STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

August 18, 2003

Mr. Steve Lund
U.S. Army Corps of Engineers
Asheville Field Office
151 Patton Ave., Room 208
Asheville, NC 28801-5006

Attention: Mr. Steve Lund
NCDOT Coordinator

SUBJECT: Application for Individual Section 404 and 401 permits: Catawba County, Newton-Conover Eastern Loop; Federal Aid Project No. STP-16(2). State Project No. 8.1792401. TIP No. U-2404A. WBS Element 34797.1.1. $475.00 Debit work order 8.1792401, WBS Element 34797.1.1

The North Carolina Department of Transportation (NCDOT) proposes to construct on new location a four-lane median-divided curb and gutter highway from NC 16 south of Newton to SR 1739 (Emanuel Church Rd). The project is approximately 3.9 miles in length. This application package consists of the cover letter, ENG Form, permit drawings, a document entitled HYDRAULIC DESIGN AND PERMIT REVIEW MEETINGS FOR U-2404A and half size plan sheets

Purpose and Need: The EA states that the purpose of the project is to improve accessibility and traffic service for residents, businesses and industry in Newton, Conover, Hickory and surrounding areas. The Eastern Loop will also provide a section of the proposed thoroughfare loop that will eventually encircle Newton and Conover and will provide the opportunity to relocate NC 16 out of the downtown area to the eastern perimeters of Newton and Conover.

Summary of Impacts: There will be a total of 2128 feet (ft) of permanent stream impacts. Riverine wetland impacts total 0.22 ac.

Summary of Mitigation: The project has been designed to avoid and minimize impacts to the streams and wetlands to the greatest extent possible. The Ecosystem Enhancement Program (EEP) will assume responsibility for satisfying the compensatory mitigation requirements for this project.

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.NCDOT.ORG

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

NEPA DOCUMENT STATUS

An Environmental Assessment (EA) was submitted by the NCDOT in compliance with the National Environmental Policy Act. The EA was approved on December 10, 1996. A Finding of No Significant Impact (FONSI) was approved on August 29, 1997. The document addressed all sections of U-2404 from the NC 16 south of Newton to NC 16 north of Conover in Catawba County. The EA explains the purpose and need for the project; provides a description of the alternatives considered; and characterizes the social, economic, and environmental effects. After the EA was approved it was circulated to federal state and local agencies. Copies of the EA and FONSI have been provided to regulatory review agencies involved in the approval process. Additional copies will be provided upon request.

INDEPENDENT UTILITY

It is the opinion of the NCDOT that the proposed construction Newton-Conover Eastern Loop, involving Section A, has independent utility from the remaining section of the project. The NCDOT believes that this section can be considered independent of the remaining section because it meets the following objectives of "independent utility" as defined by the FHWA:

- this section of the project connects logical termini since it ties into an existing alignment;
- this section of the project is of sufficient length that environmental matters have been addressed on a broad scope (EA and FONSI);
- this section of the project has independent significance such that it is usable and of reasonable expenditure even if no other improvements are made in the area; and,
- this section of the project does not restrict consideration of alternatives for other reasonable forseeable transportation improvements.

IMPACTS TO WATERS OF THE UNITED STATES

Construction of the proposed project will necessitate impacts to jurisdictional surface waters. The project lies in the Catawba River Basin. Sites 1-4 are in Hydrologic Unit 03050102 and Sites 5-10 are in Hydrologic Unit 03050101. Streams crossed by the project include an unnamed tributary (UT) to Smyre Creek (index #11-129-5-4-1), UT to Town Creek (index #11-129-5-4), UT to McLin Creek and McLin Creek itself (index #11-76-5-(0.3). All streams have a Best Usage Classification of "C".

Surface waters will be affected by placement of pipes and box culverts within the roadway fill to accommodate stream crossings. Jurisdictional streams were identified according to guidelines set forth in "Field Location of Streams, Ditches, and Ponding" (NCDENR 1997). Stream and wetland delineations were verified by the U.S. Army Corps of Engineers (USACE) on October 7, 1999. Wetland delineations were conducted using the field delineation method outlined in the 1987 Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987). Table 2 summarizes impacts to surface waters from TIP No. U-2404 A.

Table 1. Surface Water Impacts Resulting from TIP No. U-2404 A

Site	Stream Type	Stream Name	Hydrologic Unit	Impact Area (ac)	Linear Impacts (ft)	Mitigation Required (ft)
1	perennial	UT to Smyre Creek	03050102	0.02	59	118
2	perennial	UT to Town Creek	03050102	<0.02	72	144
3	perennial	UT to Town Creek	03050102	0.05	266	266
4	perennial	UT to Town Creek	03050102	0.05	236	236
5	intermittent	UT to McLin Creek	03050101	<0.10	177	0
6	perennial	UT to McLin Creek	03050101	0.02	312	624
7	perennial	UT to McLin Creek	03050101	0.02	259	518
8	perennial	McLin Creek	03050101	0.02	180	360
9	perennial	McLin Creek	03050101	0.07	272	544
10	perennial	UT to McLin Creek	03050101	0.02	295	590
	TOTAL			**0.39**	**2128**	**3400**

All impacted streams from this project are perennial except Site 5. During a field visit on October 7, 1999, the USACE made determinations about mitigation for the streams on this project as shown in Table 1.

Sites 1, 2, 6, 7, 8, 9, and 10 are all perennial streams that will require mitigation at a 2:1 ratio.

Site 3 is a very low perennial stream and after discussion, it was decided a 1:1 ratio was pertinent for this site.

Site 4 is a perennial stream that is degraded and polluted by the nearby residential homes, therefore a 1:1 ratio is pertinent for this site.

Site 5 is an intermittent stream at the outlet of a pond that does not require mitigation.

Wetland impacts for this project only occur in Hydrologic Unit 03050102. The project will impact 0.22 ac of riverine wetlands. Only two wetland sites are found along this project.

Site 2 is a wetland formed by a drained pond with hydrology from the stream running through it. Vegetation at this site consists of tulip poplar (*Lirodendron tulipifera*), giant cane (*Arundinaria gigantea), Microstegium virmineum*, blackberry (Rubus argutus) and poison ivy (*Toxicodendron radicans*). Wetland impacts at this site are 0.15 ac of fill.

Site 4 is has small wetlands adjacent to the stream. Vegetation at this site consists of red maple (*Acer rubrum*), giant cane, persimmon (*Diospyros virginiana*), tag alder (*Alnus serrulata*), and netted-chain fern (*Woodwardia areolata*). Wetland impacts at this site are 0.05 ac of fill and 0.02 ac of mechanized clearing.

PROTECTED SPECIES

Endangered Species: Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE), or Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of March 7, 2002, the U.S. Fish and Wildlife Service (USFWS) lists one federally protected species for Catawba County (Table 2).

Table 2. Federally Protected Species for Catawba County

SCIENTIFIC NAME	COMMON NAME	STATUS
Hexastylis naniflora	dwarf-flowered heartleaf	Threatened

The EA states that a few areas met the soil and slope requirements but a field survey in October 1994 found no suitable habitat. A Biological Conclusion of "no effect" was given. The surveyed areas did not contain suitable habitat and no species were found. A Biological Conclusion of "No Effect" was rendered. Portions of the project study area that contained possible suitable habitat were surveyed again on August 27, 1999 to update the EA. No specimens were found. A survey was again conducted on April 15, 2003. No suitable habitat was found and no specimens were located, therefore this project will have "No Effect" on dwarf-flowered heartleaf.

CULTURAL RESOURCES

Archaeology: The EA states that according to the North Carolina State Historic Preservation Office (SHPO), there are no known archaeological sites within the project area. A survey will be accomplished when a preferred alternative is picked. The FONSI states that the final Cultural Resources Assessment Survey was completed in March 1997. The survey resulted in the discovery of four previously unrecorded sites, none of which are eligible for the National Register. One resident of the project area indicated there may be unmarked infant burials dating from the 1890s. Prior to construction, NCDOT will assess this site to address the purported presence of these unmarked burials. If remains are found, they will be relocated in accordance with all State guidelines.

Historic: The EA states that an Area of Potential Effect (APE) was determined during historic architectural survey. A reconnaissance survey was prepared and no resources listed in the National Register of Historic Places, on the State Study List or eligilble for listing in the National Register are located within the APE for the project. The SHPO concurred with this finding and no further studies are actions are required.

FEMA COMPLIANCE

NCDOT is in compliance with the National Flood Insurance Program. NCDOT was approved of a floodway modification.

WILD AND SCENIC RIVER SYSTEM

The project will not impact any Federal Wild and Scenic Rivers or any rivers included in the list of North Carolina Natural and Scenic Rivers.

INDIRECT AND CUMULATIVE IMPACTS

An Indirect and Cumulative Impact Study was conducted for TIP U-2404A, the Newton-Conover Bypass. The study concluded that the proposed project will not induce extensive development in the study area, but due to the increased regional roadway access future development will shift to the new road corridor. Although development is expected in the study area, the overall indirect and cumulative impacts resulting from the construction of the proposed project are expected to be minimal because of development limitations and regulations. There are no impaired streams in the study area. Therefore, it was determined that construction of TIP U-2404A will not result in indirect or cumulative impacts that will adversely affect water quality within the Catawba River Basin. The complete report is enclosed with this application.

MITIGATION OPTIONS

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

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

This project will impact 0.22 acre of wetlands and 2128 ft of streams. Wetlands and streams were avoided where possible. Appropriate sedimentation and erosion control measures, in accordance with the NCDOT's "Best Management Practices for Protection of Surface Waters" will be implemented to minimize impacts to wetlands and streams. No rip rap will be placed in any streambed. Impacts to streams were minimized to the fullest extent practicable by crossing the streams at a perpendicular angle. The design of the sites will result in a project that will not disturb aquatic life movements.

- No rock to be placed in streambed at jurisdictional sites.

- At Site 3, the outfall of structure 93 was moved from discharging directly into the stream. It was moved approximately 57 feet away from the stream to the south discharging into a lateral base ditch with rip rap.

- Site 7: Culvert buried one foot. The proposed box culvert is the width of the existing streambed.

- Site 8: Culvert buried one foot.

- Site 9: Culvert buried one foot.

Site 10: Culvert buried one foot. Structure 249 moved away from culvert inlet. Stormwater will flow through a lateral base ditch with rip rap that was extended from approximately 10 ft to 37 ft.

The NCDOT and its contractors will not excavate, fill, or perform land clearing activities within waters of the United States or any areas under the jurisdiction of the Department of the Army, Corps of Engineers (COE), except authorized by the COE. To ensure that all borrow and waste activities occur on high ground, except as authorized by permit, the NCDOT shall require its contractor to identify areas to be used for borrow material or for disposal of dredged or waste material. Documentation of the location and characteristics of all borrow and disposal sites associated with the project will be available to the COE on request.

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

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

1. Consideration must be given to mitigation within the right-of-way and should include the enhancement of existing wetlands and the creation of new wetlands in the highway median, borrow pit areas, interchange areas and along the roadside.

2. Where mitigation within the right-of-way does not fully offset wetland losses, compensatory mitigation may be conducted outside the right-of-way including enhancement, creation, and preservation.

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

Since the subject project is listed in Exhibit 1, the necessary compensatory mitigation to offset unavoidable impacts to waters that are jurisdictional under the federal Clean Water Act will be provided by the EEP. The offsetting mitigation will derive from an inventory of assets already in existence within the same 8-digit cataloguing unit. The Department has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. The remaining, unavoidable impacts to 0.22 acres of jurisdictional wetlands and to 2128 feet of jurisdictional streams will be offset by compensatory mitigation provided by the EEP program.

REGULATORY APPROVALS

Application is hereby made for a Department of the Army Section 404 for an Individual Permit as required for the above-described activities. We are also hereby requesting a 401 Water Quality Certification from the Division of Water Quality. In compliance with Section 143-215.3D(e) of the NCAC we will provide $475.00 to act as payment for processing the Section 401 permit application previously noted in this application (see Subject line). We are providing seven copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, for their review.

If you have any questions or need additional information please call Rachelle Beauregard at 715-1383.

Sincerely,

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

cc:

Mr. John Dorney, NCDWQ (7copies)
Mr. Marla Chambers, NCWRC
Ms. Kathy Matthews, USEPA
Mr. Marella Buncick, USFWS
Mr. John F. Sullivan III, P.E., FHWA
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
Ms. Deborah Barbour, P.E., Highway Design
Mr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, P.E., Roadside Environmental
Mr. M.L. Holder, P.E., Division 12 Engineer
Mr. Trish Simon, Divison 12 Environmental Officer
Mr. David Franklin, USACE, Wilmington Field Office (Cover Letter Only)
Mr. William Gilmore, EEP, Raleigh

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

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

PRIVACY ACT STATEMENT

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

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

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

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

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME
North Carolina Department of Transportation
Project Development & Environmental Analysis

8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)

6. APPLICANT'S ADDRESS
1548 Mail Service Center
Raleigh, NC 27611

9. AGENT'S ADDRESS

7. APPLICANT'S PHONE NOs. W/AREA CODE
a. Residence
b. Business 919-733-3141

10. AGENT'S PHONE NOs. W/AREA CODE
a. Residence
b. Business

11. **STATEMENT OF AUTHORIZATION**

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

_____ APPLICANT'S SIGNATURE

_____ DATE

NAME, LOCATION, AND DESCRIPTION OR PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions
Newton-Convoer Eastern Loop (NCDOT TIP No. U-2404A)

13. NAME OF WATERBODY, IF KNOWN (if applicable)
McLin, Town and Smyre Creeks

14. PROJECT STREET ADDRESS (if applicable)

15. LOCATION OF PROJECT
Catawba COUNTY NC STATE

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) **Section, Township, Range, Lat/Lon, and/or Accessors's Parcel Number, for example.**
New alignment from NC 16 south of Newton to SR 1739 (Emanuel Church Rd) Lat: 35°40'34 Long: 81°11'37

17. DIRECTIONS TO THE SITE
Go South in NC 16 off I-40 approximately 4 miles to reach the southern terminus of the project

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

New alignment from NC 16 south of Newton to SR 1739 (Emanuel Church Rd) with the addition of several culverts installed over stream crossings and some wetland fill

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

Public transportation

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

20. Reason(s) for Discharge

construction of culverts for new road alignment

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

The proposed installation of 7 pipe culverts, 3 box culverts and 1 culvert extension.

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

0.22 ac of wetland fill, 2128 ft of stream impacts

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

U-2404B See Environmental Document

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

See property owner list in permit drawings

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

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

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

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

M. Gerald Cumbo 8-18-03

SIGNATURE OF APPLICANT DATE SIGNATURE OF AGENT DATE

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

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

August 18, 2003

Mr. William D. Gilmore, P.E.
EEP Transition Manager
Ecosystem Enhancement Program
1652 Mail Service Center
Raleigh, NC 27699-1652

Dear Sir:

Subject: Catawba County, Newton-Conover Eastern Loop from NC 16 to SR 1739 (Emanuel Church Rd). Federal Aid Project No. STP-16(2). State Project No. 8.1792401. TIP No. U-2404A.

The purpose of this letter is to request that the North Carolina Ecosystem Enhancement Program (EEP) provide confirmation that you are willing to provide compensatory mitigation for the project in accordance with the Memorandum of Agreement (MOA) signed July 22, 2003 by the USACE, the NCDENR and the NCDOT.

The North Carolina Department of Transportation (NCDOT) proposes to construct on new location a four-lane median-divided curb and gutter highway from NC 16 south of Newton to SR 1739 (Emanuel Church Rd). The project is approximately 3.9 miles in length.

RESOURCES UNDER THE JURISDICTION OF SECTION 404 AND 401 OF THE CLEAN WATER ACT.

We have avoided and minimized the impacts to jurisdictional resources to the greatest extent possible as described in the permit application. A copy of the permit application can be found at http://www.ncdot.org/planning/pe/naturalunit/Applications.html. The remaining impacts to jurisdictional resources will be compensated for by mitigation provided by the EEP program. We estimate that 633 linear feet of jurisdictional perennial streams in Hydrological Cataloguing Unit (HU) 03050102 along with 0.22 acres of riverine wetlands will be impacted. In HU 03050101, we estimate 1318 linear feet of jurisdictional perennial streams and 177 linear feet of intermittent streams will be impacted.

The project is located in the Piedmont Physiographic Province in Catawba County in the Catawba River basin in Hydrological Cataloguing Units 03050101 and 03050102.

- The stream impacts, summarized in Table 1, will be to first, second and/OR third order perennial streams and first, second, and/or third order intermittent stream that are tributaries to Smyre Creek [DWQ #11-129-5-4-1], Town Creek [DWQ # 11-129-5-4], and McLin Creek [DWQ# 11-76-5-(0.3)], We propose to mitigate for the stream impacts by using the EEP for the 2128 feet of impacts.
- The wetland impacts, summarized in Table 1, totals 0.22 acres of riverine wetlands. We propose to provide compensatory mitigation for the wetland impacts by using the EEP for the 0.22 acres of impacts.

Table 1. Surface Water and Wetland Impacts Resulting from TIP No. U-2404 A

Site	Stream Type	Stream Name	Hydrologic Unit	Impact Area (ac)	Linear Impacts (ft)	Mitigation Required (ft)	Wetland Impacts (ac)
1	perennial	UT to Smyre Creek	03050102	0.02	59	118	0
2	perennial	UT to Town Creek	03050102	<0.02	72	144	0.15
3	perennial	UT to Town Creek	03050102	0.05	266	266	0
4	perennial	UT to Town Creek	03050102	0.05	236	236	0.07
5	intermittent	UT to McLin Creek	03050101	<0.10	177	0	0
6	perennial	UT to McLin Creek	03050101	0.02	312	624	0
7	perennial	UT to McLin Creek	03050101	0.02	259	518	0
8	perennial	McLin Creek	03050101	0.02	180	360	0
9	perennial	McLin Creek	03050101	0.07	272	544	0
10	perennial	UT to McLin Creek	03050101	0.02	295	590	0
	TOTAL			**0.39**	**2128**	**3400**	**0.22**

Please send the letter of confirmation to Steve Lund (USACE Coordinator) at U. S. Army Corps of Engineers Asheville Regulatory Field Office, 151 Patton Ave, Room 208, Asheville, NC 28801-5006). Mr. Lund's FAX number is 828-271-4858. The current let date for the project is (December 16, 2003) for which the let review date is (October 28, 2003).

In order to satisfy regulatory assurances that mitigation will be performed; the NCDWQ requires a formal letter from EEP indicating their willingness and ability to provide the mitigation work requested by NCDOT. The NCDOT requests such a letter of confirmation be addressed to Mr. John Dorney of NCDWQ, with copies submitted to NCDOT.

If you have any questions or need additional information please call Rachelle Beauregard at 715-1383.

Sincerely,

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

cc: w/attachment
Mr. John Dorney, NCDWQ (7copies)
Mr. Marla Chambers, NCWRC
Ms. Kathy Matthews, USEPA
Mr. Marella Buncick, USFWS
Mr. John F. Sullivan III, P.E., FHWA
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
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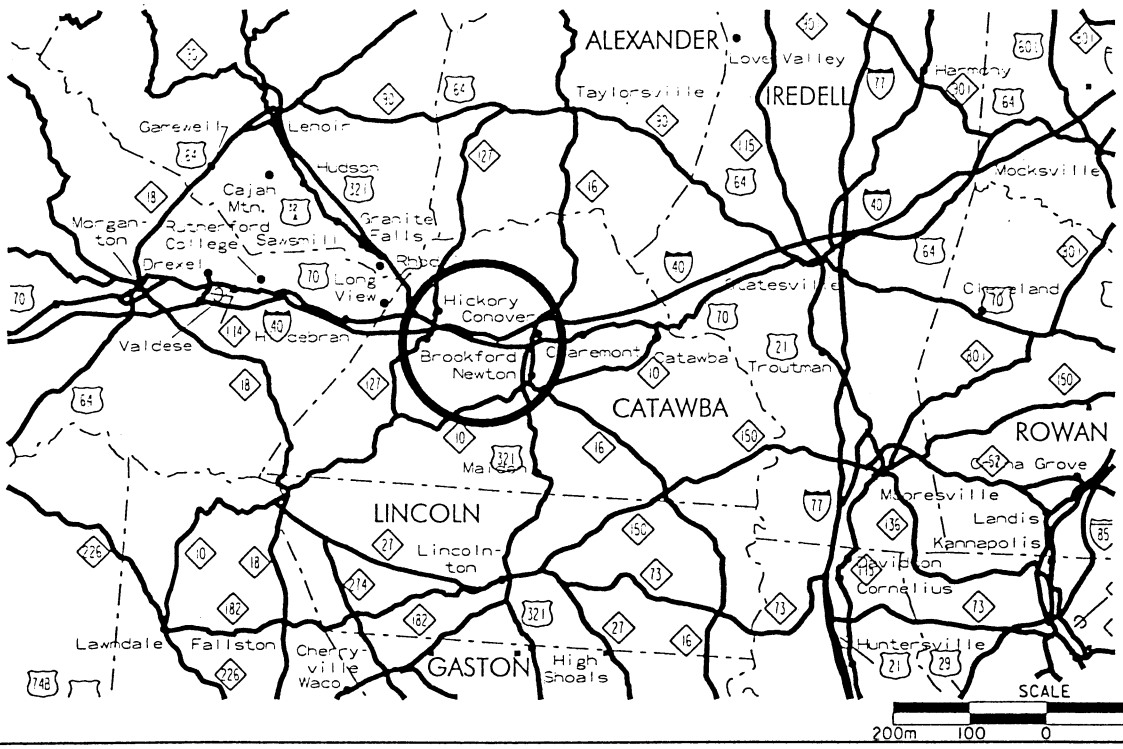
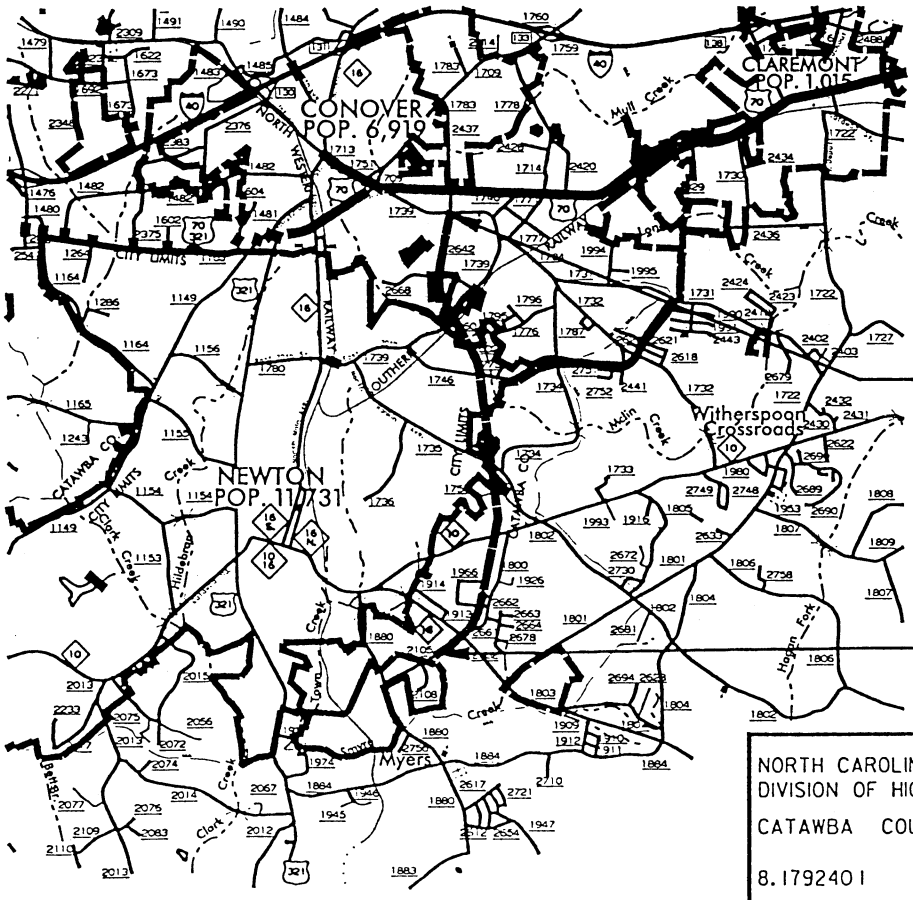
Mr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, P.E., Roadside Environmental
Mr. M.L. Holder, P.E., Division 12 Engineer
Mr. Trish Simon, Divison 12 Environmental Officer
Mr. David Franklin, USACE, Wilmington Field Office (Cover Letter Only)





VICINITY MAPS

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

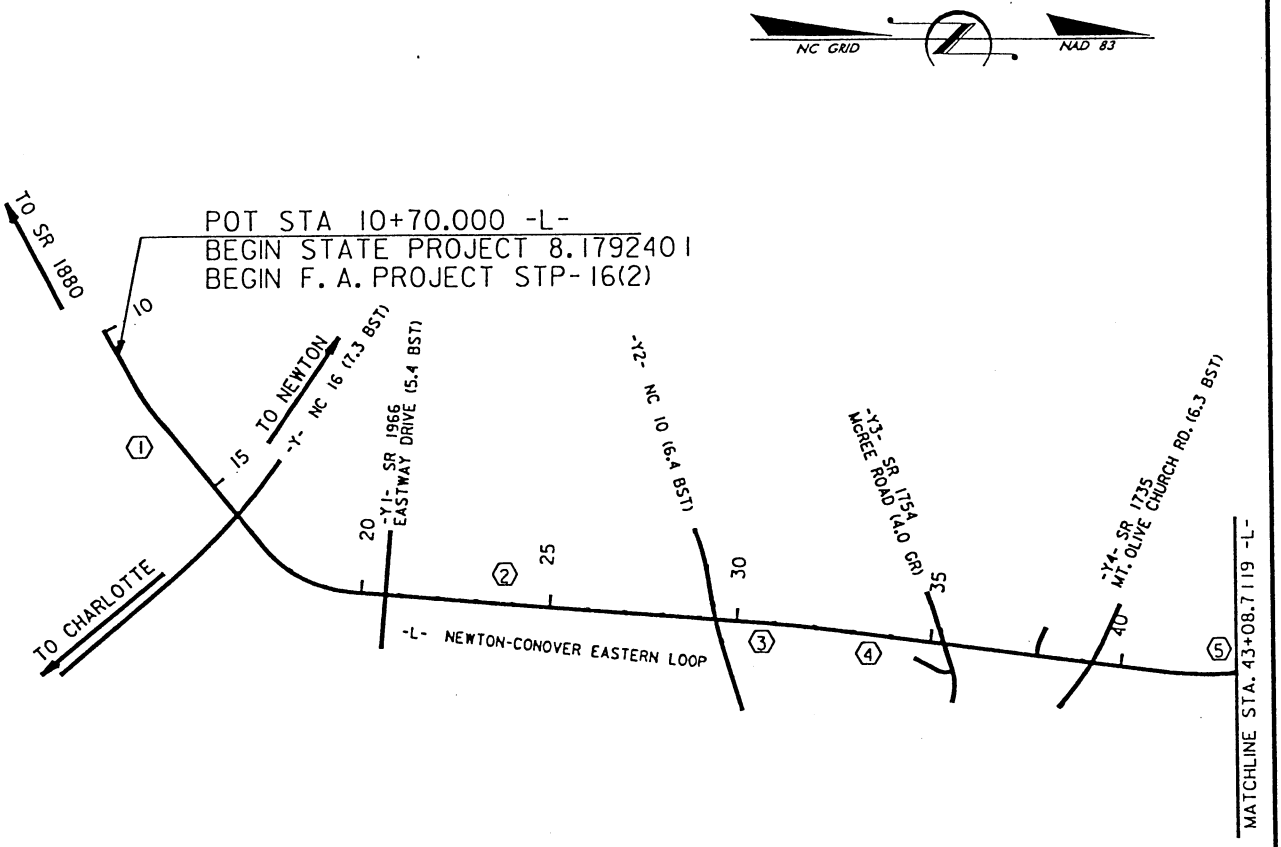
CATAWBA COUNTY

8.1792401 U-2404A

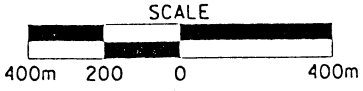
PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MARKERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET 1 OF 18 APRIL 13, 2000



SITE MAP



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CATAWBA COUNTY

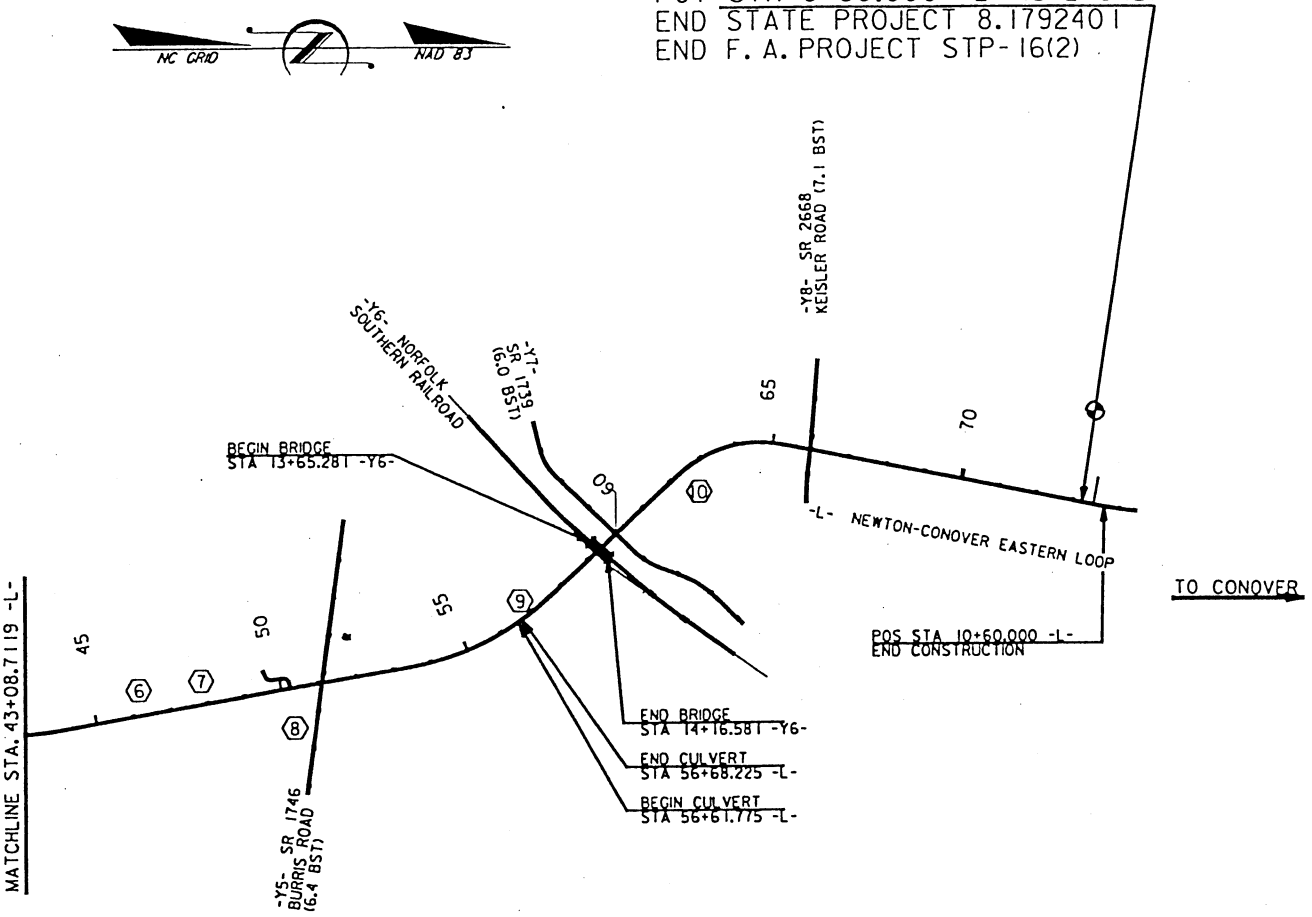
8.1792401 U-2404A

PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MARKERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET 2 OF 18 APRIL 13, 2000

POT STA 73+05.621 -L- =
POT STA 9+80.000 -L- (U-2404B)
END STATE PROJECT 8.1792401
END F. A. PROJECT STP-16(2)



SITE MAP

SCALE

400m 200 0 400m

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CATAWBA COUNTY

8.1792401 U-2404A

PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MARKERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET 3 OF 18 APRIL 13, 2000

LEGEND

WLB WETLAND BOUNDARY

WETLAND

DENOTES FILL IN WETLAND

DENOTES FILL IN SURFACE WATER

DENOTES FILL IN SURFACE WATER (POND)

