STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

November 5, 2008

U. S. Army Corps of Engineers
3331 Heritage Trace Drive, Suite 105
Wake Forest, NC 27587

ATTN: Mr. Eric Alsmeyer
NCDOT Coordinator

Subject: **Application for Section 404 Nationwide Permit 23, Nationwide Permit 13, Section 401 Water Quality Certification, Isolated Wetland Permit and Neuse Buffer Authorization** for the proposed improvements to SR 1959 (South Miami Boulevard) from South of SR 2112 (Methodist Street) to North of SR 1960 (Bethesda Avenue) in Durham County, Federal Aid Project No. STP-1959 (2); WBS 40221.1.1; Division 5; TIP No. U-4011.

$240.00 debit from WBS 40221.1.1

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to widen SR 1959 (South Miami Boulevard) from south of SR 2112 (Methodist Street) to north of SR 1960 (Bethesda Avenue). There will be 71 feet of permanent stream impacts. Of the 71 feet of permanent stream impacts, there will be 10 feet of impacts for bank stabilization. There will be 11 feet of temporary stream impacts to Stirrup Iron Creek. There will be 4393 ft^2 of allowable Zone 1 buffer impacts and 2520 ft^2 of allowable Zone 2 buffer impacts.

Please see the enclosed copies of the pre-construction notification, permit drawings, and design plans. A Categorical Exclusion (CE) was completed for this project in June 2007 and distributed shortly thereafter. Additional copies are available upon request.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

TELEPHONE: 919-715-1500
FAX: 919-715-1501
WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD
PLB SUITE 240
RALEIGH NC 27604

The project Let date is August 18, 2009 with a review date of July 7, 2009.

A copy of this permit application will be posted on the NCDOT Website at: http://www.ncdot.org/doh/preconstruct/pe/. If you have any questions or need additional information, please call Sara Easterly at (919) 715-5499.

Sincerely,

E. L. Fluck

for Gregory J. Thorpe, Ph.D.
Environmental Management Director,

PDEA

w/attachment

Mr. Brian Wrenn, NCDWQ (5 Copies)
Mr. J. Wally Bowman, PE., Division Engineer
Mr. Chris Murray, DEO

W/o attachment (see website for attachments)

Dr. David Chang, P.E., Hydraulics
Mr. Mark Staley, Roadside Environmental Unit
Mr. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Mr. Gary Jordan, USFWS
Mr. Travis Wilson, NCWRC
Mr. Steve Brown, PDEA

Office Use Only: Form Version March 05

USACE Action ID No. _____ **DWQ No.** _____

(If any particular item is not applicable to this project, please enter "Not Applicable" or "N/A".)

I. Processing

1. Check all of the approval(s) requested for this project:
   - ☒ Section 404 Permit
   - ☐ Section 10 Permit
   - ☒ 401 Water Quality Certification
   - ☒ Riparian or Watershed Buffer Rules
   - ☒ Isolated Wetland Permit from DWQ
   - ☐ Express 401 Water Quality Certification

2. Nationwide, Regional or General Permit Number(s) Requested: 13, 23

3. If this notification is solely a courtesy copy because written approval for the 401 Certification is not required, check here: ☐

4. If payment into the North Carolina Ecosystem Enhancement Program (NCEEP) is proposed for mitigation of impacts, attach the acceptance letter from NCEEP, complete section VIII, and check here: ☐

5. If your project is located in any of North Carolina's twenty coastal counties (listed on page 4), and the project is within a North Carolina Division of Coastal Management Area of Environmental Concern (see the top of page 2 for further details), check here: ☐

II. Applicant Information

1. Owner/Applicant Information
   Name: Gregory J. Thorpe, Ph.D., Environmental Management Director
   Mailing Address: North Carolina Department of Transportation
   1598 Mail Service Center, Raleigh, NC 27699

   Telephone Number: 919-733-3141 Fax Number: 919-715-5501
   E-mail Address: _____

2. Agent/Consultant Information (A signed and dated copy of the Agent Authorization letter must be attached if the Agent has signatory authority for the owner/applicant.)
   Name: _____
   Company Affiliation: _____
   Mailing Address: _____

   Telephone Number: _____ Fax Number: _____
   E-mail Address: _____

III. Project Information

Attach a **vicinity map** clearly showing the location of the property with respect to local landmarks such as towns, rivers, and roads. Also provide a detailed **site plan** showing property boundaries and development plans in relation to surrounding properties. Both the vicinity map and site plan must include a scale and north arrow. The specific footprints of all buildings, impervious surfaces, or other facilities must be included. If possible, the maps and plans should include the appropriate USGS Topographic Quad Map and NRCS Soil Survey with the property boundaries outlined. Plan drawings, or other maps may be included at the applicant's discretion, so long as the property is clearly defined. For administrative and distribution purposes, the USACE requires information to be submitted on sheets no larger than 11 by 17-inch format; however, DWQ may accept paperwork of any size. DWQ prefers full-size construction drawings rather than a sequential sheet version of the full-size plans. If full-size plans are reduced to a small scale such that the final version is illegible, the applicant will be informed that the project has been placed on hold until decipherable maps are provided.

1. Name of project: Improve SR 1959 (South Miami Boulevard) from south of SR 2112 (Methodist Street) to north of SR 1960 (Bethesda Avenue).

2. T.I.P. Project Number or State Project Number (NCDOT Only): U-4011

3. Property Identification Number (Tax PIN): _____

4. Location
   County: Durham Nearest Town: Durham
   Subdivision name (include phase/lot number): _____
   Directions to site (include road numbers/names, landmarks, etc.): Highway 70 towards Durham. Turn left onto Miami Boulevard.

5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
   Decimal Degrees (6 digits minimum): 35.9522 °N -78.8358 °W

6. Property size (acres): Project Area is approximately 0.7 miles.

7. Name of nearest receiving body of water: Stirrup Iron Creek

8. River Basin: Neuse (HUC 03030201)
   (Note – this must be one of North Carolina's seventeen designated major river basins. The River Basin map is available at http://h2o.enr.state.nc.us/admin/maps/.)

9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: Residential and commercial.

10. Describe the overall project in detail, including the type of equipment to be used:
The project will widen SR 1959 (South Miami Boulevard) from south of SR 2112 (Methodist Street) to north of SR 1960 (Bethesda Avenue). Heavy duty excavation equipment will be used such as trucks, dozers, and other equipment necessary for roadway construction.

Explain the purpose of the proposed work: The purpose of the project is to improve the operational effectiveness of SR 1959 (South Miami Boulevard) and the intersection with SR 1954 (Ellis Road), and improve safety for motorists, pedestrians, and bicyclists in the project area.

IV. Prior Project History

If jurisdictional determinations and/or permits have been requested and/or obtained for this project (including all prior phases of the same subdivision) in the past, please explain. Include the USACE Action ID Number, DWQ Project Number, application date, and date permits and certifications were issued or withdrawn. Provide photocopies of previously issued permits, certifications or other useful information. Describe previously approved wetland, stream and buffer impacts, along with associated mitigation (where applicable). If this is a NCDOT project, list and describe permits issued for prior segments of the same T.I.P. project, along with construction schedules.

Mr. Eric Alsmeyer of the USACE visited the project area to assess jurisdictional areas on November 2, 2006. One isolated wetland was found within the project area. No formal Jurisdictional Determination was given for the project.

V. Future Project Plans

Are any future permit requests anticipated for this project? If so, describe the anticipated work, and provide justification for the exclusion of this work from the current application.
N/A

VI. Proposed Impacts to Waters of the United States/Waters of the State

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to wetlands, open water, and stream channels associated with the project. Each impact must be listed separately in the tables below (e.g., culvert installation should be listed separately from riprap dissipater pads). Be sure to indicate if an impact is temporary. All proposed impacts, permanent and temporary, must be listed, and must be labeled and clearly identifiable on an accompanying site plan. All wetlands and waters, and all streams (intermittent and perennial) should be shown on a delineation map, whether or not impacts are proposed to these systems. Wetland and stream evaluation and delineation forms should be included as appropriate. Photographs may be included at the applicant's discretion. If this proposed impact is strictly for wetland or stream mitigation, list and describe the impact in Section VIII below. If additional space is needed for listing or description, please attach a separate sheet.

1. Provide a written description of the proposed impacts:

Permanent Impacts: There will be <0.01 acres of permanent impacts due to mechanized clearing in one isolated wetland. There will also be <0.01 acres of permanent fill in the same isolated wetland. Isolated wetland impacts are <0.02 acres. There will be 61 linear feet of permanent surface water impacts to Stirrup Iron Creek due to the installation of a 30 inch pipe to direct it under Miami Boulevard. There will be 10 feet of permanent impacts for the placement of rip rap along the outlet of the pipe for bank stabilization. The rip rap will not result in loss of Waters of the United States.

Temporary Impacts: There will be 11 linear feet of temporary impacts to Stirrup Iron Creek. There will be <0.01 acre of temporary fill placed in Stirrup Creek due to the placement of the 30 inch pipe and the rip-rap discussed in the previous section.

Utility Impacts: There will be no utility impacts to jurisdictional resources within the project area.

2. Individually list wetland impacts. Types of impacts include, but are not limited to mechanized clearing, grading, fill, excavation, flooding, ditching/drainage, etc. For dams, separately list impacts due to both structure and flooding.

Wetland Impact Site Number (indicate on map)	Type of Impact	Type of Wetland (e.g., forested, marsh, herbaceous, bog, etc.)	Located within 100-year Floodplain (yes/no)	Distance to Nearest Stream (linear feet)	Area of Impact (acres)
Site 1	Mechanized clearing	herbaceous	no	1,661	<0.01
Site 1	Permanent fill	herbaceous	no	1,661	<0.01
Total Wetland Impact (acres)					<0.02

3. List the total acreage (estimated) of all existing wetlands on the property: <0.02 acres

4. Individually list all intermittent and perennial stream impacts. Be sure to identify temporary impacts. Stream impacts include, but are not limited to placement of fill or culverts, dam construction, flooding, relocation, stabilization activities (e.g., cement walls, rip-rap, crib walls, gabions, etc.), excavation, ditching/straightening, etc. If stream relocation is proposed, plans and profiles showing the linear footprint for both the original and relocated streams must be included. To calculate acreage, multiply length X width, then divide by 43,560.

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
Site 2	Stirrup Iron Creek	Permanent fill	Perennial	4 ft	61	0.01
Site 2	Stirrup Iron Creek	Bank stabilization	Perennial	4 ft	10	<0.01
Site 2	Stirrup Iron Creek	Temporary fill	Perennial	4 ft	11	<0.01
Total Stream Impact (by length and acreage)					82	<0.03

5. Individually list all open water impacts (including lakes, ponds, estuaries, sounds, Atlantic Ocean and any other water of the U.S.). Open water impacts include, but are not limited to fill, excavation, dredging, flooding, drainage, bulkheads, etc.

Open Water Impact Site Number (indicate on map)	Name of Waterbody (if applicable)	Type of Impact	Type of Waterbody (lake, pond, estuary, sound, bay, ocean, etc.)	Area of Impact (acres)
Total Open Water Impact (acres)				0

6. List the cumulative impact to all Waters of the U.S. resulting from the project:

Stream Impact (acres):	<0.03
Wetland Impact (acres):	<0.02
Open Water Impact (acres):	0
Total Impact to Waters of the U.S. (acres)	<0.05
Total Stream Impact (linear feet):	82

7. Isolated Waters
Do any isolated waters exist on the property? ☒ Yes ☐ No
Describe all impacts to isolated waters, and include the type of water (wetland or stream) and the size of the proposed impact (acres or linear feet). Please note that this section only applies to waters that have specifically been determined to be isolated by the USACE.
There will be <0.02 acres of impacts to isolated wetland due to permanent fill and mechanized clearing.

8. Pond Creation
If construction of a pond is proposed, associated wetland and stream impacts should be included above in the wetland and stream impact sections. Also, the proposed pond should be described here and illustrated on any maps included with this application.
Pond to be created in (check all that apply): ☐ uplands ☐ stream ☐ wetlands
Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.):_____
Proposed use or purpose of pond (e.g., livestock watering, irrigation, aesthetic, trout pond, local stormwater requirement, etc.):_____
Current land use in the vicinity of the pond:_____
Size of watershed draining to pond:_____ Expected pond surface area:_____

VII. Impact Justification (Avoidance and Minimization)

Specifically describe measures taken to avoid the proposed impacts. It may be useful to provide information related to site constraints such as topography, building ordinances, accessibility, and financial viability of the project. The applicant may attach drawings of alternative, lower-impact site layouts, and explain why these design options were not

feasible. Also discuss how impacts were minimized once the desired site plan was developed. If applicable, discuss construction techniques to be followed during construction to reduce impacts.

- Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of stringent erosion control schedule and use of Best Management Practices (BMPs).
- Two preformed scour holes will be located north and south of Stirrup Iron creek.

VIII. Mitigation

DWQ - In accordance with 15A NCAC 2H .0500, mitigation may be required by the NC Division of Water Quality for projects involving greater than or equal to one acre of impacts to freshwater wetlands or greater than or equal to 150 linear feet of total impacts to perennial streams.

USACE – In accordance with the Final Notice of Issuance and Modification of Nationwide Permits, published in the Federal Register on January 15, 2002, mitigation will be required when necessary to ensure that adverse effects to the aquatic environment are minimal. Factors including size and type of proposed impact and function and relative value of the impacted aquatic resource will be considered in determining acceptability of appropriate and practicable mitigation as proposed. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland and/or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferable in the same watershed.

If mitigation is required for this project, a copy of the mitigation plan must be attached in order for USACE or DWQ to consider the application complete for processing. Any application lacking a required mitigation plan or NCEEP concurrence shall be placed on hold as incomplete. An applicant may also choose to review the current guidelines for stream restoration in DWQ's Draft Technical Guide for Stream Work in North Carolina (see DWQ website for most current version.).

1. Provide a brief description of the proposed mitigation plan. The description should provide as much information as possible, including, but not limited to: site location (attach directions and/or map, if offsite), affected stream and river basin, type and amount (acreage/linear feet) of mitigation proposed (restoration, enhancement, creation, or preservation), a plan view, preservation mechanism (e.g., deed restrictions, conservation easement, etc.), and a description of the current site conditions and proposed method of construction. Please attach a separate sheet if more space is needed.

No mitigation is proposed for the isolated wetland. The section of Stirrup Iron Creek being impacted by the installation of the 30 inch pipe exhibited poor stream quality. The only macroinvertebrates found during inspection of the stream were amphipods. This section of the stream is highly influenced from stormwater runoff from South Miami Boulevard and the residential development found on the west side of South Mimi Boulevard. Therefore, NCDOT

proposes a mitigation ratio of 1:1. The stream impacts of 61 feet will be mitigated by the NCDOT using the Jeffreys Warehouse Mitigation Site. The Jeffreys Warehouse Mitigation Site was originally constructed as on-site mitigation for R-1030 US 117 from south of NC 581 in Goldsboro to the US 264 Bypass in Wilson. There are two parcels associated with this mitigation site. The west parcel (approximately 50.2 acres) is bounded on the northwest by the Little River and on the southeast by the US 117 right-of-way. The east parcel (approximately 37.5 acres) is bounded on the northwest by the US 117 right-of-way, on the northeast by a Wayne County Board of Education school bus maintenance shop, and on the east and southeast by private property. The site was constructed in 2006 and has undergone two year of successful hydrologic and vegetative monitoring.

To offset the unavoidable 61 L.F. of stream impacts associated with T.I.P. U-4011 the Jeffreys Warehouse Mitigation Site will be debited 61 L.F. of stream restoration. These debits are reflected in the table below.

Site Name	Site TIP	HUC	River Basin	Division	County
Jefferey's Warehouse (JALO)	**R-1030AA**	**3020201**	**Neuse**	**4**	**Wayne**

Mitigation Type	As Built Quantity	Available	Debit B-3528	Debit B-4300
Stream Restoration	3,731	3,193	452(226@2:1)	
Riverine Wetland Restoration	3.66	2.74		
Non-Riverine Wetland Restoration	23.02	23.02		
Riverine Wetland Preservation	12.36	12.36		
Neuse Buffer Restoration	689,607	466,528	75,577	40,075

Debit R-2719A	Debit B-4592	Debit B-4304	Debit U-3344 A	Debit U-4011
			25	61
		0.92		
41,818	16,398	3,653	45,558	

The stream banks at the end of the 30 inch pipe will be armored with rip-rap for bank stabilization. This will result in 10 feet of stream impact. Bank stabilization is provided to prevent erosion and does not constitute loss of Waters of the U.S., and therefore no mitigation is proposed for impacts resulting from bank stabilization.

2. Mitigation may also be made by payment into the North Carolina Ecosystem Enhancement Program (NCEEP). Please note it is the applicant's responsibility to contact the NCEEP at (919) 715-0476 to determine availability, and written approval from the NCEEP indicating that they are will to accept payment for the mitigation must be attached to this form. For additional information regarding the application process for the NCEEP, check the NCEEP website at http://www.nceep.net/pages/inlieureplace.htm. If use of the NCEEP is proposed, please check the appropriate box on page five and provide the following information:

Amount of stream mitigation requested (linear feet): 0
Amount of buffer mitigation requested (square feet): 0
Amount of Riparian wetland mitigation requested (acres): 0
Amount of Non-riparian wetland mitigation requested (acres): 0
Amount of Coastal wetland mitigation requested (acres): 0

IX. Environmental Documentation (required by DWQ)

1. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land? Yes ☒ No ☐

2. If yes, does the project require preparation of an environmental document pursuant to the requirements of the National or North Carolina Environmental Policy Act (NEPA/SEPA)? Note: If you are not sure whether a NEPA/SEPA document is required, call the SEPA coordinator at (919) 733-5083 to review current thresholds for environmental documentation. Yes ☒ No ☐

3. If yes, has the document review been finalized by the State Clearinghouse? If so, please attach a copy of the NEPA or SEPA final approval letter. Yes ☒ No ☐

X. Proposed Impacts on Riparian and Watershed Buffers (required by DWQ)

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to required state and local buffers associated with the project. The applicant must also provide justification for these impacts in Section VII above. All proposed impacts must be listed herein, and must be clearly identifiable on the accompanying site plan. All buffers must be shown on a map, whether or not impacts are proposed to the buffers. Correspondence from the DWQ Regional Office may be included as appropriate. Photographs may also be included at the applicant's discretion.

1. Will the project impact protected riparian buffers identified within 15A NCAC 2B .0233 (Neuse), 15A NCAC 2B .0259 (Tar-Pamlico), 15A NCAC 02B .0243 (Catawba) 15A NCAC 2B .0250 (Randleman Rules and Water Supply Buffer Requirements), or other (please identify) Neuse Yes☒ No ☐

2. If "yes", identify the square feet and acreage of impact to each zone of the riparian buffers. If buffer mitigation is required calculate the required amount of mitigation by applying the buffer multipliers.

Zone*	Impact (square feet)	Multiplier	Required Mitigation
1	4393	3 (2 for Catawba)	0
2	2520	1.5	0
Total	6913		0

* Zone 1 extends out 30 feet perpendicular from the top of the near bank of channel; Zone 2 extends an additional 20 feet from the edge of Zone 1.

3. If buffer mitigation is required, please discuss what type of mitigation is proposed (i.e., Donation of Property, Riparian Buffer Restoration / Enhancement, or Payment into the Riparian Buffer Restoration Fund). Please attach all appropriate information as identified within 15A NCAC 2B .0242 or .0244, or .0260. Buffer mitigation is not required. Impacts are allowable because they are under the threshold.

XI. Stormwater (required by DWQ)

Describe impervious acreage (existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property. If percent impervious surface exceeds 20%, please provide calculations demonstrating total proposed impervious level. N/A

XII. Sewage Disposal (required by DWQ)

Clearly detail the ultimate treatment methods and disposition (non-discharge or discharge) of wastewater generated from the proposed project, or available capacity of the subject facility.
N/A

XIII. Violations (required by DWQ)

Is this site in violation of DWQ Wetland Rules (15A NCAC 2H .0500) or any Buffer Rules?
Yes ☐ No ☒

Is this an after-the-fact permit application? Yes ☐ No ☒

XIV. Cumulative Impacts (required by DWQ)

Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes ☐ No ☒
If yes, please submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent North Carolina Division of Water Quality policy posted on our website at http://h2o.enr.state.nc.us/ncwetlands. If no, please provide a short narrative description:

XV. Other Circumstances (Optional):

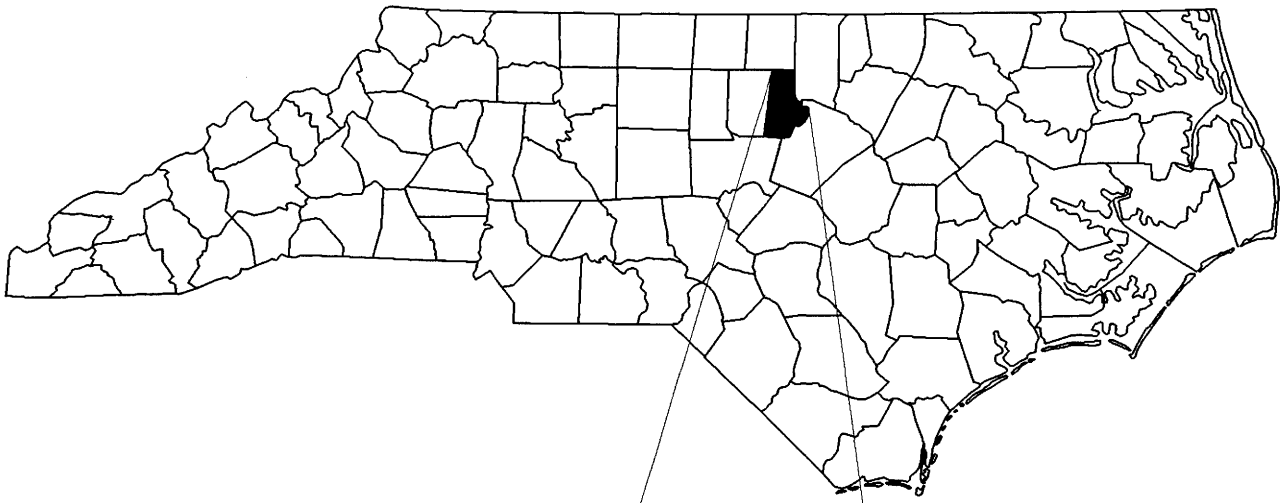
It is the applicant's responsibility to submit the application sufficiently in advance of desired construction dates to allow processing time for these permits. However, an applicant may choose to list constraints associated with construction or sequencing that may impose limits on work schedules (e.g., draw-down schedules for lakes, dates associated with Endangered and Threatened Species, accessibility problems, or other issues outside of the applicant's control).

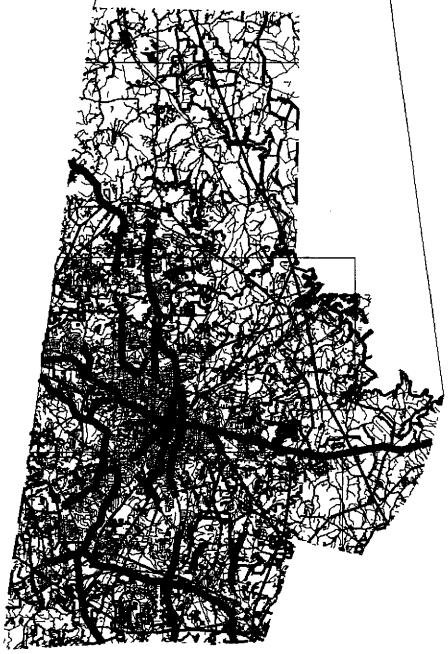
A biological conclusion of "No Effect" was given in the CE for smooth coneflower and Michaux's sumac. Marginal habitat is located within the project area, however no specimens were observed during surveys conducted on August 8, 2005 and June 6, 2008. A biological conclusion of "No Effect" remains valid for Michaux's sumac and the smooth coneflower. North Carolina Natural Heritage Program (NCNHP) documents no occurrences of Michaux's or smooth coneflower within 1.0 miles of the project area.

E. L. Luck 11.5.08

Applicant/Agent's Signature **Date**

(Agent's signature is valid only if an authorization letter from the applicant is provided.)





WETLAND AND SURFACE WATER

VICINITY MAPS

NCDOT

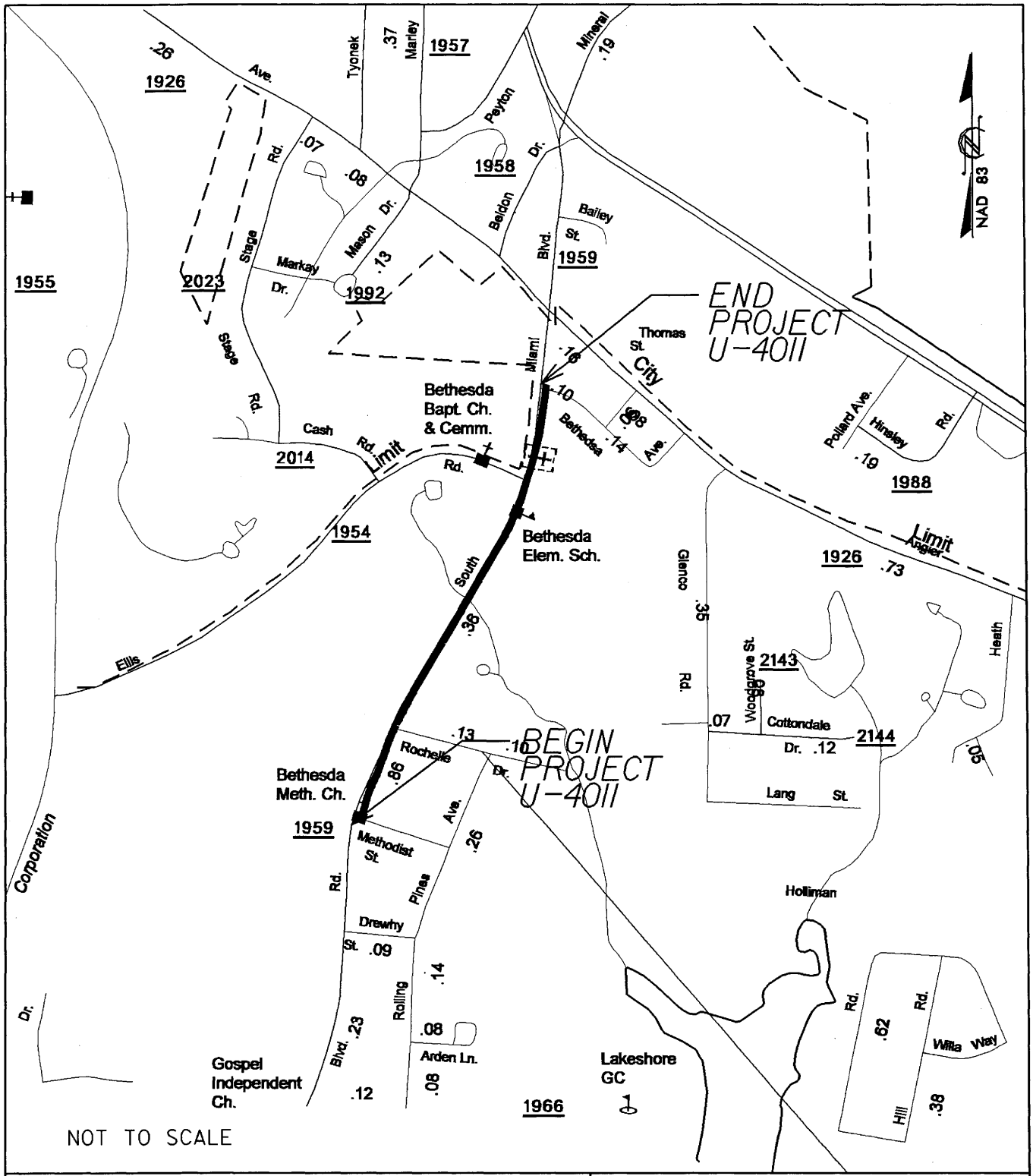
DIVISION OF HIGHWAYS

DURHAM COUNTY

PROJECT: 40221.1.1 (U-4011)

SR 1959 (S. MIAMI BLVD) FROM SOUTH OF SR 2112 (METHODIST ST) TO NORTH OF SR 1960 (BETHESDA AVE)

SHEET 1 OF 11 **9/17/08**



WETLAND AND SURFACE WATER

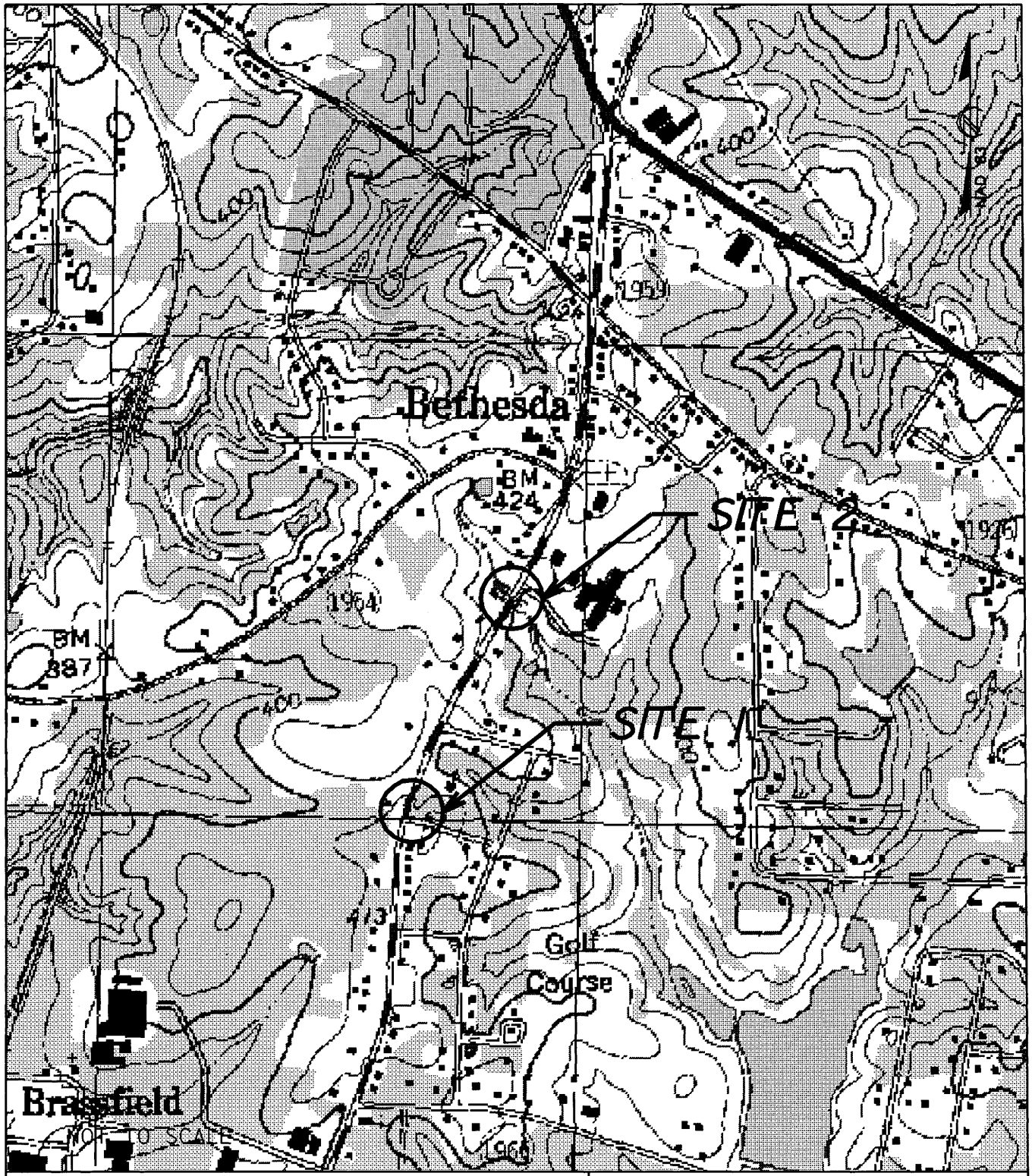
VICINITY MAPS

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
DURHAM COUNTY

PROJECT: 40221.1.1 (U4011)

SR 1959 (S. MIAMI BLVD) FROM S. OF SR 2112 (METHODIST ST) TO N. OF SR 1960 (BETHESDA AVE)

SHEET 2 OF 11



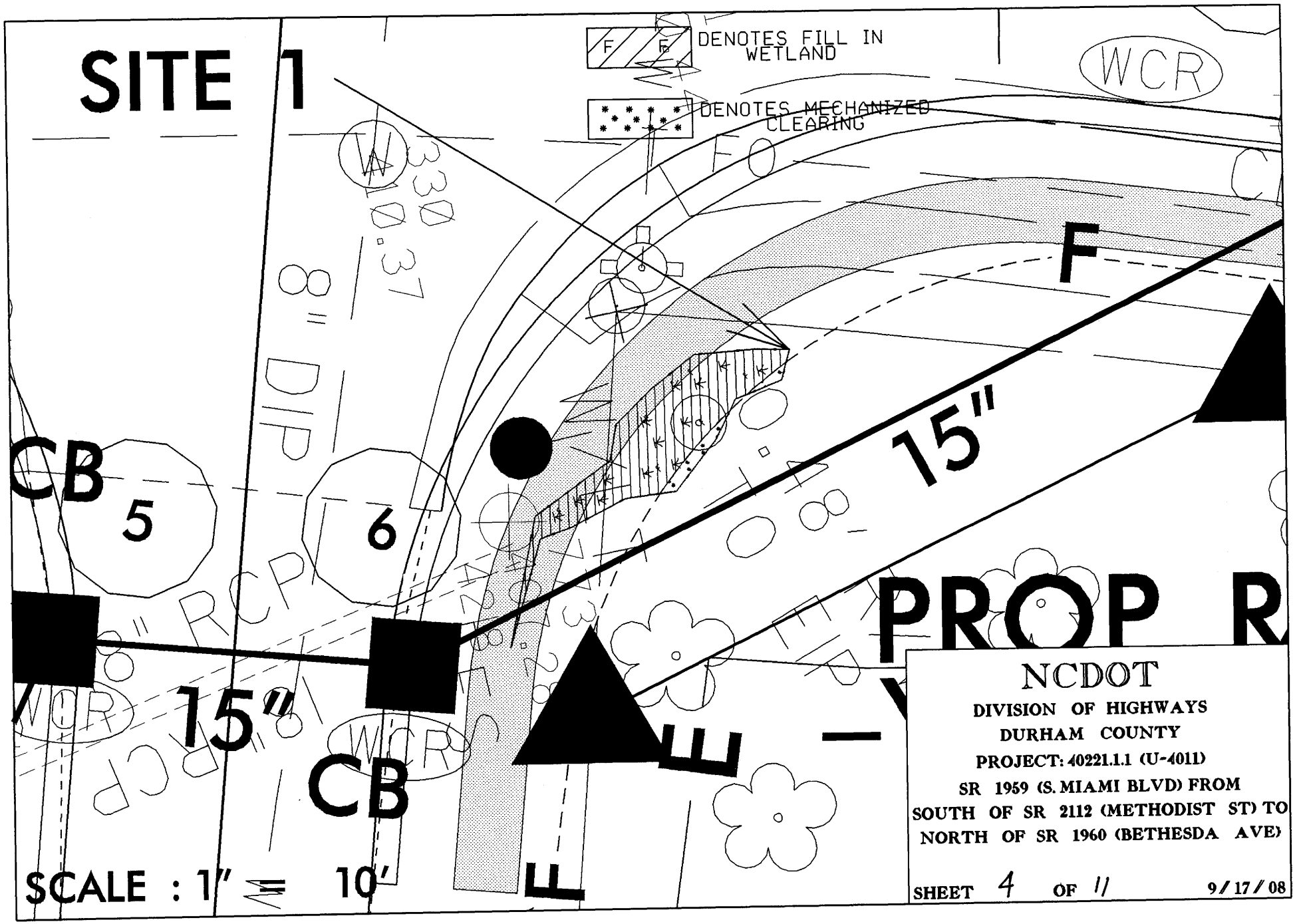
WETLAND AND SURFACE WATER

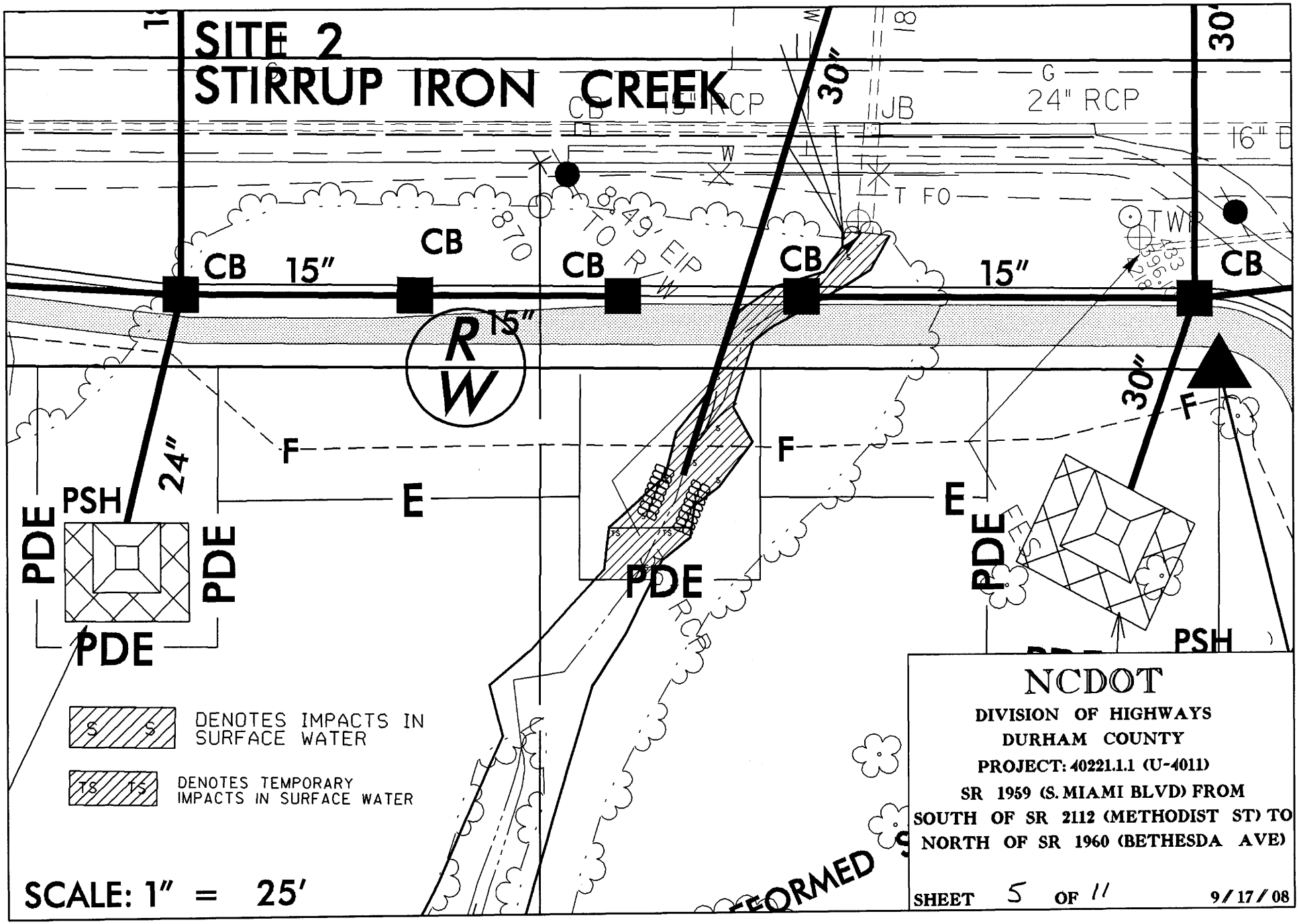
VICINITY MAPS

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
DURHAM COUNTY

PROJECT: 40221.1.1 (U4011)

SR 1959 (S. MIAMI BLVD) FROM
S. OF SR 2112 (METHODIST ST) TO
N. OF SR 1960 (BETHESDA AVE)
SHEET 3 OF 11


SITE 1
F F DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
WCR
CB
5
6
15"
CB
15"
PROP R
SCALE : 1" = 10'
NCDOT
DIVISION OF HIGHWAYS
DURHAM COUNTY
PROJECT: 40221.1.1 (U-4011)
SR 1959 (S. MIAMI BLVD) FROM
SOUTH OF SR 2112 (METHODIST ST) TO
NORTH OF SR 1960 (BETHESDA AVE)
SHEET 4 OF 11
9/17/08


SITE 2
STIRRUP IRON CREEK
CB
15" RCP
30"
24" RCP
16"
T FO
TWP
CB
15"
CB
CB
CB
15"
CB
870
849
TO R/W
EIP
R/W
15"
30"
F
F
F
E
E
24"
PSH
PDE
PDE
PDE
PDE
PDE
PSH
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
SCALE: 1" = 25'
NCDOT
DIVISION OF HIGHWAYS
DURHAM COUNTY
PROJECT: 40221.1.1 (U-4011)
SR 1959 (S. MIAMI BLVD) FROM
SOUTH OF SR 2112 (METHODIST ST) TO
NORTH OF SR 1960 (BETHESDA AVE)
SHEET 5 OF 11
9/17/08

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	12+52 - 12+77 -Y-		<0.01			<0.01						
2	36+76 - 37+18 -L-	30" RCP						0.01		61		
	36+76 - 37+18 -L-	Channel Stab.								10		
	36+64 - 36+91 -L-								<0.01		11	
TOTALS:			<0.01			<0.01		0.01	<0.01	71	11	

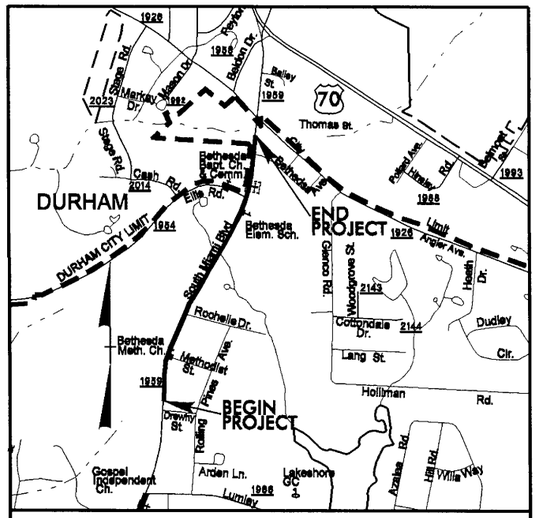
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

DURHAM COUNTY
WBS - 40221.1.1 (U-4011)

09/09/09

TIP PROJECT: U-4011

CONTRACT:



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

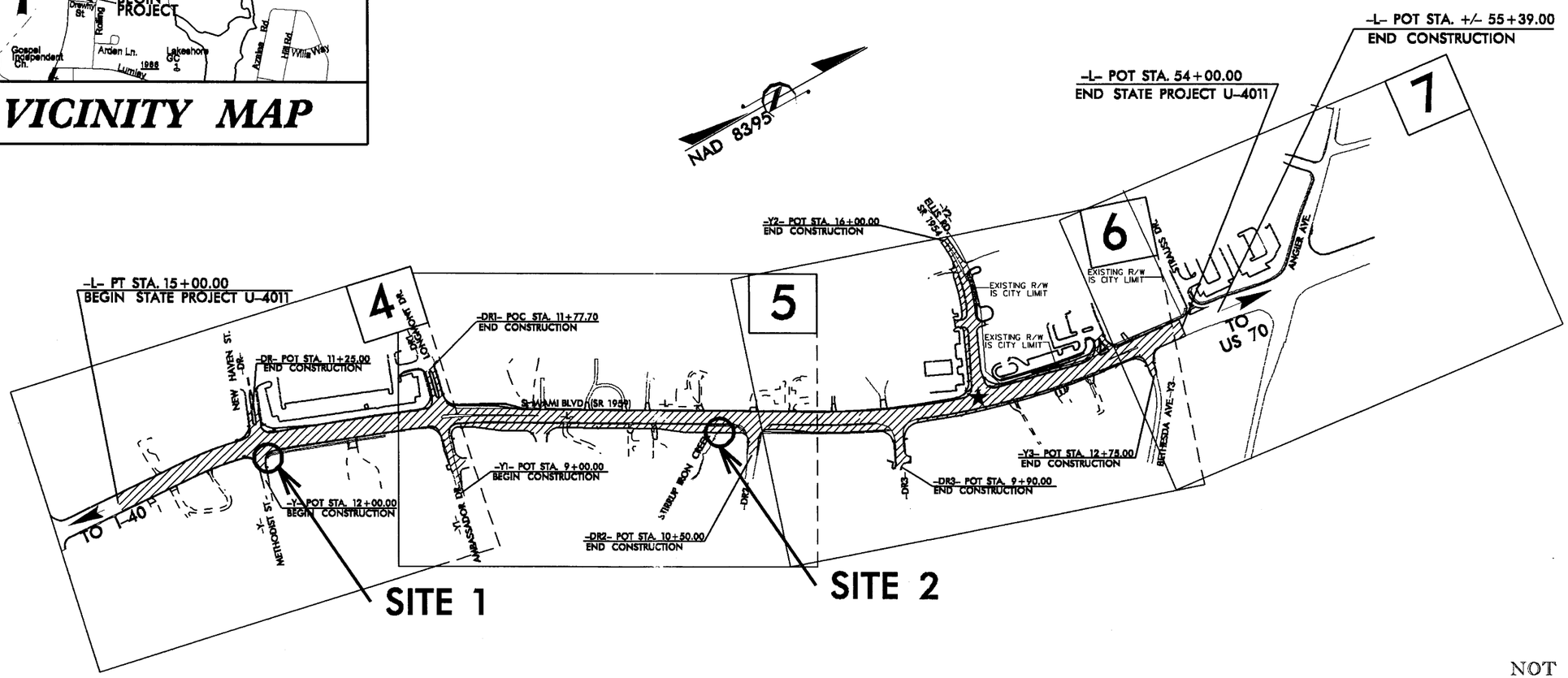
DURHAM COUNTY

LOCATION: SR 1959 (SOUTH MIAMI BLVD.) FROM SOUTH OF SR 2112 (METHODIST ST.) TO NORTH OF SR 1960 (BETHESDA AVE.)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4011	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
40221.1.1	STP-1959(2)	PE
40221.2.1	STP-1959(2)	R/W & UTILITIES

Permit Drawing
Sheet 7 of 11



NOT TO SCALE

GRAPHIC SCALES

50 25 0 50 100
PLANS

WETLAND AND SURFACE WATER SITE MAP

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

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rmullins AT HY244571

PROJECT REFERENCE NO.	SHEET NO.
U-4011	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 8 of 11

F/F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83/95

-L- POT STA. 15+00.00
BEGIN STATE PROJECT U-4011
BEGIN CONSTRUCTION

-DR- POT STA. 11+43.17

-DR- POT STA. 11+25.00
END CONSTRUCTION

-Y- POT STA. 13+30.11=
-DR- POT STA. 10+00.00=
-L- POC STA. 20+41.74

-L- PC STA. 25+49.68

-L- PT STA. 21+58.03

-Y- POT STA. 12+00.00
BEGIN CONSTRUCTION

-Y- POT STA. 11+00.00

-L- STA. 26+00
MATCHLINE

SITE 1

FOR -L- PROFILE SEE SHEET 8
FOR -Y- PROFILE SEE SHEET 9
FOR -DR- PROFILE SEE SHEET 10

REVISIONS

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mwilkes on NAD83/97

PROJECT REFERENCE NO.	SHEET NO.
U-4011	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 9 of 11

F/F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 1983

-L- POT STA. 15+00.00
BEGIN STATE PROJECT U-4011
BEGIN CONSTRUCTION

-DR- POT STA. 11+43.17

-DR- POT STA. 11+25.00
END CONSTRUCTION

-Y- POT STA. 13+30.11=
-DR- POT STA. 10+00.00=
-L- POC STA. 20+41.74

-L- PC STA. 25+49.68

-L- PT STA. 21+58.03

-Y- POT STA. 12+00.00
BEGIN CONSTRUCTION

-Y- POT STA. 11+00.00

-L- STA. 26+00
MATCHLINE

SITE 1

FOR -L- PROFILE SEE SHEET 8
FOR -Y- PROFILE SEE SHEET 9
FOR -DR- PROFILE SEE SHEET 10

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
U-4011	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 10 of 11

8/17/99

REVISIONS

SITE 2
STIRRUP IRON CREEK

NAD 8395

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE -L- STA.26+00

MATCHLINE -L- STA.39+00

TICON THOMAS PROPERTIES LIMITED PARTNERSHIP D.B. 1446, PG. 370 P.B. 140, PG. 124

TICON THOMAS PROPERTIES LIMITED PARTNERSHIP D.B. 1446, PG. 370 P.B. 144, PG. 47

FRANK S. MELDAU & RHODA B. MELDAU D.B. 993, PG. 873 P.B. 22, PG. 166 D.B. 529, PG. 378 P.B. 68, PG. 120

RAVENCO, LLC D.B. 2960, PG. 68 P.B. 68, PG. 120

JAMES W. PERRY & CAROLYN L. PERRY D.B. 882, PG. 69 D.B. 359, PG. 623 D.B. 354, PG. 624 P.B. 68, PG. 120

WESLEY PERRY & CAROLYN L. PERRY D.B. 296, PG. 347 P.B. 7, PG. 136

RANDALL F. STONE D.B. 2045, PG. 130 D.B. 1446, PG. 368 P.B. 36, PG. 32

ROBERT E. WARD, III & JOANN WARD D.B. 2271, PG. 121 P.B. 155, PG. 75

BETHESDA ELEMENTARY SCHOOL DURHAM PUBLIC SCHOOL NO DEED FOUND

BM#2
-BL- STA 36+01
255' RIGHT
ELEV.= 402.74
-L- STA. 38+34.68
(220.90' RT)

DETAIL E
PIPE OUTLET CHANNEL
(Not to Scale)

d= L25 Ft.

