

BRIDGE REPAIR
U-7-5(II)--40-94

WEBSTER COUNTY

Webster IA #26

947525007

CONVENTIONAL SIGNS

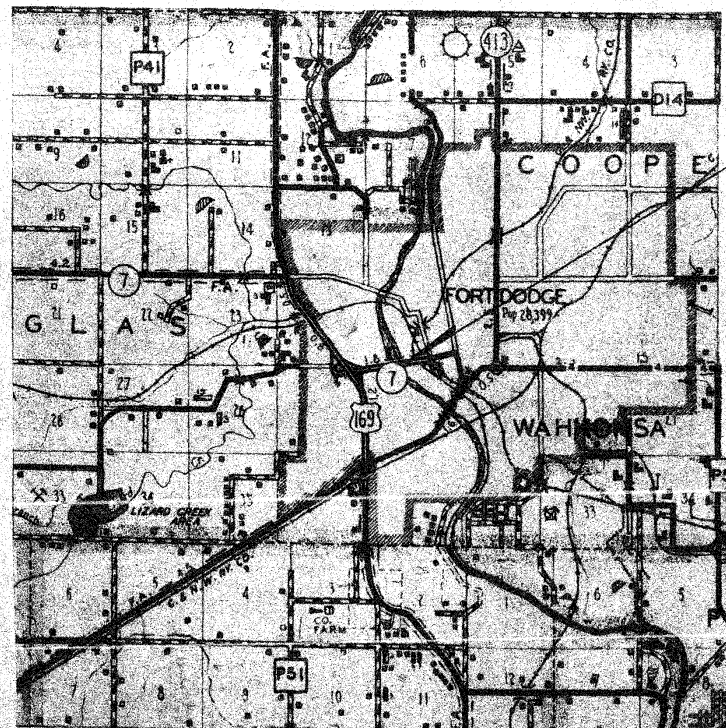
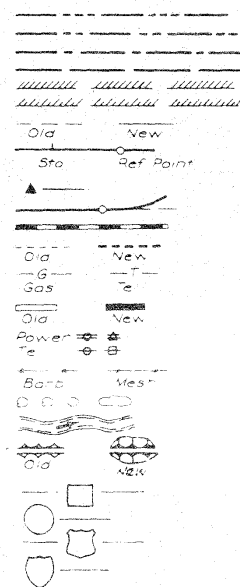
State Line
Co. Line
Twp. Line
Sec. Line
Corp. Line
Urban Bdry
R.O.W. Lines
Survey Line

Sec. Corner
Profile Grade
Railroad
Field Tile
Underground Lines

Culverts
Utility Poles

Fences
Trees Or Brush
Stream
Dike

County Road No.
Primary Road No.
U. S. Road No.
Interstate Road No.



R-29 W

LOCATION MAP



IOWA DEPARTMENT OF TRANSPORTATION Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE PRIMARY ROAD SYSTEM WEBSTER COUNTY

BRIDGE REPAIR

Ia #7 over Des Moines River - Karl King Bridge in Ft. Dodge

SCALES AS NOTED

THE STANDARD SPECIFICATIONS, SERIES OF 1972,
OF THE IOWA STATE HIGHWAY COMMISSION,
SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

(PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS)

Spec. 788 "Supplemental Specifications for Traffic Controls".

THIS PLAN INCLUDES:

BRIDGE REPAIR - WATERLOO, CONSTRUCTION - 1977

CONSTRUCTION PLANS
SHOWING PROJECT AS BUILT
PLAN PREPARATION SUPERVISED BY Ron Deibel DATE 3-31-78
RE'S. CONST. ENG.
REVIEWED & FORWARDED TO AMES BY Don Anderson DATE 3-31-78
DIST. CONST. ENG.
NO. OF COPIES (FULL 2 50% 1) TO BE MADE & RETURNED TO
DISTRICT ENGINEER
AFTER MICROFILMING RETURN ORIGINAL TO DISTRICT NO. 1

DES. NO. 177

NO MILEAGE SUMMARY

REV.
-90-

TRAFFIC COUNT
8500 AADT (1974)

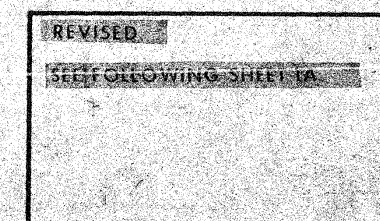
STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	1		1	14
PROJECT NUMBER				
U-7-5(II)--40-94				
R.O.W. PROJECT NUMBER				

INDEX OF SHEETS	
NO.	DESCRIPTION
1	Title Sheet
1A	REVISION SHEET
2	Estimate Sheet
3-14	Bridge Des. No. 177

DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION
STANDARDS REQUIRED (Available at Bridge Design Services)

STANDARD	ISSUED	REVISED
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NONE REQUIRED



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.
R. Deibel
IOWA REGISTRATION NUMBER 2792 DATE 3-7-77

U.S. DEPT. TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ENGINEER DATE

LETTING DATE APRIL 26, 1977

STATE CONTROL SECTION NUMBER 94-0700

FILE NO. 25875

WEBSTER COUNTY

PROJECT NO. U-7-5(II)--40-94

SHEET NO. 1 OF 14

LISTING OF PROJECT REVISIONS

DATE	SHEET NUMBER	DESCRIPTION OF REVISIONS	DATE	SHEET NUMBER	DESCRIPTION OF REVISIONS
4-5-77	1A of 14	Design 177			
	4 of 14	This sheet added to project (Revision Sheet).			
	3 of 14	"Epoxy" deleted from curb repair note.			
	1 of 14	Mortar material changed.			
		Sheet 1A added to "Index of Sheets".			
		REASON: Wrong application for mortar specified. No change in quantities.			
		MASTERS PRINTED			

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.
3-3-77
DATE
James R. Sassaman
JAMES R. SASSAMAN
REG NO 2663

Des. No. 177
WEBSTER COUNTY
Ia. #7 Karl King Br. Sta 213+16.00 to 224+25.00
in Ft. Dodge Br. Maint. No. 9403.00007
Section 19 T-89N, R-28W WAHKONSA Twp.
Design For Repairs to
MULTISPAN CONTINUOUS PLATE GIRDER
BRIDGE plus
90'-0" x 58' CONTINUOUS CONC. SLAB BRIDGE
~~ESTIMATE~~ ~~OF~~ ~~QUANTITIES~~

ITEM NO.	ITEM	UNITS	TOTAL
1	Bridge Floor Overlay	sq yds	7223
2	Class A Bridge Floor Repair	sq yds	2004
3	Structural Steel	lbs	15,162
4	Bridge Repair	l.s.	Lump Sum
5	Preformed Elastic Neoprene Joint, 1 1/2 in.	lin. ft.	71

