

TO Dist. 4/23/82

BRIDGE
RETROFIT

FN-30-5(48)--21-85

STORY COUNTY

Story US 30#36

CONVENTIONAL SIGNS

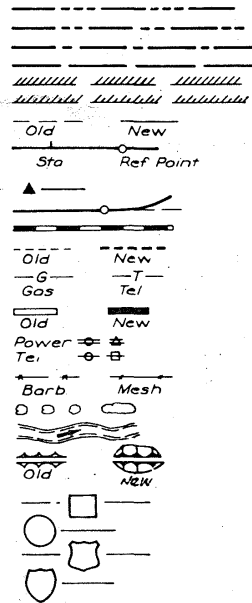
State Line
Co. Line
Twp. Line
Sec. Line
Corp. Line
Urban Bdry.
R.O.W. Lines
Survey Line

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.

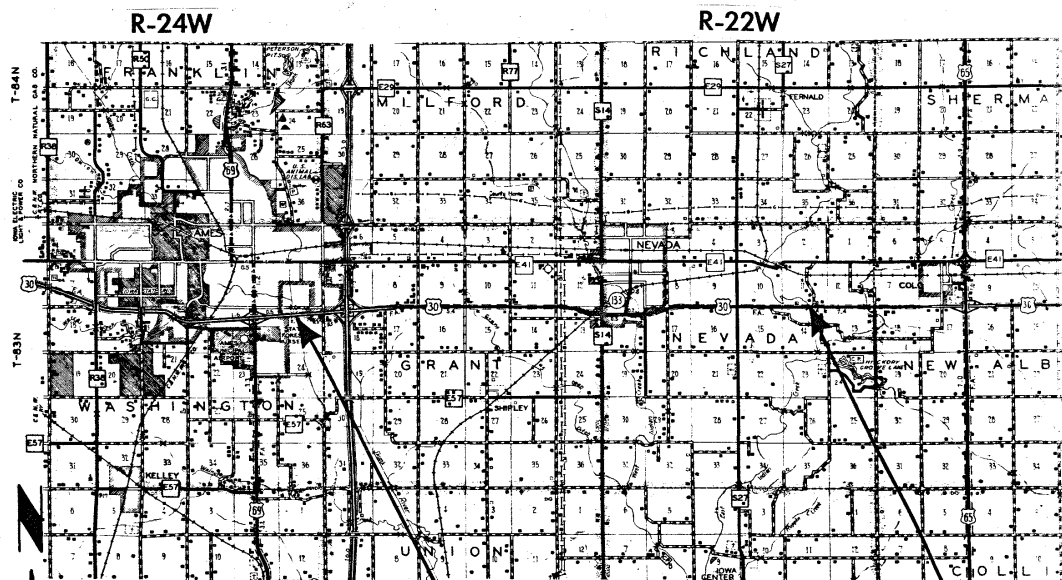


IOWA DEPARTMENT OF TRANSPORTATION Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE PRIMARY ROAD SYSTEM STORY COUNTY

**BRIDGE
RETROFIT**
ON TWO LOCATIONS ON U.S. 30
SKUNK RIVER IN AMES AND EAST INDIAN CREEK 2 MILES E. OF NEVADA
SCALES AS NOTED

THE STANDARD SPECIFICATIONS, SERIES OF 1977
OF THE IOWA DEPARTMENT OF TRANSPORTATION,
SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT
(PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS)



DES. NO. 781

~~DES. NO. 881~~

120

*to Paul
11-11-84
Done*

INSPECTOR - Bob BRANDSER 8-9-82 - 8-16-82

CONTRACTOR - DORMARK CONSTRUCTION CO.

RECEIVED

MAY 30 1984

IOWA DEPT. OF TRANSPORTATION
RESIDENCY 11 OFFICE

CORRECTED BY Richard Eccles
CHECKED BY Merrill M. Heintz

NOT TO SCALE

LOCATION MAP

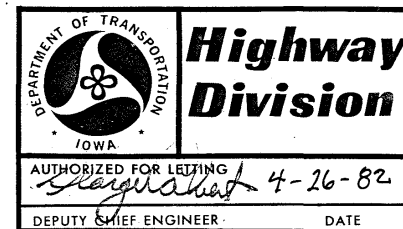


STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	5		1	14
PROJECT NUMBER				
FN-30-5(48)--21-85				
R.O.W. PROJECT NUMBER				
PRELIMINARY ENGINEER NUMBER				