Length= 10 Ft.
D= 3 Ft.
Est.= 5 Tons of Class I Rip-Rap

FROM STA. 36+69 TO STA. 36+83 -L- (RT)

FOR -L- PROFILE SEE SHEET 8
FOR -Y1- PROFILE SEE SHEET 10
FOR -DR1- PROFILE SEE SHEET 10
FOR -DR2- PROFILE SEE SHEET 10

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mullins 61174457

PROJECT REFERENCE NO.	SHEET NO.
U-4011	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 11 of 11

NAD 83/95

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SITE 2
STIRRUP IRON CREEK

REVISIONS

8/17/99

MATCHLINE -L- STA.26+00

MATCHLINE -L- STA.39+00

TICON THOMAS PROPERTIES LIMITED PARTNERSHIP D.B. 3496, PG. 370 P.B. 144, PG. 47

THOMAS ENTERPRISES LIMITED PARTNERSHIP D.B. 3496, PG. 370 P.B. NO. PG. 124

FRANK S. MELDAU & RHODA B. MELDAU D.B. 593, PG. 873 P.B. 124, PG. 156 D.B. 624, PG. 378 P.B. 68, PG. 120

RAVENCO, LLC D.B. 2980, PG. 151 P.B. 68, PG. 120

WESLEY PERRY & CAROLYN L. PERRY D.B. 256, PG. 347 P.B. 7, PG. 136

JAMES W. PERRY & CAROLYN L. PERRY D.B. 562, PG. 49 D.B. 559, PG. 623 D.B. 556, PG. 624 P.B. 68, PG. 120

RANDALL F. STONE D.B. 2045, PG. 150 D.B. 82, PG. 442 P.B. 36, PG. 13

ROBERT E. WARD, III & JOANN WARD D.B. 2273, PG. 121 P.B. 155, PG. 75

BM#2
-BL- STA 36+01
255' RIGHT
ELEV.= 402.74 =
-L- STA. 38+34.68
(220.90' RT)

BETHESDA ELEMENTARY SCHOOL
DURHAM PUBLIC SCHOOL
NO DEED FOUND

DETAIL E
PIPE OUTLET CHANNEL
(Not to Scale)

Length= 10 Ft.
D= 3 Ft.
Est.= 5 Tons of Class I Rip-Rap

FROM STA. 36+69 TO STA. 36+83 -L- (RT)

FOR -L- PROFILE SEE SHEET 8
FOR -Y1- PROFILE SEE SHEET 10
FOR -DR1- PROFILE SEE SHEET 10
FOR -DR2- PROFILE SEE SHEET 10

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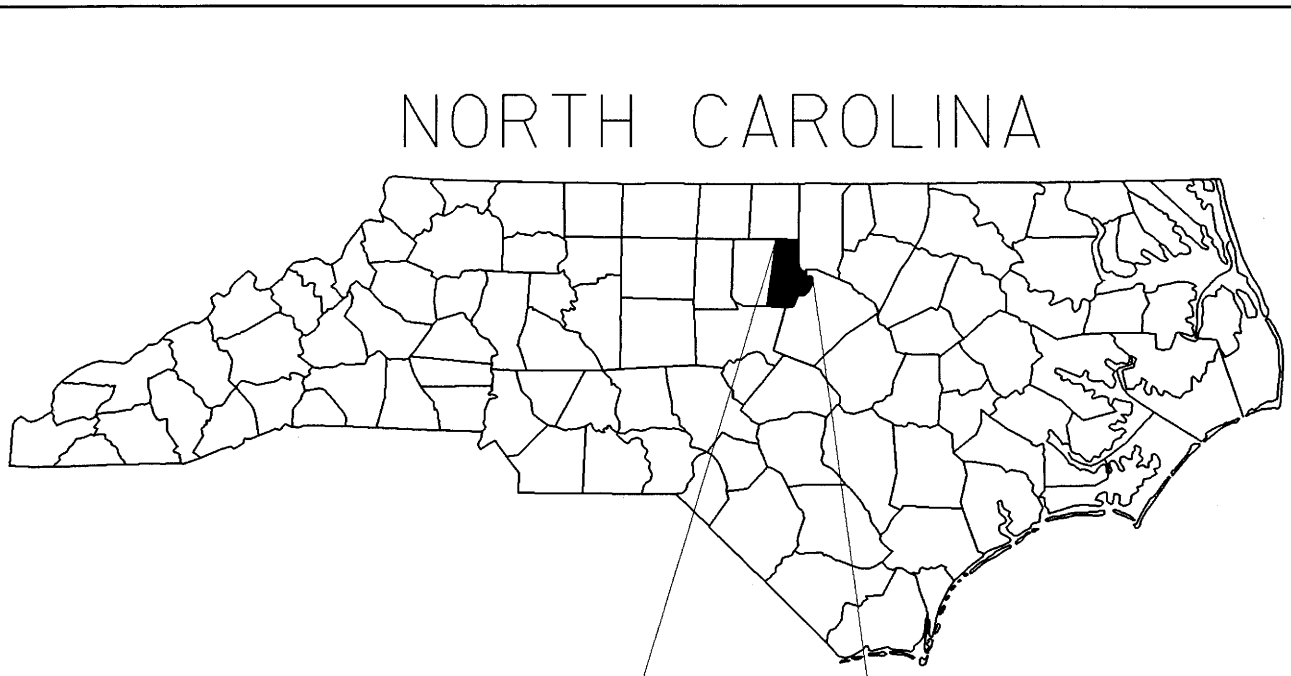
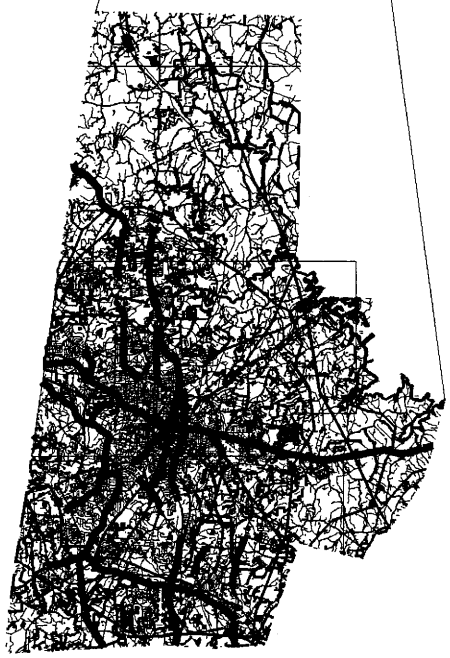




NEUSE BUFFER
VICINITY MAPS

NCDOT

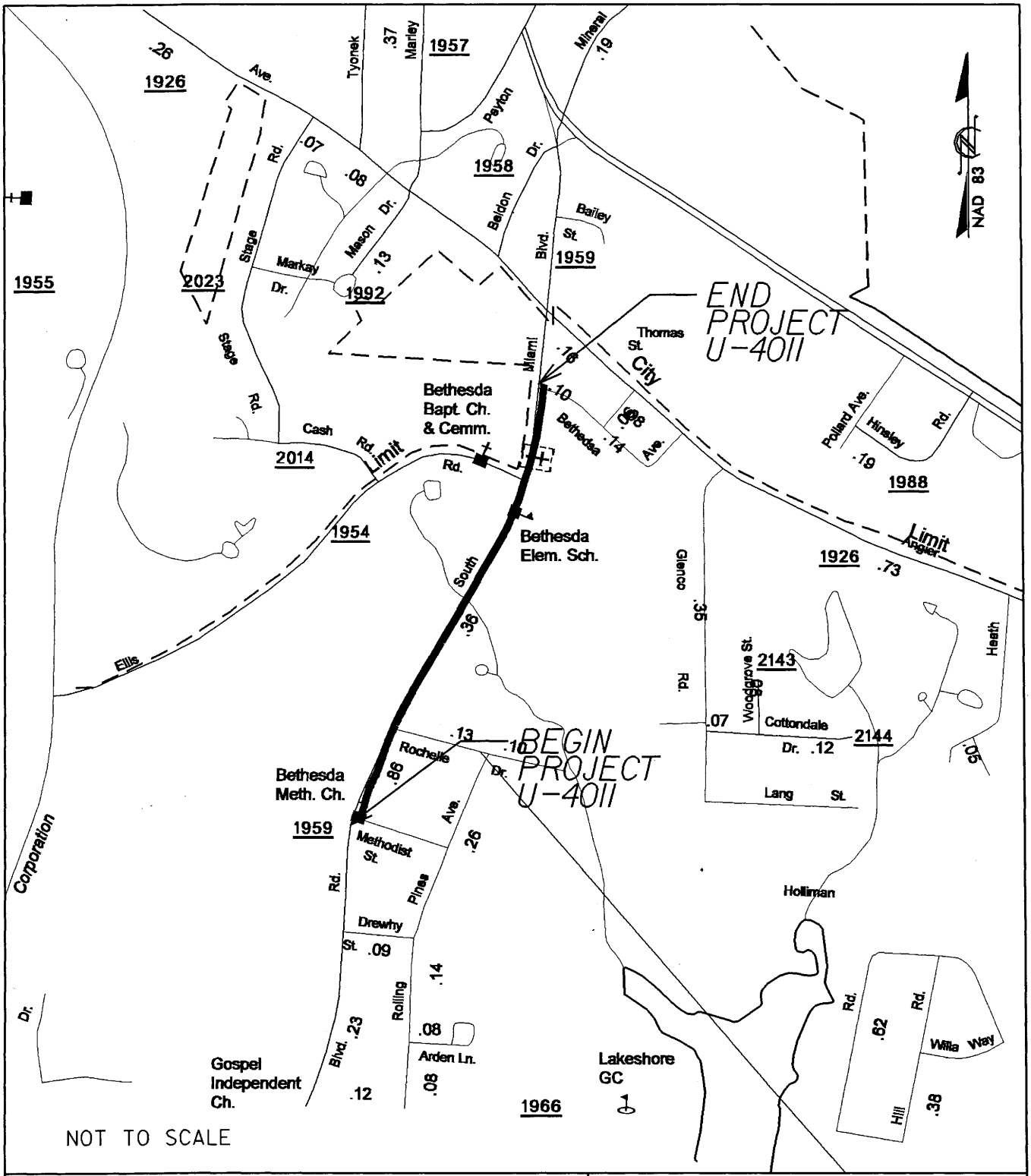
DIVISION OF HIGHWAYS

DURHAM COUNTY

PROJECT: 40221.1.1 (U-4011)

SR 1959 (S. MIAMI BLVD) FROM SOUTH OF SR 2112 (METHODIST ST) TO NORTH OF SR 1960 (BETHESDA AVE)

SHEET 1 OF 7 9/17/08



NOT TO SCALE

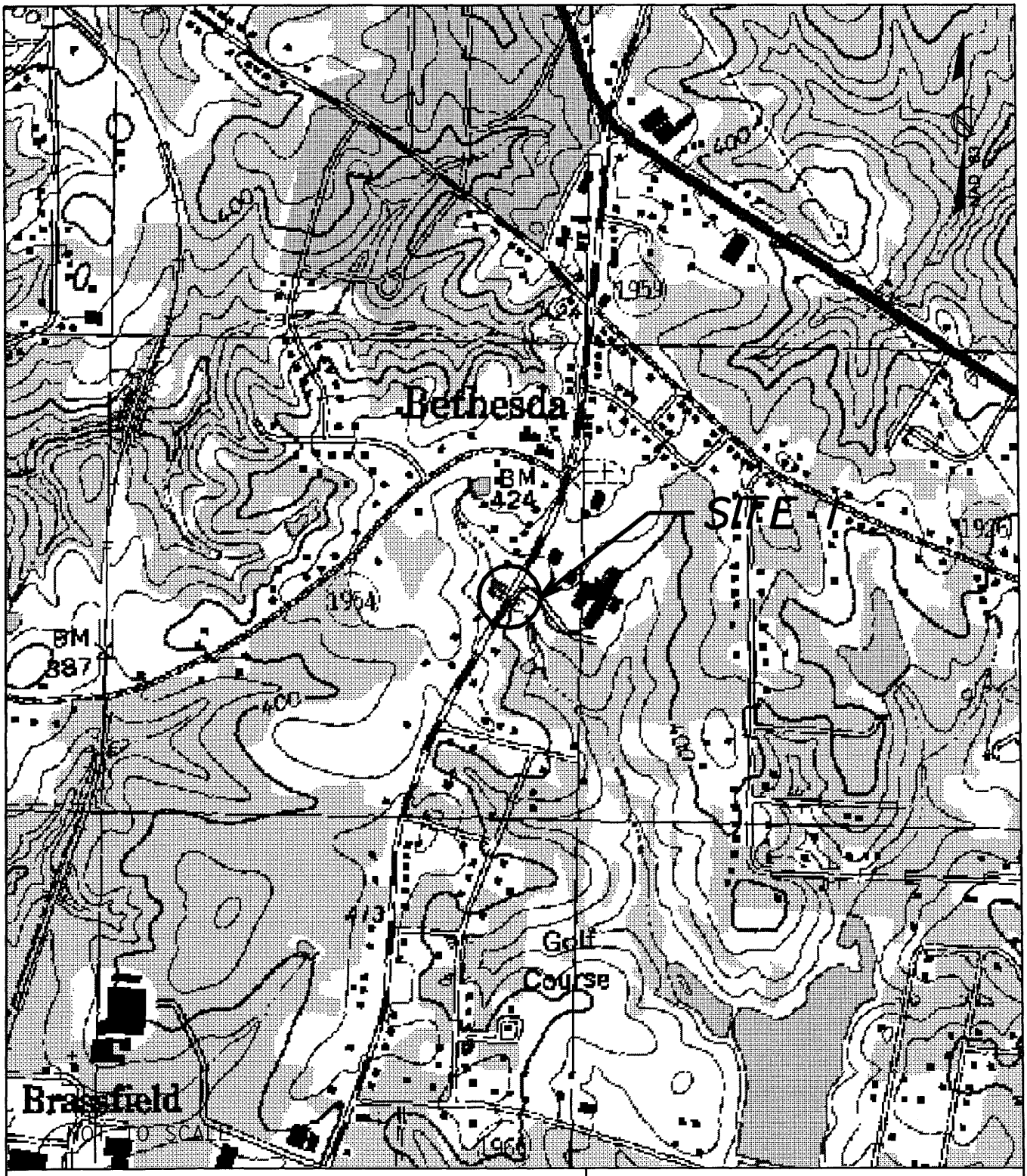
NEUSE BUFFER
VICINITY MAPS

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
DURHAM COUNTY

PROJECT: 40221.1.1 (U4011)

SR 1959 (S. MIAMI BLVD) FROM S. OF SR 2112 (METHODIST ST) TO N. OF SR 1960 (BETHESDA AVE)

SHEET 2 OF 7



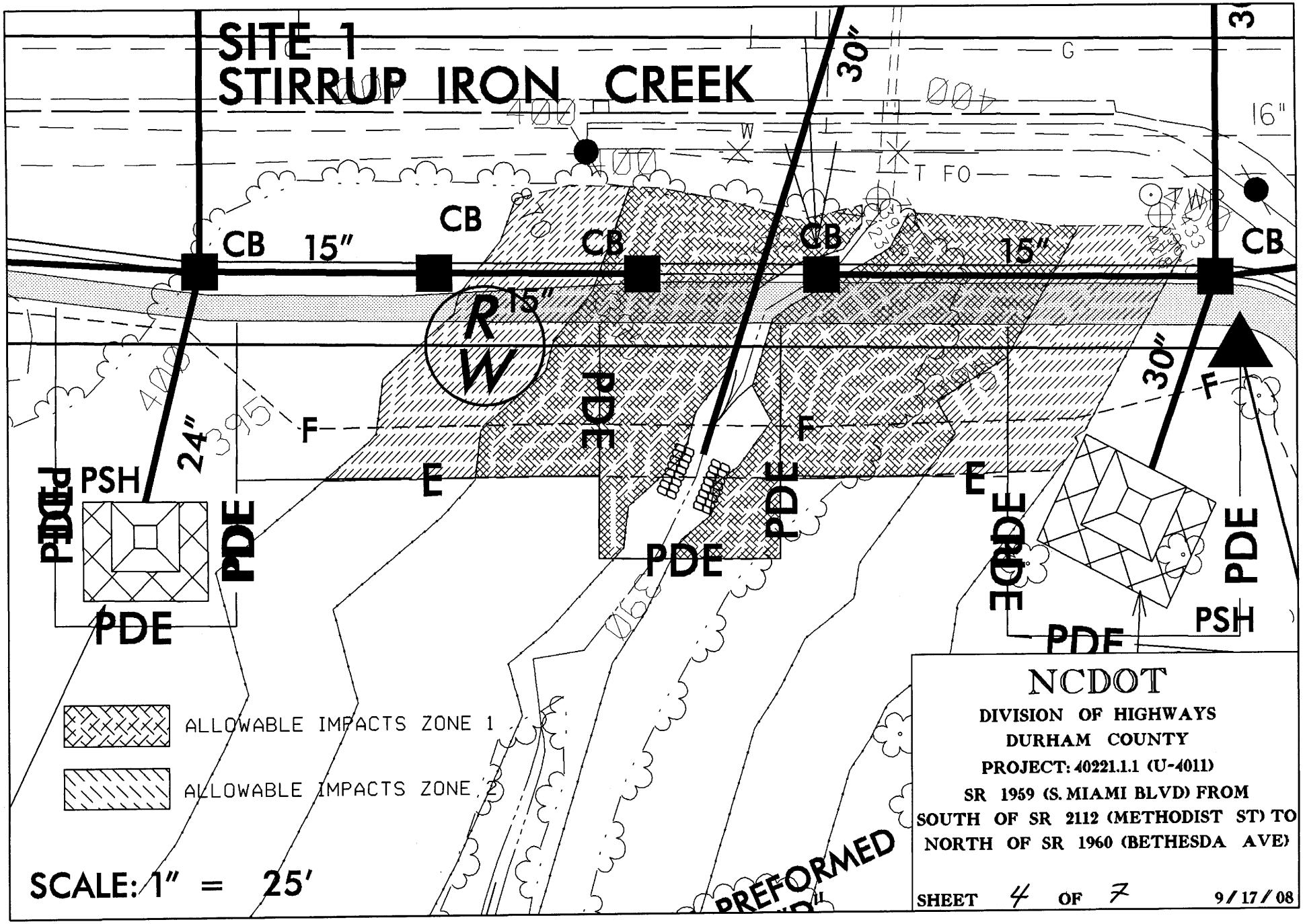
NEUSE BUFFER
VICINITY MAPS

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
DURHAM COUNTY

PROJECT: 40221.1.1 (U4011)

SR 1959 (S. MIAMI BLVD) FROM
S. OF SR 2112 (METHODIST ST) TO
N. OF SR 1960 (BETHESDA AVE)

SHEET 3 OF 7



NCDOT

DIVISION OF HIGHWAYS

DURHAM COUNTY

PROJECT: 40221.1.1 (U-4011)

SR 1959 (S. MIAMI BLVD) FROM SOUTH OF SR 2112 (METHODIST ST) TO NORTH OF SR 1960 (BETHESDA AVE)

SHEET 4 OF 7 9/17/08

BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1		36+05 - 37+71 -L-	X			4393	2520	6913					
TOTAL:						4393	2520	6913	0.0	0.0	0.0		

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

DURHAM COUNTY
PROJECT: 40221.1.1 (U-4011)

9/17/2008
SHEET 5 OF 7

Rev. May 2006

05/08/99

TIP PROJECT: U-4011

CONTRACT:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

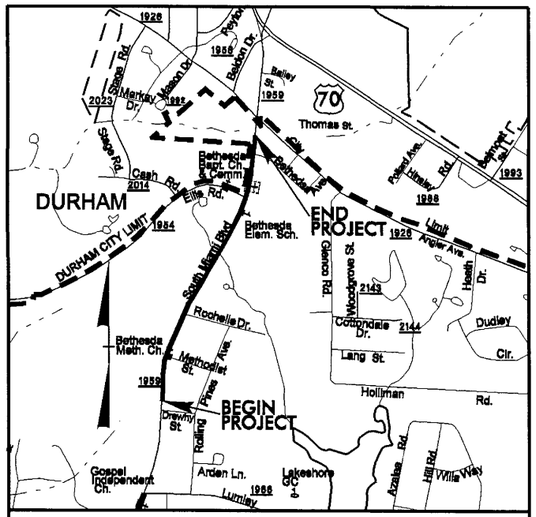
DURHAM COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4011	1	

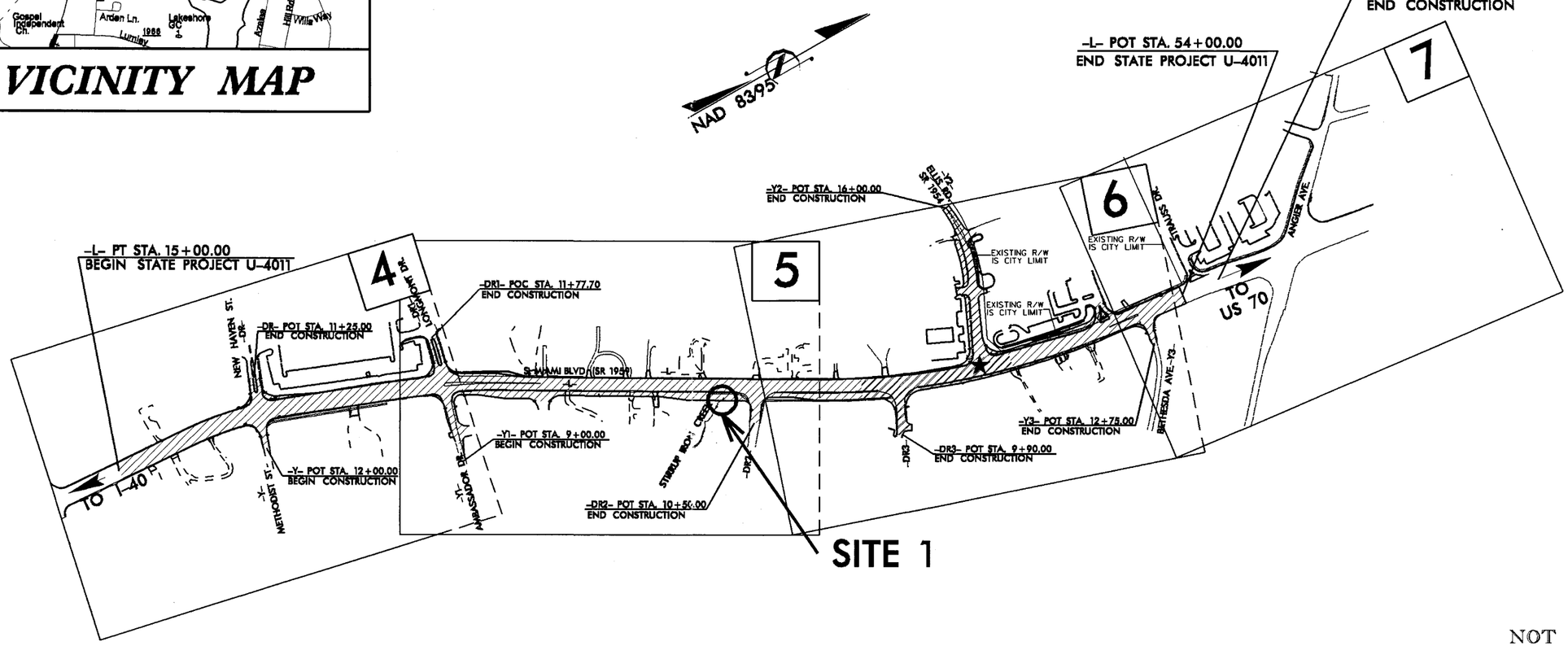
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
40221.1.1	STP-1959(2)	PE
40221.2.1	STP-1959(2)	R/W & UTILITIES

Buffer Drawing Sheet 6 of 7

LOCATION: SR 1959 (SOUTH MIAMI BLVD.) FROM SOUTH OF SR 2112 (METHODIST ST.) TO NORTH OF SR 1960 (BETHESDA AVE.)



VICINITY MAP



NOT TO SCALE

GRAPHIC SCALES

50 25 0 50 100

PLANS

NEUSE BUFFER
SITE MAP

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

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rmullins AT H12457I

PROJECT REFERENCE NO.	SHEET NO.
U-4011	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Buffer Drawing
Sheet 7 of 7

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

NAD 83/95

SITE 1
STIRRUP IRON CREEK

-DR1- PT STA. 12+17.73

-DR1- POC STA. 11+77.70
END CONSTRUCTION

-DR1- PC STA. 11+23.19

-DR1- POT STA. 10+00.00=
-L- POC STA. 27+14.00

-L- PT STA. 27+53.08

-Y1- POT STA. 12+01.82=
-L- POC STA. 27+14.00

-Y1- PT STA. 11+88.59

-Y1- PC STA. 10+15.30

-Y1- POT STA. 9+00.00
BEGIN CONSTRUCTION

-DR2- POT STA. 11+73.38=
-L- POT STA. 38+34.42

-DR2- POT STA. 10+50.00
END CONSTRUCTION

MATCHLINE -L- STA. 26+00

MATCHLINE -L- STA. 39+00

PREFORMED SCOUR HOLE
DETAIL "D"

PLAN VIEW

Pipe or Ditch Outlet

Reinforcing Bar(typ.) in concrete bottom of hole

Install level and flush with natural ground.

Square Preformed Scour Hole (PSH)

Rip Rap in basin not shown for clarity)

Seed, mulch, fertilize or grass at installation.

B= 8.0 Ft.
D= 2.0 Ft.
W= 4.0 Ft.
d= 0.0 Ft.

SECTION A-A

Pipe or Ditch outlet

Drawing

PSRM

d

Natural Ground

B

1' tuck

Liner: Class B Rip Rap to ft. thick with Filter Fabric

5/05

AT STA. 37+49 -L- RT.

PREFORMED SCOUR HOLE
DETAIL "C"

PLAN VIEW

Pipe or Ditch Outlet

Reinforcing Bar(typ.) in concrete bottom of hole

Install level and flush with natural ground.

Square Preformed Scour Hole (PSH)

Rip Rap in basin not shown for clarity)

Seed, mulch, fertilize or grass at installation.

B= 6.0 Ft.
D= 2.0 Ft.
W= 4.0 Ft.
d= 0.0 Ft.

SECTION A-A

Pipe or Ditch outlet

Drawing

PSRM

d

Natural Ground

B

1' tuck

Liner: Class B Rip Rap to ft. thick with Filter Fabric

5/05

AT STA. 35+70 -L- RT.

DETAIL E
PIPE OUTLET CHANNEL
(Not to Scale)

Natural Ground

Existing Ditch Invert

Rip Rap

Natural Ground

d= 1.25 Ft.

Channel Bed Invert

Length= 10 Ft.
D= 3 Ft.
Est.= 5 Tons of Class I Rip-Rap

FROM STA. 36+69 TO STA. 36+83 -L- (RT)

CL I RIP RAP PIPE OUTLET CHANNEL SEE DETAIL "E"

SEE PREFORMED SCOUR HOLE DETAIL "C" (-L-)

SEE PREFORMED SCOUR HOLE DETAIL "D" (-DR1-)

BM#2
-BL- STA 36+01
255' RIGHT
ELEV.= 402.74 =
-L- STA. 38+34.68
(220.90' RT)

FOR -L- PROFILE SEE SHEET 8
FOR -Y1- PROFILE SEE SHEET 10
FOR -DR1- PROFILE SEE SHEET 10
FOR -DR2- PROFILE SEE SHEET 10

REVISIONS

8/17/99

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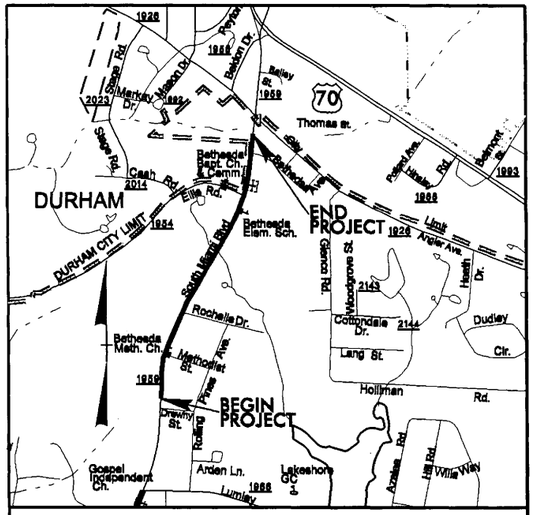
mmiller

09/08/'09

TIP PROJECT: U-4011

CONTRACT:

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

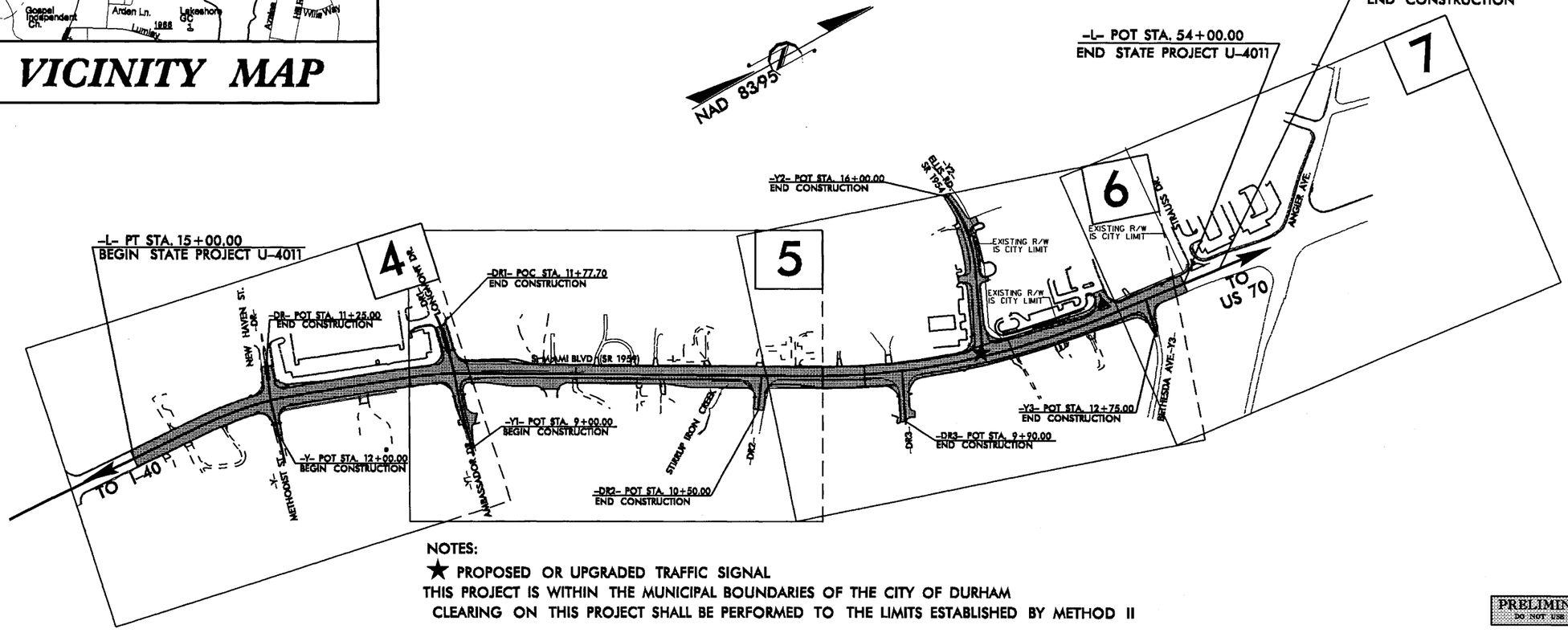
DURHAM COUNTY

LOCATION: SR 1959 (SOUTH MIAMI BLVD.) FROM SOUTH OF SR 2112 (METHODIST ST.) TO NORTH OF SR 1960 (BETHESDA AVE.)

TYPE OF WORK: WIDENING, DRAINAGE, GRADING, PAVING, CURB & GUTTER AND SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4011	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
40221.1.1	STP-1959(2)	PE
40221.2.1	STP-1959(2)	R/W & UTILITIES



NOTES:

★ PROPOSED OR UPGRADED TRAFFIC SIGNAL

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF DURHAM

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2007 = 32,400
ADT 2030 = 55,000
DHV = 11 %
D = 70 %
T = 7 % *
V = 50 MPH

FUNCTIONAL CLASSIFICATION: URBAN MINOR ARTERIAL

* TTST 3% DUAL 4%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4011 = 0.739 MILES

TOTAL LENGTH OF TIP PROJECT U-4011 = 0.739 MILES

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 27, 2008

LETTING DATE: AUGUST 10, 2010

JASON MOORE, PE
PROJECT ENGINEER

JEANIE TYSON
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

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$$$$USERNAME$$$$

3/15/06

PROJECT REFERENCE NO.	SHEET NO.
U-4011	1B

Note: Not to Scale

S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Wheel Chair Ramp — WCR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- H-Frame Pole
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- Recorded U/G Telephone Cable — T
- Designated U/G Telephone Cable (S.U.E.*) — T
- Recorded U/G Telephone Conduit — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC
- Recorded U/G Fiber Optics Cable — T FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole — S
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- A/G Tank; Water, Gas, Oil
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

6/2/99

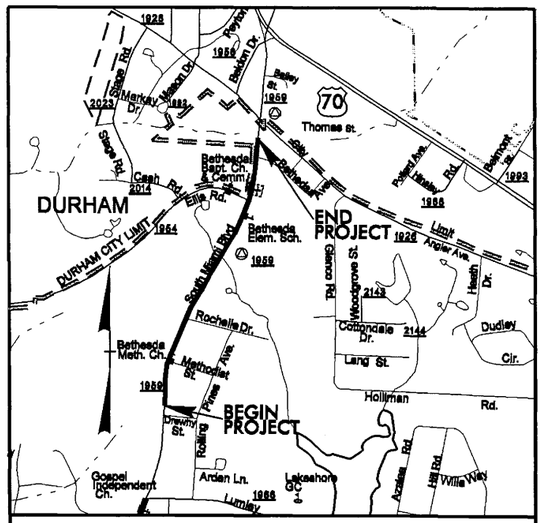
PROJECT REFERENCE NO.	SHEET NO.
U-4011	1 C
Location and Surveys	

U-4011

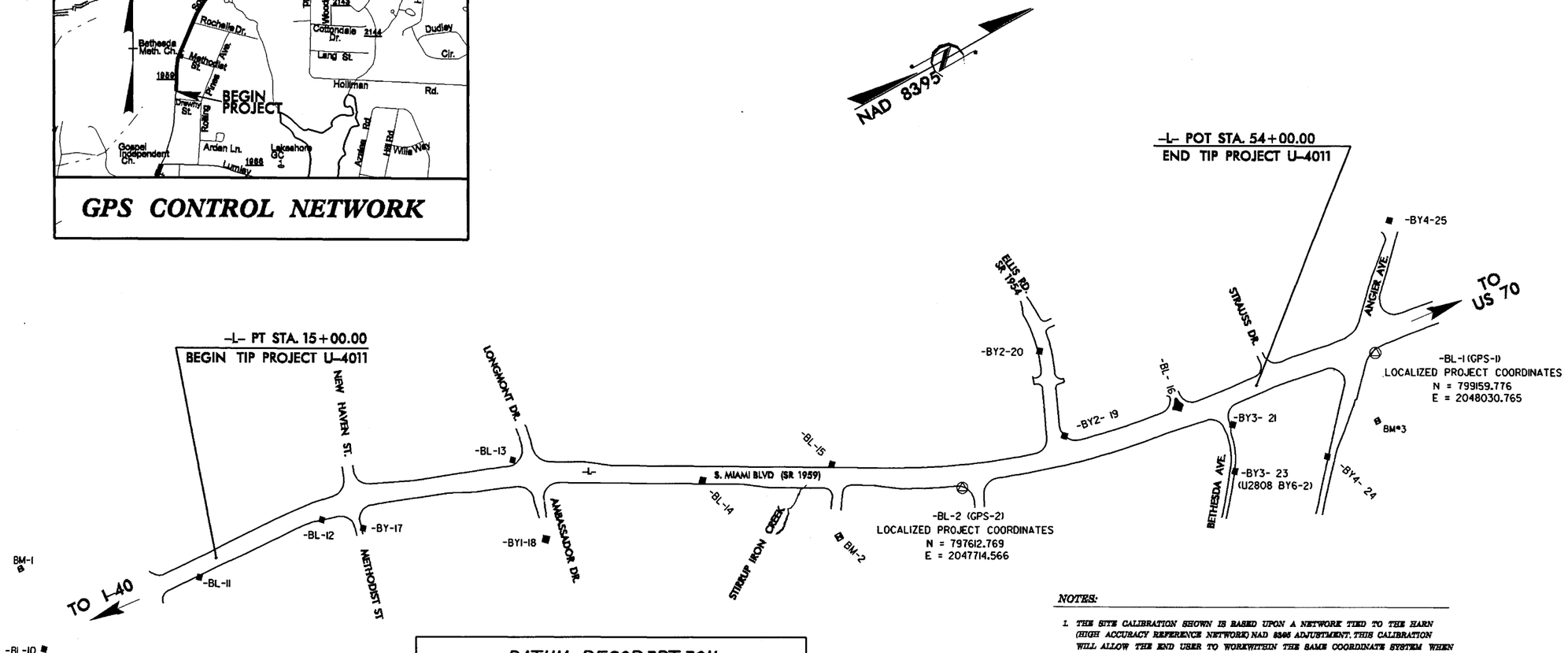
SURVEY CONTROL SHEET U-4011

DURHAM COUNTY

LOCATION: SR 1959 (SOUTH MIAMI BLVD.) FROM SOUTH OF SR 2112 (METHODIST ST.) TO NORTH OF SR 1960 (BETHESDA AVE.)



GPS CONTROL NETWORK



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U4011-1" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 799,159.776(ft) EASTING: 2,048,030.765(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99993032
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U4011-1" TO -L- STATION 15+00.00 IS
S 19°39'46.0"W 4,292.97'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

NOTES:

1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.
2. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

THE FILES TO BE FOUND ARE AS FOLLOWS:
U4011_LS_GPSCALIB_080117.HTML
U4011_LS_WGS84_080117.TXT
U4011_LS_LOCAL_080117.TXT
U4011_LS_CONTROL_080117.TXT

THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

△ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

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$$$$CONFIGURATION

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-4011	1 D
Location and Surveys	

SURVEY CONTROL SHEET U-4011

GPS CALIBRATION REPORT

PROJECT : U4011

TIP NUMBER

USER NAME	GGREEN	DATE & TIME	3:10:18 PM 12/5/2007
COORDINATE SYSTEM	US STATE PLANE 1983(AT GROUND)	ZONE	NORTH CAROLINA 3200
HORIZONTAL DATUM	NAD 1983 (CONUS)		
VERTICAL DATUM	NAVD88	GEOID MODEL	GEOID03 (CONUS) NC SUB GRID
COORDINATE UNITS	US SURVEY FEET		
DISTANCE UNITS	US SURVEY FEET		
HEIGHT UNITS	US SURVEY FEET		

LOCAL SITE INFORMATION
LOCALIZED AROUND

LATITUDE	35:56'44.40526"N
LONGITUDE	78:50'15.83937"W
SITE SCALE FACTOR	1.0000006968
HEIGHT	319.616SFT

THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION USES A LOCALIZED COORDINATE SYSTEM
WHICH IS VERY SIMILAR TO NORTH CAROLINA ZONE 3200 FROM WHICH IT IS DERIVED.
PLEASE TAKE CARE IN UTILIZING THESE COORDINATES TO ELIMINATE CONFUSION OF THE TWO SYSTEMS.
THIS FILE IS TO AID IN THE USE OF REAL TIME KINEMATIC (RTK) GPS DURING CONSTRUCTION LAYOUT.

DATUM TRANSFORMATION PARAMETERS

DATUM TRANSFORMATION COMPUTATION NOT REQUESTED

UPDATED DEFAULT PROJECTION (TRANSVERSE MERCATOR) DEFINITION

UPDATED DEFAULT PROJECTION NOT REQUESTED

HORIZONTAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ROTATION CENTER	799159.717SFT
EASTING COORDINATE OF ROTATION CENTER	2048030.742SFT
ROTATION ABOUT THE CENTER POINT	0:00'08"
TRANSLATION NORTH	0.059SFT
TRANSLATION EAST	0.022SFT
SCALE FACTOR	0.99997946

VERTICAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ORIGIN POINT	799159.776SFT
EASTING COORDINATE OF ORIGIN POINT	2048030.765SFT
VERTICAL SEPARATION AT ORIGIN	0.715SFT
SLOPE NORTH	-0.047PPM
SLOPE EAST	-0.010PPM

GEOID MODEL DEFINITION

GEOID03 (CONUS) NC SUB GRID

RESIDUAL DIFFERENCES BETWEEN GPS (WGS84) AND LOCAL COORDINATES

SUMMARY

	MAXIMUM ERROR	ROOT MEAN SQUARE ERROR	POINT
HORIZONTAL	0.000SFT	0.000	U4011-1 GPS
VERTICAL	0.000SFT	0.000	U4011-1 GPS
THREE-DIMENSIONAL	0.000SFT	0.000	U4011-1 GPS

POINT RESIDUALS

WGS84 COORDINATES		CALCULATED POINT FOR DISPLAY ONLY		LOCAL COORDINATES	
POINT	U4011-1 GPS	NORTHING	799159.776SFT	POINT	U4011-1
LATITUDE	35:56'44.40467"N	EASTING	2048030.765SFT	NORTHING	799159.776SFT
LONGITUDE	78:50'15.83966"W	ELEVATION	423.599SFT	EASTING	2048030.765SFT
HEIGHT	318.901SFT	HORZ ERROR	0.000SFT	ELEVATION	423.599SFT
		VERT ERROR	0.000SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.000SFT	QUALITY	QUALITY
POINT	U4011-2 GPS	NORTHING	797612.769SFT	POINT	U4011-2
LATITUDE	35:56'29.10990"N	EASTING	2047714.566SFT	NORTHING	797612.769SFT
LONGITUDE	78:50'19.71520"W	ELEVATION	414.922SFT	EASTING	2047714.566SFT
HEIGHT	310.202SFT	HORZ ERROR	0.000SFT	ELEVATION	414.922SFT
		VERT ERROR	0.000SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.000SFT	QUALITY	QUALITY

DATUM DESCRIPTION

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THE FILES TO BE FOUND ARE AS FOLLOWS:
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U4011_LS_WGS84_080117.TXT
U4011_LS_LOCAL_080117.TXT
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© ***INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.***
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NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-4011	1 E
Location and Surveys	

SURVEY CONTROL SHEET U-4011

BASELINE DATA

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
10	BL-10	794406.4690	2046567.9310	410.63	OUTSIDE PROJECT LIMITS	
11	BL-11	795029.7070	2046616.9940	412.89	14+14.78	36.42 RT
12	BL-12	795523.9010	2046656.4980	412.49	19+14.73	35.74 RT
13	BL-13	796234.7680	2046811.9770	406.60	26+38.63	54.16 LT
14	BL-14	796802.4510	2047220.7350	405.17	33+30.12	19.02 RT
15	BL-15	797244.6070	2047406.0000	401.02	38+05.46	43.25 LT
2	U4011-2 GPS	797612.7690	2047714.5660	414.23	42+73.92	52.71 RT
26	NOT SET	798020.1705	2047781.4374	UNKNOWN	46+77.89	23.52 LT
16	BL-16	798442.0120	2047850.6790	418.84	51+10.32	35.51 LT
27	NOT SET	798631.4700	2047898.2138	UNKNOWN	53+03.95	9.77 LT
1	U4011-1 GPS	799159.7760	2048030.7650	422.97	OUTSIDE PROJECT LIMITS	

BY

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
A12	BL-12	795523.9010	2046656.4980	412.49	12+85.16	122.17 LT
17	BY-17	795637.5640	2046759.8200	410.26	12+20.11	16.98 RT

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
A13	BL-13	796234.7680	2046811.9770	406.60	26+38.63	54.16 LT
18	BY1-18	796193.8340	2047122.8170	404.33	27+54.84	240.50 RT

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
20	BY2-20	798104.9170	2047422.2490	426.56	13+95.84	29.87 LT
19	BY2-19	798031.5030	2047733.4060	421.18	10+77.77	27.81 RT
A26	NOT SET	798020.1705	2047781.4374	UNKNOWN	10+29.37	37.43 RT

BY3

POINT	DESC.	NORTH	EAST	ELEVATION	Y3 STATION	OFFSET
A27	NOT SET	798631.4700	2047898.2138	UNKNOWN	OUTSIDE PROJECT LIMITS	
21	BY3-21	798580.3530	2047999.3070	423.03	12+99.41	21.76 RT
23	U2808 BY6-2	798503.8630	2048150.5800	428.53	11+34.13	7.82 RT

BY4

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
25	BY4-25	799444.0000	2047636.8570	420.48	OUTSIDE PROJECT LIMITS	
A1	U4011-1	799159.7760	2048030.7650	422.97	OUTSIDE PROJECT LIMITS	
24	BY4-24	798822.9220	2048271.6520	423.66	55+37.74	339.51 RT

BASELINE DATA

BM1 ELEVATION = 407.84
N 794477 E 2046267
L STATION 10+00
S 63° 45' 08.2" W DIST 319.31
RR SPIKE SET IN 36" OAK

BM2 ELEVATION = 402.74
N 797137 E 2047649
L STATION 38+35 221 RIGHT
'X' CHISLED IN BASE OF LIGHT POLE

BM3 ELEVATION = 426.16
N 799044 E 2048249
L STATION 56+67
N 79° 49' 20.0" E DIST 302.76
RR SPIKE SET IN 18" GUM

DATUM DESCRIPTION

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U4011_LS_WGS84_080118.TXT
U4011_LS_LOCAL_080118.TXT
U4011_LS_CONTROL_080118.TXT

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$$$$USERNAME$$$$

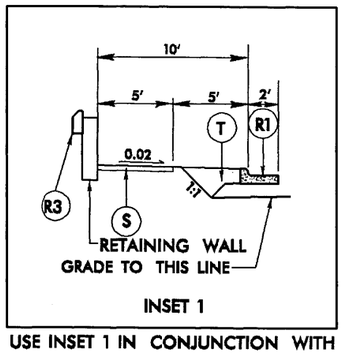
6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-4011	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R1	2'-6" CONCRETE CURB & GUTTER
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	R2	1'-6" CONCRETE CURB & GUTTER
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R3	8" x 12" CONCRETE CURB
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2¼" IN DEPTH OR GREATER THAN 4" IN DEPTH.	S	4" CONCRETE SIDEWALK.
E1	PROP. APPROX. 3.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.	T	EARTH MATERIAL.
E2	PROP. APPROX. 8.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 484.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS	U	EXISTING PAVEMENT.
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	V	MILLING SEE SHEET 3-B FOR LOCATIONS OF MILLING OF THE EXISTING PAVEMENT
J1	PROP. 10" AGGREGATE BASE COURSE	W	WEDGING



INSET 1

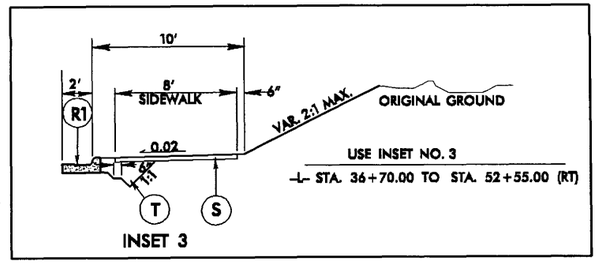
USE INSET 1 IN CONJUNCTION WITH TYPICAL SECTION NO. 1
-L- STA. +/- 47+25.88 TO +/- 50+43.15 (LT)

INSET 2

USE INSET 2 IN CONJUNCTION WITH TYPICAL SECTION NO. 2
-L- STA. 51+80.90 TO 52+57.05 (LT)

