R.E. Clarence Stanley
✓R.A.D

	ROUTE NO	SEC	COUNTY	TOTAL SHEETS	SHEET NO
F.A.S.	516	77-00089-01-BR	CHAMPAIGN	10	1
	FED ROAD DIST NO	ILLINOIS	PROJECT BR-S-516(103) RS-516(104)		

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANS FOR PROPOSED SPECIAL BRIDGE REPLACEMENT PROGRAM

SCALES

PLAN	0'	50'
PROFILE-HORIZ.	0'	50'
PROFILE-VERT.	0'	5'
CROSS SECTIONS	0'	5'

FAS ROUTE 516 SECTION 77-00089-01-BR CHAMPAIGN COUNTY

PROJECT BR-S-516(103)
C-95-044-79

PROJECT RS-516(104)
C-95-045-79

INDEX OF SHEETS

1. COVER SHEET & INDEX OF SHEETS
2. SUMMARY OF QUANTITIES; GENERAL NOTES; SCHEDULE OF QUANTITIES
3. TYPICAL CROSS SECTIONS; ENTRANCE DETAILS; INTERSECTION DETAILS; PAVEMENT DESIGN DATA; MAILBOX TURNOUT DETAILS

4.-6. PLAN AND PROFILE
7.-10. STATION CROSS SECTIONS
11.-15. BRIDGE PLANS
16. TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR ROAD CLOSURE

STANDARDS

1530-5
1686-4
1914-6
2115-7
2117-1
2219-3
2239-6
2298-4
2299-7
2300-1
2301-3
2302-3
2303-4
2306-4
2307-4
2336
2340-1
2323-4

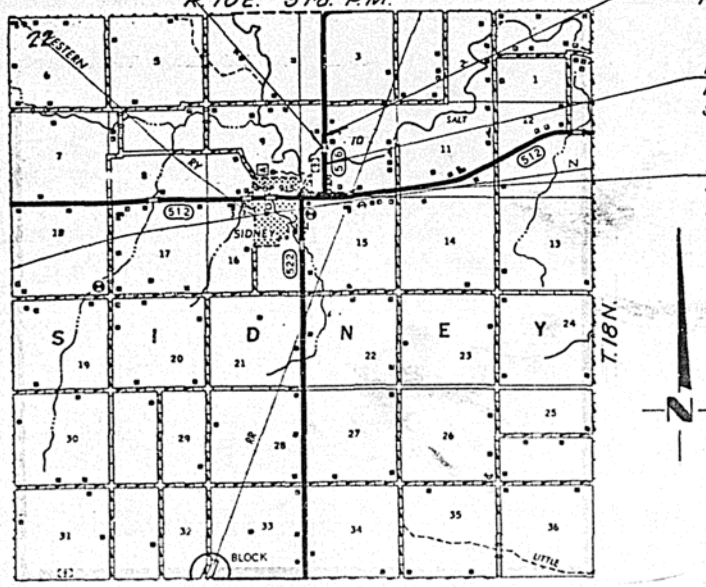
CONTRACT NO. 31966

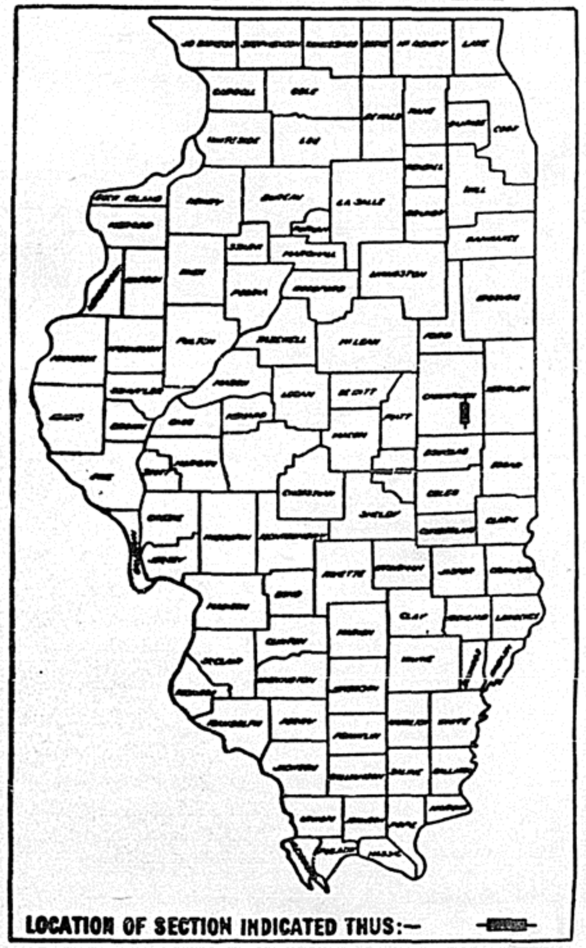
Sta. 26+87.50 Special Bridge Design Precast Prestressed Concrete Deck Beam Superstructure on Modified Existing Substructure. 3 spans 57'-10"; 30' f.f. rail Skew = 0°

Improvement Ends
Sta. 29+55
Proj. BR-S-516(103)

Proj. RS-516(104) Ends
Proj. BR-S-516(103) Begins
Sta. 22+00

Improvement Begins
Sta. 0+55
Proj. RS-516(104)




LOCATION OF SECTION INDICATED THUS:—

LAYOUT

APPROXIMATE SCALE: 1 INCH = 1 MILE
TOTAL LENGTH OF SECTION 77-00089-01-BR = 2900.00 FEET = 0.549 Miles
TOTAL LENGTH OF PROJ. BR-S-516(103) = 755.00 FEET = 0.143 Miles
TOTAL LENGTH OF PROJ. RS-516 (104) = 2,145.00 FEET = 0.406 Miles

APPROVED Dec. 21 19 78
LOCAL AGENCY REPRESENTATIVE

PASSED 1-4 19 79
W. F. Patton
DISTRICT ENGINEER OF LOCAL ROADS & STREETS

APPROVED 1-4 19 79
Robert E. Kunst
DISTRICT ENGINEER

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

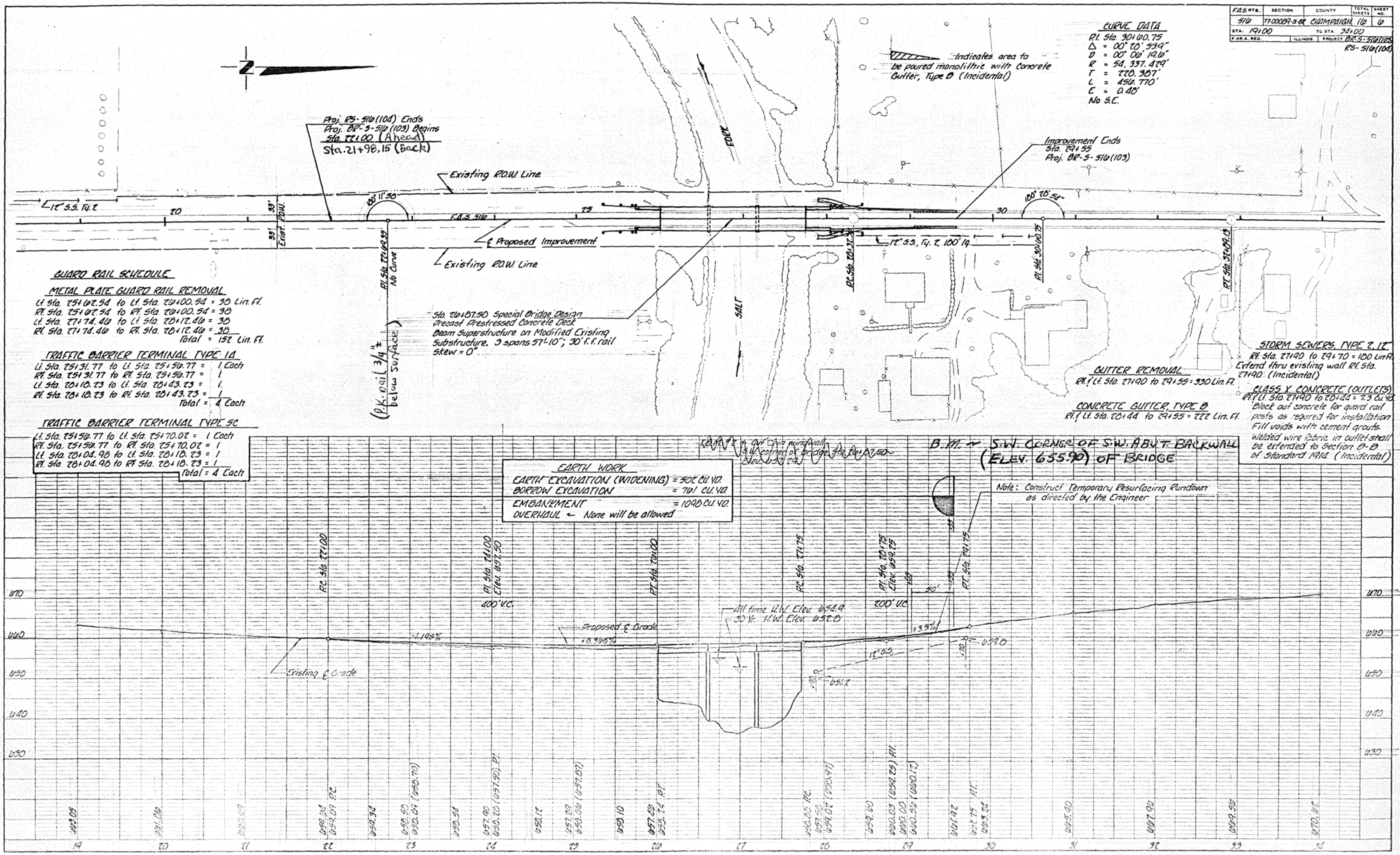
Marcus J. Rice 12-19-78
Illinois Professional No. 20110

MARCUS J. RICE 20110 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

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

COLLINS AND RICE, INC. CONSULTING ENGINEERS SPRINGFIELD, ILLINOIS

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
516	77-00089-01-BR	CHAMPAIGN	16	6
STA. 19+00		TO STA. 34+00		
F.HW.A. REG.	ILLINOIS	PROJECT BR-5-516(103) RS-516(104)		



CURVE DATA
P.I. Sta. 30+60.75
Δ = 00° 28' 53.9"
D = 00° 06' 19.6"
R = 54, 337.429'
T = 228.387'
L = 456.770'
E = 0.48'
No S.E.

