STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

February 16, 2018

Kyle Barnes
NCDOT Coordinator-Division One
United States Army Corps of Engineers
2407 West Fifth Street
Washington, NC 27889-1000

Greg Daisey
NC Div. of Environmental Quality
Division of Coastal Management
401 S. Griffin St., Suite 300
Elizabeth City, NC 27909

Subject: **Revised Application for Section 404 and Section 10 Individual Permit, Section 401 Individual Water Quality Certification, and CAMA Major Development Permit Modification** for the proposed Rodanthe Breach Long-Term Improvements, Bonner Bridge Replacement Project Phase IIb in Dare County, North Carolina; TIP Project B-2500B, Federal Aid Project No. BRNHF-0012(56); WBS Element 32635.3.9

Reference: B-2500 II B Application dated January 23, 2017

Dear Sirs,

On January 23, 2018, the North Carolina Department of Transportation (NCDOT) submitted the application for the subject project. As project material delivery logistics continue to progress, it has been determined that material deliveries via the Rodanthe ferry terminal are no longer practicable. As such, we are removing impacts associated with deliveries via the ferry terminal (Site 4). This revised application presents the revisions due to this impact removal. In addition to this cover letter, this revised application package includes revised CAMA MP 1 and 5 forms, revised permit drawing sheets, and the SAV Mitigation Plan.

Per DCM's request, the permit drawing sheets have been updated to enlarge the drawing date, include the Rodanthe Historic District, provide clarity with the identification of the water withdraw sites for jetting, and the addition of graphics that depict the project's proximity to the ocean. All remaining aspects of the application and impacts remain unchanged.

3.0 Summary of Impacts
Proposed impacts to 404 and CAMA jurisdictional areas total 0.33 acre of permanent wetland impacts, 1.49 acres of temporary wetland impacts, 0.09 acre of mechanized clearing, 0.46 acre of hand clearing, 0.11 acre of permanent surface water impacts, 10.07 acres of temporary surface water impacts, 2.57 acres of permanent submerged aquatic vegetation (SAV) impacts, and 3.07 acres of temporary SAV impacts.

4.0 Summary of Mitigation
The proposed construction of B-2500B (Phase IIb) will permanently impact 0.42 acre of 404 jurisdictional wetlands and <0.01 acre of CAMA wetlands requiring mitigation.

7.4 Impacts to Jurisdictional Resources
Impacts to 404 and CAMA wetlands as well as surface waters are summarized in Tables 1 through 3.

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

Telephone: (919) 707-6100
Fax: (919) 212-5785
Customer Service: 1-877-368-4968
Website: www.ncdot.gov

Location:
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610-4328

Table 1. Permanent Wetland Impacts

Permit Drawing Site No.	Wetland Biotic Communities	Wetland Type*	Permanent 404 Impacts** (ac)	Permanent CAMA Impacts (ac)	Mitigable Impacts (ac)
1	Maritime shrub/ grassland	404	0.01	-	0.01
2	Maritime grassland	404	0.31	-	0.31
3A	Maritime shrub thicket, Maritime shrub/grassland, CAMA salt shrub/ grassland	404 / CAMA	0.10***	<0.01	0.10
3B	-	n/a	-	-	-
3C	Salt shrub/ grassland, Maritime shrub thicket, Maritime shrub/ grassland, Salt grassland	404 / CAMA	<0.01	<0.01	<0.01
		TOTALS	**0.42**	**<0.01**	**0.42**

* 404 represents non-coastal wetlands
** Permanent Impacts represent permanent excavation, fill, and mechanized clearing
*** Includes 0.04 acre of utility impacts

Permanent Impacts: Proposed permanent impacts for B-2500B (Phase IIb) include fill, excavation (of which there are none), and mechanized clearing in wetlands. This includes fill impacts to <0.01 acre of CAMA wetlands and 0.33 acre of 404 wetlands, which are mitigable impacts. Mechanized clearing totals 0.09 acre in 404 wetlands only. Total permanent mitigable wetland impacts total 0.42 acre. Proposed permanent impacts to surface waters are 0.11 acre. Surface waters also include SAV, which is discussed in more detail in Section 7.4.4.

Table 2. Temporary Wetland Impacts

Permit Drawing Site No.	Wetland Biotic Communities	Wetland Type*	Temporary 404 Impacts (ac)	Temporary CAMA Impacts (ac)
1	Maritime shrub/ grassland	404	0.06**	-
2	Maritime grassland	404	0.68	-
3A	Maritime shrub thicket, Maritime shrub/grassland, CAMA salt shrub/ grassland	404 / CAMA	0.33**	0.03
3B	-	n/a	-	-
3C	Salt shrub/ grassland, Maritime shrub thicket, Maritime shrub/ grassland, Salt grassland	404 / CAMA	0.27	0.11
		TOTALS	**1.34**	**0.14**

* 404 represents non-coastal wetlands
** Includes utility impacts

Temporary Impacts: There will be 1.34 acres of temporary 404 wetland impacts and 0.14 acre of CAMA impacts due to the advancing rail system, lay-down yard, proposed bridge construction, and installation of utilities. Additionally, there will be 0.46 acre of hand-clearing (which are not included in the totals in Table 2).

Table 3. CAMA (Coastal) Wetland Impacts (included in Tables 1 & 2)

Permit Drawing Site No	Wetland Biotic Communities	Mitigable (for permanent)	Permanent Impacts* (ac)	Temporary Impacts** (ac)
3A	Maritime shrub thicket, Maritime shrub/grassland, CAMA salt shrub/ grassland	No	< 0.01	0.03
3C	Salt shrub/ grassland, Maritime shrub thicket, Maritime shrub/ grassland, Salt grassland	No	< 0.01	0.11
		TOTALS	**< 0.01**	**0.14**

* Permanent Impacts represents permanent excavation, fill, and mechanized clearing
** Temporary Impacts represent temporary fill (trenching for utilities), and disturbance.

7.4.4 Site 3B (Bridge over Sound)

Site 3B impact is the bridge over open water (Pamlico Sound), from -L- Sta. 25+45 to Sta. 133+17. It encompasses impacts from the bridge bents, advancing rail system, and shading impacts to SAV. The impacts are broken down as follows:

Surface Water

- 0.11 acre permanent fill from bridge bents
- 5.95 acres temporary fill for advancing rail system
- 4.32 acres temporary fill for primary containment area

If you have any questions or need additional information, please contact Michael Turchy at 919-707-6157 or maturchy@ncdot.gov. A copy of this application will also be posted at https://xfer.services.ncdot.gov/pdea/PermApps/.

Sincerely,

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

cc: NCDOT Permit Application Standard Distribution List
Pablo A. Hernandez, P.E., Resident Engineer
Colin Mellor, Environmental Coordination and Permitting
Chris Rivenbark, Environmental Coordination and Permitting
David Hering, Design Build Unit

DCM MP-1

APPLICATION for Major Development Permit

(last revised 12/27/06)

North Carolina DIVISION OF COASTAL MANAGEMENT

1. Primary Applicant/ Landowner Information

Business Name North Carolina Department Of Transportation		Project Name (if applicable) B-2500B Phase IIb, Rodanthe Breach Long-Term Improvements		
Applicant 1: First Name Philip	MI S	Last Name Harris		
Applicant 2: First Name Michael	MI	Last Name Turchy		
If additional applicants, please attach an additional page(s) with names listed.				
Mailing Address 1598 Mail Service Center		PO Box	City Raleigh	State NC
ZIP 27699-1598	Country USA	Phone No. 919 - 707 - 6123 ext.	FAX No. 919 - 212 - 5785	
Street Address *(if different from above)* 1020 Birch Ridge Drive		City Raleigh	State NC	ZIP 27610-
Email maturchy@ncdot.gov				

2. Agent/Contractor Information

Business Name				
Agent/ Contractor 1: First Name	MI	Last Name		
Agent/ Contractor 2: First Name	MI	Last Name		
Mailing Address		PO Box	City	State
ZIP		Phone No. 1 - - ext.	Phone No. 2 - - ext.	
FAX No.		Contractor #		
Street Address *(if different from above)*		City	State	ZIP -
Email				

<Form continues on back>

3. Project Location

County (can be multiple)	Street Address	State Rd. #
Dare		NC 12

Subdivision Name	City	State	Zip
N/A	Rodanthe	NC	27968 -

Phone No.	Lot No.(s) *(if many, attach additional page with list)*
- - ext.	See attached list, , , ,

a. In which NC river basin is the project located?	b. Name of body of water nearest to proposed project
Pasquotank	Pamlico Sound
c. Is the water body identified in (b) above, natural or manmade?	**d. Name the closest major water body to the proposed project site.**
☒Natural ☐Manmade ☐Unknown	Pamlico Sound
e. Is proposed work within city limits or planning jurisdiction?	**f. If applicable, list the planning jurisdiction or city limit the proposed work falls within.**
☒Yes ☐No	Rodanthe

4. Site Description

a. Total length of shoreline on the tract (ft.)	b. Size of entire tract (sq.ft.)
North: 201', South: 168'	NCDOT: 46.75 ac, Pea Island: 31.01 Ac
c. Size of individual lot(s)	**d. Approximate elevation of tract above NHW *(normal high water)* or NWL *(normal water level)***
N/A, , , *(If many lot sizes, please attach additional page with a list)*	0-7' ☐NHW or ☒NWL

e. Vegetation on tract

Maritime shrub thicket, salt/shrub grassland, maritime shrub/grassland, marsh

f. Man-made features and uses now on tract

Features are: NC 12, electric and water utility lines, residential and commercial buildings.
Uses are: transportation, residential, commercial, recreational, and historic.

g. Identify and describe the existing land uses adjacent to the proposed project site.

Residential, commercial, recreational (Cape Hatteras National Seashore and Pea Island National Wildlife Refuge), historic, transportation, open space, open water

h. How does local government zone the tract?	i. Is the proposed project consistent with the applicable zoning? (Attach zoning compliance certificate, if applicable)
Dare County - Rodanthe is zoned as a Specieal District. Hatteras Island is unzoned.	☒Yes ☐No ☐NA

j. Is the proposed activity part of an urban waterfront redevelopment proposal?	☐Yes ☒No
k. Has a professional archaeological assessment been done for the tract? If yes, attach a copy.	☒Yes ☐No ☐NA
If yes, by whom?	State Historic Office
l. Is the proposed project located in a National Registered Historic District or does it involve a National Register listed or eligible property?	☒Yes ☐No ☐NA

<Form continues on next page>

m. (i) Are there wetlands on the site?	☒Yes ☐No
(ii) Are there coastal wetlands on the site?	☒Yes ☐No
(iii) If yes to either (i) or (ii) above, has a delineation been conducted? *(Attach documentation, if available)*	☒Yes ☐No

n. Describe existing wastewater treatment facilities.

County sewer

o. Describe existing drinking water supply source.

Dare County

p. Describe existing storm water management or treatment systems.

None

5. Activities and Impacts

a. Will the project be for commercial, public, or private use? ☐Commercial ☒Public/Government ☐Private/Community

b. Give a brief description of purpose, use, and daily operations of the project when complete.

The long-term improvements encompassed by Phase IIb contribute to the overall purpose of the project by providing a long-term solution to the future challenges of shoreline erosion and overwash in this area, as well as the potential presence of breaches and inlets in the Phase IIb project area. The proposed bridge will serve as NC 12 connecting Rodanthe and locations south with Hatteras Island locations north. Cars and trucks carrying residents, tourists, workers, and goods will use the bridge daily.

c. Describe the proposed construction methodology, types of construction equipment to be used during construction, the number of each type of equipment and where it is to be stored.

The proposed bridge will be constructed from two approaches, one to the south and one to the north. Typical bridge construction equipment will include cranes, pile hammers, vibratory hammers, jetting pumps, forklifts, generators, etc. A small safety boat will be used to monitor work within the Pamlico Sound. Specific to each approach, the temporary work bridge will support one 400 ton crawler crane, two 250 ton crawler cranes, one 85 ton straddle crane, and one 70 ton straddle crane, among other small pieces of equipment. Typical roadway construction will include but is not limited to the following equipment; bulldozers, dump trucks and motor graders.

d. List all development activities you propose.

Construction of a 107 span bridge, removal of a portion of existing NC 12, and construction of a round-about where the new roadway facility will tie back into the existing roadway. Construct a new 288 'x 62.5' parking area within the Refuge near the beginning of the bridge. Underperforming driveway pipes/conveyances will be cleaned out along NC 12 from the roundabout north the Refuge, as needed.

e. Are the proposed activities maintenance of an existing project, new work, or both? Both - the proposed activity is construction of a roadway/bridge on new alignment which ties back to existing.

f. What is the approximate total disturbed land area resulting from the proposed project? 44.64 ☐Sq.Ft or ☒Acres

g. Will the proposed project encroach on any public easement, public accessway or other area that the public has established use of? ☒Yes ☐No ☐NA

h. Describe location and type of existing and proposed discharges to waters of the state.

Throughout the entire length of the bridge, proposed discharge will occur through deck drains of varying size (6" circular or 8"x4" openings) and varied spacings (between 5' and 45'-8").

i. Will wastewater or stormwater be discharged into a wetland? ☒Yes ☐No ☐NA

If yes, will this discharged water be of the same salinity as the receiving water? ☐Yes ☒No ☐NA

j. Is there any mitigation proposed? If yes, attach a mitigation proposal.	☒Yes ☐No ☐NA

<Form continues on back>

6. Additional Information

In addition to this completed application form, (MP-1) the following items below, if applicable, must be submitted in order for the application package to be complete. Items (a) – (f) are always applicable to any major development application. Please consult the application instruction booklet on how to properly prepare the required items below.

a. A project narrative.

b. An accurate, dated work plat (including plan view and cross-sectional drawings) drawn to scale. Please give the present status of the proposed project. Is any portion already complete? If previously authorized work, clearly indicate on maps, plats, drawings to distinguish between work completed and proposed.

c. A site or location map that is sufficiently detailed to guide agency personnel unfamiliar with the area to the site.

d. A copy of the deed (with state application only) or other instrument under which the applicant claims title to the affected properties.

e. The appropriate application fee. Check or money order made payable to DENR.

f. A list of the names and complete addresses of the adjacent waterfront (riparian) landowners and signed return receipts as proof that such owners have received a copy of the application and plats by certified mail. Such landowners must be advised that they have 30 days in which to submit comments on the proposed project to the Division of Coastal Management.

Name See attached list Address	Phone No.
Name Address	Phone No.
Name Address	Phone No.

g. A list of previous state or federal permits issued for work on the project tract. Include permit numbers, permittee, and issuing dates.

USACE, NWP 6 to NCDOT for geotechnical borings, SAW-2017-00540 (Issued 4/14/17, Expires 3/18/22)	USFWS, Special Use Permit to NCDOT for geotechnical borings, 2017-001G (Issued 3/25/17, Expires 9/15/17)
National Park Service, Special Use Permit to NCDOT for geotechnical borings, 5700-022 (Issued 6/15/17)	

h. Signed consultant or agent authorization form, if applicable.

i. Wetland delineation, if necessary.

j. A signed AEC hazard notice for projects in oceanfront and inlet areas. *(Must be signed by property owner)*

k. A statement of compliance with the N.C. Environmental Policy Act (N.C.G.S. 113A 1-10), if necessary. If the project involves expenditure of public funds or use of public lands, attach a statement documenting compliance with the North Carolina Environmental Policy Act.

7. Certification and Permission to Enter on Land

I understand that any permit issued in response to this application will allow only the development described in the application. The project will be subject to the conditions and restrictions contained in the permit.

I certify that I am authorized to grant, and do in fact grant permission to representatives of state and federal review agencies to enter on the aforementioned lands in connection with evaluating information related to this permit application and follow-up monitoring of the project.

I further certify that the information provided in this application is truthful to the best of my knowledge.

Date 02-15-2018 Print Name COLIN MELLOR

Signature

Please indicate application attachments pertaining to your proposed project.

☐DCM MP-2 Excavation and Fill Information
☐DCM MP-3 Upland Development
☐DCM MP-4 Structures Information
☒DCM MP-5 Bridges and Culverts

Form DCM MP-5

BRIDGES and CULVERTS

Attach this form to Joint Application for CAMA Major Permit, Form DCM MP-1. Be sure to complete all other sections of the Joint Application that relate to this proposed project. Please include all supplemental information.

1. BRIDGES

☐ *This section not applicable*

a. Is the proposed bridge:
☐Commercial ☒Public/Government ☐Private/Community

b. Water body to be crossed by bridge:
Pamlico Sound

c. Type of bridge (construction material):
Prestressed concrete

d. Water depth at the proposed crossing at NLW or NWL:
Sound average depth approximately 0-4' (NWL)

e. (i) Will proposed bridge replace an existing bridge? ☐Yes ☒No
If yes,
(ii) Length of existing bridge: _____
(iii) Width of existing bridge: _____
(iv) Navigation clearance underneath existing bridge: _____
(v) Will all, or a part of, the existing bridge be removed? (Explain)

f. (i) Will proposed bridge replace an existing culvert? ☐Yes ☒No
If yes,
(ii) Length of existing culvert: _____
(iii) Width of existing culvert: _____
(iv) Height of the top of the existing culvert above the NHW or NWL: _____
(v) Will all, or a part of, the existing culvert be removed? (Explain)

g. Length of proposed bridge: 2.46 miles

h. Width of proposed bridge: 45'

i. Will the proposed bridge affect existing water flow? ☐Yes ☒No
If yes, explain:

j. Will the proposed bridge affect navigation by reducing or increasing the existing navigable opening? ☐Yes ☒No
If yes, explain:

k. Navigation clearance underneath proposed bridge: 17'

l. Have you contacted the U.S. Coast Guard concerning their approval? ☒Yes ☐No
If yes, explain: A Permit Determination Request was submitted ot the U.S. Coast Guard on July 13, 2017.

m. Will the proposed bridge cross wetlands containing no navigable waters? ☒Yes ☐No
If yes, explain: The wetlands under the bridge on both north and south ends of the proposed bridge are not navigable, but are adjacent to navigable waters.

n. Height of proposed bridge above wetlands: 14-18'

2. CULVERTS

☒ *This section not applicable*

a. Number of culverts proposed: _____

b. Water body in which the culvert is to be placed:

< Form continues on back>

c. Type of culvert (construction material):

_____

d. (i) Will proposed culvert replace an existing bridge? ☐Yes ☐No

If yes,

(ii) Length of existing bridge: _____

(iii) Width of existing bridge: _____

(iv) Navigation clearance underneath existing bridge: _____

(v) Will all, or a part of, the existing bridge be removed? (Explain)

_____

_____

_____

e. (i) Will proposed culvert replace an existing culvert? ☐Yes ☐No

If yes,

(ii) Length of existing culvert(s): _____

(iii) Width of existing culvert(s): _____

(iv) Height of the top of the existing culvert above the NHW or NWL: _____

(v) Will all, or a part of, the existing culvert be removed? (Explain)

_____

_____

_____

f. Length of proposed culvert: _____

g. Width of proposed culvert: _____

h. Height of the top of the proposed culvert above the NHW or NWL.

_____

i. Depth of culvert to be buried below existing bottom contour.

_____

j. Will the proposed culvert affect navigation by reducing or increasing the existing navigable opening? ☐Yes ☐No

If yes, explain:

_____

_____

_____

k. Will the proposed culvert affect existing water flow? ☐Yes ☐No

If yes, explain:

_____

_____

_____

3. EXCAVATION and FILL

☐*This section not applicable*

a. (i) Will the placement of the proposed bridge or culvert require any excavation below the NHW or NWL? ☒Yes ☐No

If yes,

(ii) Avg. length of area to be excavated: varies

(iii) Avg. width of area to be excavated: varies

(iv) Avg. depth of area to be excavated: varies

(v) Amount of material to be excavated in cubic yards: 11,661

b. (i) Will the placement of the proposed bridge or culvert require any excavation within coastal wetlands/marsh (CW), submerged aquatic vegetation (SAV), shell bottom (SB), or other wetlands (WL)? If any boxes are checked, provide the number of square feet affected.

☒CW 6,098 ☒SAV 245,678 ☐SB _____

☒WL 76,665 ☐None

(ii) Describe the purpose of the excavation in these areas:

Excavation will be limited to the circumference of the bridge piles used to support bridge and temporary piles used to construct advancing rail system (see cover letter)

_____

_____

_____

c. (i) Will the placement of the proposed bridge or culvert require any high-ground excavation? ☐Yes ☒No

If yes,

(ii) Avg. length of area to be excavated: _____

(iii) Avg. width of area to be excavated: _____

(iv) Avg. depth of area to be excavated: _____

(v) Amount of material to be excavated in cubic yards: _____

d. If the placement of the bridge or culvert involves any excavation, please complete the following:

(i) Location of the spoil disposal area: Spoil with either be incorporated into new roadway embankment to disposed at an approved NCDOT facility

(ii) Dimensions of the spoil disposal area: undertermined

(iii) Do you claim title to the disposal area? ☐Yes ☒No (*If no, attach a letter granting permission from the owner.)*

(iv) Will the disposal area be available for future maintenance? ☒Yes ☐No

(v) Does the disposal area include any coastal wetlands/marsh (CW), submerged aquatic vegetation (SAVs), other wetlands (WL), or shell bottom (SB)?

☐CW ☐SAV ☐WL ☐SB ☒None

If any boxes are checked, give dimensions if different from (ii) above.

(vi) Does the disposal area include any area below the NHW or NWL? ? ☐Yes ☒No

If yes, give dimensions if different from (ii) above.

e. (i) Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item **d** above) to be placed below NHW or NWL? ☐Yes ☒No

If yes,

(ii) Avg. length of area to be filled: _____

(iii) Avg. width of area to be filled: _____

(iv) Purpose of fill:

f. (i) Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item **d** above) to be placed within coastal wetlands/marsh (CW), submerged aquatic vegetation (SAV), shell bottom (SB), or other wetlands (WL)? If any boxes are checked, provide the number of square feet affected.

☐CW _____ ☐SAV _____ ☐SB _____

☐WL _____ ☒None

(ii) Describe the purpose of the excavation in these areas:

g. (i) Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item **d** above) to be placed on high-ground? ☒Yes ☐No

If yes,

(ii) Avg. length of area to be filled: 6675'

(iii) Avg. width of area to be filled: 15'-80'

(iv) Purpose of fill: for roadway construction

4. GENERAL

a. Will the proposed project require the relocation of any existing utility lines? ☒Yes ☐No

If yes, explain: Telecommunications, power, and water

b. Will the proposed project require the construction of any temporary detour structures? ☒Yes ☐No

If yes, explain: A short detour will be used to move NC 12 slightly east of the existing alignment to allow the tie-in of the new road to NC 12 in the Refuge

If this portion of the proposed project has already received approval from local authorities, please attach a copy of the approval or certification.

< Form continues on back>

c. Will the proposed project require any work channels? ☐Yes ☒No

If yes, complete Form DCM-MP-2.

d. How will excavated or fill material be kept on site and erosion controlled?

Will be kept within silt fences on land, specially designed containment areas within Sound (see Cover Letter)

e. What type of construction equipment will be used (for example, dragline, backhoe, or hydraulic dredge)?

cranes, pile hammers, dozers, trucks, etc.

f. Will wetlands be crossed in transporting equipment to project site? ☒Yes ☐No

If yes, explain steps that will be taken to avoid or minimize environmental impacts.

See Cover Letter

g. Will the placement of the proposed bridge or culvert require any shoreline stabilization? ☐Yes ☒No

If yes, complete form MP-2, Section 3 for Shoreline Stabilization only.

