STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	
IOWA	8		1	48

PROJECT NUMBER
FN-12-2(2)--21-75

R.O.W. PROJECT NUMBER
FN-12-2(3)--21-75

BRIDGE [redacted]
FN-12-2(2)--21-75

PLYMOUTH COUNTY

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

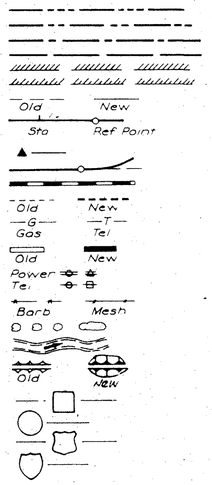
Culverts

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 [redacted] IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM
PLYMOUTH COUNTY

BRIDGE [redacted]

ON IA. #12 FROM AKRON, NORTH TO SIOUX CO. LINE

SCALES AS NOTED

THE STANDARD SPECIFICATIONS, SERIES OF 1972, OF THE HIGHWAY DIVISION, DEPARTMENT OF TRANSPORTATION, SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

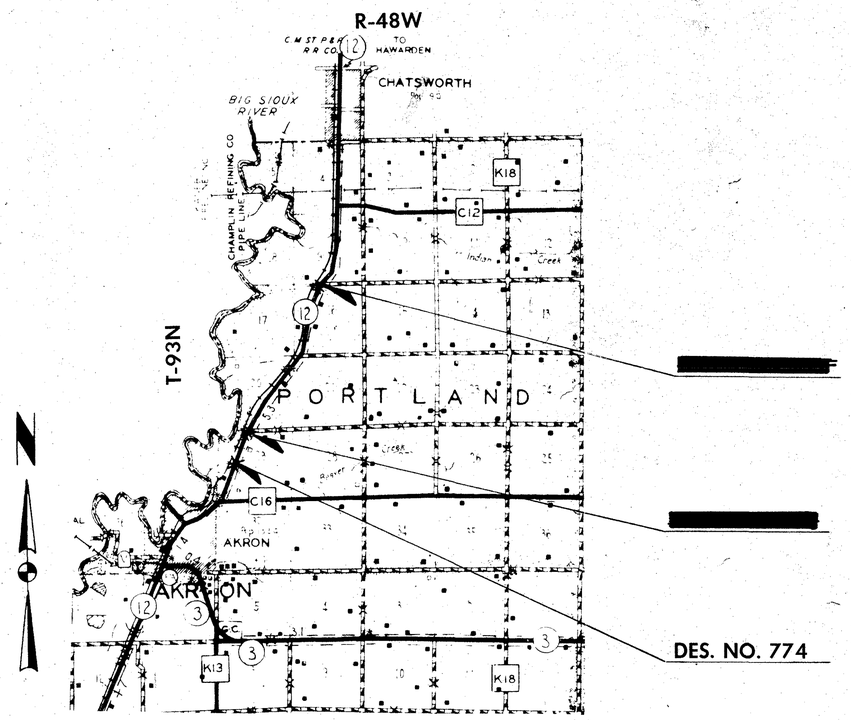
(PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS)

DESIGN STRESSES
Design stresses for the following materials are in accordance with AASHO's Standard Specifications for Highway Bridges, Series of 1973.

Concrete in accordance with Section 1.5.1., f'c=3,500 psi.

Reinforcing Steel in accordance with Section 1.5.1.(D), fs=20,000 psi.

INDEX OF SHEETS	
NO.	DESCRIPTION
1	Title Sheet
[redacted]	
3 FINAL QUANTITY	Sheet (Bridge) & LOG OF PILE DRIVEN
[redacted]	
24-48	Bridge Des. No. 774



LOCATION MAP

LOCATION MAP SCALE
0 1 2 3
miles

CONTRACTOR: GRAVES CONSTRUCTION CO. INC. —— 1976
CONST. FIELD ASST. —— L. ANDERSON
PROJ. MANAGER —— A. KIRCHNER
SURVEY PARTY CHIEF —— R. STEPHENS

CONSTRUCTION PLANS SHOWING PROJECT AS BUILT

Plan Preparation Supervised By: Norman E. Pitsch
Resident Construction Engineer

Date 31 March 77 Iowa Reg. No. 4123

REVIEWED AND FORWARDED TO AMES

H W Nelson
District Construction Engineer
Date 7-19-77

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

J. R. Dump
District Engineer

[redacted]

-110-

MILEAGE SUMMARY 105-1

LOCATION	LIN. FT.	MILES
Bridge at Station 96+30.00	133.67	.025

DESIGN DATA RURAL

1976 AADT	1040	V.P.D.
1996 AADT	1330	V.P.D.
1996 DHV	163	V.P.H.
DIRECTIONAL	51	%
TRUCKS	12	%
DESIGN V		M.P.H.
CLASS ___ ACCESS CONTROL		

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

STANDARD	ISSUED	REVISED
~~[redacted]~~	~~[redacted]~~	
P10A	1959	6-12-1972

DEPARTMENT OF TRANSPORTATION IOWA — Highway Division

APPROVED [signature] 7/15/75
DEPUTY CHIEF ENGINEER — DATE

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY SUPERVISION AND THAT ENGINEERING DECISIONS WITH REGARD TO THE DESIGN WERE MADE BY ME OR BY OTHER DULY REGISTERED PROFESSIONAL ENGINEERS UNDER THE LAWS OF THE STATE OF IOWA.

[signature]
2792 — 7-16-75
IOWA REGISTRATION NUMBER — DATE

U.S. DEPT. TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED

DIVISION ENGINEER — DATE

LETTING DATE JULY 22, 1975 | STATE CONTROL SECTION NUMBER 75-0500 | FILE NO. 25158 | PLYMOUTH COUNTY | PROJECT NO. FN-12-2(2)--21-75 | SHEET NO. 1 OF 48

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

6-19-75 DATE — James R Sassaman — REG NO 2663

JAMES R. SASSAMAN

IN LETTING OF July 22, 1975

DES. NO. 774 — ON IA. #12 OVER BEAVER CREEK — STA. 96+30.00

PLYMOUTH COUNTY

SECTION 29 — T-93N, R-48W — PORTLAND TWP

DESIGN FOR 35° SKEW (R. A.)

130'-0 x 44' CONTINUOUS CONCRETE SLAB BRIDGE

FINAL [redacted] QUANTITIES

NO.	ITEM		UNIT	TOTAL
10	Structural Concrete		Cu. Yds.	508.4
11	Reinforcing Steel		Lbs.	9166.
12	Reinforcing Steel - Galvanized		Lbs.	104,185
13	Class 20 Excavation		Cu. Yds.	[redacted] 80.4
14	Class 10 Channel Excavation		Cu. Yds.	[redacted] 1451.4
15	Subdrain		Lin. Ft.	176
16A	Aluminum Handrail		Lin. Ft.	257.0
[redacted]				
17	HP 10 x 42	Furnish	Lin. Ft.	[redacted] 1917.6
18	Steel Bearing	Drive	Lin. Ft.	[redacted] 1730.3
19	Piling	Encase	Lin. Ft.	504
20	Removal of Existing Structures		L. S.	Lump Sum
21	Floodlighting		L. S.	Lump Sum
22	Granular Backfill		Cu. Yds.	72

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
1	The abut. ftg. & temp. p'v'g blk. & pier caps, 95.0 Cu. Yds., are to be Class "C" Concrete. The remainder, 413.4 Cu. Yds., is to be Class "D" Concrete.

FINAL [redacted] ROADWAY QUANTITIES — 100-0

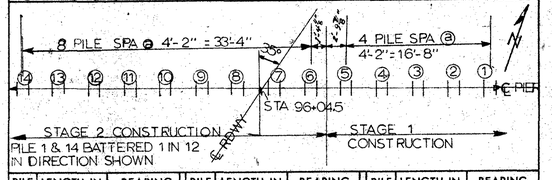
NO.	ITEM	UNIT	TOTAL
23	Class 10 Excavation (Rdwy. & Bor.)	Cu. Yds.	[redacted] 16306
24	Removal of Old Pavement	Sq. Yds.	[redacted] 429.4
25	Special Compaction of Subgrade	Stations	2
26	8" St'd. P. C. Concrete Pavement (Class C)	Sq. Yds.	302
27	Reinforced Bridge Approach Section	Sq. Yds.	107
28	Granular Surfacing, Class A Crushed Stone-on road	Tons	[redacted] 77.25
29	Formed Steel Beam Railing	Lin. Ft.	287.5
30	Beam Guard Rail Posts	No.	62
31	Beam Guard Rail End Anchorage	No.	4
32	24" Ø Unclassified Entrance Pipe Culv.	Lin. Ft.	84
33	Earth Shoulder Finishing	Stations	[redacted] 5.2
8001	CLEARING & GRUBBING	DOLLARS	983.15
8002	RETARDER	CU YD	254.3

[redacted] 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
1.	Borrow material is available within existing right-of-way as directed by the Engineer. Bid price to include hauling; maximum haul one-half mile. Template quantities include earthwork for earth shoulder finishing. Article 1109.03 shall not apply to this item. Erosion control work is to be included and considered incidental. All disturbed areas including borrow area shall require mulching, fertilizing, and seeding as follows: Seed - Kentucky 31 Fescue at a rate of 3 lbs. per 1000 sq. ft. Fertilizer - 20 lbs. of 13-13-13 or equivalent, chemically combined or blended fertilizer per 1000 sq. ft. Mulch - Rate: 75 lbs. of straw per 1000 sq. ft. The preparation of the seed bed, furnishing and application of seed, fertilizer and mulch shall be considered incidental to other work on this project and no extra compensation will be allowed.
2.	Existing pavement is asphaltic concrete. See Standard Note 109-8 for disposal. Also required 48 lineal ft. of saw cut.
4, 5.	Surface treatment as per Article 2521 is to be included and considered incidental to other work.
5.	"CF" joints will not be required.
6.	For surfacing existing shoulder and detouring traffic on same. See stage construction details.

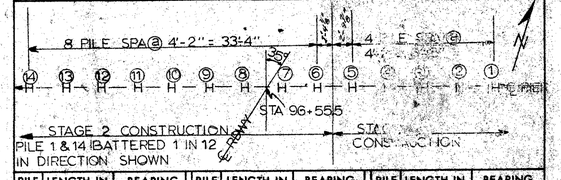
FOUNDATION NUMBER PIER NO.1 STA 96+04.5 | **PILING LOG** | **KIND OF PILING** STEEL H PILE HP 10 X 42



PILE 1 & 14 BATTERED 1 IN 12 IN DIRECTION SHOWN

PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS	PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS	PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS	PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS
B1	41.5	REFUSAL									
2	41.5	REFUSAL									
3	42.0	REFUSAL									
4	43.0	REFUSAL									
5	43.5	REFUSAL									
6	37.3	REFUSAL									
7	36.2	REFUSAL									
8	36.6	REFUSAL									
9	41.4	REFUSAL									
10	35.9	REFUSAL									
11	35.9	REFUSAL									
12	36.3	REFUSAL									
13	36.3	REFUSAL									
B14	35.9	REFUSAL									
TOTAL=	543.3										
AVG.=	38.8										

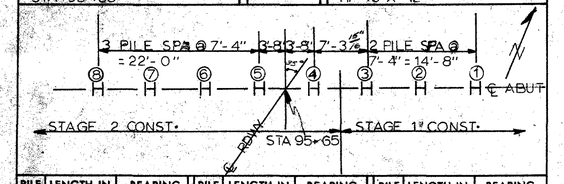
FOUNDATION NUMBER PIER NO 2 STA 96+55.5 | **PILING LOG** | **KIND OF PILING** STEEL H PILE HP 10 X 42



PILE 1 & 14 BATTERED 1 IN 12 IN DIRECTION SHOWN

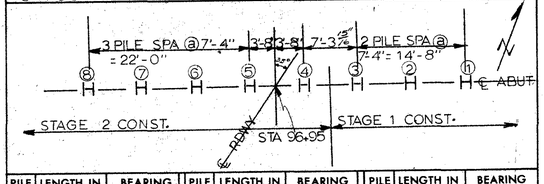
PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS	PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS	PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS	PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS
B1	45.0	REFUSAL									
2	45.0	REFUSAL									
3	45.0	REFUSAL									
4	45.0	REFUSAL									
5	45.0	REFUSAL									
6	41.0	REFUSAL									
7	42.9	REFUSAL									
8	41.2	REFUSAL									
9	41.6	REFUSAL									
10	45.0	REFUSAL									
11	42.9	REFUSAL									
12	42.2	REFUSAL									
13	43.6	REFUSAL									
B14	41.7	REFUSAL									
TOTAL=	607.1										
AVE =	43.4										

FOUNDATION NUMBER SOUTH ABUTMENT STA 95+65 | **PILING LOG** | **KIND OF PILING** STEEL H PILE HP 10 X 42



PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS	PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS	PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS	PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS
1	34.0	REFUSAL									
2	32.3	REFUSAL									
3	32.8	REFUSAL									
4	32.9	REFUSAL									
5	33.0	REFUSAL									
6	32.9	REFUSAL									
7	34.0	REFUSAL									
8	34.8	REFUSAL									
TOTAL=	266.7										
AVG =	33.3										

FOUNDATION NUMBER NORTH ABUTMENT STA. 96+95 | **PILING LOG** | **KIND OF PILING** STEEL H PILE HP 10 X 42



PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS	PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS	PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS	PILE NO.	LENGTH IN STRUCTURE	BEARING IN TONS
1	38.9	REFUSAL									
2	38.2	REFUSAL									
3	37.3	REFUSAL									
4	38.5	REFUSAL									
5	38.7	REFUSAL									
6	40.8	REFUSAL									
7	41.1	REFUSAL									
8	39.7	REFUSAL									
TOTAL=	313.2										
AVG =	39.2										