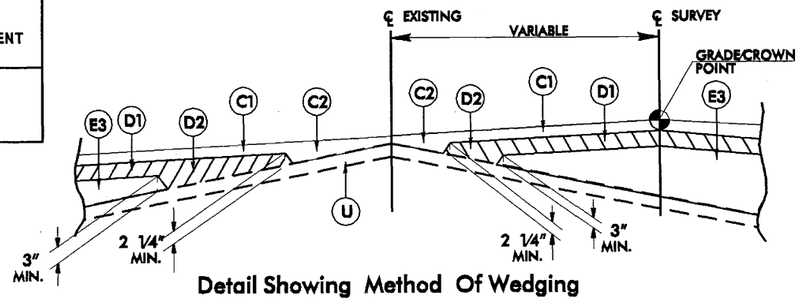
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

* NOTE: USE E2 FOR WIDENING LESS THAN 6'
USE E1 AND J1 FOR WIDENING GREATER THAN 6'

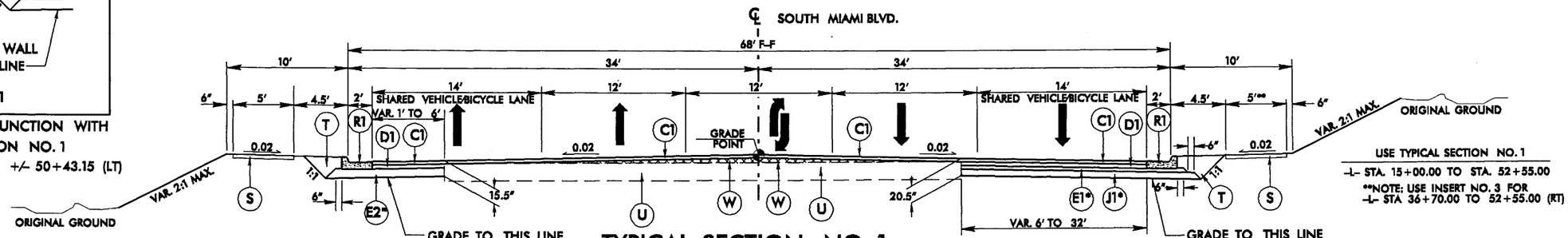


INSET 3

USE INSET NO. 3
-L- STA. 36+70.00 TO STA. 52+55.00 (RT)

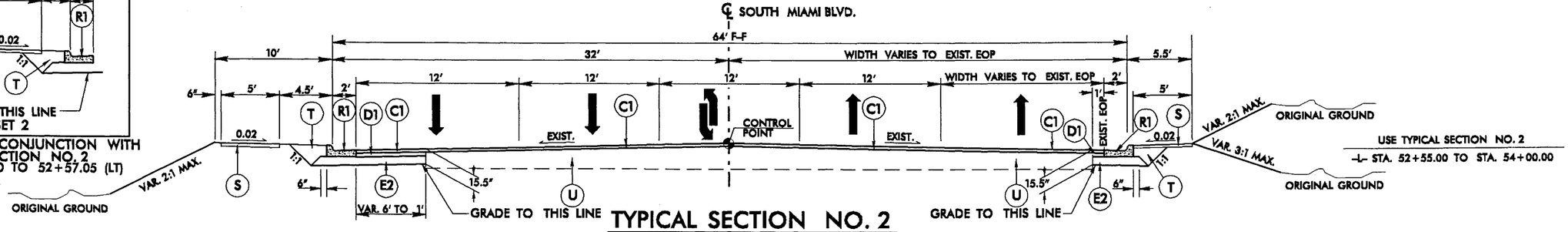


Detail Showing Method Of Wedging



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
-L- STA. 15+00.00 TO STA. 52+55.00
**NOTE: USE INSERT NO. 3 FOR
-L- STA 36+70.00 TO 52+55.00 (RT)



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
-L- STA. 52+55.00 TO STA. 54+00.00

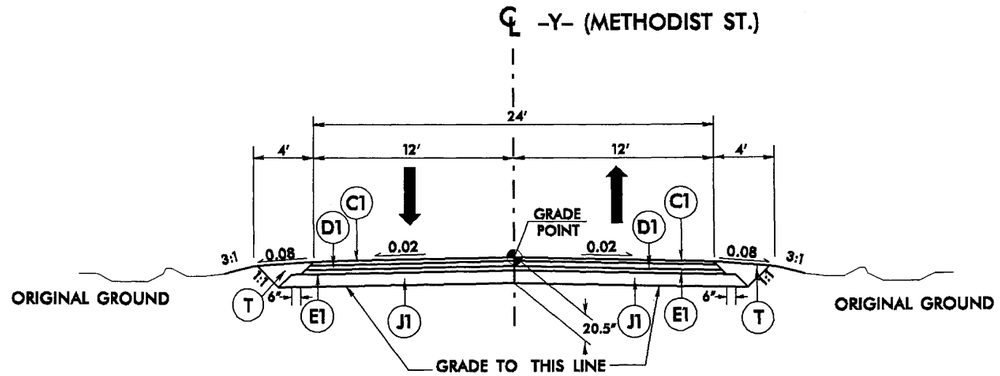
6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-4011	2A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

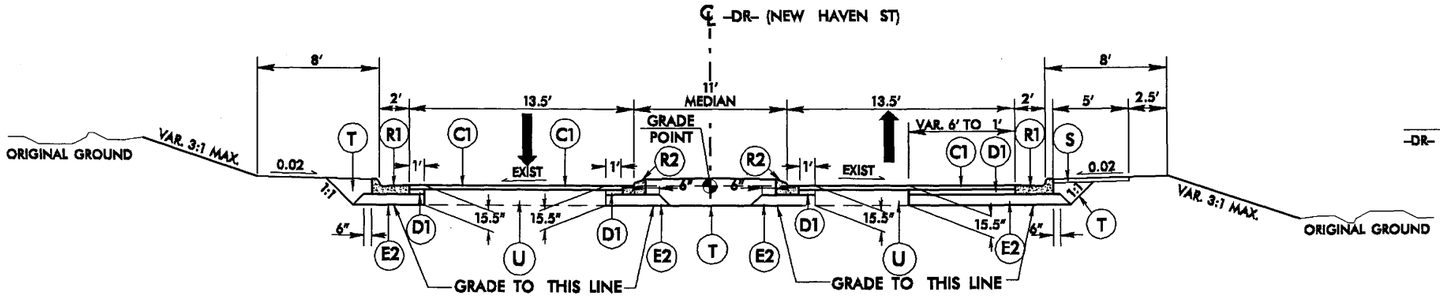
PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" TYPE S9.5C
C2	PROP. VAR. DEPTH TYPE S9.5C
D1	PROP. APPROX. 4" I19.0C
D2	PROP. VAR. DEPTH I19.0C
E1	PROP. APPROX. 3.5" TYPE B25.0C
E2	PROP. APPROX. 8.5" TYPE B25.0C
E3	PROP. VAR. DEPTH TYPE B25.0C
J1	PROP. 10" AGGREGATE BASE COURSE
R1	2'-6" CONCRETE CURB & GUTTER
R2	1'-6" CONCRETE CURB & GUTTER
S	4" CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING SEE SHEET 3-B FOR LOCATIONS OF MILLING OF THE EXISTING PAVEMENT
W	WEDGING SEE SHEET 2 FOR WEDGING DETAIL



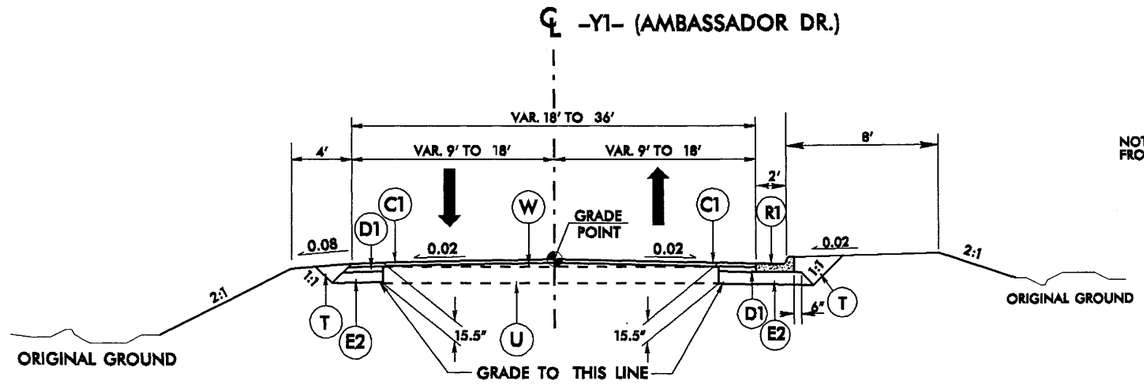
TYPICAL SECTION NO. 3

USE TYPICAL NO. 3
-Y- STA. 12+00.00 TO STA. 12+25.00



TYPICAL SECTION NO. 4

USE TYPICAL NO. 4
-DR- STA. 11+06.07 TO STA. 11+25.00



TYPICAL SECTION NO. 5

NOTE: TRANSITION FROM EXISTING TO TYPICAL NO. 5 FROM -Y1- STA. 9+00.00 TO STA. 9+25.00

USE TYPICAL NO. 5
-Y1- STA. 9+25.00 TO STA. 10+89.99

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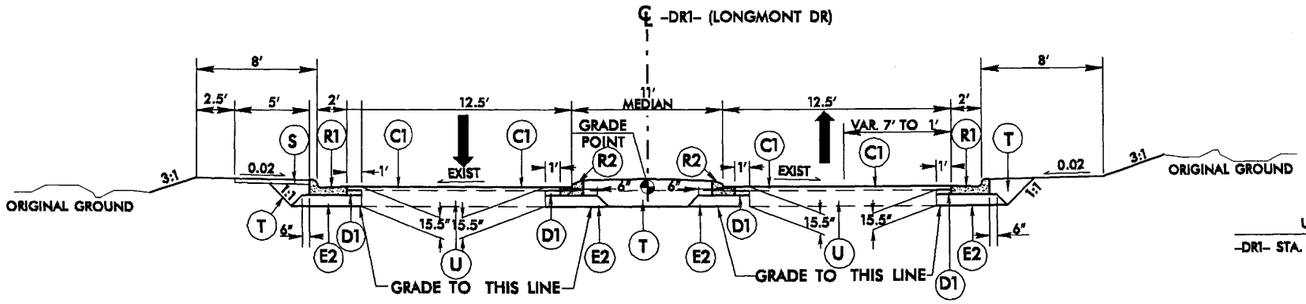
6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-4011	2B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

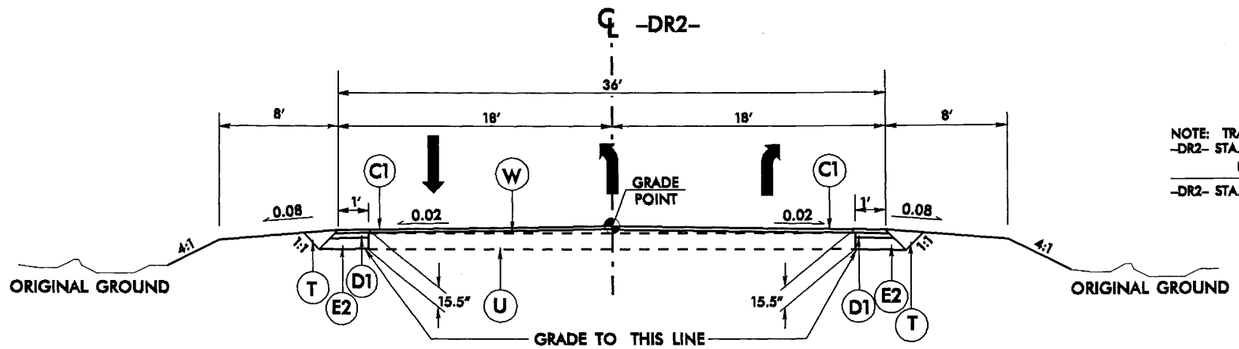
PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" TYPE S9.5C
C2	PROP. VAR. DEPTH TYPE S9.5C
D1	PROP. APPROX. 4" I19.0C
D2	PROP. VAR. DEPTH I19.0C
E1	PROP. APPROX. 3.5" TYPE B25.0C
E2	PROP. APPROX. 8.5" TYPE B25.0C
E3	PROP. VAR. DEPTH TYPE B25.0C
J1	PROP. 10" AGGREGATE BASE COURSE
R1	2'-6" CONCRETE CURB & GUTTER
R2	1'-6" CONCRETE CURB & GUTTER
S	4" CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING SEE SHEET 3-B FOR LOCATIONS OF MILLING OF THE EXISTING PAVEMENT
W	WEDGING SEE SHEET 2 FOR WEDGING DETAIL



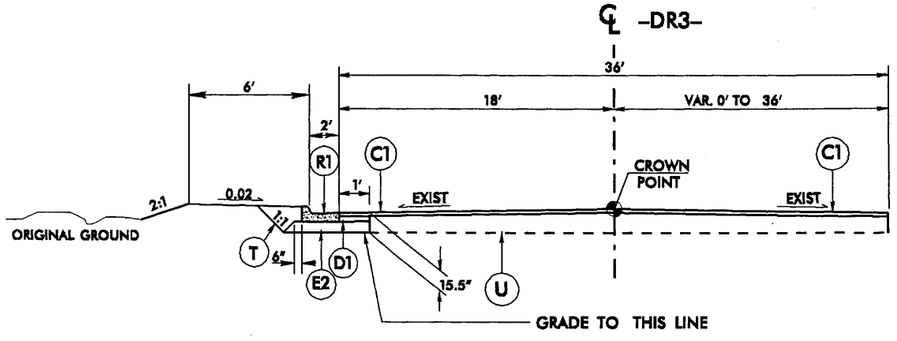
TYPICAL SECTION NO. 6

USE TYPICAL NO. 6
-DR1- STA. 11+09.97 TO STA. 11+77.70



TYPICAL SECTION NO. 7

NOTE: TRANSITION TO TYPICAL NO.7
-DR2- STA. 10+50.00 TO STA. 10+75.00
USE TYPICAL NO. 7
-DR2- STA. 10+75.00 TO STA. 10+94.14



TYPICAL SECTION NO. 8

USE TYPICAL NO. 8
-DR3- STA. 9+90.00 TO STA. 10+25.00
NOTE: TRANSITION FROM TYPICAL NO. 8 TO TYPICAL NO. 9
-DR3- STA. 10+25.00 TO STA. 10+44.25

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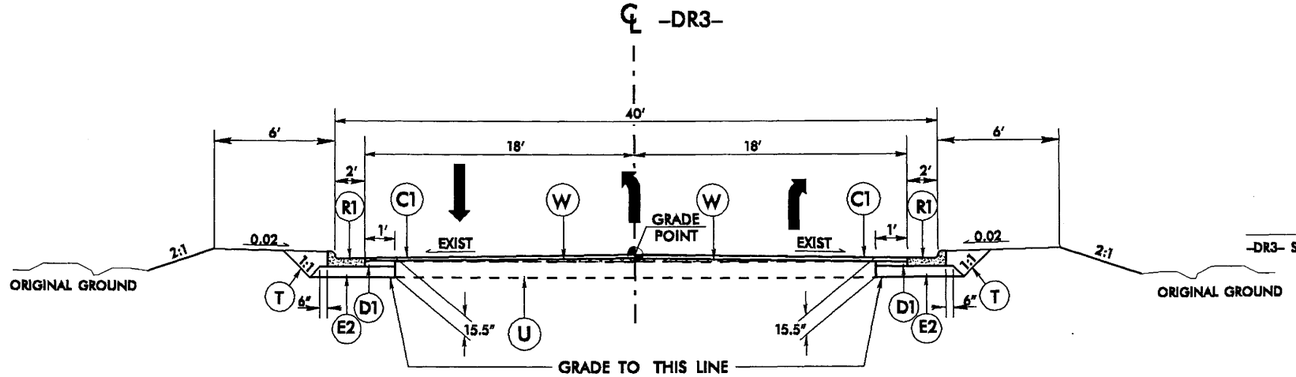
6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-4011	2C
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

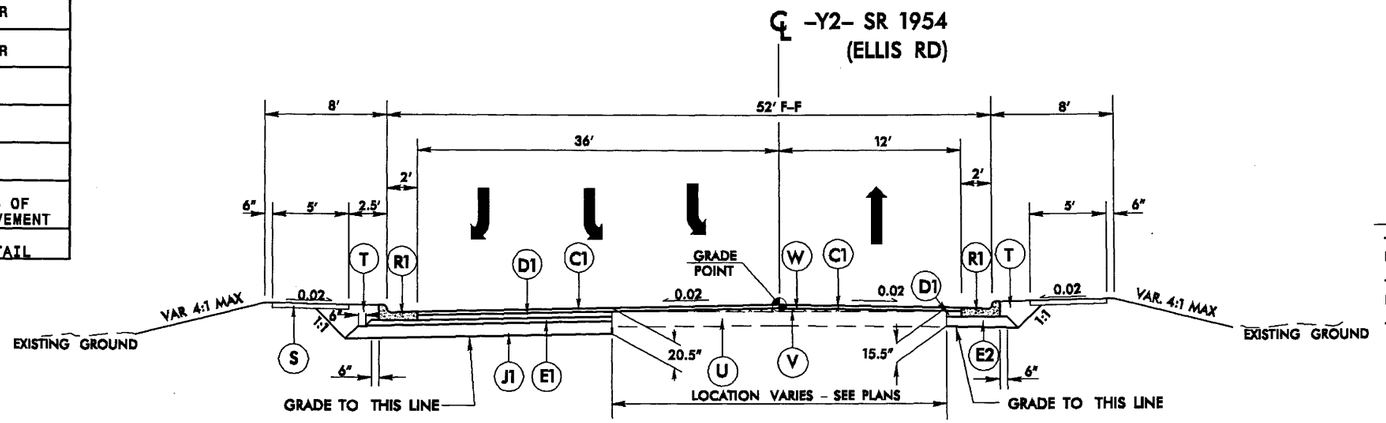
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3" TYPE S9.5C
C2	PROP. VAR. DEPTH TYPE S9.5C
D1	PROP. APPROX. 4" I19.0C
D2	PROP. VAR. DEPTH I19.0C
E1	PROP. APPROX. 3.5" TYPE B25.0C
E2	PROP. APPROX. 8.5" TYPE B25.0C
E3	PROP. VAR. DEPTH TYPE B25.0C
J1	PROP. 10" AGGREGATE BASE COURSE
R1	2'-6" CONCRETE CURB & GUTTER
R2	1'-6" CONCRETE CURB & GUTTER
S	4" CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING SEE SHEET 3-B FOR LOCATIONS OF MILLING OF THE EXISTING PAVEMENT
W	WEDGING SEE SHEET 2 FOR WEDGING DETAIL



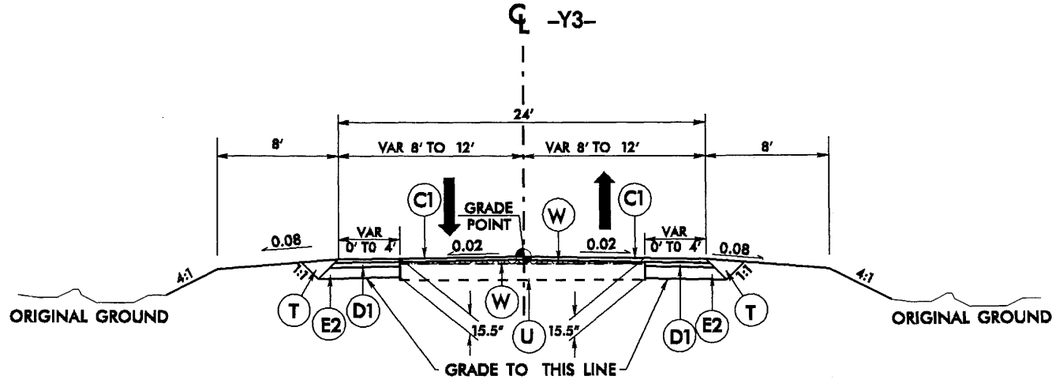
TYPICAL SECTION NO. 9

USE TYPICAL NO. 9
-DR3- STA. 10+44.25 TO STA. 10+65.68



TYPICAL SECTION NO. 10

USE TYPICAL NO. 10 AS FOLLOWS:
-Y2- STA. 11+16.73 TO STA. 14+65.00
NOTE: TRANSITION FROM TYPICAL NO. 10 TO EXISTING
-Y2- STA. 14+65.00 TO 15+00.00
NOTE: MINIMAL RESURFACING FROM
-Y2- STA. 15+00.00 TO 16+00.00



TYPICAL SECTION NO. 11

USE TYPICAL NO. 11
-Y3- STA. 12+75.00 TO STA. 13+03.26

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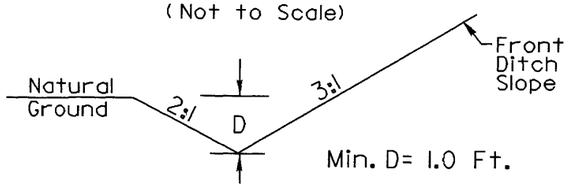
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-4011	2D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

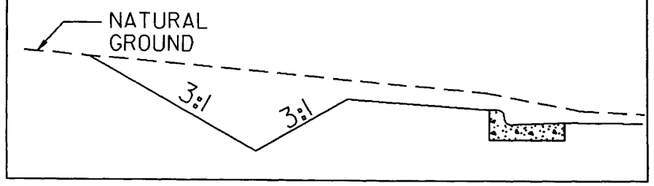
PRELIMINARY PLANS
NOT FOR CONSTRUCTION

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



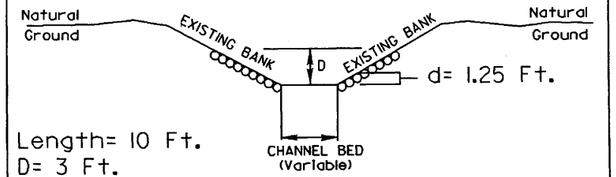
FROM STA. 12+00 TO STA. 12+25 –Y– (LT)
FROM STA. 10+00 TO STA. 10+51.65 –Y1– (RT)

DETAIL B
SPECIAL BACK OF CURB CUT DITCH
(NOT TO SCALE)



FROM STA. 50+43.15 TO STA. 51+50 –L– (RT)
FROM STA. 10+44.25 TO STA. 11+21.40 –DR3– (RT)
FROM STA. 43+92.68 TO STA. 45+00 –L– (RT)

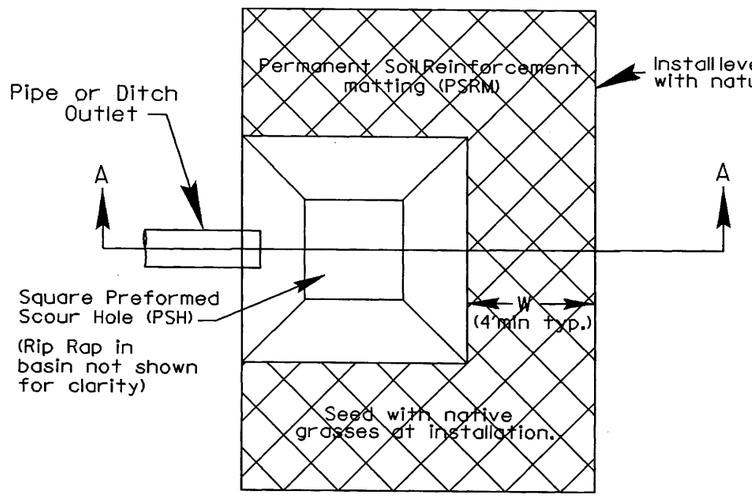
DETAIL F
PIPE OUTLET CHANNEL
(Not to Scale)



FROM STA. 36+69 TO STA. 36+83 –L– (RT)

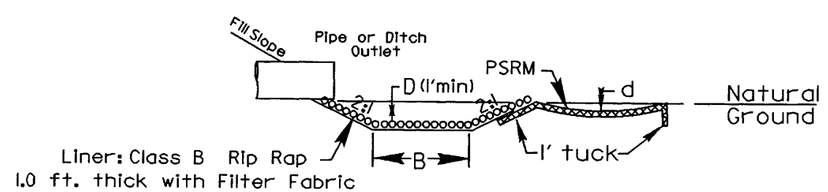
PREFORMED SCOUR HOLE
DETAIL "C"

PLAN VIEW



B=	6.0 Ft.
D=	2.0 Ft.
W=	4.0 Ft.
d=	0.0 Ft.

SECTION A-A

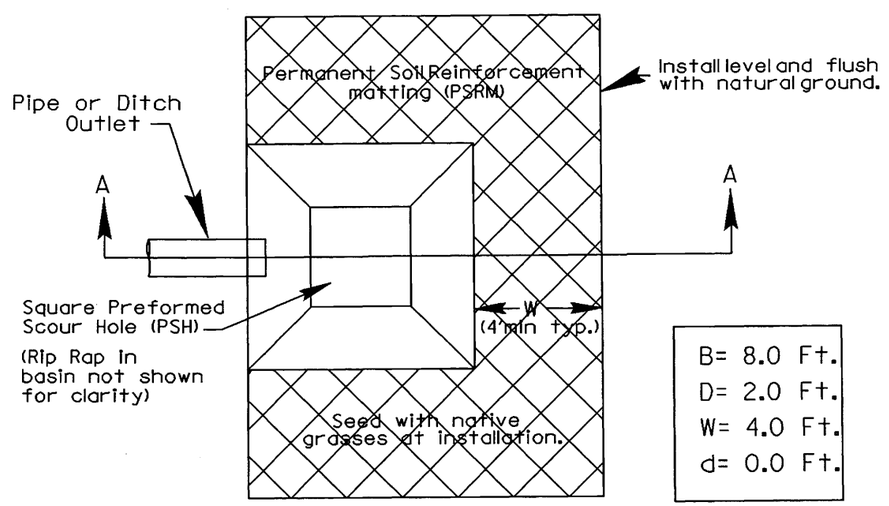


5/05

AT STA. 35+70 –L– RT.

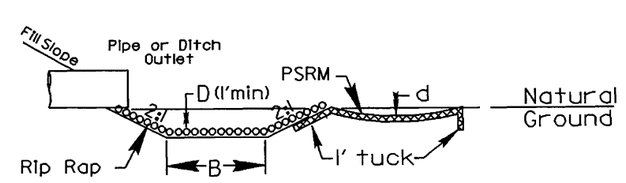
PREFORMED SCOUR HOLE
DETAIL "D"

PLAN VIEW



B=	8.0 Ft.
D=	2.0 Ft.
W=	4.0 Ft.
d=	0.0 Ft.

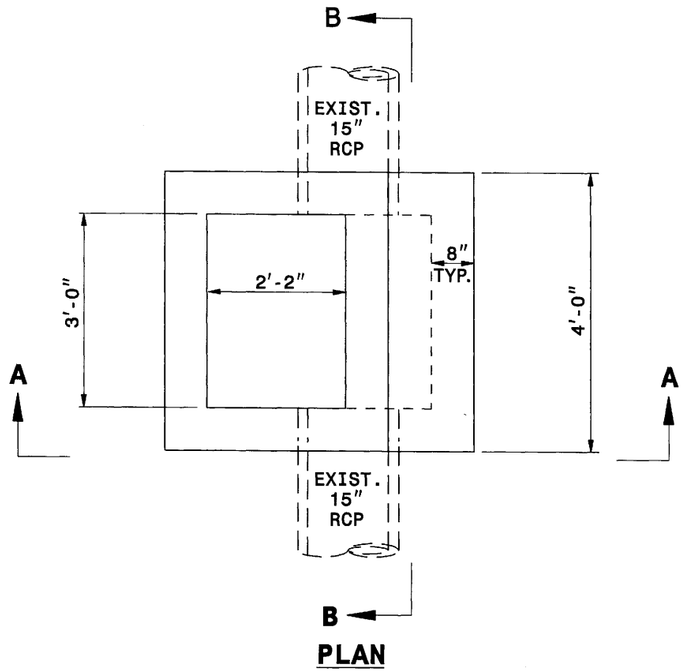
SECTION A-A



5/05

AT STA. 37+65 –L– RT.

PROJECT REFERENCE NO.	SHEET NO.



PLAN

NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

CONSTRUCT CONCRETE BOX IN ACCORADANCE WITH SECTION 825 OF THE STANDARD SPECIFICATIONS.

USE FORMS FOR CONSTRUCTION OF THE BOTTOM SLAB.

ADJUST LENGTH OF STEEL BARS AS NEEDED TO COMPENSATE FOR PIPES AND FRAME AND GRATE OPENINGS.

CONFORM REINFORCING STEEL TO ASTM A 615, GRADE 400.

CUT OR BEND STEEL BARS AS NEEDED TO PROVIDE 50mm CLEARANCE AROUND PIPES AND OPENINGS OR AS DIRECTED BY THE ENGINEER.

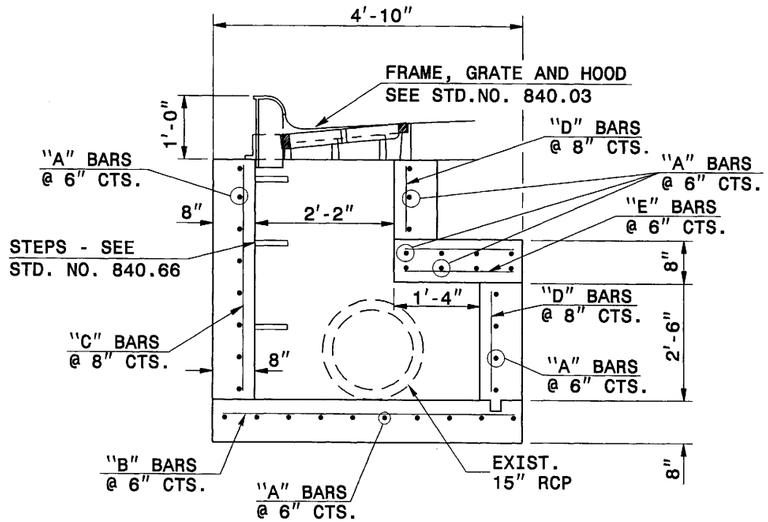
LOCATE FRAME, GRATE AND HOOD (SEE STANDARD 840.03) AS FIELD CONDITIONS DICTATE AND AS DIRECTED BY THE ENGINEER.

IF REINFORED CONCRETE PIPE IS SET IN BASE SLAB OR BOX, ADD TO BASE AS SHOWN ON STD. NO. 840.00.

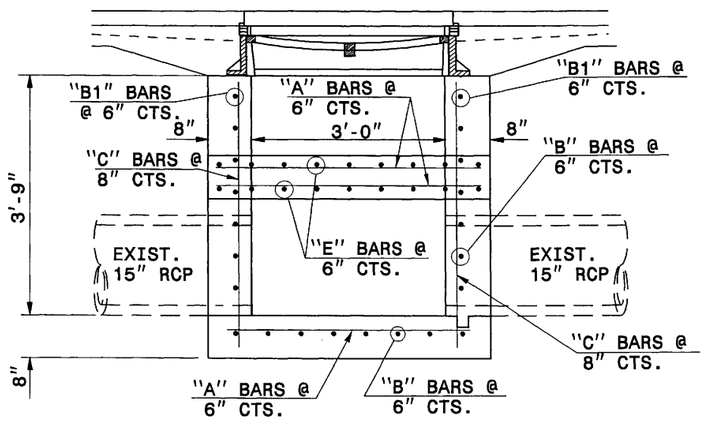
BILL OF MATERIALS

BAR	QTY	SIZE	LENGTH	WEIGHT
A	32	#5	4'-0"	133
B	16	#5	3'-8"	61
B1	18	#5	3'-2"	59
C	17	#5	7'-2"	127
D	20	#5	3'-6"	73
E	18	#5	1'-8"	31
TOTAL REINF. STEEL (LBS.)				483
TOTAL CONC. (CU.YDS.)				1.85
DEDUCTION FOR ONE 15" RCP				0.05

NOTE: NO DEDUCTIONS HAVE BEEN MADE TO ACCOMMODATE PIPES.



SECTION A-A



SECTION B-B

PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

DETAIL OF SPECIAL CATCH BASIN

ORIGINAL BY: T.S.Spell DATE: 7-26-02
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: w:stand/cb15rcp_r2908a.dgn

$$$$SYSTEMFONT$$$$
$$$$SYSTEMSTYLE$$$$
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-4011	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

-BL-11 11+25.17 PINC=
-L- POT STA. 14+14.78
(36.42' RT)

NAD 83/95

-L- POT STA. 15+00.00
BEGIN STATE PROJECT U-4011
BEGIN CONSTRUCTION

-DR- POT STA. 11+43.17

-DR- POT STA. 11+25.00
END CONSTRUCTION

-Y- POT STA. 13+30.11=
-DR- POT STA. 10+00.00=
-L- POC STA. 20+41.74

-L- PC STA. 25+49.68

-L- STA. 26+00
MATCHLINE

TIE PROP 5' SIDEWALK TO EXIST

TIE PROP 5' CONC SIDEWALK TO EXIST (100' TAPER TO PROP)

100' TAPER FROM EXISTING

150' TAPER

DO NOT DISTURB EXIST C&G

TIE PROP C&G TO EXIST.

TIE PROP C&G TO EXIST.

SPECIAL CUT DITCH SEE DETAIL A

END C&G

-Y- POT STA. 12+00.00
BEGIN CONSTRUCTION

-L- PT STA. 21+58.03

-Y- POT STA. 12+20.11 (16.98' RT)

-BY- 17 6+53.61 POT =

-Y- POT STA. 11+00.00

-BL- 12 16+20.94 PINC=
-BY- A12 5+00.00 POT
-L- POC STA. 19+14.73 (35.74' RT)

-L-	
PI Sta 19+66.84	PI Sta 26+51.60
Δ = 17° 10' 44.9" (RT)	Δ = 9° 14' 55.8" (RT)
D = 4° 27' 31.7"	D = 4° 32' 50.2"
L = 385.28'	L = 203.39'
T = 194.10'	T = 101.92'
R = 1,285.00'	R = 1,260.00'
SE = .04	SE = .04
RO = 168'	RO = 168'

	NEW HAVEN ST.	
	800 / 800	
292 / 200		516 / 700
23,792 / 35,200	S. MIAMI BLVD. (SR 1959)	24,108 / 35,700
-100 / -100		-100 / -100
	METHODIST ST. (SR 2112)	
	100 / 100	

2007 ADT
2030 ADT

FOR -L- PROFILE SEE SHEET 8
FOR -Y- PROFILE SEE SHEET 9
FOR -DR- PROFILE SEE SHEET 10

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PROJECT REFERENCE NO.	SHEET NO.
U-4011	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

NAD 83/95

-DRI- PT STA. 12+17.73

-DRI- POC STA. 11+77.70
END CONSTRUCTION

TIE PROP C&G TO EXIST

-BL-13 23+48.61 PINC=
-BN- A13 5+00.00 POT =
-L- POC STA. 26+38.63 (54.16' LT)

-DRI- PC STA 11+23.19

-DRI- POT STA 10+00.00=
-L- POC STA 27+14.00

125' FULL LANE

100' TAPER

-L- PT STA. 27+53.08

REMOVE EXIST CONC SIDEWALK

MATCHLINE -L- STA.26+00

MATCHLINE -L- STA.39+00

-BL-15 35+27.54 PINC =
-L- POT STA. 38+05.46 (43.25' LT)

-DR2- POT STA. 11+73.38=
-L- POT STA. 38+34.42

LONGMONT DR.

1300 / 1300			
592 / 500		708 / 800	
24,108 / 35,700	S. MIAMI BLVD. (SR 1959)		24,324 / 36,100
-100 / -100		-100 / -100	
100 / 100			

AMBASSADOR DR.

2007	ADT
2030	ADT

-Y1- POT STA 12+01.82=
-L- POC STA 27+14.00

-Y1- PT STA. 11+88.59

-Y1- PC STA 10+15.30

-BY1- 18 8+13.52 POT =
-L- POT STA. 27+54.84 (240.50' RT)

-Y1- POT STA 9+00.00
BEGIN CONSTRUCTION

DO NOT DISTURB SIDEWALK OR FENCE

END C&G

REMOVE AND RESET GATE

PREFORMED SCOUR HOLE SEE DETAIL C

CL I RIP RAP PIPE OUTLET CHANNEL SEE DETAIL 'B'

PREFORMED SCOUR HOLE SEE DETAIL D

200' FULL TURN LANE

-DR2- POT STA 10+50.00
END CONSTRUCTION

-BL-14 30+48.14 PINC =
-L- POT 33+30.12 (19.02' RT)

BEGIN 50' TRANSITION TO 8' SIDEWALK -L- 36+00

PIPE OUTLET CHANNEL
(Not to Scale)

BM#2
-BL- STA 36+01
255' RIGHT
ELEV.= 402.74 =
-L- STA. 38+34.68
(220.90' RT)

-L-

PI Sta 26+51.60
Δ = 9° 14' 55.8" (RT)
D = 4° 32' 50.2"
L = 203.39'
T = 101.92'
R = 1,260.00'
SE = .04
RO = 168'

PI Sta 11+92.06
Δ = 7° 05' 50.6" (RT)
D = 4° 05' 33.2"
L = 173.20'
R = 1,400.00'
SE = SEE PLANS
RO = SEE PLANS

-DRI-

PI Sta 11+70.60
Δ = 10° 49' 57.9" (LT)
D = 11° 27' 33.0"
L = 94.53'
T = 47.41'
R = 500.00'
SE = SEE PLANS

FOR -L- PROFILE SEE SHEET 8
FOR -Y1- PROFILE SEE SHEET 10
FOR -DR1- PROFILE SEE SHEET 10
FOR -DR2- PROFILE SEE SHEET 10

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PROJECT REFERENCE NO.	SHEET NO.
U-4011	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

24,624	ELLIS RD. (1954) 4,136 / 8,000	16,016 / 34,600
36,400	S. MIAMI BLVD. (SR 1959) 11,880 / 26,600	32,368 / 55,000
2007 ADT		
2030 ADT		

-L-	-Y2-
PI Sta 45+57.05	PI Sta 14+58.88
Δ = 23° 41' 06.0" (LT)	Δ = 30° 34' 39.3" (LT)
D = 2° 09' 14.3"	D = 11° 48' 48.8"
L = 1,099.59'	L = 258.83'
T = 557.76'	T = 132.58'
R = 2,660.00'	R = 485.00'
SE = .03	SE = SEE PLANS
RO = 126'	RO = SEE PLANS

FOR -L- PROFILE SEE SHEET 9
FOR -DR3- PROFILE SEE SHEET 10
FOR -Y2- PROFILE SEE SHEET 10

REVISIONS 8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
U-4011	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/99

NAD 83/95

-L- POT STA. 54+00.00
END STATE PROJECT U-4011

-BL- 27 50+43.58 PINC =
-BY3- A27 5+00.00 POT
(POINT NOT SET)
-L- POT STA. 53+03.95 (9.77' LT)

-L- PC Sta. 55+17.18

-L- POC Sta. +/-55+39.00
END CONSTRUCTION
END PROP SIDEWALK

-BY4- 25 5+00.00 POT

-L- PT Sta. 56+66.67

MATCHLINE -L- STA.52+00

-Y3- POT STA. 13+93.87 =
-L- POT STA. 52+55.04

-BY3- 21 6+13.28 PINC=
-L- POT STA. 52+64.63 (96.47' RT)

-Y3- POT STA. 12+75.00
END CONSTRUCTION
-Y3 PT STA. 12+53.95

-BY3- 23 7+82.79 POT
(U2808 BY6-2)
-L- POT STA. 52+05.79 (255.44' RT)

-BY4- 24 13+99.87 POT

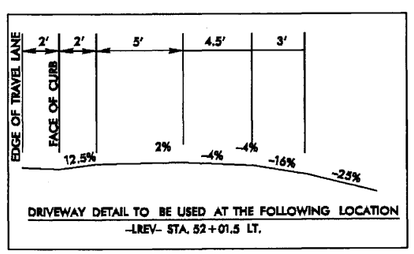
-BL-1(GPS-1) 55+88.26 POT=
-BY4- A1 9+85.74 PINC

BM#3
-BL- STA 55+30
240' RIGHT
-BY4- STA 12+07
111' LEFT
ELEV.= 426.16

-L-	-Y3-
PI Sta 55+91.93	PI Sta 11+85.54
Δ = 1°30'00.0" (RT)	Δ = 26°37'01.3" (LT)
D = 1°00'12.3"	D = 19°05'54.9"
L = 149.49'	L = 139.37'
T = 74.75'	T = 70.96'
R = 5,710.04'	R = 300.00'

NOTE: CONSTRUCT 5' SIDEWALK AT END OF PROJECT ON RIGHT IF POSSIBLE W/O DISTURBING EXISTING HOUSES

32,368		32,368
55,000	S. MIAMI BLVD. (SR 1959)	55,000
	-100 -100 / -100 -100	
	BETHESDA AVE.	
	100 / 100	
2007 ADT		
2030 ADT		



DRIVEWAY DETAIL TO BE USED AT THE FOLLOWING LOCATION
-LREV- STA. 52+01.5 LT.

FOR -L- PROFILE SEE SHEET 9
FOR -Y3- PROFILE SEE SHEET 10

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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-4011	8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L- STA. 15+00.00
BEGIN PROJECT U-4011
ELEV 413.39
BEGIN GRADE

BM #1 ELEV = 407.84'
N = 794477 E = 2046267
-BL- STA. 5+46 305' LT
RR SPIKE SET IN 36" OAK

-L- STA 18+60.00
VC = 440'
EL = 415.48'
K = 177
Vdes = 50 MPH

(+)0.5806%

(-)1.9087%

-L- STA 25+50.00
VC = 640'
EL = 402.31'
K = 170
Vdes = 50 MPH

(+)1.8535%

FOR -L- PLAN VIEW SEE SHEET 4

-L- STA 30+55.00
EL = 411.67'
VC = 340'
K = 86
Vdes = 50 MPH

(+)1.8535%

(-)2.1070%

BM #2 ELEV = 402.74'
N = 797137 E = 2047649
-BL- STA. 36+01 255' RT
-L- STA. 38+34.68 220.90' RT
X CHISELED IN BASE OF LIGHT POLE

-L- STA 37+00.00
EL = 398.08'
VC = 470'
K = 96
Vdes = 50 MPH

(+)2.8140%

DITCH LEGEND
LEFT DITCH PROFILE
RIGHT DITCH PROFILE

FOR -L- PLAN VIEW SEE SHEET 5

30-SEP-2008 08:13
P:\roadway\proj\u-4011\rdy_pfl.dgn
$$$$USERNAME$$$$

430 420 410 400 390 380 370 360

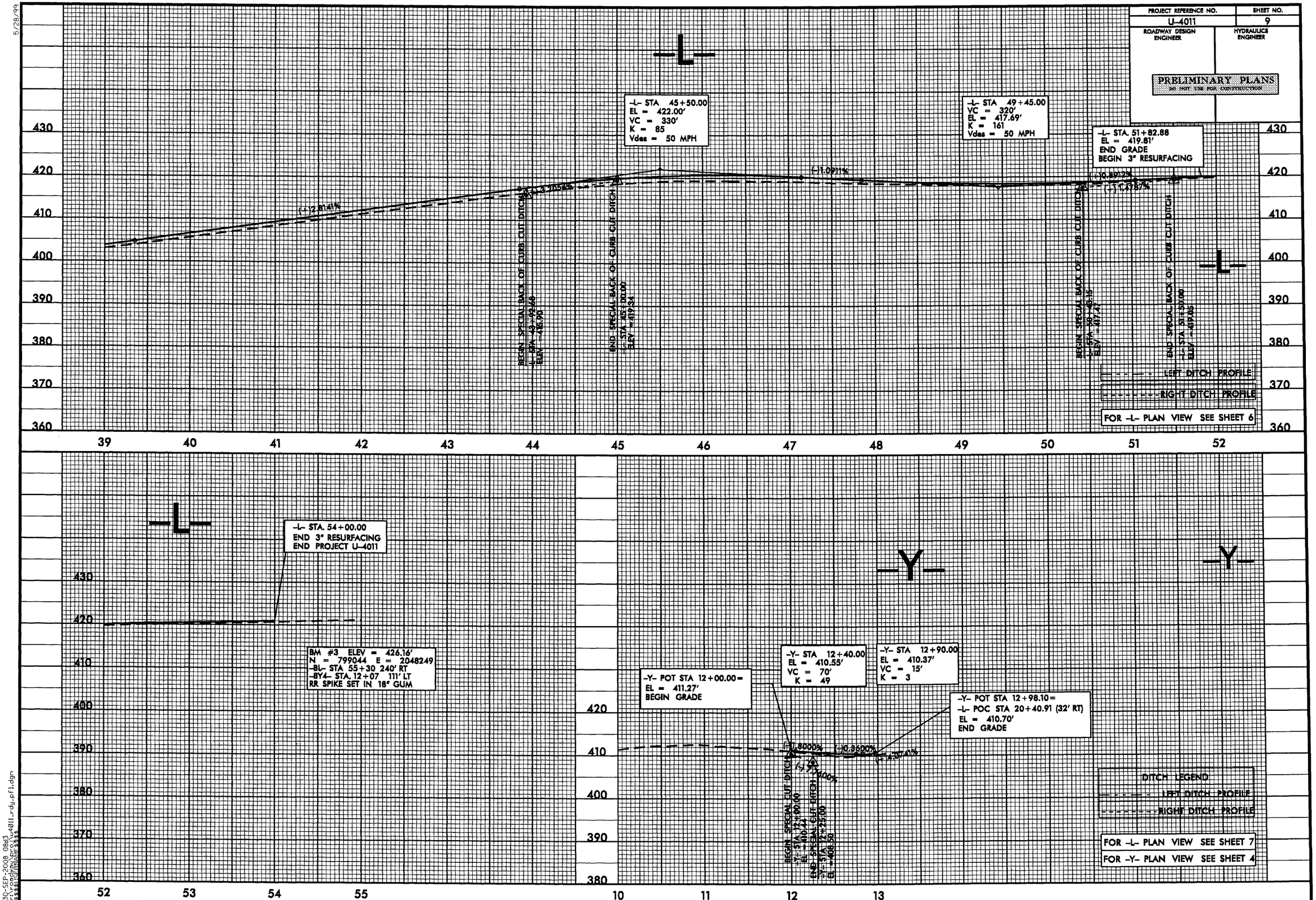
13 14 15 16 17 18 19 20 21 22 23 24 25 26

26 27 28 29 30 31 32 33 34 35 36 37 38 39

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-4011	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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I:\roadway\pro\u4011_rdy_pf1.dgn
$$$$USERNAME$$$$

52809

PROJECT REFERENCE NO.	SHEET NO.
U-4011	10

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

–DR–

NOTE: PROFILE IS 8' RIGHT OF ALIGNMENT

–DR– POT STA 10+32.21 (8' RT) =
–L– POC STA 20+51.31 (32' LT)
EL = 413.05'
BEGIN GRADE

–L– STA 10+40.00
EL = 413.17'
VC = 15
K = 3

(+)1.6404%
(+)4.3750%

–DR– POT STA 10+71.50
EL = 411.81'
END GRADE
3" RESURFACING TO STA 11+25.00

FOR –DR– PLAN VIEW SEE SHEET 4

–Y1–

–Y1– POT STA 9+00.00
BEGIN 3" RESURFACING

–Y1– POT STA 9+05.00
EL = 404.22'
BEGIN GRADE

–Y1– POT STA 11+69.57
–L– POC STA 27+18.02 (32' RT)
EL = 404.98'
END GRADE

–L– STA 11+20.00
EL = 403.25'
VC = 90'
K = 21

(–)0.8435%
(+)3.4900%
(–)6.4622%

END SPECIAL CUT DITCH
–Y1– STA 10+51.65
ELEV = 400.29

BEGIN SPECIAL CUT DITCH
–Y1– STA 10+00.00
ELEV = 405.62

–L– STA 10+05.00
EL = 404.22'
VC = 70'
K = 39

FOR –Y1– PLAN VIEW SEE SHEET 5

–DR1–

NOTE: PROFILE IS 6' RIGHT OF ALIGNMENT

–DR1– POT STA. 10+32.93 (6' RT) =
–L– POC STA. 27+06.33 (32' LT)
EL = 407.27'
BEGIN GRADE

–DR1– POT STA. 11+77.70
EL = 409.04'
END GRADE

–L– STA 10+55.00
EL = 408.05'
VC = 40'
K = 13

(+)1.5312%
(–)0.3280%
(+)1.1765%

–L– STA 11+25.00
EL = 408.42'
VC = 50'
K = 77

FOR –DR1– PLAN VIEW SEE SHEET 5

–DR2–

–DR2– POT STA. 10+50.00
EL = 400.45'
BEGIN RESURFACING (3")

–DR2– POT STA. 10+65.00
EL = 400.55'
BEGIN GRADE

(+)1.5088%
(+)0.0667%
(–)2.0091%

–DR2– POT STA. 11+41.22 =
–L– POT STA. 38+31.17 (32' RT)
EL = 401.70'
END GRADE

FOR –DR2– PLAN VIEW SEE SHEET 5

–DR3–

–DR3– POT STA. 11+40.80 =
–L– POC STA. 43+34.26 (32' RT)
EL = 416.89'
END GRADE

–DR3– POT STA. 10+25.00
EL = 415.62'
BEGIN GRADE

START SPECIAL BACK OF CURB CUT DITCH
–DR3– STA 10+44.79
ELEV = 416.30

END SPECIAL BACK OF CURB CUT DITCH
–DR3– STA 11+21.40
ELEV = 416.90

(+)3.7714%
(+)24.9978%
(–)0.5185%

–L– STA 10+95.00
EL = 418.26'
VC = 70'
K = 10

–DR3– POT STA. 9+90.00
BEGIN RESURFACING (3")

