

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**PROPOSED
HIGHWAY PLANS**

FAI ROUTE 24 (I-24)
SECTION (64-3B)I-7

BEARING REPLACEMENT
MASSAC COUNTY, ILLINOIS
McCRACKEN COUNTY, KENTUCKY

C-99-013-15

FOR INDEX OF SHEETS, SEE SHEET NO. 2
FOR SUMMARY OF QUANTITIES, SEE SHEET NO. 3-4

TRAFFIC DATA

I-24 TRAFFIC DATA

2014 ADT = 29,600 (TWO WAY)
20% TRUCKS

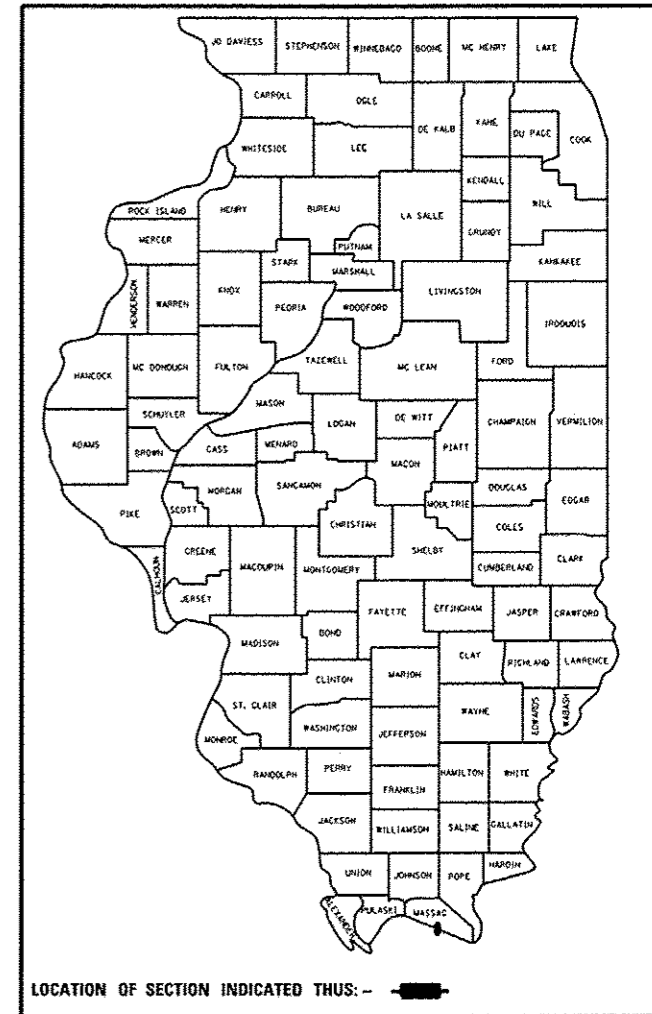
TOWNSHIPS:

COUNTY UNIT ROAD DISTRICT

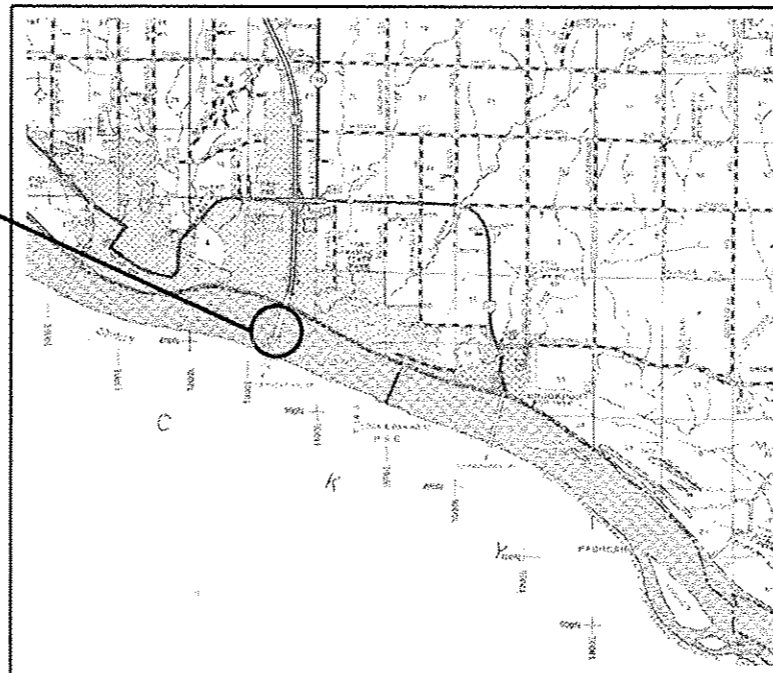
F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-24	(64-3B)I-7	MASSAC ILLINOIS	18	1
ILLINOIS CONTRACT NO. 78448				