02-15-2018

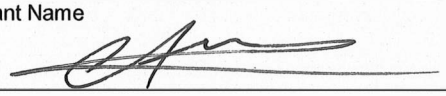
Date

B-2500B, Rodanthe Bridge

Project Name

for Philip S. Harris, III, PE

Applicant Name



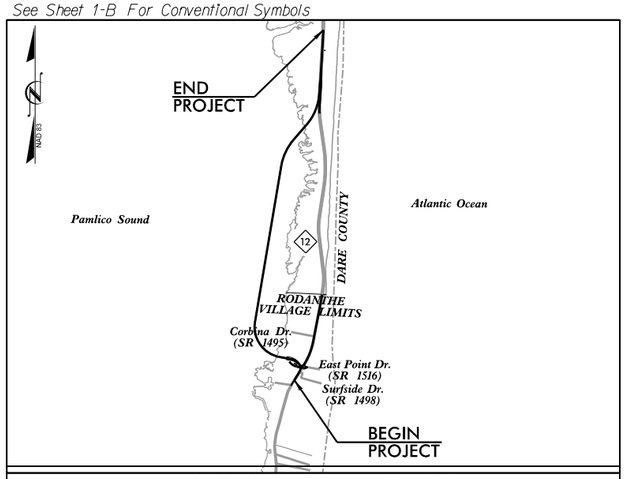
Applicant Signature

09/08/99

TIP PROJECT: B–2500B

CONTRACT: C203474

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



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DARE COUNTY

LOCATION: NC 12 – RODANTHE BREACH LONG TERM IMPROVEMENTS (PHASE IIB)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNING & STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–2500B	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
32635.3.FR7	BRNHF–0012(56)		

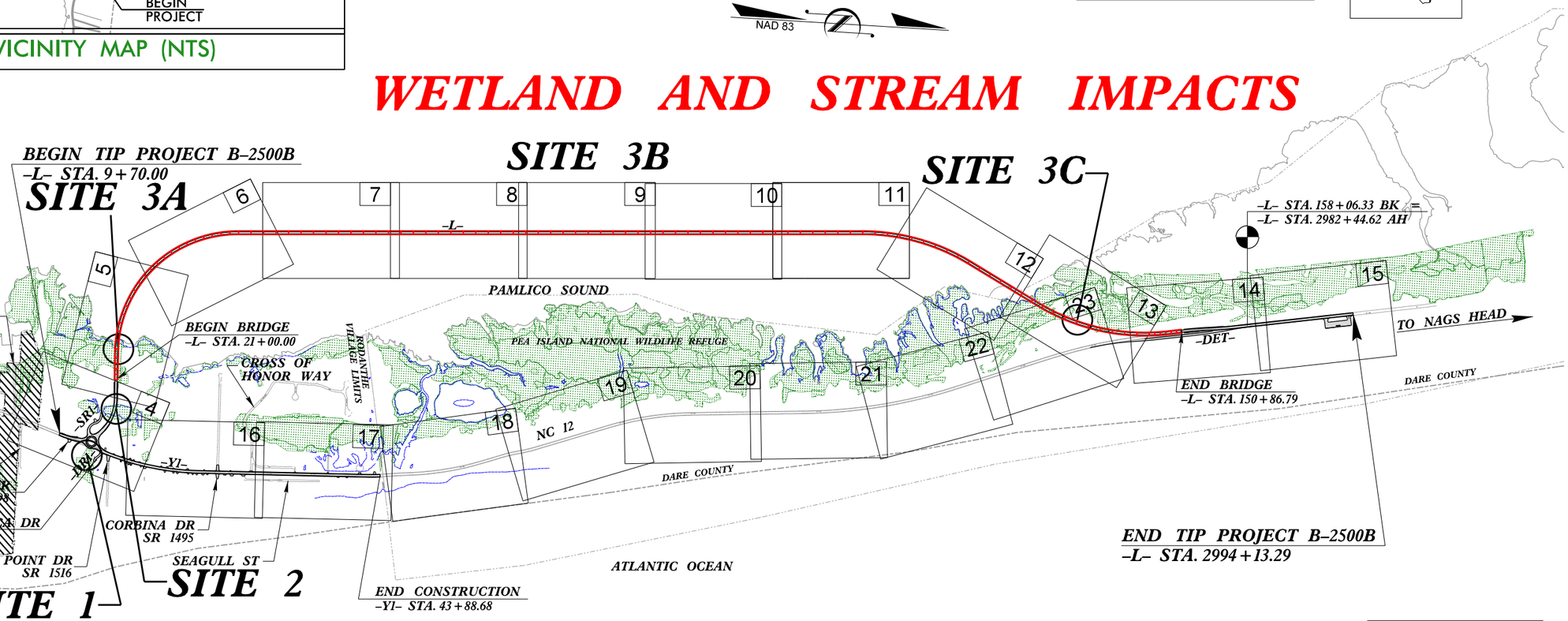
REVISED 2/1/2018
REVISED 2/15/2018

PERMIT DRAWING
SHEET 1 OF 44

ENGLISH

NAD 83

WETLAND AND STREAM IMPACTS



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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2017 = 9,800

ADT 2037 = 14,200

V = 40 /60 MPH

FUNC. CLASSIFICATION = RURAL COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–2500B.....0.572 mi
LENGTH STRUCTURE TIP PROJECT B–2500B.....2.460 mi
TOTAL LENGTH TIP PROJECT B–2500B.....3.032 mi

NCDOT CONTACT

K. Zak Hamidi, P.E.
PROJECT ENGINEER – DESIGN–BUILD GROUP

PLANS PREPARED BY:

RK&K — RUMMEL, KLEPPER & KAHL, LLP, 900 RIDGEFIELD DRIVE, SUITE 350, RALEIGH, NORTH CAROLINA 27609, NC LICENSE NO. F–0112

FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

FLATIRON

2012 STANDARD SPECIFICATIONS

LETTING DATE:
JANUARY 25, 2017

B. Keith Skinner, P.E.
PROJECT ENGINEER

Brandon J. McInnis, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

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P.E.

SIGNATURE:

ROADWAY DESIGN ENGINEER

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P.E.

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

2/15/2018
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FKeys

8/17/99

REVISED 2/1/2018

PERMIT DRAWING SHEET 2 OF 44

50 25 0 50 100
SCALE

PROJECT REFERENCE NO.	SHEET NO.
B-2500B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MATCHLINE -L- STA. 20+00 SEE SHEET 5

MATCHLINE -Y1- STA. 17+00 SEE SHEET 16

CAMA WETLAND

SITE 2

SITE 1

ENGLISH

NAD 83

DENOTES FILL IN WETLAND

DENOTES TEMPORARY FILL IN WETLAND

DENOTES MECHANIZED CLEARING

LAYDOWN YARD BOUNDARY

-SRI- POT Sta. 14+10.95

S 84° 34' 01.5" W

END CONSTRUCTION
-SRI- POT Sta. 13+90.90

-SRI- PT Sta. 13+64.42

-SRI- PRC Sta. 12+39.81

-SRI- PC Sta. 10+88.91

-L- PC Sta. 9+92.40

-L- PT Sta. 12+20.02

-RAB- PC Sta. 10+00.00 =
-RAB- POC Sta. 13+75.42

BEGIN TIP PROJECT B-2500B
-L- POT Sta. 9+70.00

N 18° 32' 56.4" E

S 87° 29' 07.9" W

-L- PT Sta. 18+87.17

-L- PC Sta. 15+05.07

-SRI- POT Sta. 10+00.00=
-Y1- POT Sta. 11+49.51 =
-L- POT Sta. 13+33.87

-Y1- PC Sta. 12+81.77

-DRI- POT Sta. 12+13.81=
-Y1- POC Sta. 13+13.08

-Y1- PCC Sta. 13+50.75

N 4° 13' 01.8" E

S 67° 49' 29.5" W

N 38° 28' 09.4" E

N 58° 15' 47.9" W

-DRI- PT Sta. 11+95.22

-DRI- PC Sta. 10+63.31

-DRI- PRC Sta. 11+14.59

BEGIN CONSTRUCTION
-DRI- POT Sta. 10+60.00

-DRI- POT Sta. 10+00.00

S 86° 04' 08.4" W

N 46° 13' 42.9" W

DITCH @ WETLAND
-Y1- 11+92 RT
Q10=14.1 CFS
V10=0.9 FT/S

DETAIL A
LATERAL BASE DITCH
(Not to Scale)
Min. D= 2.0 Ft.
B= 4.0 Ft.
b= 5.0 Ft.
-Y1- STA. 11+92 TO STA. 13+39 RT
-Y1- STA. 13+50 TO STA. 14+10 LT

-Y1- STA. 14+10 TO STA. 29+40 LT CLEANOUT ROADSIDE DITCHES AND EXISTING DRIVE PIPES AS NEEDED. REPLACE DRIVE PIPES THAT APPEAR TO BE IN POOR CONDITION AND ARE NOT FUNCTIONING PROPERLY.

FOR -L- PROFILE SEE SHT.24
FOR -Y1- PROFILE SEE SHT.30
FOR -RAB- PROFILE SEE SHT.30
FOR -DRI- PROFILE SEE SHT.31
FOR -SRI- PROFILE SEE SHT.31

ALL DRIVEWAYS ARE 16' UNLESS OTHERWISE NOTED.
ALL DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED.

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
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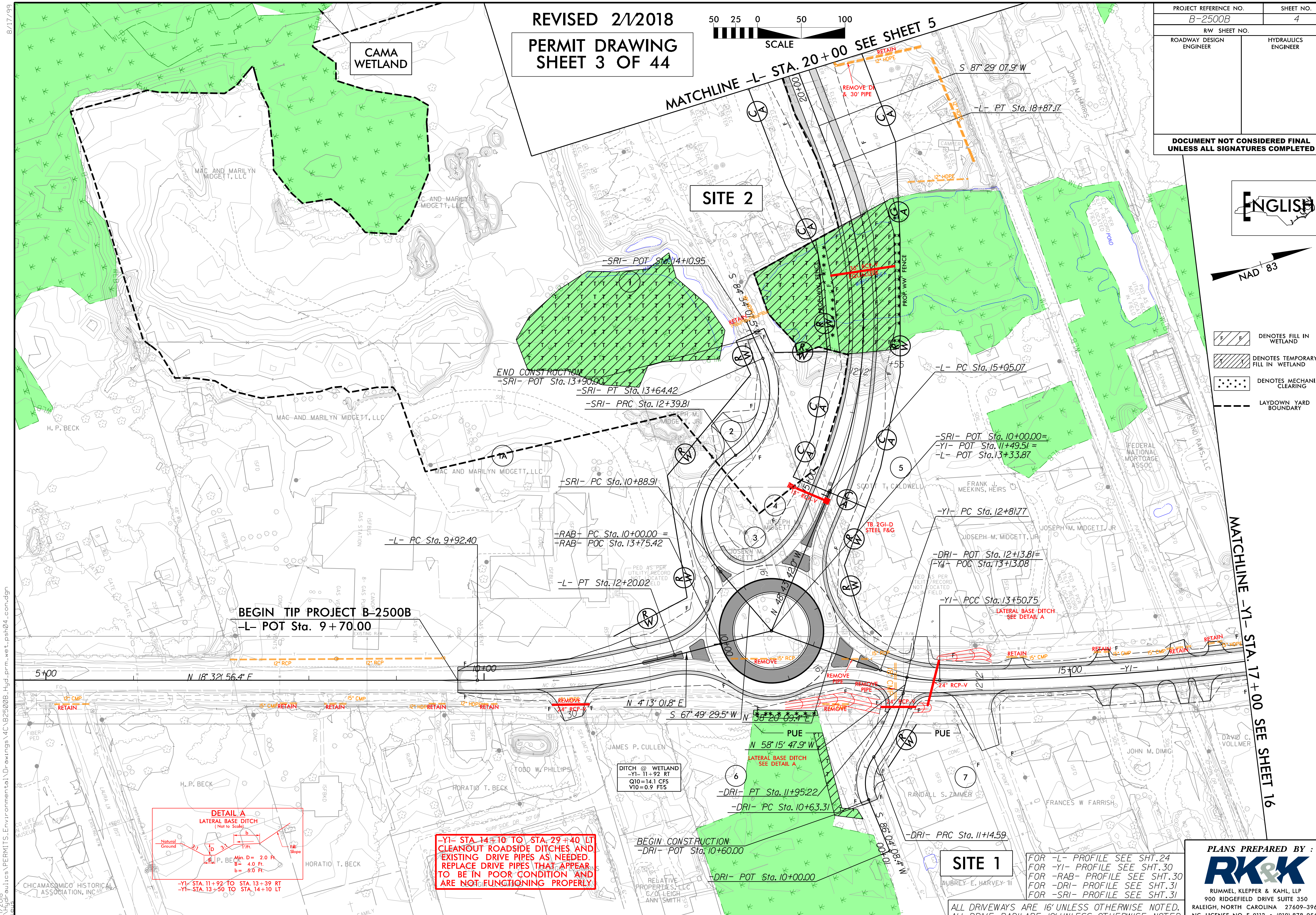
REVISED 2/1/2018
PERMIT DRAWING
SHEET 3 OF 44
50 25 0 50 100
SCALE
PROJECT REFERENCE NO. B-2500B
SHEET NO. 4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
ENGLISH
NAD 83
DENOTES FILL IN WETLAND
DENOTES TEMPORARY FILL IN WETLAND
DENOTES MECHANIZED CLEARING
LAYDOWN YARD BOUNDARY
CAMA WETLAND
MATCHLINE -L- STA. 20+00 SEE SHEET 5
MATCHLINE -Y1- STA. 17+00 SEE SHEET 16
SITE 2
SITE 1
S 87° 29' 07.9" W
-L- PT Sta. 18+87.17
-SRI- POT Sta. 14+10.95
END CONSTRUCTION
-SRI- POT Sta. 13+90.00
-SRI- PT Sta. 13+64.42
-SRI- PRC Sta. 12+39.81
-L- PC Sta. 15+05.07
-SRI- POT Sta. 10+00.00=
-Y1- POT Sta. 11+49.51 =
-L- POT Sta. 13+33.87
-SRI- PC Sta. 10+88.91
-Y1- PC Sta. 12+81.77
-RAB- PC Sta. 10+00.00 =
-RAB- POC Sta. 13+75.42
-L- PC Sta. 9+92.40
-DRI- POT Sta. 12+13.81=
-Y1- POC Sta. 13+13.08
-L- PT Sta. 12+20.02
-Y1- PCC Sta. 13+50.75
LATERAL BASE DITCH SEE DETAIL A
BEGIN TIP PROJECT B-2500B
-L- POT Sta. 9+70.00
N 18° 32' 56.4" E
N 4° 13' 01.8" E
S 67° 49' 29.5" W
N 58° 20' 09.4" E
N 58° 15' 47.9" W
PUE
DITCH @ WETLAND
-Y1- 11+92 RT
Q10=14.1 CFS
V10=0.9 FT/S
-DRI- PT Sta. 11+95.22
-DRI- PC Sta. 10+63.31
-DRI- PRC Sta. 11+14.59
BEGIN CONSTRUCTION
-DRI- POT Sta. 10+60.00
-DRI- POT Sta. 10+00.00
DETAIL A
LATERAL BASE DITCH
(Not to Scale)
Min. D= 2.0 Ft.
B= 4.0 Ft.
b= 5.0 Ft.
-Y1- STA. 11+92 TO STA. 13+39 RT
-Y1- STA. 13+50 TO STA. 14+10 LT
-Y1- STA. 14+10 TO STA. 29+40 LT CLEANOUT ROADSIDE DITCHES AND EXISTING DRIVE PIPES AS NEEDED. REPLACE DRIVE PIPES THAT APPEAR TO BE IN POOR CONDITION AND ARE NOT FUNCTIONING PROPERLY
MAC AND MARILYN MIDGETT, LLC
H. P. BECK
JOSEPH M. MIDGETT, JR.
SCOTT T. CALDWELL
FRANK J. MEEKINS, HEIRS
JOSEPH M. MIDGETT, JR
FEDERAL NATIONAL MORTGAGE ASSOC
JAMES P. CULLEN
TODD W. PHILLIPS
HORATIO T. BECK
RANDALL S. ZIMMER
FRANCES W. FARRISH
JOHN M. DIMIG
DAVID C. VOLLMER
AUBREY E. HARVEY III
CHICAMACOMICO HISTORICAL ASSOCIATION, INC.
RELATIVE PROPERTIES, LLC C/O LEIGH ANN SMITH
FOR -L- PROFILE SEE SHT.24
FOR -Y1- PROFILE SEE SHT.30
FOR -RAB- PROFILE SEE SHT.30
FOR -DRI- PROFILE SEE SHT.31
FOR -SRI- PROFILE SEE SHT.31
ALL DRIVEWAYS ARE 16' UNLESS OTHERWISE NOTED.
ALL DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED.
PLANS PREPARED BY:
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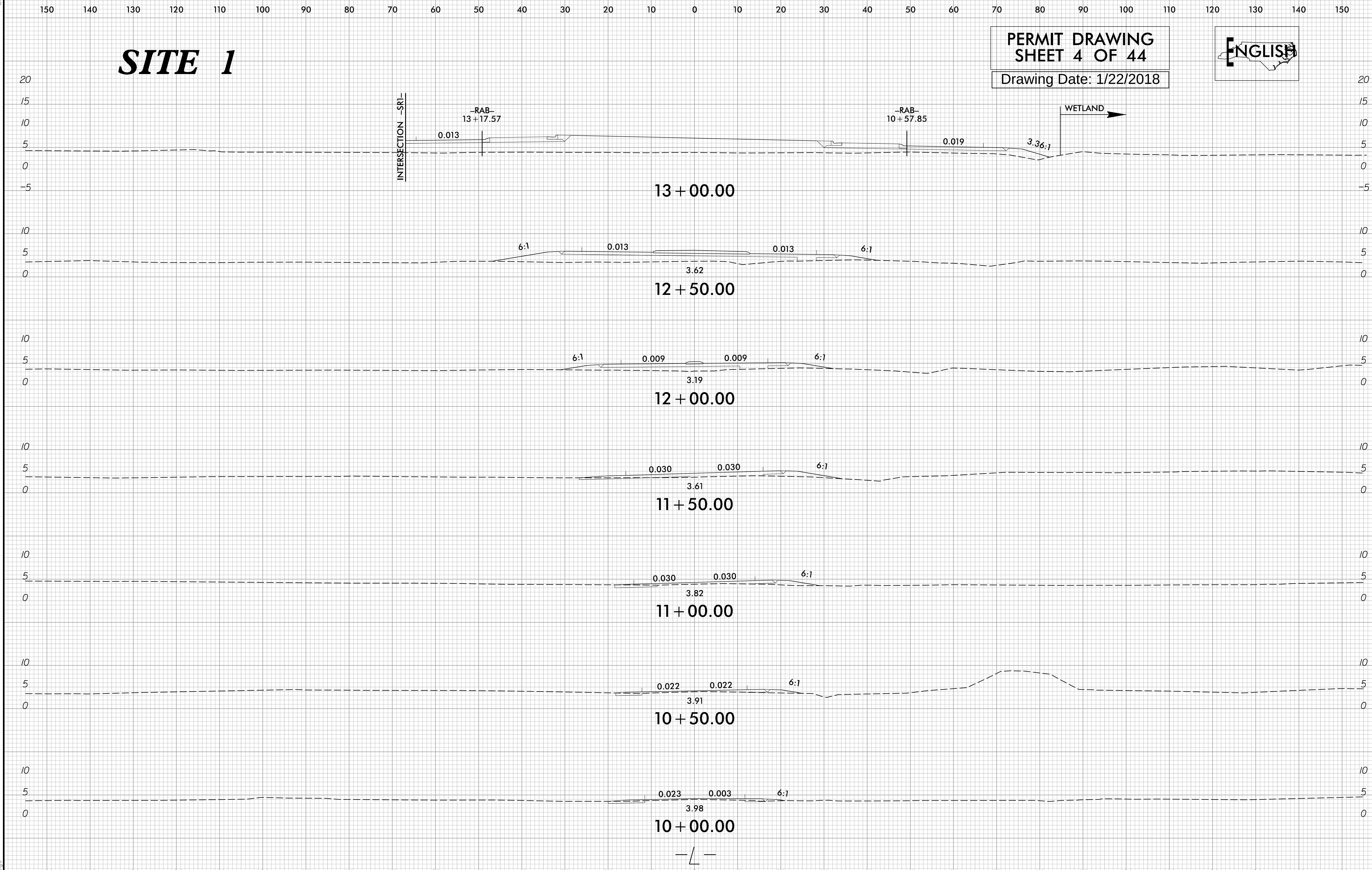
2/1/2018

PROJ. REFERENCE NO.	SHEET NO.
B-2500B	X-1

SITE 1

PERMIT DRAWING
SHEET 4 OF 44

Drawing Date: 1/22/2018



6/23/16

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6/23/16

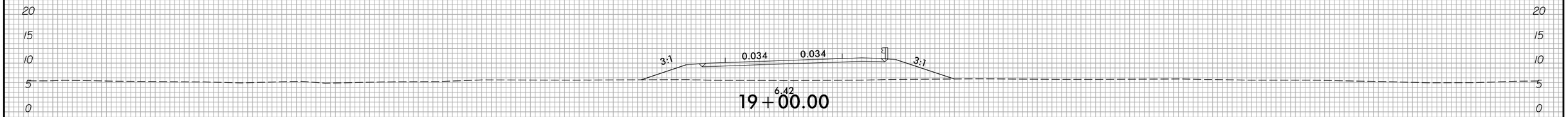
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-2500B	X-3

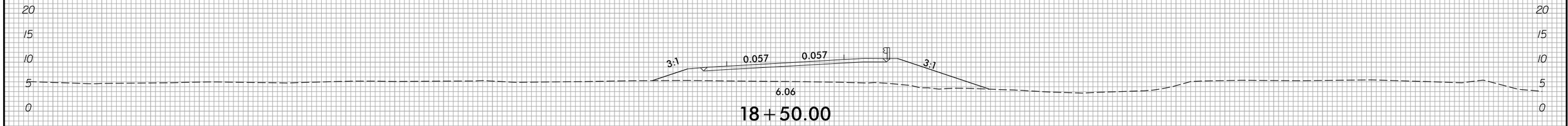
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

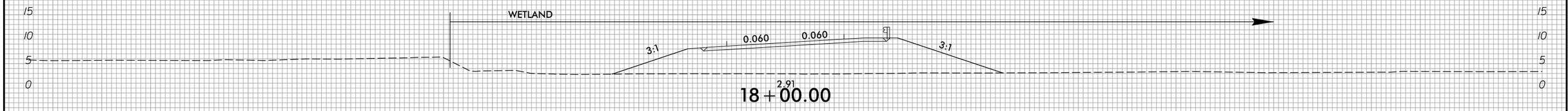
SITE 2

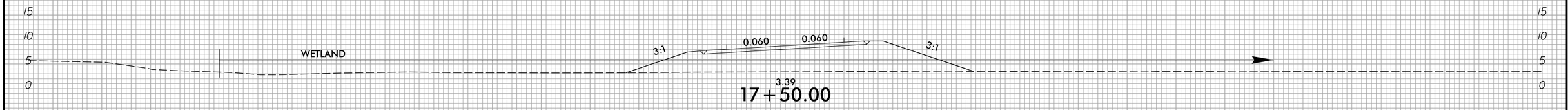
PERMIT DRAWING
SHEET 5 OF 44
Drawing Date: 1/22/2018

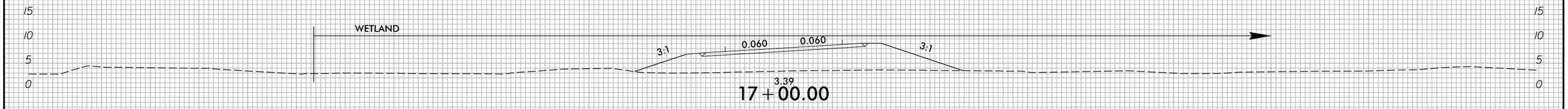
ENGLISH

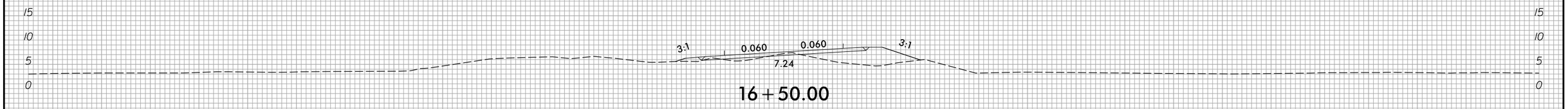












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150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 6 OF 44

Drawing Date: 1/22/2018

NAD 83

ENGLISH

F F DENOTES FILL IN WETLAND
HC HC DENOTES HAND CLEARING
S S DENOTES IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
T T DENOTES TEMPORARY FILL IN WETLAND
LAYDOWN YARD BOUNDARY
CAMA WETLAND BOUNDARY
ADVANCING RAIL SYSTEM

50 25 0 50 100
SCALE

CAMA WETLAND

SITE 3A

SITE 3B

Water intake location

Water intake location

Water intake location

-L- PC Sta. 24+05.34

Bent #1 -L- 21+60.00
Bent #2 -L- 22+20.00
Bent #3 -L- 22+80.00
Bent #4 -L- 23+40.00
Bent #5 -L- 24+37.25
Bent #6 -L- 25+34.50
Bent #7 -L- 26+31.75
Bent #8 -L- 27+29.00
Bent #9 -L- 28+26.25
Bent #10 -L- 29+23.50
Bent #11 -L- 30+20.75
Bent #12 -L- 31+18.00
Bent #13 -L- 32+15.25
Bent #14 -L- 33+12.50

MIDGETT'S CAMPGROUND, LLC
MIDGETT FAMILY CEMETERY
MIDGETT FAMILY CEM. 10 GRAVES
RETAIN SYSTEM
WD PILINGS
2GI STEEL F&G
15" RCP III
20+00
S 87° 29' 07.9" W
INSET A
CHRISTINE L. HADLEY, ET AL
ANTHONY BOLSTAD
JER K. MEHTA
MARK E. HAINES
RBC BANK (USA)
VALVE AS PER UTILITY RECORD NOT LOCATED IN FIELD
OUTLET 0503
-L- 20+50 RT
Q10=1.1 CFS
V10=0.5 FT/S
PAMLICO SOUND
SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING
MATCHLINE -L- STA. 20+00 SEE SHEET 4
MATCHLINE -L- STA. 34+00 SEE SHEET 6
FOR -L- PROFILE SEE SHT.24
ALL DRIVEWAYS ARE 16' UNLESS OTHERWISE NOTED.
ALL DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED.

