STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

March 27, 2008

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

ATTN: Mr. Richard Spencer
NCDOT Coordinator

Subject: **Nationwide 23 Permit Application** for the proposed grade separation intersection of US 74 and SR 2210 (Kingsdale Road) in Robeson County. Federal Aid Project No. STPNHS-74(66), TIP No. W-4704. WBS Element 37723.1.1

Please find enclosed permit drawings and half-size plan sheets for the above referenced project. A Categorical Exclusion (CE) was completed for this project on June 13, 2007 and distributed shortly thereafter. Additional copies are available upon request. The North Carolina Department of Transportation (NCDOT) proposes to install a grade separation at the intersection of US 74 and SR 2210 (Kingsdale Road) in Robeson County. The project involves conversion of an at grade intersection to a grade separation bridge. The new structure will consist of two 99'6" spans (199' total length) with a width of 33'3". A footing on piles will be utilized for the interior bent. There will be 0.38 acre of permanent impacts to non-riverine wetlands. Traffic will be detoured off-site, on surrounding roads, during construction.

Impacts to Waters of the United States

General Description: The project is located in the Lumber River basin (NCDWQ sub-basins 03-07-51 and 03-07-54, HUC 03040206). The entire project area is located on an interstream divide, therefore no jurisdictional streams occur in the project area. One man-made pond is located in the northeast quadrant of the project study area. No waters classified as High Quality Water (HQW), Water Supplies (WS-I or WS-II), listed Section 303(d) impairments, or Outstanding Resource Waters (ORW) occur within 1.0 mile of the project study area.

Permanent Impacts: Wetlands within the project study area will be impacted by the proposed project. Construction of the proposed project will result in permanent impacts to non-riverine wetlands, including 0.25 acre of fill in 404 wetlands due to roadway and slope fill, and 0.13 acre due to excavation in wetlands. Permanent impacts to wetlands total 0.38 acre.

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

TELEPHONE: 919-733-3141
FAX: 919-733-9794

WEBSITE: WWW.NCDOT.ORG

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

Temporary Impacts: No temporary impacts to wetlands will result from this project.

Hand Clearing: There will be 0.08 acre of hand clearing in wetlands.

Utility Impacts: There will be no impacts to jurisdictional resources due to the relocation of utilities. Any utility relocations, adjustments, or mechanized clearing performed by the utility companies shall occur outside of the wetland boundaries. If the utility companies install their proposed facilities by directional bore, then bore pits shall be located outside of wetland boundaries.

Federally Protected Species

As of January 31, 2008, the US Fish and Wildlife Service (USFWS) lists three federally protected species for Robeson County (Table 1).

Table 1. Federally Protected Species in Robeson County

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

Bald Eagle

Effective August 8, 2007, the bald eagle (*Haliaeetus leucocephalus*) was delisted from the Endangered Species Act. A Biological Conclusion is no longer necessary for this species. The bald eagle is protected under the Bald and Golden Eagle Protection Act. No suitable nesting or foraging habitat exists within 660 feet of the project limits.

Avoidance and Minimization

Avoidance examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States". Due to the presence of surface waters and wetlands within the project study area, avoidance of all impacts is not possible. The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts. Minimization measures incorporated as part of the project design included:

- Use of an off-site detour during construction
- Avoidance of impacts to surface waters located within the project limits

Mitigation

There are no available nonriverine mitigation credits within HUC 03040206. NCDOT proposes debiting the Juniper Bay Mitigation site (JBMS) at a 1:1 ratio for the 0.38 acres of unavoidable

impacts. The JBMS is in the adjacent HU within the Lumber River Basin and has been in the ground for 2 years, as described below.

The JBMS is a Carolina bay located in Robeson County, North Carolina comprising 728.5 acres. The site, located in HUC 03040203, was constructed by the North Carolina Department of Transportation in 2005.

The JBMS previously was used for agricultural production with a drainage ditch network constructed to drain the site. The hydrologic restoration plan involves systematically plugging and backfilling the interior ditch network to increase surface and subsurface water storage capacity and to increase the retention of water onsite. The wetland vegetation restoration plan is to establish two natural community types: Peatland Atlantic White Cedar Forest/Bay Forest and Pond Pine Woodland/Bay Forest.

The JBMS has met the hydrologic and vegetative success criteria over the majority of the site. The monitoring report is posted on the EEP webpage at the following link: http://www.nceep.net/business/monitoring/Monitoring_report_web/2006pdfs/JUNIPER_BAY_2006/Juniper_Bay_Summary_thru_Results.pdf

Project Schedule

The review date for this project is September 2, 2008 and the Let Date is October 21, 2008.

Regulatory Approvals

Section 404 Permit: All aspects of this project are being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). The NCDOT requests that a Nationwide Permit 23 authorize these activities (72 CFR; 11092-11198, March 12, 2007).

Section 401 Permit: We anticipate 401 General Certification numbers 3701 will apply to this project. NCDOT will adhere to all conditions of this General Water Quality Certification. NCDOT is providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their review.

A copy of this application will be posted on the NCDOT website at: http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html

Thank you for your time and assistance with this project. Please contact M. Worth Calfee at wcalfee@dot.state.nc.us or (919) 715-7225 if you have any questions or need additional information.

Sincerely,

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

w/attachment

Mr. Brian Wrenn, NCDWQ **(2 Copies)**
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS

W/o attachment (see website for attachments)

Dr. David Chang, P.E., Hydraulics
Mr. Jay Bennett, P.E., Roadway Design
Mr. Greg Perfetti, P.E., Structure Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Art McMillan, P.E., Highway Design
Ms. LeiLani Paugh, NEU – Onsite Mitigation
Mr. Scott McLendon, USACE, Wilmington
Mr. Mark Staley, Roadside Environmental
Ms. Michele James, PDEA Project Planning Engineer
Mr. Terry Gibson, P.E, Division 6 Engineer
Mr. Jim Rerko, Division 6 Environmental Officer

01/08/99

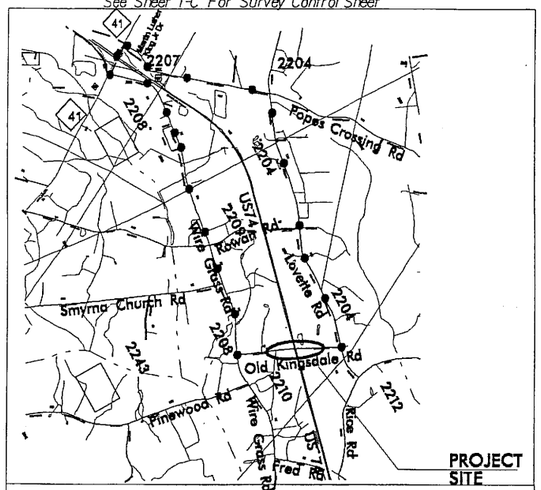
TIP PROJECT: W-4704

CONTRACT: C201968

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-4704	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
37723.1.1	STPNHS-74(66)	PE
37723.2.1	STPNHS-0074(66)	ROW & UTIL

See Sheet 1-A For Index of Sheets
See Sheet 1-B For conventional symbols
See Sheet 1-C For Survey Control Sheet



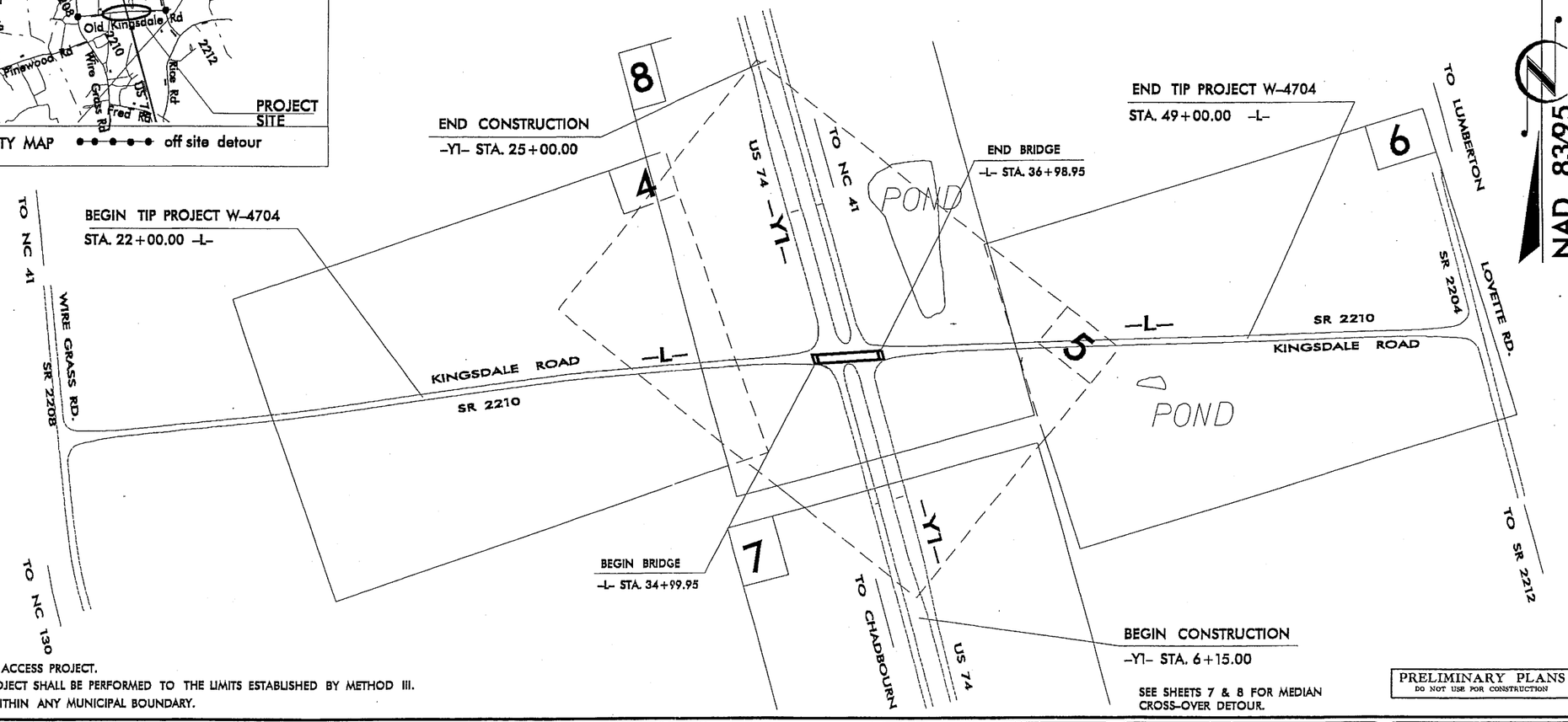
VICINITY MAP ●—●—●—● off site detour

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROBESON COUNTY

LOCATION: BRIDGE OVER US 74 AT SR 2210 (OLD KINGSDALE RD)