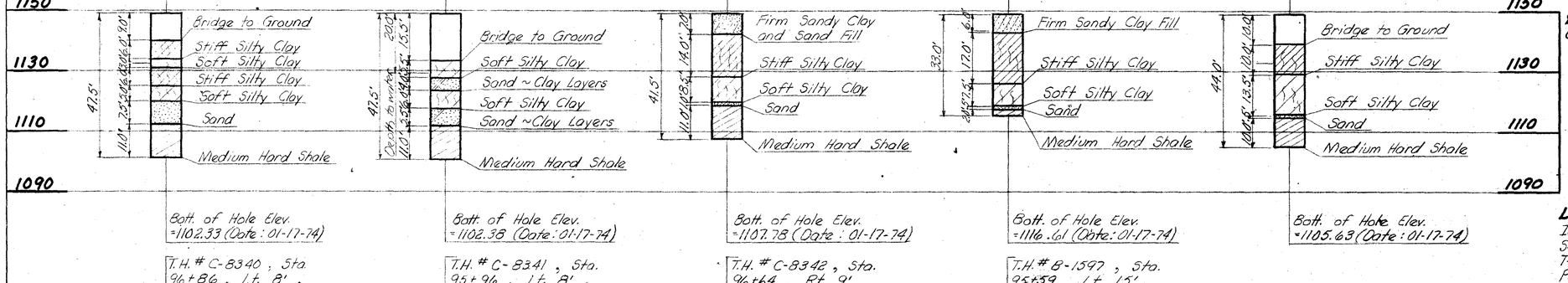
FINAL QUANTITIES [redacted] SHEET (BRIDGE)

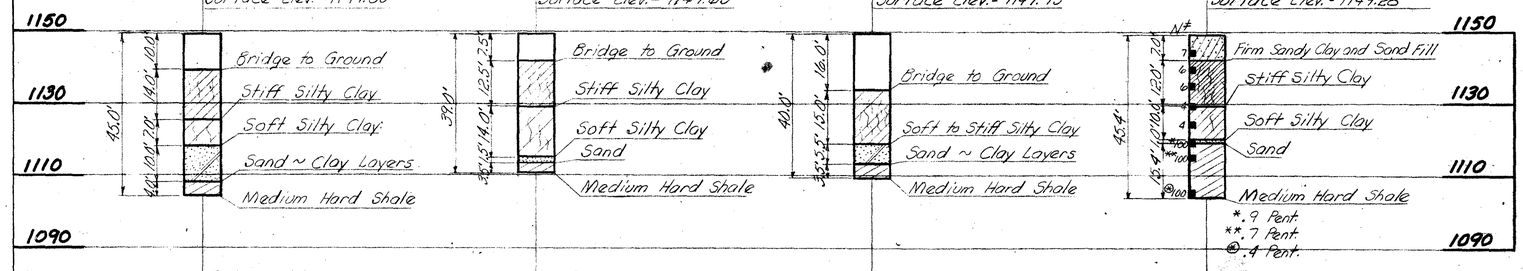
FILE NO. 25158 — PLYMOUTH COUNTY

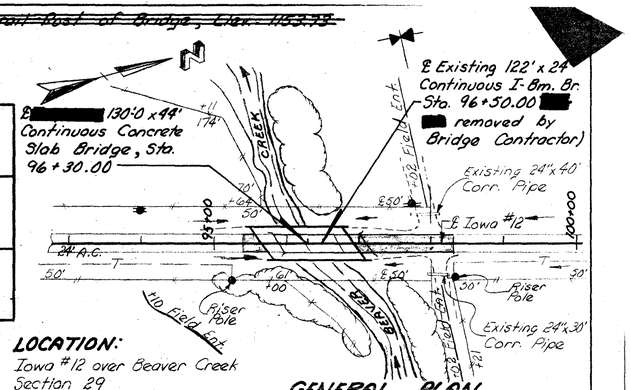
PROJECT NUMBER	STATE	SEC ROAD DIST NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
FN-12-2(2)--21-75	IOWA	5		3	48

BENCH MARK NO. 10 B, STA. 97+10.7, 23.8' RT., IHC BM IN N.E. WING POST OF BRIDGE — ELEV. 1152.71

~~Bench Mark No. 10, Sta. 97+10, 19.1' Lt., Found Brass Plug in N.W. Handrail Post of Bridge, Elev. 1153.75~~







LOCATION:
Iowa #12 over Beaver Creek
Section 29
T-93N R-48W
Portland Twp.
Plymouth County

GENERAL PLAN
SCALE : 1" = 100'

TRAFFIC COUNT : 1330 V.P.D., A.V.O.T. (1996)

LEGEND :
- Plymouth County R.E.C.
- —T— N.W. Bell Tel. Co.

SPECIFICATIONS:

Design : AASHO series of 1973.
Construction : Iowa State Highway Commission Specifications, Series of 1972, plus current Supplemental Specifications and Special Provisions of the Iowa Department of Transportation - Highway Division, and including --
Spec. 725, "Supplemental Specifications for Traffic Controls."
Spec. 760, Addendum to Spec. 725.

DESIGN STRESSES:

Design Stresses for the following materials are in accordance with AASHO Standard Specifications for Highway Bridges, series of 1972

Reinforcing Steel in accordance with Section 1.5.1 (D), f_s = 20,000 psi.
Concrete in accordance with Section 1.5.1(C), f'_c = 3500 psi.

GENERAL NOTES

This design proposes the replacement of the existing 122' x 24' Continuous I-Beam Bridge with a 130' x 44' Continuous Concrete Slab Bridge. A portion of the existing bridge will serve as a temporary run-around while the Stage I portion of the new bridge is being constructed.

DESIGN LOAD

The proposed bridge is designed for HS20-44 loading, plus 20 lbs. per square foot of roadway for future wearing surface.

EXISTING BRIDGE REMOVAL

The existing bridge (Design 1133, Plymouth County) is to be removed in accordance with Section 2401 of the Standard Specifications and the following:

1. Removal shall be accomplished in stages, with at least one lane of traffic maintained open at all times.
2. ***Structural Steel I-Beams are to be stockpiled near the site and remain property of the state for use by the Maintenance Department.***
3. The north abutment backwall is to be removed down to the top of footing.

The contractor shall exercise extreme care when removing the existing bridge deck to the break line indicated on sheet 3 of 25 so that structural adequacy of remaining portion of the bridge can be maintained for Stage I traffic.

Prints of plans for the old bridge are available from the Ames Office of the I. S. H. C. Quantities shown on the old design indicate there are about 63,000 lbs. of structural steel and 121.8 cu. yd. of concrete in the superstructure, and about 108.2 cu. yd. of concrete in the substructure of the existing bridge.

CLASS 10 CHANNEL EXCAVATION

The contractor is to clear the channel as shown by the shaded areas on the "Longitudinal Section Along ℄ Roadway," and within the limits indicated on the "Situation Plan," Sheet 2 of 25.

APPROACH FILLS

The contractor shall construct the north berm, and widen the shoulders of the south approach, as shown on the "Backfill Details," Sheet 6 of 25 before abutment piles are driven. The contractor shall level and shape the berms to the elevations and dimensions shown. Shoulders and foreslopes shall be as detailed on the plans and shall blend smoothly with existing roadway and slopes.

SOUNDING DATA

SCALE : 1" = 20' Dated as Shown
N^+ = Number of Blows per foot of penetration.

SUBDRAIN

The contractor is to install subdrain behind each abutment as detailed. The subdrain may be either drain tile or perforated plastic pipe with a minimum 4" and maximum 6" nominal diameter. The price bid for "Subdrain" is to include the excavation necessary for the installation.

CLASS 20 EXCAVATION

Class 20 Excavation includes the excavation necessary to construct the new abutments and shape the berm in front of the south abutment, as detailed on the "Backfill Details," Sheet 6 of 25.

DISPOSAL OF CONCRETE MASONRY & RUBBLE

All broken concrete masonry and rubble removed from the existing bridge and approaches is to be disposed of off the highway right-of-way on a waste area provided by the contractor. The wasted material must not create an unsightly condition when viewed from public highways. The cost of wasting concrete masonry and rubble is to be included in the lump sum bid for "Removal of Existing Structures."

TRAFFIC CONTROL

The contractor is to provide traffic control signals in accordance with Specification 725 & 760. Traffic is to be regulated in accordance with Figure 6-20 of Spec. 725. All traffic control devices, signals, pavement marking tape for stop lines, and cones) are to be furnished by the contractor. All signs and skids are to be furnished to the job site by I. S. H. C. Maintenance Department. The signs and skids are to be placed, cleaned and maintained in their proper position by the contractor. When no longer needed, or at the completion of the project, the contractor shall return the signs and skids to the nearest I. S. H. C. Maintenance Garage. The cost of all traffic control devices to be furnished and/or maintained by the contractor, shall be considered incidental to construction and no separate payment will be made.

FLOODLIGHTING

Floodlights will be required in accordance with "Floodlighting Notes" on Sheet 3 of 25, and shall be placed on the side of the roadway being used for traffic. When traffic is shifted, move floodlights as shown on Sheets 3 & 4 of 25. The lump sum bid for "Floodlighting" shall be full compensation for furnishing, installing, maintaining, and servicing the lights and shall include all costs for electric current.

GALVANIZING REINFORCEMENT

All reinforcing bars listed on Sheet 8 of 25 in "Reinforcing Bar List - Superstr. " and the 61 bars listed on Sheet 7 of 25 in "Reinforcing Bar List - One Abutment," are to be galvanized in accordance with current Supplemental Specifications.

ROAD WORK

The Bridge Contractor will be the only contractor at the site and is responsible for the completion of all work as detailed or noted on the plans. See sht. 12 of 25 for roadwork quantities.

SUGGESTED CONSTRUCTION SEQUENCE

1. Set traffic controls and floodlights, install timber curb & rail, and route traffic to west lane of existing structure.
2. Remove east portion of pavement and drive sheet piling at south abutment.
3. Remove north portion of superstructure, construct berm, and complete Stage I removal.
4. Construct Stage I portion of new bridge, drive sheet piling for Stage II, backfill Stage I of new bridge, and place Class "A" crushed stone at approaches.
5. Reset traffic controls, floodlights, and timber curb & rail, and route traffic onto completed construction.
6. Remove west portion of pavement, and complete removal of existing bridge.
7. Construct Stage II portion of new bridge, backfill, remove all sheet piling, and construct Stage II approach pavement.
8. Relocate traffic controls & floodlights, erect suitable barricades as directed by the Engineer, remove remaining pavement, and construct Stage III approach pavement.
9. Install guardrails, remove traffic controls, floodlights & barricades, and complete earthwork and channel excavation.

TOTAL [redacted] BRIDGE QUANTITIES

Item No.	Item	Units	2 Abuts.	2 Piers	Superstructure	Total
10	Structural Concrete	cu.yds.	56.4	38.6	413.4	508.4
11	Reinforcing Steel	lbs.	5706	3460		9166
12	Reinforcing Steel - Galvanized	lbs.	1476		102,709	104,185
13	Class 20 Excavation	cu.yds.	[redacted]			[redacted] 804
14	Class 10 Channel Excavation	cu.yds.				[redacted] 1451.4
15	Subdrain	lin.ft.				176
16A	Aluminum Handrail	lin.ft.				257.0
17	HP 10x42 Furnish 8@40'; 8@50'; 28@45'	lin.ft.	[redacted]	[redacted]		[redacted] 1917.6
18	Steel Bearing Drive 8@40'; 8@50'; 28@45'	lin.ft.	[redacted]	[redacted]		[redacted] 1730.3
19	Piling Encase 28@18'	lin.ft.		504		504
20	Removal of Existing Structures	L.S.				Lump Sum
21	Floodlighting	L.S.				Lump Sum
23	Granular Backfill	cu.yds.	72			72

Item No. 1. ~~Estimate~~ REFERENCE INFORMATION: The abut. ftg. ℄ temp. pvg blk. ℄ pier caps, 95.0 cu.yds. are to be Class "C" Concrete. The remainder, 413.4 cu.yds., is to be Class "D" Concrete.

NOTE: SEE SHEET 12 OF 25 FOR ROADWORK QUANTITIES FOR THIS SITE.

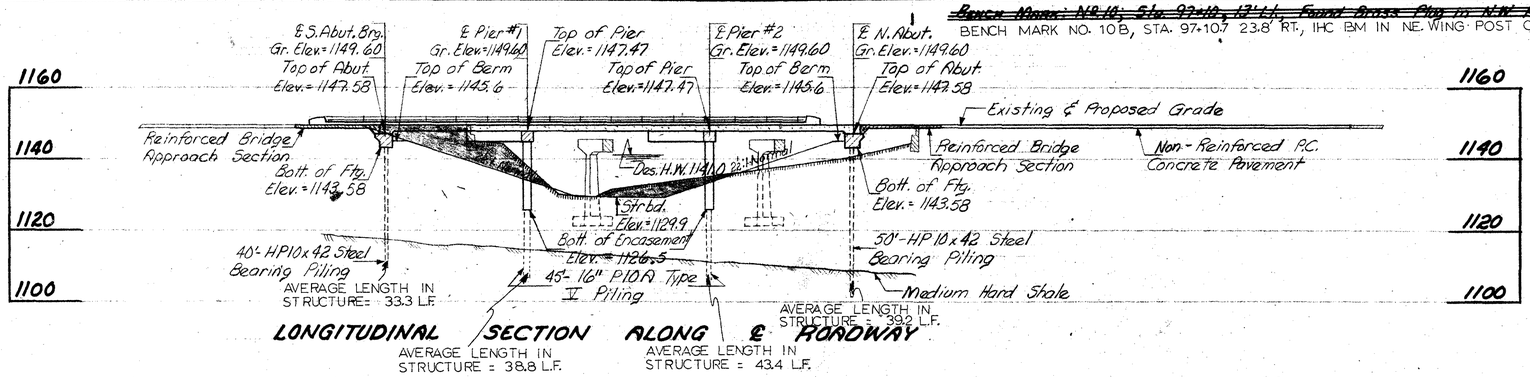
Design For 35° Skew (R.A.)
130'-0 x 44' CONTINUOUS CONCRETE SLAB BRIDGE
39'-6 End Spans 51'-0 Interior Span
SOUNDING DATA
Station: 96+30.00 May, 1975
PLYMOUTH COUNTY
IOWA STATE HIGHWAY COMMISSION
Design Sheet No.: 1 Of 25 File No.: 25158 Design No.: 774

DESIGNED BY R.A. Britson
DETAILED BY G. Brown
TRACED BY:
CHECKED BY E. Neary
SECTION LEADER James R. Swanson
DES 6-16-75
PLYMOUTH COUNTY

