## Monitoring Data Record

Project Title: R-2635C Western Wake Freeway COE Action ID: 2007-02903-292
Stream Name: UT Reedy Branch – Site 3 DWQ Number: 20071470
City, County and other Location Information: UT Reedy Branch is located along I-540 just south of Beaver Creek Commons Drive in Apex, NC.
Date Construction Completed: March 2011
Monitoring Year: ( 1 ) of 5
Ecoregion: 8 digit HUC unit 03020201
USGS Quad Name and Coordinates: N 35 44' 29" W 78 53' 29"
**Rosgen Classification:**
Length of Project: 640' Urban or Rural: Urban Watershed Size:
Monitoring DATA collected by: M. Green and J. Young Date: 7/7/11
Applicant Information:
Name: NCDOT Roadside Environmental Unit
Address: 1425 Rock Quarry Road Raleigh, NC 27610
Telephone Number: (919) 861-3772 Email address: mlgreen@ncdot.go
**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** ~~2~~ ~~3~~
Monitoring Level 1 requires completion of *Section 1, Section 2 and Section 3*

**Permit States**: **COE (2007-02903-292)** The permittee shall monitor the completed stream relocation in accordance with Monitoring Level 2 of the US army Corps of Engineers, Wilmington District, Stream Mitigation Guidelines of April 2003. Monitoring will be conducted two times per year (spring and fall) each year of a 5-year monitoring period. The monitoring reports, including reference photographs, plant survival data and visual inspection notes identifying specific problem areas, will be submitted to the Corps of Engineers, Wilmington Regulatory Field Office within 60 days of completion of the monitoring. The monitoring report will also include a discussion of any deviations from the as-built condition and an evaluation of the significance of these deviations to channel stability. The success of the stream relocation as project mitigation will be evaluated based on those success criteria listed in the referenced Stream Mitigation Guidelines.

**DWQ (20071470)** 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 year after final planting. Photo documentation shall be utilized to document the success of the riparian vegetation and submitted to DWQ in a final report within sixty (60) days after completing monitoring. After 3 years the NC Turnpike Authority shall contact the DWQ to schedule a site visit to "close out" the mitigation site.

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 8 photo points were taken from 4 photo point locations, 2 photos of the vegetation plots, and an overview photo of the site.**

**Dates reference photos have been taken at this site:7/7/11**

**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.

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

**Section 2. PLANT SURVIVAL**
**Attach plan sheet indicating reference photos.**

Identify specific problem areas (missing, stressed, damaged or dead plantings):
It was noted that the buffer was not planted at 680 trees per acre but at a lower stem count resulting in the low at planting numbers for vegetation plot #1 (23 trees) and plot #2 (33 trees).

Estimated causes, and proposed/required remedial action: Additional planting is scheduled to occur between November 15, 2011 to March 15, 2012.

ADDITIONAL COMMENTS: Planting was completed at this stream relocation in March 2011. The following planted species were planted on the streambank: black willow and silky dogwood live stakes and in the buffer area: tulip poplar, sycamore, river birch, and green ash seedlings. Two 50 x 50 foot vegetation plots were set in the buffer area in May 2011. Year 1 Summer plant survival counts were conducted during July 2011 monitoring evaluation with the results showing an average density of 618 trees per acre (see table below), which is well above the minimum success criteria of 320 trees per acre for Year 1. Black willow and silky dogwood live stakes are surviving along the streambank. NCDOT will continue to monitor plant survival at this stream relocation.

| Plot # | Tulip Poplar | Sycamore | River Birch | Green Ash | Total (1 year) | Total (at planting) |
|---|---|---|---|---|---|---|
| 1 | 2 | 4 | 6 | 10 | 22 | 23 |
| 2 | 6 | 5 | 7 | 12 | 30 | 33 |
| Average Density (Trees/Acre | | | | | | 618 |

**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 stream relocation is stabilized for the Year 1 Summer evaluation, except for, the three areas noted below. The headcuts were marked in the field to see if they continue to move upstream. NCDOT will continue to monitor channel stability at this stream relocation.

| 7/7/11 | Station 321+50-L- (additional photo) | Station 318+90-L- (additional photo) | Station 317+70-L- (additional photo) | Station Number | Station Number |
|---|---|---|---|---|---|
| Structure Type | | | | | |
| Is water piping through or around structure? | | | | | |
| Head cut or down cut present? | | Slight Headcut has formed upstream of PP#4 | Headcut has formed downstream of PP#4 | | |
| Bank or scour erosion present? | Bank scouring along left bank upstream of PP#2 | | | | |
| Other problems noted? | | | | | |

**Section 4. DEBIT LEDGER**

The entire UT to Reedy Branch (Site 3) stream mitigation site was used for the R-2635C project to compensate for unavoidable stream impacts.

