE on Parcel 5. Revised PUE on Parcel 6 DMW
09-20-2017 – PUE was Revised on Parcel 4. PUE was Added to Parcel 3G. DMW
02-09-2018 – PUE and Access Break was Added on Parcel 901. TSG

5/14/99




NOTE:
1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

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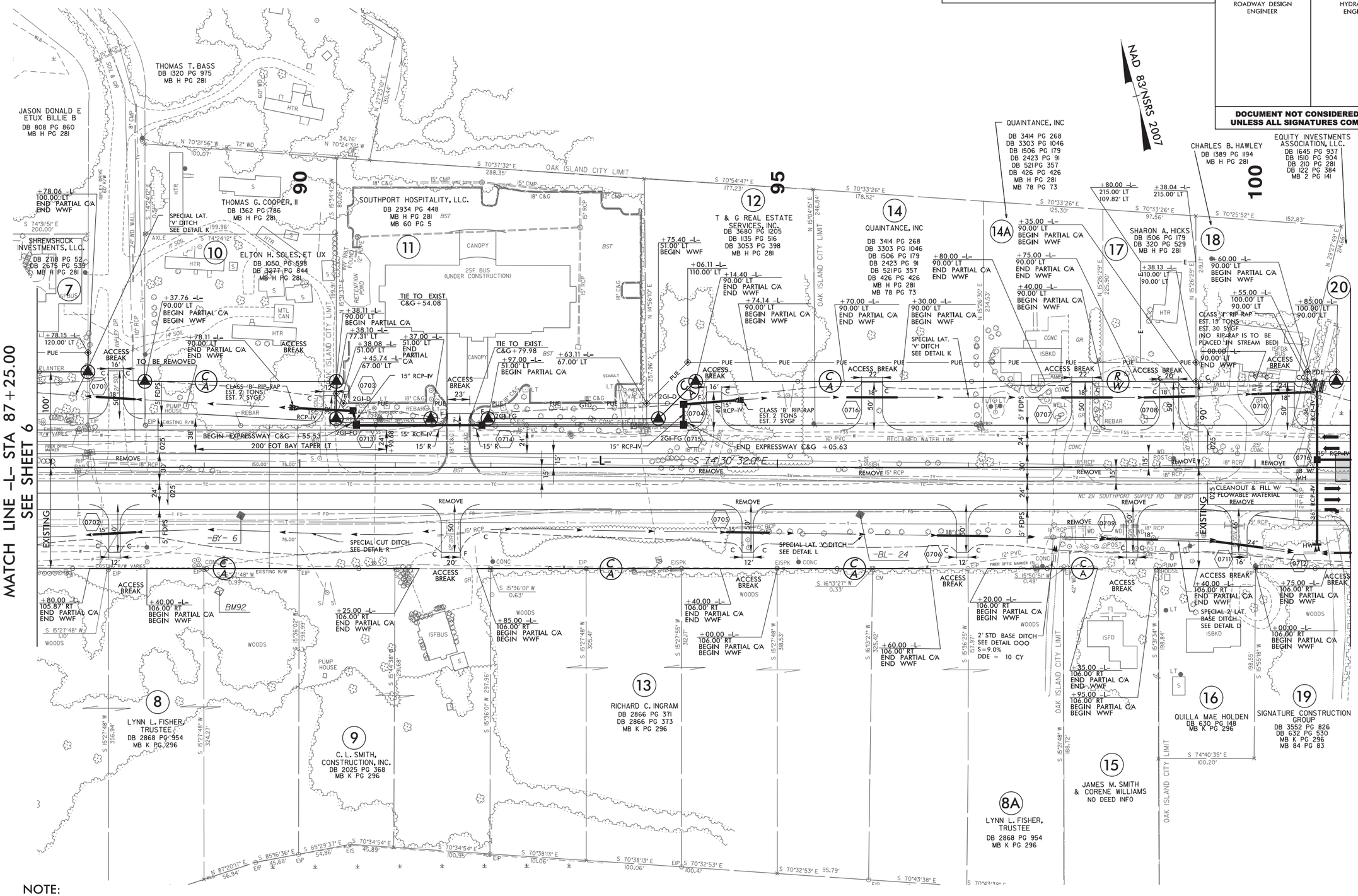
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 7 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

REVISIONS

09-07-2016 – ADDED TCE ON PARCEL 17 AROUND HOUSE. ABH
02-23-2017 – REVISED R/W & PUE ON PARCEL 11 & 12. DMW
03-13-2017 – REVISED R/W NUMBER FOR PARCEL 8 TO 8A. DMW
05-16-2017 – UPDATED SURVEY SPLIT R/W NUMBER FOR PARCEL 14 INTO 14 & 14A. DMW
07-18-2017 – ADDED ACCESS BREAK TO PARCEL 14 SINCE IT WAS PREVIOUSLY DIVIDED INTO 14 & 14A. DMW
02-09-2018 – PARCEL 10 WAS NEVER CHANGED ACCORDING 02-13-2017 REVISION. R/W WAS CHANGED BACK TO ORIGINAL PURCHASED AREA. TSG

5/14/99




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR –L– PROFILE, SEE SHEET 42
FOR DRAINAGE DETAILS, SEE SHEETS 2D–1 THRU 2D–3

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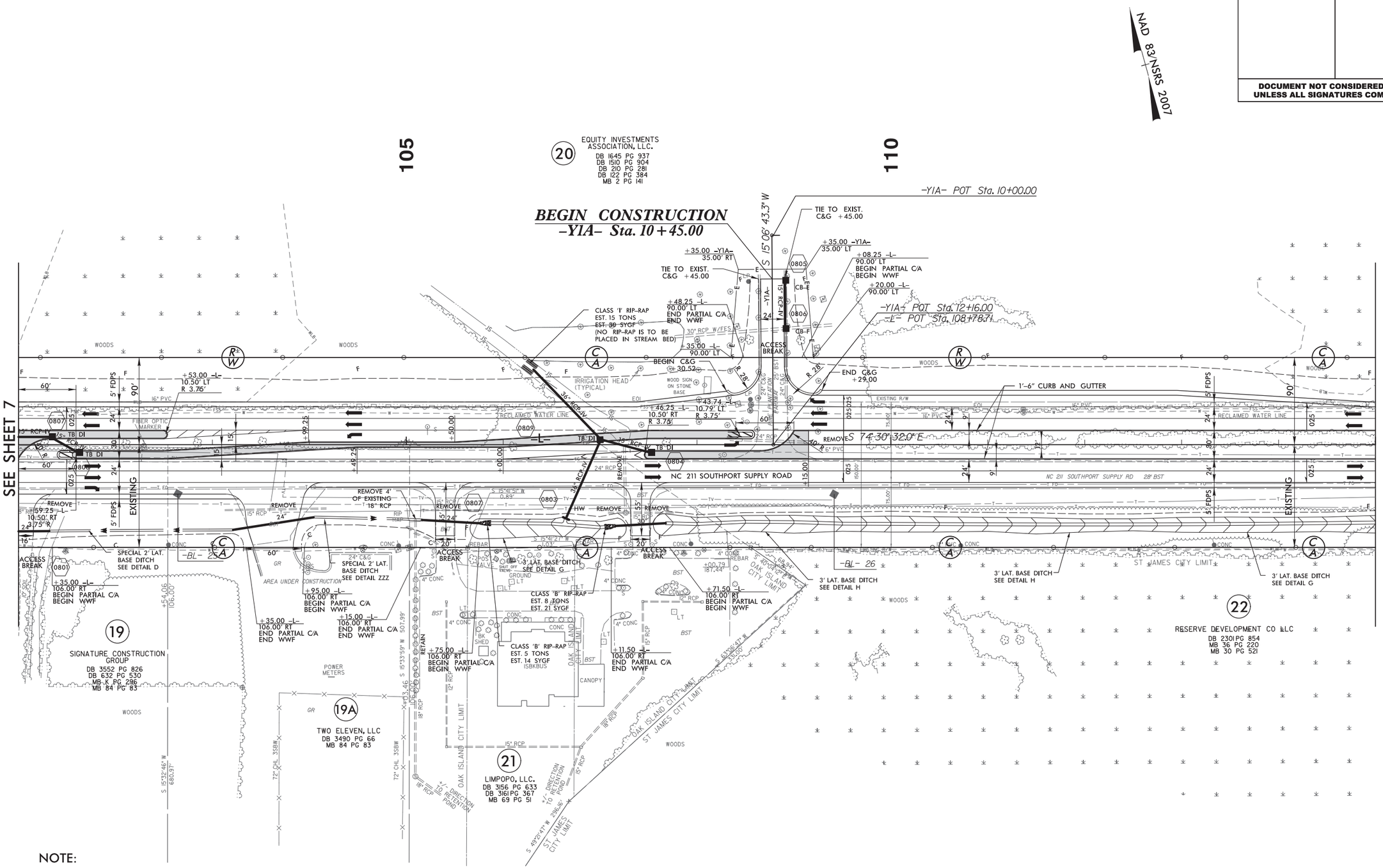
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 8 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

01-17-2017 – REVISED DRIVEWAYS AND DRAINAGE ON PARCELS 19A & 21 – DMW
03-26-2018 –PROVIDED A LEFTOVER FOR PARCEL 20, REDUCED THE ROW ON PARCEL 20, SHIFTED THE ACCESS BREAK ON PARCEL 20 & ADDED TCE ON PARCEL 20 – DMW

5/14/99




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR –Y1A– PROFILE, SEE SHEET 59
FOR –L– PROFILE, SEE SHEET 43
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

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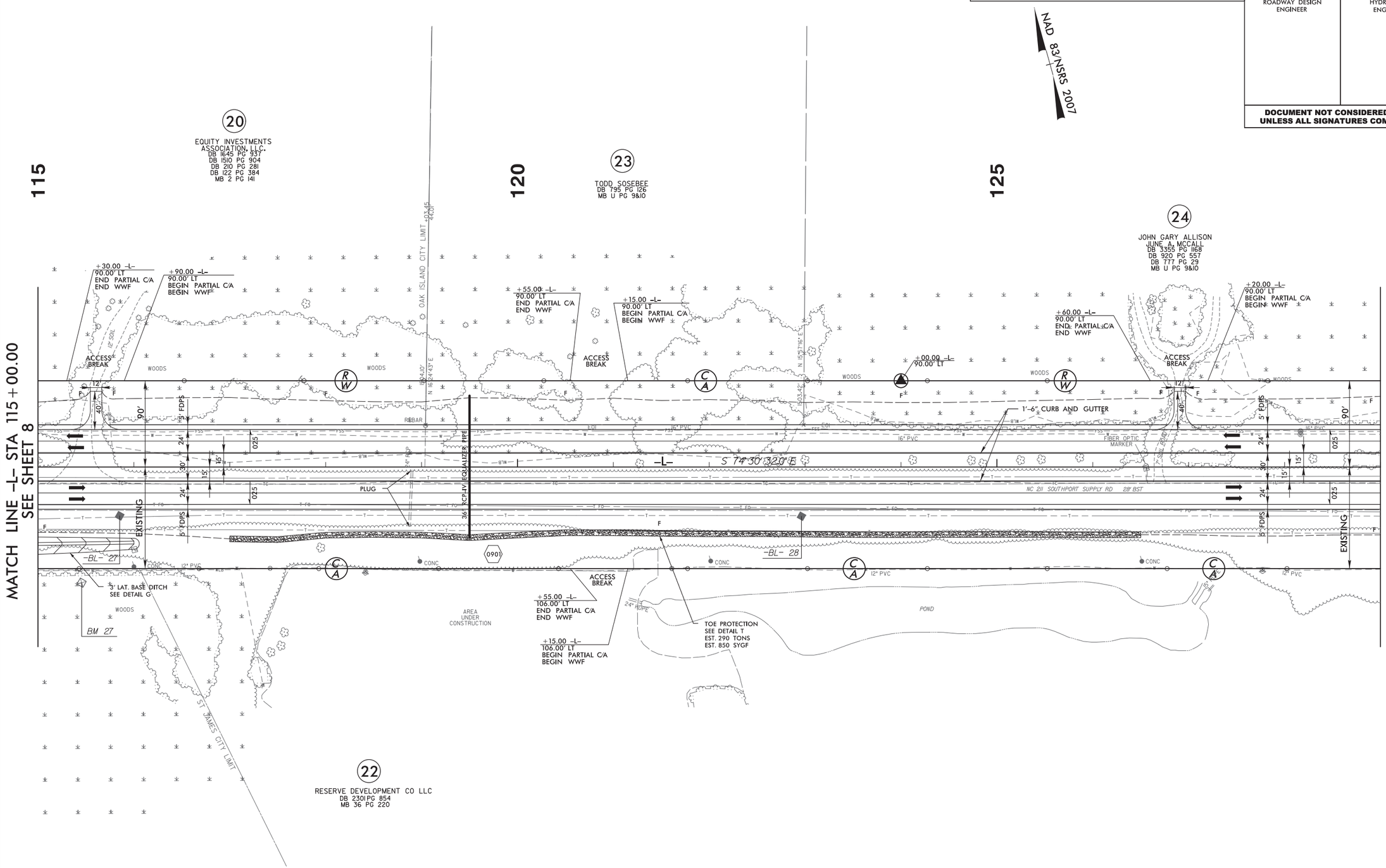
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 9 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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




NOTE:

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2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 43
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

REVISIONS

5/14/99

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 10 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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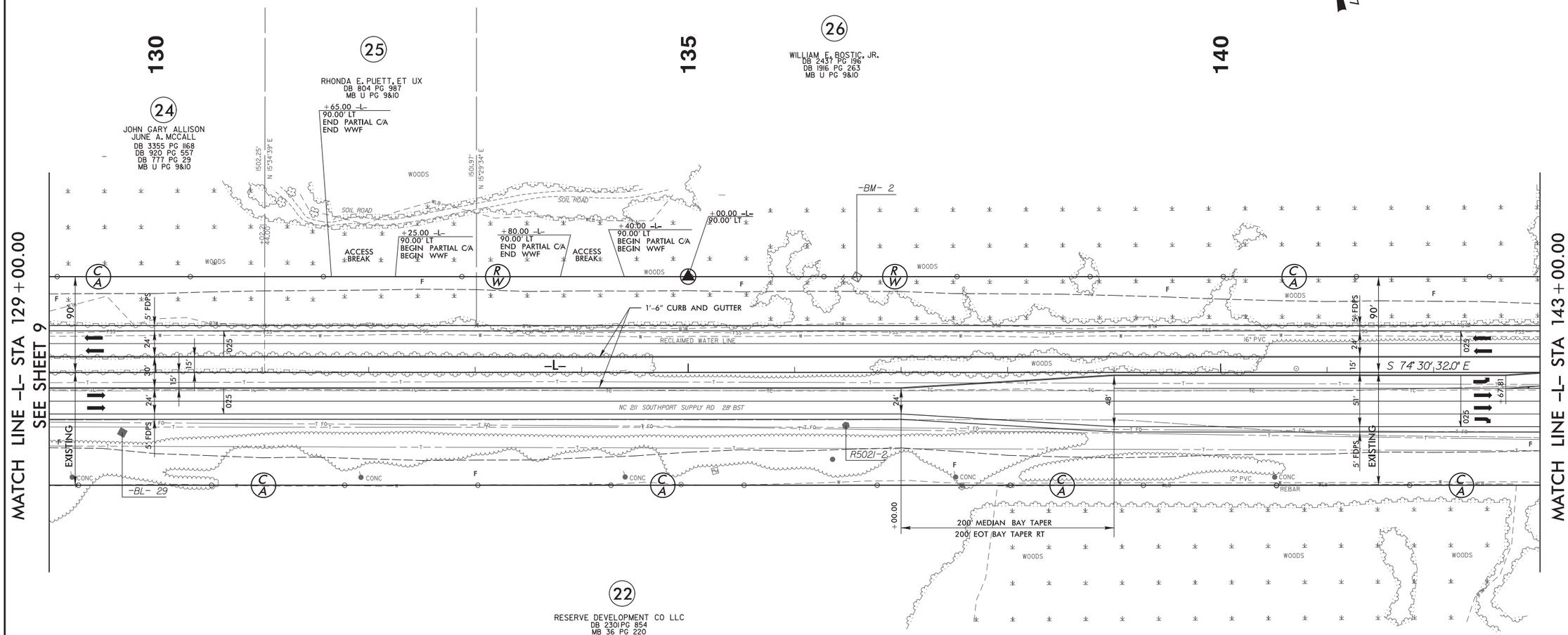
NAD 83/NSRS 2007




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 44
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

REVISIONS

5/14/99

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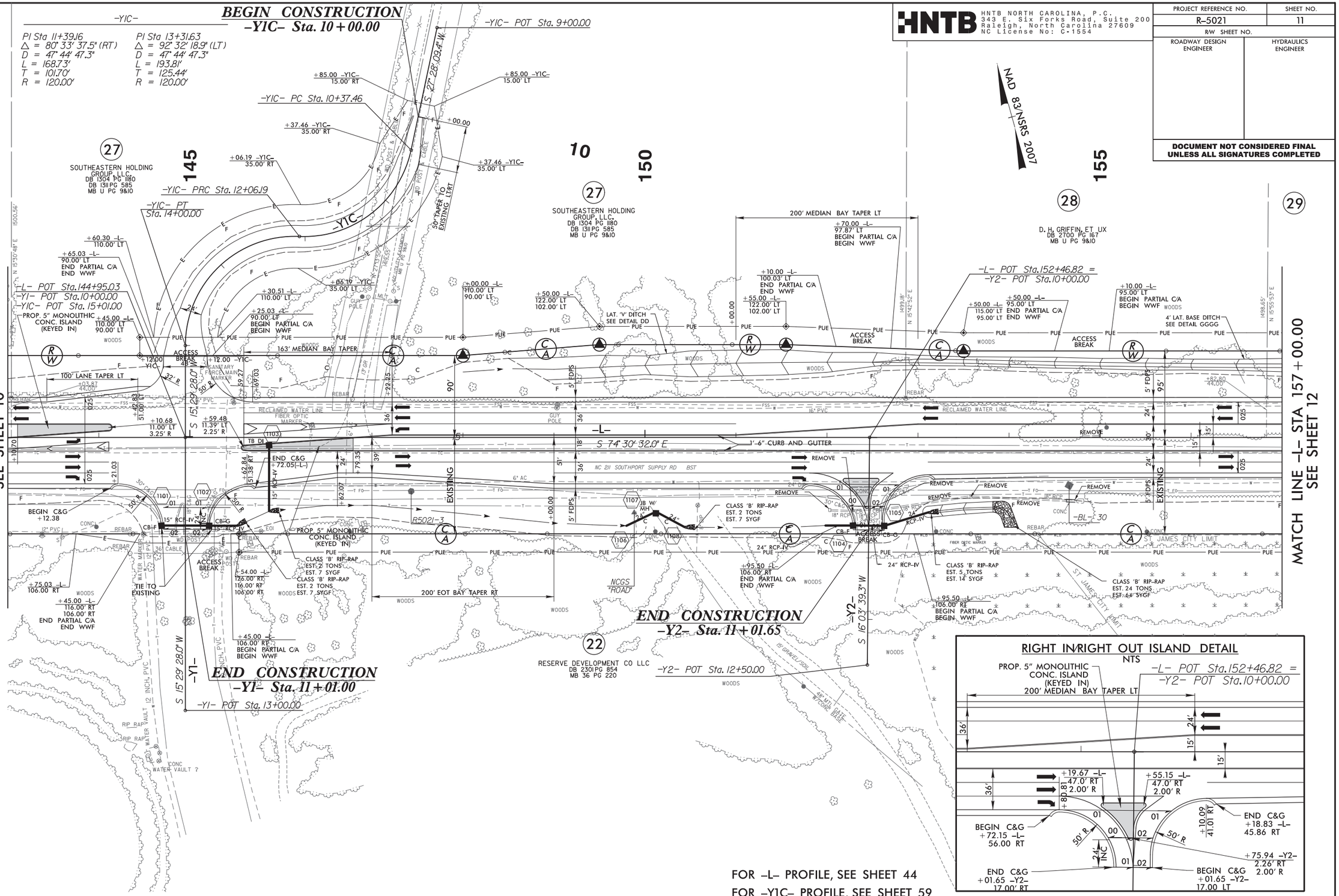
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 11 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

REVISIONS

10-12-2016 - REVISED RIGHT-OF-WAY ON PARCELS 27, 28 & 29, REVISED PUE ON PARCELS 27, 28 & 29, ABH
03-01-2018 - REVISED RIGHT-OF-WAY, PARTIAL C/A AND PUE ON PARCEL 27. ADDED TCE ON PARCEL 27 AROUND NEW DRIVEWAY. REVISED ACCESS BREAK TO ALIGN WITH NEW DRIVEWAY AND ADDED A SECOND ACCESS BREAK. DMW

5/14/99




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 44
FOR -Y1C- PROFILE, SEE SHEET 59
FOR -Y1- PROFILE, SEE SHEET 59
FOR -Y2- PROFILE, SEE SHEET 60
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

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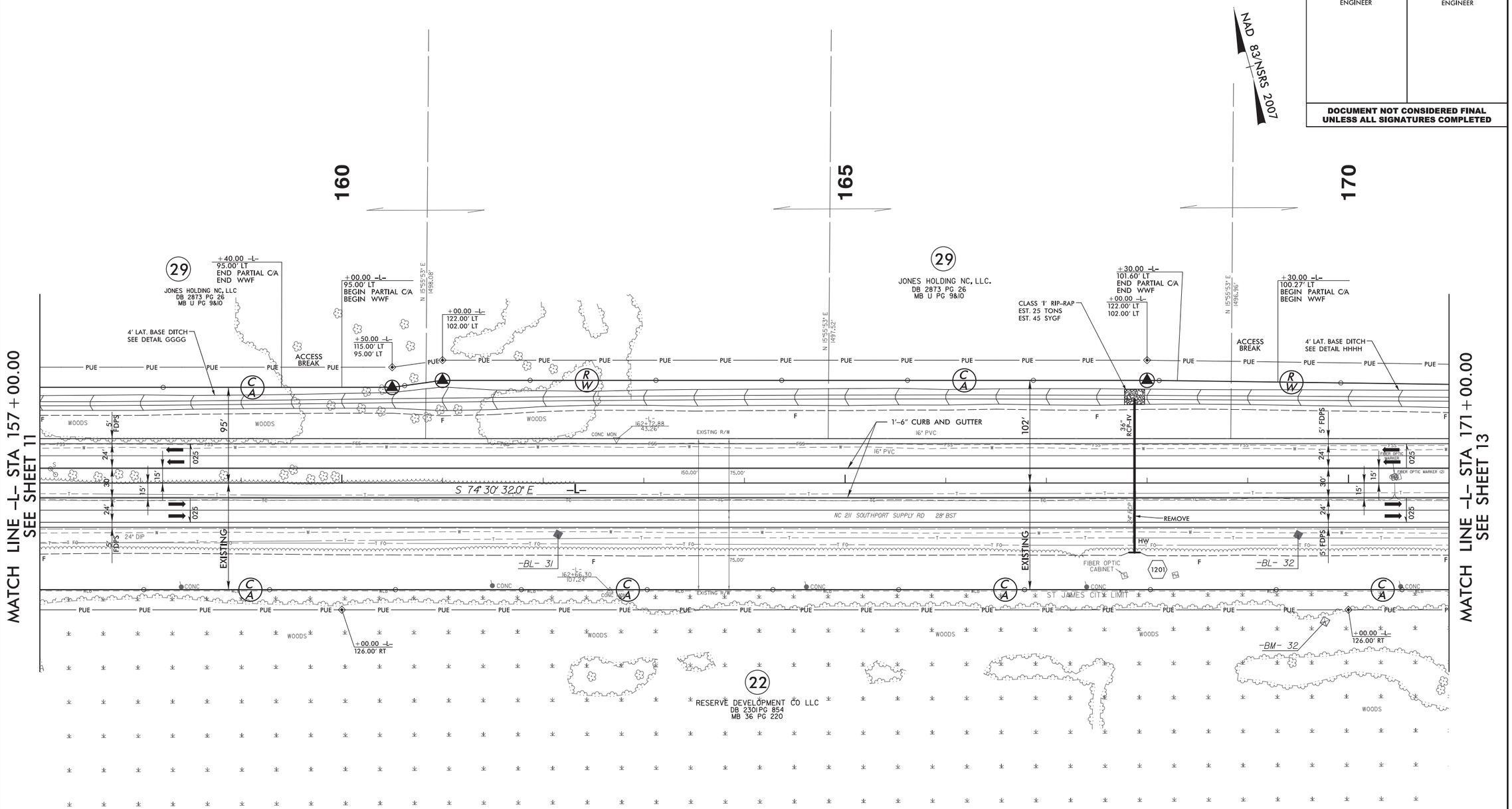
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 12 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 45
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

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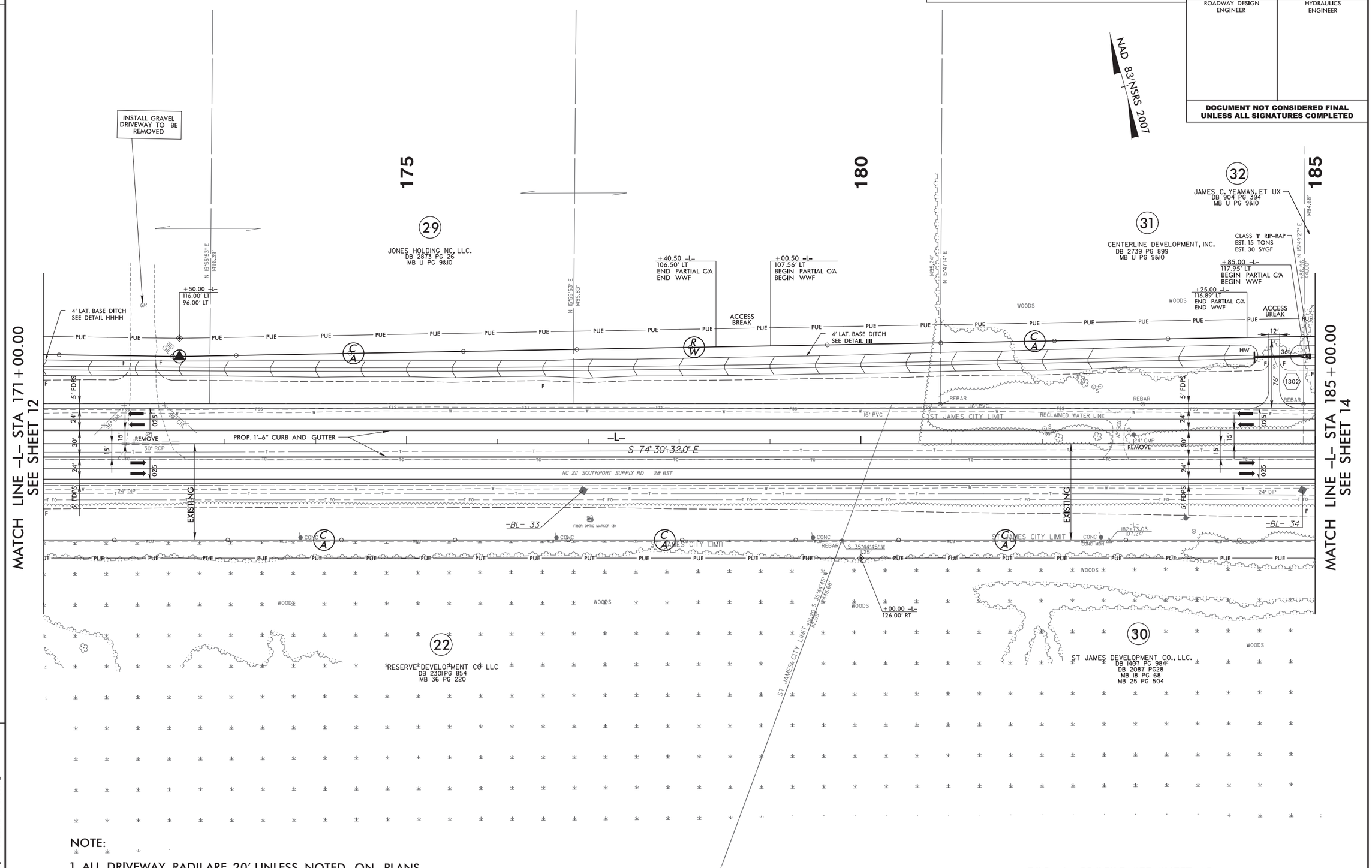
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 13 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

REVISIONS

10-12-2016 - Revised right-of-way on parcels 29,31,& 32. Revised PUE on parcels 29,31 & 32. ABH
12-19-2016 - Revised Access Breaks on parcel 29. DMW
02-13-2017 - Revised Access Break on parcel 31. DMW




NOTE:

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2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 45
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

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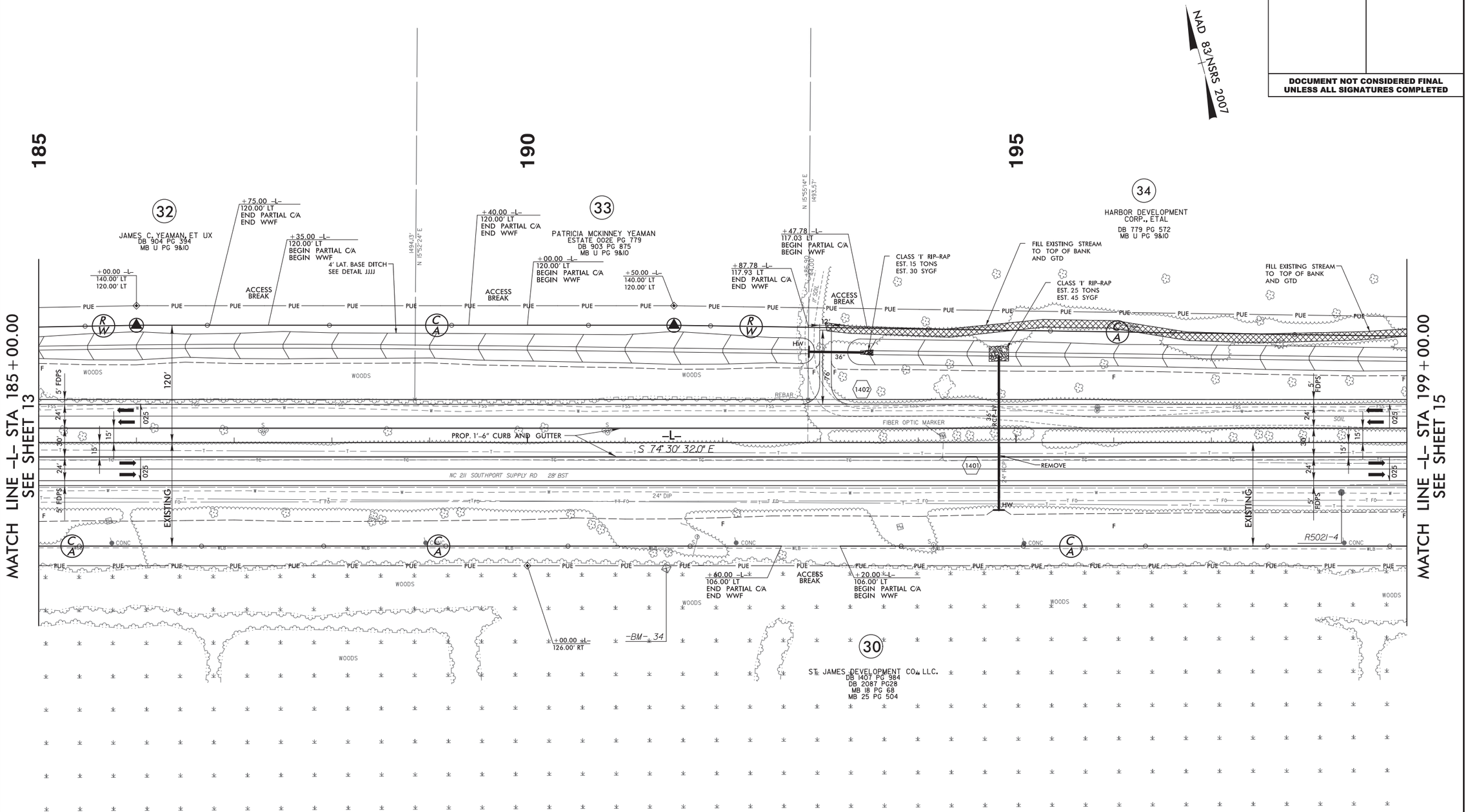
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 14 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

REVISIONS

10-12-2016 - REVISED RIGHT-OF-WAY ON PARCELS 32,33 & 34.REVISED PUE ON PARCELS 32,33 & 34. ABH

5/14/99




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 46
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

07-JUN-2018 23:00
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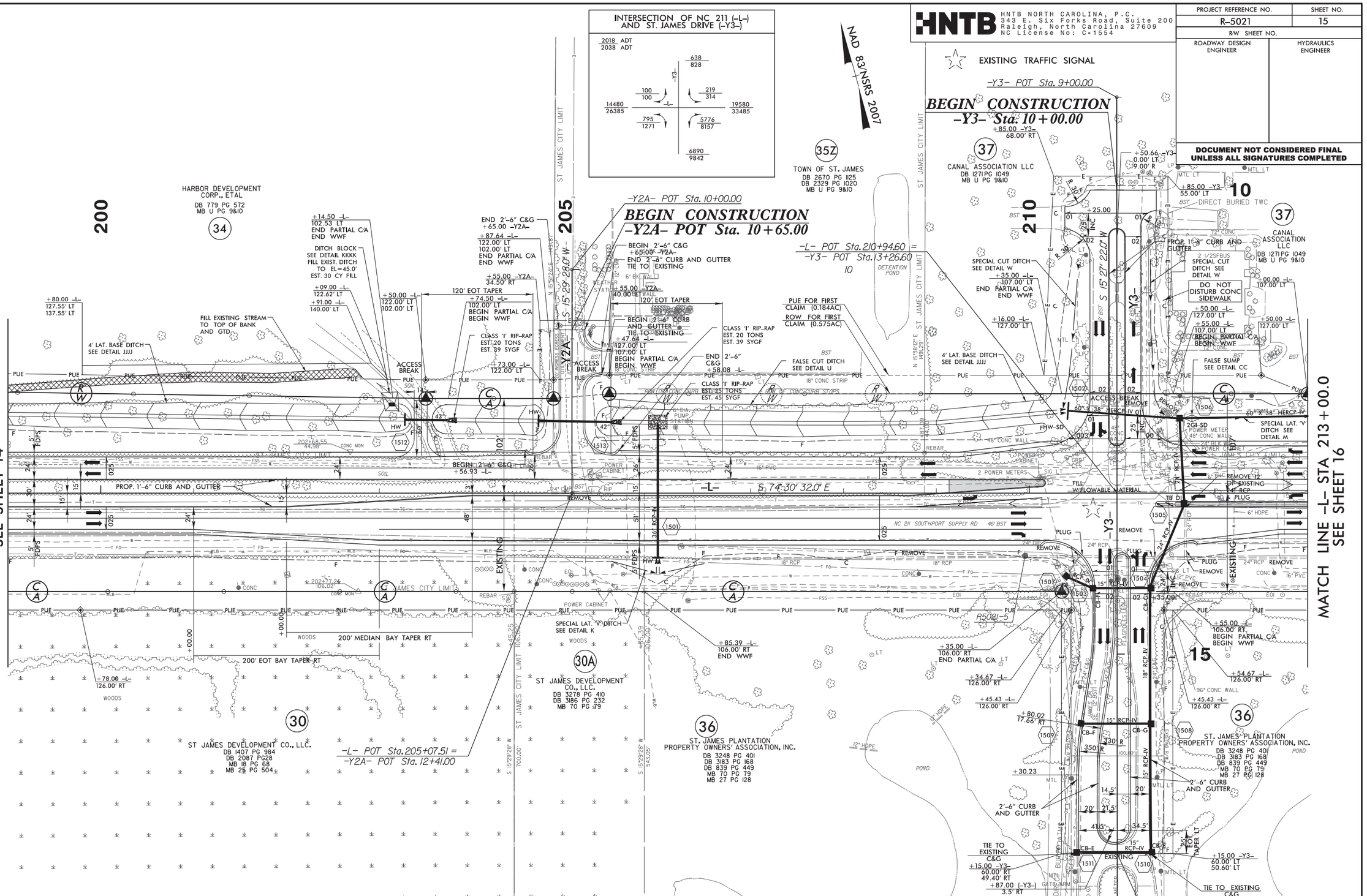
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 15 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

REVISIONS

10-12-2016 - REVISED RIGHT-OF-WAY ON PARCELS 34,35 & 37.REVISED PUE ON PARCELS 34,35 & 37. ABH
03-13-2017 - REVISED BREAK LINE ALONG PARCEL 34. DMW
03-10-2017 - PARCEL 30A ADDED TO PLANS WITH NEW SURVEY. PUE. DMW
03-26-2018 - ADDED TCE TO PARCEL 34 & 35.REVISED ROW.PUE AND ACCESS BREAK LOCATION FOR PARCEL 35.REVISED TCE ON PARCEL 37. DMW
04-18-2018 - ADDED TCE TO PARCEL 35Z. DMW

5/14/99




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 46
FOR -Y3- PROFILE, SEE SHEET 60
FOR INTERSECTION DETAIL, SEE SHEET 2B-1
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

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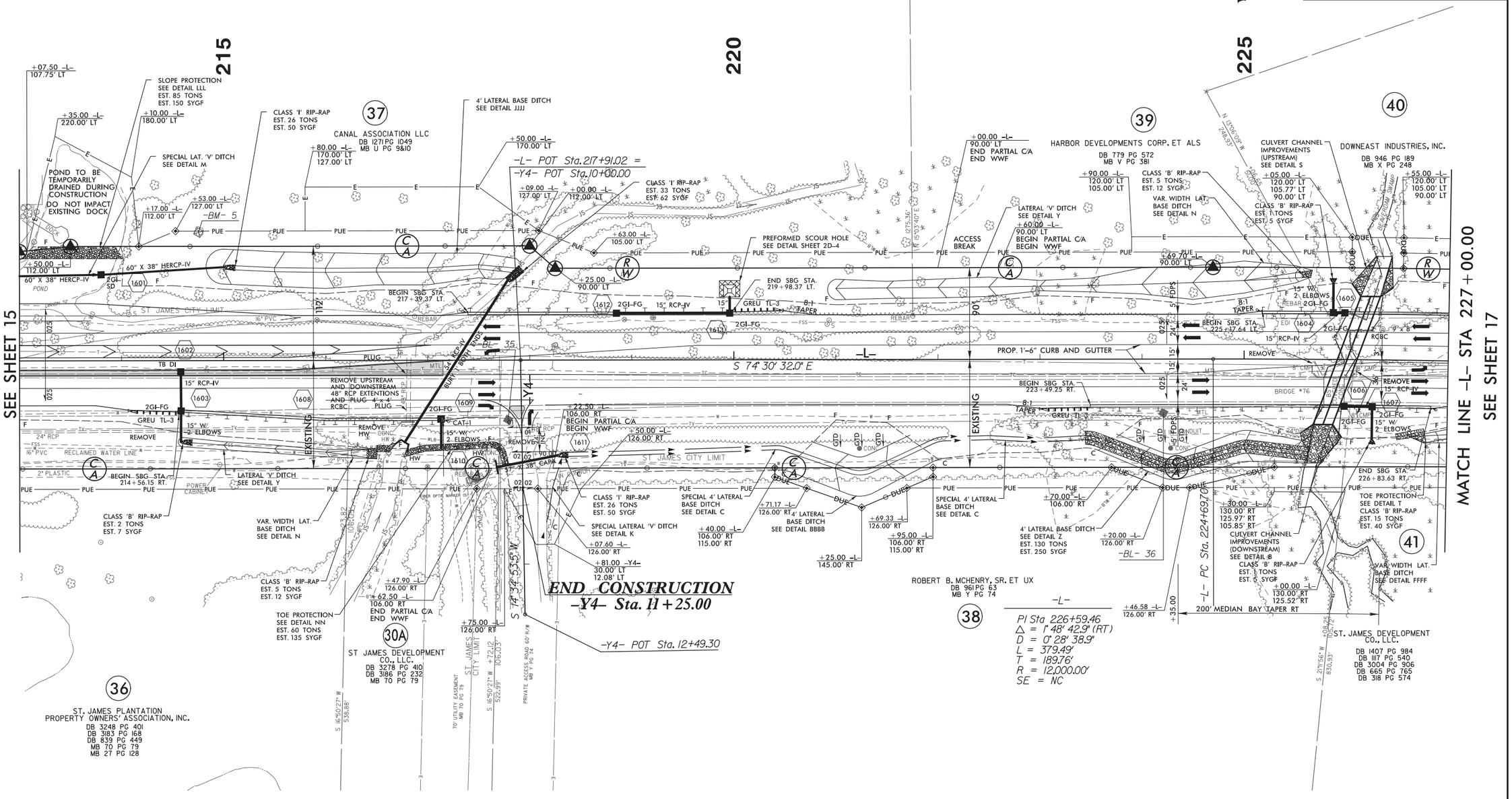
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 16 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 47
FOR -Y4- PROFILE, SEE SHEET 60
FOR INTERSECTION DETAIL, SEE SHEET 2B-1
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

REVISIONS
5/14/99
03-10-2017 - Parcel 30A Added To Plans with New Survey File. DMW

07-JUN-2018 23:01
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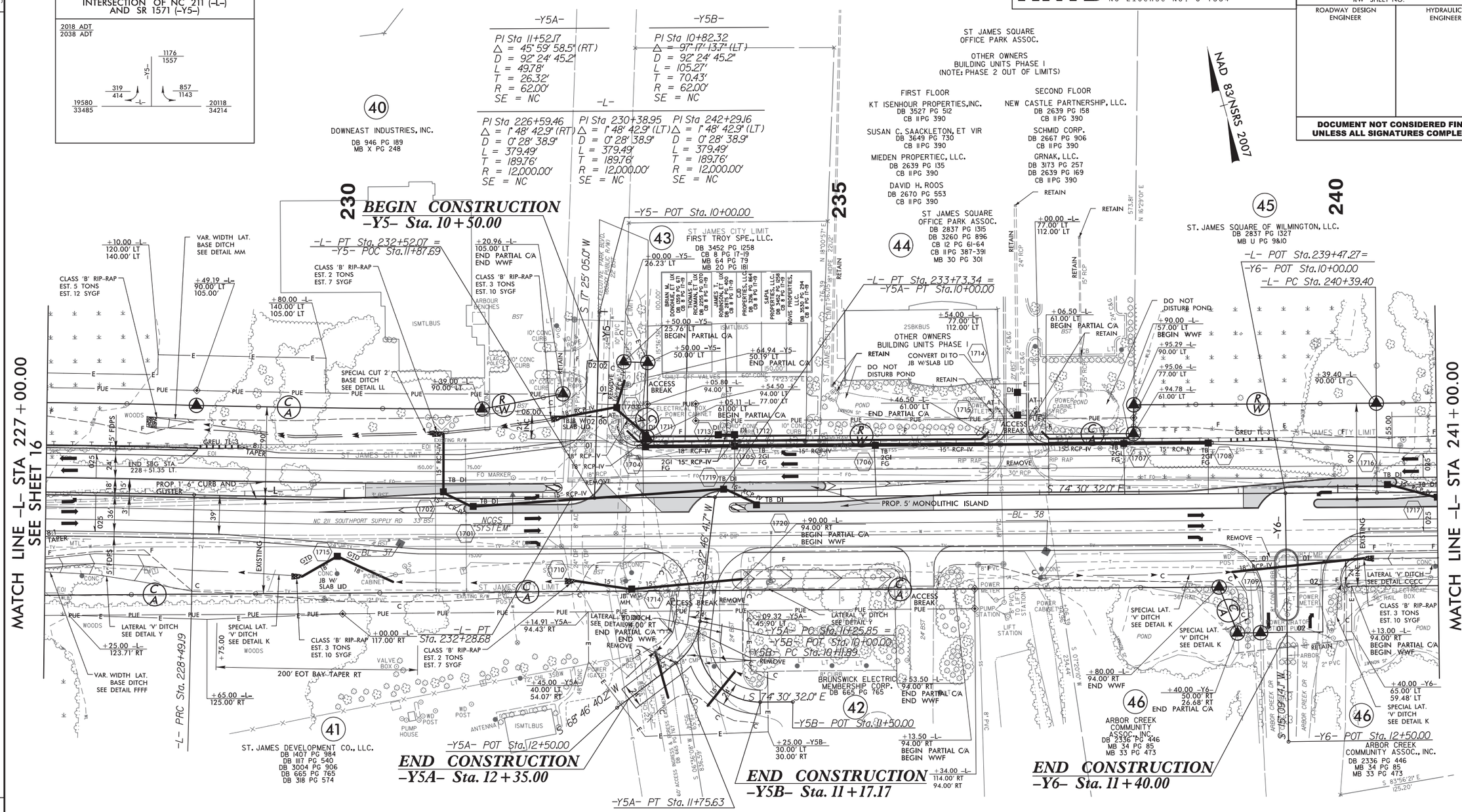
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 17 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

