STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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November 1, 2004

U.S. Army Corps of Engineers
Regulatory Field Office
6508 Falls of the Neuse Road
Suite 120
Raleigh, NC 27615

ATTN: Mr. Eric Alsmeyer
NCDOT Coordinator

SUBJECT: Individual Permit Application for US 70 (Clayton Bypass) from I-40 in Wake County to US 70 Business in Johnston County, TIP No. R-2552AA, AB, B, and C; State Project No. 8.T311002; Federal Aid Project No. NHF-60-1(9). Divisions 4 and 5. $475 to Work Order 8.T311002 (WBS Element 34459.1.1).

Dear Sir:

The NCDOT proposes to construct a bypass on new location from I-40 in Wake County to US 70 Business in Johnston County. The project totals 9.5 miles in length. The proposed typical section is a four lane divided highway with grass shoulders and ditches and a 70-ft wide grass median. There are four major interchanges, one at I-40, one at NC 42, one at SR 1560 (Ranch Road), and one at US 70 Business and US 70A. The proposed interchange at Ranch Road required the realignment of Ranch Road for 0.9 mile. Roadway improvements and grade separations were also proposed for SR 1554 (Corbett Road) and SR 1555 (Barber Mill Road) for 0.33 mile and 0.68 mile, respectively. The interchange at US 70 Business and US 70A will be redesigned, including 1.82 miles of existing US 70 Business. Also included is realigning a portion of Gordon Road (SR 1913), 0.34 mile in length. Enclosed please find the ENG 4345 Form, 8 ½ x 11 drawings, half-sized plan sheets, and Indirect and Cumulative Impacts Report for the subject project.

Summary of Impacts: Impacts on jurisdictional areas consist of a total of 22.47 acres of permanent wetland impacts, of which 9.02 acres are non-riverine and 13.45 acres are riverine. There will also be approximately 9,847 linear feet of jurisdictional stream impacts. There will also be approximately 1,214,217 square feet of riparian buffer impacts (699,048 square feet in Zone 1 and 515,169 square feet in Zone 2).

Summary of Mitigation: The project has been designed to avoid and minimize impacts to jurisdictional areas throughout the National Environmental Policy Act (NEPA) and design

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processes. Detailed descriptions of these actions are presented elsewhere in this application. We propose to relocate 410 linear feet of jurisdictional stream using natural stream design techniques. We propose to replace 36,523 square feet of riparian buffers on-site. We propose to use the Ecosystem Enhancement Program (EEP) to mitigate for 22.47 acres of wetland impacts, 9,437 linear feet of jurisdictional stream impacts, and 800,458 square feet of riparian buffer impacts (434,414 square feet in Zone 1 and 366,044 square feet in Zone 2).

Purpose and Need

The purpose of the proposed project is to construct a highway that will serve the growing transportation needs of Wake and Johnston Counties and also provide an important connection in the North Carolina Intrastate System. The proposed project would result in a facility that will better serve regional traffic by partially separating it from local traffic. With the growing number of commuters between Wake and Johnston Counties, the project would improve access for local communities to the employment centers of Raleigh and Research Triangle Park (RTP) by providing a safe, high-speed corridor.

Alternatives: NCDOT investigated several alternatives for this project which were discussed in detail in Section 2.0 of the Final Environmental Impact Statement (FEIS).

Project Schedule

Schedule: All Sections of R-2552 (AA, AB, B, and C) are scheduled to be let to construction in May 17, 2005. Table 1 reflects the project breakdown, section limits, and project let dates.

Table 1. Construction limits and schedule

Sections	Project Limits	Let Date
R-2552AA	From I-40 to east of SR 1525 (Cornwallis Rd)	May 2005
R-2552AB	From east of SR 1525 to east of NC 42	May 2005
R-2552B	From east of NC 42 to east of SR 1560 (Ranch Rd)	May 2005
R-2552C	From east of SR 1560 to US 70	May 2005

NEPA Document Status

A Draft Environmental Impact Statement (DEIS) for R-2552 was approved by the Federal Highway Administration (FHWA) on July 25, 1994. The FEIS for R-2552 was approved by the Project Development and Environmental Analysis (PDEA) Branch on June 8, 1998. A Record of Decision (ROD) for R-2552 was approved by PDEA on October 7, 1998. The FEIS explains the purpose and need for the project, provides a description of the project and characterizes the social, economic, and environmental effects of the project. Copies of the FEIS have been provided to the regulatory agencies involved in the approval process. Additional copies will be provided upon request.

Independent Utility

According to 23 Code of Federal Regulations (CFR) 771.111(f), "...in order to ensure meaningful evaluation of alternatives and to avoid commitments to transportation improvements before they are fully evaluated, the action evaluated...shall:

(1) Connect logical termini and be of sufficient length to address environmental matters on a broad scope;

(2) Have an independent utility or independent significance, i.e., be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made; and,

(3) Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements."

The proposed project will connect a four-lane section of I-40 to a four-lane section of US 70. The locations of the proposed project's termini have been coordinated with other programmed TIP projects in the area. The locations of this project's termini do not preclude the development and assessment of multiple alternates for other programmed TIP projects in the area. In this regard, the proposed project demonstrates logical termini and independent utility.

This project can stand alone as a functioning project and is designed to be compatible with other TIP projects in the area. The environmental impacts of the other projects will be fully evaluated in separate environmental documents. NCDOT has determined this project meets the criteria set forth in 23 CFR 771.111(f).

Resource Status

Delineations: Field work for the wetland delineation was conducted during July 1995 by Greenhorn & O'Mara, Inc. biologists using the criteria specified in the 1987 U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual. Additional wetland delineations were conducted during December 2002 by NCDOT biologists. Mr. Eric Alsmeyer of the USACE Raleigh Regulatory Field Office and Mr. John Hennessy of the NC Division of Water Quality verified the delineations in the field on January 9, 2003 and May 8, 2003. In addition to the delineations, the streams were characterized and data recorded on both the NCDWQ Stream Classification Form and the USACE Intermittent Channel Evaluation Form. The following characterization of the jurisdictional sites summarizes the August 2003 Delineation Report including the data form, aforementioned forms, and field notes.

R-2552AA, AB, B, and C will impact 22.47 acres of jurisdictional wetlands, 9,847 feet of jurisdictional streams, and 1,214,217 square feet of riparian buffers. The jurisdictional impacts including fill, mechanized clearing, and excavation are summarized in Tables 2, 3, and 4.

Wetlands: Approximately 0.03 acre of wetlands will be temporarily impacted on the C Section. Approximately 3.08 acres of ponds will be impacted.

The majority of vegetated wetlands identified in the study corridor are palustrine, forested, broad-leaved deciduous systems that are intermittently flooded or contain temporary surface water (PFO1A, Table 2). Also common are similar systems that are flooded seasonally (PF01C), and

may be inundated during the winter and early spring. These systems support Piedmont/Mountain Bottomland Forest plant communities, but, in two cases, support a significant component of pine (PFO1/4A and PFO1/4C).

A series of scrub/shrub systems are also represented. Hydrologic regimes range from intermittently to permanently flooded (PSS1A, PSS1C, PSS1F). Extensively flooded systems may repeatedly experience arrested vegetative succession through regular inundation, which would kill most developing woody vegetation. One scrub-shrub system in the project corridor is located in a recently drained hog waste lagoon (PSS1Dx).

Three palustrine emergent systems are represented in the project corridor. Two are elements of extensive stream/wetland systems (Sites AA14 and AB4; PEM2F). One area (Site C9, PEM1A) is adjacent to a poorly drained field. These largely herbaceous systems are generally inundated to a considerable depth and support little woody vegetation except at the edges of open water. These wetland systems are classified vegetatively as Piedmont/Mountain Semipermanent Impoundments.

Table 2. Wetland Characteristics

Site	Cowardin Class[1]	Plant Community[2]	DWQ score[3]	Wetland impact (acres)
AA1b	PFO1A	Piedmont/Mountain Bottomland Forest	75	0.01
AA2b	PFO1A	Piedmont/Mountain Bottomland Forest	34	0.02
AA4b	PFO1C	Piedmont/Mountain Bottomland Forest		0.01
AA5b	PFO1C	Piedmont/Mountain Bottomland Forest	49	0.05
AA6	PFO1C	Piedmont/Mountain Bottomland Forest	21	0.04
AA7	PFO1A	Piedmont/Mountain Bottomland Forest	21	0.04
AA8	PFO1A	Piedmont/Mountain Bottomland Forest	21	0.07
AA9	PFO1A	Piedmont/Mountain Bottomland Forest	46	0.02
AA10a	PFO1C	Piedmont/Mountain Bottomland Forest	39	0.02
AA11a	PSS1C	Scrub/shrub early successional community	68	2.33
AA11b	PFO1A	Piedmont/Mountain Bottomland Forest	68	See Site AA11a for data
AA11c	PFO1C	Piedmont/Mountain Bottomland Forest	68	See Site AA11A for data
AA12	PFO1C	Piedmont/Mountain Bottomland Forest	68	0.01
AA14	PEM2F	Piedmont/Mountain Semipermanent Impoundment	77	0.15
AA16	PSS1F	Scrub/shrub early successional community	52	0.06
			Total	2.83

Site	Cowardin Class[1]	Plant Community[2]	DWQ score[3]	Wetland impact (acres)
AB1	PSS1C	Scrub/shrub early successional community	15	0.12
AB3	PSS1A	Scrub/shrub early successional community	11	0.05
AB5b	PFO1A	Piedmont/Mountain Bottomland Forest	33	0.09
AB5c	PFO1A	Piedmont/Mountain Bottomland Forest	40	0.09
AB6a	PFO1A	Piedmont/Mountain Bottomland Forest	37	0.02
AB7	PUB2h	man-made pond	44	0.03
AB8	PFO1A	Piedmont/Mountain Bottomland Forest	39	0.22
AB9	PSS1A	Scrub/shrub early successional community	11	0.10
AB10	PFO1A	Piedmont/Mountain Bottomland Forest	35	0.47
AB11	PFO1A	Piedmont/Mountain Bottomland Forest	40	0.50
			Total	1.69

Site	Cowardin Class[1]	Plant Community[2]	DWQ score[3]	Wetland impact (acres)
B1	PFO1A	Piedmont/Mountain Bottomland Forest	49	0.21
B2	PFO1A	Piedmont/Mountain Bottomland Forest	35	0.48
B4	PFO1A	Piedmont/Mountain Bottomland Forest	39	1.28
B5	PFO1A	Piedmont/Mountain Bottomland Forest	39	1.25
B6	PFO1A	Piedmont/Mountain Bottomland Forest	39	2.19
B16	PFO1A	Piedmont/Mountain Bottomland Forest	43	0.12
			Total	5.53

Site	Cowardin Class[1]	Plant Community[2]	DWQ score[3]	Wetland impact (acres)
C1	PFO1C	Piedmont/Mountain Bottomland Forest	45	0.08
C2	PFO1C	Piedmont/Mountain Bottomland Forest	65	0.06
C3	PFO1C	Piedmont/Mountain Bottomland Forest	65	2.37
C6	PSS1C	Scrub/shrub early successional community	62	2.18
C7	PFO1C	Piedmont/Mountain Bottomland Forest	24	1.67
C8	PSS1A	Scrub/shrub early successional community	27	1.06
C9	PEM1A	Piedmont/Mountain Semipermanent Impoundment	31	0.03
C10	PFO1/4A	mixed pine/hardwood forest	58	0.06
C11	PFO1C	Piedmont/Mountain Bottomland Forest	34	1.60
C12	PFO1C	Piedmont/Mountain Bottomland Forest	82	0.03
C13	PFO1C	Piedmont/Mountain Bottomland Forest	40	1.19
C14	PFO1A	Piedmont/Mountain Bottomland Forest	61	0.35
C15	PFO1/4C	Piedmont/Mountain Bottomland Forest	23	1.38
C16	PFO1C	Piedmont/Mountain Bottomland Forest	68	0.06
			Total	12.12

[1]PFO1A=Palustrine, forested systems with broad-leaved deciduous vegetation, temporarily flooded
PFO1C=Palustrine, forested systems with broad-leaved deciduous vegetation, seasonally flooded
PSS1A=Palustrine, scrub-shrub systems with broad-leaved deciduous vegetation, temporarily flooded
PSS1C=Palustrine, scrub-shrub systems with broad-leaved deciduous vegetation, seasonally flooded
PSS1F=Palustrine, scrub-shrub systems with broad-leaved deciduous vegetation, semipermanently flooded
PSS1Dx=Palustrine, scrub-shrub systems with broad-leaved deciduous vegetation, seasonally flooded/well-drained, excavated

[2]Where applicable, based on Schafale, M.P. and A.S. Weakley. 1990. Classification of the Natural Communities of North Carolina: Third Approximation. Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment, Health, and Natural Resources. Raleigh, NC.

[3]From NCDWQ Wetland Rating Worksheet. Roughly, a score of 0-33=low-quality wetlands, 33-66=medium-quality wetlands, and >66=high-quality wetlands.

Streams: Approximately 0.53 ac of surface waters will be temporarily impacted. Approximately 2.73 ac of surface waters will be permanently impacted. The project corridor is contained within USGS Hydrologic Units 03020201110030 to 03020201110070, which encompass the Swift Creek drainage from Lake Benson to the Neuse River. A total of 55 stream systems are documented in the project corridor.

Except for Little Creek, White Oak Creek, and the unnamed tributary to Swift Creek at Site AA14, all of the streams impacted by the project corridor have drainage areas (at the project boundary) of less than 1.0 square mile (37 of the 55 systems). Almost all of the stream systems have some component of sand in the substrate. The stream systems range from natural, sinuous streams to channelized ditches. More detailed information is found in Table 3.

Table 3. Stream Characteristics

Site	Stream name	Shown On USGS quad	Shown On Soil Survey	Buffered[1]	USACE score[2]	DWQ score[3]	Stream impact (ft)
AA3a	Ut Swift Ck	Yes	Yes	Yes	44	40.5	26
AA3b	Ut Swift Ck	Yes	Yes	Yes	43	40.5	13
AA4b	Ut Swift Ck	No	Yes	Yes	42	26	128
AA5a	Ut Swift Ck	No	Yes	Yes	43	21.5	236
AA5b	Ut Swift Ck	No	Yes	Yes	53	39	391
AA10a	Ut Swift Ck	No	Yes	Yes	58	21	30
AA10b	Ut Swift Ck	No	Yes	Yes	58	21	10
AA11a	Ut Swift Ck	No	Yes	Yes	53	23.5	437
AA11b	Ut Swift Ck	No	Yes	Yes	55	42.5	417
AA11c	Ut Swift Ck	No	Yes	Yes	48	22.5	407
AA15a	Ut Swift Ck	No	Yes	Yes	24	19.25	85
AA15b	Ut Swift Ck	No	Yes	Yes	41	26.5	98
AA16	Ut Swift Ck	No	Yes	Yes			10
AA17	Ut Swift Ck	No	No	No	28	21	240
AA18a	Ut Swift Ck	Yes	Yes	Yes	34	22.5	355
AA18b	Ut Swift Ck	Yes	Yes	Yes	34	22.5	167
AB2	Ut White Oak Ck	Yes	Yes	Yes	57	21	325
AB5b	Ut White Oak Ck	Yes	Yes	No	49	20	128
AB5c	Ut White Oak Ck	Yes	Yes	Yes	51	21.5	364
AB5d	Ut White Oak Ck	Yes	Yes	Yes	52	36.5	561
AB6a	Ut White Oak Ck	No	No	No	46	26.5	102
AB6b	Ut White Oak Ck	No	No	No	46	26.5	226
AB8	Ut Swift Ck	No	Yes	Yes	43	19.75	118
AB11	Ut Swift Ck	Yes	Yes	Yes	57	28.5	351
B1	Ut Swift Ck	Yes	Yes	Yes	58	15.25	191
B2	Ut Swift Ck	No	Yes	Yes	56	18.75	276
B4	Ut Swift Ck	Yes	Yes	Yes	34	14.75	475
B5	Ut Little Ck	No	Yes	Yes	39	9.75	673
B6	Ut Little Ck	Yes	Yes	Yes	56	27.25	722
B7	Ut Little Ck	Yes	Yes	Yes	45	17.75	443
B8	Ut Little Ck	No	No	No	27	3.25	89
B9	Ut Little Ck	No	Yes	Yes	32	17	6
B12	Ut Little Ck	No	Yes	Yes	39	22	354
B14	Ut Little Ck	No	Yes	Yes	37	21.5	127
B16	Ut Little Ck	Yes	Yes	Yes	48	22	388
C1	Little Ck	Yes	Yes	Yes	70	43	115
C4	Ut Little Ck	No	Yes	Yes	28	20.5	26
C5	Ut Little Ck	No	Yes	Yes	55	28.75	282
C6	Cooper Branch	Yes	Yes	Yes	76	43.5	272
C10	Ut Reedy Branch	No	Yes	Yes	53	37.5	52
C12	Ut Reedy Branch	No	No	Yes	70	23	16
C13	Ut Reedy Branch			Yes			30
C14	Reedy Branch	Yes	Yes	Yes	51	37.5	33
C16	Reedy Branch	No	Yes	Yes	81	21	52
						Total	9,837

[1]Whether the stream system has been determined by the NCDWQ to warrant Neuse River Buffer protection.

[2]USACE Stream Quality Assessment Worksheet version 6/03. A higher score, out of a possible 100, indicates a higher-quality stream.

[3]NCDWQ Stream Classification Form. If score is greater than or equal to 19 points, the stream is at least intermittent. Used to suggest the need for a protected riparian buffer.

Table 3. Riparian Buffer Impacts

SITE	STATION	ALLOWABLE IMPACT		MITIGABLE IMPACT	
		Zone 1 (ft^2)	Zone 2 (ft^2)	Zone 1 (ft^2)	Zone 2 (ft^2)
Section AA					
1a	I1Y1 10+90	431	2,611		
1b	I1Y1 10+90	2,125	1,765		
3a	I1Y1 13+70	3,718	4,049		
3b	I1Y1 13+70	4,112	4,392		
4a	I1Y1 20+90			11,348	8,145
4b	FLYLEREV 29+50			8,830	6,470
5a	LPB 21+90			41,581	32,338
5b	FLYLEREV 28+20			0	11
10a	FLYLWREV 23+20			11,797	9,601
10b	FLYLEREV 24+45			18,156	14,594
11b	FLYLEREV 18+00			46,633	32,446
11c	FLYLEREV 18+40			See 11b for site total	
13	I1Y1 30+80	3,720	5,909		
14	LREV 14+50			18,514	15,334
15a	L 21+10	5,572	4,047		
15b	Y2B 12+70			6,284	8,148
16	L 23+00			27,649	19,749
18a	L 25+80			28,646	18,336
18b	Y2B 16+00			8,818	6,899
19	I1Y1 33+90	2,165	1,922		
Total		21,843	24,695	228,256	172,071

SITE	STATION	ALLOWABLE IMPACT		MITIGABLE IMPACT	
		Zone 1 (ft^2)	Zone 2 (ft^2)	Zone 1 (ft^2)	Zone 2 (ft^2)
Section AB					
2	L 37+10			24,211	15,173
4	L 41+00			18,478	13,016
5c	I1Y1 13+70			58,509	44,230
5d	I1Y1 13+70			See 5c for site total	
8	I1Y1 20+90	7,294	4,831		
11	FLYLEREV 29+50			20,326	13,775
Total		7,294	4,831	121,524	86,194

SITE	STATION	ALLOWABLE IMPACT		MITIGABLE IMPACT	
		Zone 1 (ft^2)	Zone 2 (ft^2)	Zone 1 (ft^2)	Zone 2 (ft^2)
Section B					
1	L 68+60			11,250	12,196
2	L 73+30			14,866	11,954
3	L 74+50-75+80			24,801	19,088
4	L 79+60-82+00			36,511	30,223
5	L 82+30-86+00			37,785	37,688
6	L 92+20			25,889	12,148
7	RPA 4+00	4,845	5,626		
8	RPA 2+40	1,147	2,138		
9	L 102+30			20,306	18,380
10	Y11 REV 14+80			14,886	11,323
11	Y13 REV 9+20			11,071	5,718
12	Y11 REV 24+10-25+60			36,491	12,865
Total		5,992	7,764	233,856	171,583

SITE	STATION	ALLOWABLE IMPACT		MITIGABLE IMPACT	
		Zone 1 (ft^2)	Zone 2 (ft^2)	Zone 1 (ft^2)	Zone 2 (ft^2)
Section C					
1	L2 108+84/110+28			23,368	13,433
4	Y1 11+06/11+35	2,097	861		
5	L2 126+12/126+49			19,889	13,157
6	L2 133+87/134+23			19,451	13,196
9	Y5 20+10/20+30	549	958		
10	RPC 7+68/8+16	5,479	2,099		
12	L2 150+05/150+42	2,712	1,087		
13	L2 150+27/150+68	1,937	850		
14	L2 153+64/155+54	4,801	2,390		
Total		17,575	8,245	62,708	39,786

NCDOT proposes to replace 21,007 square feet of riparian buffers in Zone 1 and 15,516 square feet of riparian buffer in Zone 2 on-site. There are 199,104 square feet of wetlands in Zone 1 and 90,828 square feet of wetlands in Zone 2. Therefore, NCDOT proposes to use the EEP for the remaining 434,414 square feet of riparian buffer impacts in Zone 1 and 366,044 square feet of riparian buffer impacts in Zone 2.

