STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

May 21, 2004

US Army Corps of Engineers
Regulatory Branch
6508 Falls of the Neuse Road/ Suite 120
Raleigh, NC 27615

ATTENTION: Mr. John Thomas
NCDOT Coordinator

Dear Sir:

Subject: **Nationwide 23 Permit Application** for the for the replacement Bridge No. 72 over Prong of Country Line Creek and Bridge No. 11 over Country Line Creek on SR 1565, Caswell County. Federal Aid Project No. BRZ-1565(3), State Project No. 8.2481401, Division 7, TIP Project No. B-3629, WBS #33177.1.1.1.

Please find enclosed three copies of the project planning report, permit drawings, and ½ size plans for the above referenced project. The document states that Bridge No. 72 (Site 1) over Prong of Country Line Creek will be replaced with a reinforced concrete triple barrel culvert that is 12 feet wide and 8 feet high. Prong of Country Line Creek is not a jurisdictional stream. Bridge No. 11 (Site 2) over Country Line Creek will be replaced with a new 220-foot long bridge on the existing alignment with two 11 foot lanes with 3 foot offsets on each side. Traffic will use onsite detours during construction. Onsite detours are required because there is no suitable offsite detour.

Wetlands will be permanently impacted and consist of 0.15 acres of fill and 0.10 acres of mechanized clearing. There will be no stream impacts. Prong of Country Line Creek is not a jurisdictional stream. Country Line Creek is located in the Roanoke River Basin within HUC 03010104 and is classified by the Division of Water Quality as Class C.

The approach roadway will consist of two 11-foot travel lanes and shoulder widths of 5 feet. The shoulder widths will be 3 feet wider where guardrail is warranted. There will be approximately 380 feet of approach work on each side of Bridge No. 11 and approximately 250 feet on each side of Bridge No. 72.

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

During construction, traffic will be shifted onto temporary two-lane alignments, to the north of the existing bridges. The detour for Bridge No. 72 (Site 1) will consist of three 12 foot by 8 foot RCBCs. The detour bridge for Bridge No 11 (Site 2) will be approximately 90 feet in length and 26 feet in width. An onsite detour is necessary due to the lack of a suitable offsite detour.

After construction of the new bridges is completed the temporary structures will be removed. The temporary approach fill will be removed to the natural grade and the area will be re-vegetated with appropriate plant species.

Bridge Demolition: Bridge No. 11 and 72 are composed of timber and steel with an asphalt wearing surface. The bridge railings and substructure will be removed without dropping components into Waters of the United States. All guidelines for bridge demolition and removal will be followed in addition to Best Management Practices for the Protection of Surface Waters and BMP's for Bridge Demolition and Removal.

MITIGATION

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.

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 0.25 acres of jurisdictional wetlands will be offset by compensatory mitigation provided by the EEP program.

FEDERALLY-PROTECTED SPECIES

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of January 2003 the Fish and Wildlife Service (FWS) lists one federally protected species for Caswell County (Table 1).

Table 1- Federally Protected Species of Caswell County

Common Name	Scientific Name	Federal Status	Habitat Present	Biological Conclusion
Pleurobema collina	James spinymussel	E	N	No Effect

A biological conclusion of "No Effect" was reached for the dwarf wedge mussel on October 28, 2001. NCDOT will conduct follow up surveys for the James spinymussel prior to the let date.

REGULATORY APPROVALS

This project is being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). Therefore, we do not anticipate requesting an individual permit but propose to proceed under a Nationwide 23 in accordance with 67 FR 2020, 2082, Jan 15, 2002. We anticipate a 401 General Certification number 3361 will apply to this project and will adhere to the general conditions of WQC 3361. In accordance with 15A NCAC 2H .0501(a) we are providing two copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, for their records.

If you have any questions or need additional information, please contact Brett Feulner at (919) 715-1488.

Sincerely,

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

w/ attachment

Mr. John Dorney, NCDWQ(2 Copies)
Mr. Gary Jordan, USFWS
Mr. Travis Wilson, NCWRC
Mr. J.M. Mills, P.E., Division Engineer
Mr. Jerry A. Parker, DEO

w/o attachment

Mr. Greg Perfetti, P.E., Structure Design
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
Ms. Art McMillan, PE, Highway Design
Mr. David Chang, P.E., Hydraulics
Mr. Mark Staley, Roadside Environmental
Ms. Robin Hancock, Project Planning Engineer
Mr. David Franklin, USACE, Wilmigton
Mr. Bill Gilmore, EEP

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

May 4, 2004

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

Dear Mr. Gilmore:

Subject: Bridge No. 72 over Prong of Country Line Creek and Bridge No. 11 over Country Line Creek on SR 1565, Caswell County. Federal Aid Project No. BRZ-1565(3), State Project No. 8.2481401 TIP Project No. B-3629.

The purpose of this letter is to request that the North Carolina Ecosystem Enhancement Program (EEP) provide confirmation that the EEP is 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 proposes to replace Bridge No. 72 over Prong of Country Line Creek and Bridge No. 11 over Country Line Creek in Caswell County with the use of a temporary on-site detour. Jurisdictional impacts on this project occur in the Roanoke River Basin. This project is on the list of projects covered by EEP.

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 0.41 acres of riverine wetlands will be impacted.

The project is located in the Piedmont Physiographic Province in Caswell County in the Roanoke River basin in Hydrological Cataloguing Unit 03010104.

- The wetland impacts total 0.25 acres of bottomland hardwood forest. We propose to provide compensatory mitigation for the wetland impacts by using the EEP for the 0.25 acres of impacts.

MAILING ADDRESS:
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FAX: 919-733-9794
WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

Please send the letter of confirmation to John Thomas (USACE Coordinator) at U. S. Army Corps of Engineers Raleigh Regulatory Field Office, (6508 Falls of the Neuse Road/ Suite 120, Raleigh, NC, 27615). Mr. Thomas' FAX number is 876-5823. The current let date for the project is (September 21, 2004) for which the let review date is (August 3, 2004).

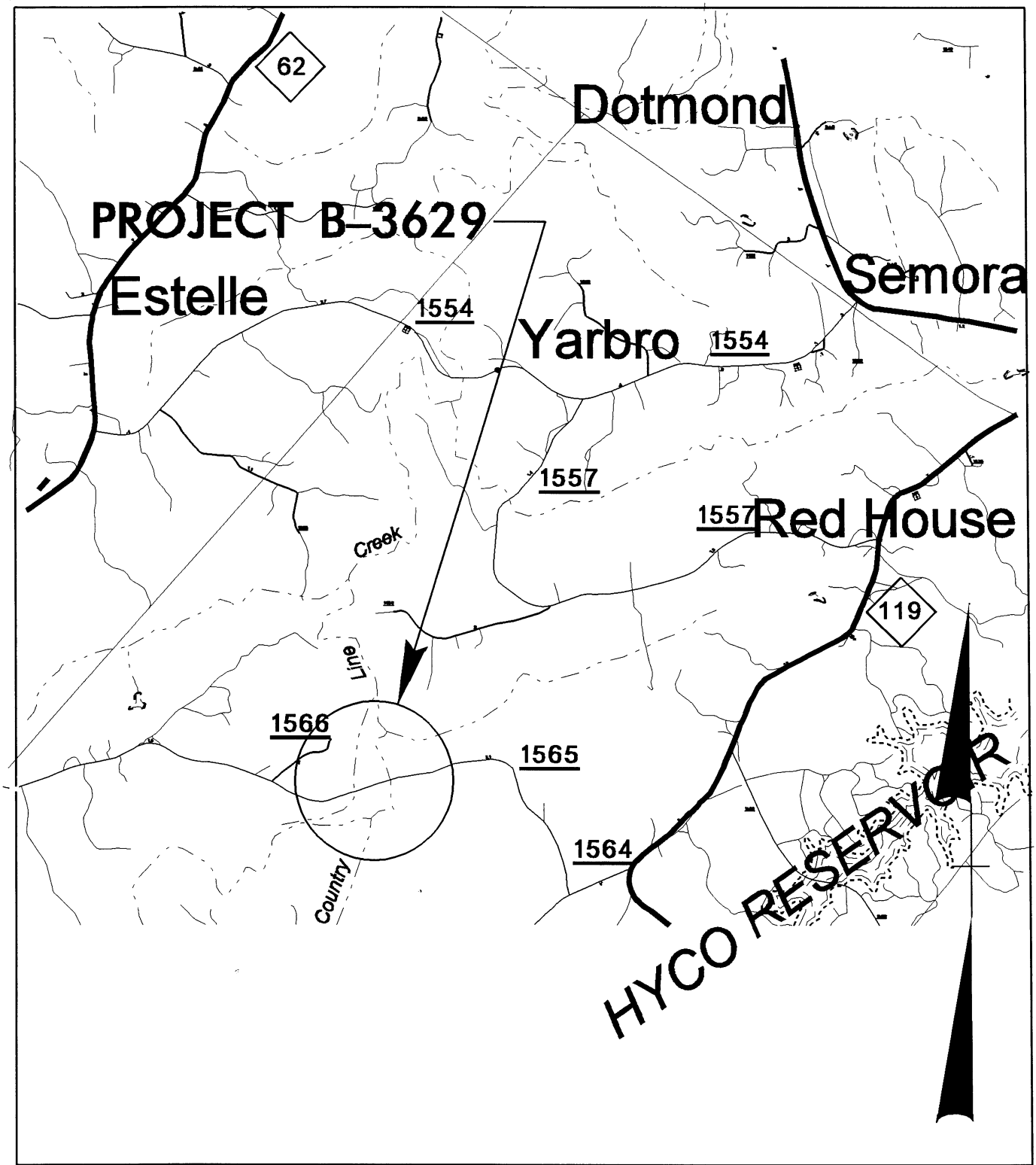
In order to satisfy regulatory assurances that mitigation will be performed; the NCDWQ requires a formal letter from EEP indicating their willingness and ability to provide the mitigation work requested by NCDOT. The NCDOT requests such a letter of confirmation be addressed to Mr. John Hennessy of NCDWQ,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

If you have any questions or need additional information please call Brett Feulner at 715-1488.

Sincerely,

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

cc: Mr. David Franklin, USACE, Wilmington
Mr. John Dorney, Division of Water Quality
Mr. Travis Wilson, NCWRC
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
Ms. Debbie Barbour, P.E., Design Services
Mr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. J.M Mills, P.E., Division 7 Engineer
Mr. Robin Hancock, Project Planning Engineer
Mr. Jerry Parker, Division 7 Environmental Officer

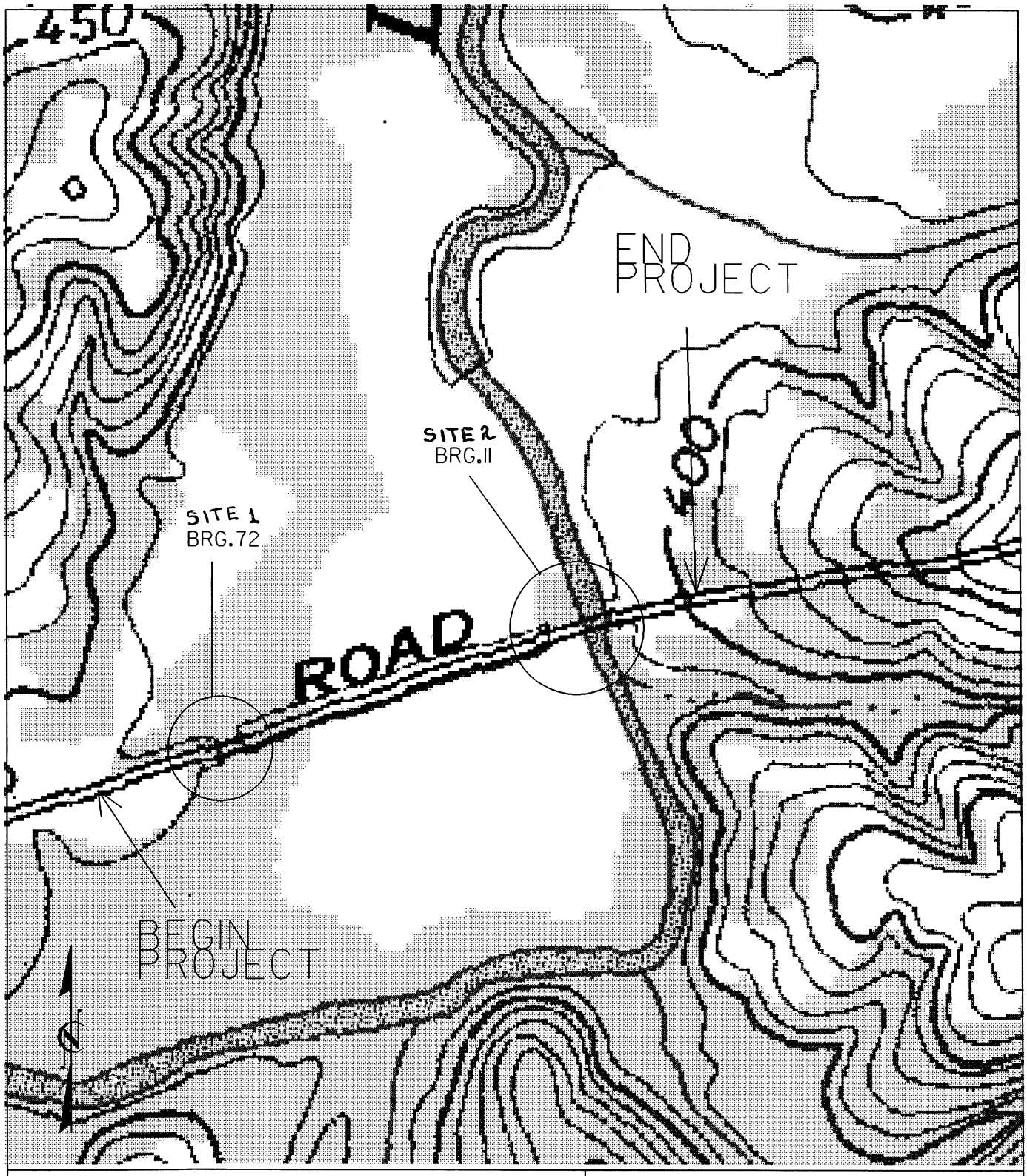


VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
CASWELL COUNTY
PROJECT: 8.2481401 (B-3629)
REPLACE BRIDGES NO.11 AND NO.72
OVER COUNTRY LINE CREEK ON
SR1565 (LONGS MILL RD.)

SHEET 1 OF 13 9/16/03



VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
CASWELL COUNTY
PROJECT: 8.2481401 (B-3629)
REPLACE BRIDGES NO.11 AND NO.72 OVER COUNTRY LINE CREEK ON SR1565 (LONGS MILL RD.)

WETLAND LEGEND

WLB WETLAND BOUNDARY

WETLAND

F F DENOTES FILL IN WETLAND

S S DENOTES FILL IN SURFACE WATER

P P DENOTES FILL IN SURFACE WATER (POND)

T T DENOTES TEMPORARY FILL IN WETLAND

E E DENOTES EXCAVATION IN WETLAND

TS TS 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

PROPOSED BRIDGE

PROPOSED BOX CULVERT

PROPOSED PIPE CULVERT
12"-48" PIPES
54" PIPES & ABOVE

(DASHED LINES DENOTE EXISTNG STRUCTURES)

SINGLE TREE

WOODS LINE

DRAINAGE INLET

ROOTWAD

RIP RAP

5 ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE

PREFORMED SCOUR HOLE

LEVEL SPREADER (LS)

DITCH / GRASS SWALE

NCDOT

DIVISION OF HIGHWAYS

CASWELL COUNTY

PROJECT: 8.2481401 (B-3629)

REPLACE BRIDGES NO.11 AND NO.72 OVER COUNTRY LINE CREEK ON SR1565. (LONGS MILL RD.)

PROJECT REFERENCE NO.	SHEET NO.
B-3629	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

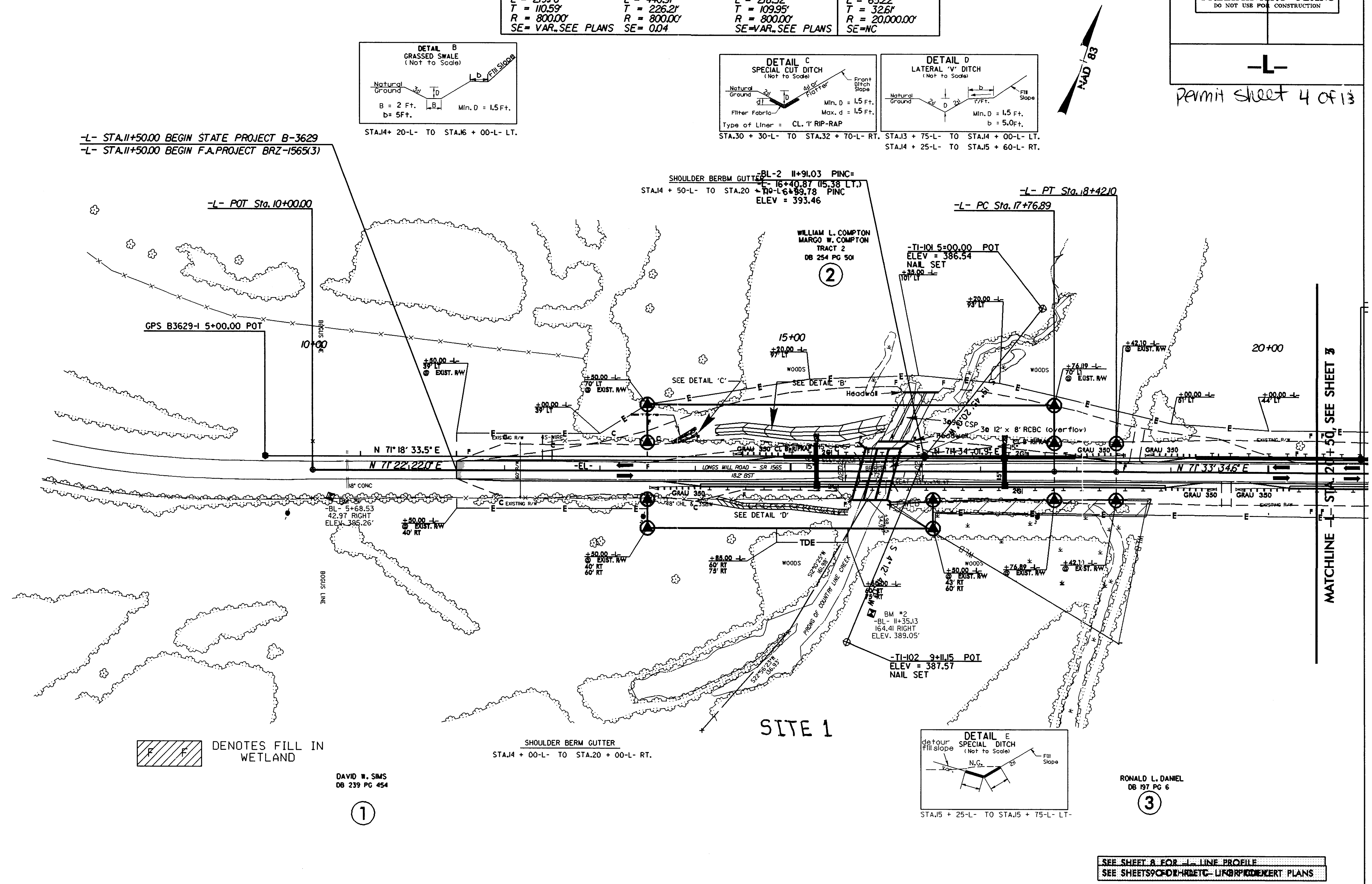
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

Permit Sheet 4 of 13

V DESIGN = 45 MPH

-DET1-			-L-
PI Sta 11+10.59	PI Sta 14+45.99	PI Sta 17+70.64	PI Sta 18+09.49
Δ = 15° 44' 26.0" (LT)	Δ = 31° 34' 41.0" (RT)	Δ = 15° 39' 02.4" (LT)	Δ = 0° 11' 12.6" (RT)
D = 7° 09' 43.1"	D = 7° 09' 43.1"	D = 7° 09' 43.1"	D = 0° 17' 11.3"
L = 219.78'	L = 440.91'	L = 218.52'	L = 65.22'
T = 110.59'	T = 226.21'	T = 109.95'	T = 32.61'
R = 800.00'	R = 800.00'	R = 800.00'	R = 20,000.00'
SE = VAR., SEE PLANS	SE = 0.04	SE = VAR., SEE PLANS	SE = NC



DETAIL B
GRASSED SWALE
(Not to Scale)
Natural Ground
Fill Slope
B = 2 Ft.
b = 5Ft.
Min. D = 1.5 Ft.
STA.14+ 20-L- TO STA.16 + 00-L- LT.
DETAIL C
SPECIAL CUT DITCH
(Not to Scale)
Front Ditch Slope
Filter Fabric
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
Type of Liner = CL. 'I' RIP-RAP
STA.30 + 30-L- TO STA.32 + 70-L- RT.
DETAIL D
LATERAL 'V' DITCH
(Not to Scale)
Fill Slope
Min. D = 1.5 Ft.
b = 5.0 Ft.
STA.13 + 75-L- TO STA.14 + 00-L- LT.
STA.14 + 25-L- TO STA.15 + 60-L- RT.
NAD '83
-L- STA.11+50.00 BEGIN STATE PROJECT B-3629
-L- STA.11+50.00 BEGIN F.A.PROJECT BRZ-1565(3)
-L- POT Sta. 10+00.00
GPS B3629-1 5+00.00 POT
SHOULDER BERBM GUTTER
STA.14 + 50-L- TO STA.20 + 00-L- LT.
-BL-2 11+91.03 PINC=
-L- 16+40.87 (15.38 LT.)
-TI-102 6+89.78 PINC
ELEV = 393.46
WILLIAM L. COMPTON
MARGO W. COMPTON
TRACT 2
DB 254 PG 501
-L- PT Sta. 18+42.10
-L- PC Sta. 17+76.89
-TI-101 5+00.00 POT
ELEV = 386.54
NAIL SET
N 71° 18' 33.5" E
N 71° 22' 22.0" E
N 71° 34' 01.9" E
N 71° 33' 34.6" E
LONGS MILL ROAD - SR 1565
18.2' BST
3@ 12' x 8' RCBC (overflow)
SEE DETAIL 'C'
SEE DETAIL 'B'
SEE DETAIL 'D'
Headwall
WOODS
PRONG OF COUNTRY LINE CREEK
-BL- 5+68.53
42.97 RIGHT
ELEV. 385.26'
BM #2
-BL- 11+35.13
164.41 RIGHT
ELEV. 389.05'
-TI-102 9+11.15 POT
ELEV = 387.57
NAIL SET
SITE 1
DENOTES FILL IN WETLAND
SHOULDER BERM GUTTER
STA.14 + 00-L- TO STA.20 + 00-L- RT.
DAVID W. SIMS
DB 239 PG 454
DETAIL E
SPECIAL DITCH
(Not to Scale)
Fill Slope
STA.15 + 25-L- TO STA.15 + 75-L- LT.
RONALD L. DANIEL
DB 197 PG 6
MATCHLINE -L- STA. 20+50, SEE SHEET 5

SEE SHEET 8 FOR -L- LINE PROFILE
SEE SHEETS 9 FOR CULVERT PLANS

PROJECT REFERENCE NO.	SHEET NO.
B-3629	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

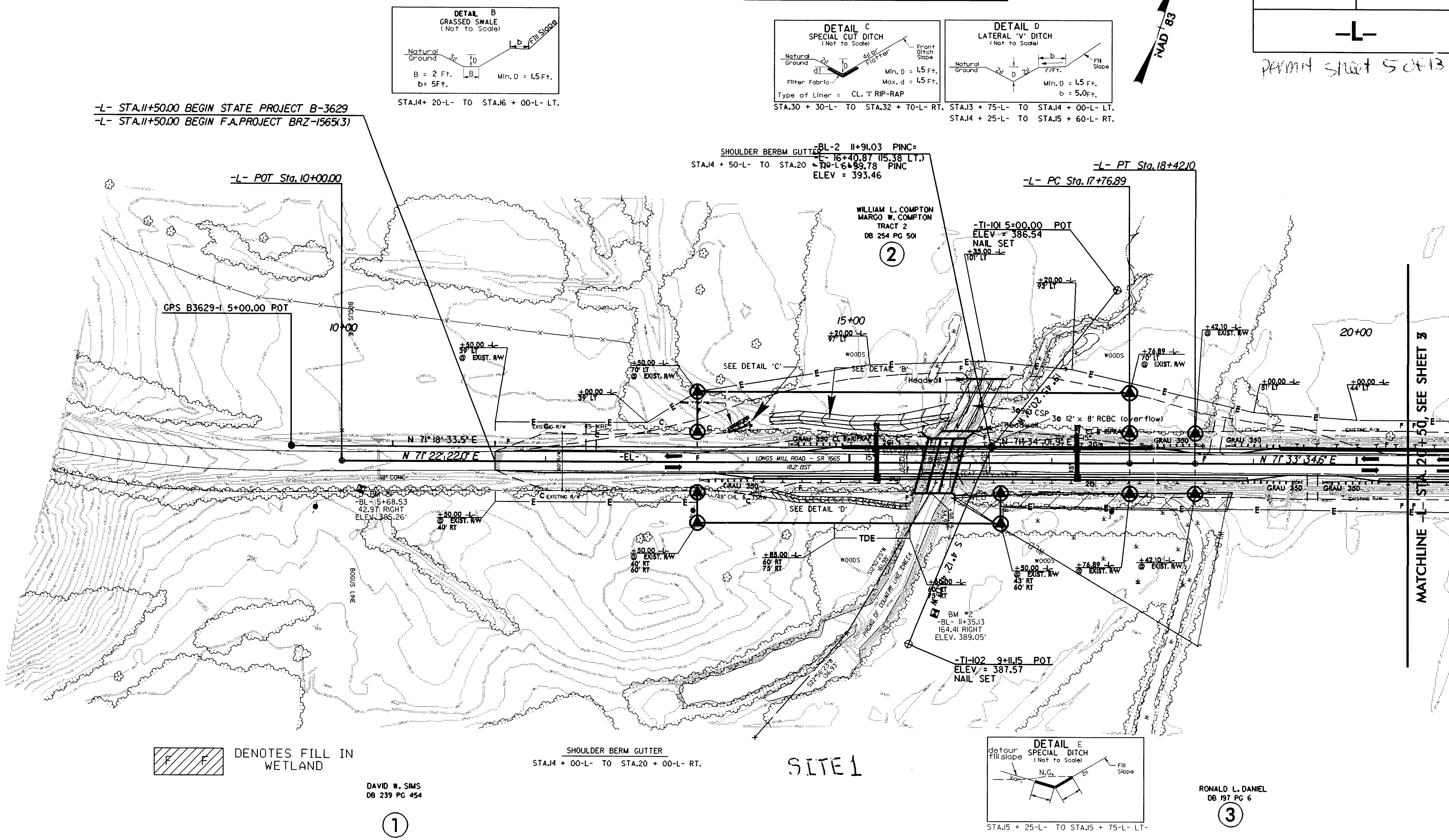
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

PRMN Sheet 5 of 13

V_{DESIGN} = 45 MPH

-DET1-			-L-
PI Sta 11+10.59	PI Sta 14+45.99	PI Sta 17+70.64	PI Sta 18+09.49
Δ = 15° 44' 26.0" (LT)	Δ = 31° 34' 41.0" (RT)	Δ = 15° 39' 02.4" (LT)	Δ = 0° 11' 12.6" (RT)
D = 7° 09' 43.1"	D = 7° 09' 43.1"	D = 7° 09' 43.1"	D = 0° 17' 11.3"
L = 219.78'	L = 440.91'	L = 218.52'	L = 65.22'
T = 110.59'	T = 226.21'	T = 109.95'	T = 32.61'
R = 800.00'	R = 800.00'	R = 800.00'	R = 20,000.00'
SE = VAR., SEE PLANS	SE = 0.04	SE = VAR., SEE PLANS	SE = NC



DETAIL B
GRASSED SWALE
(Not to Scale)
B = 2 Ft.
b = 5Ft.
Min. D = 1.5 Ft.
STA.14+20-L- TO STA.16+00-L- LT.
DETAIL C
SPECIAL CUT DITCH
(Not to Scale)
Type of Liner = CL. 'I' RIP-RAP
STA.30+30-L- TO STA.32+70-L- RT.
DETAIL D
LATERAL 'V' DITCH
(Not to Scale)
Min. D = 1.5 Ft.
b = 5.0 Ft.
STA.13+75-L- TO STA.14+00-L- LT.
STA.14+25-L- TO STA.15+60-L- RT.
NAD 83
-L- STA.11+50.00 BEGIN STATE PROJECT B-3629
-L- STA.11+50.00 BEGIN F.A.PROJECT BRZ-1565(3)
-L- POT Sta. 10+00.00
GPS B3629-1 5+00.00 POT
SHOULDER BERBM GUTTER
STA.14+50-L- TO STA.20+00-L- LT.
-BL-2 11+91.03 PINC=
-L- 16+40.87 (15.38 LT.)
-TI0-L- 6+89.78 PINC
ELEV = 393.46
WILLIAM L. COMPTON
MARGO W. COMPTON
TRACT 2
DB 254 PG 501
-L- PT Sta. 18+42.10
-L- PC Sta. 17+76.89
-TI-101 5+00.00 POT
ELEV = 386.54
NAIL SET
N 71° 18' 33.5" E
N 71° 22' 22.0" E
N 71° 34' 01.9" E
N 71° 33' 34.6" E
LONGS MILL ROAD - SR 1565
3@ 12' x 8' RCBC (overflow)
SEE DETAIL 'C'
SEE DETAIL 'B'
SEE DETAIL 'D'
-BL- 15+68.53
42.97 RIGHT
ELEV. 385.26'
BM #2
-BL- 11+35.13
164.41 RIGHT
ELEV. 389.05'
-TI-102 9+11.15 POT
ELEV = 387.57
NAIL SET
MATCHLINE -L- STA. 20+50 SEE SHEET 5
DETAIL E
SPECIAL DITCH
(Not to Scale)
STA.15+25-L- TO STA.15+75-L- LT-
SHOULDER BERM GUTTER
STA.14+00-L- TO STA.20+00-L- RT.
DENOTES FILL IN WETLAND
DAVID W. SIMS
DB 239 PG 454
RONALD L. DANIEL
DB 197 PG 6
SITE 1

SEE SHEET 8 FOR -L- LINE PROFILE
SEE SHEETS 9 FOR -DET1- LINE PROFILE & CULVERT PLANS

PROJECT REFERENCE NO.	SHEET NO.
B-3629	5

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

INCOMPLETE PLANS — DO NOT USE FOR R/W ACQUISITION

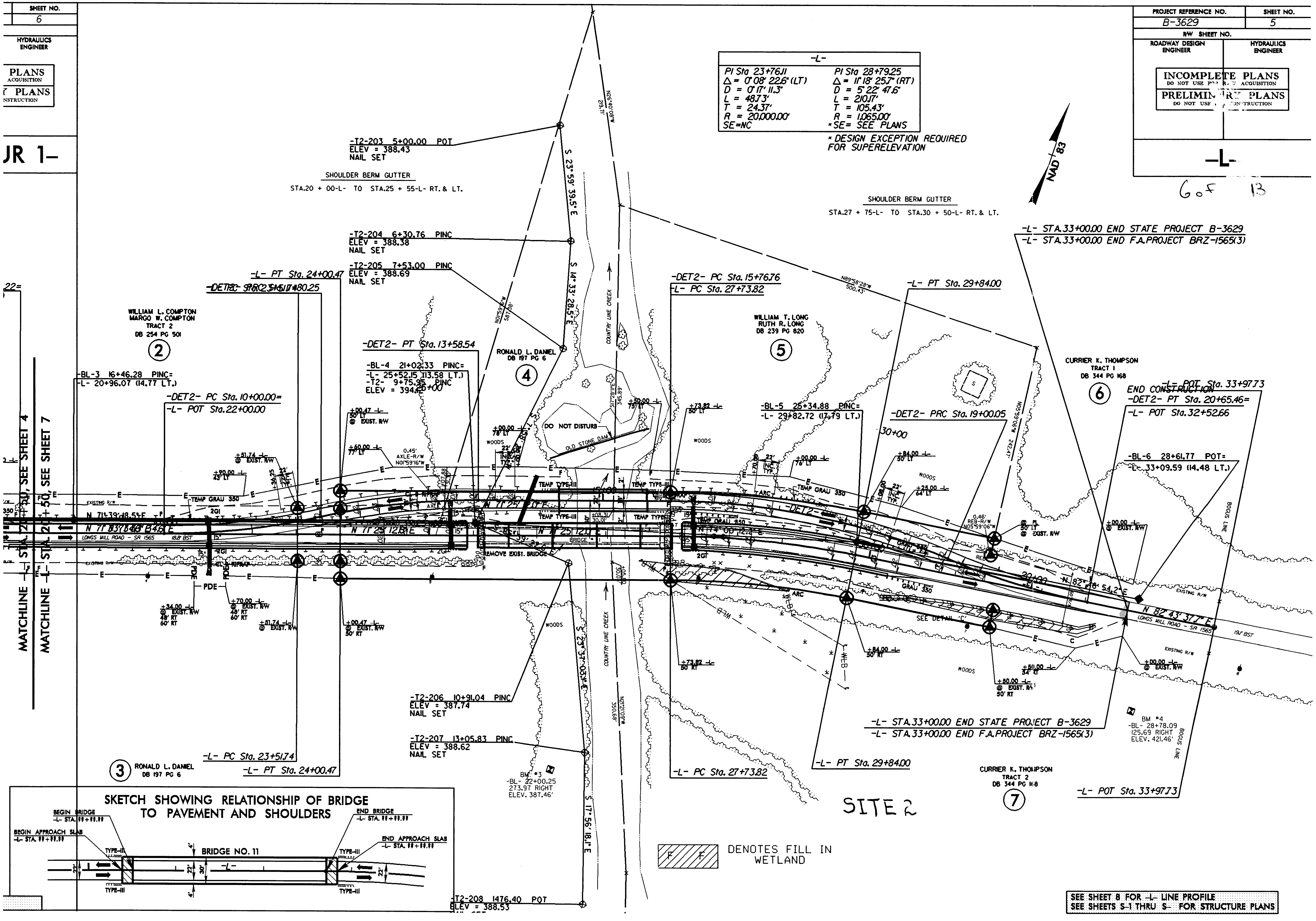
PRELIMINARY PLANS — DO NOT USE FOR CONSTRUCTION

-L-

6 of 13

-L-	
PI Sta 23+76.11	PI Sta 28+79.25
Δ = 0°08' 22.6" (LT)	Δ = 11°18' 25.7" (RT)
D = 0°17' 11.3"	D = 5°22' 47.6"
L = 48.73'	L = 210.17'
T = 24.37'	T = 105.43'
R = 20,000.00'	R = 1,065.00'
SE=NC	*SE= SEE PLANS

* DESIGN EXCEPTION REQUIRED FOR SUPERELEVATION



SHEET NO. 6
HYDRAULICS ENGINEER
PLANS ACQUISITION
PLANS CONSTRUCTION
NAD 83
-T2-203 5+00.00 POT
ELEV = 388.43
NAIL SET
SHOULDER BERM GUTTER
STA.20 + 00-L- TO STA.25 + 55-L- RT. & LT.
SHOULDER BERM GUTTER
STA.27 + 75-L- TO STA.30 + 50-L- RT. & LT.
-T2-204 6+30.76 PINC
ELEV = 388.38
NAIL SET
-T2-205 7+53.00 PINC
ELEV = 388.69
NAIL SET
-L- PT Sta. 24+00.47
-L- STA.33+00.00 END STATE PROJECT B-3629
-L- STA.33+00.00 END F.A.PROJECT BRZ-1565(3)
-DET2- PC Sta. 15+76.76
-L- PC Sta. 27+73.82
-L- PT Sta. 29+84.00
WILLIAM L. COMPTON
MARGO W. COMPTON
TRACT 2
DB 254 PG 501
2
WILLIAM T. LONG
RUTH R. LONG
DB 239 PG 820
5
RONALD L. DANIEL
DB 197 PG 6
4
CURRIER K. THOMPSON
TRACT 1
DB 344 PG 168
6
-DET2- PT Sta. 13+58.54
-BL-3 16+46.28 PINC=
-L- 20+96.07 (14.77 LT.)
-BL-4 21+02.33 PINC=
-L- 25+52.15 (13.58 LT.)
-T2- 9+75.95 PINC
ELEV = 394.42
-DET2- PC Sta. 10+00.00=
-L- POT Sta.22+00.00
-BL-5 25+34.88 PINC=
-L- 29+82.72 (17.79 LT.)
-DET2- PRC Sta. 19+00.05
-L- POT Sta. 33+97.73
END CONSTRUCTION
-DET2- PT Sta. 20+65.46=
-L- POT Sta.32+52.66
-BL-6 28+61.77 POT=
-L- 33+09.59 (14.48 LT.)
COUNTRY LINE CREEK
DO NOT DISTURB
OLD STONE DAM
WOODS
TEMP GRAU 350
TEMP TYPE-III
REMOVE EXIST. BRIDGE
LONGS MILL ROAD - SR 1565
N 82°43' 37.7" E
N 82°16' 54.2" E
MATCHLINE -L- STA. 20+50, SEE SHEET 4
MATCHLINE -L- STA. 20+50, SEE SHEET 7
PDE
SEE DETAIL 'C'
EXISTING R/W
-T2-206 10+91.04 PINC
ELEV = 387.74
NAIL SET
-T2-207 13+05.83 PINC
ELEV = 388.62
NAIL SET
BM #3
-BL- 22+00.25
273.97 RIGHT
ELEV. 387.46'
BM #4
-BL- 28+78.09
125.69 RIGHT
ELEV. 421.46'
-L- PC Sta. 23+51.74
-L- PT Sta. 24+00.47
RONALD L. DANIEL
DB 197 PG 6
3
-L- PC Sta. 27+73.82
-L- PT Sta. 29+84.00
CURRIER K. THOMPSON
TRACT 2
DB 344 PG 168
7
-L- POT Sta. 33+97.73
SITE 2
-T2-208 1476.40 POT
ELEV = 388.53
SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS
BEGIN BRIDGE -L- STA. ##+##.##
BEGIN APPROACH SLAB -L- STA. ##+##.##
END BRIDGE -L- STA. ##+##.##
END APPROACH SLAB -L- STA. ##+##.##
BRIDGE NO. 11
TYPE-III

DENOTES FILL IN WETLAND

SEE SHEET 8 FOR -L- LINE PROFILE
SEE SHEETS S-1 THRU S- FOR STRUCTURE PLANS

SHEET NO.
6

HYDRAULICS ENGINEER

PLANS ACQUISITION

PLANS CONSTRUCTION

JR 1–

PROJECT REFERENCE NO.	SHEET NO.
B-3629	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

–L–

7 of 13

–L–	
PI Sta 23+76.11	PI Sta 28+79.25
Δ = 0° 08' 22.6" (LT)	Δ = 11° 18' 25.7" (RT)
D = 0° 17' 11.3"	D = 5° 22' 47.6"
L = 48.73'	L = 210.17'
T = 24.37'	T = 105.43'
R = 20,000.00'	R = 1,065.00'
SE=NC	*SE= SEE PLANS

* DESIGN EXCEPTION REQUIRED FOR SUPERELEVATION

NAD 83

SHOULDER BERM GUTTER
STA.20 + 00-L- TO STA.25 + 55-L- RT. & LT.

