

BREMER COUNTY
BRIDGE DECK REPAIR
FN-3-6(30)--21-09

- CONVENTIONAL SIGNS
- STATE LINE
 - COUNTY LINE
 - TOWNSHIP LINE
 - SECTION LINE
 - CORPORATION LINE
 - URBAN BOUNDARY
 - R.O.W. LINES
 - SURVEY LINES
 - SECTION CORNER
 - PROPOSED PROFILE GRADE
 - RAILROAD
 - FIELD TILE
 - UNDERGROUND LINES
 - CULVERTS
 - UTILITY POLES
 - FENCES
 - TREES OR BRUSH
 - STREAM
 - DIKE
 - COUNTY ROAD NUMBER
 - PRIMARY ROAD NUMBER
 - U.S. ROAD NUMBER
 - INTERSTATE ROAD NUMBER

IOWA
DEPARTMENT OF TRANSPORTATION
Highway Division
PLANS OF ~~PROPOSED~~ IMPROVEMENTS ON THE
PRIMARY ROAD SYSTEM
BREMER COUNTY
BRIDGE DECK REPAIR
ON IA.3 - 1 MI. E. OF CO. RD. V-49

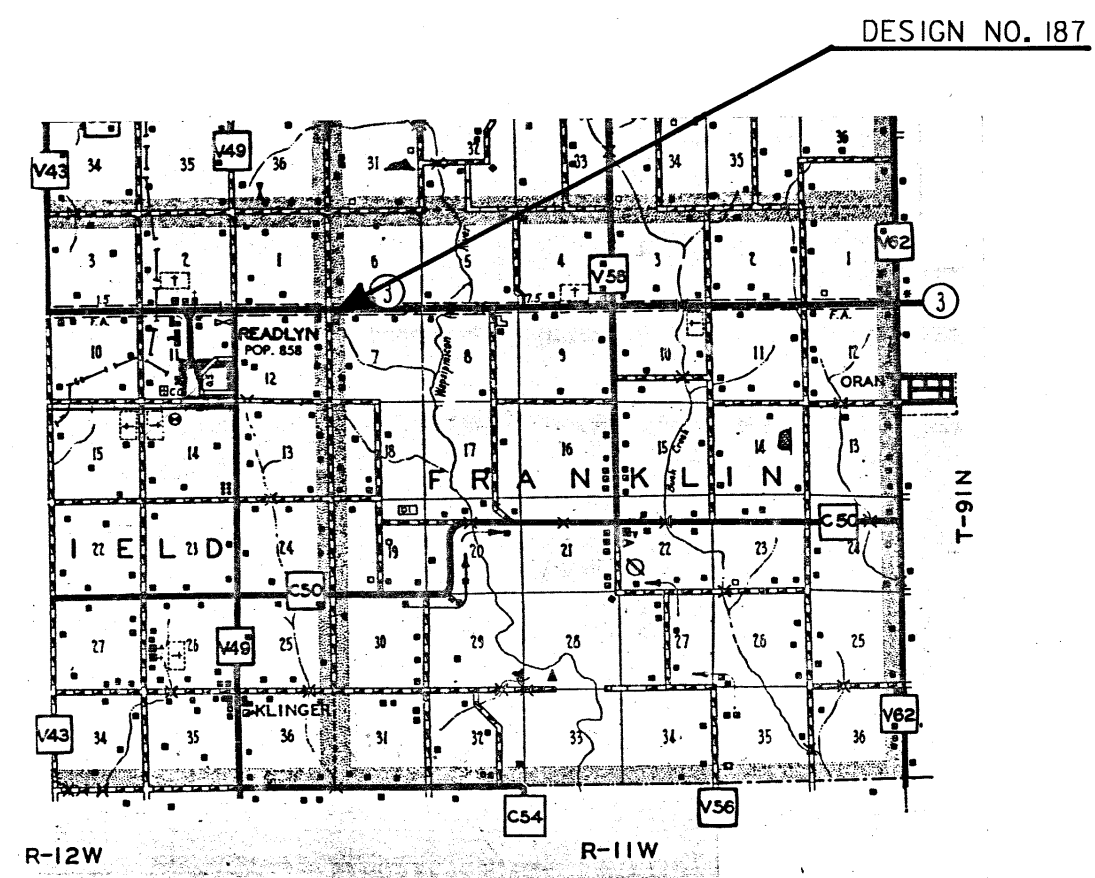
SCALES: As Noted

The standard specifications, series of 1984 of the Iowa Department of Transportation, shall apply to construction work on this project.
(PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS)

PROJECT NUMBER
FN-3-6(30)--21-09
R.O.W. PROJECT NUMBER
PIN
88-09-010-1

INDEX OF SHEETS	
NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATE SHEET
3-19	BRIDGE REPAIR DES. NO. 187

D



CONSTRUCTION PLANS SHOWING PROJECT AS BUILT

Plan Preparation Supervised By: Geo. Fearell
Resident Construction Engineer
Date 2-24-89 Iowa Reg. No. 10613

REVIEWED AND FORWARDED TO AMES
Philip Hassel Date MAR 2 1989
District Construction Engineer

One 50% Reduced and Two Full-Size Prints To Be Made and Returned To
District Engineer

AFTER MICROFILMING RETURN ORIGINAL
TO DISTRICT NO. 2

* 150 *

STANDARD ROAD PLANS				STANDARD BRIDGE PLANS		
IDENT	DATE	IDENT	DATE	STANDARD	ISSUED	REVISED
RE-2A	2-17-87					
RE-12A	5-13-86					
RE-47	11-10-87					
RE-48A	8-20-85					
RE-52	7-21-87					
RE-57	9-23-86					
RH-2A	1-19-88					
RH-2B	7-21-87					
RL-11	5-13-86					
RH-41A	2-17-87					
RK-16	2-17-87					
RS-2	8-20-85					
RS-3	1-19-88					
RF-19E	2-17-87					

YEAR	WORK	CONTRACTOR	PROJ. INSPECTOR
1988	BR. DECK REPAIR	TAYLOR CONST.	Cam Powers

REVISIONS

Iowa Department of Transportation

AUTHORIZED FOR LETTING
W. C. Anderson 12-11-87
DEPUTY CHIEF ENGINEER DATE

I hereby certify that this plan was prepared under my supervision and that engineering decisions with regard to the design were made by me or by other duly Registered Professional Engineers under the laws of the State of Iowa.

Name Wm. A. Zundt
Iowa Registration No. 4449 Date 12/11/87

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED

FOR THE DIVISION ADMINISTRATOR DATE

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA

12/10/87
DATE

JAMES R. SASSAMAN
JAMES R. SASSAMAN

REG. NO. 2663

DESIGN NO. 187 OVER DRAINAGE DITCH STATION: 410+53.60
BREMER COUNTY MAINT. NO. 0936.2S003
SECTION: 1/7 T-9IN R-11W FRANKLIN TOWNSHIP

DESIGN FOR REMODELING
40' X 44' I-BEAM BRIDGE

ESTIMATE OF QUANTITIES

NO.	ITEM	UNIT	TOTAL
1	STRUCTURAL CONCRETE	CU. YD.	51.26
2	REINFORCING STEEL - EPOXY COATED	LBS	11935.0
3	STRUCTURAL STEEL	LBS	382
4	GRANULAR BACKFILL	CU. YDS.	29
5	CLASS 20 EXCAVATION	CU. YDS.	20
6	TEMPORARY TRAFFIC SIGNALS	L.S.	#1600.00
7	REMOVALS, AS PER PLAN	L.S.	#27500.00
8	TEMPORARY	FURNISH ONLY LIN. FT.	430
9	BARRIER RAIL	PLACE ONLY LIN. FT.	830
10	TEMPORARY FLOODLIGHTING	L.S.	#1600.00
11	TRAFFIC CONTROL	L.S.	#1600.00
12	PAVEMENT MARKINGS	STA.	95.22
13	CONCRETE BARRIER RAIL - CAST IN PLACE	LIN. FT.	128.0
14	BACKFILL, SPECIAL	TONS	93.45
15	BRIDGE APPROACH SECTION, REINFORCED	SQ. YDS.	198.4
16	EMBANKMENT-IN-PLACE	CU. YDS.	68
17	GUARDRAIL, END ANCHORAGES, BEAM RE-52	NO.	4
18	GUARDRAIL, POSTS, BEAM	NO.	52
19	PAVEMENT, STANDARD P.C. CONC. CLASS C 10 IN.	SQ. YDS.	233.4
20	PAVED SHOULDERS, CLASS 1 P.C. CONC.	SQ. YDS.	0
21	REMOVAL OF OBJECT MARKERS	NO.	4
22	REMOVAL OF POSTS	NO.	24
23	RMV. & REINSTALL FORMED STEEL BM GUARDRAIL	LIN. FT.	250
24	OBJECT MARKER, TYPE 3	NO.	4
25	REMOVAL OF PAVEMENT	SQ. YDS.	337.4
26	MOBILIZATION	L.S.	#6500.00
27	FLAGGERS	DAYS	0
8999	STOCKPILED MATERIALS	L.S.	0
8001	SANDBLASTING	L.S.	#975.00
8002	SUBDRAINS	LIN. FT.	158
8003	SHOULDER STRENGTHENING	TONS	376.70
8004	E.F. JOINT	NO.	2

★ ADJUSTED PER 7000 SERIES

ESTIMATE REFERENCE INFORMATION	
Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.	
ITEM NO.	DESCRIPTION
1	CLASS 'D' CONCRETE. INCLUDES COST OF PREFORMED JOINT MATERIAL.
2	INCLUDES 4,119 LIN. FT. OF #5 BAR & 4,986 LIN. FT. OF #6 BAR. INCLUDES FURNISHING AND PLACING SHEAR CONNECTORS, FURNISHING AND PLACING 1/4 THREADED DIAPHRAGM RODS & DRILLING HOLES IN BEAM WEBS AT ABUTMENT DIAPHRAGMS.
6	INCLUDES 4 TRAFFIC SIGNALS
7	INCLUDES REMOVAL OF EXISTING DECK CONCRETE TO THE LIMITS SHOWN, AND THE EXISTING FORMED STEEL BEAM HANDRAIL (APPROXIMATELY 128 LIN. FT. AND 22 POSTS).
8 & 9	ALL TEMPORARY BARRIER RAIL SHALL BE NOMINAL 10' LONG. CONCRETE UNITS. INCLUDES 2 TAPER SECTIONS.
10	INCLUDES 2 FLOODLIGHTS.
12	INCLUDES 47.2 STA. REMOVAL OF PAVEMENT MARKINGS, 31.3 STA. OF YELLOW TEMPORARY AND PERMANENT PAVEMENT MARKINGS AND 16.7 STA. OF WHITE TEMPORARY AND PERMANENT PAVEMENT MARKINGS.
13	INCLUDES 516 LIN. FT. OF #5 BAR AND 476 LIN. FT. OF #6 BAR OF EPOXY COATED REINFORCING STEEL AND 6.4 CU. YDS. OF CLASS D STRUCTURAL CONCRETE
4,15,19&20	SEE STANDARD ROAD PLAN RK-16 FOR DETAILS.
16	CONTRACTOR SHALL PROVIDE REQUIRED MATERIAL. QUANTITY IS ESTIMATE ONLY AND PAYMENT WILL BE MADE ON THE ACTUAL VOLUME OF MATERIAL PLACED.
21	TO BE HAULED TO MAINTENANCE YARD AS DIRECTED BY THE ENGINEER
22 & 25	TO BE DISPOSED OF AS PER STANDARD NOTATION 213-1.

8001 THE ENDS AND TOP FLANGE OF THE STEEL BEAMS WERE SANDBLASTED AND PRIMED AS NEEDED.

8002 4" SUBDRAIN WAS PLACED BEHIND ABUTMENTS TO PROVIDE SUBSURFACE DRAINAGE.