INSET A
REMOVE PIPES
25 0 25 50
SCALE FOR INSETS

PLANS PREPARED BY :
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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 7 OF 44

Drawing Date: 1/22/2018

NAD 83

ENGLISH

F F DENOTES FILL IN WETLAND
HC HC DENOTES HAND CLEARING
S S DENOTES IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
T T DENOTES TEMPORARY FILL IN WETLAND
LAYDOWN YARD BOUNDARY
CAMA WETLAND BOUNDARY
ADVANCING RAIL SYSTEM

50 25 0 50 100
SCALE

CAMA WETLAND

SITE 3A

SITE 3B

-L- PC Sta. 24+05.34

MATCHLINE -L- STA. 20+00 SEE SHEET 4

MATCHLINE -L- STA. 34+00 SEE SHEET 6

MIDGETT FAMILY CEMETERY

MIDGETT'S CAMPGROUND, LLC

PAMLICO SOUND

Bent #1 -L- 21+60.00
Bent #2 -L- 22+20.00
Bent #3 -L- 22+80.00
Bent #4 -L- 23+40.00
Bent #5 -L- 24+37.25
Bent #6 -L- 25+34.50
Bent #7 -L- 26+31.75
Bent #8 -L- 27+29.00
Bent #9 -L- 28+26.25
Bent #10 -L- 29+23.50
Bent #11 -L- 30+20.75
Bent #12 -L- 31+18.00
Bent #13 -L- 32+15.25
Bent #14 -L- 33+12.50

RETAIN SYSTEM

2GI STEEL F&G

15" RCP III

S 87° 29' 07.9" W

20+00

INSET A

OUTLET 0503
-L- 20+50 RT
Q10=1.1 CFS
V10=0.5 FT/S

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

REMOVE PIPES

25 0 25 50
SCALE FOR INSETS

FOR -L- PROFILE SEE SHT.24

ALL DRIVEWAYS ARE 16' UNLESS OTHERWISE NOTED.
ALL DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED.

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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 8 OF 44

Drawing Date: 1/22/2018

NAD 83

PERMANENT IMPACTS TO SAV

TEMPORARY IMPACTS TO SAV

CAMA WETLAND BOUNDARY

ADVANCING RAIL SYSTEM

SUBMERGED AQUATIC VEGETATION

50 25 0 50 100

SCALE

ENGLISH

SITE 3A

SITE 3B

CAMA WETLAND

PAMLICO SOUND

MATCHLINE -L- STA. 20+00 SEE SHEET 4

MATCHLINE -L- STA. 34+00 SEE SHEET 6

-L- PC Sta. 24+05.34

20+00

25+00

S 87° 29' 07.9" W

MIDGETT'S CAMPGROUND, LLC

MIDGETT FAMILY CEMETERY

MIDGETT FAMILY CEM 10 GRAVES

RETAIN SYSTEM

REMOVE EXIST PIPES

2GI STEEL F&G

15" RCP-III

ANTHONY BOLSTAD

MARK E. HAINES

JER K. MEHTA

RBC BANK (USA)

CHRISTINE L. HADLEY, ET AL

VALVE AS PER UTILITY RECORD NOT LOCATED IN FIELD

Bent #1 -L- 21+60.00

Bent #2 -L- 22+20.00

Bent #3 -L- 22+80.00

Bent #4 -L- 23+40.00

Bent #5 -L- 24+37.25

Bent #6 -L- 25+34.50

Bent #7 -L- 26+31.75

Bent #8 -L- 27+29.00

Bent #9 -L- 28+26.25

Bent #10 -L- 29+23.50

Bent #11 -L- 30+20.75

Bent #12 -L- 31+18.00

Bent #13 -L- 32+15.25

Bent #14 -L- 33+12.50

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

FOR -L- PROFILE SEE SHT.24

ALL DRIVEWAYS ARE 16' UNLESS OTHERWISE NOTED.
ALL DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED.

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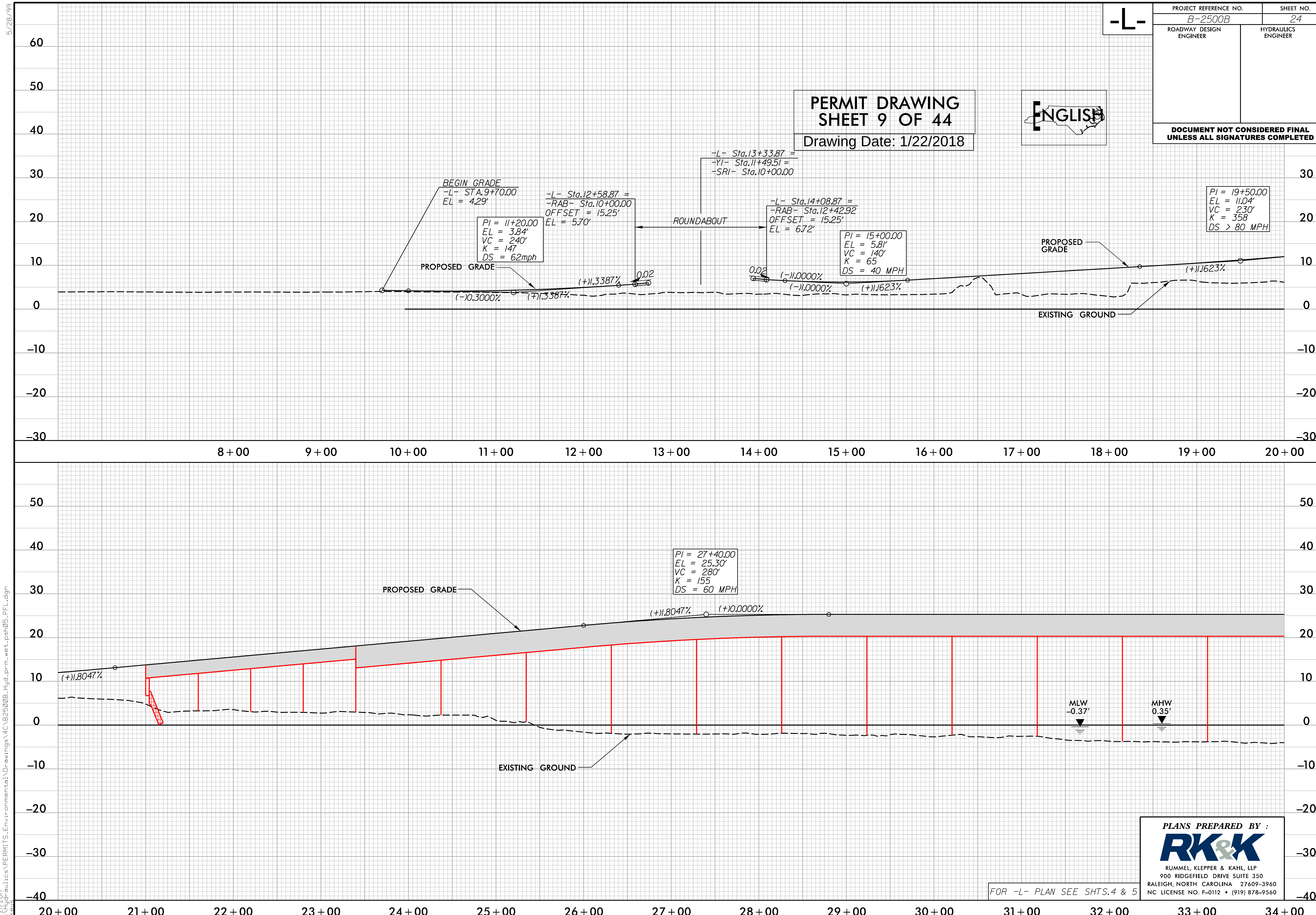

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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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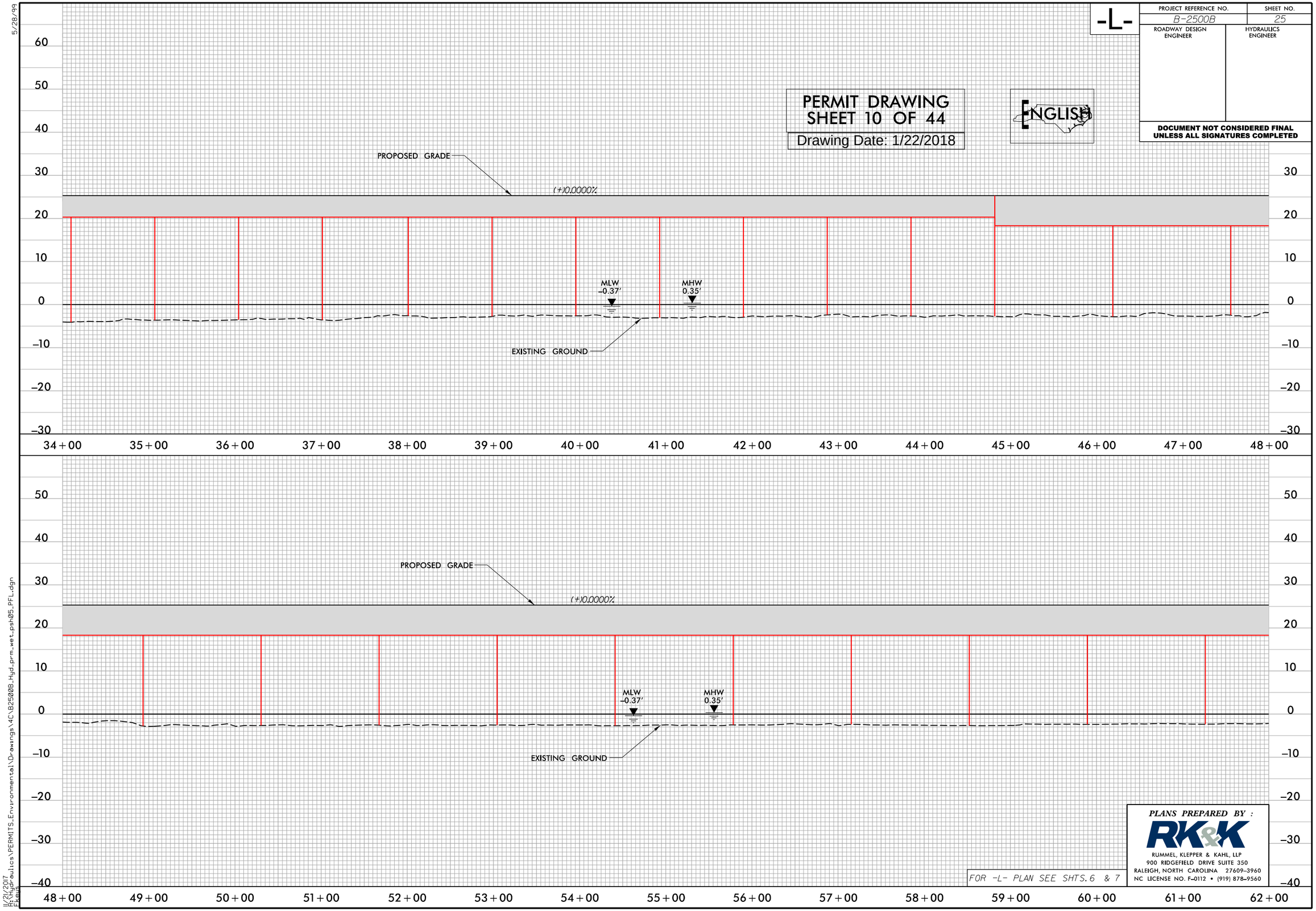
PERMIT DRAWING
SHEET 10 OF 44
Drawing Date: 1/22/2018

ENGLISH



FOR -L- PLAN SEE SHTS. 6 & 7

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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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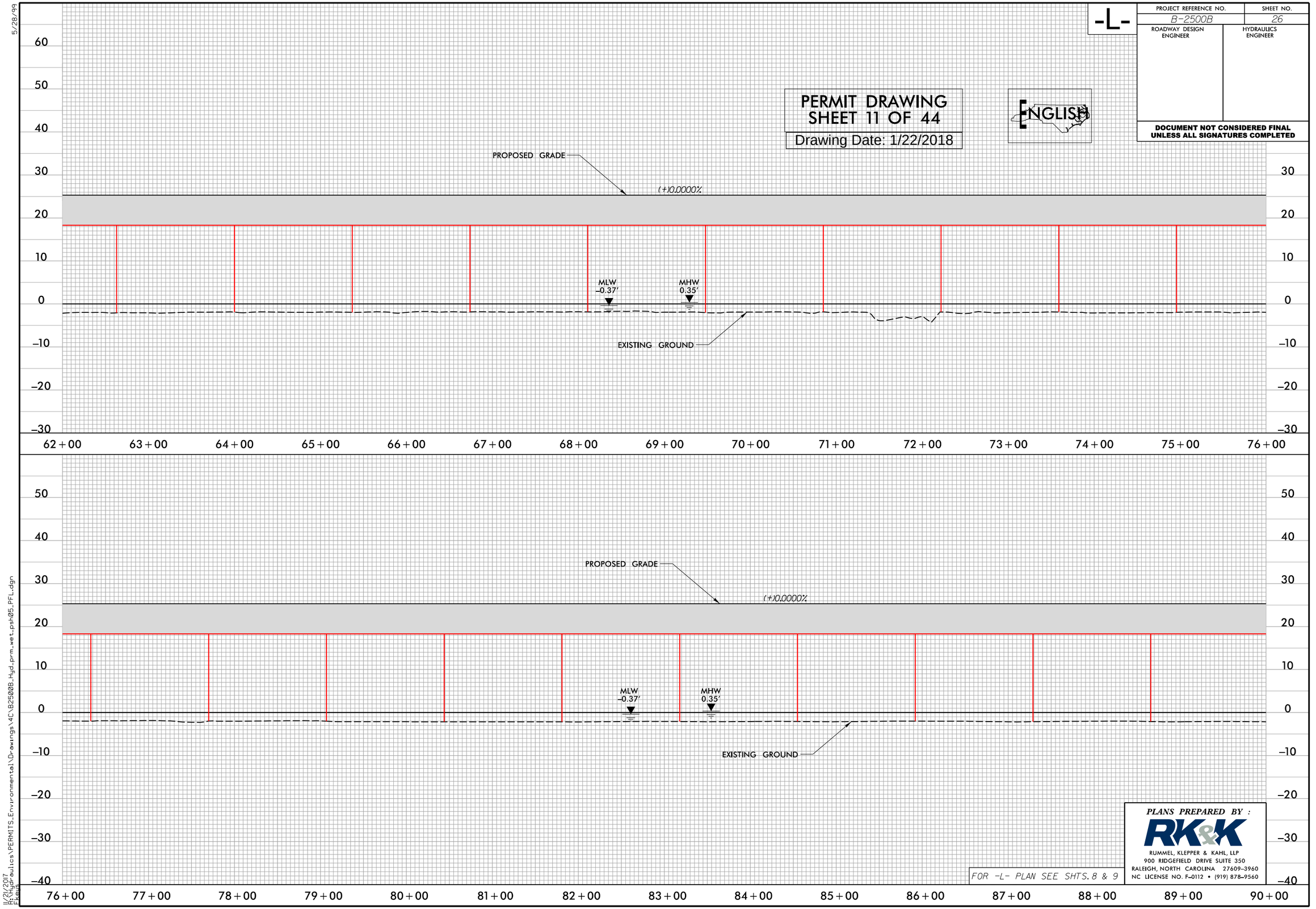
PERMIT DRAWING
SHEET 11 OF 44
Drawing Date: 1/22/2018

ENGLISH



FOR -L- PLAN SEE SHTS. 8 & 9

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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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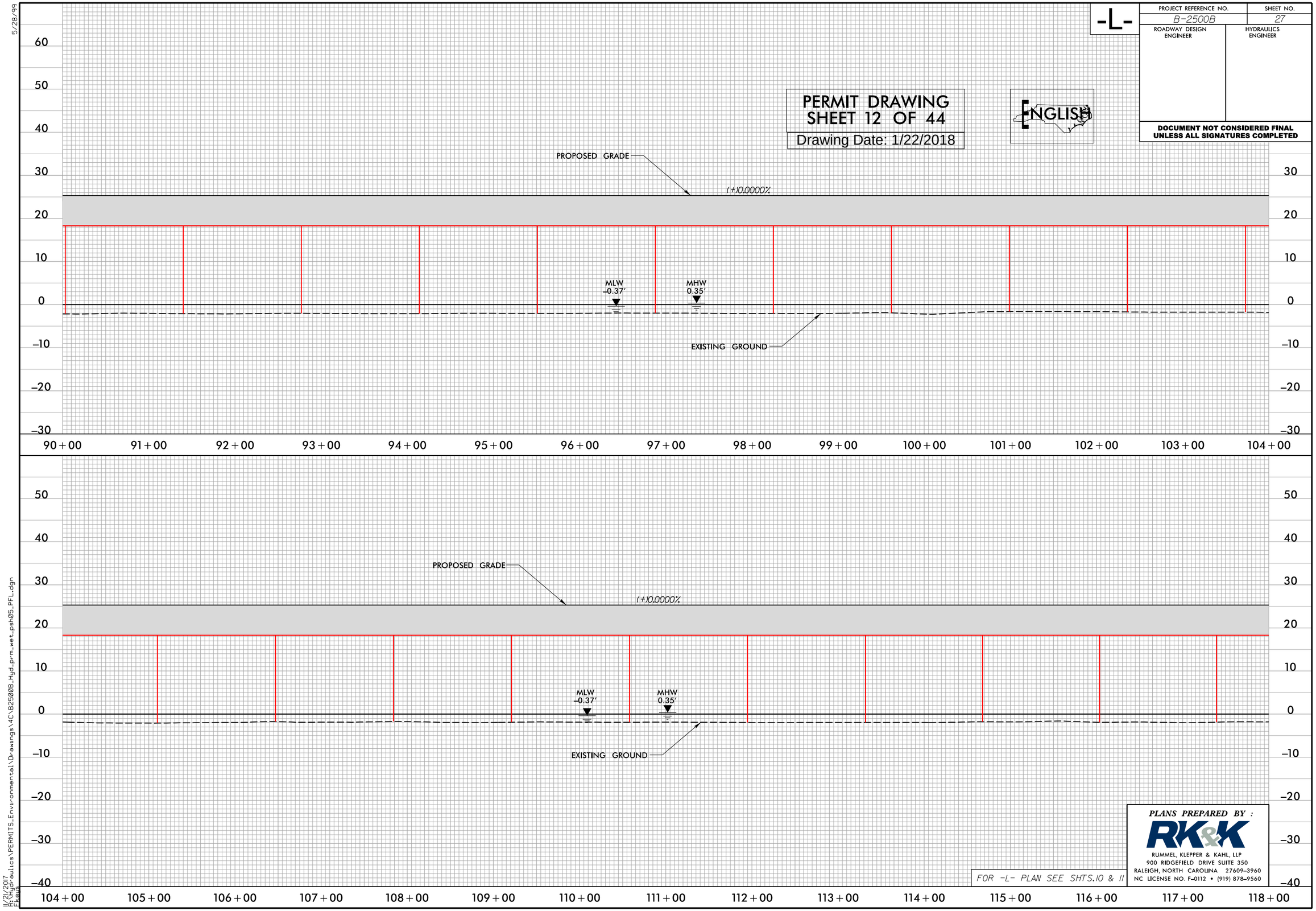
PERMIT DRAWING
SHEET 12 OF 44
Drawing Date: 1/22/2018

ENGLISH



FOR -L- PLAN SEE SHTS.10 & 11

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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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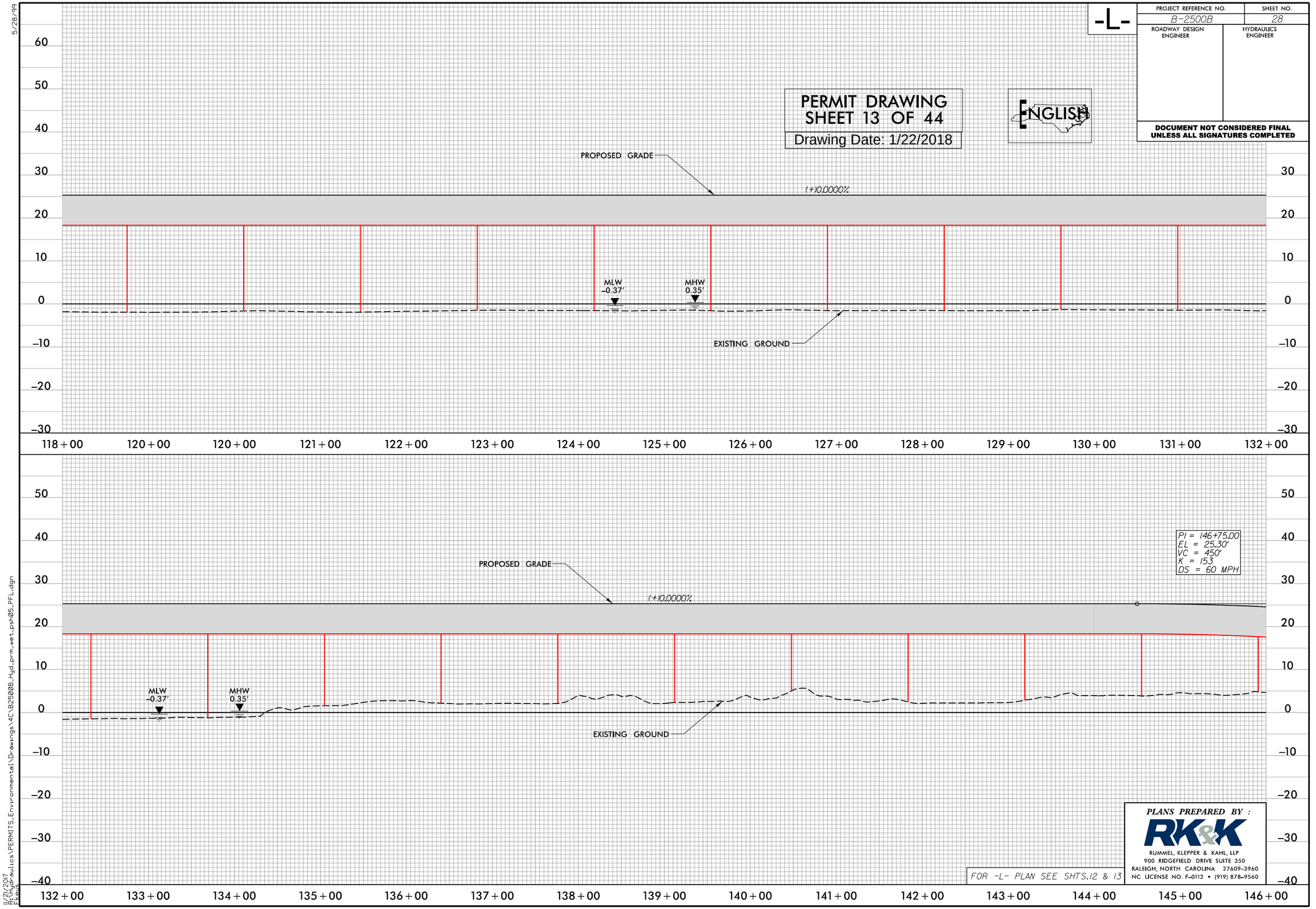
PERMIT DRAWING
SHEET 13 OF 44
Drawing Date: 1/22/2018

