STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H.TROGDON, III
SECRETARY

October 4, 2019

U. S. Army Corps of Engineers
151 Patton Avenue, Room 208
Asheville, NC 28801-5006

ATTN: Ms. Nicholle Braspennickx
NCDOT Coordinator

Subject: **Application for Section 404 General Permit 198200031 and Section 401 Water Quality Certification** for the Proposed I-485 Improvements from I-77 to US-74 (Independence Boulevard), Mecklenburg County, Division 10, STIP No. I-5507, Debit $570.00 from WBS 43609.3.2.

Dear Madam:

The North Carolina Department of Transportation (NCDOT) proposes improvements to approximately 17 miles of I-485 (Charlotte Outer Loop) in southern Mecklenburg County. The proposed project extends from I-77 to US 74 (Independence Boulevard) and involves adding one Express Lane in each direction, extension of a segment of the general purpose lane, addition of at-grade ingress and egress points, addition of Direct Connectors to the Express Lanes, bridge replacements, and intersection/interchange improvements.

As a result of the I-485 improvements, there will be 1,131 linear feet of stream bank stabilization, 1,376 linear feet of permanent stream impacts, 0.33 acre of temporary stream impacts, and 0.83 acre of permanent wetland impacts.

Please see enclosed copies of the Pre-Construction Notification (PCN), Division of Mitigation Services (DMS) mitigation acceptance letter, Stormwater Management Plan (SMP), permit drawings, roadway plan sheets, mussel report, plant survey memo, northern long-eared bat memo, State Historic Preservation Office (SHPO) letter, and No Archaeological Survey Required Form. A Categorical Exclusion (CE) was completed in August 2018 and distributed shortly thereafter. Additional copies are available upon request.

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

Telephone: (919) 707-6000
Fax: (919) 250-4224
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
1000 BIRCH RIDGE DRIVE
RALEIGH NC 27610

A copy of this permit application and its distribution list will be posted on the NCDOT Website at: http://connect.ncdot.gov/resources/Environmental. If you have any questions or need additional information, please call Erin Cheely at (919) 707-6108.

Sincerely,

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

Cc:
NCDOT Permit Application Standard Distribution List

Pre-Construction Notification (PCN) Form

For Nationwide Permits and Regional General Permits

(along with corresponding Water Quality Certifications)

September 29, 2018 Ver 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:*

Mecklenburg

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:

I-5507

WBS #*

43609.3.2

(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 used to initiate the standard/individual permit process with the Corps. Please contact your Corps representative concerning submittals for standard permits. All required items that are not provided in the E-PCN can be added to the miscellaneous upload area located at the bottom of this form.

1c. Has the NWP or GP number been verified by the Corps?*

(•) Yes ( ) No

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

RGP Numbers (for multiple RGPS):

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

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

check all that apply

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

1e. 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

1f. Is this an after-the-fact permit application?*

( ) Yes (•) No

1g. 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

I-5507 Revised DMS Acceptance.pdf 78.76KB

FILE TYPE MUST BE PDF

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

( ) Yes (•) No

1j. 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?*

North Carolina Department of Transportation, Erin Cheely

1b. Primary Contact Email:*

ekcheely@ncdot.gov

1c. Primary Contact Phone:*

(xxx)xxx-xxxx

(919)707-6108

1d. Who is applying for the permit?*

[x] Owner

(Check all that apply)

[ ] Applicant (other than owner)

1e. Is there an Agent/Consultant for this project?*

( ) Yes (•) No

2. Owner Information

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

NC Department of Transportation

2b. Deed book and page no.:

N/A

2c. Responsible party:

(for Corporations)

2d. Address*

Street Address

1598 Mail Service Center

Address Line 2

City

Raleigh

State / Province / Region

NC

Postal / Zip Code

27699

Country

USA

2e. Telephone Number:*

(xxx)xxx-xxxx

(919)707-6000

2f. Fax Number:

(919)250-4224

(xxx)xxx-xxxx

2g. Email Address:*

pharris@ncdot.gov

C. Project Information and Prior Project History

1. Project Information

1a. Name of project:*

I-5507, I-485 Express Lanes

1b. Subdivision name:

(if appropriate)

1c. Nearest municipality / town:*

Charlotte/Pineville/Matthews

2. Project Identification

2a. Property Identification Number:
(tax PIN or parcel ID)
multiple parcels

2b. Property size:
(in acres)
1959.7

2c. Project Address
Street Address
Address Line 2
City
Charlotte/Pineville/Matthews
State / Province / Region
NC
Postal / Zip Code
Country
USA

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: *
35.063857
ex: 34.208504

Longitude: *
-80.805614
-77.796371

3. Surface Waters

3a. Name of the nearest body of water to proposed project: *
Sugar Creek, Little Sugar Creek, Kings Branch, McMullen Creek, McAlpine Creek, Flat Branch, Fourmile Creek, and Sixmile Creek

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

Surface Water Lookup

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

Yadkin-PeeDee

3d. Please provide the 12-digit HUC in which the project is located. *
030401050702, 030501030102, 030501030103, 030501030105, 030501030106, 030501030107, 030501030203

River Basin Lookup

4. Project Description and History

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: *
Land use in the project vicinity consists primarily of residential, commercial, and industrial development, interspersed with forestland along stream corridors and within undeveloped parcels. Numerous corporate centers and shopping areas are located in the project area.

4b. Have Corps permits or DWR certifications been obtained for this project (including all prior phases) in the past? *
○ Yes ◉ No ○ Unknown

4d. 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

4e. 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

4f. List the total estimated acreage of all existing wetlands on the property:
16.21

4g. List the total estimated linear feet of all existing streams on the property:
(intermittent and perennial)
22,350

4h. Explain the purpose of the proposed project: *
The purpose of the project is to provide a reliable travel time option (45 mph minimum average speed) during peak demand periods along I-485 between I-77 and US 74. Without improvements to the I-485 corridor as proposed by this project, peak period travel speeds are expected to be even slower than current conditions. During the AM peak hour, average travel speeds for I-485 westbound from US 74 to I-77 are projected to decrease from approximately 53 mph in 2015 to 37 mph in 2040 if no improvements are made. Likewise, during the PM peak hour, average travel speeds for I-485 eastbound from I-77 to US 74 are projected to decrease from approximately 36 mph in 2015 to 27 mph in 2040.

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

The NCDOT proposes improvements to approximately 17 miles of I-485 (Charlotte Outer Loop) in southern Mecklenburg County. The proposed project extends from I-77 to US 74 (Independence Boulevard) and involves adding one Express Lane in each direction in the existing median, at-grade ingress and egress access points into and out of the Express Lanes, as well as direct connector ramps, and connecting local side streets directly to the Express Lanes.

The typical section for the segments from I-77 to SR 3624 (Rea Road) includes a 12-foot Express Lane in each direction, three 12-foot general purpose lanes, with a two-foot separation between the Express Lane and general purpose lanes. Plastic bollards with delineators will be installed within the two-foot separation. An 18-foot median with a concrete barrier is proposed between opposing travel lanes. The outside shoulder varies from 12 to 15 feet.

The typical section for the segment from SR 3624 (Rea Road) to NC 16 (Providence Road) includes a 12-foot Express Lane in each direction, three 12-foot general purpose lanes, with a four-foot separation between the Express Lane and general purpose lanes. Plastic bollards with delineators will be installed within the four-foot separation. A 26-foot paved median with a concrete barrier is proposed between opposing travel lanes. The outside shoulder varies from 12 to 15 feet.

The typical section for the segment from NC 16 (Providence Road) to US 74 (Independence Boulevard) includes a 12-foot Express Lane in each direction, two 12-foot general purpose lanes, with a four-foot separation between the Express Lane and the general purpose lanes. Plastic bollards with delineators will be installed within the four-foot separation. A 26-foot paved median with a concrete barrier is proposed between opposing travel lanes. The outside shoulder varies from 17.5 to 20.5 feet.

The project study area contains 55 bridges carrying I-485 (Charlotte Outer Loop) over ramps associated with the mentioned interchanges, streams, greenways, one bridge carrying I-485 over a railroad, and one bridge carrying a railroad over I-485. There are eight existing interchanges within the I-5507 project limits including I-77 and US 74 (Independence Boulevard).

Proposed improvements include the following activities: pavement resurfacing, restriping, sign installation, pavement markings, electronic toll/traffic management equipment installation and operation, addition of Express Lanes, extension of a segment of the general purpose lane, addition of at-grade ingress and egress points, addition of Direct Connectors to the Express Lanes, bridge replacements, and intersection/interchange improvements. The project will include work within jurisdictional features, such as roadway fill, bridge foundation construction, and drainage improvement, including culvert extensions, outfall protection, bank stabilization, and temporary stream impacts for bridge construction and fill slope construction. Standard roadway construction equipment such as loaders, compactors, excavators, dozers, and pavers will be used.

4j. Please upload project drawings for the proposed project.

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

I-5507 Permit Drawings.pdf	65.16MB
I-5507 Roadway Plans.pdf	43.37MB

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:

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

(•) Preliminary ( ) Approved ( ) Not Verified ( ) Unknown ( ) N/A

Corps AID Number:

Example: SAW-2017-99999

SAW-2013-02330

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

Name (if known):

Agency/Consultant Company: Environmental Services, Inc., RK&K, and NCDOT

Other:

5d. List the dates of the Corp jurisdiction determination or State determination if a determination was made by the Corps or DWR.

8/25/2015 (AJD), 7/1/2019 (PJD) - Both of these determinations were for this TIP (I-5507), but cover U-4714AB and R-0211EC resources in their entirety as well.

5d1. Jurisdictional determination upload

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

File type must be PDF

6. Future Project Plans

6a. 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
- [ ] 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.

"W." will be used in the table below to represent the word "wetland".

2a. Site # * (?)	2a1 Reason * (?)	2b. Impact type * (?)	2c. Type of W. *	2d. W. name *	2e. Forested *	2f. Type of Jurisdicition * (?)	2g. Impact area *
Total	Fill	P	NCWAM TYPES	see attached table	Yes	Corps	0.560 (acres)
Total	Mechanized Clearing	P	NCWAM TYPES	see attached table	Yes	Corps	0.270 (acres)

2g. Total Temporary Wetland Impact

0.000

2g. Total Permanent Wetland Impact

0.830

2g. Total Wetland Impact

0.830

2h. Comments:

Wetland impacts for each site are shown on an attached table. There will be no temporary wetland impacts. There will be a total of 0.83 ac of permanent wetland impacts, which includes 0.56 acre of permanent fill in wetlands and 0.27 acre of mechanized clearing.

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.

"S." will be used in the table below to represent the word "stream".

	3a. Reason for impact * (?)	3b.Impact type *	3c. Type of impact *	3d. S. name *	3e. Stream Type * (?)	3f. Type of Jurisdiction *	3g. S. width *	3h. Impact length *
S1	Total	Permanent	Bank Stabilization	see attached table	Perennial	Both	5 Average (feet)	746 (linear feet)
S2	Total	Permanent	Bank Stabilization	see attached table	Intermittent	Both	5 Average (feet)	385 (linear feet)
S3	Total	Permanent	Other	see attached table	Perennial	Both	5 Average (feet)	974 (linear feet)
S4	Total	Permanent	Other	see attached table	Intermittent	Both	5 Average (feet)	402 (linear feet)
S5	Total	Temporary	Other	see attached table	Perennial	Both	5 Average (feet)	390 (linear feet)
S6	Total	Temporary	Other	see attached table	Intermittent	Both	5 Average (feet)	957 (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:

2,507

3i. Total temporary stream impacts:

1,347

3i. Total stream and ditch impacts:

3854

3j. Comments:

Stream impacts for each site are shown on an attached table. There will be a total of 1,131 linear feet of permanent bank stabilization impacts, 1,376 linear feet of permanent stream impacts, and 0.33 acre of temporary stream impacts. In instances when suitable existing rock is found during construction activities and is approved by the engineer and NCDOT, existing rock will be used in place of artificial rock for riprap. At Sites 1, 3, 5, 13,15, 20, 22, 31,41,42, and 44, the existing culvert is not buried, therefore the culvert extension will not be buried. The bottom elevation of the extended culvert will match the elevation of the existing stream bed. At Site 44, the 3 @ 8'x9' RCBC culvert will be extended and the accumulated sediment deposition in the culvert will be removed. A 12" high bench will be left to remain in front of the southern barrel to promote low flow at the adjacent barrels.

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: *

The final project design avoids and minimizes impacts to wetlands and streams to the greatest extent practicable. The additional lanes will be constructed in the median, which will minimize direct impacts to streams in the project area. Fill slopes in and near wetlands and streams will be constructed at 2:1 slopes to minimize impacts. Where practicable, headwalls were included in the design to shorten fill slopes and minimize stream impacts, protect the ends of the pipe, and guard against erosion. An express lane direct connect ramp from the median of I-485 to/from Westinghouse Boulevard was incorporated in the current design, which reduces the amount of wetland impacts from those shown in previous designs. Rock plating will be constructed between Station 294+00 and Station 301+00 on the north side of I-485 to steepen fill slopes and minimize permanent impacts to Stream S6. At Site 44, the 3 @ 8'x9' RCBC culvert will be extended and the accumulated sediment deposition in the culvert will be removed. A 12" high bench will be left to remain in front of the southern barrel to promote low flow at the adjacent barrels. There will be one energy dissipation basin and pre-formed scour holes at flatter outfall locations to dissipate energy and promote diffuse flow.

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

NCDOT's Best Management Practices (BMPs) for Construction and Maintenance Activities and Protection of Surface Waters will be adhered to. Erosion control devices such as silt fence, rock inlet sediment traps, slope drains, clean water diversions, and silt bags will also be utilized to minimize water quality impacts. Trenchless installation will be used for several pipe supplements under I-485 and bore pits will be located outside of jurisdictional areas. Temporary bridges, rather than pipes and causeways, will be used during the construction of the bridge widening at the McAlpine Creek and McMullen Creek bridges. Installation of the culvert extensions will be conducted utilizing pump around techniques to dewater the work zone. The pump around at stream crossings will utilize temporary dams, pumps, and stilling basins to divert the channel baseflow around the work area rather than installing a temporary pipe and diversion channel. By using this method, grading in the stream channel will be less intensive and will result in less stream impacts. In locations where temporary construction activities will take place in the stream, the stream bed will be restored to pre-construction contours.

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):

[x] DWR [x] Corps

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

[ ] Mitigation bank [x] 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 ( ) No

4b. Stream mitigation requested:

(linear feet)

1376

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)

0

4e. Riparian wetland mitigation requested:

(acres)

0.83

4f. Non-riparian wetland mitigation requested:

(acres)

0

4g. Coastal (tidal) wetland mitigation requested:

(acres)

0

4h. Comments

No mitigation is required for the stream bank stabilization or temporary impacts as these impacts do not constitute a loss of waters of the U.S. Stream mitigation required by DWR will be 473 lf.

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:

The water resources within the project area are not in any buffered basins and not on the main stem of the Catawba River.

2. Stormwater Management Plan

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

(•) Yes ( ) No

Comments:

There will be one energy dissipation basin and pre formed scour holes at flatter outfall locations. BMPs that will be used include the promotion of sheet flow and infiltration with grassed shoulders except were shoulder berm gutter is required, drainage systems outlet to rip rap pads or riprap lined ditches, removal of exiting road fill under bridges that will improve conveyance and reduce velocities in bridge opening, and riprap on embankments to prevent erosion where ditches enter streams.

The stormwater management plan "I-5507_HYD_SMP" is attached at the end of the ePCN.

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? *

(•) 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)? *

(•) 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.) *

(•) 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 (•) 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 (•) No

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

The purpose of this project is travel time reliability. While travel time savings is possible, changes in traffic capacity and travel time will likely not meet or exceed minimum thresholds required to be considered Transportation Impact Causing Activities. According to the Categorical Exclusion (CE) from August 2018, due to its minimal transportation impact causing activities, this project will neither influence nearby land uses nor stimulate growth. Therefore, a detailed indirect and cumulative effects study was not necessary. Any additional development in the area would be required to adhere to local stormwater rules.

4. Sewage Disposal (DWR Requirement)

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

( ) Yes ( ) No (•) 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? *

(•) Yes ( ) No

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

(•) Yes ( ) No

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

Asheville

5d. Is another Federal agency involved? *

( ) Yes (•) No ( ) Unknown

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

( ) Yes (•) No

5f. Will you cut any trees in order to conduct the work in waters of the U.S.? *

(•) Yes ( ) No

5g. Does this project involve bridge maintenance or removal? *

( ) Yes (•) No

Link to the NLEB SLOPES document: http://saw-reg.usace.army.mil/NLEB/1-30-17-signed_NLEB-SLOPES&apps.pdf

5h. Does this project involve the construction/installation of a wind turbine(s)?*

○ Yes ◉ No

5i. Does this project involve (1) blasting, and/or (2) other percussive activities that will be conducted by machines, such as jackhammers, mechanized pile drivers, etc.?*

◉ Yes ○ No

If yes, please provide details to include type of percussive activity, purpose, duration, and specific location of this activity on the property.

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

File must be PDF

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

The August 2018 CE, USFWS county list, and a review of North Carolina Natural Heritage Program (NCNHP) data explorer on August 6, 2019 were used. Within the project area, there is a historic record of Carolina heelsplitter therefore a thorough habitat assessment was conducted in 2014 and a No Effect biological conclusion was rendered (see attached report). Within a mile of the study area, there is a known historic occurrence of Michaux's sumac. Plant surveys were conducted on September 24, 2014, October 16, 2014, October 29-30, 2015, October 7, 2016, and October 21, 2018, and no individuals of Michaux's sumac, Schweinitz's sunflower, and smooth coneflower were found (see attached memo). NCDOT determined that the proposed action does not require separate consultation for the northern long-eared bat on the grounds that the proposed action is consistent with the final 4(d) rule under Section 7 of the Endangered Species Act (see attached memo). The rusty-patched bumble bee was recently listed as endangered but as a historic record.

Consultation Documentation Upload

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

I-5507 Mussel Survey Report.pdf	9.68MB
I-5507 Additional Survey Report - Plants.pdf	130.11KB
I-5507 & R-0211EC Mecklenburg 4(d) NLEB memo 2019.pdf	202.39KB

File type must be PDF

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?*

National Oceanic and Atmospheric Administration 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?*

The State Historic Preservation Office Historic Properties Map and August 2018 CE were used to determine impacts to historic and archaeological resources. Site 31MK273** (Cemetery at John Dinkins Farm) is the surviving remnant of a site listed on the National Register of Historic Places. No project activities are to take place within the limits of the cemetery, including but not limited to the staging/storage of materials and/or equipment and vehicles.

7c. Historic or Prehistoric Information Upload

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

I-5507 SHPO Letter.pdf	96.52KB
I-5507 No Archaeological Survey Required Form.pdf	84.84KB

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:

The Division will submit sealed as-built construction plans to the Hydraulics Unit upon completion of project construction, certifying that the drainage structures and roadway embankment that are located within the 100-year floodplain were built as shown in the construction plans, both horizontally and vertically. During final design, the NCDOT Hydraulics Unit will coordinate with the Charlotte-Mecklenburg Storm Water Services Department and NC Floodplain Mapping Program for approval of any Conditional Letter of Map Revision (CLOMR) and subsequent Letter of Map Revision (LOMR).

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

FEMA Floodplain Maps

Miscellaneous

Comments

This TIP is being permitted and constructed concurrently with R-0211EC and U-4714AB. Separate permit applications are being prepared and submitted for R-0211EC and U-4714AB

Miscellaneous attachments not previously requested.

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

I-5507_HYD_SMP.pdf	156.81KB
I-5507 Wetland Impacts Table.pdf	77.49KB
I-5507 Stream Impacts Table.pdf	88.65KB
01 - I-5507 Cover Letter.pdf	233.65KB

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: *

Michael Turchy

Signature

Michael Turchy

Date

10/4/2019

STIP# I-5507 I-485 Express Lanes Wetland Impacts Table*

Site	Wetland Number	Wetland Size (ac)	Permanent Fill in Wetlands (ac)	Mechanized Clearing (ac)	Impacts Requiring Mitigation (ac)
2	W4[1]	0.49	0.08	0.02	0.10
4	W3[1]	0.03	0.03	--	0.03
9A	W2b[2]	0.30	0.05	0.05	0.10
9B	W2a[2]	0.40	0.07	0.07	0.14
12	WY/WX[1]	0.10/0.23	0.13	<0.01	0.14
14	WC(2)[1]	0.10	0.10	--	0.10
18	WB[1]	0.10	<0.01	0.04	0.05
20	WD[3]	<0.01	--	<0.01	<0.01
25	WK[1]	0.26	0.02	0.04	0.06
26	WJ[1]	0.90	--	0.01	0.01
27	WWA[3]	0.02	<0.01	--	<0.01
31	WAH[3]	<0.01	<0.01	--	<0.01
32	WAG[3]	0.02	0.02	--	0.02
33	WO[3]	0.07	<0.01	<0.01	0.01
35	WAD/WAE[3]	0.04/0.06	<0.01	<0.01	0.01
41	WAC[3]	0.02	0.02	--	0.02
42	WAB[3]	0.03	0.03	--	0.03
Total Wetland Impacts			**0.56**	**0.27**	**0.83**

*There will be no hand clearing or temporary wetland impacts for this project. Values are based on rounding due to calculating totals with actual numbers to the thousandths. All wetlands are considered riparian.

[1]Type of wetland: Bottomland Hardwood Forest

[2]Type of wetland: Riverine Swamp Forest

[3]Type of wetland: Headwater Forest

STIP# I-5507 I-485 Express Lanes Stream Impacts Table

Permit Site	Stream Name/ NRTR ID	Status/ Class	Permanent		Temporary Channel Impacts ac (lf)	USACE Required Mitigation lf	NCDWR Required Mitigation lf
			Channel Impacts lf (ac)	Bank Stabilization lf (ac)			
1[1]	UT to Sugar Creek SCC	Intermittent C	28 (<0.01)	18 (<0.01)	<0.01 (13)	28	--
2A	Sugar Creek S13	Perennial C	--	11 (<0.01)	<0.01 (20)	--	--
3[2]	Kings Branch S12	Perennial C	52 (0.03)	70 (0.02)	0.04 (16)	52	--
4	UT to Kings Branch SNH	Intermittent C	181 (0.01)	--	--	181	--
5[3]	UT to Sugar Creek S11	Perennial C	473 (0.05)	--	<0.01 (10)	473	473
6	UT to McMullen Creek S6	Intermittent C	--	48 (<0.01)	<0.01 (10)	--	--
7	UT to McMullen Creek S6	Intermittent C	--	--	0.07 (680)	--	--
8	UT to McMullen Creek S6	Intermittent C	7 (<0.01)	10 (<0.01)	--	7	--
10[4]	McMullen Creek S4	Perennial C	--	65 (0.01)	0.01 --	--	--
11[5]	McAlpine Creek S3	Perennial C	--	157 (0.03)	0.10 --	--	--
13[6]	UT to McAlpine Creek S2	Perennial C	49 (0.01)	46 (0.01)	0.01 (40)	49	--
15[7]	UT to McAlpine Creek S1	Perennial C	165 (0.08)	83 (0.02)	0.02 (30)	165	--

[1]<0.01 ac (18 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts shown in the table. The existing culvert is not buried, therefore the culvert extension will not be buried.

[2]0.02 ac (70 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts shown in the table. The existing culvert is not buried, therefore the culvert extension will not be buried.

[3]The existing culvert is not buried, therefore the culvert extension will not be burried.

[4]<0.01 ac (30 lf) of temporary impacts due to the temporary bridge are included within the bank stabilization impacts shown in the table.

[5]0.03 ac (122 lf) of temporary impacts due to the temporary bridge and installation of the drilled shaft are included within the bank stabilization impacts.

[6]< <0.01 ac (38 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts shown in the table. The existing culvert is not buried, therefore the culvert extension will not be buried.

[7]0.02 ac (65 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts shown in the table. The existing culvert is not buried, therefore the culvert extension will not be buried.

STIP# I-5507 I-485 Express Lanes Stream Impacts Table (continued)

Permit Site	Stream Name/ NRTR ID	Status/ Class	Permanent		Temporary Channel Impacts ac (lf)	USACE Required Mitigation lf	NCDWR Required Mitigation lf
			Channel Impacts lf (ac)	Bank Stabilization lf (ac)			
15A	UT to McAlpine Creek S1	Perennial C	--	8 (<0.01)	<0.01 (20)	--	--
16	UT to McAlpine Creek S1	Perennial C	--	36 (<0.01)	<0.01 (20)	--	--
17	UT to McAlpine Creek SB	Intermittent C	--	10 (<0.01)	<0.01 (10)	--	--
18	UT to Fourmile Creek SD	Perennial C	--	13 (<0.01)	--	--	--
19	UT to Fourmile Creek SE	Perennial C	--	15 (<0.01)	<0.01 (10)	--	--
20[8]	UT to Fourmile Creek SF	Perennial C	69 (0.02)	34 (<0.01)	<0.01 (22)	69	--
21	UT to Fourmile Creek SG	Perennial C	--	13 (<0.01)	<0.01 (10)	--	--
22[9]	UT to Fourmile Creek SG	Perennial C	140 (0.01)	24 (<0.01)	<0.01 (49)	140	--
24[10]	UT to Flat Branch SSC	Intermittent C	6 (<0.01)	22 (<0.01)	<0.01 (10)	6	--
27	UT to Flat Branch SSB	Perennial C	--	33 (<0.01)	<0.01 (20)	--	--
28	UT to Flat Branch SSA	Perennial C	--	37 (<0.01)	<0.01 (20)	--	--
29	Flat Branch SAO	Perennial C	--	25 (<0.01)	<0.01 (30)	--	--
30	UT to Sixmile Creek SAN	Intermittent C	--	--	<0.01 (33)	--	--
31[11]	UT to Sixmile Creek SAM	Intermittent C	3 (<0.01)	20 (<0.01)	<0.01 (10)	3	--
32	UT to Sixmile Creek SAL	Perennial C	--	6 (<0.01)	<0.01 (20)	--	--

[8]<0.01 (34 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts shown in the table. The existing culvert is not buried, therefore the culvert extension will not be buried.

[9]<0.01 (24 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts shown in the table. The existing culvert is not buried, therefore the culvert extension will not be buried.

[10]<0.01 (22 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts shown in the table.

[11]<0.01 (20 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts shown in the table. The existing culvert is not buried, therefore the culvert extension will not be buried.

STIP# I-5507 I-485 Express Lanes Stream Impacts Table (concluded)

Permit Site	Stream Name/ NRTR ID	Status/ Class	Permanent		Temporary Channel Impacts ac (lf)	USACE Required Mitigation lf	NCDWR Required Mitigation lf
			Channel Impacts lf (ac)	Bank Stabilization lf (ac)			
33	UT to Sixmile Creek SBH	Intermittent C	--	40 (<0.01)	<0.01 (10)	--	--
35	UT to Fourmile Creek SAJ	Intermittent C	--	50 (<0.01)	<0.01 (42)	--	--
36	UT to Fourmile Creek SM	Intermittent C	--	17 (<0.01)	<0.01 (25)	--	--
37	UT to Fourmile Creek SBG	Intermittent C	--	35 (<0.01)	<0.01 (20)	--	--
37A	UT to Fourmile Creek SSH	Perennial C	--	13 (<0.01)	--	--	--
38	UT to Fourmile Creek SBD	Intermittent C	--	32 0.01	0.01 (30)	--	--
39	UT to Fourmile Creek SAI	Perennial C	--	13 (<0.01)	<0.01 (10)	--	--
40	UT to Fourmile Creek SAH	Perennial C	--	16 (<0.01)	<0.01 (24)	--	--
41[12]	UT to Fourmile Creek SAR	Intermittent C	52 (<0.01)	33 (<0.01)	<0.01 (42)	52	--
42[13]	UT to Fourmile Creek SV	Intermittent C	125 (0.02)	20 (<0.01)	<0.01 (12)	125	--
43	UT to Fourmile Creek SAE	Intermittent C	--	30 (<0.01)	<0.01 (10)	--	--
44[14]	UT to McAlpine Creek S1	Perennial C	26 (<0.01)	28 (<0.01)	<0.01 (19)	26	--
Total Stream Impacts			**1376**	**1131**	**0.33**	**1376**	**473**
			2507				

[12]<0.01 (33 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts shown in the table. The existing culvert is not buried, therefore the culvert extension will not be buried.

[13]<0.01 (20 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts shown in the table. The existing culvert is not buried, therefore the culvert extension will not be buried.

[14]<0.01 (28 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts shown in the table. The existing culvert is not buried, therefore the culvert extension will not be buried.

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
TIM BAUMGARTNER
Director

NORTH CAROLINA
Environmental Quality

September 27, 2019

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

Dear Mr. Harris:

Subject: Mitigation Acceptance Letter:

I-5507, I-485 Improvements from I-77 to US 74 (Independence Boulevard), Mecklenburg County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the compensatory stream and wetland mitigation for the subject project. Based on the information supplied by you on September 27, 2019, the impacts are located in CU 03050103 of the Catawba River basin in the Southern Piedmont (SP) Eco-Region, and are as follows:

Catawba 03050103 SP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	1,376.0	0.83	0	0	0	0

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

This mitigation acceptance letter replaces the mitigation acceptance letter issued on November 19, 2018. The impacts and associated mitigation needs were under projected by the NCDOT in the 2019 impact data. DMS will commit 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 and consistent with the Guidance for Expanded Service Area for Mitigating Impacts within the Lower Catawba River Basin approved by the IRT. 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 Beth Harmon at 919-707-8420.

Sincerely,

James B. Stanfill
DMS Asset Management Supervisor

cc: Mr. Monte Matthews, USACE – Raleigh Regulatory Field Office
Ms. Joanne Steenhuis, NCDWR – Wilmington Field Office
File: I-5507 Revised

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element:	TIP No.: I-5507	County(ies): Mecklenburg	Page 1 of 4

General Project Information

WBS Element:		**TIP Number:** I-5507	**Project Type:** Roadway Widening	**Date:** 6/7/2019	
NCDOT Contact:	Malcolm Watson	**Contractor / Designer:**	Blythe Construction/WSP (Karl Dauber)		
Address:	1020 Birch Ridge Drive Raleigh, NC 27610	**Address:**	1001 Morehead Square Drive Suite 610 Charlotte, NC 28203		
Phone:	(919) 707-6614	**Phone:**	(704) 342-5403		
Email:	mcwatson@ncdot.gov	**Email:**	Karl.Dauber@wsp.com		
City/Town:	Charlotte	**County(ies):**	Mecklenburg		
River Basin(s):	Catawba / Yadkin-Pee Dee	**CAMA County?**	No		
Wetlands within Project Limits?	Yes				

Project Description

Project Length (lin. miles or feet):	17.5 miles	**Surrounding Land Use:**	Urban (residential and commercial)
	Proposed Project		**Existing Site**
Project Built-Upon Area (ac.)	436.7 ac.		425.6 ac.
Typical Cross Section Description:	There are several cross sections for this project in the typicals provided with the Redline Drainage Plans. Essentially, the project adds toll lanes in the median. In some cases a ditch section is revised to provide pavement. In other cases a large paved median is reduced to account for this new traffic pattern.		There are 2 existing cross section on 485. - 3 lanes each direction with a paved median from 77- to Johnston Road. - Then as you travel east its is 2 lanes either direction with a variable width grassed median to US-74.
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 1592	Year: 2040	Existing: 1186 Year: 2015

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

The NCDOT is widening a section of I-485 that lies within the municipal boundaries of the Cities of Charlotte and Matthews. The Design-Build Project I-5507 / R-0211EC / U-4714AB will provide an eastbound and westbound Express Lane within the I-485 median from I-77 to US 74 (Independence Boulevard), a distance of approximately 16.6 miles. The project will also provide an I-485 / Weddington Road interchange, and modify the I-485 / East Johns Street - Old Monroe Road interchange

Impacts for R-0211EC (sheets 60, 61) Weddington Road Interchange and U-4714AB (Sheets 64,65 and 77) John Street interchange are in separate SMPs.

Construction will unavoidably impact several streams and wetlands. Where practicable, 2:1 slopes will be used to minimize impacts. Where culverts are being extended in jurisdictional streams rip rap for stabilization is being installed on banks only.

Best Management Practices:
1 Energy Dissipation Basin and Pre Formed Scour holes at flatter outfall locations.
*Promotion of sheet flow and infiltration with grassed shoulders except were shoulder berm gutter was required.
*Drainage systems outlet to rip rap pads or riprap lined ditches.
*Removal of exiting road fill under bridges will improve conveyance and reduce velocities in bridge opening.
*Riprap on embankments was used to prevent erosion where ditches enter streams.

Waterbody Information

Surface Water Body (1):	Sugar Creek	**NCDWR Stream Index No.:**	11-137		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:			
Other Stream Classification:	None				
Impairments:	mercury (Hg)	turbidity	fecal coliform		
Aquatic T&E Species?		Comments:			
NRTR Stream ID:	SCC, S11		**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

WBS Element:	TIP No.: I-5507	County(ies): Mecklenburg	Page 2 of 4

Additional Waterbody Information

Surface Water Body (2):	McMullen Creek	**NCDWR Stream Index No.:**	11-137-9-5		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:			
Other Stream Classification:	None				
Impairments:	mercury (Hg)	turbidity	fecal coliform		
Aquatic T&E Species?	Comments:				
NRTR Stream ID:	S4,S6		**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	No
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):	McAlpine Creek	**NCDWR Stream Index No.:**	11-137-9		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:			
Other Stream Classification:	None				
Impairments:	fecal coliform	turbidity			
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	S3,S2,S1,SB		**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (4):	Four Mile Creek	**NCDWR Stream Index No.:**	11-137-9-4		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:			
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	Comments:				
NRTR Stream ID:	SD, SE, SF, SG, SSC, SAJ, SM, SBG, SSH, SBD, SAI, SAH, SAR, SV, SAE		**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (5):	Kings Branch	**NCDWR Stream Index No.:**	11-137-6		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:			
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	S12,SNH		**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	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:	TIP No.: I-5507	County(ies): Mecklenburg	Page 3 of 4

Additional Waterbody Information

Surface Water Body (6):	Flat Branch		**NCDWR Stream Index No.:**	11-138-3-2		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:				
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SAO,SSB, SSA			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (7):	Six Mile Creek		**NCDWR Stream Index No.:**	11-138-3		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:				
Other Stream Classification:						
Impairments:	None	Fish Community (Nar, AL, FW)				
Aquatic T&E Species?		Comments:				
NRTR Stream ID:	(SAN, SAM, SAL, SBH)			**Buffer Rules in Effect:**		
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (8):			**NCDWR Stream Index No.:**			
NCDWR Surface Water Classification for Water Body		**Primary Classification:**				
		Supplemental Classification:				
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?		Comments:				
NRTR Stream ID:				**Buffer Rules in Effect:**		
Project Includes Bridge Spanning Water Body?		**Deck Drains Discharge Over Buffer?**		**Dissipator Pads Provided in Buffer?**		
Deck Drains Discharge Over Water Body?		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

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

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: **TIP No.:** I-5507 **County(ies):** Mecklenburg

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
31	-Y2 RPD- 14+50 LT		PSH	Class 'B'	1.9	Pipe	18	1.7	12.3	No
38	-L-489+50 LT		Riprap Energy Dissipator Basin	Class I	179.2	Culvert	6'X5' RCBC	294.0	6.0	No

Additional Comments

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5507	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
43609.3.2	N/A	Design–Build

BLYTHE wsp

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

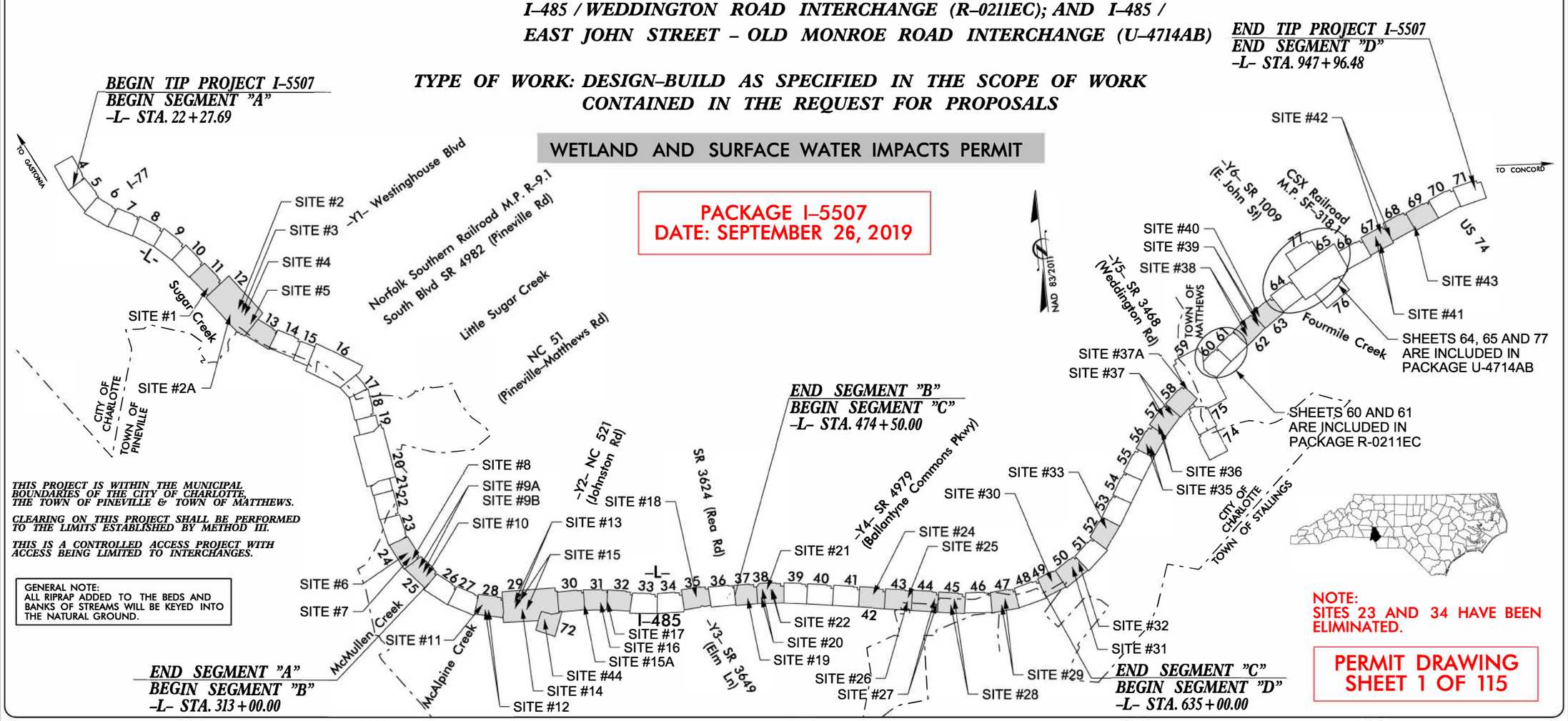
MECKLENBURG COUNTY

LOCATION: I–485 FROM I–77 TO US 74 (INDEPENDENCE BOULEVARD) (I–5507); I–485 / WEDDINGTON ROAD INTERCHANGE (R–0211EC); AND I–485 / EAST JOHN STREET – OLD MONROE ROAD INTERCHANGE (U–4714AB)

TYPE OF WORK: DESIGN–BUILD AS SPECIFIED IN THE SCOPE OF WORK CONTAINED IN THE REQUEST FOR PROPOSALS

WETLAND AND SURFACE WATER IMPACTS PERMIT

PACKAGE I–5507
DATE: SEPTEMBER 26, 2019



THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF CHARLOTTE, THE TOWN OF PINEVILLE & TOWN OF MATTHEWS.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

GENERAL NOTE:
ALL RIPRAP ADDED TO THE BEDS AND BANKS OF STREAMS WILL BE KEYED INTO THE NATURAL GROUND.

NOTE:
SITES 23 AND 34 HAVE BEEN ELIMINATED.

PERMIT DRAWING
SHEET 1 OF 115

TIP PROJECT: I-5507

CONTRACT: C203970

9/20/2019
\\prdpwics01\ics_workingdir\3990\33640_4\I2\I5507_hyd_prm_wet_psh01_TSH.dgn
PRDPWICS01$

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 = 118,400
ADT 2040 = 159,200
DHV = 9 %
D = 55 %
T = 9 % *
V = 70/75 MPH
*(TTST 4 + DUAL 5)

FUNCTIONAL CLASSIFICATION:
INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT I-5507 = 17.137 mi

LENGTH OF STRUCTURES TIP PROJECT I-5507 = 0.395 mi (BASED ON 485 WB BRIDGES)

TOTAL LENGTH OF TIP PROJECT I-5507 = 17.532 mi

NCDOT CONTACT: TIM MCFADDEN, PE
DESIGN BUILD PROJECT ENGINEER – TRANSPORTATION PROGRAM MANAGEMENT UNIT

Prepared in the Office of:
wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY: SEPTEMBER 18, 2018

LETTING DATE: SEPTEMBER 18, 2018

DANIEL H. BRIDGES, PE
DESIGN PROJECT MANAGER

DAVID B. GOURLEY, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

8/17/99

REVISIONS

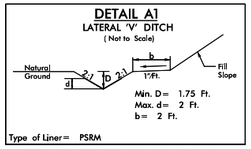
wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	2D-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

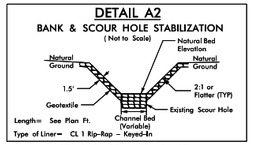
BLYTHE

DETAIL A1
LATERAL "V" DITCH
(Not to Scale)



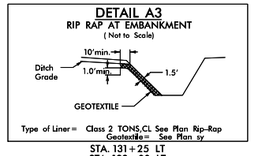
FROM STA. TO STA. 134+61 – 132+34

DETAIL A2
BANK & SCOUR HOLE STABILIZATION
(Not to Scale)



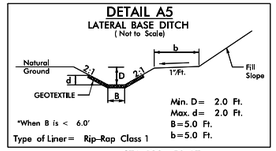
STA. 109+00 – 113+00 RT
STA 294+00 LT

DETAIL A3
RIP RAP AT EMBANKMENT
(Not to Scale)



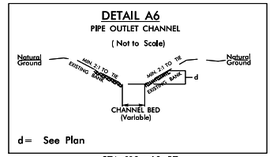
STA. 131+25 LT
STA. 132+00 LT

DETAIL A5
LATERAL BASE DITCH
(Not to Scale)



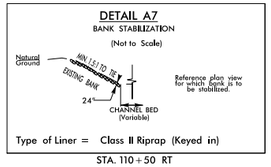
STA. 133+50 LT

DETAIL A6
PIPE OUTLET CHANNEL
(Not to Scale)



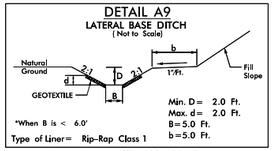
STA. 110+60 RT

DETAIL A7
BANK STABILIZATION
(Not to Scale)



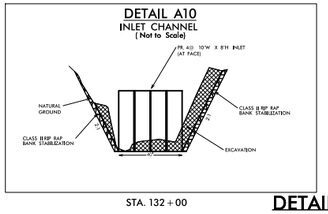
STA. 110+50 RT

DETAIL A9
LATERAL BASE DITCH
(Not to Scale)



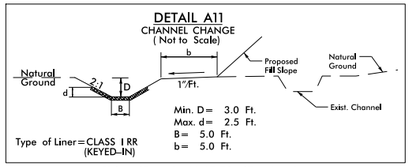
STA. 133+50 LT

DETAIL A10
INLET CHANNEL
(Not to Scale)



STA. 132+00

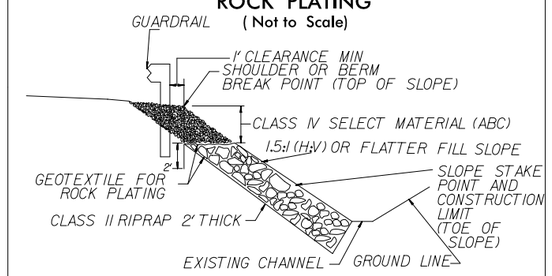
DETAIL A11
CHANNEL CHANGE
(Not to Scale)

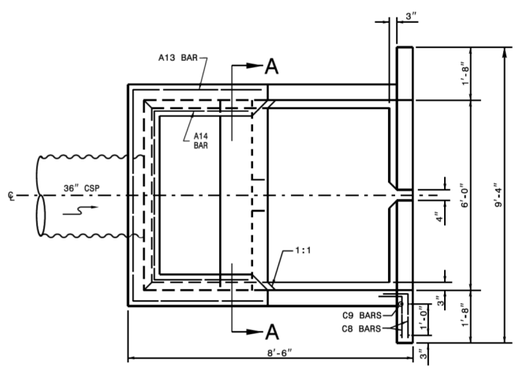


FROM STA. 142+00 LT TO STA. 137+65

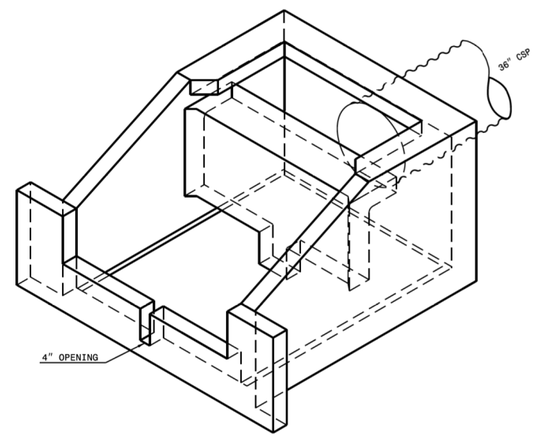
DETAIL A4
ENERGY DISSIPATOR

DETAIL A8
ROCK PLATING
(Not to Scale)



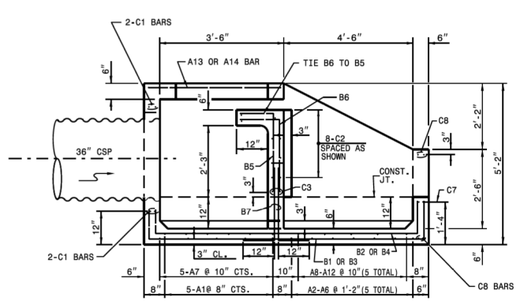


PLAN

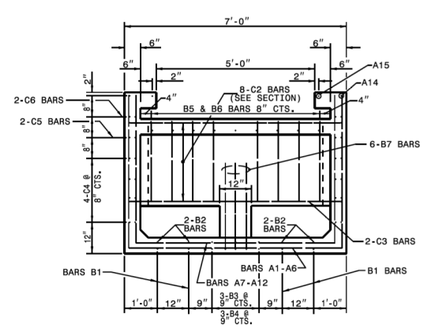


BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	5	5	1	16'-2"	84.3
A2	1	5	1	16'-0"	16.7
A3	1	5	1	15'-4"	16.0
A4	1	5	1	14'-6"	15.1
A5	1	5	1	14'-0"	14.6
A6	1	5	1	11'-10"	12.3
A7	5	5	1	15'-8"	81.7
A8	1	5	1	15'-4"	16.0
A9	1	4	1	15'-9"	10.5
A10	1	4	1	13'-4"	8.9
A11	1	4	1	12'-7"	8.4
A12	1	4	1	11'-7"	7.7
A13	1	4	1	13'-5"	8.9
A14	1	4	1	11'-7"	7.7
B1	4	4	1	13'-4"	35.6
B2	4	4	1	9'-11"	26.5
B3	4	4	1	13'-4"	26.7
B4	3	4	1	9'-11"	19.9
B5	9	4	2	2'-6"	15.0
B6	9	4	2	2'-6"	15.0
B7	6	4	2	4'-0"	16.0
C1	4	4	STR	6'-8"	17.8
C2	8	8	1	8'-9"	186.9
C3	2	8	STR	6'-8"	35.6
C4	16	4	STR	8'-2"	87.3
C5	4	4	STR	4'-11"	13.1
C6	4	4	STR	6'-7"	17.6
C7	4	4	STR	2'-8"	7.1
C8	8	4	2	2'-4"	12.5
C9	8	4	STR	2'-8"	14.3
TOTAL REINF. STEEL (LBS.)					855.7
CONCRETE (CU.YDS.)					3.44

* ALL SPLICES SHALL BE 1'-6" MIN.
* ALL REINFORCING STEEL SHALL BE 2" CL. OF ANY FACE UNLESS SHOWN OTHERWISE.

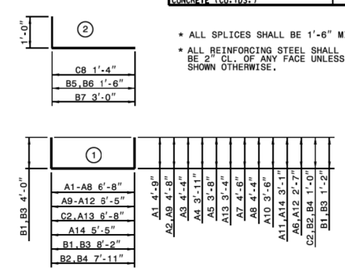


SECTION ON ℄



* SHIFT B3 & B4 BARS AS NECESSARY TO CLEAR 4" OPENING

SECTION A-A



CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

ENERGY DISSIPATOR

ORIGINAL BY:	T.S.S.	DATE:	Oct.1997
MODIFIED BY:	T.S.S.	DATE:	JULY 20, 2011
CHECKED BY:		DATE:	
FILE SPEC.:			

PERMIT DRAWING
SHEET 2 OF 115

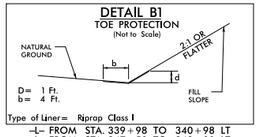
9/20/2019
C:\pwworking\pdc-prdcs01\ics_workingdir\33990\336401.4114\i5507_Hyd_prm_wet_psh02D1.dgn
PROPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-5507	2D-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

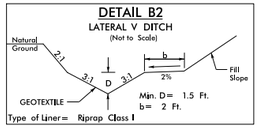
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL B1
TOE PROTECTION
(Not to Scale)



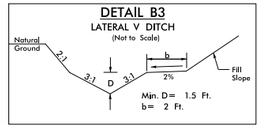
–L– FROM STA. 339+98 TO 340+98 LT
–L– FROM STA. 347+50 TO 349+00 LT
–L– FROM STA. 356+00 TO 357+50 LT
–L– FROM STA. 346+42 TO 346+98 RT
–L3_WEST– FROM STA. 364+25 TO 366+30 LT
–Y2DCC– FROM STA. 21+41 TO 27+26 RT
–Y2DCD– FROM STA. 29+38 TO 31+43 LT
–Y2RPB– FROM STA. 14+25 TO 16+66 LT
–Y2RPDB– FROM STA. 24+23 TO 27+27 LT
–Y3– FROM STA. 10+00 TO 11+53 LT
–Y3– FROM STA. 14+50 TO 15+72 LT
–Y3– FROM STA. 20+37 TO 24+13 LT

DETAIL B2
LATERAL V DITCH
(Not to Scale)



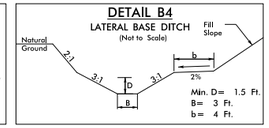
–L3_EAST– FROM STA. 358+49 TO 358+83 RT

DETAIL B3
LATERAL V DITCH
(Not to Scale)



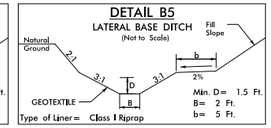
–L3_EAST– FROM STA. 358+83 TO 359+33 RT

DETAIL B4
LATERAL BASE DITCH
(Not to Scale)



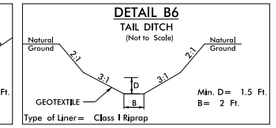
–L3_EAST– FROM STA. 359+33 TO 360+22 RT

DETAIL B5
LATERAL BASE DITCH
(Not to Scale)



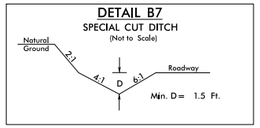
–Y2RPDB– FROM STA. 10+10 TO 11+38 LT

DETAIL B6
TAIL DITCH
(Not to Scale)



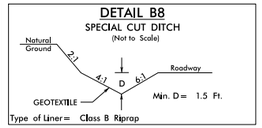
–Y2RPDB– FROM STA. 11+38 TO 12+71 LT

DETAIL B7
SPECIAL CUT DITCH
(Not to Scale)



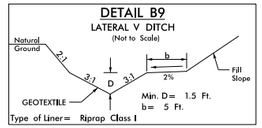
–L– FROM STA. 461+50 TO 462+00 LT
–L– FROM STA. 465+00 TO 467+50 LT
–L– FROM STA. 438+11 TO 439+00 RT
–L3_EAST– FROM STA. 347+76 TO 348+78 RT
–L3_EAST– FROM STA. 354+34 TO 357+33 RT
–Y2RPDB– FROM STA. 47+40 TO 48+40 RT
–Y23RPB– FROM STA. 16+02 TO 16+50 RT

DETAIL B8
SPECIAL CUT DITCH
(Not to Scale)



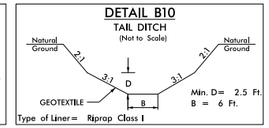
–L– FROM STA. 403+50 TO 403+78

DETAIL B9
LATERAL V DITCH
(Not to Scale)



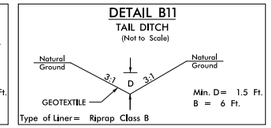
–Y2RPDB– FROM STA. 17+00 TO 22+00 LT

DETAIL B10
TAIL DITCH
(Not to Scale)



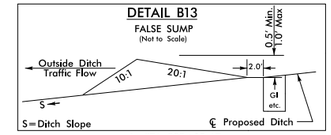
–Y2RPDB– STA. 15+47 TO 17+00 LT

DETAIL B11
TAIL DITCH
(Not to Scale)



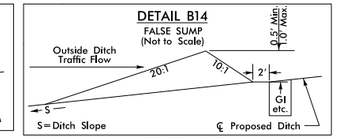
–L– STA. 336+95 RT

DETAIL B13
FALSE SUMP
(Not to Scale)



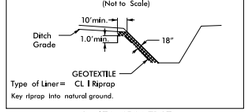
–L– STA. 392+15 LT

DETAIL B14
FALSE SUMP
(Not to Scale)



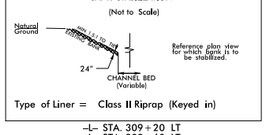
–L– STA. 754+82 RT

DETAIL B15
RIPRAP AT EMBANKMENT
(Not to Scale)



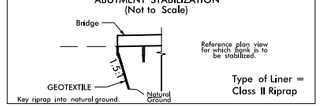
–L– STA. 454+71 LT
–L– STA. 408+20 RT
–L– STA. 725+09 RT
–Y2DCC– STA. 28+06 RT
–Y2RPDB– STA. 12+74 LT
–Y2RPDB– STA. 15+62 LT
–Y2RPDB– STA. 36+96 LT

DETAIL B16
BANK STABILIZATION
(Not to Scale)



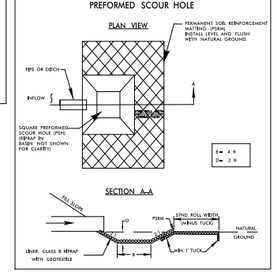
–L– STA. 309+20 LT
–L– STA. 309+60 LT
–L– STA. 342+86 LT
–L– STA. 342+86 LT
–L– STA. 343+36 LT
–L– STA. 342+28 RT
–L– STA. 342+78 RT
–Y2DCC– STA. 21+16 RT
–Y2DCC– STA. 21+46 RT
–Y2DCC– STA. 27+14 RT
–Y2DCC– STA. 27+54 RT
–Y2DCC– STA. 38+88 RT
–Y2DCC– STA. 39+25 RT
–Y2RPDB– STA. 36+70 LT
–Y2RPDB– STA. 36+80 LT

DETAIL B17
ABUTMENT STABILIZATION
(Not to Scale)



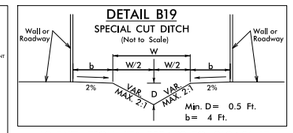
–L– STA. 310+26 LT
–L– STA. 341+95 LT
–L– STA. 344+97 LT
–L– STA. 341+30 RT
–L– STA. 344+15 RT

DETAIL B18
PREFORMED SCOUR HOLE



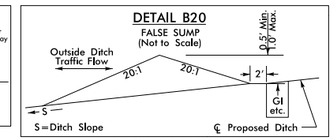
–L– STA. 400+47 RT

DETAIL B19
SPECIAL CUT DITCH
(Not to Scale)



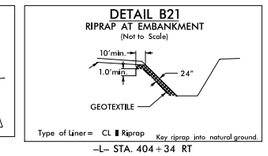
–L3_EAST– FROM STA. 359+33 TO 369+86 LT

DETAIL B20
FALSE SUMP
(Not to Scale)



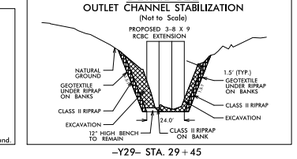
–L3_EAST– STA. 367+90 LT

DETAIL B21
RIPRAP AT EMBANKMENT
(Not to Scale)



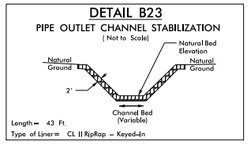
–L– STA. 404+34 RT

DETAIL B22
OUTLET CHANNEL STABILIZATION
(Not to Scale)



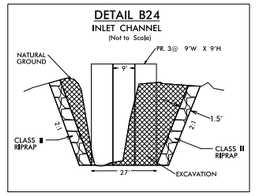
–Y29– STA. 29+45

DETAIL B23
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



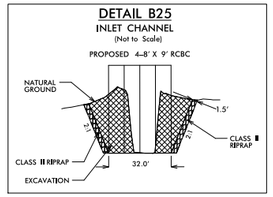
–Y29– STA. 29+85

DETAIL B24
INLET CHANNEL
(Not to Scale)



–L– STA. 360+00

DETAIL B25
INLET CHANNEL
(Not to Scale)



–L– STA. 364+22

PERMIT DRAWING
SHEET 3 OF 115

12/2019
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SDP-WICS01$

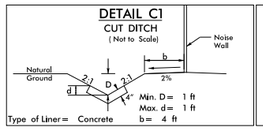
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
I-5507	2D-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

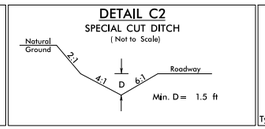
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL C1
CUT DITCH
(Not to Scale)



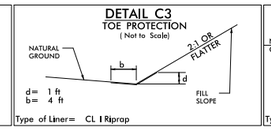
FROM –L– STA. 499+52 LT TO STA. 502+02 LT
FROM –L– STA. 511+36 LT TO STA. 523+64 LT
FROM –L– STA. 567+97 LT TO STA. 572+93 LT

DETAIL C2
SPECIAL CUT DITCH
(Not to Scale)



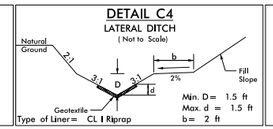
FROM –L– STA. 505+66 LT TO STA. 507+23 LT
FROM –L– STA. 568+80 LT TO STA. 570+38 LT
FROM –L– STA. 570+50 LT TO STA. 577+09 LT
FROM –L– STA. 595+50 LT TO STA. 600+00 LT
FROM –L– STA. 527+84 RT TO STA. 529+13 RT
FROM –L– STA. 575+36 RT TO STA. 576+74 RT

DETAIL C3
TOE PROTECTION
(Not to Scale)



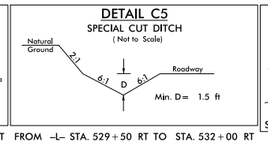
FROM –L– STA. 582+50 LT TO STA. 584+50 LT
FROM –L– STA. 592+50 LT TO STA. 593+50 LT
FROM –L– STA. 486+50 RT TO STA. 488+06 RT
FROM –L– STA. 488+15 RT TO STA. 489+22 RT

DETAIL C4
LATERAL DITCH
(Not to Scale)



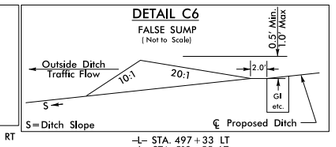
FROM –L– STA. 485+50 RT TO STA. 486+00 RT

DETAIL C5
SPECIAL CUT DITCH
(Not to Scale)



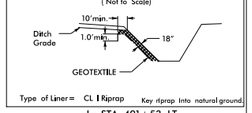
FROM –L– STA. 529+50 RT TO STA. 532+00 RT

DETAIL C6
FALSE SUMP
(Not to Scale)



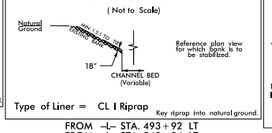
–L– STA. 497+33 LT
–L– STA. 512+55 LT
–L– STA. 517+57 LT
–L– STA. 524+12 LT
–L– STA. 530+99 LT
–L– STA. 535+00 LT
–L– STA. 553+55 LT
–L– STA. 577+25 LT

DETAIL C7
RIPRAP AT EMBANKMENT
(Not to Scale)



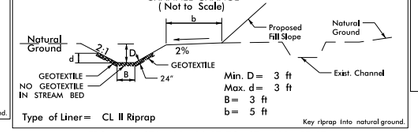
–L– STA. 491+53 LT
–L– STA. 546+23 LT
–L– STA. 578+43 LT
–L– STA. 588+21 LT
–L– STA. 480+89 RT
–L– STA. 488+11 RT
–L– STA. 496+12 RT
–L– STA. 496+43 RT
–L– STA. 579+42 RT
–L– STA. 586+77 RT

DETAIL C8
BANK STABILIZATION
(Not to Scale)



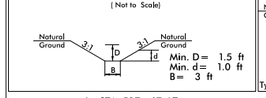
FROM –L– STA. 493+92 LT
FROM –L– STA. 540+84 LT
FROM –L– STA. 578+43 LT
FROM –L– STA. 546+23 LT

DETAIL C9
CHANNEL CHANGE
(Not to Scale)



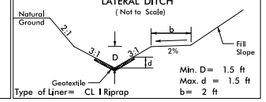
FROM –L– STA. 492+36 LT TO STA. 493+57 LT

DETAIL C10
TAIL DITCH
(Not to Scale)



–L– STA. 527+67 LT

DETAIL C11
LATERAL DITCH
(Not to Scale)

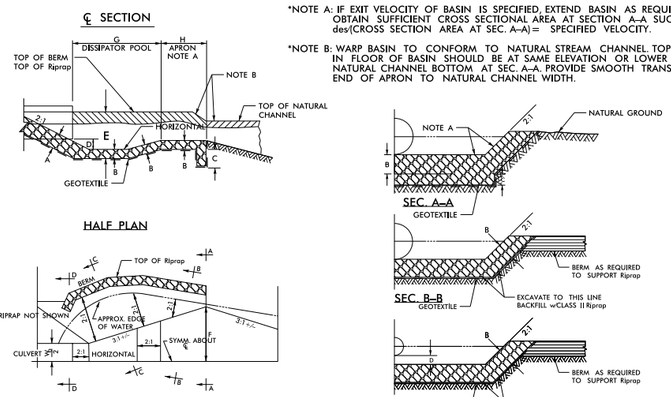


FROM –L– STA. 484+50 RT TO STA. 485+50 RT

DETAIL C12
RIPRAP ENERGY DISSIPATOR BASIN

*NOTE A: IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS SECTIONAL AREA AT SECTION A–A SUCH THAT Q des(CROSS SECTION AREA AT SEC. A–A)= SPECIFIED VELOCITY.

*NOTE B: WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL TOP OF Riprap IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A–A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.



DIM.	RIPRAP BASIN # 1	2	3	4	5	6	7	8
A	30"							
B	21"							
C	16"							
D	1.6'							
E	10.2'							
F	11.7'							
G	18.0'							
H	8.0'							

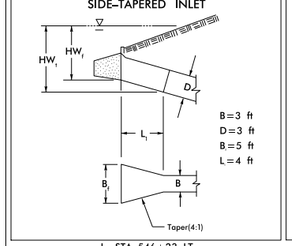
*ALL DIMENSIONS APPROXIMATE

BASIN #	LOCATION (AT OUTLET)
1	–L– STA. 488+60 LT
2	
3	
4	
5	
6	
7	
8	

NOTE:
Wo = DIAMETER OF PIPE, WIDTH OF BOX OR SPAN OF PIPE-ARCH CULVERTS

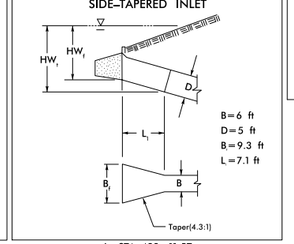
5/05

DETAIL C13
SIDE-TAPERED INLET



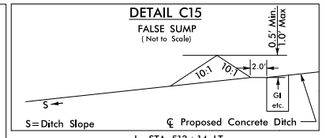
–L– STA. 546+23 LT

DETAIL C14
SIDE-TAPERED INLET



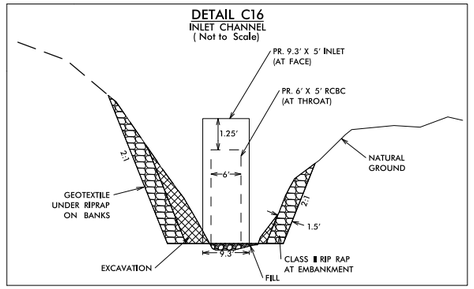
–L– STA. 488+11 RT

DETAIL C15
FALSE SUMP
(Not to Scale)



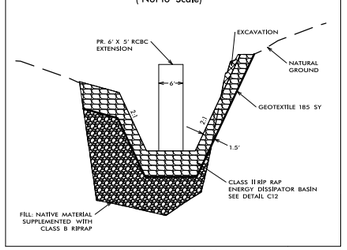
–L– STA. 513+14 LT
–L– STA. 521+00 LT
–L– STA. 523+74 LT

DETAIL C16
INLET CHANNEL
(Not to Scale)



–L– STA. 488+60

DETAIL C17
OUTLET CHANNEL
(Not to Scale)



–L– STA. 488+60

PERMIT DRAWING
SHEET 4 OF 115

9/12/2019
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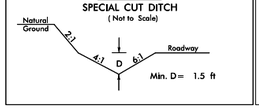
PROPWTCS01$

PROJECT REFERENCE NO.	SHEET NO.
I–5507	2D–4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

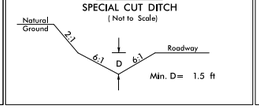
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL D1
SPECIAL CUT DITCH
(Not to Scale)



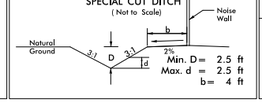
–L– FROM STA. 615+81 TO 619+50 LT
–L– FROM STA. 688+57 TO 701+37 LT
–L– FROM STA. 706+21 TO 711+00 LT
–L– FROM STA. 753+98 TO 760+32 LT
–L– FROM STA. 794+62 TO 795+50 LT
–L– FROM STA. 764+81 TO 767+50 LT
–L– FROM STA. 916+63 TO 917+50 LT
–L– FROM STA. 929+50 TO 931+50 LT
–L– FROM STA. 709+81 TO 713+00 RT
–L– FROM STA. 804+50 TO 805+50 RT
–L– FROM STA. 901+00 TO 905+17 RT
–Y5RPD– STA. FROM 24+00 TO 26+50 RT
–Y6RPC– FROM STA. 24++50 TO 26+50 RT

DETAIL D2
SPECIAL CUT DITCH
(Not to Scale)



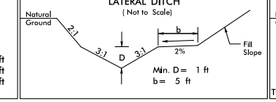
–L– FROM STA. 615+81 TO 619+50 LT

DETAIL D3
SPECIAL CUT DITCH
(Not to Scale)



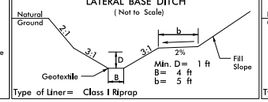
–L– FROM 628+73 TO 634+63 LT

DETAIL D4
LATERAL DITCH
(Not to Scale)



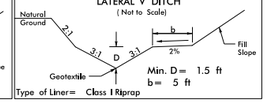
–L– FROM STA. 890+47 TO 892+50 LT
–L– FROM STA. 898+00 TO 900+00 LT
–L– FROM STA. 936+50 TO 940+50 LT
–L– FROM STA. 885+00 TO 888+19 RT
–L– FROM STA. 892+00 TO 897+09 RT

DETAIL D5
LATERAL BASE DITCH
(Not to Scale)



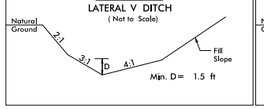
–L– FROM STA. 791+50 TO 793+50

DETAIL D6
LATERAL V DITCH
(Not to Scale)



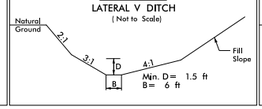
–L– FROM STA. 835+50 TO 837+27 LT
–L– FROM STA. 893+84 TO 898+00 LT
–L– FROM STA. 888+19 TO 890+77 RT
–L– FROM STA. 890+91 TO 892+00 RT
–L– FROM STA. 897+24 TO 899+50 RT

DETAIL D7
LATERAL V DITCH
(Not to Scale)



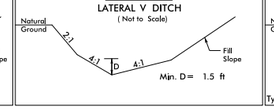
–Y5LPA– FROM STA. 14+78 TO 15+28 LT
–Y5RPA– FROM STA. 20+24 TO 22+00 LT

DETAIL D8
LATERAL V DITCH
(Not to Scale)



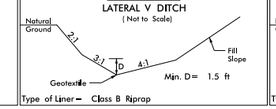
–Y5LPA– FROM STA. 15+28 TO 15+73

DETAIL D9
LATERAL V DITCH
(Not to Scale)



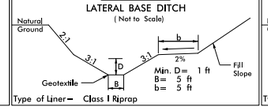
–Y5LPA– FROM STA. 15+73 TO 17+00 LT

DETAIL D10
LATERAL V DITCH
(Not to Scale)



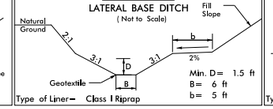
–Y5RPA– FROM STA. 19+50 TO 20+24 LT

DETAIL D11
LATERAL BASE DITCH
(Not to Scale)



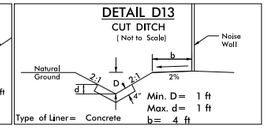
–L– FROM STA. 788+50 TO 790+00

DETAIL D12
LATERAL BASE DITCH
(Not to Scale)



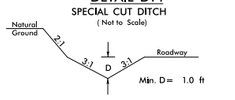
–Y6RPB– FROM 9+77 TO 11+02 LT

DETAIL D13
CUT DITCH
(Not to Scale)



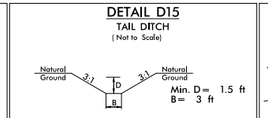
–L– FROM 706+50 TO 711+41 RT
–L– FROM 727+77 TO 729+44 RT
–Y6RPB– FROM 15+11 TO 22+63 LT

DETAIL D14
SPECIAL CUT DITCH
(Not to Scale)



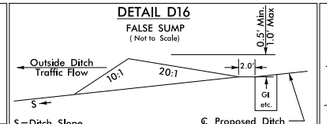
–Y6LPA– FROM 10+74 TO 11+87 LT

DETAIL D15
TAIL DITCH
(Not to Scale)



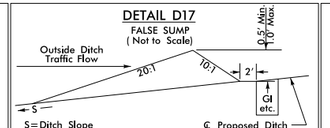
–L– STA. 777+37 LT

DETAIL D16
FALSE SUMP
(Not to Scale)



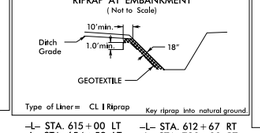
–L– STA. 794+55 LT
–L– STA. 709+74 RT
–L– STA. 760+50 RT
–L– STA. 774+58 RT
–L– STA. 827+52 RT
–Y6RPB– STA. 17+70 LT

DETAIL D17
FALSE SUMP
(Not to Scale)



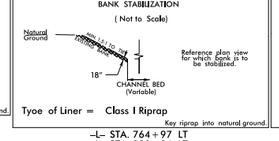
–L– STA. 701+58 LT
–L– STA. 827+52 LT
–L– STA. 835+03 LT
–L– STA. 617+94 RT
–L– STA. 795+69 RT
–L– STA. 808+22 RT
–Y5RPA– STA. 15+25 LT
–Y5RPD– STA. 21+39 LT
–Y5RPD– STA. 21+31 RT

DETAIL D18
RIPRAP AT EMBANKMENT
(Not to Scale)



–L– STA. 615+00 LT
–L– STA. 654+53 LT
–L– STA. 654+58 LT
–L– STA. 658+97 LT
–L– STA. 683+21 LT
–L– STA. 729+85 LT
–L– STA. 730+13 LT
–L– STA. 741+73 LT
–L– STA. 746+32 LT
–L– STA. 791+36 LT
–L– STA. 808+85 LT
–L– STA. 816+10 LT
–L– STA. 818+86 LT
–L– STA. 890+43 LT
–L– STA. 893+74 LT
–L– STA. 893+80 LT
–L– STA. 910+17 LT
–L– STA. 612+67 RT
–L– STA. 730+00 RT
–L– STA. 730+04 RT
–L– STA. 740+42 RT
–L– STA. 740+45 RT
–L– STA. 746+32 RT
–L– STA. 749+98 RT
–L– STA. 750+09 RT
–L– STA. 788+69 RT
–L– STA. 792+60 RT
–L– STA. 806+28 RT
–L– STA. 806+46 RT
–L– STA. 818+46 RT
–L– STA. 837+46 RT
–L– STA. 890+82 RT
–L– STA. 890+86 RT
–L– STA. 897+08 RT
–L– STA. 897+16 RT
–Y6RPC– STA. 15+28 RT

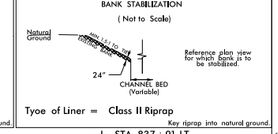
DETAIL D19
BANK STABILIZATION
(Not to Scale)



Tyoe of Liner = Class I Riprap

–L– STA. 764+97 LT
–L– STA. 890+34 LT
–L– STA. 893+72 LT
–Y19RPC– STA. 18+60 RT
–Y19RPC– STA. 18+64 RT

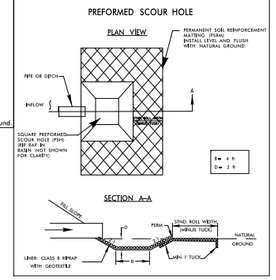
DETAIL D20
BANK STABILIZATION
(Not to Scale)



Tyoe of Liner = Class II Riprap

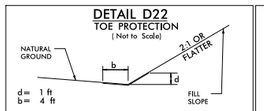
–L– STA. 837+91 LT
–L– STA. 838+91 LT
–Y6RPC– STA. 19+10 RT

DETAIL D21
PREFORMED SCOUR HOLE



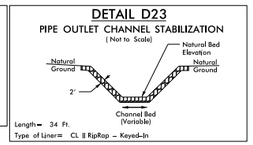
–L– STA. 790+75 LT

DETAIL D22
TOE PROTECTION
(Not to Scale)



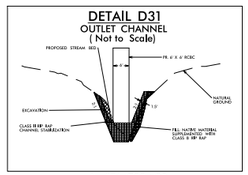
–L– FROM STA. 651+50 TO 654+49 LT
–L– FROM STA. 654+64 TO 656+50 LT
–L– FROM STA. 814+50 TO 816+04 LT
–L– FROM STA. 845+32 TO 854+00 LT
–L– FROM STA. 649+50 TO 653+10 RT
–L– FROM STA. 791+44 TO 792+52 RT
–Y5RPA– FROM STA. 21+43 TO 24+00 RT
–Y6LPC– FROM STA. 12+03 TO 13+79 RT
–Y6RPC– FROM STA. 19+26 TO 20+55 RT
–Y6RPC– FROM STA. 23+69 TO 24+87 RT

DETAIL D23
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



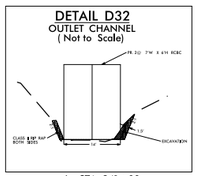
–L– STA. 790+14 LT

DETAIL D31
OUTLET CHANNEL
(Not to Scale)



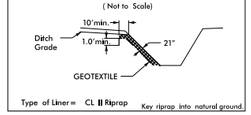
–L– STA. 789+30

DETAIL D32
OUTLET CHANNEL
(Not to Scale)



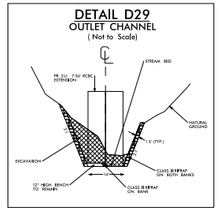
–L– STA. 841+00

DETAIL D18–A
RIPRAP AT EMBANKMENT
(Not to Scale)



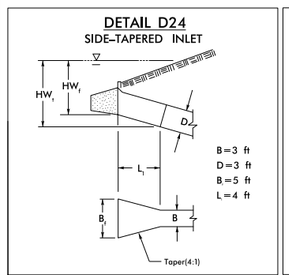
–Y6– STA. 129+88 LT

DETAIL D29
OUTLET CHANNEL
(Not to Scale)



–L– STA. 837+70 LT

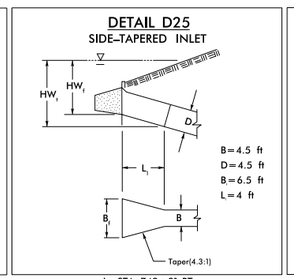
DETAIL D24
SIDE–TAPERED INLET



B=3 ft
D=3 ft
B_t=5 ft
L=4 ft

–L– STA. 641+48 LT

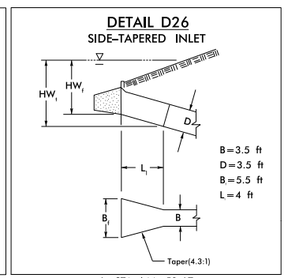
DETAIL D25
SIDE–TAPERED INLET



B=4.5 ft
D=4.5 ft
B_t=6.5 ft
L=4 ft

–L– STA. 749+91 RT
–Y24RPA– STA. 18+83 RT

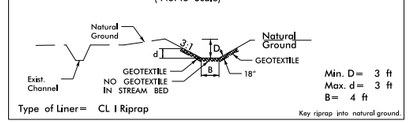
DETAIL D26
SIDE–TAPERED INLET



B=3.5 ft
D=3.5 ft
B_t=5.5 ft
L=4 ft

–L– STA. 644+52 LT

DETAIL D30
CHANNEL CHANGE
(Not to Scale)



–L– STA. 897+13 RT

PERMIT DRAWING
SHEET 5 OF 115

81799
/12/2019
\Bpdpwcs01\ics_workingdir\3081\336401.3932\15507_Hyd_prm_wet_psh02D4.dgn

PROJECT REFERENCE NO.	SHEET NO.
I-5507	2D-5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

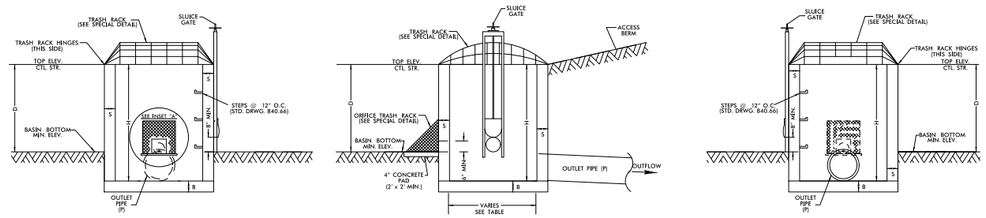
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

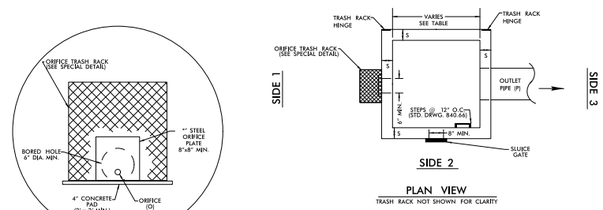
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL D27

DRY DETENTION BASIN DRAWDOWN STRUCTURE

NOT TO SCALE





PLAN VIEW
TRASH RACK NOT SHOWN FOR CLARITY

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

Water Quality Volume:

Treated Rainfall Depth = 1.6 inches
NBUA = 6.4 acres
WQv = 1.6 x 6.4 x 3450 = 35,328 CF
WQ Elev = 725.13

WQ Routing Results:
Peak WSE = 724.73
Peak Q = 0.26 cfs
Draw down = 52.5 hours

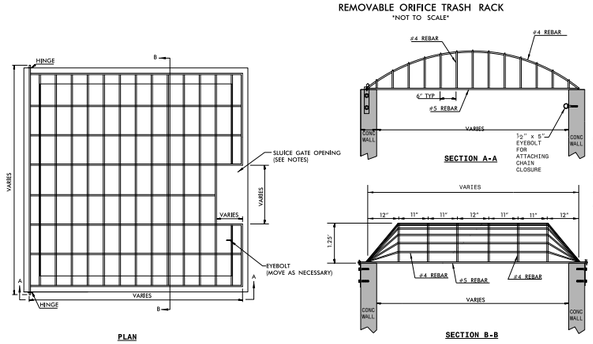
MINIMUM DIMENSIONS FOR DRY DETENTION BASIN DRAWDOWN STRUCTURE

STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	MAX. STORAGE DEPTH(D) FEET	INV. ELEV. CTL. STR.	CTL. STR. DIMENSIONS (W x L x H)	ORIFICE DIAMETER (O) INCHES	ORIFICE INV. ELEV.	OUTLET PIPE DIAMETER(P) INCHES
Weddington Rd. Y5LPD	5997	6"	6"	723.35	730.50	7.15	720.50	4' x 4' x 10'	3"	723.35	18"

DETAIL

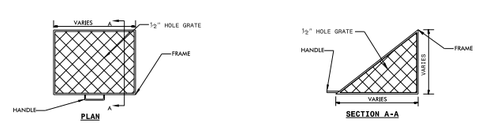
REMOVABLE ORIFICE TRASH RACK

NOT TO SCALE



REBAR TRASH RACK
NOT TO SCALE

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



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

PERMIT DRAWING
SHEET 6 OF 115

8/17/99

9/12/2019
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PROPWLCS01$

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
I-5507	2D-6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

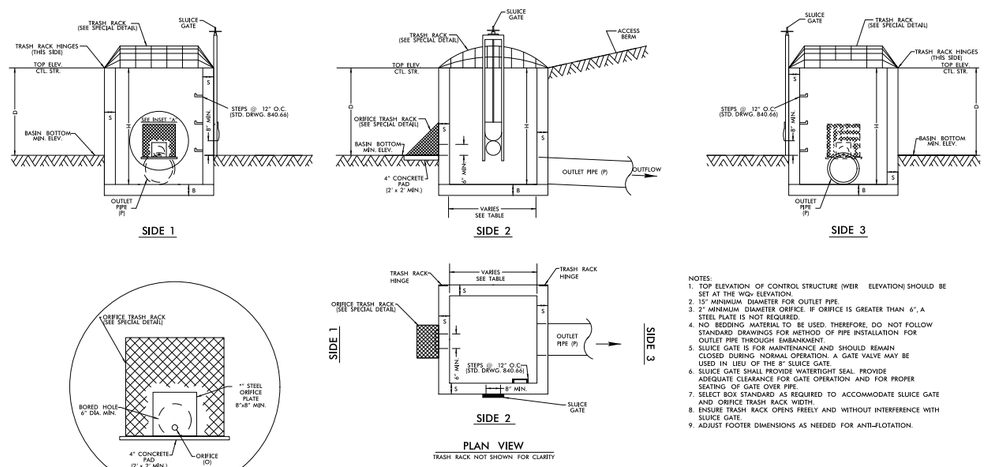
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL D28

DRY DETENTION BASIN DRAWDOWN STRUCTURE

NOT TO SCALE



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

Water Quality Volume:

Treated Rainfall Depth = 1.6 inches
NBUA = 4.5 acres
WQ_V = 1.6 x 4.5 x 3450 = 24,840 CF
WQ Elev = 686.09

WQ Routing Results:
Peak WSE = 685.33
Peak Q = 0.26 cfs
Draw down = 35.3 hours

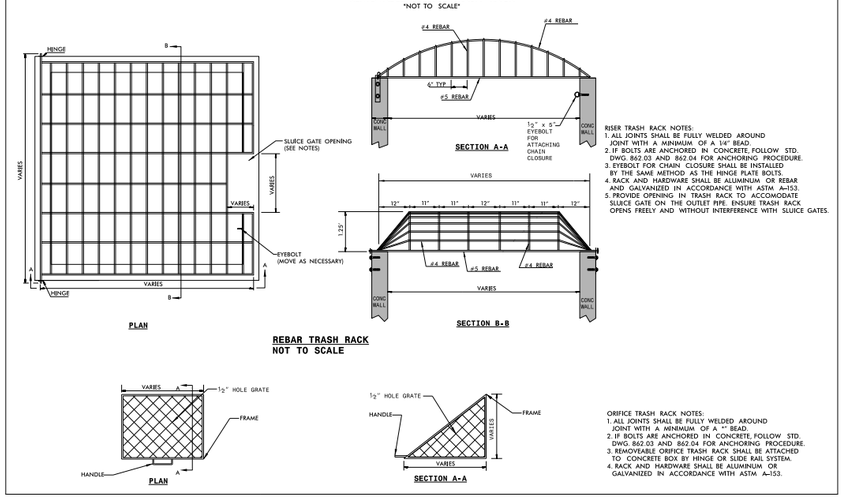
MINIMUM DIMENSIONS FOR DRY DETENTION BASIN DRAWDOWN STRUCTURE

STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	MAX. STORAGE DEPTH(D) FEET	INV. ELEV. CTL. STR.	CTL. STR. DIMENSIONS (W x L x H)	ORIFICE DIAMETER (O) INCHES	ORIFICE INV. ELEV.	OUTLET PIPE DIAMETER(P) INCHES
E. John St. Y6LPC	6545	6"	6"	684.00	690.00	6.0	681.00	4' x 4' x 9'	3"	684.00	24"
									18" W x 12" H	685.50	

DETAIL

REMOVABLE ORIFICE TRASH RACK

NOT TO SCALE



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

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

PERMIT DRAWING
SHEET 7 OF 115

9/12/2019
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PROPWTCS01$

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

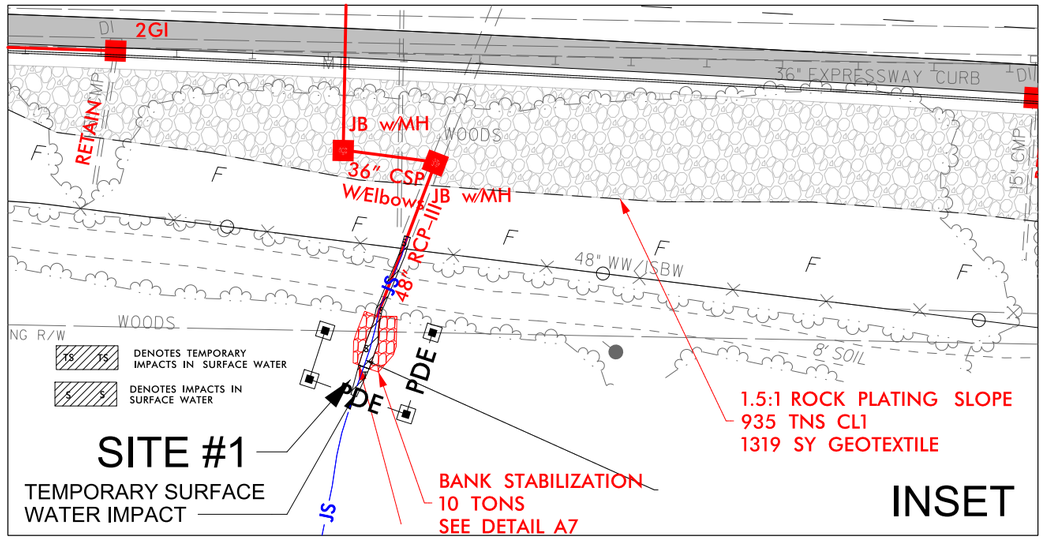
PROJECT REFERENCE NO.	SHEET NO.
I-5507	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

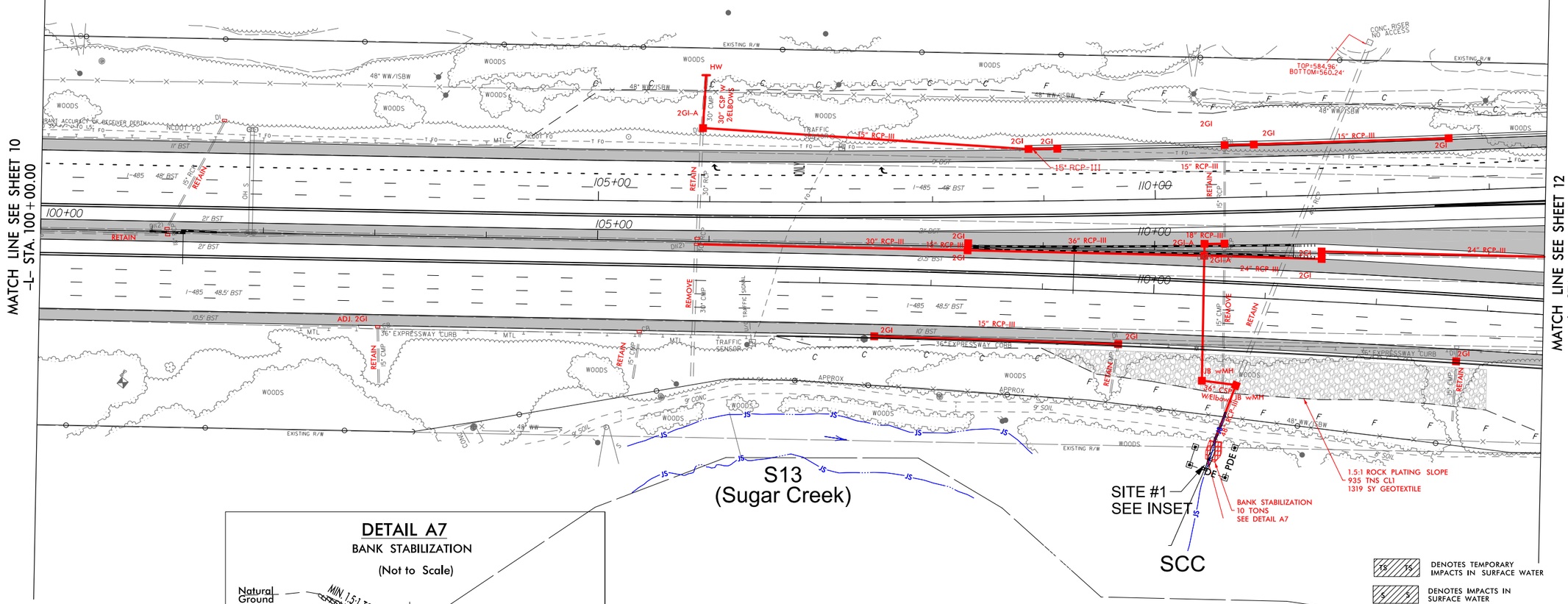
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

NAD 83/2011

SITE #1 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

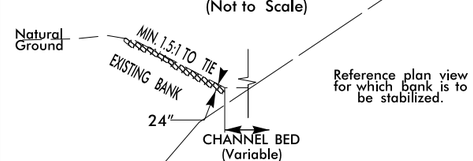




DETAIL A7

BANK STABILIZATION

(Not to Scale)



Reference plan view for which bank is to be stabilized.

Type of Liner = Class II Riprap (Keyed in)

PERMIT DRAWING
SHEET 8 OF 115

100 0 100
GRAPHIC SCALE

REVISIONS

8/17/99

9/12/2019
\\prdpwics01\ics_workingdir\3084\336401_3935\15507_Hyd_prm_wet_pshll.dgn
PRDPWICS01$

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

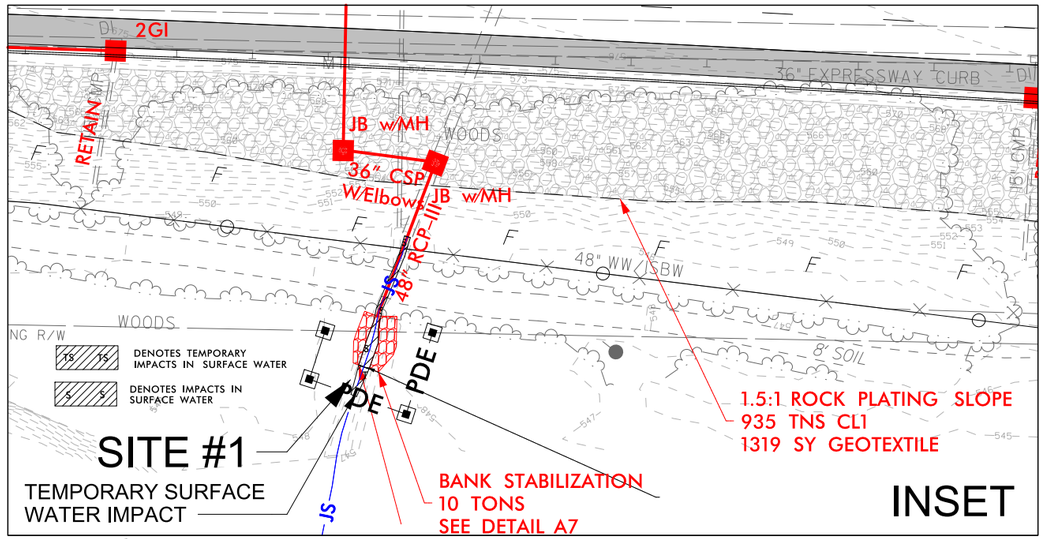
PROJECT REFERENCE NO.	SHEET NO.
I-5507	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

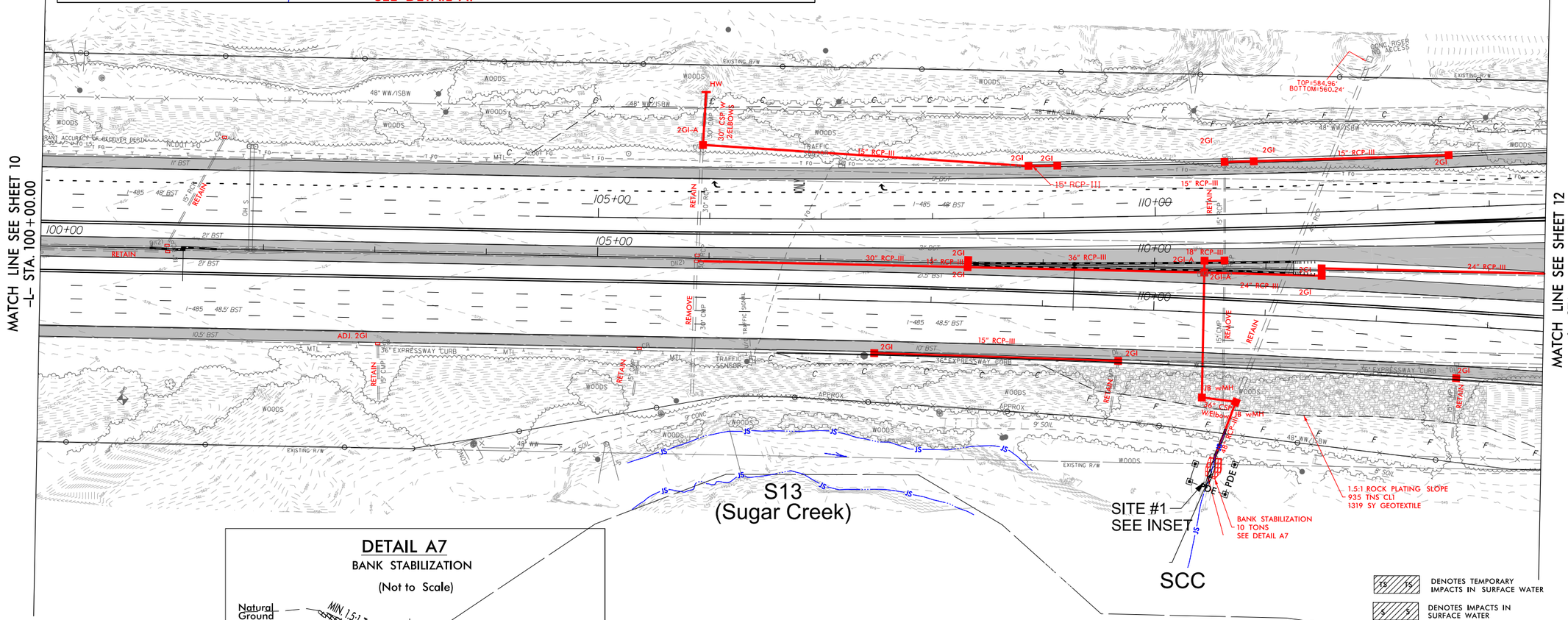
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

NAD 83/2011

SITE #1 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

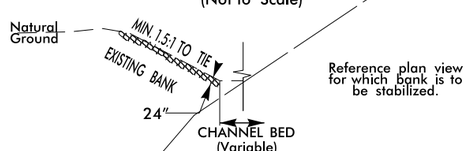




DETAIL A7

BANK STABILIZATION

(Not to Scale)



Reference plan view for which bank is to be stabilized.

Type of Liner = Class II Riprap (Keyed in)

PERMIT DRAWING
SHEET 9 OF 115

100 0 100
GRAPHIC SCALE

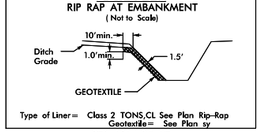
REVISIONS

8/17/99

9/12/2019
\\prdpwics01\ics_workingdir\3084\336401_3952\i5507_Hyd_prm_wet_pshll_cont.dgn
PRDPWICS01$

REVISIONS

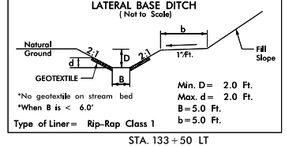
DETAIL A3
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= Class 2 TONS,CL See Plan Rip-Rap
Geotextile= See Plan sy

STA. 131+25 LT
STA. 132+00 LT

DETAIL A9
LATERAL BASE DITCH
(Not to Scale)



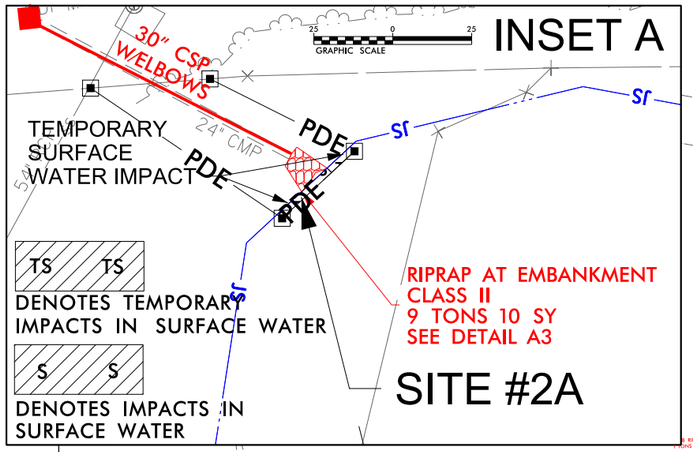
*No geotextile on stream bed
*When B is < 6.0'

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

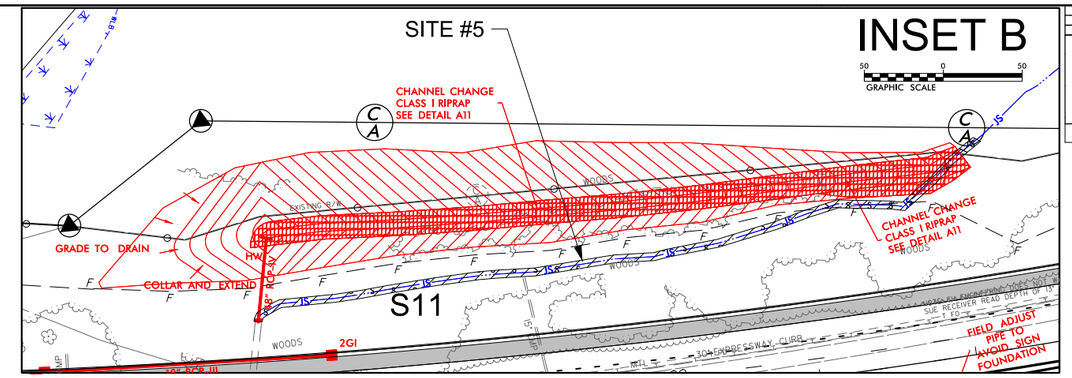
Type of Liner= Rip-Rap Class 1

STA. 133+50 LT

INSET A



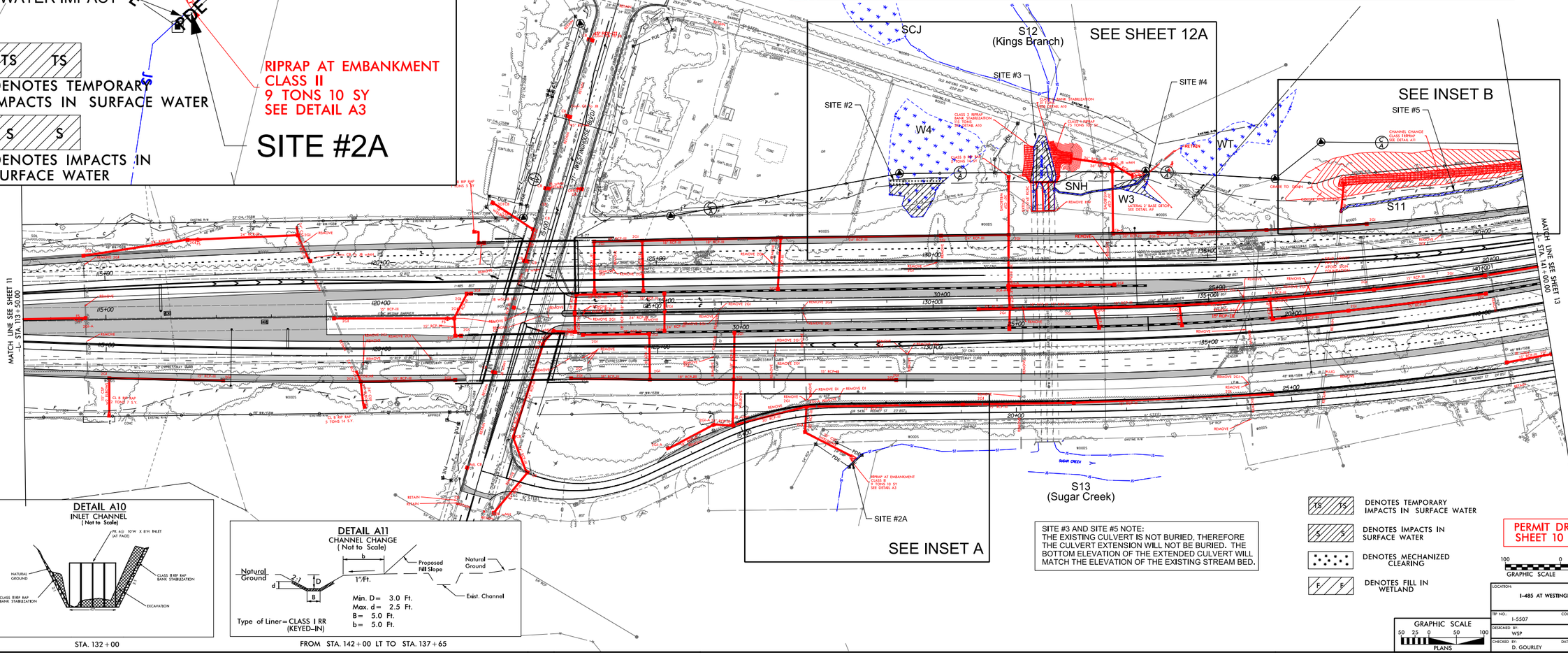
INSET B



PROJECT REFERENCE NO.	SHEET NO.
I-5507	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/2011



SITE #3 AND SITE #5 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

F F — DENOTES FILL IN WETLAND

PERMIT DRAWING
SHEET 10 OF 115

GRAPHIC SCALE
100 0 100

DETAIL A10
INLET CHANNEL
(Not to Scale)

STA. 132+00

DETAIL A11
CHANNEL CHANGE
(Not to Scale)

Type of Liner= CLASS I RR
(KEYED-IN)

Min. D= 3.0 Ft.
Max. d= 2.5 Ft.
B= 5.0 Ft.
b= 5.0 Ft.

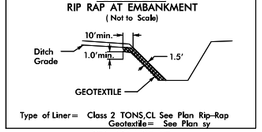
FROM STA. 142+00 LT TO STA. 137+65

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: I-485 AT WESTINGHOUSE BLVD.	
TIP NO.: I-5507	COUNTY: MECKLENBURG
DESIGNED BY: WSP	
CHECKED BY: D. GOURLEY	DATE: 9/26/2019

REVISIONS

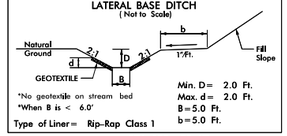
DETAIL A3
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= Class 2 TONS,CL See Plan Rip-Rap
Geotextile= See Plan sy

STA. 131+25 LT
STA. 132+00 LT

DETAIL A9
LATERAL BASE DITCH
(Not to Scale)

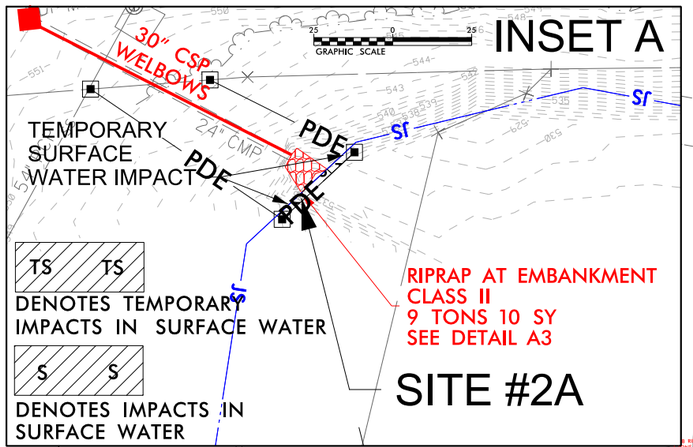


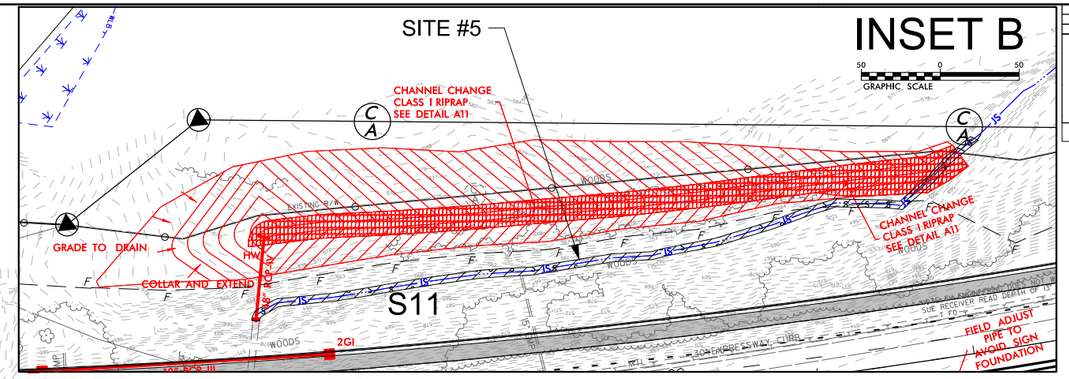
*No geotextile on stream bed
*When B is < 6.0'

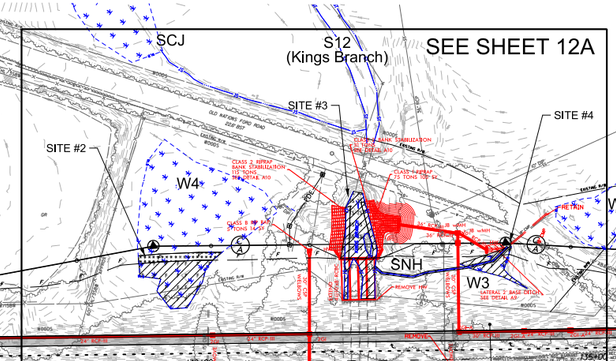
Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
B=5.0 Ft.
b=5.0 Ft.

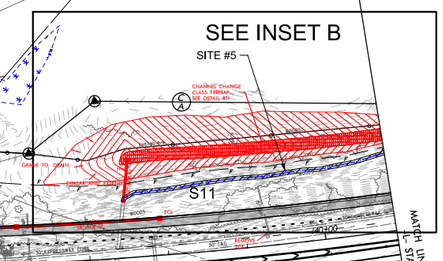
Type of Liner= Rip-Rap Class 1

STA. 133+50 LT

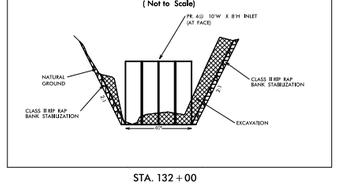






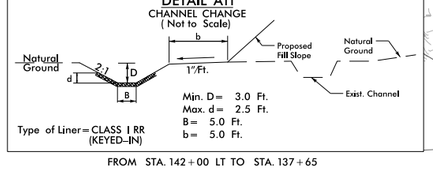


DETAIL A10
INLET CHANNEL
(Not to Scale)



STA. 132+00

DETAIL A11
CHANNEL CHANGE
(Not to Scale)



Type of Liner= CLASS I RR
(KEYED-IN)

Min. D= 3.0 Ft.
Max. d= 2.5 Ft.
B= 5.0 Ft.
b= 5.0 Ft.

