STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

June 9, 2006

Stormwater Section
Division of Water Quality
943 Washington Square Mall
Washington, North Carolina 27889

Subject: Stormwater Permit Application, Bertie County, Bridge 14 over Cashie River on US 17 in Windsor, TIP No. B-4434; State Project No. 8.1010801; Debit WBS Element 33700.1.1.

Dear Ms. Amy Franklin:

The North Carolina Department of Transportation (NCDOT) proposes to replace bridge number 14 over Cashie River on US 17 in Windsor. The NCDOT will be applying for a Section 404 Nationwide Permit in the near future.

Please find enclosed a stormwater permit application form, stormwater management narrative, bridge survey report, permit application fee of $420.00, and one copy of the project plans. Please review this project for authorization by your section of NCDWQ. If you have any questions regarding this project or need additional information, please feel free to contact Mr. Marshall Clawson of NCDOT Hydraulics Unit at (919) 250-4100, or Mr. Chris Manley of NCDOT Project Development and Environmental Analysis Branch at (919) 715-1487.

Sincerely,

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

cc: Dr. David Chang, P.E., Hydraulics
Mr. Bill Biddlecome, USACE
Mr. Brian Wrenn NCDWQ
Ms. Cathy Brittingham, NCDCM
Mr. Elmo Vance
File B-4434

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

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

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

STORMWATER MANAGEMENT PLAN

Project: 33700.1.1, TIP No. B-4434 02/17/06
Bertie County
Hydraulics Project Manager: Gus N. Saparilas and William T. Stephens, Jr., P.E. (TGS Engineers), Anne Gamber, P.E. (NCDOT Hydraulics Unit)

ROADWAY DESCRIPTION

The project involves the widening of US 17/NC 308 in Bertie County from the intersection with US 17 Bypass and extending 0.24 miles east. The Cashie River is within 100 feet of the intersection. The existing roadway is a two-lane roadway with shoulders. With Project B-4434, a two-lane roadway with a center turn lane and curb and gutter is proposed.

ENVIRONMENTAL DESCRIPTION

The project is located in the Roanoke River Basin. The project crosses the Cashie River at a bar that creates a pooled river section east of the bridge. Wetlands are located northeast of the roadway. A pocket of wetlands is found southwest of the roadway adjacent to the river. The remaining topography is highly urbanized.

BEST MANAGEMENT PRACTICES AND MAJOR STRUCTURES

A grassed swale will be used on this project to reduce stormwater impacts. The grassed swale is located at the intersection where there is existing direct discharge. Due to the close proximity of the Cashie River the swale is limited to a length of 40 feet. In addition, each drainage structure was outletted into wetlands with non-erosive velocities where practicable. All others drainage structures were outletted into uplands with a rock pad. No direct discharge was allowed from the bridge.

MWC/adg

OFFICE USE ONLY		
Date Received	Fee Paid	Permit Number

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

STORMWATER MANAGEMENT PERMIT APPLICATION FORM

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION LINEAR ROADWAY PROJECT

This form may be photocopied for use as an original.

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

I. PROJECT INFORMATION

NCDOT Project Number: 33700.1.1 (B-4434) County: Bertie

Project Name: US 17/NC 308 Bridge Replacement Over Cashie River

Project Location: Windsor, North Carolina

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

Receiving Stream Name: Cashie River River Basin: Roanoke River Basin Class: C, SW

Proposed linear feet of project: 1278 FT +/-

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

Drainage outlets into wetlands with erosion control stone at outlets.

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

☐ New ☐ Widening ☐ 2 lane* ☐ 4 lane* ☒ Curb and Gutter ☒ Bridge Replacement

☐ Other *(Describe)*

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

II. REQUIRED ITEMS CHECKLIST

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

Designer's Initials

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

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

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

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

III. OPERATION AND MAINTENANCE AGREEMENT

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

Maintenance Engineer's Initials

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

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

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

Maintenance Engineer's Name: Sterling David Baker

Title: Division Maintenance Engineer

IV. APPLICATION CERTIFICATION

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

Title: Manager - PDEA - NEU

Address: Raleigh NC

Signature: [signature] Date: 6/9/06

V. SUPPLEMENT FORMS

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

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

BRIDGE SURVEY & HYDRAULIC DESIGN REPORT

N. C. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
HYDRAULICS UNIT
RALEIGH, N. C.

I.D. No. B-4434 Project No. 33700.1.1 Proj. Station 15+29 -L-

County BERTIE Bridge Over CASHIE RIVER Bridge Inv. No. 14

On Highway US 17/NC308 Between WINDSOR and EDENTON

Recommended Structure 3 @ 50' CORED SLAB BRIDGE (21" CORED SLABS)

Recommended Width of Roadway 40' F TO F - 5.5' SW BOTH SIDES Skew 90°

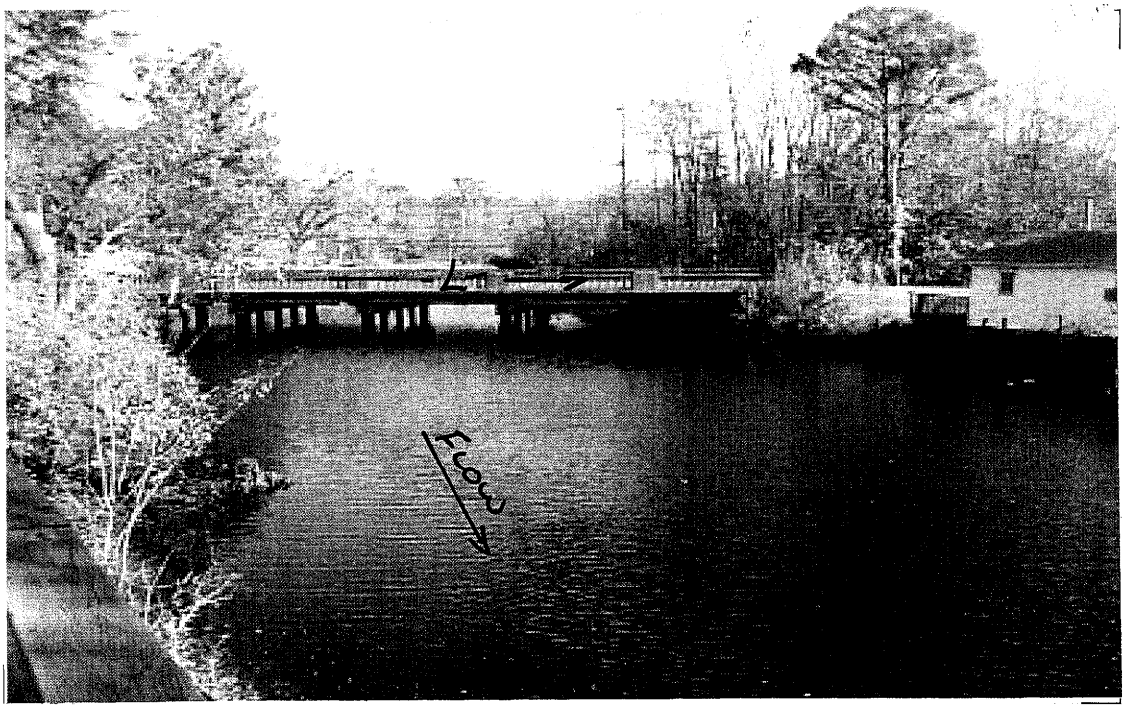
Recommended Location is (Up, At, Down) Stream from Existing Crossing. SAME LOCATION

Nearest Shipping Point WINDSOR On - R.R., Miles From Bridge

Bench Mark is #21 - RR SPIKE IN BASE OF 16" WALNUT 272.3' LT OF BASELINE STA. 27+92

Elev. 3.45 Datum: NAVD 88

Temporary Crossing IS NOT REQUIRED, STAGE CONSTRUCTION



Stream CASHIE RIVER Bridge Inv. No. 14 I.D. No. B-4434 Project No. 33700.1.1

Designed by: W.T. STEPHENS, JR, P.E. Date 3/11/05

Assisted by: R.W. ZEWE

Project Engineer: G.N. SAPARILAS

Reviewed by: Anne D. Cambre 3/14/05

NORTH CAROLINA PROFESSIONAL SEAL 20754 ENGINEER WILLIAM T. STEPHENS, JR.

SITE DATA

Drainage Area 178 SQ MI Source FLOOD STUDY Character FLAT RURAL COASTAL PLAIN

Stream Classification (Such as Trout, High Quality Water, etc.) C-SW, NO ORWS OR HQW

Data on Existing Structure 6 SPANS - 1@ 21'-3"; 4 @ 22'-6"; 1@ 21'-3".
RCDG ON CONC. & TIMBER PILES - 28' CLEAR ROADWAY WIDTH Waterway Opening 1310 SQ FT+/-

Data on Structures Up and Down Stream BR #51, 2 MILES+/- UPSTREAM - US 13
1@ 36'-9"; 2 @ 37'-6"; 1@ 36'-9" SPANS - RC ABUTMENTS - RCDG CLEAR ROADWAY 26'-3",
BUILT 1924, RECONSTRUCTED 1949

Design Control Elev. 9.4' (EXISTING 100 YR FLOOD ELEV.)