DENOTES TEMPORARY FILL IN WETLAND

DENOTES EXCAVATION IN WETLAND

DENOTES TEMPORARY FILL IN SURFACE WATER

DENOTES MECHANIZED CLEARING

FLOW DIRECTION

TB TOP OF BANK

WE EDGE OF WATER

C PROP. LIMIT OF CUT

F PROP. LIMIT OF FILL

PROP. RIGHT OF WAY

NG NATURAL GROUND

PL PROPERTY LINE

TDE TEMP. DRAINAGE EASEMENT

PDE PERMANENT DRAINAGE EASEMENT

EAB EXIST. ENDANGERED ANIMAL BOUNDARY

EPB EXIST. ENDANGERED PLANT BOUNDARY

WATER SURFACE

LIVE STAKES

BOULDER

COIR FIBER ROLLS

5 ADJACENT PROPERTY OWNER OR PARCEL NUMBER

PROPOSED BRIDGE

PROPOSED BOX CULVERT

PROPOSED PIPE CULVERT

(DASHED LINES DENOTE EXISTNG STRUCTURES)

SINGLE TREE

WOODS LINE

DRAINAGE INLET

ROOTWAD

VANE

RIP RAP

RIP RAP ENERGY DISSIPATOR BASIN

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

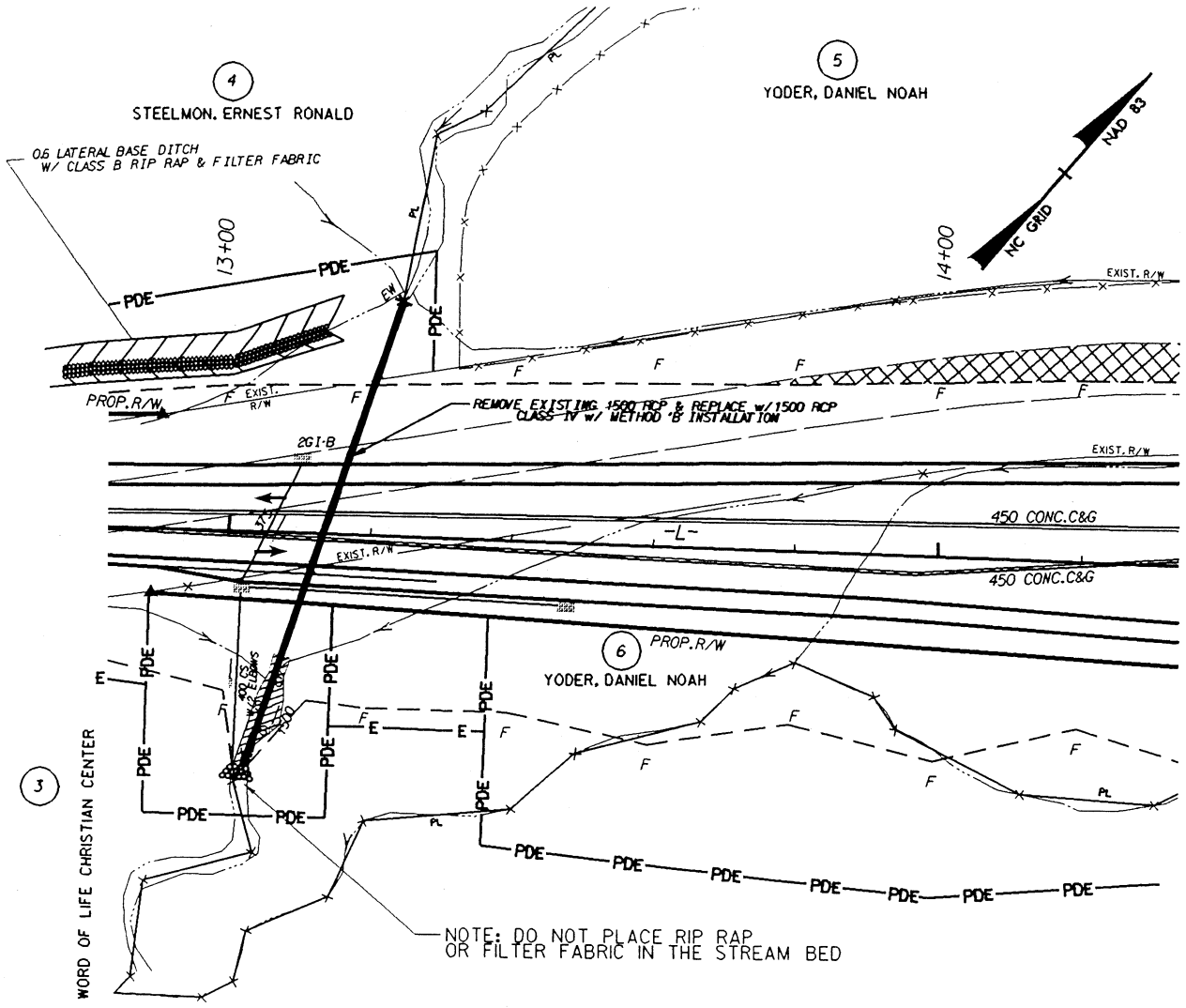
CATAWBA COUNTY

8.1792401 U-2404A

PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MARKERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET 4 OF 18 APRIL 13, 2000



SITE # 1

SCALE
20m 10 0 20m

S S DENOTES FILL IN SURFACE WATER

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CATAWBA COUNTY

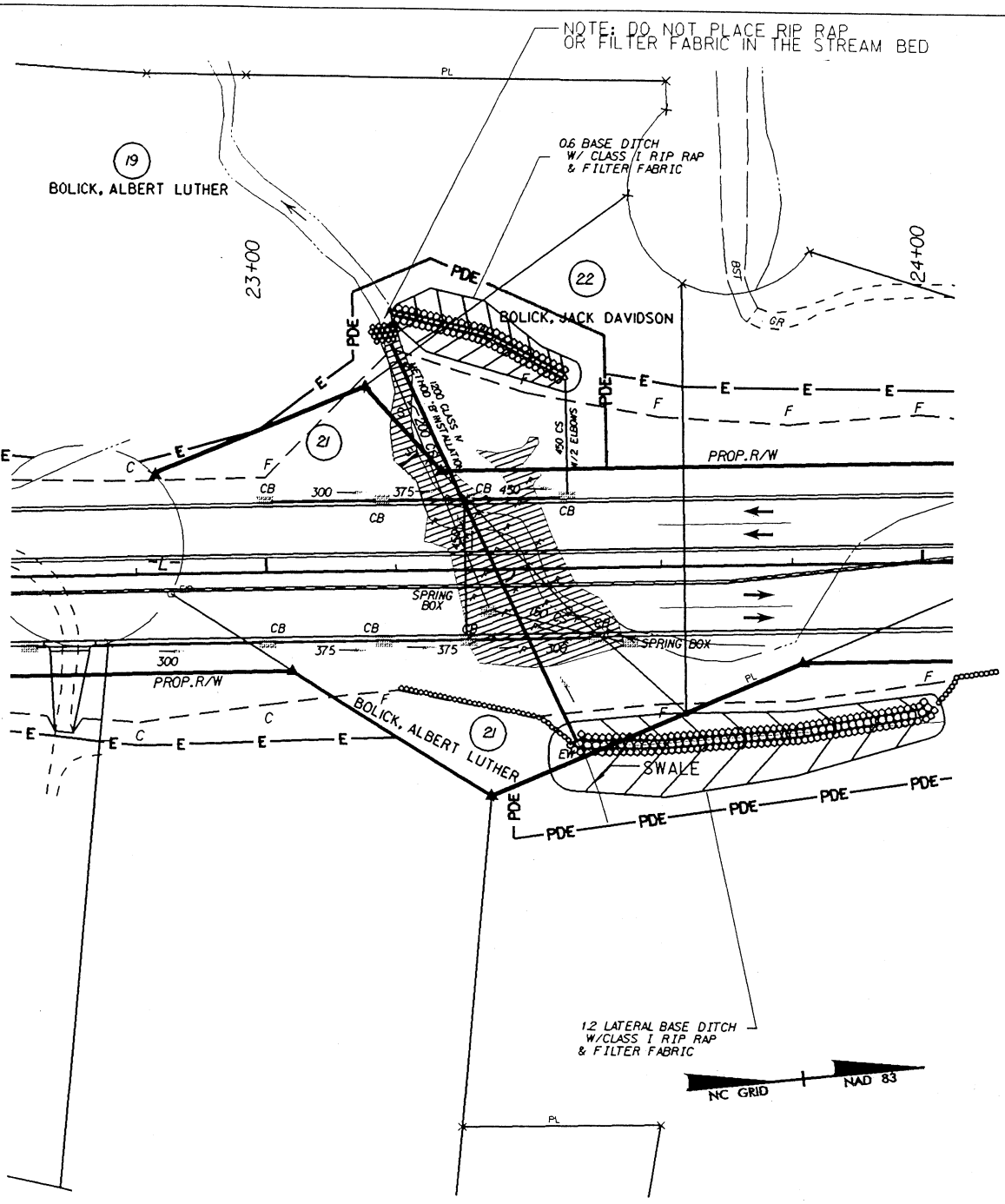
8.1792401 TIP U-2404A

PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MARKERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET 5 OF 18

August, 2003



SITE #2

SCALE

20m 10 0 20m

F F DENOTES FILL IN WETLAND

S S DENOTES FILL IN SURFACE WATER

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CATAWBA COUNTY

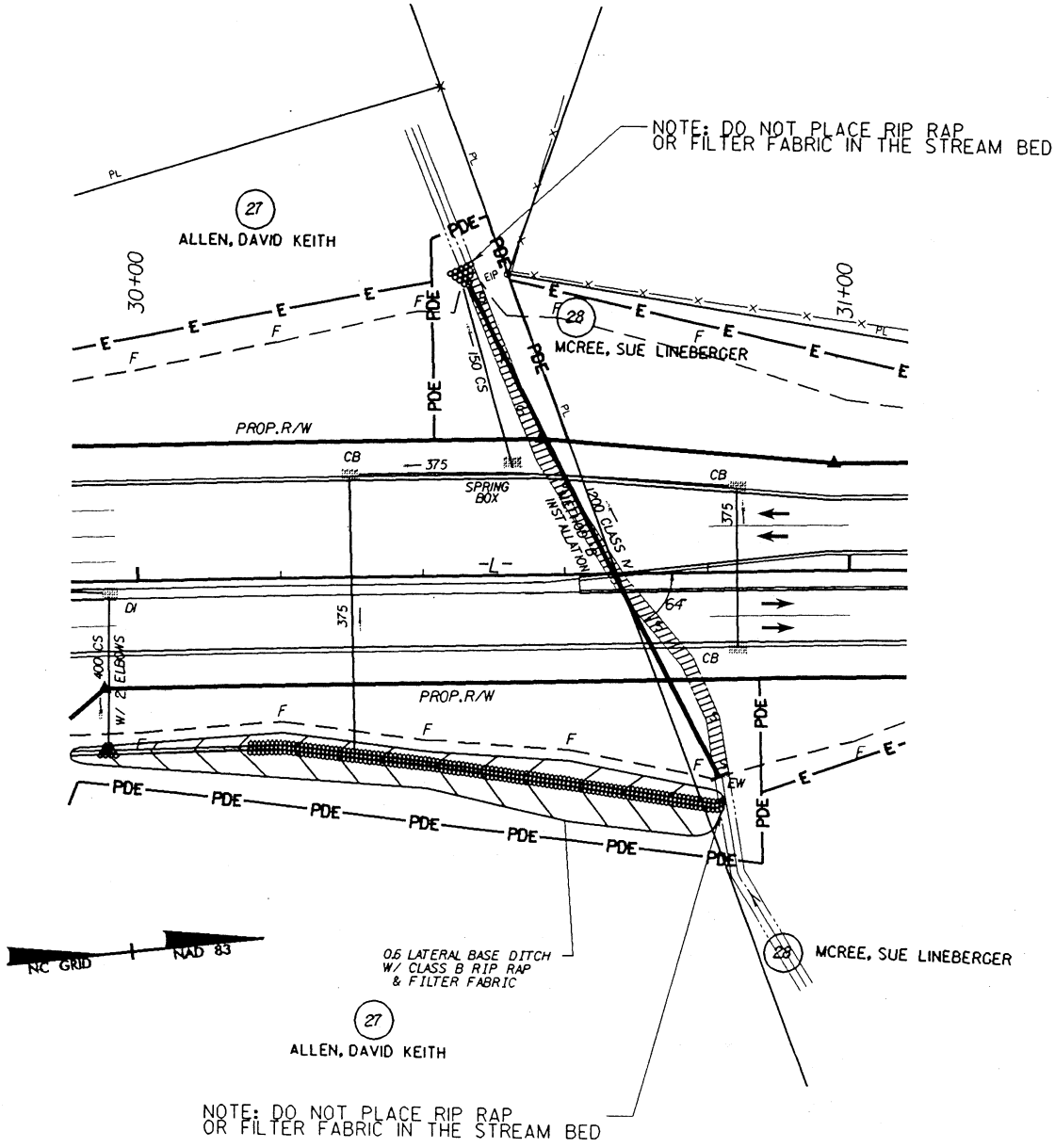
8.1792401 T.I.P. U-2404A

PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MAKRERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET 6 OF 18

August, 2003



SITE #3

SCALE
20m 10 0 20m

DENOTES FILL IN SURFACE WATER

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CATAWBA COUNTY

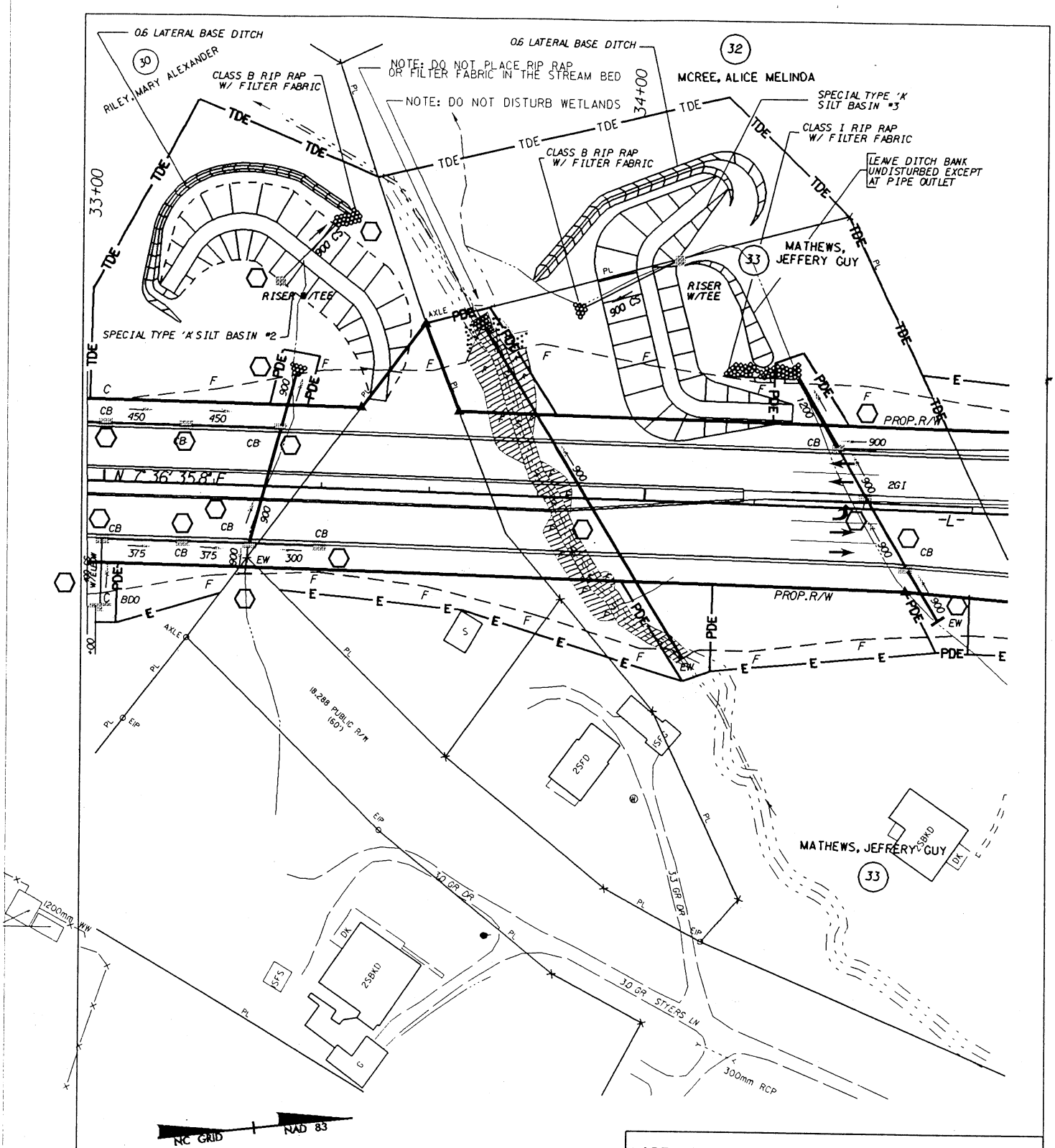
8.1792401 TIP U-2404A

PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MAKRERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET 7 OF 18

August, 2003



SITE #4

SCALE

20m 10 0 20m

F F DENOTES FILL IN WETLAND

S S DENOTES FILL IN SURFACE WATER

DENOTES MECHANIZED CLEARING

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CATAWBA COUNTY

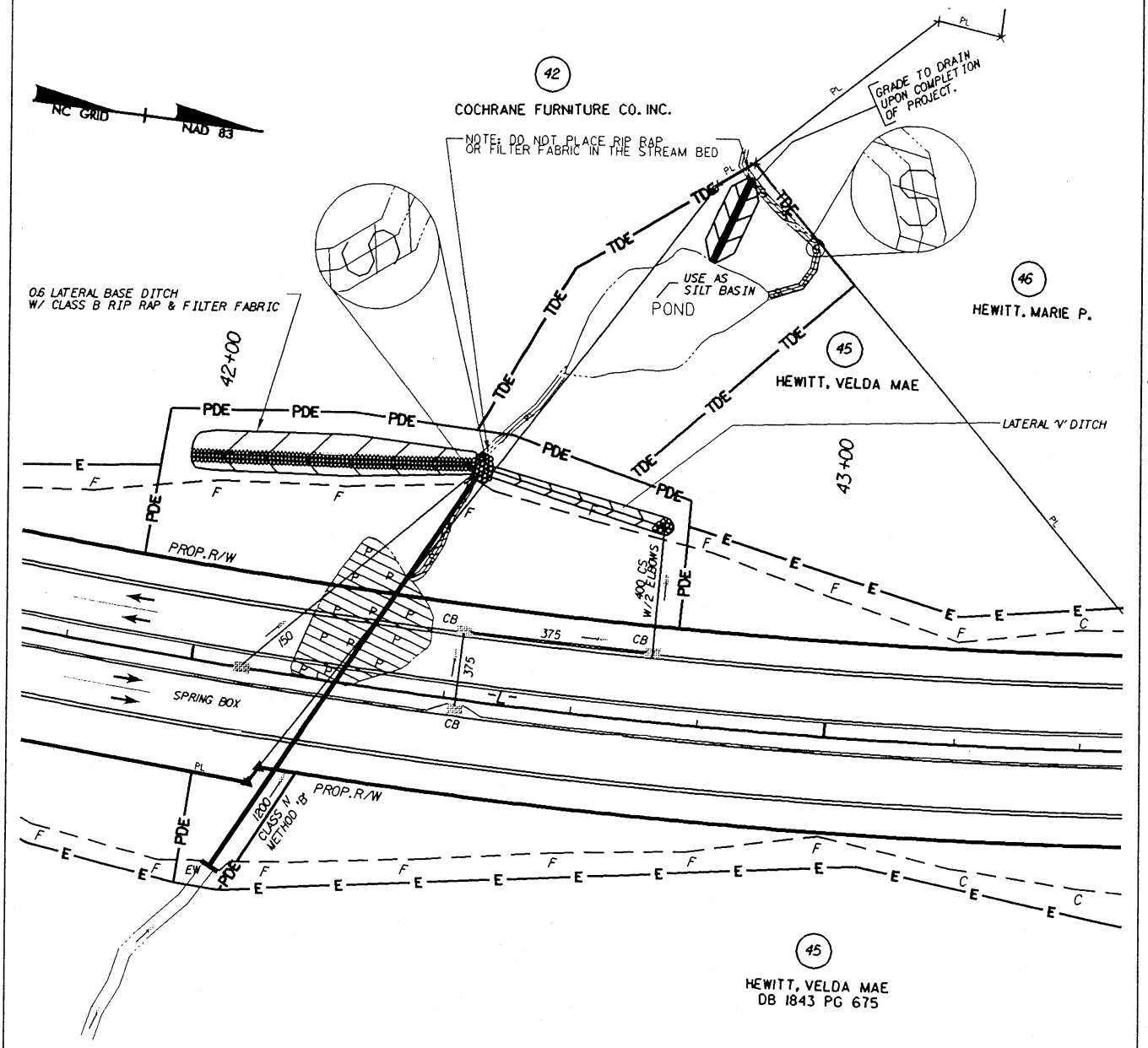
8.1792401 TIP U-2404A

PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MAKRERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET 8 OF 18

August, 2003



SITE #5

SCALE
20m 10 0 20m

DENOTES FILL IN SURFACE WATER

DENOTES [illegible]

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CATAWBA COUNTY

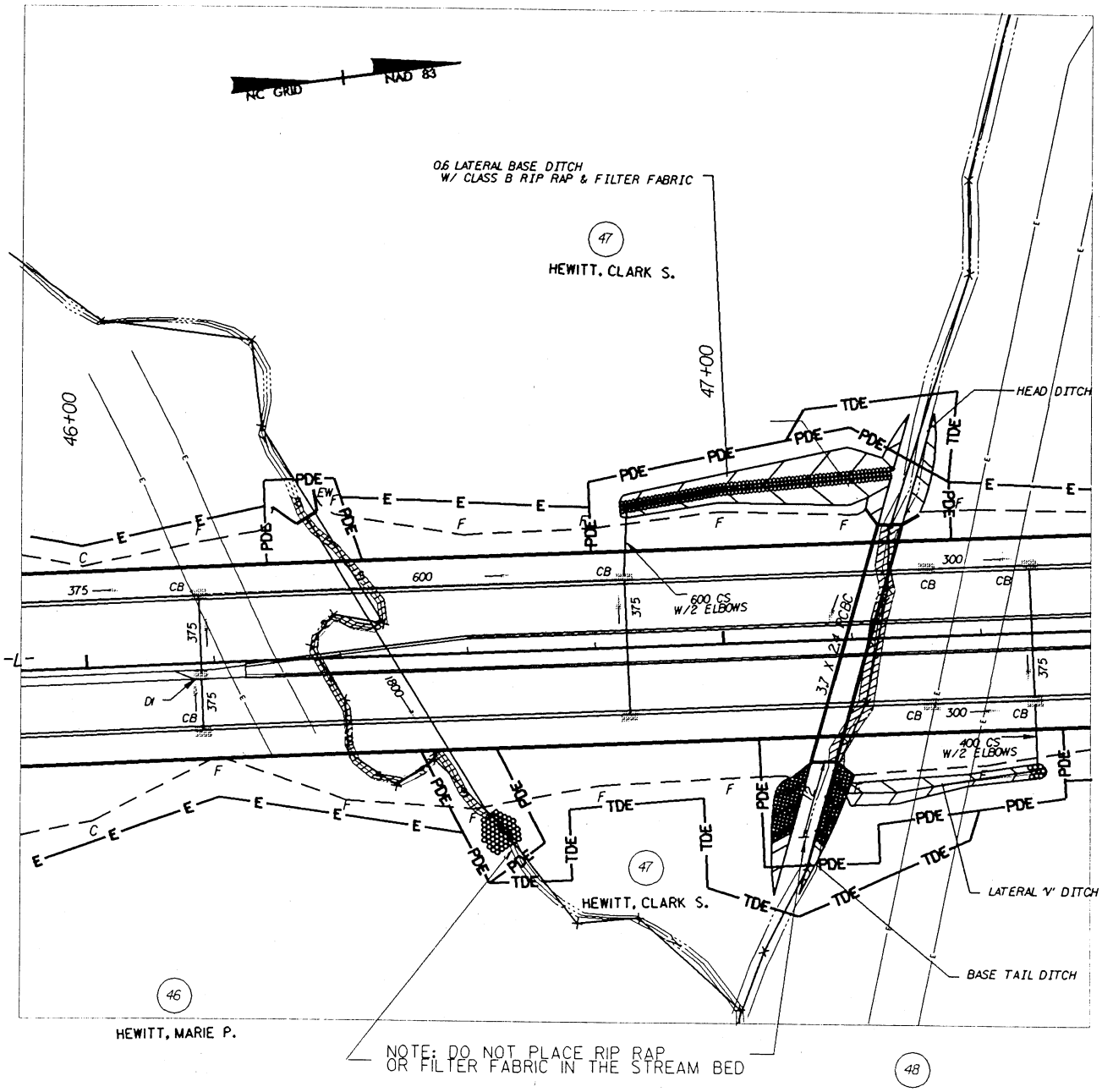
8.1792401 U-2404A

PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MARKERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET # OF 18

August, 2005



SITE #6 & 7

SCALE
20m 10 0 20m

DENOTES FILL IN SURFACE WATER

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CATAWBA COUNTY

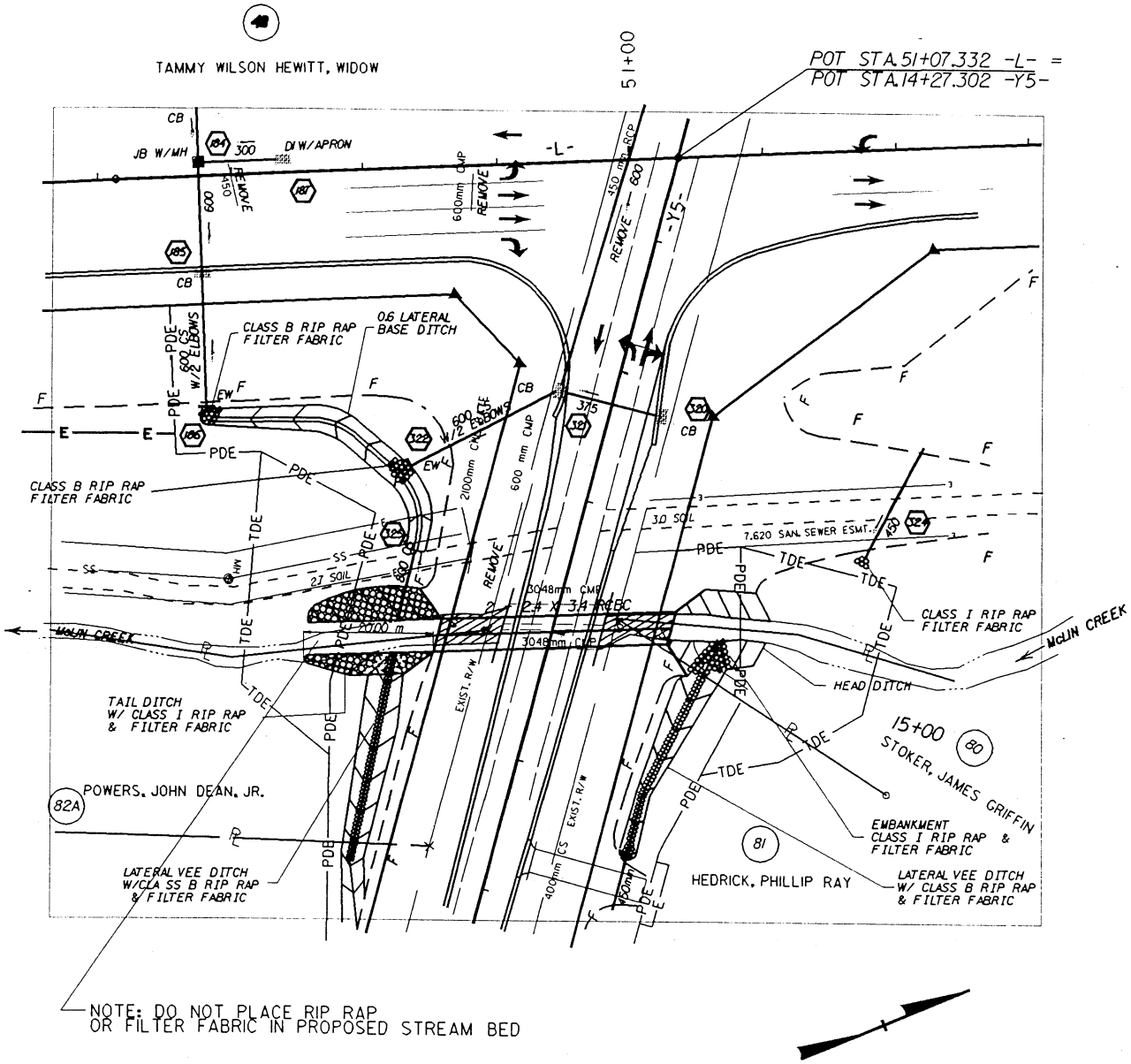
8.1792401 TIP U-2404A

PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MAKRERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET 10 OF 18

August, 2003



SITE #8

SCALE
20m 10 0 20m

S S DENOTES FILL IN SURFACE WATER

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

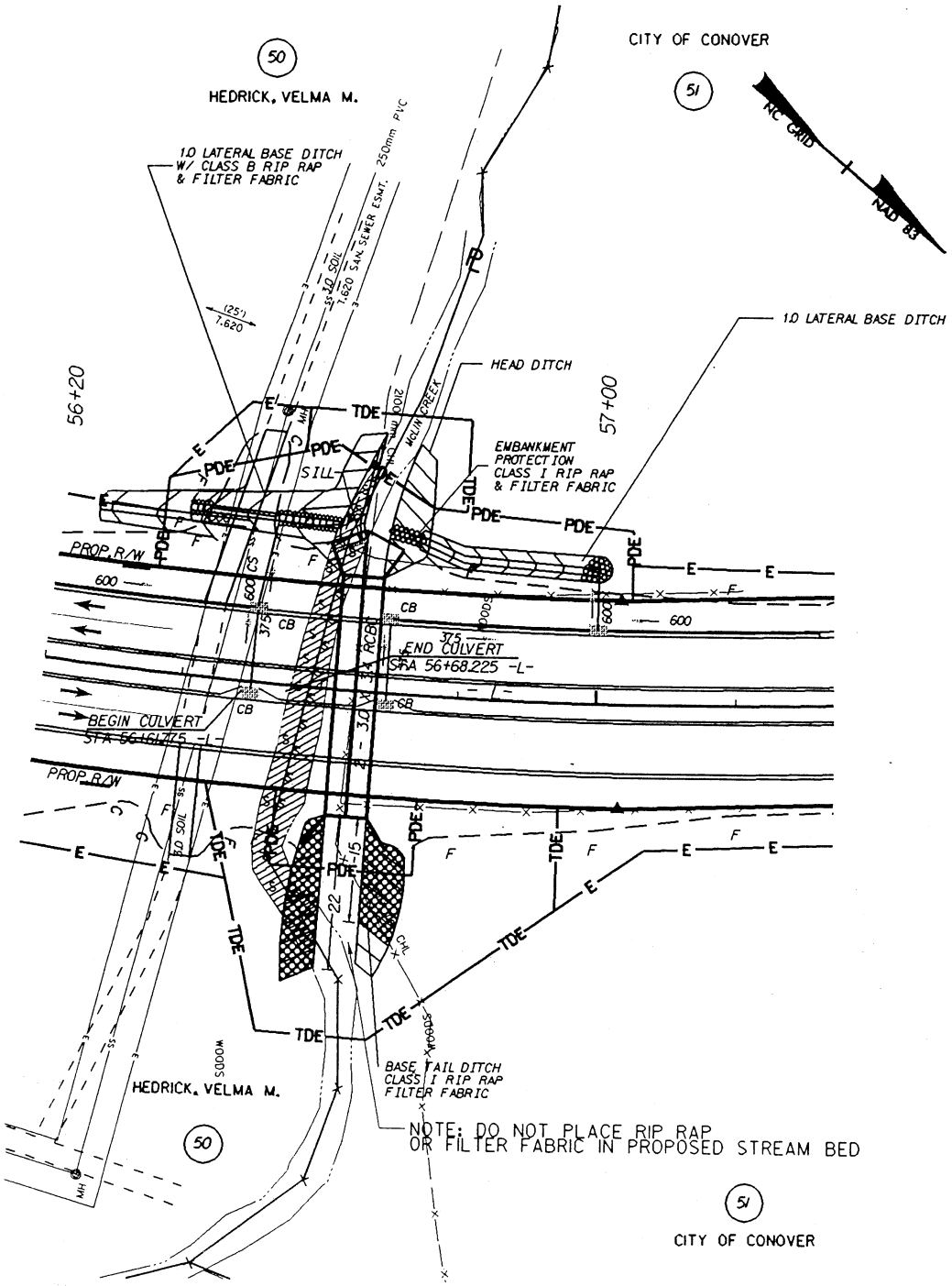
CATAWBA COUNTY

8.1792401 TIP U-2404A

PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MAKRERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET 11 OF 18 August, 2003



