STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

August 15, 2003

NC Department of Environment and Natural Resources
Division of Water Quality – Stormwater Management
127 Cardinal Drive Extension
Wilmington, NC 28405

Attention: Ms. Linda Lewis

Subject: Military Cutoff Road (SR 1409) from just North of US 74 (Eastwood Road) to Market Street. State Project No. 8.2251001, Federal Project No. NHF-1409; TIP U-2734.

Please find attached an application for a Stormwater Management Permit for the NCDOT linear roadway project described above. The processing fee check will be sent under a separate cover. Note: the check combines fees for both U-2734 and B-3682/W-3413. A copy of the check is attached to this application.

The purpose of this project is to increase traffic capacity and safety by widening Military Cutoff Road. The current construction schedule for this proposed project has a June 2004 let date. The following information is included for your review:

- Full Size Plans, Hydro Details and Title Sheet
- Stormwater Management Narrative
- Minutes from the Agency Review Meeting

Please direct any questions to NCDOT biologist Heather Montague (919)715-1456 or to NCDOT Hydraulic Engineer Galen Cail at (919)250-4100.

Sincerely,

Gregory J. Thorpe, Ph.D.
Environmental Management Director, P.D.E.A

cc: John Hennessy, DWQ Raleigh
Galen Cail, P.E., Hydraulics Unit
U-2734 file

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

NC Department of Transportation
1514 Mail Services Center
Raleigh, NC 27699-1514

Phone: *919-733-3624 x354*
Fax: *919-733-9247*
Internet: *www.ncdot.org*

Warrant: **1463725**

NC DEPT OF ENVIRONMENT & NATURAL
RESOURCES - ENVIRONMENTAL
WATER QUALITY SECTION
PERMITS & ENGINEERING UNIT
PO Box 29535
RALEIGH NC 27626-0535

Payment No.: **2000042658**
Warrant Date: **07/22/2003**
Vendor No.: **5246**

Invoice Number	Invoice Date	DOT Tracking # / Remarks / PO/Contract #	Gross Invoice Amount*	Discount	Net Amount*
INV 201 SW	07/15/2003	1900068796 TIP NUMBER U-2734	420.00	0.00	420.00
INV 200 SW	07/15/2003	1900068797 TIP NUMBER B-3682	420.00	0.00	420.00
		Check Total.....	$ **840.00**		

DETACH FROM CHECK AND KEEP FOR YOUR RECORDS

*Includes unplanned freight, if applicable

THE FACE OF THIS DOCUMENT HAS A COLORED BACKGROUND ON WHITE PAPER. THIS DOCUMENT CONTAINS A GENUINE WATERMARK PAPER. THIS DOCUMENT HAS VISIBLE AND INVISIBLE FLUORESCENT FIBERS.

NC Department of Transportation
1514 Mail Services Center
Raleigh, NC 27699-1514

66-1059
531

Warrant **1463725**
Date 07/22/2003

PAY TO THE ORDER OF

$ 840.00

$840.00

NC DEPT OF ENVIRONMENT & NATURAL
RESOURCES - ENVIRONMENTAL
WATER QUALITY SECTION
PERMITS & ENGINEERING UNIT
PO Box 29535
RALEIGH NC 27626-0535

State Treasurer, Raleigh, North Carolina
Payable at Par Through Federal Reserve System

C. Wayne Stallings
Chief Financial Officer

THIS FORM CONTAINS MICROPRINTING

⑈1463725⑈ ⑆053105941⑆ 5⑈000⑈601⑈

OFFICE USE ONLY		
Date Received	Fee Paid	Permit Number

State of North Carolina
Department of Environment and Natural Resources
Division of Water Quality

STORMWATER MANAGEMENT PERMIT APPLICATION FORM

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
LINEAR ROADWAY PROJECT

This form may be photocopied for use as an original.

DWQ Stormwater Management Plan Review:
A complete stormwater management plan submittal includes this application form, a supplement form for each BMP proposed (see Section V), design calculations, and plans and specifications showing all road and BMP details.

I. PROJECT INFORMATION

NCDOT Project Number: 8.2251001 (U-2734) County: New Hanover

Project Name: Military Cutoff Road

Project Location: Wilmington, North Carolina

Contact Person: Mr. Marshall Clawson Phone: (919) 250-4100 Fax: 250-4108

Receiving Stream Name: Howe Creek River Basin: Intra-coastal waterway Class: ORW

Proposed linear feet of project: 12,375 feet

Proposed Structural BMP and Road Station *(attach a list of station and BMP type if more room is needed)*:

Hazardous Spill Basins: Station -L- 27+60 right and Station -L-28+60 right

Type of proposed project: *(check all that apply)*:

☐ New ☑ Widening ☐ 2 lane* ☑ 4 lane* ☑ Curb and Gutter ☐ Bridge Replacement
☑ Other *(Describe)* Bicycle path on east side of roadway

**2 lane and 4 lane imply that roadside ditches are used unless Curb and Gutter is also checked.*

II. REQUIRED ITEMS CHECKLIST

Initial in the space provided below to indicate the following design requirements have been met and supporting documentation is attached. Supporting documentation shall, at a minimum, consist of a brief narrative description including (1) the scope of the project, (2) how the items below are met, (3) how the proposed best management practices minimize water quality impacts, and (4) any significant constraints and/or justification for not meeting a, b, c and d to the maximum extent practicable.

Designer's Initials

GNS a. The amount of impervious surface has been minimized as much as possible.

GNS b. The runoff from the impervious areas has been diverted away from surface waters as much as possible.

GNS c. Best Management Practices are employed which minimize water quality impacts.

GNS d. Vegetated roadside ditches are 3:1 slope or flatter.

See Stormwater Management Plan (Attached)

III. OPERATION AND MAINTENANCE AGREEMENT

I acknowledge and agree by my initials below that the North Carolina Department of Transportation is responsible for the implementation of the four maintenance items listed. I agree to notify DWQ of any operational problems with the BMP's that would impact water quality or prior to making any changes to the system or responsible party.

Maintenance Engineer's Initials

DA a. BMP's shall be inspected and maintained in good working order.

DA b. Eroded areas shall be repaired and reseeded as needed.

DA c. Stormwater collection systems, including piping, inlets, and outlets, shall be maintained to insure proper functioning.

Maintenance Engineer's Name: DAVID L. THOMAS, SR. P.E.

Title: DIVISION MAINTENANCE ENGINEER

IV. APPLICATION CERTIFICATION

I, *(print or type name)* _____ of _____ Branch, certify that the information included on this permit application form is, to the best of my knowledge, correct and that the project will be constructed in conformance with the approved plans and that the proposed project complies with the requirements of 15A NCAC 2H .1000.

Title: Environmental Unit Head

Address: 1548 Mail Service Center, Raleigh, NC 27699-1548

Signature: D. Lambert Cuthbert Date: 8-11-03

V. SUPPLEMENT FORMS

The applicable state stormwater management permit supplement form(s) listed below must be submitted for each BMP specified for this project. Contact the Stormwater and General Permits Unit at (919) 733-5083 for the status and availability of these forms.

Form SWU-102	Wet Detention Basin Supplement
Form SWU-103	Infiltration Basin Supplement
Form SWU-104	Low Density Supplement
Form SWU-105	Curb Outlet System Supplement
Form SWU-106	Off-Site System Supplement
Form SWU-107	Underground Infiltration Trench Supplement
Form SWU-108	Neuse River Basin Supplement
Form SWU-109	Innovative Best Management Practice Supplement
Form SWU-110	Extended Dry Detention Basin Supplement

STORMWATER MANAGEMENT PLAN

Project: 8.2251001, TIP No. U-2734 6/10/03
New Hanover County
Hydraulics Project Manager: Gus N. Saparilas and William T. Stephens, Jr., P.E. (TGS Engineers), Galen Cail, P.E. (NCDOT Hydraulics Unit)

ROADWAY DESCRIPTION

The project involves the widening of SR 1409 (Military Cutoff Road) in New Hanover County from just north of US 74 (Eastwood Road) to US 17 (Market Street). The overall length of the project is approximately 2.33 miles. The existing roadway is a predominately 30-foot wide roadway with two 12-foot wide lanes and 2-foot paved shoulders. The existing roadway has been widened in places to accommodate turning lanes due to heavy development along the route. With Project U-2734, it is proposed to widen Military Cutoff Road to a four-lane, shoulder section roadway with a raised grass median. Curb and gutter is proposed to be added to the section along the east side of the roadway starting at -L- Station 34+60 +/- to US 17 and to the west side of the roadway from -L- Station 43+60 +/- to US 17. A 10-foot bicycle path is also proposed along the majority of the east side of the project. The project crosses one stream, (Howe Creek) and a box culvert is proposed at this crossing. The project drainage system consists of cross pipes, grated inlets and associated pipe systems, and side and lateral stormwater ditches and swales.

ENVIRONMENTAL DESCRIPTION

The project is located in the Cape Fear River Basin. The one stream crossing along the project is of Howe Creek at approximate -L- Station 28+12. Howe Creek is designated as an Outstanding Resource Water (ORW) by the Department of Coastal Management and the Division of Water Quality. There are seven wetland sites that will be impacted by the proposed project. Wetland impacts will be kept to a minimum by symmetrical widening of the roadway.

BEST MANAGEMENT PRACTICES AND MAJOR STRUCTURES

The primary goal of Best Management Practices (BMPs) is to prevent degradation of the states surface waters by the location, construction and operation of the highway system. BMPs are activities, practices and procedures taken to prevent or reduce stormwater pollution. The BMPs and measures that will be used on this project to reduce stormwater impacts are grassed swales, raised grated inlets in ditch lines, hazardous spill basins and natural stream design. In addition, the proposed 2-barrel box culvert at Howe Creek will be buried 1-foot below the stream bed with a sill installed in one barrel to maintain the normal stream flow and channel characteristics. Infiltration basins were considered as required by the Division of Water Quality during the initial phase of the stormwater management plan. However, the infiltration basins were determined to be an unfeasible measure due to the high water tables in the project area.

The following summarizes the BMPs to be used on the proposed project:

GRASSED SWALES

Grassed swales are proposed at various locations as indicated below in the table. In addition, typical cut ditches and the ditch between the proposed roadway and bicycle path will also be used for stormwater storage by raising grated inlets 6-inches above the ditch bed.

The following table summarizes the location and storage potential for grassed swales and ditches proposed for the project.

Grassed Swale and Ditch Stormwater Runoff Storage

Location of Swale Station to Station	Lt or Rt	Storage Volume (cu. ft) (6" uniform depth)	Pavement Runoff Storage (inches)	Swale Description
-L- 16+80+/- to 18+40+/-	LT	150	0.10	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 17+00+/- to 18+47+/-	RT	122	0.07	"V"- 6:1 FRONT, 3:1 BACK SLOPE
-L- 18+90+/- to 19+60+/-	RT	185	0.25	"V"- 6:1 FRONT, 3:1 BACK SLOPE
-L- 19+00+/- to 20+47+/-	LT	185	0.10	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 21+00+/- to 21+90+/-	RT	246	0.26	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 21+90+/- to 23+20+/-	RT	540	0.46	"V"- 6:1 FRONT, 6:1 BACK SLOPE
-L- 22+00+/- to 23+00+/-	LT	985	0.50	2 FT BASE, 3:1 SLOPES
-L- 23+20+/- to 24+40+/-	RT	493	0.35	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 24+80+/- to 25+50+/-	LT	288	0.24	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 24+80+/- to 25+50+/-	RT	308	0.38	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 25+50+/- to 26+50+/-	LT	370	0.26	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 25+50+/- to 26+50+/-	RT	512	0.52	"V"- 6:1 FRONT, 6:1 BACK SLOPE
-L- 26+60+/- to 27+80+/-	RT	328	0.28	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 27+80+/- to 28+77+/-	RT	288	0.35	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 28+78+/- to 29+80+/-	RT	226	0.29	"V"- 6:1 FRONT, 3:1 BACK SLOPE
-L- 28+80+/- to 30+00+/-	LT	225	0.20	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 30+00+/- to 31+00+/-	LT	144	0.15	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 30+00+/- to 31+80+/-	RT	185	0.11	"V"- 6:1 FRONT, 3:1 BACK SLOPE
-L- 35+40+/- to 37+00+/-	LT	675	0.52	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 35+50+/- to 38+22+/-	RT	1412	0.37	2 FT BASE, 3:1 SLOPES
-L- 37+00+/- to 37+84+/-	LT	356	0.37	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 38+65+/- to 41+20+/-	LT	1080	0.43	"V"- 6:1 FRONT, 4:1 BACK SLOPE
-L- 40+20+/- to 41+30+/-	RT	270	0.14	"V" - 3:1 SLOPES
-L- 41+68+/- to 43+40+/-	LT	850	0.28	2 FT BASE- 4:1 FR., 3:1 B. SLOPE
-L- 41+70+/- to 44+20-/+	RT	1278	0.31	2 FT BASE, 3:1 SLOPES

RAISED GRATED INLETS

Where practicable, grated inlets in proposed grassed swales, cut ditches and the ditch between the roadway and the bicycle path will be raised 6-inches above the ditch line to promote stormwater storage and infiltration.

HAZARDOUS SPILL BASINS

Hazardous spill basins will be provided on both sides of the Howe Creek crossing at approximately -L- Station 27+60 RT and -L- Station 28+60 RT. The function of these basins will be to aid in the containment and cleanup of a potential accidental hazardous spill. These basins will not be used as a storage device during a normal rainfall event. A mechanical gate will be installed at outlet end of the basin to interrupt and contain normal free flow of runoff in the event of a hazardous spill.