SHOULDER BERM GUTTER
STA.27 + 75-L- TO STA.30 + 50-L- RT. & LT.

-L- STA.33+00.00 END STATE PROJECT B-3629
-L- STA.33+00.00 END F.A.PROJECT BRZ-1565(3)

-T2-203 5+00.00 POT
ELEV = 388.43
NAIL SET

-T2-204 6+30.76 PINC
ELEV = 388.38
NAIL SET

-T2-205 7+53.00 PINC
ELEV = 388.69
NAIL SET

-T2-206 10+91.04 PINC
ELEV = 387.74
NAIL SET

-T2-207 13+05.83 PINC
ELEV = 388.62
NAIL SET

-T2-208 14+76.40 POT
ELEV = 388.53

-L- PT Sta. 24+00.47
-DET2- PRC Sta. 24+80.25
-DET2- PC Sta. 10+00.00=
-L- POT Sta.22+00.00
-DET2- PT Sta. 13+58.54
-L- PC Sta. 23+51.74
-L- PT Sta. 24+00.47
-DET2- PC Sta. 15+76.76
-L- PC Sta. 27+73.82
-L- PT Sta. 29+84.00
-DET2- PRC Sta. 19+00.05
-DET2- PT Sta. 20+65.46=
-L- POT Sta. 32+52.66
-L- POT Sta. 33+97.73

-BL-3 16+46.28 PINC=
-L- 20+96.07 (14.77 LT.)

-BL-4 21+02.33 PINC=
-L- 25+52.15 (13.58 LT.)
-T2- 9+75.95 PINC
ELEV = 394.20+00

-BL-5 25+34.88 PINC=
-L- 29+82.72 (17.79 LT.)

-BL-6 28+61.77 POT=
-L- 33+09.59 (14.48 LT.)

WILLIAM L. COMPTON
MARGO W. COMPTON
TRACT 2
DB 254 PG 501
2

RONALD L. DANIEL
DB 197 PG 6
4

WILLIAM T. LONG
RUTH R. LONG
DB 239 PG 820
5

CURRIER K. THOMPSON
TRACT 1
DB 344 PG 168
6

RONALD L. DANIEL
DB 197 PG 6
3

CURRIER K. THOMPSON
TRACT 2
DB 344 PG 168
7

MATCHLINE –L– STA. 22+50, SEE SHEET 4

MATCHLINE –L– STA. 22+50, SEE SHEET 7

LONGS MILL ROAD – SR 1565

TEMP GRAU 350

TEMP TYPE-III

REMOVE EXIST. BRIDGE

DO NOT DISTURB

OLD STONE WALL

COUNTRY LINE CREEK

WOODS

WEB

SEE DETAIL "C"

BM #3
-BL- 22+00.25
273.97' RIGHT
ELEV. 387.46'

BM #4
-BL- 28+78.09
125.69' RIGHT
ELEV. 421.46'

SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS

BEGIN BRIDGE –L– STA. ##+##.##
BEGIN APPROACH SLAB –L– STA. ##+##.##
END BRIDGE –L– STA. ##+##.##
END APPROACH SLAB –L– STA. ##+##.##
BRIDGE NO. 11
TYPE-III
22'
30'
4'

SITE 2

F F DENOTES FILL IN WETLAND

SEE SHEET 8 FOR –L– LINE PROFILE
SEE SHEETS S-1 THRU S– FOR STRUCTURE PLANS

PROJECT REFERENCE NO.	SHEET NO.
B-3629	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

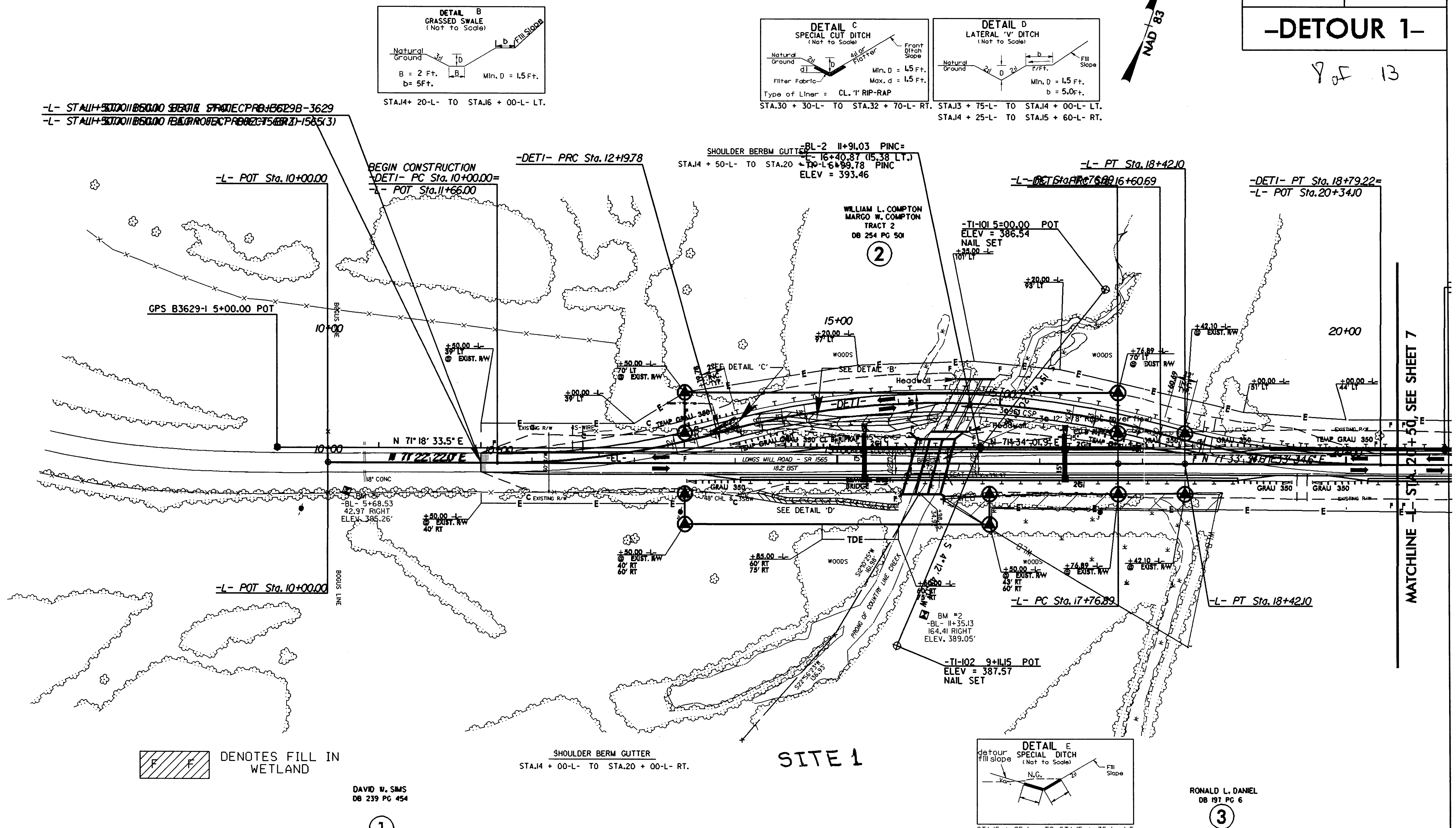
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-DETOUR 1-

8 of 13

V_{DESIGN} = 45 MPH

-DET1-			-L-
PI Sta 11+10.59	PI Sta 14+45.99	PI Sta 17+70.64	PI Sta 18+09.49
Δ = 15° 44' 26.0" (LT)	Δ = 31° 34' 41.0" (RT)	Δ = 15° 39' 02.4" (LT)	Δ = 0° 11' 12.6" (RT)
D = 7° 09' 43.1"	D = 7° 09' 43.1"	D = 7° 09' 43.1"	D = 0° 17' 11.3"
L = 219.78'	L = 440.91'	L = 218.52'	L = 65.22'
T = 110.59'	T = 226.21'	T = 109.95'	T = 32.61'
R = 800.00'	R = 800.00'	R = 800.00'	R = 20,000.00'
SE= VAR., SEE PLANS	SE= 0.04	SE=VAR., SEE PLANS	SE=NC



DETAIL B
GRASSED SWALE
(Not to Scale)
Natural Ground
Fill Slope
B = 2 Ft.
b= 5Ft.
Min. D = 1.5 Ft.
STA.14+ 20-L- TO STA.16 + 00-L- LT.
DETAIL C
SPECIAL CUT DITCH
(Not to Scale)
Front Ditch Slope
Filter Fabric
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
Type of Liner = CL. 'I' RIP-RAP
STA.30 + 30-L- TO STA.32 + 70-L- RT.
DETAIL D
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
Fill Slope
Min. D = 1.5 Ft.
b = 5.0Ft.
STA.13 + 75-L- TO STA.14 + 00-L- LT.
STA.14 + 25-L- TO STA.15 + 60-L- RT.
NAD 83
BEGIN CONSTRUCTION
-DET1- PC Sta. 10+00.00=
-L- POT Sta. 11+66.00
-L- POT Sta. 10+00.00
-DET1- PRC Sta. 12+19.78
SHOULDER BERBM GUTTER
STA.14 + 50-L- TO STA.20 + 00-L- LT.
-BL-2 11+91.03 PINC=
-L- 16+40.87 (15.38 LT.)
ELEV = 393.46
WILLIAM L. COMPTON
MARGO W. COMPTON
TRACT 2
DB 254 PG 501
2
-TI-101 5+00.00 POT
ELEV = 386.54
NAIL SET
-L- PT Sta. 18+42.10
-DET1- PT Sta. 18+79.22=
-L- POT Sta. 20+34.10
GPS B3629-1 5+00.00 POT
BOGUS LINE
15+00
20+00
WOODS
SEE DETAIL 'C'
SEE DETAIL 'B'
SEE DETAIL 'D'
Headwall
N 71° 18' 33.5" E
N 71° 22' 22.0" E
LONGS MILL ROAD - SR 1565
18.2' BST
BRIDGE
GRAU 350
TDE
-BL- 5+68.53
42.97 RIGHT
ELEV. 385.26'
BM #2
-BL- 11+35.13
164.41 RIGHT
ELEV. 389.05'
-TI-102 9+11.15 POT
ELEV = 387.57
NAIL SET
-L- PC Sta. 17+76.89
-L- PT Sta. 18+42.10
PRONG OF COUNTRY LINE CREEK
MATCHLINE -L- STA. 20+50, SEE SHEET 7
DENOTES FILL IN WETLAND
SHOULDER BERM GUTTER
STA.14 + 00-L- TO STA.20 + 00-L- RT.
SITE 1
DAVID W. SIMS
DB 239 PG 454
1
DETAIL E
SPECIAL DITCH
(Not to Scale)
detour fill slope
N.G.
Fill Slope
STA.15 + 25-L- TO STA.15 + 75-L- LT-
RONALD L. DANIEL
DB 197 PG 6
3

SEE SHEET 9 FOR -DET1- LINE PROFILE

PROJECT REFERENCE NO.	SHEET NO.
B-3629	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

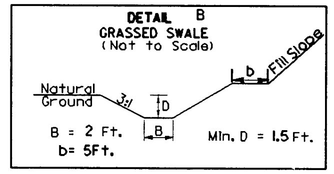
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-DETOUR 1-

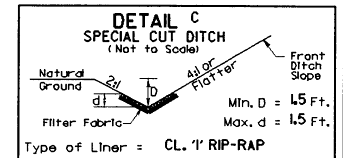
9 of 13

V DESIGN = 45 MPH

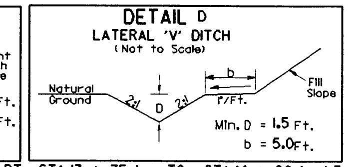
-DET1-			-L-
PI Sta 11+10.59	PI Sta 14+45.99	PI Sta 17+70.64	PI Sta 18+09.49
Δ = 15° 44' 26.0" (LT)	Δ = 31° 34' 41.0" (RT)	Δ = 15° 39' 02.4" (LT)	Δ = 0° 11' 12.6" (RT)
D = 7° 09' 43.1"	D = 7° 09' 43.1"	D = 7° 09' 43.1"	D = 0° 17' 11.3"
L = 219.78'	L = 440.91'	L = 218.52'	L = 65.22'
T = 110.59'	T = 226.21'	T = 109.95'	T = 32.61'
R = 800.00'	R = 800.00'	R = 800.00'	R = 20,000.00'
SE = VAR., SEE PLANS	SE = 0.04	SE = VAR., SEE PLANS	SE = NC



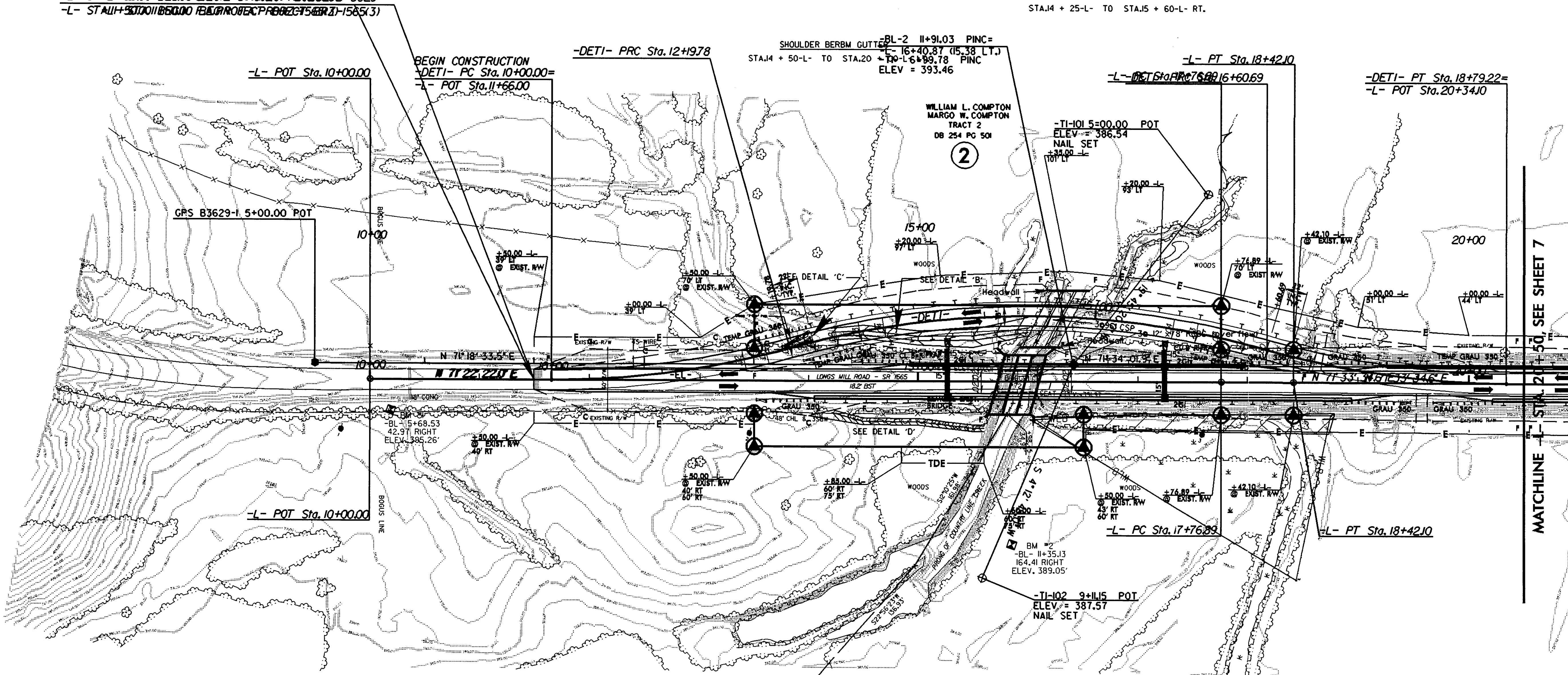
STA.14+ 20-L- TO STA.16 + 00-L- LT.



STA.30 + 30-L- TO STA.32 + 70-L- RT.



STA.13 + 75-L- TO STA.14 + 00-L- LT.
STA.14 + 25-L- TO STA.15 + 60-L- RT.



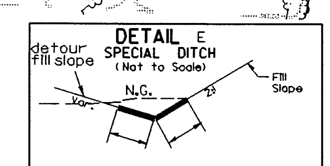
NAD 83
-L- STA. 11+50.00 BEGIN TIP PROJECT B-3629
BEGIN CONSTRUCTION
-DET1- PC Sta. 10+00.00=
-L- POT Sta. 11+66.00
-DET1- PRC Sta. 12+19.78
-L- POT Sta. 10+00.00
GPS B3629-1 5+00.00 POT
SHOULDER BERBM GUTTER
STA.14 + 50-L- TO STA.20 + 00-L- LT.
-BL-2 11+91.03 PINC=
-L- 16+40.87 (15.38 LT.)
ELEV = 393.46
WILLIAM L. COMPTON
MARGO W. COMPTON
TRACT 2
DB 254 PG 501
2
-L- PT Sta. 18+42.10
-DET1- PT Sta. 18+79.22=
-L- POT Sta. 20+34.10
-TI-101 5+00.00 POT
ELEV = 386.54
NAIL SET
SEE DETAIL 'C'
SEE DETAIL 'B'
SEE DETAIL 'D'
LONGS MILL ROAD - SR 1565
N 71° 22' 22.0" E
-BL- 5+68.53
42.97 RIGHT
ELEV. 385.26'
TDE
WOODS
BM #2
-BL- 11+35.13
164.41 RIGHT
ELEV. 389.05'
-TI-102 9+11.15 POT
ELEV = 387.57
NAIL SET
-L- PC Sta. 17+76.89
-L- PT Sta. 18+42.10
-L- POT Sta. 10+00.00
MATCHLINE -L- STA. 21+50, SEE SHEET 7

DENOTES FILL IN WETLAND

SHOULDER BERM GUTTER
STA.14 + 00-L- TO STA.20 + 00-L- RT.

SITE 1

DAVID W. SIMS
DB 239 PG 454
1



STA.15 + 25-L- TO STA.15 + 75-L- LT-

RONALD L. DANIEL
DB 197 PG 6
3

SEE SHEET 9 FOR -DET1- LINE PROFILE

PROJECT REFERENCE NO.	SHEET NO.
B-3629	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-DETOUR 2-

10 of 13

-DET2-

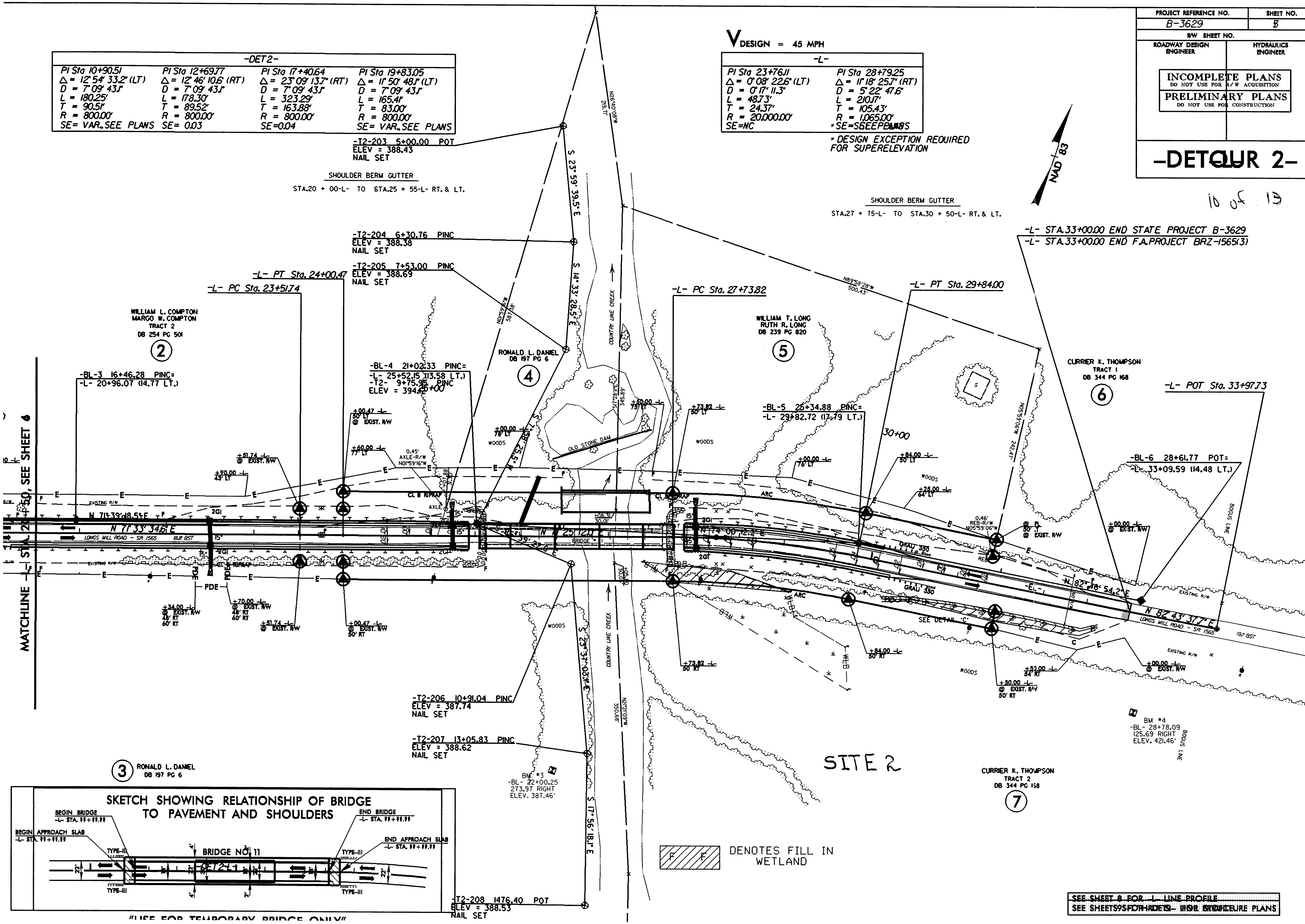
PI Sta 10+90.51	PI Sta 12+69.77	PI Sta 17+40.64	PI Sta 19+83.05
Δ = 12° 54' 33.2" (LT)	Δ = 12° 46' 10.6" (RT)	Δ = 23° 09' 13.7" (RT)	Δ = 11° 50' 48.1" (LT)
D = 7° 09' 43.1"	D = 7° 09' 43.1"	D = 7° 09' 43.1"	D = 7° 09' 43.1"
L = 180.25'	L = 178.30'	L = 323.29'	L = 165.41'
T = 90.51'	T = 89.52'	T = 163.88'	T = 83.00'
R = 800.00'	R = 800.00'	R = 800.00'	R = 800.00'
SE= VAR., SEE PLANS	SE= 0.03	SE=0.04	SE= VAR., SEE PLANS

V_{DESIGN} = 45 MPH

-L-

PI Sta 23+76.11	PI Sta 28+79.25
Δ = 0° 08' 22.6" (LT)	Δ = 11° 18' 25.7" (RT)
D = 0° 17' 11.3"	D = 5° 22' 47.6"
L = 48.73'	L = 210.17'
T = 24.37'	T = 105.43'
R = 20,000.00'	R = 1,065.00'
SE=NC	* SE= SEE PLANS

* DESIGN EXCEPTION REQUIRED FOR SUPERELEVATION



NAD 83
-T2-203 5+00.00 POT
ELEV = 388.43
NAIL SET
SHOULDER BERM GUTTER
STA.20 + 00-L- TO STA.25 + 55-L- RT. & LT.
SHOULDER BERM GUTTER
STA.27 + 75-L- TO STA.30 + 50-L- RT. & LT.
-L- STA.33+00.00 END STATE PROJECT B-3629
-L- STA.33+00.00 END F.A.PROJECT BRZ-1565(3)
-T2-204 6+30.76 PINC
ELEV = 388.38
NAIL SET
-T2-205 7+53.00 PINC
ELEV = 388.69
NAIL SET
-L- PT Sta. 24+00.47
-L- PC Sta. 23+51.74
-L- PC Sta. 27+73.82
-L- PT Sta. 29+84.00
WILLIAM L. COMPTON
MARGO W. COMPTON
TRACT 2
DB 254 PG 501
2
RONALD L. DANIEL
DB 197 PG 6
4
WILLIAM T. LONG
RUTH R. LONG
DB 239 PG 820
5
CURRIER K. THOMPSON
TRACT 1
DB 344 PG 168
6
-L- POT Sta. 33+97.73
-BL-3 16+46.28 PINC=
-L- 20+96.07 (14.77 LT.)
-BL-4 21+02.33 PINC=
-L- 25+52.15 (13.58 LT.)
-T2- 9+75.95 PINC
ELEV = 394.42
-BL-5 25+34.88 PINC=
-L- 29+82.72 (17.79 LT.)
-BL-6 28+61.77 POT=
-L- 33+09.59 (14.48 LT.)
OLD STONE DAM
COUNTRY LINE CREEK
WOODS
N 71° 39' 48.5" E
N 71° 33' 34.6" E
LONGS MILL ROAD - SR 1565
N 82° 46' 54.2" E
N 82° 43' 37.7" E
MATCHLINE -L- STA. 21+50, SEE SHEET 4
-T2-206 10+91.04 PINC
ELEV = 387.74
NAIL SET
-T2-207 13+05.83 PINC
ELEV = 388.62
NAIL SET
BM #3
-BL- 22+00.25
273.97 RIGHT
ELEV. 387.46'
BM #4
-BL- 28+78.09
125.69 RIGHT
ELEV. 421.46'
SITE 2
CURRIER K. THOMPSON
TRACT 2
DB 344 PG 158
7
RONALD L. DANIEL
DB 197 PG 6
3
SEE DETAIL 'C'
-T2-208 1476.40 POT
ELEV = 388.53
NAIL SET
SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS
BEGIN BRIDGE
END BRIDGE
BEGIN APPROACH SLAB
END APPROACH SLAB
BRIDGE NO. 11
TYPE-III
"USE FOR TEMPORARY BRIDGE ONLY"

DENOTES FILL IN WETLAND

SEE SHEET 8 FOR -L- LINE PROFILE
SEE SHEETS 9 FOR DETOUR STRUCTURE PLANS

PROJECT REFERENCE NO.	SHEET NO.
B-3629	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-DETOUR 2-

11 of 13

V_{DESIGN} = 45 MPH

-DET2-			
PI Sta 10+90.51	PI Sta 12+69.77	PI Sta 17+40.64	PI Sta 19+83.05
Δ = 12° 54' 33.2" (LT)	Δ = 12° 46' 10.6" (RT)	Δ = 23° 09' 13.7" (RT)	Δ = 11° 50' 48.1" (LT)
D = 7° 09' 43.1"	D = 7° 09' 43.1"	D = 7° 09' 43.1"	D = 7° 09' 43.1"
L = 180.25'	L = 178.30'	L = 323.29'	L = 165.41'
T = 90.51'	T = 89.52'	T = 163.88'	T = 83.00'
R = 800.00'	R = 800.00'	R = 800.00'	R = 800.00'
SE= VAR. SEE PLANS	SE= 0.03	SE=0.04	SE= VAR. SEE PLANS

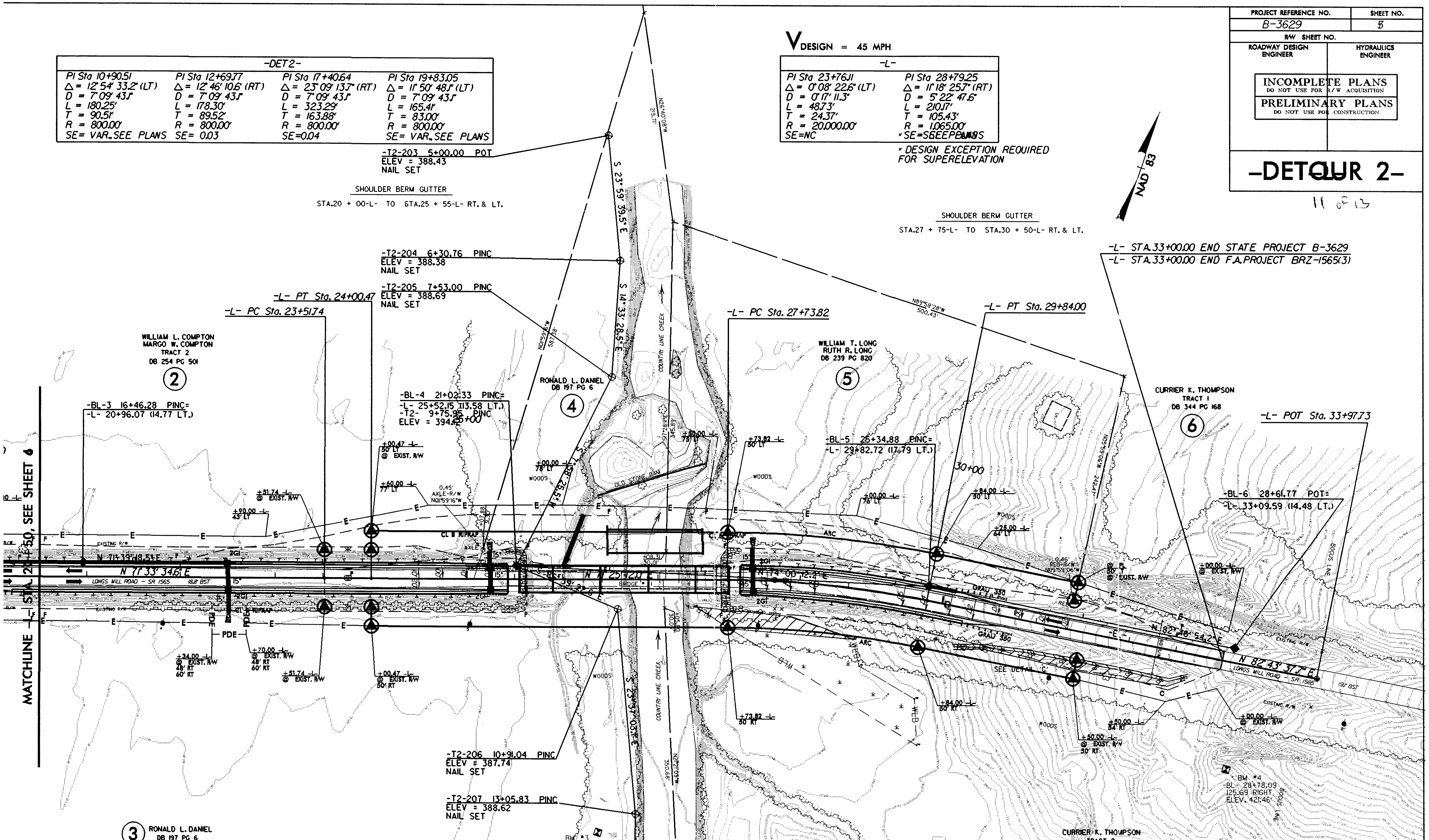
-L-	
PI Sta 23+76.11	PI Sta 28+79.25
Δ = 0° 08' 22.6" (LT)	Δ = 11° 18' 25.7" (RT)
D = 0° 17' 11.3"	D = 5° 22' 47.6"
L = 48.73'	L = 210.17'
T = 24.37'	T = 105.43'
R = 20,000.00'	R = 1,065.00'
SE=NC	* SE= SEE PLANS

* DESIGN EXCEPTION REQUIRED FOR SUPERELEVATION

SHOULDER BERM GUTTER
STA.20 + 00-L- TO STA.25 + 55-L- RT. & LT.