FROM STA. 142+00 LT TO STA. 137+65

SITE #3 AND SITE #5 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

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

PERMIT DRAWING
SHEET 11 OF 115

GRAPHIC SCALE
100 0 100

GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
I-5507	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/2011

LOCATION: I-485 AT WESTINGHOUSE BLVD.
TIP NO: I-5507
COUNTY: MECKLENBURG
DESIGNED BY: WSP
CHECKED BY: D. GOURLEY
DATE: 9/26/2019

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	12A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

DETAIL A10
INLET CHANNEL
(Not to Scale)

STA. 132 + 00

SITE #3 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

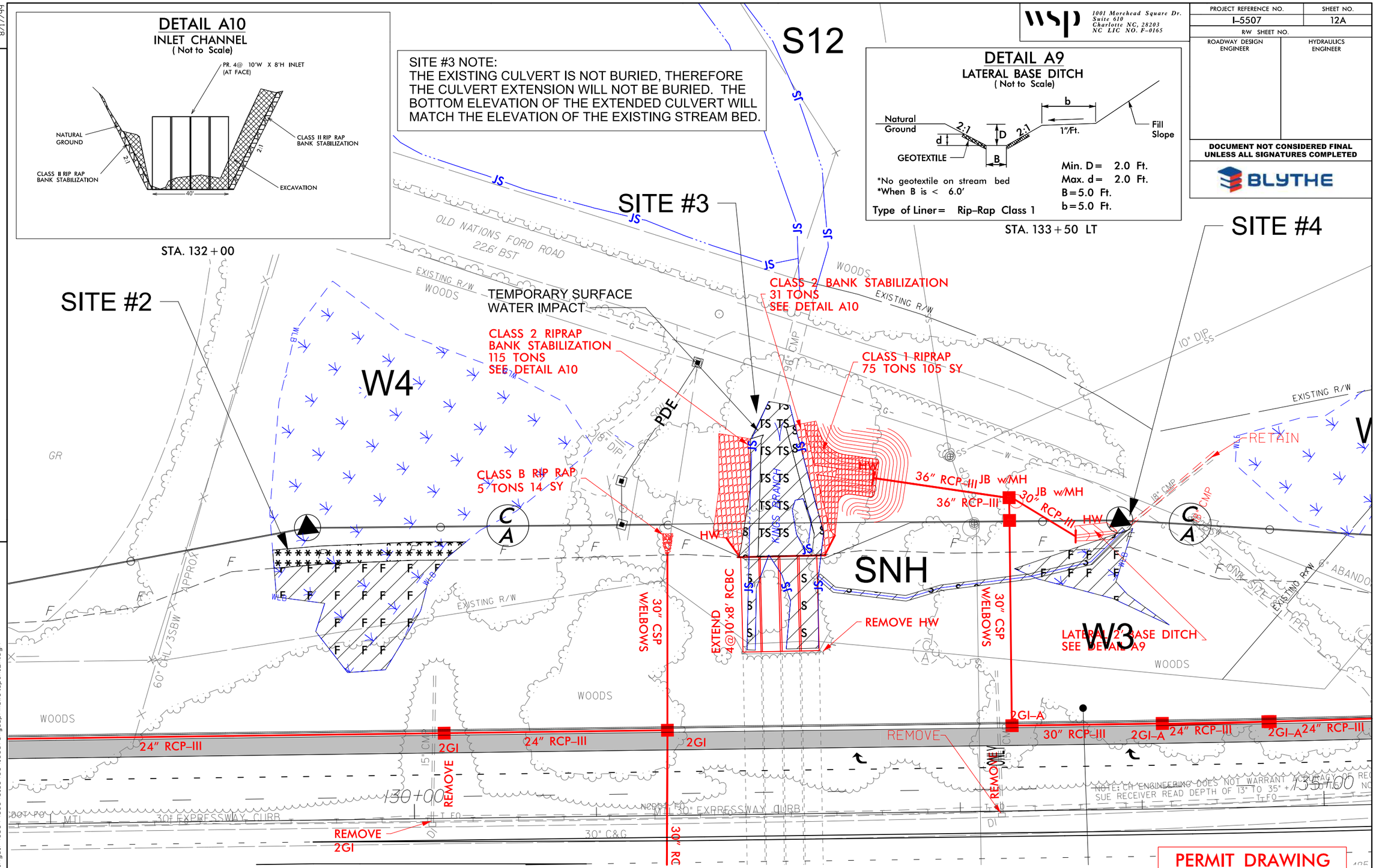
DETAIL A9
LATERAL BASE DITCH
(Not to Scale)

*No geotextile on stream bed
*When B is < 6.0'

Type of Liner = Rip-Rap Class 1

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

STA. 133 + 50 LT



F F — DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 12 OF 115

50 0 50
GRAPHIC SCALE

REVISIONS

8/17/99

9/12/2019
N:\Projects01\ics_workingdir\3084\336401_3953\I5507_Hyd_prm_wet_psh12A.dgn
PROPWTCS01$

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	12A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

DETAIL A10
INLET CHANNEL
(Not to Scale)

STA. 132 + 00

SITE #3 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

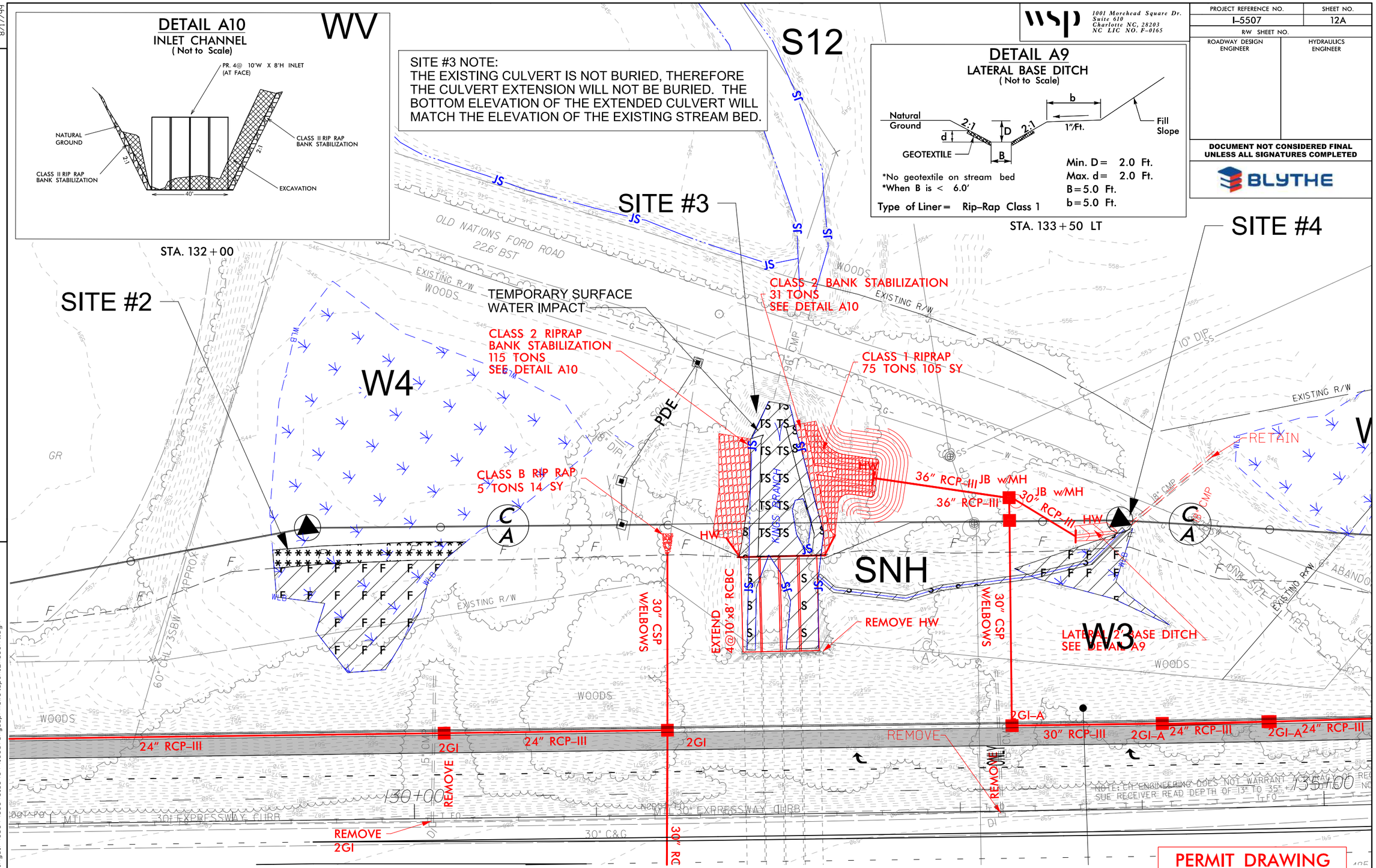
DETAIL A9
LATERAL BASE DITCH
(Not to Scale)

*No geotextile on stream bed
*When B is < 6.0'

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

Type of Liner = Rip-Rap Class 1

STA. 133 + 50 LT



F F — DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 13 OF 115

50 0 50
GRAPHIC SCALE

REVISIONS

8/17/99

9/12/2019
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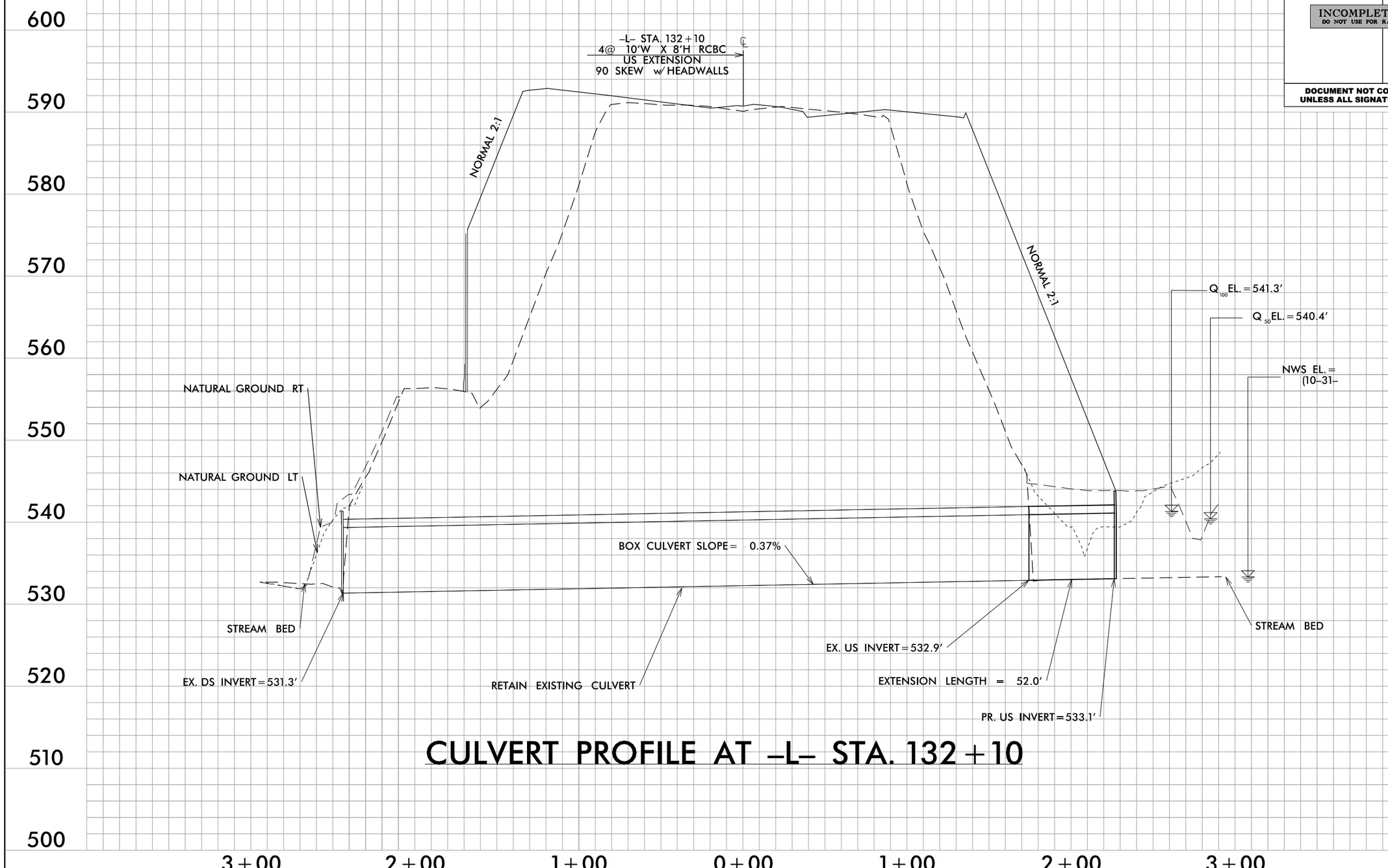
PROPWTCS01$

PROJECT REFERENCE NO.	SHEET NO.
I-5507	12-1
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SITE #3



CULVERT PROFILE AT -L- STA. 132+10

PERMIT DRAWING
SHEET 14 OF 115

50 0 50
GRAPHIC SCALE (HORIZONTAL)

10 0 10
GRAPHIC SCALE (VERTICAL)

5/28/99

9/12/2019
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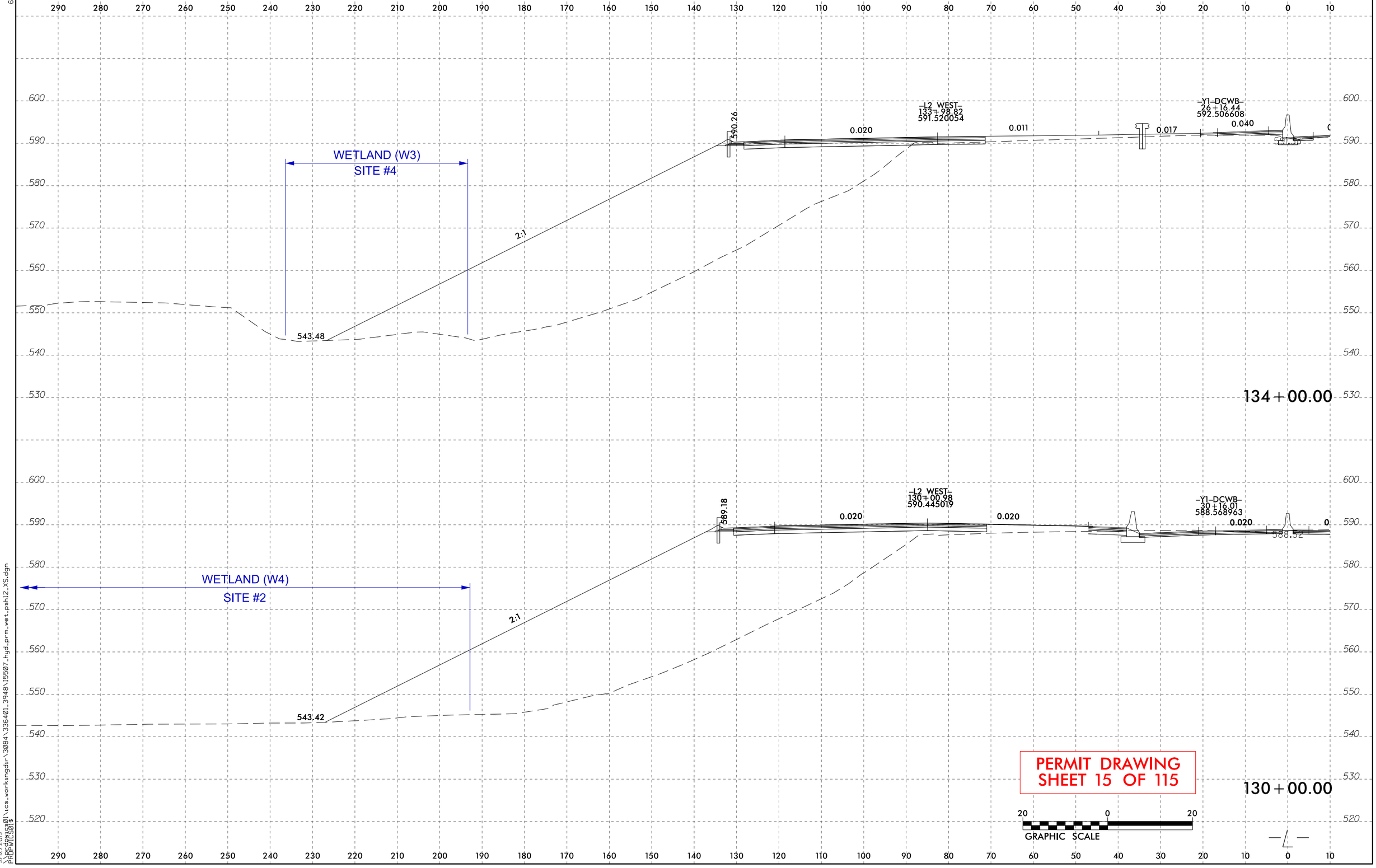
PROJ. REFERENCE NO.	SHEET NO.
I-5507	12-2



6/23/16

9/12/2019
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PRODPWCS01$

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
I-5507	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

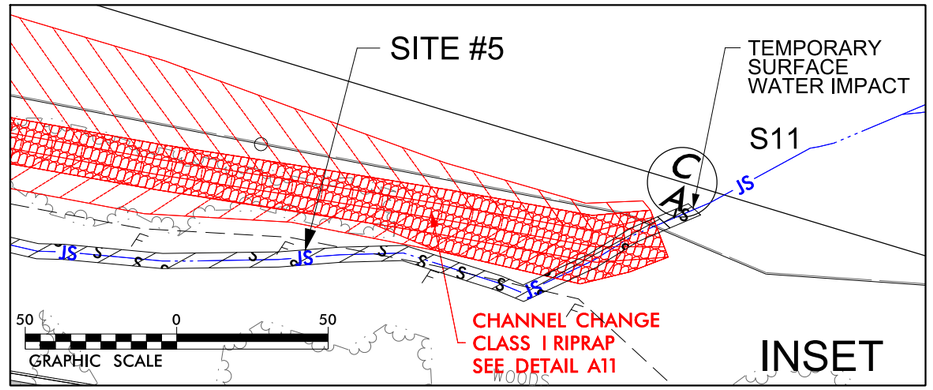
wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

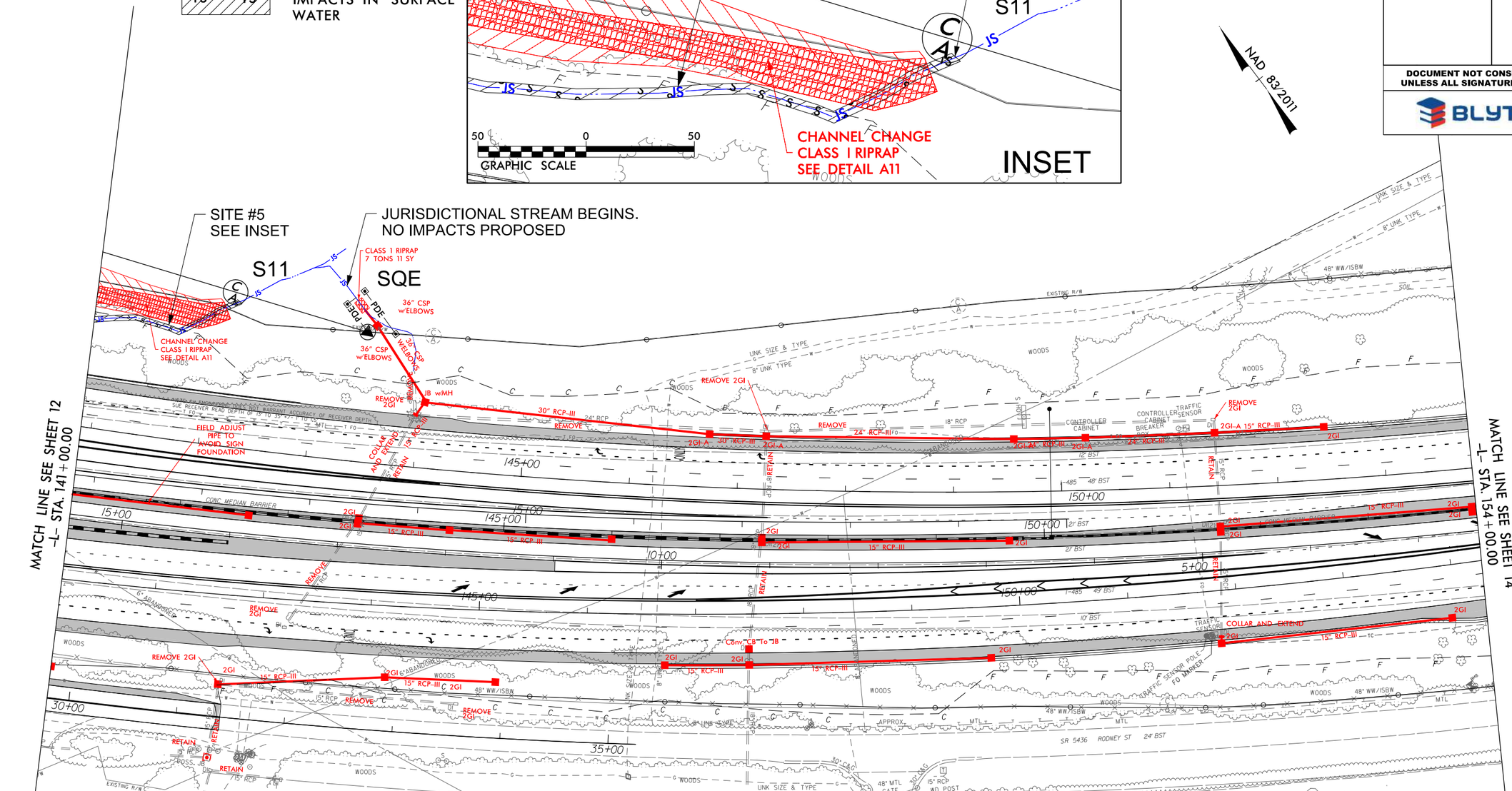
BLYTHE

S S DENOTES IMPACTS IN SURFACE WATER

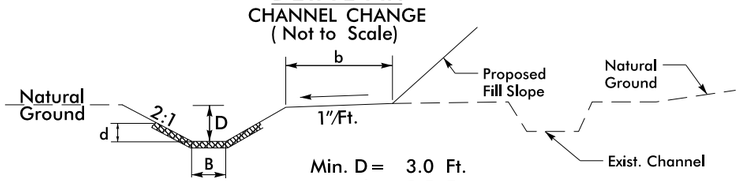
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER



NAD 83/2011



DETAIL A11
CHANNEL CHANGE
(Not to Scale)



Min. D = 3.0 Ft.
Max. d = 2.5 Ft.
B = 5.0 Ft.
b = 5.0 Ft.

Type of Liner = CLASS I RR (KEYED-IN)

FROM STA. 142+00 LT TO STA. 137+65

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 16 OF 115

100 0 100
GRAPHIC SCALE

9/26/2019
LPrpOptics01\ics_workingdir\4630\336401.4253\I5507_Hyd_prm_wet_psh13.dgn
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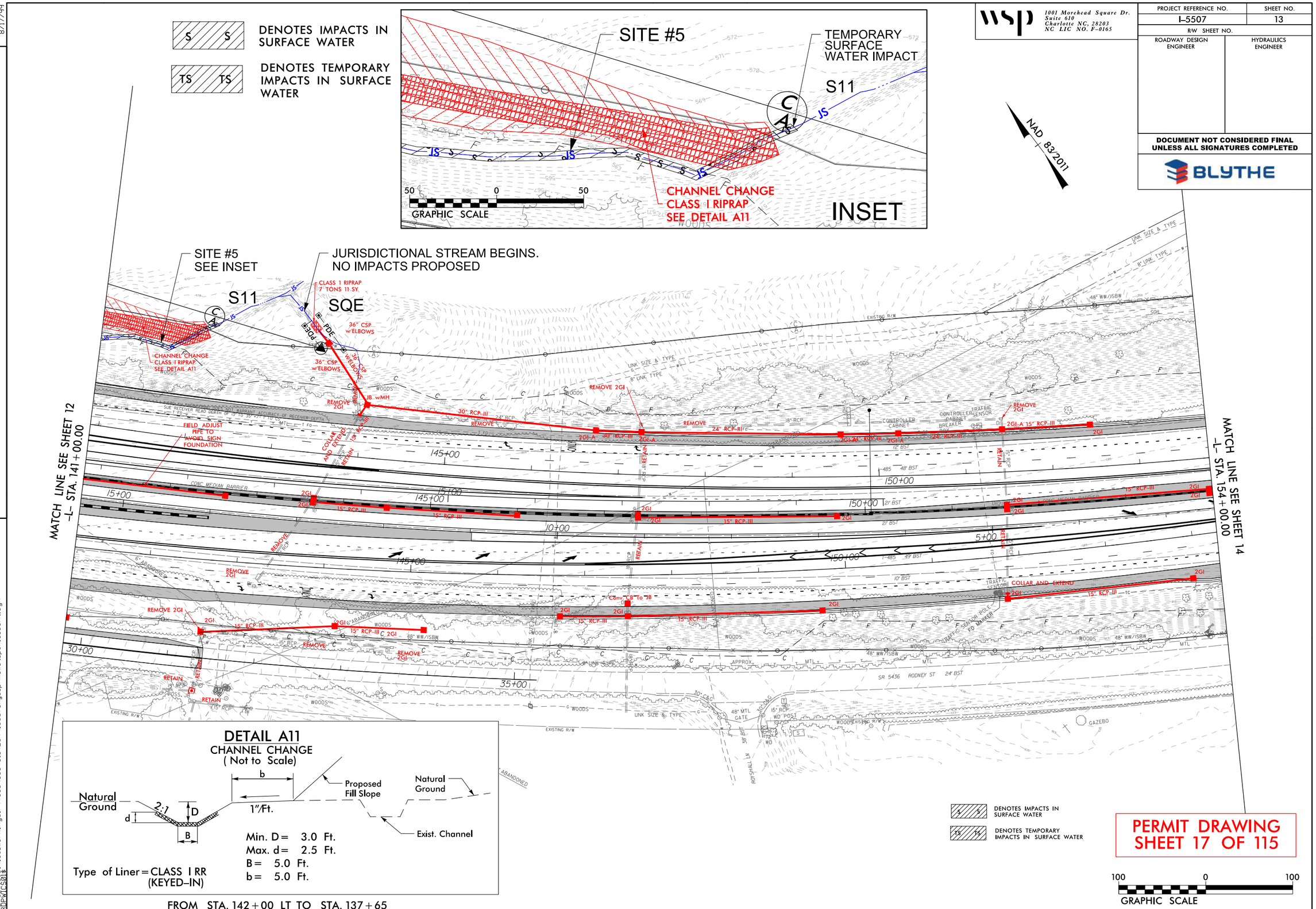

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

REVISIONS

8/17/99

9/26/2019
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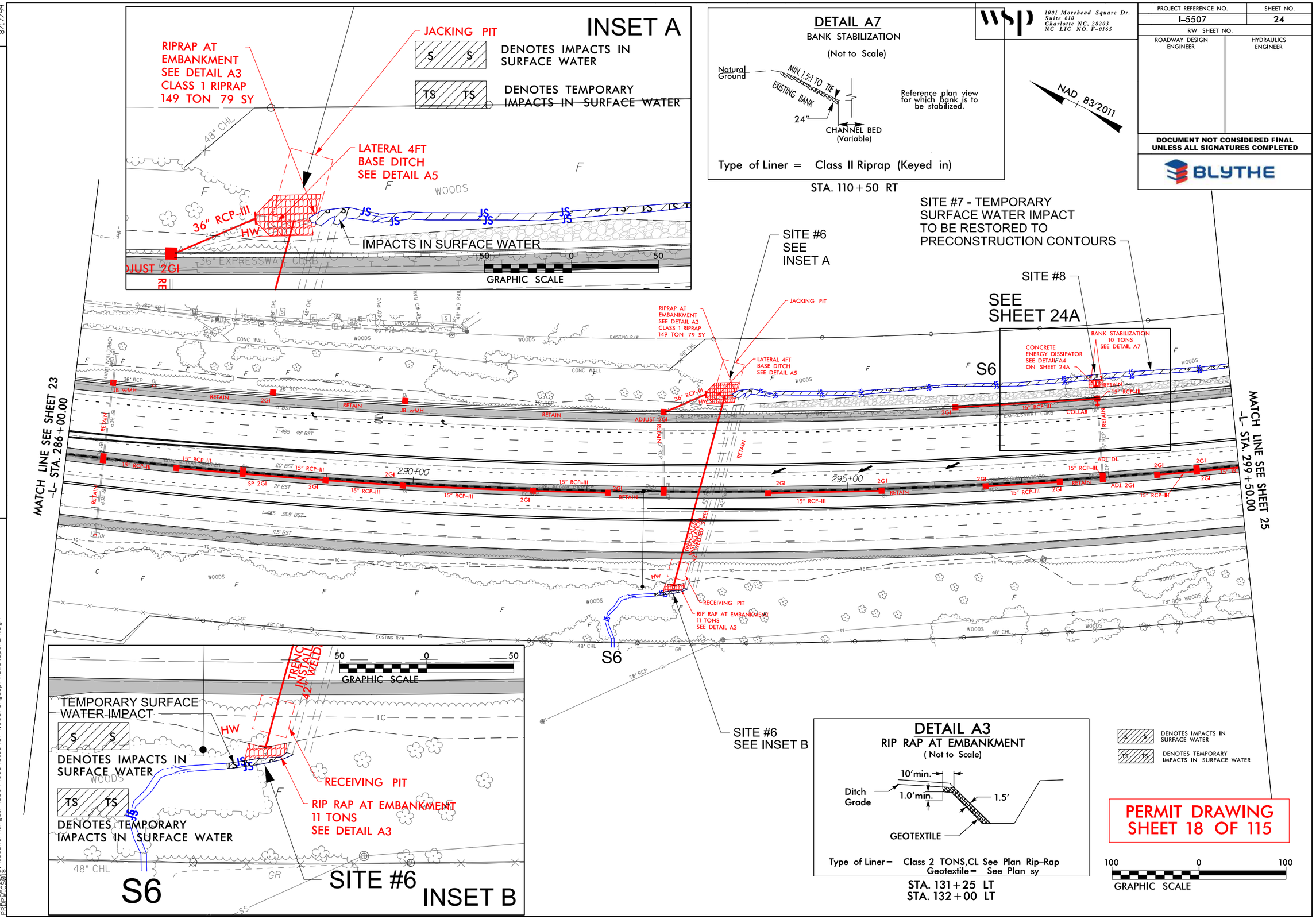

WSP
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

REVISIONS

8/17/99

9/12/2019
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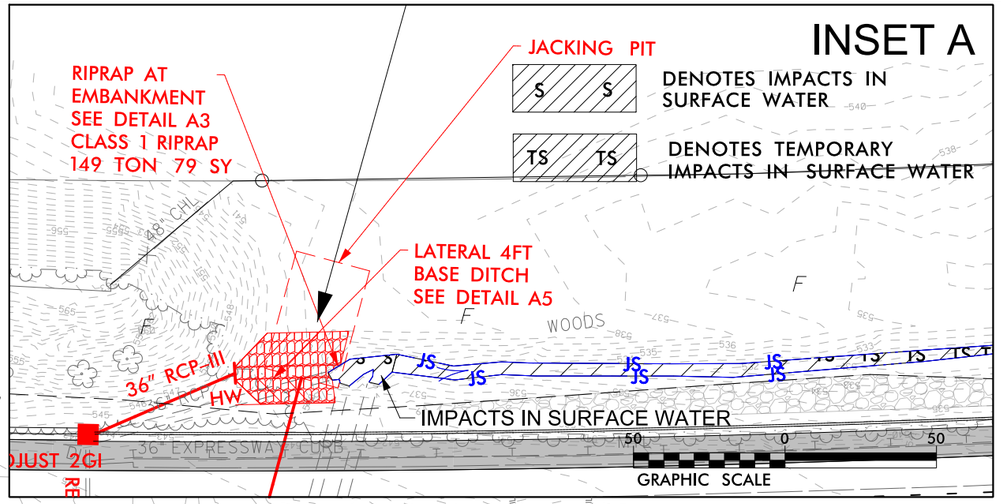
PRDPWICS01$

8/17/99

REVISIONS

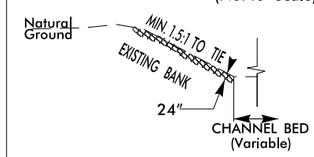
INSET A



DETAIL A7

BANK STABILIZATION

(Not to Scale)



Reference plan view for which bank is to be stabilized.

Type of Liner = Class II Riprap (Keyed in)

STA. 110+50 RT

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

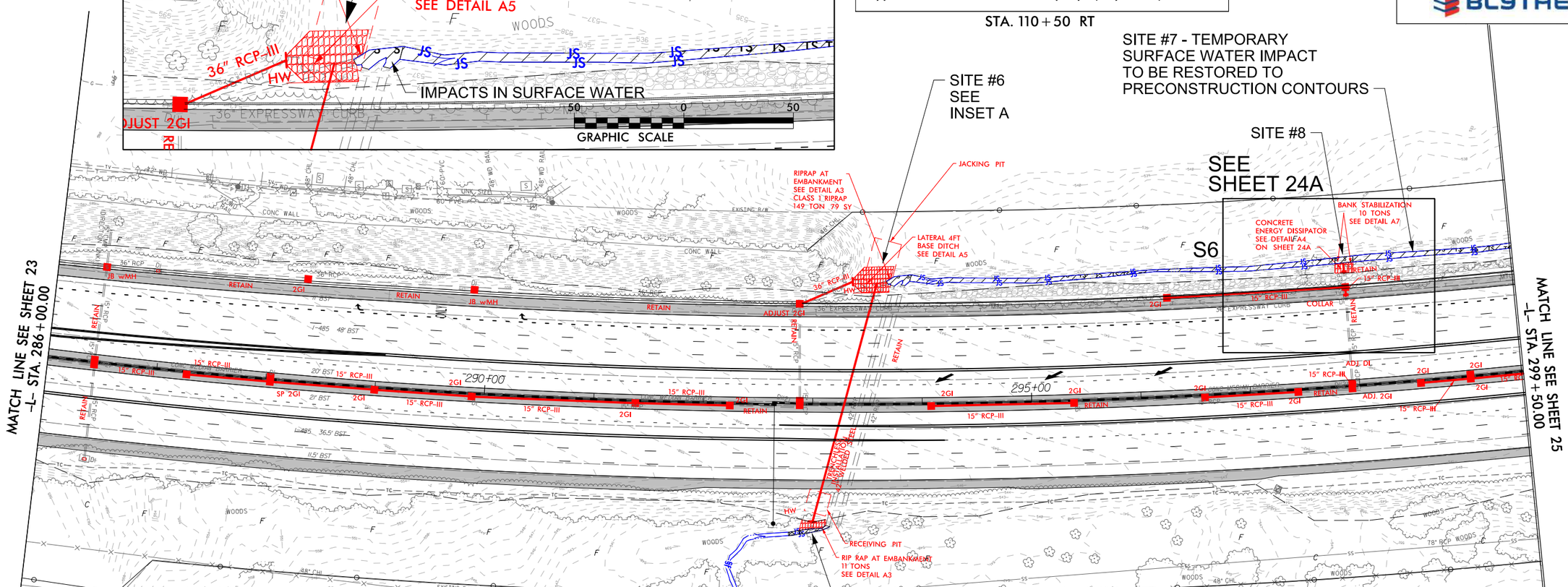
NAD 83/2011

SITE #7 - TEMPORARY SURFACE WATER IMPACT TO BE RESTORED TO PRECONSTRUCTION CONTOURS

SITE #6 SEE INSET A

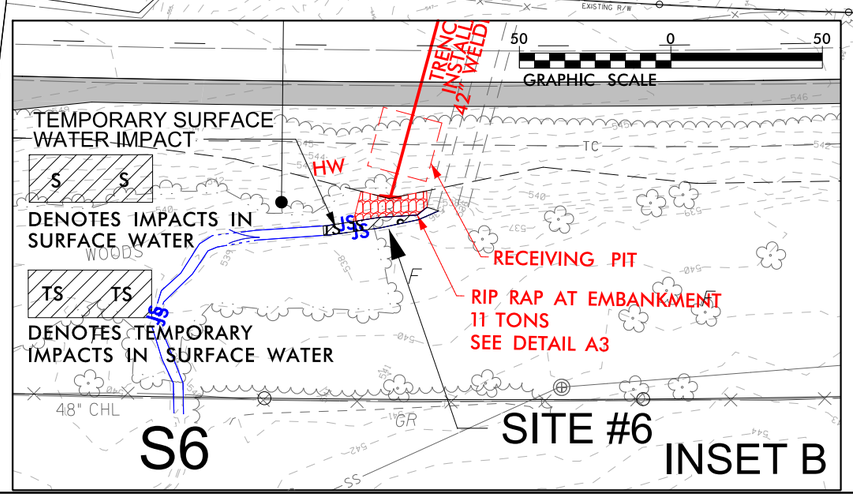
SITE #8

SEE SHEET 24A



SITE #6 SEE INSET B

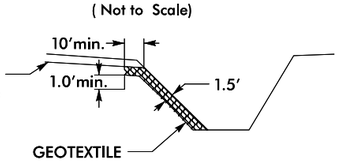
INSET B



DETAIL A3

RIP RAP AT EMBANKMENT

(Not to Scale)



Type of Liner = Class 2 TONS,CL See Plan Rip-Rap
Geotextile = See Plan sy

STA. 131+25 LT
STA. 132+00 LT

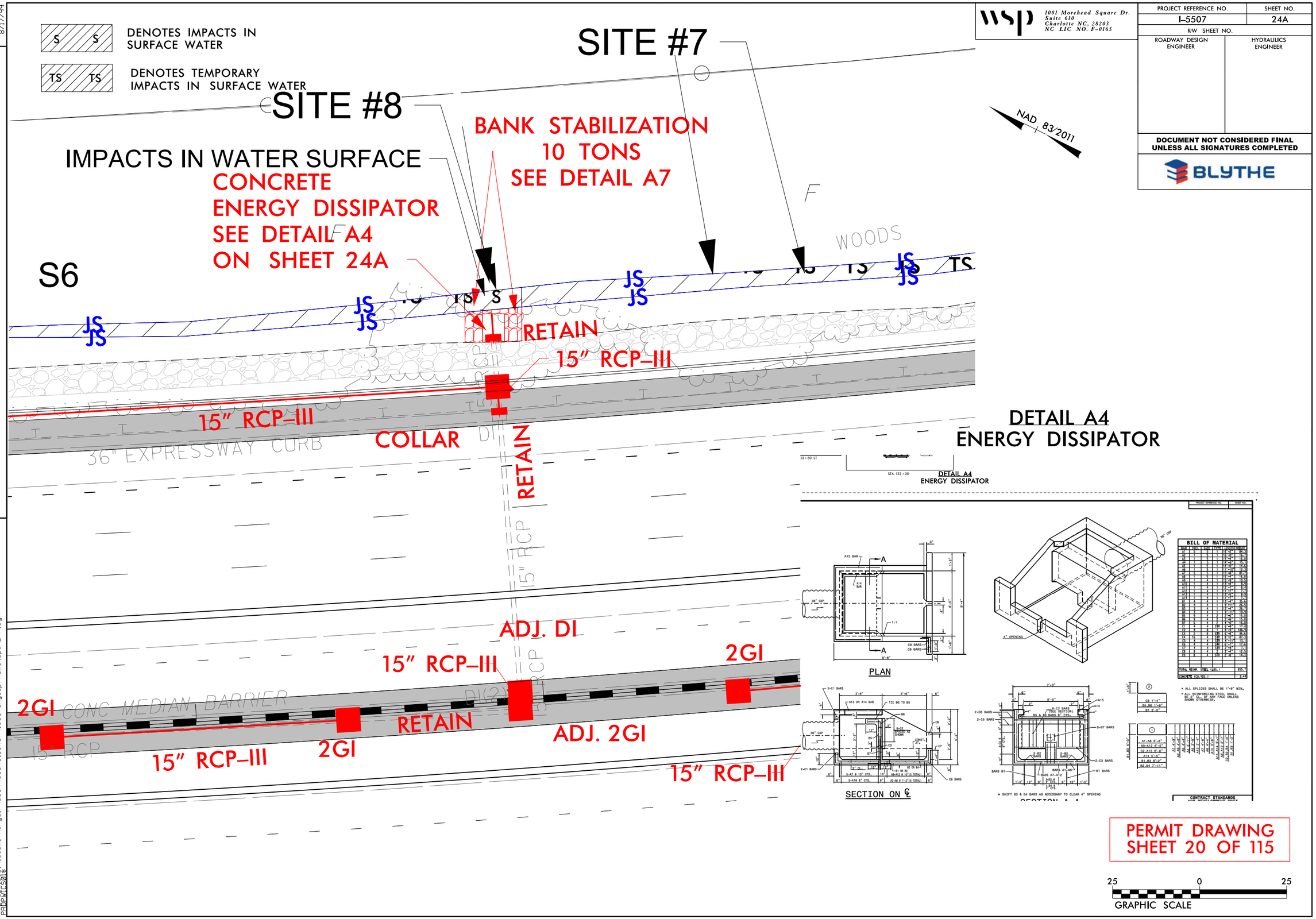
S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING SHEET 19 OF 115

100 0 100
GRAPHIC SCALE

9/12/2019
C:\pwworking\pdc01\ics_workingdir\3084\336401.3960\i5507_Hyd_prm_wet_psh24_cont.dgn
PROPWLCS01$



PROJECT REFERENCE NO.	SHEET NO.
I-5507	24A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

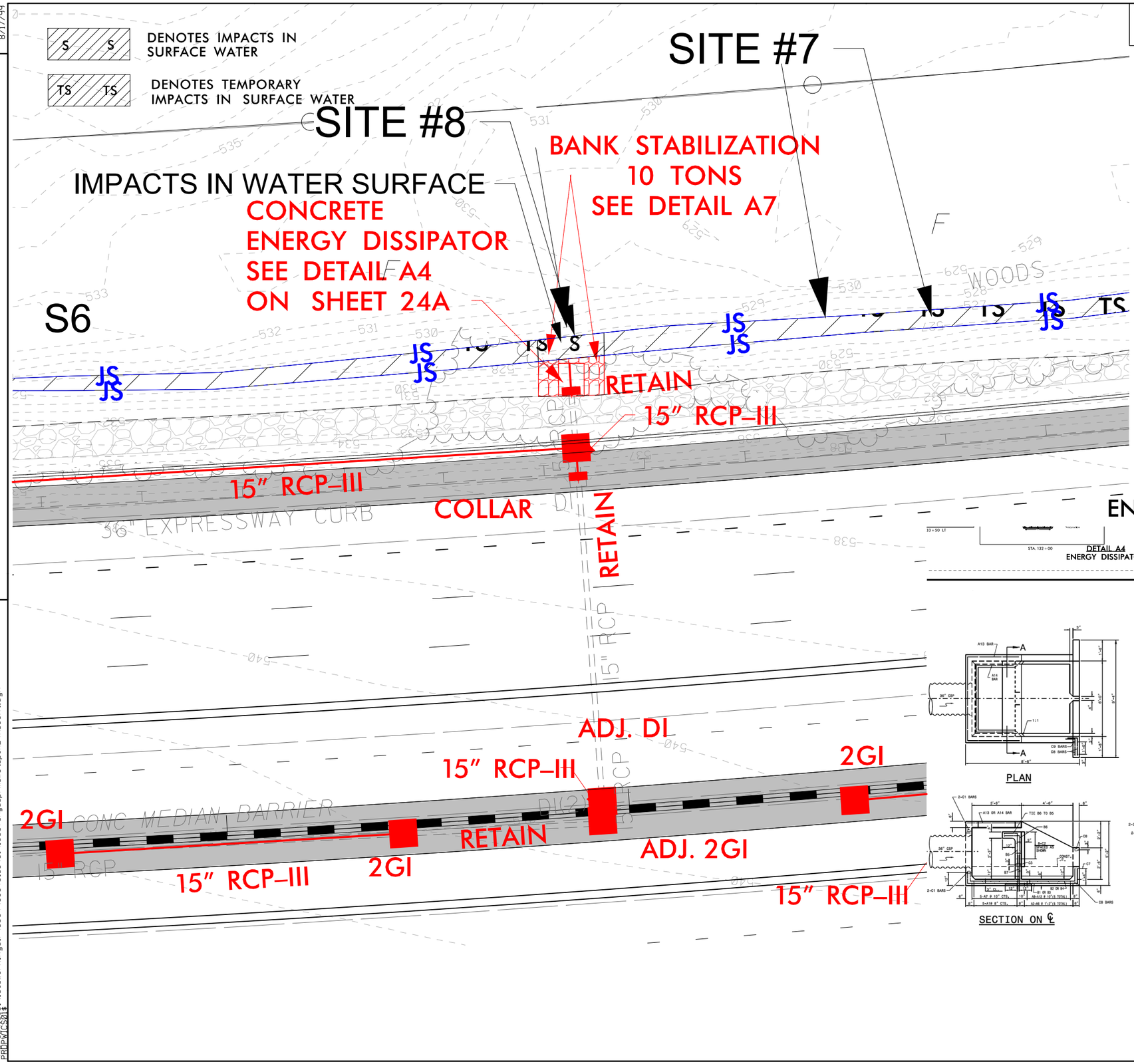
BLYTHE

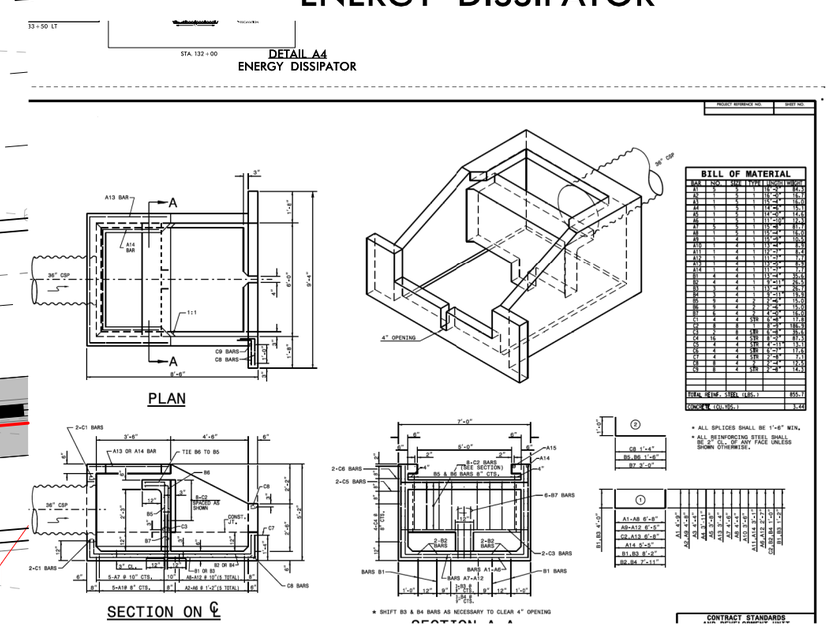
wsp 1001 Morehead Square Dr. Suite 610 Charlotte NC, 28203 NC LIC NO. F-0165

REVISIONS

8/17/99

9/12/2019 \\prdpwics01\ics_workingdir\3084\336401_3957\I5507_Hyd_prm_wet_psh24A.dgn PRDPWICS01$





PROJECT REFERENCE NO.	SHEET NO.
I-5507	24A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

WSP 1001 Morehead Square Dr. Suite 610 Charlotte NC, 28203 NC LIC NO. F-0165

PERMIT DRAWING SHEET 21 OF 115

25 0 25
GRAPHIC SCALE

REVISIONS

8/17/99

9/12/2019
\\prdpwics01\ics_workingdir\3084\336401_3961\I5507_Hyd_prm_wet_psh24A_cont.dgn
PRDPWICS01$

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

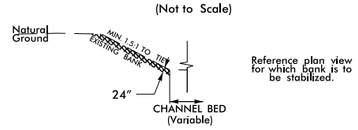
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

8/17/99

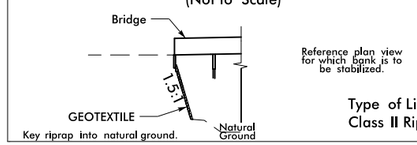
REVISIONS

DETAIL B16
BANK STABILIZATION
(Not to Scale)



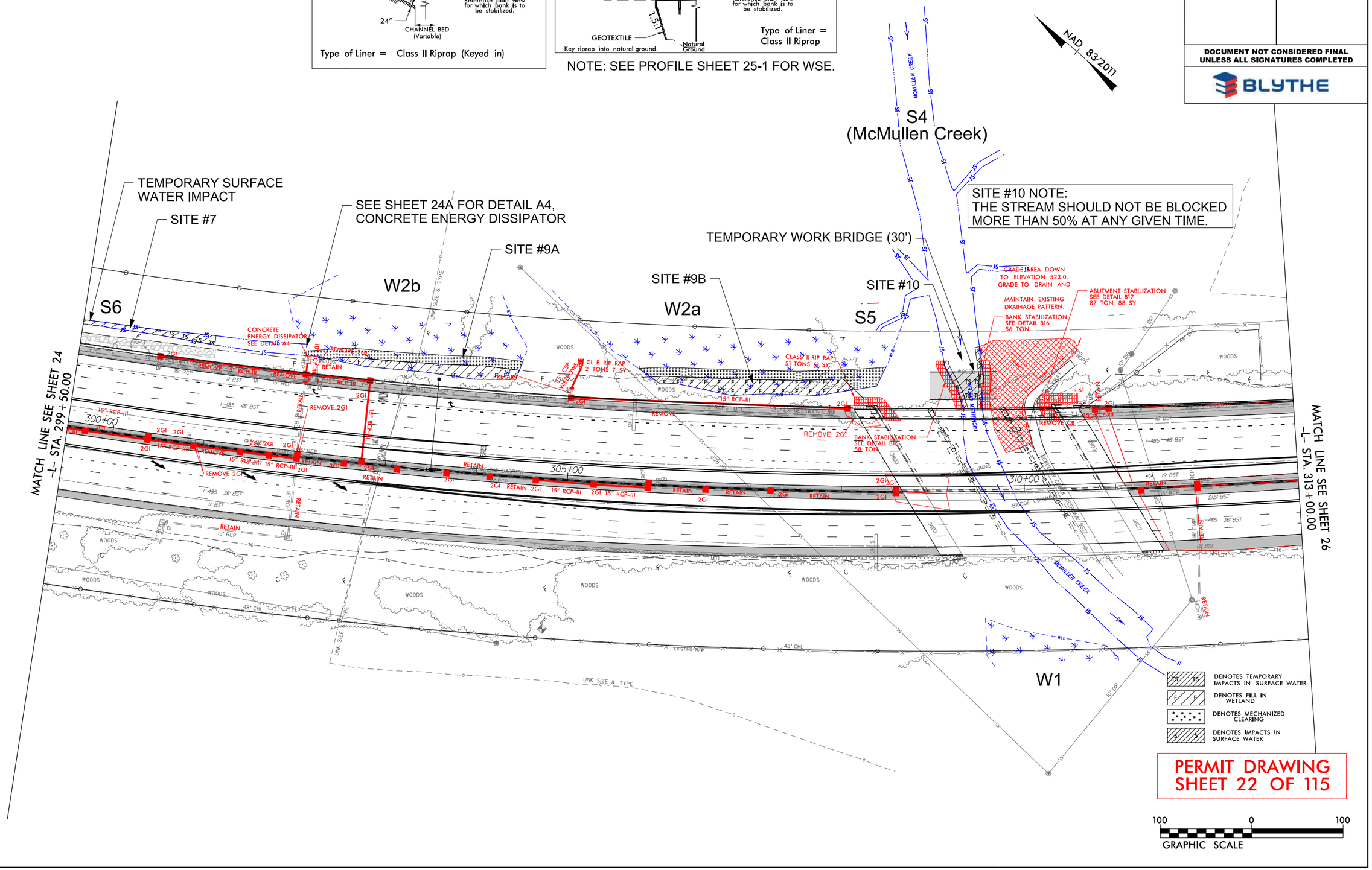
Type of Liner = Class II Riprap (Keyed in)

DETAIL B17
ABUTMENT STABILIZATION
(Not to Scale)



Type of Liner = Class II Riprap

NOTE: SEE PROFILE SHEET 25-1 FOR WSE.



PERMIT DRAWING
SHEET 22 OF 115

9/12/2019
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PRDPWTCS01$

wsp
1001 Morehead Square Dr.
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Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

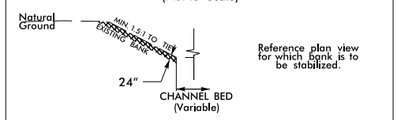
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

8/17/99

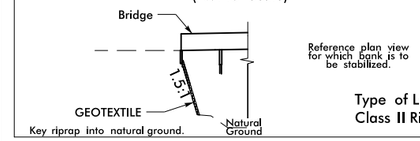
REVISIONS

DETAIL B16
BANK STABILIZATION
(Not to Scale)



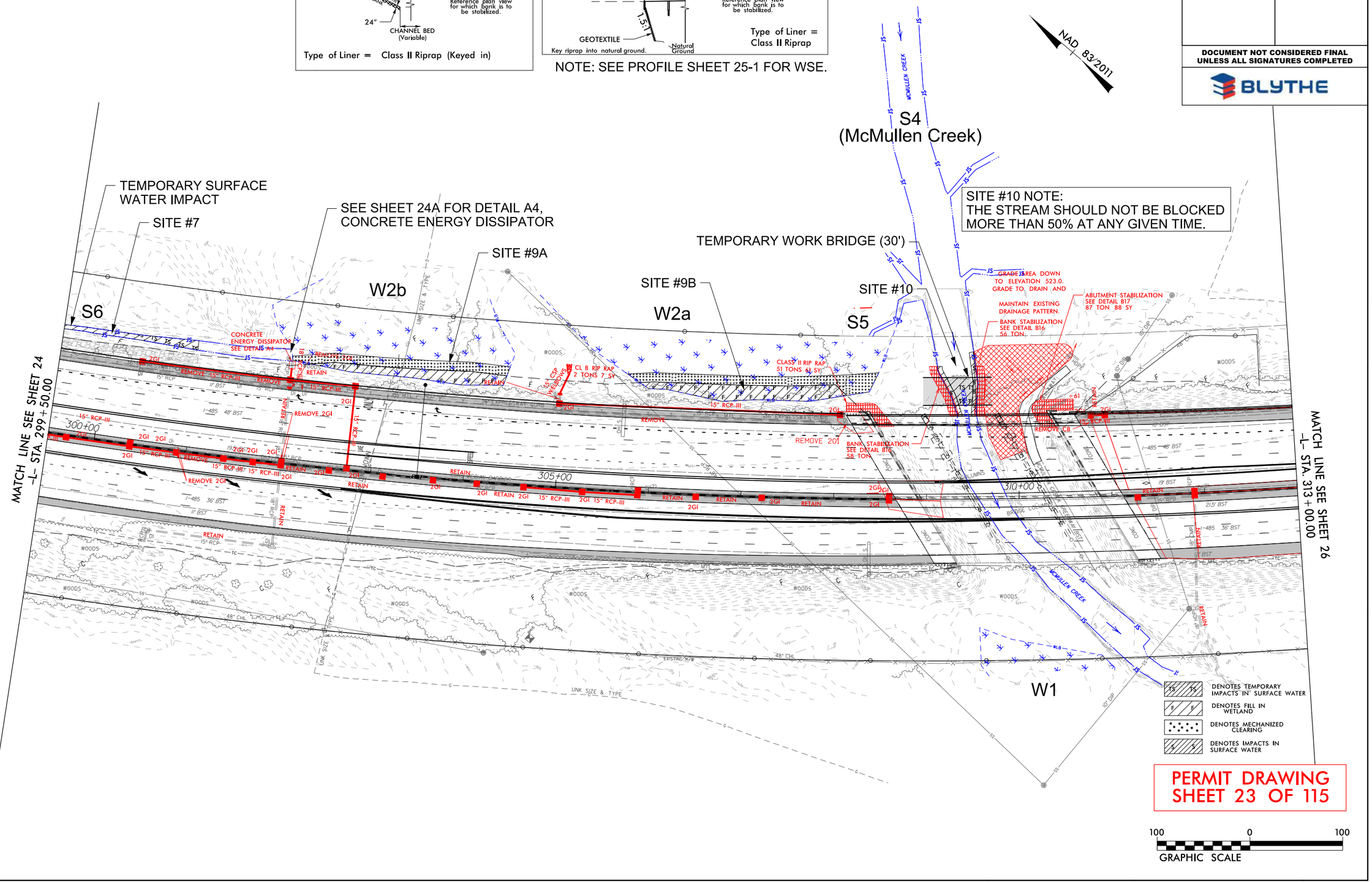
Type of Liner = Class II Riprap (Keyed in)

DETAIL B17
ABUTMENT STABILIZATION
(Not to Scale)



Type of Liner = Class II Riprap

NOTE: SEE PROFILE SHEET 25-1 FOR WSE.



PERMIT DRAWING
SHEET 23 OF 115

9/12/2019
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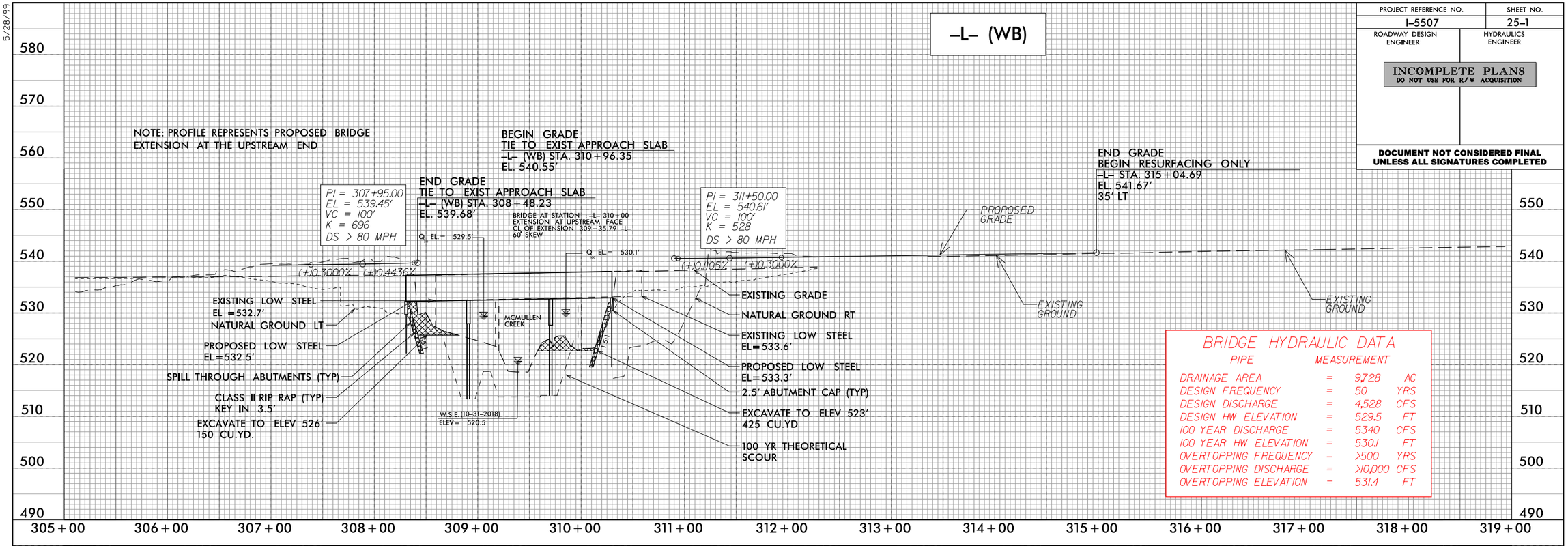
PRDPWTCS01$

PROJECT REFERENCE NO.	SHEET NO.
I-5507	25-1
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



BRIDGE HYDRAULIC DATA

PIPE		MEASUREMENT	
DRAINAGE AREA	=	9.728	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	4,528	CFS
DESIGN HW ELEVATION	=	529.5	FT
100 YEAR DISCHARGE	=	5340	CFS
100 YEAR HW ELEVATION	=	530.1	FT
OVERTOPPING FREQUENCY	=	>500	YRS
OVERTOPPING DISCHARGE	=	>10,000	CFS
OVERTOPPING ELEVATION	=	531.4	FT

PERMIT DRAWING
SHEET 24 OF 115

100 0 100
GRAPHIC SCALE (HORIZONTAL)

20 0 20
GRAPHIC SCALE (VERTICAL)

5/28/99

9/12/2019
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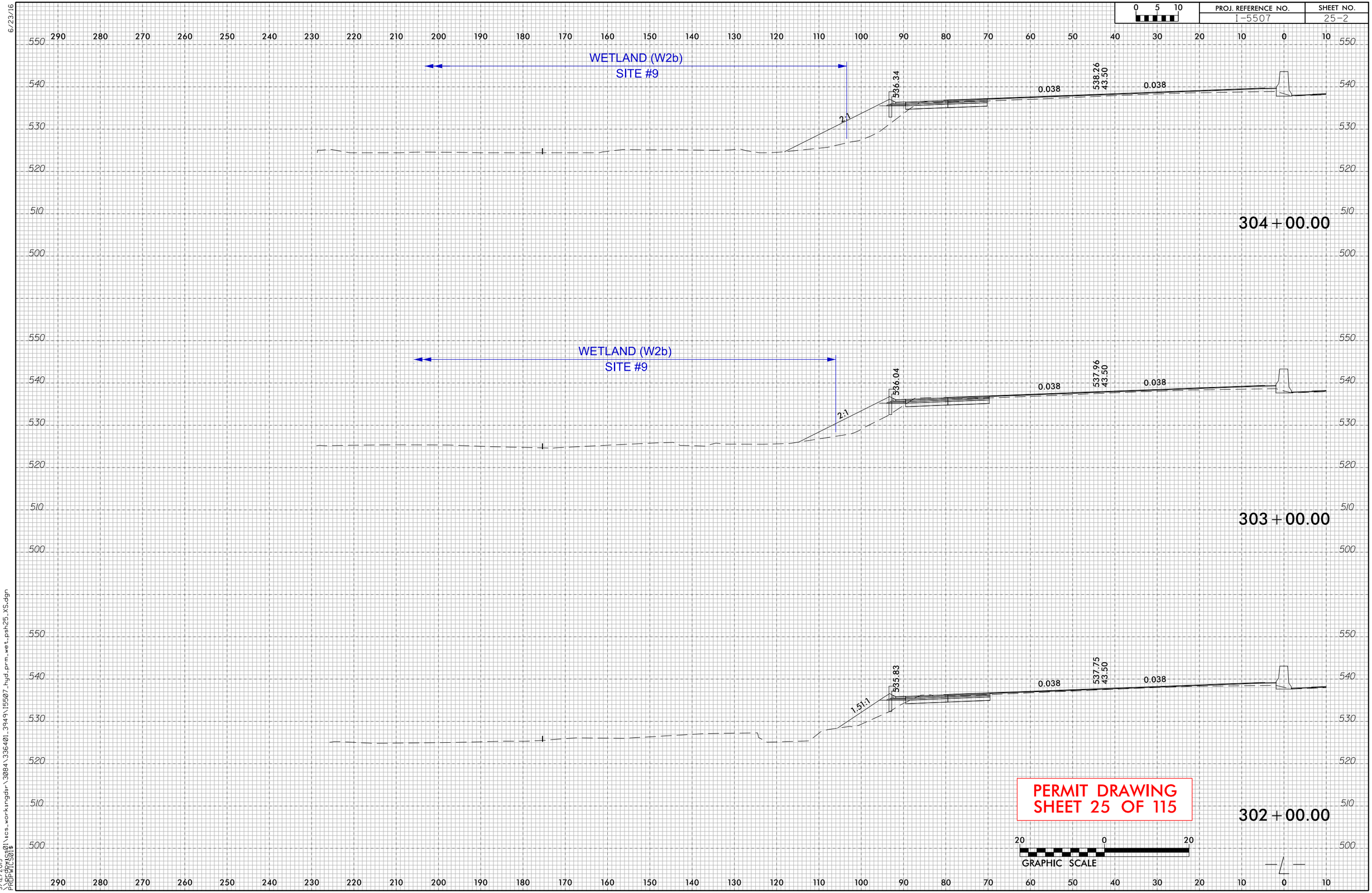
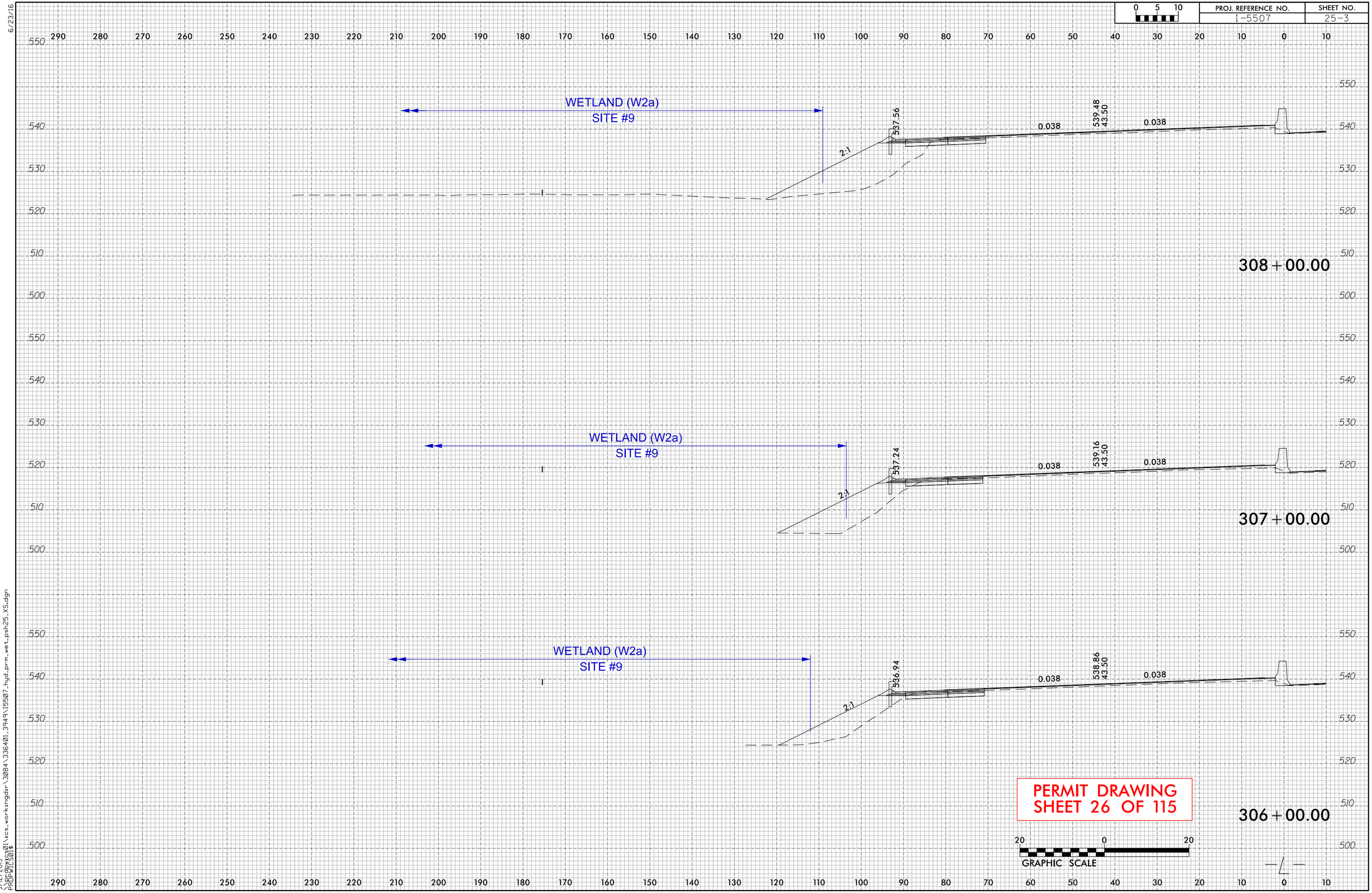
PROPWCS01$

PROJ. REFERENCE NO.	SHEET NO.
I-5507	25-2



6/23/16

9/12/2019
PROPWICS01$



6/23/16

9/12/2019
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PRDPWICS01$

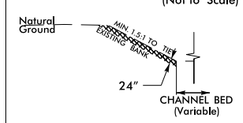
wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

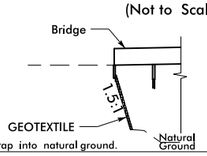
DETAIL B16
BANK STABILIZATION
(Not to Scale)



Reference plan view for which bank is to be stabilized.

Type of Liner = Class II Riprap (Keyed in)

DETAIL B17
ABUTMENT STABILIZATION
(Not to Scale)



Reference plan view for which bank is to be stabilized.

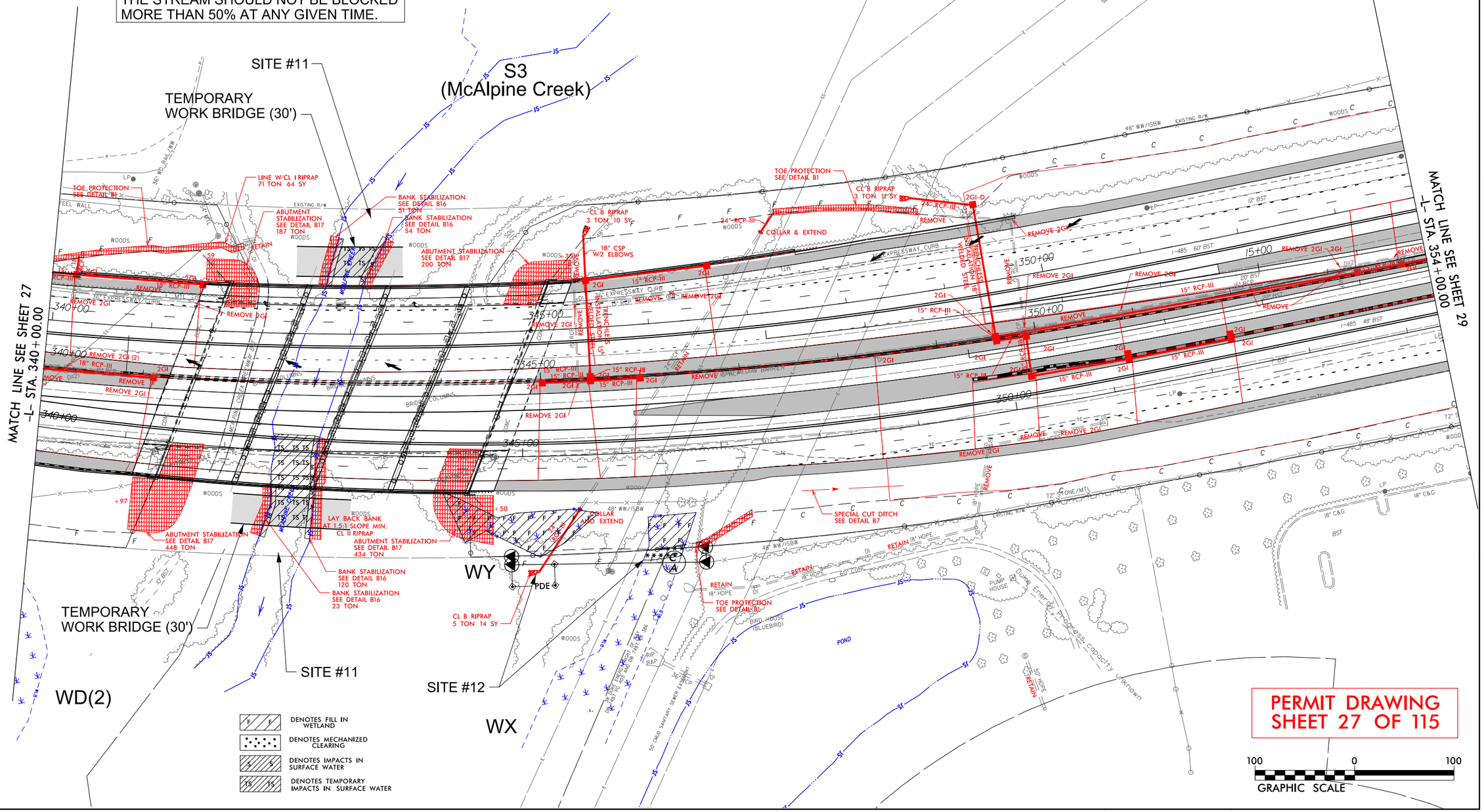
Type of Liner = Class II Riprap

Key riprap into natural ground.

NOTE: SEE PROFILE SHEET 28-1 FOR WSE.

NAD 83/2011

SITE #11 NOTE:
THE STREAM SHOULD NOT BE BLOCKED MORE THAN 50% AT ANY GIVEN TIME.



PERMIT DRAWING
SHEET 27 OF 115

REVISIONS

8/17/99

9/12/2019
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PRDPWICS01$

8/17/99

REVISIONS

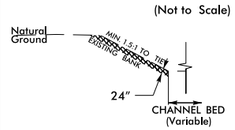
wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

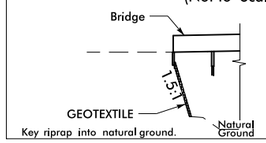
DETAIL B16
BANK STABILIZATION
(Not to Scale)



Reference plan view for which bank is to be stabilized.

Type of Liner = Class II Riprap (Keyed in)

DETAIL B17
ABUTMENT STABILIZATION
(Not to Scale)



Reference plan view for which bank is to be stabilized.

Type of Liner = Class II Riprap

NOTE: SEE PROFILE SHEET 28-1 FOR WSE.

NAD 83/2011

SITE #11 NOTE:
THE STREAM SHOULD NOT BE BLOCKED MORE THAN 50% AT ANY GIVEN TIME.

SITE #11

TEMPORARY WORK BRIDGE (30')

S3 (McAlpine Creek)

MATCH LINE SEE SHEET 27 -L- STA. 340+00.00

MATCH LINE SEE SHEET 29 -L- STA. 354+00.00

TOE PROTECTION SEE DETAIL B1

LINE W/CL I RIPRAP 71 TON 64 SY

ABUTMENT STABILIZATION SEE DETAIL B17 187 TON

BANK STABILIZATION SEE DETAIL B16 51 TON

BANK STABILIZATION SEE DETAIL B16 54 TON

ABUTMENT STABILIZATION SEE DETAIL B17 200 TON

CL B RIPRAP 3 TON 10 SY

18" CSP W/2 ELBOWS

24" RCP-III

COLLAR & EXTEND

REMOVE

REMOVE 2GI

REMOVE 2GI (2)

15" RCP-III

18" RCP-III

2GI

RETAIN

EXPRESSWAY CURB

TRIANGLES 18" WELDED STEEL

REMOVE (BARC MEDIAN BARRIER)

REMOVE 2GI (2)

ABUTMENT STABILIZATION SEE DETAIL B17 448 TON

LAY BACK BANK AT 1.5:1 SLOPE MIN. CL II RIPRAP

ABUTMENT STABILIZATION SEE DETAIL B17 434 TON

BANK STABILIZATION SEE DETAIL B16 120 TON

BANK STABILIZATION SEE DETAIL B16 23 TON

CL B RIPRAP 5 TON 14 SY

WY

PDE

SITE #12

WX

TEMPORARY WORK BRIDGE (30')

SITE #11

WD(2)

SPECIAL CUT DITCH SEE DETAIL B7

RETAIN 18" HDPE

TOE PROTECTION SEE DETAIL B1

POND

Duke Energy Progress capacity unknown

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 28 OF 115

100 0 100
GRAPHIC SCALE

9/12/2019
PROPWTCS01$
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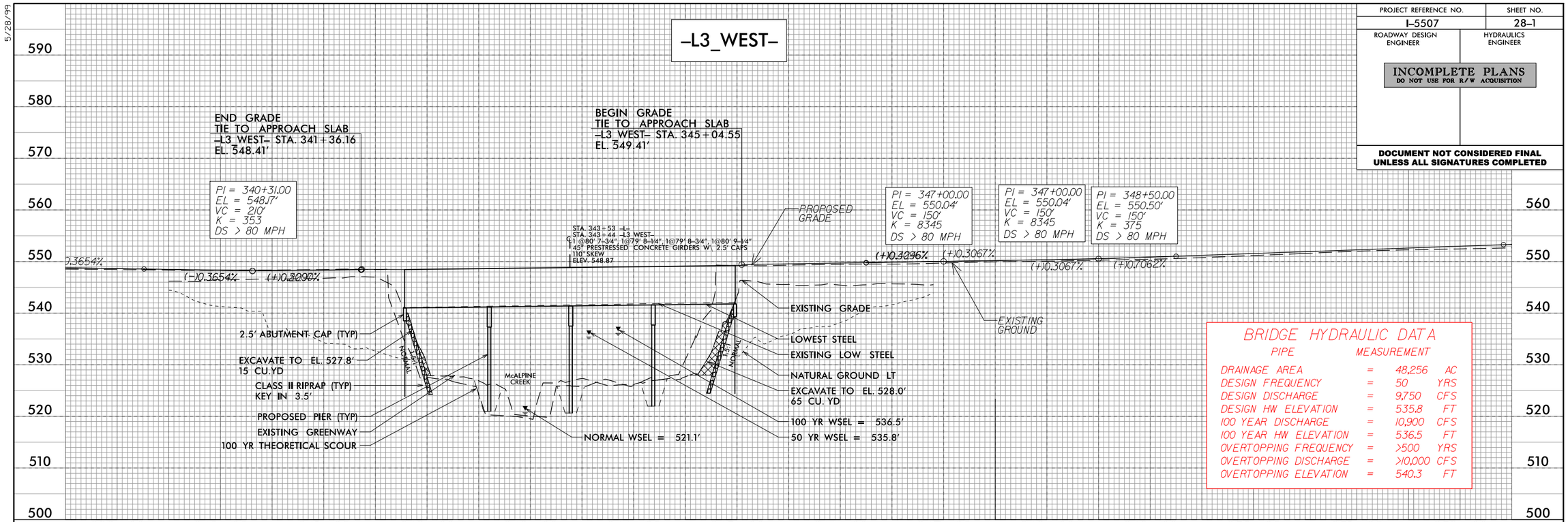
PROJECT REFERENCE NO.	SHEET NO.
I-5507	28-1
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

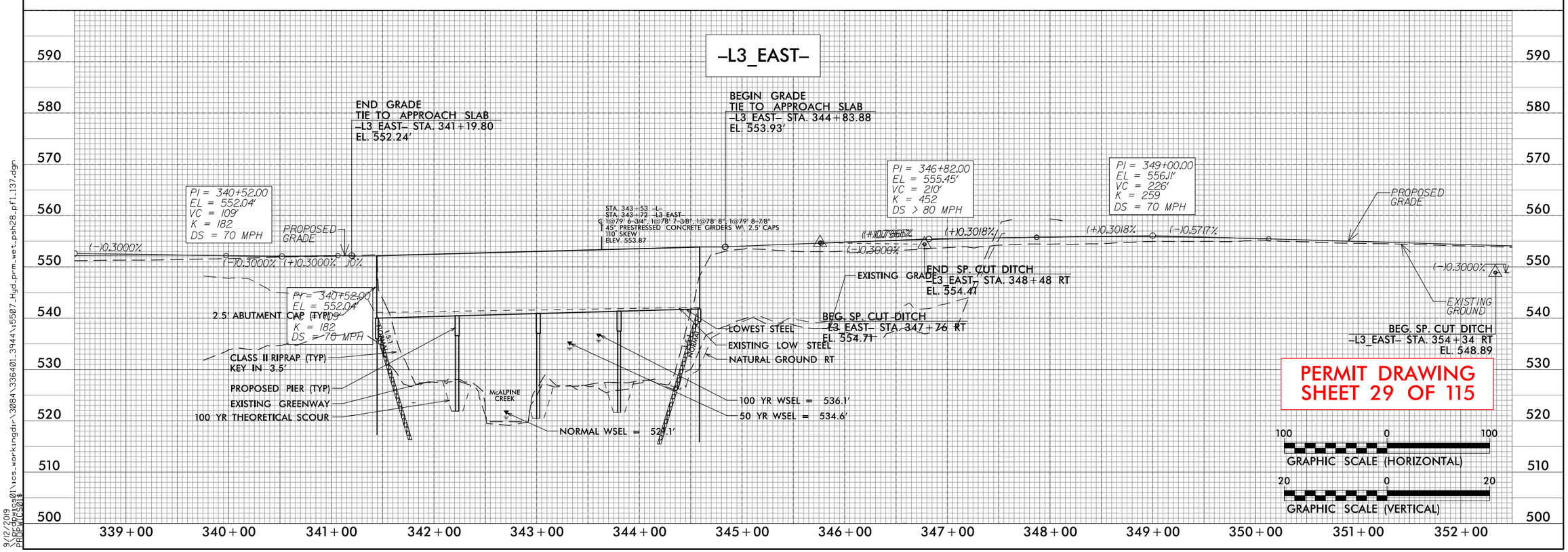
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



BRIDGE HYDRAULIC DATA

PIPE		MEASUREMENT	
DRAINAGE AREA	=	48,256	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	9,750	CFS
DESIGN HW ELEVATION	=	535.8	FT
100 YEAR DISCHARGE	=	10,900	CFS
100 YEAR HW ELEVATION	=	536.5	FT
OVERTOPPING FREQUENCY	=	>500	YRS
OVERTOPPING DISCHARGE	=	>10,000	CFS
OVERTOPPING ELEVATION	=	540.3	FT



PERMIT DRAWING
SHEET 29 OF 115

GRAPHIC SCALE (HORIZONTAL)

GRAPHIC SCALE (VERTICAL)

5/28/99

9/12/2019
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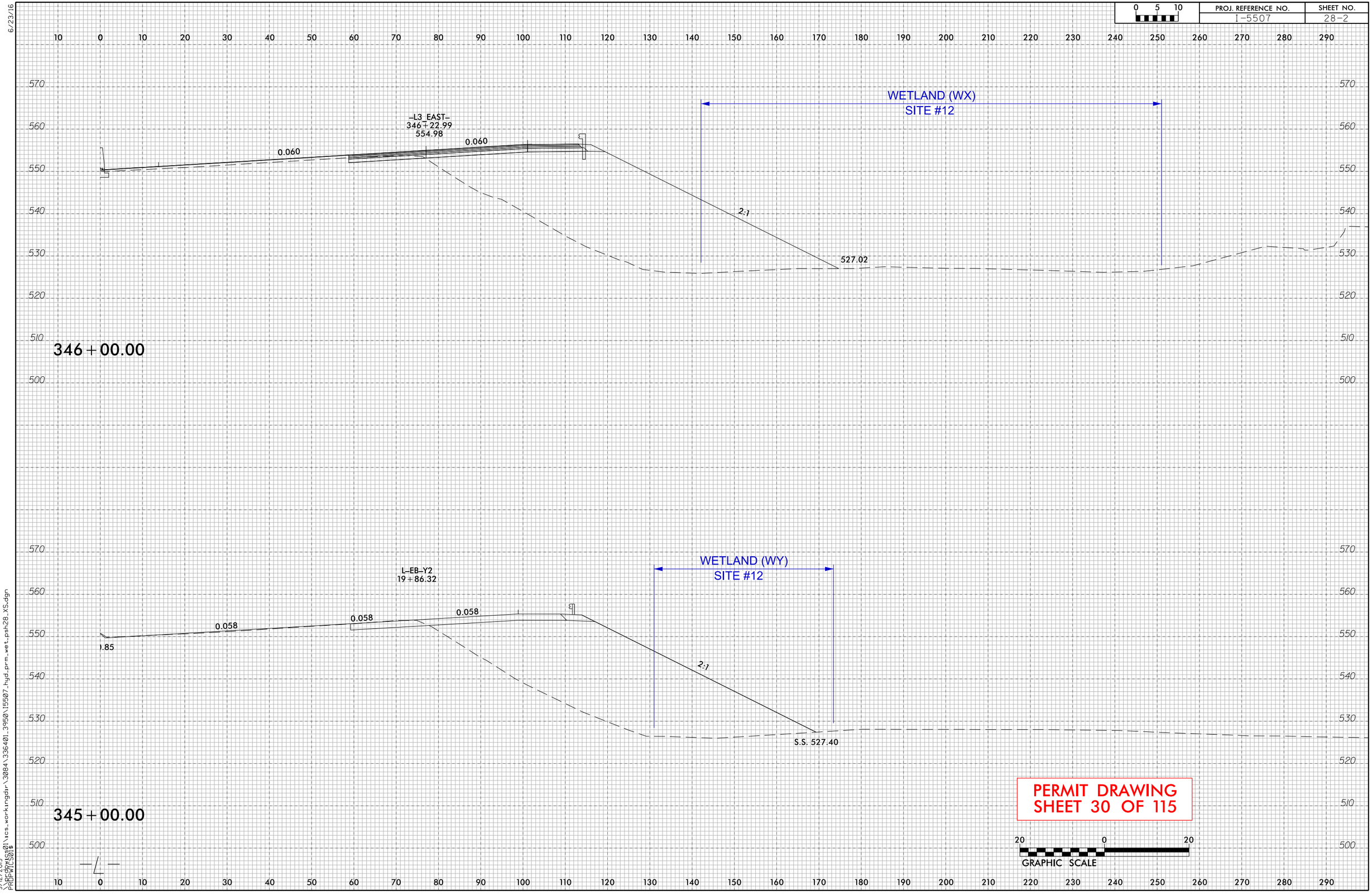
PRDPWICS01$

PROJ. REFERENCE NO.	SHEET NO.
I-5507	28-2



6/23/16

9/12/2019
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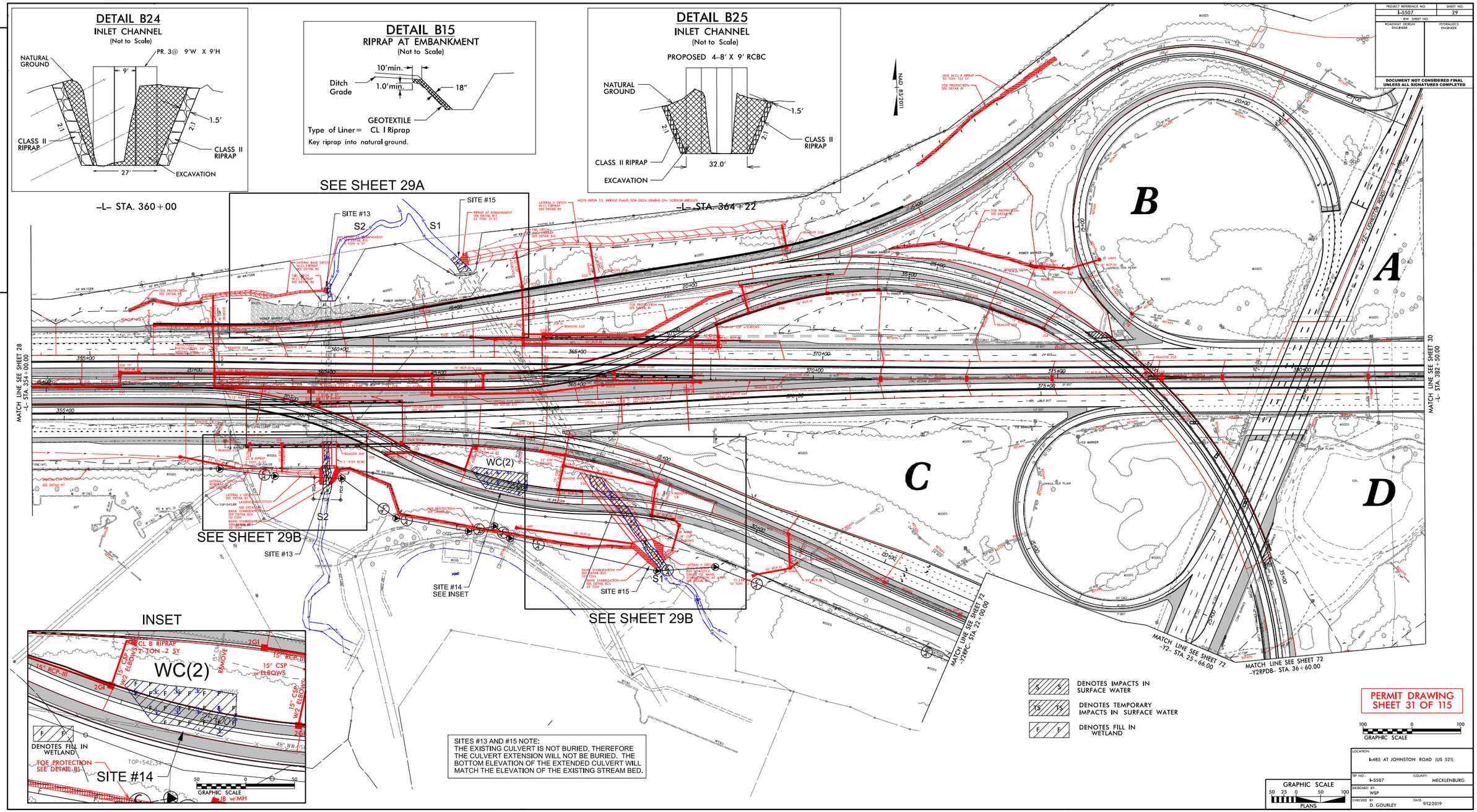


SITES #13 AND #15 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

F F DENOTES FILL IN WETLAND

PERMIT DRAWING
SHEET 31 OF 115

GRAPHIC SCALE

GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
I-5507	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LOCATION: I-485 AT JOHNSTON ROAD (US 521)

TIP NO.: I-5507 COUNTY: MECKLENBURG

DESIGNED BY: WSP

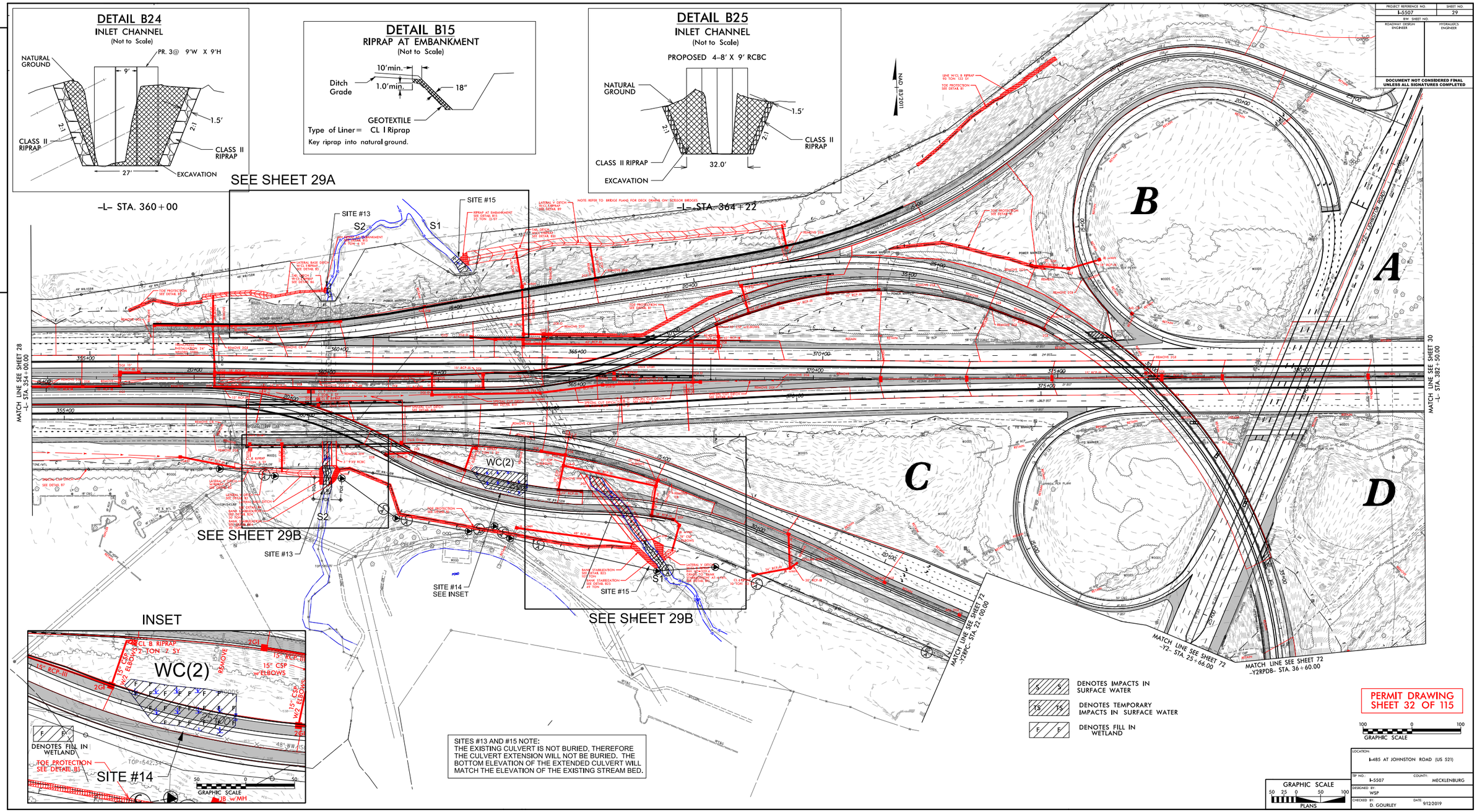
CHECKED BY: D. GOURLEY DATE: 9/12/2019

DETAIL B24
INLET CHANNEL
(Not to Scale)

DETAIL B15
RIPRAP AT EMBANKMENT
(Not to Scale)

Type of Liner= CL I Riprap
Key riprap into natural ground.

DETAIL B25
INLET CHANNEL
(Not to Scale)



SITES #13 AND #15 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

S / S — DENOTES IMPACTS IN SURFACE WATER

TS / TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

F / F — DENOTES FILL IN WETLAND

PERMIT DRAWING
SHEET 32 OF 115

GRAPHIC SCALE
100 0 100

GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
I-5507	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

LOCATION: I-485 AT JOHNSTON ROAD (US 521)
TIP NO.: I-5507
COUNTY: MECKLENBURG
DESIGNED BY: WSP
CHECKED BY: D. GOURLEY
DATE: 9/12/2019

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	29A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

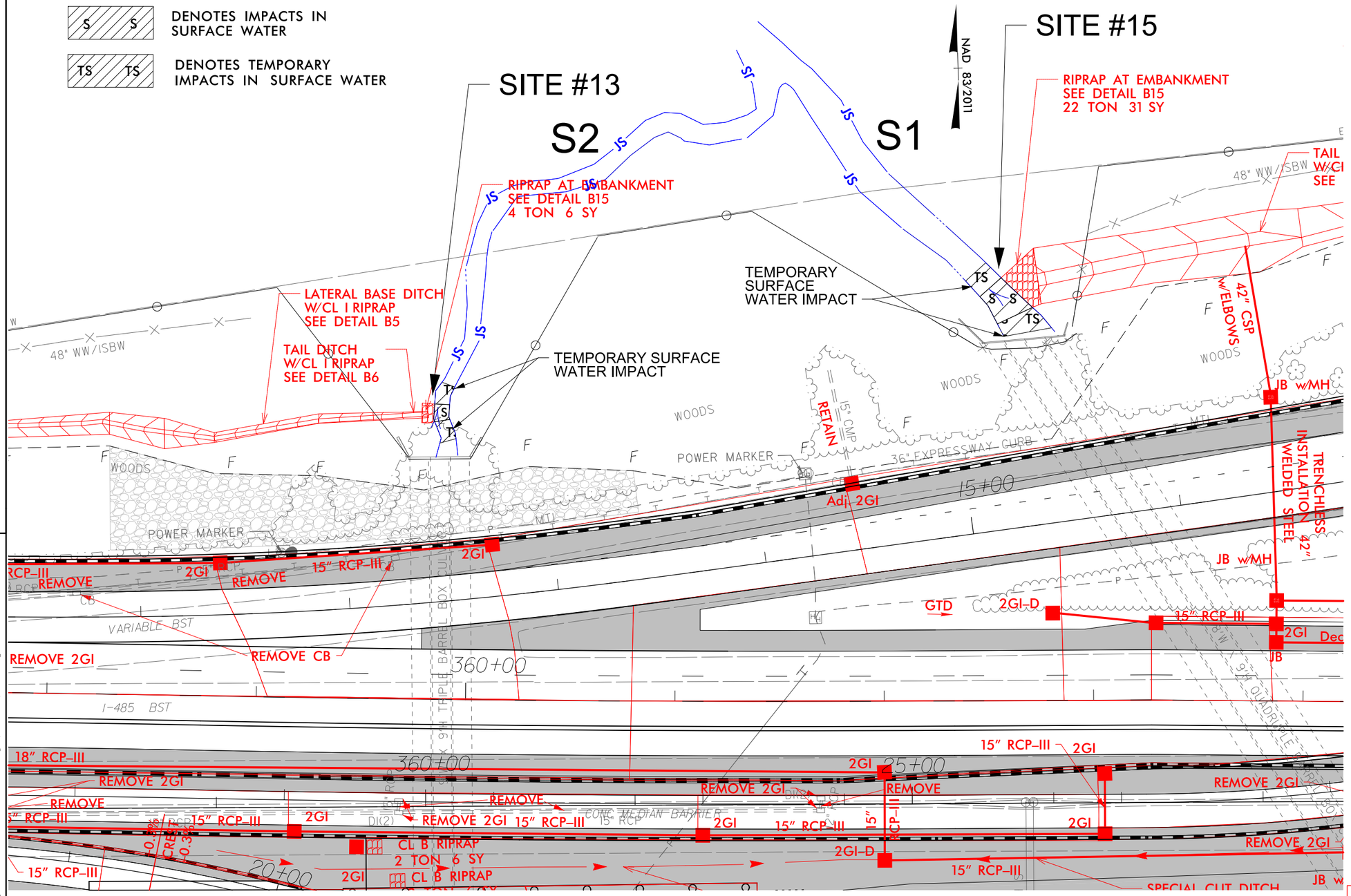
BLYTHE

8/17/99

REVISIONS

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER



PERMIT DRAWING
SHEET 33 OF 115

50 0 50
GRAPHIC SCALE

9/12/2019
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PROPWICS01$

8/17/99

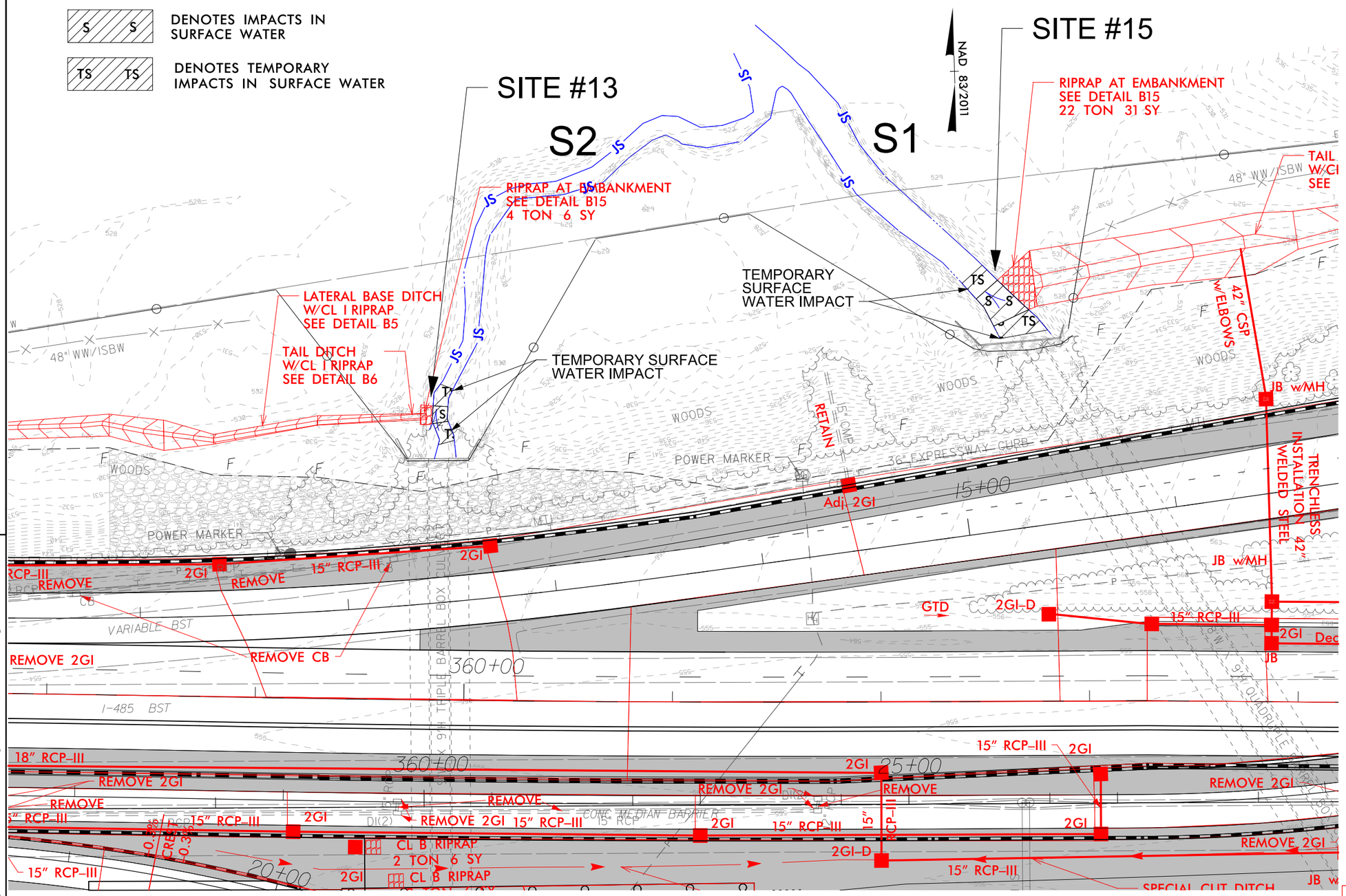
REVISIONS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	29A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



9/12/2019
N:\Projects01\ics_workingdir\3084\336401.3962\I5507_Hyd-prm_wet_psh29A_cont.dgn
PROPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-5507	29B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

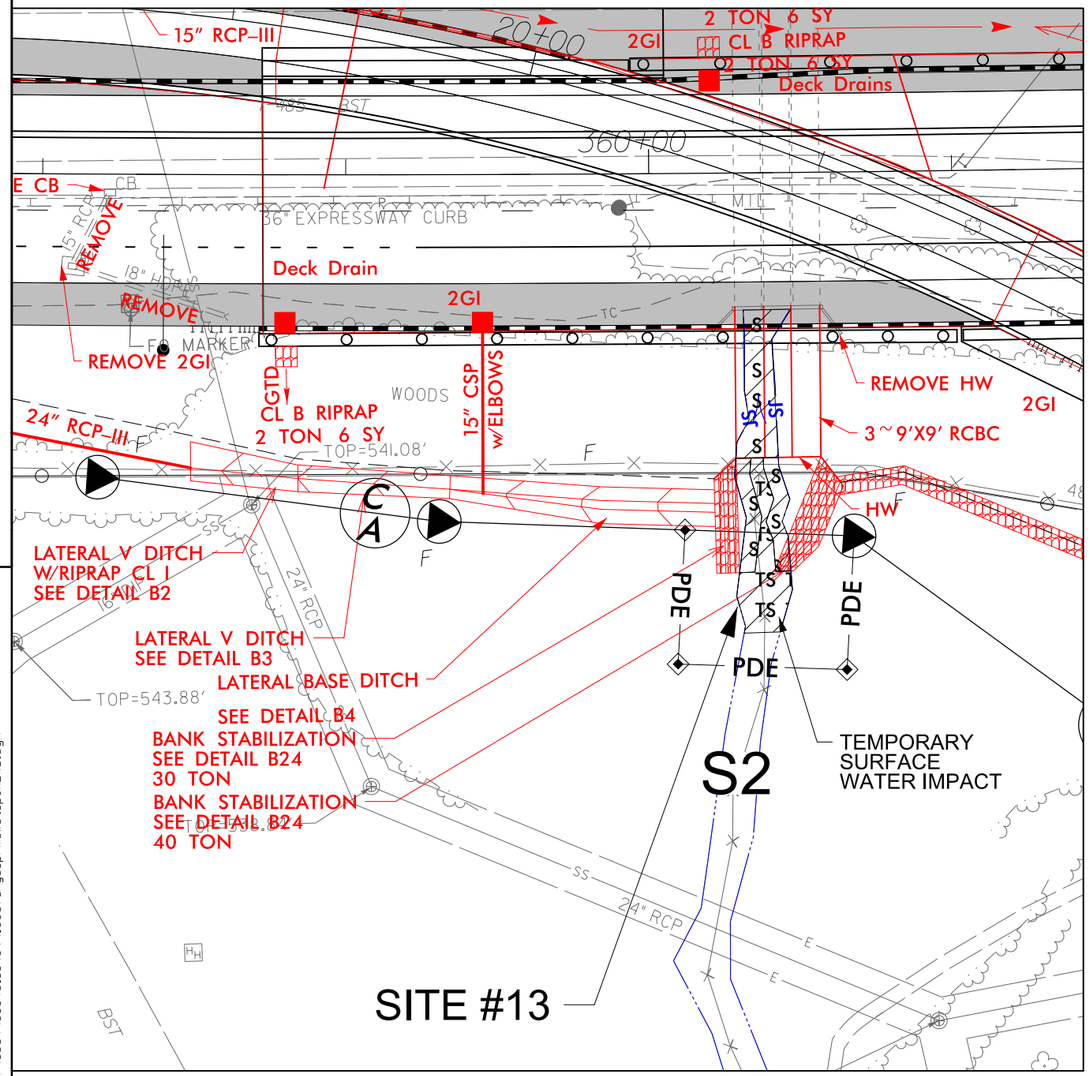
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

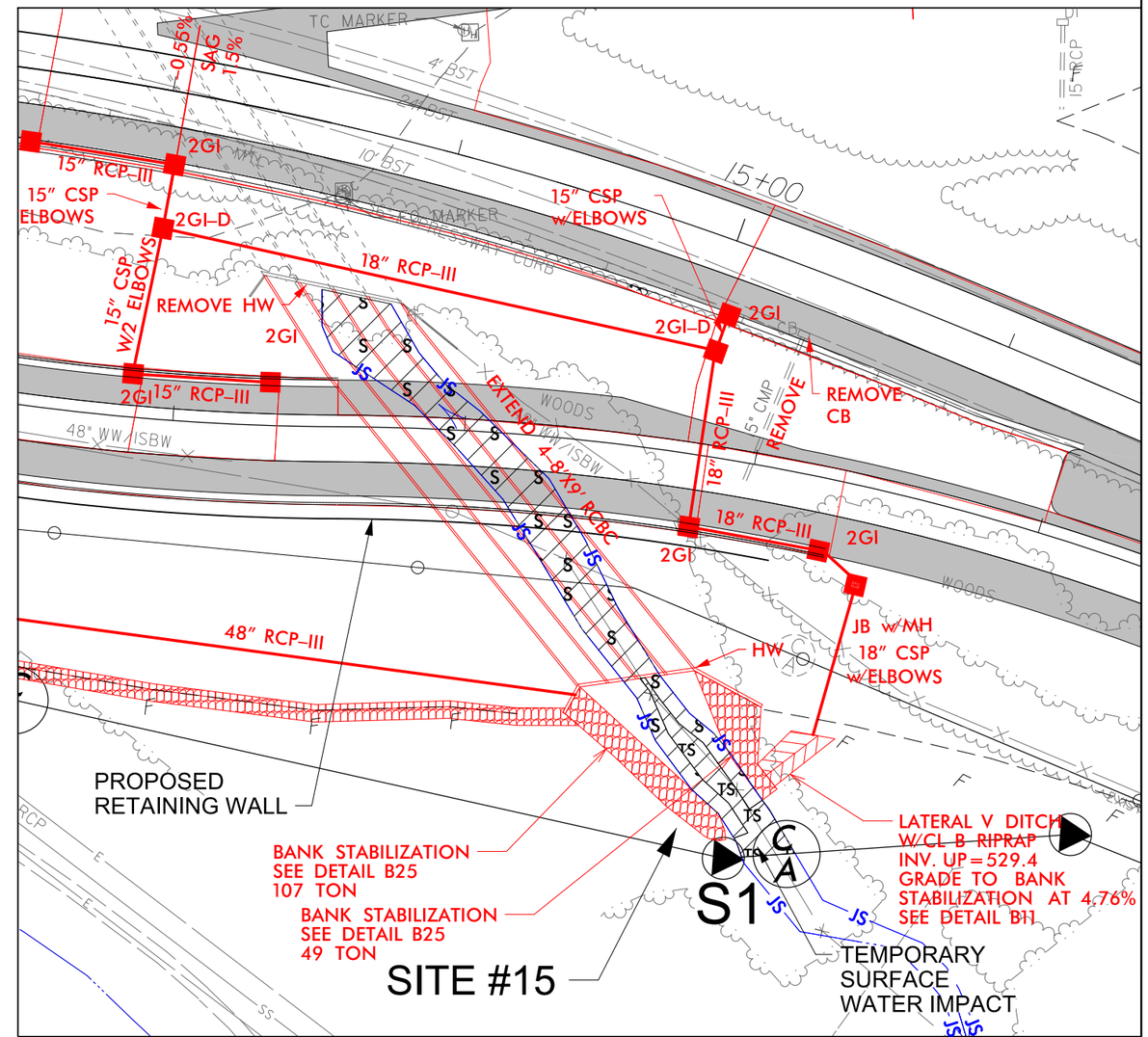
BLYTHE

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/2011





SITES #13 AND #15 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

PERMIT DRAWING
SHEET 35 OF 115

50 0 50
GRAPHIC SCALE

REVISIONS

8/17/99

9/12/2019
\\prdpwics01\ics_workingdir\3084\336401_3959\i5507_Hyd_prm_wet_psh29B.dgn
PRDPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-5507	29B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

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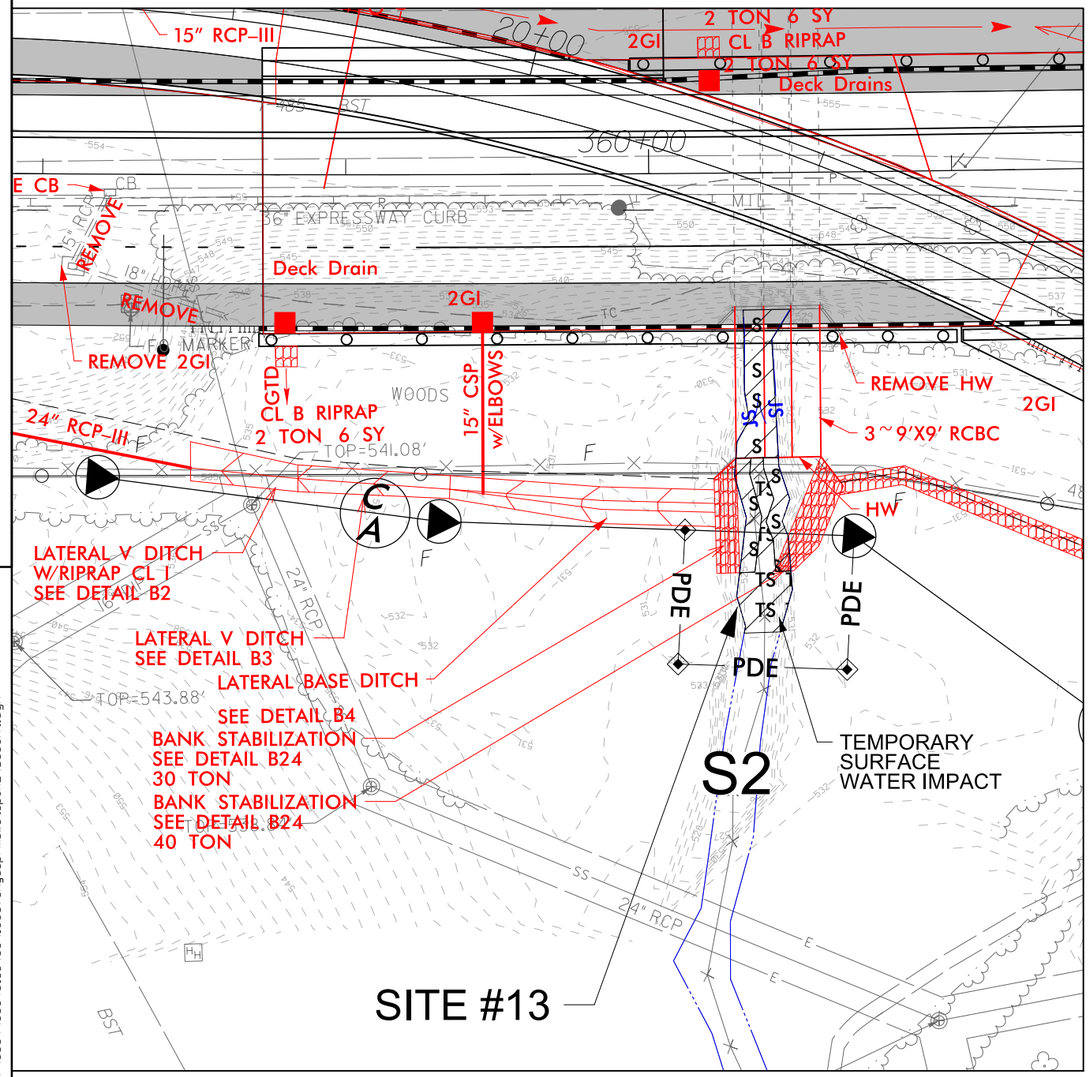
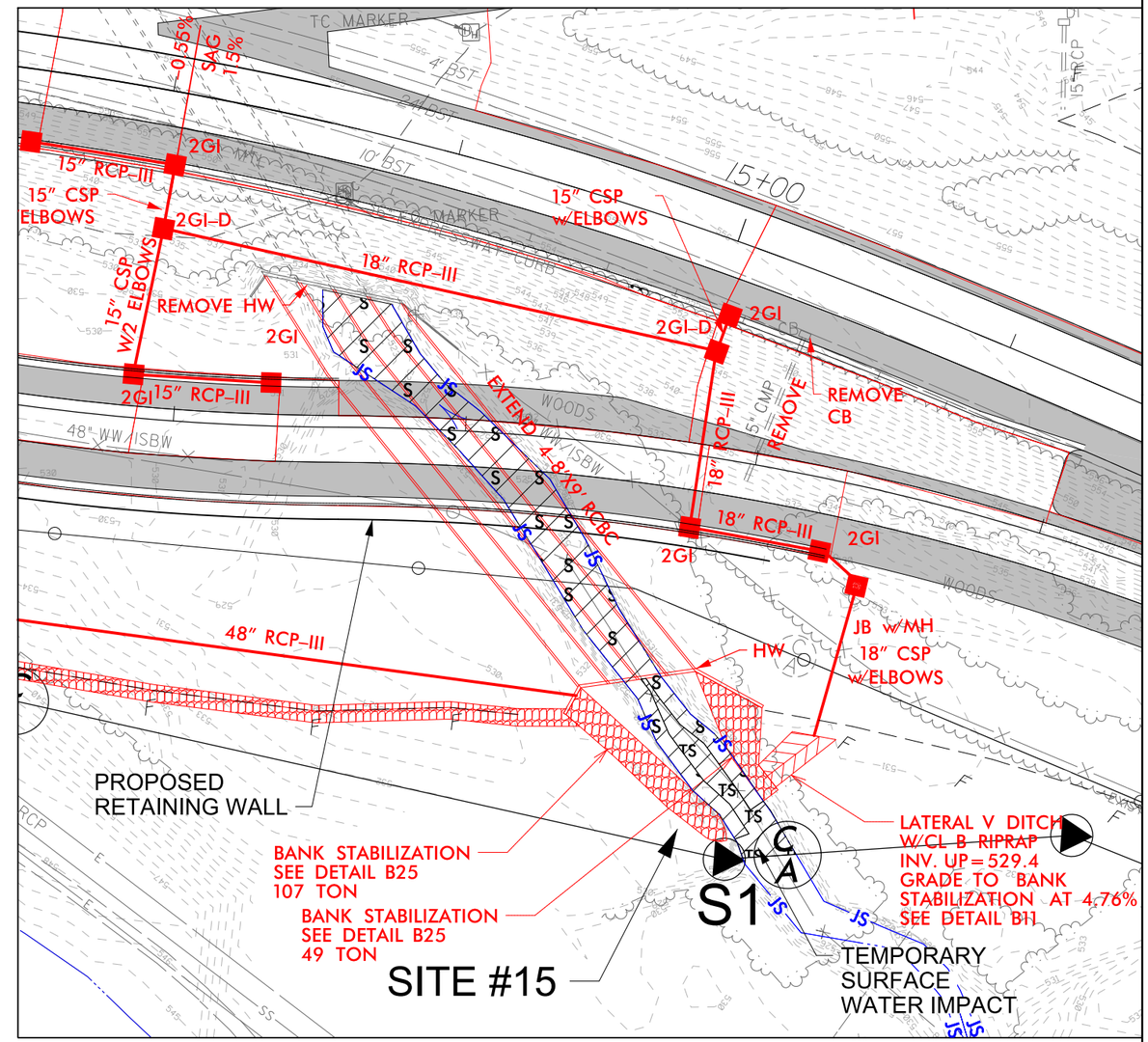
BLYTHE