REVISIONS

07-14-2017 - Revised TCE on Parcel 43, Reduced ROW From Parking Lot on Parcel 43, Changed PUE on Parcel 43 to Encompass Relocated Water Line.DWG
08-21-2017 - Reduced TCE, ROW & PUE From the Pond Area of Parcel 44, All PUE Removed From Parcel 45.DWG
08-30-2017 - Clarified Proposed 60ft Access Break For Parcel 43.DWG

5/14/99




FOR -L- PROFILE, SEE SHEET 47
FOR -Y5- & -Y6- PROFILES, SEE SHEET 61
FOR -Y5A- PROFILE, SEE SHEET 61
FOR -Y5B- PROFILE, SEE SHEET 61
FOR -Y5- & -Y6- INTERSECTION DETAILS, SEE SHEET 2B-2
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3
FOR RETAINING WALL PLANS, SEE SHEETS W-_ THRU W-_

NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

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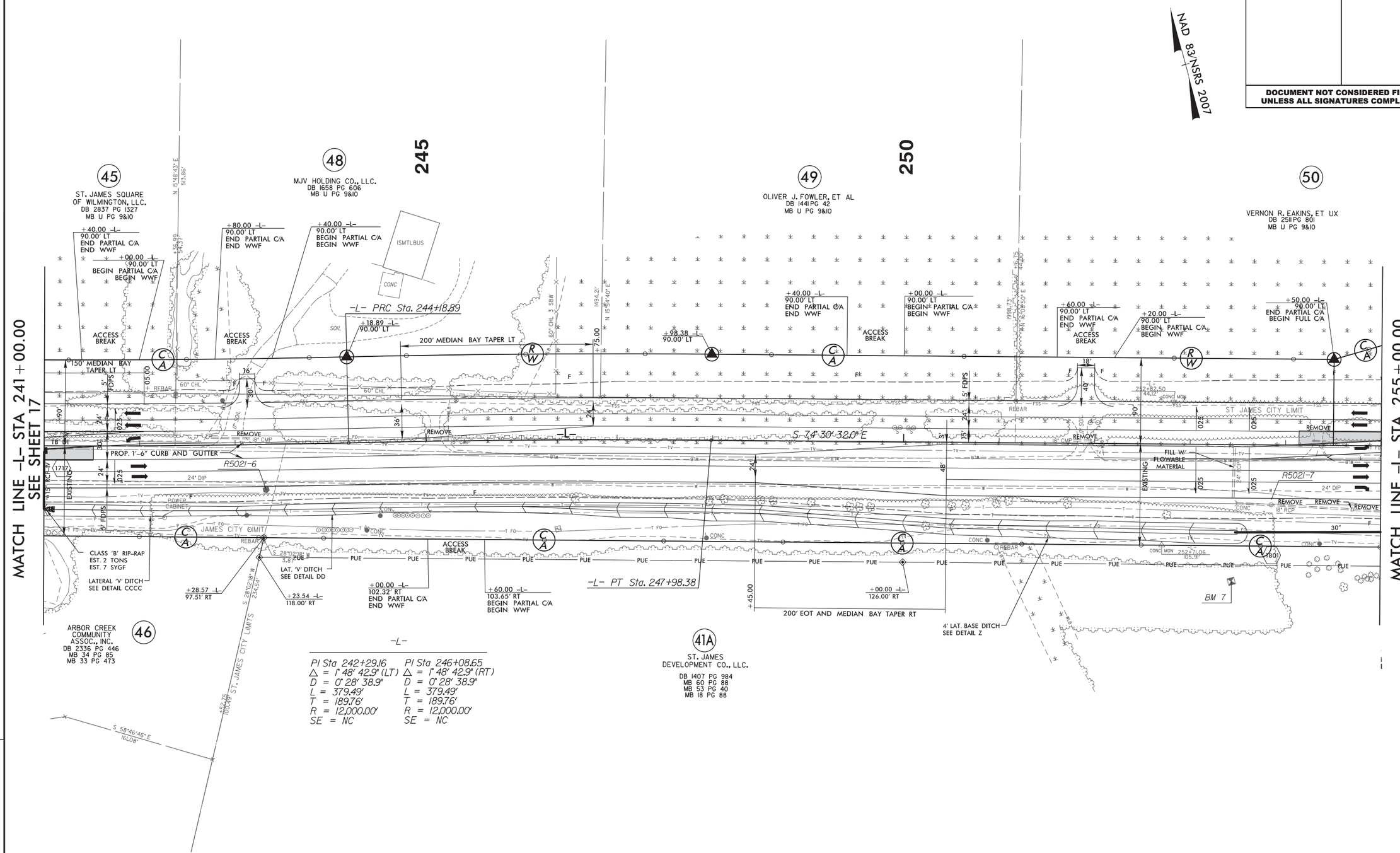
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 18 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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




-L-

| PI Sta 242+29.16 | PI Sta 246+08.65 |
|---|---|
| Δ = 1° 48' 42.9" (LT) | Δ = 1° 48' 42.9" (RT) |
| D = 0° 28' 38.9" | D = 0° 28' 38.9" |
| L = 379.49' | L = 379.49' |
| T = 189.76' | T = 189.76' |
| R = 12,000.00' | R = 12,000.00' |
| SE = NC | SE = NC |

NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 48
FOR DETAIL FOR DIRECTIONAL CROSS OVER, SEE SHEET 2B-2
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

REVISIONS
12-08-2016 - Revised Parcel 41 to Parcel 41A, DMW

5/14/99

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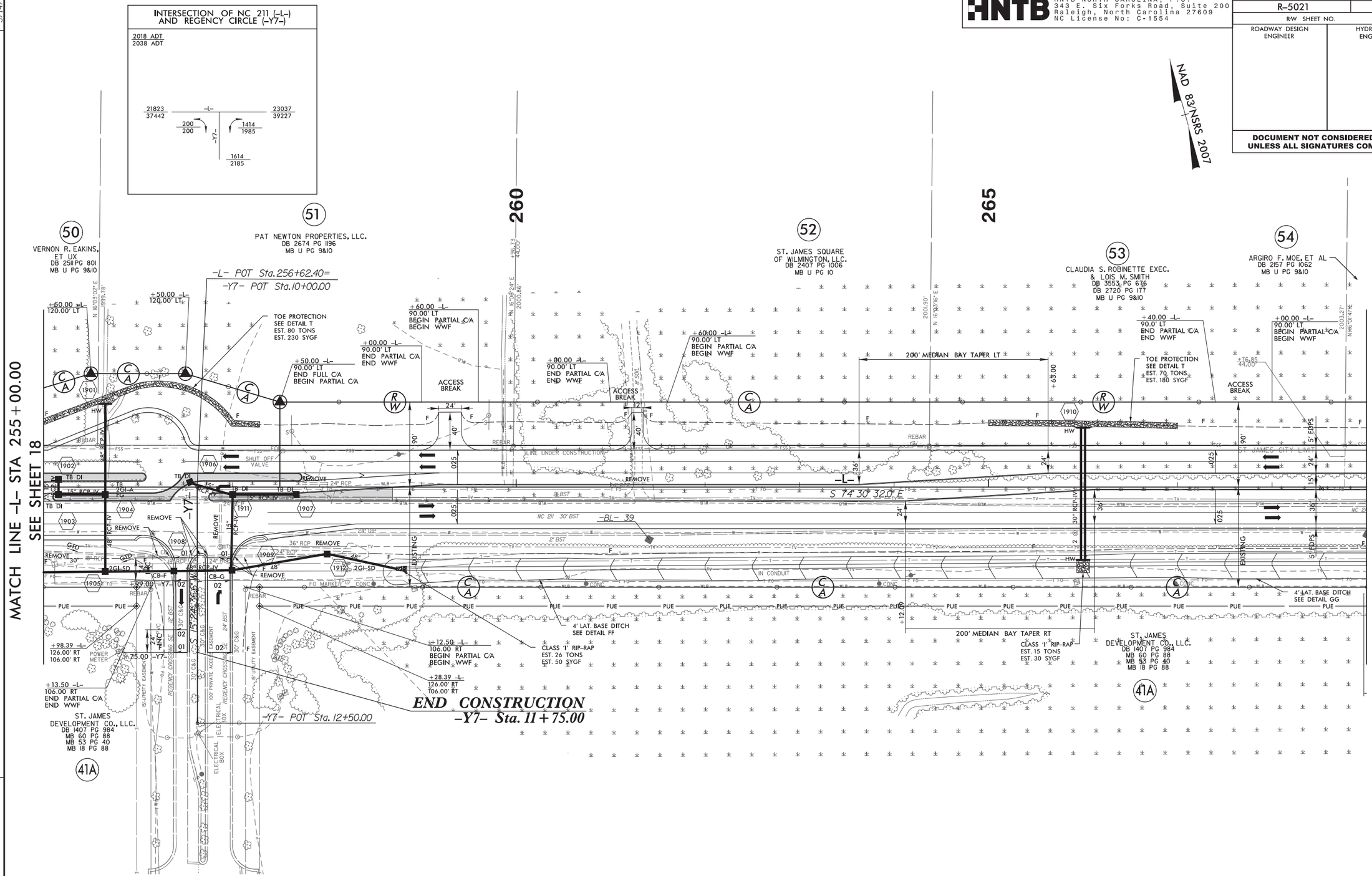
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 19 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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




NOTE:

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2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 48
FOR -Y7- PROFILE, SEE SHEET 61
FOR INTERSECTION DETAIL AND DIRECTIONAL CROSS OVER, SEE SHEET 2B-2
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

REVISIONS
12-08-2016 - Revised Parcel 41 to Parcel 41A.DWN
03-10-2017 - Revised Driveway Width on Parcel 51.DWN

5/14/99

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 20 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

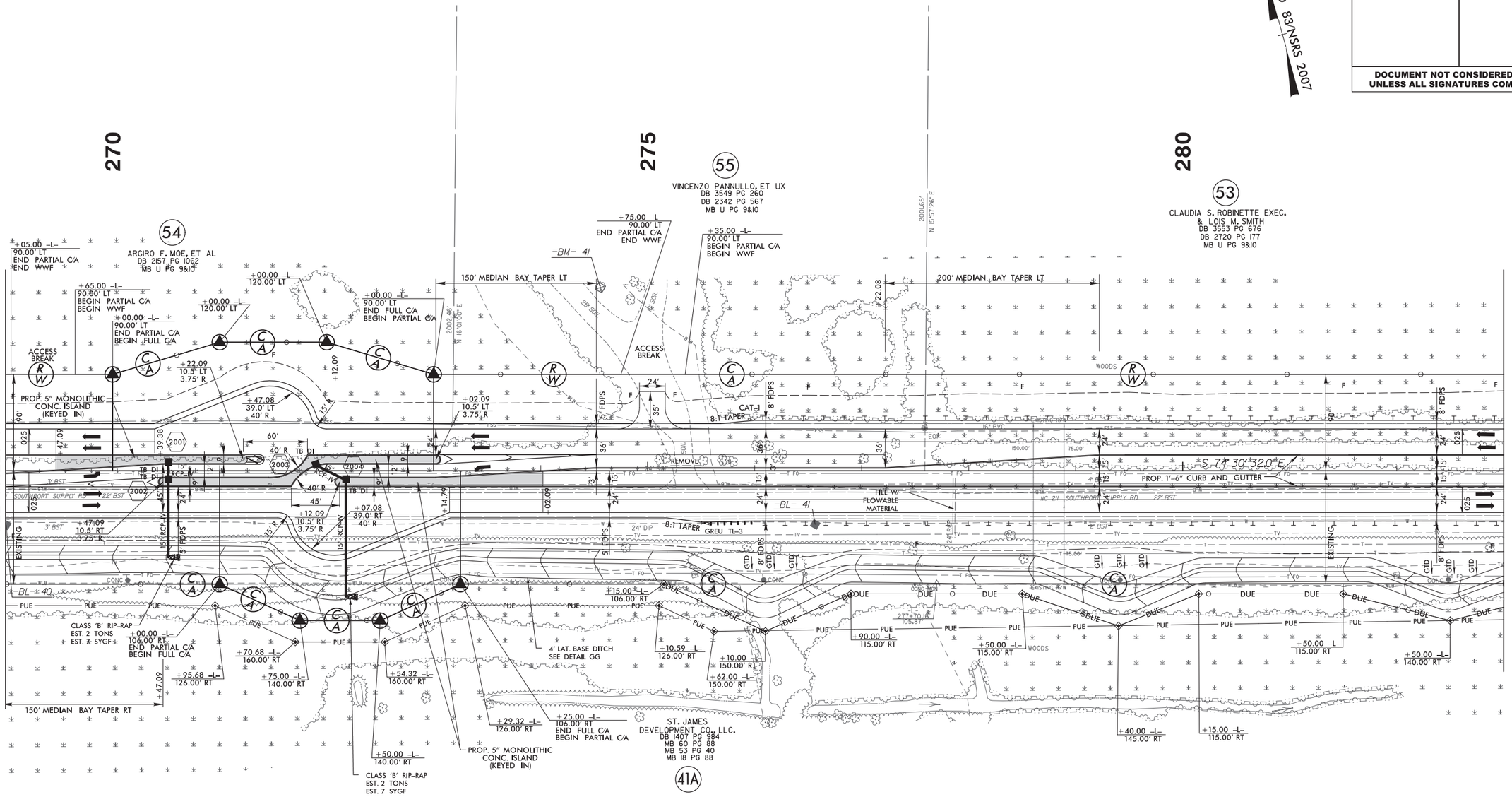
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

NAD 83/NSRS 2007

REVISIONS

12-08-2016 - Revised Parcel 41 to Parcel 41A.

5/14/99




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 49
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

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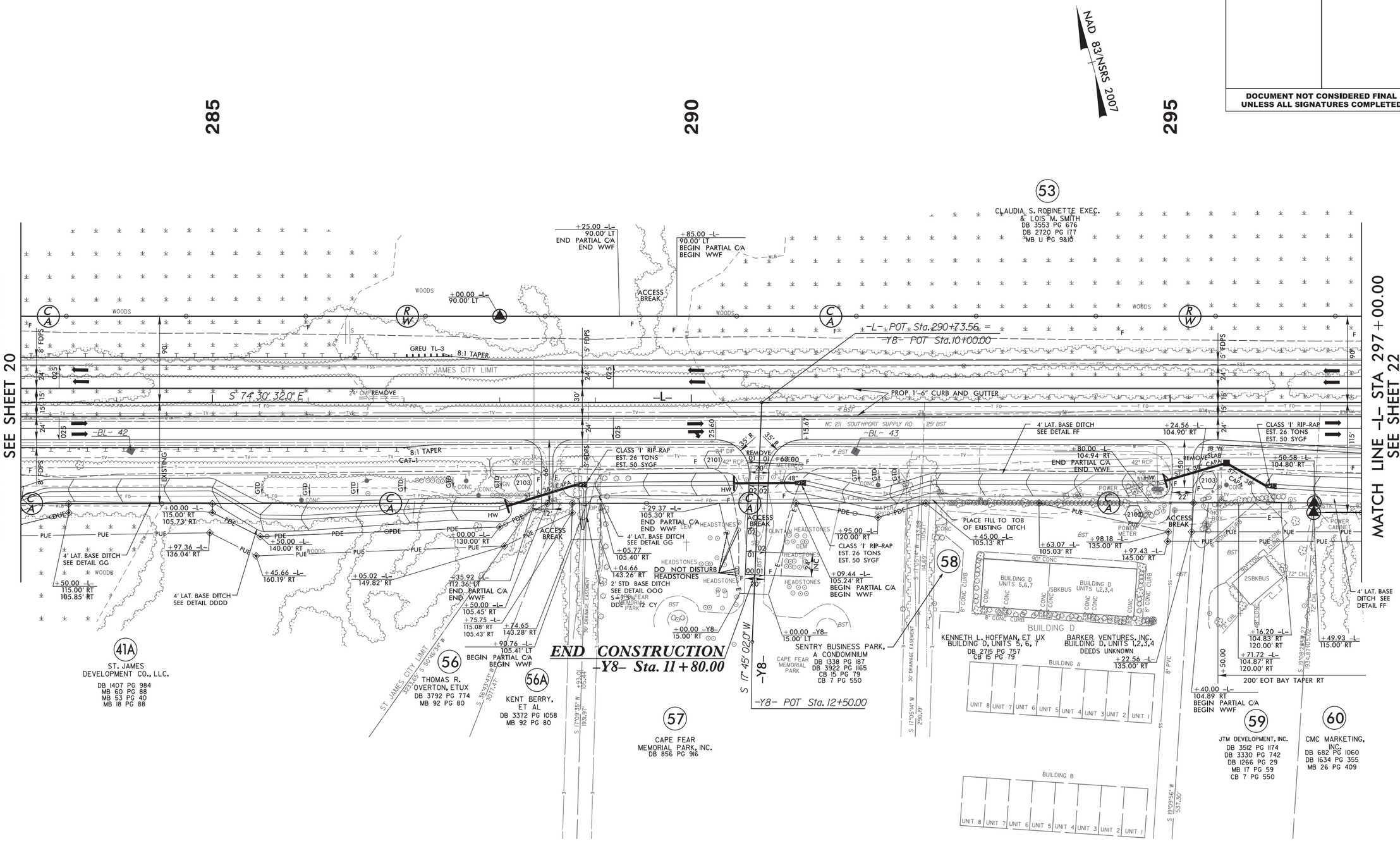
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 21 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

REVISIONS

12-08-2016 - Revised Parcel 41 to Parcel 41A.DMW
02-13-2017 - Revised Access Break On Parcel 53, Revised Access Break On Parcel 58, Revised Parcel 171 Removed due to No Claim. DMW
03-10-2017 - Revised Construction Easement on Parcel 59 around drainage ditch.DMW
09-13-2017 - Property Owner Updated For Parcel 58, Parcel 171 Removed due to No Claim. DMW
5/14/99 Revised Parcel 41 To Parcel 41A.DMW Revised Access Break On Parcel 53, Revised Access Break On Parcel 58 Revised Slope Stakes To Stay Off Headstones And Added Note To "DO




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 49
FOR -Y8- PROFILE, SEE SHEET 62
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

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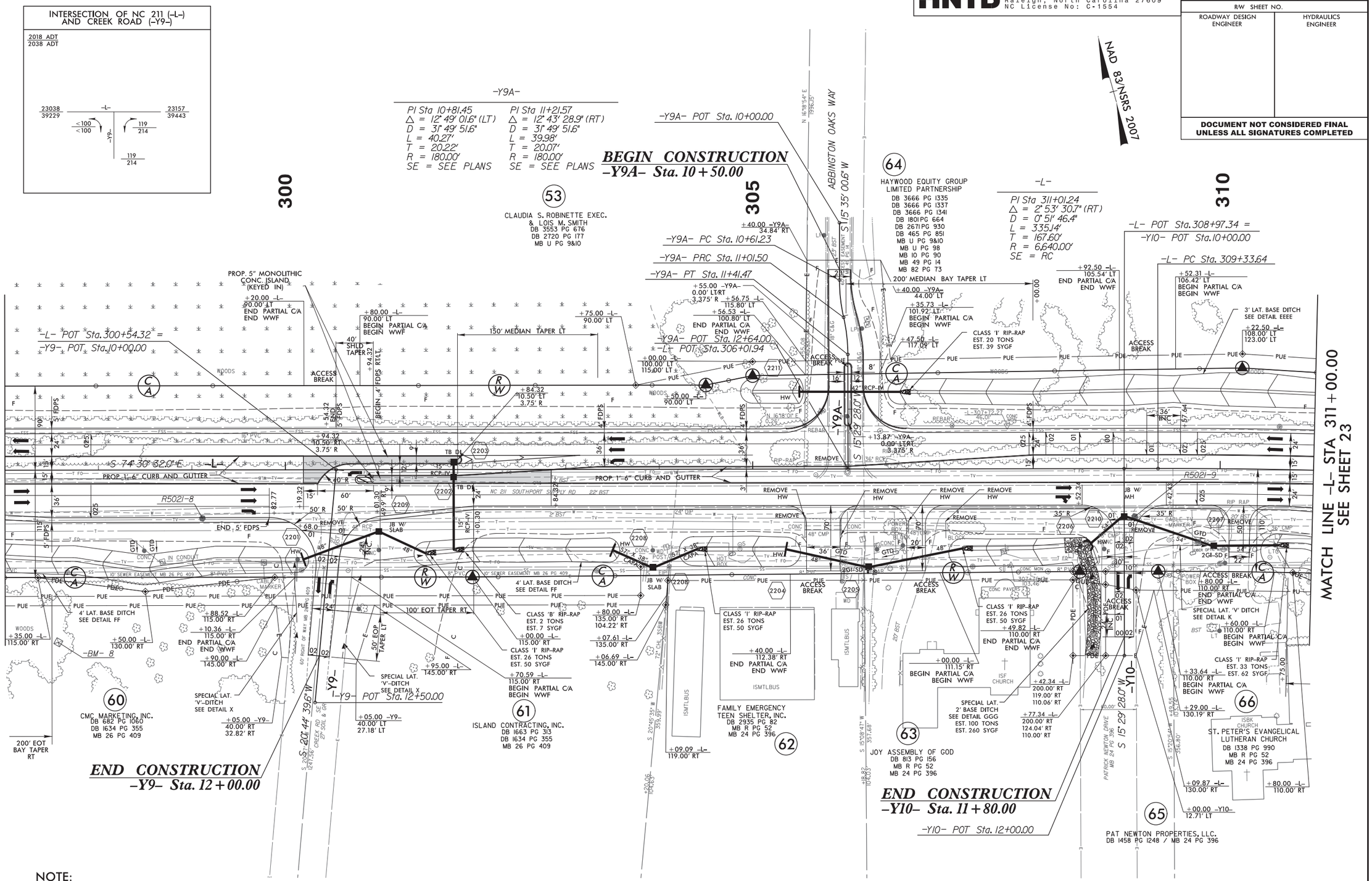
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 22 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 50
FOR -Y9-, -Y9A-, & -Y10- PROFILES, SEE SHEET 62
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

REVISIONS

02-13-2017 - Added Access Break on Parcel 53 (Sta 300+50) & 64 (Sta 309+25). DWW
03-10-2017 - Added Construction Easement on Parcel 64 For New ALN -Y9A- Tie In. DWW
06-16-2017 - Parcel 53 & 64.Revised ROW Around Ditch and Added PUE. DWW

5/14/99

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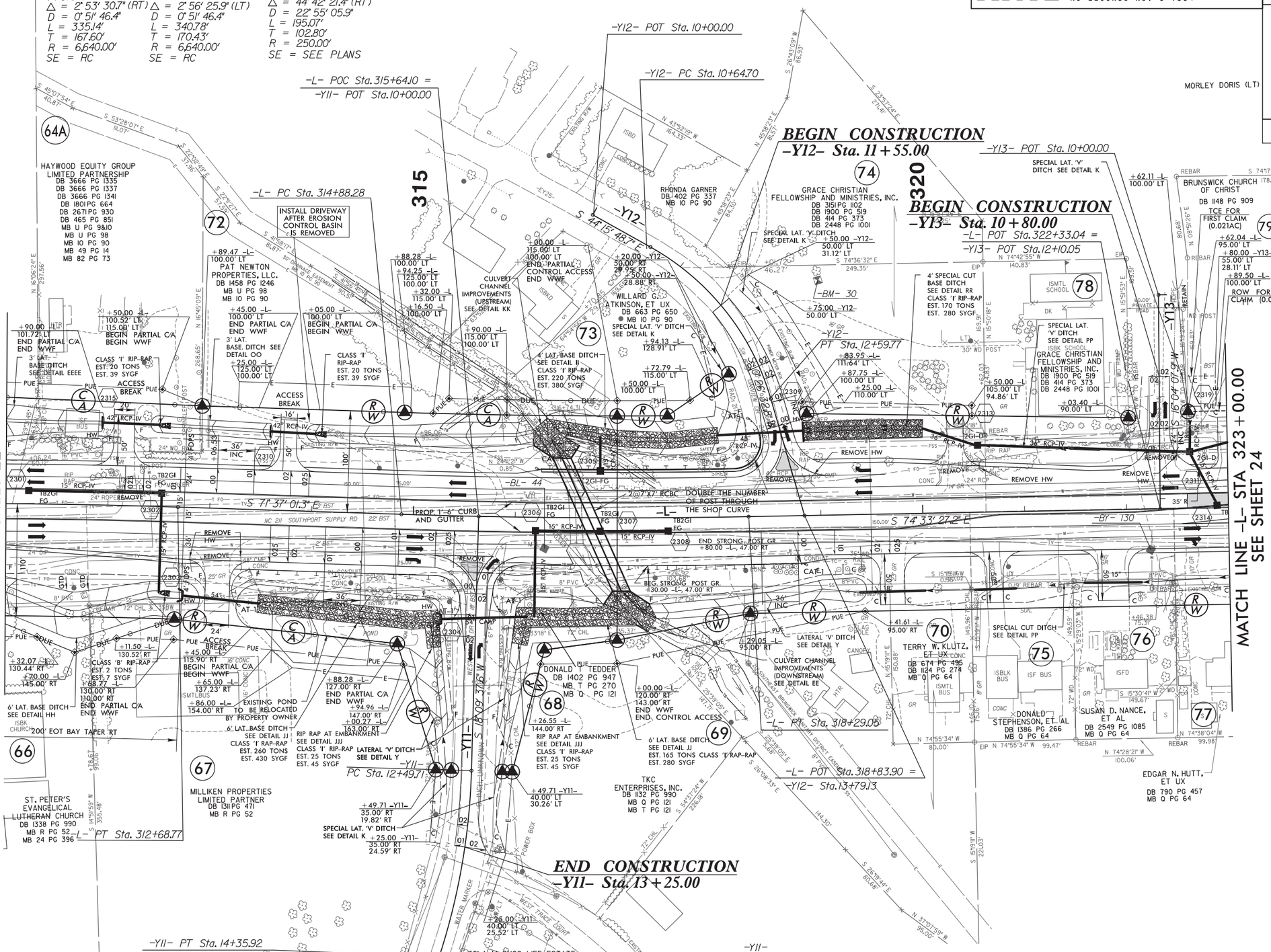
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 23 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

-L-
PI Sta 311+01.24
Δ = 2° 53' 30.7" (RT)
D = 0° 51' 46.4"
L = 335.14'
T = 167.60'
R = 6,640.00'
SE = RC

PI Sta 316+58.70
Δ = 2° 56' 25.9" (LT)
D = 0° 51' 46.4"
L = 340.78'
T = 170.43'
R = 6,640.00'
SE = RC

-Y12-
PI Sta 11+67.51
Δ = 44° 42' 21.4" (RT)
D = 22° 55' 05.9"
L = 195.07'
T = 102.80'
R = 250.00'
SE = SEE PLANS




-Y11-
PI Sta 13+43.45
Δ = 16° 24' 49.5" (RT)
D = 8° 48' 53.0"
L = 186.21'
T = 93.75'
R = 650.00'
SE = NC

INTERSECTION OF NC 211 (-L-) AND WEST TRACE DRIVE (-Y11-)

2018 ADT / 2038 ADT
-L-: 23157 / 39442 — 23376 / 39756
-Y11-: 100 / 100 — 319 / 414 — 419 / 514

INTERSECTION OF NC 211 (-L-) AND SR 1549 (-Y12-)

2018 ADT / 2038 ADT
-Y12-: 519 / 614 — 100 / 100 — 419 / 514
-L-: 23376 / 39756 — 23695 / 40170

NOTE: 1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 50
FOR -Y11-, -Y12- AND -Y13- PROFILES, SEE SHEET 62
FOR INTERSECTION DETAILS FOR -Y11-, -Y12-, AND -Y13-, SEE SHEET 2B-3
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

5/14/99

08-25-2016 - REVISED PUE ON PARCEL 70 MJD
04-03-2017 - REVISED PARCEL NUMBER 64 TO 64A, DITCH AND ADDED PUE DMW
02-02-2017 - REVISED PARCEL 64A ADDED NOTE TO "INSTALL DRIVEWAY AFTER EROSION CONTROL BASIN IS REMOVED." DMW
11-30-2017 - REVISED TCE ON PARCEL 72 AND ADDED NOTE TO "INSTALL DRIVEWAY AFTER EROSION CONTROL BASIN IS REMOVED." DMW
02-09-2018 - TCE WAS REVISED ON PARCEL 74 AND 79. PUE WAS ADDED TO PARCELS 72 AND 73. TSG

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02-09-2018 – PUE WAS ADDED TO PARCEL 79 AND 80. DUE WAS ADDED TO PARCEL 79 AND REVISED ACCESS BREAK TO ALIGN WITH NEW DRIVEWAY. R/W WAS REVISED AND REVISED ACCESS BREAK TO ALIGN WITH NEW DRIVEWAY ON PARCELS 81, 82, AND 83. TSG


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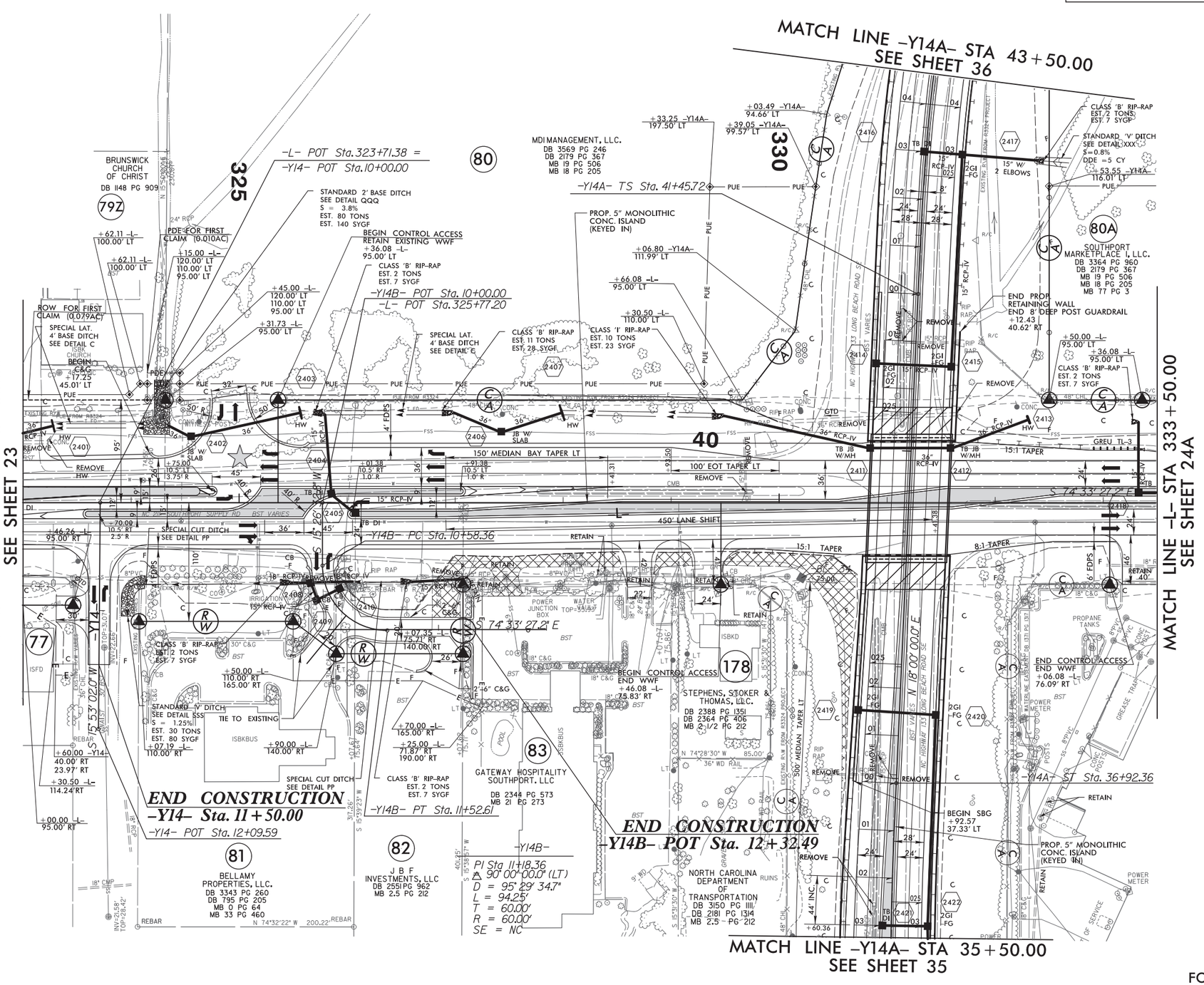
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 24 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

NAD 83/NSRS 2007

★ PROPOSED TRAFFIC SIGNAL




NOTE: 1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.


FOR –L– PROFILE, SEE SHEETS 50 AND 51
FOR –Y14– AND –Y14B– PROFILES, SEE SHEET 63
FOR –Y14A– PROFILE, SEE SHEETS 63 AND 64
FOR INTERCHANGE OVERVIEW, SEE SHEET 2B-8
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3
FOR RETAINING WALL PLANS, SEE SHEETS W-_ THRU W-_
FOR STRUCTURE PLANS, SEE SHEETS S-_ THRU S-_
FOR BRIDGE & PAVEMENT DETAIL, SEE SHEET 2B-_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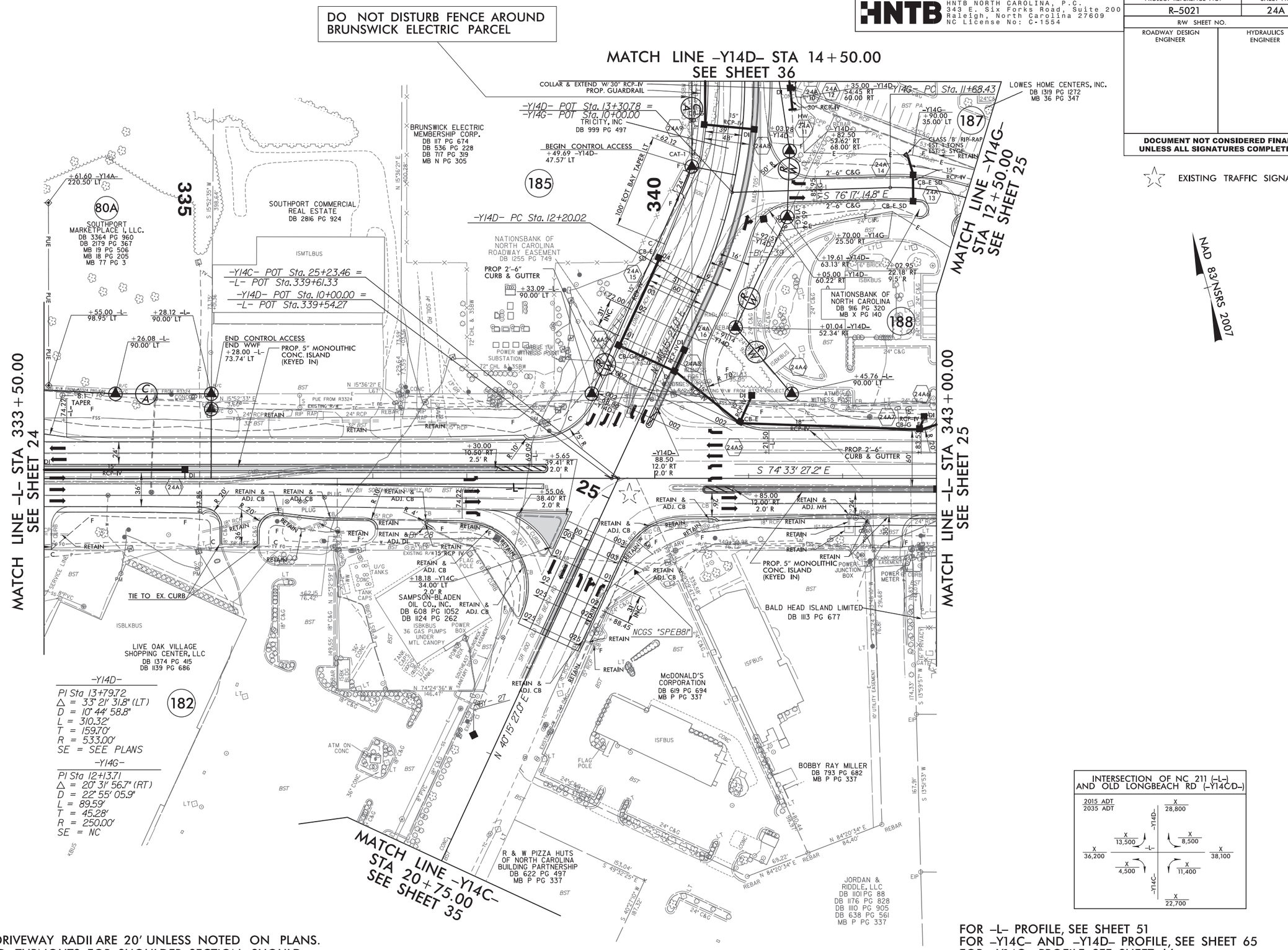
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 24A |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

EXISTING TRAFFIC SIGNAL




| INTERSECTION OF NC 211 (-L-) AND OLD LONGBEACH RD (-Y14C/D-) | | | |
|---|---|---|---|
| 2015 ADT / 2035 ADT | | -Y14D- | X / 28,800 |
| X / 13,500 | X / 8,500 | -L- | X / 38,100 |
| X / 36,200 | X / 4,500 | -Y14C- | X / 11,400 |
| | | | X / 22,700 |

NOTE: 1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 51
FOR -Y14C- AND -Y14D- PROFILE, SEE SHEET 65
FOR -Y14G- PROFILE, SEE SHEET 66
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

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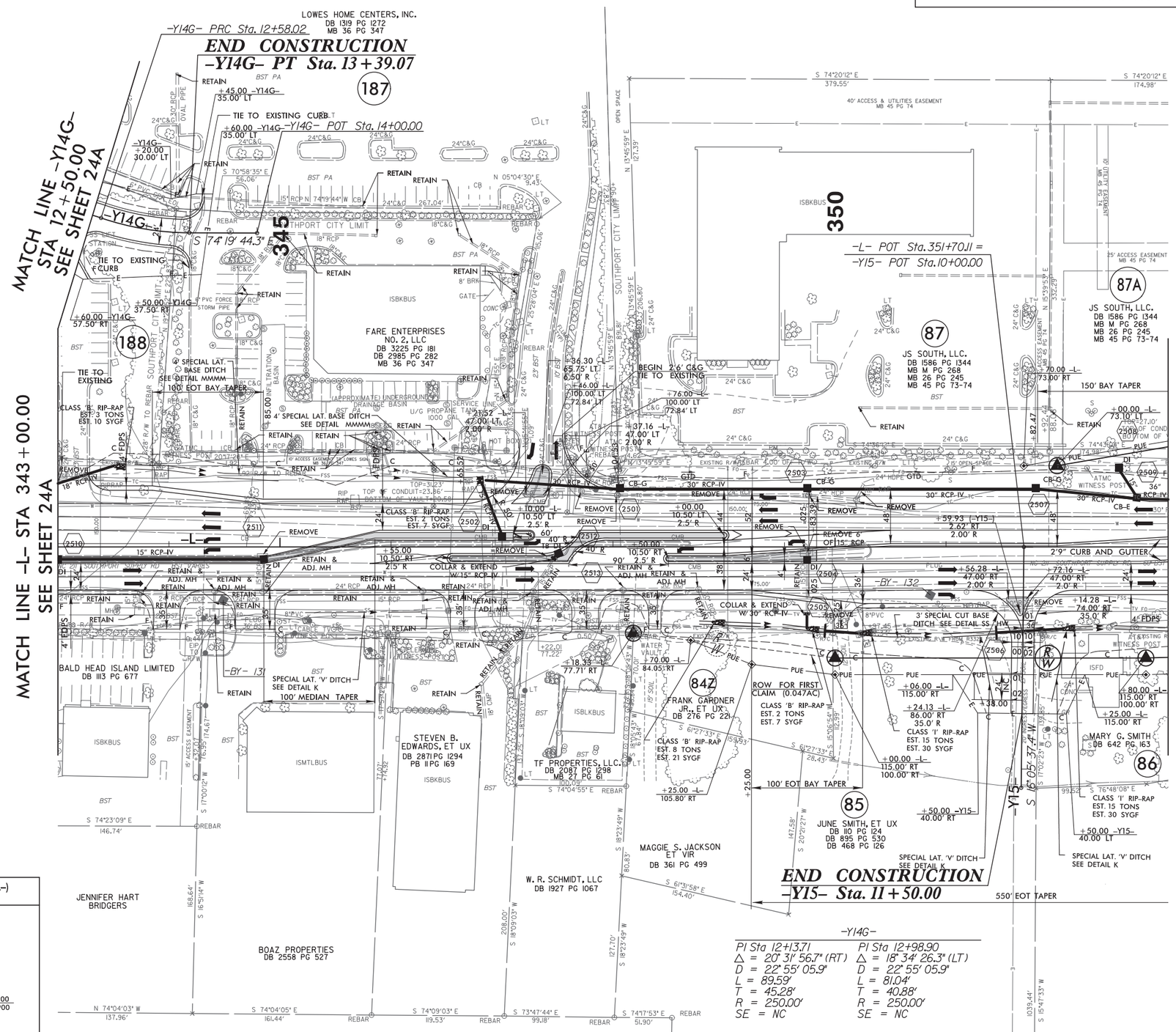
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 25 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

REVISIONS

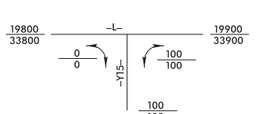
02-09-2018 - ADDED PUE TO PARCEL 84. REVISED PUE ON PARCEL 85. ADDED TCE TO PARCEL 188. TSG
05-03-2018 - REDUCED TCE ON PARCELS 187 & 188. DMW

5/14/99




INTERSECTION OF NC 211 (-L-) AND TRAILS END (-Y15-)

2018 ADT
2038 ADT




NOTE: 1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 51
FOR -Y14G- PROFILE, SEE SHEET 66
FOR -Y15- PROFILE, SEE SHEET 67
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

