STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

December 16, 2004

U. S. Army Corps of Engineers
Regulatory Branch
Post Office Box 1890
Wilmington, NC 28402-1890

ATTN: Mr. Richard Spencer
NCDOT Coordinator

Subject: **Nationwide Permit 23 Application** for replacement of Bridge No. 170 on SR 1101 over Shoe Heel Creek, Federal Aid No. BRZ-1101(8), State Project No. 8.2462501, WBS Element No. 33591.1.1, Robeson County, Division 6, TIP No. B-4248

Dear Sir:

Please see the enclosed Categorical Exclusion, Ecosystem Enhancement Program mitigation acceptance letter, restoration plan, permit drawings and design plans for the subject project. The NCDOT proposes to replace the 81foot Bridge No. 170 with a new 3-slab, pre-stressed concrete cored slab, 125 foot bridge. The new bridge will be built with top down construction and located approximately 20 feet to the south of the existing bridge and will have one bent in the water. The newly proposed alignment improves the horizontal alignment in the project vicinity and enhances the safety of fast moving vehicles passing through this area. There will be 0.30 acre of permanent impacts to wetlands due to the construction of the new bridge. Traffic will be detoured offsite during the construction period.

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

TELEPHONE: 919-715-1500
FAX: 919-715-1501
WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
2728 CAPITOL BOULEVARD
PARKER LINCOLN BUILDING, SUITE 168
RALEIGH NC 27699

IMPACTS TO WATERS OF THE UNITED STATES

General Description: Shoe Heel Creek is located in the Lumber River Basin (030755 sub-basin, Hydrological Cataloguing Unit 03040204). Shoe Heel Creek originates about 23 miles north of the project area. The stream flows south for another 4.0 miles before its confluence with the Pee Dee River in South Carolina. Shoe Heel Creek is classified by the Division of Water Quality as a C-Sw water body. The Sw designation refers to the stream as Swamp Waters. Swamp Waters are topographically located so as to generally have very low velocities and other characteristics which are different from adjacent streams draining steeper topography.

There is an abandoned gear assembly located under the bridge in the southwest quadrant of the project area. This gear assembly will be removed by crane during the construction of the proposed bridge. There will be no impacts (no clearing and grubbing as indicated on the CE Greensheet) associated with the removal of this assembly.

Permanent Impacts: There will be 0.3 acres of permanent impacts to high quality wetlands due to the construction of the new bridge. Roadway fill comprises 0.18 acre of impacts, excavation comprises 0.05 acre of impacts and mechanized clearing comprises 0.07 acre of impacts to the high quality wetlands. There will be no stream impacts other than 0.001 acre bridge bent fill from this project. The DOT proposes to remove 0.16 acre of the existing roadway fill and restore to wetlands.

Fill slopes in wetlands on this project will be 3:1 due to soils that exhibit the same characteristics as soil types east of I-95. The soils on this project site are loose alluvial sandy soils without clay or cohesion. Therefore 2:1 fill slopes will not provide enough stability in this area.

Temporary Impacts: There will be no temporary impacts to surface waters or wetlands due to the construction on this project.

Bridge Demolition: Bridge No. 170 has a superstructure composed of steel I-beams, timber deck, timber rails and an asphalt wearing surface. The substructure is composed of timber end bents and bents and timber crutch caps. Due to the components of this structure there is no anticipated fill in Big Shoe Heel Creek from the removal of the existing bridge. NCDOT shall adhere to Best Management Practices for the Protection of Surface Waters, as supplemented with Best Management Practices for Bridge Demolition and Removal.

Utility Impacts: This project will involve the adjustment of aerial power facilities, underground telephone cable and a water line. The relocations and adjustments of these utilities will not incur permanent or temporary impacts at the project site. Lumbee River EMC has an existing pole line along the south side of the project that will be relocated further south to the proposed right of way. The pole will be placed inside the wetland boundary along the west side of the creek. The area that will need to be cleared for the power line will consist of a 30 foot wide strip that runs parallel to the road and in the

wetland for approximately 500 feet. Some of this clearing will be outside the wetland boundary. The trees and brush will be cut at ground level and no grubbing will take place. Bell South has an existing underground cable along the south side of the project that will be abandoned after a new underground cable has been installed on the north side of the bridge by directional bore. There will be no impacts to wetlands due to this adjustment. The existing water line is owned by Robeson County Public Works. All activity with this water line will be outside jurisdictional boundaries and therefore no impacts.

Restoration Plan: The DOT proposes to restore the old existing road way fill to wetlands (on the north east quarter of the project at approximately station 17+00 to station 19+50- see permit drawing sheet No. 4 of 16. The restoration area will be 0.16 acre. See attached *Restoration Plan for Shoe Heel Creek Wetland*. The material used for clearing, excavation and fill in wetlands will be removed after construction. The contractor will be required to submit a reclamation plan for removal of and disposal of all material off-site.

Schedule: The project schedule calls for a March 15, 2005 LET date with a date of availability on April 25, 2005.

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 29, 2003 the US Fish and Wildlife Service (USFWS) list 3 species under federal protection for Robeson County: Red-cockaded woodpecker, Michaux's sumac and the American Alligator. A survey of the project area was conducted in July 2001 and no endangered species were found. It was determined that there is habitat for the American alligator, but no habitat for the Red-cockaded woodpecker or the Michaux's sumac. The NC Natural Heritage database of rare species and unique habitats was reviewed in September 2004. There is no documentation of rare species or unique habitats found within 1 mile of the project area.

Table 1. Species Under Federal Protection in Robeson County

Common Name	Scientific Name	Federal Status	Habitat	Biological Conclusion
American Alligator	*Alligator mississippiensis*	T(S/A)	Yes	Not Required
Red-cockaded woodpecker	*Picoides borealis*	Endangered	No	No Effect
Michaux's sumac	*Rhus michauxii*	Endangered	No	No Effect

AVOIDANCE, MINIMIZATION AND MITIGATION

Avoidance and Minimization:
Avoidance examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States". 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 stages; minimization measures were incorporated as part of the project design.

- Best Management Practices will be followed for this project as outlined in "NCDOT's Best Management Practices for Construction and Maintenance Activities".
- The new bridge will be built utilizing top down construction.
- There will be no deck drains allowed to discharge directing into Shoe Heel Creek.
- Rip/rap pads will take water draining from the ditches along the road and disperse the water, reducing the rush of flow in the wetlands.
- There will be 3:1 slopes in the wetlands.
- Mechanized clearing in the wetlands has been reduced from 10 feet to 2 feet along the fill slopes to allow for a silt fence.

Mitigation:
As mentioned above, there will be 0.16 acre of wetlands restored on this project site to help offset impacts to the wetlands. The Ecosystem Enhancement Program (EEP) will provide offsite wetland mitigation for the remaining 0.14 acre of riverine wetlands. (Please see attached EEP Mitigation Acceptance Letter dated November 30, 2004 with the agreement to mitigate for 0.33 acre. There will be a new letter forthcoming with the newly required acreage considering the newly calculated impacts. Clearing limits for mechanized clearing were reduced from 10 feet to 2 feet.)

REGULATORY APPROVALS

Section 404 Permit This project is being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). The NCDOT requests that these activities be authorized by a Nationwide Permit 23 (FR number 10, pages 2020-2095; January 15, 2002).

Section 401 Permit: We anticipate 401 General Certification No. 3403 will apply to this project. All general WQC conditions will be adhered to during project construction. Therefore, in accordance with 15A NCAC 2H, Section .0500(a) and 15A NCAC 2B.0200 we are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their notification.

Thank you for your assistance with this project. If you have any questions or need additional information please call Carla Dagnino at (919) 715-1456

Sincerely,

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

cc:
w/attachment
Mr. John Hennessy, DWQ (2 copies)
Mr. Gary Jordan, USFWS
Mr. Travis Wilson, NCWRC
Mr. Greg Perfetti, P.E., Structure Design
Dr. David Chang, P.E., Hydraulics
Mr. Terry Gibson, P.E., Division Engineer
Mr. Jim Rerko, Division Environmental Officer
w/o attachment
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Mark Staley, Roadside Environmental
Ms. Karen Capps, PDEA Project Planning Engineer
Mr. David Franklin, USACE, Wilmington
Ms. Beth Harmon, EEP

Ecosystem

PROGRAM

November 30, 2004

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

B-4248, Bridge 170 over Shoe Heel Creek, Robeson County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide wetland mitigation for the subject project. Based on the information supplied by you in a letter dated November 5, 2004, the impacts are located in CU 03040204 of the Lumber River Basin in the Southern Inner Coastal Plain Eco-Region, and are as follows:

Riverine Wetland Impacts: 0.33 acre

The subject project is not listed in Exhibit 2 of 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 dated July 22, 2003. The EEP intends to provide compensatory riverine wetland mitigation up to a 2:1 ratio in Cataloging Unit 03040204 of the Lumber River Basin.

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

Sincerely,

William D. Gilmore, P.E.
Director

cc: Richard Spencer, USACE-Wilmington
John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: B-4248

Ecosystem
PROGRAM

November 30, 2004

Mr. Richard Spencer
US Army Corps of Engineers
Wilmington Regulatory Field Office
Post Office Box 1890
Wilmington, North Carolina 28403-1890

Dear Mr. Spencer:

Subject: EEP Mitigation Acceptance Letter:

B-4248, Replace Bridge 170 over Shoe Heel Creek on SR 1101, Robeson County, Lumber River Basin (Cataloging Unit 03040204); Southern Inner Coastal Plain

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide mitigation for the 0.33 acre of unavoidable riverine wetland impact associated with the above referenced project.

The subject project is not listed in Exhibit 2 of 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 dated July 22, 2003; therefore, the EEP intends to provide compensatory riverine wetland mitigation up to a 2:1 ratio in Cataloging Unit 03040204 of the Lumber River Basin.

If you have any questions or need additional information, please contact Ms. Beth Harmon at (919) 715-1929.

Sincerely,

William D. Gilmore, P.E.
Director

cc: Phil Harris, Office of Natural Environment, NCDOT
John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: B-4248

Restoration Plan for Shoe Heel Creek Wetland
At Bridge No. 170
In Robeson County
TIP B-4248
November 12, 2004

The North Carolina Department of Transportation (NCDOT) will perform on-site mitigation for riverine swamp impacts at the SR 1101 overpass of Shoe Heel Creek in Robeson County. This mitigation site occurs within Transportation Improvement Program (TIP) B-4248. The project begins approximately 600 feet west of Bridge No. 170 and continues to approximately 500 feet to the east of the bridge. NCDOT will restore 0.16 acres of riverine swamp wetland by removing existing causeway fill in the northeast quadrant of the project.

EXISTING CONDITIONS:

The project is located in western Robeson County about 1.5 miles (2.4 km) northeast of the South Carolina border, and six miles (9.7 km) northwest from the town of Rowland. Development in the area is comprised of scattered residential homes and farms.

The existing causeway for the SR 1101 overpass at Bridge No. 170 is located in the floodplain of Shoe Heel Creek. The floodplain harbors a mature riverine swamp forest dominated by canopy species including bald cypress (*Taxodium distichum*), red maple (*Acer rubrum*), and sweet gum (*Liquidambar styraciflua*). In the northeast quadrant of the project, the swamp wetland is at the toe of slope near the bridge. A transition zone from the toe of slope to the swamp wetland gradually widens from the bridge towards the end of the project. The transition zone is dominated by mature red maple and saplings of other hardwood species.

PROPOSED CONDITIONS:

The proposed wetland mitigation will consist of restoring approximately 0.16 acres of riverine swamp wetland. Restoration will involve removing causeway fill and transition area from the toe of slope to the easement boundary to match the swamp wetland elevation. The restored area will be planted with species commonly found in riverine swamp communities.

The Categorical Exclusion (CE) for TIP B-4248, dated April 2003, provides further details concerning existing and proposed roadway conditions.

DESIGN/CONSTRUCTION:

WETLAND MITIGATION GRADING

The design of the wetland mitigation area shall consist of removing fill associated with the existing causeway. Fill will be excavated down to the alluvium soil layer. If the alluvium soil layer is encountered at an elevation above the adjacent existing wetland, excavation shall continue until the elevation matches the existing, adjacent wetland elevation. If the alluvium soil layer is encountered below the adjacent existing wetland elevation, sandy loam shall be used to backfill these areas to match the existing wetland elevation. All excavated areas shall be ripped and disked prior to placement of any backfill material and before planting of the site.

The Office of Natural Environment shall be contacted to provide construction oversight to ensure that the wetland mitigation area is constructed appropriately.

VEGETATION PLANTING

The restoration site will be planted following the completion of the site grading. The following riverine swamp tree species will be planted: bald cypress and swamp blackgum (*Nyssa sylvatica* var. *biflora*).

The hardwood tree species utilized shall be 18”-30” in size and shall be bare root seedlings that are at least one growing season in age. Planting density shall be 680 seedlings per acre, which equates to a plant spacing of 8 feet on-center.

MONITORING:

Upon successful completion of construction, the following monitoring strategy is proposed for the mitigation site. NCDOT will document monitoring activities on the site in an annual report distributed to the regulatory agencies.

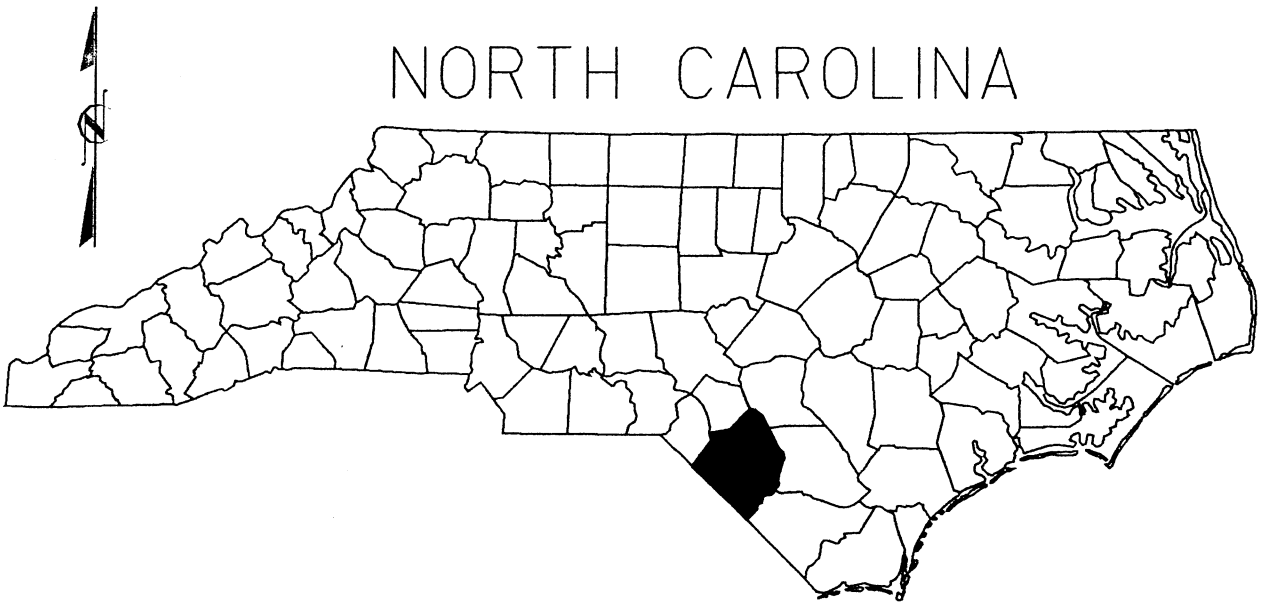
HYDROLOGIC MONITORING

No specific hydrological monitoring is proposed for this restoration site. The target elevation will be based on the adjacent wetland and verified during construction. Constructing the site at the adjacent wetland elevation will ensure the hydrology in the restored area is similar to the hydrology in the reference area.

VEGETATION SUCCESS CRITERIA

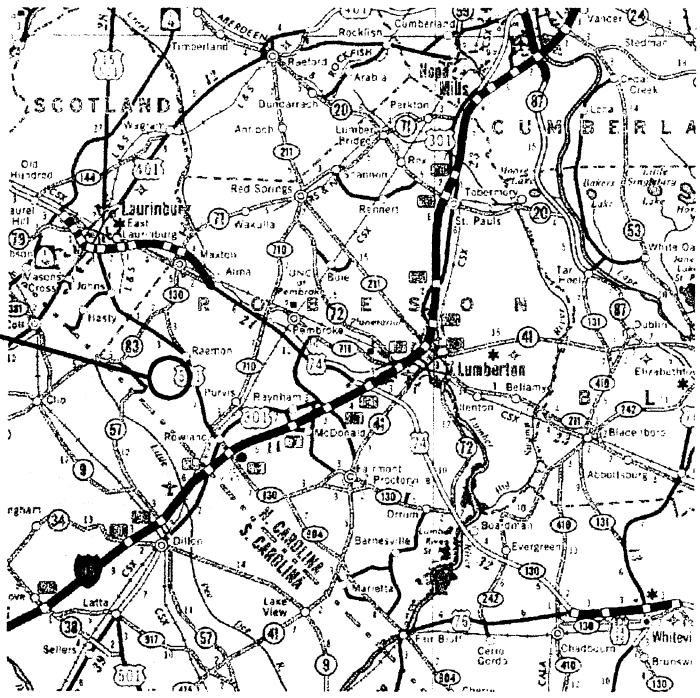
NCDOT shall monitor the restoration site by visual observation and photo points for survival of planted seedlings. NCDOT shall monitor the site for a minimum of

three years or until the site is deemed successful. Monitoring will be initiated upon completion of the site planting.



NOT TO SCALE

PROJECT



VICINITY MAPS

NCDOT

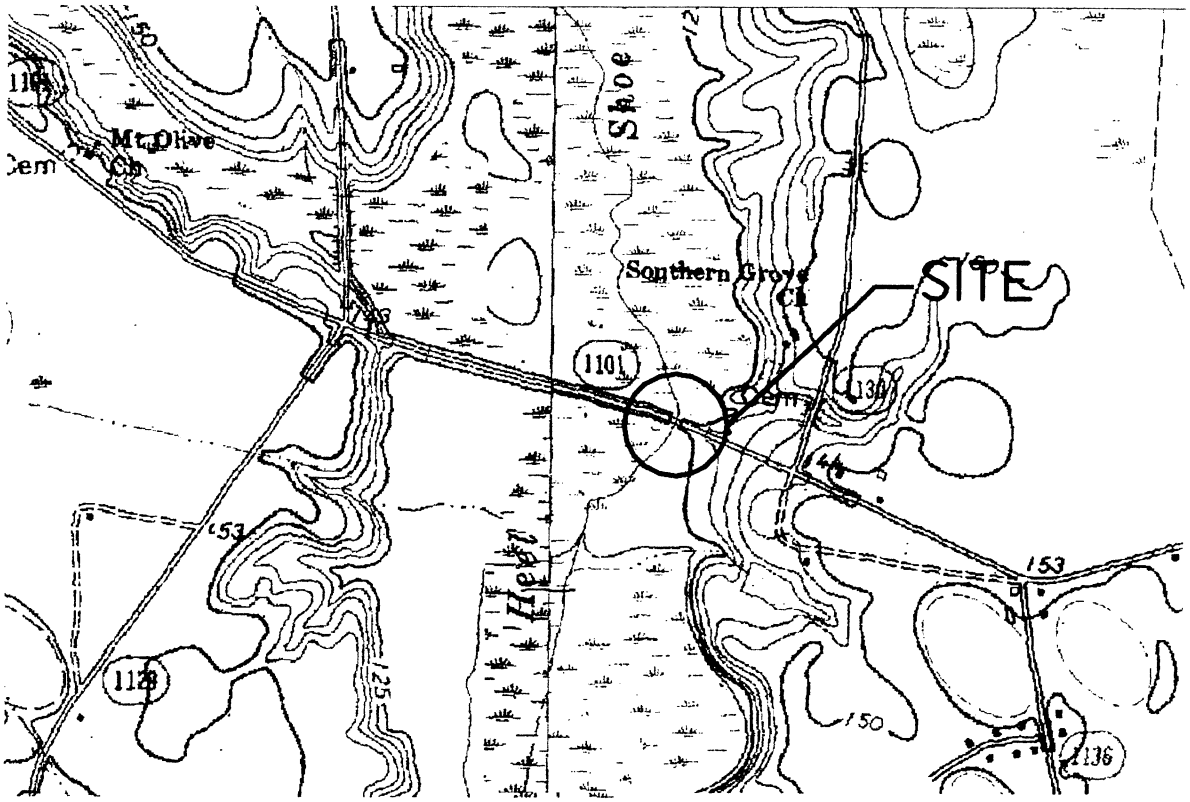
DIVISION OF HIGHWAYS

ROBESON COUNTY

PROJECT: 8.2462501 (B-4248)

