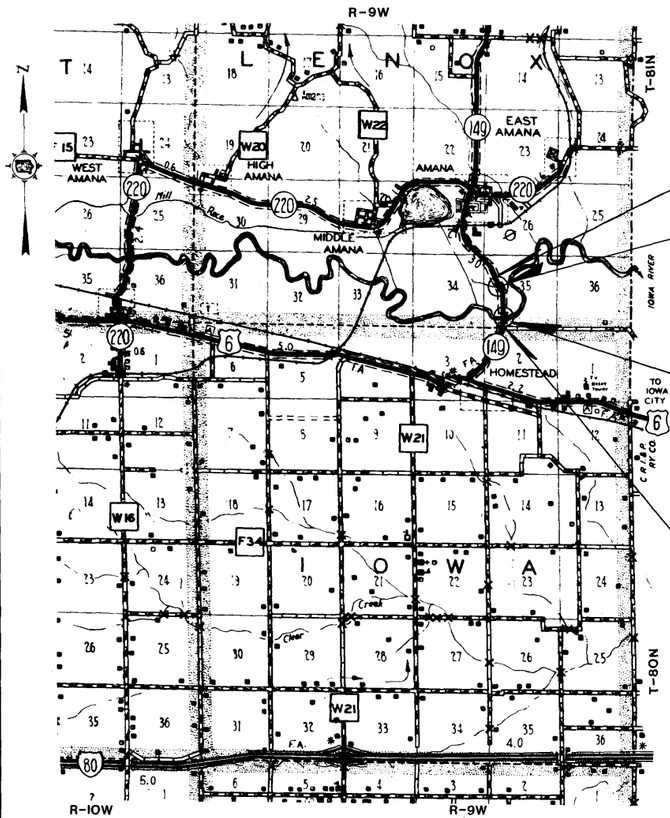
LETTING DATE October 10, 1972

FN-149-2(13)--21-48

IOWA COUNTY / BRIDGES & CULVERTS

CONVENTIONAL SIGNS

CITY LIMITS
STATE OR COUNTY LINES
SECTION LINES
FENCE LINES
RIGHT OF WAY LINES
GUARD RAIL
TRAVELED WAY
BASE OR SURVEY LINE
RAILROADS
PRESENT TILE DRAINS
PROPOSED TILE DRAINS
PIPE LINE
CULVERTS
TELEPHONE, TELEGRAPH OR TRANSMISSION LINES
PRIMARY ROAD NUMBERS
U.S. ROAD NUMBERS
INTERSTATE ROAD NUMBERS



LOCATION MAP
0 1 2 3
MILES

STATE OF IOWA
STATE HIGHWAY COMMISSION
DESIGN FOR
BRIDGES CULVERTS
PRIMARY ROAD SYSTEM
IOWA COUNTY
PROJECT FN-149-2(13)--21-48

FROM THE EAST JUNCTION OF U.S. 6 AND IA. 149 TO THE SOUTH CITY LIMITS OF AMANA

THIS PLAN INCLUDES: STRUCTURE BRIDGE DESIGN # 872 ELK HORN 1973 AND 1974

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

MILEAGE SUMMARY			STATE CONTROL SECTION NO.
LOCATION	LIN.FT.	MILES	
BRIDGES:			
~~STA. 77+75~~	~~445.83~~	~~0.084~~	
STA. 100+25	693.33	0.131	~~48-1400~~

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH AASHO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 1969.
CONCRETE IN ACCORDANCE WITH SECTION 1.5.1 f'c = 3500 psi.
REINFORCING STEEL IN ACCORDANCE WITH SECTION 1.5.1, fs = 20,000 psi.
STRUCTURAL STEEL IN ACCORDANCE WITH SECTION 1.7.1
ASTM A-36, fs = 20,000 psi.
PRESTRESSING STEEL IN ACCORDANCE WITH SEC. 1.6.7, fs = 270,000 psi.
PRESTRESS CONCRETE IN ACCORDANCE WITH SEC. 1.6.7, fc = 5,000 psi.

DESIGN DATA RURAL		
1973 AADT	2500	V.P.D.
1993 AADT	3900	V.P.D.
1993 DHV	450	V.P.H.
DIRECTIONAL	52	%
TRUCKS	7	%
DESIGN V	70	M.P.H.
CLASS III ACCESS CONTROL		

STANLEY CONSULTANTS
INTERNATIONAL CONSULTANTS IN ENGINEERING, ARCHITECTURE, PLANNING, AND MANAGEMENT

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

PROJECT NO. FN-149-2(13)--21-48
R.O.W. NO. FN-149-2(15)--21-48

INDEX OF SHEETS

SHEET NO.	TITLE	DES. SHT. NO.
	DESIGN NO. 772	
1	TITLE SHEET	
1A	REVISION SHEET	
2	ESTIMATE OF QUANTITIES	
3	SITUATION PLAN	1 OF 16
4	GENERAL PLAN	2 OF 16
5	SOUNDING DATA	3 OF 16
6	PIER DETAILS	4 OF 16
7	PIER DETAILS	5 OF 16
8	ABUTMENT DETAILS	6 OF 16
9	ABUTMENT DETAILS	7 OF 16
10	SUPERSTRUCTURE DETAILS	8 OF 16
11	SUPERSTRUCTURE DETAILS	9 OF 16
12	SUPERSTRUCTURE DETAILS	10 OF 16
13	SUPERSTRUCTURE DETAILS	11 OF 16
14	BEAM DETAILS	12 OF 16
15	BEAM DETAILS	13 OF 16
16	BEAM DETAILS	14 OF 16
17	ALUMINUM HANDRAIL	15 OF 16
18	STEEL HANDRAIL	16 OF 16
	DESIGN NO. 872	
19	SITUATION PLAN	1 OF 13
20	GENERAL PLAN	2 OF 13
21	SOUNDING DATA	3 OF 13
22	PIER DETAILS	4 OF 13
23	ABUTMENT DETAILS	5 OF 13
24	ABUTMENT DETAILS	6 OF 13
25	SUPERSTRUCTURE DETAILS	7 OF 13
26	SUPERSTRUCTURE DETAILS	8 OF 13
27	SUPERSTRUCTURE DETAILS	9 OF 13
28	SUPERSTRUCTURE DETAILS	10 OF 13
29	BEAM DETAILS	11 OF 13
30	ALUMINUM HANDRAIL	12 OF 13
31	STEEL HANDRAIL	13 OF 13

CONSTRUCTION PLANS SHOWING PROJECT AS LET
Plan Preparation Supervised By: Duane R. Ulrich, Res. Constr. Eng. 3-23-73 Date
Reviewed & Forwarded to Ames Div. ____, Dis. Constr. Eng. Date
No. of Copies (Full Size) Forwarded to: 2 VAN R. SNYDER
After Microfilming Return Reproducible Sheets to: 6

Rev (30)

REVISED:
SEE FOLLOWING SHEET 1A

APPROVED
DEPUTY CHIEF ENGINEER DATE
IOWA HIGHWAY COMMISSION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ENGINEER DATE

SHEET NO. 1 OF 31

DESIGNS 772 & 872 IOWA COUNTY PROJECT FN-149-2(13)--21-48 FILE 24550

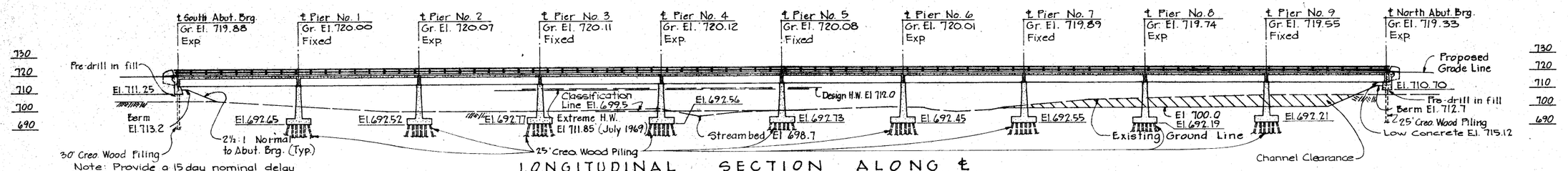
Bench mark No. 9A Sta. 103+23 - 22 LT. ISHC plug in N.W. wing Elev. 719.88

~~BENCH MARK: No. 12 - Sta. 106+85, 44' Lt. Cut (X) on E. Wingwall at N. end of "I" Beam Bridge - El. 719.80~~

V.P.I. Sta. 100+25
El 720.72
VC = 800'

+0.24%

-0.40%



Note: Provide a 15 day nominal delay at the south abutment after completion of fill construction and before pile driving.

LONGITUDINAL SECTION ALONG ℄

Scale : 1" = 30'-0"

GENERAL NOTES:

THIS BRIDGE IS DESIGNED FOR HS20-44 LOADING, PLUS 20 LB. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

THE APPROACH FILLS AS SHOWN ARE NOT A PART OF THIS CONTRACT, BUT ARE TO BE IN PLACE BEFORE ABUTMENT PILES ARE DRIVEN. THE BRIDGE CONTRACTOR IS TO LEVEL OFF AND SHAPE THE BERMS TO THE ELEVATION AND DIMENSIONS SHOWN. DRESSING OF SLOPE OUTSIDE THE BRIDGE AREA NOT DISTURBED BY THE BRIDGE CONTRACTOR SHALL BE PAID FOR AS EXTRA WORK.

BRIDGE CONTRACTOR TO HAUL BEAMS, PIER SADDLES AND DIAPHRAMS OF EXISTING BRIDGE TO I-80 AND IA. 149 MAINT. GARAGE (WILLIAMSBURG GARAGE). HANDRAIL TO BECOME PROPERTY OF THE BRIDGE CONTRACTOR. BRIDGE CONTRACTOR TO REMOVE EXISTING BRIDGE IN ACCORDANCE WITH IOWA STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS. PIERS AND ABUTMENTS ARE TO BE REMOVED TO 1'-0" BELOW FINISHED GROUND LINE OR STREAM BED ELEVATIONS.

THE BRIDGE CONTRACTOR IS TO CLEAR THE CHANNEL UNDER THE BRIDGE FOR A DISTANCE OF 34 FEET ON EITHER SIDE OF THE ℄ OF ROADWAY AS SHOWN BY THE HATCHED AREAS ON THE "SITUATION PLAN" AND "LONGITUDINAL SECTION ALONG ℄ ROADWAY".

ABUTMENT PILES ARE TO BE DRIVEN IN OVERSIZE HOLES DRILLED THROUGH THE FILL TO ELEV. 700' @ S. ABUT. AND ELEV. 703' @ N. ABUT. THE MINIMUM DIAMETER OF THE DRILLED HOLES IS TO BE 4" GREATER THAN THE DIAMETER OF THE PILE 3' FROM THE BUTT. VOIDS AROUND THE PILES ARE TO BE FILLED WITH DRY SAND. NO SEPARATE PAYMENT WILL BE MADE FOR DRILLING HOLES OR FILLING VOIDS SINCE IT IS CONSIDERED INCIDENTAL TO DRIVING PILES.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH AASHO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 1969.

CONCRETE IN ACCORDANCE WITH SECTION 1.5.1 f'c = 3500 psi.

REINFORCING STEEL IN ACCORDANCE WITH SECTION 1.5.1 fs = 20,000 psi

STRUCTURAL STEEL IN ACCORDANCE WITH SECTION 1.7.1
ASTM A-36, fs = 20,000 psi.

PRESTRESSING STEEL IN ACCORDANCE WITH SEC. 1.6.7, fs = 270,000 psi

PRESTRESS CONCRETE IN ACCORDANCE WITH SEC. 1.6.7, fc = 5,000 psi.

TEST PILE NOTE:

THE LENGTHS SHOWN FOR CREOSOTED PILING ARE ESTIMATED LENGTHS FOR BIDDING PURPOSES ONLY. ONE TEST PILE SHALL BE DRIVEN AT CENTER FOOTING OF PIER #5 (SEE SHEET 4) BEFORE ORDERING ADDITIONAL PILING. BEFORE DRIVING THE TEST PILE THE AREA AT THE TEST PILE IS TO BE EXCAVATED TO THE PROPOSED FOOTING ELEVATION. PILING LENGTHS WILL BE DETERMINED FROM TEST PILE RESULTS, EXCEPT MINIMUM LENGTH OF PILE IS TO BE 25'.

CONSTRUCTION PLANS
SHOWN PROJECT AS BUILT

Plan Preparation Supervised By: ... Res. Constr. Engr. ... Date

Reviewed & Forwarded to Area Engr. By: ... Dis. Constr. Engr. ... Date

No. of Copies (Full ... Mylar) to be sent & returned to: ... Engineer

LOCATION

Ia. 149 Over Iowa River
Overflow Channel
Iowa County
T-81N R-9W
Lenox Twp.
Section 35

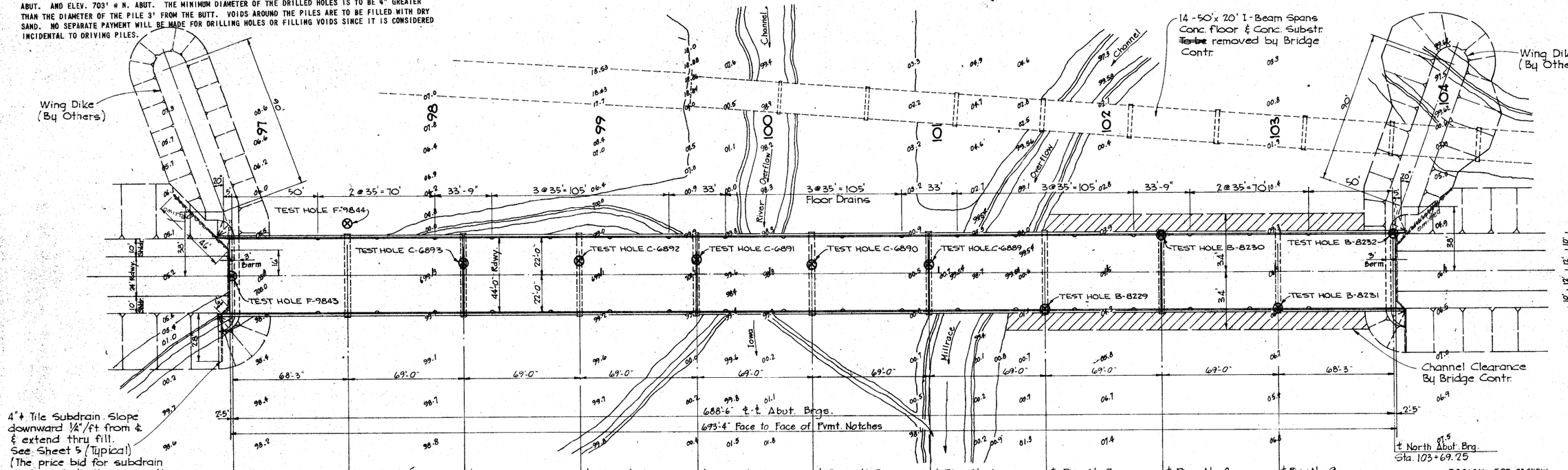
HYDRAULIC DATA

D.A. = 2864 Sq. Mi.
Design Discharge = 25,800 c.f.s.

SPECIFICATIONS:

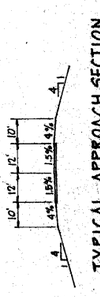
DESIGN: AASHO, SERIES OF 1969.

CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA STATE HIGHWAY COMMISSION, SERIES OF 1972, PLUS CURRENT SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.



SITUATION PLAN

Scale : 1" = 30'-0"



Traffic Count : 3900 VPD 1993
INRC Approved - Order No. 72-150 dated June 6, 1972

I HEREBY CERTIFY THAT THESE PLANS AND SPECIFICATIONS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA

Wayne R. Tyson

DATE 4/24/72 REGIST. NO. 4014

DESIGN FOR 0° SKEW

688'-6" x 44'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-3" END SPANS 69'-0" INTERIOR SPANS

CONCRETE FLOOR & SUBSTRUCTURE

SITUATION PLAN

STATION 100+25 IA. 149 OVER IOWA RIVER OVERFLOW CH.