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HNTB

5/14/99

NOTE:

1. ALL DRIVEWAY RADII ARE 20′ UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50′ UNLESS NOTED ON PLANS.

| -Y17A- | | -Y17- | | -L- |
|---|---|---|---|---|
| PI Sta 11+39.87 | PI Sta 11+83.22 | PI Sta 11+73.00 | PI Sta 13+28.43 | PI Sta 374+14.38 |
| Δ = 13° 55′ 52.7″ (LT) | Δ = 19° 04′ 42.3″ (RT) | Δ = 8° 31′ 31.8″ (LT) | Δ = 12° 16′ 08.9″ (RT) | Δ = 23° 51′ 25.5″ (RT) |
| D = 38° 11′ 49.9″ | D = 38° 11′ 49.9″ | D = 11° 27′ 33.0″ | D = 11° 27′ 33.0″ | D = 0° 53′ 03.1″ |
| L = 36.47′ | L = 49.95′ | L = 74.40′ | L = 107.07′ | L = 2,698.17′ |
| T = 18.33′ | T = 25.21′ | T = 37.27′ | T = 53.74′ | T = 1,368.92′ |
| R = 150.00′ | R = 150.00′ | R = 500.00′ | R = 500.00′ | R = 6,480.00′ |
| SE = SEE PLANS | SE = SEE PLANS | SE = SEE PLANS | SE = SEE PLANS | SE = RC |


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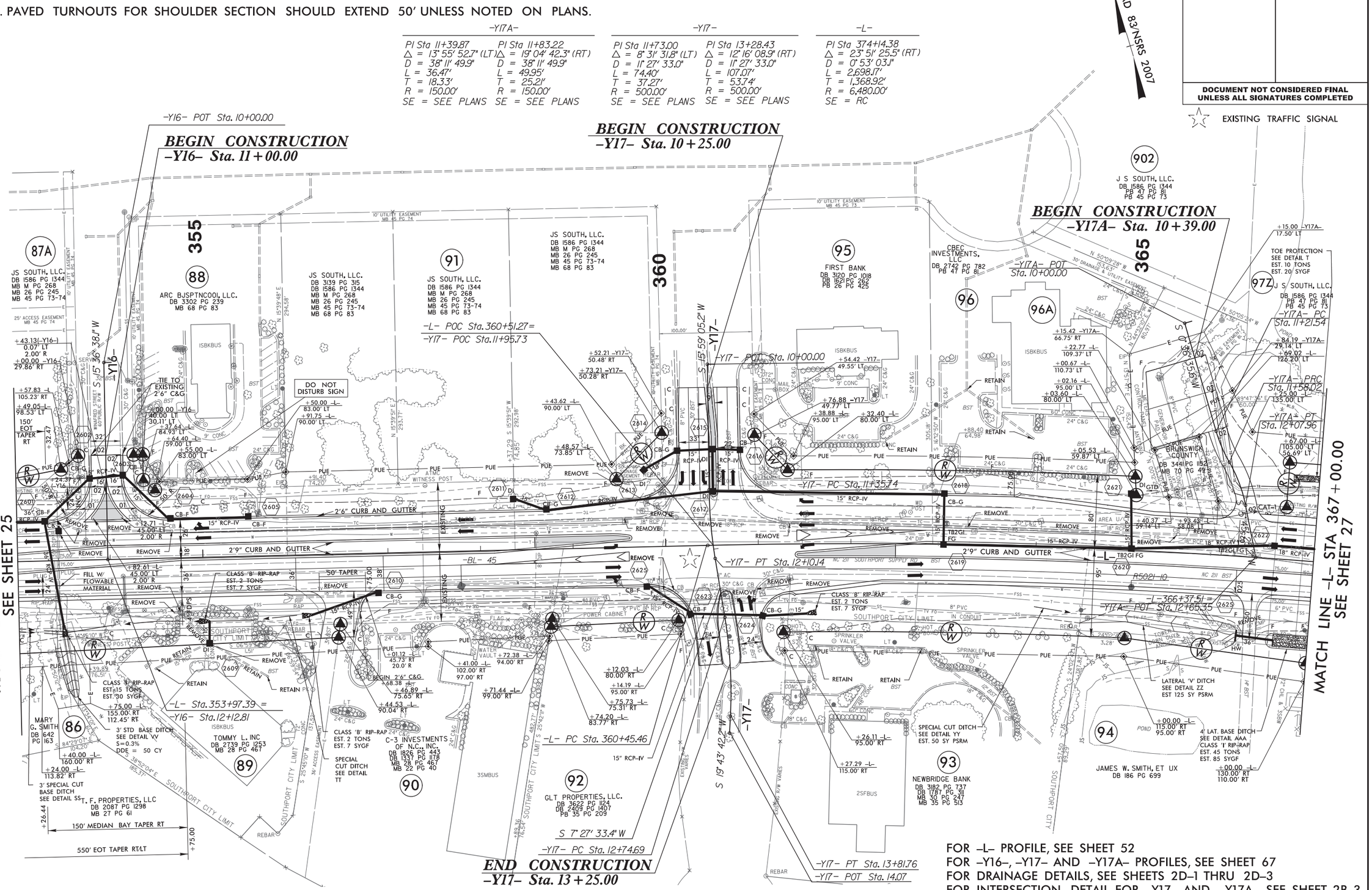
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 26 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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




FOR -L- PROFILE, SEE SHEET 52
FOR -Y16-, -Y17- AND -Y17A- PROFILES, SEE SHEET 67
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3
FOR INTERSECTION DETAIL FOR -Y17- AND -Y17A-, SEE SHEET 2B-3

REVISIONS

07-19-2016 - REVISED PUE'S ON PARCELS 88, 91, 95, 96 96A AND 97. MJD
08-25-2016 - REVISED PUE'S ON PARCELS 91 AND 95. MJD
11-09-2016 - REVISED R/W AND PUE ON PARCELS 88 & 91. DMW
02-23-2017 - REVISED R/W ON PARCEL 90. DMW
02-09-2018 - REVISED R/W AND PUE ON PARCEL 88. DMW
02-09-2018 - REVISED R/W AND PUE ON PARCELS 96 AND 96A. REVISED R/W, PUE AND TCE ON PARCEL 97 TO ALIGN WITH NEW DRIVEWAY. TSG

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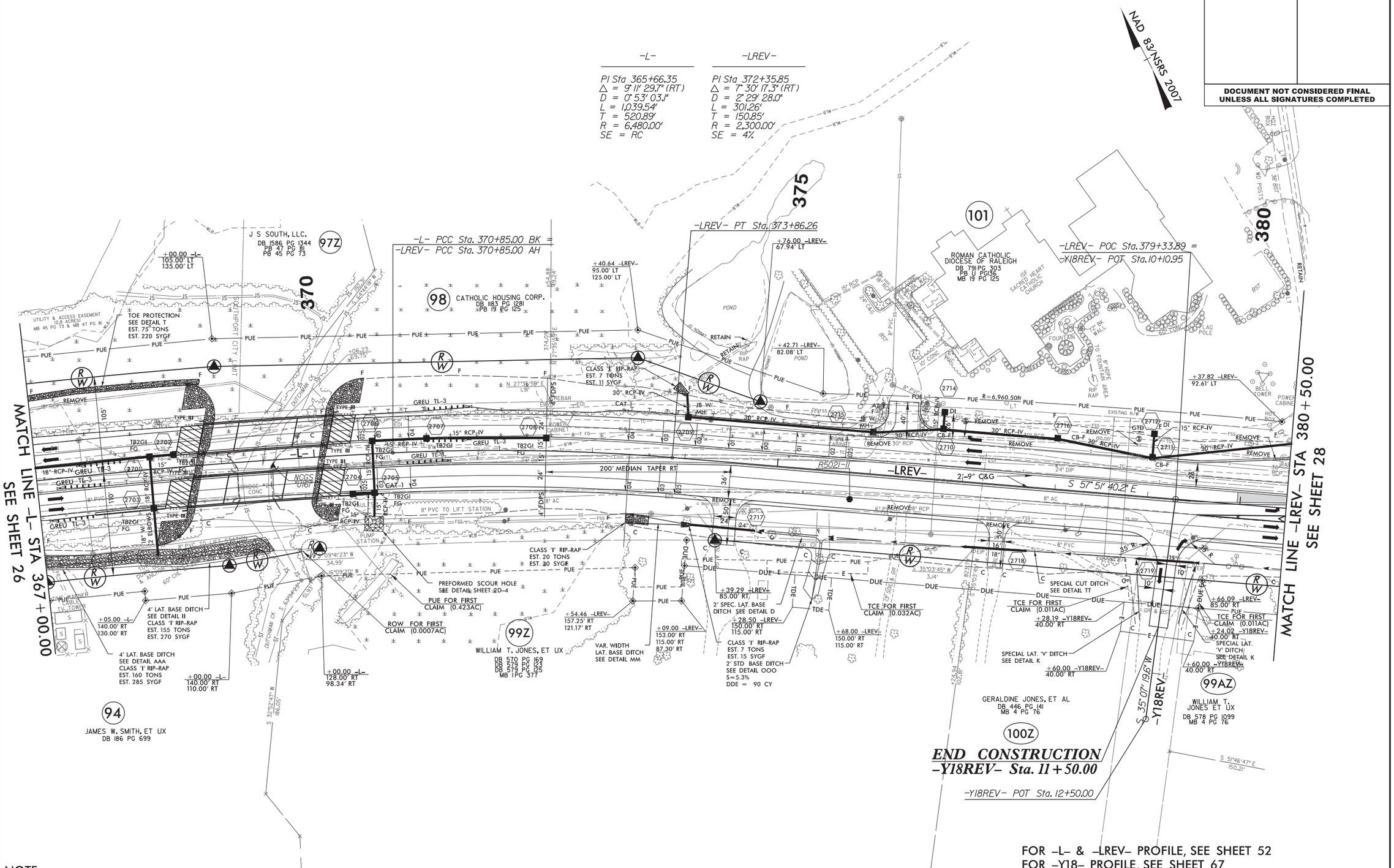
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 27 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

REVISIONS

07-13-2016 - ADDED DRIVEWAY ACCESS TO PARCEL 98. MJD
07-19-2016 - REVISED PUE ON PARCELS 97, 98 AND 101. MJD
02-09-2018 - REVISED PUE ON PARCEL 101. DRIVEWAY WAS REMOVED ON PARCEL 99. ABH
04-18-2018 - REVISED PUE ON PARCELS 97 & 101. REMOVED TCE FROM PARCEL 99. ADDED TDE & DUE TO PARCEL 99. REVISED TCE ON PARCELS 99A & 100. ADDED ROW & DUE TO PARCELS 99A & 100. DMW

5/14/99




NOTE:
1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- & -LREV- PROFILE, SEE SHEET 52
FOR -Y18- PROFILE, SEE SHEET 67
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3
FOR STRUCTURE PLANS, SEE SHEETS S-__ THRU S-__
FOR BRIDGE DETAIL SKETCH, SEE SHEET 2B-6

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 28 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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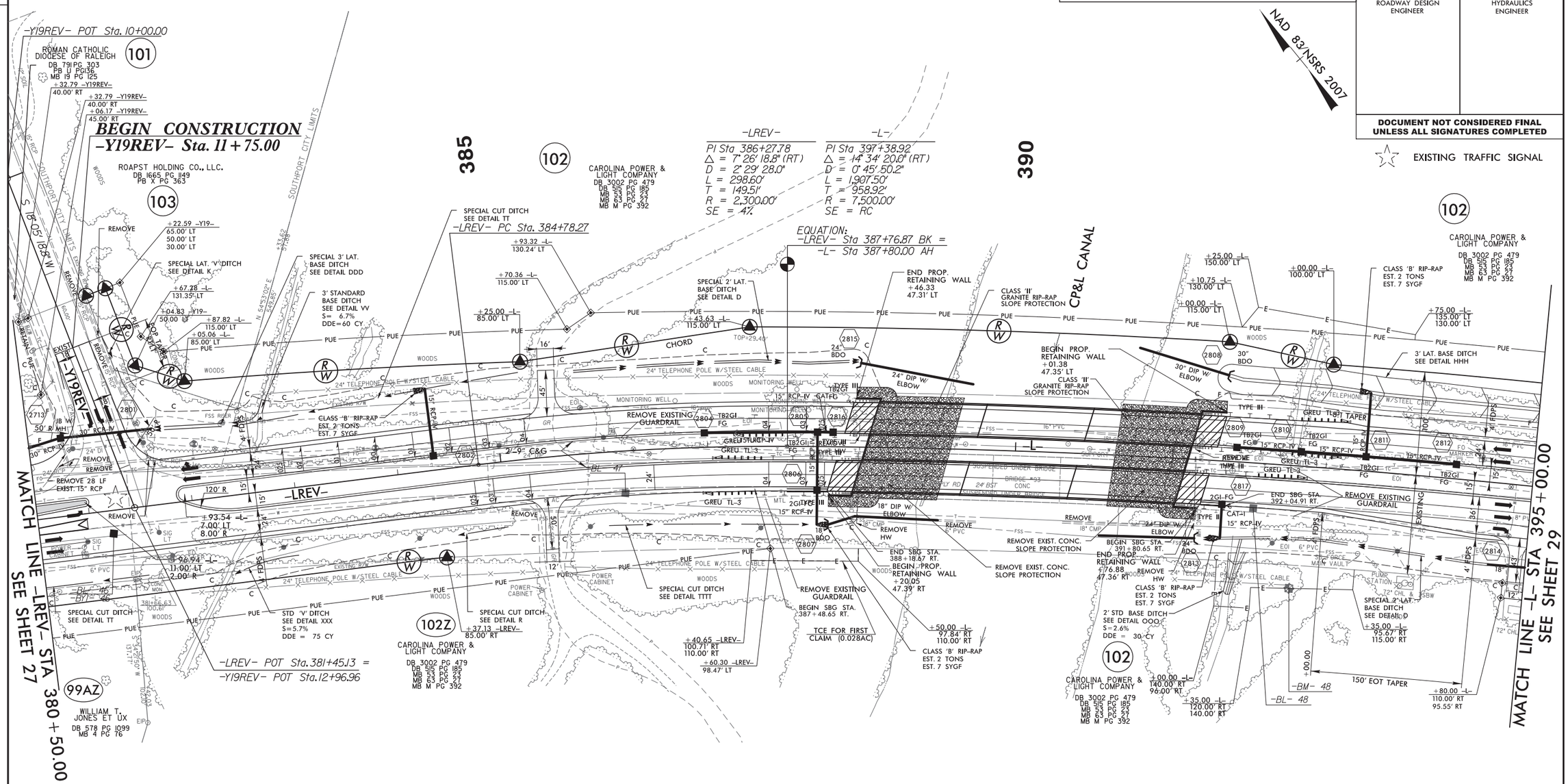
☆ EXISTING TRAFFIC SIGNAL

NAD 83/NSRS 2007




INTERSECTION OF NC 211 (-L-) AND NC 133 DOSHER CUTOFF ROAD (-Y19-)

2018 ADT
2038 ADT

| | | |
|---|---|---|
| | 3328 / 4471 | |
| 2052 / 2814 | -Y19- | 1276 / 1657 |
| 28000 / 44000 | -L- | 27224 / 42843 |

NOTE:
1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEETS 52 & 53
FOR -Y19REV- PROFILE, SEE SHEET 67
FOR BRIDGE DETAIL SHEET, SEE SHEET 2B-6
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3
FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-__
FOR RETAINING WALL PLANS, SEE SHEETS W-__ THRU W-__

REVISIONS
07-19-2016 - REVISED PUE'S ON PARCELS 101, 102 AND 103. MJD
02-09-2018 - REVISED PUE ON PARCEL 101. ABH
04-18-2018 - REVISED ROW & PUE ON PARCEL 99A. REVISED ROW, PUE & TCE ON PARCEL 102. REMOVED ROW AND REVISED PUE ON PARCEL 101. DMW

5/14/99

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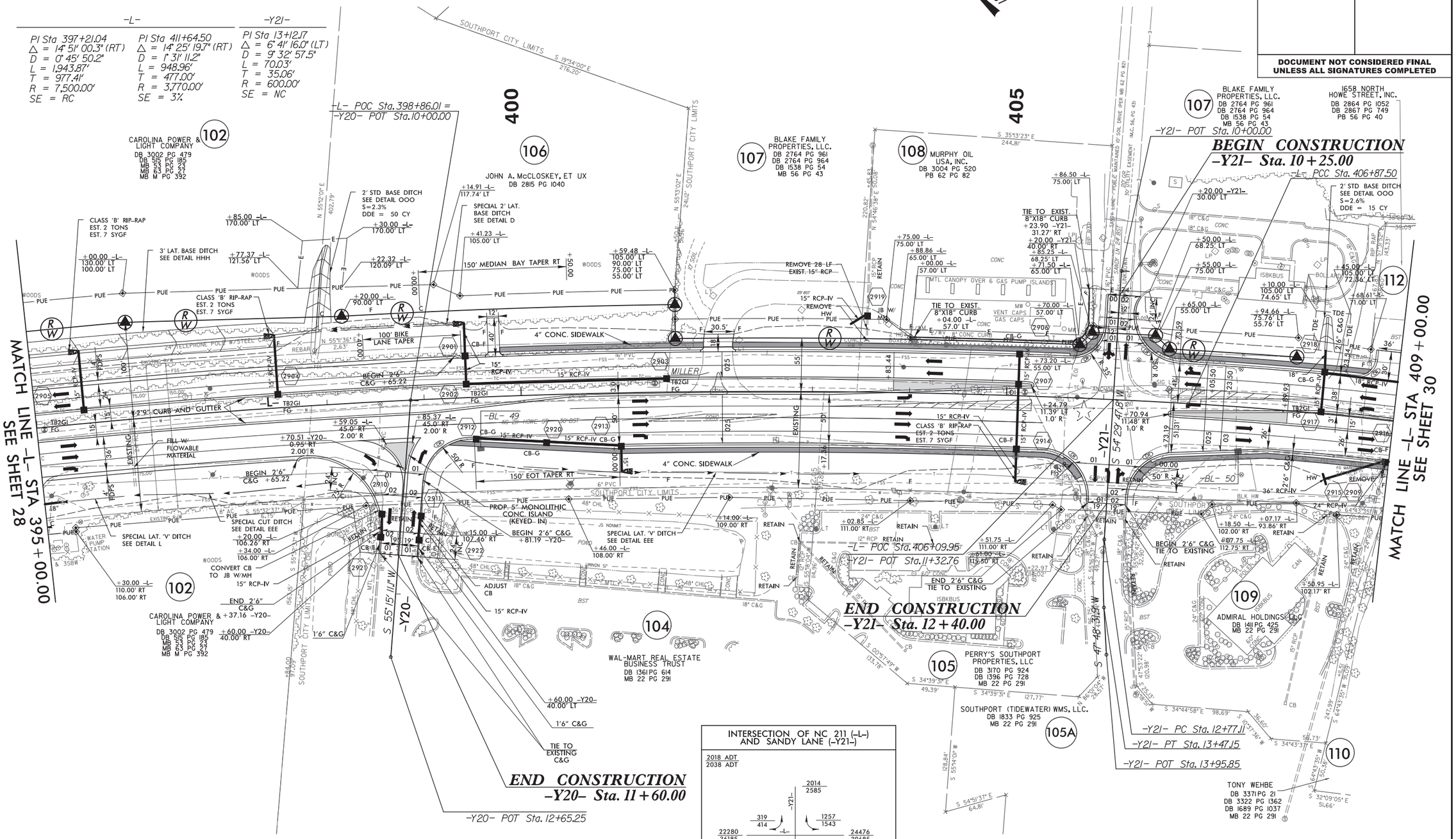
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 29 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

NAD 83/NSRS 2007

EXISTING TRAFFIC SIGNAL

| -L- | -Y21- |
|---|---|
| PI Sta 397+21.04 | PI Sta 13+12.17 |
| △ = 14° 51' 00.3" (RT) | △ = 6° 41' 16.0" (LT) |
| D = 0° 45' 50.2" | D = 9° 32' 57.5" |
| L = 1,943.87' | L = 70.03' |
| T = 977.41' | T = 35.06' |
| R = 7,500.00' | R = 600.00' |
| SE = RC | SE = NC |
| PI Sta 411+64.50 | |
| △ = 14° 25' 19.7" (RT) | |
| D = 1° 31' 11.2" | |
| L = 948.96' | |
| T = 477.00' | |
| R = 3,770.00' | |
| SE = 3% | |




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 53
FOR -Y20- & -Y21- PROFILES, SEE SHEET 68
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

REVISIONS

| | |
|---|---|
| 07-19-2016 | REVISED PUE ON PARCELS 102, 106, 107, 108 AND 112. MJD |
| 08-25-2016 | REVISED PUE ON PARCEL 107. MJD |
| 09-07-2017 | REVISED PUE ON PARCEL 112. DMW |
| 02-09-2018 | REVISED PUE ON PARCELS 104, 105, 105A, 107, 108, 109, 110 AND 112. REVISED TCE ON PARCELS 107 AND 108. REMOVED ROW ON PARCEL 112. REMOVED TCE ON PARCELS 105, 105A AND 109. ADDED TDE TO PARCEL 107. DMW |
| 04-20-2018 | REVISED ROW & PUE ON PARCELS 107 & 108. DMW |

5/14/99

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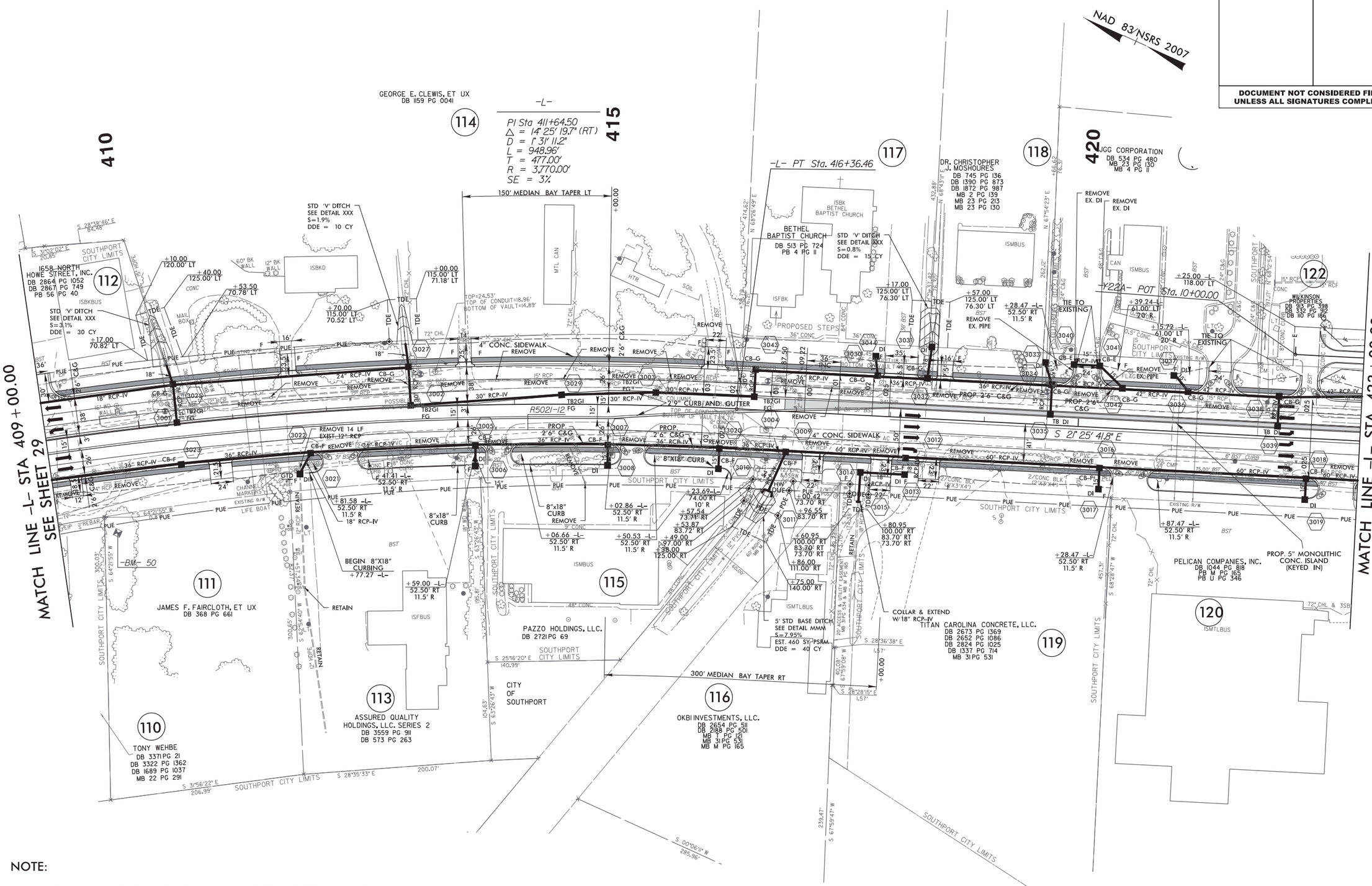
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 30 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

REVISIONS

07-19-2016 - ADDED PUE ON PARCELS 112, 114, 117, 118, 121 & 122. MJD
09-07-2016 - REVISED DRIVEWAY ON PARCEL 112. DMW
02-09-2018 - REVISED PUE ON PARCELS 110, 111, 112, 113, 114, 115, 117 & 118.
118, 121 & 122. REMOVED ROW ON PARCELS 110, 111, 112, 113, 114, 115, 117 & 118. ADDED DUE TO PARCEL 119. TDE TO PARCELS 112, 114, 115, 117, 118 & 119.
REMOVED TCE ON PARCELS 112, 114, 115, 117 & 118.
ADDED PDE TO PARCEL 115. ADDED TCE TO PARCEL 122. DMW

5/14/99




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 54
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

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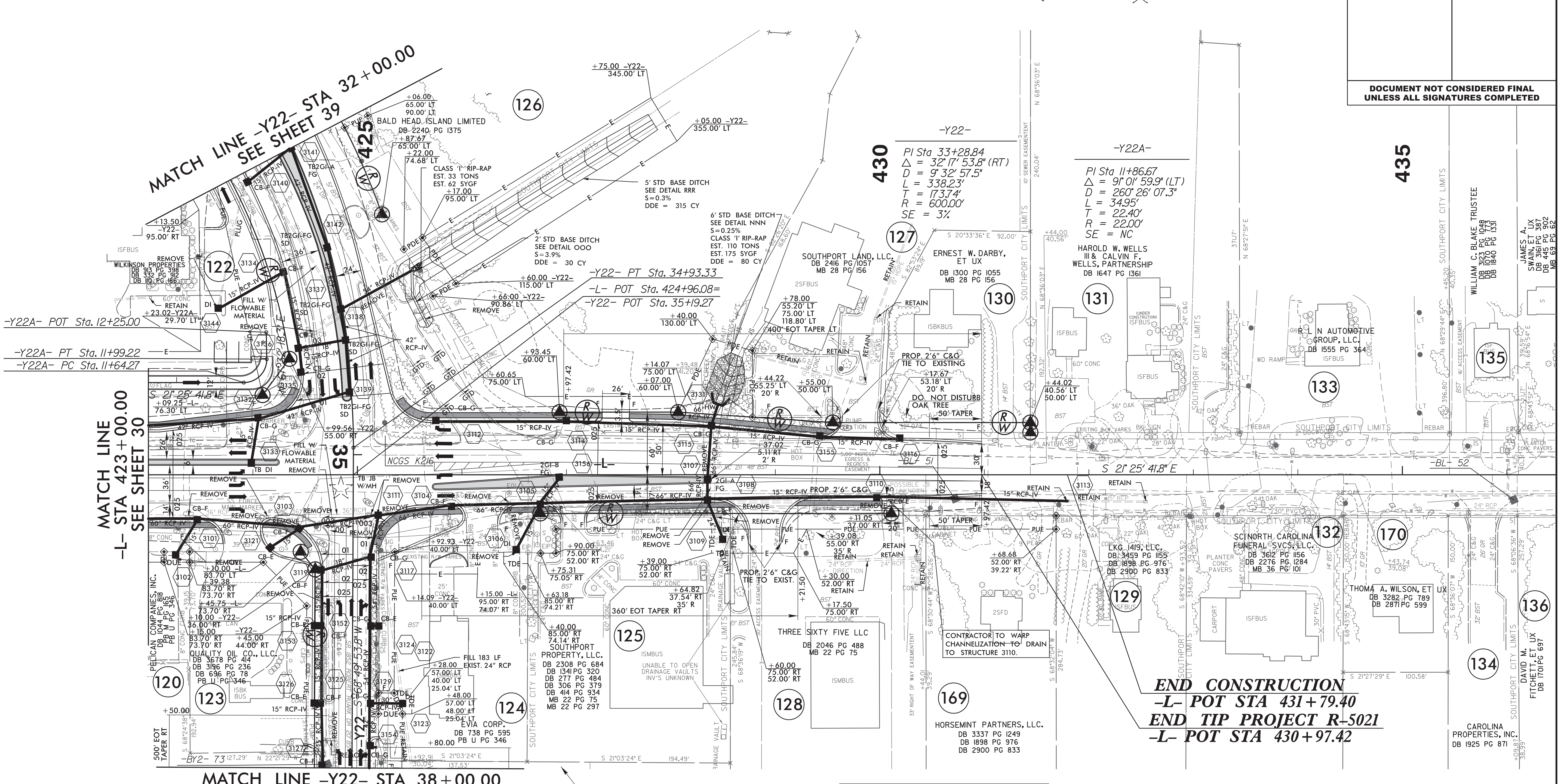
NC License No: C-1554

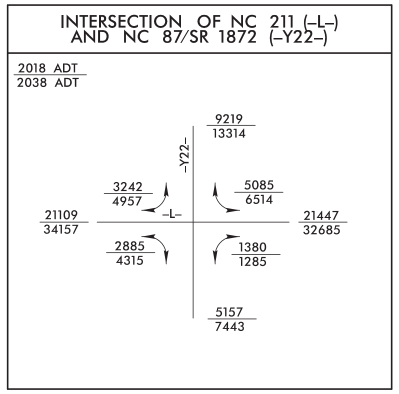
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 31 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

DO NOT DISTURB THE MONUMENT "NCGS K216".

☆ EXISTING TRAFFIC SIGNAL




INTERSECTION OF NC 211 (-L-) AND NC 87/SR 1872 (-Y22-)

NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -L- PROFILE, SEE SHEET 54
FOR -Y22- PROFILE, SEE SHEET 69
FOR INTERSECTION DETAIL, SEE SHEET 2B-4
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

REVISIONS

03-08-2018 – REVISED PUE ON PARCELS 120, 123, 124, 125, 126, 128, 129, 167 AND 169. REVISED ROW ON PARCELS 120 AND 123. REVISED TCE ON PARCELS 122, 124 AND 128. REMOVED PUE ON PARCELS 129, 132, 134, 136 AND 170. REMOVED ROW ON PARCELS 124, 129, 131, 132, 133, 134, 135, 136, 167, 169 AND 170. REMOVED TCE ON PARCELS 125, 131, 133 AND 135. ADDED TDE TO PARCELS 124, 125 AND 126. ADDED DUE TO PARCELS 120 AND 124. DMW

5/14/99

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 32 |
| R/W SHEET NO. | 33 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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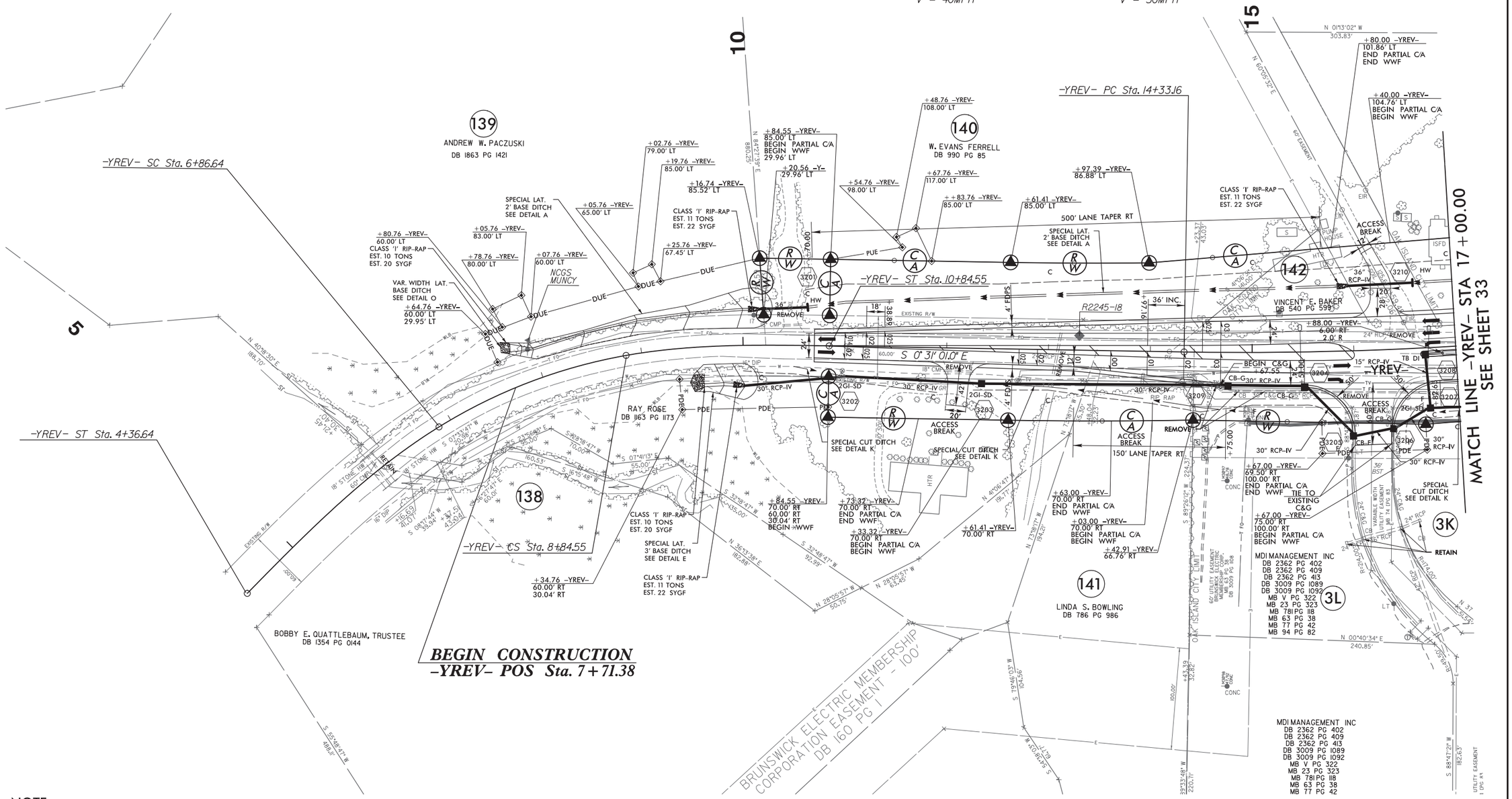
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

NAD 83/NSRS 2007

-YREV-

| PIs Sta 6+03.82 | PI Sta 7+86.81 | PIs Sta 9+51.45 | PI Sta 18+41.89 |
|---|---|---|---|
| Θs = 13° 45' 00.0" | Δ = 21° 46' 11.3" (RT) | Θs = 11° 00' 00.0" | Δ = 13° 23' 50.4" (LT) |
| Ls = 250.00' | D = 11° 00' 00.0" | Ls = 200.00' | D = 1° 38' 47.1" |
| LT = 167.17' | L = 197.91' | LT = 133.59' | L = 813.72' |
| ST = 83.79' | T = 100.16' | ST = 66.90' | T = 408.72' |
| | R = 520.87' | | R = 3,480.00' |
| | SE = 6% | | SE = 3% |
| | V = 40MPH | | V = 50MPH |




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -YREV- PROFILE, SEE SHEET 55
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

REVISIONS

07-26-2016 - Added Control Of Access Break On Parcel 141. MJD
08-02-2017 - Parcel 3 was Subdivided. Revised ROW, Removed Easement & Added PDE on Parcel 3K & 3L. DMW

5/14/99

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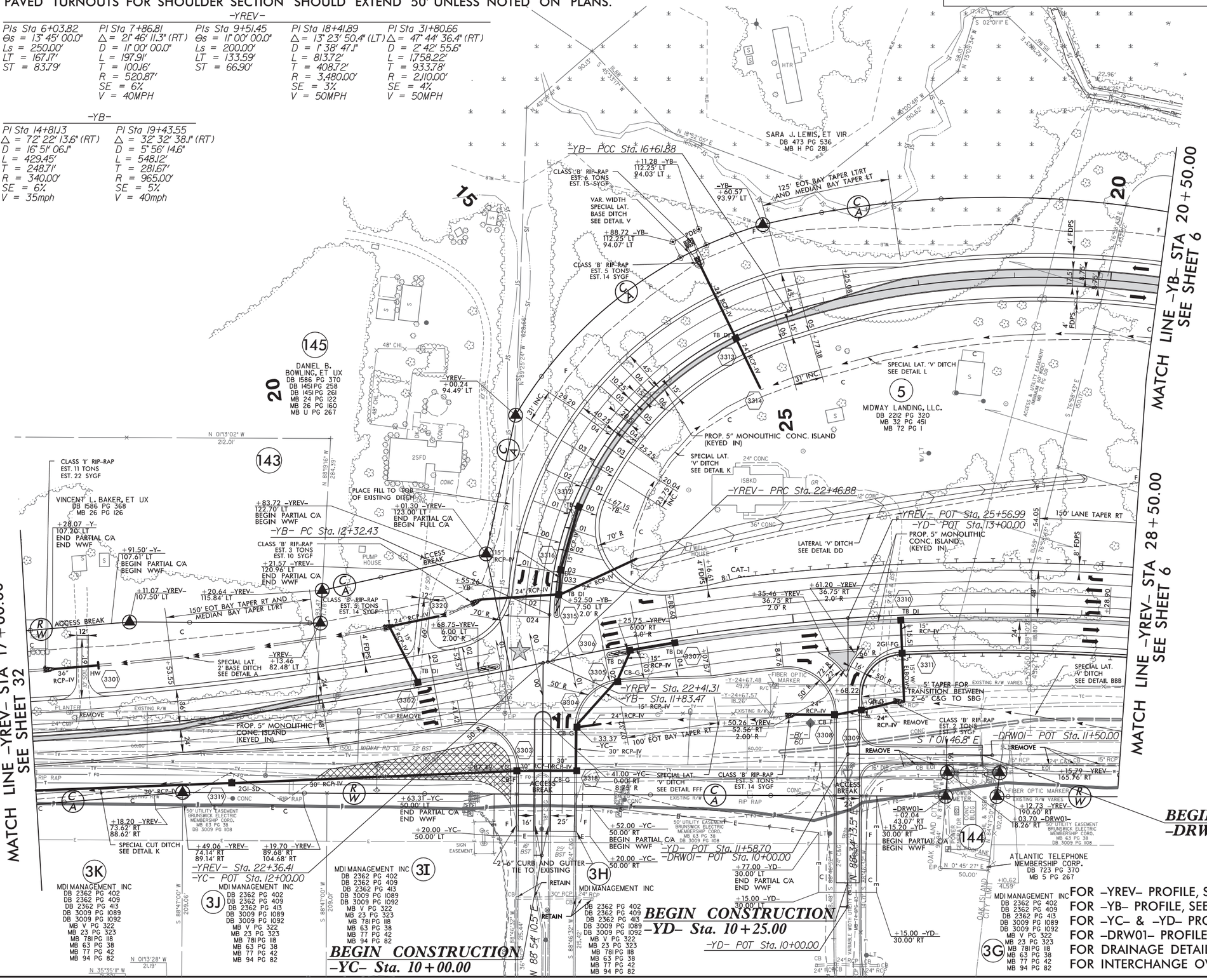
NOTE:
1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

-YREV-

| Pls Sta 6+03.82 | Pl Sta 7+86.81 | Pls Sta 9+51.45 | Pl Sta 18+41.89 | Pl Sta 31+80.66 |
|---|---|---|---|---|
| Θs = 13° 45' 00.0" | Δ = 21° 46' 11.3" (RT) | Θs = 11° 00' 00.0" | Δ = 13° 23' 50.4" (LT) | Δ = 47° 44' 36.4" (RT) |
| Ls = 250.00' | D = 11° 00' 00.0" | Ls = 200.00' | D = 1° 38' 47.1" | D = 2° 42' 55.6" |
| LT = 167.17' | L = 197.91' | LT = 133.59' | L = 813.72' | L = 1,758.22' |
| ST = 83.79' | T = 100.16' | ST = 66.90' | T = 408.72' | T = 933.78' |
| | R = 520.87' | | R = 3,480.00' | R = 2,110.00' |
| | SE = 6% | | SE = 3% | SE = 4% |
| | V = 40MPH | | V = 50MPH | V = 50MPH |

-YB-

| Pl Sta 14+81.13 | Pl Sta 19+43.55 |
|---|---|
| Δ = 72° 22' 13.6" (RT) | Δ = 32° 32' 38.1" (RT) |
| D = 16° 51' 06.1" | D = 5° 56' 14.6" |
| L = 429.45' | L = 548.12' |
| T = 248.71' | T = 281.67' |
| R = 340.00' | R = 965.00' |
| SE = 6% | SE = 5% |
| V = 35mph | V = 40mph |




| REVISIONS |
|---|
| 08-02-2017 – PARCEL 3 WAS SUBDIVIDED. REVISED ROW & EASEMENTS ON PARCEL 3. REVISED ROW, ADDED C/A & REMOVED ACCESS BREAK ON PARCEL 5. REMOVED ROW & EASEMENT CLAIM FROM PARCEL 144. REVISED ROW & REVISED ACCESS BREAK ON PARCEL 145. DMW |

5/14/99

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 33 |
| R/W SHEET NO. | 34 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NSRS 2007

PROPOSED TRAFFIC SIGNAL

FOR -YREV- PROFILE, SEE SHEET 55
FOR -YB- PROFILE, SEE SHEET 57
FOR -YC- & -YD- PROFILES, SEE SHEET 58
FOR -DRW01- PROFILE, SEE SHEET 58
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3
FOR INTERCHANGE OVERVIEW, SEE SHEET 2B-7

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 34 |
| R/W SHEET NO. | 35 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

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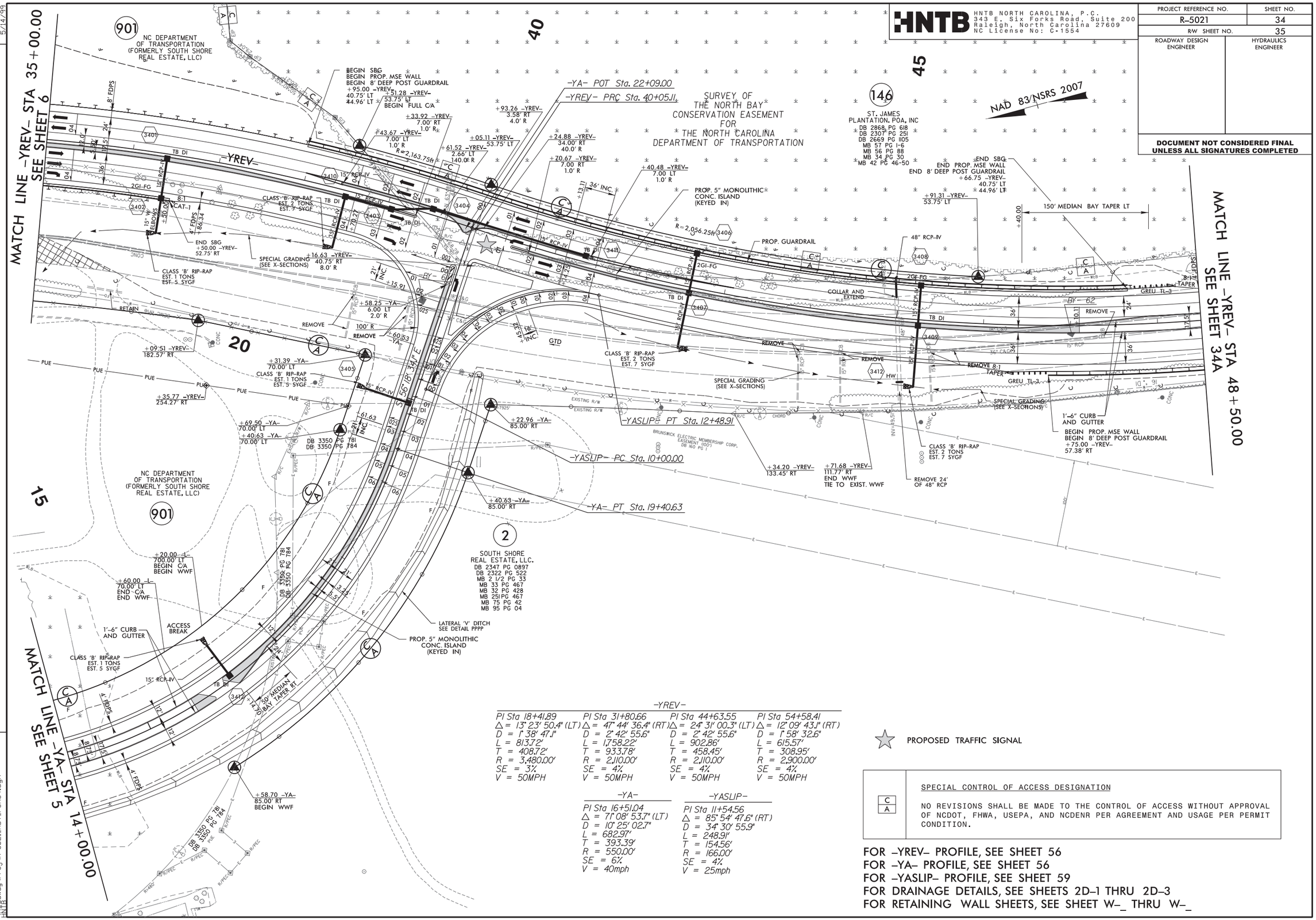


| -YREV- | | | |
|---|---|---|---|
| PI Sta 18+41.89 | PI Sta 31+80.66 | PI Sta 44+63.55 | PI Sta 54+58.41 |
| Δ = 13° 23' 50.4" (LT) | Δ = 47° 44' 36.4" (RT) | Δ = 24° 31' 00.3" (LT) | Δ = 12° 09' 43.1" (RT) |
| D = 1° 38' 47.1" | D = 2° 42' 55.6" | D = 2° 42' 55.6" | D = 1° 58' 32.6" |
| L = 813.72' | L = 1,758.22' | L = 902.86' | L = 615.57' |
| T = 408.72' | T = 933.78' | T = 458.45' | T = 308.95' |
| R = 3,480.00' | R = 2,110.00' | R = 2,110.00' | R = 2,900.00' |
| SE = 3% | SE = 4% | SE = 4% | SE = 4% |
| V = 50MPH | V = 50MPH | V = 50MPH | V = 50MPH |

| -YA- | -YASLIP- |
|---|---|
| PI Sta 16+51.04 | PI Sta 11+54.56 |
| Δ = 71° 08' 53.7" (LT) | Δ = 85° 54' 47.6" (RT) |
| D = 10° 25' 02.7" | D = 34° 30' 55.9" |
| L = 682.97' | L = 248.91' |
| T = 393.39' | T = 154.56' |
| R = 550.00' | R = 166.00' |
| SE = 6% | SE = 4% |
| V = 40mph | V = 25mph |

★ PROPOSED TRAFFIC SIGNAL

C A — SPECIAL CONTROL OF ACCESS DESIGNATION

NO REVISIONS SHALL BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, FHWA, USEPA, AND NCDENR PER AGREEMENT AND USAGE PER PERMIT CONDITION.