NATURAL STREAM DESIGN

It appears that the stream left of -L- Station 21+00 once crossed Military Cutoff Road and connected with the remnant stream to the right of -L- Station 21+40. Presently, the stream on the left has been channelized into a straight lateral roadway ditch for approximately 650 feet before crossing under Military Cutoff Road and connecting back to the natural stream on the right. It was recommended during a field review by the NCDOT and agency personnel to install a pipe across Military Cutoff Road from the existing live stream on the left of the roadway to the remnant stream on the right at a point further south, thus providing restoration. Natural stream design methods in accordance with those recommended in, "Applied River Morphology" (Rosgen, 1996) will be used to relocate the filled in stream on the right from Station 21+46 to Station 22+07 –L- Rt and from Station 22+80 to Station 23+44 –L- Rt. The length of the natural stream design is approximately 456 feet. The length of restored remnant stream is approximately 246 feet.

BOX CULVERT

At -L- Station 28+14 an existing double line of 72-inch corrugated metal pipes will be replace by a double barrel 9-foot by 7-foot reinforced concrete box culvert. The normal stream flow and channel characteristics will be maintained at the crossing by burying the culvert inverts 1-foot below the stream bed and installing a sill in one barrel to divert low flow through the other barrel. Additionally, 36-inch overflow pipes will be installed in the floodplain on each side of the box culvert to aid floodplain and wetland drainage between the two sides of the roadway.

Two locations where BMP devices are not proposed are on the east side of Military Cutoff Road from -L- Station 13+00 to 17+00 and from -L- Station 45+00 to the end of project. Existing heavy development in these two areas prohibits the use of such devices. Additionally, at the end of the project in the intersection of Military Cutoff Road and US 17 there are properties with groundwater contamination from a service station. A sealed, watertight drainage system will be required in this area in order to prevent combining of the contaminated groundwater and the stormwater. The drainage system which collects stormwater runoff from -L- Station 45+00 to the end of the project will be discharged at approximately -L- Station 46+00 RT into a wetlands area which will aid in the filtration of stormwater before it reaches a receiving stream.

Subject: Minutes from Interagency Hydraulic Design Review Meeting on March 28, 2002 for U-2734 (Military Cutoff Road Widening), New Hanover County

Participants:

Marshall Clawson, NCDOT Hydraulics	John Hennessey, NCDWQ
Galen Cail, NCDOT Hydraulics	Cathy Brittingham, NCDCM
David Chang, NCDOT Hydraulics	Bill Arrington, NCDCM
Sue Flowers, NCDOT Roadway	Howard Hall, USFWS
Anthony West, NCDOT Roadway	Gus Saparilas, TGS Engineers
Dave Timpy, USACE	Bill Stephens, TGS Engineers
Lindsey Riddick, NCDOT PD & EA	

The meeting began with the distribution of the Stormwater Management Plan and a review of the overall project layout. Marshall Clawson and Bill Stephens proceeded to review each redline plan sheet and field agency comments and questions. The question/comments are summarized as follows:

1) Wetland and Stream Impacts at Howe Creek: The wetland limits at Howe Creek need be reinvestigated. Additional delineation may be required to determine which side is more suitable for hazardous spill basins (East or West side of Military Cutoff Road). Lindsey Riddick will check delineation. It was also questioned whether stormwater could even outlet in the wetlands or within 575' on each side of Howe Creek since it is considered an Outstanding Resource Water and falls under CAMA jurisdiction. Cathy Brittingham investigated and informed that, since no CAMA permit is required for this section of Howe Creek (non-navigatable) and it is not an AEC, stormwater can outlet within the 575' buffer and in the wetlands. However, velocities must be non-erosive.

   It was determined to keep the proposed hazardous spill basins on the east side of Military Cutoff based on the following:

   -The extent of the wetland boundaries are comparable on either side of the road
   -The basins will not impact the wetlands except for the minimal ditching required to enable the basin riser pipe to outlet
   -The future Mayfaire development has proposed detention in the Southwest quadrant of the crossing
   -The east side of Military Cutoff is the downstream side of the crossing and thus the discharge in the basins will not have to pass back through the proposed box culvert.

2) Hazardous Spill Basins at Howe Creek: Dave Timpy emphasized the importance of constructing the basins on the side which will result in the least impact to the wetlands. John Hennessey wanted to know what treatment is provided since the hazardous spill basin is not a treatment facility. He was informed that treatment is acquired as stormwater traverses to the basins through grassed swales and also through storage provided by raised grated inlets (6" at each inlet) in the swales. John also emphasized that outlet velocities into the Howe Creek basin need to be non-erosive and flow spreaders should be considered. Also the basins, as designed, need to be relocated out of the wetlands.

   See above responses.

3) Environmental Issues from Prior Review Meetings: Dave Timpy expressed concern that stormwater issues brought up in prior meetings and summarized in memos dated 10/2/200 and 12/5/00 may not have been addressed. He said these issues should have already been incorporated in the plans or justification provided as to why not. The memos will be reviewed and these issues will be addressed in the plans, if they have not been so.

   The environmental commitments have been reviewed and will be adhered to including the addition of hazardous spill basins and overflow pipes at Howe Creek, retention in the ditches along the bike path, and the relocation/reconnection of the jurisdictional stream at the beginning of the project with natural stream design.

4) Proposed Pipe Culverts at Sta 21+43 –L- with Natural Stream Design: Bill Stephens and Marshall Clawson informed that the existing stream flowing towards Military Cutoff Road Sta 21+00 –L- (Lt) does not traverse under the road to Sta 21+90 –L- (Rt) as it seemingly should do based on the natural alignment of the stream. However, pipes are proposed to do so along with natural stream design (nsd) for those portions of stream impacted. All agency representatives wanted information detailing the nsd including stream morphology, typicals, and alignment.

   NSD info provided in permit.

5) System Sta 35+10 –L- Examined: The 1050 RCP system crossing at Sta 35+10 –L- which outlets at Sta 33+66 –L- (Rt) was questioned as to it's sufficiency at stormwater treatment. It was explained that additional treatment is limited by the proximity of development to the roadway and the lack of suitable outlets. To route the stormwater in a swale would require a deep channel and would impact a building along –L- (Rt) and would impact additional wetlands along –L- (Lt).

6) System Along –Y5 (Covil Farm Road) Right: The system along Covil Farm Road right was explained to be necessary due to the poor condition of the existing ditch right and the constraints of the site development to improve this ditch. Therefore, the system was provided to eliminate future erosion of this ditch. Dave Timpy

questioned whether wetlands were present at the proposed outlet of this system. Lindsey Riddick will investigate to see if delineation has been done or whether if it will need to be. John Hennessey emphasized that if wetlands are present the outlet velocities need to be non-erosive.

System was relocated to left side of road to reduce R/W impacts. Wetlands were delineated at the outlet of the system by Lindsey. Class I rip rap used at outlet.

7) Potential Mitigation Site at Sta 46+00 –L- (Rt) (Hefelfinger Property): Dave Timpy mentioned the Hefelfinger property as a potential mitigation site that had been discussed in the past. The potential acquisition of this site will be investigated by the PD & EA Unit.

8) Sealed System at Intersection of Military Cutoff Road and Market Street: Bill and Marshall pointed out that a sealed system is proposed from Sta 48+83 to the End of Project in the vicinity of the Mid State Petroleum, Inc. property due to the presence of contaminated soil. Agency representatives seemed satisfied with the system.

Subject: Draft Minutes from Interagency Permit Review Meeting on February 20, 2003 for U-2734 in New Hanover County

Team Members:

Dave Timpy-USACE	(via conference call)
John Hennessy-NCDWQ	(absent)
David Cox-NCWRC	(present)
Travis Wilson-NCWRC	(present)
Gary Jordan-USFWS	(absent)
Chris Militscher-EPA	(absent)
Heather Montague-PDEA	(present)
Bill Arrington-NCDCM	(present)
Cathy Brittingham-NCDCM	(present)

Participants:
Marshall Clawson, NCDOT Hydraulics
Galen Cail, NCDOT Hydraulics
Sue Flowers, NCDOT Roadway Design
Anthony West, NCDOT Roadway Design
Greg Thorpe, NCDOT PD&EA
Charles Cox, NCDOT PD&EA
Brian Hanks, NCDOT Structure Design
Barney Blackburn, NCDOT Roadside Env

Prior to the meeting Dave Timpy discussed with Galen, via telephone, some of his concerns/comments. They are the following:

- Make sure all potential impacts due to utilities are addressed. Galen will review with Michael Bright (NCDOT Utilities) to ensure any additional impacts are accounted for.

  Galen reviewed with Michael on 3/3/03. All sites were investigated for potential utility impacts. It was determined the only site that would require additional consideration for these impacts would be the upstream side of the double barrel box culvert at Howe Creek, due to the placement of a sanitary sewer system. Impacts accounted for to construction easement.

- Investigate if the width of mechanized clearing can be reduced from 3m (10') to 1.5m (5'). Galen will check with Joe Blair (Division Construction) to see if this is feasible.

  Discussed with Joe and Kerry Cross (Resident Engineer-Burgaw). It was determined that the additional clearing width is needed, especially in those areas with considerable fill height and where guardrail will be placed (as with the site at Howe Creek). This type of site(s) could be difficult to access/construct from the roadway and may require additional maintenance once the guardrail is placed.

- Review the natural stream design data (Site 1) and investigate whether more stream could be designed for additional mitigation credit. Dave will present any

specific questions/comments once he reviews the stream site in the field. Also, check the impact summary sheet. Stream impact length looks suspect and the length of "Relocated Channel" was not accounted for. Galen will review and make necessary changes.

Galen met with Dave Timpy and Mason Herndon in the field on 3/5/03 and reviewed the stream site. See "Natural Stream Design" summary for issues discussed.

- Need to address the type of "Native Plantings" associated with the natural stream design.

This will need to be addressed by PD&EA and/or Roadside Environmental.

- Investigate potential acquisition of the Hefelfinger property (Site 5) for wetland mitigation.

Heather said Elizabeth Lusk (PD&EA) is to meet with Dave on 2/27/03 to address.

Cathy stated that **all** culvert inverts at wetlands and jurisdictional streams should be buried a minimum of 1'.

The box culvert at Howe Creek has been designed as such. Other relative pipe crossing sites have been investigated and appropriate revisions made.

Site 1:

No additional comments.

Site 2:

Need easement on the inlet side of the Howe Creek box culvert for construction access.

R/W provided.

Show wetland symbology outside of fill limits on cross section.

Done.

Site 3:

Galen stated that not all of the wetland was shown as impacted along the Mayfaire property since the developers permit has already accounted for this portion.

Site 4:

Need to differentiate wetland impact as Excavated, Drained, or Filled. It was noted there is an existing ditch now and the proposed ditch will be of similar dimension. Also, the wetland is shown as a "total take".

Impacts designated as requested.

Site 5:

No additional comments.

Site 6:

No comments.

Review Meeting w/ John Hennessey, Marshall Clawson and Galen Cail on 4/2/03:

It was stated that an additional jurisdictional stream will be added and impacts accounted for at Sta 38+40 –L-.

Site 1:

It was discussed that Dave Timpy requested, after reviewing in the field with Galen, to revise the stream relocation by retaining the existing remnant stream and providing relocation in only the areas that are being filled. He also requested providing more stream relocation than is presently being proposed by starting further Southeast. John thought this was a good idea but to investigate improving the remnant stream dimension, since Galen suggested it was entrenched. Also, need to provide existing and proposed stream profile. Galen will update morphological data and review with John at a later time.

Stream relocation revised per Dave Timpy's recommendations. See "Natural Stream Design" summary.

Site 3:

Galen stated the wetland limits on the Eastside, stop at the boundary of where the "Mayfaire" permit accounted for impacts.

It was stated the outlet ditch cleanout Sta 33+65 –L- Rt will be eliminated, reducing the impacts to the jurisdictional stream.

Site 6:

John questioned if the outlet velocities into the wetland from the 375 (15") and 1200 (48") RCP are less than 2 ft/s. It was stated that the proposed 1200 outlets onto a Class I rip rap pad. Presently, there is an existing 750 (30") that outlets into a swale. The 375 outlet velocity will be checked.

The discharge and velocity for the 375 outlet is 1.8 cfs and 1.5 ft/s, respectively.

Site 7:

John questioned the outlet velocities in the wetland/stream. It was stated that the outlet velocities are greater than 2 ft/s but the topo limits what can be done here. It was decided to deepen the 2GI, dropping the box invert allowing energy to be dissipated in the box, and flatten the outlet pipe, reducing the outlet velocities prior to the wetland/stream.

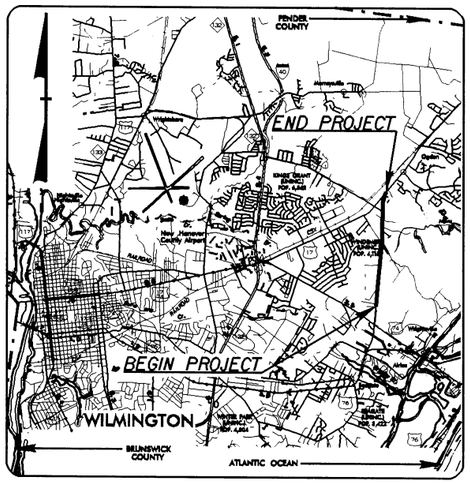
Revision implemented.