IOWA COUNTY

IOWA STATE HIGHWAY COMMISSION

DES. SHT. NO. 1 OF 13 FILE NO. 24550 DES. NO. 872

IOWA COUNTY | PROJECT NUMBER FN-149-2(13)--21-48

STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	6		19	31

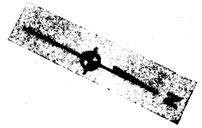
AS Built Dec. 872

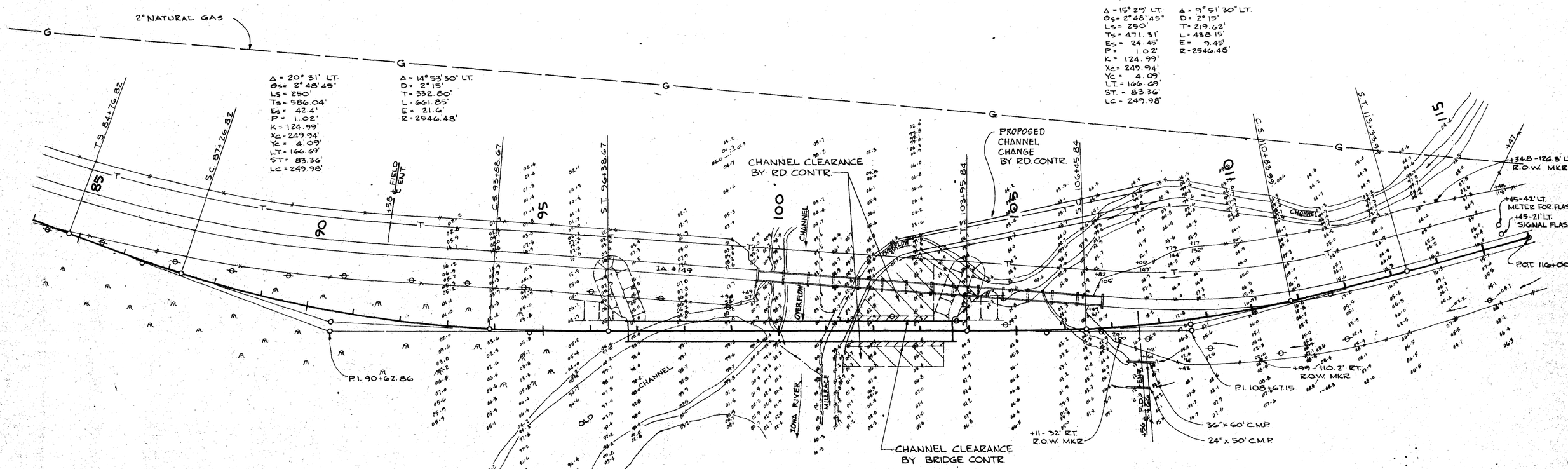
TRI-CITY BLUE PRINT- 120-3

Bench mark No. 9A - Sta. 103+23 - 22' Lt. ISHC Plug in N.W. Wing curb Elev. 719.99

BENCH MARK ~~NO. 12 - STA. 100+88 - 44' LT. CUT (x) ON E. WINGWALL AT N. END OF I BEAM BRIDGE~~ EL. ~~712.90~~

LENOX TWP.
T-81N R-9W
SEC. 35





GENERAL PLAN

SCALE: 1"=100'

LOCATION

IA. 149 OVER IOWA RIVER OVERFLOW CH.
IOWA COUNTY
T-81N R-9W
LENOX TWP.
SECTION 35

~~TOTAL ESTIMATED~~ *Actual* QUANTITIES

ITEM NO.	ITEM	UNIT	2 ABUT.	9 PIERS	SUPERSTR.	TOTAL
1	STRUCTURAL CONCRETE	C.Y.	99.8 ~~100.8~~	674.1	995.5	~~1770.4~~ 1769.4
2	REINFORCING STEEL	LBS.	11,224	104,688	241,429	357,341
3	STRUCTURAL STEEL	LBS.	-	-	37,222	37,222
4	PRETENSIONED PRESTRESSED CONCRETE BEAMS - B67	NO.	-	-	70	70
5	ALUMINUM HANDRAIL OR	L.F.	-	-	1400.3	1400.3
	~~STEEL HANDRAIL~~	L.F.	-	-	~~1400.3~~	~~1400.3~~
6	CREOSOTED WOOD PILING	L.F.	21 @ 30' 21 @ 25'	341 @ 25'	-	~~9880~~ 7835.15
7	CREOSOTED WOOD TEST PILE 1 @ 30'	L.S.				LUMP SUM
8	4" X 4 1/4" PREFORMED ELASTIC NEOPRENE JOINT	L.F.	-	-	309	309
9	CLASS 20 EXCAVATION	C.Y.	198	66	-	264
10	CLASS 21 EXCAVATION	C.Y.	-	1117	-	1117
11	CLASS 10 CHANNEL EXCAVATION	C.Y.				2470
12	4"Φ TILE SUBDRAIN	L.F.	-	-	-	~~224~~ 190
13	GRANULAR BACKFILL	C.Y.	228	-	-	228
14	REMOVAL OF EXISTING BRIDGE					LUMP SUM

ITEM 1 INCLUDES 774.9 C.Y. CLASS "C" CONCRETE FOR SUBSTRUCTURE AND 995.5 C.Y. CLASS "D" CONCRETE FOR SUPERSTRUCTURE.

Sta. 103+19 - 86' Lt.
14-50'x20' I-Beam Spans
D.A.= Iowa River Overflow
Bridge Contractor ~~to~~ build
688'-6" x 44'-0" Pretensioned
Prestressed Concrete Beam
Bridge at Sta. 100+25.

WAYNE A. LYNER 4014 REGISTERED PROFESSIONAL ENGINEER

DESIGN FOR 0° SKEW

688'-6" x 44'-0" PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE
68'-3" END SPANS 69'-0" INTERIOR SPANS
CONCRETE FLOOR & SUBSTRUCTURE

GENERAL PLAN

STATION 100+25 IA.-149 OVER IOWA RIVER OVERFLOW CH.

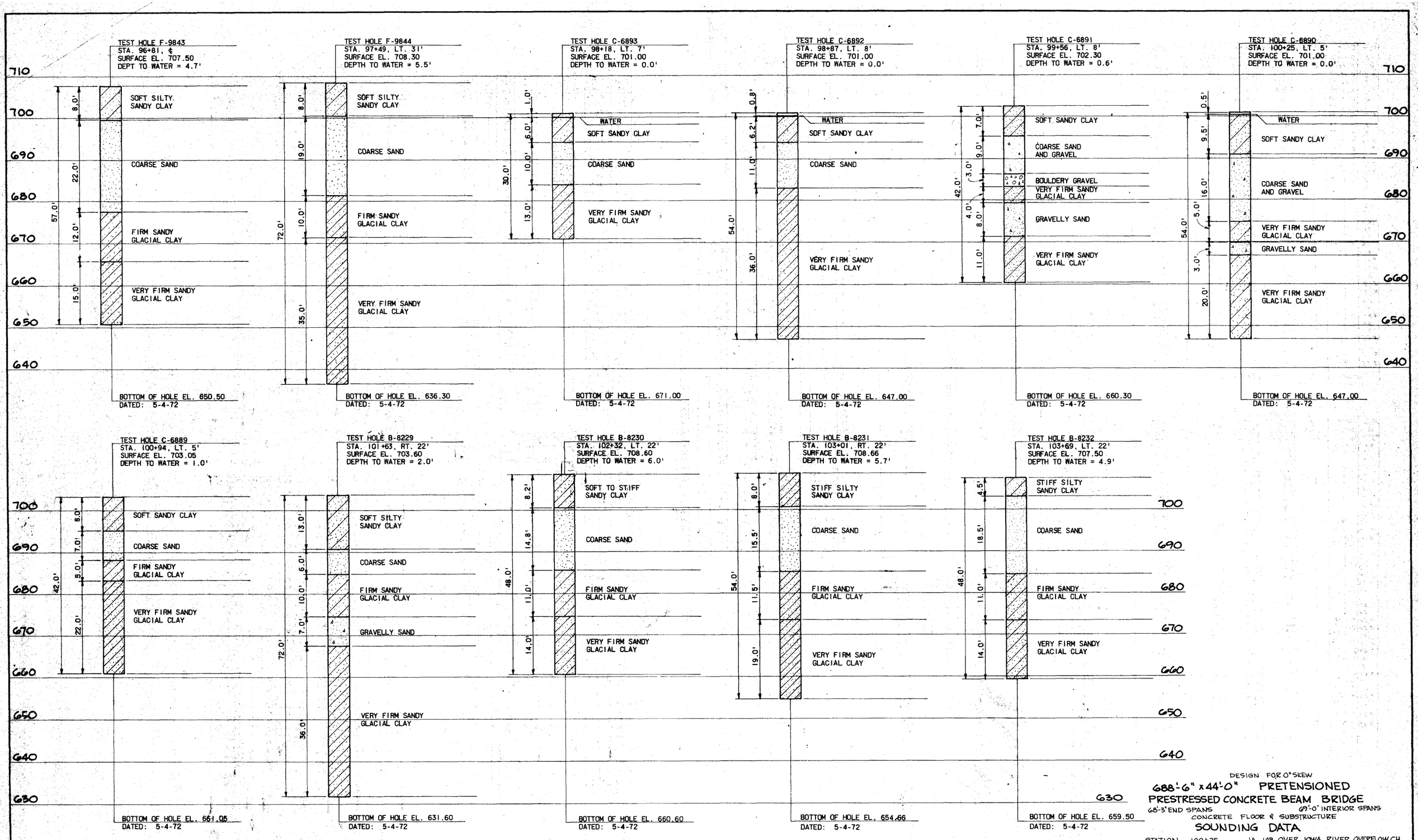
IOWA COUNTY

IOWA STATE HIGHWAY COMMISSION

DES. SHT. NO. 2 OF 13 FILE NO. 24550 DES. NO. 872

IOWA COUNTY	PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	FN-149-2(13)--21-48	IOWA	5		20	31

TRI-CITY BLUE PRINT- 138-3



DESIGN FOR 0°SKEW

68'-6" x 44'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-3" END SPANS 69'-0" INTERIOR SPANS

CONCRETE FLOOR & SUBSTRUCTURE

SOUNDING DATA

STATION 100+25 IA. 149 OVER IOWA RIVER OVERFLOW CH.

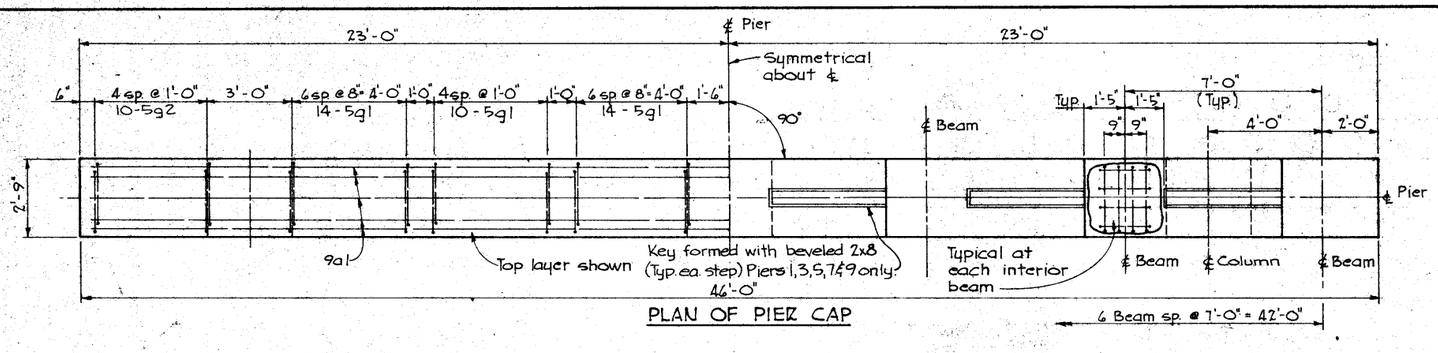
IOWA COUNTY

IOWA STATE HIGHWAY COMMISSION

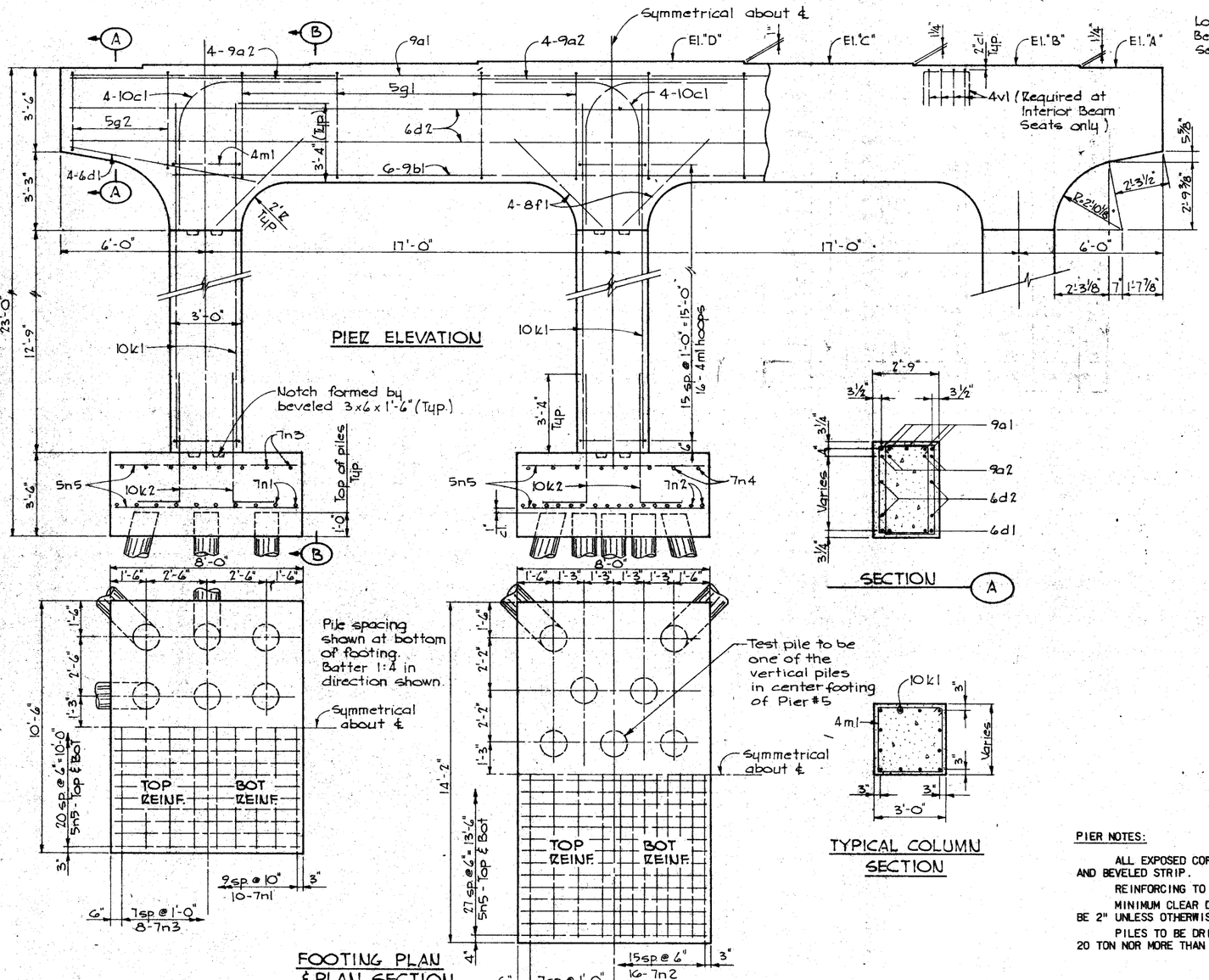
DES. SHT. NO. 3 OF 13 FILE NO. 24550 DES. NO. 872

IOWA COUNTY	PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	FN-149-2(13)--21-48	IOWA	5		21	31

BENCH MARK: ~~No 12 Sta 100+89, 44' Lt Cut (1) on E Wingwall at N end of I Beam Bridge — El 719.30~~



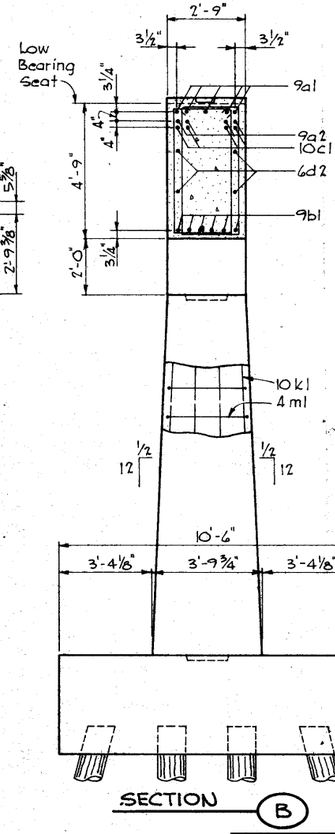
PLAN OF PIER CAP



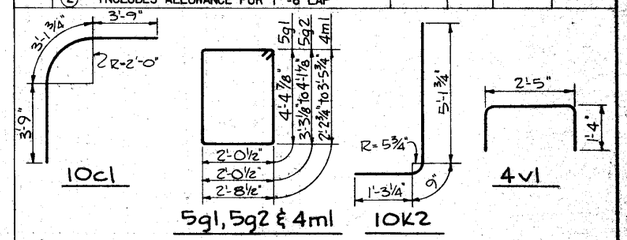
FOOTING PLAN & PLAN SECTION

SECTION A

TYPICAL COLUMN SECTION



SECTION B



BILL OF REINFORCING - ONE PIER

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
9a1	BEAM, LONGIT. TOP	——	5	(1) 45'-8	815
9a2	BEAM, LONGIT. TOP	——	12	11'-6	469
9b1	BEAM, LONGIT. BOTT.	——	6	36'-0	734
10c1	BEAM, CORNERS	⌐	16	10'-8	754
6d1	CANTILEVER, BOTT.	——	8	7'-0	84
6d2	BEAM SIDES	——	4	(2) 45'-8	283
8f1	BEAM FILLET	——	16	5'-0	214
5g1	BEAM HOOPS	□	76	13'-9	1090
5g2	CANTILEVER HOOPS	□	20	VARIES	256
10k1	COLUMN, VERT.	——	36	18'-0	2788
10k2	COLUMN DOWELS	⌐	36	7'-2	1110
4m1	COLUMN HOOPS	□	48	VARIES	379
7n1	EXTERIOR FOOTING, LONGIT., BOTT.	——	20	10'-2	416
7n2	CENTER FOOTING, LONGIT., BOTT.	——	16	13'-10	452
7n3	EXTERIOR FOOTING, LONGIT., TOP	——	16	10'-2	332
7n4	CENTER FOOTING, LONGIT., TOP	——	8	13'-10	226
5n5	ALL FOOTINGS, TRANSV. TOP AND BOTT.	——	140	7'-8	1119
4v1	BEAM SEAT (INTERIOR BEAMS ONLY)	⌐	40	4'-11	131
	TOTAL				11,632