8003 SHOULDERS STRENGTHENED TO CARRY TRAFFIC DURING STAGE 1 & 2.

8004 E.F. JOINTS REPLACED CF JOINTS REMOVED DURING CONST.

8999 USED WITH ITEM NO. 3 STRUCT. STEEL.

ESTIMATE SHEET

FILE NO. 27527 12/10/87

BREMER COUNTY

PROJECT NO. FN-3-6(30)--21-09

STATE	FHWA REGION	F.Y.	SHEET	TOTAL
IOWA	7		2	19

108-23
11-10-83

11-10-83

- GENERAL NOTES:

REHABILITATION SHALL CONSIST OF REMOVING THE DECK CONCRETE FROM AN AREA 14'-0" WIDE ON EACH SIDE OF THE ROADWAY CENTERLINE AND FULL LENGTH OF THE BRIDGE. ADD SHEAR STUDS TO STEEL I-BEAMS AND PLACE DECK CONCRETE WITHIN THE REMOVAL LIMITS. REMOVE AND REPLACE A SECTION OF P.C.C. APPROACH PAVEMENT, AT EACH END OF BRIDGE. REMOVE EXISTING HANDRAIL AND CONSTRUCT NEW CAST IN PLACE RAIL.

ALL DIMENSIONS AND DETAILS SHOWN ON THESE PLANS PERTINENT TO NEW CONSTRUCTION SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING CONSTRUCTION.

THE REINFORCEMENT SUPPLIED FOR THIS STRUCTURE SHALL BE GRADE 60.
IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANY DAMAGE TO ANY STEEL OR CONCRETE NOT TO BE REMOVED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND REPAIRED BY HIM AT NO EXTRA COST TO THE STATE.

[illegible]

FOR ROADWAY QUANTITIES
SEE DESIGN SHEET NO. 13

- 7 Includes removal of existing deck concrete to the limits shown, and the existing formed steel beam handrail (Approximately 128 lin.ft and 22 posts).
- 13 Includes 516 lin.ft. of #5 bar and 476 lin.ft. of #6 bar of epoxy coated reinforcing steel and 6.4 cu.yds. of Class D Structural Concrete.

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION SPECIFICATION, SERIES OF 1984, PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 1983. REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 60 CONCRETE IN ACCORDANCE WITH SECTION 8, $f'_c = 3,500$ PSI

Iowa #3 over Drainage Ditch
Sections 6 & 7
T-91 N R-11 W
Franklin Twp.
Bremer County
Maintenance No. 0936.25003

DESIGN HISTORY AT THIS SITE	
Design No.	Type of Work
929	Original
365	Widening

Design Sheet No.: 1 Of 17 File No.: 27527 Design No.: 187

DESIGNED BY: W.D. Tucker
DETAILED BY: D.A. Wright

TRACED BY: _____
CHECKED BY: Chong Hing Yi

Section Leader Sassaman

BREMER COUNTY

PROJECT NUMBER

FN-3-6(30)--21-09

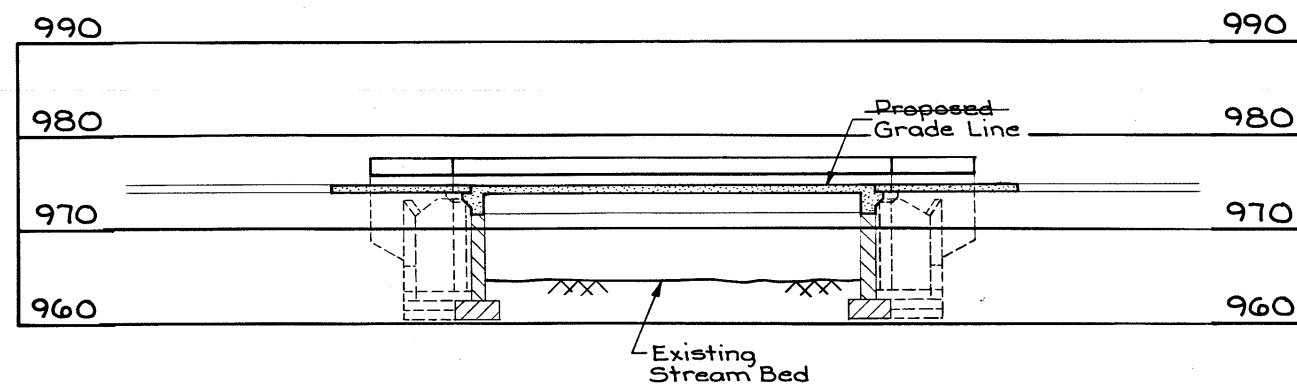
STATE
IOWA

FHWA
Region
7

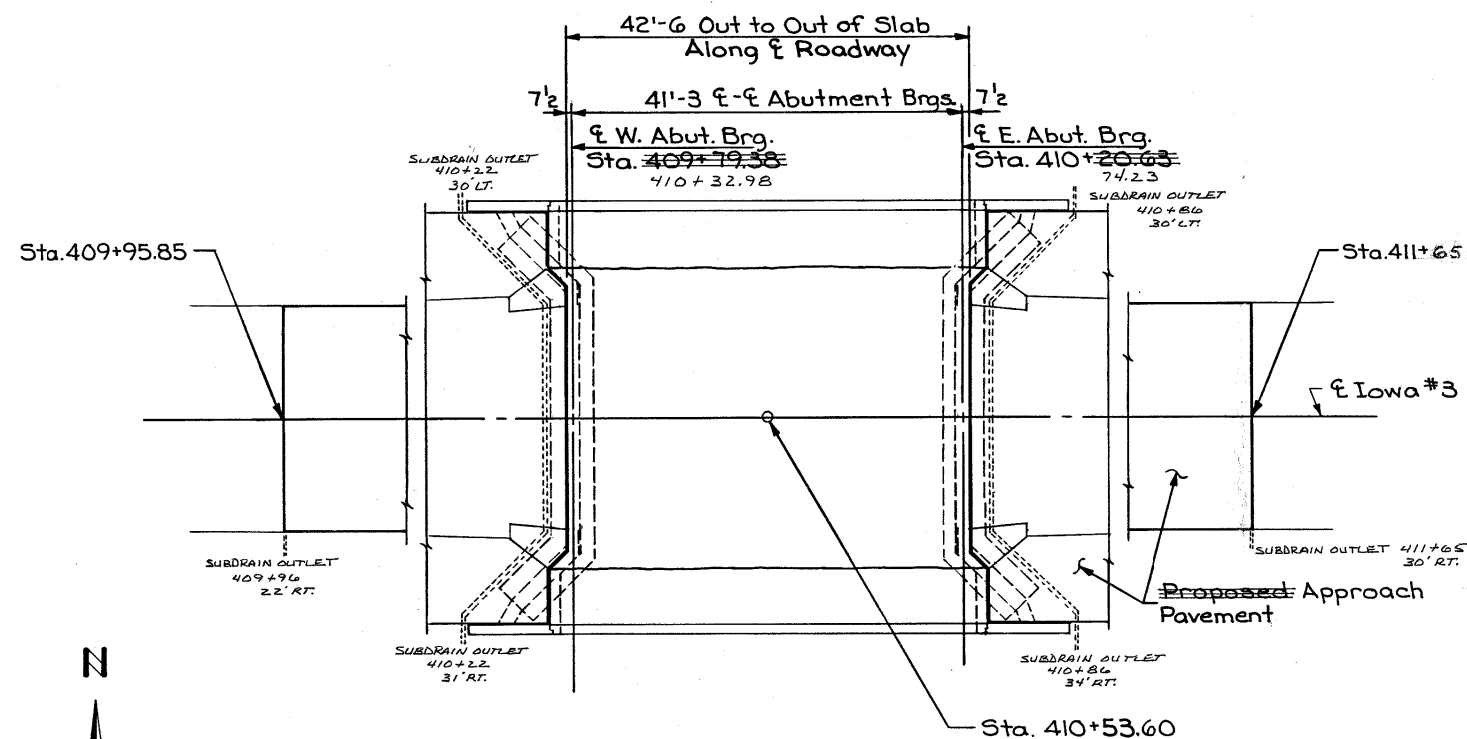
	FISCAL YEAR
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	SHEET NO.
	3

TOTAL SHEETS	19
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LONGITUDINAL SECTION ALONG & ROADWAY



SITUATION PLAN
Scale: 1" = 10'

Design For Remodeling
40'-0" x 44' I-BEAM BRIDGE
40'-0" Span

SITUATION PLAN

Station: 410+53.60 November, 1987

BREMER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION

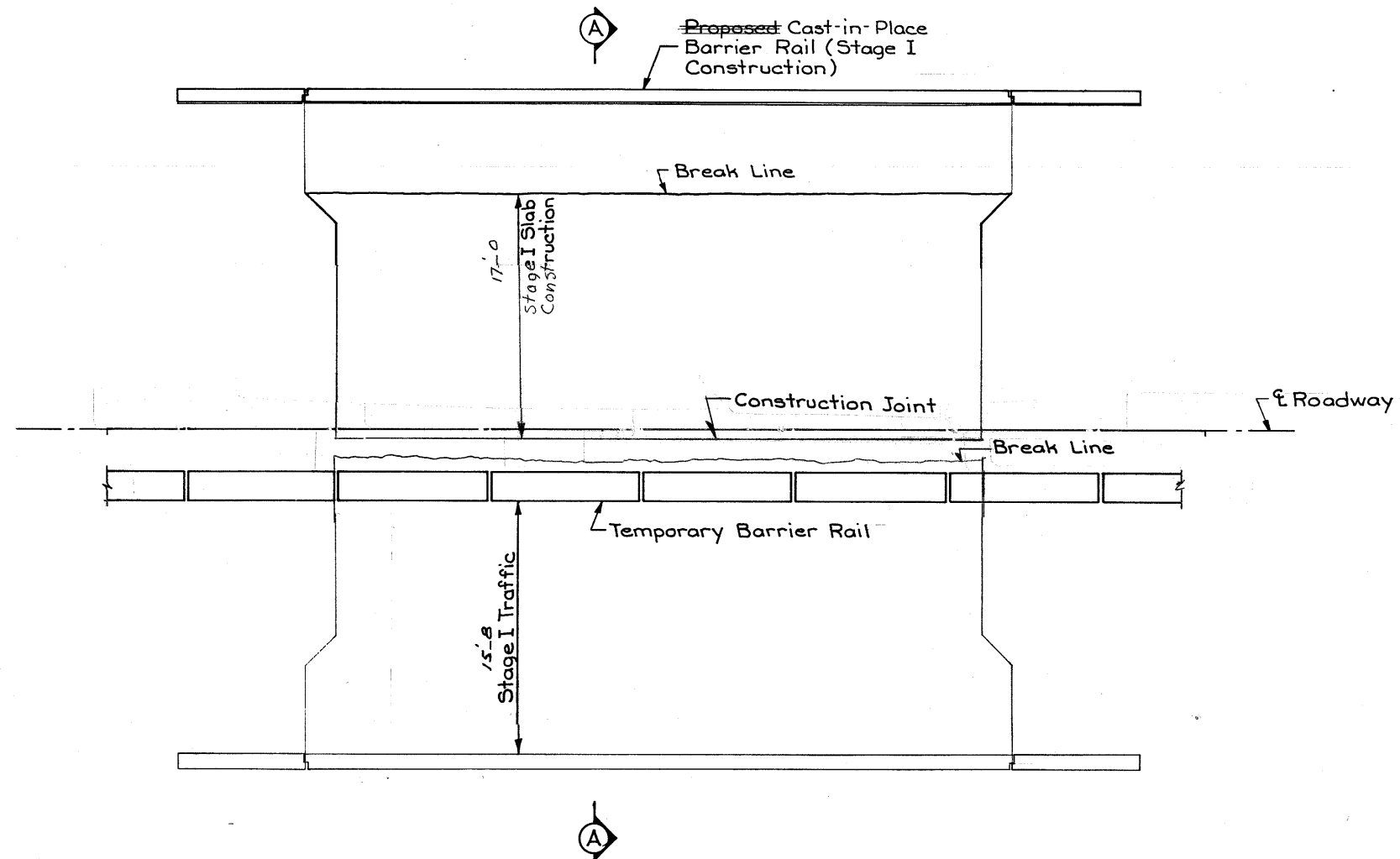
Design Sheet No.: 2 Of 17 File No.: 27527 Design No.: 187

