

Channel Mitigation Monitoring Sheets I, II, III, AND IV  
Monitoring Data Record

Project Title: R-2633A COE Action ID: SAW 1994-03552  
Stream Name: Bishop Branch DWQ Number: 20100867  
DCM Number: 20100138

City, County and other Location Information: Brunswick County, approximately 7 miles southwest of Leland in Bishop, NC on NC 87 (Maco Rd NE) where it departs from US 17 (Ocean Highway E).

Date Construction Completed: \_\_\_\_\_ Final Planting: Dec. 2013 Monitoring Year: ( 1 ) of 3  
Ecoregion: \_\_\_\_\_ 8 digit HUC unit 03040207

USGS Quad Name and Coordinates: 34.181505, -78.084210

**Rosgen Classification:** \_\_\_\_\_

Length of Project: 66ft. of stream restoration, 570ft. of stream preservation, 0.63 acres of wetland restoration, and 2.95 acres of wetland preservation

Urban or Rural: Rural Watershed Size: \_\_\_\_\_

Monitoring DATA collected by: J. Young and M. Green Date: 6/24/14

Applicant Information:

Name: NCDOT Roadside Environmental Unit

Address: 1425 Rock Quarry Road Raleigh, NC 27610

Telephone Number: (919) 861-3772 Email address: [mlgreen@ncdot.gov](mailto:mlgreen@ncdot.gov)

Consultant Information:

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone Number: \_\_\_\_\_ Email address: \_\_\_\_\_

**Project Status:** Complete

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**Monitoring Level required by COE and DWQ (404 permit/ 401 Cert.):** Level 1

**Mitigation Plan states:** NCDOT shall monitor the restoration site by visual observation and photo points for survival and aerial cover of vegetation. NCDOT shall monitor the site for a minimum of three years or until the site is deemed successful. Monitoring will be initiated upon completion of the site planting.

**Permit states:** The permittee shall visually monitor the vegetative plantings to assess and ensure complete stabilization of the mitigation restoration area. Vegetative success shall be determined by conducting stem counts to ensure a tree survival rate of at least 320 stems/acre. The monitoring shall be conducted annually for a minimum of 3 year after final planting. Photo documentation shall be utilized to document the success of the riparian vegetation and submitted to NCDWQ in a final report within sixty (60) days after completing monitoring. After 3 years the NCDOT shall contact NCDWQ to schedule a site visit to “close out” the mitigation site. Success of the mitigation site shall be determined by NCDWQ during an on-site visit at or near the end of the monitoring period.

Section 1. PHOTO REFERENCE SITES

*(Monitoring at all levels must complete this section)*

**Total number of reference photo locations at this site:** A total of 4 photos were taken from 3 photo point locations

**Dates reference photos have been taken at this site:** 6/24/14

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Individual from whom additional photos can be obtained (name, address, phone): \_\_\_\_\_

Other Information relative to site photo reference: A site map is included with this report showing the photo point locations.

**Section 2. PLANT SURVIVAL**

Attach plan sheet indicating reference photos.

Identify specific problem areas (missing, stressed, damaged or dead plantings):

\_\_\_\_\_  
 \_\_\_\_\_

Estimated causes, and proposed/required remedial action: \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_

ADDITIONAL COMMENTS: NCDOT completed planting this site in December 2013 with silky dogwood and elderberry live stakes along the streambank and water oak, tulip poplar, willow oak, swamp blackgum, baldcypress, and swamp chestnut oak bareroot seedlings within the wetland restoration area. Two 50 x 50 foot vegetation plots were set in the planted area. Plant survival counts were conducted during June 2014 monitoring evaluation with the results showing an average density of 553 trees per acre, which is well above the minimum success criteria of 320 trees per acre after the first year of monitoring. Other species noted on site included black willow, *Juncus* sp., woolgrass, fennel, cattail, red maple, *Sagittaria* sp., sedge, alder, sycamore, stinkweed, and various grasses. Pockets of standing water were noted throughout the site. NCDOT proposes to continue plant survival monitoring at this site in 2015.