INDEX OF SHEETS	
NO.	DESCRIPTION
1	TITLE SHEET
2	Quantity ESTIMATE SHEET
3-8	DESIGN NO. 781
9-14	DESIGN NO. 881

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

CONSTRUCTION PLANS
SHOWING PROJECT AS BUILT
Plan Preparation Supervised By: *E. J. Beck* Date: *12/27/83*
Reviewed & Forwarded to Ames By: *Ray Kuhn* Date: _____
No. of Copies (Full 3 50% _____) to be made & returned to:
Bob Humphrey (Typed Name)
After Microfilming Return Original to: _____



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. Pettit
2792 4-23-87
IOWA REGISTRATION NUMBER DATE

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

04-23-82 William C. Eyer
DATE WILLIAM C. EYER
REG. NO. 2926

IN LETTING OF JUNE 8, 1982

DESIGN NO. 781	OVER SKUNK RIVER	STA. 1301+20.00	
STORY COUNTY	MAINT. NO. 8550.2 R/L030		
SECTION 13	T-83N R-24W	WASHINGTON TWP.	
DESIGN FOR REPAIR TO 20° SKEW DUAL 320'-0 x 30' CONTINUOUS WELDED GIRDER BRIDGES			
ESTIMATE OF QUANTITIES			
NO.	ITEM	UNIT	TOTAL
1	Repair of Bridge	L.S.	\$7000.00 Lump Sum
2	Traffic Control	L.S.	\$1000.00 Lump Sum

ESTIMATE REFERENCE INFORMATION		100-4
Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.		
ITEM NO.	DESCRIPTION	

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.

04-23-82 William C. Eyer
DATE WILLIAM C. EYER
REG. NO. 2926

IN LETTING OF JUNE 8, 1982

DESIGN NO. 881	OVER EAST INDIAN CREEK	STA. 2292+93.00	
STORY COUNTY	MAINT. NO. 856155030		
SECTION 14	T-83N R-22W	NEVADA TWP.	
DESIGN FOR REPAIR TO 36° 52' SKEW 300'-0 x 30' CONTINUOUS WELDED GIRDER BRIDGE			
ESTIMATE OF QUANTITIES			
NO.	ITEM	UNIT	TOTAL
23	Repair of Bridge	L.S.	\$4000.00 Lump Sum
24	Traffic Control	L.S.	\$400.00 Lump Sum

ESTIMATE REFERENCE INFORMATION		100-4
Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.		
ITEM NO.	DESCRIPTION	

Quantity
ESTIMATE SHEET

The diagram illustrates a cross-section of a bridge structure with the following details:

- Elevations (Left Side):** 900, 890, 880, 870, 860, 850.
- Elevations (Right Side):** 900, 890, 880, 870, 860, 850.
- Structural Features:**
 - Abutments:** L.W. Abut. Brg. (Gr. El. 891.25) and R.W. Abut. Brg. (Gr. El. 891.35).
 - Piers:** Pier No. 1 Brg. (Gr. El. 891.71) and Pier No. 2 Brg. (Gr. El. 891.76).
 - Proposed Grade Line:** Indicated by a dashed line at the top.
 - Barrel Elav:** 880.18 (Left) and 880.32 (Right).
 - Present Ground Line:** Indicated by a solid line.
 - 2:1 Slope (Norm):** Indicated on both sides of the bridge.
 - Br. St. El.:** 882.44 (Left) and 882.50 (Right).
 - Design L.W. El.:** 881.05 (Left) and 880.85 (Right).
 - Ext. L.W. El.:** 880.85 (Right).
 - Str. Bed Elav:** 860.0 (Center).
 - Excavation Classification Line:** Indicated by a dashed line.
 - Bottom Ftg. El.:** 878.18 (Left), 859.94 (Center), and 880.00 (Right).
 - 35' Untreated Wood Piles:** Indicated in the center.
 - 35' Crossed Piles:** Indicated on both sides.
 - Bottom Ftg. El.:** 878.32 (Right).
- Horizontal Scale:** 0 to 150+00 (Left) and 150+00 to 153+00 (Right).

~~+0.959%~~ ~~VC=500'~~ ~~MC=1169'~~ ~~0.959%~~

LONGITUDINAL SECTION ALONG E. ROADWAY (WESTBOUND LANE)

LOCATION
 Story County
 T-83-N R-24-W
 Washington Twp.
 Section 13
 U.S. No. 30 over
 Skunk River

SKUNK RIVER

SITUATION PLAN
 Drainage Area: 550 sq. mi.
 Design Discharge: 14,000 cfs.