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/2011





SITES #13 AND #15 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

PERMIT DRAWING
SHEET 36 OF 115

50 0 50
GRAPHIC SCALE

REVISIONS

8/17/99

9/12/2019
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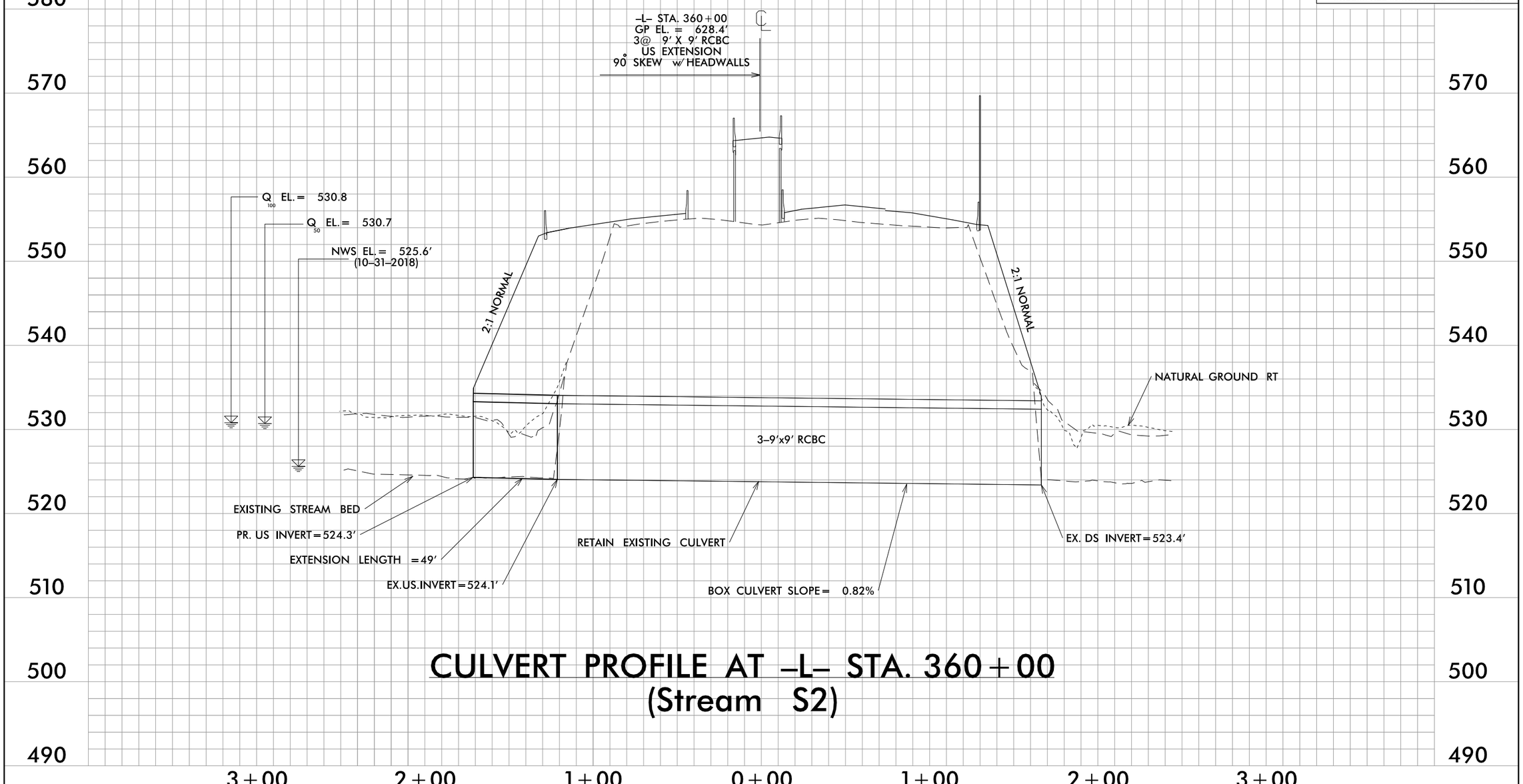
PRDPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-5507	29-1
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SITE #13



CULVERT PROFILE AT -L- STA. 360+00
(Stream S2)

PERMIT DRAWING
SHEET 37 OF 115

50 0 50
GRAPHIC SCALE (HORIZONTAL)

10 0 10
GRAPHIC SCALE (VERTICAL)

5/28/99

9/12/2019
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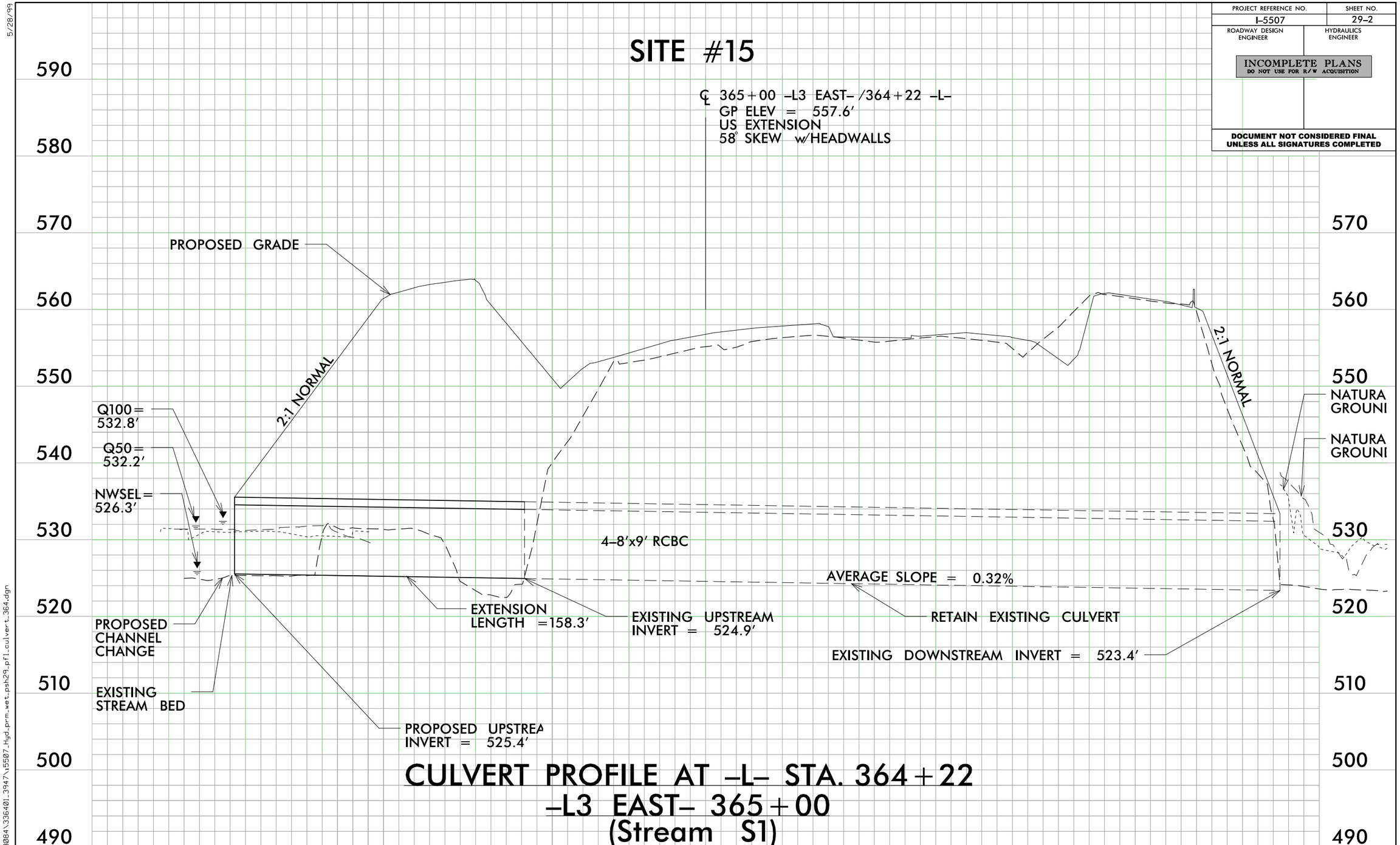
PRDPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-5507	29-2
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



CULVERT PROFILE AT -L- STA. 364+22
-L3 EAST- 365+00
(Stream S1)

PERMIT DRAWING
SHEET 38 OF 115

50 0 50
GRAPHIC SCALE (HORIZONTAL)

10 0 10
GRAPHIC SCALE (VERTICAL)

5/28/99

9/12/2019
\\prdpwics01\ics_workingdir\3084\336401_3947\i5507_Hyd_prm_wet_psh29_pfl_culvert_364.dgn
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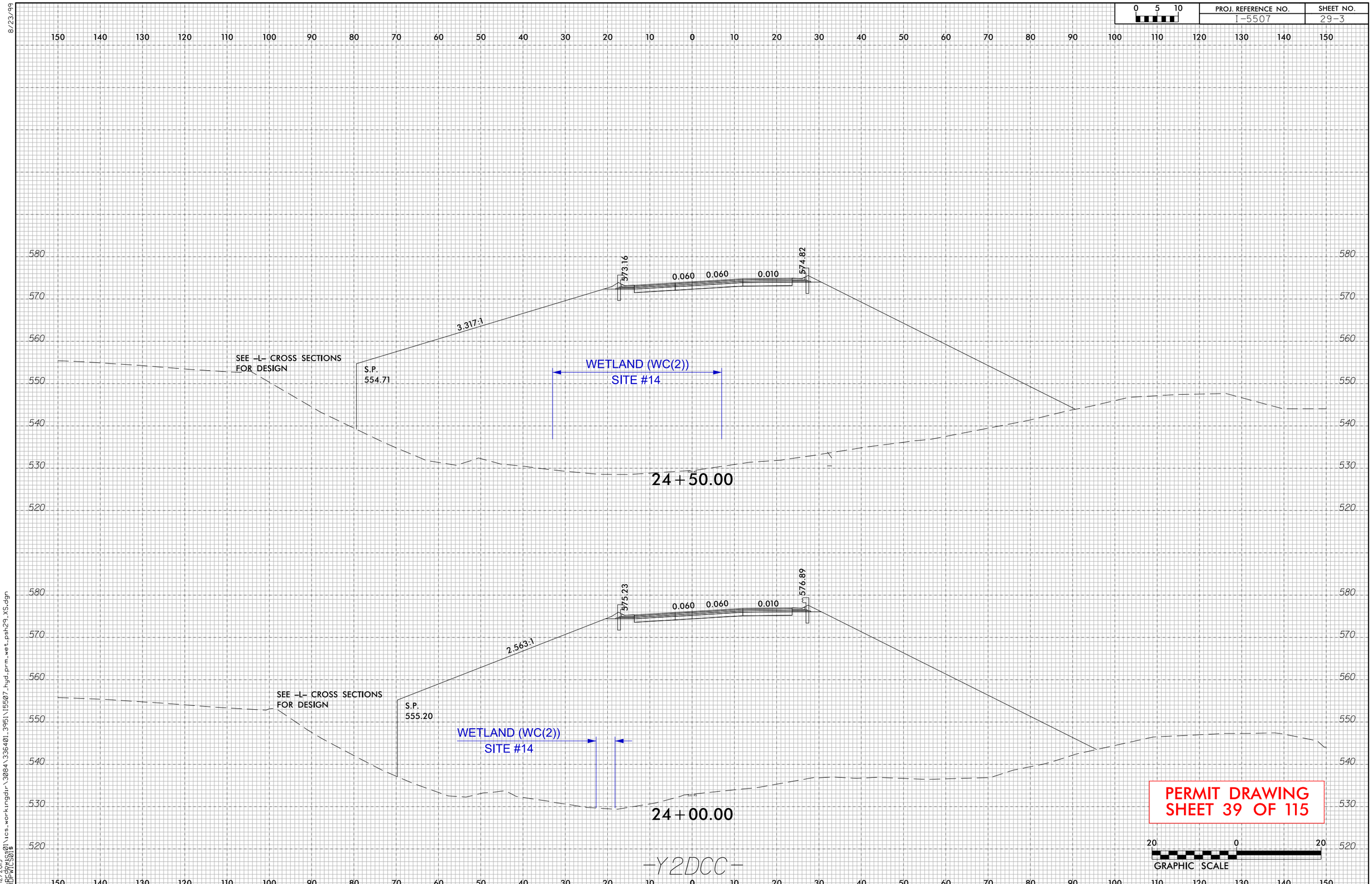

8/23/99

9/12/2019
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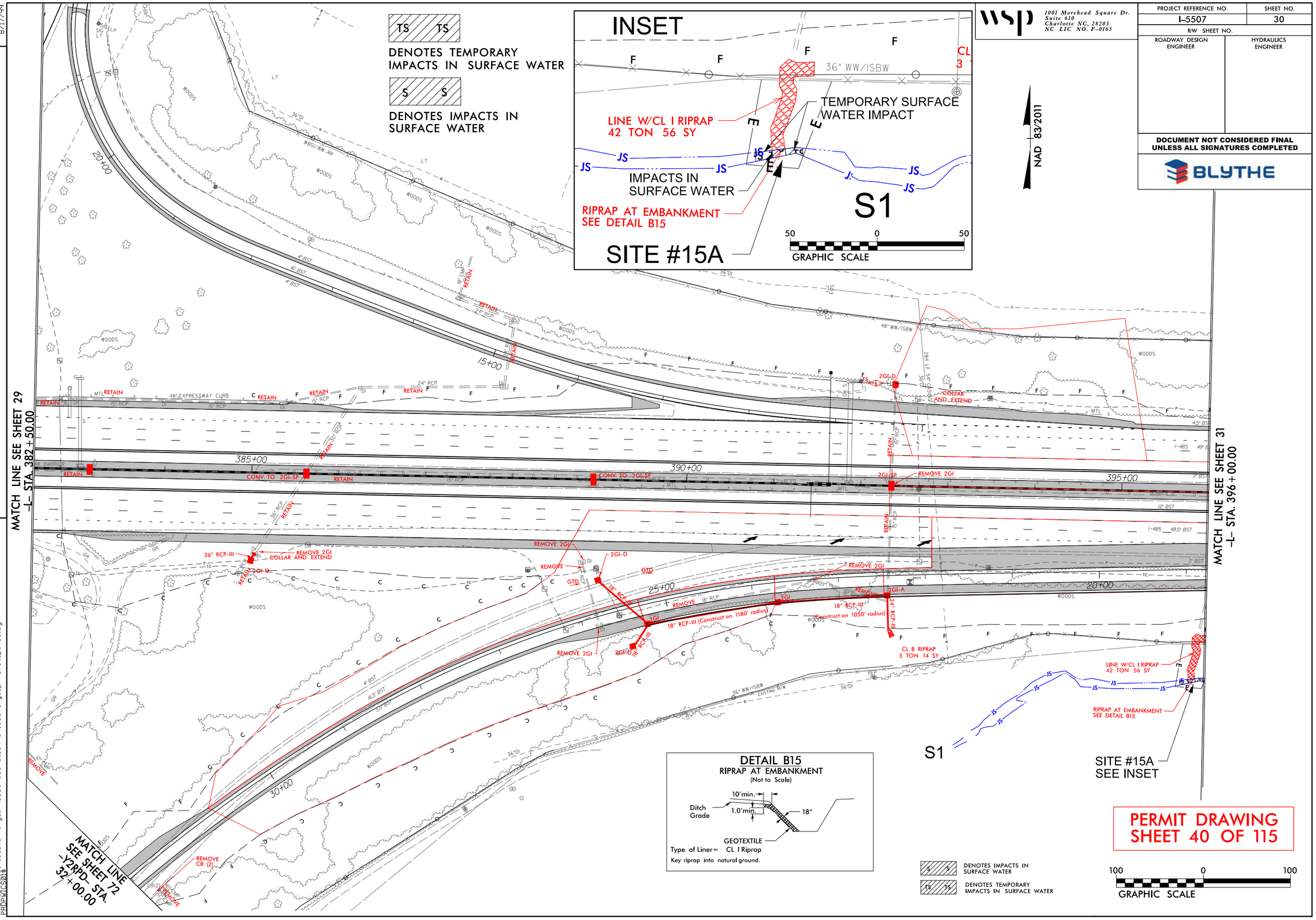

PROJECT REFERENCE NO.	SHEET NO.
I-5507	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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REVISIONS

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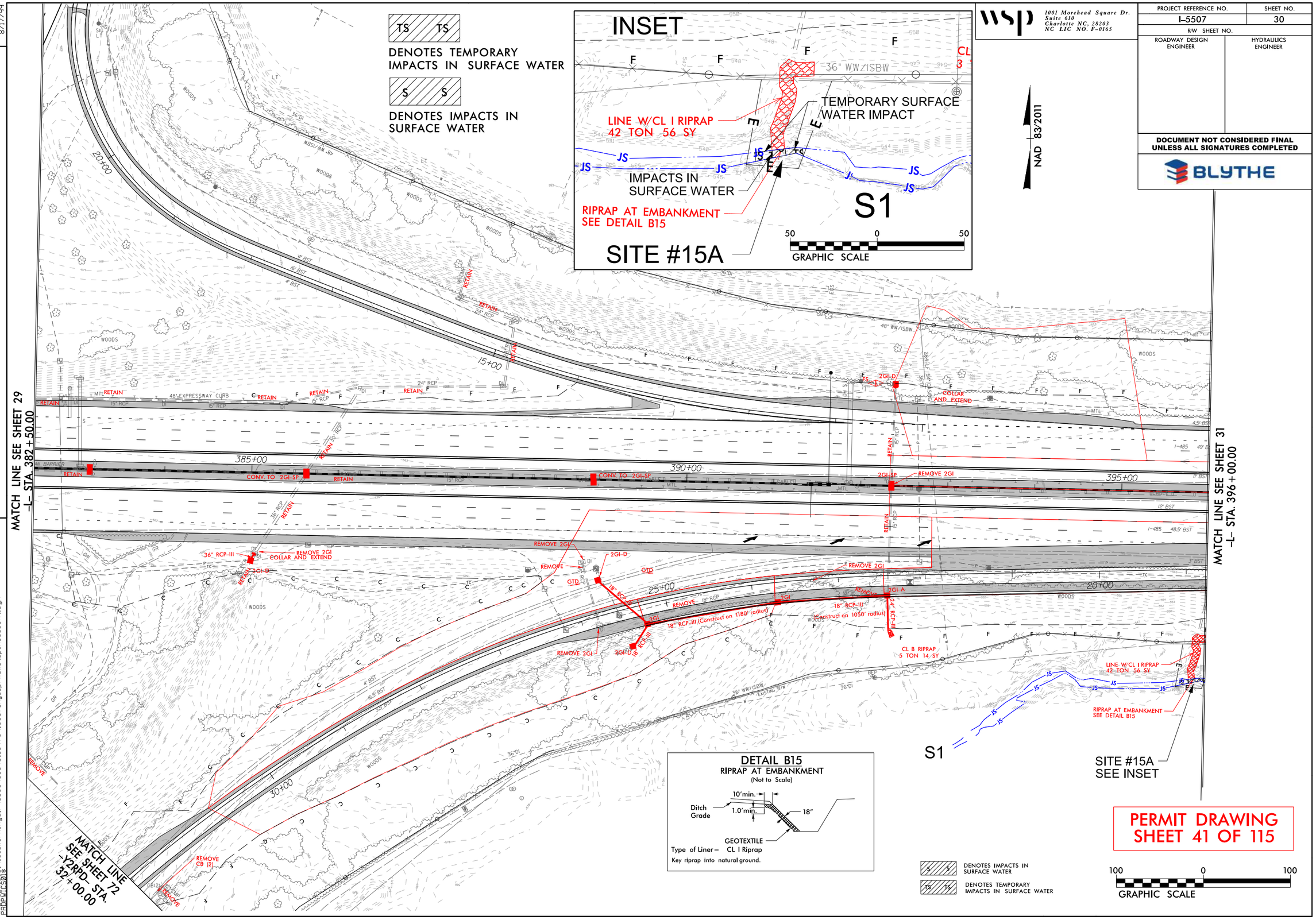
9/12/2019 \\prdpwics01\ics_workingdir\3086\336401_3973\i5507_Hyd_prm_wet_psh30.dgn PRDPWICS01$



PERMIT DRAWING
SHEET 41 OF 115

wsp
1001 Morehead Square Dr.
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Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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REVISIONS

8/17/99

9/12/2019
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PRDPWICS01$

PROJECT REFERENCE NO.	SHEET NO.
I-5507	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NC LIC NO. F-0165

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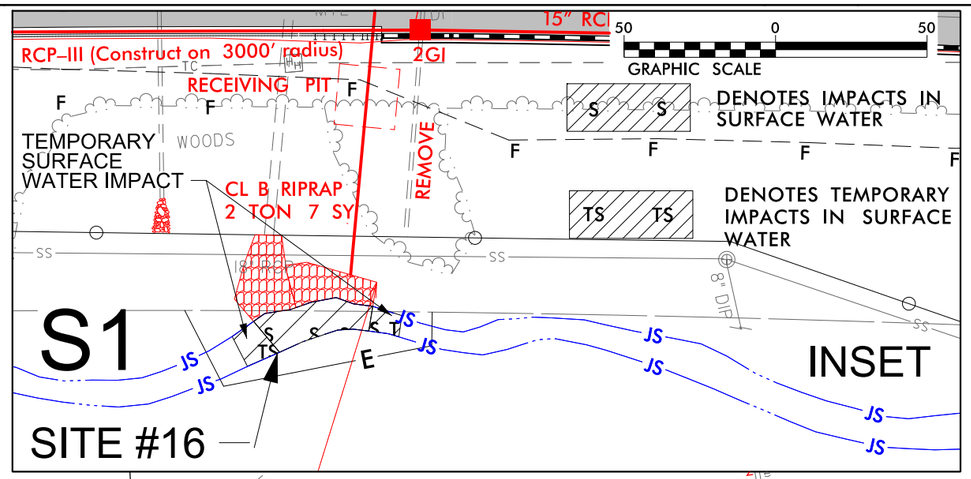
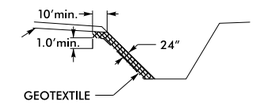
8/17/99

REVISIONS

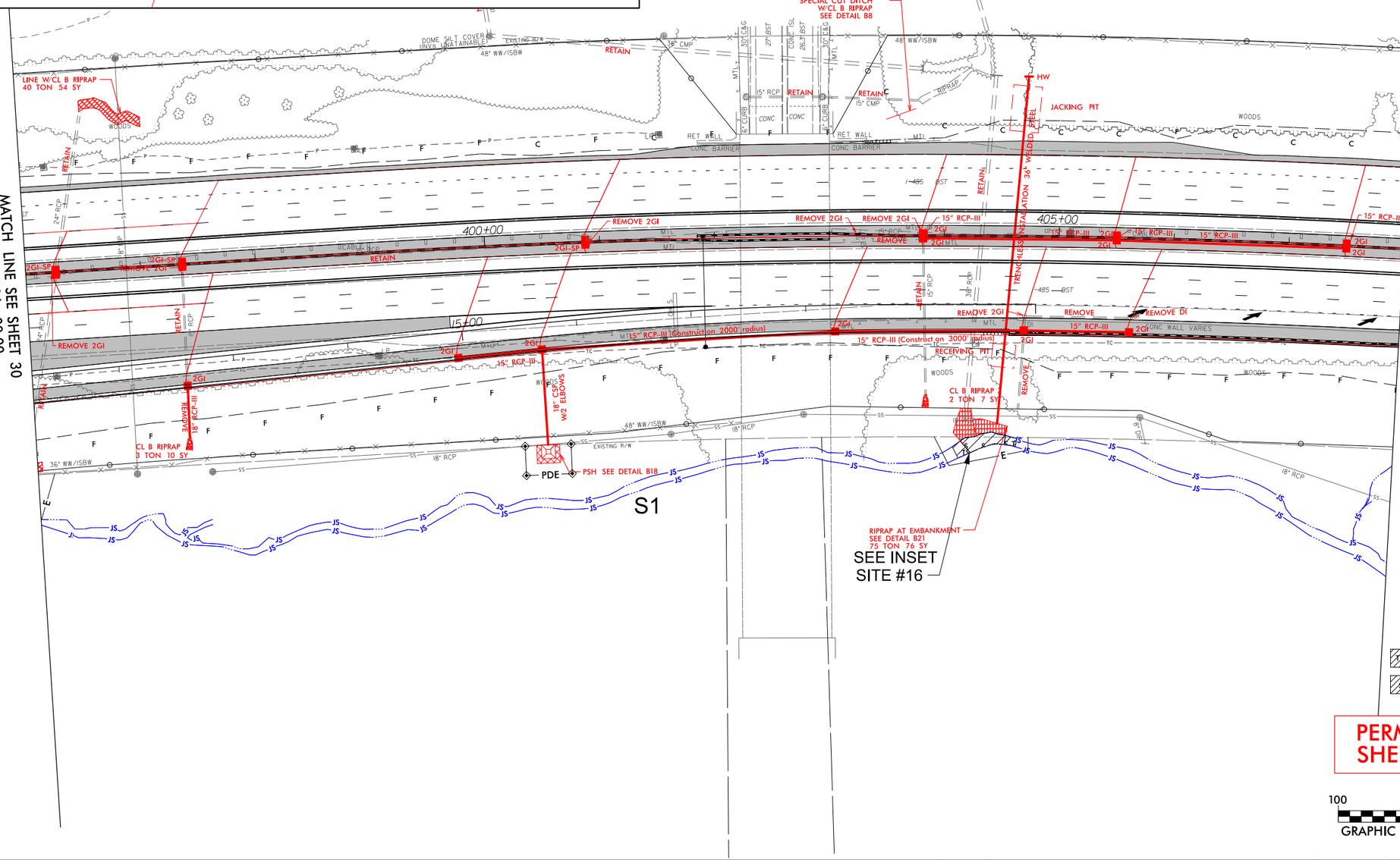


DETAIL B21
RIPRAP AT EMBANKMENT
(Not to Scale)



Type of Liner= CL II Riprap Key riprap into natural ground.

NAD 83/2011



PERMIT DRAWING SHEET 42 OF 115

9/12/2019
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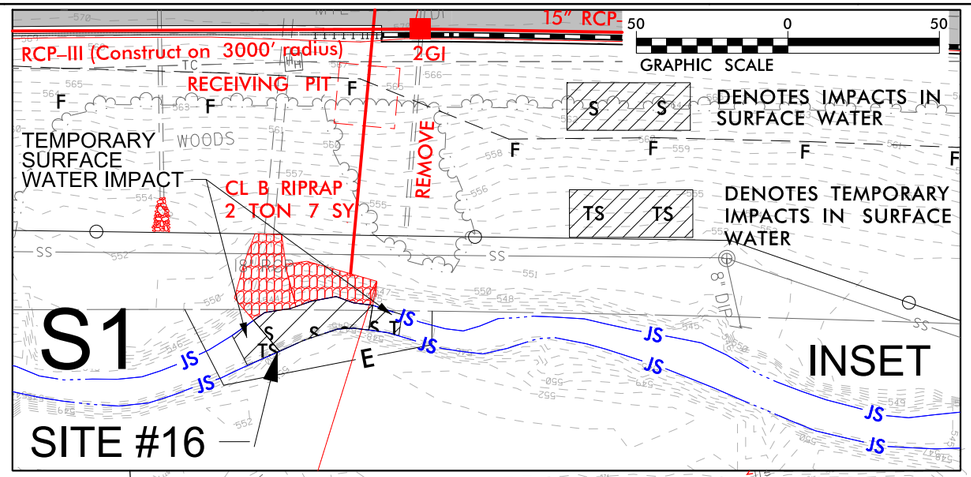
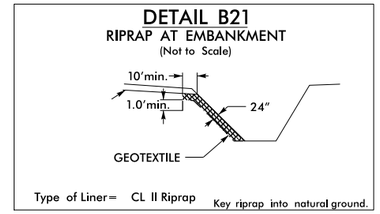
PROPWICS01$





wsp
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NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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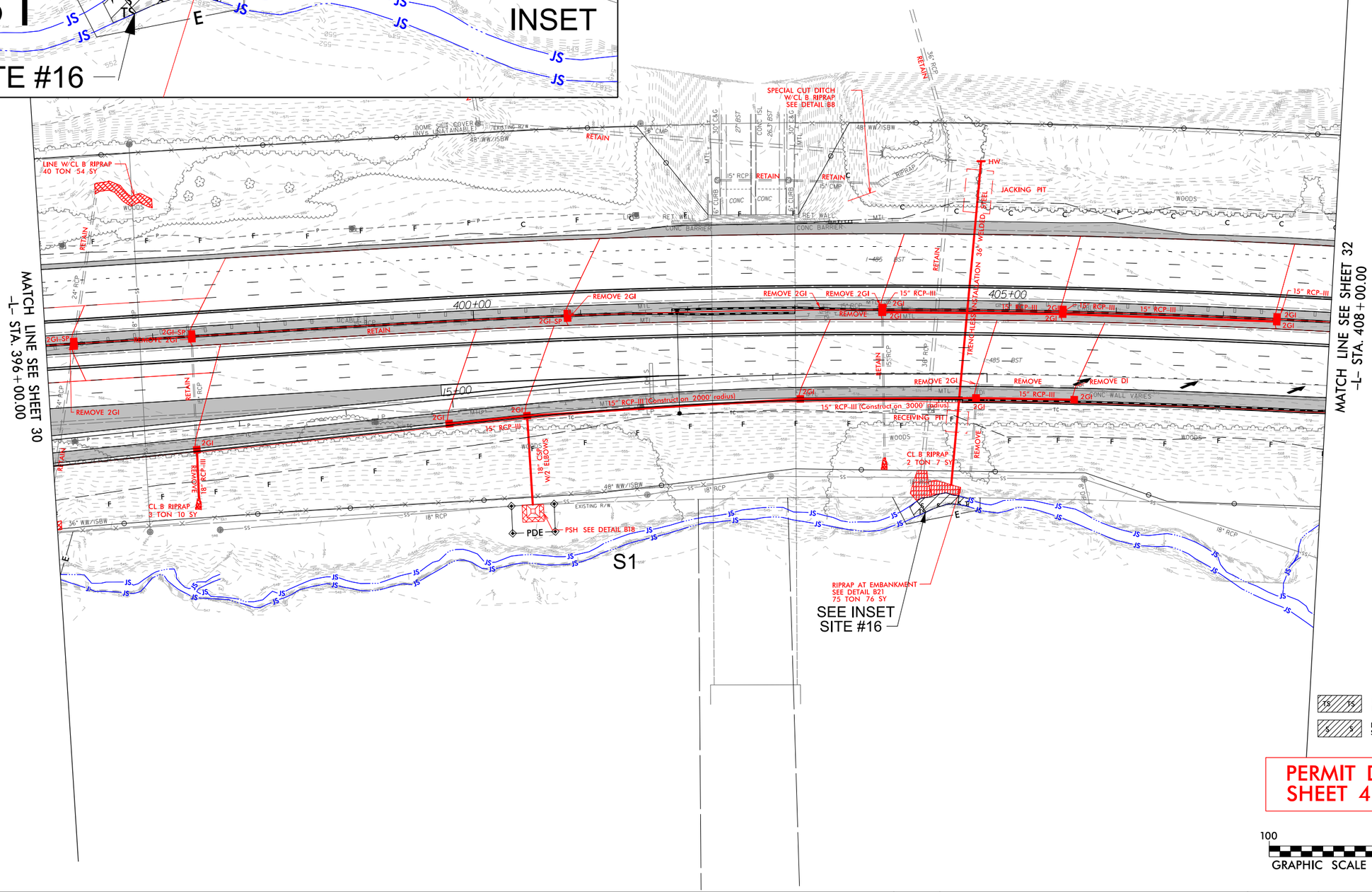
NAD 83/2011



DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 43 OF 115

100 0 100
GRAPHIC SCALE

REVISIONS

8/17/99

9/12/2019
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PRDPWICS01$

8/17/99

REVISIONS

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1001 Morehead Square Dr.
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PROJECT REFERENCE NO.	SHEET NO.
I-5507	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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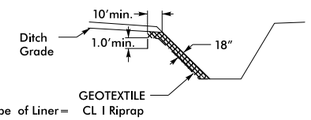
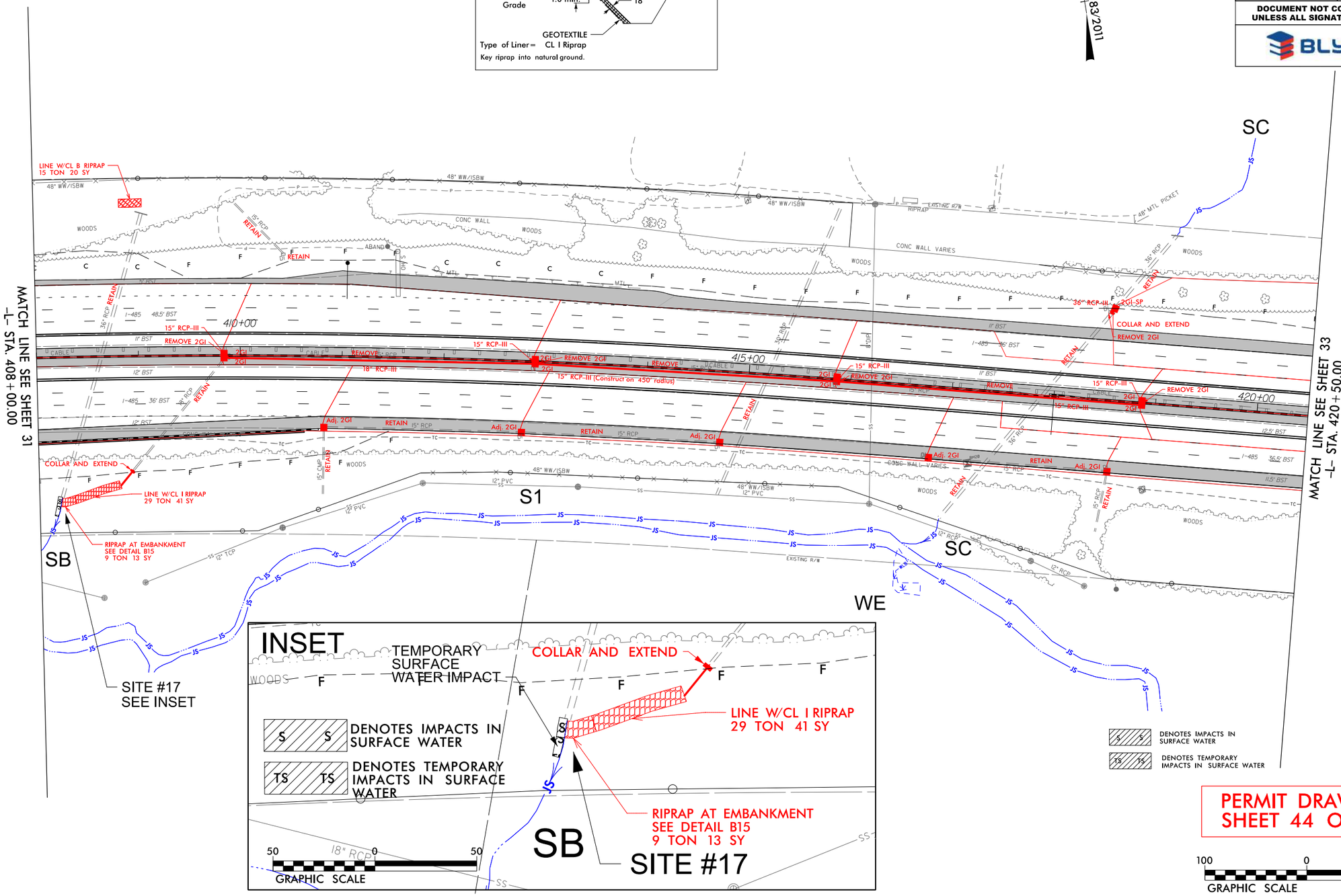
DETAIL B15
RIPRAP AT EMBANKMENT
(Not to Scale)



Type of Liner = CL I Riprap
Key riprap into natural ground.

NAD 83/2011



PERMIT DRAWING
SHEET 44 OF 115

100 0 100
GRAPHIC SCALE

9/12/2019
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PROPWTCS01$

8/17/99

REVISIONS

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NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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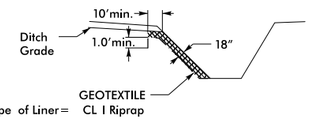
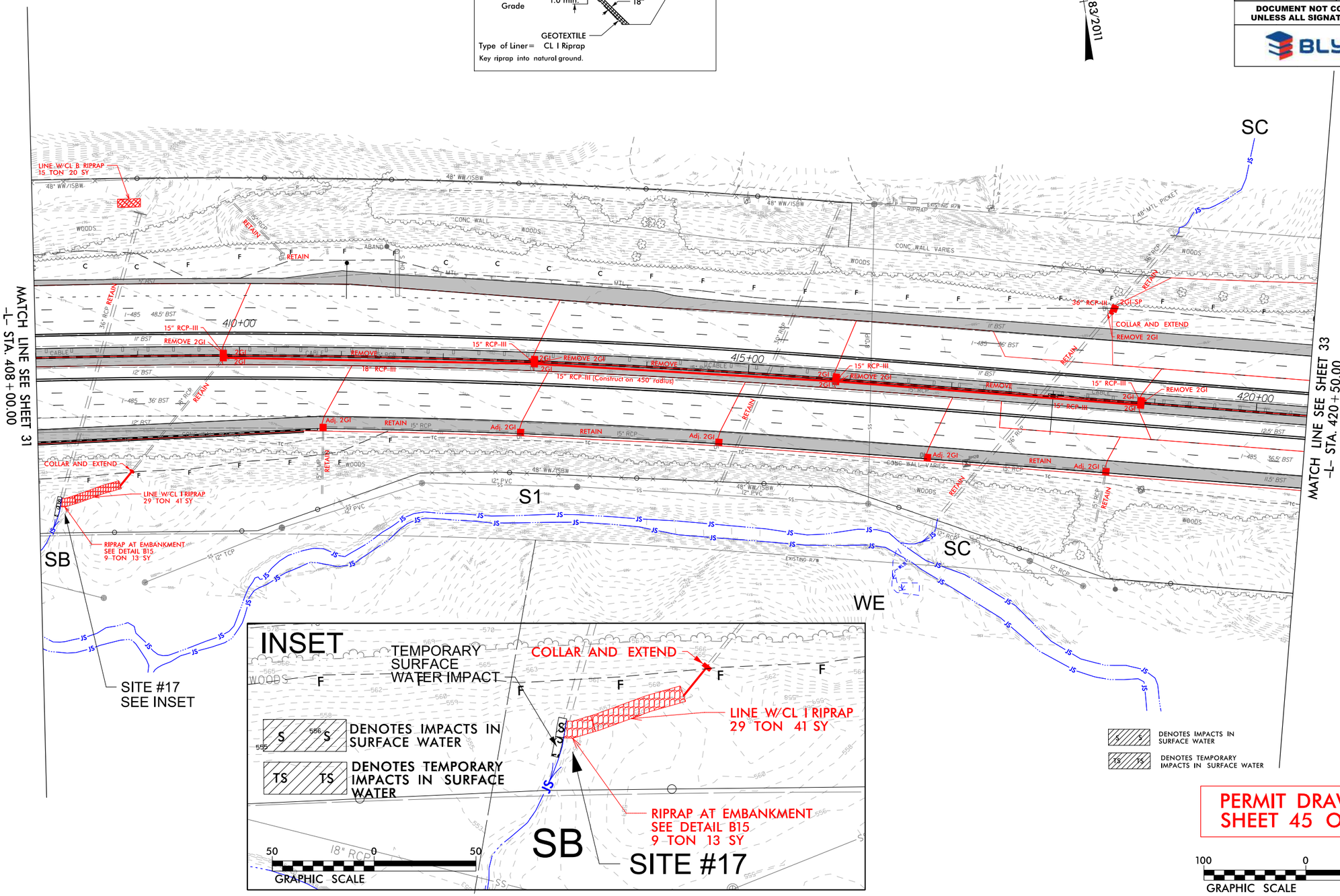
DETAIL B15
RIPRAP AT EMBANKMENT
(Not to Scale)



Type of Liner= CL I Riprap
Key riprap into natural ground.

NAD 83/2011



PERMIT DRAWING
SHEET 45 OF 115

9/12/2019
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PROPWIDCS01$

PROJECT REFERENCE NO.	SHEET NO.
I-5507	35
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

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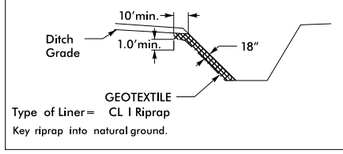
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

DETAIL B15
RIPRAP AT EMBANKMENT
(Not to Scale)



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

NAD 83/2011

MATCH LINE THIS SHEET -Y3- STA. 13+00.00

MATCH LINE SEE SHEET 34 -L- STA. 447+50.00

MATCH LINE SEE SHEET 36 -L- STA. 461+50.00

MATCH LINE THIS SHEET -Y3- STA. 13+00.00

SEE SHEET 35A

SD
SITE #18
WB
RIPRAP AT EMBANKMENT SEE DETAIL B15 14 TON 19 SY
LINE W/CL B RIPRAP 40 TON 84 SY
LINE W/CL B RIPRAP 81 TON 109 SY
CL B RIPRAP 3 TON 10 SY
CL B RIPRAP 2 TON 7 SY
TOE PROTECTION SEE DETAIL B1
COLLAR AND EXTEND
Construct on 450' radius
REMOVE 2GI
RETAIN
JB w/MH
18" RCP-III
15" RCP-III
48" WW/ISBW
CONC WALL VARIES
EXISTING R/W
WOODS
GRASS
450+00
455+00
460+00
15+00
GRAPHIC SCALE
100 0 100

PERMIT DRAWING
SHEET 46 OF 115

REVISIONS
1. 9/5/19 - ADDED BOXES 3550 AND 3550A

8/17/99

9/12/2019
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PROPWTCS01$

8/17/99

REVISIONS

1. 9/5/19 - ADDED BOXES 3550 AND 3550A

wsp
1001 Morehead Square Dr.
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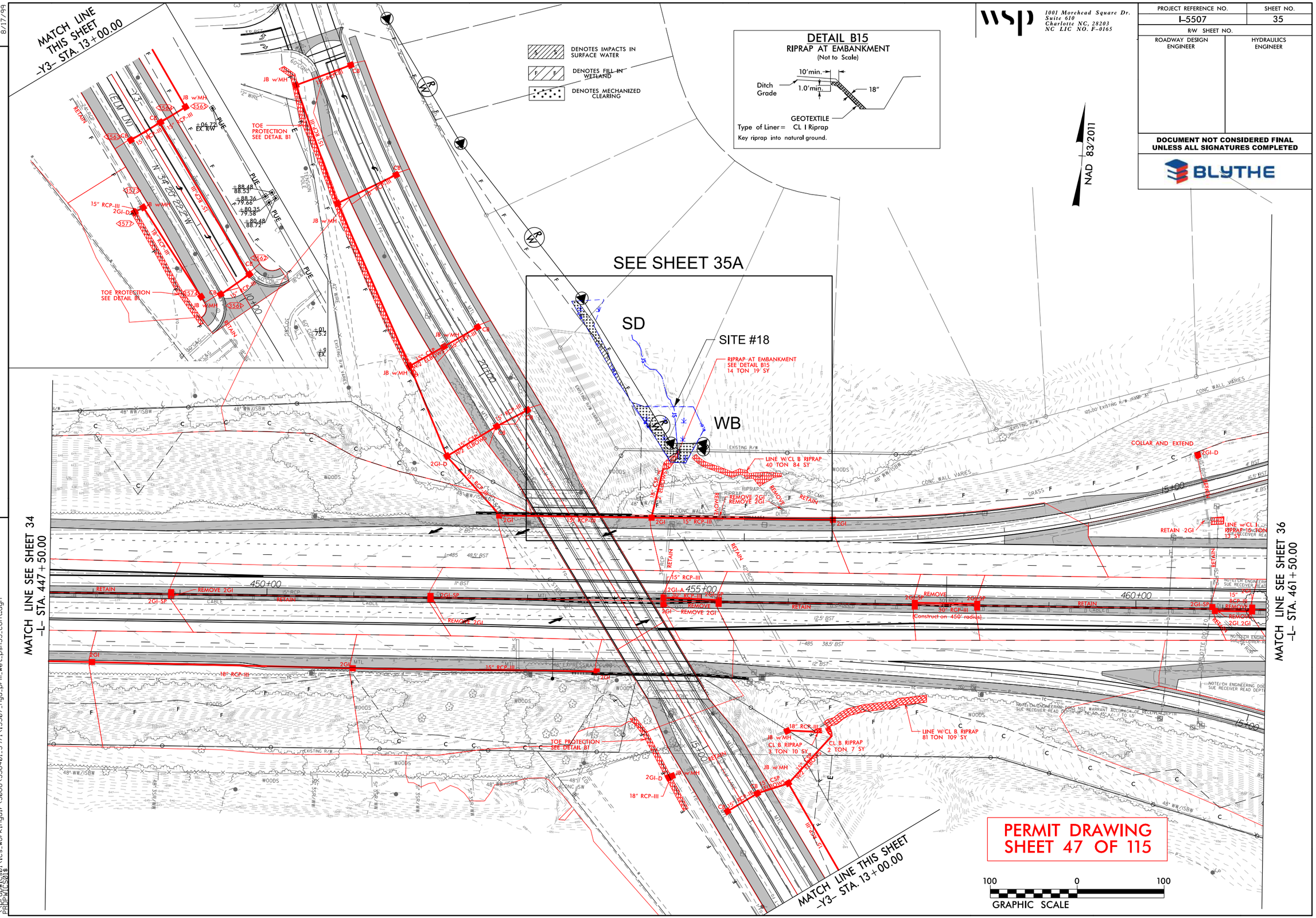
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	35
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



9/12/2019
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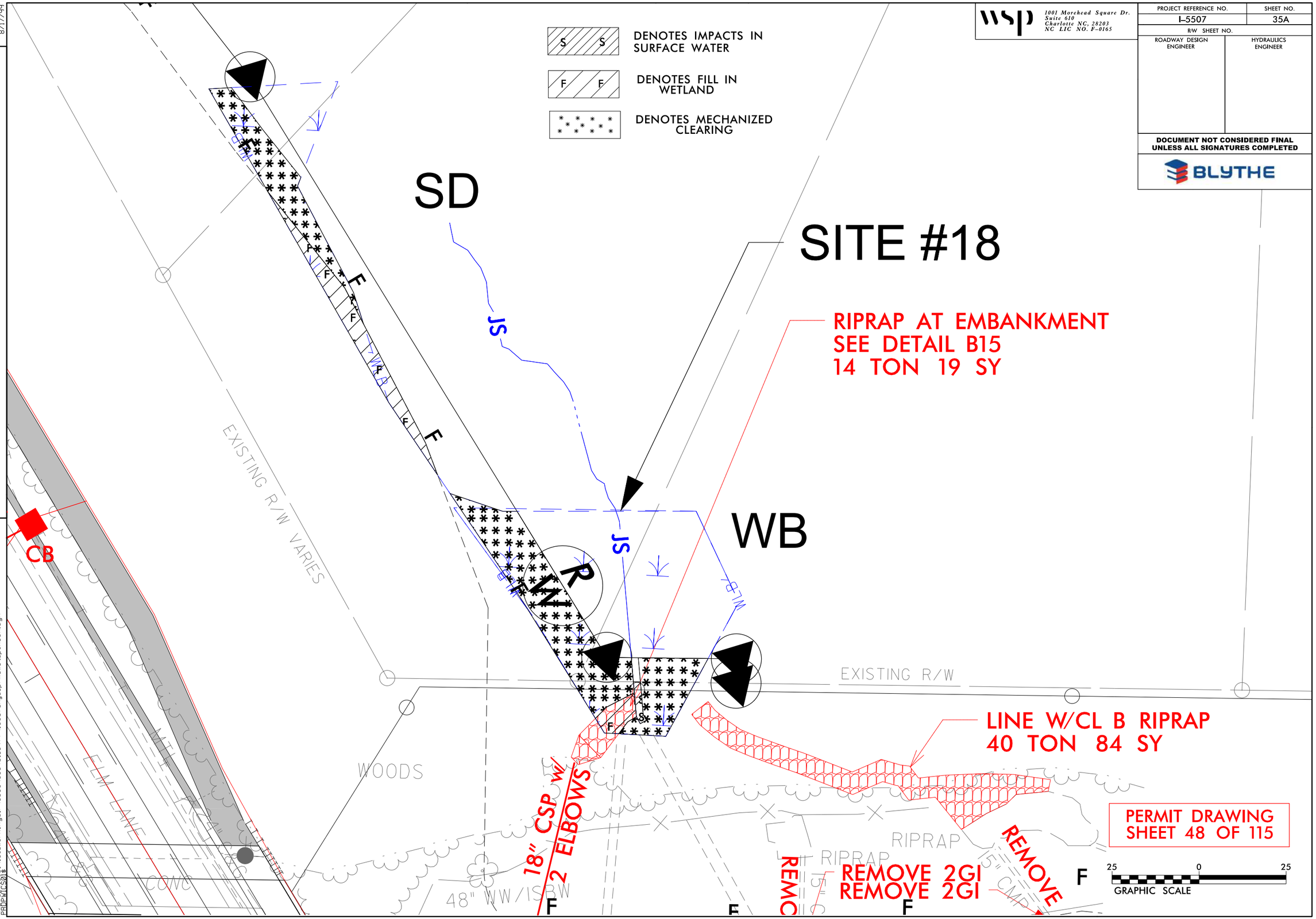
PROPWICS01$



1001 Morehead Square Dr.
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PROJECT REFERENCE NO.	SHEET NO.
I-5507	35A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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REVISIONS

8/17/99

9/12/2019
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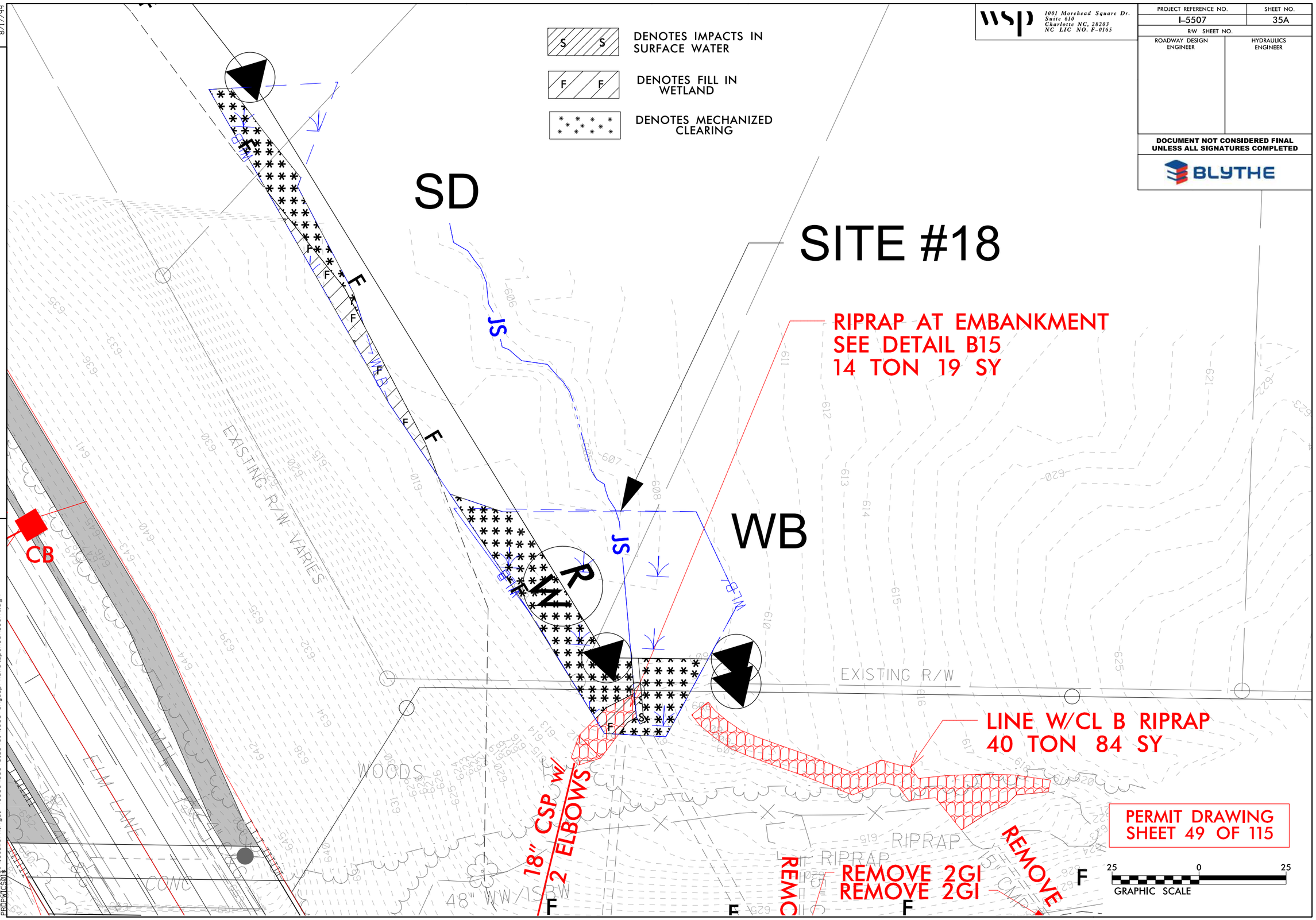

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PROJECT REFERENCE NO.	SHEET NO.
I-5507	35A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

REVISIONS

8/17/99

9/12/2019
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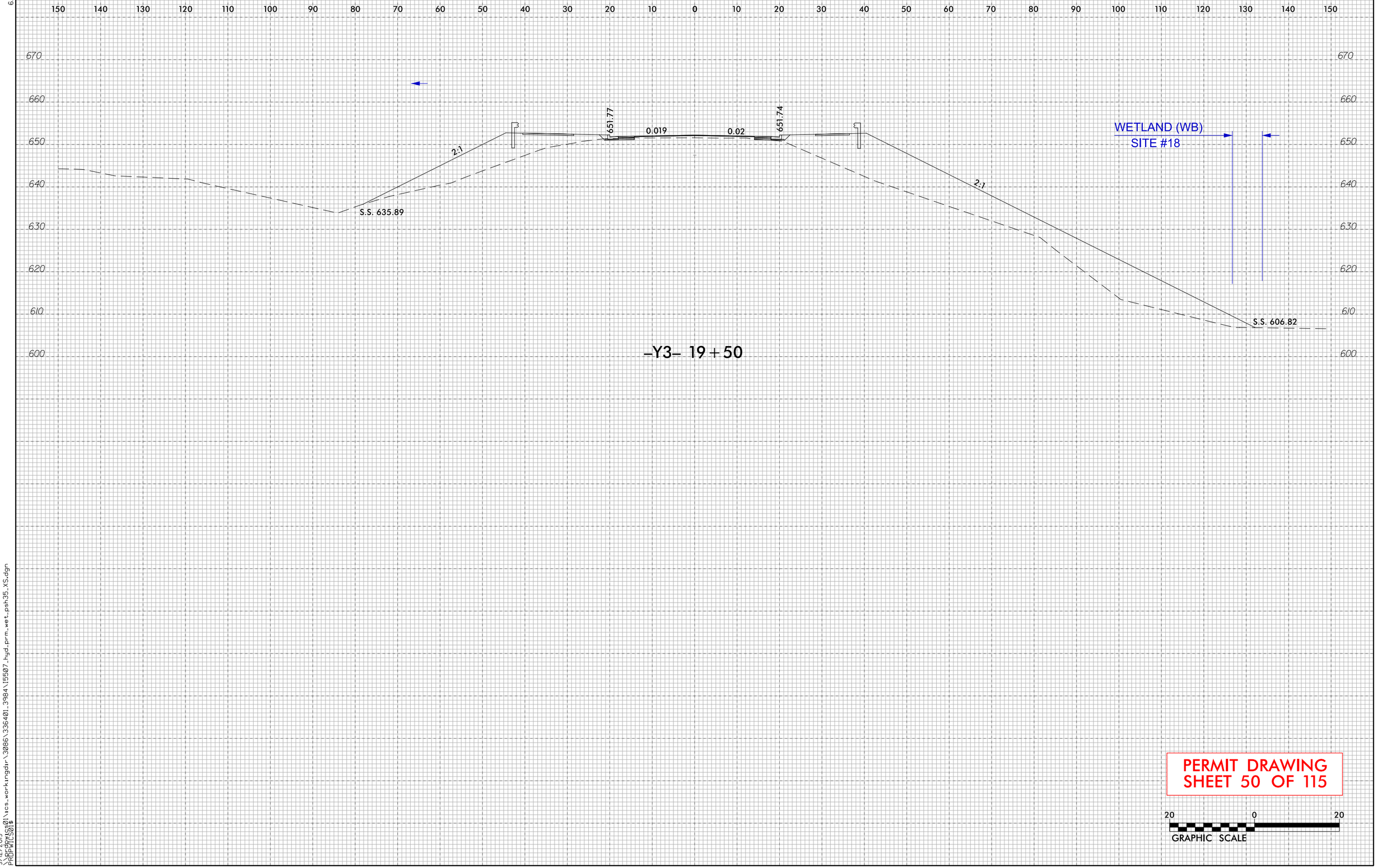

6/23/16

9/12/2019
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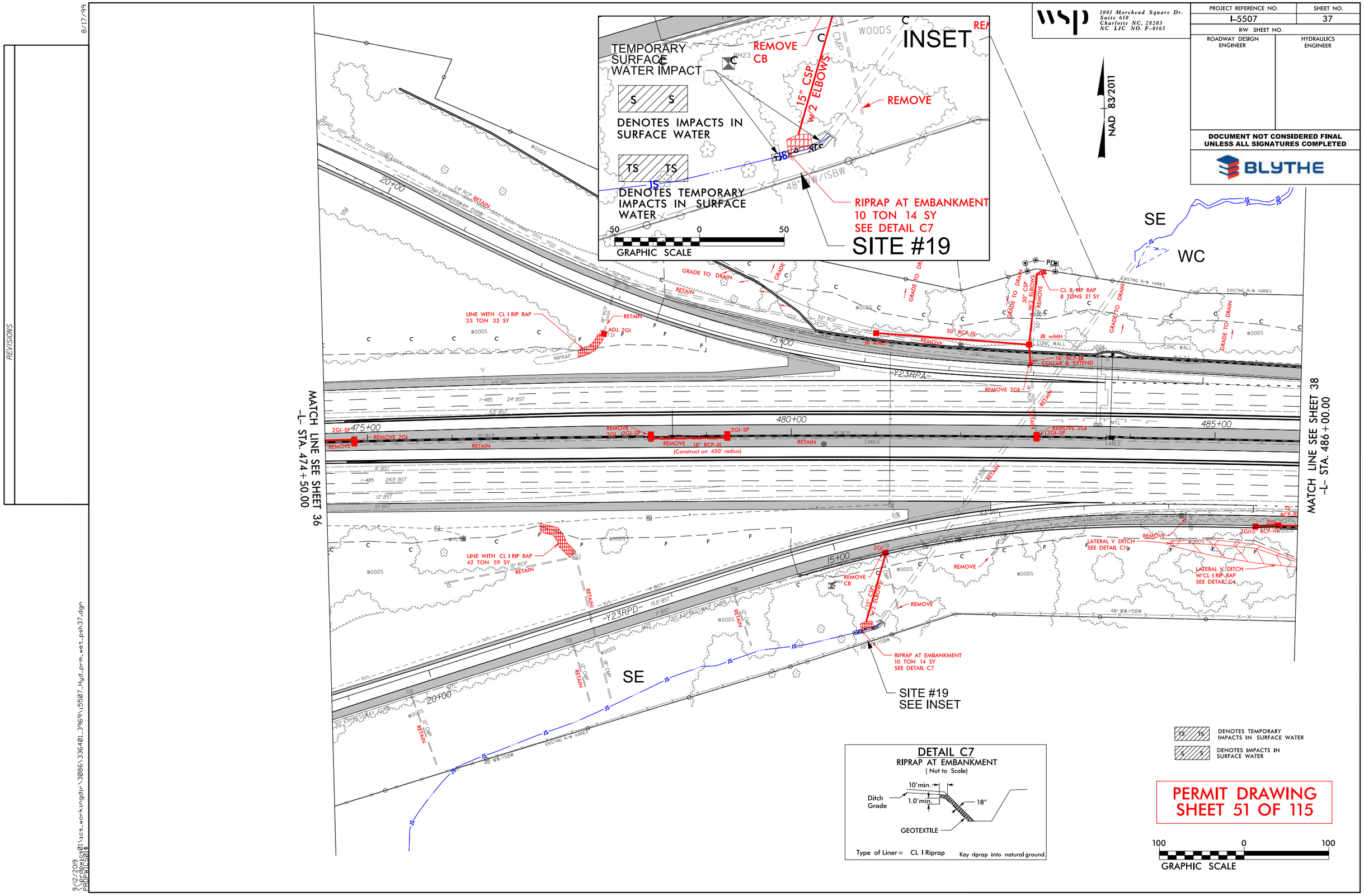
PRDPWICS01$



WSP
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	37
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

REVISIONS

8/17/99

9/12/2019
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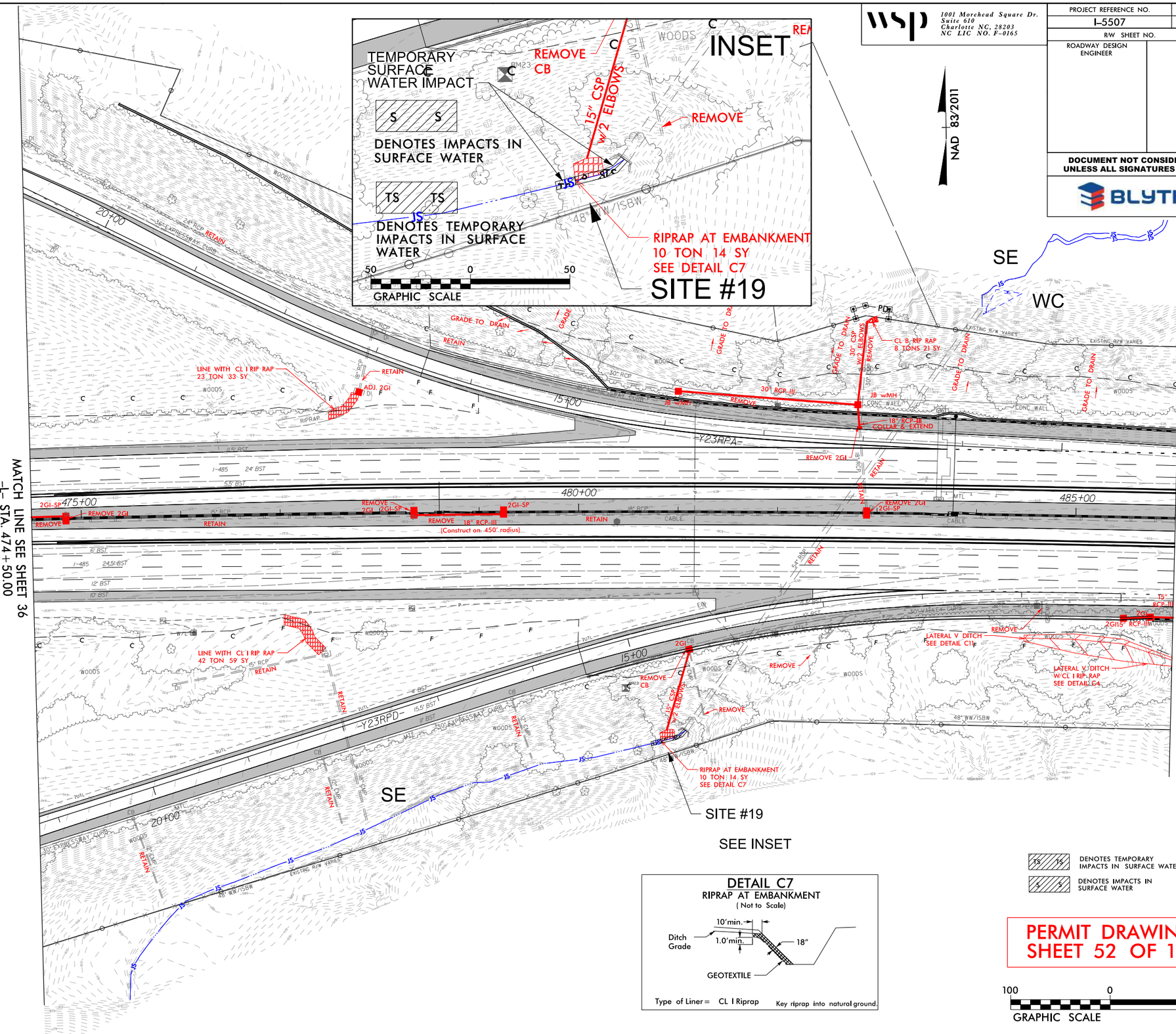
PRDPWICS01$

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	37
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



PERMIT DRAWING
SHEET 52 OF 115

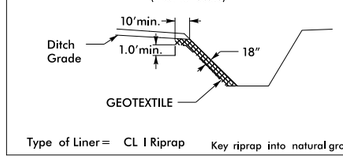
REVISIONS

8/17/99

9/12/2019
\\prdpwics01\ics_workingdir\3086\336401_3980\15507_Hyd_prm_wet_psh37_cont.dgn
PRDPWICS01$

8/17/99

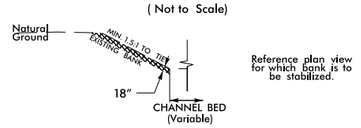
DETAIL C7
RIPRAP AT EMBANKMENT
(Not to Scale)



Type of Liner= CL I Riprap

Key riprap into natural ground.

DETAIL C8
BANK STABILIZATION
(Not to Scale)

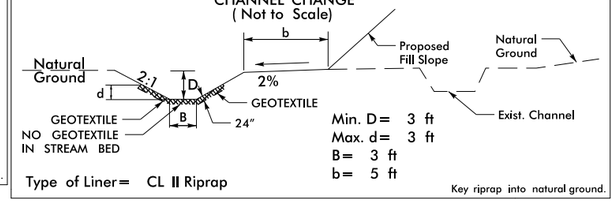


Reference plan view for which bank is to be stabilized.

Type of Liner = CL I Riprap

Key riprap into natural ground.

DETAIL C9
CHANNEL CHANGE
(Not to Scale)



Min. D= 3 ft
Max. d= 3 ft
B= 3 ft
b= 5 ft

Type of Liner= CL II Riprap

Key riprap into natural ground.

NAD 83/2011

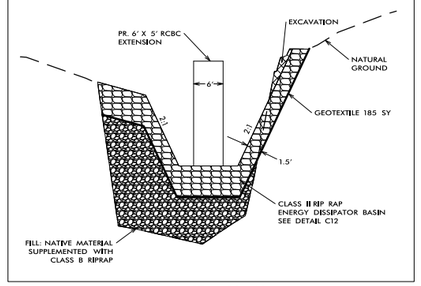
wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	38
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

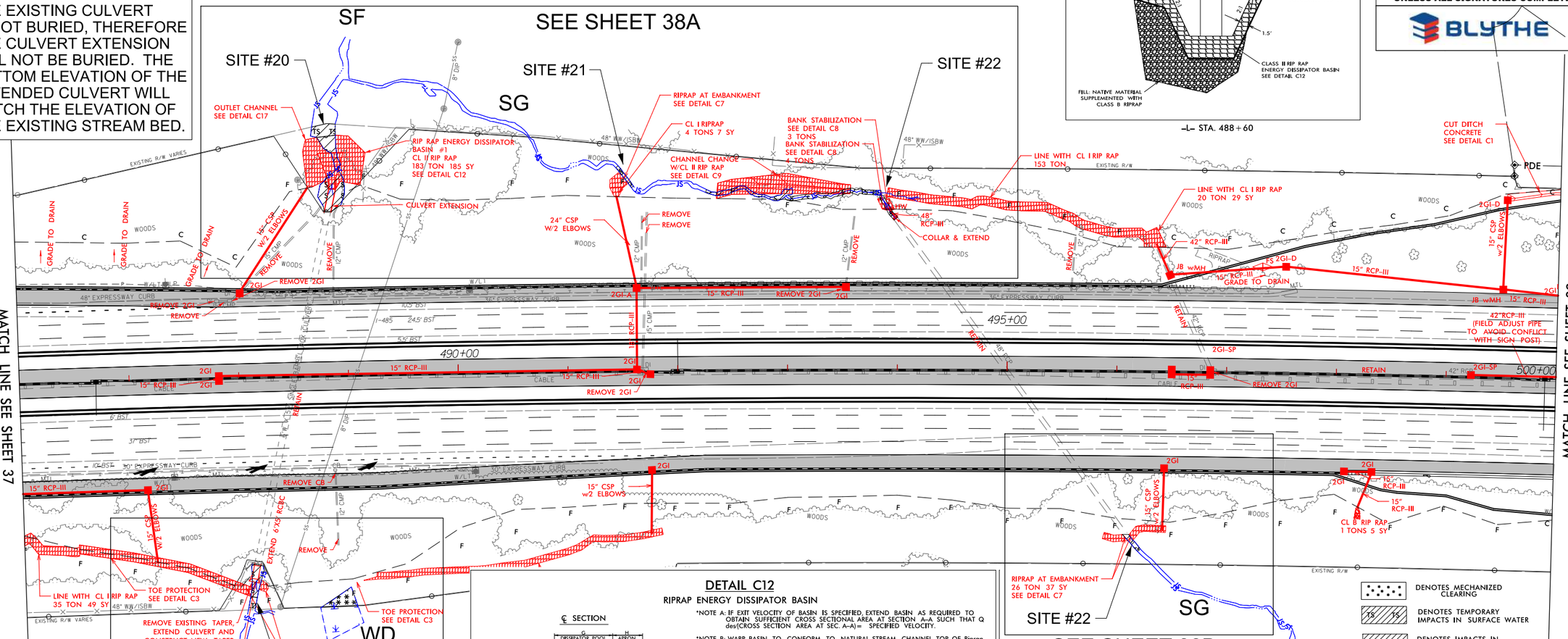
BLYTHE

DETAIL C17
OUTLET CHANNEL
(Not to Scale)

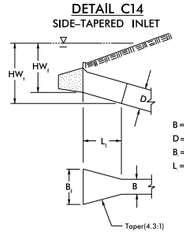


–L– STA. 488+60

SITES #20 AND #22 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.



DETAIL C14
SIDE-TAPERED INLET

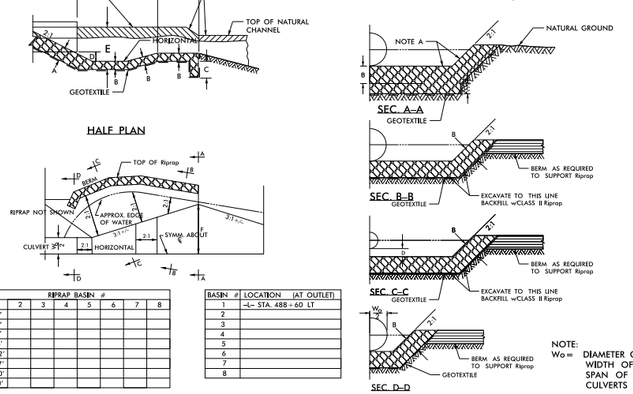


B=6 ft
D=5 ft
B1=9.3 ft
L1=7.1 ft

DETAIL C12
RIPRAP ENERGY DISSIPATOR BASIN

*NOTE A: IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS SECTIONAL AREA AT SECTION A–A SUCH THAT Q des(CROSS SECTION AREA AT SEC. A–A)= SPECIFIED VELOCITY.

*NOTE B: WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL TOP OF Riprap IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A–A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.



DIM.	RIPRAP BASIN # 1	2	3	4	5	6	7	8
A	30"							
B	21"							
C	16"							
D	1.6'							
E	10.2'							
F	11.7'							
G	18.0'							
H	8.0'							

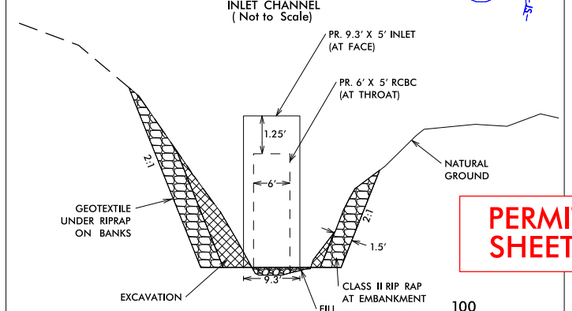
*ALL DIMENSIONS APPROXIMATE

BASIN #	LOCATION (AT OUTLET)
1	–L– STA. 488+60 LT
2	
3	
4	
5	
6	
7	
8	

NOTE:
Wo = DIAMETER OF PIPE, WIDTH OF BOX OR SPAN OF PIPE-ARCH CULVERTS

5/05

DETAIL C16
INLET CHANNEL
(Not to Scale)



–L– STA. 488+60

PERMIT DRAWING
SHEET 53 OF 115

100 0 100
GRAPHIC SCALE

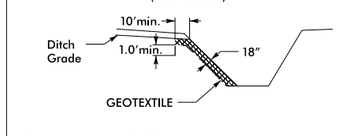
REVISIONS

9/26/2019
PROPERTIES01\ics_workingdir\4635\336401.4256\15507_Hyd_prm_wet_psh38.dgn

8/17/99

REVISIONS

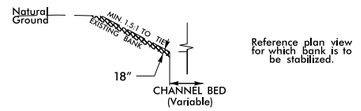
DETAIL C7
RIPRAP AT EMBANKMENT
(Not to Scale)



Type of Liner= CL I Riprap

Key riprap into natural ground.

DETAIL C8
BANK STABILIZATION
(Not to Scale)

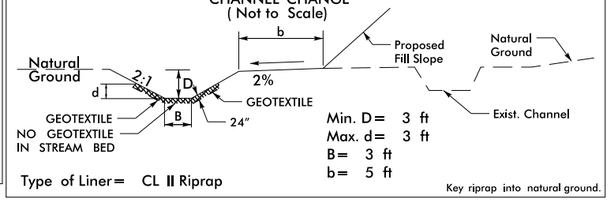


Reference plan view for which bank is to be stabilized.

Type of Liner = CL I Riprap

Key riprap into natural ground.

DETAIL C9
CHANNEL CHANGE
(Not to Scale)



Min. D= 3 ft
Max. d= 3 ft
B= 3 ft
b= 5 ft

Type of Liner= CL II Riprap

Key riprap into natural ground.

NAD 83/2011

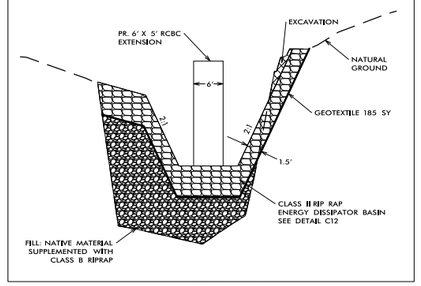
wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	38
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

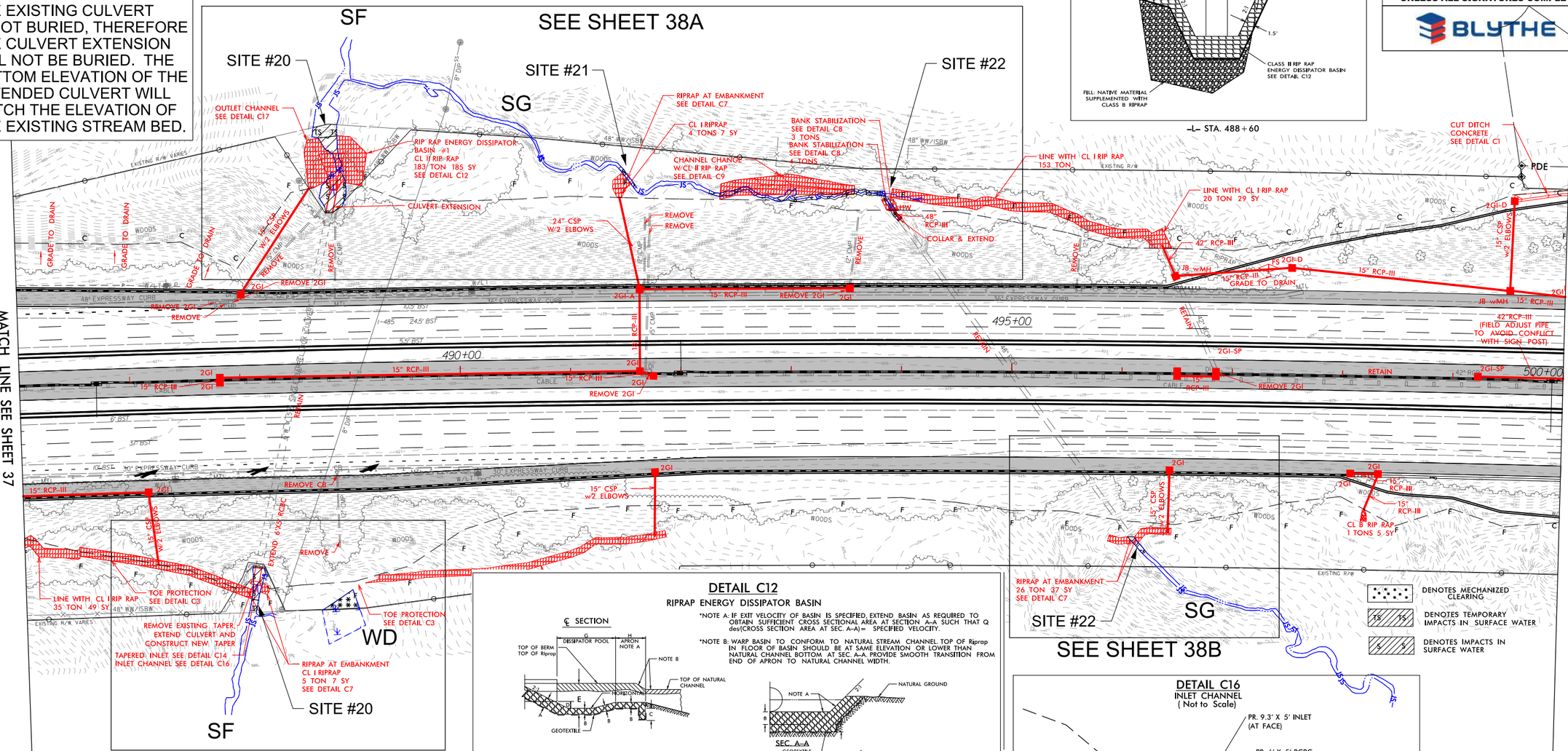
BLYTHE

DETAIL C17
OUTLET CHANNEL
(Not to Scale)



–L– STA. 488+60

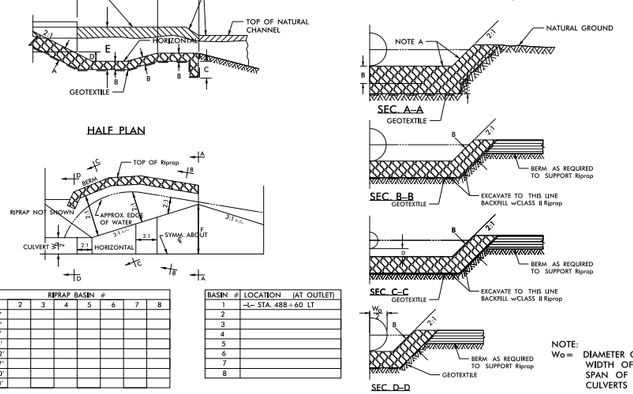
SITES #20 AND #22 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.



DETAIL C12
RIPRAP ENERGY DISSIPATOR BASIN

*NOTE A: IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS SECTIONAL AREA AT SECTION A–A SUCH THAT Q des(CROSS SECTION AREA AT SEC. A–A)= SPECIFIED VELOCITY.

*NOTE B: WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL TOP OF Riprap IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A–A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.



DIM.	RIPRAP BASIN # 1	2	3	4	5	6	7	8
A	30"							
B	21"							
C	16"							
D	1.6'							
E	10.2'							
F	11.7'							
G	18.0'							
H	8.0'							

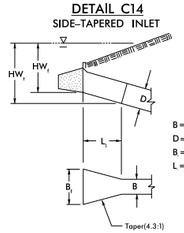
*ALL DIMENSIONS APPROXIMATE

BASIN #	LOCATION (AT OUTLET)
1	–L– STA. 488+60 LT
2	
3	
4	
5	
6	
7	
8	

NOTE:
W_D = DIAMETER OF PIPE, WIDTH OF BOX OR SPAN OF PIPE-ARCH CULVERTS

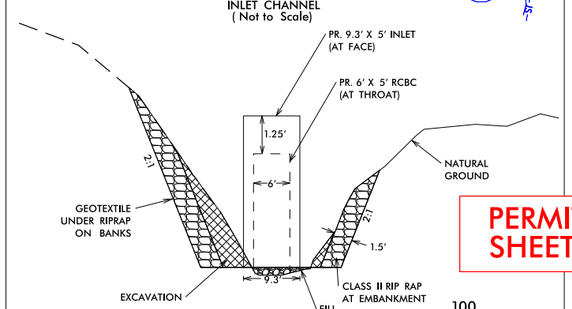
5/05

DETAIL C14
SIDE-TAPERED INLET



B=6 ft
D=5 ft
B=9.3 ft
L=7.1 ft

DETAIL C16
INLET CHANNEL
(Not to Scale)



–L– STA. 488+60

PERMIT DRAWING
SHEET 54 OF 115

100 0 100
GRAPHIC SCALE

9/26/2019
D:\PROJECTS\01\ics_workingdir\4635\336401.4257\I5507_Hyd_prm_wet_psh38_cont.dgn
PROPWTCS01$

8/17/99

REVISIONS

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

SITES #20 AND #22 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

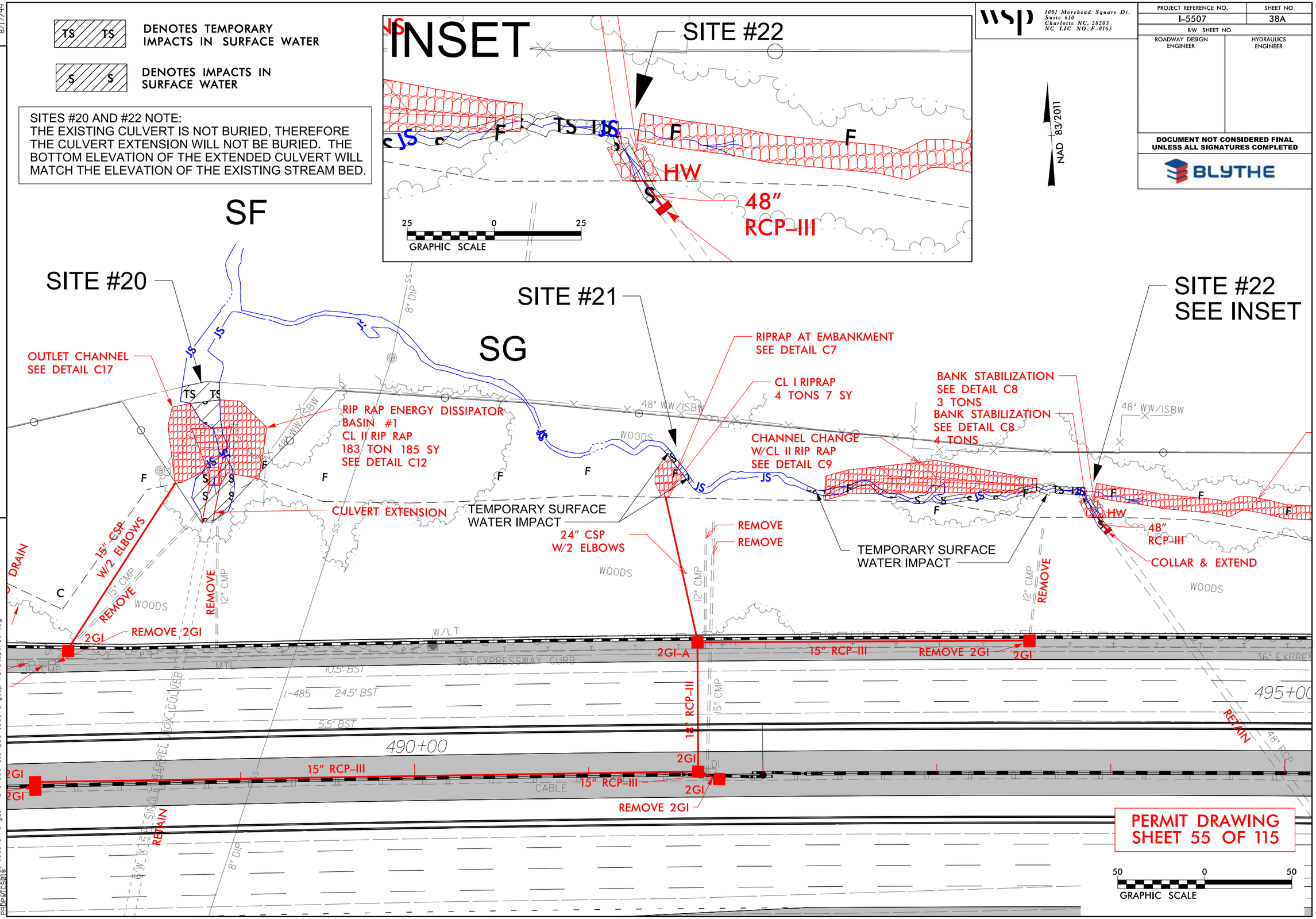
wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	38A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

NAD 83/2011



9/26/2019
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PROPWCS01$

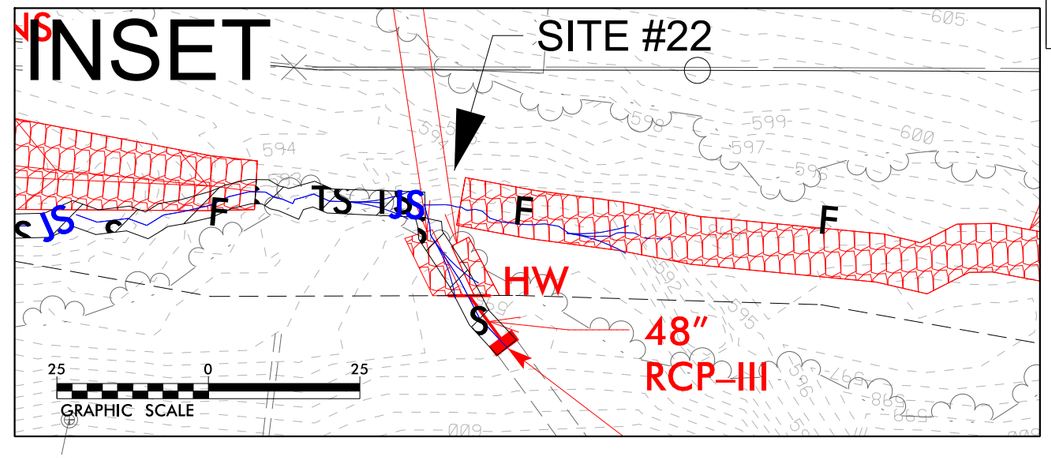
8/17/99

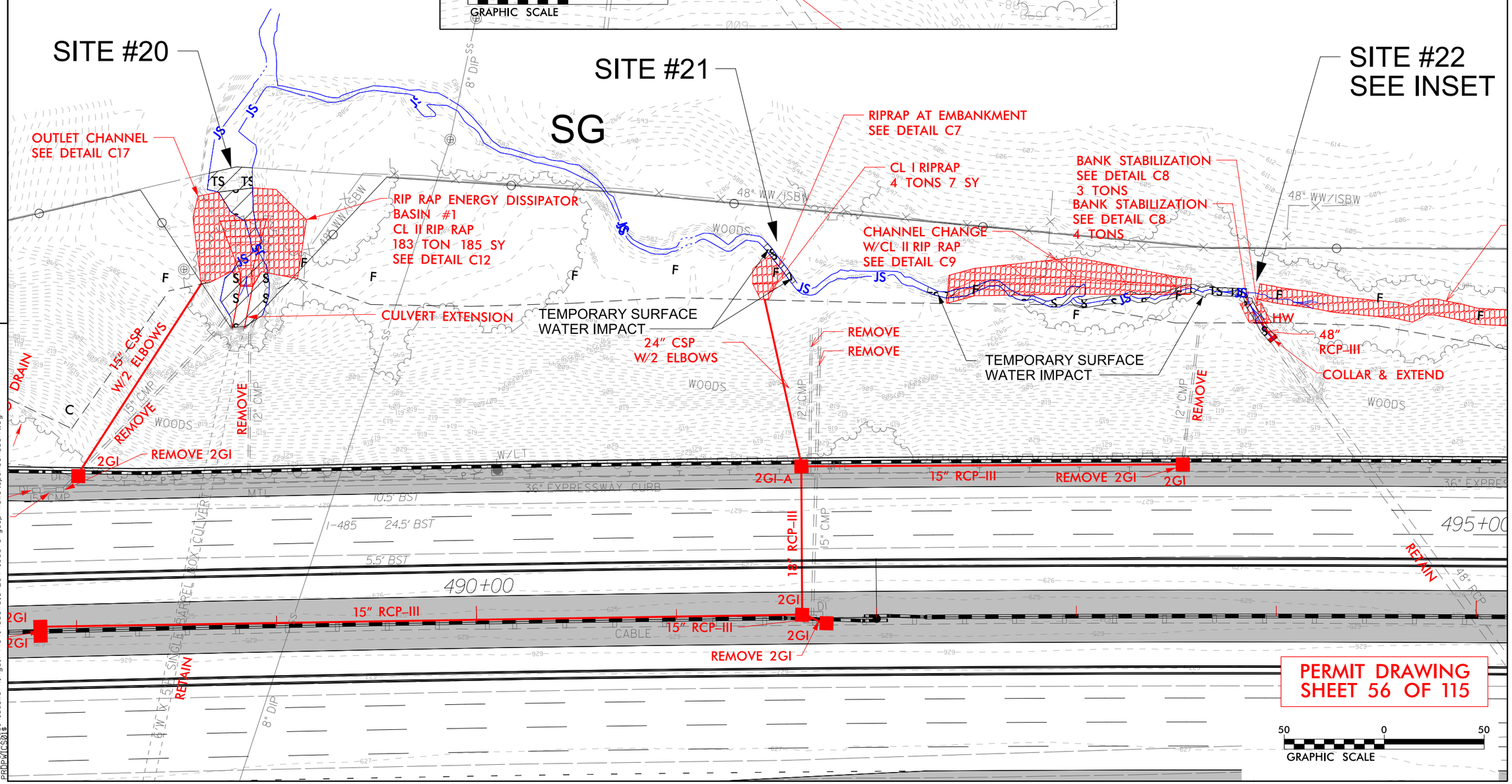
REVISIONS

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

SITES #20 AND #22 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.





PERMIT DRAWING
SHEET 56 OF 115

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	38A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

NAD 83/2011

9/26/2019
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PROPWCS01$

8/17/99

REVISIONS

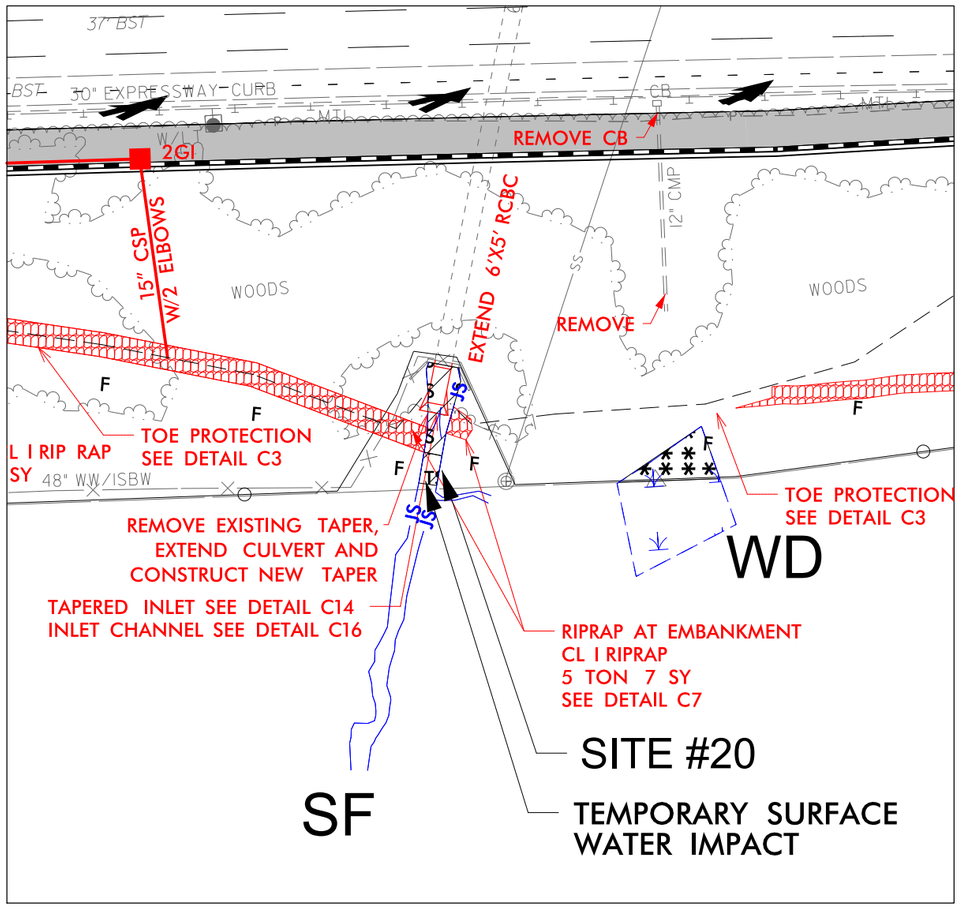
wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

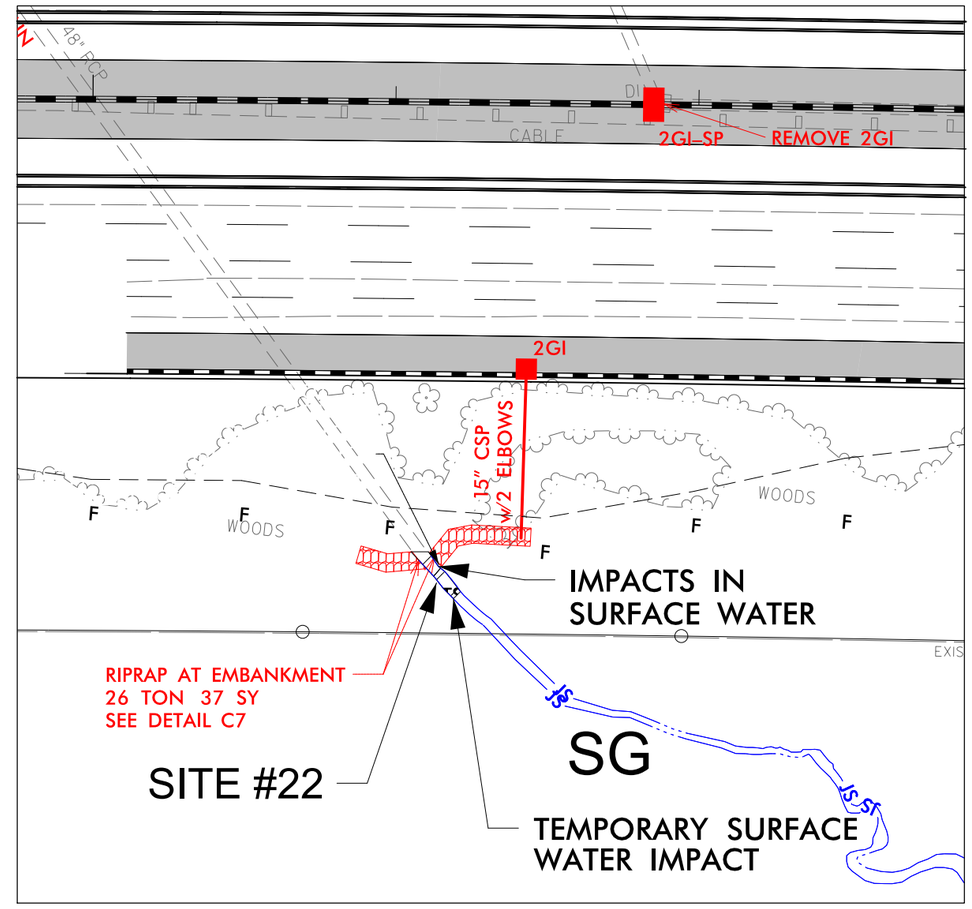
PROJECT REFERENCE NO.	SHEET NO.
I-5507	38B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

NAD 83/2011





S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

PERMIT DRAWING
SHEET 57 OF 115

50 0 50
GRAPHIC SCALE

9/12/2019
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PROPWLCS01$

8/17/99

REVISIONS

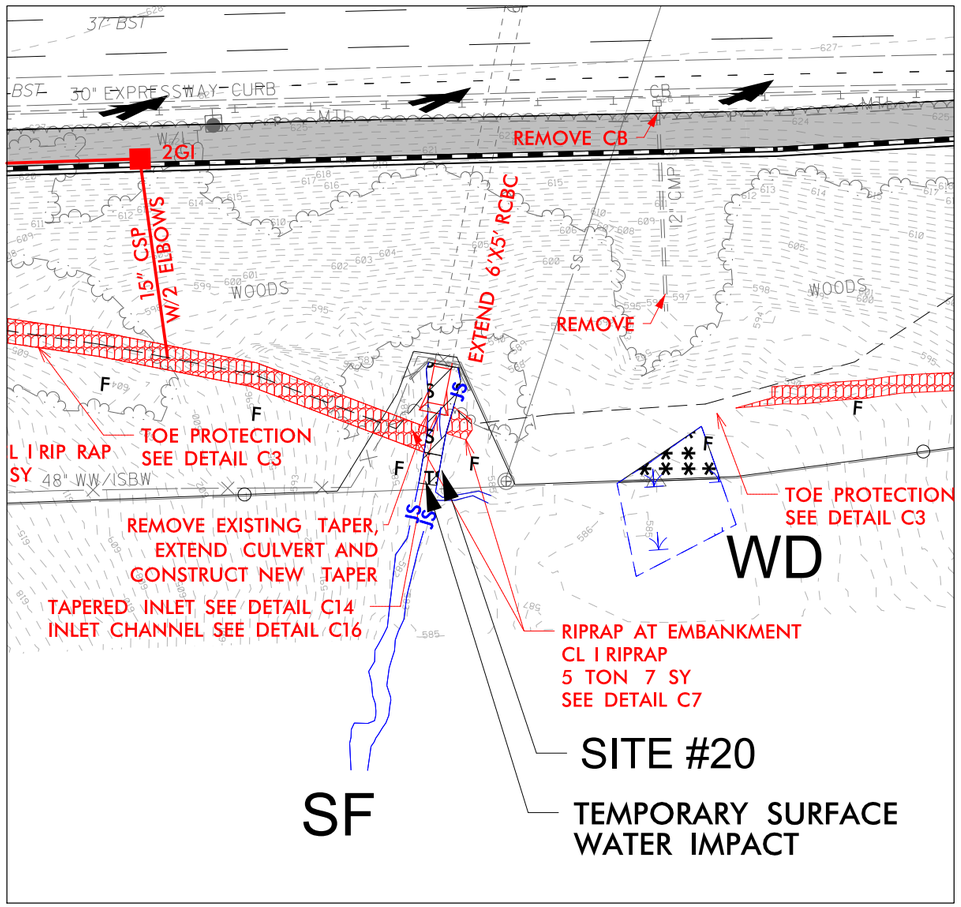
wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

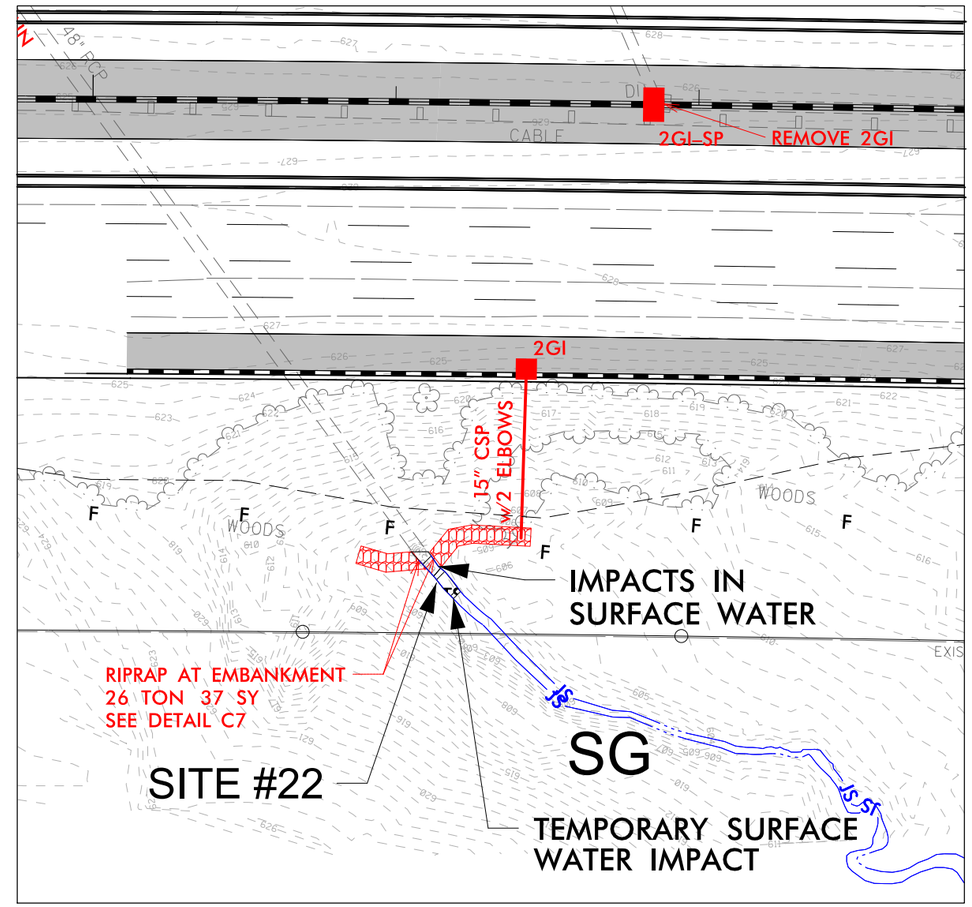
PROJECT REFERENCE NO.	SHEET NO.
I-5507	38B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

NAD 83/2011





S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
* * * * * *	DENOTES MECHANIZED CLEARING

PERMIT DRAWING
SHEET 58 OF 115

50 0 50
GRAPHIC SCALE

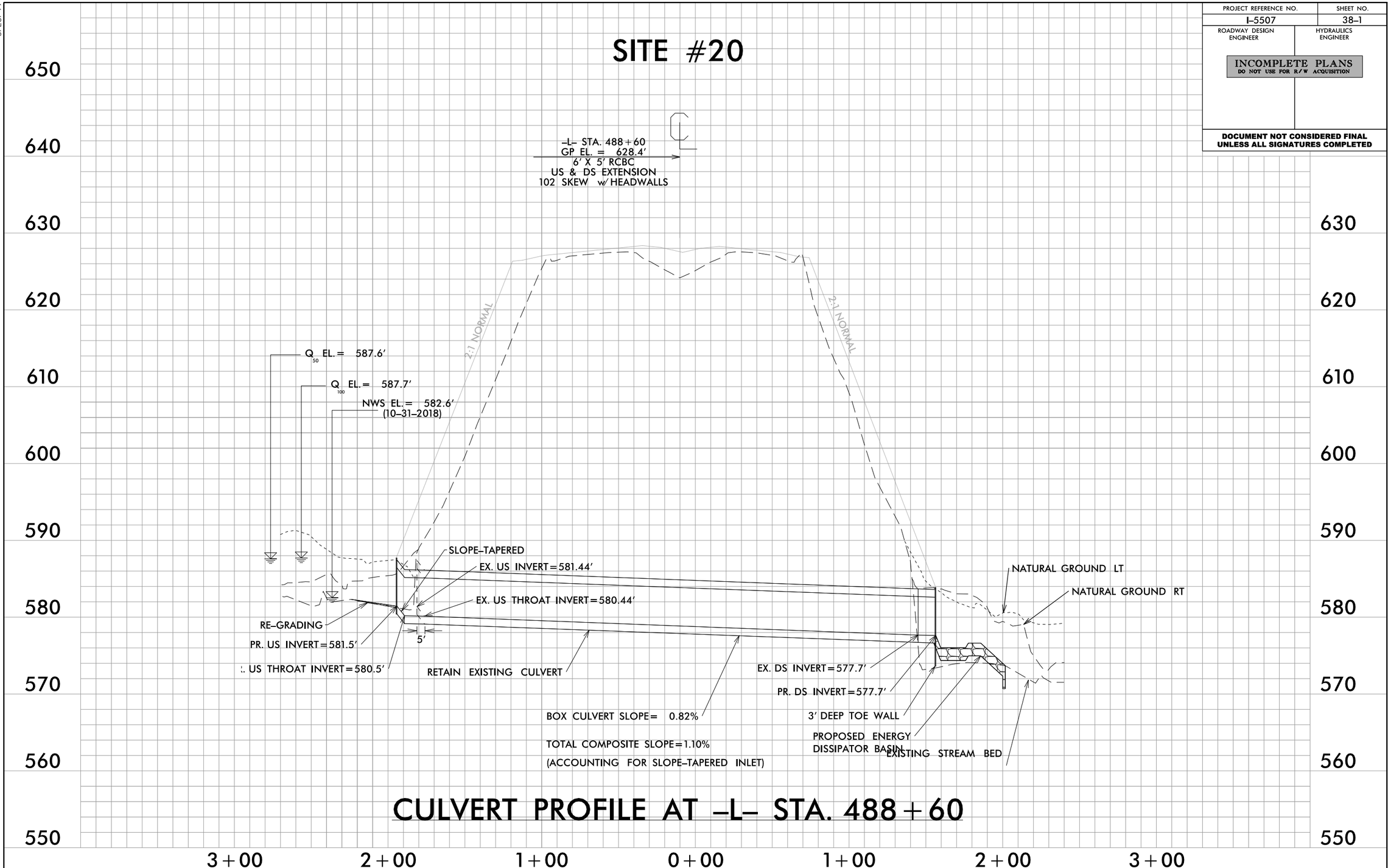
9/12/2019
CADD Data01\ics_workingdir-\3086\336401_3976\I5507_Hyd_prm_wet_psh38B_cont.dgn
PROPWCS01$

PROJECT REFERENCE NO.	SHEET NO.
I-5507	38-1
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SITE #20



CULVERT PROFILE AT -L- STA. 488+60

PERMIT DRAWING
SHEET 59 OF 115

50 0 50
GRAPHIC SCALE (HORIZONTAL)

10 0 10
GRAPHIC SCALE (VERTICAL)

5/28/99

9/12/2019
\\prdpwics01\ics_workingdir\3086\336401_3972\i5507_Hyd_prm_wet_psh38_pfl_culvert_488.dgn
PRDPWICS01$

8/17/99

REVISIONS

1. 9/5/19 – MOVED BOXES 4207A AND 4207

DETAIL C7
RIPRAP AT EMBANKMENT
(Not to Scale)

Type of Liner= CL I Riprap Key riprap into natural ground.

DETAIL C8
BANK STABILIZATION
(Not to Scale)

Reference plan view for which bank is to be stabilized.

Type of Liner = CL I Riprap Key riprap into natural ground.

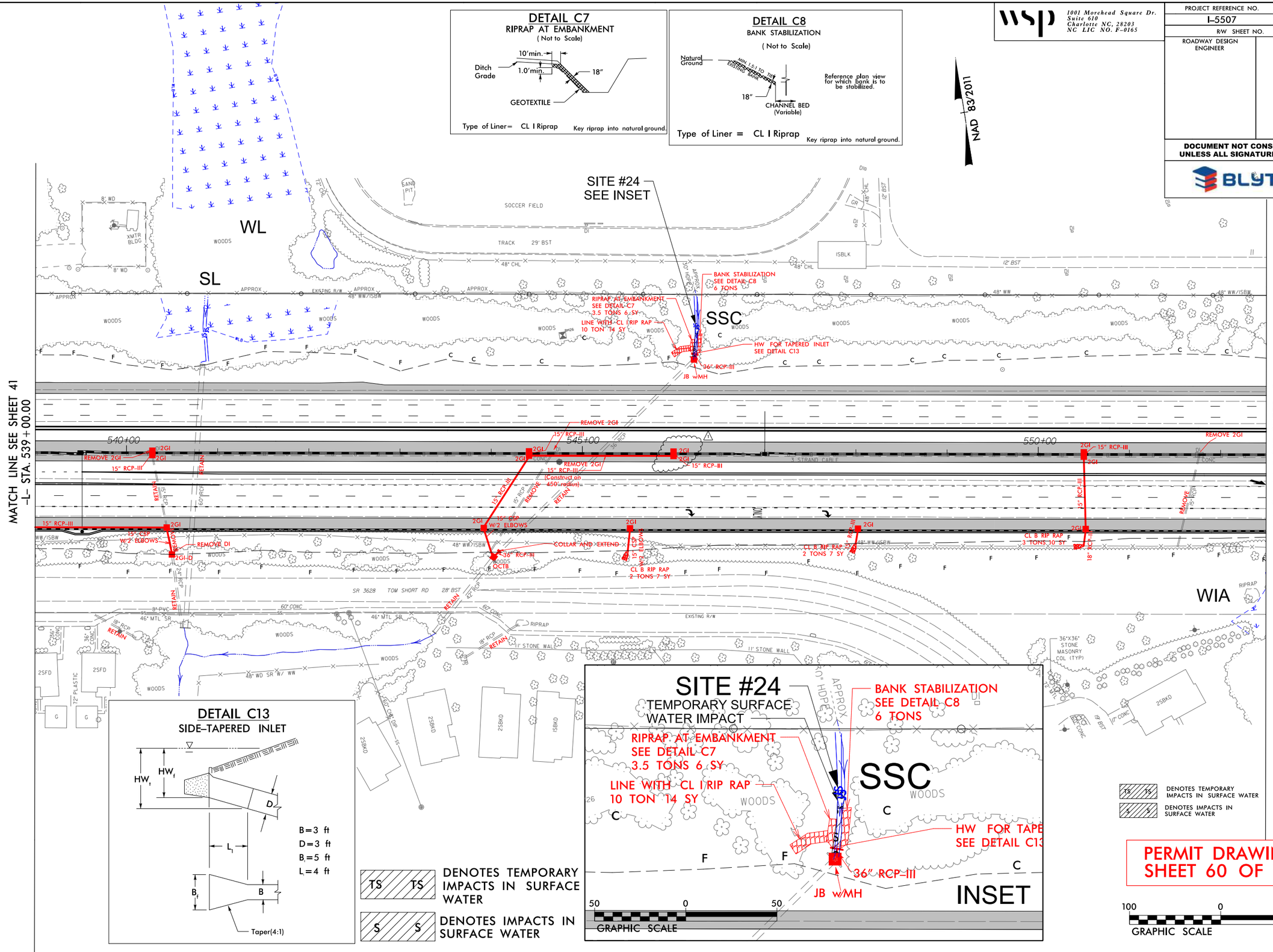
wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	42
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

NAD 83/2011



DETAIL C13
SIDE-TAPERED INLET

B=3 ft
D=3 ft
B_f=5 ft
L_1=4 ft

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

SITE #24
TEMPORARY SURFACE WATER IMPACT

PERMIT DRAWING SHEET 60 OF 115

9/12/2019
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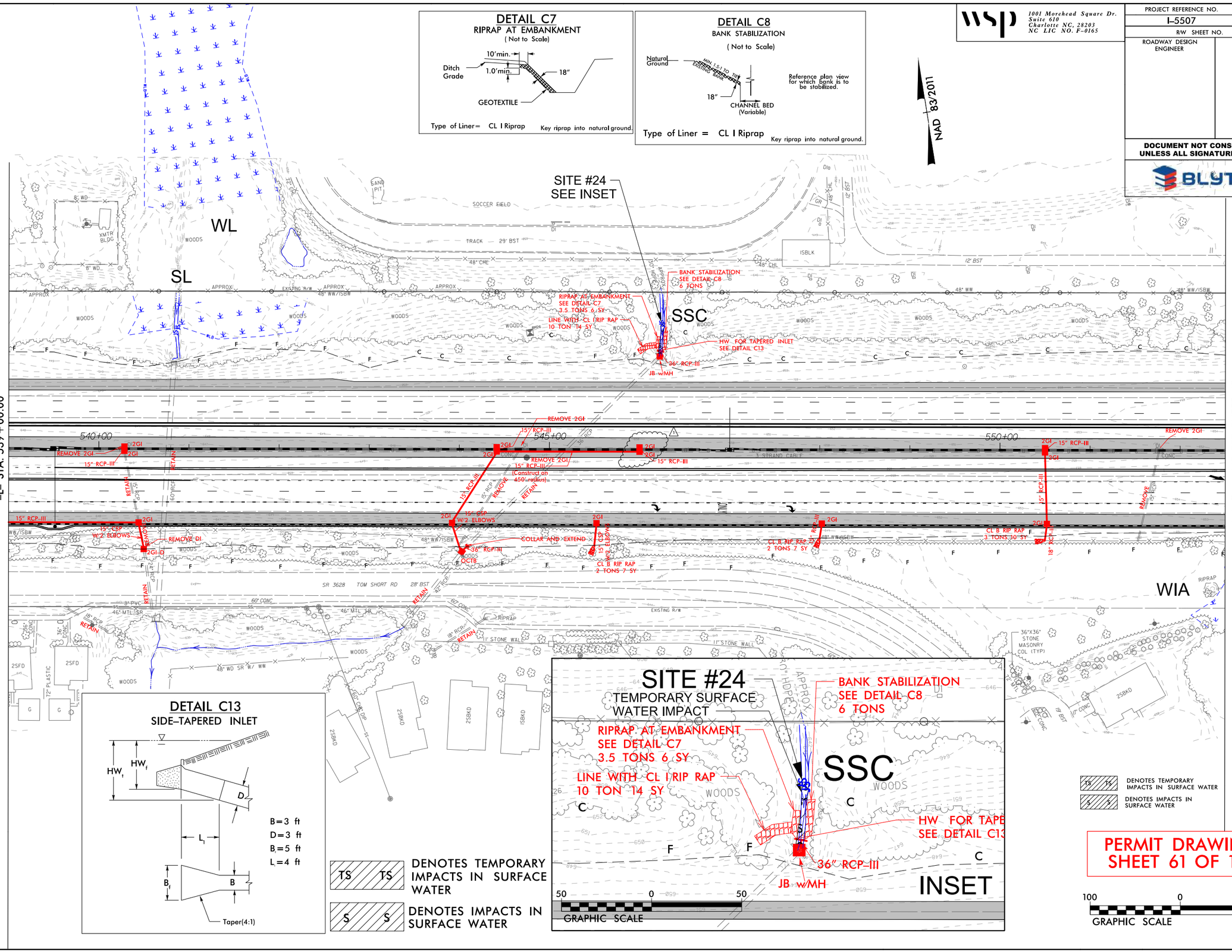
PROPWICS02$



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1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	42
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

REVISIONS
1. 9/5/19 - MOVED BOXES 4207A AND 4207

8/17/99

9/12/2019
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PRDPWICS02$

8/17/99

REVISIONS

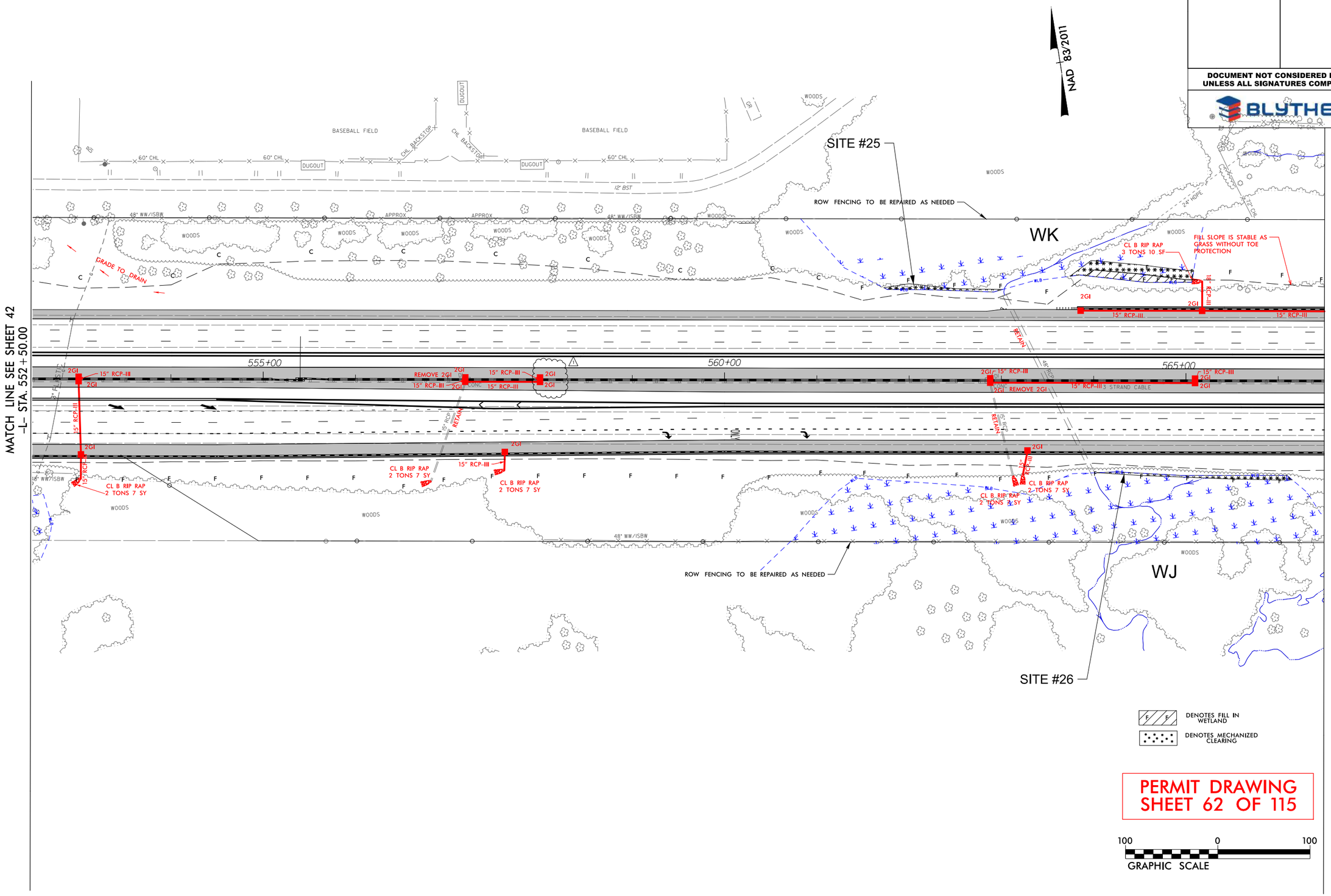
1. 9/5/19 – ADDED BOXES 43/5a AND 43/5.