(1) INCLUDES ALLOWANCE FOR 2'-3 LAP
(2) INCLUDES ALLOWANCE FOR 1'-6 LAP

TABLE OF ELEVATIONS

	EL. A	EL. B	EL. C	EL. D	FOOTING EL.	GRADE TO PIER TOP
PIER 1	715.65	715.76	715.86	715.94	692.65	4'-0 5/8
PIER 2	715.52	715.63	715.73	715.81	692.52	4'-3 1/8
PIER 3	715.77	715.87	715.98	716.06	692.77	4'-0 5/8
PIER 4	715.56	715.67	715.77	715.86	692.56	4'-3 1/8
PIER 5	715.73	715.84	715.95	716.03	692.73	4'-0 5/8
PIER 6	715.45	715.56	715.66	715.75	692.45	4'-3 1/8
PIER 7	715.55	715.65	715.76	715.84	692.55	4'-0 5/8
PIER 8	715.19	715.30	715.40	715.48	692.19	4'-3 1/8
PIER 9	715.21	715.32	715.42	715.50	692.21	4'-0 5/8

CONCRETE QUANTITIES-ONE PIER

PIER BEAM	25.8
COLUMN 3 @ 4.6	13.8
EXTERIOR FOOTING 2 @ 10.5	21.0
CENTER FOOTING	14.3
TOTAL	74.9

WAYNE R. TYNER REGISTERED 4014 IOWA PROFESSIONAL ENGINEER

ACTUAL
~~EST IMATED~~ QUANTITIES

ITEM	UNIT	PIER 1	PIER 2	PIER 3	PIER 4	PIER 5	PIER 6	PIER 7	PIER 8	PIER 9
STRUCTURAL CONC. CL. "C"	C.Y.	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9
REINFORCING STEEL	LBS.	11,632	11,632	11,632	11,632	11,632	11,632	11,632	11,632	11,632
EXCAVATION CLASS 20	C.Y.	4	-	-	13	-	22	9	9	9
EXCAVATION CLASS 21	C.Y.	123	122	116	125	116	127	125	132	131
CREOSOTED PILING	L.F.	38@25'	38@25'	38@25'	38@25'	~~38@25~~ 37@25'	38@25'	38@25'	~~38~~ 37@25'	38@25'
CREOSOTED TEST PILE	L.S.	-	-	-	-	LUMP SUM	-	-	-	-

PIER NOTES:

ALL EXPOSED CORNERS 90° OR SHARPER ARE TO BE FILLETED WITH A 3/4" DRESSED AND BEVELED STRIP.

REINFORCING TO BE SECURELY WIRED IN PLACE BEFORE CONCRETE IS POURED.

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

PILES TO BE DRIVEN TO FULL PENETRATION IF PRACTICABLE, BUT TO NOT LESS THAN 20 TON NOR MORE THAN 40 TONS BEARING CAPACITY.

DESIGN FOR 0° SKEW

68'-6" x 44'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-3" END SPANS 69'-0" INTERIOR SPANS

CONCRETE FLOOR & SUBSTRUCTURE

PIER DETAILS

STATION 100+25 IA 149 OVER IOWA RIVER OVERFLOW CH.

IOWA COUNTY

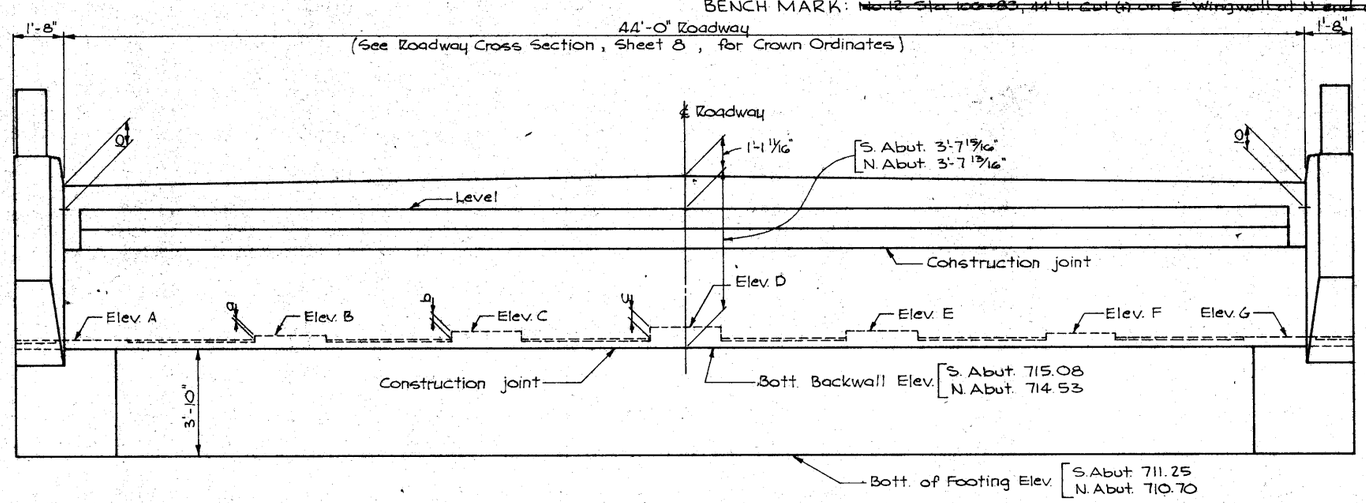
IOWA STATE HIGHWAY COMMISSION

DES. SHEET NO. 4 OF 13 FILE NO. 24550 DES. NO. 872

IOWA COUNTY	PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	FU-149-2(13)--21-48	IOWA	9		22	31

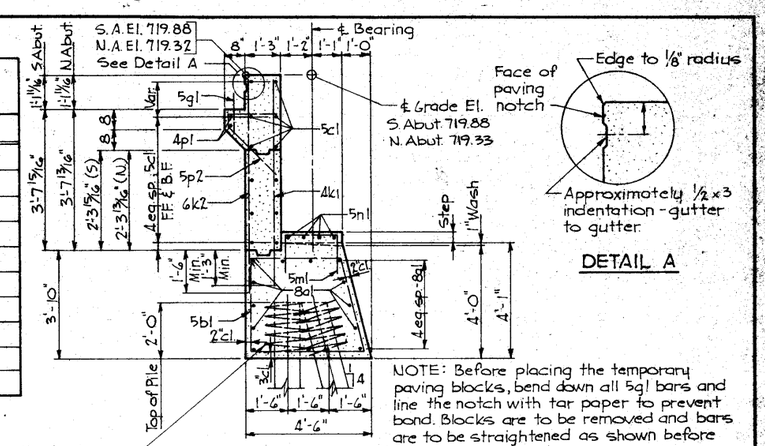
TRI-CITY BLUE PRINT- 139-3

BENCH MARK: ~~No. 12 Sta. 100+83, 44' Lt. Cut (t) on E. Wingwall of N. end of I Beam Bridge — El. 719.36~~



REAR ELEVATION

TABLE OF ELEVATIONS AND STEPS		
	S. Abut.	N. Abut.
Elev. A	715.33	714.78
Elev. B	715.43	714.88
Elev. C	715.54	714.99
Elev. D	715.62	715.07
Elev. E	715.54	714.99
Elev. F	715.43	714.88
Elev. G	715.33	714.78
Step a	1¼"	1¼"
Step b	2½"	2½"
Step c	3½"	3½"

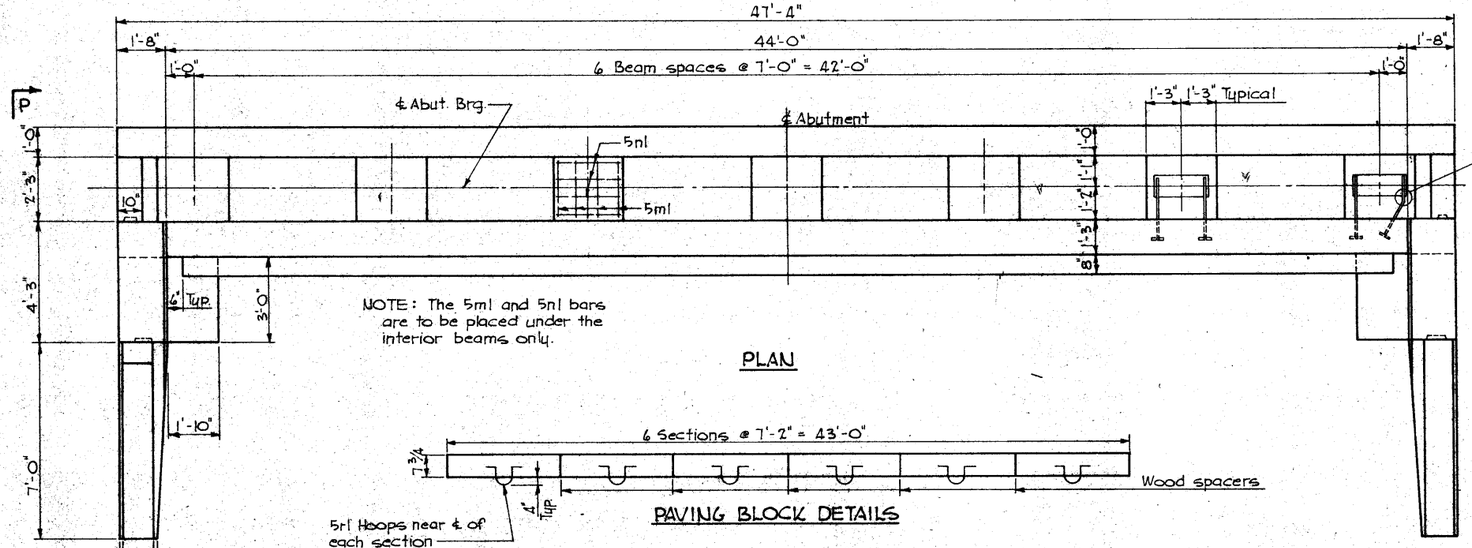


DETAIL A

Spirals at top of each pile to be 7 turns of ¼"ϕ rod, 21" dia., 3" pitch W/2 - 7/8 [0.69 spacers punched to hold spiral.

NOTE: Before placing the temporary paving blocks, bend down all 5g1 bars and line the notch with tar paper to prevent bond. Blocks are to be removed and bars are to be straightened as shown before paving is poured.

SECTION AT ℄ EXPANSION DEVICE NOT SHOWN

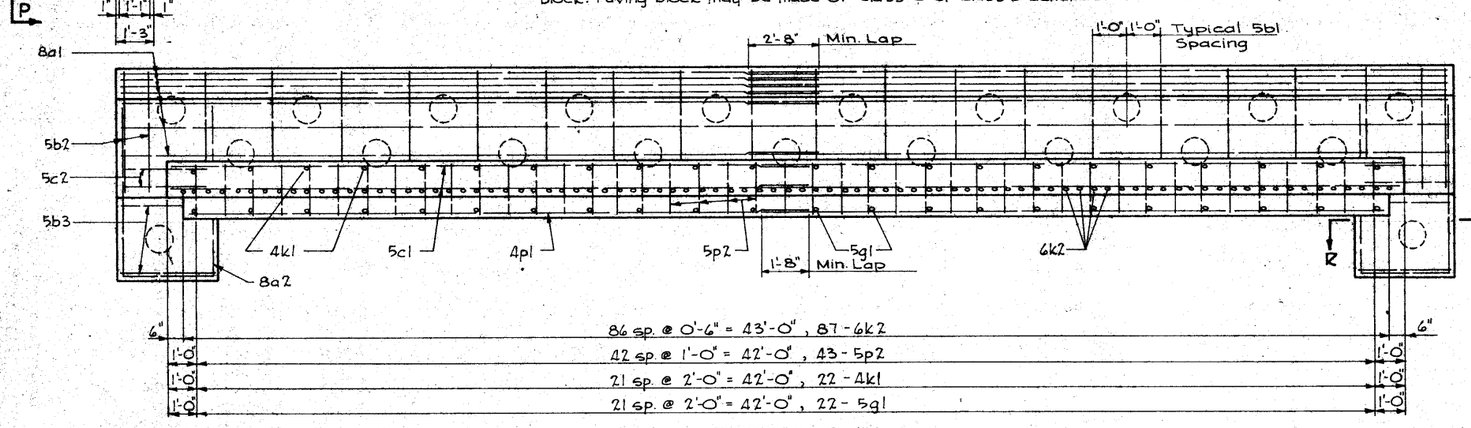


NOTE: The 5m1 and 5n1 bars are to be placed under the interior beams only.

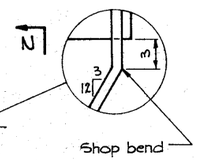
PLAN

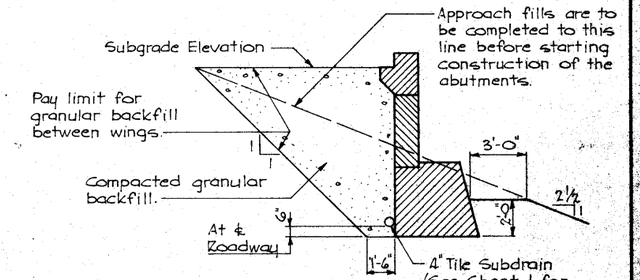
PAVING BLOCK DETAILS

NOTE: Line paving notch with tar paper before placing temporary paving block. Paving block may be made of Class C or Class D concrete.

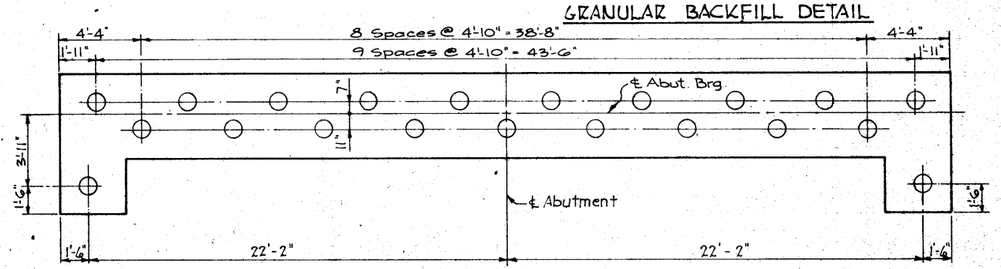


FOOTING PLAN



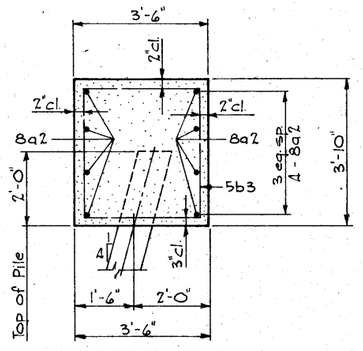


GRANULAR BACKFILL DETAIL



PILE PLAN

NOTE: Pile dimensions are at bottom of footing. Batter piles 1:4 in direction shown. Furnish 21 creosoted wood piles at each abutment.



SECTION E-E

DESIGN FOR 0° SKEW

688'-6" x 44'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-3" END SPANS 69'-0" INTERIOR SPANS

CONCRETE FLOOR & SUBSTRUCTURE

ABUTMENT DETAILS

STATION 100+25 IA 149 OVER IOWA RIVER OVERFLOW CH.

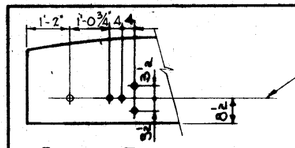
IOWA COUNTY

IOWA STATE HIGHWAY COMMISSION

DES. SHT. NO. 5 OF 13 FILE NO. 24550 DES. NO. 872

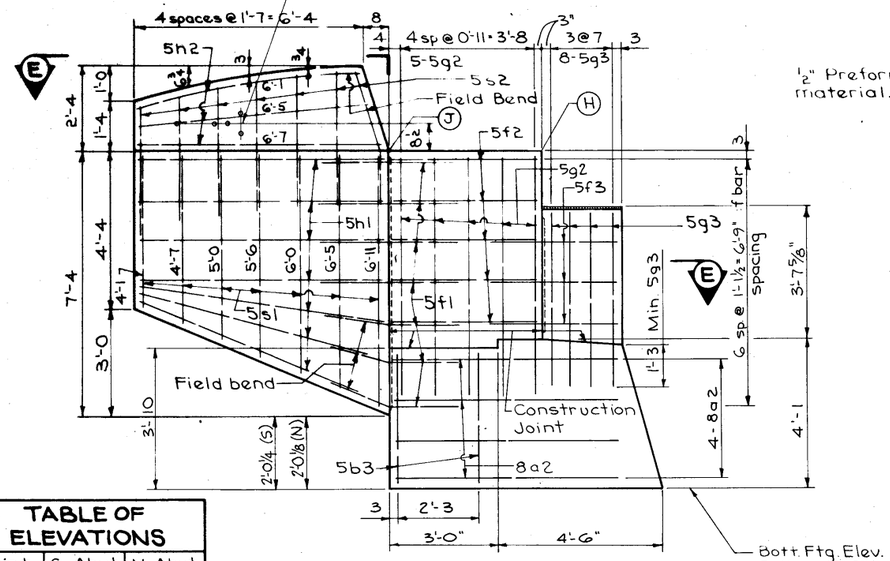
IOWA COUNTY	PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	FN-149-2(13)--21-48	IOWA	6		23	31

BENCH MARK: ~~No 12 - Sta 100+89, 44'11" Lt (L) on E Wingwall at N end of T-Beam Bridge — El. 710.30~~

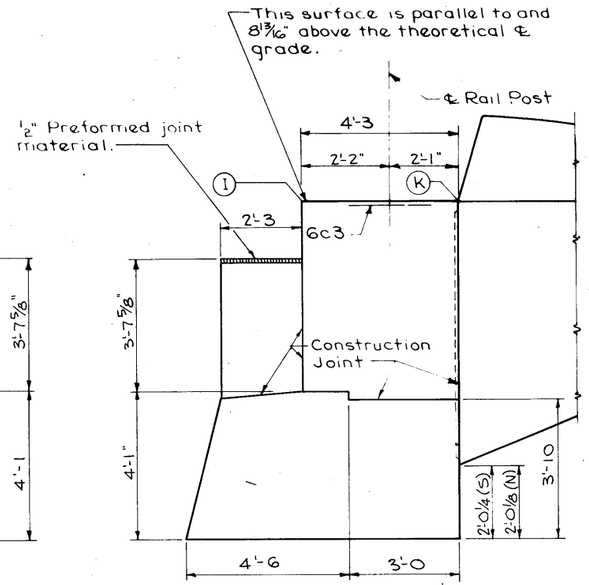


INSIDE FACE

Provide 5 - Threaded Steel Inserts with solid bottom to fit ⅝"ϕ x 2" Galvanized Cap Screws with Galvanized Round Washers. Cost of Inserts to be included in price bid for "Structural Concrete". Screws and washers are not a part of this contract.