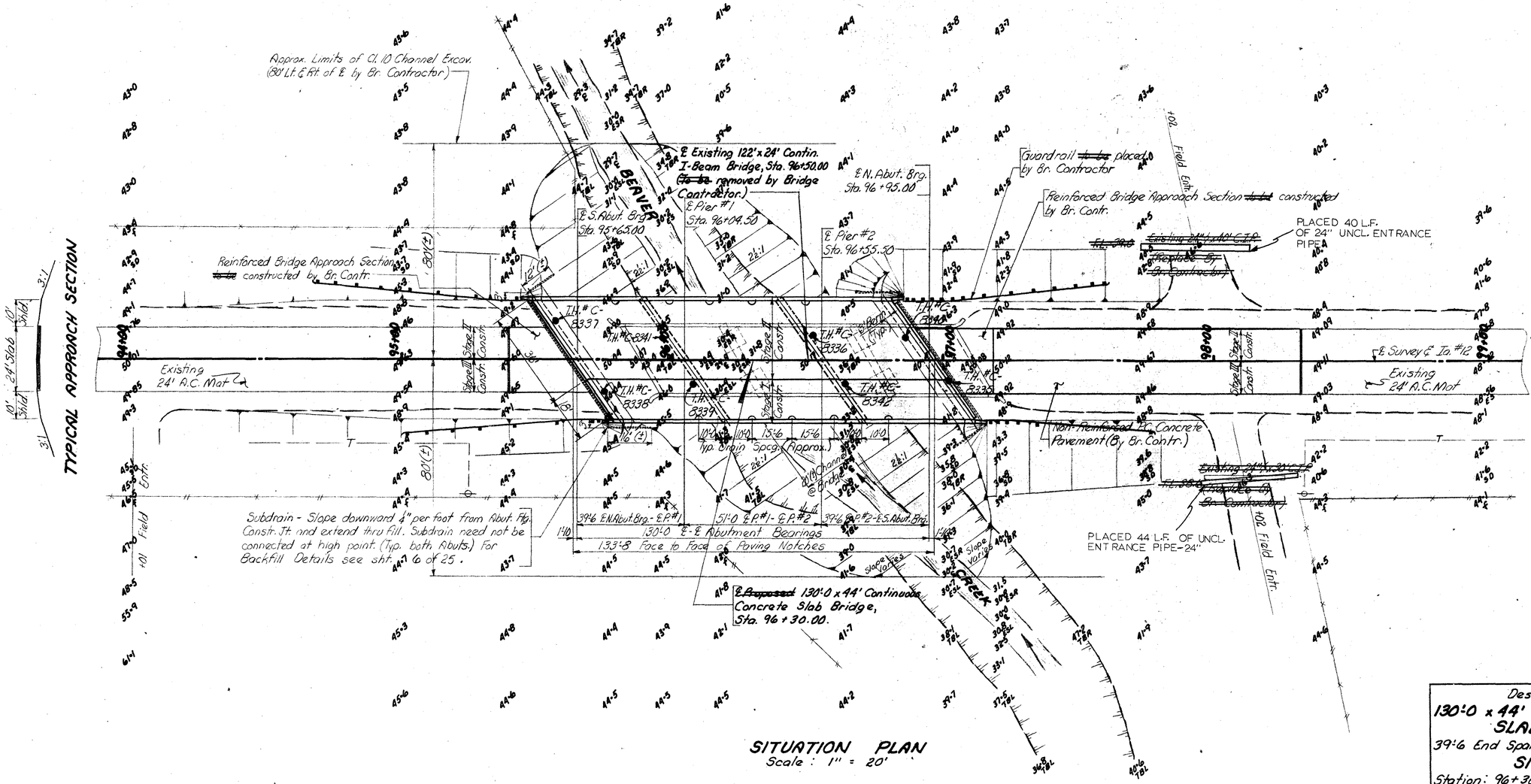
PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
FN-12-2(2)--21-75	IOWA	5		24	48

~~Bench Mark: NB 16, Sta. 97+10, 12' Lt., Found Brass Plug in N.W. Handrail Post at Bridge, Elev. 1153.33~~

BENCH MARK NO. 10 B, STA. 97+10.7 23.8 RT., IHC BM IN NE. WING POST OF BRIDGE — ELEV. 1152.71

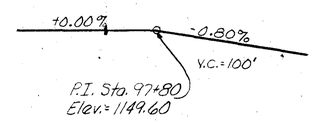


LONGITUDINAL SECTION ALONG ℄ ROADWAY

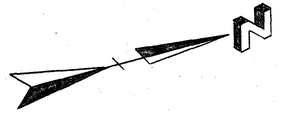


SITUATION PLAN
Scale: 1" = 20'

TYPICAL APPROACH SECTION



PROPOSED GRADE ON IA. #12



TRAFFIC COUNT: 1330 V.P.D. (1996)

LOCATION:
Iowa #12 over Beaver Creek
Section 29
T. 93-N R. 48-W
Portland Twp.
Plymouth County

HYDRAULIC DATA:
D.A. = 8.8 sq. mi. VH-H
Design Q = 1,000 cfs
Design H.W. = 1141.0

Design For 35° Skew (R.A.)

130'-0 x 44' CONTINUOUS CONCRETE SLAB BRIDGE

39'-6 End Spans . 51'-0 Interior Span

SITUATION PLAN

Station: 96+30.00 May, 1975

PLYMOUTH COUNTY
IOWA STATE HIGHWAY COMMISSION

Design Sheet No.: 2 Of 25 File No.: 25158 Design No.: 774

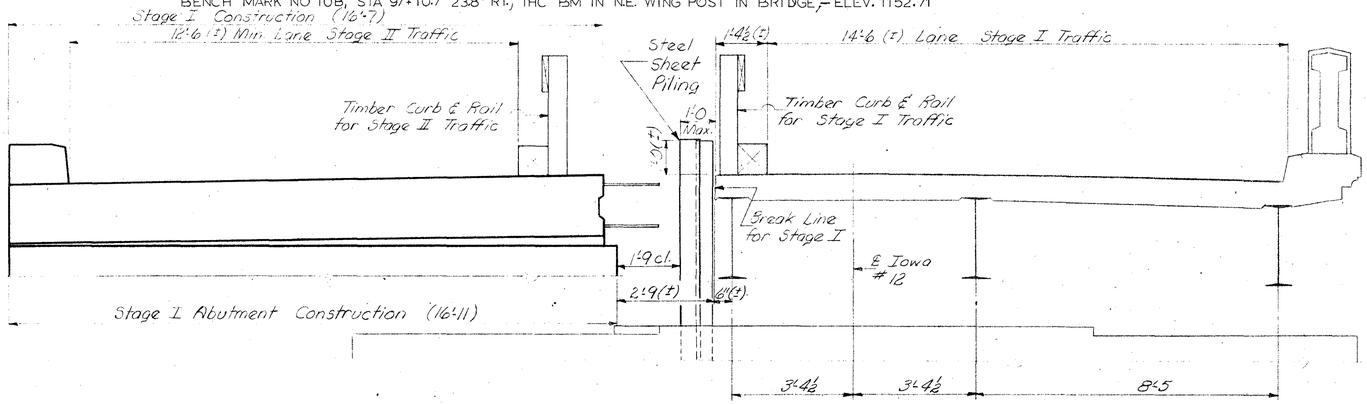
DESIGNED BY R.A. Britson
DETAILED BY R.A. Britson
TRACED BY
CHECKED BY

PLYMOUTH COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
FN-12-2(2)--21-75	IOWA	5		25	48

~~Bench Mark: No 10; Sta. 97+10, 13'Lt, found Brass Plug in N.W. Handrail Post at Bridge, Elev. 1153.78~~

BENCH MARK NO 10B, STA 97+10.7 23.8' RT., IHC BM IN N.E. WING POST IN BRIDGE, - ELEV. 1152.71



SECTION A-A

NOTE: NO PORTION OF EXISTING PIERS ~~SHALL BE~~ WAS REMOVED AS LONG AS TRAFFIC ~~IS~~ WAS USING ANY PORTION OF EXISTING BRIDGE.

FLOODLIGHTING NOTES:

Floodlights will be required as shown on this sheet and sheet 4 of 25. Poles to support floodlights shall be placed outside the normal shoulder line at the approximate locations shown. Section 602 of the "Supplemental Specifications for Traffic Controls for Street and Highway Construction and Maintenance Operations", Specification Number 725, dated July 18, 1972, shall not apply as it pertains to floodlights. Floodlighting shall be installed and in service before other construction on the bridge is started and removed after the completed bridge is placed in service.

Luminaires used for floodlighting shall be standard roadway types with totally enclosed refractors. The I.E.S. glare control rating shall be "cutoff". The lamps shall have an initial output rating of 19,000 lumens or greater, for operation in such luminaires. All luminaires shall be approved by the Engineer.

The mounting height of luminaires shall be not less than 35 feet above the roadway. The center of the light source shall be directly above the traffic lane edge where practicable, but mastarm lengths shall not be less than shoulder width.

All luminaires shall be photoelectric controlled for dusk-to-dawn operation.

The contractor shall exercise reasonable care to avoid interruptions during the hours of darkness, shall repair promptly any damage to the system and shall replace all burned out lamps as soon as possible.

All materials involved in this item shall remain the property of the contractor.

STEEL SHEET PILING NOTES:

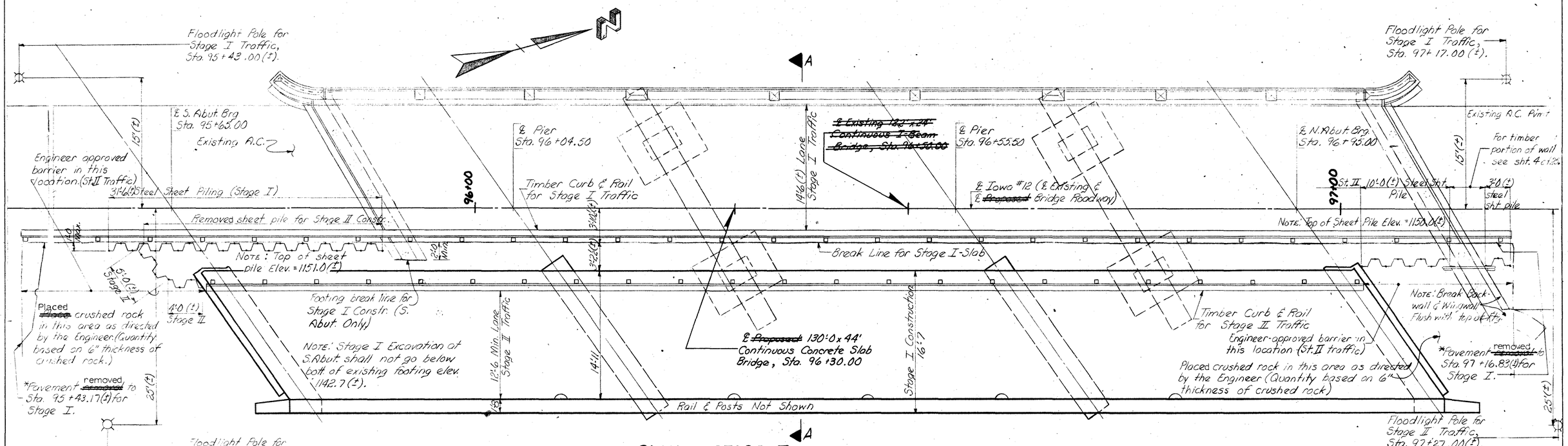
A contilevered steel sheet pile wall is to be constructed to contain the earth embankment during stage construction. Steel sheet piling of 20' minimum length is to be driven as shown in Section A-A.

The minimum size of steel sheet piling shall have a section modulus of not less than 10.7 in.³ per foot of wall.

Except as noted steel sheet piling is to be removed only after Stage II backfilling has been completed.

The cost of furnishing, driving and removing the steel sheet piling is considered incidental to the cost of construction and no direct payment will be made therefor. The steel sheet piling is to remain the property of the Contractor after removal.

The Bridge Contractor may submit an alternate plan for supporting the earth embankment during construction. The Contractor's method of supporting the embankment must have the approval of the engineer before any work on the contract is started.



PLAN - STAGE I

See sht. 4 of 25 for "Timber Curb & Rail Detail - Stage I & II".

* Final removal to stations shown on sheet 4 of 25 was ~~to be~~ done just prior to placement of approach pavement.

Design for 35° Skew (R.A.)

130'-0 x 44' CONTINUOUS CONCRETE SLAB BRIDGE

39'-6 End Spans 51'-0 Interior Span

STAGE I DETAILS

Station: 96+30.00 May, 1975

PLYMOUTH COUNTY

IOWA STATE HIGHWAY COMMISSION

Design Sheet No.: 3 Of 25 File No.: 25138 Design No.: 774

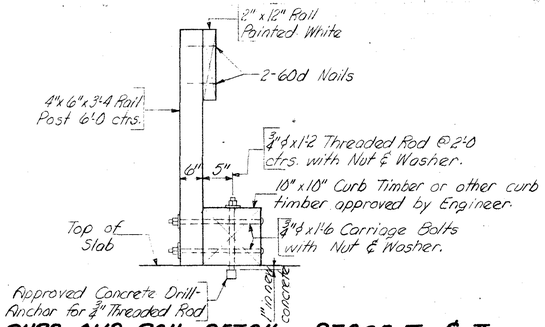
DESIGNED BY R.A. Britson
DETAILED BY G. Young
TRACED BY:
CHECKED BY:

PLYMOUTH COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
FN-12-2(2)--21-75	IOWA	5		26	48

~~Bench Mark: N° 10, Sta. 97+10, Found Brass Plug in N.W. Handrail Post of Bridge, Elev. 1153.73.~~

BENCH MARK NO. 10B, STA. 97+10.7 23.8' RT., IHC BM IN NE. WING POST OF BRIDGE — ELEV. 1152.71

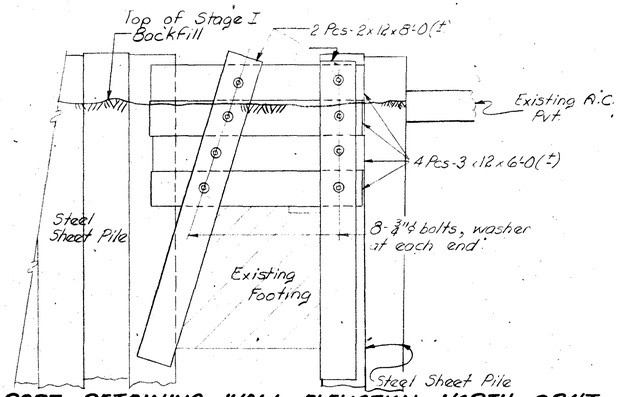


TIMBER CURB AND RAIL DETAIL - STAGE I & II

NOTE: When anchor rod is removed fill void with mortar. Mortar shall contain equal parts of portland cement and sand with sufficient water to make a workable mix.