WETLAND PERMIT



NAD 83/95

THIS IS A CONTROL OF ACCESS PROJECT.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARY.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2006 = 1,500
ADT 2030 = 400
DHV = 11 %
D = 60 %
T = 3 % *
V = 60 MPH

CLASS = RURAL COLLECTOR
* TTST 1 % DUAL 2 %

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT W-4704 = 0.473 MILES
LENGTH STRUCTURE TIP PROJECT W-4704 = 0.038 MILES
TOTAL LENGTH TIP PROJECT W-4704 = 0.511 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 19, 2007

LETTING DATE: OCTOBER 21, 2008

JASON MOORE, PE
PROJECT ENGINEER

KEVIN E. MOORE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

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Permit Drawing
Sheet 1 of 5

PROJECT REFERENCE NO.	SHEET NO.
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SHOULDER BERM GUTTER
STA. 27+98 TO 44+77 -L- LEFT
STA. 30+18 TO 44+77 -L- RIGHT

WETLAND PERMIT
12/15/06

DENOTES HAND CLEARING

DENOTES EXCAVATION IN WETLAND

DENOTES FILL IN WETLAND

SCALE: 1"= 100'

Permit Drawing
Sheet 2 of 7

PROJECT REFERENCE NO.	SHEET NO.
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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NAD 83/95

WETLAND PERMIT
12/15/06

-L- STA. 35+99.45
-Y1- STA. 41+90.18
Δ = 18° 27' 20.0"

-L- PC Sta. 38+90.75

-L- PT Sta. 42+99.83

-L-
PI Sta 40+95.31
D = 7° 57' 11.5" (RT)
Δ = 0° 05' 38.9"
T = 409.08
R = 720.56
L = 1200.00
SE = N.C.

N 15° 14' 06.5" W

N 86° 18' 33.5" E

N 15° 14' 06.5" W

N 11° 58' 58.5" E

DETAIL F
LATERAL BASE DITCH
(NOT TO SCALE)
Min. D= 2 Ft.
B= 4 Ft.
D= 5 Ft.
2% Slope

DETAIL G
LATERAL BASE DITCH
(NOT TO SCALE)
Min. D= 4 Ft.
B= 5 Ft.
D= 5 Ft.
2% Slope

DETAIL H
LATERAL BASE DITCH
(NOT TO SCALE)
Min. D=1.5 Ft.
B=2 Ft.
D=3 Ft.
2% Slope

HC HC DENOTES HAND CLEARING

E E DENOTES EXCAVATION IN WETLAND

F F DENOTES FILL IN WETLAND

100' 0' 100' 200' 300'
SCALE: 1"= 100'

Permit Drawing
Sheet 3 of 5

Property List

TIP# W-470 **Project #:** 37723.1.1 **County:** ROBESON

Property Owners	Tax Parcel	DB / Page #		Address			
1. AVENDER COLLINS		411	265	645 SOUTH BROAD	ORRUM	NC	28369
2. LOUISE OLIVER		11G	417	4931 LOVETTE ROAD	LUMBERTON	NC	28358

Permit Drawing
Sheet 5 of 5

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	WETLAND IMPACTS: Temp. Fill In Wetlands (ac)	WETLAND IMPACTS: Excavation in Wetlands (ac)	WETLAND IMPACTS: Mechanized Clearing in Wetlands (ac)	WETLAND IMPACTS: Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	SURFACE WATER IMPACTS: Temp. SW impacts (ac)	SURFACE WATER IMPACTS: Existing Channel Impacts Permanent (ft)	SURFACE WATER IMPACTS: Existing Channel Impacts Temp. (ft)	SURFACE WATER IMPACTS: Natural Stream Design (ft)
	38+83 to 42+70 L RT		0.25		0.130		0.080					
TOTALS:			0.250		0.130		0.080					

Project W4704 is a grade seperation bridge. No impacts. Bridge is two span @ 99'-6"=199'-0" total.

Width=33'-3' out to out, Interior bent is footing on piles.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ROBESON COUNTY
WBS - 37723.1.1 (W-4740)
BRIDGE NO. 490 ON SR.2210
SHEET 12/15/06

ATN Revised 3/31/05

05/08/08

TIP PROJECT: W-4704

CONTRACT: C201968

See Sheet 1-A For Index of Sheets
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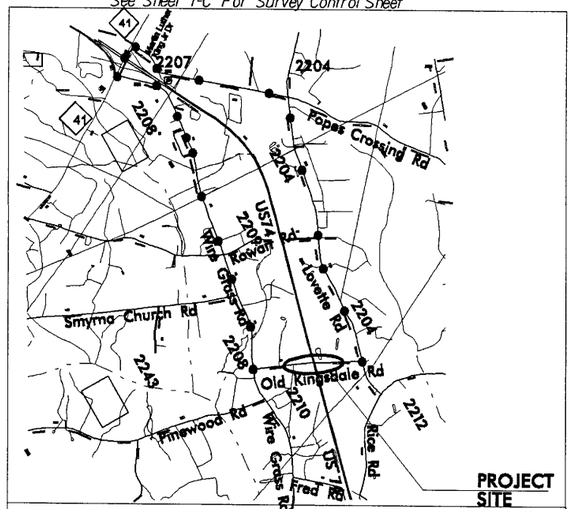


VICINITY MAP ●-●-●-●-● off site detour

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

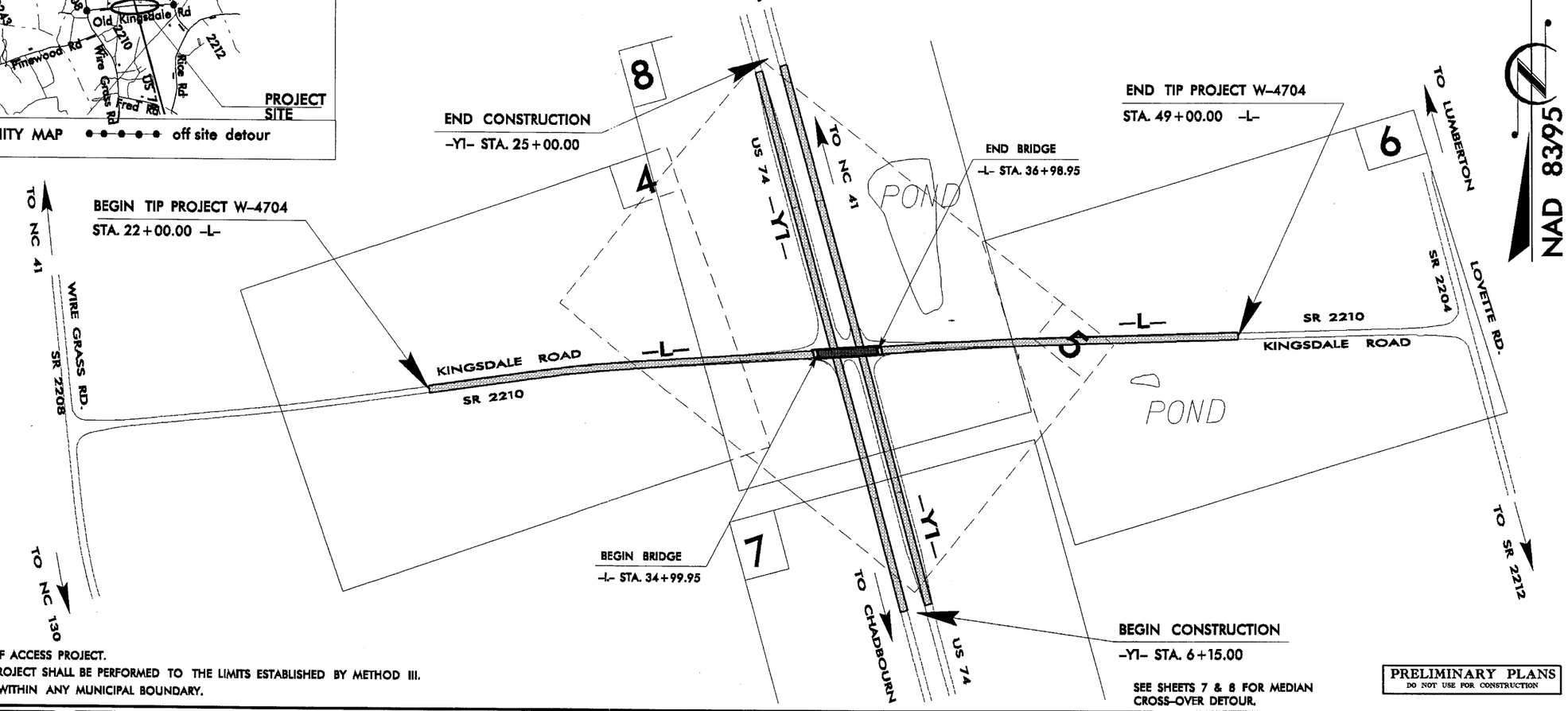
ROBESON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-4704	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
37723.1.1	STPNHS-74(66)	PE
37723.2.1	STPNHS-0074(66)	ROW & UTIL

LOCATION: BRIDGE OVER US 74 AT SR 2210 (OLD KINGSDALE RD)

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



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PLANS

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PROFILE (VERTICAL)

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2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 19, 2007

LETTING DATE: OCTOBER 21, 2008

JASON MOORE, PE
PROJECT ENGINEER

KEVIN E. MOORE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

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3/15/06

PROJECT REFERENCE NO.	SHEET NO.
W-4704	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 Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

- Baseline Control Point — BPI
- 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 — TCE
- 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
- Proposed Wheel Chair Ramp Curb Cut — WCC
- Curb Cut for Future Wheel Chair Ramp — CCFR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth
- 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.