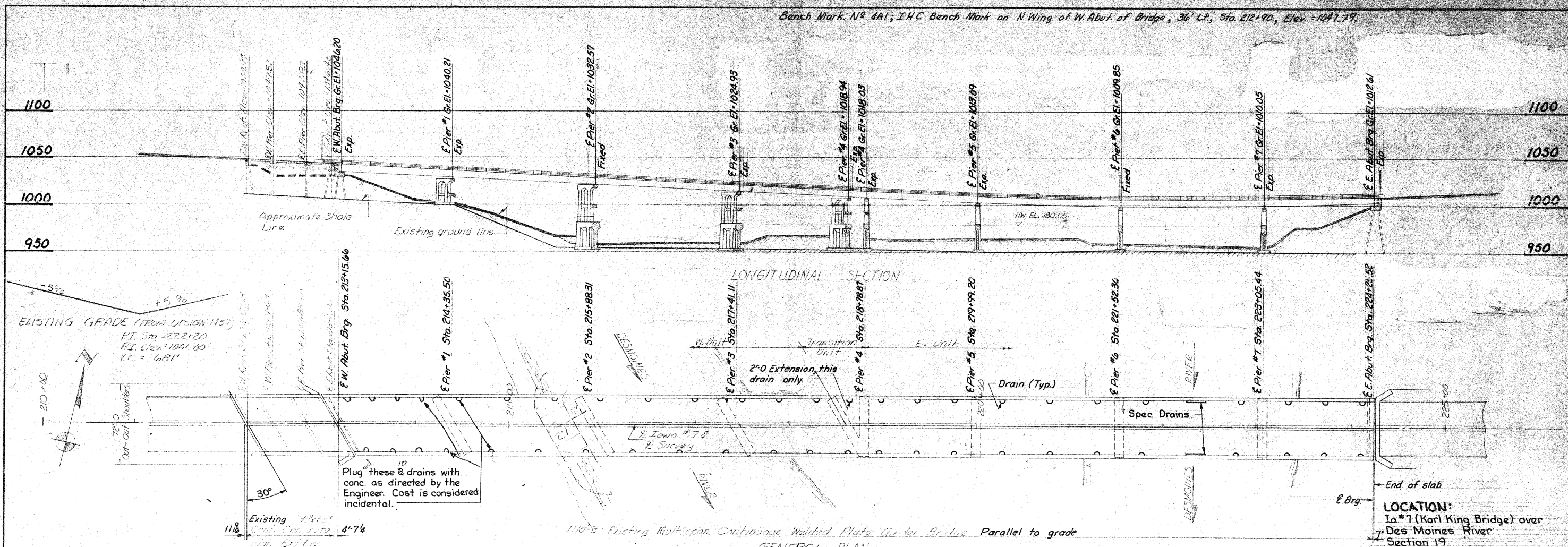
~~ESTIMATE~~ REFERENCE INFORMATION
Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.

ITEM NO.	DESCRIPTION
4	Non-participating item

EXTRA WORK ORDERS			
ITEM NO.	ITEM	UNIT	TOTAL
0001	INCREASE BRIDGE REPAIR	AGREED PRICE	
8002	MOVEMENT OF EQUIPMENT & MATERIALS	AGREED PRICE	
8003	CLASS B FLOOR REPAIR	SQ. YD.	211
8004	EXTRA WORK - DRAIN EXTENSIONS	AGREED PRICE	
8005	PILE & DRAINS & RAISE 2	AGREED PRICE	

ESTIMATE SHEET

Bench Mark: No. 4A1; IHC Bench Mark on N. Wing of W. Abut. of Bridge, 36' Lt., Sta. 212+90, Elev. = 1047.79.



SPECIFICATIONS:

Construction: Iowa State Highway Commission Specifications, Series of 1972, plus current Supplemental Specifications and Special Provisions of the Iowa Department of Transportation - Highway Division.
Spec. 788 "Supplemental Specifications for Traffic Controls."

TOTAL		ESTIMATED	QUANTITIES	
Item No.	Item	Units	Quantity	
1	Bridge Floor Overlay	sq yds	7,223	7,223
2	Class A Bridge Floor Repair	sq yds	2,004	2,004
3	Structural Steel	lbs	15,162	15,162
4	Bridge Repair	l.s.	Lump Sum	
5	Preformed Elastic Neoprene Joint, 1 3/4 in.	lin. ft.	71	71

Item No. 4 - Estimate Reference Information:
Non-participating item.

GENERAL NOTES:

This design is for repair to the existing Multispan Continuous Plate Girder Bridge (original Design No. 1457) and to the 90'-0x58' Continuous Concrete Slab Bridge (Design No. 1471) that was added to the west end of the plate girder bridge. Plans of the existing structure may be obtained at the Ames Office of the Highway Division. Repairs shall consist of bridge floor repair, bridge floor overlay, repair of some areas along outside fascia of south curb, adding tread plates to expansion devices, extending drains, and installing a preformed elastic neoprene seal at the east end of the slab bridge.

BRIDGE REPAIR

The outside fascia of the south curb of the plate girder bridge has some spalled areas that are to be repaired as noted and shown on sheet 2 of 12. The lump sum bid for "Bridge Repair" is to include all costs associated with repairing 20 lineal feet of curb. The areas to be repaired are to be designated by the engineer. The contractor shall repair more than 20 lineal feet of curb only if authorized by the engineer. Payment for repairing each additional foot of outside fascia of curb in excess of 20 lineal feet shall be one-twentieth of the lump sum bid for "Bridge Repair". Article 1109.03 of the standard specifications shall not apply to this item.

The curb is to be patched with epoxy mortar as indicated in the following steps:
1. Remove all spalled and deteriorated concrete to minimum depths shown or until a sound surface is developed.
2. Blast clean all surfaces that are to be patched.
3. Fill voids and patch areas with epoxy mortar and finish off to match original surface. Epoxy mortar is to be "Sikastix 360" as manufactured by the Sika Chemical Company. Epoxy mortar is to be used in accordance with the manufacturer's technical bulletin for the named product. Mortar shall consist of equal parts Portland cement and sand with enough water to make workable mix.

NEOPRENE JOINT

A preformed elastic neoprene joint seal is to be installed at the east abutment of the slab bridge. (See Detail A and Part Plan at Curb, Sheet 2 of 12.) The cost of furnishing and installing (including removal and replacing portion of curbs and forming the slot) joint seal is to be included in the bid item "Preformed Elastic Neoprene Joint, 1 3/4 in.". Neoprene joint seal is to be installed according to the manufacturer's recommendations.

STAGE CONSTRUCTION

Construction shall be done in stages with at least one lane of traffic maintained at all times in accordance with Highway Division Specs. No. 788 and with "Traffic Control Note" on Design Sheet 12 of 12. Cost for all traffic control devices, to be furnished and/or maintained by the contractor, will be considered incidental to other work and no separate payment will be made.

BRIDGE FLOOR REPAIR

A composite plot of preliminary surveys is shown on Design Sheets 4-11 of 13. Solid outlines represent boundaries of spalled and hollow areas determined by audible and visual sounding. Dashed outlines represent boundaries of high corrosion potential areas determined by an electrical corrosion detection device; it has been determined that significant corrosion of reinforcing is present when the device registers 0.45 volt. Hatched areas on the plot combine the spalled and hollow areas with additional areas of corrosion potential outside the spalled and hollow boundaries. The engineer will resurvey the floor and curbs, using the same methods, and establish these areas for repair as they exist at the time of construction.

Hatched areas, as shown on the plans or as adjusted by the engineer, are to be repaired by Class A repair methods. The entire concrete surface of the floor, including areas over Class A repair, shall have Bridge Floor Overlay. Surface raise, as shown on the plans, shall be considered a minimum; screed guides shall be adjusted to achieve a smooth profile.