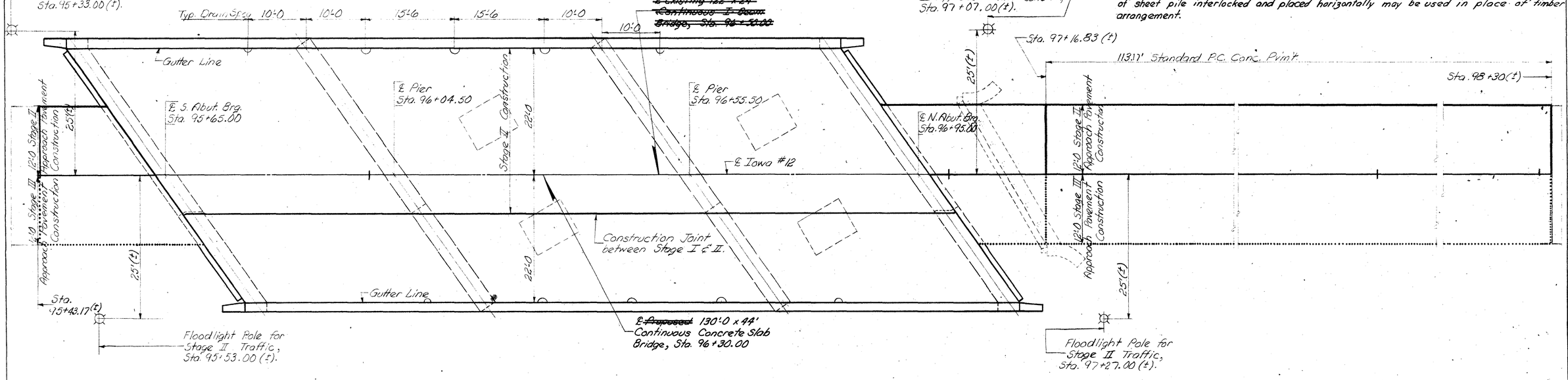
The cost of all material and labor necessary to install and remove timber curb and railing for Stage I and II shall be considered incidental to construction.

The concrete drill anchors are to be drilled in existing slab and pavement to anchor barricade for Stage I. The anchors are to be set in fresh concrete 1" below the surface to anchor barricade for Stage II.

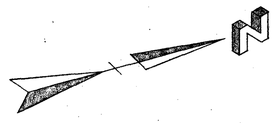


PART RETAINING WALL ELEVATION - NORTH ABUT.

NOTE: Rough lumber may be used for the timber portion of the retaining wall shown above. Ends of horizontal timber shall bear against sheet piling. Sections of sheet pile interlocked and placed horizontally may be used in place of timber arrangement.



PLAN - STAGE II COMPLETED



Design For 35° Skew (R.A.)

130'-0 x 44' CONTINUOUS CONCRETE SLAB BRIDGE

39'-6 End Spans — 51'-0 Interior Span

STAGE II DETAILS

Station: 96+30.00 — May, 1975

PLYMOUTH COUNTY

IOWA STATE HIGHWAY COMMISSION

Design Sheet No.: 4 Of 25 File No.: 25158 Design No.: 774

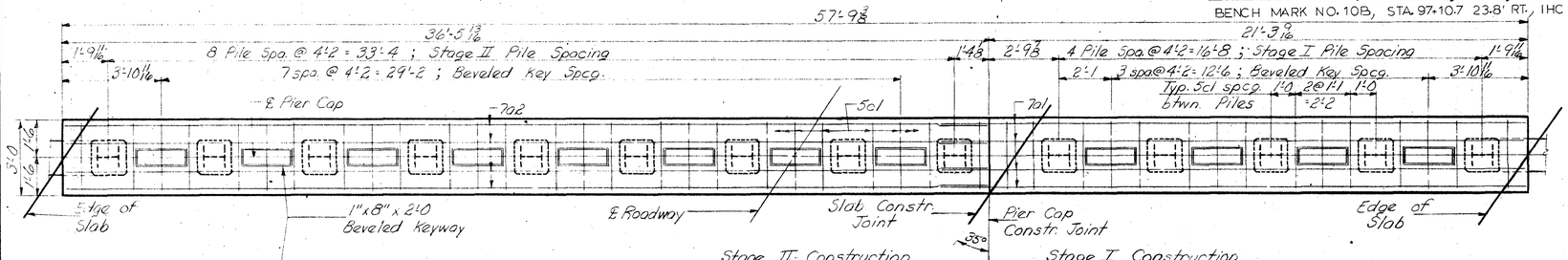
DESIGNED BY: R.A. Britson
DETAILED BY: B.C. Gaumy
TRACED BY:
CHECKED BY: E.J.M.

PLYMOUTH COUNTY

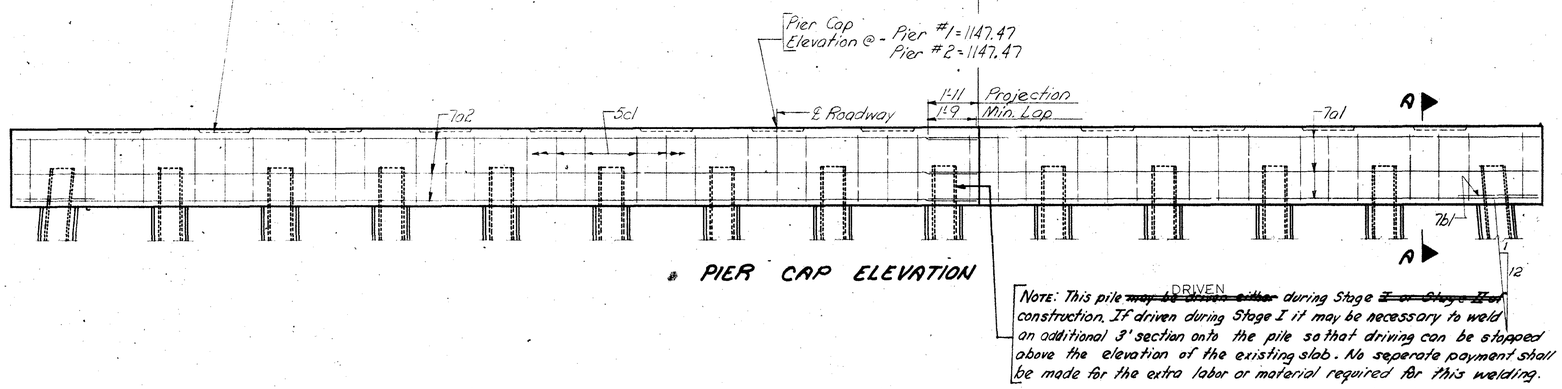
PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
FN-12-2(2)--21-75	IOWA	5		27	48

~~Datum Plane: N'ly 10, Sta. 97+10, 18' Lt., Found Brass Plug in NW Handrail Pedest. Bridge, Elev. 1153.78.~~

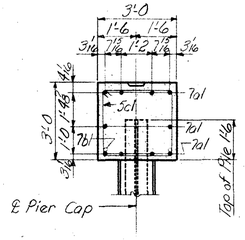
BENCH MARK NO. 10B, STA. 97+10.7 23.8' RT., IHC BM IN NE WING POST OF BIDGE — ELEV. 1152.71



PIER CAP PLAN



PIER CAP ELEVATION



SECTION A-A

Note: This pile ~~may be driven either~~ DRIVEN during Stage ~~I or Stage II~~ I construction. If driven during Stage I it may be necessary to weld an additional 3' section onto the pile so that driving can be stopped above the elevation of the existing slab. No seperate payment shall be made for the extra labor or material required for this welding.

PIER NOTES:

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

Minimum clear distance from face of concrete to near reinforcing bar is to be 2 inches unless otherwise noted or shown. All reinforcing is to be securely wired in place before concrete is placed.

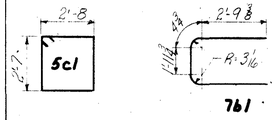
The pier pile encasements (16" - Type V, for HP10x42 steel piles) are to be as detailed and noted on ISHC Standard P10A, dated June, 1959 and revised June 12, 1972. Encasements are to extend down 18' from the bottom of pier cap. The unit price bid for "Encasement" shall be full payment for furnishing and placing all materials and necessary excavation.

Design bearing value for pier piles is 37 tons in medium hard shale.

REINFORCING BAR LIST - ONE PIER

Bar	Location	Shape	No.	Length	Weight
7a1	Cap, Longit., Stage I	——	10	23'-4	472
7a2	" " " II	——	10	36'-2	739
7b1	Cap Hairpins, Ends	⊏	2	8'-4	34
5c1	Cap Hoops	▭	41	11'-4	485
				Total - lbs.	1730

BENT BAR DETAILS



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

CONCRETE PLACEMENT QUANTITIES - 1 PIER

Location	Stage I	Stage II	Total
Cap	7.1	12.2	19.3
		Total - cu.yds.	19.3

~~ESTIMATED~~ QUANTITIES - TWO PIERS

Item		Units	~~Quantity~~	Quantity
Structural Concrete, Class "C"		cu.yds.	~~36.6~~	38.6
Reinforcing Steel		lbs.	~~3460~~	3460
HP10x42 Steel Bearing Piling	Furnish 28 @ 45'	lin. ft.	~~1260~~	1232.6
	Drive 28 @ 45'	lin. ft.	~~1260~~	1150.4
	Encase 28 @ 18'	lin. ft.	~~540~~	504.0

Design for 35° Skew (R.A.)

130'-0 x 44' CONTINUOUS CONCRETE SLAB BRIDGE

39'-6 End Spans 51'-0 Interior Span

PIER DETAILS

Station: 96+30.00

May, 1975

PLYMOUTH COUNTY

IOWA STATE HIGHWAY COMMISSION

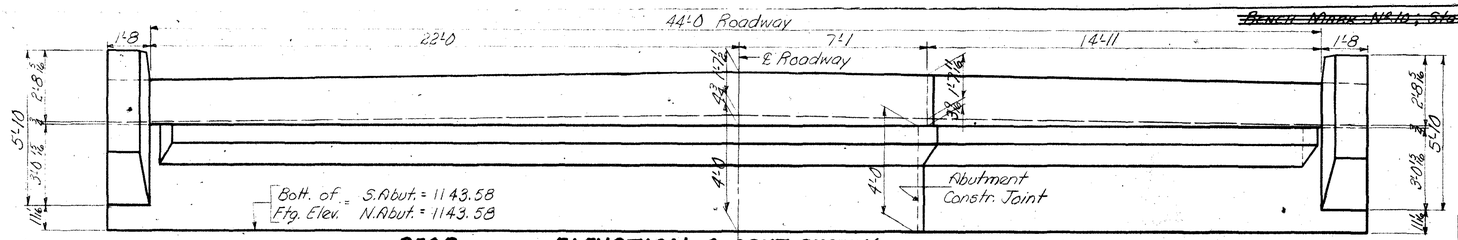
Design Sheet No.: 5 Of 25 File No.: 25158 Design No.: 774

DESIGNED BY: R.A. Britson
DETAILED BY: S. Spaney
TRACED BY:
CHECKED BY: J. Mercer

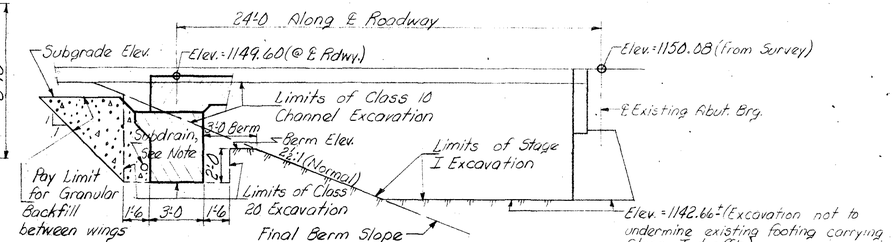
PLYMOUTH COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
FN-12-2(2)--21-75	IOWA	5		22	48

~~Bench Mark No. 10; Sta. 92+15, Found Cross Plug in N.W. Handrail Post of Bridge, Elev. 1153.19.~~