9/05/06

U-2734

PROJECT: 8.2251001

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

LOCATION: WILMINGTON – SR 1409 (MILITARY CUTOFF ROAD)
FROM NORTH OF US 74 TO US 17

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

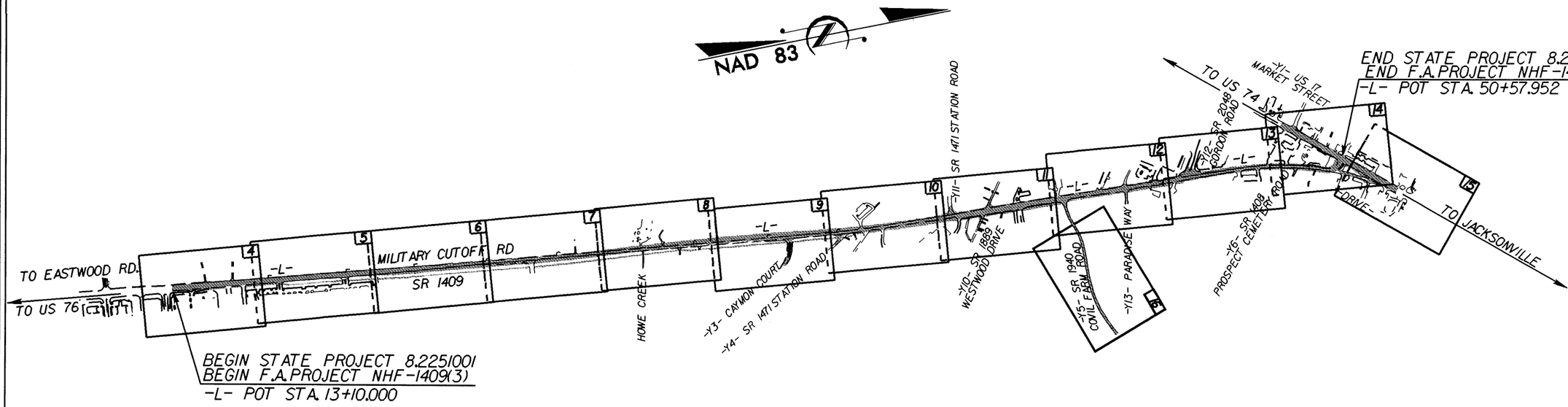
METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS UNLESS OTHERWISE SHOWN

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2734	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
8.2251001	NHF-1409(3)	P.E.
8.2251002	NHF-1409(3)	RW

NAD 83



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III
THIS PROJECT IS WITHIN THE CITY LIMITS OF THE CITY OF WILMINGTON

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES
PLANS 5 0 10
PROFILE (HORIZONTAL) 5 0 10
PROFILE (VERTICAL) 1 0 2

DESIGN DATA
ADT 2003 = 17,900–32,600 vpd
ADT 2023 = 28,900–54,400 vpd
DHV = 9 %
D = 55 %
T = 3 % *
V = 80 km/h
* TTST 1 % + DUAL 2 %

PROJECT LENGTH
TOTAL LENGTH STATE PROJECT 8.2251002 = 3.748km

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: FEBRUARY 21, 2003

LETTING DATE: JUNE 15, 2004

SUE FLOWERS
PROJECT ENGINEER

ANTHONY C. WEST
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ADMINISTRATOR DATE

11-AUG-2003 15:44
S:\Proj\U2734\Roh\
Active: 1 0012454

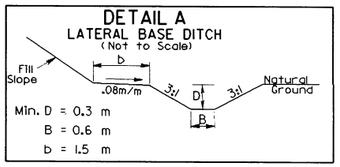
6/16/99

METRIC	PROJECT REFERENCE NO.	SHEET NO.
	U-2734	2-G
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

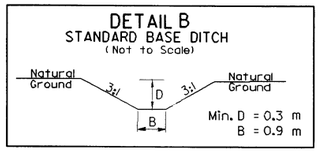
DITCH DETAILS

DETAIL A
LATERAL BASE DITCH
(Not to Scale)



STA. 33+65 TO 34+92 LT DDE=300CuM

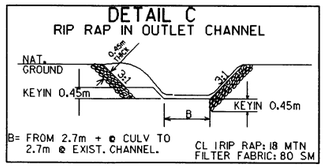
DETAIL B
STANDARD BASE DITCH
(Not to Scale)



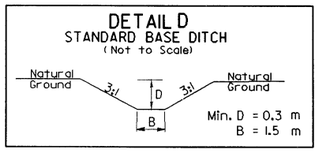
-L- STA. 23+08 LT
DDE= 12 CuM

-L- STA. 23+14 RT. (SLOPE = 0.4%)
DDE = 27 CM

DETAIL C
RIP RAP IN OUTLET CHANNEL

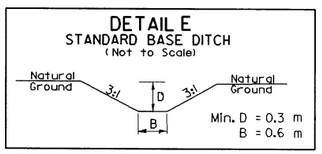


DETAIL D
STANDARD BASE DITCH
(Not to Scale)



STA. 33+65 RT
DDE=

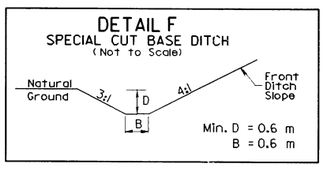
DETAIL E
STANDARD BASE DITCH
(Not to Scale)



STA. -Y1- 10+44 RT
DDE= 6 CuM

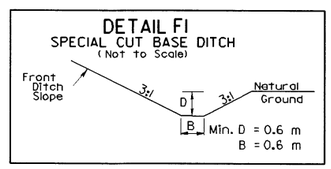
-L- STA. 24+40 RT. (SLOPE = 8.5%)
DDE = 6 CM

DETAIL F
SPECIAL CUT BASE DITCH
(Not to Scale)



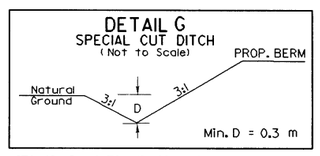
STA. 41+68 TO 42+60 LT
STA. 42+88 TO 43+40 LT

DETAIL FI
SPECIAL CUT BASE DITCH
(Not to Scale)



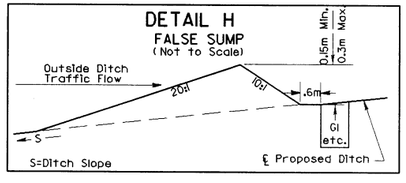
STA. 35+50 TO 38+30 RT DDE= 1205CuM
STA. 41+70 TO 44+20 RT DDE= 545 CuM

DETAIL G
SPECIAL CUT DITCH
(Not to Scale)

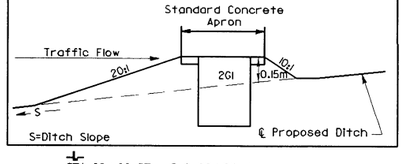


STA. 40+54+/- TO 41+32+/-, RT DDE=84CuM
STA. 40+54+/- TO 41+32+/-, RT DDE=84CuM

DETAIL H
FALSE SUMP
(Not to Scale)



DETAIL I
RAISED 2GIIN DITCH LINE
(Not to Scale)

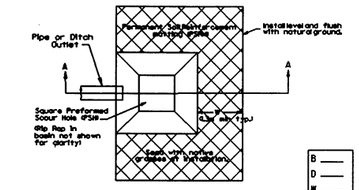


-L-
STA. 18+30 RT.
STA. 18+45 LT.
STA. 19+80 RT.
STA. 20+40 LT.
STA. 21+85 RT.
STA. 24+25 RT.
STA. 25+45 RT.
STA. 25+50 RT.
STA. 26+20 LT.
STA. 26+20 RT.
STA. 27+35 LT.
STA. 27+40 RT.
STA. 28+80 RT.
STA. 28+85 LT.
STA. 30+00 LT.
STA. 33+20 RT.
STA. 33+40 RT.
STA. 37+50 LT.
STA. 38+25 LT.
STA. 38+70 LT.
STA. 39+35 LT.
STA. 40+50 LT.

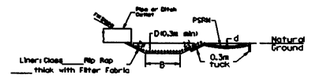
-Y1-
STA. 12+00 RT.

PREFORMED SCOUR HOLE WITH LEVEL SPREADER APRON

PLAN VIEW



SECTION A-A

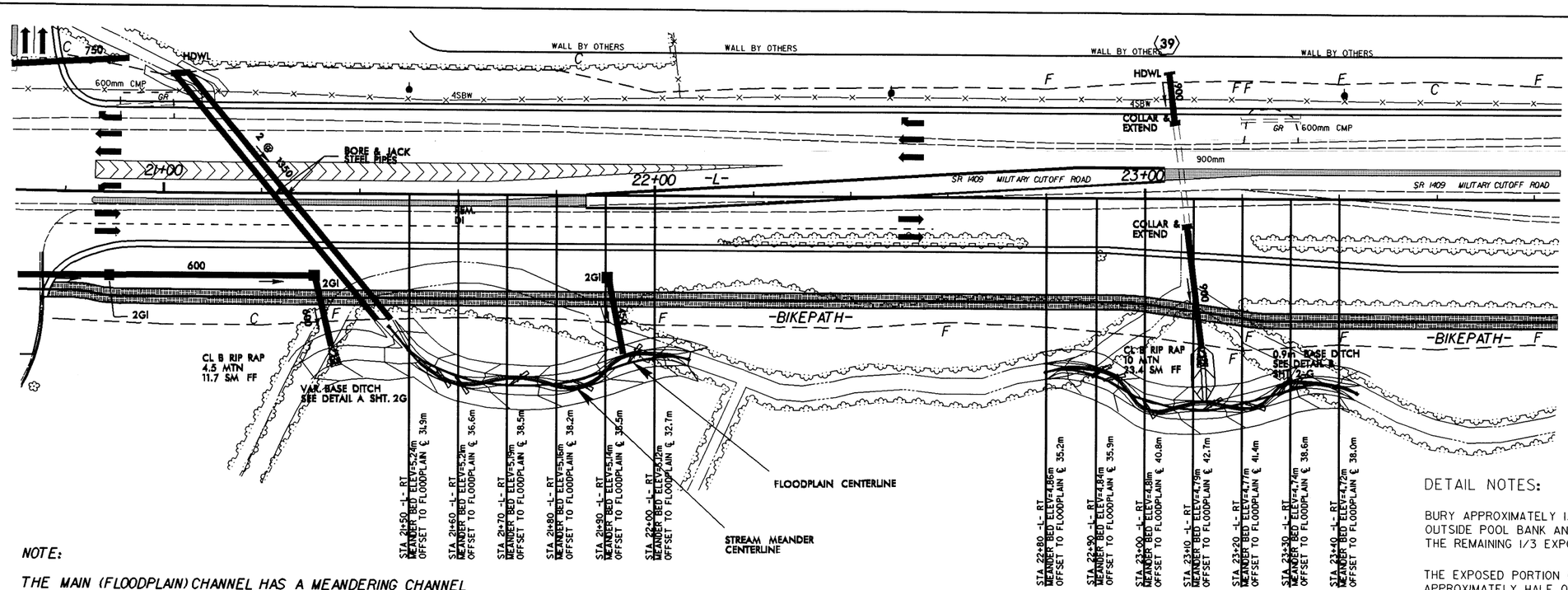


s-AUG-2003 15:46
Ashley AT R:\2734\dgn\2734.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2734	2-H
R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER

METRIC

-5 0 10

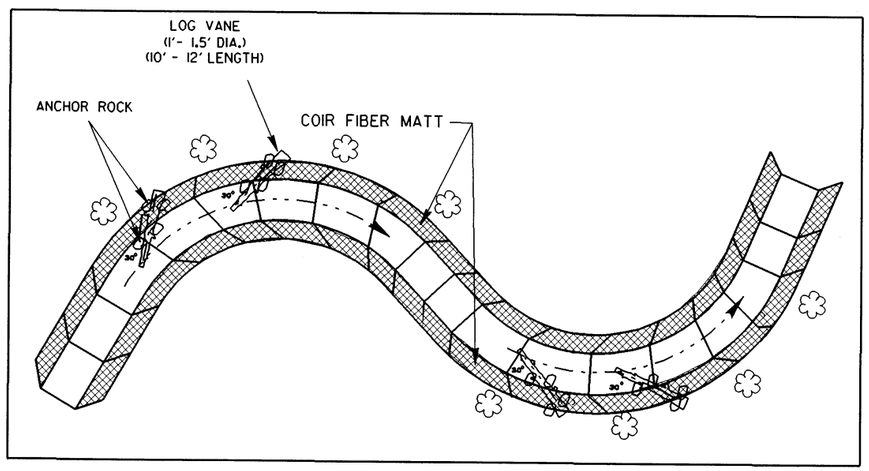


RIGHT OF WAY REVISION 07/16/03 REVISED NATURAL STREAM DESIGN

NOTE:

THE MAIN (FLOODPLAIN) CHANNEL HAS A MEANDERING CHANNEL BETWEEN IT'S BANKS. DISTANCE BETWEEN THE BENDS (RADIUS) IN THE MEANDERING CHANNEL VARY FROM 9.1m TO 12.2m.

BEGIN & END STREAM ELEVATIONS SHOULD BE CHECKED PRIOR TO CONSTRUCTION TO ENSURE PROPOSED STREAM GRADE (AND ELEVATIONS) ARE ACCURATE. ELEVATIONS MAY VARY FROM PRIOR SURVEYS.



DETAIL NOTES:

BURY APPROXIMATELY 1/3 OF LOG VANE LENGTH IN THE OUTSIDE POOL BANK AND 1/3 IN THE STREAM BED, WITH THE REMAINING 1/3 EXPOSED.

THE EXPOSED PORTION OF LOG VANE SHOULD BE APPROXIMATELY HALF OF THE BANKFULL WIDTH

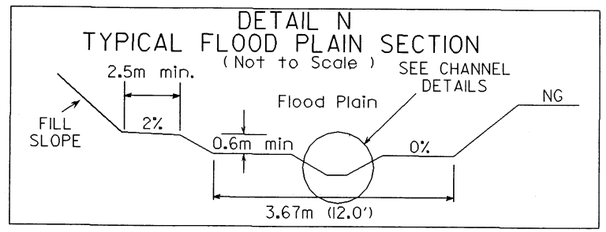
WHEN BACKFILLING OVER AND AROUND LOG VANES AND ANCHOR ROCKS FIRMLY SECURE ALL COMPONENTS INCLUDING JOINTS, CONNECTIONS AND GAPS.

PLANTINGS SHOULD BE PLACED ABOVE BANKFULL DEPTH

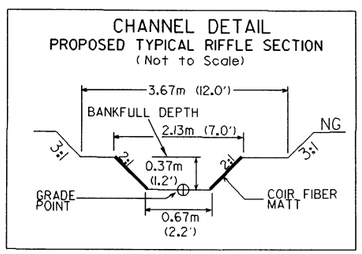
MIN. LOG VANE DIA = 0.3m. UTILIZE LOGS AT SITE.

