

Monitoring Data Record

Project Title: B-4138 COE Action ID: 2003-00357
 Stream Name: UT to Cape Fear River DWQ Number: 20091321
 City, County and other Location Information: Harnett County, project located at the US 401/NC 210 crossing at the Cape Fear River in Lillington, NC
 Date Construction Completed: planting completed Dec. 18, 2013 Monitoring Year: (1) of 5
 Ecoregion: _____ 8 digit HUC unit 030030004
 USGS Quad Name and Coordinates: 35.408081, -78.813244

Rosgen Classification: _____

Length of Project: 608 feet Urban or Rural: Rural Watershed Size: _____
 Monitoring DATA collected by: J. Young and M. Green Date: 6/12/14

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

Consultant Information:

Name: _____
 Address: _____
 Telephone Number: _____ Email address: _____

Project Status: Complete

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 for channel and bank stability and by photo documentation for the survival and the density of the vegetation. NCDOT will monitor the site for a minimum of three years or until the site is deemed successful.

NCDWQ Permit states: The permittee shall visually monitor the vegetative plantings to assess and ensure complete stabilization of the mitigation stream segments. Riparian area success shall be determined by conducting stem counts to ensure a tree survival rate of 320 stems/acre. The monitoring shall be conducted annually for a minimum of 3 years 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.

ACOE Permit states: In order to compensate for permanent impacts to 608 linear feet of stream, the permittee will perform on site mitigation consisting of approximately 608 linear feet of onsite stream restoration pursuant to the plan titled “UT to Cape Fear, Bridge No. 46 on US 401/NC 210, Stream Mitigation Plan, TIP B-4138” dated September 2009. Acceptance of this plan and mitigation proposal is predicted on compliance with the following conditions:

- a. The restored channel will be allowed to stabilize for one growing season prior to the introduction of stream flow.
- b. Monitoring shall continue for a minimum of five years unless the Corps determines in writing the monitoring may be discontinued.
- c. Within 60 days following completion of all channel construction and planting efforts, the permittee will submit an as-built of the final site to the Corps.
- d. Monitoring reports will be submitted to the Corps by January 31 of the year following each monitoring year.

Section 2. PLANT SURVIVAL

Attach plan sheet indicating reference photos.

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

There were multiple dead trees noted throughout the site due to high water from the Cape Fear River encroaching into the site and from competition from lespedeza within reforestation area. The lespedeza has encroached into the buffer from the fill slope seeding.

Estimated causes, and proposed/required remedial action: NCDOT is currently planning to apply multiple herbicide applications in order to control the lespedeza at the site. The site will then be replanted with water tolerant species and live stakes will be planted on the southern end of the site where high river flows have affected the planted vegetation.

ADDITIONAL COMMENTS: NCDOT completed planting this site on December 18, 2013 with silky dogwood, black willow, yellow poplar, sycamore, white oak, green ash, and river birch. Black willow live stakes were surviving along the upper portion of the stream relocation. Two 100 x 25 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 263 trees per acre, which is below the minimum success criteria of 320 trees per acre after the first year of monitoring. Other species noted on site included *Juncus* sp., baccharis, stinkweed, lespedeza, cattail, willow oak, fennel, sweetgum, winged elm, pine, buttonbush, and various grasses. NCDOT will continue to monitor the UT to Cape Fear River site in 2015.

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

| Plot # | Yellow Poplar | Sycamore | White Oak | River Birch | Green Ash | Total (Year 1) | Total (at planting) | Density (Trees/Acre) |
|--|---------------|----------|-----------|-------------|-----------|----------------|---------------------|----------------------|
| 1 | 1 | 5 | 1 | 4 | 0 | 11 | 50 | 150 |
| 2 | 0 | 7 | 0 | 11 | 3 | 21 | 38 | 376 |
| Year 1 Average Density (Trees/Acre) | | | | | | | | 263 |

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.