Protected Species

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act. As of January 29, 2003, a total of five federally-protected species are listed for Wake and Johnston Counties (Table 4).

Table 4. Federally-protected species for Wake and Johnston Counties

Scientific Name	Common Name	Status	Biological Conclusion
Haliaeetus leucocephalus	Bald eagle	Threatened (proposed for delisting)	No effect
Picoides borealis	Red-cockaded woodpecker	Endangered	No effect
Alasmidonta heterodon	Dwarf wedge mussel	Endangered	May Affect-Not Likely to Adversely Affect
Elliptio steinstansana	Tar spinymussel	Endangered	May Affect-Not Likely to Adversely Affect
Rhus michauxii	Michaux's sumac	Endangered	No effect

A Biological Conclusion of "No Effect" for the bald eagle was issued in several documents, including the FEIS. This conclusion was based on the fact that there is no suitable habitat present for bald eagle in the project area. The last survey for red-cockaded woodpecker and Michaux's sumac was done in July 2002. Habitat is present for both of these species, but neither species were observed during the surveys. The Natural Heritage Program (NHP) database does not denote any occurrence of red-cockaded woodpecker or Michaux's sumac within 1 mile of the project. Gary Jordan of the U.S. Fish and Wildlife Service (USFWS) concurred with a biological conclusion of "No Effect" for bald eagle, red-cockaded woodpecker, and Michaux's sumac during a phone conversation on October 14, 2004. The last surveys for dwarf wedge mussel and Tar spinymussel were done from the summer of 2002 to the fall of 2003. A Biological Assessment (BA) is currently being drafted by NCDOT for dwarf wedge mussel and Tar spinymussel.

Cultural Resources

Archaeology: The FHWA determined, and the North Carolina State Historic Preservation Office (SHPO) concurred, with the finding that none of the archaeological sites identified within the project area are eligible for listing on the National Register of Historic Places. SHPO stated that it is unlikely that significant archaeological resources will be affected by any of the Build Alternatives in a letter dated July 21, 1993. This letter can be found in the FEIS.

Historic: No resources currently listed on the National Register of Historic Places are found within the project area. Therefore, no impacts to any National Register listed historic resource will occur.

The Battle-Horne-Benson house and the Ransom Penny Farm are eligible for listing on the National Register of Historic Places. The SHPO has concurred that the project will have no effect on either the Battle-Horne-Benson house or the Ransom Penny Farm.

In addition to the Battle-Horne-Benson house and the Ransom Penny Farm, two additional properties, the Watts Store and Residence and the Wayland Poole House, were identified as eligible for listing on the National Register in a letter of concurrence dated December 30, 1993. Because Segment A was dismissed from further study, the Watts Store and Residence and the Wayland Poole House are located outside the area of potential effect and will not be affected by the project. A letter summarizing these conclusions can be found in the FEIS.

FEMA Compliance

There is no FEMA Detailed Flood Insurance Study Involvement with any of the streams on the AA or AB Section. On the B section, Little Creek at station 14+72 -Y11- REV is in a detailed study, but is a "No Rise". On the C section, Little Creek at station 110+20 –L20 is in a detailed study, but there will be no significant increase in water surface elevation.

Wild and Scenic River System

The project will not impact any Designated Wild and Scenic Rivers or any rivers included in the list of study rivers (Public Law 90-542, as amended).

Indirect and Cumulative Impacts

Two studies were completed for this project: an Indirect and Cumulative Effects study and an Indirect and Cumulative Impacts report. Copies of this report are attached. The following offers a summary of each.

Indirect and Cumulative Effects Assessment Summary

This assessment provides an estimate of the indirect effects of the project and the combined or cumulative effects of the project and other past, present, or reasonably foreseeable future development activities. The focus of the assessment is on the project's potential to induce growth and change land use, which could in turn affect natural resources of the study area. Land use changes were predicted for both without the bypass (Scenario 1) and with the bypass (Scenario 2) for the Year 2025. Land uses within the study area were sorted into twelve categories defined by the amount of impervious area and vegetation cover within a tax parcel unit.

The project area community supports regional employment centers of Raleigh, Durham and RTP (Research Triangle Park). Identifying regional commuting patterns helps to establish where future development is likely to occur. Recent history has shown that increased highway access between Johnston County and the regional employment centers has stimulated growth in Johnston County.

To better understand the likely magnitude and probability of project-induced development, a commute study was conducted between the study area and the regional

employment center of RTP. Results of the commute study demonstrate the increased access and substantial timesavings the project will provide study area commuters. This improvement to the existing roadway network will also induce development beyond the current commuteshed.

Due to past development trends and favorable growth potential for the region, the study area would likely experience considerable development regardless of whether or not the project is built. The potential for substantial growth generated by the project would mainly be limited to new interchange catchment areas within the study area. However, locations to the south and east of the study area may also experience development pressure due to increased accessibility to regional employment centers. Project-induced growth is likely to occur in the form of highway-oriented retail and residential development, replacing agricultural and forested/green space areas.

In summary, by the Year 2025 and without the project (Scenario 1), the Study Area is anticipated to be subjected to an increase of 13.5 square miles (14.6%) of development relative to the baseline. By the Year 2025 and with the project (Scenario 2), the Study Area is anticipated to be subjected to an increase of 18.2 square miles (19.7%) of development relative to the baseline (current) condition. As predicted by the Delphi study, only 5.1% additional development was attributable to the Clayton Bypass and induced Bypass-related growth.

Indirect and Cumulative Impact Analysis Summary

Nutrient and sediment analyses were performed for the 59,212-acre (92.5-square mile) Study Area inclusive of watershed boundaries that drain to Swift Creek that are likely to be impacted by Clayton Bypass (R-2552) and Bypass-related development in Wake and Johnston Counties, North Carolina. The analysis relied on future land use predictions both without the bypass (Scenario 1) and with the bypass (Scenario 2) for the Year 2025 provided in the Indirect and Cumulative Effects Assessment document prepared by URS Corporation September 2004. The Annualized Agricultural Non-Point Source (AnnAGNPS) pollutant model was used to predict annual pollutant yields exported from the Study Area for each future scenario. Correction factors for AnnAGNPS output were generated for BMPs and stream generated sediment using Soil and Water Assessment Tool (SWAT) and the Center for Computational Hydroscience and Engineering 1-Dimensional (CCHE1D) models.

Modeling for Scenario 1 predicted increases over Current Condition of 30.86-percent exported TN, 4.97-percent exported TP, and 31.87-percent exported overland sediment.

Modeling for Scenario 2 predicted increases over Current Condition of 37.69 percent exported TN, 5.15-percent exported TP, and 34.50-percent exported overland sediment.

The difference in without bypass and with bypass pollutant yields were 6.83-percent exported TN, 0.18-percent exported TP, and 2.63-percent in exported overland sediment, which suggests that a small increase in pollutant loading is attributable to the Bypass and induced Bypass-related development.

Benefit of Expanded Environmental Sensitive Areas (ESA's)

Supplemental nutrient and sediment analyses were performed for two sub-watersheds, upper Swift Creek and lower Little Creek, proposed to be impacted by the Clayton Bypass (R-2552) in Wake and Johnston Counties. The upper Swift Creek sub-watershed consists of a 24.6 square mile area, while the lower Little Creek sub-watershed consists of a 5.2 square mile area.

The analysis relied on future land use predictions both without the bypass (Future No Bypass) and with the bypass (Future Bypass) for the Year 2025 provided in the Indirect and Cumulative Effects Assessment document prepared by URS Corporation September 2004. Two buffer evaluations, Evaluation A and B, were performed with similar land-use change scenarios in order to isolate pollutant-change trends resulting from expanding the existing protected buffer network associated with designated ESAs (Evaluation A) to a more comprehensive preservation network that extends to the nearly the complete limits of both modeled sub-watersheds (Evaluation B). Evaluation A consisted of complete 50-foot buffer coverage (when identified as being extant in Current Condition) along intermittent and perennial streams throughout each modeled sub-watershed, with 100-foot buffers on perennial streams within existing ESA-designated areas. Evaluation B consisted of complete 50-foot buffer coverage (when identified as being extant in Current Condition) along intermittent streams, and 100-foot buffers on perennial streams throughout the area proposed for ESA expansion.

For the upper Swift Creek sub-watershed, the larger buffers modeled in the Future Bypass Evaluation B are successful at reducing pollutant loading by 15.3% for TN, 13.78% for TP, and 10.87% for overland sediment over the Future Bypass Evaluation A.

For the lower Little Creek sub-watershed, the larger buffers modeled in Future Bypass Evaluation B are successful at reducing pollutant loading by 9.55% for TN, 10.35% for TP, and 8.51% for overland sediment over the Future Bypass Evaluation A.
Results indicate that larger buffers provided by the expanded ESA's do have a direct benefit of reducing overland pollutants in both subwatersheds.

Utilities

Section AA: On Sheet 8 and 9, Progress Energy has an existing aerial facility that will be removed after a new power line has been constructed outside of the control of access fence. The new power line will be located along the left side of FLYLW Rev between Stations 16+00 to 12+60 then crossing to the right side. There is a buffer zone that will be in close proximity to the new pole line, but very little impact is anticipated to the buffers. Any work inside the buffer zone will not go beyond Buffer Zone 2. The width of the easement for the new pole line will be 30 feet wide and any clearing will be by hand, which is allowable.

Section AB: There will be no additional impacts to wetlands, streams, or riparian buffers due to utility relocation work on this section.

Section B: On Sheets 21, 22, 15, 24, and 25, Progress Energy has an aerial power line along existing Ranch Road (SR 1560) that will be removed after a new pole line has been constructed outside the proposed right of way left of Station 11+60 to Station 17+00. A temporary pole line will be installed from Station 17+00 crossing Line –L- at Station 98+00 to left of Station 20+60 Y. The permanent line will be crossing buffer zones outside NCDOT right of way. On Sheet 22, the width of the easement will be 10 meters, and the length will be approximately 35 meters. Clearing method will be non-mechanical, which is allowable.

Section C: On Sheets 13, 14, 15, and 16, Progress Energy has an existing overhead distribution line along US 70 Business that must be relocated. Plans are to relocate this aerial line along the new Exide Road (SR 2564) one foot outside the proposed right of way on Sheets 13, 14, and 15. On Sheet 14 at approximate Station 20+00 Y5 an aerial power line 10 meters wide by 50 meters long will be inside the Neuse buffer area. Clearing method will be non-mechanical, which is allowable.

On Sheet 15, Progress Energy will be installing their new conduit facility from right of Station 22+20 Y5 crossing Ramp A to right of Ramp A at Station 2+00. The wetland area that will be excavated will be approximately 10 meters wide by 120 meters in length (0.3 ac).

Mitigation Options

The Corps of Engineers has adopted, through the Council on Environmental Quality (CEQ), a wetland mitigation policy that embraces the concept of "no net loss of wetlands" and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of the Waters of the United States. Mitigation of wetland and surface water impacts has been defined by the CEQ to include: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts (40 CFR 1508.20). Executive Order 11990 (Protection of Wetlands) and Department of Transportation Order 5660.1A (Preservation of the Nations Wetlands), emphasize protection of the functions and values provided by wetlands. These directives require that new construction in wetlands be avoided as much as possible and that all practicable measures are taken to minimize or mitigate impacts to wetlands.

AVOIDANCE AND MINIMIZATION: The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

R-2552 Section AA

- By July 2003, the service road west of I-40 was aligned to avoid buffered stream impacts.

• Sites AA4 - AA13 (I-40 interchange)

- By May 2001, three redesigns of the I-40 interchange at New Bethel Road (SR 1548) were completed.
- By July 2003, the westbound US 70 to eastbound I-40 movement was added back to the project.

• Site AA10b (Ut to Swift Creek, -FLYLEREV- 24+45 and -LPB- 18+15)

- In August 2001, the eastbound I-40 to eastbound US 70 flyover (-FLYLE-) had been designed to cross under I-40 so that the westbound US 70 to eastbound I-40 flyover (-LPB-) could cross over I-40 in the same place. This would require lowering the Ut to Swift Creek (at Site AA13b) by 16 feet (5 meters) and rebuilding it at the lower grade for a length of 590 feet (180 meters). The regulatory agencies expressed great concern about sediment control from such a large cut area. As this is the closest point to Swift Creek, they felt that NCDOT should look at the least damaging alternatives. If the future Outer Loop were to connect here, -LPB- would also carry the Outer Loop to eastbound I-40 traffic. Any change in the interchange design would affect all flyovers.
- By July 2003, -FLYLE- was changed from under I-40 to over I-40 to avoid undercutting the unnamed tributary to Swift Creek (AA13b). The bridges over I-40 were extended to also bridge the wetland and stream system at AA10b. If the system were not bridged, it was estimated that only a 48 inch (122 centimeter) pipe would be needed to traverse it. The flyover was shifted again to avoid other buffers

and wetlands and to allow the FLYLE loop to be added. These methods moved construction further away from Swift Creek.

- Site AA11b (Ut to Swift Creek, -FLYLW- 17+00)
  - In August 2001, at this stream and adjacent wetlands, plans called for stormwater to be routed to a dry detention basin prior to flowing into the creek.
- Site AA12 (wetland, -RPD- 14+00)
  - By July 2003, a "temporary" ramp was added for the northbound I-40 to eastbound US 70 Bypass (-RPD-) that will keep construction further away from Swift Creek than the previous design. Swift Creek inhabits populations of dwarf wedge mussel. The previous design proposed a ramp closer to Swift Creek. This ramp will have to come out or be redesigned if and when the Outer Loop comes through at this location. (The old ramp alignment would have accommodated the Outer Loop without having to be rebuilt.)
- Sites AA13a and AA13b (Ut to Swift Creek)
  - At I1Y1 31+00, the plans had specified undercutting the stream to go under the ramp; the ramp has now been eliminated and I1Y1 redesigned to avoid impacts to the stream.
- Site AA14 and Ut to Swift Creek (-LREV- 13+80 - 16+00)
  - At a December 9, 1998 field meeting, regulatory agency representatives and NCDOT personnel discussed this high-quality riparian wetland system and associated perennial stream. Suggestions included to minimize fill slope and buffer area impact, to use caution with any stream location, and to evaluate installation of a bridge. It was estimated that a bridge (or two bridges) would cost $6.4 million more than a culvert.
  - By May 2001, the structure at this site was changed from a culvert to dual bridges to reduce wetland impacts. The wetland impact reduction was estimated at 1.79 acres, and the stream impact reduction was estimated at 518 feet. The cost of a culvert (1@ 7.9 feet by 7.9 feet [2.4 meter by 2.4 meter] RCBC with 7 @ 71 inch [1800 millimeter] RCP'S overflow pipes) was estimated to be $512,250, and the bridge cost (dual bridges 1 @ 565.9 feet & 1 @ 500.3 feet) was estimated to be $2,742,600. The cost increase was estimated at $2,230,350. Other improvements to the design included reducing fill slopes to 2:1 wherever possible to reduce wetland impacts and using retention basins wherever possible to reduce peak discharges and minimize bank erosion on tributaries to Swift Creek. These improvements complied with a commitment to reduce impacts on mussels in Swift Creek.
  - In August 2001, at a Hydraulics field meeting, it was decided that no deck drains were to be placed over the stream or its buffer. The Hydraulics Unit was to design storage for water draining into the wetlands from the east. Flow would then be dispersed into the wetlands.
  - By July 2003, the US 70 Bypass alignment had been shifted southward to avoid parallel encroachment and fill into a buffered stream that drains into the Ut to Swift Creek. Based on the alignment and grade now shown on the plans, the bridge lengths over the Ut to Swift Creek are estimated to be 1 @ 558 feet and 1 @ 509 feet.

- Site AA19 (Ut to Swift Creek, -I1Y1- 35+00)
  - A detour on I-40, required by the undercut -FLYLE- (near Site AA10b) would have impacted 525 feet of the tributary. Since the flyover is now being designed to go over I-40, this impact is being avoided.

R-2552 Section AB

- Site AB4 (White Oak Creek - Austin Pond, -L- 39+60 - 42+00)
  - At a December 1998 agency field review, the Austin Pond system was described as a high quality palustrine emergent system. The regulatory agencies urged the use of Best Management Practices, especially for stormwater management, and suggested bridging the entire system. A bridge at least 500 feet in length would be needed.
  - By April 2001, the design had been changed to bridge the Austin Pond system. Dual bridges were planned, increasing the project cost by $2.5 million. Planned bridge lengths were increased from 300 feet to approximately 738 feet and 656 feet. This resulted in a wetland impact reduction of 2.34 acres. Also, fill slopes were increased to 2:1 wherever possible to avoid fill in wetlands.
- Site AB11 (Ut to Swift Creek, east of NC42 interchange, -L- 57+30)
  - At the December 1998 regulatory agency field review, the following suggestions were offered: design all piping to minimize fill in wetlands and evaluate the elimination of ramp D and relocate traffic flow by using a loop in quadrant C (reconfigure interchange to eliminate impacts to Site AB8). The piping at this site has been designed to reduce fill in wetlands. In the last case, Ramp D would have to be built eventually anyway. The comment was made that accommodation of traffic at this location is critical and must be considered when evaluating a reconfiguration. A detention/hazardous spill basin is proposed near Site AB11 to minimize bank erosion on tributaries to Swift Creek.

R-2552 Section B

- Per August 1998 agency meeting comments, the alignment was shifted at approximately -L- 58+00 to -L- 64+00, to the southeast of NC 42, to avoid a parallel creek and pond, and to minimize wetland takings. This section of the alignment is at the eastern end of Section B.
- Site B1 (Ut to Swift Creek, -L- 68+60)
  - A December 1998 agency field review was conducted. No change was suggested for this area because the alignment is between two subdivisions (residential impacts would be substantial).
- Site B2 (Ut to Swift Creek, -L- 73+20)
  - By July 2003, the alignment was changed to reduce impacts to the wetlands adjacent to the Ut to Swift Creek.
- Site B5 (Ut to Little Creek, -L- 79+80 - 81+70)
  - At the same December 1998 field review, it was concluded that no opportunities for adjustments exist at this area because of residential development.
- Site B6 (Ut to Little Creek, -L- 82+70 - 85+50)
  - By July 2003, a two barrel box culvert was proposed.
- Site B13 (Ut to Little Creek, -Y11REV- 14+70)
  - By July 2003, a bridge was planned to span the stream and most of the buffer area.

R-2552 Section C

- Site C1 (Little Creek crossing, -L2- 108+90 - 111+00)
  - A December 1998 agency field review resulted in the suggestion to evaluate moving the alignment to the southern edge of the corridor, or provide a spread median and move the eastbound lanes to north.
  - By April 2001, alternatives investigated at the Little Creek crossing included using the present alignment or using a north or south shift. A realignment of Little Creek with the current roadway alignment was studied. If bridged, dual bridges would be required over Little Creek. Later that month, the proposed median width of 21 meters was changed to a spread median, and the roadway was shifted. The spread median will be composed of grass and will be 80 meters wide at the widest point, which is at a meander in Little Creek. The transition from the spread median back to the 21-meter median was shortened to reduce impacts to the wetlands. The length of the bridges was thereby reduced, and the necessity for stream relocation and mitigation was also reduced.
- Site C3 (wetland, -L2- 110+90 - 120+40)
  - At the December 1998 agency field review, it was concluded that this site was disturbed (cut-over) and that opportunities to shift the alignment were minimal.
  - By July 2003, a spread median was planned for the Little Creek crossing (C1). Subsequently, an alignment adjustment was designed to transition the spread median down more quickly and reduce the wetland impact to Wetland C3, east of SR 1571(Peele Road).
- Site C6 (crossing of Cooper Branch, -L2- 133+60 - 135+40)
  - At the December 1998 agency field review, regulatory agencies suggested an evaluation of the relocation of ramp B to the south to minimize impacts of the crossing of Cooper Branch. Moving of the ramp gore to the east was also suggested. The ramp has been shortened and the ramp gore has been moved to the east to minimize wetland impacts.
- Site C11 (wetland, -RAMPC- 8+00)
  - By July 2003, the grade along the proposed mainline and proposed Ramp C was raised to avoid cuts in expanded wetland areas. The Cole Road (SR 1573) realignment that originally ran parallel to Ramp C and tied into existing US 70 was dead-ended and cul-de-saced prior to the beginning of Ramp C to reduce wetland impacts. Jones Road was extended to the existing US 70 to replace the access lost from dead-ending Cole Road. This extension was eliminated when wetlands were found in this area.
- Site C12 (Ut to Reedy Branch, -Y4- 26+40 - -L2- 150+40)
  - In April 2001, the Ramp "B" juncture with the US 70 bypass alignment was revised to eliminate a series of reverse curves, and a tangent alignment was substituted. This resulted in a reduction of 0.4 acre of right of way and less impact to the stream crossing.
- Site C13 (wetland, -L2- 150+60)
  - At the December 1998 agency field review, regulatory agencies suggested evaluating relocation of the service road on the Williamson property to the east instead of impacting the wetland system. This would involve turning the end of the service road away from the site. The service road has been relocated to the east, avoiding impacts to the wetlands.