DESIGNED BY: W.D. Tucker
TRACED BY: Chang Jung Ji
CHECKED BY: D.A. Wraht

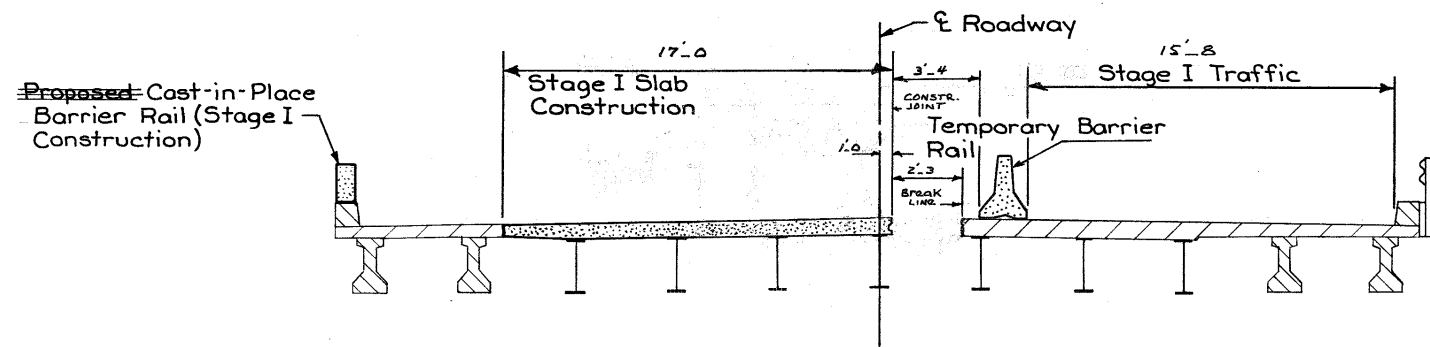
BREMER COUNTY

PROJECT NUMBER

STATE	FHWA Region	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		4	19



PLAN - STAGE I



SECTION A-A

Design For Remodeling
 40'-0" x 44' I-BEAM BRIDGE
 40'-0" Span

STAGE I DETAILS

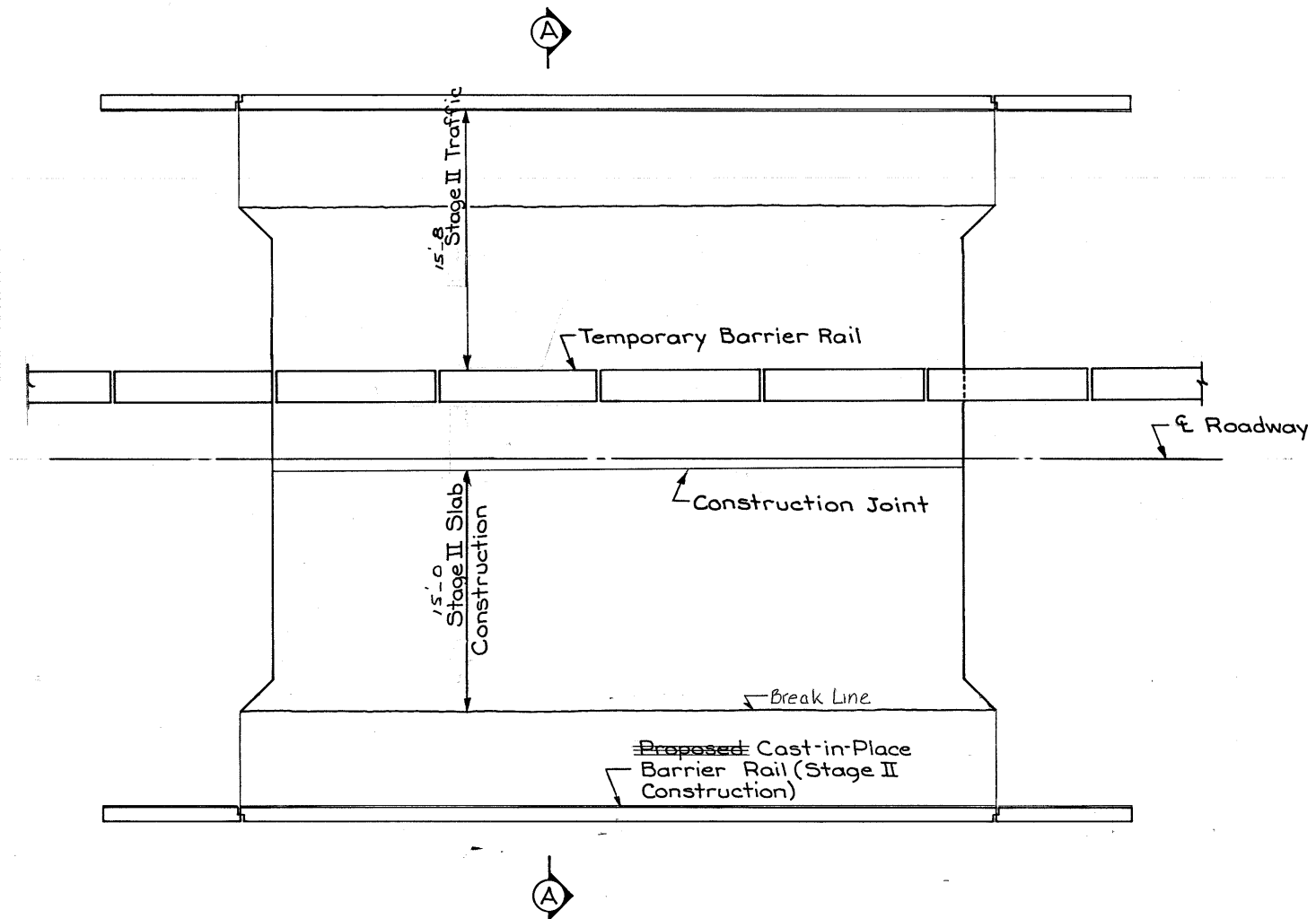
Station: 410+53.60 November, 1987
BREMER COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION
 Design Sheet No.: 3 Of 17 File No.: 27527 Design No.: 187

DESIGNED BY: *W.D. Tucker* TRACED BY: *Chang Ling Ji*
 DETAILED BY: *D.A. Wright* CHECKED BY: *Chang Ling Ji*

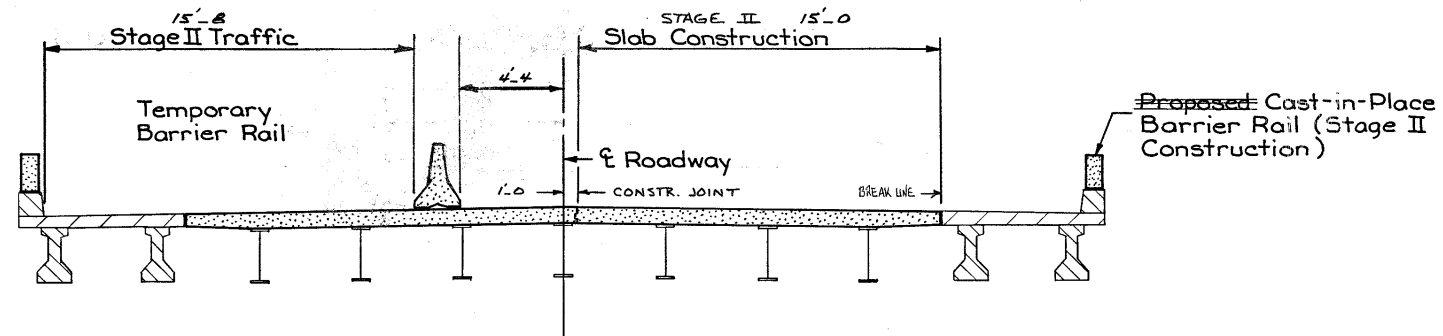
BREMER COUNTY

PROJECT NUMBER

STATE	FHWA Region	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		5	19



PLAN-STAGE II



SECTION A-A

Design For Remodeling
40'-0" x 44' I-BEAM BRIDGE
 40'-0" Span

STAGE II DETAILS

Station: 410+53.60 November, 1987

BREMER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION

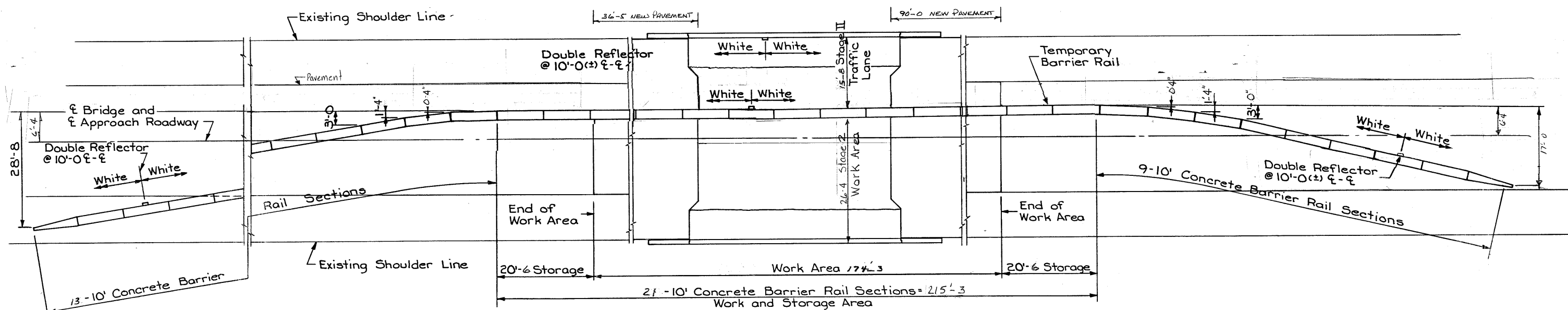
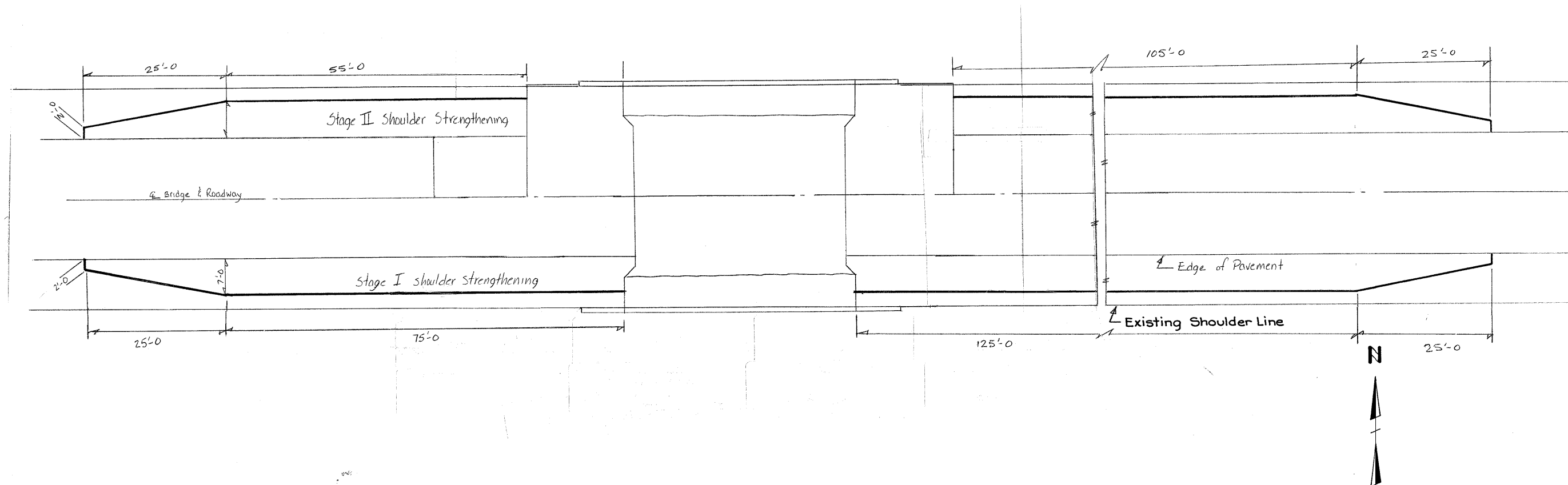
Design Sheet No.: 4 Of 17 File No.: 27527 Design No.: 187

DESIGNED BY: W.D. Tucker TRACED BY: _____
 CHECKED BY: D.A. Wright CHECKED BY: Chang Jung Yi

BREMER COUNTY

PROJECT NUMBER

STATE	FHWA Region	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		4	19



For Tapered End Section
Details See Design Sht. 15.