PROPOSED BRIDGE REPLACEMENT BRG. # 170 OVER SHOE HEEL CREEK ALONG SR 1101

SHEET 1 **OF** 16 **11/24/04**



CONTOUR INTERVAL = 5 FEET

HORIZONTAL SCALE

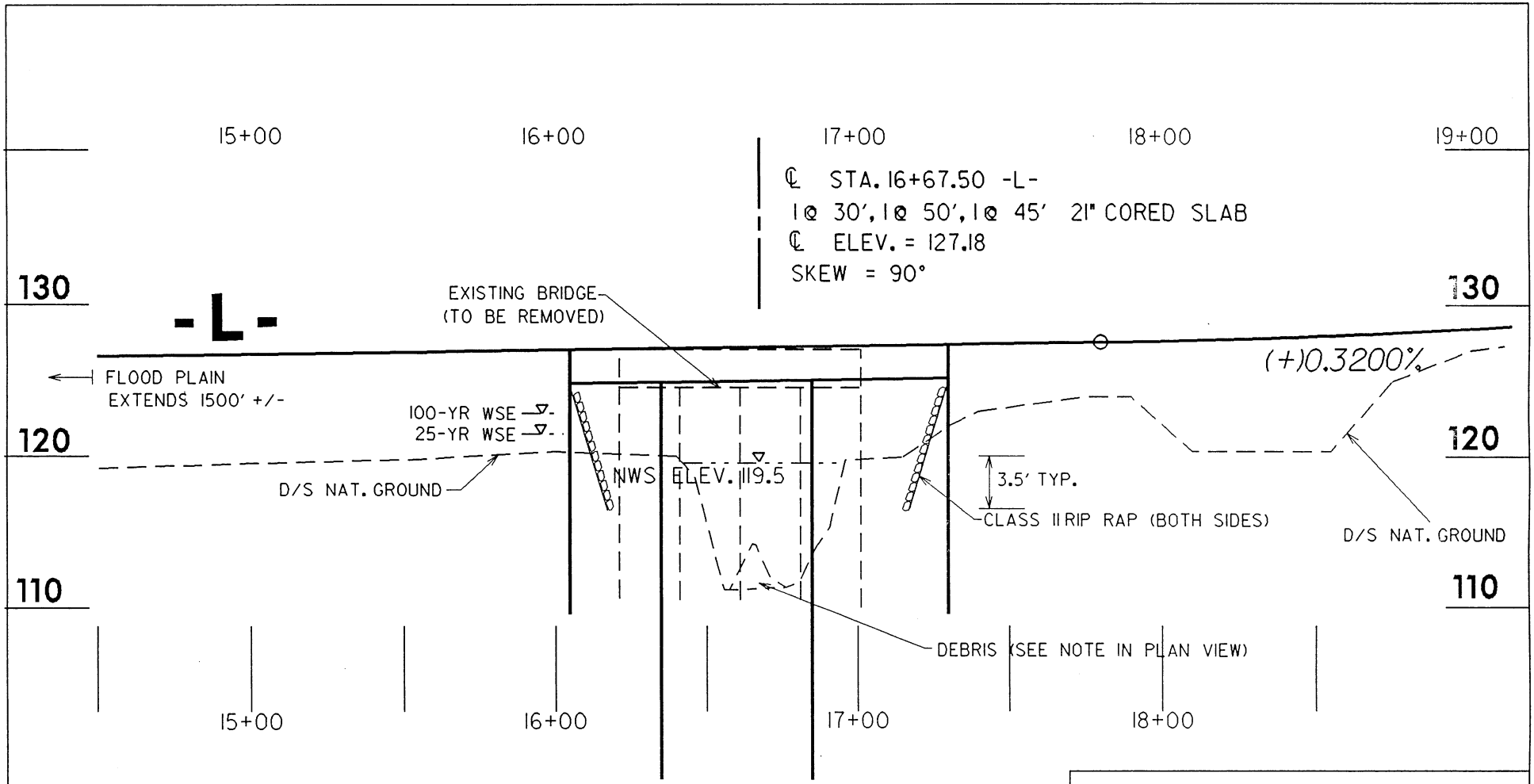
1500 0 1500

TOPOGRAPHIC MAPS

NCDOT

DIVISION OF HIGHWAYS
ROBESON COUNTY
PROJECT: 8.2462501 (B-4248)
PROPOSED BRIDGE REPLACEMENT
BRG.# 170 OVER
SHOE HEEL CREEK
ALONG SR 1101

SHEET 2 OF 14 04/15/04

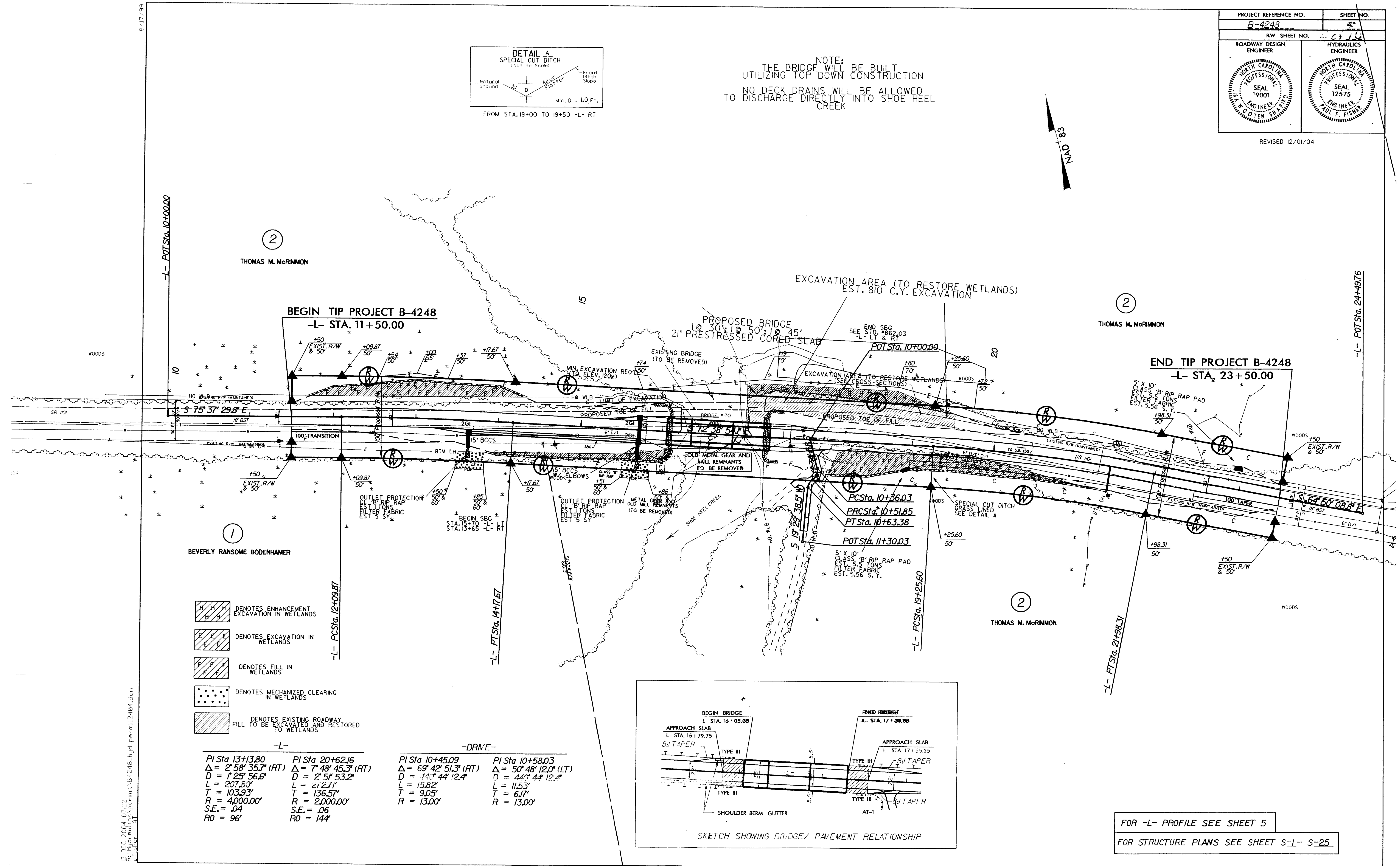


PROFILE

NCDOT

DIVISION OF HIGHWAYS
ROBESON COUNTY
PROJECT: 8.2462501 (R-2246C)
PROPOSED REPLACEMENT
BRIDGE # 170 OVER
SHOE HEEL CREEK
ALONG SR 1101

SHEET 3 **OF** 16 **03/25/04**



PROJECT REFERENCE NO.
B-4248
SHEET NO.
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19001 ENGINEER LISA WOOTEN SHAHRO
NORTH CAROLINA PROFESSIONAL SEAL 12575 ENGINEER PAUL F. FISHER
REVISED 12/01/04
DETAIL A
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
Front Ditch Slope
4:1 or Flatter
Min. D = 1.0 Ft.
FROM STA. 19+00 TO 19+50 -L- RT
NOTE:
THE BRIDGE WILL BE BUILT UTILIZING TOP DOWN CONSTRUCTION
NO DECK DRAINS WILL BE ALLOWED TO DISCHARGE DIRECTLY INTO SHOE HEEL CREEK
NAD 83
THOMAS M. McRIMMON
BEVERLY RANSOME BODENHAMER
WOODS
-L- POT Sta. 10+00.00
-L- POT Sta. 24+49.76
BEGIN TIP PROJECT B-4248
-L- STA. 11+50.00
END TIP PROJECT B-4248
-L- STA. 23+50.00
EXCAVATION AREA (TO RESTORE WETLANDS)
EST. 810 C.Y. EXCAVATION
PROPOSED BRIDGE
1@ 30', 1@ 50', 1@ 45'
21" PRESTRESSED CORED SLAB
EXISTING BRIDGE (TO BE REMOVED)
MIN. EXCAVATION REQ'D TO ELEV. 120±
LIMIT OF EXCAVATION
PROPOSED TOE OF FILL
EXCAVATION AREA (TO RESTORE WETLANDS) (SEE CROSS-SECTIONS)
END SBG SEE STD. #862.03 -L- LT & RT
POT Sta. 10+00.00
S 75° 37' 29.8" E
S 72° 38' 54" E
S 64° 50' 08.8" E
S 19° 29' 38.5" W
100' TRANSITION
100' TAPER
SR 1101
18' BST
15" BCCS
15" BCCS W/ ELBOWS
OLD METAL GEAR AND MILL REMNANTS TO BE REMOVED
OUTLET PROTECTION CL 'B' RIP RAP EST 1 TONS FILTER FABRIC EST 5 SY
BEGIN SBG STA. 13+70 -L- LT STA. 13+65 -L- RT
SHOE HEEL CREEK
PC Sta. 10+36.03
PRC Sta. 10+51.85
PT Sta. 10+63.38
POT Sta. 11+30.03
5' X 10' CLASS 'B' RIP RAP PAD EST. 5.5 TONS FILTER FABRIC EST. 5.56 S.Y.
SPECIAL CUT DITCH GRASS LINED SEE DETAIL A
-L- PC Sta. 12+09.87
-L- PT Sta. 14+17.67
-L- PC Sta. 19+25.60
-L- PT Sta. 21+98.31
EXIST. R/W & 50'
DENOTES ENHANCEMENT EXCAVATION IN WETLANDS
DENOTES EXCAVATION IN WETLANDS
DENOTES FILL IN WETLANDS
DENOTES MECHANIZED CLEARING IN WETLANDS
DENOTES EXISTING ROADWAY FILL TO BE EXCAVATED AND RESTORED TO WETLANDS
-L-
PI Sta 13+13.80 Δ = 2° 58' 35.7" (RT) D = 1° 25' 56.6" L = 207.80' T = 103.93' R = 4,000.00' S.E. = .04 RO = 96'
PI Sta 20+62.16 Δ = 7° 48' 45.3" (RT) D = 2° 51' 53.2" L = 272.71' T = 136.57' R = 2,000.00' S.E. = .06 RO = 144'
-DRIVE-
PI Sta 10+45.09 Δ = 69° 42' 51.3" (RT) D = 440° 44' 12.4" L = 15.82' T = 9.05' R = 13.00'
PI Sta 10+58.03 Δ = 50° 48' 12.0" (LT) D = 440° 44' 12.4" L = 11.53' T = 6.17' R = 13.00'
BEGIN BRIDGE -L- STA. 16+09.00
END BRIDGE -L- STA. 17+30.00
APPROACH SLAB -L- STA. 15+79.75
APPROACH SLAB -L- STA. 17+55.25
8:1 TAPER
TYPE III
AT-1
SHOULDER BERM GUTTER
SKETCH SHOWING BRIDGE/ PAVEMENT RELATIONSHIP
FOR -L- PROFILE SEE SHEET 5
FOR STRUCTURE PLANS SEE SHEET S-1 - S-25

PROJECT REFERENCE NO.	SHEET NO.
B-4248	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19001 ENGINEER LISA WOOTEN SHAPIRO	NORTH CAROLINA PROFESSIONAL SEAL 12575 ENGINEER PAUL F. FISHER

REVISED 12/01/04

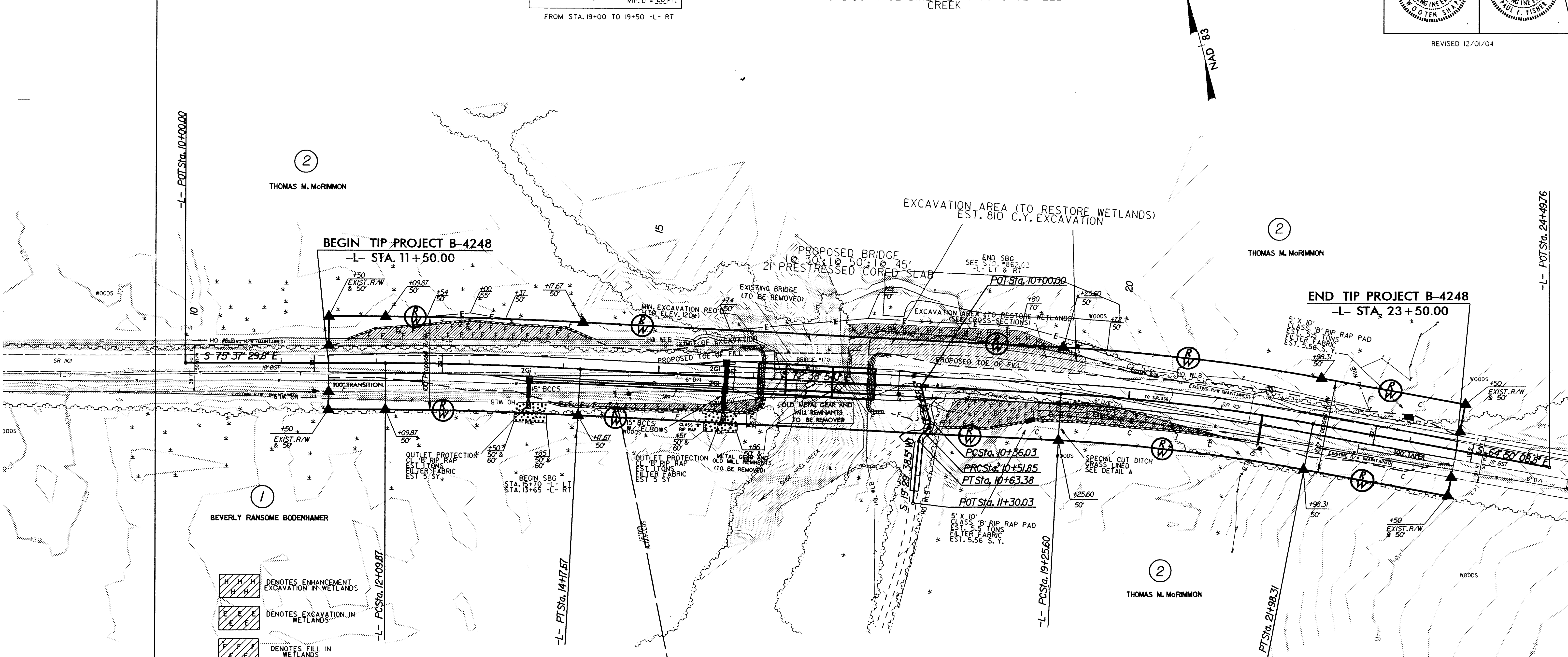
DETAIL A
SPECIAL CUT DITCH
(Not to Scale)

Natural Ground · 3:1 · D · 4:1 or Flatter · Front Ditch Slope · Min. D = 1.0 Ft.

FROM STA. 19+00 TO 19+50 -L- RT

NOTE:
THE BRIDGE WILL BE BUILT UTILIZING TOP DOWN CONSTRUCTION

NO DECK DRAINS WILL BE ALLOWED TO DISCHARGE DIRECTLY INTO SHOE HEEL CREEK



DENOTES ENHANCEMENT EXCAVATION IN WETLANDS

DENOTES EXCAVATION IN WETLANDS

DENOTES FILL IN WETLANDS

DENOTES MECHANIZED CLEARING IN WETLANDS

CONTOUR INTERVALS = 1 FOOT

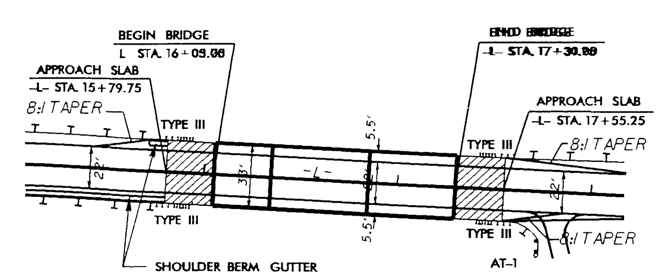
DENOTES EXISTING ROADWAY FILL TO BE EXCAVATED AND RESTORED TO WETLANDS

-L-

PI Sta 13+13.80	PI Sta 20+62.16
Δ = 2° 58' 35.7" (RT)	Δ = 7° 48' 45.3" (RT)
D = 1° 25' 56.6"	D = 2° 51' 53.2"
L = 207.80'	L = 272.71'
T = 103.93'	T = 136.57'
R = 4,000.00'	R = 2,000.00'
S.E. = .04	S.E. = .06
RO = 96'	RO = 144'

-DRIVE-

PI Sta 10+45.09	PI Sta 10+58.03
Δ = 69° 42' 51.3" (RT)	Δ = 50° 48' 12.0" (LT)
D = 440° 44' 12.4"	D = 440° 44' 12.4"
L = 15.82'	L = 11.53'
T = 9.05'	T = 6.17'
R = 13.00'	R = 13.00'



SKETCH SHOWING BRIDGE/ PAVEMENT RELATIONSHIP

FOR -L- PROFILE SEE SHEET 5

FOR STRUCTURE PLANS SEE SHEET S-1- S-25

13-DEC-2004 08:45
8/17/99

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4248	6 of 16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BM #80 R/R SPIKE IN BASE OF 8" GUM TREE
TO -L- STA. 11+50.00 IS S 82°09'06" E
DISTANCE 429.95' ELEV. = 120.66'
N 304920.91 E 1887138.98

-L-

BM #81 R/R SPIKE IN BASE OF 12" PINE TREE
53.25' RIGHT OF -L- LINE STA. 23+58.77
ELEV. 140.63'

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 2700 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 121.51 FT
BASE DISCHARGE	= 3800 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 122.87FT
OVERTOPPING DISCHARGE	= 5500 CFS
OVERTOPPING FREQUENCY	= 500 YRS
OVERTOPPING ELEVATION	= 124.47FT

END GRADE
-L- STA. 23+50.00
EL= 138.56

BEGIN GRADE
-L- STA. 11+50.00
EL= 125.53

PROPOSED 2F CORED SLAB BRIDGE
1 SPAN @ 30'
1 SPAN @ 50'
1 SPAN @ 45'
SKEW = 90°
℄ -L- STA. 16+67.50

PI = 19+30.00
EL = 128.02'
K = 137
VC = 300'

(+)0.3200%

(+)2.5088%

ESTIMATED NORMAL WATER SURFACE ELEVATION 120.0' (8/03)

CLASS II RIP RAP STRUCTURE PAY ITEM

BEGIN SPECIAL DITCH -L- STA. 19+00.00 (RT) EL = 125.45

END SPECIAL DITCH -L- STA. 19+50.00 (RT) EL = 126.9

FOR -L- PLAN VIEW SEE SHEET 4

FOR STRUCTURE PLANS SEE SHEETS S- THRU S-

140 130 120 110 100 90 80 70

11 12 13 14 15 16 17 18 19 20 21 22 23 24

17-MAR-2004 15:44
R:\Hydraulics\permit\B4248_hyd_pfl.dgn
oshepard

8/23/9

PROJ. REFERENCE NO.	SHEET NO.
b4248	X-1

Sheet 7 of 14

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

130 125 120 115

S.S. 119.37

3:1

0.0201

0.0400

125.69

125.32

12+00.00

130 125 120

0.0002

0.0598

125.30

125.53

11+50.00

125 120

125.22

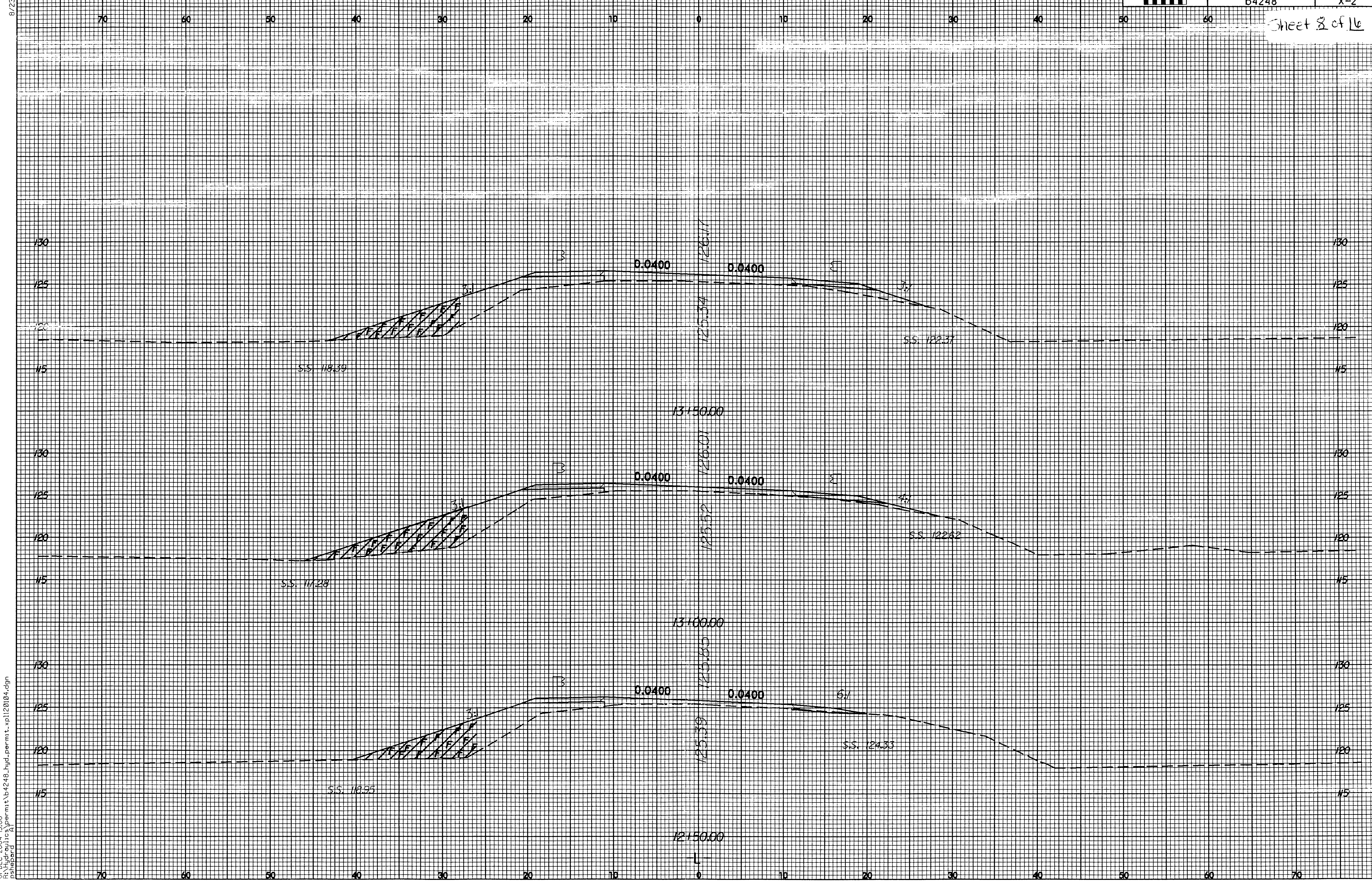
11+00.00

"QUANTITIES ARE APPROXIMATE ONLY. THE RESIDENT ENGINEER WILL RECROSS-SECTION THE WORK ACCURATELY WHEN THE PROJECT IS STAKED OUT. THESE CROSS-SECTION NOTES WILL BE USED IN COMPUTING THE FINAL QUANTITIES FOR WHICH THE CONTRACTOR WILL BE PAID."