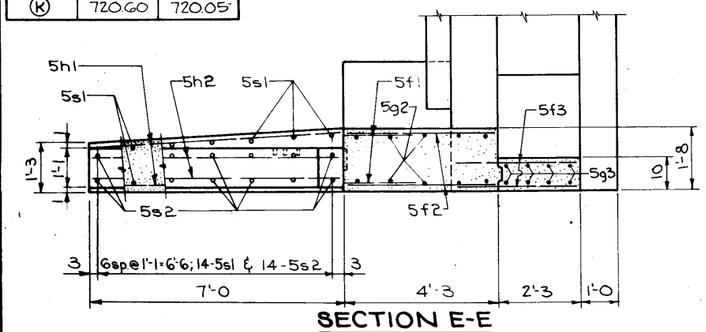


VIEW N-N

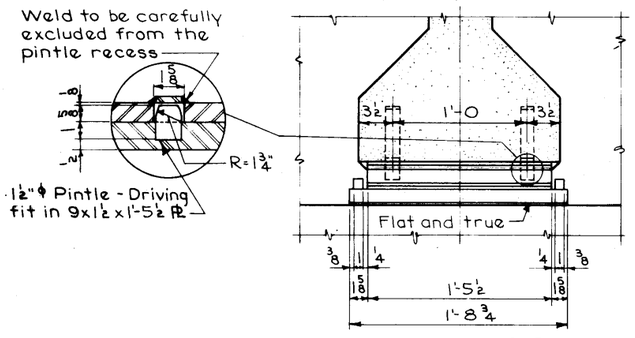


VIEW P-P

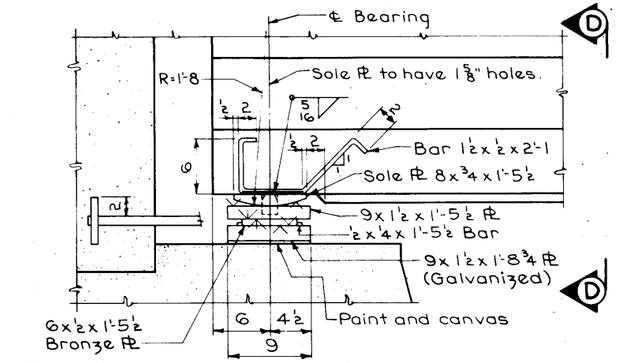
TABLE OF ELEVATIONS		
Point	S. Abut.	N. Abut.
(H)	720.61	720.06
(I)	720.61	720.06
(J)	720.60	720.05
(K)	720.60	720.05



SECTION E-E

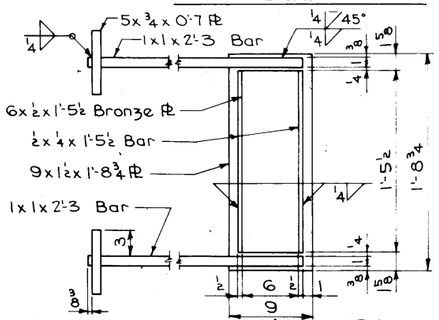


SECTION D-D



NOTE: Sole plates are to be set in forms when beams are cast and formed out below as shown to exclude concrete.

PART ELEVATION



PLAN OF MASONRY ℄ AND BRONZE ℄

ABUTMENT BEARING DETAILS

ABUTMENT NOTES:

All exposed corners 90° or sharper are to be filleted with a ¾" dressed and beveled strip.

Reinforcing steel 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 2" unless otherwise noted or shown.

All backfill behind the abutment between wings is to be granular backfill. The remainder of the abutment excavation is to be backfilled with soil.

Cost of all preformed joint material is to be included in price bid for concrete.

Beams and masonry plates are to be set before the backwall is placed.

The backwall containing the abutment anchorage of the expansion device is to be poured after the bridge floor is placed.

The maskwall is to be poured before the superstructure slab is poured.

Construction joint keyways are to be formed with beveled 2x6's.

Wood piles to be driven to full penetration, if practicable, but to not less than 20 tons nor more than 40 tons bearing capacity.

CONCRETE PLACEMENT QUANTITIES ONE ABUTMENT

Location	Unit	Quantity
Footing And Steps	c.y.	29.9
Backwall Above Construction Joint	c.y.	5.8
Backwall Below Construction Joint	c.y.	4.7
Wingwalls	c.y.	2.9
Maskwalls	c.y.	0.5
End Posts 2 @ 0.55	c.y.	1.1
*Paving Block	c.y.	as ~~req~~
Wings 2 @ 2.25	c.y.	4.5
Total	c.y.	~~9.9~~ 10.4

* Paving block may be Class C or Class D concrete.

ABUTMENT BEARING NOTES:

Bronze ℄ shall be lubricated in accordance with ISHC Specifications Article 4190.03 (Sliding surface only). Top edges of bronze ℄ shall be beveled ⅛". Masonry plates to be galvanized after welding.

Surfaces marked "V" shall be finished ASA 250 and surfaces marked "V" shall be finished ASA 125. Masonry plates are to be set in paint and canvas.

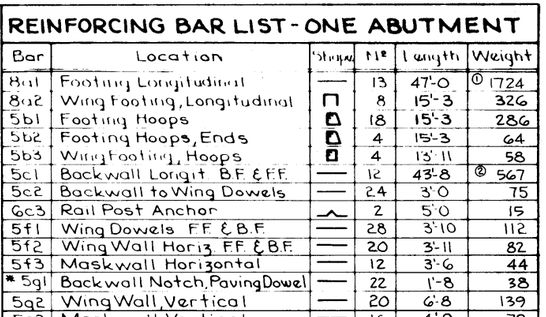
Pintle plates and masonry plates are a part of the superstructure Structural Steel Quantity. Unit price bid for Structural Steel shall include allowance for cost of bronze plates. Cost of anchored curved sole plates is to be included in price bid for Pretensioned Prestressed Concrete Beams.

REINFORCING BAR LIST - ONE ABUTMENT

Bar	Location	Shape	No	Length	Weight
8a1	Footing Longitudinal	—	13	47'-0	① 1724
8a2	Wing Footing, Longitudinal	⊓	8	15'-3	326
5b1	Footing Hoops	▯	18	15'-3	286
5b2	Footing Hoops, Ends	▯	4	15'-3	64
5b3	Wing Footing, Hoops	▯	4	13'-11	58
5c1	Backwall Longit B.F. & F.F.	—	12	43'-8	② 567
5c2	Backwall to Wing Dowels	—	24	3'-0	75
6c3	Rail Post Anchor	∼	2	5'-0	15
5f1	Wing Dowels F.F. & B.F.	—	28	3'-10	112
5f2	Wing Wall Horiz. F.F. & B.F.	—	20	3'-11	82
5f3	Maskwall Horizontal	—	12	3'-6	44
* 5g1	Backwall Notch, Paving Dowel	—	22	1'-8	38
5g2	Wing Wall, Vertical	—	20	6'-8	139
5g3	Maskwall, Vertical	—	16	4'-9	79
5h1	Wing, Horizontal	—	28	6'-8	195
5h2	End Post, Horizontal	—	12	Varies	80
4k1	Backwall Vertical, F.F.	—	22	5'-10	86
6k2	Backwall Vertical, B.F.	—	87	6'-1	795
5m1	Beam Steps, Transv.	⊓	20	4'-5	92
5n1	Beam Steps, Longit.	—	20	2'-2	45
4p1	Backwall Notch, Longit.	—	2	42'-8	② 59
5p2	Backwall Notch, Vertical	⊂	43	4'-1	183
5r1	Paving Block Lifting Loops	⊓	6	2'-3	14
5s1	Wing, Vertical	—	28	Varies	161
5s2	End Post - Wing, Vert.	—	28	3'-7	105
	Pile Spirals, ¼ ϕ rod	◎	21	38'-6	135
	Spiral Spacers, 7/8 I.D. 0.69	—	42	1'-10	53
	① Includes allowance for 2'-8	lap			
	② Includes allowance for 1'-8	lap			

* Structural Grade — Total (lb.) 5612

BENT BAR DETAILS



NOTE:
All dimensions are out to out. Radii to ℄ bar.

ACTUAL ~~ESTIMATED~~ QUANTITIES - TWO ABUTMENTS

Item	Unit	Quantity
Structural Concrete Class C	c.y.	~~998~~ ~~100.8~~
Reinforcing Steel	lb.	11,224
Class 20 Excavation	c.y.	198
Granular Backfill	c.y.	228
Creosoted Wood Piling ~~21 @ 50~~ 40 & ~~21 @ 25~~ 35	L.F.	~~1155~~ 1680

DESIGN FOR 0° SKEW

688'-6" x 44'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-3" END SPANS 69'-0" INTERIOR SPANS

CONCRETE FLOOR & SUBSTRUCTURE

ABUTMENT DETAILS

STATION 100+25 IA 149 OVER IOWA RIVER OVERFLOW CH.

IOWA COUNTY

IOWA STATE HIGHWAY COMMISSION

Design Sheet No.: 6 Of 13 File No.: 24550 Design No.: 872

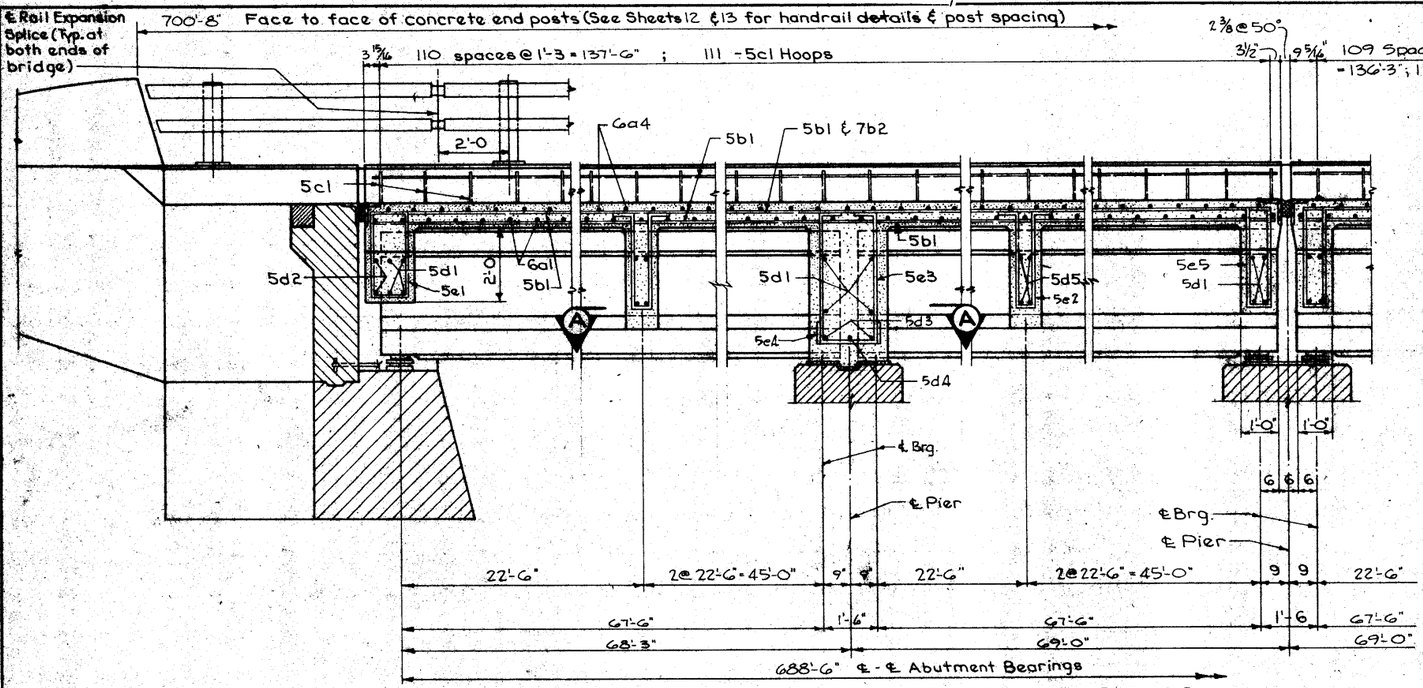
DESIGNED BY: — TRACED BY

DETAILED BY: — CHECKED BY

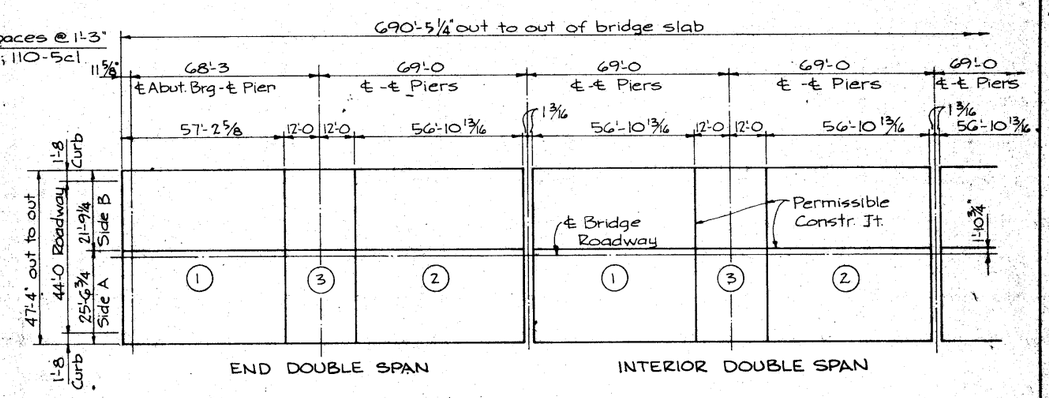
ABUTMENT - 0° OR SMALL SKEW | STANDARD SHEET | IOWA COUNTY

PROJECT NUMBER FN-149-2(13)--21-48

STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	5		24	31

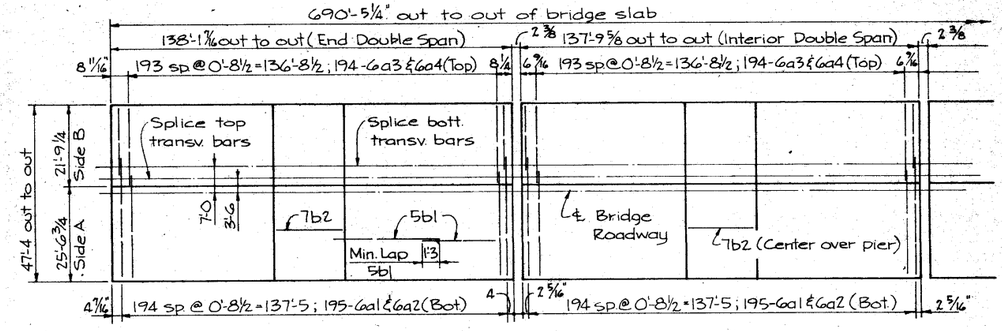


PART LONGITUDINAL SECTION NEAR CURB

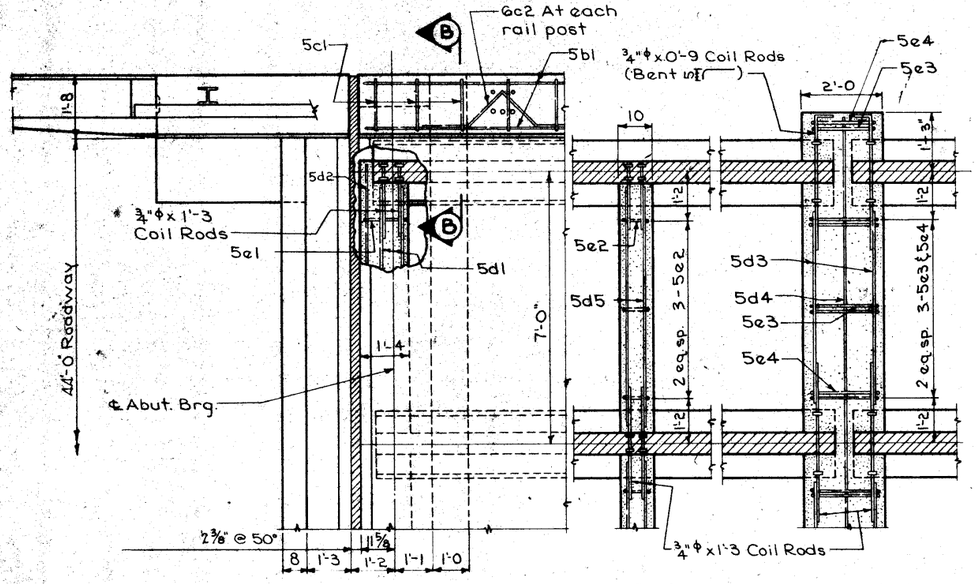


CONCRETE PLACEMENT DIAGRAM

NOTE: Roadway slab shall be placed in sections and in sequence indicated by encircled numbers on placement diagram, and preferably at intervals not exceeding 24 hours. Curbs may be placed continuously. Alternate procedures for placing concrete may be submitted for approval, together with a statement of the proposed method and evidence that the contractor possesses the necessary equipment and facilities to accomplish the required result.