TEMPORARY CONCRETE BARRIER RAIL LAYOUT (For One Lane - Two Way Traffic - Stage II Construction)

Note: The layout is for Stage 2 Construction.
Similar layout would be used for Stage I by
rotating 180°.

ESTIMATED QUANTITIES	
Item	Quantity
Temporary Barrier Rail, Furnish Only	430 L.F.
Temporary Barrier Rail, Place Only	830 L.F.*

Item Reference:
All Temporary Barrier Rail shall be nominal 10'
long concrete units.

Stage I only used 40 sections

Design For Remodeling
40'-0" x 44' I-BEAM BRIDGE
40'-0" Span

TEMPORARY BARRIER RAIL LAYOUT

Station: 410+53.60 November, 1987

BREMER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION

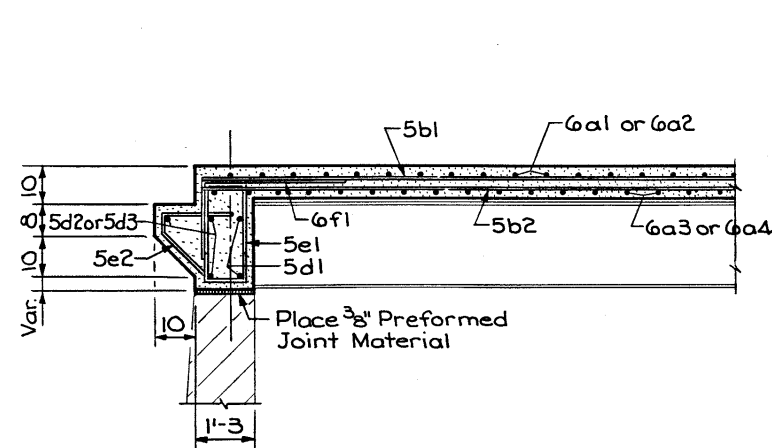
Design Sheet No.: 5 Of 17 File No.: 27527 Design No.: 187

DESIGNED BY: W.D. Tucker
TRACED BY: D.A. Wright
CHECKED BY: Changling Ji

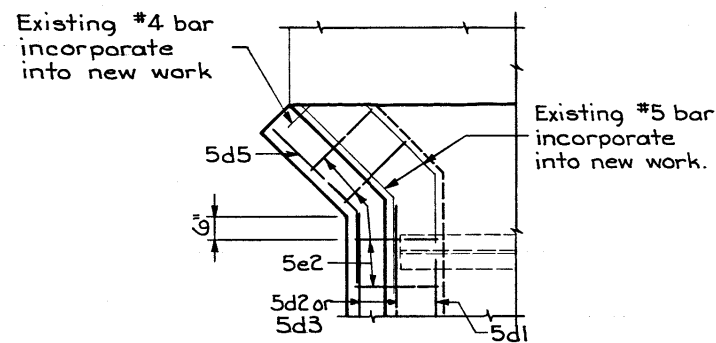
BREMER COUNTY

PROJECT NUMBER

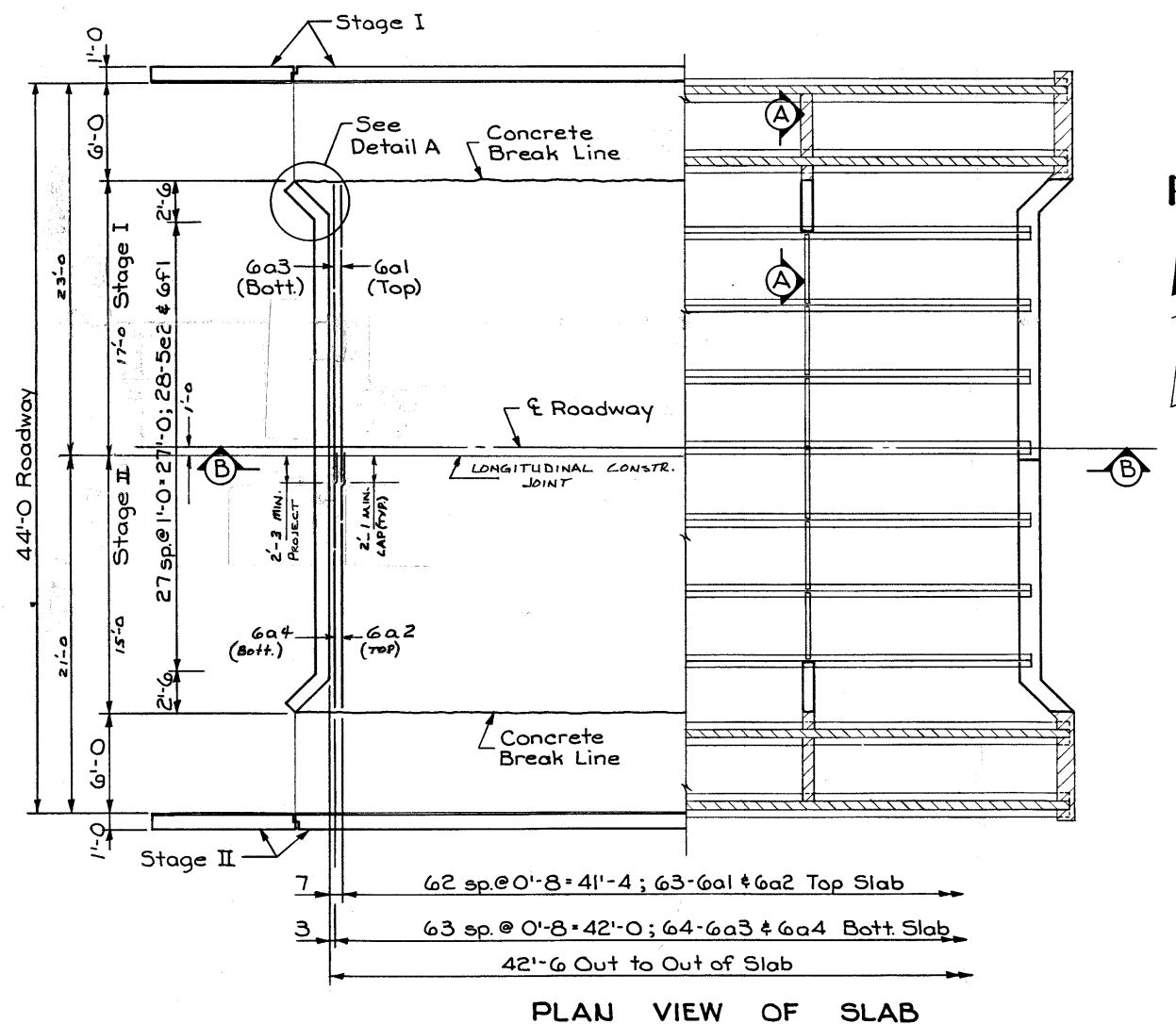
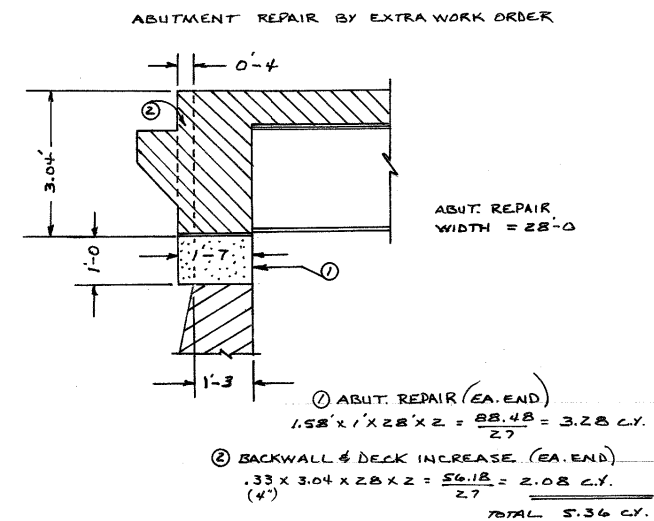
STATE	FHWA Region	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		7	19



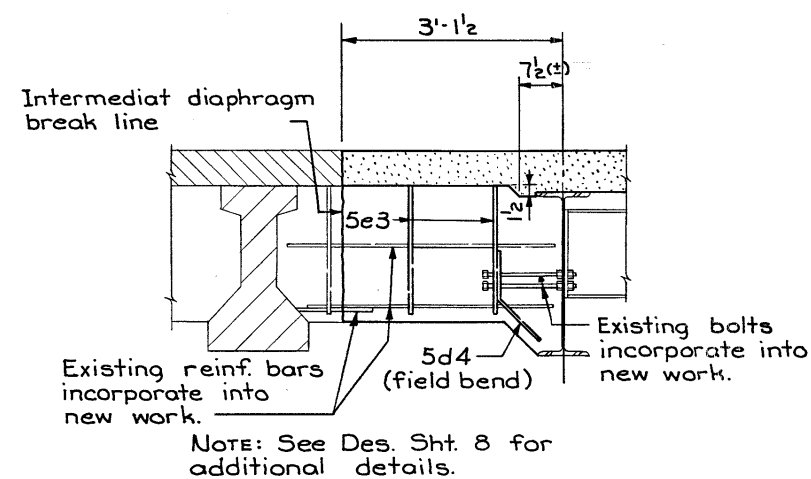
PART SECTION B-B



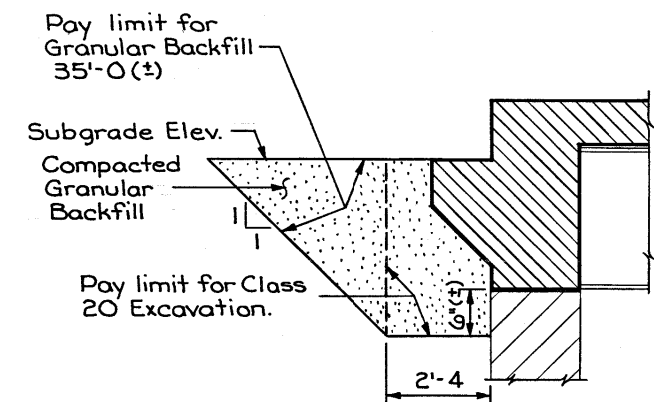
DETAIL A



PLAN VIEW OF SLAB



SECTION A-A



GRANULAR BACKFILL DETAIL

Design For Remodeling
40'-0" x 44' I-BEAM BRIDGE
40'-0" Span

SUPERSTRUCTURE DETAILS

Station: 410+53.60 November, 1987

BREMER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION

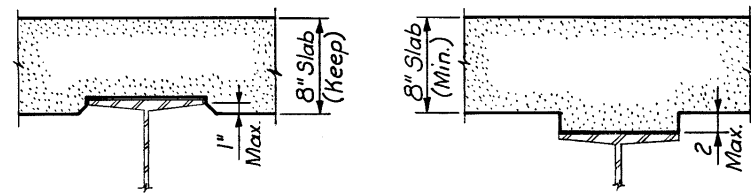
Design Sheet No.: 7 Of 17 File No.: 27527 Design No.: 187

