

STATE OF IOWA
STATE HIGHWAY COMMISSION
DESIGN FOR
PRIMARY ROAD SYSTEM
BRIDGES AND CULVERTS
PROJECT NO. FN-564
DICKINSON COUNTY

IOWA STATE HIGHWAY COMMISSION
STANDARDS REQUIRED
P10A

DESIGN NO. 159	T-100N & 99N R-38W	STATION 296+73.40
SECTION 36 & 1	OVER WEST FORK LITTLE SIOUX RIVER ON IOWA NO. 9	SILVER LAKE & EXCELSIOR TOWNSHIP
WIDENING 2 - 32' X 20' SPAN I-BEAM BRIDGE TO 28' ROADWAY		
ESTIMATE OF QUANTITIES		
ITEM	UNIT	TOTAL
Concrete	Cu. Yds.	67.1
Reinforcing Steel	Lbs.	6,623
Structural Steel	Lbs.	10,280
Creosoted Piles 4 at 45'	Lin. Ft.	180
16" P10A Piling, type III Or IV 2 at 40'	Lin. Ft.	80
Aluminum Handrail (C - C End Posts)	Lin. Ft.	128.0
Steel Handrail (C - C End Posts)	Lin. Ft.	128.0
Class 20 Excavation	Cu. Yds.	25
Class 21 Excavation	Cu. Yds.	10
Class 24 Excavation	Cu. Yds.	80
Removals	L. S.	LumpSum
Cleaning & Painting Old Steel	L. S.	LumpSum
Pavement Widening	Sq. Yds.	10.1
Project Signs	Only	2

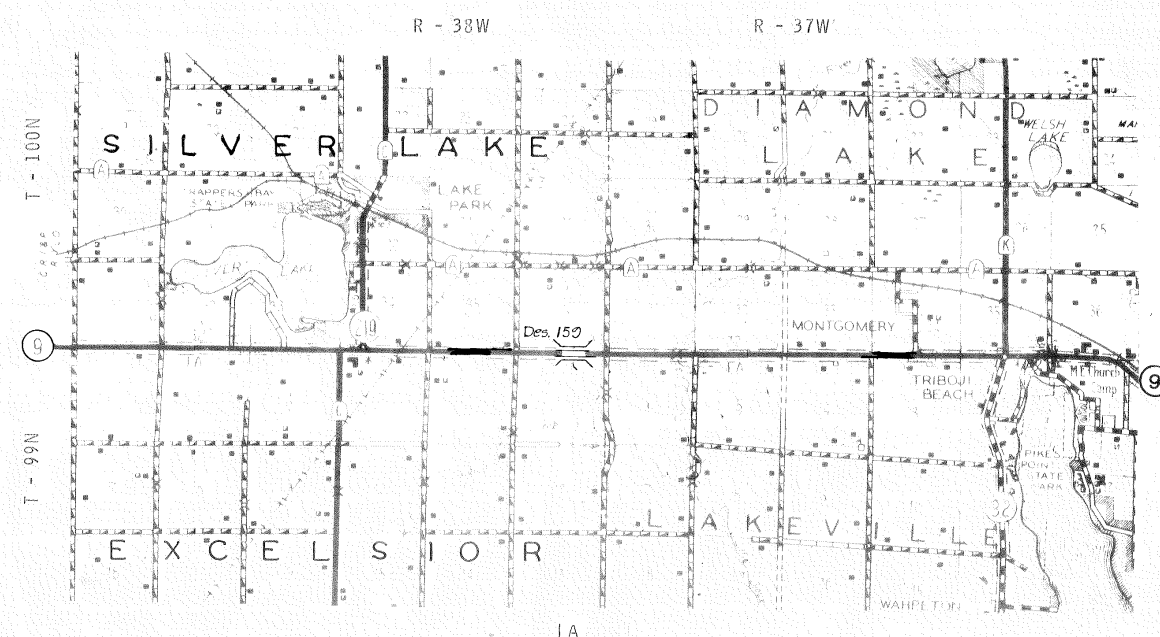
CONSTRUCTION PLANS SHOWING PROJECT AS BUILT

ONE COPY PREPARED BY Norman E. Pettsch DATE 2 March 1964
RESIDENT ENGINEER
ONE COPY APPROVED AND FORWARDED TO AMES

M. L. Smith DATE March 4, 1964
DISTRICT ENGINEER
const.

TWO COPIES TO BE MADE AND RETURNED TO
J. L. Holderfer DISTRICT ENGINEER
RESIDENT MAINTENANCE ENGINEER

TYPE OF WORK: BRIDGE WIDENING
CONTRACTOR : GRAVES CONSTRUCTION CO. INC.
MELVIN IOWA



SPECIFICATIONS:

CONSTRUCTION: Standard Specifications of the Iowa State Highway Commission, Series of 1960, plus current Special Provisions, Supplemental Specifications, and Special Provisions for Bridge Widening Projects, dated October 9, 1962, Spec's. 501.

DESIGN STRESSES for the following materials are in accordance with A. A. S. H. D. Standard Specifications for Highway Bridges, Series of 1961.