USE ANCHOR ROCK APPROXIMATELY 100 - 200 LBS.

DETAIL N
TYPICAL FLOOD PLAIN SECTION
(Not to Scale)

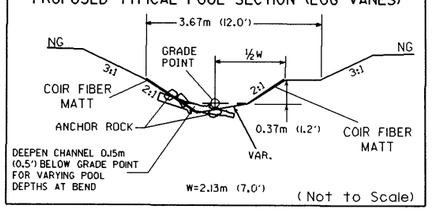


CHANNEL DETAIL
PROPOSED TYPICAL RIFFLE SECTION
(Not to Scale)



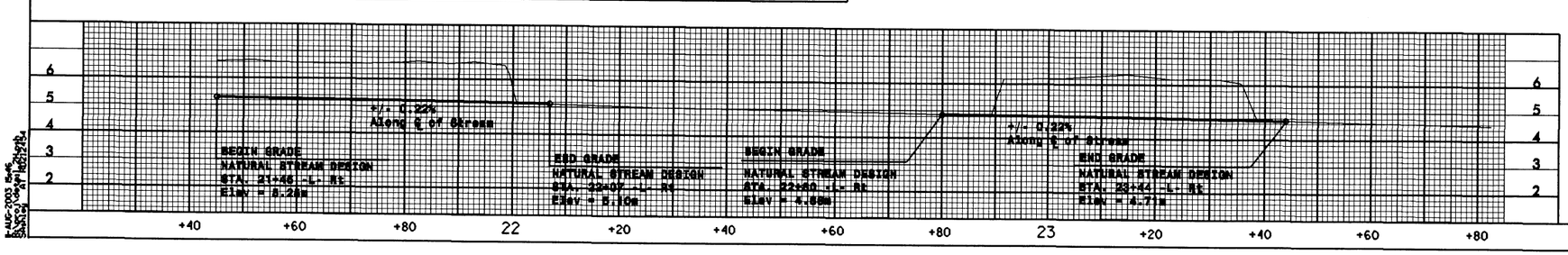
TYPICAL SECTION BETWEEN BENDS

CHANNEL DETAIL
PROPOSED TYPICAL POOL SECTION (LOG VANES)



TYPICAL SECTION AT BENDS

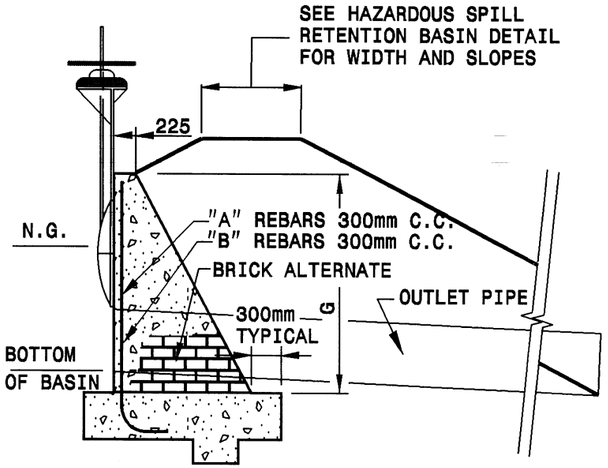
DETAILS OF NATURAL STREAM DESIGN FROM STA 21+46 TO -L- STA 22+07 -L- (RT) & FROM STA 22+80 TO STA 23+44 -L- (RT)



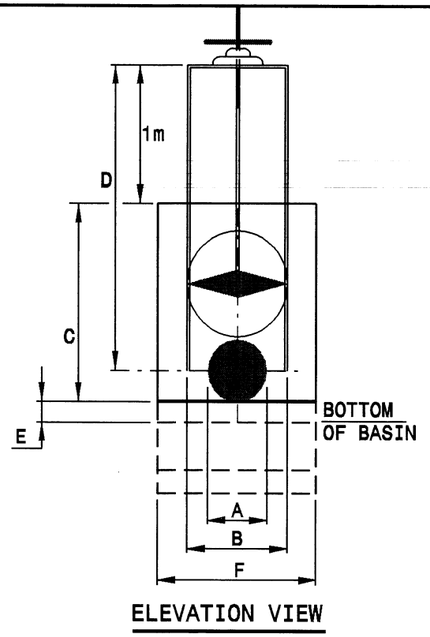
PROJ. REFERENCE NO.	SHEET NO.
U-2734	2-8

METRIC

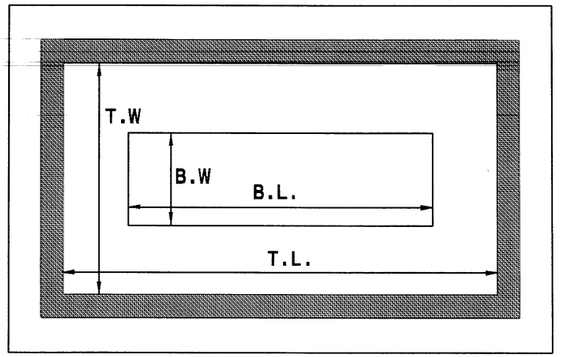
GENERAL NOTES:
1- REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO THE HEADWALL AND SHALL BE PAID FOR ON m^3 BASIS.
2- CONCRETE SHALL BE CLASS "B" THROUGHOUT STRUCTURE.
3- DELETE REINFORCING STEEL WHEN BRICK ALTERNATE IS USED.



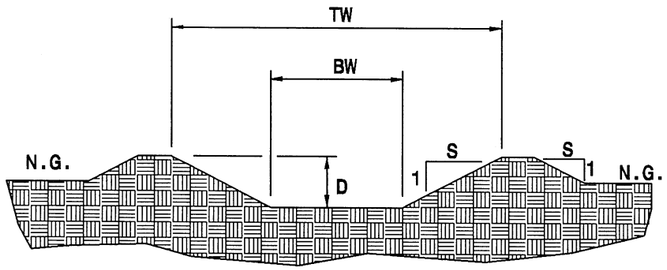
SECTION VIEW



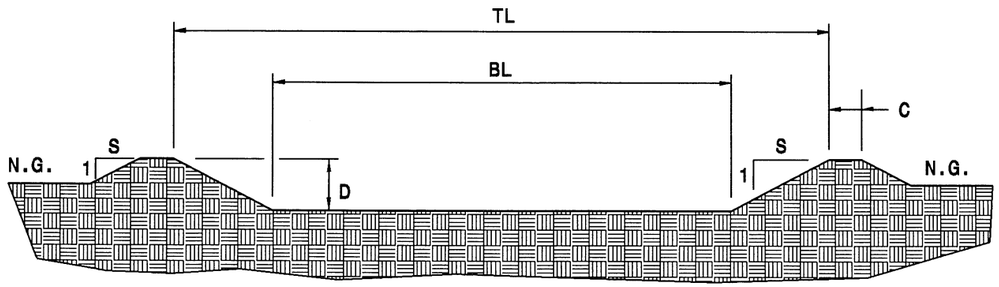
ELEVATION VIEW



PLAN VIEW OF BASIN



CROSS SECTION VIEW OF BASIN



CROSS SECTION VIEW OF BASIN

BASIN #		1	2
SLUICE GATE DIMENSIONS			
PIPE DIAMETER	A	750mm	600mm
GATE DIAMETER	B	970mm	800mm
HEADWALL HT.	C	2.13m	1.75m
FRAME HEIGHT	D	1.50m	1.20m
INVERT HEIGHT	E	100mm	100mm
HEADWALL WIDTH	F	2.80m	2.44m
HEADWALL DIMENSIONS			
PIPE DIAMETER	A	750mm	600mm
HEADWALL HT.	G	1524mm	1270mm

SEE STD. #838.02

HAZARDOUS SPILL RETENTION BASIN													
BASIN #	PIPE SIZE	TOP ELEV.	BOTTOM ELEV	T.W.	B.W.	D	T.L.	B.L.	S	C	*G	CAPACITY	STATION
1	750	6.5	4.2	24	6	2.3	20	38	3	1.0	650m^3	550m^3	-L- 27+40 RT
2	600	6.0	5.0	16	10	1.0	24	18	3	1.0	260m^3	185m^3	-L- 28+60 RT

*G DENOTES EXCAVATION AMOUNT.

NOTE: SEE PLAN SHEET FOR LOCATION OF OUTLET PIPE WITH SLUICE GATE.

** Provided at new and/or improved roadway sections to aid in containment and clean up of accidental spills by truck traffic. Basins are provided in particular locations including areas in proximity to sensitive waters and water supplies.

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

** HAZARDOUS SPILL RETENTION BASIN SEE STD. #838.02

ORIGINAL BY:_____ DATE:_____
MODIFIED BY:_____ DATE:_____
CHECKED BY:_____ DATE:_____
FILE SPEC.:_____

RIGHT OF WAY REVISION 07/16/03: ADDED RT. TURN LANE FROM ACCESS F TO VIKING LN.
EXTENDED 1.2m CONC. ISLAND, ADDED DRIVEWAY AT -L- STA. 13+90 RT.

6/10/99

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "SUNOCO" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING 57788.587(m) EASTING 717720.854(m)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000017460
THE N.C. LAMBERT GRID BEARING LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SUNOCO" TO -L- STATION 13+50.000 IS S 3° 47' 57.570" W 3,681.058m.
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

PROJECT REFERENCE NO.	SHEET NO.
U-2734	4
R/W SHEET NO.	4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST.REV. _____
R/W REV. 07/16/03

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L- STA.13+10.000 BEGIN F.A.PROJECT NHF-1409 (3)
-L- STA.13+10.000 BEGIN STATE PROJECT U-2734

NAD 83

NOTE: SEE SHEET NO.17 FOR -L- PROFILE

-L- STA.12+14.549
BEGIN WIDENING

(1) RICHARD WETHERILL, JR. ET AL
DB 1457 PG 778
DB 1537 PG 5
DB 1637 PG 1056
MB 29 PG 104
MB 31 PG 298

(2) DALLAS HARRIS REAL ESTATE-CONST., INC.
DB 1591 PG 201
DB 1899 PG 329
MB 32 PG 212

(4) MABLE WEEKS
DB 430 PG 417
DB 465 PG 18
DB 522 PG 41

BL-70 PINC 9+34.894=
-L- STA. 15+70.352
11.42m RT.

CAMERON INVESTMENT CO.
DB 1848 PG 343 DB 1857 PG 776
MB 29 PG 16
MB 29 PG 60

FRANK H. KENAN, 1988 TRUST
DB 2078 PG 443
DB 1964 PG 310
DB 1857 PG 776
MB 29 PG 60

(3) NEW HANOVER COUNTY
DB 2283 PG 780
MB 32 PG 342
MB 34 PG 223
MB 34 PG 30

(5) CITY OF WILMINGTON
DB 2061 PG 644
MB 36 PG 82
MB 29 PG 138

(6) EARL M. WORSLEY
DB 2603 PG 053
MB 36 PG 82
MB 34 PG 223

(7) FORUM ONE ASSOC., LLC
DB 1887 PG 28
DB 1910 PG 565
DB 2058 PG 924
MB 33 PG 291
MB 34 PG 354

FORUM TWO ASSOC., LLC
DB 2299 PG 890
DB 2333 PG 520
DB 2625 PG 41
MB 37 PG 281
MB 37 PG 352
MB 39 PG 111

(8)

13.716 (45') PUBLIC R/W DEDICATED TO THE CITY OF WILMINGTON

NOTE: REMOVE EXISTING PAVEMENT UNDER PROPOSED GRASS ISLANDS THRU-OUT PROJECT

LEGEND
- PAVEMENT REMOVAL
- BIKE PATH CONSTRUCTION BY OTHERS
- PROPOSED 125mm CONCRETE MONOLITHIC ISLAND (SURFACE MOUNTED)
- R/W AREA DEDICATED BY OTHERS
- TEMPORARY CONSTRUCTION EASEMENT DEDICATED BY OTHERS
- RIGHT OF WAY DEDICATED BY OTHERS

MATCHLINE SEE SHEET 5

R-MUC-2003.dgn 7/16/2003 3:43:27 PM
Stanley AT 1622124

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	U-2734	5
CONST.REV. _____	R/W SHEET NO.	5
R/W REV. 07/16/03	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOTE: SEE SHEET NO.17 FOR -L- PROFILE
SEE SHEET NO.22 FOR -BIKEPATH- PROFILE
SEE SHEET NO.2-I FOR -BIKEPATH- ALIGNMENT

RIGHT OF WAY REVISION 07/16/03: ADDED RT.TURN LANE FROM ACCESS F TO VIKING LN.
EXTENDED 1.2m CONC.ISLAND.ADDED DRIVEWAY AT -L- STA.13+90 RT.

MATCHLINE SEE SHEET 4

MATCHLINE SEE SHEET 6

-L-
PI Sta 18+85.084
Δ = 1°58'10.8" (RT)
L = 120.149
T = 60.080
R = 3,495.000
SE = NC

BM=91
-BL- STA 10+41.4
40.9m LEFT
R/R SPIKE IN AN 16" PINE TREE
ELEV. 8.650m=
-L- STA. 16+77.016
29.29m LT.

NAD 83

PCSta.18+25.004

PTSta.19+45.153

BL-71 PINC 12+56.283=
-L- STA. 18+91.966
11.533 RT.