UT to Cape Fear River is stable for the Year 1 monitoring evaluation, except for, the streambanks up and downstream at PP#4 that have sloughed off due to high water within the Cape Fear River encroaching into the site. This has left some areas of raw banks. NCDOT plans to live stake these banks after the herbicide applications on the lespedeza are complete to stabilize this area. A beaver dam was noted upstream of PP#1. USDA has been contacted to trap and remove the beavers. NCDOT will continue to monitor channel stability at the UT to Cape Fear River in 2015.

| | | | | | |
|--|----------------------------|----------------|----------------|----------------|----------------|
| Date Inspected 6/12/14 | Sta. 34+50 | Station Number | Station Number | Station Number | 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? | Sloughed off and raw banks | | | | |
| Bankfull event dates and how it was noted | Wrack line 6/12/14 | | | | |

Section 4. DEBIT LEDGER

The entire UT to Cape Fear River stream mitigation site was used for the B-4138 project to compensate for unavoidable stream impacts.

UT to Cape Fear River



PP #1 (Upstream)



PP #1 (Downstream)



PP #2 (Upstream)



PP #2 (Downstream)



PP #3 (Upstream)



PP #3 (Downstream)

UT to Cape Fear River



PP #4 (Upstream)



PP #4 (Downstream)



Vegetation Plot #1



Vegetation Plot #2



Site Overview Photo
June 2014



Beaver Dam Upstream of PP #1

UT to Cape Fear River

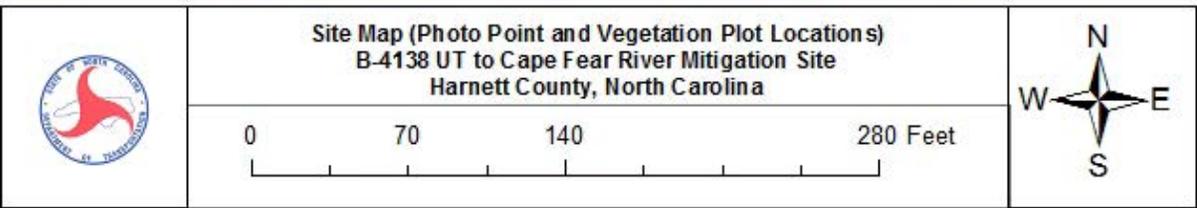
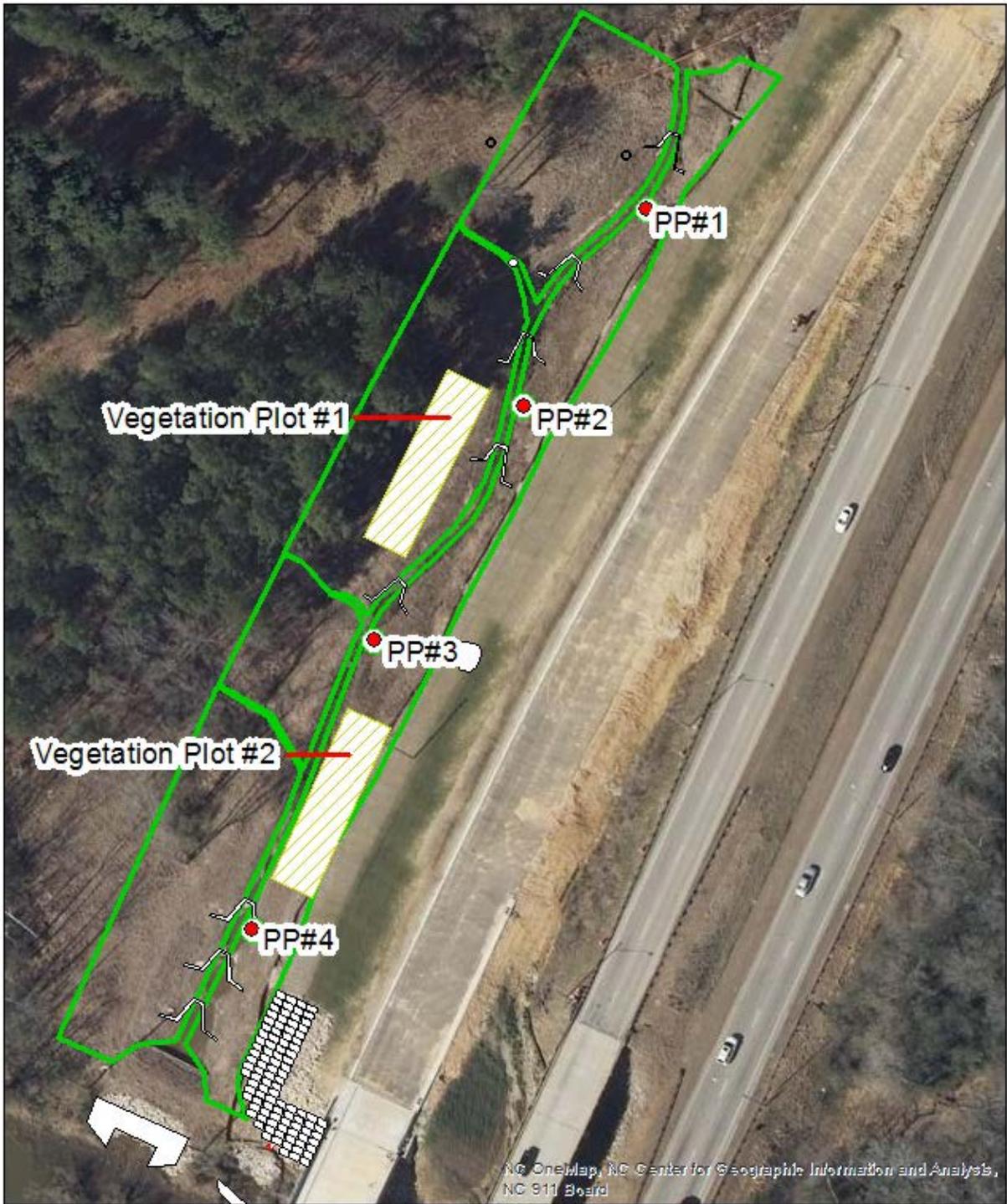