▨ Indicates area to be poured monolithic with Concrete Gutter, Type B (Incidental)

Sta. 26+87.50 Special Bridge Design
Precast Prestressed Concrete Deck
Beam Superstructure on Modified Existing
Substructure. 3 spans 57'-10"; 30' f.f. rail
Skew = 0°

GUARD RAIL SCHEDULE

METAL PLATE GUARD RAIL REMOVAL

Lt. Sta. 25+62.54 to Lt. Sta. 26+00.54 = 38 Lin. Ft.
Rt. Sta. 25+62.54 to Rt. Sta. 26+00.54 = 38
Lt. Sta. 27+74.46 to Lt. Sta. 28+12.46 = 38
Rt. Sta. 27+74.46 to Rt. Sta. 28+12.46 = 38
Total = 152 Lin. Ft.

TRAFFIC BARRIER TERMINAL TYPE 1A

Lt. Sta. 25+31.77 to Lt. Sta. 25+56.77 = 1 Each
Rt. Sta. 25+31.77 to Rt. Sta. 25+56.77 = 1
Lt. Sta. 28+18.23 to Lt. Sta. 28+43.23 = 1
Rt. Sta. 28+18.23 to Rt. Sta. 28+43.23 = 1
Total = 4 Each

TRAFFIC BARRIER TERMINAL TYPE 5C

Lt. Sta. 25+56.77 to Lt. Sta. 25+70.02 = 1 Each
Rt. Sta. 25+56.77 to Rt. Sta. 25+70.02 = 1
Lt. Sta. 28+04.98 to Lt. Sta. 28+18.23 = 1
Rt. Sta. 28+04.98 to Rt. Sta. 28+18.23 = 1
Total = 4 Each

EARTH WORK

EARTH EXCAVATION (WIDENING) = 502 CU. YD.
BORROW EXCAVATION = 761 CU. YD.
EMBANKMENT = 1098 CU. YD.
OVERHAUL ← None will be allowed

~~B.M. #2 + cut in wingwall S.W. corner of bridge Sta. 26+87.50 Elev. 657.29~~

B.M. ~ S.W. CORNER OF S.W. ABUT. BACKWALL (ELEV. 655.90) OF BRIDGE

Note: Construct Temporary Resurfacing Rundown as directed by the Engineer

GUTTER REMOVAL

Rt. & Lt. Sta. 27+90 to 29+55 = 330 Lin. Ft.

CONCRETE GUTTER, TYPE B

Rt. & Lt. Sta. 28+44 to 29+55 = 222 Lin. Ft.

STORM SEWERS, TYPE 2, 12"

Rt. Sta. 27+90 to 29+70 = 180 Lin. Ft.
Extend thru existing wall Rt. Sta. 27+90 (Incidental)

CLASS X CONCRETE (OUTLETS)

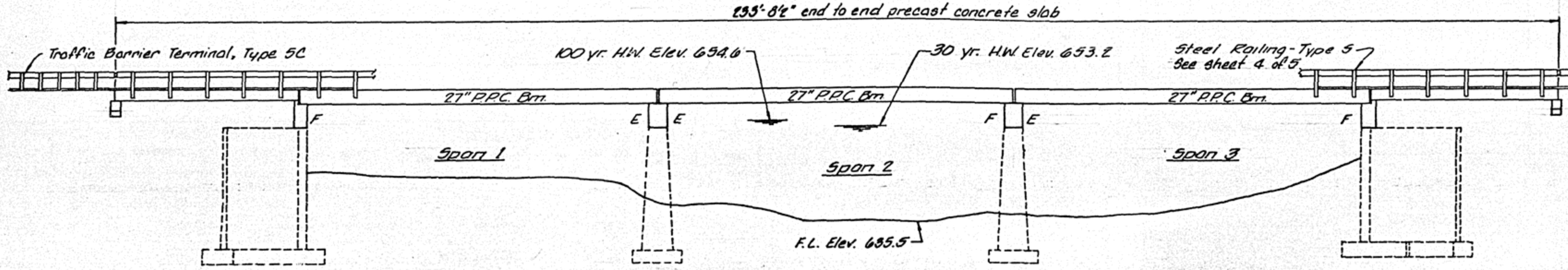
Rt. & Lt. Sta. 27+90 to 28+44 = 7.3 Cu. Yd.
Block out concrete for guard rail posts as required for installation. Fill voids with cement grouts. Welded wire fabric in outlet shall be extended to Section B-B of Standard 1914 (Incidental)

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.S. 516	77-00089-01-BR	CHAMPAIGN	16	11
FED. ROAD DIST. NO. 7		ILLINOIS	PROJECT BR-5-516(103)	

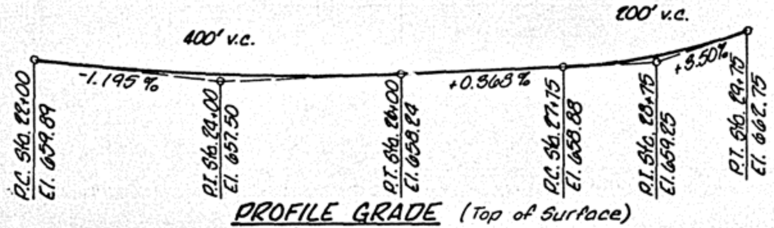
Sheet 1 of 5

B.M. "□" in S.W. Wingwall of the existing bridge
at Sta. 26+87.50 Elevation 657.29
Existing Structure: @ Sta. 26+87.50 built in 1914
as SA12, Sec. 89-150
Superstructure to be reconstructed as shown.
Existing abuts and piers to be widened to
accommodate the new Superstructure. No Salvage.

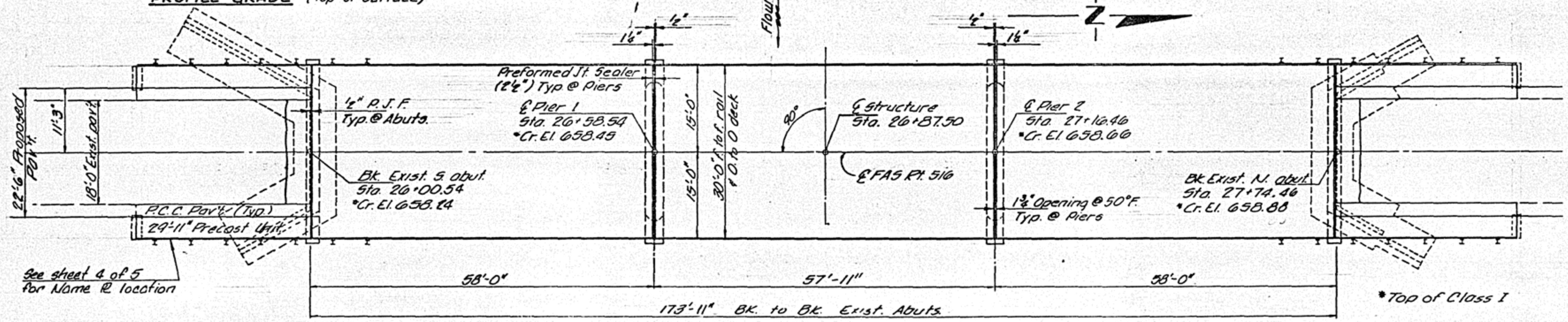
PLACED B.M. ON S.W. CORNER OF S.W.
BACKWALL OF BRIDGE (ELEV. 655.90)



ELEVATION



PROFILE GRADE (Top of Surface)



*Top of Class I

PLAN

WATERWAY DATA

Drainage Area	300.7	Sq. Mi.
Existing Opening	2,285	Sq. Ft.
Req'd Opening (30 yr.)	2,285	Sq. Ft.
Proposed Opening	2,285	Sq. Ft.
Design Discharge (30 yr.)	8,742	C.F.S.
Created Head (30 yr.)	0.20	Ft.
Computed Discharge (100 yr.)	11,000	C.F.S.
Created Head (100 yr.)	0.37	Ft.

STATION 26+87.50
SALT FORK
REBUILT 197_
F.A.S. RT. 516 SEC. 77-00089-01-BR
F.A. PROJ. BR-5-516(103)
LOADING HS20
STRUCTURE NO. 010-0090

LETTERING FOR NAME PLATE

See Std. 2113

GENERAL NOTES

All reinforcement shall be lapped as shown on plans.

Class X Concrete shall be used in abutments & piers.

It shall be the responsibility of the Contractor to verify all dimensions & conditions in the field prior to construction & ordering of materials.

Expansion bolts shall consist of self drilling expansion anchors & ¾"ϕ x 12" hooked bolts.

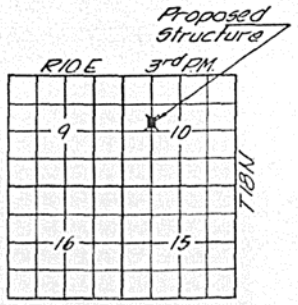
Hooked bolts shall extend 9" into new concrete.

All reinforcement bars used in the field or in the precast prestressed units shall conform to AASHTO M-31 or M-53 Grade 60.