ACCESS F

ACCESS E

SR 1409 MILITARY CUTOFF RD

FUTURE ROADWAY USE

DO NOT DISTURB EXIST. CURB

4
MABLE WEEKS
DB 430 PG 417
DB 465 PG 18
DB 522 PG 41

4A
BRODY ZIMMER, LLC
DB 2891 PG 422
121.948 HA

7
FORUM ONE ASSOC., LLC
DB 1887 PG 28
DB 1910 PG 565
DB 2058 PG 924
MB 33 PG 291
MB 34 PG 354

8
FORUM TWO ASSOC., LLC
DB 2299 PG 890
DB 2333 PG 520
DB 2625 PG 41
MB 37 PG 281
MB 37 PG 352
MB 39 PG 111

9
DAVID SWAIN
DB 2026 PG 134
DB 1873 PG 1035
MB 34 PG 354
MB 35 PG 373

10
SWAIN PROPERTIES (BANK OF WILMINGTON), LLC
DB 2824 PG 576
MB 37 PG 281

8
FORUM TWO ASSOC., LLC
DB 2299 PG 890 MB 37 PG 281
DB 2333 PG 520 MB 37 PG 352
DB 2625 PG 41 MB 39 PG 111
5.949 HA

LEGEND
- PAVEMENT REMOVAL
- BIKE PATH CONSTRUCTION BY OTHERS
- PROPOSED 125mm CONCRETE MONOLITHIC ISLAND (SURFACE MOUNTED)
- R/W AREA DEDICATED BY OTHERS
- E — TEMPORARY CONSTRUCTION EASEMENT DEDICATED BY OTHERS
- RIGHT OF WAY DEDICATED BY OTHERS

NOTE:
REMOVE EXISTING PAVEMENT UNDER PROPOSED GRASS ISLANDS THRU-OUT PROJECT

NOTE: UTILITY MARKINGS WAS PART OF INFORMATION COMPILED FROM RECORDS OF VARIOUS UTILITY DEPARTMENT AND/OR PRIVATE COMPANIES. THIS INFORMATION DOES NOT GUARANTEE THAT THESE ARE THE ONLY UTILITIES IN THE AREA, NOR DOES IT GUARANTEE THAT THE UTILITIES SHOWN ARE IN EXACT LOCATION INDICATED. ALTHOUGH IT IS BELIEVED TO BE REASONABLY CORRECT, THE CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO LOCATE UTILITIES SHOWN OR NOT SHOWN.

R-AUG-2003 8:53
Stanley u:\pdfiles\2734.5.pgh

RIGHT OF WAY REVISION 07/16/03: REVISED RIGHT OF WAY FROM STA. -L- 21+18+/- TO -L- STA. 22+20+/- RT.

5/10/93

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	U-2734	6
	R/W SHEET NO.	6
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV. 07/16/03	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

NOTE: REMOVE EXISTING PAVEMENT UNDER PROPOSED GRASS ISLANDS THRU-OUT PROJECT

NAD 83

NOTE: SEE SHEETS NO.17 & 18 FOR -L- PROFILE
SEE SHEET NO.22 FOR -BIKE- PROFILE
SEE SHEET NO.2-H FOR NATURAL STREAM DESIGN DETAILS & PROFILE
SEE DETAIL SHEET NO.2-J FOR -BIKEPATH- ALIGNMENT

4A
BRODY ZIMMER, LLC
DB 2891 PG 422

-L-
PI Sta 20+59.186
Δ = 1°56'02.5" (LT)
L = 117.974
T = 58.992
R = 3,495.000
SE = NC

MATCHLINE SEE SHEET 5

MATCHLINE SEE SHEET 7

PCSta. 20+00.194

PTSta. 21+18.167

BL-72 PINC 14+50.464=
-L- STA. 20+86.070
7.531m RT.

BL-73 PINC 16+15.610=
-L- STA. 22+51.108
3.752m RT.

+72.840
28.500m LT.(93.50')

+00.194
28.500m LT.(93.50')

+18.167
28.500m LT.(93.50')

+95
28.500m LT.(93.50')

+20
28.396m LT.(93.16')

35m R - 10m R
1.5m OFFSET

ACCESS D
10.8m 7.2m

WALL BY OTHERS

120m TAPER

0.9m BASE DITCH
SEE DETAIL B
SHT. 2-G

HDWL

BORE & JACK STEEL PIPES

FUTURE ROADWAY USE

60m TAPER

END PAVEMENT

+60
28m RT.(91.86')
+84
33m RT.
(108.27')

+00.194
30m RT.(98.43')
+53
22m RT.(72.18')
36.500m RT.(119.75')

+53
30m RT.(98.43')
22m RT.(72.18')

TIE TO EXIST. PAVEMENT

+78
30m RT.(98.43')
22m RT.(72.18')
+78
22m RT.(72.18')
36.500m RT.(119.75')

+18.167
30m RT.(98.43')
47m RT.(154.20')

+20
47m RT.(154.20')

+10
56m RT.(183.73')

2.6m BASE DITCH
SEE DETAIL J SHT. 2G

CL B RIP RAP
4.5 MTN
11.7 SM FF

LOG VANES

NATURAL STREAM RELOCATION
SEE DETAILS SHT. 2H

CL B RIP RAP
10 MTN
23.4 SM FF

COLLAR & EXTEND

10 SWAIN PROPERTIES (BANK OF WILMINGTON), LLC
DB 2824 PG 576
MB 37 PG 281

12 TCT OF WILMINGTON, LLC
DB 2518 PG 877
MB 38 PG 190

12 TCT OF WILMINGTON, LLC
DB 2518 PG 877
MB 39 PG 233

8 FORUM TWO ASSOC., LLC
DB 2299 PG 890
DB 2333 PG 520
DB 2625 PG 41
MB 37 PG 281
MB 37 PG 352
MB 39 PG III

11 TRASK/SWAIN ASSOCIATES, LLC
DB 2694 PG 541
MB 39 PG 233

13 RAIFORD G. TRASK, JR.
MB 39 PG 238

LEGEND
- PAVEMENT REMOVAL
- BIKE PATH CONSTRUCTION BY OTHERS
- PROPOSED 125mm CONCRETE MONOLITHIC ISLAND (SURFACE MOUNTED)
- R/W AREA DEDICATED BY OTHERS
- -E- TEMPORARY CONSTRUCTION EASEMENT DEDICATED BY OTHERS
- RIGHT OF WAY DEDICATED BY OTHERS

R-AUC-2703 B5A
U-2734.fcsph
Sashley at 10:21 AM

RIGHT OF WAY REVISION 07/16/03
RIGHT OF WAY FROM -L- STA. 21+18+/- TO -L- STA. 22+20+/- RT.

6/10/03

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	U-2734	7
CONST.REV.	R/W SHEET NO. 7	
R/W REV. 07/16/03	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

NOTE: SEE SHEET NO.18 FOR -L- PROFILE
SEE SHEETS NO.22 & 23 FOR -BIKE- PROFILE
SEE SHEET NO.2-H FOR NATURAL STREAM DESIGN DETAILS & PROFILE
SEE DETAIL SHEET NO.2-K FOR -BIKEPATH- ALIGNMENT

4A
BRODY ZIMMER, LLC
DB 2891 PG 422

NOTE:
REMOVE EXISTING PAVEMENT UNDER PROPOSED GRASS ISLANDS THRU-OUT PROJECT

-L-
PI Sta. 25+03.208
Δ = 2°00'23.5" (LT)
L = 122.397
T = 61.205
R = 3,495.000
SE = NC

NAD 83

PCSta. 24+42.003

BL-74 PINC 18+06.770=
-L- STA. 24+42.253
6.052m RT.

PTSta. 25+64.400

+42.003
28.500m LT.(93.50')

+20
28.396m LT.(93.16')

+08
26.600m LT.(87.27')

+67
21.400m LT.(70.21')

VX 21
WATER
N 55216.535
E 717592.042
EL 6.005
-L- 24+36.81 1.21 RT

VX 26
WATER
N 55400.503
E 717609.236
EL 5.905
-L- 26+21.46 5.17 RT

VX 25
WATER
N 55343.071
E 717603.916
EL 6.02
-L- 25+63.82 3.26 RT

MATCHLINE SEE SHEET 6

MATCHLINE SEE SHEET 8

120m TAPER
WALL BY OTHERS
EXISTING R/W
600mm CMP
300mm DI- PROPOSED
ACCESS C
18m
450 RCP
150mm PVC
70m
150m TAPER
600mm CMP REM.
REMOVE
200 PVC
GRADE TO DRAIN
N 5°23'55.5"E 24+00
N 6°05'16.9"E
N 4°25'44"E
N 3°23'32"E
3.048 (10') BUFFER EASEMENT
400mm PVC DATUM
250mm PVC
60m TAPER
22m
90m
0.9m BASE DITCH SEE DETAIL B SHT. 2-G
0.6m BASE DITCH SEE DETAIL E SHT. 2-G
CL B RIP RAP 2.7 MTN FF 8.4 SM
AIR RELEASE/VACUUM VALVE
FUTURE ROADWAY USE
30m TAPER
450
750
4.5m 4.5m
END PAVEMENT
+52.250
32m RT.
(104.99')
+52.250
53m RT.(173.88')
+52.250
41m RT.(134.51')
+73
30m RT.(98.43')
+64.400
30m RT.(98.43')
+80
49m RT.(160.76')
61m RT.(200.13')
Ret. PDE
PDE
250mm PVC
9.144 (30') UTILITY EASEMENT
2500mm PVC
CUTOFF RD
MIDDLE

BM#92
-BL- STA 17+49.3
6.6m RIGHT
R/R SPIKE IN SAN. 28" PINE TREE
ELEV. 6.686m=
-L- STA. 23+84.728
13.193m RT.

THE GREENWOOD GROUP, INC.
DB 2706 PG 340
MB 38 PG 190

RAIFORD G. TRASK, JR.
MB 39 PG 238 686m=

RAIFORD G. TRASK, JR.
MB 39 PG 238

RAIFORD G. TRASK, JR.
DB 430 PG 449
DB 582 PG 204
DB 1494 PG 1004
DB 1764 PG 361
DB 864 PG 295
DB 1910 PG 565
DB 2058 PG 924
MB 29 PG 138
MB 33 PG 291
MB 34 PG 354
MB 35 PG 373
MB 39 PG 238

LEGEND
- PAVEMENT REMOVAL
- BIKE PATH CONSTRUCTION BY OTHERS
- PROPOSED 125mm CONCRETE MONOLITHIC ISLAND (SURFACE MOUNTED)
- R/W AREA DEDICATED BY OTHERS
- -E- TEMPORARY CONSTRUCTION EASEMENT DEDICATED BY OTHERS
- RIGHT OF WAY DEDICATED BY OTHERS

8-AUG-2003 8:51
Stanley
N:\DESIGN\2734_7.dgn

5/20/93

RIGHT OF WAY REVISION 7/16/93
EXTENDED TO CE FROM 29+40 TO 27+80 LT.

PROJECT REFERENCE NO.	SHEET NO.
U-2734	8
R/W SHEET NO.	8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC
5 0 10
CONST.REV. _____
R/W REV. 07/16/03

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LEGEND
- PAVEMENT REMOVAL
- BIKE PATH CONSTRUCTION BY OTHERS
- PROPOSED 125mm CONCRETE MONOLITHIC ISLAND (SURFACE MOUNTED)
- R/W AREA DEDICATED BY OTHERS
- -E- TEMPORARY CONSTRUCTION EASEMENT DEDICATED BY OTHERS
- RIGHT OF WAY DEDICATED BY OTHERS

NOTE: SEE SHEETS NO.18 & 19 FOR -L- PROFILE
SEE SHEET NO.23 FOR -BIKE- PROFILE
SEE SHEET NO.2-K FOR -BIKE- ALIGNMENT
SEE SHEET NO.2-N FOR HAZARDOUS SPILL RETENTION BASIN

NOTE: REMOVE EXISTING PAVEMENT UNDER PROPOSED GRASS ISLANDS THRU-OUT PROJECT

NAD 83

-L-
PI Sta 30+38.034
Δ = 2° 55' 51.5" (RT)
L = 460.397
T = 230.249
R = 9,000.000
SE = NC

MATCHLINE SEE SHEET 7

MATCHLINE SEE SHEET 9

BRODY ZIMMER, LLC
DB 2891 PG 422

(15) W. ALLEN COBB, JR.
DB 1536 PG 714

(4A) BRODY ZIMMER, LLC
DB 2891 PG 422

ACCESS B

WALL BY OTHERS

400 RCP

40m UNIFORM TAPER LEFT AND RIGHT

EXISTING R/W

45BW

20m

10.8m

13.825m

27+00

30.480 EOP EOT

025

12 BST

N 3° 23' 32.0" E

BUCKEY CUTOFF RD

7.4m BST

GRADE TO DRAIN SEE BIKEPATH PROFILE

2GI (51)

FUTURE ROADWAY USE

750

(50)

GATE

30m R - 12m R
2m OFFSET

1200mm CHAIN LINK FENCE FOR HAZARDOUS SPILL BASINS LOCATION TO BE DETERMINED IN THE FIELD BY THE ENGINEER

VX 28
WATER
N 55469.054
E 717615.694
EL 6.02
-L- 26+90.27 7.55 RT

(52) CL B RIP RAP 4.5 MTN 13.4 SM FF

(53) SLUICE GATE WITH RISER

750 RCP

CL B RIP RAP: 4.5 MTN 13.4 SM FF 0.6 BASE DITCH

HAZARDOUS SPILL BASIN

+22 30m RT.(98.43') 81m RT.(265.75')

+65 81m RT.(265.75')

+70 65m RT.(213.25')

+95 52m RT.(170.60')

+73 30m RT.(98.43') 52m RT.(170.60')

CL B RIP RAP 2.7 MTN 9.2 SM FF

(13) RAIFORD G. TRASK, JR.

DB 430	PG 449	DB 2058	PG 924
DB 582	PG 204	MB 29	PG 138
DB 1494	PG 1004	MB 33	PG 291
DB 1764	PG 361	MB 34	PG 354
DB 864	PG 295	MB 35	PG 373
DB 1910	PG 565	MB 39	PG 238

PC Sta. 28+07.785

BL-34 PINC 21+77.979=
-L- STA. 28+13.222
10.628m RT.

