11-16-07 Letting, Item 097

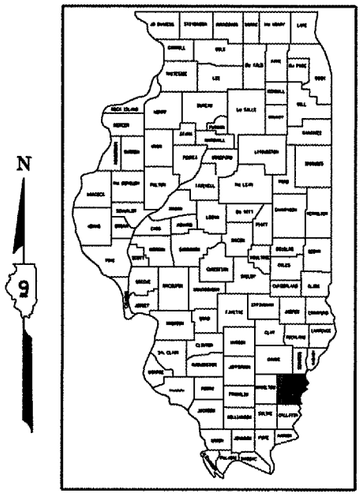
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 332	*	WHITE	13	1
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

* D9 CM BRIDGE REPAIR FY 08-1
CONTRACT NO. 78015

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED HIGHWAY PLANS

F.A.P. 332 (ILL. RTE. 1)
SECTION D9 CM BRIDGE REPAIR FY 08–1
C–99–040–07
WHITE COUNTY

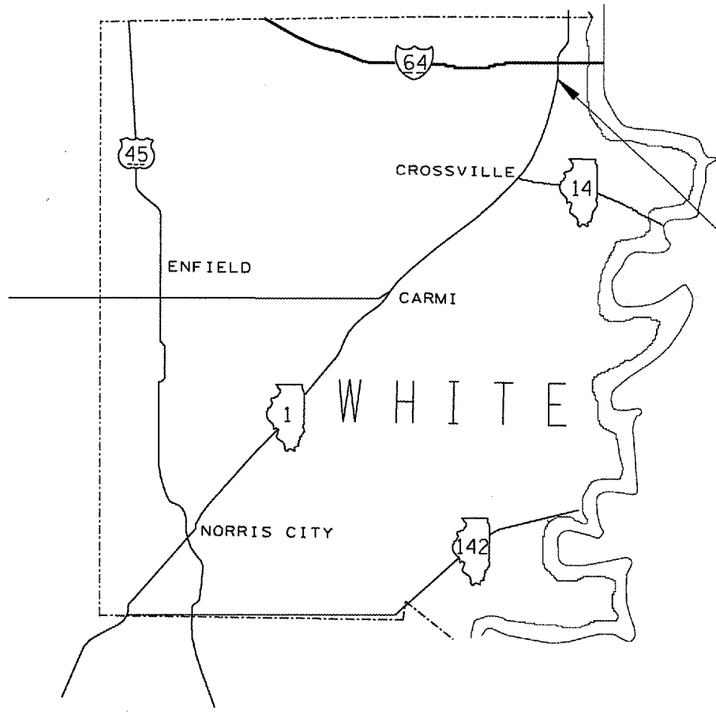


ILLINOIS TOWNSHIP: GRAY
2005 ADT = 3500
TRUCKS = 17% ADT
POSTED SPEED = 55 MPH
INVENTORY RATING HS 26.7
OPERATING RATING HS 38.9

INDEX OF SHEETS

STANDARDS

630001-07 STEEL PLATE BEAM GUARDRAIL
631032-03 TRAFFIC BARRIER TERMINAL TYPE 6A
701321-08 LANE CLOSURE, 2L, 2W, BRIDGE REPAIR WITH BARRIER
701301-02 LANE CLOSURE, 2L, 2W, SHORT TIME OPERATIONS
702001-06 TRAFFIC CONTROL DEVICES
704001-03 TEMPORARY CONCRETE BARRIER
701201-02



PROPOSED IMPROVEMENT
S.N. 097–0005
CURB AND RAIL
EXPANSION JOINT
BEARINGS

MAP NOT TO SCALE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED Aug. 17 2007
Marry C. Lamie, P.E.
DISTRICT ENGINEER
October 12 2007
Eric E. Harm
Interim ENGINEER OF DESIGN AND ENVIRONMENT
October 12, 2007
Milton R. Sees, P.E.
DIRECTOR, DIVISION OF HIGHWAYS

PLAN DRAWINGS ARE NOT TO SCALE.

J.U.L.I.E.
JOINT UTILITY LOCATION INFORMATION FOR EXCAVATION
1–800–892–0123

CONTRACT NO. 78015

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 332	*	WHITE	13	2
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

* D9 CM BRIDGE REPAIR FY 08-1
CONTRACT NO. 78015

GENERAL NOTES

WHILE SIGNAL HEADS ARE MOUNTED IN PLACE, BUT NOT YET IN OPERATION, THEY SHALL BE SECURELY COVERED IN WHITE PLASTIC.

THE ADVANCE DETECTOR LOOPS ARE TYPICALLY LOCATED 300 FEET IN ADVANCE OF THE STOP BAR. THE BUREAU OF OPERATIONS SHOULD APPROVE THE LOOP LOCATIONS PRIOR TO INSTALLATION.

THE QUANTITY OF WORK ZONE PAVEMENT MARKING REMOVAL INCLUDES REMOVAL OF EXISTING CENTERLINE PAVEMENT MARKING FROM THE STOP BARS TO ATTENUATORS, REMOVAL OF EDGE LINE IN STAGE I, AND REMOVAL OF TEMPORARY EDGE LINES.

TRAFFIC CONTROL SIGNS SHALL BE PLACED SO THAT THEY DO NOT INTERFERE WITH EXISTING SIGNS OR FLASHING BEACONS. THE DIMENSIONS BETWEEN SIGNS MAY BE MODIFIED SLIGHTLY SO AS TO AVOID CONFLICTS WITH EXISTING SIDEROADS, COMMERCIAL ENTRANCES, AND PRIVATE ENTRANCES. THE BUREAU OF OPERATIONS SHOULD APPROVE FINAL PLACEMENT OF TRAFFIC CONTROL SIGNING.

PLAN DIMENSIONS AND DETAILS RELATIVE TO EXISTING PLANS ARE SUBJECT TO ROUTINE VARIATIONS. THE CONTRACTOR SHALL FIELD VERIFY EXISTING DIMENSIONS AND DETAILS AFFECTING NEW CONSTRUCTION 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 SCOPE OF THE WORK, HOWEVER, THE CONTRACTOR WILL BE PAID FOR THE QUANTITY ACTUALLY FURNISHED AT THE UNIT PRICE BID FOR THE WORK.

THE COST OF ANY SAW CUTS MADE TO COMPLETE THE WORK AS DESCRIBED IN PLAN DETAILS SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS INVOLVED.

PRIOR TO POURING THE NEW PORTIONS OF THE CONCRETE DECK, ALL HEAVY OR LOOSE RUST, LOOSE MILL SCALE, OR OTHER LOOSE OR POTENTIALLY DETRIMENTAL FOREIGN MATERIAL SHALL BE REMOVED FROM THE SURFACES IN CONTACT WITH CONCRETE. THE REMOVAL SHALL BE ACCOMPLISHED BY METHODS WHICH WILL NOT DAMAGE THE STEEL. THE COST IS INCLUDED WITH "CONCRETE REMOVAL".

EXISTING STEEL RAILING, CONNECTION ANGLES, AND PLATES SHALL BE REMOVED. FILL HOLES IN EXISTING BEAM WITH ¾" Ø H.S. BOLTS. COST INCLUDED WITH "BRIDGE RAIL REMOVAL".

JOINT OPENING SHALL BE ADJUSTED ACCORDING TO ARTICLE 520.04 OF THE STANDARD SPECIFICATIONS WHEN THE DECK IS POURED AT AN AMBIENT TEMPERATURE OTHER THAN 50°.

THE CONTRACTOR SHALL REMOVE ALL DEBRIS FROM THE PIER CAP. PAYMENT FOR THIS WORK WILL BE DETERMINED ACCORDING TO ARTICLE 109.04 OF THE STANDARD SPECIFICATIONS.