Left Bank at Sta. 34+50



Right Bank at Sta. 34+50

June 2014



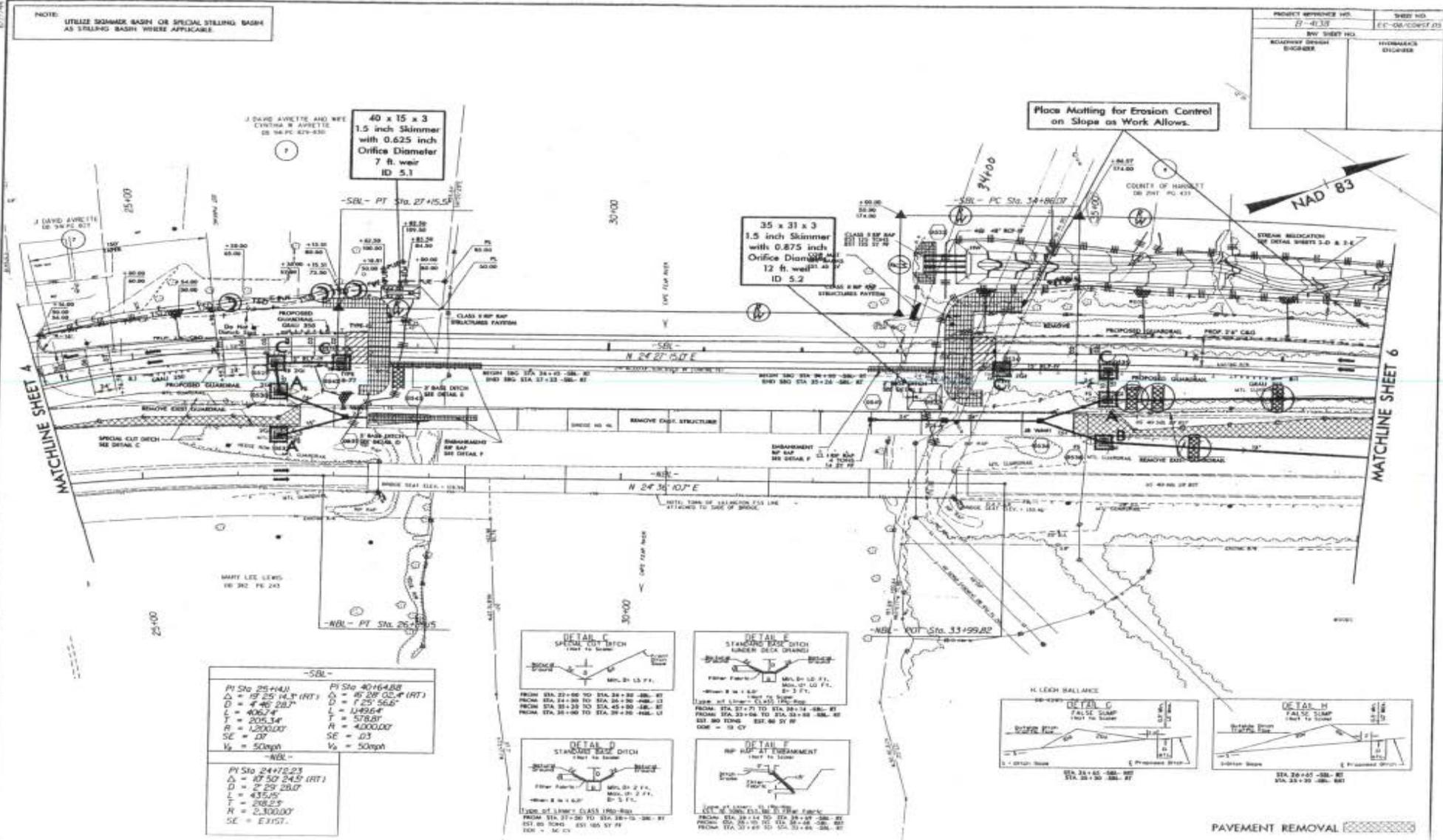
NOTE:
UTILIZE SKIMMER BASIN OR SPECIAL STILING BASIN
AS STILING BASIN WHERE APPLICABLE.

| | |
|--------------------------|---------------------------|
| PROJECT NUMBER: B-4138 | SHEET NO.: EC-08/CONST.05 |
| BY: SHEET NO. | |
| ROADWAY DESIGN ENGINEER: | HYDRAULIC ENGINEER: |

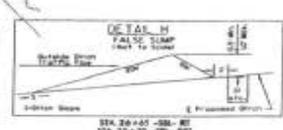
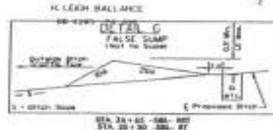
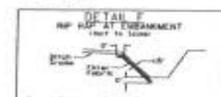
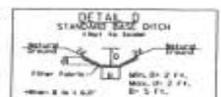
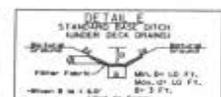
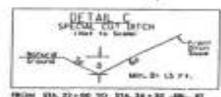
Place Matting for Erosion Control on Slope as Work Allows.

