

# REVISED

Sheet S-1 of S-16

ROUTE	SECTION	COUNTY	SHEET NO.	TOTAL SHEETS
599	(66-15d) BR-1	Rock Island	52	31A

B.M. Top R.O.W. Marker (cracked) S.W. corner 1st St. and Illinois Route 92 in Andalusia. Elev. 573.78

T.B.M. Chiseled "X" on top of Curb (B-624) 2.3' (±) east of west end of Curb and Gutter on north side of Illinois Route 92 just west of Hills Creek. Elev. 577.03

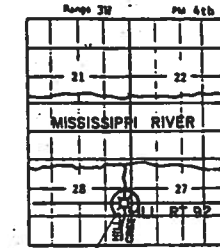
Existing Structure: SN 081-0074 Built in 1940 as SA 9, Section 66B-15d in Rock Island County at Sta. 436+00, 2 Solid reinforced concrete abutments with single span wide flange steel beams carrying 6 1/2" reinforced concrete slab 58'-0" back to back of abutments and 25'-5 1/4" overall width. The Contractor shall remove the

existing superstructure and replace it with 7 1/2" reinforced concrete slab on single span steel beams. Existing substructure shall be repaired as necessary and widened. No Salvage.

Traffic to be maintained utilizing stage construction.

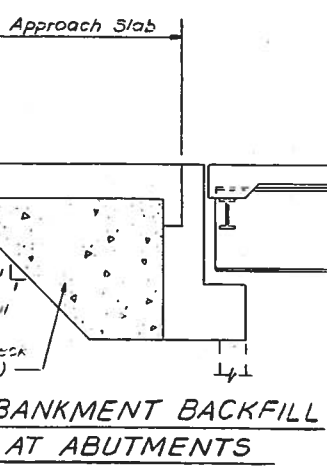
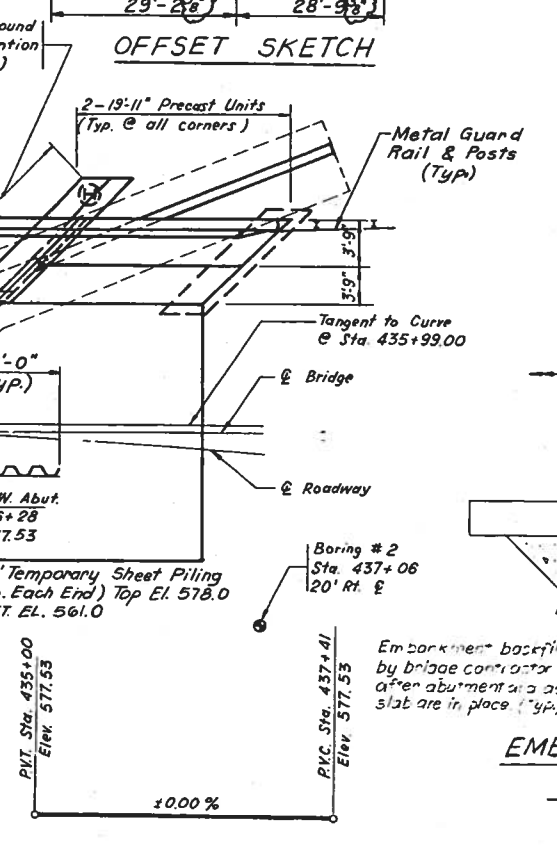
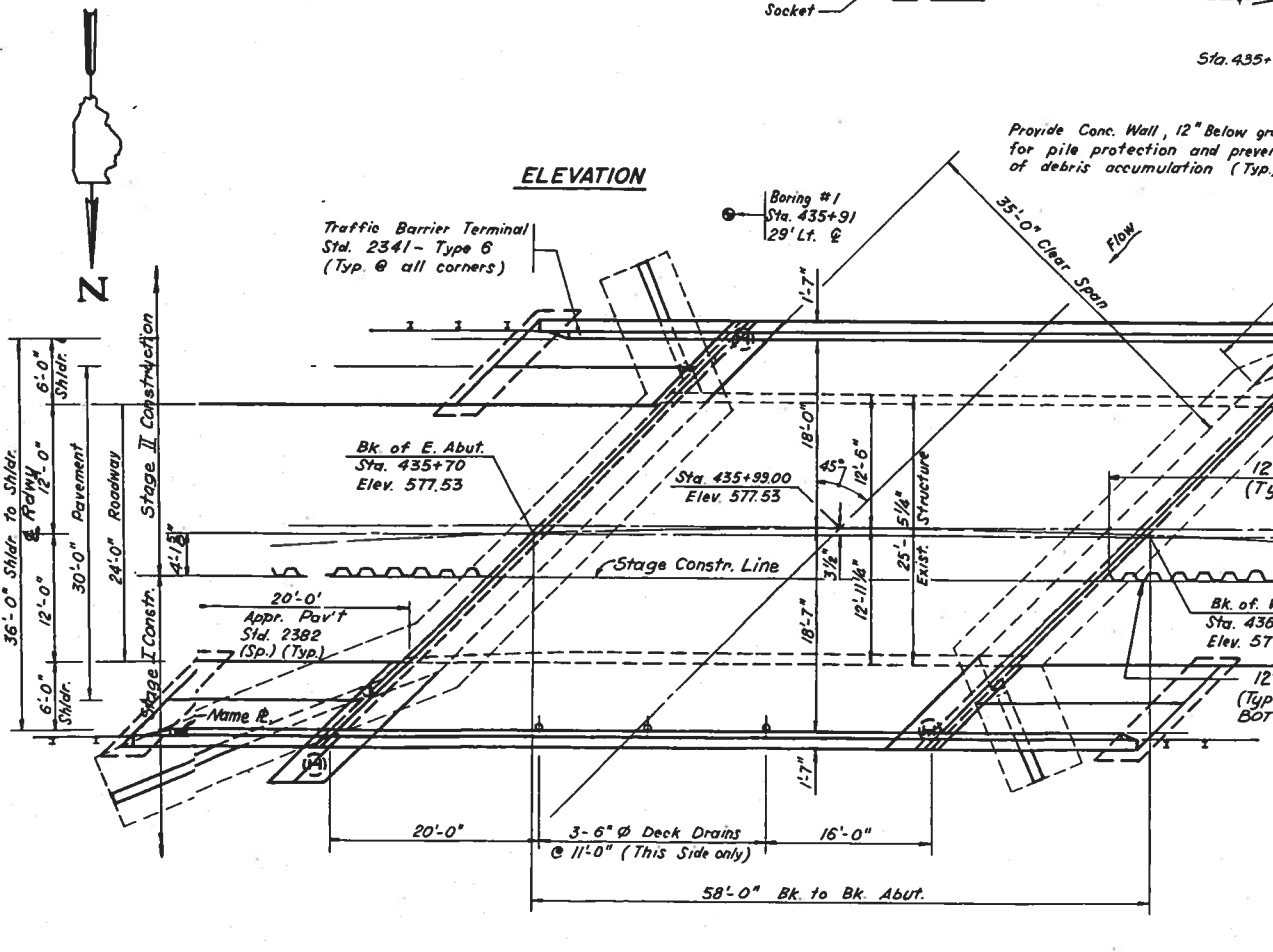
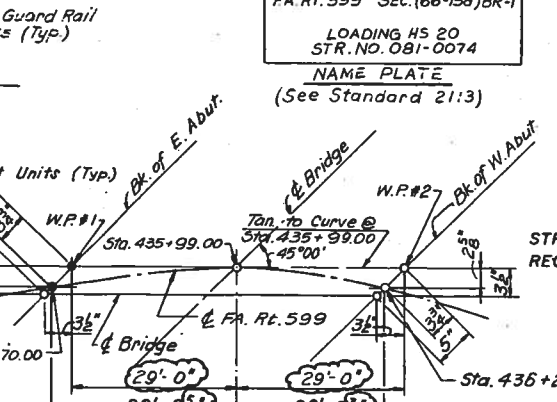
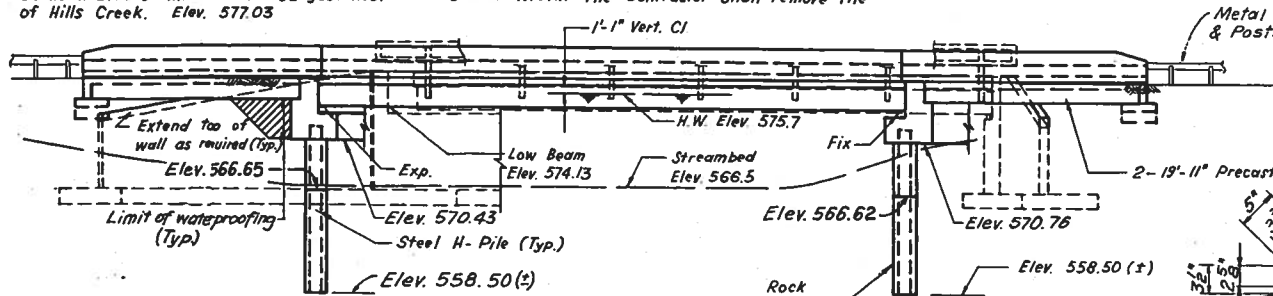
STATION 435+99.00  
REBUILT 199 BY  
STATE OF ILLINOIS  
FA. RT. 599 SEC. (66-15d) BR-1