LOCATION
 Story County
 T-83-N R-24-W
 Washington Twp.
 Section 13
 U.S. No. 30 over
 Skunk River

**THIS SHEET FROM OF
 DESIGN IS INCLUDED
 INFORMATION ONLY**

Bridge Maintenance No.

Story County
T-83-N R-24-W
Washington Twp
Section 13
U.S. No 30 over
Skunk River

The diagram illustrates a cross-section of a proposed bridge structure. Key features include:

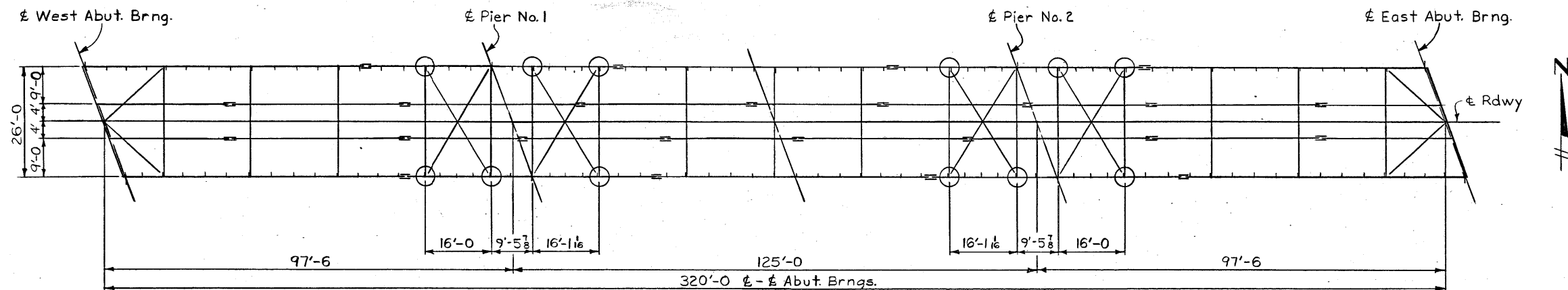
- Proposed Grade Line:** The top line of the bridge deck.
- Present Ground Line:** The existing ground level.
- Design H.W. El. 881.05:** Design High Water elevation.
- Excavation Classification Line (Elev. 882.75):** The boundary for excavation work.
- Str. Bed Elev. 884.02:** Structural bed elevation.
- Bottom Ftg. El. 878.15:** Elevation of the bottom foundation.
- 35' Creosoted Piles:** Foundation piles treated with creosote.
- 35' Untreated Wood Piles:** Foundation piles without creosote treatment.
- Bottom Ftg. El. 860.00:** Elevation of the bottom foundation for untreated piles.
- Bottom Ftg. El. 853.92:** Elevation of the bottom foundation for another pile type.
- Gr. Elev. 891.41:** Ground elevation at the left pier.
- Gr. Elev. 891.77:** Ground elevation at the left pier.
- Gr. Elev. 891.69:** Ground elevation at the right pier.
- Gr. Elev. 891.22:** Ground elevation at the right pier.

SECTION LEADER: W. EYER

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
EN-30-5 (48)--21-85	IOWA	6		3	14

Sta 1301+20.00 April 1982
STORY COUNTY
IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION
Design Sheet No.: 1 Of 6 File No.: 26593 Design No.: 781

Bridge Maintenance No. 8550.2 R/L030



STRUCTURAL STEEL LAYOUT (Typical for both bridges.)
 ○ Indicates Location of Retrofit, 12 required for each bridge.

GENERAL NOTES

In October 1980, fatigue cracks were found in the webs of the main girders of these bridges. The intent of this design is to provide additional room for the girder web to flex, and thereby prevent future web cracking or propagation of cracks now existing.

The existing bridges are Design 3061 Story County. Plans and shop drawings of the existing structure are available at the Ames office of the Iowa Department of Transportation-Highway Division.

There are 24 locations, on both bridges, of floor beam, to stiffener, to web connections that are to be retrofitted as shown and noted on Design Sheet 3.

The bid item "Repair of Bridge" shall include all costs of labor and equipment to retrofit the 24 floorbeam connections as shown and sequenced in steps 1-6 on Design Sheet 3, except for the provision for extra work as noted in step 6. The bid item shall also include cleaning, and painting with three field coats, any areas of structural steel disturbed by this repair work or crack investigation conducted previously by others.

The paint to be applied to the areas previously specified shall be in accordance with Article 2509.07 System 1. The final field coat shall match the color of the existing painted steel.

The contractor shall have the option of working on one bridge at a time or both bridges at the same time, but retrofit shall be completed on one side of a bridge before starting on the other side of that bridge.