40 x 15 x 3
1.5 inch Skimmer
with 0.625 inch
Orifice Diameter
7 ft. weir
ID 5.1

35 x 31 x 3
1.5 inch Skimmer
with 0.875 inch
Orifice Diameter
12 ft. weir
ID 5.2



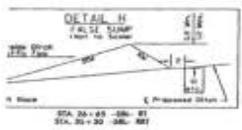
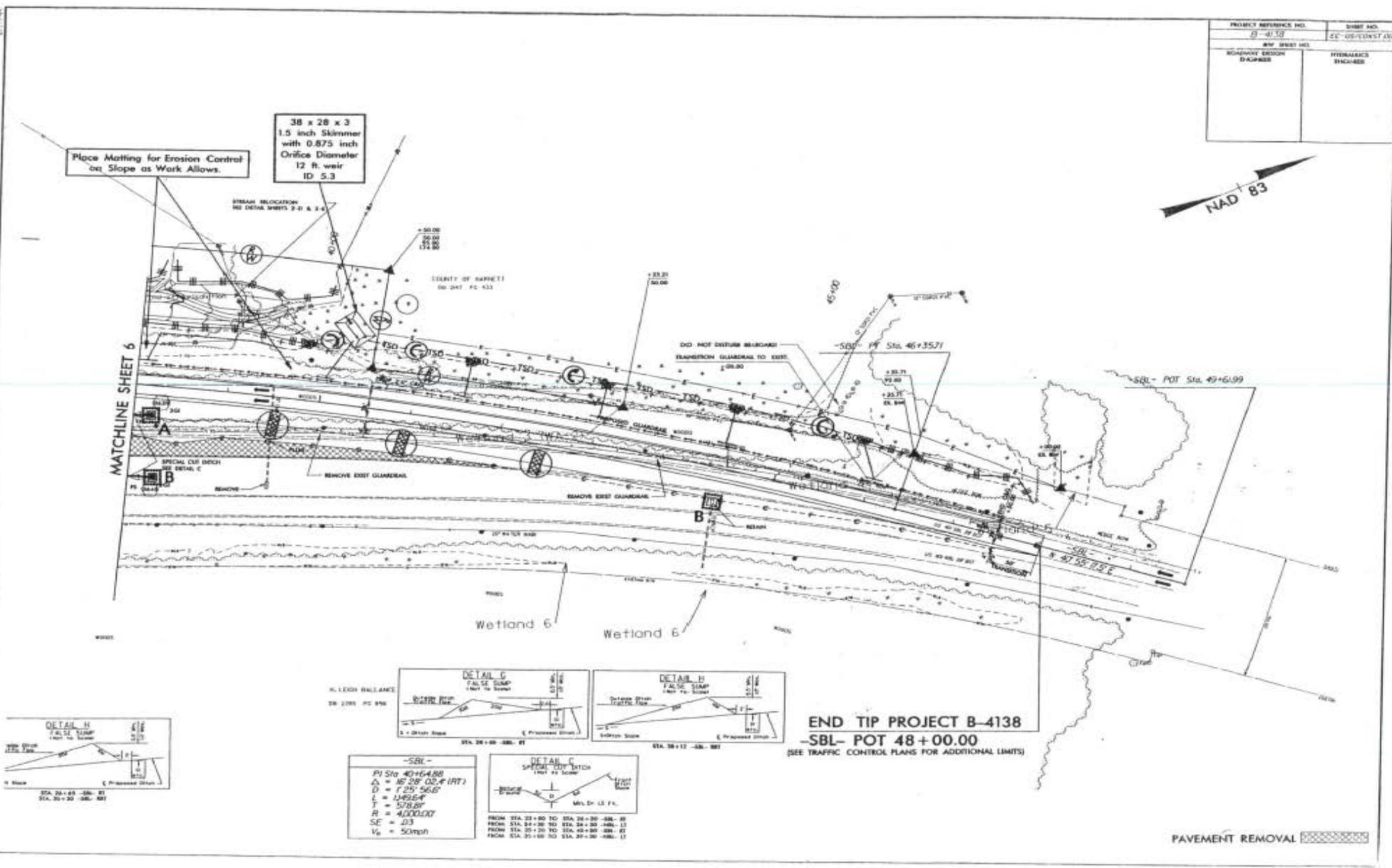
| | |
|------------------------------|------------------------------|
| -SBL- | |
| PI Sta 25+44.0 | PI Sta 40+64.88 |
| $\Delta = 15' 25" 44.1$ (RT) | $\Delta = 45' 28" 02.4$ (RT) |
| D = 4' 46" 28.7 | D = 7' 25" 56.6 |
| L = 406.74' | L = 1,495.64' |
| T = 205.34' | T = 578.87' |
| R = 1,200.00' | R = 4,000.00' |
| SE = D7 | SE = D3 |
| Vs = 50mph | Vs = 50mph |
| -NBL- | |
| PI Sta 24+75.23 | |
| $\Delta = 47' 52" 24.5$ (RT) | |
| D = 2' 29" 28.0 | |
| L = 435.25' | |
| T = 208.22' | |
| R = 2,300.00' | |
| SE = E11ST. | |