* 18+2 = 20 TOTAL SHEETS

D-89-008-15



EXISTING STRUCTURE NO.
064-0035 ILLINOIS
073-0024-B0100 KENTUCKY
FAI 24 OVER THE OHIO RIVER



STRUCTURE LENGTH = 5,634 FT.



J.U.L.I.E.
JOINT UTILITY LOCATION INFORMATION FOR EXCAVATION
1-800-892-0123
OR 811

PROJECT MANAGER: DAVID PICHE (618) 351-5227

CONTRACT NO. 78448

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED Dec 16 20 14

Anthony Z. Keim
DEPUTY DIRECTOR OF HIGHWAYS, REGION ENGINEER

John D. Baranzoli, PE, B
ENGINEER OF DESIGN AND ENVIRONMENT

Jan 30 20 15

Omer Osman, PE, B
DIRECTOR OF HIGHWAYS, CHIEF ENGINEER

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GENERAL NOTES

- 1) IN ADDITION TO THE REQUIREMENTS OF ARTICLE 107.16 THE CONTRACTOR SHALL PROTECT THE SURFACE OF ALL BRIDGE DECKS AND BRIDGE APPROACH PAVEMENTS IN A MANNER SATISFACTORY TO THE ENGINEER BEFORE ANY EQUIPMENT IS ALLOWED TO CROSS THE STRUCTURE. PROTECTION SHALL BE PROVIDED FOR ALL EQUIPMENT AS DEFINED IN ARTICLE 101.16 REGARDLESS IF TRACK MOUNTED OR WHEELED.
- 2) IF THE CONTRACTOR CHOOSES TO MODIFY THE SUGGESTED SEQUENCE OF CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT A REVISED SEQUENCE OF CONSTRUCTION AND TRAFFIC CONTROL LAYOUT DETAILS FOR REVIEW AND ACCEPTANCE BY THE ENGINEER.
- 3) COMMITMENTS: NONE AS OF MARCH 20, 2015.

INDEX OF SHEETS

- 1 COVER SHEET
- 2 INDEX OF SHEETS, GENERAL NOTES, STANDARDS
- 3-4 SUMMARY OF QUANTITIES
- 5 WIDE LOAD SIGNING PLAN
- * 6-18 BRIDGE DETAILS

* INCLUDES SHEETS 10A AND 10B.

ILLINOIS HIGHWAY STANDARDS

- 000001-06 STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS
- 001001-02 AREAS OF REINFORCEMENT BARS
- 701101-04 OFF-ROAD, MULTILANE 15' TO PAVEMENT EDGE
- 701400-08 APPROACH TO LANE CLOSURE FREEWAY/EXPRESSWAY
- 701401-09 LANE CLOSURE FREEWAY/EXPRESSWAY
- 701402-10 LANE CLOSURE FREEWAY/EXPRESSWAY, WITH BARRIER
- 701901-04 TRAFFIC CONTROL DEVICES
- 704001-07 TEMPORARY CONCRETE BARRIER

701428

Prepared By:	<i>Joe Zlanfranovich</i> DISTRICT STUDIES & PLANS ENGINEER
Examined By:	<i>Paul E. [Signature]</i> DISTRICT LAND ACQUISITION ENGINEER
Examined By:	<i>Annunzio [Signature]</i> DISTRICT PROGRAM DEVELOPMENT ENGINEER
Examined By:	<i>Karl [Signature]</i> DISTRICT OPERATIONS ENGINEER
Examined By:	<i>[Signature]</i> DISTRICT PROJECT IMPLEMENTATION ENGINEER
Examined By:	<i>[Signature]</i> DISTRICT CONSTRUCTION ENGINEER
Examined By:	<i>Bruce [Signature]</i> DISTRICT MATERIALS ENGINEER