- By July 2003, Ramp B at the existing US 70 interchange was reduced in length to limit the impacts to the wetland pocket at the culvert.

• Site C15 (wetland, -Y6- 10+70 - 12+50)

- By July 2003, the proposed Gordon Road realignment was shifted to the south to minimize wetland impacts and tie into the existing SR 1913 sooner.

COMPENSATION: The primary emphasis of the compensatory mitigation is to reestablish a condition that would have existed if the project were not built. As previously stated, mitigation is limited to reasonable expenditures and practicable considerations related to highway operation. Mitigation is generally accomplished through a combination of methods designed to replace wetland functions and values lost as a result of construction of the project. These methods consist of creation of new wetlands from uplands, borrow pits, and other non-wetland areas; restoration of wetlands; and enhancement of existing wetlands. Where such options may not be available, or when existing wetlands and wetland-surface water complexes are considered to be important resources worthy of preservation, consideration is given to preservation as at least one component of a compensatory mitigation proposal.

FHWA STEP DOWN COMPLIANCE: All compensatory mitigation must be in compliance with 23 CFR Part 777.9, "Mitigation of Impacts" that describes the actions that should be followed to qualify for Federal-aid highway funding. This process is known as the FHWA "Step Down" procedures:

1. Consideration must be given to mitigation within the right-of-way and should include the enhancement of existing wetlands and the creation of new wetlands in the highway median, borrow pit areas, interchange areas and along the roadside.
2. Where mitigation within the right-of-way does not fully offset wetland losses, compensatory mitigation may be conducted outside the right-of-way including enhancement, creation, and preservation.

Based upon the agreements stipulated in the "Memorandum of Agreement Among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U.S. Army Corps of Engineers, Wilmington District" (MOA), it is understood that the North Carolina Department of Environment and Natural Resources Ecosystem Enhancement Program (EEP) will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for NCDOT projects that are listed in Exhibit 1 of the subject MOA during the EEP transition period which ends on June 30, 2005.

Since R-2552AA, AB, B, and C are listed in Exhibit 1, the necessary compensatory mitigation to offset unavoidable impacts to waters that are jurisdictional under the federal Clean Water Act will be provided by the EEP. The offsetting mitigation will derive from an inventory of assets already in existence within the same 8-digit cataloguing unit. The Department has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. The remaining, unavoidable impacts to 22.47 acres of jurisdictional wetlands, 9,437 feet of

jurisdictional streams, and 800,458 square feet of riparian buffers will be offset by compensatory mitigation provided by the EEP program.

Regulatory Approvals

Application is hereby made for a Section 404 Individual Permit as required for the above-mentioned activities. By copy of this letter, we are also requesting a 401 Water Quality Certification and a Neuse Buffer Certification. In compliance with Section 143-215.3D(e) of the NCAC we will provide $475 to act as payment for processing the Section 401 permit application as previously noted in this application (see Subject line). Seven copies of the application are being provided to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, for their review.

Thank you for your assistance with this project. If you have any questions or need any additional information about this project, please contact Mr. Matt Haney at (919) 715-1428.

Sincerely,

Gregory J. Thorpe, Ph.D., Environmental Management Director,
Project Development and Environmental Analysis Branch

GJT/mmh

Enclosure

w/attachment
Mr. John Hennessy, NCDWQ (7 copies)
Mr. Travis Wilson, NCWRC
Ms. Becky Fox, USEPA – Whittier, NC
Mr. Ronald Mikulak, USEPA – Atlanta, GA
Mr. Gary Jordan, USFWS
Mr. Ron Sechler, NMFS
Mr. Michael Street, NCDMF
Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Jon Nance, P.E., Division 5 Engineer
Mr. Jim Trogdon, P.E., Division 4 Engineer
Mr. Jamie Shern, Division 4 DEO
Mr. Chris Murray, Division 5 DEO

w/o attachment
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Mark Staley, Roadside Environmental
Mr. David Franklin, USACE, Wilmington
Ms. Kristina Solberg, P.E., PDEA
Ms. Beth Harmon, EEP

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT (33 CFR 325)

OMB APPROVAL NO. 0710-003
Expires December 31, 2004

Public reporting burden for this collection of information is estimated to average 10 hours per response, although the majority of applications should require 5 hours or less. This includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authority: Rivers and Harbors Act, Section 10, 33 USC 403: Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research and Sanctuaries Act, 33 USC 1413, Section 103. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
North Carolina Department of Transportation Project Development & Environmental Analysis	
6. APPLICANT'S ADDRESS	**9. AGENT'S ADDRESS**
1548 Mail Service Center Raleigh, NC 27699-1548	
7. APPLICANT'S PHONE NOs. W/AREA CODE	**10. AGENT'S PHONE NOs. W/AREA CODE**
a. Residence b. Business 919-733-3141	a. Residence b. Business

11. STATEMENT OF AUTHORIZATION

I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

_____ APPLICANT'S SIGNATURE

_____ DATE

NAME, LOCATION, AND DESCRIPTION OR PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions
US 70 (Clayton Bypass) from I-40 in Wake County to US 70 Business in Johnston County

13. NAME OF WATERBODY, IF KNOWN (if applicable)
White Oak Creek, Little Creek, Cooper Branch, Reedy Branch

14. PROJECT STREET ADDRESS (if applicable)

15. LOCATION OF PROJECT

Wake/Johnston COUNTY — NC STATE

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) **Section, Township, Range, Lat/Lon, and/or Accessors's Parcel Number, for example.**

See cover letter

17. DIRECTIONS TO THE SITE
See vicinity map associated with permit drawings

18. Nature of Activity (Description of project, include all features)

Construction of US 70 (Clayton Bypass) on new location from I-40 in Wake County to US 70 Business in Johnston County. The project is 9.5 mi in length. A four-lane divided facility with a 70 ft median is proposed. The proposed right of way width for the project is 300 ft.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

To construct a highway that will serve the growing transportation needs of Wake and Johnston Counties and also provide an important connection in the North Carolina Intrastate System.

USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Roadway fill, pipe/culvert construction

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards

Roadway fill

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Wetland impact: 13.17 ac riverine, 9 ac non-riverine
Stream impact: 9,840 ft
Riparian buffer impact: 1,214,217 square ft

23. Is Any Portion of the Work Already Complete? Yes __ No _x__ IF YES, DESCRIBE THE COMPLETED WORK

24. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (If more than can be entered here, please attach a supplemental list).

See listing of property owners associated with permit drawings

25. List of Other Certifications or Approvals/Denials Received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE
[signature]	10/22/09		

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

STORMWATER MANAGEMENT PLAN

R-2552AA and R-2552AB, State Project: 34459.1.1 Date:10/1/04
Wake and Johnston Counties
Hydraulics Project Manager: Andrew Nottingham, PE

ROADWAY DESCRIPTION

The two projects involve the construction of US 70 Clayton Bypass on new location from I-40 in Wake County to east of NC 42 in Johnston County. The proposed typical section is a four lane divided highway with grass shoulders and ditches and a 70-ft wide grass median. There are two major interchanges, one at I-40 and one at NC 42. The R-2552AB project ties into project R-2552B east of NC 42.

ENVIRONMENTAL DESCRIPTION

The projects are located in the Neuse River Basin. The Neuse River Buffer Rules will apply. All of the streams on the projects are in the Swift Creek Watershed, which has populations of the endangered Dwarf Wedge Mussel. There are 31 stream crossings on these projects, which are all classified as Class C NSW. There are two bridge crossings of streams on these projects. One crosses an Unnamed Tributary to Swift Creek and the other crosses White Oak Creek at the upper reaches of Austin Pond. There are two Reinforced Concrete Box Culvert (RCBC) crossings on these projects. One crosses an Unnamed Tributary to White Oak Creek and the other crosses an Unnamed Tributary to Swift Creek. Approximately 5816 ft. of existing stream will be impacted (of which 600 ft. is temporary impact) due to the projects. Two sites will require stream relocations (neither site will be used for on site stream mitigation). 24 wetland sites will be impacted. Approximately 4.52 acres of wetlands will be impacted due to this project. Approximately 630,076 square feet of Neuse River Buffer will be impacted by these projects. The stream, wetland and buffer impacts for both projects are summarized in the respective permit drawings for each project.

BEST MANAGEMENT PRACTICES AND MAJOR STRUCTURES

Best Management Practices (BMPs) and measures used on the projects are an attempt to reduce the stormwater impacts to the receiving streams due to erosion and runoff. The primary BMP is the use of grassed roadway ditches and shoulders, as opposed to a curb and gutter roadway system. Grassed Swales were used where level spreaders were not feasible to be used. Level spreaders were used where they were feasible to be used. Also enough volume was added to the dry detention basins to accommodate the storage volume required for Hazardous Spill Basin (HSB) design and sluice gates were added. This was done as a conservation measure to protect the endangered Dwarf Wedge Mussel. HSB's were used in select areas in very close proximity to Swift Creek. Rip rapped ditches were used where warranted to control erosion. Ditches were ended in flat floodplain areas where possible to allow dispersal and infiltration. Preformed scour holes were used to attenuate and disperse flow. The inverts of all new culverts on jurisdictional streams or wetlands will be buried 20% of the pipe diameter up to 1 ft. deep. No bridge deck drains will be used directly over surface waters.

Stream Relocations

Station 25+20 to 25+70 LREV left side. Stream relocation will not be consider natural stream design (very small drainage area and requires deep cut).

Station 50 +25 –L- left side. Stream relocation between –L- and Ramp B. On site natural stream design will not be pursued due to short length of stream. Stream will be relocated using natural stream design methods.

Bridges

Station 14+26 –LREV- West Bound Lane 183 meter (600 feet) long bridge and Station 14+50 –LREV- East Bound Lane 183 meter (600 feet) long Bridge. Bridges span wetlands and buffers of Tributary to Swift Creek.

Station 40+74 –L- West Bound Lane 254 meter (833 feet) long bridge and Station 40+92.5 –L- East Bound Lane 229 meter (751 feet) long bridge. Bridges span wetlands, buffers and upper portion of Austin Pond (White Oak Creek).

Also bridges over I-40 on –LPB- (+/- Station 18+20) and –FLYLEREV- (+/- Station 24+40) have been extended approximately 110 meters and 169 meters respectively to the west in order to span wetlands and buffers associated with an Unnamed Tributary to Swift Creek.

Culverts

Station 37+11 –L- Unnamed Tributary to White Oak Creek. Proposed 2 @ 9'x7' RCBC with low flow sill and baffles. Floodplain bench will be constructed to maintain normal low flow at entrance and outlet.

Station 57+17 –L- Unnamed Tributary to Swift Creek. 2 @ 6'x8' RCBC with low flow sill. Floodplain bench will be constructed to maintain normal low flow at entrance and outlet.

BMP's

PROJECT R-2552AA

Sheet 4

Stream crossing at Station 10+88 I1Y1 (I-40). Pipe storm drainage back away from stream and outlet into a preformed scour hole (PSH) left of station 11+75 I1Y1.

Station 11+00 I1Y1 right proposed 15" pipe outlets through the buffer. Roadway ditch used as grass swale to treat stormwater.

Station 12+13 I1Y1 existing 18" cross pipe. Grassed roadway ditch drains to pipe on right side.

Station 12+69 I1Y1. Outlet storm drainage into PSH on left side away from existing stream at station 13+70 I1Y1.

Station 13+34 I1Y1. Outlet storm drainage into PSH on right side away from existing stream at station 13+70 I1Y1.

Sheet 5

Station 13+70 I1Y1 existing 66" cross pipe. Pipe will have to be extended on ends.

Station 15+20 I1Y1. Roadway ditches used as grass swale to treat stormwater.

Station 14+50 I1Y1 right proposed 24" pipe outlet into proposed rip rap ditch. Roadway ditches used as grass swales to treat the roadway drainage.

Sheet 6

Station 17+20 I1Y1 left proposed 24" pipe outlets into existing ditch outlet. Grassed roadway ditches drain to pipe outlet.

Station 21+00 I1Y1 right side. Stream begins at outlet of existing 24" pipe. Roadway ditches used as grass swales to treat the roadway drainage prior to discharging into stream. Existing 30" pipe located just downstream of this outlet under existing gravel road will be removed and new channel constructed.

Station 29+80 FLYLEREV (east bound I-40 ramp coming off of I-40 going towards Smithfield). Storm drainage collected by Drop inlets and piped directly to 36" cross pipe to minimize ditches through buffer areas. Roadside ditches used as grass swales to treat stormwater.

Station 23+50 I1Y1 right side. Stream begins at outlet of existing 30" pipe. Existing 30" pipe will be extended under Loop B (LPB) and outlet right of Station 23+60 LPB (inside the loop). The stream flows inside LPB for about 125 feet then is piped under LPB and FLYLEREV and outlets left of Station 27+80 FLYLEREV. Roadway ditches used as grassed swales.

Station 28+60 FLYLEREV right side. Grass swales used to treat stormwater prior to entering 18" pipe.

Station 10+60 –Y2- right side. Grassed roadway ditches outlet to existing ditch.

Station 10+90 –Y2- right side. Bridge deck drainage outlets into grass swale.

Station 12+13 –Y2- right side. Bridge deck drainage outlets into grassed berm ditch.

Station 12+37 –Y2- right side. Grassed roadway ditches outlet to existing ditch.

Station 10+61 –YREV- right side. Grassed swale used to treat stormwater.

Sheet 6A and 6B

Drainage along -YREV- conveyed by grassed roadway ditches.

Sheet 7

Station 27+37 FLYLEREV left side 24" pipe outlet. Stormwater treated by roadway ditches used as grass swales.

Station 26+23 FLYLEREV left side 18" pipe outlet to existing valley area. Stormwater treated by roadway ditches used as grass swales.

Station 25+54 FLYLEREV left side. Outlet storm drainage into PSH.

Station 25+60 I1Y1 right side. 15" pipe outlet. Stormwater treated by roadway ditches used as grass swales.

Station 18+90 LPB right side. 15" pipe outlet to natural ground away from stream.

Station 26+75 I1Y1 right side. Stormwater treated by roadway ditches used as grass swales.

Station 26+45 I1Y1 left side. Storm drainage outlets through rock check dam level spreader. Stormwater treated by roadside ditches used as grass swales.

Station 26+80 I1Y1 left side. Grass swale drains to existing ditch through buffer.

Station 27+10 I1Y1 right side. 15" pipe outlets to grass swale then drains to PSH.

Station 21+97 FLYLEREV right side. 15" pipe outlets to roadway ditch used as grass swale.

Station 16+43 –LPB- right side. 15" pipe outlets to PSH.

Station 16+00 –LPB- right side. 15" pipe outlets to grass swale.

Sheet 8

Station 20+52 FLYLEREV left side. 18" pipe outlets to PSH. Roadway ditches used as grass swales also treat Stormwater at this outlet.

Station 20+58 FLYLEREV left side. 18" pipe outlets to PSH. Roadway ditches used as grass swales also treat Stormwater at this outlet.

Station 19+40 FLYLEREV left side. 30" pipe outlets into PSH (not being used as level spreader). This drainage eventually flows to HSB at station 13+90 RPD left side. Grassed roadway ditches help treat stormwater.

Station 13+04 RPD right side. 15" pipe outlets into grass swale.

Station 12+70 RPD right side. Open throat catch basin used in gore area. Top elevation will be raised up to provide storage. Runoff to this area is treated by flow across flat roadway fill slopes.

Station 17+28 to station 18+90 FLYLWREV right side. Rock toe protection used in lieu of ditch to avoid draining the wetland area. Toe protection will extend right up to the 60" cross pipe at station 17+60 FLYLWREV.

Station 17+28 FLYLEREV left side. 18" pipe outlets to PSH.

Station 17+35 FLYLEREV left side. 18" pipe outlets to PSH.

Sheet 9

Station 12+00 LREV right side. Dry detention basin with level spreader used to treat stormwater. Extra volume and sluice gates will be added to basin to accommodate HSB design. Grassed roadside ditches also treat stormwater prior to entering basin.

Sheet 10

Station 13+24 LREV left side. 15" pipe outlets into PSH

Station 13+40 TO 15+40 LREV. Temporary work bridge will be used in the wetland areas to construct the two bridges over the tributary to Swift Creek. The temporary work bridge will be located between the two bridges and depending on the type of foundation used may require that additional work bridges be used underneath the two bridges. No deck drains will be used on the two bridges.

Station 16+00 LREV right side. Dry detention basin with level spreader used to treat stormwater. Extra volume and sluice gates will be added to basin to accommodate HSB design. Grassed roadside ditches also treat stormwater prior to entering basin.

Sheet 11

Station 20+75 LREV right side. 15" pipe outlets into PSH.

Station 12+80 Y2B left and right sides. Roadside ditches used as grass swales to treat stormwater.

Station 21+20 to 22+20 LREV left side. Grass swale used to treat stormwater.

Station 23+00 LREV right side. Dry detention basin with level spreader used to treat stormwater. Extra volume and sluice gates will be added to basin to accommodate HSB design.

Station 15+20 to 15+80 Y2B left side. Grass swale used to treat stormwater.

Station 16+60 Y2B left and right sides. Grass swale used to treat stormwater.

Station 25+80 LREV right side. Dry detention basin with level spreader used to treat stormwater. Extra volume and sluice gates will be added to basin to accommodate HSB design.

Sheet 12

Station 13+22 Y4 (Cornwallis Rd.). Extend existing 18" cross pipe to existing outlet ditch on right side. Drainage conveyed by grassed roadway ditches.

Station 14+00 Y4. Outlet 18" pipe to grass swale on the right side.

Sheet 14

Station 30+40 I1Y1 right side. 15" pipe outlets into hazardous spill basin. Stormwater treated by roadway ditches used as grass swales.

Station 31+05 I1Y1 right side. 15" pipe outlets into level spreader?

Station 33+35 I1Y1 left side. Storm drainage outlets into hazardous spill basin. Roadway ditches used as grass swales to treat stormwater.

Station 13+90 RPD left side. Hazardous spill basin used at outlet of 36" pipe.

Station 34+45 I1Y1 left side. 18" pipe outlets to level spreader. Grassed roadway ditches also treat stormwater.

Sheet 15

Station 39+00 I1Y1 right side. 30" pipe outlets into existing ditch then spreads out into Swift Creek floodplain. Grassed roadway ditches treat stormwater.

Station 39+60 to 41+20 I1Y1 left side. Grass swale treats roadway runoff.

PROJECT R-2552AB

Sheet 5

Station 31+40 –L- left side. 30" pipe outlets on to Class I Rip Rap energy dissipator pad. Roadside ditches used as grass swales help to treat the stormwater.

Sheet 6

Station 33+71 –L- left side. 24" pipe outlets into a PSH (not being used as level spreader). Grassed roadway ditches help to treat the stormwater.

Sheet 7

Station 37+11 –L-. Proposed 2 @ 9'x7' RCBC with low flow sill and baffles. Floodplain bench will be constructed to maintain normal low flow at entrance and outlet.

Station 37+60 –L- to 38+40 –L- right side. Multiple 18" pipe outlets into PSH's into flat floodplain area. Grassed roadway ditches help to treat the stormwater.

Sheet 8

Station 39+40 to 42+00 –L-. Temporary work bridge will be used in the wetland areas and surface water areas to construct the two bridges over White Oak Creek (Austin Pond). The temporary work bridge will be located between the two bridges and depending on the type of foundation used may require that additional work bridges be used underneath the two bridges. The West Bound lane bridge will require a drainage system. No drainage will discharge beneath the two bridges.