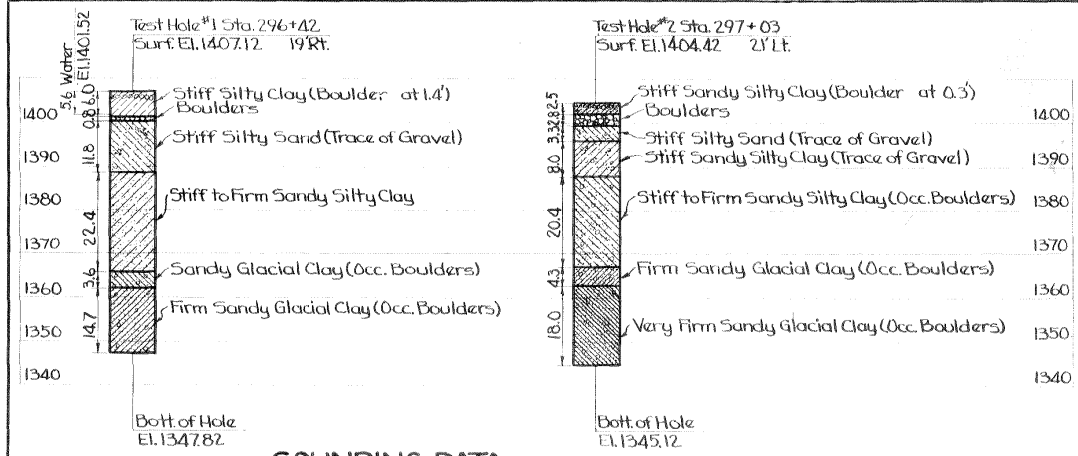
- Concrete in accordance with Section 1.4.11 ($f'_c = 3500$ psi).
- Reinforcing Steel in accordance with Section 1.4.12.
- "Reinforcement" for Intermediate, Hard, or Rail Steel Grade.
- Structural Steel in accordance with Section 1.4.2.
- "Structural Carbon Steel".

Design No 159 Revised 8-7-63: Sheet 1 General Notes changed to provide for widening under traffic and flood lighting.

8-Sheets

APPROVED
[Signature]
DEPUTY CHIEF ENGINEER
IOWA HIGHWAY COMMISSION

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
APPROVED
[Signature]



SOUNDING DATA
Scale: 1"=20'
Dated: July 23, 1959

GENERAL NOTES:

This design contemplates widening the existing two span I-Beam bridge (2@32'x20') to 28' roadway, extending abutment wings and piers, completing pavement widening adjacent to the bridge, and cleaning and painting the old steel. See I.H.C. Design No. 2429 for details of present structure.

The Bridge Contractor is to perform the following work:

- (1) Removals:
 - (a) Break off present curb and railing.
 - (b) Break off portions of present abutment wings.
 - (c) Break off ends of present pier cap.
- (2) Complete widening of the bridge as detailed in these plans, using the existing floor slab as a starting point.
- (3) Remove curbs on the adjacent approach slab and complete widening approach slab as detailed.
- (4) Backfill around completed wings and provide ditches around toe of fill. Sufficient Class 24 Excavation (about 80 cu.yd.) is to be obtained within the Right of Way and near the site to provide side slopes shaped to the satisfaction of the Engineer.

Special attention is directed to Special Provisions for Bridge Widening Projects (Spec. 501 dated Oct. 9, 1962). All exposed corners of 90° or sharper are to be filleted with a 3/4" dressed and beveled strip. All reinforcing is to be securely wired in place before concrete is poured. Minimum clear distance from face of concrete to near reinforcing bar is to be 1 1/2" unless otherwise noted or shown.

The Formed Steel Beam Rail and Creosoted Posts at the ends of the bridge are to be furnished and placed by others and are not a part of this estimate.

Brown lines on tracing and faint lines on prints indicate present structure.

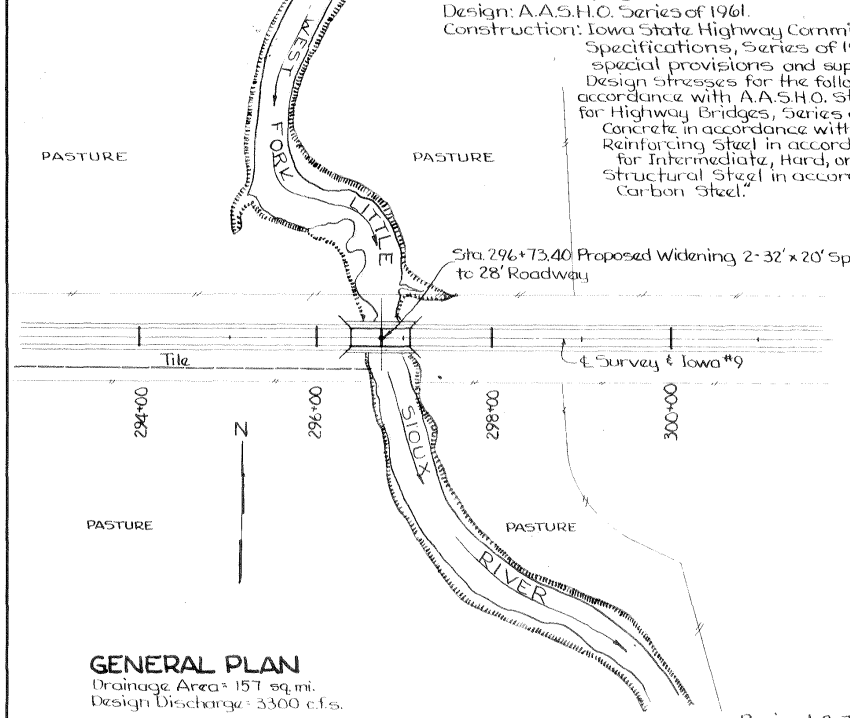
"Cleaning & Painting Old Steel" shall be in accordance with Section 2508 of I.S.H.C. Spec's for new steel except for modifications noted in Spec. 501 dated Oct. 9, 1962, and except that blast cleaning will not be required.

Two-way traffic shall be maintained until removal of the superstructure elements is started. One-way traffic shall then be maintained until the structure is completed. The Contractor shall provide traffic control signals according to I.S.H.C. Spec's, 503.