Prepared By: Kevin Grammer
DISTRICT OPERATIONS ENGINEER

Examined By: James Craig Emery
DISTRICT LAND ACQUISITION ENGINEER

Examined By: Carrie Nelson
DISTRICT PROGRAM DEVELOPMENT ENGINEER

Examined By: Joe Bollman
DISTRICT STUDIES & PLANS ENGINEER

Examined By: Joseph Lewis
DISTRICT CONSTRUCTION ENGINEER

Examined By: Bruce W Stubbs
DISTRICT MATERIALS ENGINEER

Examined By: Jon Matthews
DISTRICT PROJECT IMPLEMENTATION ENGINEER

Examined By: Larry L Lawton
ASSISTANT REGIONAL ENGINEER

Approved By: Marry C. Lamie
DEPUTY DIRECTOR OF HIGHWAYS, REGION ENGINEER

August 17 2007
DATE

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 332	*	WHITE	13	3
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

* D9 CM BRIDGE REPAIR FY 08-1
CONTRACT NO. 78015

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES

	CONSTRUCTION TYPE CODE: SAFETY-2A		100% STATE	
	CODE NO.	ITEM DESCRIPTION	UNIT	TOTAL QUANTITY
	42001300	PROTECTIVE COAT	SQ YD	114.2
	50102400	CONCRETE REMOVAL	CU YD	22.1
	50104000	BRIDGE RAIL REMOVAL	FOOT	156.0
	50300100	FLOOR DRAINS	EACH	8
	50300255	CONCRETE SUPERSTRUCTURE	CU YD	33.2
	50500405	FURNISHING AND ERECTING STRUCTURAL STEEL	POUND	1530
	50500715	JACK AND REMOVE EXISTING BEARINGS	EACH	16
	50800205	REINFORCEMENT BARS, EPOXY COATED	POUND	5630
	X0325701	STEEL *RAILING, TYPE 2399*	FOOT	156.0
	52000110	PREFORMED JOINT STRIP SEAL	FOOT	76
	52100010	ELASTOMERIC BEARING ASSEMBLY, TYPE I	EACH	16
	52100520	ANCHOR BOLTS, 1"	EACH	32
*	63100087	TRAFFIC BARRIER TERMINAL, TYPE 6A	EACH	4
	67100100	MOBILIZATION	L SUM	1
	70100405	TRAFFIC CONTROL AND PROTECTION, STANDARD 701321	EACH	1
	70106500	TEMPORARY BRIDGE TRAFFIC SIGNALS	EACH	1
	70301000	WORK ZONE PAVEMENT MARKING REMOVAL	SQ FT	357

	CONSTRUCTION TYPE CODE: SAFETY-2A		100% STATE	
	CODE NO.	ITEM DESCRIPTION	UNIT	TOTAL QUANTITY
	70400100	TEMPORARY CONCRETE BARRIER	FOOT	270
	70400200	RELOCATE TEMPORARY CONCRETE BARRIER	FOOT	270
*	78001110	PAINT PAVEMENT MARKING LINE - 4"	FOOT	688
	X6333500	TRAFFIC BARRIER TERMINAL REMOVAL	EACH	4
	X0321781	MECHANICAL SPLICE	EACH	285
	70106800	CHANGEABLE MESSAGE SIGN	CAL MO	2
	50800515	BAR SPLICERS	EACH	22
	Z0030250	IMPACT ATTENUATORS, TEMPORARY (NON-REDIRECTIVE), TEST LEVEL 3	EACH	2
	Z0030350	IMPACT ATTENUATOR, RELOCATE (NON-REDIRECTIVE), TEST LEVEL 3	EACH	2

* *SPECIALTY ITEMS*

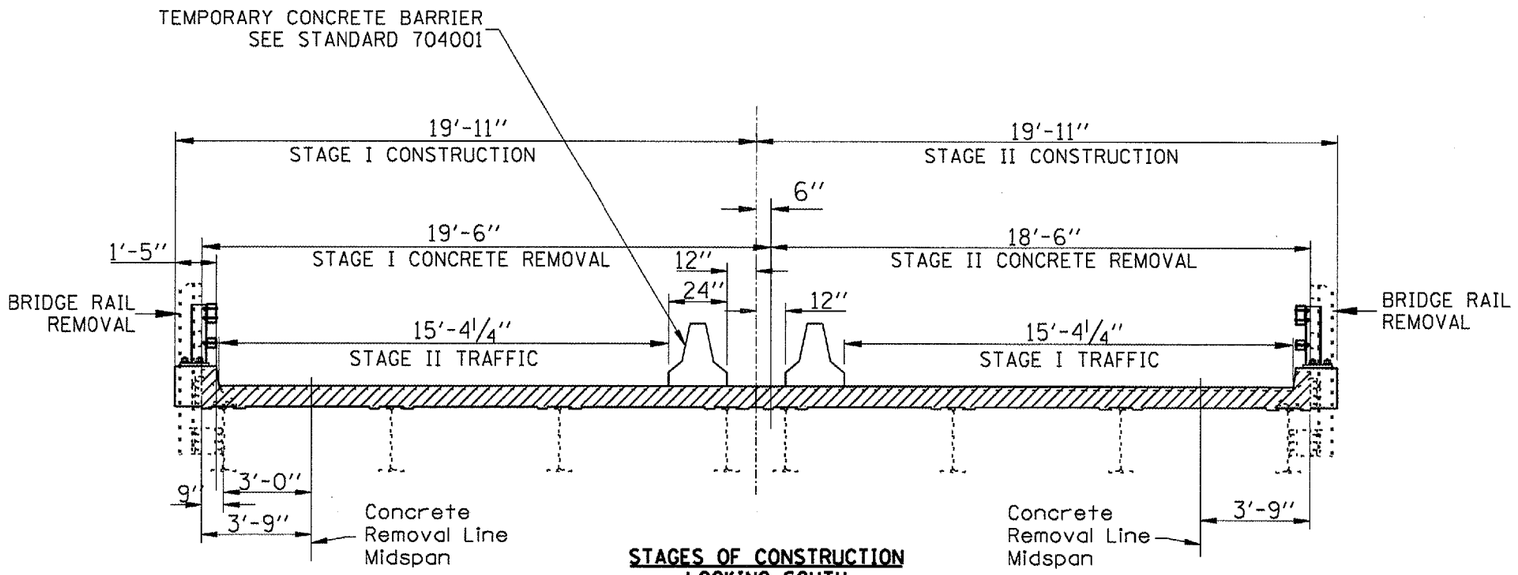
PAINT PAVEMENT MARKING - LINE 4"

COLOR	QUANTITY (FOOT)
WHITE	540
YELLOW	148
TOTAL	688

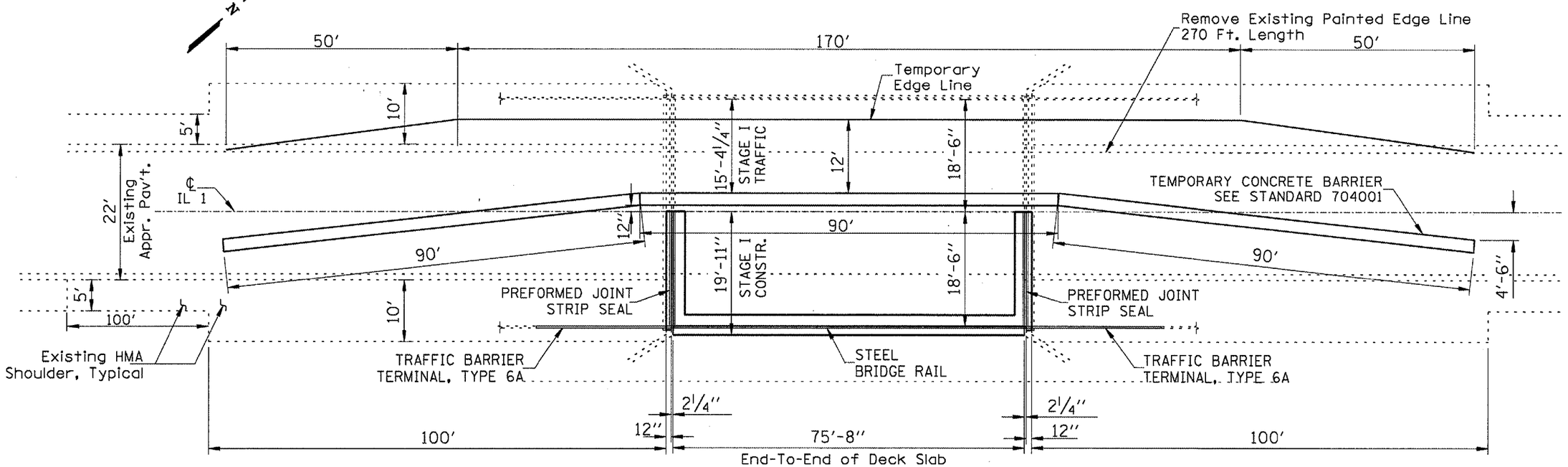
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 332	*	WHITE	13	4
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