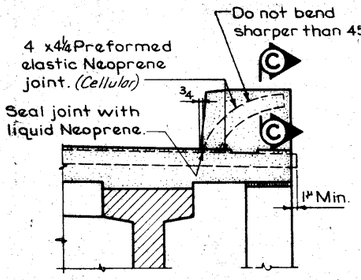


SLAB REINFORCING LAYOUT

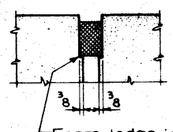


PART PLAN

PART SECTION A-A



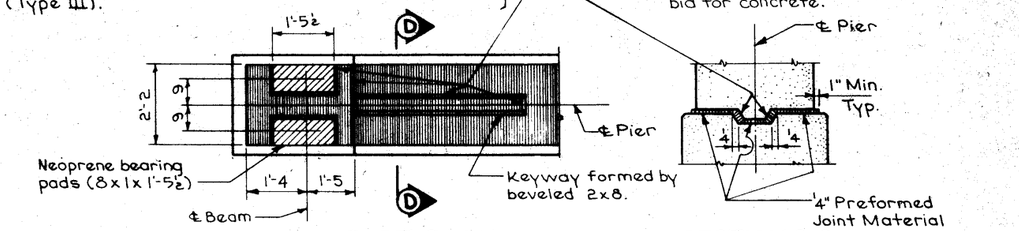
SECTION B-B



SECTION C-C

1" Thick strips of compressible material around bearing pads, face of steps, sides and ends of keyways. Compressible material shall conform to A.A.S.H.O. Specifications, M-153 (Type III).

NOTE: Cost of all preformed joint and compressible materials is to be included in price bid for concrete.



PART PLAN

SECTION D-D

PIER TOP DETAILS - PIERS #1, #3, #5, #7 & #9

DESIGN FOR 0° SKEW

688'-6" x 44'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-3" END SPANS — 69'-0" INTERIOR SPANS

CONCRETE FLOOR & SUBSTRUCTURE

SUPERSTRUCTURE DETAILS

STATION 100+25 IA 149 OVER IOWA RIVER OVERFLOW CH.

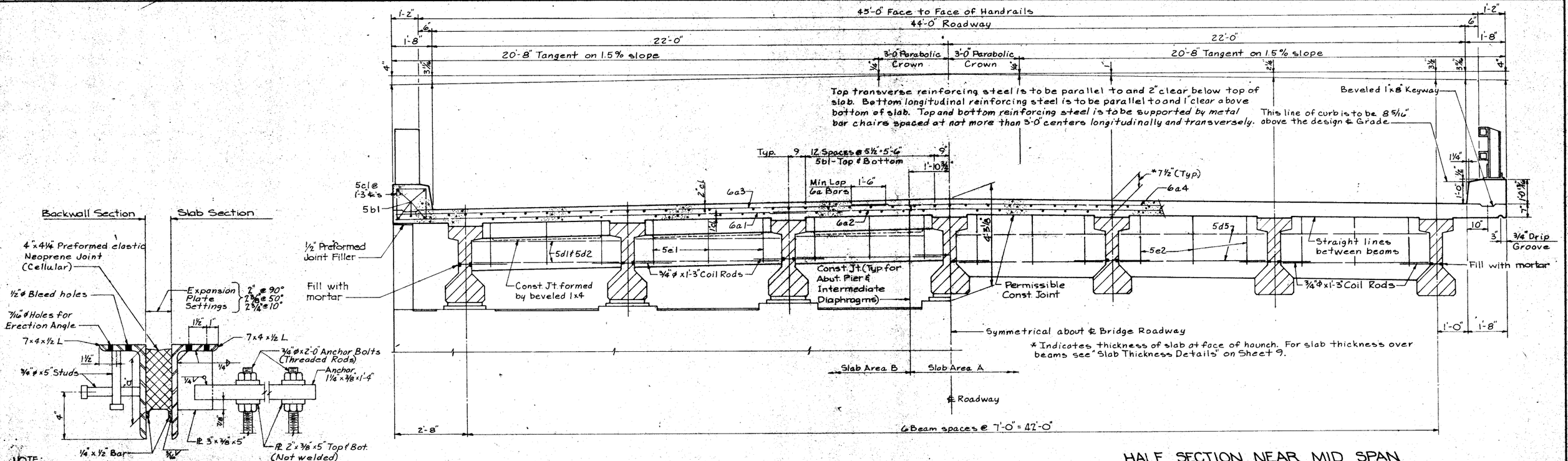
IOWA COUNTY

IOWA STATE HIGHWAY COMMISSION

Design Sheet No.: 7 Of 13 File No.: 24550 Design No.: 872

Revised 4-18-72: Nomenclature of Expansion Joint changed.

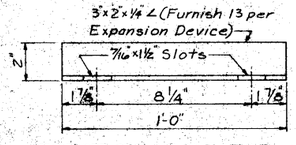
DESIGNED BY / DETAILED BY	TRACED BY / CHECKED BY	STANDARD SHEET	IOWA COUNTY	PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
				FN-149-2(13)--21-48	IOWA	5		25	31



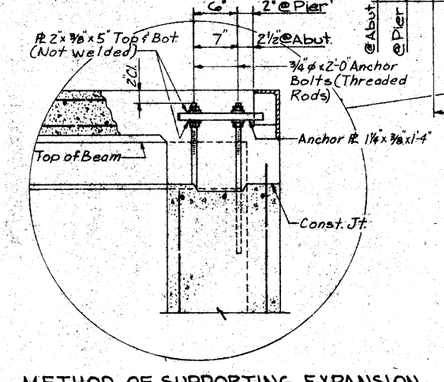
NOTE:
The distance (a) from the top of slab to compression seal retainer bar shall be consistant with the recommendation of the seal manufacturer. Drawings of the seal to be used showing the size, type, and manufacturer are to be furnished with the shop drawings of the Expansion Device.

SECTION A-A

(Shown for Abut. Expansion Device - Pier Expansion Device is similar except Slab Section on each side.

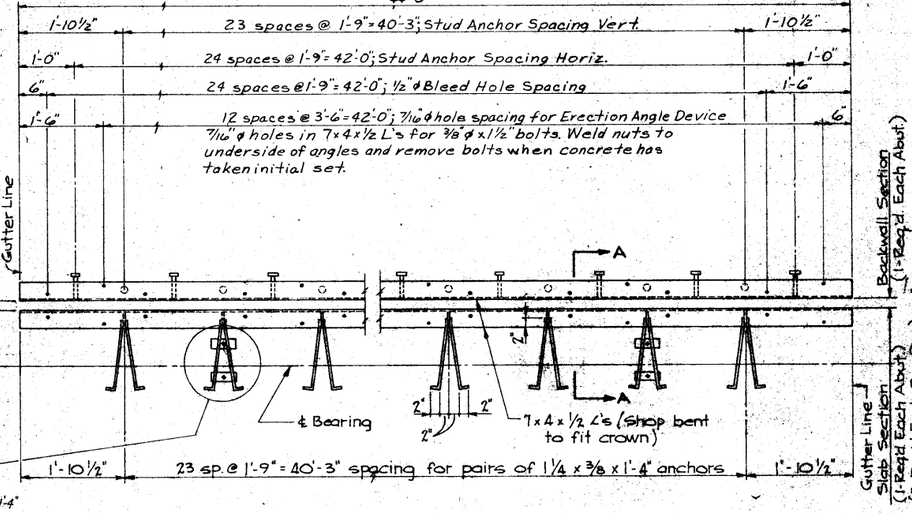


ERECTION ANGLE FOR EXPANSION DEVICE



METHOD OF SUPPORTING EXPANSION DEVICE DURING CONSTRUCTION

HALF SECTION NEAR ABUTMENT

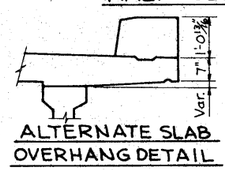


EXPANSION DEVICE DETAILS

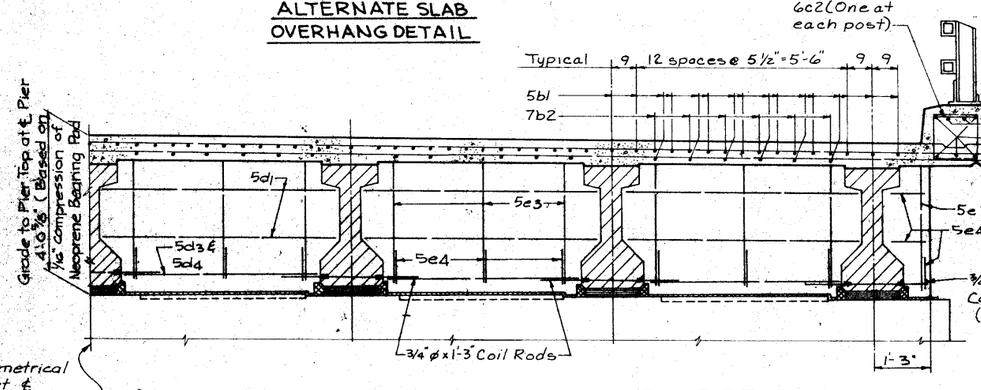
Abut. Expansion Device - 2 Req'd. (1-Backwall Sec. & 1-Slab Sec. each) Weight = 1929 lbs each
Pier Expansion Device - 4 Req'd (2-Slab Sec. each) _____ Weight = 2106 lbs each

NOTE: Expansion device, except erection angles and anchor bolt assemblies, is to be galvanized after welding.
One set of anchor bolts is required between each pair of beams. Six sets are required for each abut. expansion device and twelve sets are required for each pier expansion device. Anchor Bolt sets are to be symmetrical about ℄ Roadway

HALF SECTION NEAR MID SPAN



ALTERNATE SLAB OVERHANG DETAIL



HALF SECTION NEAR FIXED PIER

PIERS #1, 3, 5, 7 & 9

DESIGN FOR 0° SKEW

688'-6" x 44'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-3" END SPANS 69'-0" INTERIOR SPANS

CONCRETE FLOOR & SUBSTRUCTURE

SUPERSTRUCTURE DETAILS

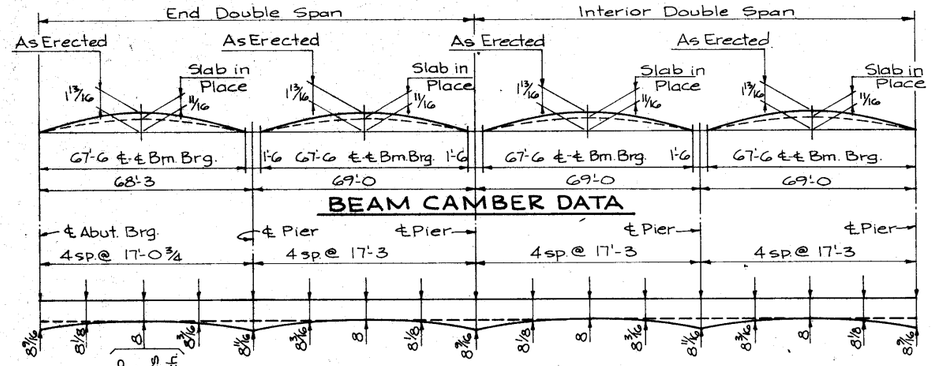
STATION 100+25 IA. 149 OVER IOWA RIVER OVERFLOW CH.

IOWA COUNTY

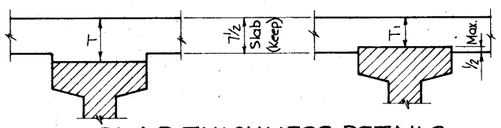
IOWA STATE HIGHWAY COMMISSION

DES. SHT. NO. 8 OF 13 FILE NO. 24550 DES. NO. 872

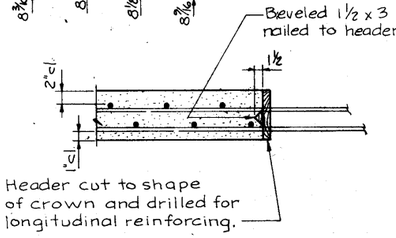
IOWA COUNTY	PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	FN-149-2(13)--21-48	IOWA	8		26	31



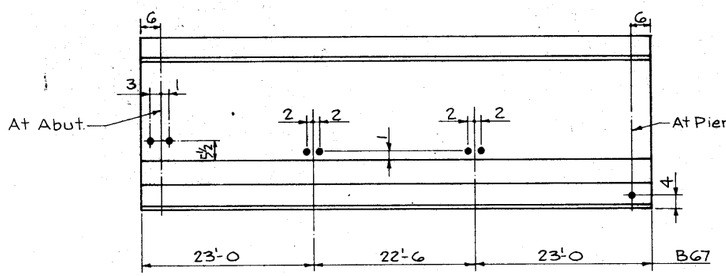
SLAB THICKNESS AT BEAMS(T)



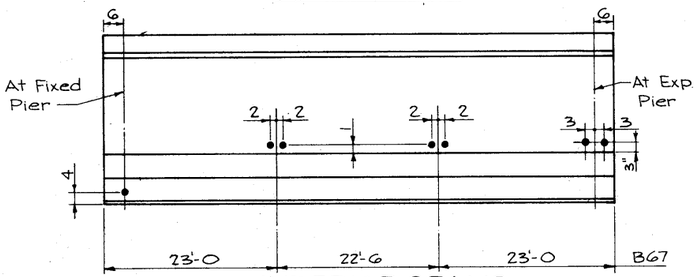
SLAB THICKNESS DETAILS



TRANSVERSE SLAB CONSTRUCTION JOINT



END SPANS



INTERIOR SPANS

BEAM COIL TIE LOCATION

NOTE:

THE SLAB THICKNESS (T) AT BEAMS IS BASED ON THE ANTICIPATED BEAM CAMBER REMAINING AFTER PLACING THE SLAB, BUT IS NOT GUARANTEED FOR CONSTRUCTION. IF BEAM IS UNDER CAMBERED, INCREASE SLAB THICKNESS (T) AT BEAMS TO COMPENSATE. IF BEAM IS OVER CAMBERED, THE SLAB THICKNESS (T) MAY BE DECREASED TO A MAXIMUM OF 1/2" EMBEDMENT AT THE BEAM (TI). IF MORE THAN 1/2" EMBEDMENT IS REQUIRED, OR IF THE HAUNCH EXCEEDS 2", THE GRADE LINE IS TO BE REVISED.

SUPERSTRUCTURE NOTES:

THIS BRIDGE IS DESIGNED FOR HS20-44 LOADING, PLUS AN ALLOWANCE OF 20 POUNDS PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

THE FLOOR SLAB AS SHOWN INCLUDES 1/2" OF WEARING SURFACE.

ALL EXPOSED CORNERS 90° OR SHARPER ARE TO BE FILLETED WITH A 3/4" DRESSED AND BEVELED STRIP.

PINTLE PLATES, MASONRY PLATES AND SWEDGE ANCHOR BOLTS ARE A PART OF THE SUPERSTRUCTURE STRUCTURAL STEEL QUANTITY. UNIT PRICE BID FOR STRUCTURAL STEEL SHALL INCLUDE ALLOWANCE FOR COST OF BRONZE PLATES. COST OF ANCHORED CURVED SOLE PLATES AND NEOPRENE BEARING PADS IS TO BE INCLUDED IN PRICE BID FOR PRESTRESSED CONCRETE BEAMS.

ALL BEAMS ARE TO BE SET VERTICAL.

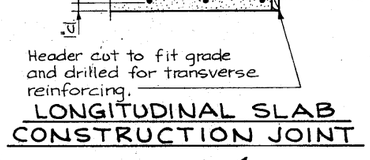
FORMS FOR THE SLAB AND CURBS ARE TO BE SUPPORTED BY THE PRESTRESSED BEAMS.

THE FIXED PIER DIAPHRAGM CONCRETE IS TO BE PLACED MONOLITHICALLY WITH THE FLOOR SLAB.