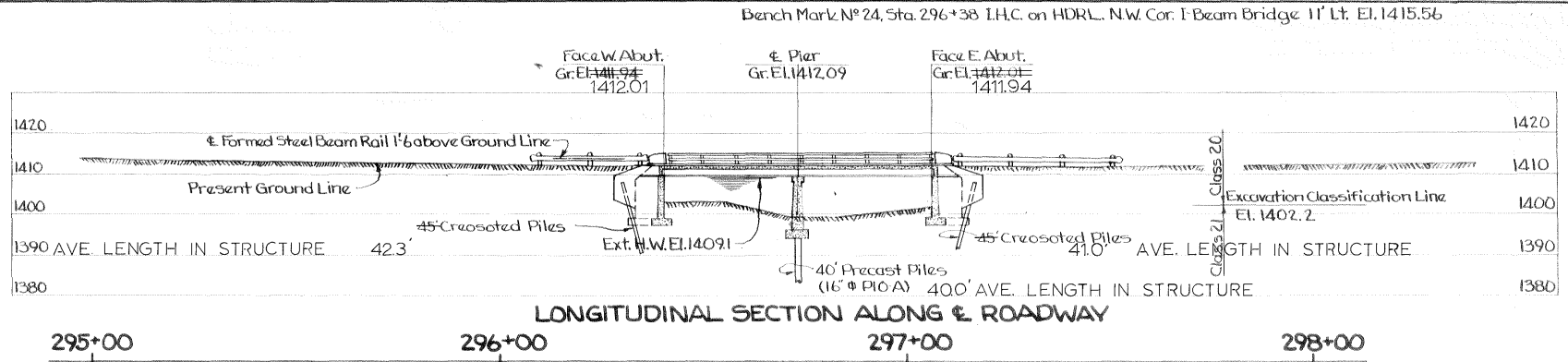
Flood Lights are to be installed as shown on the "Situation Plan" before any construction on the bridge is started and shall be removed after the completion of the bridge. The cost of the flood lighting shall be included in price bid for "Removals".

SPECIFICATIONS:

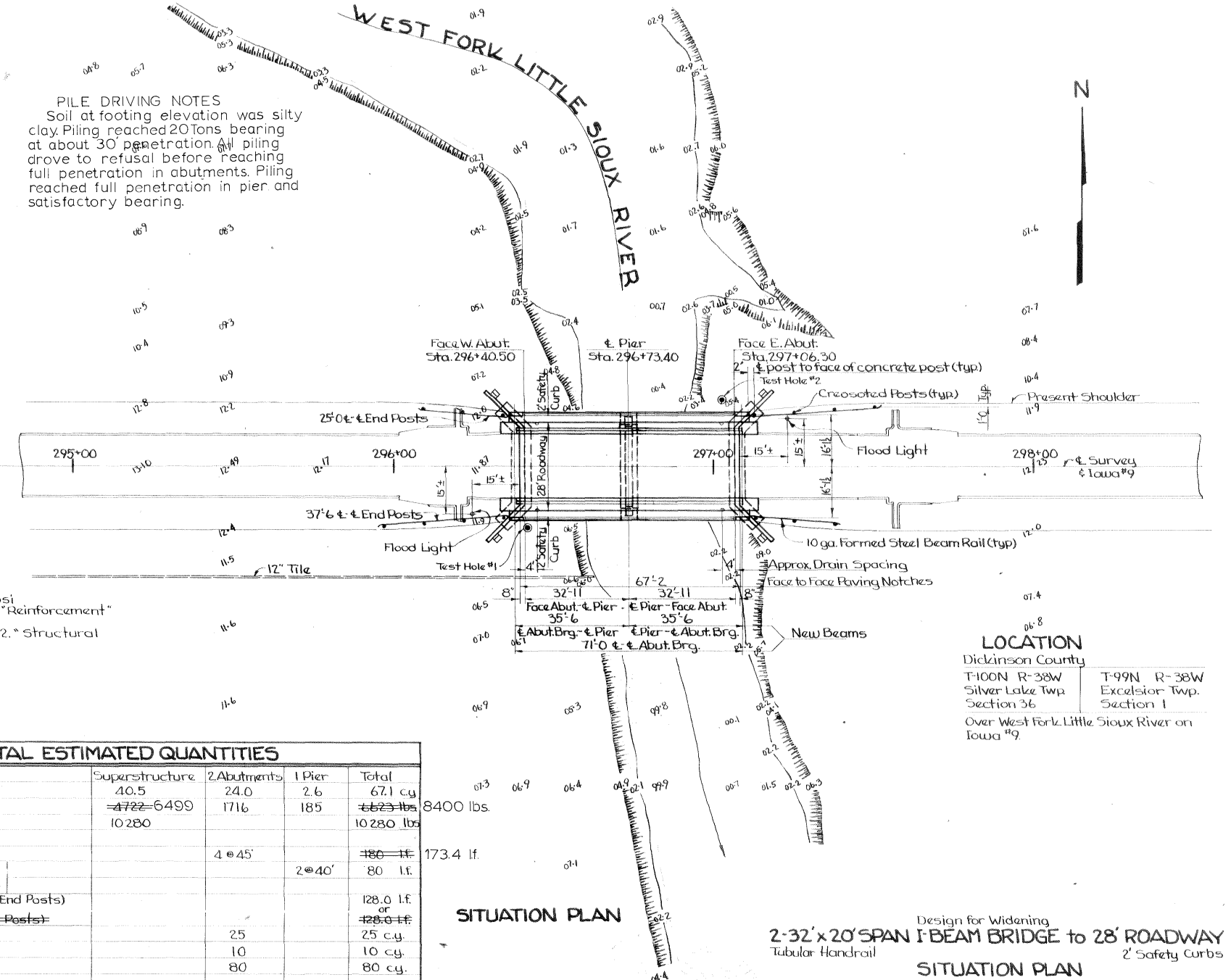
Design: A.A.S.H.O. Series of 1961.
Construction: Iowa State Highway Commission Standard Specifications, Series of 1960, plus current special provisions and supplemental specifications. Design stresses for the following materials are in accordance with A.A.S.H.O. Standard Specifications for Highway Bridges, Series of 1961.
Concrete in accordance with Section 1.4.11, $f'_c = 3500$ psi
Reinforcing Steel in accordance with Section 1.4.12, "Reinforcement" for Intermediate, Hard, or rail steel grade.
Structural Steel in accordance with Section 1.4.2, "Structural Carbon Steel."