5/14/99

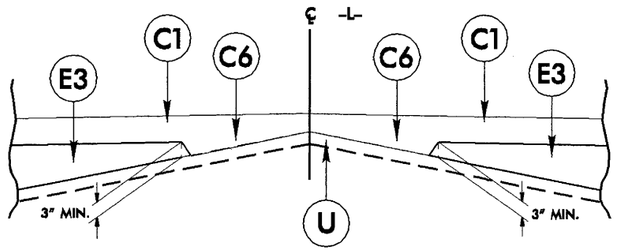
PROJECT REFERENCE NO.	SHEET NO.
W-4704	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

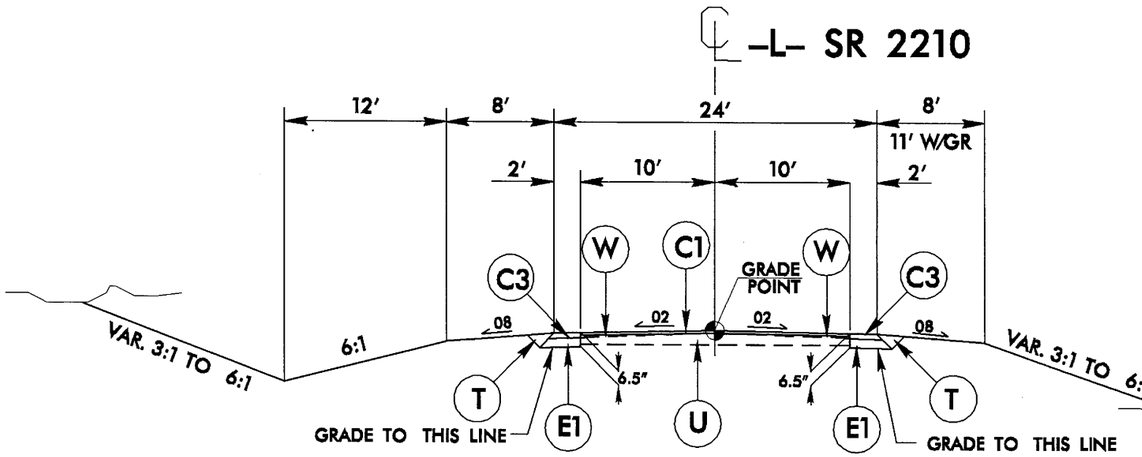
PAVEMENT SCHEDULE

C1	PROP. APPROX. 1¼" ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. IN.	E1	PROP. APPROX. 4" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. IN.
C2	PROP. APPROX. 1½" ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 166 LBS. PER SQ. IN.	E2	PROP. APPROX. 5½" ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. IN.
C3	PROP. APPROX. 2½" ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. IN. IN EACH OF TWO LAYERS.	E3	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. IN. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
C4	PROP. APPROX. 2½" ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. IN. IN EACH OF TWO LAYERS.	J1	6" ABC
C5	PROP. APPROX. 3" ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 196 LBS. PER SQ. IN. IN EACH OF TWO LAYERS.	R1	SHOULDER BERM GUTTER.
C6	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. IN. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1½" IN DEPTH.	T	EARTH MATERIAL.
D1	PROP. APPROX. 2½" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. IN.	U	EXISTING PAVEMENT.
D2	PROP. APPROX. 4" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. IN.	W	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE WEDGING DETAIL)

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

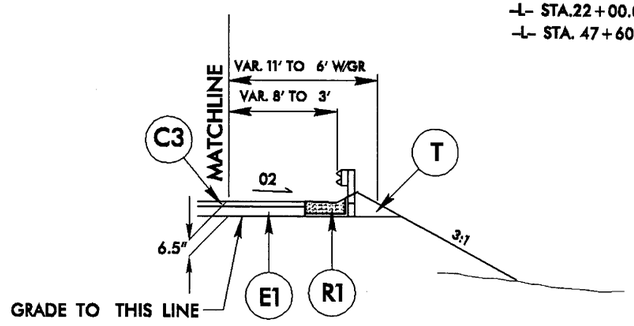


Detail Showing Method of Wedging



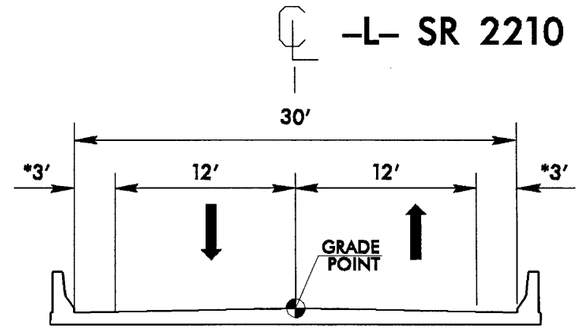
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
-L- STA.22+00.00 TO STA. 23+20.00
-L- STA. 47+60.00 TO STA. 49+00.00



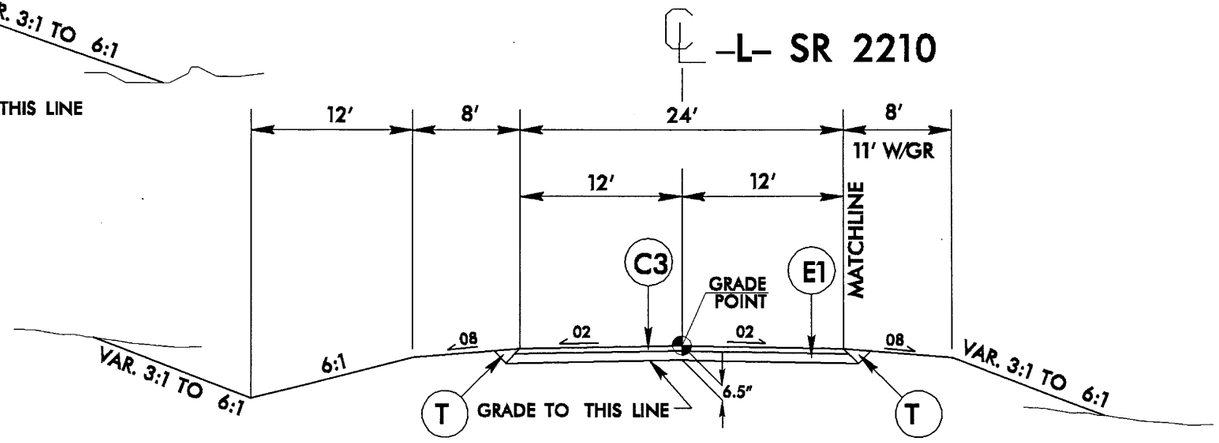
TYPICAL SECTION NO. 2A

USE TYPICAL SECTION NO. 2A
IN CONJUNCTION WITH TYPICAL SECTION NO. 2
-L- STA. 30+18.00 TO STA. 34+83.52 LT.
-L- STA. 37+09.87 TO STA. 44+77.00 LT.
-L- STA. 27+98.00 TO STA. 34+89.03 RT.
-L- STA. 37+15.38 TO STA. 44+77.00 RT.



TYPICAL SECTION ON STRUCTURE

-L- STA. 34+99.95 (BEGIN BRIDGE) TO
-L- STA. 36+98.95 (END BRIDGE)
* STRUCTURE IS OVER 100' IN LENGTH



TYPICAL SECTION NO. 2

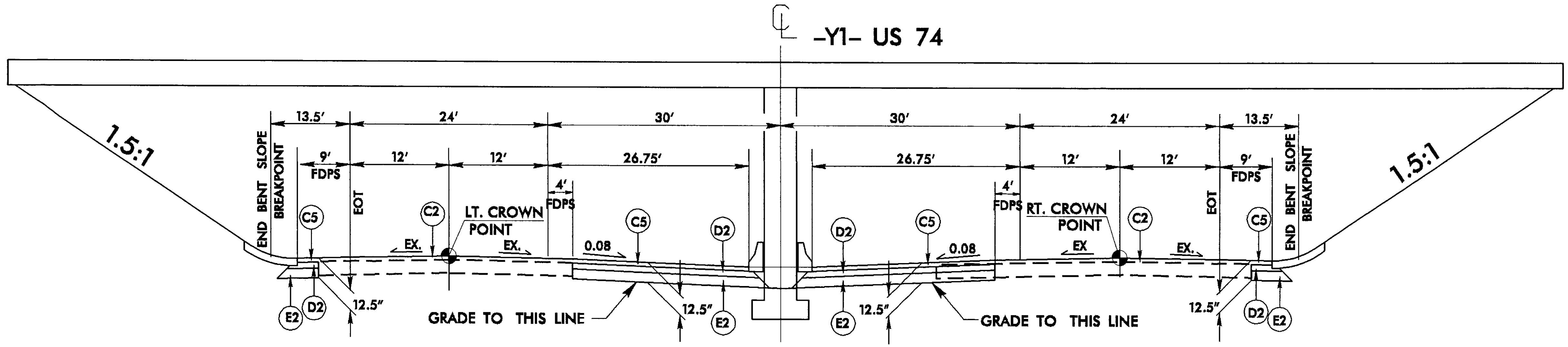
USE TYPICAL SECTION NO. 2
-L- STA.23+20.00 TO STA. 34+99.95 (BEGIN BRIDGE)
-L- STA. 36+98.95 (END BRIDGE) TO STA. 47+60.00