+80 24m & 19m LT. (78.74' & 82.34')

+07.785 19m LT.(62.34')

+40 19m LT.(62.34')

VX 38
WATER
N 55573.492
E 717625.194
EL 5.570
-L- 27+95.09 10.86 RT

BORE AND JACK STEEL PIPE

PIPE 33
WATER
N 55607.676
E 717628.601
EL 5.885
-L- 28+29.44 12.38RT

CAT-1

SILL

GRAU-350

28+00

N 4° 25' 44" E

-L- STA. 28+13
2 @ 2.7m x 2.1m RCBC 90 SKEW

N 5° 27' 09.3" E

FALSE SUMP SEE DETAIL "H"

OUTLET CHANNEL SEE DETAIL C SHT. 2-G

PREFORMED SCOUR HOLE

HAZARDOUS SPILL BASIN

SLUICE GATE WITH RISER

(57) (58)

600

BORE AND JACK STEEL PIPE

+40 24m LT.(78.74')

40m UNIFORM TAPER LEFT AND RIGHT

(56) (55)

(60) 2GI

REM.

RIP RAP

600mm CONC

29+00

(59)

END PAVEMENT

375

(61) 2GI 450

600mm CONC REM.

VX 37
GAS
N 55780.329
E 717619.404
EL 6.66
-L- 30+01.04 9.23 LT

(63) 2GI

30+00

30.480 (100')

SR 1409 MILITARY CUTOFF RD

7.3m BST

600mm CONC

(62) 2GI

400 mm PVC

EXISTING R/W

4.572 (15') PRIVACY WALL MAINTENANCE EASEMENT

WD POST

BK WALL

VX 36
WATER
N 55657.823
E 717633.398
EL 6.090
-L- 28+79.87 13.77 RT

1200mm CHAIN LINK FENCE FOR HAZARDOUS SPILL BASINS LOCATION TO BE DETERMINED IN THE FIELD BY THE ENGINEER

+41 30m RT.(98.43') 2.338

+51 25.500m RT.(83.66')

CARROLL THOMAS
DB 2955 PG 266
DO NOT DISTURB EXIST. WALL

JOHN E. FAIRCLOTH
DB 3060 PG 385

VX 38
WATER
N 55775.582
E 717644.805
EL 6.445
-L- 29+98.35 16.47 RT

JASON R. THOMPSON
DB 3241 PG 307

(16-A) (16-B) (16-C) (16-D) (16)

S & S DEVELOPERS, INC.
DB 3371 PG 304

S & S DEVELOPERS, INC.
DB 1782 PG 1106
DB 2059 PG 484
MB 34 PG 256

S44°55'13"E 2.338
N45°04'47"E 54.487
S44°55'13"E 45.720
S84°38'13"E 45.720
N44°55'13"W 29.584
N50°52'00"E 56.454

E-AUG-2003 15:54
Stahley a:\u2734_8.psh

5/10/99

RIGHT OF WAY REVISION 7/16/03
ELIMINATED TCE ON PARCEL 16-M,16-N,16-O, AND 17

NOTE: SEE SHEET NO.19 FOR -L- PROFILE
SEE SHEETS NO.23 & 24 FOR -BIKE- PROFILE
SEE SHEET NO.25 FOR -Y3- & -Y4- PROFILES
SEE DETAIL SHEET 2L & 2M FOR -BIKEPATH- ALIGNMENT
(4A) SEE SHEET 2-N FOR INTERSECTION DETAIL OF -Y3-
SEE SHEET 2-W FOR 600mm SLOPED CURB DETAIL.

BRODY ZIMMER, LLC
DB 2891 PG 422

NAD 83

-L-	
PI Sta 30+38.034	PI Sta 35+26.422
Δ = 2° 55' 51.5" (RT)	Δ = 5° 18' 10.7" (LT)
L = 460.397	L = 323.478
T = 230.249	T = 161.854
R = 9,000.000	R = 3,495.000
SE = NC	SE = NC

LEGEND
- PAVEMENT REMOVAL
- BIKE PATH CONSTRUCTION BY OTHERS
- PROPOSED 125mm CONCRETE MONOLITHIC ISLAND (SURFACE MOUNTED)
- R/W AREA DEDICATED BY OTHERS
- -E- TEMPORARY CONSTRUCTION EASEMENT DEDICATED BY OTHERS
- BY OTHERS R/W RIGHT OF WAY DEDICATED BY OTHERS

METRIC

PROJECT REFERENCE NO.	SHEET NO.
U-2734	9
R/W SHEET NO.	9

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

CONST.REV.

R/W REV. 07/16/03

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOTE:
REMOVE EXISTING PAVEMENT UNDER PROPOSED GRASS ISLANDS THRU-OUT PROJECT

MATCHLINE SEE SHEET 8

BL-35 PINC 24+14.669=
-L- STA. 30+50.203
15.88m RT.
A 24+63.8
26.3m LEFT
R/R SPIKE IN AN 12" PINE TREE
ELEV. 8.608m=
LEV. 8.608m=
LEV. 8.608m=

+85 23m LT.(75.46')
+16 19m LT.(62.34')
+60 19m LT.(62.34')

VX 39
WATER
N 5593.640
E 717661.346
EL 6.77
-L- 31+77.51 16.88 RT

BL-36 PINC 26+61.618=
-L- STA. 32+97.534
14.668m RT.

PT Sta. 32+68.183

ACCESS A

-L- POT Sta. 32+80.204 =
-Y3- POT Sta. 10+00.000

+64.568 24m LT.(78.74')
+88 29m LT.(95.14')

UNITED CEREBRAL PALSY OF N.C.
DB 1559 PG 1426
DB 2556 PG 212
1.20 HA
19

PC Sta. 33+64.568

0.6m BASE DITCH SEE DETAIL A SHT. 2-G

EXISTING R/W

31+00 | 32+00 | 33+00 | 34+00

-L-

600mm CMP

GRADE TO DRAIN

-BIKEPATH- N 5° 27' 09.3" E

FUTURE ROADWAY USE

N 5° 25' 49.9" E

-BIKEPATH-

REM. OR FILL

N 6° 19' 23.5" E

-Y3- N 34° 36' 58.3" E

300mm X 3400mm CONC. RET.

1050mm CONC RET. 30.480 (100')

REM. HDWL

HDWL

375 N 4° 40' 28.0" E 2GI

COLLAR MIN. DEPTH

1050

2250mm BK WALL

4.572 (15') PRIVACY WALL & MAINTENANCE EASEMENT

LANDSCAPED AREA SEE SHT. 2-G

SIGN EASEMENT

CONC DRIVE

-L- +08
24.750m RT.(81.20')

-Y3- +33
16m LT.(52.49')

CL B RIP RAP
1.8 MTN
+40 5.9 SM FF
30m LT.(98.43')
+37.500
24.300m LT.(79.72')

CL I RIP RAP
36 MTN
65 SM FF

-L- +51.500
25.750m RT.(84.48')

+29.500
26m RT.(85.30')
27m RT.(88.58')

-Y3- PC Sta. 10+23.673

-Y3- +36.750
13.500m RT.(44.29')

-Y3- +38.500
13.500m RT.(44.29')

-Y3- +86.500
13.500m RT.(44.29')

-Y3- +00
EXIST. R/W

-Y3- +87
16m LT.(52.49')

-Y3- +00
EXIST. R/W

-Y3- POC Sta. 11+00

-Y3- PT Sta. 11+25.304

-Y4- POT Sta. 10+99.016

END CONSTRUCTION

MABLE WEEKS
DB 430 PG 417
DB 465 PG 18
DB 522 PG 41
17

FRED J. MATT
DB 2867 PG 933
18

WILBUR J. TAYLOR, III
DB 3371 PG 307

S&S DEVELOPERS, INC.
DB 2059 PG 484
DB 1782 PG 1106
MB 34 PG 256

S&S DEVELOPERS, INC.
DB 1782 PG 1106
DB 2059 PG 484
MB 34 PG 256

DO NOT DISTURB EXIST. WALL

STEVENS LIMITED, LLC
DB 3311 PG 324

STEVENS BUILDING CO.
DB 3284 PG 357

CHARLES M. GODWIN
DB 3282 PG 115

KAREN L. DAVIS
DB 2912 PG 568

DEREK D. WRIGHT
DB 2317 PG 76
2 S F D (W/D)

S&S DEVELOPERS, INC.
DB 2059 PG 484

S & S DEVELOPERS, INC.
DB 1782 PG 1106
DB 2059 PG 484
MB 34 PG 256

-Y3-
PI Sta 10+78.132
Δ = 50° 59' 40.7" (RT)
L = 101.630
T = 54.458
R = 114.188
SE = .02

SR 1409
MILITARY CUTOFF ROAD

32,600			32,300
54,400			54,200
400			100
400		CAYMON COURT	200
2003 ADT			500
2023 ADT			600

MATCHLINE SEE SHEET 10

16-D | 16-E | 16-F | 16-G | 16-H | 16-I | 16-J | 16-K | 16-L | 16-M | 16-N | 16-O | 16

PROJECT REFERENCE NO.	SHEET NO.
U-2734	10
R/W SHEET NO.	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST.REV.	
R/W REV.	

METRIC 5 0 10

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

NOTE: SEE SHEETS NO.19 & 20 FOR -L- PROFILE
SEE SHEET NO.24 FOR -BIKE- PROFILE
SEE SHEET NO.25 FOR -Y4- PROFILE
SEE DETAIL SHEET 2-M FOR -BIKEPATH- ALIGNMENT
SEE SHEET 2-N FOR INTERSECTION DETAIL OF -Y4-

BRODY ZIMMER, LLC
DB 2891 PG 422

4A

-L-
PI Sta 35+26.422
Δ = 5° 18' 10.7" (LT)
L = 323.478
T = 161.854
R = 3,495.000
SE = NC

WOODS

102.254
S05°14'50"W

ACCESS EASEMENT

-Y4- PCSta.10+13.022

PLAY GROUND

1200mm WD

1800mm CONC

1 S F BUS

2400mm CONC

450mm CONC

150mm CONC CURB

LIFT STATION

19
UNITED CEREBRAL PALSY OF N.C.
DB 1559 PG 1426
DB 2556 PG 212
1.20 HA

-L- POCSta. 34+45.000 =
-Y4- PCTSta. 10+00.000

0.6m BASE DITCH
SEE DETAIL A SHT. 2-G

BUFFER AREA

9.144 (30') DRAINAGE EASEMENT

WOOD SHED

PHYLLIS M. TRASK
DB 2458 PG 493

JAMES L. PRINCE, JR.
DB 3020 PG 196

WILLIAM A. MERLACK
DB 2649 PG 645

JO ANNE E. HARVEY
DB 2827 PG 321

FRANK J. KOVALESKEY
DB 2693 PG 905

SANDCASTLE COURT

15,240 (50') PRIVATE R/W

21
DALLAS HARRIS LAND CO. LLC
DB 2273 PG 374
UNDER CONSTRUCTION
MB 39 PG 54

-L- PTSta.36+88.045

+00 22m LT.(72.18')
+12.300 16m LT.(52.49')
+26 17.700m LT.(58.07')
+42 22m LT.(72.18')
+04 16.750m LT.(54.95')

NO NOT DISTURB
EXIST. FENCE

1 SFD

BRICK PATIO

WOOD GUARD POST

MATCHLINE SEE SHEET 9

MATCHLINE SEE SHEET 11

SR 1409 MILITARY CUTOFF RD

60m TAPER
30m TAPER
ABOVE GROUND POOL
EXISTING R/W
ACCESS EASEMENT
7.6m
GRADE TO DRAIN
60m TAPER
HDWL
72
+16
35+00
REM.
34+00
36+00
37+00
-L-
N 1° 05' 03.2" E
GRADE TO DRAIN TO RIGHT C&G
REM. OR FILL
END PAVEMENT
GRADE TO DRAIN TO RIGHT C&G
375 RCP
CB 79
81
82
85
86
FUTURE ROADWAY USE
30m TAPER
30m-BIKEPATH-
1050 RCP
CB 71
CB 76
CB 80
CB 77
CB 78
N 4° 40' 28.0" E
N 1° 05' 03.2" E
28m R - 12m R
2m OFFSET
EXISTING R/W
OBLITERATE
400 mm
450mm CONC
10m R
375 RCP
+44.764
BEGIN C&G
& END P.S.
-Y4- +48.750
EXIST.R/W
-Y4- +63.5
EXIST.R/W
-Y4- +38.322
BEGIN P.S.15m LT.(49.2')
-Y4- EXIST.R/W
-Y4- PTSta.10+48.233
-Y4- +48.233
15m LT.(49.2')
35' RT 52.5' E
60m TAPER
CONC PAD
-Y4- +80
EXIST.R/W
END CONSTRUCTION
-Y4- POTSta.10+80.000
FRED J. MATT
DB 2867 PG 933
18
VX 44
WATER
N 56221.956
E 717686.978
EL 7.184
-L- 35+46.78 12.34 RT
VX 45
WATER
N 56278.387
E 717688.822
EL 7.335
-L- 35+03.05 11.63 RT
BL-37 PINC 28+96.747=
-L- STA. 35+32.058
11.929m RT.
+62.923
+EX.R/W MON.
EX.R/W
+04
22mRT(72.18')
+40
22m RT.(72.18')
+70.432
END C&G
+77.933
BEGIN C&G
+60
24m RT.(78.74')
SS FORCED MAIN
N 56363.956
E 717694.324
EL 7.195
-L- 35+88.51 12.12 RT
+88.045
28.500m RT.(93.50')
VX 48
SS FORCED MAIN
N 56423.555
E 717695.351
EL 7.275
-L- 36+47.91 10.89 RT
VX 49
SS FORCED MAIN
N 56526.068
E 717696.913
EL 7.215
-L- 37+49.31 10.41 RT
SEPTIC DRAIN FIELD
WOODS
WOOD GUARD POST
STORM WATER INFILTRATION SWALE
SEE DETAIL F1 SHT. 2-G
17 = MABLE D. WEEKS
NOTE: 375mm PIPE WILL HAVE 1.8 MTN. OF CL. B RIP RAP AND 5.9 SM OF FF.
22
CAROLINA POWER & LIGHT CO.
DB 958 PG 574
MB 10 PG 37
I S M BUS
2 S BLK BUS
I S BLK BUS
RADIUS PT.
20
WILLIAM B. TOWLES
MB 10 PG 37
DB 1335 PG 19
I S BLK BUS
RUN OF SALLY MARTIN BRANCH
N74°01'02"E 23.420
S45°00'29"E 15.270
S45°00'29"E 48.285
S41°30'27"E 25.446
N74°33'08"E 9.662
300mm CMP
600mm WD
600mm CMP
NB2°00'29"W 65.548
AREA OF OVERLAP
S45°48'29"E 38.66m
2400mm WOOD
S52°15'51"E 30.441m
N61°42'27"W 35.755m
N63°58'42"E 26.578m
N26°54'16"W 26.773m
N14°14'51"W 29.897m
N01°26'03"W 22.063m
N38°58'45"E 24.508m
2400mm CMP
1800mm CMP
1800mm CMP
1050 RCP
600mm CONC
BST
SOIL
CAR-PORT
I S F D
CONC
WOODS
LT
RT
EP
EOP
CL
CB
DI
REM.
EXIST.
PROP.
TYP.
SS
WD
CONC
BST
SOIL
CAR-PORT
I S F D
CONC
WOODS
LT
RT
EP
EOP
CL
CB
DI
REM.
EXIST.
PROP.
TYP.
SS
WD
CONC