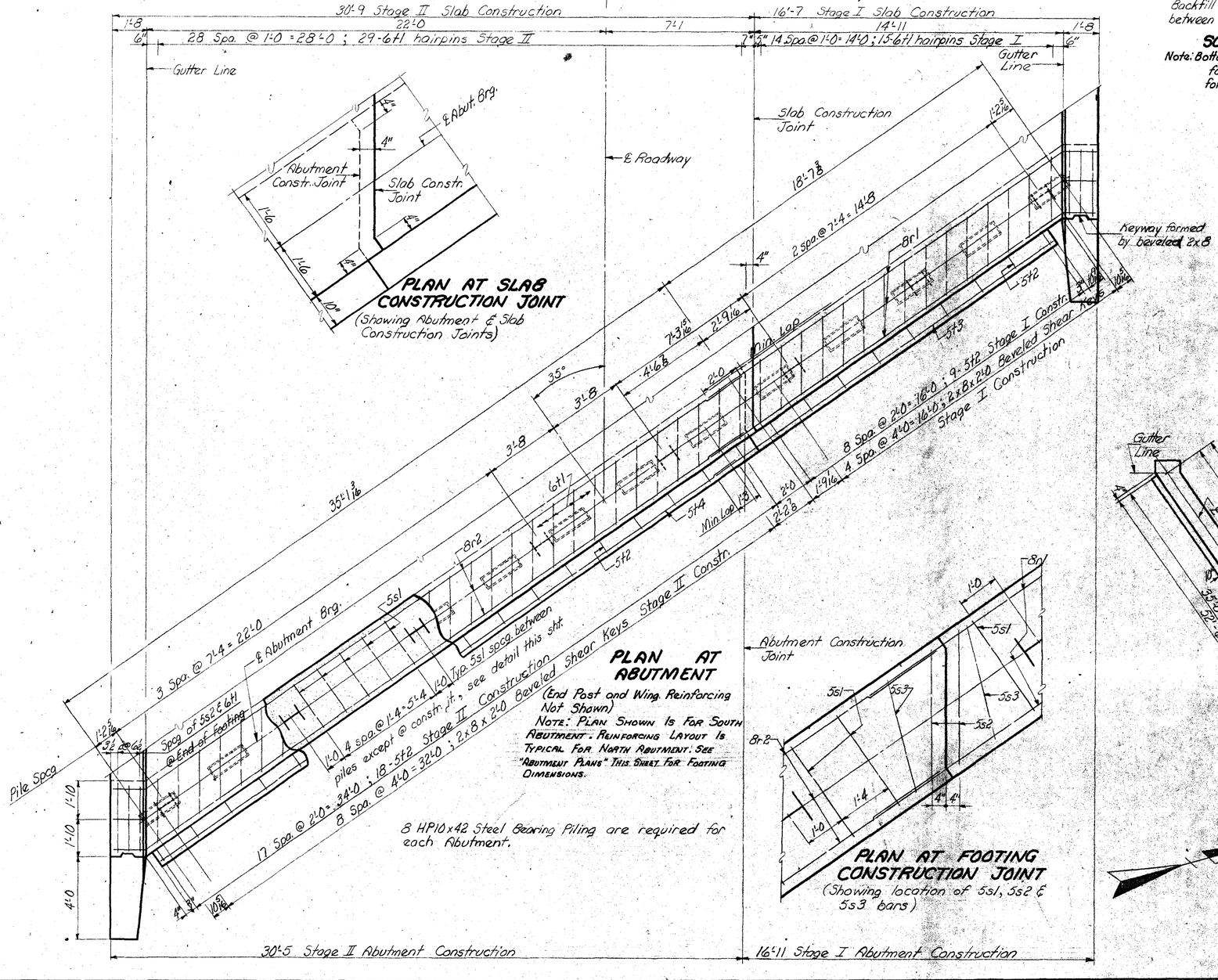


REAR ELEVATION - S. ABUT. SHOWN (PILES NOT SHOWN)



SOUTH ABUTMENT BACKFILL DETAIL (SECTION NORMAL TO ℄ ABUT. BRG.)

Note: Bottom of Subdrain (4"ϕ minimum to 6"ϕ maximum) is to be 6" above bottom of footing at abutment construction joint. See "Situation Plan" sheet 2 of 25 for length.



PLAN AT SLAB CONSTRUCTION JOINT (Showing Abutment & Slab Construction Joints)

PLAN AT ABUTMENT

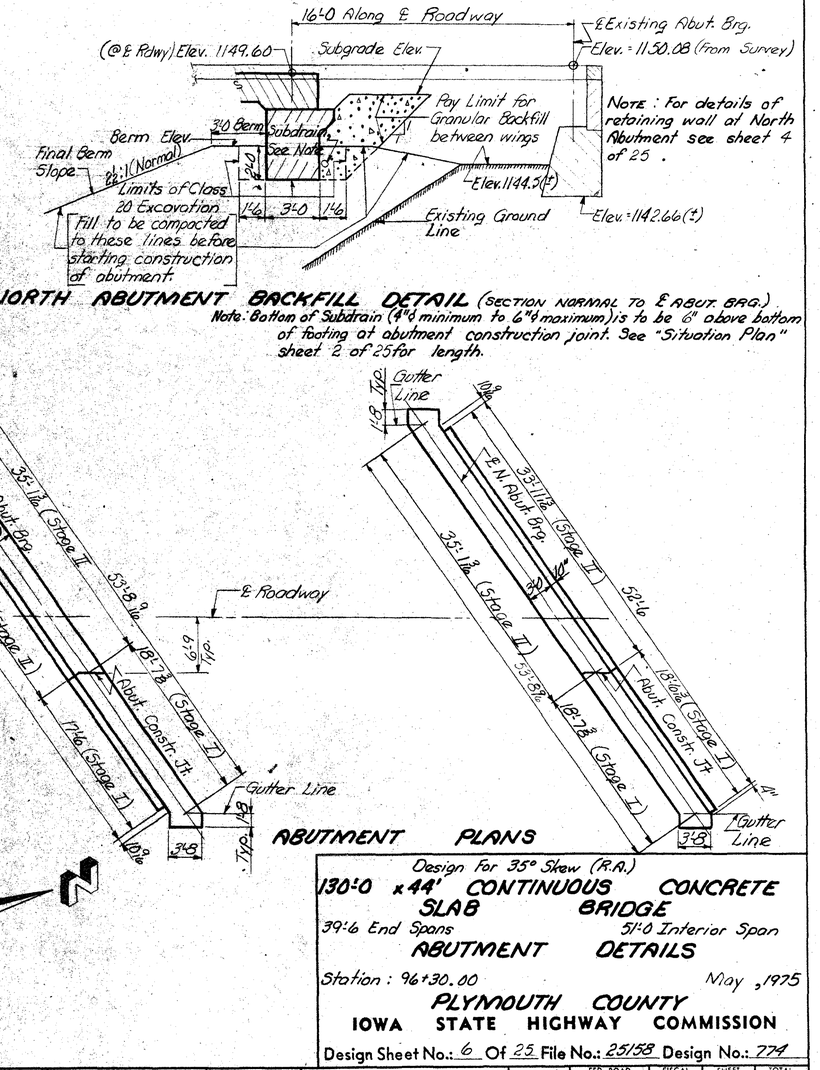
(End Post and Wing Reinforcing Not Shown)

NOTE: PLAN SHOWN IS FOR SOUTH ABUTMENT. REINFORCING LAYOUT IS TYPICAL FOR NORTH ABUTMENT. SEE "ABUTMENT PLANS" THIS SHEET FOR FOOTING DIMENSIONS.

8 HP10x42 Steel Bearing Piling are required for each Abutment.

PLAN AT FOOTING CONSTRUCTION JOINT (Showing location of 5s1, 5s2 & 5s3 bars)

16'-11 Stage I Abutment Construction



NOTE: For details of retaining wall at North Abutment see sheet 4 of 25.

NORTH ABUTMENT BACKFILL DETAIL (SECTION NORMAL TO ℄ ABUT. BRG.)

Note: Bottom of Subdrain (4"ϕ minimum to 6"ϕ maximum) is to be 6" above bottom of footing at abutment construction joint. See "Situation Plan" sheet 2 of 25 for length.

ABUTMENT PLANS

Design for 35° Skew (R.A.)

130'-0 x 44' CONTINUOUS CONCRETE SLAB BRIDGE

39'-6 End Spans — 51'-0 Interior Span

ABUTMENT DETAILS

Station: 96+30.00

May, 1975

PLYMOUTH COUNTY

IOWA STATE HIGHWAY COMMISSION

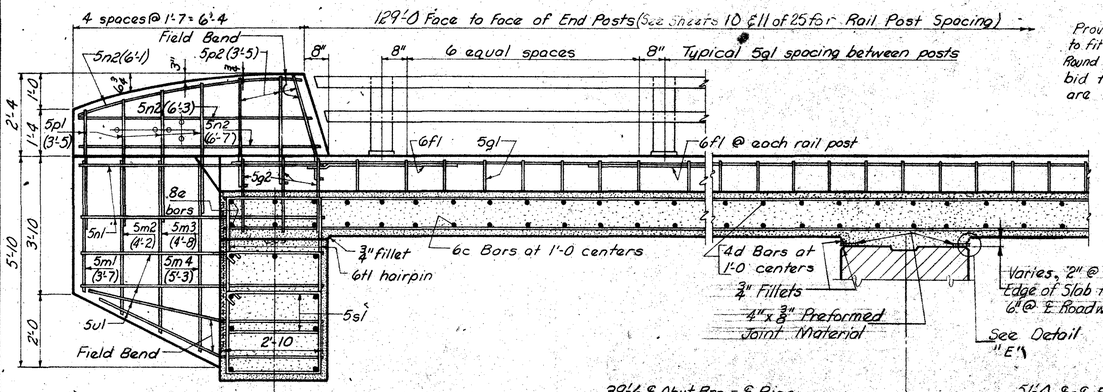
Design Sheet No.: 6 Of 25 File No.: 25158 Design No.: 774

DESIGNED BY: R.A. Britson
DETAILED BY: G.R. Mowry
TRACED BY:
CHECKED BY: E. Macey

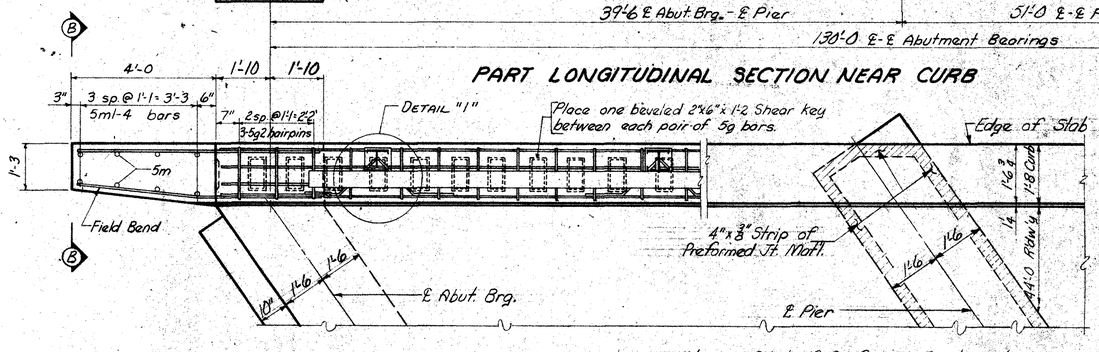
PLYMOUTH COUNTY

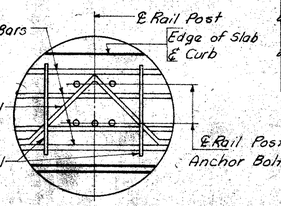
PROJECT NUMBER: FN-12-2(2)--21-75

STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	5		29	48



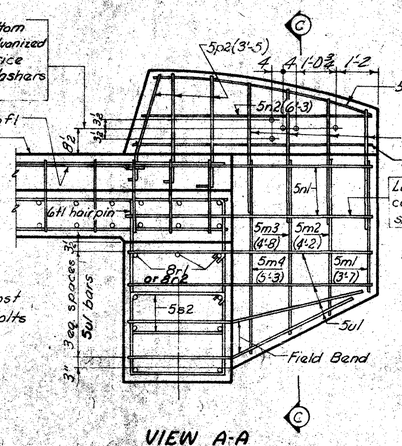
PART LONGITUDINAL SECTION NEAR CURB



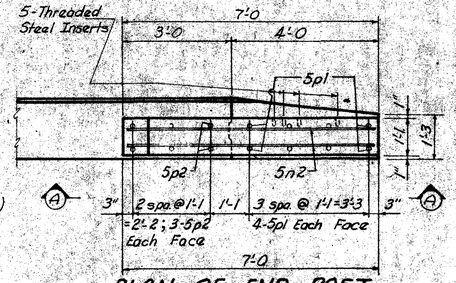


DETAIL "I."

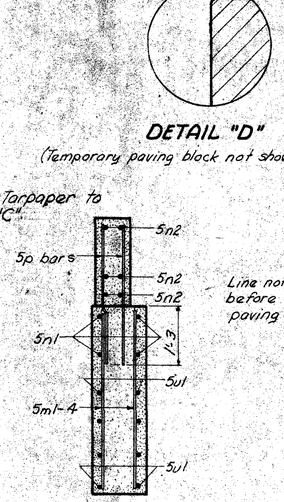
Provide 5 - Threaded Steel Inserts with solid bottom to fit 3/4" ϕ Diam. x 2" Galvanized Cap Screws with Galvanized Round Washers. Cost of inserts to be included in price bid for "Structural Concrete". Screws and Washers are not a part of this contract.



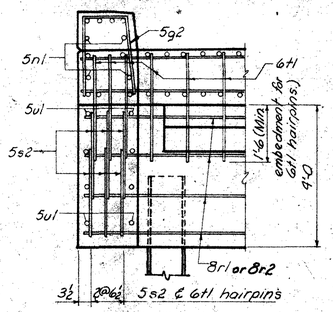
VIEW A-A



PLAN OF END POST



SECTION C-C



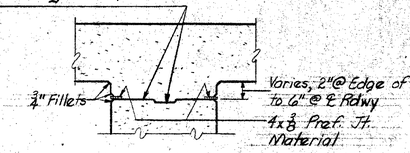
VIEW B-B
(Wing not shown)

DETAIL "D"
(Temporary paving block not shown)

Note: Cost of Preformed Joint Material and Tarpaper to be included in price bid for Structural Concrete, Cl. "C".

PART PLAN
(End Post Not Shown)

One layer of tarpaper on top of pier cap to prevent bonding of superstructure to pier top.



DETAIL "E"

SUBSTRUCTURE NOTES:

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

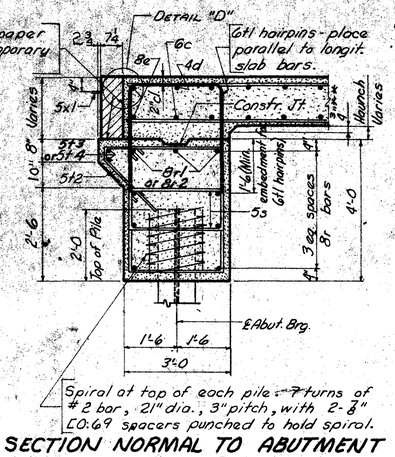
Reinforcing steel is to be securely wired in place before concrete is placed.

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.

Design bearing value for abutment pile is 35 tons in medium hard shale.