SITE #9

SCALE
20m 10 0 20m

S S DENOTES FILL IN SURFACE WATER

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CATAWBA COUNTY

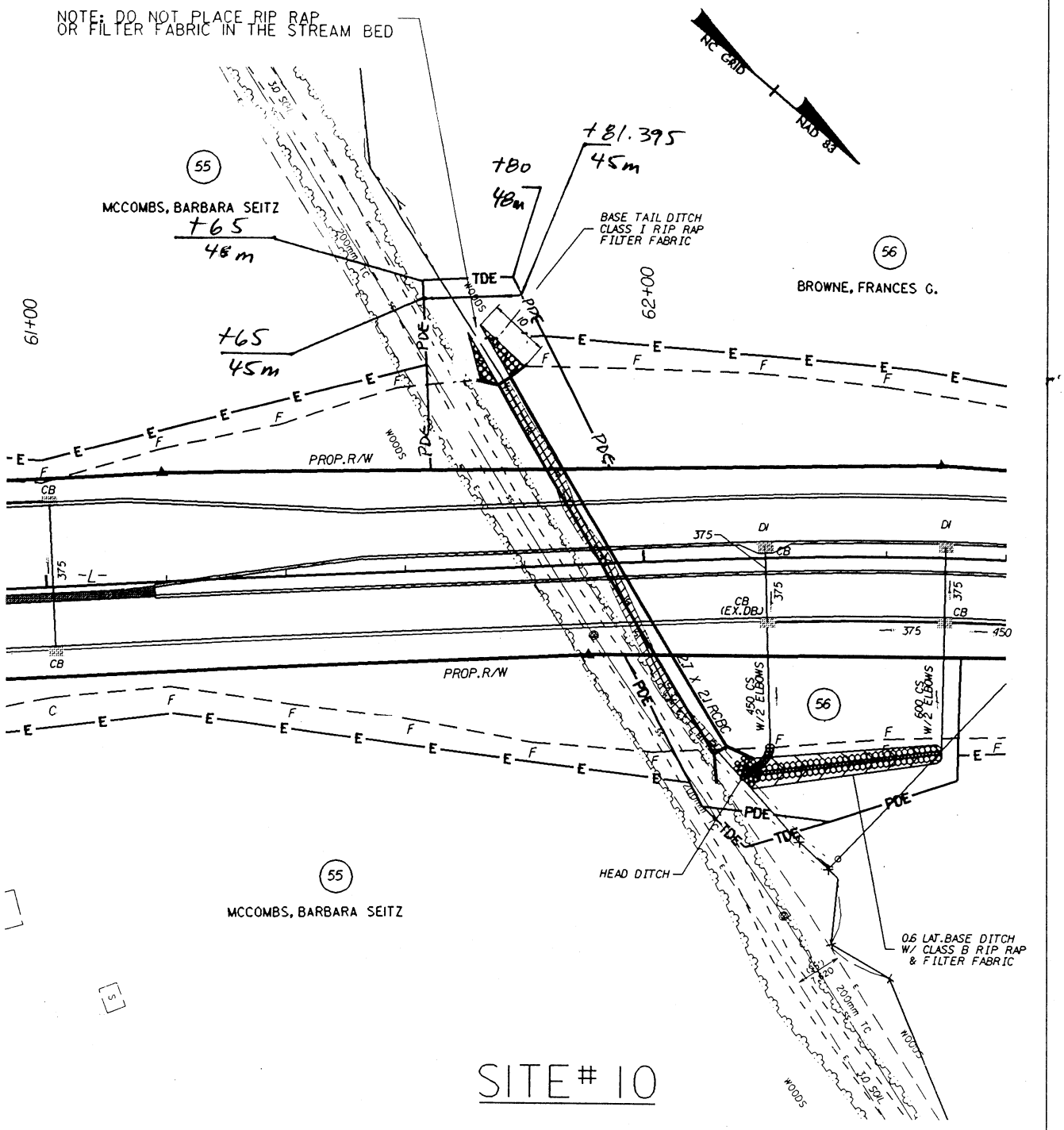
8.1792401 TIP U-2404A

PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MAKRERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET 12 OF 18

August, 2003



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CATAWBA COUNTY

8.1792401 TIP U-2404A

PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MAKRERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET 13 OF 19

August, 2003

PROPERTY OWNER

NAME AND ADDRESS

PARCEL #	OWNER'S NAME	ADDRESS
3	WORD OF LIFE CHRISTIAN CENTER	P.O. BOX 998 NEWTON, NC 28658
4	STEELMON, ERNEST RONALD	P.O. BOX 582 NEWTON, NC 28658
5	YODER, DANIEL NOAH	P.O. BOX 93 NEWTON, NC 28658
6	YODER, DANIEL NOAH	P.O. BOX 93 NEWTON, NC 28658
19	BOLICK, ALBERT LUTHER	2317 BETHANY CHURCH RD. NEWTON, NC 28658
21	BOLICK, ALBERT LUTHER	2317 BETHANY CHURCH RD. NEWTON, NC 28658
22	BOLICK, JACK DAVIDSON	54720 PROGRESS CT. VERADALE, WA 99037

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CATAWBA COUNTY

8.1792401 U-2404A

PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MARKERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET 14 OF 18 APRIL 13, 2000

PROPERTY OWNER

NAME AND ADDRESS

PARCEL #	OWNER'S NAME	ADDRESS
27	ALLEN, DAVID KEITH	1848 E. NC 10 HWY NEWTON, NC 28658
28	MCREE, SUE LINEBERGER	1904 E. NC 10 HWY NEWTON, NC 28658
32	MCREE, ALICE MELINDA	1725 McKEE RD. NEWTON, NC 28658
33	MATHEWS, JEFFERY GUY	1859 McKEE RD. NEWTON, NC 28658
42	COCHRANE FURNITURE CO. INC.	P.O. BOX 220 LINCOLNTON, NC 28092
45	HEWITT, VELDA MAE	RR 3 BOX 802 CONOVER, NC 28613
46	HEWITT, MARIE P.	1871 MT. OLIVE CHURCH RD. NEWTON, NC 28658

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CATAWBA COUNTY

8.1792401 U-2404A

PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MARKERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET 15 OF 18 APRIL 13, 2000

PROPERTY OWNER

NAME AND ADDRESS

PARCEL #	OWNER'S NAME	ADDRESS
47	HEWITT, CLARK S.	P.O. BOX 1411 TAPPAHANNO, VA 22560
48	HEWITT, ROBERT AUGUSTUS	1827 BURRIS RD. CONOVER, NC 28613
81	STOKER, JAMES GRIFFIN	902 E. 23RD ST. NEWTON, NC 28658
82	HEDRICK, PHILLIP RAY	1697 PRESTIGE DR. CONOVER, NC 28613
83	REYNOLDS, JOHNNY DALE	RR 3 BOX 778 CONOVER, NC 28613
50	HEDRICK, VELMA M.	1695 SMYRE FARM RD NEWTON, NC 28658
51	CITY OF CONOVER	P.O. BOX 549 CONOVER, NC 28613

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CATAWBA COUNTY

8.1792401 U-2404A

PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MARKERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET 16 OF 18 APRIL 13, 2000

PROPERTY OWNER

NAME AND ADDRESS

PARCEL #	OWNER'S NAME	ADDRESS
55	MCCOMBS, BARBARA SEITZ	2284 E. NC 10 HWY CONOVER, NC 28613
56	BROWNE, FRANCES G.	P.O. BOX 828 STATESVILLE, NC 28677

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CATAWBA COUNTY

8.1792401 U-2404A

PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MARKERS, SIGNALS AND TRACKWORK.

SCALE AS SHOWN

SHEET 17 OF 18 APRIL 13, 2000

SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS			
Site No.	Station (From/To)	Structure Size	Fill In Wetlands (ha)	Temp. Fill In Wetlands (ha)	Excavation In Wetlands (ha)	Interchange Isolated Wetland (ha)	Mechanized Clearing (Method III) (ha)	Fill In SW (Natural) (ha)	Fill In SW (Pond) (ha)	Existing Channel Impacted (m)	Relocated Channel (m)
1	13+01 - 13+09 -L-	1500 RCP	0	0	0	0	0	0.01	0	18	0
2	23+20 - 23+56 -L-	1200 RCP	0.06	0	0	0	0	<0.01	0	22	0
3	30+47 - 30+81 -L-	1200 RCP	0	0	0	0	0	0.02	0	81	0
4	33+66 - 34+07 -L-	900 RCP	0.02	0	0	0	<0.01 ha	0.02	0	72	0
5	42+15 - 42+37 -L-	1200 RCP	0	0	0	0	0	<0.01	0.03	54	0
6	46+36 - 46+61 -L-	1800 RCP	0	0	0	0	0	0.01	0	95	0
7	47+16 - 47+28 -L-	3.7 x 2.4 RCBC	0	0	0	0	0	0.01	0	79	0
8	14+92 - 15+06 -Y5-	2@2.4 x 3.4 RCBC	0	0	0	0	0	0.01	0	55	0
9	56+52 - 56+62 -L-	2@3.0 x 3.4 RCBC	0	0	0	0	0	0.03	0	83	0
10	61+77 - 62+12 -L-	2.7 x 2.1 RCBC	0	0	0	0	0	0.01	0	90	0
		TOTALS	0.08 ha	0 ha	0 ha	0 ha	<0.01 ha	0.14 ha	0.03 ha	649 m	0 m

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
CATAWBA COUNTY
PROJECT: 8.1792401 U2404A
PROPOSED GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, LONG-LIFE PAVEMENT MARKINGS, SNOWPLOWABLE PAVEMENT MARKERS, SIGNALS AND TRACKWORK.
SHEET 18 OF 18 AUGUST 5,2000

Subject: Draft Minutes from Interagency Permit Drawing 4C Review Meeting on June 20,2002 for U-2404A
Catawba County

Team Members: John Hendrix-USACE (present)
Cynthia Van Der Wiele-NCDWQ (present)
David Cox-NCWRC (*absent)
Marella Buncick-USFWS (phone conference)
Rachelle Beauregard, NCDOT PD&EA (present)

*David could not attend due to a schedule conflict but did provide a set of half size plans with comments. Comments reviewed and included in minutes.

Participants: Marshall Clawson, NCDOT Hydraulics Unit
Susan Locklear, NCDOT Hydraulics Unit
David Chang, NCDOT Hydraulics Unit

David Chang began the meeting by explaining the process and intention of the 4B/4C meetings. John Hendrix suggested that permit drawings be sent along with the ½ size plans when a 4C meeting is scheduled. He would also like to see the jurisdictional waters identified on the ½ size set of plans. Any other available information, which may assist the agencies in reviewing pipeline projects, should also be forwarded. Marshall Clawson proceeded to go over the permit drawings, site by site. Specific comments are listed below by wetland permit site number.

Site 1: No comment

Site 2: John Hendrix questioned what the inflow to the pipe was and whether or not it was jurisdictional. Marshall clarified that it was the wetland that is jurisdictional at this site. Ditch should be reflected on permit drawing as it is on the plans.
Action taken: Drawing revised to show ditch at inlet and outlet.

Site 3: Marella suggested that treatment for outfall of structure 93 be provided or considered. The current design demonstrates a direct discharge into the stream. Marshall stated that it would be investigated and that additional right of way may need to be acquired.
Action taken: Outfall moved from stream proximity.

Site 4-6: No comment.

Site 7: John Hendrix asked if proposed box culvert is the width of the existing streambed. The Culvert Survey Report was reviewed to reassure that, yes, it is the width of the bed. David Cox would like to see the culvert buried 1'.
Action taken: Culvert buried one foot.

Site 8: Cynthia and David Cox questioned whether sills were proposed/needed on box culvert. Culvert Survey Report demonstrated that the proposed two box culvert matches the existing width. Therefore, no sill is needed to maintain low flow. David Cox would like culvert buried a foot. Marella expressed concern with possible secondary impacts at –Y5- intersection. It seems that the floodplain is being cut off from the stream. Also, intersections of this sort attract commercial development, which will ultimately impact the creek. Marella would just like for DOT to take a closer look at this area.
Action taken: Culvert buried one foot. ICI study being conducted to address secondary impacts for the project.

Site 9: David Cox commented that site looks good and to bury culvert 1'.
Action taken: Culvert buried one foot.

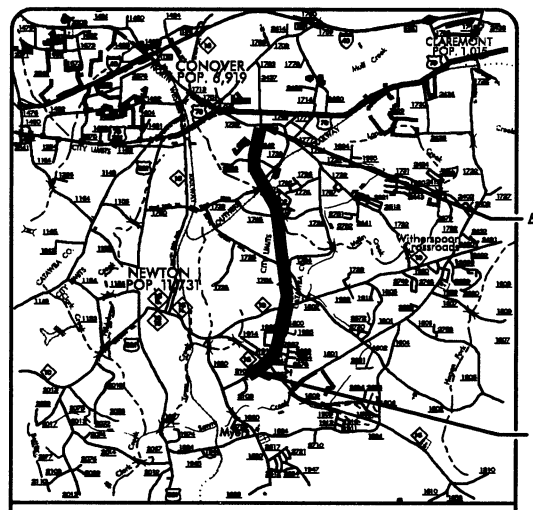
Site 10: Marella suggested that treatment for outfall of structure 249 be provided or considered. The current design demonstrates a direct discharge into the stream. Marshall stated that it would be investigated and that additional right of way may need to be acquired. David Cox would like culvert buried 1'. Also, no riprap is to be placed in channel.
Action taken: Culvert buried one foot. No rip rap allowed in bed. Structure #249 moved away form culvert inlet.

John Hendrix stated that this project might qualify for a Nationwide Permit. The agencies will look in to this possibility.

U-2404A

PROJECT: 8.1792405

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



VICINITY MAP FOR
STATE PROJECT 8.1792405

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN AND PROFILE OF PROPOSED STATE HIGHWAY

CATAWBA COUNTY

ALL DIMENSIONS IN THESE PLANS ARE IN METERS AND/OR MILLIMETERS UNLESS OTHERWISE SHOWN

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2404A	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
8.1792401	STP-16(2)	P.E.
8.1792404	STP-16(2)	R.O.W.
8.1792405	STP-16(22)	CONST.

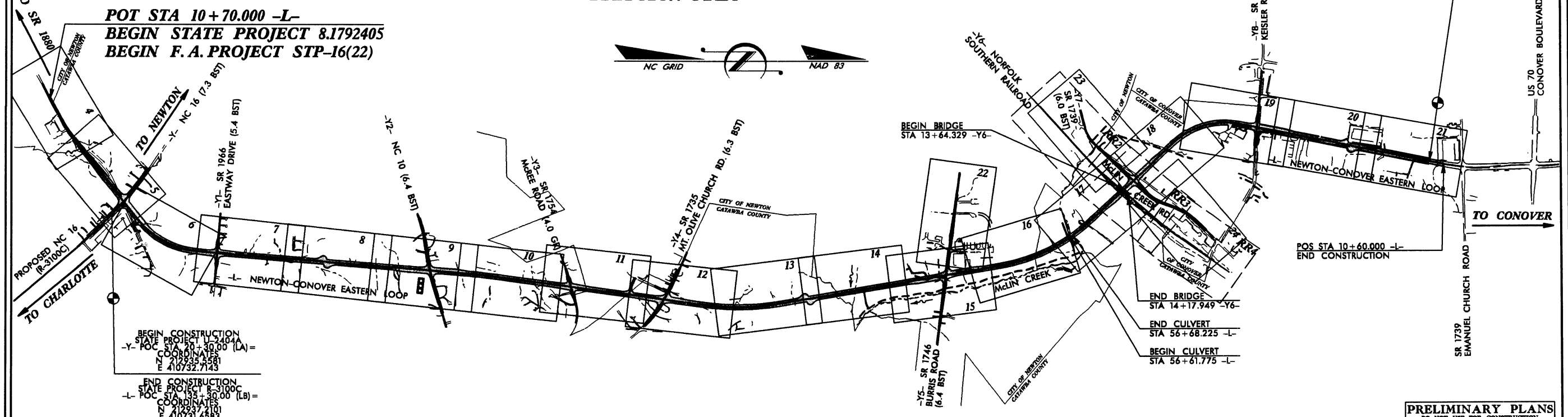
POT STA 73+05.621 –L– LB =
POT STA 9+80.000 –L– LA (U-2404B)
END STATE PROJECT 8.1792405
END F. A. PROJECT STP-16(22)

LOCATION: NEWTON–CONOVER EASTERN LOOP FROM NC 16 SOUTH OF NEWTON TO SR 1739 (EMANUEL CHURCH RD.)

TYPE OF WORK: GRADING, STRUCTURE, CULVERTS, PAVING, CURB AND GUTTER, DRAINAGE, SIGNALS AND TRACKWORK

NC GRID NAD 83

POT STA 10+70.000 –L–
BEGIN STATE PROJECT 8.1792405
BEGIN F. A. PROJECT STP-16(22)



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALE

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

DESIGN DATA

ADT 2005 = 9,290
ADT 2025 = 19,930
DHV = 10 %
D = 60 %
T = 5 % *
V = 80 km/h

* TTST 3% + DUAL 2%

PROJECT LENGTH

LENGTH OF ROADWAY, F.A. PROJECT STP-16(22) = 6.230 km

LENGTH OF STRUCTURES, F.A. PROJECT STP-16(22) = 0.006 km

TOTAL LENGTH, STATE PROJECT 8.1792405 = 6.236 km

Prepared In the Office of:
RALPH WHITEHEAD ASSOCIATES, INC.
For NCDOT

1995 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: *June 22, 2001*

LETTING DATE: *December 16, 2003*

JOHN N. JOHNSON, P.E.
PROJECT ENGINEER

KENNETH J. HERRING, P.E.
PROJECT DESIGN ENGINEER

NCDOT CONTACT: ***TERESA BRUTON, P.E.***
DESIGN SERVICES UNIT

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 36424
CHARLOTTE, NORTH CAROLINA 28236

REVISIONS
2/21/03 REVISED PROPERTY OWNER ON PARCEL 2

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED FOR MONUMENT "U2404B-1" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 218822.063(m) EASTING: 410512.877(m)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999858750
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U2404B-1" TO -L- POT STATION 10+00.000 IS
S 2° 58' 19.26" W 6,186.920 (m)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

METRIC
5 0 10

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	4
R /W SHEET NO.	4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.
R /W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NAD 83
NC GRID

DANNER, ANNA MAY
DB 1060 PG 333

CATAWBA COUNTY
CITY OF NEWTON

(2) MCLIN CREEK PARTNERS, LLC
DB 2244 P.768

(4) STEELMON, ERNEST RONALD
DB 1924 PG 352

POT Sta.10+00.000
PC Sta.11+89.617
PT Sta.12+52.654

BEGIN STATE PROJECT U-2404A
POT STA 10+70.000 -L-

(1) THE LUCKY 7 DEVELOPMENT GROUP
DB 1892 PG 1229

(3) WORD OF LIFE CHRISTIAN CENTER
DB 1823 PG 467

ISBK
WORD OF LIFE CHURCH

CURVE L-1
PI Sta 12+21.226
Δ = 10°31'22.2" (LT)
L = 63.037
T = 31.609
R = 340.000
SE = 5.7%
INC = 15.439

BEGIN SBL TAPER LT & RT
STA 11+62.000 -L-

BEGIN NBL TAPER LT & RT
STA 12+62.000 -L-

DETENTION POND

SLOPE STAKE LINE

SPECIAL VEE DITCH DETAIL 'J' SHT 2G

LATERAL VEE DITCH DETAIL 'D' SHT 2F CLASS B RIP RAP (EST 21 MTN) FILTER FABRIC (EST 51 SM) DDE (EST 35 CM)

Q6 LATERAL BASE DITCH DETAIL 'A' SHT 2F CLASS B RIP RAP (EST 82 MTN) FILTER FABRIC (EST 216 SM) DDE (EST 338 CM)

180 SBL DROP TAPER

BEGIN SHLDR. BERM GUTTER +70

DO NOT DISTURB

REMOVE

MATCH LINE -L- STA. 13+00 SHEET 5

SEE SHEET 25 FOR -L- PROFILE.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 36424
CHARLOTTE, NORTH CAROLINA 28236

REVISIONS

12/14/01 COORDINATE EQUALITY ADDED, EASEMENT NOTE DARKENED AND EASEMENT ADJUSTED ℄ -Y- STA.20+47.828 Lt.
02/21/03 REVISED EXISTING R/W ON N.C.16 AND ADDED PROPOSED R/W ON N.C.16.

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	5
R /W SHEET NO.	5

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

METRIC 5 0 10

CONST.REV.

R /W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

MATCH LINE -L- STA. 13+00 SHEET 4

MATCH LINE -Y- STA. 22+40 SHEET 23

MATCH LINE -L- STA. 16+60 SHEET 6

NAD 83
NC GRID

STEELMON, ERNEST RONALD
DB 1924 PG 352

YODER, DANIEL NOAH
DB 377 PG 105

RONDA REINHARDT
DB 1869 PG 1304

MOOSE FAMILY LTD.
DB 365 PG 484

YODER, DANIEL NOAH
DB 377 PG 105

EARNHARDT, RALPH DALE
DB 2045 PG 289

WORD OF LIFE CHRISTIAN CENTER
DB 1823 PG 467

SMYRE, MADELINE SIGMON
DB 2064 PG 286

EARNHARDT, RALPH DALE
DB 1939 PG 346

EARNHARDT, RALPH DALE
DB 1990 PG 851

EARNHARDT, RALPH DALE
DB 1511 PG 815

0.6 LATERAL BASE DITCH
DETAIL 'K SHT 2F
CLASS B RIP RAP (EST 82 MTN)
FILTER FABRIC (EST 2.16 SM)
DDE (EST 338 CM)

REPAIR DITCH EROSION
CLASS I RIP RAP (EST 40 MTN)
FILTER FABRIC (EST 105 SM)

METHOD "B" INSTALLATION

SLOPE STAKE LINE

SHLDR.BERM GUTTER

PROP.GR.

180 SBL DROP TAPER

END SBL TAPER LT & RT

END SHLDR.BERM GUTTER / BEGIN C&G

SHLDR.BERM GUTTER SLOPE STAKE LINE

CLASS I RIP RAP (EST 39 MTN)
FILTER FABRIC (EST 69 SM)

1.0 LATERAL BASE DITCH
DETAIL 'K SHT 2F
CLASS B RIP RAP (EST 104 MTN)
FILTER FABRIC (EST 268 SM)
DDE (EST 221.0 CM)

80 NBL LT & RT TURN TAPER

END NBL TAPER LT & RT

BEGIN SHLDR.BERM GUTTER
+02

CURVE Y-1

Pls Sta 18+76.817	Pl Sta 20+88.555
Θs = 0°54'23.3"	Δ = 13°13'05.1" (LT)
Ls = 53.000	L = 386.421
LT = 35.334	T = 194.072
ST = 17.667	R = 1675.000
	SE = RC
	INC = 12.6

NEWTON-CONOVER EASTERN LOOP
-Y- TRAFFIC VOLUMES

8510 / 16350	-Y- MC 16	
70 / 110	980 / 9250	
2180 / 4520 NEWTON-CONOVER E. LOOP		7880 / 18380 NEWTON-CONOVER E. LOOP
550 / 1270	5340 / 12990	
13350 / 28250	-Y- MC 16	
2005 / 2085 AOT		

END C&G & BEGIN TAPER WBL STA.22+25.000

SPECIAL VEE DITCH DETAIL 'J SHT 2G

750 CONC.C&G

CURVE Y-1

18 R - 113 R
2.4 OFFSET

17 R -100 R
2.1 OFFSET

20 R - 113 R
2.0 OFFSET

80 R - 80 R
1.4 OFFSET

TOE PROTECTION
DETAIL 'G' SHT 2F
CLASS B RIP RAP (EST 63 MTN)
FILTER FABRIC (EST 176 SM)

TOE PROTECTION
DETAIL 'G' SHT 2F
CLASS B RIP RAP (EST 107 MTN)
FILTER FABRIC (EST 299 SM)

1.0 LATERAL BASE DITCH
DETAIL 'F' SHT 2F
CLASS I RIP RAP (EST 90 MTN)
FILTER FABRIC (EST 156 SM)
DDE (EST 626 CM)

R/W & EASEMENTS TO BE AQUIRED UNDER R-3100C

DO NOT DISTURB (D.N.D.)

POT STA.15+96.992 -L- =
POC STA.21+02.855 -Y-

BEGIN CONSTRUCTION
STATE PROJECT U-2404A
-Y- POC STA.20+30.00 (LA)-
COORDINATES
N 212935.5581
E 410732.7443

END CONSTRUCTION
STATE PROJECT R-3100C
-L- POC STA.135+30.00 (LB)-
COORDINATES
N 212937.2101
E 410731.6583

SEE SHEET 25 FOR -L- PROFILE.
SEE SHEET 34 FOR -Y- PROFILE.

SYSTEM#####
DESIGN#####
USERNAME#####

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 16684
CHARLOTTE, NORTH CAROLINA 28216

REVISIONS
02-21-03 ADDED DRIVEWAY, TURNAROUND AND TEMPORARY CONSTRUCTION EASEMENT.

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	6
R/W SHEET NO.	6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NC GRID NAD 83

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

MATCH LINE -L- STA. 16+60 SHEET 5

TS Sta.16+64.225

SC Sta.17+52.225

CS Sta.19+23.241

ST Sta.20+11.241
END SBL TAPERS LT & RT

MATCH LINE -L- STA. 20+20 SHEET 7

17+00

18+00

19+00

20+00

+05 20.433m (67.04') 25m (82.02') 30m (98.42')

+83 29m (95.14')

+64.225 20.700m (67.91')

BEGIN SBL TAPERS LT & RT

40 SBL RT TURN TAPER

60 SBL LT TURN TAPER

3.0 LATERAL BASE DITCH
DETAIL 'H' SHT 8F
CLASS B RIP RAP (EST 121 MTN)
FILTER FABRIC (EST 298 SM)
DDE (EST 345 CM)

+40 29m (95.14')

+80 17.100m (56.10') 25m (82.02') 34m (111.55')

+52.225 17.100m (56.10')

(56.10 FT)

+60 25m (82.02')

+23.241 21m (68.90')

+23.241 17.100m (56.10')

(56.10 FT)

+53 21m (68.90')

(49.21 FT)

PROP.R/W 375

CHORD

PDE

SLOPE STAKE LINE

-L-

CB 750 CONC.C&G

CB W/APRON

450 CONC.C&G

CURVE L-2

PROP.GR.

750 CONC.C&G

CAT-1

BEGIN NBL TAPER RT
STA 19+63.566 -L-

N 4° 39' 32.3"E

+50 16m (52.49')

END NBL TAPER LT
STA 19+50.000 -L-

+89 15m (49.21')

+23.241 15m (49.21')

+27 25m (82.02')

+96.145 30m (98.42')

+57 29m (95.14')

BEGIN NBL TAPER LT
STA 19+10.000 -L-

+14 75.044m (246.21')

0.6R (TYP.)

6R (49.21 FT)

GRAU-350

"TEE" TURNAROUND

END CONSTRUCTION
POT Sta.10+40 -DR9-

R/W & EASEMENTS TO BE ACQUIRED UNDER N-3100C

POS Sta.17+05.165 -L-
POT Sta.10+60.000 -DR9-

300mm CMP

50 mm ø

200mm CMP 600F DR/IN

45 BST

450mm CMP

RETAIN

SR 1803 CALEB SETZER RD

55 BST

300 mm EXIST. R/W

36.68 Dist

MTL CANOPY

15FD

15FP

ISMTLG

ISMTLBLDG

DALE EARNHARDT CHEVROLET

ISPARTS

BST

EARNHARDT, RALPH DALE
DB 1511 PG 815

CHILDERS, GARY
DB 1919 PG 334

MOOSE FAMILY LTD.
DB 365 PG 484

MOOSE FAMILY LTD.
DB 365 PG 484

CURVE L-2

PIs Sta 17+22.950	PI Sta 18+39.828	PIs Sta 19+52.627
θs = 7°52'41.4"	Δ = 30°37'12.8" (LT)	θs = 7°52'41.4"
Ls = 88.00	L = 171.016	Ls = 88.000
LT = 58.725	T = 87.603	LT = 58.725
ST = 29.386	R = 320.000	ST = 29.386
	SE = 5.8%	
	INC = 15.172	

SEE SHEET 26 FOR -L- PROFILE.
SEE SHEET 42 FOR -DR9- PROFILE.

07/25/2003
n:\projects\2404A\STATION\RDW\728-85.psh
kevinherring

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 16434
CHARLOTTE, NORTH CAROLINA 28216

REVISIONS
2/21/03 REVISED DRAINAGE AND EASEMENTS ON PARCELS 19 & 22.
2/21/03 REVISED PROPERTY OWNER ON PARCEL 12
2/21/03 ADDED CURB CUTS FOR PARCELS 12,14,16,& 20

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	7
R/W SHEET NO.	7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

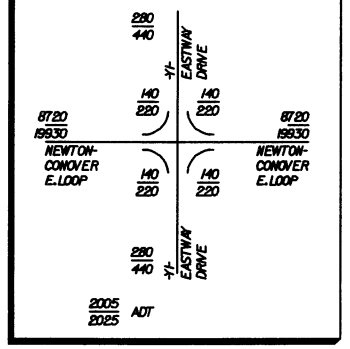
METRIC 5 0 10

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W REV.

NEWTON-CONOVER EASTERN LOOP -Y1- TRAFFIC VOLUMES



INDEX OF PROPERTY OWNERS

10 MCGHEE, VIRGINIA M.
DB 1777 PG 798

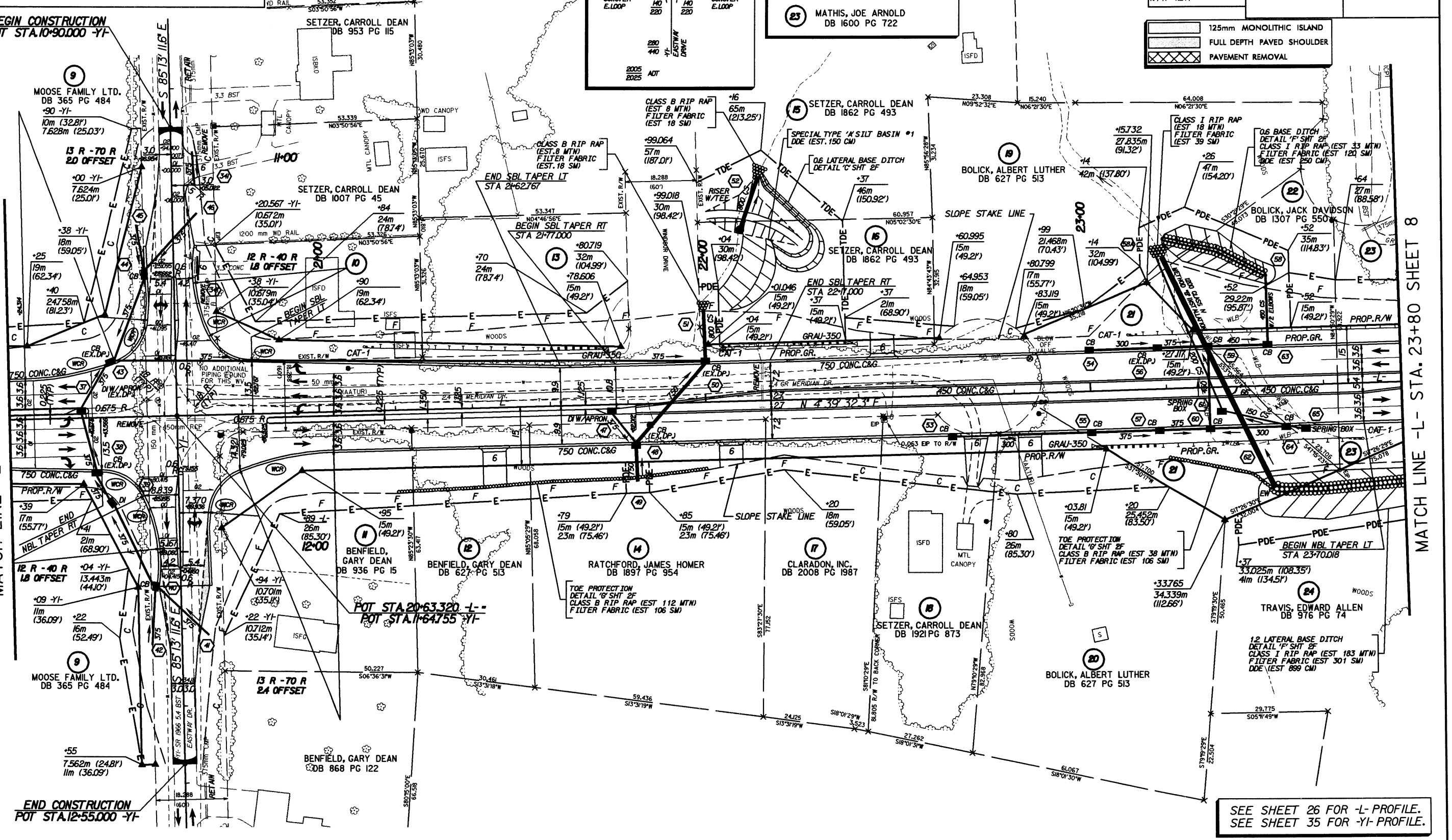
13 BOLICK, ALBERT LUTHER
DB 627 PG 513

21 BOLICK, ALBERT LUTHER
DB 1547 PG 37

23 MATHIS, JOE ARNOLD
DB 1600 PG 722

NC GRID NAD 83

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



SEE SHEET 26 FOR -L- PROFILE.
SEE SHEET 35 FOR -Y1- PROFILE.