Both bridges shall carry at least one lane of traffic during working hours in conformance with "Traffic Control Plan" note on this sheet and traffic control layout shown on Design Sheets 5 and 6.

The retrofit work is to be done at each location from a temporary platform which is accessible and is capable of supporting two men and the necessary retrofit equipment.

The Bridge Contractor shall furnish all labor and material required to construct, install and move the platform. The cost of this material and labor shall be included in the price bid for "Repair of Bridge." The platform is to become the property of the Bridge Contractor.

No torch work or cutting or grinding or drilling of holes on the existing structural steel of the bridge shall be done when air temperature and steel temperature are below 32° F.

TRAFFIC CONTROL PLAN

1. Traffic control on this project shall be in accordance with Supplemental Specification 854, Detail Sheet 521-2A for westbound traffic, and special layout for eastbound traffic, included in these plans (Design Sheets 5 and 6).
2. The roadway shall be returned to normal traffic during non-working hours.
3. All traffic control devices shall be furnished, erected, maintained, and removed by the contractor.
4. Parking of private vehicles or unattended equipment on the opposite shoulder within 1000 feet of the work area shall not be permitted.
5. The location for storage of equipment by the contractor during non-working hours will be as approved by the engineer in charge of construction.
6. Proposed sign spacing may be modified, as approved by the engineer, to meet existing field restrictions, or to prevent obstruction of the motorist's view of permanent signing.
7. Proposed changes in the Traffic Control Plan (includes layout sheets) shall be reviewed with the Office of Construction before changes are made.
8. Cost of traffic control measures required of the contractor shall be bid "Lump Sum".

TOTAL ESTIMATED QUANTITIES

Item No.	Item	Units	Quantity
1	Repair of Bridge	L.S.	Lump Sum
2	Traffic Control	L.S.	Lump Sum

SPECIFICATIONS

Construction-Iowa D.O.T. Specifications, Series 1977, plus current Supplemental Specifications and Special Provisions including:
 Spec. 854 "Supplemental Specifications for Traffic Controls"

Bridge Maintenance No. 6550.2 R/L030

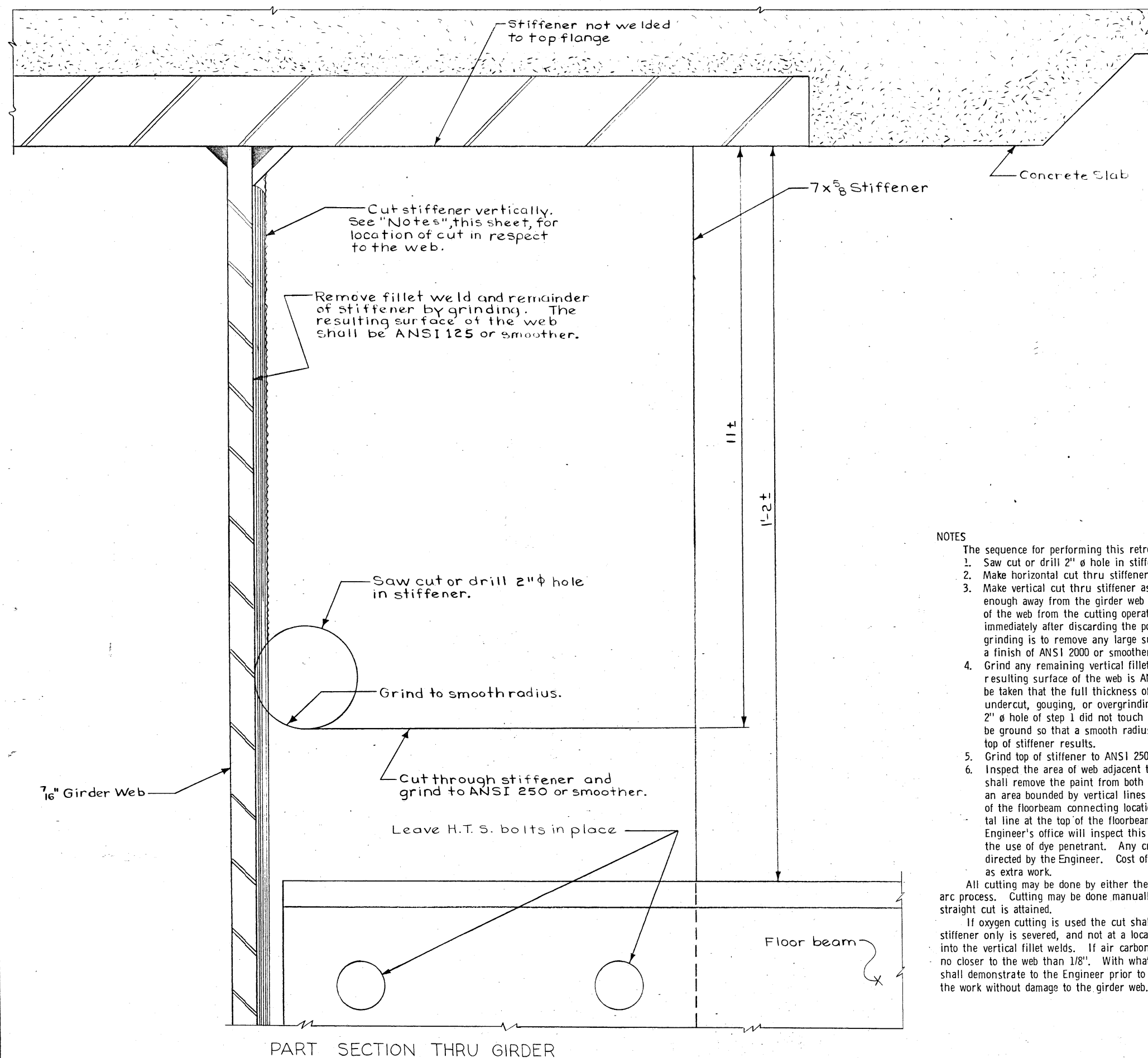
Design for Repair to 20° Skew
 DUAL 320'-0" x 30' CONTINUOUS WELDED
 GIRDER BRIDGES
 97'-6" End Spans 125'-0" Interior Span
 REPAIR DETAILS