Present floor thickness for concrete slab bridge is about 1'-3 3/8". The contractor shall exercise extreme care in order to prevent unnecessary removal of concrete below the top of the top reinforcing. The energy of hand tools shall be restricted near the bottom of designated Class A repair in order to prevent unnecessary unbonding of reinforcing. No concrete shall be removed below the top of the top longitudinal reinforcing without prior permission from the Bridge Engineer.

Present floor thickness for plate girder bridge is about 7 inches. The contractor will be required to exercise care in removing concrete in order to prevent unnecessary unbonding of reinforcing steel.

LOCATION:
1a #7 (Karl King Bridge) over
Des Moines River
Section 19
Wahkonga Twp.
T-89 N R-28 W
Webster County

TRAFFIC COUNT: 8500 A.A.D.T. (1974)

APPROACHES

The A.C. runoff taper at each end of the bridge will be placed by local Highway Division Maintenance forces before traffic is shifted to new construction. The contractor shall give adequate prior notice so that A.C. may be placed during normal working hours and working day of Maintenance.

STRUCTURAL STEEL

The bid item "Structural Steel" shall include all costs associated with furnishing and installing drain extensions and tread plates for expansion devices as shown and noted.

Design For Repairs to
MULTISPAN CONTINUOUS PLATE GIRDER
BRIDGE PLUS
90'-0x58' CONTINUOUS CONC. SLAB BRIDGE
Bridge Maintenance No. 9403.00007
REPAIR DETAILS
Station: 213+16.00 to 224+25.00 March, 1977
WEBSTER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION
Design Sheet No.: 1 Of 12 File No.: 25815 Design No.: 177

DESIGNED BY: D.A. Wright
CHECKED BY: J. Ballmann

TRACED BY: J. Ballmann
CHECKED BY: J. Ballmann

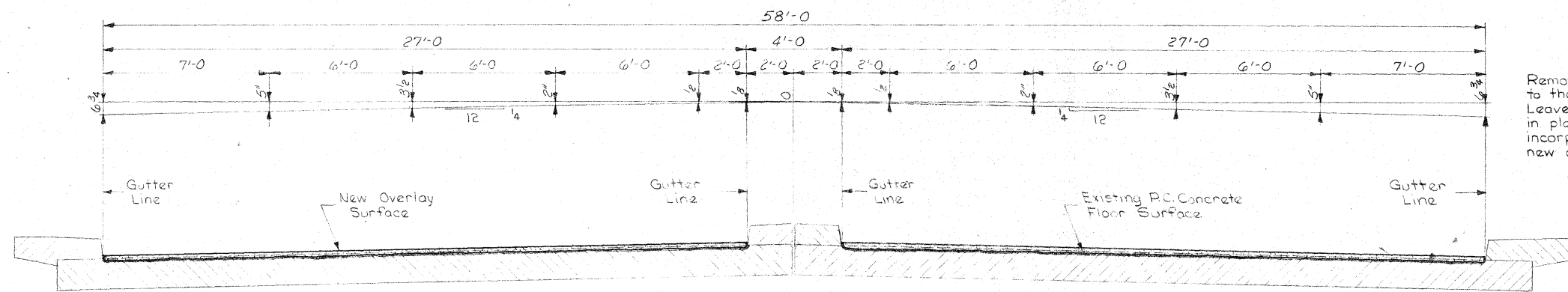
Section Leader: J. Ballmann

WEBSTER COUNTY

PROJECT NUMBER

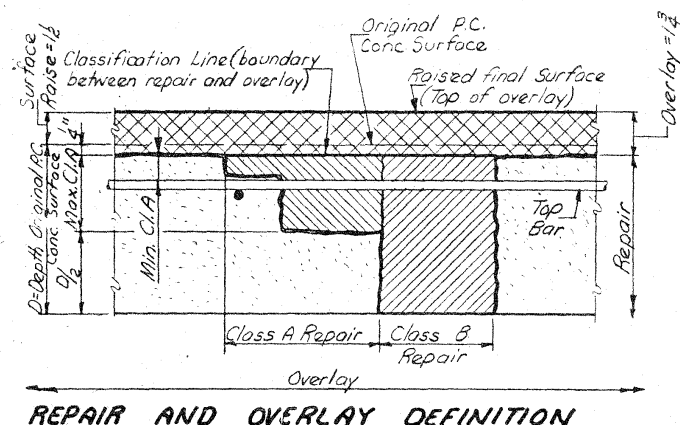
U-7-5(11)-40-94

STATE: IOWA
FED. ROAD DIST. NO.: 6
FISCAL YEAR: 1977
SHEET NO.: 3
TOTAL SHEETS: 14

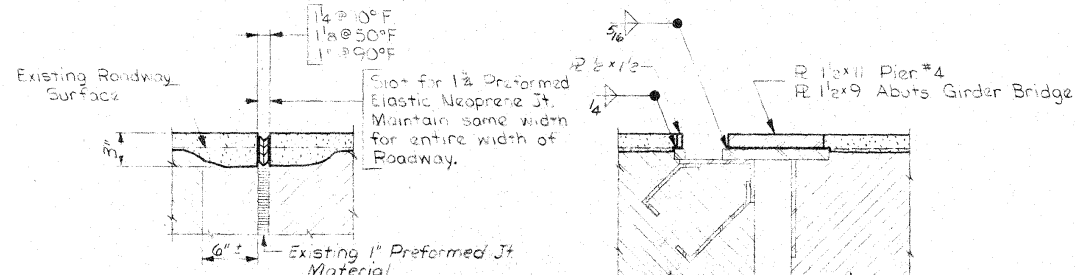


TYPICAL SECTION AT CONTINUOUS CONCRETE SLAB BRIDGE

Note: According to the old plans, the joint sealer over the preformed joint material extends down to 1 1/2" below the roadway surface. Remove the joint sealer and any joint material that is within 1 1/2" from the roadway surface.

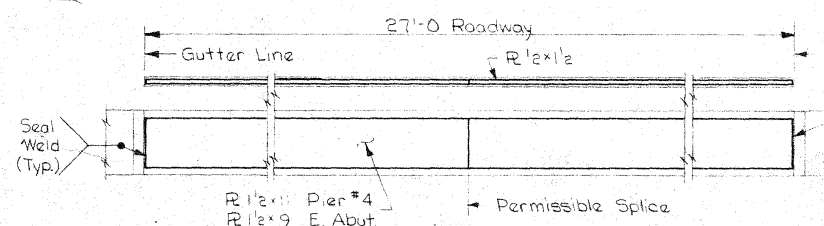


REPAIR AND OVERLAY DEFINITION

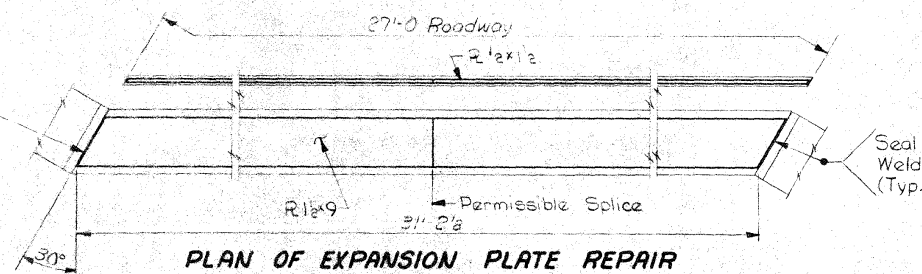


DETAIL "A"
Area for extra depth removal has been included in area for "Class A Bridge Floor Repair."