27-NOV-2007 12:30
c:\projects\w-4704_rdy_typ.dgn

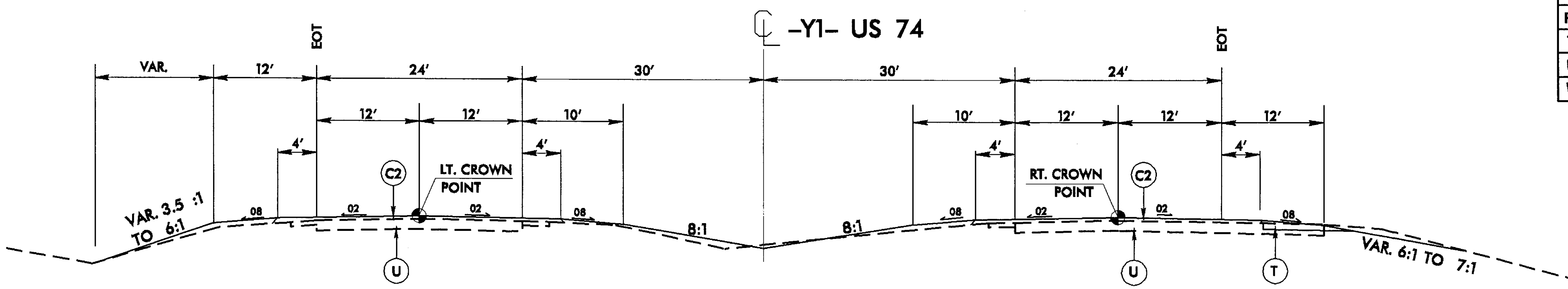
PROJECT REFERENCE NO.	SHEET NO.
W-4704	2-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROPOSED TYPICAL SECTION ON ROADWAY UNDER STRUCTURE

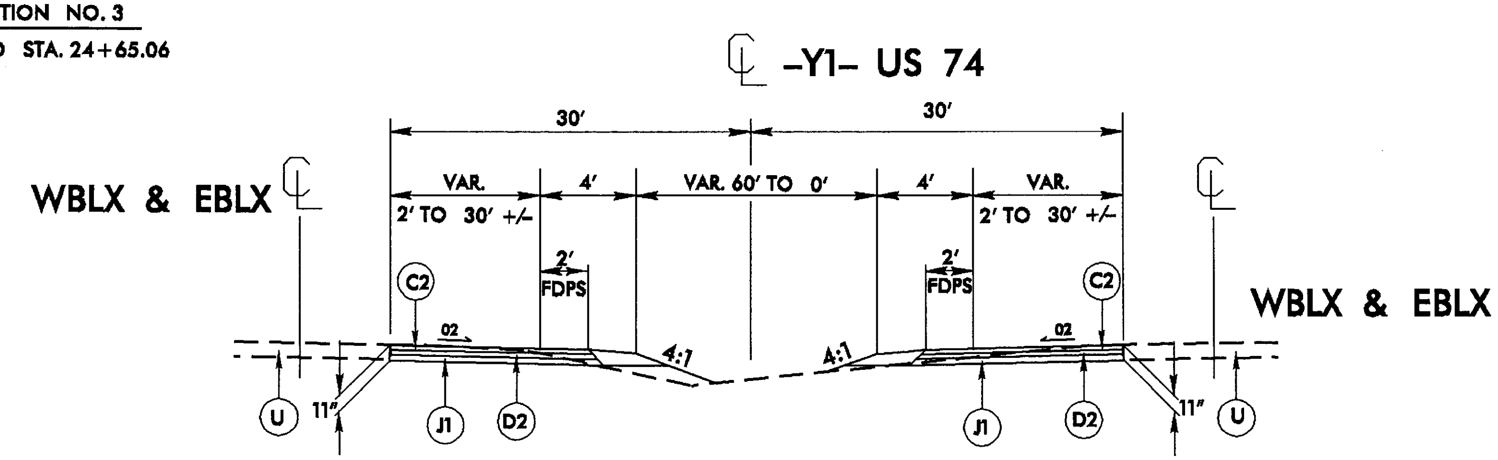


NOTE: SEE STD.'S 610.03, 862.01 AND STRUCTURE PLANS



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3
-Y1- STA. 6+15.00 TO STA. 24+65.06



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4
-Y1- STA. 6+63.92 TO STA. 12+07.11
-Y1- STA.19+22.46 TO STA. 24+65.06

PAVEMENT SCHEDULE	
C1	1¼" TYPE SF9.5A
C2	1½" TYPE S9.5C
C3	2½" TYPE SF9.5A
C4	2½" TYPE S9.5C
C5	3" TYPE S9.5C
C6	VARIABLE DEPTH TYPE SF9.5A
D1	2½" TYPE I19.0C
D2	4" TYPE I19.0C
E1	4" TYPE B25.0B
E2	5½" TYPE B25.0C
E3	VARIABLE DEPTH TYPE B25.0B
J1	6" ABC
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

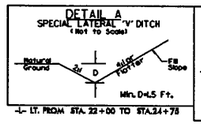
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
W-4704	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

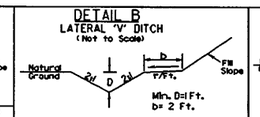
NAD 83/95

DETAIL A
SPECIAL LATERAL "V" DITCH
(Not to Scale)



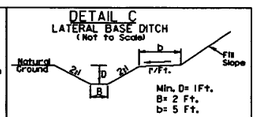
-L- LT. FROM STA. 22+00 TO STA.24+78

DETAIL B
LATERAL "V" DITCH
(Not to Scale)



-L- LT FROM STA. 24+85 TO STA.26+95

DETAIL C
LATERAL BASE DITCH
(Not to Scale)



-L- LT FROM STA.27+05 TO STA.33+00

-L-

PI Sta 17+42.16
Δ = 2° 24' 34.6" (LT)
D = 0° 59' 59.7"
L = 240.98'
T = 120.51'
R = 5,730.00'

PI Sta 27+33.11
Δ = 4° 21' 48.5" (RT)
D = 0° 59' 59.7"
L = 436.38'
T = 218.30'
R = 5,730.00'
S.E.= 0.03

BEGIN PROJECT W-4704
-L- POT STA. 22+00.00
BEGIN CONSTRUCTION

-L- PT Sta. 18+62.63

153.66' S 85°20'26" W

200.27' N24°48'24" W

JAMES G MARTIN
DB T22 PG 74

HAL STEPHENS
DB 16V PG 47

20+00

25+00

30+00

BL-3
-BL- PINC STA. 19+87.90 =
-L- STA 25+13.16 (17.62' RT)

-L- 25+14.82
EXIST R/W

SPECIAL V DITCH
SEE DETAIL A.

BEGIN PROP.
W/W FENCE
+33.50

-L- +75.00
80.00' LT

-L- +33.50
BEGIN C/A
85.00' LT

-L- +51.20
102.50' LT

BEG. PROP. SHLD.
BERM GUTTER
-L- STA 30+18.00

PROP. W/W FENCE

N 82° 05' 06.8" E

N 81° 56' 45.0" E

PLACED PER PLANS

TO SR 2208

HOUSE UNDER CONSTRUCTION

LETTIE SUE HEDGEPETH
DB 1357 PG 63

353.46' S 02°30'59" W

353.53' S 02°30'59" W

EIP TO EIP 353.58'

175.82' S 82°03'53" W

JOHNNY HEDGEPETH
DB 8KPG 65
WILL BK 69 PG 93

-L- PCS Sta. 25+14.82

REMOVE TWO PIPES

CLASS B RIP-RAP
11 TONS 38 SY F.S.

-L- +33.07
BEGIN C/A
82.00' RT

CLASS B RIP-RAP
2 TONS 7 SY F.F

BEG. PROP. SHLD.
BERM GUTTER
-L- STA 27+98.00

BEGIN PROP.
W/W FENCE
-L- +33.07

-L- +51.20
102.50' RT

PROP. W/W FENCE

N 83° 19' 35.4" E

MATCHLINE -L- 31+00.00, SEE SHEET 5.

HAL STEPHENS
DB 16V PG 47

AVENDER RAY COLLINS
DB 626 PG 599

AVENDER RAY COLLINS
DB 48 PG 265

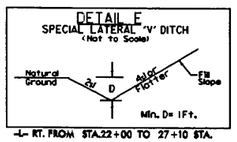
216.60' S 01°48'02" W

202.15' N 81°42'02" E

216.60' N 01°48'02" E

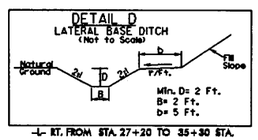
-L- PT Sta. 29+51.20

DETAIL E
SPECIAL LATERAL "V" DITCH
(Not to Scale)



-L- RT. FROM STA.22+00 TO 27+10 STA.

DETAIL D
LATERAL BASE DITCH
(Not to Scale)



-L- RT. FROM STA. 27+20 TO 35+30 STA.