GENERAL PLAN
Drainage Area: 157 sq. mi.
Design Discharge: 3300 c.f.s.



PILE DRIVING NOTES
Soil at footing elevation was silty clay. Piling reached 20 tons bearing at about 30' penetration. All piling drove to refusal before reaching full penetration in abutments. Piling reached full penetration in pier and satisfactory bearing.



LOCATION

Dickinson County
T-100N R-38W
Silver Lake Twp.
Section 36
Over West Fork Little Sioux River on Iowa #9.

TOTAL ESTIMATED QUANTITIES				
Item	Superstructure	2 Abutments	1 Pier	Total
Concrete	40.5	24.0	2.6	67.1 cu. yd.
Reinforcing Steel	4722-6499	1716	185	6623 lbs.
Structural Steel	10280			10280 lbs.
Creosoted Piles		4 @ 45'	2 @ 40'	180 lf.
16" Pile A Piling, Type III or IV				80 lf.
Aluminum Handrail (& & End Posts)				128.0 lf.
Steel Handrail (& & End Posts)				128.0 lf.
Class 20 Excavation		25		25 cu. yd.
Class 21 Excavation		10		10 cu. yd.
Class 24 Excavation		80		80 cu. yd.
Removals				Lump Sum
Cleaning & Painting Old Steel				Lump Sum
Pavement Widening				10.1 sq. yd.

SITUATION PLAN

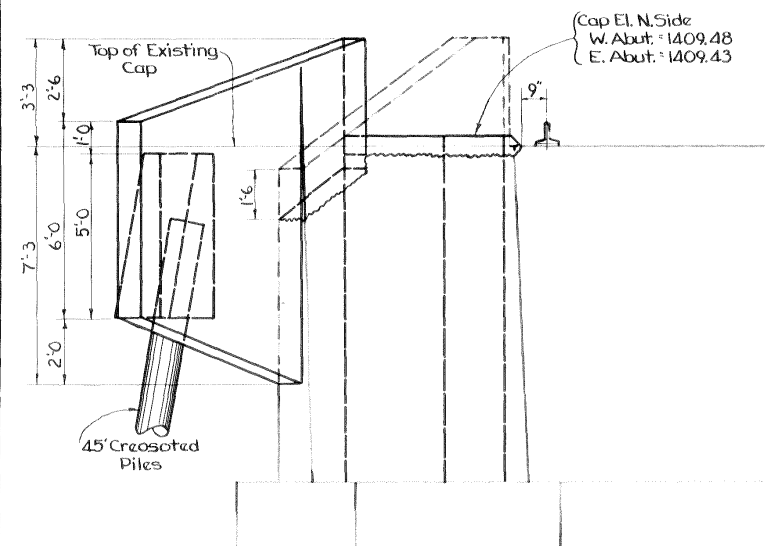
Design for Widening
2-32' x 20' SPAN I-BEAM BRIDGE to 28' ROADWAY
Tubular Handrail
2' Safety Curbs

SITUATION PLAN

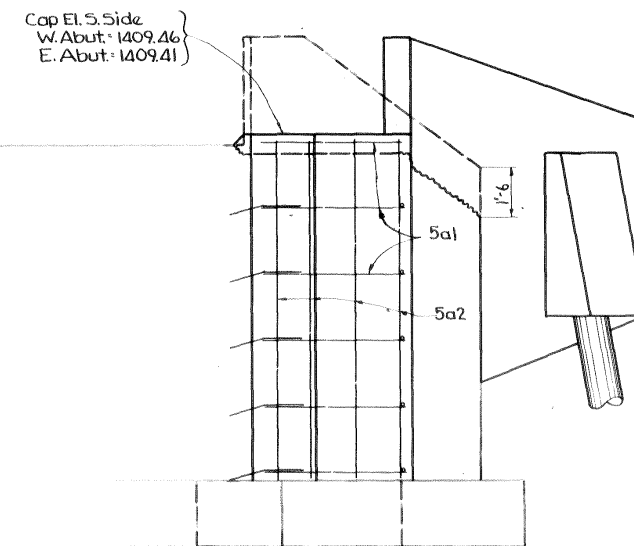
Station 296+73.40
Project: FN-564

DICKINSON COUNTY
Iowa State Highway Commission

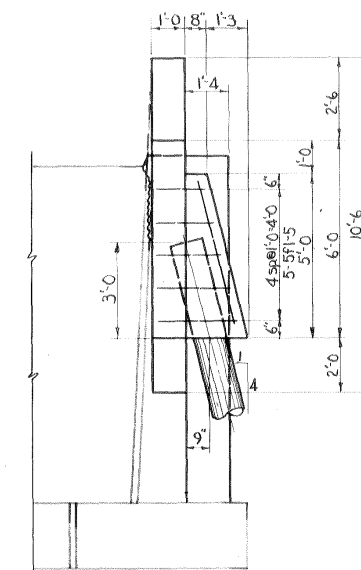
Bench Mark N^o 24 Sta. 296+38 I.H.C. on HDRL NW. Cor. I-Beam Bridge 11' Lt. El. 1415.56