SHOULDER BERM GUTTER
STA.27 + 75-L- TO STA.30 + 50-L- RT. & LT.

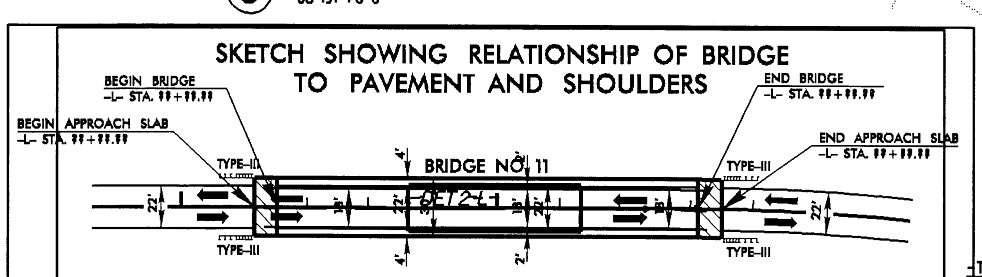
-L- STA. 33+00.00 END STATE PROJECT B-3629
-L- STA. 33+00.00 END F.A. PROJECT BRZ-1565(3)



NAD 83
-T2-203 5+00.00 POT
ELEV = 388.43
NAIL SET
-T2-204 6+30.76 PINC
ELEV = 388.38
NAIL SET
-T2-205 7+53.00 PINC
ELEV = 388.69
NAIL SET
-L- PT Sta. 24+00.47
-L- PC Sta. 23+51.74
-L- PC Sta. 27+73.82
-L- PT Sta. 29+84.00
WILLIAM L. COMPTON
MARGO W. COMPTON
TRACT 2
DB 254 PG 501
2
RONALD L. DANIEL
DB 197 PG 6
4
WILLIAM T. LONG
RUTH R. LONG
DB 239 PG 820
5
CURRIER K. THOMPSON
TRACT 1
DB 344 PG 168
6
-L- POT Sta. 33+97.73
-BL-3 16+46.28 PINC=
-L- 20+96.07 (14.77 LT.)
-BL-4 21+02.33 PINC=
-L- 25+52.15 (13.58 LT.)
-T2- 9+75.95 PINC
ELEV = 394.
-BL-5 25+34.88 PINC=
-L- 29+82.72 (17.79 LT.)
-BL-6 28+61.77 POT=
-L- 33+09.59 (14.48 LT.)
COUNTRY LINE CREEK
OLD STONE DAM
WOODS
LONGS MILL ROAD - SR 1565
N 71° 33' 34.6" E
N 82° 43' 37.2" E
S 23° 59' 39.5" E
S 14° 33' 28.5" E
MATCHLINE -L- STA. 20+50, SEE SHEET 4
-T2-206 10+91.04 PINC
ELEV = 387.74
NAIL SET
-T2-207 13+05.83 PINC
ELEV = 388.62
NAIL SET
-T2-208 1476.40 POT
ELEV = 388.53
NAIL SET
BM #3
-BL- 22+00.25
273.97 RIGHT
ELEV. 387.46'
BM #4
-BL- 28+78.09
125.69 RIGHT
ELEV. 421.46'
RONALD L. DANIEL
DB 197 PG 6
3
CURRIER K. THOMPSON
TRACT 2
DB 344 PG 138
7
SEE DETAIL 'C'
SITE 2

DENOTES FILL IN WETLAND

SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS



"USE FOR TEMPORARY BRIDGE ONLY"

SEE SHEET 8 FOR -L- LINE PROFILE
SEE SHEETS FOR -DET2- BRIDGE STRUCTURE PLANS

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
(1)	David W. Sims	2060 Longs Mill Rd. Blanch, NC 27212
(2)	William L. Compton	153 Bill Compton Road Blanch, NC 27212
(3)	Ronald L. Daniel	215 Daniels Dairy Roac Blanch, NC 27212
(4)	Ronald L. Daniel	215 Daniels Dairy Road Blanch, NC 27212
(5)	William T. Long	1716 Bearhollow Rd. Greensboro, NC
(6)	Currie K. Thompson, III	3511 Longs Mill Rd. Blanch, NC 27212
(7)	Currie K. Thompson, III	3511 Longs Mill Rd. Blanch, NC 27212

NCDOT

DIVISION OF HIGHWAYS

CABARRUS COUNTY

PROJECT: 8.2661601 (R-2246C)

CONCORD-KANNAPOLIS

WESTSIDE BYP EXT FROM

SR 1431 TO SR 1555

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS				SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)
1	16+00-L- to	FILL SLOPE	0.10			0.06					
	18+75-L- Rt.	3@12'x8'RCBC									
2	27+40-L- to	FILL SLOPE	0.05			0.04					
	29+20-L- Rt.	220' cored slab bridge									
		1@35';3@50';1@35'									
TOTALS:			0.15	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

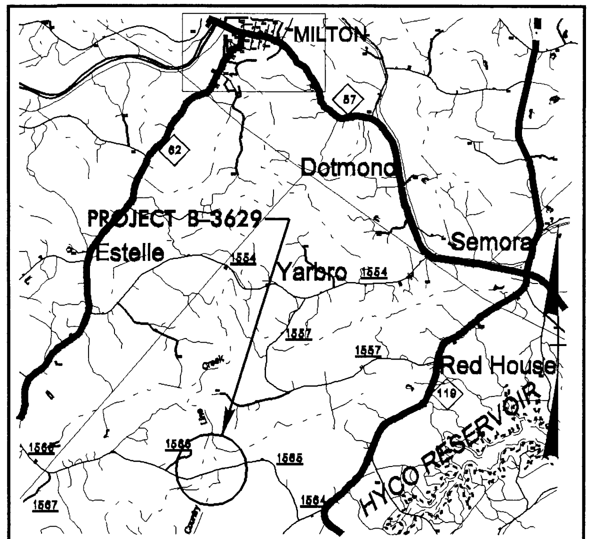
CASWELL COUNTY
PROJECT:8.2030401 (B-3629)
Rev. 4-22-04

SHEET 13 of 13 10/18/03

Form Revised 3/22/01

CONTRACT: C200961 TIP PROJECT: B-3629

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CASWELL COUNTY

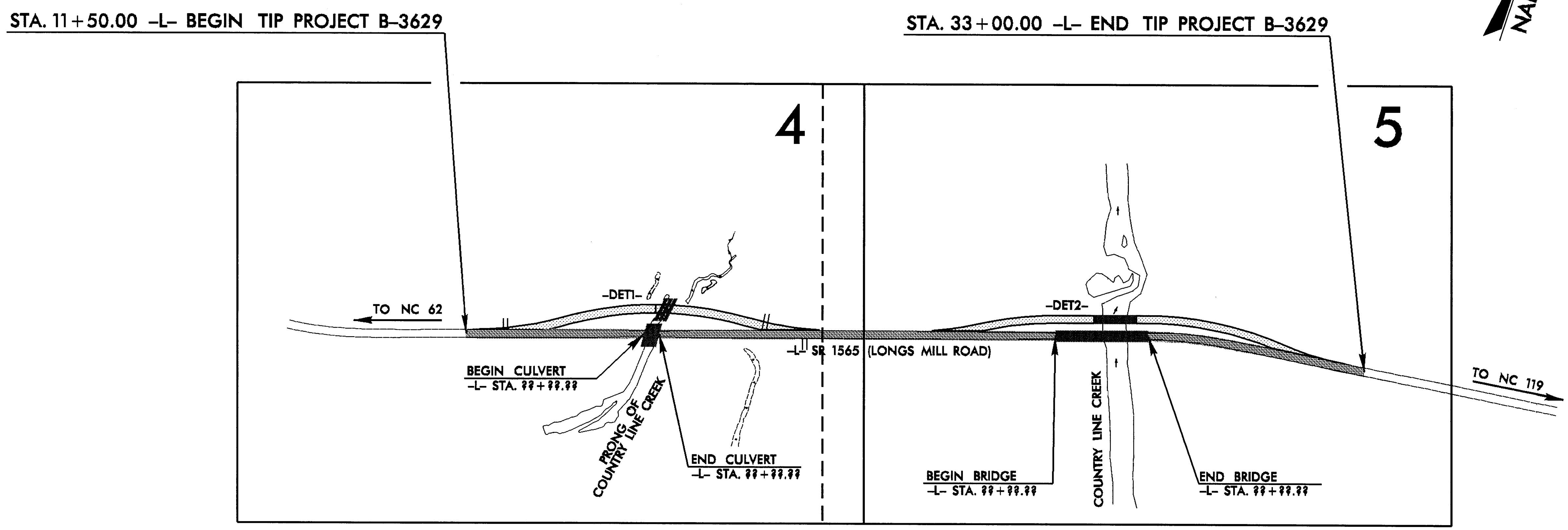
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3629	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33177.1.1	BRZ-1565(3)	PE
33177.2.1	BRZ-1565(3)	R/W & UTILITIES
33177.3.1	BRZ-1565(6)	CONST.

LOCATION: BRIDGE NO. 11 OVER COUNTRY LINE CREEK AND BRIDGE NO. 72 OVER PRONG OF COUNTRY LINE CREEK ON SR 1565 (LONGS MILL ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, GUARDRAIL, CULVERT, AND STRUCTURE

NAD 83



** A DESIGN EXCEPTION WILL BE NEEDED FOR THE SAG VERTICAL CURVES, SUPERELEVATION, AND STOPPING SIGHT DISTANCE.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100 — PLANS

50 25 0 50 100 — PROFILE (HORIZONTAL)

10 5 0 10 20 — PROFILE (VERTICAL)

DESIGN DATA

ADT 2004 = 460
ADT 2025 = 700
DHV = 14 %
D = 60 %
T = 3 % *
V = 55 MPH
V_{DETOUR} = 45 MPH
* TTST 1 % DUAL 2 %
FUNC CLASS = LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-3629	= 0.359 Mi.
LENGTH STRUCTURE TIP PROJECT B-3629	= 0.048 Mi.
TOTAL LENGTH OF TIP PROJECT B-3629	= 0.407 Mi.

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 30, 2003

LETTING DATE: SEPTEMBER 21, 2004

JAMES A. SPEER, PE
PROJECT ENGINEER

DANNY GARDNER
PROJECT DESIGN ENGINEER

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

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-3629	1-B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL SYMBOLS

*S.U.E = SUBSURFACE UTILITY ENGINEER

ROADS & RELATED ITEMS

- Edge of Pavement
- Curb
- Prop. Slope Stakes Cut — C
- Prop. Slope Stakes Fill — F
- Prop. Woven Wire Fence
- Prop. Chain Link Fence
- Prop. Barbed Wire Fence
- Prop. Wheelchair Ramp — WCR
- Curb Cut for Future Wheelchair Ramp — CFR
- Exist. Guardrail
- Prop. Guardrail
- Equality Symbol
- Pavement Removal

RIGHT OF WAY

- Baseline Control Point
- Existing Right of Way Marker
- Exist. Right of Way Line w/Marker
- Prop. Right of Way Line with Proposed R/W Marker (Iron Pin & Cap)
- Prop. Right of Way Line with Proposed (Concrete or Granite) R/W Marker
- Exist. Control of Access Line — C A
- Prop. Control of Access Line — C A
- Exist. Easement Line — E
- Prop. Temp. Construction Easement Line — E
- Prop. Temp. Drainage Easement Line — TDE
- Prop. Perm. Drainage Easement Line — PDE

HYDROLOGY

- Stream or Body of Water
- River Basin Buffer — RBB
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Shoreline
- Falls, Rapids
- Prop Lateral, Tail, Head Ditches — FLOW

STRUCTURES

MAJOR

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

MINOR

- Head & End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Boxes — CB
- Paved Ditch Gutter

UTILITIES

- Exist. Pole
- Exist. Power Pole
- Prop. Power Pole
- Exist. Telephone Pole
- Prop. Telephone Pole
- Exist. Joint Use Pole
- Prop. Joint Use Pole
- Telephone Pedestal
- U/G Telephone Cable Hand Hold
- Cable TV Pedestal
- U/G TV Cable Hand Hold
- U/G Power Cable Hand Hold
- Hydrant
- Satellite Dish
- Exist. Water Valve
- Sewer Clean Out
- Power Manhole
- Telephone Booth
- Cellular Telephone Tower
- Water Manhole
- Light Pole
- H-Frame Pole
- Power Line Tower
- Pole with Base
- Gas Valve
- Gas Meter
- Telephone Manhole
- Power Transformer
- Sanitary Sewer Manhole
- Storm Sewer Manhole
- Tank; Water, Gas, Oil
- Water Tank With Legs
- Traffic Signal Junction Box
- Fiber Optic Splice Box
- Television or Radio Tower
- Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement — TS
- Recorded Water Line — W
- Designated Water Line (S.U.E.*) — W
- Sanitary Sewer — SS
- Recorded Sanitary Sewer Force Main — FSS
- Designated Sanitary Sewer Force Main(S.U.E.*) — FSS
- Recorded Gas Line — G
- Designated Gas Line (S.U.E.*) — G
- Storm Sewer — S
- Recorded Power Line — P
- Designated Power Line (S.U.E.*) — P
- Recorded Telephone Cable — T
- Designated Telephone Cable (S.U.E.*) — T
- Recorded U/G Telephone Conduit — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC
- Unknown Utility (S.U.E.*) — ?UTL
- Recorded Television Cable — TV
- Designated Television Cable (S.U.E.*) — TV
- Recorded Fiber Optics Cable — FO
- Designated Fiber Optics Cable (S.U.E.*) — FO
- Exist. Water Meter
- U/G Test Hole (S.U.E.*)
- Abandoned According to U/G Record — ATTUR
- End of Information — E.O.I.

BOUNDARIES & PROPERTIES

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Property Line Symbol — PL
- Exist. Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Property Number — 123
- Parcel Number — 6
- Fence Line — X
- Existing Wetland Boundaries — WW & ISBW, WLB
- High Quality Wetland Boundary — HQ WLB
- Medium Quality Wetland Boundaries — MQ WLB
- Low Quality Wetland Boundaries — LQ WLB
- Proposed Wetland Boundaries — WLB
- Existing Endangered Animal Boundaries — EAB
- Existing Endangered Plant Boundaries — EPB

BUILDINGS & OTHER CULTURE

- Buildings
- Foundations
- Area Outline
- Gate
- Gas Pump Vent or U/G Tank Cap
- Church
- School
- Park
- Cemetery
- Dam
- Sign — S
- Well — W
- Small Mine
- Swimming Pool

TOPOGRAPHY

- Loose Surface
- Hard Surface
- Change in Road Surface
- Curb
- Right of Way Symbol — R/W
- Guard Post — GP
- Paved Walk
- Bridge
- Box Culvert or Tunnel
- Ferry
- Culvert
- Footbridge
- Trail, Footpath
- Light House

VEGETATION

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

RAILROADS

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

revised 02/02/00

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AT R0203021

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-3629	1-C
LOCATION AND SURVEYS	

SURVEY CONTROL SHEET B-3629

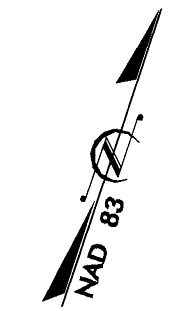
NOTES

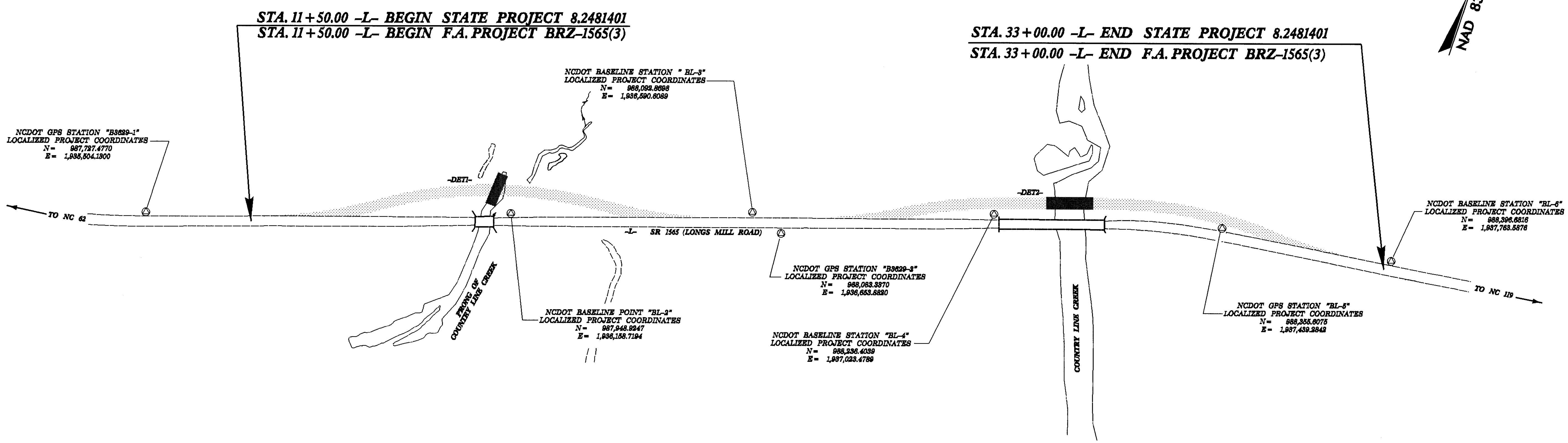
1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:

   HTTP:\WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   FILE: b3629_ls_control_030506.txt

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT.
IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.





BENCHMARK DATA

****
51 ELEVATION - 395.26
N 987709 E 1935583
L STATION 10+18 28 RIGHT
BM •1

52 ELEVATION - 389.05
N 987775 E 1936158
L STATION 15+85 149 RIGHT
BM •2

53 ELEVATION - 387.46
N 988000 E 1937193
L STATION 26+38 265 RIGHT
BM •3

54 ELEVATION - 421.46
N 988274 E 1937796
L STATION 33+26 111 RIGHT
BM •4

CONTROL DATA

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	GPS B3629-1	987727.4770	1935504.1300	397.63	OUTSIDE PROJECT LIMITS	
2	BL-2	987948.9247	1936158.7194	393.46	16+40.87	15.38 LT
3	BL-3	988092.8698	1936590.6089	394.02	20+96.07	14.77 LT
4	BL-4	988236.4039	1937023.4789	394.12	25+52.15	13.58 LT
5	BL-5	988355.6075	1937439.2842	398.83	29+82.72	14.79 LT
6	BL-6	988396.6816	1937763.5876	420.21	33+09.59	14.48 LT

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS B3629-2"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 988083.3370(ft) EASTING: 1936653.882(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00007792
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS B3629-2" TO -L- STATION 11+50.00 IS
S 72° 15' 10.5" W 1,003.15'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

⊚ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING USER SERVICE (OPUS)

NOTE: DRAWING NOT TO SCALE

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6/2/99

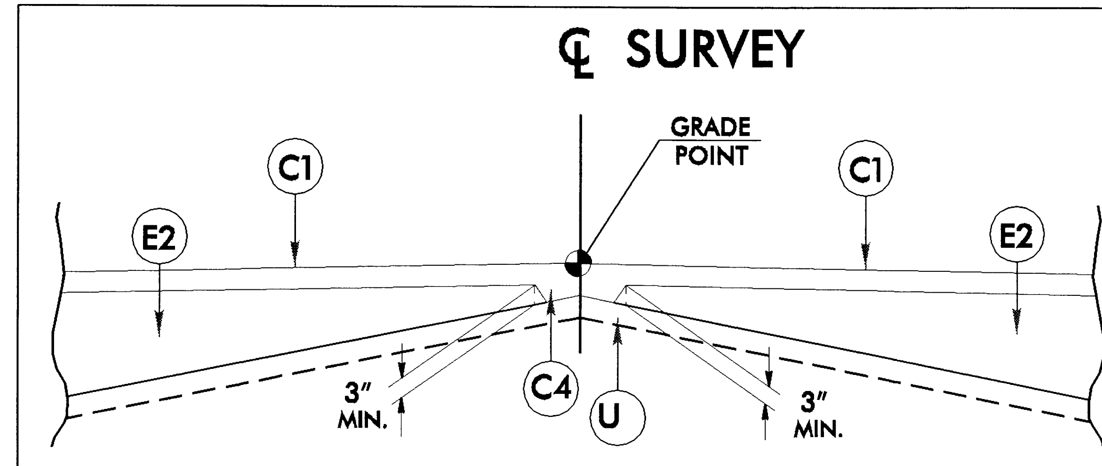
PROJECT REFERENCE NO.	SHEET NO.
B-3629	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

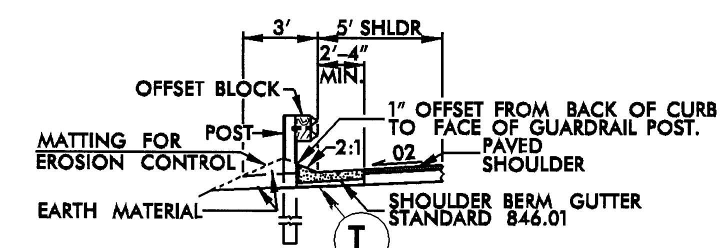
PAVEMENT SCHEDULE

C1	PROP. APPROX. 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C2	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C3	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
E1	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J	PROP. 6" AGGREGATE BASE COURSE.
P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT (SEE STANDARD WEDGING DETAIL).

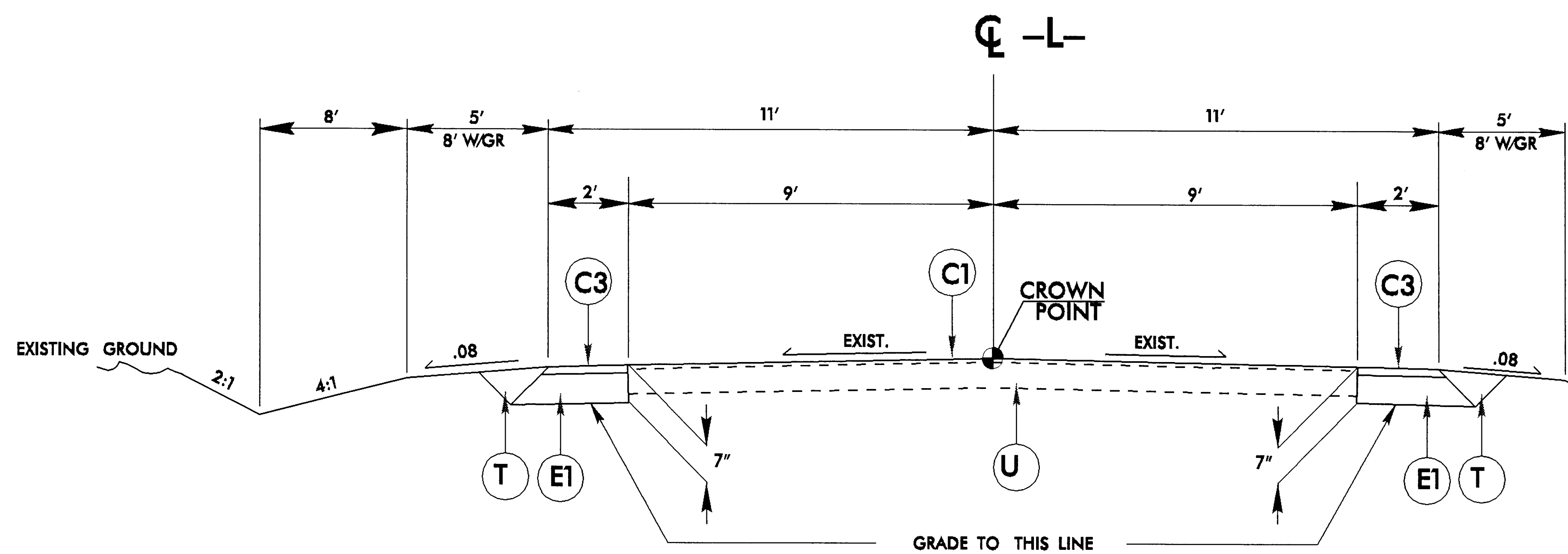
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



DETAIL SHOWING METHOD OF WEDGING



DETAIL OF SHOULDER BERM GUTTER
SEE STD. 820.04



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

-L- STA. 12+00.00 TO STA. 15+50.00
-L- STA. 16+30.00 TO STA. 24+50.00
-L- STA. 32+00.00 TO STA. 32+50.00

NOTE: TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 1
-L- STA. 11+50.00 TO STA. 12+00.00
-L- STA. 32+50.00 TO STA. 33+00.00

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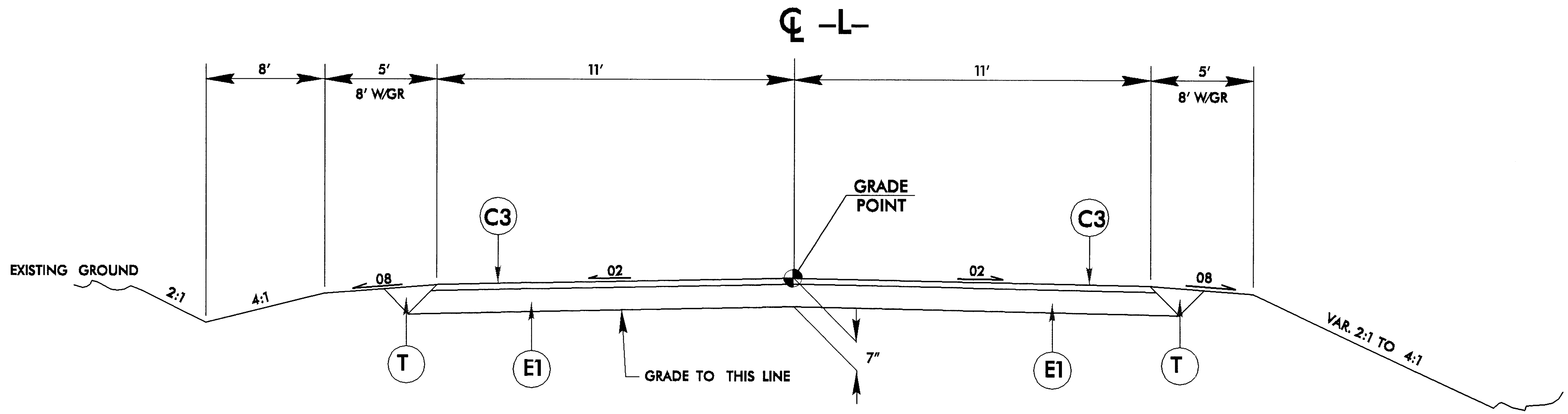
PROJECT REFERENCE NO.	SHEET NO.
B-3629	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

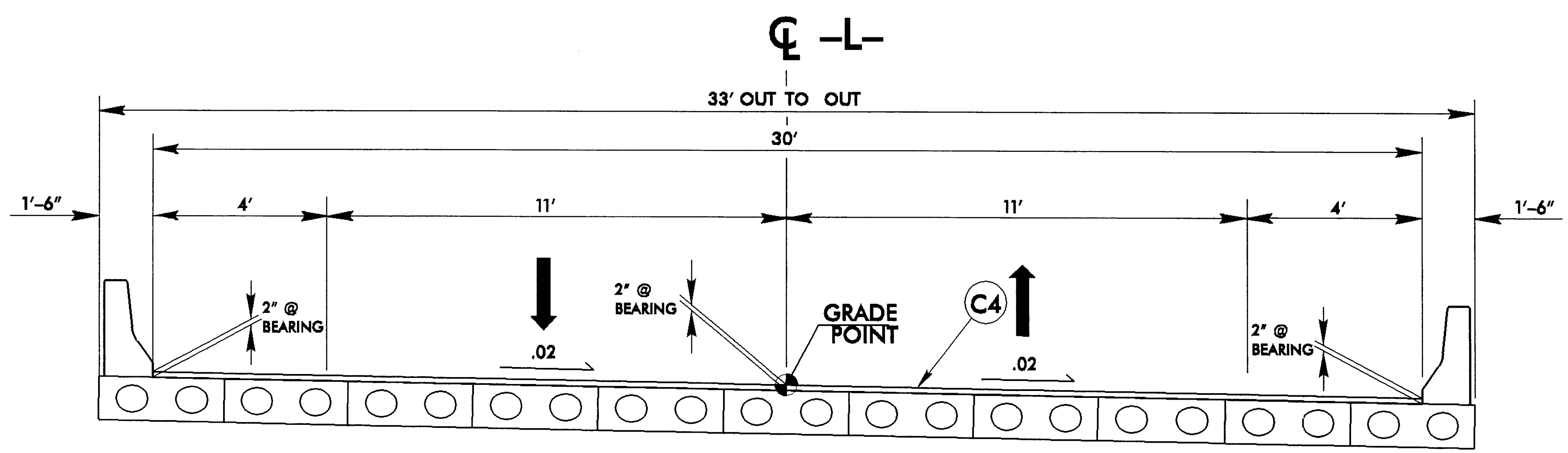
C1	1¼" TYPE SF9.5A
C2	1½" TYPE SF9.5A
C3	2½" TYPE SF9.5A
C4	VAR. DEPTH TYPE SF9.5A
E1	4½" TYPE B25.0B
E2	VAR. DEPTH TYPE B25.0B
J	6" ABC
P	PRIME COAT
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

-L- STA. 15+50.00 TO STA. 16+30.00
-L- STA. 24+50.00 TO STA. ??+??.?? (BEGIN BRIDGE)
-L- STA. ??+??.?? (END BRIDGE) TO STA. 31+00.00



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

-L- STA. ??+??.?? (BEG. BRIDGE) TO STA. ??+??.?? (END BRIDGE)

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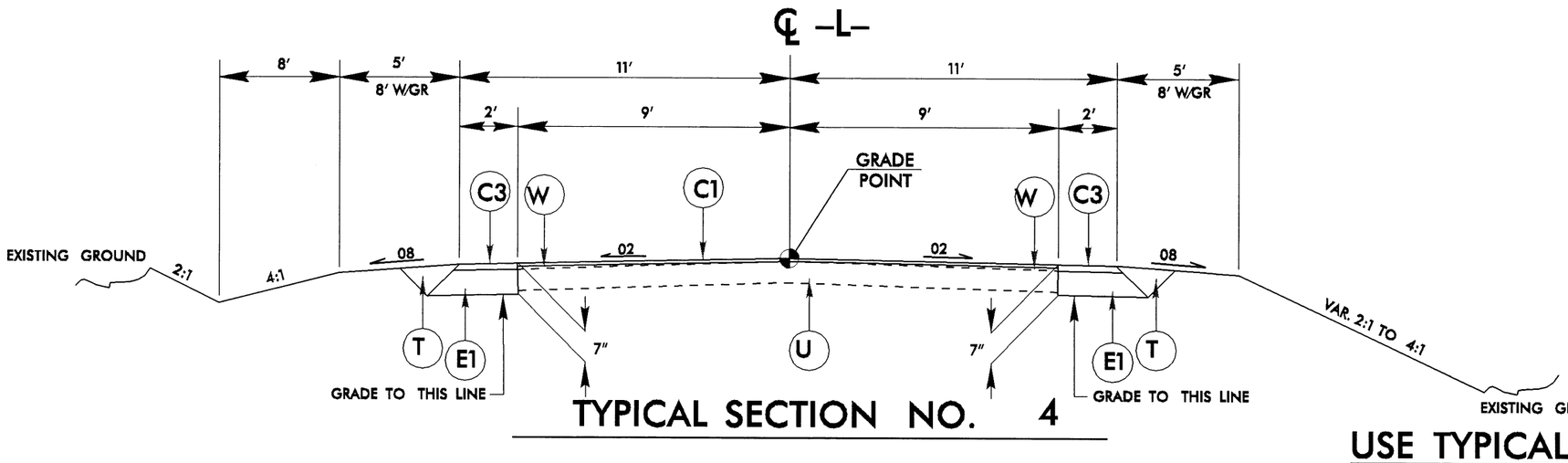
PROJECT REFERENCE NO.	SHEET NO.
B-3629	2-B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

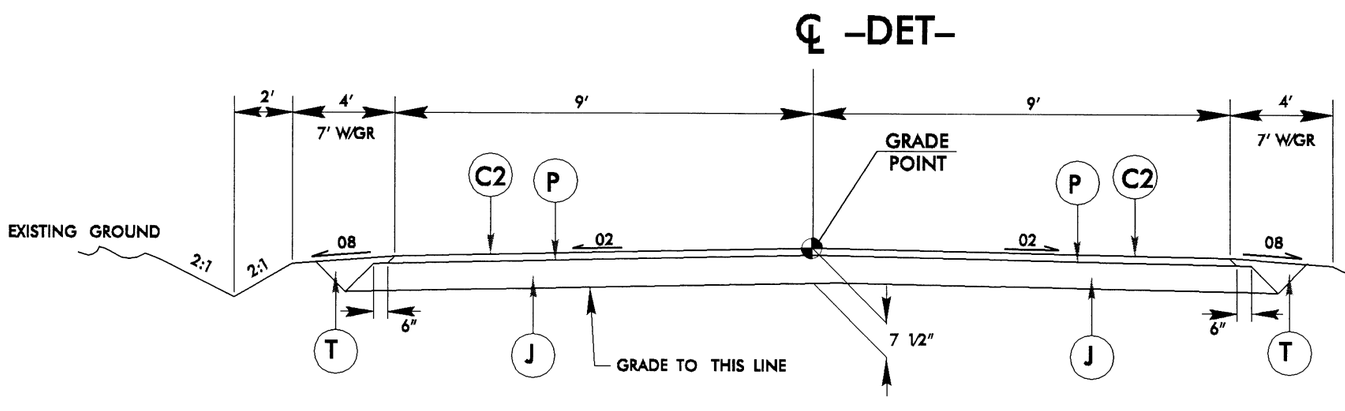
C1	1¼" TYPE SF9.5A
C2	1½" TYPE SF9.5A
C3	2½" TYPE S9.5FA
C4	VAR. DEPTH TYPE SF9.5A
E1	4½" TYPE B25.0B
E2	VAR. DEPTH TYPE B25.0B
J	6" ABC
P	PRIME COAT
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

–L– STA. 31+00.00 TO STA. 32+00.00



TYPICAL SECTION NO. 5

TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 5

–DET1– STA. 10+00.00 TO STA. 11+23.00
–DET1– STA. 17+59.12 TO STA. 18+79.22
–DET2– STA. 10+00.00 TO STA. 11+21.58
–DET2– STA. 19+40.00 TO STA. 20+65.46

USE TYPICAL SECTION NO. 5

–DET1– STA. 11+23.00 TO STA. 17+59.12
–DET2– STA. 11+21.58 TO STA. ??+??.?? (BEGIN –DET2– BRIDGE)
–DET2– STA. ??+??.?? (END –DET2– BRIDGE) TO STA. 19+40.00

NOTE: CONTRACTOR WILL STOCKPILE ABC FROM DETOURS FOR STATE FORCES TO USE.