ENGLISH



FOR -L- PLAN SEE SHTS.12 & 13

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rkelly

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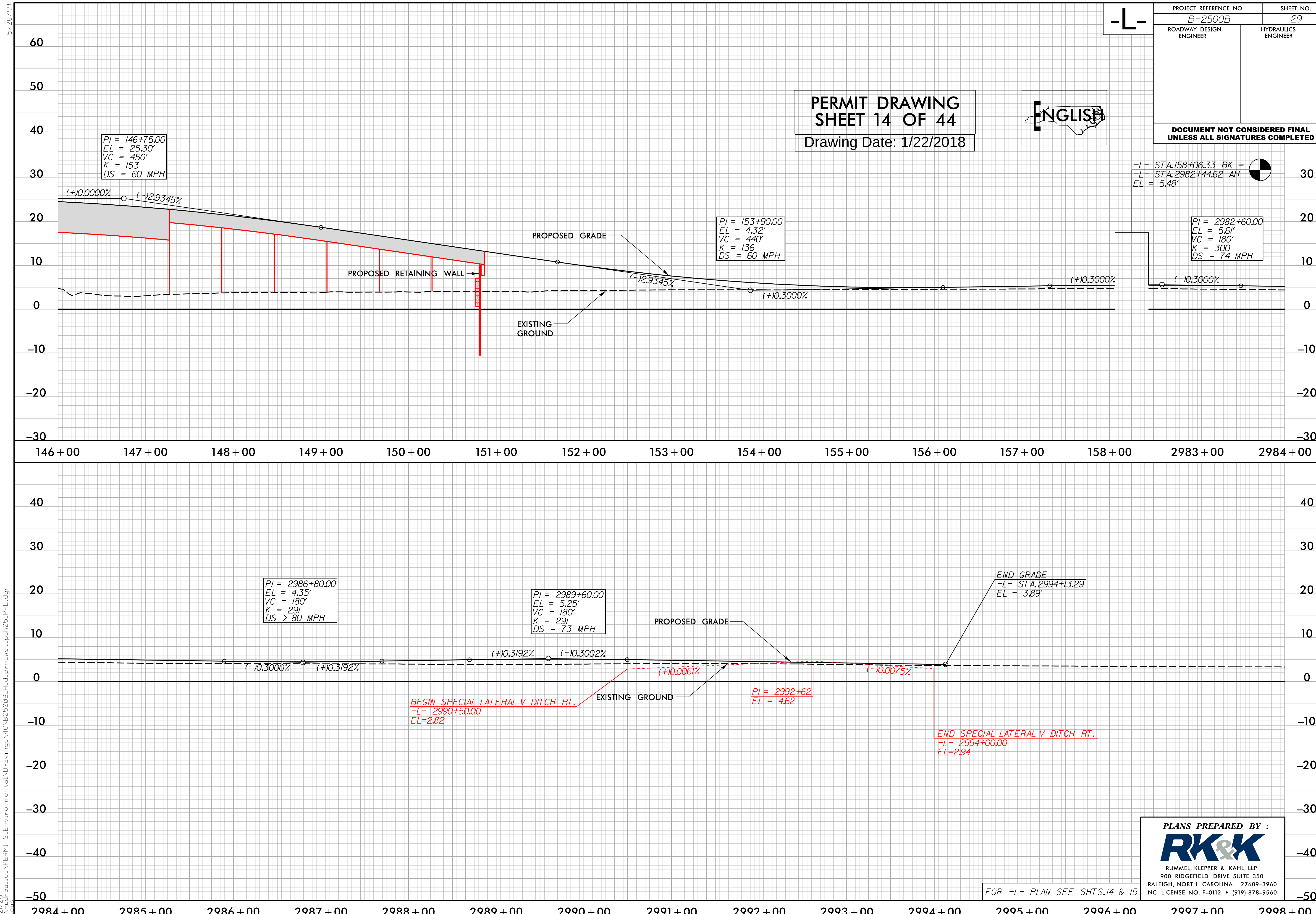
PERMIT DRAWING SHEET 14 OF 44

Drawing Date: 1/22/2018



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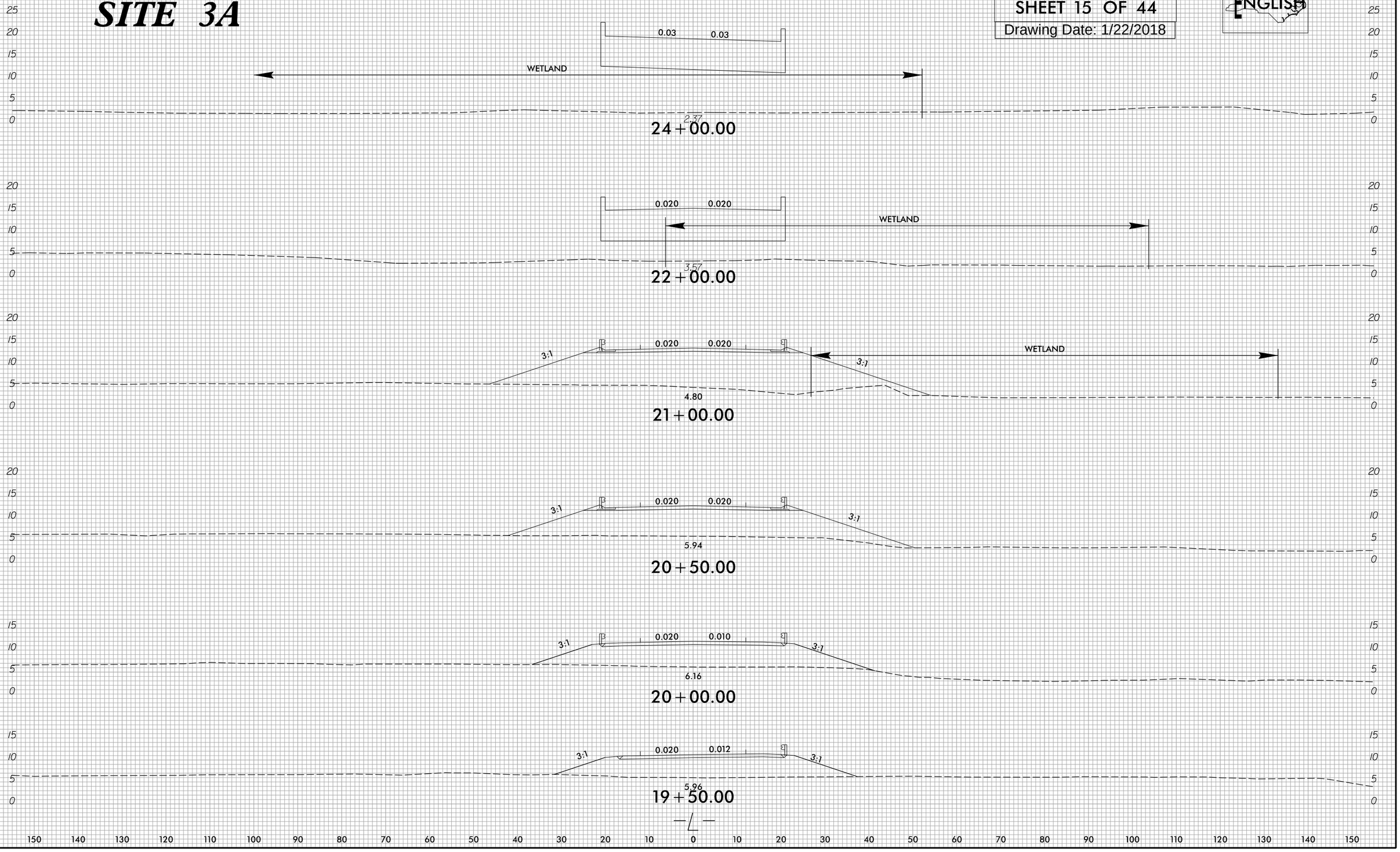
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-2500B	X-4

SITE 3A

PERMIT DRAWING
SHEET 15 OF 44
Drawing Date: 1/22/2018

ENGLISH



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Kelly

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-2500B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 16 OF 44

Drawing Date: 1/22/2018

NAD 83

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ADVANCING RAIL SYSTEM

ENGLISH

50 25 0 50 100
SCALE

SITE 3B

Water intake location

Water intake location

Water intake location

PAMLICO SOUND

Bent #15 -L- 34+09.75

Bent #16 -L- 35+07.00

Bent #17 -L- 36+04.25

Bent #18 -L- 37+01.50

Bent #19 -L- 38+01.25

Bent #20 -L- 38+98.50

Bent #21 -L- 39+95.75

Bent #22 -L- 40+93.00

Bent #23 -L- 41+90.25

Bent #24 -L- 42+87.50

Bent #25 -L- 43+84.75

Bent #26 -L- 44+82.00

Bent #27 -L- 46+19.00

Bent #28 -L- 47+56.00

-L- PT Sta. 44+71.48

100'

SUNKEN BOAT

SUNKEN BARGE

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

N 3°30'20" W

MATCHLINE -L- STA. 34+00 SEE SHEET 5

MATCHLINE -L- STA. 48+00 SEE SHEET 7

PAMLICO SOUND

FOR -L- PROFILE SEE SHT. 25

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1/22/2018
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ekeus

PROJECT REFERENCE NO.	SHEET NO.
B-2500B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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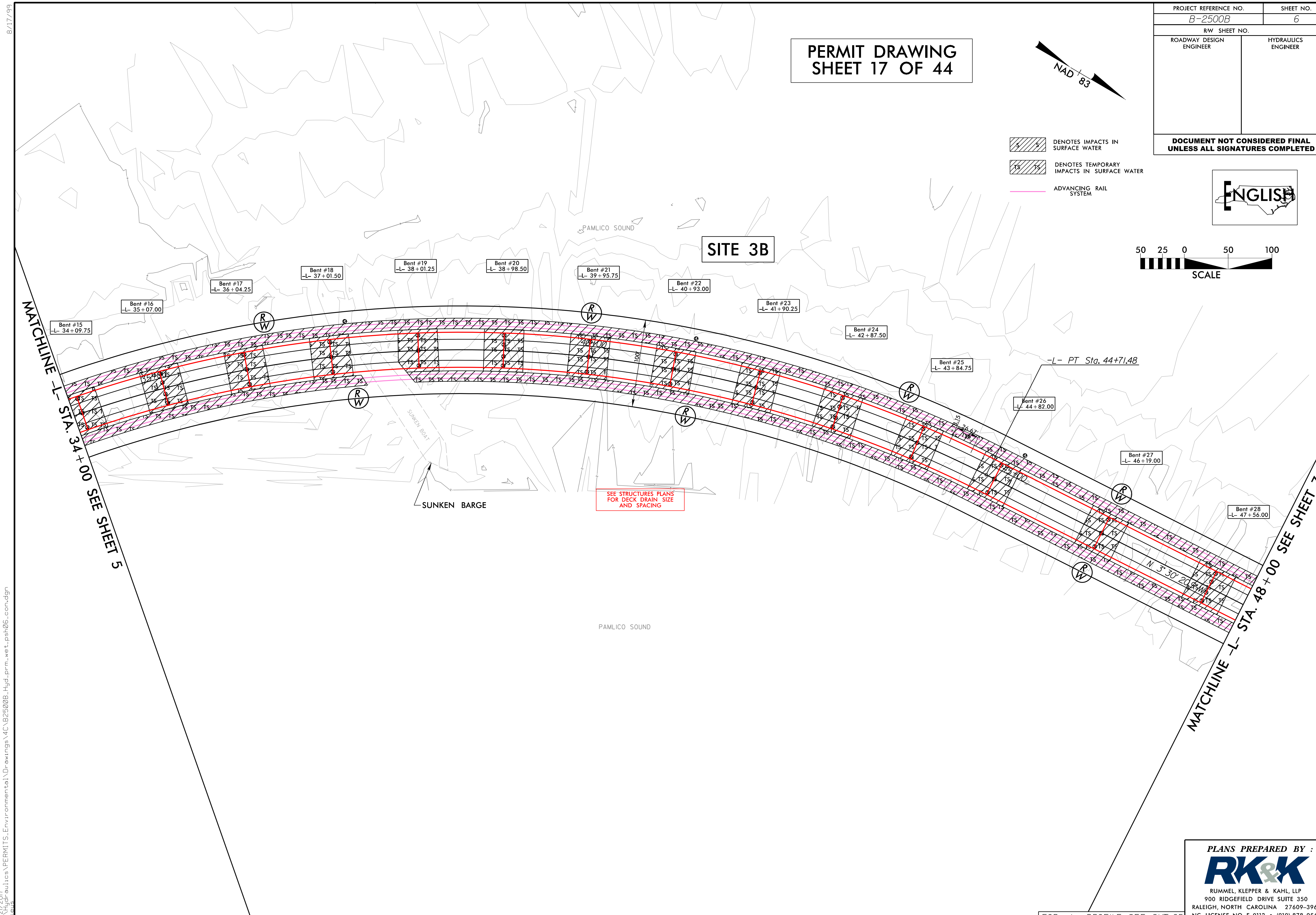
PERMIT DRAWING SHEET 17 OF 44



FOR -L- PROFILE SEE SHT. 25

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PERMIT DRAWING SHEET 18 OF 44

Drawing Date: 1/22/2018

NAD 83

PERMANENT IMPACTS TO SAV

TEMPORARY IMPACTS TO SAV

ADVANCING RAIL SYSTEM

SUBMERGED AQUATIC VEGETATION

ENGLISH

50 25 0 50 100

SCALE

PAMLICO SOUND

SITE 3B

MATCHLINE -L- STA. 34+00 SEE SHEET 5

Bent #15 -L- 34+09.75

Bent #16 -L- 35+07.00

Bent #17 -L- 36+04.25

Bent #18 -L- 37+01.50

Bent #19 -L- 38+01.25

Bent #20 -L- 38+98.50

Bent #21 -L- 39+95.75

Bent #22 -L- 40+93.00

Bent #23 -L- 41+90.25

Bent #24 -L- 42+87.50

Bent #25 -L- 43+84.75

-L- PT Sta. 44+71.48

Bent #26 -L- 44+82.00

Bent #27 -L- 46+19.00

Bent #28 -L- 47+56.00

N 5-30-29 W

SUNKEN BOAT

SUNKEN BARGE

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

PAMLICO SOUND

MATCHLINE -L- STA. 48+00 SEE SHEET 7

FOR -L- PROFILE SEE SHT.25

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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 19 OF 44

Drawing Date: 1/22/2018

NAD 83

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ADVANCING RAIL SYSTEM

ENGLISH

50 25 0 50 100
SCALE

PAMLICO SOUND

SITE 3B

Water intake location

Water intake location

Water intake location

Bent #29 -L- 48+93.00

Bent #30 -L- 50+30.00

Bent #31 -L- 51+67.00

Bent #32 -L- 53+04.00

Bent #33 -L- 54+41.00

Bent #34 -L- 55+78.00

Bent #35 -L- 57+15.00

Bent #36 -L- 58+52.00

Bent #37 -L- 59+89.00

Bent #38 -L- 51+26.00

50+00

55+00

60+00

N 30° 20.9" W

-L-

PAMLICO SOUND

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

MATCHLINE -L- STA. 48+00 SEE SHEET 6

MATCHLINE -L- STA. 62+00 SEE SHEET 8

FOR -L- PROFILE SEE SHT. 25

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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 20 OF 44

Drawing Date: 1/22/2018

NAD 83

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

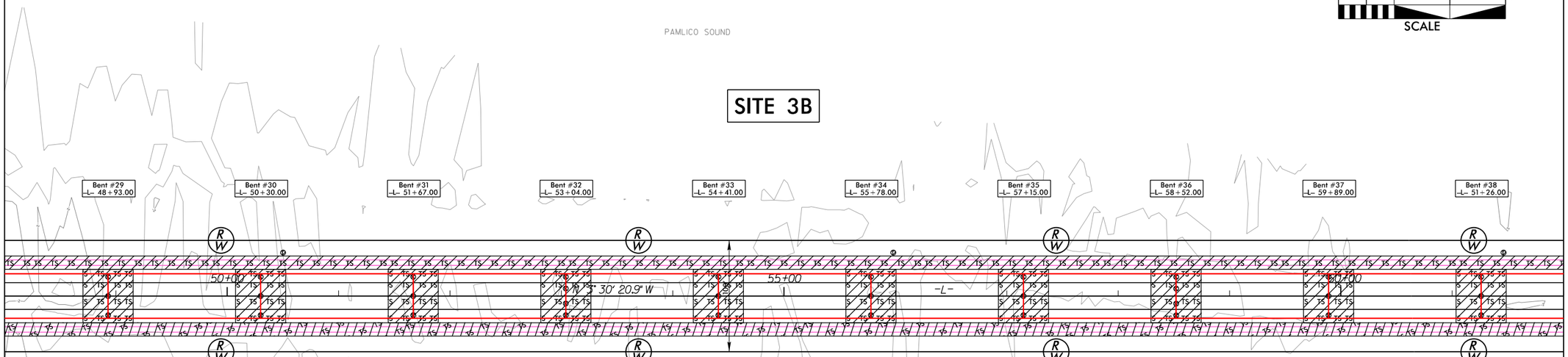
ADVANCING RAIL SYSTEM

ENGLISH

50 25 0 50 100
SCALE

PAMLICO SOUND

SITE 3B



PAMLICO SOUND

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

MATCHLINE -L- STA. 48+00 SEE SHEET 6

MATCHLINE -L- STA. 62+00 SEE SHEET 8

FOR -L- PROFILE SEE SHT.25

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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 21 OF 44

Drawing Date: 1/22/2018

NAD 83

PERMANENT IMPACTS TO SAV

TEMPORARY IMPACTS TO SAV

ADVANCING RAIL SYSTEM

SUBMERGED AQUATIC VEGETATION

ENGLISH

50 25 0 50 100

SCALE

PAMLICO SOUND

SITE 3B

MATCHLINE –L– STA. 48+00 SEE SHEET 6

MATCHLINE –L– STA. 62+00 SEE SHEET 8

Bent #29 –L– 48+93.00

Bent #30 –L– 50+30.00

Bent #31 –L– 51+67.00

Bent #32 –L– 53+04.00

Bent #33 –L– 54+41.00

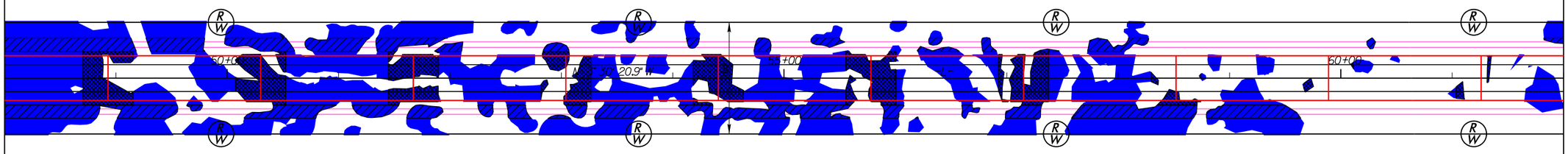
Bent #34 –L– 55+78.00

Bent #35 –L– 57+15.00

Bent #36 –L– 58+52.00

Bent #37 –L– 59+89.00

Bent #38 –L– 51+26.00



PAMLICO SOUND

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

FOR –L– PROFILE SEE SHT.25

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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83

PERMIT DRAWING SHEET 22 OF 44

Drawing Date: 1/22/2018

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ADVANCING RAIL SYSTEM

ENGLISH

50 25 0 50 100
SCALE

PAMLICO SOUND

SITE 3B

Water intake location

MATCHLINE –L– STA. 62+00 SEE SHEET 7

MATCHLINE –L– STA. 76+00 SEE SHEET 9

Bent #39 –L– 62+63.00
Bent #40 –L– 64+00.00
Bent #41 –L– 65+37.00
Bent #42 –L– 66+74.00
Bent #43 –L– 68+11.00
Bent #44 –L– 69+48.00
Bent #45 –L– 70+85.00
Bent #46 –L– 72+22.00
Bent #47 –L– 73+59.00
Bent #48 –L– 74+96.00

65+00

N 3° 30' 20.9" W

100'

70+00

PAMLICO SOUND

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

FOR –L– PROFILE SEE SHT.26

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B-2500B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83

PERMIT DRAWING SHEET 23 OF 44

Drawing Date: 1/22/2018

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ADVANCING RAIL SYSTEM

ENGLISH

50 25 0 50 100
SCALE

PAMLICO SOUND

SITE 3B

MATCHLINE -L- STA. 62+00 SEE SHEET 7

MATCHLINE -L- STA. 76+00 SEE SHEET 9

Bent #39 -L- 62+63.00
Bent #40 -L- 64+00.00
Bent #41 -L- 65+37.00
Bent #42 -L- 66+74.00
Bent #43 -L- 68+11.00
Bent #44 -L- 69+48.00
Bent #45 -L- 70+85.00
Bent #46 -L- 72+22.00
Bent #47 -L- 73+59.00
Bent #48 -L- 74+96.00

65+00
70+00
75+00
N 3° 30' 20.9" W
100'

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

PAMLICO SOUND

FOR -L- PROFILE SEE SHT.26

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B-2500B	8
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NAD 83

PERMIT DRAWING SHEET 24 OF 44

Drawing Date: 1/22/2018

PERMANENT IMPACTS TO SAV

TEMPORARY IMPACTS TO SAV

ADVANCING RAIL SYSTEM

SUBMERGED AQUATIC VEGETATION

ENGLISH

50 25 0 50 100

SCALE

PAMLICO SOUND

SITE 3B

MATCHLINE -L- STA. 62+00 SEE SHEET 7

MATCHLINE -L- STA. 76+00 SEE SHEET 9

Bent #39 -L- 62+63.00

Bent #40 -L- 64+00.00

Bent #41 -L- 65+37.00

Bent #42 -L- 66+74.00

Bent #43 -L- 68+11.00

Bent #44 -L- 69+48.00

Bent #45 -L- 70+85.00

Bent #46 -L- 72+22.00

Bent #47 -L- 73+59.00

Bent #48 -L- 74+96.00

65+00

N 3° 30' 20.9" W

100'

70+00

75+00

PAMLICO SOUND

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

FOR -L- PROFILE SEE SHT.26

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R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83

PERMIT DRAWING SHEET 25 OF 44

Drawing Date: 1/22/2018

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ADVANCING RAIL SYSTEM

ENGLISH

50 25 0 50 100
SCALE

MATCHLINE –L– STA. 76+00 SEE SHEET 8

PAMLICO SOUND

SITE 3B

Water intake location

Water intake location

Water intake location

Bent #49 –L– 76+33.00

Bent #50 –L– 77+70.00

Bent #51 –L– 79+07.00

Bent #52 –L– 80+44.00

Bent #53 –L– 81+81.00

Bent #54 –L– 83+18.00

Bent #55 –L– 84+55.00

Bent #56 –L– 85+92.00

Bent #57 –L– 87+29.00

Bent #58 –L– 88+66.00

80+00

85+00

90+00

N 3° 30' 20.9" W

100'

–L–

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

PAMLICO SOUND

MATCHLINE –L– STA. 90+00 SEE SHEET 10

FOR –L– PROFILE SEE SHT.26

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B-2500B	9
R/W SHEET NO.	
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NAD 83

PERMIT DRAWING SHEET 26 OF 44

Drawing Date: 1/22/2018

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ADVANCING RAIL SYSTEM

ENGLISH

50 25 0 50 100

SCALE

PAMLICO SOUND

SITE 3B

MATCHLINE -L- STA. 76+00 SEE SHEET 8

MATCHLINE -L- STA. 90+00 SEE SHEET 10

Bent #49 -L- 76+33.00
Bent #50 -L- 77+70.00
Bent #51 -L- 79+07.00
Bent #52 -L- 80+44.00
Bent #53 -L- 81+81.00
Bent #54 -L- 83+18.00
Bent #55 -L- 84+55.00
Bent #56 -L- 85+92.00
Bent #57 -L- 87+29.00
Bent #58 -L- 88+66.00

80+00
85+00
90+00
-L-
100'
N 3° 30' 20.9" W

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

PAMLICO SOUND

FOR -L- PROFILE SEE SHT.26

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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83

PERMIT DRAWING SHEET 27 OF 44

Drawing Date: 1/22/2018

PERMANENT IMPACTS TO SAV

TEMPORARY IMPACTS TO SAV

ADVANCING RAIL SYSTEM

SUBMERGED AQUATIC VEGETATION

50 25 0 50 100

SCALE

PAMLICO SOUND

SITE 3B

MATCHLINE -L- STA. 76+00 SEE SHEET 8

Bent #49 -L- 76+33.00 | Bent #50 -L- 77+70.00 | Bent #51 -L- 79+07.00 | Bent #52 -L- 80+44.00 | Bent #53 -L- 81+81.00 | Bent #54 -L- 83+18.00 | Bent #55 -L- 84+55.00 | Bent #56 -L- 85+92.00 | Bent #57 -L- 87+29.00 | Bent #58 -L- 88+66.00