FILE NAME *	USER NAME * halsteadt	DESIGNED -	REVISED -
c:\pwwork\pwwork\halsteadt\042077017	4448-shr-plan.dgn	DRAWN -	REVISED -
	PLOT SCALE * 100.0000 1/1 in.	CHECKED -	REVISED -
	PLOT DATE * 12/15/2014	DATE -	REVISED -

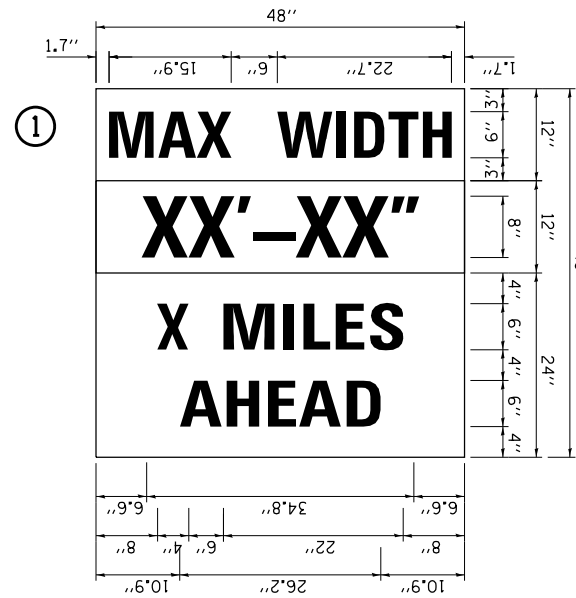
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

INDEX OF SHEETS, GENERAL NOTES,
STANDARDS

SCALE: SHEET NO. OF SHEETS STA. TO STA.

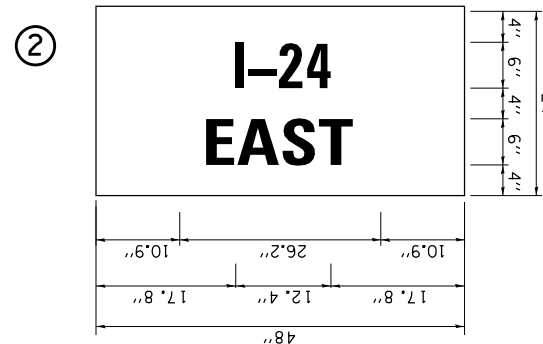
F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
24	(64-381)-7	MASSAC	18	2
CONTRACT NO. 78448				
ILLINOIS FED. AID PROJECT				