The top surface of the beams shall be finished in accordance with Art. 505.06 of the Standard Specifications except the surface shall not be roughened by brooming. The finished surface shall be free of high spots & depressions having sharp corners

TOTAL BILL OF MATERIAL

ITEM	UNIT	SUPER	SUB	TOTAL
Precast Prestressed Concrete Deck Beam (27" Depth)	Sq. Ft.	5,205		5,205
Pavement Removal and Portland Cement Concrete Replacement, Type II, 9 inch	Sq. Yd.			12
Class X Concrete	Cu. Yd.		40.3	40.3
Reinforcement Bars	Pound		5,480	5,480
Concrete Removal	Cu. Yd.		36.2	36.2
Expansion Bolts, ¾"ϕ	Each	76	92	168
Structural Steel	Pound	4,200		4,200
Plasticized Bitumen Hot Mix Seal	Ton	28		28
Bituminous Concrete Binder Course	Ton	58		58
Waterproofing Membrane System	Sq. Yd.	670		670
Preformed Joint Sealer (2½")	Lin. Ft.	60		60
Steel Railing, Type 5	Lin. Ft.	470		470
Precast Concrete Bridge Slab	Sq. Ft.	449		449
Portland Cement Concrete Pavement, 9"	Sq. Yd.			30
Pavement Fabric	Sq. Yd.			30
Name Plates	Each	1		1
Removal of Existing Superstructures	Each	1		1



LOCATION PLAN

DESIGN STRESSES

PRECAST PRESTRESSED UNITS
f'c = 5,000 psi. (Prestressed Beams)
f'ci = 4,000 psi. (Prestressed Beams)
f's = 270,000 psi (½"ϕ Prestressed Strands)
fsi = 189,000 psi. (½"ϕ Prestressed Strands)
fy = 60,000 p.s.i. (Reinforcement Bars)

FIELD UNITS
f'c = 3,500 psi. (Class X Concrete)
fy = 60,000 psi (Reinforcement Bars)
n = 8.5 (Class X Concrete)

PRECAST UNITS
f'c = 4,500 psi
fc = 1,800 psi
fs = 20,000 psi
n = 8

New Construction Loading HS 20-44
Design Specifications: AASHTO 1977 & 1978 Interims
25#/S.F. included in ℄ for future wearing surface

Fred J. Stone Jr.
Illinois Structural No. 2934

APPROVED
FOR STRUCTURAL ADEQUACY ONLY
Engineer of Bridge & Traffic Structures

FRED J. STONE, JR.
2934

GENERAL PLAN & ELEVATION
F.A.S. Rt. 516 SEC. 77-00089-01-BR
CHAMPAIGN COUNTY
STATION 26+87.50

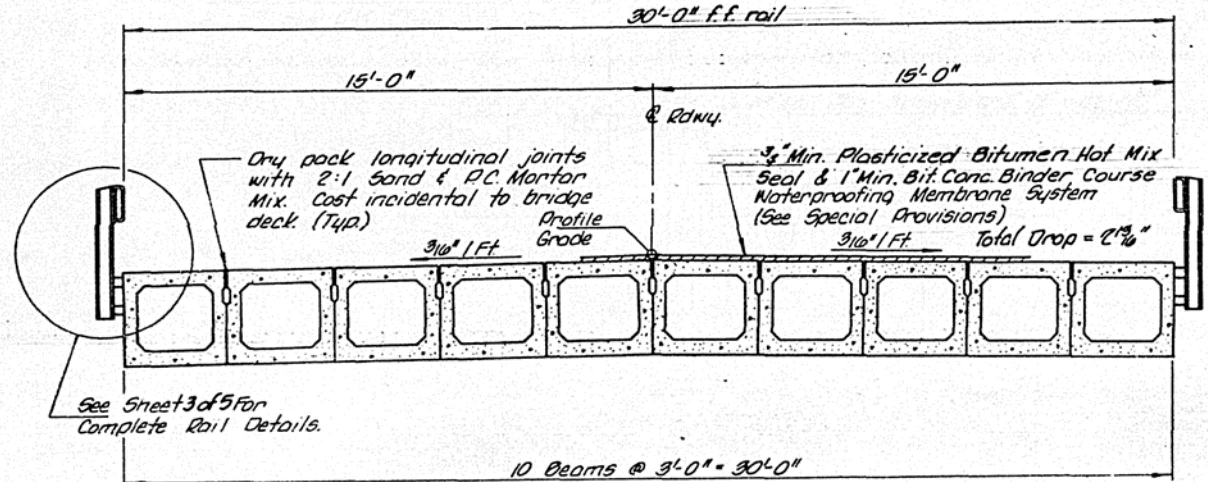
COLLINS AND RICE
CONSULTING ENGINEERS

DESIGNED F.S. CHECKED L.L.
DRAWN L.L. & G.N. DATE 7-28-78 NO. 1282

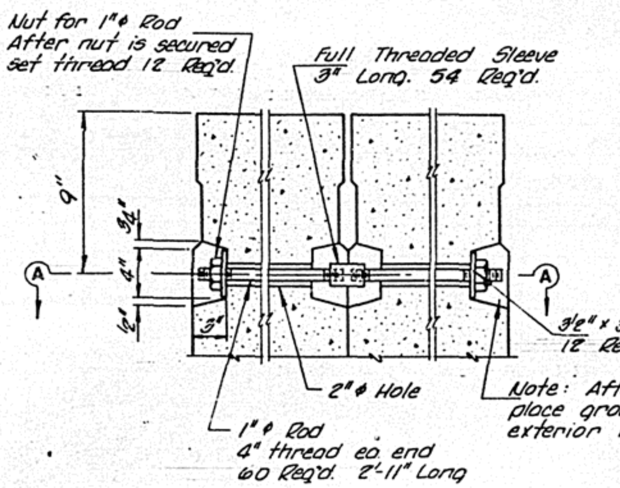
ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.S. 516	77-00089-01-BR	CHAMPAIGN	16	12
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT BR-5-516(103)		

Sheet 2 of 5

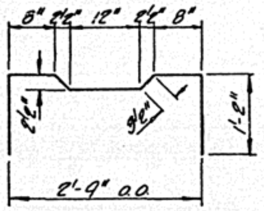
Note: All areas of unevenness between beams shall be corrected by feathering the longitudinal grout onto the lower beam from the higher beam with a slope of not less than 3:1 (Incidental).



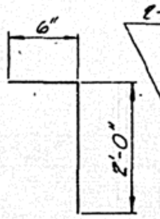
CROSS SECTION



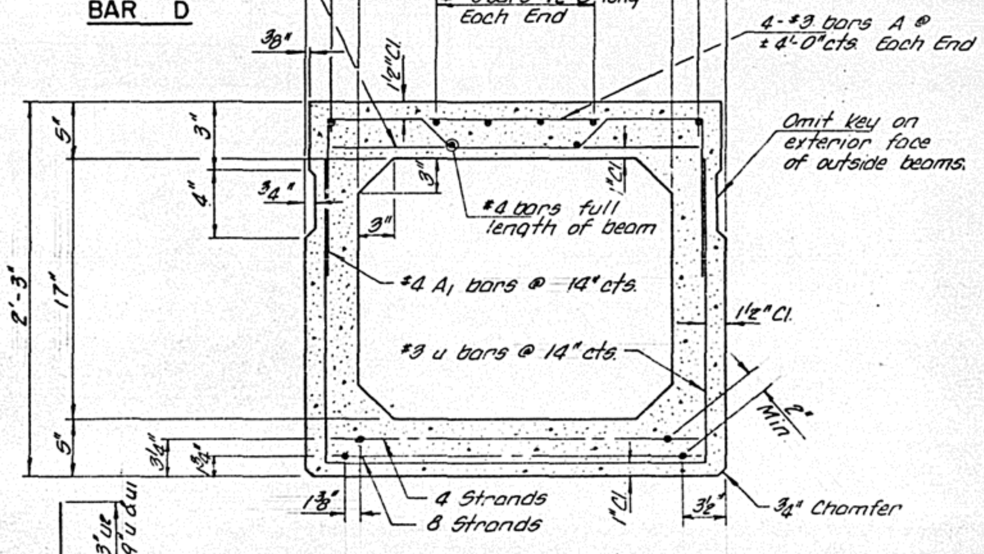
TRANSVERSE TIE BAR DETAIL



BAR A1



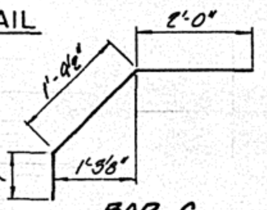
BAR D



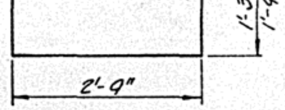
TYPICAL SECTION THRU BEAM

12 - 7 wire 1/2" φ strands stressed to 28,900 lbs. each. Strands shall be non-galvanized extra high strength stress-relieved. Place strands symmetrically about ℄ beam.