LOADING HS 20  
STR. NO. 081-0074  
NAME PLATE  
(See Standard 21:3)



### GENERAL NOTES

- SEE PROPOSAL FOR BORING DATA.
- FASTENERS SHALL BE HIGH STRENGTH BOLTS. BOLTS 3/4 IN. Ø. OPEN-HOLES 15/16 IN. Ø. UNLESS OTHERWISE NOTED.
- CALCULATED WEIGHT OF STRUCTURAL STEEL M223 GR. 50 = 39,990 # M183 = 6,250#.
- THE ZINC-SILICATE AND VINYL PAINT SYSTEM SHALL BE USED FOR SHOP AND FIELD PAINTING OF STRUCTURAL STEEL EXCEPT WHERE OTHERWISE NOTED. THE COLOR OF THE VINYL FINISH COAT SHALL BE MUNSELL NO. 7.5G (INTERSTATE GREEN).
- FIELD WELDING OF CONSTRUCTION ACCESSORIES WILL NOT BE PERMITTED TO THE BOTTOM FLANGE OF BEAMS. FIELD WELDING IN OTHER AREAS WILL BE PERMITTED ONLY WHEN APPROVED BY THE ENGINEER.
- ANCHOR BOLTS SHALL BE SET BEFORE BOLTING DIAPHRAGMS OVER SUPPORTS.
- THE MAIN LOAD CARRYING MEMBER COMPONENTS SUBJECT TO TENSILE STRESS SHALL CONFORM TO THE SUPPLEMENTAL REQUIREMENTS FOR NOTCH TOUGHNESS ZONE 2. THESE COMPONENTS ARE THE WIDE FLANGE BEAMS.
- REINFORCEMENT BARS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-31, M-42, OR M-53 GRADE 60.
- THE BACK FACE OF CLOSED ABUTMENTS SHALL BE WATERPROOFED ACCORDING TO ARTICLE 503.11 OF THE STANDARD SPECIFICATIONS.
- ALL TOP SURFACE OF ABUTMENTS SHALL RECEIVE "BRIDGE SEAT SEALER" ESTIMATED QUANTITY = 14 SQ. YD.
- THE INFORMATION SHOWN FOR THE TEMPORARY SHEET PILING IS ESTIMATED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE A DESIGN AND COMPUTATIONS OF THE TEMPORARY SHEET PILING AND ASSOCIATED MEMBERS, IF REQUIRED, SUBJECT TO THE APPROVAL OF THE ENGINEER.
- PLAN DIMENSIONS AND DETAILS RELATIVE TO EXISTING STRUCTURE HAVE BEEN TAKEN FROM EXISTING PLANS AND ARE SUBJECT TO NOMINAL CONSTRUCTION VARIATIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY SUCH DIMENSIONS AND DETAILS IN THE FIELD AND MAKE NECESSARY APPROVED ADJUSTMENTS PRIOR TO CONSTRUCTION OR ORDERING OF MATERIALS. SUCH VARIATIONS SHALL NOT BE CAUSE FOR ADDITIONAL COMPENSATION FOR A CHANGE IN THE SCOPE OF THE WORK, HOWEVER, THE CONTRACTOR WILL BE PAID FOR THE QUANTITY ACTUALLY FURNISHED AT THE UNIT PRICE BID FOR THE WORK.



### TOTAL BILL OF MATERIAL

ITEM	UNIT	SUPER	SUB	TOTAL
Removal of Existing Superstructure	Each	1	—	1
Concrete Removal	Cu. Yd.	—	34.4	34.4
Structure Excavation	Cu. Yd.	—	62.7	62.7
Protective Coat	Sq. Yd.	271.6	—	271.6
Floor Drains	Each	3	—	3
Class X Concrete, Superstructure	Cu. Yd.	77.9	—	77.9
Class X Concrete	Cu. Yd.	—	84.9	84.9
Bridge Seat Sealer	L.S.	—	1	1
Reinforcement Bars, Epoxy Coated	Lbs.	15,375	10,455	25,830
Name Plates	Each	1	—	1
Furnishing & Erecting Structural Steel	L.S.	1	—	1
Precast Concrete Bridge Slab	Sq. Ft.	598	—	598
Epoxy Crack Sealing	Lin. Ft.	—	20	20
Furnishing Steel Piles HP 12 x 53	Lin. Ft.	—	52	52
Rock Excavation	Cu. Yd.	—	4.0	4.0
Setting Piles in Rock	Each	—	4	4
Elastomeric Bearing Assembly, Type I	Each	7	—	7
Temporary Sheet Piling	Sq. Ft.	—	370	370
Preformed Joint Seal - 1 3/4"	Lin. Ft.	56	—	56
Neoprene Expansion Joint - 2"	Lin. Ft.	56	—	56
Stud Shear Connectors	Each	1155	—	1155

\* These quantities are approximate and must be verified in the field prior to construction.

### WATERWAY INFORMATION

Drainage Area = 3.0 Sq. Mi. Low Grade Elev. 576.8 @ Sta. 433+60

Flow	Freq. Yr.	Q C.F.S.	Opening Sq. Ft.		Not. Head - Ft.		Headwater El.		
			Exist.	Prop.	H.W.E. Exist.	Prop.	Exist.	Prop.	
Design	50	1,760	180	180	572.6	0.1	0.1	572.7	572.7
Base	100	2,030	195	195	572.9	0.1	0.1	573.0	573.0
Overpassing									
Max. Calc.	500	2,680	220	220	573.6	0.1	0.1	573.7	573.7

### HORIZ. CURVE DATA

P.I. STA. 437+75.02  
 $\Delta = 24^\circ - 44' - 20''$   
 $D = 3^\circ - 00' - 20''$   
 $R = 1906.33'$   
 $T = 418.08'$   
 $L = 823.08'$   
 $E = 45.30'$   
 $SE = 0.040 \%$

NOTE: For Stage Construction see Sh. S-16 of S-16.

DESIGN SPECIFICATION  
 AASHTO (1989) and 1990 thru 1991 Interim Specs, and Seismic Retrofitting Guidelines for Highway Bridge.