01-DEC-2004 13:00
R:\Hydraulics\permit\b4248_hyd_permit.xpl120104.dgn
psheppard
AJ

PROJ. REFERENCE NO.	SHEET NO.
b4248	X-2

Sheet 8 of 16

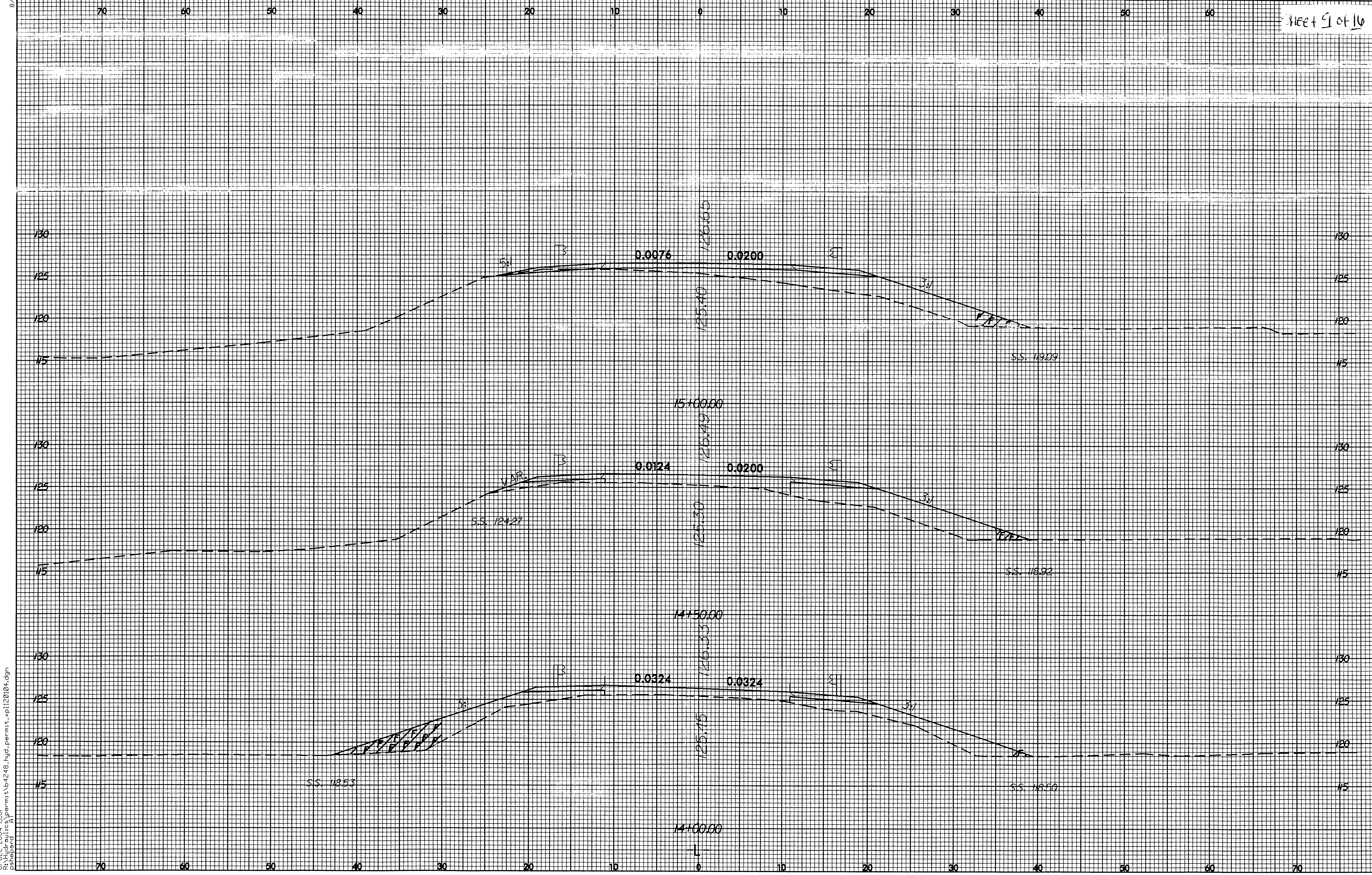


8/23/9?

01-DEC-2004 13:00
R:\Hydraulics\permit\b4248_hyd_permit_xpl120104.dgn
pshepard AT

PROJ. REFERENCE NO.	SHEET NO.
B4248	X-3

Sheet 9 of 16



01-DEC-2004 13:01
R:\Hydraulics\permit\b4248_hyd_permit_xpl12010 4.dgn
pshepard AT

8/23/05

PROJ. REFERENCE NO.	SHEET NO.
b4248	X-4

Sheet 10 of 16

70 60 50 40 30 20 10 0 10 20 30 40 50 60

130 125 120 115

0.0200 0.0200

127.15

16+50.00

S.S. 121.81

VAR

0.0200 0.0200

126.29

3:1

S.S. 120.01

16+00.00

S.S. 124.38

3:1

0.0200 0.0200

126.61

GRADE TO DRAIN
124.04

125.69

S.S. 120.19

15+50.00

135 130 125 120 115

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

01-DEC-2004 13:02
R:\Hydraulics\permit\b4248_hyd_permit.xpl120104.dgn
pshepard
A1

PROJ. REFERENCE NO.	SHEET NO.
b4248	X-6

Sheet 11 of 16

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

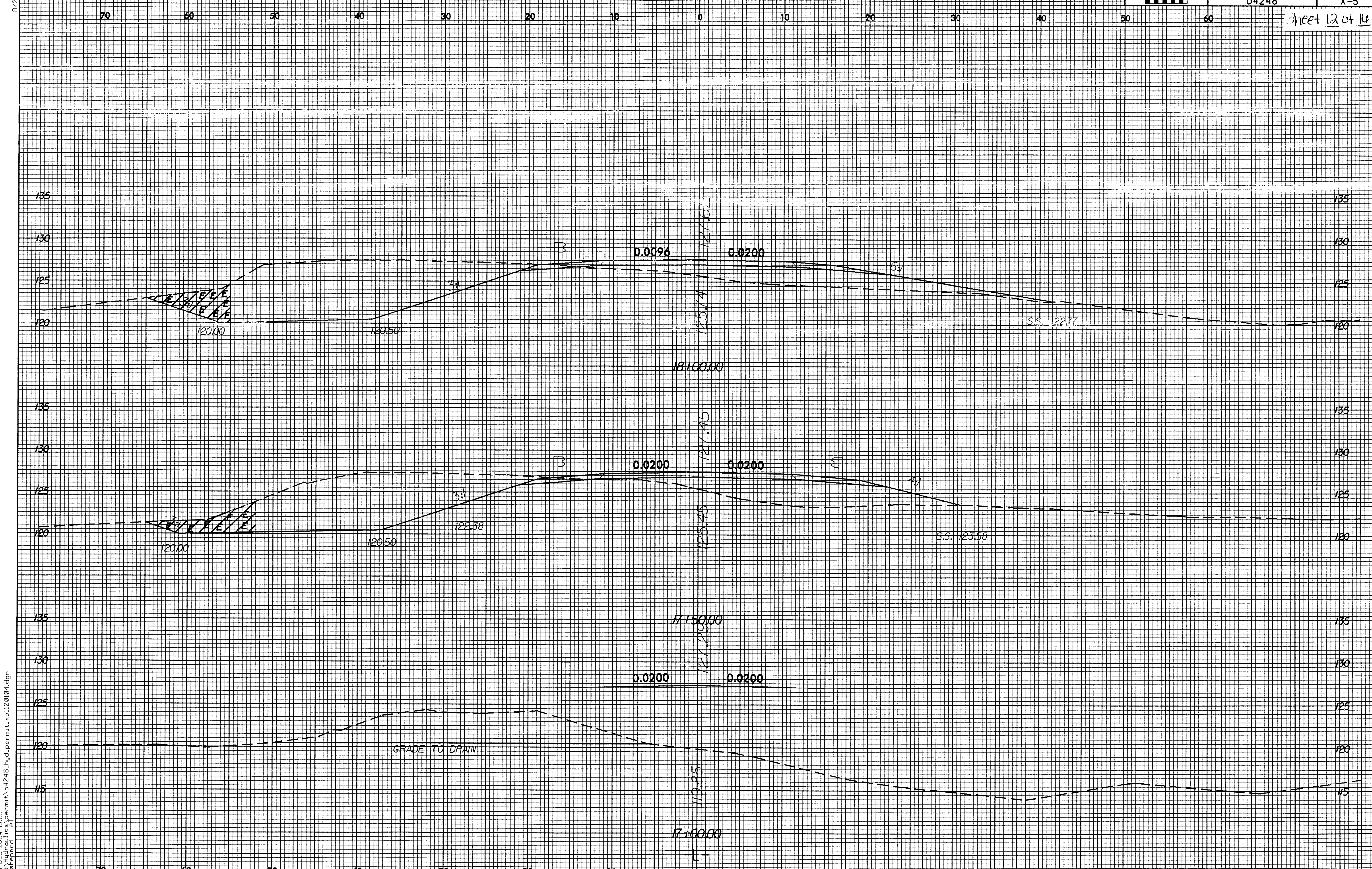
135 130 125 120

S.S. 129.21
GRADE TO DRAIN
4:1
0.0600
129.50
3:1
129.94
S.S. 128.92
0.0600
126.96
20+00.00
S.S. 128.69
3:1
0.0504
GRADE TO DRAIN
128.50
129.14
S.S. 127.60
0.0504
4:1
3:1
126.19
19+50.00
Ditch Depth
3:1
0.0304
123.30
123.30
128.26
S.S. 126.64
0.0304
4:1
3:1
125.46
19+00.00
3:1
0.0104
120.00
120.50
127.19
0.0200
3:1
125.60
S.S. 119.21
18+50.00

01-DEC-2004 14:50
R:\Hydraulics\permit\b4248_hyd_permit_xpl120104.dgn
pshepard

PROJ. REFERENCE NO.	SHEET NO.
b4248	X-5

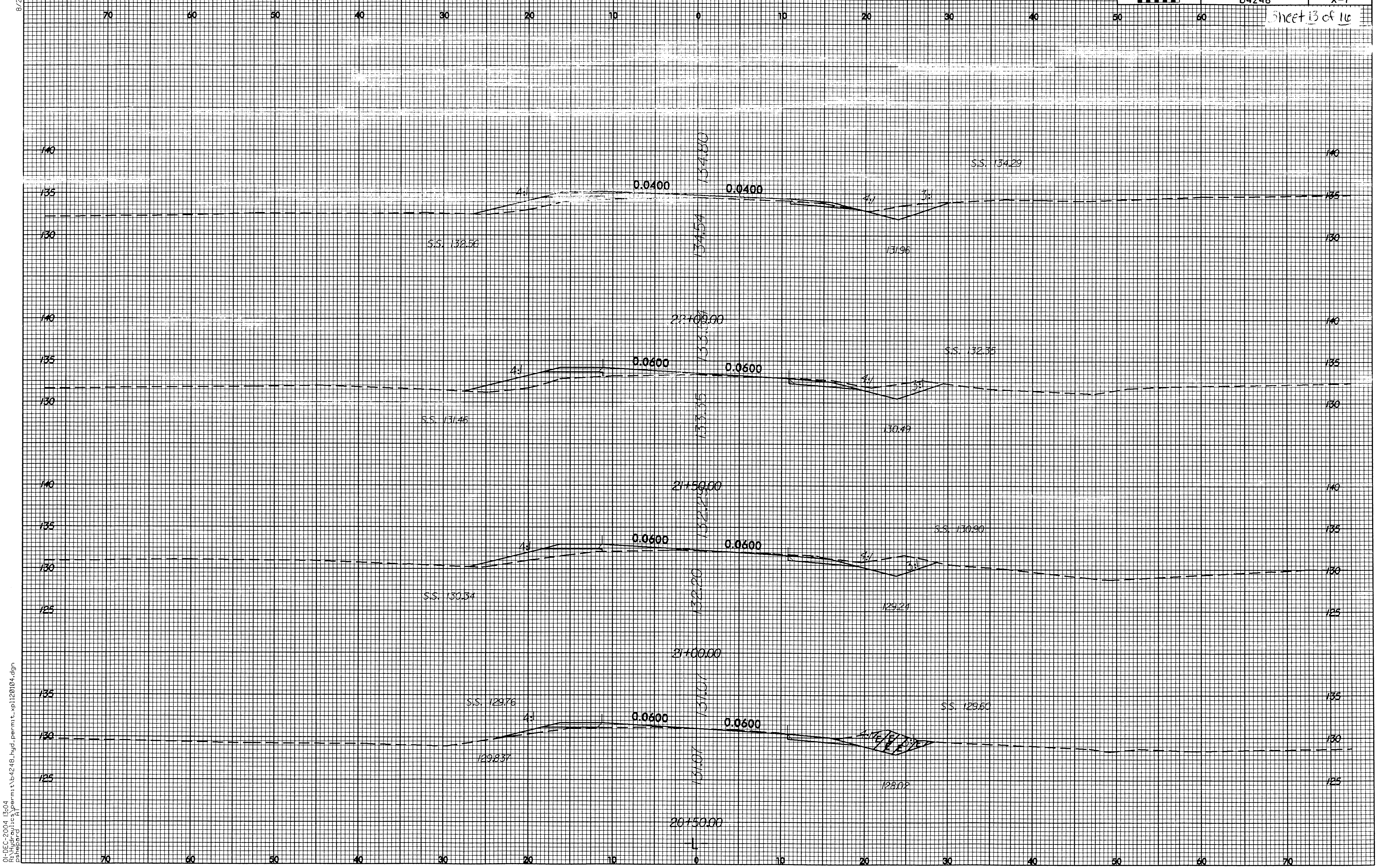
Sheet 12 of 14



01-DEC-2004 13:03
R:\Hydraulics\permit\b4248_hyd_permit_xpl120104.dgn
psheperd AT

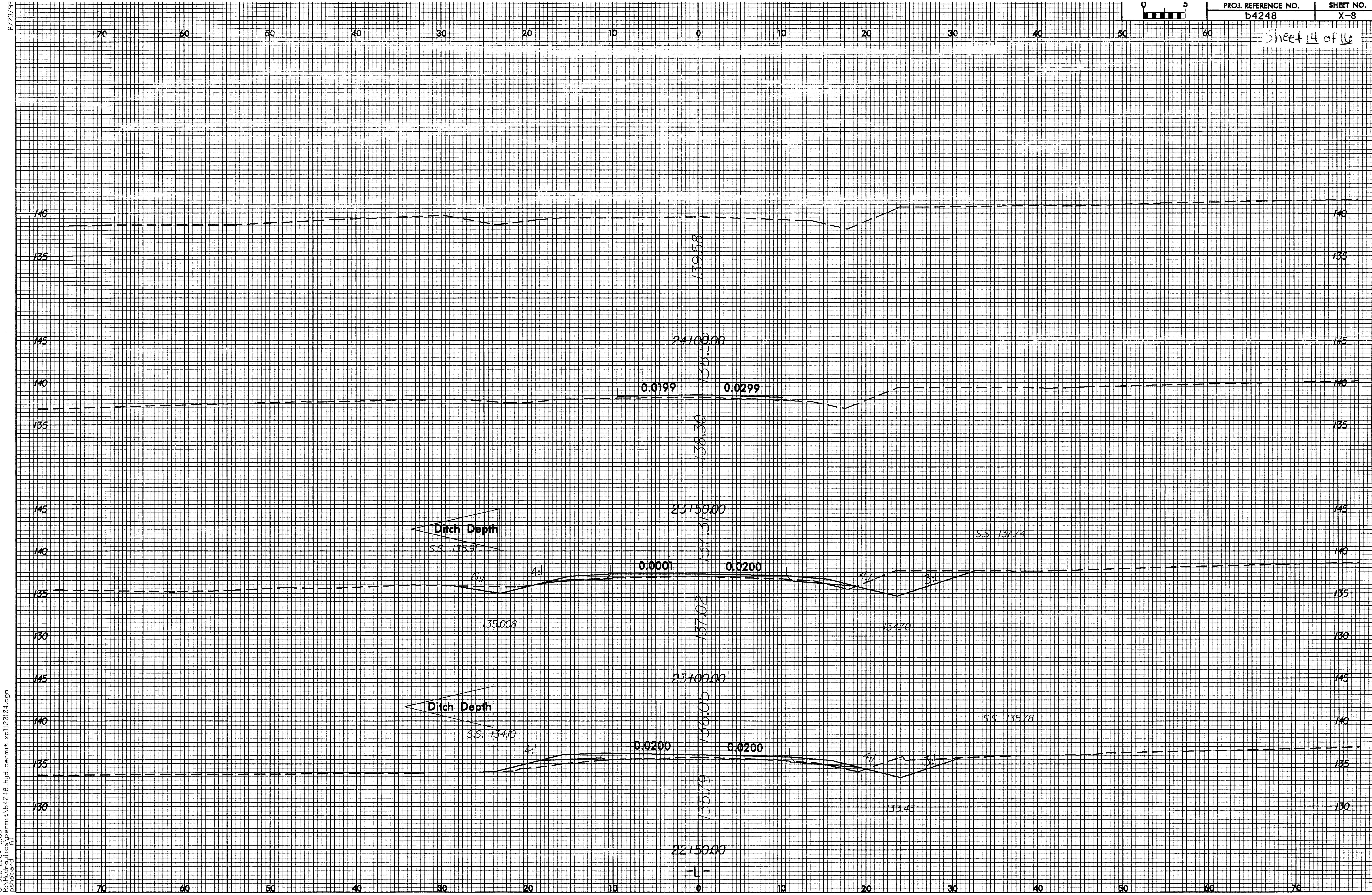
PROJ. REFERENCE NO.	SHEET NO.
b4248	X-7

Sheet 13 of 16



PROJ. REFERENCE NO.	SHEET NO.
b4248	X-8

Sheet 14 of 16



01-DEC-2004 13:05
R:\Hydraulics\permit\b4248_hyd_permit_xpl120104.dgn
psheperd AT

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NUMBER	NAMES	ADDRESSES
1	BEVERLY RANSOME BODENHAMER	6932 KITCHEN ST. ROWLAND, N.C. 28383
2	THOMAS M. McCRIMMON	8263 FAILEY RD. ROWLAND, N.C. 28383

NCDOT

DIVISION OF HIGHWAYS

ROBESON COUNTY

PROJECT: 8.2462501 (B-4248)

PROPOSED BRIDGE REPLACEMENT
BRG. # 170 OVER
SHOE HEEL CREEK
ALONG SR 1101

SHEET 15 OF 16 04/15/04

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)	Enhancement 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	11+75 TO	ROADWAY	0.08	0	0	0	0.01	0	0	0	0	0
	14+55 -L- LT	FILL										
	13+50 TO	ROADWAY	0.03	0	0	0	0.05	0	0	0	0	0
	16+25 -L- RT	FILL										
	17+10 TO	ROADWAY	0.07	0	0.05	0	0.01	0	0	0	0	0
	21+45 -L- RT	FILL										
	17+00 TO	EXISTING ROADWAY	0	0	0	0.07	0	0	0	0	0	0
	19+50 -L- LT	EXCAVATED										
TOTALS:			0.18	0	0.05	0.07	0.07	0	0	0	0	0

NOTE: FROM STA. 17+00 TO STA. 19+55 -L- (LT), A PORTION OF THE EXISTING ROADWAY EMBANKMENT WILL BE REMOVED TO APPROXIMATELY THE NATURAL GROUND ELEVATION. THE ESTIMATED AREA TO POTENTIALLY BE RESTORED TO WETLANDS IS 0.16 ACRES.