* D9 CM BRIDGE REPAIR FY 08-1
CONTRACT NO. 78015

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



STAGES OF CONSTRUCTION
LOOKING SOUTH



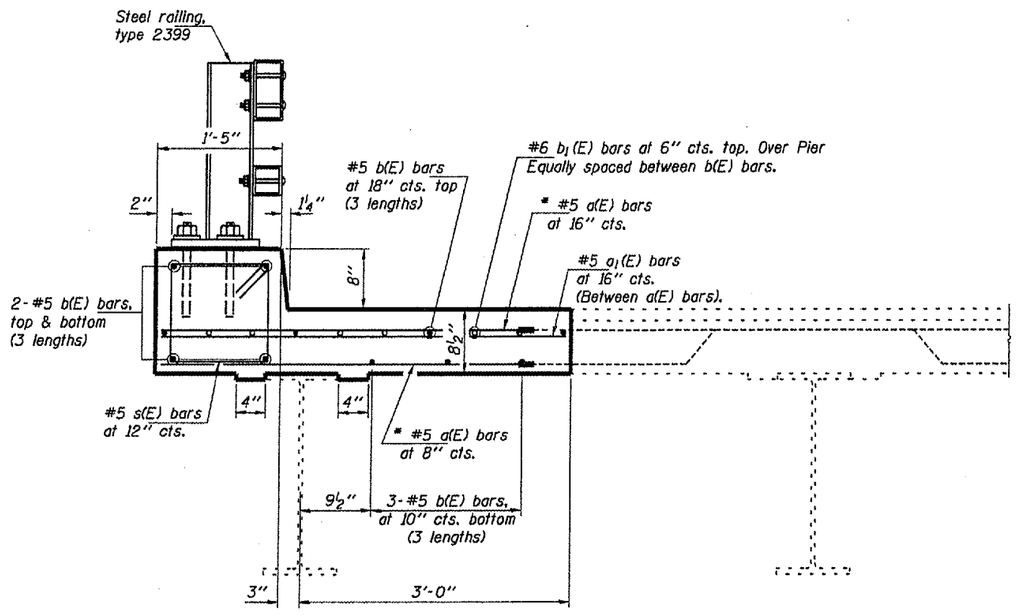
PLAN VIEW - STAGE I CONSTRUCTION

STAGE II SIMILAR BY 180° ROTATION
EXCEPT FOR PAVEMENT MARKING REMOVAL ON BRIDGE

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 332	*	WHITE	13	5
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

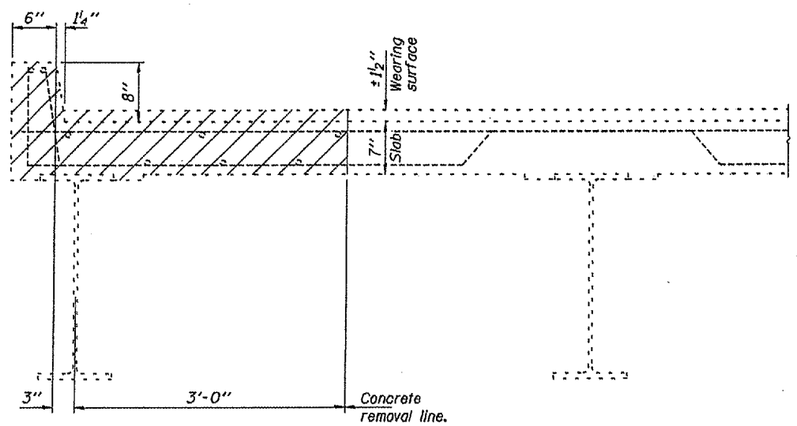
* D9 CM BRIDGE REPAIR FY 08-1
CONTRACT NO. 78015

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



PROPOSED REPLACEMENT

* Attach to existing reinforcement with mechanical splicers. Existing reinforcement to extend 6" (min.) into the removal area to allow attachment of the mechanical splicers.



PROPOSED REMOVAL

Hatched area indicates concrete removal.

GENERAL NOTES

All structural steel shall conform to AASHTO Classification M-270 Gr. 36, unless otherwise noted.

Reinforcement bars shall conform to the requirements of ASTM A 706 Gr 60 (IL Modified). See Special Provisions.

Reinforcement bars designated (E) shall be epoxy coated.

Plan dimensions and details relative to existing plans are subject to routine variations. The Contractor shall field verify existing dimensions and details affecting new construction 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 scope of the work, however, the Contractor will be paid for the quantity actually furnished based upon the unit price bid for the work.

Cost of removal and re-installation of all members necessary to complete the work as detailed on the plans and as specified in the Special Provisions shall be included with Furnishing and Erecting Structural Steel.

Existing structural steel that will be in contact with new structural steel shall be cleaned and painted prior to erection as required by the Special Provision "Cleaning and Painting Contact Surface Areas of Existing Steel Structures".

All structural steel shall be shop painted with the inorganic zinc rich primer per AASHTO M300, Type I. Cost included with Furnishing and Erecting Structural Steel.

Existing reinforcement bars extending into the removal area shall be cleaned, straightened and incorporated into the new construction. Any reinforcement bars that are damaged during concrete removal shall be replaced with an approved bar splicer or anchorage system. Cost included with Concrete Removal.

If the analysis submitted by the Contractor for the jacking/temporary support system to be used shows temporary stiffeners are required to prevent web crippling or buckling, the stiffeners shall be steel and bolted to the web. If stiffeners are not required, hardwood timbers shall be installed tightly between the top and bottom flange to prevent flange rotation.

MINIMUM BAR LAPS

#5 Bar = 2'-2"
#6 Bar = 2'-7"

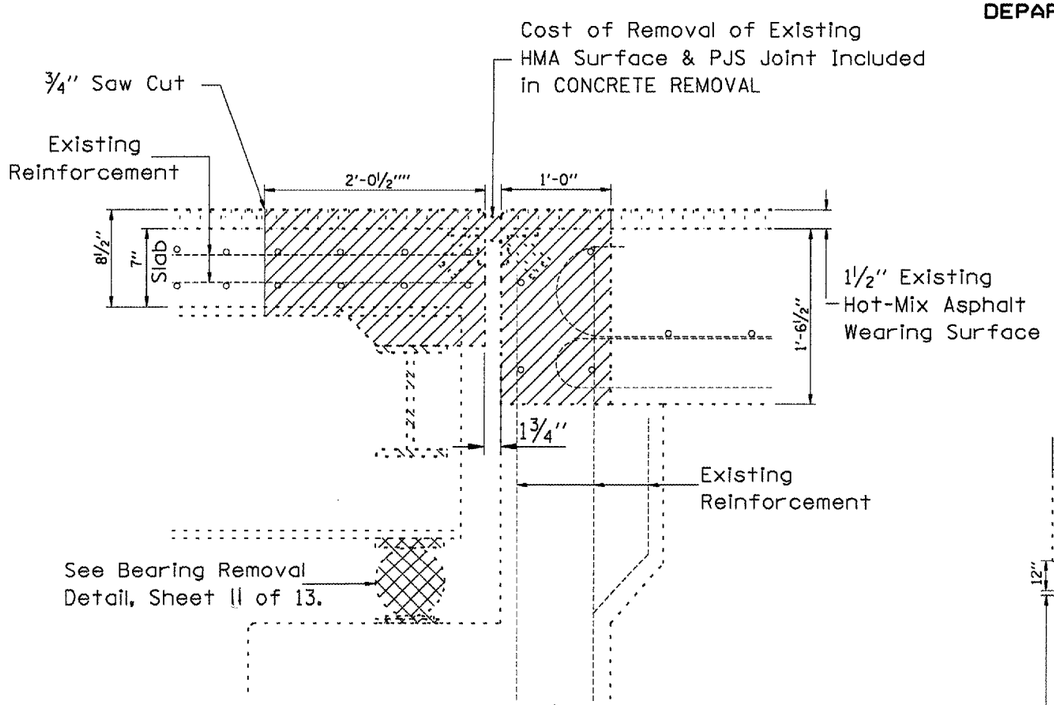
DESIGNED	DAB
CHECKED	AJB
DRAWN	baliva
CHECKED	DAB AJB

BRIDGE REPAIRS
FAP 332 OVER FRENCH CREEK
WHITE COUNTY
SN 097-0005

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 332	*	WHITE	13	6
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