FOR -YREV- PROFILE, SEE SHEET 56
FOR -YA- PROFILE, SEE SHEET 56
FOR -YASLIP- PROFILE, SEE SHEET 59
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3
FOR RETAINING WALL SHEETS, SEE SHEET W-_ THRU W-_

REVISIONS

| | |
|---|---|
| 08-09-2017 - | PARCEL 145 RENUMBERED TO 2D. ADDED ALIGNMENT -YA- WITH FULL CONTROL ACCESS ON PARCEL 2D. ALIGNMENT -Y- SHIFTED TO BECAME -YREV- WHICH ADDED FULL CONTROL ACCESS ON PARCEL 146. DMW |
| 02-09-2018 - | CONTROL ACCESS WAS ADDED TO PARCEL 901. TSG |

5/14/99

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8/17/99

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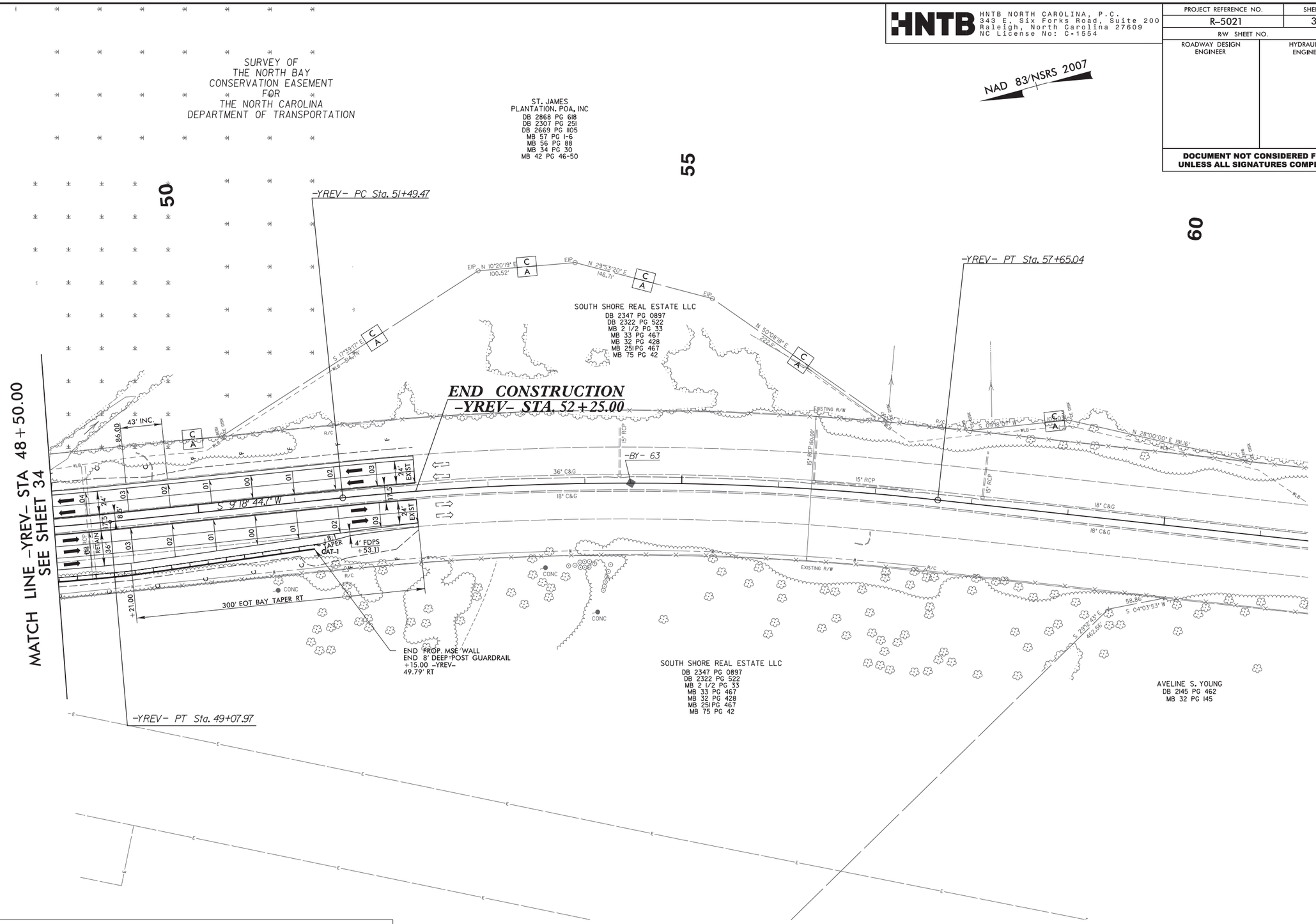
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 34A |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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




C
A

SPECIAL CONTROL OF ACCESS DESIGNATION

NO REVISIONS SHALL BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, FHWA, USEPA, AND NCDENR PER AGREEMENT AND USAGE PER PERMIT CONDITION.

FOR -YREV- PROFILE, SEE SHEET 56
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3
FOR RETAINING WALL PLANS, SEE SHEETS W-_ THRU W-_

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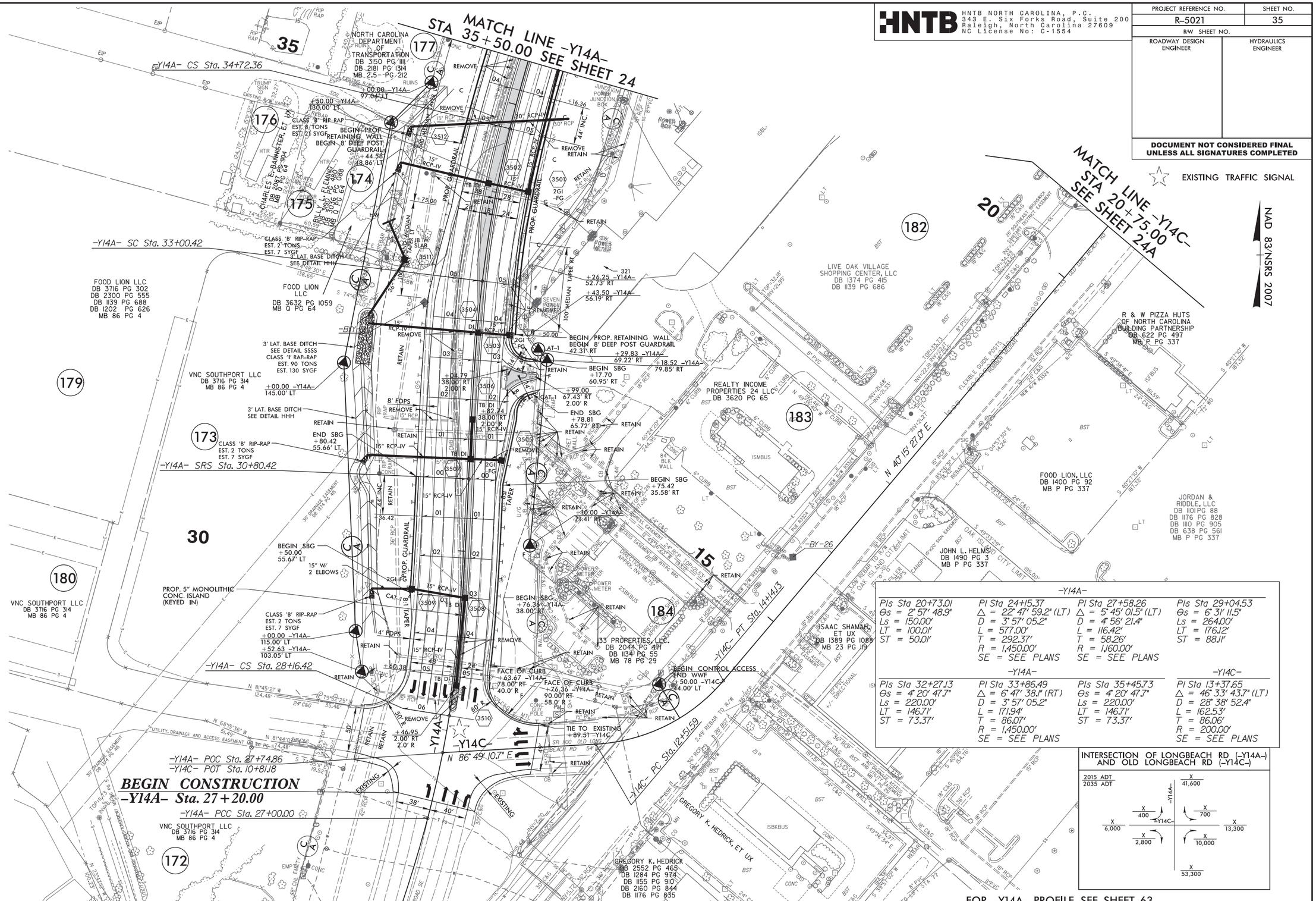
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 35 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

☆ EXISTING TRAFFIC SIGNAL

NAD 83/NSRS 2007




| -Y14A- | | | |
|---|---|---|---|
| PIs Sta 20+73.01 | PI Sta 24+15.37 | PI Sta 27+58.26 | PIs Sta 29+04.53 |
| Θs = 2° 57' 48.9" | Δ = 22° 47' 59.2" (LT) | Δ = 5° 45' 01.5" (LT) | Θs = 6° 31' 11.5" |
| Ls = 150.00' | D = 3° 57' 05.2" | D = 4° 56' 21.4" | Ls = 264.00' |
| LT = 100.01' | L = 577.00' | L = 116.42' | LT = 176.12' |
| ST = 50.01' | T = 292.37' | T = 58.26' | ST = 88.11' |
| | R = 1,450.00' | R = 1,160.00' | |
| | SE = SEE PLANS | SE = SEE PLANS | |

| -Y14A- | | | -Y14C- |
|---|---|---|---|
| PIs Sta 32+27.13 | PI Sta 33+86.49 | PIs Sta 35+45.73 | PI Sta 13+37.65 |
| Θs = 4° 20' 47.7" | Δ = 6° 47' 38.1" (RT) | Θs = 4° 20' 47.7" | Δ = 46° 33' 43.7" (LT) |
| Ls = 220.00' | D = 3° 57' 05.2" | Ls = 220.00' | D = 28° 38' 52.4" |
| LT = 146.71' | L = 171.94' | LT = 146.71' | L = 162.53' |
| ST = 73.37' | T = 86.07' | ST = 73.37' | T = 86.06' |
| | R = 1,450.00' | | R = 200.00' |
| | SE = SEE PLANS | | SE = SEE PLANS |

**INTERSECTION OF LONGBEACH RD (-Y14A-) AND OLD LONGBEACH RD (-Y14C-)**

2015 ADT
2035 ADT

-Y14A-: X 41,600; X 400; X 700
-Y14C-: X 6,000; X 13,300; X 2,800; X 10,000
X 53,300

FOR -Y14A- PROFILE, SEE SHEET 63
FOR -Y14C- PROFILE, SEE SHEET 65
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3
FOR RETAINING WALL PLANS, SEE SHEETS W-_ THRU W-_

NOTE: 1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

REVISIONS
02-09-2018 - CONTROL ACCESS WAS ADDED TO PARCELS 173, 174, 177, 182, AND 184. TSG

5/14/99

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 36 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

REVISIONS

02-09-2018 – Control Access was Added to Parcels 80, 80A, 80B, 185, 186, and 187. TSG

5/14/99

–Y14A–

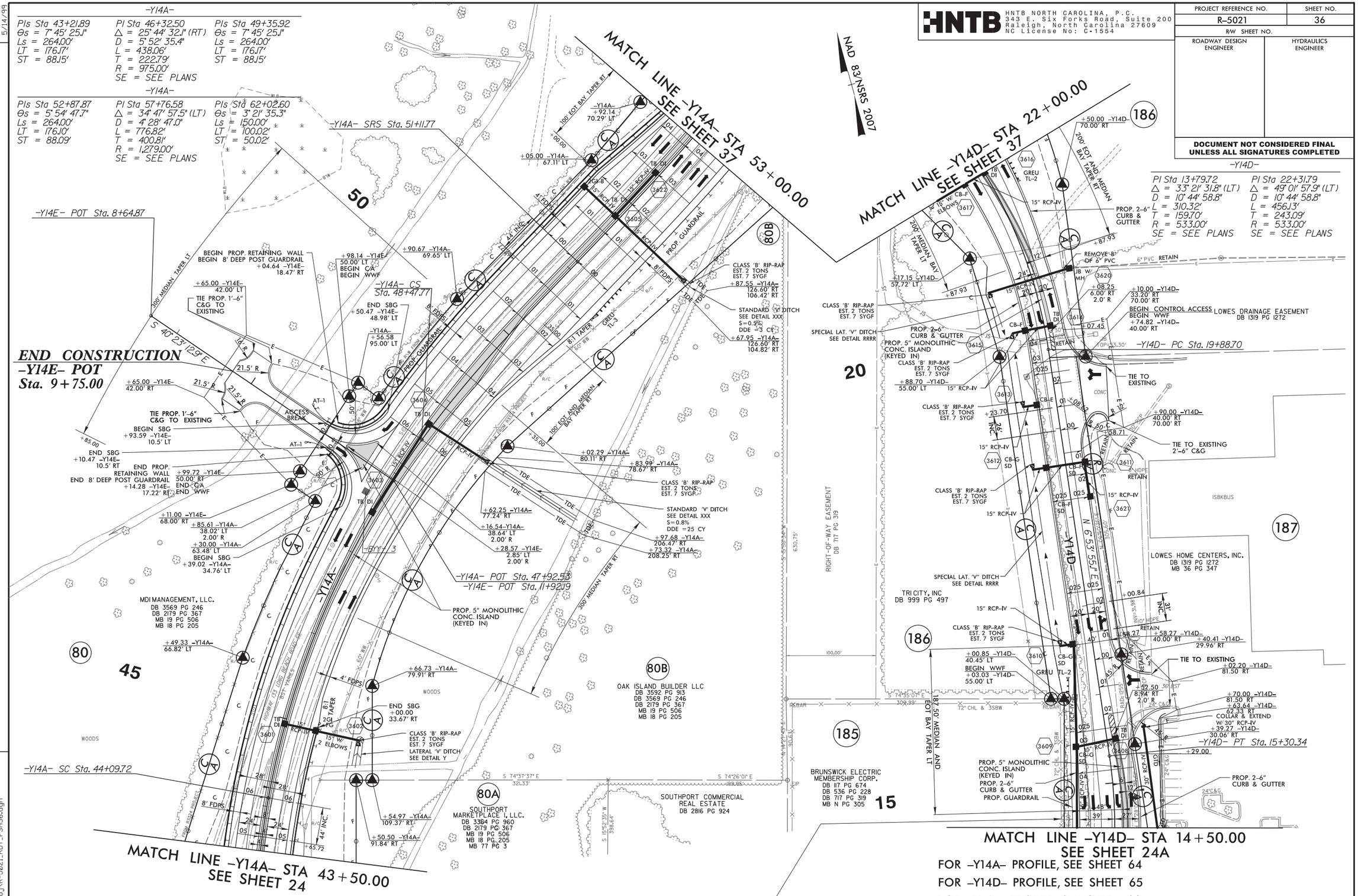
| | | |
|---|---|---|
| PIs Sta 43+21.89 | PI Sta 46+32.50 | PIs Sta 49+35.92 |
| Θs = 7° 45′ 25.1″ | Δ = 25° 44′ 32.1″ (RT) | Θs = 7° 45′ 25.1″ |
| Ls = 264.00′ | D = 5° 52′ 35.4″ | Ls = 264.00′ |
| LT = 176.17′ | L = 438.06′ | LT = 176.17′ |
| ST = 88.15′ | T = 222.79′ | ST = 88.15′ |
| | R = 975.00′ | |
| | SE = SEE PLANS | |

–Y14A–

| | | |
|---|---|---|
| PIs Sta 52+87.87 | PI Sta 57+76.58 | PIs Sta 62+02.60 |
| Θs = 5° 54′ 47.7″ | Δ = 34° 47′ 57.5″ (LT) | Θs = 3° 21′ 35.3″ |
| Ls = 264.00′ | D = 4° 28′ 47.0″ | Ls = 150.00′ |
| LT = 176.10′ | L = 776.82′ | LT = 100.02′ |
| ST = 88.09′ | T = 400.81′ | ST = 50.02′ |
| | R = 1,279.00′ | |
| | SE = SEE PLANS | |

–Y14D–

| | |
|---|---|
| PI Sta 13+79.72 | PI Sta 22+31.79 |
| Δ = 33° 21′ 31.8″ (LT) | Δ = 49° 01′ 57.9″ (LT) |
| D = 10° 44′ 58.8″ | D = 10° 44′ 58.8″ |
| L = 310.32′ | L = 456.13′ |
| T = 159.70′ | T = 243.09′ |
| R = 533.00′ | R = 533.00′ |
| SE = SEE PLANS | SE = SEE PLANS |




NOTE: 1. ALL DRIVEWAY RADII ARE 20′ UNLESS NOTED ON PLANS.
2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50′ UNLESS NOTED ON PLANS.

DO NOT DISTURB FENCE AROUND BRUNSWICK ELECTRIC PARCEL

FOR –Y14A– PROFILE, SEE SHEET 64
FOR –Y14D– PROFILE, SEE SHEET 65
FOR –Y14E– PROFILE, SEE SHEET 66
FOR DRAINAGE DETAILS, SEE SHEETS 2D–1 THRU 2D–3
FOR RETAINING WALL PLANS, SEE SHEETS W–_ THRU W–_

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 37 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

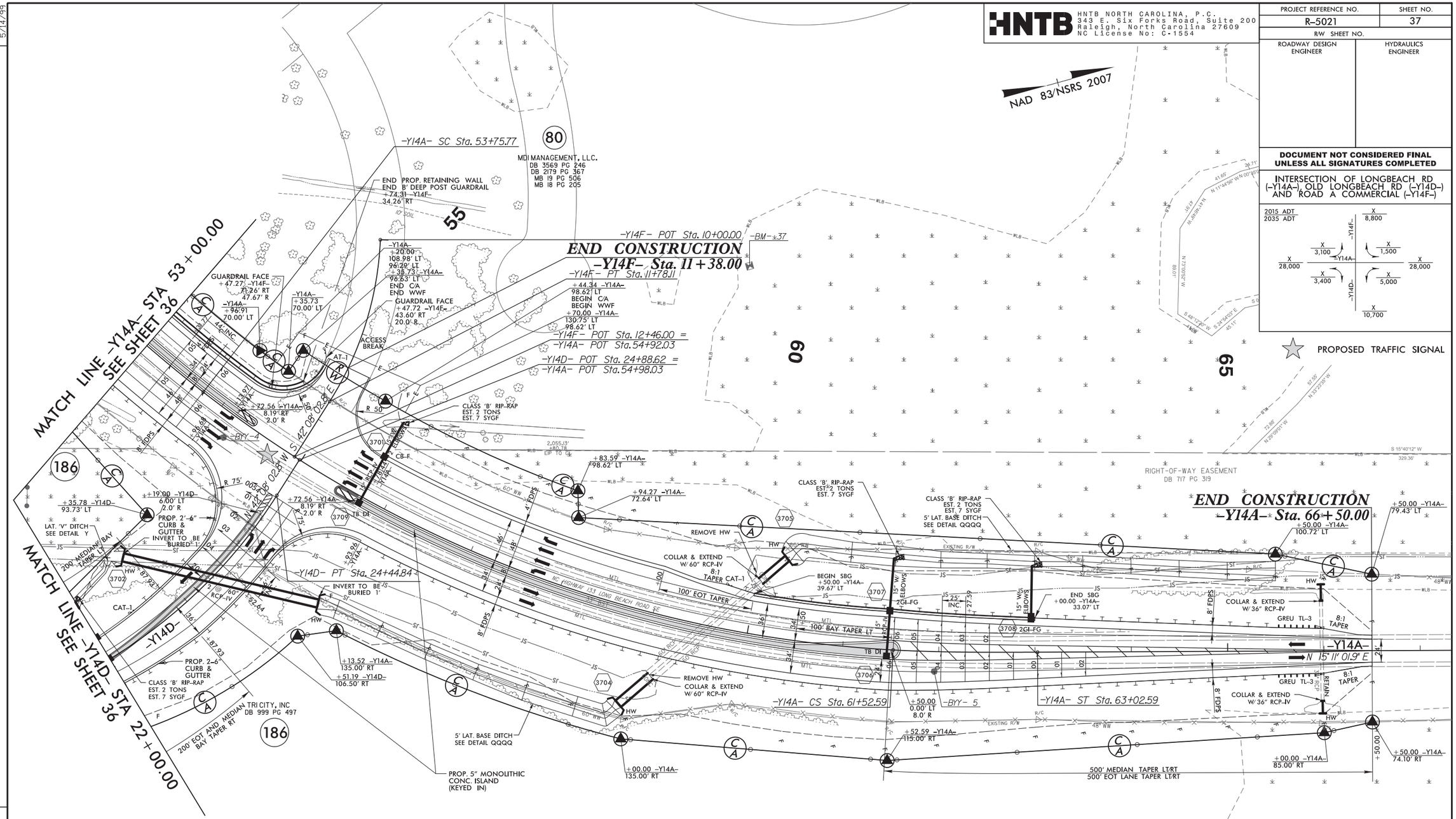
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

INTERSECTION OF LONGBEACH RD (-Y14A-), OLD LONGBEACH RD (-Y14D-) AND ROAD A COMMERCIAL (-Y14F-)

2015 ADT
2035 ADT

| | -Y14A- | -Y14D- | -Y14F- |
|---|---|---|---|
| -Y14A- | X / 28,000 | X / 3,400 | X / 3,100 |
| -Y14D- | X / 3,400 | X / 10,700 | X / 5,000 |
| -Y14F- | X / 3,100 | X / 5,000 | X / 8,800 |

★ PROPOSED TRAFFIC SIGNAL




-Y14A-

| | | |
|---|---|---|
| PIs Sta 52+87.87 | PI Sta 57+76.58 | PIs Sta 62+02.60 |
| Θs = 5° 54' 47.7" | Δ = 34° 47' 57.5" (LT) | Θs = 3° 21' 35.3" |
| Ls = 264.00' | D = 4° 28' 47.0" | Ls = 150.00' |
| LT = 176.10' | L = 776.82' | LT = 100.02' |
| ST = 88.09' | T = 400.81' | ST = 50.02' |
| | R = 1,279.00' | |
| | SE = SEE PLANS | |

-Y14D-

PI Sta 22+31.79
Δ = 49° 01' 57.9" (LT)
D = 10° 44' 58.8"
L = 456.13'
T = 243.09'
R = 533.00'
SE = SEE PLANS

-Y14F-

PI Sta 10+91.15
Δ = 30° 00' 52.6" (RT)
D = 16° 51' 06.1"
L = 178.11'
T = 91.15'
R = 340.00'
SE = SEE PLANS

FOR -Y14A- PROFILE, SEE SHEET 64
FOR -Y14D- & -Y14F- PROFILES, SEE SHEET 66
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3
FOR RETAINING WALL PLANS, SEE SHEETS W-_ THRU W-_

NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

REVISIONS

02-09-2018 - CONTROL ACCESS WAS ADDED TO PARCELS 80 AND 186. TSG

5/14/99

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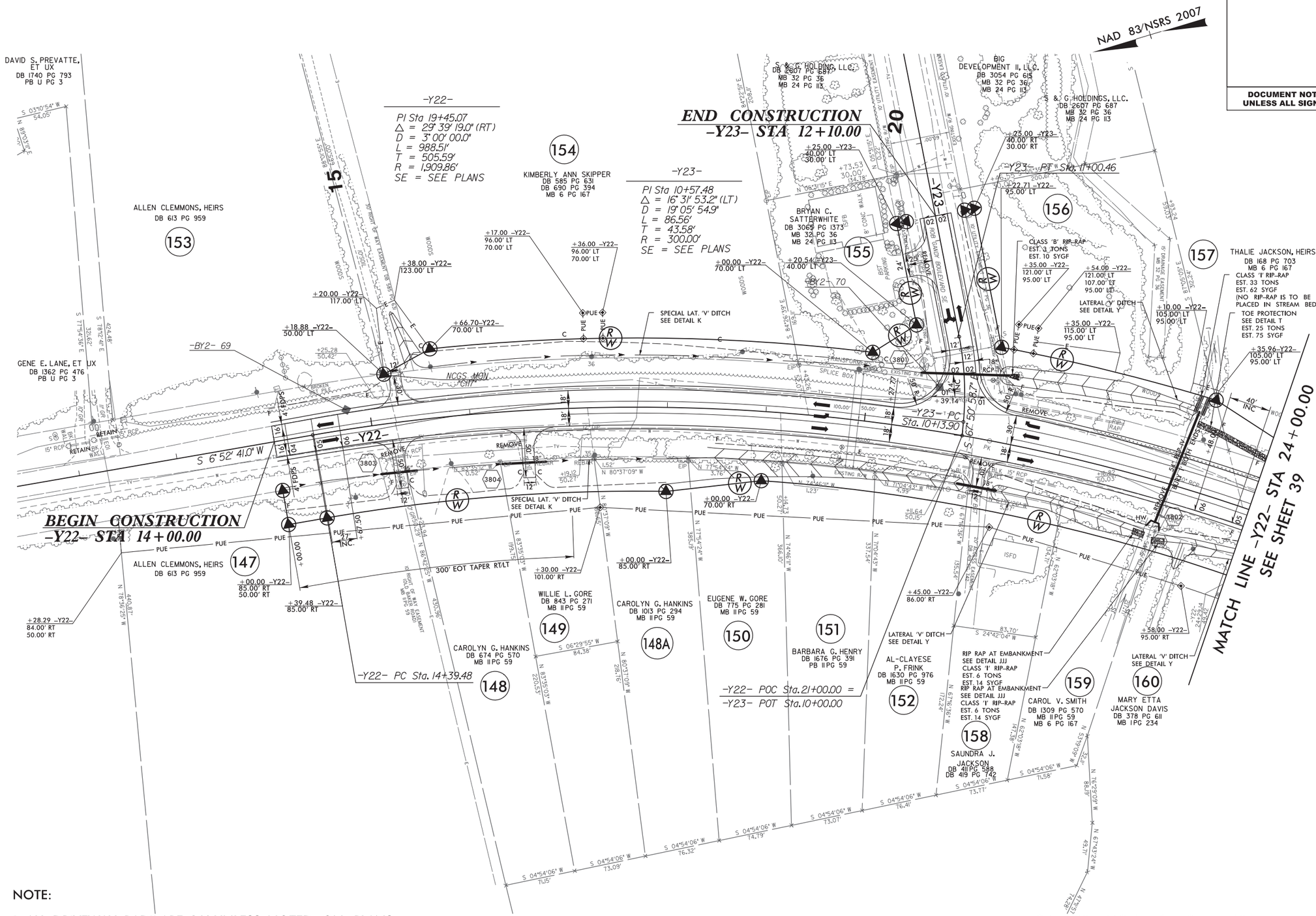
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 38 |
| R/W SHEET NO. | 36 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

11-09-2016 - REVISED PARCEL NO. 148 TO 148A. DMW

5/14/99




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -Y22- PROFILE, SEE SHEET 68
FOR -Y23- PROFILE, SEE SHEET 70
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

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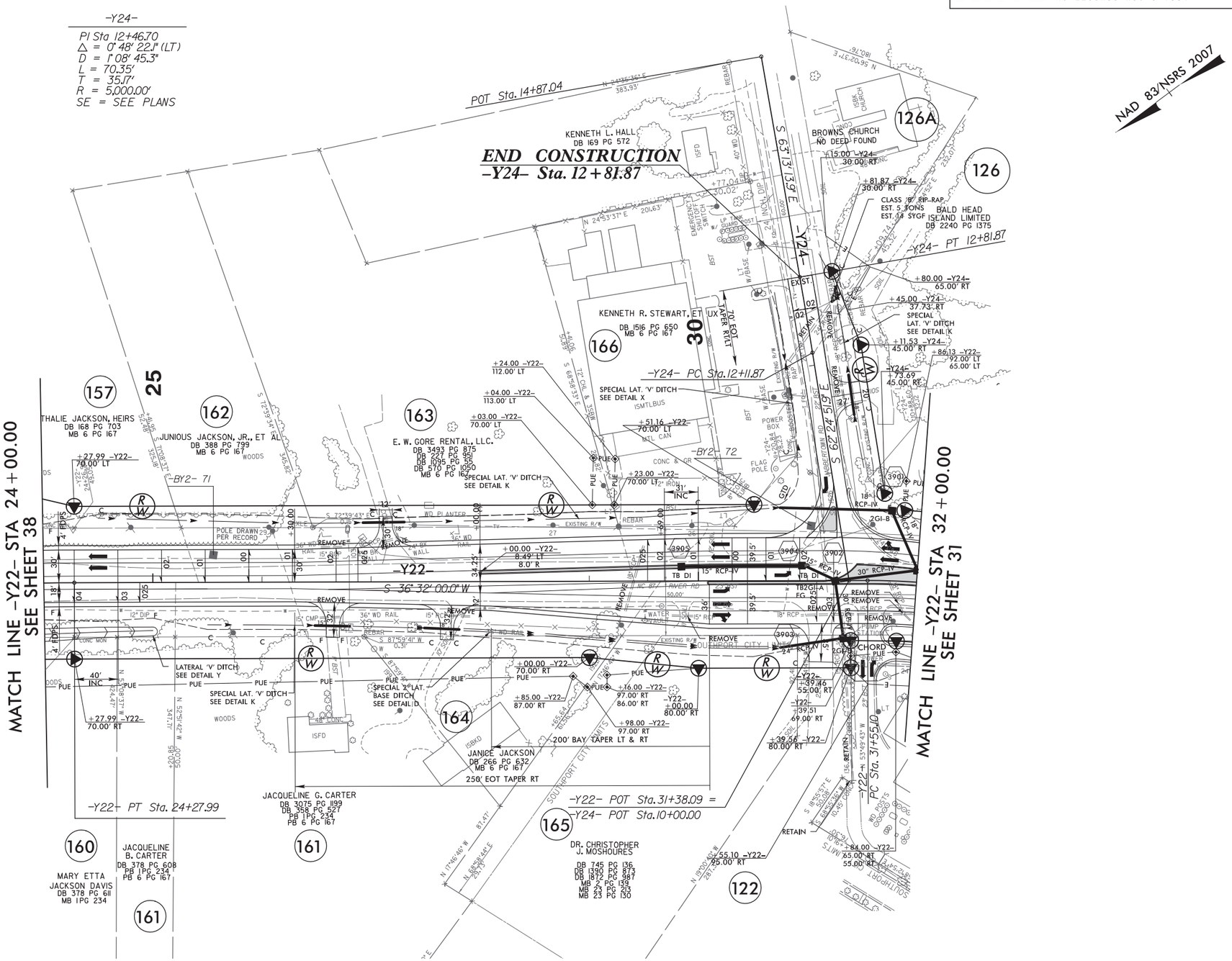
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 39 |
| R/W SHEET NO. | 37 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

REVISIONS

03-08-2018 - REVISED PUE ON PARCEL 126. REMOVED ROW ON PARCEL 166. DMW

5/14/99




NOTE:

1. ALL DRIVEWAY RADII ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -Y22- PROFILE, SEE SHEETS 68 & 69
FOR -Y24- PROFILE, SEE SHEET 70
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

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|---|---|
| R-5021 | 40 |
| R/W SHEET NO. | 38 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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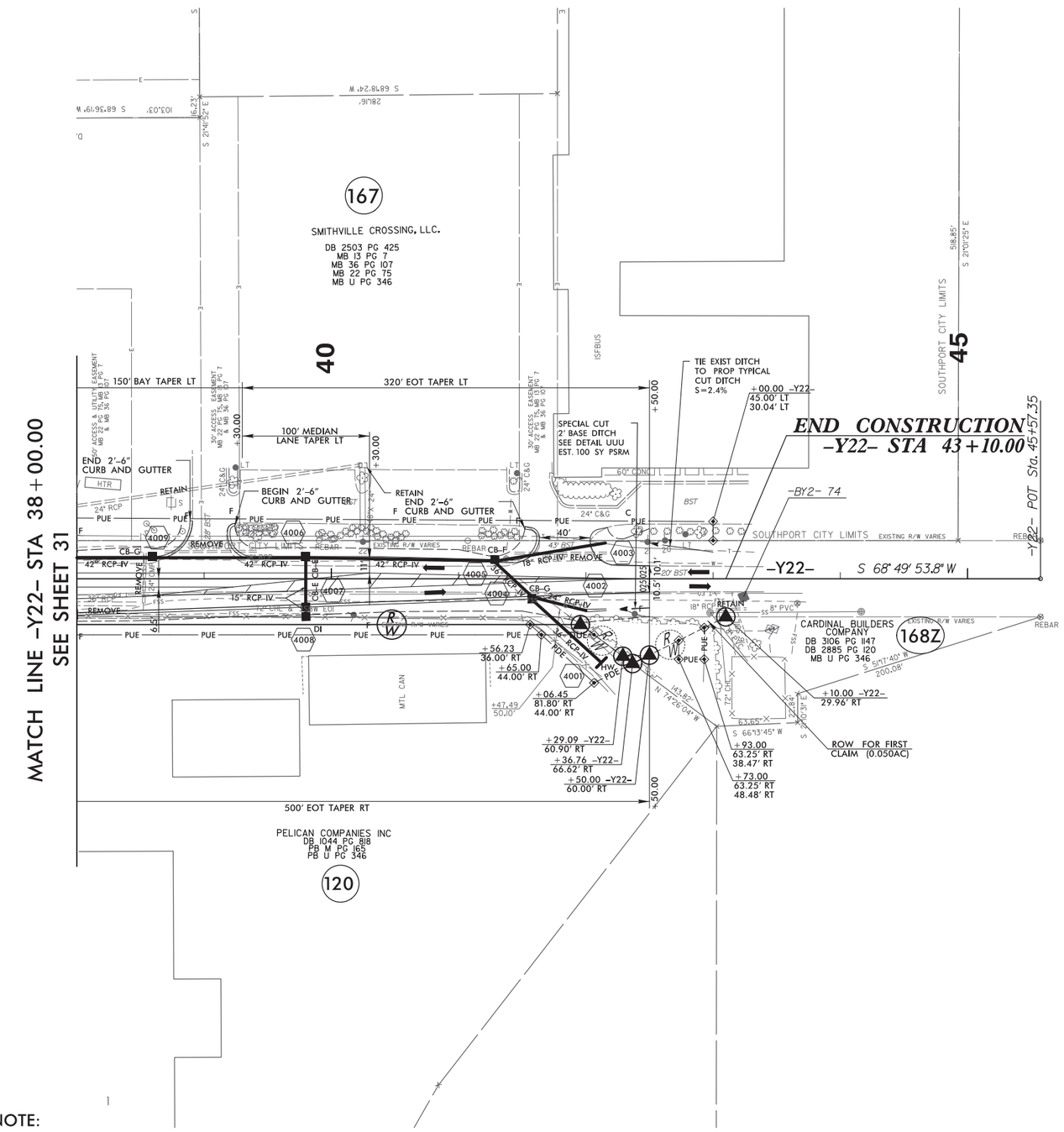
REVISIONS

03-08-2018 - REVISED PUE ON PARCEL 167. REVISED ROW ON PARCEL 120. REMOVED ROW ON PARCEL 167. ADDED PUE TO PARCELS 120 AND 168Z. ADDED DUE TO PARCEL 120. DMW

5/14/99




NOTE:

1. ALL DRIVEWAY RADII' ARE 20' UNLESS NOTED ON PLANS.

2. PAVED TURNOUTS FOR SHOULDER SECTION SHOULD EXTEND 50' UNLESS NOTED ON PLANS.

FOR -Y22- PROFILE, SEE SHEET 69
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 THRU 2D-3

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 41 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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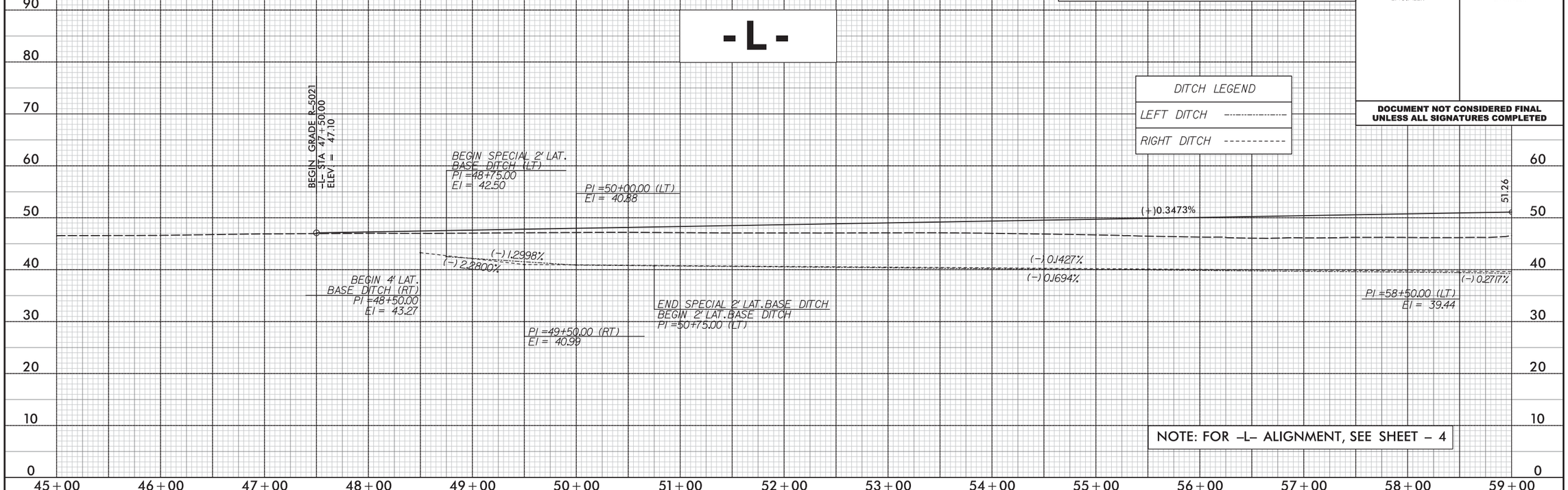
## -L-

| DITCH LEGEND | |
|---|---|
| LEFT DITCH | ---------- |
| RIGHT DITCH | ---------- |

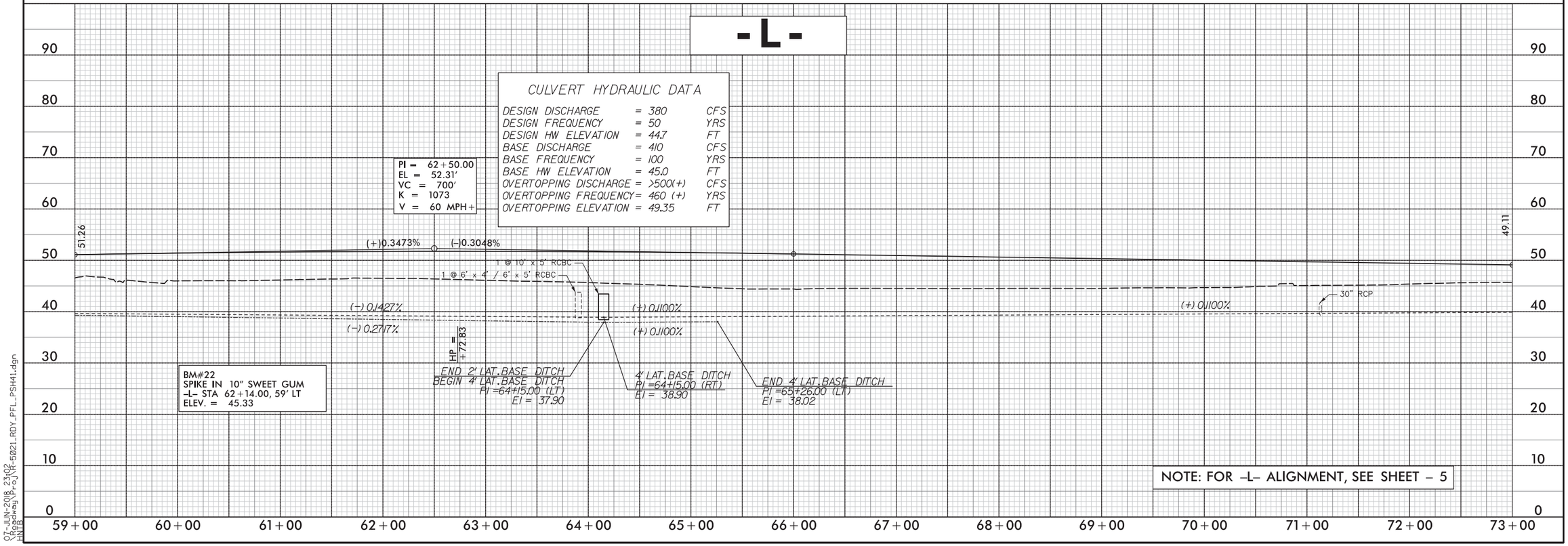



NOTE: FOR -L- ALIGNMENT, SEE SHEET - 4

## -L-

### CULVERT HYDRAULIC DATA

| | | |
|---|---|---|
| DESIGN DISCHARGE | = 380 | CFS |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN HW ELEVATION | = 44.7 | FT |
| BASE DISCHARGE | = 410 | CFS |
| BASE FREQUENCY | = 100 | YRS |
| BASE HW ELEVATION | = 45.0 | FT |
| OVERTOPPING DISCHARGE | = >500(+) | CFS |
| OVERTOPPING FREQUENCY | = 460 (+) | YRS |
| OVERTOPPING ELEVATION | = 49.35 | FT |