*One Bent in Water = 12.38 square feet or < 0.001 acre

Form Revised 3/22/01

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT: 8.2462501 (B-4248)
PROPOSED BRIDGE REPLACEMENT
BRIDGE #170 OVER SHOE HEEL CREEK
ALONG SR 1101
SHEET OF 12/10/2004

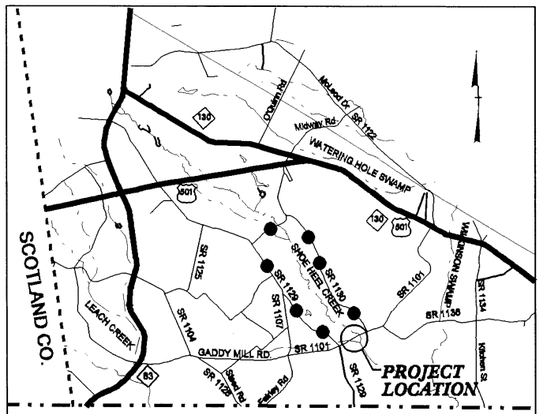
09/08/99

TIP PROJECT: B-4248

CONTRACT: C201141

14-OCT-2004 09:26
R:\Roadway Proj\B4248_rdy_tsh.dgn
BAKANAGAN
AT RD19531

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



VICINITY MAP

OFF-SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROBESON COUNTY

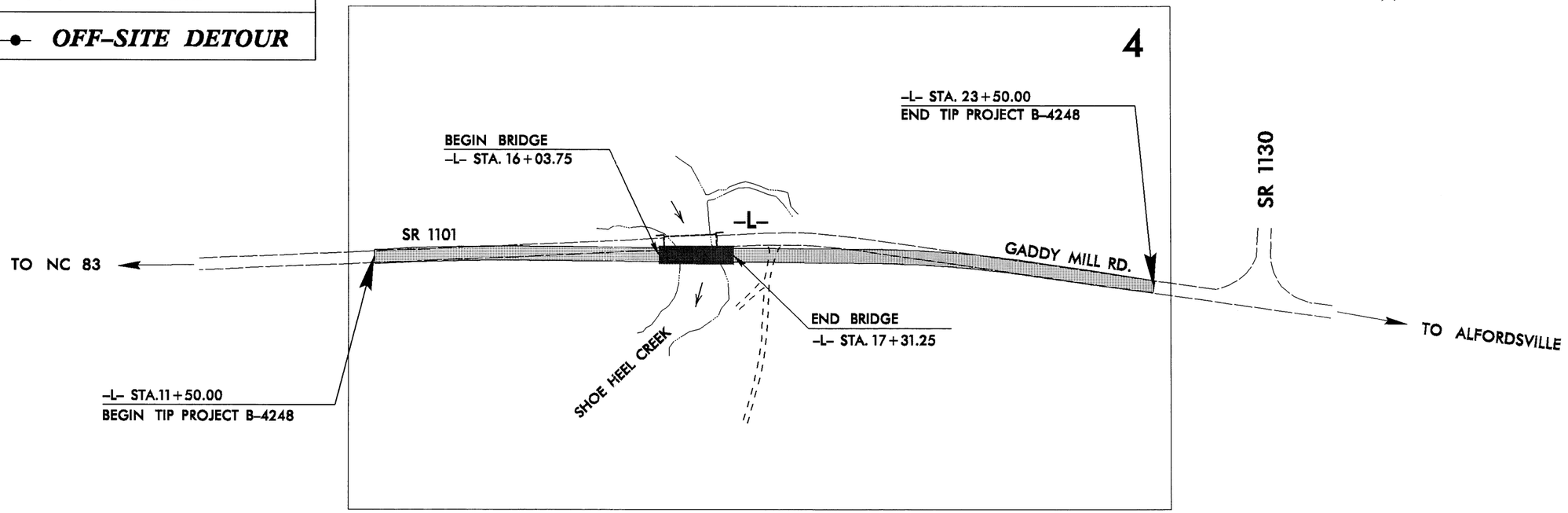
LOCATION: BRIDGE 170 OVER SHOE HEEL CREEK AND APPROACHES ON SR 1101 (GADDY MILL ROAD)

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4248	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33591.1.1	BRZ-1101(8)	P.E.
33591.2.1	BRZ-1101(8)	R/W & UTIL

NAD 83



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2002 = 400
ADT 2025 = 700
DHV = 13 %
D = 55 %
T = 3 % *
V = 60 MPH
* TTST 1% DUAL 2%
FUNC CLASS = RURAL LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4248 = 0.204 mi
LENGTH STRUCTURES TIP PROJECT B-4248 = 0.024 mi
TOTAL LENGTH TIP PROJECT B-4248 = 0.227 mi

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 31, 2004

LETTING DATE: MARCH 15, 2005

GLENN W. MUMFORD, PE
PROJECT ENGINEER

LISA W. SHAPIRO, PE
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*

PROJECT REFERENCE NO.	SHEET NO.
B-4248	1-B

Note: Not to Scale

****S.U.E. = Subsurface Utility Engineering***

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- River Basin Buffer — RBB
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
B-4248	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

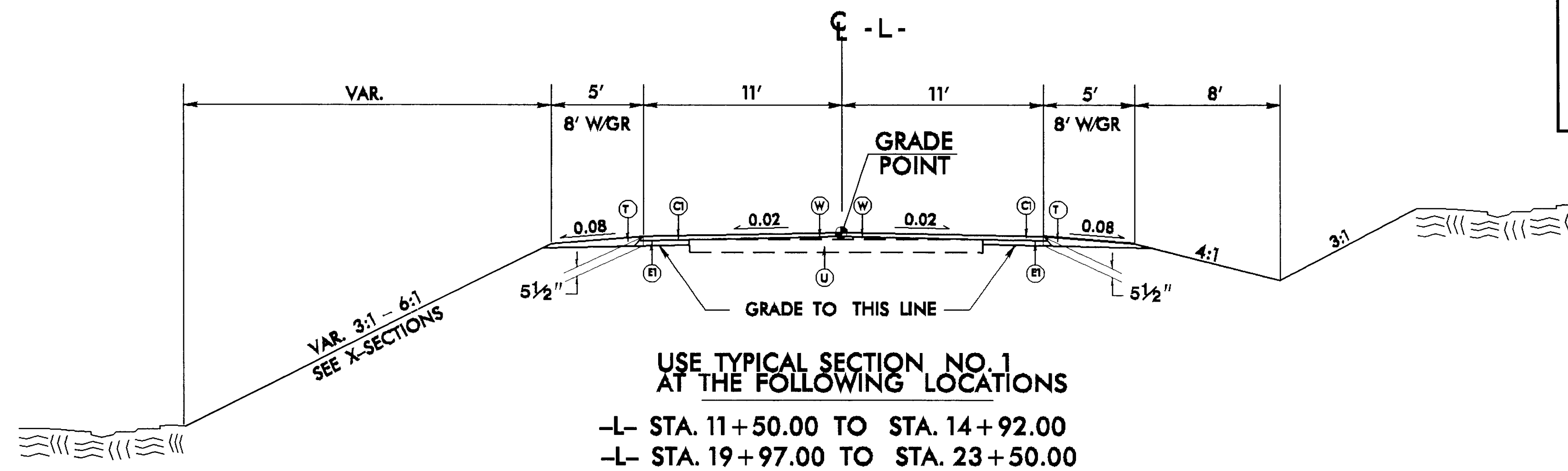
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE

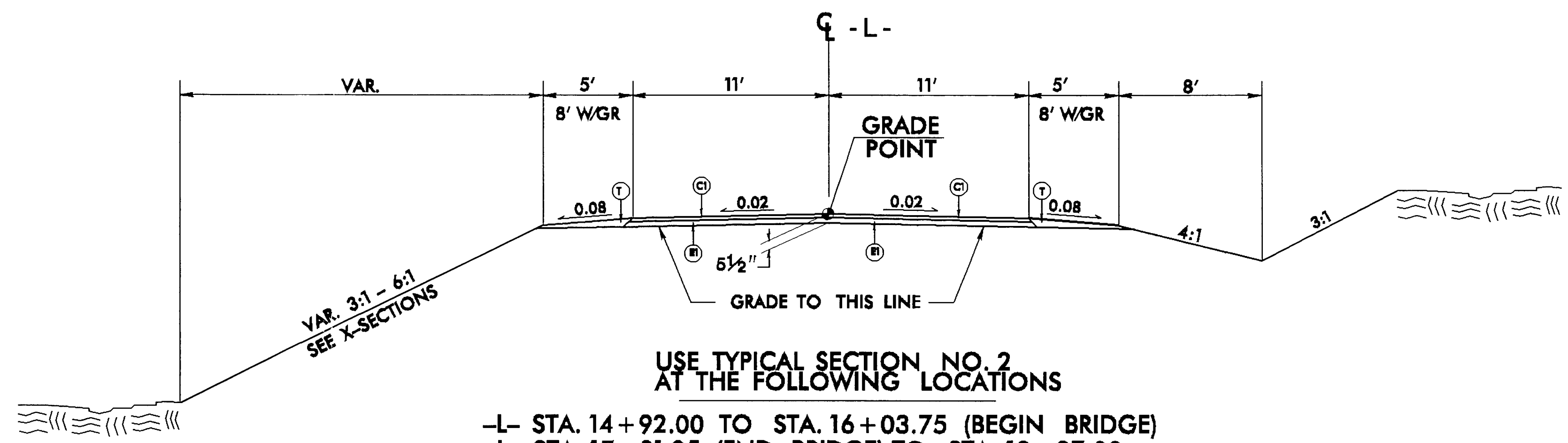
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 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	8" AGGREGATE BASE COURSE
R	SHOULDER BERM GUTTER
U	EXISTING PAVEMENT.
T	EARTH MATERIAL.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

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



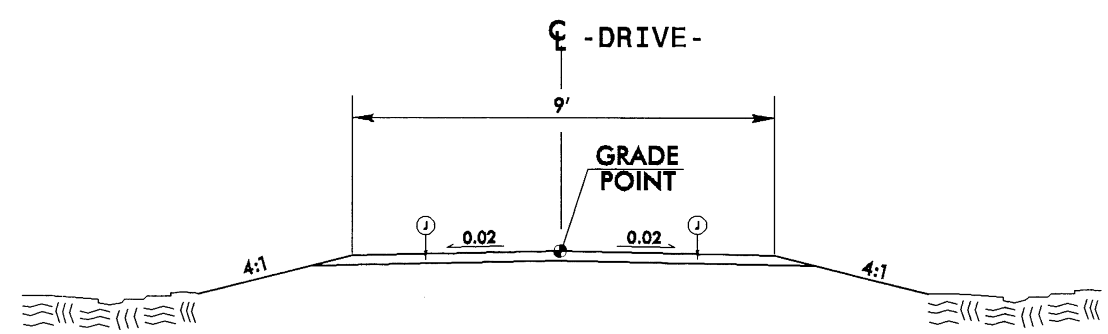
USE TYPICAL SECTION NO. 1 AT THE FOLLOWING LOCATIONS

-L- STA. 11+50.00 TO STA. 14+92.00
-L- STA. 19+97.00 TO STA. 23+50.00
TRANSITION FROM EXISTING @ -L- STA. 11+50.00 TO TYPICAL SECTION NO. 1 @ -L- STA. 12+50.00
TRANSITION FROM TYPICAL SECTION NO.1 @ -L- STA. 22+50.00 TO EXISTING @ -L- STA. 23+50.00



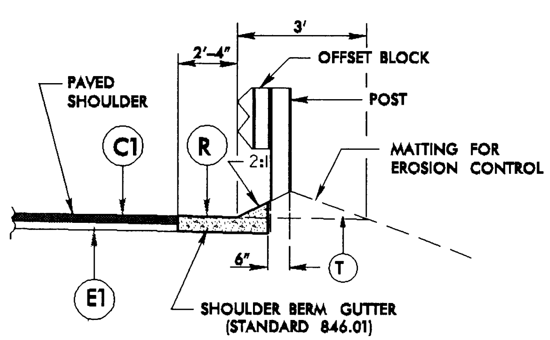
USE TYPICAL SECTION NO. 2 AT THE FOLLOWING LOCATIONS

-L- STA. 14+92.00 TO STA. 16+03.75 (BEGIN BRIDGE)
-L- STA. 17+31.25 (END BRIDGE) TO STA. 19+97.00



USE TYPICAL SECTION NO. 3 AT THE FOLLOWING LOCATIONS

-DRIVE- STA. 10+11.50 TO STA. 11+17.00



DETAIL SHOWING SHOULDER BERM GUTTER

USE WITH TYPICAL SECTION NO. 2
-L- BEGIN SBG STA. 13+65 RT
-L- BEGIN SBG STA. 15+70 LT

14-OCT-2004 09:26
R:\Roadway\Proj\B-4248_rdy_typ.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-4248	2-A

ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

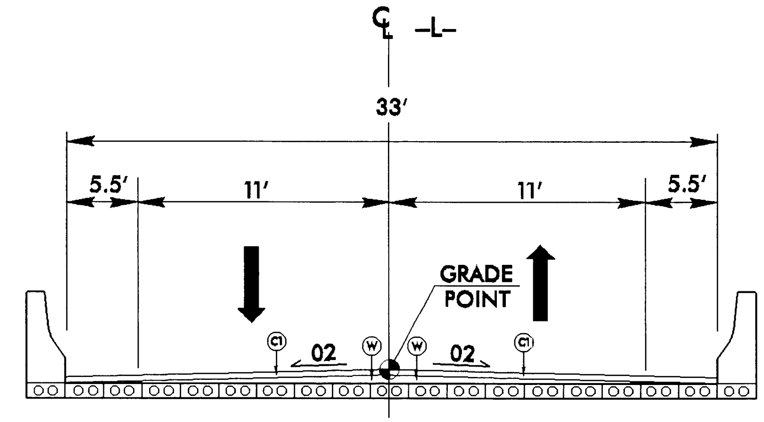
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

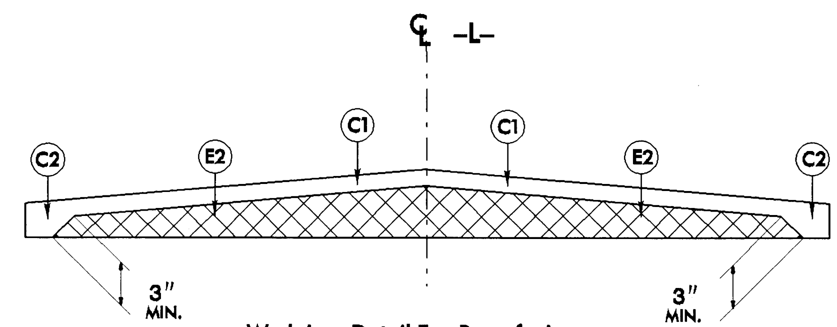
PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	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. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 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.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

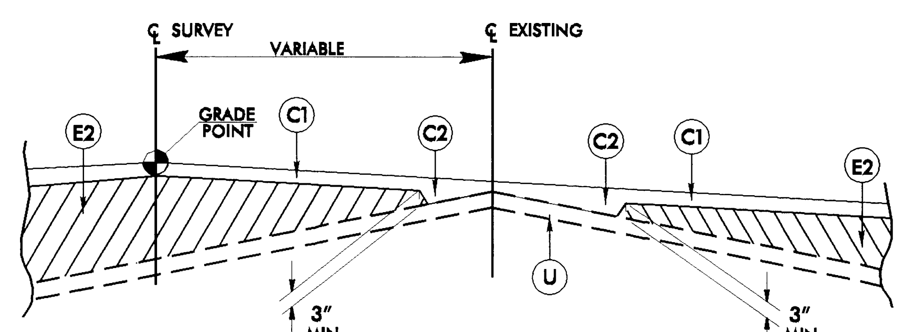
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE



DETAIL SHOWING METHOD OF WEDGING ON STRUCTURE
-L- STA. 16+03.75 TO 17+31.25



Wedging Detail For Resurfacing



Detail Showing Method Of Wedging

14-OCT-2004 09:26
R:\Roadway\Proj\B-4248_rdy_typ.dgn
Kanaan AT RD195371

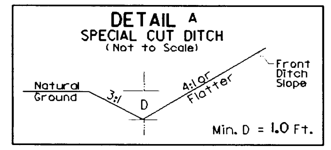
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4248	4

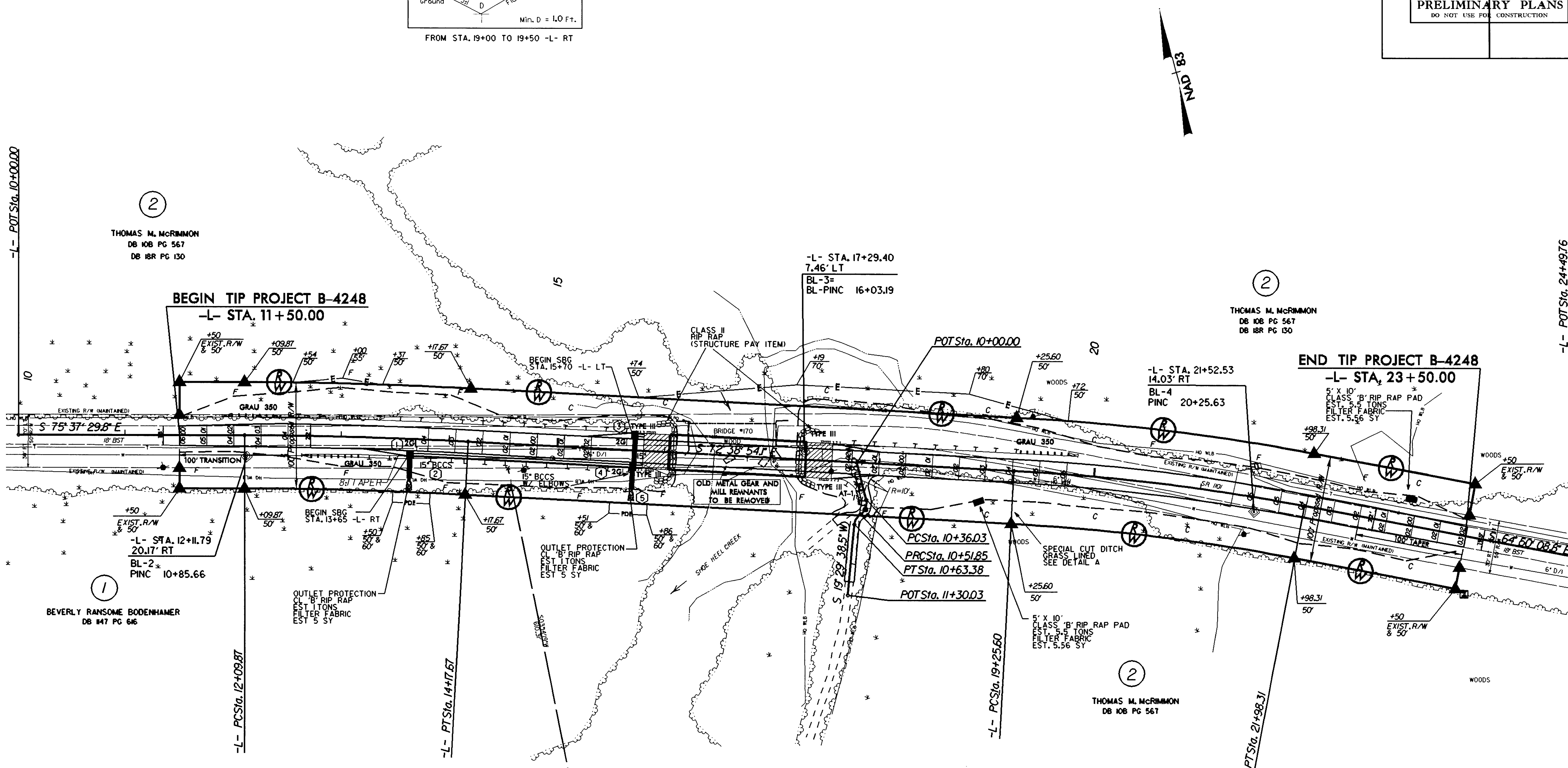
R/W SHEET NO.

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



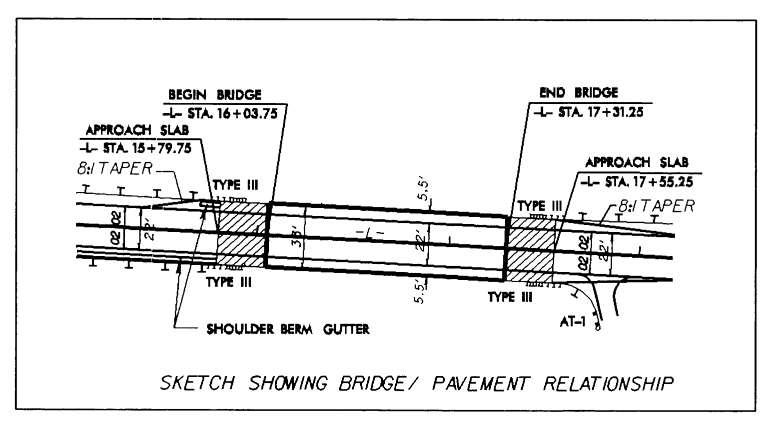
FROM STA. 19+00 TO 19+50 -L- RT



NAD 83
THOMAS M. McRIMMON
DB 108 PG 567
DB 18R PG 130
BEGIN TIP PROJECT B-4248
-L- STA. 11+50.00
-L- POT Sta. 10+00.00
-L- STA. 17+29.40
7.46' LT
BL-3=
BL-PINC 16+03.19
CLASS II RIP RAP (STRUCTURE PAY ITEM)
BEGIN SBG STA. 15+70 -L- LT
POT Sta. 10+00.00
-L- STA. 21+52.53
14.03' RT
BL-4
PINC 20+25.63
END TIP PROJECT B-4248
-L- STA. 23+50.00
5' X 10' CLASS 'B' RIP RAP PAD
EST. 5.5 TONS
FILTER FABRIC
EST. 5.56 SY
-L- POT Sta. 24+49.76
S 75° 37' 29.8" E
EXISTING R/W (MAINTAINED)
GRAU 350
100' TRANSITION
BRIDGE #170
OLD METAL GEAR AND MILL REMNANTS TO BE REMOVED
SHOE HEEL CREEK
-L- STA. 12+11.79
20.17' RT
BL-2
PINC 10+85.66
BEVERLY RANSOME BODENHAMER
DB 1147 PG 616
BEGIN SBG STA. 13+65 -L- RT
OUTLET PROTECTION
CL 'B' RIP RAP
EST 1 TONS
FILTER FABRIC
EST 5 SY
15" BCCS W/ ELBOWS
PCSta. 10+36.03
PRCSta. 10+51.85
PTSta. 10+63.38
POTSta. 11+30.03
S 19° 29' 38.5" W
SPECIAL CUT DITCH
GRASS LINED
SEE DETAIL A
-L- PCSta. 12+09.87
-L- PTSta. 14+17.57
-L- PCSta. 19+25.60
-L- PTSta. 21+98.31
WOODS
S 64° 50' 08.8" E
100' TAPER

-L-	
PI Sta 13+13.80	PI Sta 20+62.16
Δ = 2° 58' 35.7" (RT)	Δ = 7° 48' 45.3" (RT)
D = 1° 25' 56.6"	D = 2° 51' 53.2"
L = 207.80'	L = 272.71'
T = 103.93'	T = 136.57'
R = 4,000.00'	R = 2,000.00'
S.E. = .04	S.E. = .06
RO = 96'	RO = 144'

-DRIVE-	
PI Sta 10+45.09	PI Sta 10+58.03
Δ = 69° 42' 51.3" (RT)	Δ = 50° 48' 12.0" (LT)
D = 440° 44' 12.4"	D = 440° 44' 12.4"
L = 15.82'	L = 11.53'
T = 9.05'	T = 6.17'
R = 13.00'	R = 13.00'



SKETCH SHOWING BRIDGE/ PAVEMENT RELATIONSHIP

FOR -L- PROFILE SEE SHEET 5

FOR STRUCTURE PLANS SEE SHEET S - S

14-OCT-2004 09:27
R:\Roadway\Proj\B4248_rdy_psh.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-4248	5