TYPICAL SECTION
EXPANSION DEVICE

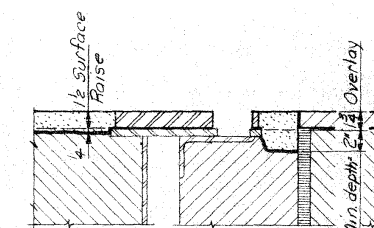
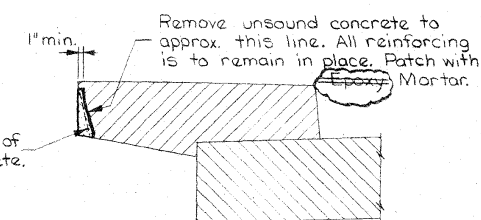


PLAN OF EXPANSION PLATE REPAIR
Typical Pier #4 & E. Abut. Girder Bridge



PLAN OF EXPANSION PLATE REPAIR
Typical W. Abut. Girder Bridge

CURB REPAIR DETAILS



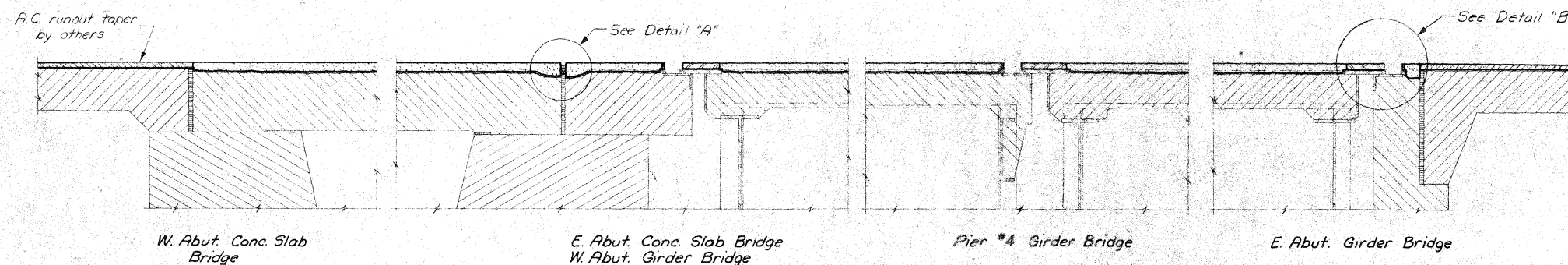
DETAIL "B"

Seal weld vertical faces of splice



PERMISSIBLE SPICE DETAIL

Fresh concrete shall not be placed closer than 6" to the plate splices until the welds have cooled.



PART LONGITUDINAL SECTION

Design For Repairs to
**MULTISPAN CONTINUOUS PLATE GIRDER
BRIDGE PLUS**
90'-0" x 58' CONTINUOUS CONC. SLAB BRIDGE
Bridge Maintenance No. 9403.00007
REPAIR DETAILS
Station: 213+16.00 to 224+25.00 March, 1977
WEBSTER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION
Design Sheet No.: 2 Of 12 File No.: 25815 Design No.: 177

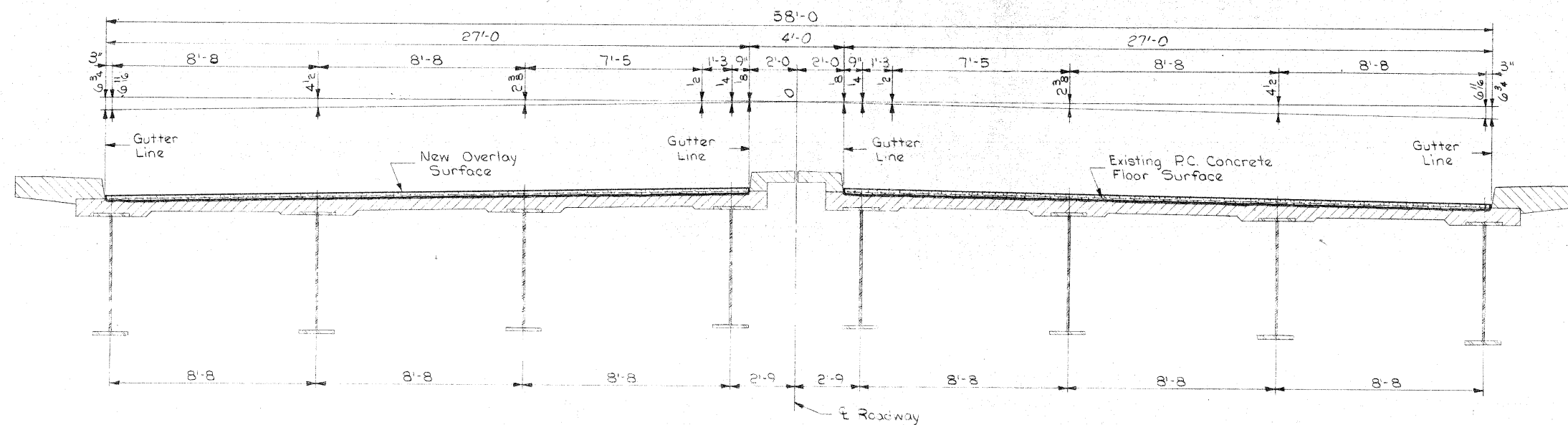
Revised 4-5-77: "Epoxy" deleted from curb repair note.