Line notch with tarpaper before placing temporary paving block.



Spiral at top of each pile - 7 turns of #2 bar, 21" dia., 3" pitch, with 2-3/8" LO.69 spacers punched to hold spiral.

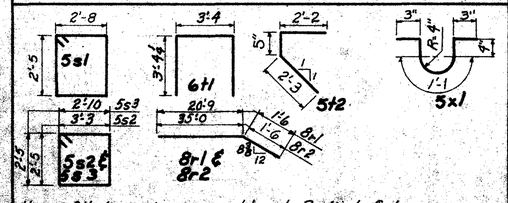
SECTION NORMAL TO ABUTMENT BEARING

** 3/4" Fillet will be total height of abutment haunch at low step.

REINFORCING BAR LIST - ONE ABUTMENT

Bar	Location	Shape	No	Length	Weight
8r1	Footing, Longit., Stage I		9	22'-3	535
8r2	" , " , " II		9	36'-6	877
5s1	Footing, Hoops		66	11'-0	757
5s2	" , " @ Ends		16	12'-2	203
5s3	" , " @ Constr. Jt.		4	11'-4	47
6t1 Ⓐ	Footing to slab, Hairpins		50	9'-10	738
5t2	Paving Support, Transverse		27	4'-9	134
5t3	" " , Longit. St. I		2	19'-9	41
5t4	" " , " " II		2	33'-8	70
5u1	Wing, Longitudinal		16	6'-8	111
5x1	Paving Block Lifting Hoops		3	2'-1	7
	Pile Spiral		8	38'-6	51
	3/8 LO.69 Spiral Spacers		16	1'-10	20
				TOTAL (lbs.)	3391

BENT BAR DETAILS



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

CONCRETE PLACEMENT - ONE ABUTMENT

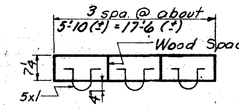
Location	Stage I	Stage II	Total
Footing	9.8	17.7	27.5
* Temporary Paving Block	0.7	——	0.7
		TOTAL - cu.yds.	28.2

~~ESTIMATED~~ QUANTITIES - TWO ABUTMENTS

Item		Unit	Quantity
*Structural Concrete, Class "C"		cu.yds.	56.4
Reinforcing Steel		lbs.	5706
Reinforcing Steel - Galvanized		lbs.	1476
Granular Backfill		cu.yds.	72
HP 10 x 42 Steel	Furnish 8@40'; 8@50'	~~lin.ft.~~	~~720~~ 685.0
Bearing Piling	Drive 8@40'; 8@50'	~~lin.ft.~~	~~765~~ 579.9
Class 20 Excavation		cu.yds.	~~855~~ 804

* Temporary paving block may be Class "C" or "D" Concrete at Contractor's option.

Ⓐ All 6t1 bars are to be galvanized. See "Galvanizing Notes" on sheet 8 of 25.



PLAN OF TEMPORARY PAVING BLOCK - STAGE I

Design For 35° Skew (R.A.)

130'-0 x 44' CONTINUOUS CONCRETE SLAB BRIDGE

39'-6 End Spans 51'-0 Interior Span

SUPERSTRUCTURE DETAILS

Station: 96+30.00 May, 1975

PLYMOUTH COUNTY

IOWA STATE HIGHWAY COMMISSION

Design Sheet No.: 7 Of 25 File No.: 25158 Design No.: 774

Revised 6-9-71, End Post and Wing details changed and number of 6t1 hairpins corrected.
Revised 7-17-72: Location of guardrail steel inserts changed.
Revised 7-31-72: Backfill note and "Poly" removed.
Revised 7-31-72: Paving notch and paving notch hook bar dimensions changed.

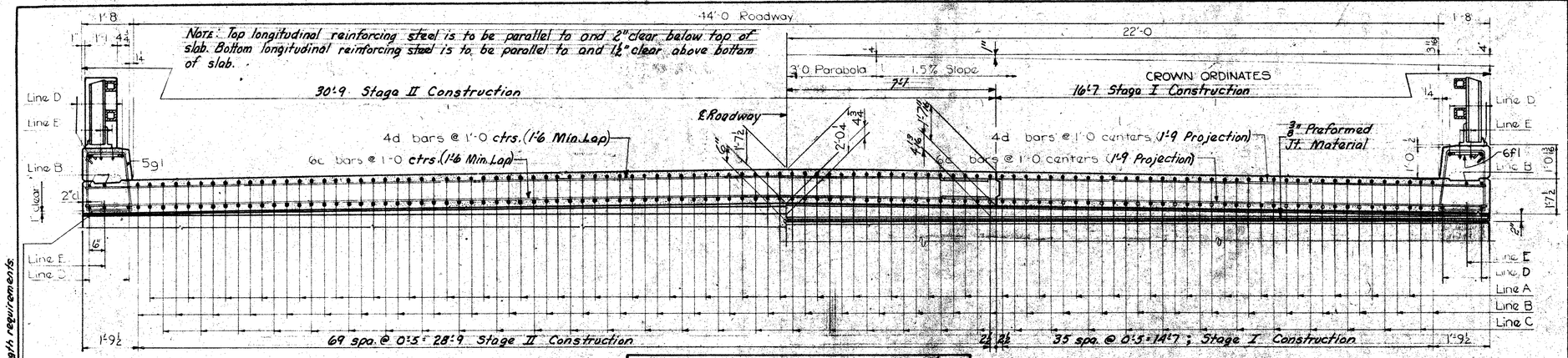
DESIGNED BY: R.A. Britson
DETAILED BY: R. Rumsey
TRACED BY:
CHECKED BY: E. Maas

CONCRETE SLAB, LONGIT. SECTION - 44' ROADWAY - USE FOR ALL SKEWS | STANDARD SHEET 4209

PLYMOUTH COUNTY

PROJECT NUMBER: FN-12-2(2)--21-75

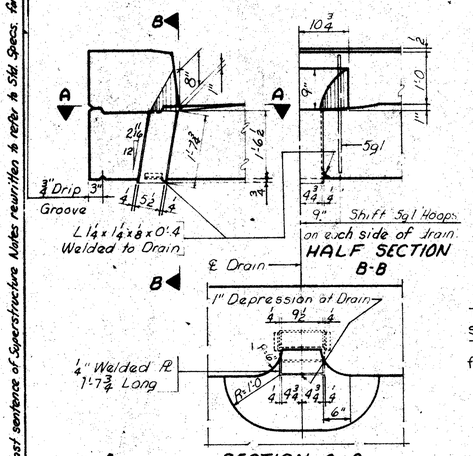
STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	8		30	48



HALF SECTION NEAR ABUTMENT

HALF SECTION NEAR PIER

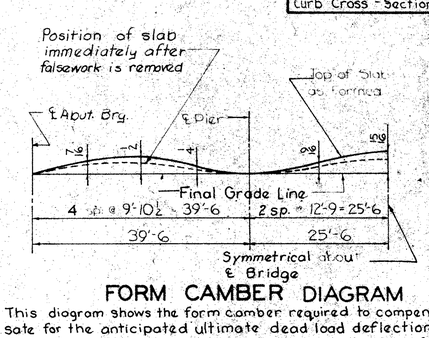
Slab Cross-Sectional Area - Stage I	= 27.074 ft²
Slab Cross-Sectional Area - Stage II	= 50.366 ft²
Curb Cross-Sectional Area - One Curb	= 1.693 ft²



FLOOR DRAIN DETAILS

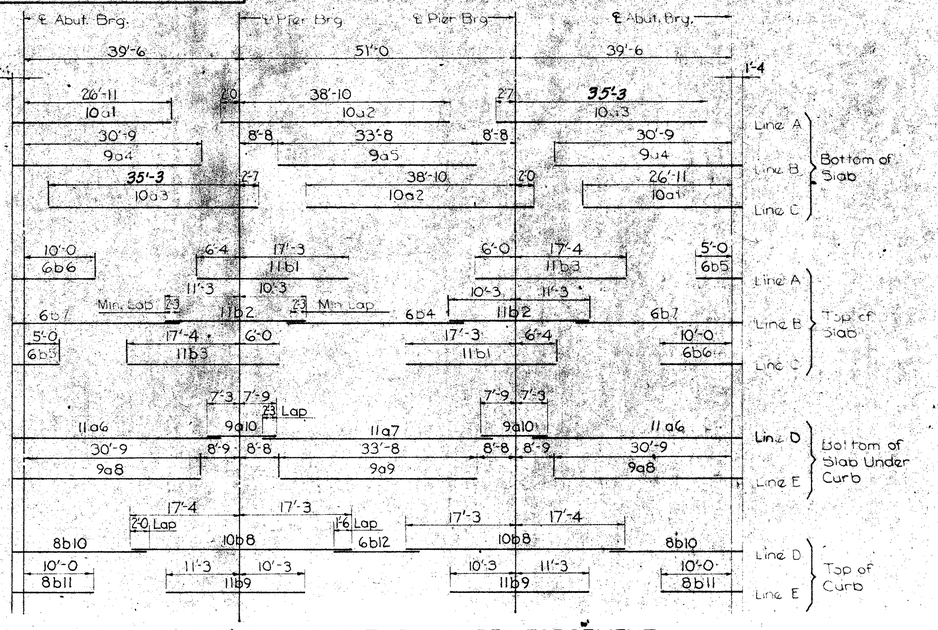
10 Drains Required, Wt. = 44 lbs. per drain.

Note: Drains are to be galvanized. See "Situation Plan" sheet 2 of 25 for location of drains. 6" x 10" outside dimension rolled tube with ¼" wall thickness may be substituted for the welded drain shown. Cost of drains shall be included in price bid for "Structural Concrete".



FORM CAMBER DIAGRAM

This diagram shows the form camber required to compensate for the anticipated ultimate dead load deflection. The above dimensions do not include any allowance for form deflection or falsework settlement.



PLACEMENT FOR LONGITUDINAL REINFORCEMENT

SUPERSTRUCTURE NOTES:

This bridge is designed for HS20-44 loading plus 20 lbs. per sq. ft. of roadway for future wearing surface.

The bridge floor as shown includes 1/2 inch of wearing surface.

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

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 and adequately supported on metal bar chairs spaced at not more than 3'-0 centers longitudinally and transversely before concrete is placed.*

The concrete slab is to be placed with a minimum of construction joints. Procedures for placing slab concrete shall 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. Each curb is to be placed in one continuous pour from end to end of bridge. Curbs are to be placed while the slab is supported by falsework.

The slab falsework shall not be removed until the full slab and curbs are in place and the concrete has attained the age and strength required by the standard specifications.

Existing Piers shall not be used to support falsework.

** Metal bar chairs and wire ties shall conform to current Supplemental Specifications.*

QUANTITIES - SUPERSTR.

Item	Units	Quantity
Structural Concrete, Class "D"	Cu Yds.	413.4
Reinforcing Steel - Galvanized	Lbs.	102,709

Structural Concrete quantity includes slab, curbs, wings and end posts. See sheet 9 of 25 for concrete placement quantities.

Note: "Reinforcing Bar List - Superstr." includes the reinforcing that is placed after the abutment footings are in place.

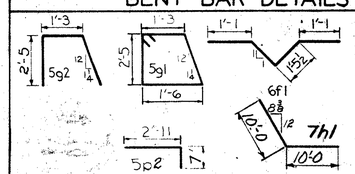
GALVANIZING NOTES:

All reinforcing bars listed in "Reinforcing Bar List - Superstr." on this sheet are to be galvanized. The Standard Specifications are to be modified in that bent bars to be galvanized shall be bent around a pin of at least 6 bar diameters. Bars are to be bent before galvanizing.

REINFORCING BAR LIST - SUPERSTR.

Bar	Location	Shape	Nº	Length	Weight
10a1	Bott. of Slab, Longit.	—	70	28'-3	8,509
10a2	" " " "	—	70	40'-10	12,299
10a3	" " " "	—	70	37'-10	11,396
9a4	" " " "	—	72	32'-1	7,854
9a5	" " " "	—	36	33'-8	4,121
11a6	" " " @ curb	—	8	35'-10	1,523
11a7	" " " "	—	4	40'-0	850
9a8	" " " "	—	4	32'-1	436
9a9	" " " "	—	2	33'-8	229
9a10	" " " "	—	8	15'-0	408
11b1	Top of Slab, Longit.	—	70	23'-7	8,771
11b2	" " " "	—	80	21'-6	9,138
11b3	" " " "	—	70	23'-4	8,678
6b4	" " " "	—	40	35'-0	2,103
6b5	" " " "	—	70	6'-4	666
6b6	" " " "	—	70	11'-4	1,192
6b7	" " " "	—	80	31'-10	3,825
10b8	Top of Curb, Longit.	—	8	34'-7	1,190
11b9	" " "	—	8	21'-6	914
8b10	" " "	—	8	25'-6	545
8b11	" " "	—	8	11'-4	242
6b12	" " "	—	4	19'-6	117
6c1	Bott. Slab, Transv., Stage I	—	122	18'-2	3329
6c2	" " " " I, End	—	9	Varies	132
6c3	" " " " I, "	—	10	Varies	161
6c4	" " " " II	—	113	30'-4	5148
6c5	" " " " II, End	—	19	Varies	491
6c6	" " " " II, "	—	18	Varies	420
4d1	Top Slab, Transv., Stage I	—	122	18'-2	1481
4d2	" " " " I, End	—	9	Varies	59
4d3	" " " " I, "	—	10	Varies	72
4d4	" " " " II	—	113	30'-9	2290
4d5	" " " " II, End	—	19	Varies	218
4d6	" " " " II, "	—	18	Varies	187
8a1	Top & bott. of Slab, Transv. @ Abuts., Stage I	—	4	20'-3	216
8a2	" & " " " " " " II	—	4	35'-9	382
6f1	Rail Rost Anchors	▽	32	5'-0	240
5g1	Curb Hoops	▯	214	8'-4	1,860
5g2	" Hairpin @ Abuts.	⌒	12	5'-11	74
7h1	Top & Bott. Slab, Corners	⌐	8	20'-0	327
5w1-4	Wing Vertical	—	32	Shown	147
5h1	Wing Horizontal	—	16	6'-8	111
5n2	End Post, Horizontal	—	24	Shown	158
5p1	" Vertical	—	32	3'-5	114
5p2	" " "	⌐	24	3'-5	86
	Total (Lbs.)				102,709

BENT BAR DETAILS



Note: All dimensions are out to out.