Sta 1301+20.00 April 1982

STORY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION

Design Sheet No.: 2 Of 6 File No.: 26593 Design No.: 781



NOTES

The sequence for performing this retrofit work is as follows:

1. Saw cut or drill 2" ϕ hole in stiffener at location shown.
2. Make horizontal cut thru stiffener as shown.
3. Make vertical cut thru stiffener as shown being careful to cut far enough away from the girder web to avoid any undercut or gouging of the web from the cutting operation. Grind resulting surface immediately after discarding the portion of stiffener removed. The grinding is to remove any large surface irregularities and provide a finish of ANSI 2000 or smoother.
4. Grind any remaining vertical fillet weld and stiffener so that the resulting surface of the web is ANSI 125 or smoother. Care shall be taken that the full thickness of the web is maintained and no undercut, gouging, or overgrinding of the web takes place. If the 2" ϕ hole of step 1 did not touch the edge of the web the hole shall be ground so that a smooth radius from the face of web to horizontal top of stiffener results.
5. Grind top of stiffener to ANSI 250 finish.
6. Inspect the area of web adjacent to retrofit repairs. The contractor shall remove the paint from both sides of the web by blast cleaning an area bounded by vertical lines approximately one foot either side of the floorbeam connecting location being retrofitted and a horizontal line at the top of the floorbeam. The Iowa D.O.T. District Materials Engineer's office will inspect this area of web both visually and by the use of dye penetrant. Any cracks found shall be repaired as directed by the Engineer. Cost of these repairs shall be considered as extra work.

All cutting may be done by either the oxygen cutting or the air carbon-arc process. Cutting may be done manually provided a guide is used and a straight cut is attained.

If oxygen cutting is used the cut shall be made in such a location that stiffener only is severed, and not at a location where the cut would extend into the vertical fillet welds. If air carbon-arc is used the cut shall be made no closer to the web than 1/8". With whatever process is used the contractor shall demonstrate to the Engineer prior to start of work that he can accomplish the work without damage to the girder web.

Bridge Maintenance No. 8550.2 R/L030

Design for Repair to 20° Skew
DUAL 320'-0" x 30' CONTINUOUS WELDED
GIRDER BRIDGES