WEBSTER COUNTY

PROJECT NUMBER U-7-5(11)-40-94

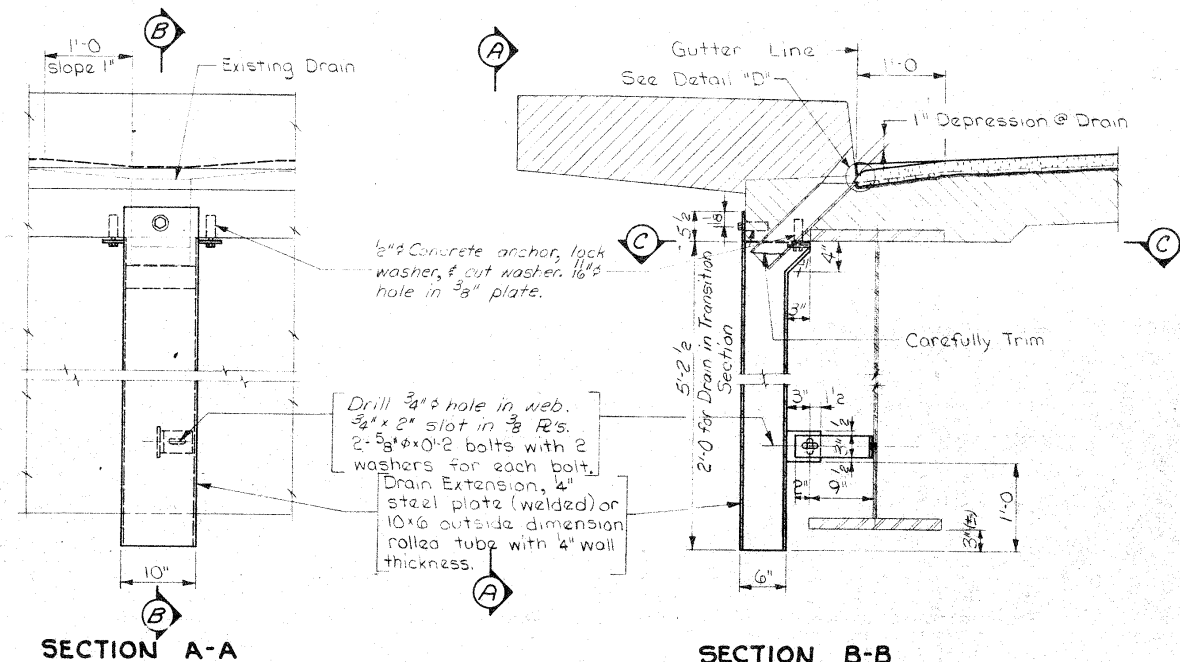
STATE IOWA FED. ROAD DIST. NO. 1 FISCAL YEAR 1977 SHEET NO. 12 TOTAL SHEETS 177

DESIGNED BY: J. Phillips
CHECKED BY: D. A. Wright
TRACED BY: J. Phillips
CHECKED BY: J. Phillips



TYPICAL SECTION AT GIRDER BRIDGE

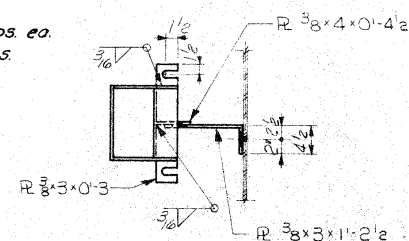
NOTE: New Overlay Surface is to be 1/2 inches above and parallel to Original P.C. Concrete Surface. Crown ordinates shown are from plans of existing bridge.



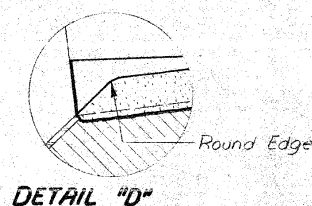
SECTION A-A

SECTION B-B

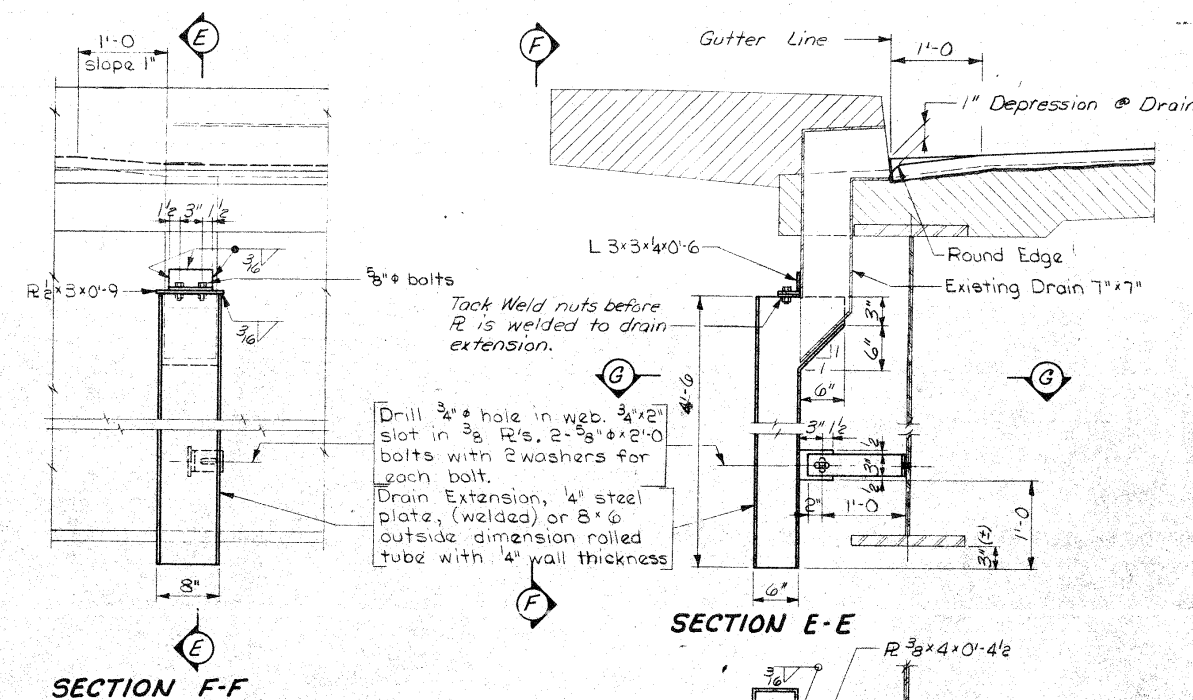
38 drains 5'-6 long Req'd. Wt. = 149 lbs. ea.
1 drain 2'-0 long Req'd. Wt. = 67 lbs.
Wt. based on tubing.



SECTION C-C



DETAIL "D"



SECTION F-F

DETAILS OF SPECIAL DRAIN EXTENSIONS

Wt. = 120 lbs. ea. 4 Required
Wt. based on tubing.

SECTION E-E

SECTION G-G

NOTE: The 1/2" anchor bolts shall have a minimum pull out strength of 5000 pounds based on 3500 psi concrete. A stud type anchor bolt which meets the requirements of Iowa D.O.T. Materials I.M. 453.09 and the pull out strength above is required. The anchor bolts are to have an electro-plated coating. All concrete anchors may be shifted slightly to clear reinforcing. The concrete anchors shall be installed according to recommendations of the manufacturer. Drain Extensions are to be galvanized after welding.

DRAIN EXTENSION DETAILS

NOTE: There are 6 drains in each span, except for 2nd span from E. end which has 4 plus 2 special drains. There is one additional drain in transition span on N. side. The drains in the W. end span of the girder bridge are plugged and won't need extensions. Drain Required: 20 N. Side, 19 S. Side. Drain Extension for transition span can be 2'-0 long. Two drains in 2nd span from west end are to be plugged (see sht. 1 of 12).