* D9 CM BRIDGE REPAIR FY 08-1
CONTRACT NO. 78015



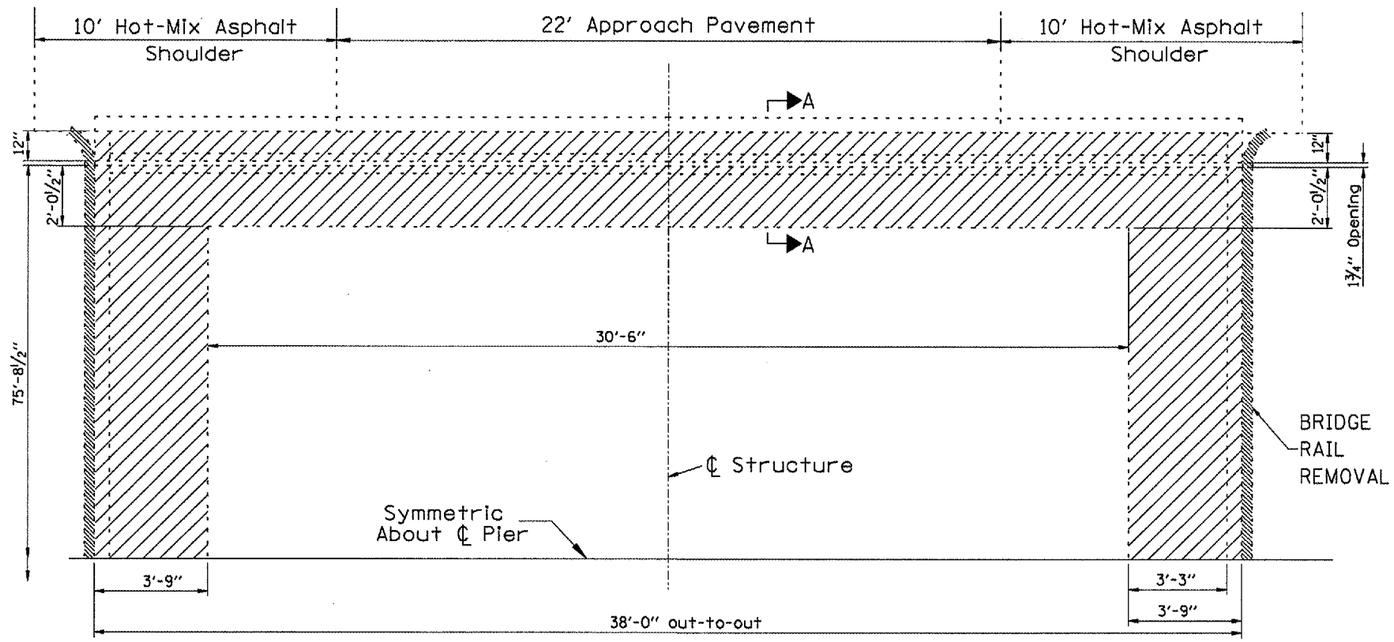
CONCRETE REMOVAL
SECTION A-A

Hooks on existing reinforcement bars may be removed if necessary.

Existing reinforcement extending into the removal area shall be cleaned, straightened and incorporated into the new construction. Any reinforcement bars that are damaged during concrete removal shall be replaced with an approved bar splicer or anchorage system. Cost shall be included with Concrete Removal.

CONCRETE REMOVAL

BRIDGE RAIL REMOVAL



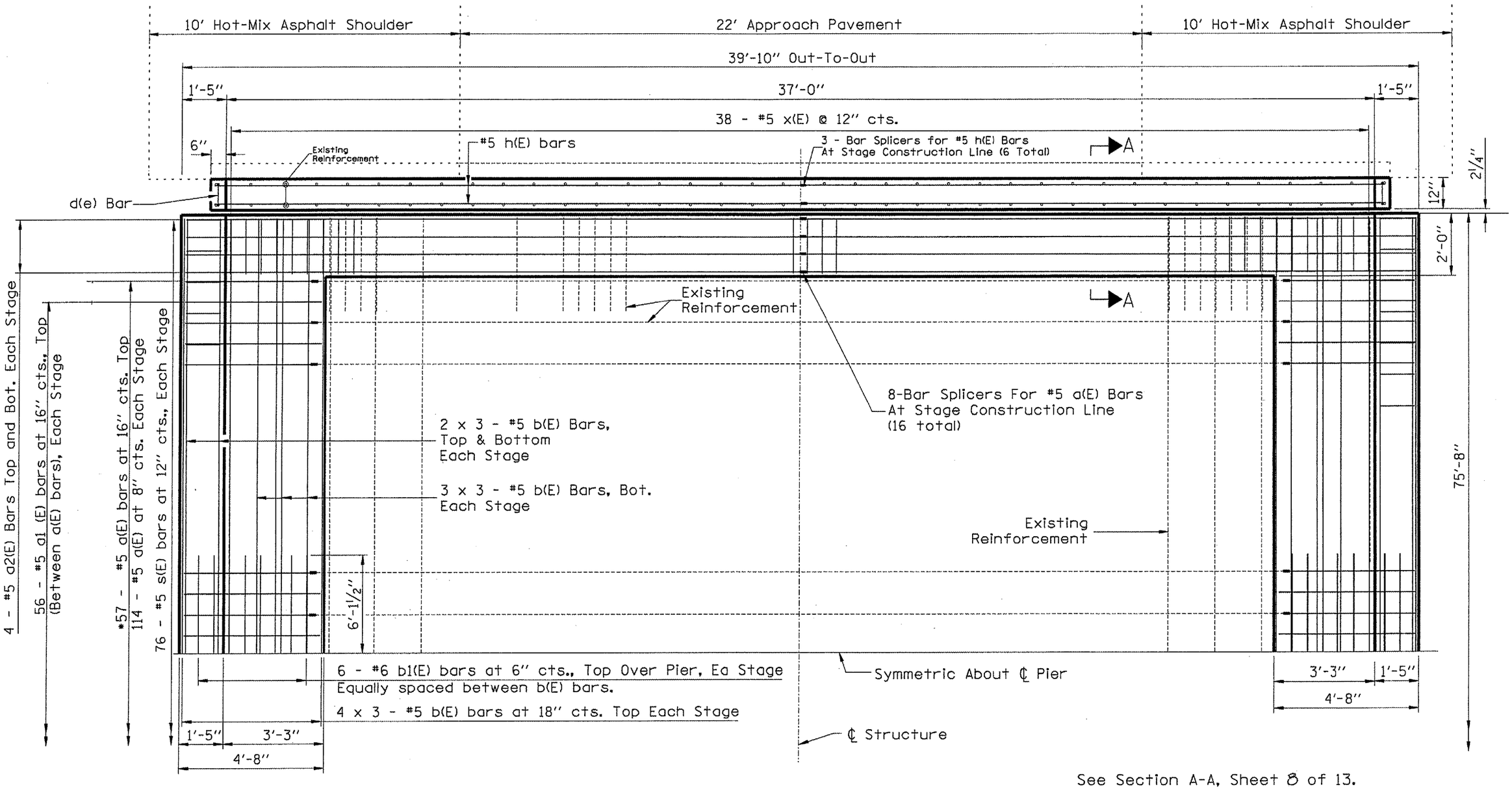
PLAN VIEW REMOVAL

Some existing reinforcement not shown for clarity.

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 332	*	WHITE	13	7
FED. ROAD DIST. NO. ?	ILLINOIS	FED. AID PROJECT-		

* D9 CM BRIDGE REPAIR FY 08-1
CONTRACT NO. 78015



*Attach to existing reinforcement with mechanical splicers. Existing reinforcement to extend 6" (min.) into the removal area to allow attachment of the mechanical splicers.