80+00 | 85+00 | 90+00

N 3°30'20"W

100'

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

PAMLICO SOUND

MATCHLINE -L- STA. 90+00 SEE SHEET 10

FOR -L- PROFILE SEE SHT.26

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B-2500B	10
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NAD 83

PERMIT DRAWING SHEET 28 OF 44

Drawing Date: 1/22/2018

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ADVANCING RAIL SYSTEM

ENGLISH

50 25 0 50 100

SCALE

PAMLICO SOUND

SITE 3B

Water intake location

Water intake location

Bent #59 -L- 90+03.00
Bent #60 -L- 91+40.00
Bent #61 -L- 92+77.00
Bent #62 -L- 94+14.00
Bent #63 -L- 95+51.00
Bent #64 -L- 96+88.00
Bent #65 -L- 98+25.00
Bent #66 -L- 99+62.00
Bent #67 -L- 100+99.00
Bent #68 -L- 102+36.00
Bent #69 -L- 103+73.00

90+00
95+00
100+00

N 3° 30' 20.9" W

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

PAMLICO SOUND

MATCHLINE -L- STA. 90+00 SEE SHEET 9

MATCHLINE -L- STA. 104+00 SEE SHEET 11

FOR -L- PROFILE SEE SHT.27

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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

PERMIT DRAWING SHEET 29 OF 44

Drawing Date: 1/22/2018

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ADVANCING RAIL SYSTEM

ENGLISH

50 25 0 50 100

SCALE

PAMLICO SOUND

SITE 3B

MATCHLINE -L- STA. 90+00 SEE SHEET 9

MATCHLINE -L- STA. 104+00 SEE SHEET 11

Bent #59 -L- 90+03.00
Bent #60 -L- 91+40.00
Bent #61 -L- 92+77.00
Bent #62 -L- 94+14.00
Bent #63 -L- 95+51.00
Bent #64 -L- 96+88.00
Bent #65 -L- 98+25.00
Bent #66 -L- 99+62.00
Bent #67 -L- 100+99.00
Bent #68 -L- 102+36.00
Bent #69 -L- 103+73.00

90+00
95+00
100+00

W 3° 30' 20.9" W

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

PAMLICO SOUND

FOR -L- PROFILE SEE SHT.27

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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83

PERMIT DRAWING SHEET 30 OF 44

Drawing Date: 1/22/2018

PERMANENT IMPACTS TO SAV

TEMPORARY IMPACTS TO SAV

ADVANCING RAIL SYSTEM

SUBMERGED AQUATIC VEGETATION

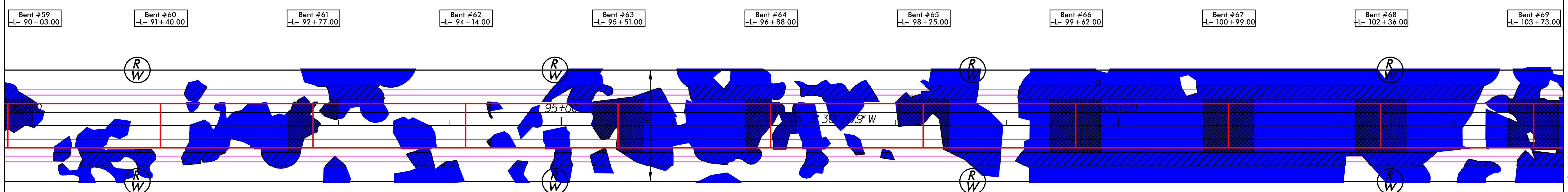
ENGLISH

50 25 0 50 100
SCALE

PAMLICO SOUND

SITE 3B

MATCHLINE -L- STA. 90+00 SEE SHEET 9



MATCHLINE -L- STA. 104+00 SEE SHEET 11

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

PAMLICO SOUND

FOR -L- PROFILE SEE SHT. 27

PLANS PREPARED BY :
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NC LICENSE NO. F-0112 • (919) 878-9560

PROJECT REFERENCE NO.	SHEET NO.
B-2500B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

PERMIT DRAWING SHEET 31 OF 44

Drawing Date: 1/22/2018

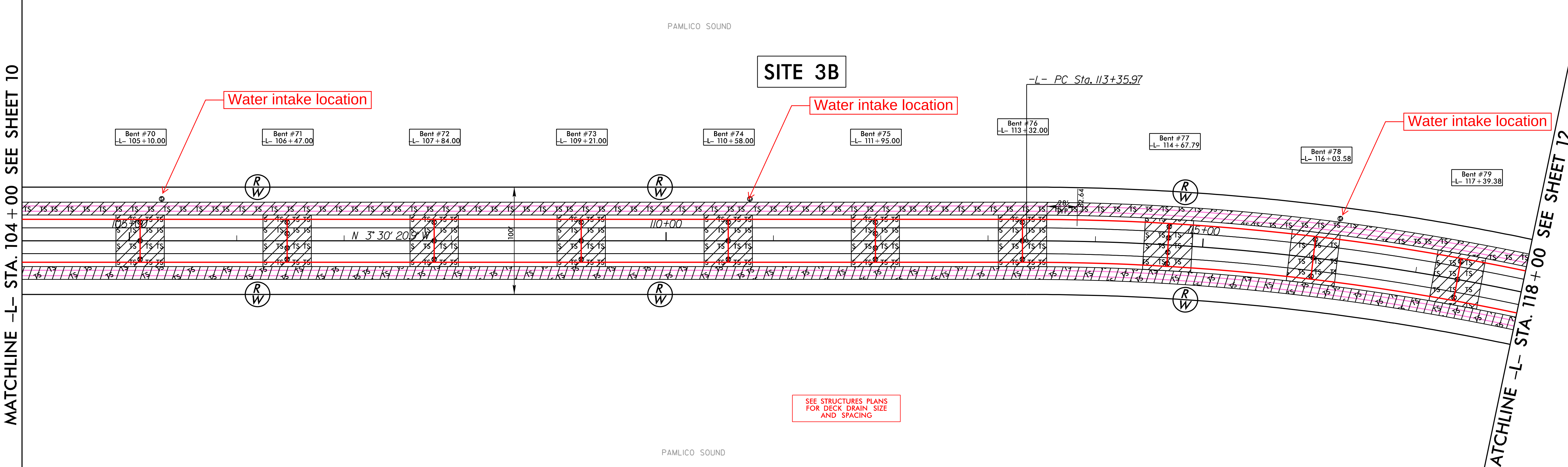
DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ADVANCING RAIL SYSTEM

ENGLISH

SCALE: 50 25 0 50 100



MATCHLINE -L- STA. 104+00 SEE SHEET 10

MATCHLINE -L- STA. 118+00 SEE SHEET 12

FOR -L- PROFILE SEE SHT.27

PLANS PREPARED BY :

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11/21/2017
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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 32 OF 44

Drawing Date: 1/22/2018

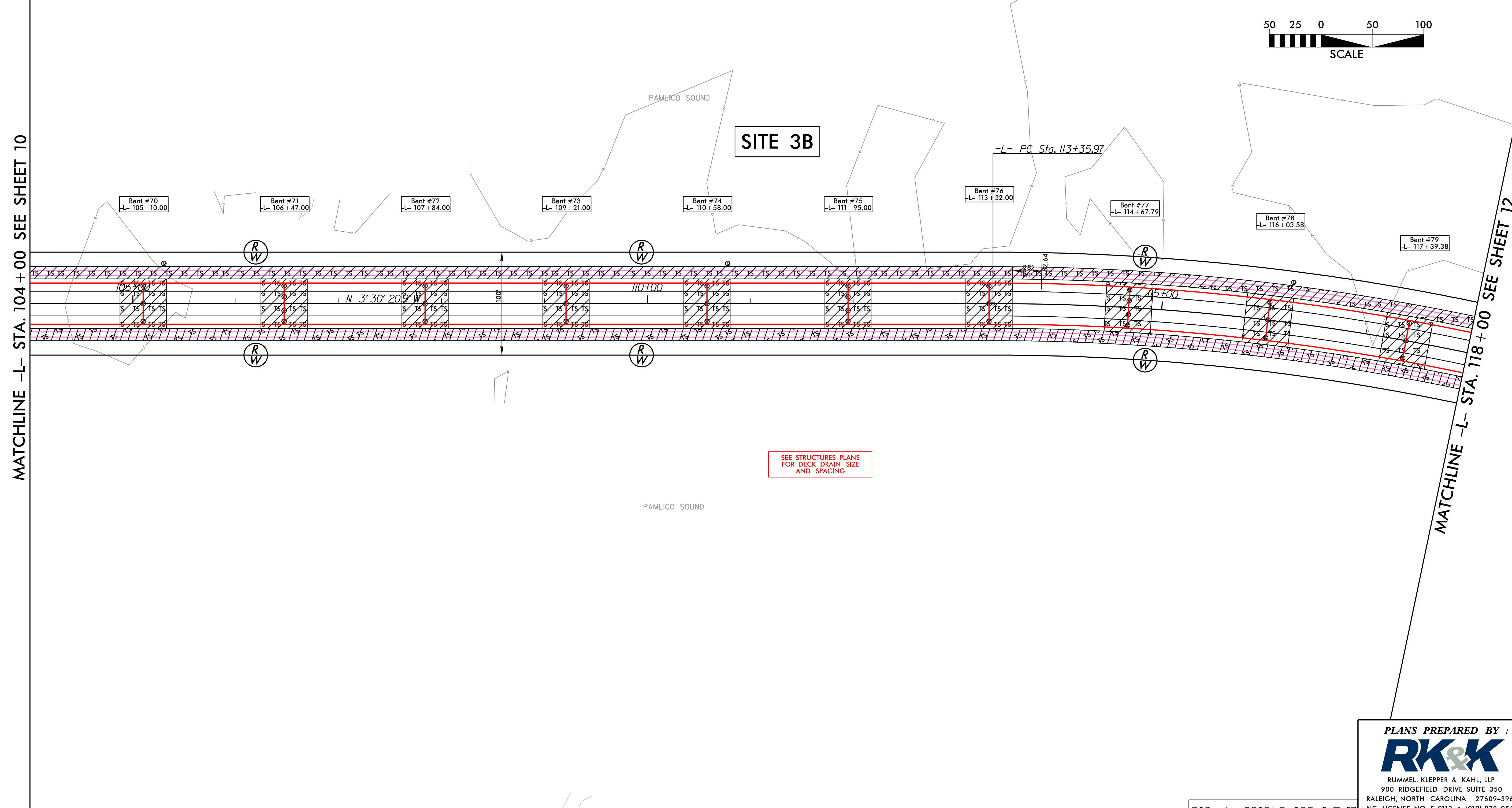
NAD 83

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ADVANCING RAIL SYSTEM

ENGLISH



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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	11

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 33 OF 44

Drawing Date: 1/22/2018

NAD 83

PERMANENT IMPACTS TO SAV

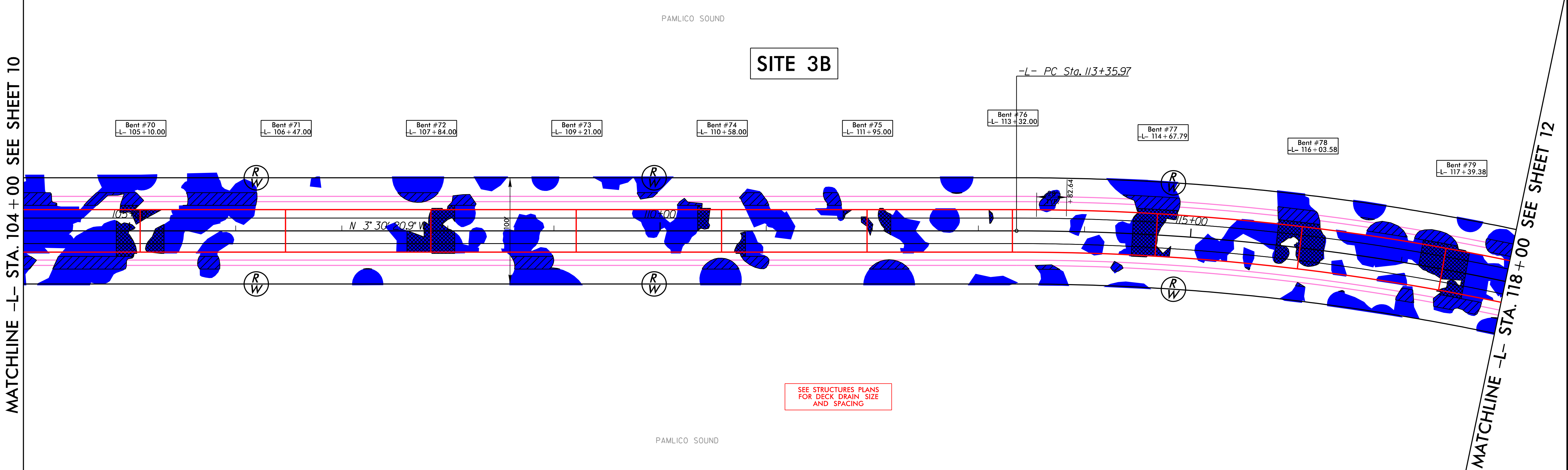
TEMPORARY IMPACTS TO SAV

ADVANCING RAIL SYSTEM

SUBMERGED AQUATIC VEGETATION

50 25 0 50 100

SCALE



FOR -L- PROFILE SEE SHT. 27

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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	12

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

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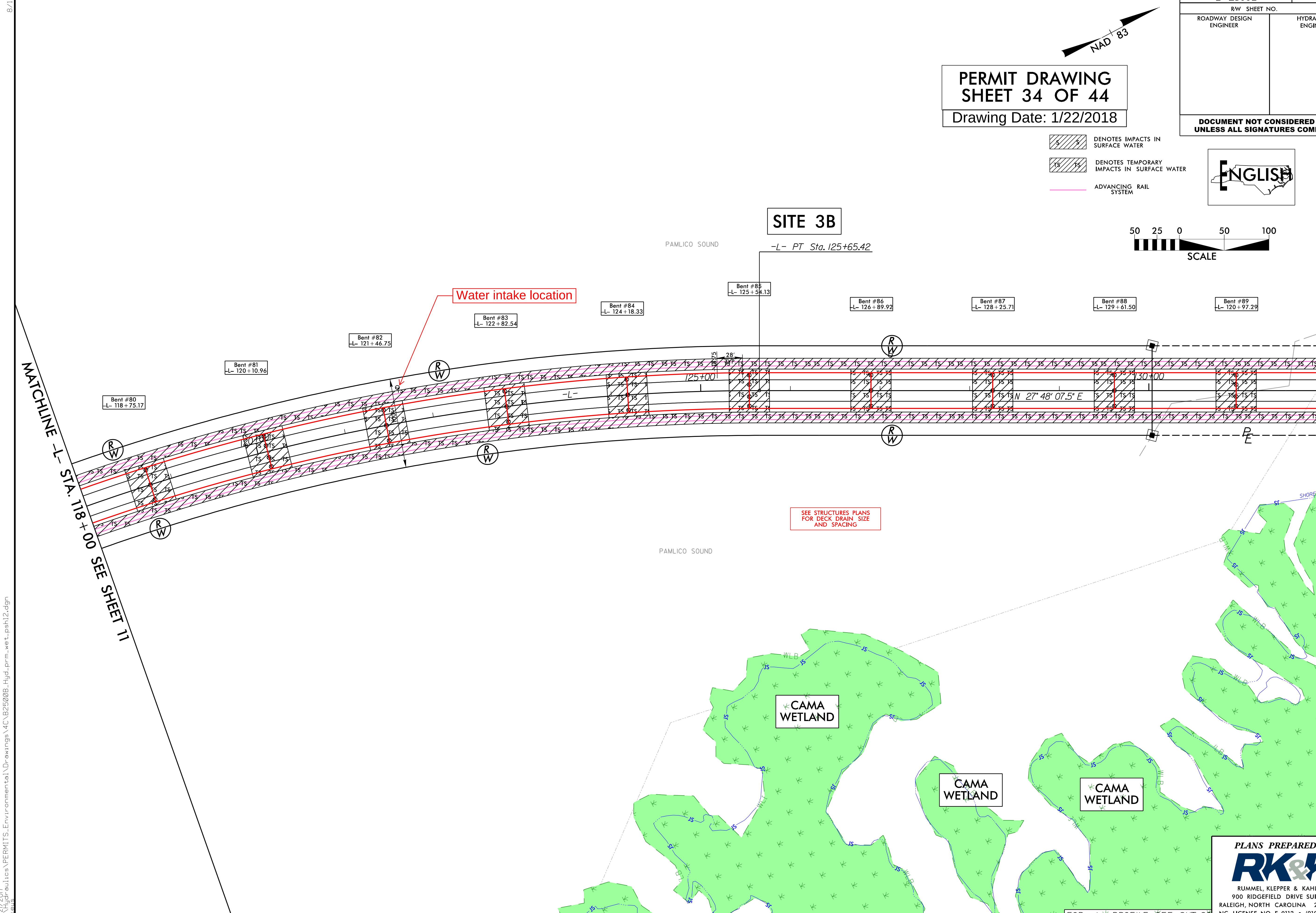
PERMIT DRAWING SHEET 34 OF 44

Drawing Date: 1/22/2018



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8/17/99

11/21/2017
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-2500B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

PERMIT DRAWING SHEET 35 OF 44

Drawing Date: 1/22/2018

JS JS DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ADVANCING RAIL SYSTEM

ENGLISH

50 25 0 50 100
SCALE

SITE 3B

PAMLICO SOUND

-L- PT Sta. 125+65.42

MATCHLINE -L- STA. 118+00 SEE SHEET 11

MATCHLINE -L- STA. 132+00 SEE SHEET 13

Bent #80 -L- 118+75.17

Bent #81 -L- 120+10.96

Bent #82 -L- 121+46.75

Bent #83 -L- 122+82.54

Bent #84 -L- 124+18.33

Bent #85 -L- 125+54.13

Bent #86 -L- 126+89.92

Bent #87 -L- 128+25.71

Bent #88 -L- 129+61.50

Bent #89 -L- 120+97.29

125+00

130+00

N 27° 48' 07.5" E

28'

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

PAMLICO SOUND

CAMA WETLAND

CAMA WETLAND

CAMA WETLAND

SHORELINE

FOR -L- PROFILE SEE SHT.28

PLANS PREPARED BY :

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1/24/2017
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Ekeen

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-2500B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

PERMIT DRAWING SHEET 36 OF 44

Drawing Date: 1/22/2018

PERMANENT IMPACTS TO SAV

TEMPORARY IMPACTS TO SAV

ADVANCING RAIL SYSTEM

SUBMERGED AQUATIC VEGETATION

ENGLISH

50 25 0 50 100

SCALE

SITE 3B

PAMLICO SOUND

-L- PT Sta. 125+65.42

Bent #80 -L- 118+75.17

Bent #81 -L- 120+10.96

Bent #82 -L- 121+46.75

Bent #83 -L- 122+82.54

Bent #84 -L- 124+18.33

Bent #85 -L- 125+54.13

Bent #86 -L- 126+89.92

Bent #87 -L- 128+25.71

Bent #88 -L- 129+61.50

Bent #89 -L- 120+97.29

MATCHLINE -L- STA. 118+00 SEE SHEET 11

MATCHLINE -L- STA. 132+00 SEE SHEET 13

SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING

PAMLICO SOUND

SHORELINE

CAMA WETLAND

CAMA WETLAND

CAMA WETLAND

FOR -L- PROFILE SEE SHT.28

PLANS PREPARED BY :

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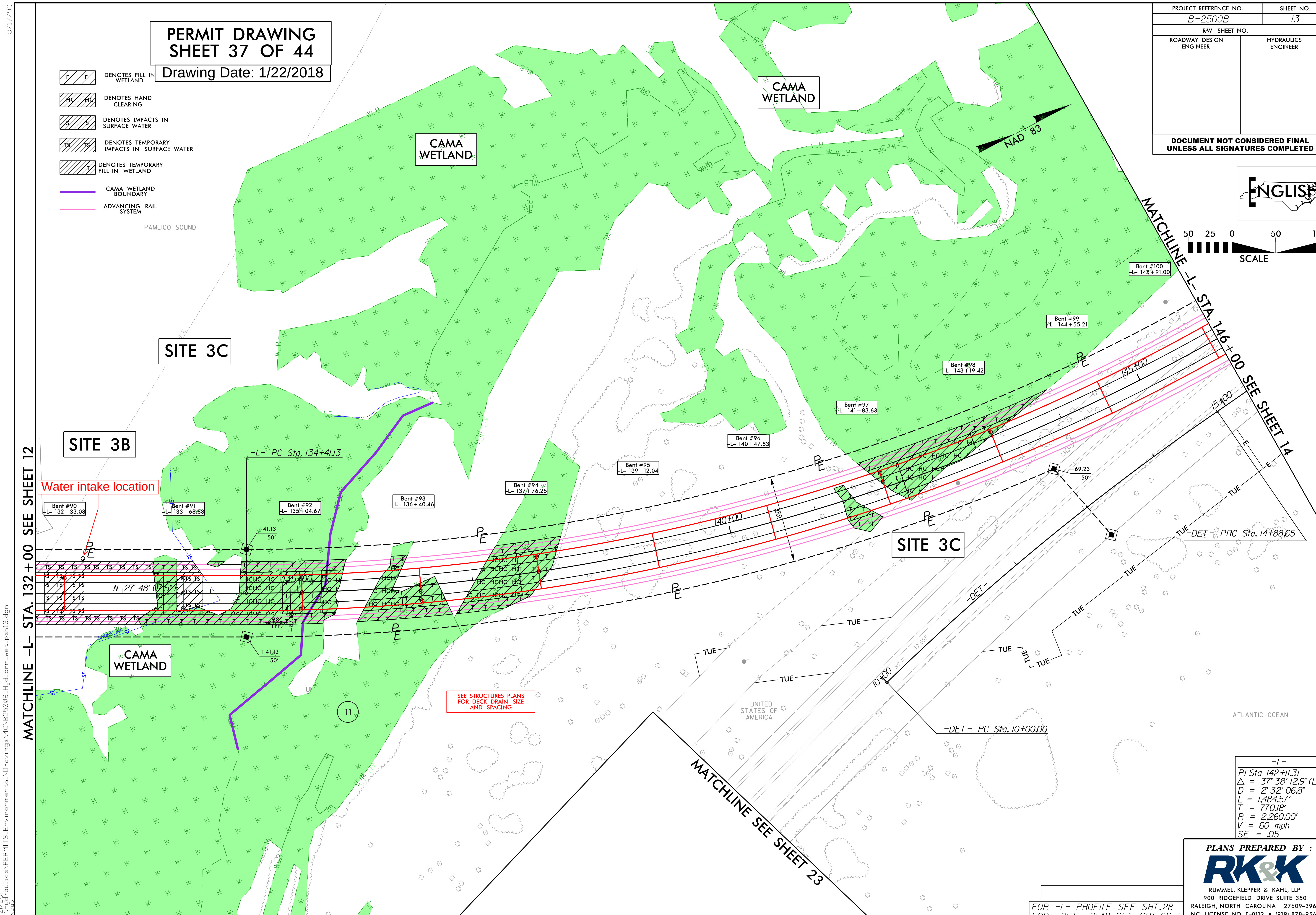