If required to complete Level 1 and Level 2 monitoring only stop here; otherwise, complete section 3.

Plot #	Water Oak	Tulip Poplar	Willow Oak	Swamp Blackgum	Baldcypress	Swamp Chestnut Oak	Total (Year 1)	Total (at planting)	Density (Trees/Acre)
1	8		7	7		6	28	31	614
2	2		3	10	3	8	26	36	491
Year 1 Average Density									553

**Section 3. CHANNEL STABILITY**

**Visual Inspection:** The entire stream project as well as each in-stream structure and bank stabilization/revetment structure must be evaluated and problems addressed.

Report on the visual inspection of channel stability. Physical measurements of channel stability/morphology will not be required. Include a discussion of any deviations from as-built and an evaluation of the significance of these deviations and whether they are indicative of a stabilizing or destabilizing situation.

The restoration of the Bishop Branch site involved the removal of the existing pavement and roadway fill of NC 87 Maco Road as well as the existing 72” by 96” CMA and associated headwall. Bishop Branch is stable for the Year 1 monitoring evaluation. NCDOT will continue to monitor channel stability at the Bishop Branch Mitigation Site in 2015.

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Date Inspected	Station Number				
Structure Type					
Is water piping through or around structure?					
Head cut or down cut present?					
Bank or scour erosion present?					
Other problems noted?					
Bankfull event dates and how it was noted					

# Bishop Branch



PP #1 looking South



PP #2 looking West (Upstream)



PP #2 looking East (Downstream)