Design for 35° Skew (R.R.)

130'-0 x 44' CONTINUOUS CONCRETE SLAB BRIDGE

39'-6 End Spans 51'-0 Interior Spans

SUPERSTRUCTURE DETAILS

Station: 96+30.00 May, 1975

PLYMOUTH COUNTY

IOWA STATE HIGHWAY COMMISSION

DESIGN SHEET Nº 8 OF 25 FILE Nº 25158 DESIGN Nº 774

DESIGNED BY: K.A. Britson TRACED BY:

DETAILED BY: R.C. Irwin CHECKED BY: E.J. Marek

CONCRETE SLAB, SUPERSTRUCTURE DETAILS - 44' ROADWAY - 130' BRIDGE | STANDARD SHEET 4221 | PLYMOUTH COUNTY | PROJECT NUMBER FN-12-2(2)--21-75

STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	3		31	48

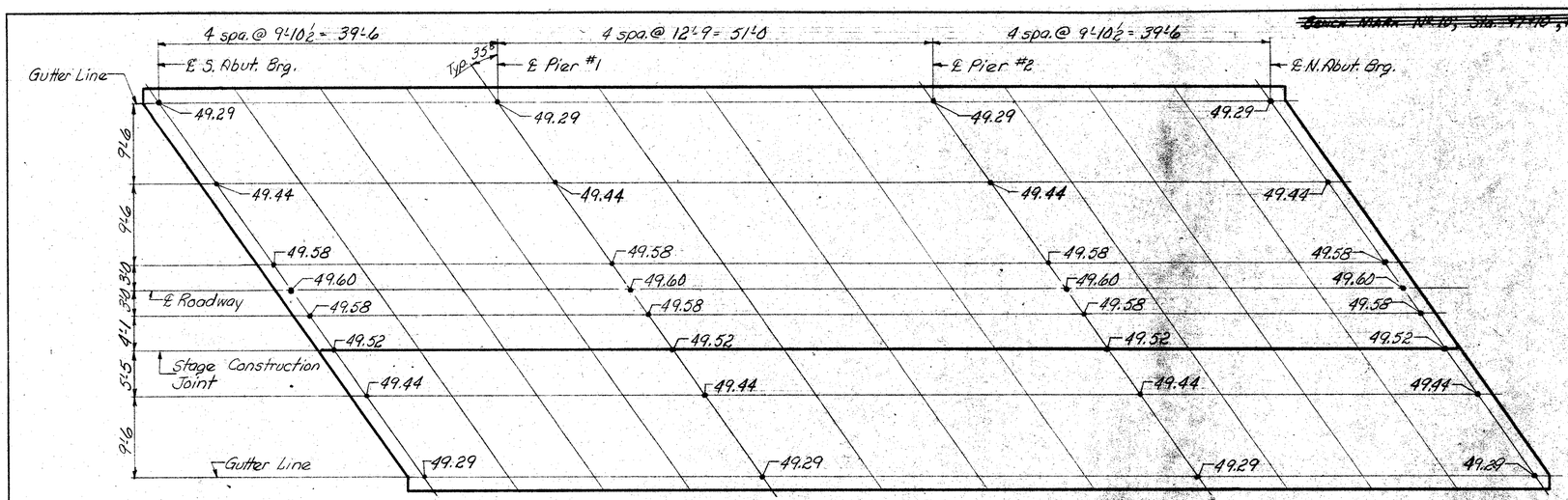
This sheet is complete (except for number of drains and sheet number for location) and is submitted for the following bridge: Sec. 4d, 8a & 8h bars. Dimension for abut. haunch at ℄ rdwy. may change due to grade of skewed bridges. The bar list is also based on the following details: 1. 15 rail post spaces. 2. 14 piles at each pier.

Revised: 6-9-71. Floor drain size and details changed, slab reinforcing (under curb) size, number and weight changed; and wing and end post reinforcing steel changed.

Revised: 11-15-71; Superstructure Notes expanded.

Revised: 6-21-74; Increased length of 10a3 bars. Revised 7-10-74; Last sentence of Superstructure Notes rewritten to refer to Std. Specs. for strength requirements.

~~BENCH MARK: NE Cor. Sta. 97+10, 15 Ft. Right, Found Brass Plug in N.W. Handrail Post of Bridge; Elev. 1100.00~~



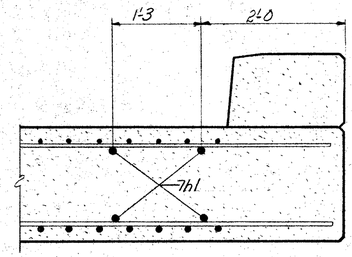
NOTE: TOP OF SLAB ELEVATIONS AT ¼ POINTS ARE THE SAME AS SHOWN ON ℄ OF BEARINGS.

TOP OF SLAB ELEVATIONS

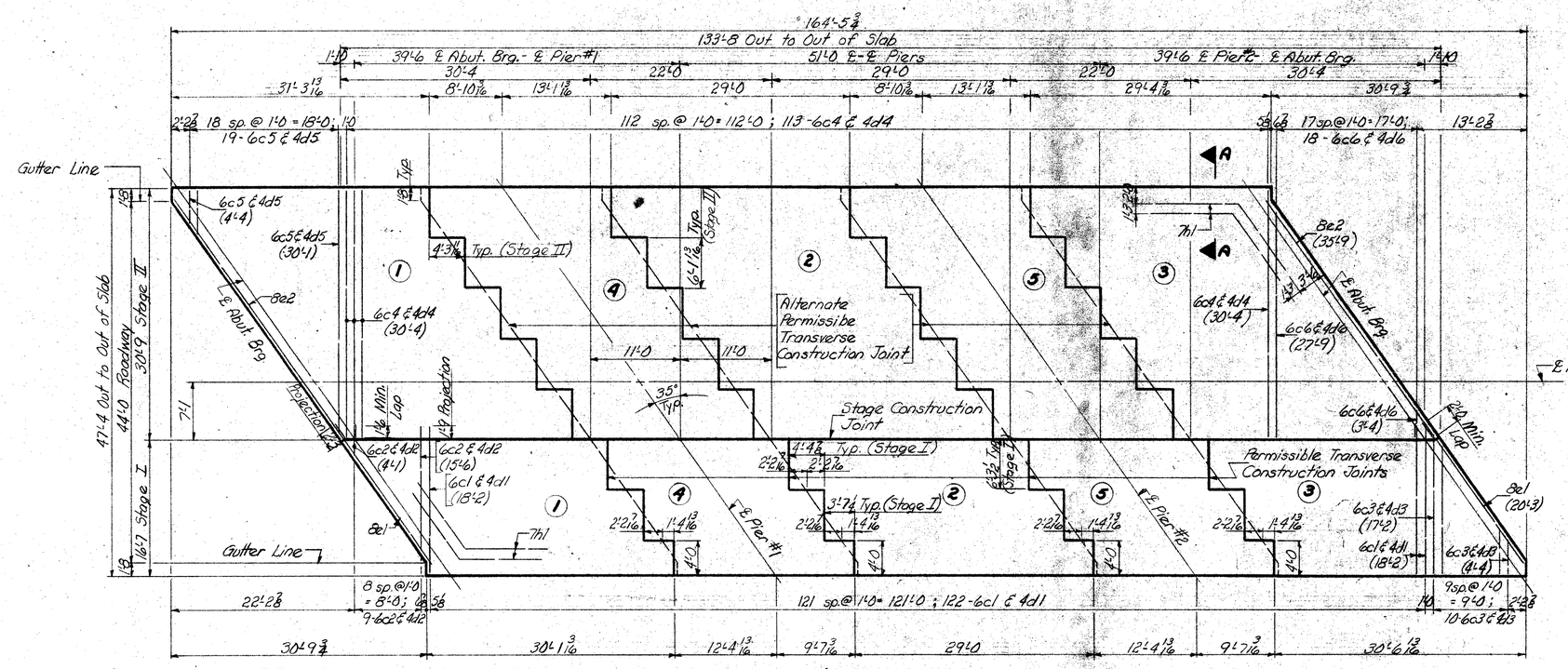
NOTE: Add 1100.00 To Elevations Shown.

CONC. PLACEMENT QUANTITIES - SUPERSTRUCTURE

LOCATION	STAGE I	STAGE II	TOTAL
Slab, Section 1	30.8	57.7	88.5
" " 2	29.1	54.1	83.2
" " 3	30.8	57.7	88.5
" " 4	22.6	42.4	65.0
" " 5	22.6	42.4	65.0
Curbs	8.4	8.4	16.8
Wings 2 @ 1.05 cu.yds.	2.1	2.1	4.2
End Posts 2 @ .55 cu.yds.	1.1	1.1	2.2
Structural Concrete, Class "D" - TOTAL - cu.yds.			413.4



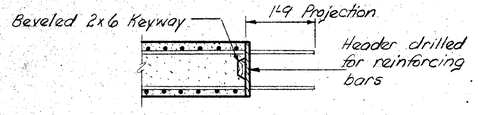
PART SECTION A-A



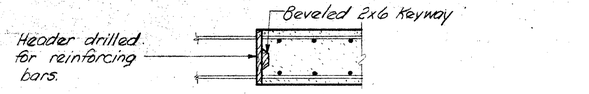
TRANSVERSE REINFORCING STEEL LAYOUT & CONCRETE PLACEMENT DIAGRAM

(SHOWING LOCATION OF 7h1 BARS IN CORNERS OF SLAB)

NOTE: Encircled figures do not indicate sequence of concrete placement. (See Superstructure Notes)



LONGITUDINAL CONSTRUCTION JOINT



TRANSVERSE CONSTRUCTION JOINT

Design For 35° Skew (R.A.)

130'-0 x 44' CONTINUOUS CONCRETE SLAB BRIDGE

39'-6 End Spans 51'-0 Interior Span

SUPERSTRUCTURE DETAILS

Station: 96 + 30.00 May, 1975

PLYMOUTH COUNTY

IOWA STATE HIGHWAY COMMISSION

Design Sheet No.: 9 Of 25 File No.: 25158 Design No.: 774

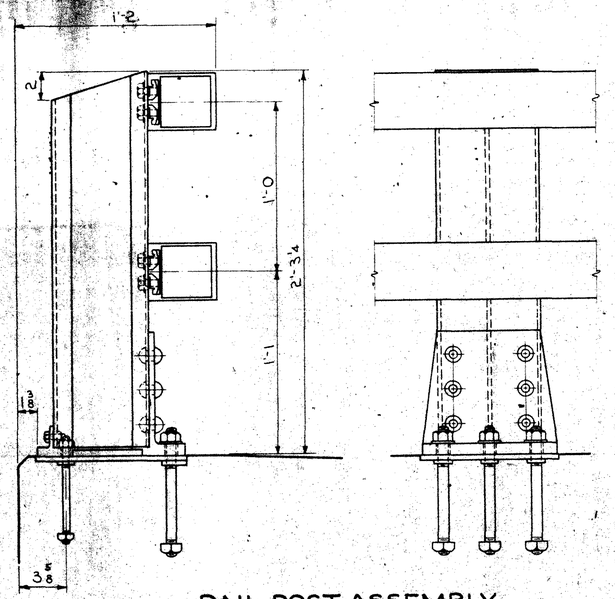
DESIGNED BY: R.A. Britson
DETAILED BY: R. Caraway
TRACED BY:
CHECKED BY: E. Macey

PLYMOUTH COUNTY

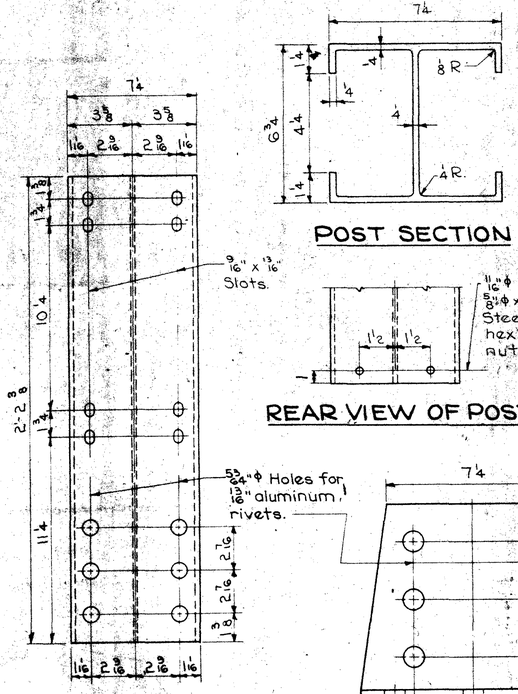
PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
FN-12-2(2)--21-75	IOWA	6		32	48

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 2"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 8-20-73: Alternate for hex steel nuts on anchor bolt assembly removed.
Revised 8-2-72: Rear post bolt size & type changed.
Revised 11-13-70: Exposed anchor bolt nuts & washers changed from aluminum to stainless steel.