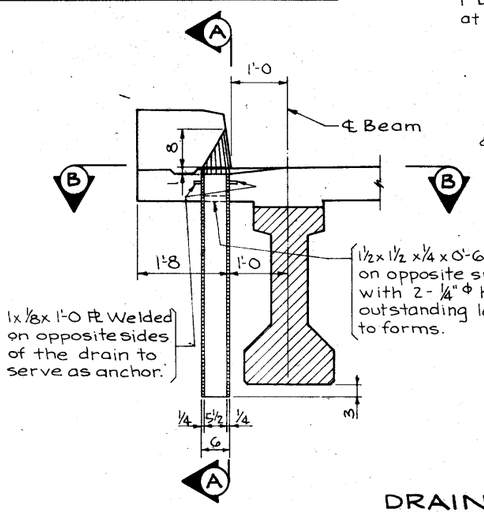
CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN. ALL REINFORCING BARS ARE TO BE SECURELY WIRED IN PLACE AND ADEQUATELY SUPPORTED ON BAR CHAIRS BEFORE CONCRETE IS PLACED.

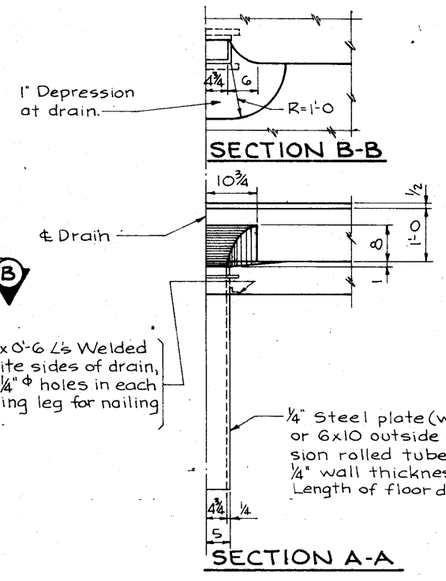
THE CONTRACT UNIT PRICE PER LINEAL FOOT OF " 4" PREFORMED ELASTIC NEOPRENE JOINT" SHALL BE FULL COMPENSATION FOR FURNISHING AND INSTALLING THE NEOPRENE JOINT AS SHOWN ON THE PLANS. ARTICLE 2412.12 SHALL NOT APPLY TO THIS BID ITEM.

NO ALLOWANCE WILL BE MADE FOR THE ADDITIONAL CONCRETE REQUIRED TO FORM THE SLAB OVERHANG WHEN USING THE ALTERNATE METHOD.



LONGITUDINAL SLAB CONSTRUCTION JOINT





DRAIN DETAILS

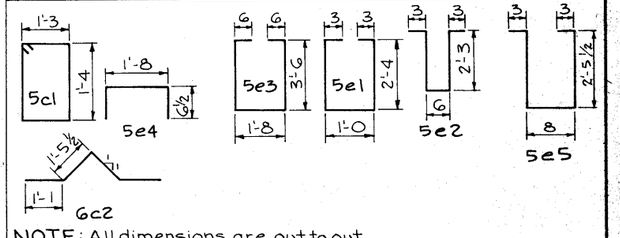
NOTE: 36 Drains required. See "Situation Plan" for location.
Weight = 110 lb. each; to be included in "Structural Steel" quantity.

Drains to be galvanized.

REINFORCING STEEL-SUPERSTRUCTURE

BAR	LOCATION	SHAPE	NO	LENGTH	WEIGHT
6a1	SLAB TRANSV. BOTTOM	——	975	17'-3"	25,262
6a2	SLAB TRANSV. BOTTOM	——	975	31'-3"	45,764
6a3	SLAB TRANSV. TOP	——	970	20'-9"	30,232
6a4	SLAB TRANSV. TOP	——	970	27'-9"	40,430
5b1	SLAB AND CURB LONGIT.	——	1940	35'-5"	71,663
7b2	SLAB & CURB LONGIT.-OVER FIXED PIERS	——	200	23'-8"	9675
5c1	CURB HOOPS	⊡	1104	5'-11"	6813
6c2	RAIL POST ANCHOR	⌒	170	5'-0"	1277
5d1	ABUTMENT & PIER DIAPH - LONGIT.	——	360	6'-0"	2253
5d2	ABUTMENT DIAPH. - LONGIT.	——	8	21'-10"	182
5d3	PIER DIAPH. - LONGIT. (FIXED PIER)	——	60	5'-1"	318
5d4	PIER DIAPH. - LONGIT (FIXED PIER)	——	10	22'-9"	237
5d5	INTERMEDIATE DIAPH. - LONGIT.	——	480	6'-0"	3004
5e1	ABUTMENT DIAPH. - HOOPS	⊓	36	5'-10"	219
5e2	INTERMEDIATE DIAPH. - HOOPS	⊓	360	5'-2"	1940
5e3	PIER DIAPH. - HOOPS (FIXED PIER)	⊓	100	9'-4"	973
5e4	PIER DIAPH. - TIES (FIXED PIER)	⊔	120	2'-7"	323
5e5	PIER DIAPH. - HOOPS (EXP. PIER)	⊓	144	5'-9"	864
				TOTAL (LB.)	241,429

BENT BAR DETAILS



NOTE: All dimensions are out to out.

CONCRETE PLACEMENT QUANT.-SUPERSTRUCTURE

ITEM	UNIT	SIDE A	SIDE B	TOTAL
END DOUBLE SPAN-SEC.1 SLAB & DIAPH.	C.Y.	39.8	33.8	73.6
END DOUBLE SPAN-SEC.2 SLAB & DIAPH.	C.Y.	39.1	33.2	72.3
END DOUBLE SPAN-SEC.3 SLAB & DIAPH.	C.Y.	19.8	16.9	36.7
138'-1 7/16 CURB @ 0.0627 CY/FT.	C.Y.	8.7	8.7	17.4
TOTAL - 1 END DOUBLE SPAN				200.0
INTERIOR DOUBLE SPAN-SEC.1 SLAB & DIAPH	C.Y.	39.1	33.2	72.3
INTERIOR DOUBLE SPAN-SEC.2 SLAB & DIAPH	C.Y.	39.1	33.2	72.3
INTERIOR DOUBLE SPAN-SEC.3 SLAB & DIAPH	C.Y.	19.8	16.9	36.7
137'-9 5/8 CURB @ 0.0627 CY/FT.	C.Y.	8.6	8.6	17.2
TOTAL - 1 INT. DOUBLE SPAN				198.5

ACTUAL

~~ESTIMATED~~ QUANTITIES-SUPERSTRUCTURE

ITEM		UNIT	QUANTITY
STRUCTURAL CONCRETE CLASS D		C.Y.	995.5
STRUCTURAL STEEL		LB.	37,222
REINFORCING STEEL		LB.	241,429
4" PREFORMED ELASTIC NEOPRENE JOINT (CELLULAR)		L.F.	309
PRETENSIONED PRESTRESSED CONCRETE BEAMS	B67	NO	70
		NO	

DESIGN FOR 0° SKEW

688'-6" x 44'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-3" END SPANS 69'-0" INTERIOR SPANS

CONCRETE FLOOR & SUBSTRUCTURE

SUPERSTRUCTURE DETAILS

STATION 100+25 IA. 149 OVER IOWA RIVER OVERFLOW CH.

IOWA COUNTY

IOWA STATE HIGHWAY COMMISSION

Design Sheet No.: 9 Of 13 File No.: 24550 Design No.: 872

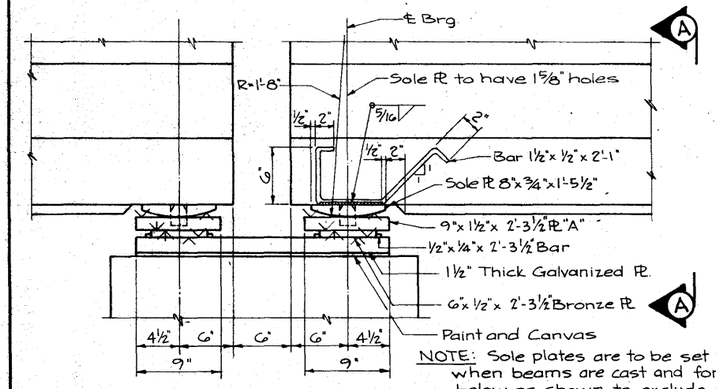
IOWA COUNTY	PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	FN-149-2(13)--21-48	IOWA	5		27	31

TRI-CITY BLUE PRINT- 128-3

BENCH MARK : ~~No.12 - Star 106+83, 44' Lt Col (1) on E. Wingwall at N end of I-Beam Bridge — El. 714.60~~

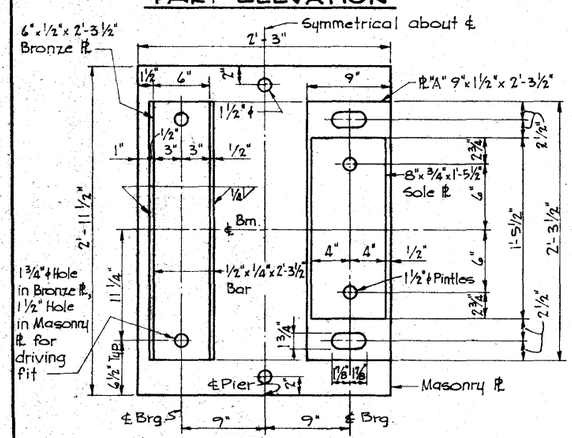
℄ Abut. Brg.				℄ Pier No. 1					℄ Pier No. 2					℄ Pier No. 3					℄ Pier No. 4					℄ Pier No. 5					℄ Pier No. 6					℄ Pier No. 7					℄ Pier No. 8					℄ Pier No. 9				℄ Abut. Brg.
719.59	719.62	719.65	719.68	719.70	719.73	719.75	719.77	719.78	719.79	719.81	719.81	719.82	719.83	719.83	719.83	719.82	719.82	719.81	719.80	719.79	719.77	719.75	719.73	719.71	719.69	719.66	719.63	719.60	719.57	719.53	719.49	719.45	719.41	719.36	719.31	719.26	719.21	719.15	719.10	719.14	719.20	719.25	719.31	719.33	719.39	719.25	719.31	719.14	719.20	719.04
719.69	719.73	719.76	719.78	719.81	719.83	719.85	719.87	719.89	719.90	719.91	719.92	719.93	719.93	719.93	719.93	719.93	719.92	719.92	719.91	719.89	719.88	719.86	719.84	719.82	719.79	719.77	719.74	719.71	719.67	719.64	719.60	719.56	719.51	719.47	719.42	719.37	719.31	719.26	719.20	719.25	719.31	719.33	719.39	719.25	719.31	719.14	719.20	719.04
719.80	719.83	719.86	719.89	719.91	719.94	719.96	719.98	719.99	720.01	720.02	720.03	720.03	720.04	720.04	720.04	720.04	720.03	720.02	720.01	720.00	719.98	719.97	719.95	719.92	719.90	719.87	719.84	719.81	719.78	719.74	719.70	719.66	719.62	719.57	719.52	719.47	719.42	719.37	719.31	719.33	719.39	719.25	719.31	719.14	719.20	719.04		
719.88	719.91	719.94	719.97	720.00	720.02	720.04	720.06	720.07	720.09	720.10	720.11	720.11	720.12	720.12	720.12	720.12	720.11	720.10	720.09	720.08	720.07	720.05	720.03	720.01	719.98	719.95	719.93	719.89	719.86	719.82	719.78	719.74	719.70	719.65	719.61	719.55	719.50	719.45	719.39	719.25	719.31	719.14	719.20	719.04				
719.80	719.83	719.86	719.89	719.91	719.94	719.96	719.98	719.99	720.01	720.02	720.03	720.03	720.04	720.04	720.04	720.04	720.03	720.02	720.01	720.00	719.98	719.97	719.95	719.92	719.90	719.87	719.84	719.81	719.78	719.74	719.70	719.66	719.62	719.57	719.52	719.47	719.42	719.37	719.31	719.14	719.20	719.04						
719.69	719.73	719.76	719.78	719.81	719.83	719.85	719.87	719.89	719.90	719.91	719.92	719.93	719.93	719.93	719.93	719.93	719.92	719.92	719.91	719.89	719.88	719.86	719.84	719.82	719.79	719.77	719.74	719.71	719.67	719.64	719.60	719.56	719.51	719.47	719.42	719.37	719.31	719.26	719.20									
719.59	719.62	719.65	719.68	719.70	719.73	719.75	719.77	719.78	719.79	719.81	719.81	719.82	719.83	719.83	719.83	719.82	719.82	719.81	719.80	719.79	719.77	719.75	719.73	719.71	719.69	719.66	719.63	719.60	719.57	719.53	719.49	719.45	719.41	719.36	719.31	719.26	719.21	719.15	719.10									
4 sp. @ 17'-0 3/4" = 68'-3"				4 sp. @ 17'-3" = 69'-0"					4 sp. @ 17'-3" = 69'-0"					4 sp. @ 17'-3" = 69'-0"					4 sp. @ 17'-3" = 69'-0"					4 sp. @ 17'-3" = 69'-0"					4 sp. @ 17'-3" = 69'-0"					4 sp. @ 17'-3" = 69'-0"					4 sp. @ 17'-3" = 69'-0"				4 sp. @ 17'-0 3/4" = 68'-3"

TOP SLAB ELEVATIONS

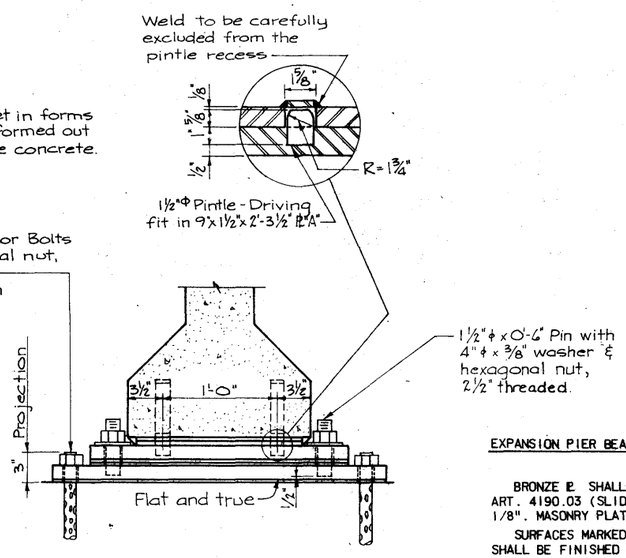


NOTE: Sole plates are to be set in forms when beams are cast and formed out below as shown to exclude concrete.

PART ELEVATION

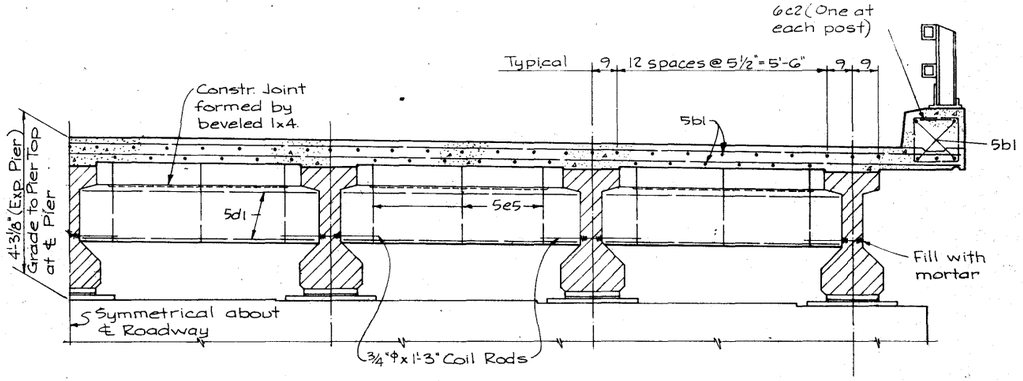


PLAN OF MASONRY Pl, BRONZE Pl, SOLE Pl & Pl "A"



SECTION A-A

EXPANSION PIER BEARING DETAILS



HALF SECTION NEAR EXPANSION PIER

PIERS #2, 4, 6 & 8

EXPANSION PIER BEARING NOTES:

BRONZE Pl SHALL BE LUBRICATED IN ACCORDANCE WITH I.S.H.C. SPECIFICATIONS ART. 4190.03 (SLIDING SURFACE ONLY). TOP EDGES OF BRONZE Pl SHALL BE BEVELED 1/8". MASONRY PLATES TO BE GALVANIZED AFTER WELDING.

SURFACES MARKED "▽" SHALL BE FINISHED ASA 250 AND SURFACES MARKED "▼" SHALL BE FINISHED ASA 125. MASONRY PLATES ARE TO BE SET IN PAINT AND CANVAS.

FOR ADDITIONAL NOTES SEE "SUPERSTRUCTURE NOTES" ON SHEET 9.

DESIGN FOR 0° SKEW

688'-6" x 44'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-3" END SPANS 69'-0" INTERIOR SPANS

CONCRETE FLOOR & SUBSTRUCTURE

SUPERSTRUCTURE DETAILS

STATION 100+75 IA 149 OVER IOWA RIVER OVERFLOW CH.