DESIGNED BY: W.D. Tucker
CHECKED BY: D.A. Wright
TRACED BY: Chang, June Ji

BREMER COUNTY

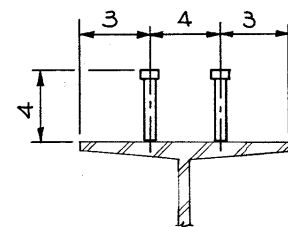
PROJECT NUMBER

STATE	FHWA Region	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		9	19

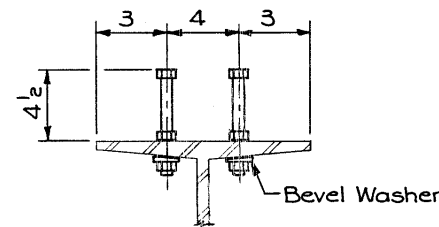


EMBEDMENT AND HAUNCH DETAILS

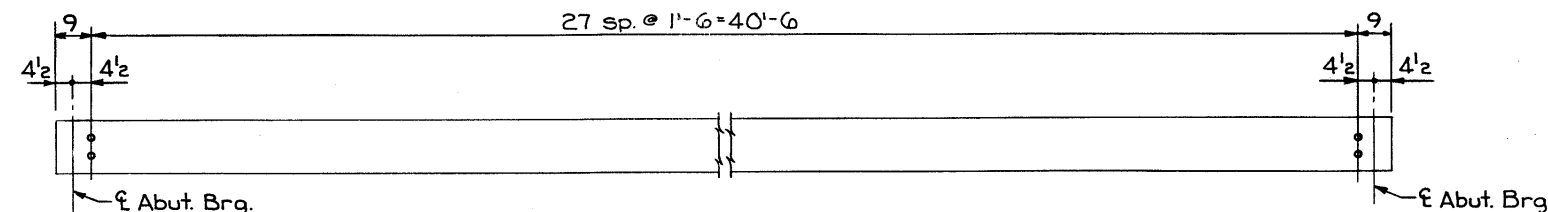
NOTE: WHERE THE HAUNCH WILL EXCEED 2", SET THE HAUNCH AT 2" AND THICKEN THE SLAB ACCORDINGLY. IF THE EMBEDMENT WILL EXCEED 1" BELOW THE BEAM FLANGE ANYWHERE ON THE BRIDGE, INCREASE THE CROSS SLOPE OF THE BRIDGE BY ROTATING THE SLAB ABOUT THE POINT WHERE THE NEW SLAB MEETS THE EXISTING SLAB. THE CROSS SLOPE SHALL ONLY BE INCREASED TO THE POINT NECESSARY TO SATISFY THE EMBEDMENT REQUIREMENT.



STUD LAYOUT

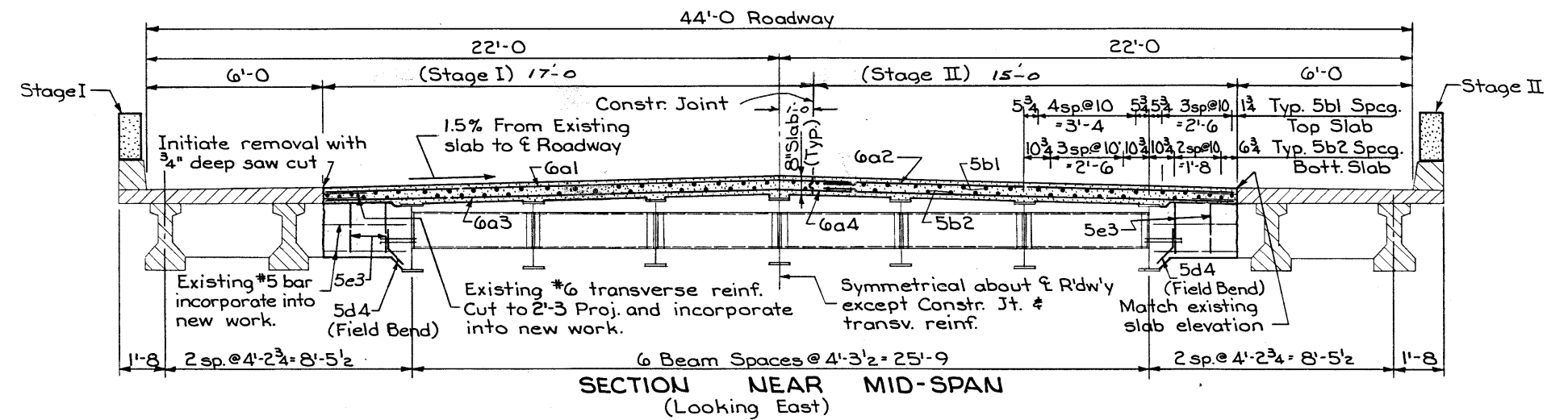


BOLT LAYOUT

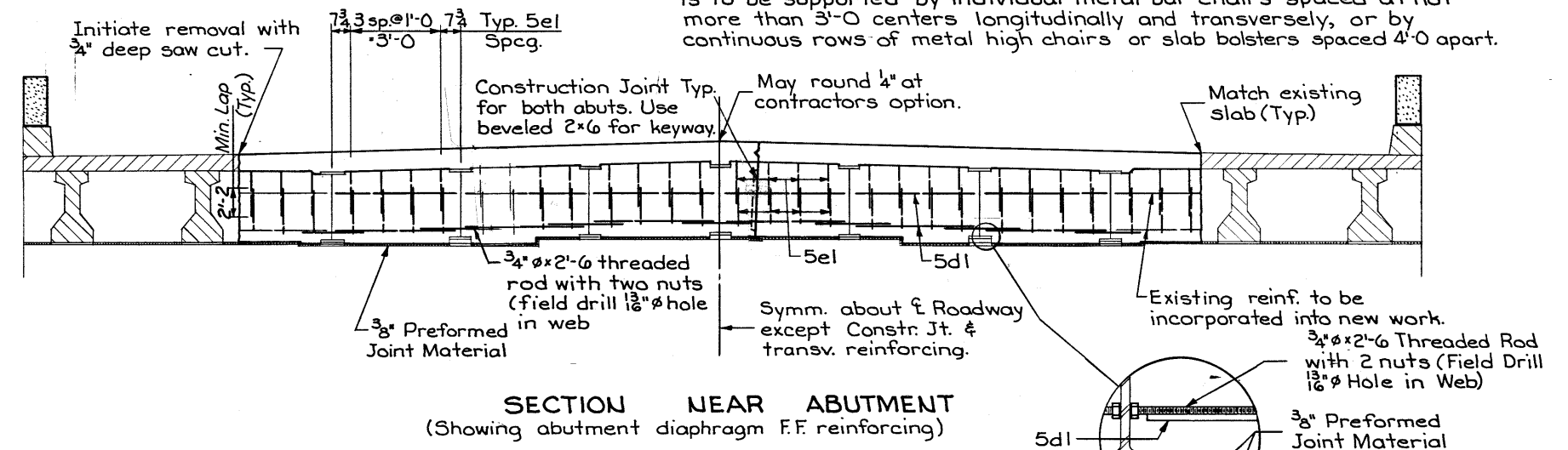


SHEAR STUD SPACING
(56-7/8" x 0'-4" Studs Required per beam.
392-Total Studs, 7 Beams.)

OPTIONAL BOLT SPACING
(56-7/8" x 0'-4" Bolts with Min. 3/2" Threaded Length,
112 Nuts and 56 Beveled Washers per beam. 392
Total Bolts, 784 Total Nuts and 392 Washers,
7 Beams.)



SECTION NEAR MID-SPAN
(Looking East)



SECTION NEAR ABUTMENT
(Showing abutment diaphragm F.F. reinforcing)

Design For Remodeling
40'-0" x 44' I-BEAM BRIDGE
40'-0" Span

SUPERSTRUCTURE DETAILS

Station: 410+53.60 November, 1987
BREMER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION

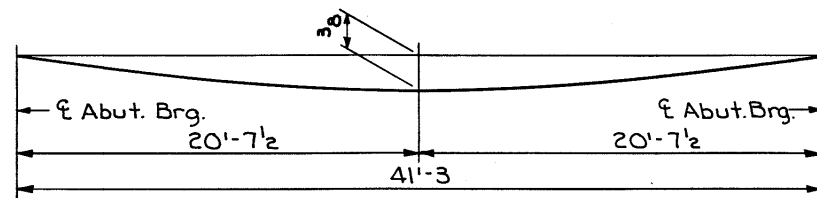
Design Sheet No.: 8 Of 17 File No.: 27527 Design No.: 187

DESIGNED BY: W.D. Tucker
DETAILED BY: D.A. Wright
TRACED BY: Chang, King, Ji
CHECKED BY:

BREMER COUNTY

PROJECT NUMBER

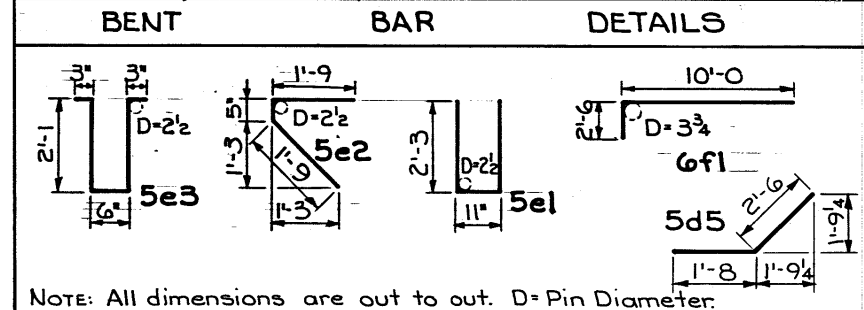
STATE	FHWA Region	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		10	19



ANTICIPATED BEAM DEFLECTION
DUE TO DEAD LOAD

SUPERSTRUCTURE NOTES:
THE REHABILITATED PORTION OF THE SUPERSTRUCTURE ON THIS BRIDGE HAS BEEN DESIGNED FOR IOWA LEGAL TRUCK LOADING.
THE FLOOR SLAB AS SHOWN INCLUDES 1/2 INCH OF WEARING SURFACE.
FORMS FOR THE SLAB ARE TO BE SUPPORTED BY THE BEAMS.
SHEAR CONNECTORS (WELDED STUDS OR BOLTS) SHALL BE PLACED AT LOCATIONS SHOWN ON THE PLANS.
SHEAR STUDS WHICH ARE UNACCEPTABLE BY TESTING MAY BE REPAIRED BY ADDING A 5/16" MINIMUM FILLET WELDS IN PLACE OF THE MISSING WELD IN ACCORDANCE WITH THE MATERIAL OFFICE I.M. 558.
THE COST OF THE 3/8" PREFORMED JOINT MATERIAL SHALL BE INCLUDED IN PRICE BID FOR "STRUCTURAL CONCRETE".
TOP TRANSVERSE REINF. STEEL IS TO BE PARALLEL TO AND 2 1/2" CLEAR BELOW TOP OF SLAB. BOTTOM TRANSVERSE REINF. STEEL IS TO BE PARALLEL TO AND 1" CLEAR ABOVE BOTTOM OF SLAB. TOP & BOTTOM REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL METAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0" CENTERS LONGITUDINALLY AND TRANSVERSELY, OR BY CONTINUOUS ROWS OF METAL HIGH CHAIRS OR SLAB BOLSTERS SPACED 4'-0" APART.
ALL SLAB REINFORCING IS TO BE SUPPORTED WITH EPOXY COATED BAR CHAIRS.