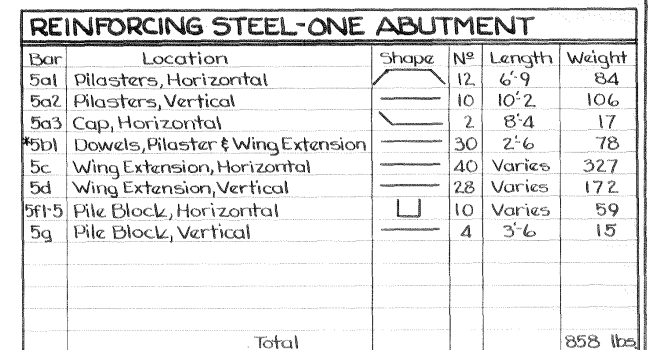
HALF BACK FACE ELEVATION



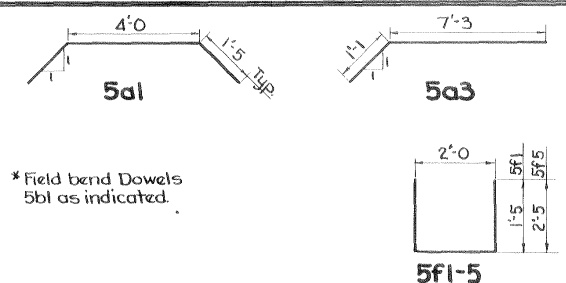
HALF FRONT FACE ELEVATION



VIEW A-A



BENT BAR DETAILS



* Field bend Dowels
5bl as indicated.

Note: All dimensions are out to out.

ESTIMATED QUANTITIES-TWO ABUTMENTS	
Concrete	24.0 c.y.
Reinforcing Steel	1716 lbs.
Crescoted Piles 4 @ 45'	180 lin.ft.
Class 20 Excavation	25 c.y.
Class 21 Excavation	10 c.y.
Class 24 Excavation	80 c.y.

ABUTMENT NOTES:

Existing wings shall be broken down to approximate lines showing existing reinforcing is to be bonded in new concrete. Brown lines on tracing and joint lines on print indicate existing structure.

Piles are to be driven to full penetration if practicable, but to not less than 20 Ton bearing value.

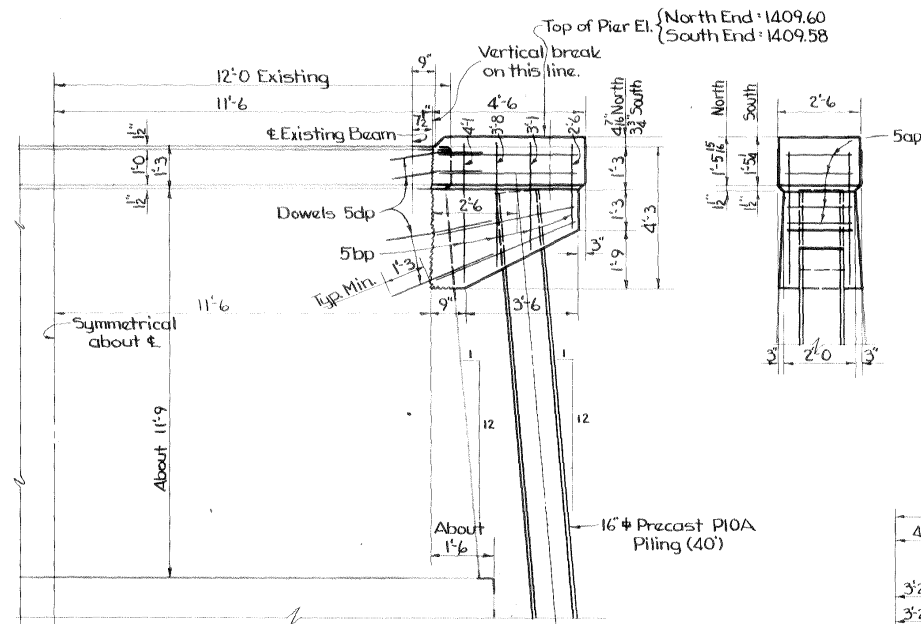
Class 24 Excavation is to be obtained within the Right of Way as directed by the Engineer.

SPECIFICATIONS:

Construction: Iowa State Highway Commission
Standard Specifications, Series
of 1960 plus current special provisions and supplemental specifications.
Design: A.A.S.H.O. Series of 1961. See Sheet 1 for Design Stresses.

Design for Widening
2-32'x20'SPAN I-BEAM BRIDGE to 28' ROADWAY
Tubular Handrail 2'Safety Curbs
ABUTMENT DETAILS
Station 296+73.40 Project: FN-564
DICKINSON COUNTY
Iowa State Highway Commission

June 1963	Iowa State Highway Commission	Sheet 2 of 6
Design 159	Dickinson County	File No. 20819
Designed by: <i>W</i>	Traced by: CEC	Checked by: <i>GP</i>



PIER NOTES:

PIER REINFORCING STEEL				
Bar	Location	Shape	Nº	Length/Weight
5ap	Horizontal		8	9'-6" 79
5bp	Vertical		16	Varies 56
*5dp	Dowels		16	3'-0" 50
Total				185