FOR –DR3– PLAN VIEW SEE SHEET 6

–Y2–

–Y2– POT STA 10+32.32 =
–L– POC STA 46+40.93 (32' LT)
EL = 419.72'
BEGIN GRADE

PI = 10+50.00
EL = 420.07'
VC = 35'
K = 15
Vdes = 15 MPH

PI = 11+75.00
EL = 425.30'
VC = 210'
K = 61
Vdes = 45 MPH

PI = 14+00.00
EL = 426.92'
VC = 100'
K = 149
Vdes = 50 MPH

PI = 15+00.00
EL = 426.97'
END GRADE
BEGIN RESURFACING

Y2– STA 16+00.00
END RESURFACING

(+)1.9794%
(+)4.1840%
(+)0.7200%
(–)0.0500%

FOR –Y2– PLAN VIEW SEE SHEET 6

–Y3–

–Y3– POT STA 12+75.00
EL = 423.42'
BEGIN GRADE

–L– STA 13+20.00
EL = 420.95'
VC = 70'
K = 23

–Y3– POT STA 13+61.61 =
–L– POT STA 52+50.94 (32' RT)
EL = 419.95'
END GRADE

(–)5.4886%
(–)2.4033%

FOR –Y3– PLAN VIEW SEE SHEET 7

–DR–
–Y1–
–DR1–
–DR2–
–DR3–
–Y2–
–Y3–

DITCH LEGEND
LEFT DITCH PROFILE
RIGHT DITCH PROFILE

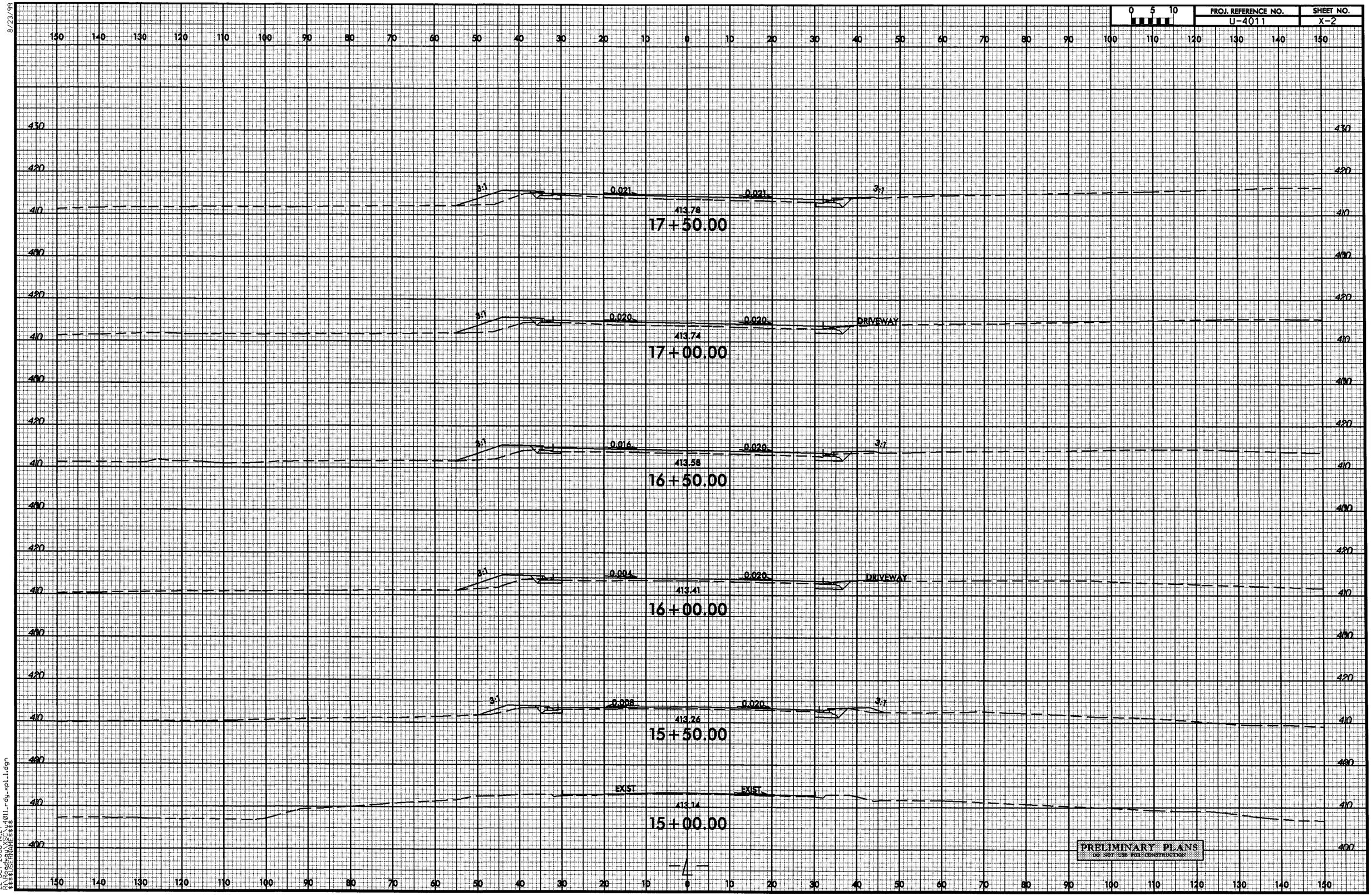
7/2/99

U–4011
CROSS–SECTION INDEX SHEET

BASELINE	SHEET NO.
–L–	X–2 THRU X–17
–Y–	X–18
–DR–	X–19
–Y1–	X–20 THRU X–21
–DR1–	X–22 THRU X–23
–DR2–	X–24
–DR3–	X–25 THRU X–26
–Y2–	X–27 THRU X–29
–Y3–	X–30

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-2



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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-3

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

430 420 410 400

3:1 0.040 0.040 3:1
413.45
19+50.00

3:1 0.040 0.040 3:1
413.08
19+00.00

3:1 0.040 0.040 3:1
413.23
18+76.72

3:1 0.040 0.040 DRIVEWAY
413.41
18+50.00

3:1 0.033 0.033 3:1
413.69
18+00.00

3:1 0.027 0.027 3:1
413.77
17+72.74

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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-4

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

420 410 400

3:1 -DR- 0.027 0.027 -Y- 3:1

409.78

21+58.03

3:1 -DR- 0.037 0.037 -Y- 3:1

409.59

21+16.49

-DR- 0.039 0.039 -Y- 3:1

409.79

21+05.75

-DR- 0.040 0.040 -Y-

410.82

20+50.00

-DR- 0.040 0.040 -Y-

411.73

20+00.00

3:1 0.040 0.040 3:1

412.14

19+73.19

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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-5

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

420 410 400 390

.02 0.020 0.020 DRIVEWAY

404.82

23+91.21

.02 0.020 0.020 2:1

405.29

23+50.00

3:1 .02 0.020 0.020 3:1

406.22

23+00.00

3:1 0.020 0.020 3:1

406.80

22+67.45

3:1 0.020 0.020 3:1

407.13

22+50.00

3:1 0.020 0.020 3:1

407.86

22+00.00

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-6

27+00.00

-DR1-

0.039

0.039

-Y1-

404.91

26+22.71

.02

0.040

0.040

3:1

404.41

26+00.00

.02

0.039

0.039

3:1

404.31

25+49.68

.02

0.027

0.027

3:1

404.28

24+91.21

0.020

0.020

3:1

404.34

24+50.00

0.020

0.020

3:1

404.37

-4-

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MXES\USERNAME$$$$

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-4011	X-7

0 5 10

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

420 410 400

3:1 0.020 0.020 3:1
406.45
29+50.00

3:1 0.007 0.020 3:1
407.58
28+95.36

3:1 0.004 0.020 3:1
406.78
28+50.00

3:1 0.014 0.020 3:1
406.07
28+07.99

3:1 0.023 0.023 3:1
405.54
27+70.36

3:1 0.027 0.027
RADIUS @ -Y1-
405.38
27+53.08

22-OCT-2008 14:27
R:\Roadway\XSC\u4011_rdy_xpl_1.dgn
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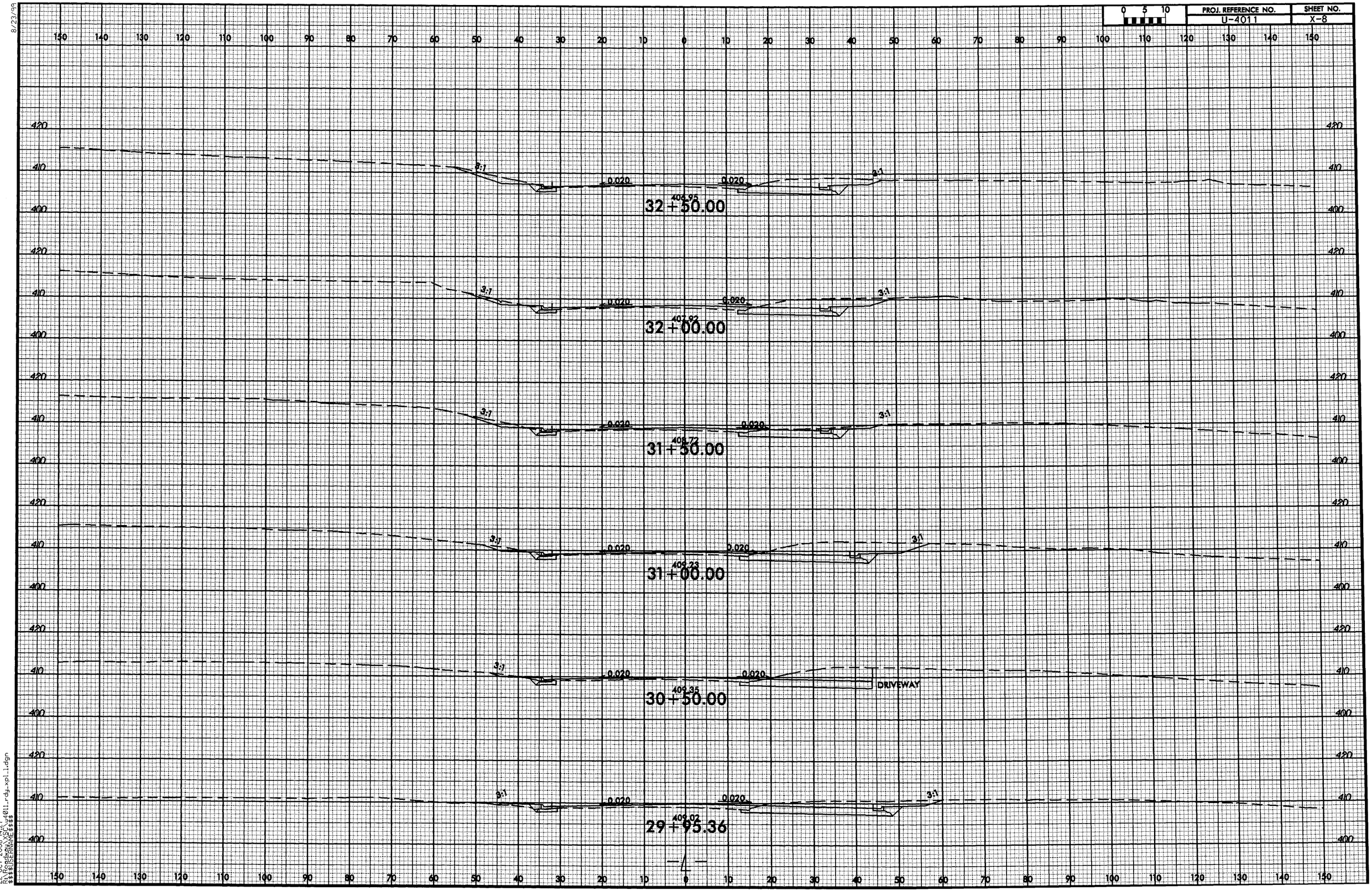
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-8



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$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-9

35+00.00

401.59

34+78.67

401.93

34+50.00

402.54

34+00.00

403.62

33+50.00

404.77

33+00.00

405.87

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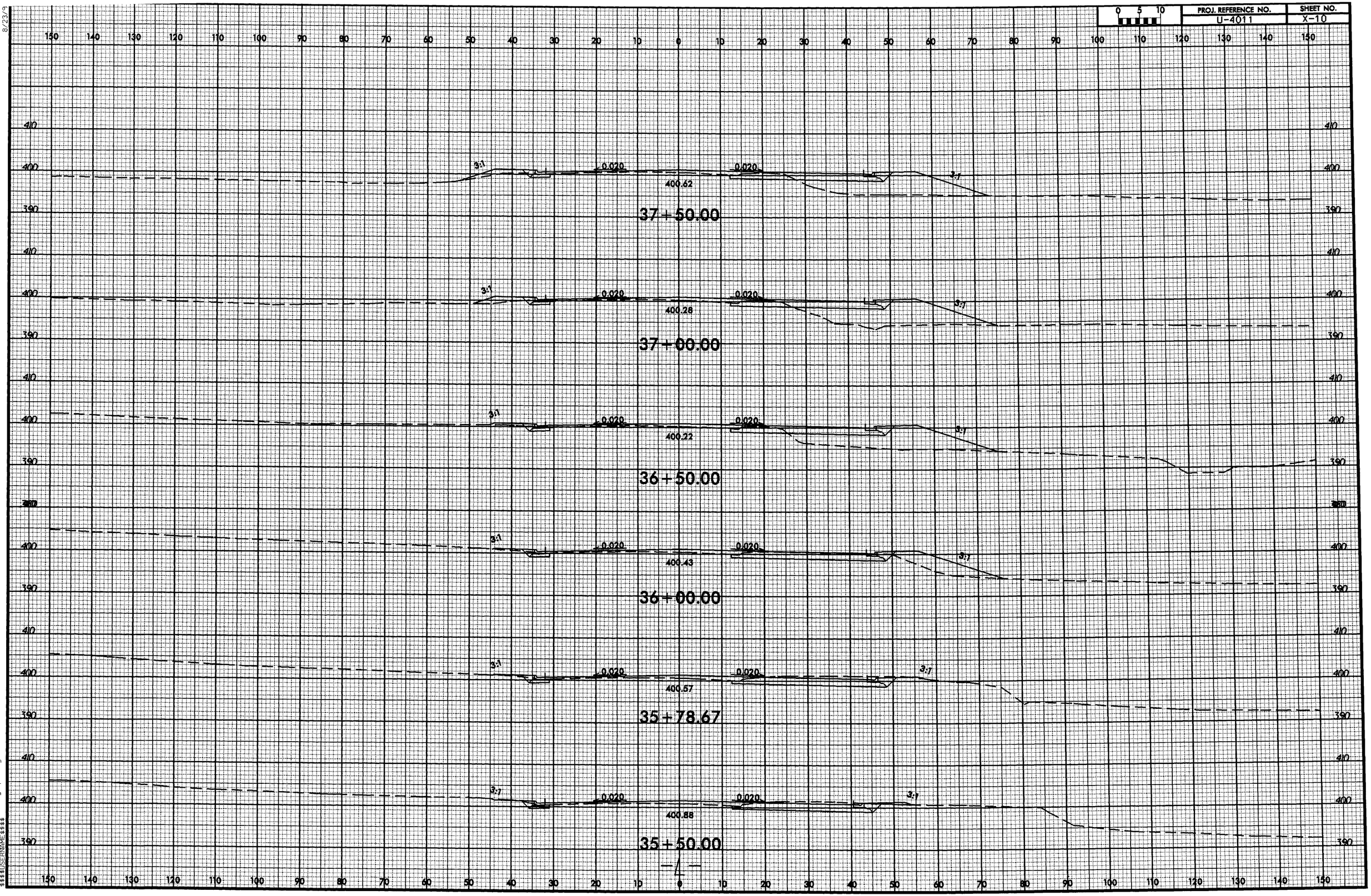
8/23/9

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-10



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E:\projects\U-4011_rdy_xpl1.dgn
$$$$USERNAME$$$$

DRIVEWAY

0.020 0.010 3:1

404.40

39+55.66

3:1 0.020 0.004 3:1

402.99

39+00.00

3:1 0.020 0.009 3:1

402.61

38+76.38

3:1 0.020 0.016 -DR2-

402.06

38+50.00

3:1 0.020 0.020 -DR2-

401.23

38+00.00

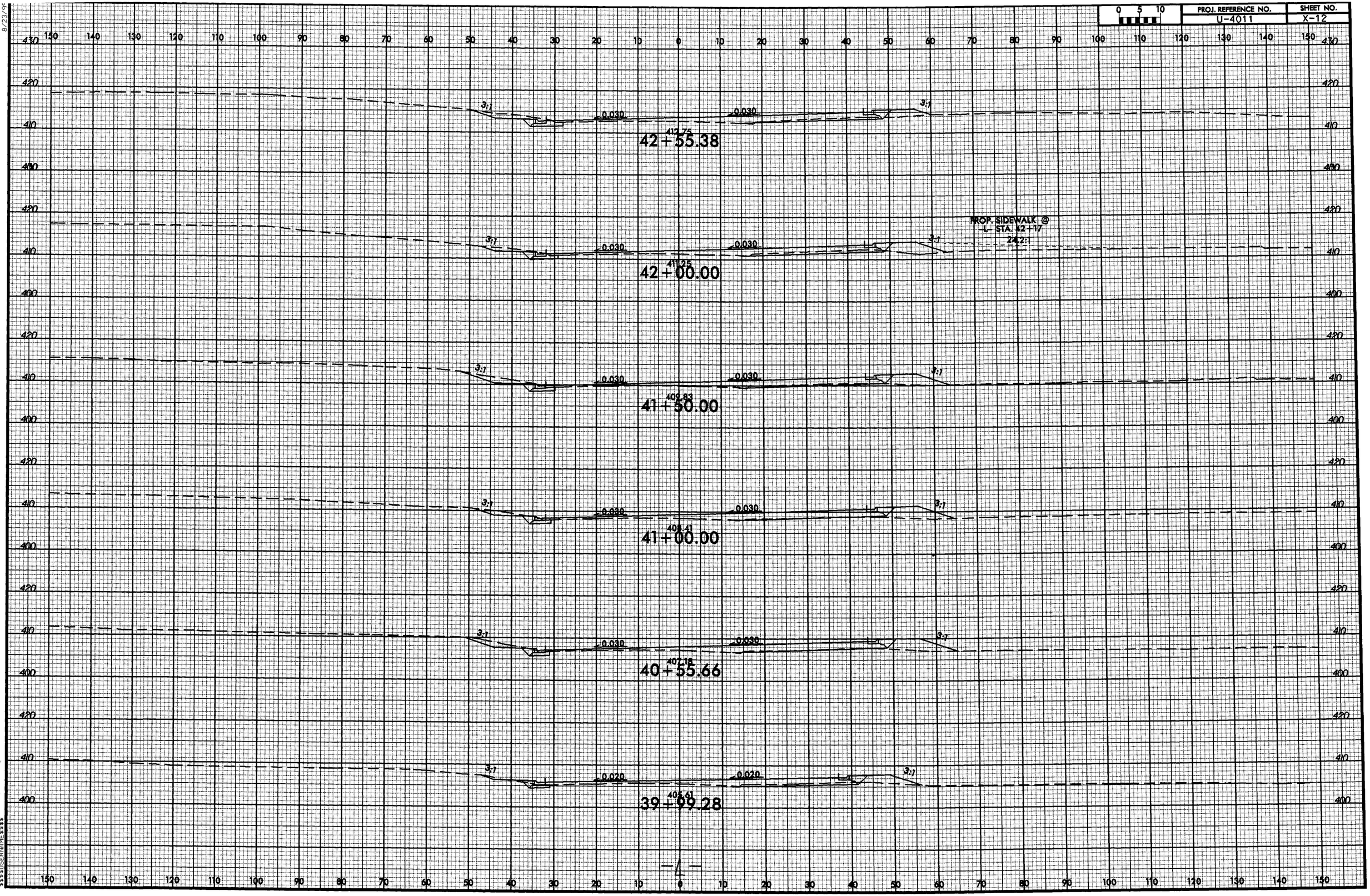
3:1 0.020 0.020 3:1

400.92

37+78.67

PROJ. REFERENCE NO.	SHEET NO.
U-4011	X-12

0 5 10



8/23/99

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C:\projects\4011_rdy_xpl.dgn
$$$$USERNAME$$$$

8/23/94

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-13

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

430 420 410

3:1 0.030 0.030 3:1

416.39

45+54.22

3:1 0.030 0.030 3:1

416.47

45+00.00

3:1 0.030 0.030 3:1 3.0

417.56 417.74

44+50.00

3:1 0.030 0.030 3:1 3:1

416.48 416.13

44+00.00

3:1 0.030 0.030 DR3

415.25

43+50.00

DRIVEWAY 0.030 0.030 DR3

413.93

43+00.00

— 4 —

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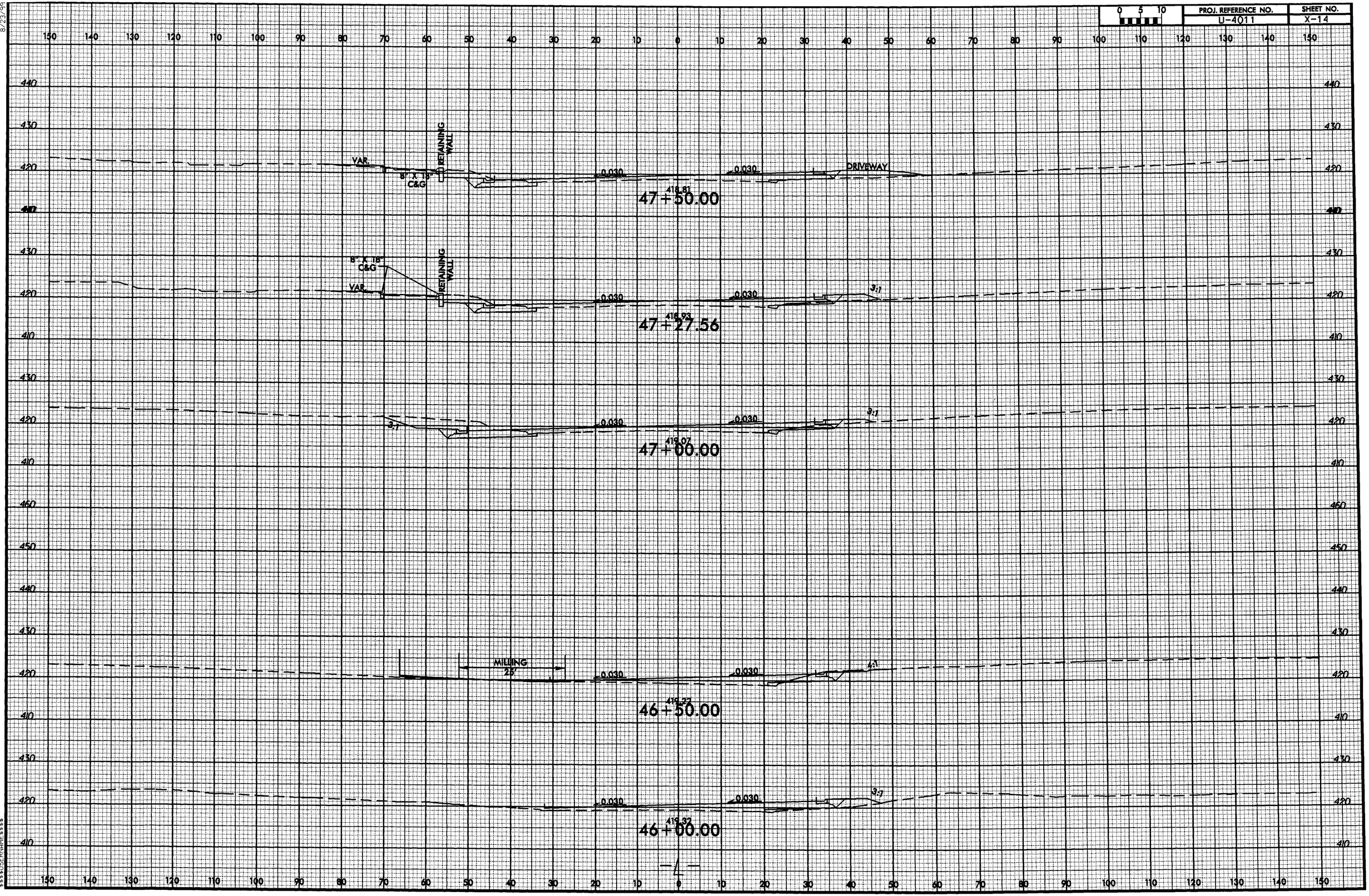
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-14



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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-15

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

440 430 420 410

8" X 18" C&G
RETAINING WALL
0.020
418.07
50+00.00
0.018
3:1

8" X 18" C&G
RETAINING WALL
0.030
417.99
49+50.00
0.030
3:1

8" X 18" C&G
RETAINING WALL
0.030
416.16
49+00.00
0.030
DRIVEWAY

8" X 18" C&G
RETAINING WALL
0.030
416.36
48+50.00
0.030
3:1

8" X 18" C&G
RETAINING WALL
0.030
418.57
48+00.00
0.030
3:1

VAR
8" X 18" C&G
RETAINING WALL
0.030
416.68
47+76.60
0.030
0.030
3:1

22-OCT-2008 14:29
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$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-16

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

430 420 410 400

EXIST 419.65 EXIST 3:1

52+00.00

3:1 EXIST 419.48 EXIST 3:1

51+80.50

DRIVEWAY 0.020 419.22 0.017 3:1 3:1 419.05

51+50.00

DRIVEWAY 0.020 418.75 0.005 3:1 3:1 418.29

50+98.88

RETAINING WALL 8" X 18" C&G 0.020 418.26 0.008 3:1 3:1 417.47

50+43.15

RETAINING WALL 8" X 18" C&G 0.020 418.19 0.011 DRIVEWAY

50+30.50

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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-17

54+00.00

EXIST. 420.70 EXIST.

53+50.00

EXIST. 420.44 EXIST. 3:1

53+07.05

EXIST. 420.24 EXIST. 2:1

52+50.00

2:1 EXIST. 419.99 EXIST.

8/23/99

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
U-4011	X-18

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

420
410
400

3:1 0.012 0.012 3:1
410.00
12+48.17

3:1 0.010 0.010 3:1
410.33
12+32.76

2:1 3:1 0.003 0.008 3:1
410.50
408.00
12+25.00

EXIST EXIST
411.02
12+00.00

—Y—

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-19

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

420
410
400

EXIST 411.77 EXIST
11+25.00

3:1 EXIST 412.18 EXIST 3:1
11+05.96

3:1 EXIST 412.37 EXIST 3:1
10+81.52

-DR-

420 410 400

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

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-4011	X-20

0 5 10

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

410 400 390

DRIVEWAY 0.020 0.010 DRIVEWAY
406.85

10+15.30

2% 0.020 0.010 3:1
406.06

10+00.00

EXIST 0.010 3:1
406.77

9+75.00

EXIST 0.010 3:1
406.39

9+50.00

EXIST 0.010 3:1
406.07

9+25.00

EXIST EXIST
406.12

9+00.00

-Y/-

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-21

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

420 410 400 390

2:1 0.020 0.000 3:1 402.35

11+25.00

2:1 0.020 0.010 3:1 402.36

11+00.00

2:1 0.020 0.010 402.52

10+75.00

2:1 0.020 0.010 DRIVEWAY 403.35

10+50.00

DRIVEWAY 0.020 0.010 DRIVEWAY 403.89

10+25.00

—Y/—

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

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-4011	X-22

0 5 10

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

420 410 400

3:1 -0.010 409.41 -0.010 3:1
11+50.00

3:1 -0.010 408.85 -0.010 3:1
11+23.19

3:1 -0.007 408.60 -0.010 3:1
11+09.97

3:1 -0.005 408.33 -0.010 3:1
11+00.00

3:1 -0.000 408.02 -0.010 3:1
10+90.62

3:1 -0.000 407.34 -0.010 3:1
10+80.50

-DRI-

8/23/99

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
U-4011	X-23

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

420

40

400

EXIST

EXIST

408.79

11+77.70

-DRI-

420

40

400

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

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-24

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

410
400
390

0.010 0.010 3:1
400.60
11+15.93

3:1 0.010 0.010 3:1
400.61
11+00.00

3:1 0.010 0.010 3:1
400.80
10+94.14

4:1 0.010 0.010 4:1
400.42
10+75.00

EXIST EXIST
400.20
10+50.00

-DR2-

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4011	X-25

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

430 420 410 430 420 410

2:1 0.010 416.05 0.010 2:1 3:1 416.27

10+50.00

2:1 0.010 413.98 0.010 2:1

10+44.25

2:1 0.010 415.87 EXIST.

10+25.00

2:1 EXIST. 414.46

10+00.00

2:1 EXIST. 414.33

9+95.49

EXIST. 414.17

9+90.00

-DR3-

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

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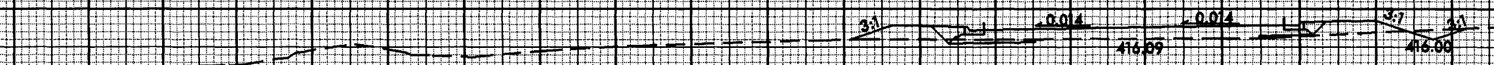
PROJ. REFERENCE NO.	SHEET NO.
U-4011	X-26

0 5 10

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

430
420
410

11+00.00



10+85.97

10+75.00

10+65.68

-DR3-

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

8/23/99

12-OCT-2008 14:29
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422.31
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SR 1959 (South Miami Boulevard) Improvements

From south of SR 2112 (Methodist Street) to north of SR 1960 (Bethesda Avenue)
Durham, Durham County
WBS Element 40221.1.1
Federal Project Number STP-1959(2)

TIP Project Number U-4011

ADMINISTRATIVE ACTION

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
AND
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
submitted pursuant to 42 U.S.C. 4332(2)(C)

APPROVED:

6/14/07 _____
Date **Gregory J. Thorpe, Ph.D., Environmental Management Director**
For Project Development and Environmental Analysis Branch, NCDOT

6/18/07 _____
Date **John F. Sullivan III, P. E., Division Administrator**
for Federal Highway Administration

SR 1959 (South Miami Boulevard) Improvements

From south of SR 2112 (Methodist Street) to north of SR 1960 (Bethesda Avenue)
Durham, Durham County
WBS Element 40221.1.1
Federal Project Number STP-1959(2)
TIP Project Number U-4011

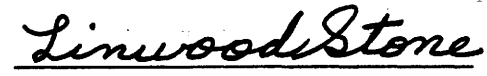
CATEGORICAL EXCLUSION

June 2007

Documentation Prepared in the Project Development and Environmental Analysis Branch by:

6-14-07

Steven L. Brown, P.E.
Project Planning Engineer



Linwood Stone
Project Engineer

PROJECT COMMITMENTS

SR 1959 (South Miami Boulevard) Improvements

From south of SR 2112 (Methodist Street) to north of SR 1960 (Bethesda Avenue)
Durham, Durham County
WBS Element 40221.1.1
Federal Project Number STP-1959(2)
TIP Project Number U-4011

Project Development and Environmental Analysis Branch, Roadway Design Unit, and Safe Routes to School Program

NCDOT will coordinate during final design of the project with school personnel at Bethesda Elementary School and Bethesda Christian Academy to provide appropriate school pedestrian crossings on the project.

Roadway Design Unit, Program Development Branch

Sidewalks will be provided on both sides of the South Miami Boulevard project. The City of Durham will be responsible for maintenance and liability of the proposed sidewalks, as well as sharing the cost of construction according to the NCDOT requirements for a municipality with a population above 100,000 (50% NCDOT and 50% municipality).

Wide outside lanes (14-foot) have been included to accommodate bicycle traffic.

Roadway Design Unit, and Division 5 Right-of-Way Office

Approximately 6-10 gravesites will be relocated within the cemetery belonging to Bethesda Baptist Church. Impacts to the cemetery will be minimized to the extent possible during final design of the project. NCDOT will coordinate with Bethesda Baptist Church to relocate the gravesites within the existing cemetery property.

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TABLES

FIGURES

APPENDICES

Categorical Exclusion

Prepared by the
Project Development and Environmental Analysis Branch
of the North Carolina Department of Transportation
In Consultation with the Federal Highway Administration

SUMMARY

1. Type of Action

This is a Federal Highway Administration (FHWA) Administrative Action, Categorical Exclusion (CE).

2. Description of Action

The North Carolina Department of Transportation (NCDOT) proposes to improve SR 1959 (Miami Boulevard) from south of SR 2112 (Methodist Street) to north of SR 1960 (Bethesda Avenue) in Durham, Durham County. Figure 1 shows the general location of the project. Figure 2 shows the project area and existing facilities. The purpose of the project is to improve the operational effectiveness of SR 1959 (South Miami Boulevard) and the intersection with SR 1954 (Ellis Road), and improve safety for motorists, pedestrians, and bicyclists in the project area. The total length of improvements is approximately 0.7 miles. Figure 3 shows a preliminary plan of the recommended alternative for the proposed action.

The improvements to SR 1959 (South Miami Boulevard) are federally funded. Project Number U-4011 is included in the NCDOT 2007-2013 Transportation Improvement Program (TIP). Right-of-Way and construction are scheduled in federal fiscal years 2008 and 2009, respectively. The current total estimated cost of the project is $6,434,026, consisting of $3,534,026 for Right-of-Way and $2,900,000 for construction.

3. Alternatives Considered

Several alternatives were considered for the proposed project including the Mass Transit Alternative, Transportation Systems Management Alternative, No-Build Alternative, and three Build Alternatives: Alternative 1 – Symmetrical Widening, Alternative 2 – Asymmetrical West Side Widening, and Alternative 3 – Asymmetrical East Side Widening.

The Mass Transit Alternative and Transportation Systems Management Alternatives were eliminated because they failed to meet the purpose and need of the project.

The No-Build Alternative avoids the environmental impacts anticipated to result from the project, but fails to improve the operational effectiveness or safety along SR 1959 (Miami Boulevard). This alternative is retained as a baseline for comparison with the Build Alternatives.

The Build Alternatives improve SR 1959 (South Miami Boulevard) by adding a center

turn lane within the project area to match existing sections of SR 1959 (South Miami Boulevard) to the south and north. Other improvements include turn lane improvements at the intersection of SR 1959 (South Miami Boulevard) and SR 1954 (Ellis Road), sidewalks throughout the length of the project, and a shared outside travel lane for bicycles. The SR 1959 (South Miami Boulevard) improvements begin approximately 550 feet south of SR 2112 (Methodist Street) and extend to approximately 150 feet north of SR 1960 (Bethesda Avenue). Figure 5 presents the horizontal alignments considered for the Build Alternatives.

The proposed typical section of SR 1959 (South Miami Boulevard) is a five lane curb and gutter section with a 12-foot wide center turn lane, 12-foot inside travel lanes, 14-foot outside lanes to accomadate bicycle travel, and 10-foot berms with 5-foot sidewalks. The typical section is shown in Figure 6.

4. Recommended Alternative

The recommended alternative is Alternative 3 – Asymmetrical East Side Widening. Widening SR 1959 (South Miami Boulevard) to the east minimizes impacts to surrounding properties and access to properties at the northern end of the project. A preliminary design of the recommended alternative appears in Figure 3.

5. Summary of Beneficial and Adverse Environmental Impacts

Table 1 contains a comparative summary of the quantifiable impacts associated with the proposed improvements along SR 1959 (South Miami Boulevard). The impacts associated with the proposed project are described in detail in Section V of this document.

4. Coordination

The following federal, state, and local agencies were consulted during the preparation of this Categorical Exclusion. An asterisk (*) indicates that a written response was received from the agency. Copies of the correspondence are included in the Appendix of this document:

US Army Corps of Engineers – Raleigh Regulatory Field Office
*US Fish and Wildlife Service –Raleigh Field Office
US Environmental Protection Agency
Federal Emergency Management Administration
NC Department of Administration, NC State Clearinghouse
NC Department of Public Instruction
*NC Department of Cultural Resources – SHPO
NC Department of Cultural Resources – Archives and History
NC Department of Environment and Natural Resources
*Division of Water Quality (DWQ)
Division of Soil and Water Conservation
Division of Forest Resources
Division of Land Resources
Division of Parks and Recreation
*NC Wildlife Resources Commission
Division of Coastal Management
Division of Marine Fisheries
Triangle J Council of Governments
*Durham-Chapel Hill-Carrboro Metropolitan Planning Organization
City of Durham

6. Actions Required By Other Agencies

Constructing the proposed action will result in impacts to jurisdictional surface waters. The proposed action has been processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance 23 CFR 771.115(b). Therefore, it is anticipated that a Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344), Nationwide Permit 23 will be required by the US Army Corps of Engineers (USACE).

The proposed project will also require a Section 401 Water Quality General Certification from the DWQ. Section 401 of the Clean Water Act requires that the state issue or deny water certification for any federally permitted or licensed activity that may result in a discharge to Waters of the United States. Section 401 Certification allows surface waters to be temporarily impacted for the duration of the construction or other land manipulation.

NCDOT will implement erosion and sedimentation control measures, as specified by NCDOT's "Best Management Practices for Protection of Surface Waters" during design and construction to avoid and minimize impacts to streams and wetlands. Additionally, NCDOT Design Standards for Sensitive Watersheds will be used in the planning and design of the project.

According to 15A NCAC 2H .0506(h) and 40 CFR 1508.20, compensatory mitigation will be required for impacts to jurisdictional streams requiring mitigation when those impacts are equal to or greater than 150 linear feet per stream. Jurisdictional stream impacts on the proposed alignment do not exceed 150 linear feet and wetland impacts on the proposed alignment are minimal and involve a small (0.02 acre), isolated wetland. Therefore, compensatory mitigation is not anticipated on this project. Final compensatory wetland and stream mitigation requirements will be determined by the USACE, under the statutory provisions of CWA §404.

In accordance with 15A NCAC 2B .0233, stream impacts caused by the widening of South Miami Boulevard are subject to the Riparian or Watershed Buffer rules. The area subject to the Riparian or Watershed Buffer rules is from the top of the stream bank to the edge of the pavement of South Miami Boulevard. Perpendicular stream impacts are subject to the Riparian or Watershed Buffer rules under the category of "Road impacts greater than 40 linear feet but equal to or less than 150 linear feet or one-third of an acre of riparian buffer" are allowable. Impacts that are equal to or less than 40 linear feet of riparian buffer are exempt and impacts that are greater than 150 linear feet or one-third of an acre of riparian buffer are allowable with mitigation. Neuse River buffer impacts for the Recommended Alternative (Alternative 3) are greater than 40 linear feet and less than 150 linear feet and less than one-third of an acre. Therefore, project impacts are expected to be in the "allowable" category. The proposed project will require certification and approval of buffers by the DWQ.

7. Additional Information

Additional information concerning the project can be obtained by contacting the following persons:

John F. Sullivan III, P. E., Division Administrator
Federal Highway Administration
310 New Bern Avenue, Suite 410
Raleigh, North Carolina 27601
Telephone 919-856-4346

Gregory J. Thorpe, Ph.D., Environmental Management Director
North Carolina Department of Transportation
Project Development and Environmental Analysis Branch
1548 Mail Service Center, Raleigh, North Carolina 27699-1548
Telephone 919-733-3141

Table 1
Comparative Summary

Category	Units	Recommended Alternative
Length	Miles	0.7
Residential Relocations	Total	2
	Minority	0
Business Relocations	Total	0
	Minority	0
Total Relocations	Total	2
Non-Profit Relocations	Total	0
Wetlands	Acres	0.002
Stream Impacts	Linear feet	102
Neuse River Basin Buffer Impact	Square feet	10,025
Hazardous Material Sites	Each	0
Protected Species	Species	0
Terrestrial Communities	Acres	6.94
Noise	Impacted Receptors	17
Historic Architecture	Properties	0
Archaeology	Sites	0
Air Quality 1-Hour	carbon monoxide (ppm)*	<9.0
Construction Cost	Dollars	$2,900,000
Right-of-Way Cost	Dollars	$3,534,026
Total Cost	Dollars	$6,434,026

*ppm = parts per million
National Ambient 1-hour Air Quality Standards: 35 ppm

SR 1959 (South Miami Boulevard) Improvements

From south of SR 2112 (Methodist Street) to north of SR 1960 (Bethesda Avenue)
Durham, Durham County
WBS Element 40221.1.1
Federal Project Number STP-1959(2)
TIP Project Number U-4011

I. PURPOSE AND NEED

A. General Description of Project

The North Carolina Department of Transportation (NCDOT) proposes to improve SR 1959 (South Miami Boulevard) from south of SR 2112 (Methodist Street) to north of SR 1960 (Bethesda Avenue) in Durham, Durham County. Figure 1 shows the location of the project. Figure 2 shows the immediate project area. The total length of the project is approximately 0.7 miles. Figure 2 shows the existing transportation facilities in the project area. Figure 3 shows a preliminary plan of the proposed action.

The improvements to SR 1959 (South Miami Boulevard) are federally funded. Project Number U-4011 is included in the NCDOT 2007-2013 Transportation Improvement Program (TIP). Right-of-Way and construction are scheduled in federal fiscal years (FY) 2008 and 2009, respectively. The current total estimated cost of the project is $6,434,026, consisting of $3,534,026 for Right-of-Way and $2,900,000 for construction.

The mutually adopted 1991 *Durham-Chapel Hill-Carrboro Metropolitan Transportation Organization (DCHC-MPO) Urban Area Thoroughfare Plan* identifies SR 1959 (South Miami Boulevard) as a major thoroughfare. The project is programmed in the DCHC-MPO 2007-2013 Metropolitan Transportation Improvement Program for Right-of Way acquisition in FY 2008 and Construction in FY 2009. The proposed improvements are included in the fiscally constrained *DCHC-MPO 2030 Long Range Transportation Plan.* The proposed improvements agree with and will be a step toward the implementation of these plans.

B. Purpose and Need

The purpose of the project is to improve the operational effectiveness of SR 1959 (South Miami Boulevard) and the intersection with SR 1954 (Ellis Road), and improve safety for motorists, pedestrians, and bicyclists in the project area.

The project is a 0.7 mile long roadway that is currently a 4-lane, undivided section that is flanked on either end by a 5-lane typical section. Over 20 driveway accesses and four major intersections exist on the project, creating turning movement demand throughout the project area. The current 4-lane section has increased through traffic congestion due to right and left turning vehicles in the through lanes. The addition of a center lane will also provide a staging area for the minor street traffic to use when attempting left-turns onto SR 1959 (South Miami Boulevard). The current section has no barrier or distance between opposing lanes, increasing the likelihood of head-on and turning movement accidents. Additionally, through lane queues created by turning vehicles increase the risk of rear end collisions on the project.

The current 4-lane undivided section provides limited and inadequate pedestrian facilities, with sidewalks at various small sections of the project area, decreasing pedestrian mobility and safety in the project area. The existing section provides no lane accommodation for bicycles, which creates a safety hazard for bicyclists traveling in the project area.

1. Traffic Volumes

Estimated Average Daily Traffic (ADT) volumes were developed for the proposed project for the year 2030. The traffic volumes are shown in Figure 4. The traffic forecast estimated that the 2030 volumes on SR 1959 (South Miami Boulevard) will range from 35,200 vehicles per day (vpd) south of SR 2112 (Methodist Street) to 55,000 vpd north of SR 1960 (Bethesda Avenue). Seven percent trucks are expected to use the facility in the year 2030. SR 1959 (South Miami Boulevard) is currently a four-lane roadway in the project area and a five-lane section with a center turn lane to the north and south of the project area.

2. Traffic Capacity

Capacity is defined as the maximum number of vehicles that can be accommodated in reasonable safety along a roadway within a specific time period. When traffic volumes approach or exceed the capacity of the roadway, operating levels of service are diminished and congestion results. Simply defined, level of service is a qualitative measure that describes operational conditions of a traffic stream along a roadway or at an intersection of two roadways. Six levels of service are defined from A to F, with Level of Service A representing the best and Level of Service F the worst operational conditions.

a. Capacity Analysis Overview

A total of seven intersections along SR 1959 (South Miami Boulevard) and three intersections along SR 1954 (Ellis Road) were analyzed during both the AM and PM peak hour using methodologies from the *Highway Capacity Manual* (HCM) to determine the LOS for each movement for all scenarios.

The ten intersections analyzed include:

- SR 1959 (South Miami Boulevard) and Bethesda Avenue
- SR 1959 (South Miami Boulevard) and Bethesda Christian Academy Entrance #1
- SR 1959 (South Miami Boulevard) and SR 1954 (Ellis Road)
- SR 1959 (South Miami Boulevard) and Bethesda Elementary School Entrance # 1
- SR 1959 (South Miami Boulevard) and Bethesda Elementary School Entrance # 2
- SR 1959 (South Miami Boulevard) and Ambassador Drive / Longmont Drive
- SR 1959 (South Miami Boulevard) and Methodist Street / New Haven Street
- SR 1954 (Ellis Road) and Bethesda Christian Academy Entrance #2
- SR 1954 (Ellis Road) and Taylor Estates Entrance #1
- SR 1954 (Ellis Road) and Taylor Estates Entrance #2

According to the *Highway Capacity Manual*, if an urban street has medium to high signal densities (i.e. more than two signals per mile), the operation of the mainline is primarily dependent on the operations of the signals along the corridor. In addition to the existing signal at SR 1954 (Ellis Road) within the project limits, there are existing signals along SR 1959 (South Miami Boulevard) outside the project limits at SR 1926 (Angier Avenue) and SR 1966 (Lumley Road) but within two miles of one another. The mainline LOS for the SR 1959 (South Miami Boulevard) within the project limits is primarily dictated by the operation of the signalized intersection at SR 1954 (Ellis Road) and, therefore, this LOS is the determining factor for the mainline LOS for the studied section.

b. Intersection Analysis

Each the 10 intersections mentioned above were analyzed during both the AM and PM peak hour under the following three scenarios:

2005 No Build

SR 1959 (South Miami Boulevard) and SR 1954 (Ellis Road) within the project limits were analyzed with the existing roadway and intersection geometries using the base year, 2005, traffic volumes. SR 1959 (South Miami Boulevard) is currently a four-lane undivided facility and SR 1954 (Ellis Road) is a two-lane undivided facility.

2030 No Build

SR 1959 (South Miami Boulevard) and SR 1954 (Ellis Road) within the project limits were analyzed with the existing roadway and intersection geometries using the design year, 2030, traffic volumes. SR 1959 (South Miami Boulevard) is a four-lane undivided facility and SR 1954 (Ellis Road) is a two-lane undivided facility.

2030 Build

SR 1959 (South Miami Boulevard) was analyzed as a five-lane facility (four-lane undivided with a center turn-lane) and SR 1954 (Ellis Road) was analyzed as a two-lane undivided facility. In addition, the intersection geometry at the SR 1959 (South Miami Boulevard) / SR 1954 (Ellis Road) intersection was modified to provide a dual left-turn lane on eastbound SR 1954 (Ellis Road).

c. Intersection Analysis Results

A summary of the calculated LOS for the movements at each intersection for all three scenarios is included in Table 1 below. An overview of the intersection analysis results for each scenario is detailed as follows. .

2005 No Build

During both the AM and PM peak hour, traffic at the unsignalized intersections along the minor streets experience a considerable amount of delay attempting both left and right-turn movements onto SR 1959 (South Miami Boulevard). The signalized intersection of SR 1959 (South Miami Boulevard) and SR 1954 (Ellis Road) operates at an overall LOS D in the AM peak hour and an overall LOS F in the PM peak hour.

2030 No Build

During both the AM and PM peak hour, the traffic at the unsignalized intersections along the minor streets experience extensive amounts of delay attempting both left and right-turn movements onto SR 1959 (South Miami Boulevard). This is due to the large volume of through traffic along SR 1959 (South Miami Boulevard) and limited gaps in the through traffic. All eastbound and westbound minor street movements operate at a failing level of service. The signalized intersection of SR 1959 (South Miami Boulevard) and SR 1954 (Ellis Road) operates at an overall LOS F in the both the AM and PM peak hour.