-Y4-
PI Sta 10+31.254
Δ = 36° 40' 50.9" (RT)
L = 35.211
T = 18.233
R = 55.000
SE = .03

NOTE:
REMOVE EXISTING PAVEMENT UNDER PROPOSED GRASS ISLANDS THRU-OUT PROJECT

LEGEND
PAVEMENT REMOVAL
BIKE PATH CONSTRUCTION BY OTHERS
PROPOSED 125mm CONCRETE MONOLITHIC ISLAND (SURFACE MOUNTED)

SR 1409
MILITARY CUTOFF ROAD

32,300 / 54,200		32,300 / 54,000
50 / 300	STATION ROAD SR 1411	50 / 100
2003 ADT / 2023 ADT		100 / 400

5/10/99

P-AUC-2003 6:55
Stanley at 10231454
U-2734_18.esh

PROJECT REFERENCE NO.	SHEET NO.
U-2734	11
R/W SHEET NO.	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV. _____

R/W REV. _____

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

6/10/99

2003 ADT	STATION ROAD	3,600
2023 ADT		9,500
2,700		900
7,100		2,400
32,300		30,500
54,000		49,300

MILITARY CUTOFF ROAD
SR 1409

NAD 83

-Y11-
PI Sta. 10+22.409
Δ = 9°41'13.5" (LT)
D = 29.588
T = 14.829
R = 175.000

MATCHLINE SEE SHEET 10

MATCHLINE SEE SHEET 12

BEGIN CONSTRUCTION -Y10- POT Sta. 9+80.000

BEGIN CONSTRUCTION -Y11- POC Sta. 10+29.061

END CONSTRUCTION -Y10- POT Sta. 11+31.004

END PAVEMENT

-Y10- POT Sta. 11+59.973

-L- POT Sta. 39+02.830

-Y10- POT Sta. 10+58.107

-Y11- POT Sta. 10+63.235

-Y11- POT Sta. 10+00.000

-Y11- PCS Sta. 10+07.580

-Y11- PT Sta. 10+37.168

-L- POT Sta. 37+94.198

-L- STA. 37+93.479

-L- STA. 40+34.332

21 DALLAS HARRIS LAND CO. LLC
DB 2273 PG 374
MB 39 PG 54

22 CAROLINA POWER & LIGHT CO.
DB 958 PG 574
MB 10 PG 37
BL-75 PINC 31+58.648
BL-75
-L- STA. 37+93.479
8.729m RT.

23 SHIRLEY NORRIS
DB 1807 PG 191
MB 10 PG 37

24 DELORIS G. EARWOOD
DB 1262 PG 572
MB 10 PG 37

25 ROBERT W. FAIRCLOTH
DB 1196 PG 213
MB 10 PG 37

26 BEN C. USSERY
DB 953 PG 587
DB 2014 PG 390
MB 10 PG 37

27 JUANITA E. GIBSON
DB 860 PG 852
MB 10 PG 37

28 PATRICIA G. HOWARD
DB 2112 PG 927
MB 10 PG 37

29 DEBORAH B. TAYLOR
DB 1252 PG 1131

30 FRANCIS A. WASCHAK
DB 1156 PG 1346
MB 10 PG 37

31 EDSEL R. THORNTON
DB 2111 PG 4
MB 10 PG 37

32 LANDFALL ASSOCIATES
DB 1389 PG 380
DB 1630 PG 1654
DB 1389 PG 374 MB 27 PG 69
MB 27 PG 142 MB 27 PG 70

33 GULF, WORSLEY & COWPER PROPERTIES, LLC.
DB 2353 PG 824

34 PEACE BAPTIST CHURCH, INC.
DB 1100 PG 468
DB 1887 PG 495

35 DLH DEVELOPMENT CO., L.L.C.
DB 1918 PG 46
MB 33 PG 316

LANDFALL ASSOCIATES
DB 1389 PG 380
DB 1630 PG 1654
DB 1389 PG 374
MB 27 PG 142
MB 27 PG 69
MB 27 PG 70

BUFFER AREA

CL B RIP RAP 4.5 MTN 11.7 SM FF

CL B RIP RAP 1.8 MTN 5.9 SM FF

REMOVE EXIST. BRICK AS NECESSARY DURING CONSTRUCTION & REUSE

FUTURE ROADWAY USE

DO NOT DISTURB EXIST. WALL

STORM WATER INFILTRATION SWALE SEE DETAIL F1 SHT. 2-G

STORM WATER INFILTRATION SWALE SEE DETAIL G SHT. 2-G

2003 ADT	SR 1889 WESTWOOD DRIVE	250
2023 ADT		560
125		125
280		280
30,500	SR 1409 MILITARY CUTOFF ROAD	30,500
49,300		49,300
125		125
280		280
	SR 1889 WESTWOOD DRIVE	250
		560

NOTE:
REMOVE EXISTING PAVEMENT UNDER PROPOSED GRASS ISLANDS THRU-OUT PROJECT

LEGEND
- PAVEMENT REMOVAL
- BIKE PATH CONSTRUCTION BY OTHERS
- PROPOSED 125mm CONCRETE MONOLITHIC ISLAND (SURFACE MOUNTED)

SR 1409 MILITARY CUTOFF ROAD		
30,500		29,500
49,300		47,400
2,200	ARBORETUM DRIVE	1,200
3,800		1,900
2003 ADT		3,400
2023 ADT		5,700

NOTE: SEE SHEET NO. 20 FOR -L- PROFILE
SEE SHEET NO. 25 FOR -Y10- PROFILE
SEE SHEET 2-O FOR INTERSECTION DETAIL OF -Y10- & -Y11-

R-2734 11.dgn
Stanley at 10/27/99 8:55

6/10/99

PROJECT REFERENCE NO.	SHEET NO.
U-2734	12
R/W SHEET NO.	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC 5 0 10

CONST.REV. _____

R/W REV. _____

PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION

SR 1409 MILITARY CUTOFF ROAD		
29,500		27,300
47,400		44,100
4,800		2,600
7,400		4,100
2003 ADT	SR 1940 COVIL FARM ROAD	7,400
2023 ADT		11,500

SR 1409 MILITARY CUTOFF ROAD		
27,300		27,100
44,100		43,700
600		400
800		400
2003 ADT	PARADISE WAY	1,000
2023 ADT		1,200

-L-
PI Sta 45+08.549
Δ = 1° 45' 16.2" (LT)
L = 107.023
T = 53.516
R = 3,495.000
SE = NC

NOTE: SEE SHEETS NO.20 & 21 FOR -L- PROFILE
SEE SHEET NO.25 FOR -Y5- PROFILE
SEE SHEET NO.26 FOR -Y13- PROFILE
SEE SHEET NO.3-P FOR INTERSECTION DETAIL OF -Y13- & -Y5-

NAD 83

(38) WILLIAM B. TOWLES DB 761 PG 453 DB 1335 PG 19

6,096 PERMANENT SANITARY SEWER EASEMENT

(40) OGDEN ASSOCIATES DB 2690 PG 425 DB 2664 PG 677

BM#95 -BL- STA 37+22.3 58.8m LEFT R/R SPIKE IN AN 18" PINE TREE ELEV. 12.438m

BY-79 PINC 35+04.541
-BY5- POT 5+00.000
BY-79 / -BY5-
-L- 41+39.341
13.297m RT.

-L- POT Sta. 41+54.073 = -Y5- POT Sta. 10+00.000

(34) PEACE BAPTIST CHURCH, INC. DB 1100 PG 468 DB 1887 PG 495

NOTE: REMOVE EXISTING PAVEMENT UNDER PROPOSED GRASS ISLANDS THRU-OUT PROJECT

BL-76 PINC 36+23.559
BL-76 PINC
-L- 42+58.285
9.107m RT.

STORM WATER INFILTRATION SWALE SEE DETAIL F SHT. 2-G

-L- POT Sta. 43+53.293 = -Y13- POT Sta. 10+00.000

-L- +58.765 BEGIN C&G

DO NOT DISTURB EXIST CURB

+20.500 2lm LT.(68.90')

PCS Sta. 44+55.033 EX.R/W

END C&G +39.798

(35) DLH DEVELOPMENT CO., L.L.C. DB 1918 PG 46 MB 33 PG 316

(36) JANE M. SIDBURY DB 2388 PG 914 MB 33 PG 209

DO NOT DISTURB EX. FENCE

(37) DALLAS HARRIS LAND CO., L.L.C. DB 2179 PG 465 MB 33 PG 316

(39) D.L.H. DEVELOPMENT CO., LLC DB 1918 PG 46

(41) OGDEN VOL. RESCUE SQUAD DB 845 PG 1873

-Y5- PCSta. 10+18.283

-Y5- PTSta. 10+84.526

-Y13- POT Sta. 10+79.288

END CONSTRUCTION -Y13- POT Sta. 10+42.135

BL-43 PINC 37+27.640
BL-43
-L- STA. 43+62.360
10.268m RT.

MATCHLINE SEE SHEET 11

MATCHLINE SEE SHEET 16

MATCHLINE SEE SHEET 13

-Y5-
PI Sta 10+51.810
Δ = 21° 48' 03.3" (LT)
L = 66.243
T = 33.527
R = 174.096
SE = .04

NOTE: 375mm PIPE WILL HAVE 1.8 MTN. OF CL. B RIP RAP AND 5.9 SM OF FF.

LEGEND
- PAVEMENT REMOVAL
- BIKE PATH CONSTRUCTION BY OTHERS
- PROPOSED 125mm CONCRETE MONOLITHIC ISLAND (SURFACE MOUNTED)

8-AUG-2000 8:57
Stanley M:\ROADWAY\2734_12.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2734	13
R/W SHEET NO.	13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC 5 0 10

CONST.REV. --------

R/W REV. 06/23/03

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

6/10/03

NAD 83

2003 ADT 10,200
2023 ADT 18,200

SR 2048 GORDON ROAD

9,700 / 16,500 — 500 / 1,700

27,100 / 43,700 — 17,900 / 28,900

MILITARY CUTOFF ROAD
SR 1409

-L-
PI Sta 48+89.380
Δ = 13° 12' 53.6" (RT)
L = 201.813
T = 101.356
R = 875.000
SE = 0.035

ZIMMER COMMERCIAL PROPERTIES, LLC
DB 2093 PG 123
DB 2614 PG 594

(40) OGDEN ASSOCIATES
DB 2690 PG 425
DB 2664 PG 677

(41) OGDEN VOL. RESCUE SQUAD
DB 1145 PG 1873

(42) MELBA FAYE HEFELFINGER
DB 1039 PG 532
MB 4 PG 96

(43)

(44) B. P. A.
DB 1426 PG 1059

(45) KEY FOODS INC.
DB 1242 PG 1787

(46) WILLIAM P. SAFFO
DB. 1798 PG .659

-L- POCSta. 45+48.393 = -Y12- POTSta. 10+93.172

-Y12- POTSta. 10+00.000

-Y12- S 60°01'15.0" E 45+62.025

BEGIN CONSTRUCTION
-Y12- POT Sta. 10+55.000

END -BIKEPATH-
-L- STA. 45+31 +/-
FUTURE ROADWAY USE

PCCSta. 45+83.294

PCCSta. 47+88.024

MATCHLINE SEE SHEET 12

MATCHLINE SEE SHEET 14

-L- EXIST. R/W 17.500m LT. (57.41')

-L- EXIST. R/W 24m LT. (78.74')

-L- EXIST. R/W 16.5m LT. (54.13')

EXIST. R/W 18m RT. (59.06')

EXIST. R/W

-L- +40.762 22.000m RT. (72.18')

+62.057 25m RT. (82.02')

+83.294 25m RT. (82.02')

+11.500 20.500m RT. (67.26') 24.500m RT. (80.38')

+26 20m RT. (65.62')

+08 18m RT. (59.06')

+24

+17.500 19.500m RT. (63.98') 24.500m RT. (80.38')

+87.500 17.500m LT. (57.41')

+81.500 17.500m LT. (57.41')

+96.500 19.500m LT. (63.98')

+36 19.500m LT. (63.98')

+42 19.500m LT. (63.98')

+18.500 EXIST. R/W

+03.500 19.500m LT. (63.98')

+09.500 19.500m LT. (63.98')

+88.024 18m RT. (59.06')

32m INC.