Design For Repairs to
**MULTISPAN CONTINUOUS PLATE GIRDER
BRIDGE PLUS
90'-0" x 58' CONTINUOUS CONC. SLAB BRIDGE**
Bridge Maintenance No. 9403.00007
REPAIR DETAILS
Station: 213+16.00 to 224+25.00 March, 1977
WEBSTER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION
Design Sheet No.: 3 Of 12 File No.: 25875 Design No.: 177

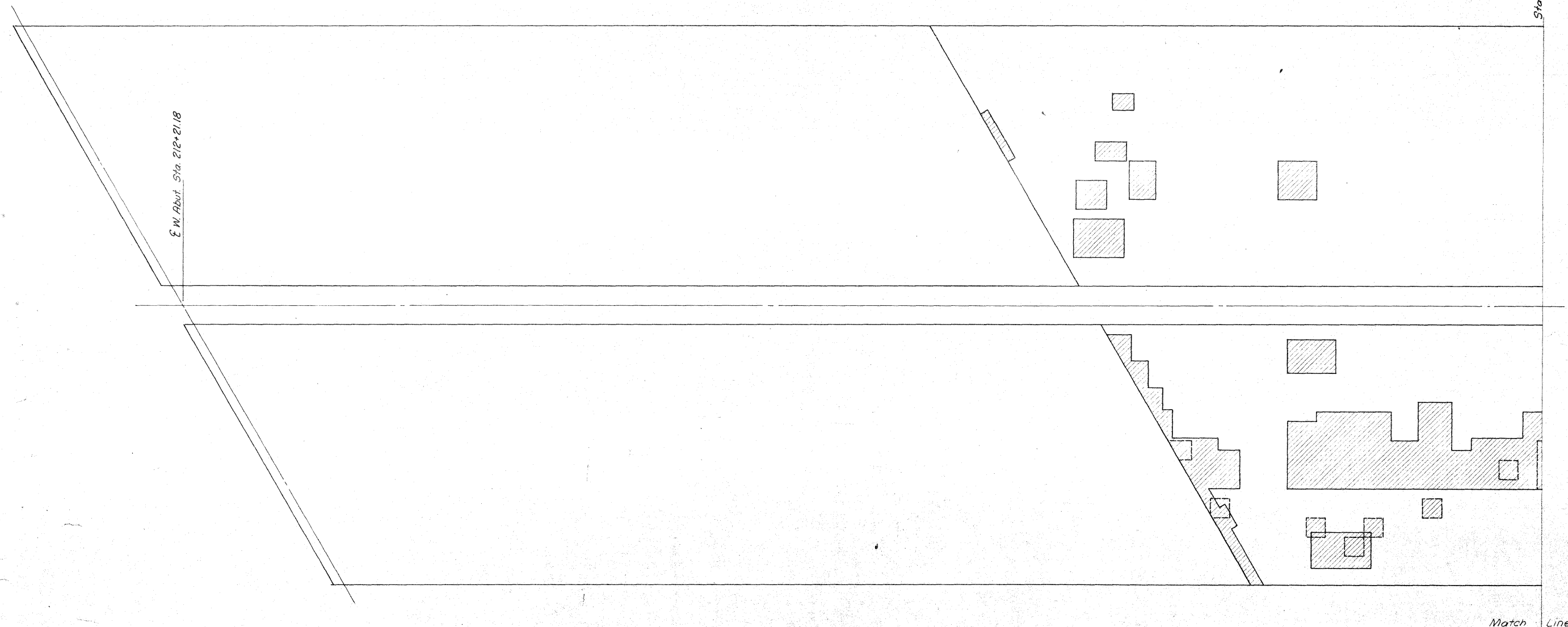
DESIGNED BY: L. Perkins
CHECKED BY: D. A. Wright

TRACED BY: L. Perkins
CHECKED BY: L. Perkins

WEBSTER COUNTY

PROJECT NUMBER U-7-5(11)-40-94

STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	5	77	3	14



PART PLAN OF BRIDGE FLOOR
 Scale: 1" = 5'
 — Audible Sounding and Visual Survey Areas
 --- Corrosion Potential Contours
 [Hatched Box] Repair Boundaries are defined by hatching



WEBSTER COUNTY

Design For Repairs to
MULTISPAN CONTINUOUS PLATE GIRDER
BRIDGE PLUS
90'-0" x 58' CONTINUOUS CONC. SLAB BRIDGE
 Bridge Maintenance No. 9403.00007
REPAIR DETAILS
 Station: 213+16.00 to 224+25.00 March, 1977
WEBSTER COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION
 Design Sheet No.: 4 Of 12 File No.: 25875 Design No.: 177

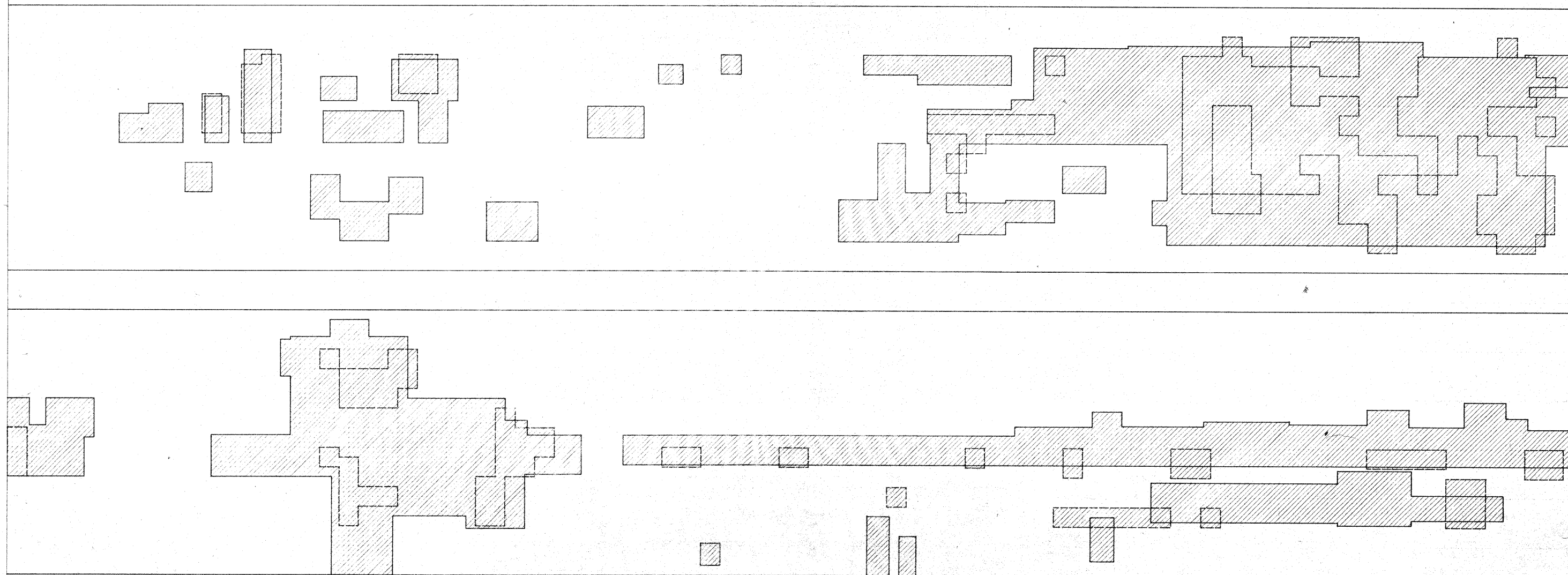
DESIGNED BY: _____
 CHECKED BY: _____

TRACED BY: *D.A. Wright*
 CHECKED BY: *J. Bellman*

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
U-7-5(11)--40-94	IOWA	8		6	14

Sta. 213+60.6±

Sta. 215+20.6±



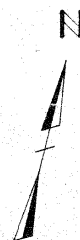
Match Line

Match Line

PART PLAN OF BRIDGE FLOOR

Scale: 1" = 5'

- Audible Sounding and Visual Survey Areas
- - - Corrosion Potential Contours
- ▨ Repair Boundaries are defined by hatching