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

5/14/99

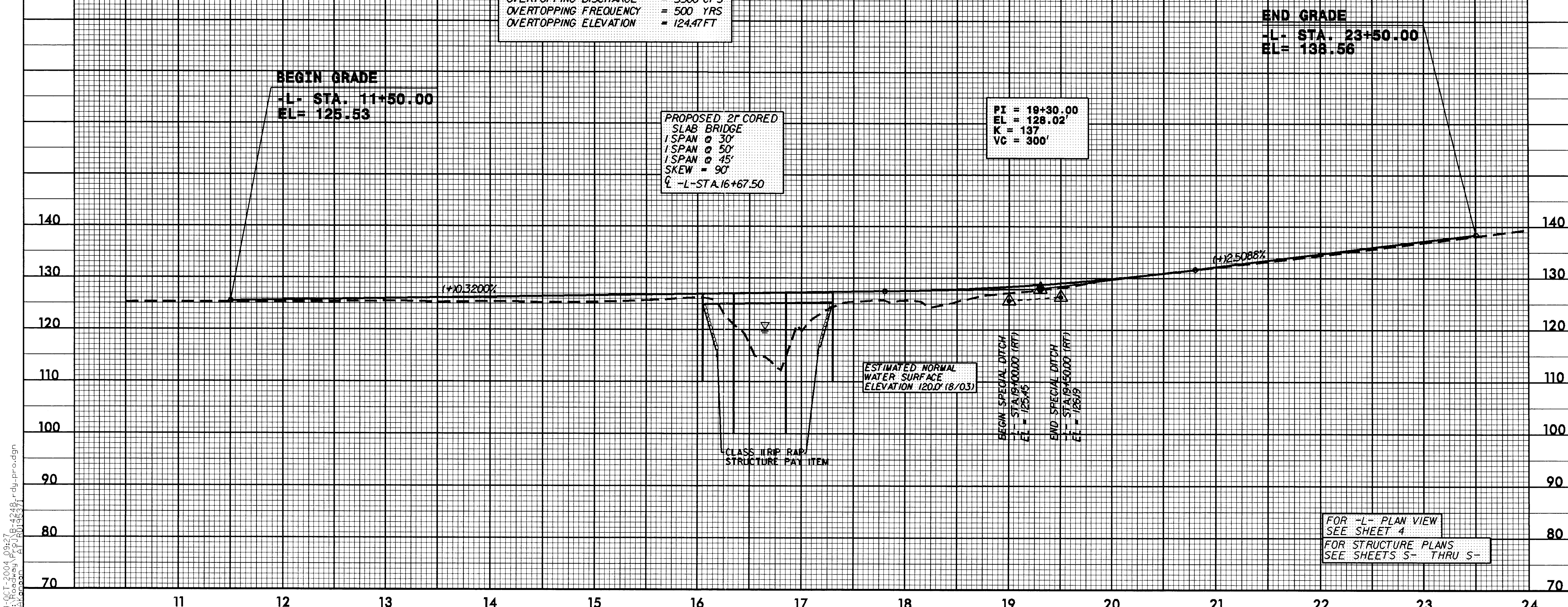
BM #80 R/R SPIKE IN BASE OF 8" GUM TREE
TO -L- STA. 11+50.00 IS S 82°09'06" E
DISTANCE 429.95' ELEV.=120.66'
N 304920.91 E 1887138.98

-L-

BM #81 R/R SPIKE IN BASE OF 12" PINE TREE
53.25' RIGHT OF -L- LINE STA. 23+58.77
ELEV. 140.63'

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 2700 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 121.51 FT
BASE DISCHARGE	= 3800 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 122.87FT
OVERTOPPING DISCHARGE	= 5500 CFS
OVERTOPPING FREQUENCY	= 500 YRS
OVERTOPPING ELEVATION	= 124.47FT



14-OCT-2004 09:27
R:\Roadway\Proj\B-4248_rdy-pro.dgn
BAKangan AT RD1953?1

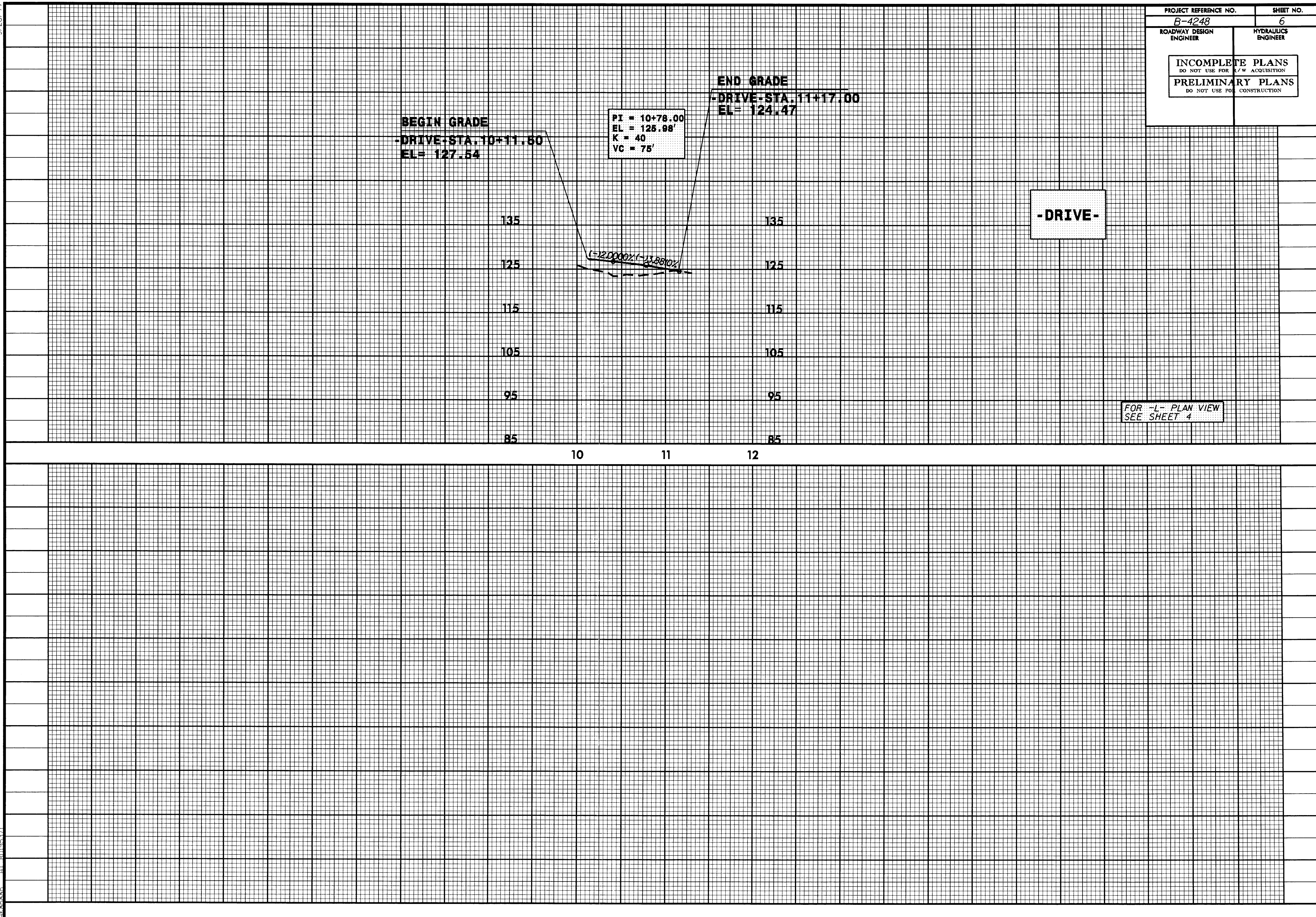
PROJECT REFERENCE NO.	SHEET NO.
B-4248	6

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



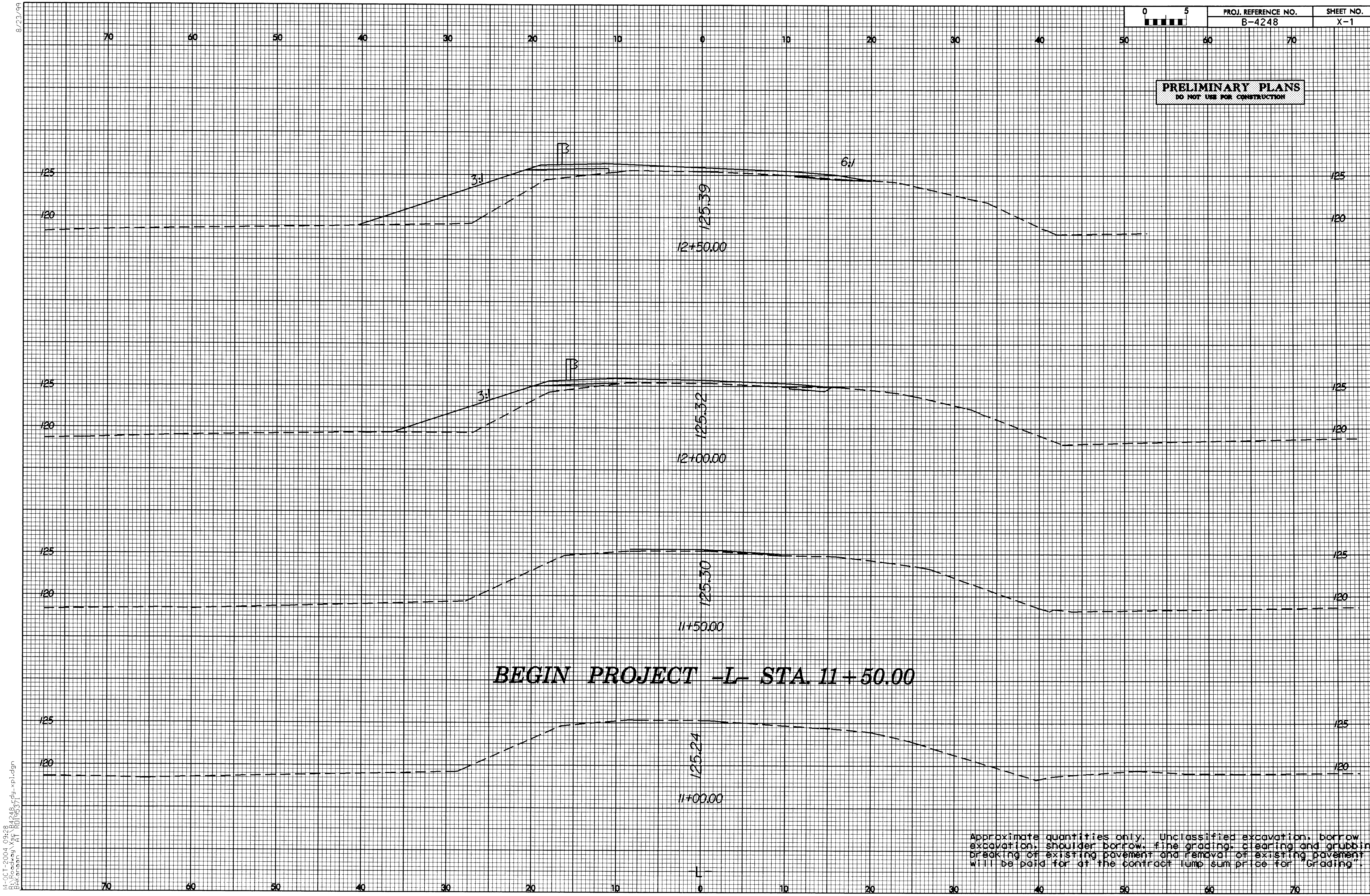
FOR -L- PLAN VIEW SEE SHEET 4

5/28/99

14-OCT-2004 09:27
R:\Roadway\Proj\B-4248_rdy-pro.dgn
BAKonnnn AT RD195371

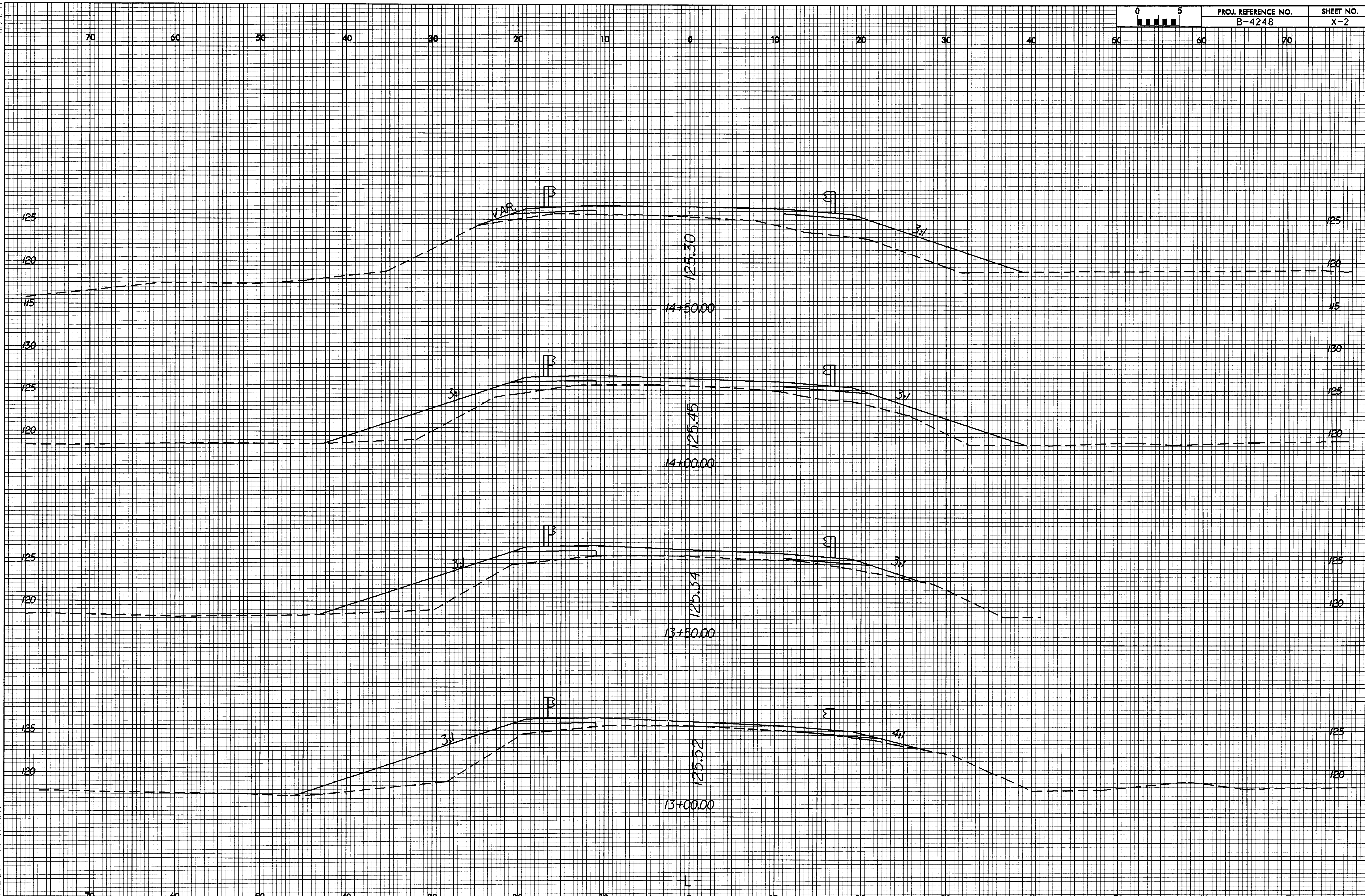
PROJ. REFERENCE NO.	SHEET NO.
B-4248	X-1

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



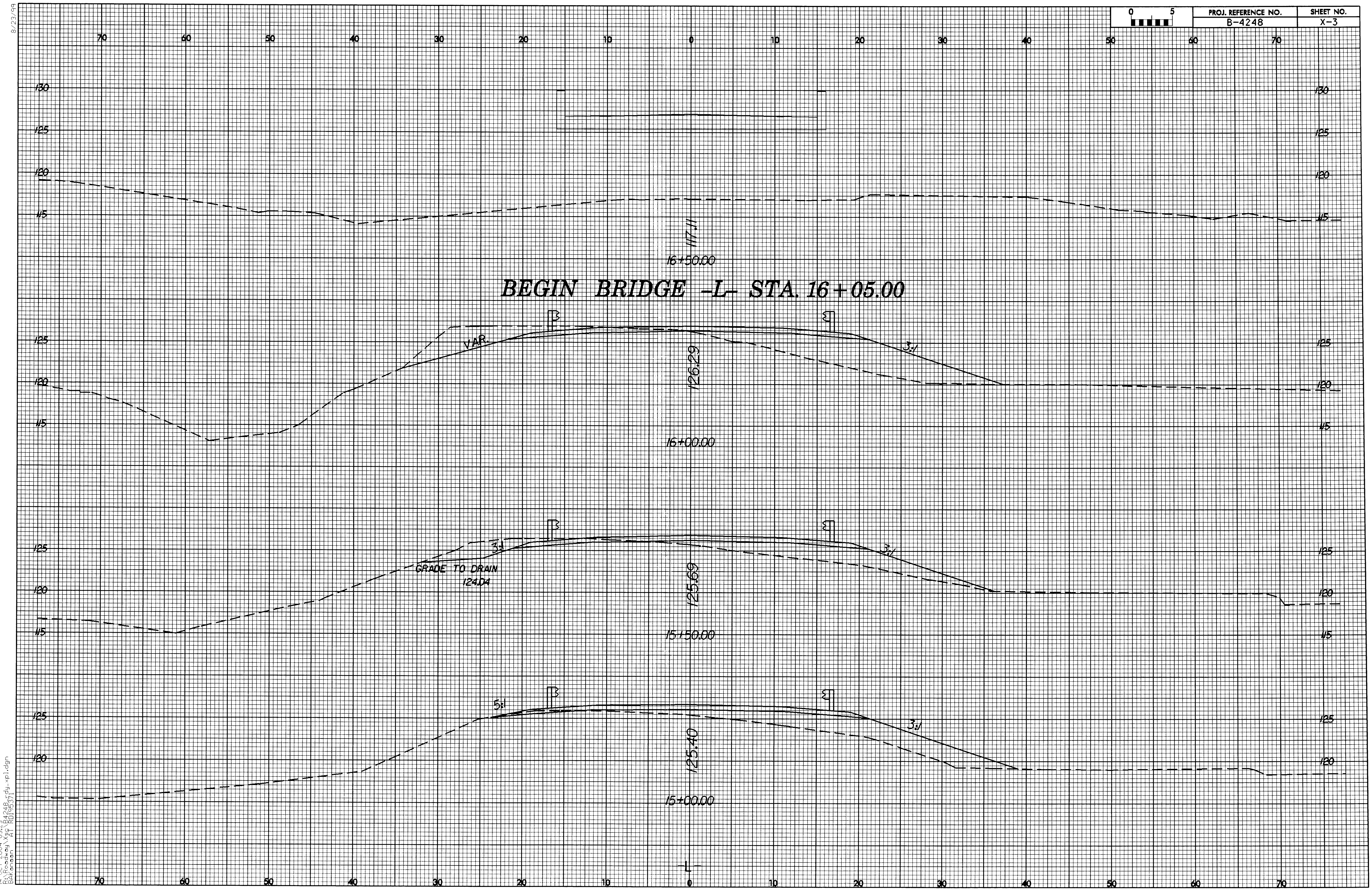
Approximate quantities only. Unclassified excavation, borrow excavation, shoulder borrow, fine grading, clearing and grubbing, breaking of existing pavement and removal of existing pavement will be paid for at the contract lump sum price for "Grading".

PROJ. REFERENCE NO.	SHEET NO.
B-4248	X-2



8/23/99

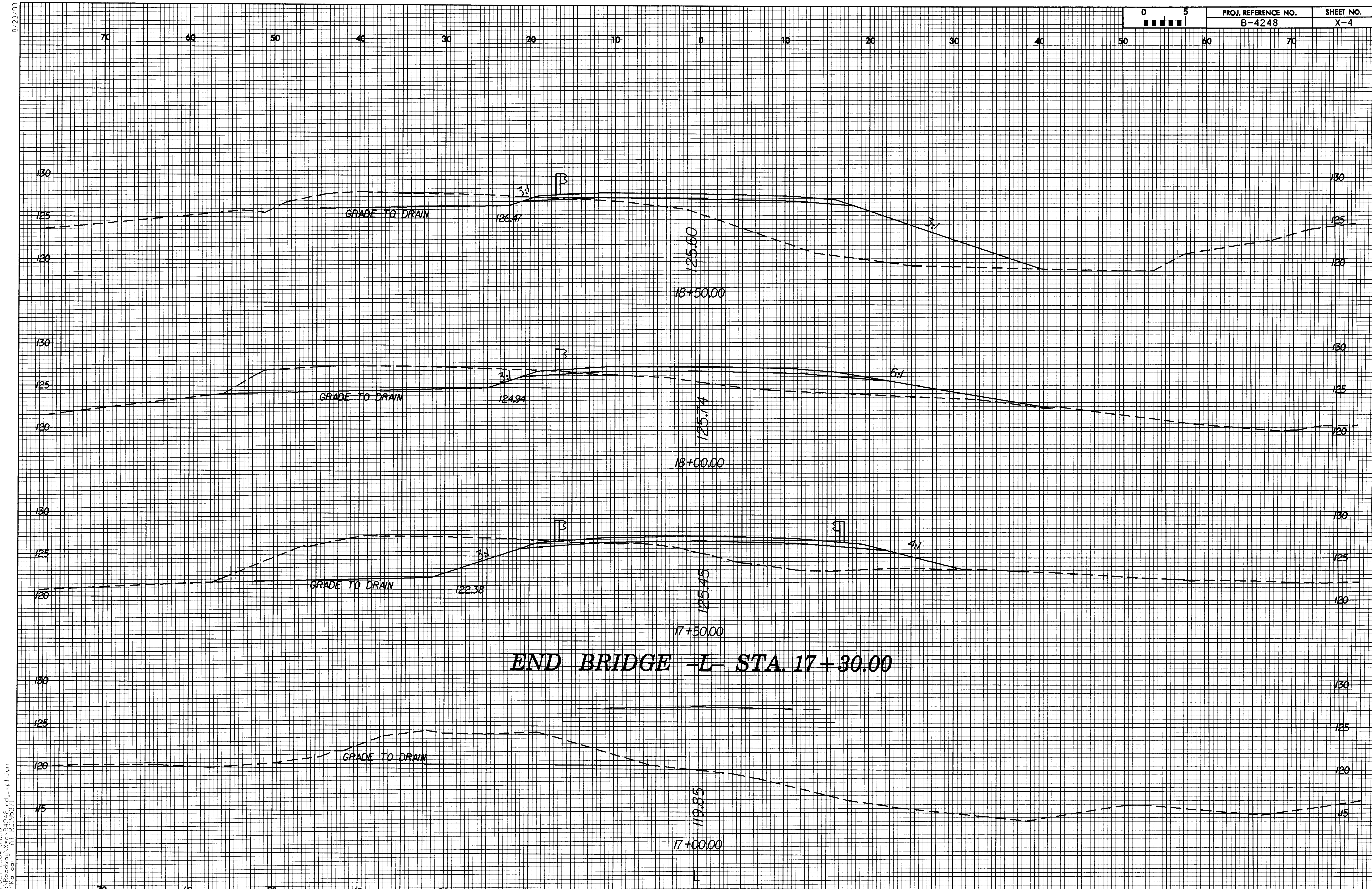
14-OCT-2004 09:29
R:\Roadway\Xsc\B4248_rdy_xpl.dgn
BAKanaan AT RDI95371



PROJ. REFERENCE NO.
B-4248
SHEET NO.
X-3
0 5
BEGIN BRIDGE -L- STA. 16+05.00
16+50.00
117.11
16+00.00
126.29
VAR.
3:1
15+50.00
125.69
GRADE TO DRAIN
124.04
3:1
15+00.00
125.40
5:1
3:1
-L-