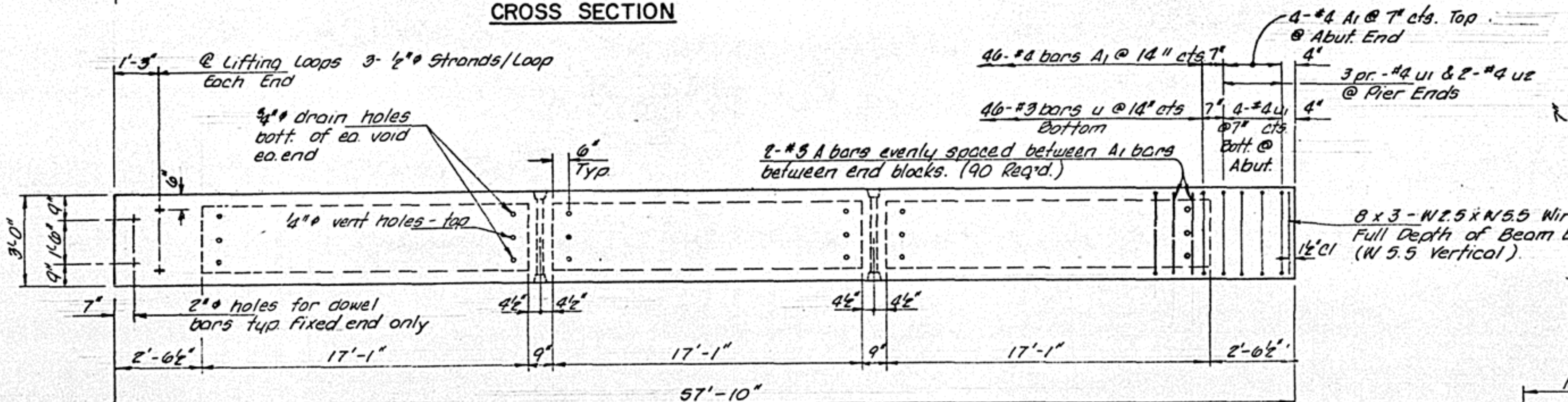
Note: All reinforcement bars shall conform to AASHTO M-31 or M-53 Grade 60.



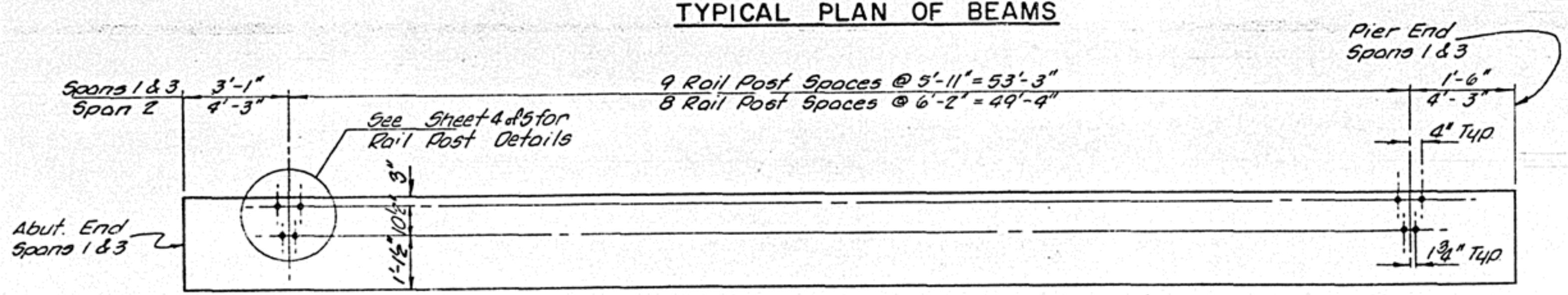
BAR C



BARS U, U1 & U2

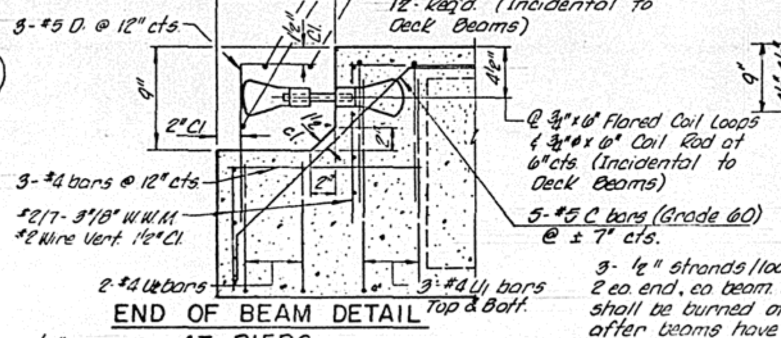


TYPICAL PLAN OF BEAMS

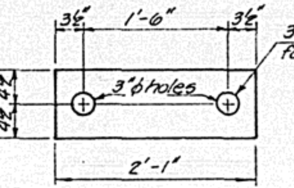


ELEVATION OF OUTSIDE BEAMS

3-#5 bars (29'-10" lg.) placed in field. Full width of deck. 12 Req'd. (Incidental to Deck Beams)



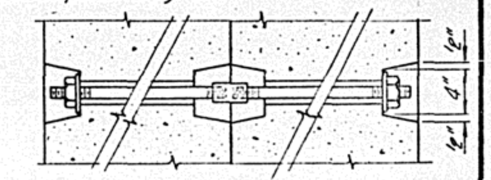
END OF BEAM DETAIL AT PIERS



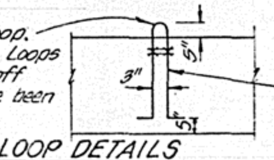
3"φ holes req'd on Fabric pads only

BRG. PAD DETAILS

30 - Fabric Pads Req'd.
60 - Asbestos Pads Req'd.



SECTION A-A

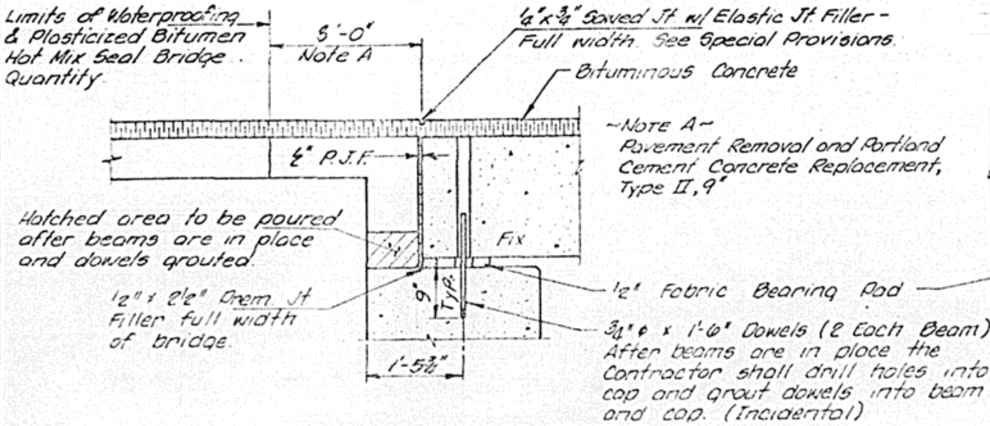


3 - 1/2" strands / loop. 2 ea. end, ea. beam. Loops shall be burned off after beams have been erected.*

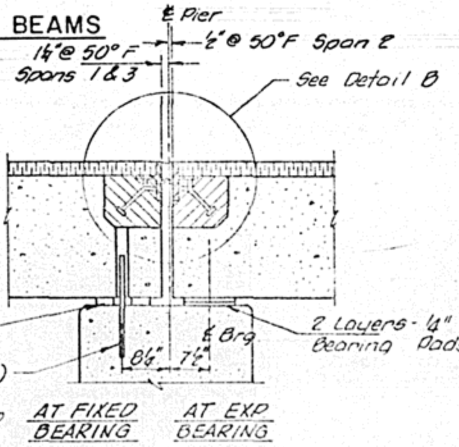
An approved alternate may be substituted for this detail.

LIFTING LOOP DETAILS

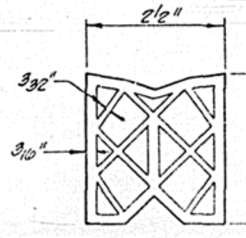
*Strands shall be extra high strength



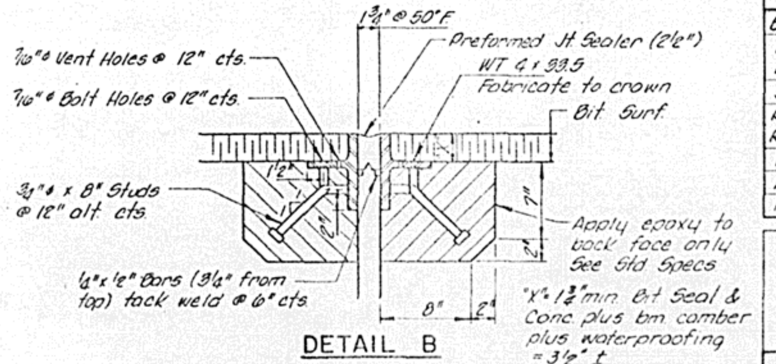
SECTION AT ABUTMENT



SECTION AT PIERS



PREFORMED JT. SEALER



DETAIL B

Dimensions are at right angles.
Hatched areas to be poured after beams have been erected and joints grouted. (Typical @ pier ends only) (Incidental)

BILL OF MATERIAL

ITEM		QUANTITY
Bit. Conc. Binder Crse.	Ton	58
Precast Prestressed Concrete Deck Beams (27" Depth)	Sq. Ft.	5,205
Structural Steel	Pound	4,200
Pavement Removal & P.C. Conc. Replacement, Ty. II, 9"	Sq. Yd.	12
Waterproofing Membrane System	Sq. Yd.	670
Plast. Bit. Hot Mix Seal	Ton	28
Preformed Joint Sealer (2 1/2")	Lin. Ft.	60