97'-6" End Spans 125'-0" Interior Span
REPAIR DETAILS

Sta 1301+20.00 April 1982

STORY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION

Design Sheet No.: 3 Of 6 File No.: 26593 Design No.: 781

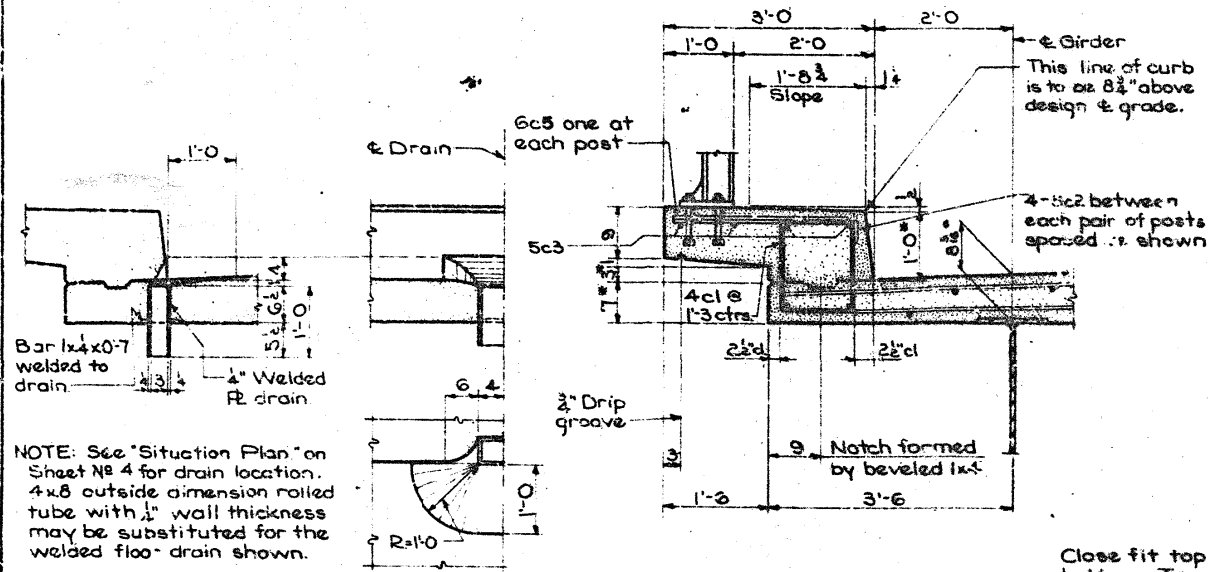
DESIGNED BY: E.W. Konechno TRACED BY: W.R. Johnston
DETAILED BY: D.E. Sweeney & E.W. Konechno CHECKED BY: W.R. Johnston

STORY COUNTY

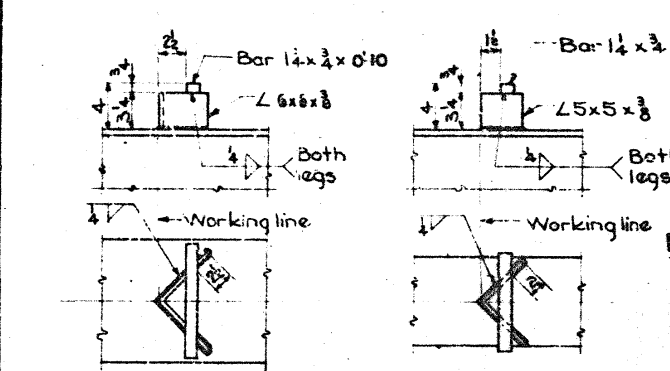
PROJECT NUMBER

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

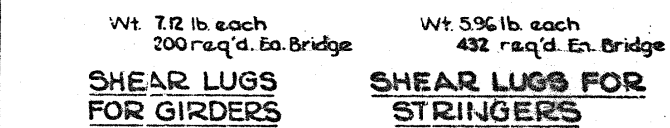
Revised 11-15-82 Slab reinforcing at pier changed & intermittent weld on girder stiffeners changed.