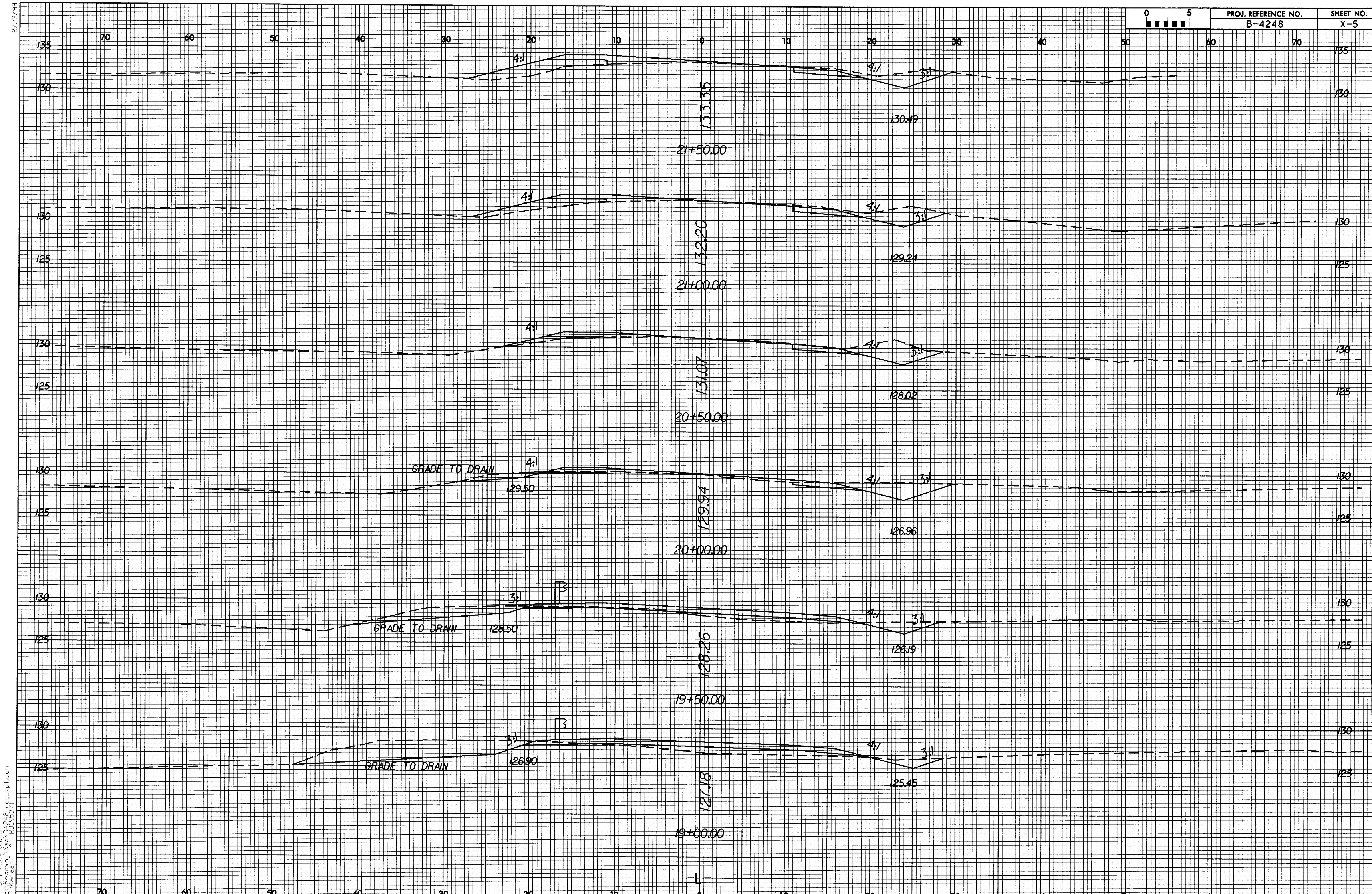
8/23/99

PROJ. REFERENCE NO.	SHEET NO.
B-4248	X-4



14-OCT-2004 09:30

PROJ. REFERENCE NO.	SHEET NO.
B-4248	X-5



8/23/99

14-OCT-2004 09:30
R:\Roadway\Xsc\B4248_rdy_xpl.dgn
BAKanaan AT RDI95371

8/23/99

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4248	X-6

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

140 135

139.68

24+00.00

END PROJECT -L- STA. 23+50.00

140 135

138.30

23+50.00

6:1 4:1 4:1 3:1

135.008 134.70

135 130

137.02

23+00.00

4:1 4:1 3:1

135 130

133.43

135.79

22+50.00

4:1 4:1 3:1

135 130

131.96

134.54

22+00.00

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

14-OCT-2004 09:31
B:\Roadway\$$\R4248_rdy_xpl.dgn
Bankson
AT R01965371

Robeson County
Bridge No. 170 on SR 1101
Over Shoe Heel Creek
Federal Aid Project No. BRZ-1101(8)
State Project No. 8.2462501
T.I.P. No. B-4248

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

4/21/03
DATE

Teresa Hart for Gregory J. Thorpe, PhD.
Environmental Management Director, PDEA

4/22/03
DATE

Thomas D. Rhyne for Donald J. Voelker,
Acting Division Administrator, FHWA

Robeson County
Bridge No. 170 on SR 1101
Over Shoe Heel Creek
Federal Aid Project No. BRZ-1101(8)
State Project No. 8.2462501
T.I.P. No. B-4248

CATEGORICAL EXCLUSION

Documentation Prepared in
Project Development and Environmental Analysis Branch By:

4/3/03
DATE

Karen B. Capps, PE
Karen B. Capps, PE
Project Planning Engineer

4/3/03
DATE

William T. Goodwin Jr.
William T. Goodwin Jr., PE, Unit Head
Bridge Replacement Planning Unit

Project Commitments

Replacement of Bridge No. 170 on SR 1101 Over Shoe Heel Creek
Robeson County
F. A. Project No. BRZ-1101(8)
State Project No. 8.2462501
T.I.P. No. B-4248

Roadway Design Unit, Division 6

The existing bridge has an abandoned gear assembly located in the southwest quadrant of the project area. This gear assembly will be moved during the construction of the proposed bridge and will be accounted for under Clearing and Grubbing.

Robeson County
Bridge No. 170 on SR 1101
Over Shoe Heel Creek
Federal Aid Project No. BRZ-1101(8)
State Project No. 8.2462501
T.I.P. No. B-4248

INTRODUCTION: Bridge No. 170 is included in the latest approved North Carolina Department of Transportation (NCDOT) Transportation Improvement Program and is eligible for the Federal-Aid Bridge Replacement and Rehabilitation 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 the bridge has a sufficiency rating of 22.1 out of a possible 100 for a new structure. The bridge is considered to be structurally deficient. The replacement of this inadequate structure will result in safer traffic operations.

II. EXISTING CONDITIONS

The project is located in western Robeson County about 1.5 miles (2.4 km) northeast of the South Carolina border, and six miles (9.7 km) northwest from the town of Rowland. (See Figure 1). Development in the area is comprised of scattered residential homes and farms.

SR 1101 is classified as a rural local route in the Statewide Functional Classification System and it is not a National Highway System Route. 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 bridge, SR 1101 has a 17-foot (5.2 meter) pavement width with approximately 2-foot (0.6-meter) grass shoulders. The roadway grade is in a slight sag vertical curve through the project area. The horizontal bridge alignment is tangent and the roadway is situated approximately 16 feet (4.9 meters) above the creek bed.

Bridge No. 170 is a four-span structure that consists of a timber floor on continuous steel I-beams with an asphalt wearing surface. The end bents and interior bents consist of timber caps and timber piles. Interior bent number two has additional timber crutch cap and timber piles. The existing bridge was constructed in 1951. The overall length of the structure is 81 feet (24.7 meters). The clear roadway width is 21.4 feet (6.5 meters). The posted weight limit on this bridge is 31 tons for single vehicles and 34 tons for TTST's.

The utility impact on this project is low. A water line and several power lines are located on the southern side of the roadway. There are no utilities attached to the existing structure.

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 one percent truck-tractor semi-trailer (TTST) and two percent dual-tired vehicles (DT). The speed limit is not posted in this area and is assumed statutory 55 mph (90 kmh). No accidents were reported in the vicinity of Bridge No. 170 during a recent three-year period. Three (3) school buses cross the bridge daily on their morning and afternoon routes.

III. ALTERNATIVES

A. Project Description

The replacement structure will consist of a 116-foot (35.4-meter) long bridge. The bridge will be of sufficient width to provide for two 11-foot (3.4-meter) lanes with three-foot (one-meter) offsets on each side.

The roadway grade of the new structure will be slightly higher than the existing grade at this location in order to facilitate drainage.

The existing roadway will be widened to a 22-foot (6.7-meter) pavement width to provide two eleven-foot (3.4-meter) lanes. Five-foot (1.5-meter) shoulders will be provided on each side and increased to eight-foot (2.4-meter) shoulders where guardrail is required. This roadway will continue to be designated as a rural local route.

B. Reasonable and Feasible Alternatives

The two alternatives for replacing Bridge No. 170 that were studied are described below.

Alternate 1: (Preferred) involves replacement of the structure approximately 20 feet (6.1 m) to the south of the existing bridge. Please reference Figure 3. The proposed alignment minimizes impacts to higher quality wetlands and improves the horizontal alignment in the project vicinity. The swamp forest wetlands, which are the highest quality wetlands found on this site, are mostly located on the north side of the existing bridge. The wetlands on the south side of the existing bridge consist mainly of a maintained powerline right of way and floodplain forest, which are lower quality wetlands. The majority of the impacts occur in the maintained disturbed right of way of the existing roadway and the maintained powerline right of way. Improvements to the approach roadways will be required for a distance of approximately 535 feet (163 meters) to the west and 657 feet (200 meters) to the east of the structure. Traffic will be detoured offsite (see Figure 1) during the construction period.

Alternate 2: involves replacement of the structure along the existing roadway alignment. While this alternate is less expensive due to decreased utility costs, it impacts more wetlands, especially the higher quality swamp forest wetlands found on the north side of the bridge. This alternate skews the proposed bridge slightly to improve the horizontal alignment on the east in of the bridge. Please reference Figure 4. Improvements to the approach roadways would be required for a distance of approximately 335 feet (102 meters) to the west and 622 feet (190 meters) to the east of the structure. Traffic would be detoured offsite (see Figure 1) during the construction period.

C. Alternatives Eliminated From Further Consideration

The "do-nothing" alternative will eventually necessitate closure of the bridge. This is not acceptable due to the traffic service provided by SR 1101.

"Rehabilitation" of the old bridge is not practical due to its age, deteriorated condition and timber substructure.

D. Preferred Alternative

Bridge No. 170 will be replaced at a location approximately 20 feet (6.1 m) to the south of the existing bridge as shown by Alternate 1 in Figure 3. Alternate 1 is recommended because it minimizes impacts to the higher quality wetlands in the vicinity of the site and improves the horizontal alignment.

A road user analysis was performed based on 400 VPD and an average of 6.5 miles (10 km) of indirect travel (see Figure 1). At a vehicle operating cost of $0.36 per mile, the cost of additional travel would be about $230,000 during an eight-month construction period. The estimated cost of maintaining traffic on-site for both alternates is $600,000. This estimate does not include the cost of additional mitigation for impacts to wetlands from an on-site detour. Therefore, it is more economical and environmentally prudent to detour traffic off-site during the construction period. The NCDOT Division 6 Construction Engineer concurs with the selection of Alternate 1 as the preferred alternative.

IV. ESTIMATED COSTS

The estimated costs for the two alternates are as follows:

	Alternate 1 (Preferred)	Alternate 2
Structure	$244,000	$244,000
Roadway Approaches	$171,000	$140,000
Structure Removal	$ 16,000	$ 16,000
Misc. & Mobilization	$ 86,000	$ 75,000
Eng. & Contingencies	$ 83,000	$ 75,000
Total Construction Costs	$600,000	$550,000
Right-Of-Way Costs	$ 63,000	$ 33,000
Total Project Cost	$ 663,000	$ 583,000

V. NATURAL RESOURCES

PHYSICAL RESOURCES

The project area lies in the eastern portion of North Carolina within the Coastal Plain physiographic province. Elevations in the project area are approximately 125 feet (37.8 m) (National Geodetic Vertical Datum, 1929). The topography of the project vicinity is generally flat.

The proposed project is in a rural area in Robeson County approximately 1.5 miles (2.4 km) northeast of the South Carolina border, and 6 miles (9.7 km) northwest from the town of Rowland. Robeson County's major economic resource is agriculture. The population of Robeson County in 2000 was 123,339 (North Carolina Office of State Budget, Planning and Management 2001).

Soils

Information about soils in the project area was taken from the *Soil Survey of Robeson County, North Carolina* (USDA 1978). The map units in the project area are Johnston soils and Rutlege loamy sands. Both soils are classified as hydric by the Natural Resources Conservation Service (NRCS).

- **Johnston soils (JT)** are mapped along the banks of Big Shoe Heel Creek within the project area. These soils are nearly level and poorly drained. They are typical of flood plain areas in the Coastal Plain, and are frequently flooded. The permeability is moderate and the water table remains at or near the surface most of the year.
- **Rutlege loamy sand (Ru)** is found in the uplands within the project area. These soils are also nearly level and poorly drained. Permeability is rapid, although they can be ponded for brief periods. The seasonal high water table remains at or near the surface.

Site index is a measure of soil quality and productivity. The index is the average height, in feet, that dominant and co-dominant trees of a given species attain in a specified

number of years (typically 50). The site index applies to fully-stocked, even-aged, unmanaged stands. The soils in the project area have the following site indices:

- Johnston soils have a site index of 100 for the following tree species: loblolly pine (*Pinus taeda*), shortleaf pine (*Pinus echinata*), sweetgum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), willow oak (*Quercus phellos*), and cottonwood (*Populus deltoides*). Water oak (*Quercus nigra*) has a site index of 90-100.
- Rutlege soils have a site index of 90 for loblolly pine, slash pine, and sweetgum. Pond pine (*Pinus serotina*) has a site index of 70.

WATER RESOURCES

Physical Characteristics of Surface Waters

The project is located in the Lumber River basin (LBR55 sub-basin, HUC 03040204). Shoe Heel Creek originates about 23 miles (37.3 km) north of the project area. As the stream flows southward it is joined by several other large streams including Little Shoe Heel Creek, Jordan Creek, and Juniper Swamp Creek. After passing through the project area the stream continues in a southerly direction, and flows into South Carolina only 2.5 miles (4 km) away. From the state line, the stream continues to meander in a southerly direction for 1.5 miles (2.4 km) to its confluence with the Pee Dee River.

Just upstream from Bridge 170, Big Shoe Heel Creek is joined by McGregor Branch from the west. Upstream of the bridge, each creek is 15 to 20 feet (4.6 to 6.1 m) wide. At the confluence, the channel of Big Shoe Heel Creek widens to about 75 feet (22.9 m). Downstream of the bridge, the stream forms a large pool in the meander bend on the left (east) bank, then turns sharply to the west and flows southwest out of the project area.

Generally the banks are 3 feet (0.9 m) high, gently sloping and well vegetated with herbs, shrubs, and trees. A wide floodplain is present on both sides of the creek. The water is dark brown and at least 2 feet (1.2 m) deep over a white sandy substrate. The flow was very slow the day of the site visit. Large amounts of coarse woody debris litter the channel.

Best Usage Classification

Surface waters in North Carolina are assigned a classification by the DWQ that is designed to maintain, protect, and enhance water quality within the state. Shoe Heel Creek [Index # 14-34-(5)] is classified as a *Class C Sw* water body (NCDENR, 2001). *Class C* water resources are waters protected for aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner. There are no restrictions on watershed development activities. The additional Sw designation refers to the stream as Swamp Waters.

No waters classified as High Quality Water (HQW), Water Supplies (WS-I or WS-II) or Outstanding Resource Waters (ORW) occur within 1.0 miles (1.6 km) of the project study area.

Water Quality

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

General Watershed Characteristics

The project area is in a largely agricultural watershed. There is a clearcut in the immediate vicinity of the proposed project, but the area is largely unsuitable for most agricultural, residential, or industrial uses. Potential threats to stream quality in this area are additional forestry operations that would result in increased soil erosion.

Basin-wide Assessment Report

Basin-wide water quality assessments are conducted by the Environmental Sciences Branch, Water Quality Section of the DWQ. The program has established monitoring stations for sampling selected benthic macroinvertebrates, which are known to have varying levels of tolerance to water pollution. An index of water quality can be derived from the number of taxa present and the ratio of tolerant to intolerant taxa. Streams can then be given a bioclassification ranging from Poor to Excellent.

There are three monitoring stations on Big Shoe Heel Creek. Two of the locations are upstream in Scotland County. The third sampling site is located at Bridge 170. This station has been sampled five times. In September 1985, it was classified as Good. In July 1987, August 1990, September 1991, and July 1996 it was classified as Excellent.

Point Source Discharge Permits

Point source discharges in North Carolina are permitted through the National Pollutant Discharge Elimination System (NPDES) program administered by the DWQ. All dischargers are required to obtain a permit to discharge.

There is one permit issued to discharge in Big Shoe Heel Creek as of September 2001 (NCDENR 2001). The Town Wastewater Treatment Plant of Maxton holds Permit NC0027120 to discharge about 9 miles (14.6 km) upstream of the project area. This is a Minor Municipal permit.

Summary of Anticipated Impacts

Any action that affects water quality can adversely affect aquatic organisms. Temporary impacts during the construction phases may result in long-term impacts to the aquatic community. In general, replacing an existing structure in the same location with an off-site detour is the preferred environmental approach. Bridge replacement at a new location results in more severe impacts, and physical impacts are incurred at the point of bridge replacement.

Project construction may result in the following impacts to surface water resources:

- Increased sediment loading and siltation as a consequence of watershed vegetation removal, erosion, and/or construction.
- Decreased light penetration/water clarity from increased sedimentation.
- Changes in water temperature with vegetation removal.
- Changes in the amount of available organic matter with vegetation removal.
- Increased concentration of toxic compounds from highway runoff, construction activities and construction equipment, and spills from construction equipment.
- Alteration of water levels and flows as a result of interruptions and/or additions to surface and groundwater flow from construction.

Construction impacts may not be restricted to the communities in which the construction activity occurs, but may also affect downstream communities. Efforts will be made to ensure that no sediment leaves the construction site. NCDOT's Best Management Practices for the Protection of Surface Waters will be implemented, as applicable, during the construction phase of the project to ensure that no sediment leaves the construction site.

The removal of the existing bridge has the potential to impact surface waters. NCDOT Best Management Practices for Bridge Demolition and Removal will be adhered to during the removal process.

BIOTIC RESOURCES

Terrestrial and aquatic communities are included in the description of biotic resources. Living systems described in the following sections include communities of associated plants and animals. These descriptions refer to the dominant flora and fauna in each community and the relationships of these biotic components. Descriptions of the terrestrial systems are presented in the context of plant community classifications. These classifications follow Schafale and Weakley (1990) where possible. They are also cross-referenced to *The Nature Conservancy International Classification of Ecological Communities: Terrestrial Vegetation of the Southeastern United States* (Weakley *et al.,* 1998), which has recently been adopted as the standard land cover classification by the Federal Geographic Data Committee. 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 used for the plant and animal

species described. Subsequent references to the same species are by the common name only.

Terrestrial Communities

Four terrestrial communities were identified within the project area: human-maintained areas, an upland pine stand, a floodplain forest, and a swamp forest. Dominant faunal components associated with these terrestrial areas will be discussed in each community description. Many species are adapted to the entire range of habitats found along the project alignment, but may not be mentioned separately in each community description.

Maintained Areas

Two types of maintained areas occur within the study corridor. An 8-foot wide maintained right-of-way runs the length of the corridor on both sides of SR 1101. Bahia grass (*Paspalum notatum*) is the dominant species. Poison ivy (*Toxicodendron radicans*), Virginia creeper (*Parthenocissus quinquefolia*), greenbrier (*Smilax rotundifolia*), and seedlings of oak (*Quercus* spp.) and red maple (*Acer rubrum*) are also found here.

The animal species present in this disturbed habitat are opportunistic and capable of surviving on a variety of resources, ranging from vegetation to both living and dead faunal components. American crow (*Corvus brachyrynchos),* European starling (*Sturnus vulgaris*), and American robin (*Turdus migratorius*) are common birds that use these habitats. The area may also be used by the Virginia opossum (*Didelphis virginiana*), various species of mice (*Peromyscus* sp.), eastern garter snake (*Thamnophis sirtalis*), and southern toad (*Bufo terrestris*).

The road shoulder slopes steeply down to a powerline right-of-way on the south side of SR 1101. This area is a jurisdictional wetland. The vegetation is hydrophytic and the sandy loam soil is saturated to the surface. Because of regular maintenance, there are no woody species beyond the seedling stage. Species in the area include sweetgum (*Liquidambar styraciflua*), red maple, buttonbush (*Cephalanthus occidentalis*), elderberry (*Sambucus canadensis*), cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis*), knotweed (*Polygonum sagittatum*), and false stinging-nettle (*Boehmeria cylindrica*).

Animals that utilize the roadside will also use this area. In addition, expect to find Carolina wren (*Thryothorus ludovicianus*), eastern towhee (*Pipilo erythrophthalmus*), common yellowthroat (*Geothlypis trichas*) and indigo bunting (*Passerina cyanea*).

Upland Pine Stand

An upland pine stand occupies the eastern end of the study corridor on both sides of SR 1101. Species in this community include loblolly pine (*Pinus taeda*), red maple, sweetgum, Chinese privet (*Ligustrum sinense*), multiflora rose (*Rosa multiflora*),

blackberry (*Rubus argutus*), muscadine (*Vitis rotundifolia*), Japanese honeysuckle (*Lonicera japonica*), and Virginia creeper.

The bird species expected in this community include downy woodpecker (*Picoides pubescens*), pine warbler (*Dendroica pinus*), Carolina wren, and ruby-crowned kinglet (*Regulus calendula*). Mammal species may include southeastern shrew (*Sorex longirostris*), northern flying squirrel (*Glaucomys sabrinus*), and woodland vole (*Microtus pinetorum*). Finally, the following herpetofauna can also be expected: black rat snake (*Elaphe obsoleta obsoleta*), corn snake (*Elaphe guttata guttata*), and oak toad (*Bufo quercicus*).