2030 Build

During both the AM and PM peak hour, the traffic at the unsignalized intersections along the minor streets still experience extensive amounts of delay attempting both left and right-turn movements onto SR 1959 (South Miami Boulevard). This is still due to the large volume of through traffic along SR 1959 (South Miami Boulevard) and limited gaps in traffic. All eastbound and westbound minor street movements operate at a failing level of service. The signalized intersection of SR 1959 (South Miami Boulevard) and SR 1954 (Ellis Road) operates at an overall LOS F in the both the AM and PM peak hour.

d. Capacity Analysis Conclusions

Currently, all of the unsignalized intersections along SR 1959 (South Miami Boulevard) and SR 1954 (Ellis Road) within the project limits are operating near capacity in both the AM and PM peak hour in the base year 2005. The signalized intersection at SR 1959 (South Miami Boulevard) and SR 1954 (Ellis Road) operates at an acceptable LOS D in the AM peak hour but operates at a failing LOS F in the PM peak hour. With the projected traffic growth in the design year 2030, it is anticipated that all of the intersections within the project limits will operate at a failing LOS F in both the No Build and Build Scenarios. However, it should be noted that the failing LOS is for the worst case scenario (i.e. during the peak hour) and that we anticipate the facility operating at an adequate LOS during the majority of the travel time.

Based on the design year 2030 forecast, it is anticipated that 2,265 vehicles in the PM peak hour will be travelling eastbound on SR 1954 (Ellis Road) desiring to make a left-turn onto SR 1959 (South Miami Boulevard). This same volume of vehicles will be reversed in the AM peak hour travelling southbound on SR 1959 (South Miami Boulevard) desiring to make a right-turn onto SR 1954 (Ellis Road). This is the major movement within the project limits. Also in the 2030 AM peak hour, it is anticipated that there will be 532 vehicles travelling northbound on SR 1959 (South Miami Boulevard) desiring to make a left-turn onto SR 1954 (Ellis Road).

Although widening SR 1959 (South Miami Boulevard) within the project limits from its existing 4-lane section to a 5-lane section is not anticipated to provide an adequate LOS during the peak hour in the design year 2030, it will increase the operational effectiveness of this facility by providing additional through capacity by removing the left-turning vehicles from the mainline. The center lane will also provide a staging area for the minor street traffic to use when attempting left-turns onto SR 1959 (South Miami Boulevard). In addition, widening SR 1959 (South Miami Boulevard) to a 5-lane section will provide increased continuity by connecting this section of SR 1959 (South Miami Boulevard) to the existing 5-lane sections on either side of the project limits to create a seamless roadway facility.

The proposed eastbound dual left-turn movement on SR 1954 (Ellis Road) will operate at a LOS C in the AM peak hour and a LOS F in the PM peak hour in the project design year of 2030. Although the proposed eastbound dual left-turn on Ellis Road will not be able to handle the forecasted 2030 PM peak hour traffic, the proposed dual left-turn lane will improve the operations of this intersection in this time period by decreasing the overall delay of this movement.

Based on upon the 95th percentile queue length from Synchro 7 and Sim Traffic software for the 2030 design year traffic projections, turn lanes and storage length at the Ellis Road and South Miami Boulevard intersection have been maximized to the extent practical within the project limits.

Table 1
Level of Service Summary

Intersection	Movement		2005 No Build (4 lanes)		2030 No Build (4 lanes)		2030 Build (5 lanes)	
			(AM)	(PM)	(AM)	(PM)	(AM)	(PM)
S. Miami Boulevard and Bethesda Ave	SB	LT	B	E	C	F	C	F
	WB	LR	C	F	F	F	F	F
S. Miami Boulevard and Bethesda Christian Academy Entrance #1	NB	LT	E	B	F	C	F	C
	EB	LR	F	C	F	F	F	F
S. Miami Boulevard and Ellis Road	EB	L	F	F	F	F	C	F
	EB	R	D	F	D	F	C	E
	NB	LT	C	F	F	F	-	-
	NB	T	-	-	-	-	B	F
	NB	L	-	-	-	-	F	F
	SB	TR	D	A	F	C	-	-
	SB	T	-	-	-	-	F	F
	SB	R	-	-	-	-	F	A
Overall Intersection LOS			D	F	F	F	F	F
S. Miami Boulevard and Bethesda Elementary Entrance #1	SB	LT	B	C	C	D	C	D
	WB	LR	C	F	F	F	F	F
S. Miami Boulevard and Bethesda Elementary Entrance #2	SB	LT	B	C	C	D	C	D
	WB	LR	C	F	F	F	F	F
S. Miami Boulevard and Ambassador Drive / Longmont Drive	NB	L	C	B	D	C	D	C
	SB	LT	B	B	C	D	B	D
	WB	LTR	F	F	F	F	F	F
	EB	LTR	F	F	F	F	F	F
S. Miami Boulevard and Methodist Street / New Haven Street	NB	LT	C	B	D	C	D	C
	SB	L	B	B	C	D	B	D
	WB	LTR	F	F	F	F	F	F
	EB	LTR	F	F	F	F	F	F
Ellis Road & Bethesda Christian Academy Entrance #2	EB	L	B	A	E	B	F	B
	SB	LR	E	D	F	F	F	F
Ellis Road & Taylor Estates Entrance # 1	WB	LT	A	B	B	E	B	E
	NB	LR	F	E	F	F	F	F
Ellis Road & Taylor Estates Entrance # 2	WB	LT	A	B	B	E	B	E
	NB	LR	F	E	F	F	F	F

3. Safety

The existing 4-lane undivided section of SR 1959 (Miami Boulevard) and the intersection of SR 1959 (Miami Boulevard) and SR 1954 (Ellis Road) present several significant safety hazards. There is no physical barrier or separation of opposing or head-on traffic on the project. This increases the risk for head-on collisions and vehicle accident severity. Additionally,

the lack of turn lanes on the project creates a situation where left and right turn movements are made directly from through lanes of traffic, causing turning queues in flowing traffic lanes. This scenario increases unexpected sudden stops and the likelihood of rear-end collisions. Rear-end collisions are the main type of accident indicative of a lack of turning lanes and maneuvering room for vehicles.

A total of 42 crashes were reported within the project for the three year period of February 1, 2004 to January 31, 2007. Of these, 27 crashes were reported at the SR 1959 (Miami Boulevard) and SR 1954 (Ellis Road) intersection. For crash rate purposes, this location is classified as a four-lane undivided urban secondary route. Table 2 shows the crash rates for the Miami Boulevard and Ellis Road intersection, as well as a comparison of the analyzed section of SR 1959 (South Miami Boulevard) versus the 2004-2007 statewide crash rates and the calculated critical rate for a comparable route type and configuration.

Table 2
Crash Rate Comparison

Rate	Miami Blvd./Ellis Road Intersection Crashes	Intersection Crashes per 100 MVM	Miami Blvd. Total Crashes	Total Crashes per 100 MVM	Statewide Rate	Critical Rate
Total	27	83.51	42	250.47	521.57	616.29
Fatal	0	0	0	0.00	0.98	7.94
Non-Fatal Injury	7	21.65	13	77.52	168.72	223.88
Night	5	15.46	7	41.74	106.20	150.58
Wet	5	15.46	9	53.67	98.29	141.10

MVM = million vehicle miles

Table 3 categorizes the majority of crashes into three types; rear-end, side-swipe, and failure to yield frontal impact.

Table 3
Crash Type Comparison

Type of Crash	Number of Intersection Crashes	Percent of Total	Total Number of Crashes	Percent of Total
Rear-end	15	56%	20	48%
Side-Swipe	4	15%	6	14%
Failure to yield frontal impact (angle, turning)	4	15%	9	21%

Crash rates for this section are below both the statewide and critical crash rates. However, crash reports for the area show the need for intersection improvements at the intersection of SR 1959 (South Miami Boulevard) and SR 1954 (Ellis Road). Specifically, crash reports indicate that there is inadequate room for the turning movement from Ellis Road onto Miami Boulevard. A total of 27 crashes in the study period occurred at the Ellis Road and Miami Boulevard intersection. Eight of these crashes involved left turning vehicles either side-swiping other turning vehicles at the SR 1959 (South Miami Boulevard) and SR 1954 (Ellis Road) intersection or sideswiping a vehicle waiting at the signal on Miami Boulevard.

Additionally, crash reports indicate that rear-end crashes occurring in the area were due to traffic congestion and turning vehicles in the through lanes of SR 1959 (Miami Boulevard) and SR 1954 (Ellis Road).

4. Bicycle and Pedestrian Safety

Bicycle and pedestrian facilities are currently inadequate or nonexistent along the project. Sporadic lengths of sidewalk exist along the project and bicycle travelers currently share a standard width lane with motor vehicles. Bicycle and pedestrian travel is expected to be significant in the area, based on commuting patterns, community makeup and the presence of a public elementary school, a church and a private school within the project limits.

The proposed project will provide continuous sidewalks along the length of the project, as well as wide outside shared bicycle lanes along the full length of the project.

This action will provide safer pedestrian and bicycle interaction with vehicle traffic and increase the viability and overall safety of pedestrian and bicycle travel in the area. Providing safe pedestrian and bicycle accommodations is consistent with local transportation plans and federal transportation policy.

II. EXISTING CONDITIONS

A. Length of Roadway Section Studied

The total length of the project is approximately 0.7 miles. The Federal Highway Administration (FHWA) has determined that the project, as currently proposed, connects logical termini. It is of sufficient length to address environmental matters on a broad scope, has independent utility and significance, and is a usable and reasonable expenditure even if no additional transportation improvements are made in the area. Figure 2 presents the existing facilities in the project area.

B. Existing Typical Section

Within the project area, SR 1959 (South Miami Boulevard) currently has two through lanes of traffic in each direction. The existing typical section consists of a four-lane undivided curb and gutter facility with 11-foot wide travel lanes and variable berm width.

C. Speed Limits

The speed limit along SR 1959 (South Miami Boulevard) is currently 45 miles per hour.

D. Sidewalks

Segments of sidewalks currently exist along SR 1959 (South Miami Boulevard), but are not continuous throughout the project limits.

E. Right of Way

The existing Right-of-Way width along SR 1959 (South Miami Boulevard) varies between approximately 60 feet and 100 feet.

F. Railroad Crossings

There are no railroad crossings along SR 1959 (South Miami Boulevard) in the project area.

G. Intersecting Roads

All roadways in the project area have at-grade intersections with SR 1959 (South Miami Boulevard). Traffic signals are located at the intersection with SR 1954 (Ellis Road).

H. Structures

There are no existing bridges or major drainage structures within the project area.

I. Utilities

The project is located within the City of Durham; all major utilities are located in the project area.

J. Bicycle Routes

There are currently no bicycle routes or accommodations in the project area.

K. School Bus Data

Durham County operates 11 bus routes on SR 1959 (South Miami Boulevard) twice daily. Approximately 10 students per day utilized Durham Area Transit Authority (DATA) buses along DATA Route 2, which runs in the project area.

L. Navigable Waters

There are no navigable waters in the project area.

M. Greenways

There are no greenways in the project area.

N. Parks

There are no parks in the project area

O. GeoEnvironmental Sites

The following sites of potential Geoenvironmental concern were noted in the project area:

1) **Property Name**
Bethesda Baptist Church
1914 S. Miami Blvd
Durham, NC 27703

Property Owner:
Bethesda Baptist Church
1914 S. Miami Blvd
Durham, NC 27703

UST Owner: Bethesda Baptist Church
1914 S. Miami Blvd
Durham, NC 27703

Facility ID #: None

This property contains both a church and a school. The UST Section's registry lists Groundwater Incident # 6197 for the property, documenting a leaking UST in 1990. No monitoring wells were noted at the site and it does not appear that the site is currently under remediation. **This site will have a negligible to low impact to the project.**

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2) **Property Name**
Tommy's Mini Mart
1803 S. Miami Blvd
Durham, NC 27703

Property Owner:
Thomas E. Stephens
4672 Forest Lake Dr
Mebane, NC 27302

UST Owner: Thomas E. Stephens
4672 Forest Lake Dr
Mebane, NC 27302

Facility ID #: 0-036488

This gas station is located in the Southeast quadrant of South Miami Boulevard and Angier Avenue. The UST Section's registry lists 2 tanks currently in use at this site and Groundwater Incident # 9052, documenting a petroleum in 1991. The tank bed is located approximately 65 feet from the existing edge of pavement of Miami Boulevard. Several monitoring wells and a remediation system, located behind the southeast corner of the building, were noted at the site. **This site will have a low to moderate impact to the project. The subject facility is located north of and outside the project limits.**

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3) **Property Name**
Page Furniture
1809 S. Miami Blvd
Durham, NC 27703

Property Owner:
Emerson Page

UST Owner: N/A

Facility ID #: None

The UST Section's registry lists Groundwater Incident # 4020 for this facility, documenting a toluene spill in 1989, which the regulatory closed in November 2004. The location of this site was identified from an address in the UST Section's registry. No corresponding physical address was identified during the field reconnaissance and the former building has apparently been demolished. **This site is anticipated to have no impact to the project.**

III. ALTERNATIVES CONSIDERED

A. Alternatives Considered For Detailed Study

Several alternatives were considered for the proposed project. Alternatives considered includes the Transit/Alternative Modes of Transportation Alternative, Transportation Systems Management Alternative, No-Build Alternative, and three Build Alternatives: Alternative 1 – Symmetrical Widening, Alternative 2 – Asymmetrical West Side Widening and Alternative 3 – Asymmetrical East Side Widening.

1. Alternative Modes of Transportation

Public transportation opportunities exist within the City of Durham and the region; and there is currently service available in the project area. The Durham Area Transit Authority (DATA) provides service via Bus Route 2 in the project area.

However, in the project area, the privately owned automobile remains the major form of transportation for area residents, commuters, and other travelers. Even with public transportation opportunities in the project area, these services would not be a substitute for improving SR 1959 (South Miami Boulevard) and would not remove enough vehicles from the project area to eliminate the need for additional capacity and other roadway improvements. The proposed improvements to SR 1959 (South Miami Boulevard) may have a positive impact on future transit operations by improving pedestrian access and bus service potential along Miami Boulevard. The Public Transportation Alternative alone is not a viable solution to meet the purpose of or need for this project and was eliminated from further consideration.

2. Transportation Systems Management Alternative

The Transportation System Management (TSM) Alternative includes limited construction activities designed to maximize the traffic flow and energy efficiency of the present transportation system. TSM measures enhance roadway operations while minimizing capital outlay. These measures can include physical improvements to the roadway network as well as operational improvements. Potential TSM options include optimizing traffic signal timing, coordinating signal operations, adding traffic signals at congested intersections, minor realignment of sharp horizontal curves, adding turn lanes at intersections, and other similar improvements.

The TSM Alternative would aid in enhancing roadway operations; however, this alternative would not address the safety problems associated with motorists, bicyclists, and pedestrians. TSM measures will be incorporated as needed during the project's final design.

3. No-Build Alternative

The No-Build Alternative offers no improvements to the project area. It assumes all other projects currently planned or programmed in the TIP will be constructed in the area as proposed. Continued roadway maintenance and minor improvements along SR 1959 (South Miami Boulevard) are a part of this concept.

The No-Build Alternative does improve the operational effectiveness and safety along SR 1959 (South Miami Boulevard).

4. Build Alternatives

The Build Alternatives improve SR 1959 (South Miami Boulevard) by adding a middle turn lane within the project area to match existing sections of SR 1959 (South Miami Boulevard) to the south and north. Other improvements include turn lane improvements at the intersection of SR 1959 (South Miami Boulevard) and SR 1954 (Ellis Road), sidewalks throughout the length of the project, and a shared outside travel lane for bicycles. The SR 1959 (South Miami Boulevard) improvements begin approximately 550 feet south of SR 2112 (Methodist Street) and extend to approximately 150 feet north of SR 1960 (Bethesda Avenue).

The Build alternative was presented to the public at a Citizens Informational Workshop, held near the project in Durham on November 22, 2005. After reviewing the comments and concerns from the workshop and other public comments, impacts were minimized by proposing a retaining wall near the Bethesda Baptist Church.

Three Build Alternatives were considered for the project: Alternative 1 – Symmetrical Widening, Alternative 2 – Asymmetrical West Side Widening, and Alternative 3 – Asymmetrical East Side Widening. Figure 5 presents the horizontal alignments considered for the build alternatives. Table 4 presents a comparative summary of impacts for the three build alternatives considered.

5. Recommended Alternative

Anticipated property relocations from each of the Build Alternatives are two residential relocations for each Build Alternative. Impacts to wetlands are equal for each Build Alternative. There are 17 residences that will be impacted with traffic noise from each of three Build Alternatives. Right-of-Way and Construction costs are equal for each of the three Build Alternatives.

Impacts to terrestrial communities are slightly lower, at 6.94 acres, on Build Alternative 3 – Asymmetrical East Side Widening, in comparison to the other alternatives studied.

Stream impacts range from 87 linear feet on Build Alternative 2 - Asymmetrical West Side Widening to 102 linear feet on Build Alternative 3 – Asymmetrical East Side Widening. Stream impacts for each alternative are below anticipated thresholds for both Individual Section 404 Clean Water Act permitting and/or stream mitigation. Neither Individual permitting nor stream mitigation is anticipated for any of the Build Alternatives.

Impacts to Neuse River Riparian Buffer zones range from 0.18 acres on Build Alternative 2 – Asymmetrical West Side Widening to 0.23 acres on Build Alternative 3 – Asymmetrical East Side Widening. Perpendicular stream impacts range from 87 linear feet on Build Alternative 2 - Asymmetrical West Side Widening to 102 linear feet on Build Alternative 3 – Asymmetrical East Side Widening. Riparian buffer impacts for each alternative considered are greater than 40 linear feet but equal to less than 150 linear feet or one-third of an acre. Buffer impacts from each alternative are considered allowable under the Nutrient Sensitive Waters Management Strategy for the Protection and Maintenance of Riparian Buffers (15A NCAC 2B.0233).

Public input on the project, specifically from officials from Bethesda Baptist Church, indicate a preference for Build Alternative 3 – Asymmetrical East Side Widening. Church officials indicated a preference for widening to the east to avoid impacts to property access, proximity to church parking and distance from church buildings. East side widening will impact

Bethesda Baptist Church's cemetery, necessitating the need to relocate 6-10 gravesites under the control of the church. Church officials preferred east side widening in the relatively narrow corridor over increased impact to active church properties on the west side of Miami Boulevard.

Additionally, east side widening creates fewer driveway and property access impacts than symmetrical or west side widening. Comparative impacts of the three Build Alternatives are presented in Table 4.

The recommended alternative is Alternative 3 – Asymmetrical East Side Widening. Widening SR 1959 (South Miami Boulevard) to the east minimizes impacts to surrounding properties and access to properties at the northern end of the project. There is minimal difference in impacts among the three considered build alternatives. Stream and Neuse River Buffer impacts are slightly higher with Alternative 3, but still below anticipated actionable thresholds for Individual permitting or stream and buffer mitigation. A preliminary design of the recommended alternative appears in Figure 3.

Table 4
Comparative Summary of Impacts

Category		Units	Alternative 1 Symmetrical Widening	Alternative 2 Asymmetrical Widening to West	Alternative 3 Asymmetrical Widening to East - Recommended Alternative
Length		Miles	0.7	0.7	0.7
Residential Relocations		Total	2	2	2
		Minority	0	0	0
Business Relocations		Total	0	0	0
		Minority	0	0	0
Total Relocations		Total	2	2	2
Non-Profit Relocations		Total	0	0	0
Wetlands		Acres	0.002	0.002	0.002
Stream Impacts		Linear feet	93	87	102
Neuse River Basin Buffer Impact Total		Acres	0.21	0.18	0.23
	Zone 1	Acres	0.13	0.11	0.14
	Zone 2	Acres	0.08	0.07	0.09
Hazardous Material Sites		Each	0	0	0
Protected Species		Species	0	0	0
Terrestrial Communities		Acres	7.01	7.14	6.94
Noise		Impacted Receptors	17	17	17
Historic Architecture		Properties	0	0	0
Archaeology		Sites	0	0	0
Air Quality 1-Hour		carbon monoxide (ppm)*	<9.0	<9.0	<9.0
Construction Cost		Dollars	$2,900,000	$2,900,000	$2,900,000
Right-of-WayCost		Dollars	$3,534,026	$3,534,026	$3,534,026
Total Cost		Dollars	$6,434,026	$6,434,026	$6,434,026

*ppm = parts per million
National Ambient 1-hour Air Quality Standards: 35 ppm

IV. PROPOSED IMPROVEMENTS

A. Length of the Proposed Project

The total length of the proposed project is approximately 0.7 miles.

B. Typical Section Description

The proposed typical section of SR 1959 (South Miami Boulevard) is a five lane curb and gutter section with a 12-foot wide center turn lane, 12-foot inside travel lanes, 14-foot outside lanes to accommodate bicycle travel, and a 10-foot berm which includes a five-foot sidewalk. The typical section is shown in Figure 6.

C. Right of Way

The proposed Right-of-Way width for the proposed project is approximately 100 feet.

D. Access Control

There is no control of access along the proposed project.

E. Intersection Treatment and Type of Control

At-grade intersections will be used throughout the proposed project. The intersection of SR 1959 (South Miami Boulevard) and SR 1954 (Ellis Road) will remain signalized. No other intersections are proposed to be signalized.

F. Speed Limit and Design Speed

The speed limit along SR 1959 (South Miami Boulevard) is proposed to remain at 45 miles per hour. The design speed for the proposed action is 50 mph.

G. Noise Barriers

No noise barriers are proposed as part of this project.

H. Sidewalks

The City of Durham has agreed to participate in cost sharing for the construction of sidewalks along both sides of SR 1959 (South Miami Boulevard). Sidewalks are currently in place in various sections of SR 1959 (South Miami Boulevard). According to NCDOT policy, existing sidewalks that are removed during construction will be replaced at no cost to local government.

I. Bicycle Accommodations

A 14-foot shared outside travel lane is proposed to accommodate bicycle traffic along the project.

J. Structures

There are no bridges or culverts within the project limits. An approximately 300-foot long retaining wall is proposed in front of the Bethesda Baptist Church to mimimize impacts to the property and prevent relocation of the Church.

K. Greenways

There are no existing or proposed greenways in the improvement area along SR 1959 (South Miami Boulevard).

L. Right-of-WayCost

Right-of-Way cost is based on the preliminary design of the proposed action. Right-of-Way cost includes: residential and business relocation, land and damage, utilities, and acquisitions. The estimated Right-of-Way cost for the proposed action is $3,534,026.

M. Construction Cost

Construction cost is based on preliminary design of the proposed action. The construction cost estimate includes items such as clearing and grubbing, earthwork, drainage, and paving. The estimated construction cost for the proposed action is $2,900,000. Table 4 shows the Right-of-Way cost, construction cost, and the total cost of the project.

N. Total Cost

The total cost of the proposed action is approximately $6,434,026. Table 5 summarizes the Right-of-Way (including utility cost), construction, and total cost of the project.

Table 5
Cost Summary

Cost Item	Proposed Action
Construction Cost	$2,900,000
Right-of-Way Acquisition Cost	$2,800,000
- Utility Cost	$734,026
Total Cost	$6,434,026

V. SOCIAL, ECONOMIC, AND ENVIRONMENTAL EFFECTS

A. Social and Economic Effects

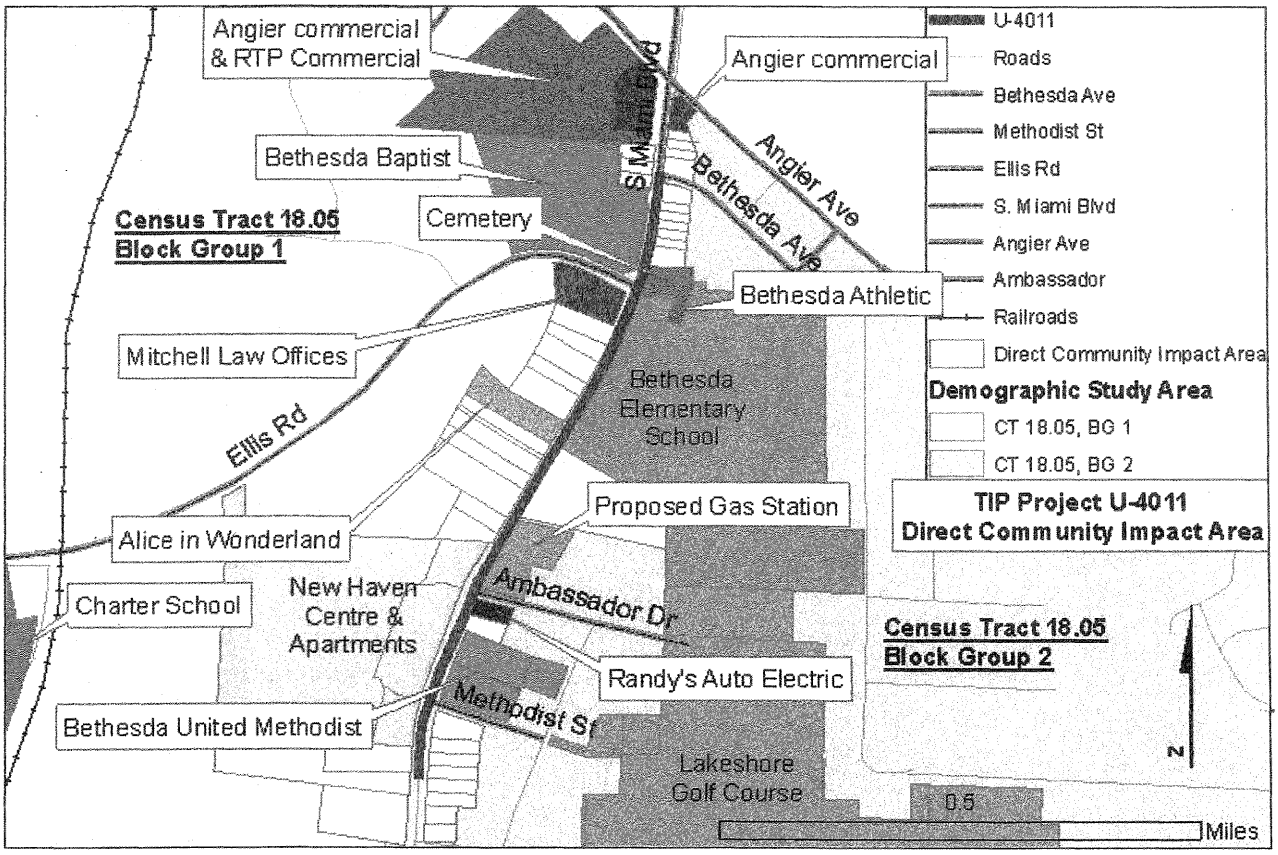
1. Land Use

The proposed improvements along SR 1959 (South Miami Boulevard) are located within the City of Durham. Land use includes a combination of residential, commercial, and institutional properties.

2. Community Profile

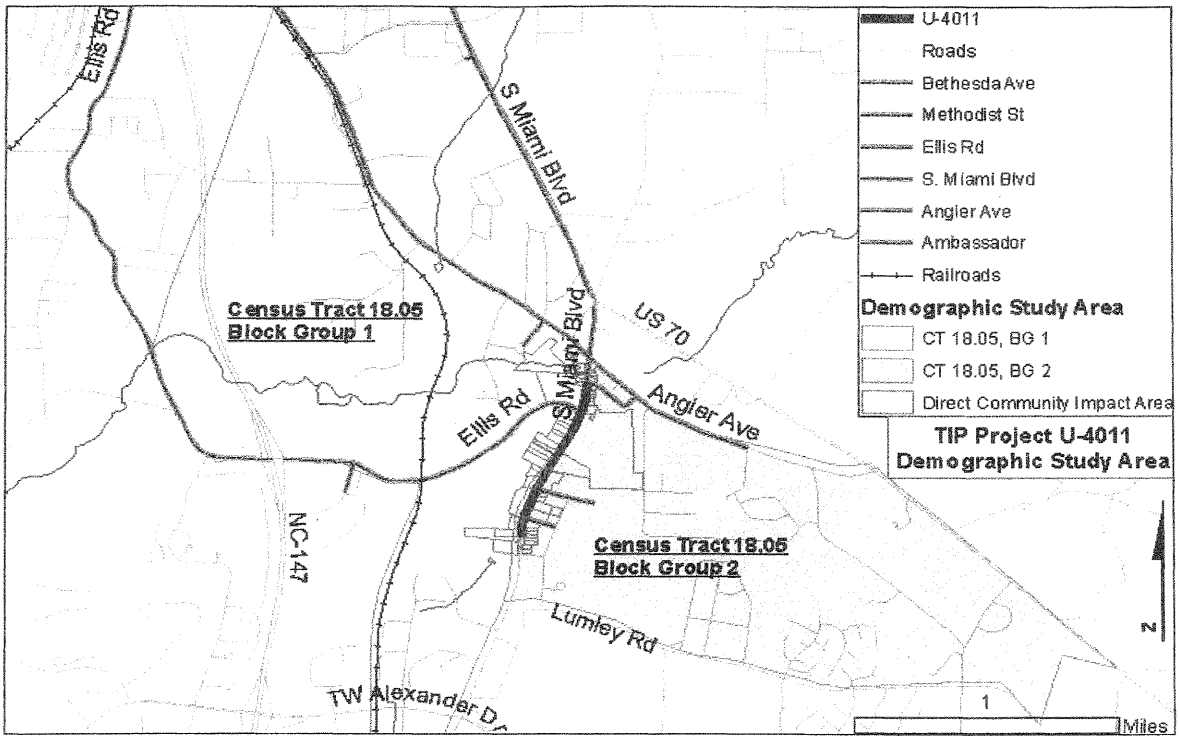
a. Direct Community Impact Area (DCIA)

The Direct Community Impact Area (DCIA) is the area surrounding a construction project that could be directly affected in any way during, throughout and after project completion. The Direct Community Impact Area chosen for this study, shown below, consists of the properties (parcels) immediately surrounding U-4011.



b. Demographic Study Area

The Demographic Study Area, shown below, is the smallest statistical area of the 2000 census that includes the Direct Community Impact Area. For the purposes of this study, the statistical area selected consists of Census Tract 18.05, Block Groups 1 and 2. The demographic study area is used to provide approximate demographic characteristics for the community around the project.



c. Community Characteristics

U-4011 is surrounded by a zoned Commercial Neighborhood (CN), as defined in Durham's Unified Development Ordinance. A mixture of uses such as schools, a law firm, office space, community center, and churches lines the project. The old-style character of the houses along the project creates the sense that this is a residential area, but these structures are primarily being used commercially. Additional zoning includes Commercial (CG & CC) at the Angier Avenue intersection, Residential (RS-20) around the Bethesda Avenue intersection and in nearby neighborhoods and a couple of Office and Institutional (OI) properties between the Ellis Road and New Haven Drive intersections.

d. Population Characteristics

According to the 2000 Census, the total population in Demographic Study Area was 2,957 people. This represented a population increase of 53% from 1990 to 2000, but most of this growth was to the east of the project where newer residential developments are occurring. During the same time period, Durham County and the City of Durham grew by 23% and 37%, respectively. Growth is partly caused by people settling in the area because of nearby Research Triangle Park (RTP).

According to the 2000 Census, the Demographic Study Area was 74% White and 18% Black racially. This is notably less diverse than the City of Durham, which is approximately evenly split among White and Black races, and Durham County, which was 51% White and 39% Black.

According to the 2000 Census, 48% of residents in the Demographic Study Area were 20-44 years old, consistent with the County and City at 45% and 46%, respectively. A number of these residents are recent college graduates and have chosen to live in the vicinity due to employment opportunities at RTP.

Twenty-one percent of residents in the Demographic Study Area had a Bachelors Degree and only 15% had less than a High School education. The County education level was

23% (Bachelors) and 17% (less High School). East of the project, 31% of residents had a Bachelors degree, which is two times the State average. In 2000, Durham County ranked ninth in North Carolina in High School graduation rates and third in percent with a Bachelors Degree or higher. Durham is one of the better-educated places in North Carolina, indicated by the 17% of County residents with a Graduate Degree. Only 6% of the Demographic Study Area had a Graduate Degree, which is slightly below the North Carolina level of 7.2%.

Table 6
Population Characteristics

	Demographic Study Area	City of Durham	Durham County	North Carolina
1990	1,928	136,594	181,835	6,628,637
2000	2,957	187,183	223,314	8,049,313
growth	1,029	50,589	41,479	1,420,676
% growth	53.4%	37.0%	22.8%	21.4%

Source: 1990 and 2000 U.S. Census

e. Race and Ethnicity

In the demographic area, 74.4% of the population identified themselves as racially White and 18.2% identified themselves as racially Black or African-American in the 2000 Census. The demographic area is a significantly higher percentage racially White than the City of Durham (45.7% White and 43.6% Black or African-American) and a significantly higher percentage racially White than Durham (51.1% White and 39.1% Black or African-American) as shown in Table 7. According to the 2000 census only 4.8% of the population or 141 people within the demographic study area identified themselves as Hispanic or Latino ethnically. This is lower than the Durham City at 8.5% percent and the County numbers at 7.6%.

Table 7
Race and Ethnicity

	Demographic Study Area		Durham City		Durham County		North Carolina	
White	2,199	74.4%	85,464	45.7%	114,070	51.10%	5,802,165	72.1%
Black / African American	539	18.2%	81,586	43.6%	87,424	39.1%	1,734,154	21.5%
Two or more races	26	0.9%	4,226	2.3%	4,554	2.0%	111,909	1.4%
Asian	65	2.2%	6,519	3.5%	7,052	3.2%	111,292	1.4%
Some other race	128	4.3%	8,754	4.7%	9,369	4.2%	185,138	2.3%
American Indian / Alaskan	0	0.0%	574	0.3%	778	0.3%	100,956	1.3%
Hispanic	141	4.8%	15,922	8.5%	16,994	7.6%	372,964	4.6%
Non-Hispanic	2,816	95.2%	171,261	91.5%	206,320	92.4%	7,676,349	95.4%

Source: 2000 U.S. Census

The Demographic Study Area is roughly 75% White and 18% Black. Conversely, 63% of Bethesda Elementary students are Black and 23% are Hispanic. The project area is notably less diverse than the City of Durham, which is nearly evenly split between White and Black/African American, and Durham County, which was 51% White and 39% Black.

f. Income / Poverty Status

According to the 2000 Census, the median household income in the demographic area was approximately $48,108, as shown in Table 8. In comparison, the median household income in the City of Durham in 2000 was $41,160 while the median household income in Durham County was $43,337. The income statistics were not uniform across the demographic area. Census Tract 18.05, Block Group 1 had a median household income of $39,083, while Census Tract 18.05, Block Group 2, closest to the Research Triangle Park, had a median household income of $55,000.

Table 8
Income / Poverty Status

	Demographic Study Area	City of Durham	Durham County	North Carolina
Median Income	$48,108	$41,160	$43,337	$39,183
% Below Poverty Level	4.7%	14.2%	12.8%	11.9%
Unemployment Rate	2.8%	5.6%	5.1%	5.3%
	CT 18.05, BG 1	**CT 18.05, BG 2**		
Median Income	$39,083	$55,000		
% Below Poverty Level	10.3%	1.0%		
Unemployment Rate	4.0%	1.9%		

Source: 2000 U.S. Census

According to the 2000 Census, 4.7% of the residents within the demographic area have incomes below the poverty level. The poverty level is not consistent across the demographic area. Census Tract 18.05, Block Group 1 has 10.3% of the population with incomes below the poverty level while Census Tract 18.05, Block Group 2 has 1.0% of the population with incomes below the poverty level.

g. Community Infrastructure and Resources

There are a number of community facilities and businesses within the Direct Community Impact Area. The majority of these businesses front on and gain access off of SR 1959 (South Miami Boulevard). Overall, the majority of businesses in the area are destination oriented; small boutiques, churches, offices, rather than convenience oriented.

Durham County manages sewer along U-4011 and water utilities and wastewater utilities exist along the project, according to the Durham Water & Sewer Maintenance Division. There is a 16-inch water main along the project.

h. Transit

Durham Area Transit Authority (DATA) bus route 2 Bethesda Elementary School transports students to and from school at 8:00 & 9:00 a.m. and 3:00 & 4:00 p.m. on instructional days and during Parent Teacher Association (PTA) evenings.

i. Community Safety and Emergency Response

Police District Four Substation is the local law enforcement provider for the project corridor. Fire Station #13 located south of the project at 2901 South Miami Blvd, would be the first responder to a structural fire or accident along the project, providing EMS services before Bethesda Volunteer Fire Company arrives. Bethesda Elementary School is the northern cutoff area for Engine #13. Bethesda Volunteer Fire Company is a county station that provides fire, EMS, ambulance services, and ladder and rescue trucks along the project.

Fire Station #3 at 822 North Miami Blvd, would provide fire and EMS services along the project if the situation warrants, but is not the initial responder despite being as close to Bethesda Elementary as Fire Station #13.

3. Analysis of Community Impact

The improvements along SR 1959 (South Miami Boulevard) are likely to have minor impacts on the surrounding community and community's quality of life.

a. Physical, Social, and Psychological Aspects

Additional Right-of-Way to widen the roadway will be required. Right-of-Way acquisition would affect certain properties along the project more than it would others. The continued viability for residential use of the houses surrounding the Bethesda Avenue intersection may be affected. The proposed Right-of-Way limits on the northbound side impacts the two adjacent houses south of the intersection and impacts the land of the residence on the north of the intersection. Proximity to the new roadway may affect the usability of the other six houses around the intersection after the widening.

The housing characteristics of the structures lining the project create the impression that this could be a close-knit area, but there appears to be limited interaction within the area. The roadway and fast-moving traffic act as a physical barrier for those in the area. The three houses on the southbound side across from the Bethesda Avenue intersection with Miami Boulevard, in particular, experience this barrier effect which could potentially be magnified by the wider roadway. The residents on the northbound side are more likely to interact with the neighborhood along Bethesda Avenue. The proposed tapered lane for accessing Bethesda Avenue would impact these houses, but it could benefit the larger Bethesda Avenue neighborhood by improving access from South Miami Boulevard.

The project will likely have no impact on the physical structures between Longmont Drive and Ellis Road, but decreasing the space between these buildings and the roadway could potentially effect the perceptions of the occupants. The Mitchell Law Offices' landscaping is within the proposed Right-of-Way, and the proposed modifications to both Ellis Road and South Miami Boulevard could impact the law firm property along both roadways. The Bethesda Baptist Church site will be impacted by the proposed modifications. A retaining wall was included in the designs to reduce impact and create a buffer between the church and South Miami Blvd. The cemetery has graves, bushes, and a tree within the proposed Right-of Way. An estimated 6 to 10 gravesites will have to be relocated within the cemetery. The cemetery is owned by Bethesda Baptist Church and church officials have expressed a preference for relocating the gravesites instead of infringing on or relocating the Bethesda Baptist Church building, located directly across and west of South Miami Boulevard.

b. Visual / Aesthetic Impacts

The size and complexity of the improvements to SR 1959 (South Miami Boulevard) could have a minor negative effect on the aesthetics of the area. The project may also impact the aesthetic qualities of individual properties where vegetation or fencing is to be removed. A minor positive affect on the aesthetics of the area would be the addition of uniform curb and gutter and sidewalks.

c. Economic Conditions

Durham County and City planners are expecting the area of the roadway to be made up of traditional retail and commercial structures in the future. Multiple commercial real estate signs along the proposed support this prediction. According to Durham planners, private developers have expressed interest in the project area, but are reluctant to develop there until NCDOT finalizes its roadway modification plans. Therefore, the project may only generate minimal commercial interest beyond that which already exists. The center left-turn lane and sidewalks would benefit commerce and local institutions.

As traditional business developers respond to the roadway modifications, existing residential tenants will likely reduce in number. Overall, widening to the west side of SR 1959 (South Miami Boulevard) (Alternate 1) would have a greater detrimental effect on area businesses. The wider roadway would potentially effect the viability of the small businesses operating out of houses between Longmont Drive and Ellis Road, and the Alice in Wonderland daycare if the roadway is widened to the west side of South Miami Blvd. For the Alice in Wonderland daycare, located on the west side of South Miami Boulevard, the relatively minor encroachment of widening the roadway to the east (Alternate 3) will not likely affect the business significantly. NCDOT will coordinate with the daycare throughout project Right-of-Way and construction to mitigate any property impacts to the daycare.

Randy's Auto Electric is in the southeastern quadrant of the Ambassador Drive intersection. The project proposes a tapered lane at this location, with the proposed Right-of-Way limits extending onto the property, impacting the property's parking lot.

Dual sidewalks may encourage walking in the area. This could benefit smaller businesses in the project area like Anthony's Clocks, who would benefit from increased foot traffic in the area.

d. Mobility & Access

South Miami Boulevard is a major thoroughfare used by regional traffic to reach Downtown Durham and the Research Triangle Park. Along the project, it provides direct access to Bethesda Elementary School and Bethesda Baptist Church's Christian Academy, each contributing to the traffic backups that routinely occur during peak driving times. The School and the Academy are diagonal from one another at the Ellis Road intersection. The project should not significantly alter commuting patterns in the area.

Traffic will likely be maintained on-site during construction. The movement of through traffic and access to adjacent properties could be limited during construction, dependent on the time of day.

Adding sidewalks on both sides of the roadway should improve the appearance of the streetscape, and encourage more pedestrian activity in the area. This could benefit the schools, churches, and athletic association. However, the wider roads (both South Miami and Ellis) would be more difficult for pedestrians to cross, especially children. Appropriate crossing

facilities will be incorporated into the project in this area.

e. Community Safety and Emergency Response

No impacts to Police, Fire, and Emergency Management Services are anticipated beyond construction-related time delays. After project completion, the roadway could serve these services similarly to other users of the roadway.

The DCHC MPO Long Range Transportation Plan stipulates that new and existing neighborhoods be designed or modified to promote safety, walkability, and a sense of place. Sidewalks and biking accommodations should make the area safer for pedestrians by dedicating facilities to them. The pedestrian crossing signal at the Ellis Road intersection should help pedestrians safely cross South Miami Blvd.

f. Environmental Justice and Title VI

Statistics from the 2000 Census suggest that the project corridor is not as racially diverse as the City of Durham. Bethesda Elementary School does however serve the needs of many minority and low-income families who come to the school from the downtown area, and was described by local school administration officials as one that serves inner city families in Durham.

Under Title VI of the Civil Rights Act of 1964, there are requirements that protect individuals for any type of discrimination on the grounds of race, age, color, religion, disability, sex, and national origin. Along with Title VI of the Civil Rights Act of 1964, Executive Order 12898 states that federal programs cannot have a disproportionately high adverse human health or environmental effect on minority or low-income populations. Environmental Justice requires the equitable treatment of people of all races, cultures, ages, and incomes during development, implementation and enforcement of environmental laws, regulations and policies. Other special populations may include the elderly, children, or the disabled. Based on site visits, demographic and income data for the community impact study area as previously described, the proposed project is not expected to impose disproportionate or adverse impacts to minority or low income populations in the vicinity of the project.

g. Future Land Use Effects

No future land use effects are expected as a result of this project. The roadway capacity improvements expected will result in improved conditions and opportunities for existing commuters but will not affect semi-regional commuting patterns.

h. Indirect and Cumulative Effects Analysis

The proposed project lies in a commercial neighborhood in the City of Durham consisting mostly of small businesses, schools, and churches. NCDOT will widen an existing road by providing a center turn lane, and include provisions for bicyclists and pedestrians. Modifications are also being planned for the Ellis Road intersection, as well as right-turn taper lanes along South Miami Blvd. These improvements should ease local congestion and improve safety without providing new access to undeveloped lands.

The limited length/scope of the proposed project, the zoning of the residences in the area (commercial), and information gathered from local officials indicate that development in the area would likely be attributable to the areas proximity to the City of Durham and RTP.

The proposed project is unlikely to affect route choice, increase property/vehicle exposure or provide new access. The proposed project would not likely induce new growth in the area. Improvements will only marginally affect travel time to and development decisions in the

area. Therefore, no further ICE analysis is warranted.

It should be noted that, as discussed in the economic impacts section, private developers are delaying any proposed project planning in the project area for the immediate future until a proposed design of the roadway improvements is completed.

i. Relocation Impacts

As required by the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646) and the North Carolina Relocation Assistance Act (GS-133-5 through 133-18), the NCDOT right-of-way acquisition policy provides a relocation program to help property owners when unavoidable relocations occur because of roadway construction. The relocation program offers assistance, moving payments, or replacement housing payments or rent. Another component of the relocation policy is to provide "last resort housing" when comparable replacement housing is not available or is unavailable within an individual's financial means. Through the last resort housing program NCDOT has greater latitude in offering replacement payments which exceed federal or state legal requirements.

According to the relocation report located in Appendix 1, the proposed action would displace two residences (two owners). No businesses, farms, or non-profit organizations would be impacted by the project. Table 8 shows a summary of the relocation impacts associated with the proposed action.

Table 9
Relocation Impact Summary

Relocation		Proposed Action
Residences	Owners	2
	Tenants	0
	Total	2
	Minority	0
Businesses	Owners	0
	Tenants	0
	Total	0
	Minority	0
Farms		0
Non-Profit Organizations		0

j. Cultural Resources

1) Compliance Guidelines

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified as 36 CFR Part 800. Section 106 requires Federal agencies to take into account the effect of their undertakings (federally-funded, licensed, or permitted) on properties included in or eligible for inclusion in the National Register of Historic Places and afford the Advisory Council a reasonable opportunity to comment on such undertakings.

2) Historic Architecture

In a memorandum dated July 29, 2005, the North Carolina State Historic Preservation Office (SHPO) determined that the project would not affect any historic structures. Accordingly, NCDOT architectural historians did not initiate a survey of the project area. A copy of the SHPO letter appears in Appendix 4.

3) Archaeological Resources

As stated in the Historic Architectural section above, the State Historic Preservation Officer indicated there are no known archaeological sites within the proposed project area and recommended that no archaeological investigation be conducted. A copy of the SHPO letter appears in Appendix 4.

k. Section 4(f) Resources

Section 4(f) of the DOT Act of 1966 protects the use and function of publicly owned parks, recreation areas, wildlife/waterfowl refuges, and historic properties. A transportation project can only use land from a 4(f) resource when there are no other feasible or prudent alternatives and when the project includes all possible planning to minimize harm to the resource. No Section 4(f) resources will be impacted by the proposed action.

B. Farmland Effects

North Carolina Executive Order Number 96, Preservation of Prime Agricultural and Forest Lands, requires all state agencies to consider the impact of land acquisition and construction projects on prime farmland soils, as designated by the U.S. Natural Resources Conservation Service (NRCS). These soils are determined by the SCS based on criteria such as crop yield and level of input of economic resources. The project is located within the developed portion of the City of Durham and no farmland impacts are expected in the project area.

C. Environmental Effects

1. Physical Resources

a. Regional Characteristics and Physiography

This project is located in Durham County just southeast of Durham in the Piedmont physiographic province of north central North Carolina. The topography of Durham County is characterized by rolling hills with major drainageways that are bordered by steep slopes. Elevation within the study area is approximately 400 feet above mean sea level. Most of the land area in the basin is agricultural or forests, while urban development is concentrated around Raleigh, Durham, and Cary in the upper basin. Land use within the study area is mainly residential and commercial.

b. Soils

Two major soil types occur within the study area (USDA 1976): White Store sandy loam – WsB (2 to 6 percent slopes) and White Store sandy loam - WsC (6 to 10 percent slopes). Soil types located within the project study area are classified as non-hydric. Drainage characteristics and hydric classifications of area soils are presented in Table 10.

Table 10
Study Area Soils and Characteristics

MAP UNIT SYMBOL	Specific Map Unit	Percent Slope	Drainage Class	Hydric Class
WsB	White Store sandy loam	2 to 6	Moderately well drained	non hydric
WsC	White Store sandy loam	6 to 10	Moderately well drained	non hydric

The White Store Soil Series consists of nearly level to moderately steep, well drained soils on uplands. These soils are low in natural fertility and organic matter content. Permeability is very slow, and available water capacity is medium. The root zone is deep and the shrink swell potential is high. Most of the acreage is covered with loblolly pine and low quality hardwoods.

In the study area White Store sandy loam (**WsB**) (2 to 6 percent slope) is located on both the east and west side of South Miami Boulevard. White Store sandy loam (**WsC**) (6 to 10 percent slope) is located on both the east and west side of Stirrup Iron Creek and the southeast side of South Miami Boulevard.

c. Water Resources

This section contains information concerning surface water resources likely to be impacted by the proposed project. Water resource assessments include the physical characteristics likely to be impacted by the proposed project, best usage classifications and water quality aspects of the water resources. Probable impacts to surface water resources are also discussed, as are means to minimize those impacts.

1) Waters Impacted and Characteristics

The jurisdictional surface waters located within the project study area include Stirrup Iron Creek, an unnamed tributary (UT) to Northeast Creek and one ephemeral channel (EC) found within the project study corridor.

The proposed project impacts surface waters of the Neuse River Basin, USGS Hydrologic Unit 03030201 and DWQ sub-basin 03-04-02. A small portion of the study area located west of South Miami Boulevard and 225 feet southwest of Bethesda Avenue is in the Cape Fear River Basin, USGS Hydrologic Unit 03030002 and DWQ sub-basin 03-06-05. One unnamed tributary (UT1) to Northeast Creek is located in the Cape Fear River Basin. All other study area waters drain into Stirrup Iron Creek, in the Neuse River Basin. For areas of the project in the Neuse River Basin (the majority of the project), NCDOT Design Standards in Sensitive Watersheds will be used in the planning and design process.