# UT to Reedy Branch

Photo Point #1 (Upstream)

Photo Point #1 (Downstream)

Photo Point #2 (Upstream)

Photo Point #2 (Downstream)

Photo Point #3 (Upstream)

Photo Point #3 (Downstream)

Year 1 Summer – July 2011

# UT to Reedy Branch

Photo Point #4 (Upstream) (Crossvane #2)

Photo Point #4 (Downstream)

Vegetation Plot #1

Vegetation Plot #2

Overview Photo of Site

Crossvane #1

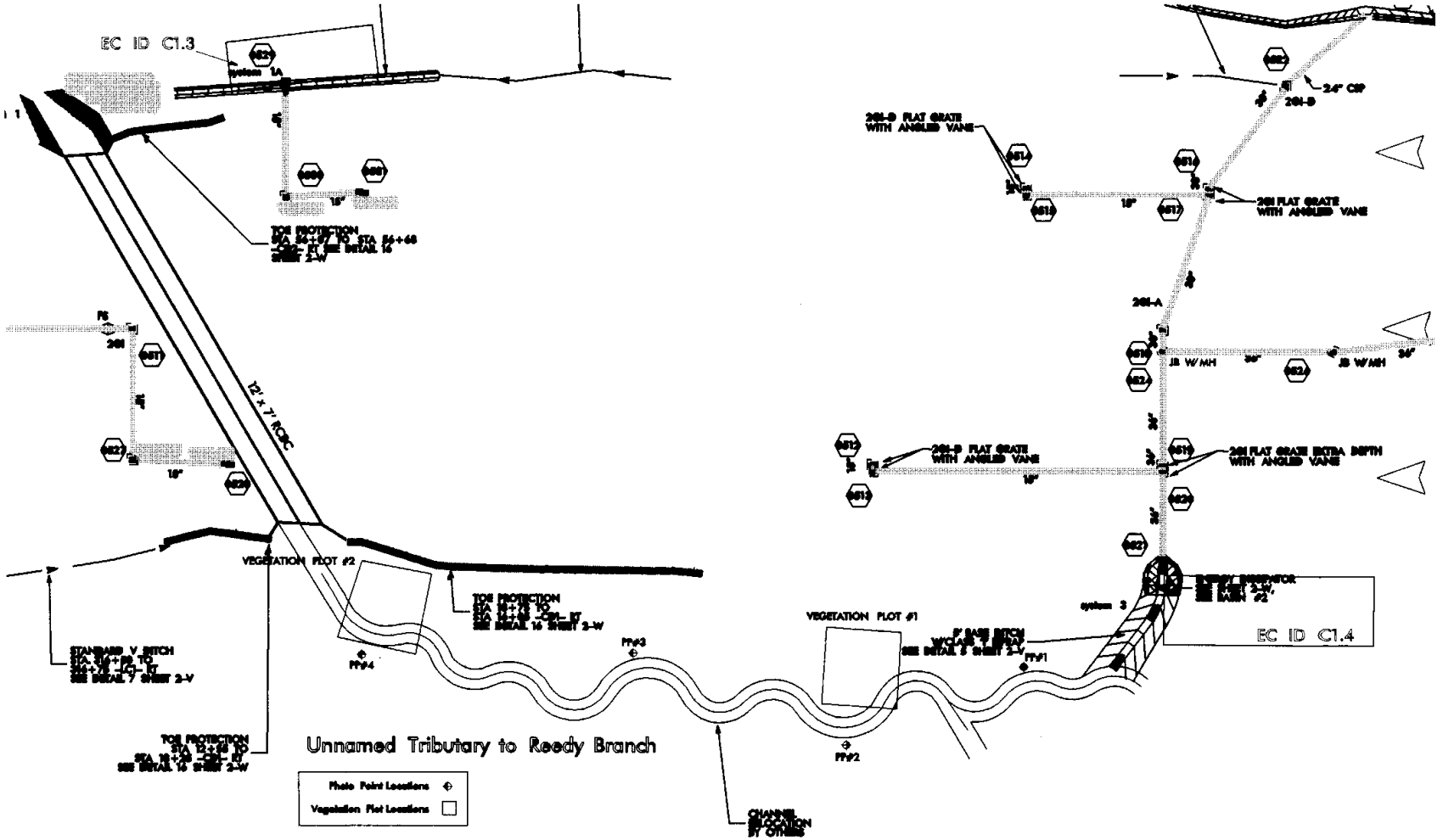
# UT to Reedy Branch

Left Bank Scouring @ STA. 321+50-L-

Slight Heacut @ STA. 318+90-L-

Headcut @ STA. 317+70-L-

Year 1 Summer – July 2011


EC ID C1.3
TOE PROTECTION
12' x 7' RCBC
VEGETATION PLOT #2
TOE PROTECTION
STANDARD V DITCH
TOE PROTECTION
Unnamed Tributary to Reedy Branch
Photo Point Locations
Vegetation Plot Locations
CHANNEL RELOCATION BY OTHERS
VEGETATION PLOT #1
PP#1
PP#2
PP#3
PP#4
24" CMP
201-B
201-B FLAT GRATE WITH ANGLED VANE
201 FLAT GRATE WITH ANGLED VANE
201-A
JB W/MH
201-B FLAT GRATE WITH ANGLED VANE
201 FLAT GRATE EXTRA DEPTH WITH ANGLED VANE
system 3
EC ID C1.4