Gage Station No. 02081111310 @ SR 1257 Period of Records D.A. 108 SQ MI 16 YEARS

Max. Discharge 15,700 c.f.s. Date SEPT 16, 1999 Frequency 500 YR (FLOYD)

Historical Flood Information: PER MICHAEL TODD, BUSINESS OWNER WITH 40 YRS KNOWLEDGE WATER APPROX. 10' OVER US 17 DURING HURRICANE FLOYD - 1999

00cfs Date 10/19/99 Elev. 7.0+/- Est. Freq. > 10 Source GAGE Period of Knowledge

00cfs Date 6/17/01 Elev. 7.0+/- Est. Freq. 10 Source GAGE Period of Knowledge

00cfs Date 8/18/92 Elev. Est. Freq. < 10 Source GAGE Period of Knowledge

Historical Scour Info. : General NA Contraction NA Local NA

Channel Slope 0.002 FT/FT Source FLOOD STUDY Normal Water Surface Elev. -0.5'

Manning's n : Left O.B. 0.12 Channel 0.05 Right O.B. 0.12 Source OBSERVATION

Flood Study / Status DETAIL FLOOD STUDY Floodway Established? YES

Flood Study 100 yr. Discharge 9800 c.f.s.; W.S. Elev. : With Floodway 10.5 Without Floodway 9.5

DESIGN DATA

Hydrological Method FEMA - DETAIL FLOOD STUDY DISCHARGES

Hydraulic Design Method HEC-RAS PROJECT: B-4434 CASHIE RIVER

Floods Evaluated:

	Freq.	Q	Elev.	Backwater	Bridge Opening Velocity
AT HEC RAS MODEL SEC. 1420	10	4,400	5.0'	0.1'	3.1 fps
	50	7,900	8.3'	0.3'	4.3 fps
	100	9,800	9.4'	0.2'	3.9 fps
	500	15,500	12.1'	0.1'	2.6 fps

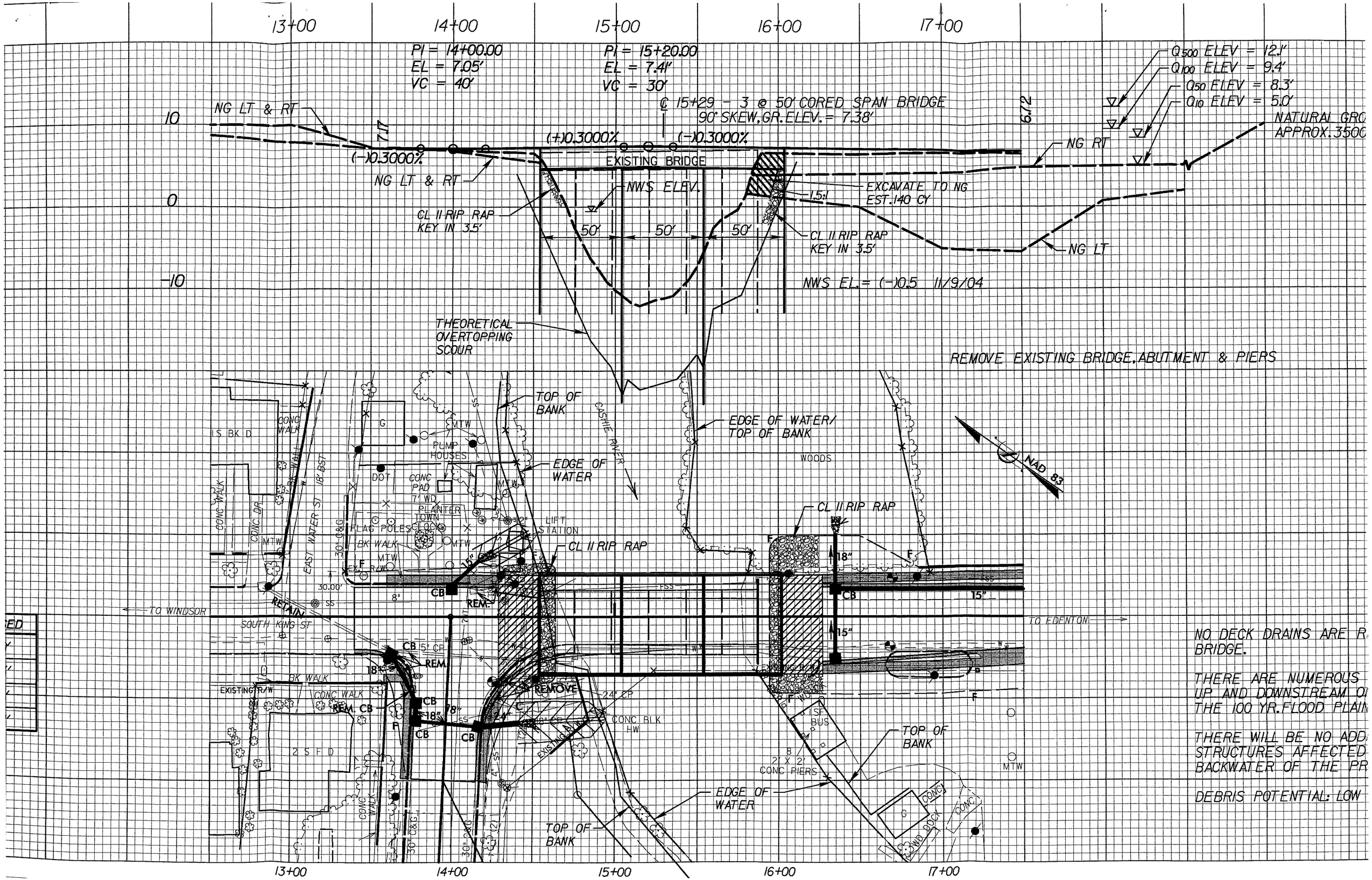
BACKWATER = PROPOSED - NATURAL CONDITIONS

Waterway Opening Provided Below: Design W.S. Elev. 1420 SQ FT, 100yr W.S. Elev. 1420 SQ FT

Average Channel Velocity (Design) 2.0 fps Average Overbank Velocity (Design) 0.5 fps

Computed Scour : General NA Contraction OVERTOPPING 10 FT Local OVERTOPPING 3.8 FT

Is a Floodway Revision Required? NO

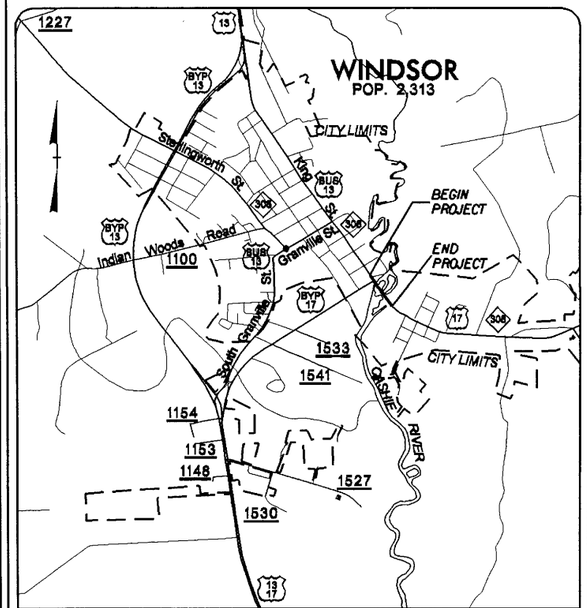


13+00
14+00
15+00
16+00
17+00
PI = 14+00.00
EL = 7.05'
VC = 40'
PI = 15+20.00
EL = 7.41'
VC = 30'
℄ 15+29 - 3 @ 50' CORED SPAN BRIDGE
90° SKEW, GR. ELEV. = 7.38'
Q500 ELEV = 12.1'
Q100 ELEV = 9.4'
Q50 ELEV = 8.3'
Q10 ELEV = 5.0'
NATURAL GRO
APPROX. 3500
NG LT & RT
(+)0.3000%
(-)0.3000%
(-)0.3000%
EXISTING BRIDGE
NG RT
NG LT & RT
NWS ELEV.
EXCAVATE TO NG
EST. 140 CY
1.5:1
CL II RIP RAP
KEY IN 3.5'
50'
50'
50'
CL II RIP RAP
KEY IN 3.5'
NG LT
NWS EL. = (-)0.5 11/9/04
THEORETICAL
OVERTOPPING
SCOUR
REMOVE EXISTING BRIDGE, ABUTMENT & PIERS
TOP OF
BANK
EDGE OF WATER/
TOP OF BANK
EDGE OF
WATER
WOODS
NAD 83
CASHIE RIVER
PUMP
HOUSES
CONC
PAD
PLANTER
TOWN
CLOCK
FLAG POLES
LIFT
STATION
CL II RIP RAP
CL II RIP RAP
EAST WATER ST 18' BST
CONC WALK
CONC DR
BK WALK
MTW
30.00'
RETAIN
TO WINDSOR
SOUTH KING ST
TO EDENTON
CB
REM.
REMOVE
CONC BLK
HW
EXISTING R/W
2 S F D
TOP OF
BANK
EDGE OF
WATER
TOP OF
BANK
2' X 2'
CONC PIERS
NO DECK DRAINS ARE R
BRIDGE.
THERE ARE NUMEROUS
UP AND DOWNSTREAM O
THE 100 YR. FLOOD PLAIN
THERE WILL BE NO ADD
STRUCTURES AFFECTED
BACKWATER OF THE PR
DEBRIS POTENTIAL: LOW

09/08/99

TIP PROJECT: B-4434

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

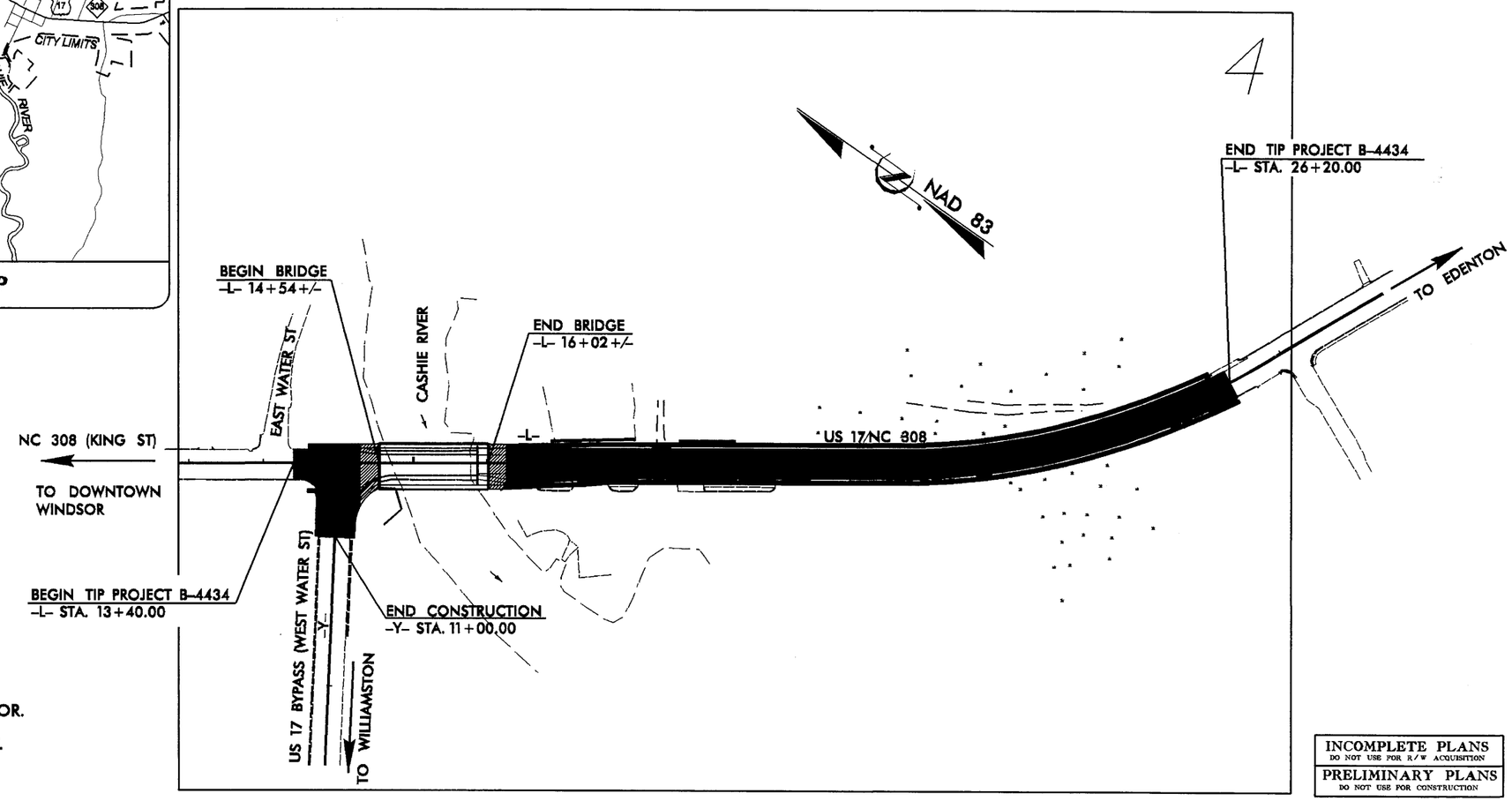
BERTIE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4434	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33700.1.1	BRNHS-17(35)	PE

LOCATION: BRIDGE NO. 14 OVER CASHIE RIVER ON US 17/NC 308

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



THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF WINDSOR.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:

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	=	11,921
ADT 2026	=	10,004
DHV	=	12 %
D	=	60 %
T	=	9 % *
V	=	40 MPH

* (TTST 5% + DUAL 4%)

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4434 =	*0.214 MILES*
LENGTH STRUCTURE TIP PROJECT B-4434 =	*0.028 MILES*
TOTAL LENGTH TIP PROJECT B-4434 =	*0.242 MILES*

PLANS PREPARED BY:

TGS ENGINEERS
SUITE 141
975 WALNUT STREET
CARY, NC 27511
PH (919) 319-8850

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 15, 2007

LETTING DATE:
JUNE 17, 2008

NCDOT CONTACT: *B. DOUG TAYLOR, PE*
PROJECT ENGINEER - ROADWAY DESIGN

PLANS PREPARED FOR:

DIVISION OF HIGHWAYS
1000 Birch Ridge Dr.
Raleigh, NC 27610

CHARLES L. FLOWE, PE
PROJECT ENGINEER

W. CRAIG PARKER, 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*

06-MAR-2006 07:22
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$$$$USERNAME$$$$

TGS ENGINEERS
SUITE 141
975 WALNUT STREET
CARY, NC 27511
PH (919) 319-8850

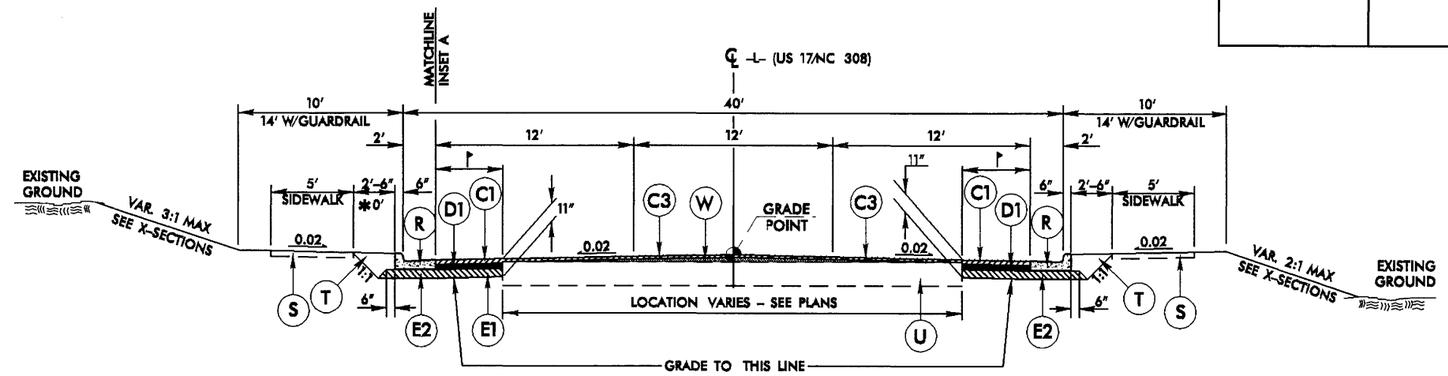
PROJECT REFERENCE NO.	SHEET NO.
B-4434	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1¼" IN DEPTH OR GREATER THAN 1½" IN DEPTH.
C3	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4.0" 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.
R	2'X6" CONCRETE CURB.
S	4" CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING EXISTING PAVEMENT. (SEE STD.DETAILS, THIS SHEET)

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



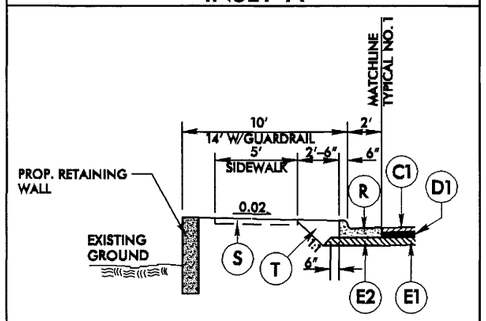
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 AS FOLLOWS:

* -L- STA. 13+40.00 TO 14+54+/- (BEGIN BRIDGE)
-L- STA. 16+02+/- (END BRIDGE) TO 26+20.00

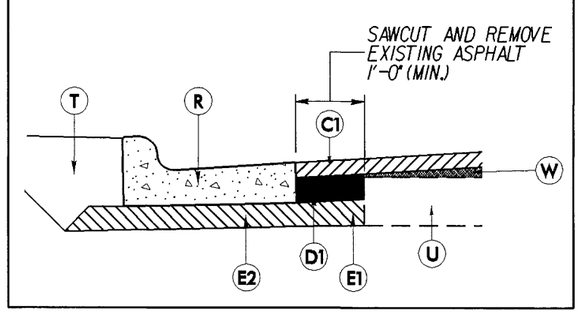
↱ NOTE: FOR AREAS <1'-0" USE SAWCUT DETAIL (THIS SHEET)

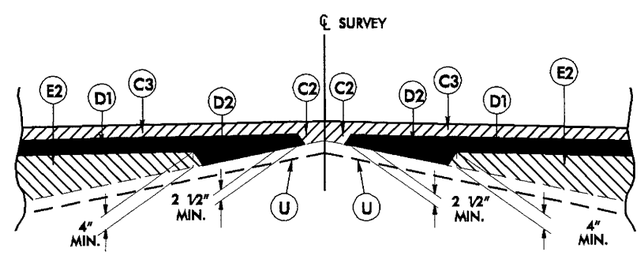
INSET A



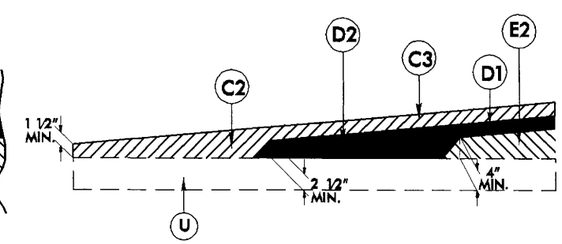
USE INSET 'A' AS FOLLOWS:
-L- STA. 16+86.20 TO 18+00.42 LT
-L- STA. 18+59.41 TO 19+36.34 LT

SAWCUT DETAIL





DETAIL SHOWING METHOD OF WEDGING



WEDGING DETAIL FOR RESURFACING

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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-4434	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

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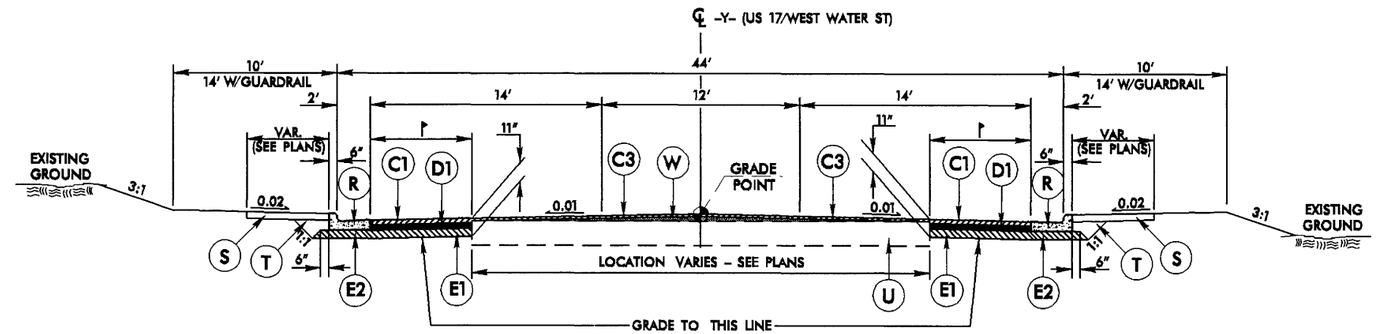
S	4" CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING EXISTING PAVEMENT. (SEE STD.DETAILS, SHEET 2)

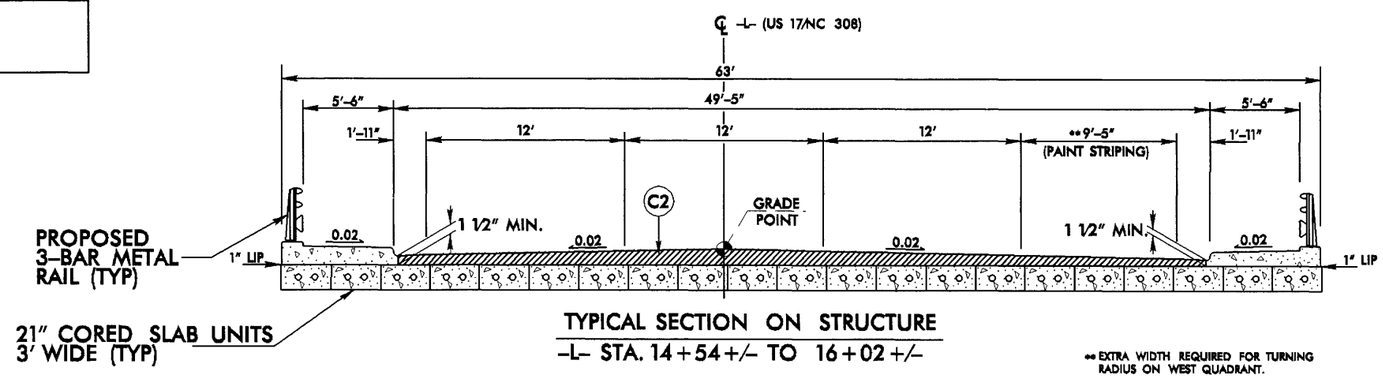
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2 AS FOLLOWS:
-Y- STA. 10+20.02 TO 11+00.00
MINIMUM RESURFACING ONLY AS FOLLOWS:
-Y- STA. 11+00.00 TO 11+60.00

NOTE: FOR AREAS <1'-0" USE SAWCUT DETAIL (SHEET 2)



TYPICAL SECTION ON STRUCTURE

-L- STA. 14+54+/- TO 16+02+/-

** EXTRA WIDTH REQUIRED FOR TURNING RADIUS ON WEST QUADRANT.

6/2/99
06-MAR-2006 07:23
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$$$$USERNAME$$$$

8/17/99

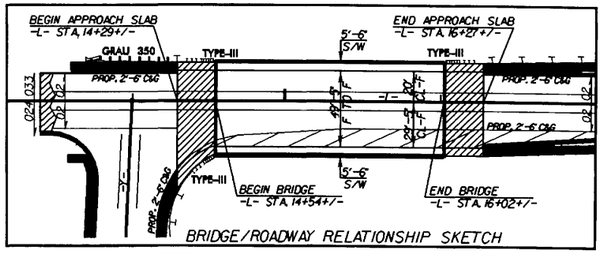
REVISIONS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS B4434-3"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF
NORTHING: 821537.2851(ft) EASTING: 2610434.373(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99996160
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS B4434-3" TO -L- STATION 13+40.00 IS
N 52° 23' 00.57" W 2,433.7 (ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

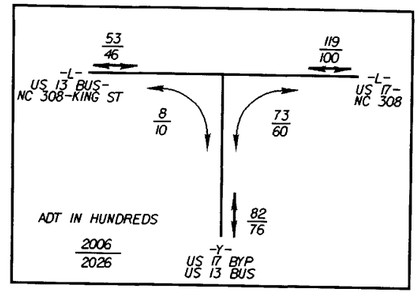
DETAIL A
STANDARD BASE DITCH
(Not to Scale)

-L- 14+18+/-, LT (0.5% Grade)
DDE: 35 CY
-Y- 10+63+/-, LT (0.5% Grade)
DDE: 130 CY



BRIDGE/ROADWAY RELATIONSHIP SKETCH

NOTE:
ALL PIPES ARE RC CLASS III, UNLESS OTHERWISE INDICATED ON PLANS.

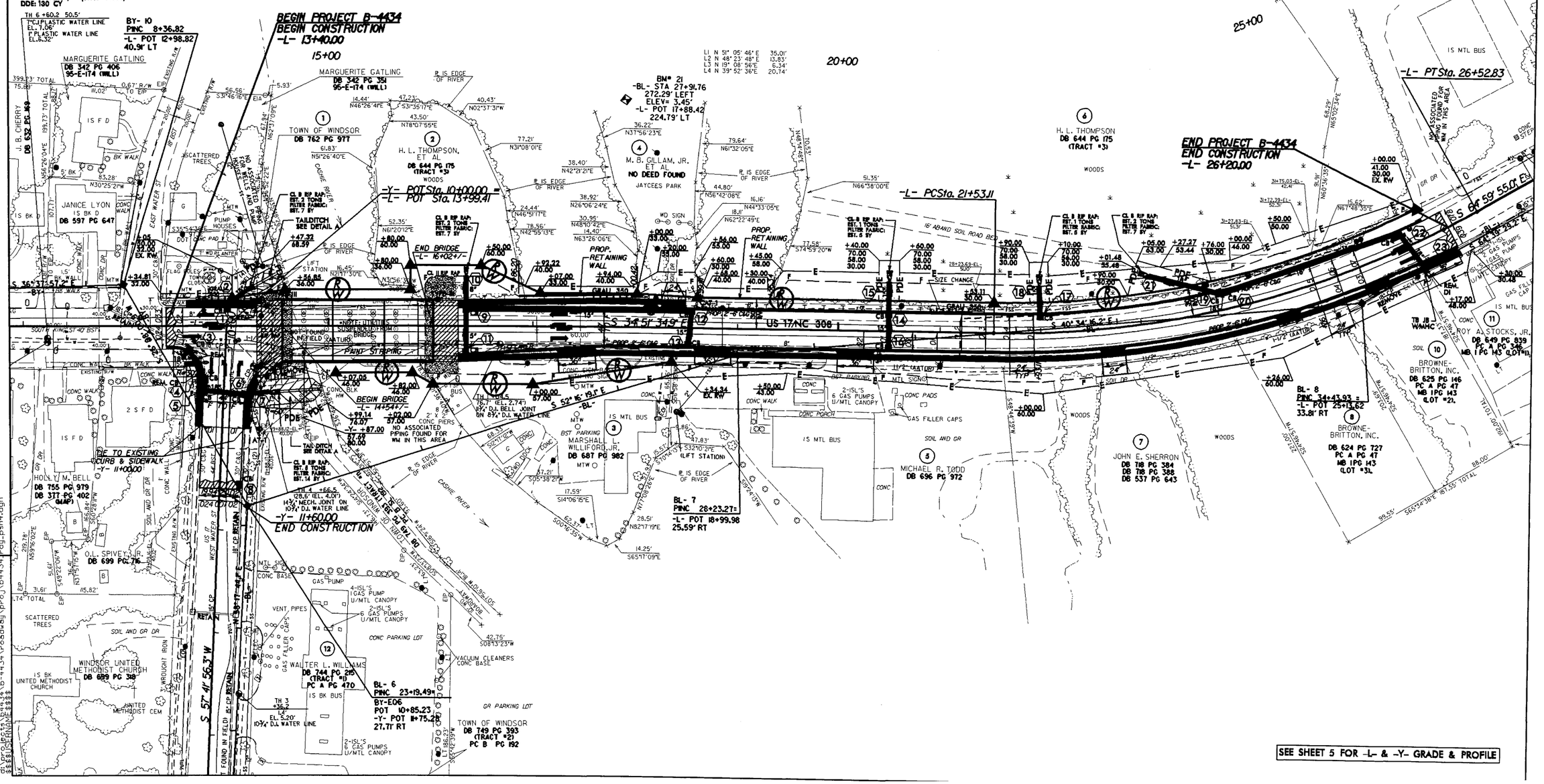


-L-
PI Sta 24+08.89
Δ = 30° 08' 20.1" (LT)
D = 6° 01' 52.1"
L = 499.72'
T = 255.79'
R = 950.00'
SE = 0.05
Vd = 40 mph

TGS ENGINEERS
TGS ENGINEERS
SUITE 141
975 WALNUT STREET
CARY, NC 27511
PH (919) 319-8850

PROJECT REFERENCE NO.	SHEET NO.
B-4434	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET 5 FOR -L- & -Y- GRADE & PROFILE

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5/28/99

TGS ENGINEERS
TGS ENGINEERS
SUITE 141
975 WALNUT STREET
CARY, NC 27511
PH (919) 319-8850

PROJECT REFERENCE NO.	SHEET NO.
B-4434	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

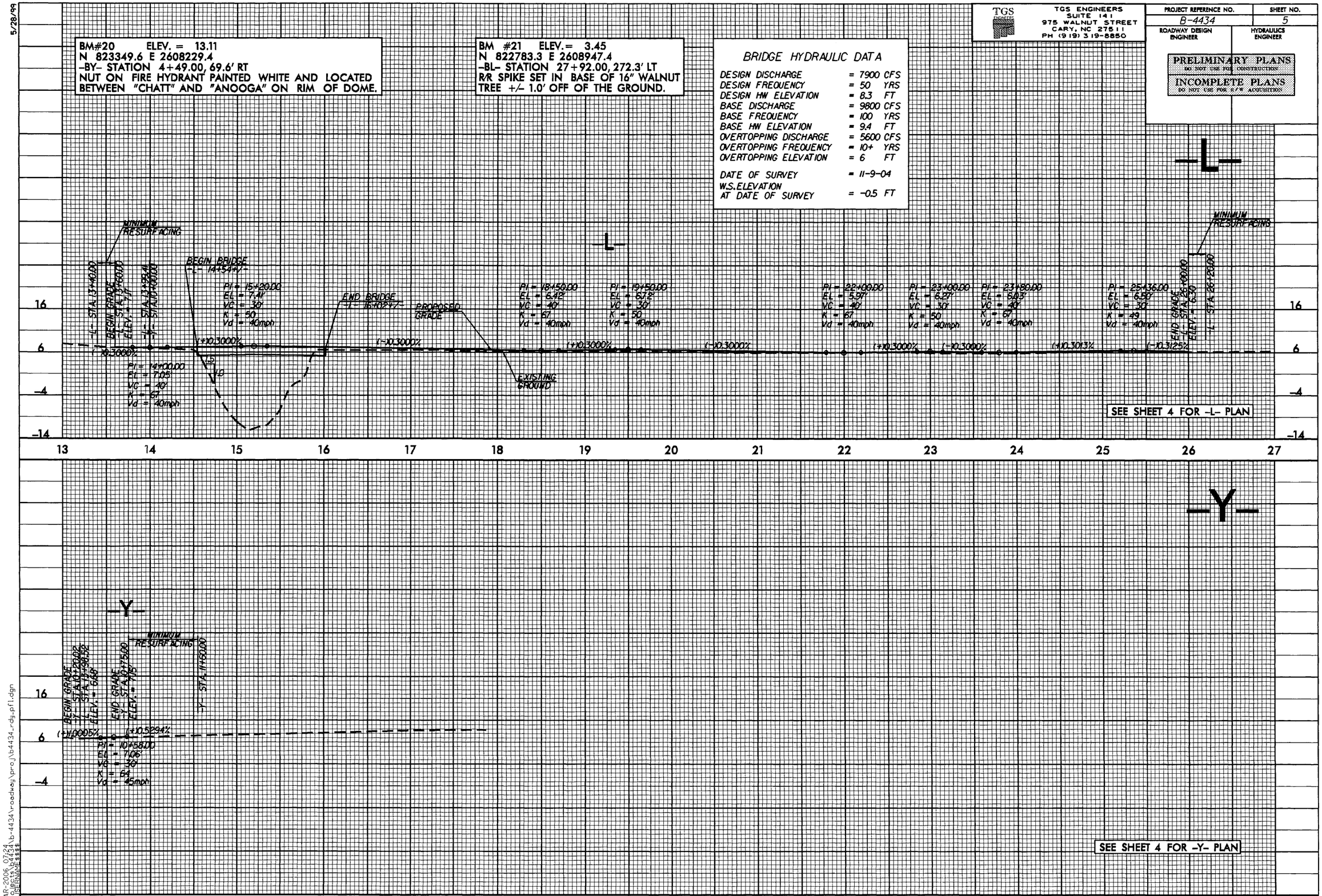
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

BM#20 ELEV. = 13.11
N 823349.6 E 2608229.4
-BY- STATION 4+49.00, 69.6' RT
NUT ON FIRE HYDRANT PAINTED WHITE AND LOCATED BETWEEN "CHATT" AND "ANOOGA" ON RIM OF DOME.

BM #21 ELEV.= 3.45
N 822783.3 E 2608947.4
-BL- STATION 27+92.00, 272.3' LT
R/R SPIKE SET IN BASE OF 16" WALNUT TREE +/- 1.0' OFF OF THE GROUND.

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 7900	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 8.3	FT
BASE DISCHARGE	= 9800	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 9.4	FT
OVERTOPPING DISCHARGE	= 5600	CFS
OVERTOPPING FREQUENCY	= 10+	YRS
OVERTOPPING ELEVATION	= 6	FT
DATE OF SURVEY	= 11-9-04	
W.S. ELEVATION AT DATE OF SURVEY	= -0.5	FT



SEE SHEET 4 FOR -L- PLAN

SEE SHEET 4 FOR -Y- PLAN

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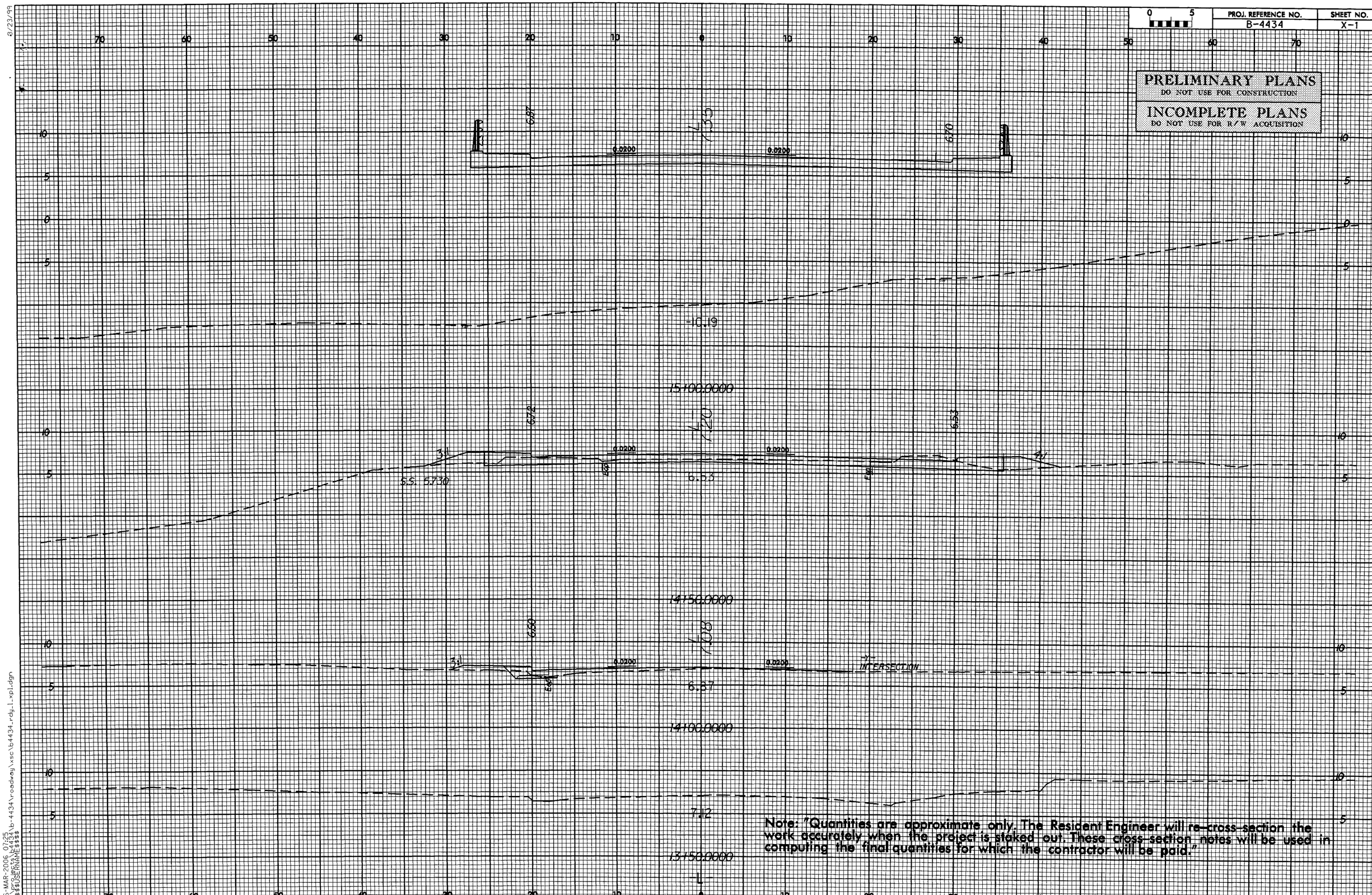
PROJ. REFERENCE NO.	SHEET NO.
B-4434	X-1

0 5

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



Note: "Quantities are approximate only. The Resident Engineer will re-cross-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."

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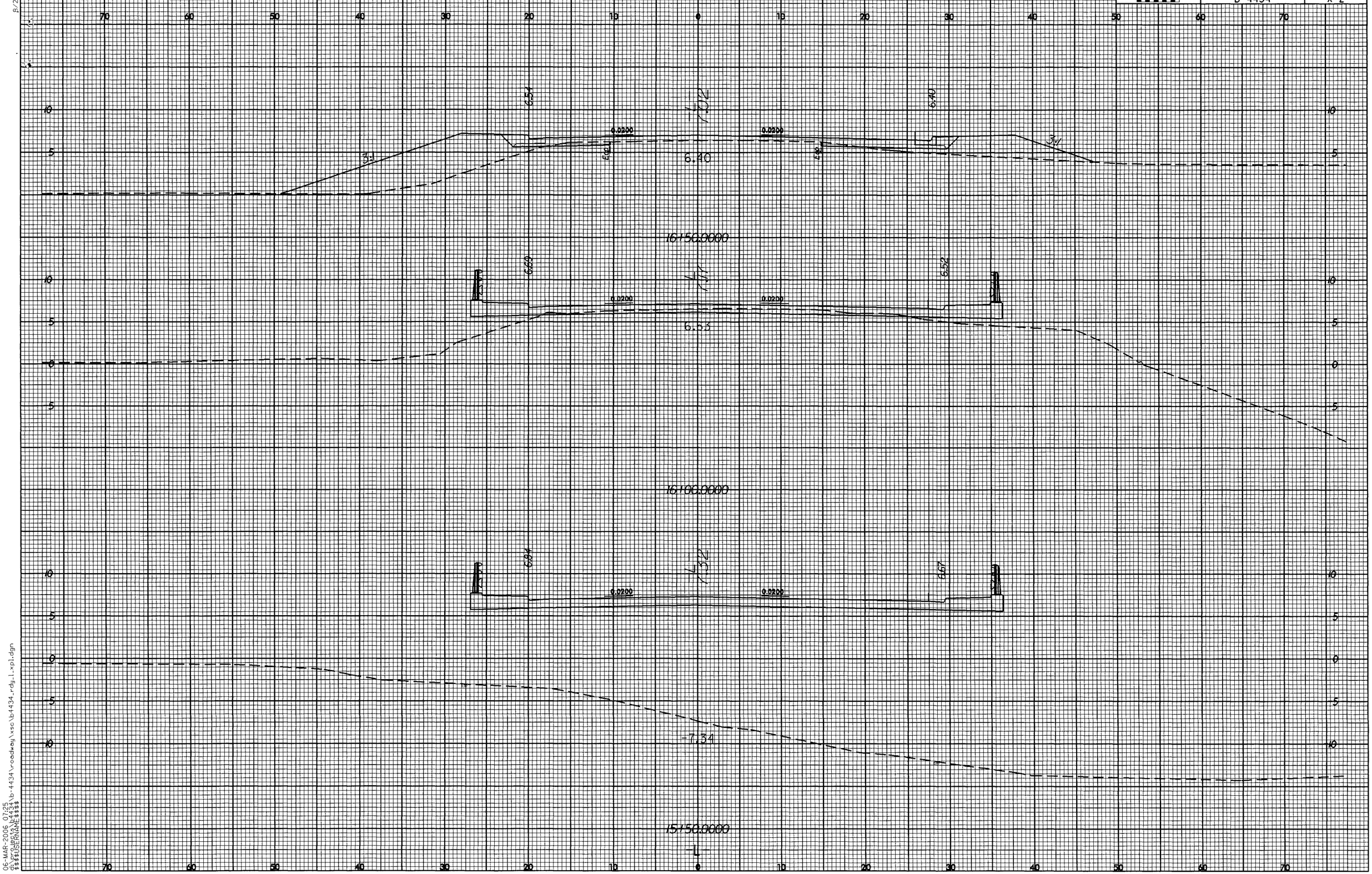
PROJ. REFERENCE NO.	SHEET NO.
B-4434	X-2



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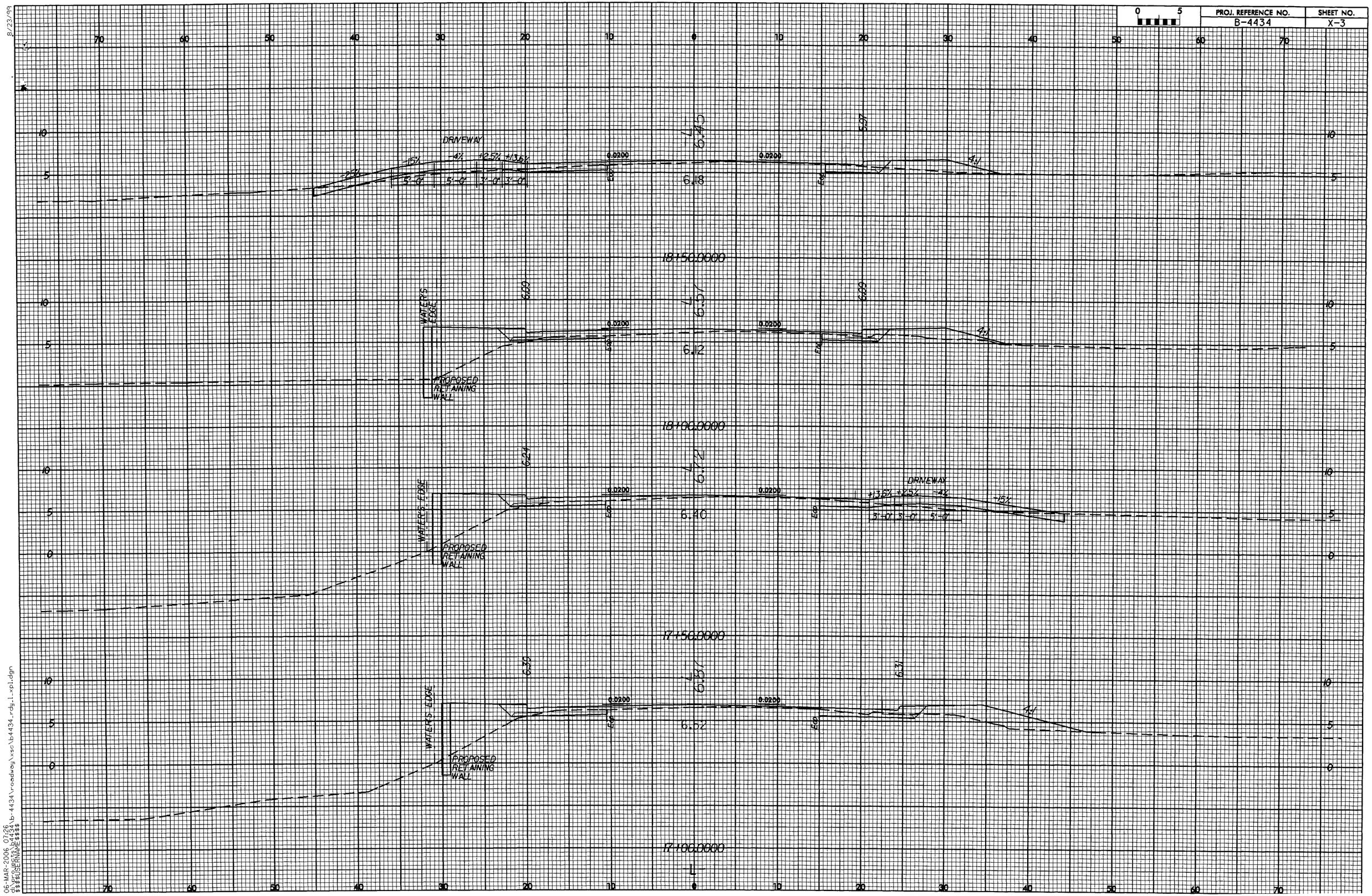

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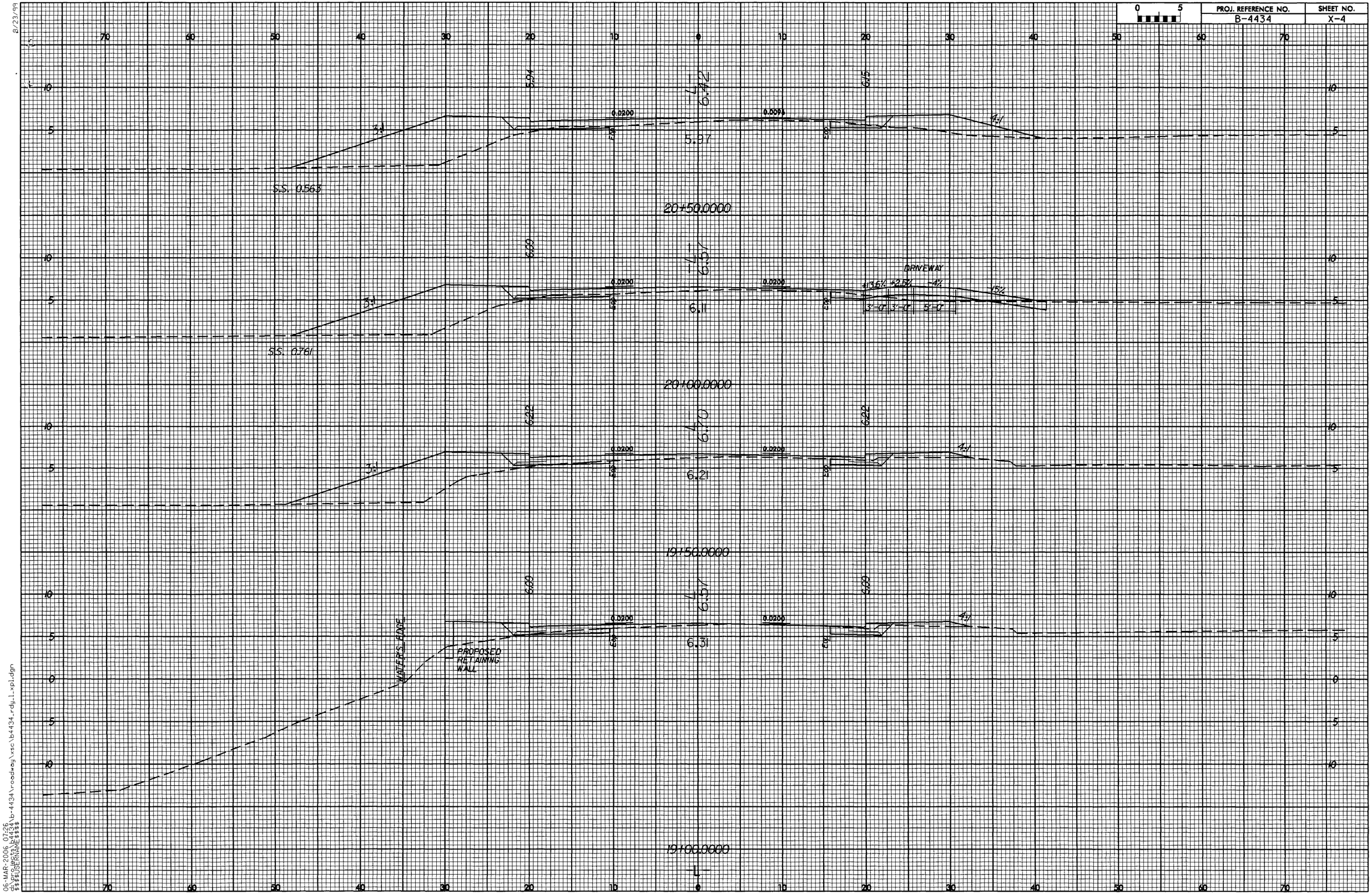
PROJ. REFERENCE NO.	SHEET NO.
B-4434	X-4



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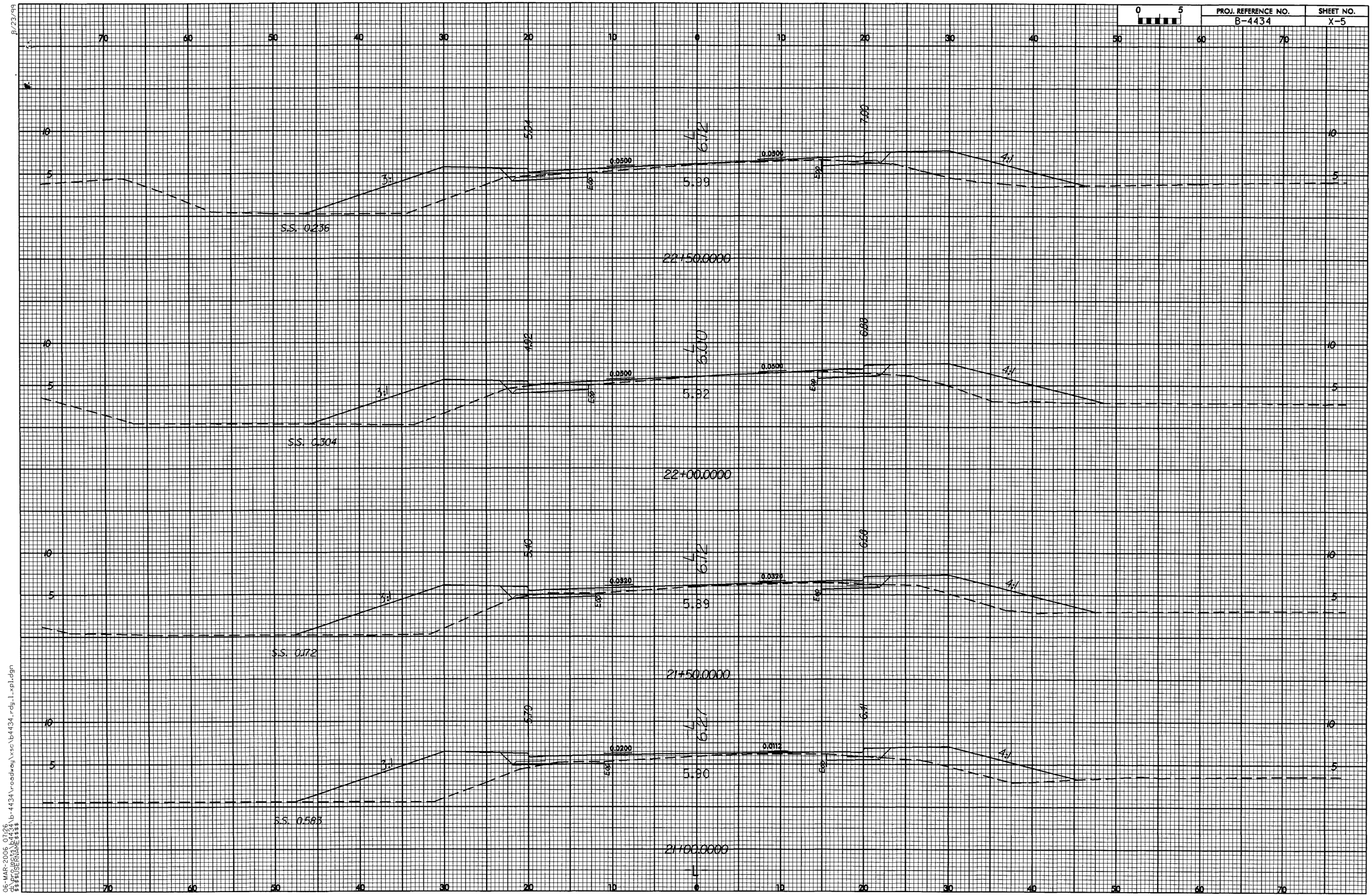

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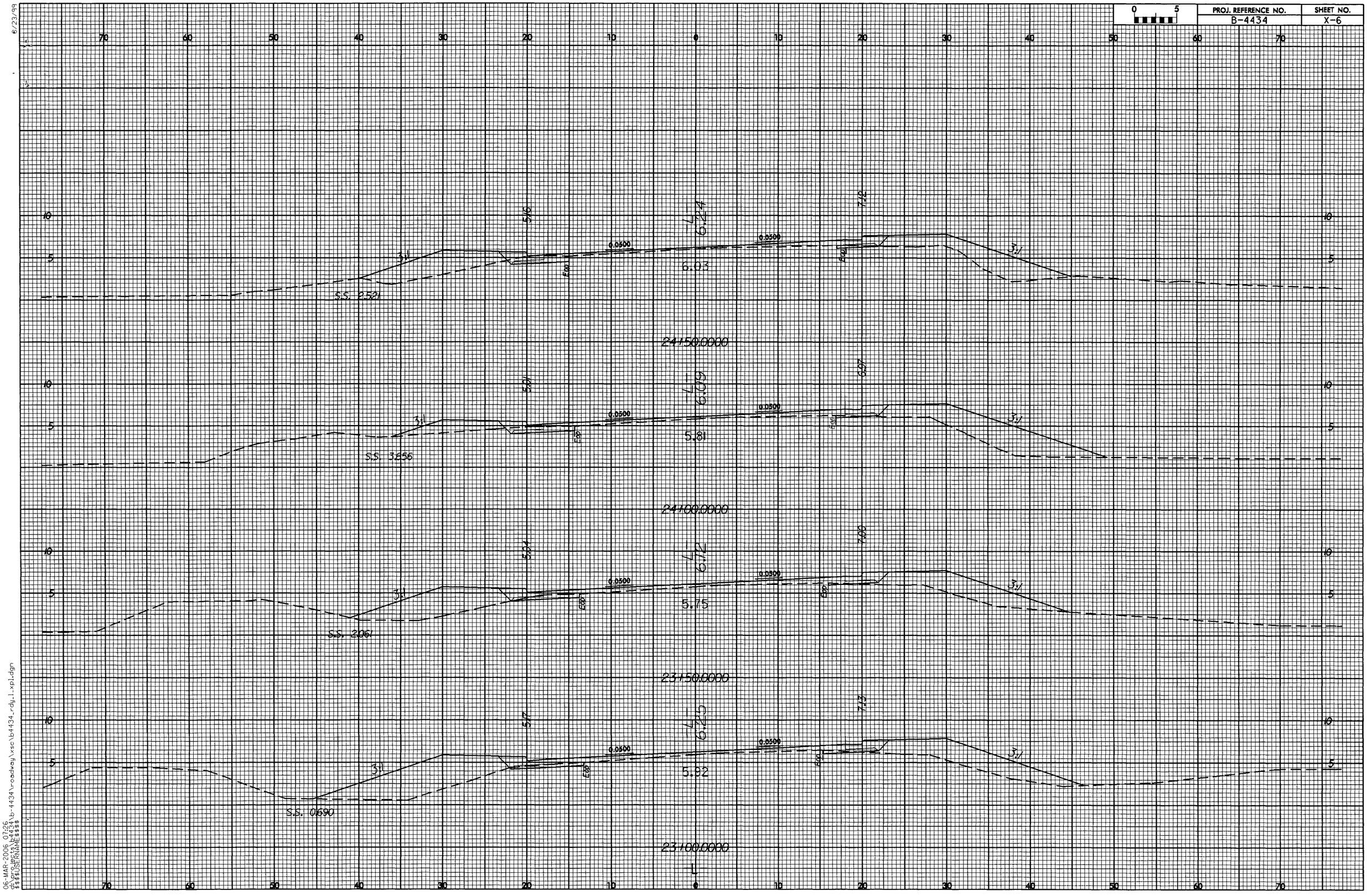
PROJ. REFERENCE NO.	SHEET NO.
B-4434	X-6