NOTE: FOR -L- ALIGNMENT, SEE SHEET - 5

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 42 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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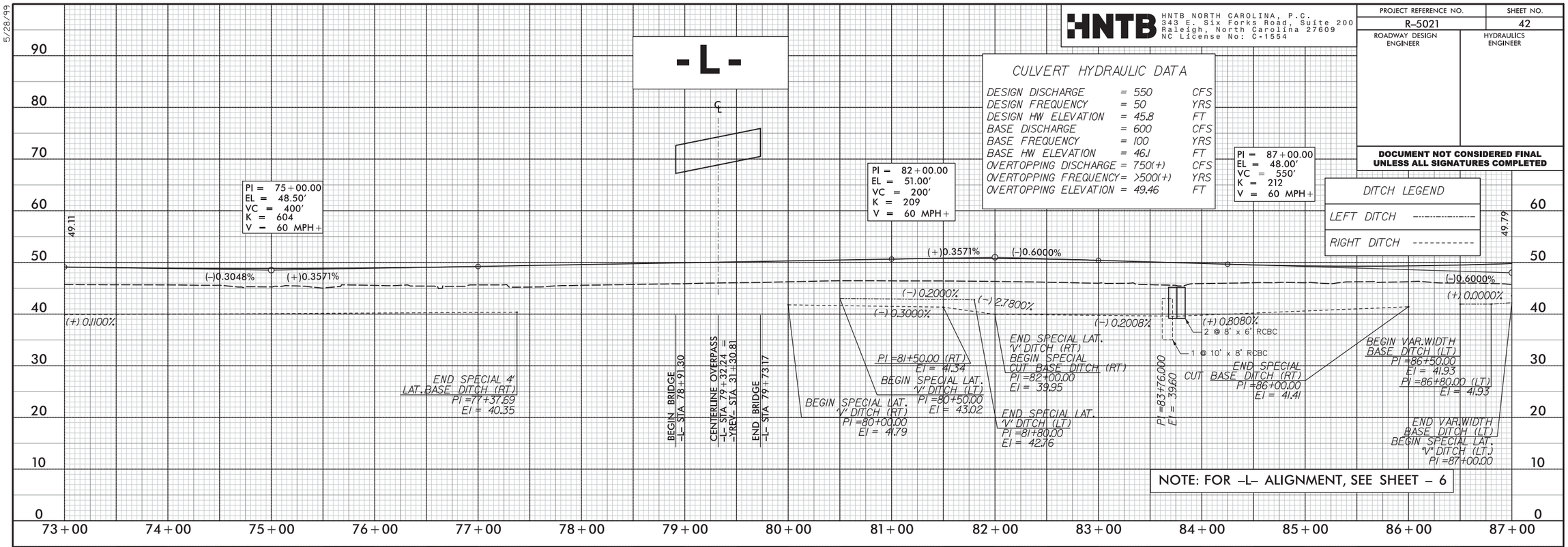


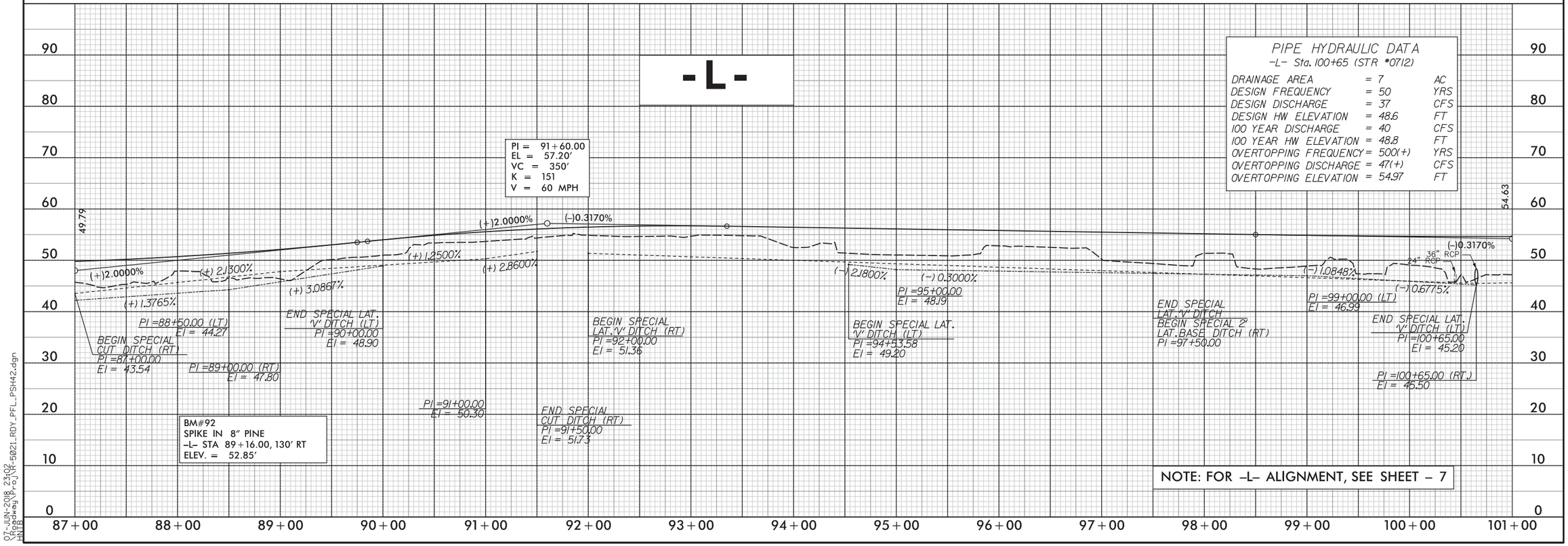


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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 43 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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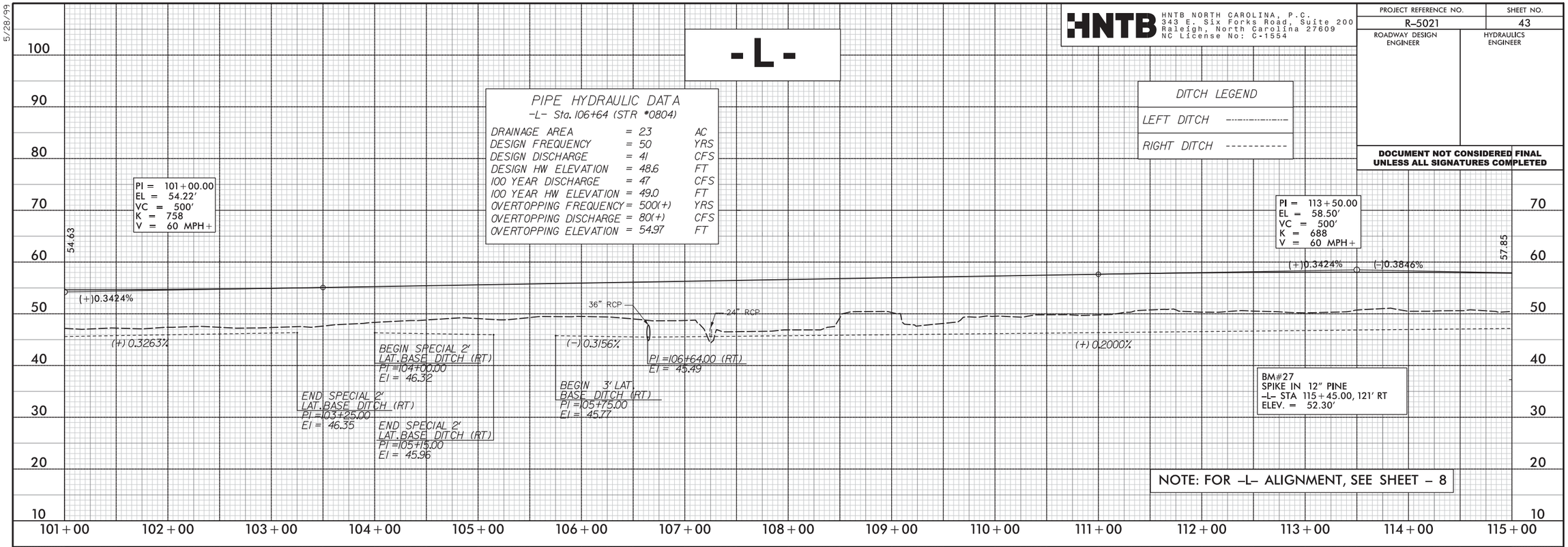
## -L-

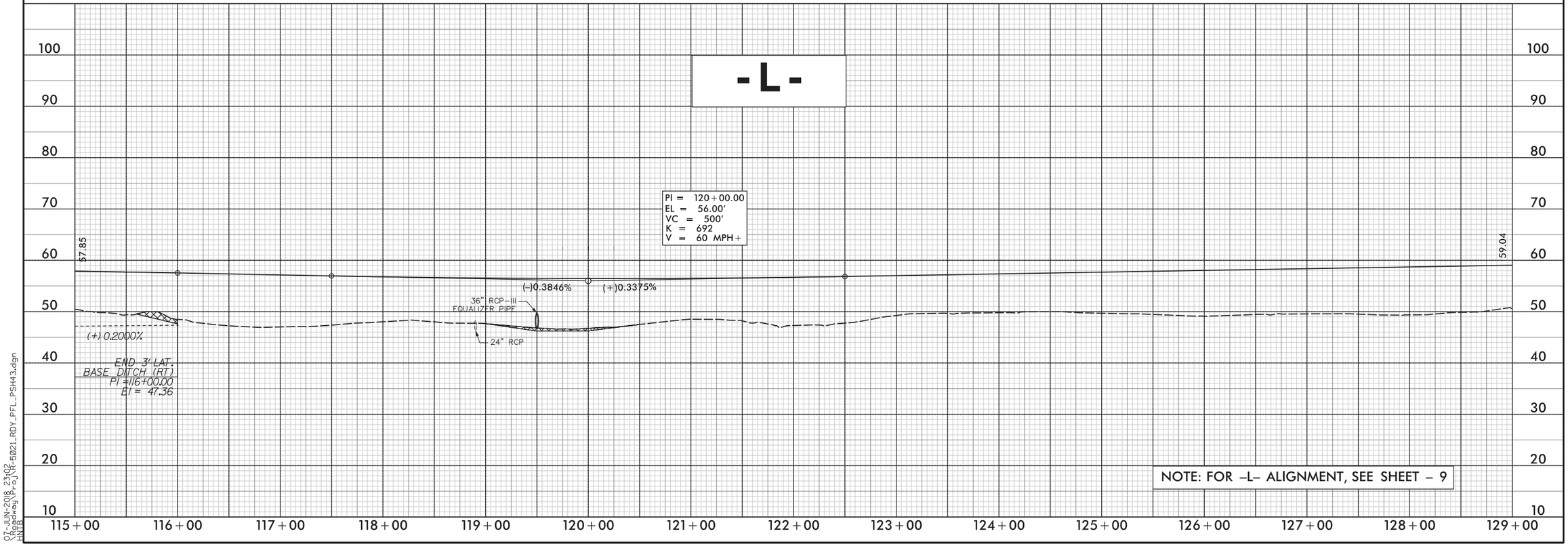
### PIPE HYDRAULIC DATA
-L- Sta. 106+64 (STR #0804)

| | | | |
|---|---|---|---|
| DRAINAGE AREA | = | 23 | AC |
| DESIGN FREQUENCY | = | 50 | YRS |
| DESIGN DISCHARGE | = | 41 | CFS |
| DESIGN HW ELEVATION | = | 48.6 | FT |
| 100 YEAR DISCHARGE | = | 47 | CFS |
| 100 YEAR HW ELEVATION | = | 49.0 | FT |
| OVERTOPPING FREQUENCY | = | 500(+) | YRS |
| OVERTOPPING DISCHARGE | = | 80(+) | CFS |
| OVERTOPPING ELEVATION | = | 54.97 | FT |

DITCH LEGEND
LEFT DITCH
RIGHT DITCH




## -L-

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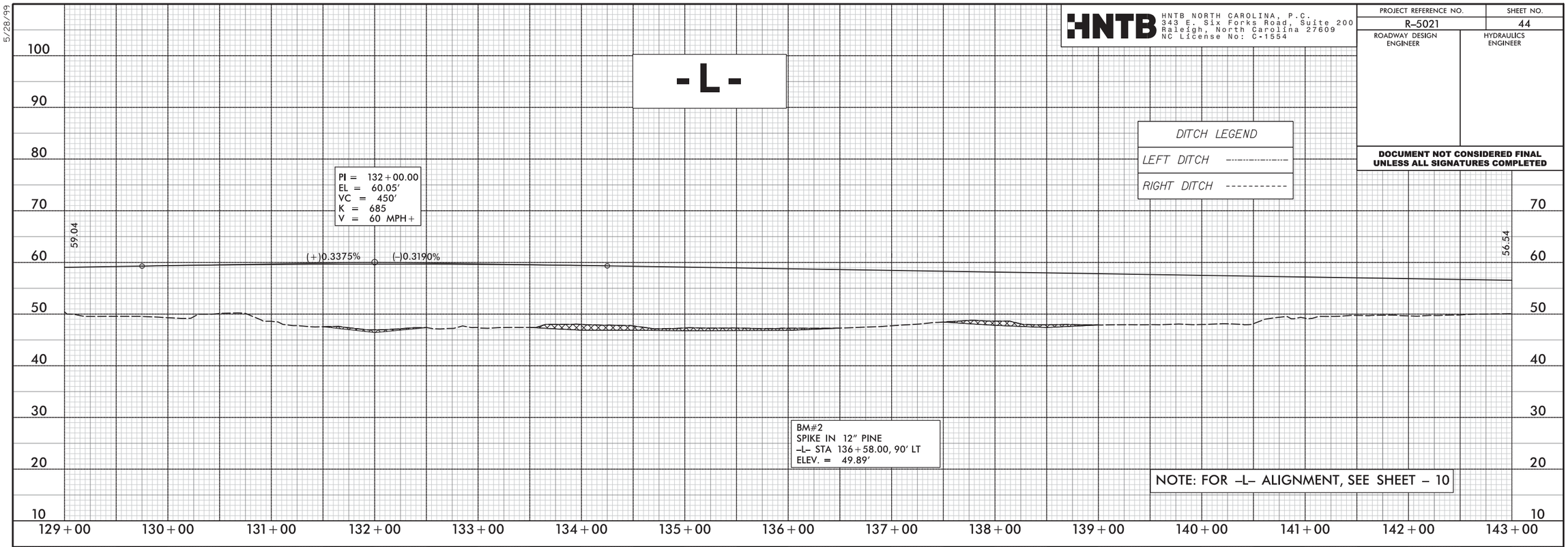
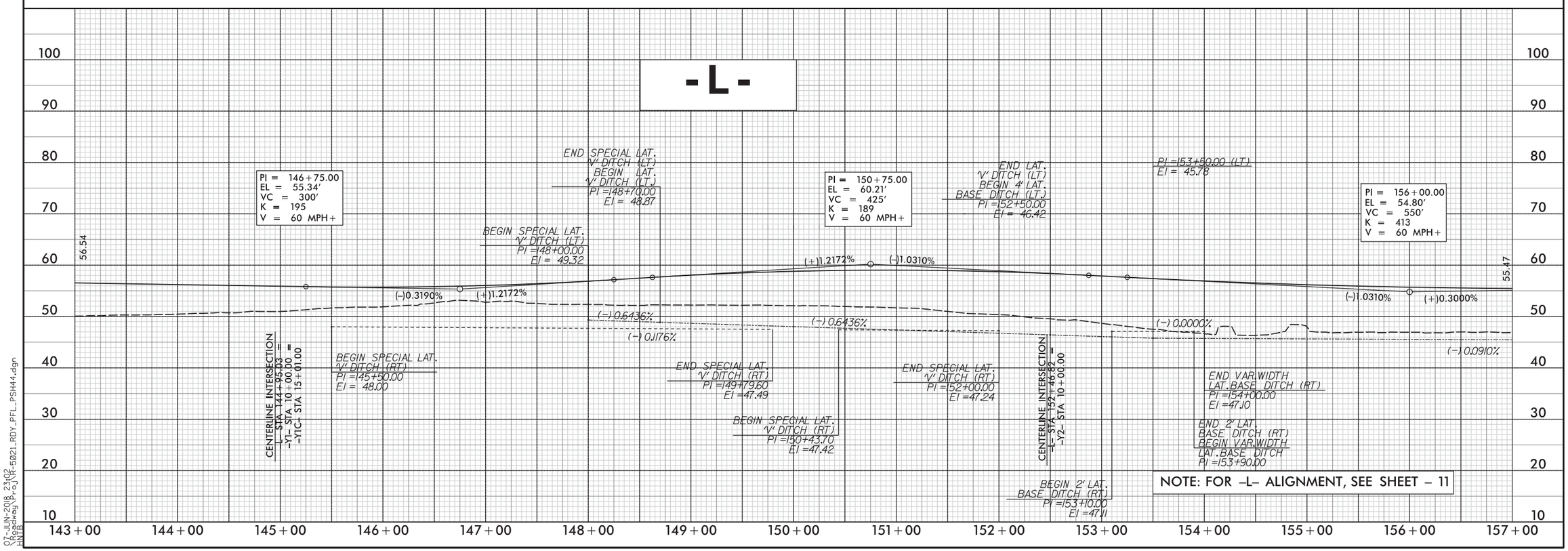
|---|---|
| R-5021 | 44 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 45 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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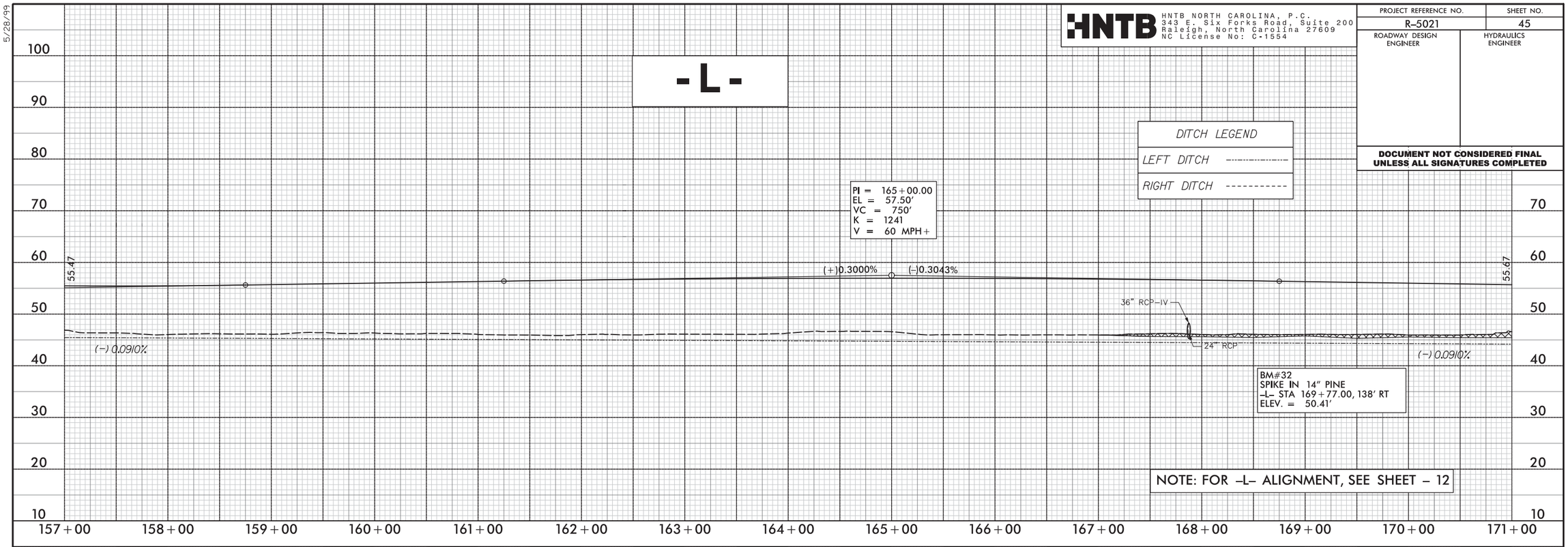


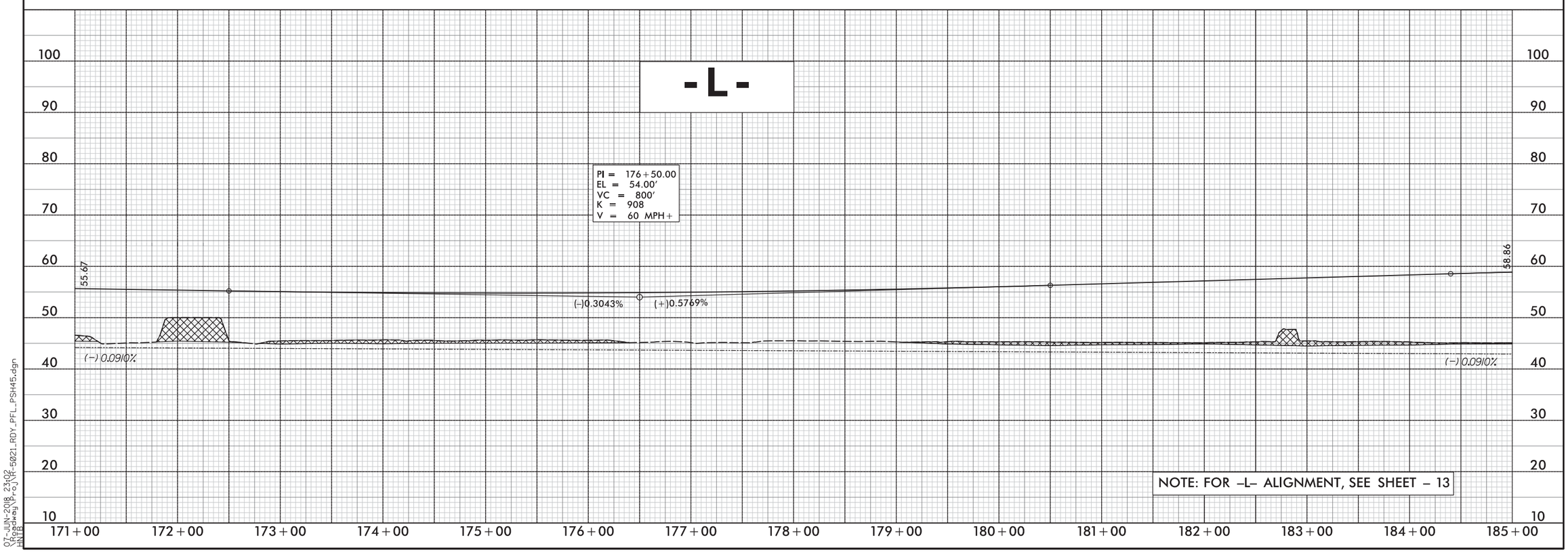


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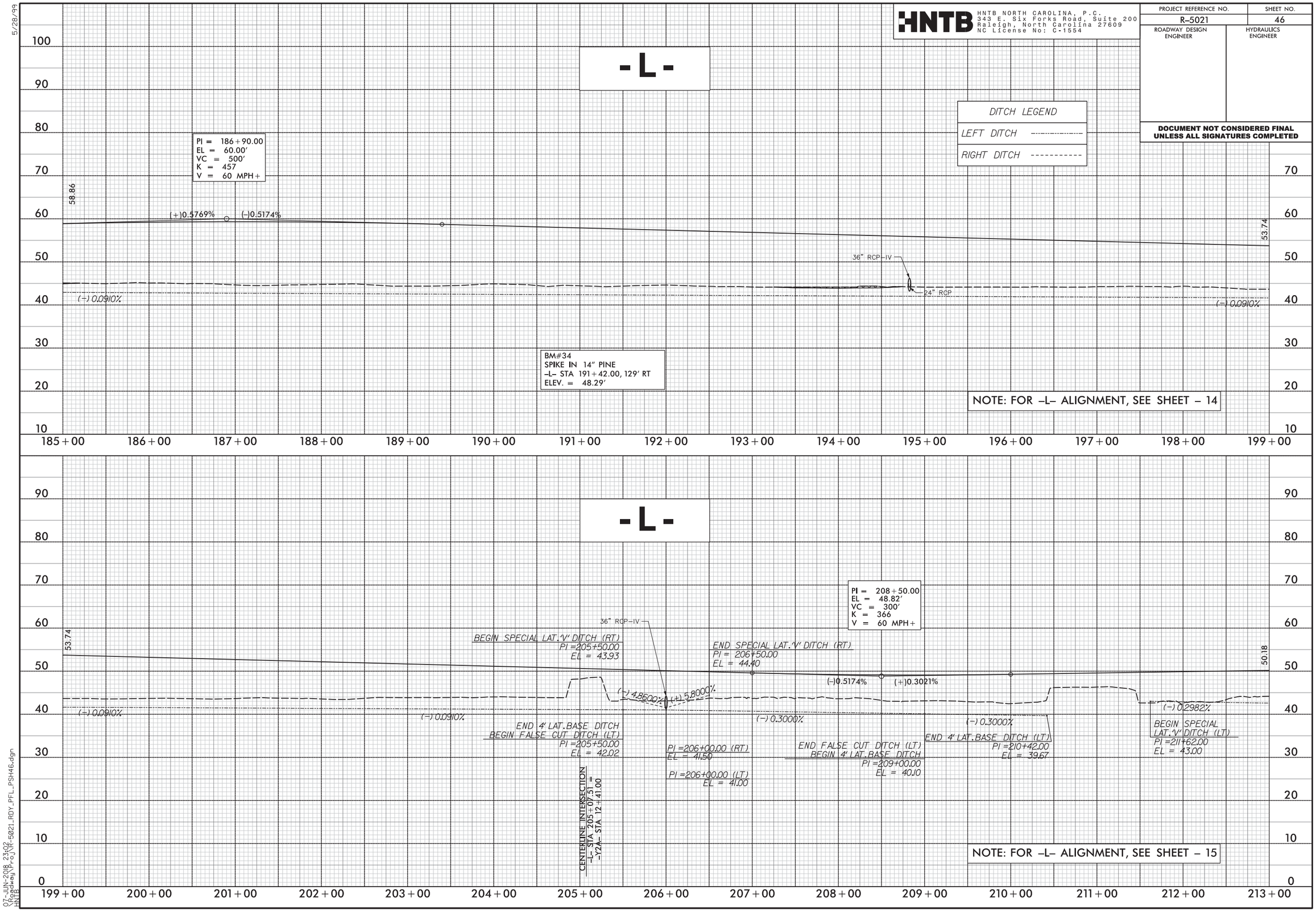
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 46 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 47 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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## PIPE HYDRAULIC DATA
-L- Sta. 217+29 (STR #1608)

| | | |
|---|---|---|
| DRAINAGE AREA | = 43 | AC |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN DISCHARGE | = 37.5* | CFS |
| DESIGN HW ELEVATION | = 42.3 | FT |
| 100 YEAR DISCHARGE | = 42.5* | CFS |
| 100 YEAR HW ELEVATION | = 42.5 | FT |
| OVERTOPPING FREQUENCY | = 200 | YRS |
| OVERTOPPING DISCHARGE | = 55* | CFS |
| OVERTOPPING ELEVATION | = 43.08 | FT |

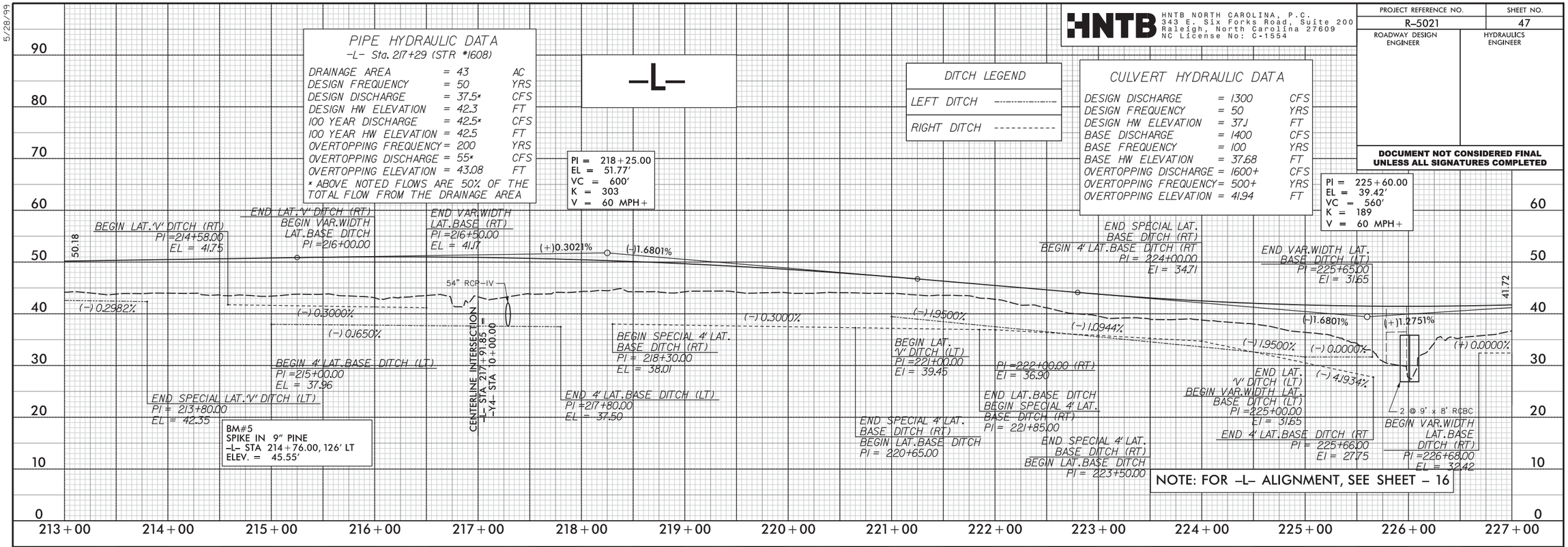
* ABOVE NOTED FLOWS ARE 50% OF THE TOTAL FLOW FROM THE DRAINAGE AREA

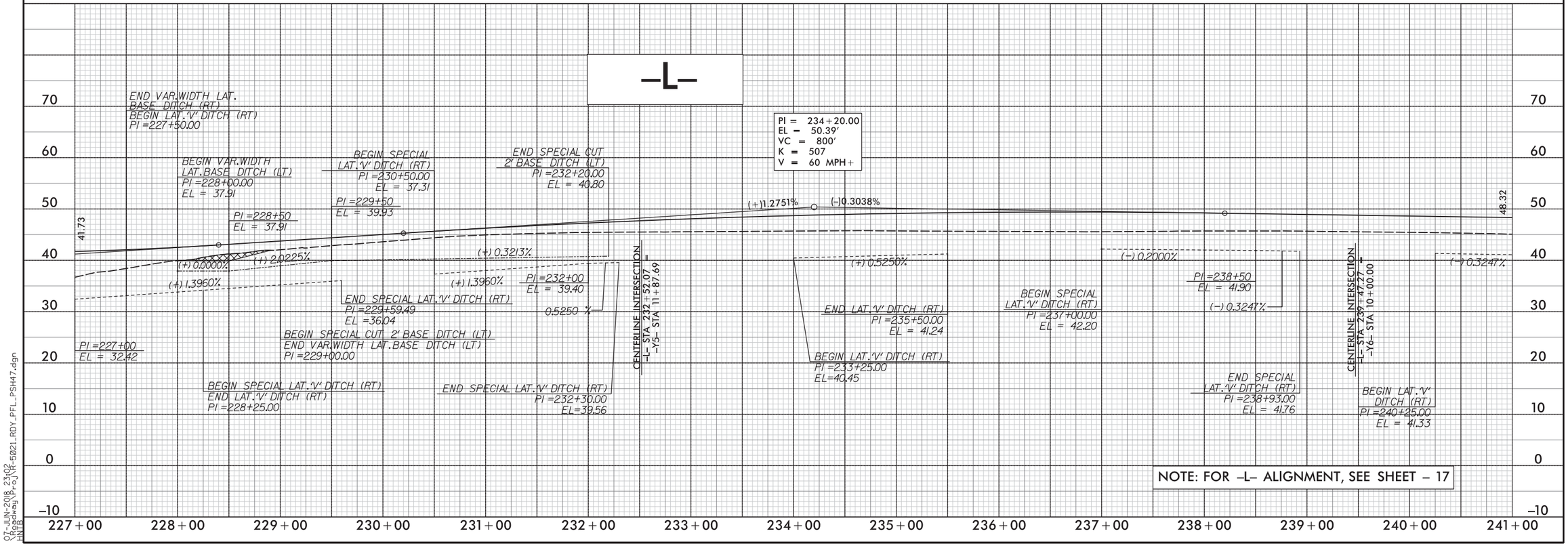
## DITCH LEGEND

LEFT DITCH
RIGHT DITCH

## CULVERT HYDRAULIC DATA

| | | |
|---|---|---|
| DESIGN DISCHARGE | = 1300 | CFS |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN HW ELEVATION | = 37.1 | FT |
| BASE DISCHARGE | = 1400 | CFS |
| BASE FREQUENCY | = 100 | YRS |
| BASE HW ELEVATION | = 37.68 | FT |
| OVERTOPPING DISCHARGE | = 1600+ | CFS |
| OVERTOPPING FREQUENCY | = 500+ | YRS |
| OVERTOPPING ELEVATION | = 41.94 | FT |

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|---|---|
| R-5021 | 48 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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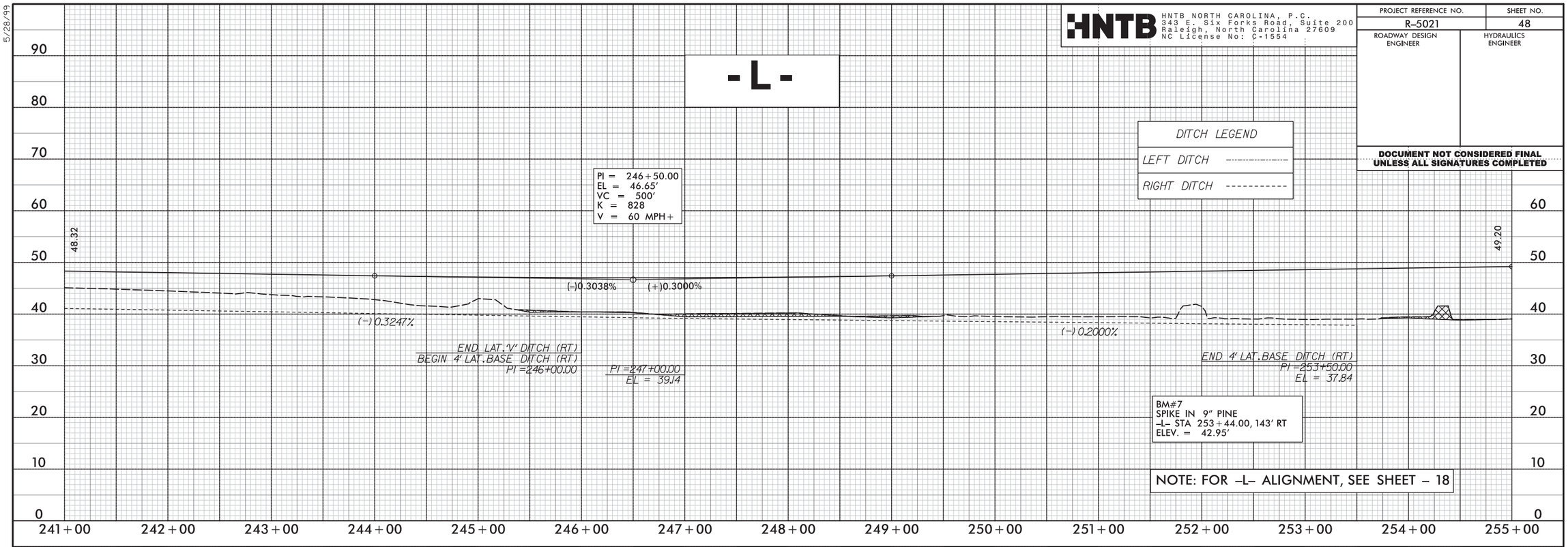


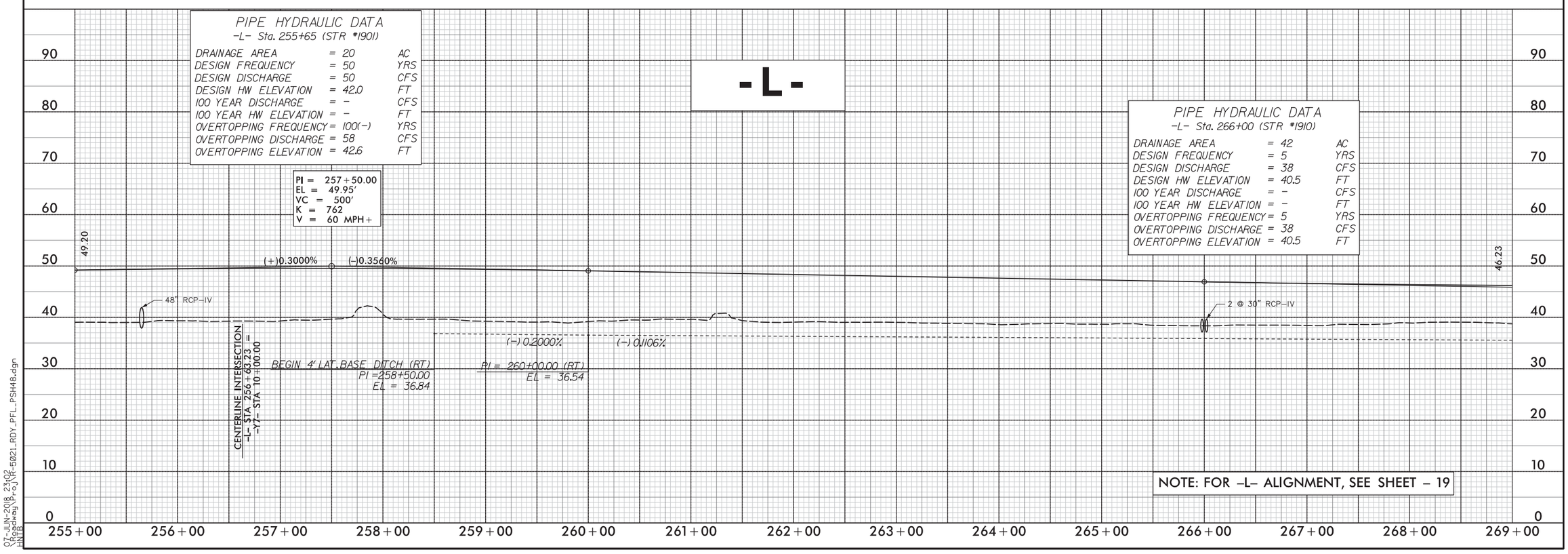


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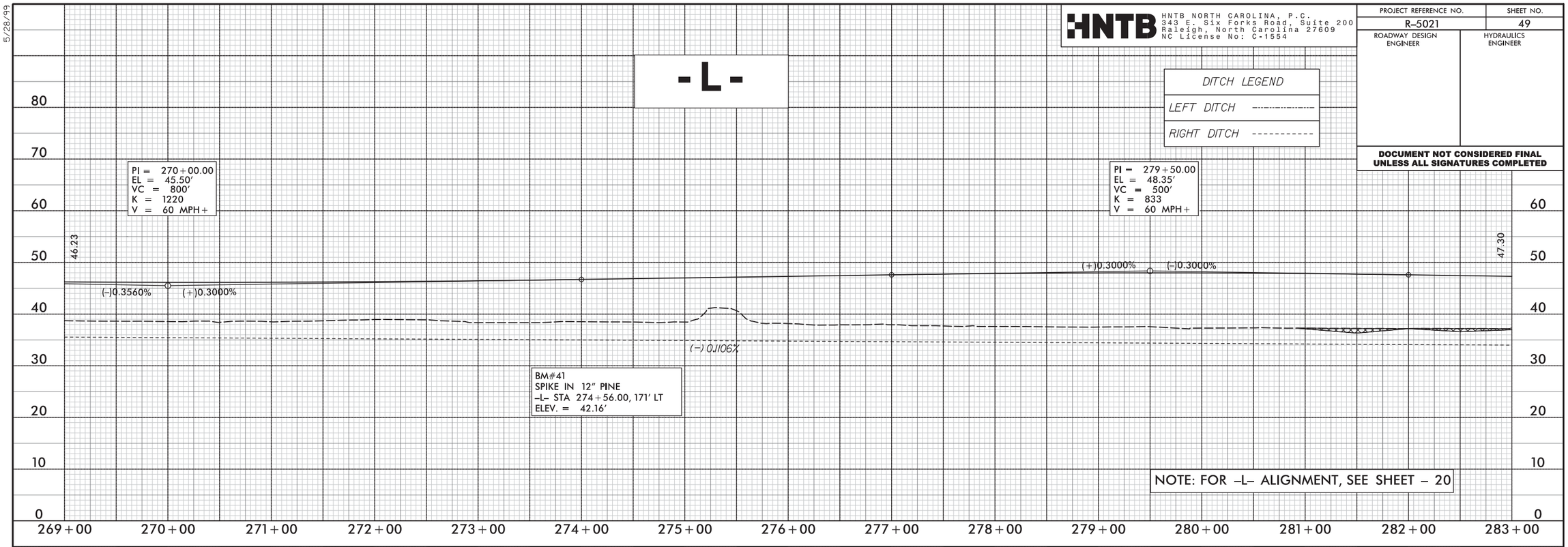
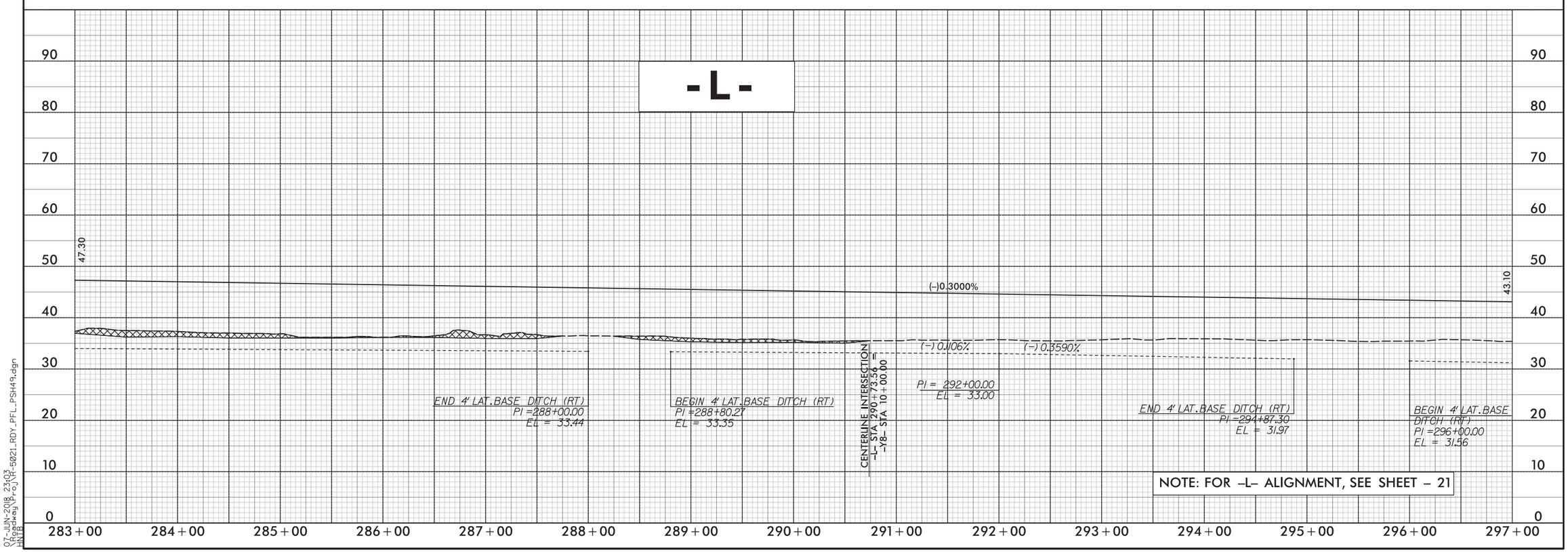
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 49 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