Floodplain Forest

The upland pine stand grades westward into a gently sloping floodplain forest on both sides of SR 1011. This forest occurs over wet, sandy loam soils and is a jurisdictional wetland. Species include yellow poplar (*Liriodendron tulipifera*), red maple, loblolly pine, water oak (*Quercus nigra*), sweetgum, greenbrier, trumpet creeper (*Campsis radicans*), muscadine, Chinese privet, sweet pepperbush (*Clethra alnifolia*), sensitive fern (*Onoclea sensibilis*), and netted chain fern (*Woodwardia areolata*). This community probably corresponds to a Coastal Plain Small Stream Swamp (Blackwater Subtype) as described by Schafale and Weakley (1990). The soils and community composition are more characteristic of Coastal Plain Bottomland Hardwoods (Blackwater Subtype), but this classification is usually reserved for forests on larger rivers with well-developed alluvial landforms. The hydrology of Small Stream Swamps is somewhat different, and apparently results in a more variable community composition caused by patches of wet and dry vegetation at scale too small to be considered distinct communities.

Many species that utilize the upland pine stand and the swamp forest will also wander into this community. Expect to find white-breasted nuthatch (*Sitta carolinensis*), summer tanager (*Piranga rubra*), blue-headed vireo (*Vireo solitarius*), and northern flicker (*Colaptes auratus*) in this community. The mammal species expected in this area may include white-tailed deer (*Odocoileus virginianus*), Virginia opossum, white-footed mouse (*Peromyscus leucopus*), gray squirrel (*Sciurus carolinensis*), and eastern mole (*Scalopus aquaticus*). Amphibians and reptiles may include southern dusky salamander (*Desmognathus auriculatus*), eastern box turtle (*Terrapene carolina*), and copperhead (*Agkistrodon contortrix*).

Swamp Forest

The remainder of the study corridor is occupied by a swamp forest. This flat, low-lying area on both banks of Shoe Heel Creek has wet, mucky soils and is a jurisdictional wetland. Part of this area at the western end of the corridor has been clearcut. Regenerating species are the same as those in the intact swamp forest and the soils are similar. Species include bald cypress (*Taxodium distichum*), swamp blackgum (*Nyssa sylvatica* var. *biflora*), red maple, loblolly pine, sweetgum, false stinging-nettle, arrow arum (*Peltandra virginica*), royal fern, dog-hobble (*Leucothoe axillaris*), poison ivy,

netted chainfern, Chinese privet, and sweet pepperbush. This community may also be classified as a Coastal Plain Small Stream Swamp (Blackwater Subtype) for the reasons described above.

Bird species expected in this community include barred owl (*Strix varia*), red-shouldered hawk (*Buteo lineatus*), great blue heron (*Ardea herodias*), prothonotary warbler (*Protonotaria citrea*), Louisiana waterthrush (*Seiurus motacilla*), Swainson's warbler (*Limnothlypis swainsonii*), and white-eyed vireo (*Vireo griseus*). Mammal species such as Virginia opossum, raccoon (*Procyon lotor*), bobcat (*Felis rufus*), southern short-tailed shrew (*Blarina carolinensis*), and hispid cotton rat (*Sigmodon hispidus*) may be found in the swamp forest. Herpetofauna that may be encountered here include eastern cottonmouth (*Agkistrodon piscivorus piscivorus*), redbelly water snake (*Nerodia erythrogaster erythrogaster*), snapping turtle (*Chelydra serpentina*), yellowbelly slider (*Trachemys scripta scripta*), Florida cooter (*Pseudemys floridana floridana*) and southern dusky salamander.

Aquatic Communities

Within the project area, Big Shoe Heel Creek is a low-gradient, fourth-order stream. The bed material consists of mostly of sand. On the day of the site visit, the water was clear but stained a dark brown color because of high levels of tannins. The riparian community is mostly deciduous trees and mixed evergreen-deciduous shrubs. No aquatic vegetation was observed in the channel.

According to a communication from Keith Ashley, District 4 Biologist for the NCWRC, Big Shoe Heel Creek is likely to support populations of largemouth bass (*Micropterus salmoides*), redear sunfish (*Lepomis microlepis*), redbreast sunfish (*Lepomis auritus*), bluegill (*Lepomis macrochirus*), warmouth (*Lepomis gulosus*), spotted sunfish (*Lepomis punctatus*), dollar sunfish (*Lepomis marginatus*), spotted sucker (*Minytrema melanops*), chain pickerel (*Esox niger*), redfin pickerel (*Esox americanus*), yellow perch (*Perca flavescens*), American eel (*Anguilla rostrata*), and various minnow species. Anadromous fish would probably not be found in Shoe Heel Creek because of its small size.

Summary of Anticipated Impacts

Project construction will have various impacts to the previously described terrestrial and aquatic communities. Any construction 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 plants and animals affected. Temporary and permanent impacts are considered here along with recommendations to minimize or eliminate impacts.

Terrestrial Communities

Terrestrial communities in the project area will be impacted permanently by project construction from clearing and paving. Estimated impacts are based on the length of the

alternate and the entire study corridor width. Table 1 describes the potential impacts to terrestrial communities by habitat type. Because impacts are based on the entire study corridor width, the actual loss of habitat will likely be less than the estimate.

Table 1. Estimated Area of Impact to Terrestrial Communities

	Alternate 1	**Alternate 2**
Community		
Maintained roadside	0.54 Ac	0.44 Ac
Maintained PROW	0.08 Ac	0.07 Ac
Upland pine stand	0.04 Ac	0.04 Ac
Floodplain forest	0.11 Ac	0.16 Ac
Swamp forest	0.01 Ac	0.08 Ac
Total Impact	**0.78 Ac**	**0.79 Ac**
Total Wetland Impact	**0.20 Ac**	**0.31 Ac**

Destruction of natural communities along the project alignment will result in the loss of foraging and breeding habitats for the various animal species that utilize the area. Animal species will be displaced into surrounding communities. Adult birds, mammals, and some reptiles are mobile enough to avoid mortality during construction. Young animals and less mobile species, such as many amphibians, may suffer direct loss during construction. The plants and animals that are found in the upland communities are generally common throughout eastern North Carolina.

Impacts to terrestrial communities, particularly in locations having steep to moderate slopes, can result in the aquatic community receiving heavy sediment loads as a consequence of erosion. Construction impacts may not be restricted to the communities in which the construction activity occurs, but may also affect downstream communities. Efforts should be made to ensure that no sediment leaves the construction site.

Aquatic Communities

Impacts to aquatic communities include fluctuations in water temperatures as a result of the loss of riparian vegetation. Shelter and food resources, both in the aquatic and terrestrial portions of these organisms' life cycles, will be affected by losses in the terrestrial communities. The loss of aquatic plants and animals will affect terrestrial fauna that rely on them as a food source.

Temporary and permanent impacts to aquatic organisms may result from increased sedimentation. Although aquatic invertebrates may drift downstream during construction, as it is toxic to some aquatic life, and re-colonize the disturbed area once it has been stabilized, sediments have the potential to affect fish and other aquatic life in several ways, including the clogging and abrading of gills and other respiratory surfaces, affecting the habitat by scouring and filling of pools and riffles, altering water chemistry,

and smothering different life stages. Increased sedimentation may cause decreased light penetration through an increase in turbidity.

Wet concrete should not come into contact with surface water during bridge construction because it is toxic to some aquatic life. Potential adverse effects can be minimized through the implementation of NCDOT *Best Management Practices for Protection of Surface Waters*.

JURISDICTIONAL TOPICS

This section provides inventories and impact analyses for two federal and state regulatory issues: "Waters of the United States" and rare and protected species.

Waters of the United States

Wetlands and surface waters fall under the broad category of "Waters of the United States" as defined in 33 CFR § 328.3 and in accordance with provisions of Section 404 of the Clean Water Act (33 U.S.C. 1344). These waters are regulated by the U.S. Army Corps of Engineers (USACE). Any action that proposes to dredge or place fill material into surface waters or wetlands falls under these provisions.

Characteristics of Wetlands and Surface Waters

Jurisdictional wetlands occur within the project area and will be impacted by project construction. The wetlands are present on both sides of SR 1011 along almost the entire study corridor. Shoe Heel Creek meets the definition of surface waters, and is therefore classified as Waters of the United States. The channel ranges from 15-70 feet (4.6-21.3 m) wide within the project area.

Bridge Demolition

Demolition and removal of a highway bridge over Waters of the United States must be addressed when applying to the U.S. Corps of Engineers (COE) for a permit. A worst-case scenario of dropping components of the bridge in the water is assumed. Effective 9/20/99, this issue is included in the permit application for bridge reconstruction. The permit application henceforth will require disclosure of demolition methods and potential impacts to the body of water in the planning document for the bridge reconstruction.

Section 402-2 "Removal of Existing Structures" of NCDOT's Standard Specifications for Roads and Structures stipulates that "excavated materials shall not be deposited....in rivers, streams, or impoundments," and "the dropping of parts or components of structures into any body of water will not be permitted unless there is no other practical method of removal. The removal from the water of any part or component of a structure shall be done so as to keep any resulting siltation to a minimum." To meet these specifications, NCDOT shall adhere to Best Management Practices for the Protection of

Surface Waters, as supplemented with Best Management Practices for Bridge Demolition and Removal.

In addition, all in-stream work shall be classified into one of three categories as follows:

Case 1) In-water work is limited to an absolute minimum, due to the presence of Outstanding Resource Waters or threatened and/or endangered species, except for the removal of the portion of the sub-structure below the water. The work is carefully coordinated with the responsible agency to protect the Outstanding Resource Water or T&E species.

Case 2) No work at all in the water during moratorium periods associated with fish migration, spawning, and larval recruitment into nursery areas.

Case 3) No special restrictions other than those outlined in Best Management Practices for Protection of Surface Waters and supplements added by the Bridge Demolition document, dated 9/20/99.

Big Shoe Heel Creek in the vicinity of the proposed project is designated as Class C Sw waters. It is not known to provide habitat for any federally protected aquatic animals or anadromous fish. Therefore, Case 3 applies to the proposed replacement of Bridge No. 170 over Big Shoe Heel Creek.

The superstructure is composed of steel I-beams, timber deck, timber rails and an asphalt wearing surface. The substructure is composed of timber end bents and bents and timber crutch caps. Therefore, there is no anticipated fill in Big Shoe Heel Creek from the removal of the existing bridge.

The stream bed in the project area is nearly all sand. Therefore, conditions in the stream do not raise sediment concerns and a turbidity curtain is not recommended.

Summary of Anticipated Impacts

The preferred alternative (Alternative 1) has a total wetland impact of 0.2 Ac, which will require mitigation. Project construction cannot be accomplished without infringing on the surface waters. Anticipated surface water impacts fall under the jurisdiction of the USACE and the DWQ. There will be a total of 80 feet (24.4 m.) of stream impacts from the proposed project. The maximum amount of stream impacts that can occur without requiring mitigation is 150 feet (45.7 m.).

Permits

Impacts to jurisdictional surface waters and wetlands are anticipated from the proposed project. Permits and certifications from various state and federal agencies may be required prior to construction activities.

Construction is likely to be authorized by Nationwide Permit (NWP) No. 23, as promulgated under 61 FR 65874, 65916; December 13, 1996. This permit authorizes activities undertaken, assisted, authorized, regulated, funded, or financed in whole or in part, by another Federal agency or department where that agency or department has determined that, pursuant to the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act:

- the activity, work, or discharge is categorically excluded from environmental documentation because it is included within a category of actions that neither individually nor cumulatively have a significant effect on the human environment; and
- the Office of the Chief Engineer 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 or waiver thereof, from the Department of Environment and Natural Resources (DENR) prior to issuance of the NWP 23. Section 401 of the Clean Water Act requires that the state issue or deny water certification for any federally permitted or licensed activity that results in a discharge into Waters of the U.S. Final permit decision rests with the USACE.

Avoidance, Minimization, Mitigation

Because this project will likely be authorized under a Nationwide Permit, mitigation for impacts to surface waters may or may not be required by the USACE. In accordance with the Division of Water Quality Wetland Rules [15A NCAC 2H .0506 (h)] "Fill or alteration of more than one acre of wetlands will require compensatory mitigation; and fill or alteration of more than 150 linear feet of streams may require compensatory mitigation." If wetland impacts are less than an acre, wetland mitigation will not be required. If the final length of stream impact is greater than 150 linear feet (45.6 m), compensatory mitigation may be required.

Rare and Protected Species

Some populations of plants and animals are declining either as a result of natural forces or their difficulty competing with humans for resources. Rare and protected species listed for Robeson County, and any likely impacts to these species as a result of the proposed project construction, are discussed in the following sections.

Species Under Federal Protection

Plants and animals with a federal classification of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended.

The USFWS lists 3 species under federal protection for Robeson County as of January 29, 2003 (USFWS 2001). These species are listed in Table 2.

Table 2. Species Under Federal Protection in Robeson County

Common Name	Scientific Name	Federal Status
Vertebrates		
American Alligator	*Alligator mississippiensis*	T (S/A)
Red-cockaded woodpecker	*Picoides borealis*	E
Vascular Plants		
Michaux's sumac	*Rhus michauxii*	E

Notes:
- E — Endangered-A species that is threatened with extinction throughout all or a significant portion of its range.
- T — Threatened-A species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
- T S/A — Similarity of Appearance-A species that is listed as threatened due to similarity of appearance with other rare species.

A brief description of the characteristics and habitat requirements of each species follows, along with a conclusion regarding potential project impact.

***Alligator mississippiensis* (American alligator) Threatened (Similar Appearance)**

Family: Alligatoridae
Federally Listed: 1967

The American alligator is a conservation success story. This species was nearly extirpated from their range as a result of market hunting and loss of habitat by the 1960's. It was listed as Endangered in 1967. Alligators responded well to management practices and were delisted in 1987. Although this species is secure some related crocodiles and caimans are still in trouble. For this reason alone, the USFWS still regulates the trade of alligator skins or any products made from them. Hopefully this will protect those endangered animals whose skin has a similar appearance, but that is illegal to trade on the commercial market.

Male alligators may reach lengths of 15 feet (4.5 m) while females tend to only reach 6 feet (1.8 m). These animals have a large, slightly rounded body with thick limbs, a broad head, and a very powerful tail used for propulsion in the water as well as for defense.

These reptiles frequent wetland areas and are the top predator of the food chain. Alligators will eat just about anything but prefer fish, turtles, and snails. Small mammals that venture to the water's edge may also be eaten. Young alligators mostly feed on insects, crustaceans, snails, and fish.

The alligator's greatest value to the wetland is the "gator holes" created by adults as a resting area. After removing vegetation with it's mouth an adult gator will thrash about in the depression to create a hole that will trap water during the rains and retain it during

the dry season. These holes serve as refugia and watering areas for fish, birds, turtles, snakes and many other animals. Alligators may expand their holes by digging underneath an overhanging bank up to 20 feet away from the water body. These areas are then expanded and used by the animals to survive dry seasons and winters.

Shoe Heel Creek provides potential habitat for the American alligator. However, the federal listing for the alligator is due to "Similarity of Appearance" and does not afford it any special protection.

***Picoides borealis* (Red-cockaded woodpecker)** **Endangered**

Vertebrate Family: Picidae
Federally Listed: 1970

The red-cockaded woodpecker is a small to medium sized bird 7.4 to 8.5 inches (18 to 20 cm) long with a wingspan of 14 to 15 inches (35 to 38 cm). The back and top of the head are black. The cheek is white. Numerous small white spots arranged in horizontal rows give a ladder-back appearance. The chest is dull white with small black spots on the side. Males and females look alike except males have a small red streak above the cheek.

Among woodpeckers, the red-cockaded has an advanced social system. They live in a group termed a clan. The clan may have from two to nine birds, but never more than one breeding pair. The other adults are usually males and are called helpers. The helpers are usually the sons of the breeding male and can be from 1 to 3 years old. The helpers assist in incubating eggs, feeding young, making new cavities, and defending the clan's area from other red-cockaded woodpeckers.

Roosting cavities are excavated in living pines, and usually in those that are infected with a fungus producing red-heart disease. A clan nests and roosts in a group of cavity trees called a colony. The colony may have one or two cavity trees to more than 12, but it is used only by one clan. In most colonies, all the cavity trees are within a circle about 450 m (1,500 ft) wide. Open stands of pines with a minimum age of 80 to 120 years provide suitable nesting habitat. Longleaf pines are the most commonly used, but other species of southern pine are also acceptable. Dense stands of pines, or stands that have a dense hardwood understory are avoided. Foraging habitat is provided in pine and pine hardwood stands 30 years or older with foraging preference for pine trees 10 inches (25 cm) or larger in diameter. The woodpeckers diet consists mainly of insects, which includes ants, beetles, wood-boring insects, and caterpillars.

Biological Conclusion **No Effect**

Although there is a pine stand within the project corridor, it is not suitable as foraging or nesting habitat for the red-cockaded because of its young age, the density of the understory, and its small size. Therefore, it may be concluded that the proposed project will have no effect on this endangered species.

***Rhus michauxii* (Michaux's sumac)** **Endangered**

Family: Anacardiaceae
Federally Listed: 1989

Michaux's sumac or false poison sumac is a densely hairy colonial shrub with erect stems, which are 1 to 3 feet (0.3-0.9 m) in height. The shrub's compound leaves are narrowly winged at their base, dull on their tops, and veiny and slightly hairy on their bottoms. Each leaf is finely toothed on its edges. Flowers are greenish-yellow to white and are 4 to 5 parted. Each plant is unisexual. With a male plant the flowers and fruits are solitary, with a female plant all flowers are grouped in 3 to 5 stalked clusters. The plant flowers from April to June; its fruit, a dull red drupe, is produced in October and November.

Michaux's sumac grows in sandy or rocky open woods in association with basic soils. Apparently, this plant survives best in areas where some form of disturbance has provided an open area. Most of the plant's remaining populations are on highway rights-of way, roadsides, or on the edges of artificially maintained clearings. Other populations are in areas with periodic fires, or on sites undergoing natural succession. One population is situated in a natural opening on the rim of a Carolina bay. Currently, the plant survives in the following North Carolina Counties: Richmond; Hoke, Scotland, Franklin, Davie, Robeson, and Wake.

Biological Conclusion **No Effect**

There are no sandy or rocky open woods in the study corridor that could serve as habitat for Michaux's sumac. The open roadway right-of-way is generally too wet and probably too acidic to serve as habitat. No occurrences of Michaux's sumac were observed the day of the site visit. Therefore, it may be concluded that the proposed project will have no effect on this species.

Federal Species of Concern and State Status

Federal Species of Concern (FSC) are not legally protected 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. Table 3 includes FSC species listed for Robeson County and their state classifications. Organisms that are listed as Endangered (E), Threatened (T), or Special Concern (SC) on the North Carolina Natural Heritage Program list of Rare Plant and Animal Species are afforded state protection under the State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1979. However, the level of protection given to state-listed species does not apply to NCDOT activities.

Table 3. Federal Species of Concern in Robeson County

Common Name	Scientific Name	State Status	Habitat present
Vertebrates			
Bachman's sparrow	*Aimophila aestivalis*	SC	NO
Carolina gopher frog	*Rana capito capito*	SC	NO
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*	SC	NO
Southern hognose snake	*Heterodon simus*	SR	NO
Vascular Plants			
Awned meadowbeauty	*Rhexia aristosa*	T	NO
Bog spicebush	*Lindera subcoriacea*	E	NO
Carolina bogmint	*Macbridea caroliniana*	T	YES
Dwarf burhead	*Echinodorus parvulus*	C	YES
Georgia indigo-bush	*Amorpha georgiana var. georgiana*	E	NO
Sandhills milkvetch	*Astragalus michauxii*	T	NO
Venus flytrap	*Dionaea muscipula*	C-SC	NO
Sources: Amoroso, ed., 1999; LeGrand and Hall, eds., 1999 Key: T = Threatened, E = Endangered, SC = Special Concern, C = Candidate, SR = Significantly Rare *=Historic record. The species was last observed in the county more than 50 years ago. **=Obscure record. The date and/or location of observation is uncertain.			

No FSC species were observed during the site visit, and none are recorded at NHP as occurring within 2 miles (3.2 km) of the project area.

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

The North Carolina Historic Preservation Office stated that there are no historic properties that will be affected by the undertaking. Adjacent to the existing bridge is a partial submerged gear assembly. Further investigation was requested since the existing bridge is close to the site of the old Gaddy's Mill. There is no record of Gaddy's Mill in the National Register files nor is there any record of the mill in the State Study List files in the Archives. Based on the pedestrian reconnaissance, the gear assembly (axle) does not have historical value and would not be considered eligible for listing on the National Register of Historic Places. In addition, no traces of Gaddy's Mill were located. Therefore, no further archaeological work is recommended prior to construction. Since this project will not involve significant archaeological resources, a finding of "no historic properties affected" is considered appropriate for this bridge replacement project.

C. Archaeology

Based on the reconnaissance discussed above, there are no known archaeological sites within the project study area.

VII. GENERAL ENVIRONMENTAL EFFECTS

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

The project is considered to be a Federal "Categorical Exclusion" due to its limited scope and lack of substantial environmental consequences.

The bridge replacement will not have an adverse effect on the quality of the human or natural environment with the use of the current North Carolina Department of Transportation 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 the construction of the project.

No adverse impact 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.

The proposed project will not require right-of-way acquisition or easement from any land protected under Section 4(f) of the Department of Transportation Act of 1966.

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. 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.

The 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.

An examination of records at the North Carolina Department of Environment and Natural Resources, Divison of Environmental Management, Groundwater Section and the North Carolina Department of Human Resources, Solid Waste Management Section revealed no underground storage tanks or hazardous waste sites in the project area.

Robeson County is a participant in the National Flood Insurance Program. There are no practical alternatives to crossing the floodplain area. Any shift in alignment will result in an impact area of about the same magnitude. The proposed project is not anticipated to increase the level or extent of upstream flood potential.

On the basis of the above discussion, it is concluded that no substantial adverse environmental impacts will result from implementation of the project.

VII. AGENCY COMMENTS

Comments from United States Fish and Wildlife Service

1. Wetland impacts should be avoided and minimized to the maximum extent practical.

   Two alternates for replacing the existing bridge were studied so that maximum avoidance and minimization of wetlands could be achieved.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

December 7, 2004

MEMORANDUM TO: Mr. Greg Smith, PE, Supervisor
Geo-Environmental Section

FROM: Ryan L. White
Project Development Engineer
Project Development and Environmental Analysis Branch

SUBJECT: Request for Hazardous Material Evaluation for TIP Project **U-3621** (SR 1604 – Hunter Hill Road), Nash County

Please prepare a Hazardous Materials Evaluation for this project. Attached is an aerial photograph with the design for section A of the project overlaid on it. Also, attached is a vicinity map of the project area.

I would appreciate receiving any information by March 15, 2004. If you have any questions, or are unable to meet the schedule, please call me at (919) 733-7844 ext. 245 or send email to rlwhite@dot.state.nc.us.