Stirrup Iron Creek is located in the central portion of the project study area just south of Bethesda Elementary School. Stirrup Iron Creek flows in a southeasterly direction until it reaches Lake Crabtree. Stirrup Iron Creek is a perennial stream with a bank to bank distance of approximately 2 to 4 feet. Bank height ranged from 18 inches to 36 inches with a wet width

between 1 and 3 feet. The water depth ranged between 2 inches to 24 inches. A very slow flow was observed in the channel during the field visit. The substrate was a mix of gravel, sand and silt. The stream was somewhat entrenched and the banks were heavily eroded in some areas.

The stream had moderate sinuosity. Stirrup Iron Creek scored a 31.5 on the DWQ Stream Identification Form (Version 3.1)

Ephemeral Channel 1 (EC1) is located on the east side of South Miami Boulevard, 96 feet north of Bethesda United Methodist Church and 236 feet south of Ambassador Drive. EC1 originates from a stormwater pipe that crosses under South Miami Boulevard from the New Haven Mixed Development area. A deep scour hole approximately 2 to 3 feet deep exists under the corrugated metal pipe. EC1's streambed and bank were well defined for approximately 70 feet and becoming less defined further down stream. Both bank full width and wet width of EC1 are approximately 2 to 3 feet. During the initial field evaluation the water depth was approximately 1 inch. The substrate consisted of sand and muck. A very slight flow was observed going southeast, away from South Miami Boulevard. EC1 scored a 15.5 on the DWQ Stream Identification Form. EC1 is on the Durham County Soil Survey Map, however it appears to have been relocated since the soil survey was published. The stream was reinspected on August 10, 2006. Water was present only in the scour hole and not the remainder of the channel during the reinspection. At that time the stream only had water in the deep scour hole. Water was not present in the remainder of the channel. EC1 does not appear on the Southeast Durham USGS topographic map as a blue lined stream.

UT1 to Northeast Creek is an intermittent stream located behind three residential homes in the northwest portion of the project study area. This portion of the project study area is located in the Cape Fear River Basin. UT1 to Northeast Creek is approximately 2 feet wide from bank to bank with a wet width of 2 feet. The bank height was 1 to 2 feet and sinuosity was weak. The water was dark in color and had a foul odor. A large amount of garbage and debris was found in the stream. UT1 to Northeast Creek scored a 17.5 on the DWQ Stream Identification Form. UT1 to Northeast Creek is found on the Durham County Soil Survey Map but is not found on the Southeast Durham USGS topographic map. Project streams and wetlands are shown in Figure 7.

2) Best Usage Classification

The classification of Stirrup Iron Creek (index # 27-33-4-2) and Northeast Creek (index # 16-41-1-17-(0.3) is C; NSW (NCDENR-DWQ 2005). Nutrient Sensitive Waters (NSW) are waters needing additional protections because they are subject to excessive macroscopic vegetation growth. Class "C" water resources are used for aquatic life propagation and survival, fishing, wildlife, secondary recreation and agriculture.

Unnamed tributaries (UTs) present within the study area carry the same classification as their receiving stream. **No High Quality Waters (HQW), Water Supplies (WS-I or WS-II), or Outstanding Resource Waters (ORW) occur within one mile of the project study area.** None of the streams located within the project study area are classified as C-Tr (Trout) streams, and Durham County is not one of the 25 mountain counties designated by the North Carolina Wildlife Resource Commission (NCWRC) as containing Mountain Trout Waters (MTWs). None of the streams located within the project study area support trout or anadromous fish, therefore, no in-stream moratoriums will be requested. No essential fish habitat has been designated for any of the streams located within the project study area, nor are there any listed streams within one mile of the project study area.

d. Water Quality

This section describes the water quality of the water resources within the study area. Potential impacts to water quality from point and nonpoint sources are evaluated. Water quality assessments are based upon published resource information and field study observations.

1) Nonpoint Source Discharge

Nonpoint source runoff from residential areas, commercial sites with adjacent parking areas and roads are likely to be the primary source of water quality degradation to the water resources located within the study area. The surrounding vicinity appears to be highly developed with land being used for residential and commercial uses. Results from nonpoint runoff may include nutrient and toxicity loading and increased erosion and sedimentation.

2) Listed Waters of Section 303(d) of the Clean Water Act

Section 303(d) of the Clean Water Act (CWA) requires states to develop a list of waters not meeting water quality standards or which have impaired uses. Listed waters must be prioritized, and a management strategy or total maximum daily load (TMDL) must subsequently be developed for all listed waters. Waterbodies with a 303(d) index value are defined as an impaired waterbody that does not meet water quality uses, such as water supply, fishing or propagation of aquatic life. A review of the 303(d) list for North Carolina indicates that Lick Creek has a 303(d) Assessment Unit (AU) of 27-11-(0.5). Lick Creek is located within a mile of the north project terminus. However, no surface waters within the study area drain directly into Lick Creek. The cause of impairment (or Impaired Use) is Historic Listing for sediment based on biological impairment. Potential sources that contribute to the listing of Lick Creek include urban runoff and storm sewers. The priority level is designed to take into account the severity of the impairment, especially threats to human health and endangered species and the designated uses of the waterbody as required by the CWA 303(d)(1)(a). The priority level for Lick Creek is "High" (NCDENR-DWQ, 2003).

3) Benthic Macroinvertebrate and Fish Sampling Stations

There are no benthic macroinvertebrate monitoring station located within a mile radius of the study area (NCDENR-DWQ 2005). There are no Fish Community Assessment stations located within a mile radius of the study area (NCDENR-DWQ, 2002).

4) Point Source Discharges

Point source discharges located throughout North Carolina are permitted through the National Pollutant Discharge Elimination System (NPDES) Program. Any person that discharges or proposes to discharge waste to the surface waters of the state must obtain a NPDES permit prior to the initiation of such discharge. There are forty-nine NPDES permitted discharges located within the 03-04-02 subbasin. None of these forty-nine NPDES permitted discharges are located along Stirrup Iron Creek. There are eight NPDES permitted discharges located within the 03-06-05 subbasin. None of the eight permitted discharges are located along Northeast Creek (NCDENR-DWQ 2005).

5) Floodplains and Regulated Floodways

Durham County and the City of Durham are participants in the National Flood Insurance Regular Program, administered by the Federal Emergency Management Agency (FEMA). Stirrup Iron Creek is included in a detailed flood study, having an established floodplain and floodway. However, the project crossing of Stirrup Iron Creek is situated just upstream of the limit of the detailed flood study, and it is not anticipated that the project improvements will result in any encroachment into the detailed study area. Therefore, approval of a Conditional Letter of Map Revision (CLOMR) is not anticipated for this project. NCDOT

Hydraulics Unit will coordinate with FEMA and local authorities during the design stage of the project to ensure compliance with applicable floodplain management ordinances.

e. Summary of Anticipated Impacts to Water Resources

Project construction may result in the following impacts to surface waters:

- Increased sedimentation and siltation from construction and/or erosion
- Changes in incident light levels and turbidity due to increased sedimentation rates and vegetation removal
- Alteration of water levels and flows due to interruptions and/or additions to surface and ground water flow from construction
- Increases in nutrient loading during construction through runoff from temporarily exposed land surfaces
- Increased concentration of toxic compounds from highway runoff, construction, toxic spills and increased vehicular use
- Changes in water temperature due to removal of streamside vegetation
- Increased potential for release of toxic compounds such as fuel and oil from construction equipment and other vehicles

Precautions will be taken to minimize impacts to water resources in the study area. NCDOT's Best Management Practices for the protection of surface waters and water supplies will be strictly enforced during the construction stage of the project. Provisions to preclude contamination by toxic substances during the construction interval will be strictly enforced. Limiting instream activities and revegetating stream banks of the perennial and intermittent streams immediately following the completion of grading can further reduce impacts.

2. Biotic Resources

Biotic resources include aquatic and terrestrial communities. This section describes those communities encountered in the study area as well as the relationships between fauna and flora within these communities. Composition and distribution of biotic communities throughout the project are reflective of topography, hydrologic influences and past and present land uses in the study area. Descriptions of the terrestrial systems are presented in the context of plant community classifications and follow descriptions presented by Schafale and Weakley (1990) where possible. Dominant flora and fauna observed, or likely to occur, in each community are described and discussed.

Scientific nomenclature and the common names (when applicable) are included for each described plant and animal species. Plant taxonomy follows Radford, et al. (1968). Animal taxonomy follows Martof et al. (1980), Webster et al. (1985), National Geographic (1987) and Rohde et al. (1994). Subsequent references to the same organism will include the common name only. Spoor evidence or tracks equate to observation of the species. Published range distributions and habitat analysis are used in estimating fauna expected to be present within the study area.

a. Terrestrial Communities

Two different community types were observed in the project study area: mixed pine-hardwood forest and maintained-disturbed community. Project terrestrial communities are presented in Figure 8.

1) Mixed Pine-Hardwood Forest

The Mixed Pine-Hardwood Forest community is located on both floodplain and upland areas. This community is best classified as a variation of Schafale and Weakley's (1990) Dry Mesic Oak-Hickory Forest. This community type is found on the west side of South Miami Boulevard in the northwest corner of the project study area, south of Bethesda Elementary School on the east side of South Miami Boulevard and on the north and south corners of South Miami Boulevard and Methodist Street. The canopy contains loblolly pine (*Pinus taeda*), white oak (*Quercus alba*), tulip poplar (*Liriodendron tulipifera*), northern red oak (*Quercus rubra*), and sweetgum (*Liquidambar styraciflua*). Understory species include dogwood (*Cornus florida*), ironwood (*Carpinus caroliniana*), and red maple (*Acer rubrum*). A shrub layer was present and included Japanese privet (*Ligustrum japonicum*), black cherry (*Prunus serotina*), and red cedar (*Juniperus virginiana*). Vines include grapevine (*Vitis rotundifolia*), blackberry (*Rubus* sp.), Japanese honeysuckle (*Lonicera japonica*), greenbrier (*Smilax rotundifolia*), trumpet creeper (*Campsis radicans*), and poison ivy (*Toxicodendron radicans*).

Several avian species can be found in this community. During the site visits the following species were observed: Carolina chickadee (*Poecile carolinensis*), tufted titmouse (*Baeolophus bicolor*), northern cardinal (*Cardinalis cardinalis*), and turkey vulture (*Cathartes aura*).

Reptiles and amphibians likely to be found in this community are the three-lined salamander (*Eurycea guttolineata*), bull frog (*Rana catesbeiana*) spring peeper (*Pseudacris crucifer*), eastern box turtle (*Terrapene carolina*), five-lined skink (*Eumeces fasciatus*), and rat snake (*Elaphe obsoleta*).

Different mammals may pass through this community or use it for nesting and foraging. Mammals observed during the site visit were the white-tailed deer (*Odocoileus virginianus*) and raccoon (*Procyon lotor*). Other mammals that may be present include Virginia opossum (*Didelphis virginiana*), eastern cottontail (*Sylvilagus floridanus*), and gray squirrel (*Sciurus carolinensis*).

2) Maintained-Disturbed Community

The majority of the study area supports a maintained, disturbed community located at roadside shoulders, in residential areas and within commercial business properties. These areas are maintained in low growing condition and support ground cover species such as fescue (*Festuca* sp.), crabgrass (*Digitaria* sp.), dandelion (*Taraxacum officinale*), Japanese grass (*Microstegium vimineum*), violet (*Viola* sp.), sericea (*Lespedeza* sp.) plantain (*Plantago* spp.), and clover (*Trifolium* sp.).

Avian species likely to be found in this community include Canadian geese (*Branta canadensis*), northern mockingbird (*Mimus polyglottos*), and American robin (*Turdus migratorius*).

Amphibians common to this community are American toad (*Bufo americanus*), and spring peeper. Reptiles likely to be found in this community include eastern garter snake (*Thamnophis sirtalis*).

Different mammals may pass through this community or use it for nesting and foraging such as the eastern cottontail, gray squirrel, white-tailed deer, raccoon and Virginia opossum. The eastern mole (*Scalopus aquaticus*) may also be present in this community.

One potential wetland (W1) was found in a roadside depression (drainage ditch) next to an underground fiber optic cable, power pole and fire hydrant. W1 was located on the north corner of Methodist Street and South Miami Boulevard. Several inches of standing water were observed at the time of the site visit on May 6, 2006. Dominant species include herbaceous plants such as rush (*Juncus sp.)* and sedge (*Carex sp.*)

b. Aquatic Communities

The aquatic communities potentially impacted by the project are Stirrup Iron Creek, UT1 to Northeast Creek, W1 and EC1. Physical characteristics of a water body and the condition of the water resource influence faunal composition of aquatic communities.

Streambank areas provide habitat for amphibians such as the American toad, marbled salamander (*Ambystoma opacum*), and green frog (*Rana clamitans*). Representative species of fish that may be found in the study area are the bluehead chub (*Nocomis leptocephalus*), and the rosyside dace (*Clinostomus funduloides*). The study area streams may provide habitat for several reptiles that tolerate temporary water conditions such as the red belly water snake (*Nerodia erythrogaster*), rough green snake (*Opheodrys aestivus*), and the eastern mud turtle (*Kinosternon subrubrum*). Invertebrates that would be expected in the streams include dragonflies (Odonata) amphipods and isopods.

c. Summary of Anticipated Impacts

1) Summary of Anticipated Terrestrial Impacts

Construction of the subject project will have various impacts on the biotic resources described. Any construction related activities in or near these resources have the potential to impact biological functions. Table 11 quantifies the terrestrial communities within the study area and calculated impact to proposed project alternates.

Table 11
Impacts to Terrestrial Communities

			Actual Impacts From Proposed Alternates		
Community Type	**Acreage**	**% of Project Study Area**	**Alternate 1 (Acres)**	**Alternate 2 (Acres)**	**Alternate 3 (Acres)**
Mixed Pine-Hardwood Forest	1.5	16.7%	1.17	1.01	1.46
Maintained-Disturbed	7.5	83.3%	5.84	6.13	5.48
TOTAL	9.0	100.0%	**7.01**	**7.14**	**6.94**

* Project Impacts are calculated within the boundary of the project construction limits (Cut/Fill Line) + 25 feet per NCDOT policy.

Plant communities found within the study area serve as nesting and sheltering habitat for various kinds of wildlife. Project construction may reduce habitat for faunal species, thereby diminishing faunal numbers. Habitat reduction concentrates wildlife into smaller areas of refuge, thus causing some species to become more susceptible to disease, predation, and starvation.

Areas modified by construction (but not paved) will become road shoulders and early successional habitat. Increased traffic noise and reduced habitat will displace some wildlife further from the roadway while attracting other wildlife by the creation of more early successional habitat. Animals temporarily displaced by construction activities will repopulate

areas suitable for the species. This temporary displacement of animals may result in an increase of competition for the remaining resources. Terrestrial community impacts are shown on Figure 8.

2) Summary of Anticipated Aquatic Communities Impacts

Aquatic communities are sensitive to small changes in their environment. Construction of the proposed project may impact water resources by one or more of the following processes:

- Increased sedimentation and siltation from construction and/or erosion.
  Alteration of water levels and flows due to interruptions and additions to surface and ground water flow from construction.
- Changes in light incidence and water clarity due to increased sedimentation and vegetation
  removal
- Changes in water temperature due to vegetation removal
- Increased nutrient loading during construction via runoff from exposed areas
- Increased concentration of toxic compounds from highway runoff, construction, and toxic spills, and increased vehicular use

Although direct impacts may be temporary, environmental impacts from these construction processes may result in long-term or irreversible effects. NCDOT's *Best Management Practices for Protection of Surface Waters* (BMP-PSW), Sediment Control guidelines, and design standards for sensitive watersheds (15A NCAC 04B:0124) will be strictly enforced during construction stages of the project. Alterations in the aquatic community may result if existing pipes or culverts are extended, new pipes are installed, or the existing perennial stream and any of the roadside ditches are relocated.

The removal of streamside vegetation and placement of fill material at the construction site alters the terrain and enhances erosion and sedimentation. Revegetation stabilizes the soil thus mitigating these processes. Erosion and sedimentation carry soils, toxic compounds, and other materials into aquatic communities at the construction site. These processes magnify turbidity and can cause the formation of sandbars at the site and downstream, thereby altering water flow and the growth of vegetation. Streamside alterations also lead to more direct sunlight penetration and to elevations of water temperatures, which may impact many species.

3. Jurisdictional Topics

a. Waters of the United States

The U.S. Army Corps of Engineers (USACE) promulgated the definition of "Waters of the United States" under 33 CFR §328.3(a). Waters of the United States include most interstate and intrastate surface waters, tributaries, and wetlands. Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions are considered "wetlands" under 33 CFR §328.3(b). Wetlands generally include swamps, marshes, bogs, and similar areas. Any action that proposes to place dredged or fill materials into Waters of the United States falls under the jurisdiction of the USACE, and must follow the statutory provisions under Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344).

1) **Wetlands and Surface Waters**

Potential wetland communities were investigated pursuant to the 1987 "Corps of Engineers Wetland Delineation Manual". The three-parameter approach is used where hydric soils, hydrophytic vegetation and prescribed hydrologic characteristics must all be present for an area to be considered a wetland.

One small wetland, designated W1, was identified within the project study area.

Surface waters present in the study area include: Stirrup Iron Creek, EC1 and UT1 to Northeast Creek. Calculated impacts to jurisdictional streams for each proposed alternate appears below in Table 12.

Table 12
Impacts to Jurisdictional Streams

				Actual Impacts From Proposed Alternates		
Stream Name	**Stream Type**	**Coverage Area**	**NCDWQ Rating**	**Alternate 1 (LF)**	**Alternate 2 (LF)**	**Alternate 3 (LF)**
Stirrup Iron Creek	Perennial	191 feet	32	66	57	77
UT1 to Northeast Creek	Intermittent	154 feet	17.5	0	0	0
EC1	Ephemeral	65 feet	15.5	27	30	25
			Totals	**93**	**87**	**102**

* Project Impacts are calculated within the boundary of the project construction limits (Cut/Fill Line) + 25 feet per NCDOT policy.

Wetland 1 (W1) is located on the north corner of Methodist Street and South Miami Boulevard. W1 is located within the maintained-disturbed area. The water source for W1 was a corrugated metal stormwater drainage pipe. W1 has no hydrologic connection to waters of the State. The dominant vegetation located within the wetland are rushes and sedges. Wetland hydrology indicators include inundation and saturation in the upper 12 inches. The soil found from 0 to 6 inches had a matrix color (Munsell Moist) of 10YR 2/2, which included mottles of 5YR 4/6 that were common. The soil represented a texture of clay. The soil found from 7 to 12 inches had a matrix color of 10YR 6/1 which did not include mottles and had a texture of clay (see the 1987 USACE Wetland Determination Data Form in the Appendix). This wetland is best classified as a palustrine, emergent, nonpersistant, saturated (PEM2B), with a Wetland Rating score of 14. Calculated project impacts to W1 appear below in Table 13.

Table 13
Impacts to Wetlands

					Actual Impacts From Proposed Alternates		
Wetland	**Classification**	**Wetland Type**	**Wetland Rating**	**Coverage Area (acres)**	**Alternate 1 (LF)**	**Alternate 2 (LF)**	**Alternate 3 (LF)**
Wetland 1	PEM2B*	Non-Riverine	14.0	0.002	0.002	0.002	0.002
			Total	**0.002**	**0.002**	**0.002**	**0.002**

* PEM2B = palustrine, emergent, nonpersistant, saturated wetland

* Project Impacts are calculated within the boundary of the project construction limits (Cut/Fill Line) + 25 feet per NCDOT policy.

The above sites will be verified by the USACE and DWQ. USACE has field verified the wetland and stream sites on this project. The following jurisdictional rulings have been made:

- Stirrup Iron Creek – Perennial, jurisdictional stream. Mitigation would be required for impacts over established threshold levels.
- Stream EC 1 – Intermittent, Ephemeral channel. Isolated and unimportant – no mitigation required.
- Stream UT 1 – intermittent, unimportant – no mitigation required.
- Wetland W 1 – isolated, no mitigation required.

b. Permit Issues

In accordance with provisions of Section 404 of the Clean Water Act (33 U.S.C. 1344), a Section 404 Nationwide Permit (NWP) 23 from the USACE is likely to be applicable for all impacts to Waters of the United States resulting from the proposed project. This permit authorizes activities required for construction, expansion, modification, or improvement of linear transportation crossings in waters of the United States, including wetlands if the activity meets the following criteria: 1) This NWP is subject to the following acreage and linear limits: Part a. For linear transportation projects in non-tidal waters, provided the discharge does not cause the loss of greater than use 0.5 acre of waters of the United States.

The project is primarily located in the Neuse watershed and is subject to the Nutrient Sensitive Waters Management Strategy for the Protection and Maintenance of Riparian Buffers (15 A NCAC 2B.0233). The Neuse River Riparian Buffer Rule applies to 50-foot wide riparian buffers directly adjacent to perennial and intermittent surface waters in the Neuse River Basin (NCDWQ, 2004) or waterside area is protected along waterways and roads, bridges, stormwater management facilities, ponds and utilities may be allowed where no practical alternative exists. The rules also state that these structures shall be located, designed, constructed, and maintained to have minimal disturbance, to provide maximum erosion protection, to have the least adverse effects on aquatic life and habitat, and to protect water quality to the maximum extent practical through the use of Best Management Practices (BMP). Calculated impacts to Neuse River buffer areas appears below in Table 14.

Table 14
Impacts To Neuse River Riparian Buffers

		Actual Impacts From Proposed Alternates					
Stream Name	**Buffer Zone**	**Alternate 1**		**Alternate 2**		**Alternate 3 (SF)**	
		SF	**Acres**	**SF**	**Acres**	**SF**	**Acres**
Stirrup Iron Creek	Zone 1	3821	0.088	3141	0.072	4517	0.104
	Zone 2	2369	0.054	1783	0.040	3153	0.072
EC1	Zone 1	1621	0.037	1784	0.041	1518	0.035
	Zone 2	1009	0.023	1134	0.026	837	0.020
	Total Acres	**8,820**	**0.202**	**7,842**	**0.179**	**10,025**	**0.231**

* Project Impacts are calculated within the boundary of the project construction limits (Cut/Fill Line) + 25 feet per NCDOT policy.

Stream, Wetland and Neuse River Buffer impacts are shown by Figure 9. Stream impacts caused by the widening of South Miami Boulevard are subject to the Riparian or Watershed Buffer rules. The area subject to the Riparian or Watershed Buffer rules is from the top of the stream bank to the edge of the pavement of South Miami Boulevard. Perpendicular stream impacts are subject to the Riparian or Watershed Buffer rules under the category of "Road impacts greater than 40 linear feet but equal to or less than 150 linear feet or one-third of an acre of riparian buffer" are **allowable**. Impacts that are equal to or less than 40 linear feet of riparian buffer are **exempt** and impacts that are greater than 150 linear feet or one-third of an acre of riparian buffer are **allowable with mitigation.**

Neuse River buffer impacts for the Recommended Alternative (Alternative 3) are greater than 40 linear feet and less than 150 linear feet and less than one-third of an acre. Therefore, project impacts are expected to be in the "allowable" category.

Written concurrence from the DWQ will be needed when applying for a Riparian or Watershed Buffer. In addition, application for a North Carolina Division of Water Quality (DWQ) Section 401 Water Quality Certification is required for this project prior to the issuance of the Section 404 Nationwide 14 permit.

1) Mitigation

The USACE has adopted, through the Council on Environmental Quality (CEQ), a wetland mitigation policy which 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 Waters of the United States, specifically wetlands. Mitigation of wetland impacts has been defined by the CEQ to include: avoiding impacts (to wetlands), minimizing impacts, rectifying impacts, reducing impacts over time and compensating for impacts (40 CFR 1508.20). Each of these three aspects (avoidance, minimization, and compensatory mitigation) must be considered sequentially.

Avoidance

Avoidance mitigation examines all appropriate and practicable possibilities of averting impacts to Waters of the United States. According to a 1990 Memorandum of Agreement (MOA) between the Environmental Protection Agency (EPA) and the USACE, in determining "appropriate and practicable" measures to offset unavoidable impacts, such measures should be appropriate to the scope and degree of those impacts and practicable in terms of cost, existing technology and logistics in light of overall project purposes. There is one wetland on this project, which is an isolated wetland near an existing intersection on the project. All considered build alternatives will unavoidably impact all of this small (0.02 acres), isolated wetland. The ACOE has ruled that compensatory mitigation will not be required for this wetland.

Minimization

Minimization includes the examination of appropriate and practicable steps to reduce the adverse impacts to Waters of the United States. Implementation of these steps will be required through project modifications and permit conditions. Minimization typically focuses on decreasing the footprint of the proposed project through the reduction of median widths, Right-of-Way (Right-of-Way) widths, fill slopes and/or road shoulder widths. Project construction and facility widths have been reduced to the extent practicable, while still meeting the Purpose and Need of the project, in the project's physically constrained corridor. Other practical mechanisms that will be used as applicable on this project to minimize impacts to Waters of the United States crossed by the proposed project include:

- Reduction of clearing and grubbing activity
- Decrease or elimination of direct discharge into streams
- Reduction of runoff velocity; re-establishment of vegetation on exposed areas
- Judicious pesticide and herbicide usage
- Minimization of "in-stream" activity
- Use responsible litter control practices

Strict enforcement of sedimentation control Best Management Practices (BMP's) should be implemented for the protection of surface waters during the entire life of the project:

Compensatory Mitigation

Compensatory mitigation is not normally considered until anticipated impacts to Waters of the United States have been avoided and minimized to the maximum extent possible. It is recognized that "no net loss of wetlands" functions and values may not be achieved in each and every permit action. Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts that remain after all appropriate and practicable minimization has been required. Compensatory actions often include restoration, creation and enhancement of Waters of the United States. Such actions should be undertaken in areas adjacent to or contiguous to the discharge site. Compensatory mitigation is anticipated if impacts to wetlands and streams cannot be avoided and/or minimized.

In accordance with 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), July 22, 2003, the North Carolina Department of Environment and Natural Resources Ecosystem Enhancement Program (EEP), will be requested to provide off-site mitigation to satisfy the federal Clean Water Act compensatory mitigation requirements for this project. Compensatory mitigation is not aniticipated for this project although final determination rests with the USACE.

c. Protected Species

Some populations of fauna and flora have been in, or are in, the process of decline either due to natural forces or their inability to coexist with human activities. Federal law (under the provisions of the Endangered Species Act of 1973, as amended) requires that any action, likely to adversely affect a species classified as federally-protected, be subject to review by the USFWS. Other species may receive additional protection under separate state laws.

1) Federally-Protected Species

Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE) and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of May 10, 2007, the USFWS lists the following federally protected species for Durham County (Table 15). A brief description of each species' characteristics and habitat follows.

Table 15
Federally Endangered and Threatened Species

Scientific Name	Common Name	Status	Biological Conclusion	Habitat
Haliaeetus leucocephalus	Bald Eagle	T (proposed for delisting)	No Effect	No
Echinacea laevigata	Smooth Coneflower	E	No Effect	Yes
Rhus michauxii	Michaux Sumac	E	No Effect	Yes

"E" denotes Endangered (a species in danger of extinction throughout all or a significant portion of its range).
"T" denotes Threatened (a species that is likely to become endangered species within the foreseeable future throughout all or a significant portion of its range.

Bald Eagle (*Haliaeetus leucocephalus*) Threatened (proposed for delisting)

The bald eagle is currently listed as threatened (proposed for delisting) due to its population increase since the original listing in 1967. Adult bald eagles can be identified by their large white head and short white tail. The body plumage is dark-brown to chocolate-brown in color. In flight bald eagles can be identified by their flat wing soar.

Eagle nests are found in close proximity to water (within a half mile) with a clear flight path to the water, in the largest living tree in an area, and having an open view of the surrounding land. Human disturbance can cause an eagle to abandon otherwise suitable habitat. The breeding season for the bald eagle begins in December or January. Fish are the major food source for bald eagles. Other sources include coots, herons, and wounded ducks. Food may be live or carrion.

BIOLOGICAL CONCLUSION: NO EFFECT

No suitable habitat for the bald eagle exists along the project corridor. The study area is developed except for four small, undeveloped forested sites that are not suitable to support a bald eagle nest. No large bodies of water are within the study area or within 1.0 mile of the study area. The area located within 1.0 mile of the project study area is commercially and residentially developed. No suitable nesting trees were found within 1.0 mile of the study area. A review on August 8, 2005 of the NCNHP database of rare species and unique habitats revealed no occurrence of federally protected species within one mile of the project study area. It can be concluded that project construction will have no effect on the bald eagle.

Smooth Coneflower (*Echinacea laevigata*) Endangered

Smooth coneflower is a perennial herb with hairless stems and few leaves. Plants can reach 20 to 59 inches in height. The simple leaves are alternate, smoothed with toothed edges, range in shape from lance-shaped basal leaves with rounded bases to smaller mid-elliptic stem leaves, 4 to 8 inches long and 1 to 3 inches wide. Flowers are composite, single with purple centers and deep to pale pink, occasionally white, drooping ray flowers.

Smooth coneflower prefers basic or circumneutral soils of meadows, open woodlands and border areas in-between. This species prefers abundant sunlight, with little competition from other herbaceous plants. It grows best where there is disturbance such as natural fires that serve to reduce shade and competition from woody plants.

BIOLOGICAL CONCLUSION: **NO EFFECT**

Marginally suitable habitat exists along South Miami Boulevard in the Maintained-Disturbed community. These areas are intensely maintained in low growing condition. Plant by plant surveys for smooth coneflower was conducted on June 6, 2006 by NCDOT biologists and no smooth coneflower was found. A review of the NCNHP database on August 8, 2005 revealed no known populations of smooth coneflower within 1.0 mile of the study area. Therefore, this project will have "No Effect" on smooth coneflower.

Michaux's Sumac (*Rhus michauxii*) Endangered

Michaux's sumac is a rhizomatous, densely hairy shrub growing to a height of 1.0–2.0 feet. Plants flower in June, producing a terminal, erect, dense cluster of 4 to 5 parted greenish-yellow to white flowers. Fruits, produced from August through September, are red, densely short-pubescent drupes, 0.25 inches across. Most populations, however, are single sexed and reproduce only by rhizomes. The entire plant is densely pubescent. The deciduous leaves are composed of 9-13 sessile, oblong leaflets on a narrowly winged or wingless rachis. The acute to acuminate leaflets have rounded bases and are 1.5 to 3.5 inches long and 1.0 to 2.0 inches wide. They are simply or doubly serrate.

This species prefers sandy, rocky, open woods and roadsides. Its survival is dependent on disturbance (mowing, clearing, and fire) to maintain an open habitat. It is often found with other members of its genus as well as with poison ivy. There is no longer believed to be an association between this species and specific soil types.

BIOLOGICAL CONCLUSION: **NO EFFECT**

Habitat in the form of forest edges and roadsides are present within the project area. Plant by plant survey for Michaux's sumac was conducted on June 6, 2006 by NCDOT biologists. Approximately 1.5 man-hours was spent completing surveys for Michaux's sumac. The forest edges and roadsides were highly maintained and not ideal habitat for Michaux's sumac. Michaux's sumac was not found. A review of the NCNHP database on August 8, 2005 revealed no known populations of Michaux's sumac within 1.0 mile of the study area. Therefore, this project will have "No Effect" on Michaux's sumac.

2) Federal Species of Concern and State Listed Species

There are thirteen Federal Species of Concern (FSC) listed for Durham County as of May 10, 2007. Federal Species of Concern are not afforded federal protection under the ESA and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. Federal Species of Concern are defined as those species that may or may not be listed in the future. These species were formally candidate species, or species under consideration for listing for which there was insufficient information to support a listing of Endangered, Threatened, Proposed Endangered and Proposed Threatened. Species which are listed as Endangered, Threatened, Significantly Rare, or Special Concern by the NCNHP list of rare plant and animal species are afforded state protection under the State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1979.

Table 16 lists Federal Species of Concern, species state status, and the existence of suitable habitat for each species in the study area. This species list is provided for information purposes as the status of these species may be upgraded in the future.

Surveys for these species were not conducted during the site visit, nor were any of these species observed. As of August 8, 2005 review of the NCNHP database of the rare species and unique habitats revealed no records of North Carolina rare and/or protected species in or near the study area or within 1.0 mile.

Table 16
Federal Species of Concern

Scientific Name	Common Name	NC Status	Habitat
Etheostoma collis lepidinion	Carolina darter	SC	No
Lythrurus matutinus	Pinewoods shiner	W2	No
Noturus furiosus pop.	Carolina madtom	SC(PT)	No
Fusconaia masoni	Atlantic pigtoe	E	No
Gomphus septima	Septima's clubtail dragonfly	SR	No
Lampsilis cariosa	Yellow lampmussel	E	No
Lasmigona subviridis	Green floater	E	No
Somotogyrus virginicus	Panhandle pebblesnail	SR	No
Delphinium exaltatum	Tall larkspur	E-SC	No
Juglans cinera	Butternut	W5a	No
Anguilla vostrata	American eel	N/L	No
Ambloplites cavitrons	Roanoke bass	N/L	No
Monotropsis odorata	Sweet pinesap	SR-T	No

"**E**" - An Endangered species is one whose taxon is in danger of extinction throughout all or a significant portion of its range.
"**T**" - A Threatened species is one which is likely to become endangered species within the foreseeable future throughout all or a significant portion of its range.
"**SC**" - A Special Concern species is one which requires monitoring but may be taken or collected and sold under regulations adopted under the provisions of Article 25 of Chapter 113 of the General Statutes (animals) and the Plant Protection and Conservation Act (plants). Only propagated material may be sold of Special Concern plants that are also listed as Threatened or Endangered.
"**C**" - A Candidate species is one which is very rare in North Carolina, generally with 1-20 populations in the state, generally substantially reduced in numbers by habitat destruction, direct exploitation or disease. The species is also either rare throughout its range or disjunct in North Carolina from a main range in a different part of the country or the world.
"**SR**" - A Significantly Rare species is one which is very rare in North Carolina, generally with 1-20 populations in the state, generally substantially reduced in numbers by habitat destruction, direct exploitation or disease. The species is generally more common elsewhere in its range, occurring peripherally in North Carolina.
"**-T**"- These species are rare throughout their ranges (fewer than 100 populations total).
"**P**" - denotes a species which has been formally proposed for listing as Endangered, Threatened, or Special Concern, but has not yet completed the listing process.
"**W**" - Animals :Any other species believed to be of conservation concern in the state because of scarcity, declining populations, or inadequacy of information to assess its rarity. Animals
"**W2**" - animals: Species that are rare to uncommon in North Carolina, but are not necessarily considered to be declining or otherwise in trouble Animals
"**W**" - Plants: Any other species believed to be rare and of conservation concern in the state but not warranting active monitoring at this time.
"**W5a**" - Plants: (W5a – rare because of severe decline) includes species which have declined sharply in North Carolina, but which do not appear yet to warrant site-specific monitoring.
"**N/L**" - Not Listed

D. Traffic Noise

Note: The full Noise Analysis Report including noise characteristics, abatement criteria, methodology, and procedures for analysis is available and on file at NCDOT.

1. Traffic Noise Impacts and Noise Contours

It is noted that preliminary alignment was available for use in this noise analysis. The project proposes widening SR 1959 (South Miami Boulevard) from south of SR 2112 (Methodist Street) to north of SR 1960 (Bethesda Avenue) to a 5 lane facility. This noise analysis evaluated three alignment alternatives; symmetrical, west side and east side widening. Only those existing natural or man-made barriers were included in setting up the model. The roadway sections and proposed intersections were assumed to be flat and at-grade. Thus, this analysis represents the "worst-case" topographical conditions. The noise predictions made in this report are highway-related noise predictions for the traffic conditions during the year being analyzed. All Noise Analysis Tables and Figures appear in Appendix 2. A summary of the noise abatement criteria for various land uses is presented in Table N2 in Appendix 2. The ambient measurement location is shown in Figure N1 and Table N3 in Appendix 2.

Traffic noise impacts occur when the predicted traffic noise levels either: [a] approach or exceed the FHWA noise abatement criteria (with "approach" meaning within 1 dBA of the Table N2 value), or [b] substantially exceed the existing noise levels. The NCDOT definition of substantial increase is shown in the lower portion of Table N2. Consideration for noise abatement measures must be given to receptors that fall in either category.

In accordance with the NCDOT 2004 Traffic Noise Abatement Policy, the Federal/State governments are not responsible for providing noise abatement measures for new development which building permits are issued within the noise impact area of a proposed highway after the Date of Public Knowledge. The Date of Public Knowledge of the location of a proposed highway project will be the approval date of CEs, FONSIs, RODs, or the Design Public Hearing, whichever comes later. For development occurring after this public knowledge date, local governing bodies are responsible to insure that noise compatible designs are used along the proposed facility.

The number of receptors in each activity category for each section predicted to become impacted by future traffic noise is shown in Table N5 in Appendix 2. These are noted in terms of those receptors expected to experience traffic noise impacts by either approaching or exceeding the FHWA NAC or by a substantial increase in exterior noise levels. Under Title 23 CFR Part 772, 17 residences and 1 business are predicted to be impacted due to highway traffic noise in the project area with the selection of the west side widening option. The maximum extent of the 72-dBA noise level contour is 75.2 feet from the center of the proposed roadway. The maximum extent of the 67-dBA noise level contour is 137.8 feet from the center of the proposed roadway. Contour information in Table N5 shows this contour information by section. This information should assist local authorities in exercising land use control over the remaining undeveloped lands adjacent to the roadway within local jurisdiction. For example, with the proper information on noise, the local authorities can prevent further development of incompatible activities and land uses with the predicted noise levels of an adjacent highway.

Table N6 exhibits the exterior traffic noise level increases for the identified receptors by roadway section. **There are no substantial noise level impacts anticipated for this project by the selection of any of the widening options evaluated. The predicted noise level increases for this project range up to +6 dBA.** When real-life noises are heard, it is possible barely to detect noise level changes of 2-3 dBA. A 5-dBA change is more readily noticeable.

2. Traffic Noise Abatement Measures

If traffic noise impacts are predicted, examination and evaluation of alternative noise abatement measures for reducing or eliminating the noise impacts must be considered. Consideration for noise abatement measures must be given to all impacted receptors. There are impacted receptors due to highway traffic noise in the project area. The following discussion addresses the applicability of these measures to the proposed project.

3. Highway Alignment Selection

Highway alignment selection involves the horizontal or vertical orientation of the proposed improvements in such a way as to minimize impacts and costs. The selection of alternative alignments for noise abatement purposes must consider the balance between noise impacts and other engineering and environmental parameters. For noise abatement, horizontal alignment selection is primarily a matter of siting the roadway at a sufficient distance from noise sensitive areas. Changing the highway alignment is not a viable alternative for noise abatement since the scope of the project is limited to addressing concerns along the existing alignment.

4. Traffic System Management Measures

Traffic system management measures, which limit vehicle type, speed, volume and time of operations, are often effective noise abatement measures. For this project, traffic management measures are not considered appropriate for noise abatement due to their effect on the capacity and level-of-service of the proposed facility.

Past project experience has shown that a reduction in the speed limit of 10 mph would result in a noise level reduction of approximately 1 to 2 dBA. Because most people cannot detect a noise reduction of up to 3 dBA and because reducing the speed limit would reduce roadway capacity, it is not considered a viable noise abatement measure. This and other traffic system management measures, including the prohibition of truck operations, are not considered to be consistent with the project's objective of providing a high-speed, limited-access facility.

5. Noise Barriers

Physical measures to abate anticipated traffic noise levels are often applied with a measurable degree of success on fully controlled facilities by the application of solid mass, attenuable measures strategically placed between the traffic sound source and the receptors to effectively diffract, absorb, and reflect highway traffic noise emissions. Solid mass, attenuable measures may include earth berms or artificial abatement walls.

The project will maintain uncontrolled or limited control of access, meaning most commercial establishments and residents will have direct access connections to the proposed roadway, and all intersection will adjoin the project at grade. For a noise barrier to provide sufficient noise reduction it must be high enough and long enough to shield the receptor from significant sections of the highway. Access openings in the barrier severely reduce the noise reduction provided by the barrier. It then becomes economically unreasonable to construct a barrier for a small noise reduction. Safety at access openings (driveways, crossing streets, etc.) due to restricted sight distance is also a concern. Furthermore, to provide a sufficient reduction, a barrier's length would normally be 8 times the distance from the barrier to the receptor. For example, a receptor located 50 feet from the barrier would normally require a barrier 400 feet long. An access opening of 40 feet (10 percent of the area) would limit its noise reduction to approximately 4 dBA (FUNDAMENTAL AND ABATEMENT OF HIGHWAY TRAFFIC NOISE, Report No. FHWA-HHI-HEV-73-7976-1, USDOT, chapter 5, section 3.2, page 5-27). Hence, this type of control of access effective eliminates the consideration of berms or noise walls as noise mitigation measures.

In addition, businesses, churches, and other related establishments located along a particular highway normally require accessibility and high visibility. Solid mass, attenuable measures for traffic noise abatement would tend to disallow these two qualities, and thus, would not be acceptable abatement measures in this case.

6. Other Mitigation Measures Considered

The acquisition of property in order to provide buffer zones to minimize noise impacts is not considered to be a feasible noise mitigation measure for this project. The cost to acquire impacted receptors for buffer zones would exceed the abatement threshold cost per benefited receptor. The use of buffer zones to minimize impacts to future sensitive areas is not recommended because this could be accomplished through land use control.

The use of vegetation for noise mitigation is not considered reasonable for this project, due to the amount of substantial amount of Right-of-Way necessary to make vegetative barriers effective. FHWA research has shown that a vegetative barrier should be approximately 100 feet wide to provide a 3-dBA reduction in noise levels. In order to provide a 5-dBA reduction, substantial amounts of additional Right-of-Way would be required. The cost of the additional Right-of-Way and plant sufficient vegetation is estimated to exceed the allowed abatement cost per benefited receptor. Noise insulation was also considered; however, no public or non-profit institutions were identified that would be impacted by this project.

7. "Do Nothing" Alternative

The traffic noise impacts for the "do nothing" or "no-build" alternative was also considered. If the proposed widening did not occur, 17 receptors are anticipated to approach or exceed the FHWA NAC. Also, the receptors could anticipate experiencing an increase in exterior noise levels of approximately 4 dBA increase. As previously noted, it is barely possible to detect noise level changes of 2-3 dBA. A 5-dBA change in noise levels is more readily noticed.

8. Construction Noise

The major construction elements of this project are expected to be earth removal, hauling, grading, and paving. General construction noise impacts, such as temporary speech interference for passers-by and those individuals living or working near the project, can be expected particularly from paving operations and from the earth moving equipment during grading operations. However, considering the relatively short-term nature of construction noise and the limitation of construction to daytime hours, these impacts are not expected to be substantial. The transmission loss characteristics of nearby natural elements and man-made structures are believed to be sufficient to moderate the effects of intrusive construction noise.

9. Summary

Traffic noise impacts are an unavoidable consequence of transportation projects especially in areas where there are no traffic noise sources. All traffic noise impacts were considered for noise mitigation. Based on these preliminary studies, traffic noise abatement is not recommended, and no noise abatement measures are proposed. This evaluation completes the highway traffic noise requirements of Title 23 CFR Part 772.

E. Air Quality Analysis

Note: The full Air Quality Analysis Report including characteristics, criteria, methodology, and procedures for analysis is available and on file at NCDOT.

Air pollution originates from various sources. Emissions from industry and internal combustion engines are the most prevalent sources. Impacts resulting from highway construction range from intensifying existing air pollution problems to improving the ambient air quality. Changing traffic patterns are a primary concern when determining the impact of a new highway facility or the improvement of an existing highway facility. Motor vehicles emit carbon monoxide (CO), nitrogen oxide (NO), hydrocarbons (HC), particulate matter, sulfur dioxide (SO2), and lead (Pb) (listed in order of decreasing emission rate). Automobiles are considered to be the major source of CO in the project area. For this reason, most of the analysis presented herein is concerned with determining expected carbon monoxide levels in the vicinity of the project due to traffic flow. All air quality analysis tables and figures appear in Appendix 3.

A microscale air quality analysis was performed to determine future CO concentrations resulting from the proposed highway improvements. "CAL3QHC - A Modeling Methodology For Predicting Pollutant Concentrations Near Roadway Intersections" was used to predict the CO concentration near sensitive receptors.

Inputs into the mathematical model used to estimate hourly CO concentrations consisted of a level roadway under normal conditions with predicted traffic volumes, vehicle emission factors, and worst-case meteorological parameters. The traffic volumes are based on the annual average daily traffic projections. Carbon monoxide vehicle emission factors were calculated for the years 2010, 2015, and 2030 using the EPA publication "Mobile Source Emission Factors", and the MOBILE6 mobile source emissions computer model.

The background CO concentration for the project area was estimated to be 1.8 parts per million (ppm). Consultation with the Air Quality Section, Division of Environmental Management (DEM), North Carolina Department of Environment, Health and Natural Resources indicated that an ambient CO concentration of 1.8 ppm is suitable for most suburban and rural areas.

The worst-case air quality scenario was determined to be in the vicinity of the intersection of Ellis Road and South Miami Boulevard . The predicted 1-hour average CO concentrations for the evaluation build years of 2010, 2015, and 2030 are 5.30, 5.10 and 5.40 ppm, respectively. Comparison of the predicted CO concentrations with the NAAQS (maximum permitted for 1-hour averaging period = 35 ppm; 8-hour averaging period = 9 ppm) indicates no violation of these standards. Since the results of the worst-case 1-hour CO analysis for the build scenario is less than 9 ppm, it can be concluded that the 8-hour CO level does not exceed the standard. See Tables A1 through A3 in Appendix 3 for input data and output.

The project is located in Durham County, which is within the Raleigh-Durham-Chapel Hill nonattainment area for ozone (O_3) and the Raleigh-Durham for carbon monoxide (CO) as defined by the EPA. The 1990 Clean Air Act Amendments (CAAA) designated these areas as moderate nonattainment area for CO. However, due to improved monitoring data, these areas were redesignated as maintenance for CO on September 18, 1995. The area was designated nonattainment for O_3 under the eight-hour ozone standard effective June 15, 2004. Section 176(c) of the CAAA requires that transportation plans, programs, and projects conform to the intent of the state air quality implementation plan (SIP). The current SIP does not contain any

transportation control measures for Durham County. The Durham-Chapel Hill-Carrboro Metropolitan Planning Organization 2030 Long Range Transportation Plan (LRTP) and the 2006-2012 Metropolitan Transportation Improvement Program (MTIP) conform to the intent of the SIP. The USDOT made a conformity determination on the LRTP on 6/15/05 and the MTIP on 11/14/05. The current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93. There are no significant changes in the project's design concept or scope, as used in the conformity analyses.

This project will not result in any meaningful changes in traffic volumes, vehicle mix, location of the existing facility, or any other factor that would cause an increase in emissions impacts relative to the no-build alternative. As such, FHWA has determined that this project will generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special MSAT concerns. Consequently, this effort is exempt from analysis for MSATs. EPA regulations for vehicle engines and fuels will cause overall MSATs to decline significantly over the next 20 years. FHWA predicts MSATs will decline in the range of 57 percent to 87 percent, from 2000 to 2020, based on regulations now in effect, even with a projected 64 percent increase in vehicle miles traveled (VMT). Therefore, both the background level of MSATs and the possibility of even minor MSAT emissions from this project will be reduced.

During construction of the proposed project, all materials resulting from clearing and grubbing, demolition or other operations will be removed from the project, burned or otherwise properly disposed of by the Contractor. Any burning done will be done in accordance with applicable local laws and ordinances and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520. Care will be taken to insure burning will be done at the greatest distance practical from dwellings and not when atmospheric conditions are such as to create a hazard to the public. Any potential burning will be performed under constant surveillance. Also during construction, measures will be taken to reduce the dust generated by construction when the control of dust is necessary for the protection and comfort of motorists or area residents. This evaluation completes the assessment for air quality and satisfies the requirements for air quality of the 1990 Clean Air Act Amendments and the NEPA process.

VI. COMMENTS AND COORDINATION

A. Citizens Informational Workshop

A Citizens Informational Workshop were held near the project in Durham. The workshop was held on November 22, 2005 at the Bethesda Ruritan Club on South Miami Boulevard Drive. A total of 20 people attended the workshop, including NCDOT personnel, local officials and citizens from the project area. A total of five citizens attended the workshop. Comments focused on Bethesda Church and Cemetery and Right-of-Way acquisition issues. An official from Bethesda Church indicated that widening in the tight corridor between the church and cemetery was a concern. He indicated that relocating a small number of graves from the cemetery was preferable to the church, instead of encroaching on the church building property. Most of the citizens agreed the project was needed due to congestion at the intersection of SR 1959 (South Miami Boulevard) and SR 1954 (Ellis Road).

After reviewing the comments and concerns presented at the workshop, measures were taken to minimize impacts within the improvement area. Impacts were minimized by proposing a retaining wall along the frontage of Bethesda Baptist Church and widening to the east, away from the church building and other properties.

B. Agency Coordination

Sidewalks are proposed on both sides of the roadway. The City of Durham was present at the Citizens Informational Workshop and will formally request construction of sidewalks under a standard cost sharing agreement with NCDOT.