FOR -L- PROFILE, SEE SHEET 9

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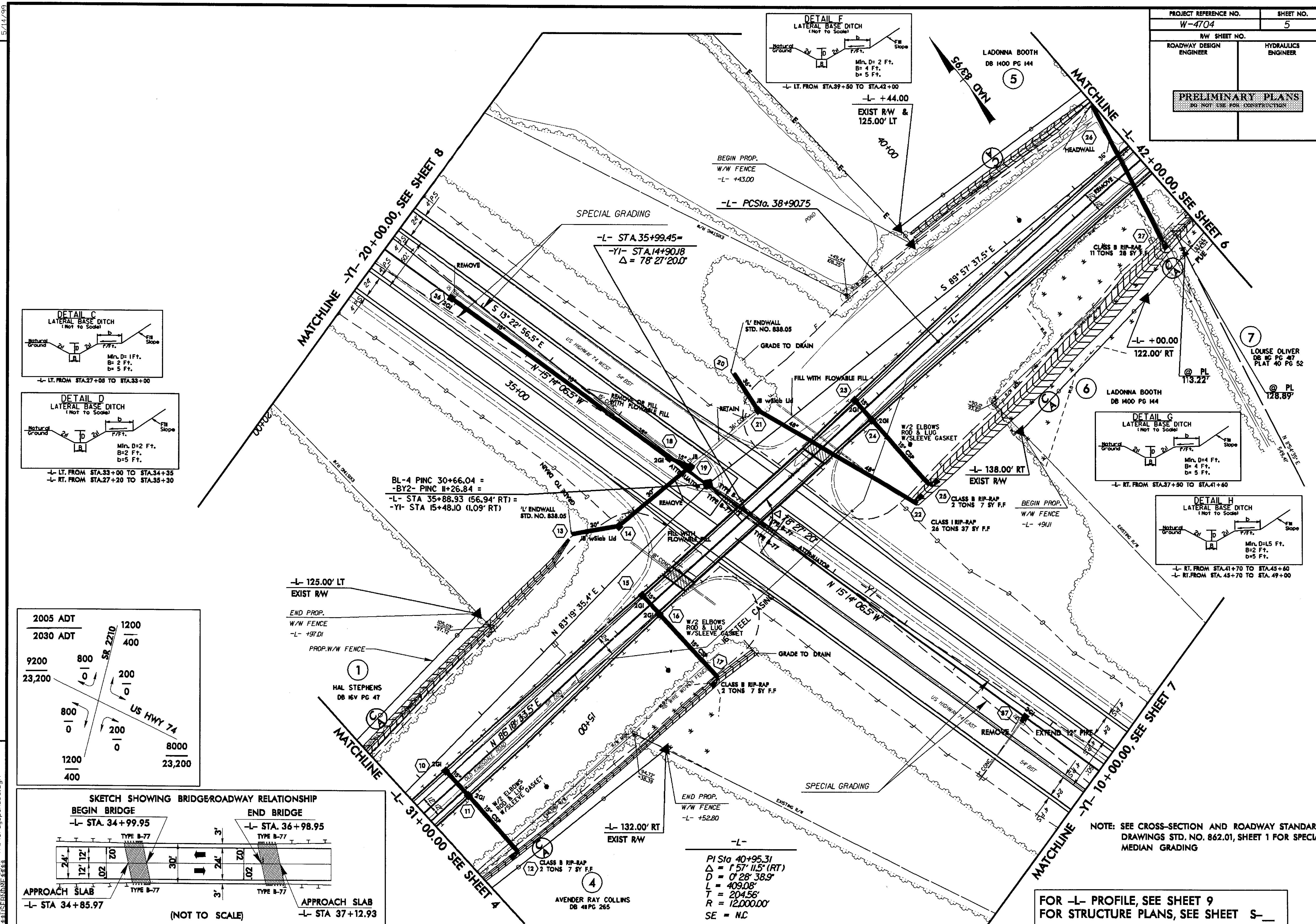
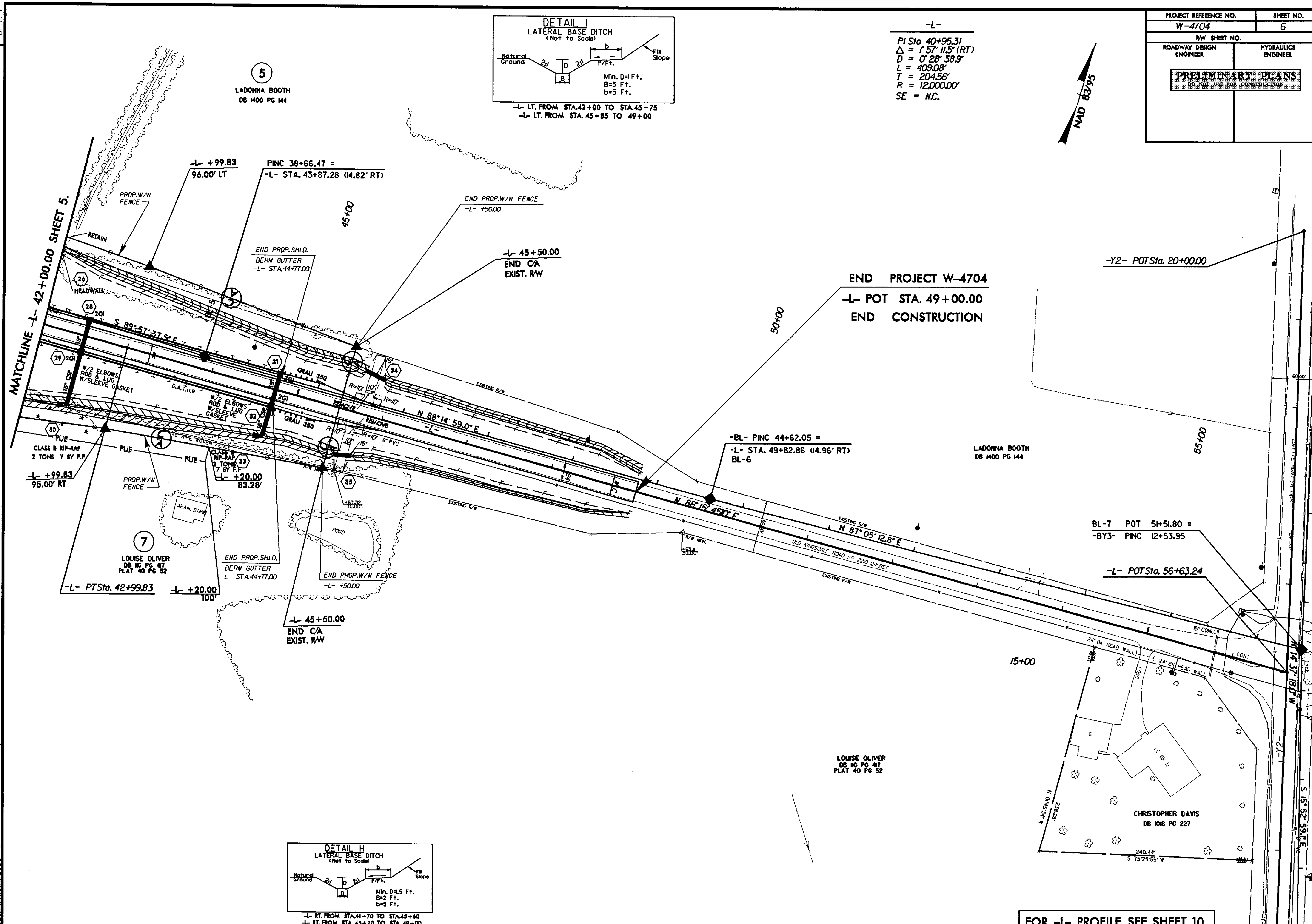

PROJECT REFERENCE NO.
W-4704
SHEET NO.
5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
DETAIL F
LATERAL BASE DITCH
(Not to Scale)
Min. D= 2 Ft.
B= 4 Ft.
b= 5 Ft.
-L- LT. FROM STA.39+50 TO STA.42+00
NAD 83/95
LADONNA BOOTH
DB 1400 PG 144
-L- +44.00
EXIST R/W &
125.00' LT
MATCHLINE -L- 42+00.00, SEE SHEET 6
MATCHLINE -Y1- 20+00.00, SEE SHEET 8
SPECIAL GRADING
-L- STA.35+99.45=
-Y1- STA.14+90.18
Δ = 78°27'20.0"
BEGIN PROP.
W/W FENCE
-L- +43.00
-L- PCSta. 38+90.75
S 13°22'56.5"E
N 15°14'06.5"W
S 89°57'37.5"E
US HIGHWAY 74 WEST
HEADWALL
REMOVE
CLASS B RIP-RAP
11 TONS 28 SY F.F
'L' ENDWALL
STD. NO. 838.05
GRADE TO DRAIN
FILL WITH FLOWABLE FILL
REMOVE OR FILL WITH FLOWABLE FILL
RETAIN
W/2 ELBOWS
ROD & LUG
W/SLEEVE GASKET
-L- +00.00
122.00' RT
@ PL
113.22'
@ PL
128.89'
LOUISE OLIVER
DB 16 PG 417
PLAT 40 PG 52
DETAIL G
LATERAL BASE DITCH
(Not to Scale)
Min. D=4 Ft.
B= 4 Ft.
b= 5 Ft.
-L- RT. FROM STA.37+50 TO STA.41+60
DETAIL H
LATERAL BASE DITCH
(Not to Scale)
Min. D=1.5 Ft.
B=2 Ft.
b=5 Ft.
-L- RT. FROM STA.41+70 TO STA.45+60
-L- RT.FROM STA. 45+70 TO STA. 49+00
-L- 138.00' RT
EXIST R/W
CLASS B RIP-RAP
2 TONS 7 SY F.F
CLASS I RIP-RAP
26 TONS 37 SY F.F
BEGIN PROP.
W/W FENCE
-L- +91.11
DETAIL C
LATERAL BASE DITCH
(Not to Scale)
Min. D= 1 Ft.
B= 2 Ft.
b= 5 Ft.
-L- LT. FROM STA.27+05 TO STA.33+00
DETAIL D
LATERAL BASE DITCH
(Not to Scale)
Min. D=2 Ft.
B=2 Ft.
b=5 Ft.
-L- LT. FROM STA.33+00 TO STA.34+35
-L- RT. FROM STA.27+20 TO STA.35+30
BL-4 PINC 30+66.04 =
-BY2- PINC 11+26.84 =
-L- STA 35+88.93 (56.94' RT) =
-Y1- STA 15+48.10 (1.09' RT)
ATTENUATOR
TYPE B-77
Δ 78°27'20"
N 15°14'06.5"W
-Y1-
-L- 125.00' LT
EXIST R/W
END PROP.
W/W FENCE
-L- +97.01
PROP.W/W FENCE
N 83°19'35.4"E
HAL STEPHENS
DB 16V PG 47
GRADE TO DRAIN
CLASS B RIP-RAP
2 TONS 7 SY F.F
US HIGHWAY 74 EAST
REMOVE
EXTEND 12" PIPE
N 86°18'33.5"E
OLD RIDGEDALE ROAD
SPECIAL GRADING
MATCHLINE -L- 31+00.00 SEE SHEET 4
MATCHLINE -Y1- 10+00.00, SEE SHEET 7
CLASS B RIP-RAP
2 TONS 7 SY F.F
AVENDER RAY COLLINS
DB 41 PG 265
END PROP.
W/W FENCE
-L- +52.80
-L- 132.00' RT
EXIST R/W
-L-
PI Sta 40+95.31
Δ = 1°57'11.5" (RT)
D = 0°28'38.9"
L = 409.08'
T = 204.56'
R = 12,000.00'
SE = N.C
NOTE: SEE CROSS-SECTION AND ROADWAY STANDARD DRAWINGS STD. NO. 862.01, SHEET 1 FOR SPECIAL MEDIAN GRADING
2005 ADT
2030 ADT
SR 2210
US HWY 74
SKETCH SHOWING BRIDGE/ROADWAY RELATIONSHIP
BEGIN BRIDGE
-L- STA. 34+99.95
END BRIDGE
-L- STA. 36+98.95
APPROACH SLAB
-L- STA 34+85.97
APPROACH SLAB
-L- STA 37+12.93
(NOT TO SCALE)
FOR -L- PROFILE, SEE SHEET 9
FOR STRUCTURE PLANS, SEE SHEET S-__