PERMIT DRAWING
SHEET 37 OF 44
Drawing Date: 1/22/2018
DENOTES FILL IN WETLAND
DENOTES HAND CLEARING
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES TEMPORARY FILL IN WETLAND
CAMA WETLAND BOUNDARY
ADVANCING RAIL SYSTEM
PAMLICO SOUND
CAMA WETLAND
CAMA WETLAND
CAMA WETLAND
CAMA WETLAND
SITE 3C
SITE 3B
SITE 3C
Water intake location
NAD 83
-L- PC Sta. 134+41.13
N 27° 48' 07.5" E
Bent #90 -L- 132+33.08
Bent #91 -L- 133+68.88
Bent #92 -L- 135+04.67
Bent #93 -L- 136+40.46
Bent #94 -L- 137+76.25
Bent #95 -L- 139+12.04
Bent #96 -L- 140+47.83
Bent #97 -L- 141+83.63
Bent #98 -L- 143+19.42
Bent #99 -L- 144+55.21
Bent #100 -L- 145+91.00
140+00
145+00
15+00
10+00
+41.13 50'
+69.23 50'
-DET- PRC Sta. 14+88.65
-DET- PC Sta. 10+00.00
SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING
UNITED STATES OF AMERICA
ATLANTIC OCEAN
MATCHLINE -L- STA. 132+00 SEE SHEET 12
MATCHLINE -L- STA. 146+00 SEE SHEET 14
MATCHLINE SEE SHEET 23
PROJECT REFERENCE NO. B-2500B
SHEET NO. 13
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
ENGLISH
50 25 0 50 100
SCALE
-L-
PI Sta 142+11.31
Δ = 37° 38' 12.9" (LT)
D = 2° 32' 06.8"
L = 1,484.57'
T = 770.18'
R = 2,260.00'
V = 60 mph
SE = .05
FOR -L- PROFILE SEE SHT. 28
FOR -DET- PLAN SEE SHT. 2B-1
PLANS PREPARED BY :
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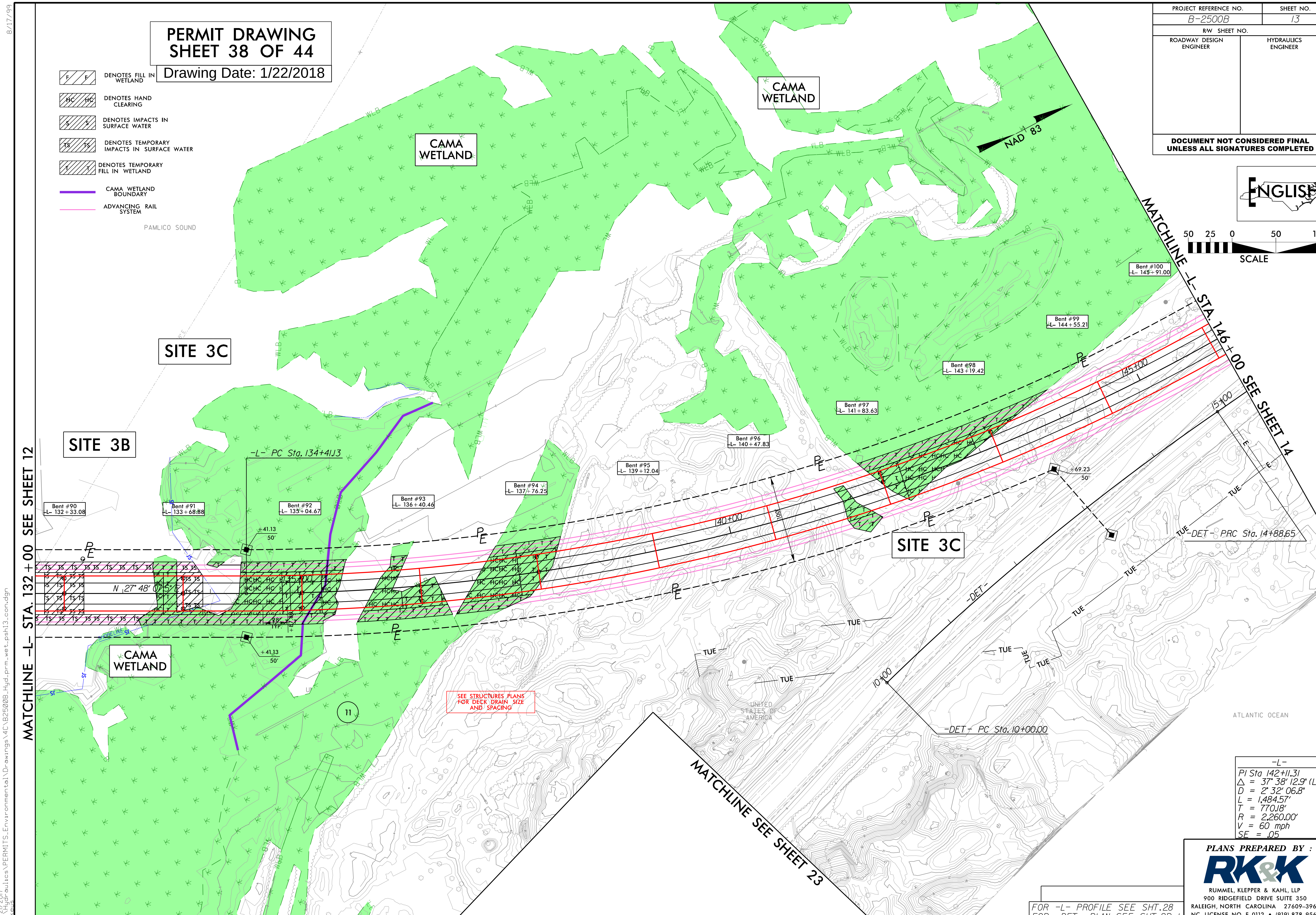
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560


PERMIT DRAWING
SHEET 38 OF 44
Drawing Date: 1/22/2018
DENOTES FILL IN WETLAND
DENOTES HAND CLEARING
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES TEMPORARY FILL IN WETLAND
CAMA WETLAND BOUNDARY
ADVANCING RAIL SYSTEM
PAMLICO SOUND
PROJECT REFERENCE NO.
B-2500B
SHEET NO.
13
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
ENGLISH
NAD 83
SCALE
CAMA WETLAND
SITE 3C
SITE 3B
MATCHLINE -L- STA. 132+00 SEE SHEET 12
MATCHLINE -L- STA. 146+00 SEE SHEET 14
MATCHLINE SEE SHEET 23
-L- PC Sta. 134+41.13
N 27° 48' 07.5" E
Bent #90 -L- 132+33.08
Bent #91 -L- 133+68.88
Bent #92 -L- 135+04.67
Bent #93 -L- 136+40.46
Bent #94 -L- 137+76.25
Bent #95 -L- 139+12.04
Bent #96 -L- 140+47.83
Bent #97 -L- 141+83.63
Bent #98 -L- 143+19.42
Bent #99 -L- 144+55.21
Bent #100 -L- 145+91.00
140+00
145+00
15+00
10+00
-DET- PRC Sta. 14+88.65
-DET- PC Sta. 10+00.00
SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING
UNITED STATES OF AMERICA
ATLANTIC OCEAN
-L-
PI Sta 142+11.31
Δ = 37° 38' 12.9" (LT)
D = 2° 32' 06.8"
L = 1,484.57'
T = 770.18'
R = 2,260.00'
V = 60 mph
SE = .05
PLANS PREPARED BY :
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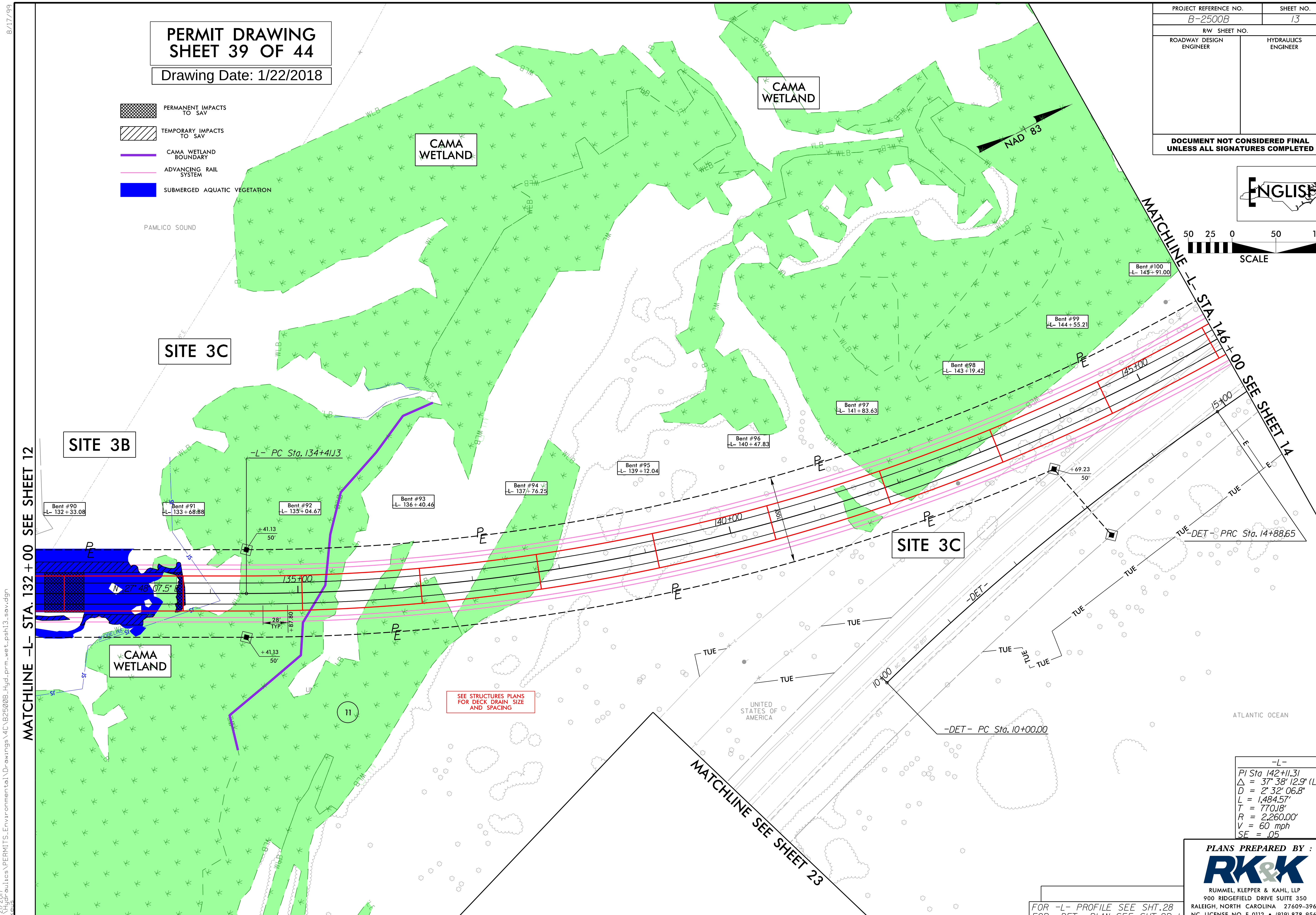
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560
FOR -L- PROFILE SEE SHT. 28
FOR -DET- PLAN SEE SHT. 2B-1


PERMIT DRAWING
SHEET 39 OF 44
Drawing Date: 1/22/2018
PERMANENT IMPACTS TO SAV
TEMPORARY IMPACTS TO SAV
CAMA WETLAND BOUNDARY
ADVANCING RAIL SYSTEM
SUBMERGED AQUATIC VEGETATION
PAMLICO SOUND
CAMA WETLAND
CAMA WETLAND
CAMA WETLAND
SITE 3C
SITE 3B
SITE 3C
-L- PC Sta. 134+41.13
Bent #90 -L- 132+33.08
Bent #91 -L- 133+68.88
Bent #92 -L- 135+04.67
Bent #93 -L- 136+40.46
Bent #94 -L- 137+76.25
Bent #95 -L- 139+12.04
Bent #96 -L- 140+47.83
Bent #97 -L- 141+83.63
Bent #98 -L- 143+19.42
Bent #99 -L- 144+55.21
Bent #100 -L- 145+91.00
N 27° 48' 07.5" E
135+00
140+00
145+00
15+00
10+00
+41.13 50'
+41.13 50'
+69.23 50'
28' TYP.
+87.80
SHORELINE
11
NAD 83
MATCHLINE -L- STA. 132+00 SEE SHEET 12
MATCHLINE -L- STA. 146+00 SEE SHEET 14
MATCHLINE SEE SHEET 23
SEE STRUCTURES PLANS FOR DECK DRAIN SIZE AND SPACING
UNITED STATES OF AMERICA
ATLANTIC OCEAN
-DET-
-DET- PRC Sta. 14+88.65
-DET- PC Sta. 10+00.00
TUE
PROJECT REFERENCE NO. B-2500B
SHEET NO. 13
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
ENGLISH
50 25 0 50 100
SCALE
-L-
PI Sta 142+11.31
Δ = 37° 38' 12.9" (LT)
D = 2° 32' 06.8"
L = 1,484.57'
T = 770.18'
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V = 60 mph
SE = .05
PLANS PREPARED BY :
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FOR -L- PROFILE SEE SHT.28
FOR -DET- PLAN SEE SHT.2B-1
8/17/99
11/21/2017
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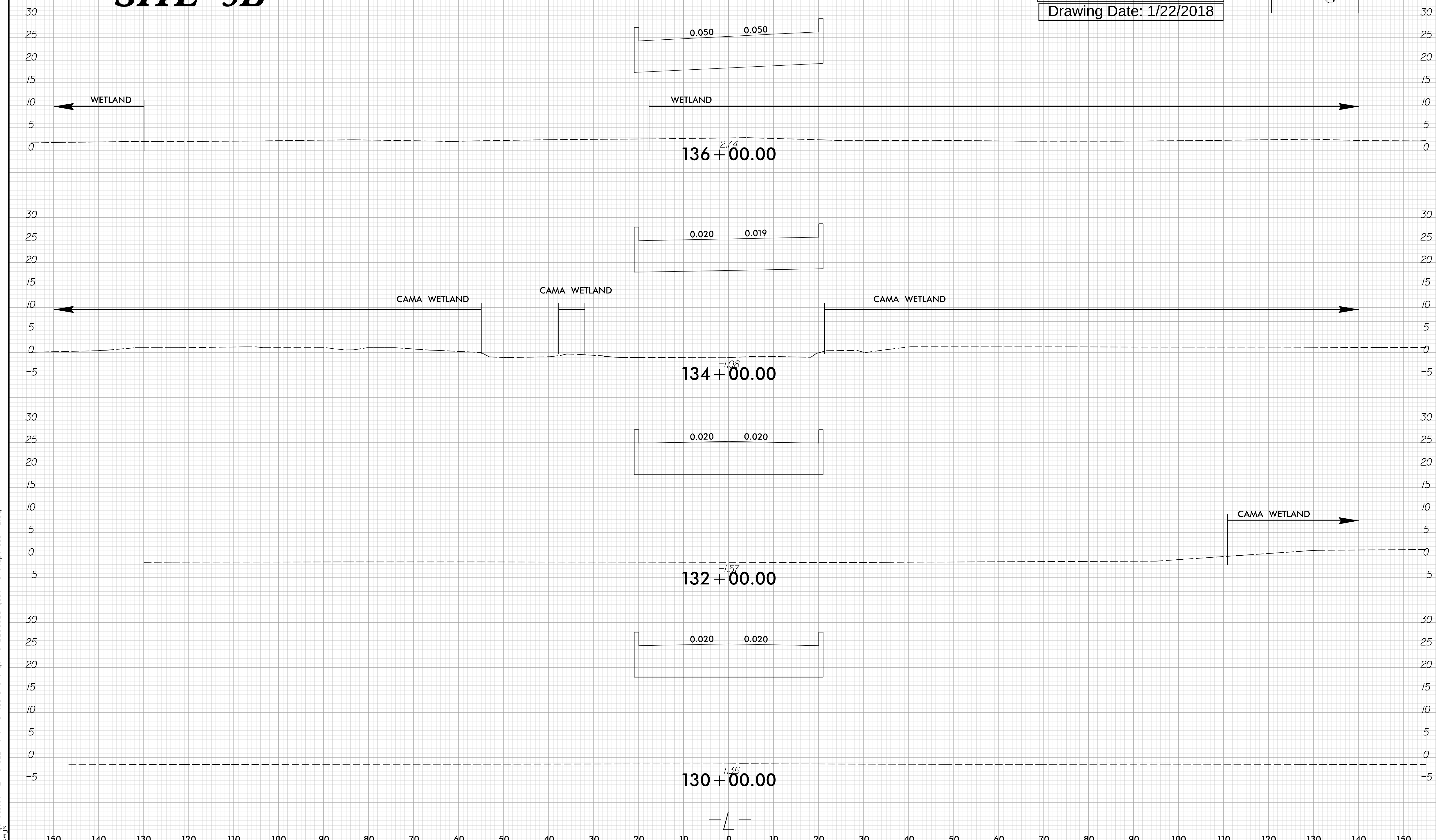
PROJ. REFERENCE NO.	SHEET NO.
B-2500B	X-18

SITE 3B

PERMIT DRAWING
SHEET 40 OF 44

Drawing Date: 1/22/2018

ENGLISH



6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-2500B	X-19

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

SITE 3B

PERMIT DRAWING
SHEET 41 OF 44

Drawing Date: 1/22/2018

ENGLISH

30 25 20 15 10 5 0

0.050 0.050

WETLAND

3.92

144+00.00

30 25 20 15 10 5 0

0.050 0.050

WETLAND

2.15

142+00.00

30 25 20 15 10 5 0

0.050 0.050

WETLAND

3.56

140+00.00

30 25 20 15 10 5 0

0.050 0.050

WETLAND

3.99

138+00.00

—℄—

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

11/21/2017
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-2500B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING
SHEET 42 OF 44

REVISED 2/1/2018

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2/1/2018
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PROJECT REFERENCE NO.	SHEET NO.
B-2500B	

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING
SHEET 43 OF 44

REVISED 2/1/2018

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2/1/2018
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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	-L- 13+00 RT	ROADWAY FILL		0.03		0.01						
2	-L- 17+62	36" RCP-V EQUALIZER, ROADWAY FILL, LAYDOWN YARD	0.25	0.68		0.06						
3A	-L- 20+60 - 25+45	BRIDGE - 4 SPANS @ 60' 15-24" C.S. & 4 SPANS @ 97'-3" 4-45" F.I.B.s	0.04	0.31		0.02	0.21					
3B	-L- 25+45 - 133+17	BRIDGE AND ADVANCING RAIL SYSTEM						0.11	10.07			
3C	-L- 133+17 - 143+95	BRIDGE - 9 SPANS @ 135'-8" 4-72" F.I.B.s	< 0.01	0.38			0.24					
TOTALS*:			0.29	1.40		0.09	0.46	0.11	10.07			

*Rounded totals are sum of actual impacts

NOTES:

SAV IMPACTS: 2.57AC PERM. IMPACT; 3.07AC TEMP. IMPACT

REVISED 2/1/2018

CAMA vs 404 Wetland Impacts

Perm. Fill in CAMA Wetlands = 0ac

Perm. Fill in 404 Wetlands = 0.29ac

Temp. Fill in CAMA Wetlands = 0.15ac

Temp. Fill in 404 Wetlands = 1.25ac

Mech. Clearing in CAMA Wetlands = 0ac

Mech. Clearing in 404 Wetlands = 0.09ac

Hand Clearing in CAMA Wetlands = 0.11ac

Hand Clearing in 404 Wetlands = 0.35ac

Bent Impacts

Proposed Bridge	Advancing Rail System
Perm. Fill in CAMA Wetlands = <0.01ac	Temp. Fill in CAMA Wetlands = 0.08ac
Perm. Fill in 404 Wetlands = 0.02ac	Temp. Fill in 404 Wetlands = 0.32ac
Temp. Fill in CAMA Wetlands = 0.08ac	Temp. Fill in Surface Water = 5.95ac
Temp. Fill in 404 Wetlands = 0.20ac	
Perm. Fill in Surface Water = 0.11ac	
Temp. Fill in Surface Water = 4.12ac	

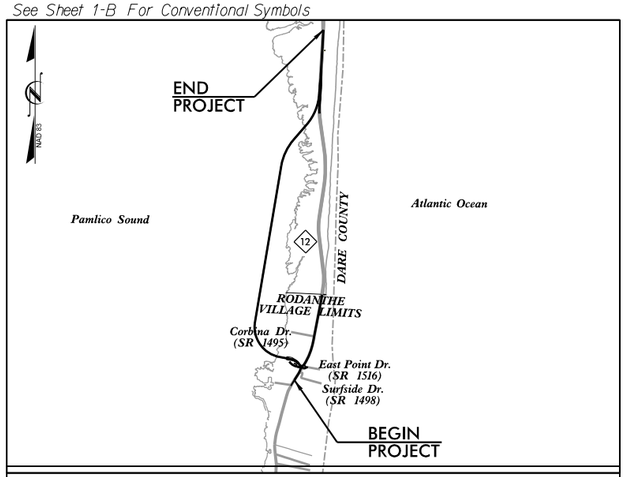
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
FEBRUARY 2018
DARE
B-2500B
32635.3.FR7

09/08/99

TIP PROJECT: B-2500B

CONTRACT: C203474

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



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DARE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-2500B	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
32635.3.FR7	BRNHF-0012(56)		

LOCATION: NC 12 – RODANTHE BREACH LONG TERM IMPROVEMENTS (PHASE IIB)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNING & STRUCTURES

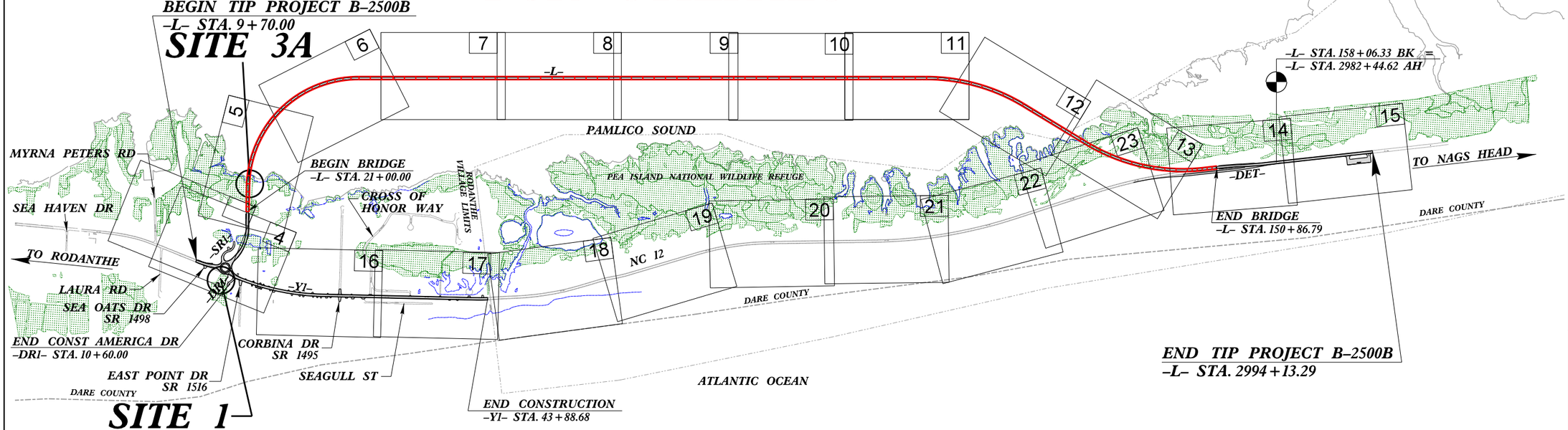
UTILITY PERMIT DRAWING SHEET 1 OF 9

Drawing Date: 1/22/2018

ENGLISH

NAD 83

JURISDICTIONAL IMPACTS FOR UTILITIES



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GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2017 = 9,800

ADT 2037 = 14,200

V = 40 /60 MPH

FUNC. CLASSIFICATION = RURAL COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-2500B.....0.572 mi
LENGTH STRUCTURE TIP PROJECT B-2500B.....2.460 mi
TOTAL LENGTH TIP PROJECT B-2500B.....3.032 mi

NCDOT CONTACT

K. Zak Hamidi, P.E.
PROJECT ENGINEER – DESIGN-BUILD GROUP

PLANS PREPARED BY:

RK&K — RUMMEL, KLEPPER & KAHL, LLP, 900 RIDGEFIELD DRIVE, SUITE 350, RALEIGH, NORTH CAROLINA 27609, NC LICENSE NO. F-0112

FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

FLATIRON

2012 STANDARD SPECIFICATIONS

LETTING DATE: JANUARY 25, 2017

B. Keith Skinner, P.E.
PROJECT ENGINEER

Brandon J. McInnis, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

11/2/2017
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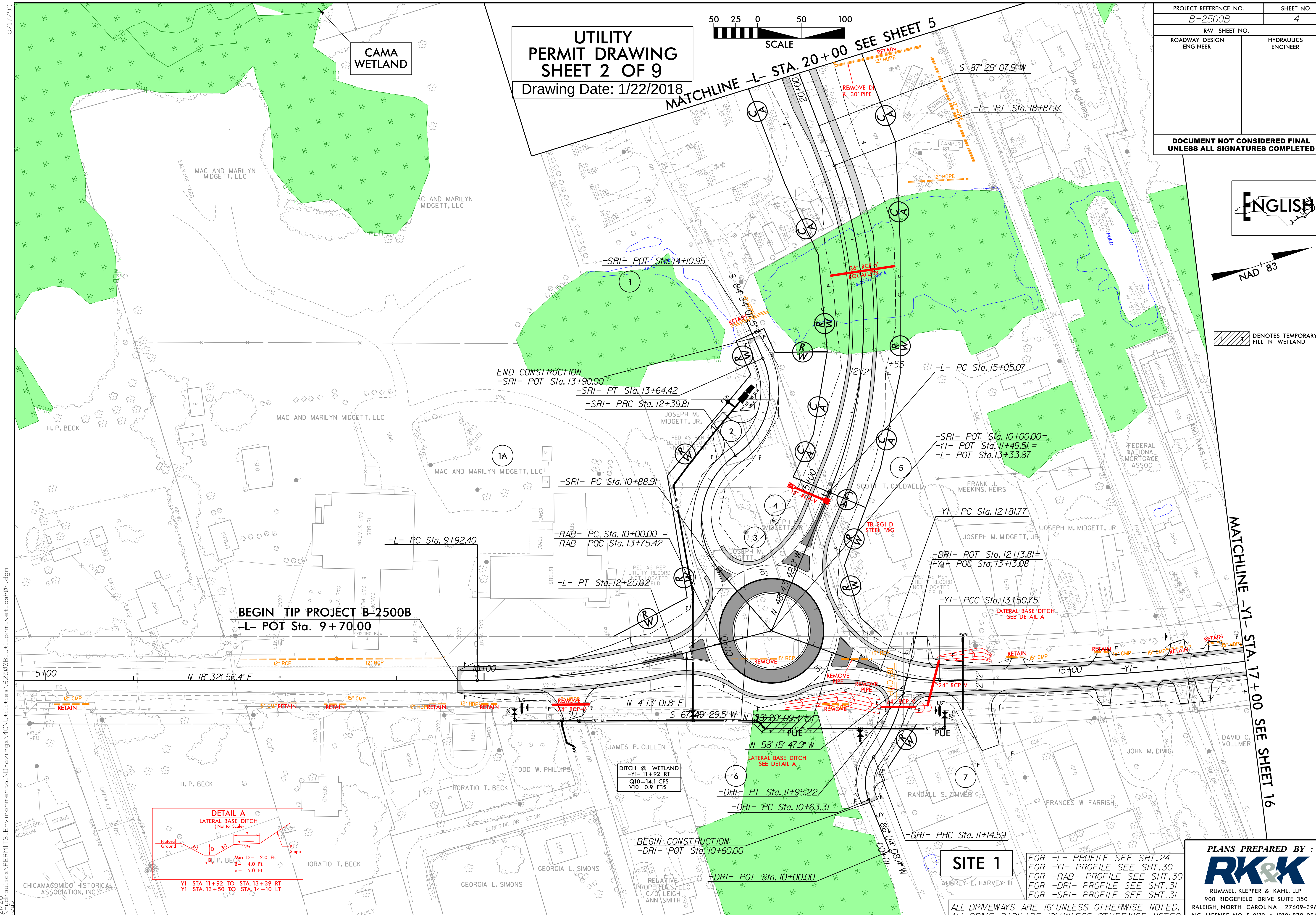
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Drawing Date: 1/22/2018
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R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
ENGLISH
NAD 83
DENOTES TEMPORARY FILL IN WETLAND
SCALE 50 25 0 50 100
CAMA WETLAND
MATCHLINE -L- STA. 20+00 SEE SHEET 5
MATCHLINE -Y1- STA. 17+00 SEE SHEET 16
S 87° 29' 07.9" W
-L- PT Sta. 18+87.17
-SRI- POT Sta. 14+10.95
END CONSTRUCTION -SRI- POT Sta. 13+90.00
-SRI- PT Sta. 13+64.42
-SRI- PRC Sta. 12+39.81
-L- PC Sta. 15+05.07
-SRI- POT Sta. 10+00.00= -Y1- POT Sta. 11+49.51 = -L- POT Sta. 13+33.87
-SRI- PC Sta. 10+88.91
-Y1- PC Sta. 12+81.77
-RAB- PC Sta. 10+00.00 = -RAB- POC Sta. 13+75.42
-L- PC Sta. 9+92.40
-DRI- POT Sta. 12+13.81= -Y1- POC Sta. 13+13.08
-L- PT Sta. 12+20.02
-Y1- PCC Sta. 13+50.75
BEGIN TIP PROJECT B-2500B -L- POT Sta. 9+70.00
N 18° 32' 56.4" E
N 4° 13' 01.8" E
S 67° 48' 29.5" W
N 38° 20' 09.4" W
N 58° 15' 47.9" W
S 86° 04' 08.4" W
LATERAL BASE DITCH SEE DETAIL A
DITCH @ WETLAND -Y1- 11+92 RT Q10=14.1 CFS V10=0.9 FT/S
-DRI- PT Sta. 11+95.22
-DRI- PC Sta. 10+63.31
-DRI- PRC Sta. 11+14.59
BEGIN CONSTRUCTION -DRI- POT Sta. 10+60.00
-DRI- POT Sta. 10+00.00
DETAIL A LATERAL BASE DITCH (Not to Scale)
Min. D= 2.0 Ft. B= 4.0 Ft. b= 5.0 Ft.
-Y1- STA. 11+92 TO STA. 13+39 RT
-Y1- STA. 13+50 TO STA. 14+10 LT
SITE 1
FOR -L- PROFILE SEE SHT.24
FOR -Y1- PROFILE SEE SHT.30
FOR -RAB- PROFILE SEE SHT.30
FOR -DRI- PROFILE SEE SHT.31
FOR -SRI- PROFILE SEE SHT.31
ALL DRIVEWAYS ARE 16' UNLESS OTHERWISE NOTED.
ALL DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED.
PLANS PREPARED BY:
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560
MAC AND MARILYN MIDGETT, LLC
JOSEPH M. MIDGETT, JR.
SCOTT T. CALDWELL
FRANK J. MEEKINS, HEIRS
FEDERAL NATIONAL MORTGAGE ASSOC
ISLAND RAWS, LLC
JOHN M. HARRIS
H. P. BECK
JAMES P. CULLEN
TODD W. PHILLIPS
HORATIO T. BECK
GEORGIA L. SIMONS
RANDALL S. ZIMMER
JOHN M. DIMIG
DAVID C. VOLLMER
FRANCES W FARRISH
AUBREY E. HARVEY III
CHICAMACOMICO HISTORICAL ASSOCIATION, INC
RELATIVE PROPERTIES, LLC C/O LEIGH ANN SMITH
8/17/99

8/17/99

UTILITY PERMIT DRAWING SHEET 3 OF 9

Drawing Date: 1/22/2018

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R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

50 25 0 50 100
SCALE

ENGLISH

NAD 83

DENOTES TEMPORARY FILL IN WETLAND

MATCHLINE -L- STA. 20+00 SEE SHEET 5

MATCHLINE -Y1- STA. 17+00 SEE SHEET 16

CAMA WETLAND

BEGIN TIP PROJECT B-2500B
-L- POT Sta. 9+70.00

BEGIN CONSTRUCTION
-DRI- POT Sta. 10+60.00

-DRI- POT Sta. 10+00.00

-SRI- POT Sta. 14+10.95

END CONSTRUCTION
-SRI- POT Sta. 13+90.00
-SRI- PT Sta. 13+64.42
-SRI- PRC Sta. 12+39.81

-SRI- PC Sta. 10+88.91

-L- PC Sta. 9+92.40

-L- PT Sta. 12+20.02

-RAB- PC Sta. 10+00.00 =
-RAB- POC Sta. 13+75.42

-L- PC Sta. 15+05.07

-L- PT Sta. 18+87.17

-SRI- POT Sta. 10+00.00=
-Y1- POT Sta. 11+49.51 =
-L- POT Sta. 13+33.87

-Y1- PC Sta. 12+81.77

-DRI- POT Sta. 12+13.81=
-Y1- POC Sta. 13+13.08

-Y1- PCC Sta. 13+50.75

-DRI- PT Sta. 11+95.22

-DRI- PC Sta. 10+63.31

-DRI- PRC Sta. 11+14.59

S 87° 29' 07.9" W

S 84° 34' 05" W

N 18° 32' 56.4" E

N 4° 13' 01.8" E

S 67° 49' 29.5" W

N 58° 20' 09.4" W

N 58° 15' 47.9" W

S 86° 04' 08.4" W

N 45° 13' 42" W

DITCH @ WETLAND
-Y1- 11+92 RT
Q10=14.1 CFS
V10=0.9 FT/S

DETAIL A
LATERAL BASE DITCH
(Not to Scale)

-Y1- STA. 11+92 TO STA. 13+39 RT
-Y1- STA. 13+50 TO STA. 14+10 LT

LATERAL BASE DITCH SEE DETAIL A

SITE 1

FOR -L- PROFILE SEE SHT.24
FOR -Y1- PROFILE SEE SHT.30
FOR -RAB- PROFILE SEE SHT.30
FOR -DRI- PROFILE SEE SHT.31
FOR -SRI- PROFILE SEE SHT.31

ALL DRIVEWAYS ARE 16' UNLESS OTHERWISE NOTED.
ALL DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED.

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

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Ekevans

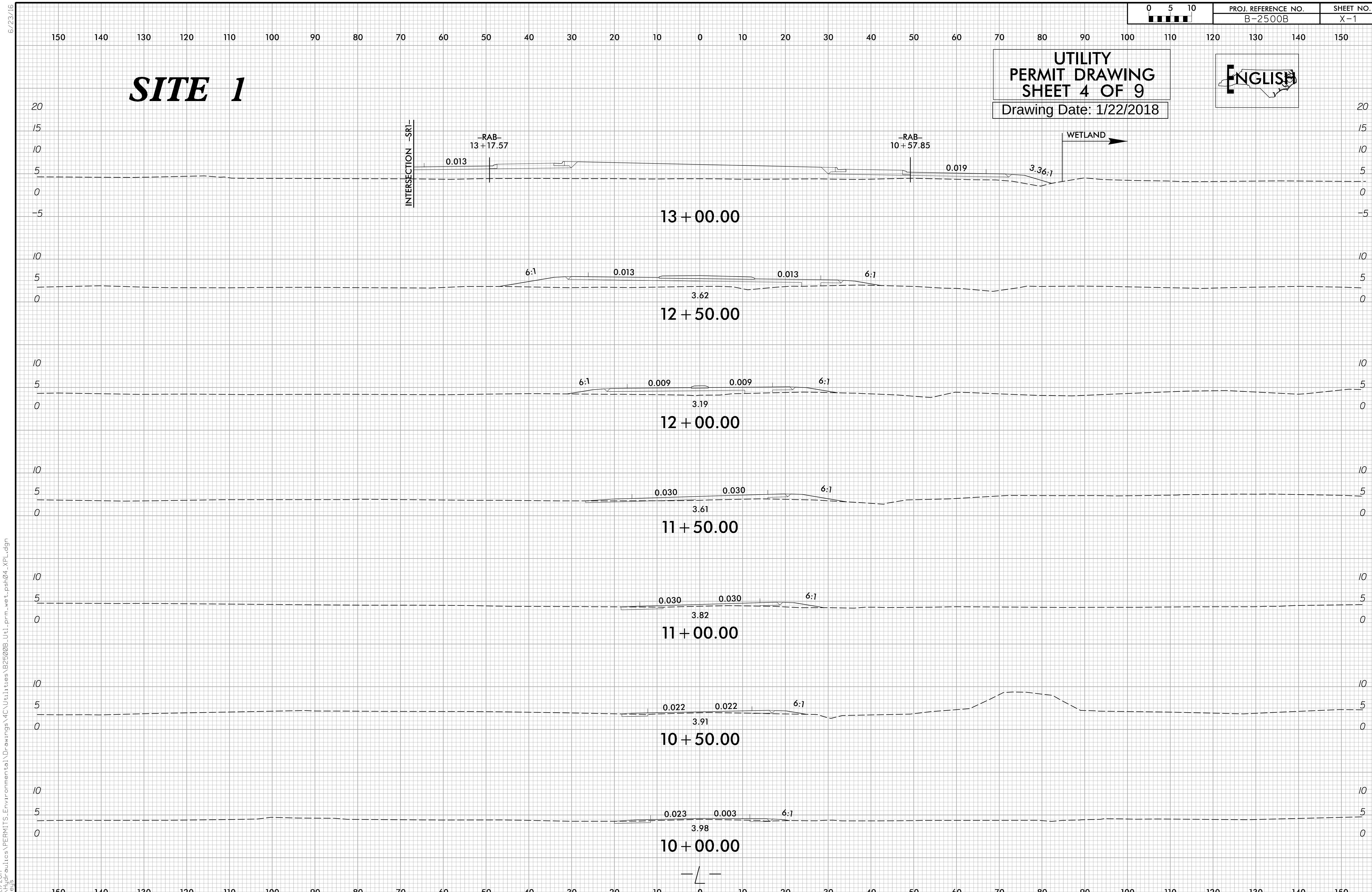
PROJ. REFERENCE NO.	SHEET NO.
B-2500B	X-1

SITE 1

UTILITY
PERMIT DRAWING
SHEET 4 OF 9

Drawing Date: 1/22/2018

ENGLISH



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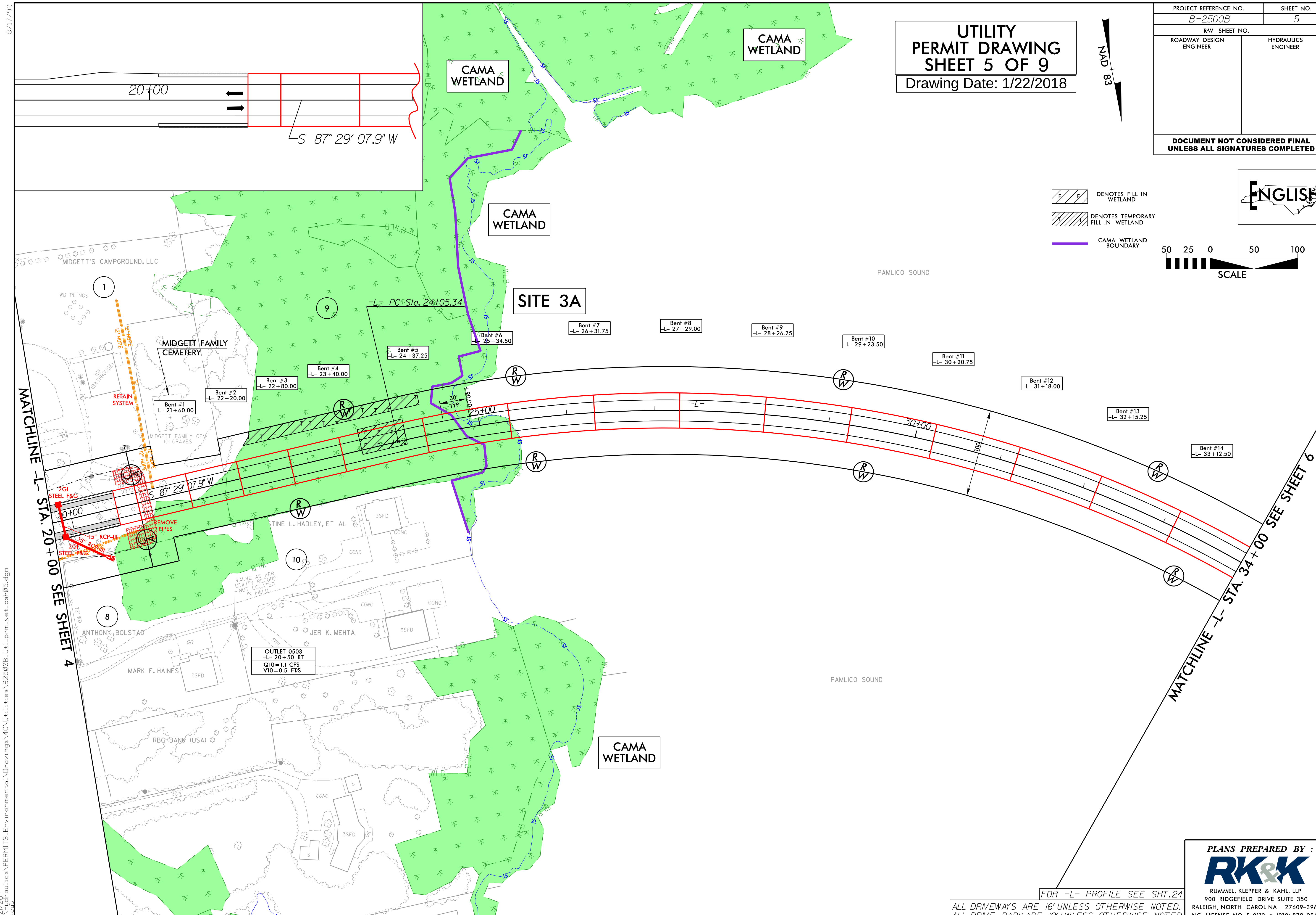

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R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
UTILITY PERMIT DRAWING SHEET 5 OF 9
Drawing Date: 1/22/2018
NAD 83
ENGLISH
DENOTES FILL IN WETLAND
DENOTES TEMPORARY FILL IN WETLAND
CAMA WETLAND BOUNDARY
50 25 0 50 100
SCALE
CAMA WETLAND
CAMA WETLAND
CAMA WETLAND
CAMA WETLAND
SITE 3A
PAMLICO SOUND
PAMLICO SOUND
20+00
S 87° 29' 07.9" W
MIDGETT'S CAMPGROUND, LLC
MIDGETT FAMILY CEMETERY
RETAIN SYSTEM
REMOVE PIPES
2GI STEEL F&G
2GI STEEL F&G
15" RCP-III
-L- PC Sta. 24+05.34
Bent #1 -L- 21+60.00
Bent #2 -L- 22+20.00
Bent #3 -L- 22+80.00
Bent #4 -L- 23+40.00
Bent #5 -L- 24+37.25
Bent #6 -L- 25+34.50
Bent #7 -L- 26+31.75
Bent #8 -L- 27+29.00
Bent #9 -L- 28+26.25
Bent #10 -L- 29+23.50
Bent #11 -L- 30+20.75
Bent #12 -L- 31+18.00
Bent #13 -L- 32+15.25
Bent #14 -L- 33+12.50
30' TYP.
25+00
30+00
-L-
MATCHLINE -L- STA. 20+00 SEE SHEET 4
MATCHLINE -L- STA. 34+00 SEE SHEET 6
TINE L. HADLEY, ET AL
ANTHONY BOLSTAD
MARK E. HAINES
JER K. MEHTA
RBC BANK (USA)
VALVE AS PER UTILITY RECORD NOT LOCATED IN FIELD
OUTLET 0503 -L- 20+50 RT Q10=1.1 CFS V10=0.5 FT/S
FOR -L- PROFILE SEE SHT.24
ALL DRIVEWAYS ARE 16' UNLESS OTHERWISE NOTED.
ALL DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED.
PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560
8/17/99

8/17/99

UTILITY PERMIT DRAWING SHEET 6 OF 9

Drawing Date: 1/22/2018

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
B-2500B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGLISH

F F DENOTES FILL IN WETLAND

T T DENOTES TEMPORARY FILL IN WETLAND

CAMA WETLAND BOUNDARY

50 25 0 50 100
SCALE

CAMA WETLAND

CAMA WETLAND

CAMA WETLAND

CAMA WETLAND

SITE 3A

PAMLICO SOUND

PAMLICO SOUND

MIDGETT'S CAMPGROUND, LLC

MIDGETT FAMILY CEMETERY

MIDGETT FAMILY CEM ID GRAVES

ANTHONY BOLSTAD

MARK E. HAINES

RBC BANK (USA)

-L- PC Sta. 24+05.34

Bent #1 -L- 21+60.00
Bent #2 -L- 22+20.00
Bent #3 -L- 22+80.00
Bent #4 -L- 23+40.00
Bent #5 -L- 24+37.25
Bent #6 -L- 25+34.50
Bent #7 -L- 26+31.75
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Bent #9 -L- 28+26.25
Bent #10 -L- 29+23.50
Bent #11 -L- 30+20.75
Bent #12 -L- 31+18.00
Bent #13 -L- 32+15.25
Bent #14 -L- 33+12.50

25+00
30+00
20+00
S 87° 29' 07.9" W

30' TYP.

RETAIN SYSTEM

2GI STEEL F&G

REMOVE PIPES

15" RCP-III

2GI RCP-III STEEL F&G

OUTLET 0503
-L- 20+50 RT
Q10=1.1 CFS
V10=0.5 FT/S

MATCHLINE -L- STA. 20+00 SEE SHEET 4

MATCHLINE -L- STA. 34+00 SEE SHEET 6

FOR -L- PROFILE SEE SHT.24

ALL DRIVEWAYS ARE 16' UNLESS OTHERWISE NOTED.
ALL DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED.