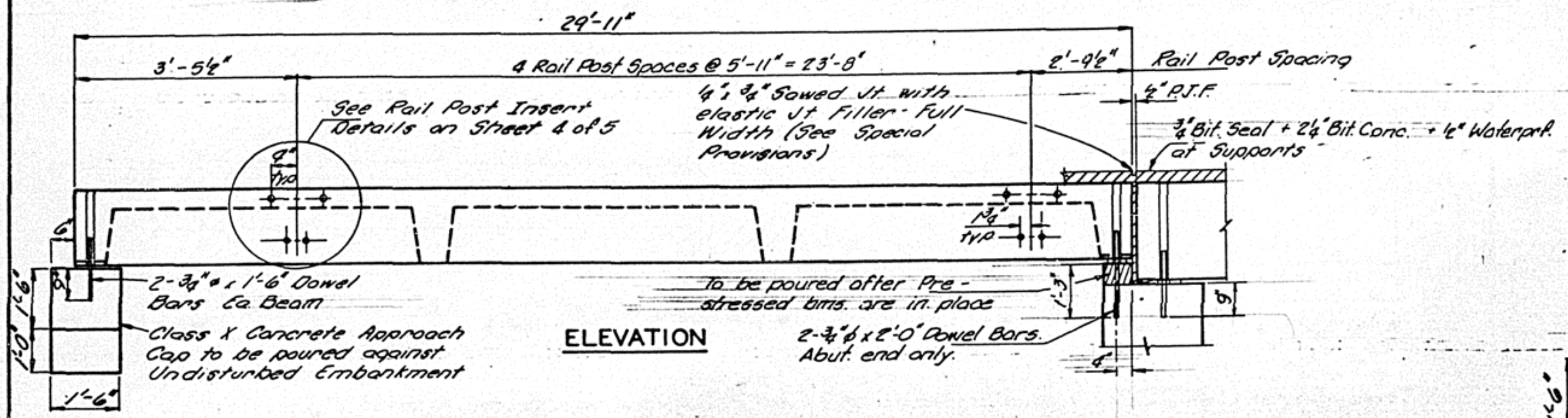
SUPERSTRUCTURE
F.A.S. RT. 516 SEC. 77-00089-01-BR
CHAMPAIGN COUNTY
STATION 26+87.50

COLLINS AND RICE
CONSULTING ENGINEERS

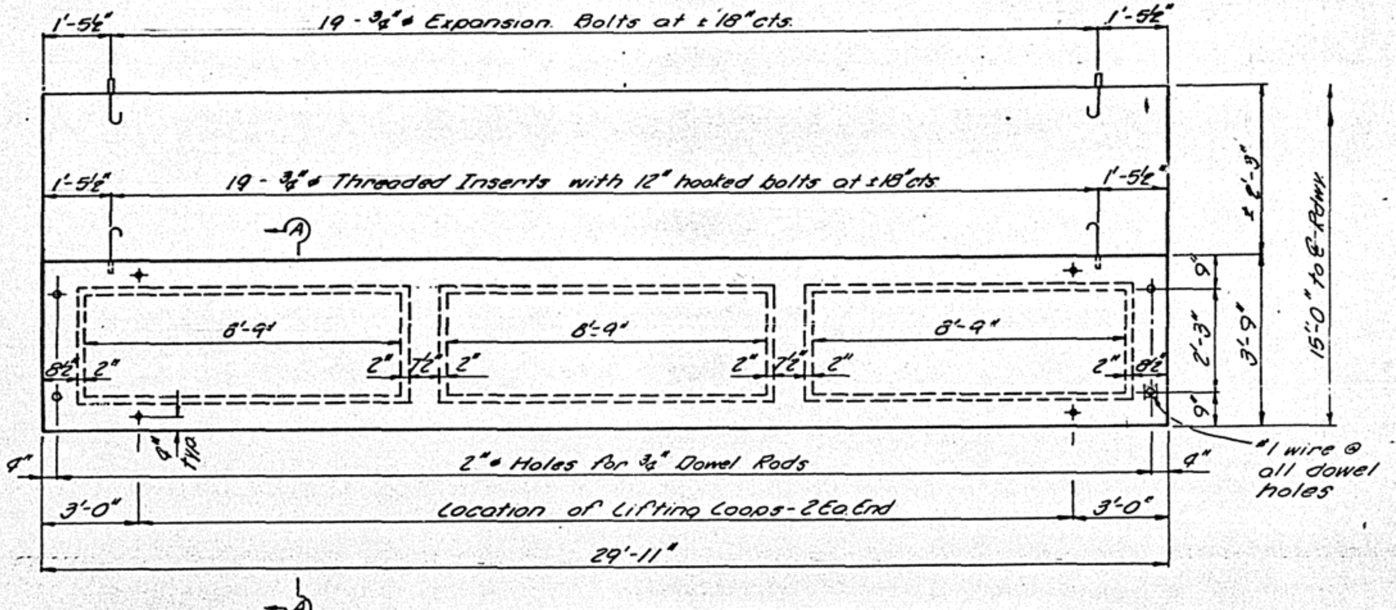
DESIGNED F.S. CHECKED L.L.
DRAWN L.L. DATE 7-28-76 NO. 1282

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.S. 516	77-00089 -01-BR	CHAMPAIGN	16	15
FED. ROAD DIST. NO. 7		ILLINOIS	PROJECT BR-5-516(103)	

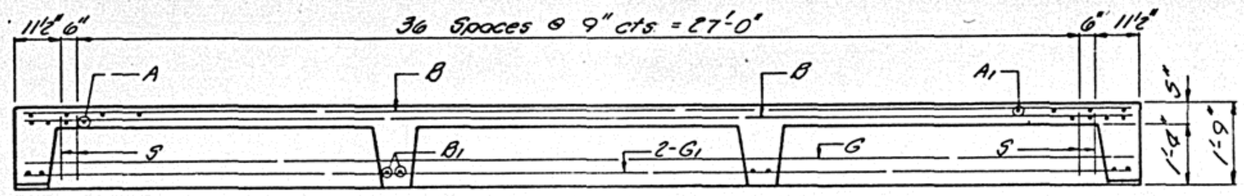
Sheet 3 of 5



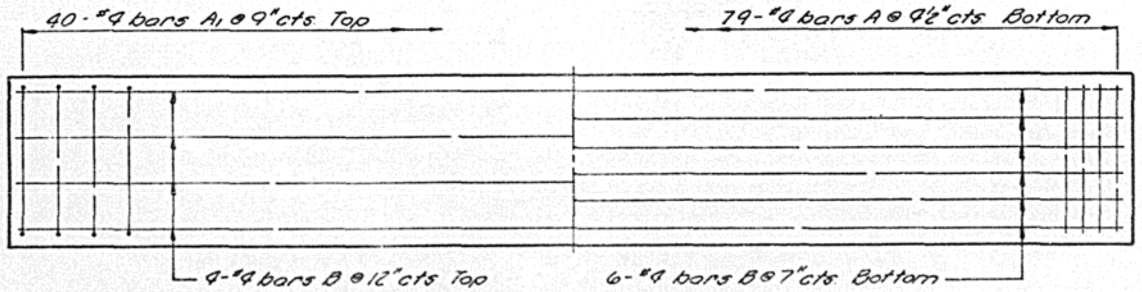
ELEVATION



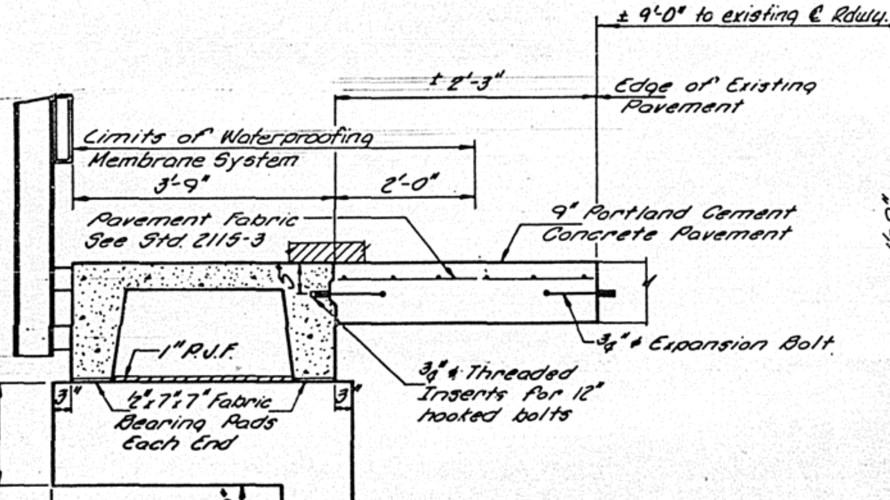
PARTIAL PLAN OF APPROACH



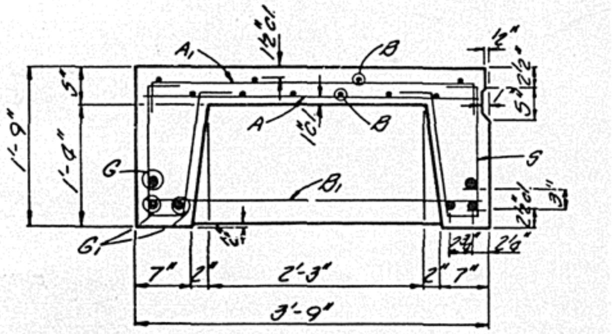
LONGITUDINAL SECTION



SLAB REINFORCEMENT



SECTION A-A

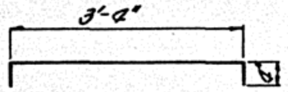


SECTION THRU PRECAST UNIT

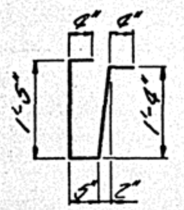
BAR LIST - ONE UNIT

Reinforcement to be cast in slab

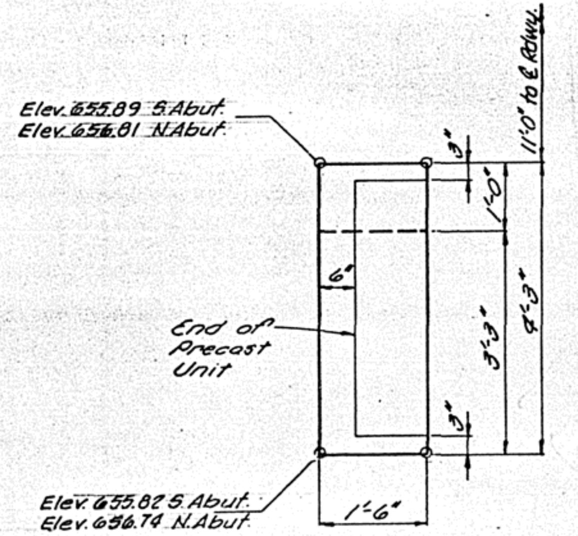
BAR	NO	SIZE	LENGTH	SHAPE
A	79	#4	3'-3"	—
A1	40	#4	4'-0"	⊓
B	10	#4	29'-6"	—
B1	8	#4	3'-6"	—
G	2	#11	29'-6"	—
G1	4	#11	29'-6"	—
S	78	#3	3'-10"	⊏



BAR A1

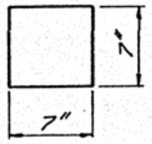


BAR S



PLAN-APPR. CAP

Elevations given are Top of Cap Elevations



½" FABRIC BRG. PAD

16 Req'd

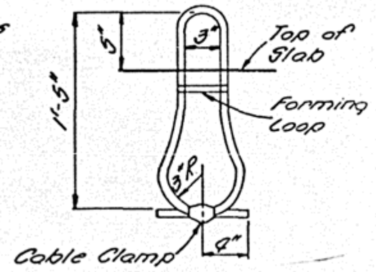
NOTES

Unless otherwise approved by the Engineer, lifting loops shall be ½" ø, 6x25 class wire rope with fiber core and shall have a minimum ultimate strength of 21,000 lbs. Loops shall be burned off after slab has been erected.