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	8
R/W SHEET NO.	8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

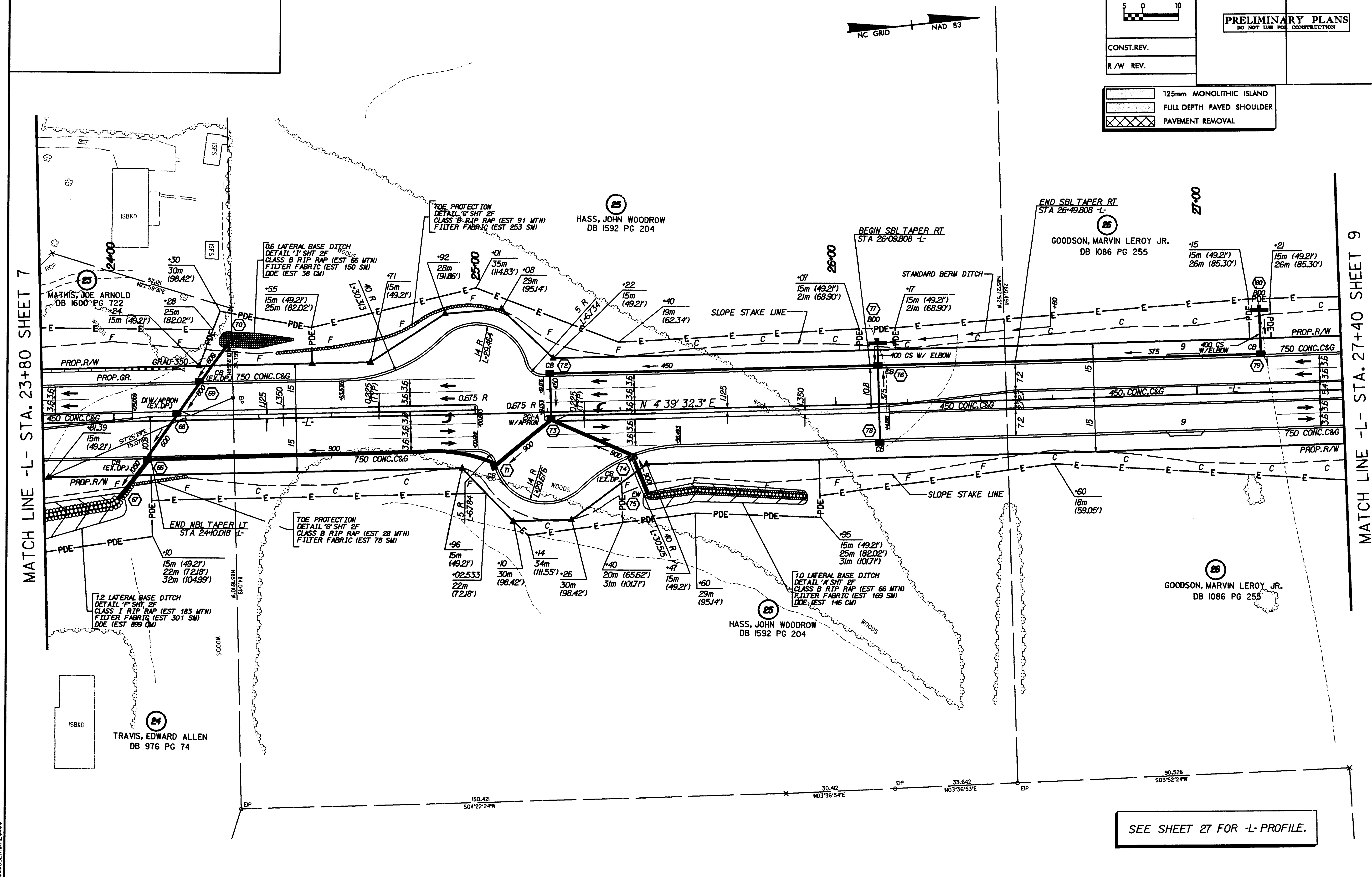
METRIC

CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS
2/21/03 ADDED CURB CUTS FOR PARCEL 26



NC GRID
NAD 83
125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
MATCH LINE -L- STA. 23+80 SHEET 7
MATCH LINE -L- STA. 27+40 SHEET 9
MATHIS, JOE ARNOLD
DB 1600 PG 722
HASS, JOHN WOODROW
DB 1592 PG 204
GOODSON, MARVIN LEROY JR.
DB 1086 PG 255
TRAVIS, EDWARD ALLEN
DB 976 PG 74
BEGIN SBL TAPER RT
STA 26+09.808 -L-
END SBL TAPER RT
STA 26+49.808 -L-
END NBL TAPER LT
STA 24+10.018 -L-
SLOPE STAKE LINE
STANDARD BERM DITCH
N 4° 39' 32.3" E
750 CONC.C&G
450 CONC.C&G
PROP.R/W
TOE PROTECTION
DETAIL 'G' SHT 2F
CLASS B RIP RAP (EST 91 MTN)
FILTER FABRIC (EST 253 SM)
0.6 LATERAL BASE DITCH
DETAIL 'I' SHT 2F
CLASS B RIP RAP (EST 66 MTN)
FILTER FABRIC (EST 150 SM)
DDE (EST 38 CM)
TOE PROTECTION
DETAIL 'G' SHT 2F
CLASS B RIP RAP (EST 28 MTN)
FILTER FABRIC (EST 78 SM)
1.0 LATERAL BASE DITCH
DETAIL 'K' SHT 2F
CLASS B RIP RAP (EST 66 MTN)
FILTER FABRIC (EST 169 SM)
DDE (EST 146 CM)
1.2 LATERAL BASE DITCH
DETAIL 'F' SHT 2F
CLASS I RIP RAP (EST 183 MTN)
FILTER FABRIC (EST 301 SM)
DDE (EST 899 CM)
WOODS

SEE SHEET 27 FOR -L- PROFILE.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 36464
CHARLOTTE, NORTH CAROLINA 28236

REVISIONS
2/21/03 ADDED CURB CUTS FOR PARCEL 26

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	9
R /W SHEET NO.	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC 5 0 10

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.
R /W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

MATCH LINE -L- STA. 27+40 SHEET 8

MATCH LINE -L- STA. 31+00 SHEET 10

MATCH LINE -Y2- STA. 11+40 SHEET 23

MATCH LINE -Y2- STA. 13+80 THIS SHEET

NC GRID NAD 83

GOODSON, MARVIN LEROY JR.
DB 1086 PG 255

RINK, WAYNE HARLEY
DB 1923 PG 762

LYNCH, SCOTT ANDREW
DB 2061 PG 291

POPE, DEWEY KENNETH
DB 1089 PG 748

ALLEN, DAVID KEITH
DB 1509 PG 572

AIKEN, ROBERT ALLEN
DB 1351 PG 601

MCREE, SUE LINEBERGER
DB 529 PG 404

ABERNETHY, CLEO P.
DB 486 PG 387

GILBERT, KERMIT WILSON
DB 390 PG 193

RADCLIFF, IVAN DWIGHT
DB 959 PG 647

POT STA 29+43.174 -L-
POC STA 12+40.310 -Y2-

PC Sta. 11+85.221

PT Sta. 13+06.796

BEGIN SBL TAPER LT & RT
STA 30+57.000 -L-

END SBL TAPER LT & RT
STA 30+97.000 -L-

BEGIN NBL TAPER LT & RT
STA 27+88.000 -L-

END NBL TAPER LT & RT
STA 28+28.000 -L-

BY2-108
BL-PINC 25+22.436 =
BY2-PINC 7+41.925

BL-154
BL-PINC 23+84.809

BL-157
BL-PINC 26+01.139

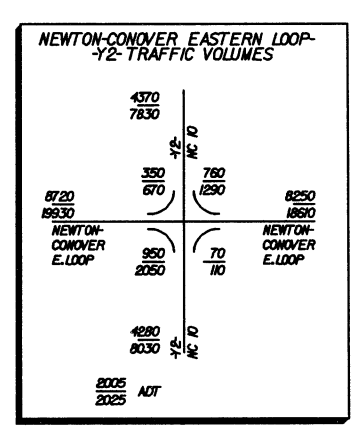
CURVE Y2-2
PI Sta 12+46.107
Δ = 7°57'38.9" (LT)
L = 121.574
T = 60.885
R = 875.000
SE = SEE PLANS
INC = 12.000

CURVE L-3
PI Sta 31+64.307
Δ = 2°57'03.6" (RT)
L = 154.514
T = 77.274
R = 3,000.000
SE = NC

N 4° 39' 32.3" E
N 73° 01' 48.6" E

SEE SHEET 27 FOR -L- PROFILE.
SEE SHEET 35 & 36 FOR -Y2- PROFILE.

NEWTON-CONOVER EASTERN LOOP
-Y2- TRAFFIC VOLUMES



RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 16684
CHARLOTTE, NORTH CAROLINA 28216

REVISIONS
2/21/03 REVISED PROPERTY OWNER ON PARCELS 32 & 33

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	10
R /W SHEET NO.	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R /W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NC GRID NAD 83

CITY OF NEWTON
CATAWBA COUNTY

MATCH LINE -L- STA. 31+00 SHEET 9

MATCH LINE -L- STA. 34+60 SHEET 11

CURVE L-3
PI Sta 31+64.307
Δ = 2°57'03.6" (RT)
L = 154.514
T = 77.274
R = 3,000.000
SE = NC

SEE SHEET 28 FOR -L- PROFILE.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 36061
CHARLOTTE, NORTH CAROLINA 28236

REVISIONS
2/21/03 REVISED PROPERTY OWNER ON PARCELS 32,33,36 & 37
4/09/03 REVISED PROPERTY OWNER ON PARCELS 36 & 37

NEWTON-CONOVER EASTERN LOOP
-Y3- TRAFFIC VOLUMES

250/980 -Y3- SR 1754
120/410 130/590
8250/10860 8190/10870
NEWTON-CONOVER E.LOOP
140/220 70/110
NEWTON-CONOVER E.LOOP
210/330 -Y3- SR 1754
2005/2025 ADT

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NC GRID NAD 83

METRIC
5 0 10

CONST.REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	11
R/W SHEET NO.	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

MATCH LINE -L- STA. 34+60 SHEET 10

MATCH LINE -L- STA. 38+20 SHEET 12

CURVE Y3-1
PI Sta 10+40.686
Δ = 3°31'33.1" (RT)
L = 12.000
T = 6.002
R = 195.000
SE = N/A

CURVE Y3-2
PI Sta 12+46.780
Δ = 29°47'34.6" (RT)
L = 72.798
T = 37.242
R = 140.000
SE = SEE PLANS

CURVE -DR2-
PI Sta 10+43.476
Δ = 17° 24' 14.8" (LT)
L = 30.376
T = 15.306
R = 100.000
SE = NC

CURVE DR-1
PI Sta 10+77.223
Δ = 45° 10' 23.6" (LT)
L = 31.537
T = 16.639
R = 40.000
SE = N/A

P.B. RILEY
DB 2134 PG 1782

BEGIN CONSTRUCTION
POT STA.10+52.830 -Y3-
BEGIN TAPER EBL & WBL

BEGIN PAVEMENT
POT STA.10+65.647 -Y3-
END TAPER EBL & WBL

PC Sta.10+34.684

PT Sta.10+46.684

N 70°31'44"E CURVE Y3-1

SPECIAL VEE DITCH DETAIL 'J' SHT 2G

CITY OF NEWTON
CATAWBA COUNTY

RILEY, MARY ALEXANDER
DB 1682 PG 419

POT STA.35+35.400 -L-
POT STA.11+37.659 -Y3-

BEGIN SBL TAPER LT
STA 35+45.725 -L-

TOE PROTECTION
DETAIL 'G' SHT 2F
CLASS B RIP RAP (EST 161 MTN)
FILTER FABRIC (EST 448 SM)

END SBL TAPER LT
STA 36+25.725 -L-

BEGIN SBL TAPER RT
STA 36+41.000 -L-

END SBL TAPER RT
STA 36+87.000 -L-

SLOPE STAKE LINE

SNYDER PAPER CORPORATION
DB 2130 PG 1687

PT Sta.10+58.546

POC STA.37+80.000 -L-
POT STA.10+72.835 -DR2-

15 R - 60 R
2.5 OFFSET

GRADE TO DRAIN

BEGIN CONSTRUCTION
POT STA.10+00.000 -DR2-

PC Sta.10+28.170

HEWITT, MARIE P.
DB 372 PG 19

BEGIN NBL TAPER LT
STA 37+73.000 -L-

BEGIN NBL TAPER RT
STA 38+07.251 -L-

END NBL TAPER LT
STA 38+13.000 -L-

STANLEY SETZER
DB 2164 PG 677

SHOOK, JIMMY DALE
DB 1657 PG 601

10 R - 85 R
2.0 OFFSET

WEPNER, TIM
DB 2218 PG 1863

BEGIN CONSTRUCTION
POT STA 10+00.900 -DR1-

PCSta.10+60.583

PTSta.10+92.120

CURVE Y3-2

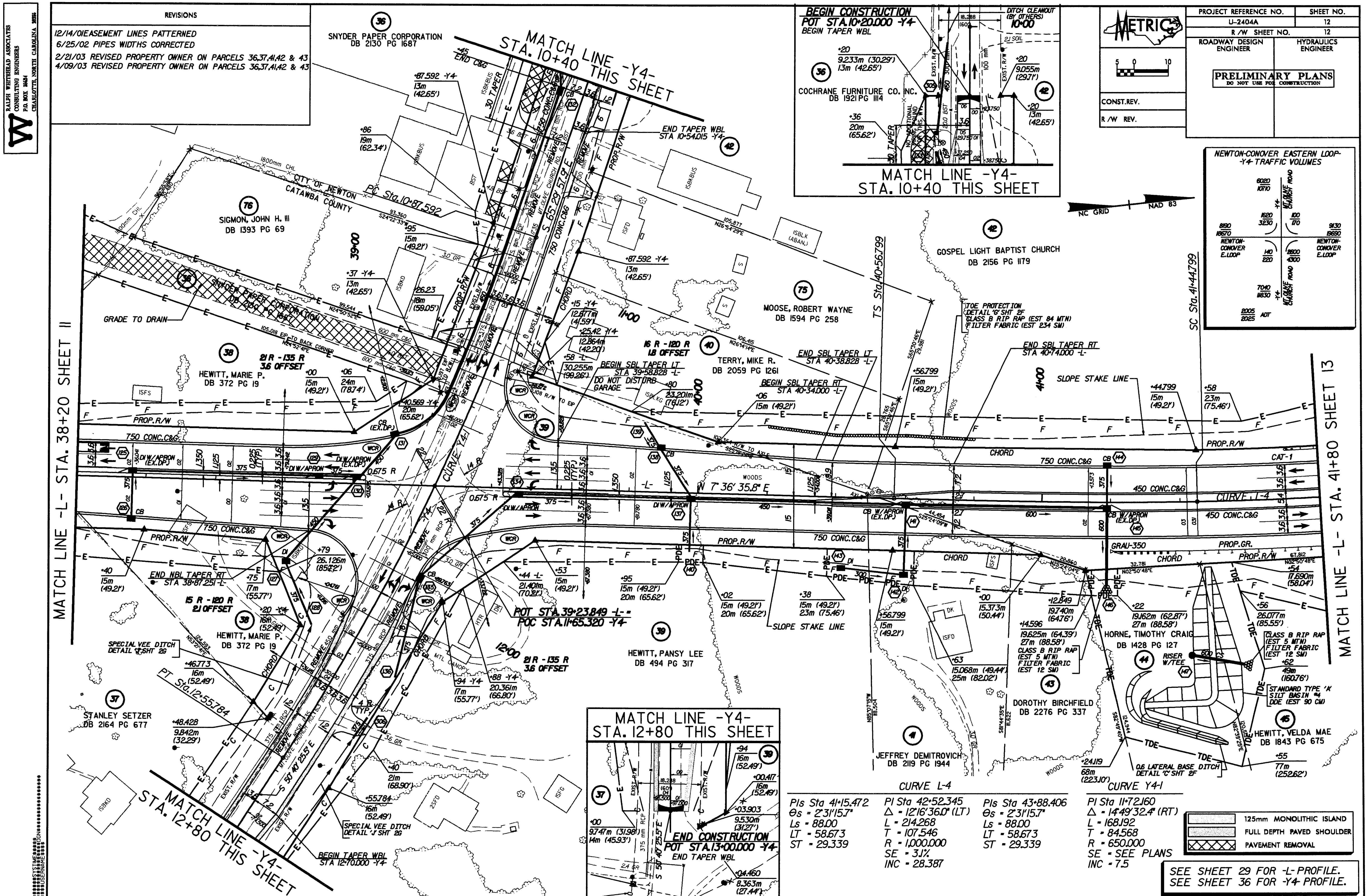
POC STA.12+11.533 -Y3-
POT STA.11+00.024 -DR1-

END CONSTRUCTION
POC STA.12+35.000 -Y3-
END TAPER EBL & WBL

END PAVEMENT
POC STA.12+09.760 -Y3-
BEGIN TAPER EBL & WBL

PC Sta.12+09.538

SEE SHEET 28 FOR -L- PROFILE.
SEE SHEET 36 FOR -Y3- PROFILE.
SEE SHEET 39 FOR -DR1- AND
-DR2- PROFILES.



RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235
REVISIONS
12/14/01 EASEMENT LINES PATTERNED
6/25/02 PIPES WIDTHS CORRECTED
2/21/03 REVISED PROPERTY OWNER ON PARCELS 36,37,41,42 & 43
4/09/03 REVISED PROPERTY OWNER ON PARCELS 36,37,41,42 & 43
PROJECT REFERENCE NO. U-2404A
SHEET NO. 12
R/W SHEET NO. 12
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
CONST. REV.
R/W REV.
METRIC
NEWTON-CONOVER EASTERN LOOP -Y4- TRAFFIC VOLUMES
NC GRID
NAD 83
MATCH LINE -Y4- STA. 10+40 THIS SHEET
MATCH LINE -Y4- STA. 12+80 THIS SHEET
MATCH LINE -L- STA. 38+20 SHEET 11
MATCH LINE -L- STA. 41+80 SHEET 13
BEGIN CONSTRUCTION
POT STA.10+20.000 -Y4-
BEGIN TAPER WBL
END CONSTRUCTION
POT STA.13+00.000 -Y4-
END TAPER WBL
SNYDER PAPER CORPORATION
DB 2130 PG 1687
COCHRANE FURNITURE CO. INC.
DB 1921 PG 1114
SIGMON, JOHN H. III
DB 1393 PG 69
CITY OF NEWTON
CATAWBA COUNTY
GOSPEL LIGHT BAPTIST CHURCH
DB 2156 PG 1179
MOOSE, ROBERT WAYNE
DB 1594 PG 258
TERRY, MIKE R.
DB 2059 PG 1261
HEWITT, MARIE P.
DB 372 PG 19
HEWITT, PANSY LEE
DB 494 PG 317
STANLEY SETZER
DB 2164 PG 677
JEFFREY DEMITROVICH
DB 2119 PG 1944
DOROTHY BIRCHFIELD
DB 2276 PG 337
HORNE, TIMOTHY CRAIG
DB 1428 PG 127
HEWITT, VELDA MAE
DB 1843 PG 675
POT STA.39+23.849 -L-
POC STA.11+65.320 -Y4-
PC Sta.10+87.592
PT Sta.12+55.784
TS Sta.40+56.799
SC Sta.41+44.799
CURVE L-4
PIs Sta 41+15.472
θs = 2°31'15.7"
Ls = 88.00
LT = 58.673
ST = 29.339
PI Sta 42+52.345
Δ = 12°16'36.0" (LT)
L = 214.268
T = 107.546
R = 1,000.000
SE = 3.1%
INC = 28.387
PIs Sta 43+88.406
θs = 2°31'15.7"
Ls = 88.00
LT = 58.673
ST = 29.339
CURVE Y4-1
PI Sta 11+72.160
Δ = 14°49'32.4" (RT)
L = 168.192
T = 84.568
R = 650.000
SE = SEE PLANS
INC = 7.5
125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
SEE SHEET 29 FOR -L- PROFILE.
SEE SHEET 36 FOR -Y4- PROFILE.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35434
CHARLOTTE, NORTH CAROLINA 28235

REVISIONS
2/21/03 REVISED DRAINAGE AND EASEMENTS ON PARCELS 42 & 45.
2/21/03 REVISED PROPERTY OWNER ON PARCEL 42
4/09/03 REVISED PROPERTY OWNER ON PARCEL 42

METRIC

5 0 10

CONST.REV.	
R /W REV.	

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	13
R /W SHEET NO.	13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NC GRID — NAD 83

MATCH LINE -L- STA. 41+80 SHEET 12

MATCH LINE -L- STA. 45+40 SHEET 14

CS Sta.43+59.068

ST Sta.44+47.068

GOSPEL LIGHT BAPTIST CHURCH
DB 2156 PG 1179

HEWITT, VELDA MAE
DB 1843 PG 675

HEWITT, MARIE P.
DB 406 PG 286

DAM BREACH
DETAIL 'W' SHT 2G
CLASS I RIP RAP (EST 70 MTN)
FILTER FABRIC (EST 100 SM)
DDE (EST 125 CM)

GRADE TO DRAIN UPON COMPLETION OF PROJECT.

USE AS SILT BASIN

W.E. 287.7

0.6 LATERAL BASE DITCH
DETAIL 'K' SHT 2F
CLASS B RIP RAP (EST 60 MTN)
FILTER FABRIC (EST 158 SM)
DDE (EST 220 CM)

CLASS I RIP RAP
(EST 27 MTN)
FILTER FABRIC
(EST 48 SM)

'LATERAL 'V' DITCH
DETAIL 'U' SHT 2G
DDE (EST. 23 CM)

CLASS B RIP RAP
(EST 1.8 MTN)
FILTER FABRIC
(EST 5.9 SM)

0.6 BASE TAIL DITCH
DETAIL 'B' SHT 2F
CLASS B RIP RAP (EST 24 MTN)
FILTER FABRIC (EST 50 SM)
DDE (EST 75 CM)

TOE PROTECTION
DETAIL 'G' SHT 2F
CLASS B RIP RAP (EST 129 MTN)
FILTER FABRIC (EST 359 SM)

PROPOSED UNDERCUT

PROP.R/W

PROP.GR.

750 CONC.C&G

450 CONC.C&G

450 CONC.C&G SPRING BOX

375 CB

CB W/APRON

CURVE L-4

CAT-1

GRAU-350

SLOPE STAKE LINE

STANDARD BERM DITCH

CHORD

DW/APRON

DW/APRON 0.675 R -L- (EX.DP)

BEGIN NBL TAPER LT
STA 43+80.000 -L-

END NBL TAPER LT
STA 44+20.000 -L-

N 9° 42' 31.4" W

WOODS

HTR

50 GR

SW

1500mm WW

CURVE L-4

PIs Sta 41+15.472	PI Sta 42+52.345	PIs Sta 43+88.406
Θs = 2°31'15.7"	Δ = 12°16'36.0" (LT)	Θs = 2°31'15.7"
Ls = 88.00	L = 214.268	Ls = 88.00
LT = 58.673	T = 107.546	LT = 58.673
ST = 29.339	R = 1,000.000	ST = 29.339
	SE = 3.1%	
	INC = 28.387	

SEE SHEET 29 FOR -L- PROFILE.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

REVISIONS
2/21/03 REVISED DRAINAGE AND EASEMENTS ON PARCEL 48.
2/21/03 REVISED PROPERTY OWNER ON PARCEL 48

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	14
R/W SHEET NO.	14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

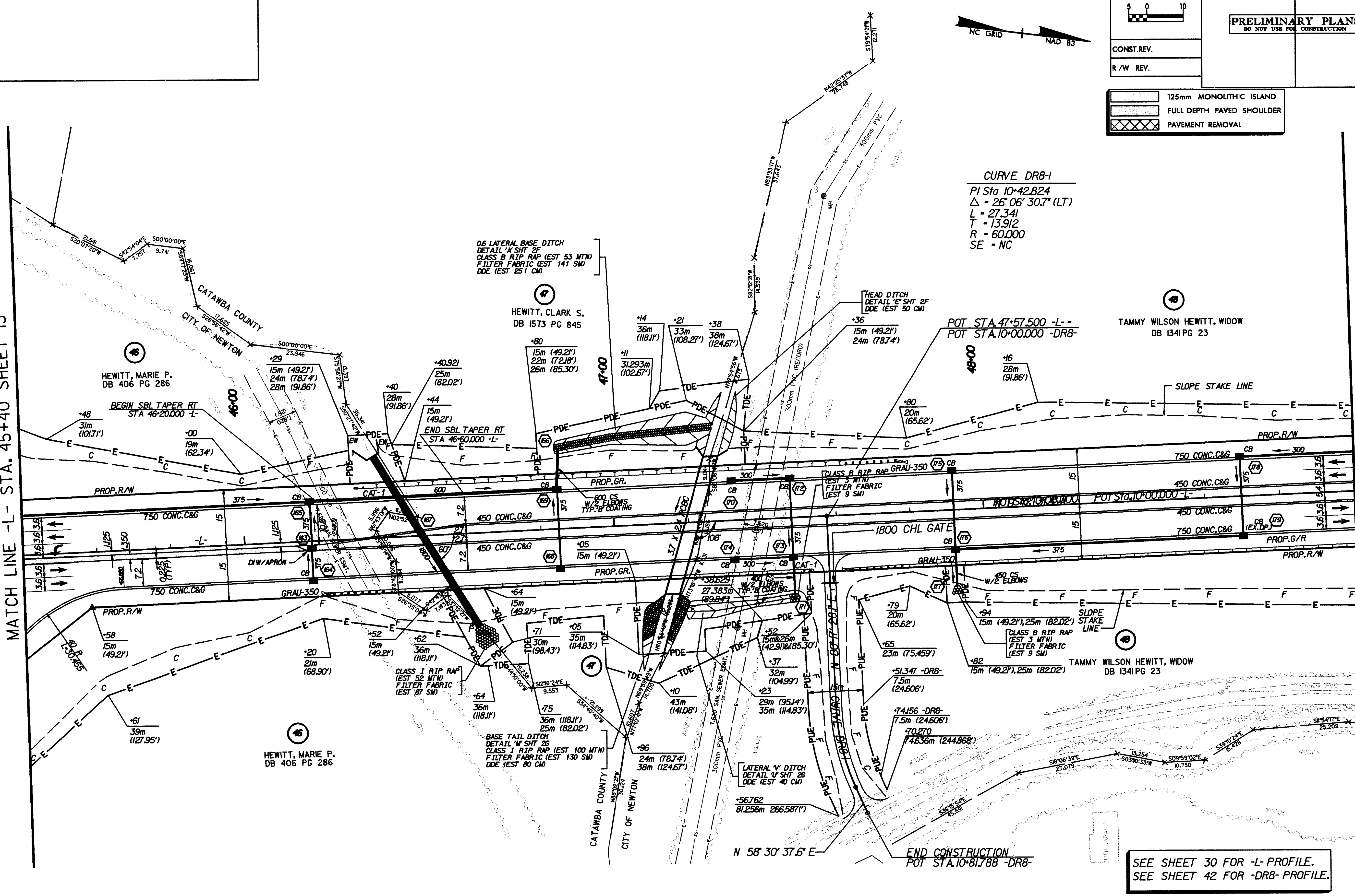
METRIC

CONST.REV.

R/W REV.

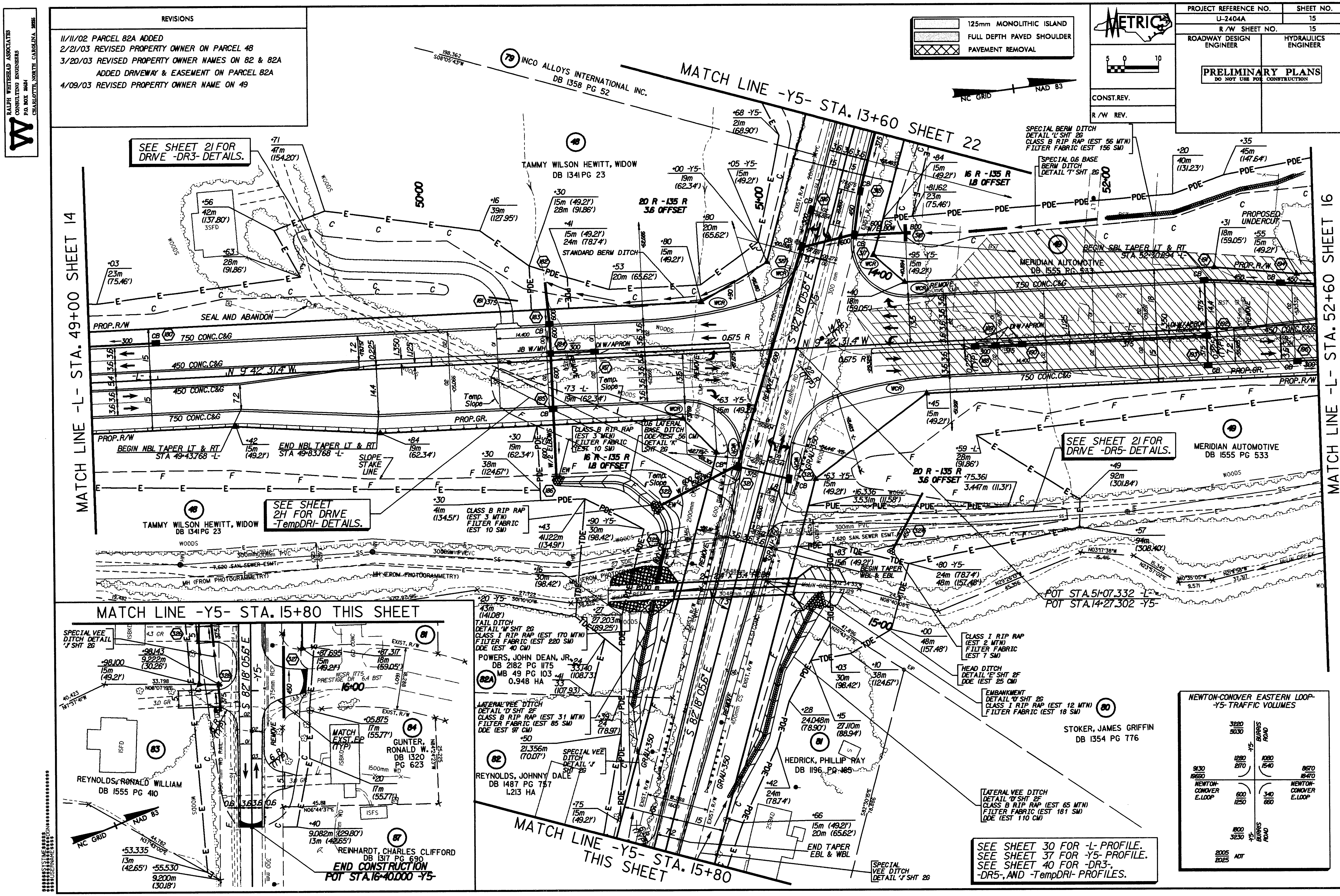
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

- 125mm MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL


MATCH LINE -L- STA. 45+40 SHEET 13
MATCH LINE -L- STA. 49+00 SHEET 15
NC GRID
NAD 83
CURVE DR8-1
PI Sta 10+42.824
Δ = 26° 06' 30.7" (LT)
L = 27.341
T = 13.912
R = 60.000
SE = NC
POT STA.47+57.500 -L- =
POT STA.10+00.000 -DR8-
HEWITT, MARIE P.
DB 406 PG 286
HEWITT, CLARK S.
DB 1573 PG 845
TAMMY WILSON HEWITT, WIDOW
DB 1341 PG 23
CATAWBA COUNTY
CITY OF NEWTON
BEGIN SBL TAPER RT
STA 46+20.000 -L-
END SBL TAPER RT
STA 46+60.000 -L-
0.6 LATERAL BASE DITCH
DETAIL 'K' SHT 2F
CLASS B RIP RAP (EST 53 MTN)
FILTER FABRIC (EST 141 SM)
DDE (EST 251 CM)
HEAD DITCH
DETAIL 'E' SHT 2F
DDE (EST 50 CM)
CLASS I RIP RAP
(EST 52 MTN)
FILTER FABRIC
(EST 87 SM)
BASE TAIL DITCH
DETAIL 'M' SHT 2B
CLASS I RIP RAP (EST 100 MTN)
FILTER FABRIC (EST 130 SM)
DDE (EST 80 CM)
LATERAL 'V' DITCH
DETAIL 'U' SHT 2B
DDE (EST 40 CM)
CLASS B RIP RAP
(EST 3 MTN)
FILTER FABRIC
(EST 9 SM)
750 CONC.C&G
450 CONC.C&G
1800 CHL GATE
SLOPE STAKE LINE
PROP.R/W
PROP.GR.
300mm PVC
N 58° 30' 37.6" E
END CONSTRUCTION
POT STA.10+81.788 -DR8-
46+00
47+00
48+00

SEE SHEET 30 FOR -L- PROFILE.
SEE SHEET 42 FOR -DR8- PROFILE.