to bridge req'd. Wt. 20lb. each
DRAIN DETAILS



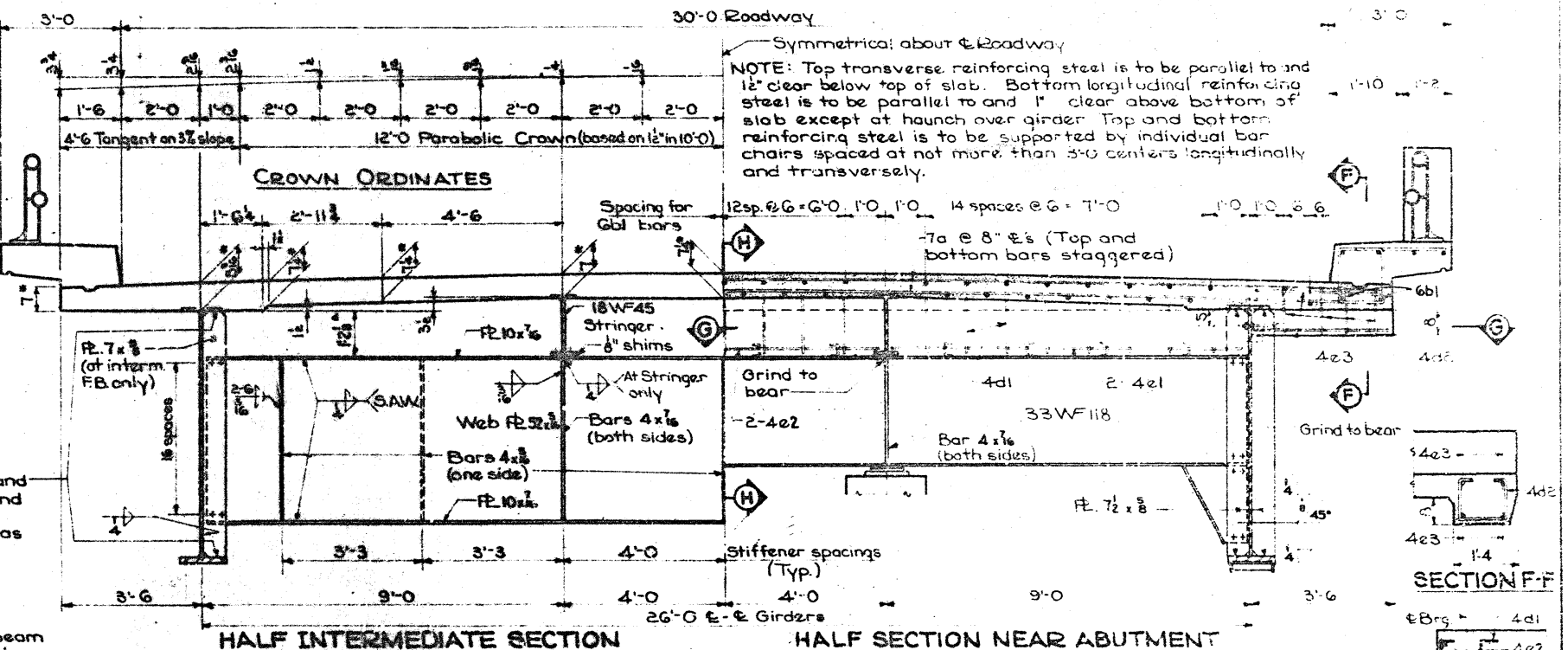
TYPICAL STRINGER TO FLOOR BEAM CONNECTION



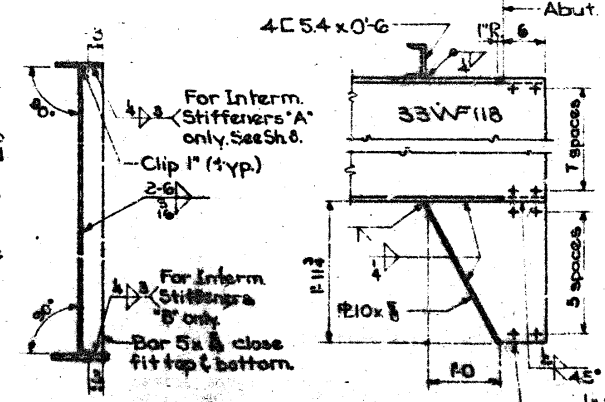
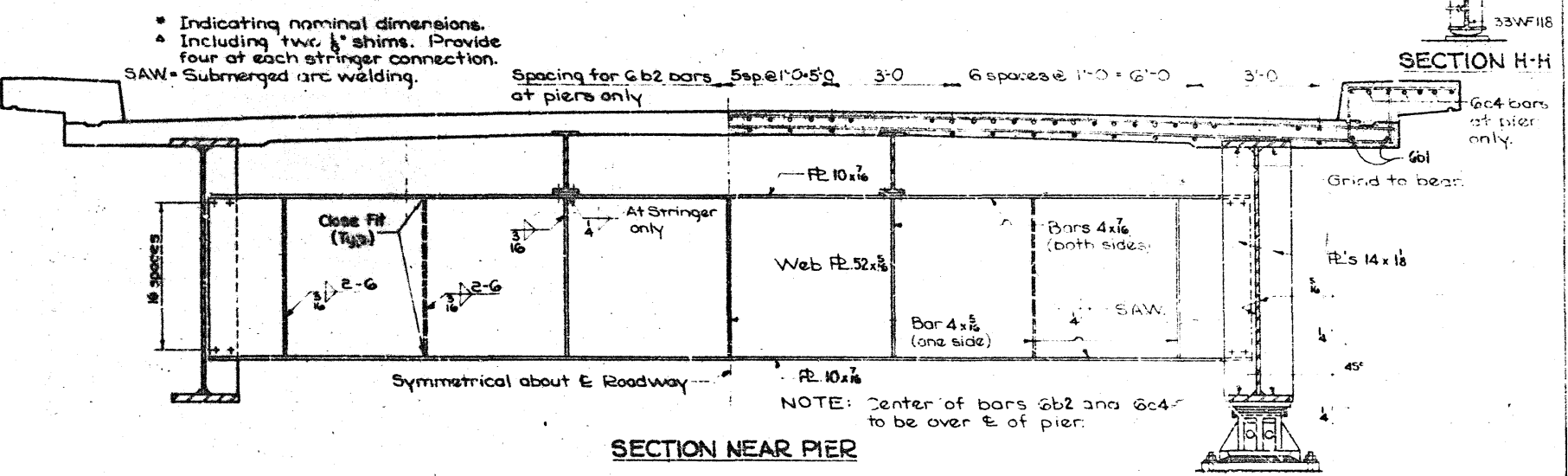
SUPERSTRUCTURE NOTES:
This bridge is designed for H20-S16 loading and alternate loading designated in the Bureau of Public Roads P.P.M. 20-4, Section C, plus 19 lb. per sq. ft. of roadway for future wearing surface.
The floor slab as shown includes 2" of wearing surface.
All field connections, except as noted, are to be riveted or bolted using high tensile strength bolts. The estimated weight and pay weight of structural steel is based on riveted connections.
Unless otherwise noted, all bolts or rivets are to be 3/4" and all open holes are to be 1 1/2".
The girder splices are to be supported by false work or other approved means as directed by the Engineer, and adjusted as closely as possible to the dimensions shown on the diagram "Girder As Fabricated And Erected" before riveting and bolting is completed.
The parts of structural steel inaccessible after erection are to be given three coats of paint in the shop.
~~All structural steel to be A572-A36 Steel~~
All flange plates, flange splice plates and web splice plates are to be U.M. plates except flange plates that are cut to taper.
The flange plates for all floor beams except the abutment shall be coped near side on one end and far side on the other end.
Flange and web plates of main floor beam girders, stringers, bearing stiffeners, and splice plates shall conform to A57M Specification for A36 Carbon Steel. All other structural steel, except as noted, shall conform to the A57M Specifications for A7, A573, or A36 Carbon Steel.