PROJECT INFORMATION

TIP PROJECT NO.:	U-3621
COUNTY:	Nash
WBS ELEMENT:	34694.1.1
STATE PROJECT NO.:	8.2321801
F.A. PROJECT NO.:	STP-1604 (1)

DESIGN INFORMATION

TIP Project U-3621 is located in Rocky Mount, in Nash County. The proposed improvements involve widening SR 1604 (Hunter Hill Rd) to a multi-lane facility from SR 1613 (N. Winstead Avenue) to NC 43-48 (Benvenue Road). The project is approximately 2.4 miles long.

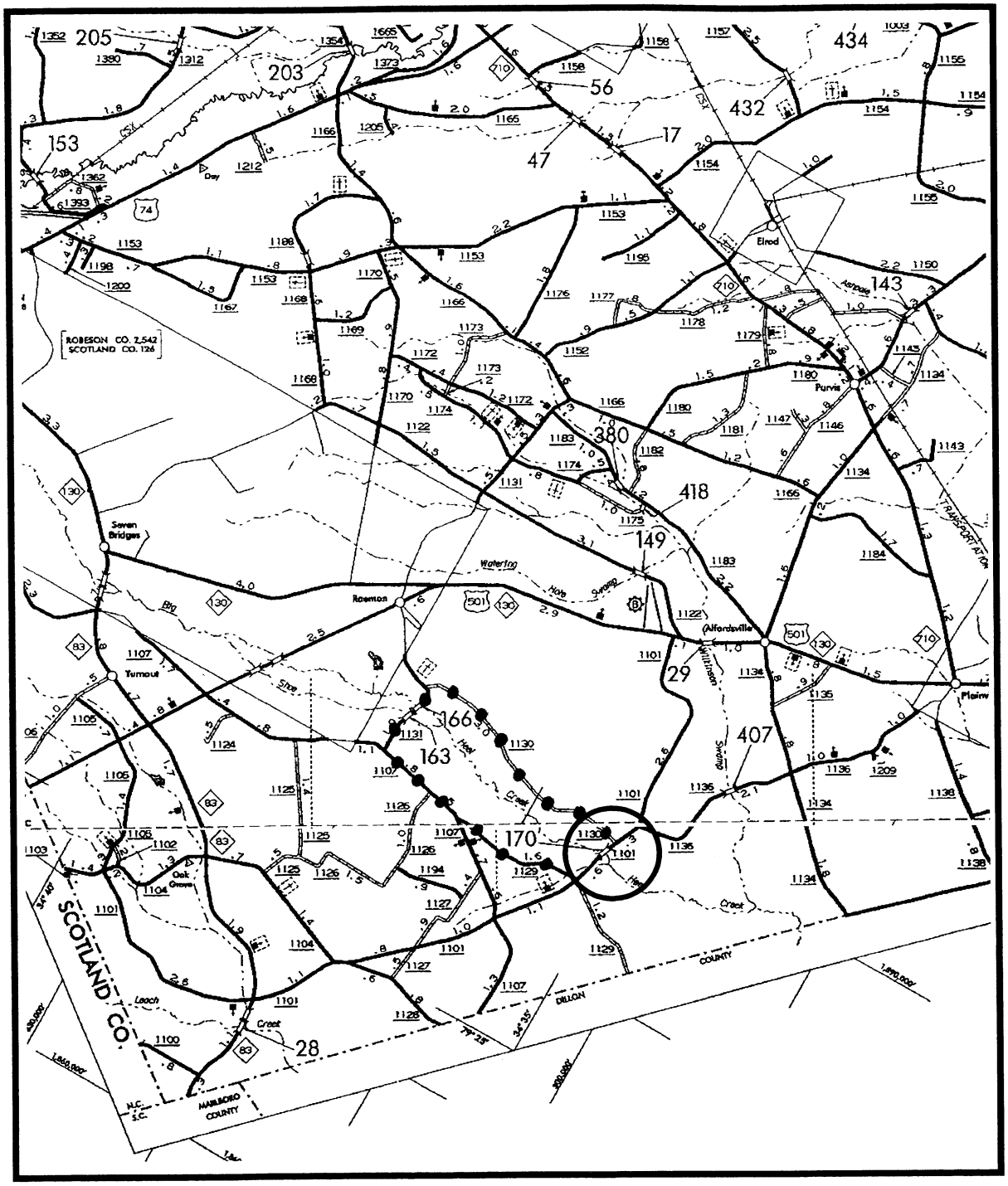
Attachment

rlw

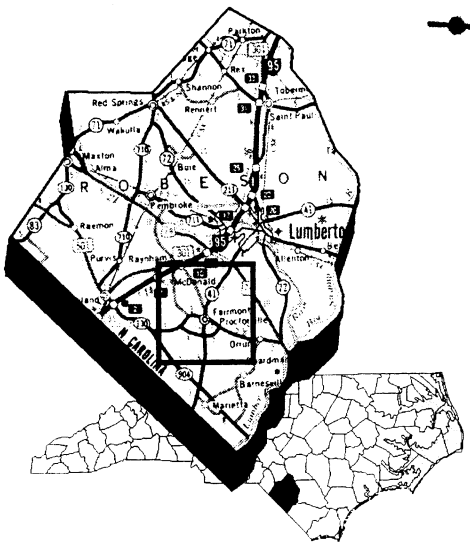
MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1548 MAIL SERVICE CENTER
RALEIGH NC 27699-1548

TELEPHONE: 919-733-7844
FAX: 919-733-9794
WEBSITE: WWW.NCDOT.ORG/PLANNING/PE/

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC



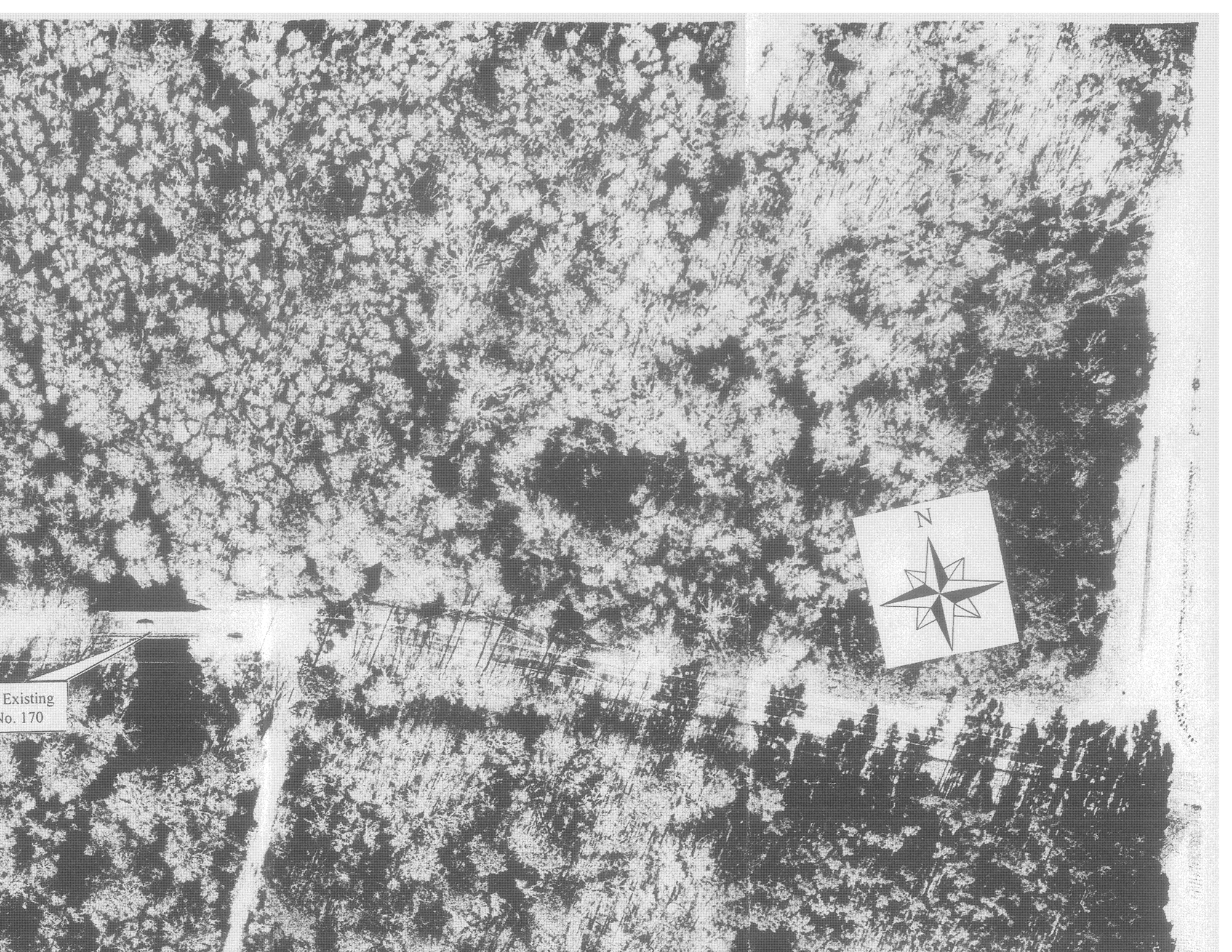
Proposed Detour

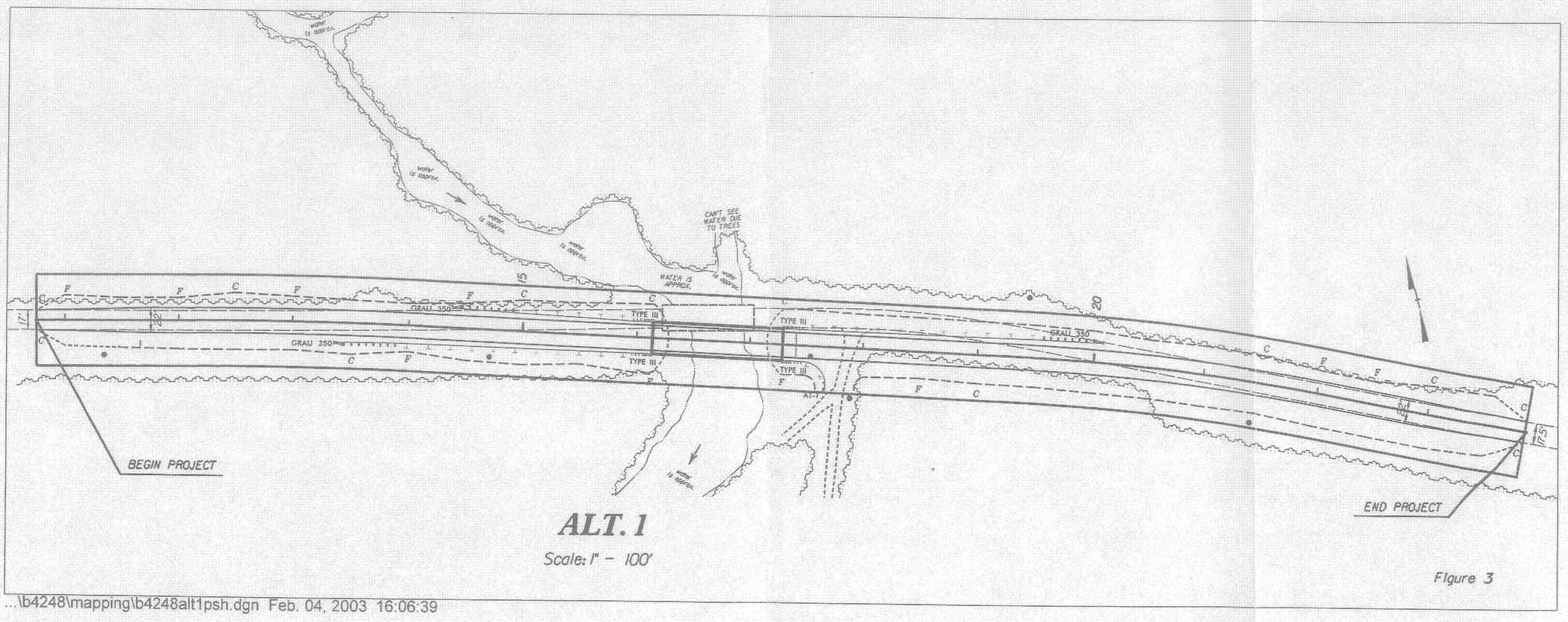


NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT & ENVIRONMENTAL ANALYSIS BRANCH

ROBESON COUNTY
REPLACE BRIDGE NO. 170 ON SR 1101
OVER SHOE HILL CREEK
B-4248

Figure 1


N
Existing
No. 170

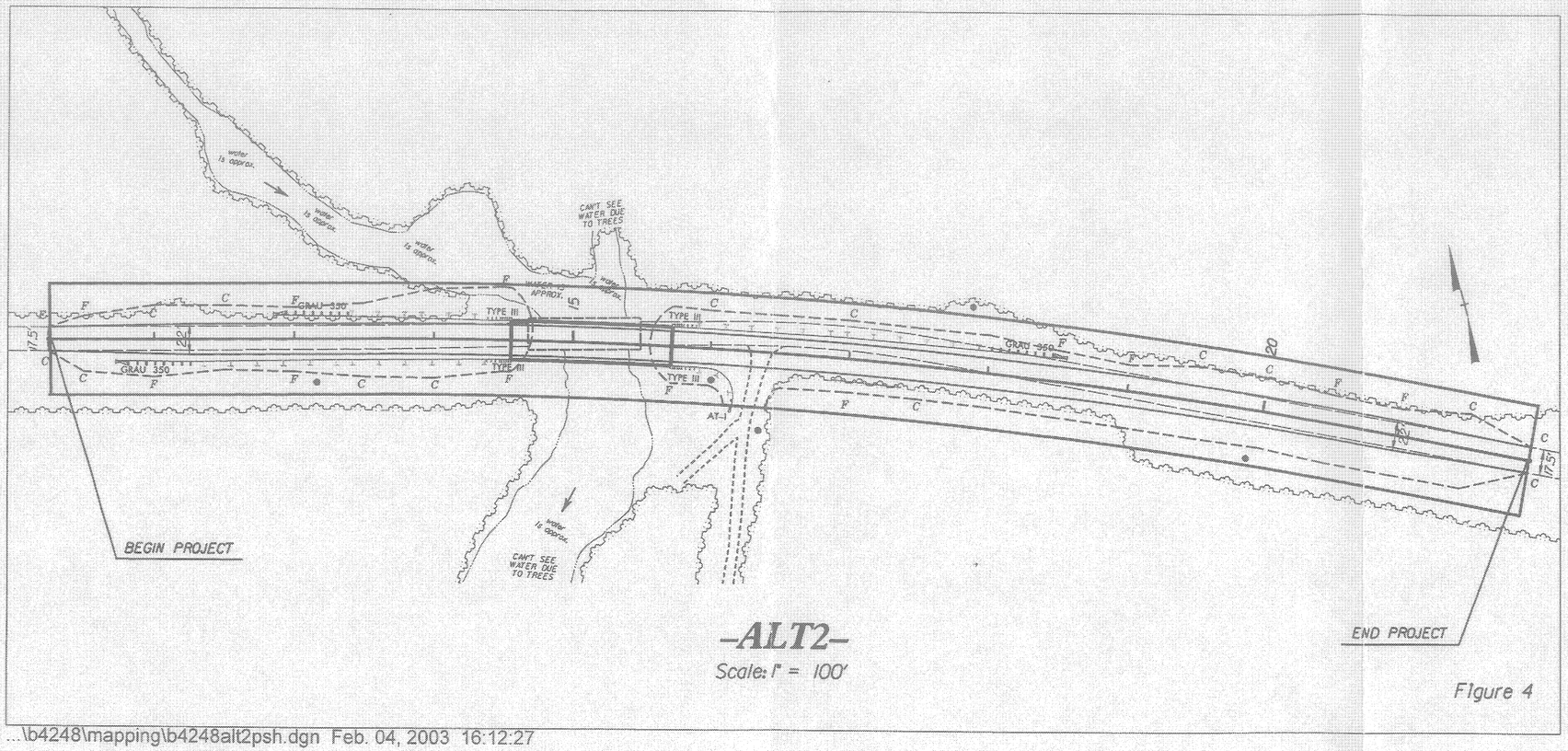


ALT. 1

Scale: 1" = 100'

Figure 3

...\b4248\mapping\b4248alt1psh.dgn Feb. 04, 2003 16:06:39



–ALT2–

Scale: 1" = 100'

Figure 4

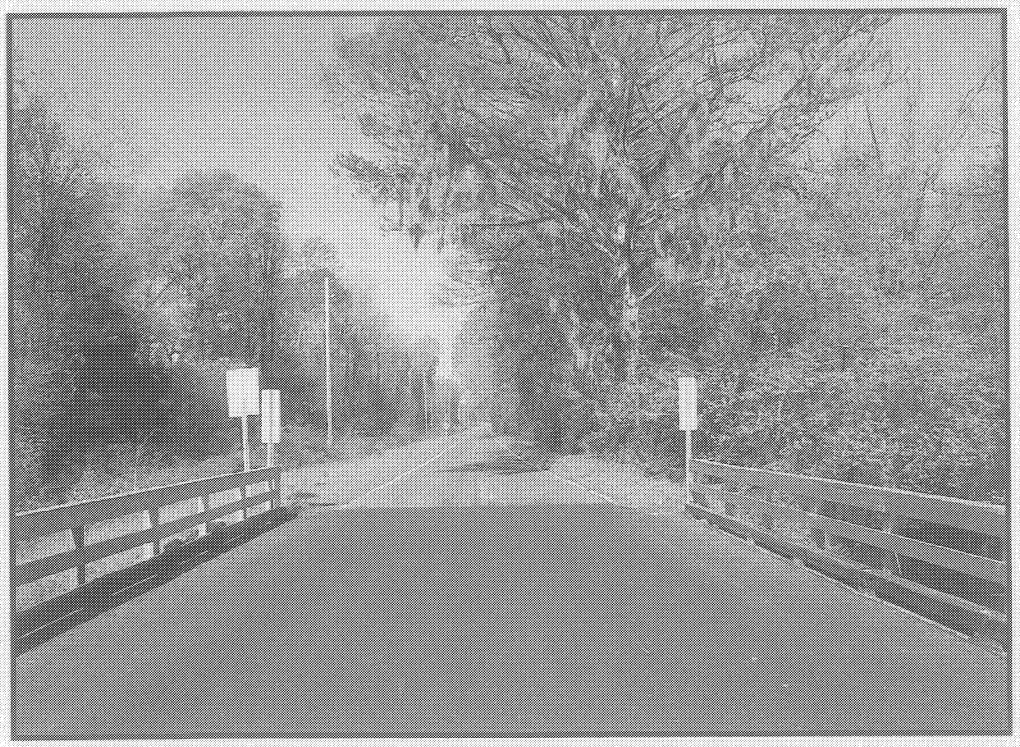
...\b4248\mapping\b4248alt2psh.dgn Feb. 04, 2003 16:12:27

Looking North

Looking South

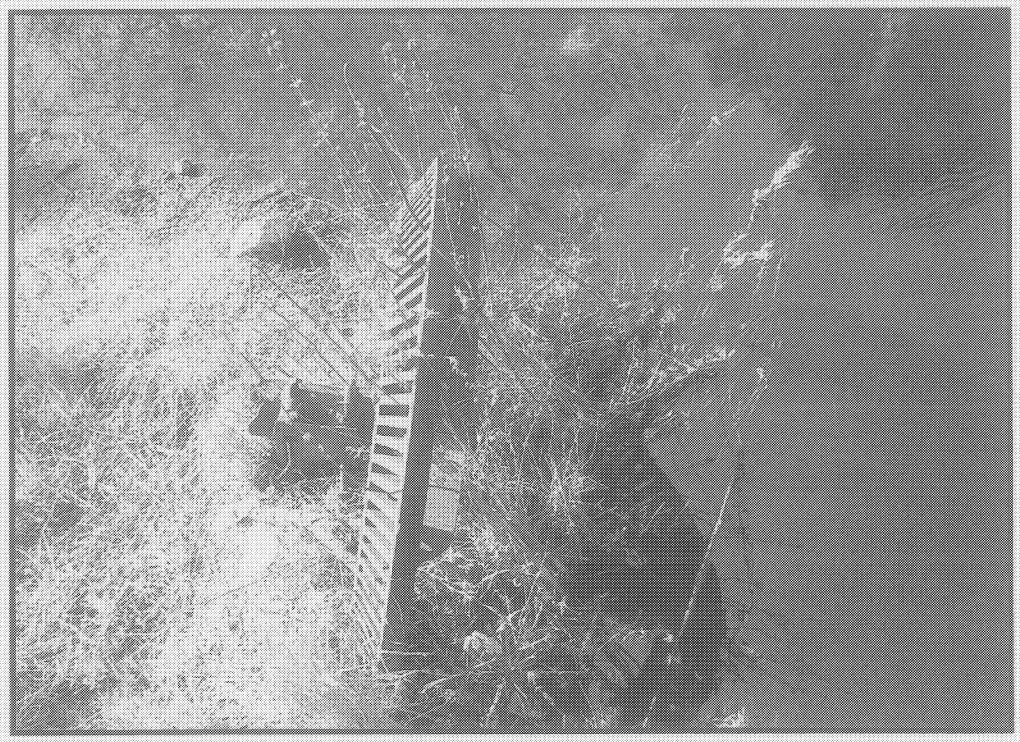
Figure 5

Looking East



Looking West

Figure 6



Gear Assembly (Looking Down from Bridge)

Gear Assembly (Side View)

Figure 7

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

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary

Division of Historical Resources
David J. Olson, Director

February 11, 2003

MEMORANDUM

TO: William D. Gilmore, Manager
Project Development and Environmental Analysis Branch
Division of Highways
Department of Transportation

FROM: David Brook David Brook

SUBJECT: Replacement of Bridge No. 170 on SR 1101 over Shoe Hill Creek, B-4248, Robeson County, ER 02-8577

On July 18, 2002 , Sarah McBride our preservation specialist for transportation projects met with North Carolina Department of Transportation (NCDOT) staff for a meeting of the minds concerning the above project. We reported our available information on historic architectural and archaeological surveys and resources along with our recommendations. NCDOT provided project area photographs and aerial photographs at the meeting.

Based upon our review of the photographs and the information discussed at the meeting, we offer our preliminary comments regarding this project.

In terms of historic architectural resources, we are aware of no historic structures located within the area of potential effect. We recommend that no historic architectural survey be conducted for this project.

There are no recorded archaeological sites within the proposed project area. Based on our present knowledge of the area, it is unlikely that any archaeological resources which may be eligible for listing in the National Register of Historic Places will be affected by the project construction. We, therefore, recommend that no archaeological investigation be conducted in connection with this project.

Having provided this information, we look forward to receipt of either a Categorical Exclusion or Environmental Assessment which indicates how NCDOT addressed our comments.

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

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above referenced tracking number.

DB:pmm

cc: Mary Pope Furr