Station 42+00 –L- left side. Dry detention basin with level spreader used to treat stormwater. Extra volume and sluice gates will be added to basin to accommodate HSB design. Grassed roadway ditches help to treat the stormwater.

Sheet 9

Station 45+60 -L- right side. Dry detention basin with level spreader used to treat stormwater. Extra volume and sluice gates will be added to basin to accommodate HSB design. Roadside ditches used as grass swales also treat the Stormwater.

Sheet 11

Station 12+80 RP-B- right side. Grass lined roadside ditches with rock check dams used to help treat the stormwater.

Station 13+00 RP-B- left side. Grass lined roadside ditches with rock check dams used to help treat the stormwater.

Station 51+20 –L- left side. Roadside ditch used as grass swale treats the stormwater.

Station 13+00 RP-C- right side. Grass swale with rock check dams treats the stormwater.

Station 19+10 -Y2- right side storm drainage outleted to overland flow

Station 53+80 –L- right side. Stormwater outlets to level spreader.

Station 18+80 –Y2DET- left side. Pipe outlets into PSH.

Station 19+35 –Y2DET- left side. Pipe outlets into PSH.

Station 13+80 –RP-D right side. Grass swale and PSH used.

Station 12+50 –RP-D left side. Pipe outlets into PSH.

Station 15+15-RP-D right side. Pipe outlets into PSH.

Sheet 12

Station 11+40 –RP-A right side. Dry detention basin with level spreader used to treat stormwater. Extra volume and sluice gates will be added to basin to accommodate HSB design. 30" outlet pipe will be outlet directly into 2 @ 6'x8' RCBC at station 57+17 –L- to avoid disturbing wetland and buffer areas.

Station 57+17 –L-. 2 @ 6'x8' RCBC with low flow sill. DOT will show floodplain bench at the inlet and outlet of the culvert.

Station 56+20 –L- right side. Storm drainage outlets into PSH.

Station 56+80 –L- right side. Storm drainage outlets into PSH.

Sheet 14

Station 15+98 –Y2- left side. Storm drainage outlets into existing ditch outlet. Grassed roadway ditches used to convey stormwater.

Drainage along Service RD-B- conveyed by grass roadway ditches.

Sheet 15

Station 20+59 –Y2- left side. Pipe outlets to overland flow.

Station 11+75 Service RD-D- right side. Grass swale used.

STORMWATER MANAGEMENT PLAN

September 15, 2004

T.I.P. No.: R-2552B (US 70 Clayton Bypass)
State Project: 8.T311002
Johnston County, NC
Hydraulic Project Engineers: Dan Robinson, P.E. and Jason Lawing, E.I.T. (Kimley-Horn and Associates)
NCDOT Hydraulics Project Engineer: Galen Cail, P.E.

Project Description:

This roadway project is a portion of the US-70 Clayton Bypass, a 4-lane divided facility on new location. The R-2552B portion is from East of NC 42 to East of SR 1560 (Ranch Road) and is 5.053 KM (3.14 Mi.) long. It involves the design of a new interchange at US-70 and SR 1560 (Ranch Road). This proposed interchange required the realignment of Ranch Road (SR 1560) for 1.45 KM (0.9 Mi.). Roadway improvements and grade separations were also proposed for SR 1554 (Corbett Rd.) and SR 1555 (Barber Mill Rd.) for .53 KM (0.33 Mi.) and 0.11 KM (0.68 Mi.) respectively.

The project mainline will have a typical section that predominately consists of a 21 M (69 ft) median of which 18.6 M (61 ft) is grassed lined. The entire length of the bypass will have grass cut ditches, except areas where shoulder berm gutter will be necessary to control sheet flow from eroding fill slopes. Drainage will be facilitated by bridges, box culverts, cross pipes, storm sewer systems, lateral ditches, and grassed lined swales.

The surrounding area is predominately agricultural with rapid developing residential subdivisions.

Environmental Description:

The project is located in the Neuse River Basin. All streams draining from this project are tributaries to Swift Creek which is a tributary to the Neuse River. As such, they are regulated under the Neuse River Riparian Buffer Rules (15A NCAC 2B.0233). These rules require a 50 foot buffer adjacent to jurisdictional streams and water bodies. Concentrated runoff from new ditches and manmade conveyances must have diffused flow or non-erosive velocities before entering the riparian buffer.

Little Creek is the only name stream crossed by Project R-2552B. All the other stream crossings are unnamed tributaries to Little Creek or Swift Creek. All these streams are classified as C NSW waterways. Class C uses are defined as "aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture". Nutrient Sensitive (NSW) are those that require "limitations on nutrient inputs".

Best Management Practices:

The primary goal of the Best Management Practices (BMP's) is to prevent degradation of the states surface waters by the location, construction, and operation of the highway system. BMP's are activities, practices and procedures taken to prevent or reduce stormwater pollution. The BMP's and measures that will be taken on this project to reduce stormwater impacts include:

- Level Spreaders
- Pre-formed scour holes
- Energy dissipater basins
- Grass swales with maximum side slopes of 3:1
- Spanning one stream buffer with a bridge
- Burying cross drainage structures below the stream bed by approximately 20% of the structure depth, up to one foot depth, in order to minimize impacts to aquatic life
- Use of 2:1 fill slopes in wetland areas to reduce wetland impacts
- Use of 1.5:1 fill slopes with [illegible] to protect stream impacts from station 84+40 to 85+40 –L- RT
- Elimination of riprap in stream beds at cross pipe outlets (riprap specified on stream banks only)
- All drainage inlets in grass ditches meet the 100' of grass swale per 1.0 acre of drainage criteria
- All proposed ditches have been designed to allow the 2 yr storm velocity to be at or less than 2 feet/second.

In general, all storm drainage will be diffused and designed for a non-erosive velocity before entering a buffer zone or wetland, unless otherwise noted.

Major Structures:

There are four box culverts and one bridge. The following summarizes the structures and their locations.

Culvert #1
Station +/- 84+17.5 –L-
The culvert conveys an unnamed tributary to Little Creek. The required size is 1 @ 3.0m x 2.13m. The box culvert will be buried 0.3m below the existing streambed and will contain low flow baffles to promote a sinuous low flow channel through the culvert. A natural Rosgen stream design feeds the upstream (North) entrance of this culvert. The outlet protection for this box culvert will contain 1 – rock cross vein, 2 – rock J hooks, and 1- boulder wall for bank protection. A 600mm stormdrain pipe also ties into the Southwest side of the box culvert at station +/- 84+40 -L- Rt.

Culvert #2
Station +/- 92+23.5 –L-
The culvert conveys an unnamed tributary to Little Creek. The required size is 1 @ 3.0m x 2.13m. The box culvert will be buried 0.3m below the existing streambed. The outlet protection for this box culvert will contain 1 – rock cross vein and class 1 riprap on the channel banks. A 600mm stormdrain pipe also ties into the Southwest side of the box culvert at station +/- 92+23.5 -L- Rt.

Culvert #3
Station +/- 24+48.77 –Y11- REV
The culvert conveys an unnamed tributary to Little Creek. The required size is 1 @ 3.0m x 2.7m. The box culvert will be buried 0.3m below the existing streambed. The outlet protection for this box culvert will contain 1 – rock cross vein and class 1 riprap on the channel banks.

Culvert #4
Station +/- 25+01.77 –Y11- REV
The culvert conveys an unnamed tributary to Little Creek. The required size is 1 @ 2.4m x 2.4m. The box culvert will be buried 0.3m below the existing streambed. The outlet of this culvert requires a new channel be constructed to tie into the natural channel 19.2 m downstream. This outlet protection for this box culvert will contain 1 – rock cross vein and class 1 riprap on the channel banks.

Bridge
Station +/- 14+72 –Y11- REV
The bridge will span Little Creek. No bents are proposed in the channel and the entire buffer zone will be spanned. Zone 2 on the South end of the bridge contains two pre-formed scour holes that dissipate the outlet velocities for two stormdrain pipe systems. The discharge contained in these stormdrain systems has been treated in grass swales prior to entering the system.

Wetland/Buffer Site 1
This unnamed tributary to Swift Creek borders a wetland and is subject to the buffer rules. The proposed drainage structure is a 1650mm RCP to be buried 0.3m below the stream bed. Level spreaders in series are proposed in the Southwest quadrant. Median and roadside cut ditch drainage is treated by use of grass swales prior to entering the stormwater system and then outlets in to the aforementioned level spreaders. Due to the existing topography and the close proximity of the stormdrain outfall, a portion of the second level spreader will be located in buffer zone 2.

Wetland/Buffer Site 2
This unnamed tributary to Swift Creek borders a wetland and is subject to the buffer rules. The proposed drainage structure is a 1350mm RCP to be buried 0.3m below the stream bed. Storm drainage collected in the shoulder-berm gutter on the Southeast side of the site outlets into a pre-formed scour hole prior to the buffer.

Wetland/Buffer Site 3
This unnamed tributary to Swift Creek borders a wetland and is subject to the buffer rules. This stream becomes a buffered stream at the outlet of an existing pond at station 75+70 –L- Lt. The proposed drainage structure is a 1500mm RCP to be buried 0.3m below the stream bed. Storm drainage collected in the shoulder-berm gutter and the median on the Southwest and Northeast sides of the site outlet into a pre-formed scour holes prior to the buffer. Grass swales treat the median drainage prior to entering the system. A riprap lined lateral base ditch carrying offsite surface water drains into the Southeast quadrant of this site. The flow in the ditch is reduced to a non-erosive velocity by way of an energy dissipater basin prior the existing wetland. The wetland then provides supplemental treatment to the offsite water. The Northwest quadrant of this site contains toe protection adjacent to the fill slope through the buffer zones to prevent erosion from offsite drainage.

Wetland/Buffer Site 4
This unnamed tributary to Little Creek borders a wetland and is subject to the buffer rules. The existing stream crosses the proposed roadway with an undesirable skew angle for pipe placement. Therefore, a proposed channel relocation (lateral base ditch) was designed on the South side of the alignment feeding a proposed 1050 mm cross pipe. This channel was field evaluated by Eric Alsmeyer (USACE) for a Rosgen Stream design, but it was determined to intermittent and not be worthy of restoration. Toe protection riprap lines the fill slope just to the East of the proposed pipe entrance to prevent erosion. Storm drainage collected in the shoulder-berm gutter and the median on the Northwest quadrant outlet into a pre-formed scour holes prior to the buffer. Grass swales treat the median drainage prior to entering the system. The Northwest quadrant of this site also contains toe protection adjacent to the fill slope located downstream of the pre-formed scour hole and through the buffer zones to prevent erosion.

Wetland/Buffer Site 5
This unnamed tributary to Little Creek borders a wetland and is subject to the buffer rules. The existing jurisdictional stream crosses the proposed roadway with an undesirable skew angle for pipe placement. Therefore, a proposed Rosgen natural stream design was proposed to from station 82+77 to 83+77 –L- lt. This natural stream design feeds the proposed reinforced box culvert # 1 (1 @ 3.0m x 2.13m as described above). Newly established buffers bordering the natural stream design will provide buffer credit. A riprap lined lateral V ditch carrying offsite surface water drains into a berm drain outlet structure the Southwest quadrant of this site. The water captured in the BDO is pipe directly into the side of the RCBC thereby avoiding ditching through the buffer. Storm drainage collected in the shoulder-berm gutter and the median are piped downgrade of the site to station 85+92 and outlet into a grass lined lateral base ditch that has sufficient length to treat the water from the shoulder berm gutter structures. Grass swales treat the median drainage prior to entering the system. The grass lined lateral base ditch eventually flows West into an energy dissipater basin prior to entering the existing wetland. This little wetland pocket will provide supplemental treatment prior to entering the new buffer zones. The use of 1.5:1 fill slopes with rock armor plating from station 84+40 to 85+40 –L- RT prevent stream impacts downstream of the culvert outlet.

Wetland/Buffer Site 6
This site has no wetlands, but this unnamed tributary to Little Creek is subject to the buffer rules. The proposed drainage structure is a reinforced box culvert 1 @ 3.0m x 2.13m (culvert #2 as described above) to be buried 0.3m below the stream bed. West of the site, median and roadside cut ditch drainage is treated by use of grass swales prior to entering the stormwater system and is piped directly into the side of the box culvert. Median drainage is also captured East of the site and outlets into a pre-formed scour hole. The Northeast quadrant of this site has a grass lined cut ditch that transitions into a riprap lined special cut ditch and eventually flows into an energy dissipater basin prior to entering buffer zone 2. Treatment is attained for all site locations entering the buffer zone.

Wetland/Buffer Site 7
This site has no wetlands, but this unnamed tributary to Little Creek is subject to the buffer rules. This stream buffer location begins at the intersection of -Y11- REV and Ramp A. This site is the outlet location for a large stormdrain system that collects water from the entire interchange. All the stormdrain structures are located in grass swales (with the exception of BDO's) and therefore receive acceptable treatment prior to discharging into this buffer site. The flows from the 1200mm RCP outlet into an energy dissipater basin. Due to the existing topography, the energy dissipater had to be located inside the buffer zone, thereby causing buffer impacts.

Wetland/Buffer Site 8
This site has no wetlands, but this unnamed tributary to Little Creek is subject to the buffer rules. This stream buffer location begins near the outlet of a 600mm cross pipe under Ramp A at station 2+50 Right. This cross pipe is fed by an upstream system that contains two drop inlets. These structures are located in grass swales and therefore the discharge is adequately treated. The only impacts present at this site are minor stream impacts and buffer impacts due to proposed roadway fill.

Wetland/Buffer Site 9
This site has no wetlands, but this unnamed tributary to Little Creek is subject to the buffer rules. The proposed drainage structure is a 1200mm RCP to be buried 0.3m below the stream bed. A storm drainage system east of the site contains a drop inlet that is located in the median. The median drainage is treated prior to entering the structure by grass swales. This system is tied into the 1200 mm cross pipe by a series of junction boxes. A stormdrain system (also fed by grass swales) outlets in the Southwest quadrant and drains toward the site through a riprap lined lateral base ditch. This treated stormwater and offsite drainage is then captured in a berm drain outlet and pipe directly into a blind junction box located on the 1200 mm cross pipe. Treatment is attained for all drainage tying into the cross line.

Buffer Site 10
This site is a bridge crossing over Little Creek. This site has no wetlands, is subject to the buffer rules. The bridge will span Little Creek. No bents are proposed in the channel and the entire buffer zone will be spanned. Zone 2 on the South end of the bridge contains two pre-formed scour holes that dissipate the outlet velocities for two stormdrain pipe systems. The discharge contained in these stormdrain systems has been treated in grass swales prior to entering the system.

Wetland Site 10/Buffer Site 11
This site has no wetlands, but this unnamed tributary to Little Creek is subject to the buffer rules. The proposed drainage structure is a 1200mm RCP to be buried 0.3m below the stream bed.

Wetland Site 11
This pond is an isolated surface water, and, as such, is not subject to buffer rules. Since a large portion of this pond is located in the proposed right of way and is subject to roadway improvements, it will be permanently drained. The entire pond is considered a surface water impact.

Wetland/Buffer Site 12
These unnamed tributaries to Little Creek border a wetland and are subject to the buffer rules. This site contains an existing reinforced box culvert (1 @ 2.9m x 2.4m) under –Y11- that is to be removed. Since the proposed alignment of –Y11- REV is upstream of the existing culvert, the proposed fill impacted the two tributaries that previously confluence upstream of the existing box culvert that is to be removed. Therefore two new culverts will be required to provide passage for both tributaries. The new culvert on the main tributary to Little Creek (flowing North to South) is a 1 @ 3.0m x 2.7m reinforced box culvert (culvert #3 as described above). The new culvert on the smaller tributary to Little Creek (flowing West to East) is a 1 @ 2.4m x 2.4m reinforced box culvert (culvert #4 as described above). A grass lined cut ditch flows toward this site in the Southeast quadrant. This ditch flows into a 600 mm cross pipe under –DR-1 its now concentrated flow is dumped into a energy dissipater basin to minimize the erosive velocities prior to entering the buffer. An existing grass lined ditch also flows adjacent to –Y11- toward this site in the Southwest quadrant. This existing ditch has been relocated to flow down –Y11-REV. Due to

the steep topography, this new lateral V ditch warranted riprap to minimize erosive velocities. An energy dissipater basin is also located at the end of this relocated ditch to further reduce flow velocities prior to entering the buffer.

State Project: 34459.1.6

T.I.P. No. : R-2552C

Johnston County, NC

US-70 (Clayton Bypass) from East of SR-1560 to US-70 East of Clayton

STORMWATER MANAGEMENT PLAN

Prepared by: Richard Scarce & Associates, P.A.
2497 Whitmell School Road
Dry Fork, VA 24549

As Sub-consultant to: H. W. Lochner, Inc.

September 15, 2004

PROJECT DESCRIPTION

This roadway project is a portion of the US-70 Clayton Bypass, a 4-lane divided facility on new location. The R-2552C portion is 5.00 KM (3.11 Mi.) long. It involves redesigning the interchange of US-70 Business and US-70A southeast of Clayton, including some 2.92 KM (1.82 Mi.) of existing US-70 Buisness. Also included is realigning a portion of Gordon Road (SR-1913), some 0.54 KM (0.34 Mi.) in length.

The project will have grassed median and outside ditches. Drainage will be facilitated by bridges, box culverts, and cross pipes, as well as storm sewer systems, lateral ditches and grassed swails.

The surrounding area is predominately agricultural with rapidly developing residential subdivisions. The area along existing US-70 has extensive commercial and industrial development.

ENVIRONMENTAL IMPACTS

There are three named streams crossed by Project R-2552C (Little Creek, Cooper Branch, and Reedy Branch). These streams and their tributaries are classified as C NSW waterways. Class C uses are defined as "aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture". Nutrient Sensitive Waters (NSW) are those that require "limitations on nutrient inputs". [i]

All streams draining from this project are tributary to Swift Creek which is tributary to the Neuse River. As such, they are regulated under the Neuse River Riparian Buffer Rules (15A NCAC 2B.0233). These rules require a 50 foot buffer adjacent to jurisdictional streams and water bodies. Concentrated runoff from new ditches and manmade conveyances must have diffused flow or non-erosive velocities before entering the riparian buffer.

Wetlands encountered by this project are regulated under Section 404 of the Clean Water Act.

The project alignment encounters 16 jurisdictional wetland and/or surface water sites. Of these, 10 sites have regulated stream buffers.

BEST MANAGEMENT PRACTICES (BMP's)

"Management of nonpoint source pollution is a stated goal of the 1987 Water Quality Act. An important source of these pollutants is stormwater runoff from urban and developing areas." [ii] BMP's are practices undertaken to prevent or minimize stormwater pollution.

BMP's used on this project include spanning one stream buffer with bridges, level spreaders, grassed swails, and pre-formed scour holes. Other measures include:

- burying cross drainage structures below the stream bed by approximately 20% of the structure depth, up to one foot depth, in order to minimize impacts to aquatic life;
- use of 2:1 fill slopes on the outside of roadway fills to reduce wetland impacts; and
- elimination of rip rap in stream beds.

It should be noted that at one site fill slopes do exceed 2:1 in wetlands. On Ramp A from Station 1+00 to 2+90 fill slopes ranging from 4:1 to 6:1 were utilized for safety reasons (sight distance). However, road fill height is minimal in this area, on the order of 1M to 1.5M. This design encroaches into the wetland about 0-4M more than one which utilizes 2:1 fill slopes, and impacts an additional 0.038 hectare (0.09 Acre).

Level spreaders were the first choice BMP. However, only two sites met the criteria for a level spreader due to constraints of ground slope and cover and runoff rates.

Pre-formed scour holes were utilized where other BMP's were not practicable and where terrain was relatively flat and 10-year discharge did not exceed 10 feet per second.

Grass swails were designed to have at least 100 linear feet of swail per acre of drainage area. The swails were design to have a 2-year velocity of not more than 2 feet per second, and have side slopes of 3:1 or flatter. The typical roadway cut ditches meet this criteria. Data for these ditches and other lateral and berm ditches utilized as grass swails are tabulated on pages 6-15 in the 8.5"x11" summary sheets in the permit application for this project.

BMP's for each of the 16 jurisdictional sites are discussed below:

SITE C-1

This site involves the crossing of Little Creek via dual bridges. The roadways in this area were originally separated in order to minimize wetland and stream impacts. Subsequent to that design it was decided to span the entire stream buffer with bridges, and the original alignments were kept. Bridge decks are designed such that there is no direct discharge of stormwater into the stream or its buffers. The right lane bridge has two long spans in order to move a bridge bent further away from the stream. Work bridges and haul roads are proposed during construction.