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jbaucom AT RD20021

PROJECT REFERENCE NO.	SHEET NO.
B-3629	3-

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

5/28/99

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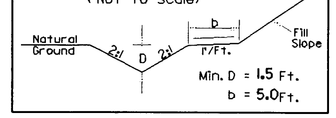
R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

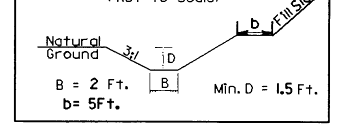
-L-

DETAIL A
LATERAL 'V' DITCH
(Not to Scale)



STA. 13+75 -L- TO STA. 14+00 -L- LT., DDE= 2CY
STA. 14+25 -L- TO STA. 15+60 -L- RT., DDE= 18CY

DETAIL B
GRASSED SWALE
(Not to Scale)

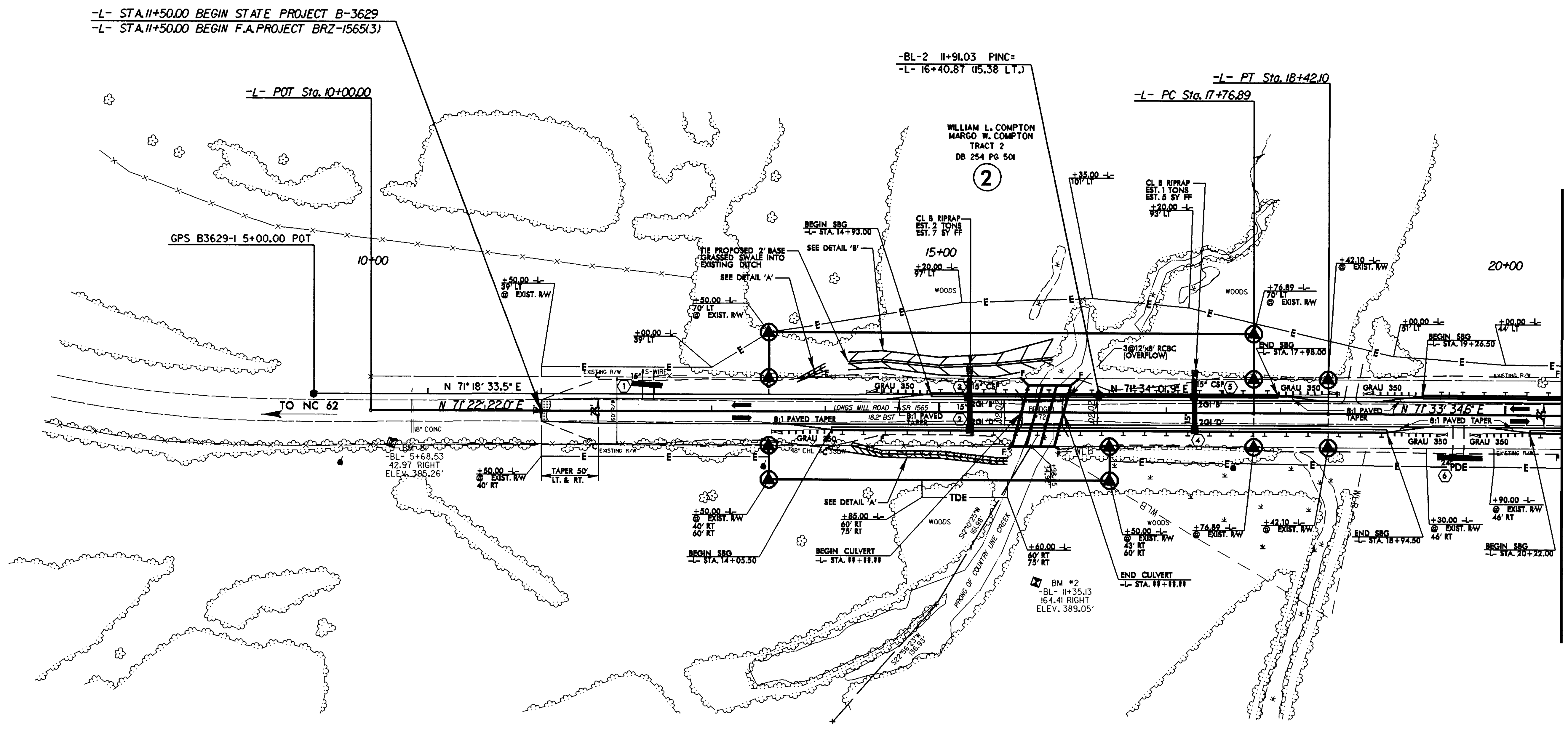


STA. 14+20 -L- TO STA. 16+00 -L- LT., DDE= 199CY

-L-
PI Sta 18+09.49
Δ = 0° 11' 12.6" (RT)
D = 0° 17' 11.3"
L = 65.22'
T = 32.61'
R = 20,000.00'
SE=NC

SHOULDER BERM GUTTER
STA. 14+93.00 -L- TO STA. 17+98.00 -L- LT.
STA. 19+26.50 -L- TO STA. 20+50.00 -L- LT.
STA. 14+05.50 -L- TO STA. 18+94.50 -L- RT.
STA. 20+22.00 -L- TO STA. 20+50.00 -L- RT.

SEE SHEET 2 AND STD. DRAWINGS



NAD 83
-L- STA. 11+50.00 BEGIN STATE PROJECT B-3629
-L- STA. 11+50.00 BEGIN F.A. PROJECT BRZ-1565(3)
-L- POT Sta. 10+00.00
GPS B3629-1 5+00.00 POT
10+00
TO NC 62
N 71° 18' 33.5" E
N 71° 22' 22.0" E
-BL-2 11+91.03 PINC=
-L- 16+40.87 (15.38 LT.)
WILLIAM L. COMPTON
MARGO W. COMPTON
TRACT 2
DB 254 PG 501
2
-L- PT Sta. 18+42.10
-L- PC Sta. 17+76.89
15+00
20+00
LONGS MILL ROAD SR 1565
8:1 PAVED TAPER
N 71° 33' 34.6" E
TAPER 50' LT. & RT.
3@12'x8' RCBC (OVERFLOW)
CL B RIPRAP EST. 2 TONS EST. 7 SY FF
CL B RIPRAP EST. 1 TONS EST. 5 SY FF
BEGIN SBG -L- STA. 14+93.00
BEGIN SBG -L- STA. 14+05.50
END SBG -L- STA. 17+98.00
END SBG -L- STA. 18+94.50
BEGIN SBG -L- STA. 19+26.50
BEGIN SBG -L- STA. 20+22.00
SEE DETAIL 'A'
SEE DETAIL 'B'
TIE PROPOSED 2' BASE GRASSED SWALE INTO EXISTING DITCH
BEGIN CULVERT
END CULVERT
WOODS
PRONG OF COUNTRY LINE CREEK
BM #2 -BL- 11+35.13 164.41 RIGHT ELEV. 389.05'
-BL- 5+68.53 42.97 RIGHT ELEV. 385.26'
TDE
PDE
GRAU 350
DAVID W. SIMS
DB 239 PG 454
1
RONALD L. DANIEL
DB 197 PG 6
3

MATCHLINE -L- STA. 20+50, SEE SHEET 5

SEE SHEET 8 FOR -L- LINE PROFILE
SEE SHEETS C-1 THRU C- FOR CULVERT PLANS

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
B-3629	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

DETAIL C
SPECIAL CUT DITCH
(Not to Scale)

Natural Ground — Front Ditch Slope 4:1 or Flatter — Filter Fabric
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
Type of Liner = CL. 'I' RIP-RAP

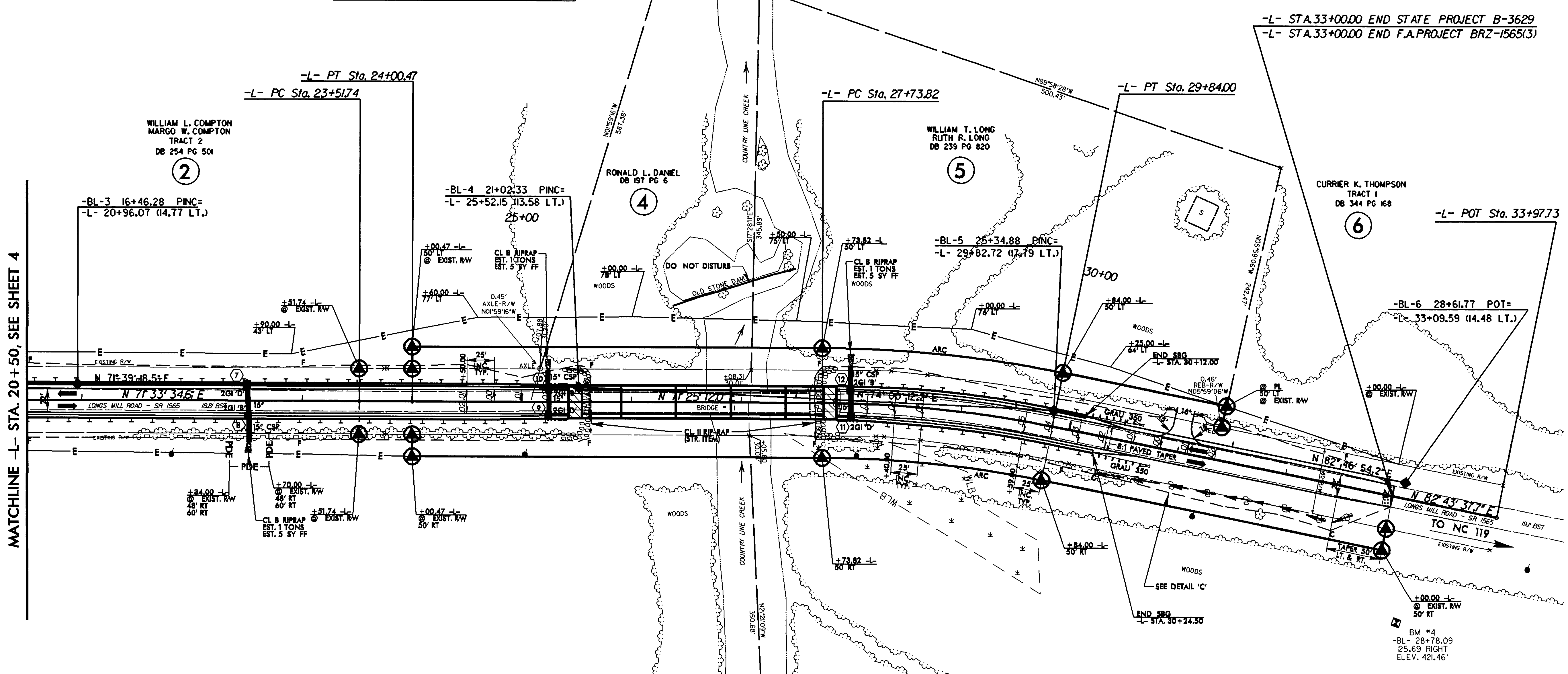
STA. 30+30 -L- TO STA. 32+70 -L- RT.
EST. 200 TONS CL. 'I' RIP-RAP
EST. 400 SY FILTER FABRIC

SHOULDER BERM GUTTER

STA. 20+50.00 -L- TO STA. 25+43.00 -L- RT. & LT.
STA. 27+87.00 -L- TO STA. 30+12.00 -L- LT.
STA. 27+87.00 -L- TO STA. 30+24.50 -L- RT.
SEE SHEET 2 AND STD. DRAWINGS

-L-	
PI Sta 23+76.11	PI Sta 28+79.25
Δ = 0°08' 22.6" (LT)	Δ = 11°18' 25.7" (RT)
D = 0°17' 11.3"	D = 5°22' 47.6"
L = 48.73'	L = 210.17'
T = 24.37'	T = 105.43'
R = 20,000.00'	R = 1,065.00'
SE=NC	*SE= SEE PLANS

*DESIGN EXCEPTION REQUIRED FOR SUPERELEVATION

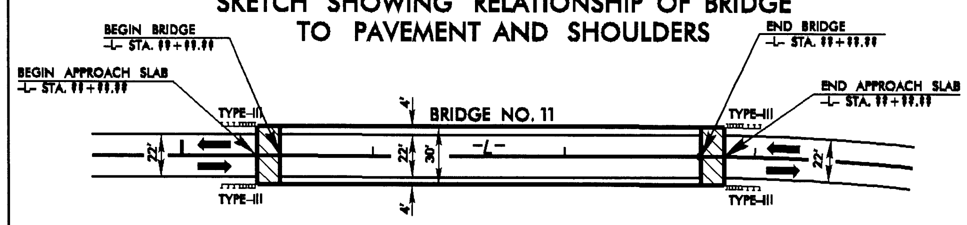


NAD 83
-L- STA.33+00.00 END STATE PROJECT B-3629
-L- STA.33+00.00 END F.A.PROJECT BRZ-1565(3)
-L- PT Sta. 24+00.47
-L- PC Sta. 23+51.74
-L- PC Sta. 27+73.82
-L- PT Sta. 29+84.00
-L- POT Sta. 33+97.73
WILLIAM L. COMPTON
MARGO W. COMPTON
TRACT 2
DB 254 PG 501
RONALD L. DANIEL
DB 197 PG 6
WILLIAM T. LONG
RUTH R. LONG
DB 239 PG 820
CURRIER K. THOMPSON
TRACT 1
DB 344 PG 168
-BL-3 16+46.28 PINC=
-L- 20+96.07 (14.77 LT.)
-BL-4 21+02.33 PINC=
-L- 25+52.15 (13.58 LT.)
-BL-5 25+34.88 PINC=
-L- 29+82.72 (17.79 LT.)
-BL-6 28+61.77 POT=
-L- 33+09.59 (14.48 LT.)
MATCHLINE -L- STA. 20+50, SEE SHEET 4
N 71°39'18.5" E
N 71°25'12.0" E
N 82°43'37.7" E
LONGS MILL ROAD - SR 1565
DO NOT DISTURB
OLD STONE DAM
COUNTRY LINE CREEK
CL. II RIP-RAP (STR. ITEM)
CL B RIPRAP EST. 1 TONS EST. 5 SY FF
SEE DETAIL 'C'
TO NC 119
WOODS
BM #4 -BL- 28+78.09 125.69 RIGHT ELEV. 421.46'
BM #3 -BL- 22+00.25 273.97 RIGHT ELEV. 387.46'

RONALD L. DANIEL
DB 197 PG 6

CURRIER K. THOMPSON
TRACT 2
DB 344 PG 168

SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS



SEE SHEET 8 FOR -L- LINE PROFILE
SEE SHEETS S-1 THRU S- FOR STRUCTURE PLANS

REVISIONS
R/W REVISION 11/06/03 DWG-ADDED DRIVE FOR PARCEL 5 (WILLIAM T.LONG AND RUTH R.LONG)

8/17/99
25-FEB-2004 08:25

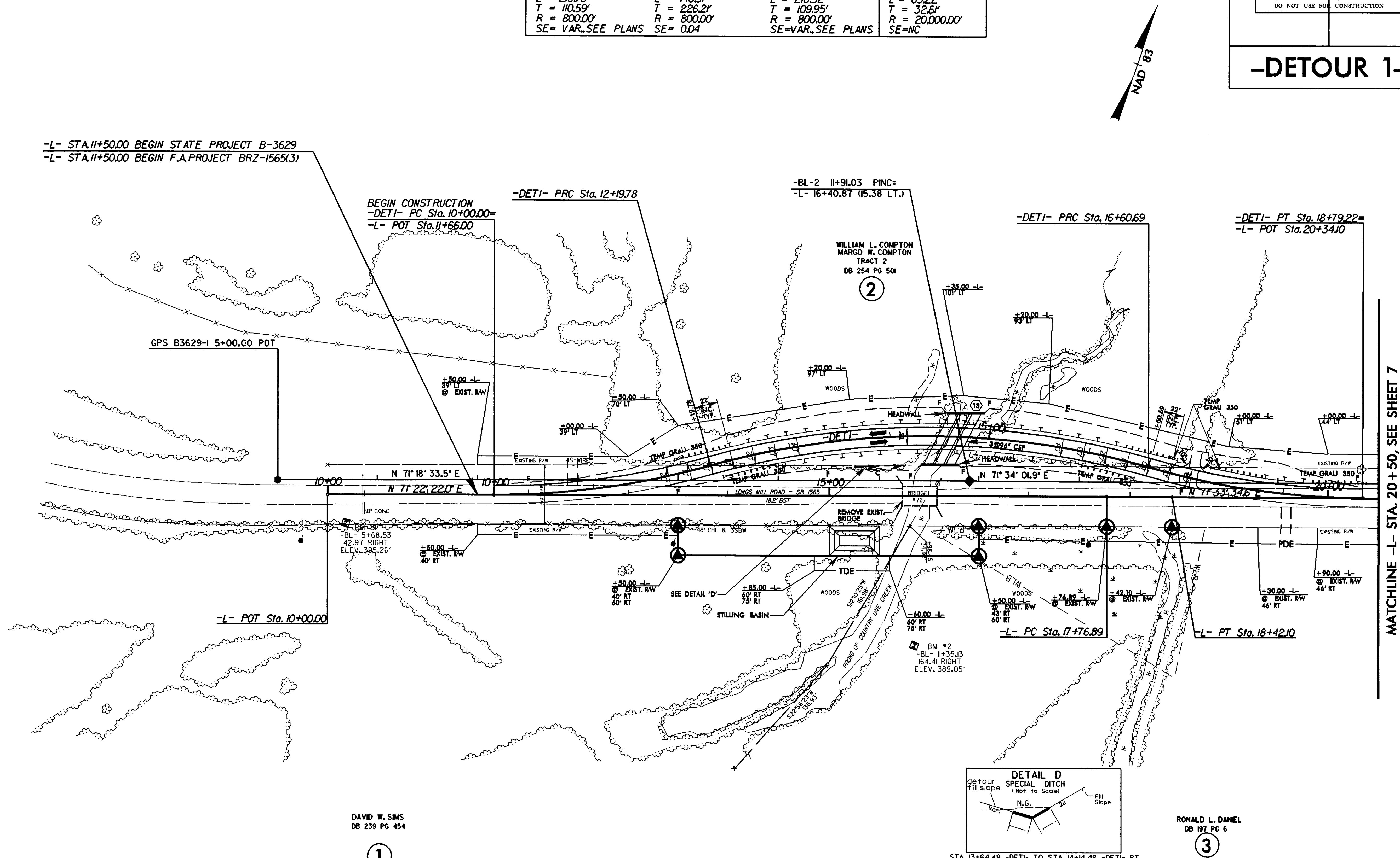
PROJECT REFERENCE NO.	SHEET NO.
B-3629	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-DETOUR 1-

V_{DESIGN} = 45 MPH

-DET1-			-L-
PI Sta 11+10.59	PI Sta 14+45.99	PI Sta 17+70.64	PI Sta 18+09.49
Δ = 15° 44' 26.0" (LT)	Δ = 31° 34' 41.0" (RT)	Δ = 15° 39' 02.4" (LT)	Δ = 0° 11' 12.6" (RT)
D = 7° 09' 43.1"	D = 7° 09' 43.1"	D = 7° 09' 43.1"	D = 0° 17' 11.3"
L = 219.78'	L = 440.91'	L = 218.52'	L = 65.22'
T = 110.59'	T = 226.21'	T = 109.95'	T = 32.61'
R = 800.00'	R = 800.00'	R = 800.00'	R = 20,000.00'
SE= VAR., SEE PLANS	SE= 0.04	SE=VAR., SEE PLANS	SE=NC



NAD 83
-L- STA.11+50.00 BEGIN STATE PROJECT B-3629
-L- STA.11+50.00 BEGIN F.A.PROJECT BRZ-1565(3)
BEGIN CONSTRUCTION
-DET1- PC Sta. 10+00.00=
-L- POT Sta.11+66.00
-DET1- PRC Sta. 12+19.78
-BL-2 11+91.03 PINC=
-L- 16+40.87 (15.38 LT.)
WILLIAM L. COMPTON
MARGO W. COMPTON
TRACT 2
DB 254 PG 501
2
-DET1- PRC Sta. 16+60.69
-DET1- PT Sta. 18+79.22=
-L- POT Sta.20+34.10
GPS B3629-1 5+00.00 POT
N 71° 18' 33.5" E
N 71° 22' 22.0" E
N 71° 34' 01.9" E
N 71° 33' 34.6" E
LONGS MILL ROAD - SR 1565
18.2' BST
REMOVE EXIST. BRIDGE
BRIDGE 1 #72
HEADWALL
3@96" CSP
TEMP GRAU 350
WOODS
BM #1
-BL- 5+68.53
42.97 RIGHT
ELEV. 385.26'
-L- POT Sta. 10+00.00
SEE DETAIL 'D'
STILLING BASIN
TDE
PDE
PRONG OF COUNTRY LINE CREEK
BM #2
-BL- 11+35.13
164.41 RIGHT
ELEV. 389.05'
-L- PC Sta. 17+76.89
-L- PT Sta. 18+42.10
MATCHLINE -L- STA. 20+50, SEE SHEET 7
DAVID W. SIMS
DB 239 PG 454
1
DETAIL D
SPECIAL DITCH
(Not to Scale)
detour fill slope
N.G.
Fill Slope
STA. 13+64.48 -DET1- TO STA. 14+14.48 -DET1- RT.
RONALD L. DANIEL
DB 197 PG 6
3

SEE SHEET 9 FOR -DET1- LINE PROFILE

REVISIONS

8/17/99

25-FEB-2004 08:26

PROJECT REFERENCE NO.	SHEET NO.
B-3629	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

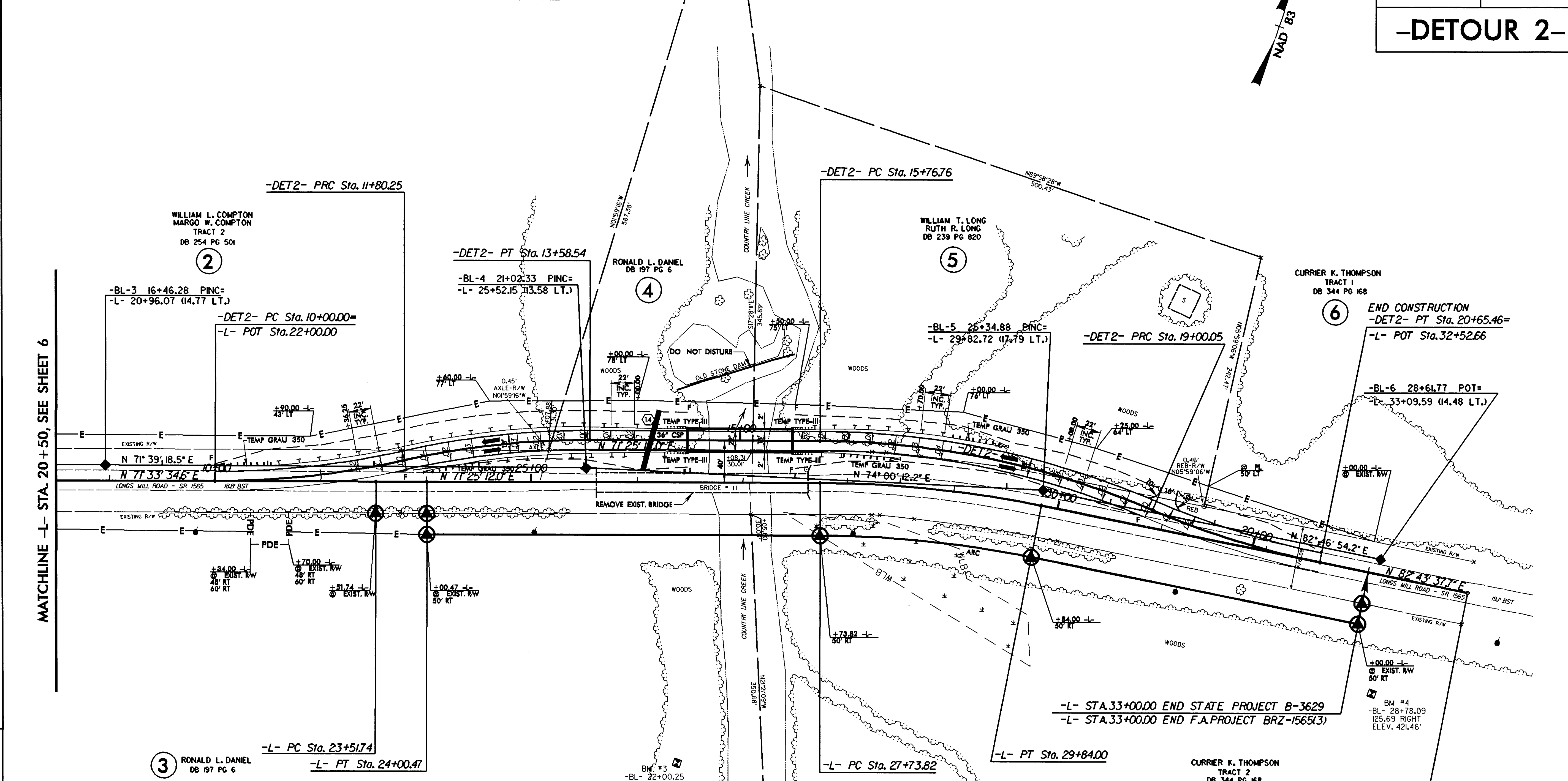
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-DETOUR 2-

-DET2-			
PI Sta 10+90.51	PI Sta 12+69.77	PI Sta 17+40.64	PI Sta 19+83.05
Δ = 12° 54' 33.2" (LT)	Δ = 12° 46' 10.6" (RT)	Δ = 23° 09' 13.7" (RT)	Δ = 11° 50' 48.1" (LT)
D = 7° 09' 43.1"	D = 7° 09' 43.1"	D = 7° 09' 43.1"	D = 7° 09' 43.1"
L = 180.25'	L = 178.30'	L = 323.29'	L = 165.41'
T = 90.51'	T = 89.52'	T = 163.88'	T = 83.00'
R = 800.00'	R = 800.00'	R = 800.00'	R = 800.00'
SE= VAR., SEE PLANS	SE= 0.03	SE=0.04	SE= VAR., SEE PLANS

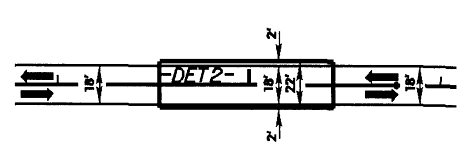
V DESIGN = 45 MPH

-L-	
PI Sta 23+76.11	PI Sta 28+79.25
Δ = 0° 08' 22.6" (LT)	Δ = 11° 18' 25.7" (RT)
D = 0° 17' 11.3"	D = 5° 22' 47.6"
L = 48.73'	L = 210.17'
T = 24.37'	T = 105.43'
R = 20,000.00'	R = 1,065.00'
SE=NC	SE=SEE PLANS



NAD 83
MATCHLINE -L- STA. 20+50, SEE SHEET 6
-DET2- PRC Sta. 11+80.25
-DET2- PT Sta. 13+58.54
-DET2- PC Sta. 15+76.76
-DET2- PRC Sta. 19+00.05
WILLIAM L. COMPTON
MARGO W. COMPTON
TRACT 2
DB 254 PG 501
RONALD L. DANIEL
DB 197 PG 6
WILLIAM T. LONG
RUTH R. LONG
DB 239 PG 820
CURRIER K. THOMPSON
TRACT 1
DB 344 PG 168
-BL-3 16+46.28 PINC=
-L- 20+96.07 (14.77 LT.)
-DET2- PC Sta. 10+00.00=
-L- POT Sta.22+00.00
-BL-4 21+02.33 PINC=
-L- 25+52.15 (13.58 LT.)
-BL-5 25+34.88 PINC=
-L- 29+82.72 (17.79 LT.)
END CONSTRUCTION
-DET2- PT Sta. 20+65.46=
-L- POT Sta.32+52.66
-BL-6 28+61.77 POT=
-L- 33+09.59 (14.48 LT.)
DO NOT DISTURB
OLD STONE DAM
COUNTRY LINE CREEK
WOODS
TEMP TYPE-III
36" CSP
TEMP GRAU 350
N 71° 39' 18.5" E
N 71° 33' 34.6" E
N 71° 25' 12.0" E
N 74° 00' 12.2" E
N 82° 46' 54.2" E
N 82° 43' 37.7" E
LONGS MILL ROAD - SR 1565
BRIDGE # 11
REMOVE EXIST. BRIDGE
EXISTING R/W
N89°58'28"W
500.43'
-L- PC Sta. 23+51.74
-L- PT Sta. 24+00.47
-L- PC Sta. 27+73.82
-L- PT Sta. 29+84.00
-L- STA.33+00.00 END STATE PROJECT B-3629
-L- STA.33+00.00 END F.A.PROJECT BRZ-1565(3)
-L- POT Sta. 33+97.73
BM #3
-BL- 22+00.25
273.97 RIGHT
ELEV. 387.46'
BM #4
-BL- 28+78.09
125.69 RIGHT
ELEV. 421.46'
RONALD L. DANIEL
DB 197 PG 6
CURRIER K. THOMPSON
TRACT 2
DB 344 PG 168

SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS



"USE FOR TEMPORARY BRIDGE ONLY"

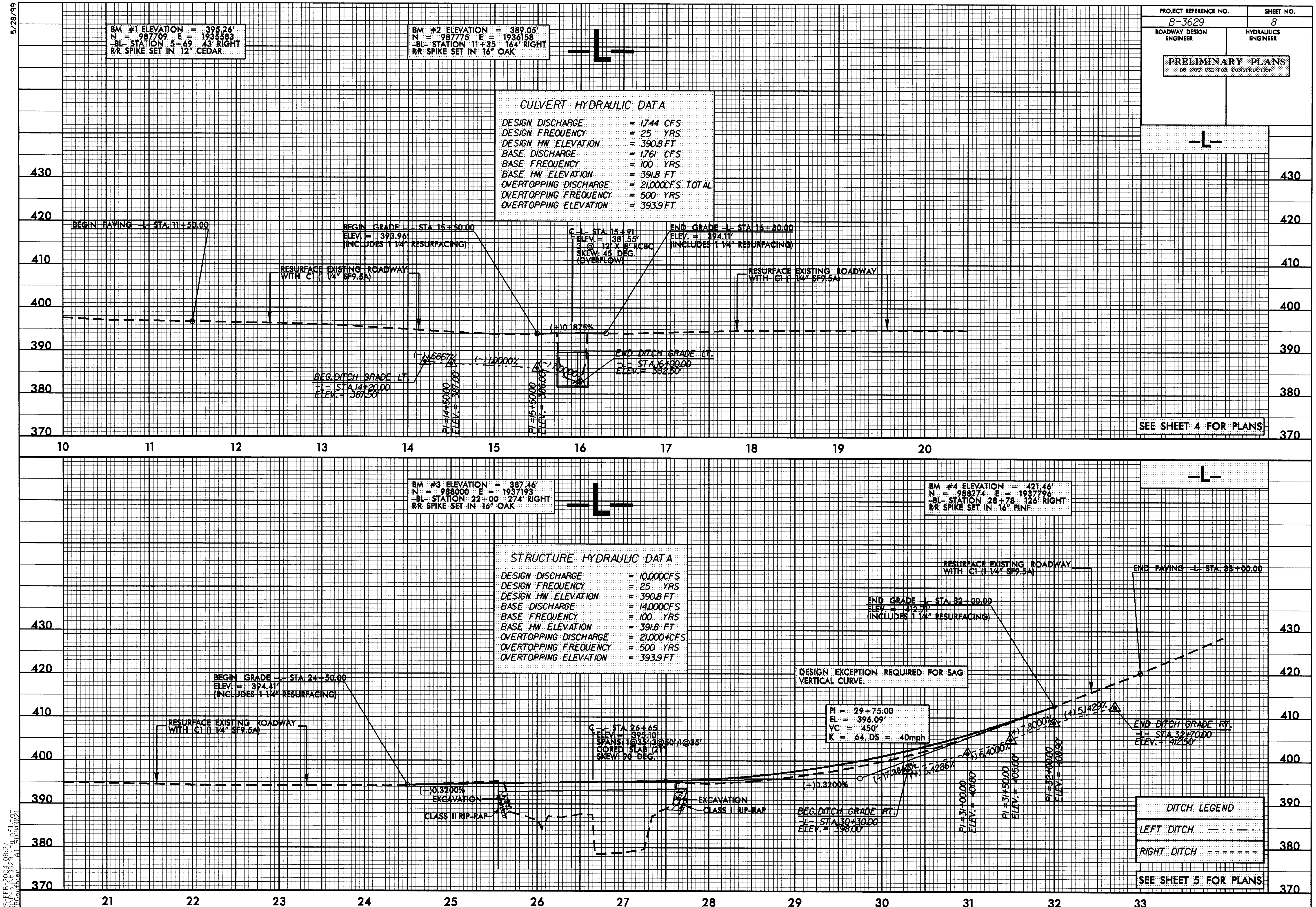
SEE SHEET 9 FOR -DET2- LINE PROFILE

REVISIONS

R/W REVISION 11/06/03 DWG - ADDED DRIVE FOR PARCEL 5 (WILLIAM T.LONG AND RUTH R.LONG)