Approved stud shear connectors may be used as an alternate for the angle shear connectors shown. If studs are used, each angle lug 6x5x3/8 is to be replaced by a group of 8-1/2"x4" studs, and each angle lug 6x6x3/8 is to be replaced by a group of 10-1/2"x4" studs. The centroid of the stud group is to be in the approximate location of the angle lug replaced. Maximum spacing between rows of stud rows is to be 24" and where the angle lug spacing exceeds 24" the equivalent studs are to be located in two or more rows so that the maximum spacing is not exceeded. Studs are to be welded in the shop at the locations shown on shop drawings approved by the Iowa State Highway Commission.
Shear lugs are spaced in multiples of the slab transverse reinforcing bar spacing and are located so as to clear bottom transverse bars.
Paint is to be omitted on tops of top flanges and all other steel surfaces in contact with concrete.
The forms for roadway slab and curbs are to be supported by stringers, floor beams and girders.

SPECIFICATIONS:
DESIGN: A.A.S.H.O., Series of 1961.
CONSTRUCTION: Iowa State Highway Commission Standard Specifications, Series of 1961 plus current Special Provisions and Supplemental Specifications.



Cross Sectional Area of Slab = 20.454 sq. ft.
Cross Sectional Area of One Curb = 2.689 sq. ft.



TYPICAL INTERM. STIFFENER DETAIL
(Main Girder)
ABUTMENT FLOOR BEAM END CONNECTION DETAIL

Revised 2-27-83: Superstructure Notes changed to designate use of different steels.

THIS SHEET FROM ORIGINAL DESIGN IS INCLUDED FOR INFORMATION ONLY

Bridge Maintenance No. 8550.2R/L030

Design for Repair to 20° Skew
DUAL 32'-0"x30' CONTINUOUS WELDED GIRDER BRIDGES
97'-6" End Spans 125'-0" Interior Span
SUPERSTRUCTURE DETAILS
Sta 1301+20.00 April 1982
STORY COUNTY
IOWA DEPARTMENT OF TRANSPORTATION-HIGHWAY DIVISION
Design Sheet No. 4 Of 6 File No. 26593 Design No. 781

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	IOWA	5		6	14