IOWA COUNTY

IOWA STATE HIGHWAY COMMISSION

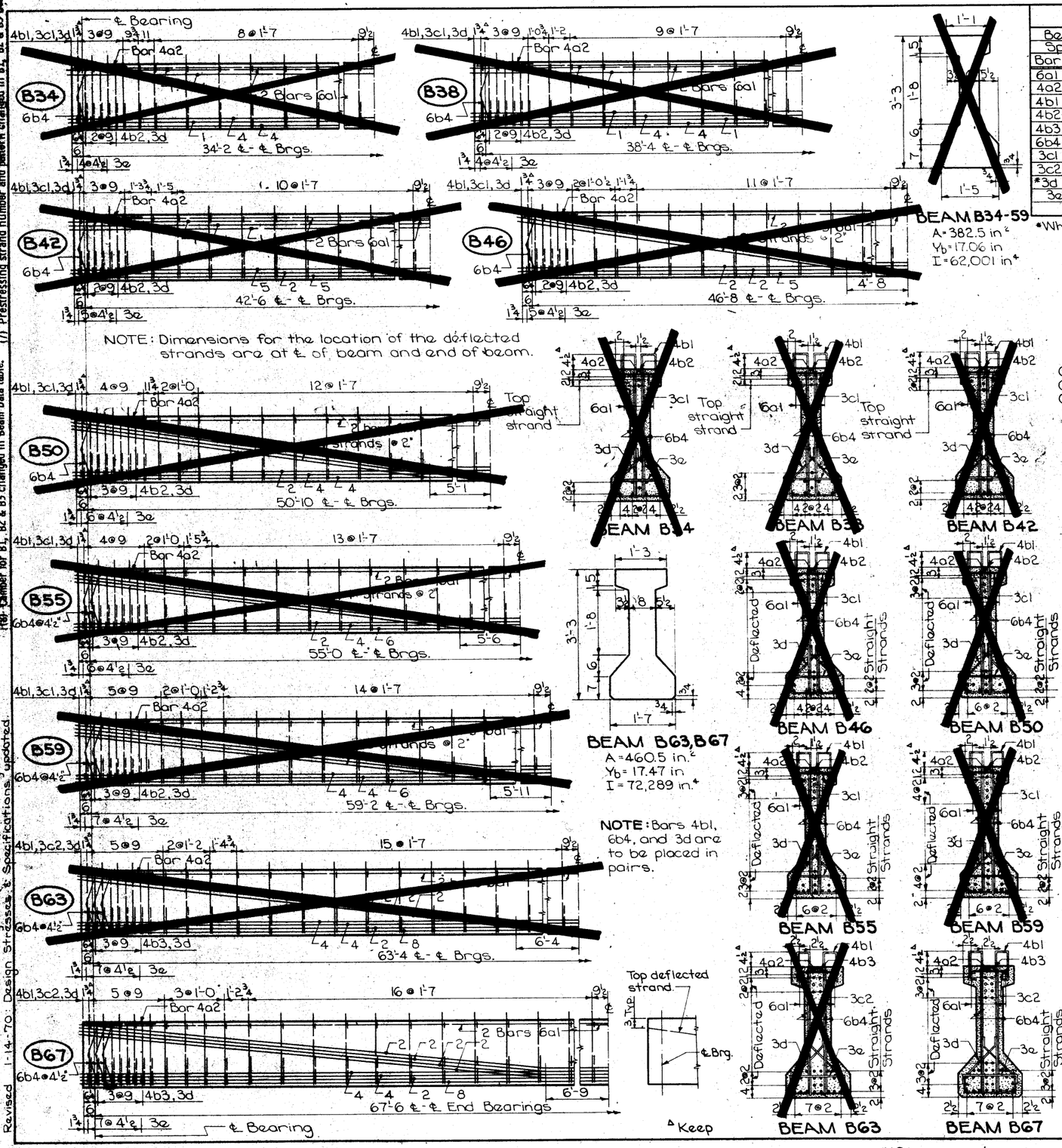
DES. SHEET NO. 10 OF 13 FILE NO. 24550 DES. NO. 872

IOWA COUNTY	PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS

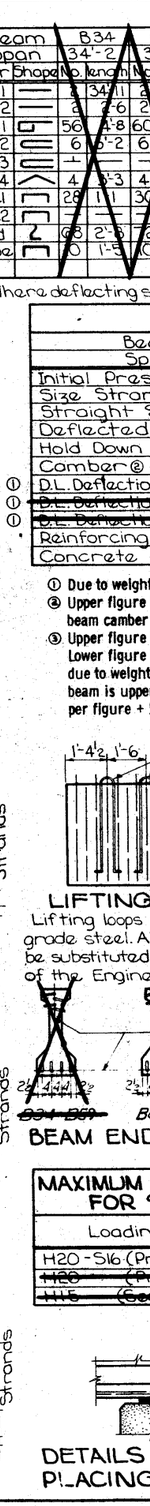
Revised (7-8-66) Lower figures of D.L. deflection due to creep and shrinkage in Beam Data table changed.
Revised (1-25-67) Bars 3e added & No. of 3d Bars increased, deflection note re-written.
Revised 5-2-67: Note concerning roughening of beams at diaphragms added.
Revised 6-1-67: Initial Prestress for B3 changed.
Revised 9-4-68: Projection of Bar 4b1 above top flange changed from 4" to 4½" Also Future W.S. Loading changed.
Revised 3-6-69: Beam designation numbers changed.
Revised 1-14-70: Design Stresses & Specifications updated.

Revised (1-5-71) "BEAM END DETAIL AT PIER AND ABUT." changed.

Revised (9-12-67)
(1) End of bm changed from sloped to square.
(2) Projection of Bar 4b1 above top flange changed from 4 1/2" to 4".
(3) Stirrup spacings near bm end changed.
(4) Bend detail of projected bottom strands at bm end changed.
(5) Length of bar 5a1 & 4b1 changed.
(6a) Detail showing location of top deflected strands at bm end added
(7) Prestressing strand number and pattern changed in B1, B2 & B3 Beams.
(8) Camber for B1, B2 & B3 changed in Beam Data table.

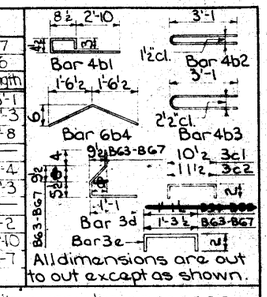


NOTE: Bars 4b1, 6b4, and 3d are to be placed in pairs.



REINFORCING BAR LIST

Beam	B34		B38		B42		B46		B50		B55		B59		B63		B67	
Span	34'-2		38'-4		42'-6		46'-8		50'-10		55'-0		59'-2		63'-4		67'-6	
Bar Shape	No.	length	No.	length	No.	length	No.	length	No.	length	No.	length	No.	length	No.	length	No.	length
6a1	2	34'-11	2	39'-1	2	43'-7	2	47'-8	2	51'-9	2	55'-10	2	59'-11	2	64'-0	4	35'-1
4a2	3	2'-6	2	2'-6	2	2'-6	2	2'-6	2	2'-6	2	3'-3	2	3'-3	2	3'-3	2	3'-3
4b1	56	4'-8	60	4'-8	64	4'-8	72	4'-8	80	4'-8	84	4'-8	92	4'-8	96	4'-8	104	4'-8
4b2	6	5'-2	6	5'-2	6	5'-2	6	5'-2	8	5'-2	8	5'-2	8	5'-2	—	—	—	—
4b3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	6'-4	8	6'-4
6b4	4	3'-3	4	3'-3	4	3'-3	4	3'-3	4	3'-3	8	3'-3	8	3'-3	12	3'-3	12	3'-3
3c1	28	1'-1	30	1'-1	32	1'-1	36	1'-1	40	1'-1	42	1'-1	46	1'-1	48	1'-1	52	1'-2
3c2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	1'-1	4	1'-2
*3d	68	2'-3	72	2'-3	76	2'-3	84	2'-6	96	2'-6	100	2'-6	108	2'-6	112	2'-10	120	2'-10
3e	10	1'-5	10	1'-5	12	1'-5	12	1'-5	14	1'-5	14	1'-5	16	1'-5	16	1'-7	16	1'-7



*Where deflecting strands interfere with placement, some in-place bending may be necessary.

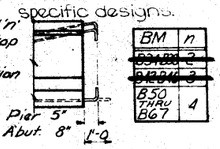
BEAM DATA

Beam	B34	B38	B42	B46	B50	B55	B59	B63	B67
Span	34'-2	38'-4	42'-6	46'-8	50'-10	55'-0	59'-2	63'-4	67'-6
Initial Prestress Kips	318	347	434	347	405	462	548	604	752
Size Strands	½	½	½	½	½	½	½	½	½
Straight Strands	11	12	15	9	10	12	14	16	18
Deflected Strands	—	—	—	9	10	12	13	16	18
Hold Down Stress Kips	—	—	—	13.8	12.7	13.7	16.6	16.6	19.3
Camber ②	.13	.18	.18	.25	.26	.31	.46	.65	.60	.84	.83	.18	.64	.48	1.49	.75	1.30	1.86
① D.L. Deflection ③ in. (7'-3 Spcg.)	.08	.02	.14	.04	.19	.05	.26	.07	.37	.09	.51	.13	.66	.17	.96	.19	1.36	.24
① D.L. Deflection ③ in. (8'-0 Spcg.)	.09	.02	.16	.04	.21	.05	.29	.07	.41	.10	.56	.14	.73	.18	1.06	.21	1.50	.26
① D.L. Deflection ③ in. (8'-6 Spcg.)	.09	.03	.16	.04	.22	.06	.30	.08	.43	.11	.59	.15	.77	.19	1.12	.22	1.58	.28
Reinforcing Steel Lbs.	411	441	478	526	585	635	684	744	792
Concrete C.Y.	3.47	3.87	4.28	4.69	5.10	5.51	5.92	7.62	8.11

① Due to weight of slab and diaphragms.
② Upper figure is the beam camber at release. Lower figure is the beam camber just before slab is placed.
③ Upper figure is the elastic deflection of beam due to weight of slab. Lower figure is the deflection due to the combined effect of creep due to weight of slab and shrinkage of slab. Total deflection of beam is upper figure + 75% of lower figure for end spans and upper figure + 50% of lower figure for interior spans.

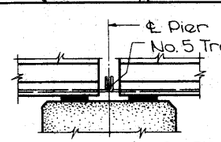
LIFTING LOOP DETAILS
Lifting loops are to be structural grade steel. Alternate types may be substituted with the approval of the Engineer.

COILTIE DETAILS
Number and location of coil ties to be as detailed on specific designs.



BEAM END DETAIL AT PIER AND ABUT.

MAXIMUM SPACING OF BEAMS FOR SPANS SHOWN		
Loading	Future W. S.	Maximum Spacing
H20-S16 (Primary)	20#/s'	7'-3
~~H20 (Primary)~~	~~20#/s'~~	~~8'-0~~
~~H15 (Secondary)~~		~~9'-6~~



DETAILS AT PIER BEFORE PLACING PIER DIAPHRAGM

NOTES

Unless otherwise noted lengths of all beams shall be increased .0005 L to compensate for creep shrinkage and elastic shortening.

All deflected strands are to be held down at .4 points except that the hold down point may be moved toward the end of the beam a distance not to exceed .05 span at the producer's option.

Tops of beams are to be struck off level and artificially roughened in accordance with the I. H. C. Materials Department recommendations.

Bearing details will be as detailed on the Bridge design sheets.

All strands are to be 1/2" ϕ 270 kip grade.

Beams for continuous bridges shall be at least 4 weeks old before the slab is placed except as otherwise approved by the Engineer.

The portions of the prestress beams that are to be embedded in the abutment and pier diaphragms shall be roughened by sandblasting or other approved methods to provide suitable bond between the beam and the diaphragm in accordance with Article 2403.15 of the specifications.

DESIGN STRESSES

Design stresses for the following materials are to be in accordance with A. A. S. H. O. Standard Specifications for Highway Bridges, Series of 1969.

Reinforcing steel in accordance with section 1.2.1 f's = 20,000 psi.

Concrete in accordance with 1.2.7, f'c = 5000 psi.

Prestressing steel in accordance with 1.2.7 f's = 270,000 psi.

SPECIFICATIONS

DESIGN: A. A. S. H. O. Series 1969.

CONSTRUCTION: Standard Specifications of the Iowa State Highway Commission, current series, plus current special provisions and supplemental specifications.

Design for

688'-6" x 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-3" End Spans 69'-0" Interior Spans

BEAM DETAILS PC 66 B

Station: 100+25 IA. 149 Over Iowa River Overflow Ch.

IOWA STATE HIGHWAY COMMISSION
STANDARD SHEET 4101
Des. Sh. No. 11 of 13 File No. 24550 Des. No. 872

4101

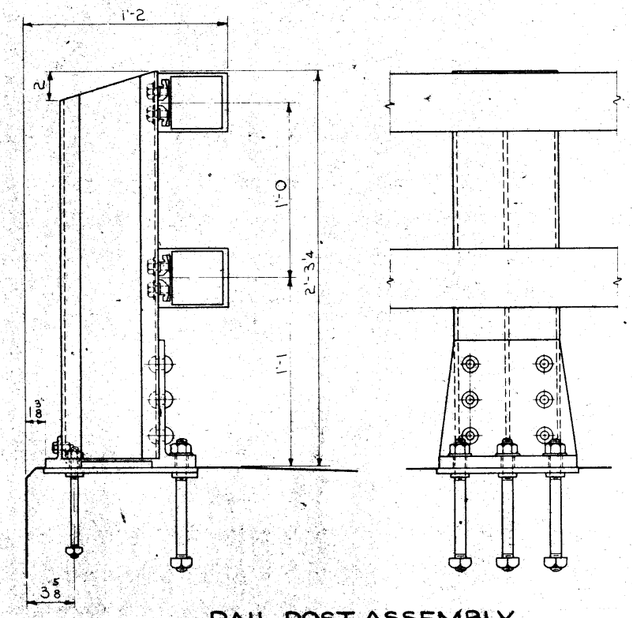
IOWA | COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
FN-149-2(13)-21-48	IOWA	3		29	31

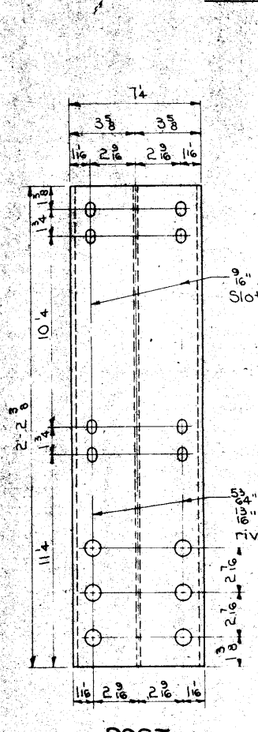
DIETZGEN NO. 131 ARK-KNIGHT

Revised 12-26-68: Added explanation for material for clamp bar bolt.
Revised 6-7-67: Red lead shop coat paint note added.
Revised 5-2-67: Material specifications for aluminum and stainless steel changed.
Revised 10-13-66: Note concerning ½"ϕ drain holes added.
Revised 9-23-66: Gage of holes in Post Base Plate changed.
Revised 8-19-66: Post Base Plate and Anchor Bolt Assembly Plate details changed.
Revised 7-25-66: Caulking at posts eliminated.
Revised 3-14-66: Minor changes made.