*Field bend
as shown

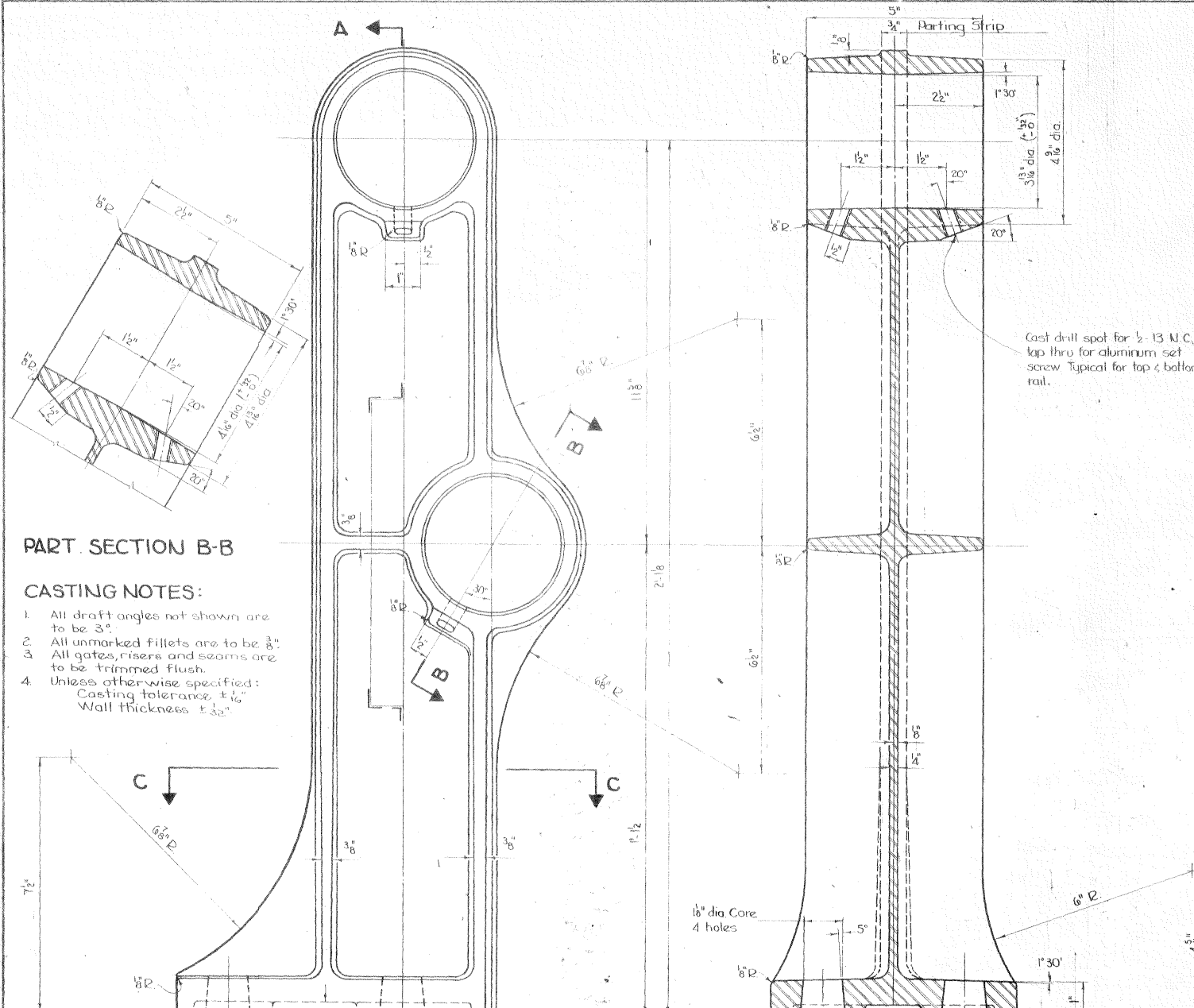
Note: All dimensions are out to out.

Item	Amount
Concrete	2.6 c.y.
Reinforcing Steel	185 lbs.
16" Pile Piling, Type III ~~or IV~~ 2@40'	80 lf.

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Note: Sections of floor on each side are to be placed in sequence indicated by the encircled figures for either "Slab Placement" or "Alternate Slab Placement" or may, with permission of the Engineer, be placed in one continuous pour.