Level spreaders were not feasible at this wooded site due to steep terrain (slopes up to 25%). Also, 10-year discharge exceeded allowable at 3 locations. Stormwater treatment was achieved through the use of grass swails (mainly roadway cut ditches) and pre-formed scour holes (two). The median area east of the stream utilizes a wide grass swail for treatment. Rock ditch checks are used where the ditch slope exceeds 4%.

SITE C-2

This pond is an isolated surface water, and , as such, is not subject to buffer rules. This is a very old pond and is subject to dry up during arid times. Since the road profile requires most of the pond area the pond will be drained permanently. The entire pond area is considered a surface water impact.

SITE C-3

This site is a wetland having no defined stream running through it. Therefore, it does not have surface waters or stream buffers. Stormwater treatment is achieved through use of grass swails and a pre-formed scour hole. The 1050mm cross pipe is to be buried 0.2M to 0.3M below the ground.

SITE C-4

It is proposed to replace the existing 600mm cross pipe with a 750 mm pipe. This site is considered a "modified natural surface water", and is subject to the buffer rules. Jurisdiction begins at the existing pipe outlet. Level spreader design will not work at this location because the existing roadway ditches are cut well below the existing ground. To block these ditches would cause water to pond close to the subgrade of the roadway. In-kind replacement of the roadway ditches is the only feasible alternative.

SITE C-5

In the project vicinity this site is a surface water only, and is subject to buffer rules. The proposed drainage structure is a 1500mm pipe to be buried 0.3M below the stream bed. Level spreaders are proposed in the northwest and southeast quadrants. There is no roadway discharge draining to the northeast and southwest quadrants. Median drainage is treated by use of grass swails prior to entering the stormwater system. Roadway and outside shoulder drainage are treated by a pre-formed scour hole or routed to one of the level spreaders.

SITE C-6

This site involves the crossing of Cooper Branch. It is both a wetland and surface water subject to buffer rules. The main drainage structure is a double barrel 2.7Mx1.8M box culvert, to be buried 0.3M below the stream bed. A concrete sill is to be placed in one barrel to confine low flow to the barrel in the channel. An additional 1200mm pipe will drain a minor side channel, and a 3.7Mx2.4M box culvert will be provided as a wildlife crossing. On the left side of the roadway level spreaders were not feasible at this wooded site due to excessive discharges. On the right side stormwater discharges into wetlands prior to reaching stream buffers, and should be sufficiently diffused. In all areas treatment is attained through the use of grass swails and pre-formed scour holes except at Station 134+55 RT. where a rip rap and filter fabric apron was used in lieu of a pre-formed scour hole. The U.S. Army, Corps of Engineers, indicated this preference since the discharge point is in a wetland.

SITE C-7

This site consists of a wetland without a defined channel. Also, nearby is a farm pond ("tank") considered to be an isolated surface water not subject to buffer rules. The main drainage structure at this site is a 1200mm pipe buried 0.25M. Since the pond falls within the right-of-way it is proposed to be filled in. In order to properly drain Ramp B and to protect the left side of the –L- line fill from erosion it is necessary to cut ditchs through the wetland in the median area. The small amount of wetland in the median area that is not under roadway fill is considered to be destroyed. Runoff treatment at this site is achieved through the use of grass swails.

SITE C-8

This wetland only site falls under several roadways and is considered to be completely destroyed.

SITE C-9

This site has a small wetland pocket upstream of an existing farm road and a small creek draining from an 450mm pipe under the road. The creek is considered to be a surface water subject to buffer rules. Due to increased runoff volume resulting from interchange construction it is necessary to replace the 450mm pipe with a 750mm pipe. The highway construction destroys about half of the wetland and makes a small lateral encroachment into the stream buffer. Highway drainage discharges into the wetland and the wetland drains to the creek below the farm road. Runoff is treated through use of grassed swails at this site.

One of the roadway cross pipes was intentionally undersized in order to raise the pipe inverts of the remaining drainage system and, thus, avoid the need to excavate the surface water.

SITE C-10

This site drains most of the proposed interchange area. Jurisdictional surface waters begin at the outlet end of an existing 1800mm pipe under SR-1573 (Cole Road). Near the pipe outlet is a wetland area on the south side of the creek.

It is proposed to retain and extend the 1800mm pipe and to add a 2.7Mx1.8M box culvert to convey increased runoff from interchange construction. The creek will be altered for a short distance to accommodate the new box culvert. The alignment of Ramp C will also encroach into the wetland and stream buffers.

No new ditches will drain into this area. One existing ditch ends and sheet flows into the wetland prior to reaching the stream buffer. Runoff treatment in this ditch is achieved via grassed swail. Inverts of the box culvert and pipe will be buried one foot below the stream bed.

SITE C-11

This site has a large wetland through which Ramp C traverses. No jurisdictional surface waters exist at this site. The area will be drained by a 1200mm pipe to be buried 0.2M-0.3M below the stream bed and laid in an existing ditch. Also draining the site will be a 600mm pipe laid high enough so as to not drain an observed ponded area. The wetland area below this pipe is considered to be destroyed by the excavation required to construct Loop C. No roadway ditches discharge directly into the wetland, just sheet flow.

SITE C-12

Site C-12 is situated between US-70 Business (-Y4-) and US-70A (-L2-). It consists of a wetland and a jurisdictional surface water subject to buffer rules. Existing roadways are to be widened. No permanent fill will be placed in these wetlands, but there will be temporary impacts. There will be a minor permanent impact to buffers at the downstream end of this site due to a short extension if an existing 1200mm pipe and roadway widening. Temporary impacts will also be required to facilitate placement of roadway fill.

At the upper end of this site existing roadway ditches drain through the buffer. A proposed ditch will tie to this existing drainage system prior to reaching the buffer, and the existing ditches are not expected to be changed inside of the buffer. At the lower end of the site on the south side of the creek an existing ditch will be relocated. The new ditch will end at the wetland edge. Roadway and median areas draining to this site are treated in grassed swails.

SITE C-13

This site is situated upstream of existing US-70A and is drained by an existing 1050mm pipe. During an initial site visit there was observed a defined stream draining to this pipe; however, a subsequent site visit revealed that the area had been ponded by beaver activity. Consequently, this site is considered to have both a wetland and a jurisdictional stream with buffers.

North of the stream Ramp A encroaches into the wetland. As previously mentioned, fill slopes in this area are flatter than 2:1 due to safety concerns, but additional impacts due to flattening of slopes amount to only 0.09 Acre. The existing pipe is to be extended about 10M upstream to accommodate Ramp A construction and will have permanent impacts to the stream and buffers as well as to wetlands. Since the area is quite

flat the existing roadway ditches draining to this site are to be eliminated, so there will be only sheet flow draining to the wetland.

SITE C-14

This site is situated on both sides of existing US-70A about 300M east of Site C-13 and drains Reedy Creek. Existing drainage structures are a 600mm pipe, a 2.44Mx1.83M box culvert and a 900mm pipe. These structures are to be retained and extended on the outlet end and a 1650mm steel pipe is to be added. Since the existing structures have only short extensions there is no advantage of burying the new inverts, and the structures were extended on approximately their existing grades. The new 1650 pipe will be buried 1 foot.

No defined stream was found draining to or from the 900mm pipe near the eastern edge of this site. However, a stream does appear on the soils map of this area, and thus would make this site subject to buffer rules. Consequently, a "best fit" stream was shown on the roadway plans with associated buffers.

Although the box culvert is not to be extended on the upstream end, temporary impacts are anticipated to facilitate installation of rip rap on the roadway fill above the culvert. This rip rap is used to plate the proposed 1.5:1 fill slope in this area and is used in lieu of extending the culvert. Although permanent wetland impacts are avoided on the left side of the roadway the proximity of roadway fill will require some mechanical clearing and temporary impacts.

On the right side of the roadway a small amount of permanent impacts will be required to facilitate roadway widening and ditch construction. There will also be mechanical clearing and temporary impacts to facilitate the pipe and culvert extensions.

On the west side of the stream, roadway ditches discharge into wetlands prior to reaching stream buffers. Roadway and median runoff are treated using grass swails. On the east side of the stream and the right side of the roadway an existing ditch that drains through stream buffers is to be relocated and widened. Again, runoff is treated using grass swails. A level spreader installed here would cut well into the wetland. If the level spreader were located outside of the wetland the roadway median could not be properly drained.

SITE C-15

Sites 15 and 16 impacts result from the relocation of Gordon Road (SR-1913) (-Y6-). Site 15 crosses a wetland and does not have stream impacts. Drainage structures are a 750mm pipe and a 600mm pipe. These pipes are to be buried about 20% of their diameter. As requested earlier by NCDOT field personnel, rip rap has been eliminated at pipe outlets. Non-erosive velocities in roadway ditches are attained using grass swails prior to entering the wetland.

SITE C-16

This site is in the upper reaches of Reedy Branch. In this area the relocated portion of Gordon Road converges with the existing roadway. The left side of the roadway has extensive wetlands. There are no wetlands on the right side. Reedy Creek is a jurisdictional surface water and is subject to buffer rules.

Existing drainage structures are a 1050mm pipe and a 900mm pipe. These pipes are failing and are to be replaced with two 1500mm pipes to be buried 1 foot below the stream bed. The proposed pipes are longer than the existing ones and will result in permanent impacts to stream and buffers. Temporary impacts are also required to facilitate pipe installation.

On the left side of the roadway short ditches enter the wetland, and flow is diffused prior to reaching the stream buffer. Runoff treatment is provided using grass swails.

On the right side of the road and west of the stream treatment is provided using a pre-formed scour hole. Unused portions existing Gordon Road pavement will be removed and new pavement will drain to the left side, so no roadway pavement will drain to this area. The existing roadway ditch on the left side of the stream will be eliminated and only sheet flow will drain to stream buffers.

SUMMARY

At the 10 sites where buffer rules apply, surface water runoff has been treated using the above mentioned Best Management Practices. At all jurisdictional sites where roadway ditches enter wetlands, surface waters, or stream buffers 2-year velocities do not exceed 2 feet per second, which is considered to be non-erosive. Drainage structures in these sites are buried approximately 20% up to one foot depth in order to minimize impacts to wildlife. One additional road, Jones Road extension (-Y8-) as proposed at the public hearing meeting has been eliminated due to high wetland impacts.

8.5"x11" summary sheets included in the permit application for this project show calculations for grass swail treatment as well as wetland, surface water and buffer impact quantities.

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[i] Final Environmental Impact Statement, U.S. 70 Improvements from I-40 to Intersection of U.S. 70 and U.S. 70 Business in Wake and Johnston Counties, FHWA and NCDOT, June 8, 1998.

[ii] Stormwater Best Management Practices, NCDENR, April, 1999.

FINAL MINUTES OF INTERAGENCY HYDRAULIC DESIGN REVIEW MEETING FOR PROJECTS R-2552AA AND R-2552AB, WAKE AND JOHNSTON COUNTIES
Held on 4/21/04

Team Members:	Andrew Nottingham	NCDOT Hydraulics (Present)
	Eric Alsmeyer	USACE (Present)
	John Hennessy	NCDWQ (Present)
	Gary Jordan	USFWS (Present)
	Travis Wilson	NCWRC (Present)
	Chris Militscher	EPA (Present)
	Matt Haney	NCDOT PDEA (Present)
	Ron Allen	NCDOT Roadway Design (Present)
	Glen Mumford	NCDOT Roadway Design (Present)
Participants:	Marc Shown	NCDOT Hydraulics
	Jared Gray	NCDOT PDEA
	Drew Joyner	NCDOT TIP Program Manager
	Lonnie Brooks	NCDOT Structures Design
	Jason Davis	NCDOT Hydraulics
	Theresa Wyatt	NCDOT Admin. Office
	Wendi Johnson	NCDOT Division 4
	Mike McKeel	NCDOT Division 4
	Jeffery Teague	NCDOT Roadway Design
	Kevin Moore	NCDOT Roadway Design
	Steve Sollod	DCM

DOT began the meeting at approximately 9:30 A.M with an overview of the R-2552AA project. DOT then proceeded to review the hydraulic design for the R-2522AA project sheet by sheet.

PROJECT R-2552AA

Sheet 4

Stream crossing at Station 10+88 I1Y1 (I-40). Adjust fill slopes to 2:1 to minimize stream, buffer and wetland impacts and avoid extending existing 24" pipe. Pipe storm drainage back away from stream and outlet into a preformed scour hole (PSH) left of station 11+75 I1Y1.

Station 11+00 I1Y1 right proposed 15" pipe outlets through the buffer. Roadside ditch used as grass swale to treat stormwater. DWQ noted that this was okay as long as grass swale is long enough to treat runoff.

Station 12+13 I1Y1 existing 18" cross pipe. Adjust fill slopes to 2:1 to minimize wetland impacts and avoid extending existing 18" pipe.

Station 12+69 I1Y1. Outlet storm drainage into PSH on left side away from existing stream at station 13+70 I1Y1.

Station 13+57 I1Y1. Outlet storm drainage into PSH on right side away from existing stream at station 13+70 I1Y1.

Sheet 5

Station 13+70 I1Y1 existing 66" cross pipe. Adjust fill slopes to 2:1 to minimize stream and buffer impacts. Pipe will have to be extended on left side (outlet end).

Station 13+60 I1Y1 to 15+00 I1Y1. Grass swale used on left side to treat stormwater from 18" pipe outlet left of station 15+20 I1Y1.

Station 14+50 I1Y1 right proposed 24" pipe outlet into existing rip rap ditch. EPA asked about the rip rap ditch. DOT noted that the ditch was an existing rip rap ditch that will remain in place. Roadside ditches used as grass swales to treat the roadway drainage. DWQ inquired if the grass swales where long enough to treat the stormwater. DOT noted that they were.

Sheet 6

Station 17+20 I1Y1 left proposed 24" pipe outlets into existing ditch outlet.

At this point DOT started using a large roll plan sheet in order to see the I-40/Clayton Bypass interchange area more clearly. The impact of the interchange to natural resources on the West Side of I-40 was then discussed.

Station 21+00 I1Y1 right side. Stream begins at outlet of existing 24" pipe. Roadside ditches used as grass swales to treat the roadway drainage prior to discharging into stream. Existing 30 pipe located just downstream of this outlet under existing gravel road will be removed and new channel constructed.

Station 29+80 FLYLEREV (east bound I-40 ramp coming off of I-40 going towards Smithfield). Storm drainage collected by Drop inlets and piped directly to 36" cross pipe to minimize ditches through buffer areas. Roadside ditches used as grass swales to treat stormwater.

Station 23+50 I1Y1 right side. Stream begins at outlet of existing 30" pipe. Existing 30" pipe will be extended under Loop B (LPB) and outlet right of Station 23+60 LPB (inside

the loop). The stream flows inside LPB for about 125 feet then is piped under LPB and FLYLEREV and outlets left of Station 27+80 FLYLEREV. USACOE will consider entire stream impacted inside of the LPB area. NCWRC concurred. DOT discussed if curb and gutter would be required on inside of shoulder on LPB. Presently no gutter is shown and 4:1 slopes are being used. DWQ expressed concerns about using curb and gutter and still being able to get stormwater treatment. DOT will investigate. DWQ noted that they will require sediment and erosion control above and beyond what is normally required for this project.

Sheet 7

Station 27+37 FLYLEREV left side 24" pipe outlet. Stormwater treated by roadside ditches used as grass swales.

Station 26+23 FLYLEREV left side 18" pipe outlet to existing valley area. Stormwater treated by roadside ditches used as grass swales.

Station 25+25 FLYLEREV left side. Outlet storm drainage into PSH.

Station 25+60 I1Y1 right side 15" pipe outlet. Stormwater treated by roadside ditches used as grass swales.

Station 18+90 LPB right side 15" pipe outlet to natural ground away from stream.

Stream crossing at Station 26+70 I1Y1. Adjust fill slopes to 2:1 to minimize stream, buffer and wetland impacts and avoid extending existing 30" pipe.

Station 26+45 I1Y1 left side. Storm drainage outlets through rock check dam level spreader. Stormwater treated by roadside ditches used as grass swales.

Station 26+80 I1Y1 left side. Grass swale drains to existing ditch through buffer.

Station 27+10 I1Y1 right side. 15" pipe outlets to ditch then drains to PSH.

Sheet 14

The proposed bridges over I-40 for LPB and FLYLEREV were extended on the West Side of I-40 to span streams, wetlands and buffer zones. DWQ wants to keep bents out of streams and a minimum of 10 feet from stream bank. They prefer that the bents be left out of buffer zone 1 if possible. DOT noted they were looking at spanning the streams and wetlands but would probably be in the buffers somewhere. DOT will try to keep bents out of zone 1.

Station 16+60 LPB. Outlet storm drainage into PSH on right side.

Station 30+40 I1Y1 right side. Proposed 15" pipe outlets into existing ditch. Stormwater treated by roadside ditches used as grass swales.

Station 33+35 I1Y1 left side. Dry detention basin with level spreader. USFWS asked if DOT had investigated if there was a way to use dry detention basins as hazardous spill basins (HSB). DOT noted that dry detention basins are design to capture the first inch of rainfall runoff and then required to have it draw down in a time period of 2 to 5 days. HSB's are designed to capture the runoff from a 2 year storm of 5 minute duration plus a 10,000 gallon spill. They are designed with a sluice gate on the outlet pipe that can be closed in the event of a spill. DOT noted that by providing additional storage in the dry detention basin and by adding a sluice gate to the outlet pipe then the dry detention basin would also be able to serve as a HSB even if the basin was full of water from a previous storm. DOT presented a general sketch showing the proposed design.

DWQ asked if HSB's would be required for this project. USFWS noted that they had requested that DOT look into using HSB's as a conservation measure for this project due to the close proximity of this area of the project to Swift Creek which has endangered mussels. DOT noted that according to their guidelines HSB's would not be required for this project but that since they are already using dry detention basins with level spreaders at several locations on this project that they could add volume to accommodate the HSB design also.

USFWS noted that they want as much prevention to toxic spills as possible realizing that 100 percent is not an option. USFWS noted that they were not as concerned about areas where storm drainage is discharged away from the streams and allowed to spread out and flow over land as it was about areas where storm drainage was draining directly to streams. Also it was noted by EPA that it was not a good idea to use basins where they would impact another resource such as streams, wetlands or buffers.

DWQ requested that DOT look at using a HSB right of station 30+50 I1Y. DOT will investigate.

The team requested that DOT add a HSB left of station 13+90 RPD

EPA suggested that the drop inlet left of station 15+90 RPD be changed to outlet to dry detention basin. DOT concurred.

Station 34+55 I1Y1 left side existing 18" pipe extended.

Sheet 15

Station 39+00 I1Y1 right side. 30" pipe outlets into existing ditch then spreads out into Swift Creek floodplain. Discussion was had over the need for a HSB here and it was determined that one was not needed

Sheet 8

Station 20+60 FLYLEREV left side. DWQ noted 24" pipe to large to use PSH if PSH is to act as level spreader. DOT will investigate other options for treatment. Roadside ditches used as grass swales also treat Stormwater at this outlet.

Station 19+40 FLYLEREV left side. 30" pipe outlets into PSH (not being used as level spreader). This drainage eventually flows to HSB at station 13+90 RPD left side.

Station 13+04 RPD right side. Add grass swale from 15" pipe outlet to tie to grass swale at station 13+40 RPD. This will help route the drainage along RPD to HSB on RPD at station 13+90 RPD.

Station 12+70 RPD right side. Open throat catch basin used in gore area. Top elevation will be raised up to provide storage. Runoff to this area is across flat roadway fill slopes.

Station 17+60 to station 18+90 FLYLWREV right side. Rock toe protection used in lieu of ditch to avoid draining the wetland area. Toe protection will extend right up to the 60" cross pipe at station 17+60 FLYLWREV. USACOE expressed concern about stream bank erosion where toe protection ends. DOT noted that the stream bank was very shallow at this location and it should not be a problem.

Station 17+35 FLYLEREV left side. 24" pipe outlets to PSH. DWQ noted 24" pipe to large to use PSH if PSH is to act as level spreader. DOT will investigate other options for treatment.

Sheet 9

Station 11+80 LREV right side. Dry detention basin with level spreader used to treat stormwater. Extra volume and sluice gates will be added to basin to accommodate HSB design.