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	43
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



9/12/2019
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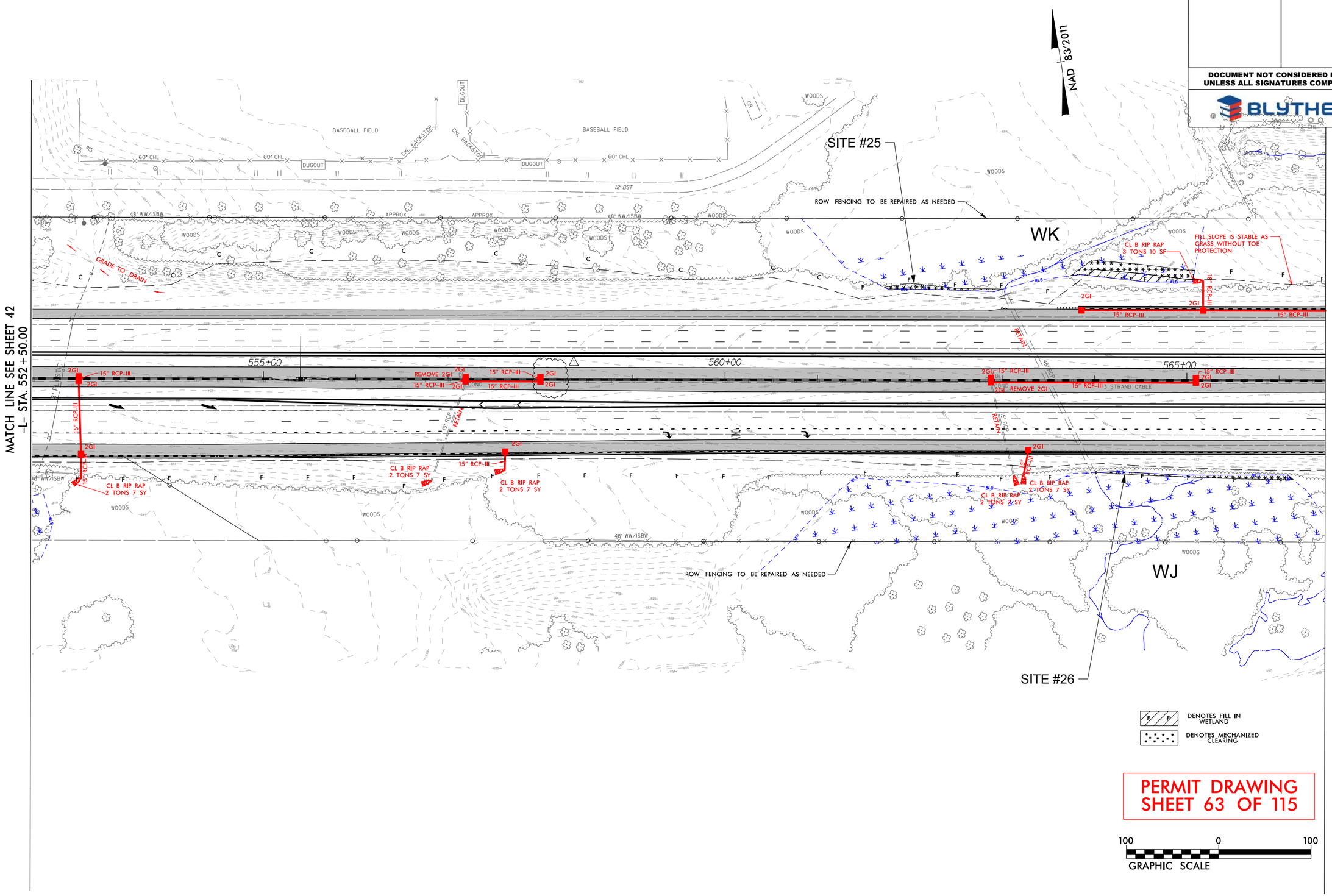
PROPWICS02$

PROJECT REFERENCE NO.	SHEET NO.
I-5507	43
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

BLYTHE



PERMIT DRAWING
SHEET 63 OF 115

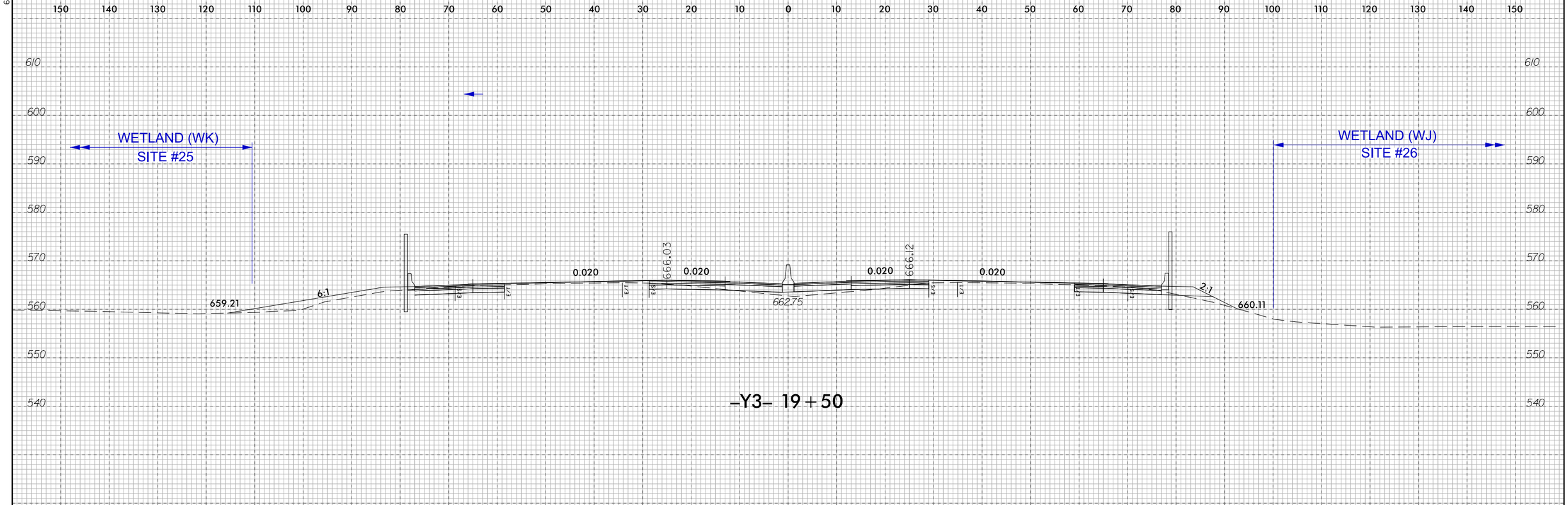
REVISIONS
1.9/5/19 - ADDED BOXES 43/5a AND 43/5.

8/17/99

9/12/2019
\\prdpwics02\ics_workingdir\3792\336401_3992\i5507_Hyd_prm_wet_psh43_cont.dgn
PRDPWICS02$

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-5507	43-1



PERMIT DRAWING
SHEET 64 OF 115

20 0 20
GRAPHIC SCALE

9/12/2019
N:\Projects02\ics_workingdir\3792\336401_4000\I5507_hyd_prm_wet_psh43_XS.dgn
PRDPWICS02$

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

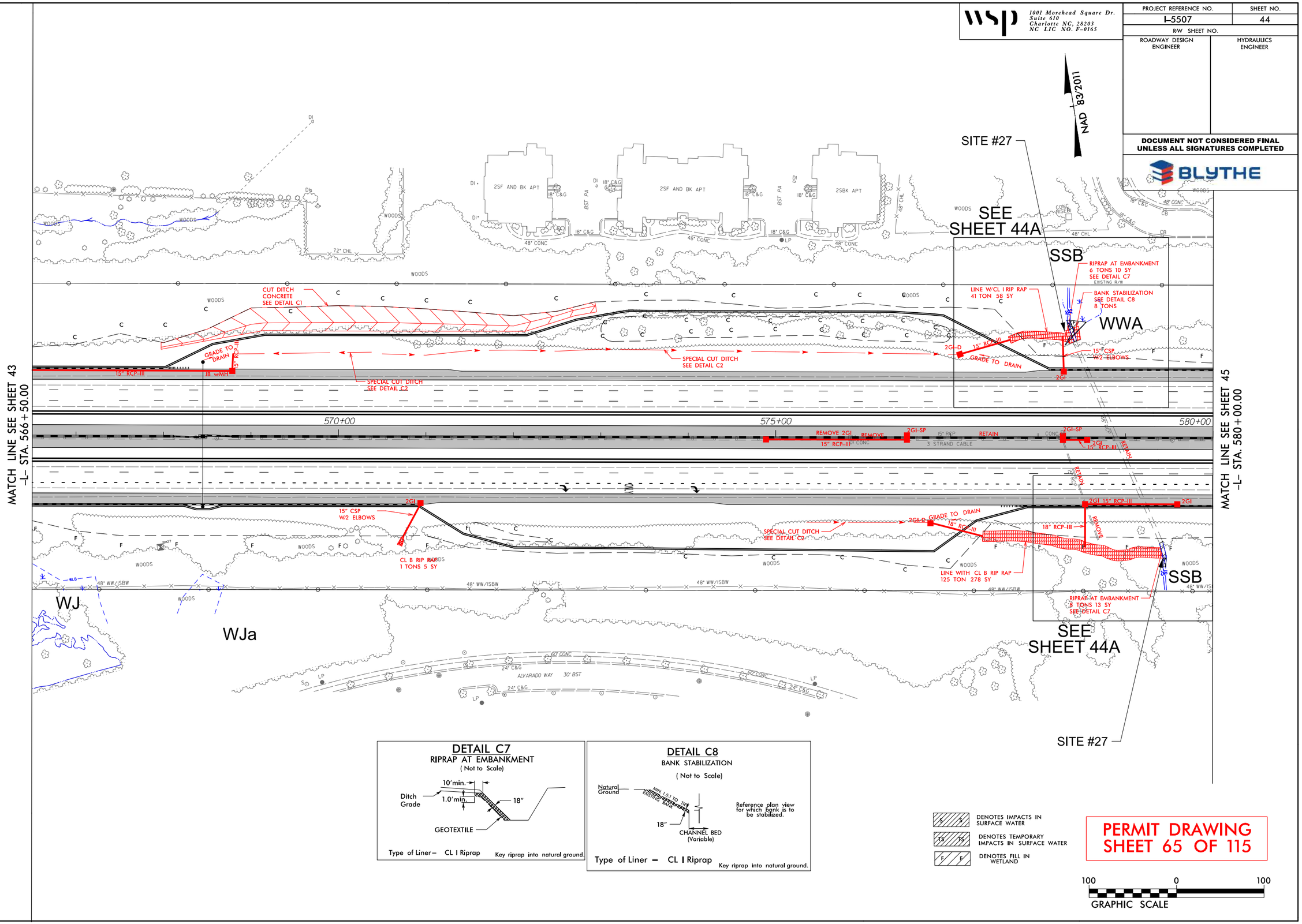
PROJECT REFERENCE NO.	SHEET NO.
I-5507	44
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

8/17/99

REVISIONS



PERMIT DRAWING
SHEET 65 OF 115

9/12/2019
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PRDPWICS02$

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

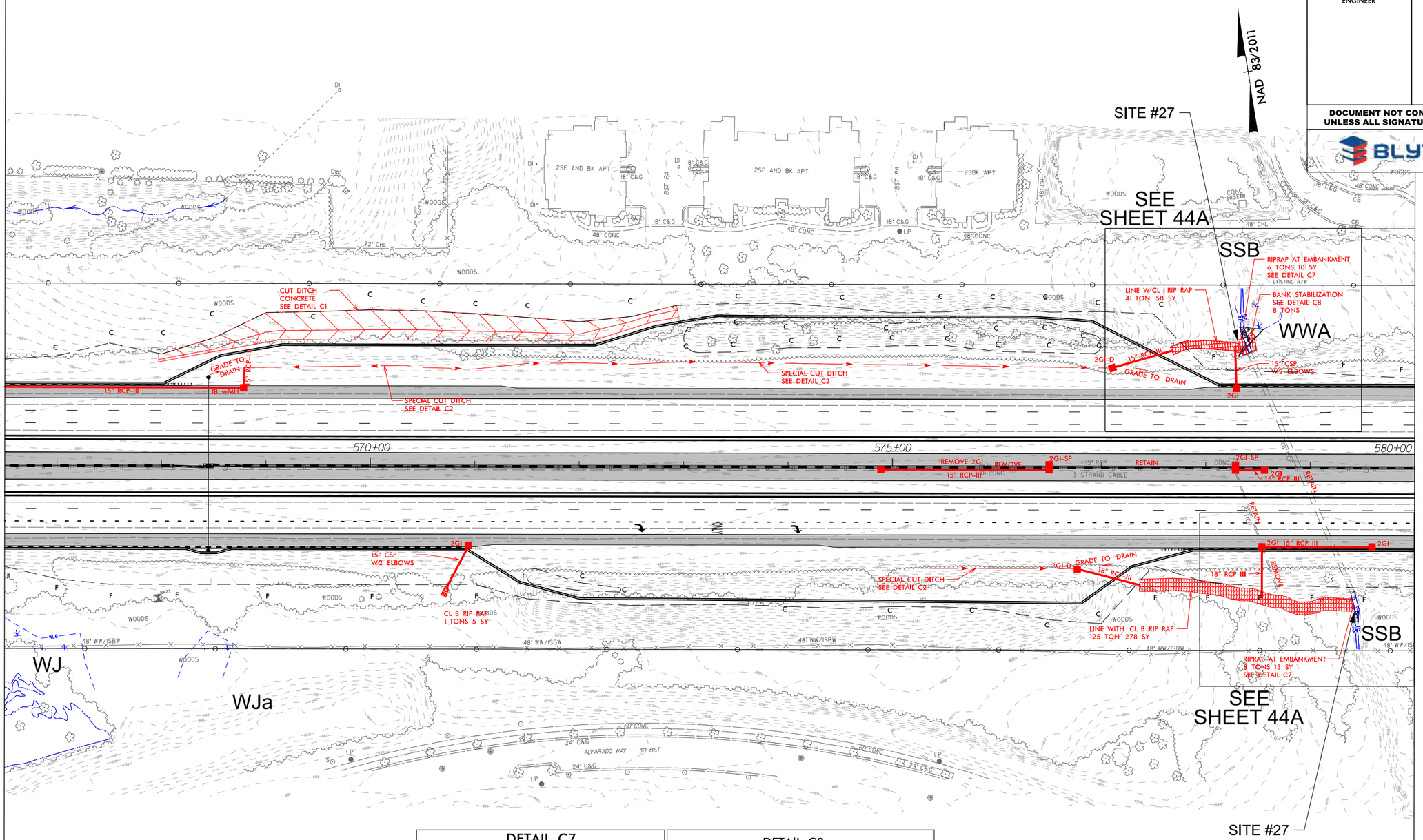
PROJECT REFERENCE NO.	SHEET NO.
I-5507	44
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

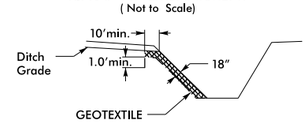
BLYTHE

REVISIONS

8/17/99



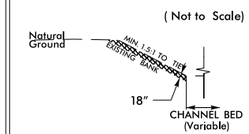
DETAIL C7
RIPRAP AT EMBANKMENT
(Not to Scale)



Type of Liner = CL I Riprap

Key riprap into natural ground.

DETAIL C8
BANK STABILIZATION
(Not to Scale)



Reference plan view for which bank is to be stabilized.

Type of Liner = CL I Riprap

Key riprap into natural ground.

S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
F F	DENOTES FILL IN WETLAND

PERMIT DRAWING
SHEET 66 OF 115

100 0 100
GRAPHIC SCALE

9/12/2019
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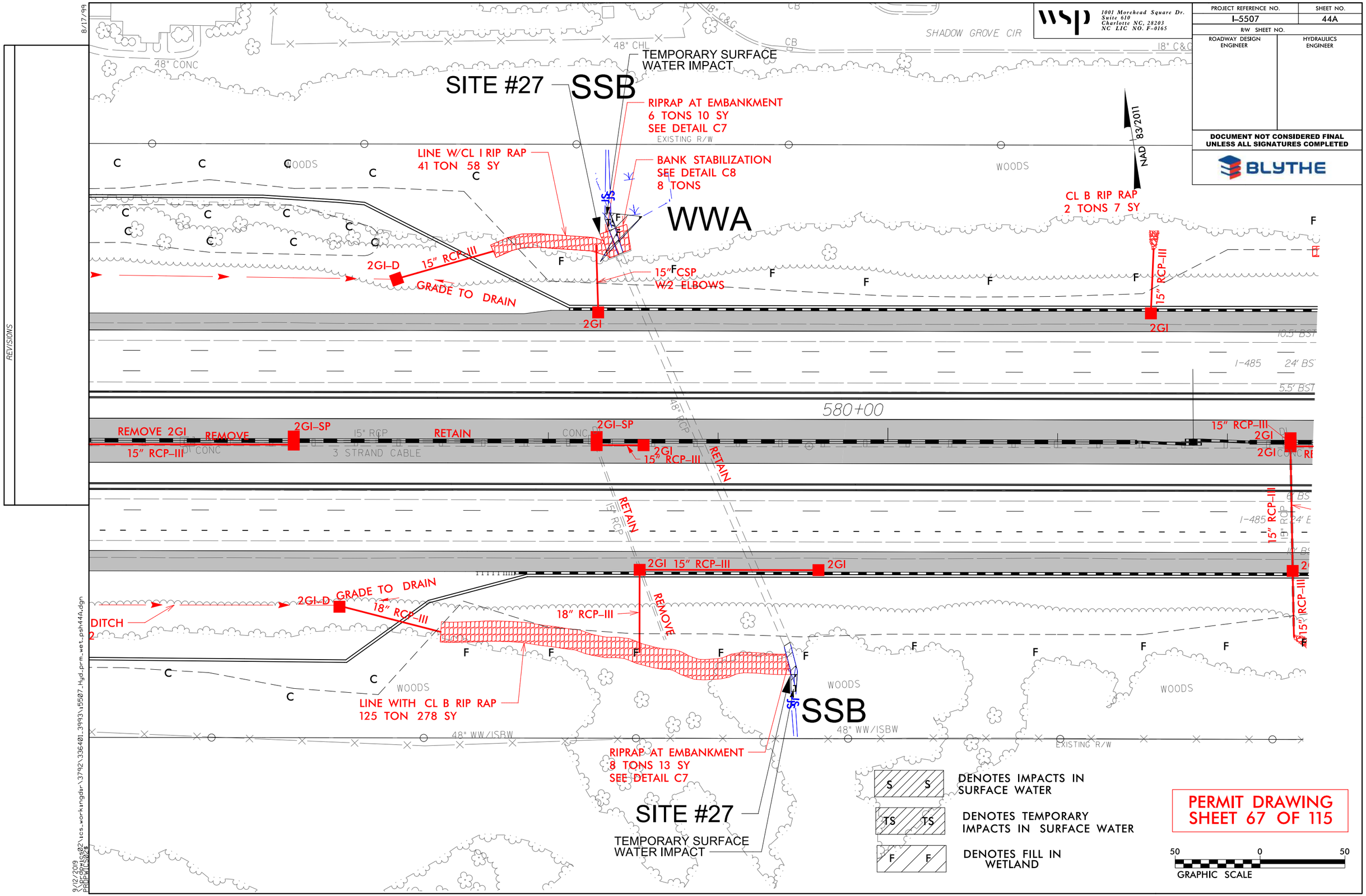
PRDPWICS02$



PROJECT REFERENCE NO.
I-5507
SHEET NO.
44A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
BLYTHE
1001 Morehead Square Dr. Suite 610 Charlotte NC, 28203 NC LIC NO. F-0165
SHADOW GROVE CIR
48" CONC
48" CHL
TEMPORARY SURFACE WATER IMPACT
SITE #27
SSB
RIPRAP AT EMBANKMENT
6 TONS 10 SY
SEE DETAIL C7
EXISTING R/W
LINE W/CL I RIP RAP
41 TON 58 SY
BANK STABILIZATION
SEE DETAIL C8
8 TONS
WOODS
NAD 83/2011
CL B RIP RAP
2 TONS 7 SY
WWA
2GI-D
15" RCP-III
GRADE TO DRAIN
15" CSP
W/2 ELBOWS
2GI
10.5' BST
I-485
24' BST
5.5' BST
580+00
REMOVE 2GI
REMOVE
15" RCP-III
2GI-SP
15" RCP
RETAIN
3 STRAND CABLE
48" RCP
2GI
15" RCP-III
RETAIN
15" RCP-III
2GI
2GI
6' BS
I-485
24' B
15" RCP-III
19" RCP
2GI 15" RCP-III
2GI
2GI-D
GRADE TO DRAIN
18" RCP-III
DITCH
18" RCP-III
REMOVE
15" RCP-III
WOODS
LINE WITH CL B RIP RAP
125 TON 278 SY
SSB
48" WW/ISBW
EXISTING R/W
RIPRAP AT EMBANKMENT
8 TONS 13 SY
SEE DETAIL C7
SITE #27
TEMPORARY SURFACE WATER IMPACT
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
PERMIT DRAWING
SHEET 67 OF 115
50 0 50
GRAPHIC SCALE
REVISIONS
8/17/99
9/12/2019
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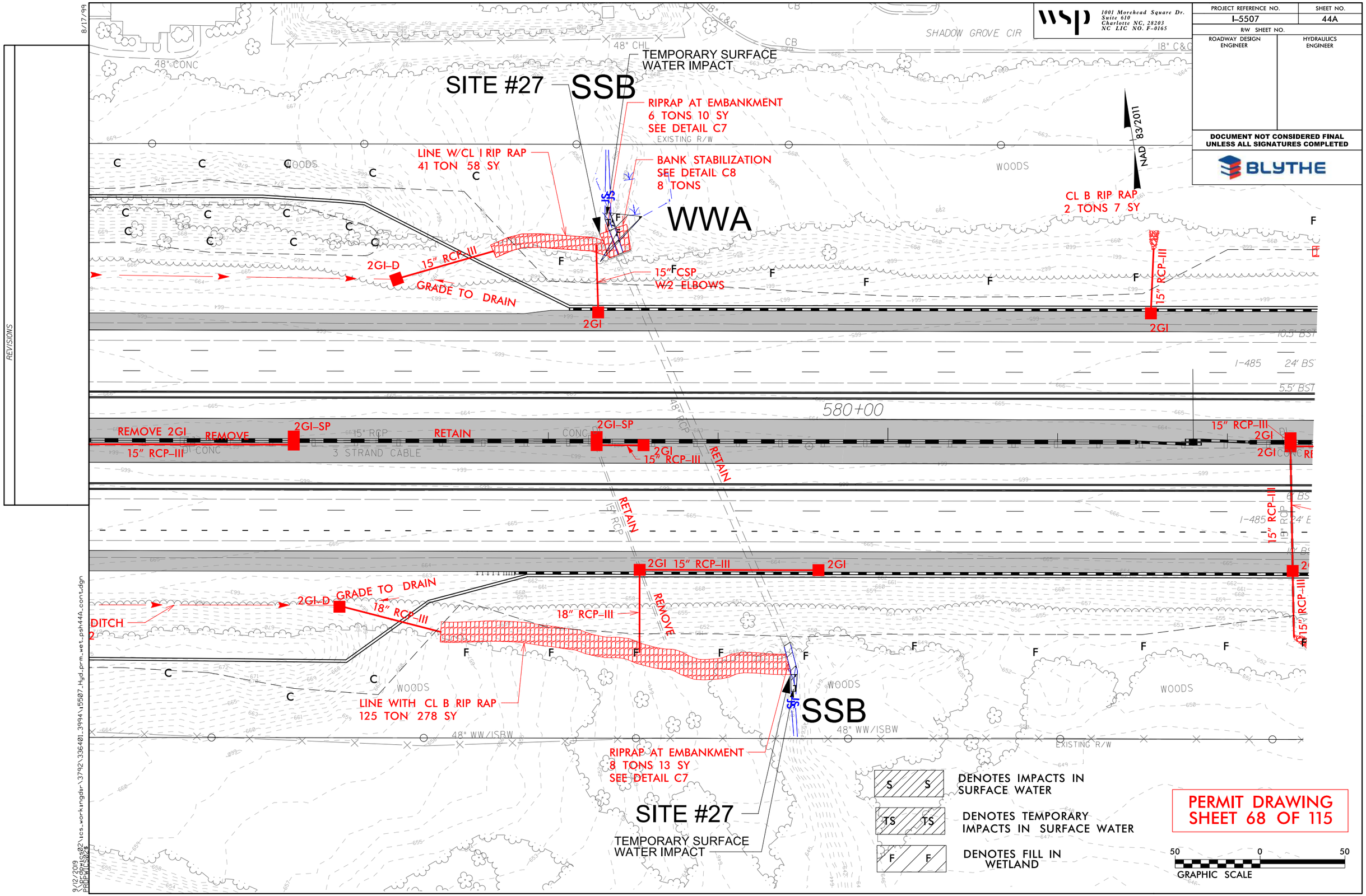
PRDPWICS02$



wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165
PROJECT REFERENCE NO.
I-5507
SHEET NO.
44A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
BLYTHE
SITE #27
SSB
TEMPORARY SURFACE WATER IMPACT
RIPRAP AT EMBANKMENT
6 TONS 10 SY
SEE DETAIL C7
LINE W/CL I RIP RAP
41 TON 58 SY
BANK STABILIZATION
SEE DETAIL C8
8 TONS
WWA
CL B RIP RAP
2 TONS 7 SY
NAD 83/2011
SHADOW GROVE CIR
48" CONC
48" CHL
18" C&G
EXISTING R/W
WOODS
2GI-D
15" RCP-III
GRADE TO DRAIN
15" CSP
W/2 ELBOWS
2GI
10.5' BST
I-485
24' BST
5.5' BST
580+00
REMOVE 2GI
REMOVE
15" RCP-III
2GI-SP
RETAIN
3 STRAND CABLE
15" RCP
2GI
15" RCP-III
RETAIN
15" RCP-III
2GI
2GI
15" RCP-III
2GI
2GI-D
GRADE TO DRAIN
18" RCP-III
DITCH
18" RCP-III
REMOVE
LINE WITH CL B RIP RAP
125 TON 278 SY
48" WW/ISBW
SSB
RIPRAP AT EMBANKMENT
8 TONS 13 SY
SEE DETAIL C7
SITE #27
TEMPORARY SURFACE WATER IMPACT
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
PERMIT DRAWING
SHEET 68 OF 115
50 0 50
GRAPHIC SCALE
REVISIONS
8/17/99
9/12/2019
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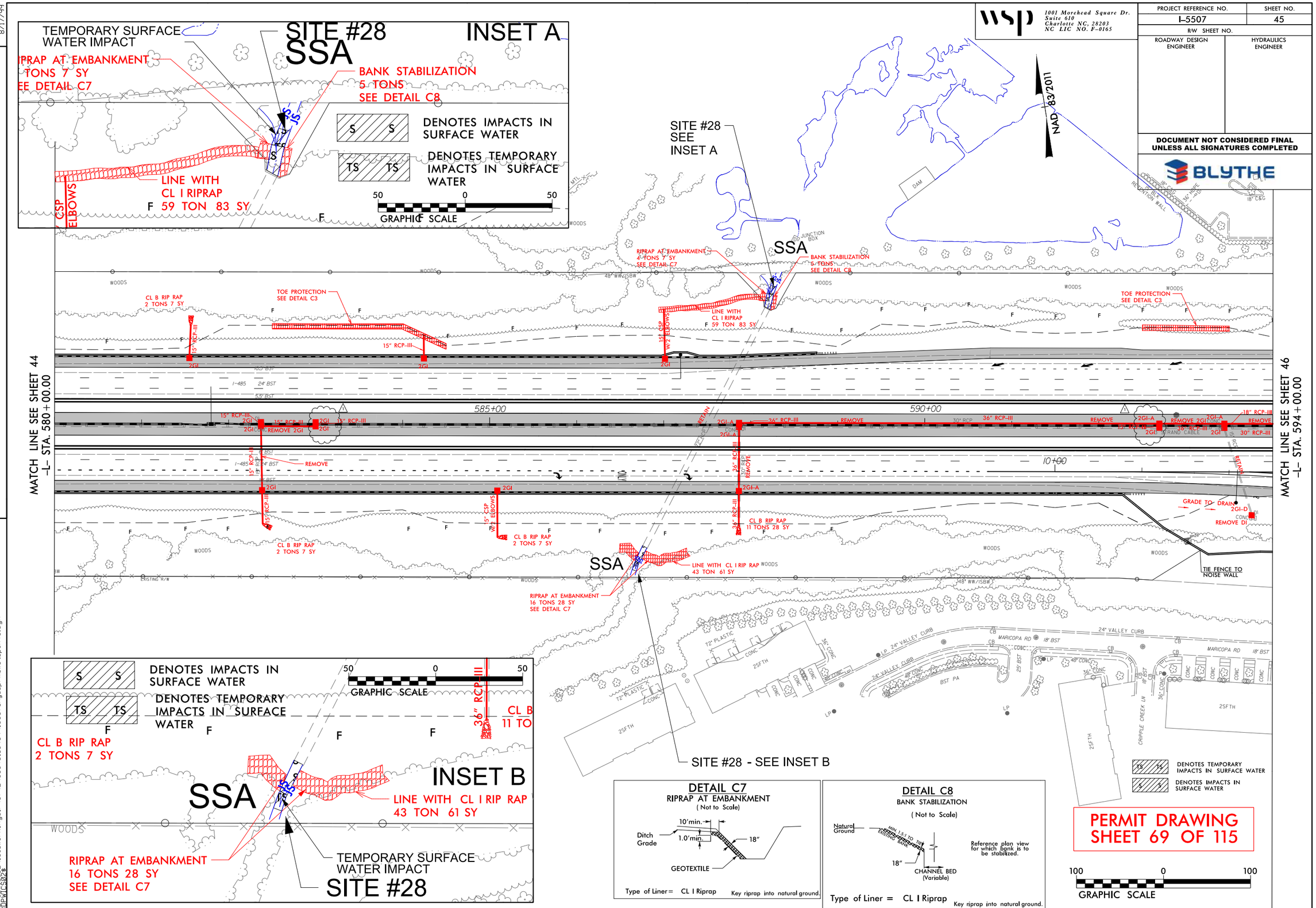

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	45
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

REVISIONS
1. 9/5/19 - ADDED BOXES 4520A,4520,4530A,AND 4530.

8/17/99

9/12/2019
\\prdpwics02\ics_workingdir\3792\336401_3989\i5507_Hyd_prm_wet_psh45.dgn
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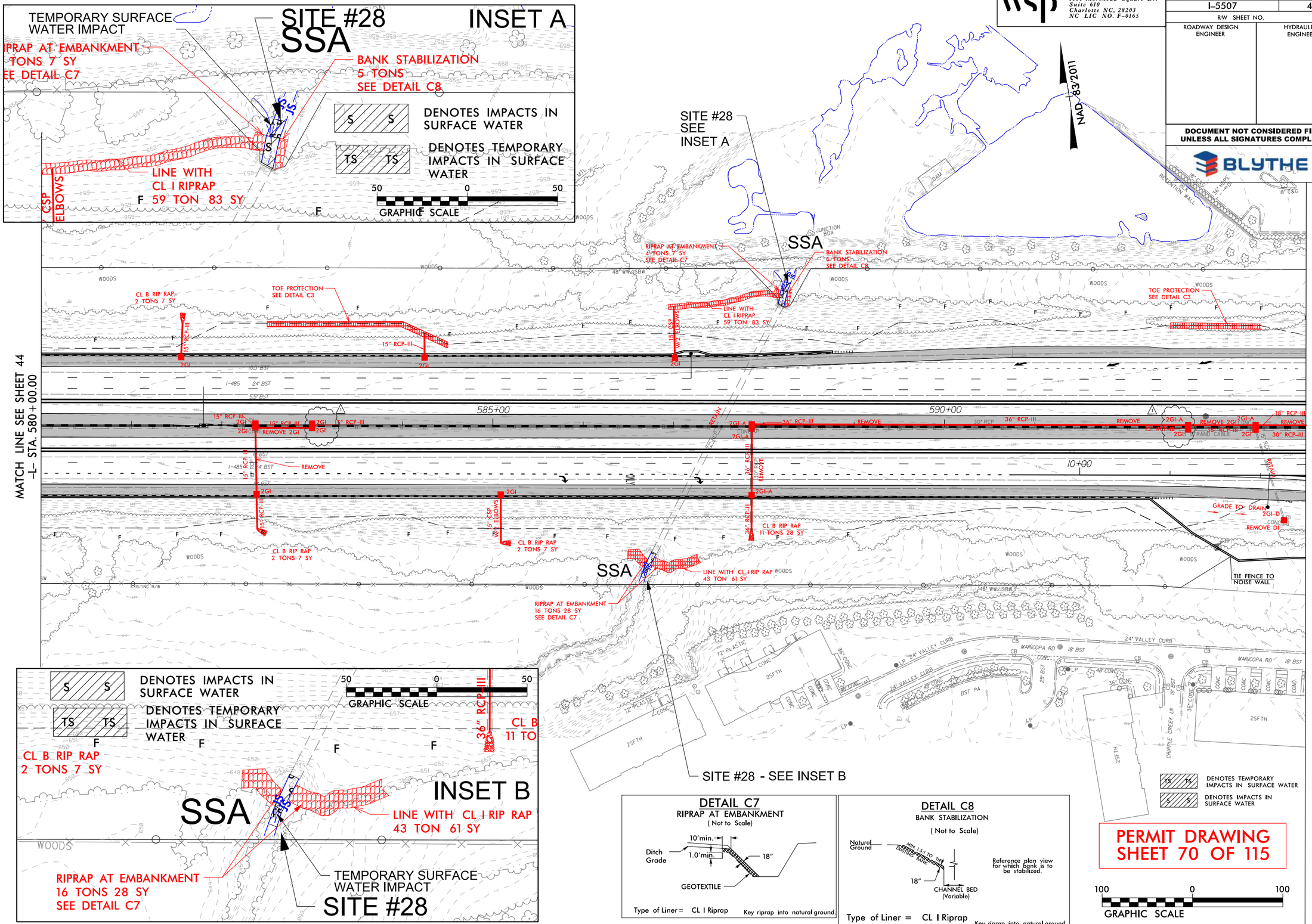

WSP
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	45
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

REVISIONS
1. 9/5/19 - ADDED BOXES 4520A,4520,4530A,AND 4530.

8/17/99

9/12/2019
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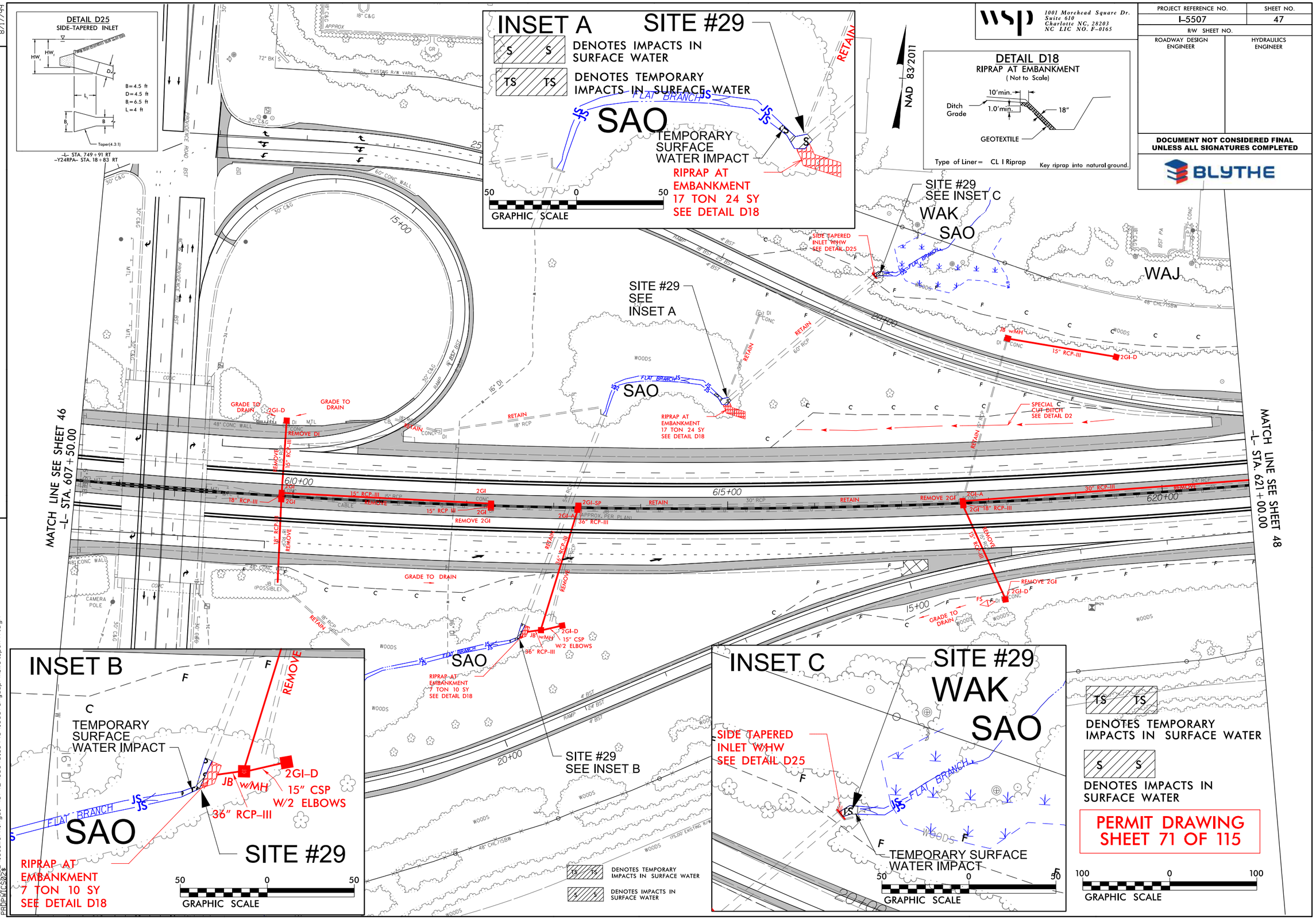

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	47
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

REVISIONS

8/17/99

9/12/2019
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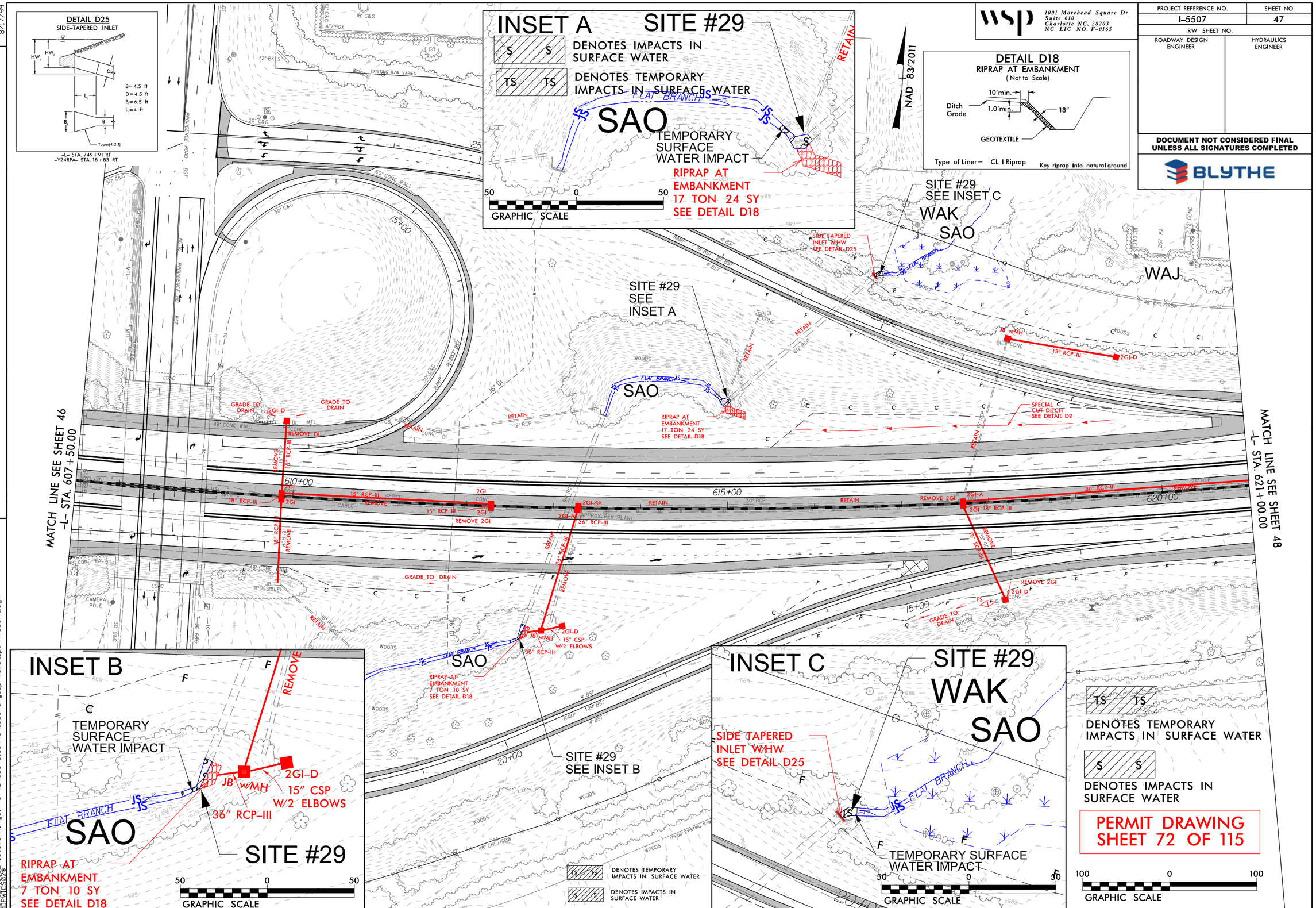

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	47
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

REVISIONS

8/17/99

9/12/2019
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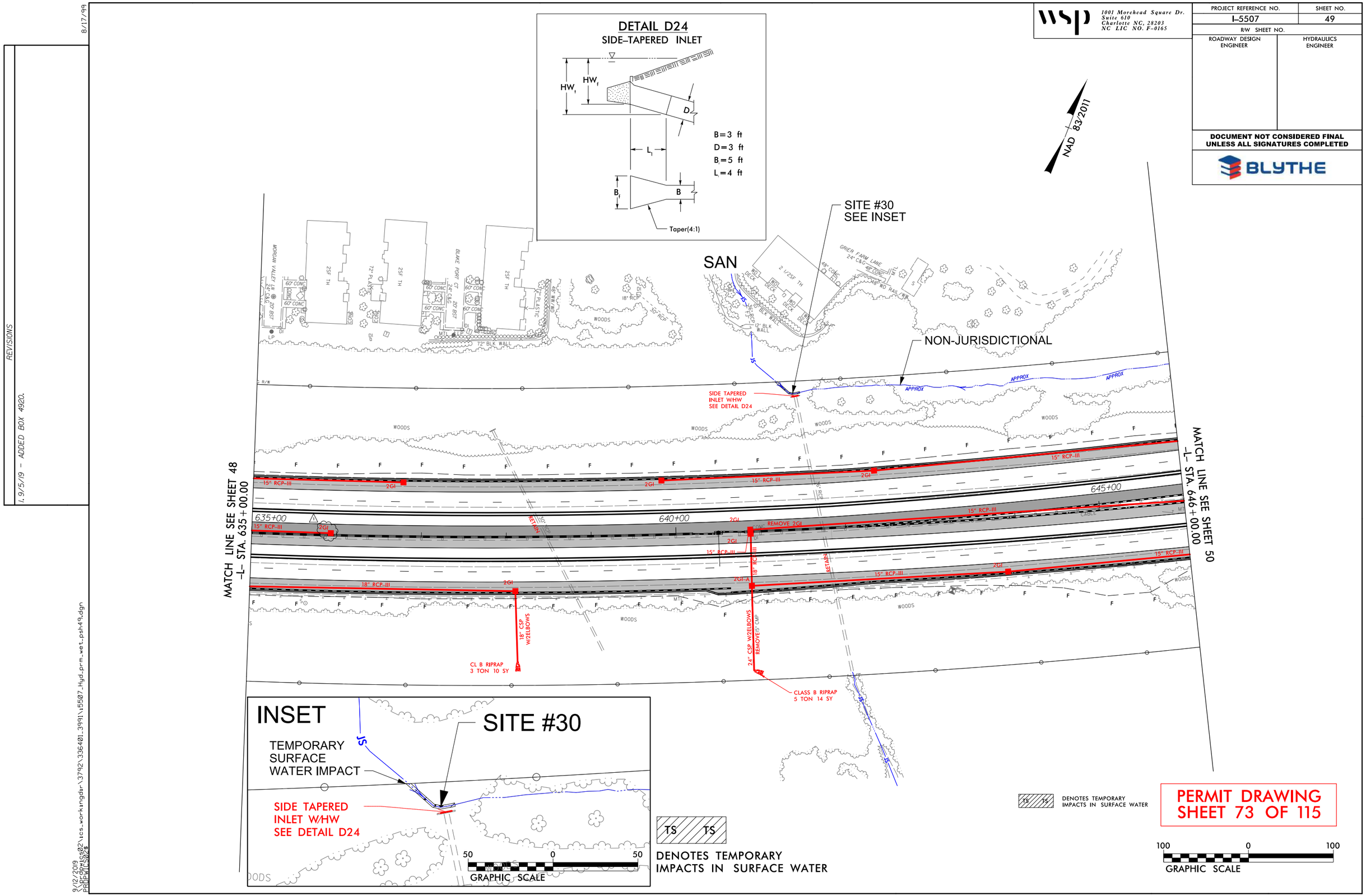


WSP
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	49
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

PERMIT DRAWING
SHEET 73 OF 115

REVISIONS
1.9/5/19 - ADDED BOX 4920.

8/17/99

9/12/2019
\\prdpwics02\ics_workingdir\3792\336401.3991\i5507_Hyd_prm_wet_psh49.dgn
PRDPWICS02$

8/17/99

REVISIONS

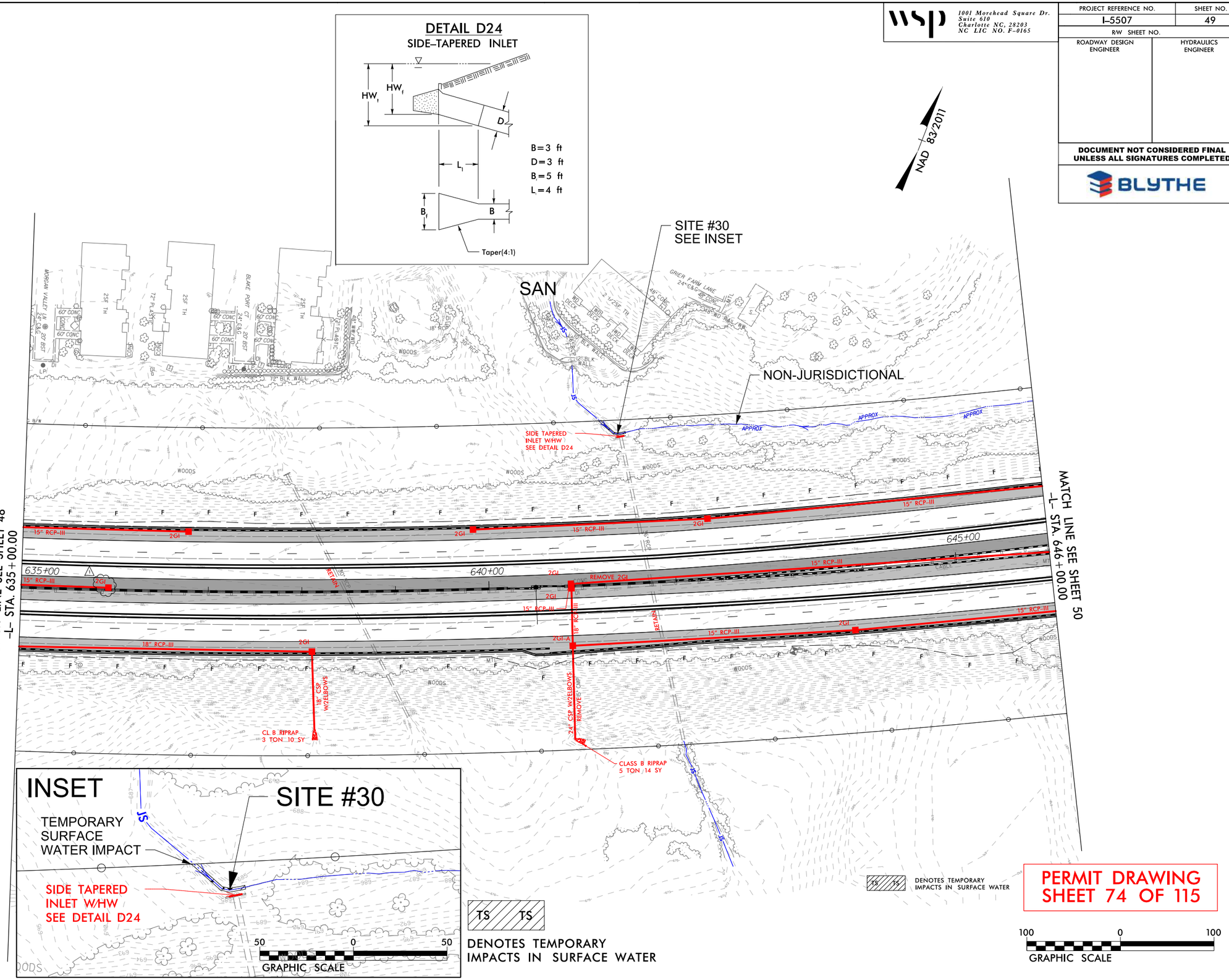
1 9/5/19 – ADDED BOX 4920.

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	49
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



9/12/2019
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PROPWTCS02$

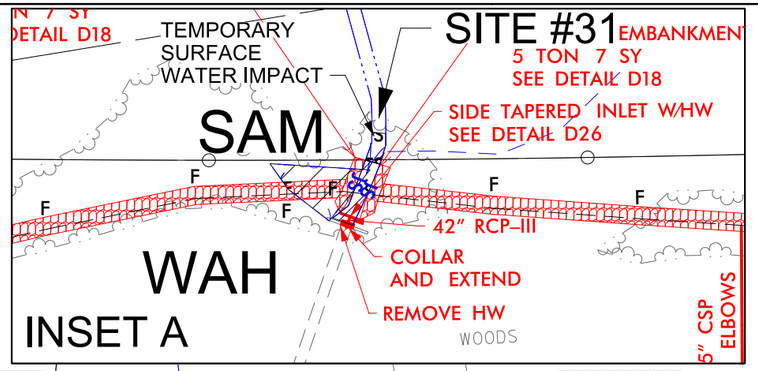
wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

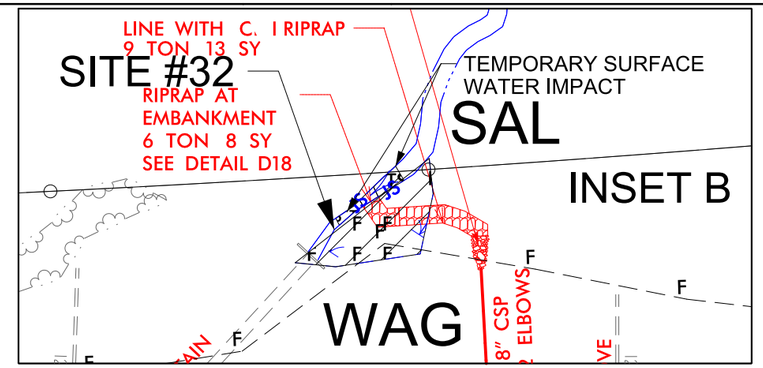
PROJECT REFERENCE NO.	SHEET NO.
I-5507	50
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

NAD 83/2011



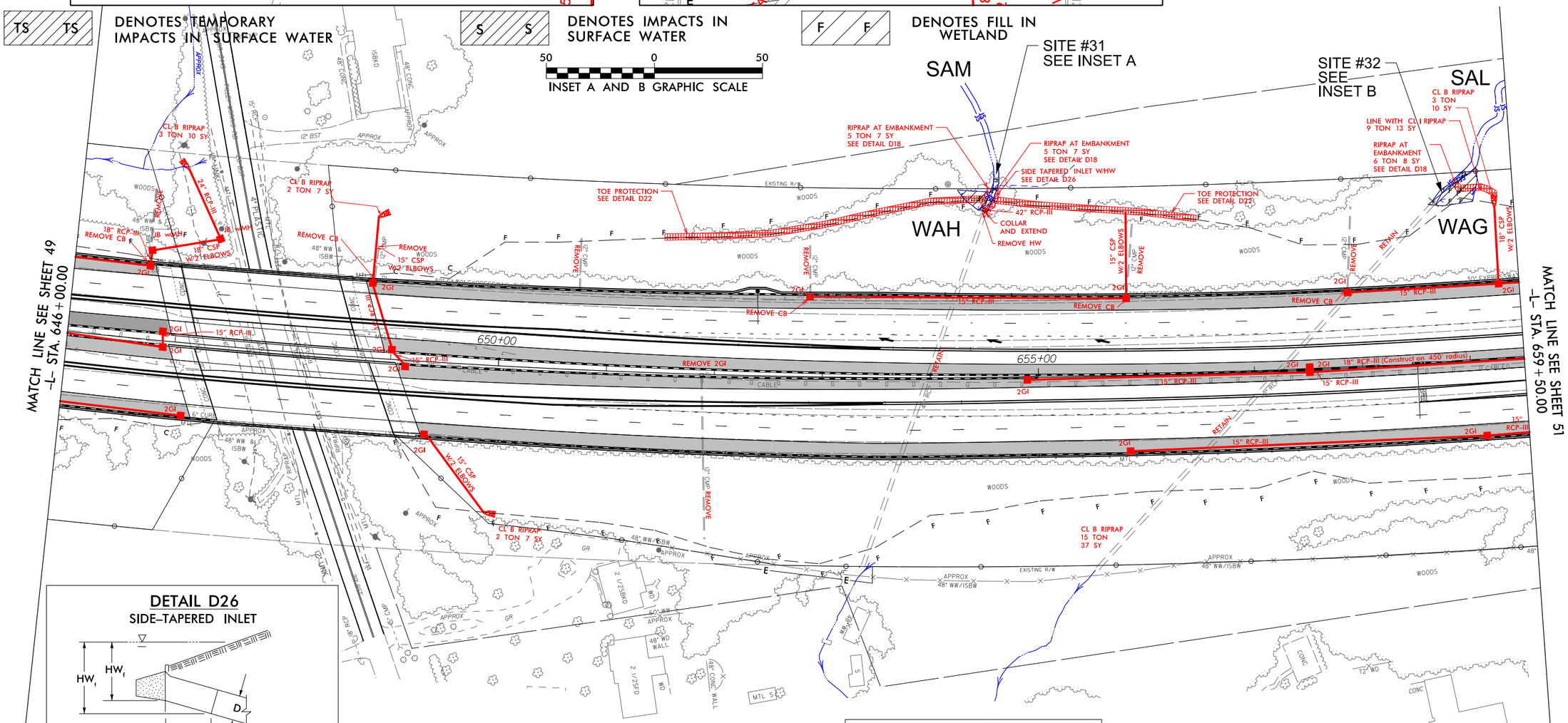


TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

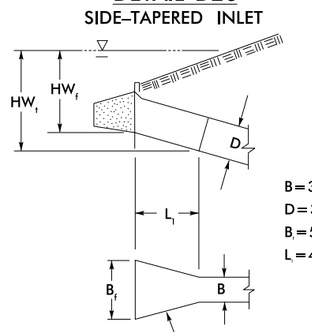
S S DENOTES IMPACTS IN SURFACE WATER

F F DENOTES FILL IN WETLAND

50 0 50
INSET A AND B GRAPHIC SCALE



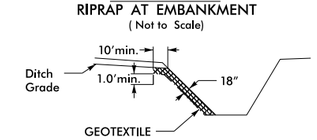
DETAIL D26
SIDE-TAPERED INLET



B=3.5 ft
D=3.5 ft
B_f=5.5 ft
L_i=4 ft

SITE #31 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

DETAIL D18
RIPRAP AT EMBANKMENT
(Not to Scale)



Type of Liner= CL I Riprap
Key riprap into natural ground.

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

100 0 100
GRAPHIC SCALE

PERMIT DRAWING
SHEET 75 OF 115

REVISIONS

8/17/99

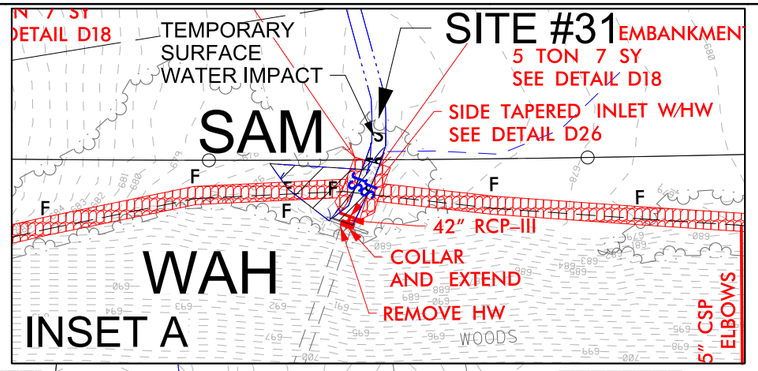
9/12/2019
pr5pgs01\ics_workingdir\3088\336401_4001\i5507_hyd-prm_wet_psh50.dgn
PROPWTCS01$

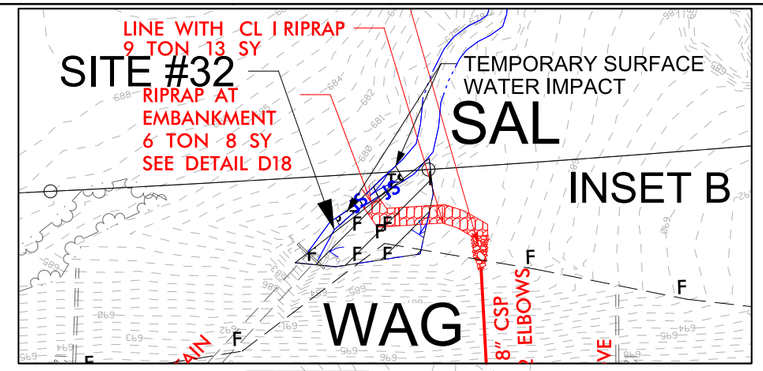
wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	50
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE





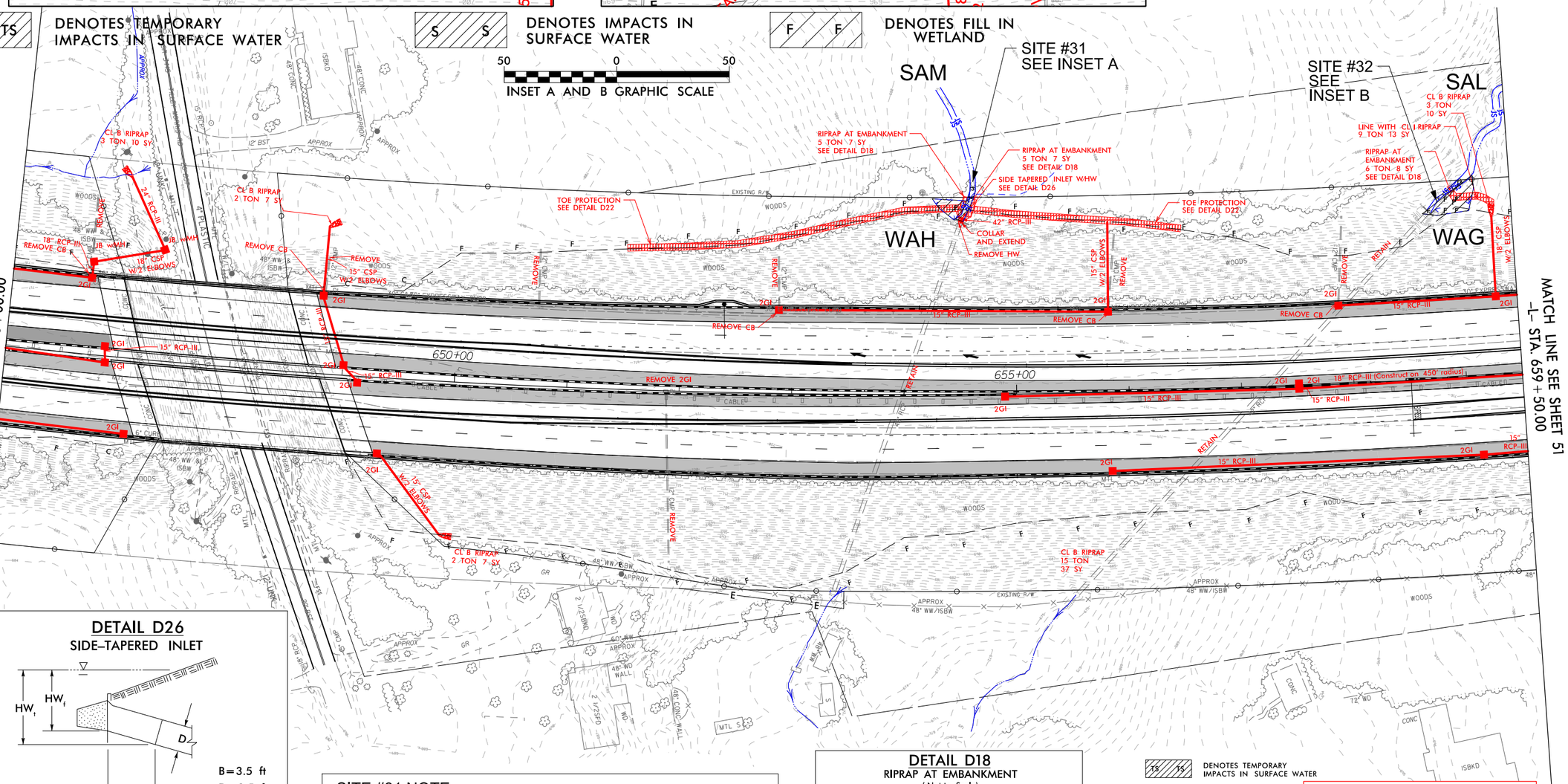
NAD 83/2011

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

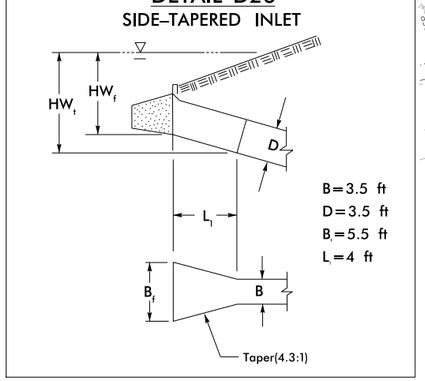
S S DENOTES IMPACTS IN SURFACE WATER

F F DENOTES FILL IN WETLAND

50 0 50
INSET A AND B GRAPHIC SCALE



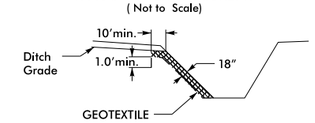
DETAIL D26
SIDE-TAPERED INLET



B=3.5 ft
D=3.5 ft
B=5.5 ft
L=4 ft

SITE #31 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

DETAIL D18
RIPRAP AT EMBANKMENT
(Not to Scale)



Type of Liner= CL I Riprap
Key riprap into natural ground.

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 76 OF 115

100 0 100
GRAPHIC SCALE

REVISIONS

8/17/99

9/12/2019
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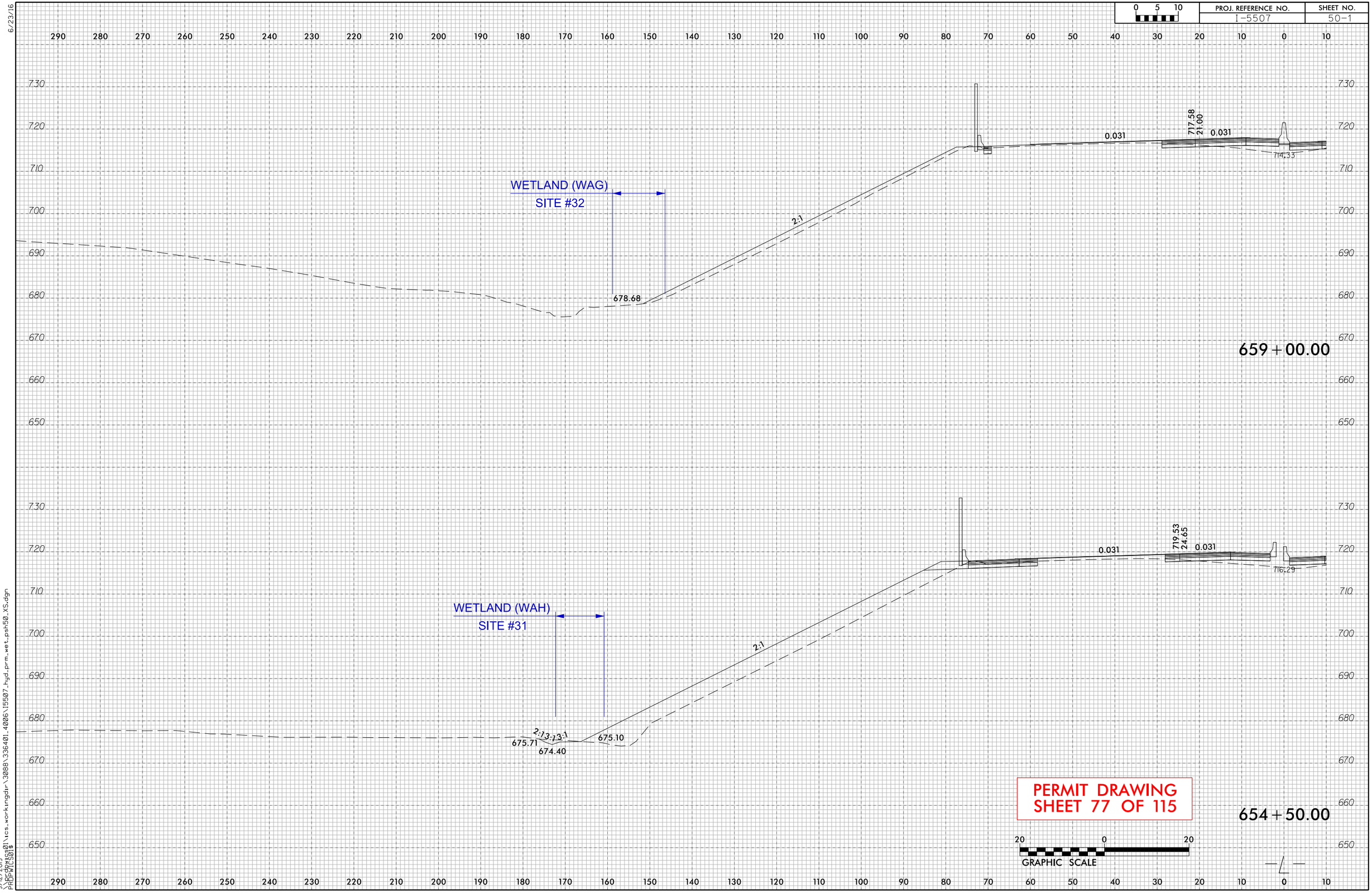

6/23/16

9/12/2019
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PRDPWICS01$

8/17/99

REVISIONS

1. 9/5/19 - MOVED BOXES 5209A AND 5209

PROJECT REFERENCE NO.	SHEET NO.
I-5507	52
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

INSET A SITE #33

RIPRAP AT EMBANKMENT
21 TON 47 SY
SEE DETAIL D18

IMPACTS TO SURFACE WATER

WO

SBH

JS

F

50 0 50
GRAPHIC SCALE

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

NAD 83/2011

SITE #33 SEE INSET A

SITE #33 SEE INSET B

MATCH LINE SEE SHEET 51 -L- STA. 673+00.00

MATCH LINE SEE SHEET 53 -L- STA. 686+00.00

675+00

680+00

685+00

RIPRAP AT EMBANKMENT SEE DETAIL D18

18" CSP W/2 ELBOWS

LINE WITH CL I RIPRAP 109 TON 154 SY

GRADE TO DRAIN

15" CSP W/2 ELBOWS

RIPRAP AT EMBANKMENT 21 TON 47 SY SEE DETAIL D18

15" CSP W/2 ELBOWS

CL B RIPRAP 9 TON 20 SY

OTCB-4

36" CSP W/2 ELBOWS

WILSON DR

BLACKMUIR WOOD CIR

RET POND

POND

WOODS

EXISTING R/W

INSET B SITE #33

RIPRAP AT EMBANKMENT SEE DETAIL D18

TEMPORARY SURFACE WATER IMPACT

JS

IMPACTS TO SURFACE WATER

F

50 0 50
GRAPHIC SCALE

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DETAIL D18
RIPRAP AT EMBANKMENT
(Not to Scale)

10'min.
Ditch Grade
1.0'min.
18"
GEOTEXTILE

Type of Liner= CL I Riprap
Key riprap into natural ground.

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

100 0 100
GRAPHIC SCALE

PERMIT DRAWING SHEET 78 OF 115

9/12/2019
pr\pr\tlcs01\tlcs_workingdir\3088\336401_4002\i5507_hyd_prm_wet_psh52.dgn
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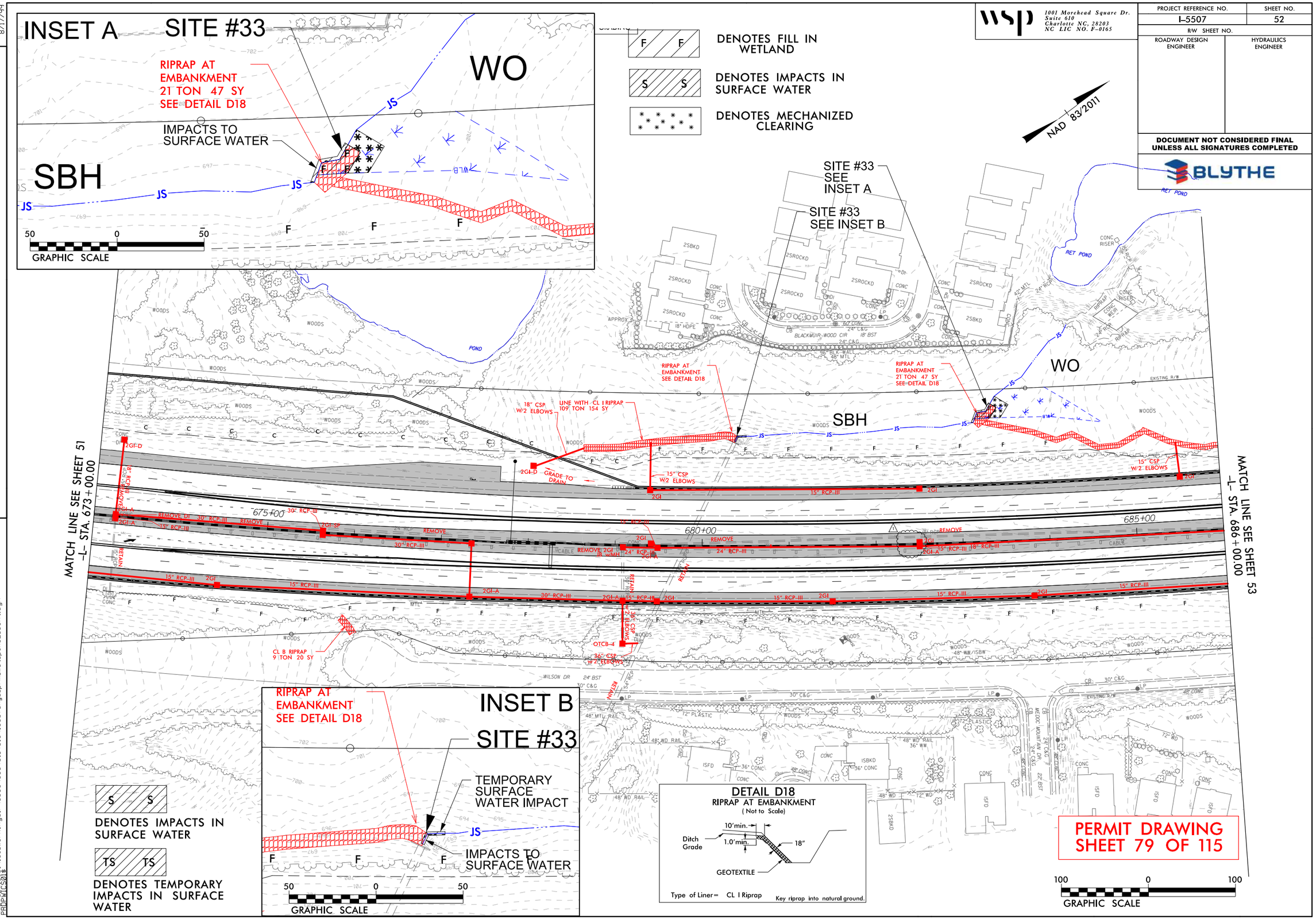

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	52
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

REVISIONS
1.9/5/19 - MOVED BOXES 5209A AND 5209

8/17/99

9/12/2019
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PRDPWICS01$

8/17/99

REVISIONS

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1001 Morehead Square Dr.
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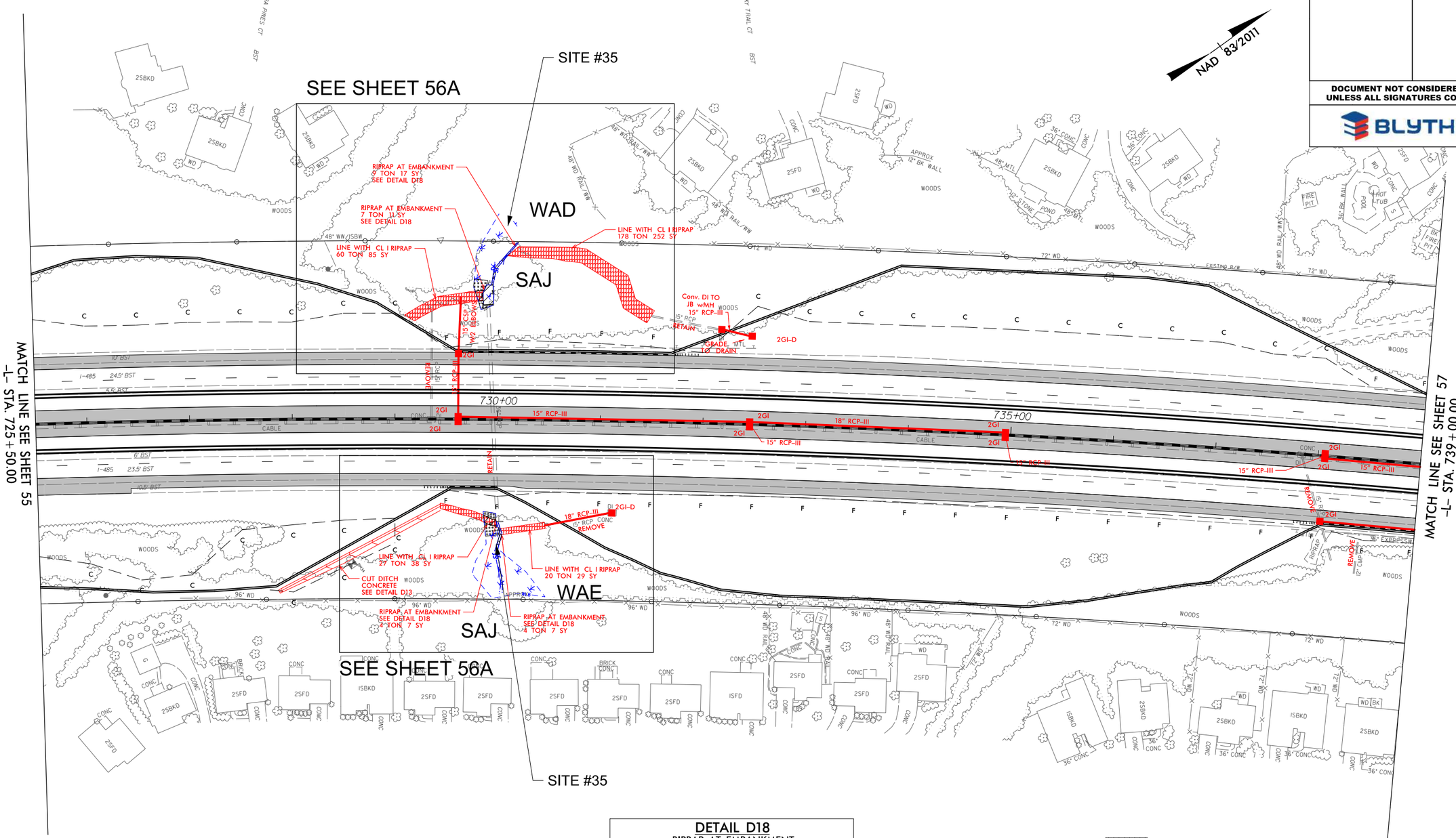
Charlotte NC, 28203
NC LIC NO. F-0165

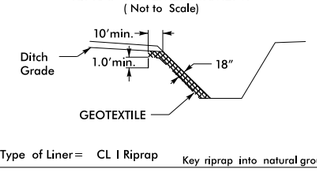
PROJECT REFERENCE NO.	SHEET NO.
I-5507	56
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



DETAIL D18
RIPRAP AT EMBANKMENT
(Not to Scale)



Type of Liner= CL I Riprap

Key riprap into natural ground.

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

PERMIT DRAWING SHEET 80 OF 115

100 0 100
GRAPHIC SCALE

9/12/2019
ODOPowCad01\ics_workingdir-\3088\336401_4003\I5507_Hyd_prm_wet_psh56.dgn
PROPWCS01$

8/17/99

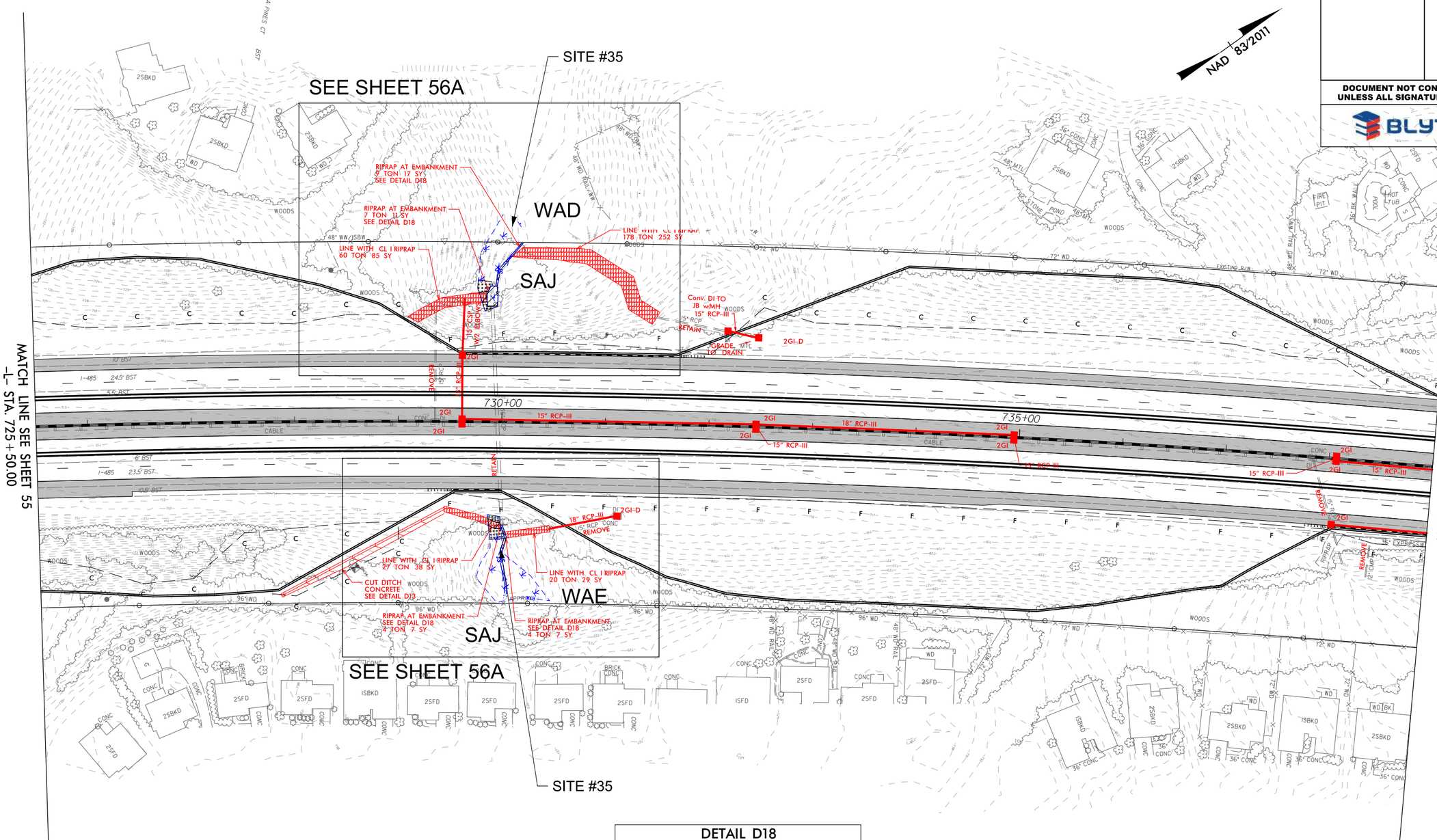
REVISIONS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

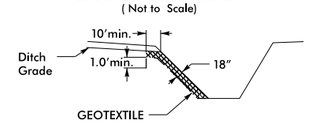
PROJECT REFERENCE NO.	SHEET NO.
I-5507	56
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



DETAIL D18
RIPRAP AT EMBANKMENT
(Not to Scale)



Type of Liner= CL I Riprap

Key riprap into natural ground.

TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

S DENOTES IMPACTS IN SURFACE WATER

F DENOTES FILL IN WETLAND

PERMIT DRAWING SHEET 81 OF 115

100 0 100
GRAPHIC SCALE

9/12/2019
pdpw01a01\ncs_workingdir-\3088\336401_4009\I5507_Hyd_prm_wet_psh56_cont.dgn
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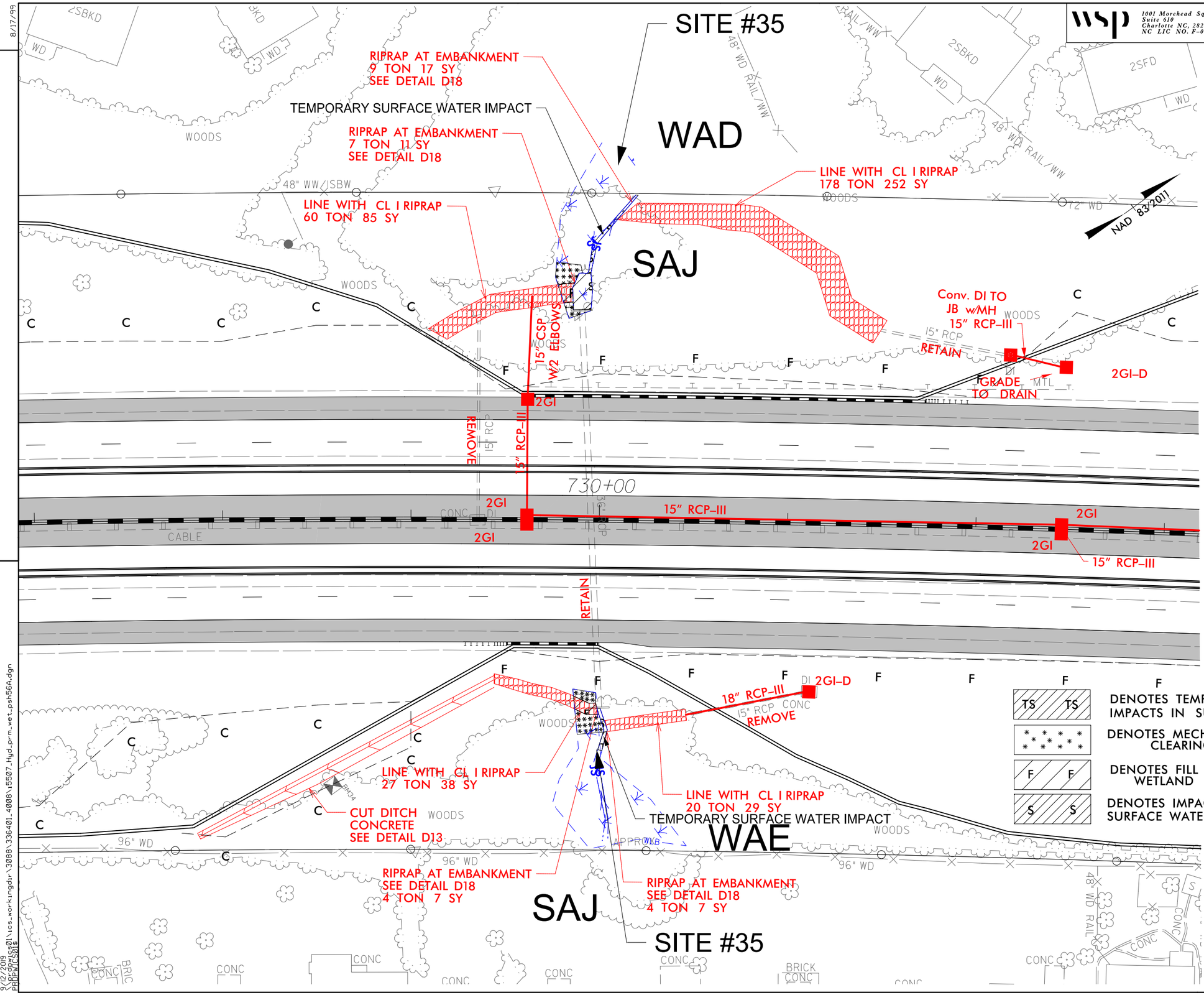

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	56A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

PERMIT DRAWING
SHEET 82 OF 115

8/17/99

REVISIONS

9/12/2019
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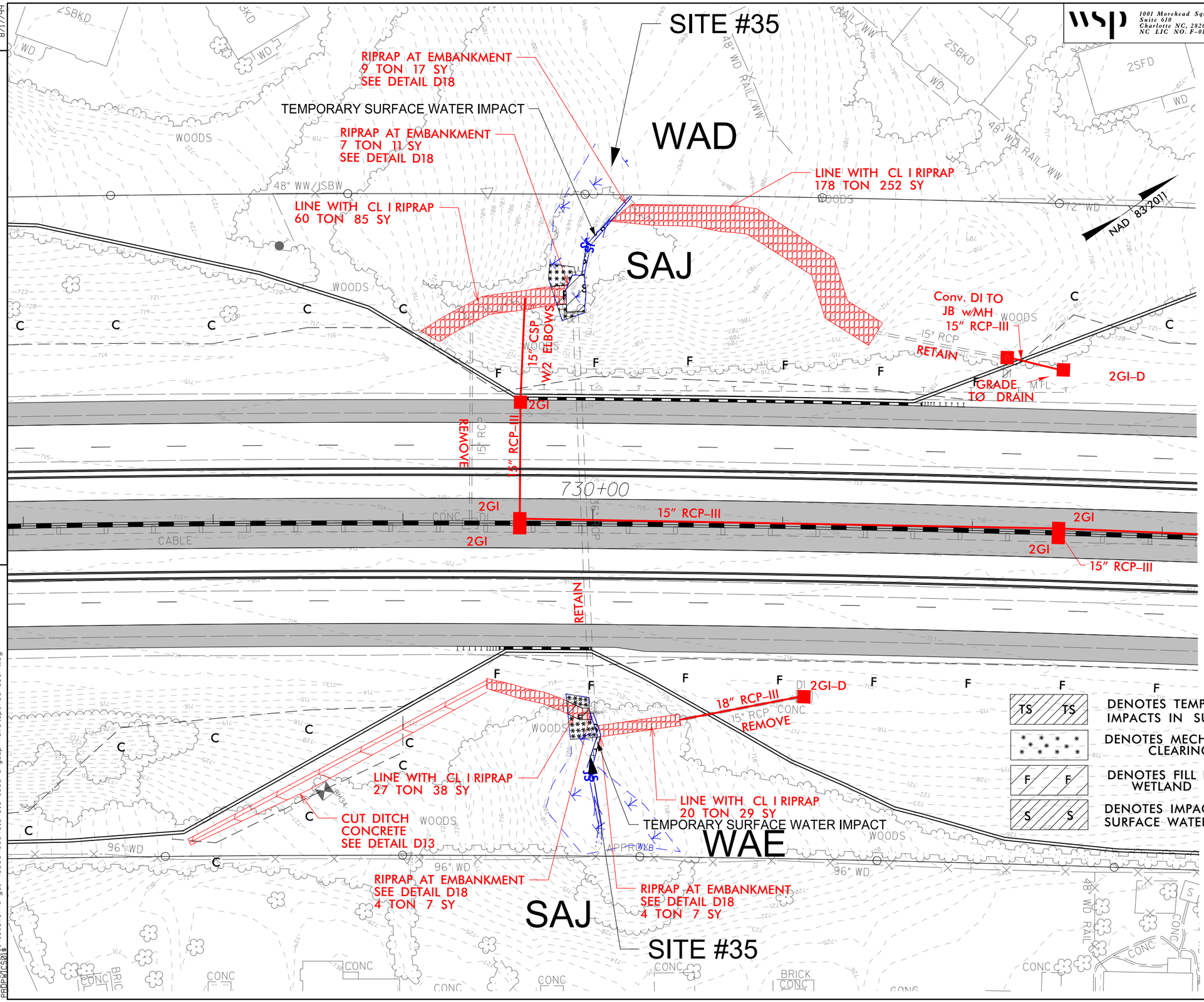
PROPWTCS01$



wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	56A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

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

PERMIT DRAWING
SHEET 83 OF 115

50 0 50
GRAPHIC SCALE

REVISIONS

8/17/99

9/12/2019
DRP:SPrice
FRP:WTCS01$
01\ics_workingdir\3088\336401_4010\I5507_Hyd_prm_wet_psh56A_cont.dgn

8/17/99

REVISIONS

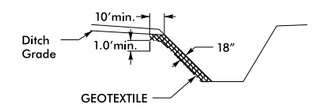
wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	57
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

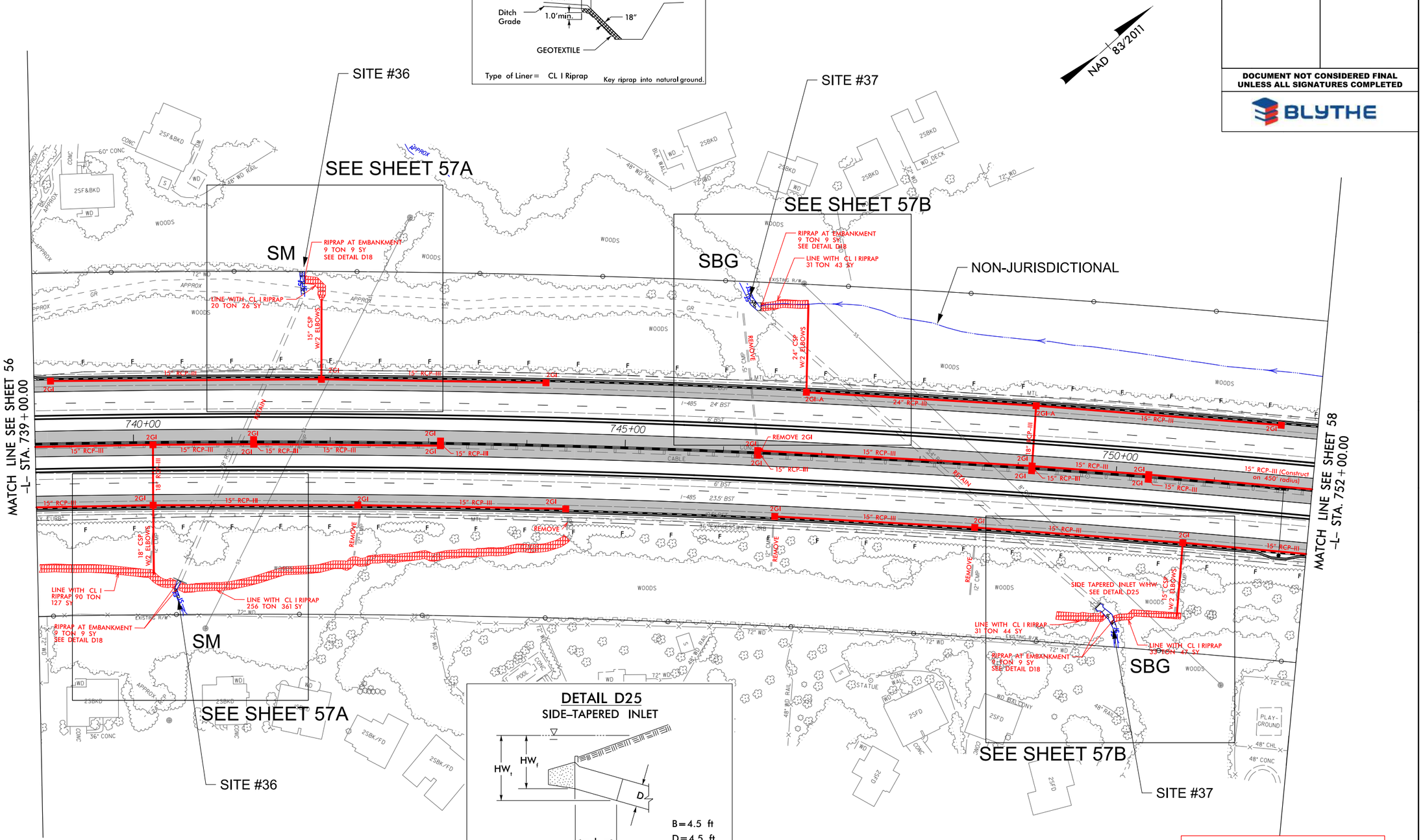
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

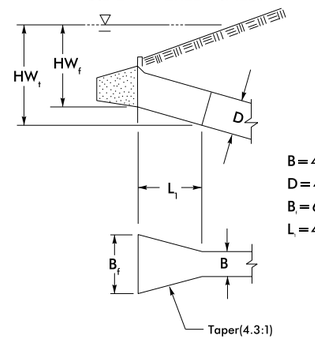
DETAIL D18
RIPRAP AT EMBANKMENT
(Not to Scale)



Type of Liner = CL I Riprap
Key riprap into natural ground.