PROJECT REFERENCE NO.	SHEET NO.
W-4704	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DETAIL I
LATERAL BASE DITCH
(Not to Scale)
Natural Ground
Fill Slope
Min. D=1 Ft.
B=3 Ft.
b=5 Ft.
-L- LT. FROM STA.42+00 TO STA.45+75
-L- LT. FROM STA. 45+85 TO 49+00
-L-
PI Sta 40+95.31
Δ = 1° 57' 11.5" (RT)
D = 0° 28' 38.9"
L = 409.08'
T = 204.56'
R = 12,000.00'
SE = N.C.
NAD 83/95
5
LADONNA BOOTH
DB 1400 PG 144
MATCHLINE -L- 42+00.00 SHEET 5.
-L- +99.83
96.00' LT
PINC 38+66.47 =
-L- STA. 43+87.28 (14.82' RT)
PROP. W/W FENCE
RETAIN
HEADWALL
END PROP. SHLD.
BERM GUTTER
-L- STA.44+77.00
END PROP. W/W FENCE
-L- +50.00
-L- 45+50.00
END C/A
EXIST. R/W
45+00
END PROJECT W-4704
-L- POT STA. 49+00.00
END CONSTRUCTION
50+00
-Y2- POT Sta. 20+00.00
S 89° 57' 37.5" E
W/2 ELBOWS ROD & LUG W/SLEEVE GASKET
GRAU 350
REMOVE
N 88° 14' 59.0" E
EXISTING R/W
CLASS B RIP-RAP
2 TONS 7 SY F.F.
PUE
-L- +99.83
95.00' RT
PROP. W/W FENCE
ABAN. BARN
POND
-L- +20.00
83.28'
-BL- PINC 44+62.05 =
-L- STA. 49+82.86 (14.96' RT)
BL-6
N 88° 15' 45.0" E
N 87° 05' 12.8" E
OLD KINGSDALE ROAD SR 2210 24' BST
LADONNA BOOTH
DB 1400 PG 144
55+00
7
LOUISE OLIVER
DB 116 PG 417
PLAT 40 PG 52
END PROP. SHLD.
BERM GUTTER
-L- STA.44+77.00
END PROP. W/W FENCE
-L- +50.00
-L- PT Sta. 42+99.83
-L- +20.00
100'
-L- 45+50.00
END C/A
EXIST. R/W
BL-7 POT 51+51.80 =
-BY3- PINC 12+53.95
-L- POT Sta. 56+63.24
15' CONC.
24" BK HEAD WALL
15+00
N 14° 37' 18.0" W
LOUISE OLIVER
DB 116 PG 417
PLAT 40 PG 52
CHRISTOPHER DAVIS
DB 1018 PG 227
240.44'
S 75°25'55" W
S 15° 52' 59.1" E
-Y2-
DETAIL H
LATERAL BASE DITCH
(Not to Scale)
Natural Ground
Fill Slope
Min. D=1.5 Ft.
B=2 Ft.
b=5 Ft.
-L- RT. FROM STA.41+70 TO STA.45+60
-L- RT. FROM STA. 45+70 TO STA. 49+00

FOR -L- PROFILE, SEE SHEET 10

REVISIONS

R/W REVISION: 11/1/07 NNA: ADDED PUE ON PARCEL NO 7

8/17/99

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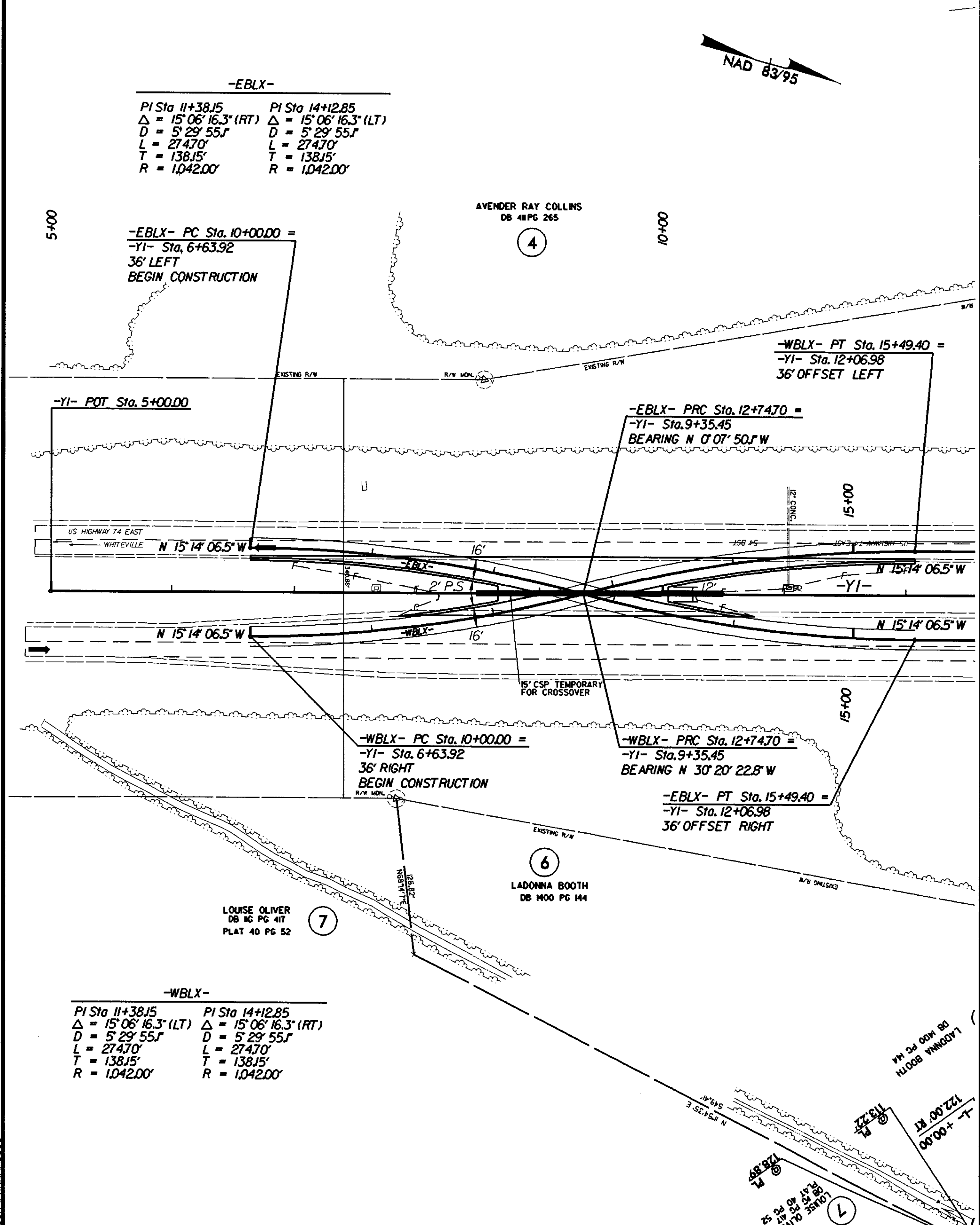
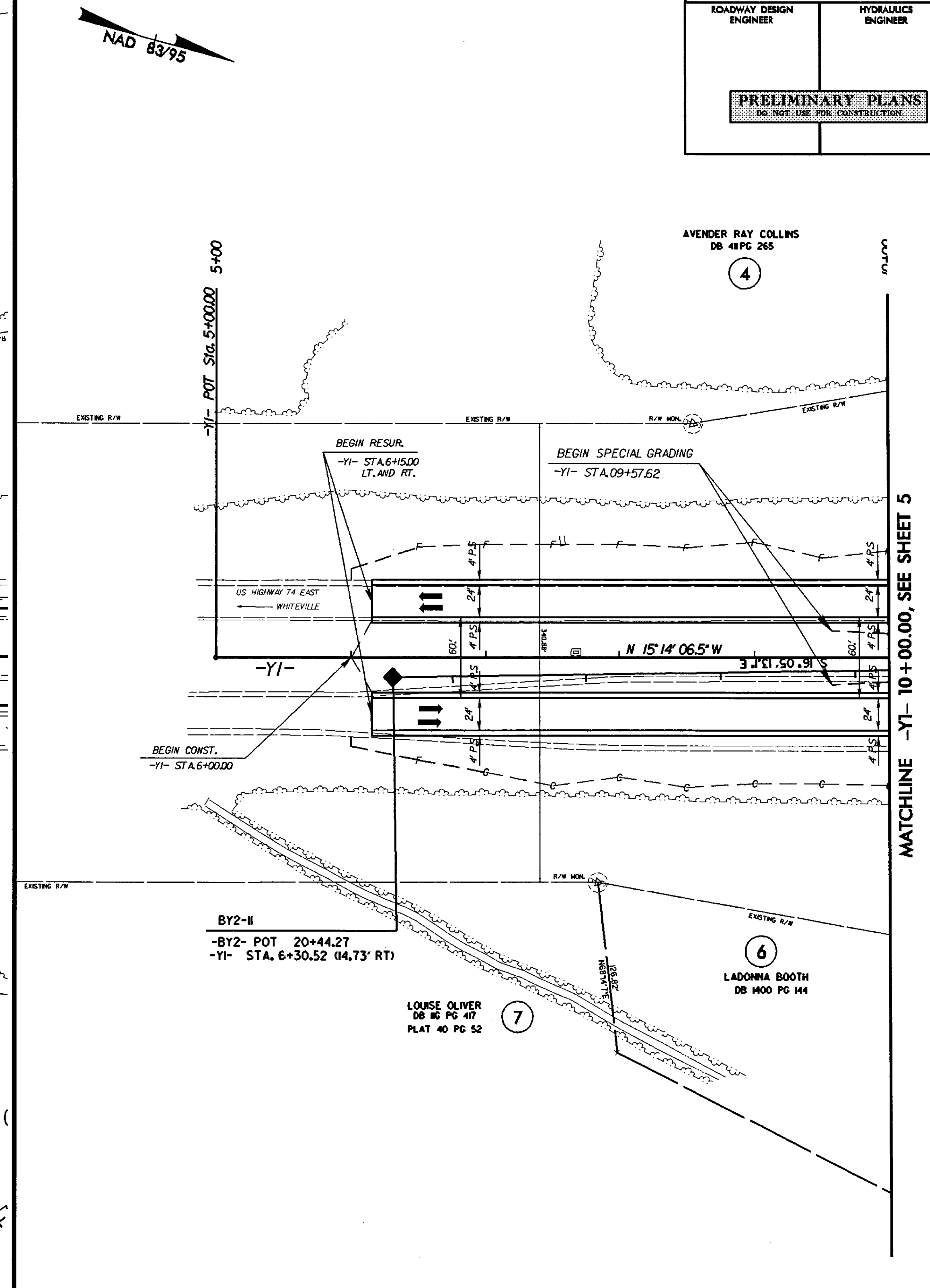
US 74 TEMPORARY CROSSOVER FOR BRIDGE CONSTRUCTION (SOUTH)