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

5/28/99

-L-

PROJECT REFERENCE NO.	SHEET NO.
B-2500B	25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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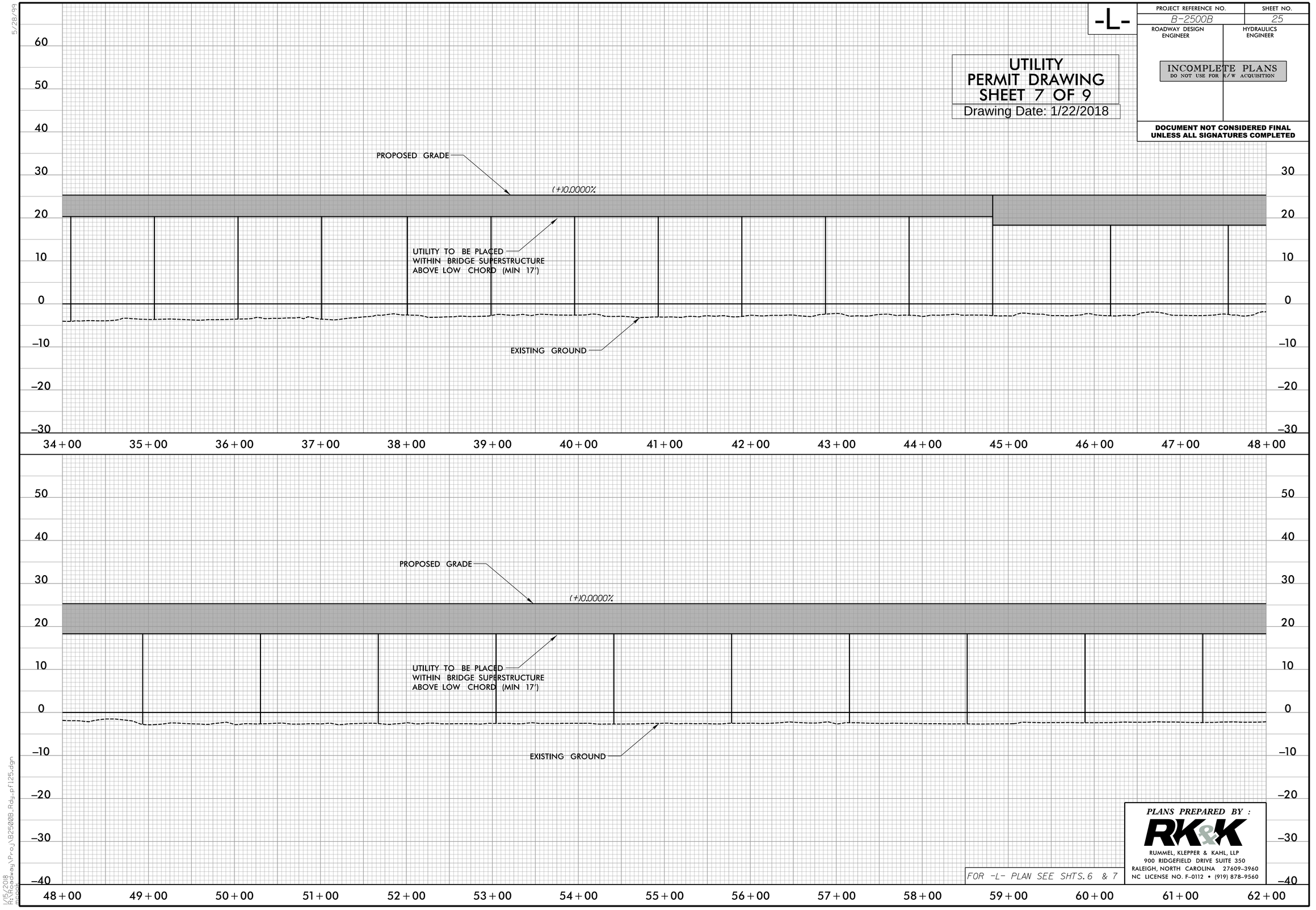
UTILITY PERMIT DRAWING SHEET 7 OF 9

Drawing Date: 1/22/2018



FOR -L- PLAN SEE SHTS. 6 & 7

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

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6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
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SITE 3A

UTILITY PERMIT DRAWING SHEET 8 OF 9

Drawing Date: 1/22/2018

ENGLISH

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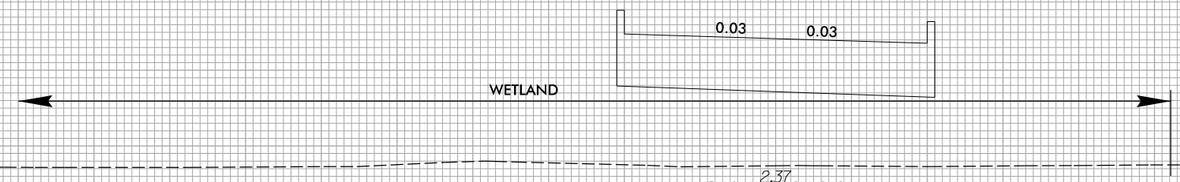

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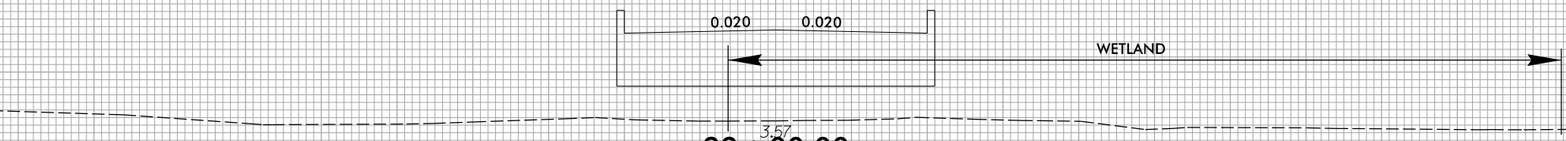

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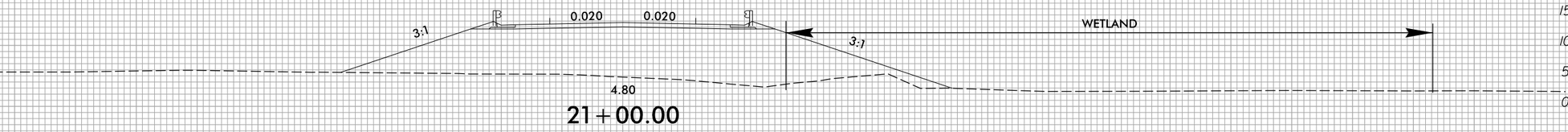

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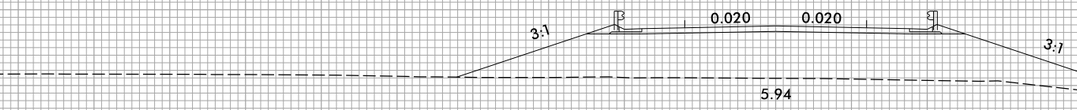

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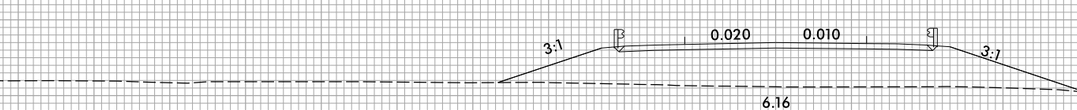

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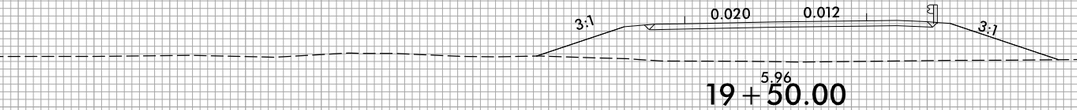

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Kiesa

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 13+00 RT	8" WATER LINE		0.03								
3A	-L- 24 +27	UTILITIES ON BRIDGE	0.04	0.06								
TOTALS*:			0.04	0.10								

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
DECEMBER 2017
DARE
B-2500B
32635.3.FR7

Revised 2016 09 09

TIP: B-2500 II B
First Line of Stable Vegetation in relationship to Future NC 12 Parking Lot

1 inch = 100 feet

<u>Area of Parking Lot:</u>
Entire area from edge of NC 12: 31,321 square feet
Impervious area: 21,590 square feet

TIP: B-2500 II B
Relationship of Project Work to Atlantic Ocean

North Carolina Department of Transportation

NC 12 – Rodanthe Breach Long-Term Improvements

Bonner Bridge Replacement Project Phase IIB

SAV Mitigation and Monitoring Plan

January 2018

TIP Project No. B-2500

Dare County

TABLE OF CONTENTS

1.0 INTRODUCTION AND BACKGROUND

The Bonner Bridge Replacement Project Phase IIb is the long-term solution at the northern Rodanthe breach area, which includes the Rodanthe 'S' Curves Hot Spot, a section of NC 12 that was extensively damaged by Hurricane Irene in August 2011. The Phase IIb project area extends for a distance of 2.6 miles from a point approximately 1.8 miles north of the southern boundary of the Pea Island National Wildlife Refuge (the Refuge) to approximately 170 feet north of Myrna Peters Road (SR 1492) in Rodanthe.

Phase IIb is one part of the Parallel Bridge Corridor with NC 12 Transportation Management Plan Alternative (PBC/TMP Alternative), which is the Selected Alternative for the Bonner Bridge Replacement Project. The Bonner Bridge Replacement Project, including its multiple phases, is included in the State Transportation Improvement Program (STIP) as STIP Project Nos. B-2500, B-2500A, and B-2500B. (Figure 1.)

The project study area is centered along the proposed bridge alignment, located in and adjacent to Pamlico Sound, west of the Town of Rodanthe in Dare County (Figure 2). The proposed bridge is approximately 13,000 linear feet in length and 40 to 52 feet in width, occupying approximately 12.6 acres. Approximately 10,900 linear feet of the proposed bridge is located over the open waters of Pamlico Sound occupying a total of 10.6 acres.

Within the open-water section of the project study area, water depths range from the shoreline to greater than 4 feet in the vicinity of the visible ship remains located near the southern terminus of the project study area. The substrate within this section consists of sand, with no areas of hard bottom noted. The majority of the habitat in the alignment consists of void to sparse seagrass areas in very shallow water (< 2ft) (Figure 3).

High salinity estuarine Submerged Aquatic Vegetation (SAV) species that occur in the project area include eelgrass (Zostera marina) and shoalgrass (Halodule wrightii). Eelgrass is a temperate species at the southern limit of its Atlantic range in North Carolina. In contrast, shoalgrass is a tropical species that reaches its northernmost extent in the state. Widgeon grass (Ruppia maritima) grows best in moderate salinity but has a wide salinity range. The co-occurrence of these three SAV species is unique to North Carolina, resulting in high coverage of shallow bottom area in North Carolina's estuaries, both spatially and temporally (Ferguson and Wood 1994).

Based on aerial photography and studies conducted by NCDOT, SAV coverage has remained fairly consistent within the open-water 10.6 acre section of the project study area for the last 5 years at approximately 6 acres.

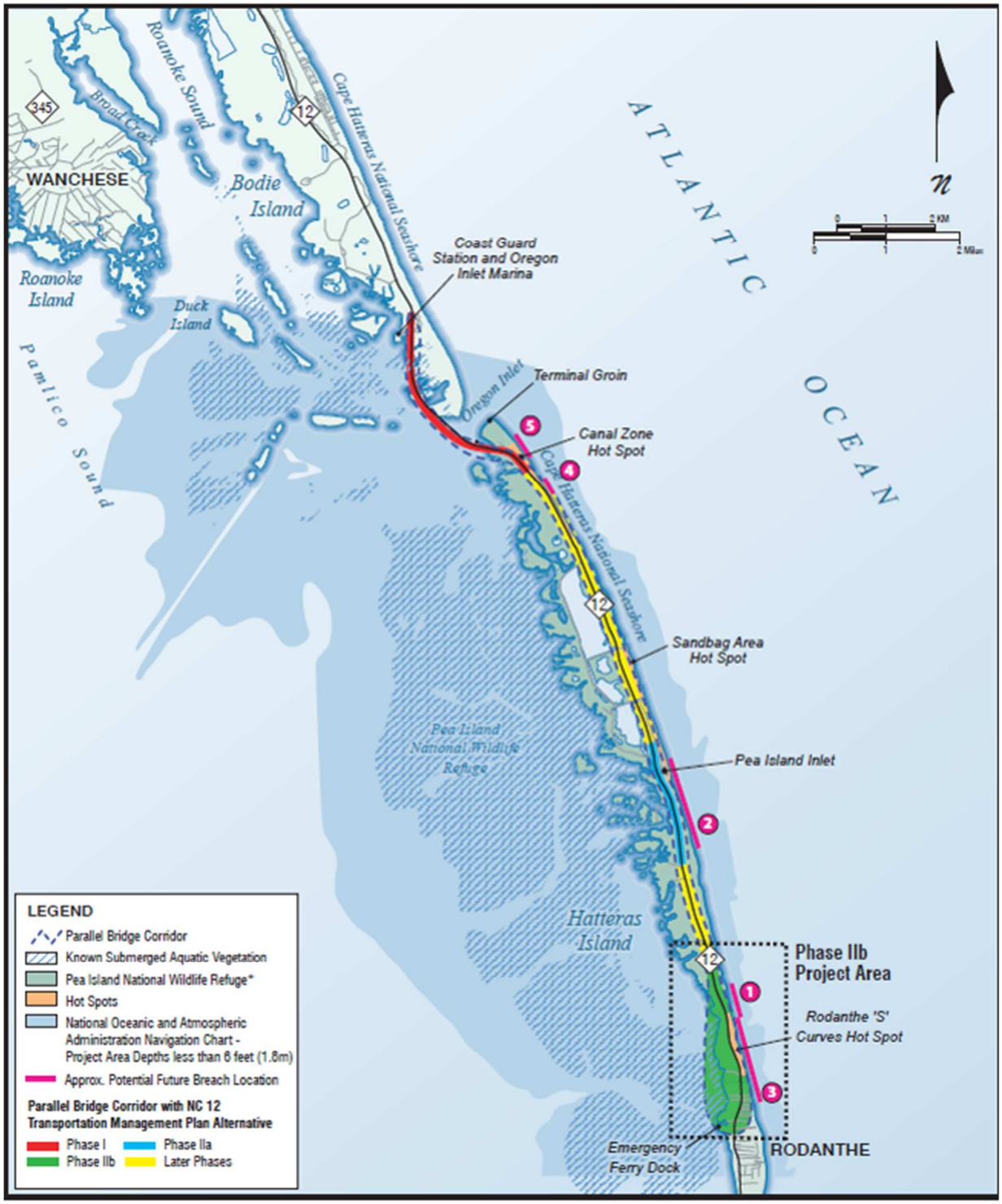

FIGURE 1. OVERVIEW OF STUDY AREA

FIGURE 2. PROJECT STUDY AREA

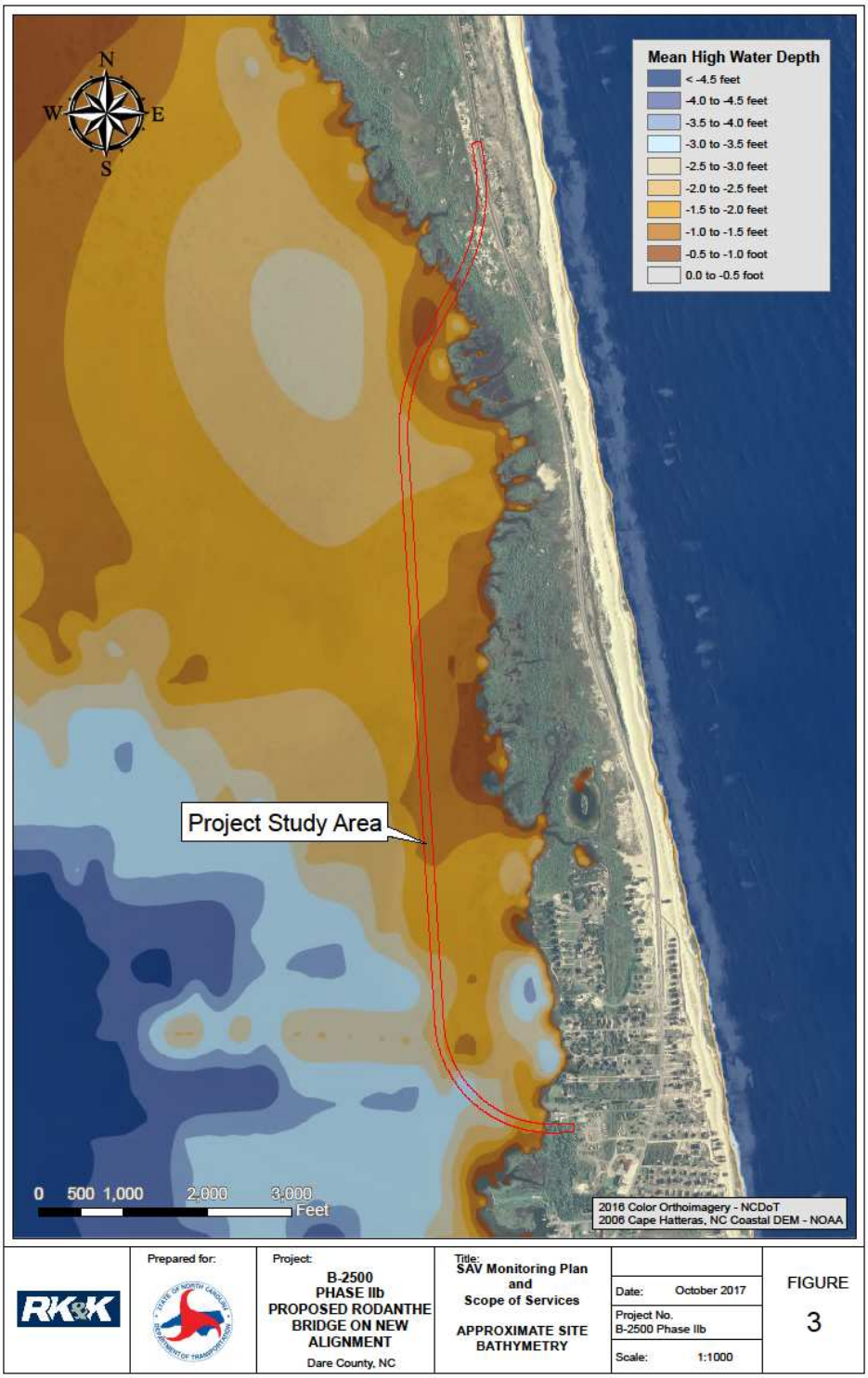

FIGURE 3. BATHYMETRY

2.0 BRIDGE CONSTRUCTION AND IMPACT SUMMARY

The bridge on the project will be 2.46 miles long with 107 spans and a low chord 17' above mean high water. The bridge will essentially run parallel to existing NC 12 and is approximately 1900' to the west of existing NC 12 on the north end and approximately 2600' from existing NC 12 on the south end. Construction of the south end will begin first, with construction of the north end to begin following relocation of a power line utility. The primary pile configuration for the permanent bridge will be three or four, 54" cylinder piles. Approximately 75% of the bents configurations will be three, 54" cylinder piles per bent and the remainder 25% of the bent configurations will be four, 54" cylinder piles per bent. To further minimize impacts to SAV the contractor has removed the plan for footings. There will be no pile footings within the Pamlico Sound. The permanent bridge piles will be installed by a water jetting method with spoils containment around each bent.

The bridge will be constructed utilizing an advancing rail system that will allow for bridge construction in place. As the rail system advances, temporary hollow steel piles will be driven into place and subsequently removed to accommodate bridge construction advancement. It will run along both sides of the bridge. Temporary SAV impacts will be the result of the advancing rail temporary piles along with temporary forms/templates utilized for the construction of bridge support structures.

The system will have an open grate to allow for sunlight to minimize impacts to SAV. Cranes will run along the rail system and be used for construction. The rail system will be approximately 1300' in length at each end. Each span of the rail system will be in place for approximately 4 months prior to being moved forward, which is what allows the rail system to be limited to the 1300' length on each end.

2.1 SPOILS CONTAINMENT

During placement of the permanent bridge piles by jetting, spoils will be generated. These spoils will be contained within a containment area around each bent (approximately 2160 sq. feet) and will consist of a primary and a secondary containment area.

2.1.1 PRIMARY CONTAINMENT AREA

The primary containment system will be a 48' X 45' area around each bent. This containment area will be in place for six to eight months until the permanent bridge deck has progressed to the extent that it can be used to remove spoils. Prior to placement of the primary containment area, plastic geogrid matting will be placed on the existing ground line to delineate between original sound bottom and temporary sand spoils. The spoils will be removed down to this temporary grid.

The distribution of spoils in the primary containment area will be variable. The average depth of spoils is estimated at 1.5 feet within each 48' X 45' area.

2.1.2 SECONDARY CONTAINMENT AREA

The secondary containment area will consist of an anchored turbidity curtain located around each primary containment area (bent line).

The secondary containment area will serve two purposes:

1) As water is filtered out of the primary containment area, the secondary area will allow any of the suspended fine sand particles to settle out.
2) If a failure of the primary area were to occur, the secondary containment area will be in place to prevent further spread of sediment into the Pamlico Sound.

This area will allow any fines to settle out, however, no measurable amount of sediment is expected to accumulate in this area.

2.2 IMPACT SUMMARY AND PROJECT AREA HABITAT QUALITY

Based on preliminary design, the bridge piles of the constructed permanent bridge would result in approximately 0.06 acres of permanent impacts to SAV beds. The impacts of all other SAV are unknown at this time due to their temporal nature.

There is the potential for 2.57 acres of permanent impact to SAV beds from the primary spoils containment area. Shading within the 10.6 acres of open water section of the project area may affect approximately 6 acres of SAV beds. This area is inclusive of the permanent and temporary impact areas. The impact from shading may be less or more than the total area of SAV beds directly under the dripline of the bridge due to the height of the bridge (17ft), its North-South orientation, and the dynamic nature of SAV habitat. The shading affect area encompasses all other impact areas.

Type of Impact	***Acres Affected***
Shading	$\geq$ 6.0
Permanent bridge piles	0.06
Primary Containment Area	2.57
Secondary Containment Area	0*

* ***No measureable amount of sediment is expected to accumulate in the secondary spoils area.***

The final preferred alternative for the B-2500 Phase IIB was chosen primarily because it is located in a less productive habitat area of the Pamlico Sound (very shallow, near shore with mostly sparse to patchy seagrass). There is very little cover and foraging area for organisms in this sparsely covered, shallow water environment. Large portions of this shallow area are also subject to becoming exposed and dry from high wind events, further limiting the availability for animal utilization.

The SAV habitat that is impacted by the Phase IIB footprint is very small compared to the remainder of SAV habitat of Pamlico Sound in the project area. The surrounding un-impacted habitat for animal utilization will provide adequate forage and nursery areas and so will avoid long-term impacts to faunal resources. Additionally the project will not hinder the ability of any aquatic species to access and utilize habitat adjacent to the project area.

2.2.1 SHADING IMPACTS

The relationship of light availability to growth and health of submerged aquatic vegetation has been long studied. Understanding of this relationship continues to evolve with application of new techniques that better describe the physiological responses of these plants. However, most studies of light / SAV relationships have been directed at impacts associated with degradation of water bodies, such as those associated with nutrient and sediment loading. Fewer studies have been directed at the influence of light limitation associated with light interception by structures.

Light limitation associated with interception is a more straightforward phenomenon as there are not issues such as those arising with changes in optical water quality and selective spectral attenuation driven by various combinations of changing suspended solids, chl *a* (e.g., nutrient-related) and colored dissolved organic matter in the water column. Thus, this assessment may be approached with conventional shading assessments associated with structures in general.

There are two basic needs to understand the effect of structures on SAV abundance and distribution.

1. Review of the literature to understand the extent and information content regarding light interception effects on SAV.
2. Development of a decision tool that predicts the impact footprint of a structure based on the literature review information and:
    a. Height
    b. Width
    c. Orientation
    d. Latitude
    e. Water depth
    f. SAV species

3.0 PROPOSED MITIGATION PLAN DEVEOPMENT

During a June 8, 2017 presentation to the Merger Team, NCDOT had proposed to monitor all impact areas in the ROW of Phase IIB for 5 years post construction to determine the final permanent SAV impact acreage and mitigate at a 1:1 ratio for that amount at the end of monitoring using the best available mitigation science including results of the Phase I monitoring study.

However, later in 2017, the construction firm determined that the construction and spoils handling methods presented to the Merger Team at Concurrence Point 4C could not be utilized. The revised construction methods would require that jetting spoils from each bent be held in a 48' by 45' containment area for up to 8 months as stated in Section 2.1.1. These construction methodology changes led to further discussions concerning the distinction between determining permanent and temporary impacts to seagrass. Based on these discussions, and to expedite the permitting process, NCDOT agreed to mitigate for the 2.57 acres of SAV within the primary containment areas as permanent impacts at a 2:1 ratio.

4.0 PROPOSED MITIGATION AND MONITORING PLAN

The NCDOT will immediately provide compensatory mitigate for the 0.06 acres of permanently impacted seagrass in the footprint of the permanent bridge pilings by relocating this grass to areas of existing grass. This location will be determined in coordination with the appropriate agency representative(s).

Compensatory mitigation, at a 2:1 ratio, for the SAV within the primary containment areas will be implemented once monitoring for the current Phase I SAV mitigation pilot project is completed to the satisfaction of the US Army Corps of Engineers and Division of Coastal Management. This mitigation plan shall use the best available SAV mitigation science at that time, including results and lessons learned from the Phase I SAV pilot project.

The NCDOT will monitor shading impacts from the bridge during construction and for 5 years post construction. Any shading impacts to SAV that are determined by the NEPA/404 Project Team to be permanent impacts shall be mitigated at a 1:1 ratio, using the best science available at the end of the 5-year shade monitoring and study.

4.1 MONITORING

Bridge construction is estimated at two years. Thus, the proposed shading impact monitoring plan will be conducted in two phases for seven total monitoring years (MY). Phase 1 – Will occur during bridge construction for monitoring of shading impacts for two years (MY1 and MY2). Phase 2 – will occur post-construction and will monitor the entire study area for five years (MY3, MY4, MY5, MY6 and MY7).

4.1.1 PRECONSTRUCTION

Collect baseline data during the growing season within the ROW to include SAV presence/absence, present cover, and species composition and distribution.

4.1.2 DURING AND POST CONSTRUCTION

Monitoring of the shading impacts will begin as soon as portions of the bridge are competed. Monitoring of shading impacts will occur throughout the entire ROW and consists of the following metrics:

- GIS analysis of aerial photography to delineate changes to SAV beds as compared to pre-construction baseline
- Ground truthing of GIS assessment. This will include a DGPS located delineation of changes to the aerial GIS-based assessment and exclude areas discovered to not be composed of live SAV (e.g., detritus)
- Seagrass species percent cover and composition/distribution via random quadrat analysis
- Monitoring of the shadow produced by the structure, targeting areas where the shadow passes through seagrass cover
- Measurement of photosynthetically active radiation (PAR) reaching the water surface at fixed grids
- Comparison of pre and post construction data sets

This plan may be adjusted as necessary to address construction schedule and methods. An annual report will be submitted, as well as a final report at the end of the monitoring period.

4.1.3. SHADING TOOL

NCDOT proposes to create a portable, decision tool that allows us to input a structure's geometry (e.g., height, width, orientation etc.) and scenario (e.g., depth, plant species, etc.) data to derive an expected seafloor effect area and degree of reduced SAV abundance (e.g., biomass, cover) based on those geometries plus assignation of light attenuation through the water column. Additionally, this tool will be transportable and of use to the State in other over-water structures as they occur.

The combination of the review, Shading Decision Support Tool and field verification will result in both predicted and observed areas of influence from the Rodanthe bridge development prior to its construction and through construction that can guide and verify any shading impacts to SAV arising from its construction.

References

Ferguson, R. L., and L. L. Wood. 1994. Rooted vascular aquatic beds in the Albemarle-Pamlico estuarine system. NMFS, NOAA, Beaufort, NC