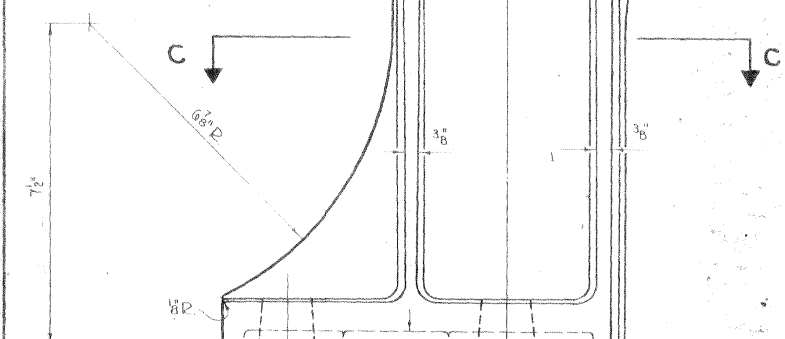




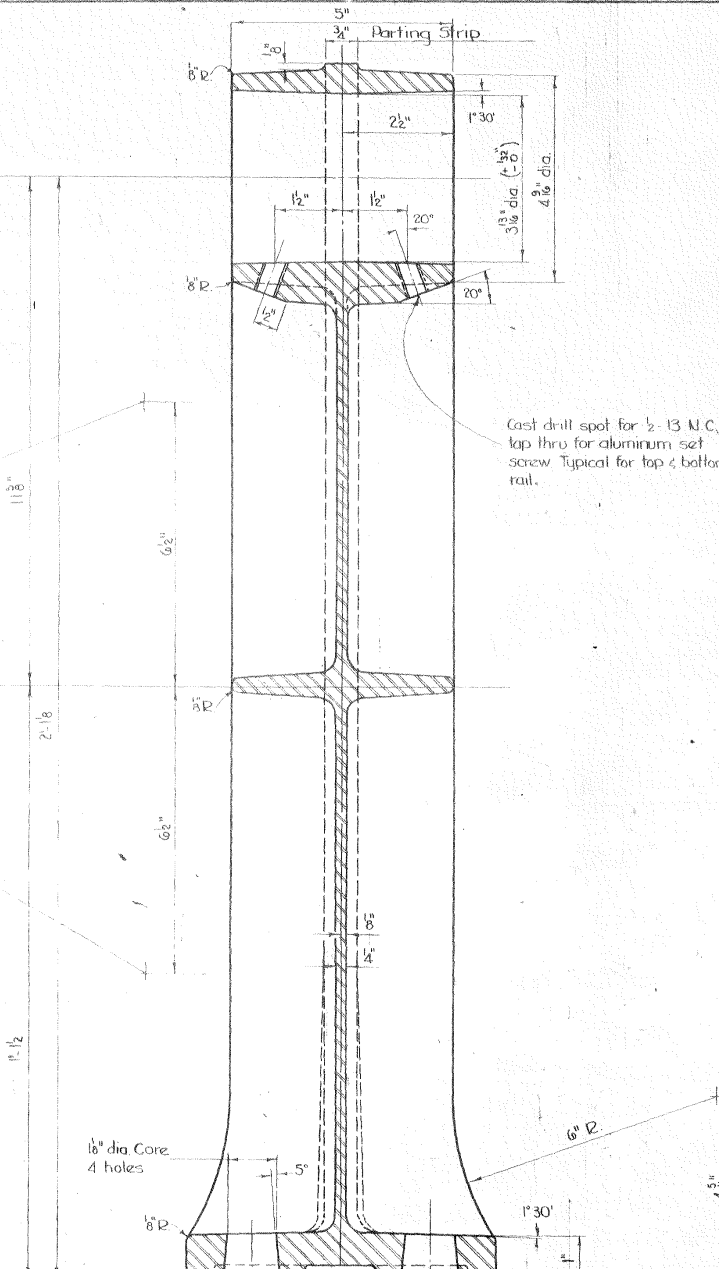
PART SECTION B-B

CASTING NOTES:

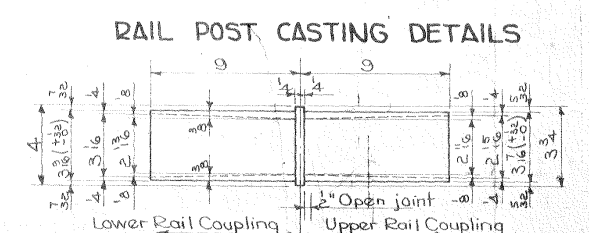
1. All draft angles not shown are to be 3°.
2. All unmarked fillets are to be 3/8".
3. All gates, risers and seams are to be trimmed flush.
4. Unless otherwise specified: Casting tolerance ± 1/16" Wall thickness ± 3/32"