REINFORCING		BAR		LIST	
Bar	Location	Shape	No.	Length	Weight
A6a1	Slab, Transv., Top, Stage I	—	63	19'-0	1806
A6a2	Slab, Transv., Top, Stage II	—	63	14'-0	1388
A6a3	Slab, Transv., Bott., Stage I	—	64	19'-1	1834
A6a4	Slab, Transv., Bott., Stage II	—	64	14'-8	1410
A5b1	Slab, Longit., Top	—	38	42'-2	1671
A5b2	Slab, Longit., Bott.	—	30	42'-2	1319
A5d1	Abut. Diaphr., Longit., F.F.	—	24	3'-11	98
A5d2	Abut. Diaphr., Longit., B.F., Stg. I	—	6	17'-3	108
A5d3	Abut. Diaphr., Longit., F.F., Stg. II	—	6	12'-10	80
A5d4	Interm. Diaphr., Vertical	—	8	2'-6	21
A5d5	Paving Notch, Longit., Ends	—	4	4'-2	17
A5e1	Abut. Diaphr., Vertical	—	120	5'-5	678
A5e2	Paving Support	—	64	3'-11	261
A5e3	Interm. Diaphr., Vertical	—	8	5'-2	43
A6f1	Abut. Diaphr., B.F., Vert.	—	56	12'-6	1051
4	ABUT. REPAIR — E.W.O.	—	8	17'-0	150
Reinforcing Steel-Epoxy Coated				Total -lbs	11935

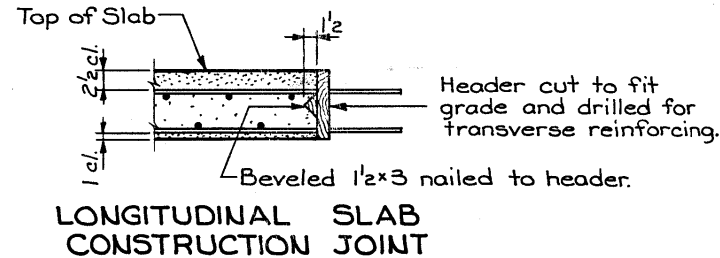


CONCRETE PLACEMENT		SUMMARY
Location		Quantity
Slab and Diaphragms, Stage I		12.3
Slab and Diaphragms, Stage II		33.6
ABUT. REPAIR BY E.W.O.		5.36
Total - (cu. yds.)		51.26

△ EPOXY COATING NOTE:
From the reinforcing bar list shown on this sheet, the following size and length of bars to be epoxy-coated in accordance with current Special Provisions and Supplemental Specifications of the Iowa D.O.T. Highway Division are as follows:
4,119 lin. ft. of #5 bar; 4,296 lbs.
4,986 lin. ft. of #6 bar; 7,489 lbs.
224 lin. ft. of #4 bar; 1,501 lbs.
11,935 lbs.

Moments in Ft.-Kips MOMENT & REACTION TABLE			Reaction in Kips
	Maximum Moments		Reactions
Dead Load	110		10.6
Live Load	163		24.2
Impact	49		7.3

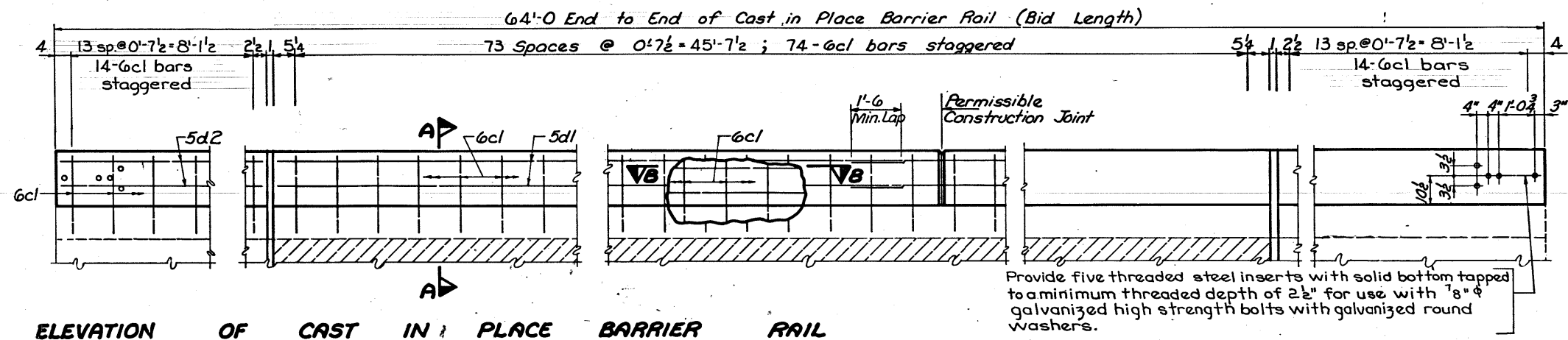
NOTE: Dead Load includes weight of slab, haunch, intermediate diaphragm and steel I-Beam. Live load and impact moment shown are for Iowa Legal Truck Loading, Type 4, and Live Load and Impact Reactions shown are for Iowa Legal Truck Loading, Type 3S3.



Design For Remodeling
40'-0" x 44' I-BEAM BRIDGE
40'-0" Span
SUPERSTRUCTURE DETAILS
Station: 410+53.60 November, 1987
BREMER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION
Design Sheet No.: 9 Of 17 File No.: 27527 Design No.: 187

REVISED 12-19-86; GRADE 60 REINFORCING STEEL NOTE ADDED.

Revised 6-3-85: Dowel Setting Note changed.
Revised 8-23-83: Notes concerning steel inserts and anchor bolts changed.
Revised: 7-7-81; Grout requirement changed.
Revised: 4-16-1980; This sheet re-drawn.



EPOXY REINFORCING STEEL ~ TWO RAILS

BAR	LOCATION	SHAPE	Nº	LENGTH	WEIGHT
6cl	Rail, Vertical	—	204	2'-4"	715
5d1	Rail, Longitudinal	—	16	23'-11"	399
5d2	Rail, Longit. Ends	—	16	8'-4"	139
TOTAL (lbs.)					1,253

CONCRETE PLACEMENT SUMMARY

CONCRETE	TOTAL
128,000' @ 0.05 cu yds per lin. ft.	6.4

ESTIMATED QUANTITIES

ITEM	UNITS	QUANTITY
Rail, Concrete Barrier (Cast in Place)	lin. ft.	128.0

CAST IN PLACE BARRIER RAIL NOTES:

Minimum clear distance from face of concrete to near reinforcing bar is to be 2" unless otherwise noted or shown.

All exposed corners 90° or sharper are to be filleted with a 3/4" dressed and beveled strip.

Top of the cast in place barrier rail is to be parallel to the theoretical & grade.

The permissible construction joints are to be placed between vertical bars at a minimum spacing of 20 feet. Construction joint contact surfaces are to be coated with an approved bond breaker.

Cost of joint sealer and bond breaker shall be considered incidental to other construction.

The cast in place barrier rail is to be bid on a lineal foot basis measured from end to end of rail. The number of lineal feet of cast in place barrier rail installed will be paid for at the contract price per lineal foot based on plan quantities. Price bid for cast in place barrier rail shall be full compensation for furnishing all material, including reinforcing steel, and all of the equipment and labor required to erect the rail in accordance with these plans and current specifications.

All cast in place barrier rail concrete is to be Class D.

The joint sealer shall conform to Fed. Spec. TT-S00230 or TT-S00227 for type II, Class A or B.

All reinforcing is to be epoxy coated.

All reinforcing steel is to be Grade 60.

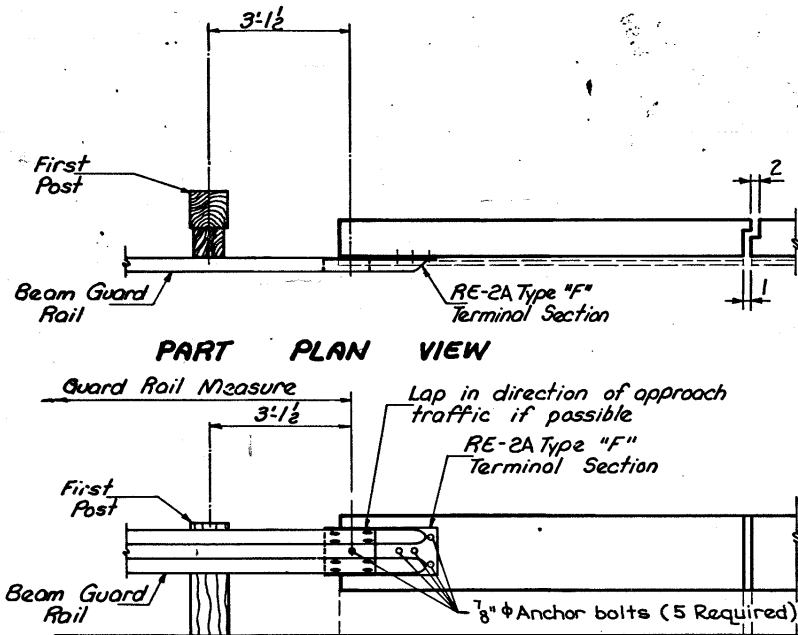
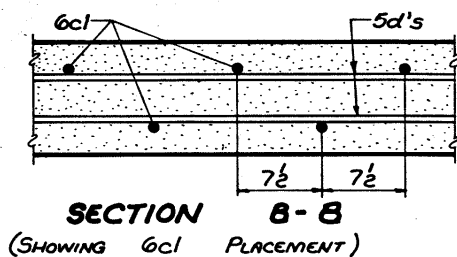
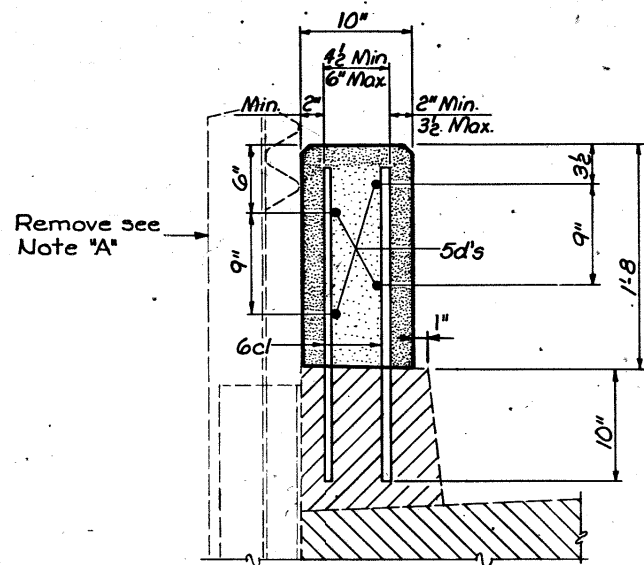
Anchor bolts shall conform to requirements of ASTM A 325 or A 449 and shall be galvanized in compliance with ASTM A-153. Anchor bolts shall be installed in threaded steel inserts held in proper position by use of an assembly set in the concrete and allowing a minimum embedment of 2 1/2" for the anchor bolts. The components and procedure shall be subject to the approval of the Engineer.