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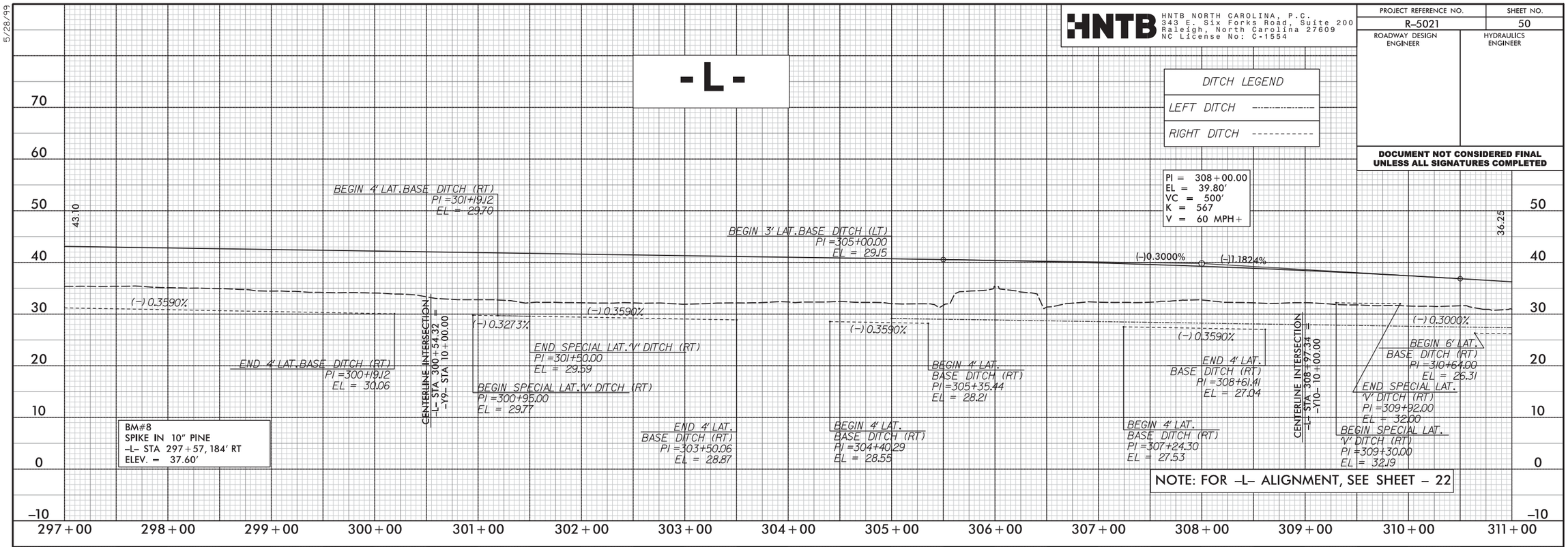
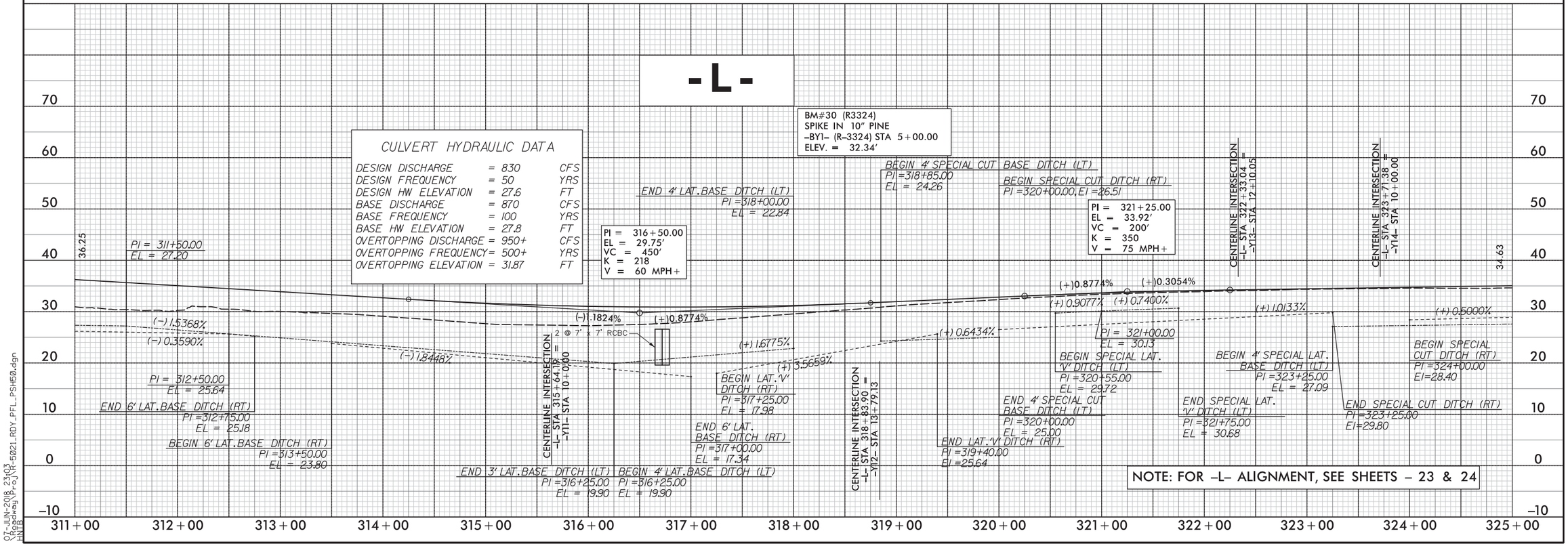
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 50 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 51 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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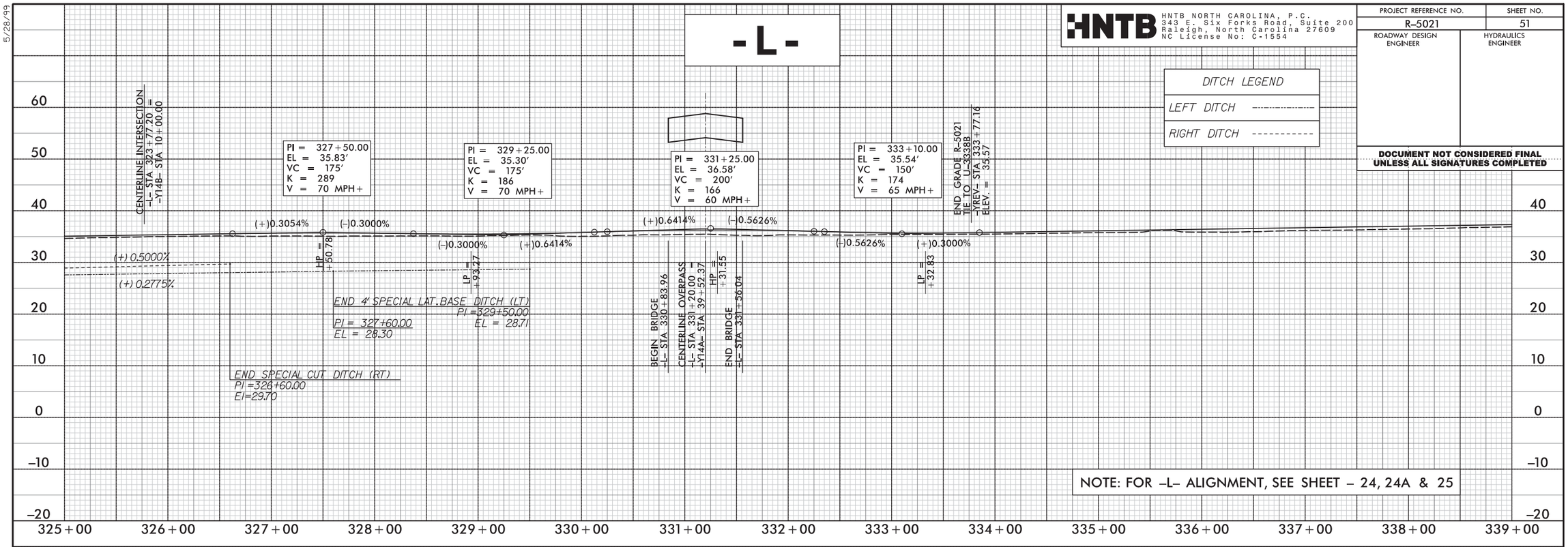
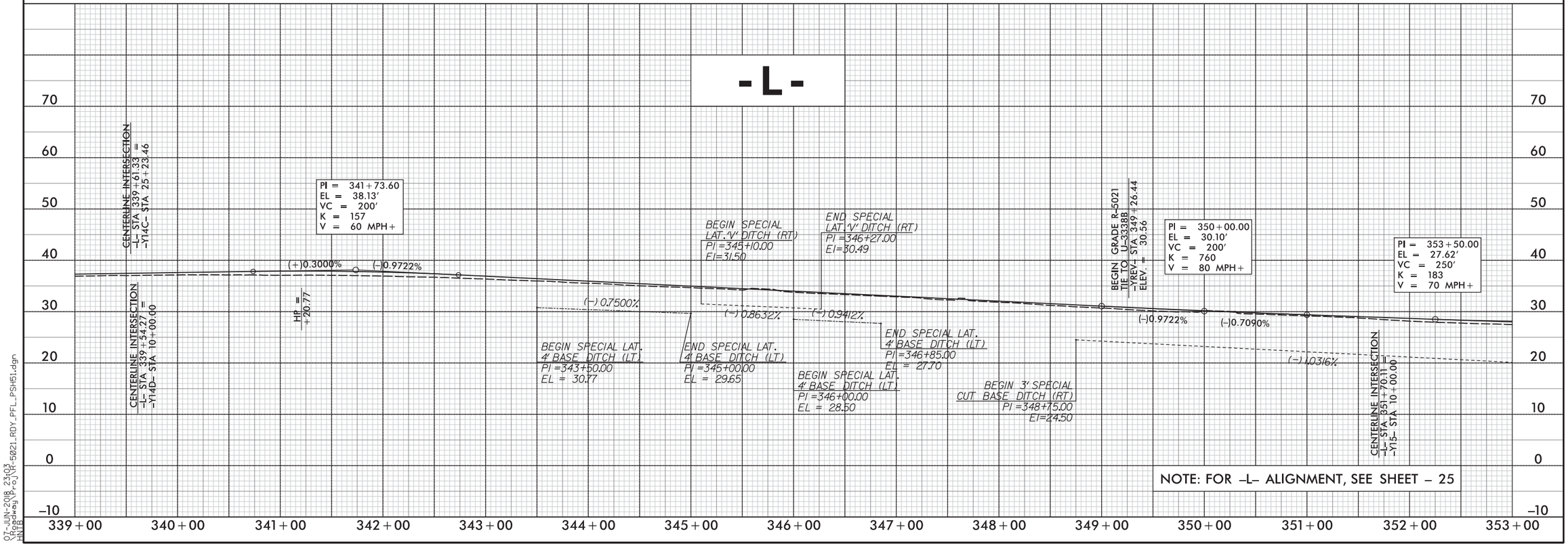
DITCH LEGEND

LEFT DITCH

RIGHT DITCH




NOTE: FOR -L- ALIGNMENT, SEE SHEET - 24, 24A & 25




NOTE: FOR -L- ALIGNMENT, SEE SHEET - 25

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 52 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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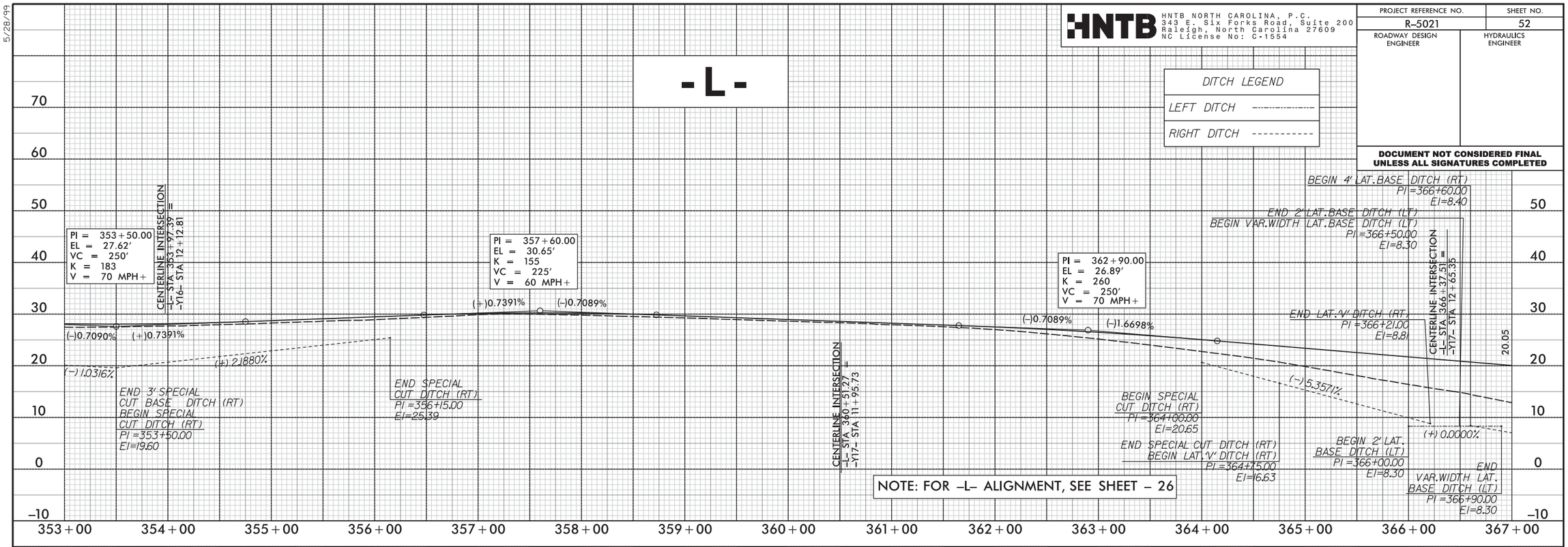
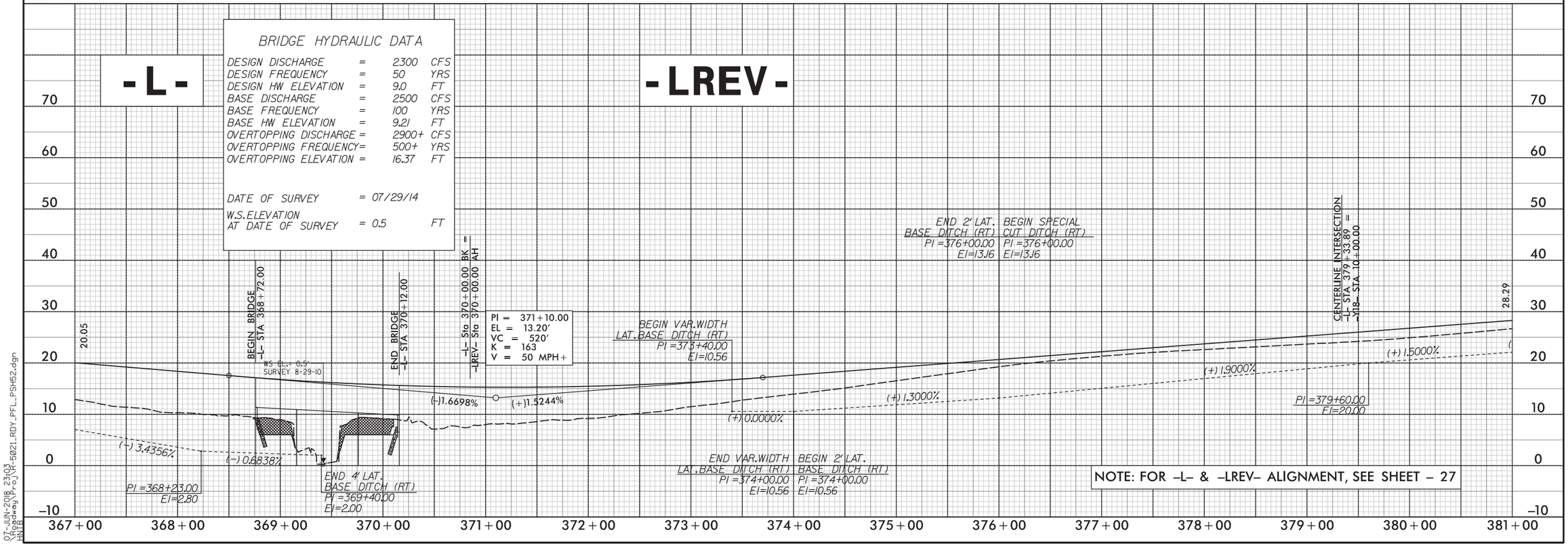
| DITCH LEGEND | |
|---|---|
| LEFT DITCH | ---·---·--- |
| RIGHT DITCH | ---------- |

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 53 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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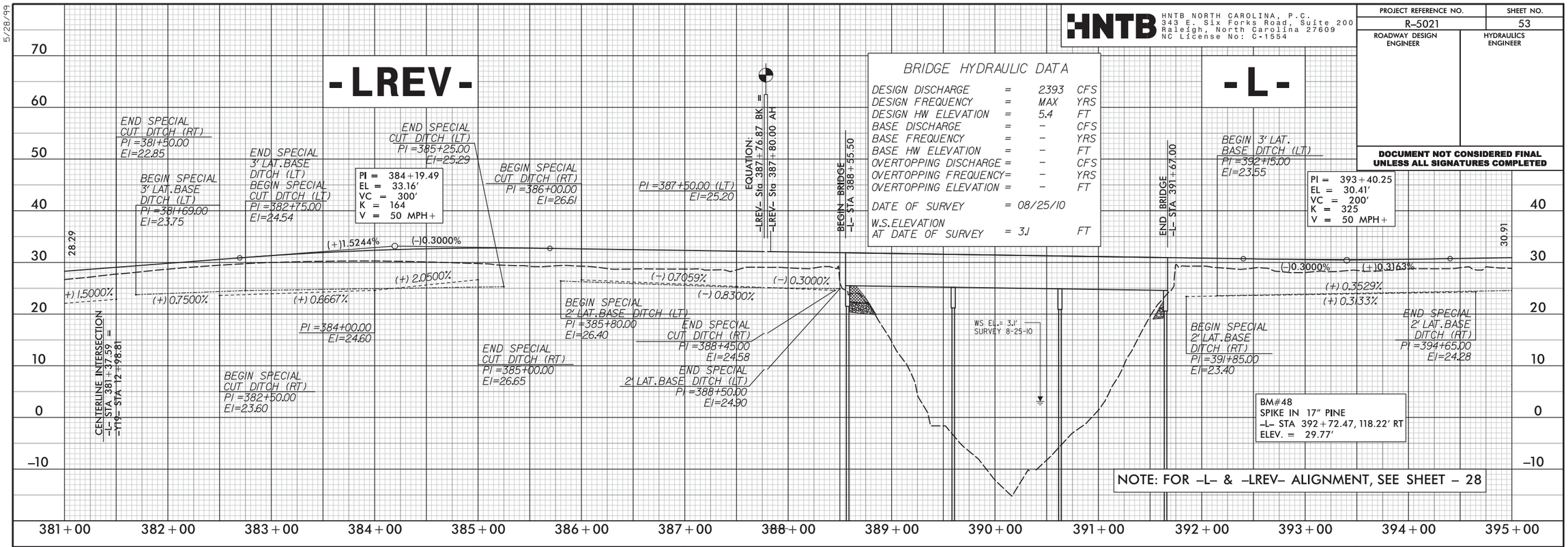

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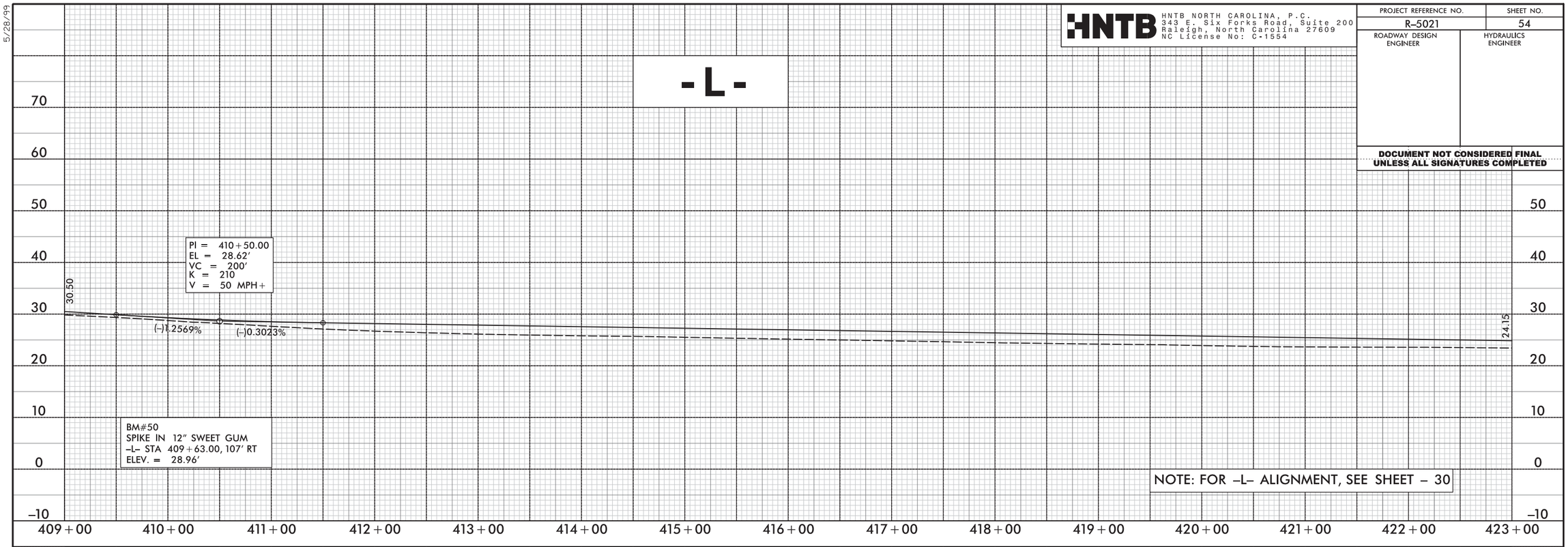
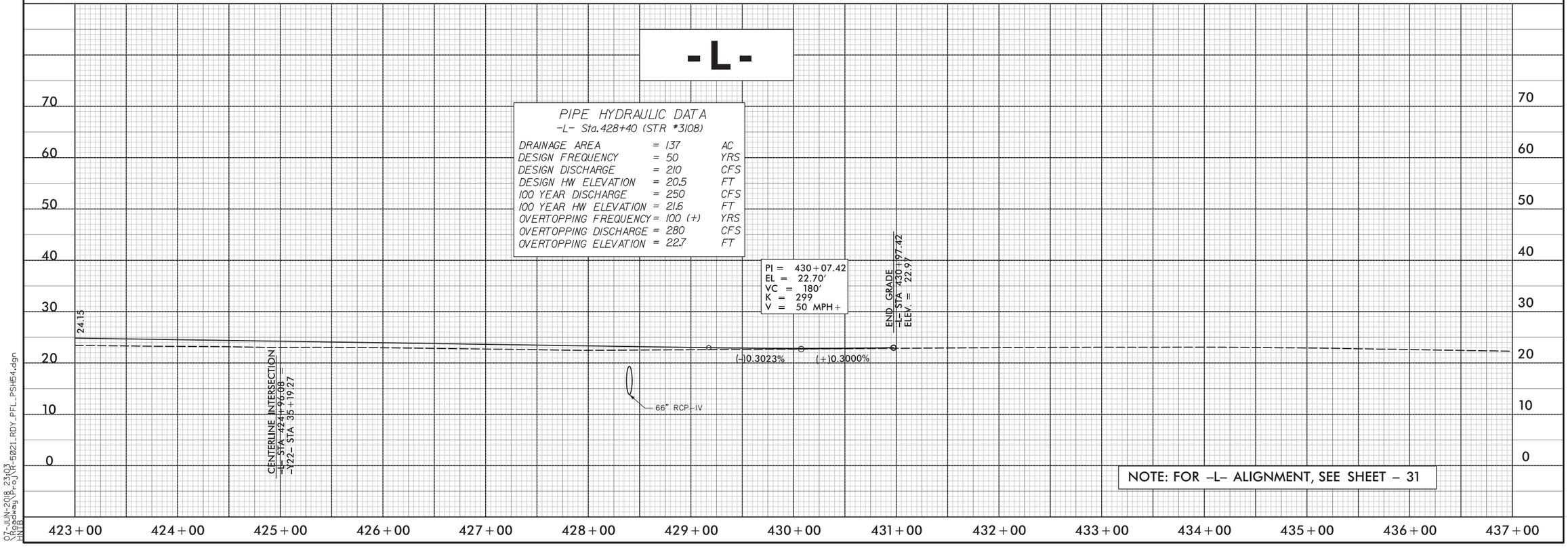
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 54 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 55 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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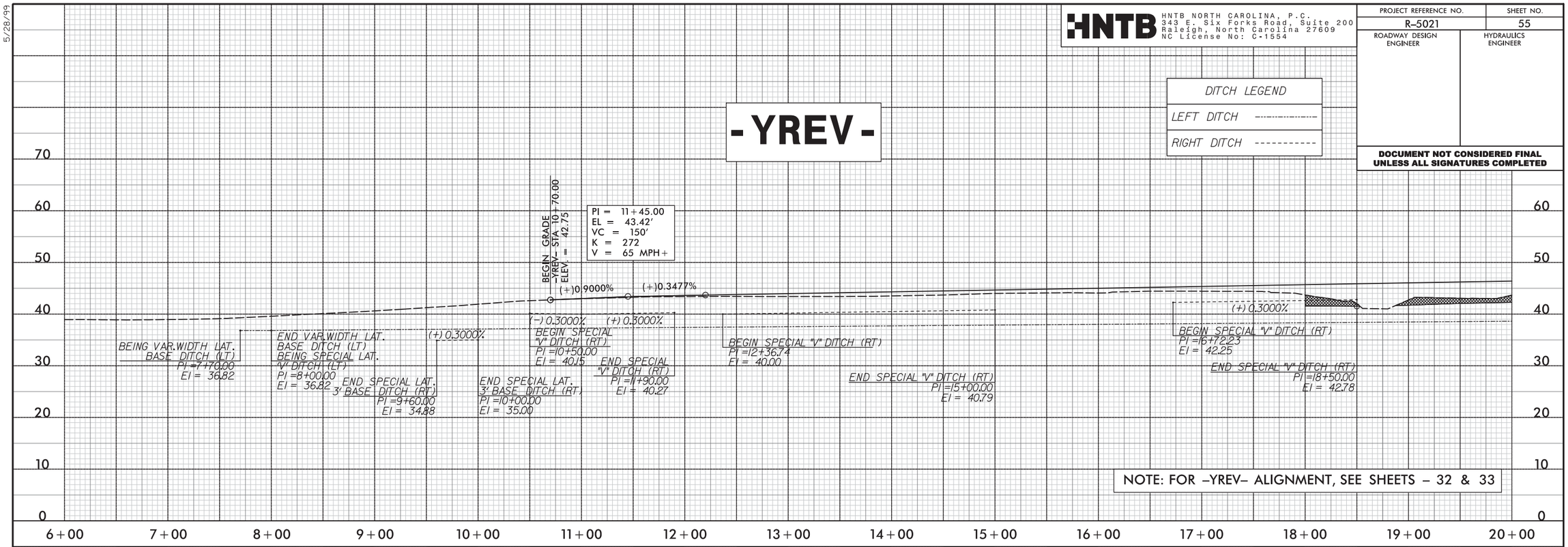


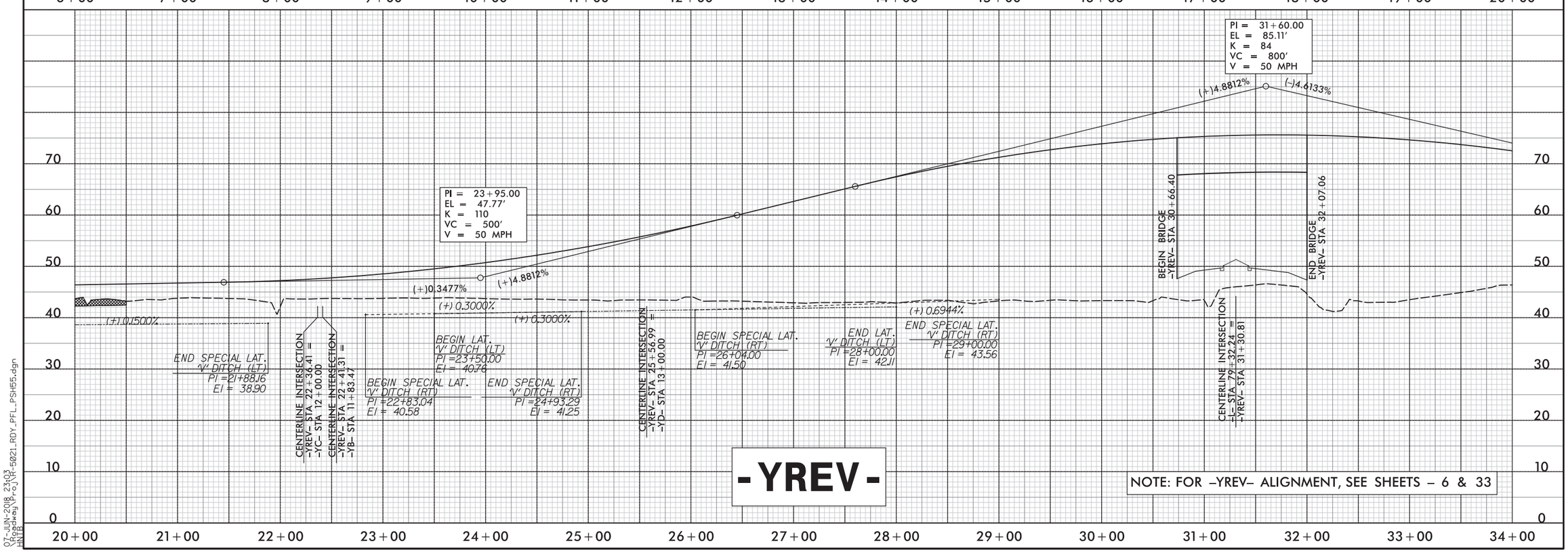


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|---|---|
| R-5021 | 56 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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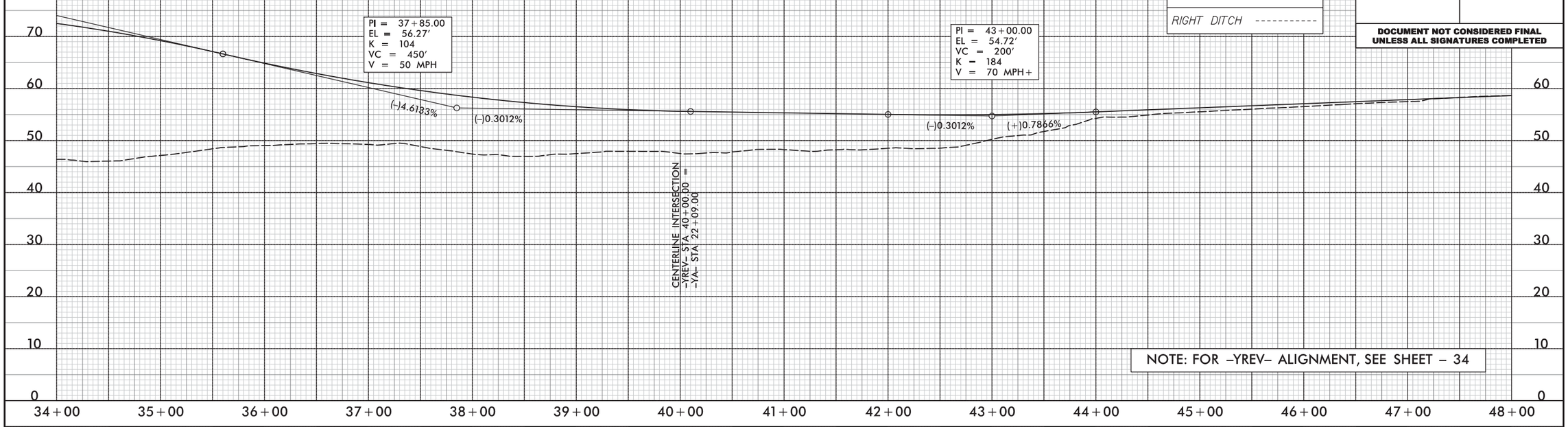
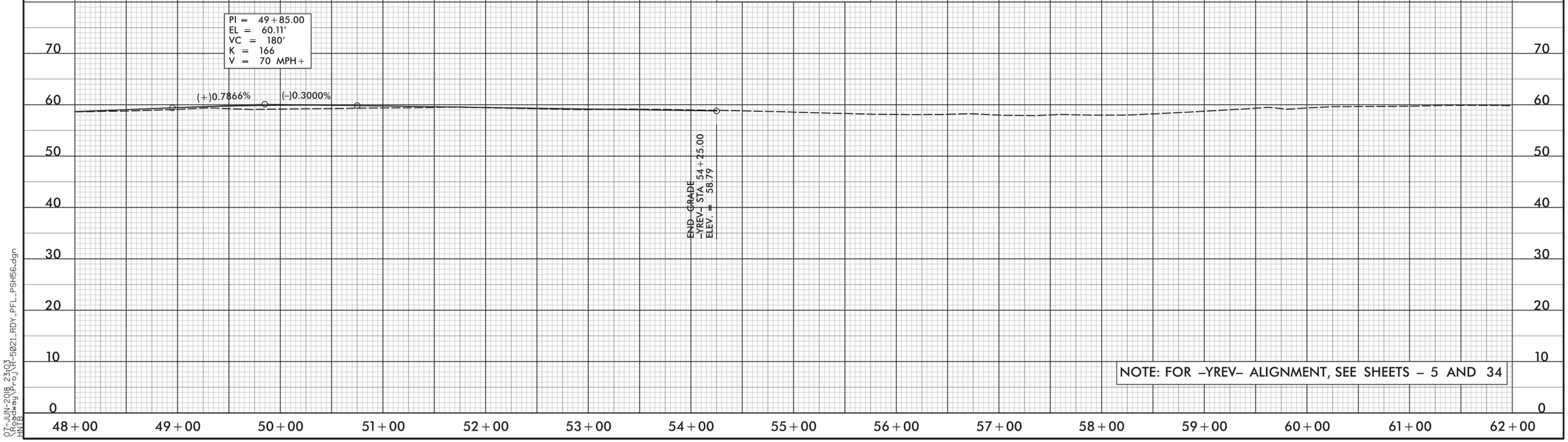
## - YREV -

DITCH LEGEND
LEFT DITCH
RIGHT DITCH




NOTE: FOR -YREV- ALIGNMENT, SEE SHEET - 34

## - YREV -




NOTE: FOR -YREV- ALIGNMENT, SEE SHEETS - 5 AND 34

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| R-5021 | 57 |
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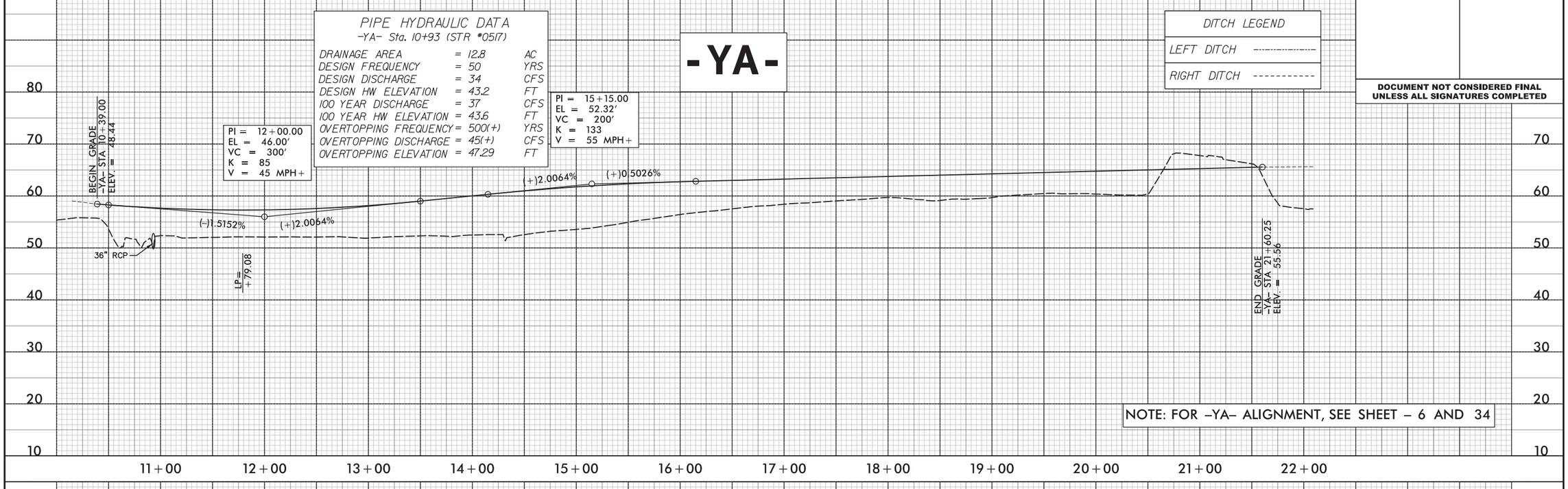
## -YA-

**PIPE HYDRAULIC DATA**
-YA- Sta. 10+93 (STR #05117)

| | | |
|---|---|---|
| DRAINAGE AREA | = 12.8 | AC |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN DISCHARGE | = 34 | CFS |
| DESIGN HW ELEVATION | = 43.2 | FT |
| 100 YEAR DISCHARGE | = 37 | CFS |
| 100 YEAR HW ELEVATION | = 43.6 | FT |
| OVERTOPPING FREQUENCY | = 500(+) | YRS |
| OVERTOPPING DISCHARGE | = 45(+) | CFS |
| OVERTOPPING ELEVATION | = 47.29 | FT |

**DITCH LEGEND**
LEFT DITCH
RIGHT DITCH




NOTE: FOR -YA- ALIGNMENT, SEE SHEET - 6 AND 34

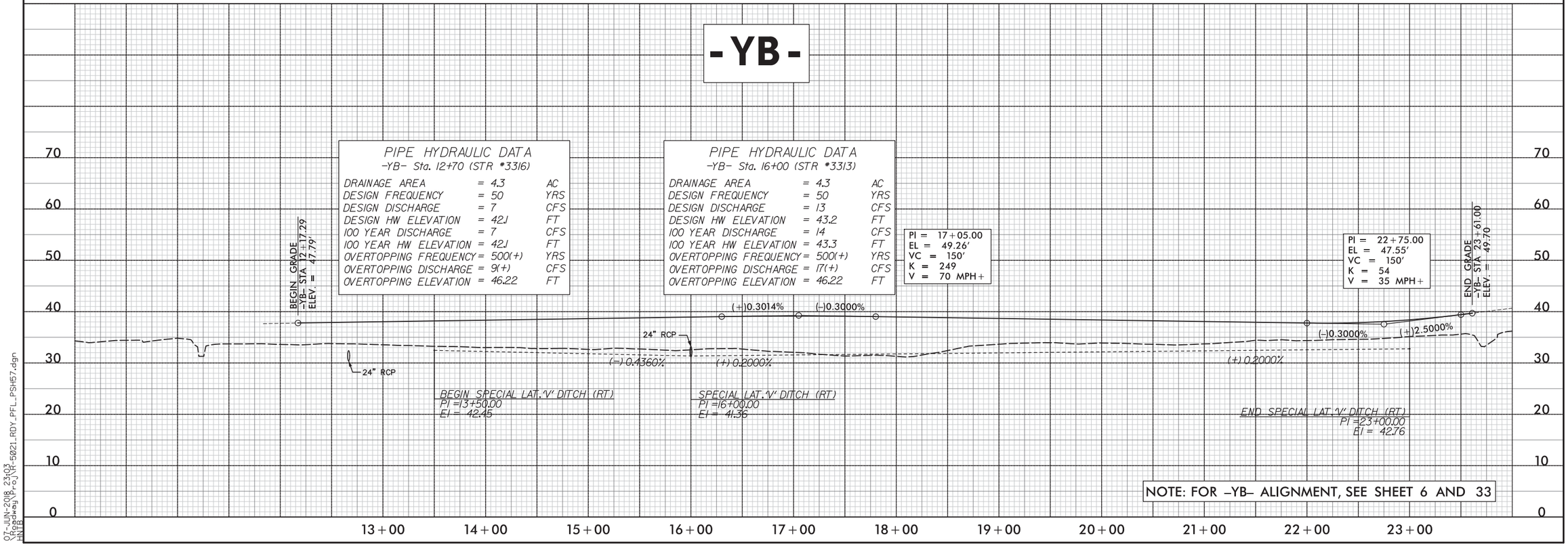
## -YB-

**PIPE HYDRAULIC DATA**
-YB- Sta. 12+70 (STR #33116)

| | | |
|---|---|---|
| DRAINAGE AREA | = 4.3 | AC |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN DISCHARGE | = 7 | CFS |
| DESIGN HW ELEVATION | = 42.1 | FT |
| 100 YEAR DISCHARGE | = 7 | CFS |
| 100 YEAR HW ELEVATION | = 42.1 | FT |
| OVERTOPPING FREQUENCY | = 500(+) | YRS |
| OVERTOPPING DISCHARGE | = 9(+) | CFS |
| OVERTOPPING ELEVATION | = 46.22 | FT |