Holes shall be drilled and anchor dowels grouted in place.

Cost of reinforcement and accessories cast into the slab unit, bearing pads, furnishing, drilling for, placing and grouting anchor dowels and ¾" ø hooked bolts is included in Unit bid price for "Precast Concrete Bridge Slab."

The Precast Concrete Bridge Slab shall be erected and aligned with the exterior face of the exterior Deck Beam after Deck Beams are in final position.



LIFTING LOOP DETAILS

Tack welding of stirrups to the bottom longitudinal reinforcement bars will not be permitted except as otherwise authorized in writing by the Engineer.

DESIGN STRESSES

$f'_c = 4{,}500$ p.s.i.
$f_c = 1{,}800$ p.s.i.
$f_s = 20{,}000$ p.s.i.
$n = 8$
Loading HS20-44

BILL OF MATERIAL

ITEM		QUANTITY
Precast Concrete Bridge Slab	Sq. Ft.	449
Portland Cement Concrete Pavement (9")	Sq. Yd.	30
Pavement Fabric	Sq. Yd.	30
Expansion Bolts ¾" ø	Each	76
Class X Concrete	Cu. Yd.	1.6

APPROACH DETAILS

F.A.S. RT. 516 SEC. 77-00089-01-BR
CHAMPAIGN COUNTY
STATION 26+87.50

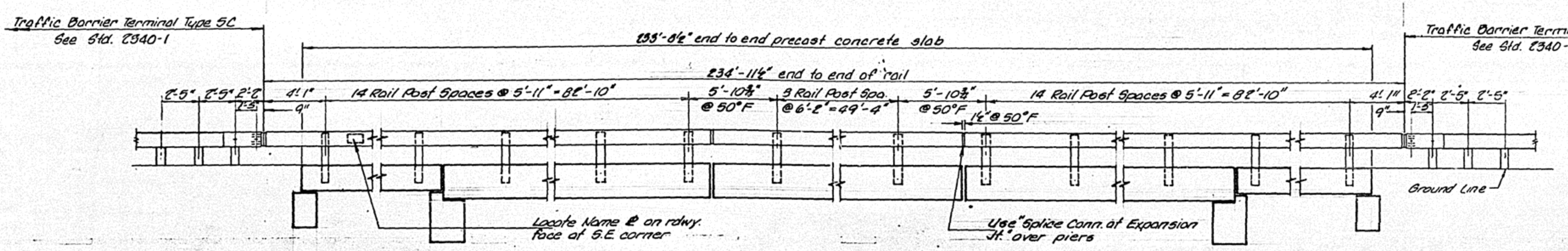
COLLINS AND RICE
CONSULTING ENGINEERS

DESIGNED F.S. CHECKED L.L.
DRAWN L.L. DATE 7-26-78 NO. 1282

ROUTE NO.	SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.S. 516	77-00089-01-BR	CHAMPAIGN	16	14

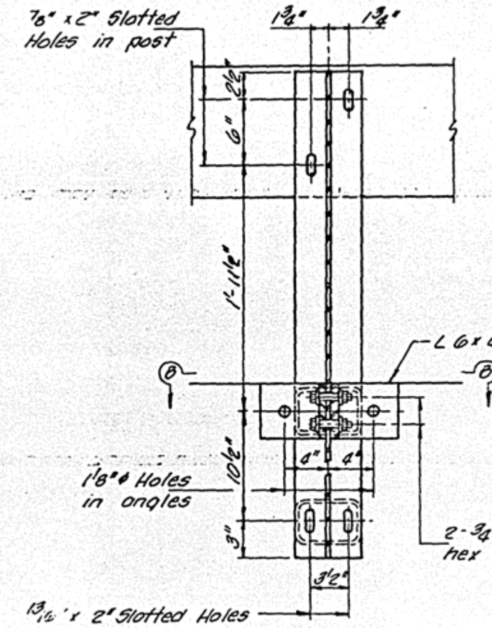
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT BR-5-516(103)

Sheet 4 of 5

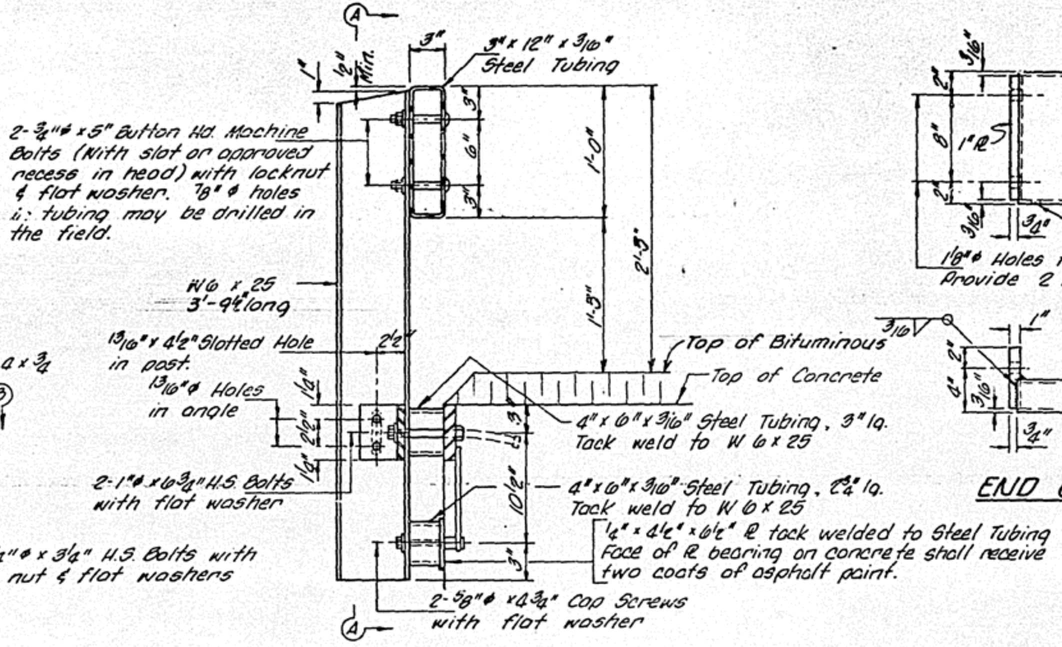


ELEVATION

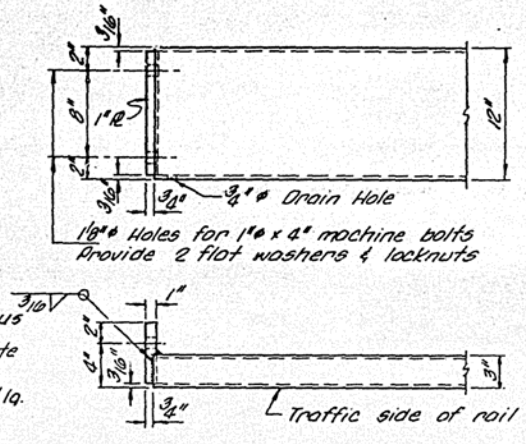
Showing inside face of rail



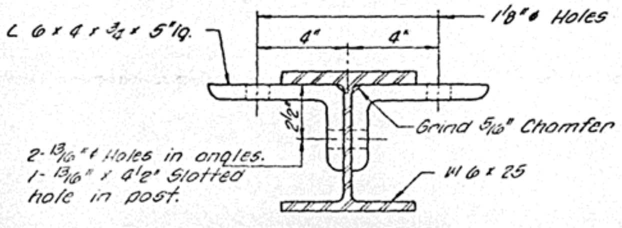
SECTION A-A



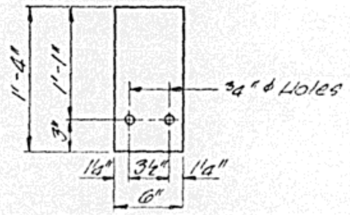
SECTION AT RAIL POST



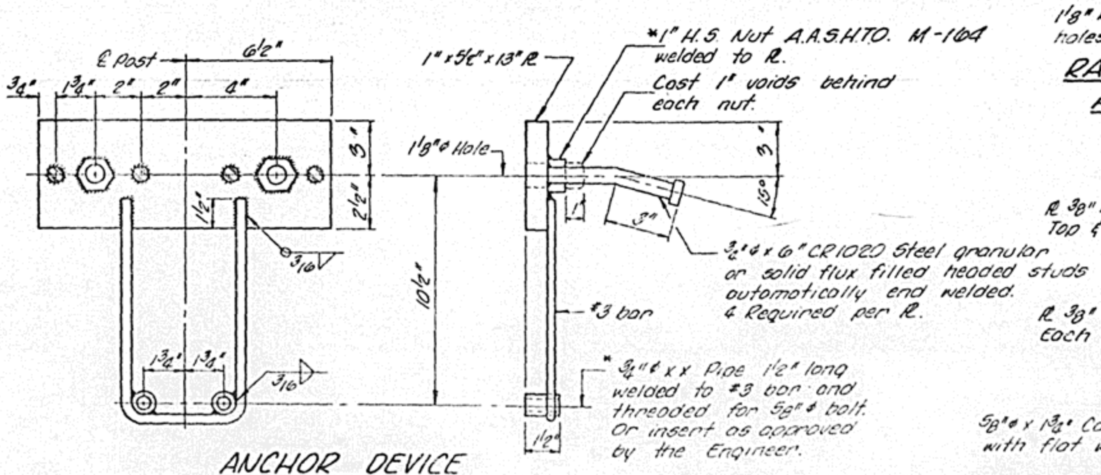
END OF RAIL DETAILS



SECTION B-B

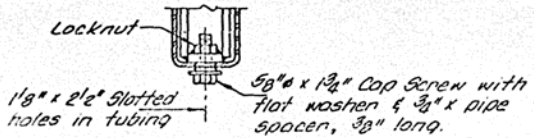


SHIM DETAIL

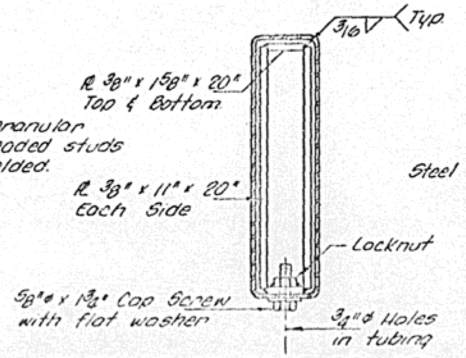


ANCHOR DEVICE

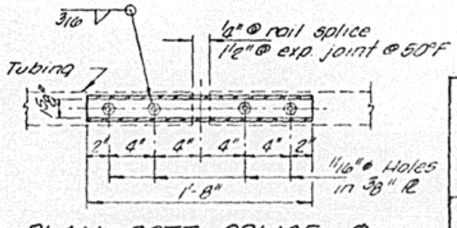
* Threaded areas shall be plugged or blocked off during casting of beam.



RAIL SPLICE CONNECTION AT EXPANSION JT.



SECTION AT RAIL SPLICE



PLAN - BOTT. SPLICE ℙ

NOTES

Hollow structural steel tubing shall conform to the requirements of A.S.T.M. designation A-500 Grade B or A-501 Structural Steel Tubing.

All other steel shapes and plates shall conform to the requirements of A.A.S.H.T.O. designation M-183 except posts shall conform to A.A.S.H.T.O. M-188.

Bolts, cap screws, and nuts shall conform to the requirement of A.S.T.M. designation A-307 except for high strength bolts, nuts and washers noted which shall conform to A.A.S.H.T.O. designation M-164.

All bolts, nuts, cap screws, washers and lockwashers shall be galvanized in accordance with A.A.S.H.T.O. designation M-232.

All posts, railing, rail splices, anchor devices and angles shall be galvanized after shop fabrication in accordance with A.S.T.M. designation A-385 & A.A.S.H.T.O. M-111. Galvanized rail shall not be painted.

Railing shall be in accordance with Section 508 of the Standard Specifications, except as noted, and shall be paid for at the contract unit price per lineal foot for STEEL RAILING, TYPE 5.

All field drilled holes shall be coated with an approved zinc rich paint before erection.

For multi-span bridges, sufficient ¼" x 6" x 1'-4" galvanized steel shims shall be provided to align rail between adjacent spans. Cost incidental to Steel Railing.

The ¾"φ high strength bolts used to connect the 6 x 4 x ¾ angles to the post shall be tightened in accordance with Art. 507.04(g)(3) of the Standard Specifications. The 1"φ high strength bolts connecting the angle to the concrete shall be tightened to a snug fit and given an additional ⅛ turn.

BILL OF MATERIAL

Item	Unit	Quantity
Steel Railing, Type 5	Lin. Ft.	470

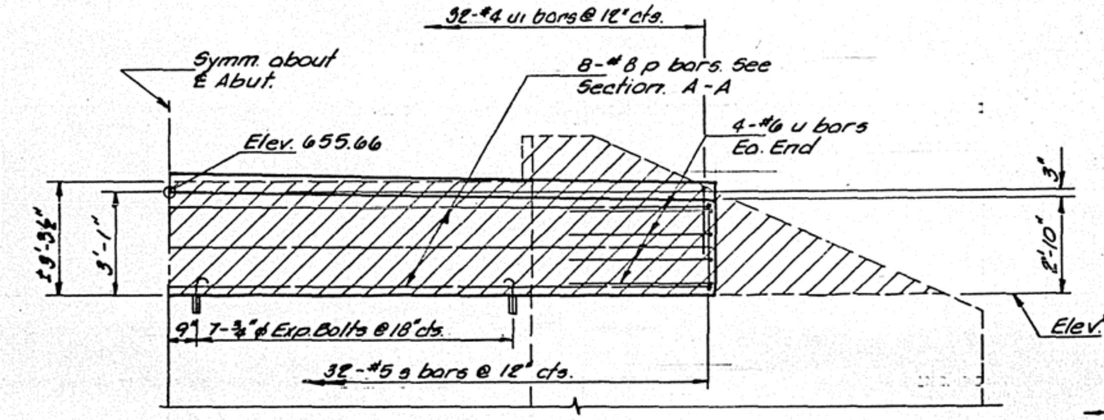
STEEL RAILING, TYPE 5
F.A.S. RT. 516 SEC. 77-00089-01-BR
CHAMPAIGN COUNTY
STATION 26+87.50

COLLINS AND RICE
CONSULTING ENGINEERS

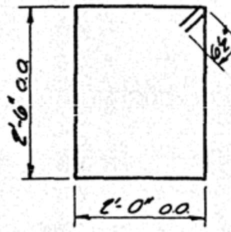
DESIGNED F.S.
CHECKED L.L.
DRAWN L.L.
DATE 7-25-78
NO. 1282

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.S. 516	77-00089-01-BR	CHAMPAIGN	16	15
FED. ROAD DIST. NO. 7		ILLINOIS	PROJECT BR-5-516(103)	

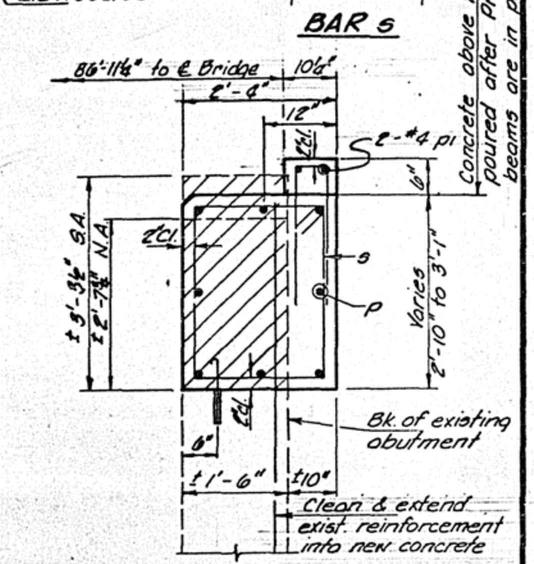
Sheet 5 of 5



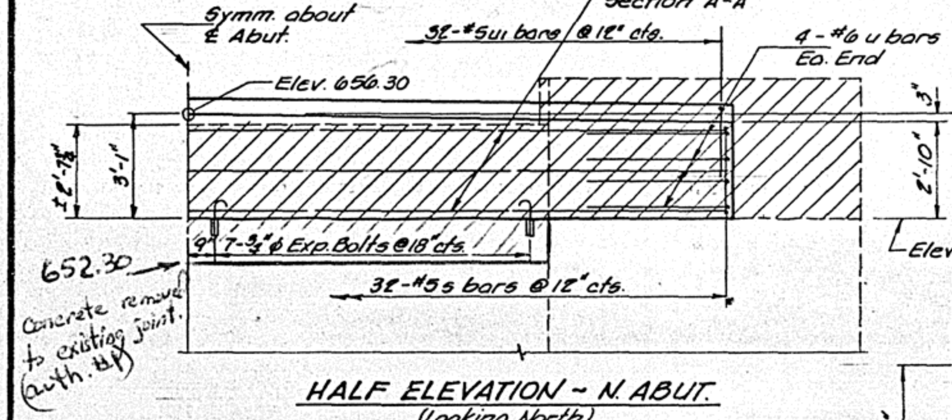
HALF ELEVATION ~ S. ABUT.
(Looking South)



BAR s

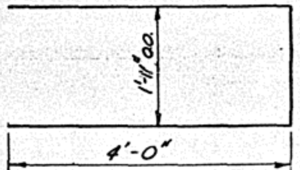


SECTION A-A



HALF ELEVATION ~ N. ABUT.
(Looking North)