The cost of the RE-2A Type F terminal section, threaded steel inserts and anchor bolts shall be included in price bid for "Cast in Place Barrier Rail".

DOWEL SETTING NOTE

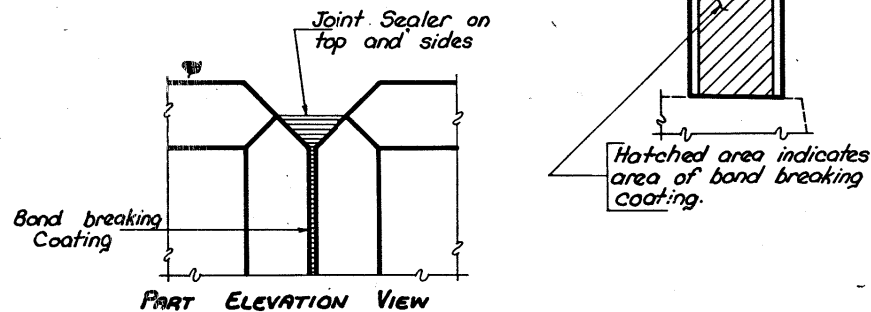
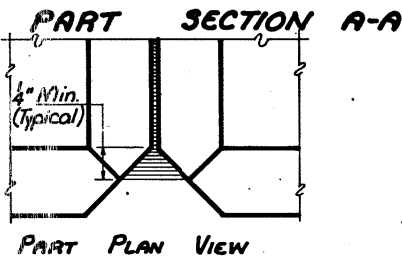
The 6cl bars shall be set as dowels in drilled holes. Holes are to be 10" deep. The dowels shall be installed in accordance with the manufacturer's recommendations. One of the two following systems shall be used as a bonding agent for the dowels:

- EPOXY GROUT SYSTEM IN ACCORDANCE WITH STANDARD SPECIFICATIONS ARTICLE 2301.15.
- HYDRAULIC CEMENT GROUT SYSTEMS. DRILLED HOLES ARE TO BE 2 1/2 TIMES THE DOWEL DIAMETER AND ARE TO BE BLOWN CLEAN WITH COMPRESSED AIR IMMEDIATELY PRIOR TO PLACING GROUT. THE HYDRAULIC CEMENT GROUT SHALL BE ONE OF THOSE APPROVED IN MATERIALS I.M. 491.13 AND SHALL BE USED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.



PART ELEVATION VIEW (Showing beam guard rail attachment to RE-2A Type "F" Terminal Section)

NOTE A:
EXISTING ANCHOR BOLTS SHALL BE CUT OFF FLUSH WITH OR SLIGHTLY BELOW CONCRETE SURFACE AND THE REMAINING EXPOSED ENDS PAINTED WITH TWO COATS OF ZINC RICH PAINT. CUTTING AND PAINTING OF THE EXISTING ANCHOR BOLTS SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.
IF THE EXISTING ANCHOR BOLTS ARE STAINLESS STEEL THEY MAY BE LEFT IN POSITION AT THE CONTRACTOR'S OPTION SUBJECT TO THE APPROVAL OF THE ENGINEER.



CAST IN PLACE BARRIER RAIL JOINT DETAILS

Design For Remodeling
40'-0" x 44" I-BEAM BRIDGE
40' Span
CAST IN PLACE BARRIER RAIL DETAILS
Station: 410+53.60 November, 1987
BREMER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION
Design Sheet No. 10 Of 17 File No. 27527 Design No. 187

DESIGNED BY: W.D. Tucker
DETAILED BY: D.A. Wright

TRACED BY:
CHECKED BY: Changlong Ji

CAST IN PLACE BARRIER RAIL

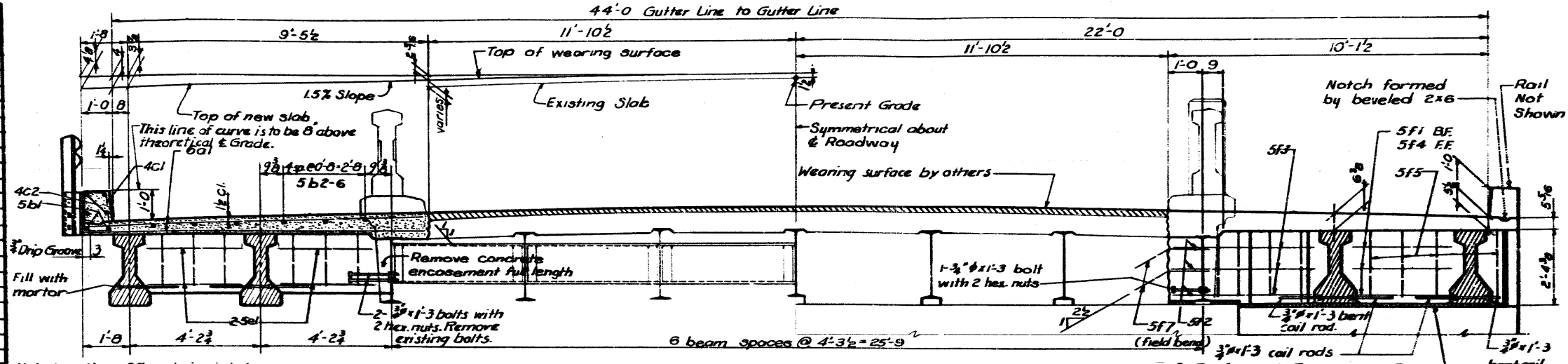
STANDARD SHEET 1031

BREMER COUNTY

STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	8		12	19

Bar	Location	Shape	N ^o	Length	Weight
6a1	Slab Transv. Top & Bt.	—	170	10'-11"	2788
6a2-3	" " " " " "	—	8	Varies	99
6a4-5	" " " " " "	—	8	Varies	35
5b1	" " " " " "	—	28	23'-8"	691
5b2-6	" " " " " "	—	60	Varies	472
4c1	Curb Hoops	□	74	3'-5"	169
4c2	" " " " " "	—	16	23'-6"	251
5e1	Inter. Diaphragm Horiz.	—	32	3'-0"	100
5e2	" " " " " "	—	64	4'-11"	123
5f1	Abut. B.F. Horiz.	—	12	7'-2"	90
5f2	" " " " " "	—	12	6'-9"	85
5f3	" " " " " "	—	12	4'-1"	51
5f4	" " " " " "	—	12	2'-8"	33
5f5	" " " " " "	—	32	5'-11"	197
5f7	" " " " " "	—	8	2'-6"	21
4g1	Paving Notch Longit.	—	8	4'-4"	23
4g2	" " " " " "	—	20	3'-4"	45
TOTAL					5323

Note: Location of floor drains is to be as shown on Situation Plan.



HALF INTERMEDIATE SECTION
Scale: 1/2"=1'-0"

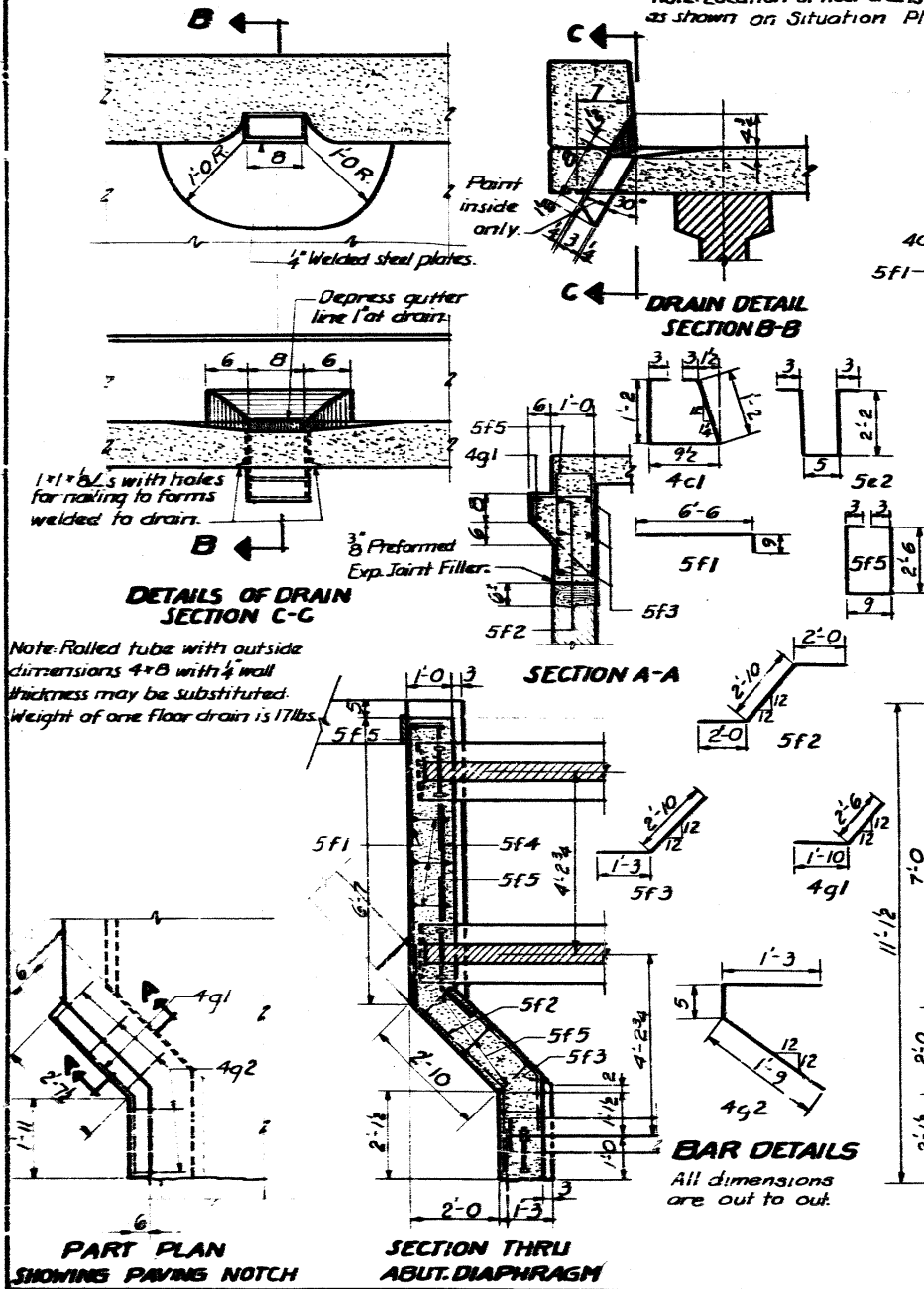
HALF SECTION NEAR ABUTMENT

NOTE: Beams are to be set on 6x3x11-2 1/2 Fabric Bearing Pads. See detail on Sheet 4.

THIS SHEET FROM ORIGINAL DESIGN PLANS TO SHOW EXISTING ROADWAY CROSS SECTION, SLAB THICKNESS AND CROWN ORDINATES.

SUPERSTRUCTURE NOTES.