8/17/99

25-FEB-2004 08:26



5/28/99
PROJECT REFERENCE NO. B-3629
SHEET NO. 8
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-L-
BM #1 ELEVATION = 395.26'
N = 987709 E = 1935583
-BL- STATION 5+69 43' RIGHT
RR SPIKE SET IN 12" CEDAR
BM #2 ELEVATION = 389.05'
N = 987775 E = 1936158
-BL- STATION 11+35 164' RIGHT
RR SPIKE SET IN 16" OAK
CULVERT HYDRAULIC DATA
DESIGN DISCHARGE = 1,744 CFS
DESIGN FREQUENCY = 25 YRS
DESIGN HW ELEVATION = 390.8 FT
BASE DISCHARGE = 1,761 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 391.8 FT
OVERTOPPING DISCHARGE = 21,000 CFS TOTAL
OVERTOPPING FREQUENCY = 500 YRS
OVERTOPPING ELEVATION = 393.9 FT
BEGIN PAVING -L- STA. 11+50.00
BEGIN GRADE -L- STA. 15+50.00
ELEV. = 393.96'
(INCLUDES 1 1/4" RESURFACING)
℄ -L- STA. 15+91
ELEV. = 381.55'
1 @ 12' X 8' RCBC
SKEW: 45 DEG.
(OVERFLOW)
END GRADE -L- STA. 16+30.00
ELEV. = 394.11'
(INCLUDES 1 1/4" RESURFACING)
RESURFACE EXISTING ROADWAY WITH C1 (1 1/4" SF9.5A)
RESURFACE EXISTING ROADWAY WITH C1 (1 1/4" SF9.5A)
(+)0.1875%
(-)1.6667%
(-)1.0000%
(-)2.0000%
BEG. DITCH GRADE LT.
-L- STA. 14+20.00
ELEV. = 387.50'
PI = 14+50.00
ELEV. = 387.00'
PI = 15+50.00
ELEV. = 386.00'
END DITCH GRADE LT.
-L- STA. 16+00.00
ELEV. = 382.50'
SEE SHEET 4 FOR PLANS
430 420 410 400 390 380 370
10 11 12 13 14 15 16 17 18 19 20
BM #3 ELEVATION = 387.46'
N = 988000 E = 1937193
-BL- STATION 22+00 274' RIGHT
RR SPIKE SET IN 16" OAK
BM #4 ELEVATION = 421.46'
N = 988274 E = 1937796
-BL- STATION 28+78 126' RIGHT
RR SPIKE SET IN 16" PINE
STRUCTURE HYDRAULIC DATA
DESIGN DISCHARGE = 10,000 CFS
DESIGN FREQUENCY = 25 YRS
DESIGN HW ELEVATION = 390.8 FT
BASE DISCHARGE = 14,000 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 391.8 FT
OVERTOPPING DISCHARGE = 21,000+CFS
OVERTOPPING FREQUENCY = 500 YRS
OVERTOPPING ELEVATION = 393.9 FT
RESURFACE EXISTING ROADWAY WITH C1 (1 1/4" SF9.5A)
END PAVING -L- STA. 33+00.00
END GRADE -L- STA. 32+00.00
ELEV. = 412.71'
(INCLUDES 1 1/4" RESURFACING)
DESIGN EXCEPTION REQUIRED FOR SAG VERTICAL CURVE.
BEGIN GRADE -L- STA. 24+50.00
ELEV. = 394.41'
(INCLUDES 1 1/4" RESURFACING)
RESURFACE EXISTING ROADWAY WITH C1 (1 1/4" SF9.5A)
℄ -L- STA. 26+65
ELEV. = 395.10'
SPANS: 1@35', 3@50', 1@35'
CORED SLAB (21")
SKEW: 90 DEG.
PI = 29+75.00
EL = 396.09'
VC = 450'
K = 64, DS = 40mph
(+)0.3200%
EXCAVATION
CLASS II RIP-RAP
EXCAVATION
CLASS II RIP-RAP
(+)0.3200%
(+)7.3846%
(+)5.4286%
(+)6.4000%
(+)7.8000%
(+)5.1429%
BEG. DITCH GRADE RT.
-L- STA. 30+30.00
ELEV. = 398.00'
PI = 31+00.00
ELEV. = 401.80'
PI = 31+50.00
ELEV. = 405.00'
PI = 32+00.00
ELEV. = 408.90'
END DITCH GRADE RT.
-L- STA. 32+70.00
ELEV. = 412.50'
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
SEE SHEET 5 FOR PLANS
430 420 410 400 390 380 370
21 22 23 24 25 26 27 28 29 30 31 32 33
25-FEB-2004 08:27
R:\Hydraulics\B3629_hyd_pfl.dgn
jbgauthier AT R0203021

5/28/99

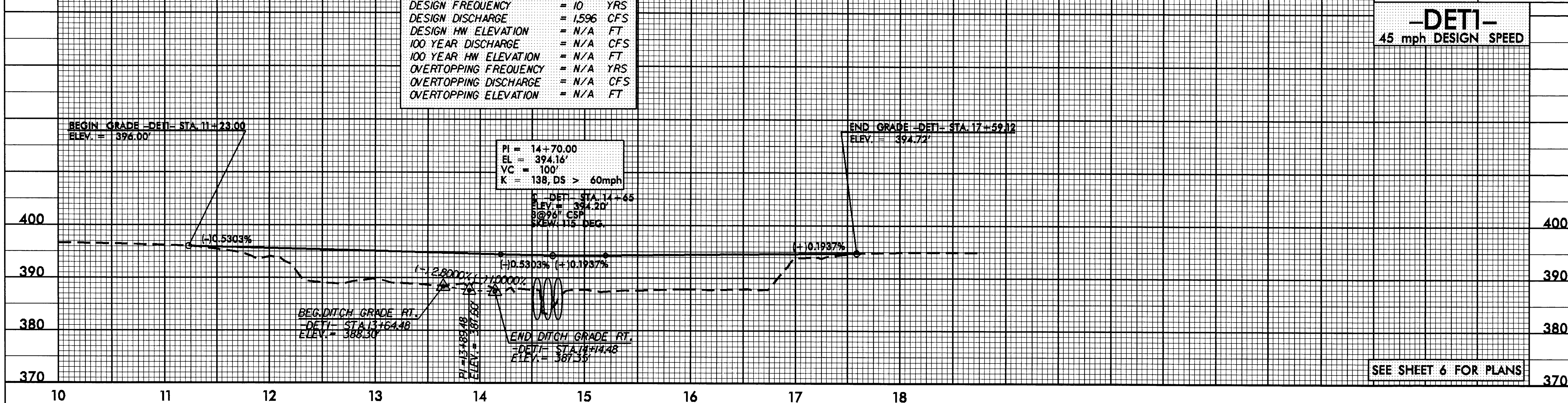
PROJECT REFERENCE NO.	SHEET NO.
B-3629	9

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

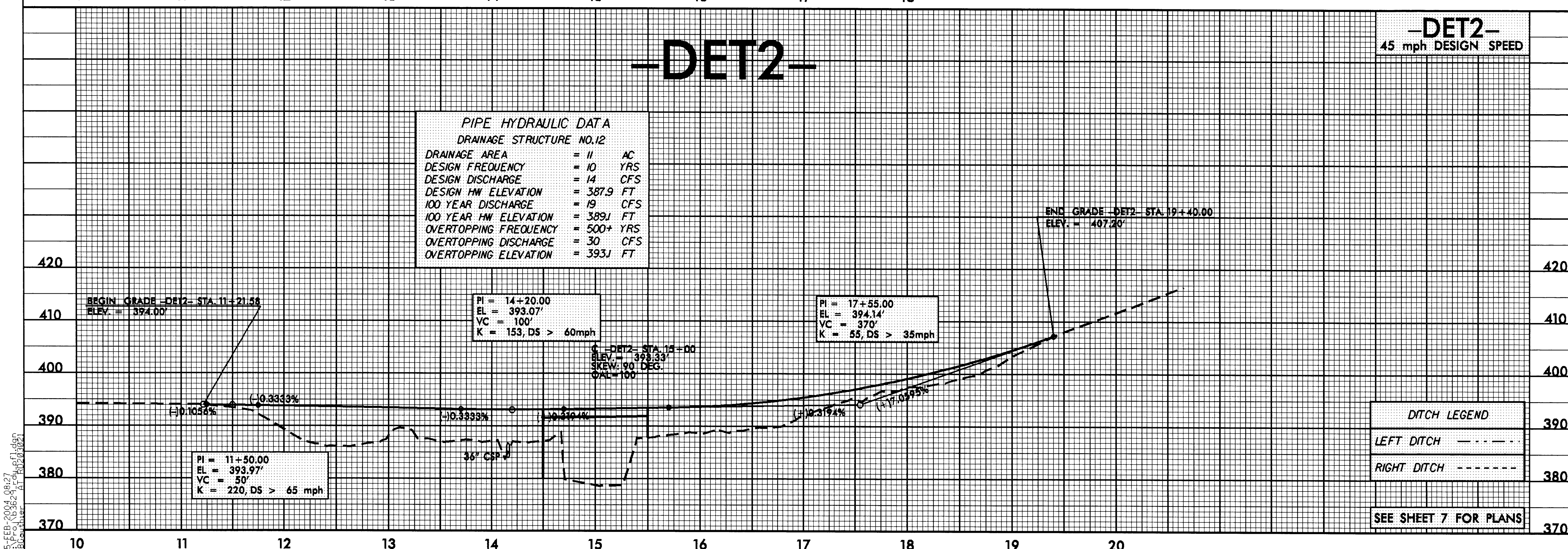
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-DET1-



PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO. 11		
DRAINAGE AREA	= 120	sq.mi.
DESIGN FREQUENCY	= 10	YRS
DESIGN DISCHARGE	= 1,596	CFS
DESIGN HW ELEVATION	= N/A	FT
100 YEAR DISCHARGE	= N/A	CFS
100 YEAR HW ELEVATION	= N/A	FT
OVERTOPPING FREQUENCY	= N/A	YRS
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING ELEVATION	= N/A	FT

-DET2-



PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO. 12		
DRAINAGE AREA	= 11	AC
DESIGN FREQUENCY	= 10	YRS
DESIGN DISCHARGE	= 14	CFS
DESIGN HW ELEVATION	= 387.9	FT
100 YEAR DISCHARGE	= 19	CFS
100 YEAR HW ELEVATION	= 389.1	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 30	CFS
OVERTOPPING ELEVATION	= 393.1	FT

25-FEB-2004 08:27
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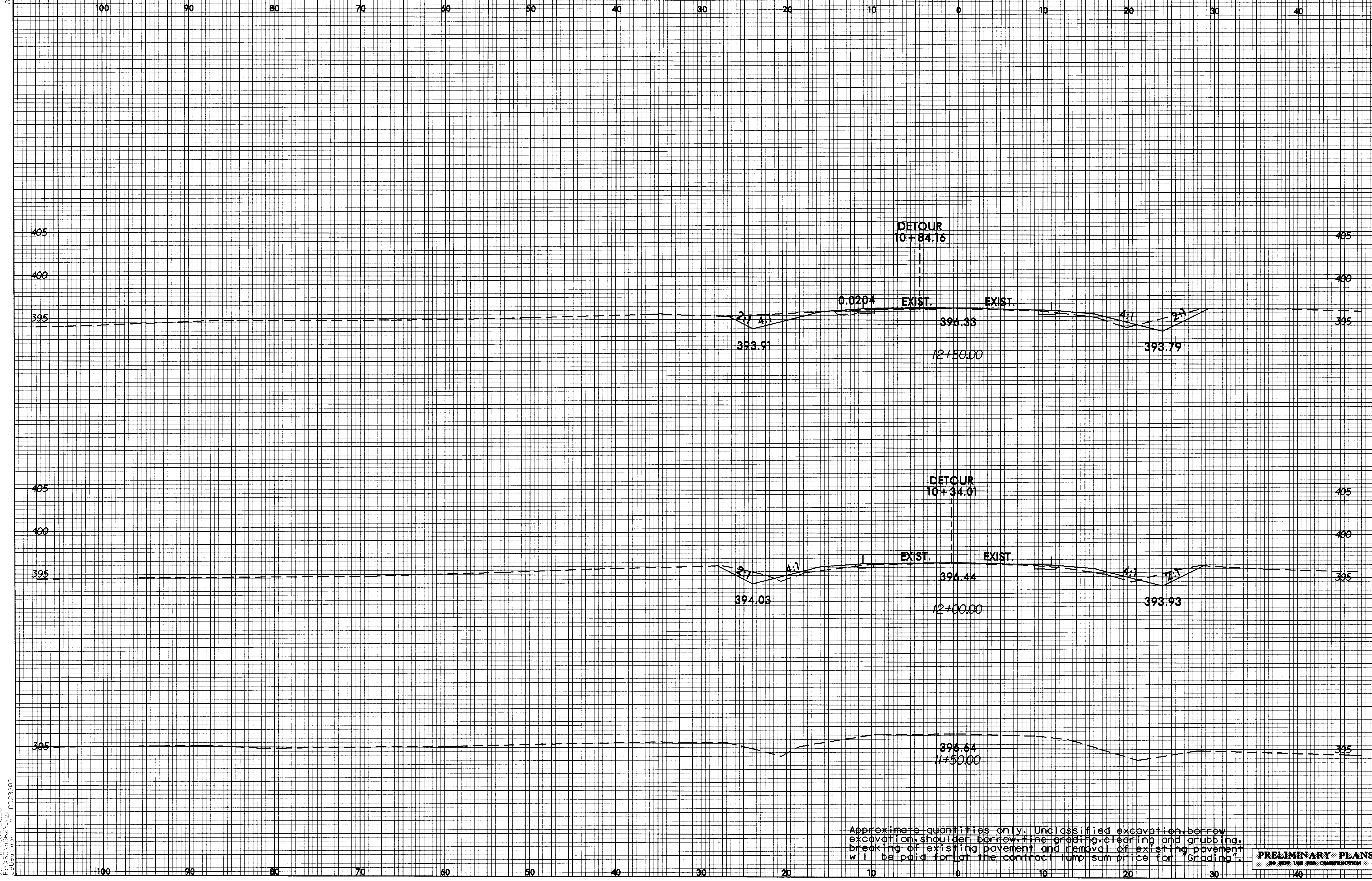
JBGauthier AT RD203021

PROJ. REFERENCE NO.	SHEET NO.
B-3629	X-2



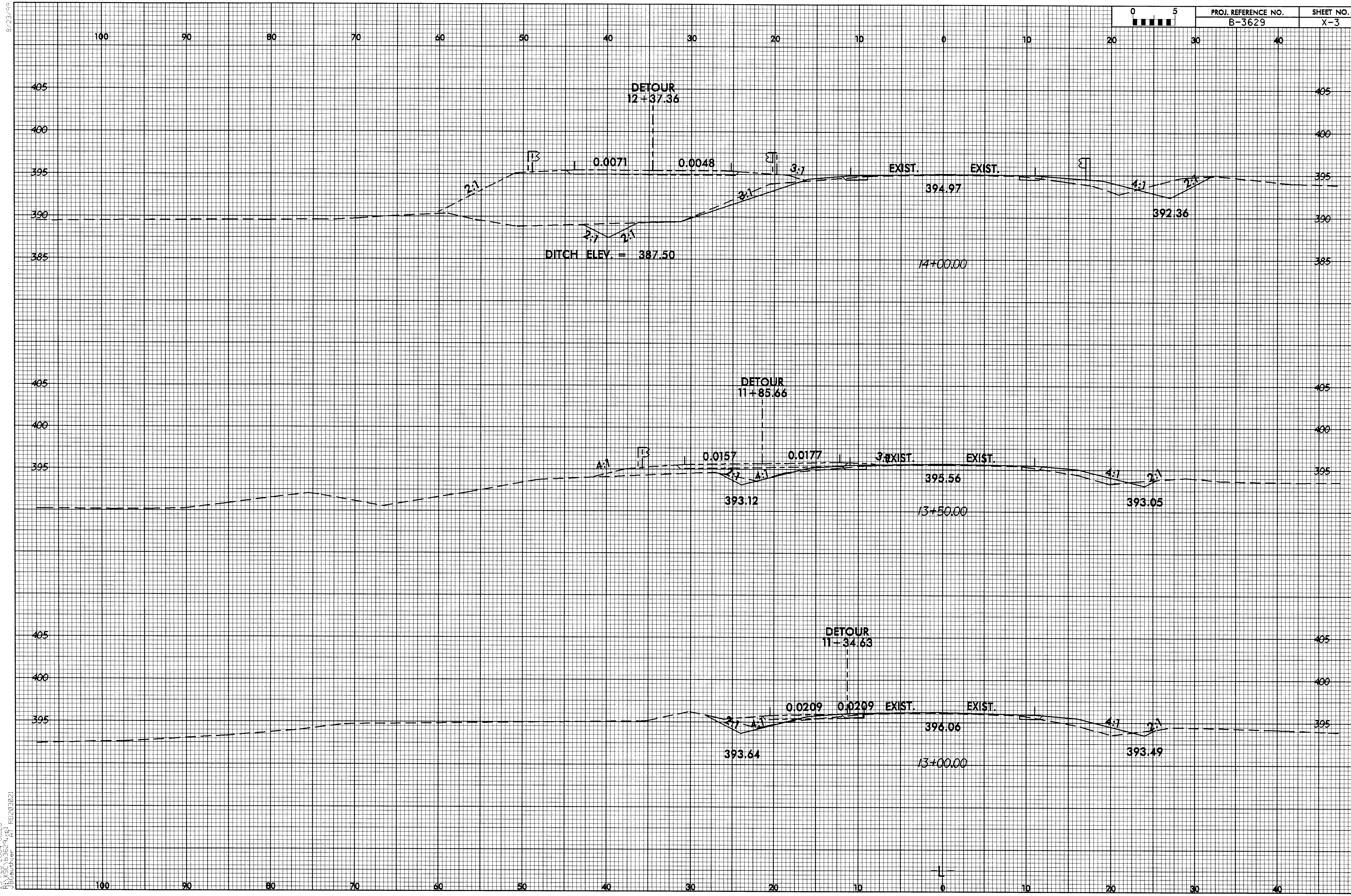
Approximate quantities only. Unclassified excavation, borrow excavation, shoulder borrow, fine grading, clearing and grubbing, breaking of existing pavement and removal of existing pavement will be paid for at the contract lump sum price for "Grading".

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/23/99
25-FEB-2004 08:28
R:\XSC\b3629.xpl
JBGauthier AT RD203021

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
B-3629	X-3



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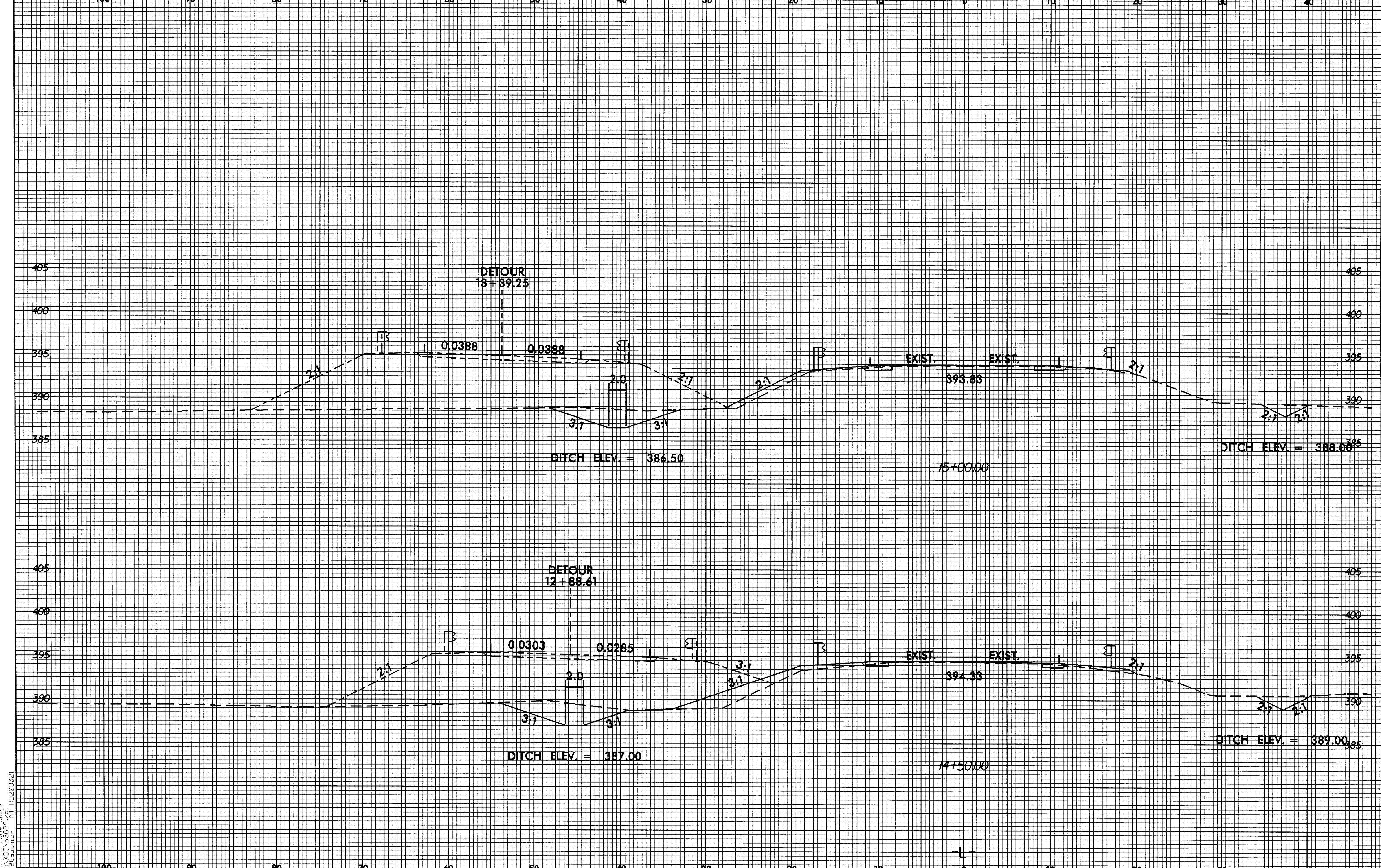
JBGouthier AT RD20302I

PROJ. REFERENCE NO.	SHEET NO.
B-3629	X-4



8/23/99

25-FEB-2004 08:29
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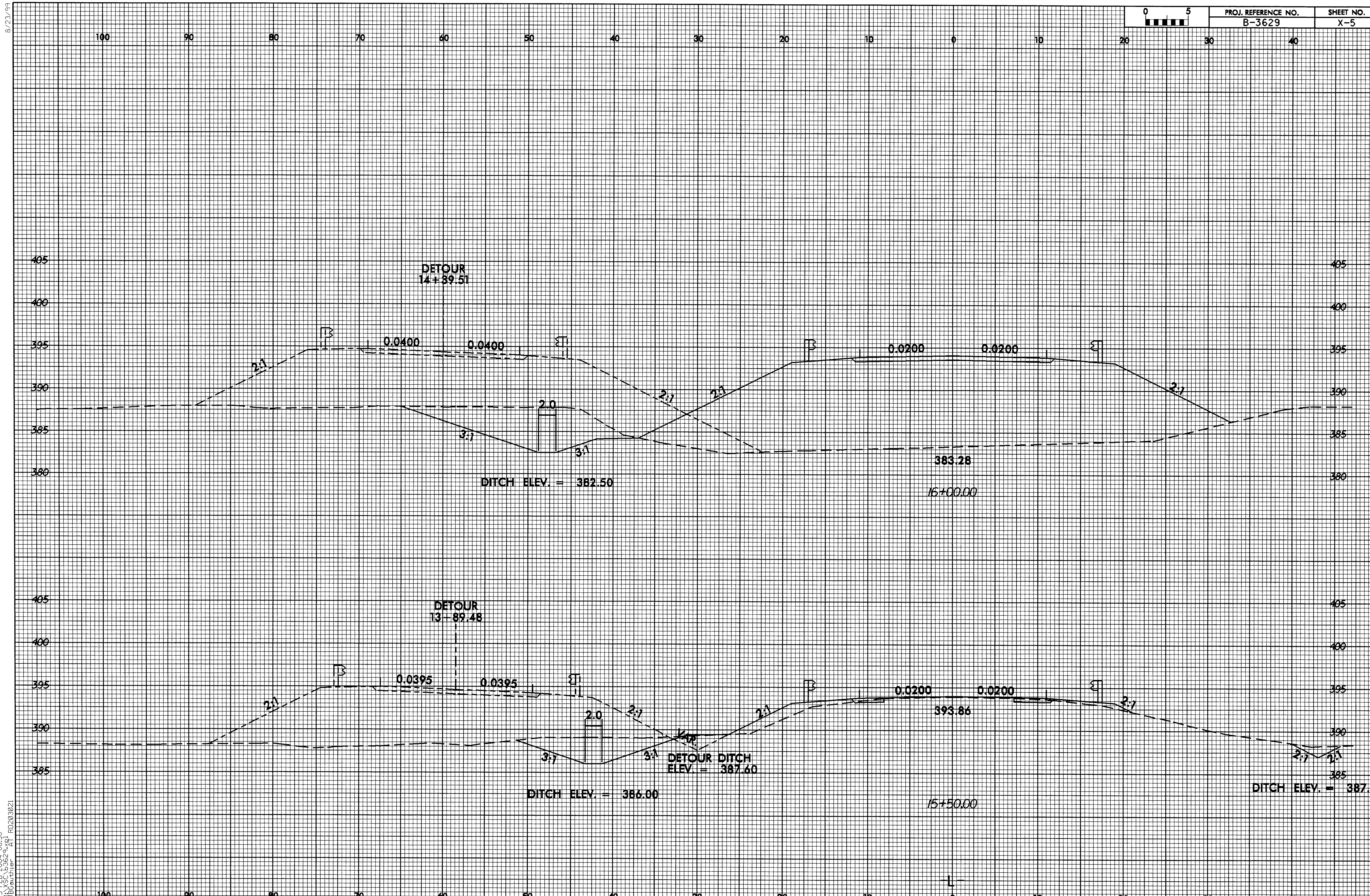
JBGouthier AT RD203021

PROJ. REFERENCE NO.	SHEET NO.
B-3629	X-5



8/23/99

25-FEB-2004 08:30
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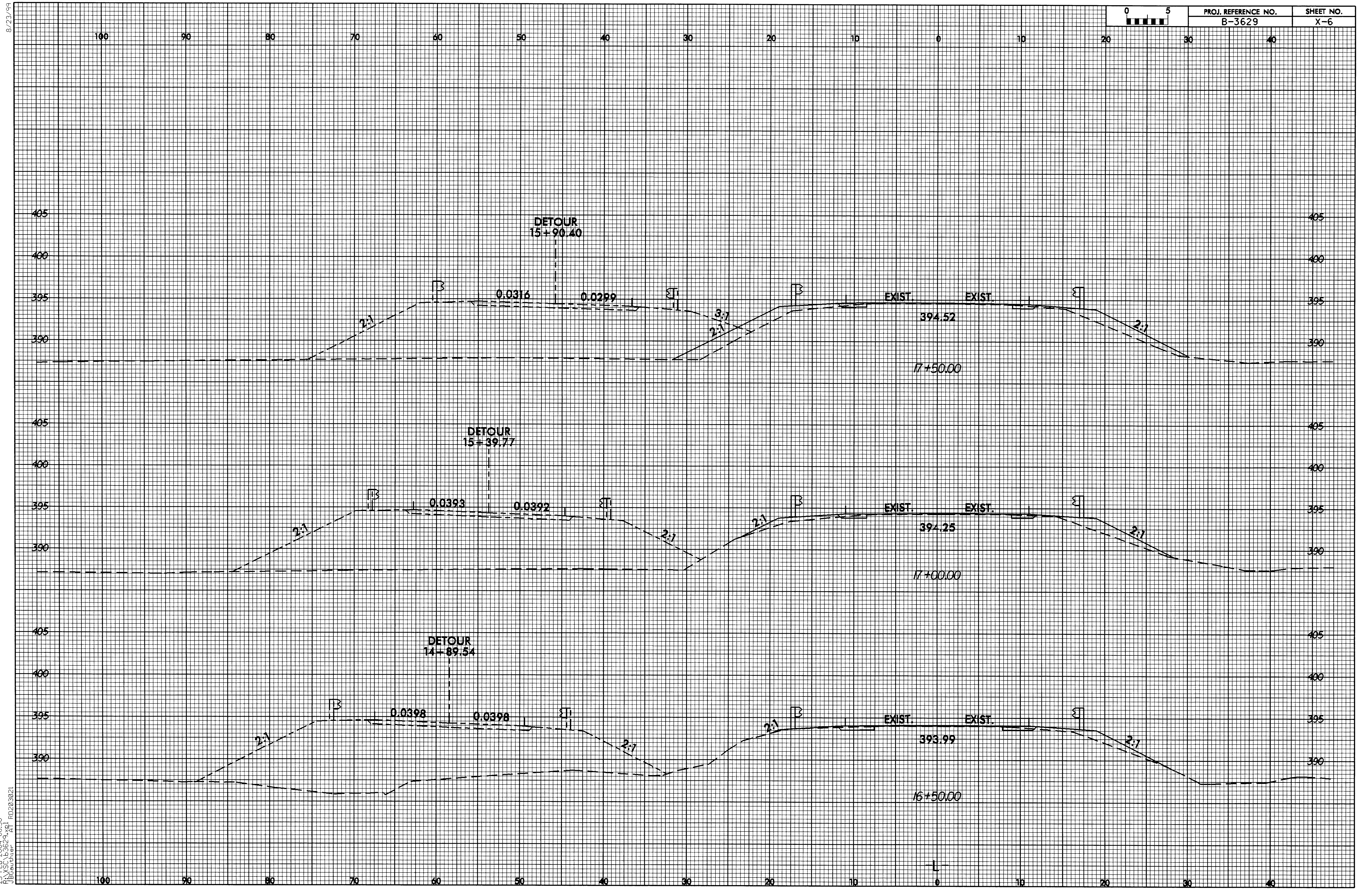
JBouthier AT RD203021

PROJ. REFERENCE NO. B-3629
SHEET NO. X-6



8/23/99
25-FEB-2004 08:30
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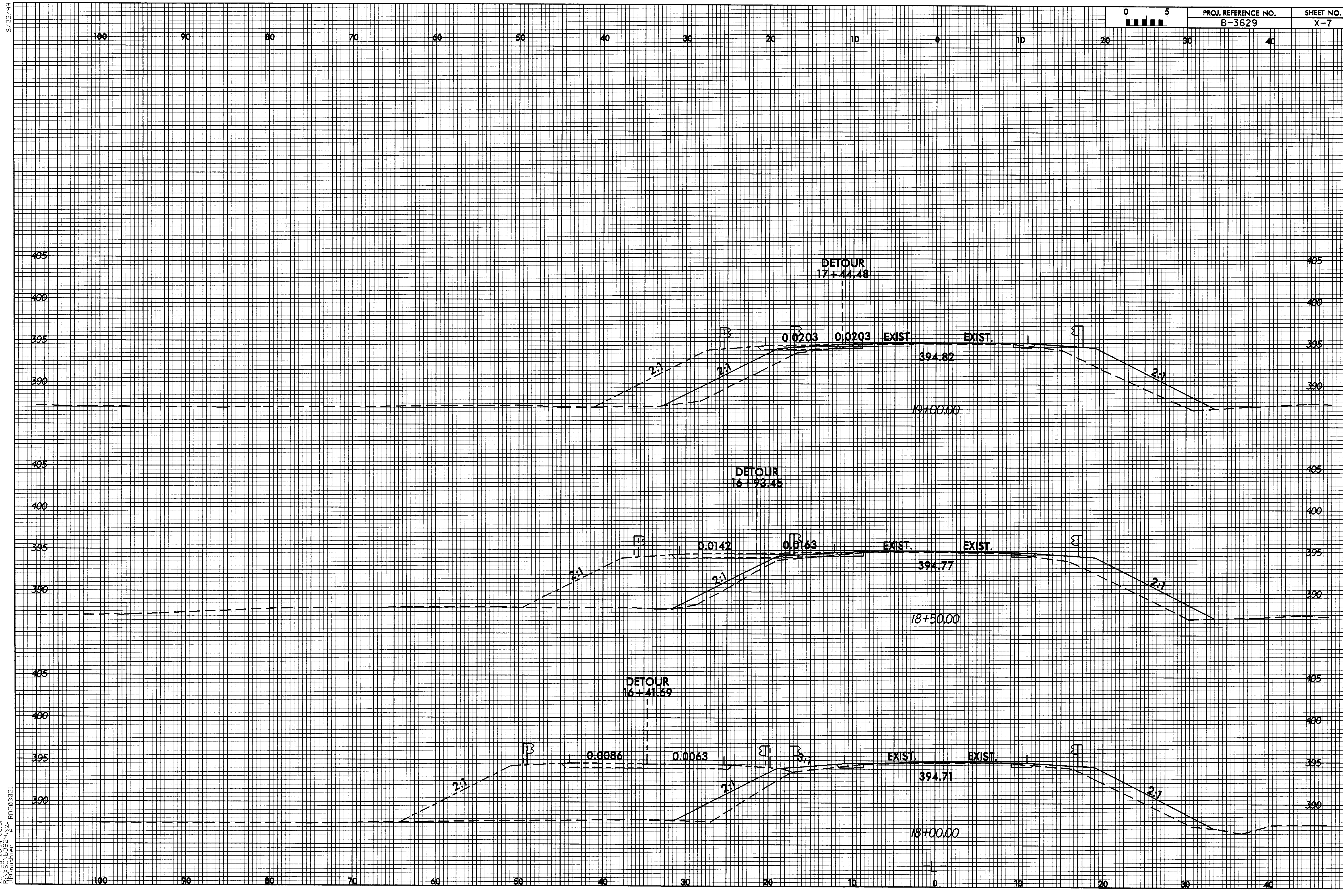
JBGouthier AT RD203021