BAR u1



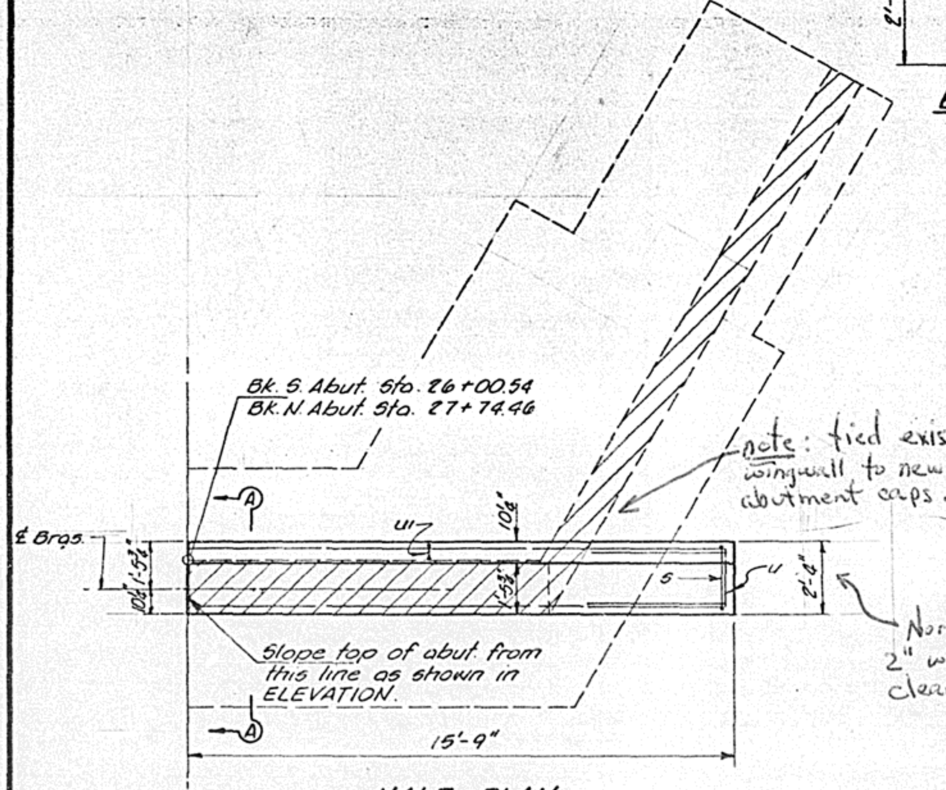
BAR u

BILL OF MATERIAL ~ 2 ABUTS.

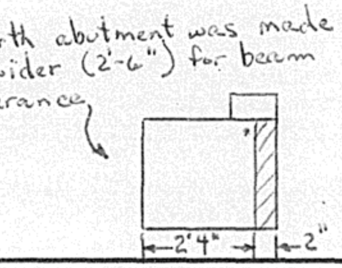
BAR	NO. REQ'D.	SIZE	LENGTH	SHAPE
p	16	#8	31'-2"	—
p1	4	#4	31'-2"	—
s	64	#5	10'-1"	□
u	16	#6	9'-11"	⊐
u1	64	#5	4'-5"	⊓

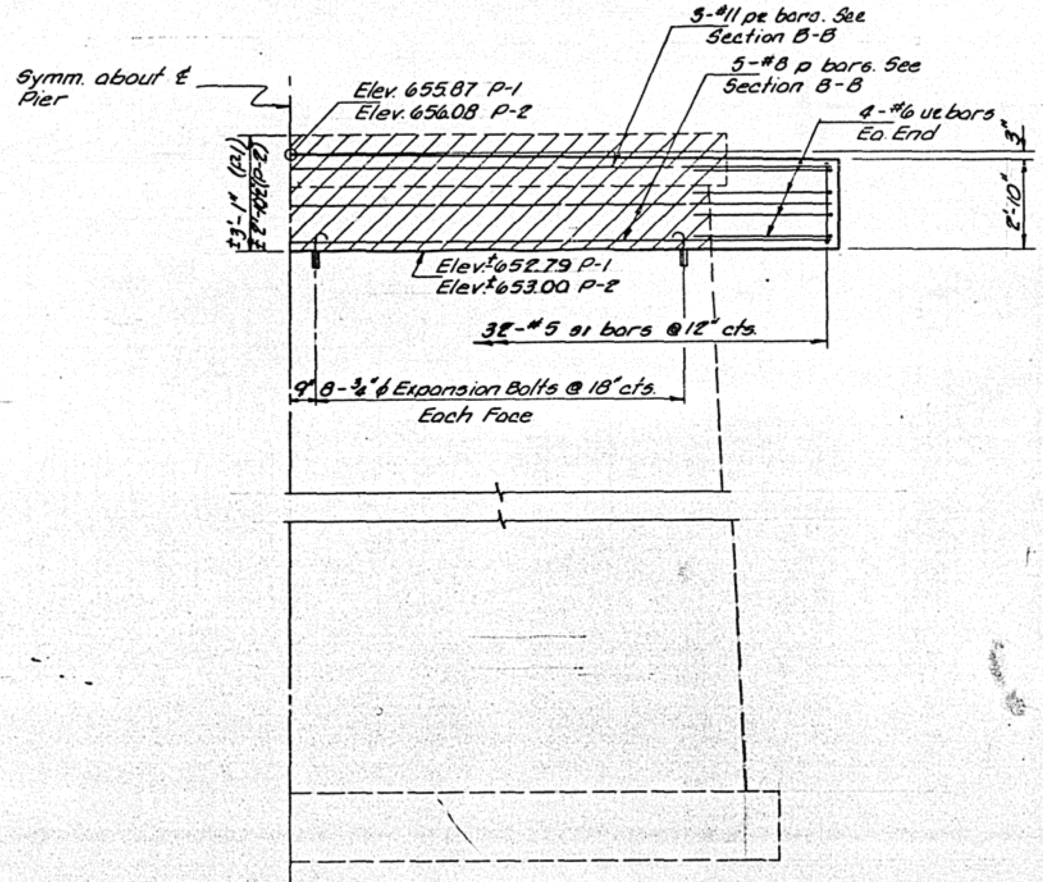
Class X Concrete	Cu. Yd.	17.1
Reinforcement Bars	Pound	2,620
Concrete Removal	Cu. Yd.	17.5
Expansion Bolts, ¾"ϕ	Each	28

Note: Hatched portion of existing abutments to be removed.

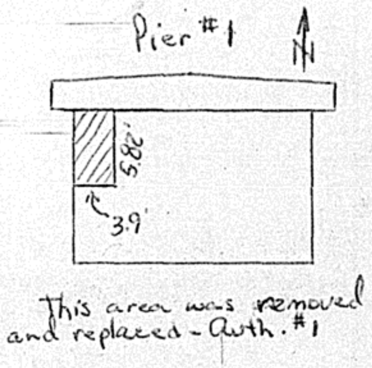


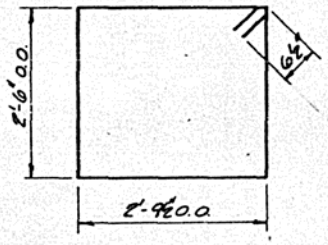
HALF PLAN
(Showing N. Abut.)



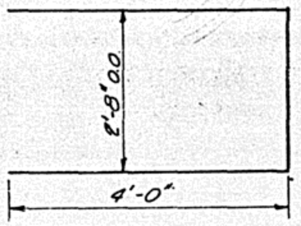


HALF ELEVATION

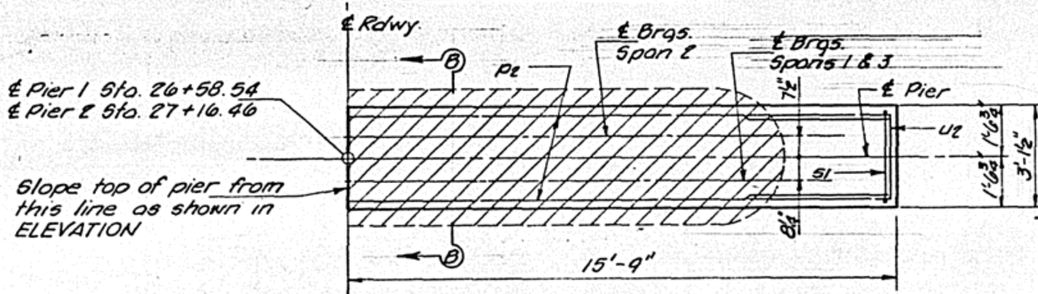




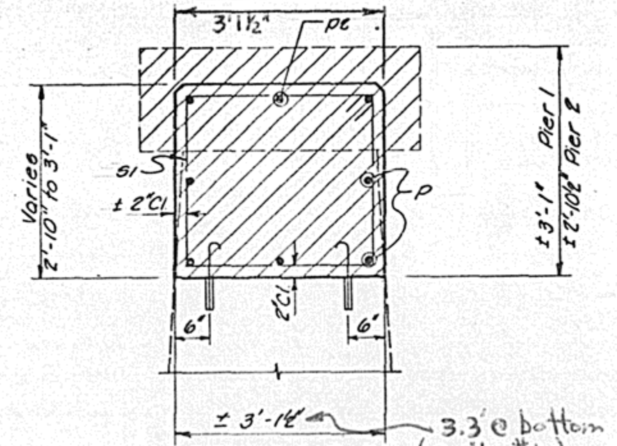
BAR s1



BAR u2



HALF PLAN



SECTION B-B

BILL OF MATERIAL ~ 2 PIERS

BAR	NO. REQ'D.	SIZE	LENGTH	SHAPE
p	10	#8	31'-2"	—
p2	6	#11	31'-2"	—
				|
s1	64	#5	11'-8"	□
u2	16	#6	10'-8"	⊐

Class X Concrete	Cu. Yd.	21.6
Reinforcement Bars	Pound	2,860
Concrete Removal	Cu. Yd.	18.7
Expansion Bolts, ¾"ϕ	Each	64

Note: Hatched portion of existing piers to be removed.

SUBSTRUCTURE
F.A.S. RT. 516 SEC. 77-00089-01-BR
CHAMPAIGN COUNTY
STATION 26+87.50

COLLINS AND RICE
CONSULTING ENGINEERS

DESIGNED F.S. CHECKED L.L.
DRAWN L.L. DATE 7-28-75 NO. 1282