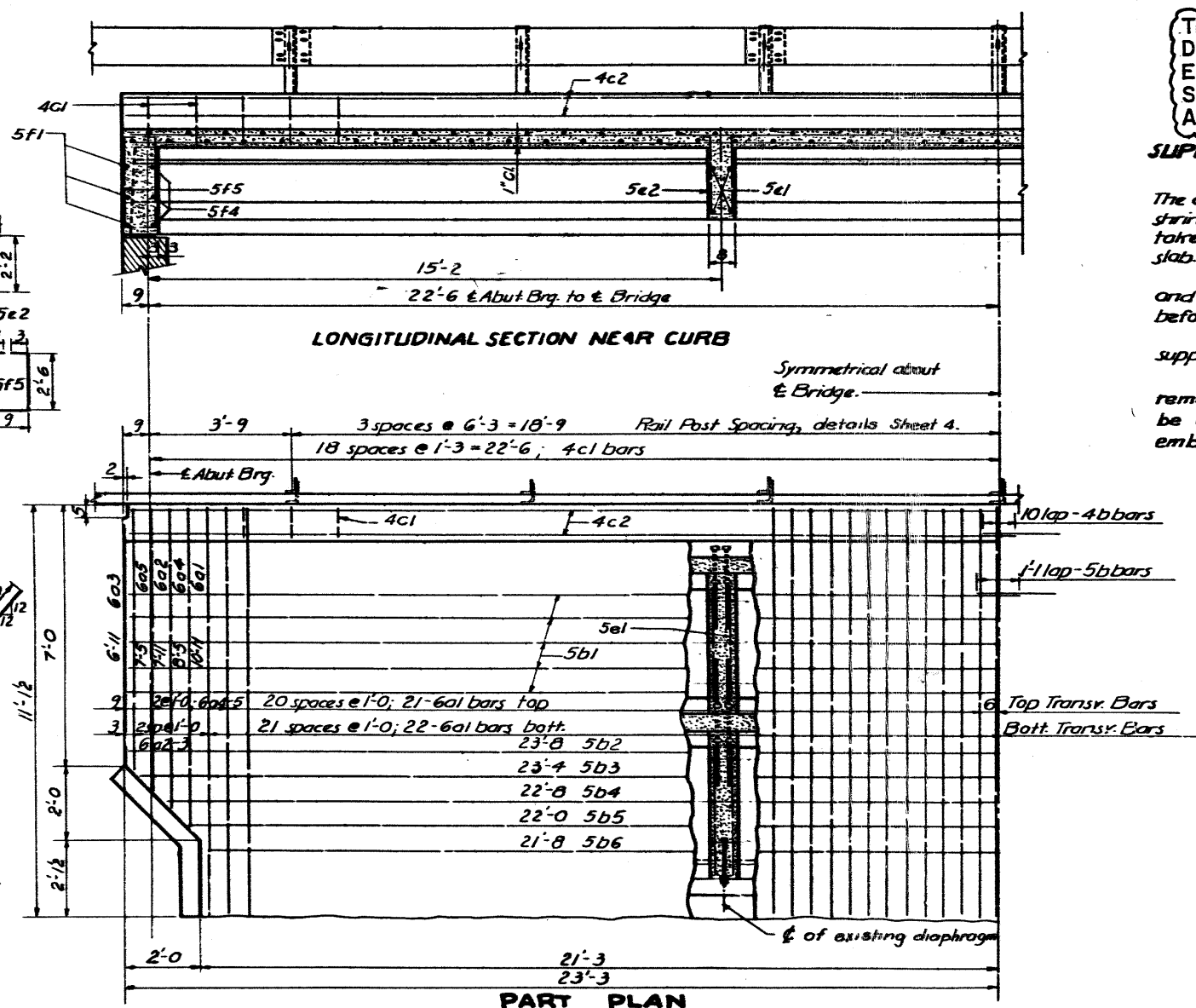
- The slab concrete is to contain no class II aggregate. The concrete is to be placed as dry as practicable to reduce shrinkage to a minimum and special precaution is to be taken to secure a complete bond between the beam and slab.
- All slab reinforcing is to be securely wired in place and is to be adequately supported on metal bar chairs before placing the concrete.
- Forms for the slab and for the curb are to be supported by the beams.
- All existing slab reinforcing exposed while removing curb and beam encasement shall not be cut off but shall be straightened and embedded in new slab.



PART PLAN SHOWING PAVING NOTCH

SECTION THRU ABUT. DIAPHRAGM

BAR DETAILS
All dimensions are out to out.



LONGITUDINAL SECTION NEAR CURB

PART PLAN

TOTAL ESTIMATED QUANTITIES-SUPERSTR.		
Item	Unit	Amount
Structural Concrete Class D	c.y.	29.8
Reinforcing Steel	lbs.	5323
Structural Steel	lbs.	1390
Prestressed Prest. Conc. Bms. 45'-0"	N ^o	4
Formed Steel Beam Rail	L.F.	125.0

① Length is to end of end posts.
Price bid for this item shall include 4 curved end sections and special 5/8" bolts necessary for erection.

DESIGN NO. 187
FILE NO. 27527
DES. SH. NO. 12 OF 17

Design for Widening under Traffic
40' x 24' I-BEAM BRIDGE
TO
40' x 44' I-BEAM BRIDGE
SUPERSTRUCTURE DETAILS
Station 110+53.60 Proj. N^o F-88(9)
BREMER COUNTY
Iowa State Highway Commission
April 1961 Sheet 3 of 4
Design N^o 365 Bremer County File N^o 21230

204-1
1-20-84

The installation of each continuous piece of guardrail shall be completely functional within five consecutive working days. The following shall apply unless modified by the engineer:

Grading work, if necessary, shall be completed prior to the removal of any existing guardrail or the installation of new guardrail.

Removal of any existing guardrail and installation of new posts and beam rail, except for the approach end section, shall be completed on the same working day. Beam rail shall be fully connected to all posts and protected with a Type E terminal section plus Type II barricade with Type A warning light.

Not later than the next working day, concrete for the end anchorage (RE-52 or RE-53) shall be poured.

204-2
1-20-84

All holes resulting from operations of the contractor, including removal of guardrail posts, fence posts, utility poles, or foundation studies, shall be filled and consolidated to finished grade as directed by the engineer to prevent future settlement. The voids shall be filled as soon as practical--preferably the day created and not later than the following day. Any portion of the right-of-way or project limits (including borrow areas and operation sites) disturbed by any such operations shall be restored to an acceptable condition. This operation shall be considered incidental to other bid items in project.

204-3
8-20-85

All formed steel beam railing and posts that are to be removed and reinstalled on this project shall meet the approval of the engineer before reinstalling. Painted steel beam railing and painted posts shall not be used on this project.

EROSION CONTROL

Seeding, fertilizing, and mulching of all disturbed areas following the work on this project and as directed by the engineer.

Seeding: 3 lbs. per 1,000 sq. ft. of Fescue, Ky. 31

Fertilizer: Rate--15 lbs. of 15-15-15 or equivalent chemically combined commercial fertilizer per 1,000 square feet.

Mulch: Rate--75 lbs. of Dry Cereal Straw per 1000 sq. ft.

The preparation of the seedbed, furnishing and application of seed, fertilizer, and mulch to all disturbed areas on this project shall be considered incidental to work on this project and no extra compensation will be allowed.

213-1
1-20-84

It shall be the contractor's responsibility to provide waste areas or disposal sites for excess material which is not desirable to be incorporated in the work involved on this project (excavation or broken concrete). No payment for overhaul will be allowed for material hauled to these sites.

251-2
6-22-84

The contractor is hereby notified that removal of any existing traffic markers, warning devices or guardrail barriers shall be scheduled subject to the approval of the engineer. The contractor may be required to place temporary warning devices at certain locations where replacement features are not installed the same day during which any such removals take place.

ESTIMATE REFERENCE INFORMATION

100-4

1-23-85

Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.

ITEM NO.	DESCRIPTION
14, 15, 19, 20.	See Standard Road Plan RK-16 for details.
16.	Contractor shall provide required material. Quantity is estimate only and payment will be made on the actual volume of material placed.
21.	To be hauled to maintenance yard as directed by the engineer.
22, 25.	To be disposed of as per Standard Notation 213-1.

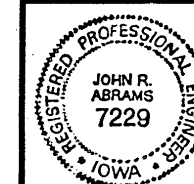
ESTIMATED ROADWAY QUANTITIES

100-00

1-20-84

No.	ITEM	UNIT	TOTAL
14	Backfill, Special	Tons	93.45
15	Bridge Approach Section, Reinforced	Sq.Yds.	196
16	Embankment-in-Place	Cu.Yds.	68
17	Guardrail, End Anchorages, Beam RE-52	No.	4
18	Guardrail, Posts, Beam	No.	52
19	Pavement, Standard P.C. Conc. Class C 10 in.	Sq.Yds.	233.7
20	Paved Shoulders, Class 1 P.C. Conc.	Sq.Yds.	0
21	Removal of Object Markers	No.	4
22	Removal of Posts	No.	24
23	Remove & Reinstall Formed Steel Beam Guardrail	Lin.Ft.	250
24	Object Marker, Type 3	No.	4
25	Removal of Pavement	Sq.Yds.	337.7

ROADWAY DESIGN



I hereby certify that this plan was prepared under my supervision and that engineering decisions with regard to the design were made by me or by other duly Registered Professional Engineers under the laws of the State of Iowa.

Name John R. Abrams
Iowa Registration No. 7229 Date _____

TABULATION OF "W" BEAM GUARDRAIL INSTALLATIONS

(Refer to appropriate Standard Road Plans)

LOCATION		STANDARD ROAD PLAN	Case	FORMED STEEL "W" BEAM GUARDRAIL				BEAM GUARDRAIL POSTS				Post & Adapter RE-37	BEAM GUARDRAIL END ANCHORAGE						REMARKS
NO.	STATION			(L2) (Feet)	(A) Lin. Ft.	(H) Lin. Ft.	(T) Lin. Ft.	TOTAL Lin. Ft.	10"x10" SINGLE SPACER	8"x8" SINGLE SPACER	6"x8" NO SPACER		BRIDGE RE-26 RE-28	END RE-33 RE-52, RE-53	RE-27* RE-41* RE-49* RE-55* Special*	No.	Type	No.	
	410+54	EB	RE-57	G	62.5		62.5	125	6	16		4			RE-52	2	540-16	2	
	410+54	WB	RE-57	G	62.5		62.5	125	6	16		4			RE-52	2	540-16	2	

108-8
8-20-85

TABULATION OF GRADING FOR GUARDRAIL INSTALLATIONS

107-23

*Refer to Standard Road Plan RL-11 or Typical 4303 and 4306

07-21-87

LOCATION POINT		TYPE	DIMENSIONS*			CLASS 10 EXCAVATION Cu.Yds.	PIPE			REMARKS
No.	Station		(A) Lin.Ft.	(Y) Lin.Ft.	(Z) Lin.Ft.		Size Inches	Type	Length Lin.Ft.	
	409+59 NW	1		7	26	16				
	409+59 SW	1		7	26	12				
	411+48 NE	1		7	26	20				
	411+48 SE	1		7	26	20				

TABULATION OF DELINEATORS AND OBJECT MARKERS

108-17

Refer to Standard Road Plan RE-48A-B* and RE-29C **Not a bid item

11-10-83

LOCATION		TYPE*	DELINEATOR	OBJECT MARKER				REMARK
STATION	NO.		SINGLE WHITE D-1W	TRIPLE YELLOW OM2-3YV	TYPE 3		OFFSET BRACKETS **	
			NO.	NO.	OM-3L	OM-3R	NO.	
					NO.	NO.		
410+54	NE	3				1		
410+54	NW	3			1			
410+54	SE	3			1			
410+54	SW	3				1		

REMOVAL OF BEAM GUARDRAIL

110-7

11-10-83

REMOVAL OF BEAM GUARDRAIL											11-10-83
LOCATION		BEAM GUARDRAIL		POSTS					END ANCHORAGE		
				ROUND	8''x8''		10''x10''				
No.	Station	Remove	Remove & Reinstall	Remove	Remove	Remove & Reinstall	Remove	Remove & Reinstall	NO.	TYPE	Remarks
	410+54 NE		75	7							
	410+54 NW		50	5							
	410+54 SE		50	5							
	410+54 SW		75	7							

DESIGN NO. 187
FILE NO. 27527
DE S. SH. NO. 13 OF 17

BREMER COUNTY

PROJECT NUMBER

STATE
IOWA

FHWA Region
7

FISCAL YEAR
15

SHEET NO.
19

TOTAL SHEETS
19