PROJ. REFERENCE NO.	SHEET NO.
B-3629	X-7



8/23/99

25-FEB-2004 08:31
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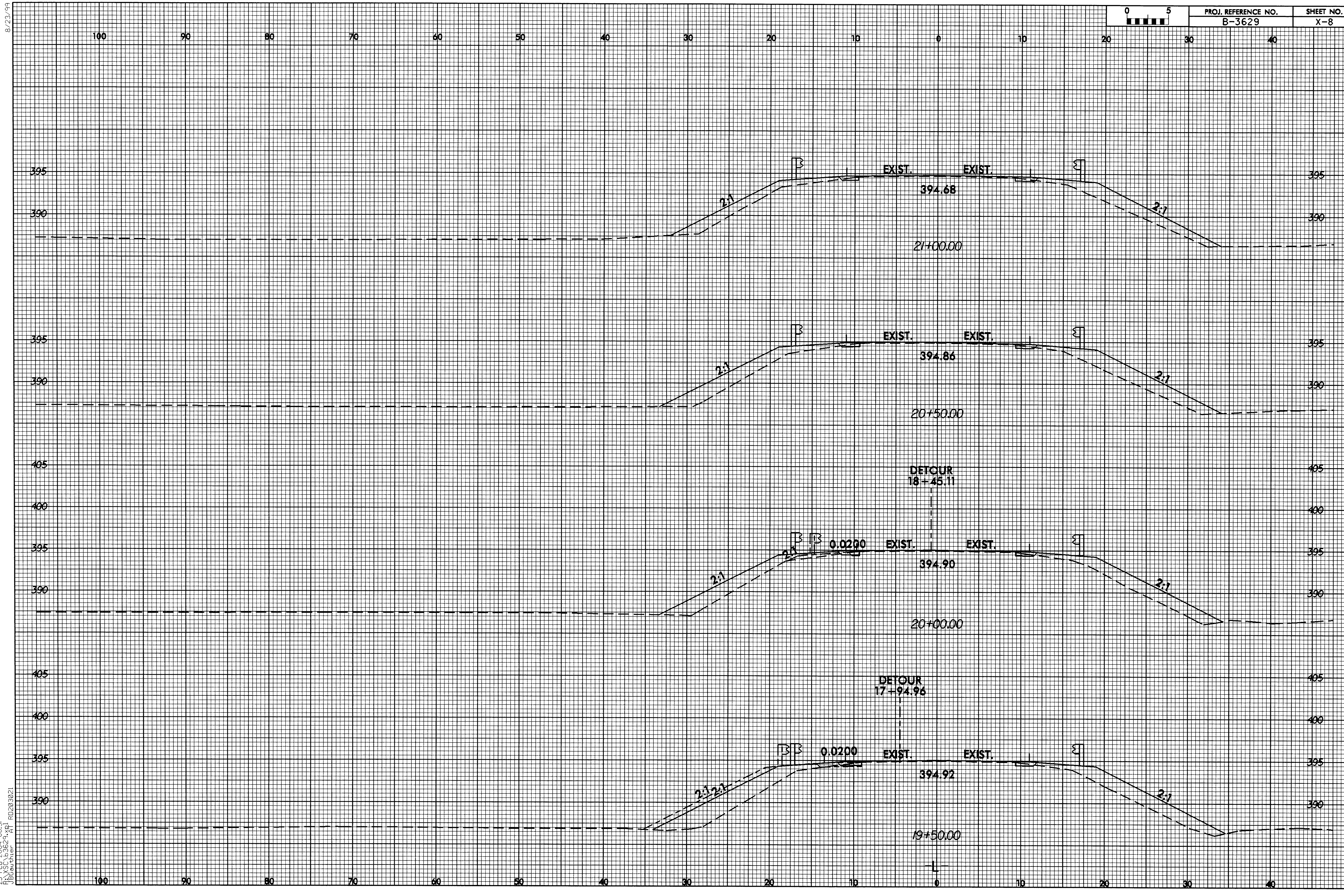
JBGouthier

PROJ. REFERENCE NO.	SHEET NO.
B-3629	X-8



8/23/99

25-FEB-2004 08:31
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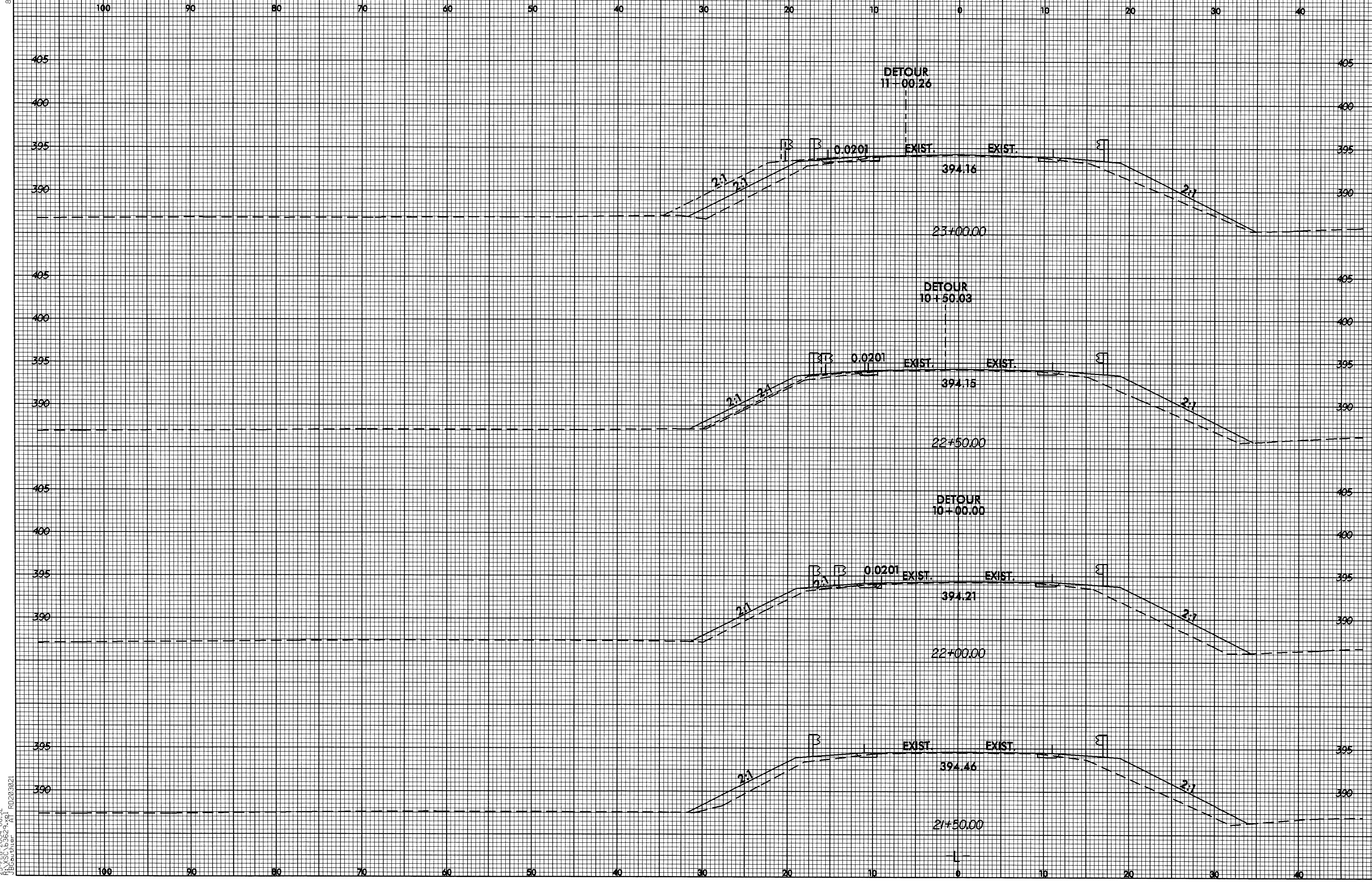
JBGauthier

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
B-3629	X-9



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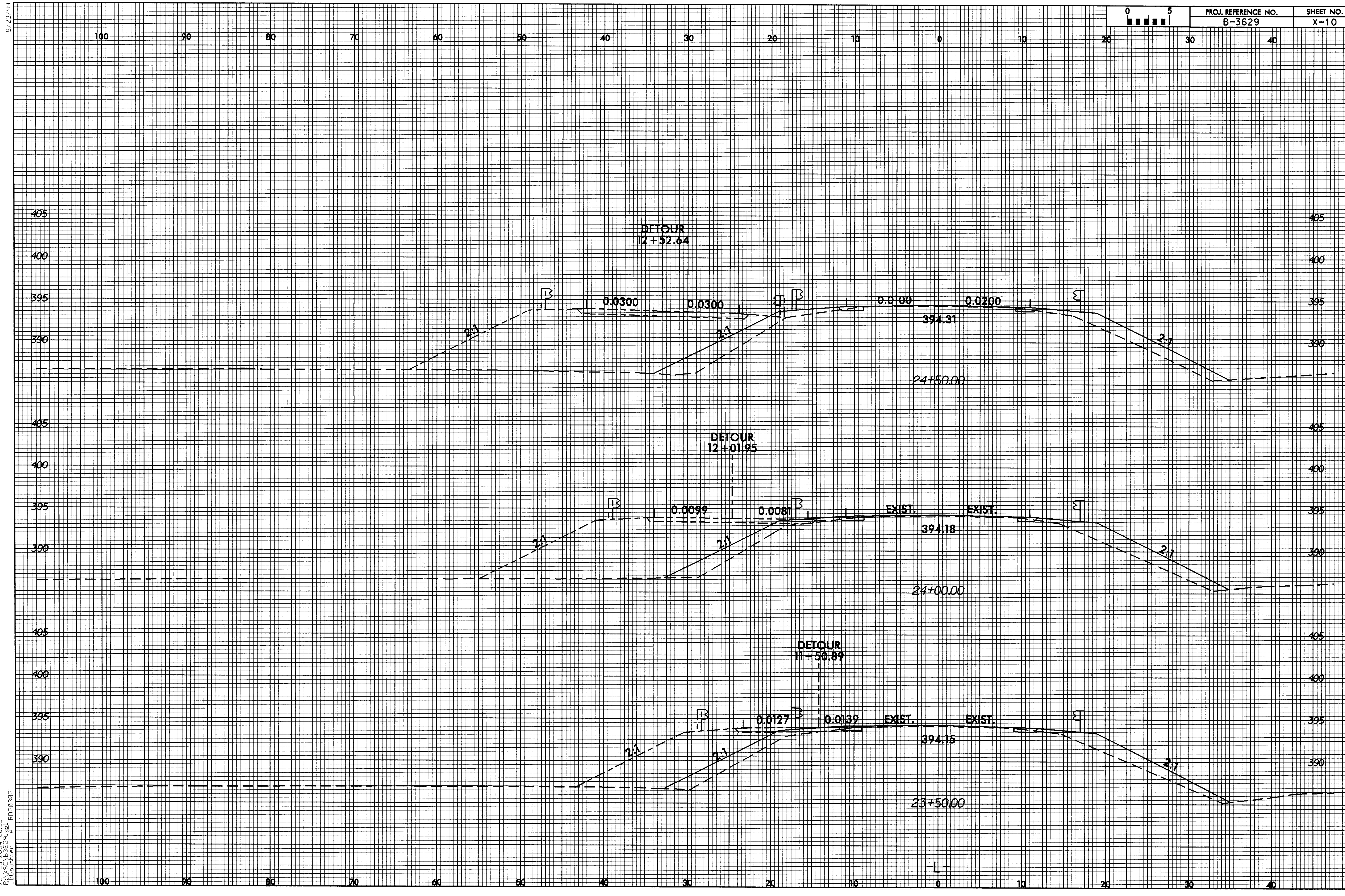
JBGouthier AT RD203021



8/23/99

25-FEB-2004 08:33
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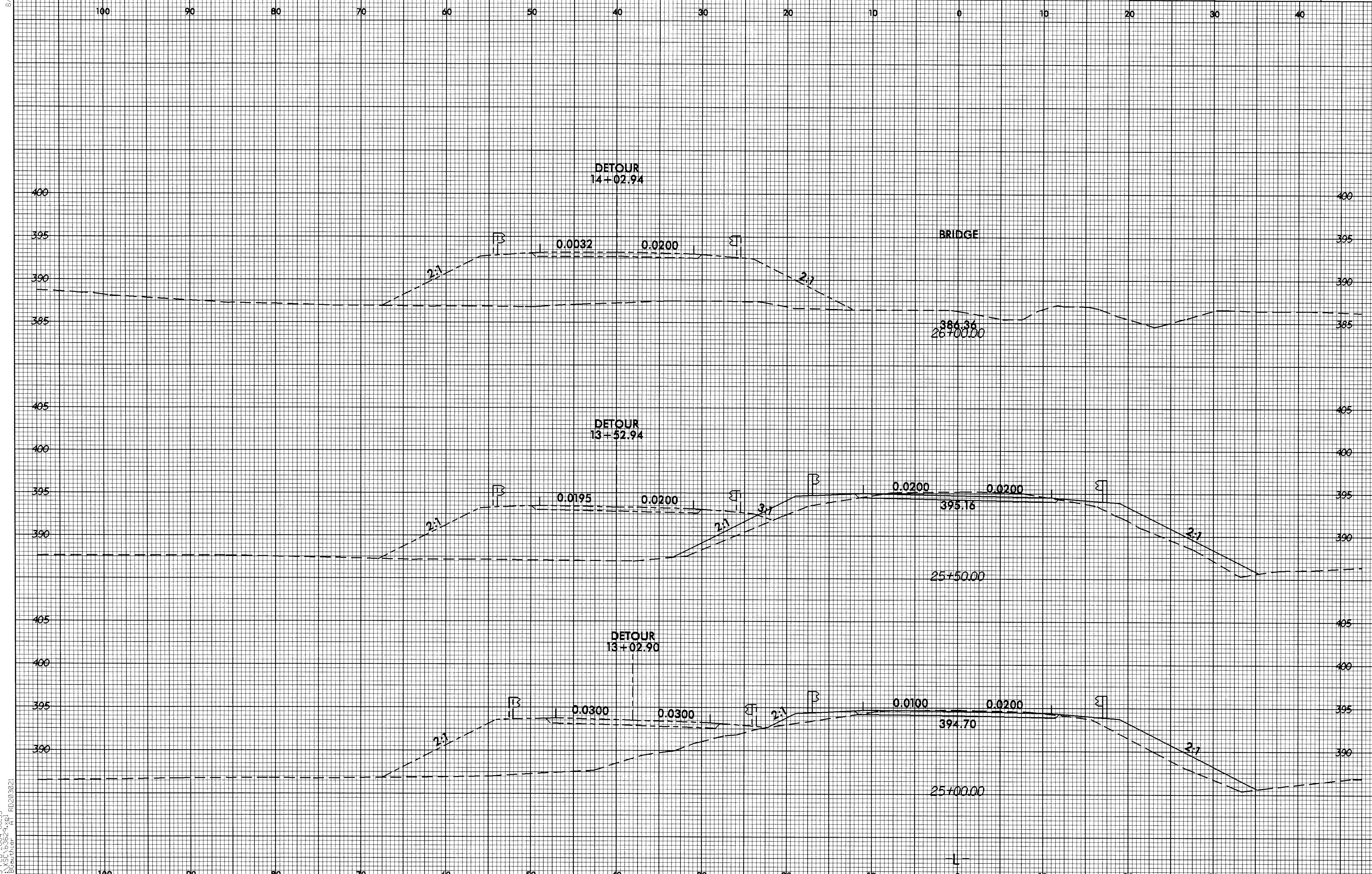
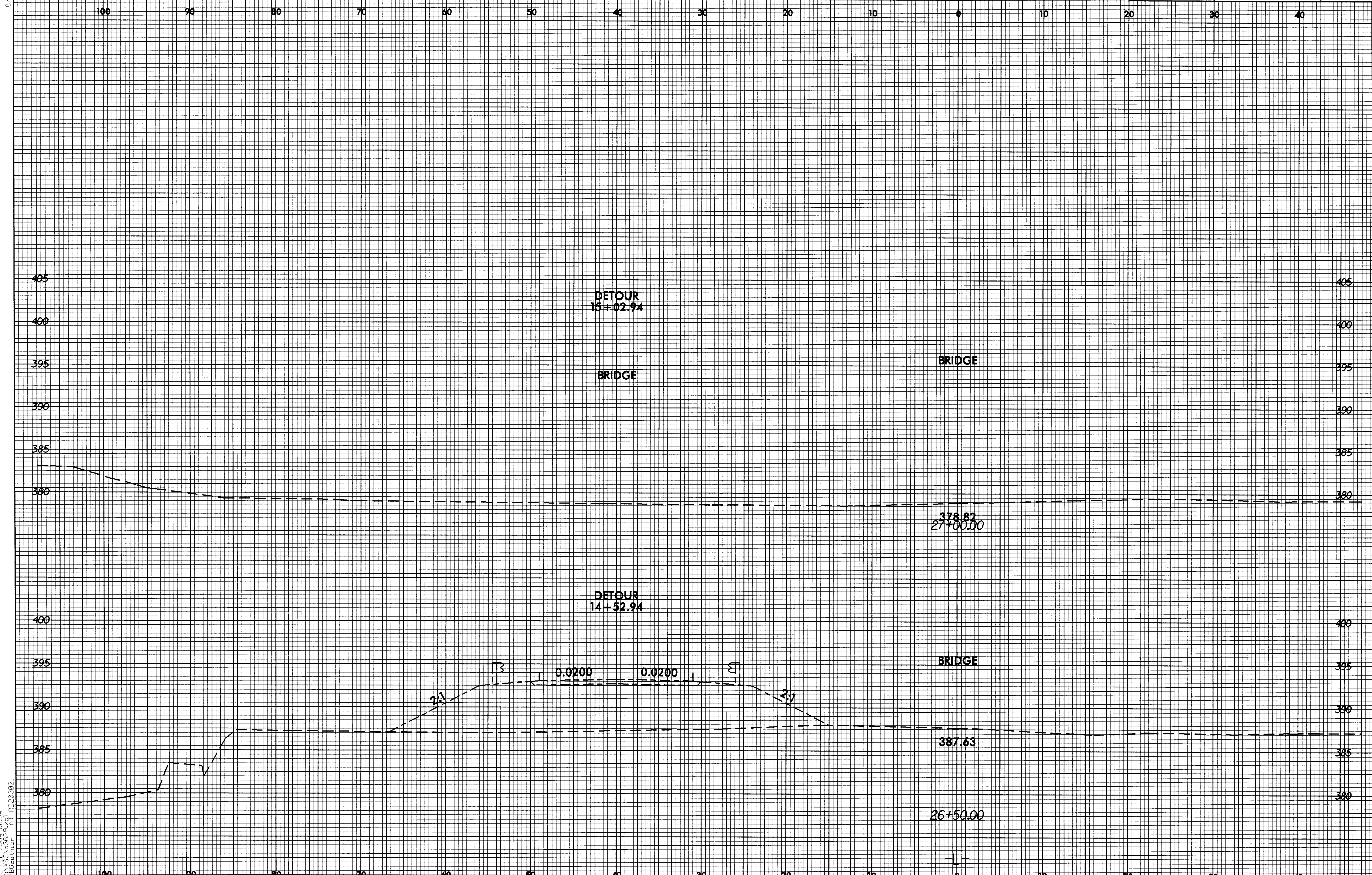
JBGouthier AT RD203021

PROJ. REFERENCE NO.	SHEET NO.
B-3629	X-11



PROJ. REFERENCE NO.	SHEET NO.
B-3629	X-12



8/23/99

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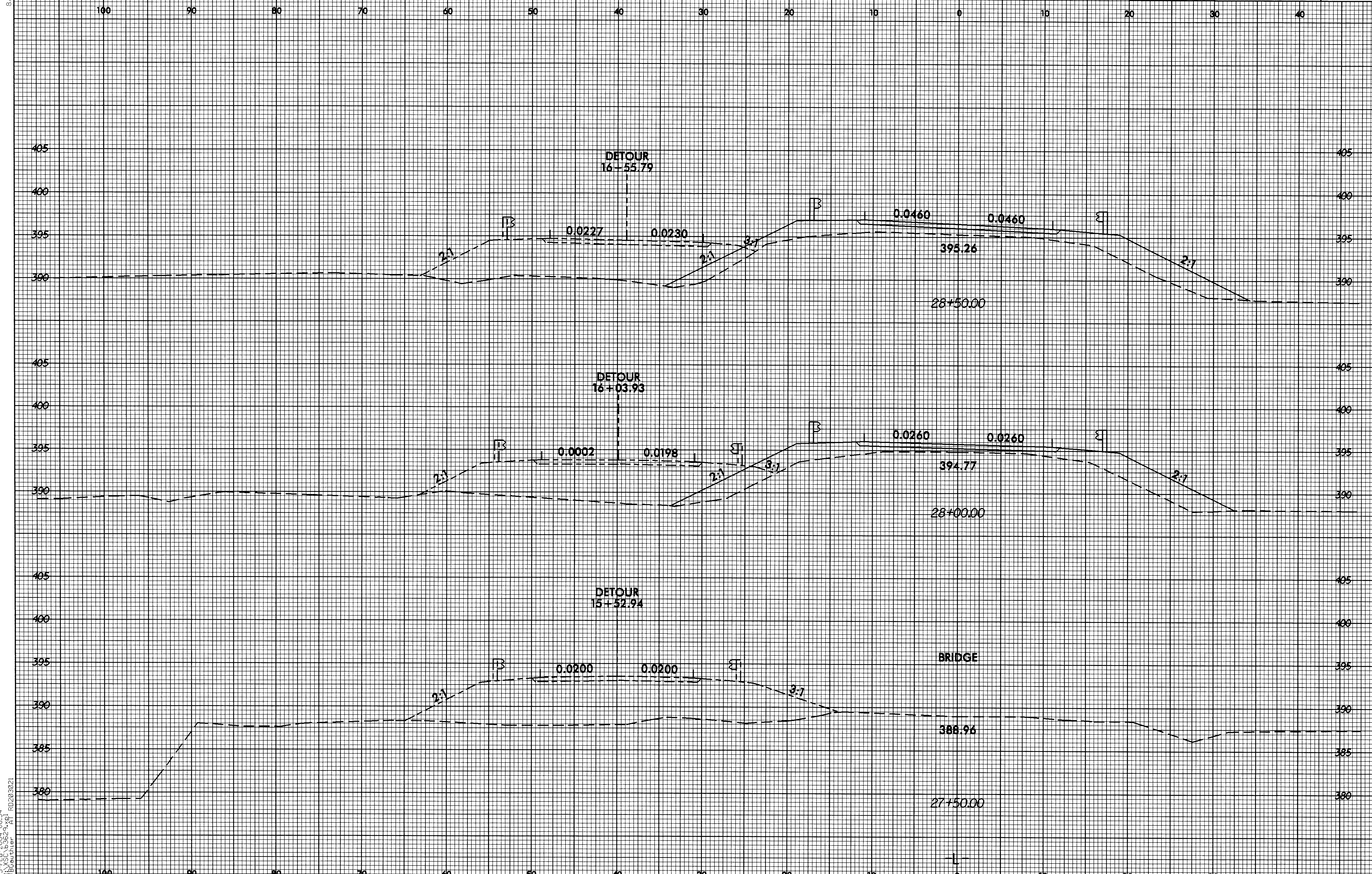
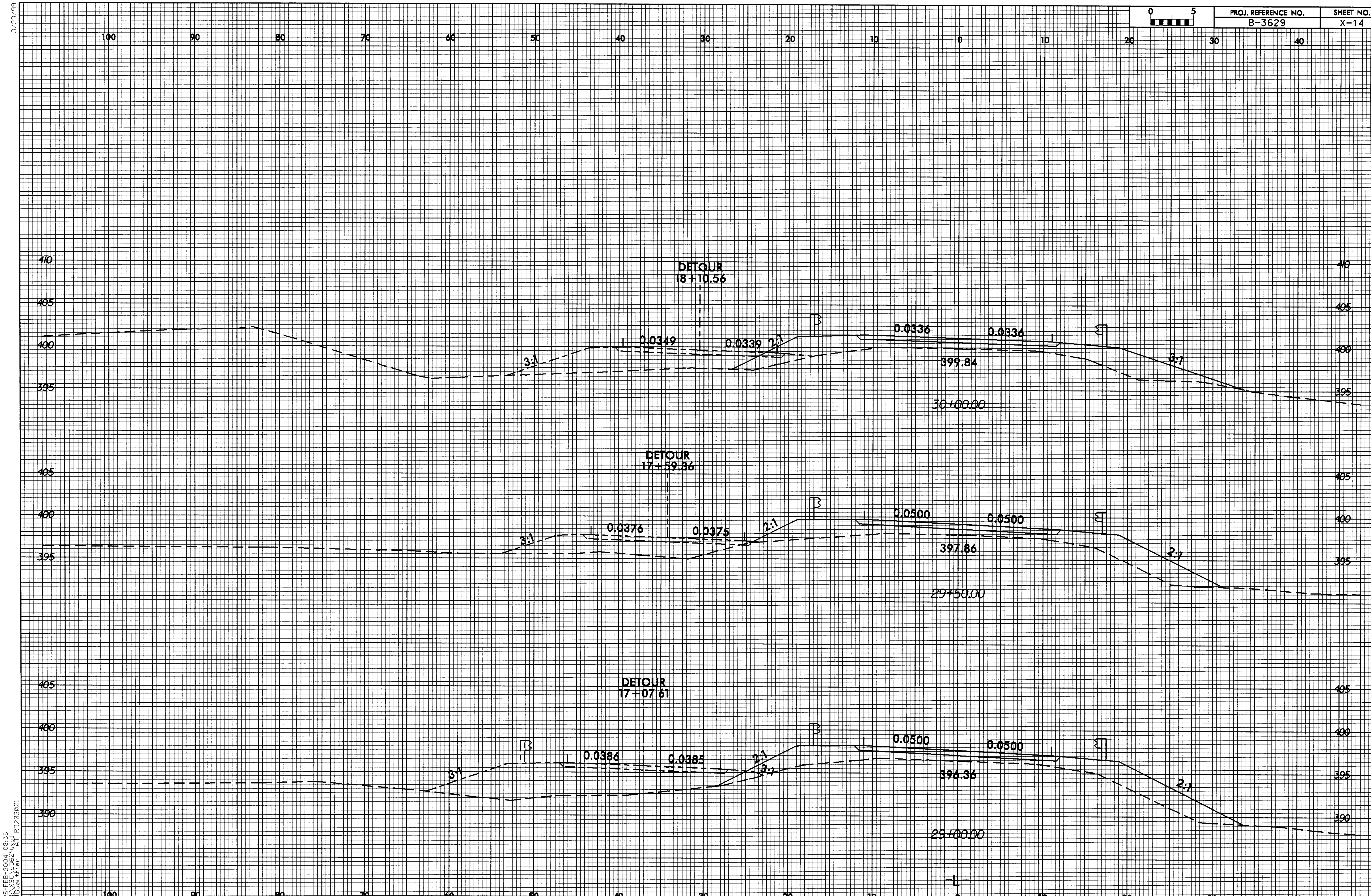
JBGauthier

PROJ. REFERENCE NO. B-3629

SHEET NO. X-13



PROJ. REFERENCE NO.	SHEET NO.
B-3629	X-14



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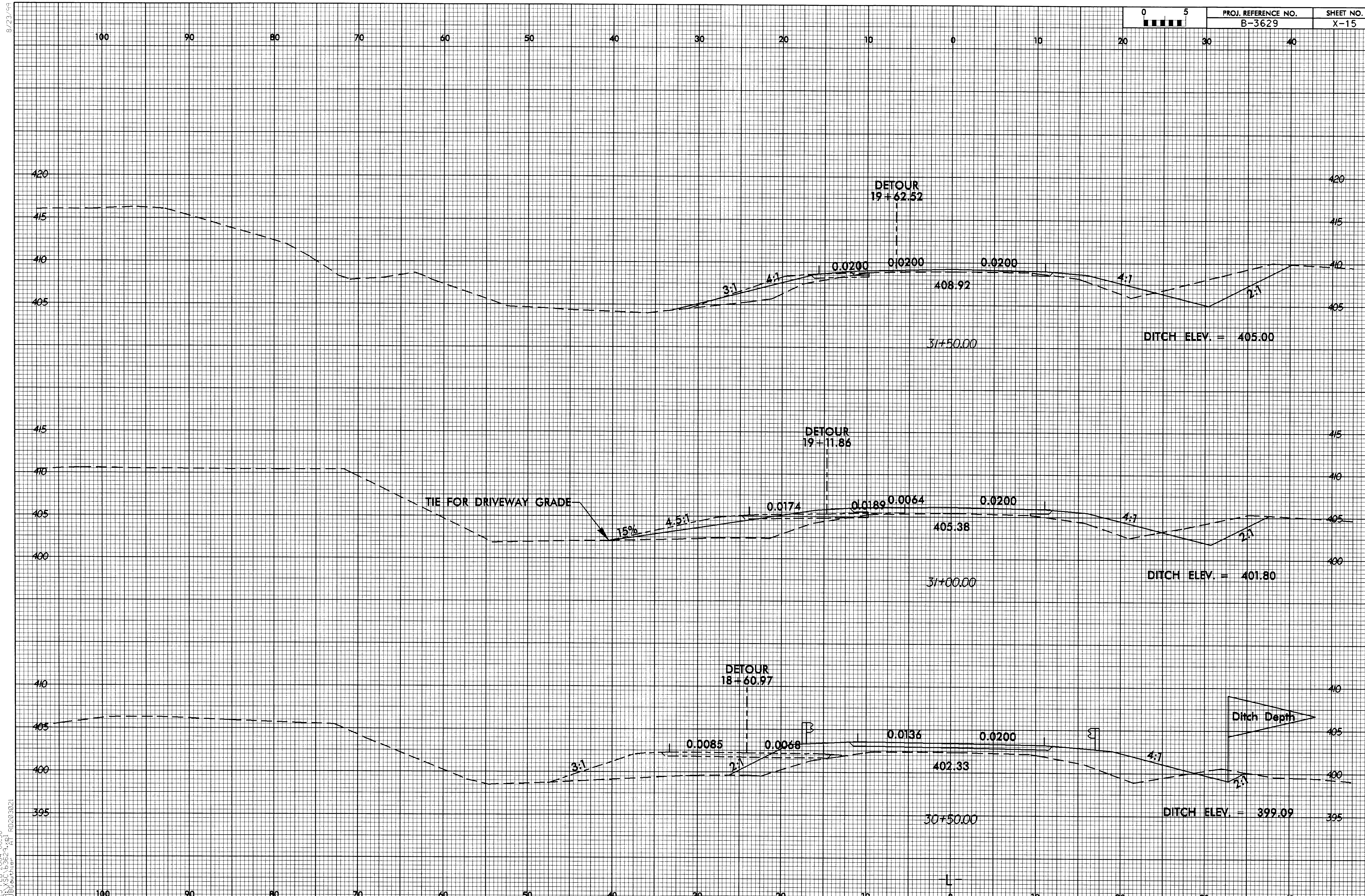

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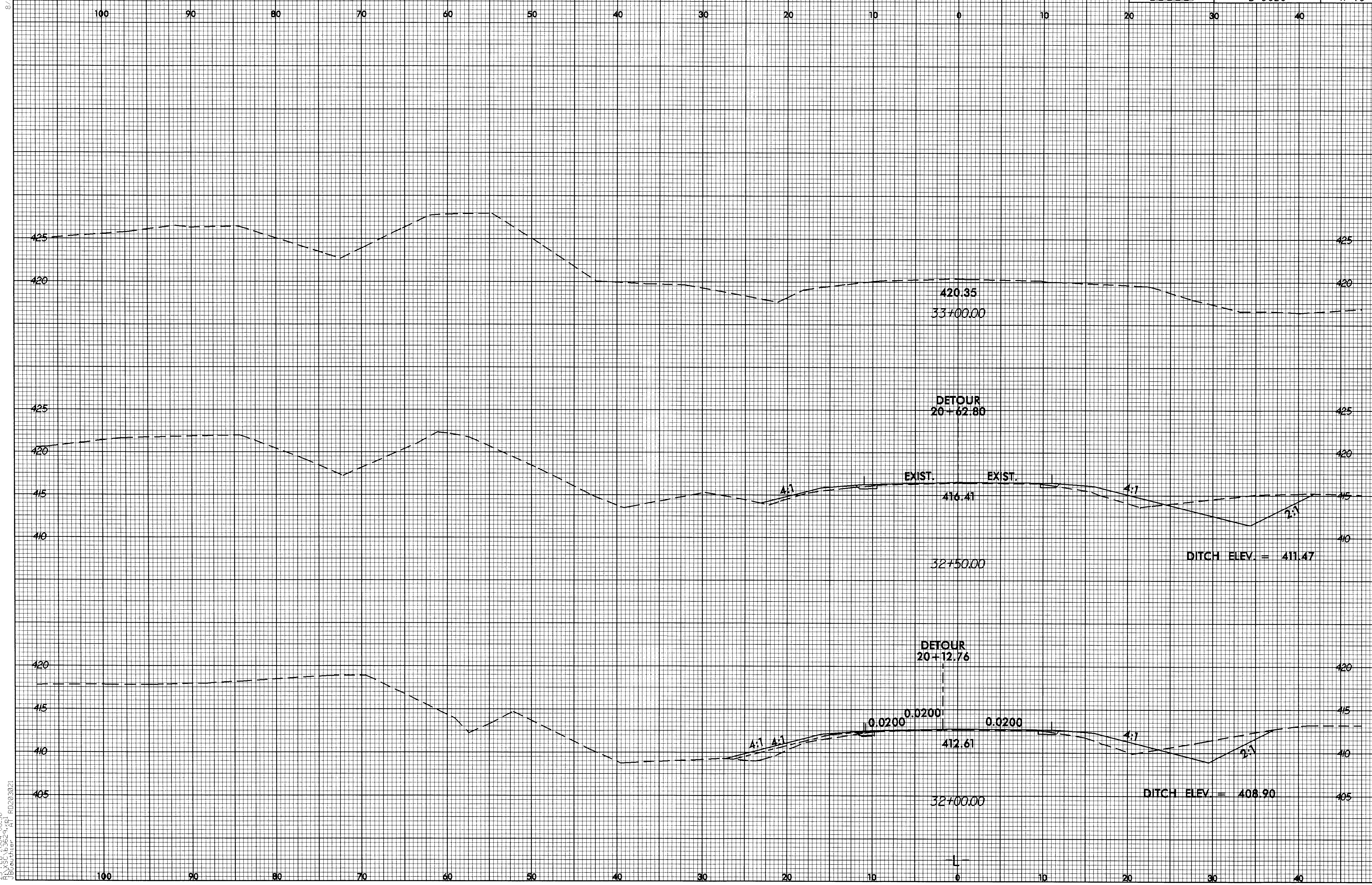

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Caswell County
Bridge No.'s 11 & 72 on SR 1565
Over Country Line Creek
Federal Project BRZ-1565(3)
State Project 8.2481401
TIP No. B-3629

CATEGORICAL EXCLUSION

U. S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

N. C. DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

APPROVED:

2-7-02

Date **William D. Gilmore, PE, Manager**
Project Development and Environmental Analysis Branch

2-13-02

Date for **Nicholas L. Graf, PE**
Division Administrator, FHWA

Caswell County
Bridge No.'s 11 & 72 on SR 1565
Over Country Line Creek
Federal Project BRZ-1565(3)
State Project 8.2481401
TIP No. B-3629

CATEGORICAL EXCLUSION

Documentation Prepared in
Project Development and Environmental Analysis Branch By:

2-5-02 Robin C. Young
Date **Robin C. Young**
Project Planning Engineer

2-5-02 William T. Goodwin Jr.
Date **William T. Goodwin Jr., PE, Unit Head**
Bridge Replacement Planning Unit

2-7-02 Lubin V. Prevatt
Date **Lubin V. Prevatt, PE, Assistant Manager**
Project Development and Environmental Analysis Branch

PROJECT COMMITMENTS

Caswell County
Bridge No.'s 11 & 72 on SR 1565
Over Country Line Creek
Federal Project BRZ-1565(3)
State Project 8.2481401
TIP No. B-3629

Commitments Developed Through Project Development and Design

Division 7 Construction, Roadside Environmental Unit, Structure Design Unit
Bridge Demolition: Best Management Practices for Bridge Demolition & Removal will be implemented. Bridge No. 11 is constructed entirely of timber and steel. Therefore, Bridge No. 11 will be removed without dropping any component into Waters of the United States. Bridge No. 72 is constructed entirely of timber. Therefore, Bridge No. 72 will be removed without dropping any component into Waters of the United States.