Personnel from the Army Corps of Engineers (ACOE) – Raleigh Regulatory office have conducted a field visit with NCDOT personnel to inspect potential project jurisdictional surface water impacts. The resulting jurisdictional rulings are discussed in Section V, Part C of this document. One stream in the project area was ruled significant and potentially requiring mitigation. However, impacts to that stream appear to be below established threshold levels for mitigation.

The following federal, state, and local agencies were consulted during the preparation of this Categorical Exclusion. An asterisk (*) indicates that a written response was received from the agency. Copies of the correspondence are included in Appendix 4 of this document:

US Army Corps of Engineers – Raleigh Regulatory Field Office
*US Fish and Wildlife Service –Raleigh Field Office
US Environmental Protection Agency
Federal Emergency Management Administration
NC Department of Administration, NC State Clearinghouse
NC Department of Public Instruction
*NC Department of Cultural Resources – SHPO
NC Department of Cultural Resources – Archives and History
NC Department of Environment and Natural Resources
*Division of Water Quality
Division of Soil and Water Conservation
Division of Forest Resources
Division of Land Resources
Division of Parks and Recreation
*NC Wildlife Resources Commission

Division of Coastal Management
Division of Marine Fisheries
Triangle J Council of Governments
Durham-Chapel Hill-Carrboro Metropolitan Planning Organization
City of Durham

C. Actions Required By Other Agencies

Constructing the proposed action will result in impacts to jurisdictional surface waters. The proposed action has been processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance 23 CFR 771.115(b). Therefore, it is anticipated that a Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344), Nationwide Permit 23 will be required by the US Army Corps of Engineers (USACE). Estimated impacts from the proposed project are less than the threshold of 300 feet for stream impacts and wetland impacts are less than 0.5 acres. The USACE determines final permit requirements under the statutory provisions of CWA. Written concurrence from the North Carolina Department of Environment and Natural Resources , Division of Water Quality (DWQ) will be required.

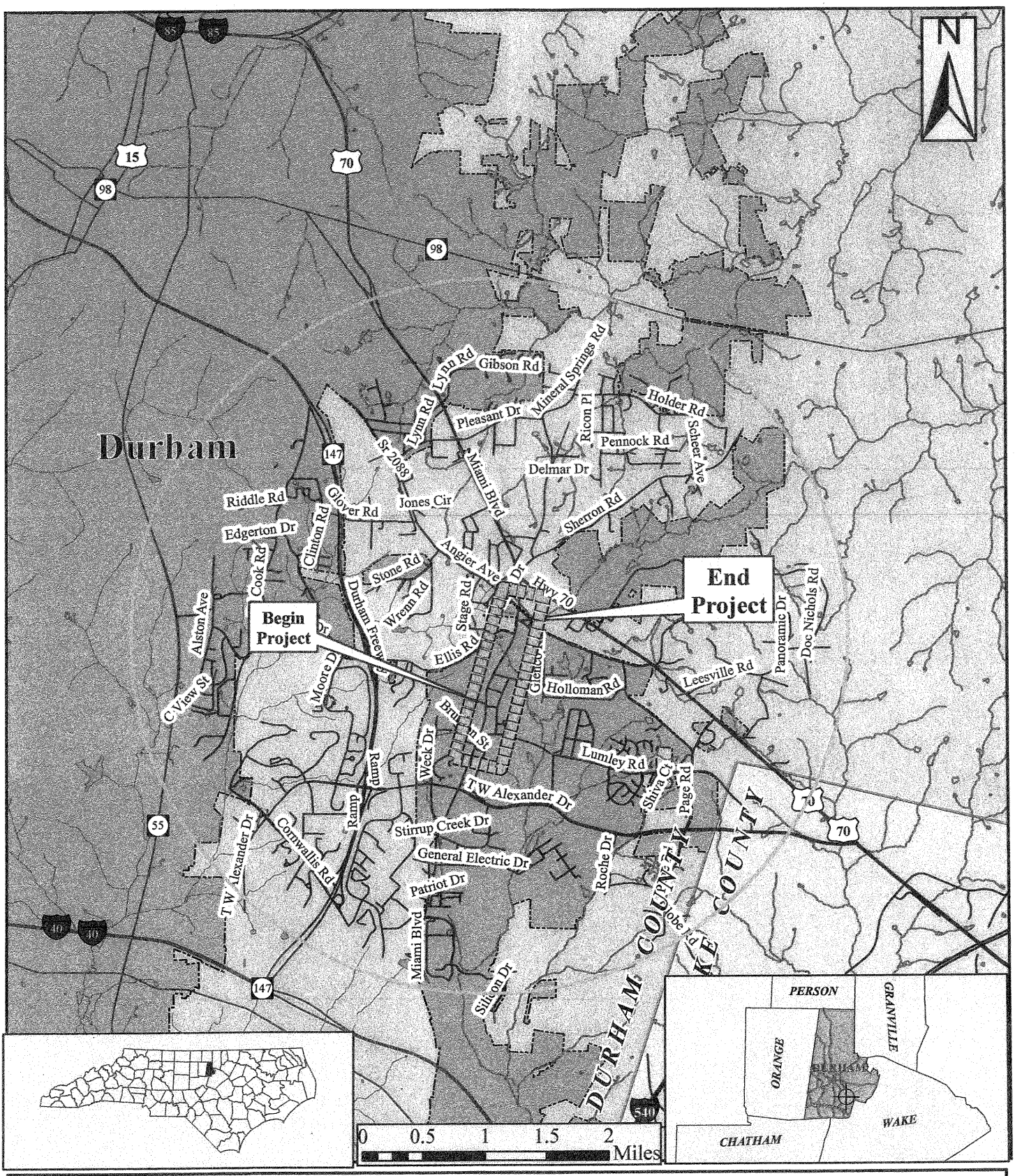
The proposed project will also require a Section 401 Water Quality General Certification from the DWQ. Section 401 of the Clean Water Act requires that the state issue or deny water certification for any federally permitted or licensed activity that may result in a discharge to Waters of the United States. Section 401 Certification allows surface waters to be temporarily impacted for the duration of the construction or other land manipulation.

NCDOT will implement erosion and sedimentation control measures, as specified by NCDOT's "Best Management Practices for Protection of Surface Waters" during design and construction to avoid and minimize impacts to streams and wetlands.

According to 15A NCAC 2H .0506(h) and 40 CFR 1508.20, compensatory mitigation will be required for impacts to jurisdictional streams requiring mitigation when those impacts are equal to or greater than 150 linear feet per stream. Jurisdictional stream impacts on the proposed alignment do not exceed 150 linear feet and wetland impacts on the proposed alignment are minimal and involve a small (0.02 Acre), isolated wetland. Therefore, compensatory mitigation is not anticipated on this project. Final compensatory wetland and stream mitigation requirements will be determined by the USACE, under the statutory provisions of CWA §404.

In accordance with 15A NCAC 2B .0233, stream impacts caused by the widening of South Miami Boulevard are subject to the Riparian or Watershed Buffer rules. The area subject to the Riparian or Watershed Buffer rules is from the top of the stream bank to the edge of the pavement of South Miami Boulevard. Perpendicular stream impacts are subject to the Riparian or Watershed Buffer rules under the category of "Road impacts greater than 40 linear feet but equal to or less than 150 linear feet or one-third of an acre of riparian buffer" are allowable. Impacts that are equal to or less than 40 linear feet of riparian buffer are exempt and impacts that are greater than 150 linear feet or one-third of an acre of riparian buffer are allowable with mitigation. Neuse River buffer impacts for the Recommended Alternative (Alternative 3) are greater than 40 linear feet and less than 150 linear feet and less than one-third of an acre. Therefore, project impacts are expected to be in the "allowable" category. The proposed project will require certification and approval of buffers by the DWQ.

FIGURES

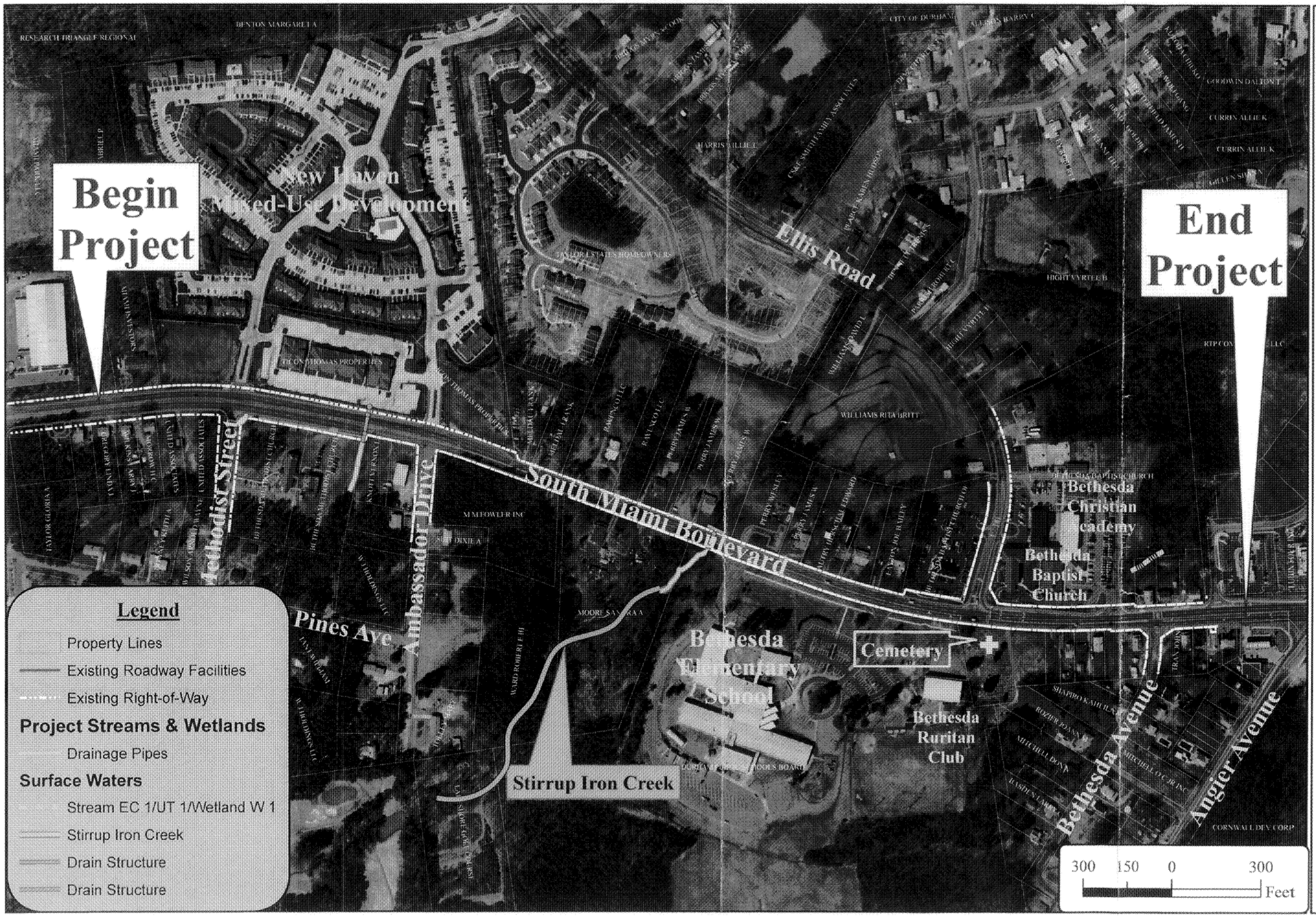


NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

VICINITY MAP
SOUTH MIAMI BOULEVARD WIDENING
DURHAM
DURHAM COUNTY
TIP PROJECT U-4011

County:	DURHAM
Div: 5	TIP# U-4011
WBS:	40221.1.1
Date:	MAY 2007

Figure 1



Legend

- Property Lines
- Existing Roadway Facilities
- Existing Right-of-Way

Project Streams & Wetlands

- Drainage Pipes

Surface Waters

- Stream EC 1/UT 1/Wetland W 1
- Stirrup Iron Creek
- Drain Structure
- Drain Structure

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

PROJECT AREA
SOUTH MIAMI BOULEVARD
WIDENING
DURHAM
DURHAM COUNTY
TIP PROJECT U-4011

N

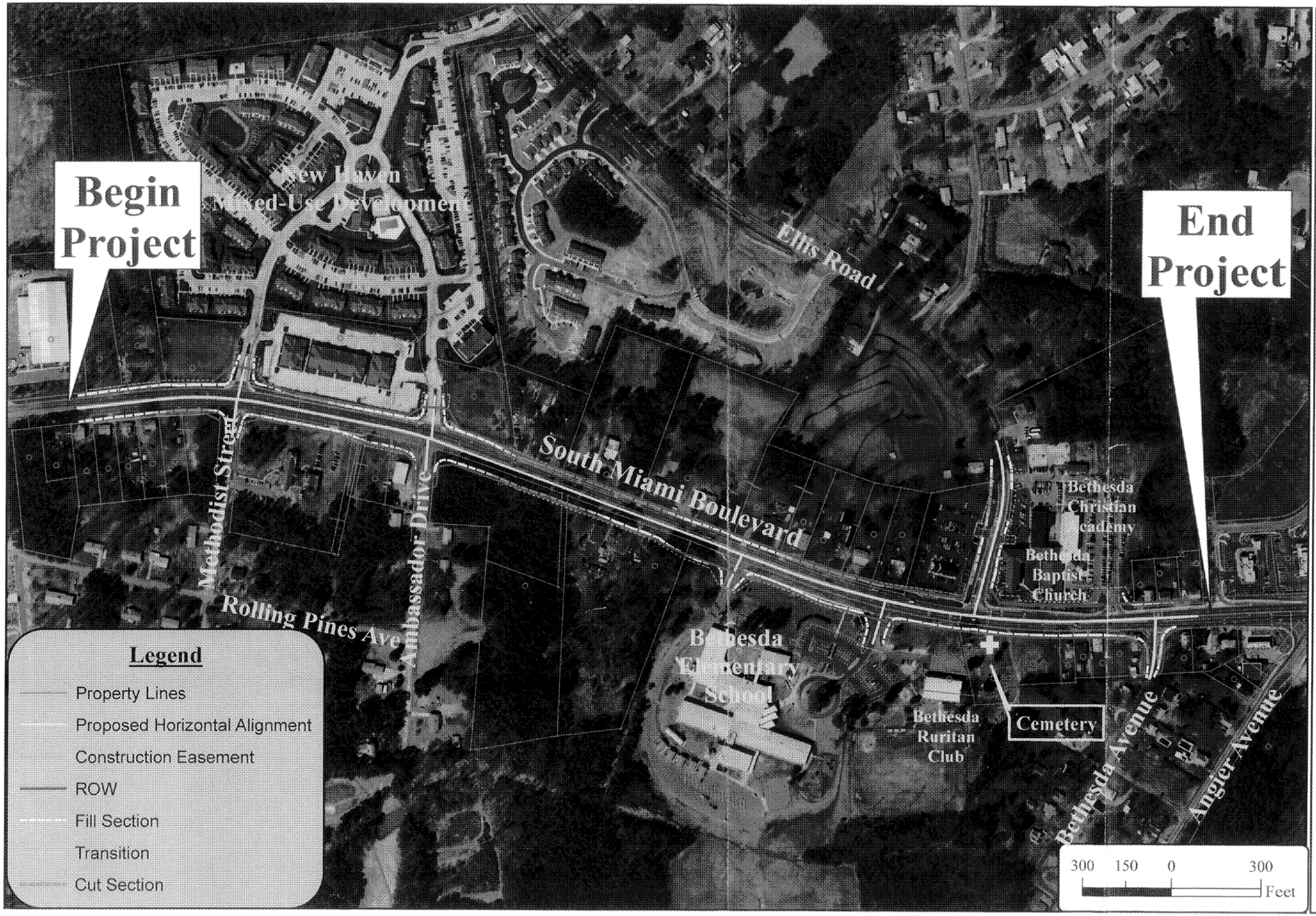
County: DURHAM

Div: 5 | TIP# U-4011

WBS: 40221.1.1

Date: MAY 2007

Figure 2



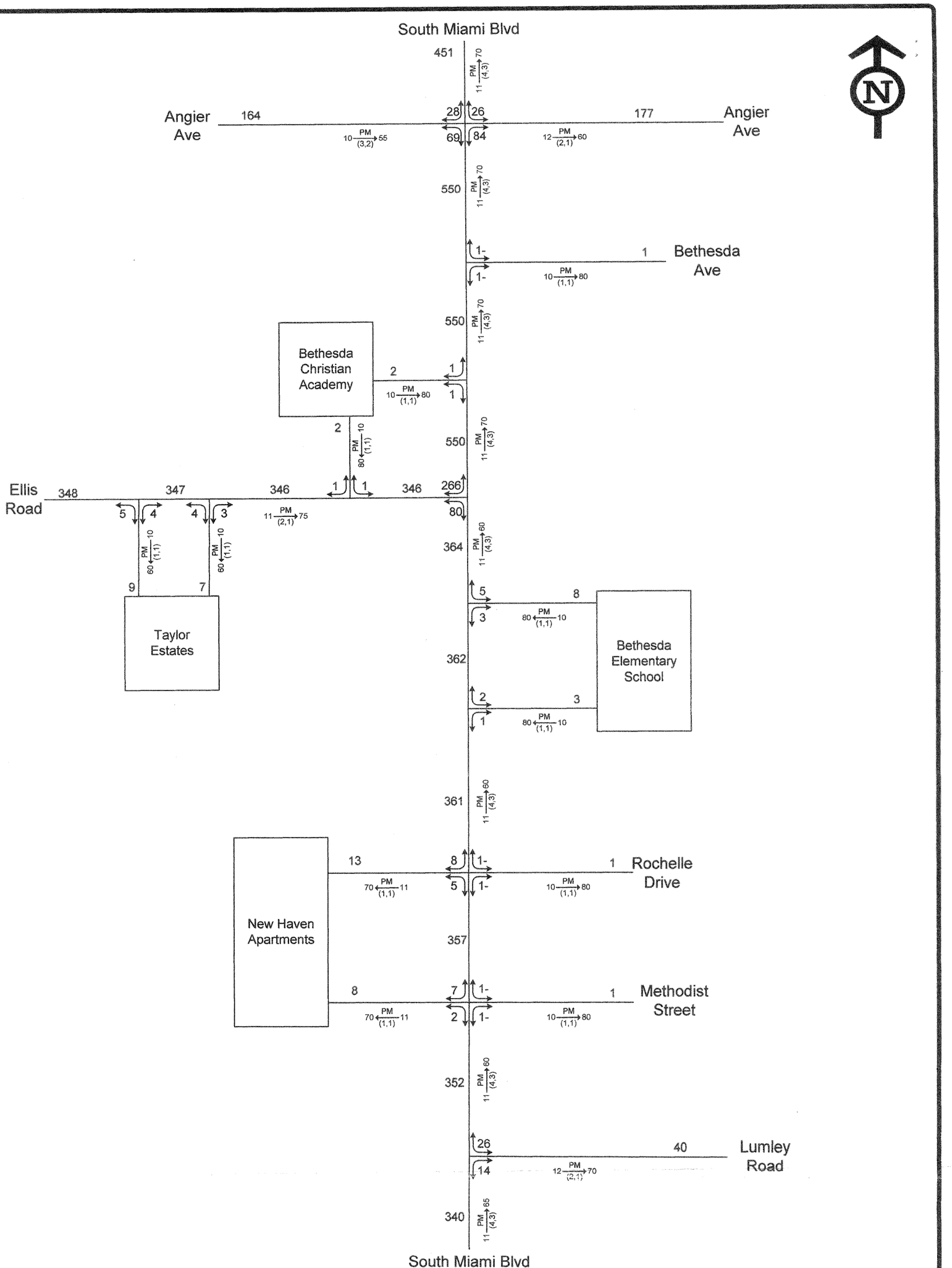
RECOMMENDED ALTERNATE (ALT 3)
SOUTH MIAMI BOULEVARD
WIDENING
DURHAM
DURHAM COUNTY
TIP PROJECT U-4011

NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND
ENVIRONMENTAL ANALYSIS BRANCH

N

County: DURHAM	
Div: 5	TIP# U-4011
WBS: 40221.1.1	
Date: MAY 2007	

Figure
3

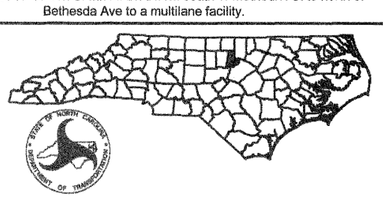


2030 ESTIMATED AVERAGE ANNUAL DAILY TRAFFIC WITH TRUCK, DHV AND DIRECTIONAL PERCENTAGES

COUNTY: Durham	**DIV.:** 5	**WBS:** 36330.1.1
TIP: U-4011	**DATE:** December 16, 2005	

LOCATION: SR1959 - S. Miami Blvd from south of SR2112 - Methodist St to north of SR1969 - Bethesda Ave

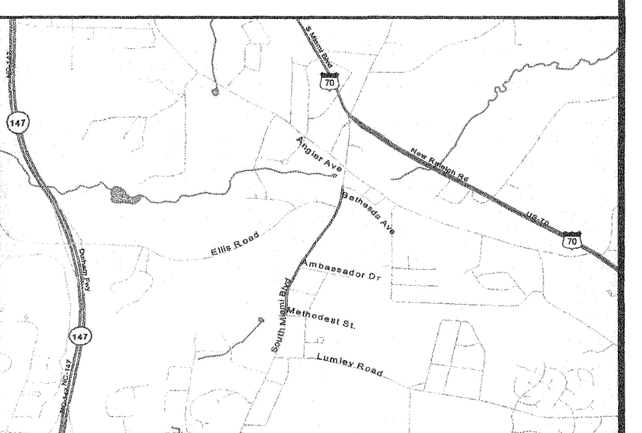
PROJECT: Widen S. Miami Blvd from south of Methodist St to north of Bethesda Ave to a multilane facility.

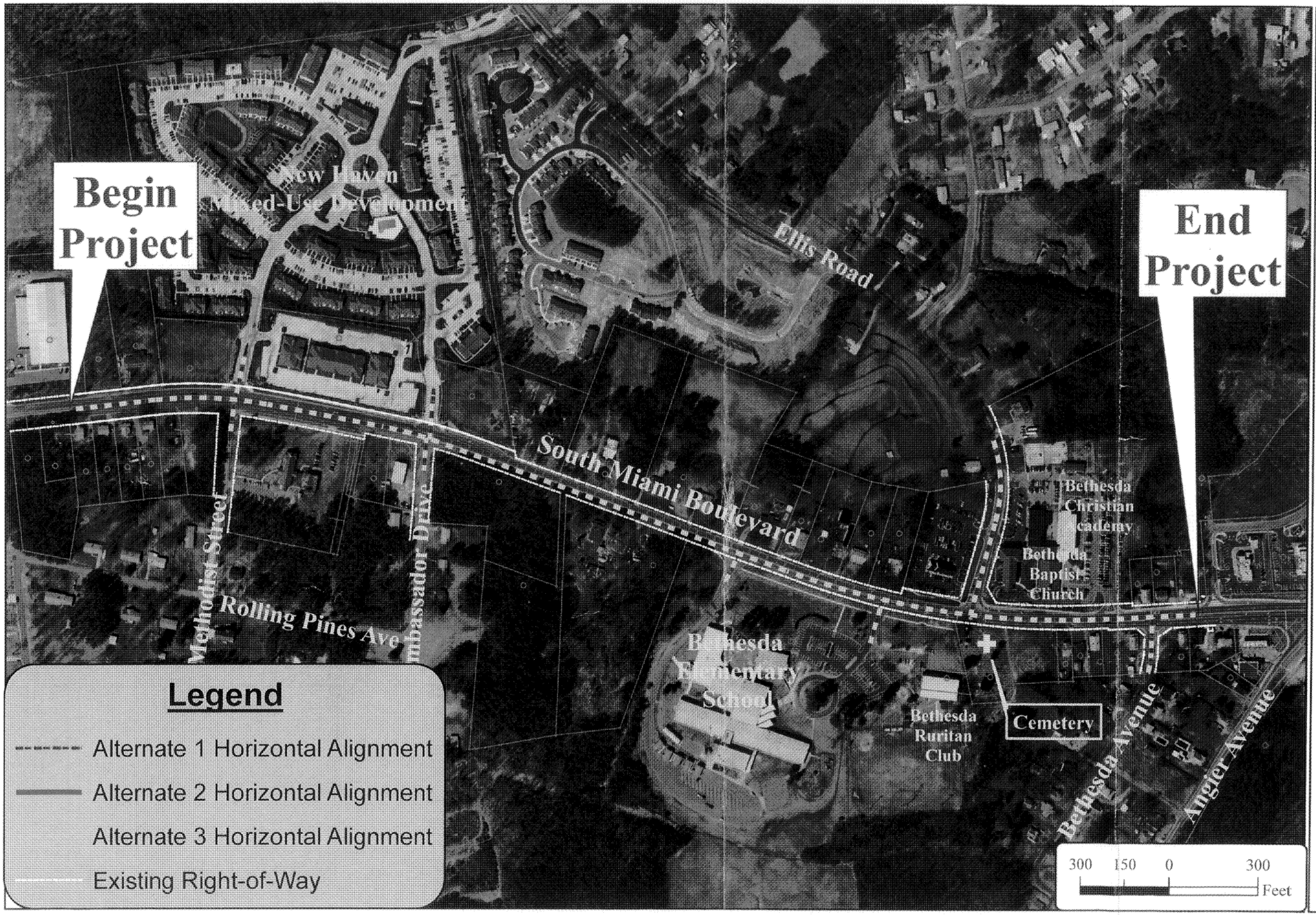


LEGEND

###	No. of Vehicles Per Day in 100s
###-	Much less than ### VPD
###	Turning volume VPD
PM DHV → D (d, t)	
DHV	Design Hourly Volume (%) = K30
PM	PM Peak Period
D	Peak Hour Directional Split (%)
→	Indicates Direction of D
(d, t)	Duals, TT-STs (%)

Figure 4





NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

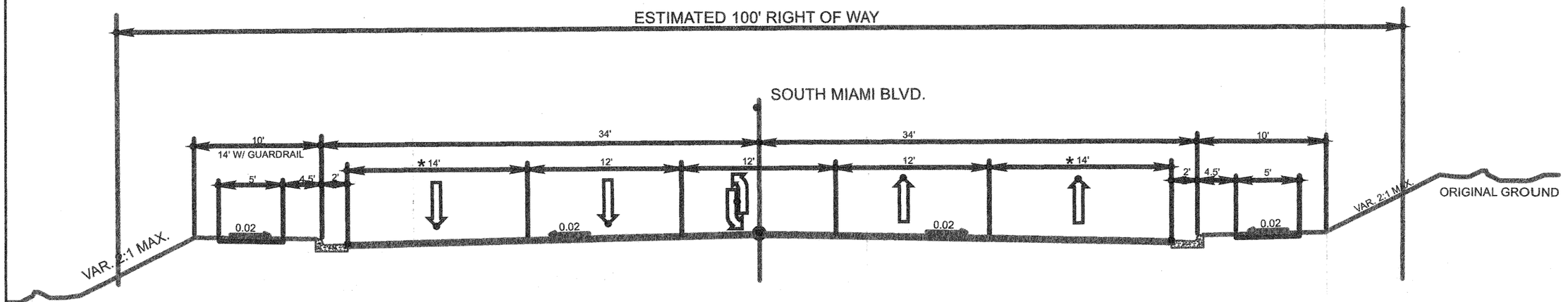
DESIGN ALTERNATES EVALUATED
SOUTH MIAMI BOULEVARD
WIDENING
DURHAM

DURHAM COUNTY
TIP PROJECT U-4011

N

County: DURHAM	
Div: 5	TIP# U-4011
WBS: 40221.1.1	
Date: MAY 2007	

Figure
5



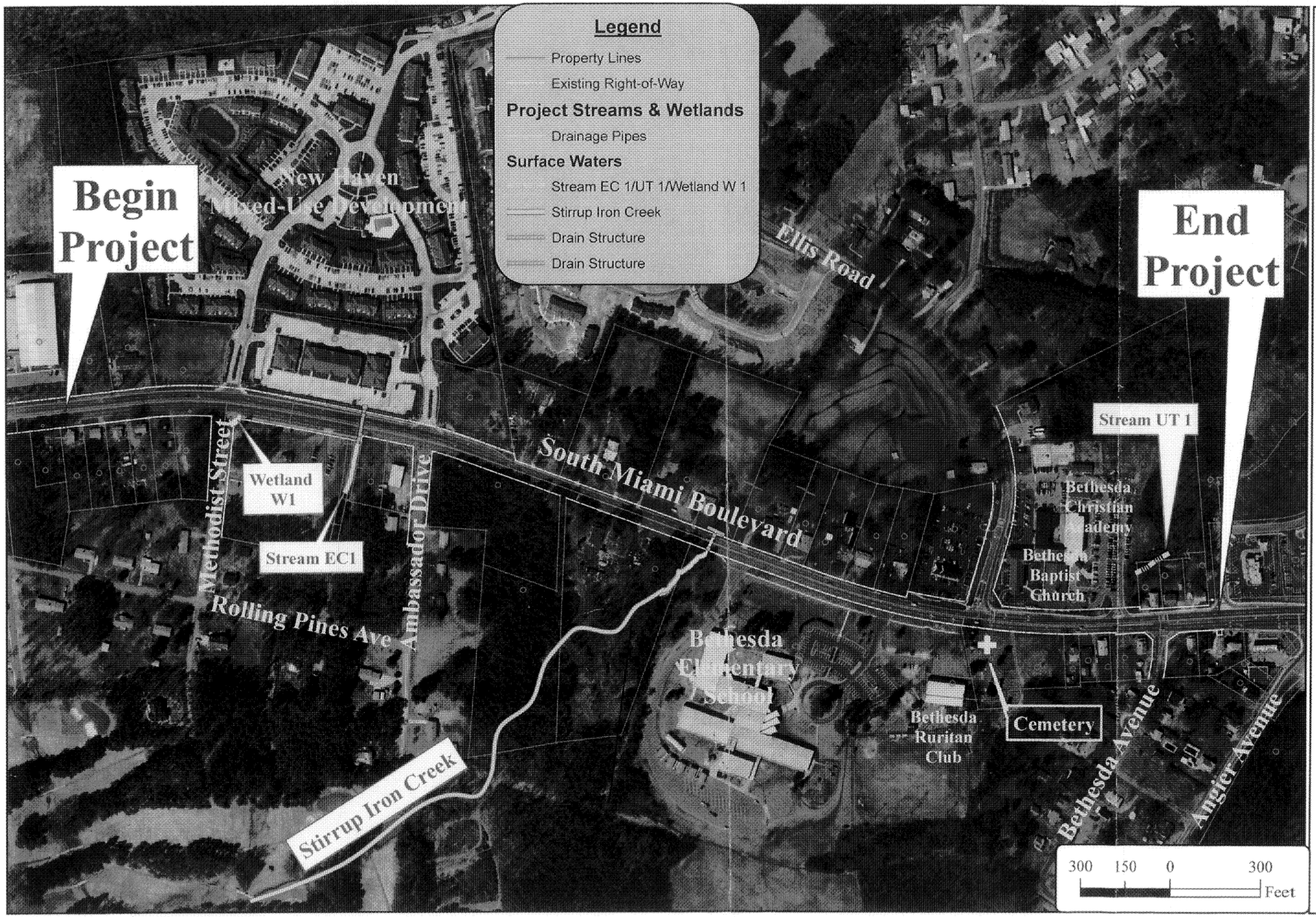
ESTIMATED TYPICAL SECTION
* NOTE: SHARED BICYCLE LANE

NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND
ENVIRONMENTAL ANALYSIS BRANCH

PROPOSED TYPICAL SECTION
SOUTH MIAMI BOULEVARD
WIDENING
DURHAM
DURHAM COUNTY
TIP PROJECT U-4011

County: DURHAM	
Div: 5	TIP# U-4011
WBS: 40221.1.1	
Date: MAY 2007	

Figure
6



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

PROJECT SURFACE WATERS
SOUTH MIAMI BOULEVARD
WIDENING
DURHAM
DURHAM COUNTY
TIP PROJECT U-4011

N

County: DURHAM	
Div: 5	TIP# U-4011
WBS: 40221.1.1	
Date: MAY 2007	

Figure
7

TERRESTRIAL COMMUNITY IMPACTS
SOUTH MIAMI BOULEVARD
WIDENING
DURHAM
DURHAM COUNTY
TIP PROJECT U-4011

NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND
ENVIRONMENTAL ANALYSIS BRANCH

N

County: DURHAM	
Div: 5	TIP# U-4011
WBS: 40221.1.1	
Date: MAY 2007	

Figure 8

Legend

- Property Lines
- Proposed Facility Limits
- Fill Section
- Transition
- Cut Section
- Drainage Structure
- Surface Waters
- Stream & Wetland Impacts
- Neuse River Buffer Impacts

Inset A - Stirrup Iron Creek Impacts

Inset B - Stream EC 1 and Wetland W 1 Impacts

Wetland W1

Stream EC1

South Miami Boulevard

Stirrup Iron Creek

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

JURISDICTIONAL STREAM AND WETLAND IMPACTS
SOUTH MIAMI BOULEVARD WIDENING
DURHAM
DURHAM COUNTY
TIP PROJECT U-4011

N

County: DURHAM

Div: 5 | TIP# U-4011

WBS: 40221.1.1

Date: MAY 2007

Figure 9

APPENDIX 1

Relocation Report

and

Relocation Assistance Program

EIS RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE PROGRAM

☒ E.I.S. ☐ CORRIDOR ☐ DESIGN

WBS ELEMENT:	36330.1.1	COUNTY	Durham	Alternate 1 of 3 Alternate
T.I.P. NO.:	U-4011			
DESCRIPTION OF PROJECT:	Miami Boulevard Widening Project – SR 1959 (Miami Boulevard) from South of SR 2112 (Methodist Street) to North of SR 1960 (Bethesda Avenue)			

ESTIMATED DISPLACEES

Type of Displacees	Owners	Tenants	Total	Minorities
Residential	2	0	2	0
Businesses	0	--	--	--
Farms	0	--	--	--
Non-Profit	0	--	--	--

INCOME LEVEL

0-15M	15-25M	25-35M	35-50M	50 UP
0	0	0	2	0

VALUE OF DWELLING / DSS DWELLING AVAILABLE

Owners		Tenants		For Sale		For Rent	
0-20M	2	$ 0-150	0	0-20M	0	$ 0-150	0
20-40M	0	150-250	0	20-40M	3	150-250	0
40-70M	0	250-400	0	40-70M	5	250-400	0
70-100M	0	400-600	0	70-100M	14	400-600	0
100 UP	0	600 UP	0	100 UP	477	600 UP	3
TOTAL	2		0		499		3

ANSWER ALL QUESTIONS

Yes	No	Explain all "YES" answers.
	X	1. Will special relocation services be necessary?
	X	2. Will schools or churches be affected by displacement?
X		3. Will business services still be available after project?
	X	4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage?
		6. Source for available housing (list).
	X	7. Will additional housing programs be needed?
	X	8. Should Last Resort Housing be considered?
	X	9. Are there large, disabled, elderly, etc. families?
	X	10. Will public housing be needed for project?
X		11. Is public housing available?
X		12. Is it felt there will be adequate DSS housing housing available during relocation period?
	X	13. Will there be a problem of housing within financial means?
X		14. Are suitable business sites available (list source).
		15. Number months estimated to complete RELOCATION? 1 Year

REMARKS (Respond by Number)

3. Business services will continue as in the before situation.

6. MLS, Realtor.com

11. Durham County Housing Authority

12. Adequate housing is available.

14. N/A

Note: Part of a cemetery (6-10 graves) may be involved.

Robert H. Mathes, Jr. / tsg
Senior Right of Way Agent

March 30, 2007
Date

Ann Simpson
Relocation Coordinator

4-3-07
Date

FRM15-E

EIS RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE PROGRAM

☒ E.I.S. ☐ CORRIDOR ☐ DESIGN

WBS ELEMENT:	36330.1.1	COUNTY	Durham	Alternate 2 of 3 Alternate
T.I.P. NO.:	U-4011			
DESCRIPTION OF PROJECT:	Miami Boulevard Widening Project – SR 1959 (Miami Boulevard) from South of SR 2112 (Methodist Street) to North of SR 1960 (Bethesda Avenue)			

ESTIMATED DISPLACEES

Type of Displacees	Owners	Tenants	Total	Minorities
Residential	2	0	2	0
Businesses	0	--	--	--
Farms	0	--	--	--
Non-Profit	0	--	--	--

ANSWER ALL QUESTIONS

Yes	No	Explain all "YES" answers.	
	X	1.	Will special relocation services be necessary?
	X	2.	Will schools or churches be affected by displacement?
X		3.	Will business services still be available after project?
	X	4.	Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	X	5.	Will relocation cause a housing shortage?
		6.	Source for available housing (list).
	X	7.	Will additional housing programs be needed?
	X	8.	Should Last Resort Housing be considered?
	X	9.	Are there large, disabled, elderly, etc. families?
	X	10.	Will public housing be needed for project?
X		11.	Is public housing available?
X		12.	Is it felt there will be adequate DSS housing housing available during relocation period?
	X	13.	Will there be a problem of housing within financial means?
X		14.	Are suitable business sites available (list source).
		15.	Number months estimated to complete RELOCATION? 1 Year

INCOME LEVEL

0-15M	15-25M	25-35M	35-50M	50 UP
0	0	0	2	0

VALUE OF DWELLING				DSS DWELLING AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	2	$ 0-150	0	0-20M	0	$ 0-150	0
20-40M	0	150-250	0	20-40M	3	150-250	0
40-70M	0	250-400	0	40-70M	5	250-400	0
70-100M	0	400-600	0	70-100M	14	400-600	0
100 UP	0	600 UP	0	100 UP	477	600 UP	3
TOTAL	2		0		499		3

REMARKS (Respond by Number)

3. Business services will continue as in the before situation.

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12. Adequate housing is available.

14. N/A

NOTE: Part of a cemetery (6-10 graves) may be involved.

Robert H. Mathes, Jr. / tsg
Senior Right of Way Agent

March 30, 2007
Date

Ann Simpson
Relocation Coordinator

4-3-07
Date

FRM15-E

EIS RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE PROGRAM

☒ E.I.S. ☐ CORRIDOR ☐ DESIGN

WBS ELEMENT:	36330.1.1	COUNTY	Durham	Alternate 3 of 3 Alternate
T.I.P. No.:	U-4011			
DESCRIPTION OF PROJECT:	Miami Boulevard Widening Project – SR 1959 (Miami Boulevard) from South of SR 2112 (Methodist Street) to North of SR 1960 (Bethesda Avenue)			

ESTIMATED DISPLACEES

Type of Displacees	Owners	Tenants	Total	Minorities
Residential	2	0	2	0
Businesses	0	--	--	--
Farms	0	--	--	--
Non-Profit	0	--	--	--

INCOME LEVEL

0-15M	15-25M	25-35M	35-50M	50 UP
0	0	0	2	0

VALUE OF DWELLING				DSS DWELLING AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	2	$ 0-150	0	0-20M	0	$ 0-150	0
20-40M	0	150-250	0	20-40M	3	150-250	0
40-70M	0	250-400	0	40-70M	5	250-400	0
70-100M	0	400-600	0	70-100M	14	400-600	0
100 UP	0	600 UP	0	100 UP	477	600 UP	3
TOTAL	2		0		499		3

ANSWER ALL QUESTIONS

Yes	No	Explain all "YES" answers.
	X	1. Will special relocation services be necessary?
	X	2. Will schools or churches be affected by displacement?
X		3. Will business services still be available after project?
	X	4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage?
		6. Source for available housing (list).
	X	7. Will additional housing programs be needed?
	X	8. Should Last Resort Housing be considered?
	X	9. Are there large, disabled, elderly, etc. families?
	X	10. Will public housing be needed for project?
X		11. Is public housing available?
X		12. Is it felt there will be adequate DSS housing housing available during relocation period?
	X	13. Will there be a problem of housing within financial means?
X		14. Are suitable business sites available (list source).
		15. Number months estimated to complete RELOCATION? 1 Year

REMARKS (Respond by Number)

3. Business services will continue as in the before situation.

6. MLS, Realtor.com

11. Durham County Housing Authority

12. Adequate housing is available.

14. N/A

NOTE: Part of a cemetery (6-10 graves) may be involved.

Robert H. Mathes

Robert H. Mathes, Jr. / tsg
Senior Right of Way Agent

March 30, 2007
Date

Ann Simpson

Relocation Coordinator

4-3-07
Date

FRM15-E

Relocation Assistance Program

The Division of Highways offers a Relocation Assistance Program to help minimize the effects of displacement on families. The occupants of the affected residences may qualify for aid under one or more of the NCDOT relocation programs. It is the policy of the NCDOT to ensure that comparable replacement housing will be available prior to construction of state and federally assisted projects. Furthermore, the North Carolina Board of Transportation has the following three programs to minimize the inconvenience of relocation:

*Relocation Assistance,
*Relocation Moving Payments, and
*Relocation Replacement Housing Payments or Rent Supplement.

With the Relocation Assistance Program, experienced NCDOT staff will be available to assist displacees with information such as availability and prices of homes, apartments, or businesses for sale or rent and financing or other housing programs. The Relocation Moving Payments Program, in general, provides for payment of actual moving expenses encountered in relocation. Where displacement will force an owner or tenant to purchase or rent property of higher cost or to lose a favorable financing arrangement (in cases of ownership), the Relocation Replacement Housing Payments or Rent Supplement Program will compensate up to $22,500 to owners who are eligible and qualify and up to $5,250 to tenants who are eligible and qualify.

The relocation program for the proposed action will be conducted in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), and/or the North Carolina Relocation Assistance Act (GS-133-5 through 133-18). The program is designed to provide assistance to displaced persons in relocating to a replacement site in which to live or do business. At least one relocation officer is assigned to each highway project for this purpose.

The relocation officer will determine the needs of displaced families, individuals, businesses, non-profit organizations, and farm operations for relocation assistance advisory services without regard to race, color, religion, sex, or national origin. The NCDOT will schedule its work to allow ample time, prior to displacement, for negotiations and possession of replacement housing which meets decent, safe, and sanitary standards. The displacees are given at least a 90-day written notice after NCDOT purchases the property. Relocation of displaced persons will be offered in areas not generally less desirable in regard to public utilities and commercial facilities. Rent and sale prices of replacement property will be within the financial means of the families and individuals displaced and will be reasonably accessible to their places of employment. The relocation officer will also assist owners of displaced businesses, non-profit organizations, and farm operations in searching for and moving to replacement property.

All tenant and owner residential occupants who may be displaced will receive an explanation regarding all available options, such as (1) purchase of replacement housing, (2) rental of replacement housing, either private or public, or (3) moving existing owner-occupant housing to another site (if possible). The relocation officer will also supply information concerning other state or federal programs offering assistance to displaced persons and will provide other advisory services as needed in order to minimize hardships to displaced persons in adjusting to a new location.

The Moving Expense Payments Program is designed to compensate the displacee for the costs of moving personal property from homes, businesses, non-profit organizations, and farm operations acquired for a highway project. Under the Replacement Program for Owners, NCDOT will participate in reasonable incidental purchase payments for replacement dwellings such as attorney's fees, surveys, appraisals, and other closing costs and, if applicable, make a payment for any increased interest expenses for replacement dwellings. Reimbursement to owner-occupants for replacement housing payments, increased interest payments, and incidental purchase expenses may not exceed $22,500 (combined total), except under the Last Resort Housing provision.

A displaced tenant may be eligible to receive a payment, not to exceed $5,250, to rent a replacement dwelling or to make a down payment, including incidental expenses, on the purchase of a replacement dwelling. The down payment is based upon what the state determines is required when the rent supplement exceeds $5,250.

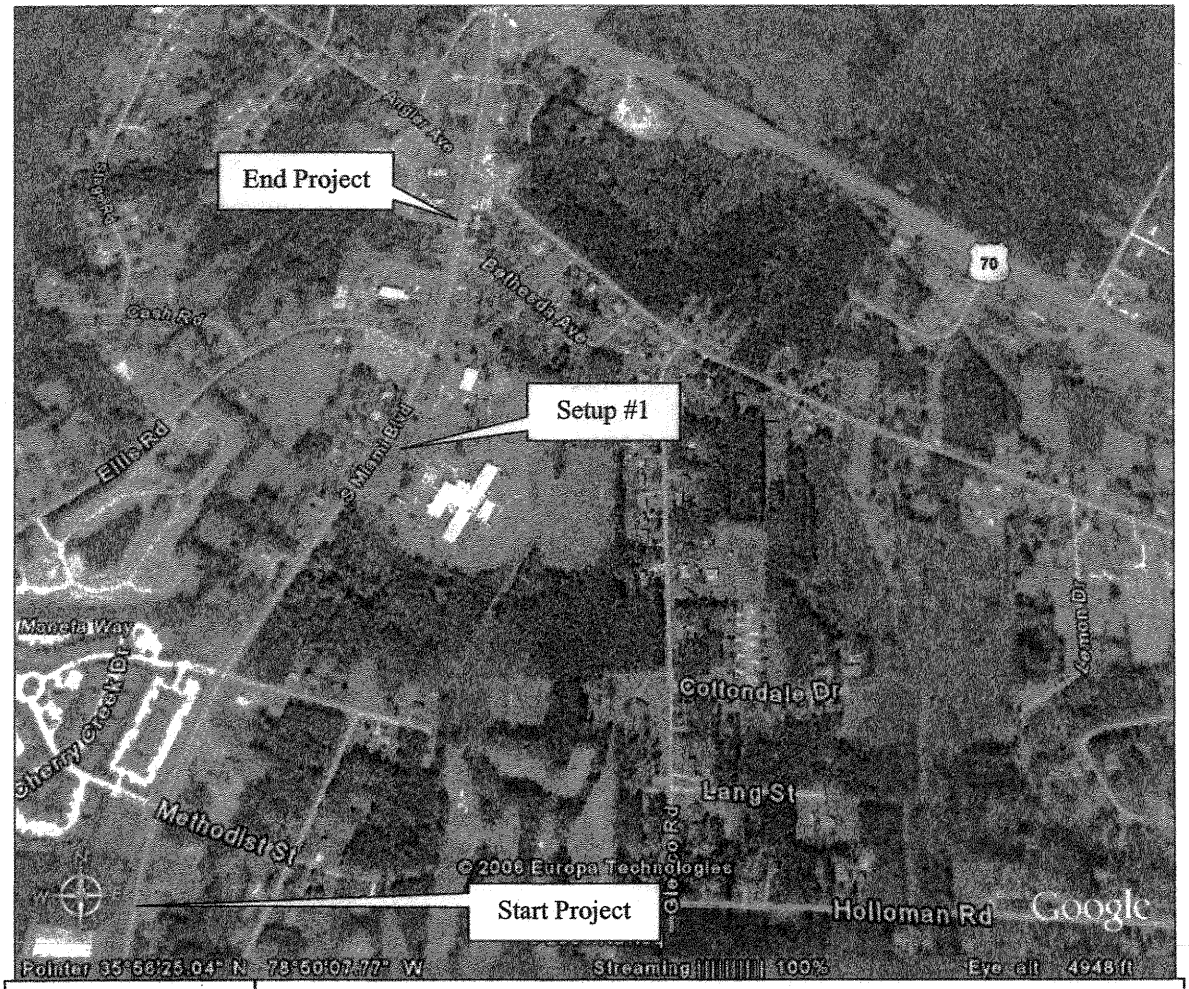
It is a policy of the state that no person will be displaced by the NCDOT's state or federally-assisted construction projects unless and until comparable replacement housing has been offered or provided for each displacee within a reasonable period of time prior to displacement. No relocation payment received will be considered as income for the purposes of the Internal Revenue Code of 1954 or for the purposes of determining eligibility or the extent of eligibility of any person for assistance under the Social Security Act or any other federal law.

Last Resort Housing is a program used when comparable replacement housing is not available, or when it is unavailable within the displacee's financial means, and the replacement payment exceeds the federal/state legal limitation. The purpose of the program is to allow broad latitudes in methods of implementation by the state so that decent, safe, and sanitary replacement housing can be provided.