CONCRETE SUPERSTRUCTURE PLAN VIEW

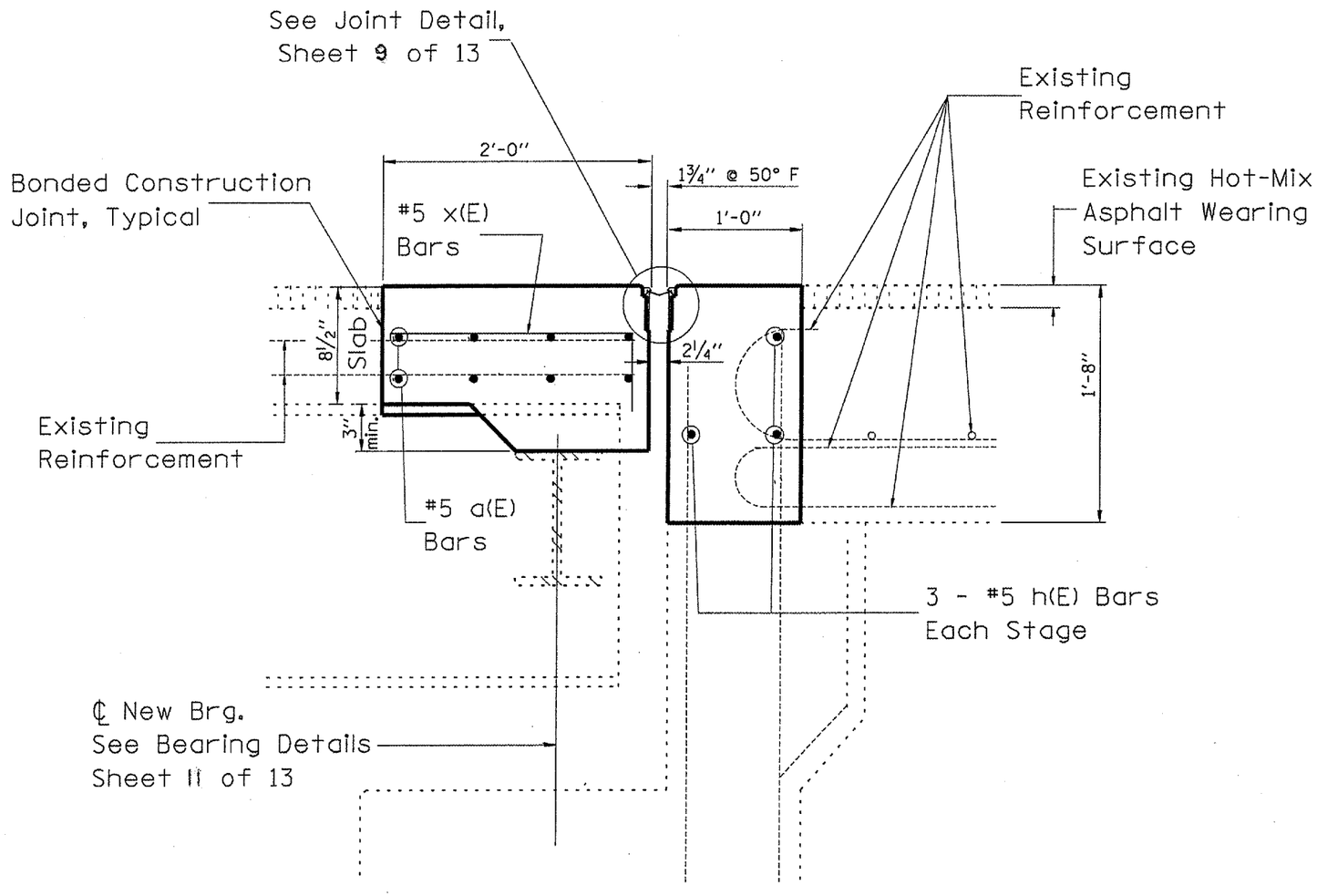
See Section A-A, Sheet 8 of 13.

Minimum Bar Laps #5 Bar = 2'-2"

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 332	•	WHITE	13	8
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

* D9 CM BRIDGE REPAIR FY 08-1
CONTRACT NO. 78015

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



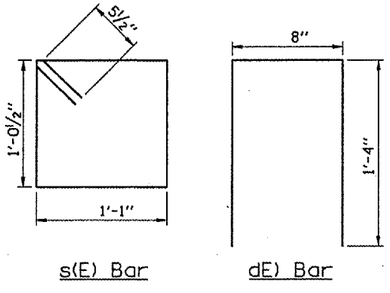
SECTION A-A

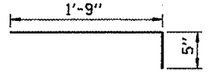
BILL OF REINFORCEMENT

Bar	No.	Size	Length	Shape
a(E)	285	#5	3'-11"	
a_1(E)	112	#5	4'-5"	
a_2(E)	32	#5	19'-8"	
b(E)	66	#5	26'-7"	
b_1(E)	12	#6	12'-3"	
d(E)	4	#4	3'-4"	
h(E)	12	#5	18'-9"	
s(E)	152	#5	5'-2"	
x(E)	76	#5	2'-2"	
Mechanical Splicers			Each	285
Bar Splicers			Each	22
Reinforcement Bars, Epoxy Coated			Pound	5630

Reinforcement bars designated (E) shall be epoxy coated.

Bars indicated thus 2 x 3 -#5 etc. indicates 2 lines of bars with 3 lengths per line.





x(E) Bar

Minimum Bar Laps #5 Bar = 2'-2"

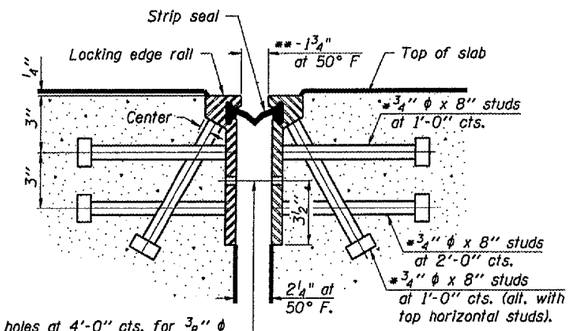
* Granular or solid flux filled headed studs conforming to Article 1006.32 of the Std. Specs., automatically end welded.

** When joint is fixed, dimension is set at 1½".

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

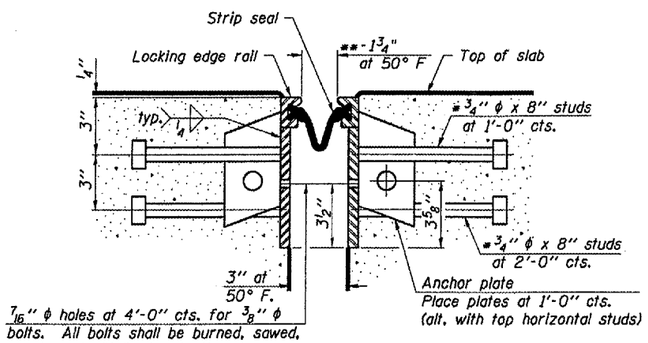
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 332	•	WHITE	13	9
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

* D9 CM BRIDGE REPAIR FY 08-1
CONTRACT NO. 78015



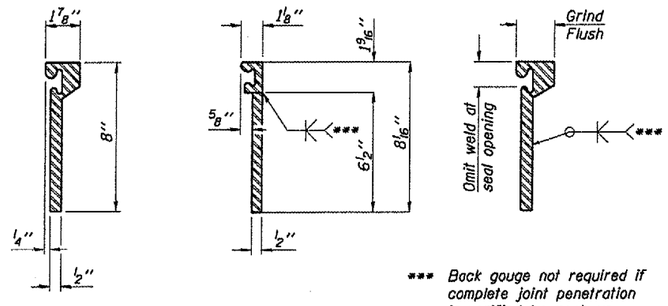
7/16" ϕ holes at 4'-0" cts. for ⅜" ϕ bolts. All bolts shall be burned, sawed, or chipped off flush with the plates after forms are removed, typ.

SECTION THRU ROLLED RAIL JOINT



7/16" ϕ holes at 4'-0" cts. for ⅜" ϕ bolts. All bolts shall be burned, sawed, or chipped off flush with the plates after forms are removed, typ.

SECTION THRU WELDED RAIL JOINT



*** Back gouge not required if complete joint penetration is verified by mock-up.

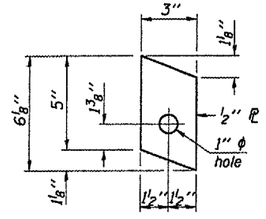
ROLLED (EXTRUDED) RAIL

WELDED RAIL

LOCKING EDGE RAIL SPLICE

The inside of the locking edge rail groove shall be free of weld residue.

LOCKING EDGE RAILS



ANCHOR ℄ (for welded rail)

Notes:

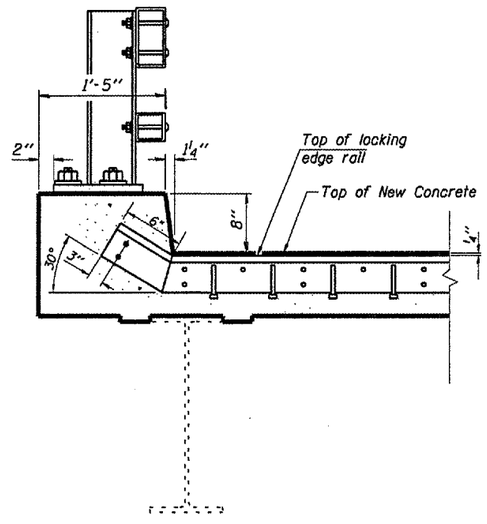
The strip seal shall be made continuous and shall have a minimum thickness of ¼". The configuration of the strip seal shall match the configuration of the Locking Edge Rails. Open or "webbed" strip seal gland configurations are not permitted. The gland shall be sized for a maximum rated movement of 4 inches.