PROJECT REFERENCE NO.	SHEET NO.
W-4704	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION


NAD 83/95
-EBLX-
PI Sta 11+38.15
Δ = 15° 06' 16.3" (RT)
D = 5° 29' 55.1"
L = 274.70'
T = 138.15'
R = 1,042.00'
PI Sta 14+12.85
Δ = 15° 06' 16.3" (LT)
D = 5° 29' 55.1"
L = 274.70'
T = 138.15'
R = 1,042.00'
AVENDER RAY COLLINS
DB 41 PG 265
4
5+00
10+00
15+00
-EBLX- PC Sta. 10+00.00 =
-Y1- Sta. 6+63.92
36' LEFT
BEGIN CONSTRUCTION
-WBLX- PT Sta. 15+49.40 =
-Y1- Sta. 12+06.98
36' OFFSET LEFT
-Y1- POT Sta. 5+00.00
-EBLX- PRC Sta. 12+74.70 =
-Y1- Sta. 9+35.45
BEARING N 0° 07' 50.1" W
US HIGHWAY 74 EAST
WHITEVILLE
N 15° 14' 06.5" W
16'
2' P.S.
12'
-Y1-
-EBLX-
-WBLX-
15' CSP TEMPORARY FOR CROSSOVER
-WBLX- PC Sta. 10+00.00 =
-Y1- Sta. 6+63.92
36' RIGHT
BEGIN CONSTRUCTION
-WBLX- PRC Sta. 12+74.70 =
-Y1- Sta. 9+35.45
BEARING N 30° 20' 22.8" W
-EBLX- PT Sta. 15+49.40 =
-Y1- Sta. 12+06.98
36' OFFSET RIGHT
EXISTING R/W
R/W MON.
6
LADONNA BOOTH
DB 1400 PG 144
LOUISE OLIVER
DB 1G PG 417
PLAT 40 PG 52
7
-WBLX-
PI Sta 11+38.15
Δ = 15° 06' 16.3" (LT)
D = 5° 29' 55.1"
L = 274.70'
T = 138.15'
R = 1,042.00'
PI Sta 14+12.85
Δ = 15° 06' 16.3" (RT)
D = 5° 29' 55.1"
L = 274.70'
T = 138.15'
R = 1,042.00'


NAD 83/95
AVENDER RAY COLLINS
DB 41 PG 265
4
5+00
-Y1- POT Sta. 5+00.00
BEGIN RESUR.
-Y1- STA.6+15.00
LT. AND RT.
BEGIN SPECIAL GRADING
-Y1- STA.09+57.62
US HIGHWAY 74 EAST
WHITEVILLE
N 15° 14' 06.5" W
-Y1-
BEGIN CONST.
-Y1- STA.6+00.00
BY2-II
-BY2- POT 20+44.27
-Y1- STA. 6+30.52 (14.73' RT)
EXISTING R/W
R/W MON.
6
LADONNA BOOTH
DB 1400 PG 144
LOUISE OLIVER
DB 1G PG 417
PLAT 40 PG 52
7
MATCHLINE -Y1- 10+00.00, SEE SHEET 5

NOTE: SEE CROSS-SECTION AND ROADWAY STANDARD DRAWINGS STD. NO. 862.01, SHEET 1 FOR SPECIAL MEDIAN GRADING

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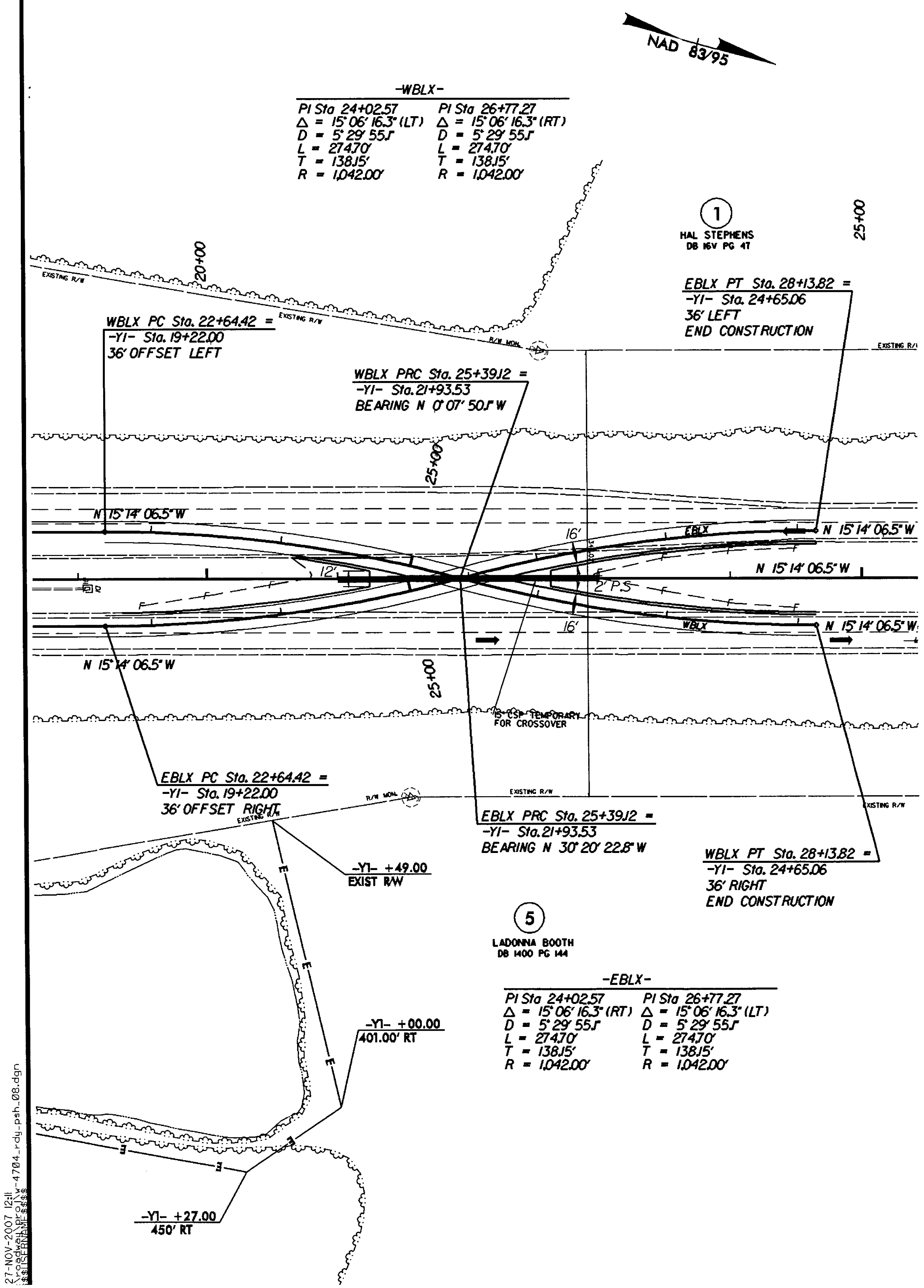
5/14/99