Roadway Design Unit, Roadside Environmental Unit, Division 7 Construction
Once construction of the new bridges and approaches are complete, the temporary structures will be removed. The temporary approach fill will be removed to natural grade and the area will be re-vegetated with appropriate plant species.

Division 7 Construction, Roadside Environmental Unit, Hydraulics Unit
Due to the potential sedimentation concerns resulting from demolition of the bridges, where it is possible to do so, turbidity curtains will be used to minimize sedimentation in the stream.

Project Development & Environmental Analysis (Natural Resource Specialist)
Wetland impacts will most likely exceed 0.10 acre (0.04 hectares). As a result, this may require mitigation. The final decision will be made by the US Army Corps of Engineers during the permitting phase of the project.

Caswell County
Bridge No.'s 11 & 72 on SR 1565
Over Country Line Creek
Federal Project BRZ-1565(3)
State Project 8.2481401
TIP No. B-3629

INTRODUCTION: Bridge No.'s 11 and 72 are included in the 2002-2008 North Carolina Department of Transportation (NCDOT) Transportation Improvement Program and in the Federal-Aid Bridge Replacement Program. The location is shown in Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion".

I. PURPOSE AND NEED STATEMENT

Bridge Maintenance Unit records indicate Bridge No.'s 11 and 72 have sufficiency ratings of 16.6 and 16.8, respectively, out of a possible 100 for a new structure. These bridges are considered to be both functionally obsolete and structurally deficient. The replacement of these inadequate structures will result in safer traffic operations.

II. EXISTING CONDITIONS

The project is located in Caswell County, northeast of Yanceyville, close to the intersection of NC 119 and SR 1564 (see Figure 1). Development in the area is primarily residential and agricultural in nature.

SR 1565 is classified as a Rural Local Route in the Statewide Functional Classification System and it is a Federal-Aid Highway. This route is not a designated bicycle route and there is no indication that an unusual number of bicyclists use this roadway.

In the vicinity of the bridges, SR 1565 has an 18-foot (5.4-meter) pavement width with 4-foot (1.2-meter) grass shoulders (see Figure 3A and 3B). The roadway grade is in a slight sag vertical curve through the project area. The existing bridges are on a tangent.

Bridge No. 11:
The existing Bridge No.11 is an 8-span structure constructed in 1953. The superstructure has a timber deck on steel girders with an asphalt wearing surface. The substructure consists of timber piles with timber caps. The bridge is 201 feet (61.3 meters) long with a clear roadway width of 17.1 feet (5.2 meters). There is approximately 20 feet (6.1 meters) between the deck surface and streambed. There are two lanes of traffic on the bridge. Presently the bridge is posted with weight restrictions of 6 tons for single vehicles and 6 tons for truck-tractor semi-trailers.

Bridge No. 72:
The existing Bridge No.72 is a 2-span structure constructed in 1953. The superstructure has a timber deck on timber joists with an asphalt wearing surface. The substructure consists entirely of timber and steel. The bridge is 36 feet (11 meters) long with a clear roadway width of 15.9 feet (4.8 meters). There is approximately 11 feet (3.3 meters) between the deck surface and streambed. There is one lane of traffic on the bridge. Presently the bridge is posted with weight restrictions of 9 tons for single vehicles and 16 tons for truck-tractor semi-trailers.

Carolina Power and Light has aerial single-phase electrical service running along the south side of SR 1565. Utility impacts are considered to be low. There is a rock dam approximately 75 feet (23 meters) north of Bridge No. 11.

The current traffic volume of 400 vehicles per day (VPD) is expected to increase to 700 VPD by the year 2025. The projected volume includes 1% truck-tractor semi-trailer (TTST) and 2% dual-tired vehicles (DT). The speed limit in the vicinity of the bridge is 55 mph (90 kmh).

There were no accidents reported in the vicinity of the project during a recent three year period.

According to the Transportation Director for Caswell County Schools, rerouting the school buses will have some impact on their efficiency rating, but can be handled without a great deal of expense. There are four school bus crossings per day over Bridge No.'s 11 and 72.

III. ALTERNATIVES

A. Project Description

The replacement structure for Bridge No. 11 will consist of a 220-foot (67.1-meter) long bridge and will be of sufficient width to provide for two 11-foot (3.3-meter) lanes with 3-foot (1-meter) offsets on each side. The replacement structure for Bridge No. 72 will consist of a triple barrel, 12-foot (3.6-meter) wide by 8-foot (2.4-meter) high reinforced concrete box culvert. This replacement structure will be of sufficient width to provide for two 11-foot (3.3-meter) lanes with 5-foot (1.5-meter) offsets to the proposed guardrail.

The roadway grade of the new structures will be approximately the same as the existing grade at their respective locations.

The existing roadway will be widened to a 22-foot (6.6-meter) pavement width to provide two 11-foot (3.3-meter) lanes. Shoulder widths will be 5 feet (1.5 meters) on each side. The shoulder widths will be increased 3 feet (1 meter) where guardrail is warranted.

B. Reasonable and Feasible Alternatives

The three alternatives that were studied for replacing Bridge No.'s 11 and 72 are described below.

All alternatives will replace Bridge No. 11 with a new 220 foot (67.1 meter) long bridge and Bridge No. 72 with a triple 12' x 8' (3.6 meter by 2.4 meter) reinforced concrete box culvert (RCBC) at approximately the same roadway elevation as the existing bridges.

Alternate 1A: Both bridges will be replaced at approximately the same location as the existing bridges. Traffic will be maintained using temporary, one-lane on-site detours to the north during construction. Temporary traffic signals will be installed at each end of the bridges during construction.

Alternate 1B: (Recommended) Both bridges will be replaced at approximately the same location as the existing bridges. Traffic would be maintained using a temporary, two-lane on-site detour located to the north of the existing bridges during construction.

Alternate 2: Realign SR 1565 to the north of the existing roadway. Traffic would be maintained using the existing alignment during construction.

C. Alternatives Eliminated From Further Consideration

An off-site detour is not considered to be prudent due to the lack of a suitable detour route.

The "do-nothing" alternative is not practical and will eventually necessitate closure of the bridge. This is not acceptable due to the traffic service provided by SR 1565.

"Rehabilitation" of the existing deteriorating bridge is neither practical nor economical. This is due to the fact that major structural components of these bridges are timber, thus replacement is more prudent than rehabilitation.

D. Recommended Alternate

As recommended in Alternate 1B, Bridge No. 11 will be replaced with a new bridge at approximately the same location and roadway elevation as the existing bridge. The new Bridge No. 11 will be approximately 220 feet (67.1 meters) in length and 28 feet (8.6 meters) in width. A travelway of 22 feet (6.6 meters) will be accommodated, with an offset of 3 feet (1 meter) on each side. Bridge No. 72 will be replaced with a triple 12 feet by 8 feet (3.6 meter by 2.4 meter) reinforced concrete box culvert (RCBC) at approximately the same location and roadway elevation of the existing structure (see Figure 2). A travelway of 22 feet (6.6 meters) will be accommodated, with an offset of 5 feet (1.5 meters) on each side. Based on preliminary design, the design speed should be approximately 55 mph (90 kmh) for the permanent improvement and 45 mph (70 kmh) for the detour.

The approach roadway will consist of two 11-foot (3.3-meter) travel lanes and shoulder widths of at least 5 feet (1.5 meters). The shoulder widths will be 3 feet (1 meter) wider where guardrail is warranted. There will be approximately 380 feet (116 meters) of approach work on each side of Bridge No. 11 and approximately 250 feet (76 meters) on each side of Bridge No. 72. The grades of the temporary bridges can be placed 2 feet (0.06 meters) lower than the existing bridges.

During construction, traffic will be shifted onto a temporary, two-lane alignment to the north (downstream) of the existing bridges. The detour bridge for Bridge No. 11 will be approximately 90 feet (27.4 meters) in length and 26 feet (8 meters) in width. The detour for Bridge No. 72 will be a single barrel 11 feet 10 inches by 7 feet 7 inches (3.6 meter by 2.3 meter) corrugated steel pipe arch. The temporary structures may be placed as much as 3 feet (1 meter) lower than the existing bridges.

The construction of the recommended alternate does not have the potential to cause substantial impacts to the local environment. Since the costs of Alternate 1A and 1B are essentially the same, Alternative 1B is recommended because it provides a safer traffic pattern for motorists.

The NCDOT Division 7 Engineer concurs with the selection of Alternative 1B as the preferred alternative.

IV. ESTIMATED COSTS (Table 1)

The estimated costs for the two alternatives are as follows:

COMPONENT	ALTERNATE 1A (1-lane on-site)	**Recommended** ALTERNATE 1B (2-lane on-site)	ALTERNATE 2 (new alignment)
Structures	$ 505,000	$ 505,000	$ 505,000
Bridge Removal	$ 34,000	$ 34,000	$ 34,000
Roadway & Approaches	$ 212,000	$ 214,000	$ 526,000
Detour & Approaches	$ 365,000	$ 376,000	$ 0
Mobilization & Miscellaneous	$ 502,000	$ 509,000	$ 500,000
Engineering & Contingencies	$ 245,000	$ 262,000	$ 235,000
Total Construction	$ 1,863,000	$ 1,900,000	$ 1,800,000
Right of Way	$ 63,000	$ 63,000	$ 18,000
Total Cost	**$ 1,926,000**	**$ 1,963,000**	**$ 1,818,000**

The estimated cost of the project shown in the 2002-2008 NCDOT Transportation Improvement Program is $1,180,000, including $130,000 spent in prior years, $50,000 in right of way, and $1,000,000 for construction.

V. NATURAL RESOURCES

PHYSICAL RESOURCES

Soil and water resources that occur in the project area are discussed below with respect to possible environmental concerns. Soil properties and site topography significantly influence the potential for soil erosion and compaction, along with other possible construction limitations or management concerns. Water resources within the project area present important management limitations due to the need to regulate water movement and the increased potential for water quality degradation. Excessive soil disturbance resulting from construction activities can potentially alter both the flow and quality of water resources, limiting downstream uses. In addition, soil characteristics and the availability of water directly influence the composition and distribution of flora and fauna in biotic communities, thus affecting the characteristics of these resources.

Regional Characteristics

Caswell County is located in the Northern Piedmont physiographic region of North Carolina. The county is characterized by predominately nearly level or gently sloping to strongly sloping soils on the Piedmont uplands and narrow to wide flood plains. Most of the upland ridges are convex, and the side slopes and shoulder slopes are dissected by numerous drainageways. Caswell County is located in the Roanoke River drainage basin. Tributaries of the Dan River, such as Moon Creek, Country Line Creek, Hyco Creek, and Hogans Creek drain a large portion of the county. The Roanoke River drainage basin is composed of two major rivers. They are the Dan River located to the West of Hyco Lake and the Roanoke River. The Roanoke Basin eventually drains into the Albemarle Sound. The North Carolina portion of the basin contains 16 counties with over half of that land in forest.

The project area is located in a terrace of Country Line Creek. The topography adjacent to the creek has typical bottomland characteristics. Alluvial deposits from the creek at periods of high flow has created a microtopography that holds a few ephemeral pools at the western end of the project. A portion of the project area located on the north and south side of SR 1565 (Long's Mill Road) is an agricultural row crop field.

Soils

The Natural Resource Conservation Service (NRCS) for Caswell County was contacted to provide soils information within the project vicinity. NCDOT was informed by the NRCS that currently there has been no soils mapping done for the project area. Therefore, soils information is not available.

Water Resources

This section contains information concerning surface water resources likely to be impacted by the proposed project. Water resource assessments include the physical characteristics, best usage standards, and water quality aspects of the water resources, along with their relationship to major regional drainage systems. Probable impacts to surface water resources are also discussed, as are means to minimize impacts.

Best Usage Classification

Water resources within the study area are located in the Roanoke River Drainage Basin; Division of Water Quality sub-basin number 03-02-04; United States Department of Interior Hydrologic Unit is 03010104. There are two water resources, Country Line Creek and an associated unnamed tributary, in the project study area crossed by SR 1565. (Figure 1)

Streams have been assigned a best usage classification by the Division of Water Quality (DWQ), formerly Division of Environmental Management (DEM), which reflects water quality conditions and potential resource usage. Unnamed tributaries receive the same classification as the streams to which they flow. The classification for Country Line Creek [DEM Index No. 22-56-(3.7), 8/03/92] is class C. Class C waters are freshwaters protected for secondary recreation, fishing, aquatic life including propagation and survival, and wildlife. All freshwaters shall be classified to protect these uses at a minimum.

No waters classified as High Quality Waters (HQW), Water Source (WS I or WS II), or Outstanding Resource Waters (ORW) occur within 1 mile (1.6 km) of the project study area. Country Line Creek is not designated as a North Carolina Natural and Scenic River, nor is it designated as a National Wild and Scenic River.

Physical Characteristics of Surface Waters

As SR 1565 crosses Country Line Creek at the study area it is approximately 30-35 feet (9.1-10.6 meters) wide at the top of the bank and ranges in depth from 3-6 feet (0.9-1.8 meters) with a northeasterly, moderate flow. The substrate in the study area is composed of a sandy-silt loam. This creek, with moderate flow has relatively steep banks [6 feet (1.8 meters) deep at bank full].

An unnamed tributary flowing into Country Line Creek is crossed by Bridge No. 72 on SR 1565. It is approximately 13-18 feet (3.9–5.4 meters) wide at the top of the bank and ranges in depth from 2-4 feet (0.6-1.2 meters) on the south side of the bridge. As it passes under the bridge and into the woods it narrows to a bank full width of approximately 3-5 feet (0.91-1.50 meters) wide with a depth of 2-10 inches (5.1-25.4 cm). This tributary becomes much more meandering and prone to flooding as it enters the wooded area north of Long's Mill Road. The substrate is composed of sandy-silt loam. At the time of the survey the creek had a slow flow rate and may become stagnate during dry periods.

Water Quality

This section describes the quality of the water resources within the project area. Potential sediment loads and toxin concentrations of these waters from both point sources and nonpoint sources are evaluated. Water quality assessments are made based on published resource information and existing general watershed characteristics. These data provide insight into the value of water resources within the project area to meet human needs and to provide habitat for aquatic organisms.

Benthic Macroinvertebrate Ambient Network

The Benthic Macroinvertebrate Ambient Network (BMAN), managed by the DWQ, is part of an ongoing ambient water quality monitoring program which addresses long term trends in water quality. There are no BMAN monitoring station within the project vicinity. However, there is one station located approximately 7 miles downstream in Country Line Cr. at the NC 57 crossing. This station received a Good-Fair condition in August 1994.

Point source and Nonpoint source dischargers

Point source dischargers located throughout North Carolina are permitted through the National Pollutant Discharge Elimination System (NPDES) Program. Any discharger is required to register for a permit. There are no permitted dischargers within the project vicinity.

Nonpoint source discharge refers to runoff that enters surface waters through stormwater or snowmelt. Agricultural activities may serve as a source for various forms of nonpoint source pollutants. Land clearing and plowing disturbs soils to a degree where they are susceptible to erosion, which can lead to sedimentation in streams. Sediment is the most widespread cause of nonpoint source pollution in North Carolina. Pesticides, chemical fertilizers, and land application of animal wastes can be transported via runoff to receiving streams and potentially elevate concentrations of toxic compounds and nutrients. Animal wastes can also be source of bacterial contamination and elevate biochemical oxygen demand (BOD). Drainage ditches on poorly drained soils enhances the transportation of stormwater into surface waters (DEM, 1993). A primary nonpoint pollution source in the project vicinity is runoff from the adjacent agricultural field, which could contain chemicals used in the practice of farming. Another nonpoint pollution source is runoff from SR 1565 which could contain petroleum products deposited by automobiles.

Summary of Anticipated Impacts

Impacts to water resources in the project area are likely to result from activities associated with project construction. Activities likely to result in impacts are clearing and grubbing on streambanks, riparian canopy removal, instream construction, fertilizers and pesticides used in revegetation, and pavement installation. The following impacts to surface water resources are likely to result from the above mentioned construction activities.

- Increased sedimentation and siltation downstream of the crossing and increased erosion in the project area.
- Changes in light incidence and water clarity due to increased sedimentation and vegetation removal.
- Alteration of water levels and flows due to interruptions and/or additions to surface and ground water flow from construction.
- Changes in and destabilization of water temperature due to vegetation removal.
- Increased nutrient loading during construction via runoff from exposed areas.
- Increased concentrations of toxic compounds in roadway runoff.
- Increased potential for release of toxic compounds such as fuel and oil from construction equipment and other vehicles.
- Alteration of stream discharge due to silt loading and changes in surface and groundwater drainage patterns.

In order to minimize potential impacts to water resources in the project area, NCDOT's Best Management Practices for the Protection of Surface Waters will be strictly enforced during the construction phase of the project. Limiting instream activities and revegetating stream banks immediately following the completion of grading can further reduce impacts.

BIOTIC RESOURCES

Biotic resources include terrestrial and aquatic communities. This section describes the biotic communities encountered in the project area, as well as the relationships between fauna and flora within these communities. The composition and distribution of biotic communities throughout the project area are reflective of topography, soils, hydrology, and past and present land uses. These classifications follow Schafale and Weakley (1990) where possible. Representative animal species that are likely to occur in these habitats (based on published range distributions) are also cited.

Scientific nomenclature and common names (when applicable) are provided for each animal and plant species described. Subsequent references to the same organism refer to the common name only. Fauna observed during the site visit are denoted in the text with an asterisk (*).

Terrestrial communities

Descriptions of the two terrestrial systems are presented in the context of plant community classifications. Terrestrial wildlife relationships are discussed after the three terrestrial community descriptions.

Disturbed/maintained roadside community

This community is located on both sides of SR 1565 and may be impacted by Alternates 1A, 1B, and 2. Included in this community are two agricultural fields that lie adjacent to the roadside community, both north and south of SR 1565. Because of farming practices, mowing, and the use of herbicides, this community is kept in a constant state of early succession. The ground cover of this community is composed of several species of herbaceous grasses and weeds, that may include: common chickweed (*Stellaria media*)*, wild ginger (*Asarum canadense*)*, star toadflax (*Comandra umbellata*)*, field sorrel (*Rumex acetosella*)*, corn salad (*Valerianella olitoria*)*, viola (*Viola sp.*)*, wild geranium (*Geranium maculatum*)*, purple dead nettle (*Lamium purpureum*)*, panic grass (*Panicum* sp.), milkweed (*Asclepias* sp.), ragweed (*Ambrosia artemisifolia*), wood sorrel (*Oxalis* sp.), red clover (*Trifolium pratense*), thistle (*Carduus* sp.), beggar's tick (*Bidens* sp.), plantain (*Plantago* sp.), vaseygrass (*Paspalum* sp.), wingstem (*Actinomeris alternifolia*), and bluegrass (*Poa* sp.). Vines that occupy these areas include swamp rose (*Rosa* sp.), Virginia creeper (*Parthenocissus quinquefolia)**, trumpet vine (*Campsis radicans*), Japanese honeysuckle (*Lonicera japonica*)*, and blackberry (*Rubus* sp.)*. Often, the duration between maintenance sessions of highway right-of-ways is quite long, allowing time for larger herbaceous shrubs and woody vegetation to inhabit this disturbed area. Some of these herbaceous shrubs and woody vegetation that may inhabit this disturbed community include: hazelnut (*Corylus americana*), sweet gum (*Liquidambar styraciflua*)*, red maple (*Acer rubrum*)*, tulip poplar (*Lirodendron tulipifera*)*, scrub pine (*Pinus virginiana*), black walnut (*Juglans nigra*), evening primrose (*Oenothera biennis*), and smooth sumac (*Rhus glabra*).

Piedmont Bottomland Forest

This community is located on both sides of the tributaries that are being bridged and adjacent to the maintained/disturbed roadside community. The canopy layer in this community is composed of primarily sweet gum (*Liquidambar styraciflua*)*, river burch (*Betula nigra*)*, sycamore (*Platanus occidentalis*)*, red maple (*Acer rubrum*)*, and American elm (*Ulmus americana*)*. The understory is sparse and comprised of saplings of black cherry (*Prunus serotina*)*, red maple*, box elder (*Acer negunda*)*, blackhaw (*Viburnum prunifolium*)*, paw paw (*Asimina triloba*), spicebush (*Lindera melissafolium*)*, muscle wood (*Carpinus caroliniana*)*, bladdernut (*Staphylea trifolia*)*, and American elm*. The herbaceous layer is comprised of many species of plants. Some of these include bedstraws (*Galium spp.*)*, pale indian plantain (*Cacalia atriplicifolia*)*, bluegrass (*Poa spp.*)*, false nettle (*Boehmeria cylindrica*)*, white wood aster (Aster divaricatus), and various sedges (*Carex spp.*)*. Vines are frequently prominent in this community and may include Japanese honeysuckle*, crossvine (*Bignonia capreolata*)*, virgin's bower (*Clematis virginiana*)*, muscadine (*Vitis rotundifolia*)*, and poison ivy (*Toxicodendron radicans*)*. There is a wetland within this community on the east and west ends of the project associated with Country Line Creek and the unnamed tributary crossed by bridges 11 and 72, both north and south of SR 1565. This area is frequently flooded and ephemeral pools exist in the area due to the flooding. Low soil chroma values were observed in the wetland, as defined by Munsell color chart, in this area they were a 5/2 (10yr page). Representative vegetation in the wetland community included a canopy of red maple, river birch, sycamore, and sweetgum. The understory was comprised of black willow (*Salix nigra*), muscle wood, box elder, pepperbush

(*Clethra alnifolia*), and possum-haw (*Viburnum nudum*). Vines found in the wetland are trumpet creeper (*Campsis radicans*), poison ivy (*Rhus radicans*), and Virginia creeper. The herbaceous layer included netted chainfern (*Woodwardia areolata*), rush (*Juncus sp.*), and knotweed (*Polygonum sp.*). The combined wetland area on the east and west end of the project that may be impacted by alternate 1a,1b, and 2 is approximately 0.16 acre (0.07 ha).

Terrestrial Wildlife

The disturbed/maintained roadside and agricultural fields adjacent to forested tracts provide rich ecotones for foraging, while the forests provide forage areas and cover. Birds that are often associated with ecotones between these communities are ruby-crowned kinglet (*Regulus calendula*), Carolina chickadee (*Parus carolinensis*), bluebird (*Sialia sialis*), downy woodpecker (*Picoides pubescens*), yellow-throated warbler (*Dendroica dominica*)*, blue-gray gnatcatcher (*Polioptila caerulea*)*, white-breasted nuthatch (*Sitta carolinensis*), northern cardinal (*Cardinalis cardinalis*), ruby-throated hummingbird (*Archilochus colubris*), indigo bunting (*Passerina cyanea*), yellow-billed cuckoo (*Coccyzus americanus*), blue jay (*Cyanocitta cristata*), tuffed titmouse (*Parus bicolor*)*, acadian flycatcher (*Empidonax traillii*), and mourning dove (*Zenaida macroura*)*. The red-tailed hawk (*Bueto jamaicensis*) is a major predator in this habitat, feeding on small mammals, reptiles, and amphibians.

Small mammals may inhabit these early successional habitats along forested areas, roadsides, and streams for nesting and feeding. Some of these small mammals include, woodchuck (*Marmota monax*), white-footed mouse (*Peromyscus leucopus*), least shrew (*Crypototis parva*), southern short-tailed shrew (*Blarina carolinensis*), hispid *cottonrat (Sigmodon hispidus*), and eastern cottontail rabbit (*Sylvilagus floridanus*).

Larger mammals may be present in these habitat areas during the four seasons for foraging, feeding, watering, bedding, and mating. Some of these larger mammals include: raccoon (*Procyon lotor*), white-tailed deer (*Odocoilus virginiana*), opossum (*Didelphis virginiana*), eastern gray squirrel (*Sciurus carolinensis*), red fox (*Vulpes vulpes*), and gray fox (*Urocyon cinereoargenteus*).

Reptiles and amphibians that may inhabit these community types include queen snake (*Regina septenvittata*), black rat snake (*Elaphe obsoleta*), copperhead (*Aghistrodon contortrix*), garter snake (*Thamnophis sirtalis*), American toad (*Bufo americanus*), Fowler's toad *(Bufo woodhousii*), fence lizard (*Sceloporus undulatus*), and five-lined skink (*Eumeces laticeps*).

Aquatic Community

This community consists of Country Line Creek and an unnamed tributary to Country Line Creek. Research has shown that a large amount of food chain energy of stream communities is derived from allochthonous (produced outside the river ecosystem) sources, in the form of terrestrial detritus. Rocks, fallen debris (logs, sticks, etc.), and low velocity areas in the river trap detritus within the river. The detritus is then decomposed by heterotrophic microorganisms, such as bacteria and consumed by macroinvertebrates, such as aquatic insects. In turn, the aquatic

insects are then consumed by larger organisms. The amount of allochthonous energy input within a river varies seasonally. Autochthonous (produced within the river ecosystem) energy sources include planktonic and benthic micro and macro algae as well as aquatic vascular vegetation. Fallen logs in the water and rock surfaces offer an attachment substrate for algae.

Aquatic insects found in this community include the water strider* (*Gerris* spp.), water beetle (Dytiscidae), stonefly (Plecoptera), cranefly (*Tipula* spp.), caddisfly (Trichoptera), stream mayfly (Ephemeroptera), and black-winged damselfly (*Calopteryx maculata).*

Aquatic insects found in this community may be eaten by gamefish and other fishes that may occur in Country Line Creek and the tributary. Gamefish such as chain pickeral (*Esox nigra*), largemouth bass (*Micropterus salmoides*), and sunfishes (*Lepomis* spp.) may occupy these tributaries. Other fishes, such as shiners (*Notropis* spp.), golden shiners (*Notemigonus crysoleucas*), eastern mosquitofish *(Gambusia affinis*), darters (*Etheostoma* spp.)*, chubs (*Semotilus* spp.), daces (*Clinostomus* spp.), and catfishes (Ictaluridae) may occupy these tributaries as well.

Several other animals representing all vertebrate classes are integral parts of the aquatic system. The northern dusky salamander (*Desmognathus fuscus*) and the two-lined salamander (*Eurycea bislineata*) may occur under rocks and logs within the riverbed. Frogs, such as pickeral frog (R*ana palustris*), southern leopard frog (*Rana sphenocephala*), and bullfrog (*Rana catesbeiana),* may occur in this habitat along stream banks feeding on aquatic invertebrates. Other reptiles and amphibians occurring in this habitat feeding on small fish and mussels may include northern water snake (*Nerodia sipedon*) and snapping turtle (*Chelydra serpentina*).

Summary of Anticipated Impacts

Construction of the proposed project will have various impacts on the biotic resources described. Any construction related activities in or near these resources have the potential to impact biological functions. This section quantifies and qualifies potential impacts to the natural communities within the project area in terms of the area impacted and the organisms affected. Temporary and permanent impacts are considered here as well, along with recommendations to minimize or eliminate impacts.

Terrestrial Impacts

Impacts to terrestrial communities will result from project construction due to the clearing and paving of portions of the project area, and thus the loss of community area. Table 2 (page 12) summarizes potential losses to these communities, resulting from project construction. Calculated impacts to terrestrial communities reflect the relative abundance of each community present in the study area. Estimated impacts are derived based on the project lengths described above in Section III-D (page 3) and the entire proposed right-of-way width of 80 feet (24.4 meters) for the bridge replacement for alternate 1A, 1B, and 2, and a proposed right-of-way width of 60 feet (18.2 meters) for the on-site detour. However, project construction often does not require the entire right-of-way; therefore, actual impacts may be considerably less.

Table 2. Estimated Area Impacts to Terrestrial Communities.

Community	Impacted Area acre (ha)		
	Alt. 1A & B*	**Alt. 2***	**On-Site Detour ****
Maintained / Disturbed Roadside	0.92 ac (0.37 ha)	1.78 ac (0.72 ha)	1.01 ac (0.40 ha)
Piedmont Bottomland Forest	0.44 ac (0.18 ha)	1.24 ac (0.46 ha)	0.93 ac (0.38 ha)
Total Impacts	**1.36 ac (0.55 ha)**	**3.02 ac (1.18 ha)**	**1.94 ac (0.78 ha)**

*Permanent Impacts
**Temporary Impacts

Aquatic Impacts

Impacts to the aquatic communities of Country Line Creek and the tributary to Country Line Creek will result from the replacement of Bridge No.'s 11 and 72. Impacts are likely to result from the physical disturbance of aquatic habitats (i.e. substrate and water quality). Disturbance of aquatic habitats has a detrimental effect on aquatic community composition by reducing species diversity and the overall quality of aquatic habitats. Physical alterations to aquatic habitats can result in the following impacts to aquatic communities:

- Inhibition of plant growth.
- Algae blooms resulting from increased nutrient concentrations.
- Loss of benthic macroinvertebrates through scouring resulting from an increased sediment load.

Impacts to aquatic communities can be minimized by strict adherence to Best Management Practices (BMP's).

Bridge No. 11 is located on SR 1565 over Country Line Creek in Caswell County. The bridge is composed completely of timber and steel. Therefore, Bridge No. 11 will be removed without dropping any component into Waters of the United States during construction. Bridge demolition is classified as a Case 3 - (*there are no special restrictions other than those outlined in the Best Management Practices for Protection of Surface Waters*).

Bridge No. 72 is located on SR 1565 over Country Line Creek in Caswell County. The bridge is composed completely of timber. Therefore, Bridge No. 72 will be removed without dropping any component into Waters of the United States during construction. Bridge demolition is classified as a Case 3 - (*there are no special restrictions other than those outlined in the Best Management Practices for Protection of Surface Waters*).

Due to the potential sedimentation concerns resulting from demolition of the bridges, where it is possible to do so, a turbidity curtain shall be included to contain and minimize sedimentation in the stream.

For the protection of Surface Waters, Best Management Practices for Bridge Demolition and Removal will be adhered to.

Natural resource recommendation for alternates

Natural resource issues should be major concerns during transportation improvement project development. The proper alignment chosen will have variable impacts on natural resources. From a natural resources perspective, Alternate 1A is the recommended and preferred alternate with the least natural resource impacts.

JURISDICTIONAL TOPICS

This section provides inventories and impact analyses pertinent to two significant regulatory issues: Waters of the United States and Rare and Protected species. These issues retain particular significance because of federal and state mandates that regulate their protection. This section deals specifically with the impact analyses required to satisfy regulatory authority prior to project construction.

Waters of the United States

Surface waters and wetlands fall under the broad category of "Waters of the United States," as defined in Title 33 of the Code of Federal Regulations (CRF) Part 328.3. Any action that proposes to dredge or place fill material into surface waters or wetlands falls under the jurisdiction of the U.S. Army Corps of Engineers (COE) under Section 404 of the Clean Water Act (33 U.S.C. 1344). Surface waters include all standing or flowing waters which have commercial or recreational value to the public. Wetlands are identified based on the presence of hydric soils, hydrophytic vegetation, and saturated or flooded conditions during all or part of the growing season.

Characteristics of Wetlands and Surface Waters

Criteria to delineate jurisdictional wetlands include evidence of hydric soils, hydrophytic vegetation and hydrology. Jurisdictional wetland impacts are likely to be ($\geq$0.16 acres [0.06 ha]). Impacts to jurisdictional surface waters are calculated based on the linear feet of the stream that is located within the proposed right-of-way. Physical aspects of surface waters are described in the Best Usage Classification section (page 6). Impacts to jurisdictional surface waters within in the project right-of-way could possibly impact, but not to exceed, 80 linear feet (24.3 meters) of creek (proposed right-of-way) for alternate 1 and alternate 2. The on-site detour possible impacts would not exceed 60 linear feet (18.2 meters) of creek (proposed right-of-way).

Permits

Impacts to jurisdictional surface waters are anticipated from the proposed project. As a result, construction activities will require permits and certifications from various regulatory agencies in

charge of protecting the water quality of public water resources.

A Nationwide Permit 33 CFR 330.5(a) (23) is likely to be applicable for all impacts to Waters of the United States resulting from the proposed project. This permit authorizes activities undertaken, assisted, authorized, regulated, funded or financed in whole, or part, by another Federal agency or department where that agency or department has determined that pursuant to the council on environmental quality regulation for implementing the procedural provisions of the National Environmental Policy Act:

1. that the activity, work, or discharge is categorically excluded from environmental documentation because it is included within a category of actions which neither individually nor cumulatively have a significant effect on the human environment, and;
2. that the office of the Chief of Engineers has been furnished notice of the agency's or department's application for the categorical exclusion and concurs with that determination.

This project will also require a 401 Water Quality Certification from the DWQ prior to the issuance of the Nationwide Permit. Section 401 of the Clean Water Act requires that the state issue or deny water certification for any federally permitted or licensed activity that may result in a discharge to Waters of the United States. Section 401 Certification allows surface waters to be temporarily impacted for the duration of the construction or other land manipulation. The issuance of a 401 permit from the DWQ is a prerequisite to issuance of a Section 404 permit.