CL I RIP RAP 23.4 MTN 31.8 SM FF

CL B RIP RAP 0.9 MTN 4.2 SM FF

VX 61 WATER N 57391.554 E 717709.171 EL 11.080 -L- 46+15.79 10.23 RT

VX 62 WATER N 57560.694 E 717715.085 EL 11.390 -L- 47+85.90 6.94 RT

RET. 600mm CONC

RET. GRATE & 1200 PIPE

REM. FES 1200

BORE & JACK STEEL PIPE

DETENTION POND

WOODS

MTL WAREHOUSE

GATE

I S MTL & M BUS

-L-	
PI Sta 45+08.549	PI Sta 46+85.776
Δ = 1° 45' 16.2" (LT)	Δ = 6° 42' 10.7" (RT)
L = 107.023	L = 204.730
T = 53.516	T = 102.482
R = 3,495.000	R = 1,750.000
SE = NC	SE = RC

NOTE:
REMOVE EXISTING PAVEMENT UNDER PROPOSED GRASS ISLANDS THRU-OUT PROJECT

LEGEND
- PAVEMENT REMOVAL
- BIKE PATH CONSTRUCTION BY OTHERS
- PROPOSED 125mm CONCRETE MONOLITHIC ISLAND (SURFACE MOUNTED)

NOTE: SEE SHEET NO. 21 FOR -L- PROFILE
SEE SHEET NO. 26 FOR -Y12- PROFILE
SEE SHEET NO. 2-0 FOR INTERSECTION DETAIL OF -Y12-

70.668
N08°44'45"E

S-AUC-2003 (5-67)
Stanley at 16221454

u2734_13.dgn

RIGHT OF WAY REVISIONS 07/16/03: REVISED DRAINAGE TO AVOID SIGN ON PARCEL 52

U-2725 -Y- POT Sta. 45+40.000 =
U-2734 -Y1- POT Sta. 10+00.000

BEGIN CONSTRUCTION
-Y1- POT Sta. 10+31.536

-Y1- +31.536
BEGIN C&G
-Y1- +37.500
EXIST. R/W

-Y1- +45
EXIST. R/W

-Y1- +45.536
BEGIN C&G
CL E RIP RAP
E 4.5 WITH
111.7 SM FF

-Y1- +48.800
18.500m (60.70')

0.6m BASE DITCH
SEE DETAIL E SHT. 2-G

-Y1- +52
52m RT. (170.60')
-Y1- +41
52m RT. (170.60')

-Y1- +48.500
EXIST. R/W
19.500m RT
(63.98')

+82.500
19.500m LT (63.98')

+88.500
EXIST. R/W
19.500m LT (63.98')

-L- POC Sta. 49+01.000 =
-Y6- POT Sta. 10+60.000

-L- +82.500 -Y6-
18m RT. (59.06') +20.216

-Y6- BEGIN C&G
EXIST. R/W

-Y6- +30
EXIST. R/W

END CONSTRUCTION
-Y6- POT Sta. 10+30.000

-Y6- POT Sta. 10+33.746

-L- +13.500
18m RT. (59.06')

+89.837
18m RT. (59.06')

-Y1- +96.500
EXIST. R/W
18.500m RT (60.70')

-Y1- +02.500
EXIST. R/W
18.500m RT
(60.70')

-L- STA. 49+35.572
6.369m RT.

-L- STA. 49+39.83 (2.87 RT)
-L- STA. 49+93.38 9.27 LT

PT Sta. 50+44.382

PRC Sta. 49+89.837

-L- STA. 50+28.57
-DRIVE- STA. 10+00.000

-Y1- +06.500
19.500m LT (63.98')

-L- STA. 50+39.327
84.737m RT.

PT Sta. 10+38.422

PRC Sta. 10+68.728

BL-41 PNC 44+68.793

-L- STA. 50+57.952 END STATE PROJECT U-2734
-L- STA. 50+57.952 END F.A. PROJECT NHF-1409 (3)
-Y1- POT STA. 12+68.287

NOTE: REMOVE EXISTING PAVEMENT UNDER PROPOSED GRASS ISLANDS THRU-OUT PROJECT

DO NOT DISTURB SIGNS

US 17 MARKET STREET

32100 / 31700			48400 / 58000
800 / 1300		17100 / 276000	
2003 ADT / 2023 ADT		17900 / 28900	

SR 1409 MILITARY CUTOFF ROAD

NOTE: SEE SHEET NO. 21 FOR -L- PROFILE
SEE SHEET NO. 26 FOR -Y6- PROFILE
SEE SHEET NO. 27 FOR -Y1- & -DRIVE- PROFILES

PROJECT REFERENCE NO.	SHEET NO.
U-2734	14
R/W SHEET NO.	14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC
5 0 10

CONST. REV. _____
R/W REV. 07/16/03

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

50 COASTAL STORAGE, INC.
DB 2252 PG 0003

51 SOUTHEAST MORTGAGE & INVESTMENT CORP.
DB 1814 PG 336
BY-4 POT 5+00.000 = BY-4 POT 5+00.000 (U-2725)
-Y1- +01.500
19.500m LT (63.98')
BY-4
-Y1- STA. 10+78.873
13.425m LT.

CORNELIUS NIXON, TRUSTEE
DB 598 PG 441
BY-50
PINC 6+49.360
BY-50
-Y1- STA. 12+28.185
9.634m LT.

52

53 FRANCES E. BAZEMORE
DB 1122 PG 5

54 CORNELIUS NIXON, TRUSTEE
DB 1429 PG 406
DB 776 PG 233
DB 738 PG 463
DB 1648 PG 1194
DB 1304 PG 52

45 BAY FOODS INC.
DB 1242 PG 1787
VX 63 WATER N 57661.857 E 717714.069 EL 12.255 -L- 48+85.47 10.07 LT

46 WILLIAM P. SAFFO
DB. 1798 PG. 659

47 MID STATE PETROLEUM INC.
DB 1663 PG 0640 PINC 42+99.247
BL-40
VX 66 WATER N 57765.789 E 717744.307 EL 13.130

48 PROSPECT CEMETERY ASSOC.
DB 1133 PG 1289
MB 4 PG 96

B P A
DB 1426 PG 1059
DB 1610 PG 851
MB 4 PG 96

44 VX 65 WATER N 57757.971 E 717759.254 EL 12.630 -L- 49+80.12 7.30 RT

49 STATE OF N.C.
DB 348 PG 282

NORMAN H. PHILLIPS, III

MATCHLINE SEE SHEET 13

MATCHLINE SEE SHEET 15

-L-
PI Sta. 50+21.025
Δ = 69° 26' 54.6" (LT)
L = 54.545
T = 31.188
R = 45.000
SE = 0.04

-DRIVE-

PI Sta. 10+27.719	PI Sta. 10+74.284
Δ = 36° 18' 21.6" (LT)	Δ = 18° 02' 22.0" (RT)
L = 22.178	L = 11.020
T = 11.476	T = 5.556
R = 35.000	R = 35.000
SE = .03	SE = .03

-L-
PI Sta. 48+89.380
Δ = 13° 12' 53.6" (RT)
L = 201.813
T = 101.356
R = 875.000
SE = 0.035

LEGEND
PAVEMENT REMOVAL
PROPOSED 125mm CONCRETE MONOLITHIC ISLAND (SURFACE MOUNTED)

6/10/99
Scale: 1" = 50'
w-AUG-2003 15:57
s2734_14.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2734	15
R/W SHEET NO.	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC 5 0 10

CONST.REV. _____

R/W REV. _____

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOTE: SEE SHEET NO.27 FOR -Y1- & -DRIVE- PROFILES

LEGEND

PAVEMENT REMOVAL

PROPOSED 125mm CONCRETE MONOLITHIC ISLAND (SURFACE MOUNTED)

NAD 83

CORNELIUS NIXON, TRUSTEE
DB 1429 PG 406
DB 776 PG 233
DB 738 PG 463
DB 1648 PG 1194
DB 1304 PG 52

54

55

ENOCH CHAPEL MISSIONARY BAPTIST CHURCH
DB 1235 PG 1978

END CONSTRUCTION
-Y1- POT Sta.14+67.260

PHILLIP MCINNIS, JR.
DB 1838 PG 464
MB 34 PG 196

FANNY FRAZIER LIFE ESTATE
DB 1197 PG 614
DB 907 PG 176

WICKER WORKS, INC.
DB 1464 PG 1208

WILLIAM T. EVANS, SR. HEIRS
DB 418 PG 424

CAROLINA POWER & LIGHT CO. EASEMENT 30.480 (100')

MATCHLINE SEE SHEET 14

BL-42
POT 45+96.961 =
BY-42
PINC 8+95.233

BL-42 / BY-42
-Y1- STA. 14+74.049
11.669m LT.
-Y1- +67.260
EXIST. R/W
19.500m LT (63.98')

-Y1- +62.460
END C&G

-Y1- +67.260
END C&G

-Y1- +82.186
BEGIN C&G

OBLITERATE

CURB CUT RIP RAP
2.7 MTN VEG
8.4 SM FF

-Y1- 13+76.553 25.640 RT. =
-DRIVE- 11+13.650

80m TAPER

N 39° 15' 55.5" E

N 39° 44' 23.0" E

N 21° 36.1" E

N 4° 12' 3" W

N 39° 20' 31.1" E

EXISTING R/W

EXISTING

I.S. BY CHURCH

I.S. MTL BUS

I.S. F.D.

I.S. BLK BUS

I.S. IT MARKET ST

MTL WAREHOUSE BUS

I.S. BK BUS

MARY RUTH MARSHALL
DB 1181 PG 350
MB 4 PG 96

NORMAN H. PHILLIPS, III
DB 1871 PG 1068
MB 4 PG 96

R. T. IMPORTS, INC.
DB 1680 PG 1065

WILLIAM M. MANGUM, III
DB 1295 PG 1802
DB 1972 PG 337

CARDINAL LANES, INC.
DB 1257 PG 78

AREA OF OVERLAP

30.480 (100') CAROLINA POWER & LIGHT CO. EASEMENT

P-AUG-2003 15:58
Stanley at R0027454

6/10/99

PROJECT REFERENCE NO.	SHEET NO.
U-2734	16
R/W SHEET NO.	16

METRIC

CONST.REV.

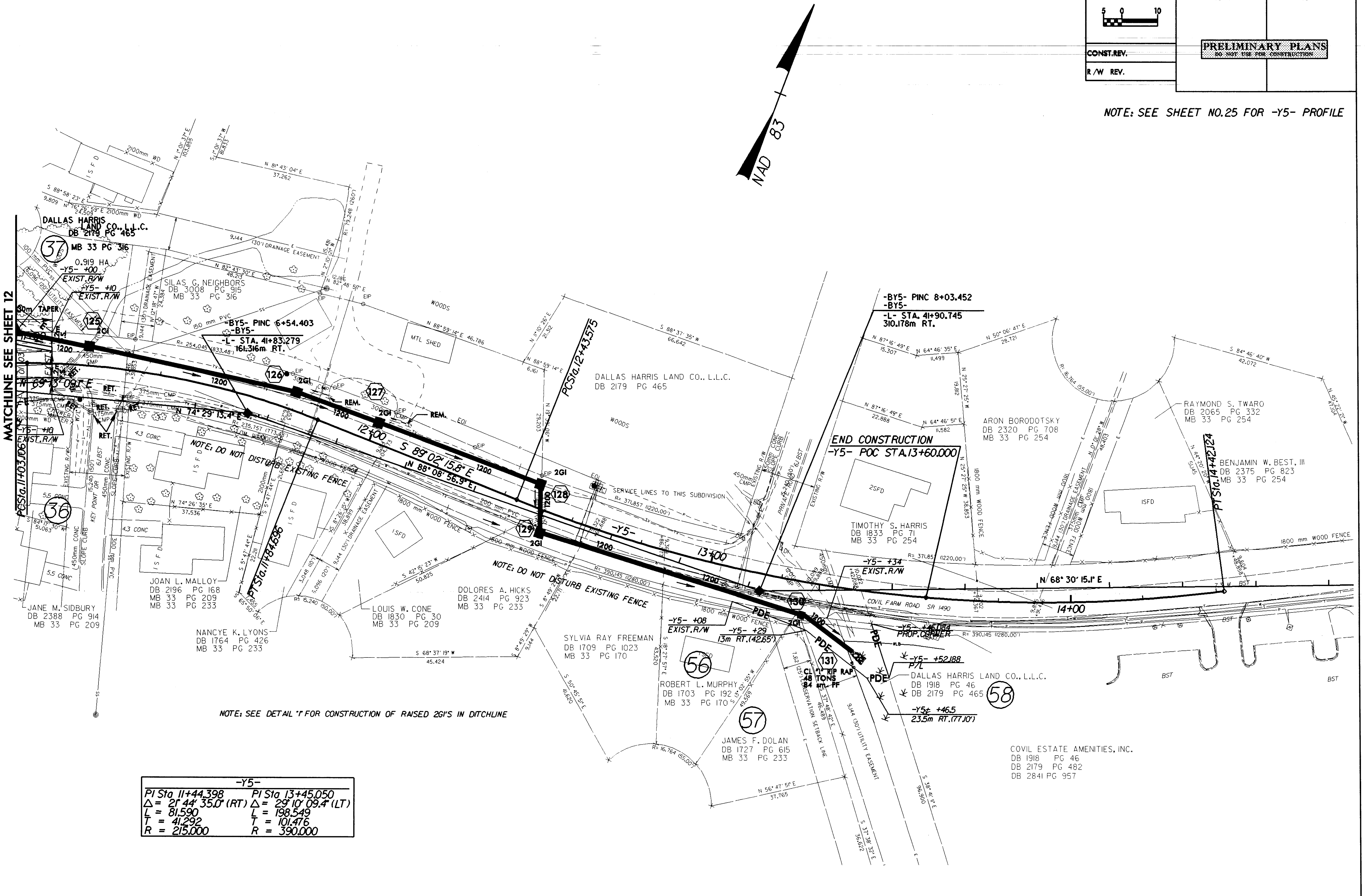
R/W REV.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOTE: SEE SHEET NO.25 FOR -Y5- PROFILE



NOTE: SEE DETAIL "I" FOR CONSTRUCTION OF RAISED 2GI'S IN DITCHLINE

-Y5-

PI Sta 11+44.398	PI Sta 13+45.050
Δ = 21° 44' 35.0" (RT)	Δ = 29° 10' 09.4" (LT)
L = 81.590	L = 198.549
T = 41.292	T = 101.476
R = 215.000	R = 390.000

8-AUG-2003 15:58
SAshley AT RD0212454
u2734_16.psh