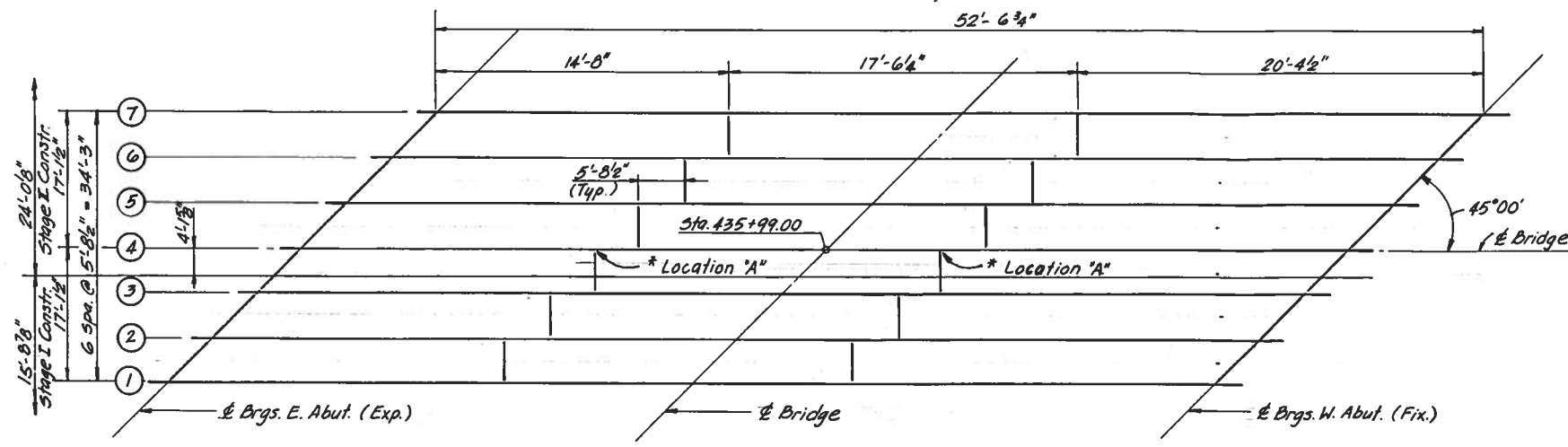
LOADING HS 20-44  
 Allow 25 #/sq. ft. for future wearing surface

DESIGN STRESSES  
 Field Units  
 $f_c = 3,500$  psi  
 $f_y = 60,000$  psi (Reinf.)  
 $f_y = 50,000$  psi (M 223)-Grade 50  
 $f_y = 36,000$  psi (M 183)  
 Precast Units  
 $f_c = 4,500$  psi  
 $f_c = 1,800$  psi  
 $f_s = 20,000$  psi

STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION  
 GENERAL PLAN AND ELEVATION  
 HILLS CREEK  
 F.A. ROUTE 599 SEC. (66-15d) BR-1  
 ROCK ISLAND COUNTY  
 STA. 435+99.00  
 STRUCTURE SN 081-0074  
 SCALE NONE  
 DATE 7-26-91  
 CHECKED BY B.M.  
 DRAWN BY W.T.

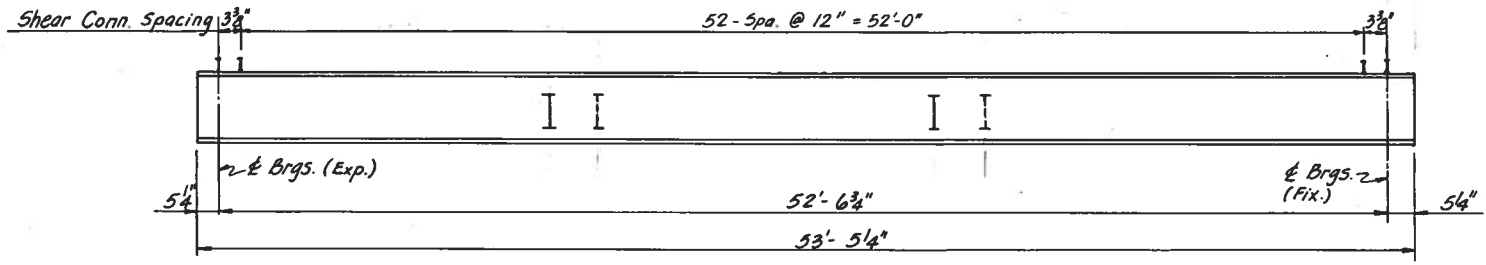
2257  
 Kevin Adams 5/19/91

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
599	(66-15d)BR-1	ROCK ISLAND	52	36
SPL.		TO STA.		
FED. ROAD DIST. NO. 7		ILLINOIS		FEDERAL AID PROJECT

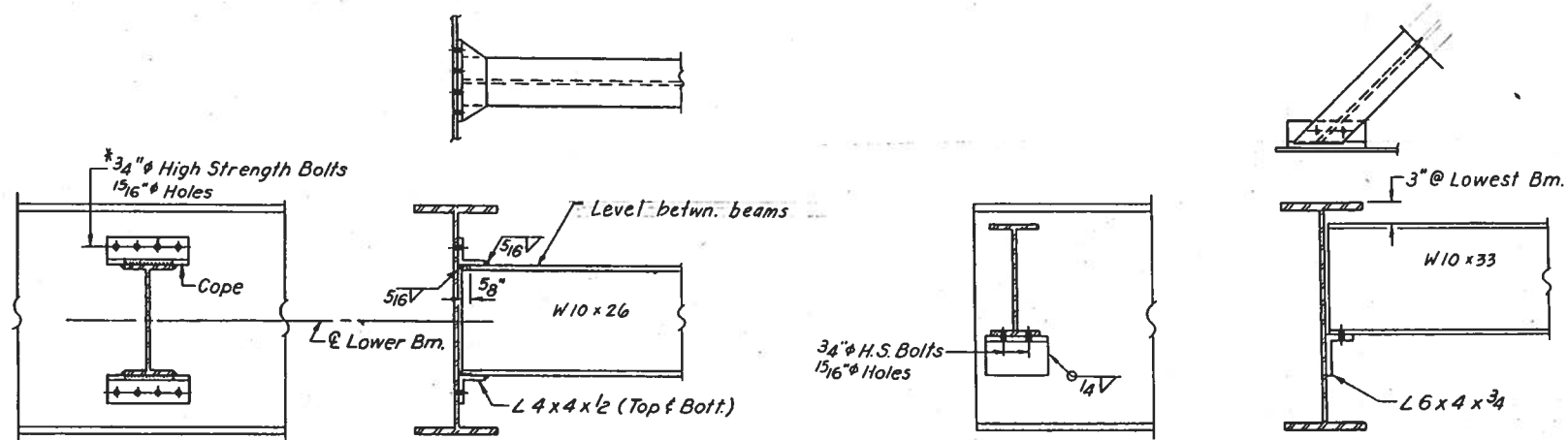


FRAMING PLAN

\* Use 1 3/16" x 1/2" slotted holes in 4" x 4" x 1/2" L @ Location "A" only provide 5/16" plate washers for slotted holes. Bolts shall be finger-tightened prior to the Deck pour for Stage II Construction. Tighten bolts after Deck is poured.



BEAM ELEVATION  
(W24 x 104, N.T.R. Typ. All Beams)



INTERIOR DIAPHRAGM

END DIAPHRAGM

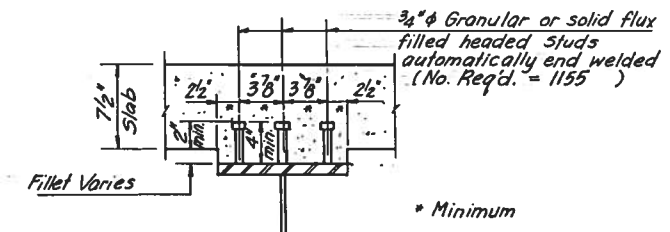
Note: Two hardened washers shall be required over all oversize holes.

\* TOP OF FLANGE ELEVATIONS

Beam No.	Brgs. E. Abut.	Brgs. W. Abut.
7	577.537	577.556
6	577.310	577.323
5	577.084	577.090
4	576.859	576.858
3	576.634	576.627
2	576.410	576.397
1	576.187	576.167

\*(For Fabrication only)

	0.5 Sp.
$I_s$ (in. <sup>4</sup> )	3100
$I_c$ (in. <sup>4</sup> )	8980
$S_s$ (in. <sup>3</sup> )	258
$S_c$ (in. <sup>3</sup> )	391.3
$R$ (K/I)	0.650
$M_d$ (K)	224.6
$f_s$ non-comp (KSI)	10.45
$S_R$ (K/I)	0.248
$M_d R$ (K)	85.7
$M_E$ (K)	349.8
$M_{imp}$ (K)	98.0
$S_y (M_d + I)$ (K)	758.1
$Z$ (in. <sup>3</sup> )	289
$M_a$ (K)	1373.6
$M_u$ (K)	-
$f_s R$ (comp) (KSI)	2.63
$f_s$ (Overload) (KSI)	35.98
$f_s S_y (L + E)$ (K.S.I)	22.90
$f_s$ TOTAL (KSI)	46.77
VR (K)	39.36



SHEAR STUDS

Steel W 24 x 104 beams & bearing assemblies, shall be AASHTO M-223 Grade 50. Estimated Weight = 39,990 Lbs.  
Steel diaphragms and angles shall be AASHTO M-183. Estimated Weight = 6,250 Lbs.

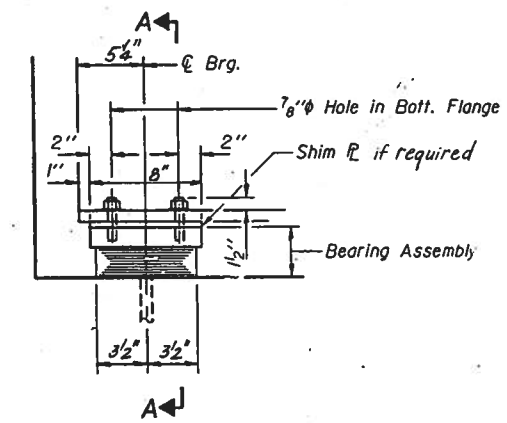
	Abut.
$R_d$ (K)	23.70
$R_L$ (K)	30.75
$I_{mp}$ (K)	8.61
$R_{TOTAL}$ (K)	63.06

$I_s$  and  $S_s$  are the moment of inertia and section modulus of the steel section used in computing  $f_s$  (TOTAL and overload)  
 $I_c$  and  $S_c$  are the moment of inertia and section modulus of the composite section used in computing  $f_s$  (TOTAL and overload)  
VR is the maximum  $L + Impact$  shear range in span.  
 $f_s$  (Total) is the sum of the stresses due to  $1.3[M_d R + M_d + \frac{1}{2}(M_L + I)]$ .  
 $f_s$  (Overload) is the sum of the stresses due to  $M_d R + M_d + \frac{1}{2}(M_L + I)$ .  
 $M_d R$  - Moment due to dead loads on non-composite section.  
 $M_d$  - Moment due to dead loads on composite section.  
 $M_L$  - Moment due to live load on non-composite or composite section.  
I - Live load impact.  
Z - is the plastic section modulus used to determine the Fully Plastic Moments in the non-composite areas.

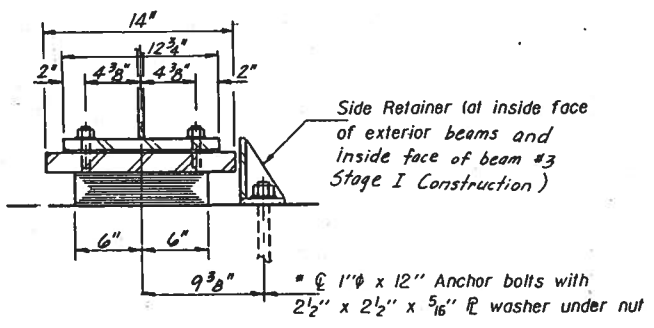
\*  $M_u$  = Full Plastic Moment Capacity for Compact, Braced section.  
\*\* Non-Compact section  
 $M_a$  (Applied Moment) =  $1.3[M_d R + M_d + \frac{1}{2}(M_L + I)]$

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
FRAMING PLAN  
HILLS CREEK  
F.A. ROUTE 599 SEC. (66-15d)BR-1  
ROCK ISLAND COUNTY  
STA. 435+99.00  
STRUCTURE SN 081-0074  
DRAWN BY D.C.  
SCALE DATE 7-26-91 CHECKED BY B.M.

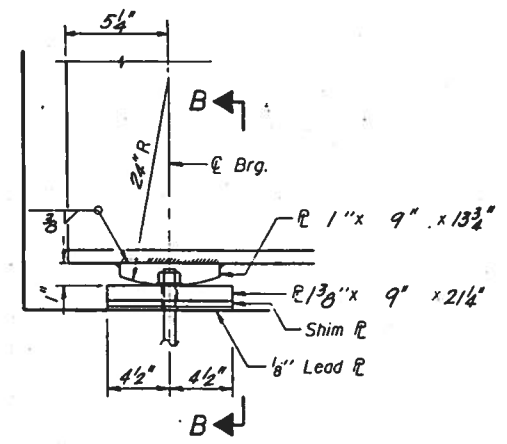
STATE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
ILLINOIS	66-15d)BR-1	ROCK ISLAND	52	37
STA. 435+99.00		FEDERAL AID PROJECT		



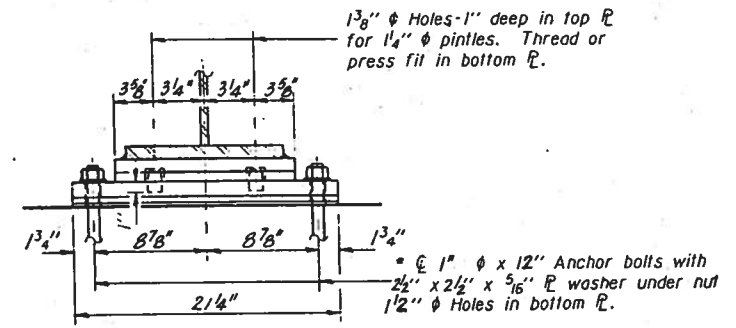
ELEVATION AT E. ABUT.



SECTION A-A



ELEVATION AT W. ABUT.

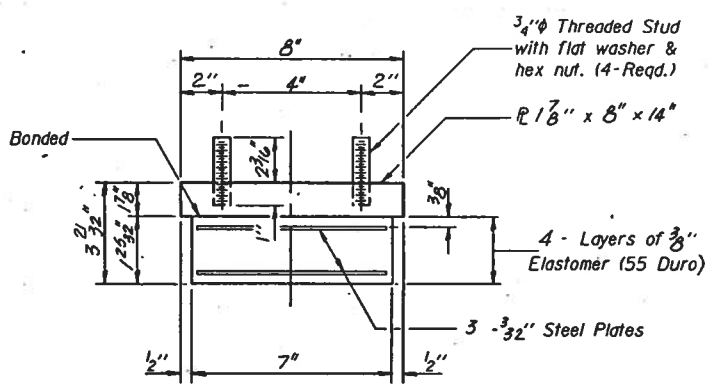


SECTION B-B

**TYPE I ELASTOMERIC EXP. BRG.**  
(At East Abutment)

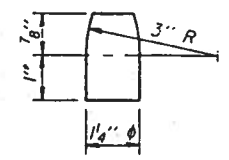
\* Notes: Anchor bolts at fixed bearings may be built into the masonry.  
See sheet #5-9 for Anchor Bolt installation.

**FIXED BEARING**  
(At West Abutment)

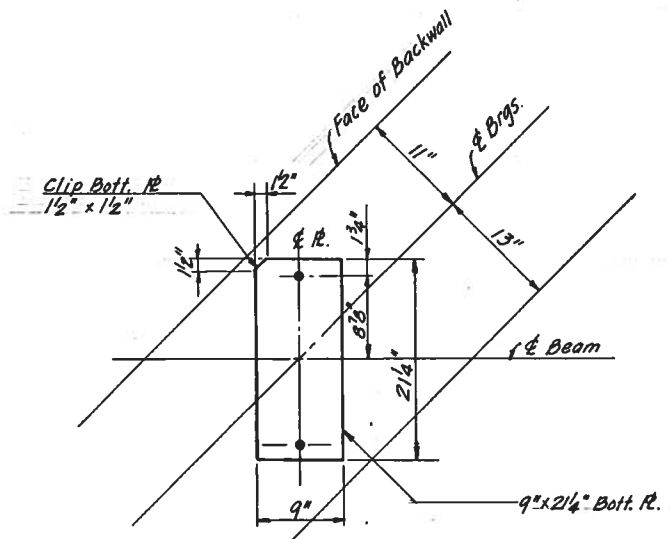


BEARING ASSEMBLY

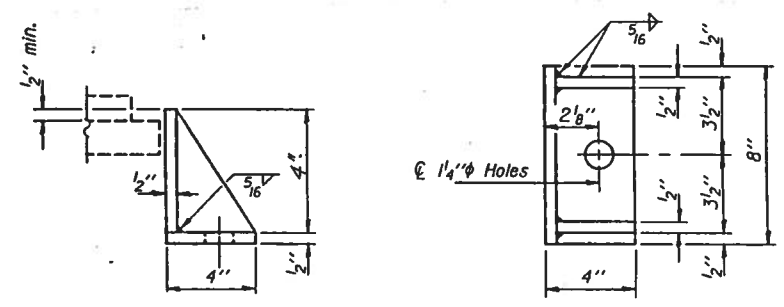
Note: Shim plates shall not be placed under Bearing Assembly.



PINTLE



BOTTOM R DETAIL



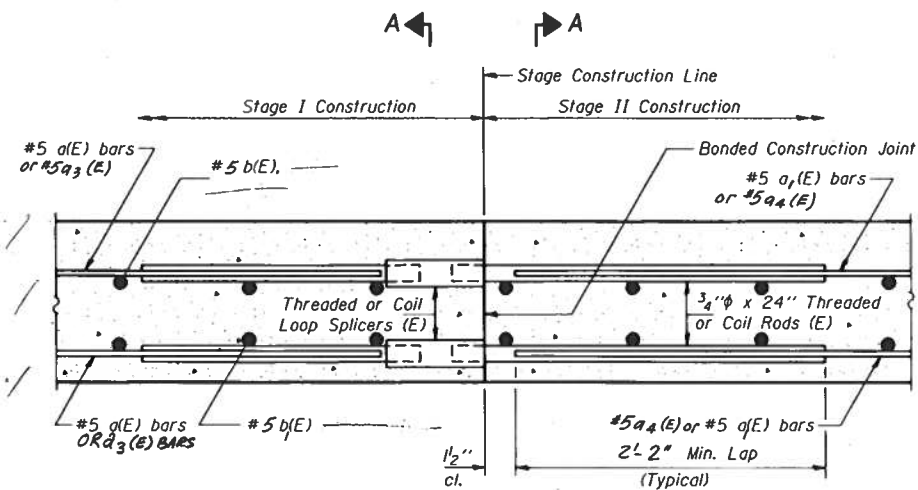
**SIDE RETAINER**  
Equivalent rolled angle with stiffeners will be allowed in lieu of welded plates.

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
BEARINGS  
HILLS CREEK  
F. A. ROUTE 599 SEC. (66-15d)BR-1  
ROCK ISLAND COUNTY  
STA. 435+99.00  
STRUCTURE SN 081-0074  
SCALE DRAWN BY D.C.  
DATE 7-26-91 CHECKED BY B.M.

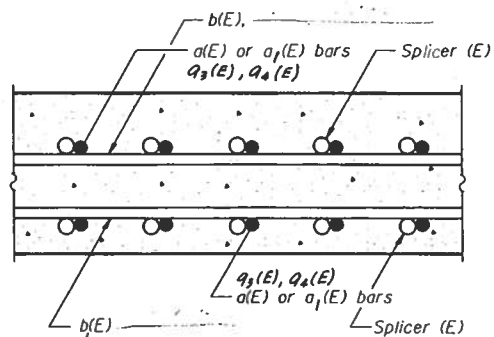
STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

Sheet S-14 of S-16

ROUTE NO.	SECTION	COUNTY	SHEET	TOTAL
66-599	BR-1	Rock Island	52	44
FED. ROAD DIST. NO. 7		ALL PORTS	PER. AND PROJECT	



SECTION THRU SLAB



SECTION A-A

SPLICER DETAILS

\*\* Cost incidental to Reinforcement Bars (Epoxy Coated).

The diameter of this part of Splicer is the same as the diameter of the bar spliced.

ROLLED THREAD DOWEL BAR



ONE PIECE

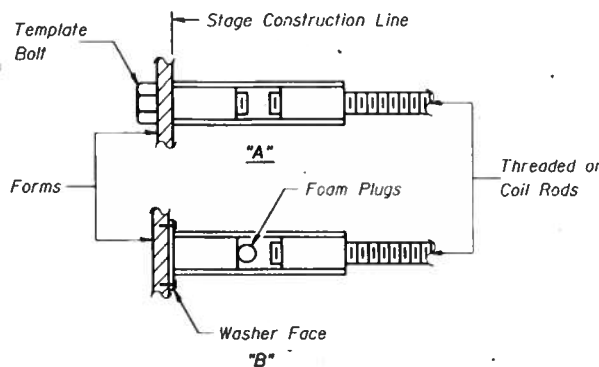
Wire Connector



WELDED SECTIONS

SPLICER ALTERNATIVES

\*\* Heavy Hex Nuts conforming to ASTM A 563, Grade C, D or DH may be used.



INSTALLATION AND SETTING METHODS

"A" : Set splicer by means of a template bolt.

"B" : Set splicer by nailing to wood forms or cementing to steel forms.

(E) : Indicates epoxy coating.

NOTES

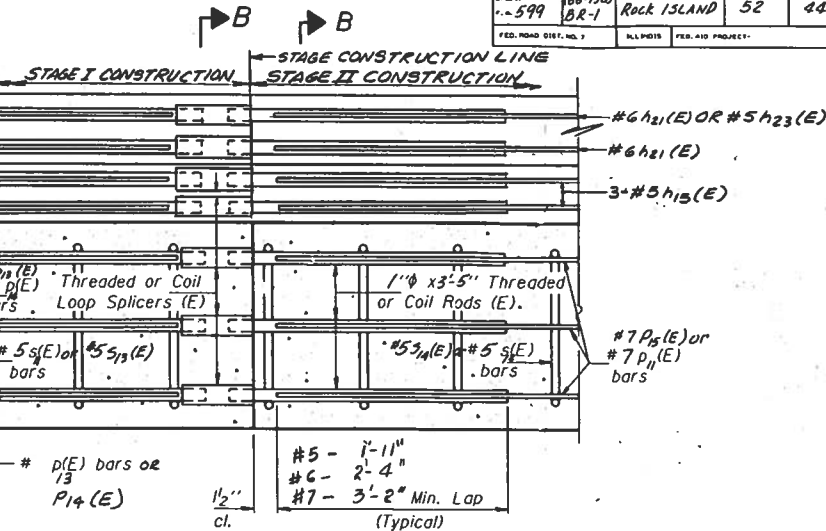
Steel Splicer (Coupler) assembly shall be of an approved type and shall develop in tension at least 125 percent of the yield strength of the lapped reinforcement bars.  
Steel Splicer rods shall be of minimum 60 ksi yield strength, threaded or coiled full length and have effective tensile stress area equal to or greater than that of the lapped reinforcement bars.  
All reinforcement bars shall be lapped and tied to the splicer rods.  
Splicer (coupler) assembly shall be epoxy coated in accordance with the requirements for reinforcement bars.  
Other systems of similar design may be submitted to the Engineer for approval. Approval shall be based on certified test results from an approved testing laboratory that the proposed splicer (coupler) assembly satisfies the following requirements:

- Minimum Capacity =  $1.25 \times f_y \times A_t$   
(Tension in kips)
- Minimum \*Pull-out Strength =  $1.25 \times f_{allow} \times A_t$   
(Tension in kips)

Where  $f_y$  = Yield strength of lapped reinforcement bars in ksi.  
 $f_{allow}$  = Allowable tensile stress in lapped reinforcement bars in ksi (Service Load)  
 $A_t$  = Tensile stress area of lapped reinforcement bars.  
\* = 28 day concrete

Typical Splicer (Coupler) Assembly Sizes:

In Slabs	#5 bar lap with 3/4" Splicer (Coupler) x 2'-5" Splicer Rods	Minimum Capacity = 23.0 kips-tension Minimum Pull-out Strength = 9.2 kips-tension
In Sub-Structure	#7 bar lap with 1" Splicer (Coupler) x 3'-5" Splicer Rods	Minimum Capacity = 45.1 kips-tension Minimum Pull-out Strength = 18.0 kips-tension
	#5 bar lap with 3/4" Splicer (Coupler) x 2'-2" Splicer Rods	Minimum Capacity = 23.0 kips-tension Minimum Pull-out Strength = 9.2 kips-tension
	#6 BAR LAP WITH 7/8" SPLICER (E) (COUPLER) x 2'-7" SPLICER RODS (E)	MINIMUM CAPACITY = 33.1 KIPS-TENSION MINIMUM PULL-OUT STRENGTH = 13.3 KIPS-TENSION

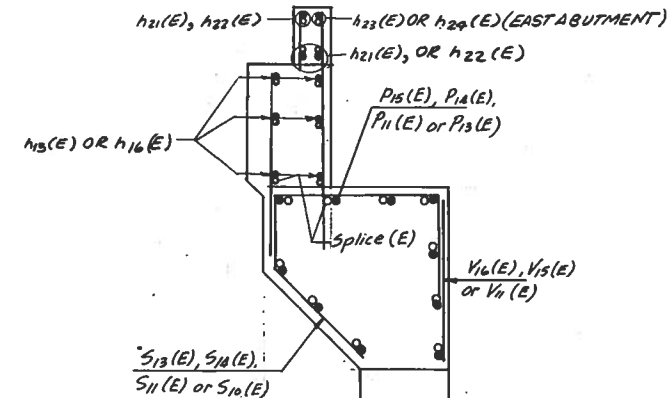


SECTION THRU ABUTMENTS

SPLICER DETAILS

(No. Req'd. 10)

\*\* Cost incidental to Reinforcement Bars (Epoxy Coated).



SECTION B-B

\*\* SPLICER (E) NO. REQUIRED  
3/4" SPLICER (E) 167  
7/8" SPLICER (E) 6  
1" SPLICER (E) 20

DESIGNED	
CHECKED	
DRAWN	
CHECKED	

BSD-1

6-1-89

BAR SPLICER (COUPLER) DETAILS

AT STAGE CONSTRUCTION

HILLS CREEK  
F.A. ROUTE 599 SEC. (66-15d) BR-1  
ROCK ISLAND COUNTY  
STA. 435+99.00  
STRUCTURE SN 081-0074

SCALE

DATE 7-26-91

DRAWN BY DC  
CHECKED BY BM