PP #3 looking North

June 2014

REVISIONS

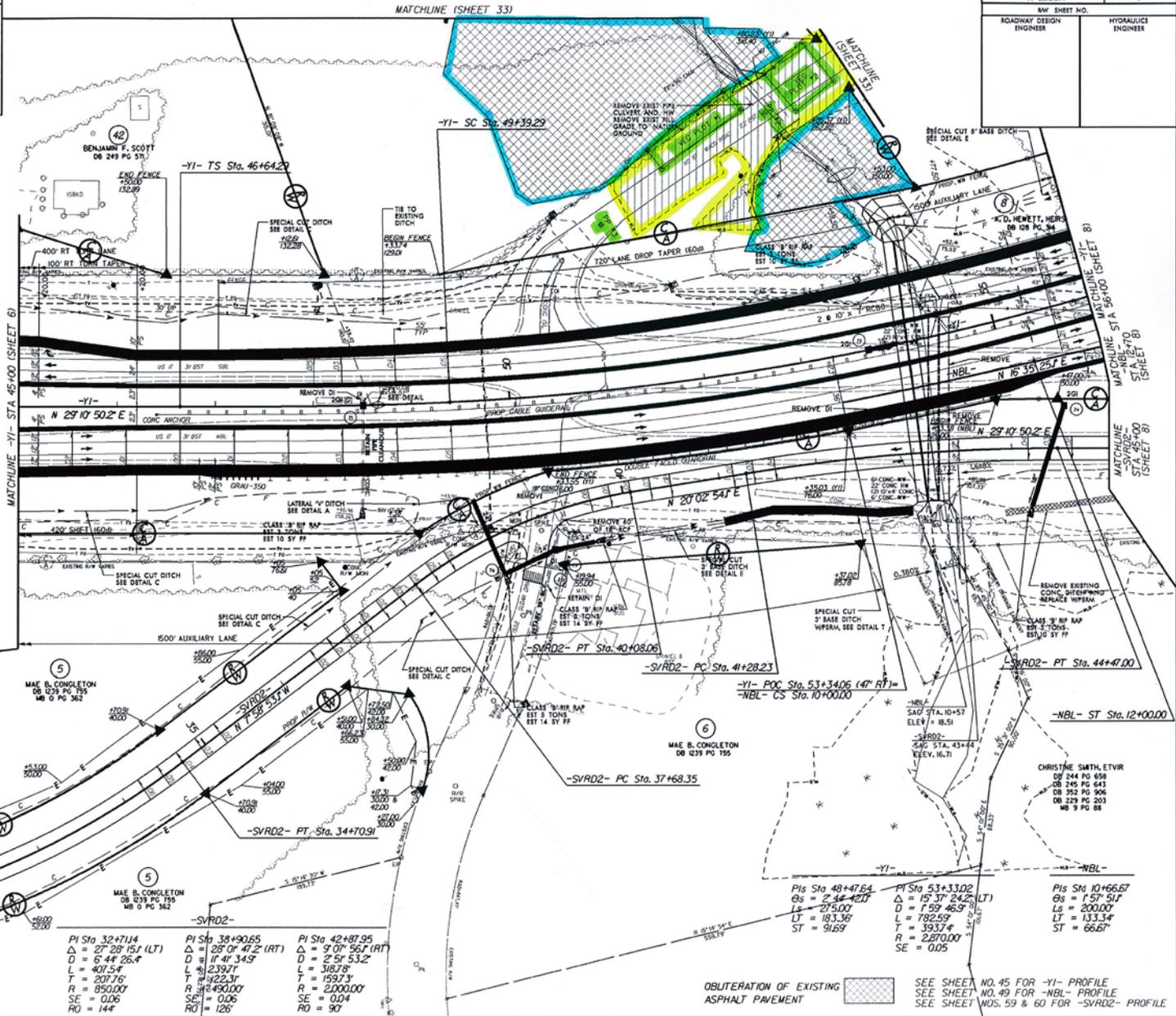


PROJECT REFERENCE NO.	SHEET NO.
R-2633A	7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**R-2633A BISHOP BRANCH AS-BUILT PLANS**

VEGETATION PLOT AND PHOTO POINT LOCATIONS

- WETLAND PRESERVATION
- WETLAND RESTORATION



PI Sta 32+71.4 $\Delta = 27^{\circ} 28' 15.1" (LT)$ $D = 6' 44' 26.4"$ $L = 401.54'$ $T = 207.76'$ $R = 850.00'$ $SE = 0.06$ $RO = 144$	PI Sta 38+90.65 $\Delta = 28^{\circ} 07' 47.2" (RT)$ $D = 11' 41' 34.5"$ $L = 239.71'$ $T = 122.37'$ $R = 490.00'$ $SE = 0.06$ $RO = 126$	PI Sta 42+87.95 $\Delta = 9' 07' 56.7" (RT)$ $D = 2' 51' 53.2"$ $L = 318.78'$ $T = 159.73'$ $R = 2000.00'$ $SE = 0.04$ $RO = 90$
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OBLITERATION OF EXISTING ASPHALT PAVEMENT

SEE SHEET NO. 45 FOR -Y1- PROFILE  
 SEE SHEET NO. 49 FOR -NBL- PROFILE  
 SEE SHEET NOS. 59 & 60 FOR -SVRD2- PROFILE

PI Sta 48+47.64 $\Delta = 2^{\circ} 44' 42.0" (LT)$ $D = 275.00'$ $L = 183.36'$ $T = 91.69'$	PI Sta 53+33.02 $\Delta = 15^{\circ} 37' 24.2" (LT)$ $D = 1' 59' 46.5" (RT)$ $L = 782.89'$ $T = 393.74'$ $R = 2870.00'$ $SE = 0.05$	PI Sta 10+66.67 $\Delta = 1^{\circ} 57' 51.1" (LT)$ $D = 200.00'$ $L = 133.34'$ $T = 66.67'$
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B:\FILES

REVISIONS

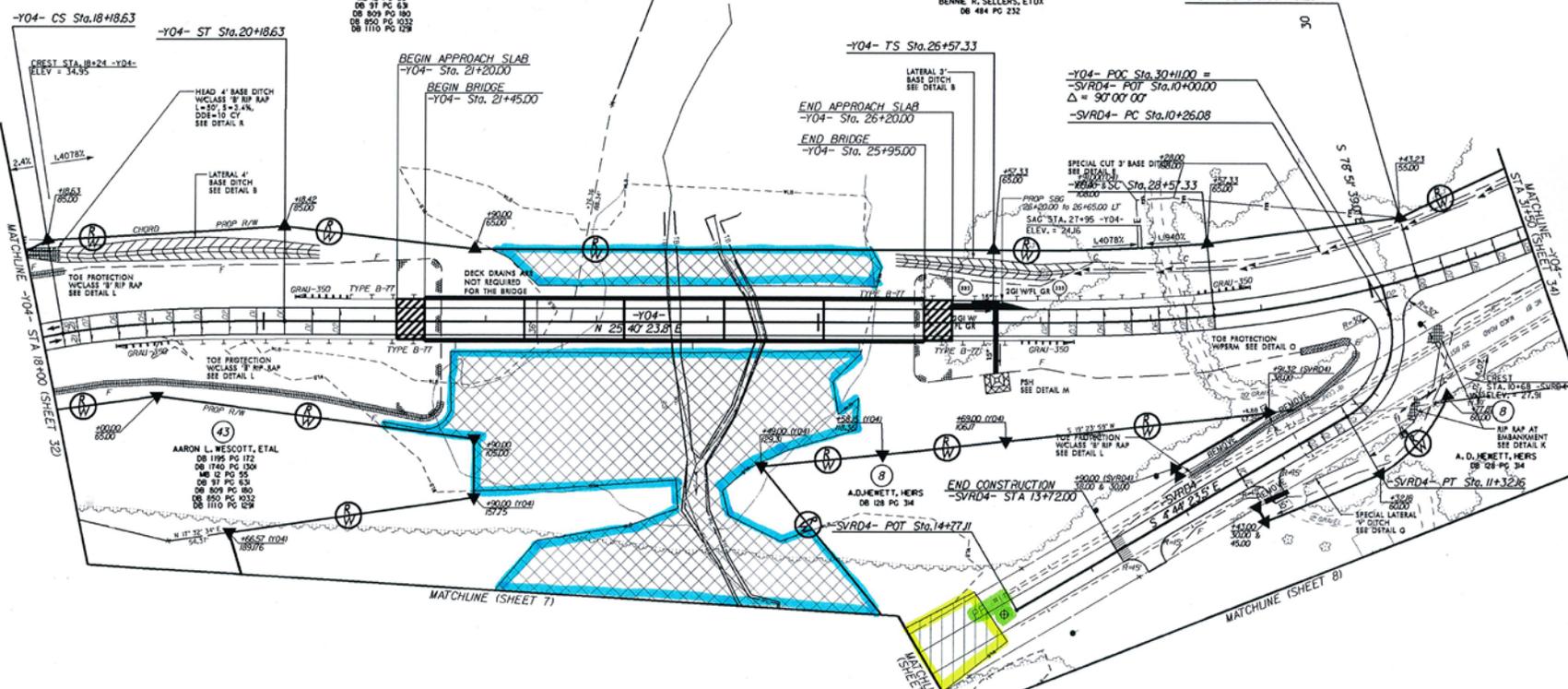
**-Y04-**

Pls Sta 18+85.48 6ls = 5'42" 40.7' Ls = 200.00' LT = 133.53' ST = 66.85'	Pls Sta 27+90.74 6ls = 5'43" 46.5' Ls = 200.00' LT = 133.40' ST = 66.73'	Pls Sta 29+50.55 $\Delta = 10' 39" 03.9' (LT)$ D = 5'43" 46.5' L = 185.90' T = 93.22' R = 1000.00' SE = 0.02 RO = 200'	Pls Sta 31+09.96 6ls = 5'43" 46.5' Ls = 200.00' LT = 133.40' ST = 66.73'
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**-SVRD4-**

PI Sta 10+88.00 $\Delta = 74' 07" 15.5' (RT)$ D = 63' 52" 22.4' L = 106.08' T = 61.93' R = 82.00' SE = 0.02 RO = 42'
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PROJECT REFERENCE NO. R-2633A	SHEET NO. 33
ROW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



R-2633A BISHOP BRANCH AS-BUILT PLANS  
VEGETATION PLOT AND PHOTO POINT LOCATIONS

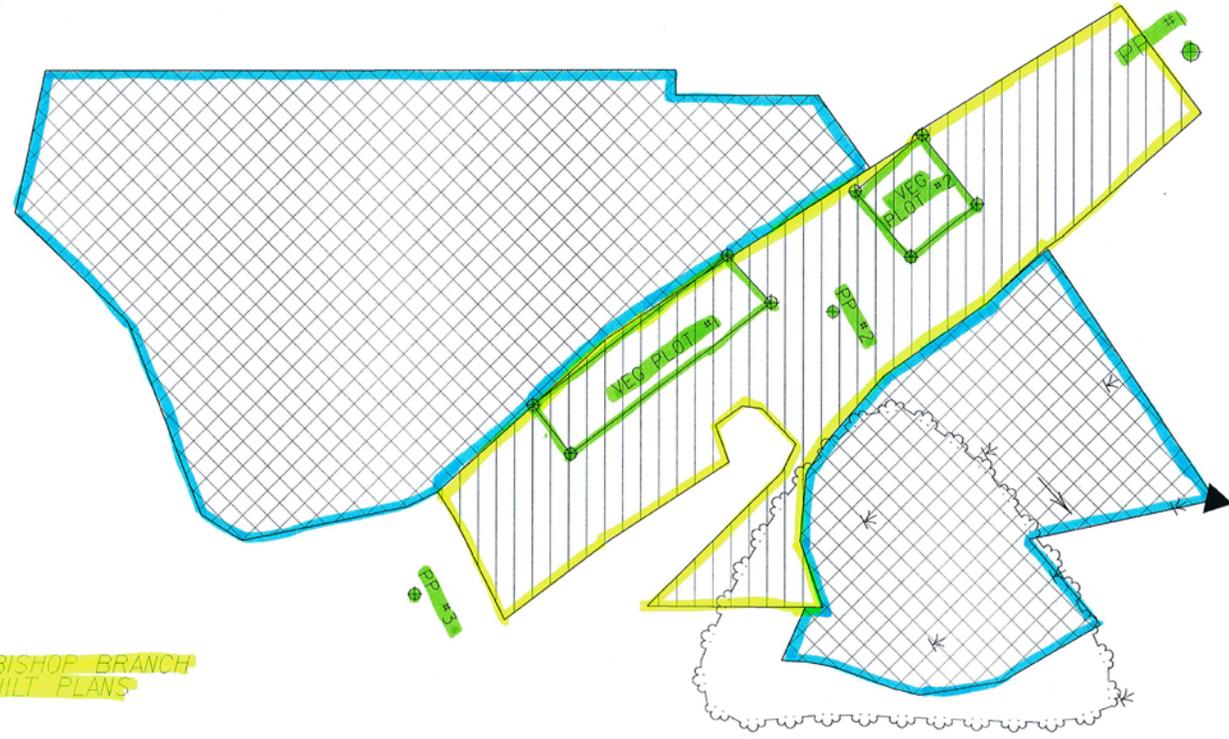
- WETLAND PRESERVATION
- WETLAND RESTORATION

#15/16#

# WETLAND REFORESTATION PLANTING PLAN



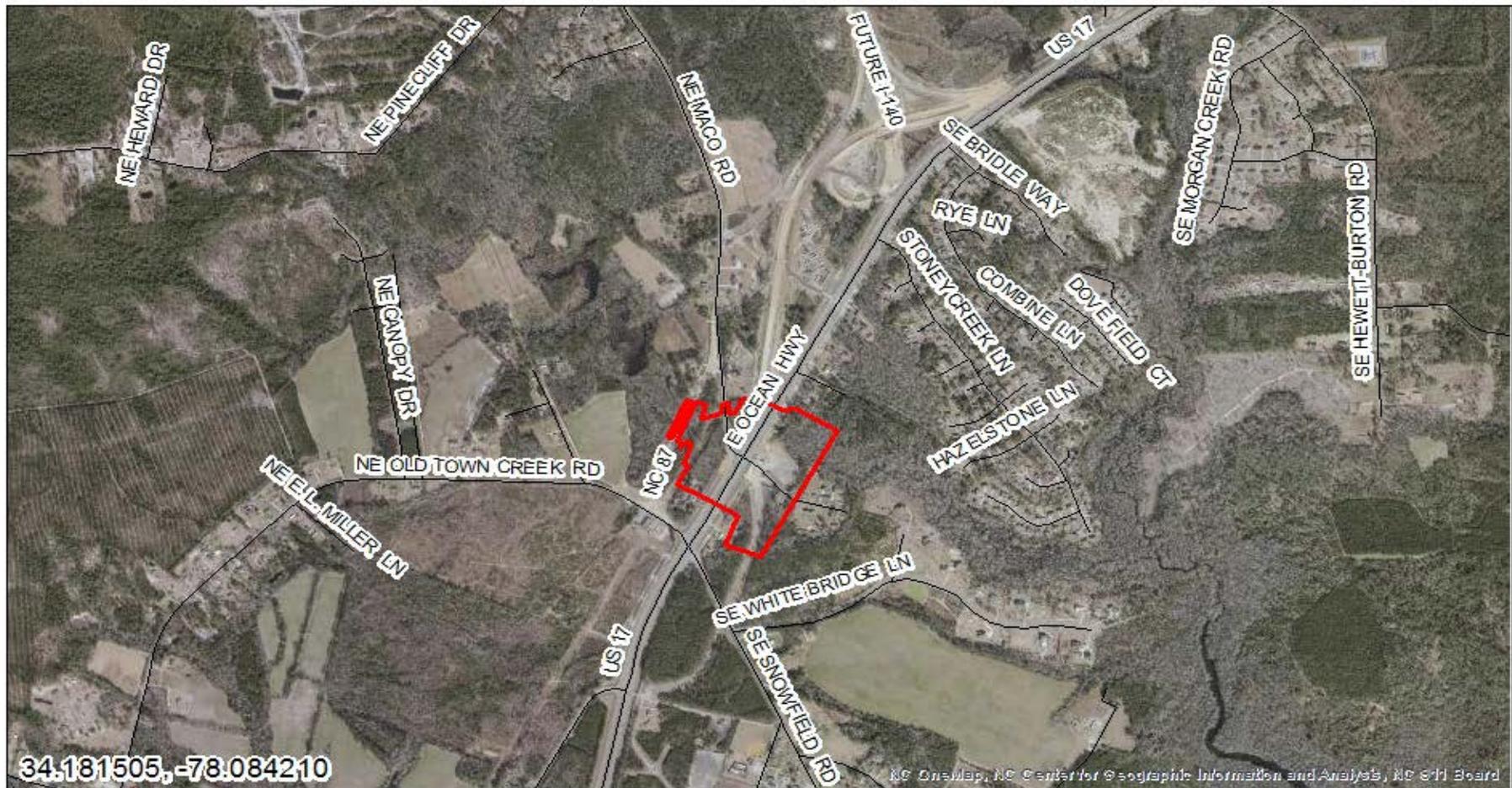
PROJECT REFERENCE NO. R-2633A	SHEET NO. RF-3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



R-2633A BISHOP BRANCH  
AS-BUILT PLANS

 WETLAND PRESERVATION AREA

 WETLAND HARDWOOD REFORESTATION AREA SEE  
REFORESTATION DETAIL SHEET RF-1



34.181505, -78.084210

NC OneMap, NC Center for Geographic Information and Analysis, NC GIM Board



**VICINITY MAP**  
**R-2633A Bishop Branch Mitigation Site**  
**Brunswick County, North Carolina**