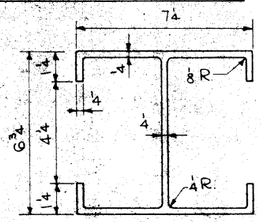
Revised 8-2-72: Rear post bolt size & type changed.
Revised 11-13-70: Exposed anchor bolt nuts & washers changed from aluminum to stainless ste



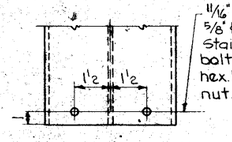
RAIL POST ASSEMBLY



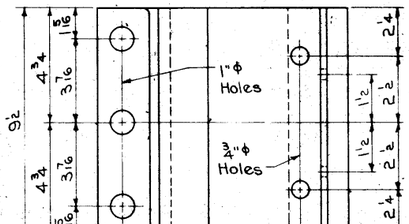
POST

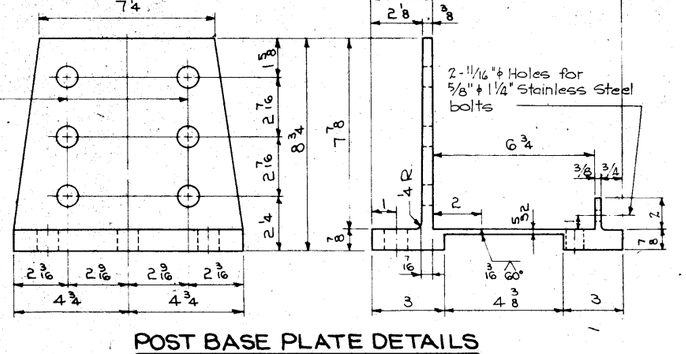


POST SECTION

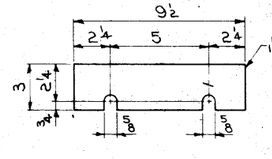


REAR VIEW OF POST

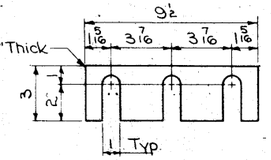




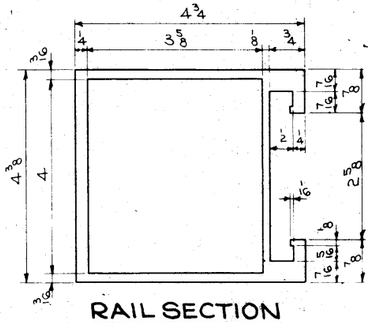
POST BASE PLATE DETAILS



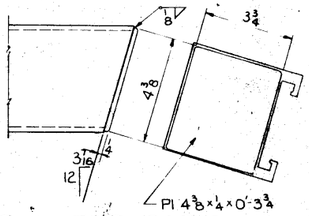
SHIM "A" DETAIL



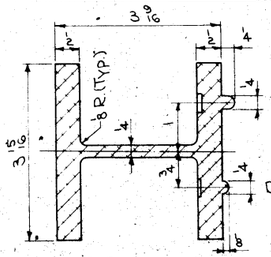
SHIM "B" DETAIL



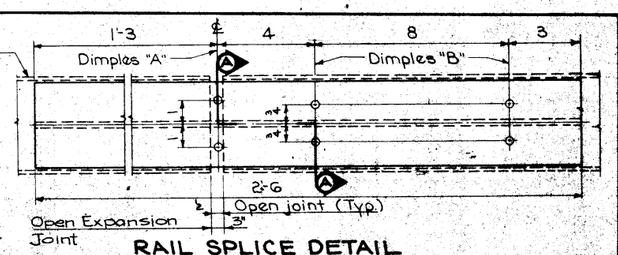
RAIL SECTION



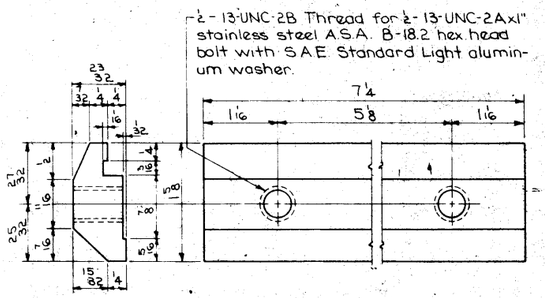
RAIL END CAP DETAILS



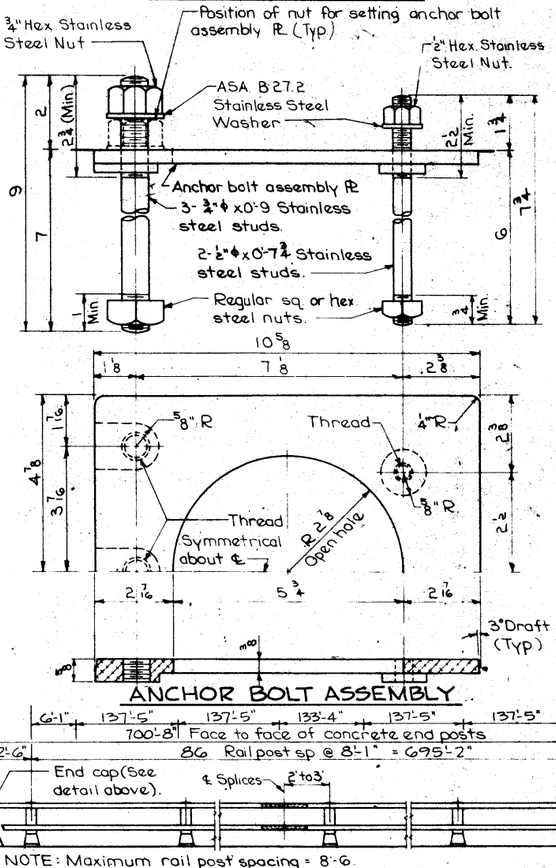
SECTION A-A



RAIL SPLICE DETAIL



CLAMP BAR DETAILS



ANCHOR BOLT ASSEMBLY

NOTE: Maximum rail post spacing = 8'-6.

TYPICAL ELEVATION OF RAILING AND RAIL POST LAYOUT

ALUMINUM HANDRAIL NOTES:

The aluminum handrail is to be bid on a lineal foot basis measured from end to end of rail. The price bid for "Aluminum Handrail" shall be full compensation for furnishing all material including the anchor bolts and all of the equipment and labor required to erect the rail in accordance with these plans and specifications.

Each rail section must be attached to as many posts as possible but to at least three posts before being spliced.

Material for rails, post, post base plate, rail splice bar and clamp bar shall be ASTM B-221 Alloy 6061-T6. Material for aluminum nuts shall be ASTM B-211 Alloy 6061-T6 or 6262-T9. Material for the aluminum bolts shall be ASTM B-211 Alloy 2024-T4.

Material for aluminum washers and shims shall be ASTM B-209, Alloy Alclad 2024-T3 for washers and Alloy 1100-O for shims.

Material for anchor studs shall be an ASTM A276 Stainless steel with a minimum ultimate strength of 100,000 psi, a minimum elongation in two inches of 12% and a minimum reduction of area of 40%. Stud thread shall conform to A.S.A. B-1.1 for UNC threads series, class 2A fit. Threads may be rolled or cut. Diameter of stud shall be not less than pitch diameter of threads.

Material for steel nuts shall be A.S.T.M. A-307 Grade A, and shall conform to A.S.A. B-18.2. Threads shall comply with A.S.A. B-1.1 for UNC threads series, class 2B fit.

The anchor bolt assembly plate shall be a flat and true aluminum alloy permanent mold casting complying with ASTM B-108 Alloy SG70 A or B. Condition F is acceptable. Suitable alternates will be considered for approval.

The entire surfaces of anchor bolt assembly plate and the shims are to be given one shop coat of zinc chromate shop coat paint or red lead shop coat paint.

One shim "A" and one shim "B" is to be furnished for each post, to be used as required.

Material for clamp bar bolt shall be stainless steel A.S.T.M. A-193, Grade B8 (Carbide solution treated) or ASTM A-276 Type 430 (Annealed - hot or cold finished).

The material for the stainless steel nuts and washers shall be non-magnetic stainless steel. The stainless steel nuts shall be hexagonal, finished and shall comply with A.S.A. B-18.2. Threads shall comply with A.S.A. B-1.1 for UNC threads series, class 2B fit.

Handling, storage and installation of aluminum handrail shall be in accordance with Section 2414.06 of the Standard Specifications, except that no caulking will be required.

Material for aluminum rivets shall be A.S.T.M. B-316 or B-221 Alloy 6061-T6. Rivets shall be button head, cone point and cold driven.

A ½"ϕ drain hole is to be provided, 3 inches in from the end, at the bottom side of the end sections of all rails.

Ends of rail sections to be sawed or milled. Cut ends to be true, smooth and free from burrs or ragged edges.

DESIGN SPECIFICATIONS:

Designed in accordance with 1964 interim A.A.S.H.O. Specifications.

ALUMINUM HANDRAIL QUANTITIES		
Aluminum Handrail	1400.3	Lin. Ft.

DESIGN FOR 0° SKEW

688'-6" x 44'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-3" END SPANS 69'-0" INTERIOR SPANS

CONCRETE FLOOR & SUBSTRUCTURE

ALUMINUM HANDRAIL DETAILS

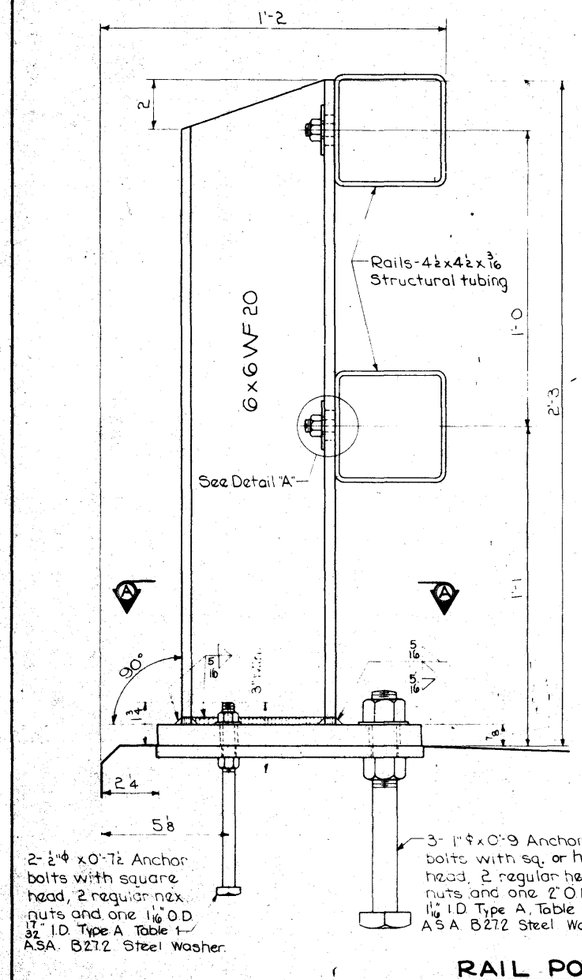
STATION 100+25 IA 149 OVER IOWA RIVER OVERFLOW CH.

IOWA COUNTY

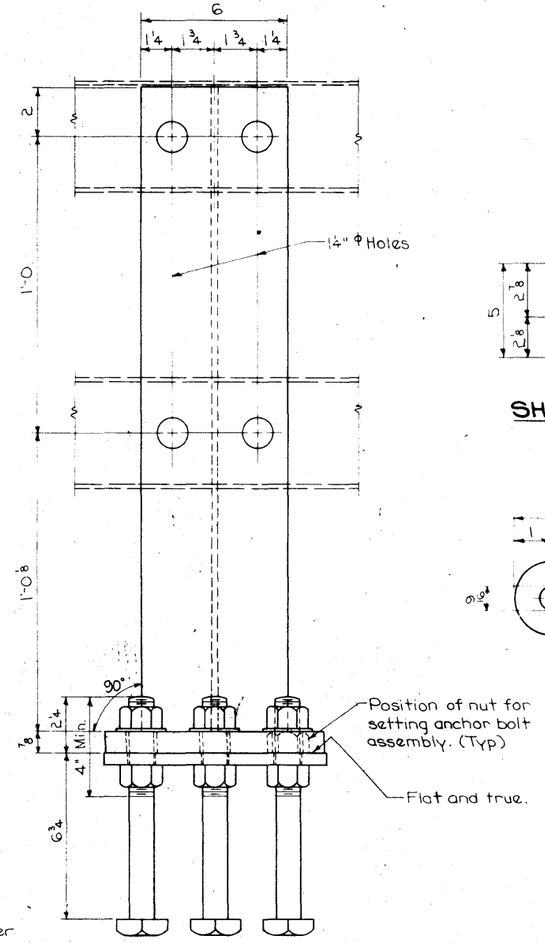
IOWA STATE HIGHWAY COMMISSION

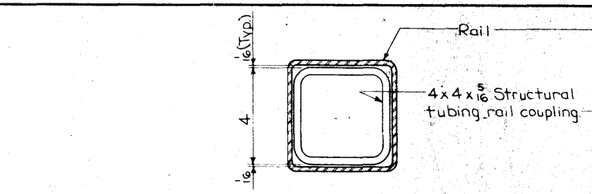
Design Sheet No 12 Of 13 File No 24550 Design No 672.

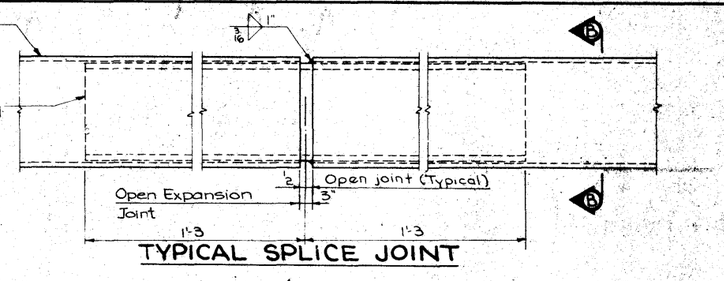
DESIGNED BY:	TRACED BY:	ALUMINUM HANDRAIL DETAILS	STANDARD SHEET 1012 A	IOWA COUNTY	PROJECT NUMBER FN-149-2(13)--21-48	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
DETAILED BY:	CHECKED BY:					IOWA	5		30	31

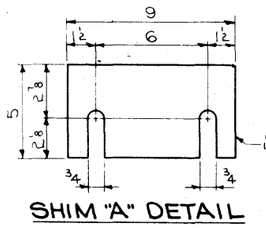


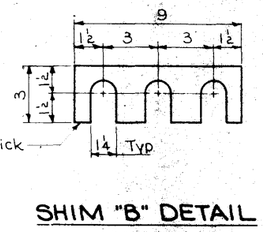
RAIL POST

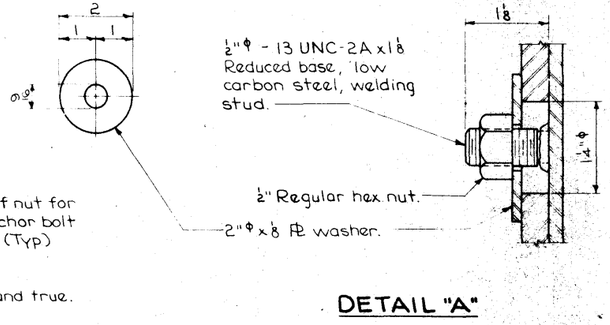












STEEL HANDRAIL NOTES:

The steel handrail is to be bid on a lineal foot basis measured from end to end of rail. The price bid for "Steel Handrail" shall be full compensation for furnishing all material including the anchor bolts and all equipment and labor required to erect the rail in accordance with these plans and Specifications.

Each rail section must be attached to as many posts as possible, but to at least three posts before being spliced.

Material for rail tubing, post, base plate and anchor cage shall be A.S.T.M. A-36 and are to be galvanized after fabrication to A.S.T.M. A-123.

Material for anchor bolts and nuts, and rail to post attachment nuts shall be A.S.T.M. A-307 - G1.T, Grade A.

Anchor bolts and nuts, rail to post attachment nuts, end caps, washers and shims are to be galvanized to A.S.T.M. A-153.

Ends of tube sections to be sawed or milled. Cut ends to be true, smooth and free from burrs or ragged edges.

Welding shall be in accordance with Section 2408.15 of the Standard Specifications.

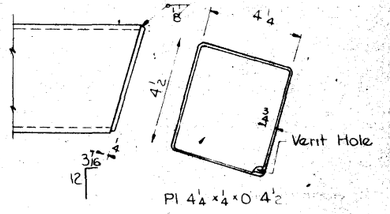
Handling, storage and installation of steel handrail shall be in accordance with Section 2414.06 of the Standard Specifications, except that no caulking will be required.

One shim 'A' and one shim 'B' is to be furnished for each post, to be used as required.

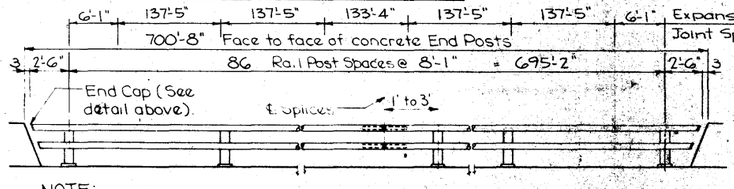
A surface is considered to be "Flat and True" when the deviation from a straight edge placed on this surface in any position, is less than 1/16".

No painting will be required.

Rail studs shall be provided with adequate protection during shipment.

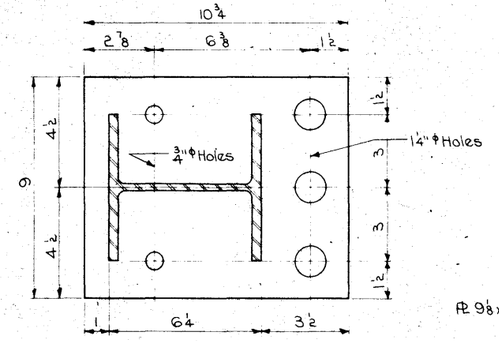


RAIL END CAP DETAILS

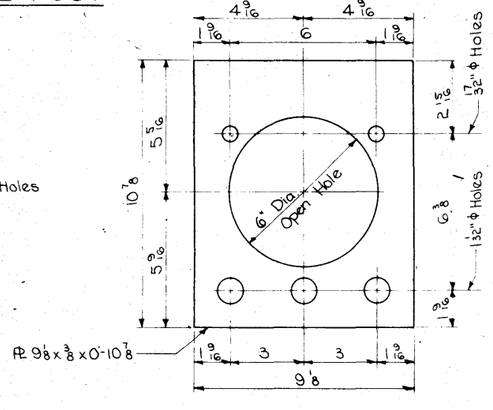


NOTE:
Maximum rail post spacing = 8'-6.

TYPICAL ELEVATION OF RAILING AND RAIL POST LAYOUT



SECTION A-A



ANCHOR CAGE DETAILS

DESIGN SPECIFICATIONS:

Designed in accordance with 1964 interim A.A.S.H.O. Specifications.

STEEL HANDRAIL QUANTITIES

~~Steel Handrail~~	1400.3	~~Lin. Ft.~~

DESIGN FOR 0° SKEW

688'-6" x 44'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-3" END SPANS 69'-0" INTERIOR SPANS

CONCRETE FLOOR & SUBSTRUCTURE

STEEL HANDRAIL DETAILS

STATION 100+25 IA 149 OVER IOWA RIVER OVERFLOW CH.

IOWA COUNTY

IOWA STATE HIGHWAY COMMISSION

Design Sheet Nº 13 Of 13 File Nº 24550 Design Nº 672

Revised 7-25-66: Caulking at posts eliminated.

DESIGNED BY:	TRACED BY:	STEEL HANDRAIL DETAILS	STANDARD SHEET 1013A	IOWA COUNTY	PROJECT NUMBER	STATE	FED ROAD DIST. NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
DETAILED BY:	CHECKED BY:				FN-149-2(13)--21-48	IOWA	5		13	13