07/04/2003
m:\proj\2228\STATION\RDWY\728-14.psh


REVISIONS
11/11/02 PARCEL 82A ADDED
2/21/03 REVISED PROPERTY OWNER ON PARCEL 48
3/20/03 REVISED PROPERTY OWNER NAMES ON 82 & 82A
ADDED DRIVEWAY & EASEMENT ON PARCEL 82A
4/09/03 REVISED PROPERTY OWNER NAME ON 49
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA
PROJECT REFERENCE NO. U-2404A
SHEET NO. 15
R/W SHEET NO. 15
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
METRIC
CONST.REV.
R/W REV.
125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
NC GRID
NAD 83
MATCH LINE -Y5- STA. 13+60 SHEET 22
MATCH LINE -L- STA. 49+00 SHEET 14
MATCH LINE -L- STA. 52+60 SHEET 16
MATCH LINE -Y5- STA. 15+80 THIS SHEET
INCO ALLOYS INTERNATIONAL INC.
DB 1358 PG 52
TAMMY WILSON HEWITT, WIDOW
DB 1341 PG 23
MERIDIAN AUTOMOTIVE
DB 1555 PG 533
SEE SHEET 21 FOR DRIVE -DR3- DETAILS.
SEE SHEET 21 FOR DRIVE -DR5- DETAILS.
SEE SHEET 2H FOR DRIVE -TempDR1- DETAILS.
BEGIN SBL TAPER LT & RT STA 52+30.894 -L-
BEGIN NBL TAPER LT & RT STA 49+43.768 -L-
END NBL TAPER LT & RT STA 49+83.768 -L-
SEAL AND ABANDON
STANDARD BERM DITCH
POT STA.51+07.332 -L-
POT STA.14+27.302 -Y5-
POWERS, JOHN DEAN, JR.
DB 2182 PG 1175
MB 49 PG 103
0.948 HA
REYNOLDS, JOHNNY DALE
DB 1487 PG 757
1.213 HA
HEDRICK, PHILLIP RAY
DB 1196 PG 185
STOKER, JAMES GRIFFIN
DB 1354 PG 776
REYNOLDS, RONALD WILLIAM
DB 1555 PG 410
GUNTER, RONALD W.
DB 1320 PG 623
REINHARDT, CHARLES CLIFFORD
DB 1317 PG 690
END CONSTRUCTION
POT STA.16+40.000 -Y5-
END TAPER EBL & WBL
BEGIN TAPER WBL & EBL
NEWTON-CONOVER EASTERN LOOP -Y5- TRAFFIC VOLUMES
SEE SHEET 30 FOR -L- PROFILE.
SEE SHEET 37 FOR -Y5- PROFILE.
SEE SHEET 40 FOR -DR3-, -DR5-, AND -TempDR1- PROFILES.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

REVISIONS
12/14/01 R/W AND EASEMENT LINES REMOVED FOR DRIVEWAY -DR4-
2/21/03 REVISED PROPERTY OWNER ON PARCEL 48

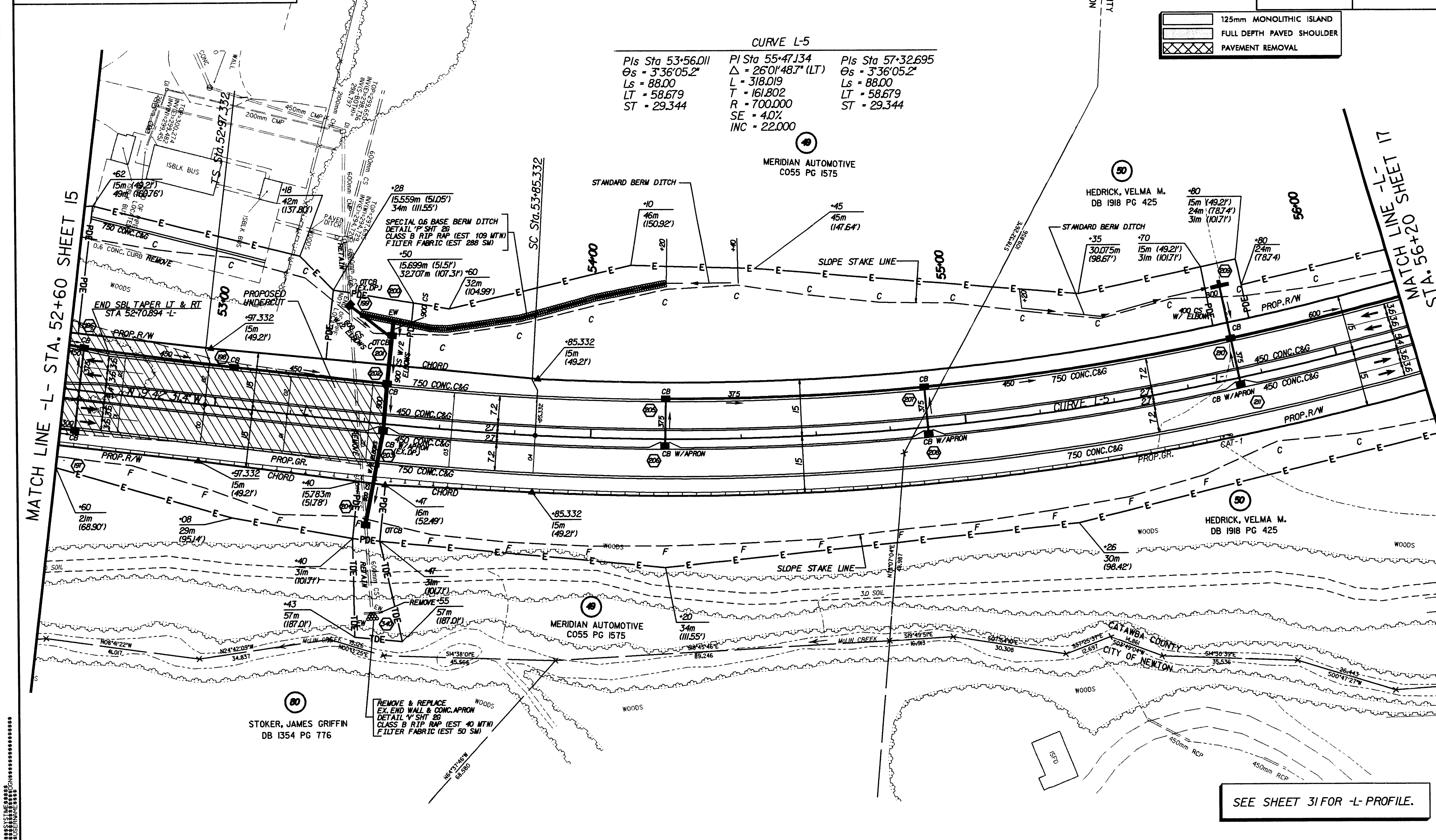
METRIC

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	16
R/W SHEET NO.	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST.REV.
R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



CURVE L-5
PIs Sta 53+56.011
θs = 3°36'05.2"
Ls = 88.00
LT = 58.679
ST = 29.344
PI Sta 55+47.134
Δ = 26°01'48.7" (LT)
L = 318.019
T = 161.802
R = 700.000
SE = 4.0%
INC = 22.000
PIs Sta 57+32.695
θs = 3°36'05.2"
Ls = 88.00
LT = 58.679
ST = 29.344
MERIDIAN AUTOMOTIVE
C055 PG 1575
HEDRICK, VELMA M.
DB 1918 PG 425
STOKER, JAMES GRIFFIN
DB 1354 PG 776
CATAWBA COUNTY
CITY OF NEWTON
MATCH LINE -L- STA. 52+60 SHEET 15
MATCH LINE -L- STA. 56+20 SHEET 17
TS Sta. 52+97.332
SC Sta. 53+85.332
END SBL TAPER LT & RT
STA 52+70.894 -L-
PROPOSED UNDERCUT
STANDARD BERM DITCH
SLOPE STAKE LINE
SPECIAL 0.6 BASE BERM DITCH
DETAIL 'P' SHT 2G
CLASS B RIP RAP (EST 109 MTN)
FILTER FABRIC (EST 288 SM)
REMOVE & REPLACE
EX. END WALL & CONC. APRON
DETAIL 'V' SHT 2G
CLASS B RIP RAP (EST 40 MTN)
FILTER FABRIC (EST 50 SM)
750 CONC.C&G
450 CONC.C&G
PROP.R/W
PROP.GR.
CHORD
CB W/APRON
McLIN CREEK
WOODS
NC GRID
NAD 83

SEE SHEET 31 FOR -L- PROFILE.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

REVISIONS
2/21/03 REVISED DRAINAGE AND EASEMENTS ON PARCEL 51.
2/21/03 REVISED PROPERTY OWNER ON PARCEL 52
5/28/03 ADDED PUE ON PARCELS 53 & 54

125mm MONOLITHIC ISLAND	
FULL DEPTH PAVED SHOULDER	
PAVEMENT REMOVAL	

NC GRID NAD 83

METRIC

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	17
R/W SHEET NO.	17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

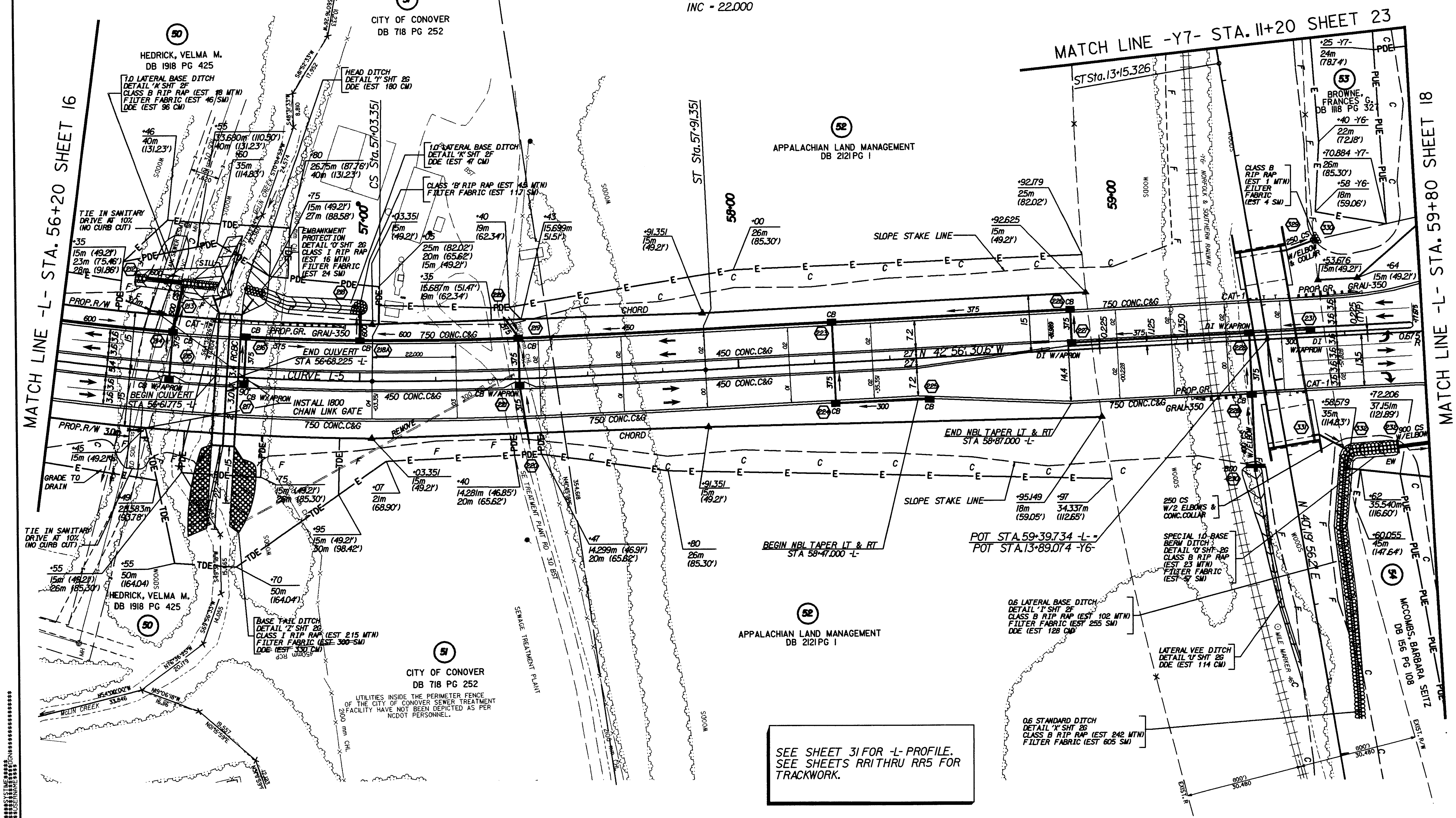
CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CURVE L-5

PIs Sta 53+56.011	PI Sta 55+47.134	PIs Sta 57+32.695
Θs = 3°36'05.2"	Δ = 26°01'48.7" (LT)	Θs = 3°36'05.2"
Ls = 88.00	L = 318.019	Ls = 88.00
LT = 58.679	T = 161.802	LT = 58.679
ST = 29.344	R = 700.000	ST = 29.344
	SE = 4.0%	
	INC = 22.000	



RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

REVISIONS
9/10/02 ADDED MEDIAN CROSSOVER @ STA.63+00
2/21/03 ADDED CURB CUT FOR PARCEL 56

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	18
R/W SHEET NO.	18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

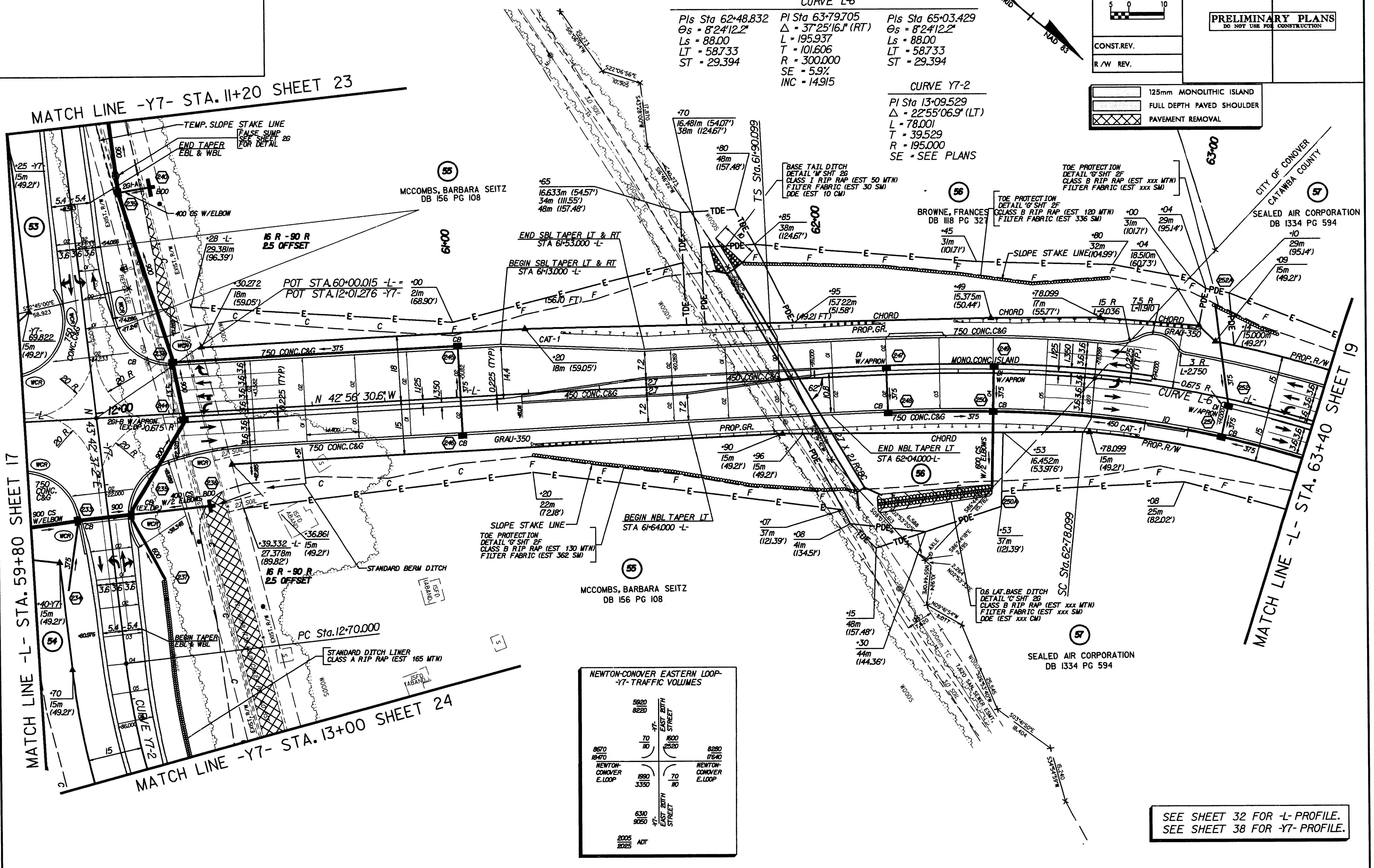
125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

CURVE L-6

PIs Sta 62+48.832	PI Sta 63+79.705	PIs Sta 65+03.429
Θs = 8°24'12.2"	Δ = 37°25'16.1" (RT)	Θs = 8°24'12.2"
Ls = 88.00	L = 195.937	Ls = 88.00
LT = 58.733	T = 101.606	LT = 58.733
ST = 29.394	R = 300.000	ST = 29.394
	SE = 5.9%	
	INC = 14.915	

CURVE Y7-2

PI Sta 13+09.529
Δ = 22°55'06.9" (LT)
L = 78.001
T = 39.529
R = 195.000
SE = SEE PLANS

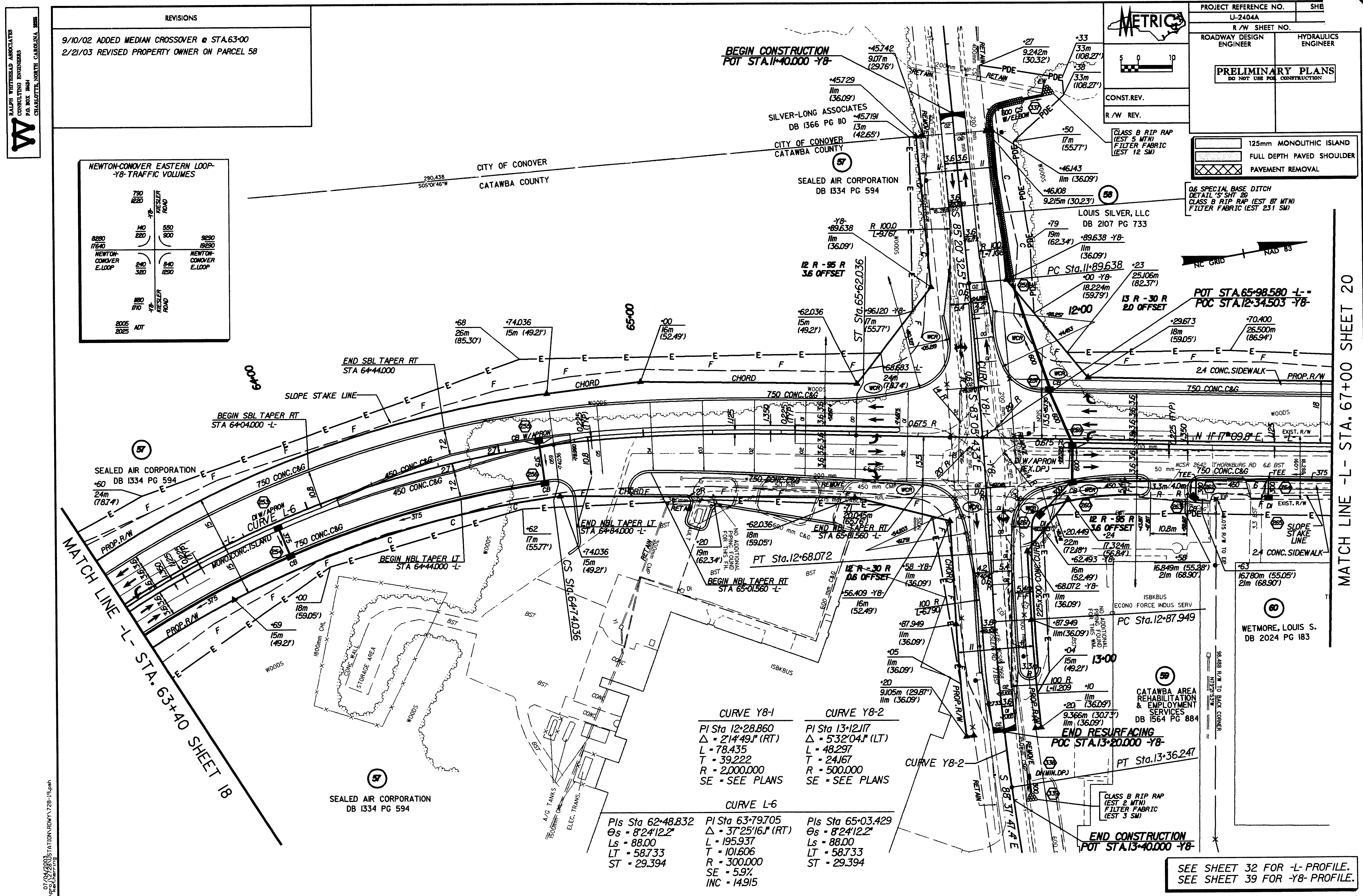


MATCH LINE -Y7- STA. 11+20 SHEET 23
MATCH LINE -L- STA. 59+80 SHEET 17
MATCH LINE -Y7- STA. 13+00 SHEET 24
MATCH LINE -L- STA. 63+40 SHEET 19
NC GRID
NAD 83
MCCOMBS, BARBARA SEITZ
DB 156 PG 108
BROWNE, FRANCES
DB 1118 PG 327
SEALED AIR CORPORATION
DB 1334 PG 594
CITY OF CONOVER
CATAWBA COUNTY
TEMP. SLOPE STAKE LINE
FALSE SUMP SEE SHEET 2G FOR DETAIL
END TAPER EBL & WBL
BEGIN TAPER EBL & WBL
POT STA.60+00.015 -L- = POT STA.12+01.276 -Y7-
N 42°56' 30.6" W
N 43°42' 37.2" E
END SBL TAPER LT & RT STA 61+53.000 -L-
BEGIN SBL TAPER LT & RT STA 61+13.000 -L-
END NBL TAPER LT STA 62+04.000 -L-
BEGIN NBL TAPER LT STA 61+64.000 -L-
TS Sta.61+90.099
SC Sta.62+78.099
PC Sta.12+70.000
750 CONC.C&G
450 CONC.C&G
MONO.CONC.ISLAND
GRAU-350
CAT-1
PROP.GR.
PROP.R/W
EXIST.R/W
CHORD
CURVE L-6
CURVE Y7-2
2.7 X 2.1 RCBC
16 R - 90 R 2.5 OFFSET
BASE TAIL DITCH DETAIL 'M' SHT 2G CLASS I RIP RAP (EST 50 MTN) FILTER FABRIC (EST 30 SM) DDE (EST 10 CM)
TOE PROTECTION DETAIL 'G' SHT 2F CLASS B RIP RAP (EST 120 MTN) FILTER FABRIC (EST 336 SM)
TOE PROTECTION DETAIL 'G' SHT 2F CLASS B RIP RAP (EST xxx MTN) FILTER FABRIC (EST xxx SM)
TOE PROTECTION DETAIL 'G' SHT 2F CLASS B RIP RAP (EST 130 MTN) FILTER FABRIC (EST 362 SM)
0.6 LAT.BASE DITCH DETAIL 'C' SHT 2G CLASS B RIP RAP (EST xxx MTN) FILTER FABRIC (EST xxx SM) DDE (EST xxx CM)
SLOPE STAKE LINE
STANDARD BERM DITCH
STANDARD DITCH LINER CLASS A RIP RAP (EST 165 MTN)
WOODS

NEWTON-CONOVER EASTERN LOOP- -Y7- TRAFFIC VOLUMES

-Y7- EAST 20TH STREET (north)	5920 / 8220
NEWTON-CONOVER E.LOOP (west)	8670 / 18470
NEWTON-CONOVER E.LOOP (east)	8280 / 17640
-Y7- EAST 20TH STREET (south)	6310 / 9050
Turning movements	70/110; 1600/2520; 1990/3350; 70/110
ADT	2005 / 2025

SEE SHEET 32 FOR -L- PROFILE.
SEE SHEET 38 FOR -Y7- PROFILE.


REVISIONS
9/10/02 ADDED MEDIAN CROSSOVER @ STA.63+00
2/21/03 REVISED PROPERTY OWNER ON PARCEL 58
PROJECT REFERENCE NO.
U-2404A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
METRIC
CONST. REV.
R/W REV.
125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235
NEWTON-CONOVER EASTERN LOOP -Y8- TRAFFIC VOLUMES
KIESLER ROAD
NEWTON-CONOVER E.LOOP
2005
2025
ADT
CITY OF CONOVER
CATAWBA COUNTY
SEALED AIR CORPORATION
DB 1334 PG 594
SILVER-LONG ASSOCIATES
DB 1366 PG 110
LOUIS SILVER, LLC
DB 2107 PG 733
WETMORE, LOUIS S.
DB 2024 PG 183
CATAWBA AREA REHABILITATION & EMPLOYMENT SERVICES
DB 1564 PG 884
BEGIN CONSTRUCTION
POT STA.11+40.000 -Y8-
END CONSTRUCTION
POT STA.13+40.000 -Y8-
END RESURFACING
POC STA.13+20.000 -Y8-
POT STA.65+98.580 -L- =
POC STA.12+34.503 -Y8-
PC Sta.11+89.638
PT Sta.12+68.072
PC Sta.12+87.949
PT Sta.13+36.247
ST Sta.65+62.036
CS Sta.64+74.036
BEGIN SBL TAPER RT
STA 64+04.000 -L-
END SBL TAPER RT
STA 64+44.000
BEGIN NBL TAPER LT
STA 64+44.000 -L-
END NBL TAPER LT
STA 64+84.000 -L-
BEGIN NBL TAPER RT
STA 65+01.560 -L-
END NBL TAPER RT
STA 65+81.560 -L-
SLOPE STAKE LINE
CURVE Y8-1
PI Sta 12+28.860
Δ = 2°14'49.1" (RT)
L = 78.435
T = 39.222
R = 2,000.000
SE = SEE PLANS
CURVE Y8-2
PI Sta 13+12.117
Δ = 5°32'04.1" (LT)
L = 48.297
T = 24.167
R = 500.000
SE = SEE PLANS
CURVE L-6
PIs Sta 62+48.832
θs = 8°24'12.2"
Ls = 88.00
LT = 58.733
ST = 29.394
PI Sta 63+79.705
Δ = 37°25'16.1" (RT)
L = 195.937
T = 101.606
R = 300.000
SE = 5.9%
INC = 14.915
PIs Sta 65+03.429
θs = 8°24'12.2"
Ls = 88.00
LT = 58.733
ST = 29.394
MATCH LINE -L- STA. 63+40 SHEET 18
MATCH LINE -L- STA. 67+00 SHEET 20
SEE SHEET 32 FOR -L- PROFILE.
SEE SHEET 39 FOR -Y8- PROFILE.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

REVISIONS
EASEMENTS PATTERNED ON 2/28/02.
CONSTRUCTION EASEMENT REVISED FOR PARCEL 63 ON 2/28/02.
CHANNELIZATION REVISED TO ALLOW TRACTOR-TRAILORS TO MAKE A U-TURN ON 9/10/02
2/21/03 REVISED PROPERTY OWNER ON PARCEL 58

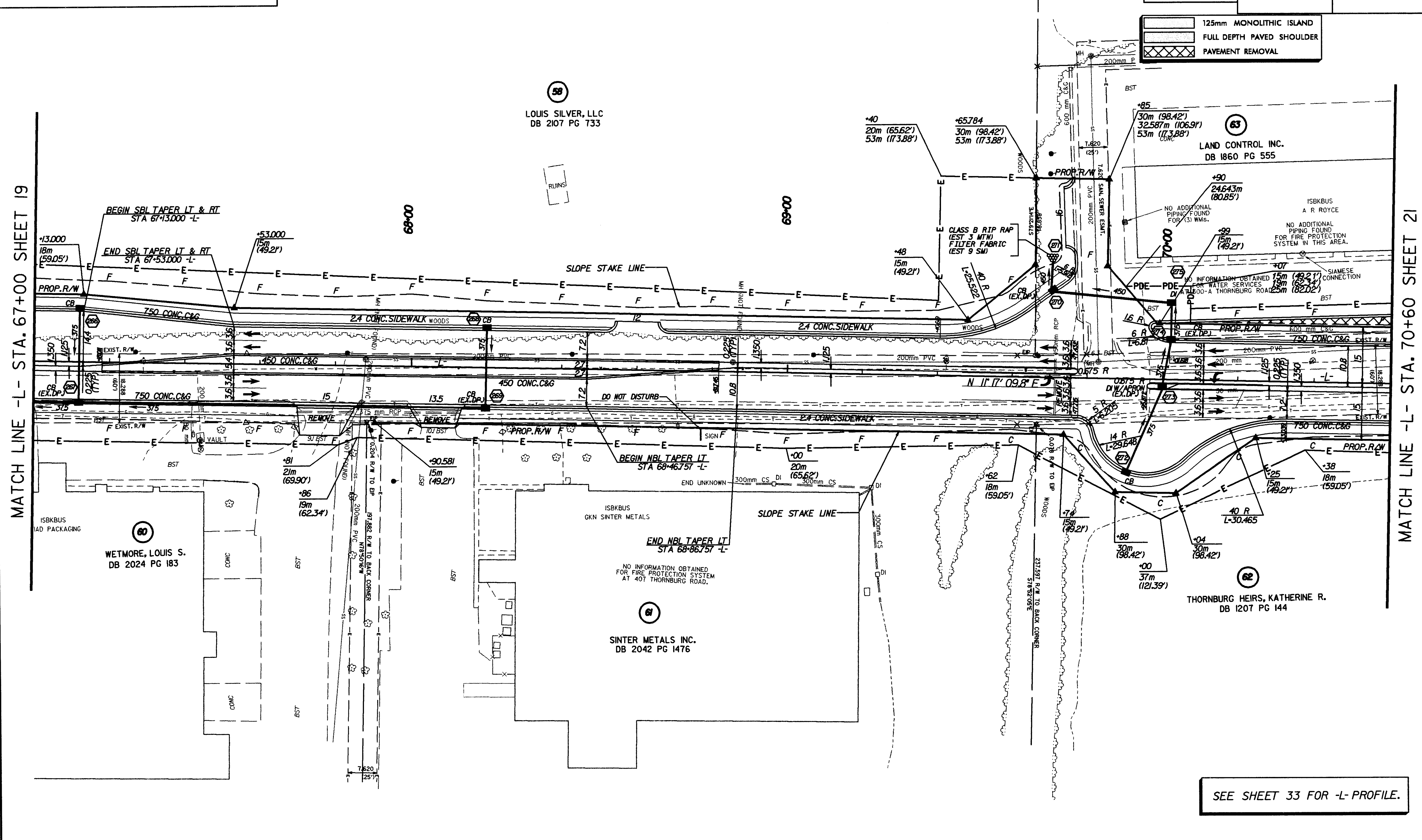
METRIC

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	20
R/W SHEET NO.	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



NC GRID
NAD 83
125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
MATCH LINE -L- STA. 67+00 SHEET 19
MATCH LINE -L- STA. 70+60 SHEET 21
LOUIS SILVER, LLC
DB 2107 PG 733
LAND CONTROL INC.
DB 1860 PG 555
WETMORE, LOUIS S.
DB 2024 PG 183
SINTER METALS INC.
DB 2042 PG 1476
THORNBURG HEIRS, KATHERINE R.
DB 1207 PG 144
ISBKBUS
A R ROYCE
ISBKBUS
GKN SINTER METALS
ISBKBUS
IAD PACKAGING
BEGIN SBL TAPER LT & RT
STA 67+13.000 -L-
END SBL TAPER LT & RT
STA 67+53.000 -L-
BEGIN NBL TAPER LT
STA 68+46.757 -L-
END NBL TAPER LT
STA 68+86.757 -L-
SLOPE STAKE LINE
2.4 CONC. SIDEWALK
750 CONC. C&G
450 CONC. C&G
PROP. R/W
EXIST. R/W
DO NOT DISTURB
REMOVE
RUINS
VAULT
WOODS
N 11° 17' 09.8" E
CLASS B RIP RAP
(EST 3 MTN)
FILTER FABRIC
(EST 9 SM)
NO ADDITIONAL PIPING FOUND FOR (3) WMS.
NO ADDITIONAL PIPING FOUND FOR FIRE PROTECTION SYSTEM IN THIS AREA.
SIAMESE CONNECTION
NO INFORMATION OBTAINED FOR WATER SERVICES
NO INFORMATION OBTAINED FOR FIRE PROTECTION SYSTEM AT 407 THORNBURG ROAD.
END UNKNOWN
MH (NOT FOUND)
T.620 SAN. SEWER ESMT.
237.597 R/W TO BACK CORNER
S78°52'05"E
197.882 R/W TO BACK CORNER
N78°50'16"W
0.204 R/W TO EIP
0.078 R/W TO EIP
68+00
69+00
70+00
SEE SHEET 33 FOR -L- PROFILE.