DETAIL D25
SIDE-TAPERED INLET



B=4.5 ft
D=4.5 ft
B$_t$=6.5 ft
L$_t$=4 ft

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 84 OF 115

100 0 100
GRAPHIC SCALE

9/12/2019
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PROPWICS01$

8/17/99

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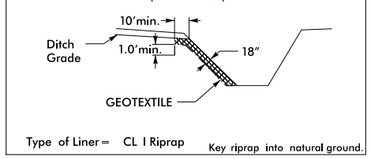
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	57
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

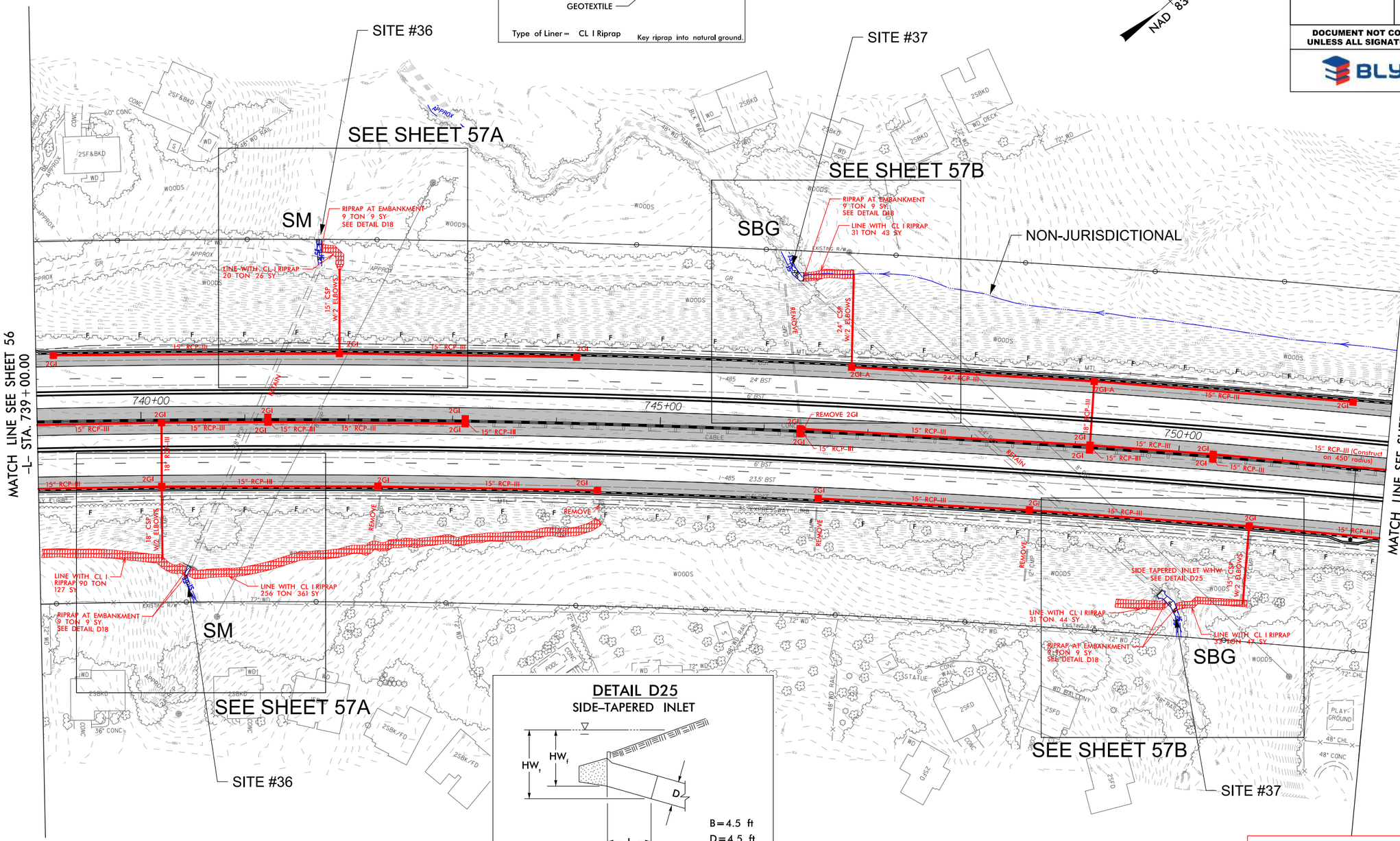
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

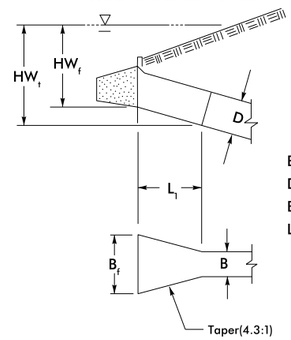
DETAIL D18
RIPRAP AT EMBANKMENT
(Not to Scale)



NAD 83/2011



DETAIL D25
SIDE-TAPERED INLET



B=4.5 ft
D=4.5 ft
B_t=6.5 ft
L_t=4 ft

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 85 OF 115

100 0 100
GRAPHIC SCALE

9/12/2019
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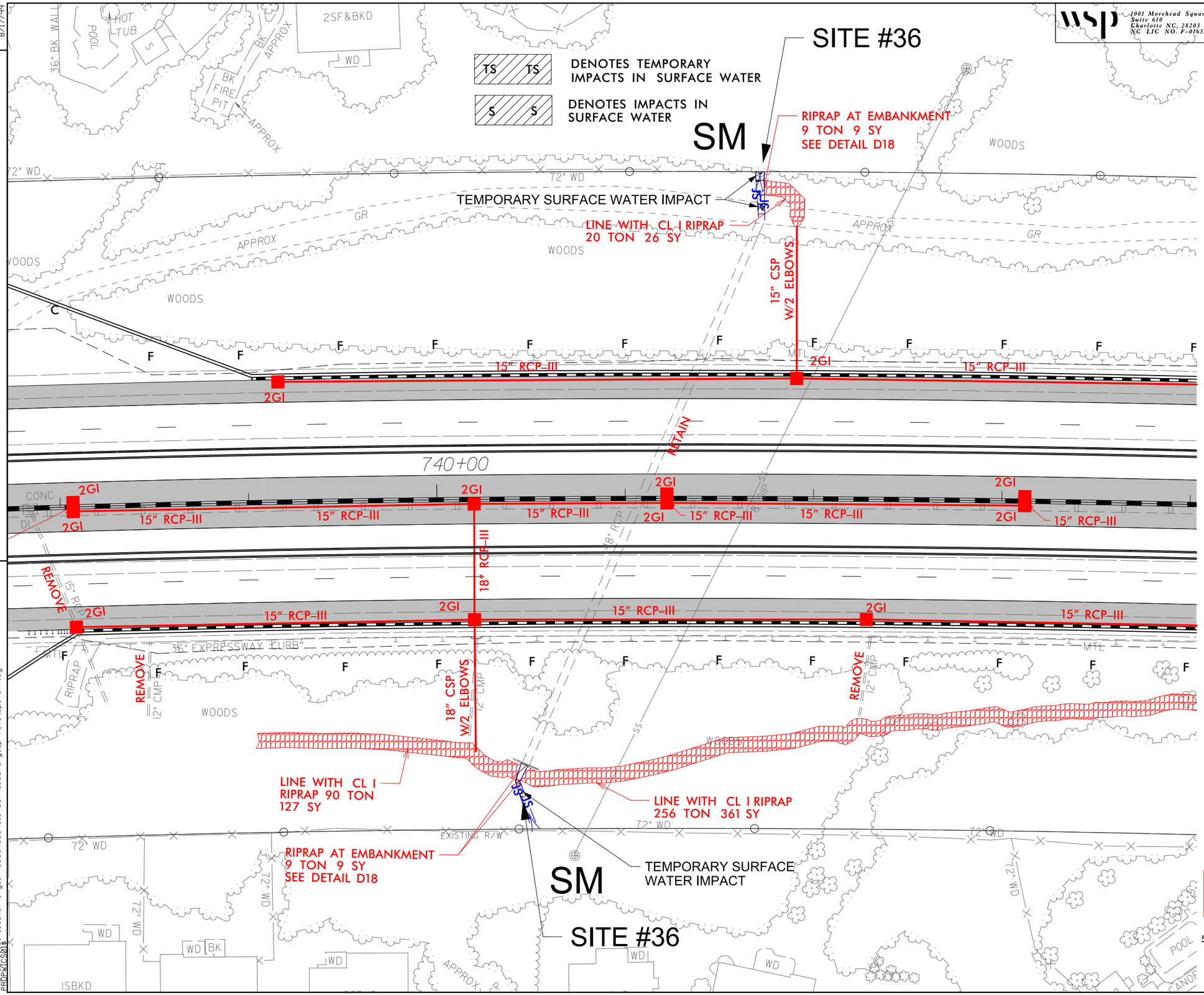

PERMIT DRAWING
SHEET 86 OF 115

50 0 50
GRAPHIC SCALE

PROJECT REFERENCE NO.	SHEET NO.
I-5507	57A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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WSP
1001 Morehead Square Dr.
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NC LIC NO. F-0165

REVISIONS

8/17/99

9/12/2019
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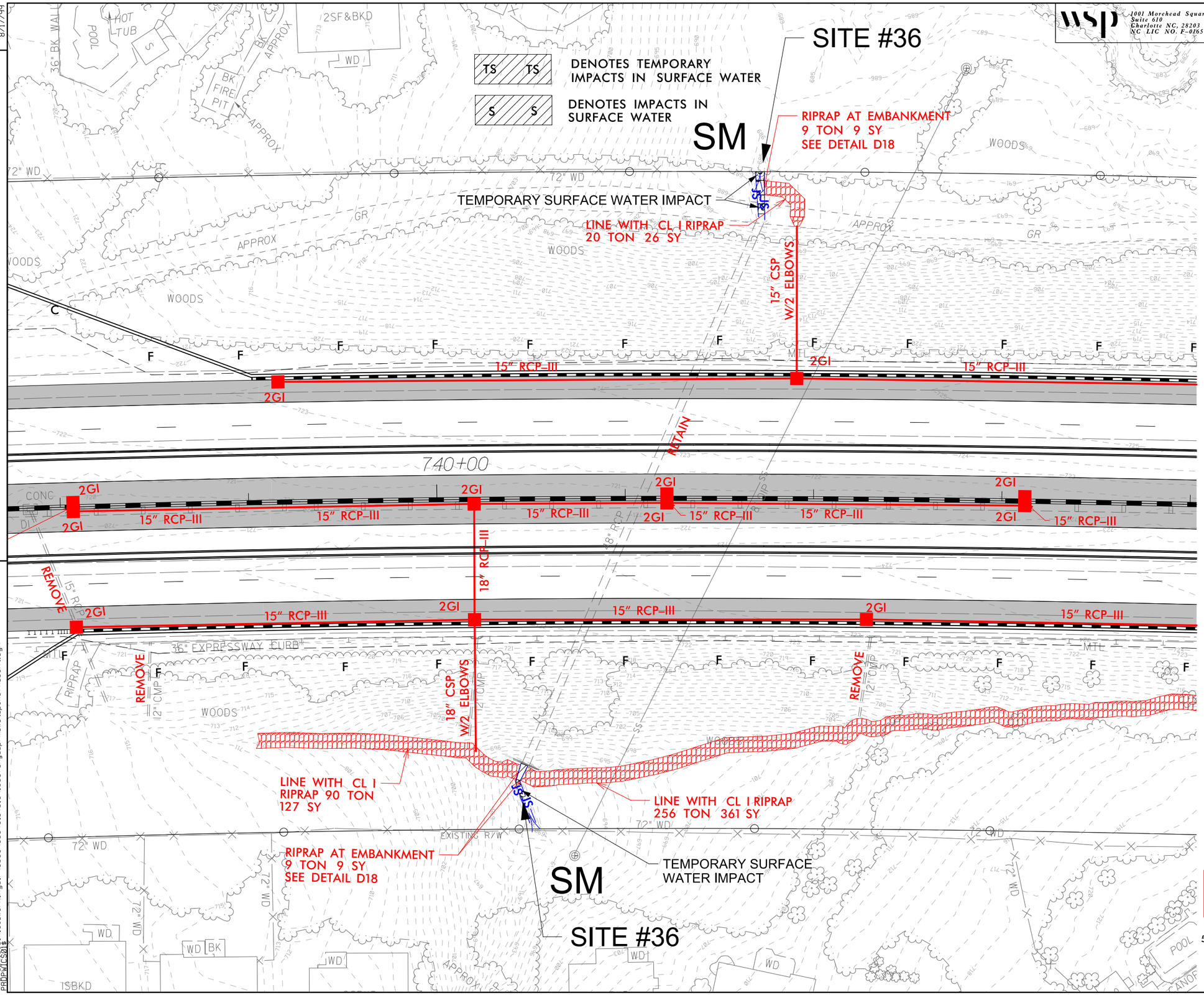

PROJECT REFERENCE NO.	SHEET NO.
I-5507	57A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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REVISIONS

PERMIT DRAWING
SHEET 87 OF 115

50 0 50
GRAPHIC SCALE

8/17/99

9/12/2019
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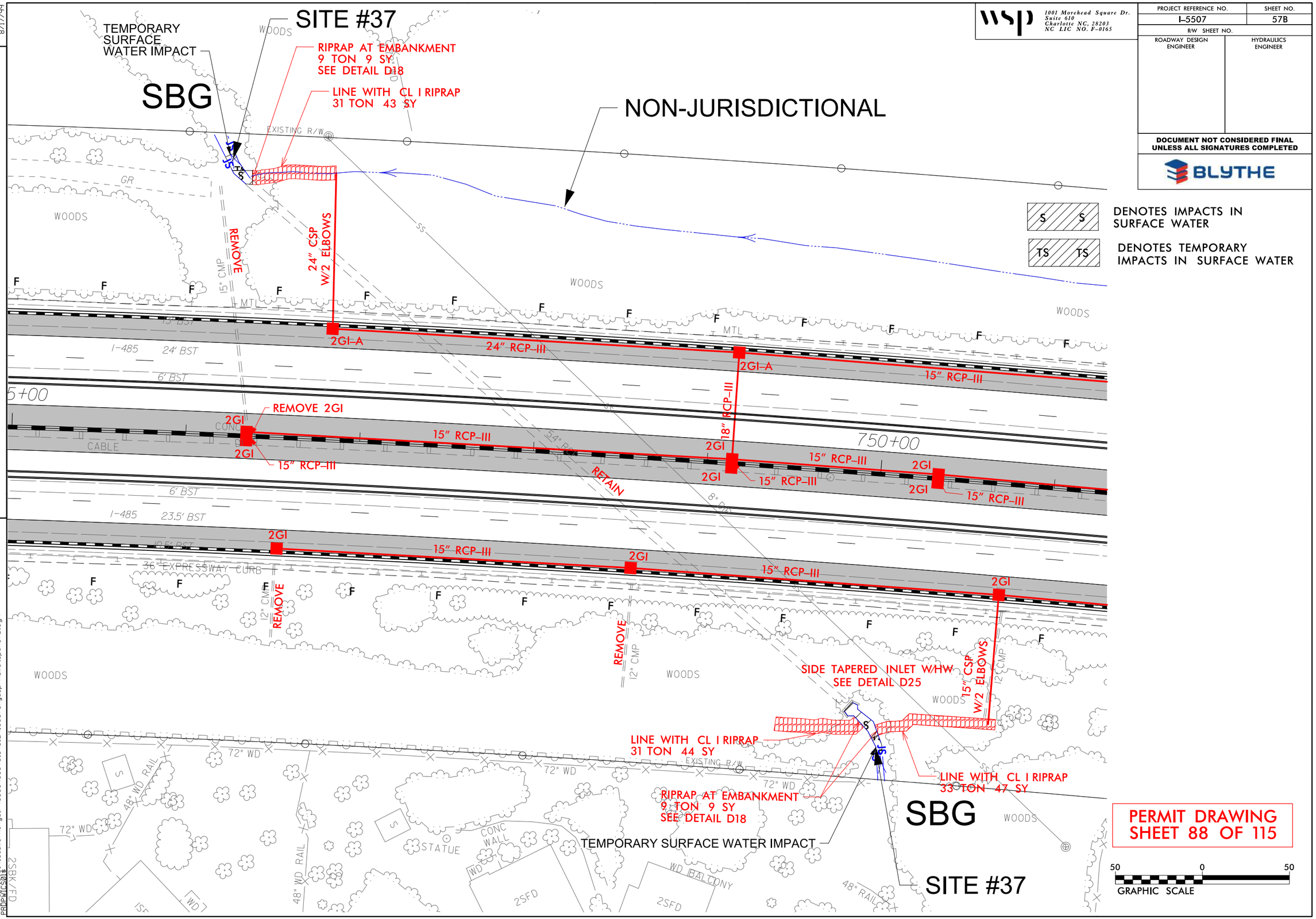

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	57B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

REVISIONS

8/17/99

9/12/2019
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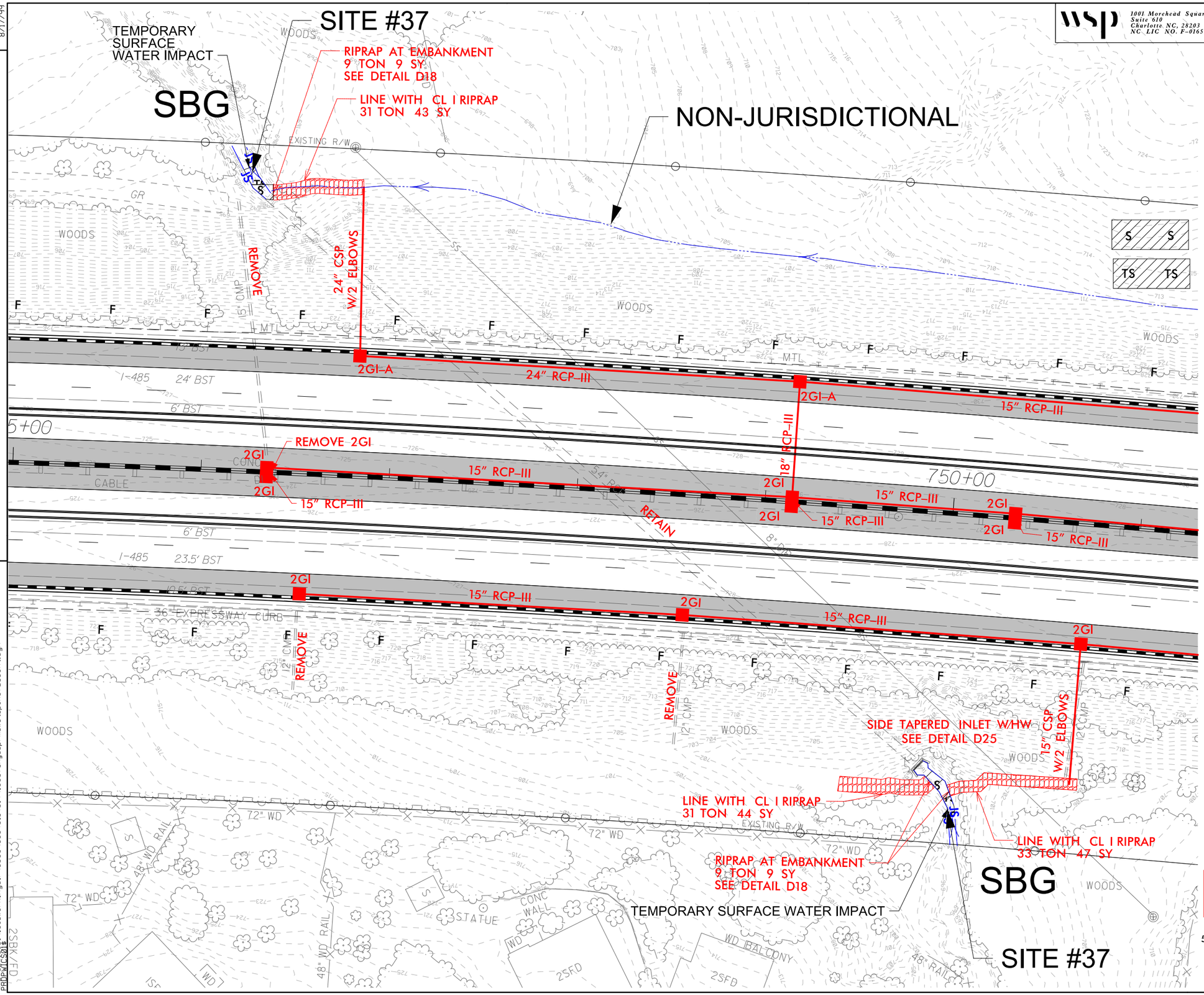

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 89 OF 115

50 0 50
GRAPHIC SCALE

REVISIONS

8/17/99

9/12/2019
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wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	57B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

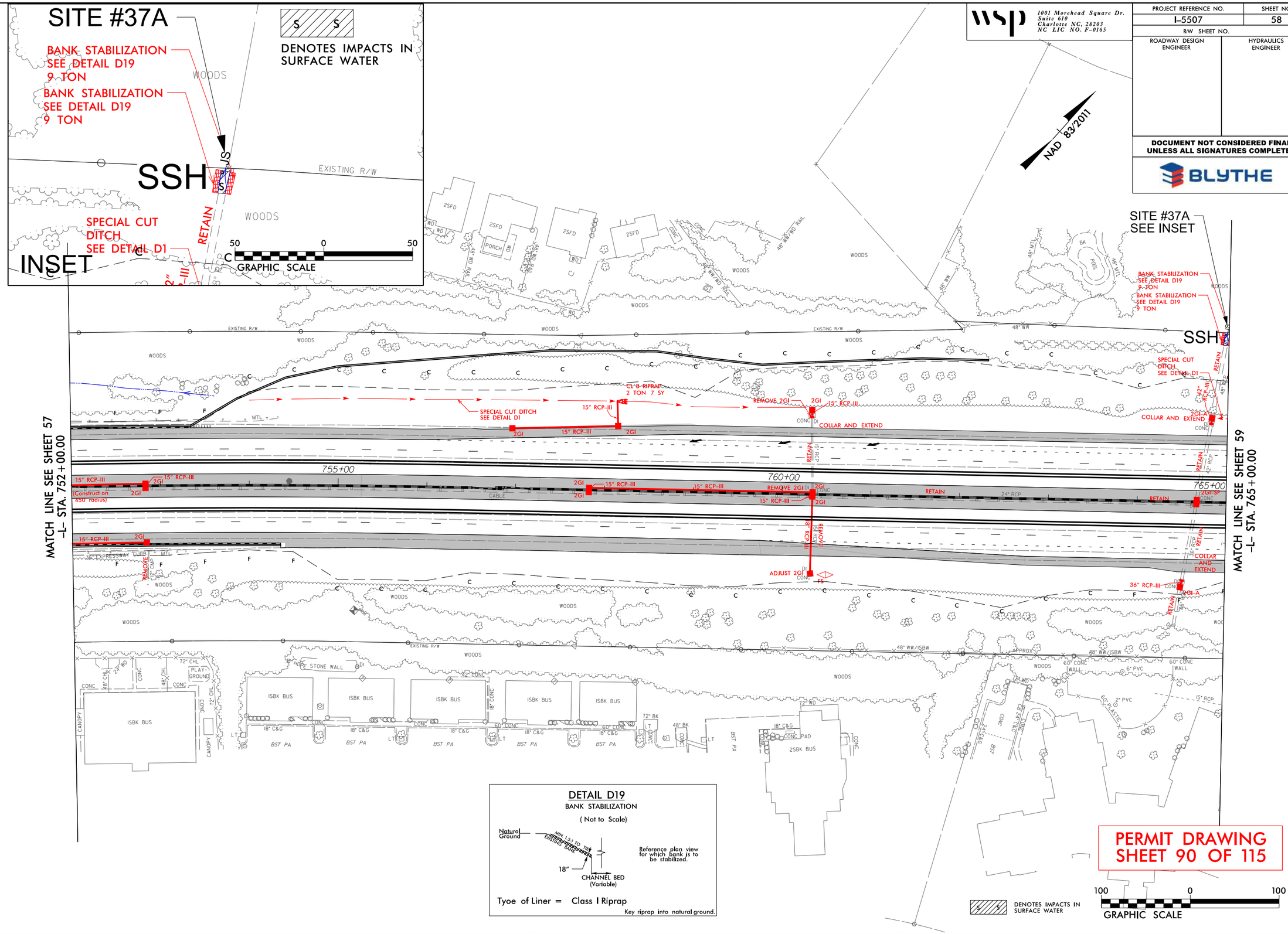
BLYTHE

PROJECT REFERENCE NO.	SHEET NO.
I-5507	58
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165



REVISIONS

8/17/99

9/12/2019
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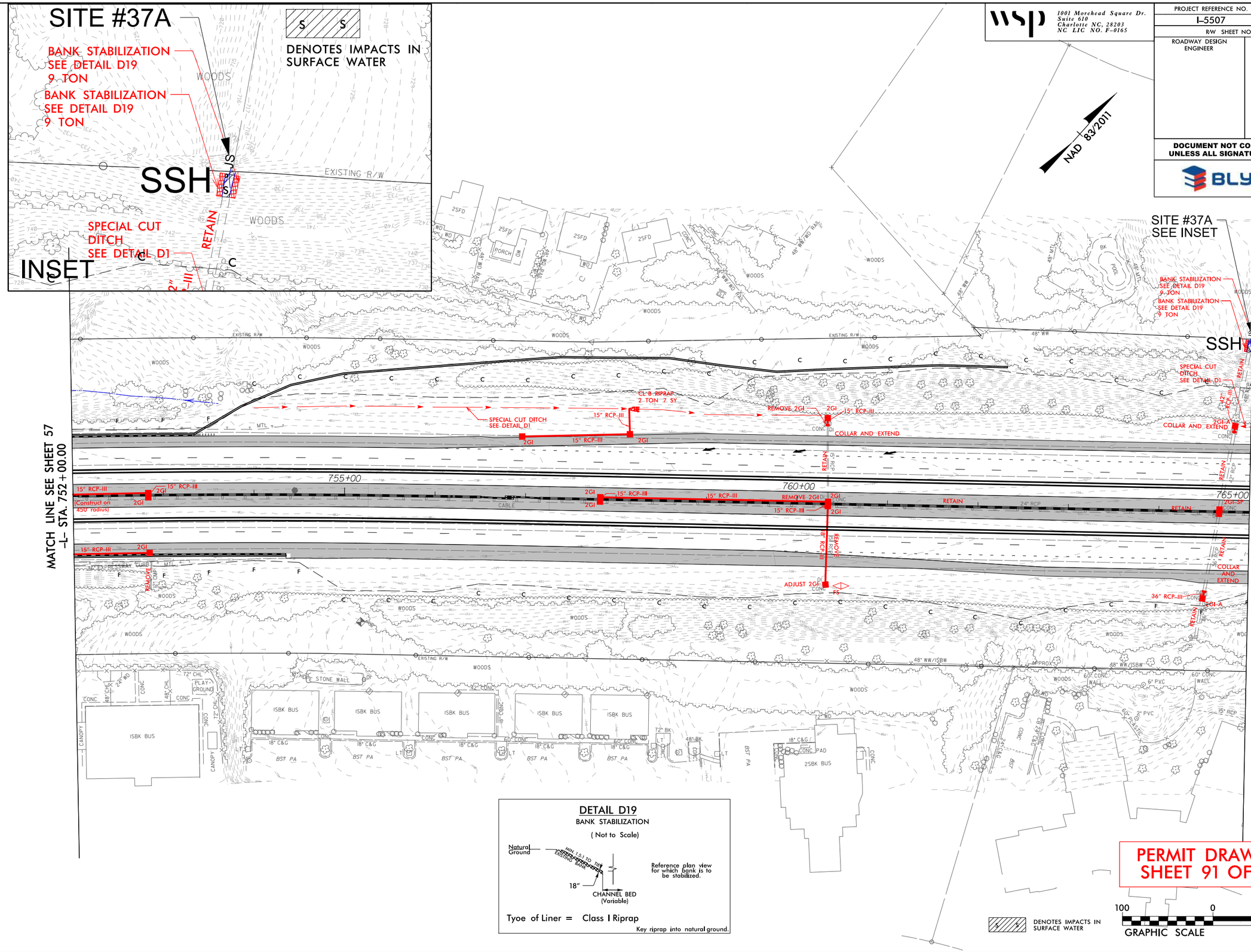
PROJECT REFERENCE NO.	SHEET NO.
I-5507	58
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

wsp 1001 Morehead Square Dr. Suite 610 Charlotte NC, 28203 NC LIC NO. F-0165

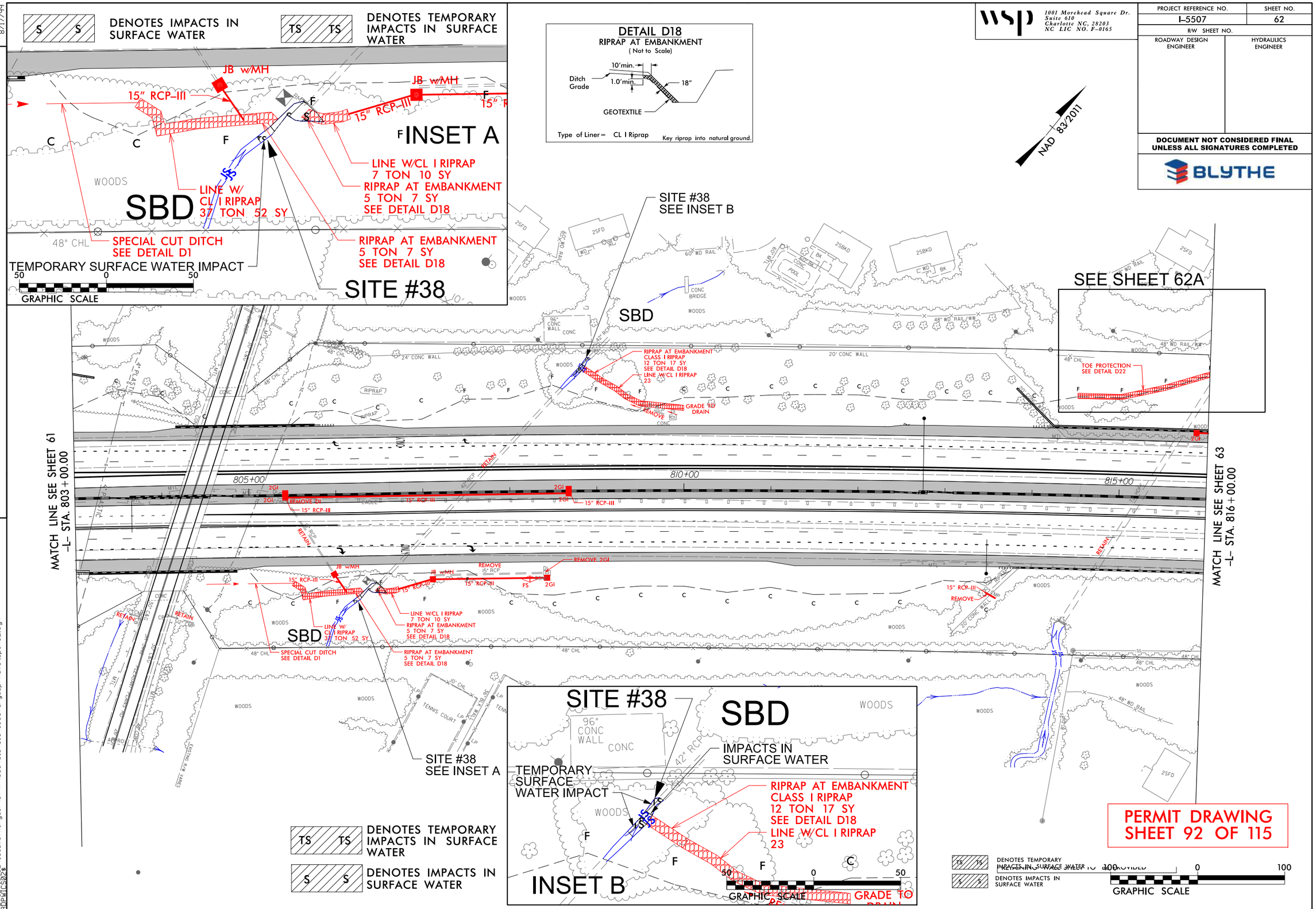


PERMIT DRAWING SHEET 91 OF 115

REVISIONS

8/17/99

9/12/2019 \\prdpwics01\ics_workingdir\3088\336401_4016\15507_Hyd_prm_wet_psh58_cont.dgn PRDPWICS01$



wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	62
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

REVISIONS

8/17/99

9/12/2019
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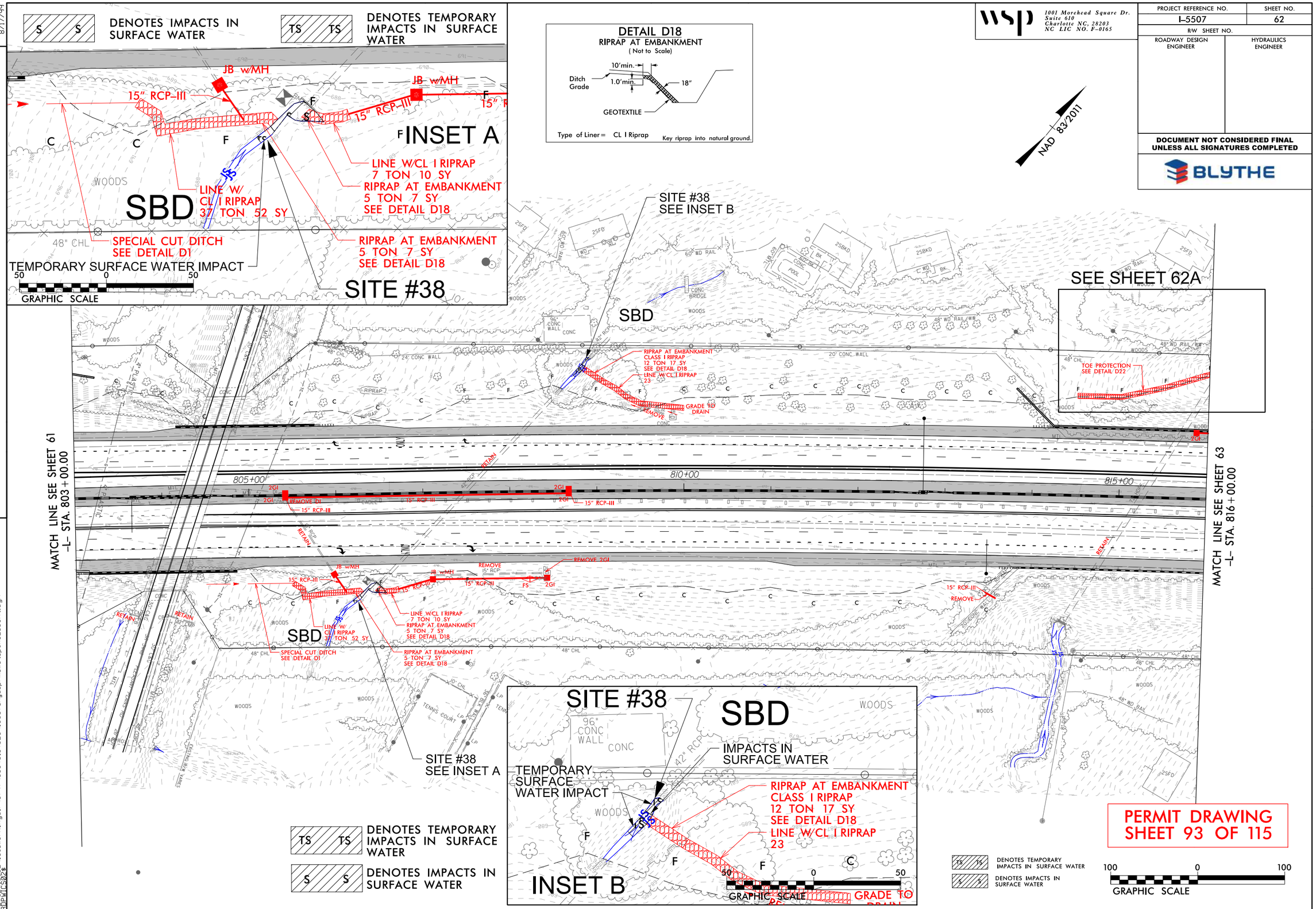


PERMIT DRAWING SHEET 93 OF 115

PROJECT REFERENCE NO.	SHEET NO.
I-5507	62
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

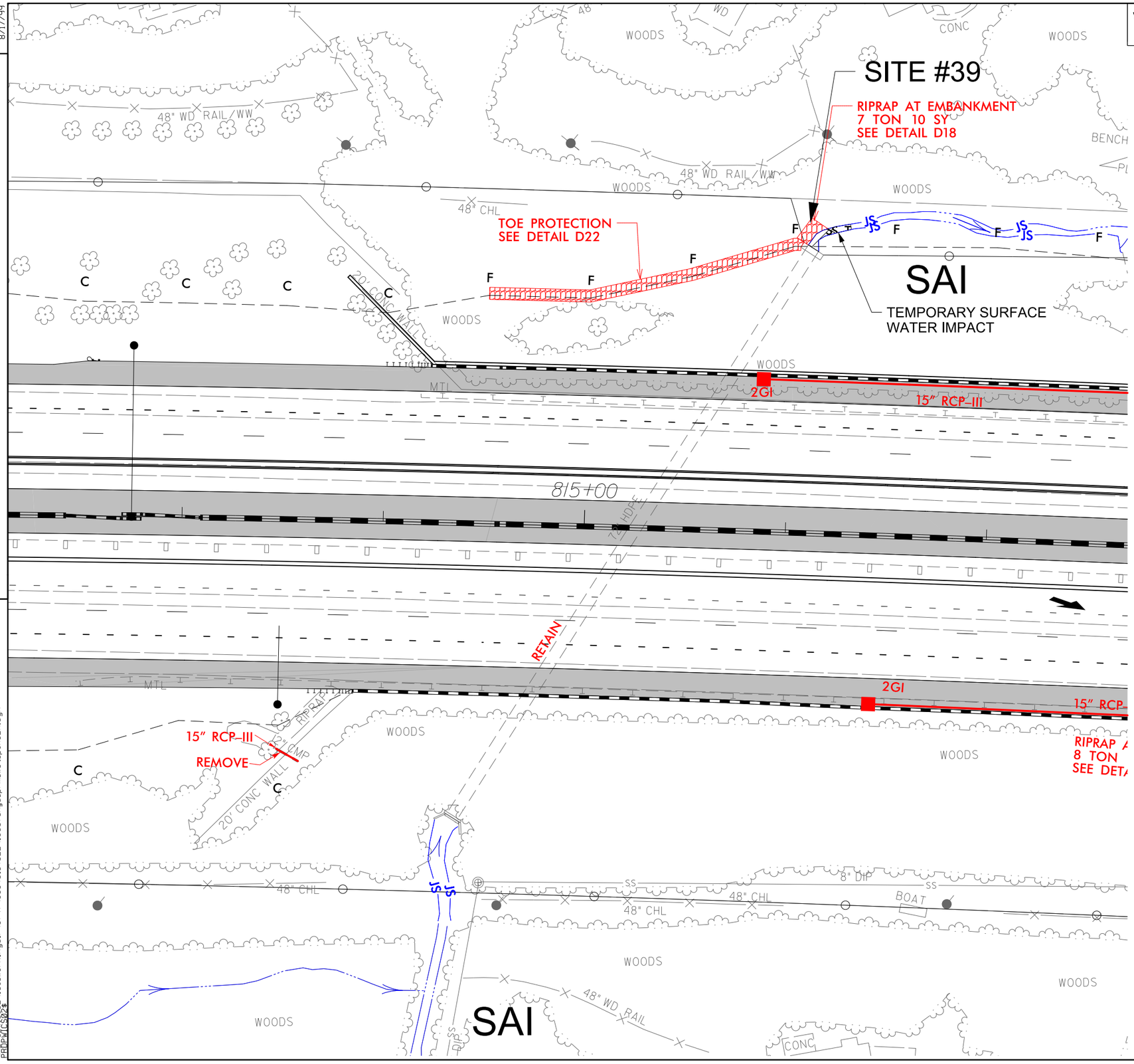
BLYTHE

wsp 1001 Morehead Square Dr. Suite 610 Charlotte NC, 28203 NC LIC NO. F-0165

REVISIONS

8/17/99

9/12/2019 \\prdpwics02\ics_workingdir\3797\336401_4026\i5507_Hyd_prm_wet_psh62_cont.dgn PRDPWICS02$



wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	62A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 94 OF 115

50 0 50
GRAPHIC SCALE

REVISIONS

8/17/99

9/12/2019
\\prdpwics02\ics_workingdir\3797\336401_4022\i5507_Hyd_prm_wet_psh62A.dgn
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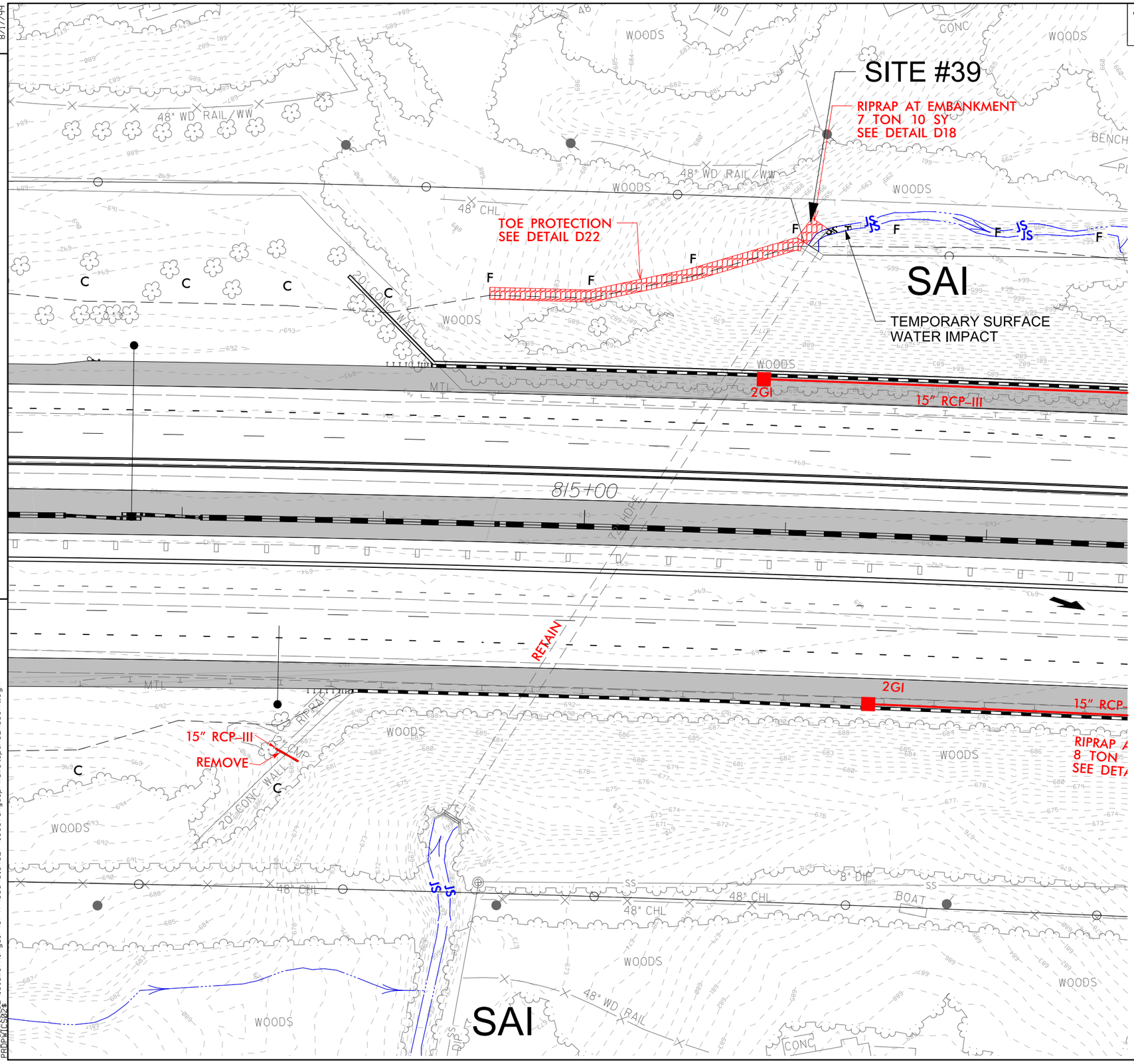

NAD 83/2011

1001 Morehead Square Dr. Suite 610 Charlotte NC, 28203 NC LIC NO. F-0165	
PROJECT REFERENCE NO.	SHEET NO.
I-5507	62A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 95 OF 115

50 0 50
GRAPHIC SCALE

REVISIONS

8/17/99

9/12/2019
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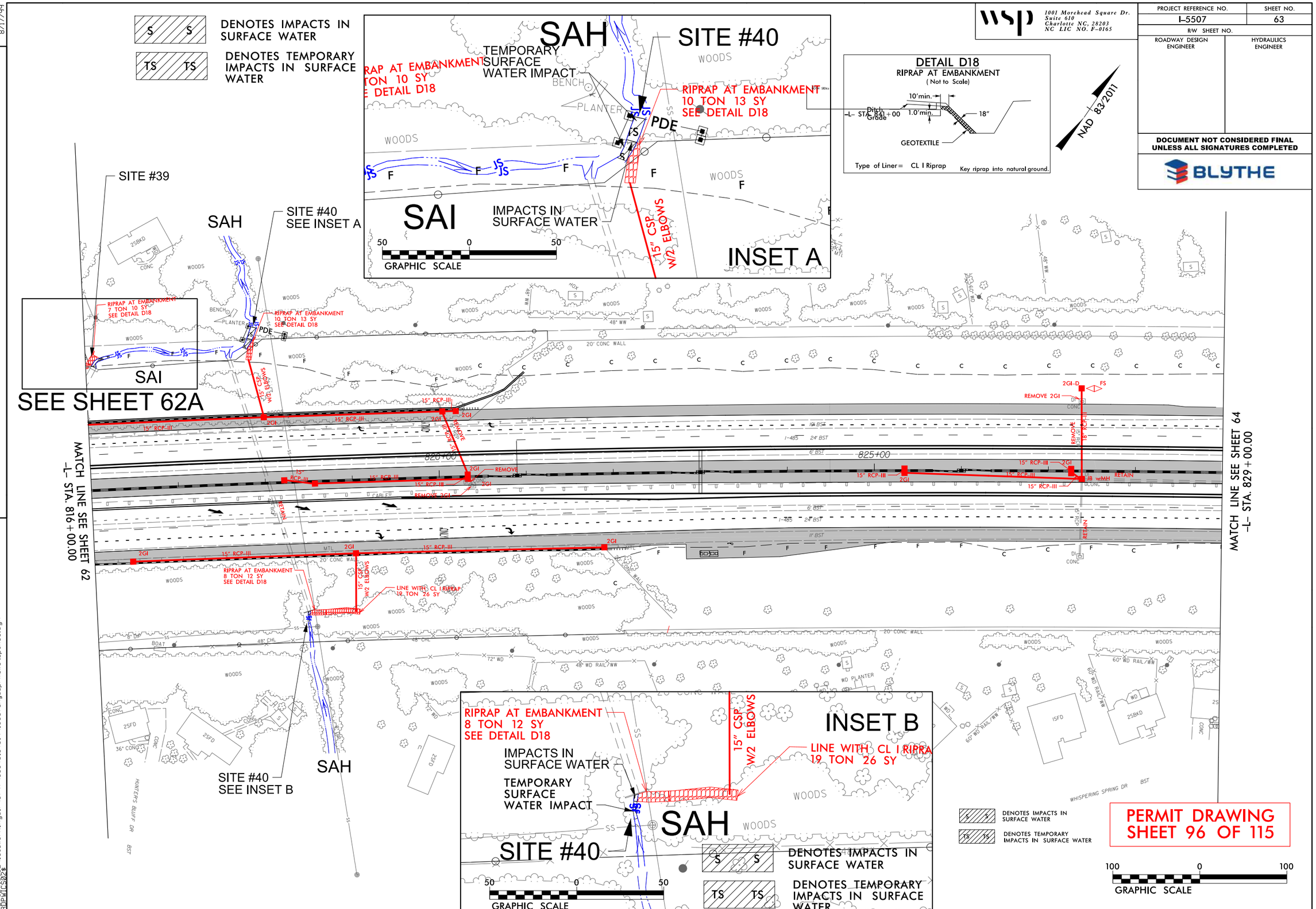

wsp 1001 Morehead Square Dr. Suite 610 Charlotte NC, 28203 NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	63
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

REVISIONS

8/17/99

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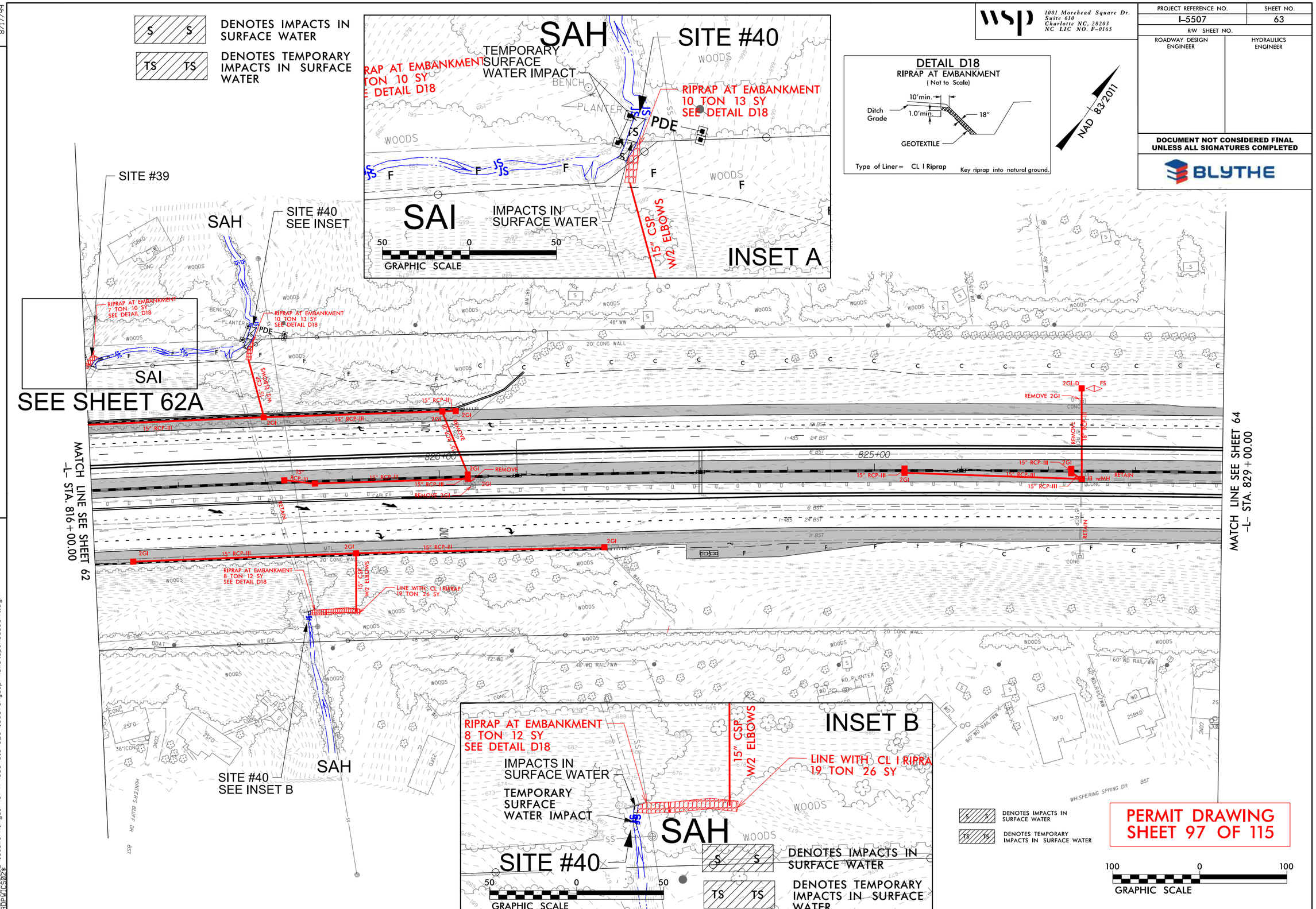

PERMIT DRAWING SHEET 97 OF 115

PROJECT REFERENCE NO.	SHEET NO.
I-5507	63
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

wsp 1001 Morehead Square Dr. Suite 610 Charlotte NC, 28203 NC LIC NO. F-0165

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8/17/99

9/12/2019 \\prdpwics02\ics_workingdir\3797\336401_4025\15507_Hyd_prm_wet_psh63_cont.dgn PRDPWICS02$

8/17/99

REVISIONS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	67
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

SITE #41 — INSET A

SAR

TEMPORARY SURFACE WATER IMPACT

WAC

BANK STABILIZATION 6 TON SEE DETAIL D19

BANK STABILIZATION 7 TON SEE DETAIL D19

LATERAL V DITCH SEE DETAIL D4

COLLAR AND EXTEND

RCP-IV

EXISTING R/W VARIES

48" WW/ISBW

WOODS

F F — DENOTES FILL IN WETLAND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

GRAPHIC SCALE 50 0 50

TYPICAL DITCH SECTION

B=5' (varies)
T=15' (varies)
D=2.5'
Channel Material=Gravel
Overbank Material=Woods
OHW Depth=1'
Channel Condition=Fair
STA.890+50 (L)

TYPICAL DITCH SECTION

B=5' (varies)
T=19' (varies)
D=3.5'
Channel Material=Silty Bottom
Overbank Material=Woods
OHW Depth=1'
Channel Condition=Fair
STA.895+50 (L)

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES IMPACTS IN SURFACE WATER

F F — DENOTES FILL IN WETLAND

NAD 83/2011

SITE #41 SEE INSET A

SITE #42

SEE SHEET 67A

SAR

WAC

WAB

SV

BANK STABILIZATION 6 TON SEE DETAIL D19

BANK STABILIZATION 7 TON SEE DETAIL D19

LATERAL V DITCH SEE DETAIL D4

BANK STABILIZATION 7 TON SEE DETAIL D19

BANK STABILIZATION 8 TON SEE DETAIL D19

LATERAL V DITCH W/CL I RIPRAP SEE DETAIL D6

CL B RIPRAP 2 TON 7 SY

COLLAR AND EXTEND

42" RCP-III

15" CSP W/2 ELBOWS

15" RCP-III

Conv. 2GI To JB w/MH

REMOVE 2GI

30" EXPRESSWAY CURB

MATCH LINE SEE SHEET 66 -L- STA. 883+50.00

MATCH LINE SEE SHEET 68 -L- STA. 897+00.00

885+00

890+00

895+00

10+00

CABLE

6" STEEL

36" RCP

RETAIN

REMOVE

LATERAL V DITCH SEE DETAIL D4

LATERAL V DITCH W/CL I RIPRAP SEE DETAIL D6

REMOVE HW

COLLAR AND EXTEND 36" RCP-IV

15" CSP W/2 ELBOWS

REMOVE HW, COLLAR AND EXTEND

RIPRAP AT EMBANKMENT 6 TON 9 SY SEE DETAIL D18

RIPRAP AT EMBANKMENT 6 TON 8 SY SEE DETAIL D18

WH

SEE SHEET 67A

SITE #42

SITES #41 AND 42 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

SITE #41 SEE INSET B

INSET B

S S — DENOTES IMPACTS IN SURFACE WATER

TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

LATERAL V DITCH W/CL I RIPRAP SEE DETAIL D6

REMOVE HW

COLLAR AND EXTEND 36" RCP-IV

LATERAL V DITCH W/CL I RIPRAP SEE DETAIL D6

SAR

RIPRAP AT EMBANKMENT 6 TON 9 SY SEE DETAIL D18

RIPRAP AT EMBANKMENT 6 TON 8 SY SEE DETAIL D18

TEMPORARY SURFACE WATER IMPACT

SITE #41

WH

15" RCP

CONC

72" CHL

GRAPHIC SCALE 50 0 50

DETAIL D18

RIPRAP AT EMBANKMENT
(Not to Scale)

Ditch Grade
10' min.
1.0' min.
18"
GEOTEXTILE

Type of Liner = CL I Riprap

Key riprap into natural ground.

DETAIL D19

BANK STABILIZATION
(Not to Scale)

Natural Ground
MIN 1.5:1 TO 1:1
EXISTING BANK
18"
CHANNEL BED (Variable)

Reference plan view for which bank is to be stabilized.

Tyoe of Liner = Class I Riprap

Key riprap into natural ground.

PERMIT DRAWING SHEET 98 OF 115

GRAPHIC SCALE 100 0 100

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NC LIC NO. F-0165

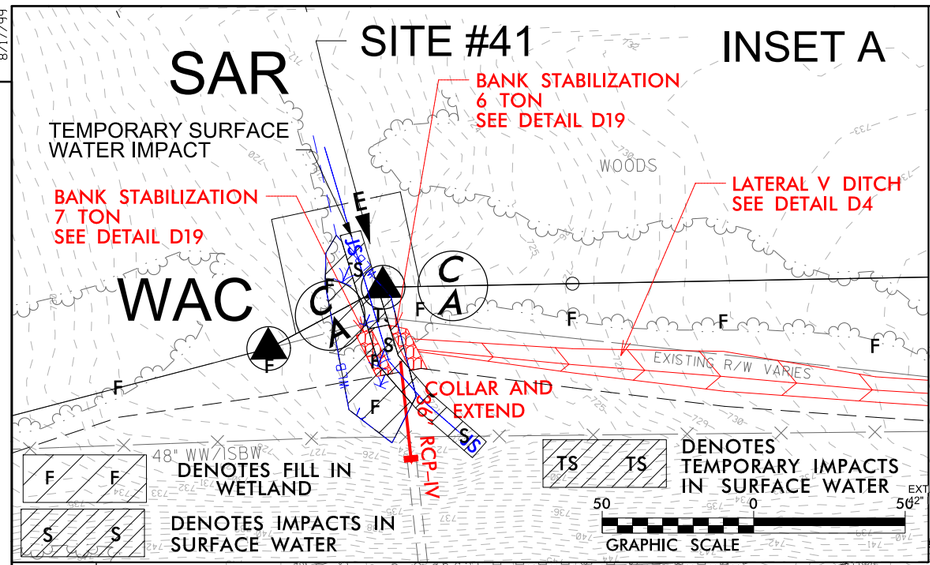
PROJECT REFERENCE NO.	SHEET NO.
I-5507	67
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

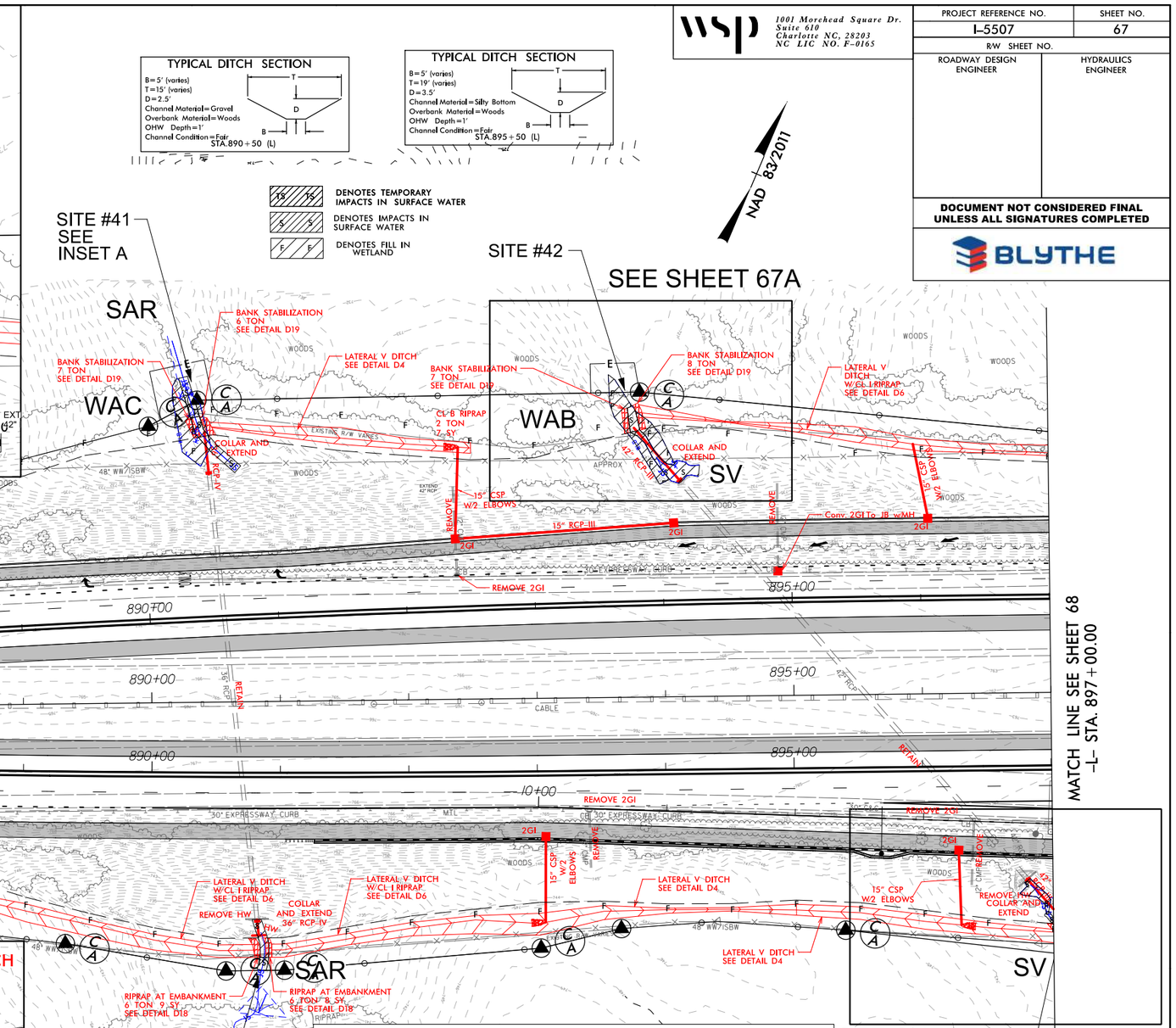
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

8/17/99

REVISIONS





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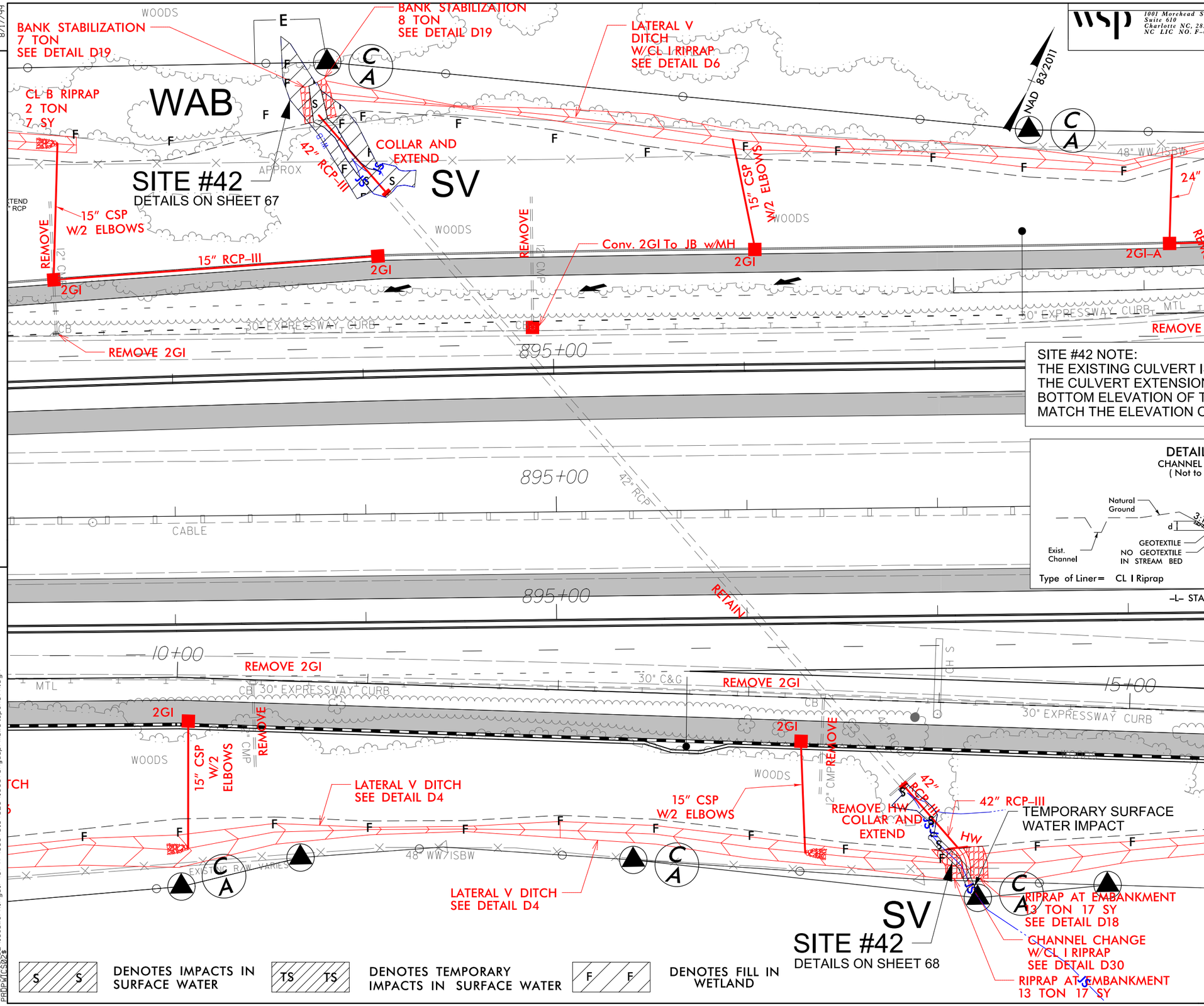
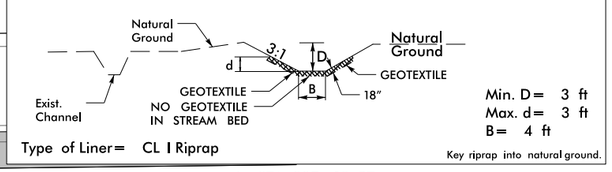


SITE #42 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

DETAIL D30
CHANNEL CHANGE
(Not to Scale)



-L- STA. 897+13 RT

PERMIT DRAWING
SHEET 100 OF 115

PROJECT REFERENCE NO.	SHEET NO.
I-5507	67A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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BLYTHE

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REVISIONS

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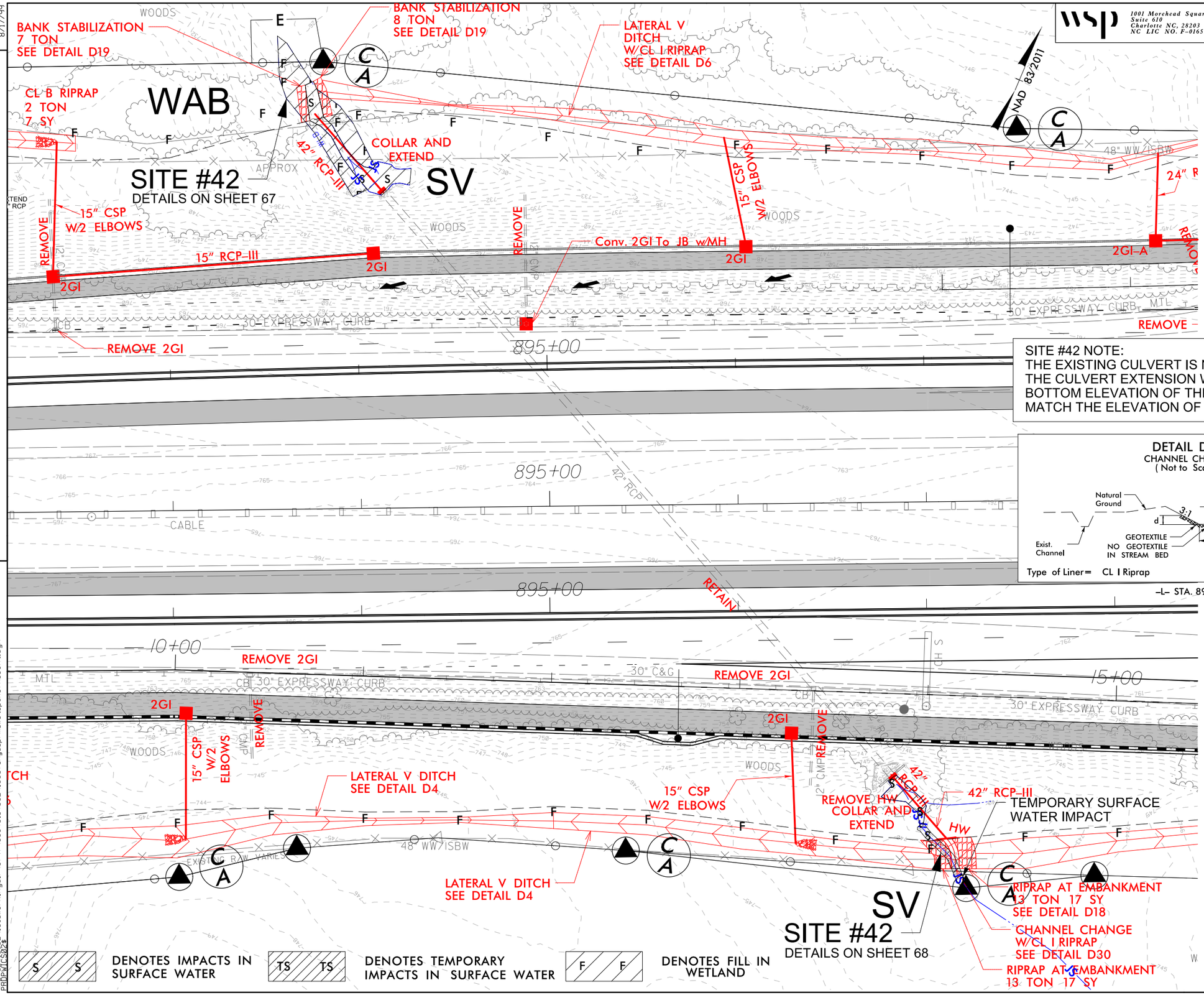

SITE #42 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

DETAIL D30
CHANNEL CHANGE
(Not to Scale)

Natural Ground
Exist. Channel
GEOTEXTILE
NO GEOTEXTILE IN STREAM BED
Natural Ground
GEOTEXTILE
18"
Min. D= 3 ft
Max. d= 3 ft
B= 4 ft
Type of Liner= CL I Riprap
Key riprap into natural ground.

S S DENOTES IMPACTS IN SURFACE WATER
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
F F DENOTES FILL IN WETLAND

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PROJECT REFERENCE NO.	SHEET NO.
I-5507	67A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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BLYTHE

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REVISIONS

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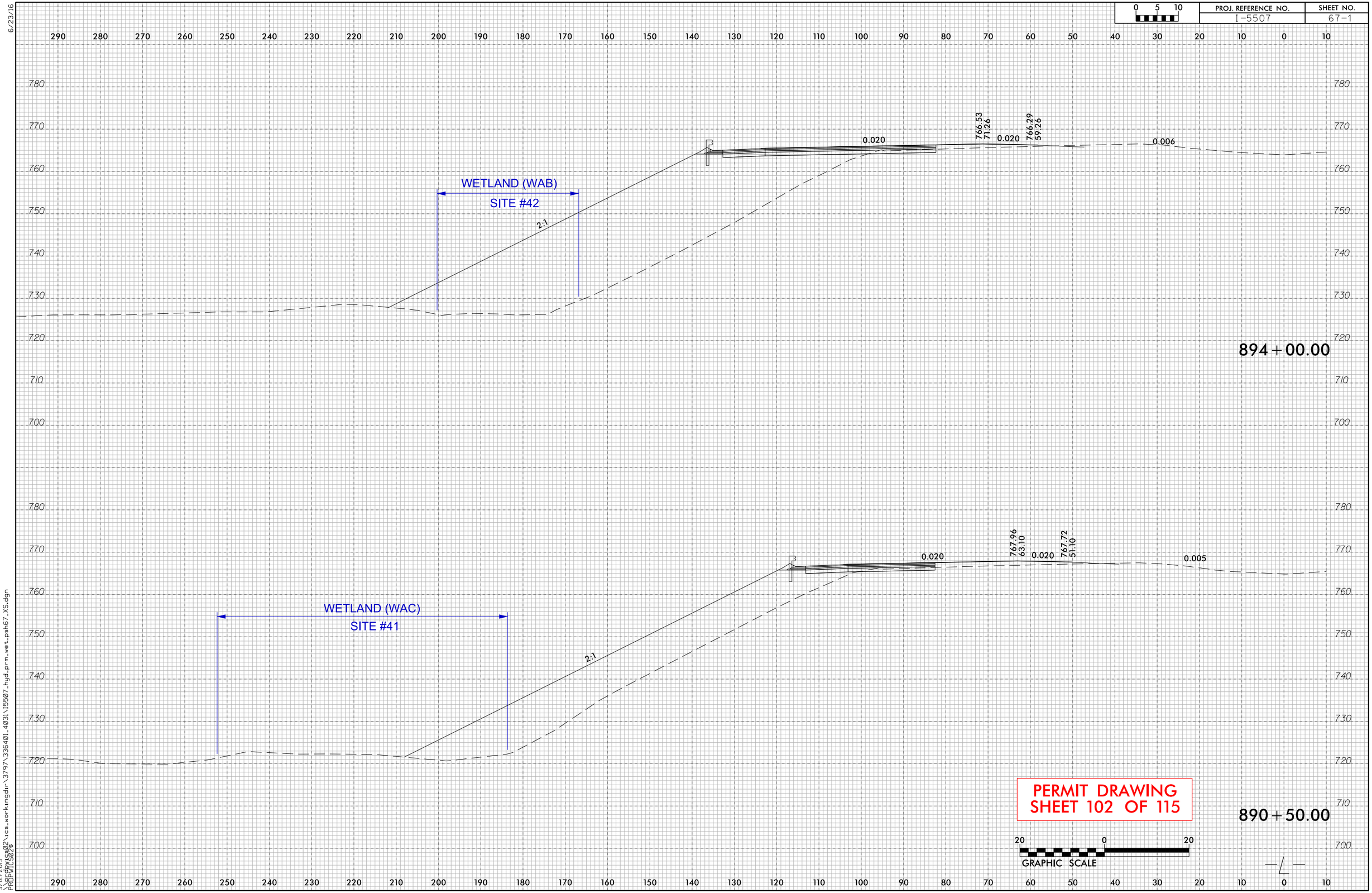
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-5507	67-1



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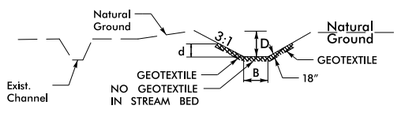
REVISIONS

DETAIL D30
CHANNEL CHANGE
(Not to Scale)

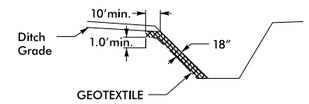


Min. D = 3 ft
Max. d = 3 ft
B = 4 ft

Type of Liner = CL I Riprap

Key riprap into natural ground.

DETAIL D18
RIPRAP AT EMBANKMENT
(Not to Scale)



Type of Liner = CL I Riprap

Key riprap into natural ground.

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PROJECT REFERENCE NO.	SHEET NO.
I-5507	68
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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BLYTHE

-L- STA. 897+13 RT

NAD 83/2011

MATCH LINE SEE SHEET 67
-L- STA. 897+00.00

MATCH LINE SEE SHEET 69
-L- STA. 910+00.00

LATERAL V DITCH
SEE DETAIL D4

24" RCP-III

2GI-A

JB w/MH

REMOVE

CL I RIPRAP
20 TON 28 SY

RETAIN

SAE

RETAIN 18" RCP

GRADE TO DRAIN

REMOVE DI

REMOVE CB

15" RCP-III

2GI

2GI-D

42" RCP-III

RIPRAP AT EMBANKMENT
47 TON 17 SY
SEE DETAIL D18

CHANNEL CHANGE
W/CL I RIPRAP
SEE DETAIL D30

RIPRAP AT EMBANKMENT
13 TON 17 SY
SEE DETAIL D18

CL B RIPRAP
2 TON
7 SY

LATERAL V DITCH
W/CL I RIPRAP
SEE DETAIL D6

SPECIAL CUT
DITCH
SEE DETAIL D1

BOLLARDS W/2 STEEL CABLES

LINE WITH CL I RIPRAP

SITE #42

SV

SEE SHEET 67A

PERMIT DRAWING
SHEET 103 OF 115

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

100 0 100
GRAPHIC SCALE

9/12/2019
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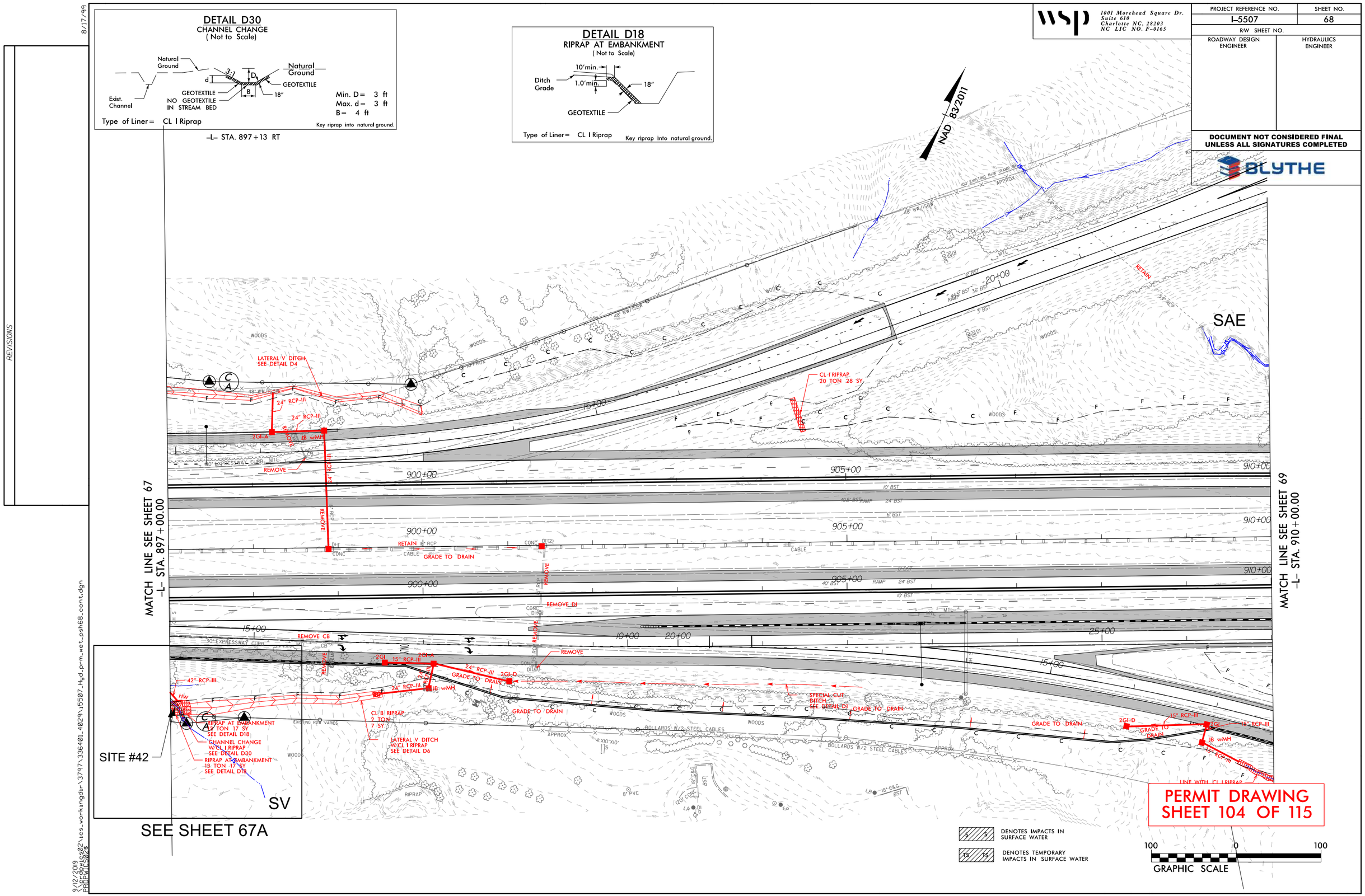

PERMIT DRAWING
SHEET 104 OF 115

PROJECT REFERENCE NO.	SHEET NO.
I-5507	68
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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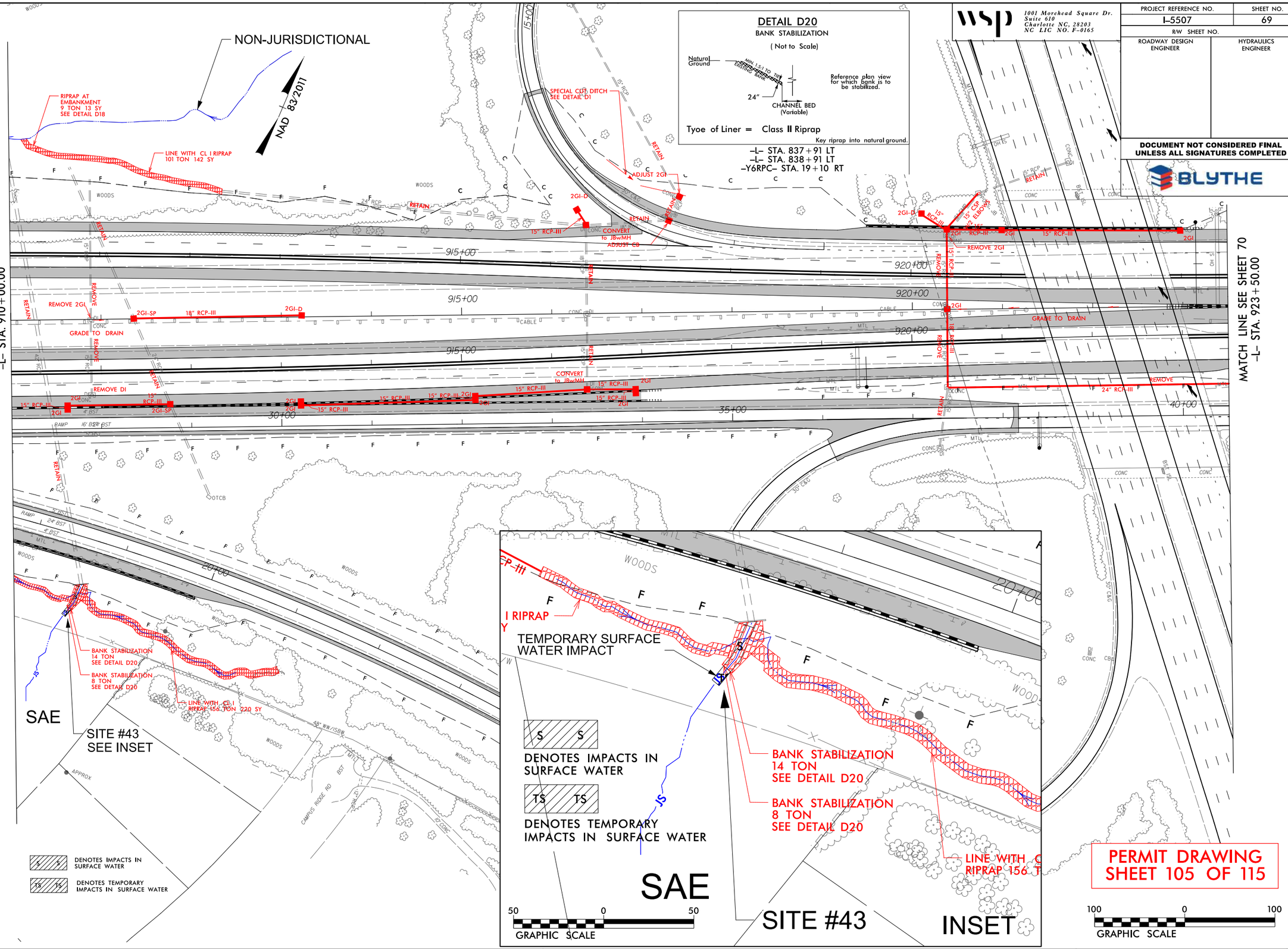

DETAIL D20

BANK STABILIZATION

(Not to Scale)

Natural Ground — MIN 1.5:1 TO TIE EXISTING BANK — 24" — CHANNEL BED (Variable)

Reference plan view for which bank is to be stabilized.

Tyoe of Liner = Class II Riprap

Key riprap into natural ground.

-L- STA. 837+91 LT
-L- STA. 838+91 LT
-Y6RPC- STA. 19+10 RT

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NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	69
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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BLYTHE

PERMIT DRAWING SHEET 105 OF 115

9/12/2019
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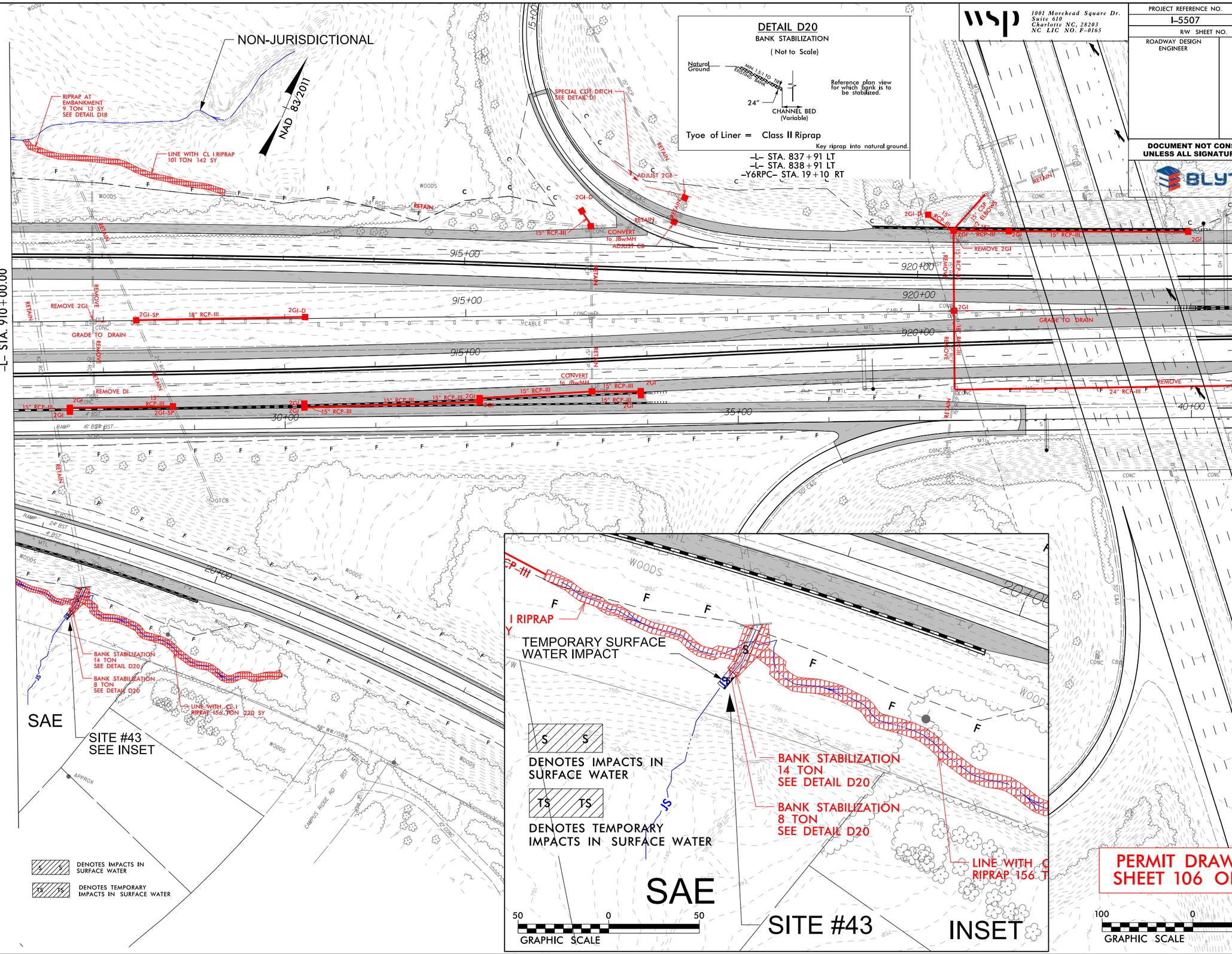
REVISIONS



DETAIL D20

BANK STABILIZATION

(Not to Scale)

Reference plan view for which bank is to be stabilized.

Tyoe of Liner = Class II Riprap

Key riprap into natural ground.

-L- STA. 837+91 LT
-L- STA. 838+91 LT
-Y6RPC- STA. 19+10 RT

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NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	69
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 106 OF 115

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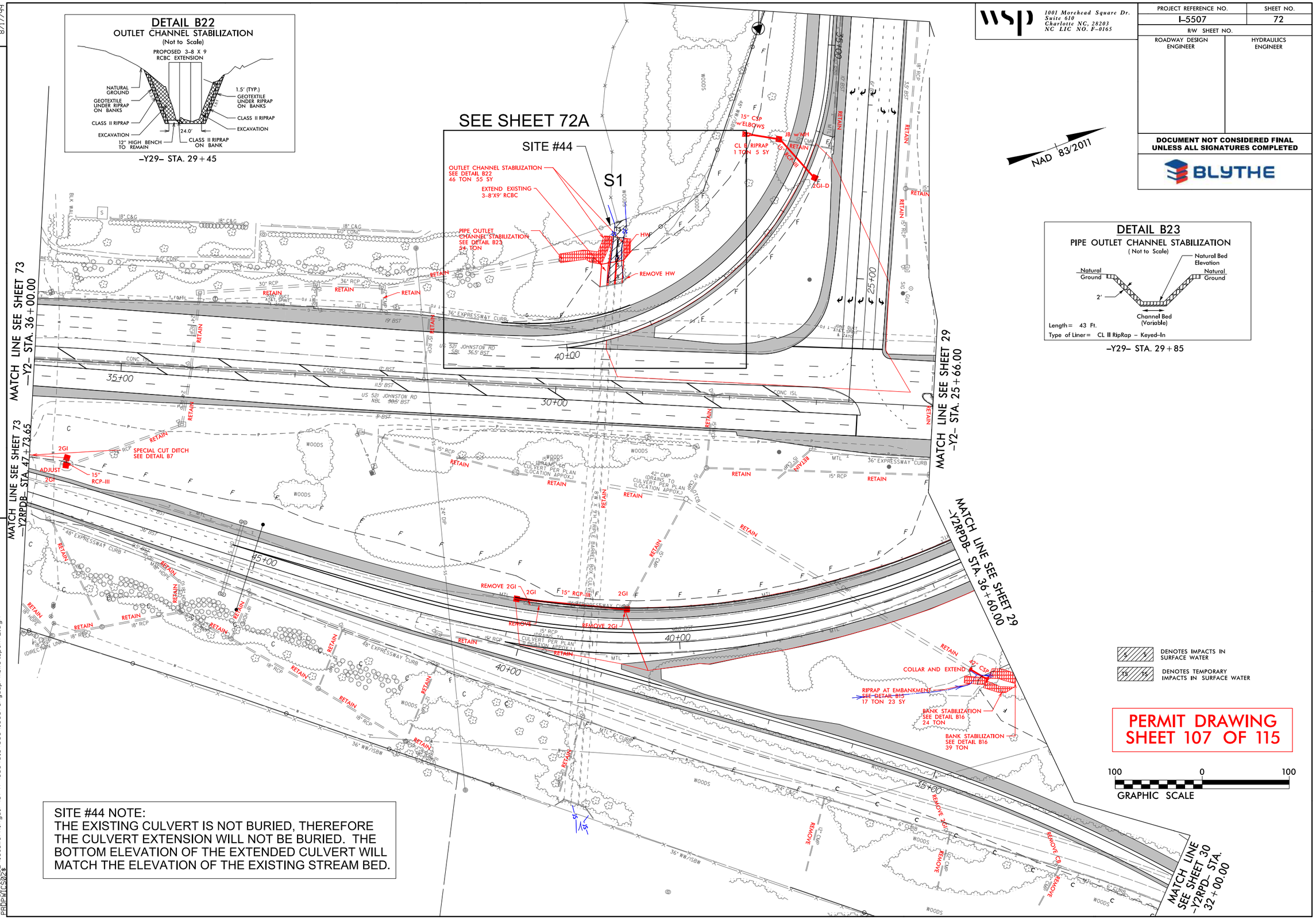

SITE #44 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

PERMIT DRAWING
SHEET 107 OF 115

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PROJECT REFERENCE NO.	SHEET NO.
I-5507	72
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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BLYTHE

REVISIONS

8/17/99

9/12/2019
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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
I-5507	72
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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BLYTHE

NAD 83/2011

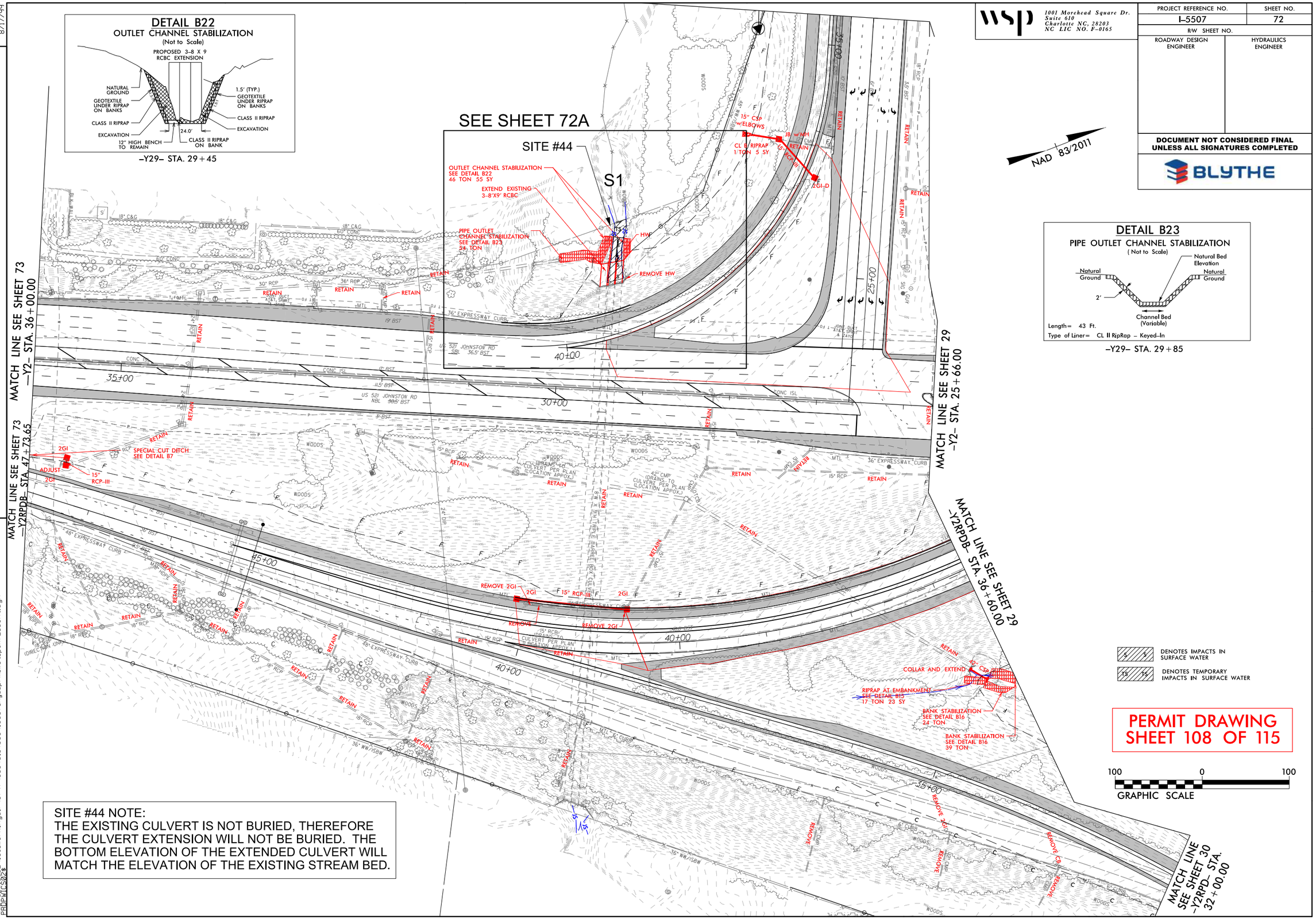
DETAIL B22
OUTLET CHANNEL STABILIZATION
(Not to Scale)

–Y29– STA. 29+45

DETAIL B23
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)

Length= 43 Ft.
Type of Liner= CL II RipRap – Keyed–In

–Y29– STA. 29+85



PERMIT DRAWING SHEET 108 OF 115

SITE #44 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

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PROJECT REFERENCE NO.	SHEET NO.
I-5507	72A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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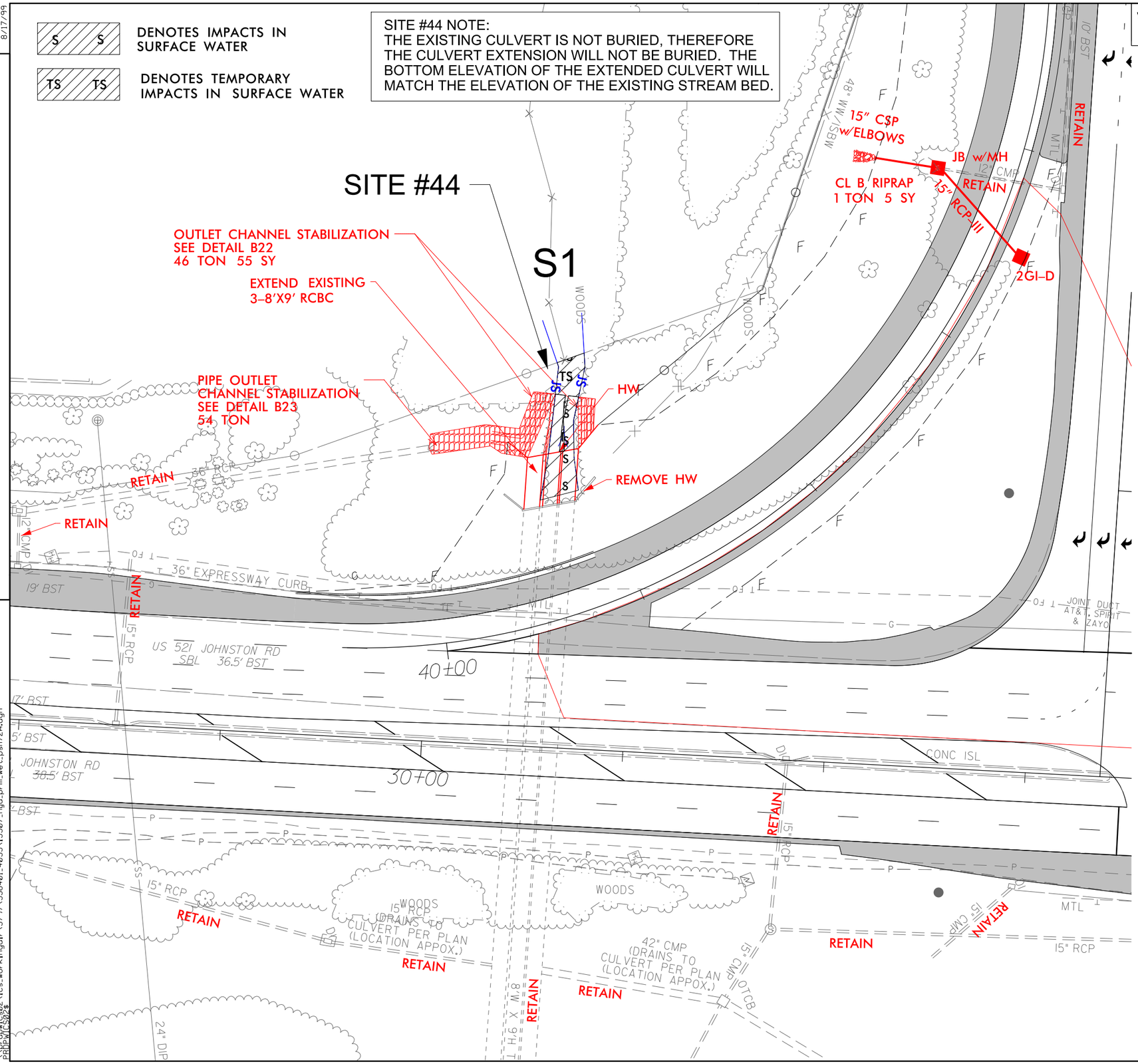
S S DENOTES IMPACTS IN SURFACE WATER

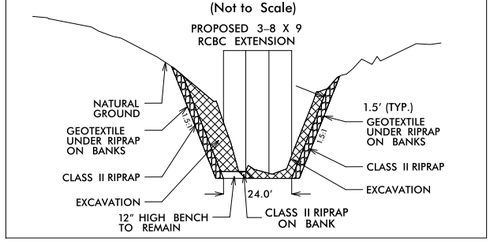
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SITE #44 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.



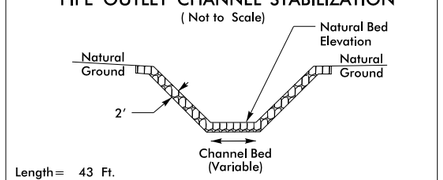
NAD 83/2011

DETAIL B22
OUTLET CHANNEL STABILIZATION
(Not to Scale)



-Y29- STA. 29+45

DETAIL B23
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



Length= 43 Ft.
Type of Liner= CL II RipRap - Keyed-In

-Y29- STA. 29+85

PERMIT DRAWING
SHEET 109 OF 115

50 0 50
GRAPHIC SCALE

REVISIONS

8/17/99

9/12/2019
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PRDPWICS02$

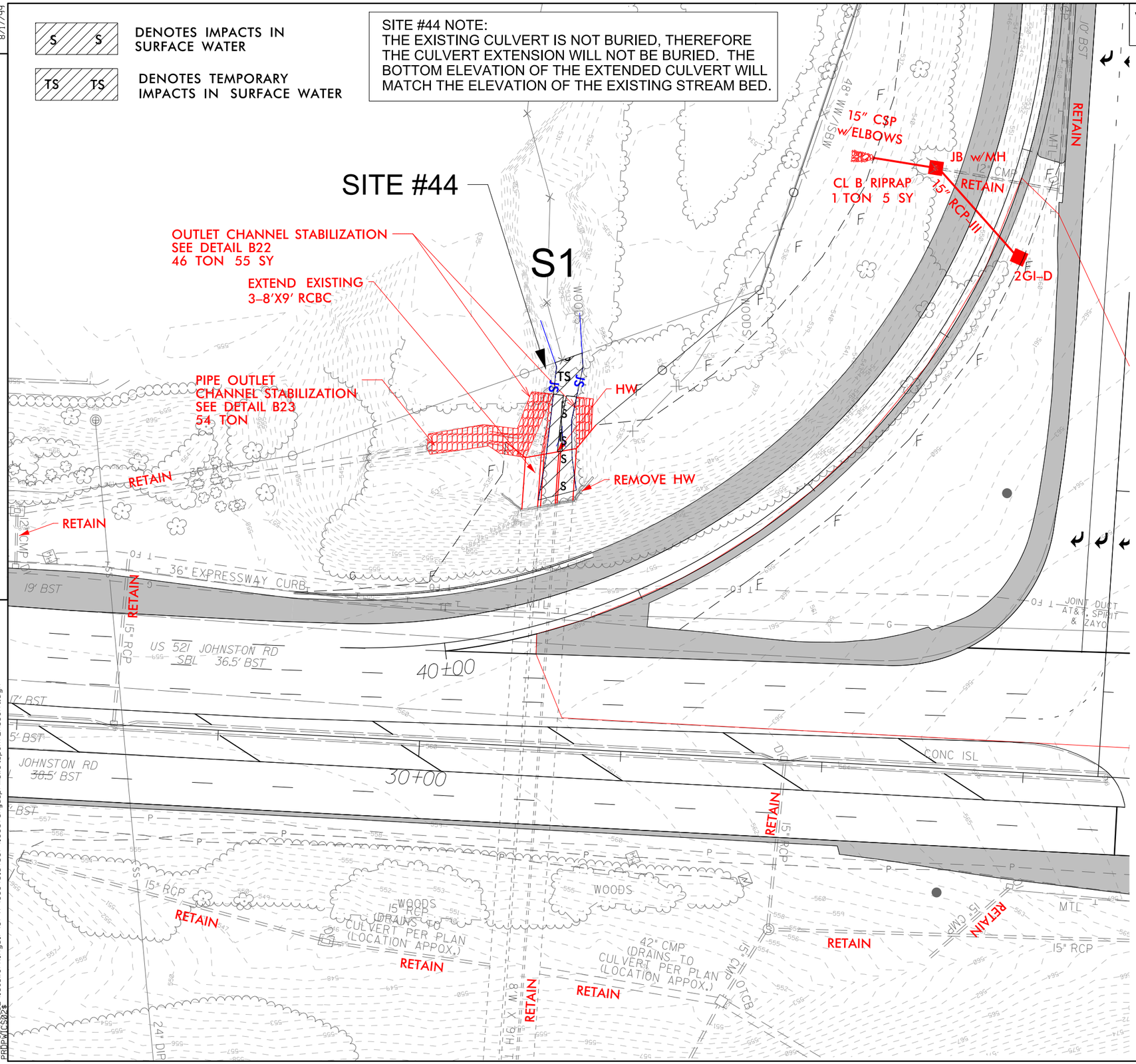
8/17/99

REVISIONS

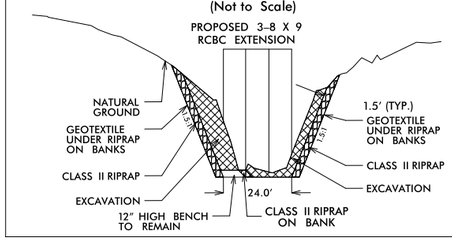
S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SITE #44 NOTE:
THE EXISTING CULVERT IS NOT BURIED, THEREFORE THE CULVERT EXTENSION WILL NOT BE BURIED. THE BOTTOM ELEVATION OF THE EXTENDED CULVERT WILL MATCH THE ELEVATION OF THE EXISTING STREAM BED.

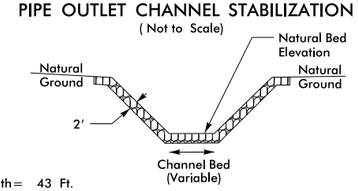


DETAIL B22
OUTLET CHANNEL STABILIZATION
(Not to Scale)



-Y29- STA. 29+45

DETAIL B23
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



Length= 43 Ft.
Type of Liner= CL II RipRap - Keyed-In

-Y29- STA. 29+85

PERMIT DRAWING
SHEET 110 OF 115

50 0 50
GRAPHIC SCALE

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NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	72A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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BLYTHE

9/12/2019
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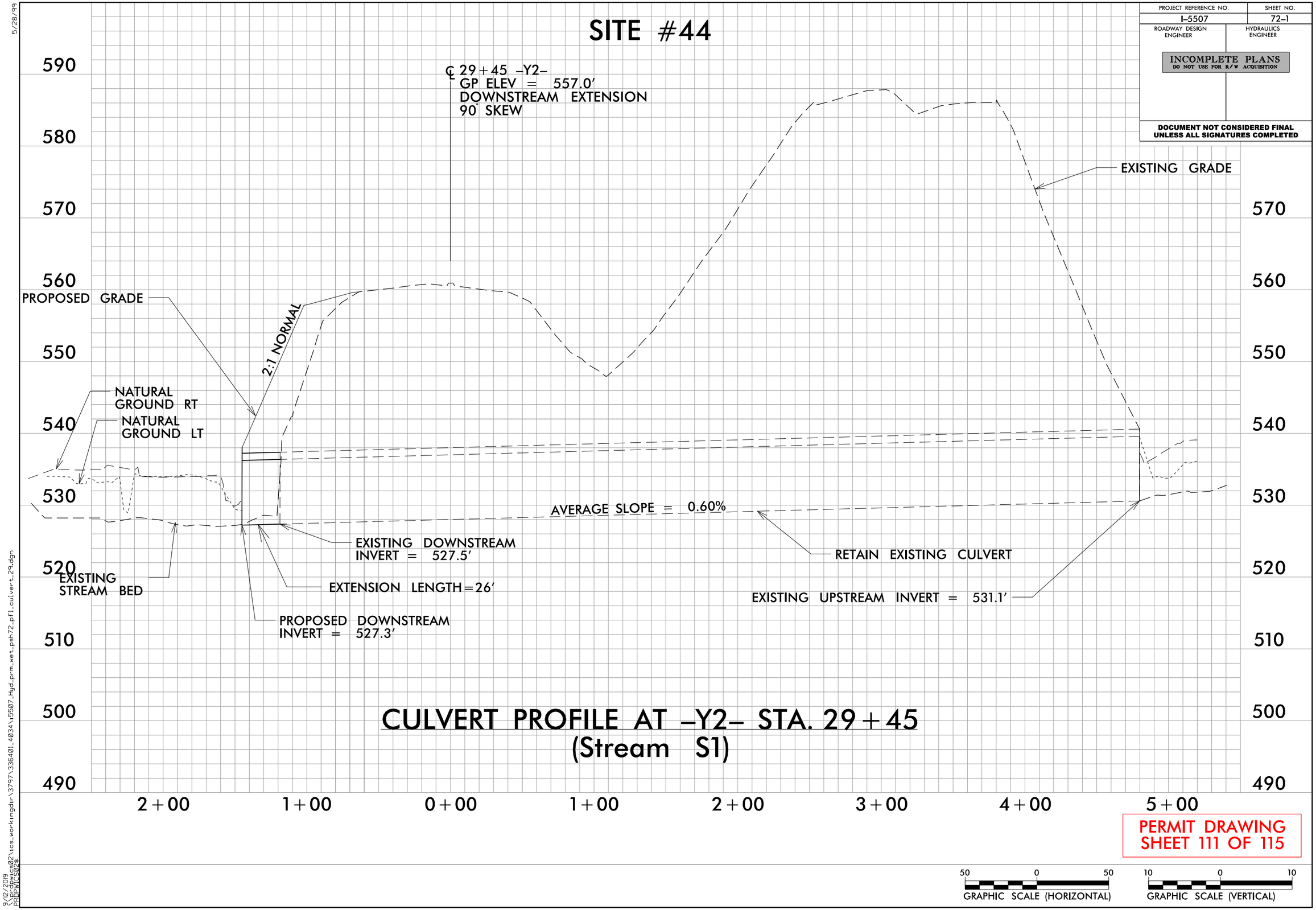

PROJECT REFERENCE NO.	SHEET NO.
I-5507	72-1
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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5/28/99

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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	110+50 -L- RT	Extend Existing 48" RCP						< 0.01		28		
1	110+50 -L- RT	Bank Stabilization						< 0.01	< 0.01	18	13	
2	129+00 - 130+00 -L- LT	Roadway Fill	0.08			0.02						
2A	128+50 -L- RT	Bank Stabilization						< 0.01	< 0.01	11	20	
3	132+00 -L- LT	Extend 4 @ 10'x8' RCBC						0.03		52		
3	132+00 LT	Bank Stabilization						0.02	< 0.01	70	16	
3	132+00 LT	Culvert Construction Activities							0.03			
4	132+00 - 134+00 -L- LT	Roadway Fill	0.03					0.01		181		
5	137+40 -L- LT	Extend Existing 48" RCP						< 0.01		54		
5	137+65 -142+00 -L- LT	Channel Change						0.05	< 0.01	419	10	
6	293+50 -L-	Bank Stabilization						< 0.01	< 0.01	48	10	
7	294+00 - 301+00 -L- LT	Rock Plating							0.07		680	
8	298+00 -L- LT	Concrete Energy Dissipator						< 0.01		7		
8	298+00 -L- LT	Bank Stabilization						< 0.01		10		
9A	302+00 - 308+50 LT	Roadway Fill	0.05			0.05						
9B	309+50 -L- LT	Roadway Fill	0.07			0.07						
10	309+50 -L- LT	Bank Stabilization at Temp. Bridge						0.01	0.01	65		
11	343+00 -L-	Bank Stabilization at Temp. Bridge						0.03	0.05	157		
11	343+00 -L-	Drill Shaft Installation							0.05			
12	344+50 - 346+50 -L- RT	Roadway Fill	0.13			< 0.01						
13	360+00 -L- LT	Bank Stabilization						< 0.01	< 0.01	8	20	
13	360+00 -L- RT	Extend 3@ 9'x9' RCBC						0.01		49		
13	360+50 -L- RT	Bank Stabilization						< 0.01	< 0.01	38	20	
13	360+50 -L- RT	Culvert Construction Activities							< 0.01			
TOTALS*:			0.36			0.15		0.19	0.24	1215	789	0

*Rounded totals are sum of actual impacts

NOTES:

At Sites 1, 3, 5, and 13, the existing culvert is not buried, therefore the culvert extension will not be buried. The bottom elevation of the extended culvert will match the elevation of the existing stream bed.

At Site 1, <0.01 ac (18 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts.

At Site 3, 0.02 ac (70 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts.

At Site 10, <0.01 ac (30 lf) of temporary impacts due to the temporary bridge are included within the bank stabilization impacts.

At Site 11, 0.03 ac (122 lf) of temporary impacts due to the temporary bridge and installation of the drilled shaft are included within the bank stabilization impacts.

At Site 13, <0.01 ac (38 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts.

Revised 2018 Feb

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
09/20/19
MECKLENBURG
TIP NO. I-5507
WBS NO. 43609.3.2

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)
14	363+50 -L- RT	Roadway Fill	0.10									
15	363+00 -L- LT	Bank Stabilization						< 0.01	< 0.01	18	20	
15	365+00 -L- RT	Extend 4@ 8'x9' RCBC						0.08		165		
15	365+00 -L- RT	Bank Stabilization						0.01	< 0.01	65	10	
15	365+00 -L- RT	Culvert Constuction Activities							< 0.01			
15A	395+80 -L- RT	Bank Stabilization						< 0.01	< 0.01	8	20	
16	404+50 -L- RT	Bank Stabilization						< 0.01	< 0.01	36	20	
17	408+50 -L- RT	Bank Stabilization						< 0.01	< 0.01	10	10	
18	454+50 -L- LT	Roadway Fill	< 0.01			0.04						
18	454+50 -L- LT	Riprap Outfall	< 0.01									
18	454+50 -L- LT	Bank Stabilization						< 0.01		13		
19	15+00 -Y23RPD- RT	Bank Stabilization						< 0.01	< 0.01	15	10	
20	488+30 -L- RT	Extend 6' x 5' RCBC						< 0.01		13		
20	488+30 -L- RT	Bank Stabilization				< 0.01		< 0.01	< 0.01	17	10	
20	488+80 -L- LT	Energy Dissipator Basin						< 0.01		35		
20	488+80 -L- LT	Extend 6' x 5' RCBC						0.01		21		
20	488+80 -L- LT	Bank Stabilization						< 0.01	< 0.01	17	12	
21	491+50 -L- LT	Bank Stabilization						< 0.01	< 0.01	13	10	
22	492+50 - 493+70 -L- LT	Channel Change						0.01	< 0.01	129	39	
22	494+00 -L- LT	Extend 48" RCP						< 0.01		11		
22	494+00 -L- LT	Bank Stabilization						< 0.01		15		
22	496+00 RT	Bank Stabilization						< 0.01	< 0.01	9	10	
24	545+30 -L- LT	JB and 36" RCP						< 0.01		6		
24	545+30 -L- LT	Bank Stabilization						< 0.01	< 0.01	22	10	
TOTALS*:			0.11			0.04		0.15	0.04	638	181	0

*Rounded totals are sum of actual impacts

NOTES:

At Sites 15, 20, and 22, the existing culvert is not buried, therefore the culvert extension will not be buried. The bottom elevation of the extended culvert will match the elevation of the existing stream bed.

At Site 15, 0.02 ac (65 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts.

At Site 20, <0.01 ac (34 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts.

At Site 22, <0.01 ac (24 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts.

At Site 24, <0.01 ac (22 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts.

Revised 2018 Feb

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
09/20/19
MECKLENBURG
TIP NO. I-5507
WBS NO. 43609.3.2

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)
25	561+80 - 565+00 -L- LT	Roadway Fill	0.02			0.04						
26	564+00 - 566+20 -L- RT	Roadway Fill				0.01						
27	578+50/579+30 -L-	Bank Stabilization	< 0.01					< 0.01	< 0.01	33	20	
28	586+70/588+00 -L-	Bank Stabilization						< 0.01	< 0.01	37	20	
29	612+00/615+00 -L-	Bank Stabilization						< 0.01	< 0.01	25	30	
30	641+50 -L- LT	Headwall							< 0.01		33	
31	654+50 -L- LT	Extend 42" RCP						< 0.01		3		
31	654+50 -L- LT	Lateral Ditch/Stabilization	< 0.01					< 0.01	< 0.01	20	10	
32	658+70 -L- LT	Roadway Fill	0.02									
32	658+70 -L- LT	Bank Stabilization						< 0.01	< 0.01	6	20	
33	680+20 -L- LT	Bank Stabilization						< 0.01	< 0.01	7	10	
33	683+40 -L- LT	Bank Stabilization	< 0.01			< 0.01		< 0.01		33		
35	729+90 -L-	Bank Stabilization						< 0.01	< 0.01	50	42	
35	729+90 -L- LT	Class I Riprap	< 0.01			< 0.01						
36	740+50/741+50 -L-	Bank Stabilization						< 0.01	< 0.01	17	25	
37	746+30/750+00 -L-	Bank Stabilization						< 0.01	< 0.01	35	20	
37A	765+00 -L- LT	Bank Stabilization						< 0.01		13		
38	806+50 -L- RT	Bank Stabilization						< 0.01	< 0.01	26	10	
38	808+50 -L- LT	Bank Stabilization						< 0.01	< 0.01	6	20	
39	814+50/816+00 -L- LT	Bank Stabilization						< 0.01	< 0.01	13	10	
40	818+00 -L-	Bank Stabilization						< 0.01	< 0.01	16	24	
41	890+50 -L-	Roadway Fill	0.02									
41	890+50 -L-	Extend 36" RCP						< 0.01		52		
41	890+50 -L-	Bank Stabilization						< 0.01	< 0.01	33	42	
TOTALS*:			0.07			0.07		0.05	0.04	425	336	0

*Rounded totals are sum of actual impacts

NOTES:

At Sites 31 and 41, the existing culvert is not buried, therefore the culvert extension will not be buried. The bottom elevation of the extended culvert will match the elevation of the existing stream bed.

At Site 31, <0.01 ac (20 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts.

At Site 41, <0.01 ac (33 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
09/20/19
MECKLENBURG
TIP NO. I-5507
WBS NO. 43609.3.2

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)
42	894+00/895+70 -L-	Roadway Fill	0.03									
42	894+00/895+70 -L- RT	Extend 42" RCP						0.02		105		
42	894+00/895+70 -L- RT	Channel Change						< 0.01	< 0.01	20	12	
42	894+00/895+70 -L- LT	Bank Stabilization						< 0.01		20		
43	18+60 -Y19RPC- RT	Bank Stabilization						< 0.01	< 0.01	30	10	
44	28+50 -Y2-	Extend 3 @ 8'x9' RCBC						< 0.01		26		
44	28+50 -Y2-	Bank Stabilization						< 0.01	< 0.01	28	19	
44	28+50 -Y2-	Culvert Construction Activities							< 0.01			
	SHEET 1 SUBTOTALS*		0.36			0.15		0.19	0.24	1215	789	
	SHEET 2 SUBTOTALS*		0.11			0.04		0.15	0.04	638	181	
	SHEET 3 SUBTOTALS*		0.07			0.07		0.05	0.04	425	336	
TOTALS*:			0.56			0.27		0.43	0.33	2507	1347	0

*Rounded totals are sum of actual impacts

NOTES:

At Sites 42 and 44, the existing culvert is not buried, therefore the culvert extension will not be buried. The bottom elevation of the extended culvert will match the elevation of the existing stream bed.

At Site 42, <0.01 ac (20 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts.