DESIGNED BY _____
 CHECKED BY _____

TRACED BY: *D.A. Wright*
 CHECKED BY: *A. Johnson*

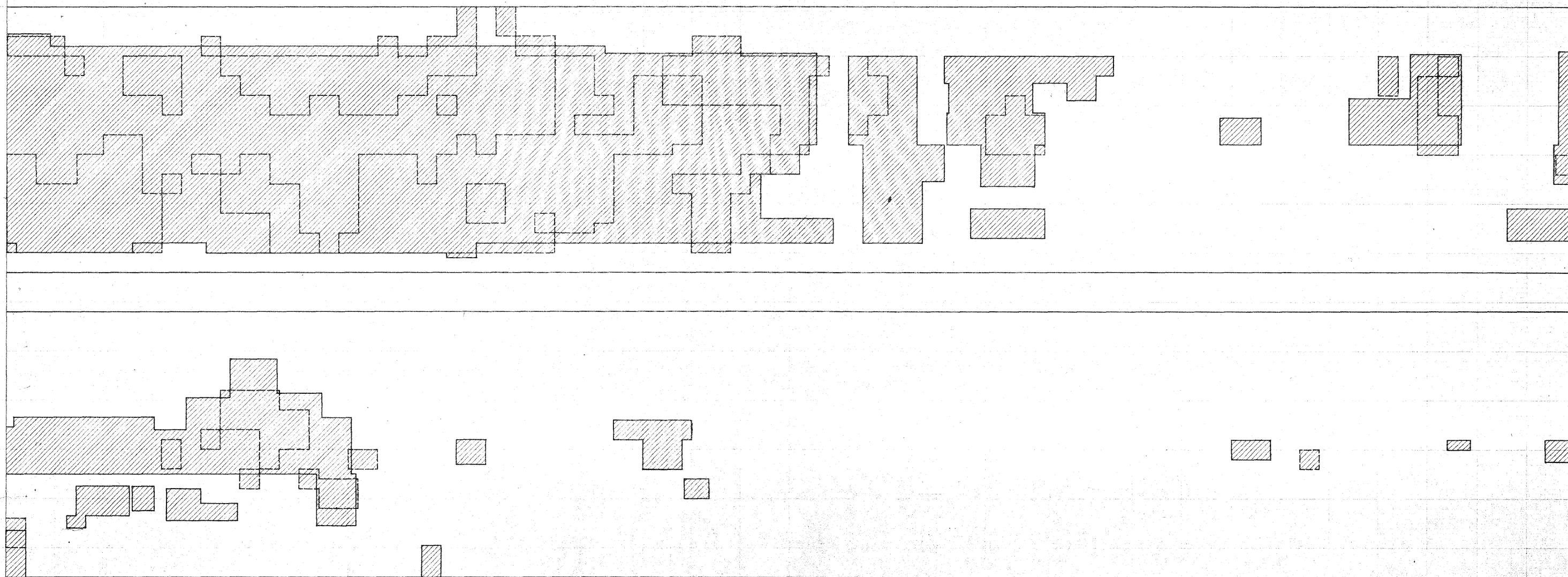
WEBSTER COUNTY

Design For Repairs to
MULTISPAN CONTINUOUS PLATE GIRDER
BRIDGE PLUS
90'-0" x 58' CONTINUOUS CONC. SLAB BRIDGE
 Bridge Maintenance No. 9403 00007
REPAIR DETAILS
 Station: 213+16.00 to 224+25.00 March, 1977
WEBSTER COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION
 Design Sheet No.: 5 Of 12 File No.: 25875 Design No.: 177

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
U-7-5(11)-40-94	IOWA	6		7	14

Sta. 216+80.6 ±

Sta. 218+40.6 ±



Match Line

Match Line

PART PLAN OF BRIDGE FLOOR

Scale: 1" = 5'

- Audible Sounding and Visual Survey Areas
- - - Corrosion Potential Contours
- ▨ Repair Boundaries are defined by hatching.

N



DESIGNED BY: _____
CHECKED BY: *D.A. Wright*
TRACED BY: *J. Callahan*

WEBSTER COUNTY

Design For Repairs to
**MULTISPAN CONTINUOUS PLATE GIRDER
BRIDGE PLUS
90'-0" x 58' CONTINUOUS CONC. SLAB BRIDGE**
Bridge Maintenance No. 9403.00007
REPAIR DETAILS
Station: 213+16.00 to 224+25.00 March, 1977
WEBSTER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION
Design Sheet No.: 7 Of 12 File No.: 25875 Design No.: 177

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
U-7-5(11)-40-94	IOWA	6		9	14

Sta. 218+40.6±

Sta. 220+00.6±

Match Line

Match Line

PART PLAN OF BRIDGE FLOOR

Scale: 1" = 5'

- Audible Sounding and Visual Survey Areas
 --- Corrosion Potential Contours
 ▨ Repair Boundaries are defined by hatching.

N

DESIGNED BY: _____
 CHECKED BY: *H. G. Wright*
 REVISIONS: _____

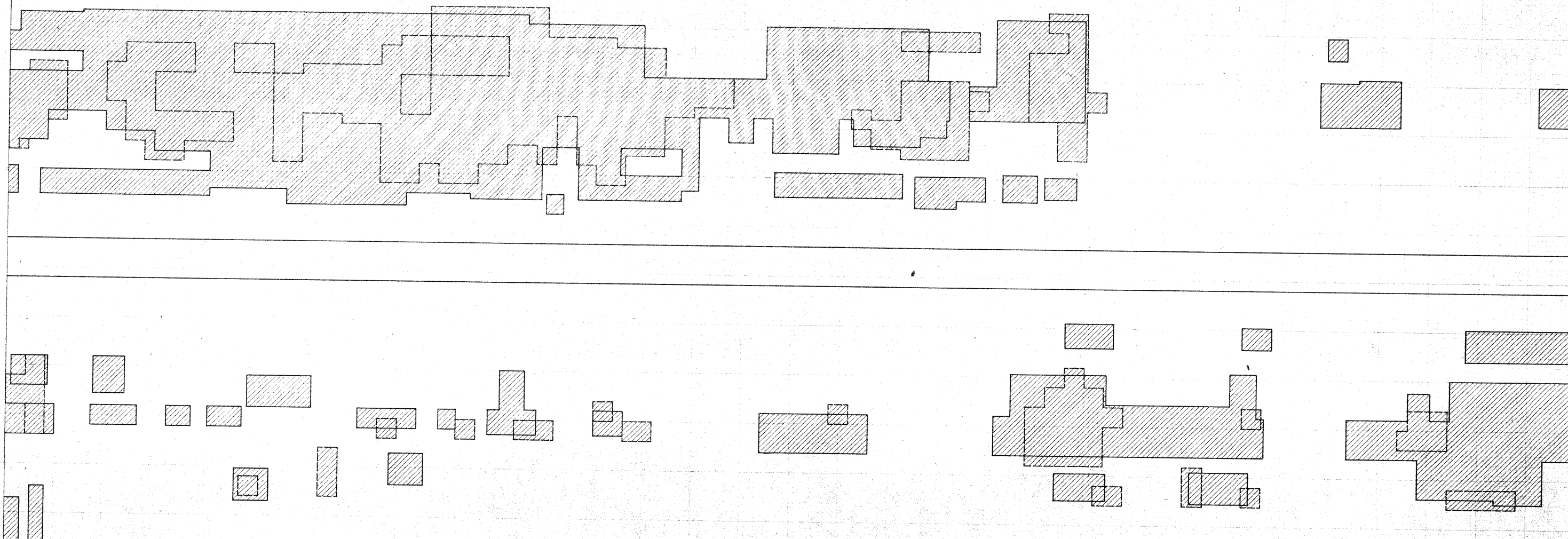
WEBSTER COUNTY

Design For Repairs to
MULTISPAN CONTINUOUS PLATE GIRDER
BRIDGE PLUS
90'-0" x 58' CONTINUOUS CONC. SLAB BRIDGE
 Bridge Maintenance No. 9403.00007
REPAIR DETAILS
 Station: 213+16.00 to 224+25.00 March, 1977
WEBSTER COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION
 Design Sheet No.: 8 Of 12 File No.: 25875 Design No.: 177