Avoidance, Minimization, Mitigation

The COE has adopted through the Council on Environmental Quality (CEQ) a wetland mitigation policy which embraces the concept of "no net loss of wetlands" and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of Waters of the United States, specifically wetlands. Mitigation of wetland impacts has been defined by the CEQ to include: avoiding impacts (to wetlands), minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts (40 CFR 1508.20). Each of these three aspects (avoidance, minimization and compensatory mitigation) must be considered sequentially.

Avoidance mitigation examines all appropriate and practicable possibilities of averting impacts to Waters of the United States. According to a 1990 Memorandum of Agreement (MOA) between the Environmental Protection Agency (EPA) and the COE, in determining "appropriate and practicable" measures to offset unavoidable impacts, such measures should be appropriate to the scope and degree of those impacts and practicable in terms of cost, existing technology, and logistics in light of overall project purposes.
Minimization includes the examination of appropriate and practicable steps to reduce the adverse impacts to Waters of the United States. Implementation of these steps will be required through project modifications and permit conditions. Minimization typically focuses on decreasing the footprint of the proposed project through the reduction to median widths, right-of-way widths, fill slopes, and/or road shoulder widths.

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

Compensatory mitigation is required for those projects authorized under Nationwide Permits that result in the fill or alteration of:

- More than 0.10 ac (0.04 ha) of wetlands will require compensatory mitigation;
- And/or more than 150 linear feet (45.7 meters) of streams will require compensatory mitigation.

Written approval of the final mitigation plan is required from the DWQ prior to the issuance of a 401 Certification. Final permit/mitigation decisions rest with the COE; although, compensatory mitigation may be required due to wetland impacts (i.e. $\geq$0.16 acres [0.06 ha] of wetlands). Compensatory stream mitigation is not expected due to limited impacts (i.e. $\leq$150 feet [45.7 meters] of linear streams).

Rare and Protected Species

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

Federally-Protected Species

Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under the provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of March 22, 2001, the FWS lists the James River Spiny mussel as the only species federally-protected for Caswell County.

On November 29, 2000, field surveys were conducted by the NCDOT biologist. No federally listed endangered or threatened species were observed during the surveys. Therefore the biological conclusion is No Effect.

Federal Species of Concern and State Listed Species

Federal species of concern are not afforded federal protection under the Endangered Species Act and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. However, the status of these species is subject to change, and so should be included for consideration. Federal Species of Concern (FSC) are defined as a species that is under consideration for listing for which there is insufficient information to support listing. In addition, organisms which are listed as Endangered (E), Threatened (T), or Special Concern (SC) by the North Carolina Natural Heritage Program list of Rare Plant and Animal Species are afforded state protection under the NC State Endangered Species Act and the NC Plant Protection and Conservation Act of 1979. There are three federal species of concern listed by the FWS for Caswell County.

Table 3. Federal Species of Concern for Caswell County.

Scientific Name	Common Name	NC Status	Habitat
Fusconaia masoni	Atlantic Pigtoe	T	Present
Isoetes virginica	Virginia quillwort	C*	Absent
Lotus helleri	Heller's trefoil	C*	Present

- "T"--A Threatened species is one which is likely to become endangered species within the foreseeable future throughout all or a significant portion of its range.
- "C"--A Candidate species is one which is very rare in North Carolina, generally with 1-20 populations in the state, generally substantially reduced in numbers by habitat destruction, direct exploitation or disease. The species is also either rare throughout its range or disjunct in North Carolina from a main range in a different part of the country or the world.

* Historic record - the species was last observed in the county more than 50 years ago.

A review of the NCNHP database of rare species and unique habitats shows no occurrences of rare species within the project vicinity.

VI. CULTURAL RESOURCES

A. Compliance Guidelines

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

B. Historic Architecture

On February 29, 2000, the State Historic Preservation Office (SHPO) reviewed the subject project. Subsequently, no known historic architecture structures are located within the area of potential effect. The SHPO concurs that the project is not likely to affect any resources of historical significance (see letter dated August 6, 2001).

C. Archaeology

The State Historic Preservation Office (SHPO) reviewed the subject project. There are no known archaeological sites within the proposed project area, and no archaeological investigation need be conducted (see letter dated August 6, 2001).

VII. GENERAL ENVIRONMENTAL EFFECTS

This project is expected to have an overall positive impact. Replacement of an inadequate bridge will result in safer traffic operations.

This project is considered to be a "Categorical Exclusion" due to its limited scope and insignificant environmental consequences.

This bridge replacement will not have a substantial adverse effect on the quality of the human or natural environment by implementing the environmental commitments listed on the Project Commitments Sheet (Green Sheet) of this document in addition to use of current NCDOT standards and specifications.

The project is not in conflict with any plan, existing land use, or zoning regulation. No change in land use is expected to result from construction of this project.

There are no hazardous waste impacts.

No adverse effect on families or communities is anticipated. Right-of-way acquisition will be limited. No relocatees are expected with implementation of the proposed alternative.

No adverse effect on public facilities or services is expected. The project is not expected to adversely affect social, economic, or religious opportunities in the area.

There are no publicly owned parks, recreational facilities, or wildlife and waterfowl refuges of national, state, or local significance in the vicinity of the project. This project will not impact any resource protected by Section 4(f) of the US Department of Transportation Act of 1966.

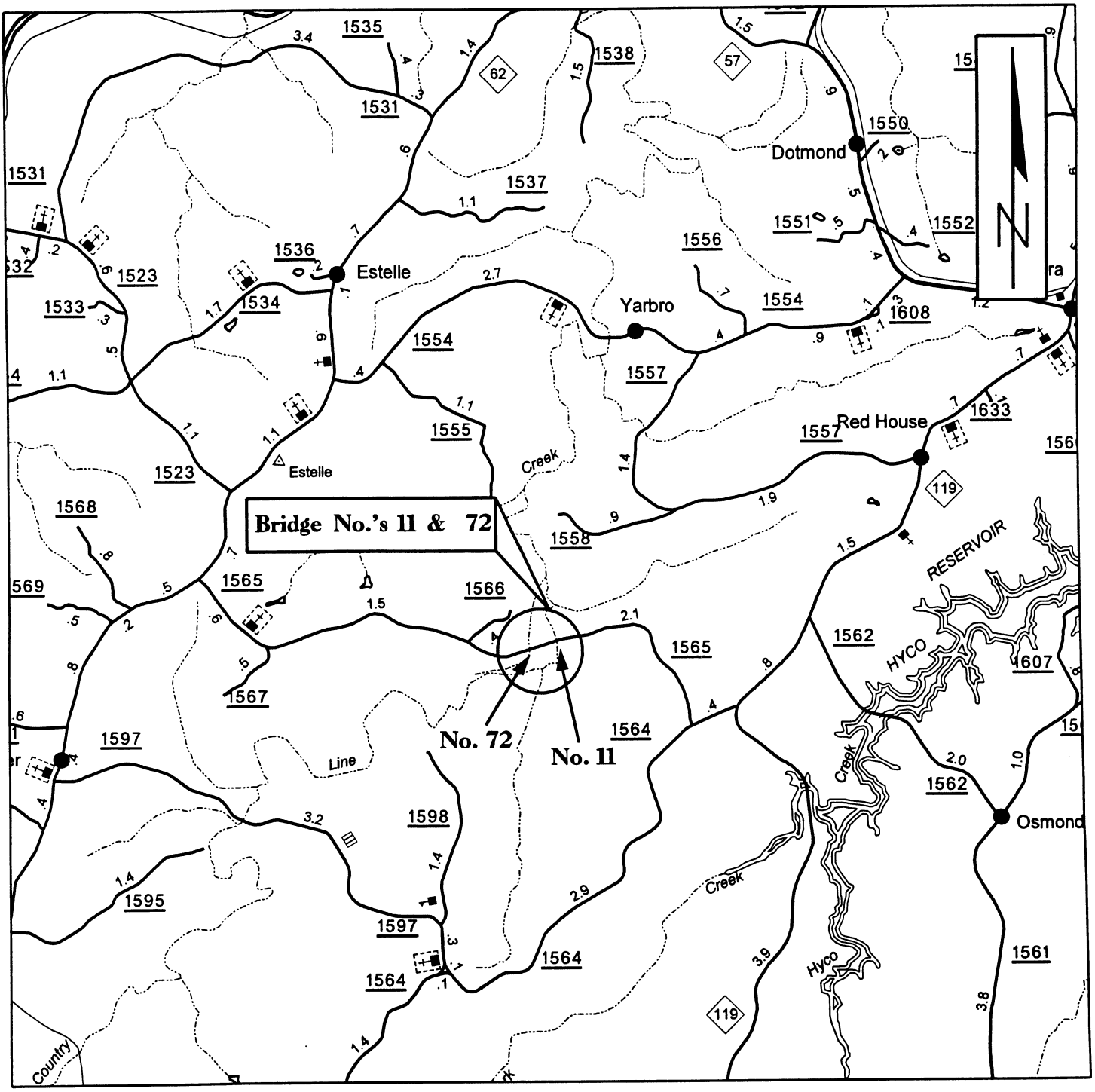
This project has been coordinated with the United States Natural Resources Conservation Service. The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impact to prime farmland of all land acquisition and construction

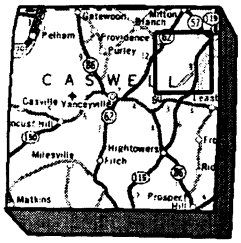
projects. With the exception of the construction of a temporary detour, all work will be done within the existing right-of-way. There are no soils classified as prime, unique, or having state or local importance in the vicinity of the project. Therefore, the project will not involve the direct conversion of farmland acreage within these classifications.

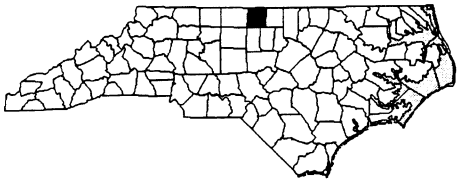
This project is an air quality "neutral" project, so it is not required to be included in the regional emissions analysis and a project level CO analysis is not required. If vegetation is disposed of by burning, all burning shall be done in accordance with applicable local laws and regulations of the North Carolina State Implementation Plan (SIP) for air quality in compliance with 15 NCAC 2D.0520.

Noise levels could increase during construction but will be temporary. This evaluation completes the assessment requirements for highway traffic noise of Title 23, Code of Federal Regulation (CFR), Part 772 and for air quality (1990 Clean Air Act Amendments and the National Environmental Policy Act) and no additional reports are required.

The proposed bridge replacement project will not raise the existing flood levels or have any significant adverse effect on the existing floodplain.





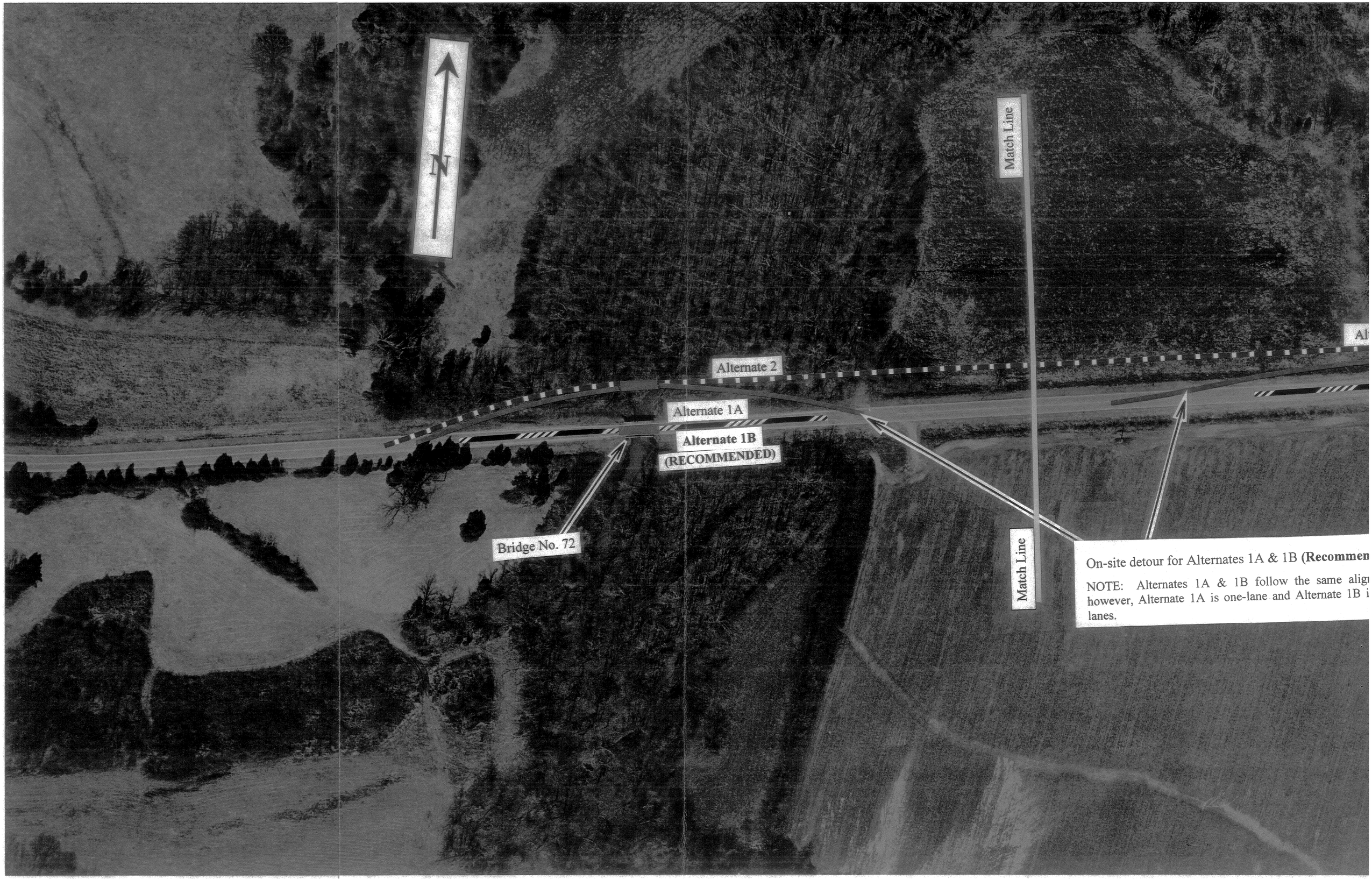


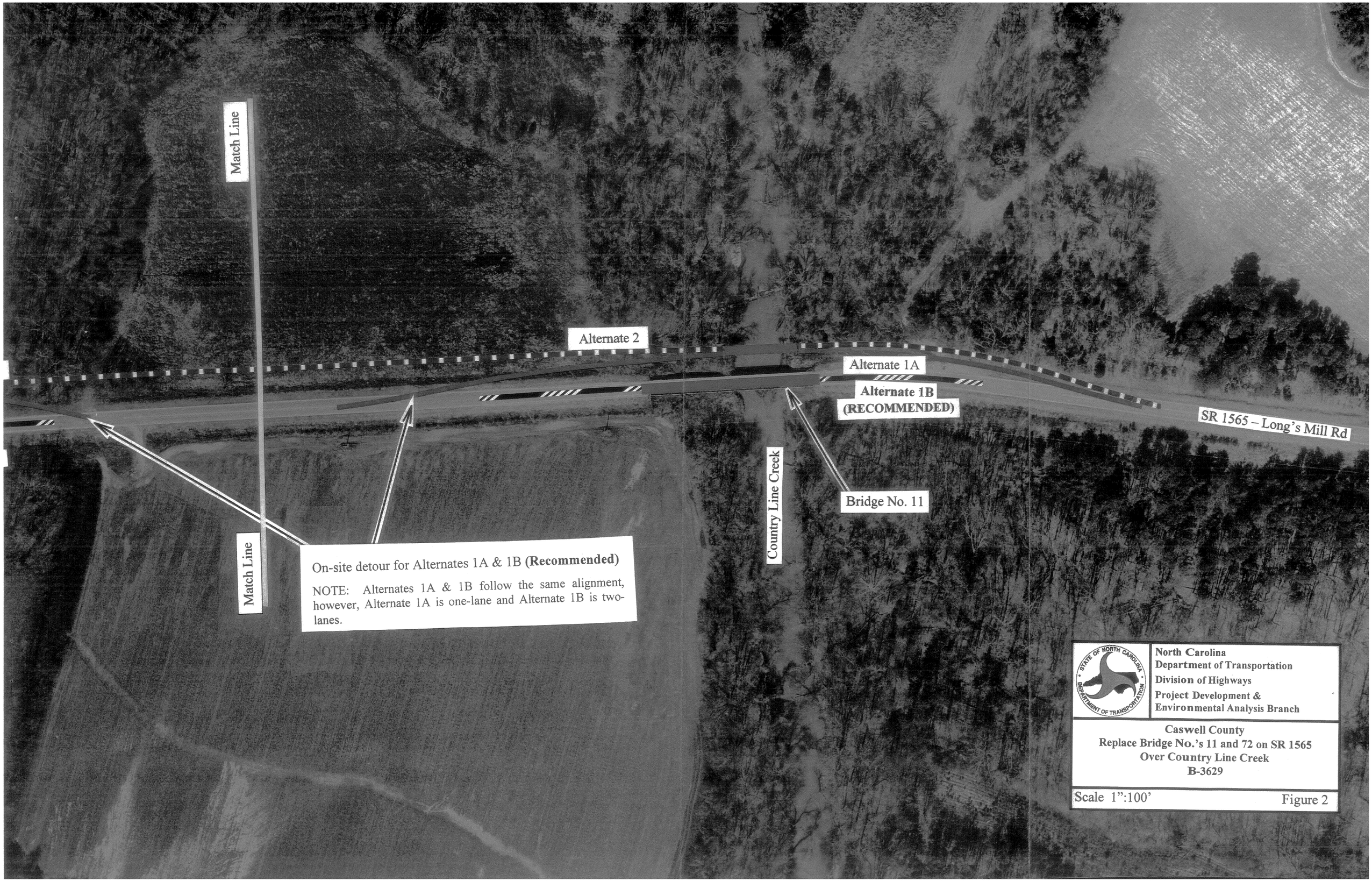
North Carolina Department of Transportation
Division of Highways
Project Development & Environmental Analysis Branch

Caswell County
Replace Bridge No.'s 11 & 72 on SR 1565 over Country Line Creek
B-3629

SCALE: 1 in = 1 mi

Figure 1


N
Match Line
Alternate 2
Alternate 1A
Alternate 1B
(RECOMMENDED)
Bridge No. 72
Match Line
On-site detour for Alternates 1A & 1B (Recommen
NOTE: Alternates 1A & 1B follow the same alig
however, Alternate 1A is one-lane and Alternate 1B i
lanes.



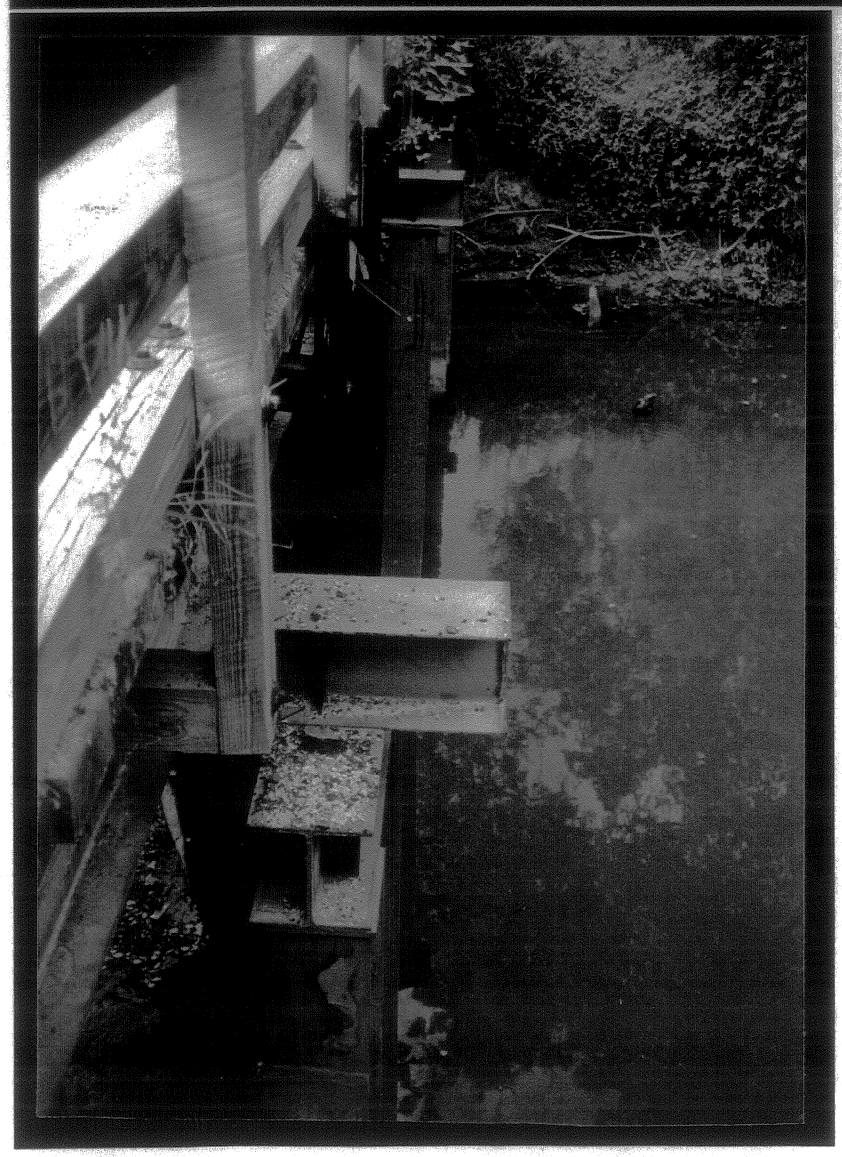
North Carolina
Department of Transportation
Division of Highways
Project Development &
Environmental Analysis Branch

Caswell County
Replace Bridge No.'s 11 and 72 on SR 1565
Over Country Line Creek
B-3629

Scale 1":100'

Figure 2

Bridge No. 11 – Looking East from the bridge



Bridge No. 11 – North Face of Bridge

B-3629

FIGURE 3A

Bridge No. 72 – Looking East from the Bridge

Bridge No. 72 – North Face of Bridge

B-3629 **FIGURE 3B**

North Carolina Department of Cultural Resources
State Historic Preservation Office
David L. S. Brook, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary

Division of Archives and History
Jeffrey J. Crow, Director

August 6, 2001

MEMORANDUM

To: William D. Gilmore, P.E., Manager
NCDOT, Project Development & Environmental Analysis Branch

From: David Brook RLH for David Brook
Deputy State Historic Preservation Officer

Re: Replace Bridge No.'s 11 and 72 on SR 1565 over Country Line Creek, TIP No. B-3629, Caswell County, ER 00-7866

Thank you for your memorandum of July 11, 2001, concerning the above project.

We have conducted a review of the project and are aware of no properties of architectural, historic, or archaeological significance, which would be affected by the project. Therefore, we have no comment on the project as currently proposed.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, Environmental Review Coordinator, at 919/733-4763.

DB:kgc

cc: Mary Pope Furr, NCDOT
T. Padgett, NCDOT

	Location	Mailing Address	Telephone/Fax
Administration	507 N. Blount St, Raleigh, NC	4617 Mail Service Center, Raleigh 27699-4617	(919) 733-4763 •733-8653
Restoration	515 N. Blount St, Raleigh , NC	4613 Mail Service Center, Raleigh 27699-4613	(919) 733-6547 •715-4801
Survey & Planning	515 N. Blount St, Raleigh, NC	4618 Mail Service Center, Raleigh 27699-4618	(919) 733-4763 •715-4801

B-3629

North Carolina Wildlife Resources Commission

512 N. Salisbury Street, Raleigh, North Carolina 27604-1188, 919-733-3391
Charles R. Fullwood, Executive Director

MEMORANDUM

TO: Robin Young, Project Planning Engineer
Project Development & Environmental Analysis Branch, NCDOT

FROM: David Cox, Highway Project Coordinator
Habitat Conservation Program

DATE: December 6, 1999

SUBJECT: NCDOT Bridge Replacements in Caswell, Chatham, and Guilford counties. TIP Nos. B-3627, B-3629, B-3630, B-3631, B-3632, B-3633, B-3823, B-3462, B-3463, B-3646, B-3647, and B-3648.

Biologists with the N. C. Wildlife Resources Commission (NCWRC) have reviewed the information provided and have the following preliminary comments on the subject project. Our comments are provided in accordance with provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

On bridge replacement projects of this scope our standard recommendations are as follows:

1. We generally prefer spanning structures. Spanning structures usually do not require work within the stream and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allows for human and wildlife passage beneath the structure, does not block fish passage, and does not block navigation by canoeists and boaters.

2. Bridge deck drains should not discharge directly into the stream.

3. Live concrete should not be allowed to contact the water in or entering into the stream.

4. If possible, bridge supports (bents) should not be placed in the stream.

5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.

6. A clear bank (riprap free) area of at least 10 feet should remain on each side of the steam underneath the bridge.

7. In trout waters, the N.C. Wildlife Resources Commission reviews all U.S. Army Corps of Engineers nationwide and general '404' permits. We have the option of requesting additional measures to protect trout and trout habitat and we can recommend that the project require an individual '404' permit.

8. In streams that contain threatened or endangered species, NCDOT biologist Mr. Tim Savidge should be notified. Special measures to protect these sensitive species may be required. NCDOT should also contact the U.S. Fish and Wildlife Service for information on requirements of the Endangered Species Act as it relates to the project.

9. In streams that are used by anadromous fish, the NCDOT official policy entitled "Stream Crossing Guidelines for Anadromous Fish Passage (May 12, 1997)" should be followed.

10. In areas with significant fisheries for sunfish, seasonal exclusions may also be recommended.

If corrugated metal pipe arches or concrete box culverts are used:

1. The culvert must be designed to allow for fish passage. Generally, this means that the culvert or pipe invert is buried at least 1 foot below the natural stream bed. If multiple cells are required the second and/or third cells should be placed so that their bottoms are at stream bankful stage (similar to Lyonsfield design). This will allow sufficient water depth in the culvert or pipe during normal flows to accommodate fish movements. If culverts are long, baffle systems are required to trap gravel and provide resting areas for fish and other aquatic organisms.

2. If multiple pipes or cells are used, at least one pipe or box should be designed to remain dry during normal flows to allow for wildlife passage.

3. Culverts or pipes should be situated so that no channel realignment or widening is required. Widening of the stream channel at the inlet or outlet of structures usually causes a decrease in water velocity causing sediment deposition that will require future maintenance.

4. Riprap should not be placed on the stream bed.

In most cases, we prefer the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to

avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure should be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed down to the natural ground elevation. The area should be stabilized with grass and planted with native tree species. If the area that is reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be used as wetland mitigation for the subject project or other projects in the watershed.

Project specific comments:

1. B-3627 – Caswell County – Bridge No. 24 over (North) Hyco Creek. This bridge should be replaced with a bridge. There appears to be high quality wetlands on both sides of the bridge. If an on-site detour is necessary, we recommend the upstream side of the bridge. Standard recommendations apply.

2. B-3629 – Caswell County – Bridge No. 11 over Country Line Creek. We recommend replacing this bridge with a bridge. Standard recommendations apply.

3. B-3630 – Caswell County – Bridge No. 70 over Lynch Creek. We recommend replacing this bridge with a bridge. Standard recommendations apply.

4. B-3631 – Caswell County – Bridge No. 105 over a prong of County Line Creek. No specific comments. Standard recommendations apply.

5. B-3632 – Chatham County – Bridge No. 200 over Bear Creek. We would recommend replacing this bridge with a bridge. A significant fishery exists for sunfish and largemouth bass immediately downstream of this site. We recommend an in-water work moratorium from April 1 to June 15 to minimize impacts to spawning sunfish and largemouth bass. There are also records of the federally endangered Cape Fear shiner (*Notropis mekistocholas*) in the vicinity of this bridge. We recommend that NCDOT biologist, Tim Savidge, be notified and an on-site inspection be scheduled with NCWRC and USFWS biologists as soon as possible.

6. B-3633 – Chatham County – Bridge No. 247 over Little Brush Creek. We recommend replacing this bridge with a bridge. Standard recommendations apply.

7. B-3823 – Chatham County – Bridge No. 40 over Landrum Creek. We would recommend replacing this bridge with a bridge. A significant fishery exists for sunfish and largemouth bass of this site. We recommend an in-water work moratorium from April 1 to June 15 to minimize impacts to spawning sunfish and largemouth bass. There are also records of the federally endangered Cape Fear shiner (*Notropis mekistocholas*) in the vicinity of this bridge. We recommend that NCDOT biologist, Tim Savidge, be notified and an on-site inspection be scheduled with NCWRC and USFWS biologists as soon as possible.

8. B-3462 – Guilford County – Bridge No. 194 over Buffalo Creek. We recommend replacing this bridge with a bridge. Standard recommendations apply.

9. B-3463 – Guilford County – Bridge No. 171 over South Buffalo Creek. We recommend replacing this bridge with a bridge. Standard recommendations apply.

10. B-3646 – Guilford County – Bridge No. 185 over Haw Creek. Standard recommendations apply.

11. B-3647 – Guilford County – Bridge No. 172 over North Buffalo Creek. We recommend replacing this bridge with a bridge. Standard recommendations apply.

12. B-3648 – Guilford County – Bridge No. 158 over North Buffalo Creek. We recommend replacing this bridge with a bridge. Standard recommendations apply.

We request that NCDOT routinely minimize adverse impacts to fish and wildlife resources in the vicinity of bridge replacements. The NCDOT should install and maintain sedimentation control measures throughout the life of the project and prevent wet concrete from contacting water in or entering into these streams. Replacement of bridges with spanning structures of some type, as opposed to pipe or box culverts, is recommended in most cases. Spanning structures allow wildlife passage along streambanks, reducing habitat fragmentation and vehicle related mortality at highway crossings.

If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (919) 528-9886. Thank you for the opportunity to review and comment on these projects.

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

TO: Robin Young, Project Engineer
Project Development and Environmental Analysis Branch, NCDOT

FROM: David Cox, Highway Project Coordinator
Habitat Conservation Program

DATE: January 28, 2002

SUBJECT: NCDOT Bridge Replacement in Caswell County of North Carolina. TIP No. B-3629.

Biologists with the N. C. Wildlife Resources Commission (NCWRC) have reviewed the information provided and have the following preliminary comments on the subject project. Our comments are provided in accordance with provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

On bridge replacement projects of this scope our standard recommendations are as follows:

1. We generally prefer spanning structures. Spanning structures usually do not require work within the stream and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allows for human and wildlife passage beneath the structure, does not block fish passage, and does not block navigation by canoeists and boaters.

2. Bridge deck drains should not discharge directly into the stream.

3. Live concrete should not be allowed to contact the water in or entering into the stream.

4. If possible, bridge supports (bents) should not be placed in the stream.

5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain

Mailing Address: Division of Inland Fisheries • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 733-3633 ext. 281 • **Fax:** (919) 715-7643

saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.

6. A clear bank (riprap free) area of at least 10 feet should remain on each side of the steam underneath the bridge.

7. In trout waters, the N.C. Wildlife Resources Commission reviews all U.S. Army Corps of Engineers nationwide and general '404' permits. We have the option of requesting additional measures to protect trout and trout habitat and we can recommend that the project require an individual '404' permit.

8. In streams that contain threatened or endangered species, NCDOT biologist Mr. Tim Savidge should be notified. Special measures to protect these sensitive species may be required. NCDOT should also contact the U.S. Fish and Wildlife Service for information on requirements of the Endangered Species Act as it relates to the project.

9. In streams that are used by anadromous fish, the NCDOT official policy entitled "Stream Crossing Guidelines for Anadromous Fish Passage (May 12, 1997)" should be followed.

10. In areas with significant fisheries for sunfish, seasonal exclusions may also be recommended.

11. Sedimentation and erosion control measures sufficient to protect aquatic resources must be implemented prior to any ground disturbing activities. Structures should be maintained regularly, especially following rainfall events.

12. Temporary or permanent herbaceous vegetation should be planted on all bare soil within 15 days of ground disturbing activities to provide long-term erosion control.

13. All work in or adjacent to stream waters should be conducted in a dry work area. Sandbags, rock berms, cofferdams, or other diversion structures should be used where possible to prevent excavation in flowing water.

14. Heavy equipment should be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams.

15. Only clean, sediment-free rock should be used as temporary fill (causeways), and should be removed without excessive disturbance of the natural stream bottom when construction is completed.

16. During subsurface investigations, equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

If corrugated metal pipe arches, reinforced concrete pipes, or concrete box culverts are used:

1. The culvert must be designed to allow for fish passage. Generally, this means that the culvert or pipe invert is buried at least 1 foot below the natural stream bed. If multiple cells are required the second and/or third cells should be placed so that their bottoms are at stream bankful stage (similar to Lyonsfield design). This could be

accomplished by constructing a low sill on the upstream end of the other cells that will divert low flows to another cell. This will allow sufficient water depth in the culvert or pipe during normal flows to accommodate fish movements. If culverts are long, notched baffles should be placed in reinforced concrete box culverts at 15 foot intervals to allow for the collection of sediments in the culvert, to reduce flow velocities, and to provide resting places for fish and other aquatic organisms moving through the structure.

2. If multiple pipes or cells are used, at least one pipe or box should be designed to remain dry during normal flows to allow for wildlife passage.

3. Culverts or pipes should be situated so that no channel realignment or widening is required. Widening of the stream channel at the inlet or outlet of structures usually causes a decrease in water velocity causing sediment deposition that will require future maintenance.

4. Riprap should not be placed on the stream bed.

In most cases, we prefer the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure should be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed down to the natural ground elevation. The area should be stabilized with grass and planted with native tree species. If the area that is reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be used as wetland mitigation for the subject project or other projects in the watershed.

Project specific comments:

1. B-3629 – Caswell County – Bridge No. 11 and 72 over Country Line Creek. We are resubmitting comments on this project due to a change in scope. We have previously submitted comments for bridge No. 11. The previously submitted comments, along with our general guidance, apply to both bridge replacements.

We request that NCDOT routinely minimize adverse impacts to fish and wildlife resources in the vicinity of bridge replacements. The NCDOT should install and maintain sedimentation control measures throughout the life of the project and prevent wet concrete from contacting water in or entering into these streams. Replacement of bridges with spanning structures of some type, as opposed to pipe or box culverts, is recommended in most cases. Spanning structures allow wildlife passage along streambanks, reducing habitat fragmentation and vehicle related mortality at highway crossings.

If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (919) 528-9886. Thank you for the opportunity to review and comment on these projects.