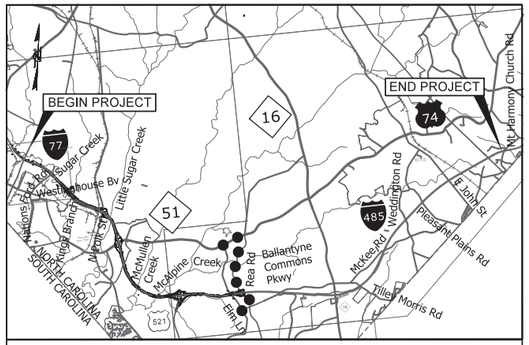
At Site 44, <0.01 ac (28 lf) of temporary impacts due to construction activities are included within the bank stabilization impacts.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
09/20/19
MECKLENBURG
TIP NO. I-5507
WBS NO. 43609.3.2

Revised 2018 Feb

CONTRACT: C203970 TIP PROJECT: I-5507/R-0211EC/U-4714AB

See Sheet 1A For Index of Sheets
See Sheet 1B For Standard Symbology



VICINITY MAP

ELM LANE DETOUR

N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MECKLENBURG COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5507 / R-0211EC / U-4714AB	1	

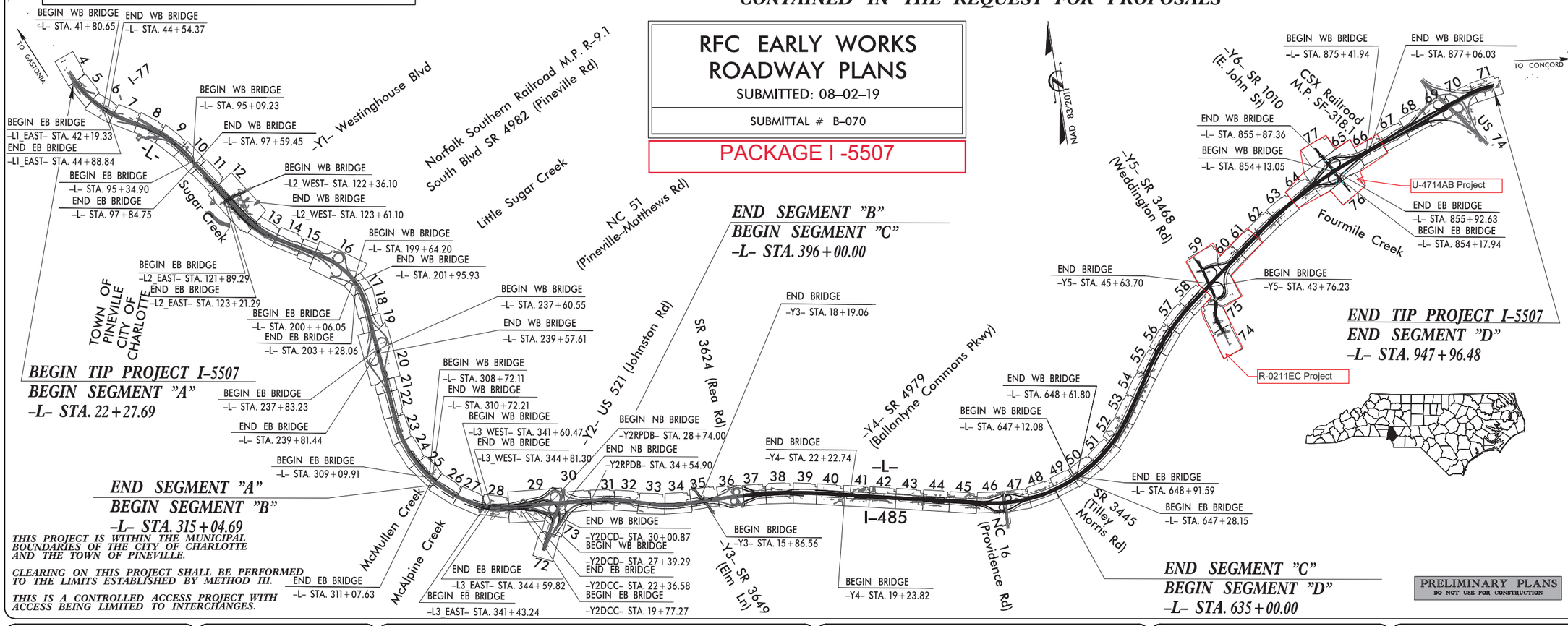
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
43609.3.2	N/A	Design–Build

LOCATION: I–485 FROM I–77 TO US 74 (INDEPENDENCE BOULEVARD); I–485 / WEDDINGTON ROAD INTERCHANGE; AND I–485 / EAST JOHN STREET – OLD MONROE ROAD INTERCHANGE

TYPE OF WORK: DESIGN–BUILD AS SPECIFIED IN THE SCOPE OF WORK CONTAINED IN THE REQUEST FOR PROPOSALS

RFC EARLY WORKS ROADWAY PLANS
SUBMITTED: 08–02–19
SUBMITTAL # B–070

PACKAGE I -5507



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2018 = 118,400
ADT 2040 = 159,200
DHV = 9 %
D = 55 %
T = 9 % *
V = 70/75 MPH
*(TTST 4 + DUAL 5)

FUNCTIONAL CLASSIFICATION:
INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT I–5507 = 17.137 mi

LENGTH OF STRUCTURES TIP PROJECT I–5507 = 0.395 mi (BASED ON 485 WB BRIDGES)

TOTAL LENGTH OF TIP PROJECT I–5507 = 17.532 mi

NCDOT CONTACT: TIM MCFADDEN, PE
DESIGN BUILD PROJECT ENGINEER – TRANSPORTATION PROGRAM MANAGEMENT UNIT

Prepared In the Office of:
WSP BLYTHE
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY: SEPTEMBER 18, 2018

LETTING DATE: SEPTEMBER 18, 2018

DAVID B. GOURLEY, PE
PROJECT ENGINEER

SEAN R. MELVILLE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER MARK R DAUBER
P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032689 ENGINEER DAVID B. GOURLEY
P.E.
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

8/28/2019
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wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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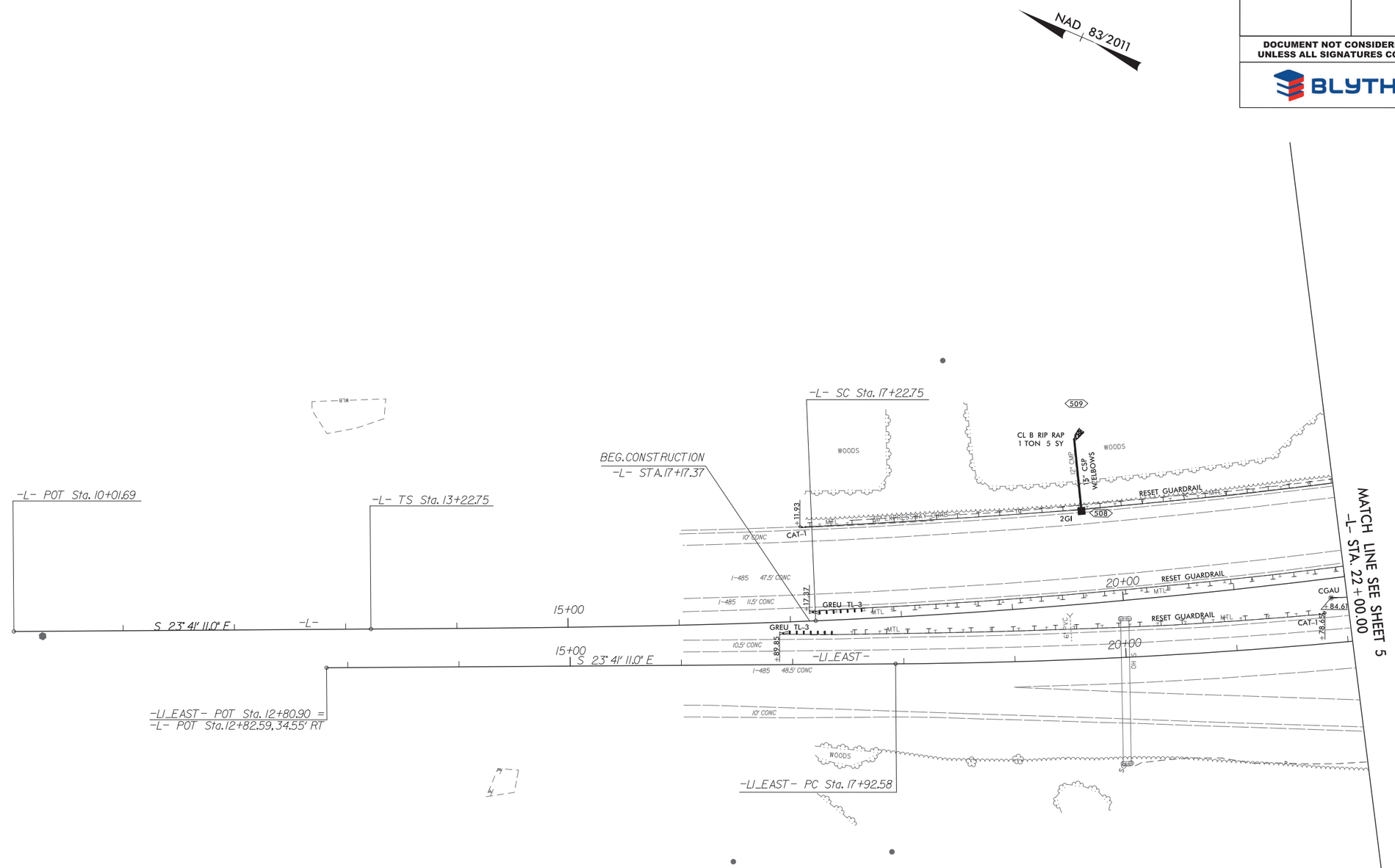

-L-		-LI_EAST-
PIs Sta 15+89.43	PI Sta 36+13.45	PI Sta 24+60.17
Θs = 1° 59' 59.5"	Δ = 36° 31' 20.1" (LT)	Δ = 15° 45' 29.6" (LT)
Ls = 400.00'	D = 0° 59' 59.7"	D = 1° 11' 15.8"
LT = 266.68'	L = 3,652.49'	L = 1,326.76'
ST = 133.35'	T = 1,890.70'	T = 667.59'
	R = 5,730.00'	R = 4,824.00'
	SE = EXIST	SE = EXIST
	DS = 70 MPH	DS = 70 MPH

9/23/2019
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PROJECT REFERENCE NO.	SHEET NO.
I-5507	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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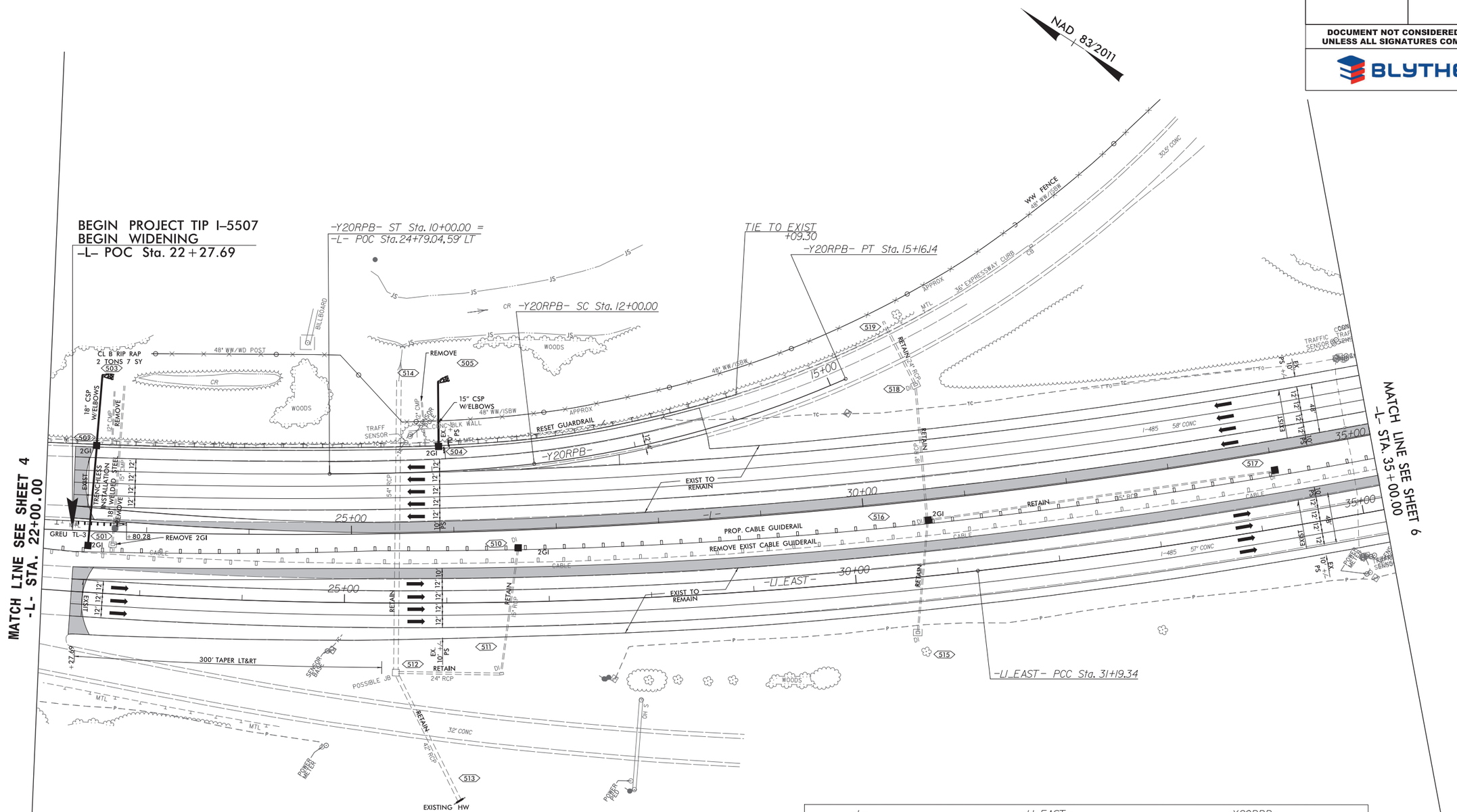

-L-	-LI_EAST-		-Y20RPB-	
PI Sta 36+13.45	PI Sta 24+60.17	PI Sta 39+53.67	PIs Sta 11+22.89	PI Sta 13+59.24
△ = 36° 31' 20.1" (LT)	△ = 15° 45' 29.6" (LT)	△ = 16° 41' 32.6" (LT)	Θs = 1° 00' 32.8"	△ = 17° 00' 28.7" (LT)
D = 0° 59' 59.7"	D = 1° 11' 15.8"	D = 1° 00' 27.0"	Θs = 5° 22' 51.9"	D = 5° 22' 47.6"
L = 3,652.49'	L = 1,326.76'	L = 1,656.83'	Ls = 200.00'	L = 316.14'
T = 1,890.70'	T = 667.59'	T = 834.33'	LT = 122.89'	T = 159.24'
R = 5,730.00'	R = 4,824.00'	R = 5,687.00'	ST = 77.30'	R = 1,065.00'
SE = EXIST (0.036)	SE = EXIST (0.042)	SE = EXIST (0.036)		SE = EXIST
DS = 70 MPH	DS = 70 MPH	DS = 70 MPH		DS = 50 MPH

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PROJECT REFERENCE NO.	SHEET NO.
I-5507	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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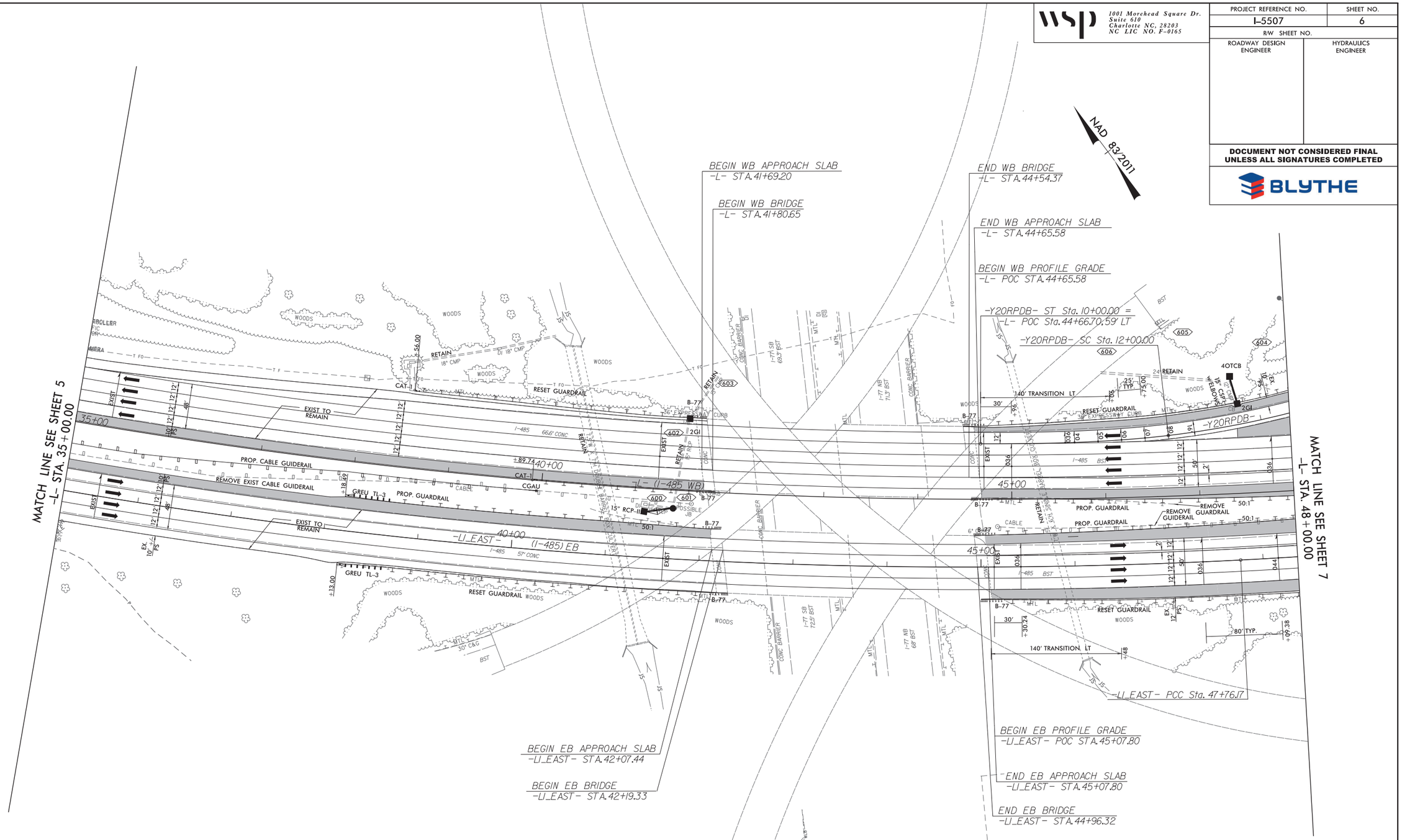

-L-	-LI_EAST-		-Y20RPDB-	
PI Sta 36+13.45	PI Sta 39+53.67	PI Sta 51+47.90	PIs Sta 11+23.56	PI Sta 13+21.19
Δ = 36° 31' 20.1" (LT)	Δ = 16° 41' 32.6" (LT)	Δ = 9° 15' 00.5" (LT)	Θs = 1° 00' 35.1"	Δ = 14° 00' 00.0" (LT)
D = 0° 59' 59.7"	D = 1° 00' 27.0"	D = 1° 14' 48.9"	Θs = 5° 48' 20.2"	D = 5° 48' 18.2"
L = 3,652.49'	L = 1,656.83'	L = 741.84'	Ls = 200.00'	L = 241.17'
T = 1,890.70'	T = 834.33'	T = 371.73'	LT = 123.56'	T = 121.19'
R = 5,730.00'	R = 5,687.00'	R = 4,595.00'	ST = 76.65'	R = 987.00'
SE = 0.036	SE = 0.036	SE = 0.044		SE = 0.08
DS = 70 MPH	DS = 70 MPH	DS = 70 MPH		DS = 55 MPH

SEE SHEET 78 FOR -L- (WB) PROFILE
SEE SHEET 78 FOR -L1_EAST- PROFILE
SEE SHEET 132 FOR -Y20RPDB- PROFILE

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PROJECT REFERENCE NO.	SHEET NO.
I-5507	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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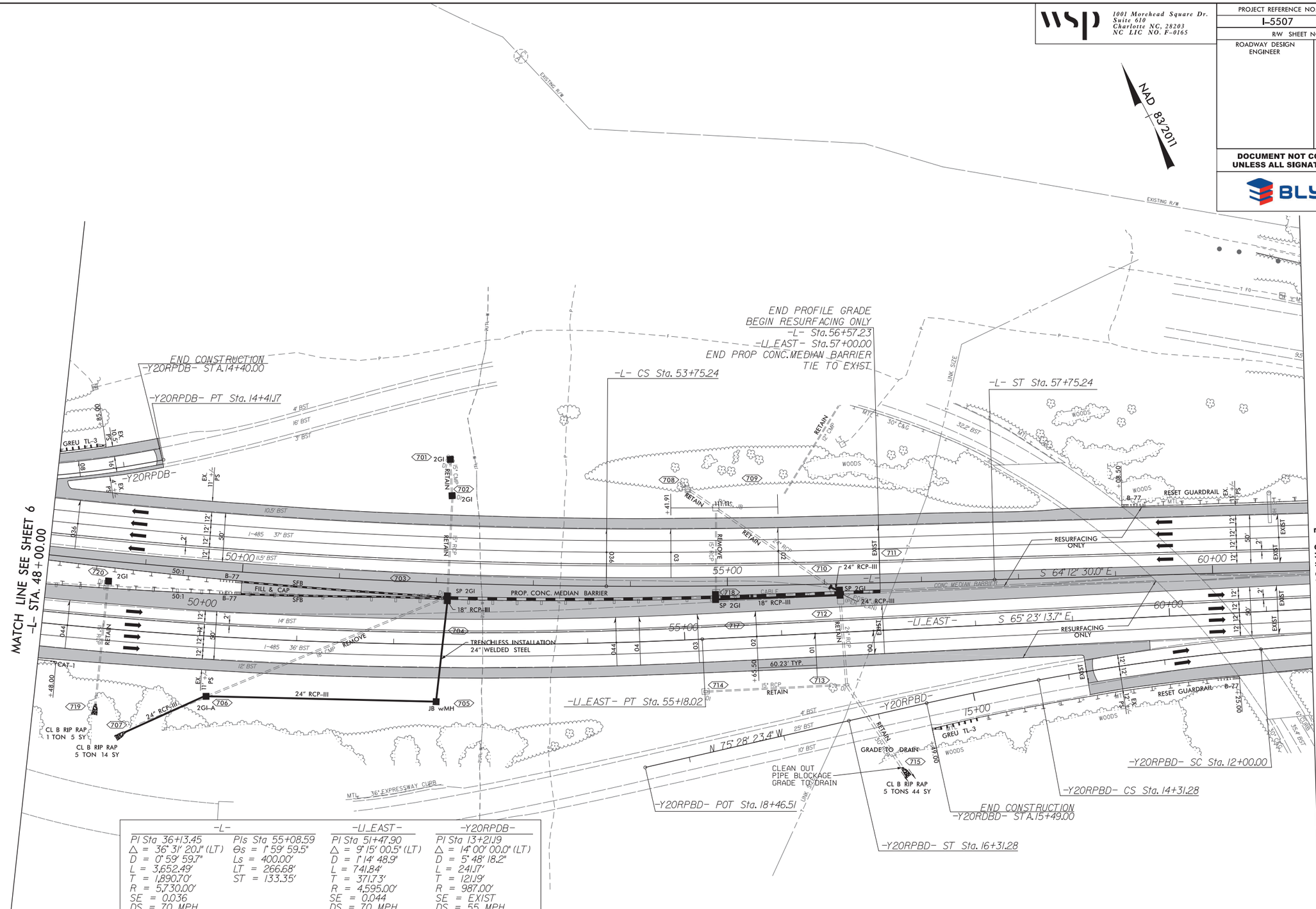

-L-		-L1_EAST-	-Y20RPDB-
PI Sta 36+13.45	PIs Sta 55+08.59	PI Sta 51+47.90	PI Sta 13+21.19
Δ = 36° 31' 20.1" (LT)	Θs = 1° 59' 59.5"	Δ = 9° 15' 00.5" (LT)	Δ = 14° 00' 00.0" (LT)
D = 0° 59' 59.7"	Ls = 400.00'	D = 1° 14' 48.9"	D = 5° 48' 18.2"
L = 3,652.49'	LT = 266.68'	L = 741.84'	L = 241.17'
T = 1,890.70'	ST = 133.35'	T = 371.73'	T = 121.19'
R = 5,730.00'		R = 4,595.00'	R = 987.00'
SE = 0.036		SE = 0.044	SE = EXIST
DS = 70 MPH		DS = 70 MPH	DS = 55 MPH

-Y20RPBD-		
PIs Sta 14+97.96	PI Sta 13+15.73	PIs Sta 11+33.34
Θs = 2° 20' 19.0"	Δ = 5° 24' 31.8" (LT)	Θs = 2° 20' 19.0"
Ls = 200.00'	D = 2° 20' 19.0"	Ls = 200.00'
LT = 133.34'	L = 231.28'	LT = 133.34'
ST = 66.68'	T = 115.73'	ST = 66.68'
	R = 2,450.00'	
	SE = EXIST	
	DS = 60 MPH	

SEE SHEET 78 FOR -L- (WB) PROFILE
SEE SHEET 78 FOR -L1_EAST- PROFILE
SEE SHEET 132 FOR -Y20RPDB- PROFILE

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PROFILE$

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PROJECT REFERENCE NO.	SHEET NO.
I-5507	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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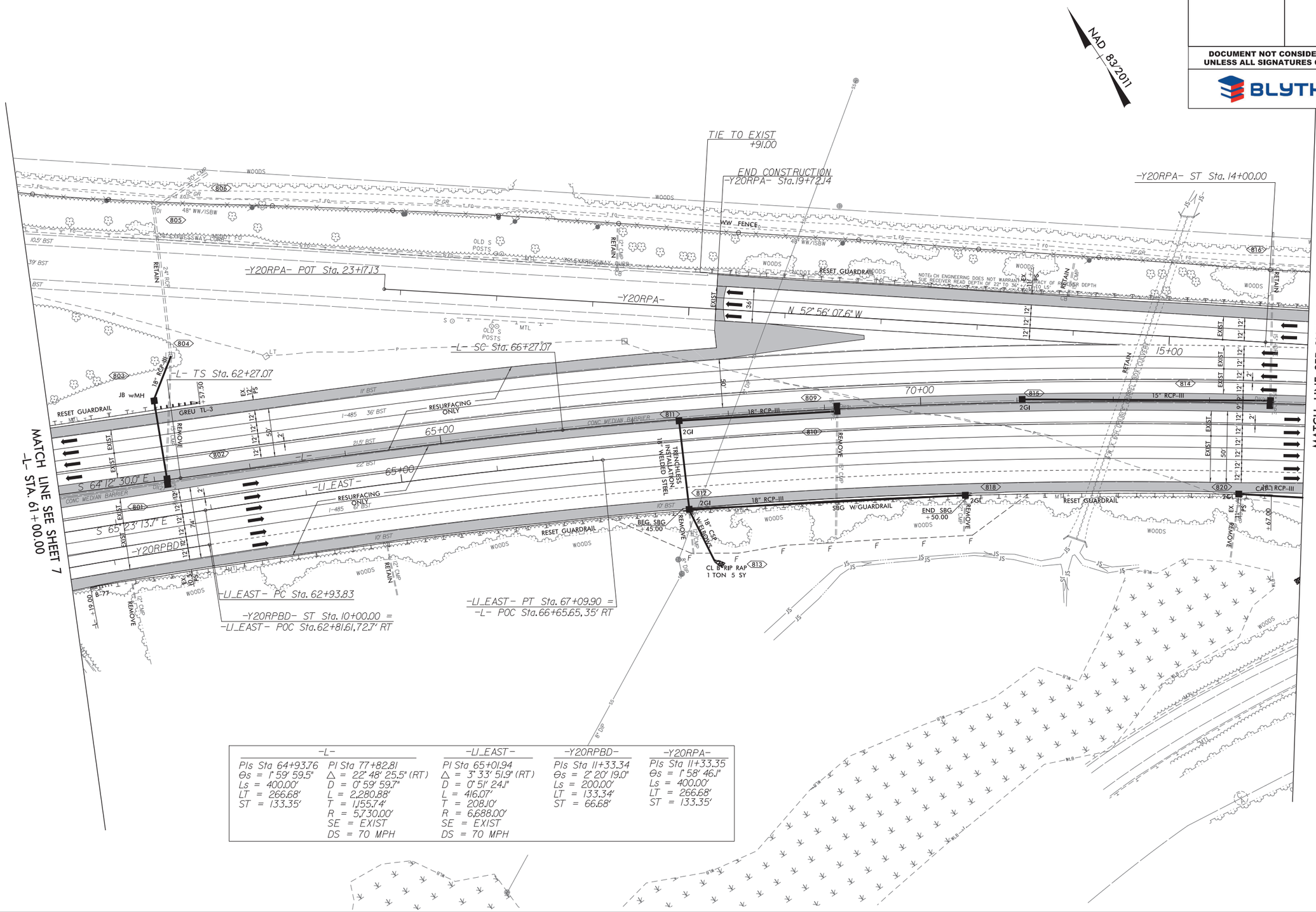
8/17/99

REVISIONS



-L-		-LI_EAST-	-Y20RPBD-	-Y20RPA-
PIs Sta 64+93.76	PI Sta 77+82.81	PI Sta 65+01.94	PIs Sta 11+33.34	PIs Sta 11+33.35
Θs = 1° 59' 59.5"	Δ = 22° 48' 25.5" (RT)	Δ = 3° 33' 51.9" (RT)	Θs = 2° 20' 19.0"	Θs = 1° 58' 46.1"
Ls = 400.00'	D = 0° 59' 59.7"	D = 0° 51' 24.1"	Ls = 200.00'	Ls = 400.00'
LT = 266.68'	L = 2,280.88'	L = 416.07'	LT = 133.34'	LT = 266.68'
ST = 133.35'	T = 1,155.74'	T = 208.10'	ST = 66.68'	ST = 133.35'
	R = 5,730.00'	R = 6,688.00'		
	SE = EXIST	SE = EXIST		
	DS = 70 MPH	DS = 70 MPH		

9/23/2019
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PRDPWICS01$

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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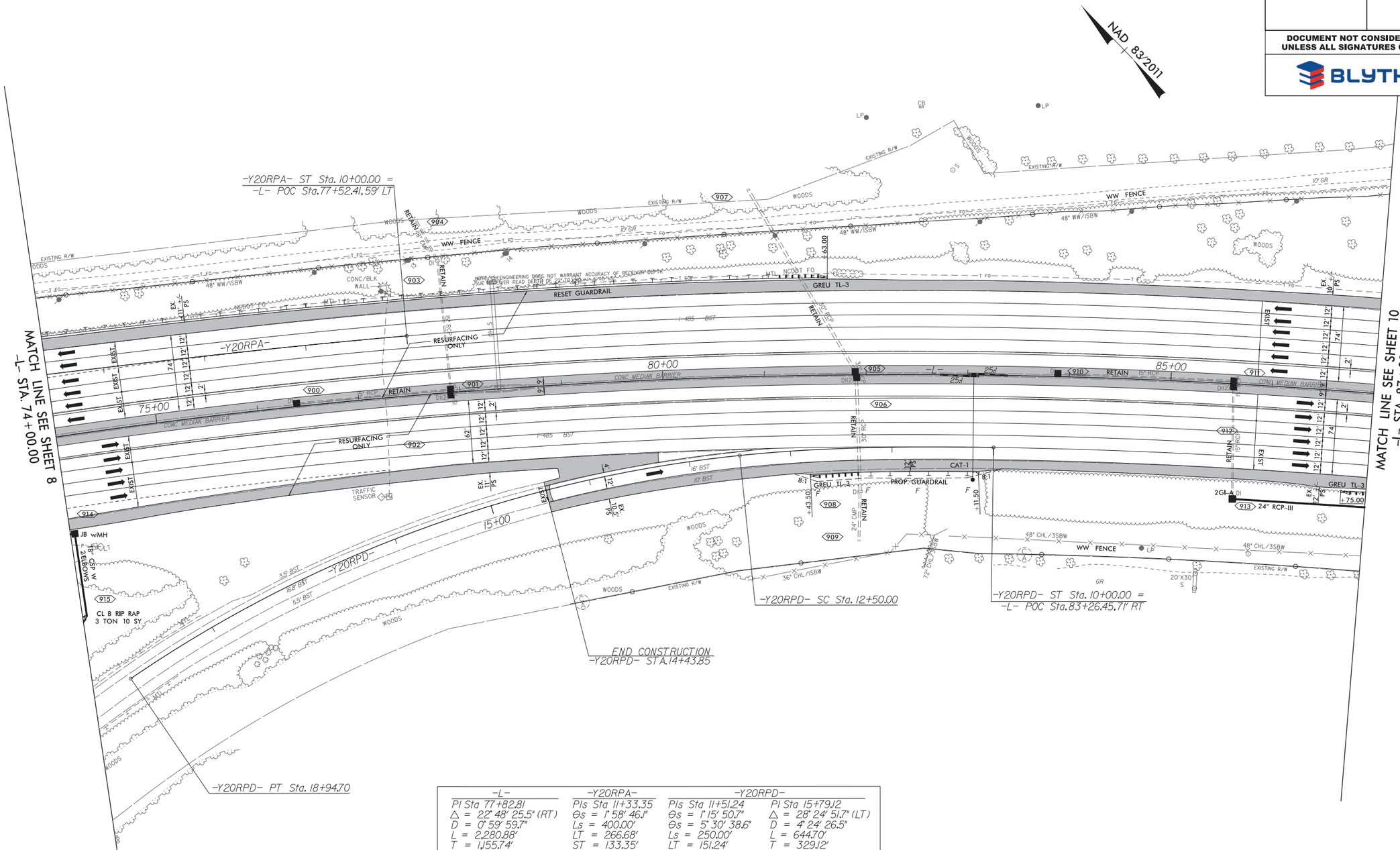

-L-	-Y20RPA-	-Y20RPD-	
PI Sta 77+82.81	PIs Sta 11+33.35	PIs Sta 11+51.24	PI Sta 15+79.12
△ = 22° 48' 25.5" (RT)	Θs = 1° 58' 46.1"	Θs = 1° 15' 50.7"	△ = 28° 24' 51.7" (LT)
D = 0° 59' 59.7"	Ls = 400.00'	Θs = 5° 30' 38.6"	D = 4° 24' 26.5"
L = 2,280.88'	LT = 266.68'	Ls = 250.00'	L = 644.70'
T = 1,155.74'	ST = 133.35'	LT = 151.24'	T = 329.12'
R = 5,730.00'		ST = 99.03'	R = 1,300.00'
SE = EXIST			SE = EXIST
DS = 70 MPH			DS = 60 MPH

9/23/2019
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REVISIONS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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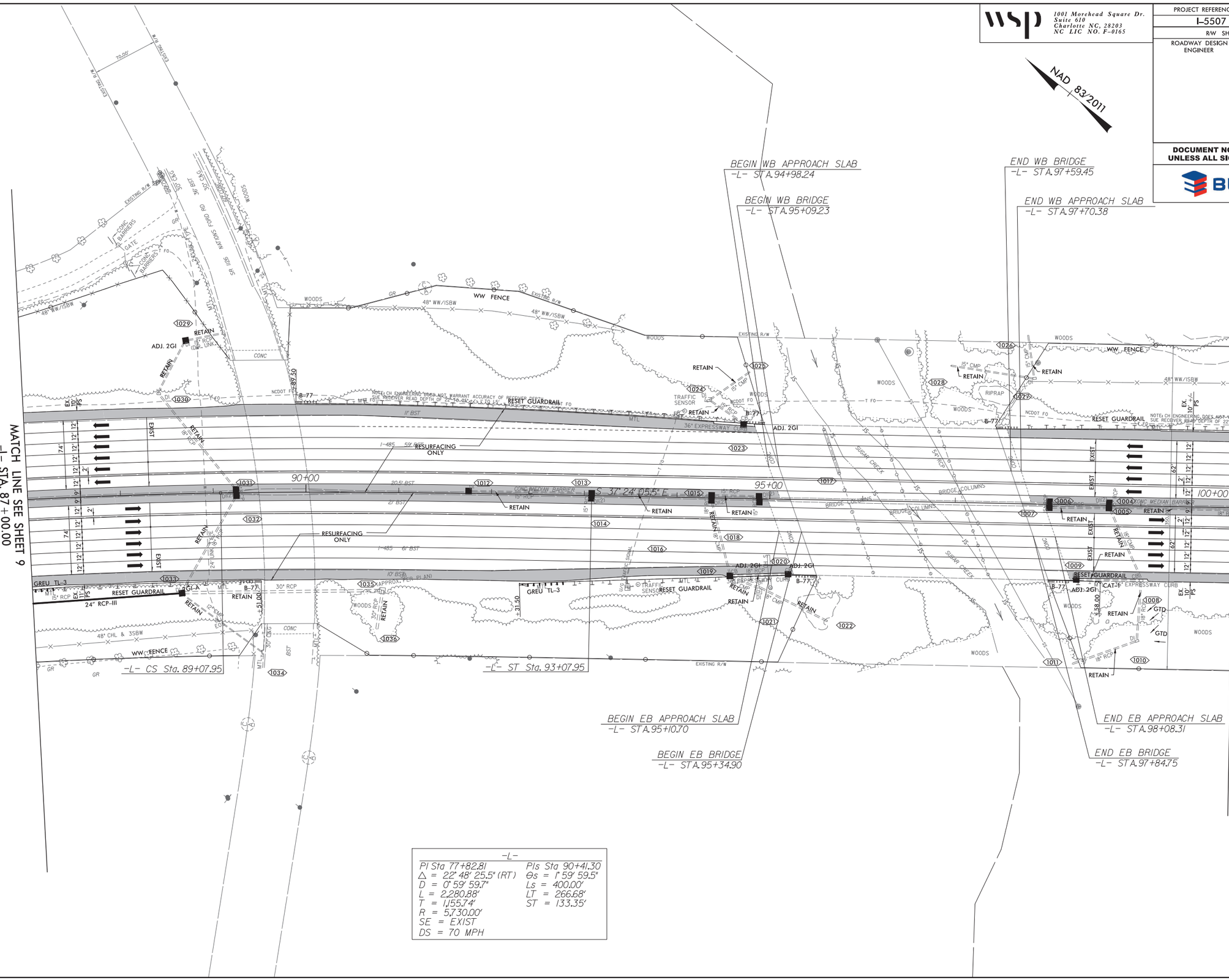

-L-	
PI Sta 77+82.81	PIs Sta 90+41.30
△ = 22° 48' 25.5" (RT)	Θs = 1° 59' 59.5"
D = 0° 59' 59.7"	Ls = 400.00'
L = 2,280.88'	LT = 266.68'
T = 1,155.74'	ST = 133.35'
R = 5,730.00'	
SE = EXIST	
DS = 70 MPH	

9/23/2019
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PROPWICS01$

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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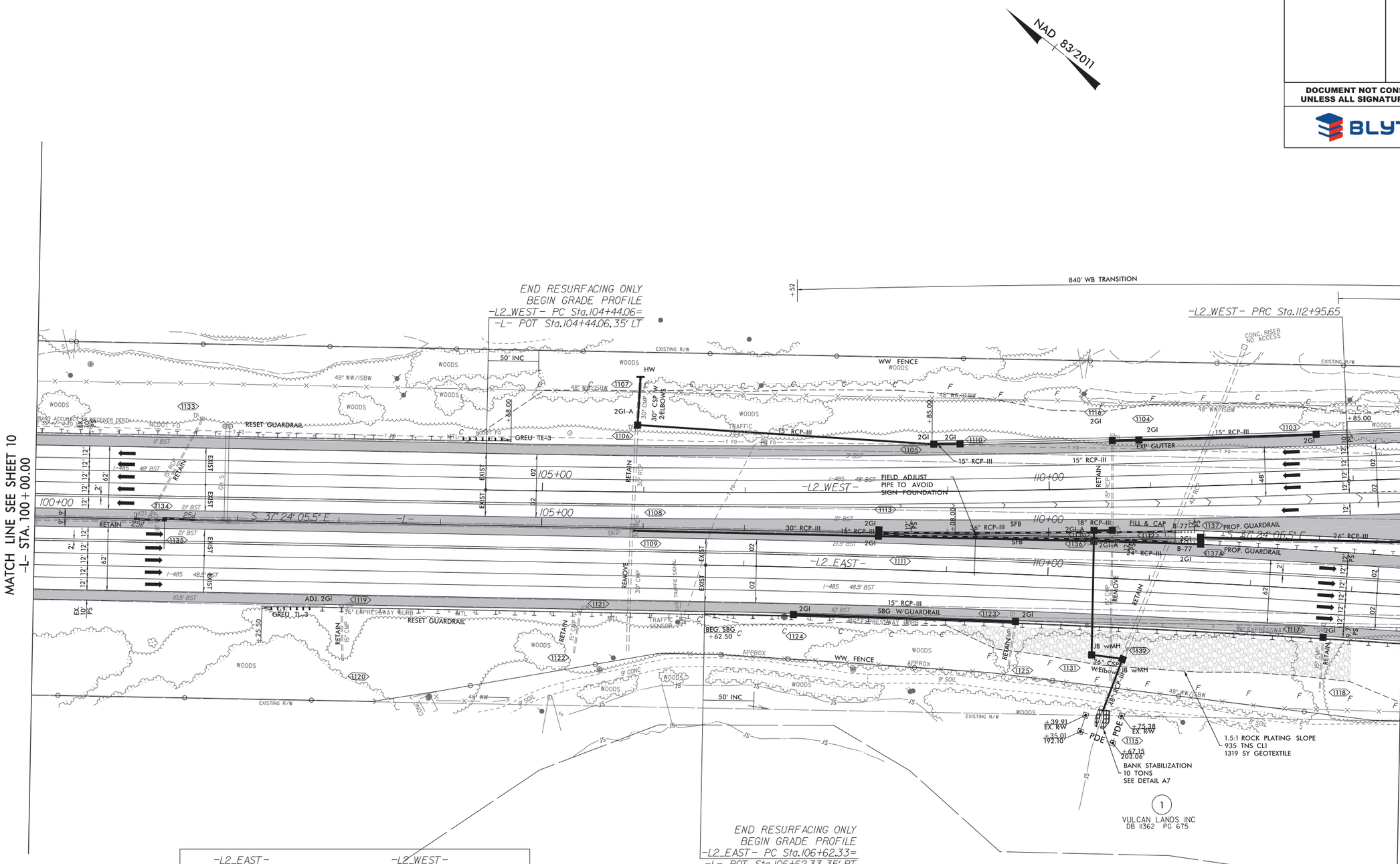
REVISIONS

8/17/99



-L2_EAST-	-L2_WEST-	
PI Sta 110+33.60	PI Sta 108+69.98	PI Sta 117+21.57
△ = 2° 56' 00.4" (RT)	△ = 3° 21' 54.0" (LT)	△ = 3° 21' 54.0" (RT)
D = 0° 23' 42.5"	D = 0° 23' 42.5"	D = 0° 23' 42.5"
L = 742.37'	L = 851.59'	L = 851.59'
T = 371.27'	T = 425.92'	T = 425.92'
R = 14,500.00'	R = 14,500.00'	R = 14,500.00'
SE = NC	SE = NC	SE = NC
DS = 70 MPH	DS = 70 MPH	DS = 70 MPH

SEE SHEET 126 FOR -L2_WEST- PROFILE
SEE SHEET 128 FOR -L2_EAST- PROFILE

9/23/2019
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PROPWTCS01$

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
I-5507	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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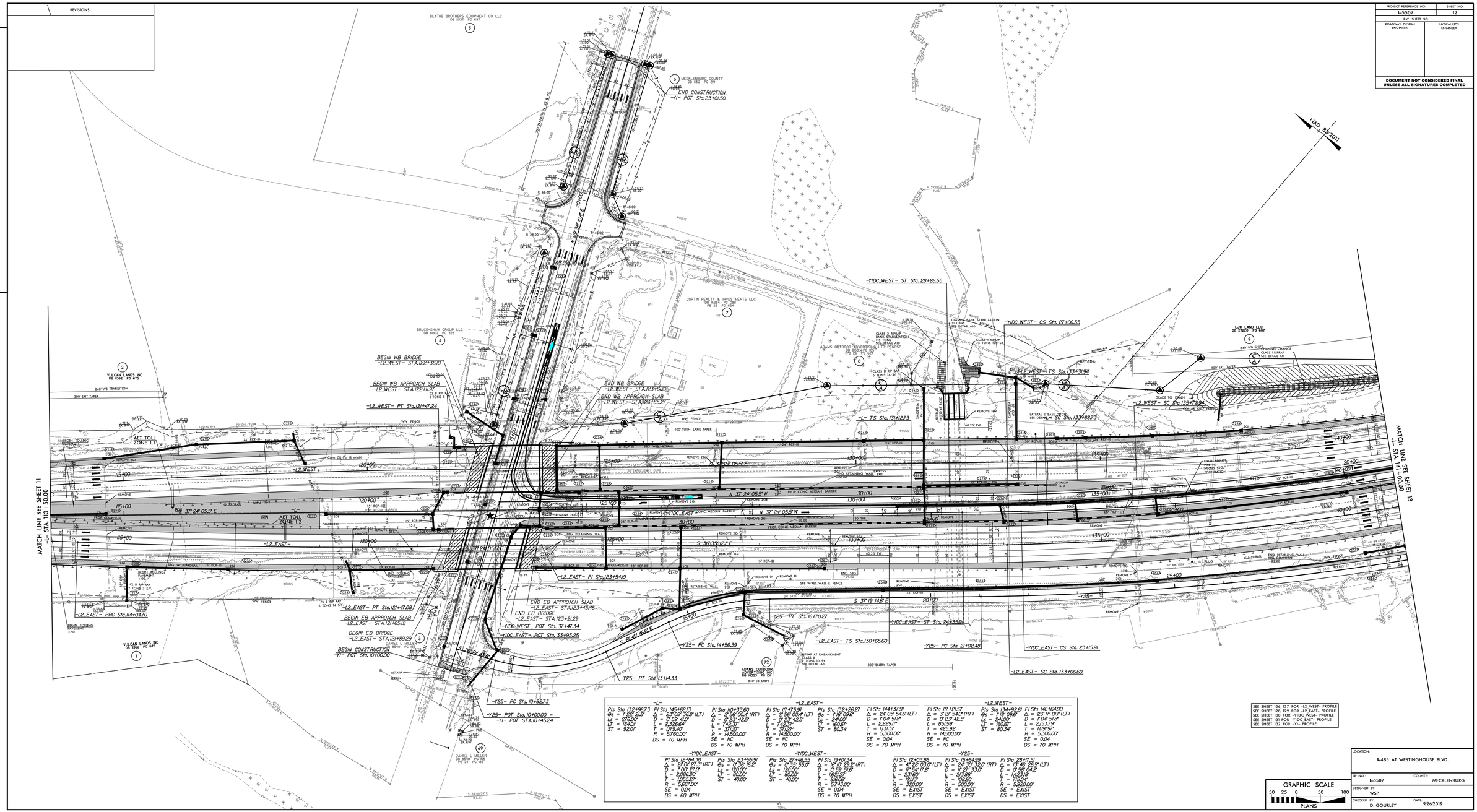

-L-			
PIs Sta 132+96.73	PI Sta 145+68.13		
Θs = 1°22'21.8"	Δ = 23°08'36.8" (LT)		
Ls = 276.00'	D = 0°59'41.0"		
LT = 184.01'	L = 2,328.64'		
ST = 92.01'	T = 1,179.40'		
	R = 5,760.00'		
	DS = 70 MPH		

-L2_EAST-			
PI Sta 110+33.60	PI Sta 117+75.97	PIs Sta 132+26.27	PI Sta 144+37.91
Δ = 2°56'00.4" (RT)	Δ = 2°56'00.4" (LT)	Θs = 1°18'09.6"	Θs = 1°18'09.6"
D = 0°23'42.5"	D = 0°23'42.5"	Ls = 241.00'	Ls = 241.00'
L = 742.37'	L = 742.37'	LT = 160.67'	L = 2,229.17'
T = 371.27'	T = 371.27'	ST = 80.34'	T = 1,113.31'
R = 14,500.00'	R = 14,500.00'		R = 5,300.00'
SE = NC	SE = NC		SE = 0.04
DS = 70 MPH	DS = 70 MPH		DS = 70 MPH

-L2_WEST-			
PI Sta 117+21.57	PIs Sta 134+92.61	PI Sta 146+64.90	
Δ = 3°21'54.0" (RT)	Θs = 1°18'09.6"	Δ = 23°17'01.2" (LT)	
D = 0°23'42.5"	Ls = 241.00'	D = 1°04'51.8"	
L = 851.59'	LT = 160.67'	L = 2,153.79'	
T = 425.92'	ST = 80.34'	T = 1,119.51'	
R = 14,500.00'		R = 5,300.00'	
SE = NC		SE = 0.04	
DS = 70 MPH		DS = 70 MPH	

-YIDC_EAST-			
PI Sta 12+84.38	PIs Sta 23+55.91	PIs Sta 27+46.55	PI Sta 19+01.34
Δ = 27°01'27.3" (RT)	Θs = 0°36'16.2"	Θs = 0°35'55.0"	Δ = 16°10'39.3" (RT)
D = 1°00'27.0"	Ls = 120.00'	Ls = 120.00'	D = 0°59'51.6"
L = 2,086.80'	LT = 80.00'	LT = 80.00'	L = 1,621.27'
T = 1,055.27'	ST = 40.00'	ST = 40.00'	T = 816.00'
R = 5,687.00'			R = 5,743.00'
SE = 0.04			SE = 0.04
DS = 60 MPH			DS = 70 MPH

-YIDC_WEST-		
PI Sta 12+03.86	PI Sta 15+64.99	PI Sta 28+17.51
Δ = 40°28'03.0" (LT)	Δ = 24°30'33.0" (RT)	Δ = 13°46'26.5" (LT)
D = 17°54'17.8"	D = 11°27'33.0"	D = 0°58'04.2"
L = 231.60'	L = 213.88'	L = 1,423.18'
T = 121.13'	T = 108.60'	T = 715.04'
R = 320.00'	R = 500.00'	R = 5,920.00'
SE = EXIST	SE = EXIST	SE = EXIST
DS = EXIST	DS = EXIST	DS = EXIST

SEE SHEET 126, 127 FOR -L2 WEST- PROFILE
SEE SHEET 128, 129 FOR -L2 EAST- PROFILE
SEE SHEET 130 FOR -YIDC WEST- PROFILE
SEE SHEET 131 FOR -YIDC EAST- PROFILE
SEE SHEET 132 FOR -Y1- PROFILE

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: I-485 AT WESTINGHOUSE BLVD.	
TIP NO. I-5507	COUNTY: MECKLENBURG
DESIGNED BY: WSP	
CHECKED BY: D. GOURLEY	DATE: 9/26/2019

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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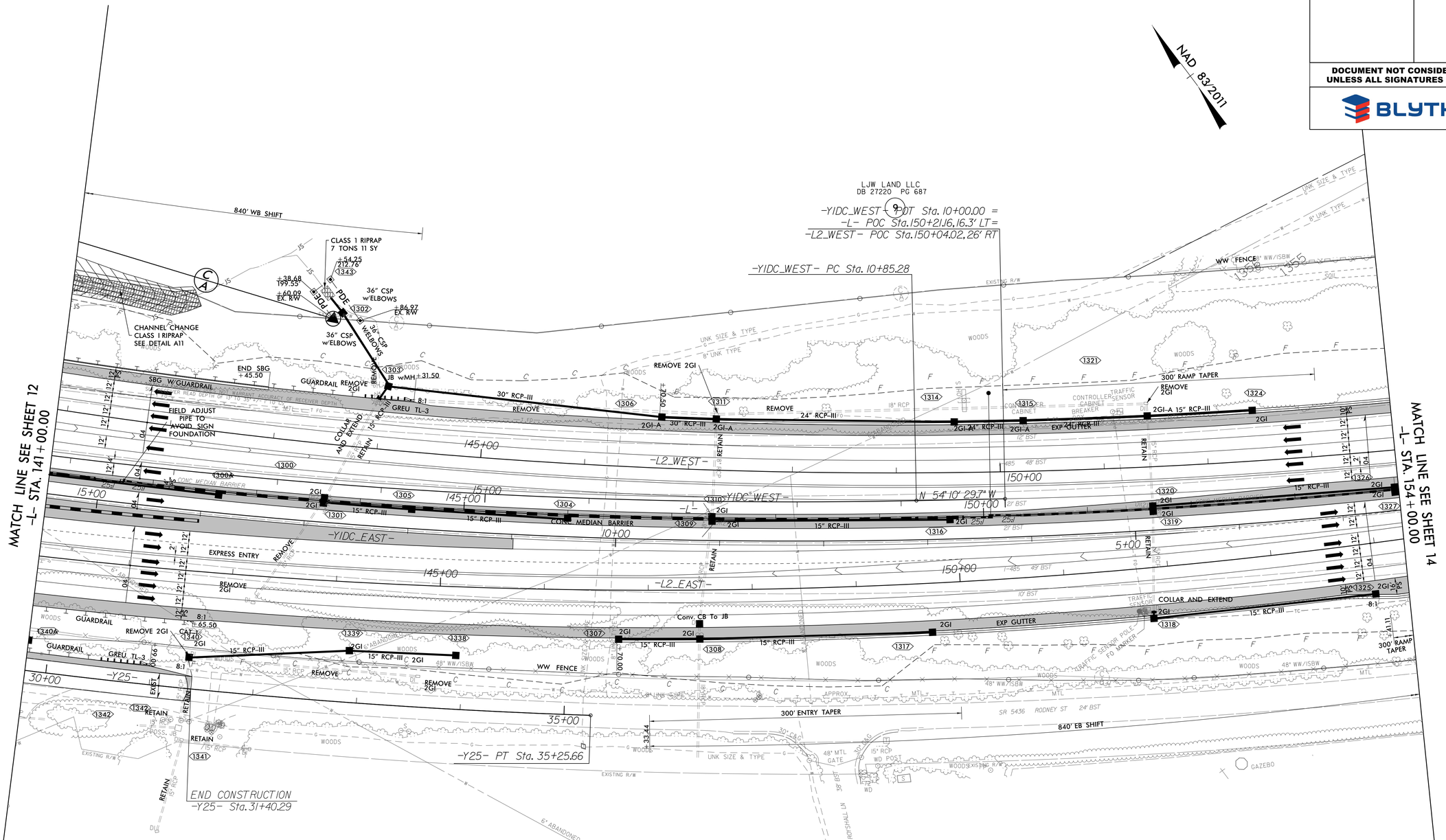

-L-	-L2_EAST-	-L2_WEST-	-YIDC_EAST-	-YIDC_WEST-	-Y25-
PI Sta 145+68.13	PI Sta 144+37.91	PI Sta 146+64.90	PI Sta 12+84.38	PI Sta 19+01.34	PI Sta 28+17.51
△ = 23° 08' 36.8" (LT)	△ = 24° 05' 54.6" (LT)	△ = 23° 17' 01.1" (LT)	△ = 21° 01' 27.3" (RT)	△ = 16° 10' 29.2" (RT)	△ = 13° 46' 26.5" (LT)
D = 0° 59' 41.0"	D = 1° 04' 51.8"	D = 1° 04' 51.8"	D = 1° 00' 27.0"	D = 0° 59' 51.6"	D = 0° 58' 04.2"
L = 2,326.64'	L = 2,229.17'	L = 2,153.79'	L = 2,086.80'	L = 1,621.27'	L = 1,423.18'
T = 1,179.40'	T = 1,131.31'	T = 1,091.97'	T = 1,055.27'	T = 816.06'	T = 715.04'
R = 5,760.00'	R = 5,300.00'	R = 5,300.00'	R = 5,687.00'	R = 5,743.00'	R = 5,920.00'
DS = 70 MPH	SE = 0.04	SE = 0.04	SE = 0.04	SE = 0.04	SE = EXIST
	DS = 70 MPH	DS = 70 MPH	DS = 60 MPH	DS = 70 MPH	DS = EXIST

SEE SHEET 127 FOR -L2_WEST- PROFILE
SEE SHEET 129 FOR -L2_EAST- PROFILE
SEE SHEET 130 FOR -YIDC_WEST- PROFILE
SEE SHEET 131 FOR -YIDC_EAST- PROFILE

REVISIONS

8/17/99

9/26/2019
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wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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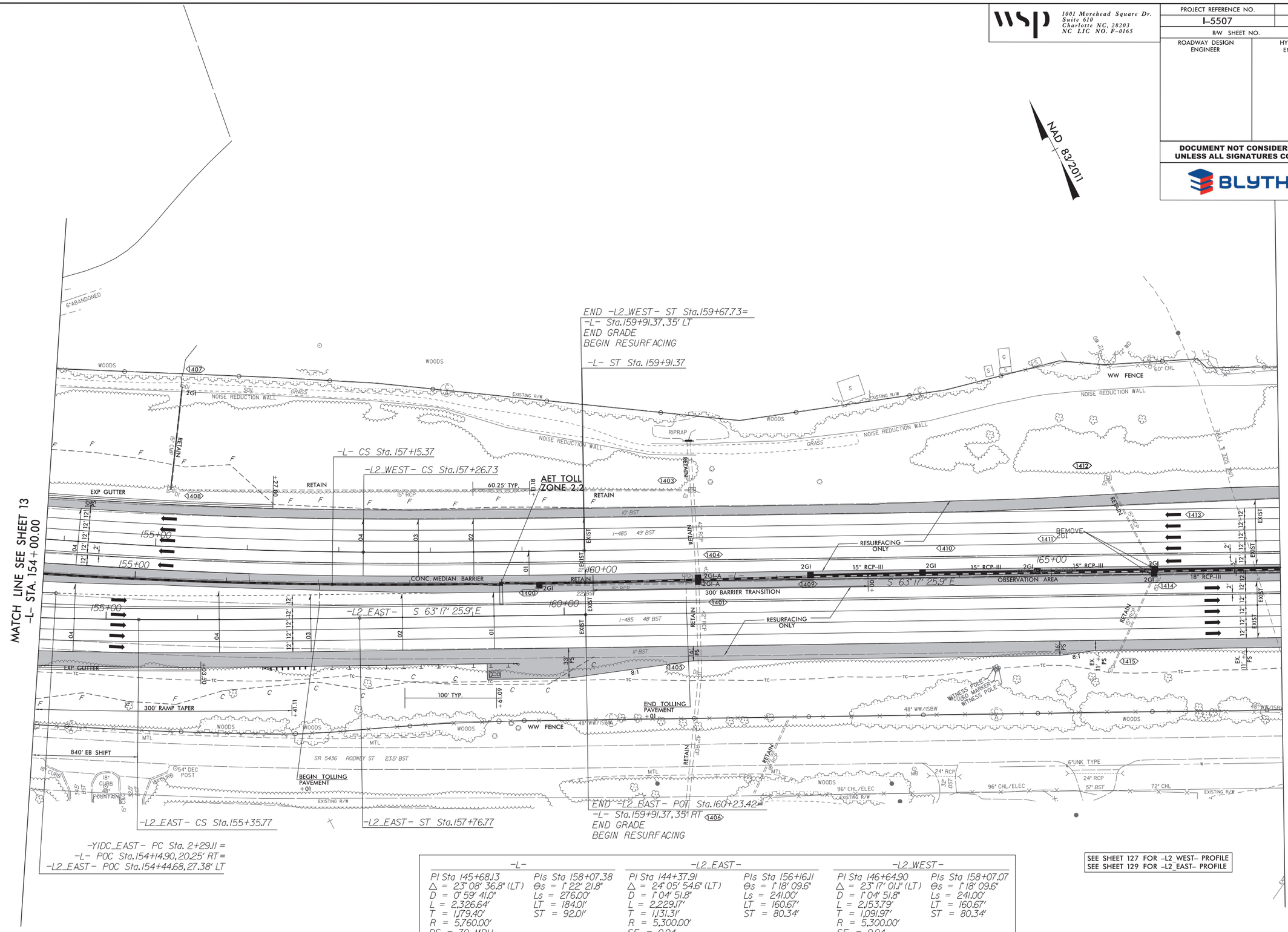
8/17/99



-L-		-L2_EAST-		-L2_WEST-	
PI Sta 145+68.13	PIs Sta 158+07.38	PI Sta 144+37.91	PIs Sta 156+16.11	PI Sta 146+64.90	PIs Sta 158+07.07
Δ = 23° 08' 36.8" (LT)	Θs = 1° 22' 21.8"	Δ = 24° 05' 54.6" (LT)	Θs = 1° 18' 09.6"	Δ = 23° 17' 01.1" (LT)	Θs = 1° 18' 09.6"
D = 0° 59' 41.0"	Ls = 276.00'	D = 1° 04' 51.8"	Ls = 241.00'	D = 1° 04' 51.8"	Ls = 241.00'
L = 2,326.64'	LT = 184.01'	L = 2,229.17'	LT = 160.67'	L = 2,153.79'	LT = 160.67'
T = 1,179.40'	ST = 92.01'	T = 1,131.31'	ST = 80.34'	T = 1,091.97'	ST = 80.34'
R = 5,760.00'		R = 5,300.00'		R = 5,300.00'	
DS = 70 MPH		SE = 0.04		SE = 0.04	
		DS = 70 MPH		DS = 70 MPH	

SEE SHEET 127 FOR -L2_WEST- PROFILE
SEE SHEET 129 FOR -L2_EAST- PROFILE

9/23/2019
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PRDPWICS01$

8/17/99

REVISIONS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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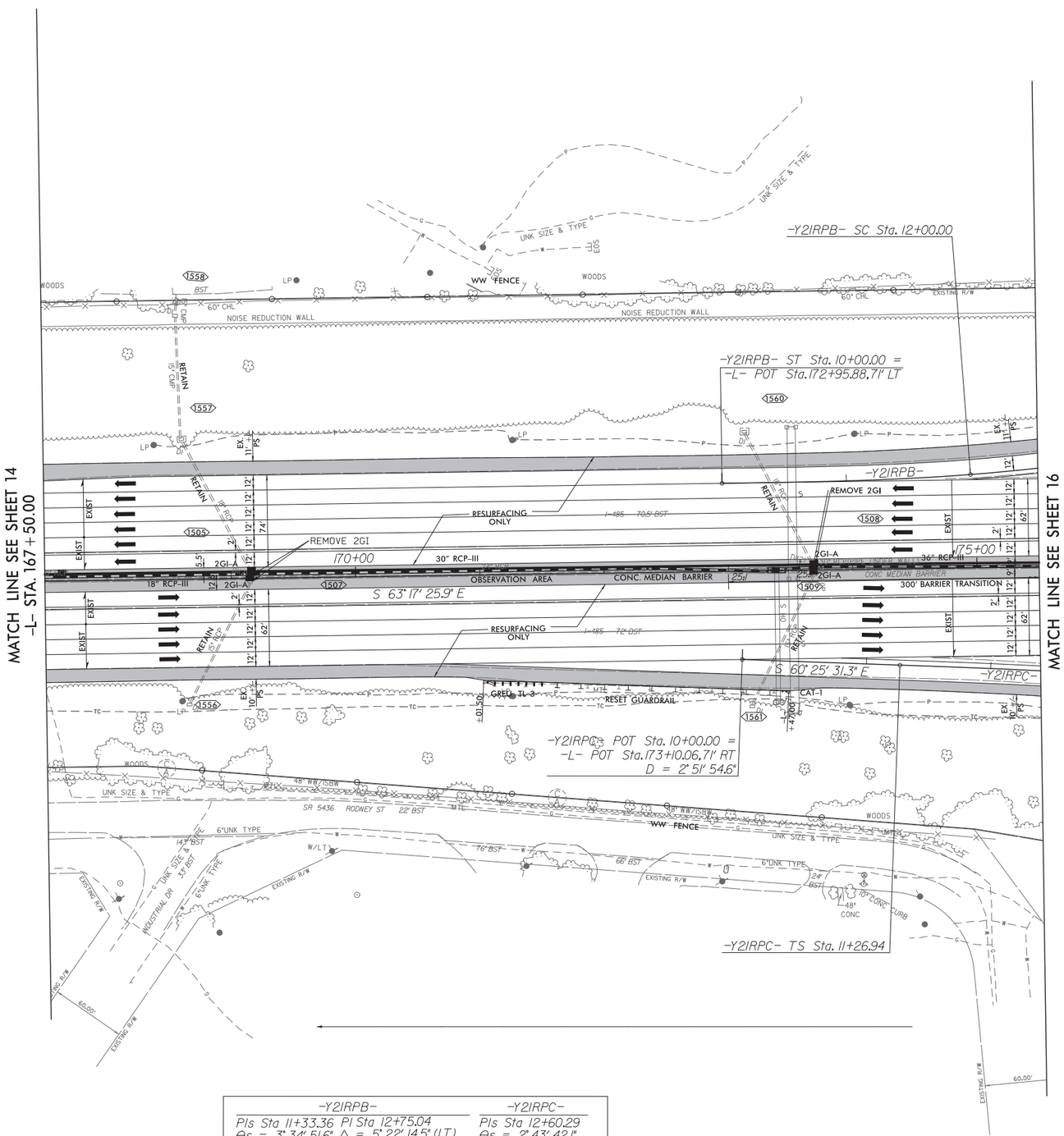

-Y2IRPB-		-Y2IRPC-
PIs Sta 11+33.36	PI Sta 12+75.04	PIs Sta 12+60.29
Θs = 3° 34' 51.6"	Δ = 5° 22' 14.5" (LT)	Θs = 2° 43' 42.1"
Ls = 200.00'	D = 3° 34' 51.6"	Ls = 200.00'
LT = 133.36'	L = 149.98'	LT = 133.35'
ST = 66.69'	T = 75.04'	ST = 66.68'
	R = 1,600.00'	
	SE = EXIST	
	DS = EXIST	

9/23/2019
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PROPWCS01$

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
I-5507	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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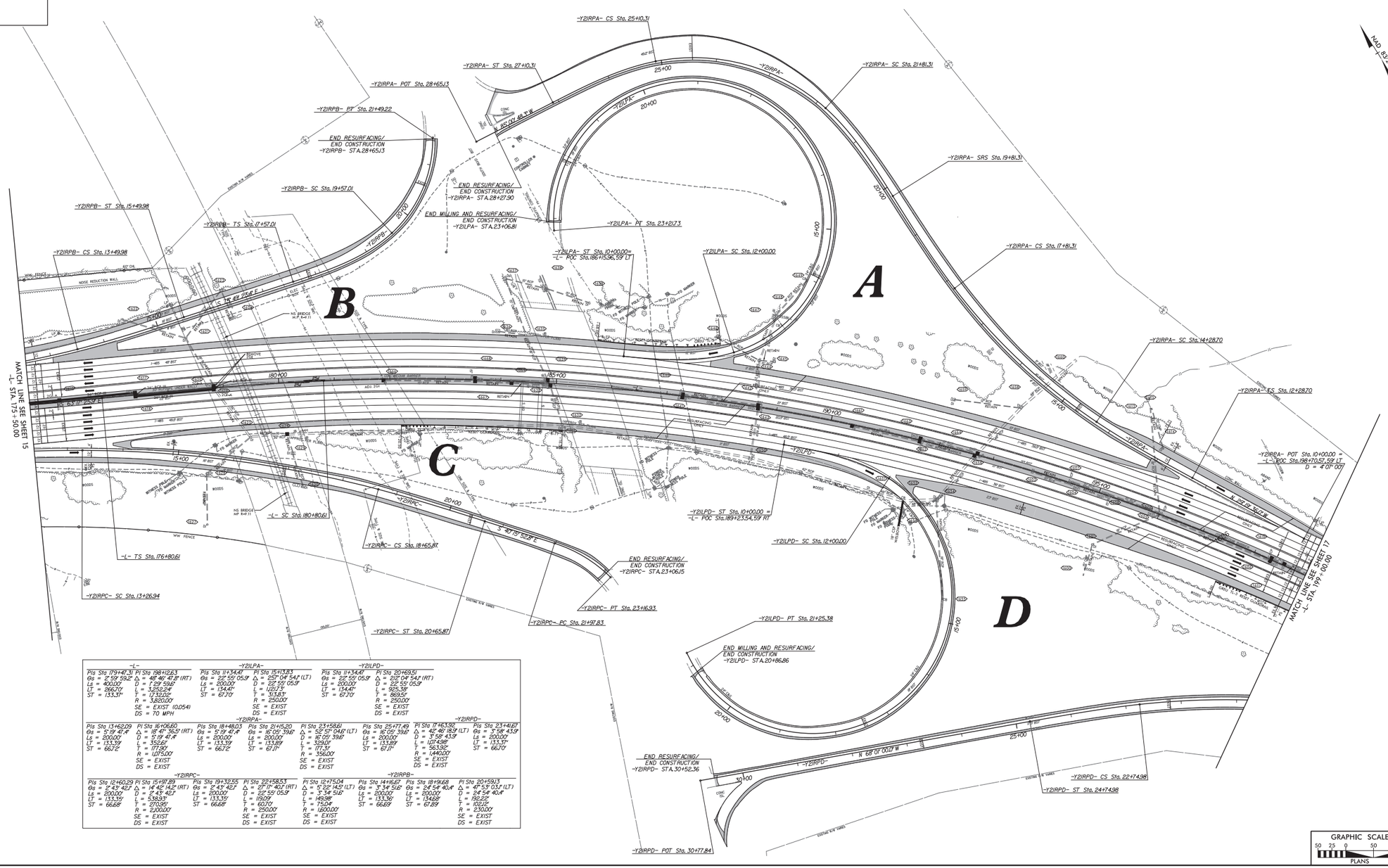

-L-			
PIs Sta 179+47.31	PI Sta 198+12.63		
Gs = 2°59' 59.2"	Δ = 48° 46' 47.8" (RT)		
Ls = 400.00'	D = 1°29' 59.6"		
LT = 266.70'	L = 3,250.24'		
ST = 133.37'	T = 1,713.02'		
	R = 3,820.00'		
	SE = EXIST (0.054)		
	DS = 70 MPH		

-Y2ILPA-			
PIs Sta 11+34.47	PI Sta 15+13.83		
Gs = 22° 55' 05.9"	Δ = 257° 04' 54.4" (LT)		
Ls = 200.00'	D = 22° 55' 05.9"		
LT = 134.47'	L = 1,121.73'		
ST = 67.70'	T = 3,153.83'		
	R = 250.00'		
	SE = EXIST		
	DS = EXIST		

-Y2ILPD-			
PIs Sta 11+34.47	PI Sta 20+69.51		
Gs = 22° 55' 05.9"	Δ = 212° 04' 54.4" (RT)		
Ls = 200.00'	D = 22° 55' 05.9"		
LT = 134.47'	L = 925.38'		
ST = 67.70'	T = 863.51'		
	R = 250.00'		
	SE = EXIST		
	DS = EXIST		

-Y2IRPA-			
PIs Sta 13+60.29	PI Sta 16+06.60		
Gs = 5° 19' 41.4"	Δ = 18° 47' 36.5" (RT)		
Ls = 200.00'	D = 5° 19' 41.4"		
LT = 133.39'	L = 352.61'		
ST = 66.72'	T = 177.90'		
	R = 1,075.00'		
	SE = EXIST		
	DS = EXIST		

-Y2IRPA-			
PIs Sta 18+48.03	PI Sta 21+15.20		
Gs = 5° 19' 41.4"	Gs = 16° 05' 39.6"		
Ls = 200.00'	Ls = 200.00'		
LT = 133.39'	LT = 133.89'		
ST = 66.72'	ST = 67.17'		

-Y2ILPD-			
PIs Sta 23+58.61	PI Sta 25+77.49		
Δ = 52° 57' 04.8" (LT)	Gs = 16° 05' 39.6"		
D = 16° 05' 39.6"	Ls = 200.00'		
L = 329.01'	LT = 133.89'		
T = 177.31'	ST = 67.17'		
R = 356.00'			
SE = EXIST			
DS = EXIST			

-Y2IRPD-			
PIs Sta 17+63.92	PI Sta 23+44.67		
Δ = 42° 46' 18.9" (LT)	Gs = 3° 58' 43.5"		
D = 3° 58' 43.5"	Ls = 200.00'		
L = 1,017.48'	LT = 133.37'		
T = 563.92'	ST = 66.70'		
R = 1,440.00'			
SE = EXIST			
DS = EXIST			

-Y2IRPC-			
PIs Sta 12+60.29	PI Sta 15+97.89		
Gs = 2° 43' 42.2"	Δ = 14° 42' 14.2" (RT)		
Ls = 200.00'	D = 2° 43' 42.2"		
LT = 133.35'	L = 538.93'		
ST = 66.68'	T = 270.95'		
	R = 2,100.00'		
	SE = EXIST		
	DS = EXIST		

-Y2IRPC-			
PIs Sta 19+32.55	PI Sta 22+58.53		
Gs = 2° 43' 42.2"	Δ = 67° 17' 40.1" (RT)		
Ls = 200.00'	D = 22° 55' 05.9"		
LT = 133.35'	L = 1,19.09'		
ST = 66.68'	T = 60.77'		
	R = 250.00'		
	SE = EXIST		
	DS = EXIST		

-Y2IRPB-			
PI Sta 12+17.04	PI Sta 14+16.67		
Δ = 5° 22' 14.5" (LT)	Gs = 3° 34' 51.6"		
D = 3° 34' 51.6"	Ls = 200.00'		
L = 149.98'	LT = 133.36'		
T = 75.04'	ST = 66.69'		
R = 1,600.00'			
SE = EXIST			
DS = EXIST			

-Y2IRPB-			
PIs Sta 18+91.68	PI Sta 20+59.13		
Gs = 24° 54' 40.4"	Δ = 41° 53' 03.7" (LT)		
Ls = 200.00'	D = 24° 54' 40.4"		
LT = 134.68'	L = 192.22'		
ST = 67.89'	T = 102.12'		
	R = 230.00'		
	SE = EXIST		
	DS = EXIST		

LOCATION: I-485 AT SOUTH BLVD (SR 4982)	
TIP NO. I-5507	COUNTY: MECKLENBURG
DESIGNED BY: WSP	
CHECKED BY: D. GOURLEY	DATE: 9/23/2019

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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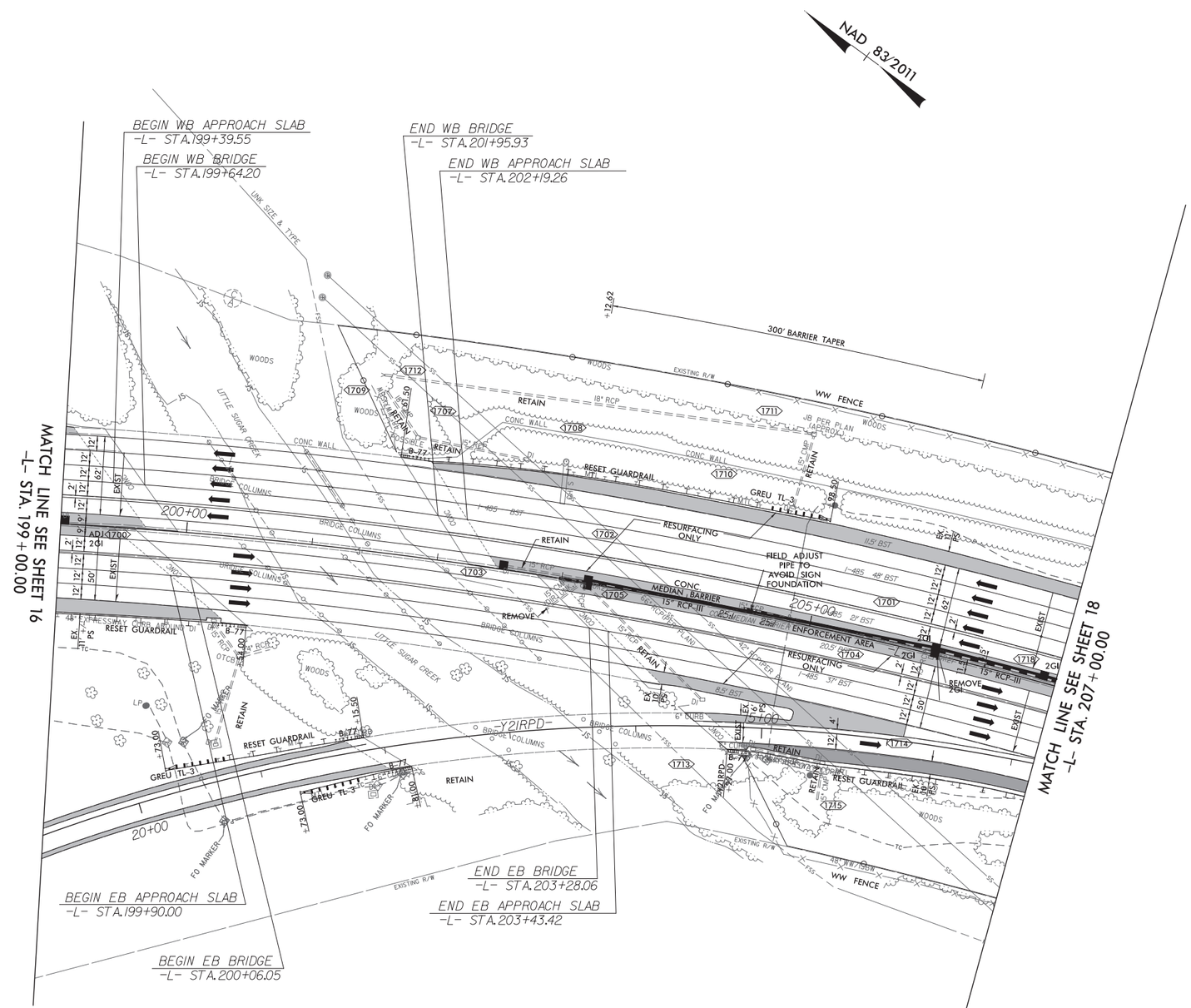
REVISIONS

8/17/99



-L-	-Y2IRPD-
PI Sta 198+12.63	PI Sta 17+63.92
△ = 48° 46' 47.8" (RT)	△ = 42° 46' 18.9" (LT)
D = 1° 29' 59.6"	D = 3° 58' 43.9"
L = 3,252.24'	L = 1,074.98'
T = 1,732.02'	T = 563.92'
R = 3,820.00'	R = 1,440.00'
SE = EXIST (0.054)	SE = EXIST
DS = 70 MPH	DS = EXIST

9/23/2019
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PRDPWICS01$

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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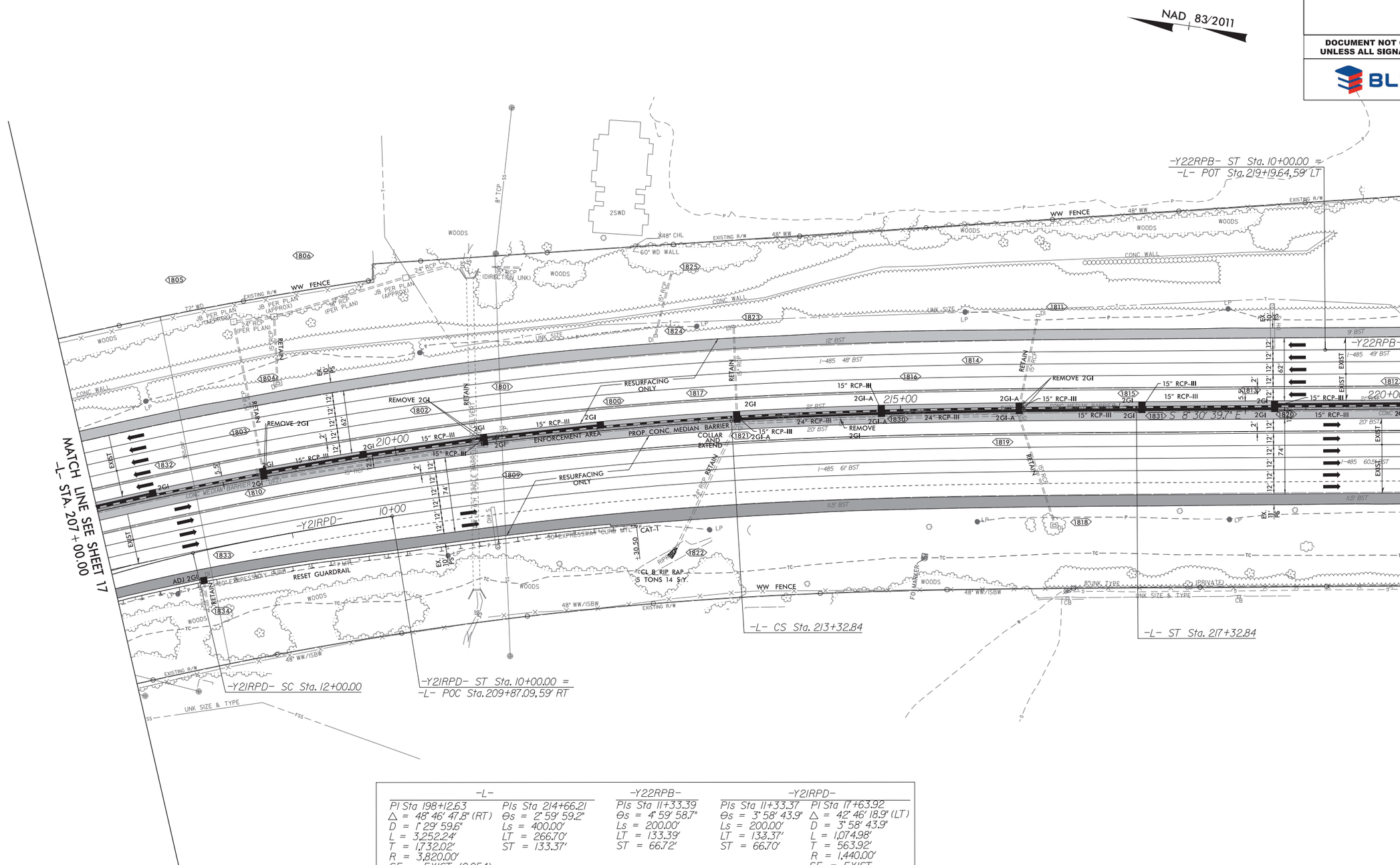

-L-		-Y22RPB-	-Y21RPD-	
PI Sta 198+12.63	PIs Sta 214+66.21	PIs Sta 11+33.39	PIs Sta 11+33.37	PI Sta 17+63.92
Δ = 48° 46' 47.8" (RT)	Θs = 2° 59' 59.2"	Θs = 4° 59' 58.7"	Θs = 3° 58' 43.9"	Δ = 42° 46' 18.9" (LT)
D = 1° 29' 59.6"	Ls = 400.00'	Ls = 200.00'	Ls = 200.00'	D = 3° 58' 43.9"
L = 3,252.24'	LT = 266.70'	LT = 133.39'	LT = 133.37'	L = 1,074.98'
T = 1,732.02'	ST = 133.37'	ST = 66.72'	ST = 66.70'	T = 563.92'
R = 3,820.00'				R = 1,440.00'
SE = EXIST (0.054)				SE = EXIST
DS = 70 MPH				DS = EXIST

REVISIONS

8/17/99

9/23/2019
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REVISIONS

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1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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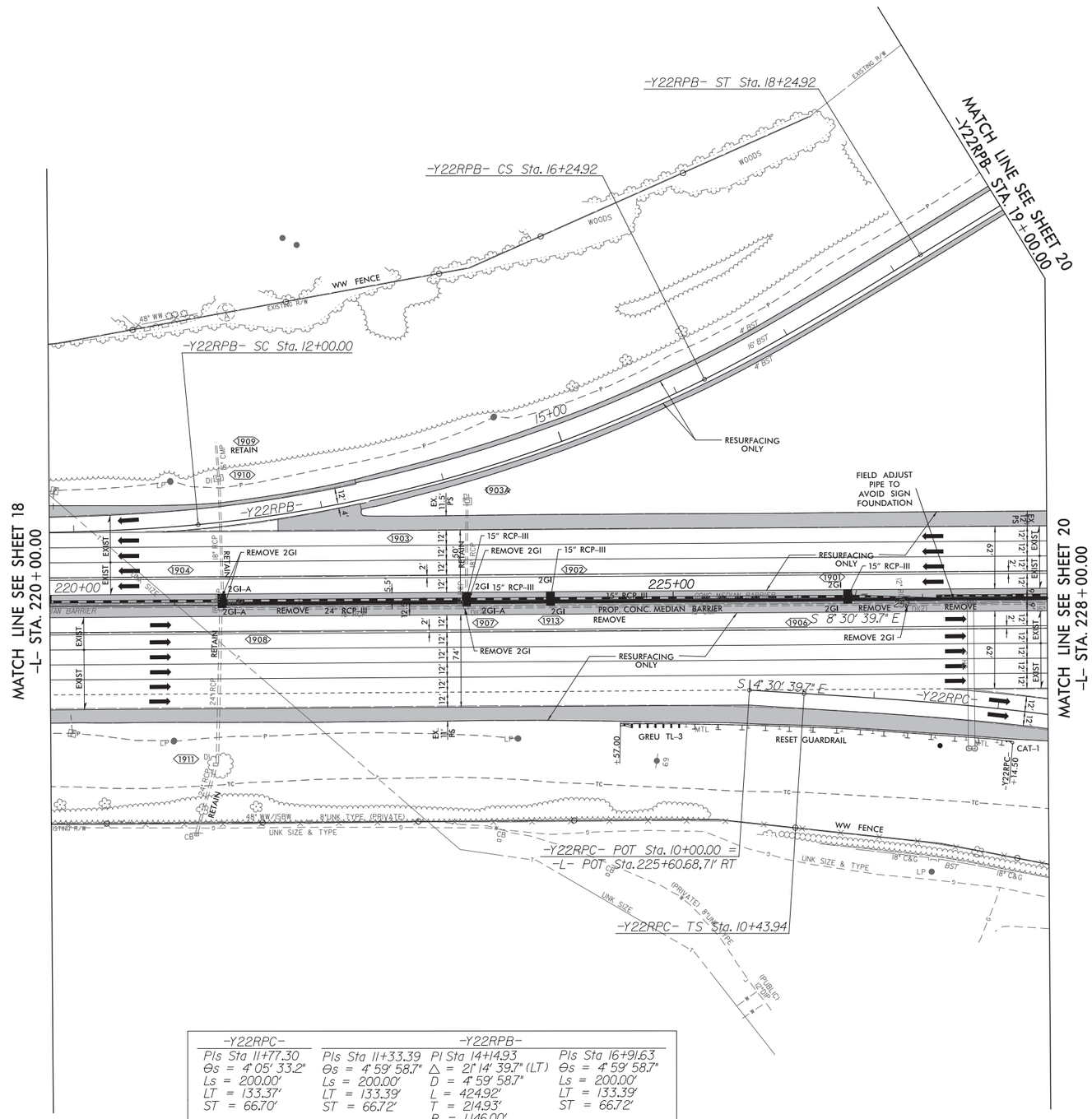
NAD 83/2011



-Y22RPC-	-Y22RPB-		
PIs Sta 11+77.30	PIs Sta 11+33.39	PI Sta 14+14.93	PIs Sta 16+91.63
Θs = 4° 05' 33.2"	Θs = 4° 59' 58.7"	Δ = 21° 14' 39.7" (LT)	Θs = 4° 59' 58.7"
Ls = 200.00'	Ls = 200.00'	D = 4° 59' 58.7"	Ls = 200.00'
LT = 133.37'	LT = 133.39'	L = 424.92'	LT = 133.39'
ST = 66.70'	ST = 66.72'	T = 214.93'	ST = 66.72'
		R = 1,146.00'	
		SE = EXIST	
		DS = EXIST	

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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
I-5507	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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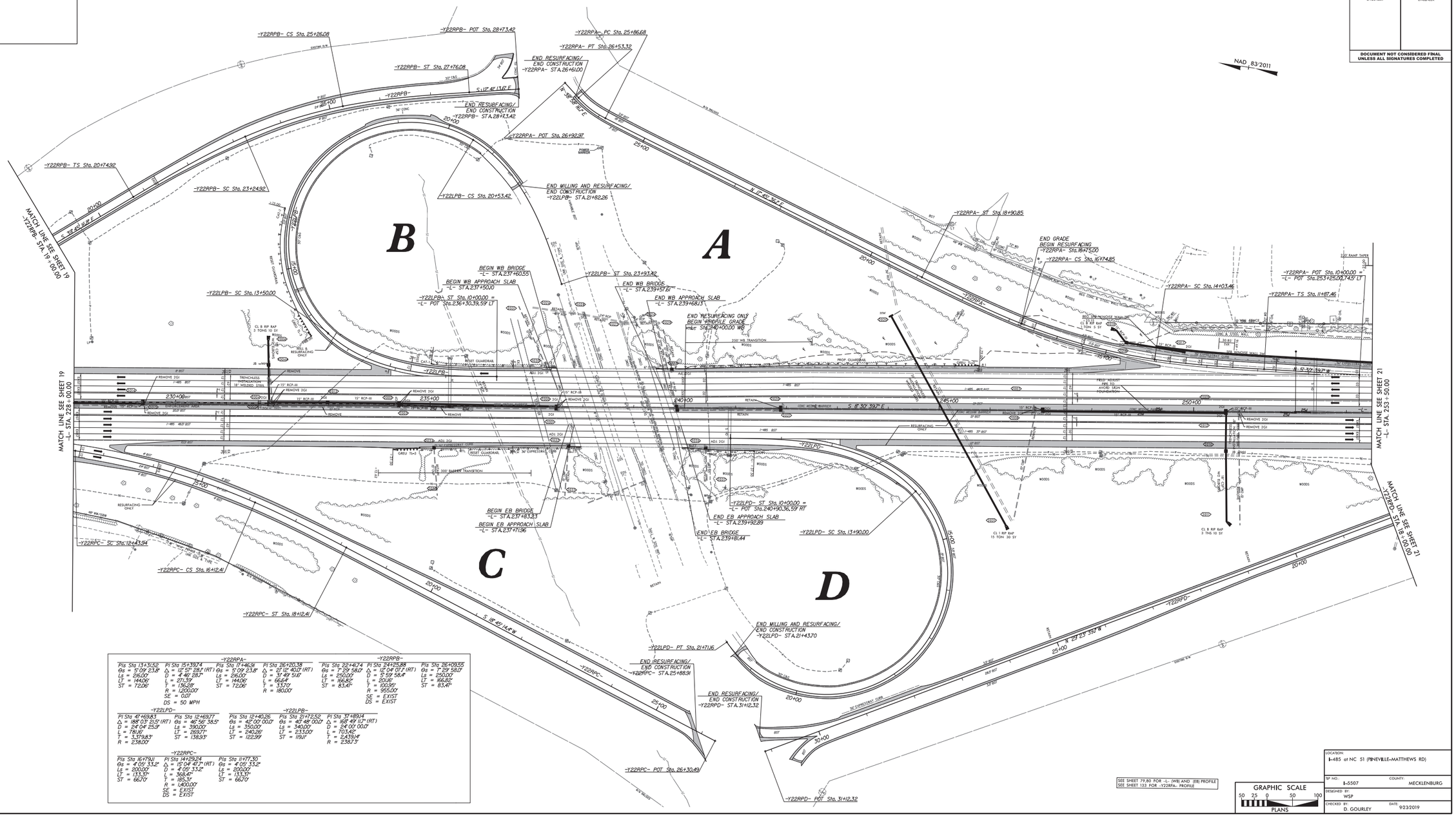

-Y22RPA-			
PIs Sta 13+31.52	PI Sta 15+39.74	PIs Sta 17+46.91	PI Sta 26+20.38
Θs = 5°09' 23.8"	Δ = 12° 57' 28.1" (RT)	Θs = 5°09' 23.8"	Δ = 27° 12' 40.0" (RT)
Ls = 216.00'	D = 4° 46' 28.7"	Ls = 216.00'	D = 31° 49' 51.6"
LT = 144.06'	L = 271.59'	LT = 144.06'	L = 666.4'
ST = 72.06'	T = 136.28'	ST = 72.06'	T = 337.0'
	R = 1,200.00'		R = 180.00'
	SE = 0.01'		
	DS = 50 MPH		

-Y22RPB-		
PIs Sta 22+41.74	PI Sta 24+25.88	PIs Sta 26+09.55
Θs = T 29 58.0'	Δ = 12° 04' 01.7" (RT)	Θs = T 29 58.0'
Ls = 250.00'	D = 5° 59' 58.4"	Ls = 250.00'
LT = 166.82'	L = 201.16'	LT = 166.82'
ST = 83.41'	T = 100.95'	ST = 83.41'
	R = 955.00'	
	SE = EXIST	
	DS = EXIST	

-Y22LPD-			
PI Sta 47+69.83	PIs Sta 12+69.77	PIs Sta 12+40.26	PIs Sta 21+72.52
Δ = 188° 03' 21.9" (RT)	Θs = 46° 56' 38.5"	Θs = 42° 00' 00.0"	Θs = 40° 48' 00.0"
D = 24° 04' 25.9"	Ls = 390.00'	Ls = 350.00'	Ls = 340.00'
L = 781.16'	LT = 269.77'	LT = 240.26'	LT = 233.00'
T = 3,579.83'	ST = 138.93'	ST = 122.99'	ST = 119.11'
R = 238.00'			

-Y22RPD-	
PI Sta 31+89.14	
Δ = 168° 49' 11.7" (RT)	
D = 24° 02' 00.0"	
L = 703.42'	
T = 2,439.14'	
R = 238.73'	

-Y22RPC-		
PIs Sta 16+79.11	PI Sta 14+29.24	PIs Sta 11+77.30
Θs = 4° 09' 33.2"	Δ = 15° 04' 47.2" (RT)	Θs = 4° 09' 33.2"
Ls = 200.00'	D = 4° 05' 33.2"	Ls = 200.00'
LT = 133.37'	L = 368.47'	LT = 133.37'
ST = 66.70'	T = 185.31'	ST = 66.70'
	R = 1,400.00'	
	SE = EXIST	
	DS = EXIST	

LOCATION: I-485 at NC 51 (PINEVILLE-MATTHEWS RD)	
TIP NO. I-5507	COUNTY: MECKLENBURG
DESIGNED BY: WSP	
CHECKED BY: D. GOURLEY	DATE: 9/23/2019

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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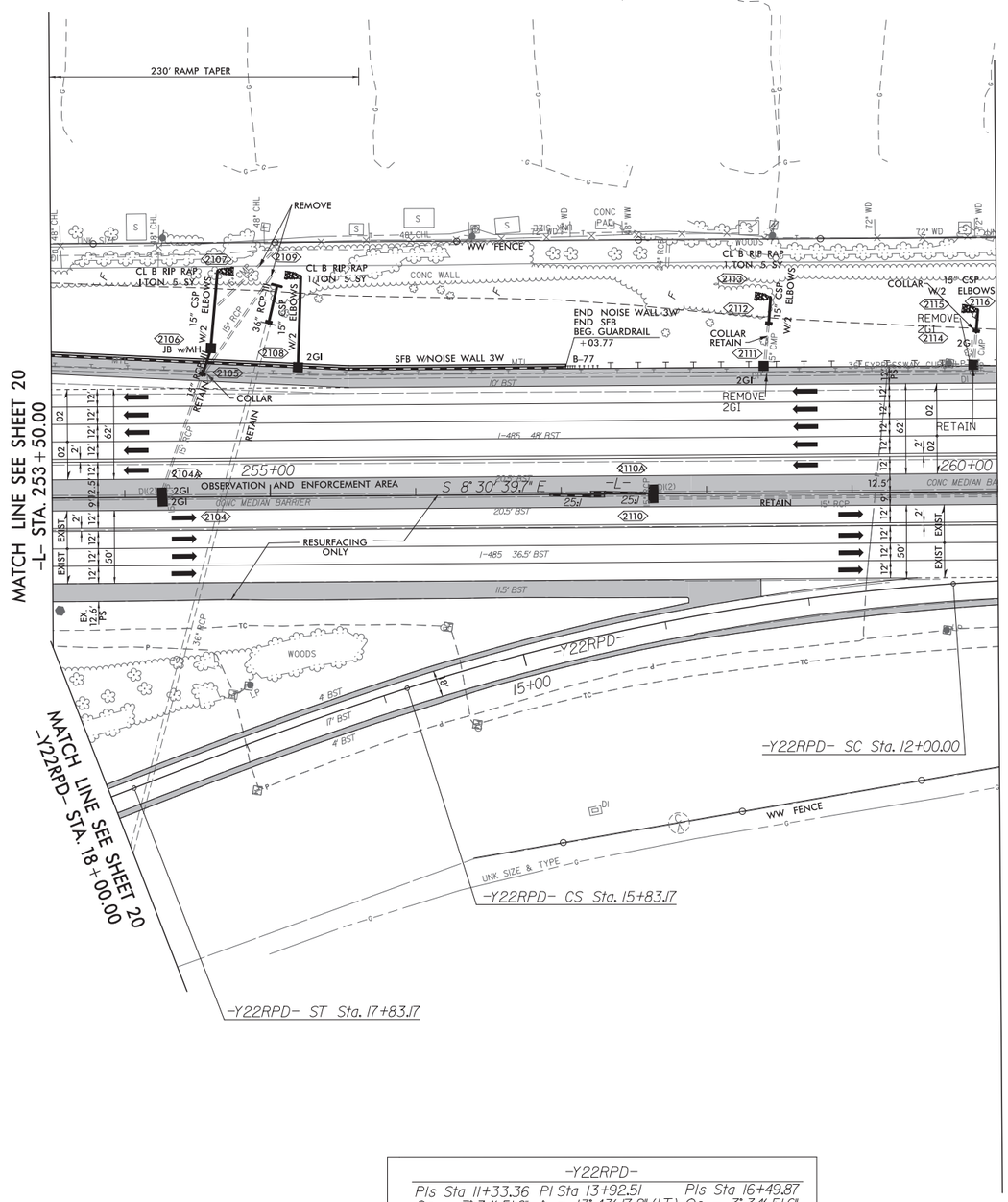
NAD 83/2011



-Y22RPD-		
PIs Sta 11+33.36	PI Sta 13+92.51	PIs Sta 16+49.87
Θs = 3° 34' 51.6"	Δ = 13° 43' 17.2" (LT)	Θs = 3° 34' 51.6"
Ls = 200.00'	D = 3° 34' 51.6"	Ls = 200.00'
LT = 133.36'	L = 383.17'	LT = 133.36'
ST = 66.69'	T = 192.51'	ST = 66.69'
	R = 1,600.00'	
	SE = EXIST	
	DS = EXIST	

SEE SHEET 80 FOR -L- (WB) AND -L- (EB) PROFILE

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
I-5507	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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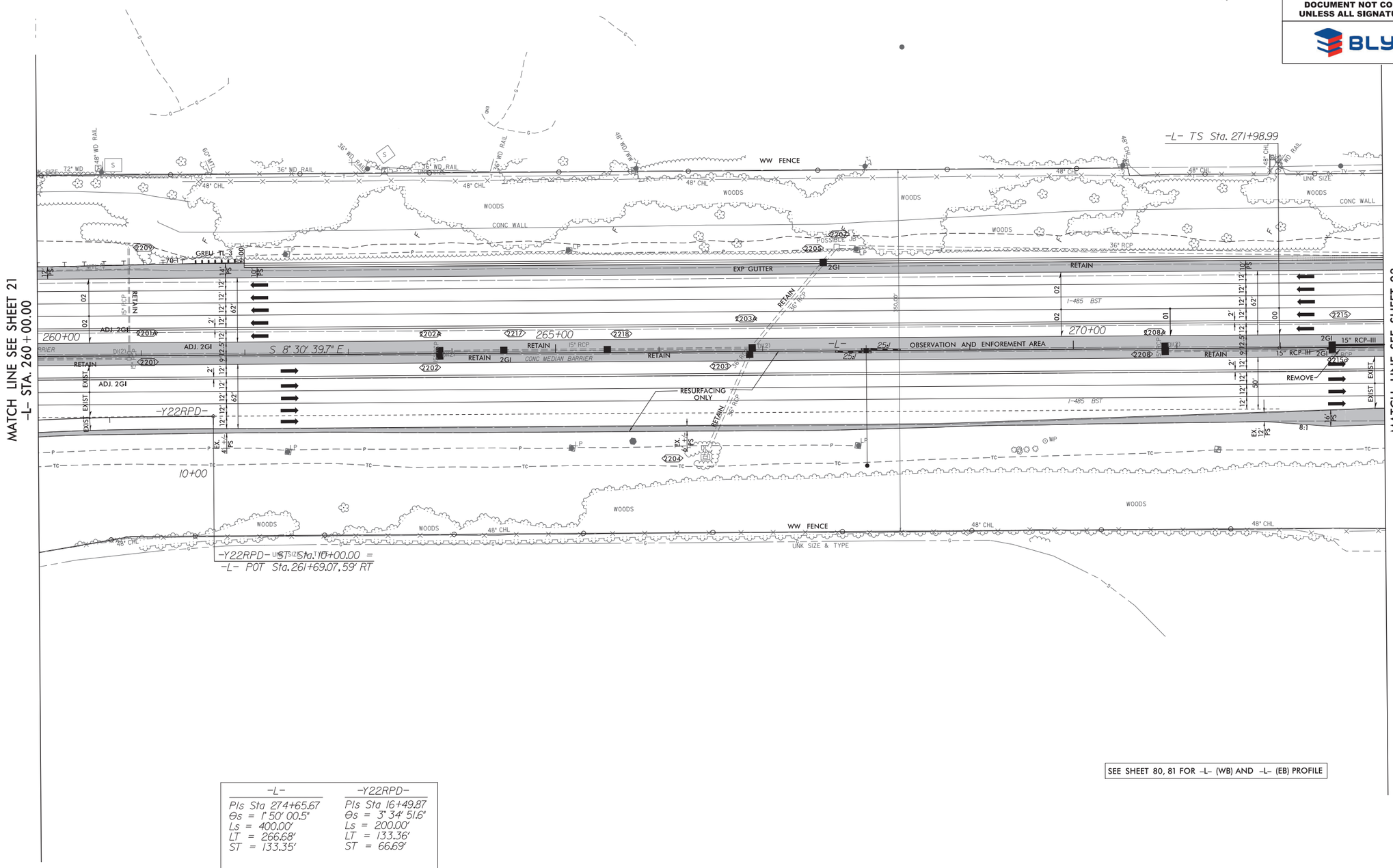

-L-	-Y22RPD-
PIs Sta 274+65.67	PIs Sta 16+49.87
Θs = 1° 50' 00.5"	Θs = 3° 34' 51.6"
Ls = 400.00'	Ls = 200.00'
LT = 266.68'	LT = 133.36'
ST = 133.35'	ST = 66.69'

SEE SHEET 80, 81 FOR -L- (WB) AND -L- (EB) PROFILE

9/23/2019
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Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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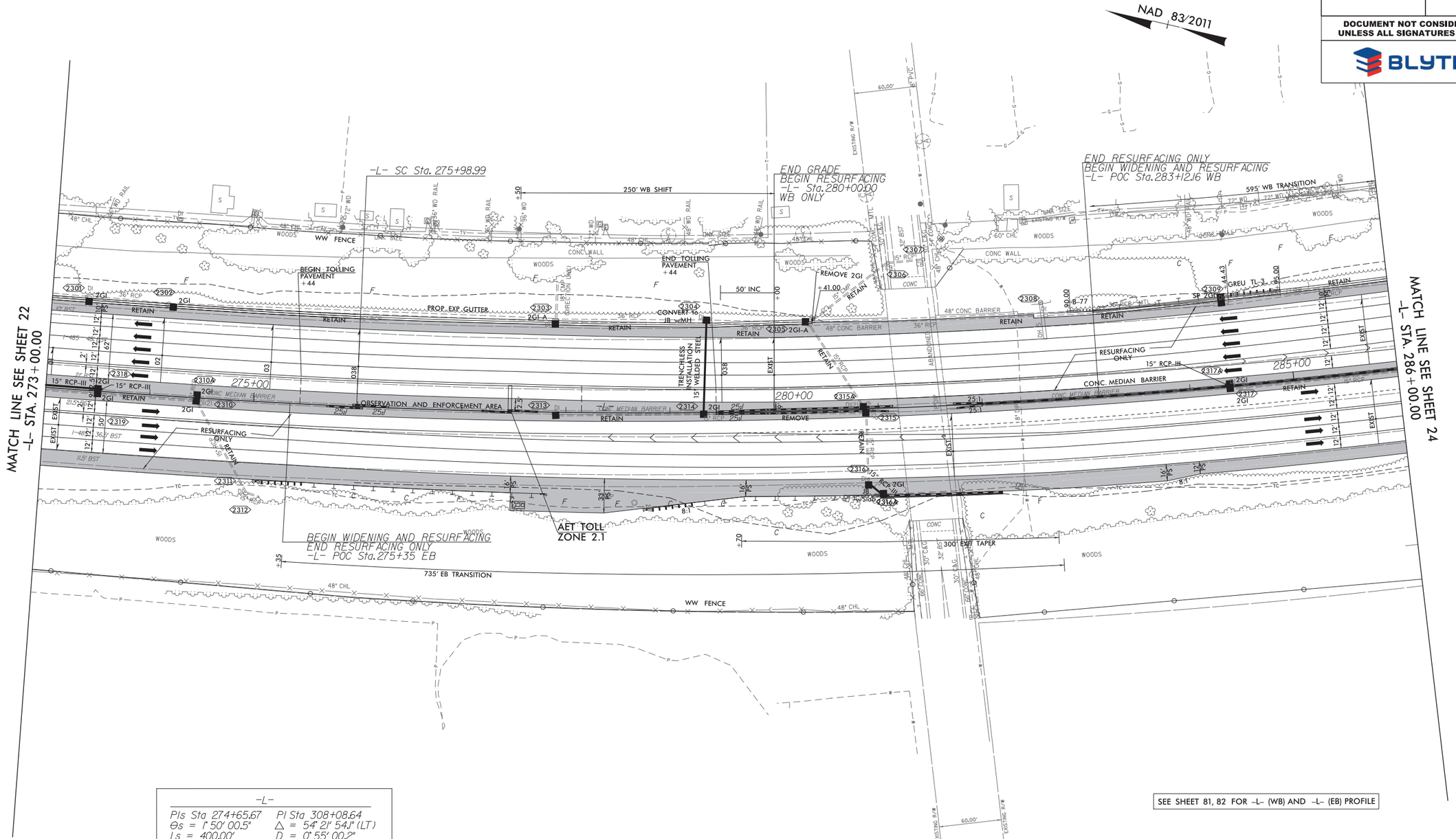

-L-	
PIs Sta 274+65.67	PI Sta 308+08.64
Θs = 1° 50' 00.5"	Δ = 54° 21' 54.1" (LT)
Ls = 400.00'	D = 0° 55' 00.2"
LT = 266.68'	L = 5,930.30'
ST = 133.35'	T = 3,209.65'
	R = 6,250.00'
	SE = EXIST
	DS = 70 MPH

SEE SHEET 81, 82 FOR -L- (WB) AND -L- (EB) PROFILE

9/23/2019
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Charlotte NC, 28203
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PROJECT REFERENCE NO.	SHEET NO.
I-5507	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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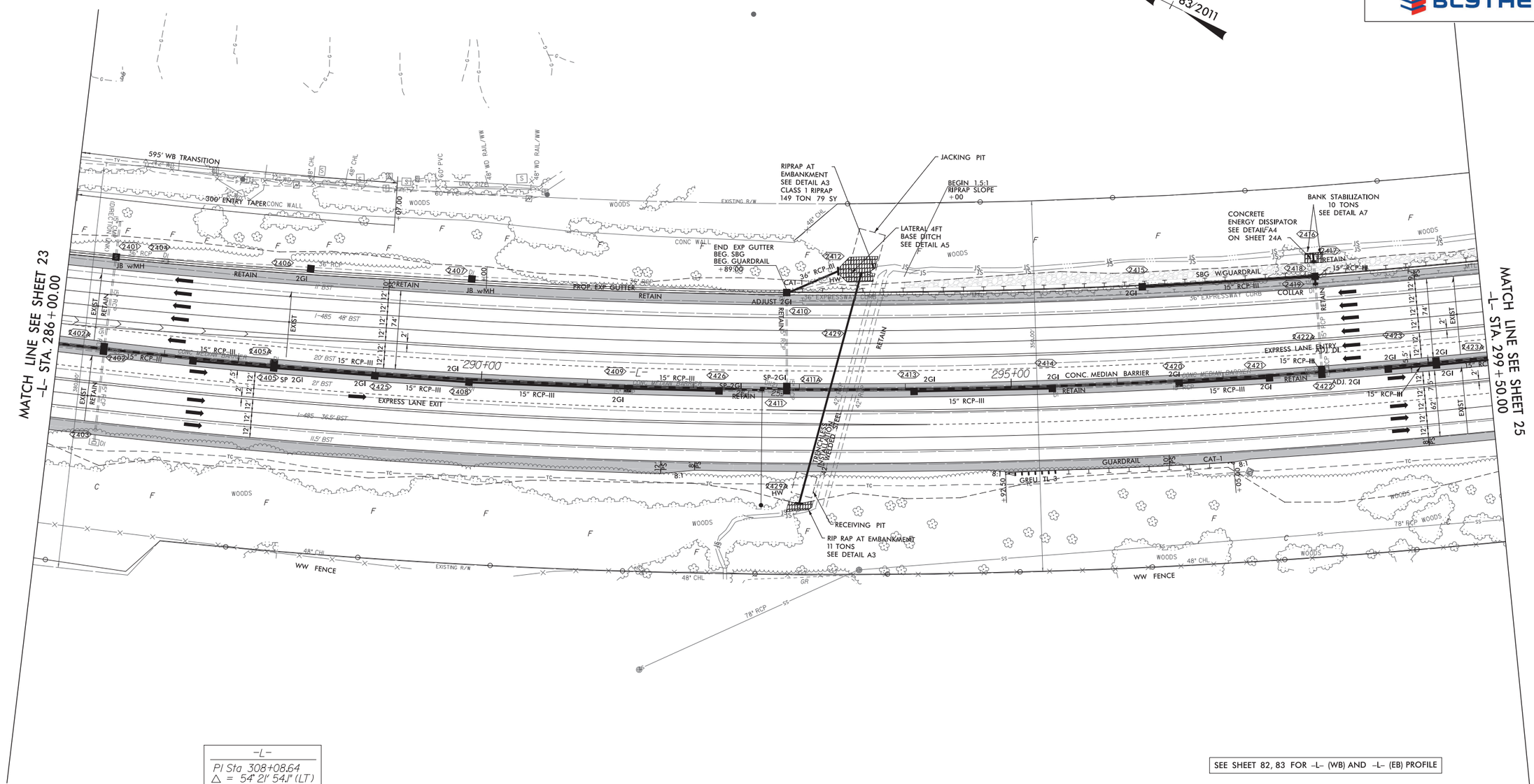

-L-
PI Sta 308+08.64
△ = 54° 21' 54.1" (LT)
D = 0° 55' 00.2"
L = 5,930.30'
T = 3,209.65'
R = 6,250.00'
SE = EXIST
DS = 70 MPH

REVISIONS

8/17/99

9/23/2019
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Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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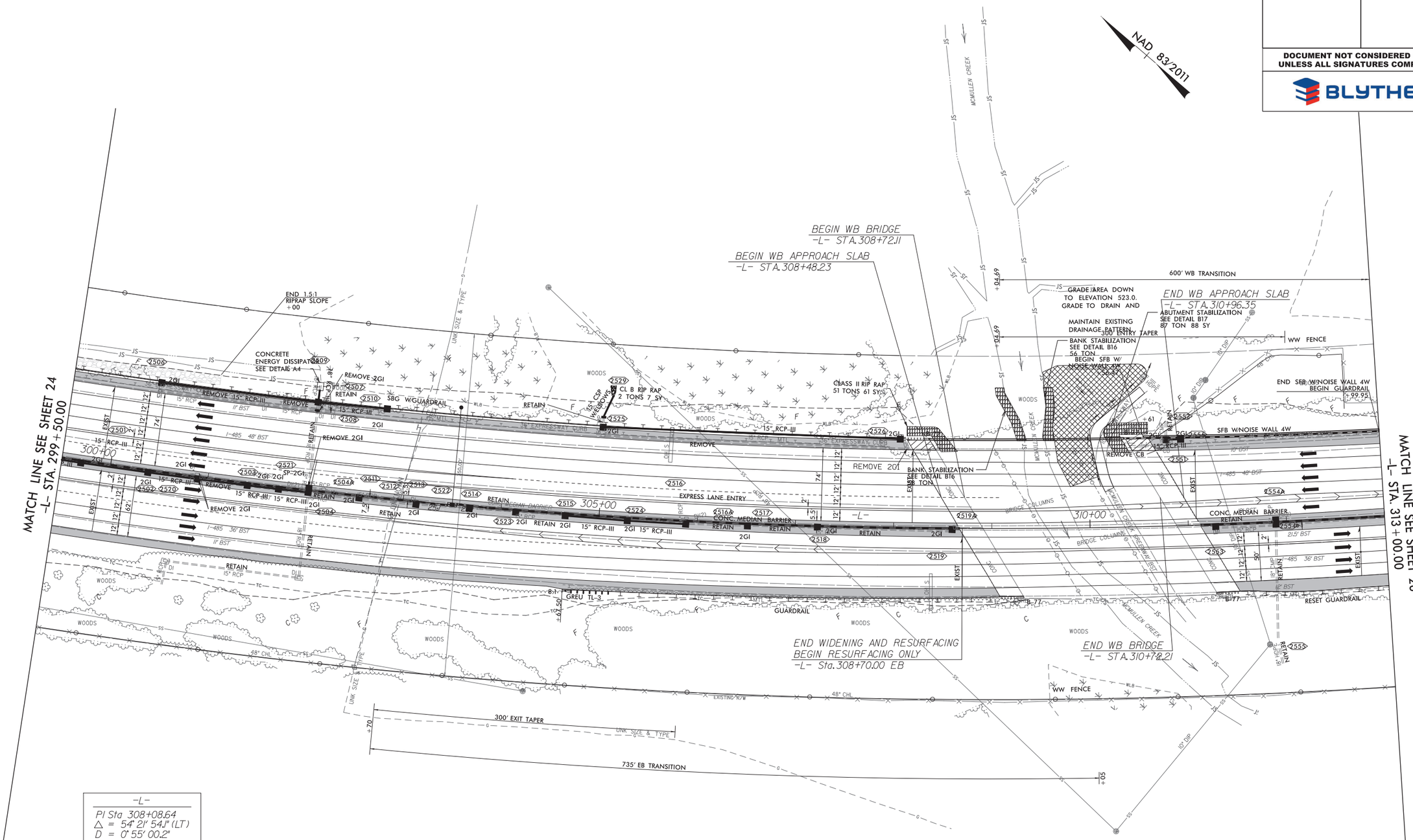
REVISIONS



SEE SHEET 83, 84 FOR -L- (WB) AND -L- (EB) PROFILE

9/23/2019
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Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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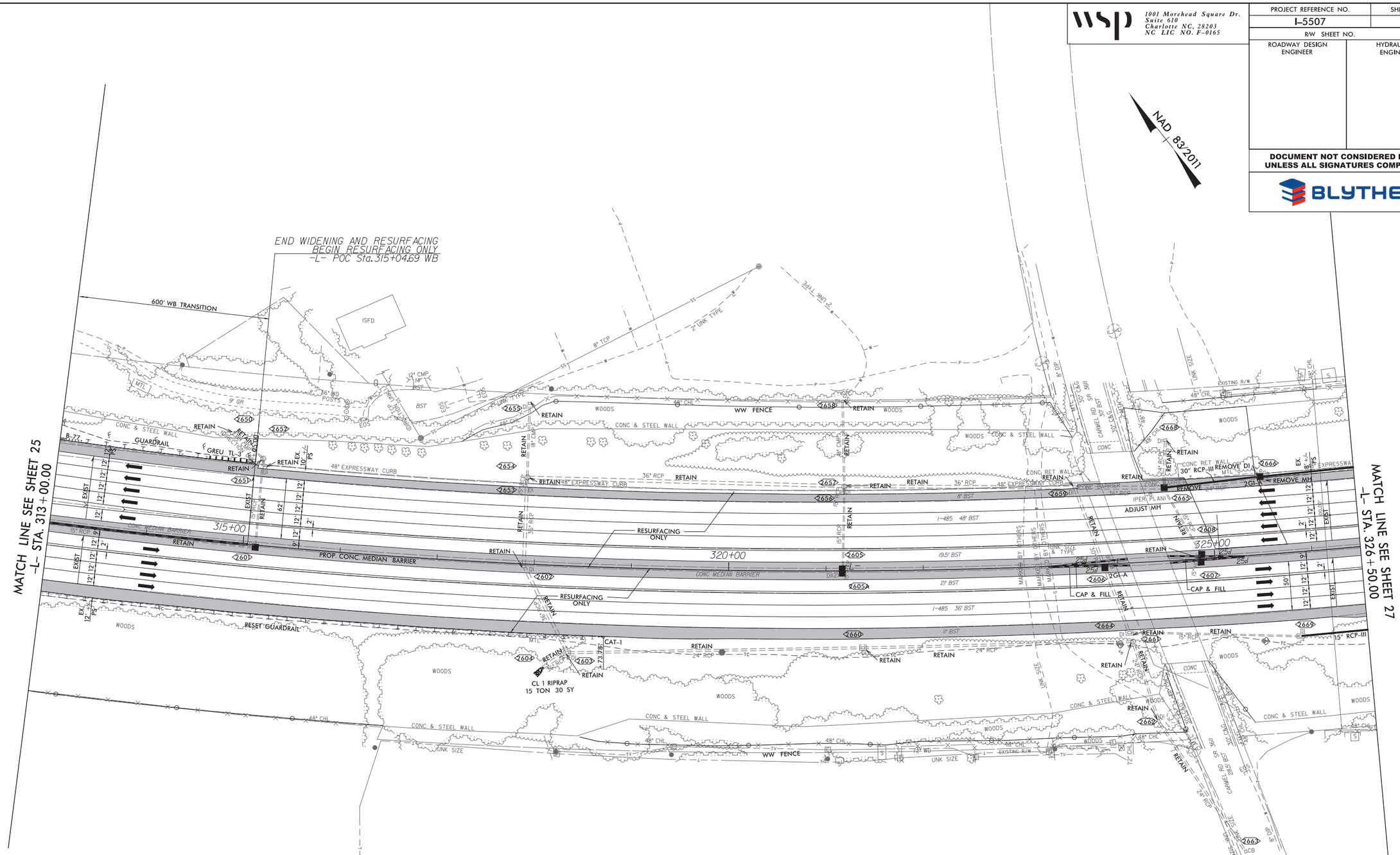

-L-

PI Sta 308+08.64
△ = 54° 21' 54.1" (LT)
D = 0° 55' 00.2"
L = 5,930.30'
T = 3,209.65'
R = 6,250.00'
SE = EXIST
DS = 70 MPH

SEE SHEET 84 & 84A FOR -L- (WB) AND -L- (EB) PROFILE

9/23/2019
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Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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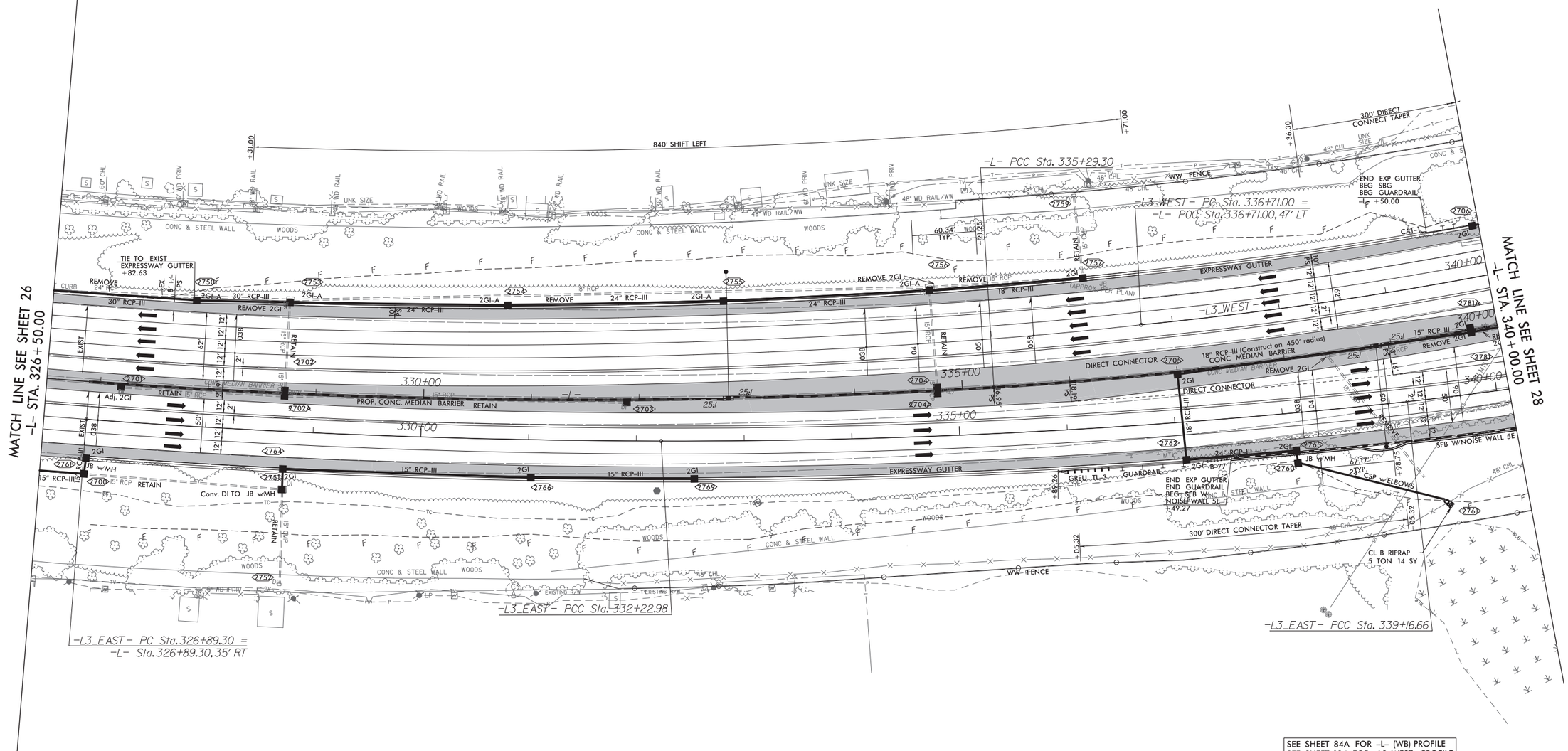
REVISIONS



-L3_EAST-		
PI Sta 329+56.25	PI Sta 335+70.17	PI Sta 344+16.38
Δ = 4° 04' 37.3" (LT)	Δ = 6° 18' 42.3" (LT)	Δ = 18° 01' 43.3" (LT)
D = 0° 45' 50.2"	D = 0° 54' 35.6"	D = 1° 49' 08.1"
L = 533.68'	L = 693.68'	L = 991.18'
T = 266.95'	T = 347.19'	T = 499.72'
R = 7,500.00'	R = 6,297.00'	R = 3,150.00'
SE = 0.038	SE = 0.038	SE = 0.06
DS = 70 MPH	DS = 70 MPH	DS = 70 MPH

-L3_WEST-	-L-	
PI Sta 342+67.44	PI Sta 308+08.64	PI Sta 342+37.61
Δ = 18° 43' 02.4" (LT)	Δ = 54° 21' 54.1" (LT)	Δ = 21° 00' 33.8" (LT)
D = 1° 34' 59.5'	D = 0° 55' 00.2"	D = 1° 29' 59.6"
L = 1,182.25'	L = 5,930.30'	L = 1,400.73'
T = 596.44'	T = 3,209.65'	T = 708.32'
R = 3,619.00'	R = 6,250.00'	R = 3,820.00'
SE = 0.058	SE = 0.038	SE = 0.058
DS = 70 MPH	DS = 70 MPH	DS = 70 MPH