**PIPE HYDRAULIC DATA**
-YB- Sta. 16+00 (STR #33113)

| | | |
|---|---|---|
| DRAINAGE AREA | = 4.3 | AC |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN DISCHARGE | = 13 | CFS |
| DESIGN HW ELEVATION | = 43.2 | FT |
| 100 YEAR DISCHARGE | = 14 | CFS |
| 100 YEAR HW ELEVATION | = 43.3 | FT |
| OVERTOPPING FREQUENCY | = 500(+) | YRS |
| OVERTOPPING DISCHARGE | = 17(+) | CFS |
| OVERTOPPING ELEVATION | = 46.22 | FT |




NOTE: FOR -YB- ALIGNMENT, SEE SHEET 6 AND 33

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| R-5021 | 58 |
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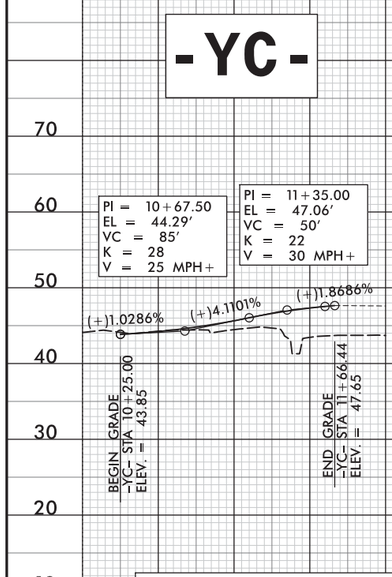
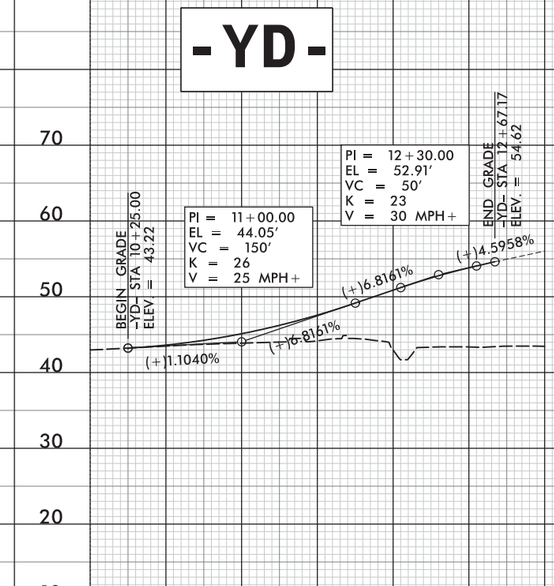
## -YC-



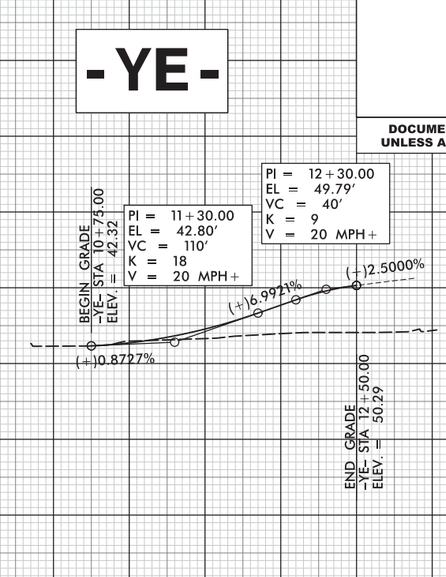

NOTE: FOR -YC- ALIGNMENT, SEE SHEET - 33

## -YD-



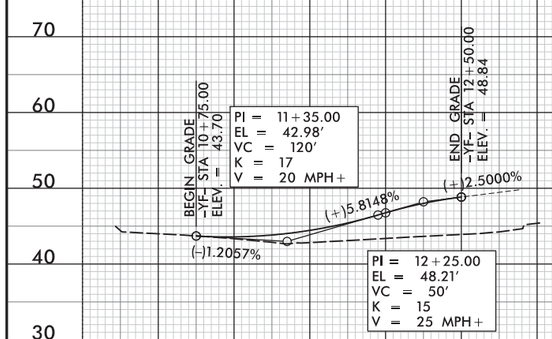

NOTE: FOR -YD- ALIGNMENT, SEE SHEET - 33

## -YE-



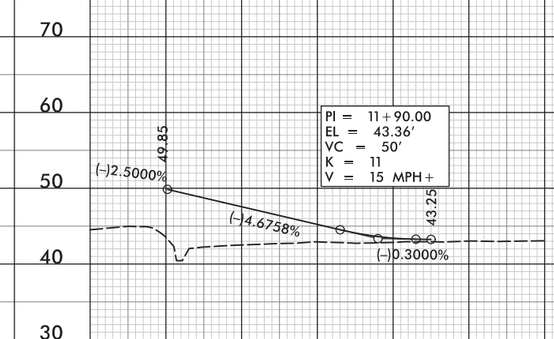

NOTE: FOR -YE- ALIGNMENT, SEE SHEET - 5

## -YF-



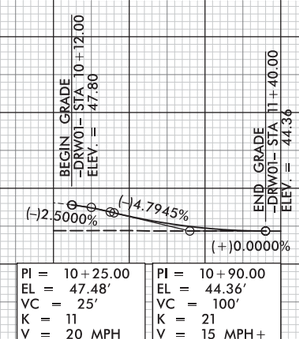

NOTE: FOR -YF- ALIGNMENT, SEE SHEET - 5

## -YG-




NOTE: FOR -YG- ALIGNMENT, SEE SHEET - 33

## -DRW01-




NOTE: FOR -DRW01- ALIGNMENT, SEE SHEET - 33

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| R-5021 | 59 |
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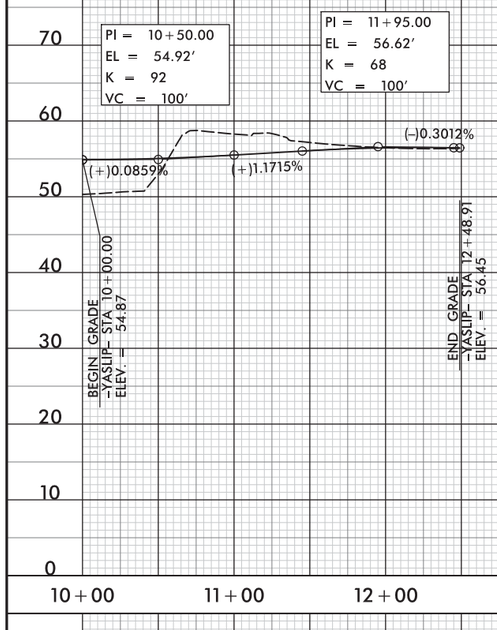
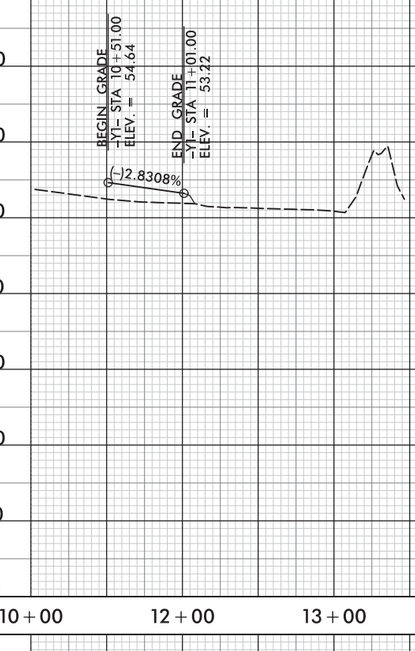
| DITCH LEGEND | |
|---|---|
| LEFT DITCH | ----------·---------- |
| RIGHT DITCH | ---------- |

## -YASLIP-



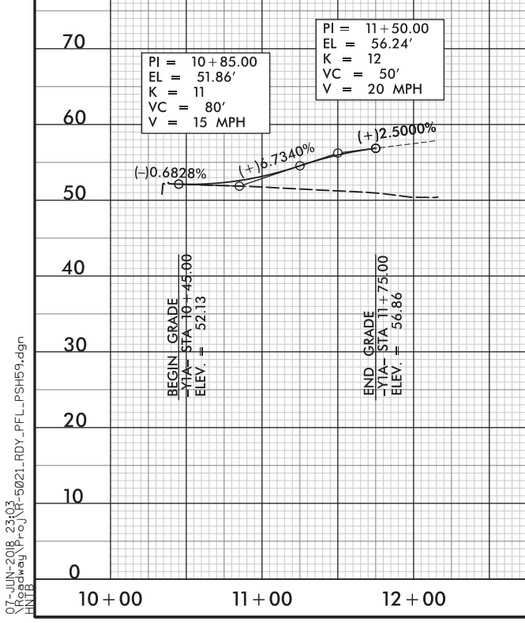

NOTE: FOR –YASLIP– ALIGNMENT, SEE SHEET – 34

## -Y1-



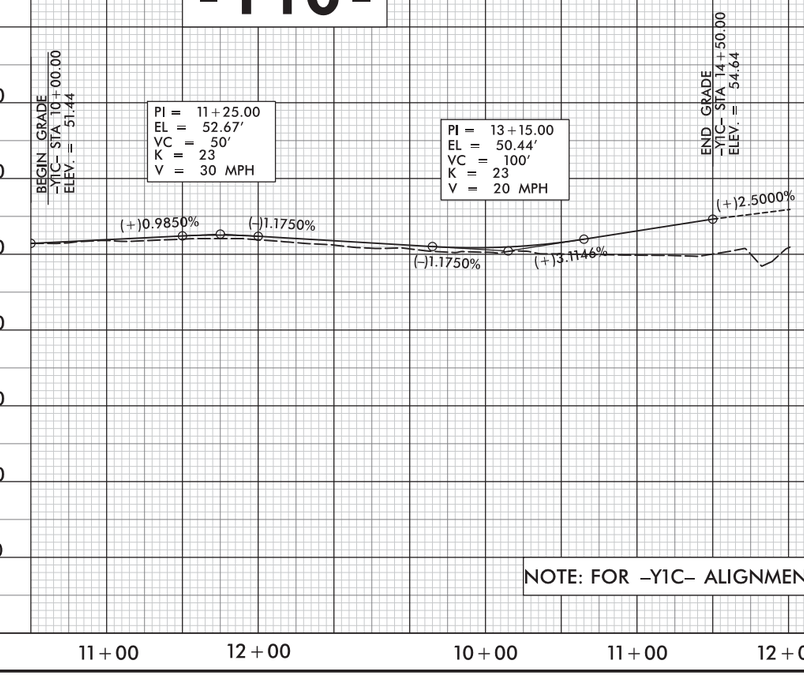

NOTE: FOR –Y1– ALIGNMENT, SEE SHEET – 11

## -Y1A-




NOTE: FOR –Y1A– ALIGNMENT, SEE SHEET – 8

## -Y1C-




NOTE: FOR –Y1C– ALIGNMENT, SEE SHEET – 11

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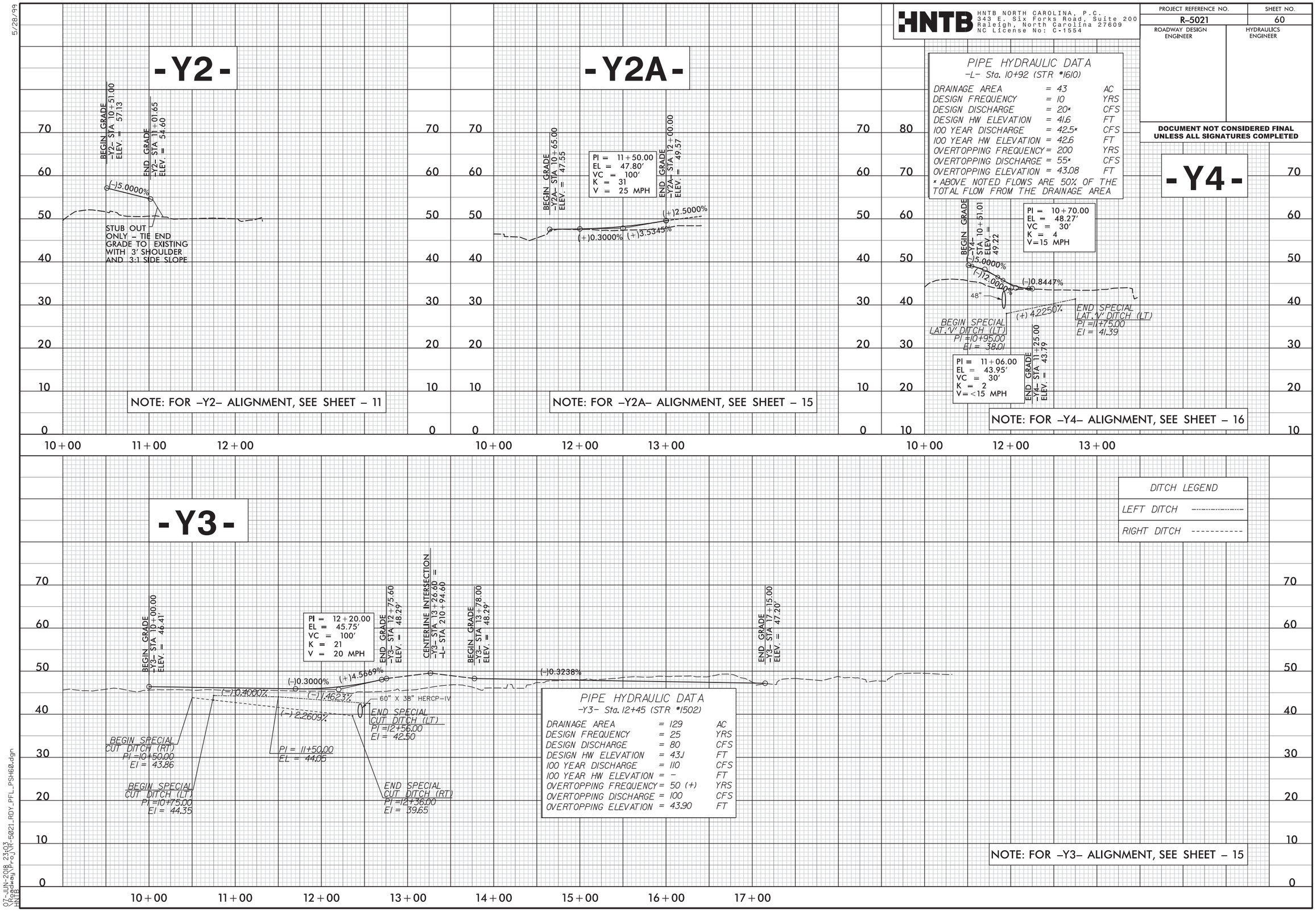


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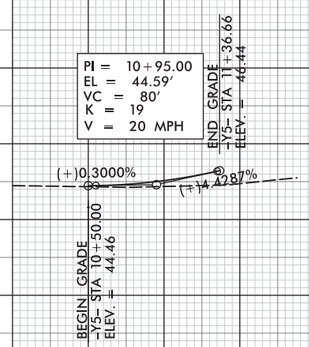
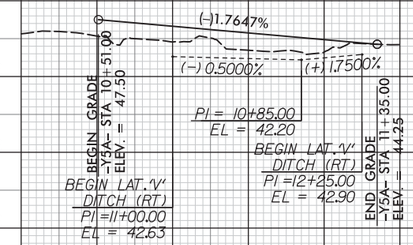
## -Y5-



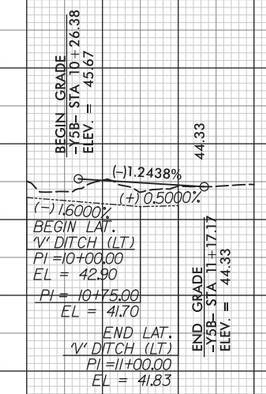

NOTE: FOR –Y5– ALIGNMENT, SEE SHEET – 17

## -Y5A-




NOTE: FOR –Y5A– ALIGNMENT, SEE SHEETS – 17

## -Y5B-

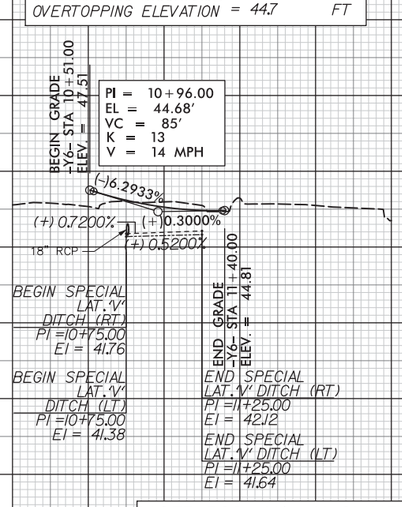



NOTE: FOR –Y5B– ALIGNMENT, SEE SHEETS – 17

## -Y6-

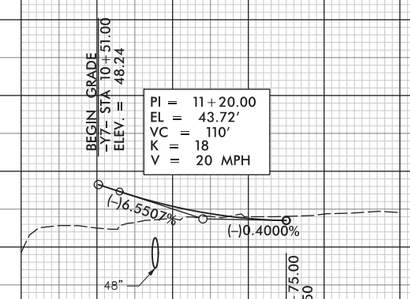
PIPE HYDRAULIC DATA
-Y6- Sta.10+76 (STR #1709)

| | | |
|---|---|---|
| DRAINAGE AREA | = 0.8 | AC |
| DESIGN FREQUENCY | = 25 | YRS |
| DESIGN DISCHARGE | = 4.4 | CFS |
| DESIGN HW ELEVATION | = 42.9 | FT |
| 100 YEAR DISCHARGE | = 5.0 | CFS |
| 100 YEAR HW ELEVATION | = 43.0 | FT |
| OVERTOPPING FREQUENCY | = 500 (+) | YRS |
| OVERTOPPING DISCHARGE | = 6.0 (+) | CFS |
| OVERTOPPING ELEVATION | = 44.7 | FT |




NOTE: FOR –Y6– ALIGNMENT, SEE SHEET – 17

## -Y7-




NOTE: FOR –Y7– ALIGNMENT, SEE SHEET – 19

10+00 11+00 12+00 13+00 14+00 10+00 11+00 12+00 13+00 14+00

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| R-5021 | 62 |
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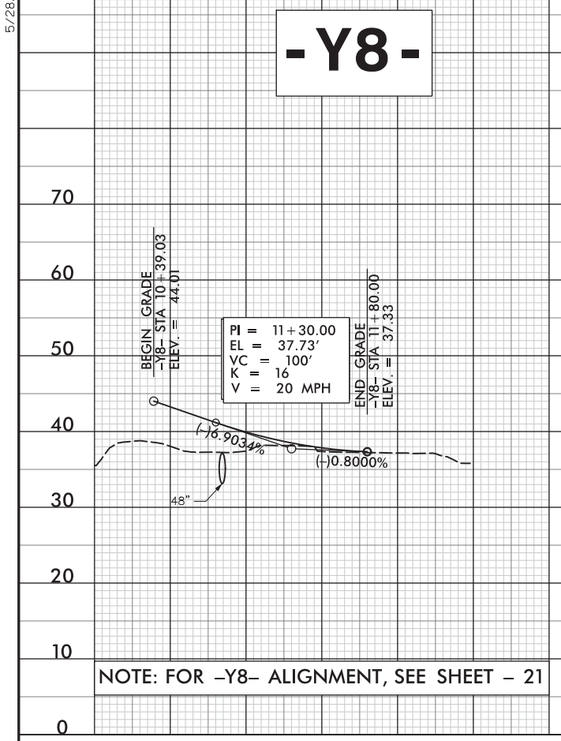
DITCH LEGEND

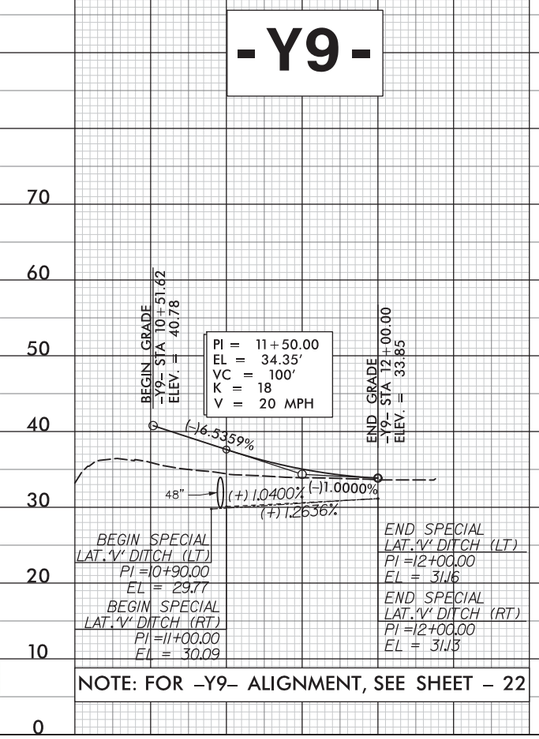
LEFT DITCH

RIGHT DITCH

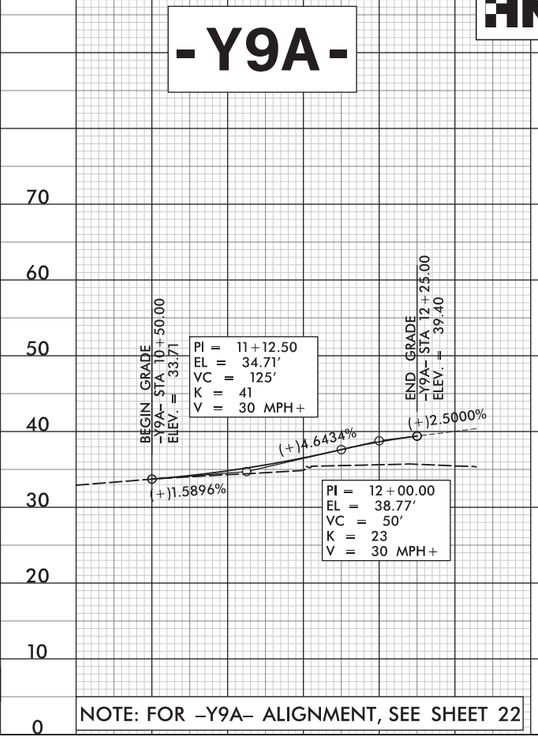
## -Y8-



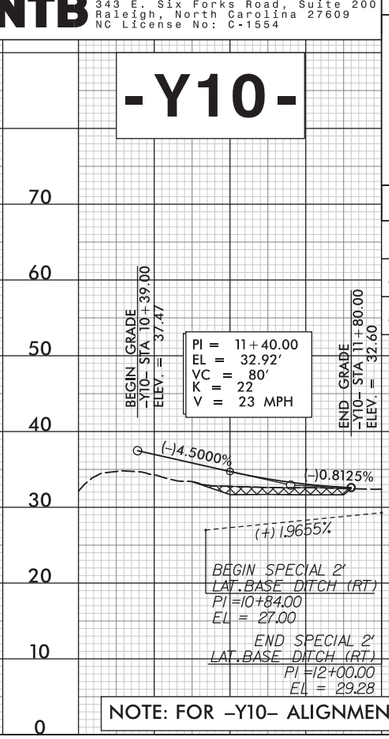

## -Y9-




## -Y9A-



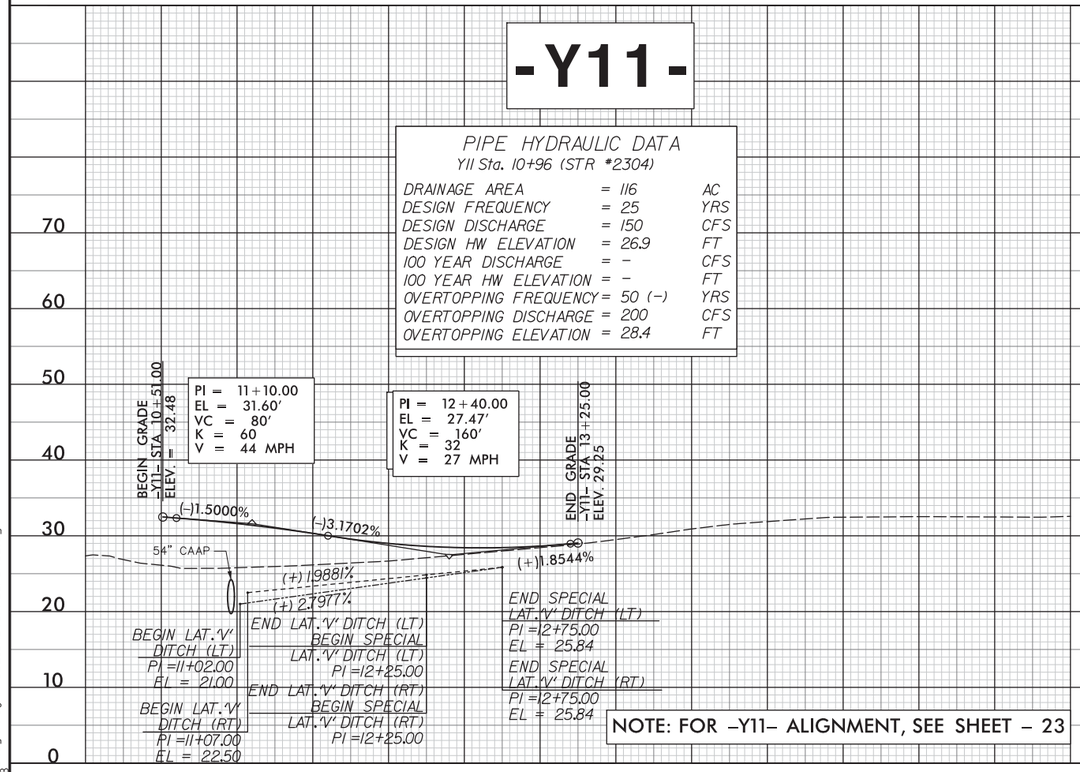

## -Y10-




## -Y11-

PIPE HYDRAULIC DATA
Y11 Sta. 10+96 (STR *2304)

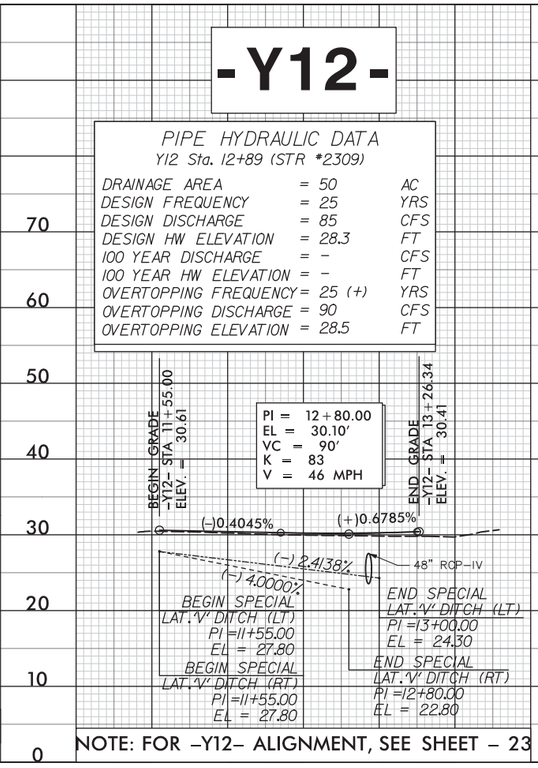
| | | |
|---|---|---|
| DRAINAGE AREA | = 116 | AC |
| DESIGN FREQUENCY | = 25 | YRS |
| DESIGN DISCHARGE | = 150 | CFS |
| DESIGN HW ELEVATION | = 26.9 | FT |
| 100 YEAR DISCHARGE | = - | CFS |
| 100 YEAR HW ELEVATION | = - | FT |
| OVERTOPPING FREQUENCY | = 50 (-) | YRS |
| OVERTOPPING DISCHARGE | = 200 | CFS |
| OVERTOPPING ELEVATION | = 28.4 | FT |



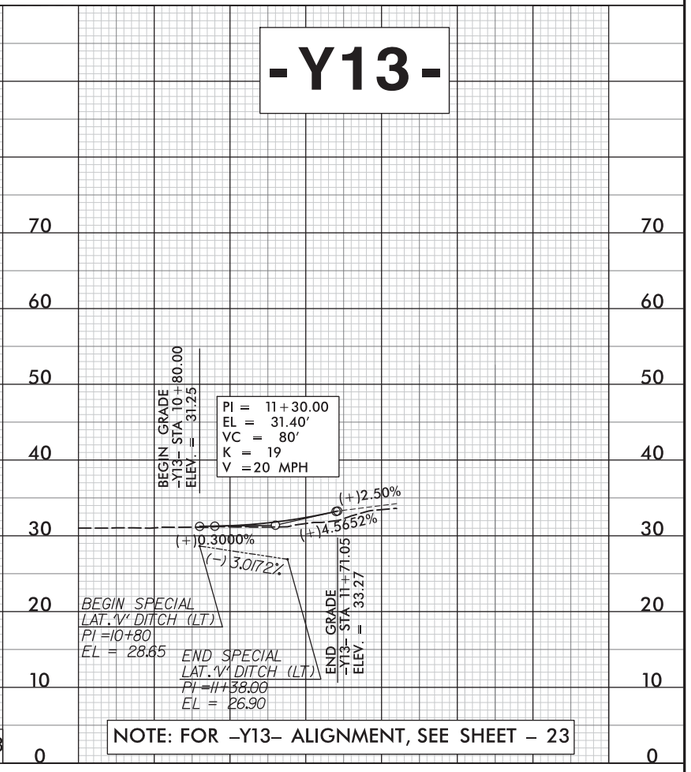

## -Y12-

PIPE HYDRAULIC DATA
Y12 Sta. 12+89 (STR *2309)

| | | |
|---|---|---|
| DRAINAGE AREA | = 50 | AC |
| DESIGN FREQUENCY | = 25 | YRS |
| DESIGN DISCHARGE | = 85 | CFS |
| DESIGN HW ELEVATION | = 28.3 | FT |
| 100 YEAR DISCHARGE | = - | CFS |
| 100 YEAR HW ELEVATION | = - | FT |
| OVERTOPPING FREQUENCY | = 25 (+) | YRS |
| OVERTOPPING DISCHARGE | = 90 | CFS |
| OVERTOPPING ELEVATION | = 28.5 | FT |




## -Y13-

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|---|---|
| R-5021 | 63 |
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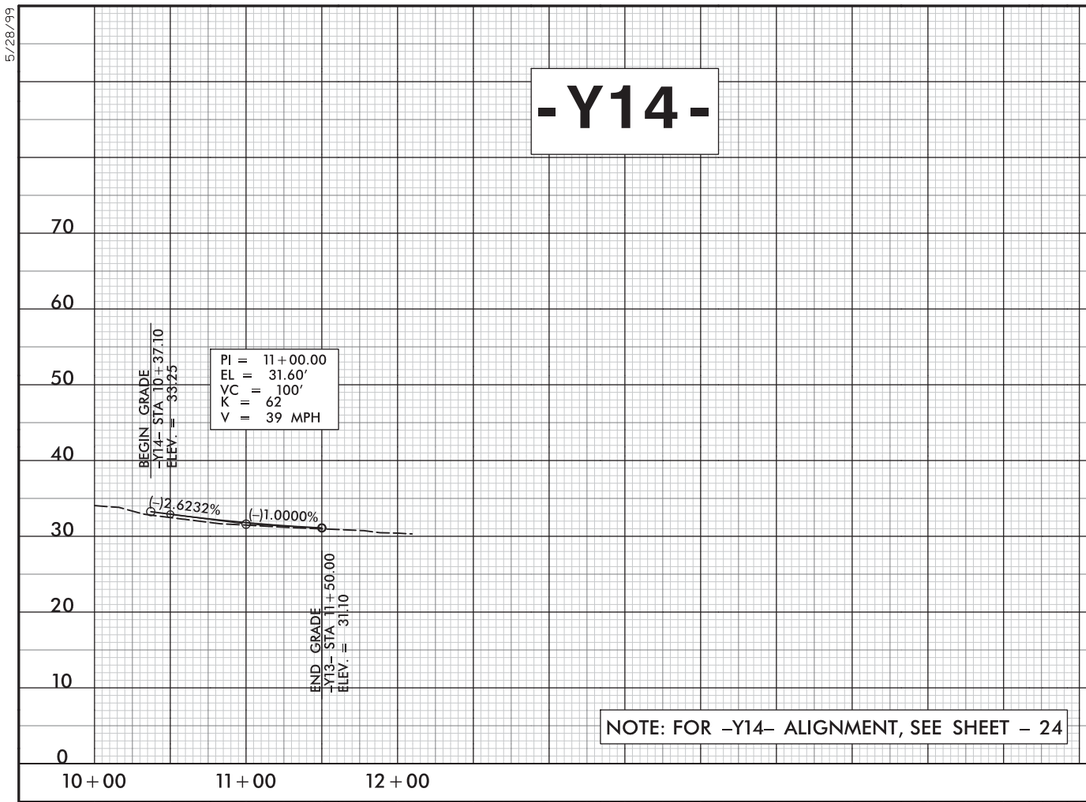
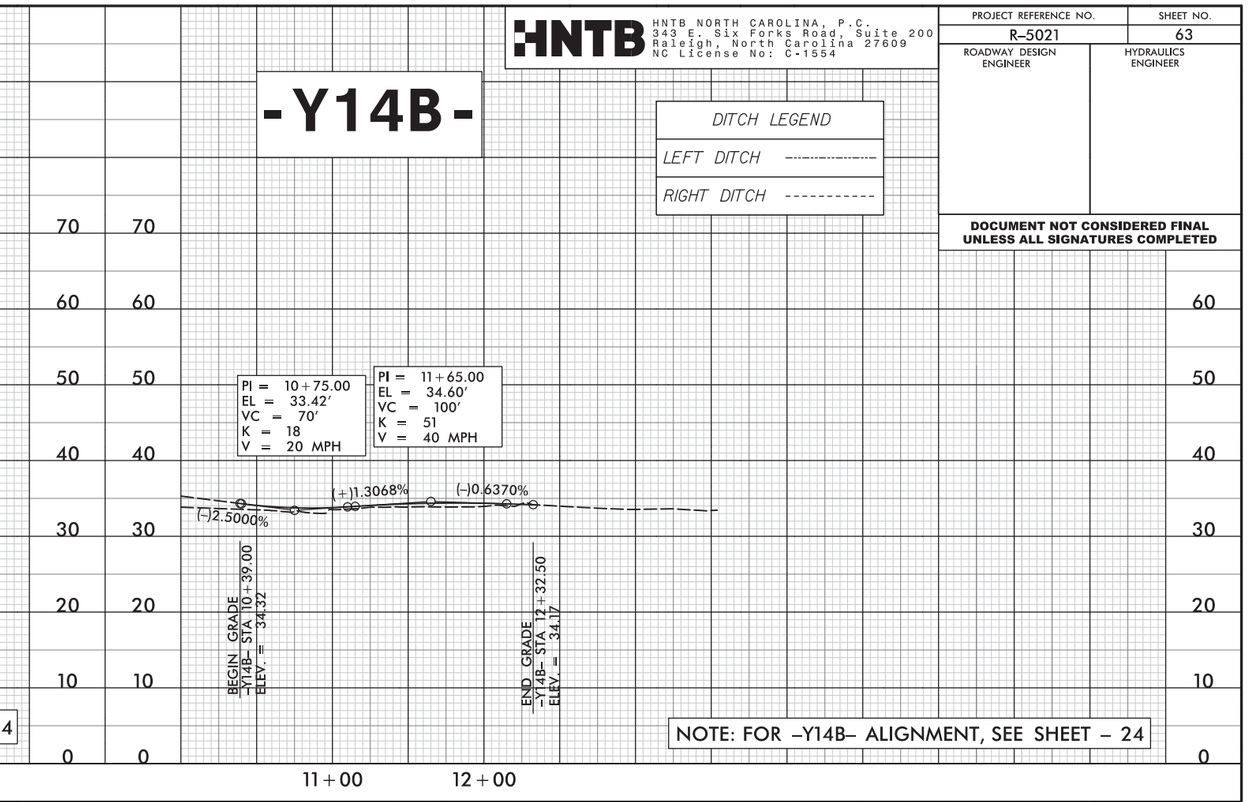
| DITCH LEGEND | |
|---|---|
| LEFT DITCH | ---·---·--- |
| RIGHT DITCH | ---------- |

# -Y14-



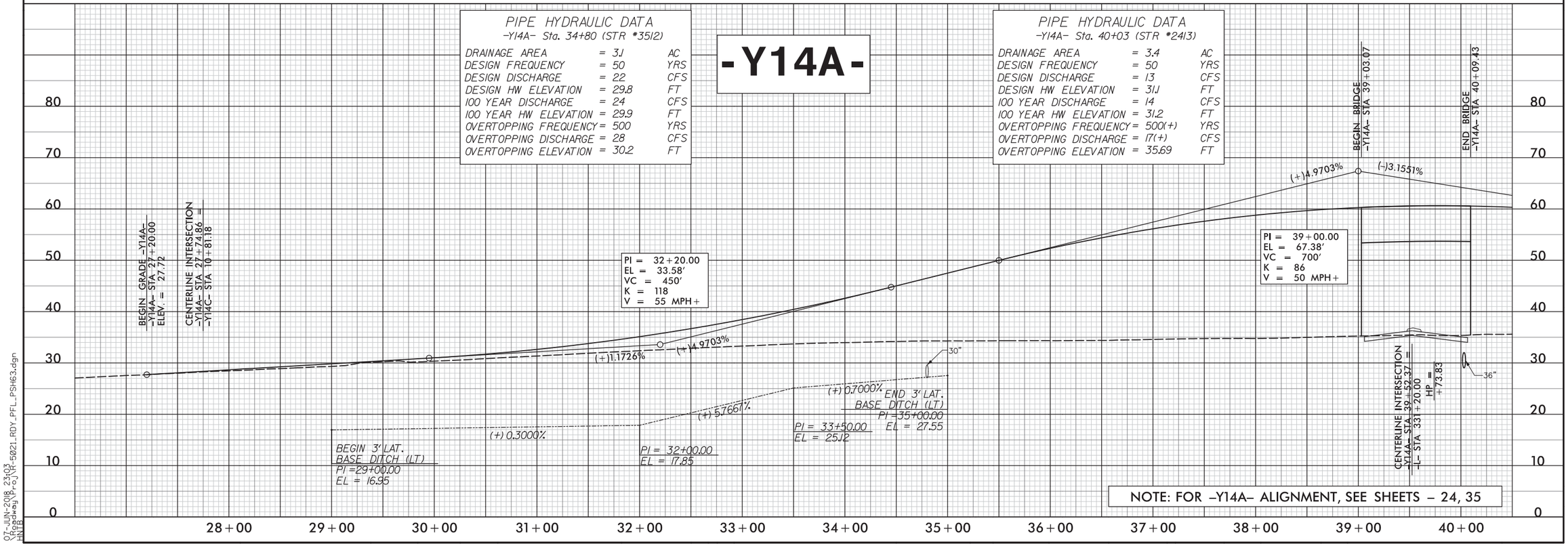

NOTE: FOR -Y14- ALIGNMENT, SEE SHEET - 24

# -Y14B-




NOTE: FOR -Y14B- ALIGNMENT, SEE SHEET - 24

# -Y14A-




NOTE: FOR -Y14A- ALIGNMENT, SEE SHEETS - 24, 35

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| R-5021 | 64 |
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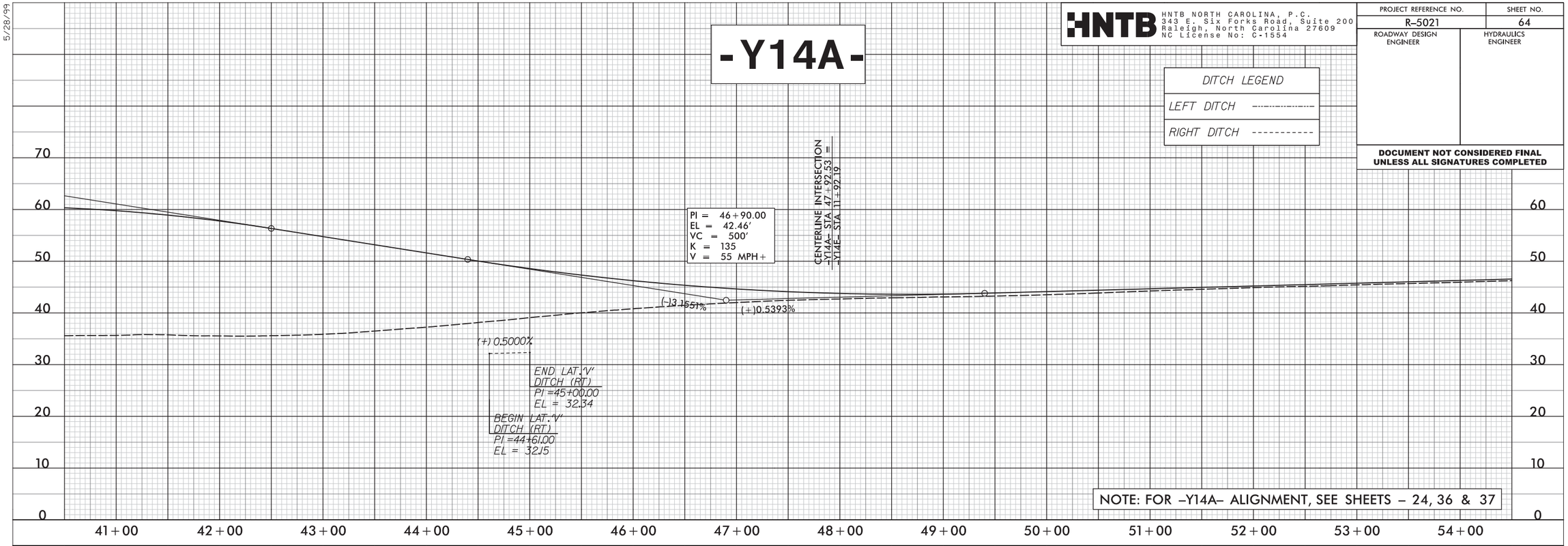
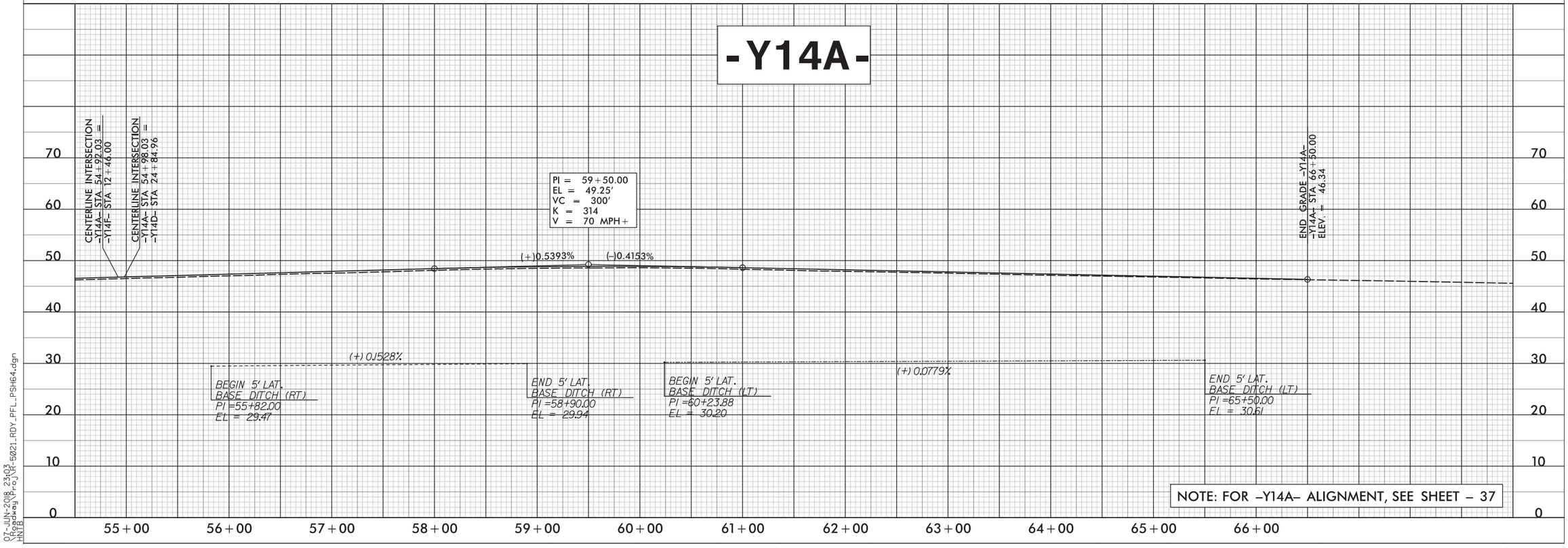
| DITCH LEGEND | |
|---|---|
| LEFT DITCH | -·-·-·-·- |
| RIGHT DITCH | - - - - - - - - - - |