Sheet 10

Station 13+24 LREV left side. 15" pipe outlets into PSH

Station 13+40 TO 15+40 LREV. DOT noted that a temporary work bridge would be used in the wetland areas to construct the two bridges over the tributary to Swift Creek. The temporary Work Bridge will be located between the two bridges and depending on the type of foundation used may require that additional work bridges be used underneath the two bridges. No deck drains will be used on the two bridges.

Station 16+00 LREV right side. Dry detention basin with level spreader used to treat stormwater. Extra volume and sluice gates will be added to basin to accommodate HSB design. DOT will add energy dissipation at end of the bypass channel prior to the wetlands.

Sheet 11

Station 20+75 LREV right side. 15" pipe outlets into PSH.

Station 12+80 Y2B left and right sides. Roadside ditches used as grass swales to treat stormwater.

Station 21+20 to 22+20 LREV left side. Grass swale used to treat stormwater.

Station 23+00 LREV right side. Dry detention basin with level spreader used to treat stormwater. Extra volume and sluice gates will be added to basin to accommodate HSB design.

USFWS requested that notification of first responders as to the location of the HSB's be addressed as part of DOT's conservation measures.

Station 15+20 to 15+80 Y2B left side. Grass swale used to treat stormwater.

Station 16+60 Y2B left and right sides. Grass swale used to treat stormwater.

Station 25+20 to 25+70 LREV left side. Stream relocation will not be consider natural stream design (very small drainage area and requires deep cut).

Station 25+80 LREV right side. Dry detention basin with level spreader used to treat stormwater. Extra volume and sluice gates will be added to basin to accommodate HSB design. EPA noted that they did not think a HSB was necessarily needed at this location.

Station 25+00 LREV right side. Team agreed the area of stream between LREV and Y2B does not need to be considered as impacted if it is not cleared.

Sheet 12

Station 13+22 Y4 (Cornwallis Rd.). Extend existing 18" cross pipe to existing outlet ditch on right side.

Station 14+00 Y4. Outlet 18" pipe to outlet ditch on the right side.

This completed the R-2552AA project.

DOT then proceeded to review the hydraulic design of the R-2552AB project sheet by sheet.

PROJECT R-2552AB

Sheet 5

Station 31+40 –L- left side. 30" pipe outlets into dry detention basin. The team decided to get rid of the dry detention basin since it was impacting a wetland and a stream. Roadside ditches used as grass swales treat the Stormwater. DOT will locate the outlet of the 30" pipe to minimize the impacts as much as possible. Energy dissipator will be used to reduce velocity at outlet.

Sheet 6

Station 33+71 –L- left side. 24" pipe outlets into a PSH (not being used as level spreader). Roadside ditches used as grass swales treat the Stormwater.

Sheet 7

Station 37+11 –L-. Proposed 2 @ 9'x 7' RCBC with low flow sill and baffles. Floodplain bench will be constructed to maintain normal low flow at entrance and outlet.

Station 37+60 –L- to 38+40 –L- right side. Multiple 18" pipes outlet into PSH's into flat floodplain area.

Sheet 8

Station 39+40 to 42+00 –L-. DOT noted that a temporary work bridge would be used in the wetland areas and surface water areas to construct the two bridges over White Oak Creek (Austin Pond). The temporary Work Bridge will be located between the two bridges and depending on the type of foundation used may require that additional work bridges be used underneath the two bridges. The West Bound lane bridge will require a drainage system. No drainage will discharge beneath the two bridges.

Station 42+00 –L- left side. Dry detention basin with level spreader used to treat stormwater. Extra volume and sluice gates will be added to basin to accommodate HSB design.

Sheet 9

Dry detention basin with level spreader used to treat stormwater. Extra volume and sluice gates will be added to basin to accommodate HSB design. Slopes may be to steep at outlet of basin to accommodate level spreader. DOT will investigate. Based on

roadway grade it appears the roadside ditches can be used as grass swales to treat the stormwater.

Sheet 11

Station 50+20 –L- right side. The team decided that the stream area between the –L- line and Ramp C will be considered an impact whether it is cleared or not. DOT may look at doing something in this area (possibly creating storage while maintaining normal flow) to help with energy dissipation.

Station 50+25 –L- left side. Stream relocation between -L- and Ramp B. On site natural stream design mitigation will not be pursued due to short length of stream. Stream will be relocated using natural stream design methods.

Station 51+20 –L- left side. The team decided that the stream area between the –L- line and Ramp B will not be considered an impact as long as there is no clearing or disturbance of the stream. DOT noted that they could put note on the plans specifying areas that should not be cleared.

Station 53+20 –L- right side. The stream, buffer and wetland area between the –L- line and Ramp D should not be cleared beyond normal construction limits required to build the road. DOT will note this on the plans.

Station 54+00 –L- right side. Level spreader used to treat stormwater.

Sheet 12

Station 11+40 –L- right side. Dry detention basin with level spreader used to treat stormwater. Extra volume and sluice gates will be added to basin to accommodate HSB design. 30" outlet pipe will outlet directly into 2 @ 6'x 8' RCBC at station 57+17 –L- to avoid disturbing wetland and buffer areas.

Station 57+17 –L-. 2 @ 6'x 8' RCBC with low flow sill. DOT will show floodplain bench at the inlet and outlet of the culvert.

The meeting was adjourned at approximately 12:15 PM.

Subject: Draft Minutes from Interagency Hydraulic Design Review Meeting on April 21, 2004 for R-2552B in Johnston County

Team Members:

Eric Alsmeyer-USACE	(present)
John Hennessy-NCDWQ	(present)
Travis Wilson-NCWRC	(present)
Gary Jordan-USFWS	(present)
Chris Militscher-EPA	(present)
Matt Haney-PDEA	(present)
Steve Sollod-DCM	(present)

Participants:
Marshall Clawson, NCDOT Hydraulics
Dan Robinson, Kimley-Horn & Associates
Jason Lawing, Kimley-Horn & Associates
R. N. Scarce, Richard Scarce & Associates
Jared Gray, NCDOT-ONE
Drew Joyner, NCDOT-TIP Program Manager
Wendi Johnson, NCDOT-DIV. 4
Theresa Wyatt, NCDOT-Admin. Office

The meeting began with Marshall Clawson calling it to order and establishing its purpose. The meeting was then turned over to Dan Robinson with a review of the 30% drainage design plans.

General Comment:

It was discussed that for all crosspipes located in perennial streams it is standard practice to bury the culvert inverts a minimum of 20% of culvert diameter or 1'. Also, no rip rap is permitted in the bed of perennial streams.

The agencies did not recommend adding hazardous spill basins to any of the drainage outfalls on R-2552B section.

Sheet 4-6:

The drainage for sheets 4-6 (approximately 1000m) is all located in a cut section and is captured in a storm drain system that outfalls at Station 57+60 RT. It was determined that a level spreader at Station 57+60 RT is not the preferred option for the system from sheets 4 through 6. It was decided the system will be tied into the double box culvert on section A, instead of outletting into the 50' buffer. This decision is acceptable because, all drainage received grass swale treatment before it was captured in the inlets. The design calculations for this system will be given to Andrew Nottingham to be incorporated in his design of R-2552A.

Sheet 7:

Structure 23 at Station 68+65 (1500mm RCP crosspipe) is located in a perennial stream, therefore the general revision of burying a portion of the culvert and eliminating the rip rap in the outlet stream bed applies.

At Station 69+00 RT (outlet structure 27) it was determined that an energy dissipater is not the preferred design (per John Hennessy). For treatment purposes, the use of a level spreader will be investigated for this location.

Sheet 8:

Structure 32 at Station 73+40 (1200mm RCP crosspipe) is located in a perennial stream, therefore the general revision of burying a portion of the culvert and eliminating the rip rap in the outlet stream bed applies.

Sheet 9:

Structure 37 at Station 75+20 (1350mm RCP crosspipe) is located in a perennial stream, therefore the general revision of burying a portion of the culvert and eliminating the rip rap in the outlet stream bed applies.

Sheet 11:

Structure 46 at Station 81+30 (1050mm RCP crosspipe) is located in an intermittent stream, therefore rip rap can remain and culvert does not have to be buried.

The proposed ditch relocation (Station 80+00 to 81+00 RT) will include a proposed 50' stream buffer that will allow for buffer credit. Matt Haney will incorporate into permit.

The isolated wetland pocket at Station 81+00 RT should be shown in the wetland permit drawings as an impact.

The proposed Rosgen stream design (Station 82+80 to 83+80 Lt) was discussed. It was determined that stream mitigation could be achieved and 50' of right of way or PDE (from top of bank) would be required.

Sheet 12:

For the 1 @ 3.0m x 2.1m RCBC at Station 84+17, there was some concern about the rip rap lining the outlet channel and the skew of the box culvert. It was determined that the skew of the RCBC was appropriate. The outlet protection measures that were discussed were: Option 1-building a bench along the right overbank of the channel outlet that would provide some relief from storm flows to minimize erosion, or Option 2- rip rap the banks as currently designed. It was discussed that Option 1 would cause a large amount of cut on the existing, steep, vegetated slope, therefore making this option not desirable. It was decided to leave the existing outlet design (Option 2) in the plans, but during construction John Hennessy would coordinate with DWQ or Wild Life Resources (Travis Wilson) to check on the outlet and see if the bench is feasible.

Sheet 14:

Due to site constraints, it was determined that a level spreader is not the preferred option for the system from sheets 13 and 14 with an outlet at Station 92+00 RT (structure 69). Therefore, the system will be tied into the 3.0m x 2.1m RCBC. This design is acceptable because all drainage received grass swale treatment before the inlet.

Sheet 15:

This sheet contains the interchange (-L- / -Y11-REV). This interchange is all in a deep cut and drained by a storm system that outlets at Station 17+20 Lt –Y11-REV. The existing topography does not allow for a level spreader treatment device, however, this design is acceptable because grass swale treatment is achieved prior to all inlets. The energy dissipater at the system outfall is required to reduce system velocities.

Sheet 16:

The portion of the existing dam within the Right of way near Station 101+60 RT will be removed and the pond will be drained.

It was decided that instead of tying drop inlet 113A into the crosspipe near Station 102+40, which caused a structure depth of 34', to move the drop inlet near Station 102+60 and connect it to a junction box on the left fill slope. This junction box would then tie into the end of the crosspipe with a blind junction box, thus avoiding the extra depth structure.

It was also decided to eliminate the manhole cover on structure 112, (causing it to be extra depth) and utilize a blind junction.

Sheet 22:

The original bridge design over Little Creek did not account for buffers. The revised drainage plans show a preliminary new bridge length (@ Station 14+71 –Y11-REV) of 58m that spans the buffer.

It was also discussed to extend the shoulder berm gutter on the North side of the bridge to the sag location Station 14+04 and provide 2GI drop inlets to pickup the surface drainage. These structures will need to outlet to preformed scour holes (PFSH). Grading of the existing –Y11- road bed may be necessary on the West side of –Y11-REV to accommodate the PFSH. Additional right of way may be necessary on the East side of –Y11-REV to accommodate the PFSH.

A minor variance at the Little Creek Bridge will be required due to the proposed preformed scour holes that are located in buffer Zone 2.

Sheet 25:

For the 1500mm RCP at Station 25+00 –Y11-REV, there was some concern about the rip rap which lines the outlet channel and removed culvert area (-Y11-). It was decided to line the banks of the outlet channel with rip rap and if possible, add rip rap along the existing main channel bank directly across from the 1500mm RCP outlet. The proposed rip rap lining the culvert removal area was eliminated. In its place will be a note to lay back slopes to existing condition and line with erosion control matting and install live stakes.

April 22, 2004

Subject: Draft Minutes Interagency Hydraulic Design Review Meeting on April 21, 2004, for R-2552C, Johnston County.

Team Members:
Eric Alsmeyer – USACE (Present)
John Hennessy – NCDWQ (Present)
Travis Wilson – NCWRC (Present)
Gary Jordan – USFWS (Present)
Chris Militscher – EPA (Present)
Matt Haney – NCDOT PDEA (Present)

Participants:
Richard Scarce – Richard Scarce and Assoc.
Doug Taylor – NCDOT Design Services
Steve Sollod – DCM
Wendi Johnson – NCDOT Division 4
Jared Gray – NCDOT PDEA-ONE
Drew Joyner – NCDOT TIP Program Manager
Terry Wyatt – NCDOT Admin. Office
Marshall Clawson – NCDOT Hydraulics
Anne Gamber – NCDOT Hydraulics

This project consists of a portion of the Clayton Bypass (US 70). The meeting began at 3:20.

1. Bridges at Station 109+56 –L2-: The bridges were widened to span the riparian buffers. No scuppers are allowed directly over the buffer zone or surface water. The structure engineers (Lonnie Brooks and Theo Beach) will investigate options to avoid having bent columns within the tops of bank for the right lane bridge. The left lane bridge did not have this problem. Constructability should not be an issue.
2. Grass Swales: Although level spreaders were considered first, grass swales were used for treatment in areas with topographical restraints. These restraints included adjacent wetlands, steep slopes and confined areas resulting from proposed fill slopes. All swales will have the calculations include on the permit drawings showing adequate treatment before entering streams.
3. Pond on sheet 7: Once the isolated pond is drained, the new reach formed in the pond floor will have buffers. John Hennessy will investigate how this needs to be addressed.
4. Equalizer Pipe: Remove riprap at outlet of equalizer pipe on sheet 7 and sheet 20.
5. Culvert on Sheet 9: No riprap is allowed in channel bottom.
6. Coopers Branch: a 12'x 8' wildlife crossing will be added in floodplain. Look at pulling PFSH out of wetlands.
7. Sheet 17: Move the proposed bore and jack pipe closer to the existing 900mm pipe to consolidate impacts.
8. Sheet 26A:Additional area needs to be investigated for wetlands.

The meeting was adjourned at 5:15.

10/01/04
FINAL MINUTES OF INTERAGENCY PERMIT DRAWING REVIEW MEETING FOR PROJECTS R-2552AA AND R-2552AB, WAKE AND JOHNSTON COUNTIES
Held on 8/18/04

Team Members:	Andrew Nottingham	NCDOT Hydraulics (Present)
	Eric Alsmeyer	USACE (Absent)
	John Hennessy	NCDWQ (Absent/Present)
	Gary Jordan	USFWS (Present)
	Travis Wilson	NCWRC (Present)
	Chris Militscher	EPA (Absent)
	Matt Haney	NCDOT PDEA (Present)
	Ron Allen	NCDOT Roadway Design (Absent)
	Glen Mumford	NCDOT Roadway Design (Present)
	Nicole Thomson	NCDWQ (Present)

Participants:	Marc Shown	NCDOT Hydraulics
	Derrick Weaver	NCDOT PDEA
	Lee McCrory	NCDOT Roadway Design
	Lonnie Brooks	NCDOT Structures Design
	Jason Davis	NCDOT Hydraulics
	Theresa Wyatt	NCDOT Admin. Office
	Wendi Johnson	NCDOT Division 4
	David Chang	NCDOT Hydraulics
	Jennifer Seaboch	NCDOT Roadside Environmental
	Kevin Moore	NCDOT Roadway Design
	Mark Staley	NCDOT Roadside Environmental
	Ron Hancock	NCDOT Construction Unit
	David B. Harris	NCDOT Roadside Environmental

Hydraulics began the meeting at approximately 8:30 A.M. Hydraulics asked for questions and comments on the stormwater management plan (SMP). The USFWS noted that they would like a location map showing where all the hazardous spill basins (HSB's) are located on the project for inclusion in the Biological Assessment. DOT noted that they would prepare a topographical map showing the locations of the HSB's on the project. Hydraulics noted they would round off the stream impact numbers and buffer impact numbers shown in the SMP.

The permit drawings were then discussed.

PROJECT R-2552AA

Site AA1b

- Hydraulics will show a 10 feet temporary stream impact at inlet of pipe due to construction of the fill slope.
- DWQ noted to make sure the outlet velocities of the pipe right of Station 10+90 I1Y1 are nonerosive.

Site AA3a

- Hydraulics noted that an enlarged view of this site would help clarify the permanent and temporary channel impacts.
- NCWRC noted that rip rap should not be placed in the stream bed at this site.
- DWQ questioned why the buffer impact was so large at this site. DOT noted that impacts on the left side of the stream were shown due to the 10 feet clearing limit for the fill slope construction. The impacts on the right side of the stream were shown for the construction of the grass swale entering the stream on that side as well as access to the stream for installation of the proposed pipe extension.

Site AA3b

- Hydraulics noted that the proposed base ditch would be extended all the way to the stream to prevent erosion prior to entering stream. This will require more buffer impacts to be shown at this site.

Site AA4a

- Hydraulics will show temporary stream impacts at this site due to the removal of existing pipe and construction of open channel where existing gravel service road is located.

Site AA4b

- Hydraulics will enlarge the scale for sites AA4a and AA4b.

Site AA5a and Site AA5b

- NCWRC expressed concern about sediment impact on mussels downstream due to increased velocities at pipe outlets. NCWRC noted that if the stream was intermittent they did not have a problem with a rip rap dissipator structure in the stream. They were concerned about rip rap dissipator structures in the stream if the stream is

perennial. Towards the end of the meeting in a general discussion about this it was decided that a cross vane rock weir with rip rap on the channel banks would be an acceptable method for outlet protection on perennial streams.
- DOT will clarify wetland boundaries and impacts at site AA5b.
- Hydraulics will enlarge view.

Site AA6

- Hydraulics will provide energy dissipation at 600mm (24 inch) pipe outlet.

Site AA7

- No comments

Site AA9

- This site is a linear wetland. Rip rap will be used at outlet to dissipate energy.

Site AA8

- Hydraulics noted that entire site is shown as being impacted.

SiteAA10a

- DOT will show additional impact to buffer needed for construction. A note will be placed on the drawings noting that timber mats should be used in wetland areas outside of the 10 foot mechanized clearing limits.
- DOT will classify impacts to pond as fill in surface water pond.
- Hydraulics will enlarge view.

Site AA10b

- Hydraulics will enlarge view.
- Hydraulics will show stream impact due 750 mm pipe (30 inch) pipe extension.

Site AA11a, Site AA11b and Site AA11c

- Hydraulics will show all of the wetlands on the south side of FLYLEREV as being impacted since there will only be a small amount left that will be isolated from the rest of the wetland. 4:1 slopes are being used in this area.
- Rip rap on channel banks and a cross vane rock weir will be used at outlet of 1500mm (60 inch) pipe. Impacts to wetlands and buffers will be adjusted at outlet to allow room for installation of pipe and outlet protection. Hand clearing and timber mats will be used in wetlands outside of 10 feet mechanized clearing zone.

- Pipe system draining to preformed scour holes (PSH) will be revised to show only one pipe crossing under the road and then the pipe system will be split to flow into the two PSH's
- Hydraulics will enlarge view

Site AA14

- Hydraulics will label begin and end of work bridge and label the work bridge dimensions.
- DOT will report permanent impacts due to bridge piers and temporary impacts due to work bridge piers.
- Hydraulics will enlarge view

Site AA15a and AA15b

- Hydraulics will enlarge view
- Hydraulics will show rip rap outlet protection at the outlet of 1050 mm (42 inch) pipe right of station 21+00 –L-. This is an intermittent stream.

Site AA16

- Hydraulics will enlarge view.
- DOT will classify impacts to pond as fill in surface water pond.
- Permanent and temporary stream impacts will be shown at the outlet of the 750 mm (30 inch) pipe.

Site AA17 and AA18a

- Pond will be drained and graded to drain at site AA18a. DOT will report impacts to pond as fill in surface water pond.
- Rip rap on channel banks and a cross vane rock weir will be used for outlet protection at outlet of 1200mm (48 inch) pipe.
- Hydraulics will enlarge view.

Site AA18b

- Hydraulics will show additional temporary stream impact on downstream end of pipe for pipe installation.
- Rip rap on channel banks and a cross vane rock weir will be used for outlet protection at outlet of 1350mm (54 inch) pipe.

Site AA12

- Hydraulics will enlarge view.

Site AA13a and AA13b

- Hydraulics will enlarge view.

Site AA19

- Hazardous Spill Basin (HSB) left of station 33+00 I1Y1 Lt. At 4B meeting this was going to be dry detention basin with level spreader also. After further review it has been determined that it is not possible to use a level spreader. In order to drain the outlet pipe a ditch will have to cut through the buffer. The stormwater coming to the HSB will be treated by grass swales.
- USFWS asked DOT if they were able to put HSB's at all the locations discussed in the 4B meeting. Hydraulics answered yes.

This completed the R-2552AA project.

PROJECT R-2552AB

Site AB1

- Hydraulics will show additional wetland impact area required to install riprap outlet protection at the end of 750 mm (30 inch) pipe.
- This site is not a stream.