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	21
R/W SHEET NO.	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

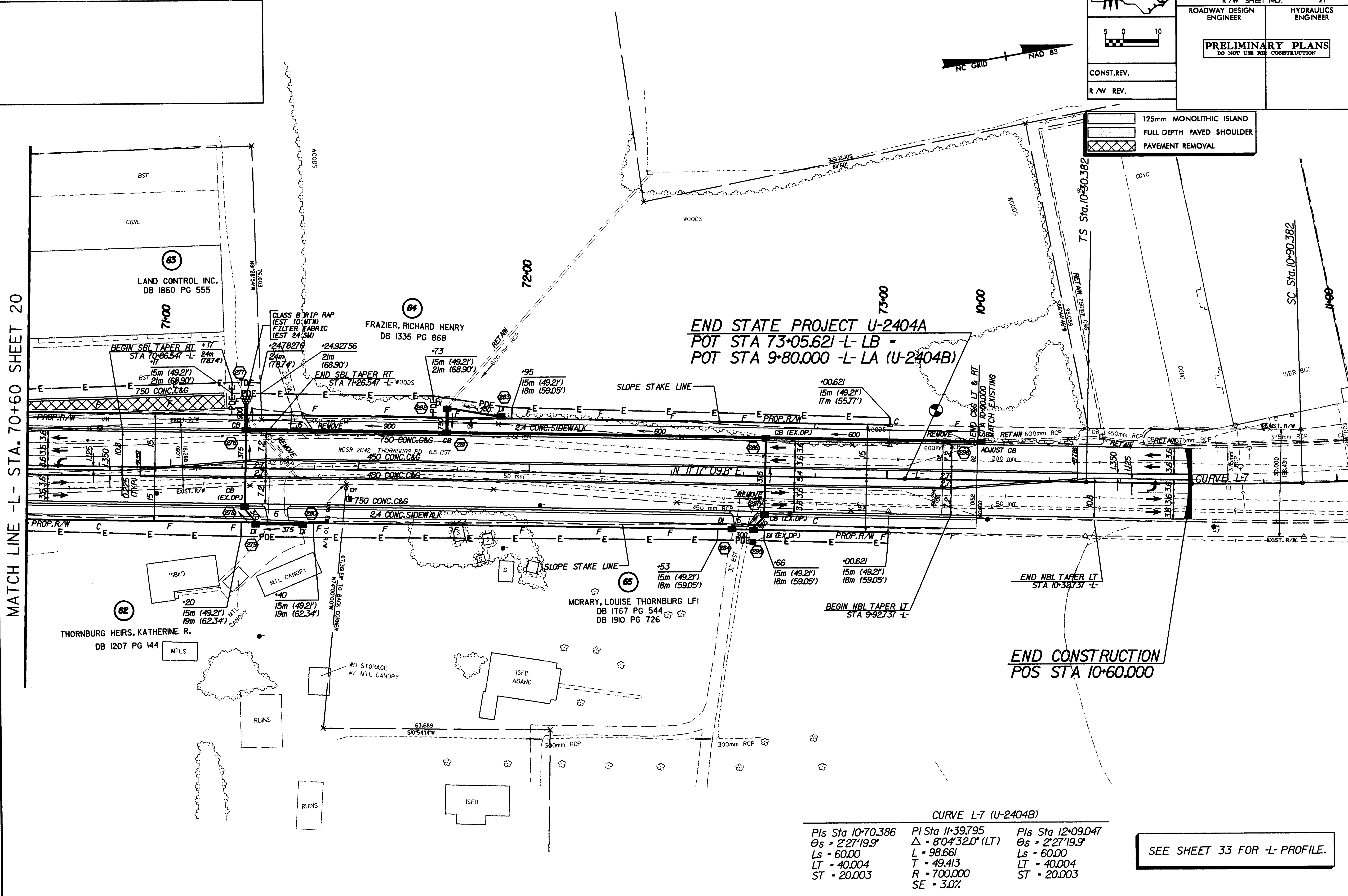
METRIC

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. REV.
R/W REV.

REVISIONS

- 125mm MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL



CURVE L-7 (U-2404B)

PIs Sta 10+70.386	PI Sta 11+39.795	PIs Sta 12+09.047
θs = 2°27'19.9"	Δ = 8°04'32.0" (LT)	θs = 2°27'19.9"
Ls = 60.00	L = 98.661	Ls = 60.00
LT = 40.004	T = 49.413	LT = 40.004
ST = 20.003	R = 700.000	ST = 20.003
	SE = 3.0%	

SEE SHEET 33 FOR -L- PROFILE.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	22
R/W SHEET NO.	22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

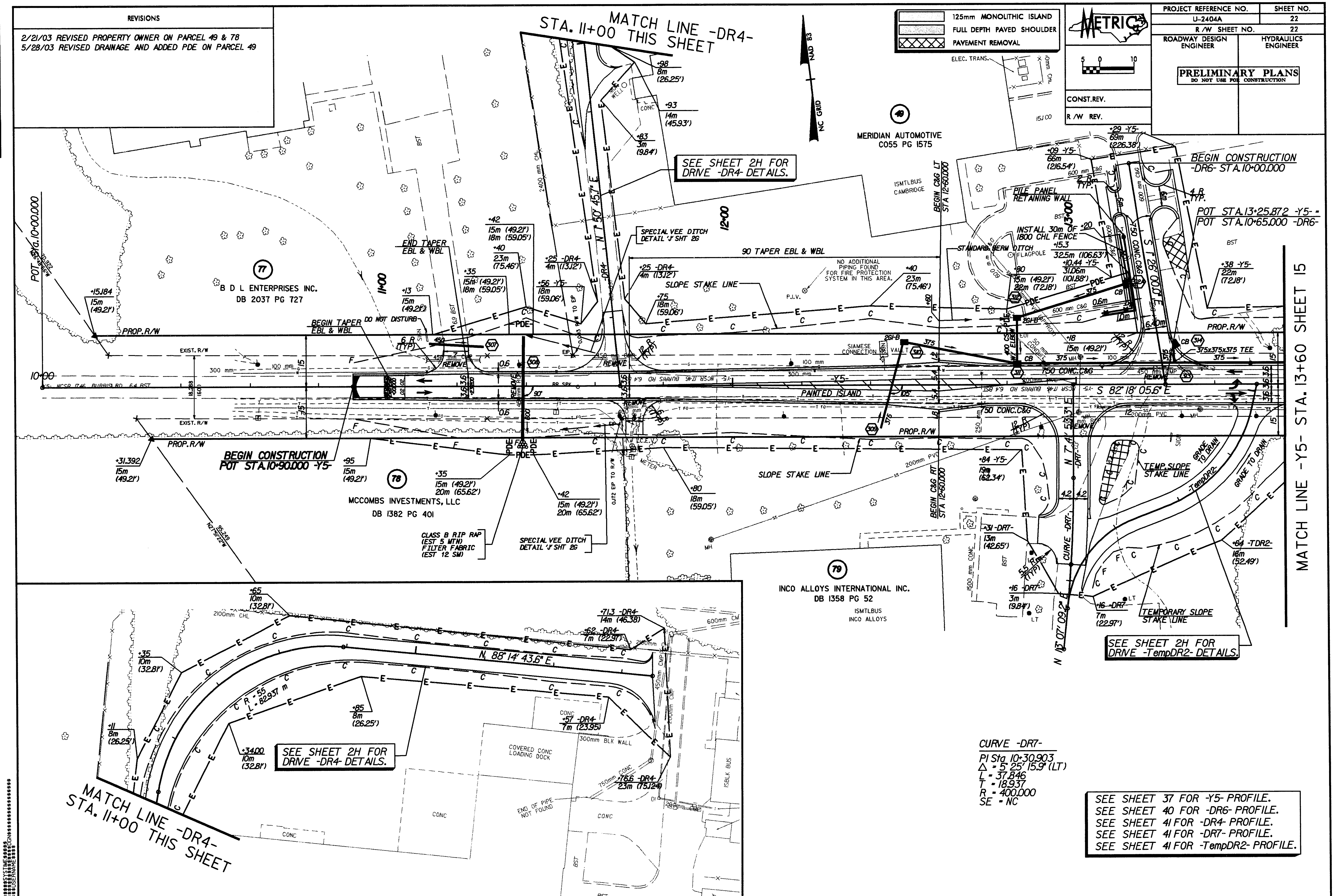
METRIC

CONST.REV.

R/W REV.

REVISIONS
2/21/03 REVISED PROPERTY OWNER ON PARCEL 49 & 78
5/28/03 REVISED DRAINAGE AND ADDED PDE ON PARCEL 49

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235



125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
MATCH LINE -DR4- STA. 11+00 THIS SHEET
MATCH LINE -Y5- STA. 13+60 SHEET 15
SEE SHEET 2H FOR DRIVE -DR4- DETAILS.
SEE SHEET 2H FOR DRIVE -TempDR2- DETAILS.
MERIDIAN AUTOMOTIVE C055 PG 1575
B D L ENTERPRISES INC. DB 2037 PG 727
MCCOMBS INVESTMENTS, LLC DB 1382 PG 401
INCO ALLOYS INTERNATIONAL INC. DB 1358 PG 52
BEGIN CONSTRUCTION POT STA.10+90.000 -Y5-
BEGIN CONSTRUCTION -DR6- STA.10+00.000
POT STA.13+25.872 -Y5- = POT STA.10+65.000 -DR6-
POT STA.10+00.000
S 82° 18' 05.6" E
N 50° 45.7" E
N 88° 14' 43.6" E
N 13° 07' 09.2" E
S 7° 26' 00.0" E
90 TAPER EBL & WBL
BEGIN TAPER EBL & WBL
END TAPER EBL & WBL
SLOPE STAKE LINE
TEMP. SLOPE STAKE LINE
TEMPORARY SLOPE STAKE LINE
PAINTED ISLAND
750 CONC.C&G
PILE PANEL RETAINING WALL
INSTALL 30m OF 1800 CHL FENCE
STANDARD BERM DITCH
SPECIAL VEE DITCH DETAIL 'J' SHT 2G
CLASS B RIP RAP (EST 5 MTN) FILTER FABRIC (EST 12 SM)
NO ADDITIONAL PIPING FOUND FOR FIRE PROTECTION SYSTEM IN THIS AREA.
CURVE -DR7-
PI Sta 10+30.903
Δ = 5° 25' 15.9" (LT)
L = 37.846
T = 18.937
R = 400.000
SE = NC
SEE SHEET 37 FOR -Y5- PROFILE.
SEE SHEET 40 FOR -DR6- PROFILE.
SEE SHEET 41 FOR -DR4- PROFILE.
SEE SHEET 41 FOR -DR7- PROFILE.
SEE SHEET 41 FOR -TempDR2- PROFILE.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 36434
CHARLOTTE, NORTH CAROLINA 28236

REVISIONS
2/21/03 REVISED DRAINAGE AND EASEMENTS ON PARCEL 5 & ADDED PARCEL 88.
2/21/03 REVISED EXISTING R/W ON N.C.16 & ADDED PROPSED R/W ON N.C.16.
2/21/03 REVISED PROPERTY OWNER ON PARCELS 52 & 69
5/28/03 ADDED PUE ON PARCEL 53

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	23
R /W SHEET NO.	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC 5 0 10

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R /W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

SEE SHEET 35 FOR -Y2- PROFILE

MATCH LINE -Y2- STA. 11+40 SHEET 9

(69) KRISTINE COYLE
DB 509 PG 467

(70) LYNCH, SCOTT ANDREW
DB 2061 PG 291

(67) DUNCAN, TAMRA DIANNA & MURPHY, LINDA FRYE
DB 1602 PG 691

(68) RINK, WAYNE HARLEY
DB 1923 PG 762

BEGIN CONSTRUCTION
POC STA 10+20.000 -Y2-
BEGIN TAPER EBL & WBL

END TAPER EBL & WBL

SLOPE STAKE LINE

CLASS B RIP RAP (EST 3 WTN) FILTER FABRIC (EST 10 SW)

SPECIAL VEE DITCH DETAIL 'R' SHT 26 CLASS B RIP RAP (EST 48 WTN) FILTER FABRIC (EST 134 SW)

CURVE Y2-1
PI Sta 10+56.911
Δ = 14°15'31.7" (RT)
L = 113.233
T = 56.910
R = 455.000
SE = 5.9%
INC = 12.000

PT Sta. 11+13.233

N 80° 59' 27.5" E

SEE SHEET 34 FOR -Y- PROFILE

(88) STEELMON, ERNEST RONALD
DB 1908 PG 1104

(5) YODER, DANIEL NOAH
DB 377 PG 105

(9) MOOSE FAMILY LTD.
DB 365 PG 484

CURVE Y-1
PIs Sta 18+76.817
θs = 0°54'23.3"
Ls = 53.000
LT = 35.334
ST = 17.667

PI Sta 20+88.555
Δ = 13°13'05.1" (LT)
L = 386.421
T = 194.072
R = 1675.000
SE = MATCH EXIST.
INC = 12.6

END CONSTRUCTION
POC STA 22+80.000 -Y-
END TAPER EBL & WBL

PT Sta. 22+80.904

SPECIAL VEE DITCH DETAIL 'J' SHT 26

SLOPE STAKE LINE

MATCH LINE -Y- STA. 22+40 SHEET 5

CURVE Y7-1
PI Sta 9+40.748
Δ = 32°33'49.6" (LT)
L = 90.935
T = 46.732
R = 160.000

PT Sta. 9+84.951

(55) MCCOMBS, BARBARA SEITZ
DB 156 PG 108

CITY OF NEWTON
DB 986 PG 310

AMERICAN CONCRETE PRODUCTS INC.
DB 1593 PG 288

(53) BROWNE, FRANCES G.
DB 1118 PG 327

(52) APPALACHIAN LAND MANAGEMENT
DB 2121 PG 1

CLASS B RIP RAP (EST 7 WTN) FILTER FABRIC (EST 19 SW)

MOTE: 450 DUCTILE IRON REQUIRED THROUGH MH

TEMP. SLOPE STAKE LINE

SLOPE STAKE LINE

BEGIN TAPER EBL & WBL

END TAPER EBL & WBL

SPECIAL VEE DITCH DETAIL 'R' SHT 25 CLASS A RIP RAP (EST 42 WTN)

TOE PROTECTION DETAIL 'B' SHT 2F CLASS B RIP RAP (EST 30 WTN) FILTER FABRIC (EST 84 SW)

BEGIN CONSTRUCTION
POT STA 10+00.000 -Y7-
BEGIN TAPER EBL & WBL

TS Sta. 11+83.683

SC Sta. 12+23.683

CS Sta. 12+75.326

4.9W X 5.8H CONC TUNNEL

N 47° 49' 46.4" E

N 45° 42' 37.2" E

CURVE Y6-1
PIs Sta 12+10.351
θs = 1°38'13.3"
Ls = 40.000
LT = 26.668
ST = 13.334

PI Sta 12+49.518
Δ = 4°13'38.6" (LT)
L = 51.643
T = 25.835
R = 700.000

PIs Sta 12+88.660
θs = 1°38'13.3"
Ls = 40.000
LT = 26.668
ST = 13.334

SEE SHEET 38 FOR -Y7- PROFILE.
SEE SHEETS RR1THRU RR5 FOR TRACKWORK.

MATCH LINE -Y7- STA. 11+20 SHEET 18

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	24
R/W SHEET NO.	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

METRIC

CONST.REV.

R/W REV.

REVISIONS
5/28/03 ADDED PUE ON PARCELS 54 & 86

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

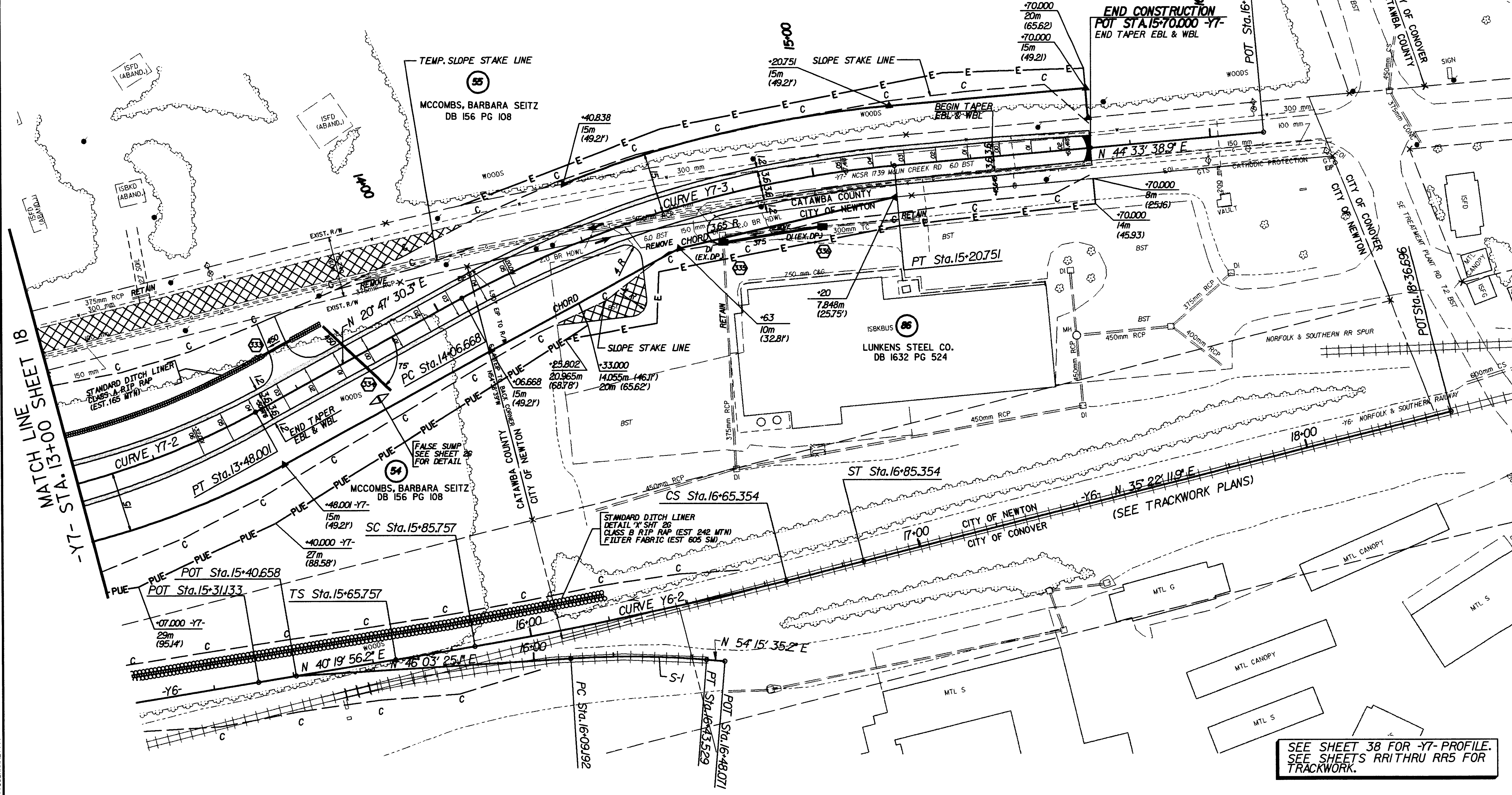
CURVE Y7-2
PI Sta 13+09.529
Δ = 22°55'06.9" (LT)
L = 78.001
T = 39.529
R = 195.000
SE = 6.0%
INC = 8.000

CURVE Y7-3
PI Sta 14+64.542
Δ = 23°46'08.6" (RT)
L = 114.083
T = 57.874
R = 275.000
SE = 5.0%
INC = 8.000

CURVE Y6-2

Pls Sta 15+79.090	PI Sta 16+25.573	Pls Sta 16+65.354
Θs = 0°29'53.6"	Δ = 3°57'57.0" (LT)	Θs = 0°29'53.6"
Ls = 20.000	L = 79.597	Ls = 20.000
LT = 13.333	T = 44.148	LT = 13.333
ST = 6.667	R = 1,150.000	ST = 6.667

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



MATCH LINE -Y7- STA. 13+00 SHEET 18
END CONSTRUCTION
POT STA.15+70.000 -Y7-
END TAPER EBL & WBL
BEGIN TAPER EBL & WBL
CURVE Y7-3
CURVE Y7-2
CURVE Y6-2
PT Sta.15+20.751
PC Sta.14+06.668
PT Sta.13+48.001
POT Sta.16+13.552
POT Sta.18+36.696
N 44° 33' 38.9" E
N 20° 41' 30.3" E
N 35° 22' 11.9" E
N 40° 19' 56.2" E
N 46° 03' 25.4" E
N 54° 15' 35.2" E
ST Sta.16+85.354
CS Sta.16+65.354
SC Sta.15+85.757
TS Sta.15+65.757
POT Sta.15+40.658
POT Sta.15+31.133
PC Sta.16+09.192
PT Sta.16+43.529
POT Sta.16+48.071
TEMP. SLOPE STAKE LINE
SLOPE STAKE LINE
MCCOMBS, BARBARA SEITZ
DB 156 PG 108
LUNKENS STEEL CO.
DB 1632 PG 524
CATAWBA COUNTY
CITY OF NEWTON
CITY OF CONOVER
STANDARD DITCH LINER
CLASS A RIP RAP
(EST.165 MTN)
STANDARD DITCH LINER
DETAIL 'X' SHT 2G
CLASS B RIP RAP (EST 242 MTN)
FILTER FABRIC (EST 605 SM)
FALSE SUMP
SEE SHEET 2G
FOR DETAIL
NORFOLK & SOUTHERN RR SPUR
(SEE TRACKWORK PLANS)
NCSR 1739 MAIN CREEK RD
SE TREATMENT PLANT RD
NAD 83
NC GRID
MTL CANOPY
MTL G
MTL S

SEE SHEET 38 FOR -Y7- PROFILE.
SEE SHEETS RR1 THRU RR5 FOR TRACKWORK.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 36824
CHARLOTTE, NORTH CAROLINA 28236

REVISIONS

METRIC

5 0 10

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	RR1
R /W SHEET NO.	RR1

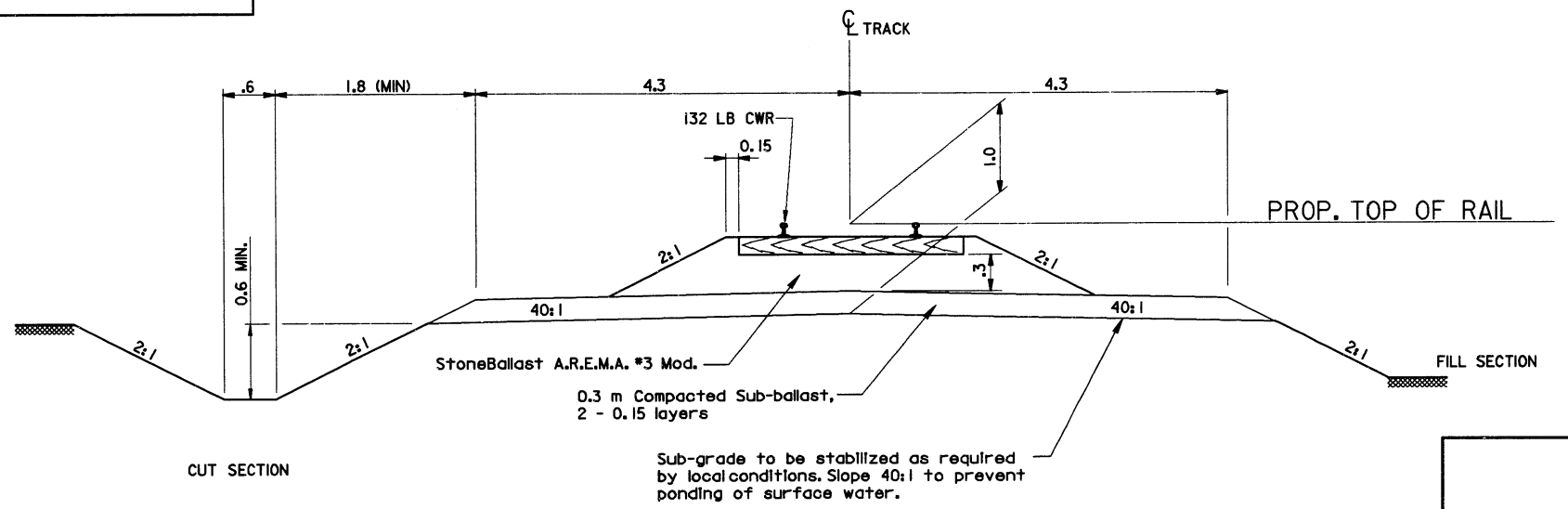
ROADWAY DESIGN ENGINEER

CONST.REV.

R /W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



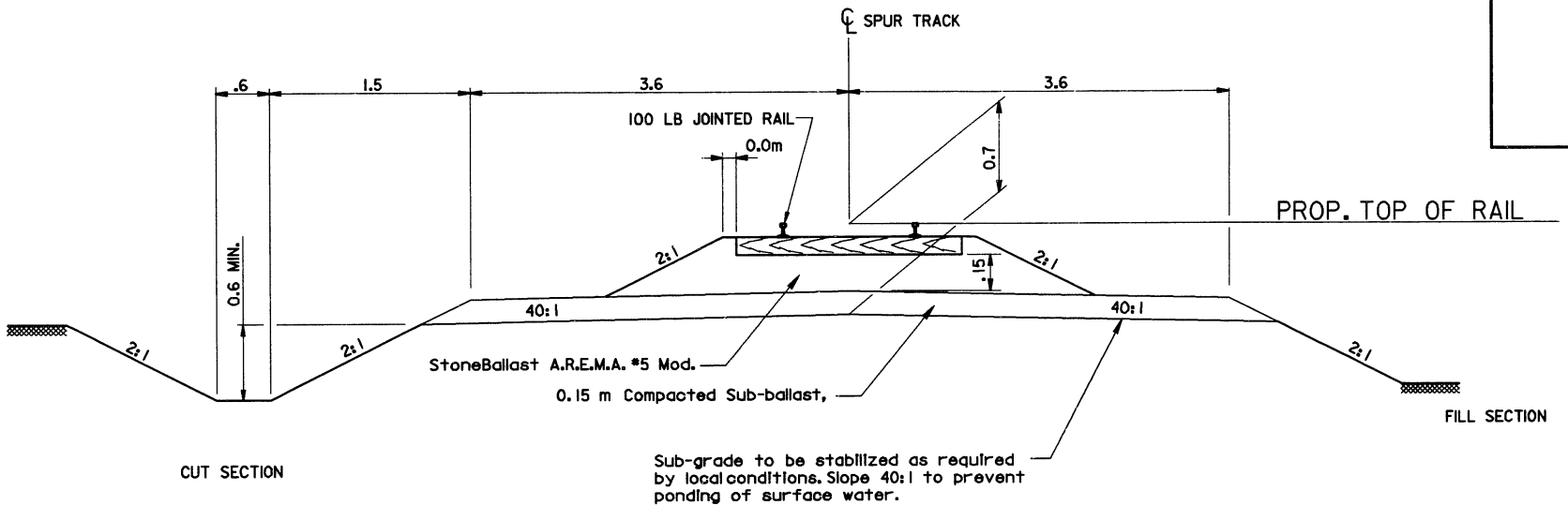
TYPICAL -Y6- SECTION

NOTES:

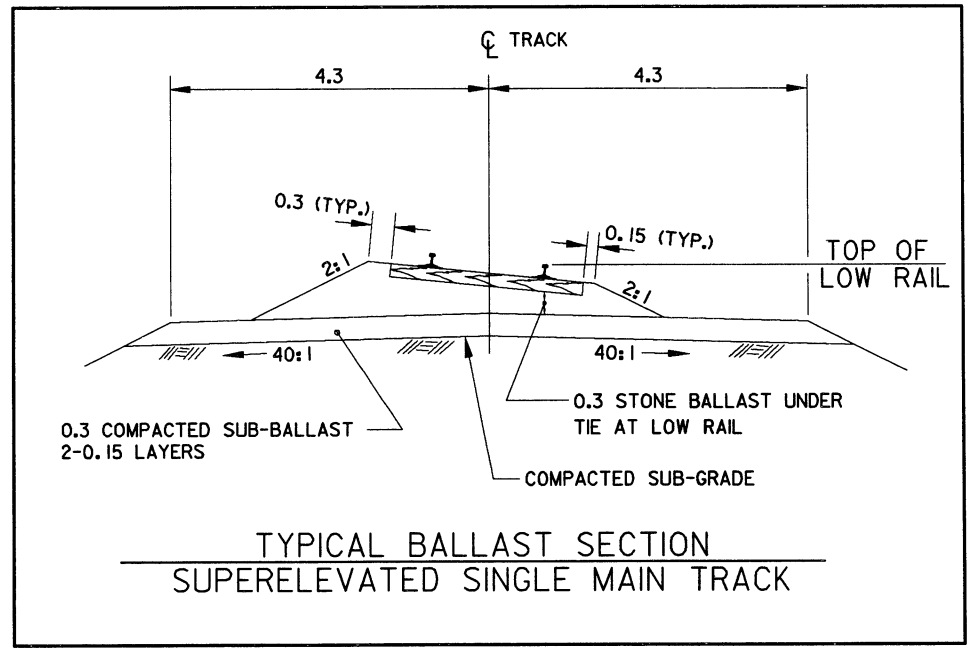
(1) SUBGRADE MAY BE STABILIZED WITH LIME, LIME-FLYASH, CEMENT OR STONE.

(2) TAMPING OF BALLAST MUST NOT DISTURB COMPACTED SUB-BALLAST.

(3) TOP OF SUB-GRADE IS TO BE CROWNED.