# -Y14A-




NOTE: FOR –Y14A– ALIGNMENT, SEE SHEETS – 24, 36 & 37

# -Y14A-




NOTE: FOR –Y14A– ALIGNMENT, SEE SHEET – 37

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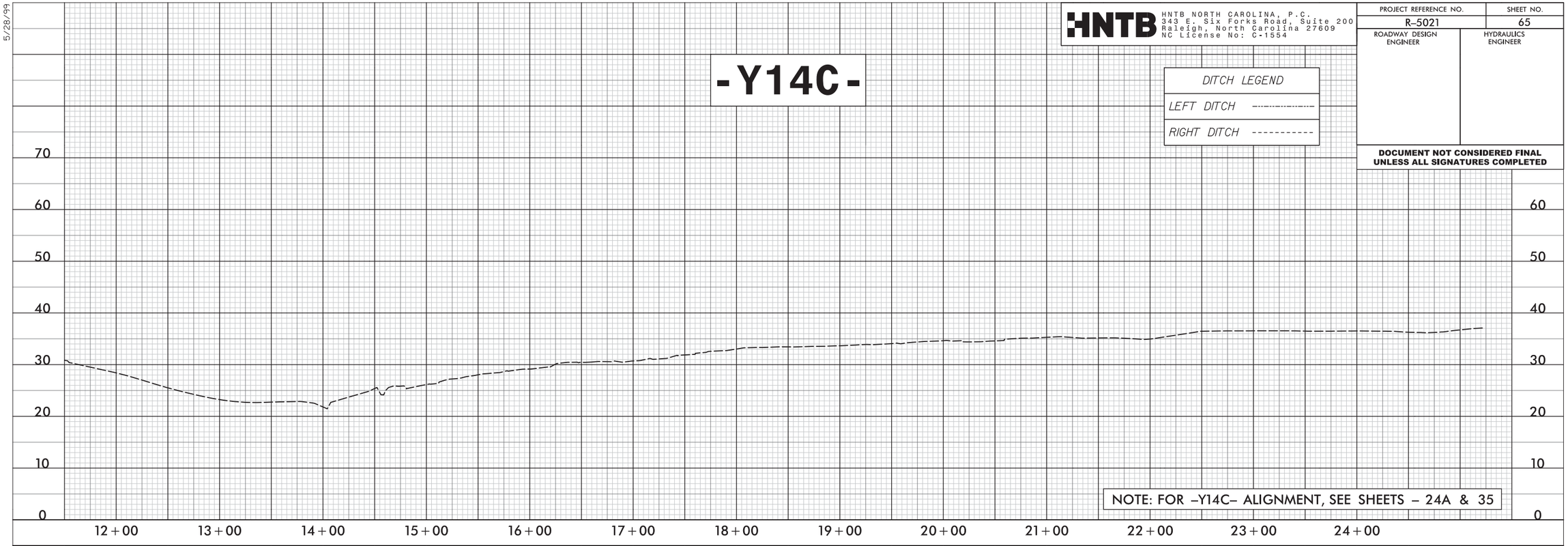
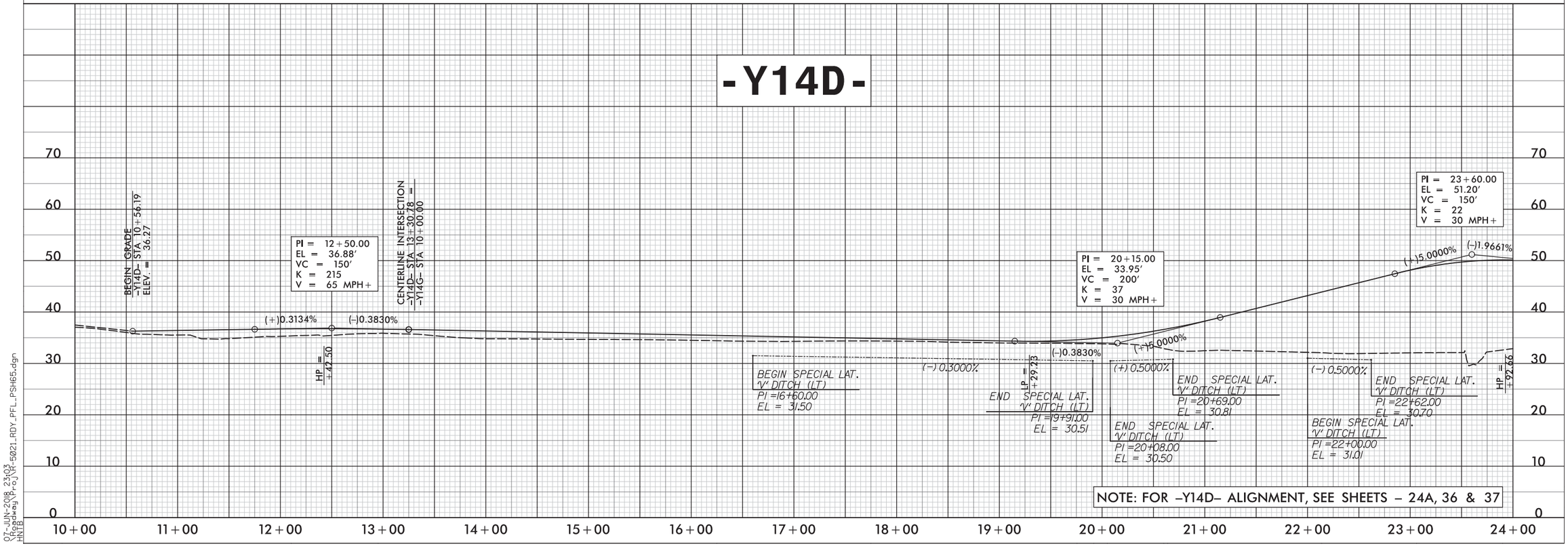
| DITCH LEGEND | |
|---|---|
| LEFT DITCH | -·-·-·-·- |
| RIGHT DITCH | - - - - - - - - - - |

# -Y14C-




NOTE: FOR –Y14C– ALIGNMENT, SEE SHEETS – 24A & 35

# -Y14D-




NOTE: FOR –Y14D– ALIGNMENT, SEE SHEETS – 24A, 36 & 37

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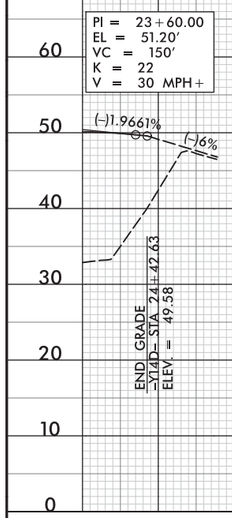
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 66 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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

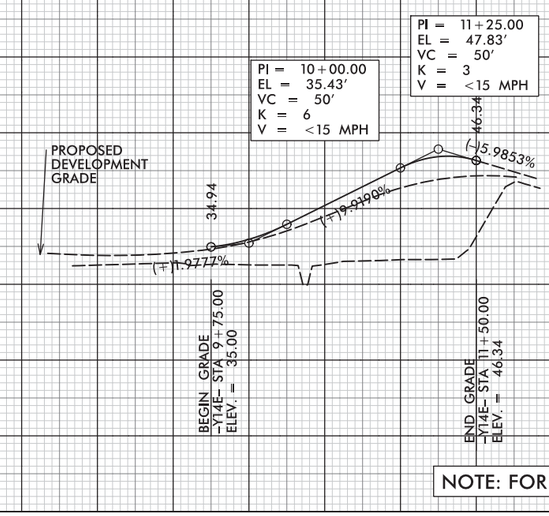
| DITCH LEGEND | |
|---|---|
| LEFT DITCH | ----------·---------- |
| RIGHT DITCH | ---------- |

## -Y14D-



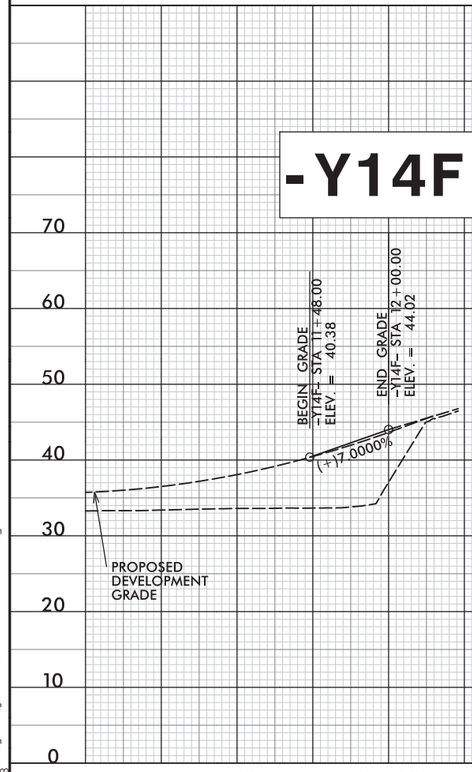

NOTE: FOR –Y14D– ALIGNMENT, SEE SHEET – 37

## -Y14E-



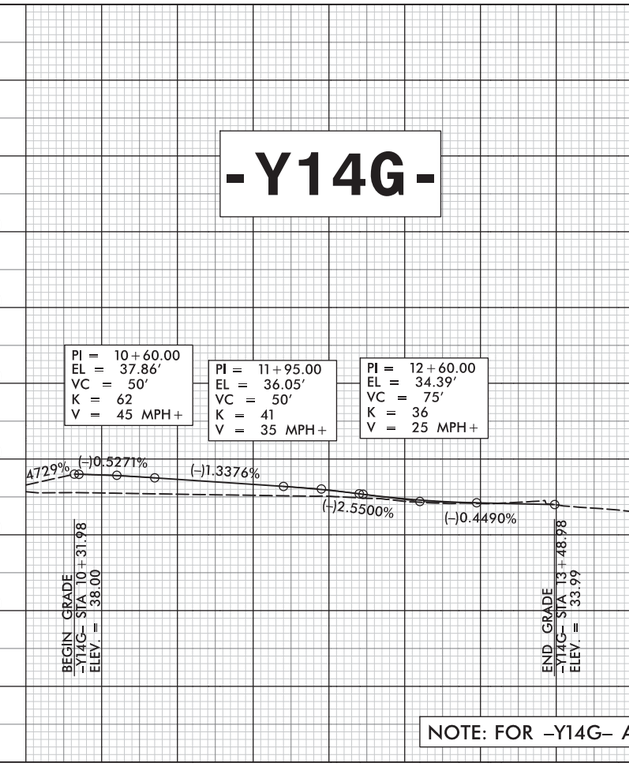

NOTE: FOR –Y14E– ALIGNMENT, SEE SHEET – 36

## -Y14F-




NOTE: FOR –Y14F– ALIGNMENT, SEE SHEET – 37

## -Y14G-




NOTE: FOR –Y14G– ALIGNMENT, SEE SHEETS – 24A & 25

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| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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DITCH LEGEND

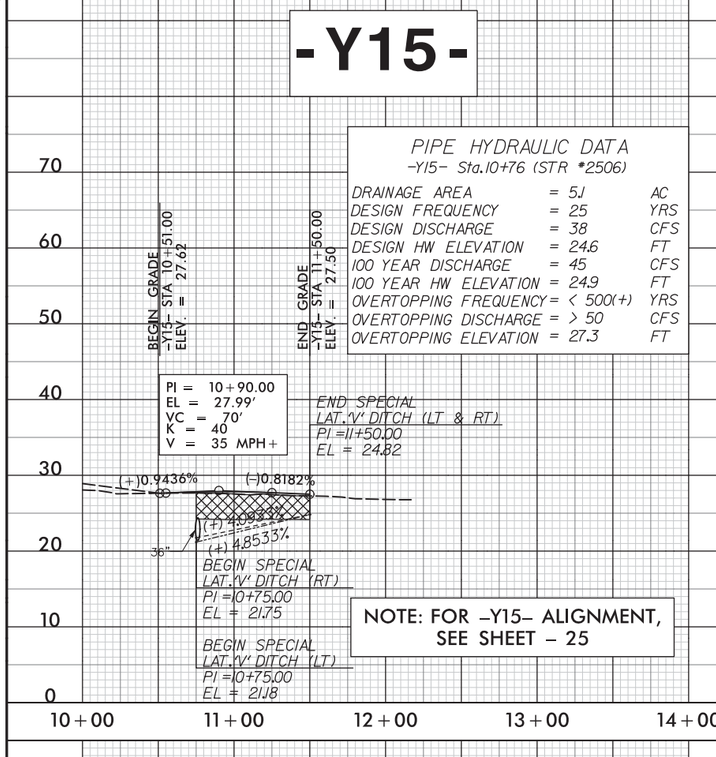
LEFT DITCH

RIGHT DITCH

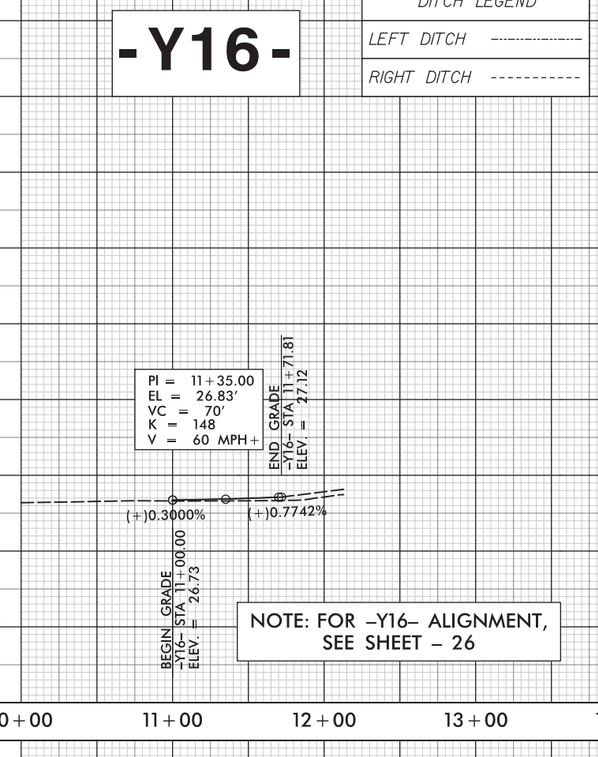
## -Y15-

PIPE HYDRAULIC DATA
-Y15- Sta.10+76 (STR #2506)

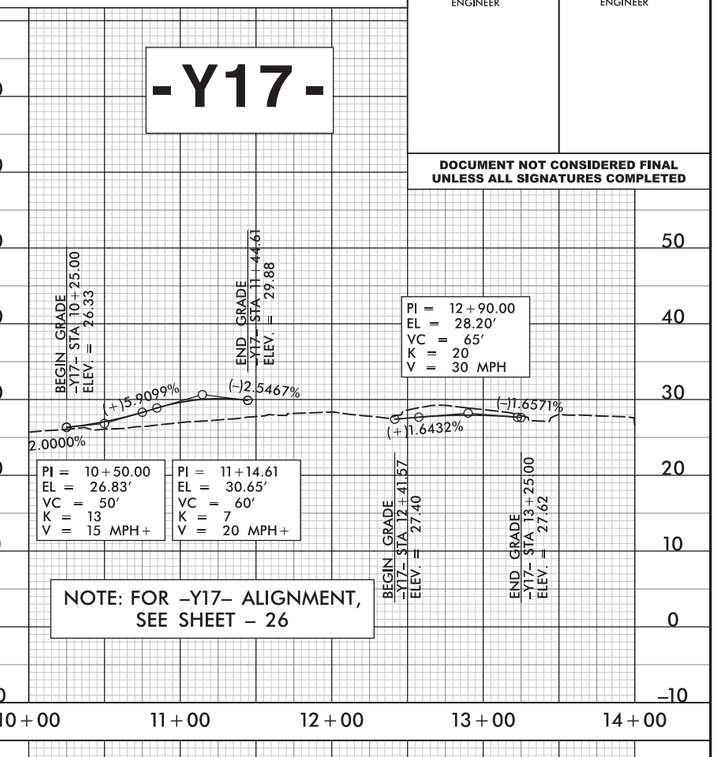
| | | |
|---|---|---|
| DRAINAGE AREA | = 5.1 | AC |
| DESIGN FREQUENCY | = 25 | YRS |
| DESIGN DISCHARGE | = 38 | CFS |
| DESIGN HW ELEVATION | = 24.6 | FT |
| 100 YEAR DISCHARGE | = 45 | CFS |
| 100 YEAR HW ELEVATION | = 24.9 | FT |
| OVERTOPPING FREQUENCY | = < 500(+) | YRS |
| OVERTOPPING DISCHARGE | = > 50 | CFS |
| OVERTOPPING ELEVATION | = 27.3 | FT |



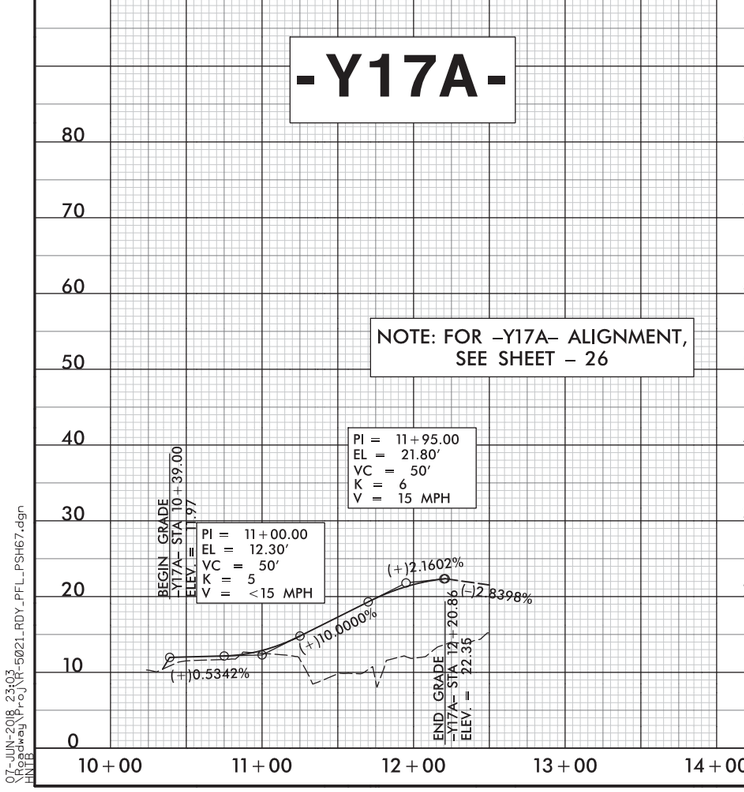

## -Y16-



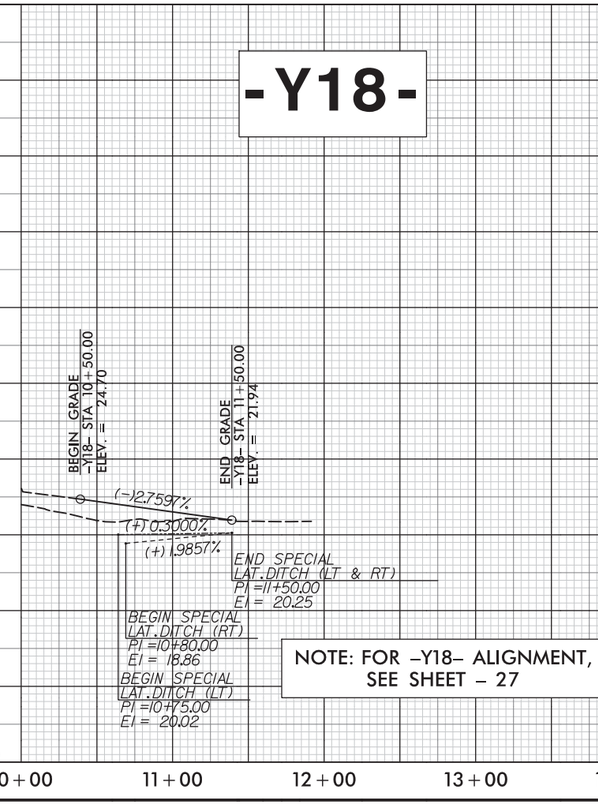

## -Y17-



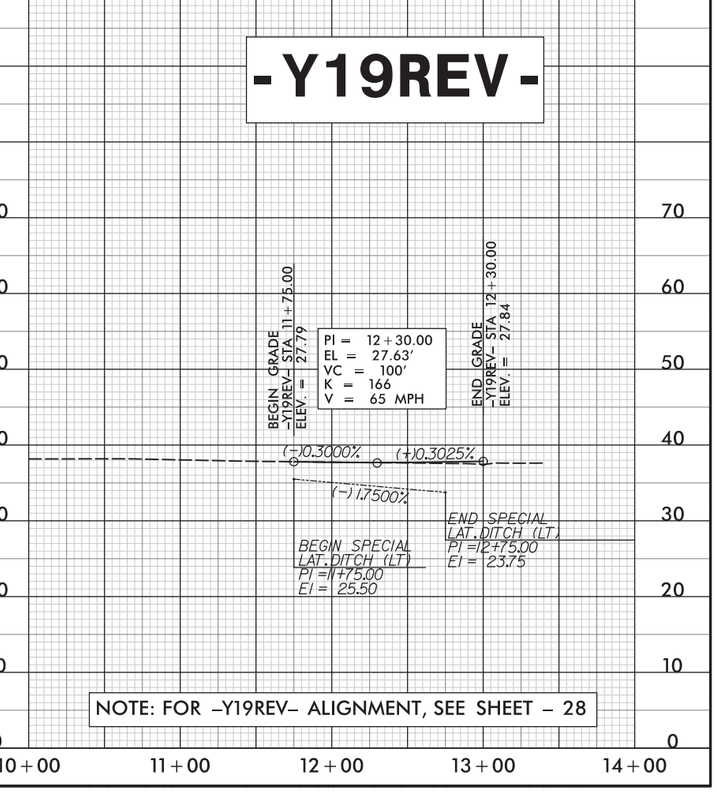

## -Y17A-




## -Y18-




## -Y19REV-

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 68 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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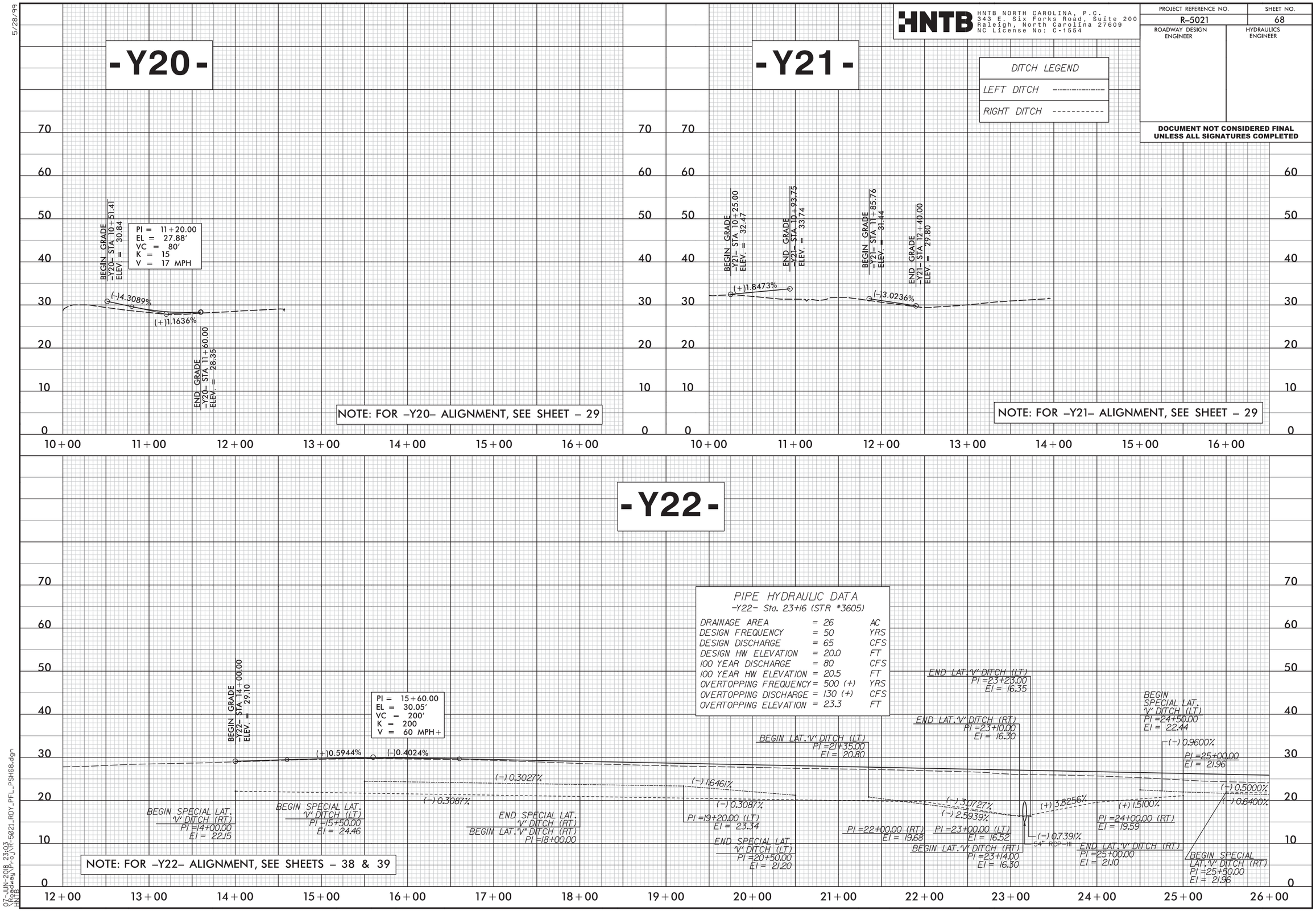
| DITCH LEGEND | |
|---|---|
| LEFT DITCH | -·-·-·-·- |
| RIGHT DITCH | - - - - - - - - - - |

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 69 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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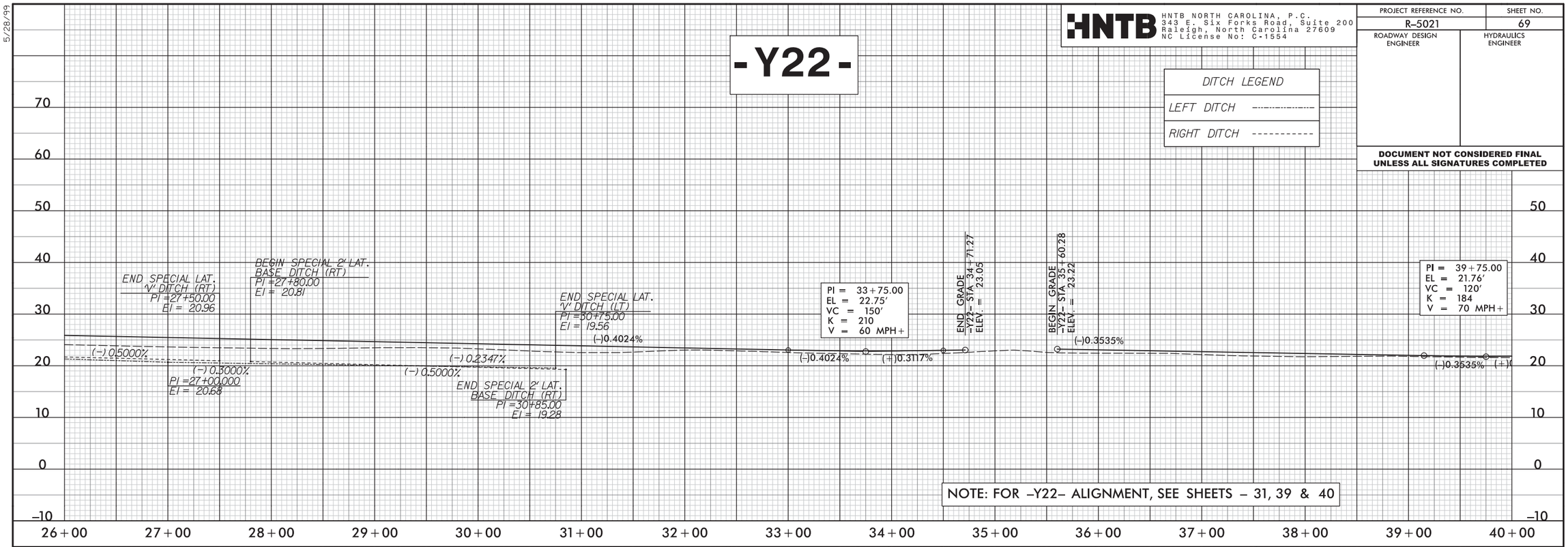
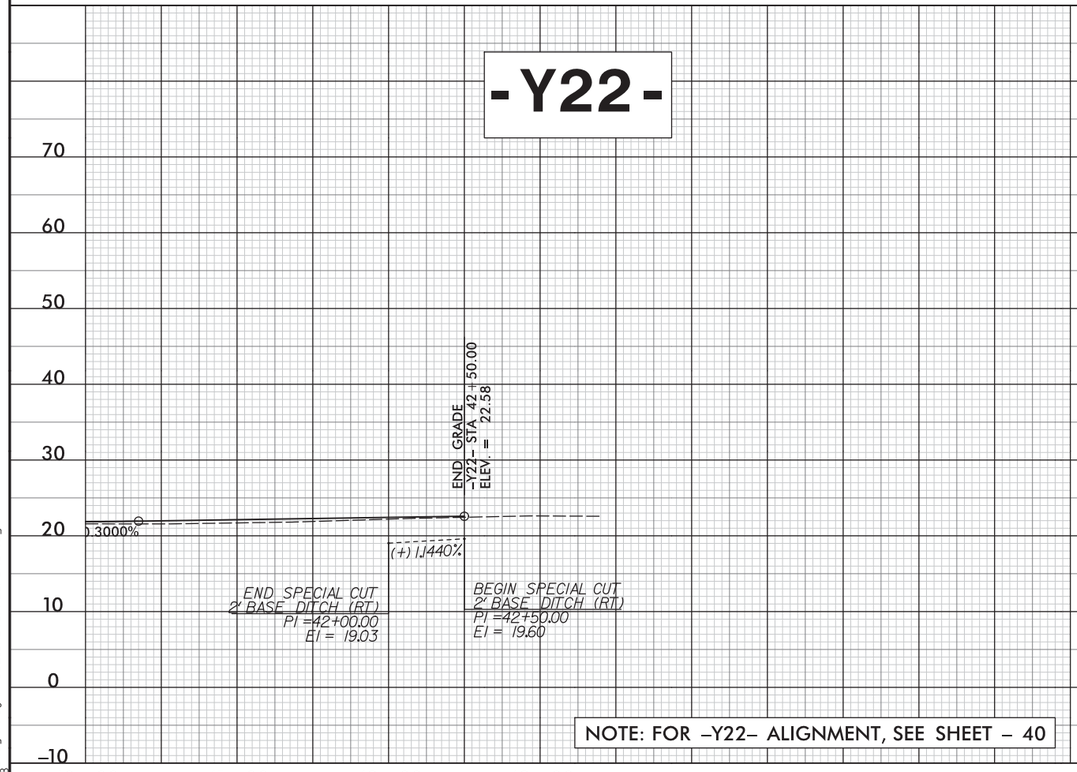
| DITCH LEGEND | |
|---|---|
| LEFT DITCH | ----------·---------- |
| RIGHT DITCH | ---------- |

## -Y22-



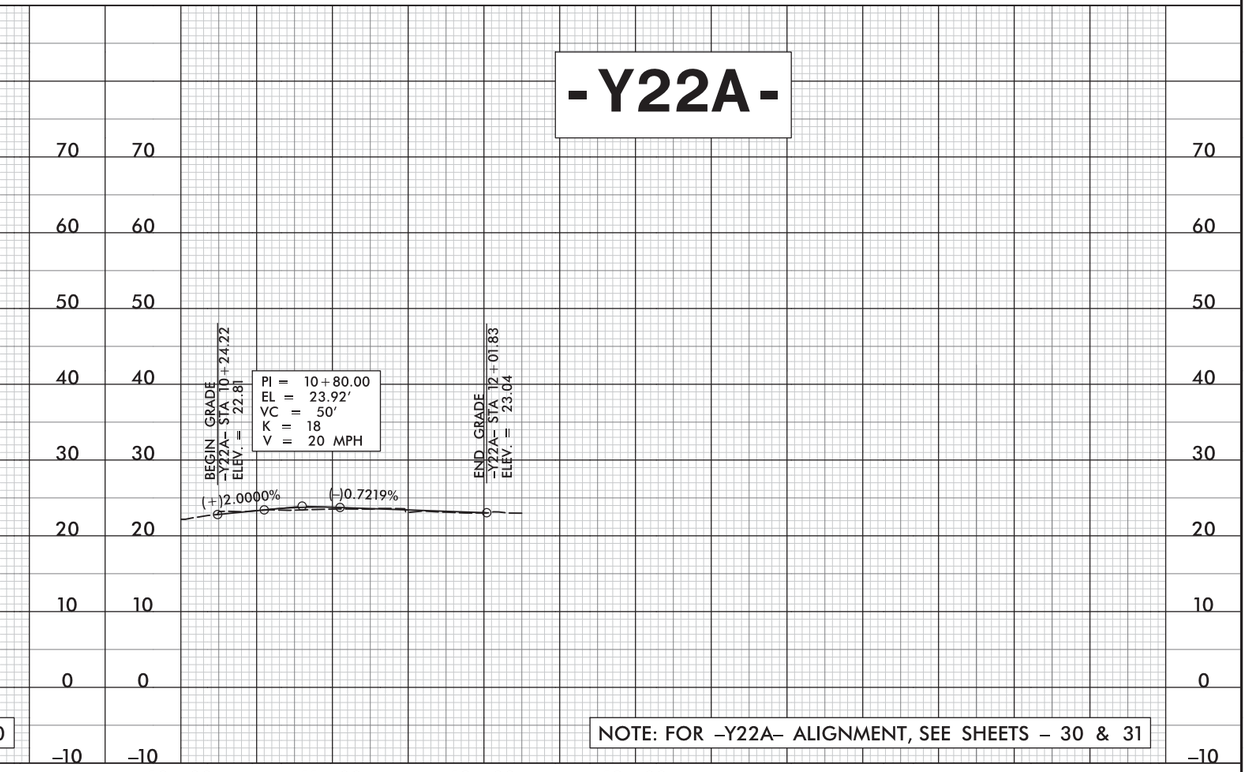

NOTE: FOR -Y22- ALIGNMENT, SEE SHEETS - 31, 39 & 40

## -Y22-




NOTE: FOR -Y22- ALIGNMENT, SEE SHEET - 40

## -Y22A-




NOTE: FOR -Y22A- ALIGNMENT, SEE SHEETS - 30 & 31

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| R-5021 | 70 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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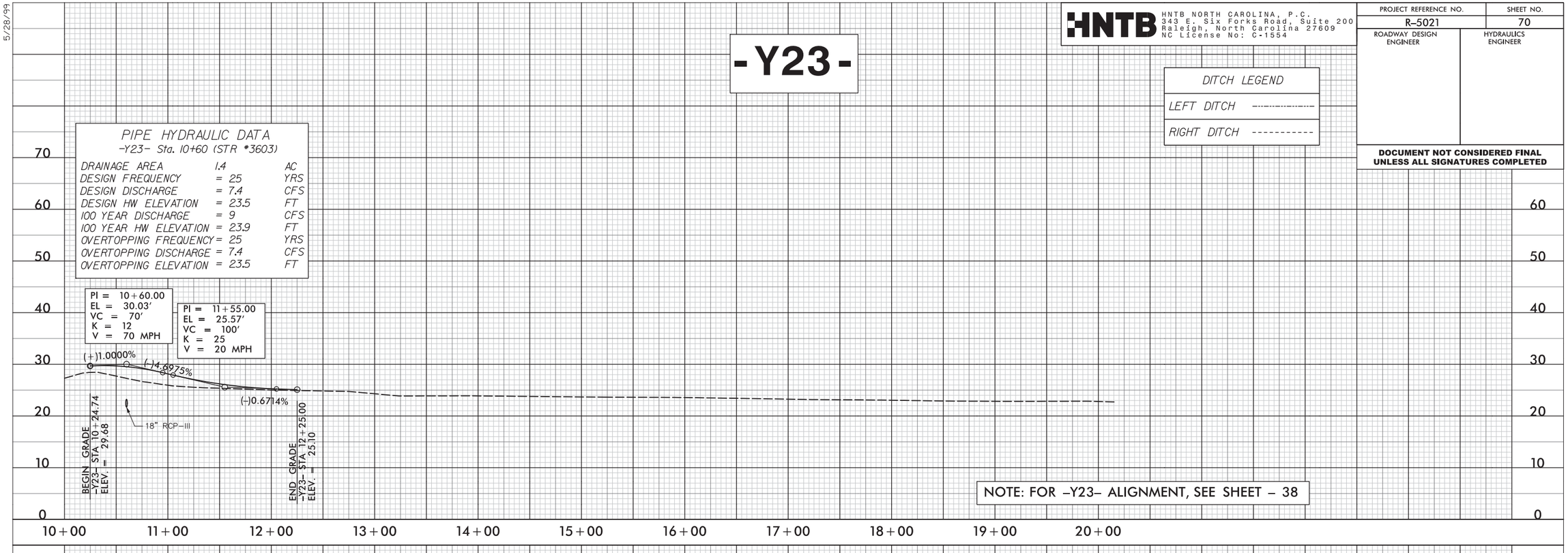
# -Y23-

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

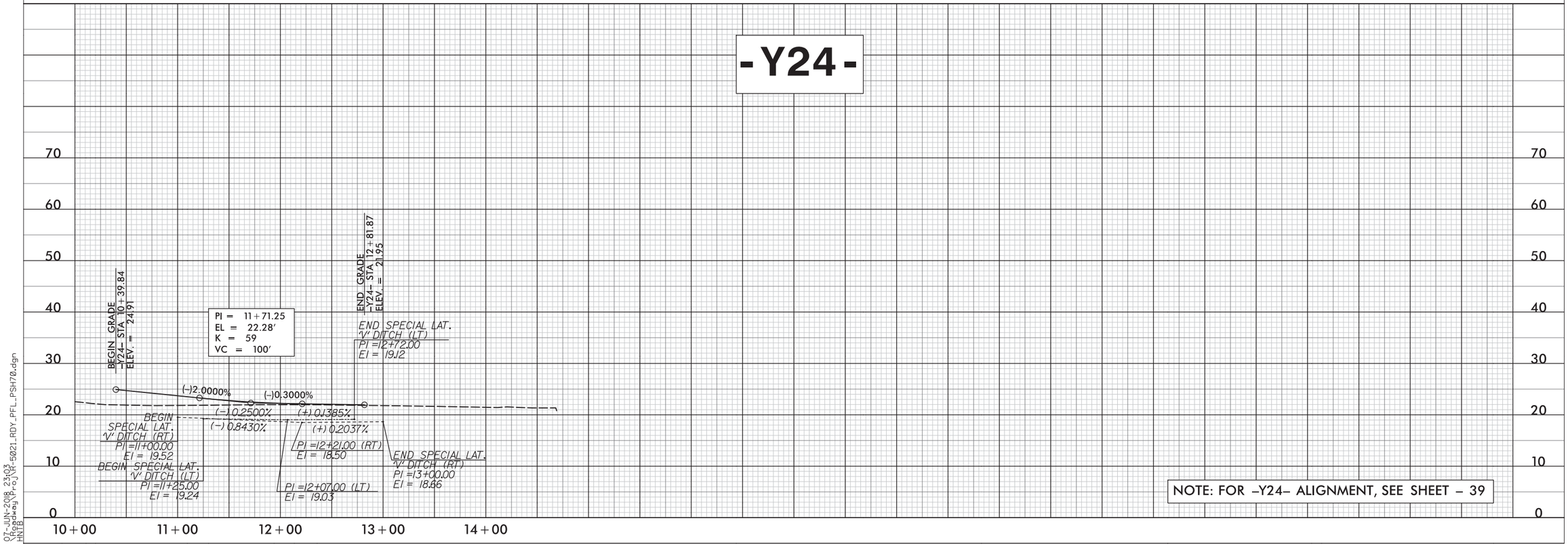
PIPE HYDRAULIC DATA
-Y23- Sta. 10+60 (STR #3603)

| | | |
|---|---|---|
| DRAINAGE AREA | 1.4 | AC |
| DESIGN FREQUENCY | = 25 | YRS |
| DESIGN DISCHARGE | = 7.4 | CFS |
| DESIGN HW ELEVATION | = 23.5 | FT |
| 100 YEAR DISCHARGE | = 9 | CFS |
| 100 YEAR HW ELEVATION | = 23.9 | FT |
| OVERTOPPING FREQUENCY | = 25 | YRS |
| OVERTOPPING DISCHARGE | = 7.4 | CFS |
| OVERTOPPING ELEVATION | = 23.5 | FT |




NOTE: FOR -Y23- ALIGNMENT, SEE SHEET - 38

# -Y24-




NOTE: FOR -Y24- ALIGNMENT, SEE SHEET - 39

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