Site AB2

- Hydraulics noted that the culvert size should be labeled in the plan view drawing.
- Hydraulics noted that a roadway profile showing the culvert needs to be added to the drawings.
- Hydraulics noted that the additional buffer impact shown on the east side of the culvert is because the diversion channel for culvert construction will be placed on this side.

Site AB3

- No changes

Site AB4

- DOT will report permanent impacts due to bridge piers and temporary impacts due to work bridge piers.
- DOT will eliminate stream lines in pond that are shown in error.
- Hand clearing in wetlands will be shown on the east side of pond between the two bridges.

Site AB5d

- Hydraulics will show additional temporary stream impact and buffer impact on downstream end of pipe for pipe installation.
- Rip rap on channel banks and a cross vane rock weir will be used for outlet protection at outlet of 1350mm (54 inch) pipe.

Site AB6b

- No changes

Site AB5c

- Hydraulics will show additional wetland and buffer impact around pond that is to be drained in order to allow construction equipment room to work. Hand clearing and timber mats will be used in wetlands outside of 10 feet mechanized clearing zone.
- Hydraulics will show small wetland area right of station 50+00 –L- impacted due to construction.

Site AB5b

- Hydraulics will show stream impacts at this site. Additional wetland area will be impacted at outlet of pipe for pipe installation and outlet protection. Hand clearing and timber mats will be used in wetlands outside of 10 feet mechanized clearing zone.
- Hydraulics will enlarge view.

Site AB8

- Hydraulics will show buffer impacts in zone 2 due to 10 feet mechanized clearing zone.
- Additional wetland area will be impacted at outlet of pipe for pipe installation and outlet protection. Hand clearing and timber mats will be used in wetlands outside of 10 feet mechanized clearing zone.

Site AB9

- DOT will change side slopes to 2:1 on right side of Ramp D to minimize wetland impact.
- Hydraulics will investigate pipe under the driveway right of station 15+40 Ramp D to see if it should be removed or left in place.

Site AB10

- No changes

Site AB11

- Hydraulics will show sill at entrance of culvert and detail showing channel construction at inlet and outlet of culvert.
- Hydraulics noted that the additional buffer impact shown on the east side of the culvert is because the diversion channel for culvert construction will be placed on this side.
- Hydraulics will label dry detention/hazardous spill basin.

General notes:

- The scale and legend will be shown on all enlarged views.
- DWQ prefers that HSB's not be used as sediment basins
- It was determined for this project rip rap outlet protection in the stream bed is acceptable on intermittent streams due to concern about sediment impact on mussels downstream. It was determined that a cross vane rock weir with rip rap on the channel banks would be an acceptable method for outlet protection on perennial streams.
- In addition to regular size buffer permit drawings, DOT will provide DWQ with full size plan buffer drawings.

The meeting was adjourned at approximately 11:40 am.

POST MEETING ACTIVITIES

A follow up meeting was held with the USACOE on 9/17/04 with the following people in attendance:

Eric Alsmeyer	USACOE
Andrew Nottingham	NCDOT Hydraulics
Glenn Mumford	NCDOT Roadway Design
Mike McKeel	NCDOT Division 4 Construction
Matt Haney	NCDOT PDEA ONE
David Harris	NCDOT Roadside Environmental Unit
Marc Shown	NCDOT Hydraulics
Jason Davis	NCDOT Hydraulics
Jason Moore	NCDOT Roadway Design
Kevin Moore	NCDOT Roadway Design

The USACOE provided comments based on the permit drawings and review of the draft meeting minutes for the 8/18/04 permit drawing review meeting.

- Hand clearing in wetlands does not need to be in the summary table but an acreage amount should be shown in a note at the bottom of the summary sheet.

- The site map, vicinity map and summary tables need to be on 8.5" by 11.5" paper, all other sheets may be 11" by 17" paper

- Requested that the summary tables be put behind the site maps in the permit package.

- Requested 3 copies of the permit drawings.

PROJECT R-2552AA

Site AA1b

- Stream impact should match mechanized clearing impact.

Site AA4a

- USACOE expressed concern about showing impact verses minimization. NCDOT noted that in order to remove the pipe and reconstruct the channel there would be temporary stream impacts to the channel up and downstream of the pipe.

Site AA5a

- USACOE addressed rip rap in intermittent streams. They noted that if the intermittent stream has function and requires mitigation then no rip rap should be placed in the stream bed. For perennial streams no rip rap should be placed in the stream bed. If the intermittent stream has no function and does not require mitigation then rip rap can be used in the bottom but it must be keyed into the stream bed. This would be considered a permanent impact. If rip rap is used on the stream banks only then it should not require mitigation (for both intermittent and perennial streams). For these permit drawings it was decided that NCDOT will show rip rap on the stream banks at the outlet of pipes as a permanent impact on the drawings and in the summary table. NCDOT will subtract this amount out of the final total permanent stream impacts to come up with a number requiring mitigation.

- USACOE also expressed concern about using cross vane rock weirs at the outlet of pipes. They noted example where it ended up acting like a dam in the stream instead of a natural feature. NCDOT noted that for them to work well they need to be constructed correctly. USACOE noted that if cross vane rock weirs are used they should be installed flush with the stream bed and not constructed as a dam.

Site AA6

- NCDOT will make sure the wetland boundary is shown correctly at this site.

Site AA9

- NCDOT will show rip rap at outlet of pipe in wetland as impact.

Site AA8

- USACOE does not want the remainder of the wetland that is shown as mechanized clearing to be filled. Erosion control device will be used at the inlet of the pipe to trap sediment. The mechanized clearing area should be restored to original contours before completion of the project.

Site AA10a

- USACOE questioned why timber mats should be used in wetland areas outside clearing limits. They noted only the area required to build the road should be impacted. If additional area is needed outside of the 10 foot mechanized clearing to construct the pipe and outlet protection then we should show it as mechanized clearing. This same comment applies to all other sites where it was noted in the previous meeting minutes that timber mats would be used in wetland areas outside of the 10 foot mechanized clearing zone.
- The question as to whether this wetland area needed to be cleared for site distance came up. After the meeting Roadway Design noted that the area did not have to be cleared.

Site AA11a, b, and c

- USACOE asked why 4:1 slopes are being used. Roadway Design noted that guardrail in the ramp gore area is not desirable for site distance safety reasons. They also noted that if 3:1 slopes were used more clearing in the wetlands would have to be done to provide clear recovery area.
- USACOE noted that instead of using timber mats in wetlands show mechanized clearing if additional area is needed to construct pipe and outlet protection.
- USACOE asked if a channel will be cut at the rip rap toe protection. NCDOT noted that rip rap will be placed on both the fill slope and the natural ground. Where the toe protection is located in wetlands the rip rap on the natural ground will be shown as fill in wetlands.

Site AA14

- NCDOT will report permanent impacts due to bridge piers and temporary impacts due to work bridge piers. This information will be shown as a note at the bottom of the summary sheet.

Site AA15

- USACOE noted that their previous comments about rip rap in intermittent streams apply

PROJECT R-2552AB

Site AB1

- NCDOT will show enough mechanized clearing to construct the rip rap outlet protection.

Site AB2

- USACOE questioned why the temporary channel impact extended so far beyond culvert ends. NCDOT noted that it was due to the temporary channel diversion required for the culvert.

Site AB4

- NCDOT will report permanent impacts due to bridge piers and temporary impacts due to work bridge piers. This information will be shown as a note at the bottom of the summary sheet.

SiteAB5

- NCDOT questioned if a cross vane rock weir is considered a permanent stream impact at the outlet of the pipe. USACOE noted that it would be considered a permanent impact.

SiteAB5b

- NCDOT may need to show more mechanized clearing to install rip rap outlet protection.

SiteAB11

- NCDOT noted that temporary stream diversion on east side of culvert would cause the least amount of impact.

Subject: Draft Minutes from Interagency Permit Drawing Review Meeting on August 18, 2004 for R-2552B in Johnston County

* A separate review meeting was held with Eric Alsmeyer on 9/17/04. Additional comments are included at end of original minutes.

Team Members:

Eric Alsmeyer-USACE	**(present)** *
John Hennessy-NCDWQ	(present)
Nikki Thomson-NCDWQ	(present)
Travis Wilson-NCWRC	(present)
Gary Jordan-USFWS	(present)
Chris Militscher-EPA	(present)
Matt Haney-ONE	(present) *
Derrick Weaver-PD&EA	(present)

Participants:
Marshall Clawson, NCDOT Hydraulics *
Galen Cail, NDOT Hydraulics *
Dan Robinson, Kimley-Horn & Associates *
Jason Lawing, Kimley-Horn & Associates *
Jimmy Goodnight, NCDOT Roadway *
Steve Kendall, NCDOT Roadway
Lonnie Brooks, NCDOT Structures
Jennifer Seaboch, NCDOT REU
Wendi Johnson, NCDOT-DIV. 4
Jim Trogden, NCDOT-DIV. 4
Terry Wyatt, NCDOT-Admin. Office
Mike McKeel, NCDOT-DIV. 4 Resident *

General Comments:

Until USACE has reviewed the permit drawing DWQ will withhold approval.

It was noted and observed that impacts were taken to R/W limits. It was stated by DWQ this may not be acceptable if efforts for avoidance and minimization cannot be justified. It was stated by DOT that these additional limits were shown to minimize the need for permit modifications due to access issues or other revisions that have occurred during construction. After continued discussion, it was determined the Division will need to review each site to accurately prescribe the impact/access limits required to construct. The permit will then be updated when these limits are provided to the Hydraulics Unit.

In light of the previous comment, there was discussion on showing temporary diversions on the plans for culvert construction at stream crossings. There were agency concerns over fish passage and thermal pollution due to stream diversions required at crossings for an extended period of time.

It was stated that no rip rap be placed in the bed or perennial streams.

A number of cross sections show 3:1 side slopes in wetlands. The Standard NCDOT Guideline is to construct maximum side slopes of 3:1 East of I-95 and 2:1 West of I-95.

It was noted that the impact shown on the legend did not necessarily match the applicable impact on the drawing. Drawings to be revised. Also noted, only show those impacts in the legend that are accounted for on the permit sheet.

DWQ requested electronic files of the permit drawings for their review. The files will be forwarded by the Hydraulics Unit once drawings are approved.

Site 1:

It was noted that one of the level spreaders is in the buffer. The level spreaders were placed parallel due to the steep topo.

Site 4:

It was stated the "wedge" of wetland at the 1050 inlet was shown as a total take.

Site 5:

At the outlet of the box culvert, it was asked if the channel could be opened up to provide a floodplain bench versus using the bank rip rap. It was stated the outer bank at the outlet is steep and would require significant excavation and tree removal. It was decided to leave as is.

It was noted that 1.5:1 slopes were used on the outlet side of the stream in order to minimize stream impacts.

DWQ stated they will need to review the stream design in more detail. They also requested the pebble count data/graph. Also, the reference stream will need to be approved if not done so.

Site 6:

There were concerns of culvert outlet velocities. It was stated that a rock cross vane is proposed at the outlet.

It was questioned if treatment is attained for system tying into the box culvert. It was stated treatment is attained and is detailed on the treatment summary sheet.

Site 9:

It was questioned whether wing walls will be used for the 1200mm inlet. There were concerns about erosion around the inlet due to the proximity of the confluence just upstream. It was stated that wing walls are standard. However, upon further investigation, wing walls are only standard for inlet pipes with diameters of 1350mm and

larger. Headwalls only are provided for 1200mm pipes. The headwall dimension for this pipe 12.7' wide by 6.2' high.

Site 10:

It was noted that the preformed scour holes were in the buffer. It was explained that this was the only practical location for the scour holes due to the steep site topo. Per DWQ, since buffer to be bridged, account for impacts as allowable.

Site 12(Buffer):

There was discussion on how to accurately show and account for buffer impacts for the proposed removal of the existing culvert and roadway fill under –Y11- (Ranch Road, SR 1560). It was explained that, since an existing facility is exempt under buffer rules, impacts were to be considered starting from the existing roadway fill. This impact would be exempt up to 40 linear feet. The impact would be allowable from 40 linear feet up to 150 linear feet. It was observed that this impact may be more than 40' but would be less than 150'. If so, account for as allowable.

Review Meeting 9/17/04:

It was noted that temporary diversion channels will not be shown on the permit plans. However, their impact area will be shown and accounted for.

Eric stated there should be no rip rap in the bed of intermittent streams that require mitigation. Also, for intermittent streams, non-mitigable, need to key rip rap into bed.

Need to include SR road #'s and names, stream names, etc on the vicinity map.

There was further evaluation of the area/impact necessary to access/construct sites. Permit plans will be modified, and in most cases, impacts reduced, based on input from the Division Construction personnel.

There was discussion whether temporary impact/handing clearing versus mechanized clearing should be shown. It was stated if any equipment is anticipated to use an area it should be shown and accounted for as mechanized clearing.

Make sure impact limits for wetlands and buffers are consistent.

If cross vanes are prescribed, make sure vane elevations are specific/relative to stream bed, bankfull elevation, etc.

Where temporary diversions are shown through wetlands need to account for as mechanized clearing, not temporary impact/hand clearing.

Site 4:

Show/account for "wedge" impact Sta 81+05 –L- Rt as "Fill in Wetlands" and not "Mechanized Clearing", since considered a "total take".

Site 7:

Eric requested that a larger scaled plan view be provided to improve clarity.

Show impact as "Fill in Surface Water" (permanent), not TS (Temporary…).

Site 9:

Eric questioned if there is a stream relocation/confluence at the culvert inlet and if there is a sharp bend to enter that culvert. It was stated this is the natural/existing confluence approximately 11m upstream from the inlet. Temporary impact is shown here to account for where the temporary diversion will tie.

Site 12:

Eric questioned why the amount of TS is shown. It was stated this amount is required due to temporary diversion.

Subject: Draft Minutes from Interagency Permit Drawing Review Meeting on August 18, 2004 for R-2552C in Johnston County

* A separate review meeting was held with Eric Alsmeyer on 9/17/04. Additional comments are included at end of original minutes.

Team Members:

Eric Alsmeyer-USACE	**(present)** *
John Hennessy-NCDWQ	(present)
Nikki Thomson-NCDWQ	(present)
Travis Wilson-NCWRC	(present)
Gary Jordan-USFWS	(present)
Chris Militscher-EPA	(present)
Matt Haney-ONE	(present) *
Derrick Weaver-PD&EA	(present)

Participants:
Marshall Clawson, NCDOT Hydraulics *
Galen Cail, NDOT Hydraulics *
Richard Scarce, R. Scarce & Associates *
Doug Taylor, NCDOT Project Services
Lonnie Brooks, NCDOT Structures
Jennifer Seaboch, NCDOT REU
Wendi Johnson, NCDOT-DIV. 4
Jim Trogden, NCDOT-DIV. 4
Terry Wyatt, NCDOT-Admin. Office
Mike McKeel, NCDOT-DIV. 4 Resident *

General Comments:

Until USACE has reviewed the permit drawing DWQ will withhold approval.

It was stated the plans/permit are not completely updated from recommendations made at the Final Field Inspection. Will be updated in final submittal.

It was noted and observed that impacts were taken to R/W limits. It was stated by DWQ this may not be acceptable if efforts for avoidance and minimization cannot be justified. It was stated by DOT that these additional limits were shown to minimize the need for permit modifications due to access issues or other revisions that have occurred during construction. After continued discussion, it was determined the Division will need to review each site to accurately prescribe the impact/access limits required to construct. The permit will then be updated when these limits are provided to the Hydraulics Unit.

In light of the previous comment, there was discussion on showing temporary diversions on the plans for culvert construction at stream crossings. There were agency concerns over fish passage and thermal pollution due to stream diversions required at crossings for an extended period of time.

It was stated that no rip rap be placed in the bed or perennial streams.

It was stated that impacts due to haul roads need to show impacts of the total footprint (ie slope stake). Show slope stake lines on plan view. Also, the haul road fill should be specified (ie rip rap, timber, etc). The agencies expressed concern that if soil fill was

used a storm event could potentially erode this soil fill and distribute the sediment load downstream.

DWQ requested electronic files of the permit drawings for their review. It was stated the Hydraulics Unit will provide once the drawings have updated and approved.

Site C-1:

It was noted the proposed detention basin in the median will be eliminated.

It was questioned whether a causeway would be needed to access Bent #2 Lt. This would require showing temporary impact to surface waters. The Division concluded there should be enough access without having to use a causeway. Therefore, no temporary stream impacts required. However, the Division plans to resurvey this crossing to ensure the location of the proposed bents and stream are accurately shown and that now piers will be in the stream.

It was noted the proposed Special Type A Basin shown Sta 113+60 –L2- Rt has been eliminated. Presently, houses have been built at the site.

Site C-4:

It was questioned whether velocities were non-erosive at the buffer. It was stated velocities were non-erosive and were shown on the treatment summary sheet.

Site C-5:

It was stated level spreader data is provided on the treatment summary table.

Site C-6:

It was questioned if the wildlife culvert will frequently have water in it. It was stated the wildlife culvert is in the overbank approximately 2' above the stream culvert invert and approximately 1' above the stream. Therefore, the culvert will likely have water in it with nominal storm frequencies.

Site C-7:

It was noted the wetland in the gore area is shown as a total take since a base ditch is proposed here which will likely drain the wetland.

Site C-9:

It was noted this wetland was not shown as a total take since the existing stream will continue to supply water with the proposed design.

Site C-10:

It was questioned if there was adequate treatment. It was stated there is adequate treatment for the 1800mm crossing.

Site C-11:

It was noted the wetland in the interchange is shown as a total take since the roadway is in cut.

It was noted the inlet of the 600mm pipe is not buried 20% so the wetland will not be drained.

Site C-13:

It was noted the ramp fill slopes through the wetland are flatter than 2:1. This is standard for ramps and loops in order to improve site distance. With flatter side slopes, guardrail can be eliminated and the shoulders can be maintained.

Site C-14:

It was noted there is impact at the inlet of the existing culvert although there is no extension. This is due to the fact that in order to eliminate an extension the side slopes had to be steepened to a 1.5:1 with rip rap plating. Therefore, access in needed in order to construct the slopes and place the rip rap.

It was noted the proposed rip rap in the bed at the 1650mm outlet will be removed.

Site C-15:

It was questioned if the pipes in the wetlands were equalizer pipes. It was stated the pipes were necessary for drainage of the road facility but would function as equalizer pipes.

Site C-16:

It was questioned if velocities at wetland were non-erosive. It was stated they were.

It was questioned if the dual 1350mm's had the same invert elevation. It was stated they did. In order to have one of the pipes as the low flow culvert it was decided to construct

the inlet rip rap sill to block off one pipe from the low flow. A detail of this will be forwarded to Richard.

Review Meeting 9/17/04:

It was noted temporary diversion channels will not be shown on the permit plans. However, their impact area will be shown and accounted for.

Eric stated there should be no rip rap in the bed of intermittent streams that require mitigation. Also, for intermittent streams, non-mitigable, need to key rip rap into bed.

There was further discussion of the area/impact necessary to access/construct sites. Permit plans will be modified based on input from Division Construction personnel.

Make sure impact areas for wetlands and buffers are consistent.

Also need to provide plans sheets without contours.

There was discussion whether temporary impact/hand clearing versus mechanized clearing should be shown. It was stated, if any equipment is anticipated to use an area it should be shown and accounted for as mechanized clearing.

Where temporary diversions are shown through wetlands need to account for as mechanize clearing, not temporary impact/hand clearing.

Site C-1:

Investigate reducing wetland impacts around PSH.

Site C-2:

Eric stated he would not require showing impacts to the pond. Matt will check with DWQ to see if still required.

Site C-6:

Consider using the standard outlet rip rap pad in the wetland versus the scour hole. Could reduce construction limits and impacts.

Site C-7:

Eric stated it needs to be noted on the plans to only fill enough of pond to address any safety issues. Since in wetland do not want to overfill.

Site C-9:

It was noted the pipe size was reduced to eliminate any channel work and thus impact. Although undersized, the additional backwater will be within R/W and will not impact the subgrade.

Site C-13:

It was decided the impact of the pipe extension could be reduced to 3m out from pipe extension.

Site C-14:

The parallel impact South of US 70 needs to be mechanized clearing instead of temporary fill.

At the box culvert inlet, it was decided the rip rap could be placed from the existing road shoulder. This would reduce impacts. Need to show mechanized clearing up to stream.

For pipe to be bore and jacked, need to show and account for impacts needed for equipment. Need 13m out from pipe and 6m wide for equipment access.

Site C-15:

Show mechanized clearing 3m out from pipe extensions.

Inside of –Y5- and –Y6-, show impact to wetland "wedge" mechanized clearing.