SECTION C-C

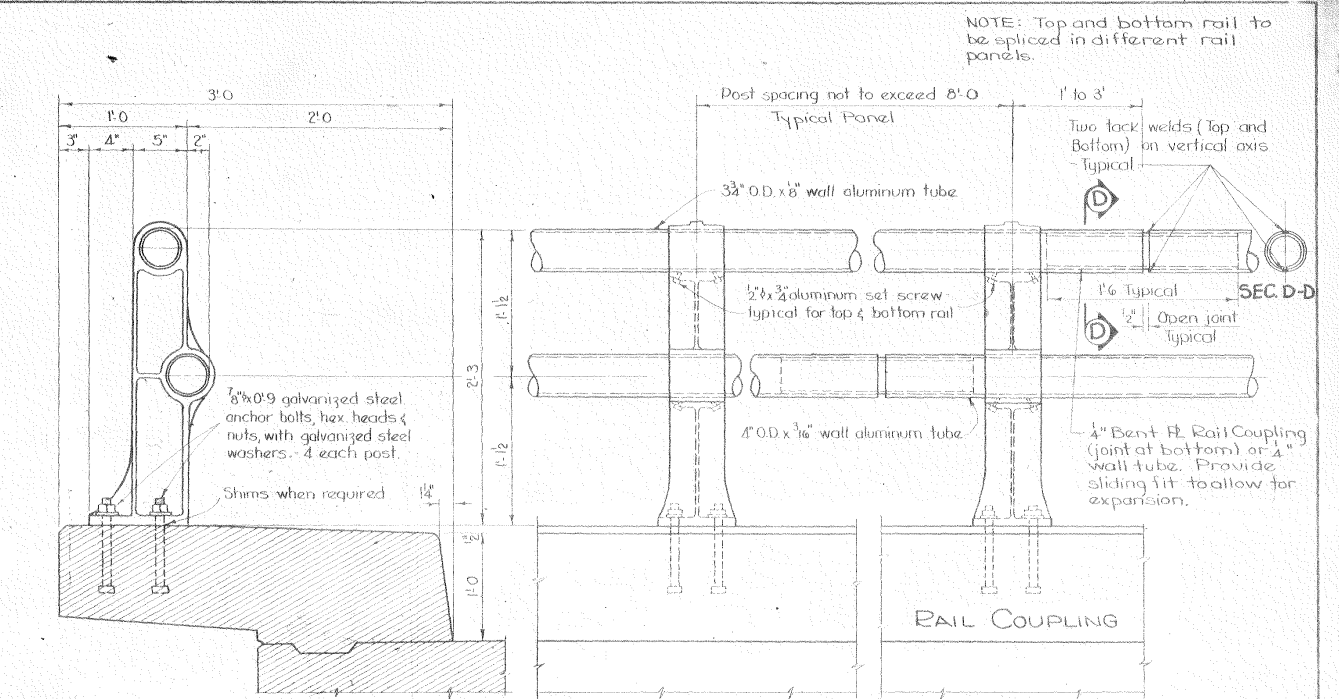


SECTION A-A

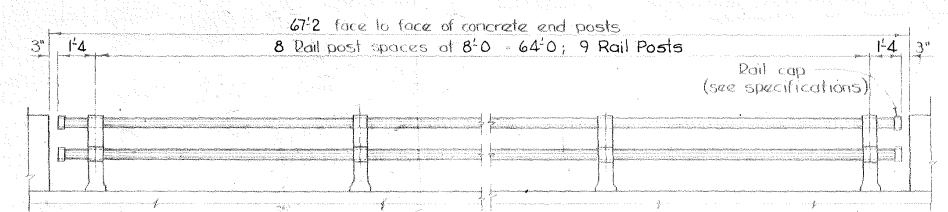


DETAIL OF CASTING FOR ALTERNATE RAIL COUPLING

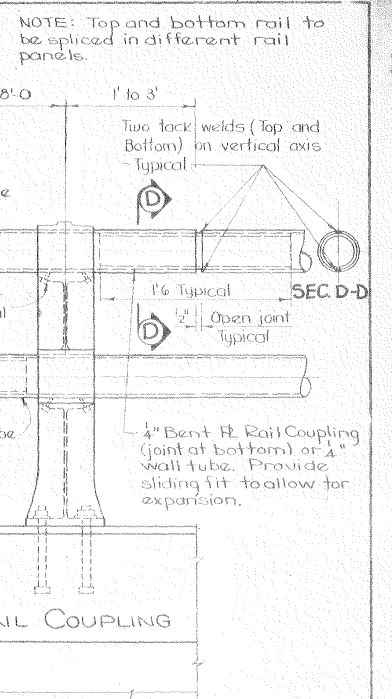
Revised 6-27-61 Rails made continuous through three posts.
 Revised 7-8-60 Post casting material and railing splice details changed.
 Revised 8-6-59 Alternate material for Rail Caps added (Specs: Part 2A Item 2).
 Revised 12-10-58 Post casting finish changed (Specifications: Part 2B Item 4).
 Revised 10-6-58 Post casting base changed out and other minor changes.



SECTION THRU CURB



RAIL POST LAYOUT



ALUMINUM SHIM DETAIL

SPECIFICATIONS:

1. DESCRIPTION OF BID ITEM
 A. Aluminum handrail is to be bid on a linear foot basis measured from center to center of end posts. The price bid for "Aluminum Handrail" shall consist of furnishing, fabricating, erecting, and cleaning all metal handrail and shall include the furnishing and installation of anchor bolts and all other incidental items in accordance with these plans and specifications.
2. COMPONENT PARTS AND MATERIALS
 A. Aluminum Bridge Rail Tubing
 1. Aluminum tubing shall comply with the A.S.T.M. Specification B235 - alloy 6061-T6 (commercial designation 6061-T6). The rail tubing is to be fabricated from random length tubing and joined as indicated. Each rail section must pass thru at least three posts before being spliced, for as many rail sections as possible.
 2. The aluminum rail tubing shall be closed at the ends next to the concrete and post, as detailed, by means of cast caps or plugs or by means of welded end plates. The cast caps or plugs shall comply with the material specifications as outlined for post castings or with ASTM Specification B102 or B206 alloy 6061-T6 (AA Alloy 6061) condition F.
 B. Aluminum Castings For Rail Posts, End Caps And Rail Couplings
 1. Aluminum castings shall comply with the Iowa State Highway Commission Supplemental Specifications for "Aluminum Rail Posts And Cast End Caps" dated May 22, 1962.

3. CONSTRUCTION
 A. The specifications for construction shall be the Standard Specifications of the Iowa State Highway Commission, Series of 1960, plus current Special Provisions and current Supplemental Specifications with these added provisions:
 1. The anchor bolts for the aluminum posts shall be set at the line and elevations shown on the plans. They shall be firmly held in place by suitable templates that will assure their correct position during the placement of concrete. Aluminum shims, as detailed, shall be used if necessary to insure the correct elevation of the rails.
 2. The cast aluminum posts and the aluminum tube rails shall be carefully handled during their unloading, handling, and erection. Members that are marred, disfigured or damaged to the extent that they impair their usefulness or appearance shall be rejected and replaced at the contractor's expense.
 3. The aluminum handrail shall be stored above ground upon suitable platforms and kept free from dirt, grease, and contact with dissimilar metals. The stored aluminum handrail shall be protected from moisture as far as practical.
 4. After anchor bolts have been tightened, the excess caulking compound shall be removed and all openings around the base of the post pointed full and flush with caulking compound.
 5. After erection, rails and posts and the concrete around the post bases shall be thoroughly cleaned of all dirt, grease, caulking compound and other foreign material by an approved means as directed by the Engineer.
 6. Set screws are to be tightened to prevent rails from rattling, but they are not to be tightened so as to prevent movement due to rail expansion.

ALUMINUM HANDRAIL QUANTITIES	
Aluminum Handrail (4 End Posts)	128.0 lin. ft.

Design for Widening
2-32' x 20' SPAN I-BEAM BRIDGE to 28 ROADWAY
 Tubular Handrail 2 Safety Curbs
ALUMINUM HANDRAIL DETAILS
 Station: 296 + 73.40 Proj. No. FN-564
DICKINSON COUNTY
 Iowa State Highway Commission
 June 1963 Rail Standard Sheet 1000 Sheet 5 of 6
 Design 159 Dickinson County File No. 20819

Checked by: JW

Revised 1-3-62: Specifications changed.
 Revised 5-4-62: Cast coupling added and location of couplings changed.