The height and thickness of the Locking Edge Rails shown are minimum dimensions. The actual configuration of the Locking Edge Rails and matching strip seal may vary from manufacturer to manufacturer. Flanged edge rails will not be allowed. Locking Edge Rails may be spliced at slope discontinuities and stage construction joints.

The manufacturer's recommended installation methods shall be followed.

The joint opening and deck dimensions detailed on the superstructure are based on a rolled rail expansion joint. If the Contractor elects to use the welded rail expansion joint, the opening and deck dimensions shall be modified according to the dimensions detailed on this sheet. Required modifications shall be made at no additional cost to the State.

All steel components shall be galvanized after fabrication according to Article 520.03 of the Standard Specifications.



TYPICAL END TREATMENTS

BILL OF MATERIAL

Item	Unit	Total
Preformed Joint Strip Seal	Foot	76

PREFORMED JOINT STRIP SEAL

EJ-SSJ

11-1-06
7/20/07 rkg Revised Typical End Treatments

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 332	*	WHITE	13	10
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT.		

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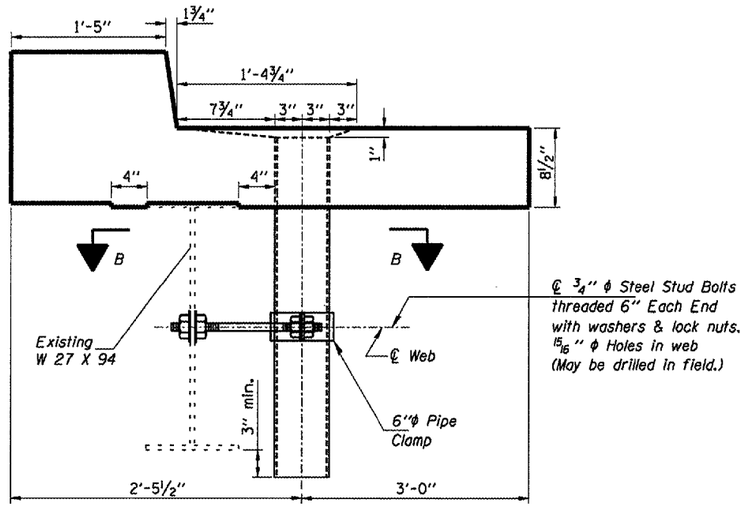
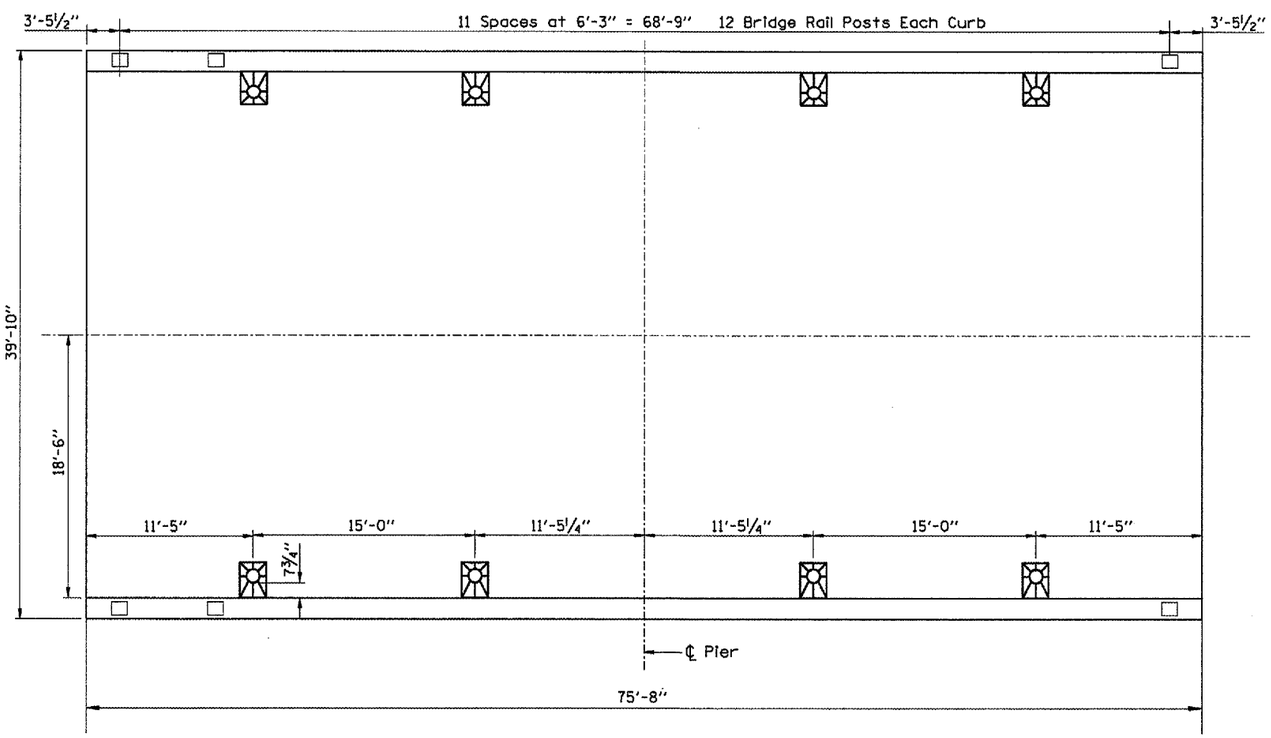
CONTRACT NO. 78015

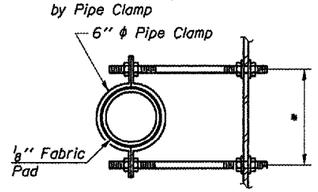


FLOOR DRAIN

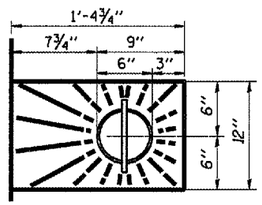


DECK PLAN VIEW

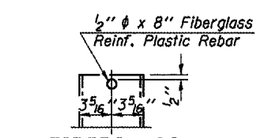
* *Dimension as required by Pipe Clamp*



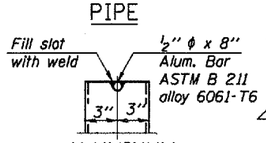
SECTION B-B



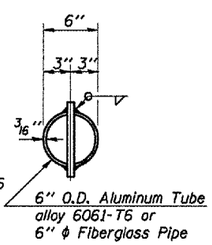
TOP PLAN



FIBERGLASS PIPE



ALUMINUM TUBE

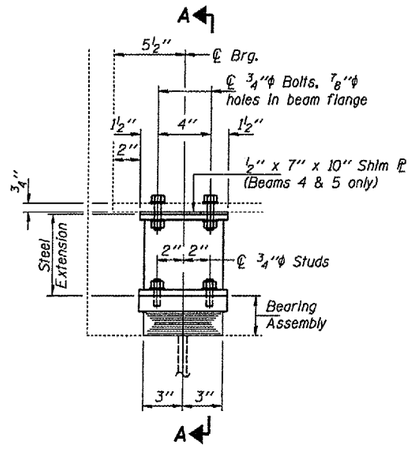


TOP PLAN
(Showing Aluminum Tube)

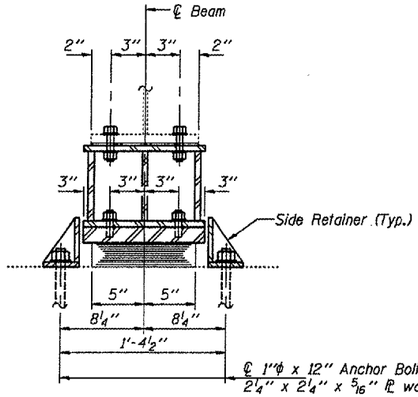
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 332	*	WHITE	13	11
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

Contract # 78015
* D9 CM BRIDGE REPAIR FY 08-1



ELEVATION AT ABUTMENT



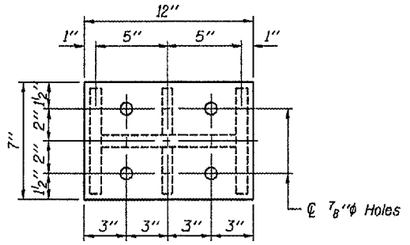
SECTION A-A

TYPE I ELASTOMERIC EXP. BRG.