SEE SHEET 84A FOR -L- (WB) PROFILE
SEE SHEET 134 FOR -L3_WEST- PROFILE
SEE SHEET 137 FOR -L3_EAST- PROFILE

9/23/2019
pedpatel01
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1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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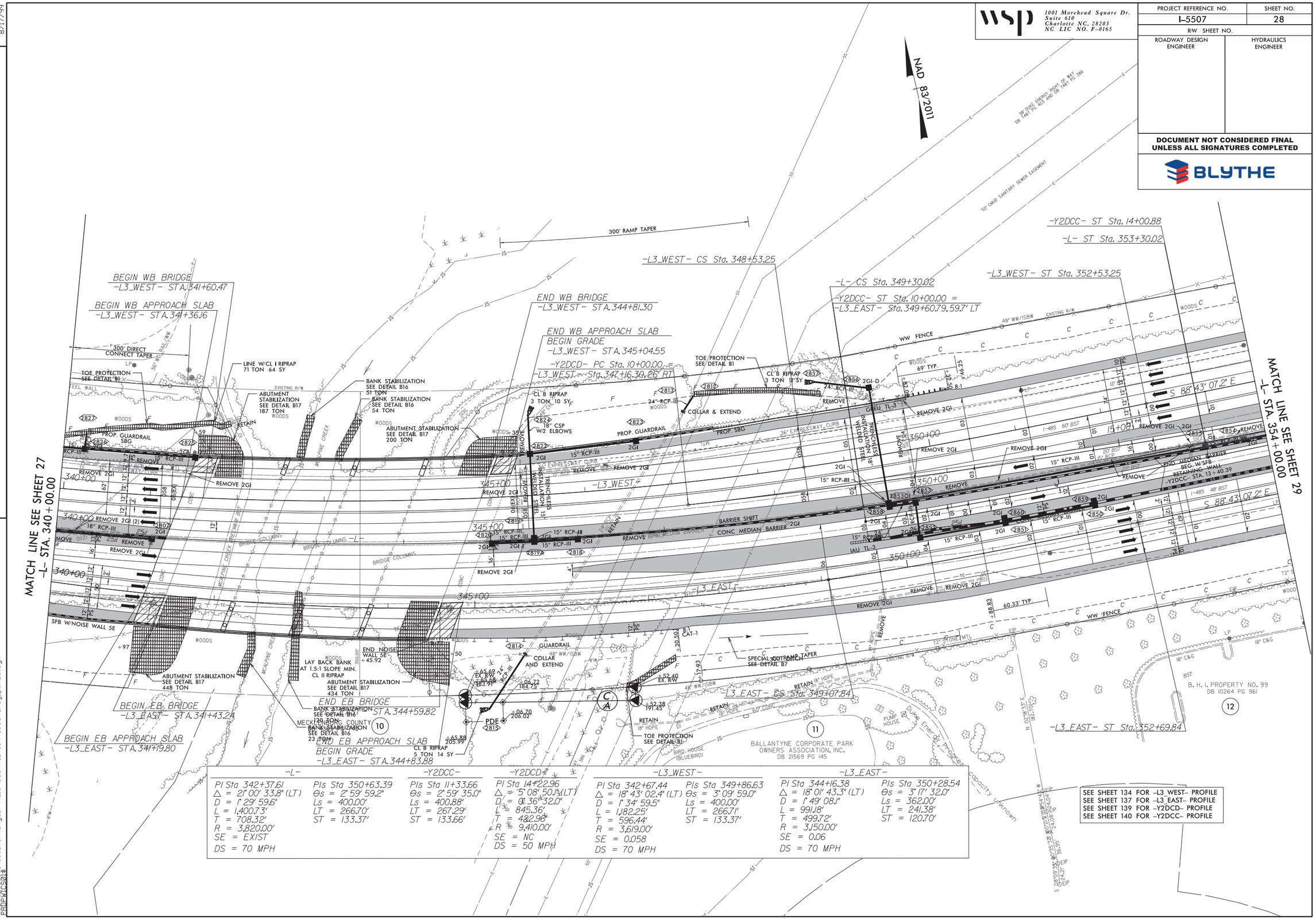

-L-		-Y2DCC-	-Y2DCD-	-L3_WEST-		-L3_EAST-	
PI Sta 342+37.61	PIs Sta 350+63.39	PIs Sta 11+33.66	PI Sta 14+22.96	PI Sta 342+67.44	PIs Sta 349+86.63	PI Sta 344+16.38	PIs Sta 350+28.54
△ = 21° 00' 33.8" (LT)	Θs = 2° 59' 59.2"	Θs = 2° 59' 35.0"	△ = 5° 08' 50.1" (LT)	△ = 18° 43' 02.4" (LT)	Θs = 3° 09' 59.0"	△ = 18° 01' 43.3" (LT)	Θs = 3° 17' 32.0"
D = 1° 29' 59.6"	Ls = 400.00'	Ls = 400.88'	D = 0° 36' 32.0"	D = 1° 34' 59.5"	Ls = 400.00'	D = 1° 49' 08.1"	Ls = 362.00'
L = 1,400.73'	LT = 266.70'	LT = 267.29'	L = 845.36'	L = 1,182.25'	LT = 266.71'	L = 991.18'	LT = 241.38'
T = 708.32'	ST = 133.37'	ST = 133.66'	T = 422.96'	T = 596.44'	ST = 133.37'	T = 499.72'	ST = 120.70'
R = 3,820.00'			R = 9,410.00'	R = 3,619.00'		R = 3,150.00'	
SE = EXIST			SE = NC	SE = 0.058		SE = 0.06	
DS = 70 MPH			DS = 50 MPH	DS = 70 MPH		DS = 70 MPH	

SEE SHEET 134 FOR -L3_WEST- PROFILE
SEE SHEET 137 FOR -L3_EAST- PROFILE
SEE SHEET 139 FOR -Y2DCD- PROFILE
SEE SHEET 140 FOR -Y2DCC- PROFILE

REVISIONS

8/17/99

9/23/2019
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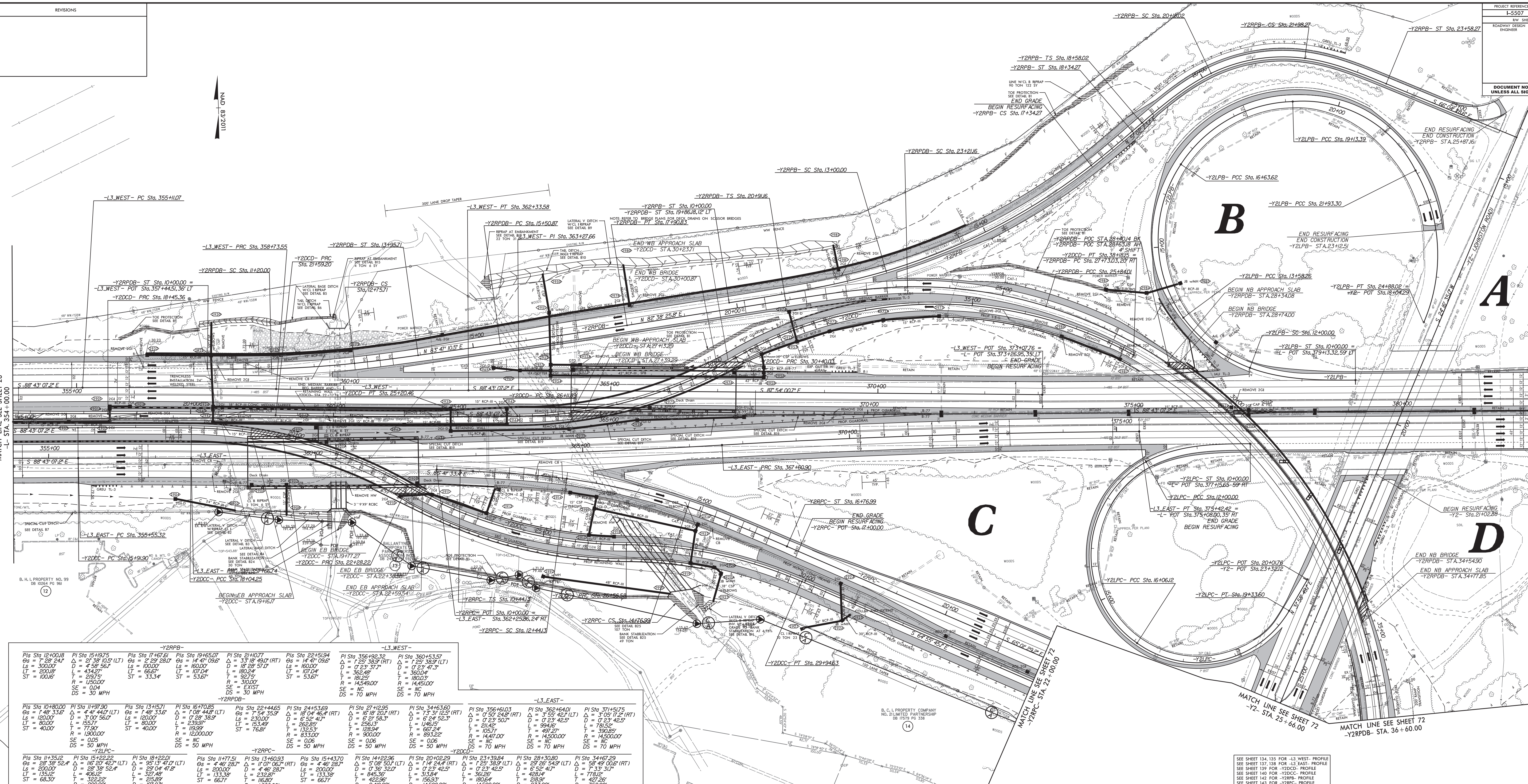
REVISIONS



Alignment	PI Sta	Θs	Δ	D	Ls	L	LT	ST	T	R	SE	DS
-Y2RPB-	PIs Sta 12+00.18	7° 28' 24.1"			300.00'		200.18'	100.16'				
-Y2RPB-	PI Sta 15+19.75		21° 38' 10.5" (LT)	4° 58' 56.1"		434.27'			219.75'	1,150.00'	0.04	30 MPH
-Y2RPB-	PIs Sta 17+67.61	2° 29' 28.0"			100.00'		66.67'	33.34'				
-Y2RPB-	PIs Sta 19+65.07	14° 47' 09.6"			160.00'		107.04'	53.67'				
-Y2RPB-	PI Sta 21+10.77		33° 18' 49.0" (RT)	18° 28' 57.0"		180.24'			92.75'	310.00'	EXIST	30 MPH
-Y2RPB-	PIs Sta 22+51.94	14° 47' 09.6"			160.00'		107.04'	53.67'				
-L3_WEST-	PI Sta 356+92.32		1° 25' 38.9" (RT)	0° 23' 37.7"		362.48'			181.25'	14,549.00'	NC	70 MPH
-L3_WEST-	PI Sta 360+53.57		1° 25' 38.9" (LT)	0° 23' 47.3"		360.04'			180.03'	14,451.00'	NC	70 MPH
-Y2RPDB-	PIs Sta 10+80.00	1° 48' 33.6"			120.00'		80.00'	40.00'				
-Y2RPDB-	PI Sta 11+97.90		4° 41' 44.0" (LT)	3° 00' 56.0"		155.71'			77.90'	1,900.00'	0.05	50 MPH
-Y2RPDB-	PIs Sta 13+15.71	1° 48' 33.6"			120.00'		80.00'	40.00'				
-Y2RPDB-	PI Sta 16+70.85		1° 08' 44.8" (LT)	0° 28' 38.9"		239.97'			119.99'	12,000.00'	NC	50 MPH
-Y2RPDB-	PIs Sta 22+44.65	7° 54' 35.9"			230.00'		153.49'	76.81'				
-Y2RPDB-	PI Sta 24+53.69		18° 04' 46.4" (RT)	6° 52' 41.7"		262.85'			132.53'	833.00'	0.06	50 MPH
-Y2RPDB-	PI Sta 27+12.95		16° 18' 20.1" (RT)	6° 21' 58.3"		256.13'			128.94'	900.00'	0.06	50 MPH
-Y2RPDB-	PI Sta 34+63.60		73° 31' 12.5" (RT)	6° 24' 52.3"		1,146.15'			667.24'	893.22'	0.06	50 MPH
-L3_EAST-	PI Sta 356+61.03		0° 50' 24.8" (RT)	0° 23' 50.7"		211.42'			105.71'	14,417.00'	NC	70 MPH
-L3_EAST-	PI Sta 362+64.01		3° 55' 42.1" (LT)	0° 23' 42.5"		994.16'			497.27'	14,500.00'	NC	70 MPH
-L3_EAST-	PI Sta 371+51.75		3° 05' 17.2" (RT)	0° 23' 42.5"		781.52'			390.85'	14,500.00'	NC	70 MPH
-Y2LPC-	PIs Sta 11+35.12	28° 38' 52.4"			200.00'		135.12'	68.30'				
-Y2LPC-	PI Sta 15+22.22		116° 20' 42.7" (LT)	28° 38' 52.4"		406.12'			322.22'	200.00'	EXIST	25 MPH
-Y2LPC-	PI Sta 18+22.01		95° 13' 47.0" (LT)	29° 04' 47.8"		327.48'			215.89'	197.03'	EXIST	25 MPH
-Y2RPC-	PIs Sta 11+77.51	4° 46' 28.7"			200.00'		133.38'	66.71'				
-Y2RPC-	PI Sta 13+60.93		11° 07' 06.7" (RT)	4° 46' 28.7"		232.87'			116.80'	1,200.00'	0.08	60 MPH
-Y2RPC-	PIs Sta 15+43.70	4° 46' 28.7"			200.00'		133.38'	66.71'				
-Y2DCD-	PI Sta 14+22.96		5° 08' 50.1" (LT)	0° 36' 32.0"		845.36'			422.96'	9,410.00'	NC	50 MPH
-Y2DCD-	PI Sta 20+02.29		1° 14' 24.4" (RT)	0° 23' 42.5"		313.84'			156.93'	14,500.00'	NC	50 MPH
-Y2DCD-	PI Sta 23+39.84		1° 25' 38.9" (LT)	0° 23' 42.5"		361.26'			180.64'	14,500.00'	NC	50 MPH
-Y2DCD-	PI Sta 28+30.80		29° 26' 54.9" (LT)	6° 52' 41.7"		428.14'			218.91'	833.00'	0.06	50 MPH
-Y2DCD-	PI Sta 34+67.29		58° 49' 00.6" (RT)	7° 33' 31.7"		778.12'			427.26'	758.00'	0.08	50 MPH
-Y2DCC-	PI Sta 16+98.08		0° 50' 26.2" (RT)	0° 23' 45.1"		212.35'			106.18'	14,474.00'	NC	50 MPH
-Y2DCC-	PI Sta 20+20.93		29° 09' 41.2" (RT)	6° 52' 41.7"		423.97'			216.68'	833.00'	0.06	50 MPH
-Y2DCC-	PI Sta 24+47.25		29° 27' 50.7" (LT)	6° 52' 41.7"		428.37'			219.03'	833.00'	0.06	50 MPH
-Y2DCC-	PI Sta 28+27.96		23° 15' 05.5" (RT)	6° 52' 41.7"		338.04'			171.38'	833.00'	0.06	50 MPH
-Y2LPB-	PIs Sta 11+34.27	20° 50' 05.4"			200.00'		134.27'	67.52'				
-Y2LPB-	PI Sta 12+81.39		32° 58' 21.5" (RT)	20° 50' 05.4"		158.26'			81.39'	275.00'	EXIST	30 MPH
-Y2LPB-	PI Sta 15+32.82		69° 23' 38.2" (RT)	22° 43' 30.1"		305.36'			174.56'	252.13'	EXIST	30 MPH
-Y2LPB-	PI Sta 17+99.27		55° 27' 58.0" (RT)	22° 12' 24.1"		249.77'			135.65'	258.01'	EXIST	30 MPH
-Y2LPB-	PI Sta 20+72.60		68° 11' 21.3" (RT)	24° 21' 40.8"		279.91'			159.20'	235.19'	EXIST	30 MPH
-Y2LPB-	PI Sta 23+52.03		52° 44' 09.0" (RT)	17° 53' 35.9"		294.72'			158.73'	320.21'	EXIST	30 MPH

SEE SHEET 134, 135 FOR -L3_WEST- PROFILE
SEE SHEET 137, 138 FOR -L3_EAST- PROFILE
SEE SHEET 139 FOR -Y2DCD- PROFILE
SEE SHEET 140 FOR -Y2DCC- PROFILE
SEE SHEET 142 FOR -Y2RPB- PROFILE
SEE SHEET 143 FOR -Y2RPC- PROFILE
SEE SHEET 146 FOR -Y2RPDB- PROFILE

GRAPHIC SCALE: 50 25 0 50 100 — PLANS

PROJECT REFERENCE NO.	SHEET NO.
I-5507	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LOCATION: I-485 AT JOHNSTON ROAD (US 521)
TIP NO.: I-5507 COUNTY: MECKLENBURG
DESIGNED BY: WSP
CHECKED BY: D. GOURLEY DATE: 9/23/2019

8/17/99

REVISIONS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	30
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 032689 ENGINEER DAVID B. GOURLEY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

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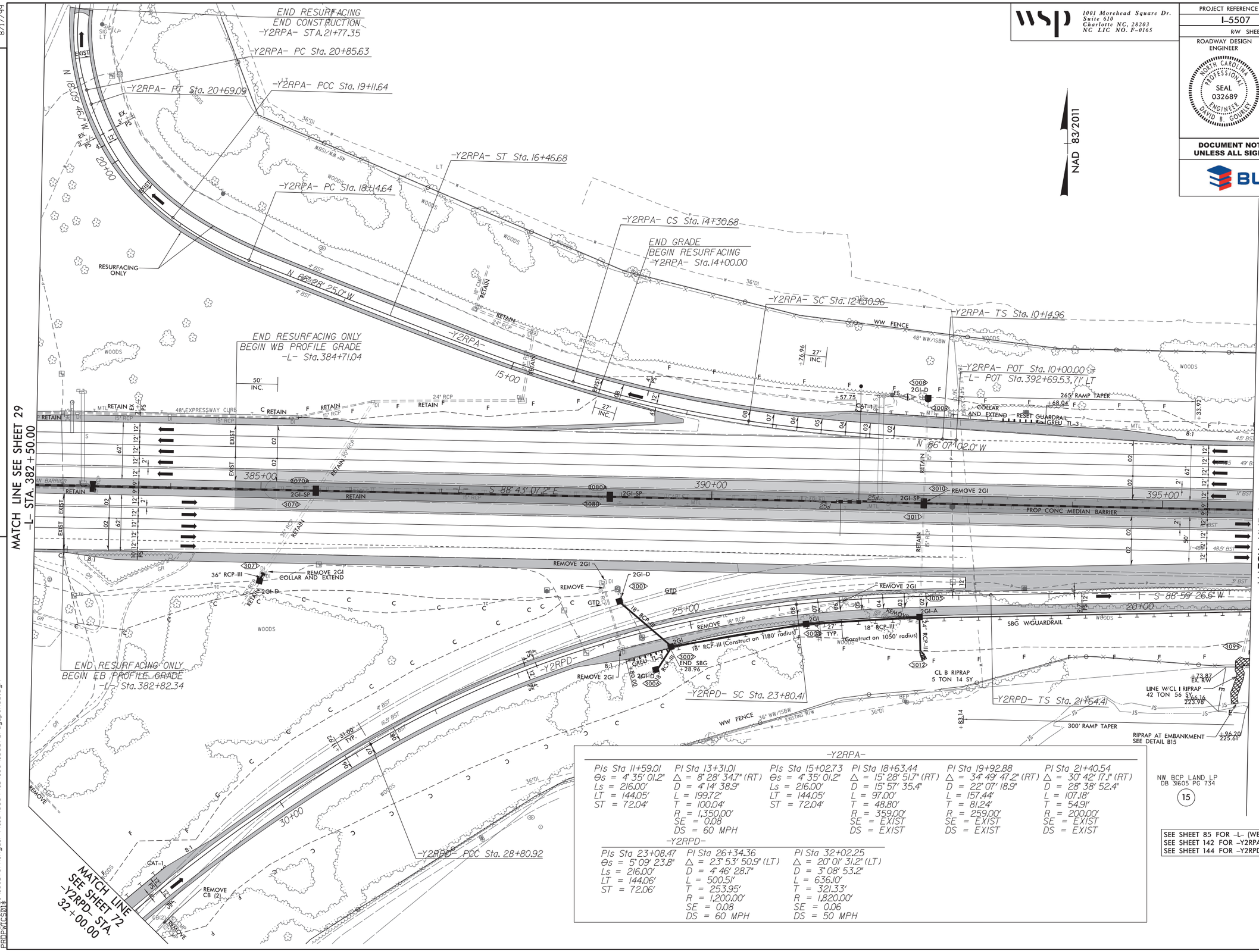
BLYTHE



-Y2RPA-

PIs Sta 11+59.01	PI Sta 13+31.01	PIs Sta 15+02.73	PI Sta 18+63.44	PI Sta 19+92.88	PI Sta 21+40.54
Θs = 4° 35' 01.2"	Δ = 8° 28' 34.7" (RT)	Θs = 4° 35' 01.2"	Δ = 15° 28' 51.7" (RT)	Δ = 34° 49' 47.2" (RT)	Δ = 30° 42' 17.1" (RT)
Ls = 216.00'	D = 4° 14' 38.9"	Ls = 216.00'	D = 15° 57' 35.4"	D = 22° 07' 18.9"	D = 28° 38' 52.4"
LT = 144.05'	L = 199.72'	LT = 144.05'	L = 97.00'	L = 157.44'	L = 107.18'
ST = 72.04'	T = 100.04'	ST = 72.04'	T = 48.80'	T = 81.24'	T = 54.91'
	R = 1,350.00'		R = 359.00'	R = 259.00'	R = 200.00'
	SE = 0.08		SE = EXIST	SE = EXIST	SE = EXIST
	DS = 60 MPH		DS = EXIST	DS = EXIST	DS = EXIST

-Y2RPD-

PIs Sta 23+08.47	PI Sta 26+34.36	PI Sta 32+02.25
Θs = 5° 09' 23.8"	Δ = 23° 53' 50.9" (LT)	Δ = 20° 01' 31.2" (LT)
Ls = 216.00'	D = 4° 46' 28.7"	D = 3° 08' 53.2"
LT = 144.06'	L = 500.51'	L = 636.10'
ST = 72.06'	T = 253.95'	T = 321.33'
	R = 1,200.00'	R = 1,820.00'
	SE = 0.08	SE = 0.06
	DS = 60 MPH	DS = 50 MPH

SEE SHEET 85 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 142 FOR -Y2RPA- PROFILE
SEE SHEET 144 FOR -Y2RPD- PROFILE

9/23/2019
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PROPWCS01$

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Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032689 ENGINEER DAVID B. GOURLEY	NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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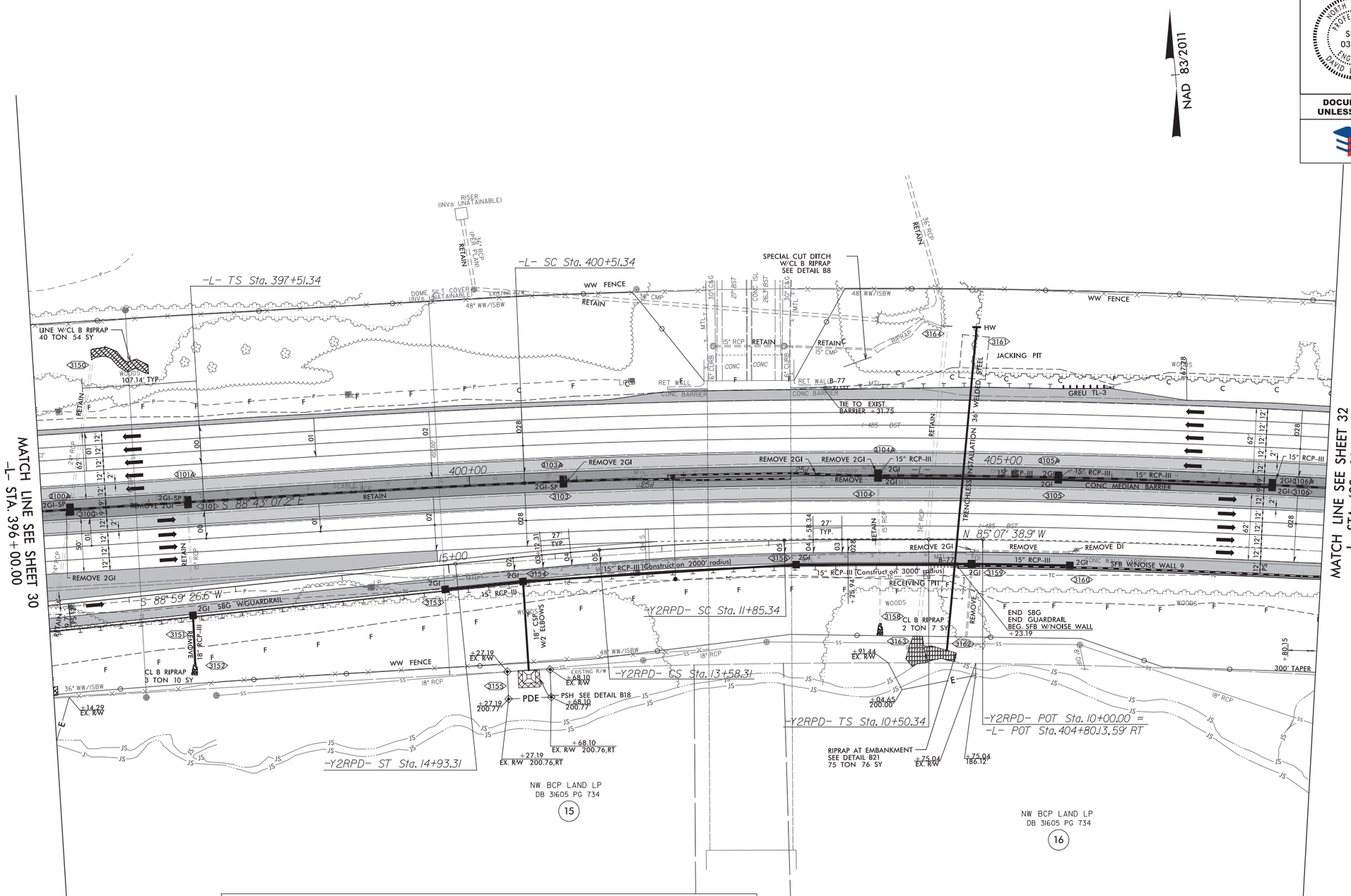
REVISIONS

8/17/99



-Y2RPD-			-L-	
PIs Sta 11+40.34	PI Sta 12+71.85	PIs Sta 14+03.31	PIs Sta 399+51.34	PI Sta 407+45.77
Θs = 1° 17' 21.0"	Δ = 3° 18' 12.5" (LT)	Θs = 1° 17' 21.0"	Θs = 1° 07' 30.2"	Δ = 10° 23' 18.5" (RT)
Ls = 135.00'	D = 1° 54' 35.5"	Ls = 135.00'	Ls = 300.00'	D = 0° 45' 00.2"
LT = 90.00'	L = 172.97'	LT = 90.00'	LT = 200.00'	L = 1,385.05'
ST = 45.00'	T = 86.51'	ST = 45.00'	ST = 100.00'	T = 694.43'
	R = 3,000.00'			R = 7,639.00'
	SE = 0.05			SE = 0.028
	DS = 60 MPH			DS = 70 MPH

SEE SHEET 85, 86 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 144 FOR -Y2RPD- PROFILE

9/23/2019
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PROJECT REFERENCE NO.	SHEET NO.
I-5507	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032689 ENGINEER DAVID B. GOURLEY	NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

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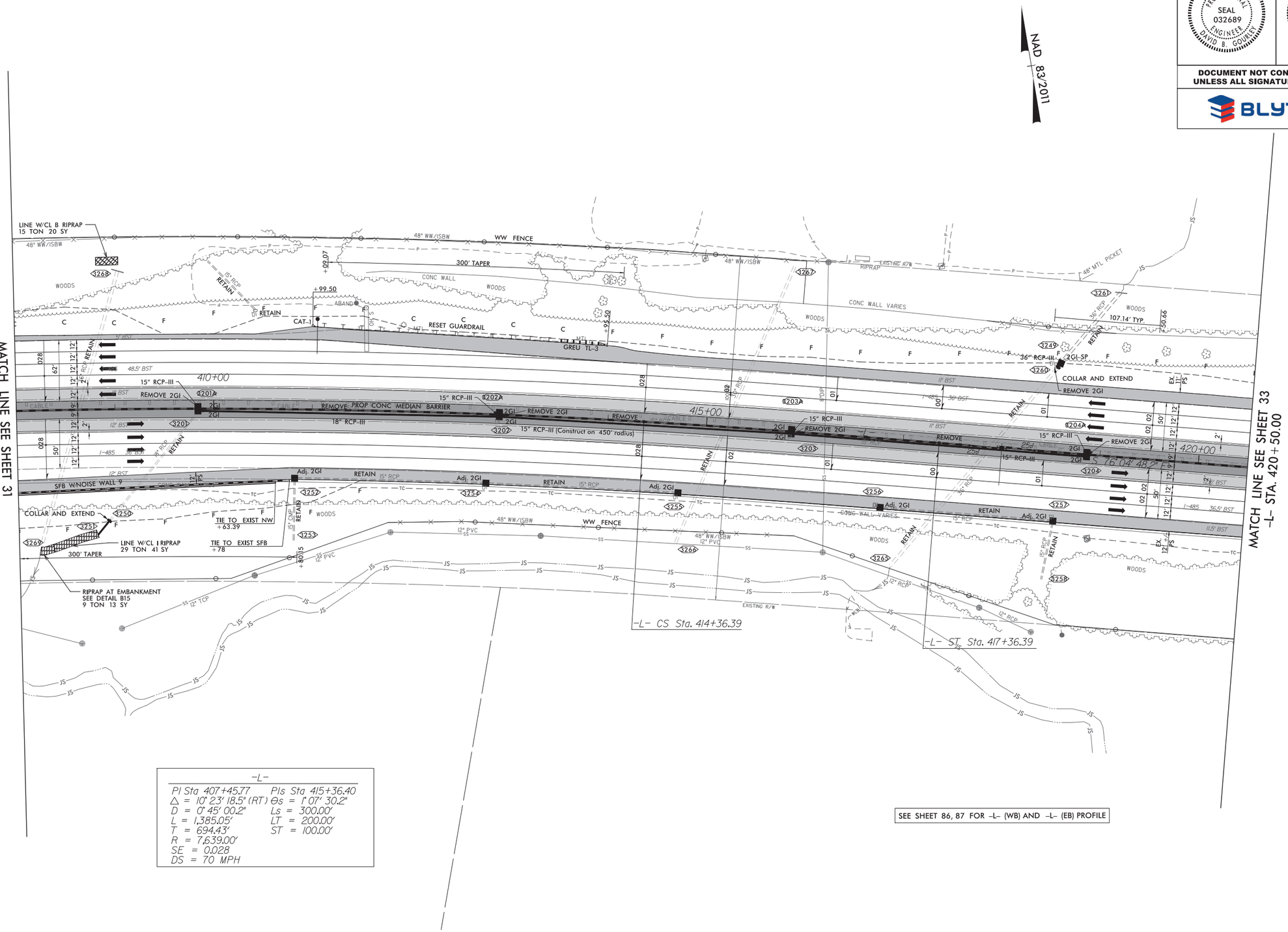
REVISIONS

8/17/99



-L-

PI Sta 407+45.77	PIs Sta 415+36.40
△ = 10° 23' 18.5" (RT)	Θs = 1° 07' 30.2"
D = 0° 45' 00.2"	Ls = 300.00'
L = 1,385.05'	LT = 200.00'
T = 694.43'	ST = 100.00'
R = 7,639.00'	
SE = 0.028	
DS = 70 MPH	

SEE SHEET 86, 87 FOR -L- (WB) AND -L- (EB) PROFILE

9/23/2019
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Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	33
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032689 ENGINEER DAVID B. GOURLEY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

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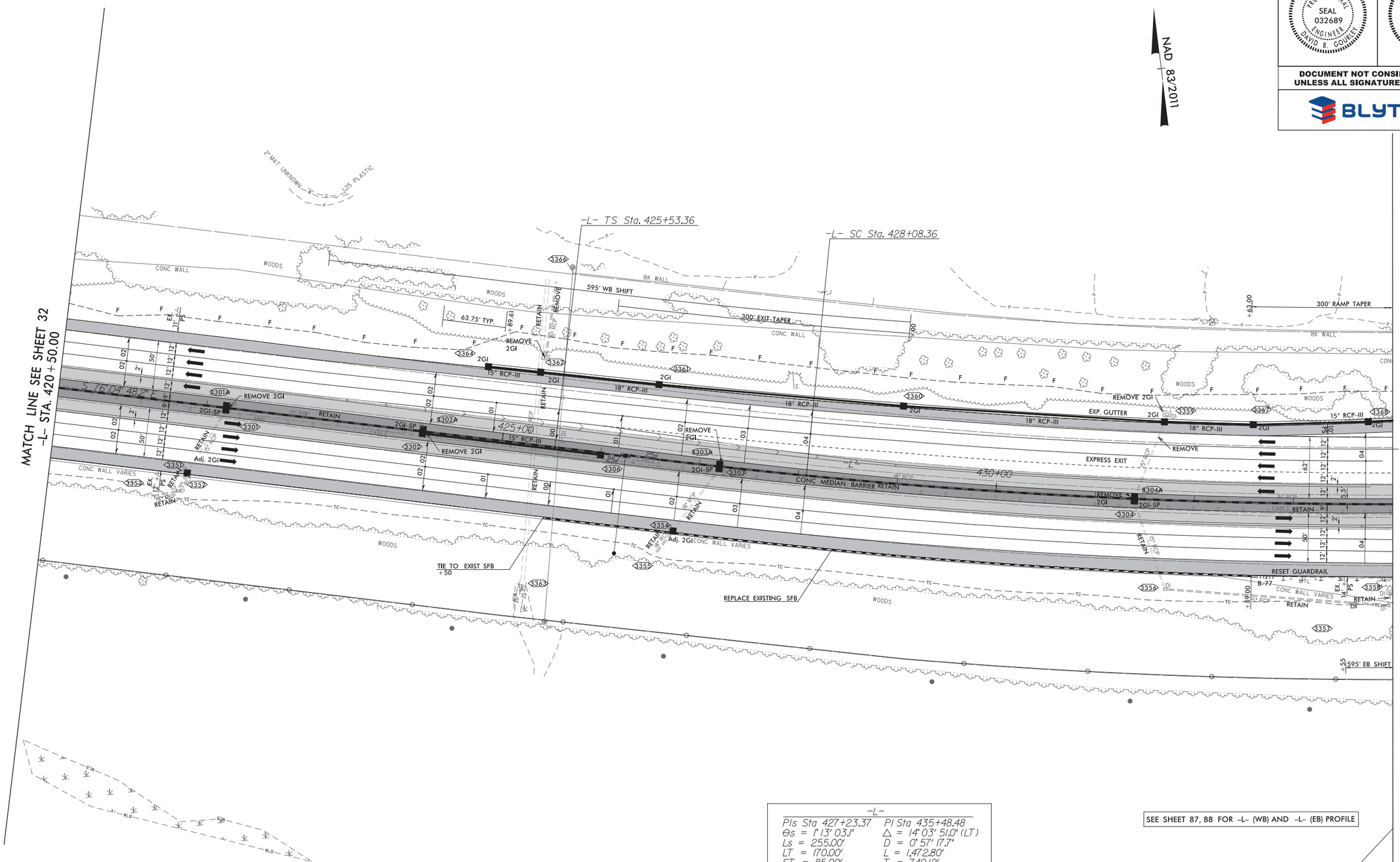

-L-

PIs Sta 427+23.37	PI Sta 435+48.48
Θs = 1° 13' 03.1"	Δ = 14° 03' 51.0" (LT)
Ls = 255.00'	D = 0° 57' 17.7"
LT = 170.00'	L = 1,472.80'
ST = 85.00'	T = 740.12'
	R = 6,000.00'
	SE = 0.04
	DS = 70 MPH

SEE SHEET 87, 88 FOR -L- (WB) AND -L- (EB) PROFILE

REVISIONS

8/17/99

9/23/2019
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8/17/99

REVISIONS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	34
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 032689 ENGINEER DAVID B. GOURLEY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

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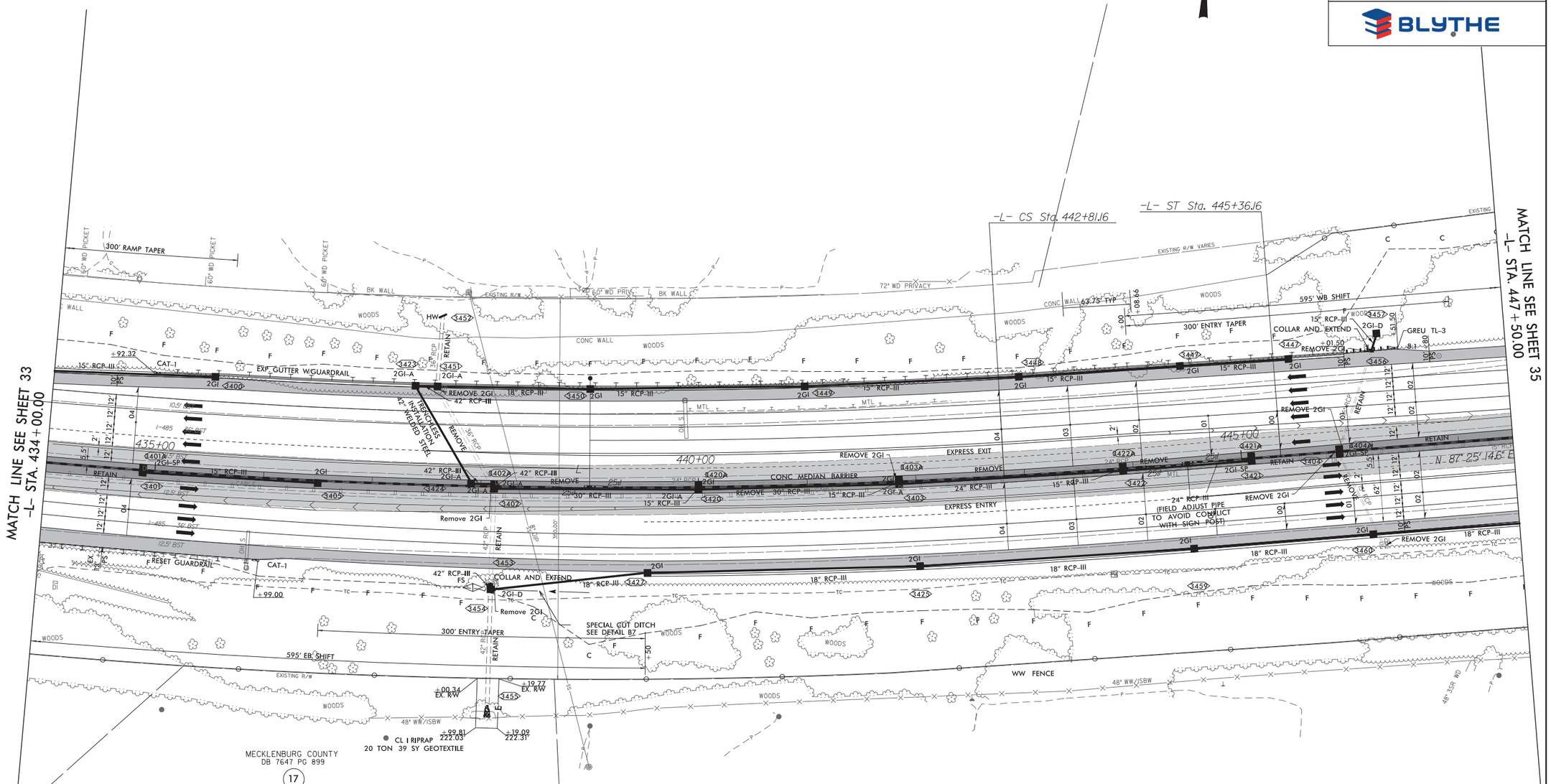
NAD 83/2011



-L-	
PI Sta 435+48.48	PIs Sta 443+66.16
Δ = 14° 03' 51.0" (LT)	Θs = 1° 13' 03.1"
D = 0° 57' 17.7"	Ls = 255.00'
L = 1,472.80'	LT = 170.00'
T = 740.12'	ST = 85.00'
R = 6,000.00'	
SE = 0.04	
DS = 70 MPH	

SEE SHEET 88, 89 FOR -L- (WB) AND -L- (EB) PROFILE

9/23/2019
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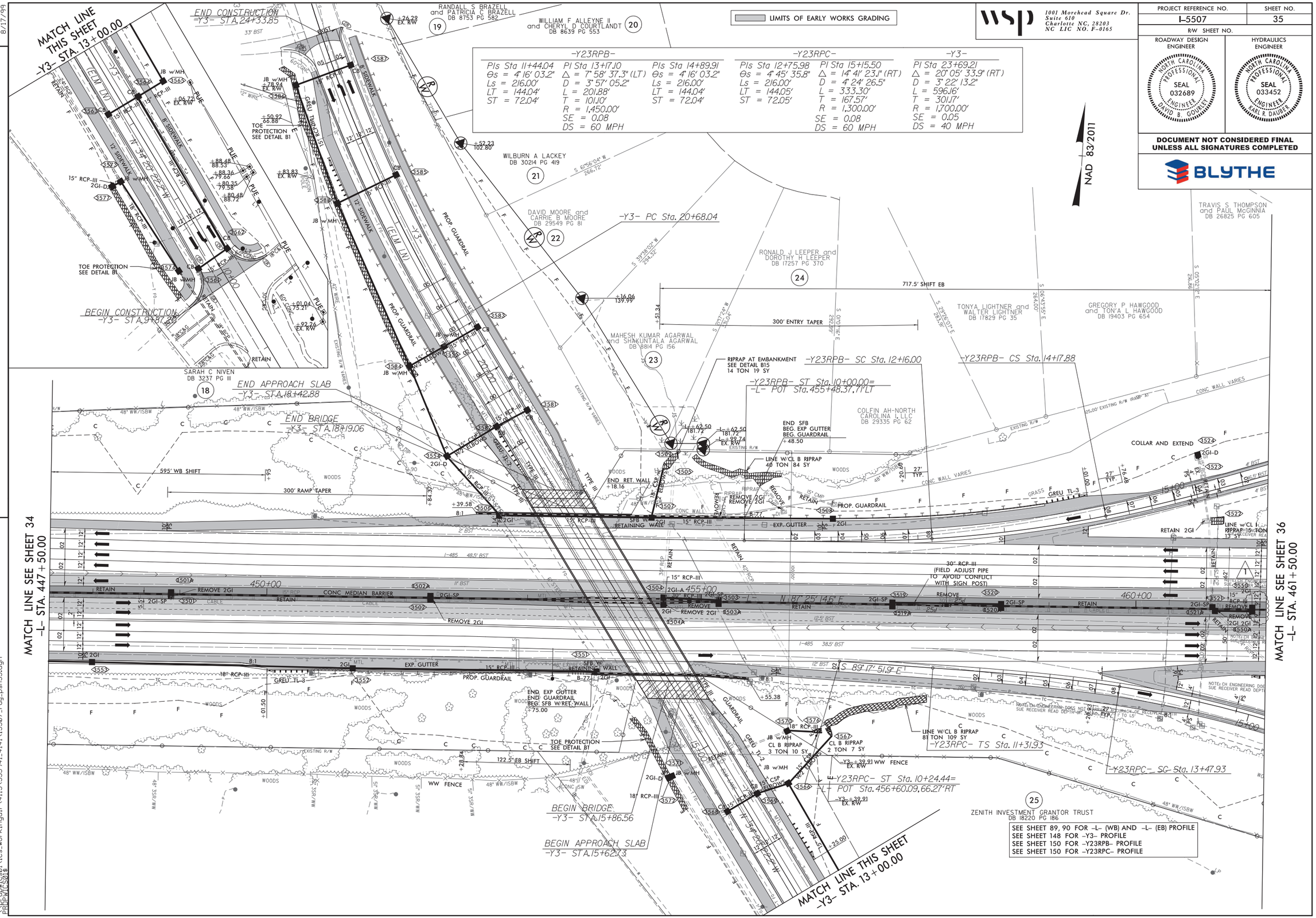
RDP WCS01$

8/17/99

REVISIONS

1. 9/5/19 - ADDED BOXES 3550 AND 3550A



-Y23RPB-		-Y23RPC-		-Y3-
PIs Sta 11+44.04	PI Sta 13+17.10	PIs Sta 14+89.91	PIs Sta 12+75.98	PI Sta 23+69.21
Θs = 4° 16' 03.2"	Δ = 7° 58' 37.3" (LT)	Θs = 4° 16' 03.2"	Θs = 4° 45' 35.8"	Δ = 20° 05' 33.9" (RT)
Ls = 216.00'	D = 3° 57' 05.2"	Ls = 216.00'	Ls = 216.00'	D = 3° 22' 13.2"
LT = 144.04'	L = 201.88'	LT = 144.04'	LT = 144.05'	L = 596.16'
ST = 72.04'	T = 101.10'	ST = 72.04'	ST = 72.05'	T = 301.17'
	R = 1,450.00'			R = 1,700.00'
	SE = 0.08			SE = 0.05
	DS = 60 MPH			DS = 40 MPH

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Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	35
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 032689 ENGINEER DAVID B. GOURLEY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

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9/23/2019
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PROP WICS01$

8/17/99

REVISIONS

1. 9/13/19 - REVISED PROFILE AND DRAINAGE BETWEEN STATIONS 463+75 TO 474+50 (INNER LOOP) AND 463+00 TO 474+50 (OUTER LOOP)

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NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	36
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 032689 ENGINEER DAVID B. GOURLEY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

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LIMITS OF EARLY WORKS GRADING

-L-

PI Sta 490+61.69
Δ = 11° 46' 07.5" (RT)
D = 0° 15' 00.0"
L = 4,707.44'
T = 2,362.03'
R = 22,918.00'
SE = NC
DS = 70 MPH

-Y23RPB-

PIs Sta 14+89.91
Θs = 4° 16' 03.2"
Ls = 216.00'
LT = 144.04'
ST = 72.04'

PI Sta 22+81.27
Δ = 94° 01' 40.4" (LT)
D = 34° 56' 11.2"
L = 269.14'
T = 175.95'
R = 164.00'
SE = EXIST
DS = 25 MPH

-Y23LPC-

PIs Sta 11+36.17
Θs = 35° 48' 35.5"
Ls = 200.00'
LT = 136.17'
ST = 69.25'

PI Sta 15+02.73
Δ = 235° 42' 55.7" (LT)
D = 35° 48' 35.5"
L = 658.24'
T = 302.73'
R = 160.00'
SE = EXIST
DS = EXIST

PIs Sta 19+07.19
Θs = 25° 46' 59.2"
Ls = 144.00'
LT = 97.04'
ST = 48.95'

-Y23LPA-

PIs Sta 10+97.04
Θs = 25° 46' 59.2"
Ls = 144.00'
LT = 97.04'
ST = 48.95'

PI Sta 13+88.74
Δ = 246° 20' 57.9" (LT)
D = 35° 48' 35.5"
L = 687.94'
T = 244.74'
R = 160.00'
SE = EXIST
DS = EXIST

PIs Sta 18+80.88
Θs = 25° 46' 59.2"
Ls = 144.00'
LT = 97.04'
ST = 48.95'

-Y23RPA-

PI Sta 23+91.98
Δ = 46° 06' 15.0" (LT)
D = 9° 23' 33.9"
L = 490.85'
T = 259.58'
R = 610.00'
SE = EXIST
DS = EXIST

-Y23RPD-

PI Sta 22+54.68
Δ = 84° 33' 49.6" (LT)
D = 36° 57' 54.1"
L = 228.77'
T = 140.95'
R = 155.00'
SE = EXIST
DS = EXIST

-Y23RPC-

PI Sta 15+15.50
Δ = 14° 41' 23.1" (RT)
D = 4° 24' 26.5"
L = 333.30'
T = 167.57'
R = 1,300.00'
SE = 0.08
DS = 60 MPH

PIs Sta 17+53.27
Θs = 4° 45' 35.8"
Ls = 216.00'
LT = 144.05'
ST = 72.05'

PI Sta 21+90.74
Δ = 21° 02' 04.6" (LT)
D = 7° 50' 55.5"
L = 268.00'
T = 135.53'
R = 730.00'
SE = EXIST
DS = EXIST

PI Sta 24+66.72
Δ = 28° 59' 44.3" (LT)
D = 10° 19' 24.8"
L = 280.87'
T = 143.51'
R = 555.00'
SE = EXIST
DS = EXIST

-Y23RPB- POT Sta. 24+04.88
-Y23RPB- PT Sta. 23+74.45
END RESURFACING/ END CONSTRUCTION -Y23RPB- STA. 22+78.27
-Y23RPB- PC Sta. 21+05.31
-Y23RPB- ST Sta. 16+33.88
END GRADE BEGIN RESURFACING -Y23RPB- Sta. 19+25.00
AET TOLL ZONE 3.2
-Y23RPA- POT Sta. 27+40.79
-Y23RPA- PT Sta. 26+23.24
END RESURFACING/ END CONSTRUCTION -Y23RPA- STA. 26+67.95
-Y23RPA- PC Sta. 21+32.39
END RESURFACING/ END CONSTRUCTION -Y23LPA- STA. 18+08.73
-Y23LPA- CS Sta. 18+31.94
-Y23LPA- SC Sta. 11+44.00
-Y23LPA- ST Sta. 19+75.94
-Y23LPA- ST Sta. 10+00.00 = -L- Sta. 470+55.30, 59' LT
END GRADE BEGIN RESURFACING -Y23LPA- Sta. 12+01.78
-Y23LPC- ST Sta. 10+00.00 = -L- POC Sta. 470+27.64, 59' RT
-Y23LPC- ST Sta. 20+02.24
END GRADE BEGIN RESURFACING ONLY -Y23LPC- SC Sta. 12+00.00
END RESURFACING/ END CONSTRUCTION -Y23LPC- STA. 18+73.46
-Y23LPC- CS Sta. 18+58.24
END RESURFACING/ END CONSTRUCTION -Y23RPC- STA. 26+69.15
-Y23RPC- POT Sta. 26+55.76
-Y23RPC- PT Sta. 26+04.08
END RESURFACING/ END CONSTRUCTION -Y23RPD- STA. 22+69.28
-Y23RPD- PT Sta. 23+42.50
END GRADE/ BEGIN RESURFACING -Y23RPC- STA. 16+00.00
-Y23RPC- CS Sta. 16+81.23
-Y23RPC- ST Sta. 18+97.23
-Y23RPC- PC Sta. 20+55.21
-Y23RPC- PCC Sta. 23+23.21
-L- PC Sta. 466+99.66

SEE SHEET 90, 91 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 150 FOR -Y23RPC- PROFILE
SEE SHEET 150 FOR -Y23RPB-
SEE SHEET 151 FOR -Y23LPA- AND -Y23LPC- PROFILE

MATCH LINE SEE SHEET 35 -L- STA. 461+50.00

MATCH LINE SEE SHEET 37 -L- STA. 474+50.00

9/23/2019
PDP-WTC-SD$

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1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	37
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 032689 ENGINEER DAVID B. GOURLEY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

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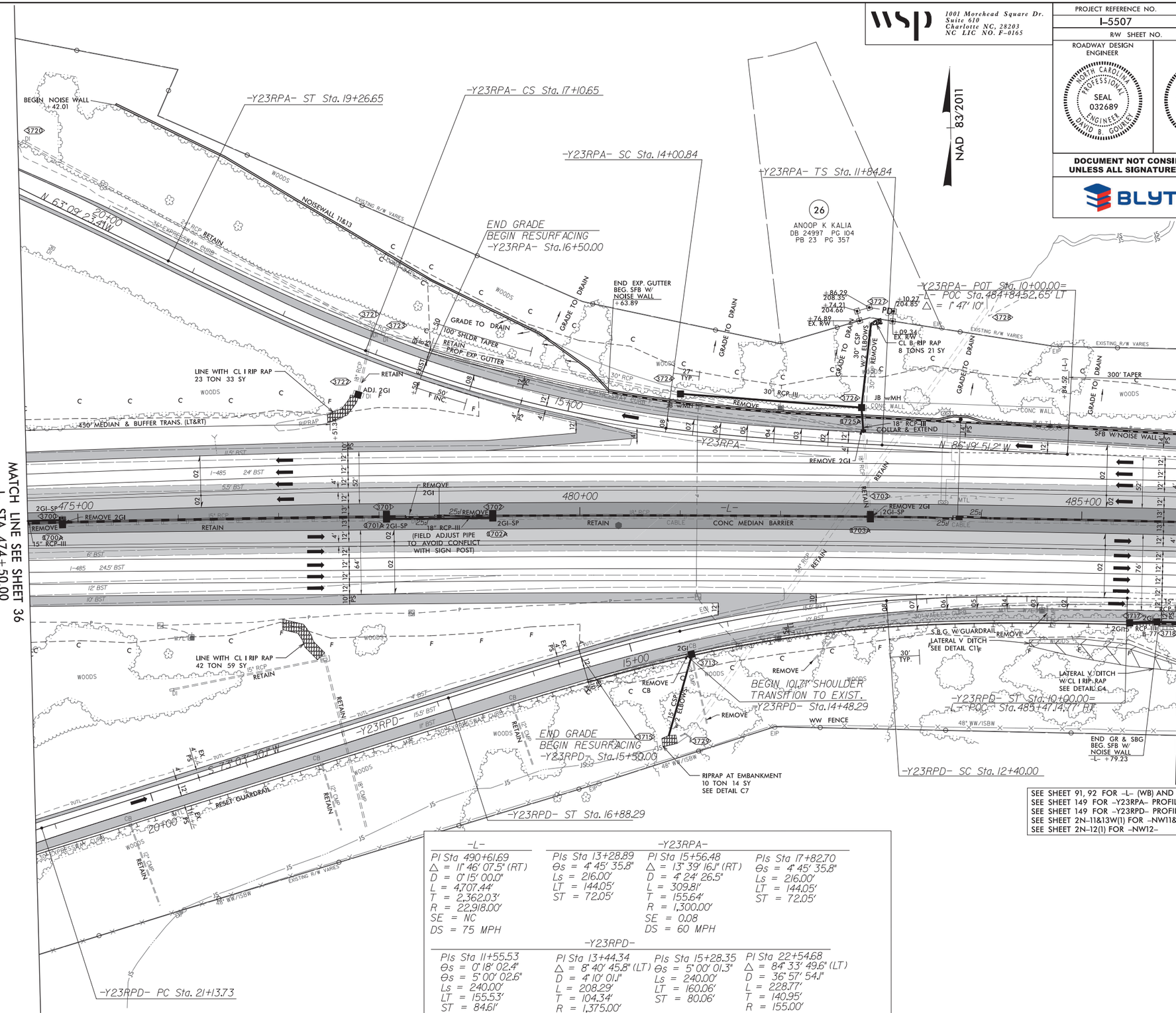

SEE SHEET 91, 92 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 149 FOR -Y23RPA- PROFILE
SEE SHEET 149 FOR -Y23RPD- PROFILE
SEE SHEET 2N-11&13W(1) FOR -NW11&13-
SEE SHEET 2N-12(1) FOR -NW12-

-L-

PI Sta 490+61.69
△ = 11° 46' 07.5" (RT)
D = 0° 15' 00.0"
L = 4,707.44'
T = 2,362.03'
R = 22,918.00'
SE = NC
DS = 75 MPH

-Y23RPA-

PIs Sta 13+28.89
Θs = 4° 45' 35.8"
Ls = 216.00'
LT = 144.05'
ST = 72.05'

PI Sta 15+56.48
△ = 13° 39' 16.1" (RT)
D = 4° 24' 26.5"
L = 309.81'
T = 155.64'
R = 1,300.00'
SE = 0.08
DS = 60 MPH

PIs Sta 17+82.70
Θs = 4° 45' 35.8"
Ls = 216.00'
LT = 144.05'
ST = 72.05'

-Y23RPD-

PIs Sta 11+55.53
Θs = 0° 18' 02.4"
Θs = 5° 00' 02.6"
Ls = 240.00'
LT = 155.53'
ST = 84.61'

PI Sta 13+44.34
△ = 8° 40' 45.8" (LT)
D = 4° 10' 01.1"
L = 208.29'
T = 104.34'
R = 1,375.00'
SE = 0.08
DS = 60 MPH

PIs Sta 15+28.35
Θs = 5° 00' 01.3"
Ls = 240.00'
LT = 160.06'
ST = 80.06'

PI Sta 22+54.68
△ = 84° 33' 49.6" (LT)
D = 36° 57' 54.1"
L = 228.77'
T = 140.95'
R = 155.00'
DS = EXIST.
SE = EXIST.

REVISIONS

8/17/99

9/23/2019
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PROP WCS01$

8/17/99

REVISIONS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	38
R/W SHEET NO.	

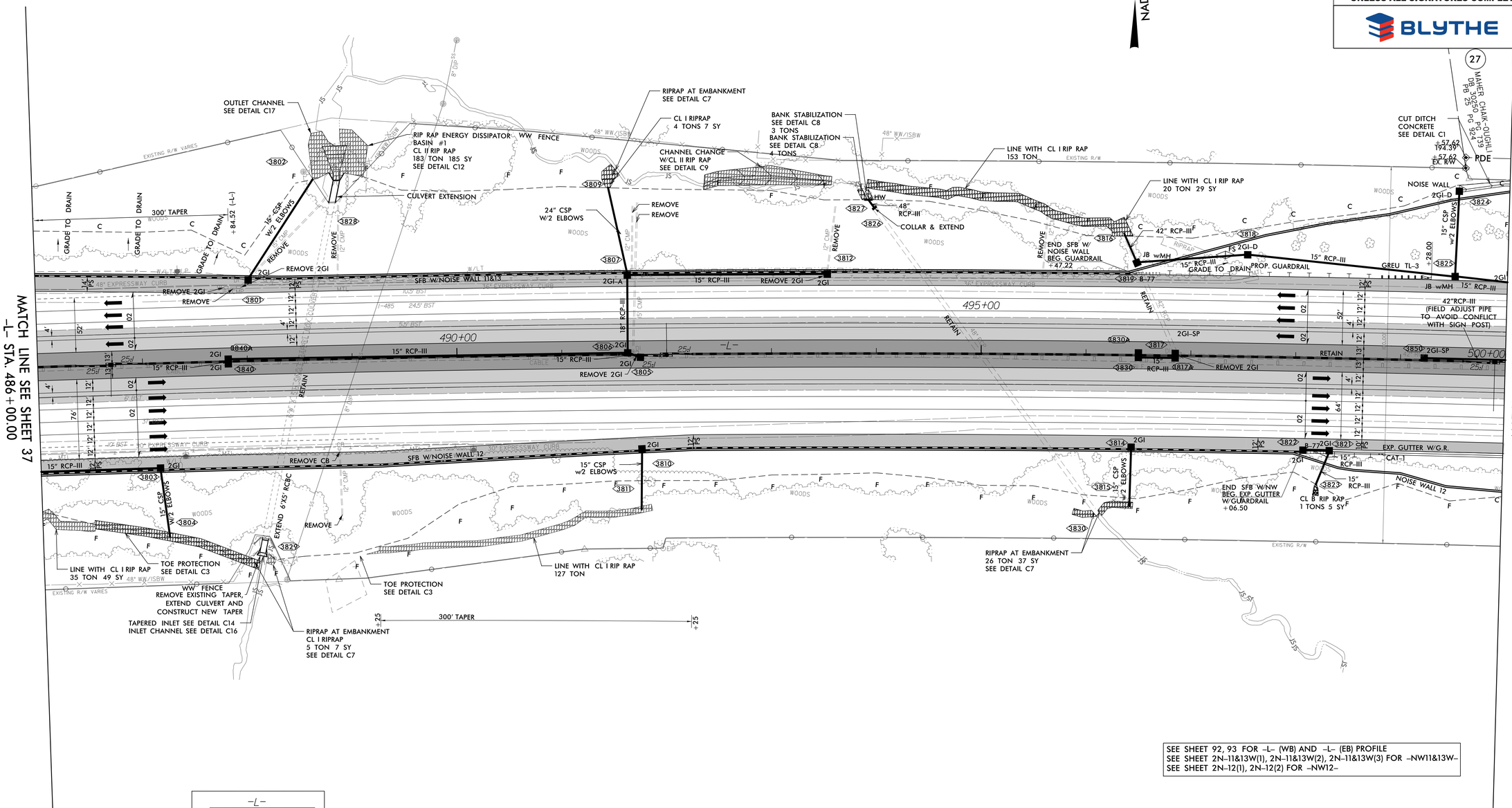
ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 032689 ENGINEER DAVID B. GOURLEY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

NAD 83/2011



SEE SHEET 92, 93 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 2N-11&13W(1), 2N-11&13W(2), 2N-11&13W(3) FOR -NW11&13W-
SEE SHEET 2N-12(1), 2N-12(2) FOR -NW12-

-L-
PI Sta 490+61.69
△ = 11° 46' 07.5" (RT)
D = 0° 15' 00.0"
L = 4,707.44'
T = 2,362.03'
R = 22,918.00'
SE = NC
DS = 75 MPH

9/26/2019
n:\pe\dwtcs01\ics_workingdir\4640\335941.4186\i5507_rdy_psh38.dgn
ADPWTC\$DS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

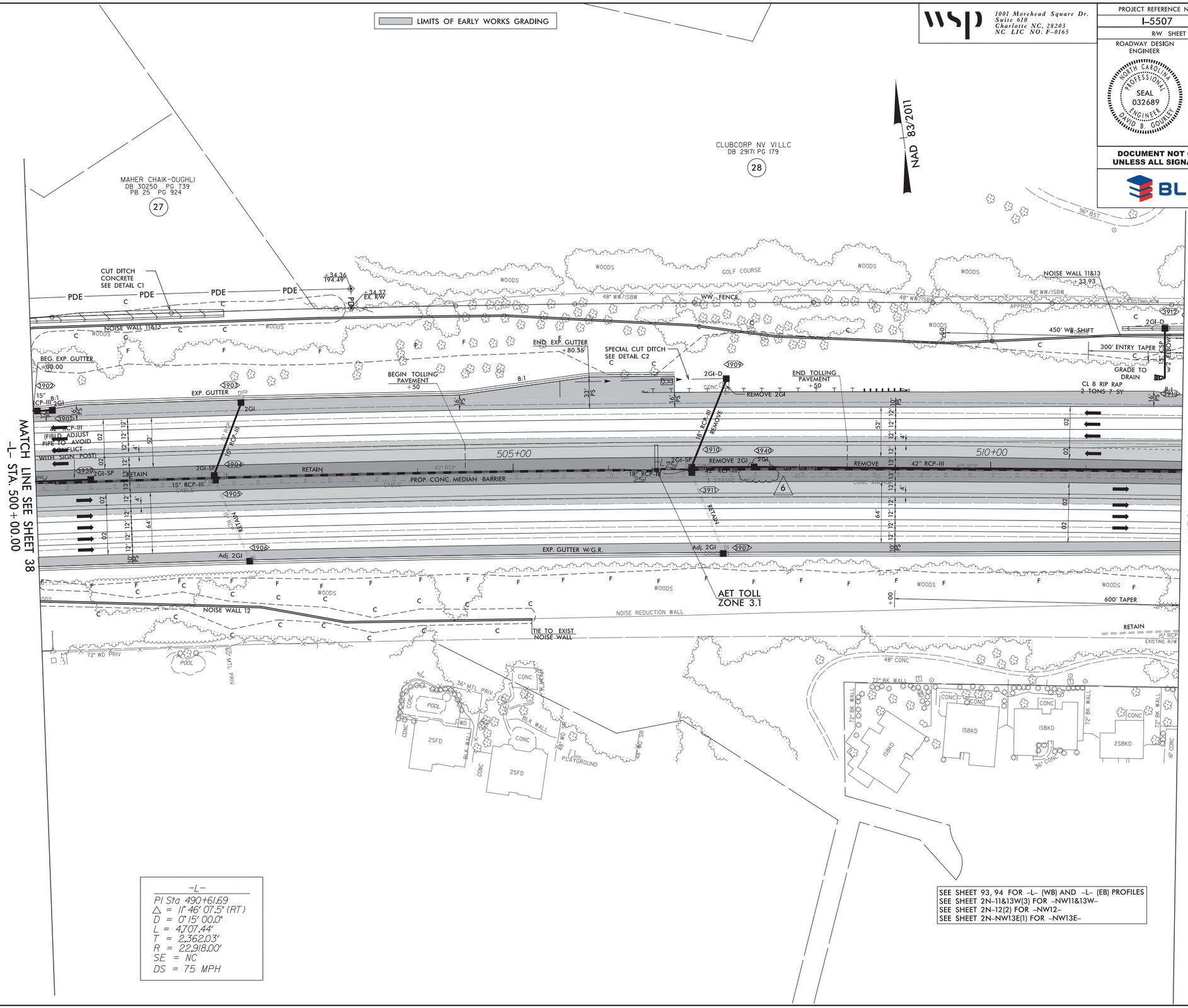
PROJECT REFERENCE NO.	SHEET NO.
I-5507	39
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032689 ENGINEER DAVID B. GOURLEY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



REVISIONS

1. 9/5/19 - ADDED BOXES 3940.

8/17/99

9/23/2019
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PRDPWICS01$

8/17/99

REVISIONS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	40
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 043225 ENGINEER KEVIN R. MELVILLE

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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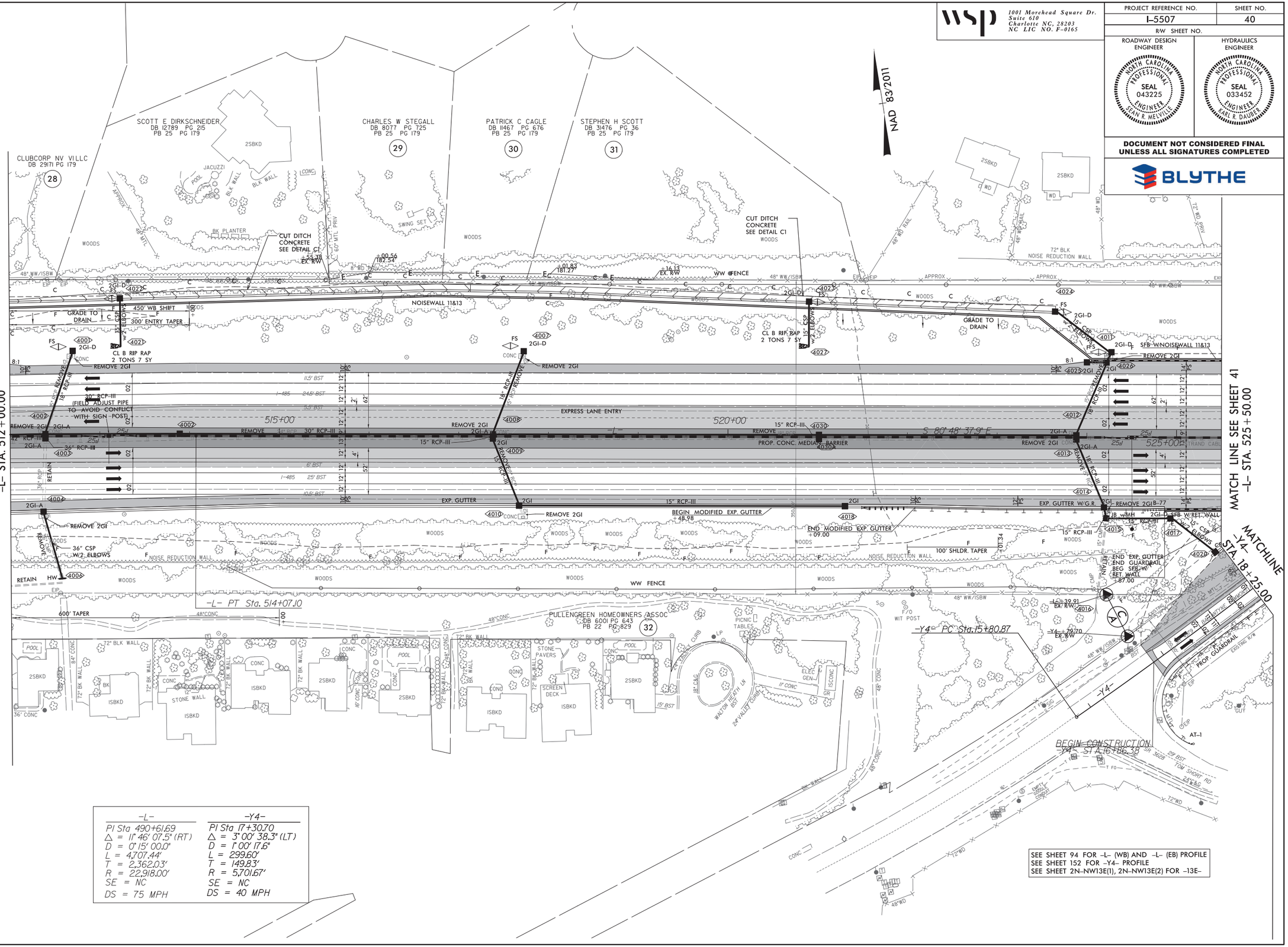

-L-	-Y4-
PI Sta 490+61.69	PI Sta 17+30.70
Δ = 11° 46' 07.5" (RT)	Δ = 3° 00' 38.3" (LT)
D = 0° 15' 00.0"	D = 1° 00' 17.6"
L = 4,707.44'	L = 299.60'
T = 2,362.03'	T = 149.83'
R = 22,918.00'	R = 5,701.67'
SE = NC	SE = NC
DS = 75 MPH	DS = 40 MPH

9/23/2019
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PROPWLCS01$

8/17/99

REVISIONS

1. 9/5/19 - ADDED BOX 4120.

LIMITS OF EARLY WORKS GRADING

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	41
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 043225 ENGINEER SEAN R. MELVILLE	NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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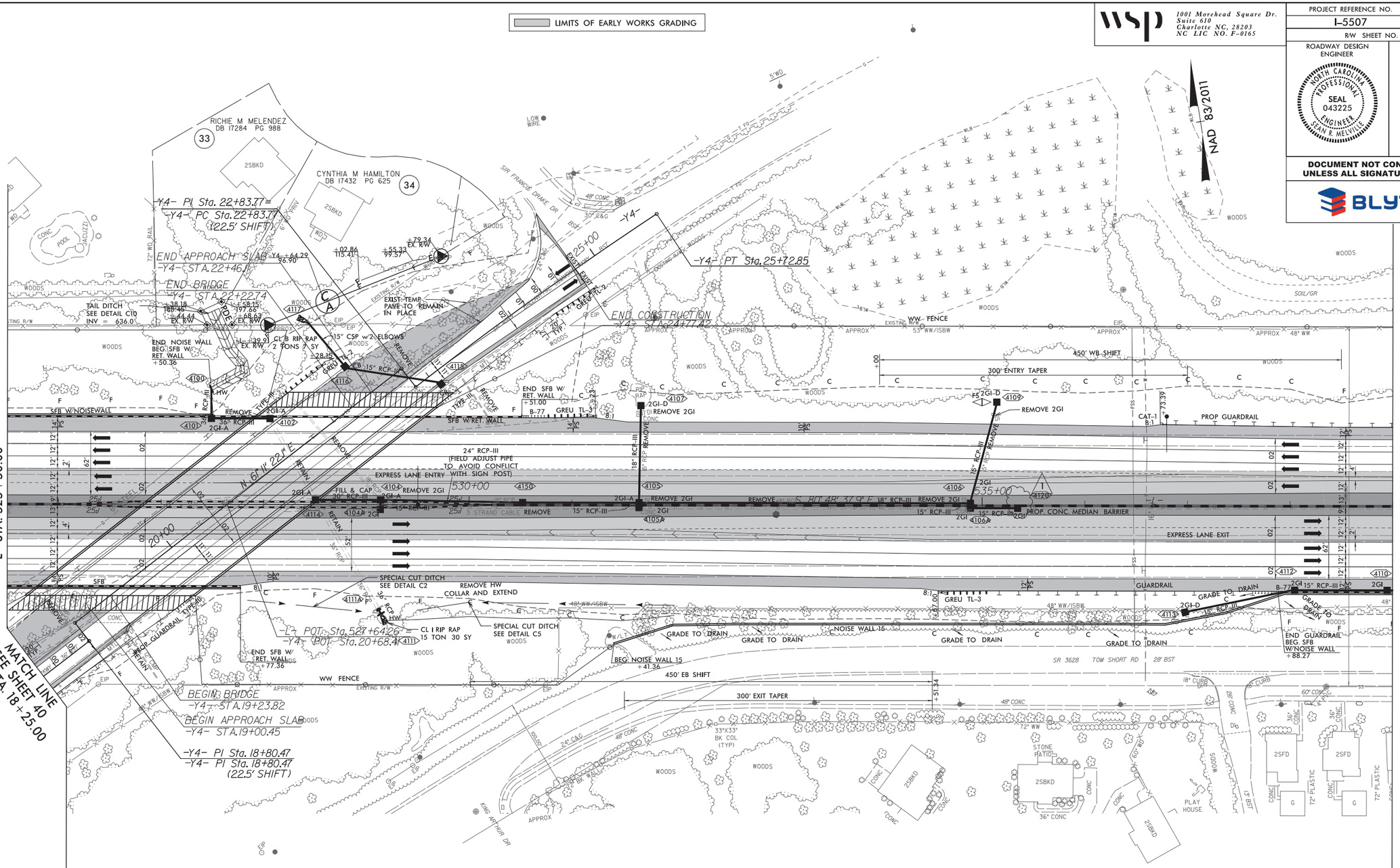

-Y4-	
PI Sta 17+30.70	PI Sta 24+28.38
Δ = 3° 00' 38.3" (LT)	Δ = 4° 23' 36.0" (RT)
D = 1° 00' 17.6"	D = 1° 31' 11.2"
L = 299.60'	L = 289.08'
T = 149.83'	T = 144.61'
R = 5,701.67'	R = 3,770.00'
SE = NC	SE = RC
DS = 40 MPH	DS = 40 MPH

SEE SHEET 95, 96 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 152 FOR -Y4- PROFILE
SEE SHEET 2N-NW13E(2) FOR -NW13-
SEE SHEET 2N-15(1) FOR -NW15-

9/23/2019
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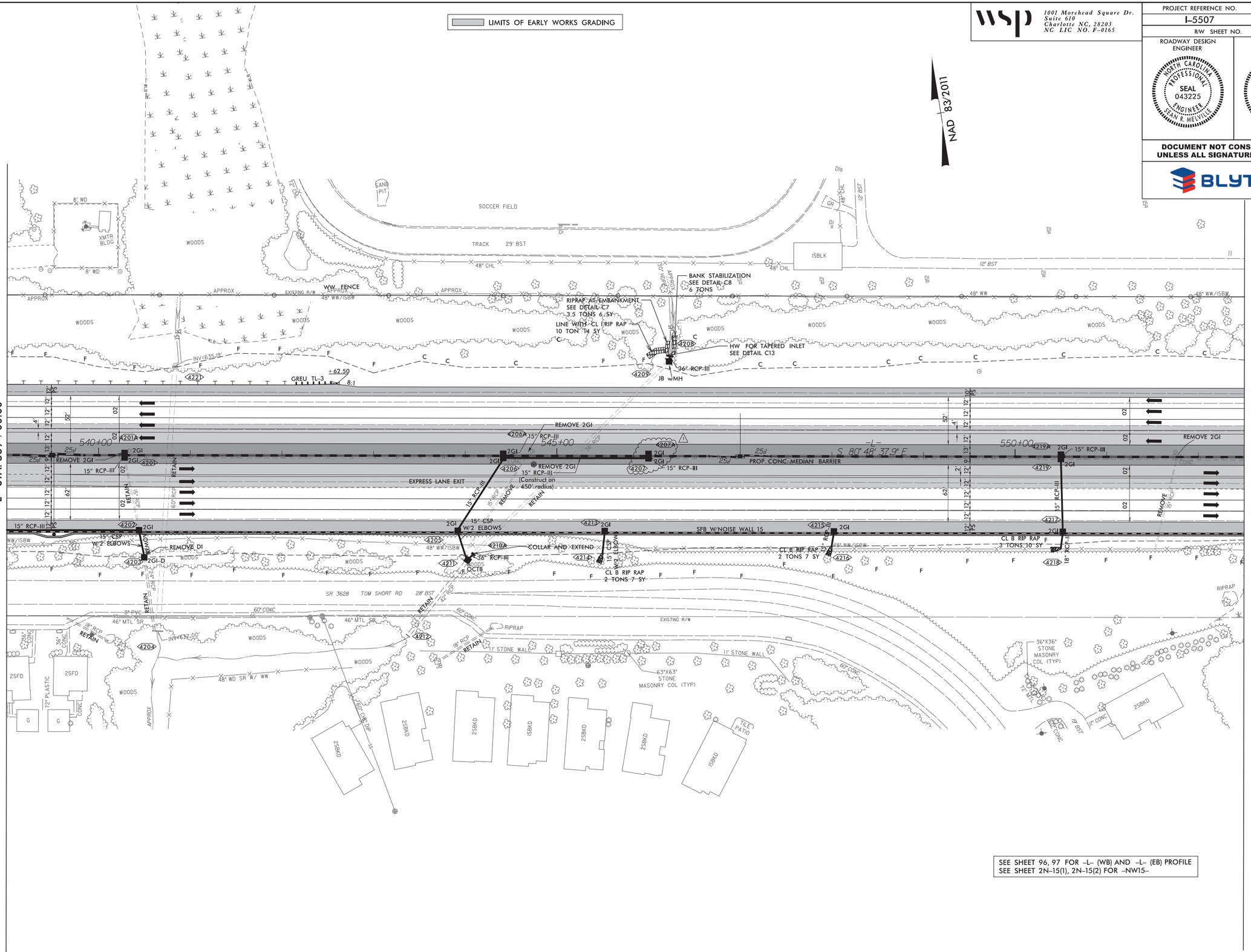
PROPWTCS01$

8/17/99

REVISIONS

1. 9/5/19 - MOVED BOXES 4207A AND 4207



SEE SHEET 96, 97 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 2N-15(1), 2N-15(2) FOR -NW15-

9/23/2019
\\prdpwics01\ics_workingdir\4113\335941_4148\i5507_rdy_psh42.dgn
PRDPWICS01$

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	42
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 043225 ENGINEER SEAN R. MELVILLE	NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

8/17/99

REVISIONS

1. 9/5/19 – ADDED BOXES 43/5a AND 43/5.

LIMITS OF EARLY WORKS GRADING

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

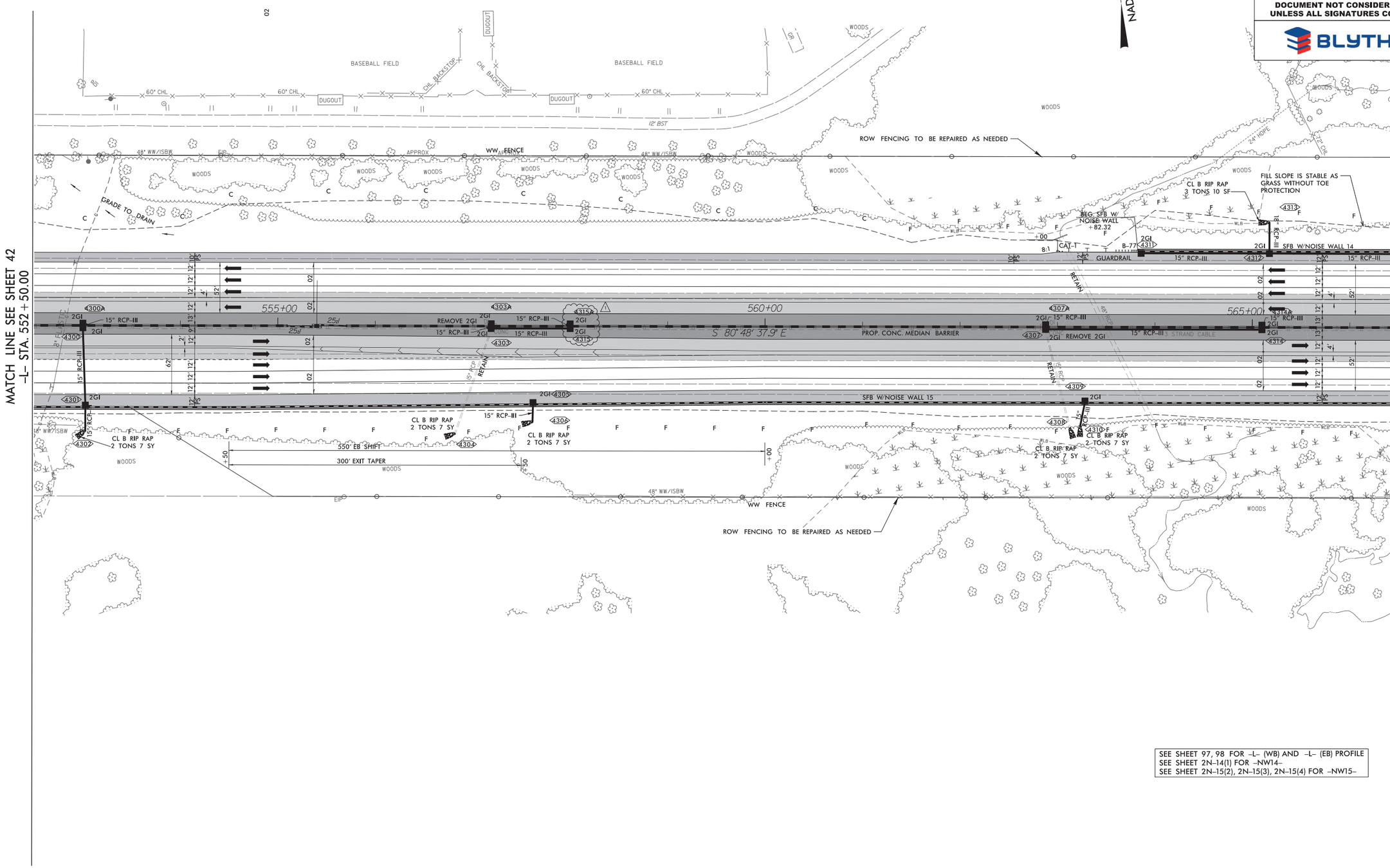
PROJECT REFERENCE NO.	SHEET NO.
I-5507	43
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 043225 ENGINEER KEVIN R. MELVILLE

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



SEE SHEET 97, 98 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 2N-14(1) FOR -NW14-
SEE SHEET 2N-15(2), 2N-15(3), 2N-15(4) FOR -NW15-

9/23/2019
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PROPWCS01$

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

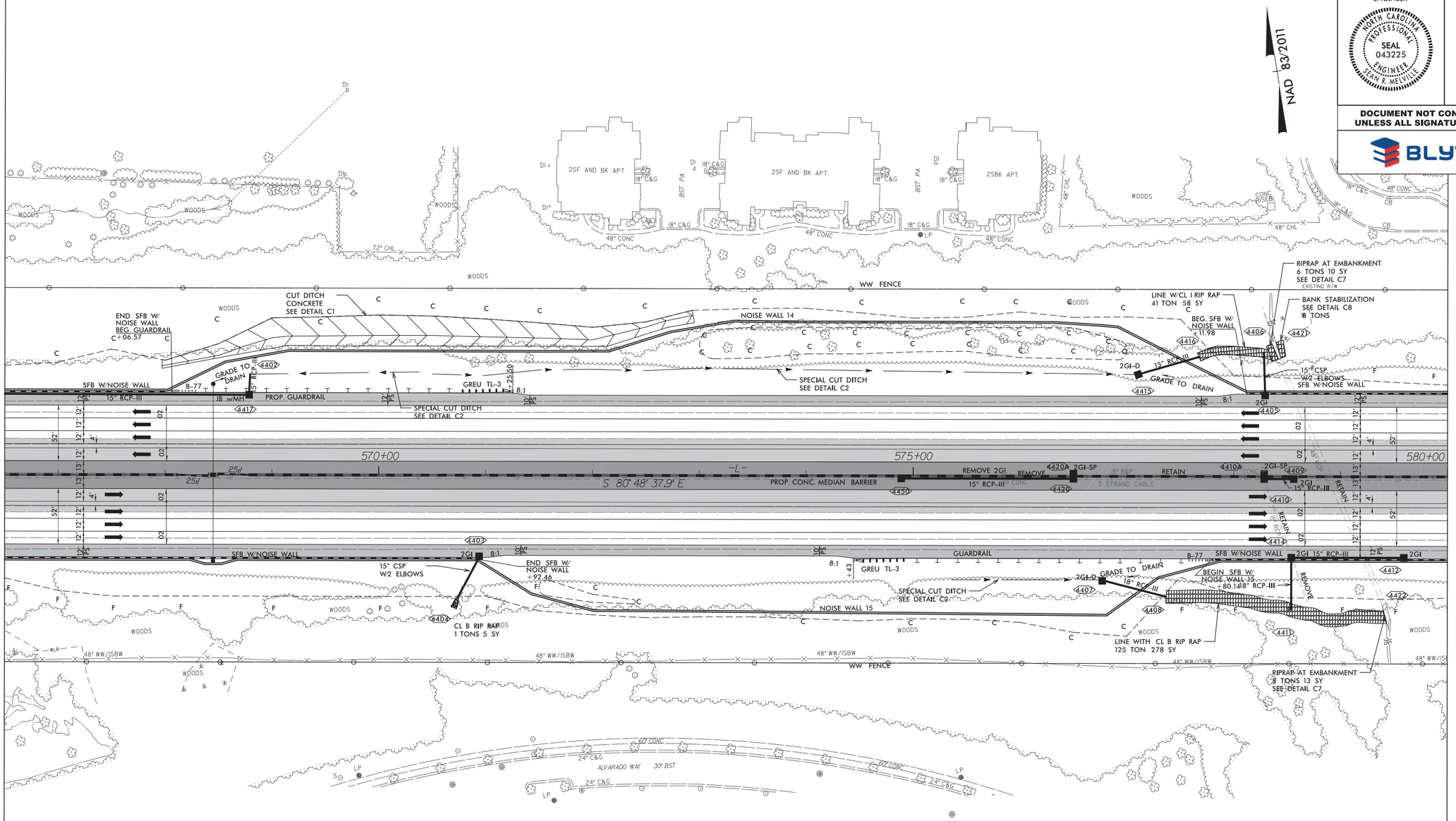
PROJECT REFERENCE NO.	SHEET NO.
I-5507	44
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 043225 ENGINEER KEVIN R. MELVILLE

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



SEE SHEET 98, 99 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 2N-14(1), 2N-14(2) FOR -NW14
SEE SHEET 2N-15(4), 2N-15(5) FOR -NW15-

REVISIONS

8/17/99

9/23/2019
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PROPWICS01$

8/17/99

REVISIONS

1. 9/5/19 - ADDED BOXES 4520A, 4520, 4530A, AND 4530.

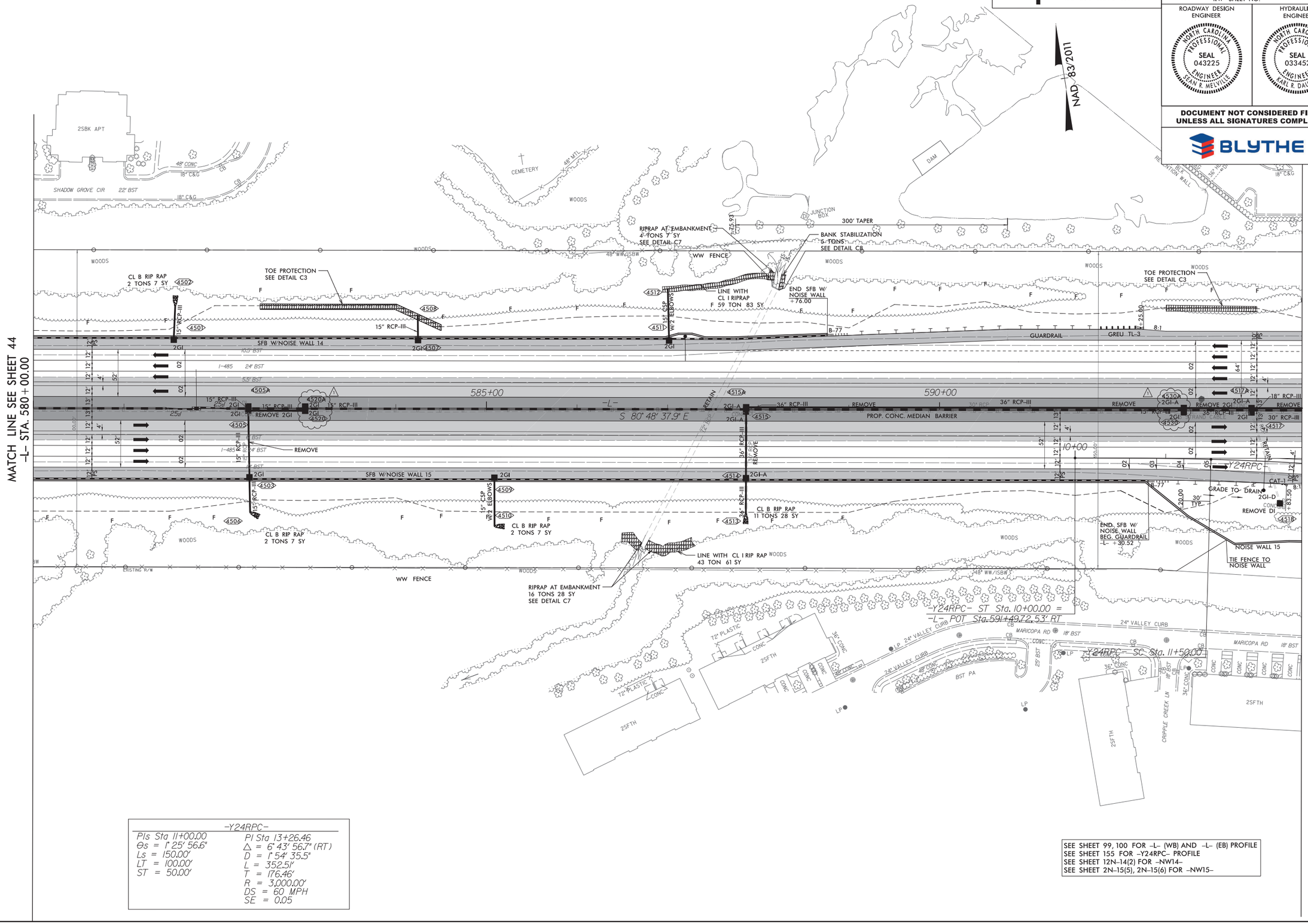
LIMITS OF EARLY WORKS GRADING

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	45
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 043225 ENGINEER SEAN R. MELVILLE	NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



-Y24RPC-	
PIs Sta 11+00.00	PI Sta 13+26.46
Θs = 1° 25' 56.6"	Δ = 6° 43' 56.7" (RT)
Ls = 150.00'	D = 1° 54' 35.5"
LT = 100.00'	L = 352.51'
ST = 50.00'	T = 176.46'
	R = 3,000.00'
	DS = 60 MPH
	SE = 0.05

SEE SHEET 99, 100 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 155 FOR -Y24RPC- PROFILE
SEE SHEET 12N-14(2) FOR -NW14-
SEE SHEET 2N-15(5), 2N-15(6) FOR -NW15-

9/23/2019
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PRDPWICS01$

8/17/99

REVISIONS

-L-	
PIs Sta 597+62.74 Θs = 0° 44' 59.4" Ls = 200.00' LT = 133.33' ST = 66.67'	PI Sta 649+39.49 Δ = 67° 32' 49.1" (LT) D = 0° 44' 59.4" L = 9,008.10' T = 5,110.08' R = 7,641.00' SE = 0.031 DS = 75 MPH

-Y24RPB-				
PIs Sta 11+46.74 Θs = 5° 43' 46.5" Ls = 220.00' LT = 146.74' ST = 73.40'	PI Sta 13+37.97 Δ = 12° 14' 32.4" (LT) D = 5° 12' 31.3" L = 235.04' T = 117.97' R = 1,100.00' SE = 0.08 DS = 50 MPH	PIs Sta 15+28.44 Θs = 5° 43' 46.5" Ls = 220.00' LT = 146.74' ST = 73.40'	PI Sta 21+05.92 Δ = 10° 44' 48.5" (LT) D = 5° 17' 25.7" L = 203.14' T = 101.87' R = 1,083.00' SE = EXIST. DS = EXIST.	

-Y24LPC-	
PIs Sta 13+45.02 Θs = 45° 14' 00.6" Ls = 240.00' LT = 165.56' ST = 85.07'	PI Sta 24+75.10 Δ = 196° 23' 14.4" (LT) D = 37° 41' 40.5" L = 521.00' T = 1,055.63' R = 152.00' SE = EXIST. DS = EXIST.

-Y24RPC-					
PI Sta 13+26.46 Δ = 6° 43' 56.7" (RT) D = 1° 54' 35.5" L = 352.51' T = 176.46' R = 3,000.00' SE = 0.05 DS = 60 MPH	PIs Sta 15+60.13 Θs = 0° 57' 17.0" Θs = 2° 33' 29.0" Ls = 100.00' LT = 57.62' ST = 42.41'	PI Sta 16+98.39 Δ = 9° 47' 11.3" (RT) D = 5° 06' 56.5" L = 191.30' T = 95.88' R = 1,120.00' SE = 0.07 (EXIST.) DS = 45 MPH (EXIST.)	PIs Sta 18+49.84 Θs = 4° 17' 49.9" Ls = 168.00' LT = 112.03' ST = 56.03'	PIs Sta 21+63.26 Θs = 7° 29' 58.0" Ls = 200.00' LT = 133.45' ST = 66.78'	PI Sta 23+67.97 Δ = 20° 30' 00.0" (LT) D = 7° 29' 58.0" L = 273.35' T = 138.15' R = 764.00' SE = EXIST. DS = EXIST.

PIs Sta 25+69.94 Θs = 7° 29' 58.0" Ls = 200.00' LT = 133.45' ST = 66.78'

LIMITS OF EARLY WORKS GRADING

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

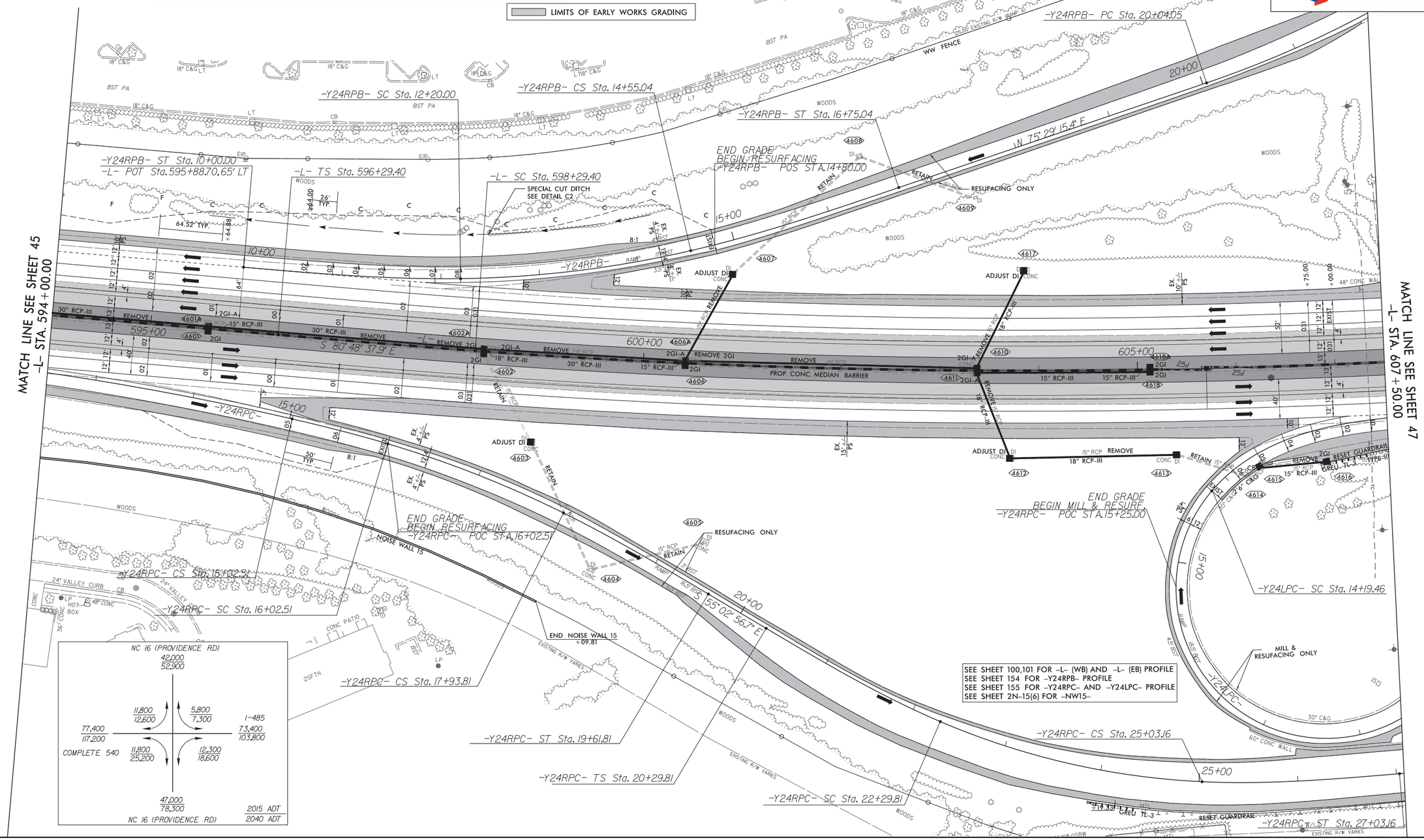
PROJECT REFERENCE NO.	SHEET NO.
I-5507	46
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 043225 ENGINEER BRIAN R. MELVILLE

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



SEE SHEET 100,101 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 154 FOR -Y24RPB- PROFILE
SEE SHEET 155 FOR -Y24RPC- AND -Y24LPC- PROFILE
SEE SHEET 2N-15(6) FOR -NW15-

9/23/2019
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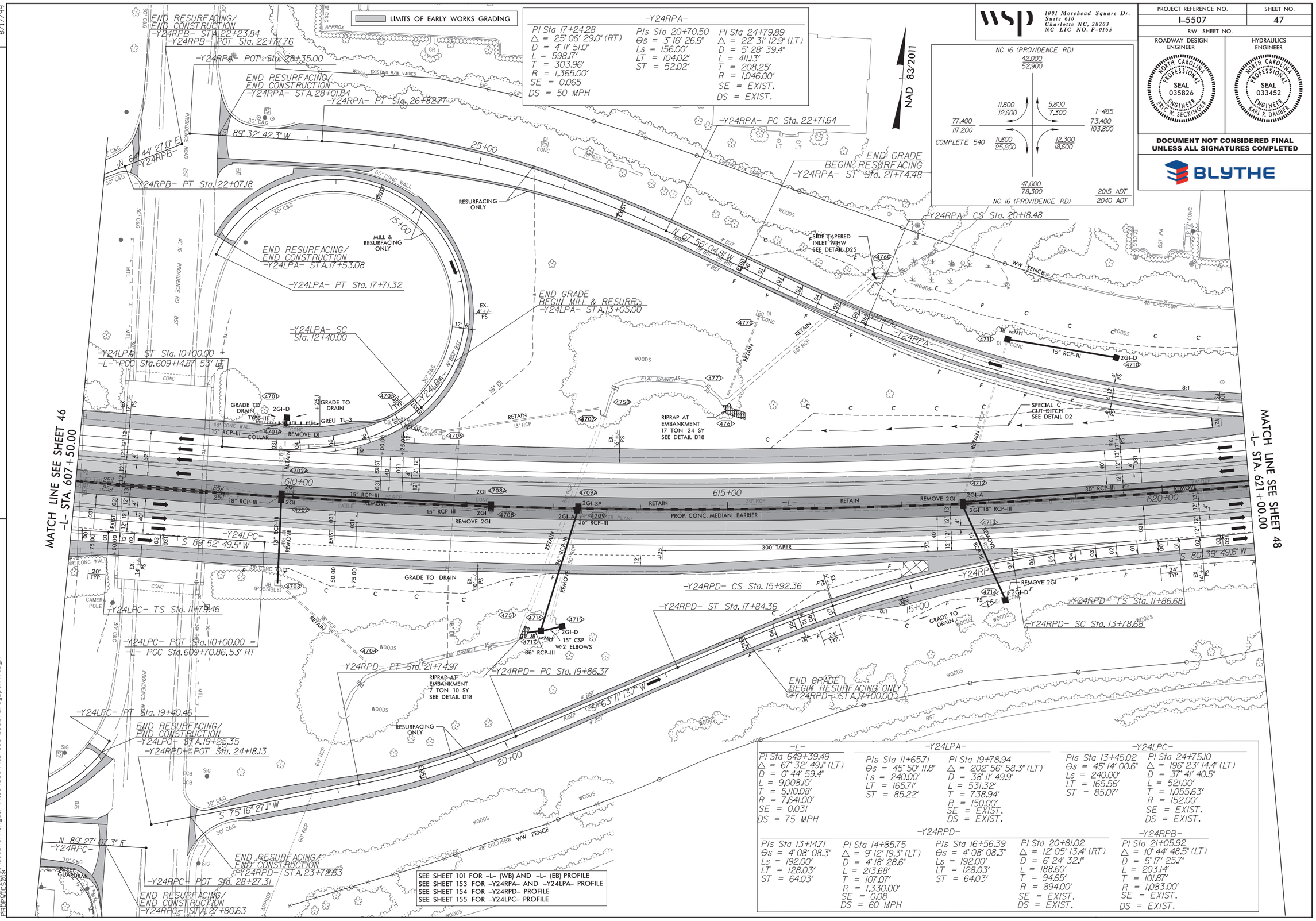

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	47
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W. SECKINGER

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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8/17/99

REVISIONS

9/23/2019
pdpw1cs001

8/17/99

REVISIONS

1. 9/5/19 – ADDED BOXES 4830 AND 4840.

LIMITS OF EARLY WORKS GRADING

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

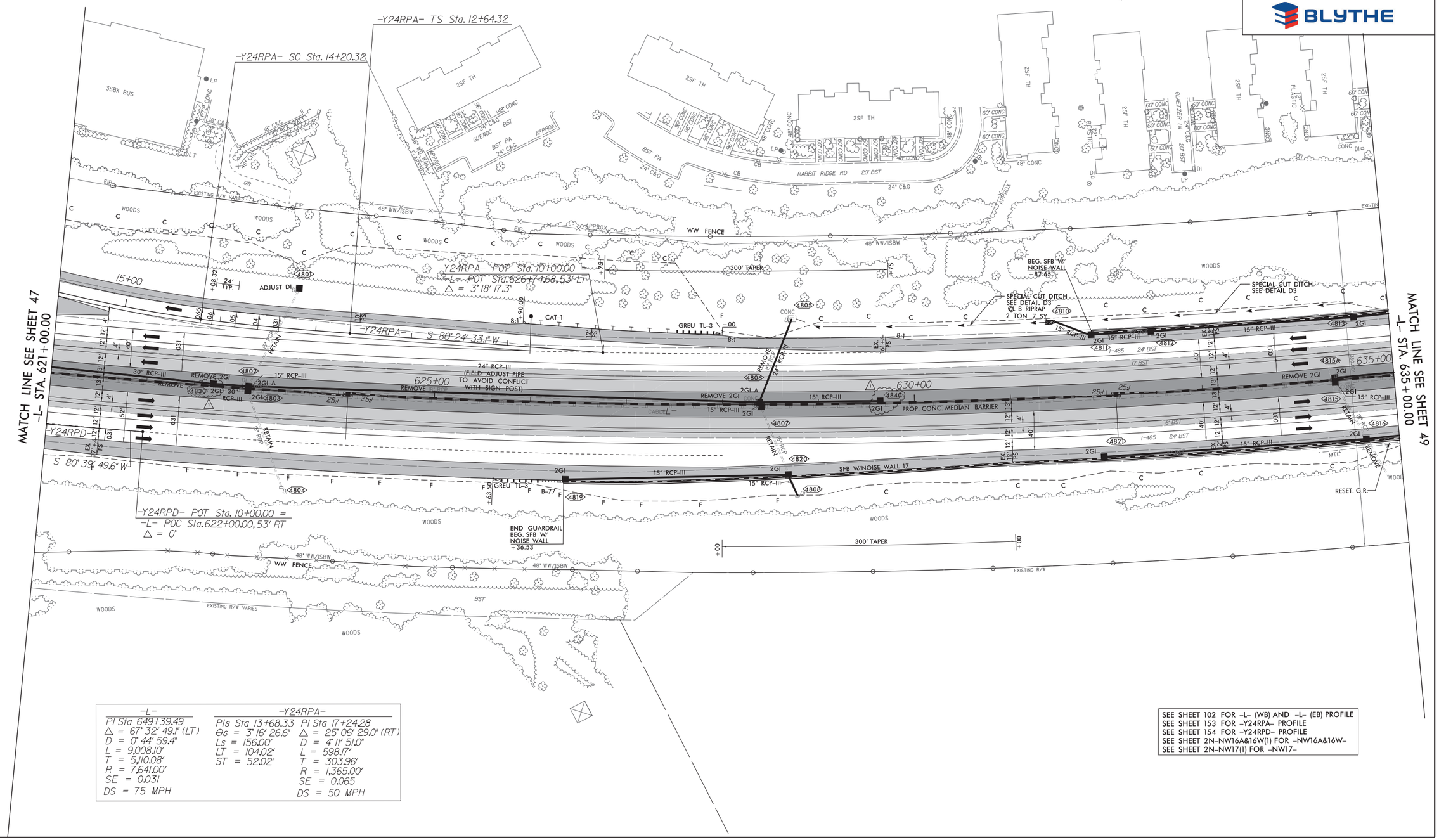
PROJECT REFERENCE NO.	SHEET NO.
I-5507	48
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W. SECKINGER

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



-L-	-Y24RPA-
PI Sta 649+39.49	PIs Sta 13+68.33 PI Sta 17+24.28
△ = 67° 32' 49.1" (LT)	Θs = 3° 16' 26.6" △ = 25° 06' 29.0" (RT)
D = 0° 44' 59.4"	Ls = 156.00' D = 4° 11' 51.0"
L = 9,008.10'	LT = 104.02' L = 598.17'
T = 5,110.08'	ST = 52.02' T = 303.96'
R = 7,641.00'	R = 1,365.00'
SE = 0.031	SE = 0.065
DS = 75 MPH	DS = 50 MPH

SEE SHEET 102 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 153 FOR -Y24RPA- PROFILE
SEE SHEET 154 FOR -Y24RPD- PROFILE
SEE SHEET 2N-NW16A&16W(1) FOR -NW16A&16W-
SEE SHEET 2N-NW17(1) FOR -NW17-

9/23/2019
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PROPWCS01$

8/17/99

REVISIONS

1. 9/5/19 – ADDED BOX 4920.