APPENDIX 2

Noise Analysis

Figure N1
Project Location & Ambient Measurement Sites
SR 1959 (South Miami Boulevard)
Durham County, TIP #U-4011



North Carolina Department of Transportation
Division of Highways
Project Development & Environmental Analysis Branch
Traffic Noise & Air Quality Unit

Durham County
SR 1959 (South Miami Boulevard)
TIP #U-4011

TABLE N1

HEARING: SOUNDS BOMBARDING US DAILY

DECIBELS		
	140	Shotgun blast, jet 30m away at takeoff — PAIN
		Motor test chamber — HUMAN EAR PAIN THRESHOLD
	130	---
		Firecrackers
	120	Severe thunder, pneumatic jackhammer
		Hockey crowd
		Amplified rock music — UNCOMFORTABLY LOUD
	110	---
		Textile loom
	100	Subway train, elevated train, farm tractor
		Power lawn mower, newspaper press
		Heavy city traffic, noisy factory — LOUD
	90	---
		Diesel truck 65 kmph at 15m away
	80	Crowded restaurant, garbage disposal
		Average factory, vacuum cleaner
		Passenger car 80 kmph at 15m away — MODERATELY LOUD
	70	---
		Quiet typewriter
	60	Singing birds, window air-conditioner
		Quiet automobile
		Normal conversation, average office — QUIET
	50	---
		Household refrigerator
		Quiet office — VERY QUIET
	40	---
		Average home
	30	Dripping faucet
		Whisper at 1.5m away
	20	Light rainfall, rustle of leaves
		AVERAGE PERSON'S THRESHOLD OF HEARING
		Whisper — JUST AUDIBLE
	10	---
	0	THRESHOLD FOR ACUTE HEARING

Sources: World Book, Rand McNally Atlas of the Human Body, Encyclopedia America, "Industrial Noise and Hearing Conversation" by J. B. Olishifski and E. R. Harford (Researched by N. Jane Hunt and published in the Chicago Tribune in an illustrated graphic by Tom Heinz.)

TABLE 2

NOISE ABATEMENT CRITERIA

CRITERIA FOR EACH FHWA ACTIVITY CATEGORY HOURLY A-WEIGHTED SOUND LEVEL - DECIBELS (dBA)		
Activity Category	Leq(h)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities are essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: Title 23 Code of Federal Regulations (CFR) Part 772, U. S. Department of Transportation, Federal Highway Administration.

CRITERIA FOR SUBSTANTIAL INCREASE HOURLY A-WEIGHTED SOUND LEVEL - DECIBELS (dBA)	
Existing Noise Level in Leq(h)	Increase in dBA from Existing Noise Levels to Future Noise Levels
<= 50	>= 15
51	>= 14
52	>= 13
53	>= 12
54	>= 11
>= 55	>= 10

Source: North Carolina Department of Transportation Noise Abatement Policy (09/02/04).

TABLE N3
AMBIENT NOISE LEVELS (Leq)
SR 1959 (South Miami Boulevard) Widening
Durham County, TIP # U-4011

SITE	LOCATION	DESCRIPTION	NOISE LEVEL (dBA)
1	SR 1959 (South Miami Blvd.) @ Bethesda Elementary School	Grassy	67.1

NOTE: The ambient noise level sites were measured at 50 feet from edge of pavement of the nearest lane of traffic.

TABLE N4
TRAFFIC NOISE EXPOSURES
SR 1959 (South Miami Blvd.) Widening
Durham County, TIP # U-4011
Symmetrical Widening

RECEPTOR INFORMATION			NEAREST EXISTING	AMBIENT NOISE	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL
ID#	LAND USE	CATEGORY	ROADWAY	LEVEL	NAME	CL DIST(ft)	-L-	-Y-	MAXIMUM	INCREASE
	SR 1959 (South Miami Blvd.) From Start of Project to SR 1954 (Ellis Road)									
10	Business	C	SR 1959	61	-L-	145.0 L	-	-	65	+ 4
11	Residence	B	"	63	"	115.0 L	-	-	* 67	+ 4
12	Business	C	"	64	"	100.0 L	-	-	69	+ 5
13	Residence	B	"	64	"	100.0 L	-	-	* 69	+ 5
14	Business	C	"	66	"	85.0 L	-	-	70	+ 4
15	Business	C	"	63	"	115.0 L	-	-	67	+ 4
16	School	E	"	54/<40	"	300.0 R	-	-	58/<40	+ 4/0
17	Business	C	"	63	"	125.0 L	-	-	67	+ 4
18	Business	C	"	64	"	100.0 L	-	-	69	+ 5
19	Residence	B	"	60	"	155.0 L	-	-	64	+ 4
20	Residence	B	"	65	"	90.0 R	-	-	* 69	+ 4
21	Residence	B	"	64	"	110.0 L	-	-	* 68	+ 4
22	Business	C	"	55	"	255.0 L	-	-	59	+ 4
23	Business	C	"	61	"	140.0 L	-	-	66	+ 5
24	Business	C	"	63	"	115.0 R	-	-	67	+ 4
25	Church	E	"	59/<40	"	170.0 R	-	-	63/<40	+ 4/4
26	Residence	B	"	66	"	80.0 R	-	-	* 71	+ 5
27	Residence	B	"	66	"	80.0 R	-	-	* 71	+ 5
28	Residence	B	"	66	"	80.0 R	-	-	* 71	+ 5
29	Residence	B	"	66	"	80.0 R	-	-	* 71	+ 5
30	Residence	B	"	66	"	80.0 R	-	-	* 71	+ 5
	SR 1959 (South Miami Blvd.) From SR 1954 (Ellis Road) to End of Project North of SR 1960 (Bethesda Ave.)									
1	Residence	B	SR 1959	67	-L-	70.0 L	-	-	* 72	+ 5
2	Residence	B	"	68	"	60.0 L	-	-	* 73	+ 5
3	Residence	B	"	68	"	55.0 L	-	-	* 73	+ 5
4	Residence	B	"	68	"	60.0 R	-	-	* 73	+ 5
5	Residence	B	"	68	"	60.0 R	-	-	* 73	+ 5
6	Residence	B	"	69	"	50.0 R	-	-	* 74	+ 5
7	Residence	B	"	67	"	70.0 R	-	-	* 72	+ 5
8	Residence	B	"	67	"	70.0 R	-	-	* 72	+ 5
9	School	E	"	63/<40	"	120.0 L	-	-	68/43	+ 5/4

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and Category E noise levels shown as exterior/interior (68/48).

TABLE N4
TRAFFIC NOISE EXPOSURES
SR 1959 (South Miami Blvd.) Widening
Durham County, TIP # U-4011
East Side Widening

RECEPTOR INFORMATION			NEAREST EXISTING	AMBIENT NOISE	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL
ID#	LAND USE	CATEGORY	ROADWAY	LEVEL	NAME	CL DIST(ft)	-L-	-Y-	MAXIMUM	INCREASE
	SR 1959 (South Miami Blvd.) From Start of Project to SR 1954 (Ellis Road)									
10	Business	C	SR 1959	61	-L-	151.0 L	-	-	65	+ 4
11	Residence	B	"	63	"	121.0 L	-	-	* 67	+ 4
12	Business	C	"	64	"	106.0 L	-	-	68	+ 4
13	Residence	B	"	64	"	106.0 L	-	-	* 68	+ 4
14	Business	C	"	66	"	91.0 L	-	-	69	+ 3
15	Business	C	"	63	"	121.0 L	-	-	67	+ 4
16	School	E	"	54/<40	"	294.0 R	-	-	58/<40	+ 4/0
17	Business	C	"	63	"	131.0 L	-	-	66	+ 3
18	Business	C	"	64	"	106.0 L	-	-	68	+ 4
19	Residence	B	"	60	"	161.0 L	-	-	64	+ 4
20	Residence	B	"	65	"	84.0 R	-	-	* 70	+ 5
21	Residence	B	"	64	"	116.0 L	-	-	* 67	+ 3
22	Business	C	"	55	"	261.0 L	-	-	59	+ 4
23	Business	C	"	61	"	146.0 L	-	-	65	+ 4
24	Business	C	"	63	"	109.0 R	-	-	68	+ 5
25	Church	E	"	59/<40	"	164.0 R	-	-	64/<40	+ 5/0
26	Residence	B	"	66	"	74.0 R	-	-	* 71	+ 5
27	Residence	B	"	66	"	74.0 R	-	-	* 71	+ 5
28	Residence	B	"	66	"	74.0 R	-	-	* 71	+ 5
29	Residence	B	"	66	"	74.0 R	-	-	* 71	+ 5
30	Residence	B	"	66	"	74.0 R	-	-	* 71	+ 5
	SR 1959 (South Miami Blvd.) From SR 1954 (Ellis Road) to End of Project North of SR 1960 (Bethesda Ave.)									
1	Residence	B	SR 1959	67	-L-	76.0 L	-	-	* 71	+ 4
2	Residence	B	"	68	"	66.0 L	-	-	* 72	+ 4
3	Residence	B	"	68	"	61.0 L	-	-	* 73	+ 5
4	Residence	B	"	68	"	54.0 R	-	-	* 73	+ 5
5	Residence	B	"	68	"	54.0 R	-	-	* 73	+ 5
6	Residence	B	"	69	"	44.0 R	-	-	* 75	+ 6
7	Residence	B	"	67	"	64.0 R	-	-	* 72	+ 5
8	Residence	B	"	67	"	64.0 R	-	-	* 72	+ 5
9	School	E	"	63/<40	"	126.0 L	-	-	67/42	+ 4/2

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and Category E noise levels shown as exterior/interior (68/48).

TABLE N4
TRAFFIC NOISE EXPOSURES
SR 1959 (South Miami Blvd.) Widening
Durham County, TIP # U-4011
West Side Widening

RECEPTOR INFORMATION			NEAREST EXISTING	AMBIENT NOISE	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL
ID#	LAND USE	CATEGORY	ROADWAY	LEVEL	NAME	CL DIST(ft)	-L-	-Y-	MAXIMUM	INCREASE
	SR 1959 (South Miami Blvd.) From Start of Project to SR 1954 (Ellis Road)									
10	Business	C	SR 1959	61	-L-	139.0 L	-	-	66	+ 5
11	Residence	B	"	63	"	109.0 L	-	-	* 68	+ 5
12	Business	C	"	64	"	94.0 L	-	-	69	+ 5
13	Residence	B	"	64	"	94.0 L	-	-	* 69	+ 5
14	Business	C	"	66	"	79.0 L	-	-	* 71	+ 5
15	Business	C	"	63	"	109.0 L	-	-	68	+ 5
16	School	E	"	54/<40	"	306.0 R	-	-	58/<40	+ 4/0
17	Business	C	"	63	"	119.0 L	-	-	67	+ 4
18	Business	C	"	64	"	94.0 L	-	-	69	+ 5
19	Residence	B	"	60	"	149.0 L	-	-	65	+ 5
20	Residence	B	"	65	"	96.0 R	-	-	* 69	+ 4
21	Residence	B	"	64	"	104.0 L	-	-	* 68	+ 4
22	Business	C	"	55	"	249.0 L	-	-	60	+ 5
23	Business	C	"	61	"	134.0 L	-	-	66	+ 5
24	Business	C	"	63	"	121.0 R	-	-	67	+ 4
25	Church	E	"	59/<40	"	176.0 R	-	-	63/<40	+ 4/0
26	Residence	B	"	66	"	86.0 R	-	-	* 70	+ 4
27	Residence	B	"	66	"	86.0 R	-	-	* 70	+ 4
28	Residence	B	"	66	"	86.0 R	-	-	* 70	+ 4
29	Residence	B	"	66	"	86.0 R	-	-	* 70	+ 4
30	Residence	B	"	66	"	86.0 R	-	-	* 70	+ 4
	SR 1959 (South Miami Blvd.) From SR 1954 (Ellis Road) to End of Project North of SR 1960 (Bethesda Ave.)									
1	Residence	B	SR 1959	67	-L-	64.0 L	-	-	* 72	+ 5
2	Residence	B	"	68	"	54.0 L	-	-	* 73	+ 5
3	Residence	B	"	68	"	49.0 L	-	-	* 74	+ 6
4	Residence	B	"	68	"	66.0 R	-	-	* 72	+ 4
5	Residence	B	"	68	"	66.0 R	-	-	* 72	+ 4
6	Residence	B	"	69	"	56.0 R	-	-	* 73	+ 4
7	Residence	B	"	67	"	76.0 R	-	-	* 71	+ 4
8	Residence	B	"	67	"	76.0 R	-	-	* 71	+ 4
9	School	E	"	63/<40	"	114.0 L	-	-	68/43	+ 5/3

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and Category E noise levels shown as exterior/interior (68/48).

TABLE N4
TRAFFIC NOISE EXPOSURES
SR 1959 (South Miami Blvd.), Durham County, TIP # U-4011
No Build

RECEPTOR INFORMATION			NEAREST EXISTING	AMBIENT NOISE	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL
ID#	LAND USE	CATEGORY	ROADWAY	LEVEL	NAME	CL DIST(ft)	-L-	-Y-	MAXIMUM	INCREASE
	SR 1959 (South Miami Blvd.) From Start of Project to SR 1954 (Ellis Road)									
10	Business	C	SR 1959	61	-L-	145.0 L	-	-	65	+ 4
11	Residence	B	"	63	"	115.0 L	-	-	* 67	+ 4
12	Business	C	"	64	"	100.0 L	-	-	68	+ 4
13	Residence	B	"	64	"	100.0 L	-	-	* 68	+ 4
14	Business	C	"	66	"	85.0 L	-	-	70	+ 4
15	Business	C	"	63	"	115.0 L	-	-	67	+ 4
16	School	E	"	54/<40	"	300.0 R	-	-	58/<40	+ 4/0
17	Business	C	"	63	"	125.0 L	-	-	67	+ 4
18	Business	C	"	64	"	100.0 L	-	-	68	+ 4
19	Residence	B	"	60	"	155.0 L	-	-	64	+ 4
20	Residence	B	"	65	"	90.0 R	-	-	* 69	+ 4
21	Residence	B	"	64	"	110.0 L	-	-	* 68	+ 4
22	Business	C	"	55	"	255.0 L	-	-	59	+ 4
23	Business	C	"	61	"	140.0 L	-	-	65	+ 4
24	Business	C	"	63	"	115.0 R	-	-	67	+ 4
25	Church	E	"	59/<40	"	170.0 R	-	-	63/<40	+ 4/0
26	Residence	B	"	66	"	80.0 R	-	-	* 70	+ 4
27	Residence	B	"	66	"	80.0 R	-	-	* 70	+ 4
28	Residence	B	"	66	"	80.0 R	-	-	* 70	+ 4
29	Residence	B	"	66	"	80.0 R	-	-	* 70	+ 4
30	Residence	B	"	66	"	80.0 R	-	-	* 70	+ 4
	SR 1959 (South Miami Blvd.) From SR 1954 (Ellis Road) to End of Project North of SR 1960 (Bethesda Ave.)									
1	Residence	B	SR 1959	67	-L-	70.0 L	-	-	* 71	+ 4
2	Residence	B	"	68	"	60.0 L	-	-	* 72	+ 4
3	Residence	B	"	68	"	55.0 L	-	-	* 73	+ 5
4	Residence	B	"	68	"	60.0 R	-	-	* 72	+ 4
5	Residence	B	"	68	"	60.0 R	-	-	* 72	+ 4
6	Residence	B	"	69	"	50.0 R	-	-	* 73	+ 4
7	Residence	B	"	67	"	70.0 R	-	-	* 71	+ 4
8	Residence	B	"	67	"	70.0 R	-	-	* 71	+ 4
9	School	E	"	63/<40	"	120.0 L	-	-	67/42	+ 4/2

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and Category E noise levels shown as exterior/interior (68/48).

TABLE N5
FHWA NOISE ABATEMENT CRITERIA SUMMARY
SR 1959 (South Miami Boulevard), Durham County, TIP # U-4011

DESCRIPTION	Leq NOISE LEVELS (dBA)			MAXIMUM CONTOUR DISTANCES		APPROXIMATE # OF IMPACTED RECEPTORS ACCORDING TO TITLE 23 CFR PART 772				
SYMMETRICAL WIDENING	50ft	100ft	200ft	72 dBA	67 dBA	A	B	C	D	E
1- SR 1959 (South Miami Blvd.) From Start of Project to SR 1954 (Ellis Road)	71.3	67.3	61.7	66.9	130.0	0	9	0	0	0
2 - SR 1959 (South Miami Blvd.) From SR 1954 (Ellis Road) to End of Project	71.7	67.6	62.1	75.2	137.8	0	8	0	0	0
				TOTALS --->		0	17	0	0	0

DESCRIPTION	Leq NOISE LEVELS (dBA)			MAXIMUM CONTOUR DISTANCES		APPROXIMATE # OF IMPACTED RECEPTORS ACCORDING TO TITLE 23 CFR PART 772				
EAST SIDE WIDENING	50ft	100ft	200ft	72 dBA	67 dBA	A	B	C	D	E
1- SR 1129 (Groomtown Rd.) From Start of Project at SR 1383 (Wiley Davis Rd.) to SR 1382 (Rose	71.3	67.3	61.7	66.9	130.0	0	9	0	0	0
2 - SR 1129 (Groomtown Rd.) From SR 1382 (Rose Lake Rd.) to End of Project at SR 1479	71.7	67.6	62.1	75.2	137.8	0	8	0	0	0
				TOTALS --->		0	17	0	0	0

1. 50ft, 100ft, and 200ft distances are measured from the center of nearest travel lane.
2. 72 dBA and 67 dBA contour distances are measured from the center of proposed roadway.

TABLE N5
FHWA NOISE ABATEMENT CRITERIA SUMMARY
SR 1959 (South Miami Boulevard), Durham County, TIP # U-4011

DESCRIPTION	Leq NOISE LEVELS (dBA)			MAXIMUM CONTOUR DISTANCES		APPROXIMATE # OF IMPACTED RECEPTORS ACCORDING TO TITLE 23 CFR PART 772				
WEST SIDE WIDENING	50ft	100ft	200ft	72 dBA	67 dBA	A	B	C	D	E
1- SR 1959 (South Miami Blvd.) From Start of Project to SR 1954 (Ellis Road)	71.3	67.3	61.7	66.9	130.0	0	9	1	0	0
2 - SR 1959 (South Miami Blvd.) From SR 1954 (Ellis Road) to End of Project	71.7	67.6	62.1	75.2	137.8	0	8	0	0	0
				TOTALS --->		0	17	1	0	0

DESCRIPTION	Leq NOISE LEVELS (dBA)			MAXIMUM CONTOUR DISTANCES		APPROXIMATE # OF IMPACTED RECEPTORS ACCORDING TO TITLE 23 CFR PART 772				
NO BUILD	50ft	100ft	200ft	72 dBA	67 dBA	A	B	C	D	E
1- SR 1129 (Groomtown Rd.) From Start of Project at SR 1383 (Wiley Davis Rd.) to SR 1382 (Rose	71.2	67.3	61.0	62.8	127.3	0	9	0	0	0
2 - SR 1129 (Groomtown Rd.) From SR 1382 (Rose Lake Rd.) to End of Project at SR 1479	71.6	67.7	61.5	67.7	132.1	0	8	0	0	0
				TOTALS --->		0	17	0	0	0

1. 50ft, 100ft, and 200ft distances are measured from the center of nearest travel lane.
2. 72 dBA and 67 dBA contour distances are measured from the center of proposed roadway.

TABLE N6
TRAFFIC NOISE LEVEL INCREASE SUMMARY
SR 1959 (South Miami Boulevard), Durham County, TIP # U-4011

DESCRIPTION **SYMMETRICAL WIDENING**	RECEPTOR EXTERIOR NOISE LEVEL INCREASES							SUBSTANTIAL NOISE LEVEL INCREASE "1"	IMPACTS DUE TO BOTH CRITERIA "2"
	<=0	1-4	5-9	10-14	15-19	20-24	>=25		
1- SR 1159 (South Miami Blvd.) From Start of Project to SR 1954 (Ellis Road)	1	11	9	0	0	0	0	0	0
2 - SR 1159 (South Miami Blvd.) From SR 1954 (Ellis Road) to End of Project	0	1	8	0	0	0	0	0	0
TOTALS --->	1	12	17	0	0	0	0	0	0

DESCRIPTION **EAST SIDE WIDENING**	RECEPTOR EXTERIOR NOISE LEVEL INCREASES							SUBSTANTIAL NOISE LEVEL INCREASE "1"	IMPACTS DUE TO BOTH CRITERIA "2"
	<=0	1-4	5-9	10-14	15-19	20-24	>=25		
1- SR 1159 (South Miami Blvd.) From Start of Project to SR 1954 (Ellis Road)	2	12	7	0	0	0	0	0	0
2 - SR 1159 (South Miami Blvd.) From SR 1954 (Ellis Road) to End of Project	0	3	6	0	0	0	0	0	0
TOTALS --->	2	15	13	0	0	0	0	0	0

"1" As defined by only a substantial increase (See bottom of TABLE N2).
"2" As defined by both criteria in TABLE N2.

TABLE N6
TRAFFIC NOISE LEVEL INCREASE SUMMARY
SR 1959 (South Miami Boulevard), Durham County, TIP # U-4011

DESCRIPTION **WEST SIDE**	RECEPTOR EXTERIOR NOISE LEVEL INCREASES							SUBSTANTIAL NOISE LEVEL INCREASE "1"	IMPACTS DUE TO BOTH CRITERIA "2"
	<=0	1-4	5-9	10-14	15-19	20-24	>=25		
1- SR 1159 (South Miami Blvd.) From Start of Project to SR 1954 (Ellis Road)	2	9	10	0	0	0	0	0	0
2 - SR 1159 (South Miami Blvd.) From SR 1954 (Ellis Road) to End of Project	0	6	3	0	0	0	0	0	0
TOTALS --->	2	15	13	0	0	0	0	0	0

DESCRIPTION **NO BUILD**	RECEPTOR EXTERIOR NOISE LEVEL INCREASES							SUBSTANTIAL NOISE LEVEL INCREASE "1"	IMPACTS DUE TO BOTH CRITERIA "2"
	<=0	1-4	5-9	10-14	15-19	20-24	>=25		
1- SR 1159 (South Miami Blvd.) From Start of Project to SR 1954 (Ellis Road)	2	19	0	0	0	0	0	0	0
2 - SR 1159 (South Miami Blvd.) From SR 1954 (Ellis Road) to End of Project	0	8	1	0	0	0	0	0	0
TOTALS --->	2	27	1	0	0	0	0	0	0

"1" As defined by only a substantial increase (See bottom of TABLE N2).
"2" As defined by both criteria in TABLE N2.

APPENDIX 3

Air Quality Analysis

Table A1

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0, JANUARY 1992

JOB: U-4011Y10; ELLIS ROAD AND SOUTH MIAMI BL RUN: U-4011y10; ELLIS ROAD AND SOUTH MIAMI BL

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S VD = .0 CM/S Z0 = 108. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M
AMB = 1.8 PPM BRG = 0. DEGREES

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)							
									(G/MI)	(FT)	(FT)				(VEH)
1. NB Approach	*	18.0	-1000.0	18.0	.0	*	1000.	360.	AG	1439.	15.0	.0	44.0		
2. NB LT	*	6.0	-24.0	6.0	-398.4	*	374.	180.	AG	206.	100.0	.0	12.0	1.07	19.0
3. NB THRU	*	18.0	-24.0	18.0	-130.8	*	107.	180.	AG	139.	100.0	.0	24.0	.54	5.4
4. NB Departure	*	18.0	.0	18.0	1000.0	*	1000.	360.	AG	1184.	15.0	.0	44.0		
5. SB Approach	*	-18.0	1000.0	-18.0	.0	*	1000.	180.	AG	1943.	15.0	.0	44.0		
6. SB RT	*	-6.0	30.0	1.8	317.3	*	287.	2.	AG	116.	100.0	.0	12.0	.93	14.6
7. SB THRU	*	-18.0	30.0	-18.0	208.0	*	178.	360.	AG	231.	100.0	.0	24.0	.73	9.0
8. SB DEPT	*	-18.0	.0	-18.0	-1000.0	*	1000.	180.	AG	1184.	15.0	.0	44.0		
9. EB RT APPR	*	-1000.0	-6.0	.0	-6.0	*	1000.	90.	AG	255.	15.0	.0	32.0		
10. EB RT QUE	*	-42.0	-6.0	-163.3	-6.0	*	121.	270.	AG	183.	100.0	.0	12.0	.66	6.2
11. EB RT DEP	*	.0	-6.0	-1000.0	-6.0	*	1000.	270.	AG	255.	15.0	.0	12.0		
12. EB LT APPR	*	-1000.0	-6.0	.0	-6.0	*	1000.	90.	AG	759.	15.0	.0	44.0		
13. EB LT QUE	*	-42.0	.0	-303.5	.0	*	261.	270.	AG	366.	100.0	.0	24.0	.98	13.3
14. EB LT DEP	*	.0	-6.0	-1000.0	.0	*	1000.	270.	AG	759.	15.0	.0	44.0		

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	*	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM SIGNAL FAC	ARRIVAL TYPE	RATE (gm/hr)
2. NB LT	*	120	98	2.0	255	1600	1	3	94.10
3. NB THRU	*	120	33	2.0	1184	1600	1	3	94.10
6. SB RT	*	120	55	2.0	759	1600	1	3	94.10
7. SB THRU	*	120	55	2.0	1184	1600	1	3	94.10
10. EB RT QUE	*	120	87	2.0	255	1600	1	3	94.10
13. EB LT QUE	*	120	87	2.0	759	1600	1	3	94.10

Table A1 (Cont'd)

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. REC 1	50.0	160.0	5.0
2. REC 2	50.0	100.0	5.0
3. REC 3	50.0	50.0	5.0
4. REC 4	100.0	80.0	5.0
5. REC 5	50.0	-160.0	5.0
6. REC 6	50.0	-100.0	5.0
7. REC 7	50.0	-50.0	5.0
8. REC 8	100.0	-80.0	5.0
9. REC 9	-50.0	-160.0	5.0
10. REC 10	-50.0	-100.0	5.0
11. REC 11	-50.0	-50.0	5.0
12. REC 12	-100.0	-80.0	5.0
13. REC 13	-50.0	160.0	5.0
14. REC 14	-50.0	100.0	5.0
15. REC 15	-50.0	50.0	5.0
16. REC 16	-100.0	80.0	5.0

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16

THE HIGHEST CONCENTRATION IS 5.30 PPM AT 7 DEGREES FROM REC11.

Table A2

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0, JANUARY 1992

JOB: U-4011Y15; ELLIS ROAD AND SOUTH MIAMI BL RUN: U-4011y15; ELLIS ROAD AND SOUTH MIAMI BL

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S VD = .0 CM/S Z0 = 108. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M
AMB = 1.8 PPM BRG = 0. DEGREES

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE
	*	X1	Y1	X2	Y2	*	(FT)	(DEG)	(G/MI)	(FT)	(FT)				(VEH)
1. NB Approach	*	18.0	-1000.0	18.0	.0	*	1000.	360.	AG	1580.	12.6	.0	44.0		
2. NB LT	*	6.0	-24.0	6.0	-1033.4	*	1009.	180.	AG	169.	100.0	.0	12.0	1.34	51.3
3. NB THRU	*	18.0	-24.0	18.0	-139.3	*	115.	180.	AG	113.	100.0	.0	24.0	.58	5.9
4. NB Departure	*	18.0	.0	18.0	1000.0	*	1000.	360.	AG	1278.	12.6	.0	44.0		
5. SB Approach	*	-18.0	1000.0	-18.0	.0	*	1000.	180.	AG	2213.	12.6	.0	44.0		
6. SB RT	*	-6.0	30.0	35.1	1536.7	*	1507.	2.	AG	92.	100.0	.0	12.0	1.13	76.6
7. SB THRU	*	-18.0	30.0	-18.0	218.7	*	189.	360.	AG	184.	100.0	.0	24.0	.77	9.6
8. SB DEPT	*	-18.0	.0	-18.0	-1000.0	*	1000.	180.	AG	1278.	12.6	.0	44.0		
9. EB RT APPR	*	-1000.0	-6.0	.0	-6.0	*	1000.	90.	AG	302.	12.6	.0	32.0		
10. EB RT QUE	*	-42.0	-6.0	-194.1	-6.0	*	152.	270.	AG	149.	100.0	.0	12.0	.78	7.7
11. EB RT DEP	*	.0	-6.0	-1000.0	-6.0	*	1000.	270.	AG	302.	12.6	.0	12.0		
12. EB LT APPR	*	-1000.0	-6.0	.0	-6.0	*	1000.	90.	AG	935.	12.6	.0	44.0		
13. EB LT QUE	*	-42.0	.0	-1177.0	-.2	*	1135.	270.	AG	297.	100.0	.0	24.0	1.21	57.7
14. EB LT DEP	*	.0	-6.0	-1000.0	.0	*	1000.	270.	AG	935.	12.6	.0	44.0		

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	*	CYCLE	RED	CLEARANCE	APPROACH	SATURATION	IDLE	SIGNAL	ARRIVAL
	*	LENGTH	TIME	LOST TIME	VOL	FLOW RATE	EM	FAC	TYPE RATE
	*	(SEC)	(SEC)	(SEC)	(VPH)	(VPH)			(gm/hr)
2. NB LT	*	120	99	2.0	302	1600	76.40	1	3
3. NB THRU	*	120	33	2.0	1278	1600	76.40	1	3
6. SB RT	*	120	54	2.0	935	1600	76.40	1	3
7. SB THRU	*	120	54	2.0	1278	1600	76.40	1	3
10. EB RT QUE	*	120	87	2.0	302	1600	76.40	1	3
13. EB LT QUE	*	120	87	2.0	935	1600	76.40	1	3

Table A2 (Cont'd)

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. REC 1	50.0	160.0	5.0
2. REC 2	50.0	100.0	5.0
3. REC 3	50.0	50.0	5.0
4. REC 4	100.0	80.0	5.0
5. REC 5	50.0	-160.0	5.0
6. REC 6	50.0	-100.0	5.0
7. REC 7	50.0	-50.0	5.0
8. REC 8	100.0	-80.0	5.0
9. REC 9	-50.0	-160.0	5.0
10. REC 10	-50.0	-100.0	5.0
11. REC 11	-50.0	-50.0	5.0
12. REC 12	-100.0	-80.0	5.0
13. REC 13	-50.0	160.0	5.0
14. REC 14	-50.0	100.0	5.0
15. REC 15	-50.0	50.0	5.0
16. REC 16	-100.0	80.0	5.0

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16

THE HIGHEST CONCENTRATION IS 5.10 PPM AT 283 DEGREES FROM REC7 .

Table A3

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0, JANUARY 1992

JOB: U-4011Y30; ELLIS ROAD AND SOUTH MIAMI BL RUN: U-4011y30; ELLIS ROAD AND SOUTH MIAMI BL

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S VD = .0 CM/S Z0 = 108. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M
AMB = 1.8 PPM BRG = 0. DEGREES

LINK VARIABLES

LINK DESCRIPTION	*	LINK COORDINATES (FT)				*	LENGTH	BRG
TYPE VPH EF H W V/C QUEUE	*	X1	Y1	X2	Y2	*	(FT)	(DEG)
(G/MI) (FT) (FT) (VEH)								
1. NB Approach	*	18.0	-1000.0	18.0	.0	*	1000.	360.
AG 2002. 11.1 .0 44.0								
2. NB LT	*	6.0	-24.0	6.0	-2645.7	*	2622.	180.
AG 158. 100.0 .0 12.0 2.07 133.2								
3. NB THRU	*	18.0	-24.0	18.0	-164.9	*	141.	180.
AG 104. 100.0 .0 24.0 .71 7.2								
4. NB Departure	*	18.0	.0	18.0	1000.0	*	1000.	360.
AG 1562. 11.1 .0 44.0								
5. SB Approach	*	-18.0	1000.0	-18.0	.0	*	1000.	180.
AG 3025. 11.1 .0 44.0								
6. SB RT	*	-6.0	30.0	179.7	6839.1	*	6812.	2.
AG 84. 100.0 .0 12.0 1.74 346.0								
7. SB THRU	*	-18.0	30.0	-18.0	313.4	*	283.	360.
AG 167. 100.0 .0 24.0 .93 14.4								
8. SB DEPT	*	-18.0	.0	-18.0	-1000.0	*	1000.	180.
AG 1562. 11.1 .0 44.0								
9. EB RT APPR	*	-1000.0	-6.0	.0	-6.0	*	1000.	90.
AG 440. 11.1 .0 32.0								
10. EB RT QUE	*	-42.0	-6.0	-891.7	-6.2	*	850.	270.
AG 137. 100.0 .0 12.0 1.14 43.2								
11. EB RT DEP	*	.0	-6.0	-1000.0	-6.0	*	1000.	270.
AG 440. 11.1 .0 12.0								
12. EB LT APPR	*	-1000.0	-6.0	.0	-6.0	*	1000.	90.
AG 1463. 11.1 .0 44.0								
13. EB LT QUE	*	-42.0	.0	-3966.4	-.7	*	3924.	270.
AG 275. 100.0 .0 24.0 1.89 199.4								
14. EB LT DEP	*	.0	-6.0	-1000.0	.0	*	1000.	270.
AG 1463. 11.1 .0 44.0								

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	*	CYCLE	RED	CLEARANCE	APPROACH	SATURATION	IDLE	SIGNAL	ARRIVAL
	*	LENGTH	TIME	LOST TIME	VOL	FLOW RATE	EM	FAC	TYPE RATE
	*	(SEC)	(SEC)	(SEC)	(VPH)	(VPH)	(gm/hr)		
2. NB LT	*	120	100	2.0	440	1600	70.60	1	3
3. NB THRU	*	120	33	2.0	1562	1600	70.60	1	3
6. SB RT	*	120	53	2.0	1463	1600	70.60	1	3
7. SB THRU	*	120	53	2.0	1562	1600	70.60	1	3
10. EB RT QUE	*	120	87	2.0	440	1600	70.60	1	3
13. EB LT QUE	*	120	87	2.0	1463	1600	70.60	1	3

Table A3 (Cont')

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. REC 1	50.0	160.0	5.0
2. REC 2	50.0	100.0	5.0
3. REC 3	50.0	50.0	5.0
4. REC 4	100.0	80.0	5.0
5. REC 5	50.0	-160.0	5.0
6. REC 6	50.0	-100.0	5.0
7. REC 7	50.0	-50.0	5.0
8. REC 8	100.0	-80.0	5.0
9. REC 9	-50.0	-160.0	5.0
10. REC 10	-50.0	-100.0	5.0
11. REC 11	-50.0	-50.0	5.0
12. REC 12	-100.0	-80.0	5.0
13. REC 13	-50.0	160.0	5.0
14. REC 14	-50.0	100.0	5.0
15. REC 15	-50.0	50.0	5.0
16. REC 16	-100.0	80.0	5.0

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12	REC13	REC14	REC15	REC16

THE HIGHEST CONCENTRATION IS 5.40 PPM AT 10 DEGREES FROM REC11.

APPENDIX 4

Agency Comments

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

May 26, 2005

Gregory J. Thorpe, Ph.D.
North Carolina Department of Transportation
Project Development and Environmental Analysis
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Dr. Thorpe:

This letter is in response to your request for comments from the U.S. Fish and Wildlife Service (Service) on the potential environmental effects of the proposed widening of SR 1959 (South Miami Boulevard) from south of SR 2112 (Methodist Street) to north of SR 1960 (Bethesda Avenue) in Durham County, North Carolina (TIP No. U-4011). These comments provide scoping information in accordance with provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661-667d) and section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

For road widening projects the Service recommends the following general conservation measures to avoid or minimize environmental impacts to fish and wildlife resources:

1. Wetland and forest impacts should be avoided and minimized to the maximal extent practical. Highway shoulder and median widths should be reduced through wetland areas;

2. Culvert structures that maintain natural water flow and hydraulic regimes without scouring or impeding fish and wildlife passage should be employed;

3. If unavoidable wetland or stream impacts are proposed, a plan for compensatory mitigation to offset unavoidable impacts should be provided early in the planning process. Opportunities to protect mitigation areas in perpetuity via conservation easements, land trusts or by other means should be explored at the outset;

4. Best Management Practices (BMP) for Protection of Surface Waters should be implemented; and

5. Activities within designated riparian buffers should be avoided or minimized.

Section 7(a)(2) of the Endangered Species Act requires that all federal action agencies (or their designated non-federal representatives), in consultation with the Service, insure that any action federally authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any federally-listed threatened or endangered species. A biological assessment/evaluation may be prepared to fulfill the section 7(a)(2) requirement and will expedite the consultation process. To assist you, a county-by-county list of federally protected species known to occur in North Carolina and information on their life histories and habitats can be found on our web page at http://nc-es.fws.gov/es/countyfr.html .

Although the North Carolina Natural Heritage Program (NCNHP) database does not indicate any known occurrences of listed species near the project vicinity, use of the NCNHP data should not be substituted for actual field surveys if suitable habitat occurs near the project site. The NCNHP database only indicates the presence of known occurrences of listed species and does not necessarily mean that such species are not present. It may simply mean that the area has not been surveyed. If suitable habitat occurs within the project vicinity for any listed species, surveys should be conducted to determine presence or absence of the species.

If you determine that the proposed action may affect (i.e., likely to adversely affect or not likely to adversely affect) a listed species, you should notify this office with your determination, the results of your surveys, survey methodologies, and an analysis of the effects of the action on listed species, including consideration of direct, indirect, and cumulative effects, before conducting any activities that might affect the species. If you determine that the proposed action will have no effect (i.e., no beneficial or adverse, direct or indirect effect) on listed species, then you are not required to contact our office for concurrence.

We reserve the right to review any federal permits that may be required for this project, at the public notice stage. Therefore, it is important that resource agency coordination occur early in the planning process in order to resolve any conflicts that may arise and minimize delays in project implementation. In addition to the above guidance, we recommend that the environmental documentation for this project include the following in sufficient detail to facilitate a thorough review of the action:

1. A clearly defined and detailed purpose and need for the proposed project, supported by tabular data, if available, and including a discussion of the project's independent utility;

2. A description of the proposed action with an analysis of all alternatives being considered, including the upgrading of existing roads and a "no action" alternative;

3. A description of the fish and wildlife resources, and their habitats, within the project impact area that may be directly or indirectly affected;

4. The extent and acreage of waters of the U.S., including wetlands, that are to be impacted by filling, dredging, clearing, ditching, or draining. Acres of wetland impact should be differentiated by habitat type based on the wetland classification scheme of the National Wetlands Inventory (NWI). Wetland boundaries should be determined by using the 1987 Corps of Engineers Wetlands Delineation Manual and verified by the U.S. Army Corps of Engineers;

5. The anticipated environmental impacts, both temporary and permanent, that would be likely to occur as a direct result of the proposed project. The assessment should also include the extent to which the proposed project would result in secondary impacts to natural resources, and how this and similar projects contribute to cumulative adverse effects;

6. Design features and construction techniques which would be employed to avoid or minimize impacts to fish and wildlife resources, both direct and indirect, and including fragmentation and direct loss of habitat;

7. Design features, construction techniques, or any other mitigation measures which would be employed at wetland crossings and stream channel relocations to avoid or minimize impacts to waters of the US; and,

8. If unavoidable wetland or stream impacts are proposed, project planning should include a compensatory mitigation plan for offsetting the unavoidable impacts.

The Service appreciates the opportunity to comment on this project. Please continue to advise us during the progression of the planning process, including your official determination of the impacts of this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520, ext. 32.

Sincerely,

Pete Benjamin
Ecological Services Supervisor

cc: Eric Alsmeyer, USACE, Raleigh, NC
Nicole Thomson/Christina Breen, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

April 19, 2007

MEMORANDUM TO: Project Development File

FROM: Steve L. Brown, P.E., Project Planning Engineer
Project Development and Environmental Analysis Branch

SUBJECT: **TIP Project Number U-4011** South Miami Boulevard Improvement Project - From south of SR 2112 (Methodist Street) to north of SR 1960 (Bethesda Avenue), Durham, Durham County
WBS Element 40221.1.1, Federal Project No. STP-1959(2)
Project Documentation at the N.C. State Clearinghouse

On April 17, 2007, Steve Brown called Chrys Baggett with the North Carolina Department of Administration. Mr. Brown was in the process of drafting a Categorical Exclusion for the subject project. When reviewing the comments received on the project during the Start of Study and Scoping process for the project, Mr. Brown found copies of a Scoping notice letter sent to the Clearinghouse on May 17, 2005, but no return letter from the Clearinghouse. Mr. Brown called Ms Baggett to request a copy of that letter acknowledging receipt of the Start of Study letter.

Ms. Baggett searched her database while on the phone with Mr. Brown, but failed to find a record of the notification in the appropriate time frame or in her records for Durham County. Ms Baggett agreed to search the database further for the records and call Mr. Brown back when her search was complete.

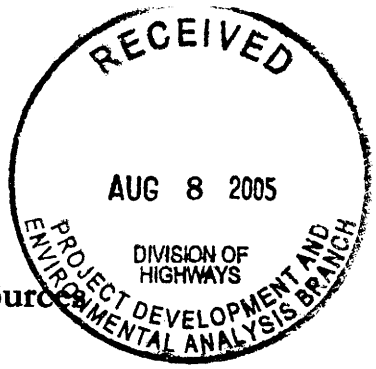
On April 18, 2007, Ms. Baggett left a message on Mr. Brown's office phone indicating that a full search of Clearinghouse records had been performed for NCDOT notifications and the Clearinghouse has no record of that Start of Study notification. Ms. Baggett then stated that, from the N.C. State Clearinghouse's perspective, NCDOT could either start the project over with a new Start of Study notification or proceed with the environmental document and distribute the document through the Clearinghouse as usual. Mr. Brown spoke to Ms. Baggett on the phone again on April 19, 2007 to verify that the documentation was not on file with the Clearinghouse. Ms. Baggett confirmed her earlier message.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1548 MAIL SERVICE CENTER
RALEIGH NC 27699-1548

TELEPHONE: 919-733-3141
FAX: 919-733-9794

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC



North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

July 29, 2005

MEMORANDUM

TO: Greg Thorpe, Ph.D., Director
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: Peter Sandbeck BSG for Peter Sandbeck

SUBJECT: SR 1959 (South Miami Boulevard) from south of SR 2112 (Methodist Street) to north of SR 1960 (Bethesda Avenue), U-4011, Durham County, ER 05-1145

Thank you for your letter of May 17 2005, concerning the above project. We apologize for the delay in our response.

We have conducted a review of the proposed undertaking and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the undertaking as proposed.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above referenced tracking number.

cc: Mary Pope Furr, NCDOT
Matt Wilkerson, NCDOT

	Location	Mailing Address	Telephone/Fax
ADMINISTRATION	507 N. Blount Street, Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919)733-4763/733-8653
RESTORATION	515 N. Blount Street, Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919)733-6547/715-4801
SURVEY & PLANNING	515 N. Blount Street, Raleigh, NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919)733-6545/715-4801

Michael F. Easley, Governor
William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Alan W. Klimek, P.E. Director
Division of Water Quality

Garrett

June 17, 2005

MEMORANDUM

To: Gregory Thorpe, Ph.D., Director
Project Development and Environmental Analysis Branch
NC Department of Transportation

From: Christina Breen CB
Transportation Permitting Unit
NC Division of Water Quality

SUBJECT: SR 1959 (South Miami Boulevard) Widening from SR 2112 (Methodist Street) to north of SR 1960 (Bethesda Avenue) in the City of Durham, Federal Aid Project No. STP-1959(2), TIP Project No. U-4011, Durham County

This office has reviewed the referenced document. The Division of Water Quality (DWQ) is responsible for the issuance of the Section 401 Water Quality Certification for activities that impact Waters of the U.S., including wetlands. It is our understanding that there are potential impacts to jurisdictional wetlands and streams. The project will have impacts to wetlands, streams, and other surface waters associated with:

Stream Name	River Basin	Stream Classification	WQ Index No.
UT Stirrup Iron Creek	Neuse	C; NSW	27-33-4-2

DWQ offers the following comments on the referenced documents:

Project Specific Comments:

1. Stirrup Iron Creek are class C; NSW waters of the State. DWQ is very concerned with sedimentation and erosion impacts that could result from this project. DWQ recommends that highly protective sedimentation and erosion control BMPs be implemented to reduce the risk of nutrient runoff to Stirrup Iron Creek. DWQ requests that road design plans provide treatment of the storm water runoff through best management practices as detailed in *Best Management Practices for the Protection of Surface Waters*. Refer to 15A NCAC 2B .0224(2) and 15A NCAC 2H .1006.

General Comments Regarding Bridge Replacement Projects

2. After the selection of the preferred alternative and prior to an issuance of the 401 Water Quality Certification, the NCDOT is respectfully reminded that they will need to demonstrate the avoidance and minimization of impacts to wetlands (and streams) to the maximum extent practical.

3. In accordance with the Environmental Management Commission's Rules {15A NCAC 2H.0506(b)(6)}, mitigation will be required for impacts of greater than 150 linear feet to any single perennial stream. In the event that mitigation is required, the mitigation plan should be designed to replace appropriate lost functions and values. In accordance with the Environmental Management Commission's Rules {15A NCAC 2H.0506 (h)(3)}, the NC Ecosystem Enhancement Program may be available for use as stream mitigation.

Transportation Permitting Unit
1650 Mail Service Center, Raleigh, North Carolina 27699-1650
2321 Crabtree Boulevard, Suite 250, Raleigh, North Carolina 27604
Phone: 919-733-1786 / FAX 919-733-6893 / Internet: http://h2o.enr.state.nc.us/ncwetlands

4. The 401 Water Quality Certification application will need to specifically address the proposed methods for storm water management. More specifically, storm water will not be permitted to discharge directly into the creek. Instead, storm water should be designed to drain to a properly designed storm water detention facility/apparatus to achieve diffuse flow and nutrient treatment.

5. For watersheds subject to riparian buffer rules, riparian buffer impacts should be avoided and minimized to the greatest extent possible. Refer to 15A NCAC 2B .0233 for a table of allowable uses.

6. If applicable, DOT should not install the bridge bents in the creek, to the maximum extent practicable.

7. Any new culverts must be countersunk to allow unimpeded fish and other aquatic organisms passage through the crossing.

8. If foundation test borings are necessary; it should be noted in the document. Geotechnical work is approved under General 401 Certification Number 3027/Nationwide Permit No. 6 for Survey Activities.

9. Sedimentation and erosion control measures sufficient to protect water resources must be implemented prior to any ground disturbing activities. Structures should be *maintained regularly*, especially following rainfall events.

10. Sediment and erosion control measures should not be placed in wetlands.

11. Borrow/waste areas should avoid wetlands to the maximum extent practicable. Impacts to wetlands in borrow/waste areas could precipitate compensatory mitigation.

12. While the use of National Wetland Inventory (NWI) maps and soil surveys is a useful office tool, their inherent inaccuracies require that qualified personnel perform onsite wetland delineations prior to permit approval.

DWQ appreciates the opportunity to provide comments on your project. Should you have any questions or require any additional information, please contact Christina Breen at (919) 733-9604.

cc: Eric Alsmeyer, US Army Corps of Engineers, Raleigh Field Office
Travis Wilson, NC WRC
Gary Jordan, USFWS
Chris Militscher, USEPA
File Copy

North Carolina Wildlife Resources Commission

Richard B. Hamilton, Executive Director

MEMORANDUM

TO: Marie Sutton
Project Development Engineer, PDEA, NCDOT

FROM: Travis Wilson, Highway Project Coordinator
Habitat Conservation Program

DATE: July 22, 2005

SUBJECT: Response to the start of study notification from the N. C. Department of Transportation (NCDOT) regarding fish and wildlife concerns for the proposed improvements SR 1959 (South Miami Boulevard) from south of SR 2112 (Methodist Street) to north of SR 1960 (Bethesda Avenue), in Durham, Durham County, North Carolina. TIP No. U-4011.

This memorandum responds to a request from Gregory J. Thorpe of the NCDOT for our concerns regarding impacts on fish and wildlife resources resulting from the subject project. Biologists on the staff of the N. C. Wildlife Resources Commission (NCWRC) have reviewed the proposed improvements. Our comments are provided in accordance with certain provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

We have no specific concerns regarding this project. However, to help facilitate document preparation and the review process, our general informational needs are outlined below:

1. Description of fishery and wildlife resources within the project area, including a listing of federally or state designated threatened, endangered, or special concern species. Potential borrow areas to be used for project construction should be included in the inventories. A listing of designated plant species can be developed through consultation with:

The Natural Heritage Program
N. C. Division of Parks and Recreation
1615 Mail Service Center
Raleigh, N. C. 27699-1615
(919) 733-7795
WWW.ncsparks.net/nhp

and,

NCDA Plant Conservation Program
P. O. Box 27647
Raleigh, N. C. 27611
(919) 733-3610

2. Description of any streams or wetlands affected by the project. The need for channelizing or relocating portions of streams crossed and the extent of such activities.

3. Cover type maps showing wetland acreages impacted by the project. Wetland acreages should include all project-related areas that may undergo hydrologic change as a result of ditching, other drainage, or filling for project construction. Wetland identification may be accomplished through coordination with the U. S. Army Corps of Engineers (COE). If the COE is not consulted, the person delineating wetlands should be identified and criteria listed.

4. Cover type maps showing acreages of upland wildlife habitat impacted by the proposed project. Potential borrow sites should be included.

5. The extent to which the project will result in loss, degradation, or fragmentation of wildlife habitat (wetlands or uplands).

6. Mitigation for avoiding, minimizing or compensating for direct and indirect degradation in habitat quality as well as quantitative losses.

7. A cumulative impact assessment section which analyzes the environmental effects of highway construction and quantifies the contribution of this individual project to environmental degradation.

8. A discussion of the probable impacts on natural resources which will result from secondary development facilitated by the improved road access.

9. If construction of this facility is to be coordinated with other state, municipal, or private development projects, a description of these projects should be included in the environmental document, and all project sponsors should be identified.

Thank you for the opportunity to provide input in the early planning stages for this project. If we can further assist your office, please contact me at (919) 528-9886.