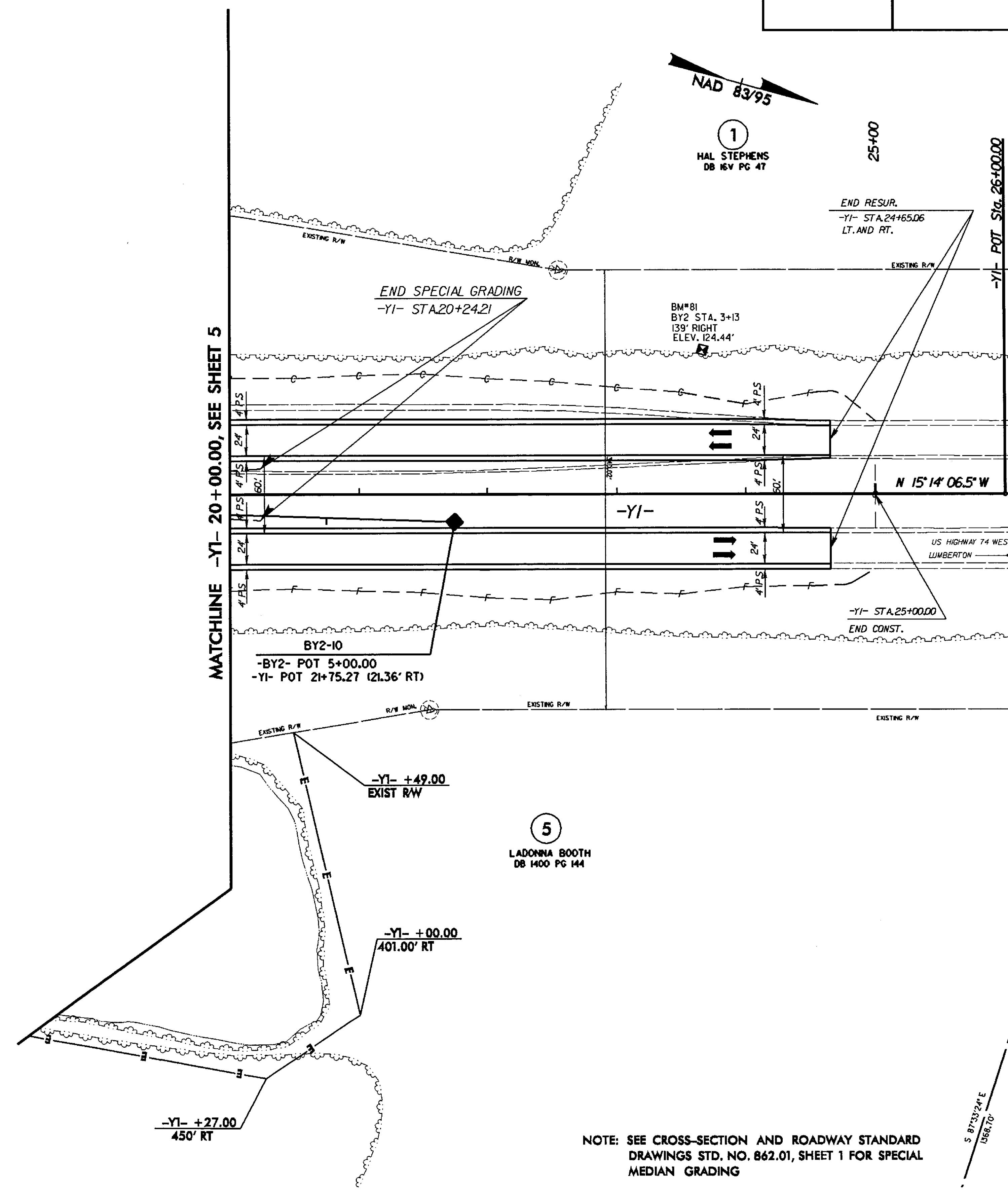
US 74 TEMPORARY CROSSOVER FOR BRIDGE CONSTRUCTION (NORTH)

PROJECT REFERENCE NO.	SHEET NO.
W-4704	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



NAD 83/95
-WBLX-
PI Sta 24+02.57
Δ = 15° 06' 16.3" (LT)
D = 5° 29' 55.1"
L = 274.70'
T = 138.15'
R = 1,042.00'
PI Sta 26+77.27
Δ = 15° 06' 16.3" (RT)
D = 5° 29' 55.1"
L = 274.70'
T = 138.15'
R = 1,042.00'
1
HAL STEPHENS
DB 16V PG 47
20+00
25+00
EXISTING R/W
R/W MON.
WBLX PC Sta. 22+64.42 =
-Y1- Sta. 19+22.00
36' OFFSET LEFT
EBLX PT Sta. 28+13.82 =
-Y1- Sta. 24+65.06
36' LEFT
END CONSTRUCTION
WBLX PRC Sta. 25+39.12 =
-Y1- Sta. 21+93.53
BEARING N 0° 07' 50.1" W
N 15° 14' 06.5" W
EBLX
WBLX
16'
12'
2' P.S.
15" CSP TEMPORARY FOR CROSSOVER
EBLX PC Sta. 22+64.42 =
-Y1- Sta. 19+22.00
36' OFFSET RIGHT
EBLX PRC Sta. 25+39.12 =
-Y1- Sta. 21+93.53
BEARING N 30° 20' 22.8" W
WBLX PT Sta. 28+13.82 =
-Y1- Sta. 24+65.06
36' RIGHT
END CONSTRUCTION
-Y1- +49.00
EXIST R/W
5
LADONNA BOOTH
DB 1400 PG 144
-EBLX-
PI Sta 24+02.57
Δ = 15° 06' 16.3" (RT)
D = 5° 29' 55.1"
L = 274.70'
T = 138.15'
R = 1,042.00'
PI Sta 26+77.27
Δ = 15° 06' 16.3" (LT)
D = 5° 29' 55.1"
L = 274.70'
T = 138.15'
R = 1,042.00'
-Y1- +00.00
401.00' RT
-Y1- +27.00
450' RT



NAD 83/95
1
HAL STEPHENS
DB 16V PG 47
25+00
-Y1- POT Sta. 26+00.00
END RESUR.
-Y1- STA.24+65.06
LT. AND RT.
END SPECIAL GRADING
-Y1- STA.20+24.21
BM#81
BY2 STA. 3+13
139' RIGHT
ELEV. 124.44'
EXISTING R/W
R/W MON.
MATCHLINE -Y1- 20+00.00, SEE SHEET 5
N 15° 14' 06.5" W
-Y1-
US HIGHWAY 74 WEST
LUMBERTON
-Y1- STA.25+00.00
END CONST.
BY2-10
-BY2- POT 5+00.00
-Y1- POT 21+75.27 (21.36' RT)
-Y1- +49.00
EXIST R/W
5
LADONNA BOOTH
DB 1400 PG 144
-Y1- +00.00
401.00' RT
-Y1- +27.00
450' RT

NOTE: SEE CROSS-SECTION AND ROADWAY STANDARD DRAWINGS STD. NO. 862.01, SHEET 1 FOR SPECIAL MEDIAN GRADING

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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
W-4704	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

BEGIN GRADE
-L- STA. 22+00.00
EL. 123.59

PI = 24+60.00
EL = 123.49'
K = 154
VC = 520'
V = 60 MPH

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 18	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 26	CFS
DESIGN HW ELEVATION	= 121.0	FT
100 YEAR DISCHARGE	= 31	CFS
100 YEAR HW ELEVATION	= 121.2	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 46+	CFS
OVERTOPPING ELEVATION	= 123.5	FT

BEG. DITCH GRADE RT.
-L- STA 22+00.00
ELEV 121.54

BEG. DITCH GRADE LT.
-L- STA 22+00.00
ELEV 121.07

PI=24+75.000
EL= 119.63

PI=24+85.000
EL= 119.57

PI=26+60.000
EL= 118.40

PI=26+95.000
EL= 116.70

PI=27+05.000
EL= 118.75

PI=27+20.000
EL= 116.58

PI=27+10.000
EL= 116.55

PI=26+75.000
EL= 118.60

36" RCP

(+)3.3342%
(-)0.0385%
(-)0.5236%
(-)0.5145%
(-)0.6826%
(+)0.5000%
(+)0.3000%
(+)0.5210%

LEFT DITCH — - - — -
RIGHT DITCH - - - - - - -

SEE SHEET 4 FOR PLANS

20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00

-L-

-L STA 34+99.95
BEGIN BRIDGE

-L STA 34+85.97
BEGIN APPROACH SLAB

PI = 36+00.00
EL = 161.50'
K = 159
VC = 1,100'
V = 60 MPH

-L STA 36+99.95
END BRIDGE

-L STA 37+12.93
END APPROACH SLAB

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 29	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 42	CFS
DESIGN HW ELEVATION	= 122.7	FT
100 YEAR DISCHARGE	= 49	CFS
100 YEAR HW ELEVATION	= 123.2	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 73 +	CFS
OVERTOPPING ELEVATION	= 125.6	FT

BM81
-L- STA. 33+14
837' LEFT
EL.= 124.44

(+)3.3342%
(-)3.5700%
(+)0.5210%
(+)0.3000%
(-)0.5037%
(-)0.3098%
(+)0.5128%
(-)0.3000%

PI=33+00.000
EL= 121.85

PI=34+35.000
EL= 121.17

PI=35+00.000
EL= 120.92

PI=37+50.000
EL= 119.55

PI=39+50.000
EL= 120.35

PI=41+50.000
EL= 118.28

PI=41+70.000
EL= 118.28

36" RCP

LEFT DITCH — - - — -
RIGHT DITCH - - - - - - -

SEE SHEET 5 FOR PLANS

31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00 39+00 40+00 41+00 42+00

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PROJECT REFERENCE NO. W-4704 | SHEET NO. 10

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION