STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

April 11, 2008

U.S. Army Corps of Engineers
Raleigh Regulatory Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, North Carolina 27587

ATTENTION: Mr. Andrew Williams
NCDOT Coordinator, Division 7

Dear Sir:

SUBJECT: **Notice of Intent to Use Section 404 Nationwide Permit 13** for the replacement of Bridge No. 108 over New Hope Creek on SR 1730 (Turkey Farm Road), Orange County, Division 7. Federal Aid Project No. BRZ-1730 (5), State Project No. 8.2502301, WBS Element 33563.1.1, T.I.P. No. B-4218.

REFERENCE: Memorandum from the North Carolina Department of Transportation rescinding Section 404 Nationwide Permits 23 and 33, dated April 11, 2008.

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 108 over New Hope Creek on SR 1730 (Turkey Farm Road) in Orange County. The project proposes to demolish the existing bridge and construct a three span, pre-stressed concrete cored slab superstructure on concrete caps atop drilled piers. The new bridge will be 120 feet long with spans, from south to north, of 30 feet, 50 feet, and 40 feet. Additionally, the new bridge will span New Hope Creek. The structure will have a clear roadway width of 27 feet, 6 inches, with two 10-foot lanes and 3-foot, 9-inch offsets. The bridge approaches will have two 10-foot lanes, with 6-foot grass shoulders. The shoulders of the approaches will be widened to 9 feet where guardrail is present. During construction, Turkey Farm Road will be closed near the existing bridge and traffic will be re-routed using an offsite detour.

Nationwide Permit (NWP) Numbers 23 and 33 were issued for this project by the U.S. Army Corps of Engineers (USACE) on December 6, 2007 (Action ID No. SAW-2007-03852). However, these permits are no longer required because the bridge design has been modified and the impacts permitted under them have been eliminated. Therefore, in a memorandum to USACE dated April 11, 2008, NCDOT rescinded its permits. Please see the enclosed copies of the permit drawings, design plans, an email from the North Carolina Wildlife Resources Commission (NCWRC) regarding a sunfish moratorium, and the U.S. Fish and Wildlife Service (USFWS) concurrence letter, dated February 25, 2005, for the above-referenced project. The Programmatic Categorical Exclusion (PCE) was completed for this project in January 2006 and distributed shortly thereafter. Additional copies of this document are available upon request.

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

TELEPHONE: 919-715-1334
FAX: 919-715-5501
WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD., SUITE 240
RALEIGH, NC 27604

IMPACTS TO WATERS OF THE UNITED STATES

General Description

The project is located in the Cape Fear River Basin (sub-basin 03-06-05). This area is part of Hydrologic Cataloging Unit 03030002. New Hope Creek is the only water resource being impacted by this project. A Jurisdictional Determination was issued for this project on December 6, 2007.

New Hope Creek is a perennial stream that flows northwest to southeast underneath the existing bridge. The portion of New Hope Creek that flows through the construction limits is assigned Stream Index Number 16-41-1-(0.5) (12/01/1983) by the N.C. Division of Water Quality (NCDWQ) and has a best usage classification of **C NSW**. The creek has a top of bank width of 50 to 75 feet, an average wetted width of 50 feet, and 3- to 10-foot tall stable stream banks. During field investigations associated with the Natural Resources Technical Report (NRTR; February 2003), 1 to 3 feet of slow to fast flowing water was observed (conditions varied because a long reach of the channel was investigated). The water clarity was described as being clear with moderate sediment deposition and the substrate was primarily composed of bedrock, cobble, gravel, and sand.

Neither High Quality Waters (HQW), Water Supplies (WS I or WS II), nor Outstanding Resource Waters (ORW) occur within 1.0 mile of the project. Additionally, no portion of New Hope Creek, its tributaries, or other surface waters within 1.0 mile of the project are listed on the NCDWQ 2006 Final 303(d) List of Impaired Waters.

The NCWRC previously determined that a significant fishery for sunfish existed in New Hope Creek at this site and requested an in-water work moratorium from April 1st to June 30th. However, according to email correspondence with Travis Wilson, the NCWRC agreed to remove this moratorium in November 2007.

Permanent Impacts

There will be a total of 60 linear feet of permanent stream impacts to New Hope Creek associated with this project (Site 1). These impacts will result from the placement of Class II rip rap atop filter fabric on the inside of each interior bent. This rip rap will act as bank stabilization and will protect against scour and slope failure.

Temporary Impacts

There are no temporary stream impacts to New Hope Creek associated with this project.

Bridge Demolition

The superstructure of Bridge No. 108 consists of three spans, one at 17 feet, 9 inches, one at 40 feet, and one at 17 feet, 11 inches. The superstructure is comprised of an asphalt wearing surface on a timber deck atop steel I-beams. The existing substructure consists of timber caps on timber piles. The timber piles of the interior bents sit atop concrete footers and are surrounded by concrete encasements. The piles will be removed to the top of the concrete encasements.

NCDOT shall adhere to NCDOT's Best Management Practices (BMPs) for Bridge Demolition and Removal. No appreciable fill will fall into New Hope Creek as a result of bridge demolition.

Utility Impacts

No impacts to jurisdictional waters will occur as a result of utility work associated with this project. The only utility work being performed within the construction limits is associated with the relocation of a power pole line. The existing overhead line is located on the south side of Turkey Farm Road from Station 13+25 ± to Station 14+36 ±. The line will be relocated within the existing right-of way (ROW) on the same side of the road and will not impact New Hope Creek.

AVOIDANCE, MINIMIZATION, AND COMPENSATORY MITIGATION

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

According to the Clean Water Act (CWA) §404(b) (1) guidelines, NCDOT must avoid, minimize, and mitigate, in sequential order, impacts to waters of the US. The following is a list of the project's jurisdictional stream avoidance/minimization activities proposed or completed by NCDOT:

Avoidance/Minimization

- The bridge design was changed from a two span, pre-stressed concrete box beam bridge with a bent in the creek to a three span, pre-stressed concrete cored slab bridge. The new structure design will now span New Hope Creek and no bents will be placed into the water.
- In-stream activity will be limited to the use of Class II rip rap for bank stabilization along 60 linear feet of New Hope Creek. The impacts will not incur a loss of aquatic use to this part of the stream.
- During construction, traffic will be re-routed using an off-site detour.
- Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of stringent erosion control methods and use of NCDOT's BMPs for Protection of Surface Waters.
- Due to the presence of a unique freshwater mussel assemblage, including several Federal Species of Concern (FSC), Design Standards in Sensitive Watersheds will be employed.
- NCDOT will implement its BMP's for Bridge Demolition and Removal during this project.

Compensatory Mitigation

NCDOT does not propose mitigation for the 60 linear feet of permanent stream impacts to New Hope Creek resulting from stream bank stabilization (Site 1). These impacts are below the threshold (stated in the NWP Number 13 general conditions) for requiring compensatory mitigation for this type of action. Additionally, the impacts will not incur a loss of aquatic use to this part of the stream.

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications 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. As of its most recent update on January 31, 2008, the USFWS website lists four federally-protected species for Orange County. These species and their associated biological conclusions are listed below in Table 1. Concurrence from the USFWS for biological conclusions assigned to these species was received on February 25, 2005.

Table 1. Federally protected species in Orange County

Common Name	Scientific Name	Federal Status	Biological Conclusion	Habitat Present
red-cockaded woodpecker*	*Picoides borealis*	E	No Effect	No
dwarf wedgemussel	*Alasmidonta heteredon*	E	May Affect, Not Likely to Adversely Affect	Yes
Michaux's sumac*	*Rhus michauxii*	E	No Effect	Yes
smooth coneflower*	*Echinacea laevigata*	E	No Effect	Yes

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

The bald eagle was previously listed by the USFWS as a federally protected species for Orange County. Due to this listing, a survey for suitable nesting and foraging habitat was conducted on March 16, 2007 by NCDOT biologists Jim Mason, Ashley Cox, and James Pflaum. No bald eagle individuals or nests were observed during the survey and no suitable nesting or foraging habitat was identified within either the project study area or 1.0 mile of the study area. A search of the North Carolina Natural Heritage Program (NCNHP) database (GIS shapefiles most recently updated on February 13, 2008) was also performed on April 1, 2008 and revealed no known occurrences of this species within 1.0 mile of the project. Based on this information, it was determined that this project will not affect the bald eagle.

According to a 2007 Federal Register release. the bald eagle was officially de-listed in the Lower 48 States and removed from the List of Endangered and Threatened Wildlife effective August 8, 2007 (72 FR 37346-37372; July 9, 2007). This species still receives protection under the Bald and Golden Eagle Protection Act.

A species survey and habitat assessment for the red-cockaded woodpecker was performed for the PCE in January 2003. No individuals or cavity trees were observed within the project area or on adjacent properties. Additionally, no suitable foraging or nesting habitat exists within the project study area. There were no large tracts of mature pines present and the tall/dense understory in the hardwood/pine forest was not usable foraging habitat for this species. Furthermore, a search of the NCNHP database on April 1, 2008 revealed no known occurrences of this species within 1.0 mile of the project. Since no habitat is present, no individuals were observed, the species records in the county are historic, and no known populations are present within 1.0 mile of the project, a biological conclusion of "No Effect" has been assigned to this species.

New Hope Creek was surveyed for dwarf wedgemussel habitat and individuals by the Catena Group on April 24, 2004, September 14, 2004, and November 3, 2004. Multiple surveys were conducted because the diversity and abundance of mussel species observed required more in-depth and lengthy surveys. Visual and tactile methods were used and a total of 13.25 man-hours were spent within the survey reach. At least nine species of freshwater mussels were found in New Hope Creek, including several FSCs. These included the brook floater (*Alasmidonta varicosa*), Carolina creekshell (*Villosa vaughaniana*), and Atlantic pigtoe (*Fusconaia masoni*). No dwarf wedgemussel individuals were found. New Hope Creek could provide potential habitat for the dwarf wedgemussel; however, due to the limited and questionable records of this species from the Cape Fear River Basin, it is unlikely that the dwarf wedgemussel occurs in the surveyed reach of this creek. Additionally, a search of the NCNHP database on April 1, 2008 revealed no known occurrences of this species within 1.0 mile of the project. Based on this information, a biological conclusion of "May Affect, Not Likely to Adversely Affect" was assigned to this species.

A survey for Michaux's sumac was initially performed by NCDOT biologists Brett Feulner and Heather Montague on July 9, 2003. Suitable habitat for the species existed within the project study area, but individuals were not observed. Only winged sumac (*Rhus copallinum*) was identified. A re-survey was performed by NCDOT biologists James Mason and Ashley Cox on September 17, 2007. Again, potential habitat was observed, but no individuals were identified. A search of the NCNHP database on April 1, 2008 revealed no known occurrences of this species within 1.0 mile of the project. Since no individuals were observed, the species records in the county are historic, and no known populations are present within 1.0 mile of the project, a biological conclusion of "No Effect" has been assigned to this species.

A survey for smooth coneflower was initially performed by NCDOT biologists Brett Feulner and Heather Montague on July 9, 2003. Suitable habitat for the species existed within the project study area, but individuals were not observed. A re-survey was performed by NCDOT biologists James Mason and Ashley Cox on September 17, 2007. Observations made during this survey were similar to those made during the 2003 survey. A search of the NCNHP database on April 1, 2008 revealed no known populations of this species within 1.0 mile of the project. Since no individuals were observed, the species records in the county are historic, and no known populations are present within 1.0 mile of the project, a biological conclusion of "No Effect" has been assigned to this species.

SCHEDULE

The project calls for a review date of May 27, 2008, a letting of July 15, 2008, and a date of availability of August 26, 2008. It is expected that the contractor will choose to start construction in August/September 2008.

REGULATORY APPROVALS

Section 404 Permit: This document hereby serves as a notice of intent to use Section 404 NWP 13 for bank stabilization. Since the activities associated with this project meet all conditions related to this permit, we are not requesting written authorization.

Section 401 Permit: We anticipate that Section 401 General Water Quality Certification (WQC) 3689 will apply to this project. The NCDOT will adhere to all general conditions of this WQC. Therefore, written concurrence from the NCDWQ is not required. In accordance with 15A NCAC 2H, Section .0500 (a) and 15A NCAC 2B, Section .0200, we are providing two copies of this application to the North Carolina Department of Environment and Natural Resources (NCDENR), NCDWQ, as notification.

A copy of this notice will be posted on the NCDOT website at: http://www.ncdot.org/doh/preconstruct/pe/. If you have any questions or need additional information please contact Mr. Jim Mason at either (919) 715-5531 or jsmason@dot.state.nc.us.

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. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Mark Staley, Roadside Environmental
Mr. J. M. Mills, P.E., Division 7 Engineer
Mr. Jerry Parker, Division 7 Environmental Officer
Mr. Jay Bennett. P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan. P.E., Highway Design
Mr. Tracy Walter, PDEA Project Planning Engineer
Mr. Scott McLendon, USACE, Wilmington

Subject: [Fwd: sunfish moratoriums]
From: Rachelle Beauregard <rbeauregard@dot.state.nc.us>
Date: Tue, 29 Jan 2008 09:20:26 -0500
To: Ashley Cox <acox@dot.state.nc.us> , "James S. Mason" <jsmason@dot.state.nc.us> , Sara Easterly <seeasterly@dot.state.nc.us>
CC: Elizabeth Lee Lusk <ellusk@dot.state.nc.us>

Please update warehouse based on this WRC email.

E,
I updated the let list moratorium spreadsheet with this info.

Subject: RE: sunfish moratoriums
From: "Travis Wilson" <travis.wilson@ncwildlife.org>
Date: Mon, 28 Jan 2008 15:18:54 -0500
To: "'Rachelle Beauregard'" <rbeauregard@dot.state.nc.us>

B-4613: Commitments associated with reducing impacts to the Cape Fear Shiner will suffice in lieu of the previous requested moratorium

⇒ B-4218: WRC agreed to remove this moratorium in November 2007

B-4525: WRC no longer request the in-water work moratorium of April 1 to June 30 as stated in our memo dated March 1, 2004.

B-4592: The SR/FSC Roanoke bass is located at this project site. We request NCDOT utilize Erosion and Sediment Control BMP as well as BMP for Bridge Demolition and Removal.

B-4216: The SR/FSC Roanoke bas is location immediately downstream of the project site. We request NCDOT utilize Erosion and Sediment Control BMP as well as BMP for Bridge Demolition and Removal.

Travis W. Wilson
Eastern Region Highway Project Coordinator
Habitat Conservation Program
NC Wildlife Resources Commission
1142 I-85 Service Rd.
Creedmoor, NC 27522
Phone: 919-528-9886
Fax: 919-528-9839
Travis.Wilson@ncwildlife.org

-----Original Message-----
From: Rachelle Beauregard [mailto:rbeauregard@dot.state.nc.us]
Sent: Friday, December 14, 2007 3:07 PM
To: David.cox@ncwildlife.org
Cc: Travis Wilson; Rachelle Beauregard
Subject: sunfish moratoriums

David,

The WRC has requested sunfish moratoriums from 4/1 to 6/30 for the following projects in the central region:

B-4613 Randolph Co

B-4592, B-4216, B-4218 Orange Co
B-4525 Granville Co.

According to the November 30, 2007 meeting with NCDOT, WRC would no longer be requesting sunfish moratoriums. Please let me know if these previous requests are still valid.

Rachelle Beauregard

RE: sunfish moratoriums.eml

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B. Teulner

RECEIVED

FEB 28 2005

DIVISION OF HIGHWAYS
PDEA-OFFICE OF NATURAL ENVIRONMENT

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

February 25, 2005

Phil Harris
North Carolina Department of Transportation
Project Development and Environmental Analysis
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Mr. Harris:

This letter is in response to your letter of February 11, 2005 which provided the U.S. Fish and Wildlife Service (Service) with the biological determination of the North Carolina Department of Transportation (NCDOT) that the replacement of Bridge No. 108 on SR 1730 over New Hope Creek in Orange County (TIP No. B-4218) may affect, but is not likely to adversely affect the federally endangered dwarf wedgemussel. In addition, NCDOT had determined that the project will have no effect on the federally listed Michaux's sumac (*Rhus michauxii*), small whorled pogonia (*Isotria medeoloides*), smooth coneflower (*Echinacea laevigata*) and red-cockaded woodpecker (*Picoides borealis*). These comments are provided in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

According to information provided, mussel surveys were conducted at the project site on April 24, September 14 and November 3 of 2004. The surveys extended 100 meters upstream and 400 meters downstream of SR 1730. The dwarf wedgemussel was not observed. New Hope Creek is in the Cape Fear River Basin. Though there is one old and questionable record of the species in the Cape Fear River Basin, the record was never verified and no voucher specimen exists for the record. Current information suggests that the dwarf wedgemussel does not currently occur in the Cape Fear River Basin.

Though no federally protected mussel species were observed during the surveys, the surveys revealed a rich assemblage of mussel fauna at and near the site. Two federal species of concern, brook floater (*Alasmidonta varicosa*) and Carolina creekshell (*Villosa vaughaniana*), and an undescribed *Lampsilis* species were observed. The Service encourages NCDOT to make every effort to protect this diverse mussel bed. Typical conservation measures used for federally protected species would serve to help conserve this important resource.

The Service does not have any documentation for the 2004 surveys that NCDOT conducted for Michaux's sumac, small whorled pogonia, smooth coneflower and red-cockaded woodpecker. However, we have no reason to dispute your "no effect" determination for these species. Please note that small whorled pogonia is no longer listed for Orange County.

Based on the information provided and other information available, the Service concurs with your determination that the proposed bridge replacement may affect, but is not likely to adversely affect the dwarf wedgemussel. We believe that the requirements of section 7(a)(2) of the ESA have been satisfied. We remind you that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

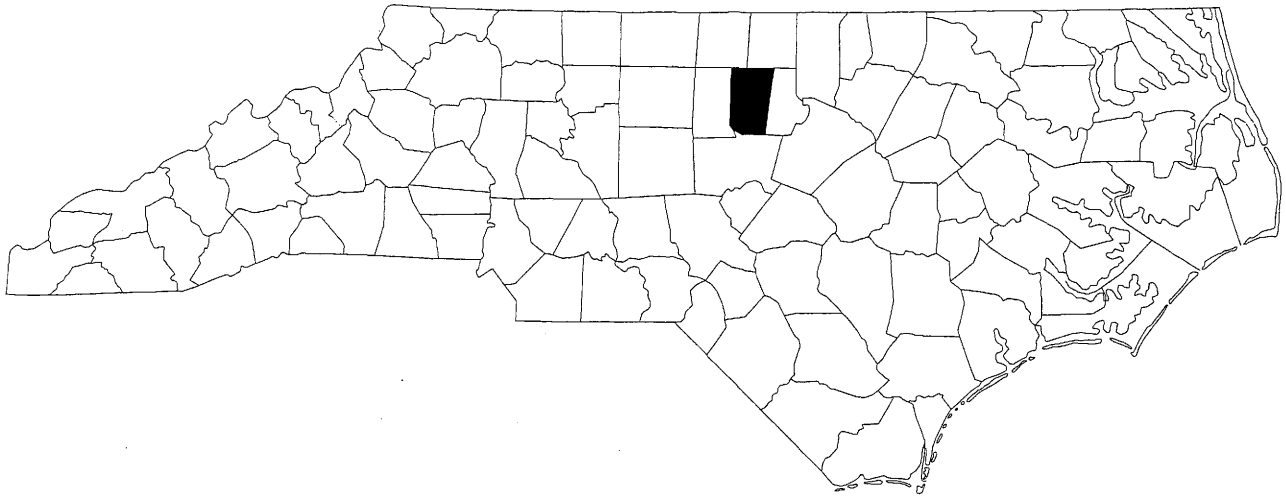
The Service appreciates the opportunity to review this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

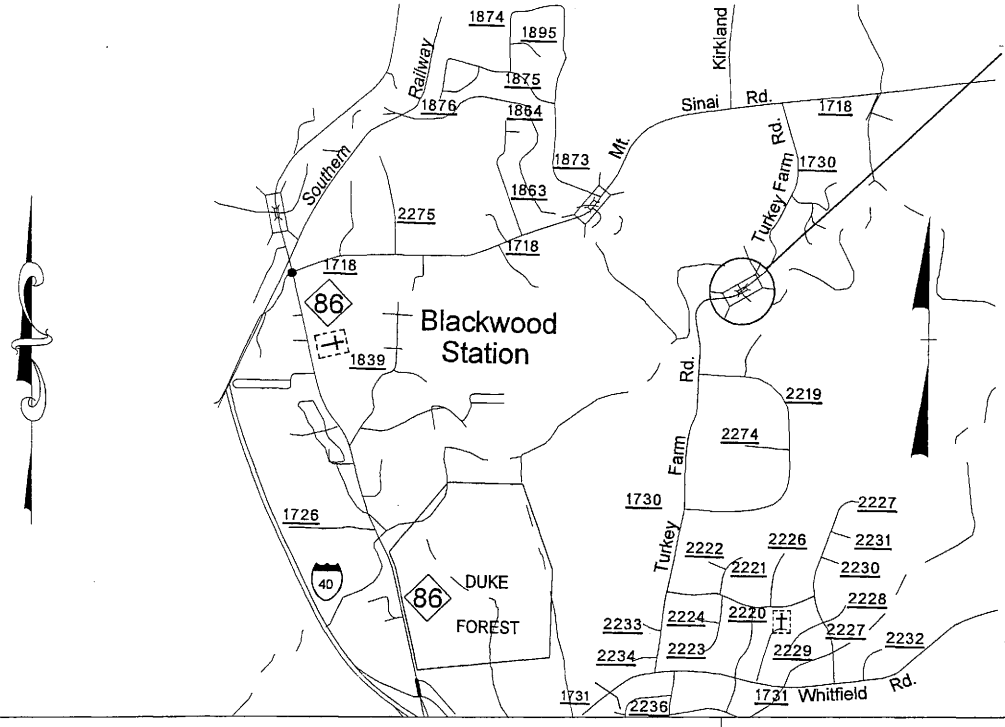
Sincerely,

John Hammond
Acting Ecological Services Supervisor

cc: John Thomas, USACE, Raleigh, NC
Beth Barnes, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC

NORTH CAROLINA



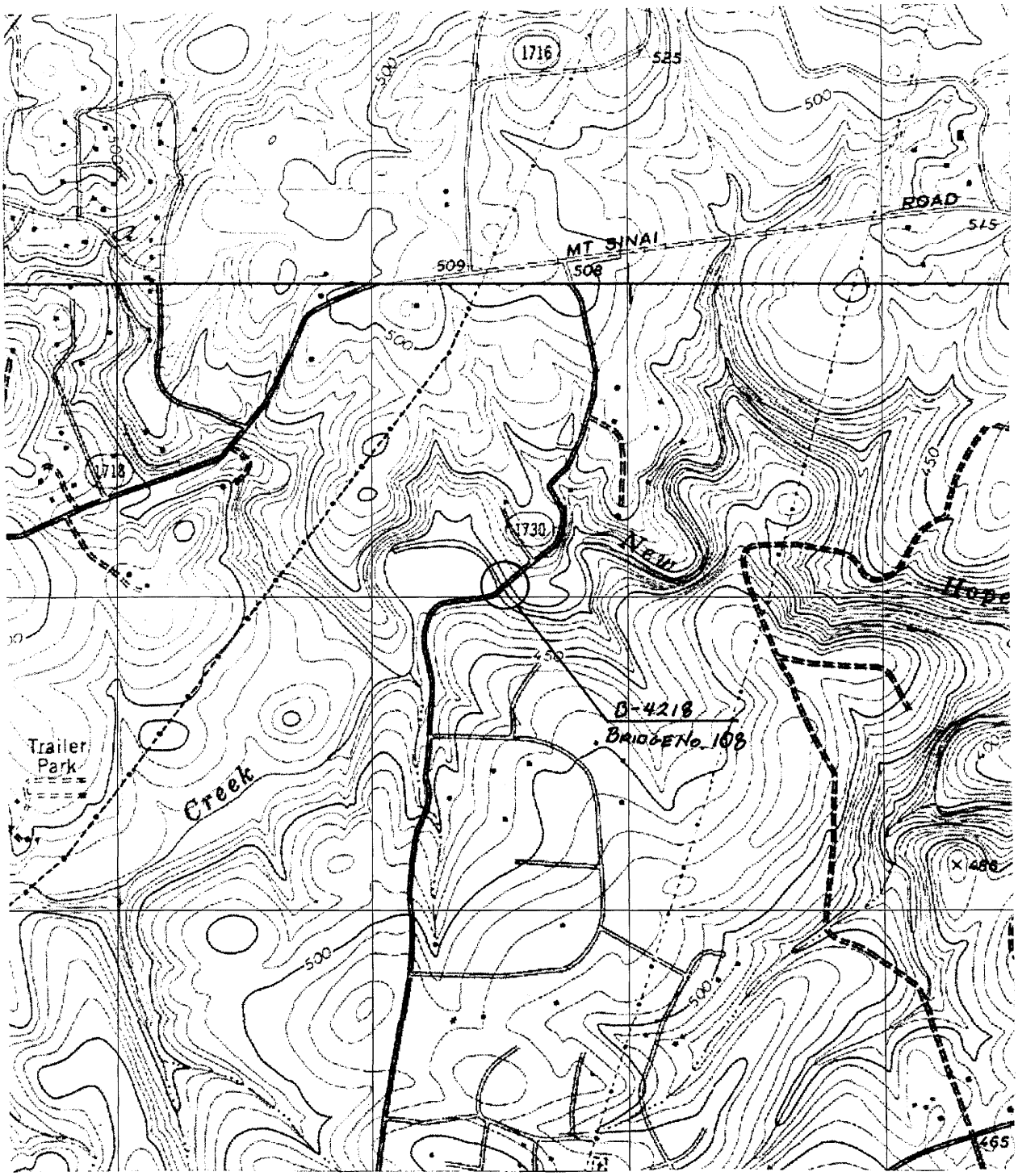


VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
ORANGE COUNTY
PROJECT: B-4218
BRIDGE NO. 108 OVER
NEW HOPE CREEK
ON SR 1730
(TURKEY FARM ROAD)

SHEET 1 OF 7 7/26/2007



TOPO MAP

SCALE: 1" : 1500'

NCDOT

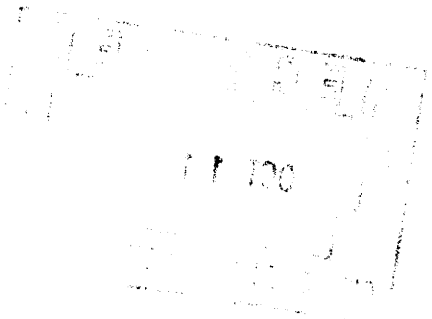
DIVISION OF HIGHWAYS
ORANGE COUNTY
PROJECT: B-4218
BRIDGE NO. 108 OVER
NEW HOPE CREEK
ON SR 1730
(TURKEY FARM ROAD)

SHEET 2 OF 7 7 / 26 / 2007

PROPERTY OWNERS

NAMES AND ADDRESSES

	NAMES	ADDRESSES
1	Triangle Land Conservancy	1100-A Wake Forest Road Raleigh, NC 27604
2	Granger Family Limited Partnership	5906 Turkey Farm Road Chapel Hill, NC 27514
3	Lockridge Community Association	5518 Turkey Farm Road Durham, NC 27705
4	Lockridge Community Association	5518 Turkey Farm Road Durham, NC 27705



NCDOT

DIVISION OF HIGHWAYS
ORANGE COUNTY
PROJECT: B-4218
BRIDGE NO. 108 OVER
NEW HOPE CREEK
ON SR 1730
(TURKEY FARM ROAD)

SHEET 3 OF 7 7/26/2007

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	13+90 -L- +/-	21" PCCS								60		
		Bridge 3 Span										
		1@30', 1@54', 1@40'										
		(Bank stabilization)										
TOTALS:			0.00	0.00	0.00	0.00	0.00	0.00	0.00	60	0	

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
Orange County
Project: B-4218 (Bridge #108)

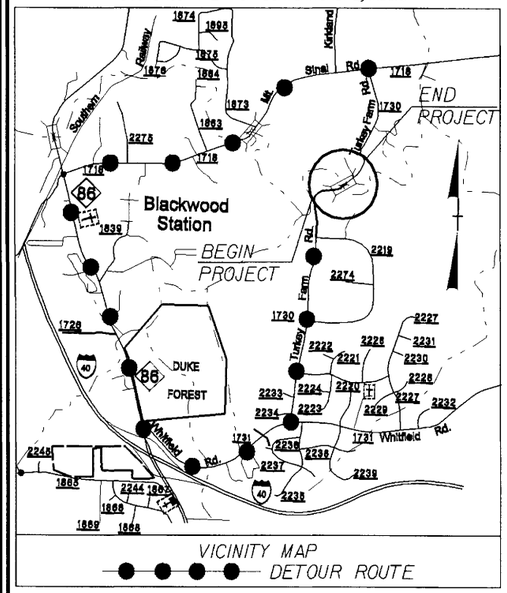
ATN Revised 3/31/05

09/08/08

TIP PROJECT: B-4218

CONTRACT: C201872

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



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ORANGE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4218	1	

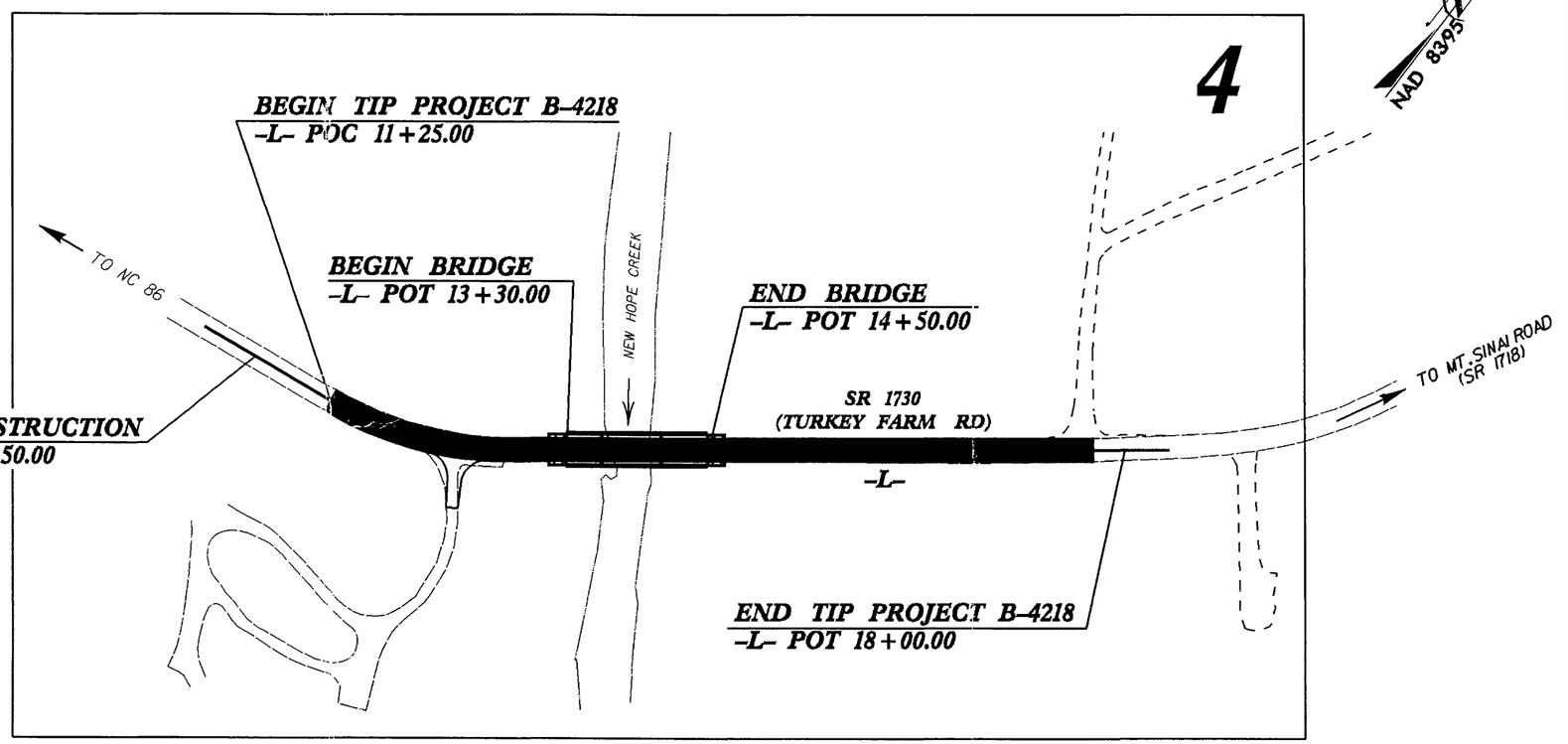
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33563.1.1	BRZ-1730(5)	P.E.
33563.2.1	BRZ-1730(5)	R/W & UTIL.
33563.3.1	BRZ-1730(5)	CONSTRUCTION

LOCATION: BRIDGE NO. 108 OVER NEW HOPE CREEK ON SR 1730 (TURKEY FARM ROAD)

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

100% PLANS
SUBMITTED: 3/13/08

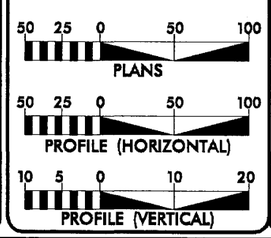
Permit Drawing
Sheet 5 of 7



NOTE:
DESIGN EXCEPTION REQUIRED FOR MINIMUM HORIZONTAL CURVATURE, VERTICAL CURVE K VALUE, MAXIMUM SUPER AND MINIMUM SHOULDER WIDTH.

NCDOT CONTACT: CATHY HOUSER, PE
PROJECT ENGINEER - ROADWAY DESIGN, ENGINEERING COORDINATION
ROBERT J. STROUP, PE
PROJECT DESIGN ENGINEER - ROADWAY DESIGN, ENGINEERING COORDINATION

GRAPHIC SCALES



DESIGN DATA

ADT 2008 = 681
ADT 2028 = 1,291
DHV = 10 %
D = 60 %
T = 4 % *
V = 40 MPH
* TTST 1 DUAL 3
FUNC CLASS = LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4218 = 0.105 mi
LENGTH STRUCTURE TIP PROJECT B-4218 = 0.023 mi
TOTAL LENGTH OF TIP PROJECT B-4218 = 0.128 mi

PLANS PREPARED BY:
CH ENGINEERING
PO Box 3026 RALEIGH, NC 27622 TELE 919.786.0224 FAX 919.786.0232

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JULY 20, 2007

LETTING DATE:
JULY 15, 2008

PLANS PREPARED FOR:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr.
Raleigh, NC 27610

THOMAS R. HEPLER, PE, PLS
PROJECT ENGINEER

RHONDA B. EARLY, 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

18-MAR-2008 16:20
r:\roadway\prj\b4218_rdy_tsh.dgn
vrivers AT HY221475

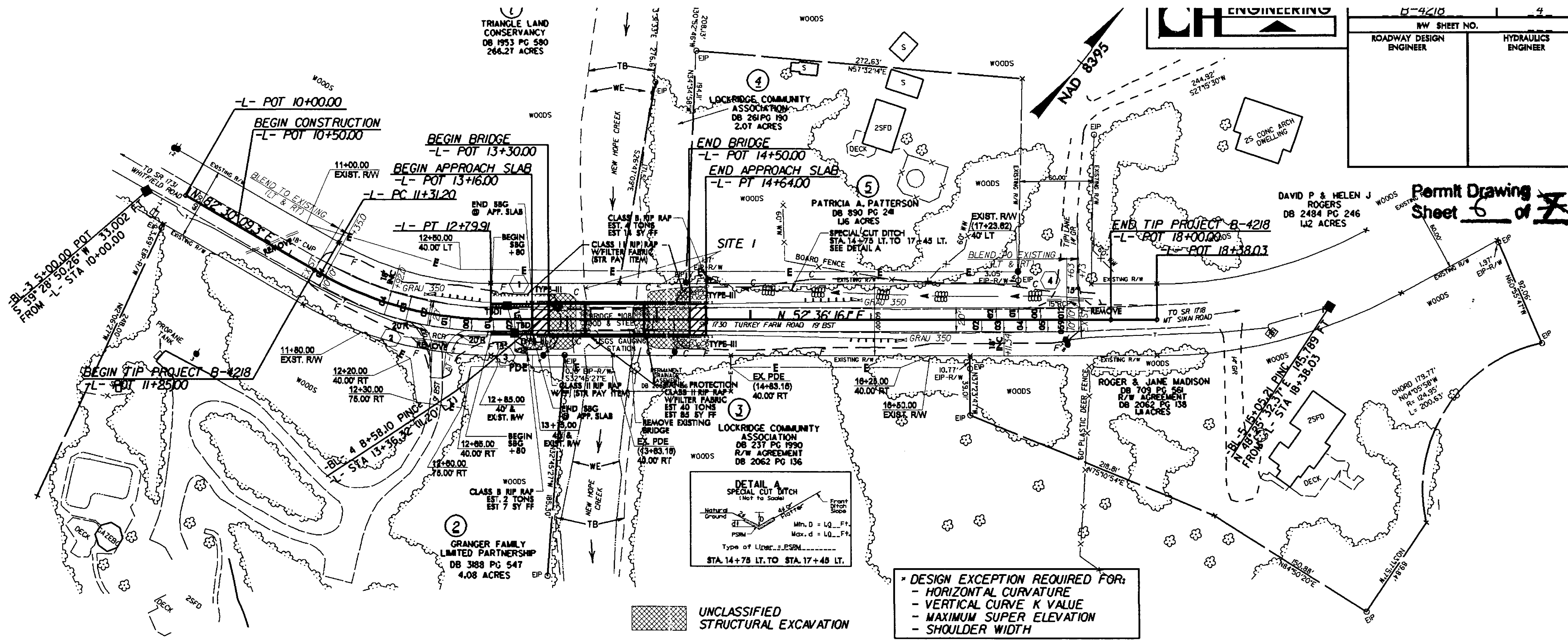
B-4218 | 4

R/W SHEET NO.

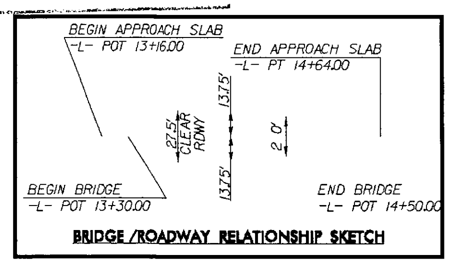
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

Permit Drawing Sheet 6 of 7

-L-
PI Sta 12+07.29
Δ = 29°53′53.1″ (LT)
D = 20°06′13.6″
L = 148.72′
T = 76.09′
* R = 285.00′
* Se = 0.04
Ro = See Planview
DS = 30 mph



* DESIGN EXCEPTION REQUIRED FOR:
- HORIZONTAL CURVATURE
- VERTICAL CURVE K VALUE
- MAXIMUM SUPER ELEVATION
- SHOULDER WIDTH

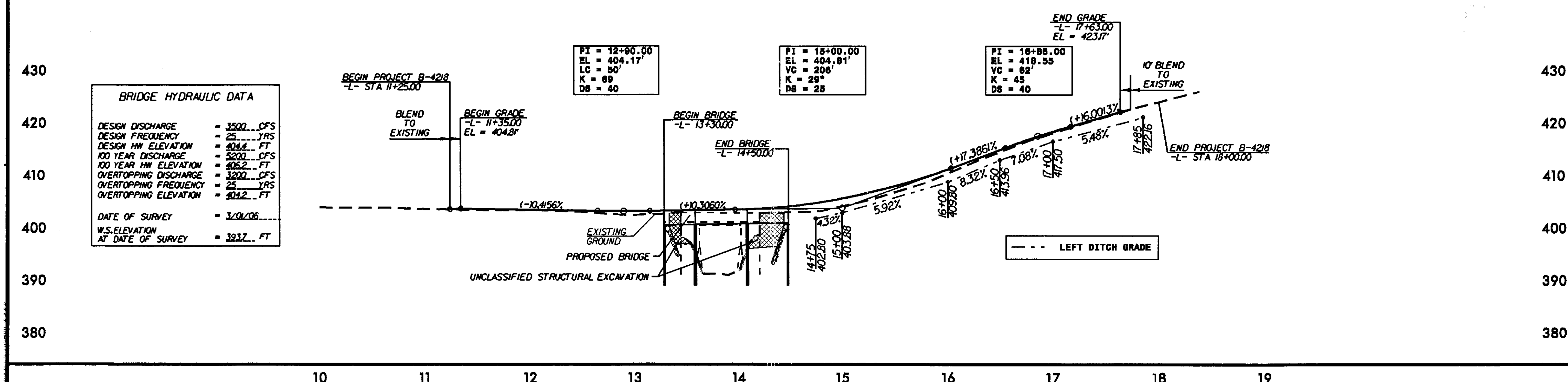


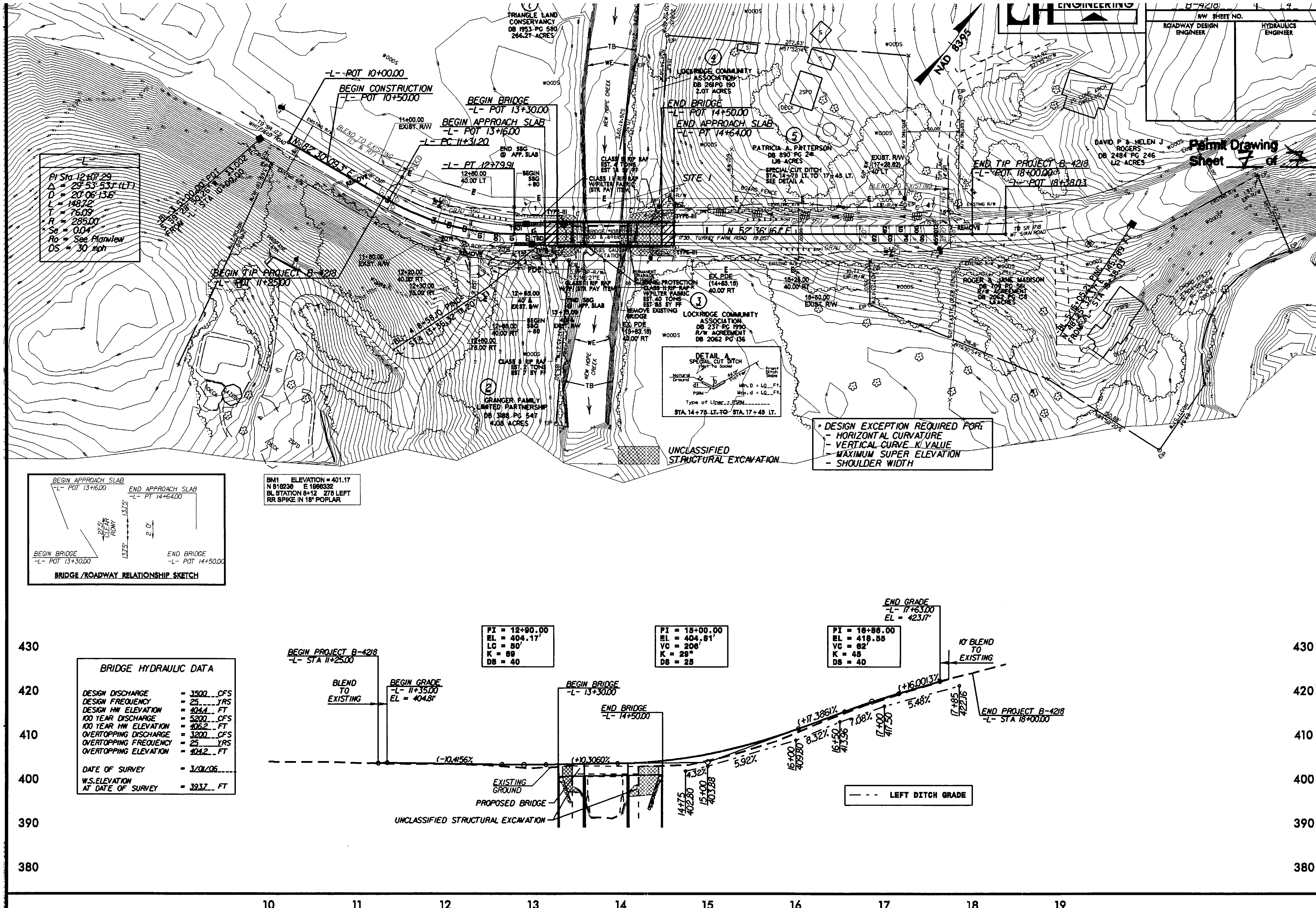
BRIDGE /ROADWAY RELATIONSHIP SKETCH

BM1 ELEVATION = 401.17
N 816236 E 1986332
BL STATION 8+12 275 LEFT
RR SPIKE IN 18" POPLAR

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 3500 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 404.4 FT
100 YEAR DISCHARGE	= 5200 CFS
100 YEAR HW ELEVATION	= 406.2 FT
OVERTOPPING DISCHARGE	= 3200 CFS
OVERTOPPING FREQUENCY	= 25 YRS
OVERTOPPING ELEVATION	= 404.2 FT
DATE OF SURVEY	= 3/01/06
W.S. ELEVATION AT DATE OF SURVEY	= 393.7 FT



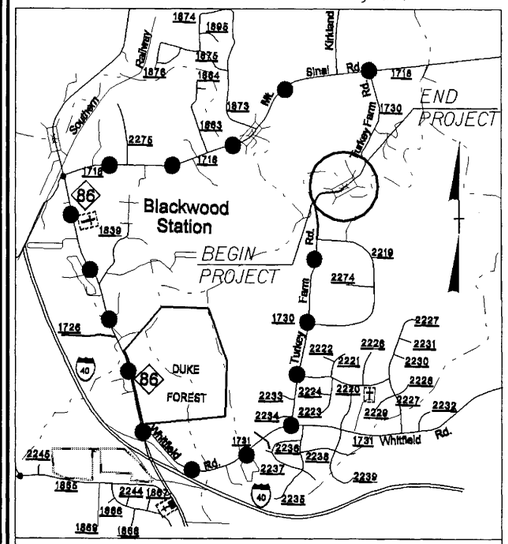

Permit Drawing
Sheet 7 of 7
B-4218
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NAD 83/95
-L- POT 10+00.00
BEGIN CONSTRUCTION -L- POT 10+50.00
BEGIN BRIDGE -L- POT 13+30.00
BEGIN APPROACH SLAB -L- POT 13+16.00
-L- PC 11+31.20
-L- PT 12+79.91
END BRIDGE -L- POT 14+50.00
END APPROACH SLAB -L- PT 14+64.00
END TIP PROJECT B-4218 -L- POT 18+00.00
-L- POT 18+38.03
BEGIN TIP PROJECT B-4218 -L- POT 11+25.00
-L-
PI Sta 12+07.29
Δ = 29° 53' 53.1" (LT)
D = 20° 06' 13.6"
L = 148.72
T = 76.09
R = 285.00
Se = 0.04
Ro = See Planview
DS = 30 mph
TRIANGLE LAND CONSERVANCY DB 1953 PG 580 266.27 ACRES
LOCKRIDGE COMMUNITY ASSOCIATION DB 2611 PG 190 2.07 ACRES
PATRICIA A. PATTERSON DB 890 PG 241 1.16 ACRES
DAVID P & HELEN J ROGERS DB 2484 PG 246 1.12 ACRES
ROGER S. & JANE MADISON
LOCKRIDGE COMMUNITY ASSOCIATION DB 237 PG 1990 R/W AGREEMENT DB 2062 PG 136
GRANGER FAMILY LIMITED PARTNERSHIP DB 3188 PG 547 4.08 ACRES
NEW HOPE CREEK
SITE 1
TURKEY FARM ROAD
DETAIL A SPECIAL CUT DITCH (Not to Scale)
STA. 14+78 LT. TO STA. 17+45 LT.
UNCLASSIFIED STRUCTURAL EXCAVATION
* DESIGN EXCEPTION REQUIRED FOR:
- HORIZONTAL CURVATURE
- VERTICAL CURVE K VALUE
- MAXIMUM SUPER ELEVATION
- SHOULDER WIDTH
BM1 ELEVATION = 401.17
N 816236 E 1986332
BL STATION 8+12 275 LEFT
RR SPIKE IN 18" POPLAR
BEGIN APPROACH SLAB -L- POT 13+16.00
END APPROACH SLAB -L- PT 14+64.00
BEGIN BRIDGE -L- POT 13+30.00
END BRIDGE -L- POT 14+50.00
BRIDGE /ROADWAY RELATIONSHIP SKETCH
BRIDGE HYDRAULIC DATA
DESIGN DISCHARGE = 3500 CFS
DESIGN FREQUENCY = 25 YRS
DESIGN HW ELEVATION = 404.4 FT
100 YEAR DISCHARGE = 5200 CFS
100 YEAR HW ELEVATION = 406.2 FT
OVERTOPPING DISCHARGE = 3200 CFS
OVERTOPPING FREQUENCY = 25 YRS
OVERTOPPING ELEVATION = 404.2 FT
DATE OF SURVEY = 3/01/06
W.S. ELEVATION AT DATE OF SURVEY = 393.7 FT
BEGIN PROJECT B-4218 -L- STA 11+25.00
BLEND TO EXISTING
BEGIN GRADE -L- 11+35.00 EL = 404.81'
PI = 12+90.00 EL = 404.17' LC = 50' K = 69 DS = 40
PI = 15+00.00 EL = 404.61' VC = 206' K = 29* DS = 25
PI = 16+86.00 EL = 418.55 VC = 62' K = 45 DS = 40
END GRADE -L- 17+63.00 EL = 423.17'
10' BLEND TO EXISTING
END PROJECT B-4218 -L- STA 18+00.00
(-10.4156%)
(+10.3060%)
(+17.3861%)
(+16.0013%)
EXISTING GROUND
PROPOSED BRIDGE
UNCLASSIFIED STRUCTURAL EXCAVATION
LEFT DITCH GRADE
430
420
410
400
390
380
10
11
12
13
14
15
16
17
18
19

09/08/99

TIP PROJECT: B-4218

CONTRACT: C201872

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



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ORANGE COUNTY

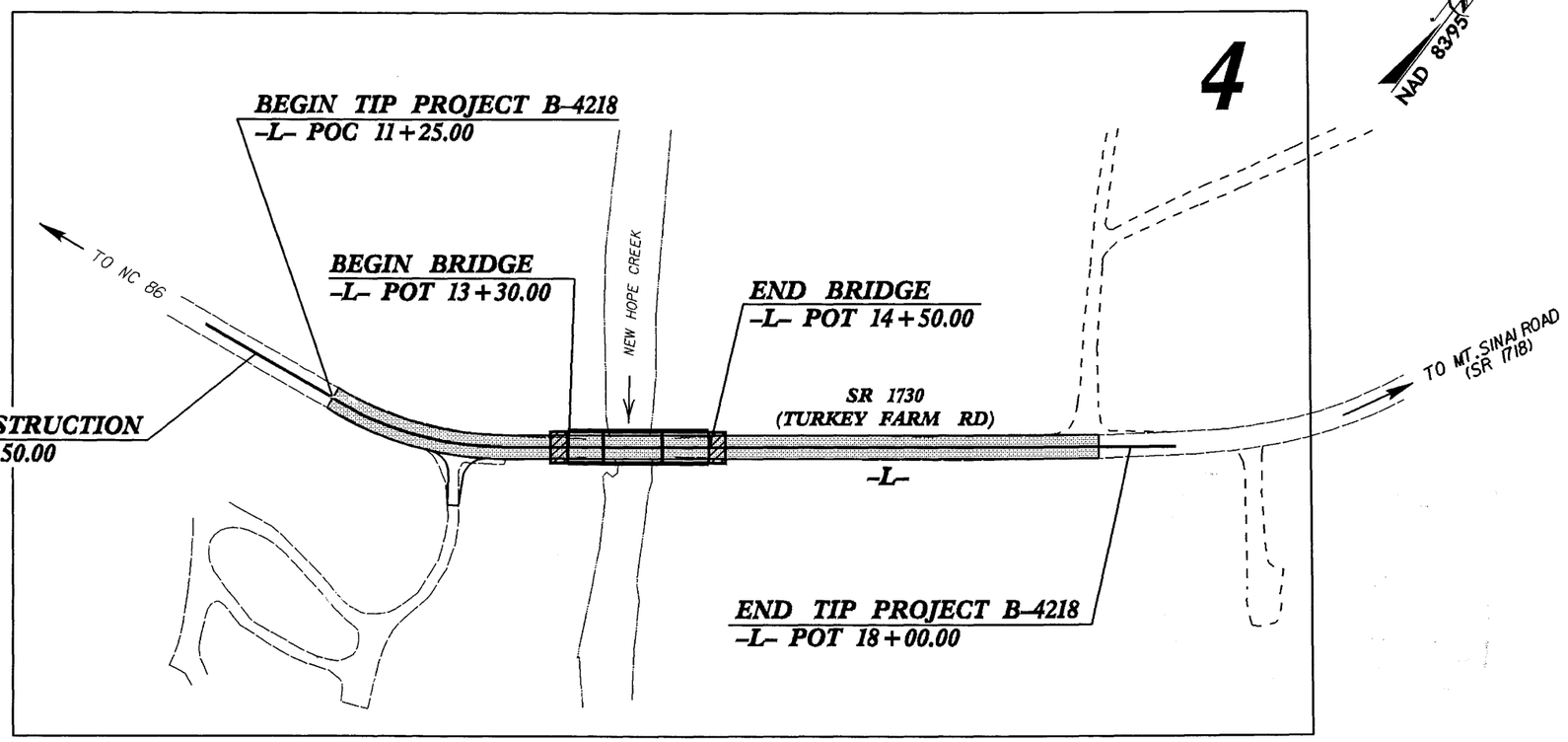
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4218	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33563.1.1	BRZ-1730(5)	P.E.
33563.2.1	BRZ-1730(5)	R/W & UTIL.
33563.3.1	BRZ-1730(5)	CONSTRUCTION

LOCATION: BRIDGE NO. 108 OVER NEW HOPE CREEK ON SR 1730 (TURKEY FARM ROAD)

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

100% PLANS
SUBMITTED: 3/13/08



NOTE:
DESIGN EXCEPTION REQUIRED FOR MINIMUM HORIZONTAL CURVATURE, VERTICAL CURVE K VALUE, MAXIMUM SUPER AND MINIMUM SHOULDER WIDTH.

NCDOT CONTACT: CATHY HOUSER, PE
PROJECT ENGINEER - ROADWAY DESIGN, ENGINEERING COORDINATION
ROBERT J. STROUP, PE
PROJECT DESIGN ENGINEER - ROADWAY DESIGN, ENGINEERING COORDINATION

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 2008	=	681
ADT 2028	=	1,291
DHV	=	10 %
D	=	60 %
T	=	4 % *
V	=	40 MPH
* TTST 1		DUAL 3
FUNC CLASS	=	LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4218	=	0.105 mi
LENGTH STRUCTURE TIP PROJECT B-4218	=	0.023 mi
TOTAL LENGTH OF TIP PROJECT B-4218	=	0.128 mi

PLANS PREPARED BY:

CH ENGINEERING
PO BOX 3026 RALEIGH, NC 27622
TELE 919.786.0224 FAX 919.786.0232

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JULY 20, 2007

LETTING DATE:
JULY 15, 2008

PLANS PREPARED FOR:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr.
Raleigh, NC 27610

THOMAS R. HEPLER, PE, PLS
PROJECT ENGINEER

RHONDA B. EARLY, 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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$$$$USERNAME$$$$

3/15/06

PROJECT REFERENCE NO.	SHEET NO.
B-4218	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 — EP
- 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
- Wetland
- 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
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line
- Proposed Right of Way Line with Iron Pin and Cap Marker
- Proposed Right of Way Line with Concrete or Granite Marker
- Existing Control of Access — CA
- Proposed Control of Access
- 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
- 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:

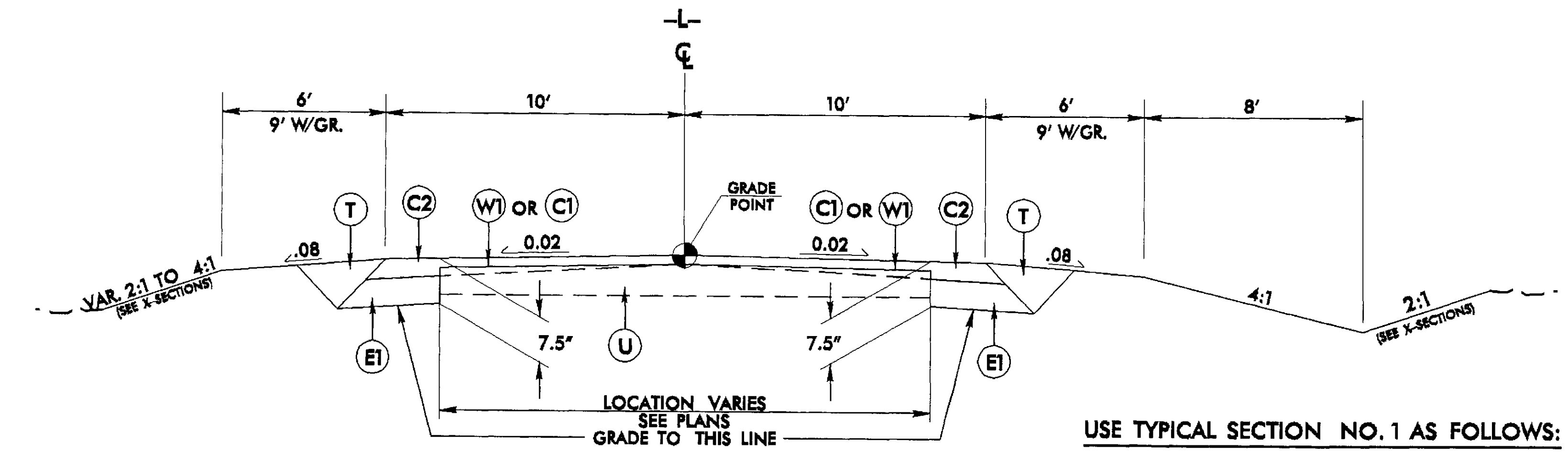
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- A/G Tank; Water, Gas, Oil
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

PROJECT REFERENCE NO.	SHEET NO.
B-4218	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

CH ENGINEERING

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



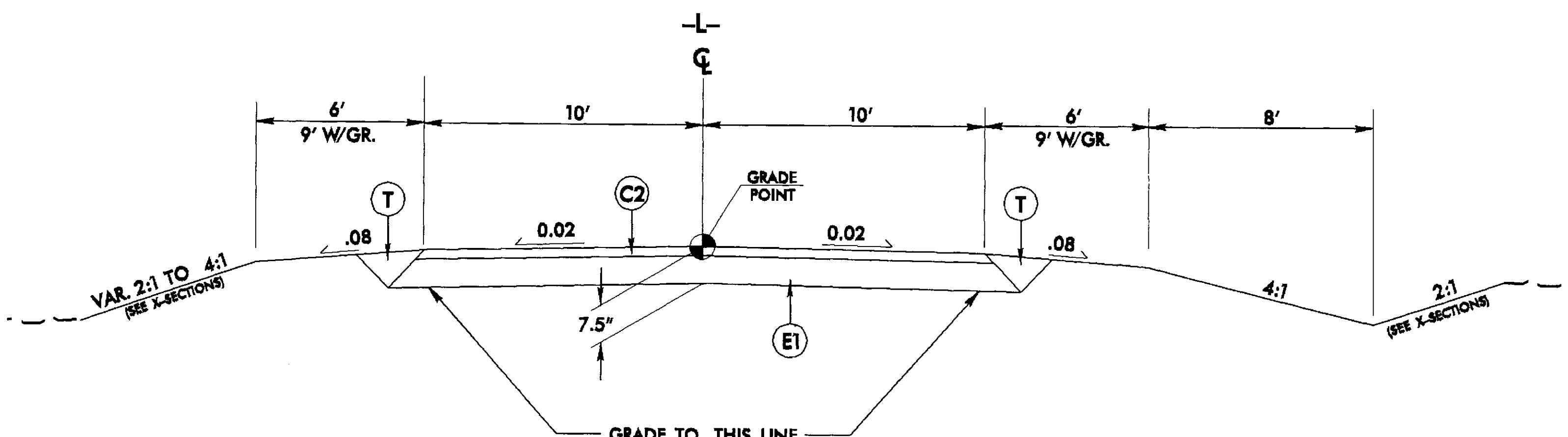
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 AS FOLLOWS:

-L- STA 11+35 TO -L- STA 12+70
-L- STA 15+40 TO -L- STA 17+63
(REFER TO INSET "A" FOR STA 16+00 TO STA 17+50 - LEFT)

TRANSITION FROM EXISTING TO T.S. NO. 1 FROM
-L- STA 11+25 TO -L- STA 11+35

TRANSITION FROM T.S. NO. 1 TO EXISTING FROM
-L- STA 17+63 TO -L- STA 17+73



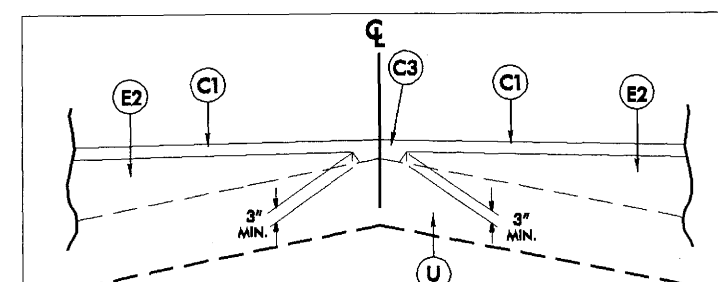
TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2 AS FOLLOWS:

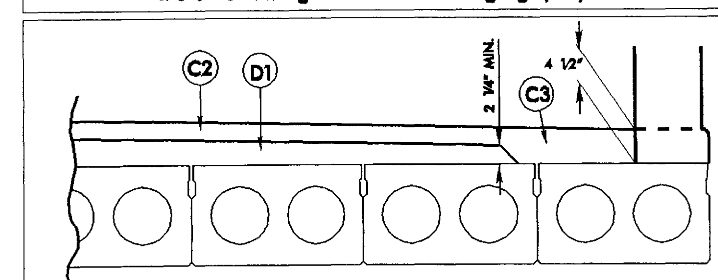
-L- STA 12+70 TO -L- STA 13+30 (BEGIN BRIDGE)
-L- STA 14+50 (END BRIDGE) TO -L- 15+40

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C2	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VARIABLE 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 LESS THAN 1¼" OR GREATER THAN 1½" IN DEPTH.
D1	PROP. VARIABLE 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 2¼" OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 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 GREATER THAN 5.5" IN DEPTH OR LESS THAN 3" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL 1)
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL 2)

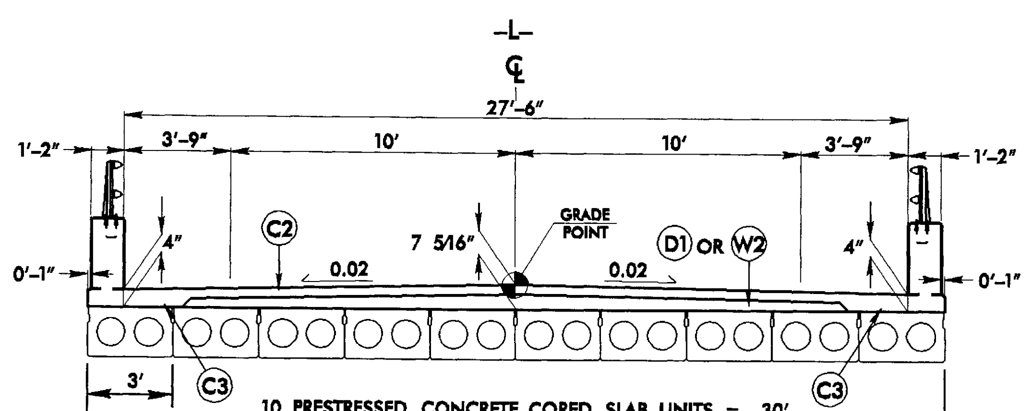
NOTE : PAVEMENT EDGE SLOPE ARE 1:1 UNLESS SHOWN OTHERWISE



Detail Showing Method of Wedging (W1)



Detail Showing Method of Wedging (W2)



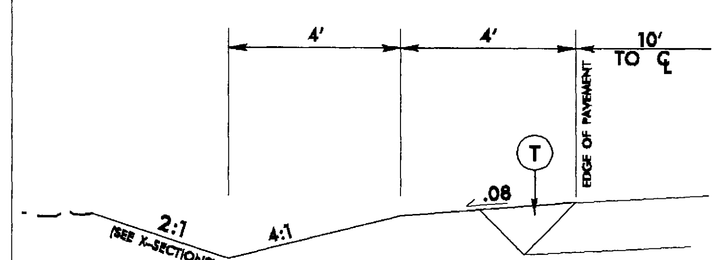
TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3 AS FOLLOWS:

-L- STA 13+30 (BEGIN BRIDGE) TO -L- STA 14+50 (END BRIDGE)

INSET "A"

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION NO. 1
FOR -L- STA 16+00 TO STA 17+50 (LEFT)



NOTE:
DESIGN EXCEPTION REQUIRED FOR MINIMUM HORIZONTAL CURVATURE, VERTICAL CURVE K VALUE, MAXIMUM SUPER AND MINIMUM SHOULDER WIDTH.

6/2/99

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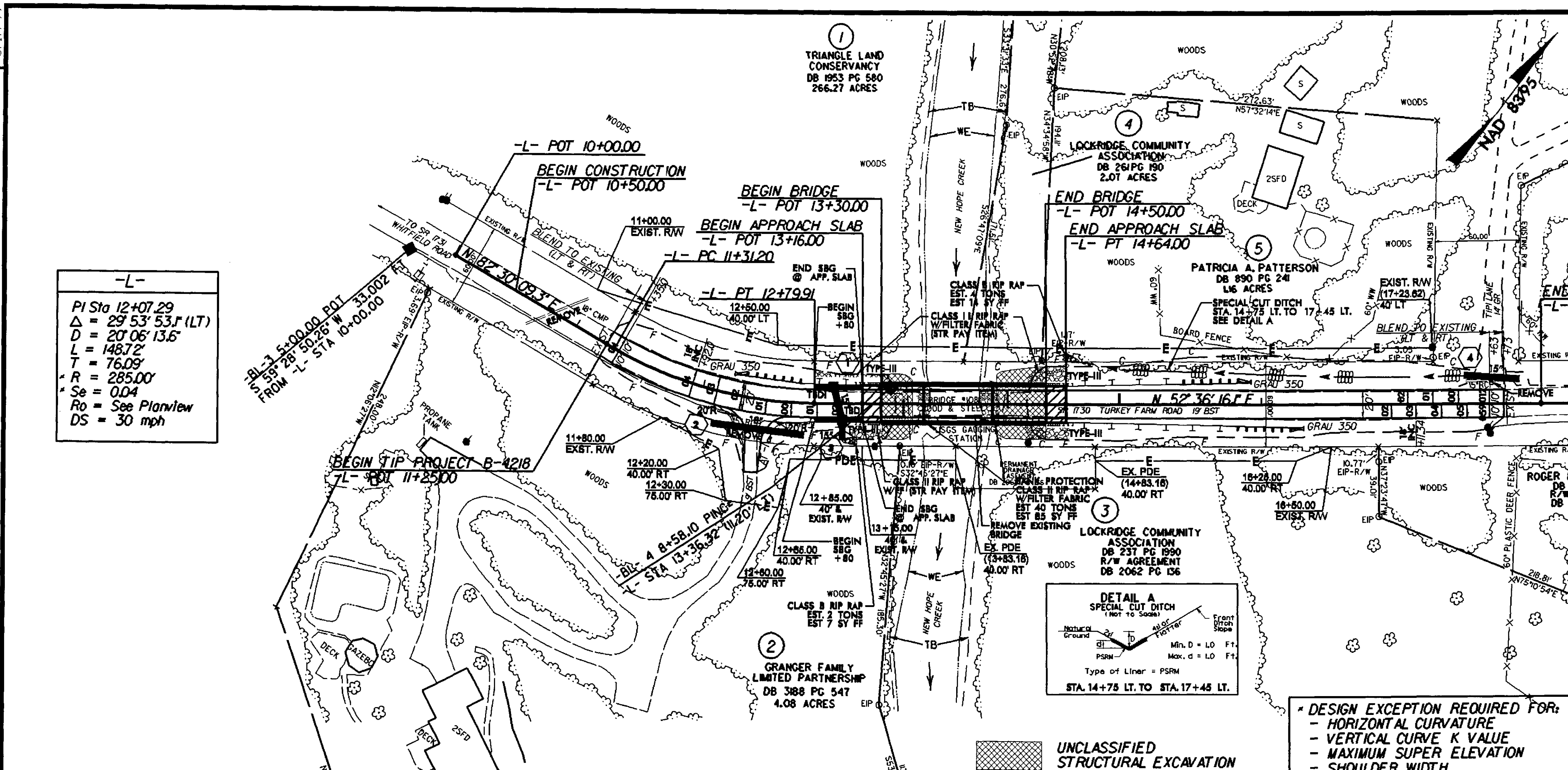
PROJECT REFERENCE NO.	SHEET NO.
B-4218	4

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CH ENGINEERING



-L-

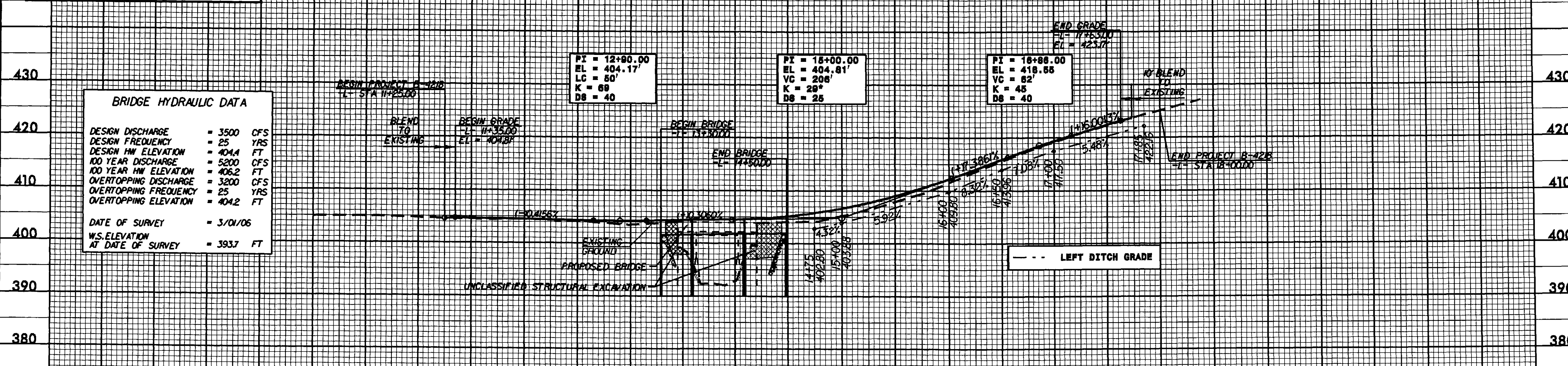
PI Sta 12+07.29
Δ = 29° 53' 53.1" (LT)
D = 20° 06' 13.6"
L = 148.72'
T = 76.09'
* R = 285.00'
* Se = 0.04
Ro = See Planview
DS = 30 mph

DETAIL A
SPECIAL CUT DITCH (Not to Scale)
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
Type of Liner = PSRM
STA. 14+75 LT. TO STA. 17+45 LT.

* DESIGN EXCEPTION REQUIRED FOR:
- HORIZONTAL CURVATURE
- VERTICAL CURVE K VALUE
- MAXIMUM SUPER ELEVATION
- SHOULDER WIDTH

BRIDGE /ROADWAY RELATIONSHIP SKETCH

BM1 ELEVATION = 401.17
N 816236 E 1986332
BL STATION 8+12 275 LEFT
RR SPIKE IN 18" POPLAR



PI = 12+90.00
EL = 404.17'
LC = 50'
K = 69
DS = 40

PI = 15+00.00
EL = 404.81'
VC = 206'
K = 29*
DS = 25

PI = 16+86.00
EL = 416.55
VC = 62'
K = 45
DS = 40

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 3500	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 404.4	FT
100 YEAR DISCHARGE	= 5200	CFS
100 YEAR HW ELEVATION	= 406.2	FT
OVERTOPPING DISCHARGE	= 3200	CFS
OVERTOPPING FREQUENCY	= 25	YRS
OVERTOPPING ELEVATION	= 404.2	FT
DATE OF SURVEY	= 3/01/06	
W.S. ELEVATION AT DATE OF SURVEY	= 393.7	FT

REVISIONS

8/17/99

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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4218	X-1

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

440 435 430 425 420 415 410 405 400 395

VAR

0.0

0.0

404.48

11+50.00

404.68

11+00.00

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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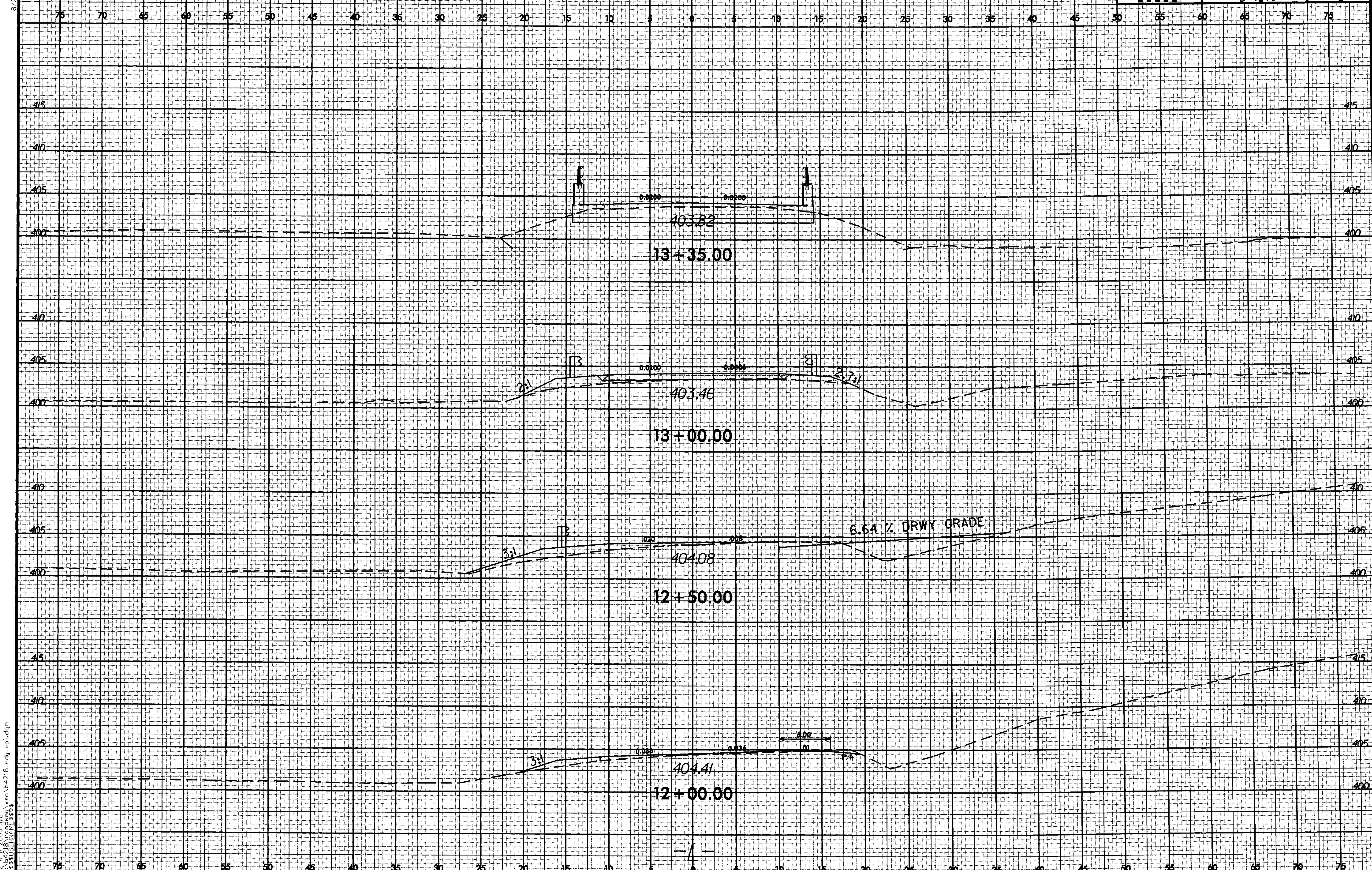
PROJ. REFERENCE NO.	SHEET NO.
B-4218	X-2



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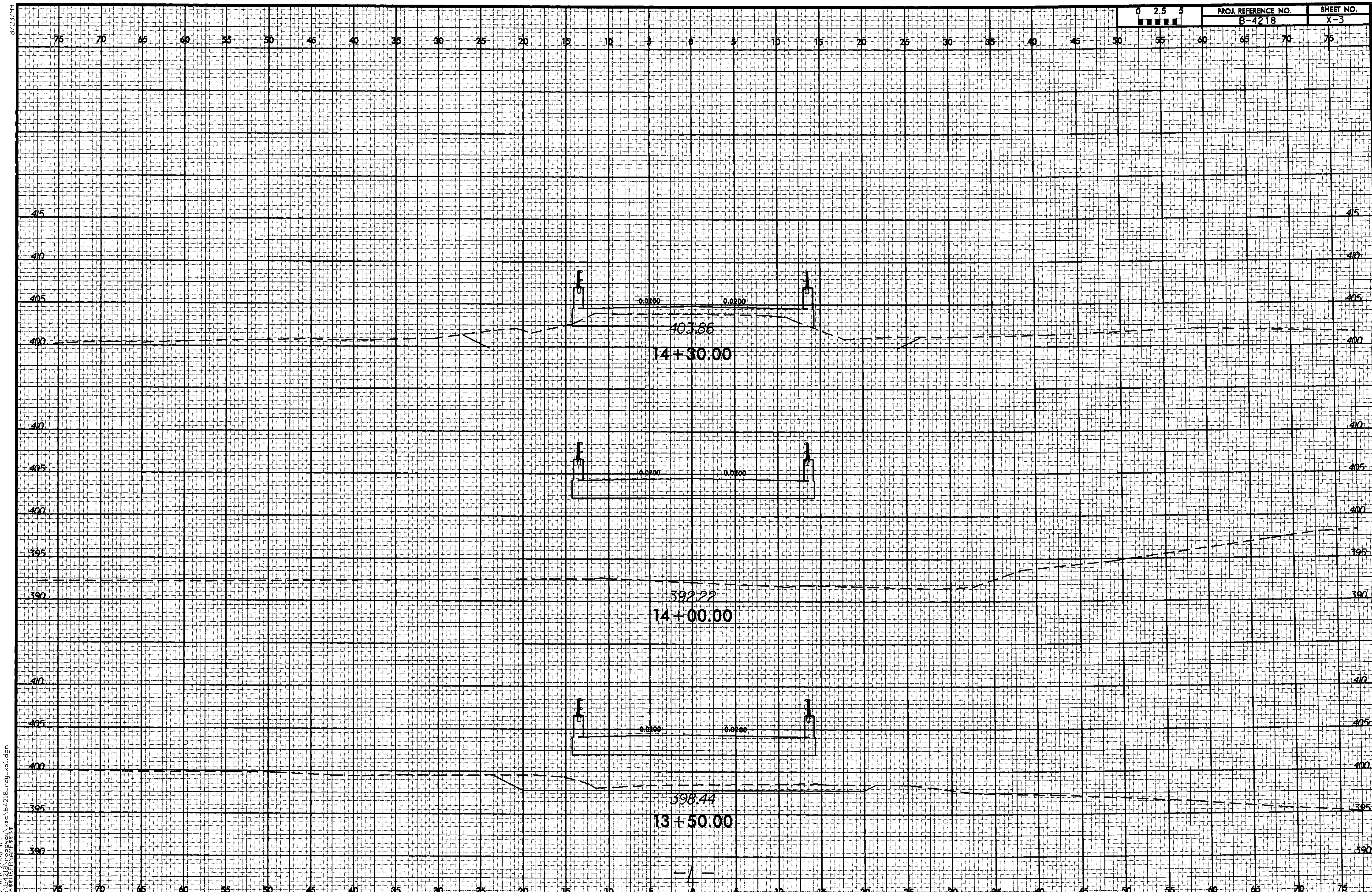
PROJ. REFERENCE NO.	SHEET NO.
B-4218	X-3



8/23/99

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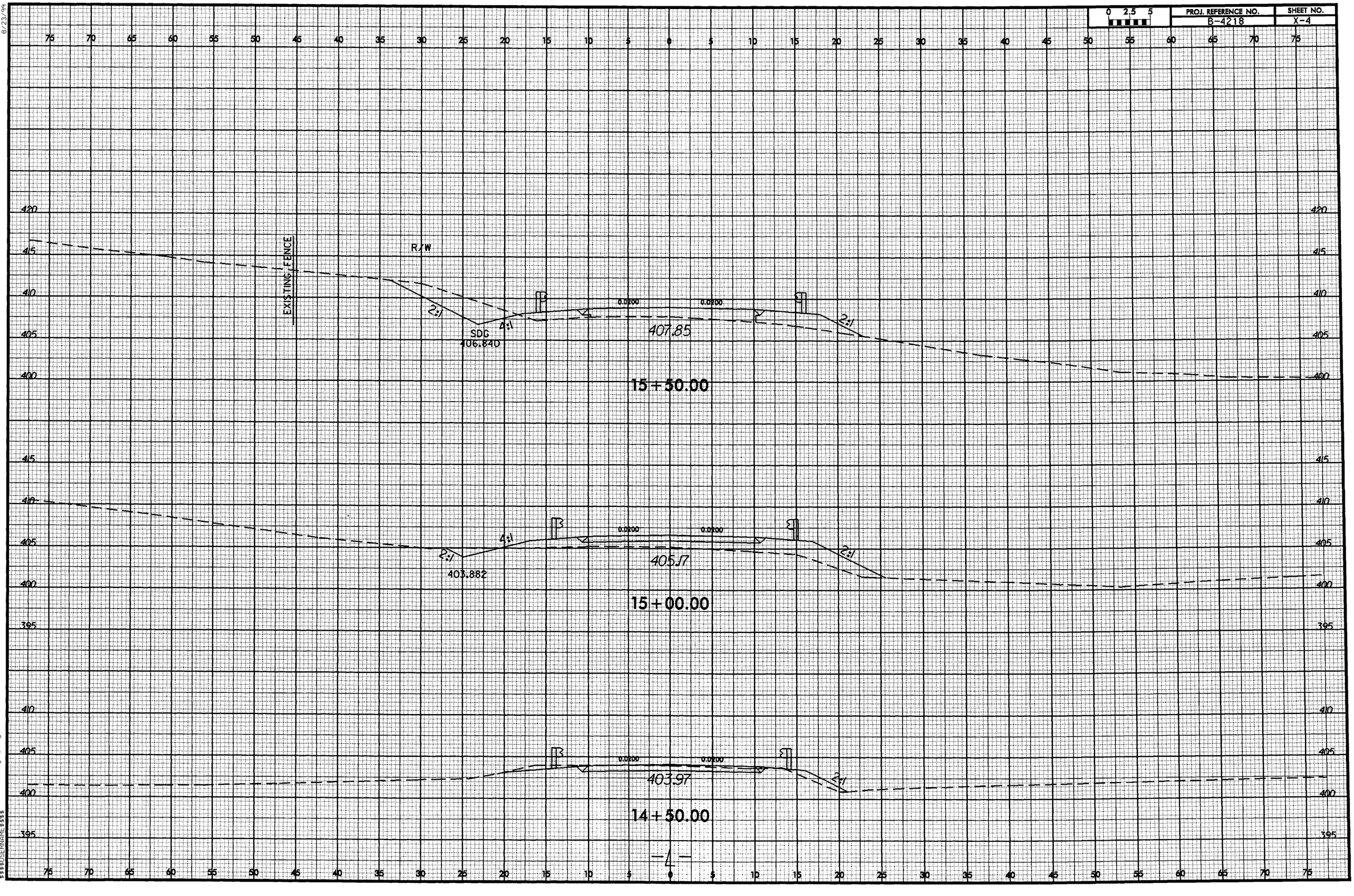
	B-4218	X-4



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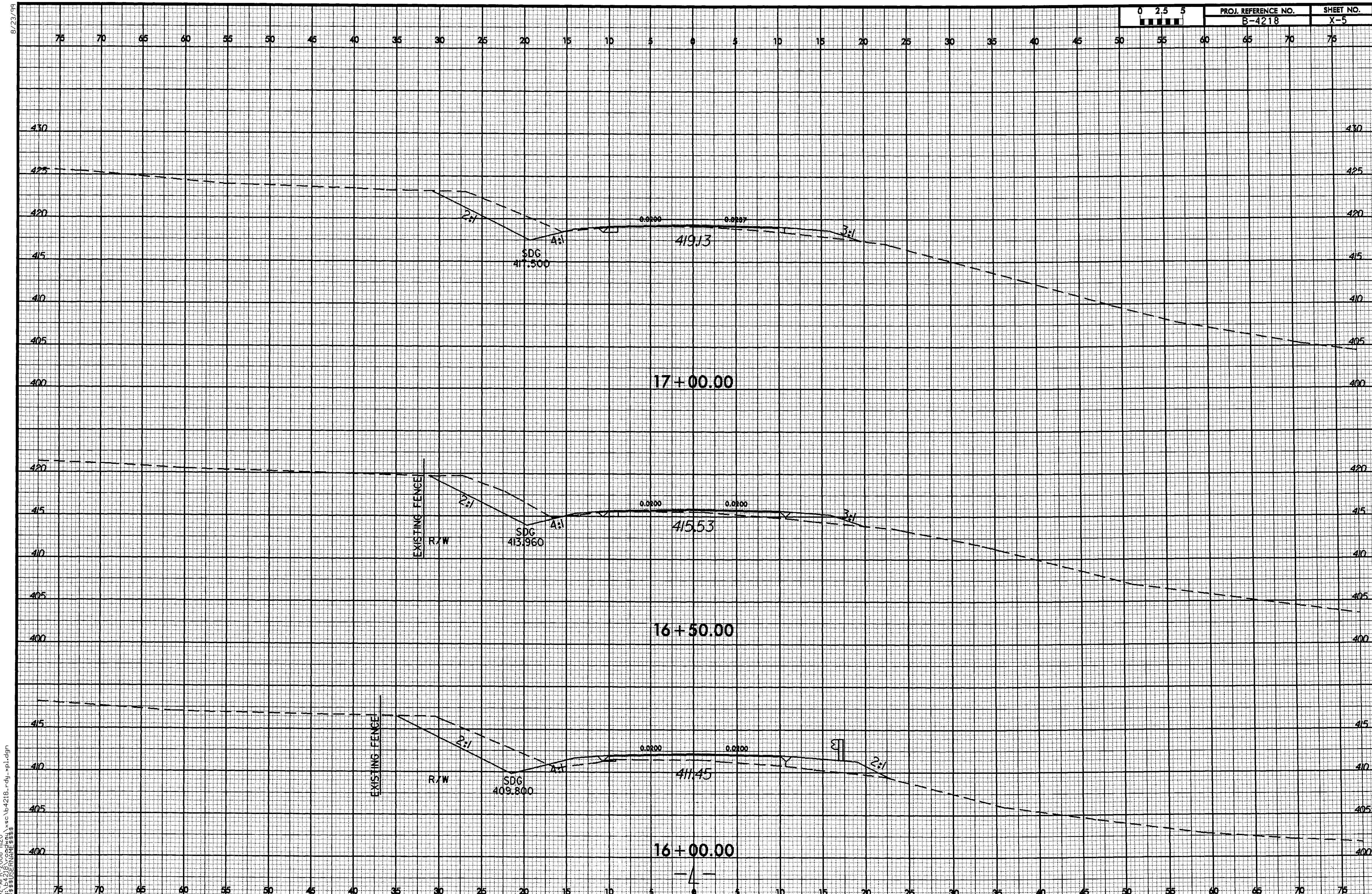
PROJ. REFERENCE NO.
B-4218
SHEET NO.
X-5
0 2.5 5
8/23/99
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4:1
3:1
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0.0207
SDG
417.500
419.13
17+00.00
EXISTING FENCE
R/W
SDG
413.960
415.53
16+50.00
2:1
SDG
409.800
411.45
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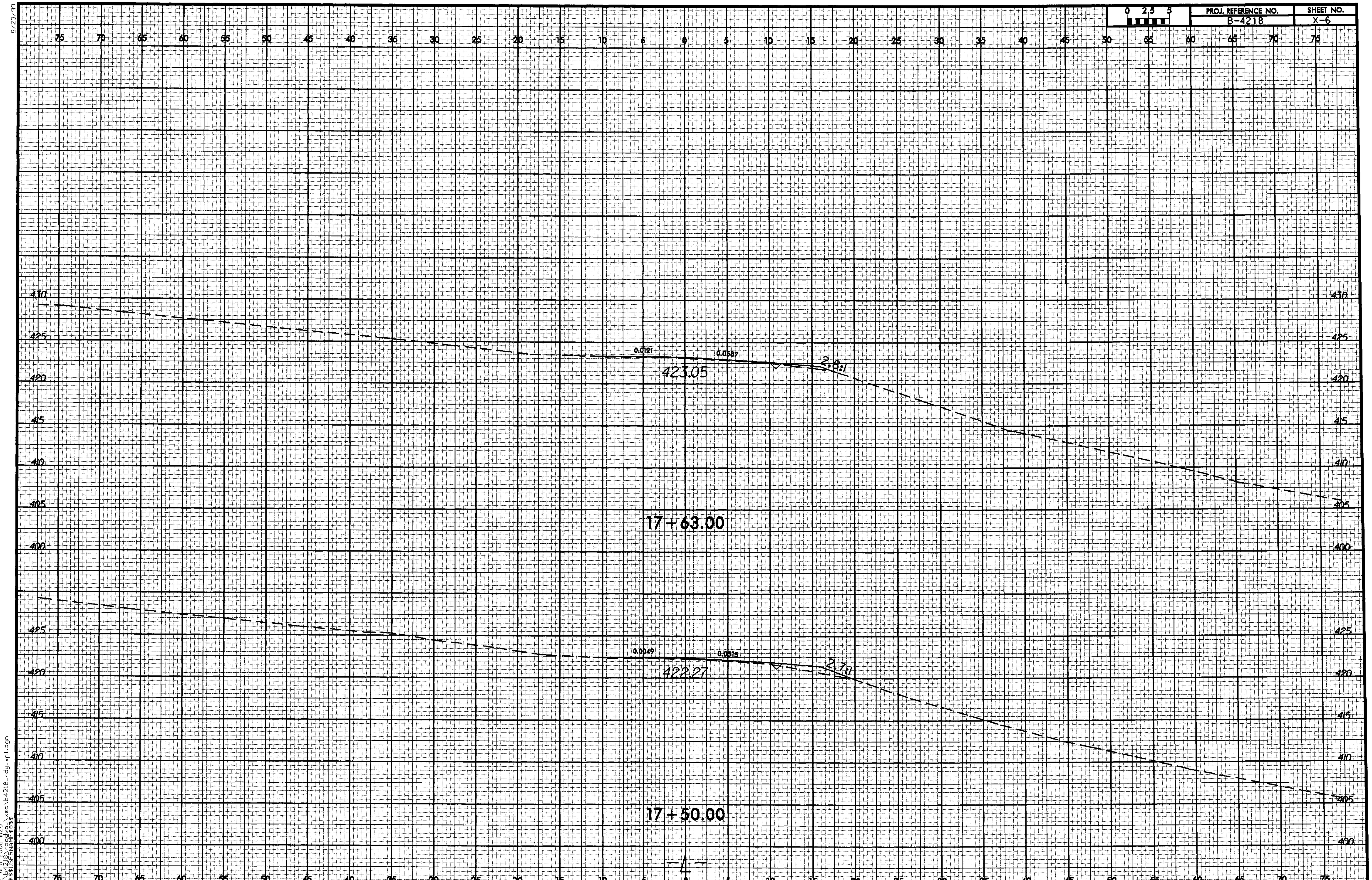
PROJ. REFERENCE NO.	SHEET NO.
B-4218	X-6



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PROJ. REFERENCE NO.	SHEET NO.
B-4218	X-7

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435 430 425 420 415 410 405 400

425.08

18+00.00

423.65

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