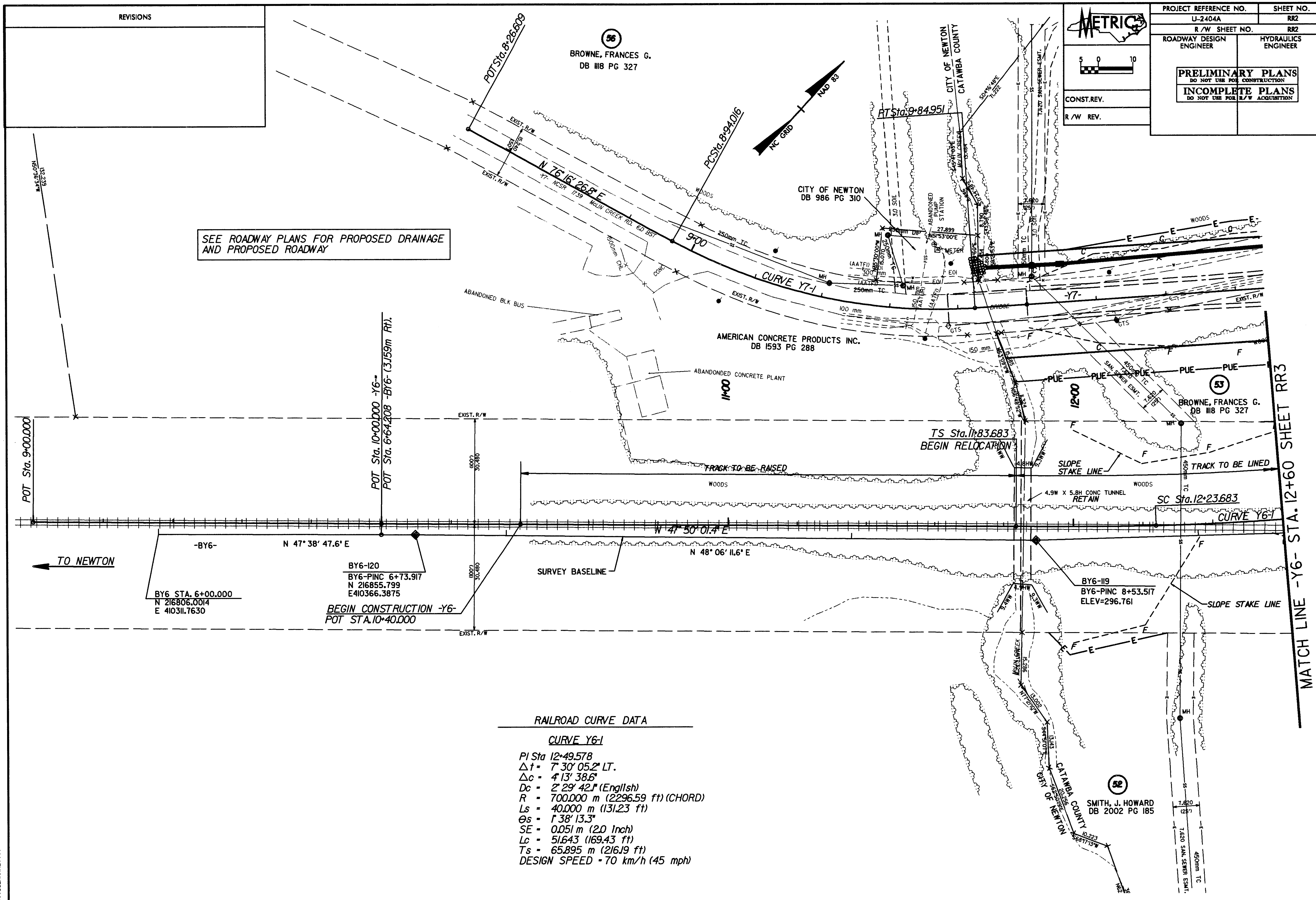


TYPICAL SPUR TRACK SECTION



TYPICAL BALLAST SECTION
SUPERELEVATED SINGLE MAIN TRACK

$$SYSTIME$$
$$USERNAME$$
$$DGN$$


PROJECT REFERENCE NO. U-2404A
SHEET NO. RR2
R/W SHEET NO. RR2
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
METRIC
CONST. REV.
R/W REV.
REVISIONS
MATCH LINE -Y6- STA. 12+60 SHEET RR3
SEE ROADWAY PLANS FOR PROPOSED DRAINAGE AND PROPOSED ROADWAY
BROWNE, FRANCES G.
DB 1118 PG 327
POT Sta. 8+26.609
PC Sta. 8+94.016
N 76° 16' 26.8" E
-Y7- NCSR 1739 McLIN CREEK RD. 60' BST
CURVE Y7-1
CITY OF NEWTON
DB 986 PG 310
CITY OF NEWTON
CATAWBA COUNTY
RT Sta. 9+84.951
ABANDONED PUMP STATION
AMERICAN CONCRETE PRODUCTS INC.
DB 1593 PG 288
ABANDONED CONCRETE PLANT
ABANDONED BLK BUS
NC GRID
NAD 83
TS Sta. 11+83.683
BEGIN RELOCATION
TRACK TO BE RAISED
TRACK TO BE LINED
SLOPE STAKE LINE
4.9W X 5.8H CONC TUNNEL
RETAIN
SC Sta. 12+23.683
CURVE Y6-1
N 47° 50' 01.4" E
N 48° 06' 11.6" E
SURVEY BASELINE
POT Sta. 9+00.000
POT Sta. 10+00.000 -Y6-
POT Sta. 6+64.208 -BY6- (3.159m Rt.)
-BY6-
N 47° 38' 47.6" E
TO NEWTON
BY6 STA. 6+00.000
N 216806.0014
E 410311.7630
BY6-120
BY6-PINC 6+73.917
N 216855.799
E410366.3875
BEGIN CONSTRUCTION -Y6-
POT STA. 10+40.000
BY6-119
BY6-PINC 8+53.517
ELEV=296.761
SMITH, J. HOWARD
DB 2002 PG 185
CATAWBA COUNTY
CITY OF NEWTON
450mm TC
7.620 SAN. SEWER ESMT.
RAILROAD CURVE DATA
CURVE Y6-1
PI Sta 12+49.578
Δt = 7° 30' 05.2" LT.
Δc = 4° 13' 38.6"
Dc = 2° 29' 42.1" (English)
R = 700.000 m (2296.59 ft) (CHORD)
Ls = 40.000 m (131.23 ft)
θs = 1° 38' 13.3"
SE = 0.051 m (2.0 Inch)
Lc = 51.643 (169.43 ft)
Ts = 65.895 m (216.19 ft)
DESIGN SPEED = 70 km/h (45 mph)

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	RR3
R/W SHEET NO.	RR3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

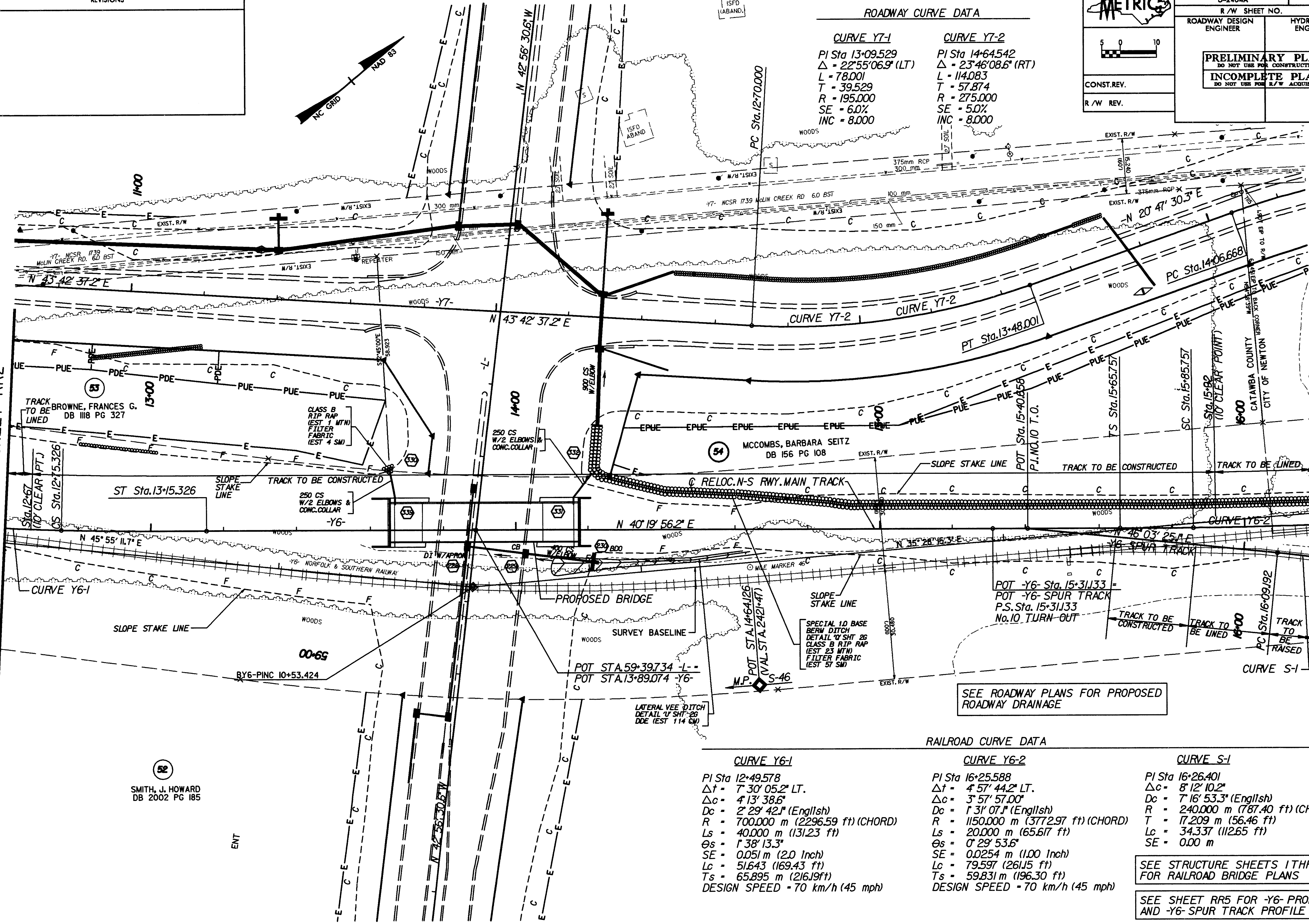
CONST.REV.

R/W REV.

PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION

REVISIONS



ROADWAY CURVE DATA

CURVE Y7-1	CURVE Y7-2
PI Sta 13+09.529	PI Sta 14+64.542
Δ = 22°55'06.9" (LT)	Δ = 23°46'08.6" (RT)
L = 78.001	L = 114.083
T = 39.529	T = 57.874
R = 195.000	R = 275.000
SE = 6.0%	SE = 5.0%
INC = 8.000	INC = 8.000

RAILROAD CURVE DATA

CURVE Y6-1	CURVE Y6-2	CURVE S-1
PI Sta 12+49.578	PI Sta 16+25.588	PI Sta 16+26.401
Δt = 7° 30' 05.2" LT.	Δt = 4° 57' 44.2" LT.	Δc = 8° 12' 10.2"
Δc = 4° 13' 38.6"	Δc = 3° 57' 57.00"	Dc = 7° 16' 53.3" (English)
Dc = 2° 29' 42.1" (English)	Dc = 1° 31' 07.1" (English)	R = 240.000 m (787.40 ft) (CHORD)
R = 700.000 m (2296.59 ft) (CHORD)	R = 1150.000 m (3772.97 ft) (CHORD)	T = 17.209 m (56.46 ft)
Ls = 40.000 m (131.23 ft)	Ls = 20.000 m (65.617 ft)	Lc = 34.337 (112.65 ft)
Θs = 1° 38' 13.3"	Θs = 0° 29' 53.6"	SE = 0.00 m
SE = 0.051 m (2.0 Inch)	SE = 0.0254 m (1.00 Inch)	
Lc = 51.643 (169.43 ft)	Lc = 79.597 (261.15 ft)	
Ts = 65.895 m (216.19 ft)	Ts = 59.831 m (196.30 ft)	
DESIGN SPEED = 70 km/h (45 mph)	DESIGN SPEED = 70 km/h (45 mph)	

SEE ROADWAY PLANS FOR PROPOSED ROADWAY DRAINAGE

SEE STRUCTURE SHEETS 1 THRU 32 FOR RAILROAD BRIDGE PLANS

SEE SHEET RR5 FOR -Y6- PROFILE AND -Y6- SPUR TRACK PROFILE

PROJECT REFERENCE NO.	SHEET NO.
U-2404A	RR4
R/W SHEET NO.	RR4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

METRIC

CONST. REV.

R/W REV.

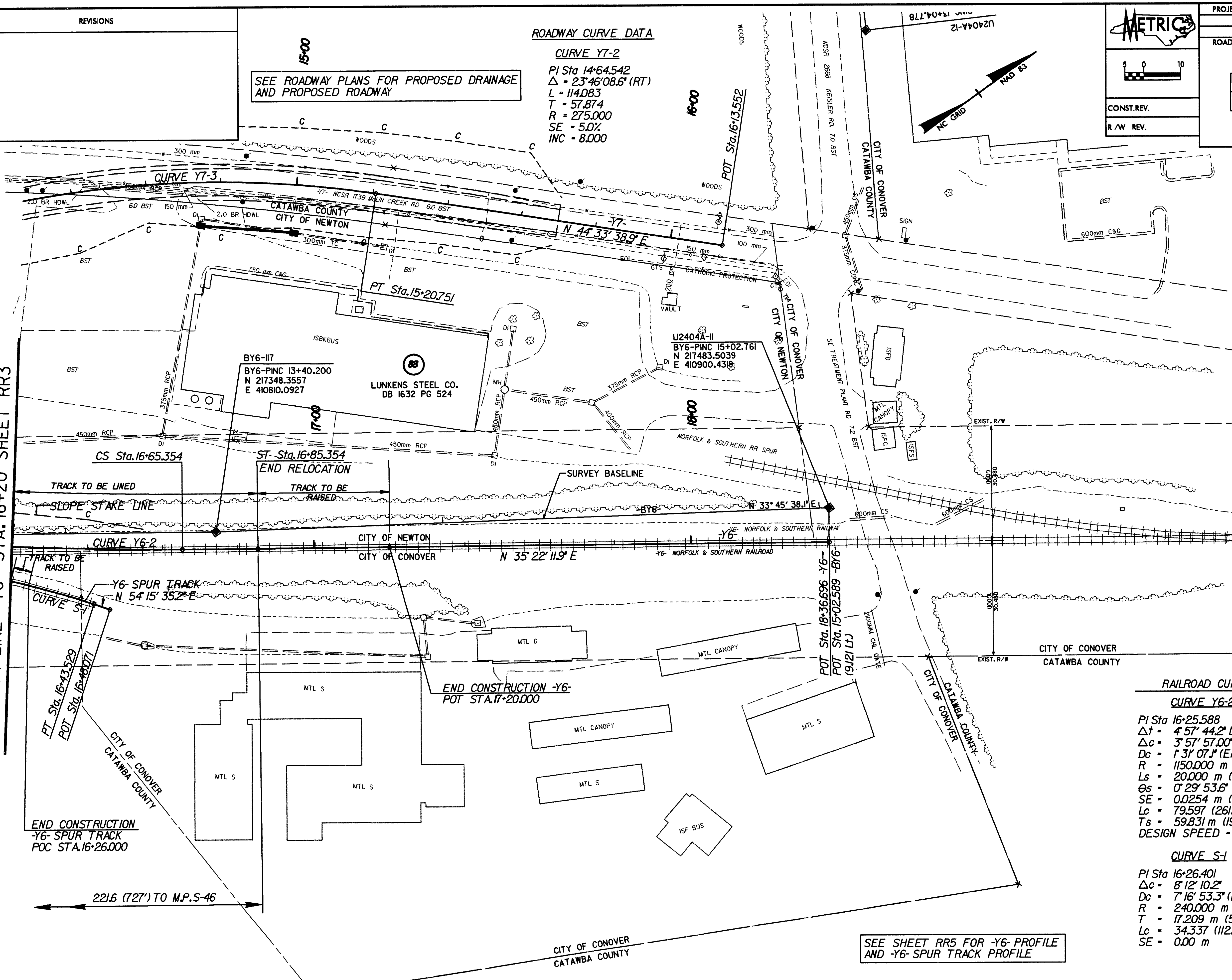
REVISIONS

SEE ROADWAY PLANS FOR PROPOSED DRAINAGE AND PROPOSED ROADWAY

ROADWAY CURVE DATA

CURVE Y7-2

PI Sta 14+64.542
Δ = 23°46'08.6" (RT)
L = 114.083
T = 57.874
R = 275.000
SE = 5.0%
INC = 8.000



NC GRID
NAD 83
U2404A-12
MATCH LINE -Y6- STA. 16+20 SHEET RR3
CURVE Y7-3
-Y7- NCSR 1139 MOLIN CREEK RD 6.0 BST
CATAWBA COUNTY
CITY OF NEWTON
N 44°33' 38.9" E
POT Sta. 16+13.552
PT Sta. 15+20.751
LUNKENS STEEL CO.
DB 1632 PG 524
BY6-117
BY6-PINC 13+40.200
N 217348.3557
E 410810.0927
U2404A-11
BY6-PINC 15+02.761
N 217483.5039
E 410900.4318
NCSR 2668 KEISLER RD. 7.0 BST
SE TREATMENT PLANT RD 7.2 BST
CITY OF CONOVER
CATAWBA COUNTY
CS Sta. 16+65.354
ST Sta. 16+85.354
END RELOCATION
TRACK TO BE LINED
TRACK TO BE RAISED
SLOPE STAKE LINE
SURVEY BASELINE
-BY6-
N 33° 45' 38.1" E
CURVE Y6-2
N 35° 22' 11.9" E
-Y6- NORFOLK & SOUTHERN RAILROAD
NORFOLK & SOUTHERN RR SPUR
POT Sta. 18+36.696 -Y6-
POT Sta. 15+02.589 -BY6-
(9.121 Lt.)
-Y6- SPUR TRACK
N 54°15' 35.2" E
CURVE S-1
PT Sta. 16+43.529
POT Sta. 16+48.071
END CONSTRUCTION -Y6-
POT STA. 17+20.000
END CONSTRUCTION
-Y6- SPUR TRACK
POC STA. 16+26.000
221.6 (727') TO M.P. S-46
EXIST. R/W
MTL S
MTL G
MTL CANOPY
ISF BUS
ISFD
ISFG
ISFS
BST
WOODS
VAULT
CATHODIC PROTECTION
15+00
16+00
17+00
18+00

RAILROAD CURVE DATA

CURVE Y6-2

PI Sta 16+25.588
Δt = 4°57' 44.2" LT.
Δc = 3°57' 57.00"
Dc = 1°31' 07.1" (English)
R = 1150.000 m (3772.97 ft) (CHORD)
Ls = 20.000 m (65.617 ft)
θs = 0°29' 53.6"
SE = 0.0254 m (1.00 Inch)
Lc = 79.597 (261.15 ft)
Ts = 59.831 m (196.30 ft)
DESIGN SPEED = 70 km/h (45 mph)

CURVE S-1

PI Sta 16+26.401
Δc = 8°12' 10.2"
Dc = 7°16' 53.3" (English)
R = 240.000 m (787.40 ft) (CHORD)
T = 17.209 m (56.46 ft)
Lc = 34.337 (112.65 ft)
SE = 0.00 m

SEE SHEET RR5 FOR -Y6- PROFILE AND -Y6- SPUR TRACK PROFILE

INDIRECT AND CUMULATIVE IMPACT STUDY

U-2404A, CATAWBA COUNTY,
NORTH CAROLINA

ARCADIS

Infrastructure, buildings, environment, communications

Indirect and Cumulative Impact Study

U-2404A, Catawba County, North Carolina

Prepared for:
North Carolina Department of Transportation

Prepared by:
ARCADIS G&M of North Carolina, Inc.
801 Corporate Center Drive
Suite 300
Raleigh
North Carolina 27607
Tel 919 854 1282
Fax 919 854 5448

Our Ref.:
NC601041.0007.0404

Date:
July 2003

Table of Contents

Tables

Figures

1. Executive Summary

The proposed project, Transportation Improvement Program (TIP) Project No. U-2404A (Newton Conover Loop), involves the construction of a new four-lane roadway around the east side of the cities of Conover and Newton in Catawba County. The eastern segment of the Newton Conover Loop begins at NC 16 southeast of Newton and proceeds north to the eastern edge of Conover to SR 1739. The project's study area includes the jurisdictions of Catawba County, the city of Conover, and the city of Newton. The project is in subbasins 03-08-32 and 03-08-35 of the Catawba River Basin.

The focus of this study is to determine whether or not indirect and cumulative impacts resulting from the project will cause a violation of downstream water quality standards. The report analyzes the area's future growth potential, discusses existing plans and programs affecting water quality, and makes a finding as to associated water quality impacts.

According to the North Carolina Division of Water Quality's (DWQ) *1999 Catawba River Basinwide Water Quality Plan*, overall water quality conditions in the basin are good. There are no impaired streams in the study area and there are only two impaired streams in the two subbasins that encompass the study area. One of these streams, Clark Creek, is just west of Newton and the study area. Several tributaries of Clark Creek are in the study area, primarily in developed areas. Therefore, the primary issue is protecting the water quality as opposed to restoring impaired waters.

Potential impacts to water quality in the study area:

- This new-build road project will bring development to a primarily undeveloped area with scattered residential areas, pastures, and fields.
- Residential growth in Newton and Conover has been occurring in the east in the direction of the eastern segment of the Newton Conover Loop.
- Increased regional roadway access will also encourage development along the loop.
- Water and sewer capacity in the cities is available and will not be an immediate growth-limiting factor. A lack of water and sewer infrastructure in the county will direct growth to the municipalities.
- Although development is expected to occur in the vicinity of the new roadway there are plans and programs in place to help mitigate the impacts.
- All jurisdictions have water quality regulations in place to mitigate water quality impacts.

In conclusion, the construction of TIP Project No. U-2404A is not expected to result in any indirect or cumulative impacts that will adversely affect the water quality within the Catawba River Basin. No further indirect or cumulative impact analysis is recommended for the proposed project.

2. Purpose of Indirect and Cumulative Impact Study

The focus of this study is to determine whether or not indirect and cumulative impacts resulting from the project will cause a violation of downstream water quality standards. The report analyzes the area's future growth potential, discusses existing plans and programs affecting water quality, and makes a finding as to associated water quality impacts.

The Council on Environmental Quality defines indirect impacts as those, ". . . which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable (40 CFR 1508.8)." Cumulative impacts are defined as, ". . . impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions (40 CFR 1508.7)."

Indirect impacts of transportation decisions can involve changes in the type, density, design and locations of development. Influences or disturbances caused by urban development such as increased runoff from impervious areas, erosion and sedimentation, disturbance of riparian vegetation, development in the riparian zone, and pollutant loading can have a cumulative effect on future water quality.

3. Project Description

The proposed project, TIP No. U-2404A, involves building 3.9 miles (6.2 km) of new roadway as part of the construction of a segment of the Newton Conover Loop in Catawba County, North Carolina. The project extends from NC 16 southeast of Newton to SR 1739, just south of US 70. The *Environmental Assessment (EA)* for the project was completed in 1996. Table 1 lists roadway projects in Catawba County from the *2004-2010 NCDOT Transportation Improvement Program.*

Table 1. 2004-2010 NCDOT TIP Roadway Projects in Catawba County*

TIP#	Route/City	Description
R-2206	NC 16	South Of Lucia In Gaston County To SR 1895 In Catawba County. Four Lanes Divided On New Location.
R-2307	NC 150	NC 27 In Lincolnton To I-77. Widen To Multi-Lanes.
R-3100	NC 16	North Of SR 1895 To SR 1800 Southeast Of Newton. Widen To Multi-Lanes. (Coordinate R-3100C With U-2404A)
R-85 *	US 321	NC 27-150 In Lincolnton To NC 127 In Hickory. Four Lane Divided Facility On New Location.
U-2306	Hickory	Lenoir Rhyne Boulevard Extension, Tate Boulevard NE To 8th Street NE. Widen To Multi-Lanes, Part On New Location. Realign 8th Street NE With Highland Avenue NE.
U-2307	Hickory	East Side Thoroughfare, US 70-321 To NC 127. Multi-Lanes, Part On New Location.
U-2404	Conover & Newton	Newton-Conover Loop, NC 16 South Of Newton To NC 16 North Of Conover. Widen To Four Lane Divided. (Coordinate U-2404A With R-3100C)
U-2414	Conover & Hickory	Tate Boulevard Ext., East Of SR 1468 (Sweet- Water Road) To I-40. Widen SR 1692 To Multi- Lanes And Construct A Multi-Lane Connector From SR 1692 To SR 1007 And Widen SR 1007 To Multi-Lanes.
U-2528	Hickory & Longview	Northwest Loop, 33rd Street At I-40 To Airport Road At US 321. Multi-Lane Improvements, Connector On New Location And A New Interchange At SR 1124 And I-40.
U-2529	Conover, Hickory, & Newton	SR 1476 (Fairgrove Church Road), NC 10 Southwest Of Newton To SR 1491 (Section House Road). Widen To Multi-Lanes And Construct Multi-Lane Connector On New Location.
U-2530	Hickory	NC 127 And SR 1213 (2nd Street SW). Widen NC 127 To A Multi-Lanes, SR 1132 To SR 1008 And Upgrade And Extend SR 1213, Proposed US 321-NC 127 Interchange To SR 1184.
U-2531	Hickory	Hickory North Crosstown Loop, NC 127 To NC 16 In Conover. Multi-Lanes On New Location.
U-2532	Brookford & Hickory	Southern Loop, I-40 At SR 1124 To US 321 In Newton. Multi-Lanes On New Location.
U-2535	Conover & Hickory	13th Avenue SE Extension, SR 1007 (Lenoir Rhyne Boulevard) To SR 1468 (Sweetwater Road). Multi-Lanes On new Location.
U-3450	Conover & Newton	Newton-Conover Loop, NC 10 West To NC 16. Two Lane Facility With Paved Shoulders, Part On New Location.
U-3614	Hickory	US 321 To NC 127. Two Lanes On Four Lane Right Of Way, Some new Location.
U-4700	US 321	US 70 In Hickory To US 64/NC18/NC90 In Lenoir. Widen To Six Lanes.

Source: North Carolina Department of Transportation TIP Program Unit.

* Includes only additional roadway area, not resurfacing or bridge replacements.

4. Identification of Study Area

The study area was devised by examining the project's location in relation to political and planning boundaries, census boundaries, and watershed boundaries; the role the facility plays in the local network; and the development patterns of the region. The study area is in central Catawba County in subbasins 03-08-32 and 03-08-35 of the Catawba River Basin. The majority of the study area consists of the cities of Newton and Conover. In the study area, Newton's northern border is slightly north of US 70. Properties north of this area are in Conover's city limits. The southeastern portion of the study area is in unincorporated Catawba County and the town of Claremont is just east of the study area. Newton is the county seat. The study area is shown in Figure 1.

5. Analysis of Study Area

5.1 Demographic Characteristics

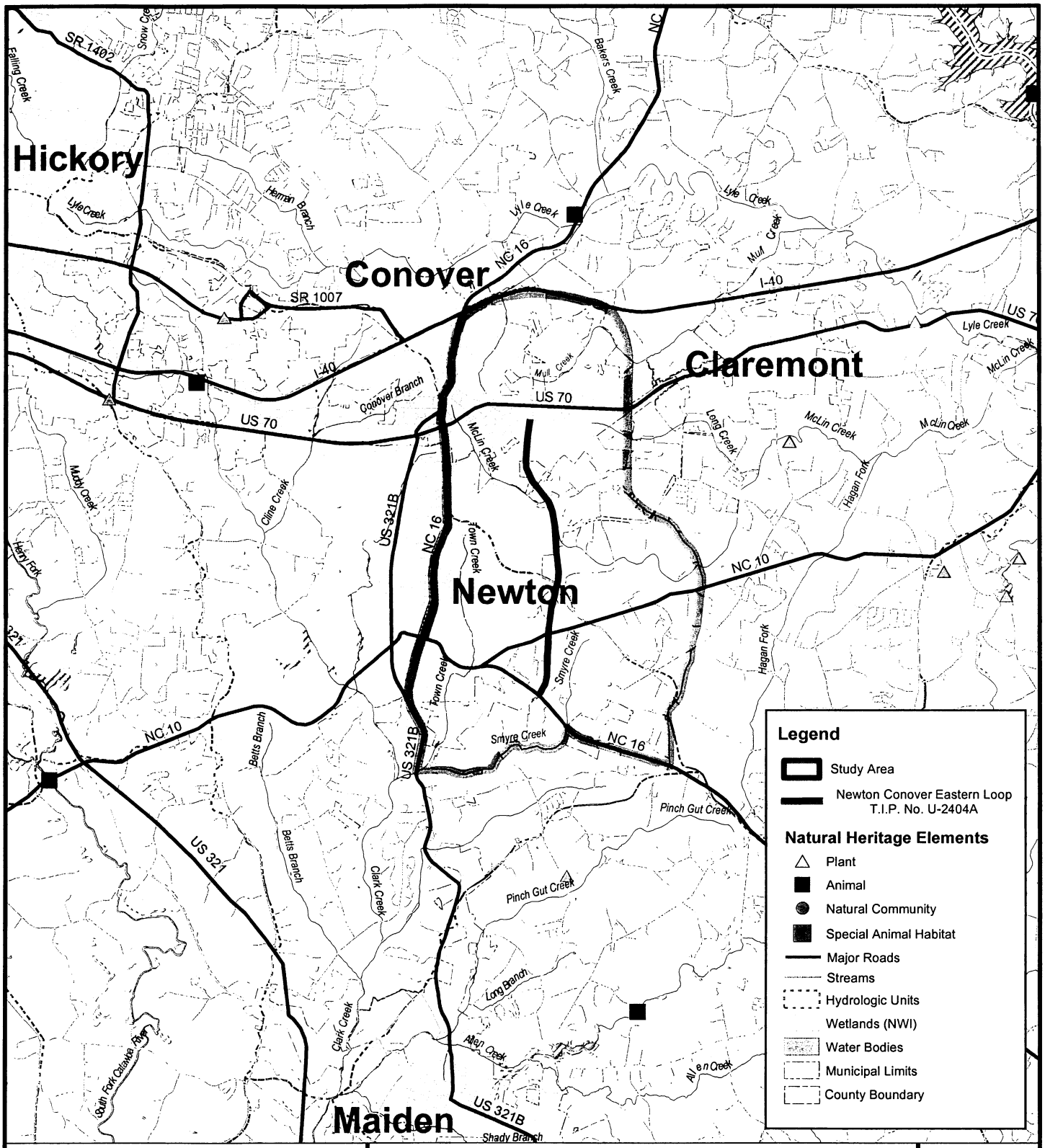
Table 2. 1990 – 2000 Population Growth for State, County, Cities, and Block Groups

	2000 Population	1990 Population	Percent Change
North Carolina	8,049,313	6,628,637	21.4%
Catawba County	141,685	118,412	19.7%
City of Newton	12,560	9,304	35.0%
City of Conover	6,604	5,465	20.8%
CT 101.02 BG 1*	790	686	15.2%
CT 101.02 BG 2*	1,485	1,210	22.7%
CT 112 BG 3	955	824	15.9%
CT 112 BG 4	1,228	1,197	2.6%
CT 113 BG 1	2,876	2,479	16.0%
CT 113 BG 2 and 3**	4,019	3,22	14.1%

Source: 1990 and 2000 US Census.

* 1990 Census Tract 101 was split into two Census Tracts. 1990 CT 101 BG 1 and BG 2 boundaries are very close to 2000 CT 101.2 BG 1 and BG 2 boundaries.