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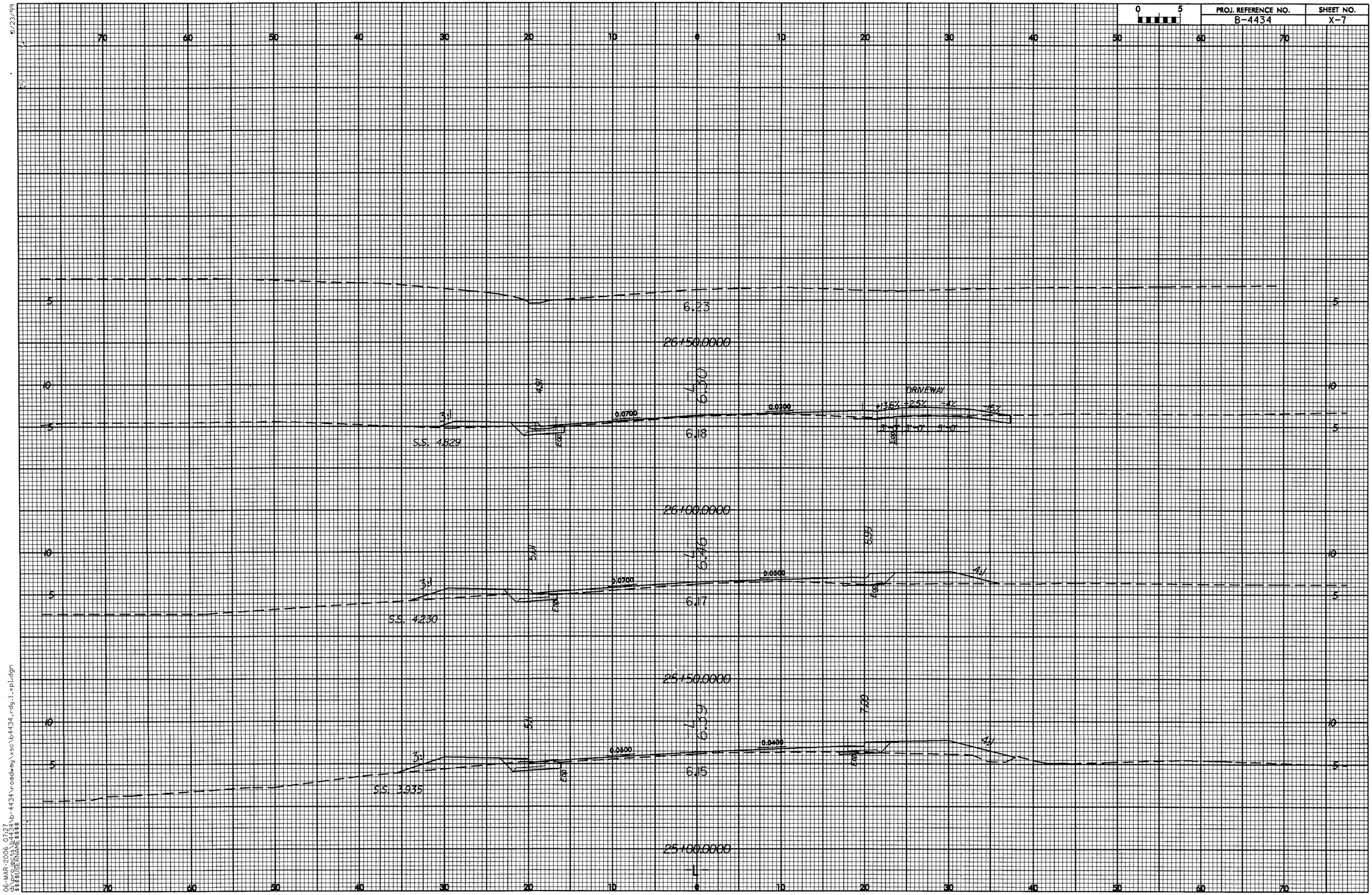
PROJ. REFERENCE NO.	SHEET NO.
B-4434	X-7



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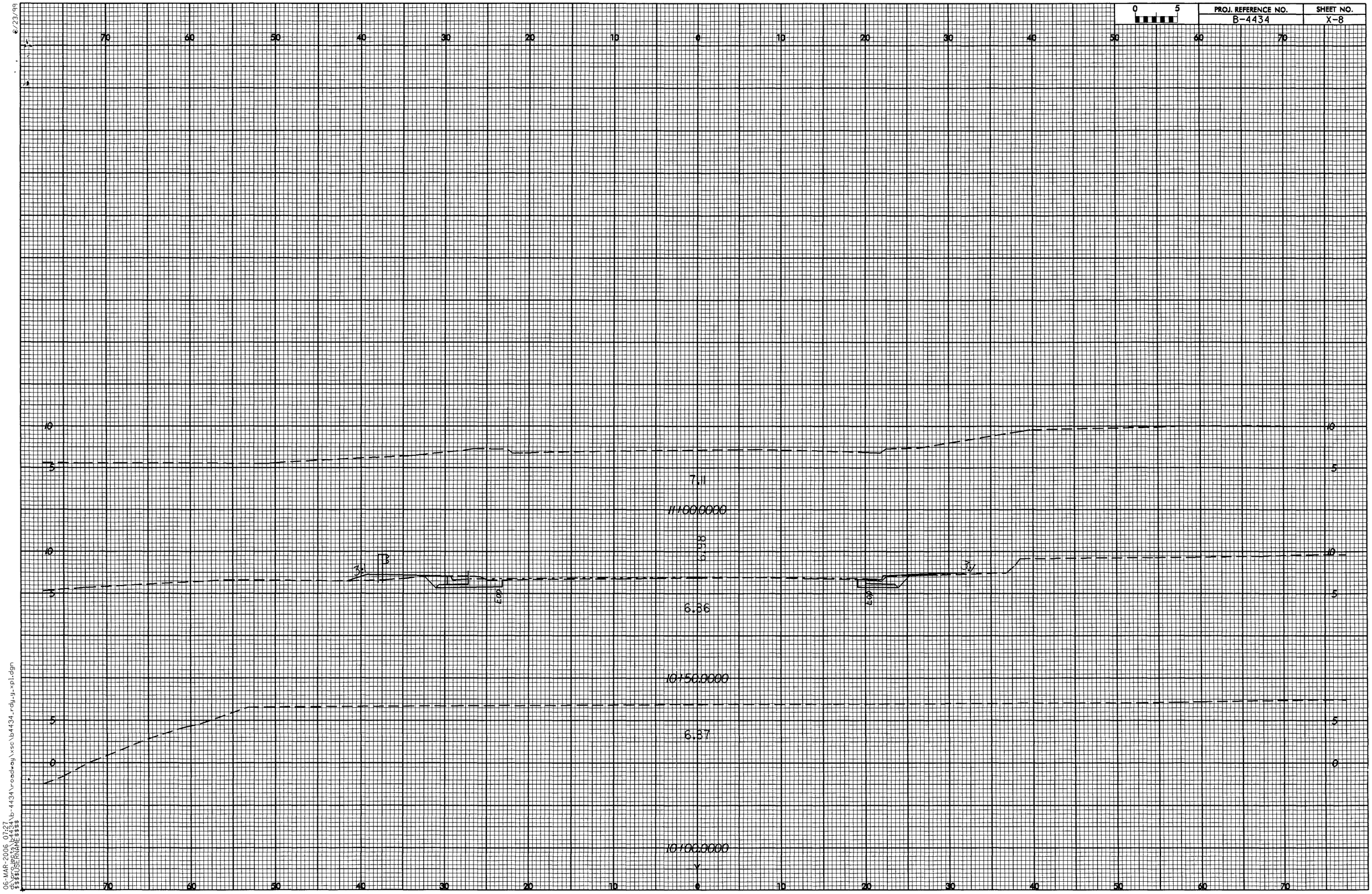

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