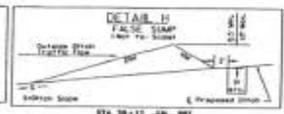
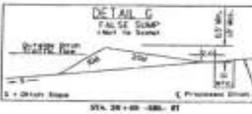
PAVEMENT REMOVAL

Plan Sheet No. EC-08/CONST.05
B-4138 UT to Cape Fear River
Harnett County, North Carolina

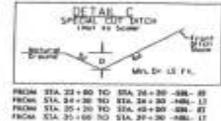
| | |
|---------------------------------|-----------------------------|
| PROJECT REFERENCE NO. B-4138 | SHEET NO. EC-09/CONST.06 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |



K. LEIGH BALLANCE
SR. CIVIL ENGINEER



-SBL-
 P1 Sta 40+64.88
 $\Delta = 16.28' \text{ @ } 2.4\% \text{ (RT)}$
 $D = 1.25' \text{ @ } 56.6'$
 $L = 146.54'$
 $T = 578.28'$
 $R = 4,000.00'$
 $SE = .03$
 $V_p = 50 \text{ mph}$



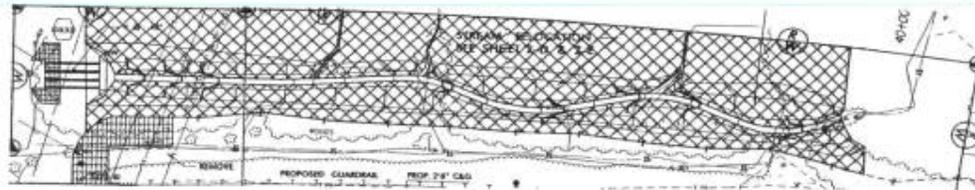
END TIP PROJECT B-4138
-SBL- POT 48+00.00
 (SEE TRAFFIC CONTROL PLANS FOR ADDITIONAL LIMITS)

PAVEMENT REMOVAL

Plan Sheet No. EC-09/CONST.06
 B-4138 UT to Cape Fear River
 Harnett County, North Carolina