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	49
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W. SECKINGER

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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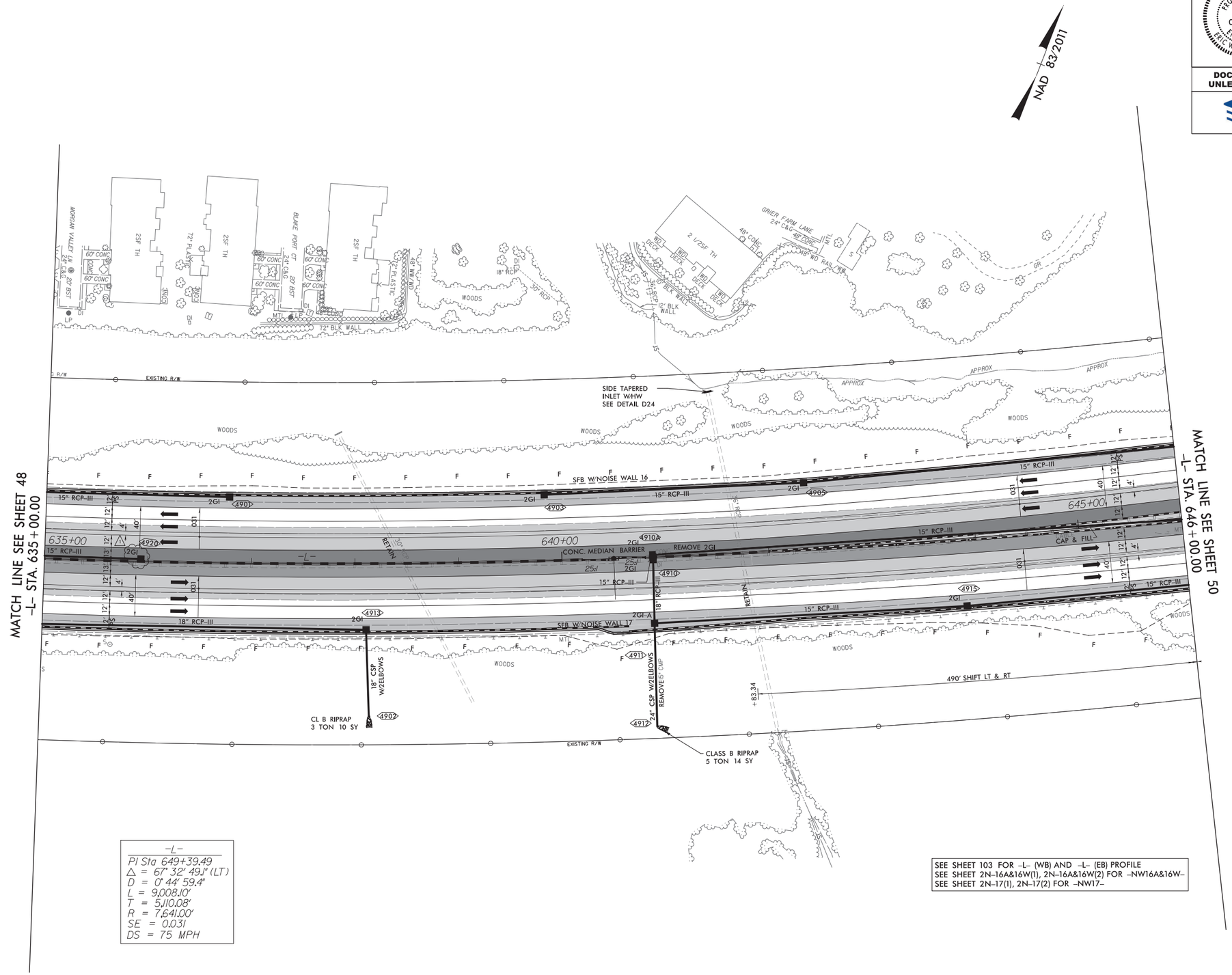

SEE SHEET 103 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 2N-16A&16W(1), 2N-16A&16W(2) FOR -NW16A&16W-
SEE SHEET 2N-17(1), 2N-17(2) FOR -NW17-

9/23/2019
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8/17/99

REVISIONS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

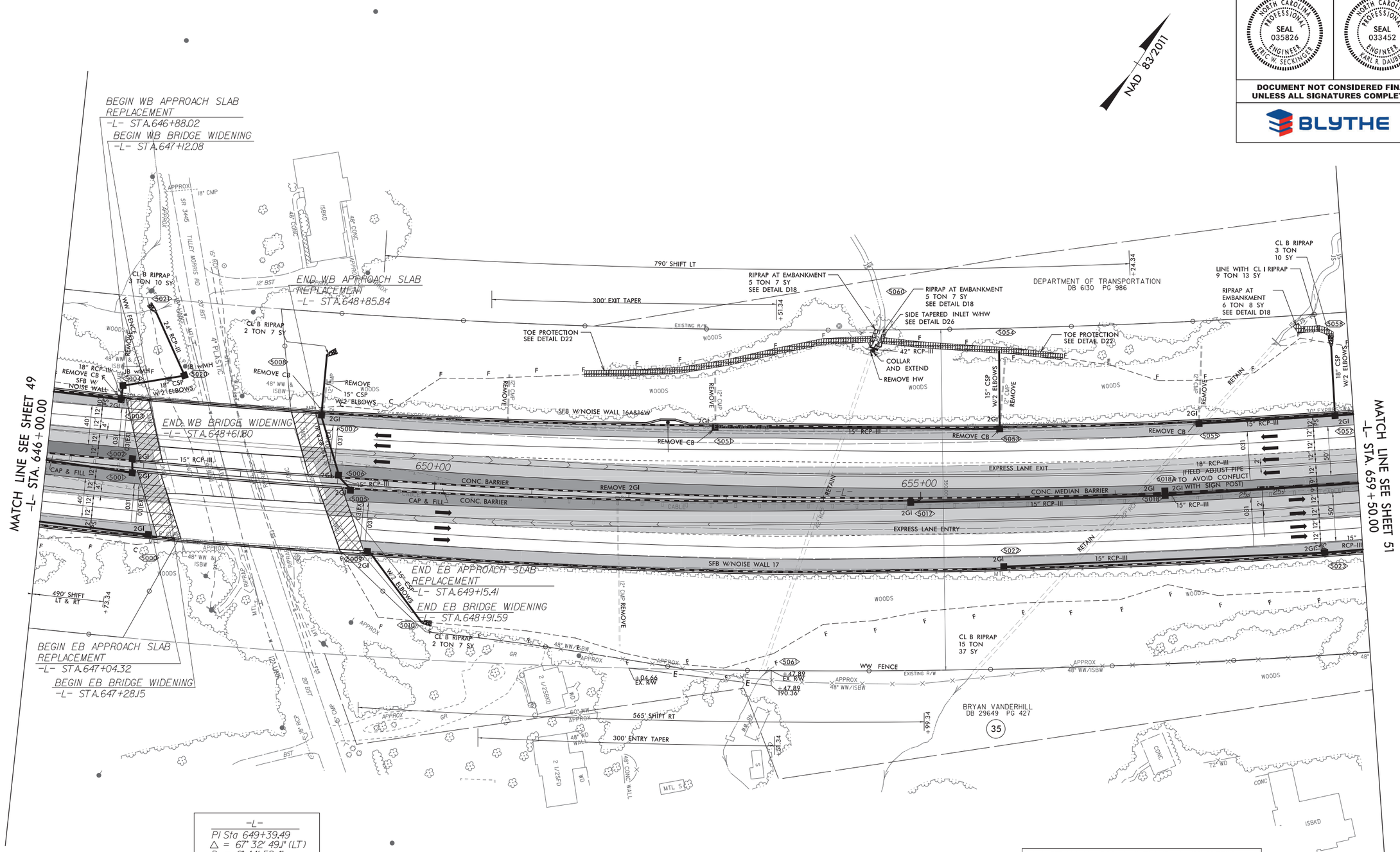
PROJECT REFERENCE NO.	SHEET NO.
I-5507	50
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W. SECKINGER

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



SEE SHEET 103, 104 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 2N-16A&16W(2), 2N-16A&16W(3) FOR -NW16A&16W-
SEE SHEET 2N-17(2), 2N-17(3) FOR -NW17-

9/23/2019
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PROPWLCS01$

8/17/99

REVISIONS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	51
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W SECKINGER

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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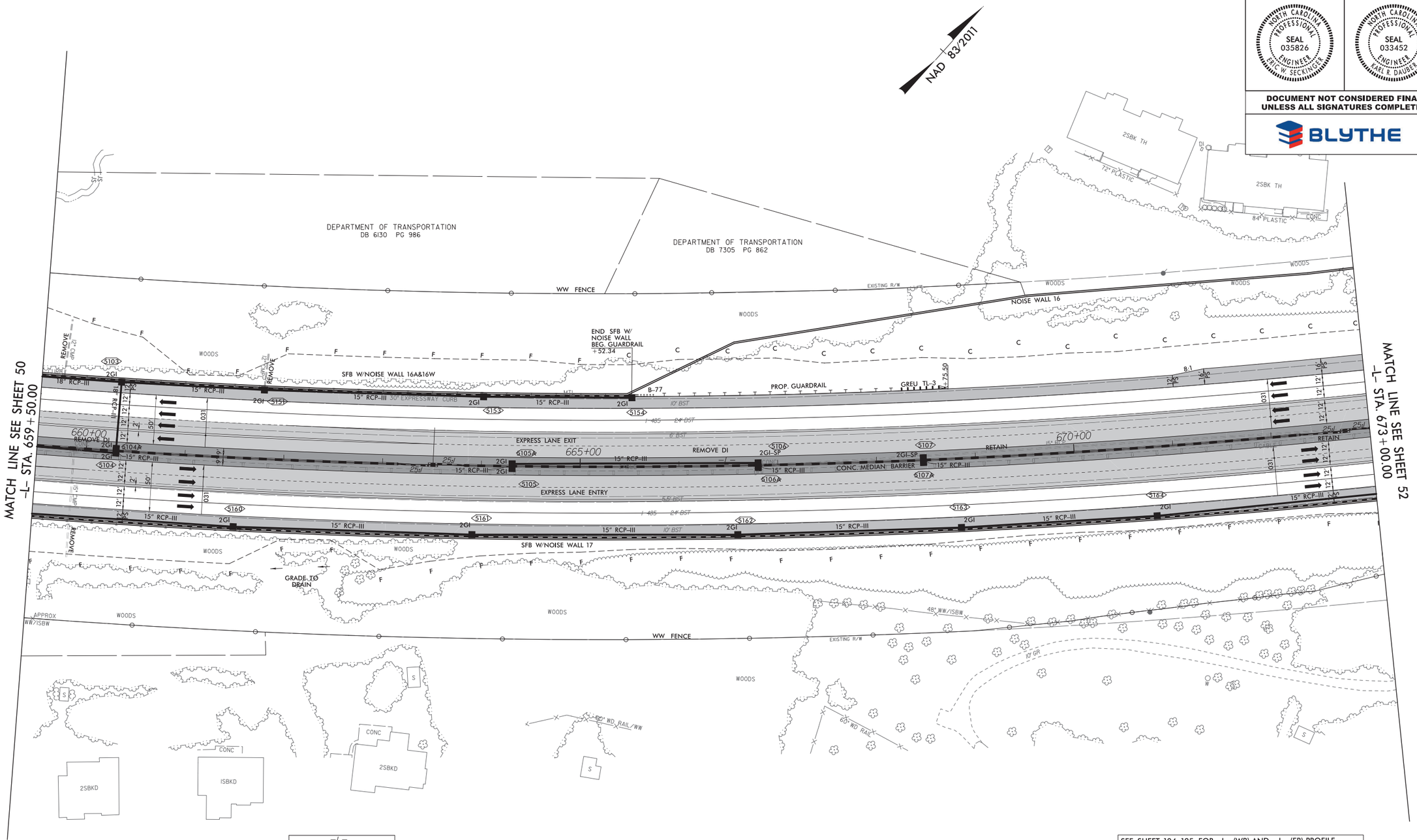

-L-
PI Sta 649+39.49
△ = 67° 32' 49.1" (LT)
D = 0° 44' 59.4"
L = 9,008.10'
T = 5,110.08'
R = 7,641.00'
SE = 0.031
DS = 75 MPH

SEE SHEET 104, 105 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 2N-16A&16W(3), 2N-16A&16W(4) FOR -NW16A&16W-
SEE SHEET 2N-17(3), 2N-17(4) FOR -NW17-

9/23/2019
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PROPWLCS01$

8/17/99

REVISIONS

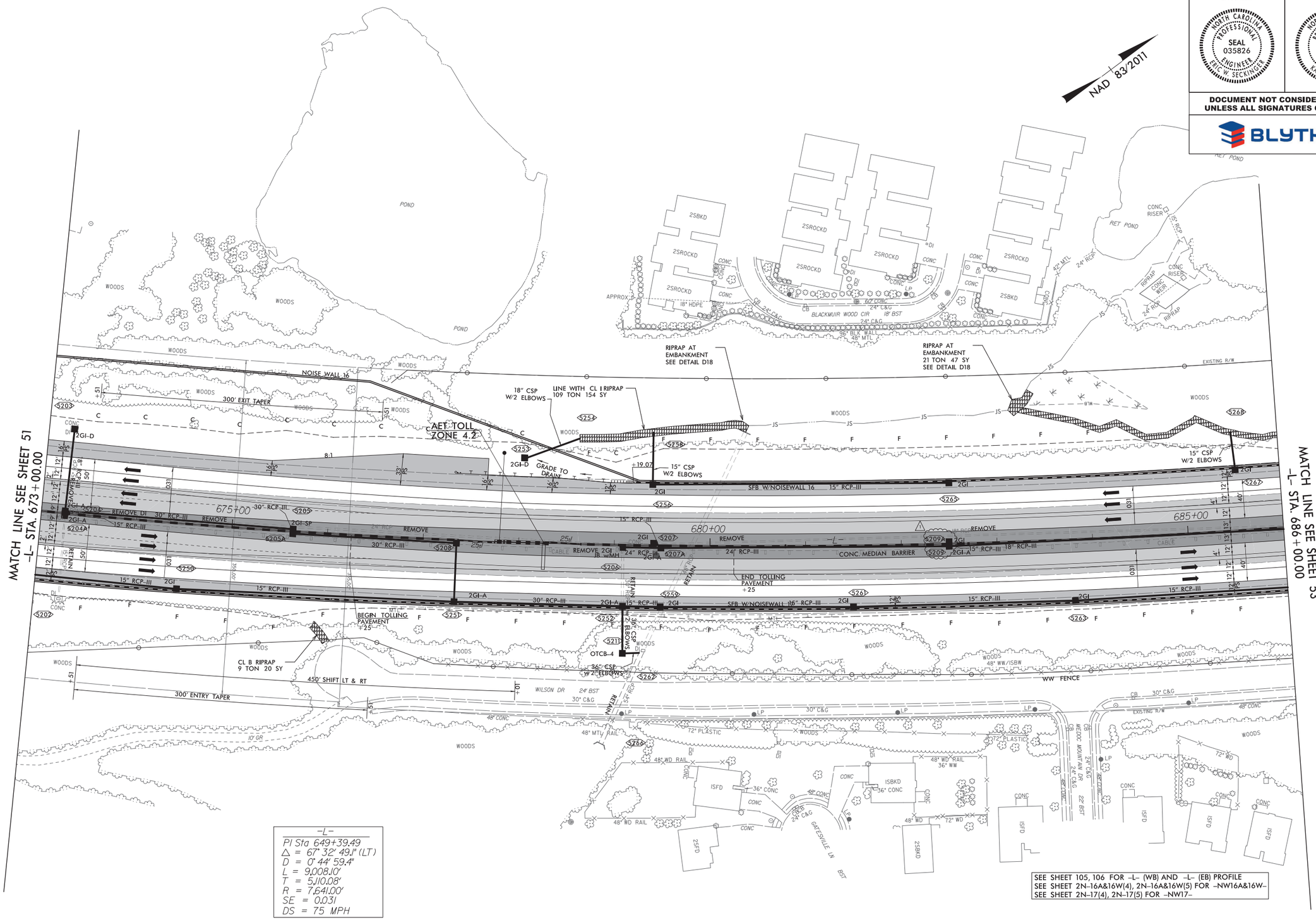
1. 9/5/19 – MOVED BOXES 5209A AND 5209

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	52
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W. SECKINGER	NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



SEE SHEET 105, 106 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 2N-16A&16W(4), 2N-16A&16W(5) FOR -NW16A&16W-
SEE SHEET 2N-17(4), 2N-17(5) FOR -NW17-

9/23/2019
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PROPWCS01$

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	53
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W. SECKINGER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

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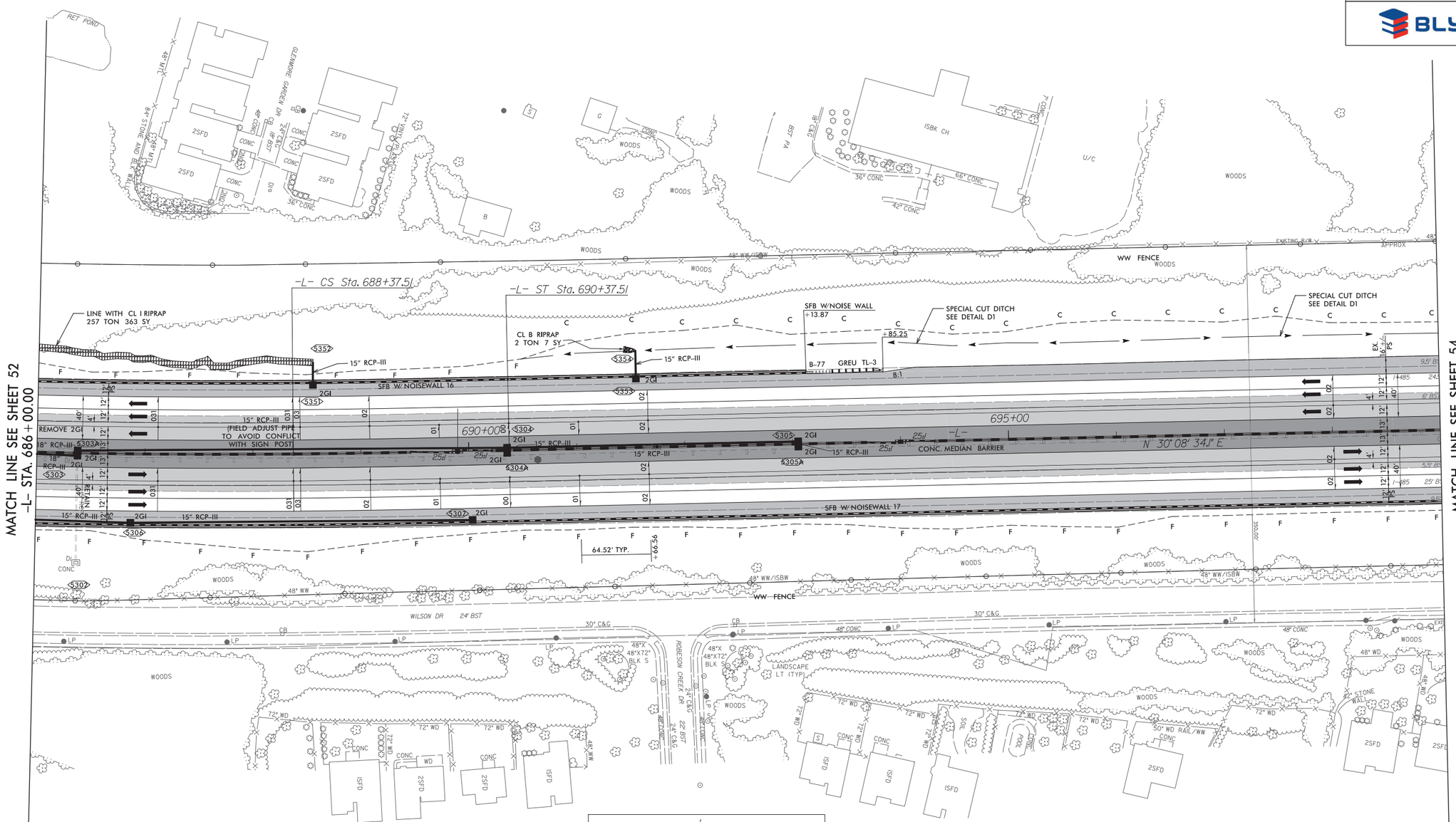
REVISIONS

8/17/99



-L-

PI Sta 649+39.49	PIs Sta 689+04.18
△ = 67° 32' 49.1" (LT)	Θs = 0° 44' 59.4"
D = 0° 44' 59.4"	Ls = 200.00'
L = 9,008.10'	LT = 133.33'
T = 5,110.08'	ST = 66.67'
R = 7,641.00'	
SE = 0.031	
DS = 75 MPH	

SEE SHEET 106, 107 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 2N-16A&16W(5) FOR -NW16A&16W-
SEE SHEET 2N-17(5), 2N-17(6) FOR -NW17-

9/23/2019
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PRDPWICS01$

8/17/99

REVISIONS

1. 9/5/19 – ADDED BOXES 5420, 5430, AND 5440.

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	54
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W SECKINGER

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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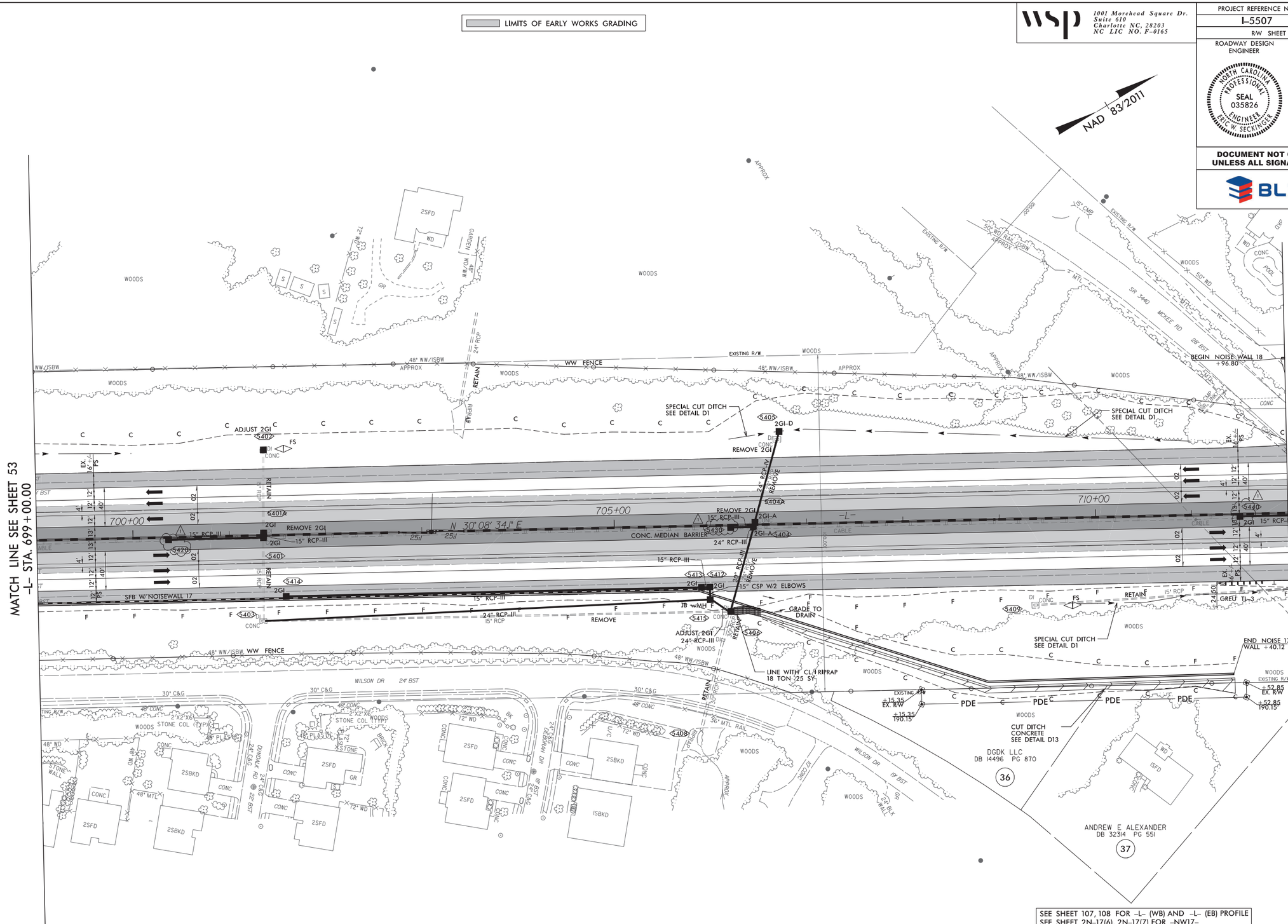

SEE SHEET 107, 108 FOR –L– (WB) AND –L– (EB) PROFILE
SEE SHEET 2N-17(6), 2N-17(7) FOR –NW17–
SEE SHEET 2N-18(1) FOR –NW18–

9/23/2019
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PAGE WICS01$

8/17/99

REVISIONS

1. 9/5/19 – ADDED BOX 5560.

LIMITS OF EARLY WORKS GRADING

wsp
1001 Morehead Square Dr.
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Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	55
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W. SECKINGER

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

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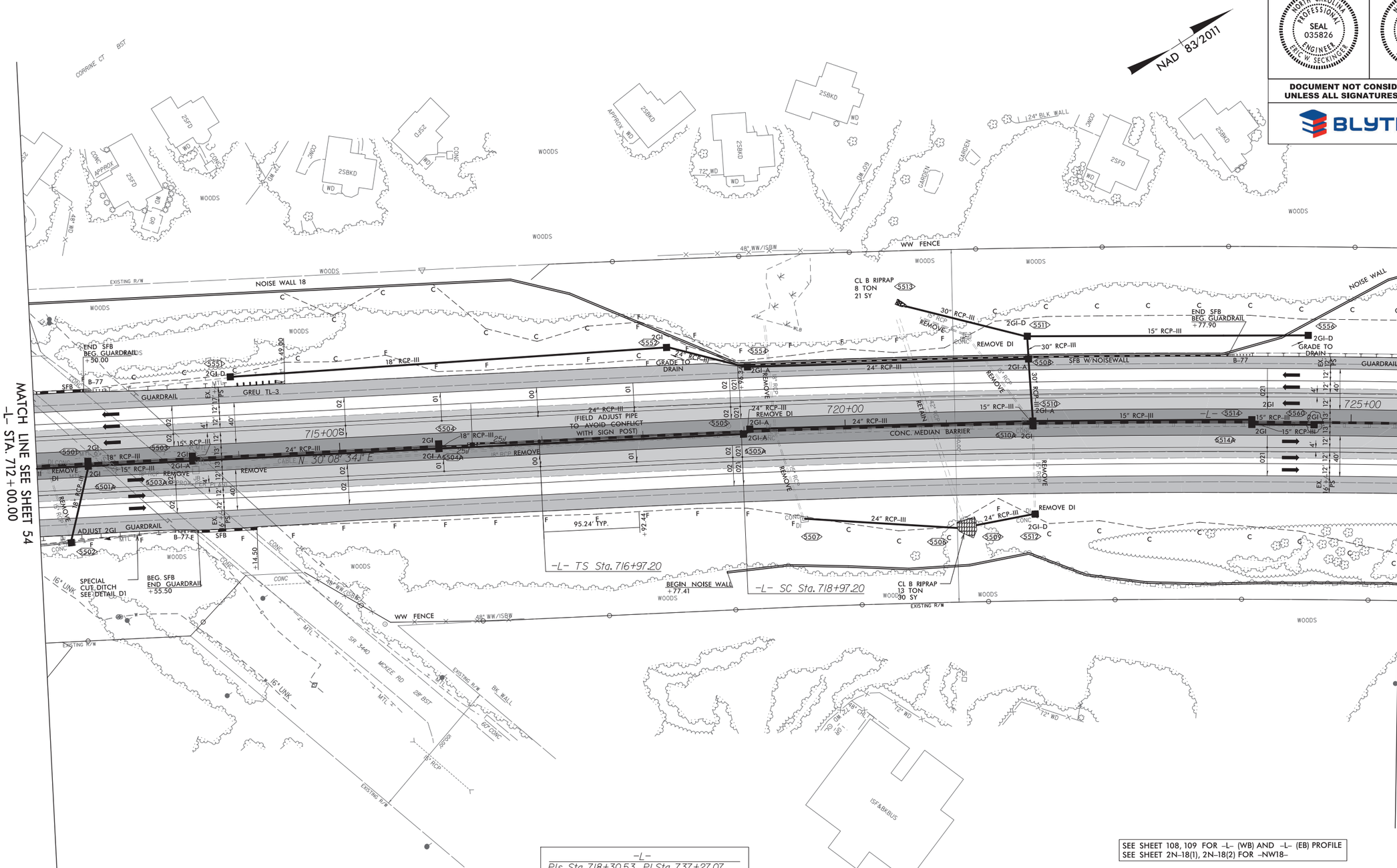

-L-	
PIs Sta 718+30.53	PI Sta 737+27.07
Θs = 0° 29' 59.4"	Δ = 18° 08' 22.2" (RT)
Ls = 200.00'	D = 0° 29' 59.4"
LT = 133.33'	L = 3,629.12'
ST = 66.67'	T = 1,829.87'
	R = 11,463.00'
	SE = 0.021
	DS = 75 MPH

SEE SHEET 108, 109 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 2N-18(1), 2N-18(2) FOR -NW18-

9/23/2019
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REVISIONS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	56
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W. SECKINGER

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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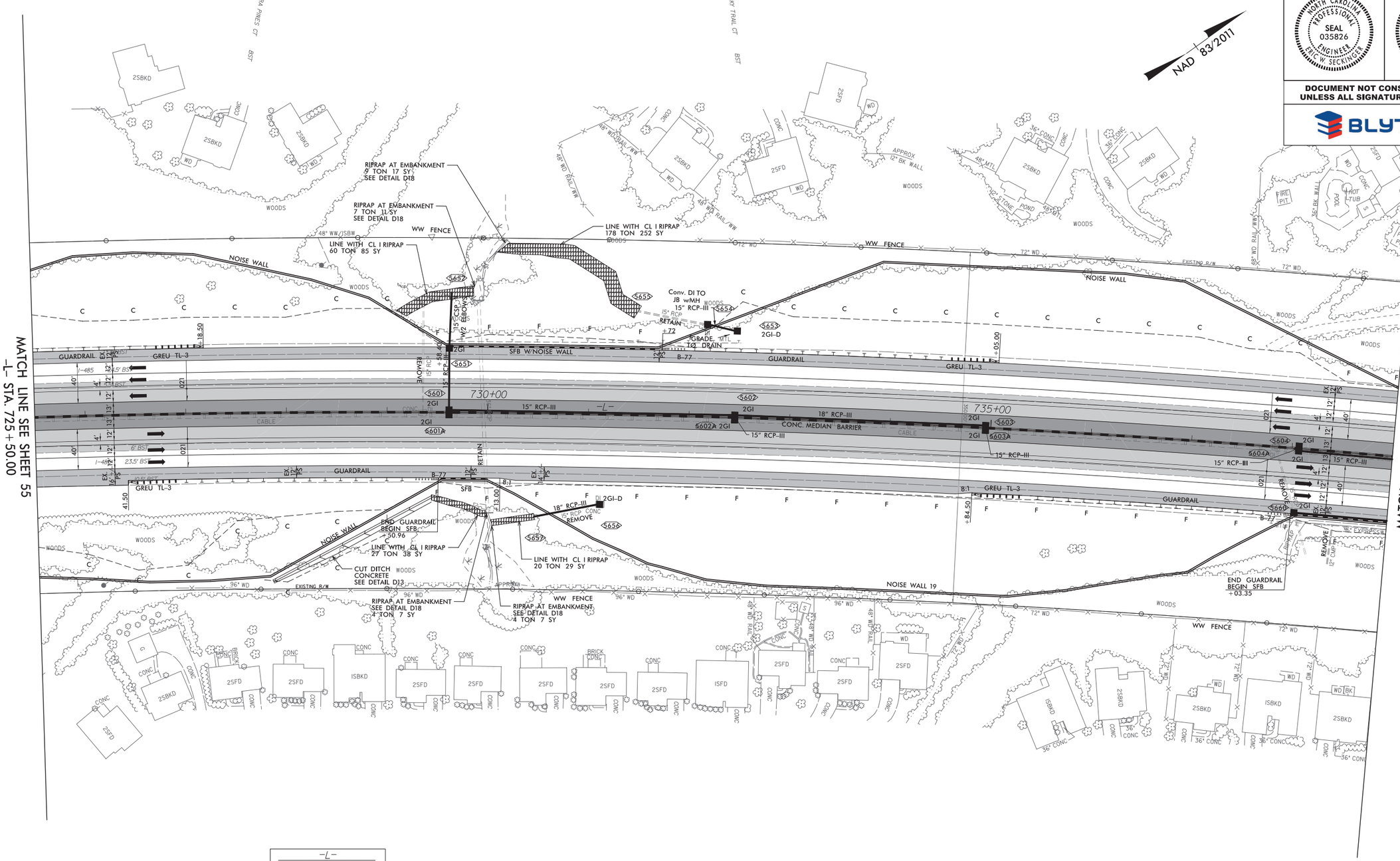

-L-
PI Sta 737+27.07
Δ = 18° 08' 22.2" (RT)
D = 0° 29' 59.4"
L = 3,629.12'
T = 1,829.87'
R = 11,463.00'
SE = 0.021
DS = 75 MPH

SEE SHEET 109, 110 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 2N-18(2), 2N-18(3) FOR -NW18-
SEE SHEET 2N-19(1), 2N-19(2) FOR -NW19-

9/23/2019
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REVISIONS

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1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	57
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W. SECKINGER

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

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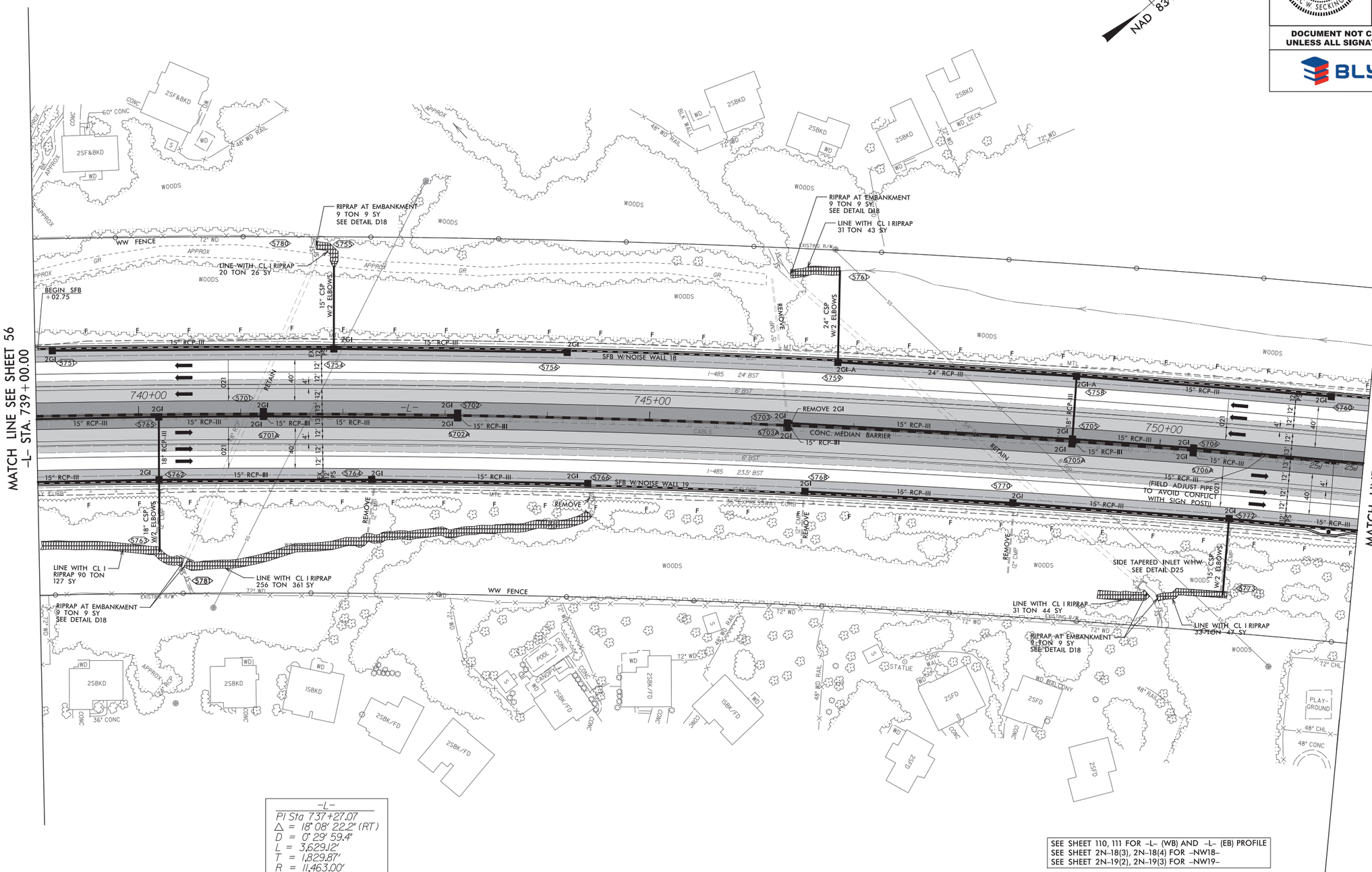
NAD 83/2011



SEE SHEET 110, 111 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 2N-18(3), 2N-18(4) FOR -NW18-
SEE SHEET 2N-19(2), 2N-19(3) FOR -NW19-

9/23/2019
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wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	58
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W. SECKINGER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

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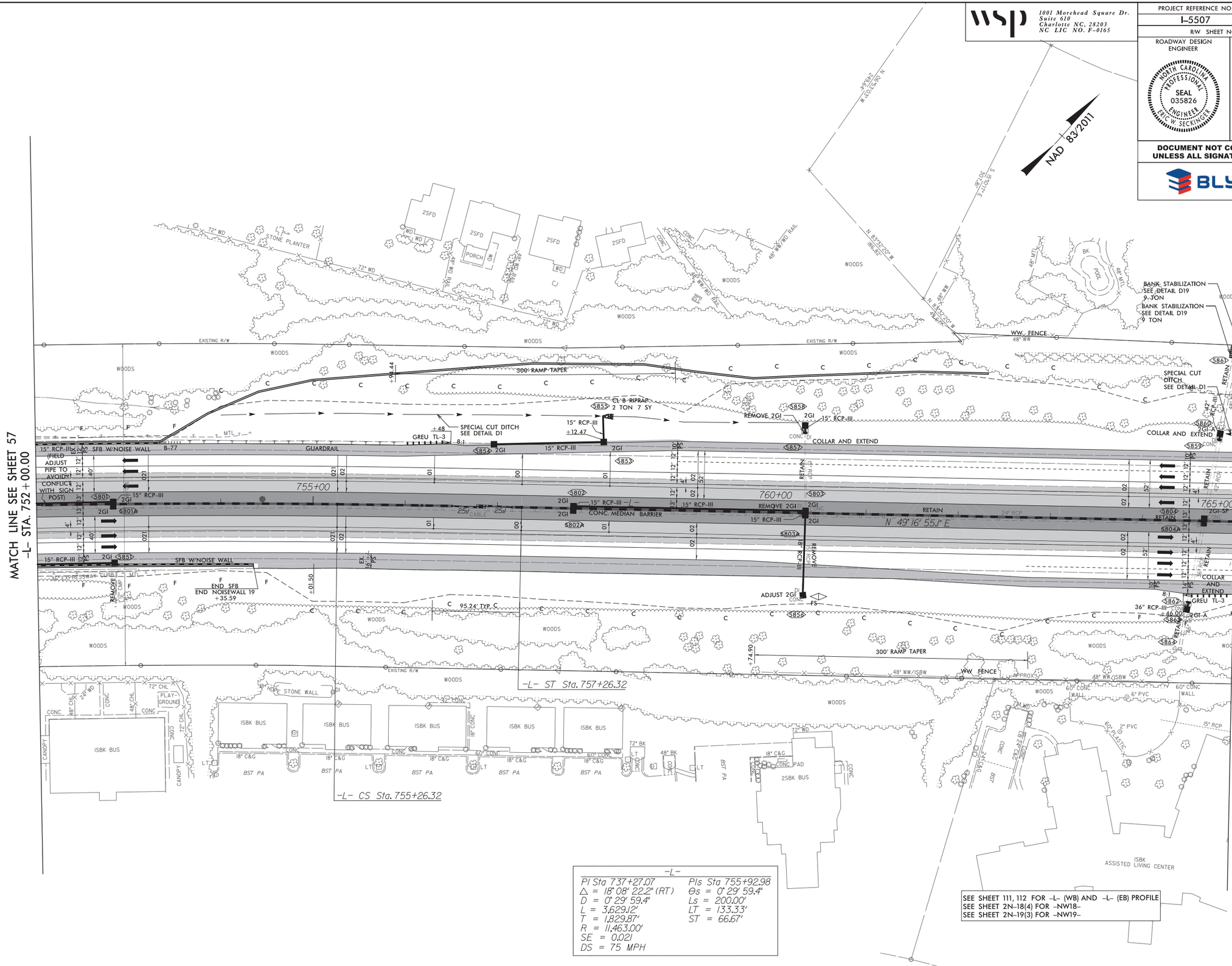

-L-

PI Sta 737+27.07	PIs Sta 755+92.98
Δ = 18° 08' 22.2" (RT)	Θs = 0° 29' 59.4"
D = 0° 29' 59.4"	Ls = 200.00'
L = 3,629.12'	LT = 133.33'
T = 1,829.87'	ST = 66.67'
R = 11,463.00'	
SE = 0.021	
DS = 75 MPH	

SEE SHEET 111, 112 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 2N-18(4) FOR -NW18-
SEE SHEET 2N-19(3) FOR -NW19-

REVISIONS

8/17/99

9/23/2019
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8/17/99

REVISIONS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	62
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W. SECKINGER

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

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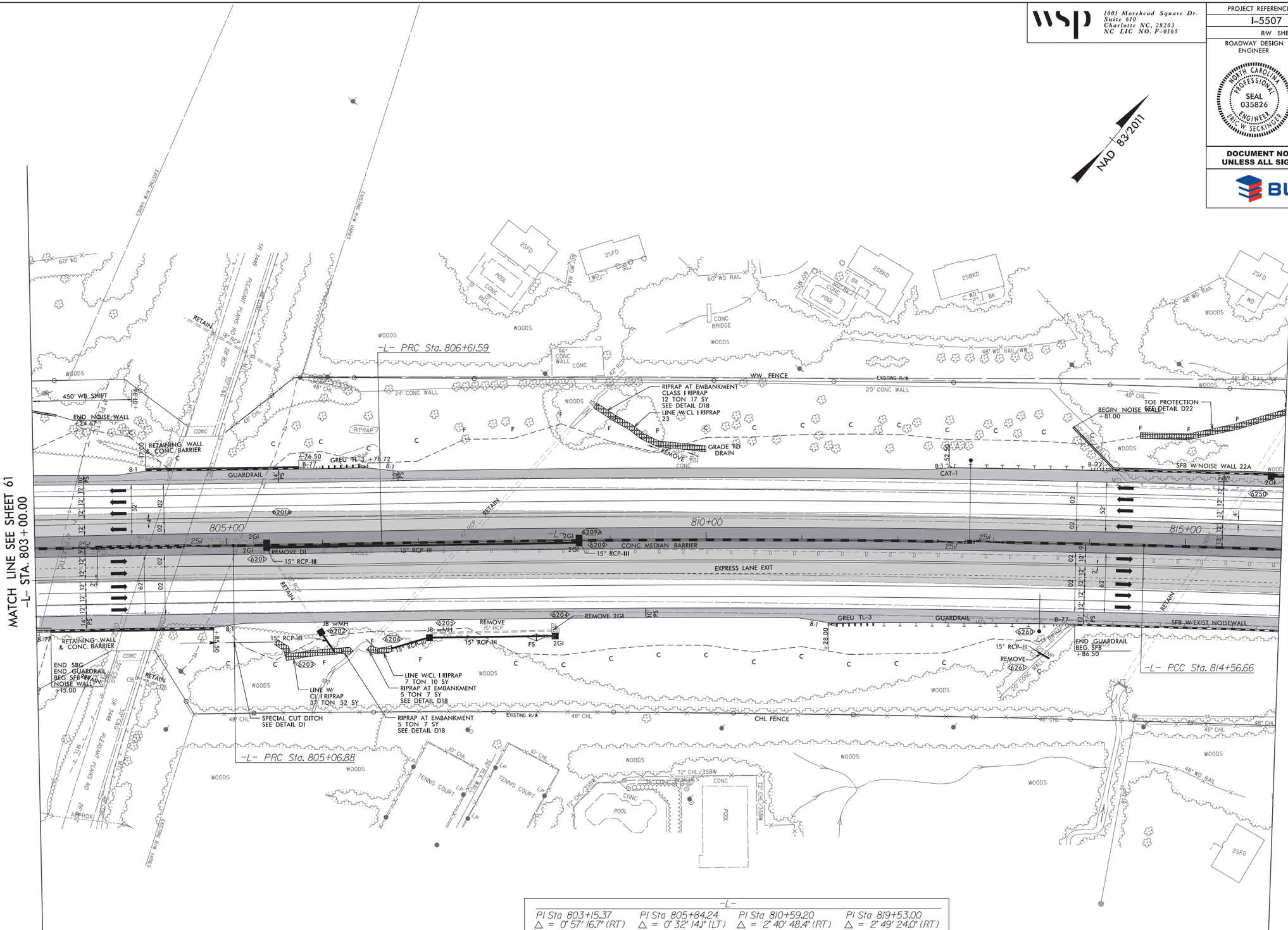

-L-			
PI Sta 803+15.37	PI Sta 805+84.24	PI Sta 810+59.20	PI Sta 819+53.00
△ = 0° 57' 16.7" (RT)	△ = 0° 32' 14.1" (LT)	△ = 2° 40' 48.4" (RT)	△ = 2° 49' 24.0" (RT)
D = 0° 14' 57.3"	D = 0° 20' 50.1"	D = 0° 20' 13.5"	D = 0° 17' 04.1"
L = 383.02'	L = 154.72'	L = 795.07'	L = 992.47'
T = 191.51'	T = 77.36'	T = 397.61'	T = 496.34'
R = 22,988.00'	R = 16,500.00'	R = 16,997.00'	R = 20,141.00'
SE = NC	SE = NC	SE = NC	SE = NC
DS = 75 MPH	DS = 75 MPH	DS = 75 MPH	DS = 75 MPH

SEE SHEET 115 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 2N-22A(1) FOR -NW22A-
RETAINING WALL SHEET TO BE PROVIDED

9/23/2019
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REVISIONS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	63
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W SECKINGER

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R DAUBER

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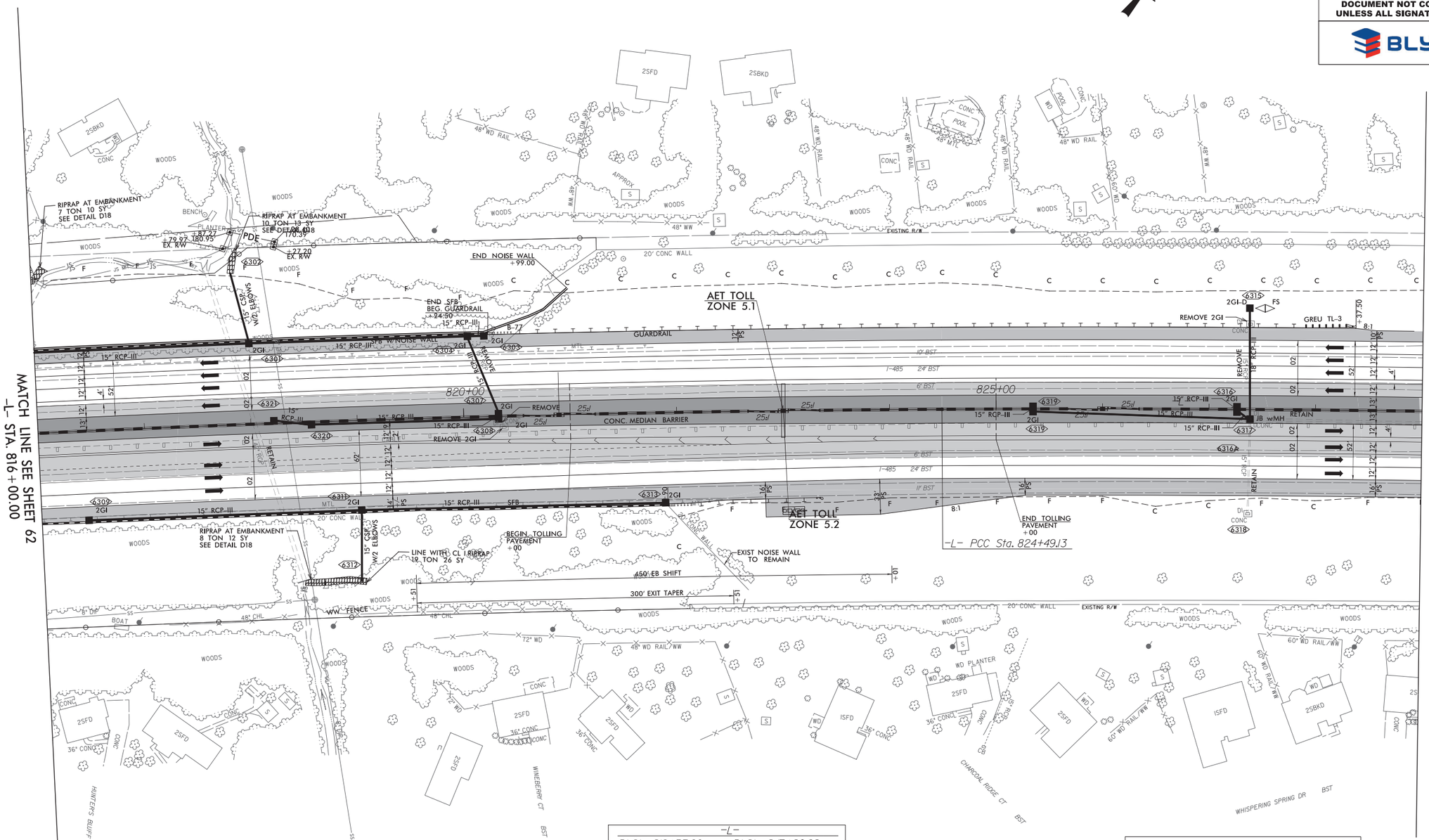
NAD 83/2011



-L-	
PI Sta 819+53.00	PI Sta 847+20.62
△ = 2° 49' 24.0" (RT)	△ = 11° 07' 36.0" (RT)
D = 0° 17' 04.1"	D = 0° 14' 44.5"
L = 992.47'	L = 4,528.68'
T = 496.34'	T = 2,271.48'
R = 20,141.00'	R = 23,320.00'
SE = NC	SE = NC
DS = 75 MPH	DS = 75 MPH

SEE SHEET 115, 116 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 2N-22A(1) FOR -NW22A-

9/23/2019
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REVISIONS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	67
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W. SECKINGER

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL E. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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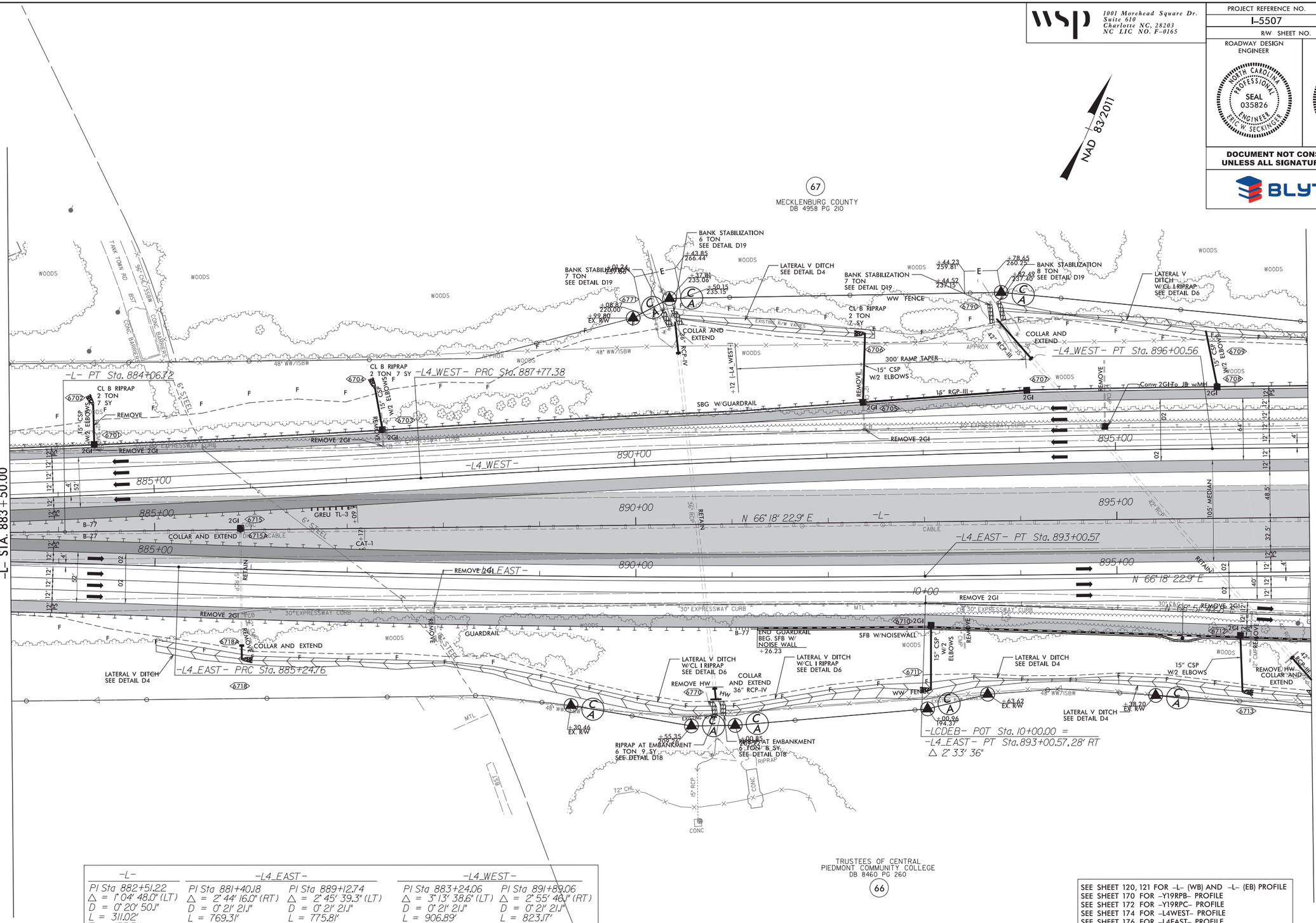

-L-	-L4_EAST-		-L4_WEST-	
PI Sta 882+51.22	PI Sta 881+40.18	PI Sta 889+12.74	PI Sta 883+24.06	PI Sta 891+89.06
△ = 1° 04' 48.0" (LT)	△ = 2° 44' 16.0" (RT)	△ = 2° 45' 39.3" (LT)	△ = 3° 13' 38.6" (LT)	△ = 2° 55' 46.1" (RT)
D = 0° 20' 50.1"	D = 0° 21' 21.1"	D = 0° 21' 21.1"	D = 0° 21' 21.1"	D = 0° 21' 21.1"
L = 311.02'	L = 769.31'	L = 775.81'	L = 906.89'	L = 823.17'
T = 155.51'	T = 384.73'	T = 387.98'	T = 453.57'	T = 411.68'
R = 16,500.00'	R = 16,100.00'	R = 16,100.00'	R = 16,100.00'	R = 16,100.00'
SE = NC	SE = NC	SE = NC	SE = NC	SE = NC
DS = 75 MPH	DS = 75 MPH	DS = 75 MPH	DS = 75 MPH	DS = 75 MPH

SEE SHEET 120, 121 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 170 FOR -Y19RPB- PROFILE
SEE SHEET 172 FOR -Y19RPC- PROFILE
SEE SHEET 174 FOR -L4WEST- PROFILE
SEE SHEET 176 FOR -L4EAST- PROFILE
SEE SHEET 2N-25C(1) FOR -NW25C-

9/23/2019
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PROPWLCS01$

8/17/99

REVISIONS

LIMITS OF EARLY WORKS GRADING

-L4_WEST-	-Y19RPC-		-Y19RPDB-			-LCDEB-
PI Sta 912+09.39	PIs Sta 11+33.34	PI Sta 27+42.24	PIs Sta 11+33.35	PI Sta 14+33.01	PIs Sta 17+30.62	PI Sta 18+31.15
Δ = 2° 54' 33.3" (RT)	Θs = 2° 14' 39.3"	Δ = 62° 16' 17.7" (RT)	Θs = 2° 51' 53.2"	Δ = 13° 17' 26.8" (LT)	Θs = 2° 51' 53.2"	Δ = 2° 34' 44.9" (LT)
D = 0° 21' 21.1"	Ls = 200.00'	D = 2° 14' 39.3"	Ls = 200.00'	D = 2° 51' 53.2"	Ls = 200.00'	D = 0° 29' 53.6"
L = 817.49'	LT = 133.34'	L = 2,774.71'	LT = 133.35'	L = 463.94'	LT = 133.35'	L = 517.67'
T = 408.83'	ST = 66.68'	T = 1,542.24'	ST = 66.68'	T = 233.01'	ST = 66.68'	T = 258.88'
R = 16,100.00'		R = 2,553.00'		R = 2,000.00'		R = 11,500.00'
SE = NC		SE = 0.06		SE = 0.07		SE = RC
DS = 75 MPH		DS = 60 MPH		DS = 70 MPH		DS = 70 MPH

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	68
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W. SECKINGER

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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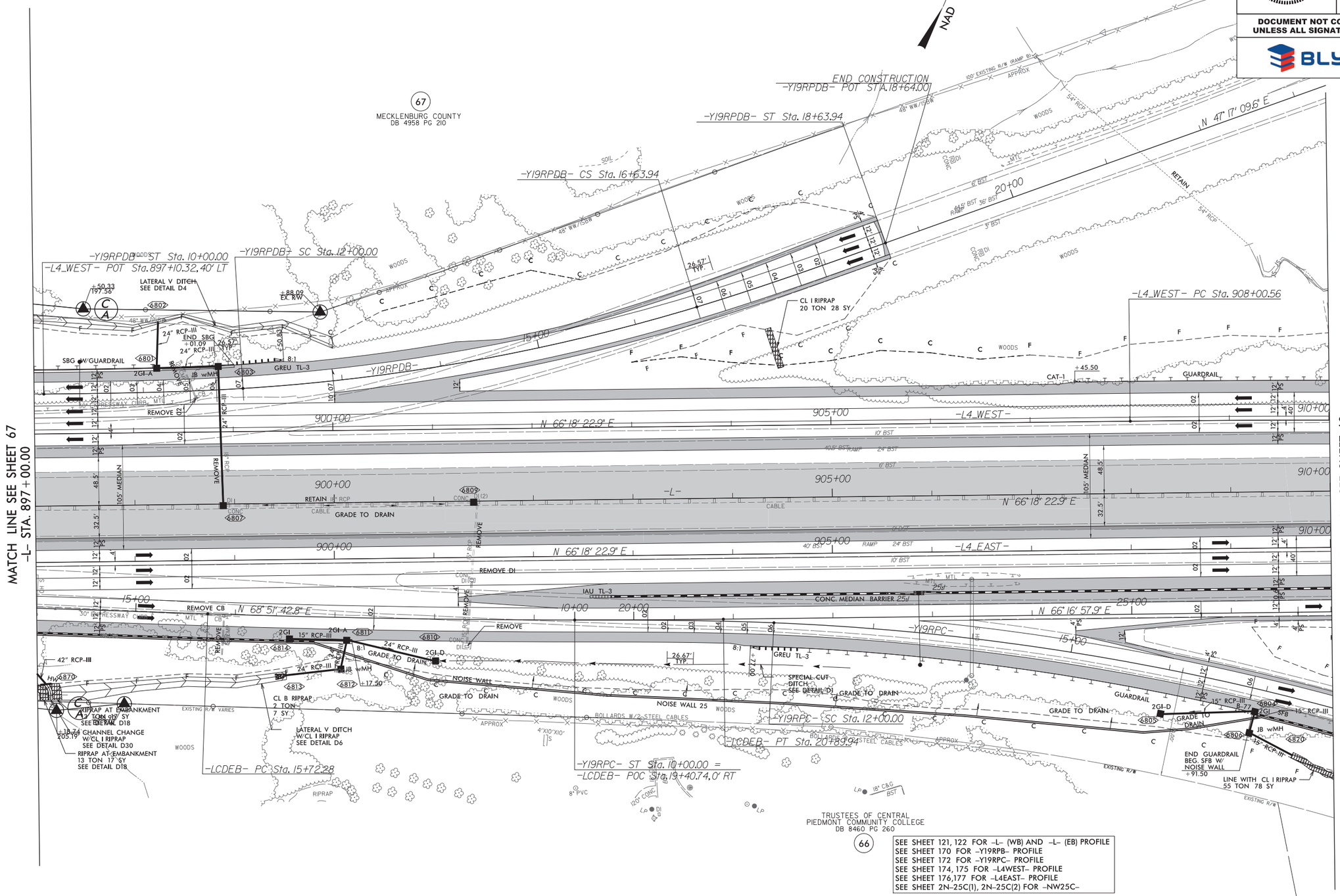

SEE SHEET 121, 122 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 170 FOR -Y19RPB- PROFILE
SEE SHEET 172 FOR -Y19RPC- PROFILE
SEE SHEET 174, 175 FOR -L4WEST- PROFILE
SEE SHEET 176,177 FOR -L4EAST- PROFILE
SEE SHEET 2N-25C(1), 2N-25C(2) FOR -NW25C-

9/23/2019
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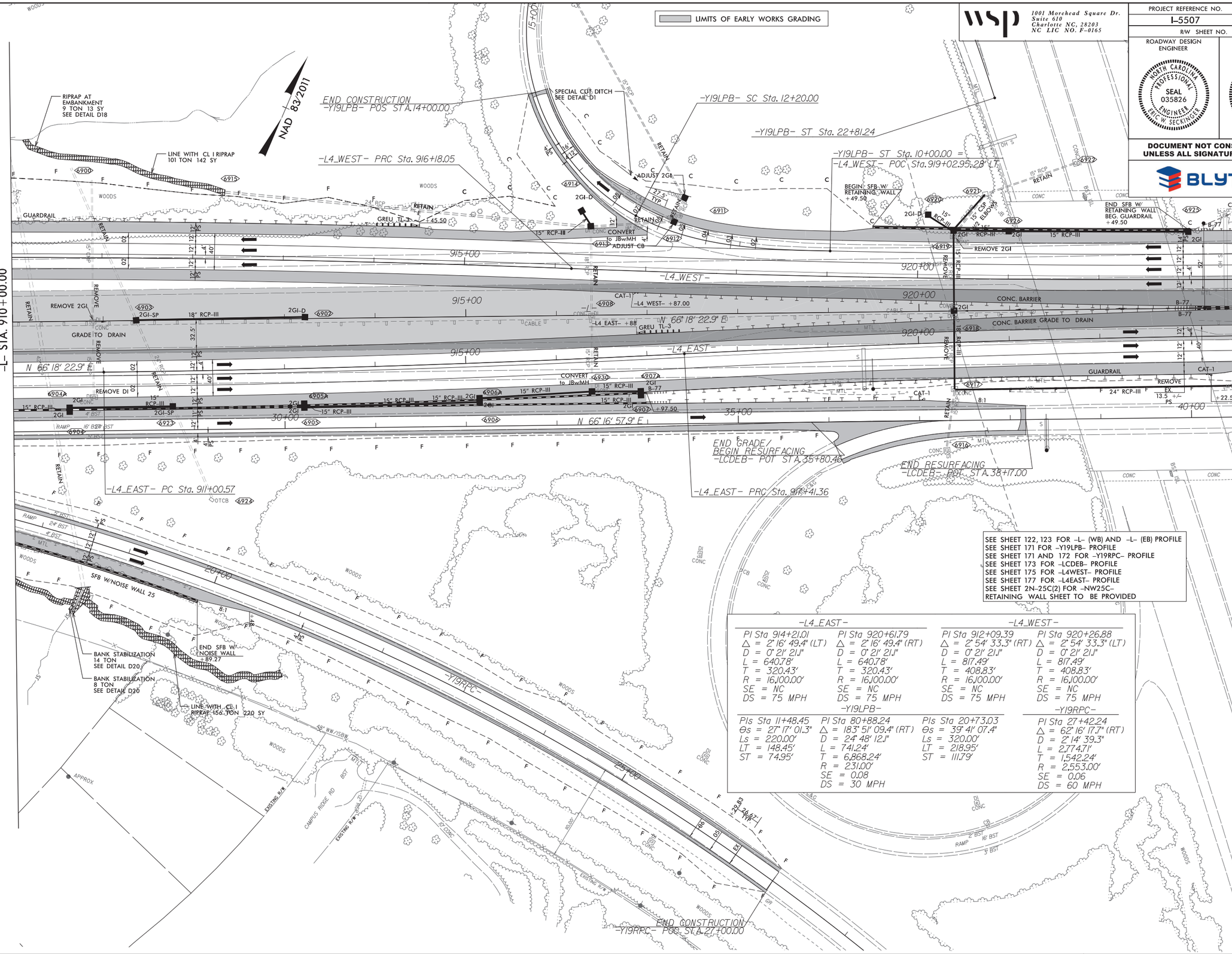
REVISIONS



SEE SHEET 122, 123 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 171 FOR -Y19LPB- PROFILE
SEE SHEET 171 AND 172 FOR -Y19RPC- PROFILE
SEE SHEET 173 FOR -LCDEB- PROFILE
SEE SHEET 175 FOR -L4WEST- PROFILE
SEE SHEET 177 FOR -L4EAST- PROFILE
SEE SHEET 2N-25C(2) FOR -NW25C-
RETAINING WALL SHEET TO BE PROVIDED

-L4_EAST-		-L4_WEST-	
PI Sta 914+21.01	PI Sta 920+61.79	PI Sta 912+09.39	PI Sta 920+26.88
Δ = 2° 16' 49.4" (LT)	Δ = 2° 16' 49.4" (RT)	Δ = 2° 54' 33.3" (RT)	Δ = 2° 54' 33.3" (LT)
D = 0° 21' 21.1"	D = 0° 21' 21.1"	D = 0° 21' 21.1"	D = 0° 21' 21.1"
L = 640.78'	L = 640.78'	L = 817.49'	L = 817.49'
T = 320.43'	T = 320.43'	T = 408.83'	T = 408.83'
R = 16,100.00'	R = 16,100.00'	R = 16,100.00'	R = 16,100.00'
SE = NC	SE = NC	SE = NC	SE = NC
DS = 75 MPH	DS = 75 MPH	DS = 75 MPH	DS = 75 MPH

-Y19LPB-			-Y19RPC-
PIs Sta 11+48.45	PI Sta 80+88.24	PIs Sta 20+73.03	PI Sta 27+42.24
Θs = 27° 17' 01.3"	Δ = 183° 51' 09.4" (RT)	Θs = 39° 41' 07.4"	Δ = 62° 16' 17.7" (RT)
Ls = 220.00'	D = 24° 48' 12.1"	Ls = 320.00'	D = 2° 14' 39.3"
LT = 148.45'	L = 741.24'	LT = 218.95'	L = 2,774.71'
ST = 74.95'	T = 6,868.24'	ST = 111.79'	T = 1,542.24'
	R = 231.00'		R = 2,553.00'
	SE = 0.08		SE = 0.06
	DS = 30 MPH		DS = 60 MPH

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	69
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W. SECKINGER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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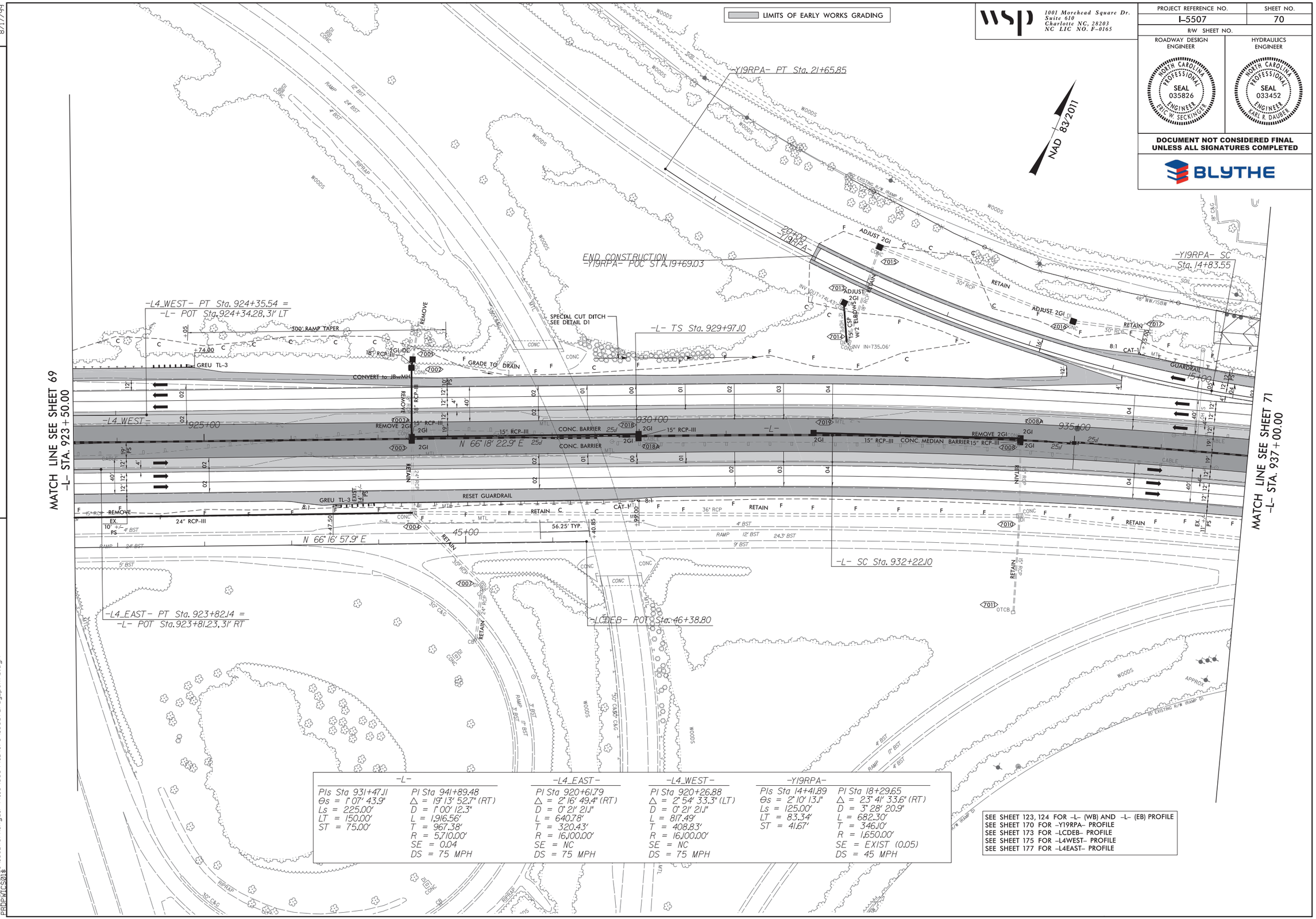

-L-		-L4_EAST-	-L4_WEST-	-Y19RPA-	
PIs Sta 931+47.11	PI Sta 941+89.48	PI Sta 920+61.79	PI Sta 920+26.88	PIs Sta 14+41.89	PI Sta 18+29.65
Θs = 1° 07' 43.9"	Δ = 19° 13' 52.7" (RT)	Δ = 2° 16' 49.4" (RT)	Δ = 2° 54' 33.3" (LT)	Θs = 2° 10' 13.1"	Δ = 23° 41' 33.6" (RT)
Ls = 225.00'	D = 1° 00' 12.3"	D = 0° 21' 21.1"	D = 0° 21' 21.1"	Ls = 125.00'	D = 3° 28' 20.9"
LT = 150.00'	L = 1,916.56'	L = 640.78'	L = 817.49'	LT = 83.34'	L = 682.30'
ST = 75.00'	T = 967.38'	T = 320.43'	T = 408.83'	ST = 41.67'	T = 346.10'
	R = 5,710.00'	R = 16,100.00'	R = 16,100.00'		R = 1,650.00'
	SE = 0.04	SE = NC	SE = NC		SE = EXIST (0.05)
	DS = 75 MPH	DS = 75 MPH	DS = 75 MPH		DS = 45 MPH

SEE SHEET 123, 124 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 170 FOR -Y19RPA- PROFILE
SEE SHEET 173 FOR -LCDEB- PROFILE
SEE SHEET 175 FOR -L4WEST- PROFILE
SEE SHEET 177 FOR -L4EAST- PROFILE

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	70
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W. SECKINGER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

REVISIONS

8/17/99

9/23/2019
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PRDPWICS01$

8/17/99

REVISIONS

1. 9/5/19 - ADDED BOX 7120.

LIMITS OF EARLY WORKS GRADING

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

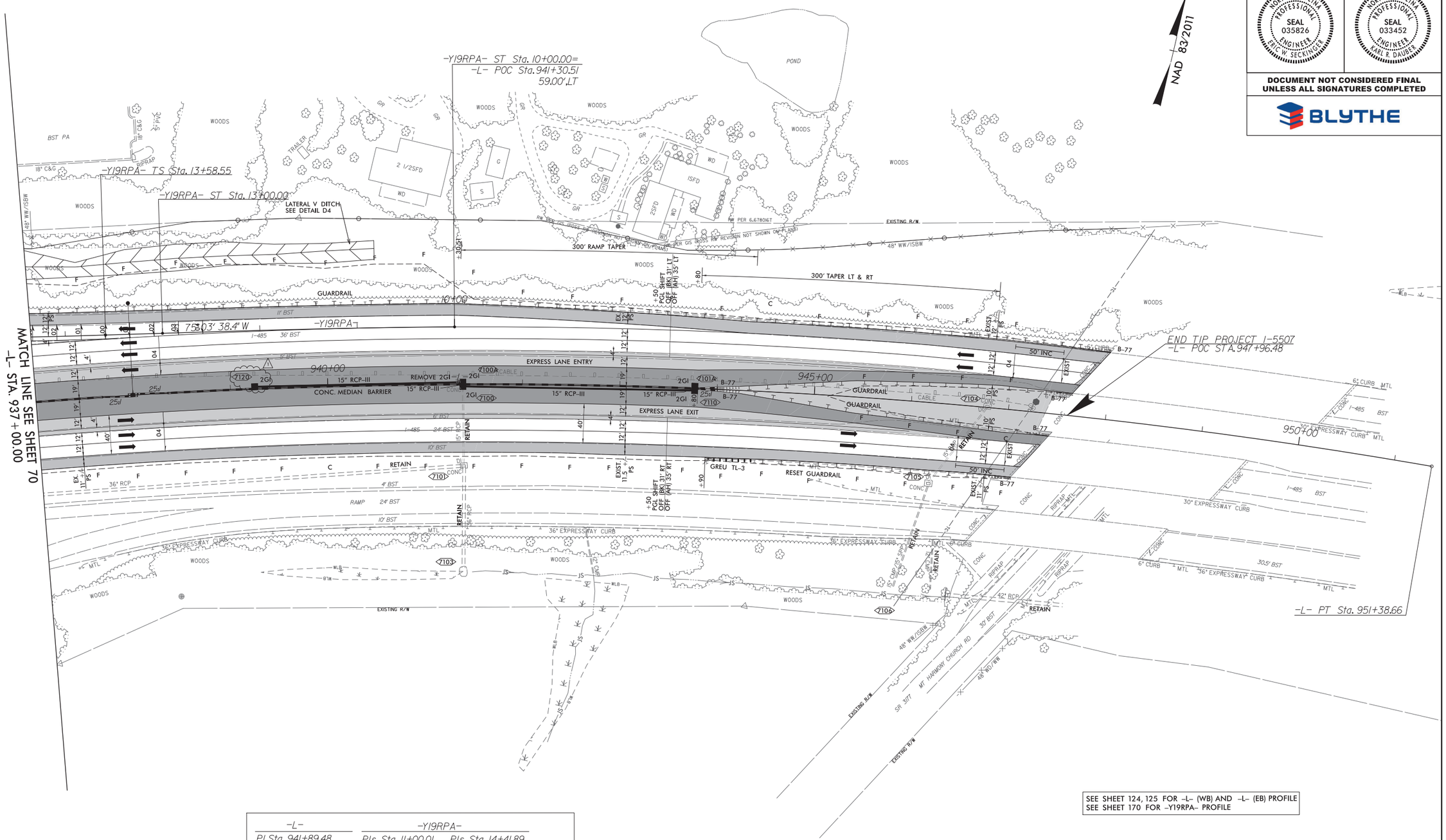
PROJECT REFERENCE NO.	SHEET NO.
I-5507	71
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 035826 ENGINEER ERIC W. SECKINGER

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033452 ENGINEER KARL R. DAUBER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



-L-	-Y19RPA-	
PI Sta 941+89.48	PIs Sta 11+00.01	PIs Sta 14+41.89
Δ = 19° 13' 52.7" (RT)	Θs = 1° 29' 23.1"	Θs = 2° 10' 13.1"
D = 1° 00' 12.3"	Ls = 300.00'	Ls = 125.00'
L = 1,916.56'	LT = 200.01'	LT = 83.34'
T = 967.38'	ST = 100.01'	ST = 41.67'
R = 5,710.00'		
SE = 0.04		
DS = 75 MPH		

SEE SHEET 124, 125 FOR -L- (WB) AND -L- (EB) PROFILE
SEE SHEET 170 FOR -Y19RPA- PROFILE

9/23/2019
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PROPWICS01$

8/17/99

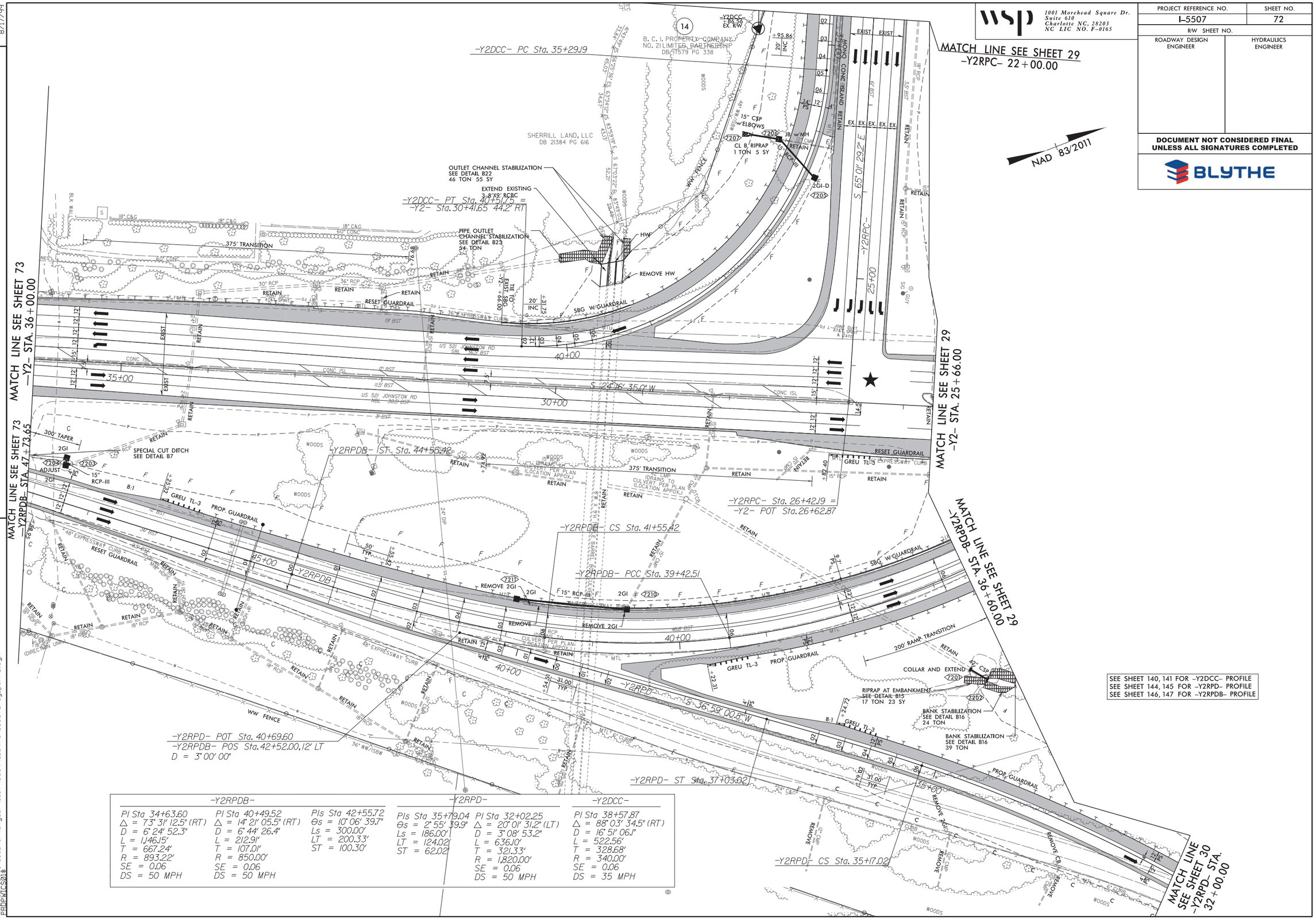
REVISIONS

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

PROJECT REFERENCE NO.	SHEET NO.
I-5507	72
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE



-Y2RPDB-			-Y2RPD-		-Y2DCC-
PI Sta 34+63.60	PI Sta 40+49.52	PIs Sta 42+55.72	PIs Sta 35+79.04	PI Sta 32+02.25	PI Sta 38+57.87
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D = 6° 24' 52.3"	D = 6° 44' 26.4"	Ls = 300.00'	Ls = 186.00'	D = 3° 08' 53.2"	D = 16° 51' 06.1"
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FROM WTC301$

wsp
1001 Morehead Square Dr.
Suite 610
Charlotte NC, 28203
NC LIC NO. F-0165

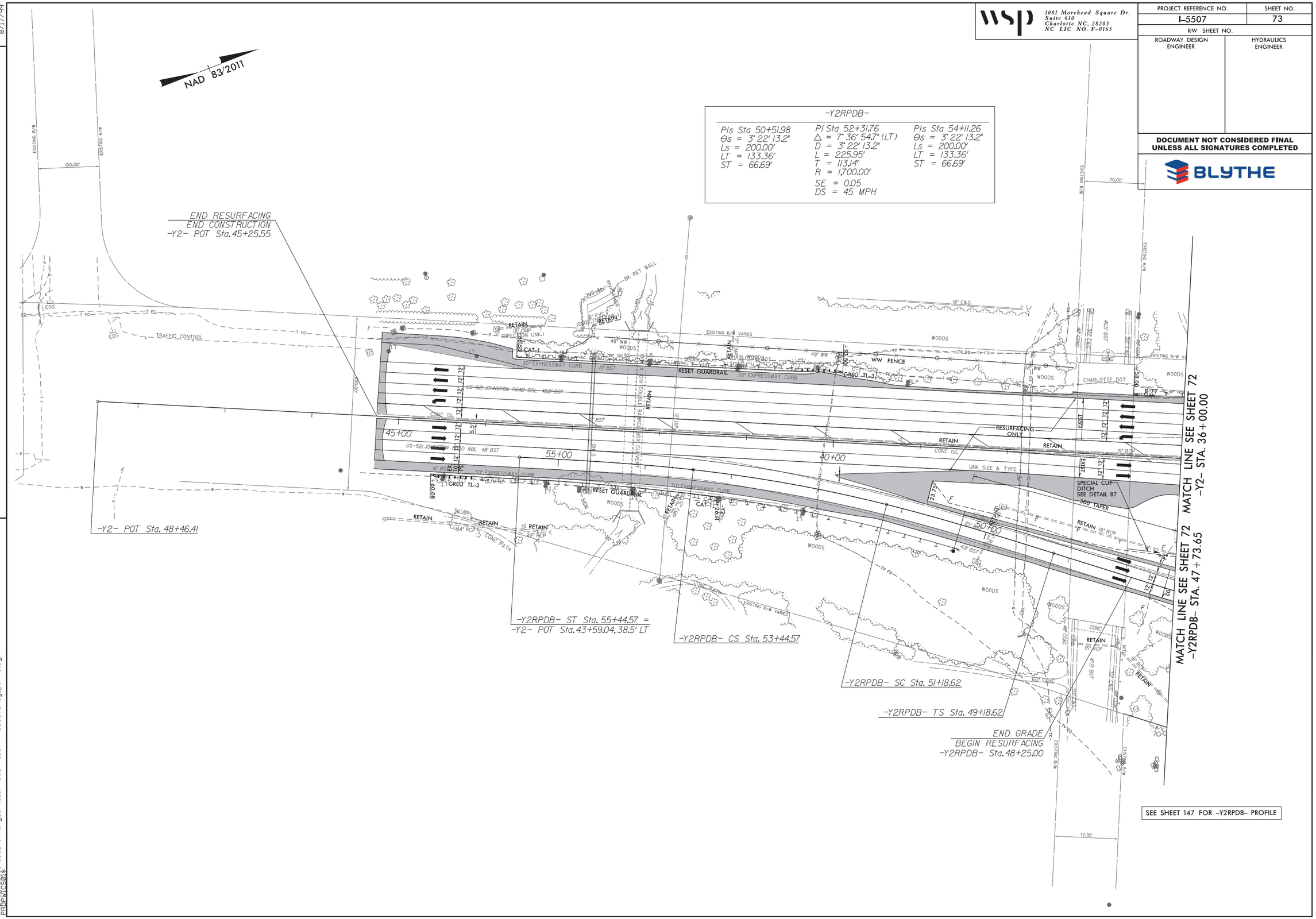
PROJECT REFERENCE NO.	SHEET NO.
I-5507	73
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BLYTHE

REVISIONS

8/17/99



SEE SHEET 147 FOR -Y2RPDB- PROFILE

9/12/2019
\\prdpwics01\ics_workingdir\3107\335941_3977\i5507_rdy_psh73.dgn
PRDPWICS01$

Freshwater Mussel Survey Report

Widening and Interchange Improvements for I-485
Mecklenburg County, North Carolina
TIP Number I-5507
WBS Element # 43609.1.1

Prepared For:

NC Department of Transportation
Raleigh, North Carolina

Contact Person:

Jared Gray
Biological Surveys Group
North Carolina Department of Transportation
jgray@ncdot.gov
1598 Mail Service Center
Raleigh NC 27699-1598

August 24, 2018

Prepared by:

900 Ridgefield Drive, Suite 350
Raleigh, NC 27609

Contact Person:

Neil Medlin
Project Manager
nmedlin@rkk.com
919-878-9560

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Figure 1: Project Vicinity & Survey Location
Figure 2: NCNHP Element Occurrences
Figure 3: NPDES Dischargers and 303(d) Listed Streams

1.0 Introduction

The North Carolina Department of Transportation (NCDOT) proposes to make improvements to I-485 from I-77 to US 74 in Mecklenburg County (Appendix A, Figure 1). The project is located predominantly within the Catawba River Basin with only a small portion within the Yadkin Pee-Dee River Basin. The Carolina Heelsplitter (*Lasmigona decorata*) is currently listed for Mecklenburg County by the U.S. Fish and Wildlife Service (USFWS) as a protected species under the Endangered Species Act (ESA).

A review of the NC Natural Heritage Program (NCNHP) records, last accessed on July 20, 2018, indicated there are element occurrences (EOs) for the target mussel species within a 5-mile buffer of the project (Figure 2). The closest current occurrence for Carolina Heelsplitter (EO ID 28415) is located on Sixmile Creek, approximately three stream miles from the project study area. The EO was first observed on February 22, 2007 and last observed on June 7, 2011. A historical EO for the Carolina Heelsplitter (EO ID 13485) intersects the project study area on Sugar Creek. The only observed date listed for this EO was pre-1918.

2.0 Waters Affected

Most of this project is located within the Catawba River Basin (HUC# 03050103). Streams potentially affect by the project in the Catawba River Basin include Sugar Creek, Kings Branch, Little Sugar Creek, McMullen Creek, McAlpine Creek, Fourmile Creek, Sixmile Creek, and unnamed tributaries (UTs) to these streams. A portion of the project area around the I-485 and US 74 interchange is located within the Yadkin Pee-Dee River Basin (HUC# 03040105). The only streams in this basin potentially affected by the project are the upper headwaters of UTs to North Fork Crooked Creek.

2.1 NPDES Dischargers

There are multiple NPDES permitted dischargers in locations that could directly affect streams within the project study area (Figure 3). In addition to the numerous minor permitted facilities discharging to project study area streams (primarily the Sugar Creek and Little Sugar Creek catchments), there are three major facilities discharging into the project streams. The Irwin Creek Waste Water Treatment Plant (WWTP) (NPDES permit # NC0024945) discharges into Irwin Creek just above its confluence with Sugar Creek. The Sugar Creek WWTP (NPDES permit # NC 0024937) discharges into Little Sugar Creek above the project study area. The McAlpine Creek WWTP (NPDES permit # NC0024970) is the third major discharger. Although the facility discharges into McAlpine Creek just below the project study area, the discharge has the potential to create an instream environment inhospitable to freshwater mussels and thereby block possible recolonization of mussels into the project study area from any downstream populations.

2.2 303(d) Classification

Multiple streams that intersect the project study area or have UTs that intersect the project study area are on the North Carolina Department of Environmental Quality (NCDEQ) - Division of

Water Resources 2016 303(d) list of impaired streams (Figure 3). Sugar Creek and Little Sugar Creek are on the list for exceeding copper standards. McMullen Creek, Sixmile Creek, and North Fork Crooked Creek are on the list for Poor bioclassification ratings. McAlpine Creek is on the list for receiving a Fair bioclassification.

3.0 Target Federally Protected Species Descriptions

3.1 Carolina Heelsplitter (*Lasmigona decorata*)

3.1.1 Characteristics

The Carolina Heelsplitter was first described in 1852. This species has an ovate, trapezoid-shaped shell. The outer surface of the shell varies from greenish brown to dark brown in color, and shells from younger specimens have faint greenish brown or black rays. The nacre (inside surface) is often pearly white to bluish white, grading to orange in the deepest part of the shell. However, in older specimens the entire nacre may be a mottled pale orange. The shell of the largest known specimen of the species measures 4.6 inches (11.684 centimeters) in length.

3.1.2 Distribution and Habitat Requirements

It was historically known from several locations within the Catawba and Pee Dee River systems in North Carolina and the Pee Dee and Savannah River systems, and possibly the Saluda River system in South Carolina. In North Carolina, the species is now known only from a handful of streams in the Pee Dee and Catawba River systems. Today, only ten populations are known to survive. The species exists in very low abundances, usually within six feet of shorelines, throughout its known range.

The general habitat requirements for the Carolina Heelsplitter are shaded areas in large rivers to small streams, often burrowed into clay banks between the root systems of trees, or in runs along steep banks with moderate current. The more recent habitat where the Carolina Heelsplitter has been found is in sections of streams containing bedrock with perpendicular crevices filled with sand and gravel, and with wide riparian buffers.

4.0 Survey Efforts

A freshwater mussel habitat assessment was conducted in association with this project on July 3, 2018 by RK&K employees Neil Medlin (Permit # 18-ES00030) and Hal Bain. Four named streams that offered the most potential to have appropriate mussel habitat were selected to be assessed. Other smaller streams and UTs were briefly observed but were either very small ($\geq$ 1.0 meter wide), had unstable substrates, were completely dry, or exhibited a combination of these characteristics and did not provide suitable Carolina Heelspitter habitat.

4.1 Stream Conditions at Time of Assessment:

4.1.1 Sugar Creek at SR 1128 (Westinghouse Boulevard)

This location is downstream of the I-485 crossing. Sugar Creek at this site was approximately 15-20 meters wide with a shifting sand substrate. Both banks had been stabilized with boulders above and below the SR 1128 road crossing with other sections of the banks having areas of erosion. An effluent odor was noted at the time of the assessment.

4.1.2 Little Sugar Creek at NC 51 (Pineville-Matthews Road)

This location is downstream of the I-485 crossing. The stream in this area varied between 10 and 15 meters wide with an average depth estimated to be 0.25 meter. The unstable substrate was dominated by shifting sand and silt. Stream banks at the road crossing had been stabilized with riprap but other areas of the banks were heavily eroded.

4.1.3 McAlpine Creek at SR 4982 (Lancaster Highway)

This location is also downstream of the I-485 crossing and downstream of the McAlpine Creek and McMullen Creek confluence. The stream width at this site varied between 12 and 15 meters and the stream banks had some areas of erosion. The substrate was composed almost entirely of unstable, shifting sand and the average depth was 0.25 meter. Although the water in the stream was clear, abundant growths of filamentous blue-green algae were observed at the site.

4.1.4 Fourmile Creek at SR 3649 (Elm Street)

This location is inside (toward the center of Charlotte) of I-485 and approximately 1.25 stream miles above the McAlpine Creek confluence. Fourmile Creek at this road crossing was only two to four meters wide and in one riffle section was approximately one meter wide and a few centimeters deep. Although the stream had a complete canopy at this location, significant areas of bank erosion were noted.

5.0 Methodology

Due to the lack of Carolina Heelspitter habitat in any of the streams assessed, no mussel surveys were conducted.

6.0 Results

No mussel surveys were conducted for this project.

6.0 Discussion/Conclusions

In addition to the current assessment, streams potentially affected by the project were also assessed by NCDOT on March 10, 2014. The only mussel survey conducted during that assessment was on Fourmile Creek at SR 3448 (Trade Street). No evidence of freshwater

mussels was found during the survey. Observations made during the 2014 assessment noted all other named streams were turbid and had shifting sand and silt substrates. A NCDOT survey on July 16, 2008 was conducted in McAlpine Creek, immediately upstream of the inner I-485 bridge. A fragment of one valve of an Eastern Elliptio (*Elliptio complanata*) was documented during the survey along with an unstable sand substrate in the stream.

Mussel surveys for the current assessment locations on McAlpine Creek and Fourmile Creek were previously conducted on April 23, 1993 (NCWRC Aquatics Database). No mussels of any species were observed during those surveys. A mussel survey was also conducted on Kings Branch at SR 1155 on June 30, 1994 (NCWRC Aquatics Database). No mussels were observed during the survey and the stream habitat was noted to be "highly degraded with sediment".

The streams within the project study area generally have poor water quality as evidenced by the number of streams on the 303(d) list. Degraded instream habitat has also been noted in multiple mussel surveys and multiple stream assessments. Based on the results of multiple stream assessments and prior mussel surveys, and poor water quality of project study area streams, completion of the project will not affect the target mussel species.

Biological Conclusion for Carolina Heelsplitter: No Effect

7.0 References

Adams, W. F., J. M. Alderman, R. G. Biggins, A. G. Gerberich, E. P. Keferl, H. J. Porter, and A.S. Van Devender. 1990. A report on the conservation status of North Carolina's freshwater and terrestrial molluscan fauna. N.C. Wildlife Resources Commission, Raleigh. 246 pp, Appendix A, 37 pp.

Eads, C. B. and J.F. Levine. 2008. Carolina Heelsplitter (*Lasmigona decorata*) and Tar River Spinymussel (*Elliptio steinstansana*) Conservation Research: July 2007-June 2008. Final report submitted to the North Carolina Wildlife Resources Commission. Raleigh, NC. 18 pp.

LeGrand, Jr., H.E., J.T. Finnegan, S.E. McRae, S.P. Hall. 2010. Natural Heritage Program List of the Rare Animal Species of North Carolina. N.C. Natural Heritage Program, Raleigh, NC.

North Carolina Department of Environmental Quality - Division of Water Resources. 2018. 2016 North Carolina 303(d) List. https://files.nc.gov/ncdeq/Water%Quality/Planning/TMDL/303d/2016/2016_NC_Category_5_303d_list.pdf (Accessed 07/20/18).

North Carolina Department of Environmental Quality. NPDES Wastewater Treatment Facility Permits. http://data-ncdenr.opendata.arcgis.com/datasets/a86af4f7549343419b4c8177cedb3e4b_0 (Accessed 07/20/18).

North Carolina Natural Heritage Program (NCNHP). 2018. nheo-2018-07. Natural Heritage Element Occurrence polygon shapefile. July 2, 2018.

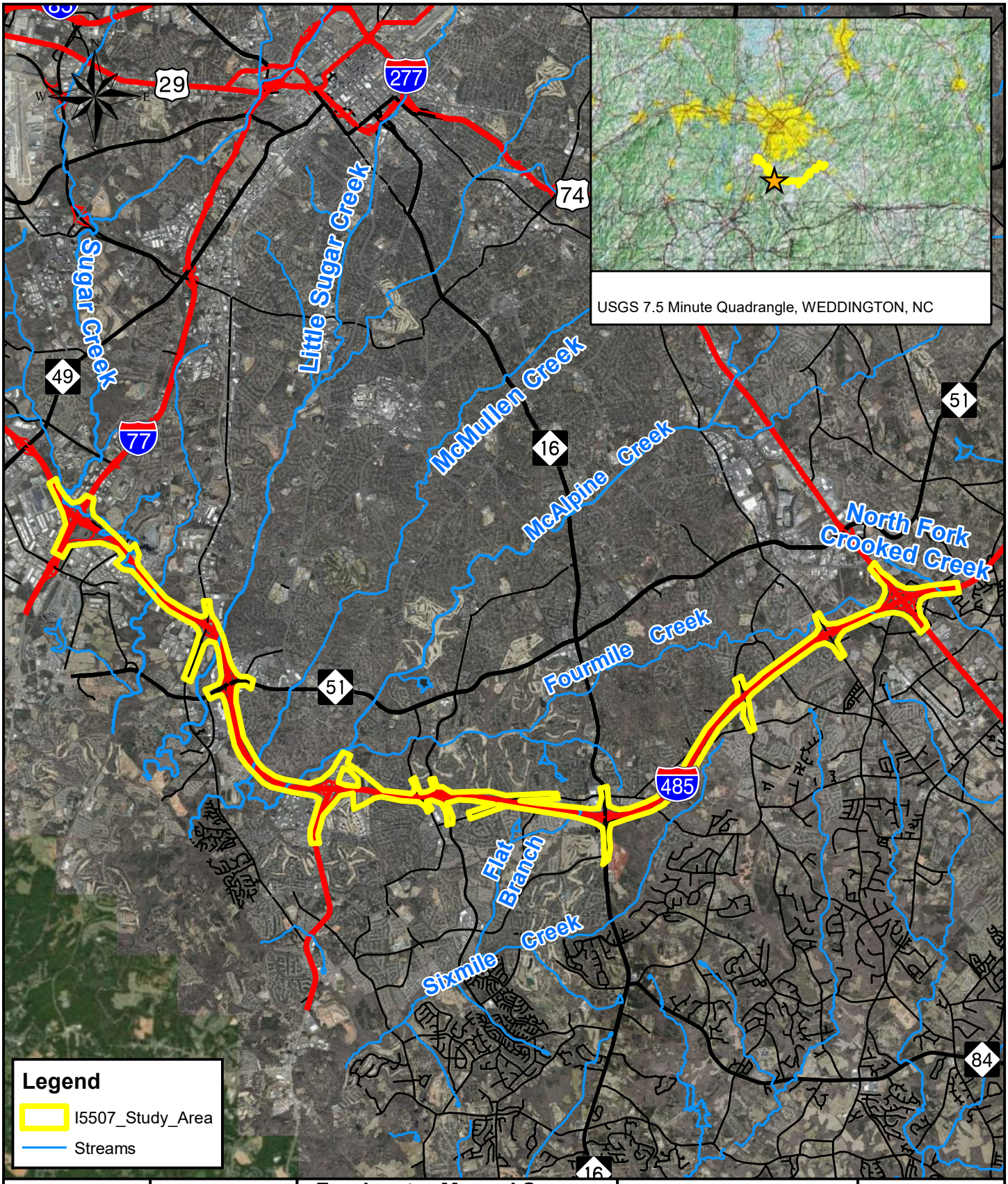
North Carolina Wildlife Resources Commission. Unpublished Aquatics Database.

U.S. Fish and Wildlife Service (USFWS). 2011. Carolina Heelsplitter (*Lasmigona decorata*) Species Profile. Raleigh Ecological Field Office Web site. https://www.fws.gov/raleigh/species/es_carolina_heelsplitter.html (Accessed 11/30/16).

U.S. Fish and Wildlife Service (USFWS). 1997. Carolina Heelsplitter (*Lasmigona decorata*) Recovery Plan. Atlanta, Georgia. 30 pp.

Appendix A

Figures



Prepared By:

Prepared For:

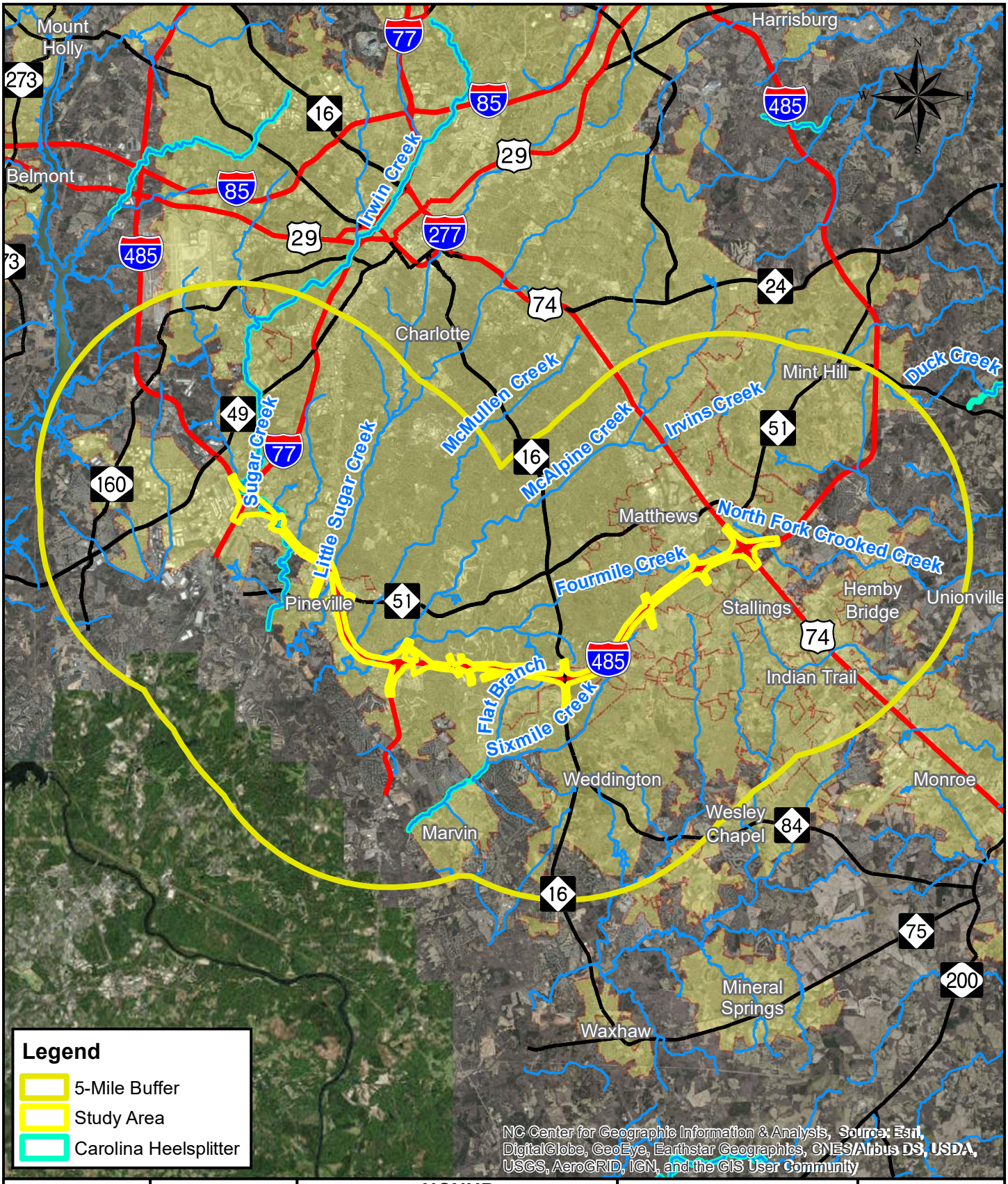
Freshwater Mussel Survey

IMPROVEMENTS to I-485
FROM I-77 to US 74
I-5507

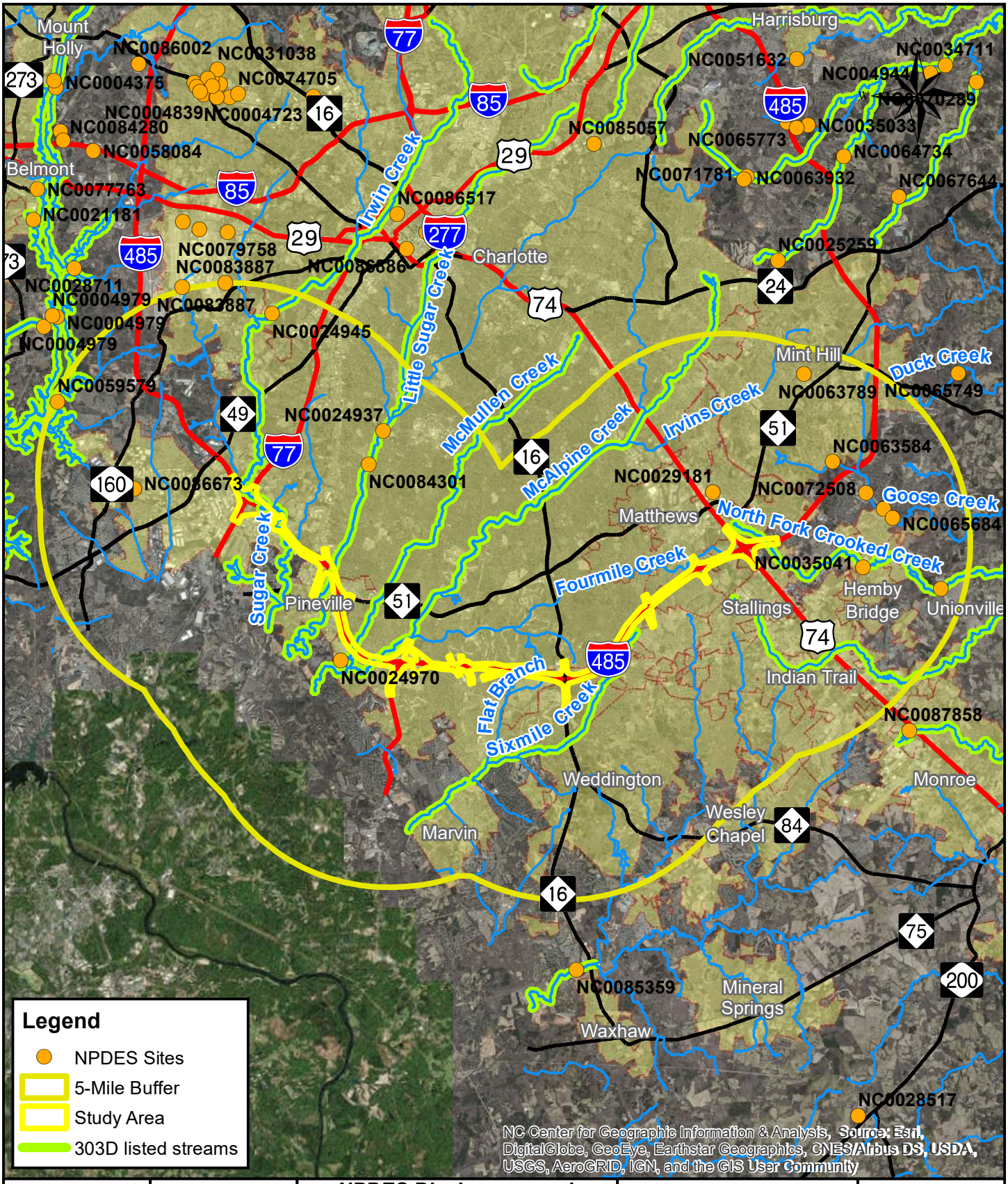
MECKLENBURG
and UNION COUNTY

Date:	August 2018
Scale	0 1 2 Miles
Job No.	I-5507
Drawn by: GSM	Checked by: KNM

Figure 1



Prepared By:	Prepared For:	NCNHP Element Occurrence	Date: August 2018	Figure
RK&K	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	IMPROVEMENTS to I-485 FROM I-77 to US 74 I-5507 MECKLENBURG and UNION COUNTY	Scale 0 1 2 Miles	2
			Job No. I-5507	
			Drawn by: GSM / Checked by: KNM	



Prepared By:

Prepared For:

NPDES Dischargers and 303(d) Listed Streams

IMPROVEMENTS to I-485
FROM I-77 to US 74
I-5507
MECKLENBURG
and UNION COUNTY

Date:	August 2018
Scale	0 1 2 Miles
Job No.	I-5507
Drawn by: GSM	Checked by: KNM

Figure 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

September 27, 2019

MEMORANDUM TO: File

FROM: Erin Cheely, Environmental Program Consultant
Environmental Analysis Unit

SUBJECT: **Protected species update** for the proposed I-485 Improvements from I-77 to US-74 (Independence Boulevard) in Mecklenburg County

This memo serves to update the status of the following federally protected species for the above-referenced project:

Species: Michaux's sumac (*Rhus michauxii*)
Schweinitz's sunflower, (*Helianthus schweinitzii*)
Smooth coneflower (*Echinacea laevigata*)

Survey Date: 8/21/2018

Habitat Description/ Survey Information:

A survey of all areas of potential habitat within the study area was conducted by NCDOT biologists on August 21, 2018. There are some small areas of potential habitat throughout the corridor where the roadside vegetation is disturbed. No Michaux's sumac, Schweinitz's sunflowers, or smooth coneflowers were identified within the project area during the survey. Previous surveys for these species were conducted on September 24, 2014, October 16, 2014, October 29-30, 2015, and October 7, 2016. None of the above-referenced species were identified during any of those surveys. Therefore, it is anticipated that this project will have **No Effect** on any of these species.

Biological Conclusion: No Effect, but Habitat Present

If you have any questions, please contact Erin Cheely at ekcheely@ncdot.gov or 919-707-6108.

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1598 MAIL SERVICE CENTER
RALEIGH, NC 27699-1598

Telephone: (919) 707-6000
Fax: (919) 212-5785
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
1000 BIRCH RIDGE DRIVE
RALEIGH, NC 27699

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

July 29, 2019

TO: Erin Cheely, Environmental Program Consultant
ECAP, Environmental Analysis Unit

FROM: Chris Manley, Environmental Program Consultant
Biological Surveys Group, EAU

SUBJECT: Section 7 survey results for the northern long-eared bat *(Myotis septentrionalis)* associated with the improvement of I-485 (Charlotte Outer Loop) from I-77 to US 74 (Independence Boulevard) in Mecklenburg County, **TIP No. I-5507**; and the new interchange on I-485 and Weddington Road (SR 3468) in Mecklenburg County, **TIP No. R-0211EC**

The North Carolina Department of Transportation (NCDOT, Division 10) proposes to improve I-485 (Charlotte Outer Loop) from I-77 to US 74 (Independence Boulevard), plus a new interchange on I-485 at Weddington Road (SR 3468), in Mecklenburg County, TIP No. I-5507 and R-0211EC. The study area for I-5507 covered the project limits for R-0211EC. In cooperation with FHWA, NCDOT proposes improvements to approximately 17 miles of I-485 by adding one Express Lane in each direction in the existing median, plus adding a new interchange at the intersection of I-485 and Weddington Road. This project serves as part of a larger network of Express Lanes in coordination with other projects in the Charlotte area.

Northern long-eared bat

The project to improve I-485 has been reviewed for effects on the northern long-eared bat (NLEB). As of May 4, 2015, NLEB is listed by the U.S. Fish and Wildlife Service (USFWS) as "Threatened" under the Endangered Species Act of 1973. As of July 29, 2019, NLEB is listed by USFWS (http://www.fws.gov/raleigh/species/cntylist/nc_counties.html) as "probable/potential" in Mecklenburg County. USFWS also established a final rule under the authority of section 4(d) of the Endangered Species Act that provides measures for the conservation of NLEB. The USFWS has tailored the final 4(d) rule to prohibit the take of NLEB from certain activities within areas where they are in decline. This incidental take protection applies only to known NLEB occupied maternity roost trees and known NLEB hibernacula. Effective February 16, 2016, incidental take resulting from tree removal is

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PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS UNIT
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

TELEPHONE: 919-707-6000
FAX: 919-212-5785

WEBSITE:NCDOT.GOV

Location:
CENTURY CENTER, BUILDING B
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

prohibited if it 1) occurs within a ¼ mile radius of known NLEB hibernacula; or 2) cuts or destroys known occupied maternity roost trees or any other trees within a 150-foot radius from the known maternity tree during the pup season (June 1-July 31).

According to the North Carolina Natural Heritage Program (NHP) Biotics Database, most recently updated April 2019, **the nearest NLEB hibernacula record is 76 miles west of the project and no known NLEB roost trees occur within 150 feet of the project area**.

NCDOT has also reviewed the USFWS Asheville Field office website (http://www.fws.gov/asheville/htmls/project_review/NLEB_in_WNC.html) for consistency with NHP records. This project is located entirely outside of the red highlighted areas (12-digit HUC) that the USFWS Asheville Field Office has determined to be representative of an area that may require consultation.

For the proposed action, NCDOT has committed to the conservation measures listed below:

1) No alterations of a known hibernacula entrance or interior environment if it impairs an essential behavioral pattern, including sheltering northern long-eared bats (January 1 through December 31);
2) No tree removal within a 0.25 mile radius of a known hibernacula (January 1 through December 31); and
3) No cutting or destroying a known, occupied maternity roost tree, or any other trees within a 150-foot radius from the known, occupied maternity tree during the period from June 1 through and including July 31.

NCDOT has determined that the proposed action does not require separate consultation on the grounds that the proposed action is consistent with the final Section 4(d) rule, codified at 50 C.F.R. § 17.40(o) and effective February 16, 2016. NCDOT may presume its determination is informed by best available information and consider Section 7 responsibilities fulfilled for NLEB.

If you need any additional information, please contact Chris Manley at 919-707-6135.

North Carolina Department of Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Pat McCrory
Secretary Susan Kluttz

Office of Archives and History
Deputy Secretary Kevin Cherry

December 5, 2013

MEMORANDUM

TO: Richard W. Hancock, P.E., Manager
Project Development and Environmental Analysis Unit
NCDOT Division of Highways

FROM: Ramona M. Bartos RSL for Ramona M. Bartos

SUBJECT: I-485 Express Lanes, from I-77 to US 74, I-5507, WBS No. 436091.1, Charlotte, Mecklenburg County, ER 13-2793

Thank you for your memorandum of November 18, 2013, concerning the above project.

The proposed project includes the construction of one additional lane, in each direction, to I-485 within the existing median. The project also includes three sections of noise walls.

We have conducted a review of the project and are aware of no historic resources that would be affected by the project as proposed. Therefore, we have no comment and no further identification work is recommended. However, should the project be revised to include new right-of-way or additional noise walls, further review will be required.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or renee.gledhill-earley@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

cc: Mary Pope Furr, NCDOT, mfurr@ncdot.gov
Angela Sanderson, NCDOT, amsanderson@ncdot.gov
Matt Wilkerson, NCDOT

NO ARCHAEOLOGICAL SURVEY REQUIRED FORM

This form only pertains to ARCHAEOLOGICAL RESOURCES for this project. It is not valid for Historic Architecture and Landscapes. You must consult separately with the Historic Architecture and Landscapes Group.

PROJECT INFORMATION

Project No:	**I-5507**	*County:*	**Mecklenburg**
WBS No:	**43609.1.1**	*Document:*	**CE**
F.A. No:	**NHS-0485(30)**	*Funding:*	☒ State ☒ Federal

Federal Permit Required? ☐ Yes ☐ No *Permit Type:* **Not Listed**

Project Description: The NCDOT proposes improvements to add one express lane in each direction along I-485 from I-77 to US 74 (Independence Boulevard) in Mecklenburg County. The project length is 17 miles. The purpose of the project is to provide travel time reliability along I-485. This segment of I-485 carries between 65,000 and 112,000 vehicles per day and experiences congestion on a regular basis. The proposed express lanes will, in combination with improvements proposed on Independence Boulevard, give motorists the option of paying a fee for a reliable trip time on I-485 between I-77 and US 74.

SUMMARY OF CULTURAL RESOURCES REVIEW

Brief description of review activities, results of review, and conclusions:

The State Historic Preservation Office/Office of State Archaeology has previously reviewed the proposed project (ER 13-2793), and are aware of no historic resources that would be affected by the project. Therefore, their office had no comment and recommended no further identification work be conducted. However, if the project were to be revised to include new ROW or additional noise wall, further review would be required. Thus, a additional map review and site file search was conducted at the Office of State Archaeology (OSA) on Monday, November 9, 2015. Various archaeological surveys have been conducted as part of the Charlotte Outer Loop (e.g. TIPs# R-211, U-2510A, and R-2123), and as a result of those surveys, numerous archaeological sites have been recorded along the interstate corridor and within one-half (1/2) mile of the proposed project. Digital copies of HPO's maps (Charlotte West, Fort Mill, Weddington, and Matthews Quadrangles) as well as the HPOWEB GIS Service (http://gis.ncdcr.gov/hpoweb/) were last reviewed on Thursday, November 19, 2015. Although various known historic architectural resources are located along the project corridor, intact archaeological deposits associated with such resources are not anticipated within the footprint of the proposed project. In addition, topographic maps, historic maps (NCMaps website), USDA soil survey maps, and aerial photographs were utilized and inspected to gauge environmental factors that may have contributed to historic or prehistoric settlement within the project limits, and to assess the level of modern, slope, agricultural, hydrological, and other erosive-type disturbances within and surrounding the archaeological APE.

Brief Explanation of why the available information provides a reliable basis for reasonably predicting that there are no unidentified historic properties in the APE:

Both Federal and State funds will be used as part of this project. The need for a Federal permit was not known at the time of submittal; however, temporary easements will be necessary. At this time, we are in compliance with NC GS 121-12a since there are no eligible (i.e. National Register-listed) archaeological resources located within the project's Study Area that would require our attention. Based on the size of the Study Area, proposed activities may take place outside the NCDOT's existing ROW in certain locations along the highway corridor. From an environmental perspective, the Study Area falls within a highly urbanized area and consists of the gently rolling terrain typical of North Carolina's Southern Piedmont physiographic region. Numerous soil types are present throughout the Study Area, with most soil conditions (urban/disturbed, eroded, slopes, and somewhat poorly drained) not favorable for preserving intact archaeological sites/resources. Preservation of archaeological materials within these soil type areas is likely to be poor. Many of the sections of the Study Area that fall in areas of favorable conditions, however, have already been subjected to archaeological investigations either as part of the original survey for what was then I-77 (TIP# R-211) or for later studies along the interstate (TIP# R-2123) or adjacent roads (TIP# U-2510A). Any remaining areas that could have been potentially surveyed were ruled out after reviewing aerials from 1993, 1998, and 2015, which revealed a significant amount of erosion and development. Other areas may have been previously ruled out by OSA as part of their environmental review for cell towers and wetland locations. Based on the presence of urban/disturbed/eroded/sloped/poorly drained soils and the fact that a large portion of the Study Area was previously surveyed, it is believed that the current Study Area, as depicted, is unlikely to contain intact and significant archaeological resources. No archaeological survey is required for this project; the No Survey recommendation stated by NC-HPO in their memo of December 5, 2013 remains valid. If design plans change or are made available prior to construction, then additional consultation regarding archaeology will be required. At this time, no further archaeological work is recommended. If archaeological materials are uncovered during project activities, then such resources will be dealt with according to the procedures set forth for "unanticipated discoveries," to include notification of NCDOT's Archaeology Group. Please take note that the Study Area outline bisects the Dinkins Family Cemetery (Site 31MK273**), which has been deemed to possess special significance in terms of Charlotte and Mecklenburg County history. Thus, the Dinkins Family Cemetery should be avoided; all project activities should not take place within the vicinity of the cemetery (to include, but not be limited to, the storage of materials and/or equipment and vehicles).

SUPPORT DOCUMENTATION

See attached: ☐ Map(s) ☐ Previous Survey Info ☐ Photos ☐ Correspondence
☐ Photocopy of County Survey Notes Other:

FINDING BY NCDOT ARCHAEOLOGIST

NO ARCHAEOLOGY SURVEY REQUIRED

Paul J. Mohler

NCDOT ARCHAEOLOGIST II — November 19, 2015 Date