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
U-7-5(11)-40-94	IOWA	5		10	14

Sta. 20+00.6±

Sta. 221+60.6±



Match Line

Match Line

PART PLAN OF BRIDGE FLOOR

Scale: 1"=5'

- Audible Sounding and Visual Survey Areas
- - - Corrosion Potential Contours
- ▨ Repair Boundaries are defined by hatching.

N



DESIGNED BY: _____
CHECKED BY: _____

TRACED BY: *P.A. Wright*
CHECKED BY: *M. Keller*

WEBSTER COUNTY

Design For Repairs to
MULTISPAN CONTINUOUS PLATE GIRDER
BRIDGE PLUS
90'-0" x 58' CONTINUOUS CONC. SLAB BRIDGE
Bridge Maintenance No. 940300001
REPAIR DETAILS
Station: 213+16.00 to 224+25.00 March, 1977
WEBSTER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION
Design Sheet No.: 9 Of 12 File No.: 25875 Design No.: 177

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
U-7-5(11)-40-94	IOWA	1	11	14	

Sta. 221+60.6 ±

Sta. 223+20.6 ±



Match Line

Match Line

PART PLAN OF BRIDGE FLOOR

Scale: 1" = 5'

- Audible Sounding and Visual Survey Areas
- - - Corrosion Potential Contours
- ▨ Repair Boundaries are defined by hatching.

N



DESIGNED BY: _____
CHECKED BY: _____

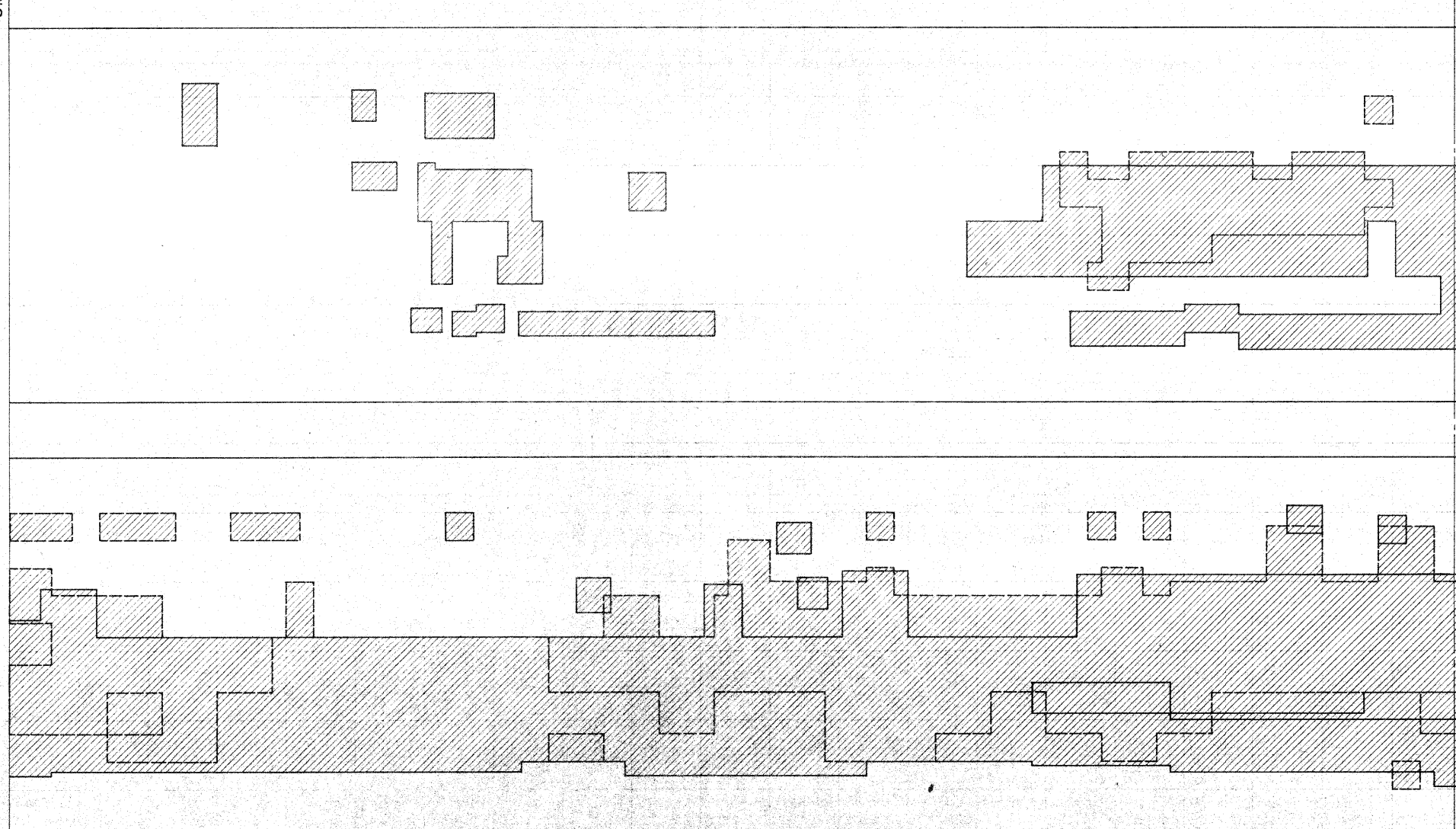
TRACED BY: *D.A. Wright*
CHECKED BY: *L. Collins*

WEBSTER COUNTY

Design For Repairs to
**MULTISPAN CONTINUOUS PLATE GIRDER
BRIDGE PLUS
90'-0" x 58' CONTINUOUS CONC. SLAB BRIDGE**
Bridge Maintenance No. 9403.00007
REPAIR DETAILS
Station: 213+16.00 to 224+25.00 March, 1977
WEBSTER COUNTY
IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION
Design Sheet No.: 10 Of 12 File No.: 25875 Design No.: 177

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
U-7-5(11)-40-94	IOWA	6		12	14

Sta. 223+20.6*



Match Line

E. E. Abut. Brg.
Sta. 224+25.52

PART PLAN OF BRIDGE FLOOR

Scale: 1" = 5'

- Audible Sounding and Visual Survey Areas
- Corrosion Potential Contours
- ▨ Repair Boundaries are defined by hatching

N



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DESIGNED BY: *[Signature]*
 CHECKED BY: *[Signature]*