Site C-16:

Show mechanized clearing 3m out from top or bank.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

April 20, 2004

MEMORANDUM

TO: File

FROM: Drew Joyner, P.E., Project Manager
Project Development and Environmental Analysis Branch

SUBJECT: Clayton Bypass (TIP Project R-2552) Section 404/NEPA Merger Team Meeting for Concurrence Points 2A and 4A

A meeting of the Section 404/NEPA Merger Team for the Clayton Bypass was held on February 17, 2004 in the EIC Room in the Transportation Building to discuss Concurrence Points 2A and 4A. A list of attendees and updated impact tables are attached. The following are the substantive comments from the discussion:

Drew Joyner welcomed everyone to the meeting. Those in attendance introduced himself or herself. Drew began by discussing the Action Items identified during the August 14, 2003 Merger Team meeting.

- The first Action Item was the question of the NCDOT-funded Johnston County Watershed Administrator position. This position is part of NCDOT's involvement with a Section 7 consultation regarding rare mussels in the project watershed. Drew Joyner noted that NCDOT is committed to coordinating with Johnston County on this position, but that contact with county officials has not recently been made. Future negotiations on this issue may involve both Johnston and Wake Counties. Gary Jordan of the U.S. Fish and Wildlife Service (USFWS) said that he would like to see a history of the negotiations for this position.
- The next Action Item was correction of the label for the AB8 site on the rollplot. The correction has been made.
- Action Item 3 involved Sites AB11 (Ut to Swift Creek) and B16 (Ut to Little Creek), and whether they warranted bridging. The systems are low-quality, contain no mussels, and received low scores on the N.C. Division of Water Quality (DWQ) and the U.S. Army Corps of Engineers (USACE) stream and wetland forms. John Hennessy (DWQ) asked what agency people visited the sites. Matt Haney (NCDOT-ONE) replied that the sites were not visited, but that he had discussed the sites with Eric Alsmeyer (USACE), who saw no need to visit the sites for bridging issues. The original reason to visit these sites was to investigate mussel issues, which have been

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resolved. Site B16 was visited as a stream relocation and natural stream design issue, and is discussed further below.

- The next bridging issue was at Site C6 (Cooper Branch). Eric Alsmeyer, Gary Jordan, and Travis Wilson (NCWRC) visited the site. It was decided that the site would be bridged by a 200-foot bridge. Originally, a 150-foot bridge was planned, but 25 feet on each side has been added for wildlife crossings. Updated impact totals will be prepared to accompany the final meeting minutes. Eric Alsmeyer noted that there would still be impacts to low-quality wetlands. John Hennessy said that construction impacts also need to be recorded as impacts. In a discussion following the meeting, John agreed that stream buffers were not required at this site.
- The last Action Item involved a possible alignment shift between Sites B1 and B7 (Stations 73+00 to 92+00) to the north and out of the construction corridor to avoid some of the wetland/stream impacts. James Goodnight (NCDOT-Roadway) passed out a sheet comparing the costs, number of relocates, and stream impacts of the original and revised alignments. NCDOT's recommendation was to keep the original alignment, since the gain in stream preservation was not worth the cost and property relocations. John Hennessy agreed, since there were at least eight relocatees involved in the new alignment.

Drew Joyner next discussed design changes that had been made since the last meeting.

- The first change was the lengthening of the bridge over Austin Pond (Site AB4, L39+47 to 42+03). The change was necessary because Austin Pond has been repaired and has refilled. Ron Allen (NCDOT-Roadway) passed out a new drawing and displayed a new roll plot showing the new bridge and slope stake configurations. The new bridge lengths and station numbers are reflected in the 2A and 4A package tables. The amounts of stream and wetland impacts will remain at zero, and buffer impacts are now zero also.
- Matt Haney referred to his field notes and said that Sites B5, B6, and B16 (all Uts to Little Creek) had been visited in the field with Eric Alsmeyer. On Site B5 (Station L 78+90 to 81+70), no mitigation would be required, since the stream is intermittent. Natural stream design would not be favorable because the stream was at a headwater. At Site B6 (L 82+70 to 85+50), stream relocation and natural stream design was recommended. At Site B16 (Y11 REV 24+40 to 25+10), stream relocation was not recommended because the site was a beaver impoundment, and relocation of the stream would have drained the impoundment. The stream was to be culverted at this site. Drew Joyner asked if the impact tables would be changed. Matt Haney said that these calculations would be handled as part of the Concurrence Point 4B process.
- Site AB11 (Ut to Swift Creek) is off NC 42 near Ranch Road, at Station L 57+30. Jared Gray (NCDOT-ONE) noted that part of the stream channel flowed underground at this spot. The site was visited by John Hennessy and Eric Alsmeyer. Eric Alsmeyer said that a bridge would only be considered if mussels were present. John Hennessy looked over the DWQ and ACE stream and wetland forms and concurred that the stream, although perennial, did not need to be bridged. Jared Gray noted that cattle regularly use the stream in this area.

As there were no more comments on these issues, Drew Joyner presented the 2A and 4A concurrence sheets, which were signed by the agencies.

Next, Drew Joyner introduced discussion on Point 4B and 4C issues.

- John Hennessy asked if plans for the I-40 interchange had been finalized. Dewayne Sykes indicated the planning for this interchange on the roll plot.
- John Hennessy said that sediment and erosion control would be a huge issue since the project is in the Swift Creek watershed, although sediment and erosion is not usually a 4B/4C issue. He mentioned that dwarf wedge mussels had been found fairly high up on White Oak Creek.
- Drew Joyner said that NCDOT was working on the BA for the mussel issues, but that it may not be ready for the 4B meeting. The USFWS should attend the 4B meeting, to be held on April 21, to keep informed about the progress of the project.
- The USFWS is satisfied that all sites with the potential for endangered mussel populations have been surveyed. Jared Gray said that there is to be a meeting on March 2 with NCWRC and USFWS to discuss conservation measures for the BA.

Drew Joyner asked if there are any specific sites to focus on for the 4B meeting.

- John Hennessy said that it would be useful to know information about bridges such as type, construction techniques, materials, and the potential for a work bridge or causeway at each site. Two sites he mentioned were Austin Pond and a tributary to White Oak Creek in Section AA. Art McMillan (NCDOT-Highway Design) said that at this point we could discuss where bridge bents would go, span length, whether prestressed concrete would be used, and whether there would be a filled causeway or a work bridge. Jared Gray said that Little Creek is another system where construction techniques would need to be discussed.
- Travis Wilson asked if any curb and gutter construction is planned for the project. Steve Kendall (NCDOT-Roadway) replied that it had been removed from the Ranch Road area. Art McMillan said that there were instances of curb and gutter use on interchange loops, where it was used to stop erosion.
- Debbie Barbour (NCDOT-Preconstruction) asked if conservation measures for the dwarf wedge mussel were to be agreed to in the March meeting. Gary Jordan said that it would be a good idea to get conservation measures into the BA as soon as possible, to minimize take and to help form a biological opinion of May Affect, Not Likely to Adversely Affect.
- Eric Alsmeyer asked if service roads would be discussed during the 4B process. Art McMillan said that all service roads are already on the plans, and that no more are anticipated.
- John Hennessy asked about planning for utilities. Art McMillan said that more detailed utility plans would be available for the 4C process.
- Eric Alsmeyer asked if there were any major powerline relocations. Dewayne Sykes said that the communications tower at Sites B1-B7 had been avoided. Drew Joyner said that NCDOT would check to see if there were any more powerline impacts.

Attachments

cc: Attendees

Clayton Bypass (R-2552)
Section 404/NEPA Merger Team Meeting
Concurrence Points 2A and 4A
February 17, 2004
Attendees

Name	Organization
Sarah McBride	State Historic Preservation Office
John Hennessy	North Carolina Division of Water Quality
Christopher Militscher	US Environmental Protection Agency
Travis Wilson	North Carolina Wildlife Resources Commission
Gary Jordan	US Fish and Wildlife Service
Eric Alsmeyer	US Army Corp of Engineers
Ronald Lucas	Federal Highway Administration
Drew Joyner	NCDOT – Project Development and Environmental Analysis Branch (PDEA)
Derrick Weaver	NCDOT – PDEA
Debbie Barbour	NCDOT – Highway Design Branch
Terry Wyatt	NCDOT – Administrator's Office
Art McMillan	NCDOT – Roadway Design Unit
Dewayne Sykes	NCDOT – Roadway Design Unit
Glenn Mumford	NCDOT – Roadway Design Unit
Ron Allen	NCDOT – Roadway Design Unit
Jeffrey Teague	NCDOT – Roadway Design Unit
Steve Kendall	NCDOT – Roadway Design Unit
James Goodnight	NCDOT – Roadway Design Unit
Kevin Moore	NCDOT – Roadway Design Unit
Jason M. Davis	NCDOT – Hydraulics Unit
Andrew Nottingham	NCDOT – Hydraulics Unit
Marshall Clawson	NCDOT – Hydraulics Unit
Lonnie Brooks	NCDOT – Structure Design
Matt Haney	NCDOT – Office of Natural Environment
Jared Gray	NCDOT – Office of Natural Environment
Phillip Todd	NCDOT – Office of Natural Environment
Doug Taylor	NCDOT – Design Services Unit
Elizabeth Scherrer	EcoScience

Riparian Buffers Not Bridged

Table 5 contains a summary of riparian buffer areas contained within the construction limits (slope stakes plus 10-foot [3 meter] clear zone) and area not bridged. Impacts are calculated by using the 30- and 20-foot (9 and 6 meter) buffer zones.

Table 5 - Riparian Buffers Not Bridged

		Zone 1			Zone 2			Total		
Site	Buffers	Sq Ft	Acres	Hectares	Sq Ft	Acres	Hectares	Sq Ft	Acres	Hectares
AA1a	Ut to Swift Creek	1,368	0.031	0.0127	3,658	0.084	0.0340	5,026	0.116	0.0467
AA1b	Ut to Swift Creek	3,485	0.080	0.0324	3,621	0.083	0.0337	7,106	0.163	0.0661
AA3a	Ut to Swift Creek	3,093	0.071	0.0288	3,585	0.082	0.0333	6,678	0.154	0.0621
AA3b	Ut to Swift Creek	5,447	0.125	0.0507	4,618	0.106	0.0429	10,065	0.231	0.0936
AA4a	Ut to Swift Creek	3,977	0.091	0.0370	4,542	0.104	0.0422	8,519	0.196	0.0792
AA4b	Ut to Swift Creek	9,654	0.222	0.0898	6,103	0.140	0.0568	15,757	0.362	0.1465
AA5a	Ut to Swift Creek	12,998	0.299	0.1209	9,223	0.212	0.0858	22,221	0.511	0.2067
AA5b	Ut to Swift Creek	23,974	0.551	0.2230	14,197	0.327	0.1341	38,171	0.878	0.3550
AA9	Ut to Swift Creek	5,846	0.134	0.0544	3,728	0.086	0.0347	9,574	0.220	0.0890
AA10a		13,134	0.302	0.1221	5,604	0.129	0.0521	18,738	0.431	0.1743
AA10b	Ut to Swift Creek	2,587	0.060	0.0241	3,364	0.077	0.0313	6,221	0.143	0.0579
AA11	Ut to Swift Creek	20,054	0.460	0.1863	14,402	0.331	0.1338	34,456	0.791	0.3201
AA13a	Ut to Swift Creek	1,480	0.034	0.0138	2,725	0.063	0.0253	4,205	0.097	0.0391
AA13b	Ut to Swift Creek	3,111	0.072	0.0289	5,710	0.131	0.0531	8,821	0.203	0.0820
AA15a	Ut to Swift Creek	5,666	0.130	0.0527	3,808	0.088	0.0354	9,474	0.218	0.0881
AA15b	Ut to Swift Creek	6,430	0.148	0.0598	4,468	0.103	0.0416	10,898	0.251	0.1014
AA16		23,809	0.548	0.2214	15,499	0.356	0.1441	39,308	0.904	0.3656
AA18a	Ut to Swift Creek	25,124	0.578	0.2337	14,158	0.326	0.1317	39,282	0.903	0.3653
AA18b	Ut to Swift Creek	10,315	0.237	0.0959	6,597	0.152	0.0614	16,912	0.389	0.1573
AA19	Ut to Swift Creek	74	0.002	0.0007	3,307	0.076	0.0308	5,470	0.126	0.0509
AB2	Ut to White Oak Creek	16,799	0.386	0.1562	11,498	0.264	0.1069	13,198	0.304	0.1227
AB5c	Ut to White Oak Creek	28,610	0.658	0.2661	15,500	0.357	0.1442	44,110	1.015	0.4102
AB5d	Ut to White Oak Creek	34,546	0.795	0.3213	16,556	0.381	0.1540	51,102	1.175	0.4752
AB8	Ut to White Oak Creek	8,139	0.187	0.0757	5,534	0.127	0.0515	13,673	0.314	0.1272
AB11	Ut to Swift Creek	20,286	0.467	0.1887	14,594	0.336	0.1357	34,880	0.802	0.3244
B1	Ut to Swift Creek	11,617	0.267	0.1080	9,127	0.210	0.0849	20,744	0.477	0.1929
B2	Ut to Swift Creek	16,628	0.382	0.1546	13,054	0.300	0.1214	29,682	0.683	0.2760
B4	Ut to Swift Creek	28,565	0.657	0.2657	21,337	0.491	0.1984	49,902	1.148	0.4641
B5	Ut to Little Creek	39,604	0.911	0.3683	30,667	0.705	0.2852	70,271	1.616	0.6535
B6	Ut to Little Creek	51,824	1.192	0.4820	39,663	0.912	0.3686	91,487	2.104	0.8508
B7	Ut to Little Creek	17,890	0.411	0.1664	11,034	0.254	0.1026	28,924	0.665	0.2690
B9	Ut to Little Creek	1,134	0.026	0.0105	2,069	0.048	0.0192	3,203	0.074	0.0298
B12	Ut to Little Creek	20,985	0.483	0.1952	15,434	0.355	0.1435	36,419	0.838	0.3387
B13	Little Creek	7,555	0.174	0.0703	5,795	0.133	0.0539	13,350	0.307	0.1242
B14	Ut to Little Creek	12,395	0.285	0.1153	5,493	0.126	0.0511	17,888	0.411	0.1664
B16	Ut to Little Creek	24,983	0.575	0.2323	15,042	0.346	0.1399	40,025	0.921	0.3722
C1	Little Creek	9,472	0.218	0.0881	12,951	0.298	0.1204	22,423	0.516	0.2085
C4	Ut to Little Creek	2,016	0.046	0.0187	1,017	0.023	0.0095	3,033	0.070	0.0282
C5	Ut to Little Creek	14,403	0.331	0.1339	16,769	0.386	0.1560	31,172	0.717	0.2899
C6	Cooper Branch	15,273	0.351	0.1420	16,980	0.391	0.1579	32,253	0.742	0.3000
C9		0	0.000	0.0000	1,097	0.025	0.0102	1,097	0.025	0.0102
C10	Ut to Reedy Branch	1,024	0.024	0.0095	1,503	0.035	0.0140	2,527	0.058	0.0235
C13		0	0.000	0.0000	2,469	0.057	0.0235	2,469	0.057	0.0230
C14	Reedy Branch	1,161	0.027	0.0108	4,899	0.113	0.0456	6,060	0.139	0.0564
C16	Reedy Branch	4,056	0.093	0.0377	2,452	0.056	0.0228	6,508	0.150	0.0605
	Totals	**571,451**	**13.141**	**5.3144**	**428,736**	**9.861**	**3.9896**	**987,447**	**22.710**	**9.1829**

Riparian Buffers Bridged

Table 6 contains a summary of riparian buffer areas that fall beneath the proposed bridges. Impacts are calculated by using the 50-foot (15 meter) buffer zones and the width of the proposed bridges.

Table 6 - Riparian Buffers Bridged										
		Zone 1			Zone 2			Total		
Site	Buffers	Sq Ft	Acres	Ha	Sq Ft	Acres	Ha	Sq Ft	Acres	Ha
AA10b	Ut to Swift Creek	5,702	0.1311	0.0530	2,492	0.0573	0.0232	8,194	0.1885	0.0762
AA14	Ut to Swift Creek	6,180	0.1419	0.0574	4,120	0.0946	0.0383	10,300	0.2365	0.0957
AB4	White Oak Creek / Austin Pond	19,820	0.4561	0.1843	15,925	0.3667	0.1482	35,745	0.8218	0.3324
B13	Ut to Little Creek	1,980	0.0455	0.0184	1,320	0.0304	0.0123	3,300	0.0759	0.0307
C1	Little Creek	11,248	0.2587	0.1046	1,453	0.0334	0.0135	12,701	0.2921	0.1181
	Totals	**44,070**	**1.0133**	**0.4097**	**22,025**	**0.5064**	**0.2049**	**66,095**	**1.5198**	**0.6146**

DRAFT 10/13/04

North Carolina Department of Transportation

Roadside Environmental Unit

September 27, 2004

PROJECT: R-2552 AA
COUNTY: WAKE/JOHNSTON
DESCRIPTION: Clayton bypass from I-40 to east of SR 1525 (Cornwallis Road)

SUBJECT: Erosion and Sedimentation Control Design and Implementation Plan for R-2552AA Clayton Bypass

A meeting was held on September 24, 2004 to review the erosion and sedimentation control plan for the R-2552 AA project. It was requested from that meeting that the Department of Transportation takes additional steps to ensure the protection of the threatened and endangered species located in Swift Creek. The Department agreed to provide the following.

Erosion and Sedimentation Control Design Criteria:

- Basins will be designed to meet the surface area requirement for the peak runoff event for a 25-year storm.
- Basins located at critical discharge points on the project will utilize the Faircloth Skimmer with jute baffles and polyacrylamides to improve settling efficiency.
- Exposed areas located adjacent to critical areas will utilize erosion control matting to assist in stabilization.
- Erosion control matting will be utilized in ditchlines to reduce accelerated erosion.

Water Quality Monitoring Proposal:

The North Carolina Department of Transportation proposes to construct R-2552 AA (Clayton Bypass from I-40 to east of SR 1525) which will be located in the Swift Creek watershed. The Swift Creek Watershed is currently the habitat for a threatened and endangered aquatic species. In order to ensure that the species is protect the Department of Transportation will initiate a water quality monitoring program to quickly and effectively identify the sources of sediment discharges to Swift Creek from R-2552AA construction activities so that corrective actions can be quickly implemented and water quality degradation minimized

A consultant will be scoped to install and maintain an automated water sampling system that will measure turbidity levels in Swift Creek. Monitoring stations will be located throughout the project to adequately measure the upstream and downstream water quality. An observation period will occur prior to construction where acceptable background turbidity levels will be established. Once construction begins the consultant will monitor and notify the Department when established thresholds are exceeded or changes in upstream and downstream readings exceed water quality standards.

When a threshold level is exceeded the consultant will coordinate with project personnel to investigate the reason for the increased turbidity levels. All occurrences will be documented identifying the cause and correction taken. All records will be made available for the regulatory agency review.

Seeding and Mulching Special Provision:

The contractor will provide the necessary means to ensure that all seeding and mulching operations will be conducted on a weekly basis until the project is complete. All exposed areas located throughout the project that are not graded in a continuous manner will be stabilized weekly. This includes but is not limited to all spoil material, fill slopes, cut slopes, shoulders, medians, borrow pits, and waste pits. Seeding and mulching will be performed in such a manner as to ensure

that all exposed erodible areas are protected from storm events. Failure to comply with this provision will result in an immediate project shutdown until corrective actions occur.

Erosion and Sedimentation Control Inspection and Oversight:

The Department of Transportation will designate an inspector that will inspect the erosion and sedimentation control devices on a daily basis to ensure that the contractor is implementing the erosion and sedimentation control plan. The Roadside Environmental Unit will provide oversight on a weekly basis to ensure that the project is in compliance with the Sedimentation Pollution Control Act.

Clearing Limits:

The Department of Transportation will note the clearing limits on the project plan sheets to prevent any confusion on what can and can not be cleared.

Hazardous Spill Basin Construction Phasing:

The Department of Transportation will utilize temporary sediment traps during the installation of the Hazardous Spill Basins along I-40 to ensure that sediment laden runoff is not transported off site. Once the Hazardous Spill Basins are installed then the contractor will utilize a Faircloth Skimmer to dewater the basin. Upon completion of the project the basin will have accumulated sediment and the skimmer removed to allow for the proper function of the Hazardous Spill Basin.

Polyacrylamides:

The Department of Transportation will utilize polyacrylamides in conjunction with the Faircloth skimmer to help reduce turbidity.