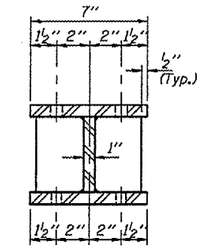
BEAM REACTIONS

R℄	(K)	11.7
R4	(K)	26.5
Imp.	(K)	8.0
R (Total)	(K)	46.2

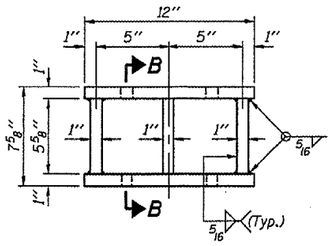
Notes:
Diaphragm removal and reinstallation may be required to facilitate drilling holes. Cost included with Furnishing and Erecting Structural Steel.
New steel extensions, shim plates and connection bolts are included with Furnishing and Erecting Structural Steel.
Prior to ordering any material, the Contractor shall verify in the field all bearing height and shim thickness dimensions.
Min. jack capacity = 25 Tons.
Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. ASTM A307 Grade C anchor bolts may be used in lieu of ASTM F1554 Grade 36 (Fy=36ksi). The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.
Drilled and set anchor bolts shall be installed according to Article 521.06 of the Standard Specifications.
Side retainers shall be included in the cost of Elastomeric Bearing Assembly, Type I.



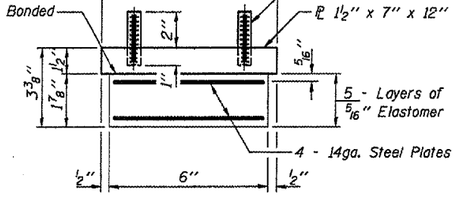
PLAN TOP AND BOTTOM PLATE



SECTION B-B

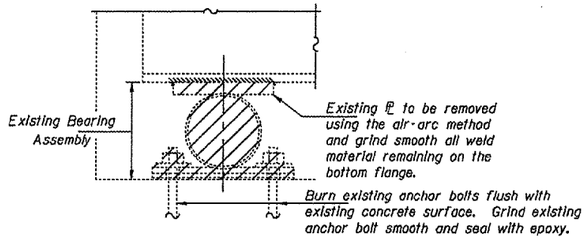


STEEL EXTENSION DETAIL



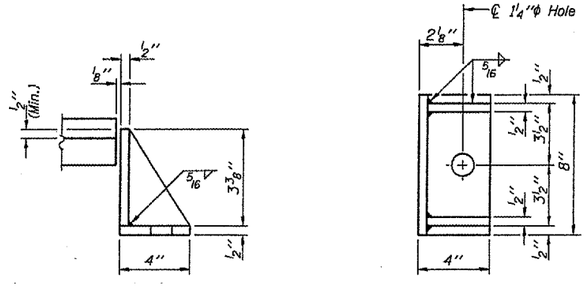
BEARING ASSEMBLY

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



EXISTING BEARING REMOVAL DETAIL

Cost included with Jack and Remove Existing Bearings.



SIDE RETAINER

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

BILL OF MATERIAL

Item	Unit	Total
Elastomeric Bearing Assembly Type I	Each	16
Jack and Remove Existing Bearings	Each	16
Furnishing and Erecting Structural Steel	Pound	1530
Anchor Bolts	Each	32

DESIGNED	DAB
CHECKED	AJB
DRAWN	baliva
CHECKED	DAB AJB

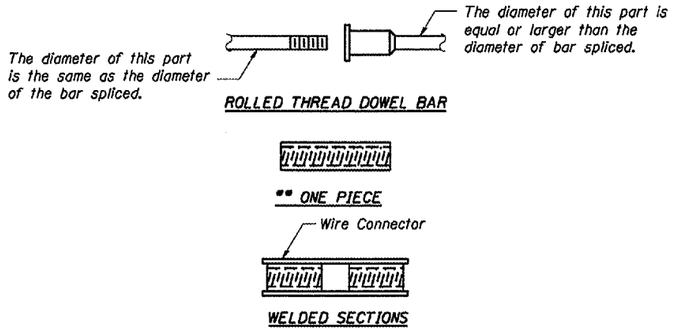
TYI/REPS 11-01-2006

BRIDGE REPAIRS
FAP 332 OVER FRENCH CREEK
WHITE COUNTY
SN 097-0005

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 332	*	WHITE	13	12
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

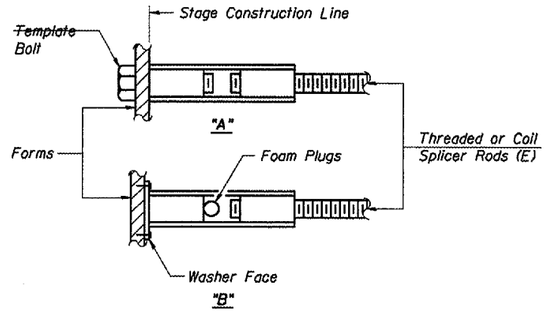
D9 CM BRIDGE REPAIR FY 08-1
CONTRACT NO. 78015

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



BAR SPLICER ASSEMBLY ALTERNATIVES

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



INSTALLATION AND SETTING METHODS

"A" : Set bar splicer assembly by means of a template bolt.
"B" : Set bar splicer assembly by nailing to wood forms or cementing to steel forms.
(E) : Indicates epoxy coating.

NOTES

Bar splicer assemblies shall be of an approved type and shall develop in tension at least 125 percent of the yield strength of the lapped reinforcement bars.

Splicer rods shall be of minimum 60 ksi yield strength, threaded or coiled full length.

All reinforcement bars shall be lapped and tied to the splicer rods or dowel bars.

Bar splicer assemblies shall be epoxy coated according to the requirements for reinforcement bars.

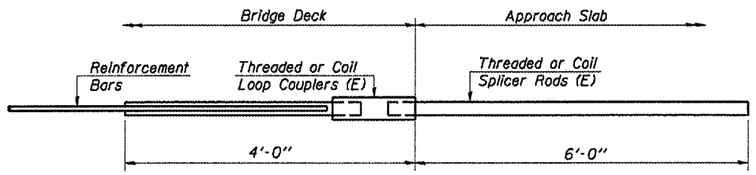
Other systems of similar design may be submitted to the Engineer for approval. Approval shall be based on certified test results from an approved testing laboratory that the proposed bar splicer assembly satisfies the following requirements:

① Minimum Capacity (Tension in kips) = $1.25 \times f_y \times A_t$

② Minimum *Pull-out Strength (Tension in kips) = $0.66 \times f_y \times A_t$

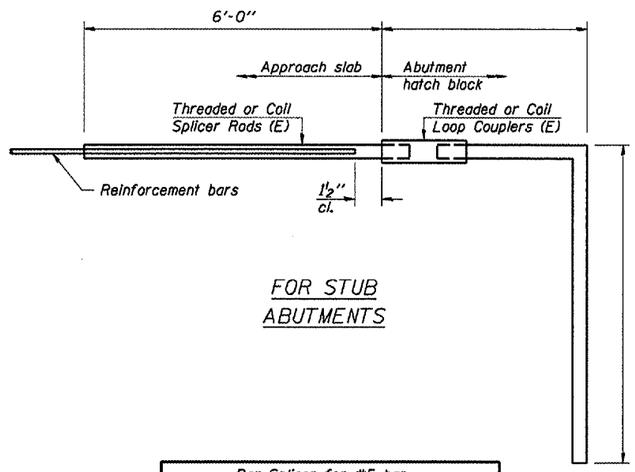
Where f_y = Yield strength of lapped reinforcement bars in ksi.
A_t = Tensile stress area of lapped reinforcement bars.
* = 28 day concrete

BAR SPLICER ASSEMBLIES			
Bar Size to be Spliced	Splicer Rod or Dowel Bar Length	Strength Requirements	
		Min. Capacity kips - tension	Min. Pull-Out Strength kips - tension
#4	1'-8"	14.7	7.9
#5	2'-0"	23.0	12.3
#6	2'-7"	33.1	17.4
#7	3'-5"	45.1	23.8
#8	4'-6"	58.9	31.3
#9	5'-9"	75.0	39.6
#10	7'-3"	95.0	50.3
#11	9'-0"	117.4	61.8



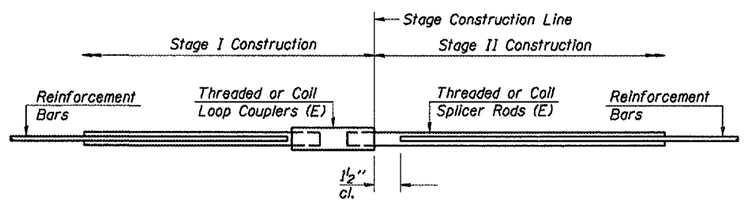
FOR INTEGRAL OR SEMI-INTEGRAL ABUTMENTS

Bar Splicer for #5 bar
Min. Capacity = 23.0 kips - tension
Min. Pull-out Strength = 12.3 kips - tension
No. Required =



FOR STUB ABUTMENTS

Bar Splicer for #5 bar
Min. Capacity = 23.0 kips - tension
Min. Pull-out Strength = 12.3 kips - tension
No. Required =



STANDARD

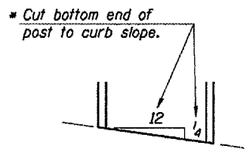
Bar Size	No. Assemblies Required	Location
#5	22	Stage Constr. Line

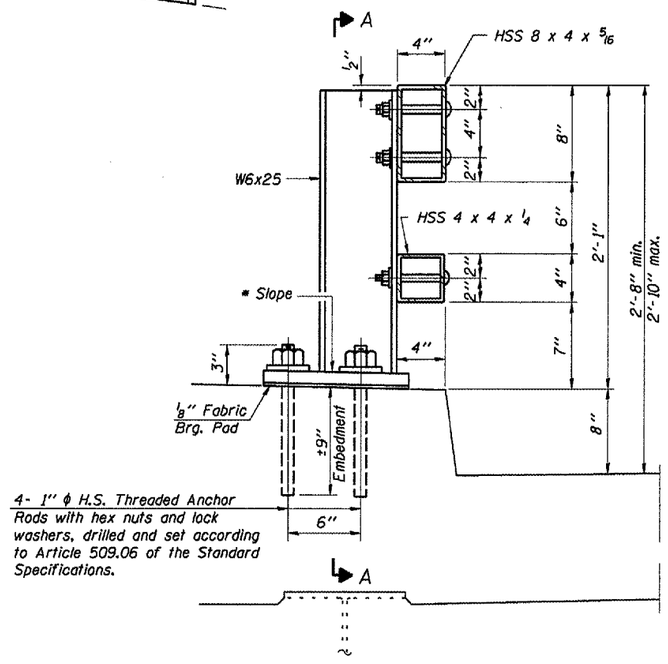
BAR SPLICER ASSEMBLY DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

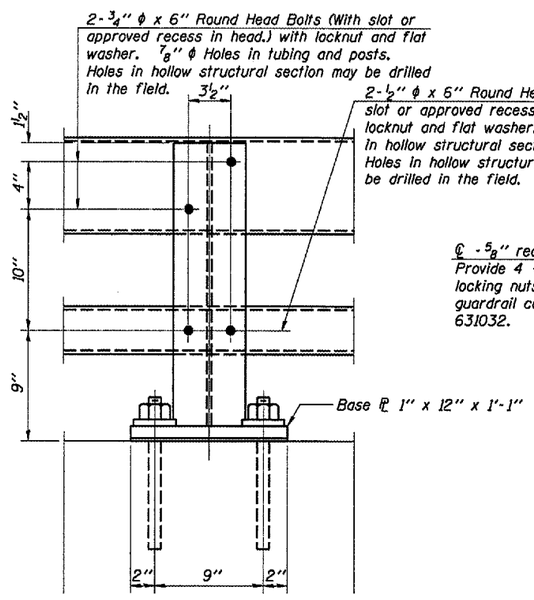
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 332	*	WHITE	13	13
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT:		

*** D9 CM BRIDGE REPAIR FY 08-1**
CONTRACT NO. 78015

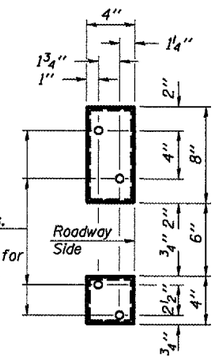




SECTION AT RAIL POST

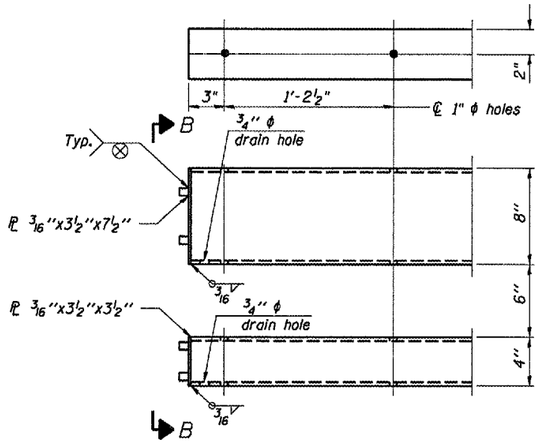


SECTION A-A



VIEW B-B

℄ - 5/8" reduced base welded studs. Provide 4 - 5/8" washers and self-locking nuts or nuts and jam nuts for guardrail connection shown on Std. 631032.



END OF RAIL DETAILS

Notes:

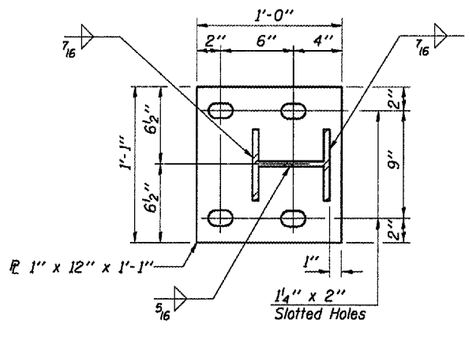
All field drilled holes shall be coated with an approved zinc rich paint before erection.

Posts shall not be located closer than 1'-3" to an existing bridge expansion joint or end of bridge.

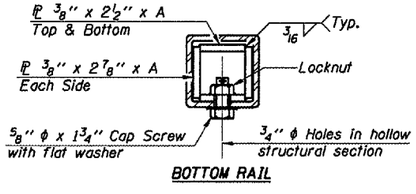
Steel Bridge Rail expansion joint shall be provided between any two (2) posts which span a bridge expansion joint. Bolts located at expansion joint shall be provided with locknuts and shall be tightened only to a point that will allow railing movement.

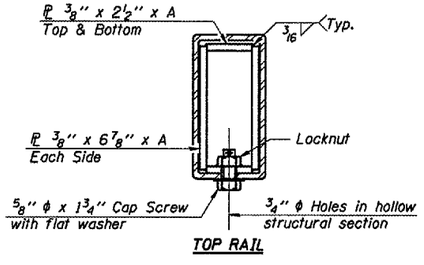
Provide one 1/8" and two 1/16" steel shims for 25% of the posts. Shims shall be similar to base plates in size and holes.

All steel rail elements shall be galvanized according to Article 509.05 of the Standard Specifications.

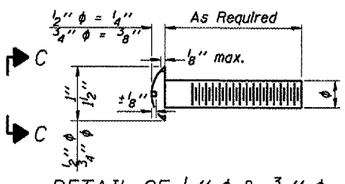


BASE PLATE DETAIL

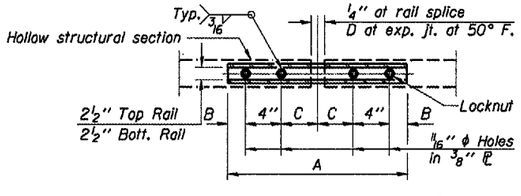




SECTIONS AT RAIL SPLICE

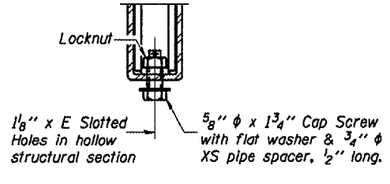


DETAIL OF 1/2" ϕ & 3/4" ϕ ROUND HEAD BOLTS



(6'-3" Maximum Post Spacing)
See post spacing Sheet 10 of 13.

PLAN-BOTT. SPLICE ℄ TYPICAL



RAIL SPLICE CONNECTION AT EXPANSION JT.

BILL OF MATERIAL

Item	Unit	Quantity
Steel Railing, Type 2399	Foot	156'-0"

SPLICE DIMENSIONS

T	D	A	B	C	E
≤4"	2 1/2"	1'-8"	2"	4"	2 1/2"
>4" ≤6 1/2"	3 3/4"	2'-0"	2 1/2"	5 1/2"	3 1/2"
>6 1/2" ≤9"	5"	2'-4"	3 1/2"	6 1/2"	9"
>9" ≤13"	7"	2'-10"	4 1/2"	8 1/2"	11"
Rail Splice	1/4"	1'-8"	2"	4"	—

T = Total movement at expansion joint as shown on the design plans.

STEEL RAILING, TYPE 2399

11-1-06
7/20/07 rkg Revised line style.