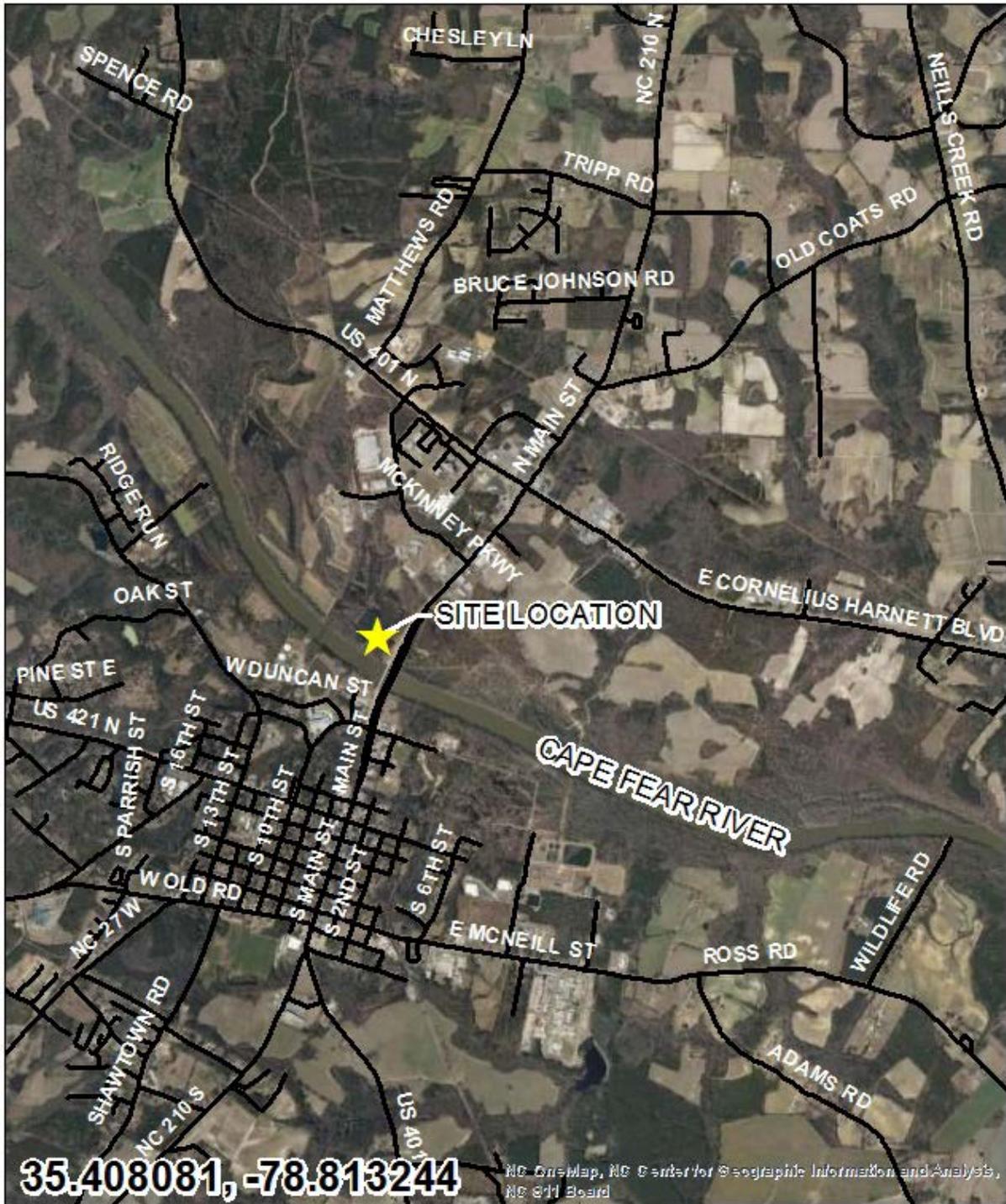
1.27 ACRE STREAMBANK REFORESTATION

| | |
|-----------------------|-------------|
| PROJECT REFERENCE NO. | SHEET NO. |
| B-4138 | 12-01 |
| BY: ENGINEER | DATE |
| REVISIONS | DESCRIPTION |



SEE RF-2, RF-3 AND PROJECT SPECIAL PROVISIONS

Streambank Reforestation Plan
B-4138 UT to Cape Fear River
Harnett County, North Carolina



| | | |
|---|---|---|
|  | <p style="text-align: center;">Vicinity Map B-4138 UT to Cape Fear River Mitigation Site Harnett County, North Carolina</p> <p style="text-align: center;">0 0.5 1 2 Miles</p>  |  |
|---|---|---|