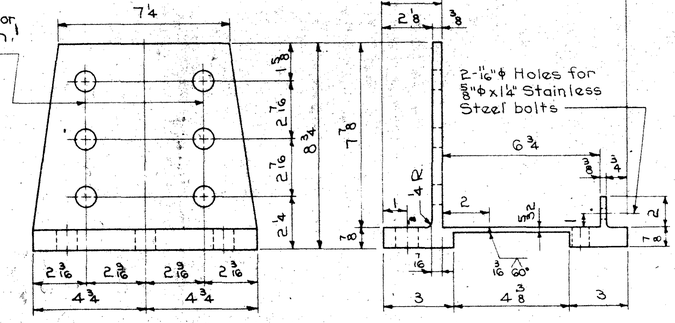
RAIL POST ASSEMBLY



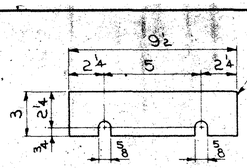
POST

POST SECTION

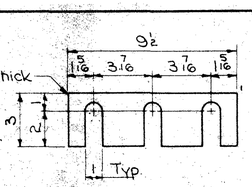
REAR VIEW OF POST



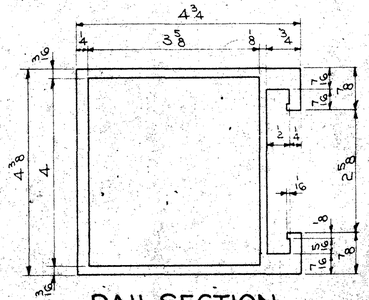
POST BASE PLATE DETAILS



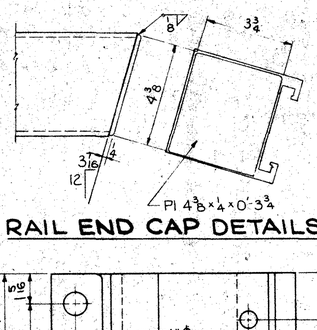
SHIM "A" DETAIL



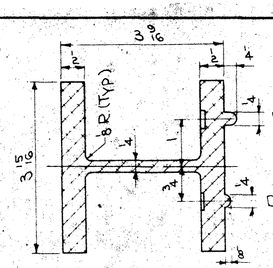
SHIM "B" DETAIL



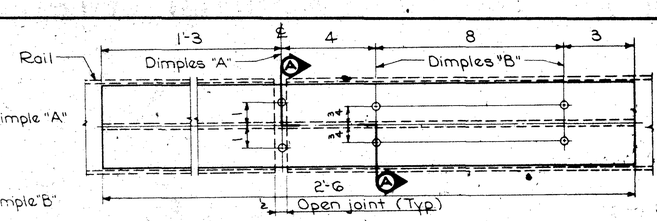
RAIL SECTION



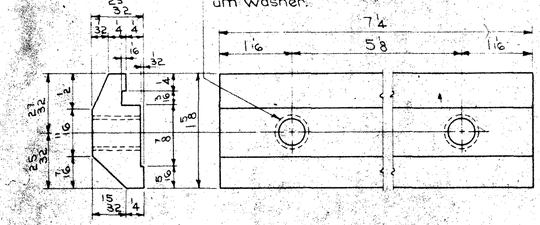
RAIL END CAP DETAILS



SECTION A-A

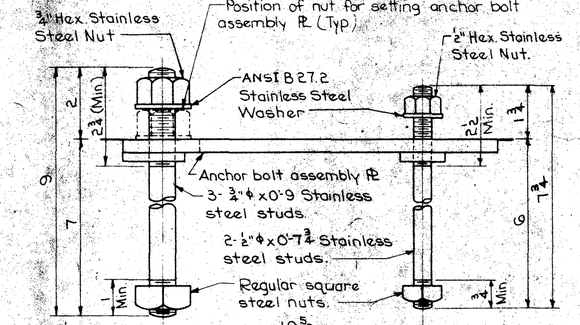


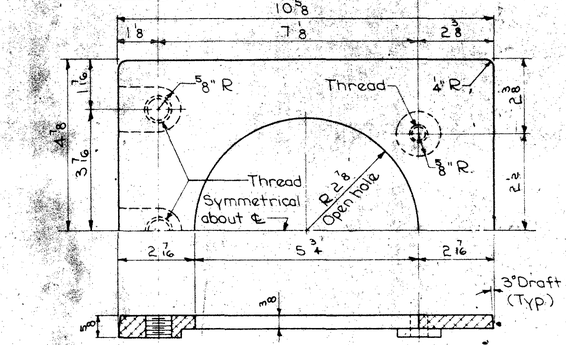
RAIL SPLICE DETAIL



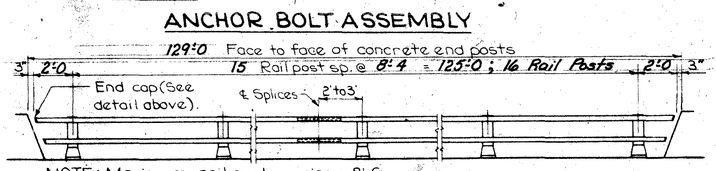
½ - 13-UNC-2B Thread for ½ - 13-UNC-2A x 1" stainless steel ANSI B-18.2 hex head bolt with SAE Standard Light aluminum washer.

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 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 ANSI 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 ANSI B-18.2. Threads shall comply with ANSI 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 and rear post bolt shall be stainless steel A.S.T.M. A-193, Grade B8 (Carbide solution treated) or A.S.T.M. 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 ANSI B-18.2. Threads shall comply with ANSI 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	257.0 Lin. Ft.

Design for 35° Skew (R.R.)

130'-0 x 44' CONTINUOUS CONCRETE SLAB BRIDGE

39'-6 End Spans 51'-0 Interior Span

ALUMINUM HANDRAIL DETAILS

Station: 96+30.00 May, 1975

PLYMOUTH COUNTY

IOWA STATE HIGHWAY COMMISSION

Design Sheet No 10 Of 25 File No 25158 Design No 774

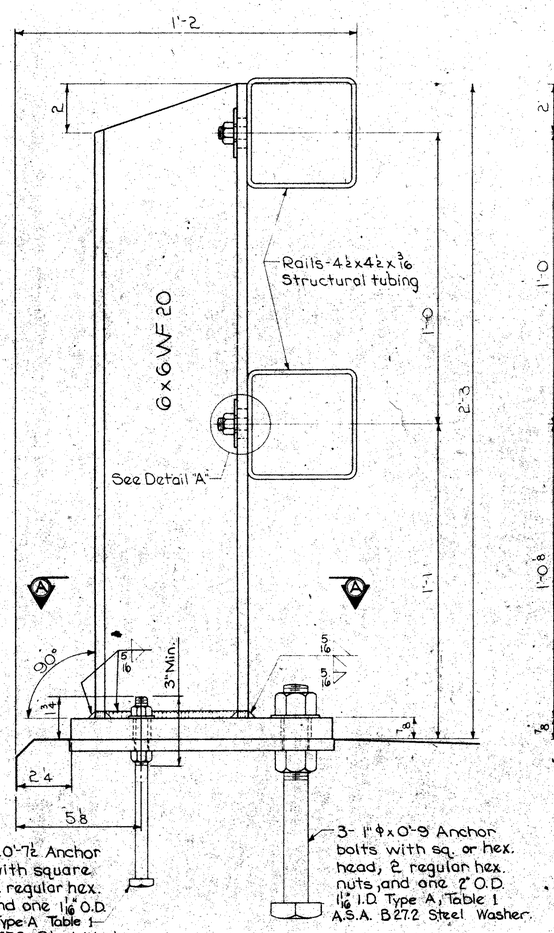
DESIGNED BY: R.A.Bristow
DETAILED BY: R.A.Bristow
TRACED BY:
CHECKED BY: E.D.Massey

ALUMINUM HANDRAIL DETAILS

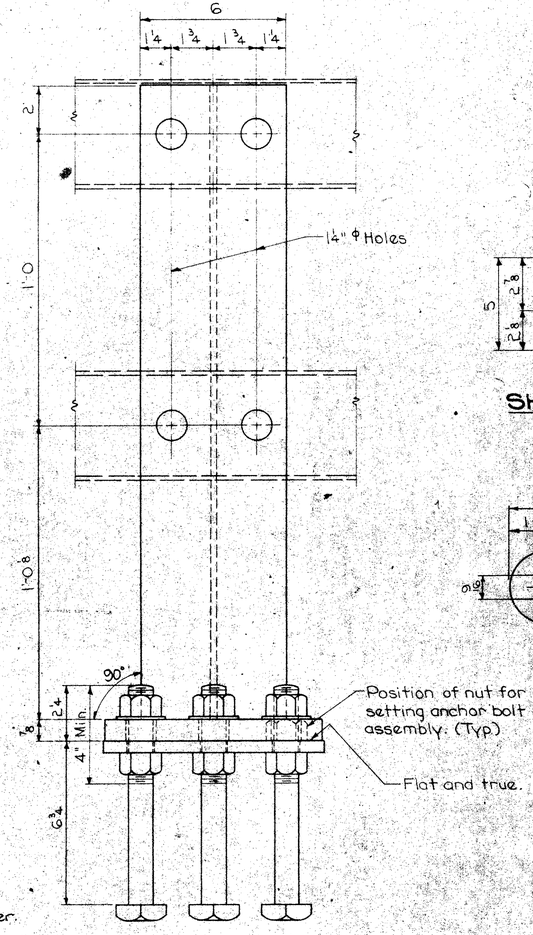
STANDARD SHEET 1012 A

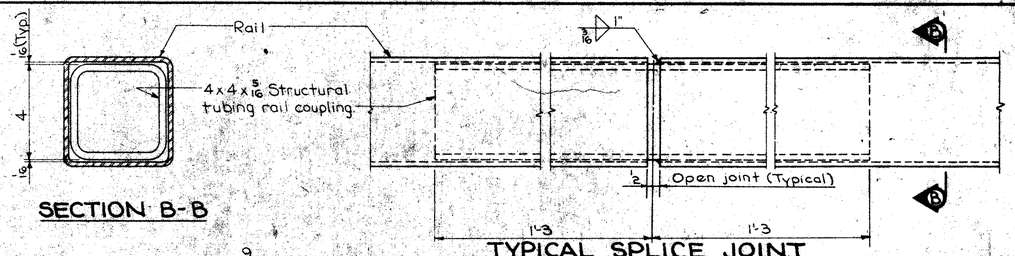
PLYMOUTH COUNTY

PROJECT NUMBER	STATE	FED ROAD DIST. No	FISCAL YEAR	SHEET No	TOTAL SHEETS
FN-12-2(2)--21-75	IOWA	5		33	48



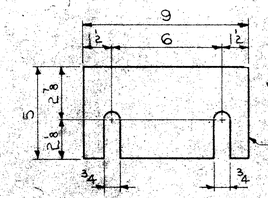
RAIL POST



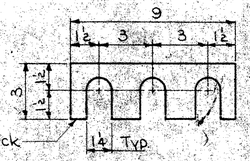


SECTION B-B

TYPICAL SPLICE JOINT



SHIM "A" DETAIL



SHIM "B" DETAIL

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 - GIT, 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.

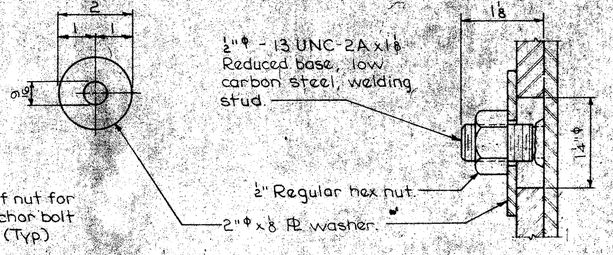
Handling, storage and installation of steel handrail shall be in accordance with Section 2414.06 of the Standard Specifications, except that no caulking will be required.

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

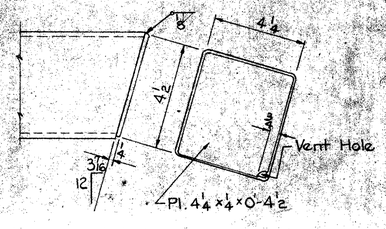
A surface is considered to be "Flat and True" when the deviation from a straight edge placed on this surface in any position, is less than 1/16".

No painting will be required.

Rail studs shall be provided with adequate protection during shipment.



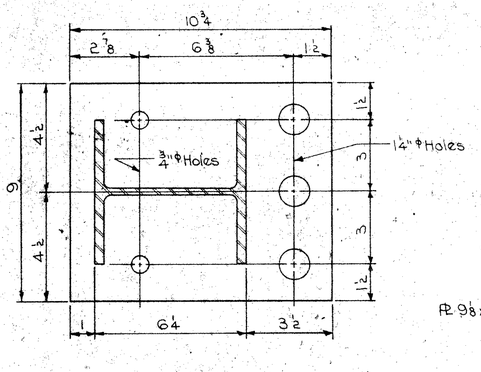
DETAIL "A"



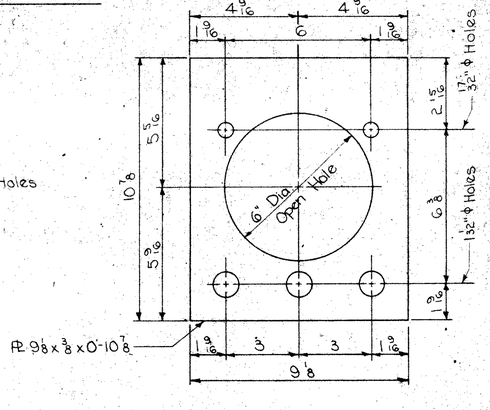
RAIL END CAP DETAILS

DESIGN SPECIFICATIONS:

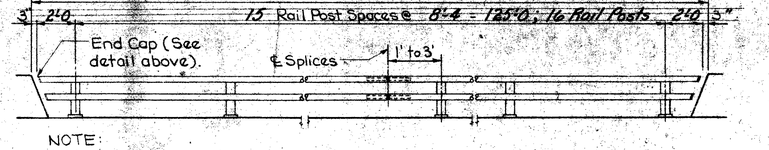
Designed in accordance with 1964 interim A.A.S.H.O. Specifications.



SECTION A-A



ANCHOR CAGE DETAILS



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

TYPICAL ELEVATION OF RAILING AND RAIL POST LAYOUT

STEEL HANDRAIL QUANTITIES	
Steel Handrail	257.0 Lin. Ft.

Design For 35° Skew (P.R.)

130'-0 x 44' CONTINUOUS CONCRETE SLAB BRIDGE

39'-6 End Spans 51'-0 Interior Span

STEEL HANDRAIL DETAILS

Station: 96+30.00 May, 1975

PLYMOUTH COUNTY

IOWA STATE HIGHWAY COMMISSION

Design Sheet No. 11 Of 25 File No. 25158 Design No. 774

Revised 7-25-66: Caulking at posts eliminated

DESIGNED BY: R.A. Britson	TRACED BY:	STEEL HANDRAIL DETAILS	STANDARD SHEET 1013A	PLYMOUTH COUNTY	PROJECT NUMBER	STATE	FED ROAD DIST. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
DETAILED BY: R.R. Feury	CHECKED BY: E. Macey				FN-12-2(2)--21-75	IOWA	5		34	48