** CT 113 BG 3 did not exist in 1990. 1990 BG 2 was split into two different BGs in 2000, CT 113 BG 2 and BG 3.



ARCADIS G&M of North Carolina, Inc.
801 Corporate Center Drive, Suite 300
Raleigh, NC 27607-5073 Tel: 919/854-1282 Fax: 919/854-5448

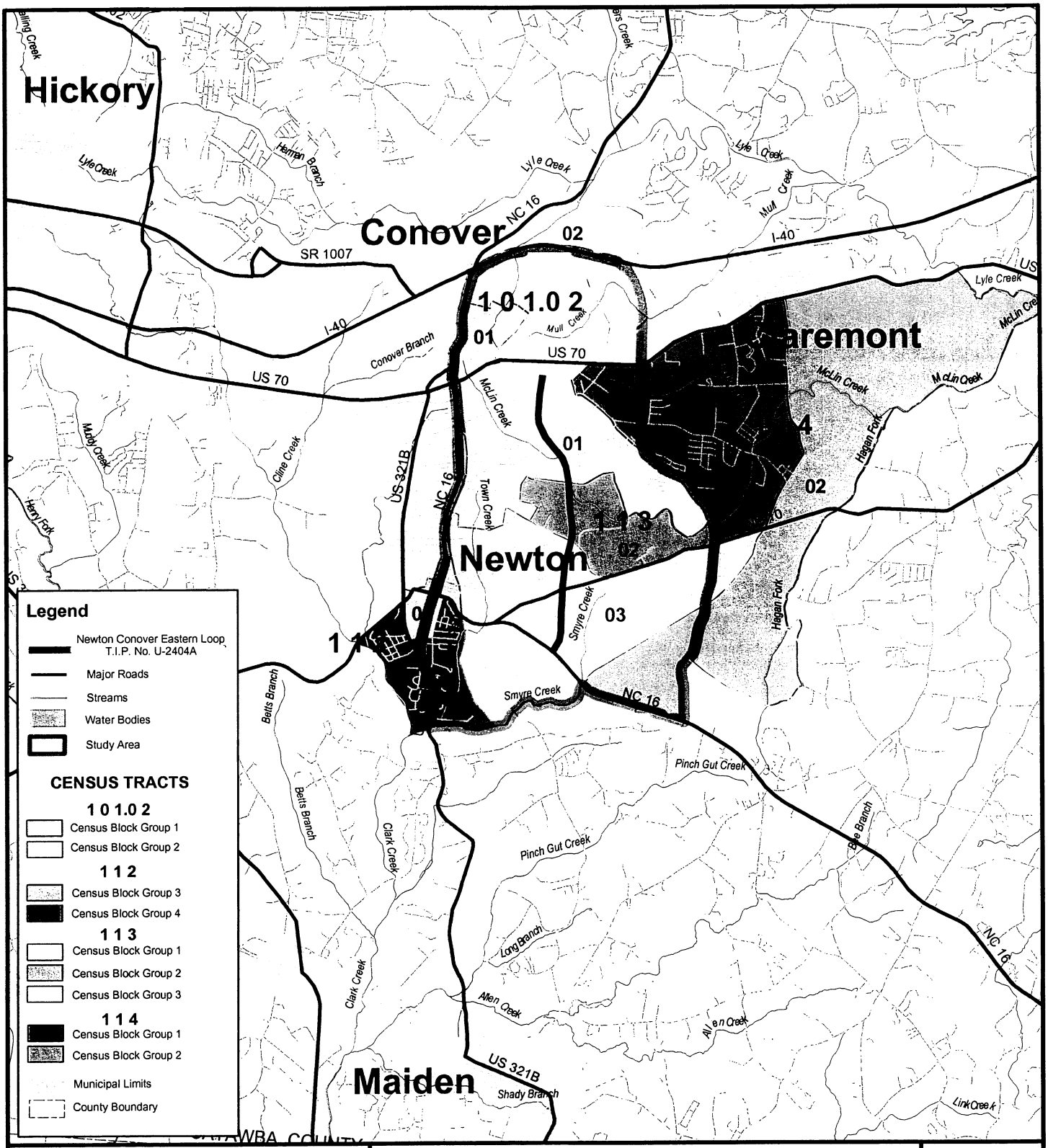
Prepared For: STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Source: North Carolina

PROJECT STUDY AREA

NEWTON CONOVER EASTERN LOOP
T.I.P. No. U-2404A
CATAWBA COUNTY, NORTH CAROLINA

Figure 1



ARCADIS G&M of North Carolina, Inc.
801 Corporate Center Drive, Suite 300
Raleigh, NC 27607-5073 Tel: 919/854-1282 Fax: 919/854-5448

Prepared For: STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Source: United States Census 2000

CENSUS BLOCK GROUPS

Newton Conover Eastern Loop
T.I.P. No. U-2404A
CATAWBA COUNTY, NORTH CAROLINA

Figure 2

The 1990 and 2000 US Census data were used to gather information on the population of the project study area. The census tract and block group boundaries for this area changed between the 1990 Census to the 2000 Census. Block Group 3 of Census Tract 113 did not exist in 1990. In 2000, Block Group 2 of Census Tract 113 was split into two different block groups: Block Groups 2 and 3.

Not all block groups in the study area were included in the demographic analysis to avoid skewing the data. For example, Census Tract 114 covers parts of the study area in the eastern portion of the study area but a majority of its data is for the town of Claremont, which is outside the study area boundary. Census Tract 113 is the only census tract that overlaps the road project and it is the only census tract that has all of its block groups completely within the study area. The boundaries of the block groups and study area are shown in Figure 2.

Population growth in all but two of the geographies in the study area, including the county and the state, had an increase in population of approximately 14 to 23 percent. Overall, areas in the downtowns grew at a slower rate than areas farther from the traditional downtown because of the greater availability of cheap land.

One of the geographic areas that do not follow the regional growth trend is Block Group 4 of Census Tract 112, which had a growth rate of 2.6 percent. It is in the older and more established area of Newton that has a small amount of vacant land available for development. The result is the area has less potential for new growth with infill development or redevelopment of older properties the only options for additional growth.

The city of Newton is the other geographic area that does not follow the regional trend of approximately 20 percent population growth; it experienced a population increase of 35.0 percent from 1990 to 2000. During the 1990s, Newton's population grew more in the southeast towards the unincorporated areas of the county, which is also towards the eastern portion of the Newton Conover Loop. Per the city of Newton's website, not all of the population increase in the city is due to new development. A portion of the additional population is due to property owners in the county requesting annexation into the municipality in order to receive water and sewer service.

5.2 Economic Factors Contributing to Growth

According to the North Carolina Department of Commerce, Catawba County has a strong manufacturing base with 41.8 percent of the workface employed in this sector.

Some of the larger employers in the area include CommScope Inc. and CommScope of North Carolina employing 2,900 people; Siecor Operations LLC employing 1,000 people; and numerous furniture manufactures like Hickory Chair Company, Bassett Upholstery, and Progressive Furniture.

The retail trade and service sectors are two other sectors in the county, when combined, employ 32.4 percent of the workforce. These sectors experienced steady growth during the 1990s but have experienced slower growth in the last several years. The annual unemployment rate in 2001 was 6.7 percent. Unemployment in March of 2002 was 8.6 percent (NC Department of Commerce).

As a way to achieve economic diversity, Catawba County and its municipalities are members of the economic region known as the Carolinas Partnership or the Charlotte Regional Partnership, a North Carolina and South Carolina economic development organization, which also includes 13 counties and those municipalities surrounding Charlotte and Mecklenburg County. Membership assists in achieving community goals of economic diversity, through targeted marketing at an international level.

Local planning officials expect additional residential and industrial development to occur in the study area in the next few years. According to Glenn Pattishall with the Newton Planning Department, additional multi-family residential subdivisions (36 units) and an industrial park are planned in the study area. He also stated that development is occurring at a moderate pace and in accordance with the city's ordinances and plans.

Regional roadway access is another factor contributing to growth in the area. According to the Newton Planning Staff, a large percentage of residents in the study area work in one city and commute to another city in the region. Living in Newton and commuting to Hickory or the Charlotte metropolitan area or the reverse is common. This increases employment options for residents throughout the region and increases the potential labor pool for companies in the region. Even with the options of employment, the municipalities are searching for ways to increase the economic diversity in the region. Conover lists this as one of its goals in its *2003 Land Development Plan (draft)*.

5.3 Notable Features

The study area is in the Catawba River Basin. The Catawba River is part of the Santee-Cooper River system, which begins on the eastern slopes of the Blue Ridge

Mountains in North Carolina and reaches the Atlantic Ocean in South Carolina. In North Carolina, the Catawba River flows into Lake Norman, a drinking water source for Lincoln County, the city of Charlotte, and the towns of Huntersville, Davidson, and Mooresville. The water supply watershed for Lake Norman extends into the eastern fringe of the study area. The critical area of the Lake Norman watershed does not extend into the study area. The study area for this project is in subbasins 03-08-32 and 03-08-35 (see Figure 3). Streams in the study area include Smyre Creek, Town Creek, McLin Creek, Long Creek, and Mull Creek, as well as several of their tributaries. Long Creek and Mull Creek are classified as Class WS-IV waters. Smyre Creek and McLin Creek are classified as Class C waters. No waters classified as High Quality Waters or as Outstanding Resource Waters are in the study area or vicinity.

5.4 Existing Land Use

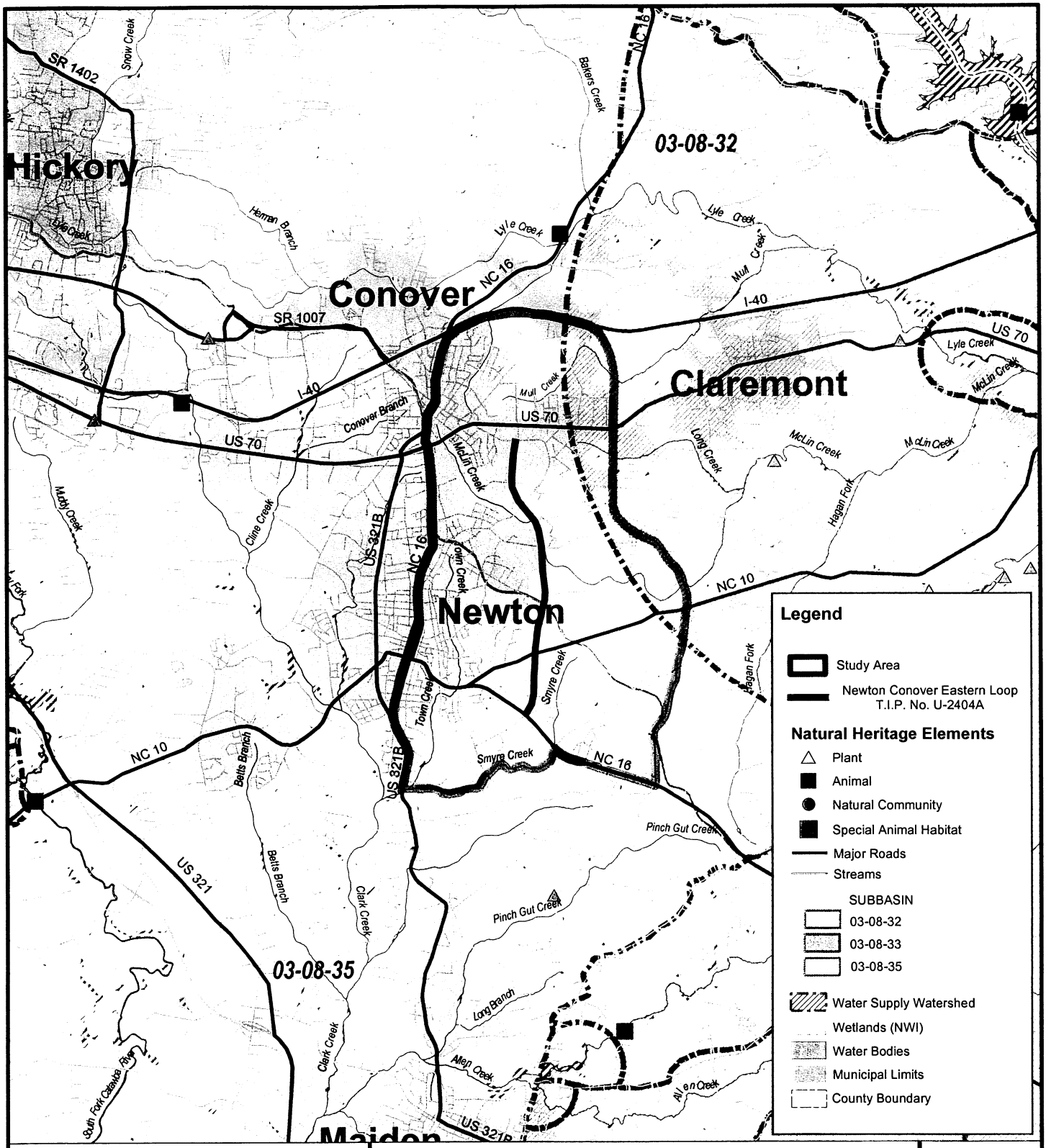
The majority of the study area is in the city of Newton's planning jurisdiction. Newton and Conover each have a good mix of small-scale development including residential, industrial, small home businesses, and commercial development. Except for the industrial development, all of these land uses are mixed throughout the study area while the industrial development is in the northeast portion of the study area near US 70. Both Newton and Conover have traditional downtowns along NC 16. Most of this development is within the study area.

The eastern and southeastern portion of the study area is in Catawba County's planning jurisdiction. Land uses near NC 10, between SR 1802 and 1804, in the county are dominated by open fields with scattered low-density residential development including stick-built homes and mobiles homes; older churches; and agricultural land uses. Land uses south of NC 16 and east of SR 1800 are similar.

5.5 Land Use Plans

5.5.1 Catawba County

Catawba County's planning jurisdiction covers only a small portion of the land in the study area. Although the county has several small area land use plans, none of them cover properties within the study area. The county does have a transportation plan that was adopted in 1992. Due to the age of the plan, the county is in the process of developing a new plan that is scheduled for public hearings in September 2003. As of July 2003, no draft of the plan is available.



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Prepared For

Source: North Carolina

WATER BOUNDARIES

NEWTON CONOVER EASTERN LOOP
T.I.P. No. U-2404A
CATAWBA COUNTY, NORTH CAROLINA

Figure 3

The Unifour Open Space and Recreation Task Force is a newly created regional program that is charged with reviewing current open space and recreation opportunities in the region and determining how to coordinate seamless open space opportunities in the region. Per the Catawba County Planning and Development Annual Report, subcommittees are currently working on sections of the plan. By preserving more open space in the area, this program may also affect the development patterns and the water quality in the study area.

5.5.2 City of Conover

Conover is developing the *2003 Land Development Plan (LDP)* to update its 1992 plan. The document is in the draft phase and is scheduled to be presented to the public in August of 2003.

Proposed goals of the *2003 LDP (draft)* include:

- Reinforce and improve the community livability of Conover.
- Provide essential public services and infrastructure with capacity to accommodate growth.
- Improve transportation mobility through alternate mode availability and vehicular facilities.
- Ensure ample and readily accessible open space.
- Pursue and maintain economic vitality.

The Conover *LDP (draft)* focuses on encouraging traditional versus strip development and providing infrastructure where growth is desired instead of following where growth occurs. According to *LDP (draft)*, "Most all of the issues Conover hopes to address in the next ten years directly or indirectly relate to the notion of "traditional" development, as opposed to conventional (development)."

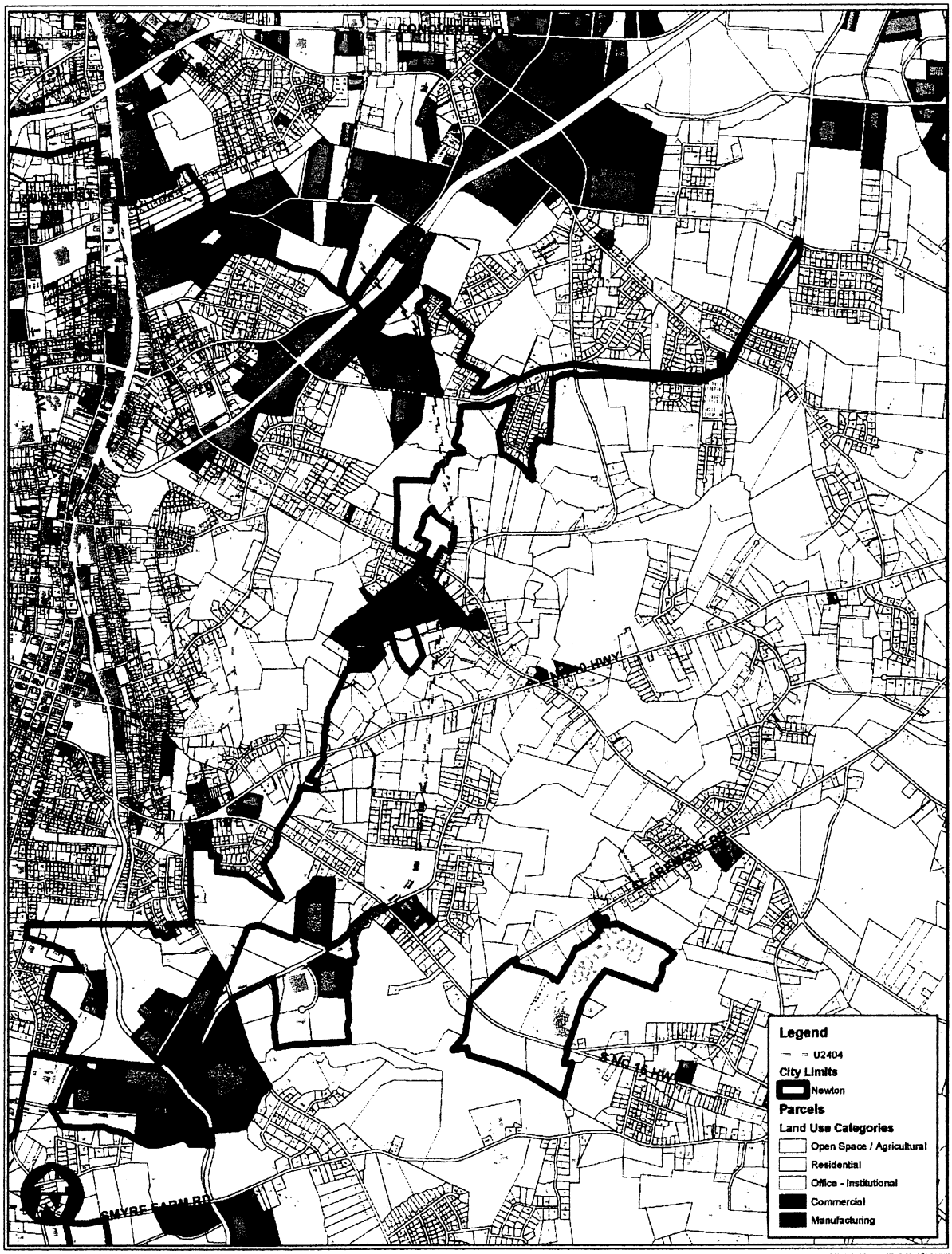
Conover's vision of traditional development is "... mixed use districts, public transportation, open space preservation, multiple connections, and the creation of a true sense of 'community'." Conover views conventional development as, "single-use zoning or mono-cultural isolated developments" that is, "random development with disconnected highway strip malls, single use subdivisions and heavy dependence on automobiles due to inadequate accessibility." Conover is especially concerned with preserving its Central Business District (CBD), which has already developed in the "traditional" pattern. To address this goal the city is doing or has done the following:

- Encouraging infill development as opposed to development in the "outskirts" of the community
- Sponsoring beautification projects in the CBD
- Recruiting appropriate businesses to locate in the CBD so that the small-town charm can be maintained while providing necessary functions for the citizens.
- Adopted a policy (the *2003 LDP draft)* that encourages mixed-use development in order to make the city more walkable and decrease the negative effects of automobile dependency.
- Negotiated a contract with NCDOT to construct 8-foot-wide sidewalks along the entire length of the new roadway within the city of Conover in order to support the pedestrian traffic which is a desired result of traditional development.
- Developed design guidelines so that streets, buildings, public spaces, parks and uses work together and are not separated, disconnected, or segregated elements.

Traditional development uses less land and requires a lower amount of impervious surface than conventional development; this results in less run-off water and reduces erosion. Therefore, this type of development reduces water quality impacts that may be greater if the area were to develop in a conventional pattern.

5.5.3 City of Newton

In an effort to plan for changes in land use with the addition of the eastern segment of the Newton Conover Loop, the city of Newton developed the "Area Specific Plan for Area 1," which includes the properties in Newton's planning jurisdiction that the Newton Planning Department believes will be impacted by the new roadway. Unlike Conover, which put its vision into document form, Newton has placed its vision on a series of maps that address land use, zoning, transportation facilities, and utilities. Per the plan, Newton is encouraging the combination of parcels and the submission of Planned Unit Developments (PUDs) in order to influence the design of the projects and encourage road interconnectivity. It is also encouraging multi-modal transportation design and traditional development. Once the Area 1 maps are completed and adopted, the city plans to create the ordinances necessary to enforce the maps. Completion is expected by the end of the year. See Figure 4 for existing land uses in the city of Newton.



NEWTON LAND USE BY TYPE

Source: *2003 NewtonArea1 Area Specific PlanDraft*

ARCADIS G&M of North Carolina, Inc.
801 Corporate Center Drive
Raleigh, NC 27607-5073
Tel: 919/854-1282 Fax: 919/854-5448

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Indirect & Cumulative Impacts

TIP Project U-2404A
Catawba County, North Carolina

Figure 4

5.6 Zoning

5.6.1 Catawba County

In the study area, Catawba County's zoning ordinances apply only to the properties in the unincorporated portions of the study area. Existing land use patterns are largely reflective of local zoning regulations. For the most part, undeveloped properties in Catawba County are zoned residential. Almost the entire county is zoned R-2, which accommodates low-density residential development, agriculture, and the necessary governmental and other support services in the more rural portions of Catawba County. In addition to the R-2 zoning district, the county has eight other different zoning districts plus the following special districts:

- Planned Development Districts: meant for several parcels of land to be developed on a unified basis. This is a new district.
- Historic Districts: No historic district is currently applied anywhere in the county.
- Special Districts: These districts include the Catawba River Corridor District, and the 321-Economic Development District.

The Voluntary Agricultural District (VAD) is another program in the development phase that may impact the development patterns in the county. The purpose of the program is to increase "the identity and pride in the agricultural community and its way of life." It is also meant to protect farmers from non-farm development issues like nuisance lawsuits and negative impacts on properly managed farms. This district will encourage more farmers to continue the agricultural land use on their property, therefore impacting the water quality in the study area. The VAD is expected to go to public hearing in September of 2003.

5.6.2 City of Conover

The majority of the properties in the study area that are within the city of Conover's planning jurisdiction are zoned Industrial. This area does not have very much vacant land area available for development. The city of Conover has five residential zoning districts: R-20, R-9, R-9A, NR, and NC. There are four commercial districts; one of these is Conover's Central Business District, which is at the intersection of two major roads, US 70 (First Street) and NC 16 (First Avenue), placing it at the heart of the city. Specialty stores, convenience stores, and public and private offices inhabit this district. Other commercial districts in Conover are the Strip Commercial and Local

Convenience, the Neighborhood Business Core District, and the Commercial Blocks or Centers District.

Other districts in the city include the Mixed-Use District, Industrial District concentrated around US 70, Open Space District, and the two historic districts.

5.6.3 City of Newton

The city of Newton has 13 different zoning districts. The majority of the undeveloped properties in the city are zoned residential. In preparation for the Newton Conover Loop, the planning department is in the process of drafting zoning maps for the area around the new roadway. Adoption of the plans and policies is expected by the end of 2003.

5.7 Water and Sewer

Water and sewer infrastructure is provided by many different sources in the region. Even though excess capacity is available at all of the facilities, plans for future expansions are being made, therefore water and sewer infrastructure will not be a growth-limiting factor in the study area.

5.7.1 Catawba County

Catawba County does not directly provide water or sewer service to its residents; it does so through one of local municipality's plant. Per Amanda Kain with Catawba County Utilities and Engineering, if the county deems it in the county's best interest to extend services, it will invest the capital fee of extending service into the county and charge its residents to hook up to the service. Once the line is extended, the property owner receives its water from a local municipality and the county is not involved in additional services. The county does not provide sewer service nor does it plan to provide that service in the future.

If the county decides it does not have an interest in extending water lines to a development, the property owner must apply for well and septic tank permits with the county or request services from a local municipality. Per the *Catawba County Strategic Growth Plan, Current Conditions Report*, public water and sewer are required "where available and feasible for extension." This may require a property owner to request that a municipality annex the property in order for it to receive

water and sewer infrastructure, therefore also requiring the owner to develop the property in accordance with the municipality's ordinances and regulations.

5.7.2 City of Conover

According to the city's web site, Conover recognizes that the water and sewer lines help direct growth and that development generally "follows" this infrastructure. The city of Conover has excess sewer and water capacity at all of the plants they own completely or have partial ownership. Conover purchases finished water from the city of Hickory.

In 1991, Conover recognized a future water shortage issue and purchased 6.7 acres on NC 16 at Shell Hollar Road (SR 1703), on which to build additional tanks and now also provides water service to Claremont and other portions of eastern Catawba County. Although the facility is currently sufficient, there is room to double the size of the plant if needed by future growth.

Conover maintains and operates two separate wastewater treatment facilities: the Southeast Wastewater Treatment Plant (WWTP) and the Northeast WWTP and owns 10 percent of the capacity in a plant operated by the city of Newton, the Clark Creek WWTP. The Northeast WWTP currently has excess capacity.

The Southeast WWTP, off McLin Creek Road, contains two separate treatment facilities. The Newton Conover Loop road project will literally run through the middle of this plant. Per the city of Conover website, an agreement was reached with NCDOT for NCDOT to pay for the city to build new facilities in the upper portion to replace the lower portion's facility. In the fall of 2003 Conover plans to increase its usage of the Clark Creek WWTP to compensate for the loss of capacity at the Southeast WWTP.

5.7.3 City of Newton

Newton operates the Newton Water Plant (NWP) and currently has excess capacity to serve its customers. Per Tim Abernethy with the NWP, in early 2004 the city is going to expand its customer base, therefore increasing its usage. Mr. Abernathy estimates the water plant will not need additional capacity for five to seven years.

Clark Creek WWTP currently operates well below its permitted flow rate. According to James Richards, Superintendent of Clark Creek WWTP, in the fall of

2003 the city of Conover is going to increase its usage of the Clark Creek WWTP. Mr. Clark still expects capacity to far exceed demand even with the city of Conover also using the WWTP.

5.8 Water Quality Plans and Programs

5.8.1 1999 Catawba River Basinwide Water Quality Plan

According to the *1999 Catawba River Basinwide Water Quality Plan*, overall water quality conditions in the basin are good. Most of the impaired stream miles are in the urbanized areas of Mecklenburg County, while the most good to excellent water quality ratings are in the basin's headwaters. The project study area is in two subbasins: 03-08-32 and 03-08-35. SR 1735 is the approximate boundary between the subbasins.

The northern portion of the study area is in subbasin 03-08-32. The subbasin includes portions of the cities of Newton and Conover, as well as Hickory. McLin Creek is the only monitored stream in the study area; however, the monitoring site is to the east of the study area at SR 1722. Support ratings based on biological and chemical monitoring data indicate that there are no impaired streams in the subbasin. However, several streams in the subbasin are impacted by nonpoint source pollution.

The southern portion of the study area is in subbasin 03-08-35. The subbasin includes primarily agricultural land uses with some urban areas. Generally, water quality in the subbasin is good with some waters designated outstanding resource waters. There are only two impaired streams in the subbasin, Clark Creek (Catawba County) and Mauney Creek (Gaston County). Neither of these streams is in the study area; however, Clark Creek is just west of Newton and the study area. Several tributaries of Clark Creek are in the study area, primarily in developed areas. One of the issues discussed in the basinwide plan is Clark Creek's contribution to the degradation of the south Fork Catawba River water quality. According to the plan, "other tributaries within the watershed are cumulatively affecting the water quality of the South Fork Catawba River." Although the river is not listed as impaired, the plan notes a need to improve water quality. The DWQ plans to take steps to address color and toxicity concerns in the South Fork Catawba River watershed. Bills Branch, just south of the study area, was listed as impaired in the 1995 basinwide plan, but is no longer included on the 303(d) list due to the elimination of discharges from the Catawba Correctional Center Wastewater Treatment Plant.

5.8.2 Catawba County Environment Task Force

The Catawba County Board of Commissioners appointed a "Foresight Steering Committee" to direct a strategic planning process for the county. A subcommittee, the Environment Task Force, is charged with "examining and evaluating the community and region's collective environmental policies and their implications on the county's economy and quality of life." One of the issues the task force will consider is water quality in the region. A final report, including specific strategies, is scheduled to be presented to the Board of Commissioners in late 2003. According to Mary George, Catawba County Planner, the county is currently pursuing educational programs addressing water quality issues.

5.8.3 City of Conover 2003 Land Use Plan (draft)

Conover's draft *2003 Land Use Plan* addresses water quality and storm water management. Conover has already taken measures to preserve water quality through its monitoring of water at wastewater treatment plants and a new telemetry system on manholes. However, the draft plan notes "storm water management will become more important and more difficult to manage as development decreases the natural filtration system." The draft plan recommends the implementation and coordination of Phase II Storm Water regulations. In addition, the draft plan recognizes that increased development in Conover may result in special drainage basin requirements for storm water runoff under the Clean Water Act. The plan also recommends construction limitations on moderate to severe slopes in order to avoid eroded slopes, which could result in increased sedimentation in surface waters.

5.8.4 Water Supply Watershed Ordinances

A portion of the eastern fringe of the study area is in the Lake Norman watershed and is classified as a WS-IV protected area (see Figure 3). The WS-IV classification is generally applied to water supply watersheds in moderate to highly developed areas. None of the watershed is within Newton's planning jurisdiction. In order to protect the water supply in the area both Conover and Catawba County adopted Water Supply Watershed Protection overlay zoning districts to regulate development in this area.

Objectives of both ordinances:

- Limit nonpoint source discharge and pollution in the water supply watershed.

- Enforce density restrictions and impervious surface coverage limitations.
- Provide options for higher densities of residential development.
- Require a 30-foot vegetated buffer adjacent to all streams or lakes in this zone.

Objectives specific to Catawba County's ordinance:

- Allow single-family residential structures on lots of 20,000 square feet or greater,
- Limit other residential and nonresidential development to 24 percent built-upon area.

Objectives specific to Conover's ordinance:

- Only new development that requires an erosion and sedimentation control plan under state law is required to comply with the WS-IV watershed regulations.

5.8.5 Other Regulations and Programs

The city of Newton adopted a sedimentation and soil erosion ordinance, while Conover and Catawba County rely on the state's "Rules and Regulations for Erosion and Sedimentation Control." A sedimentation and erosion control plan must be submitted prior to any land-disturbing activity exceeding one acre. Like Conover, the city of Newton is also covered by the Phase II requirements of the state's stormwater program.

Programs are in place to minimize direct, indirect, and cumulative impacts due to the construction of the proposed project and other NCDOT projects that will be built in the study area. These requirements, which are specific to the NCDOT, are precautions taken to protect water quality in the study area and downstream. The NCDOT activities such as general maintenance operations and facilities, construction operations including temporary erosion and sediment control, as well as project planning and design, must comply with standards set forth in the NCDOT handbook titled, "Best Management Practices for Protection of Surface Waters." Best management practices (BMPs) include preventative and control measures undertaken to avoid or reduce water pollution.

A National Pollutant Discharge Elimination System (NPDES) permit that applies throughout the state on NCDOT-owned right-of-way was issued on June 8, 1998. Requirements contained in the permit address a broad range of NCDOT activities. Included is a requirement for development of a procedure to document newly constructed stormwater outfalls and add them to a stormwater system inventory of

existing facilities. This documentation process will include the development of project stormwater management plans.

6. Conclusion

Indirect and cumulative impacts of transportation projects can involve changes in the type, density, design and locations of development. Influences or disturbances caused by urban development such as increased runoff from impervious areas, erosion and sedimentation, disturbance of riparian vegetation, development in the riparian zone, and pollutant loading can have a cumulative effect on future water quality. The following factors are potential impacts on water quality as a result of TIP Project No. U-2404A (Newton Conover Loop).

- This new-build road project will bring development to a primarily undeveloped area with scattered residential areas, pastures, and fields.
- Residential growth in Newton and Conover has been occurring in the east in the direction of the eastern segment of the Newton Conover Loop.
- Increased regional roadway access will also encourage development along the loop.
- Water and sewer capacity in the cities is available and will not be an immediate growth-limiting factor. A lack of water and sewer infrastructure in the county will direct growth to the municipalities.
- Although development is expected to occur in the vicinity of the new roadway there are plans and programs in place to help mitigate any potential impacts.
- All jurisdictions have water quality regulations in place to mitigate water quality impacts.

Based on the factors outlined in this report, it was determined that the proposed project will not induce extensive development in the study area, but due to the increased regional roadway access future development will shift to the new road corridor. The construction of the Newton Conover Loop, which will accommodate increasing traffic in the area and provide greater regional access, will play a role in development decisions along the corridor and in adjacent areas as permitted by local, state, and federal regulations.

Although development is expected in the study area, the overall indirect and cumulative impacts resulting from the construction of TIP Project No. U-2404A are expected to be minimal because of development limitations and regulations.

Therefore, it is determined that construction of TIP Project No. U-2404A will not result in indirect or cumulative impacts that will adversely affect water quality within the Catawba River Basin. No further indirect or cumulative impact analysis is recommended for the proposed project.

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