SIGN LEGEND

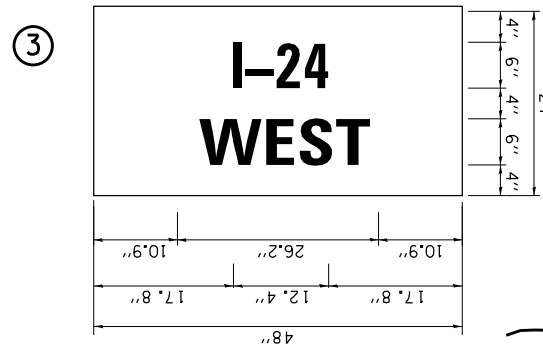


W12-1103

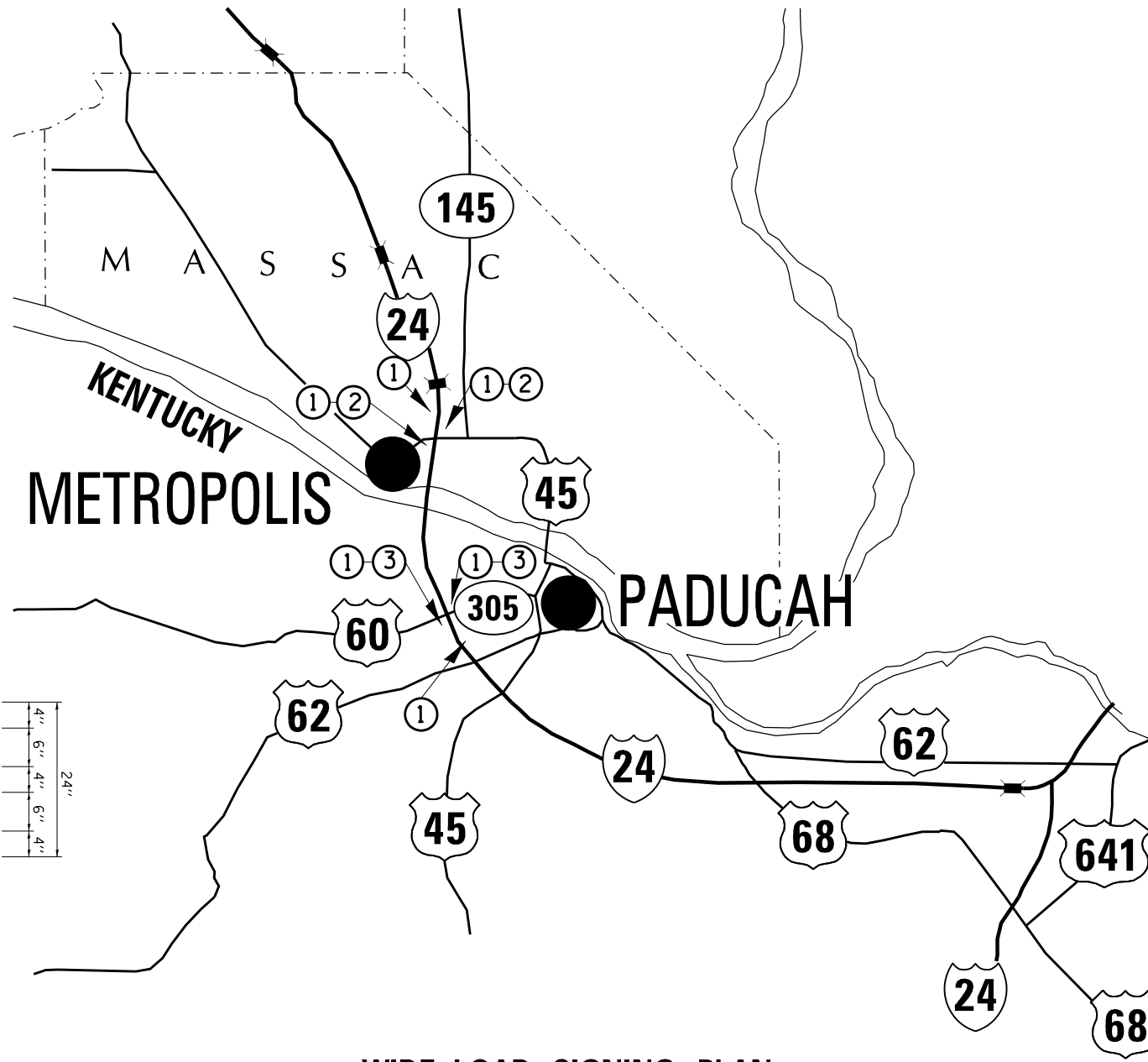
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 NO BORDER, BLACK ON WHITE;
 "MAX WIDTH" D;
 NO BORDER, BLACK ON ORANGE;
 "XX'-XX'" D;
 NO BORDER, BLACK ON WHITE;
 "X MILES" D; "AHEAD" D



NO BORDER, BLACK ON WHITE;
 "I-24" D;
 NO BORDER, BLACK ON WHITE;
 "EAST" D



NO BORDER, BLACK ON WHITE;
 "I-24" D;
 NO BORDER, BLACK ON WHITE;
 "WEST" D



WIDE LOAD SIGNING PLAN

DETOUR NOTES:

- THE CONTRACTOR SHALL FURNISH THE POSTS AND ERECT THE SIGNS AT THE LOCATIONS AS DIRECTED BY THE ENGINEER. ALL SIGNS SHALL BE POST MOUNTED.

 THE ABOVE NOTED WORK, INCLUDING SIGNS, POSTS, HARDWARE AND LABOR SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE, EACH, FOR TRAFFIC CONTROL AND PROTECTION, (SPECIAL) AND NO OTHER COMPENSATION WILL BE ALLOWED.

 THE WIDTH SHOWN ON THE W12-1103 SIGN SHALL BE 14'-1" FOR E.B TRAFFIC AND 14'-1" FOR W.B. TRAFFIC OR AS DIRECTED BY THE ENGINEER. THE "X" MILES AHEAD WILL BE DETERMINED BY THE ENGINEER.

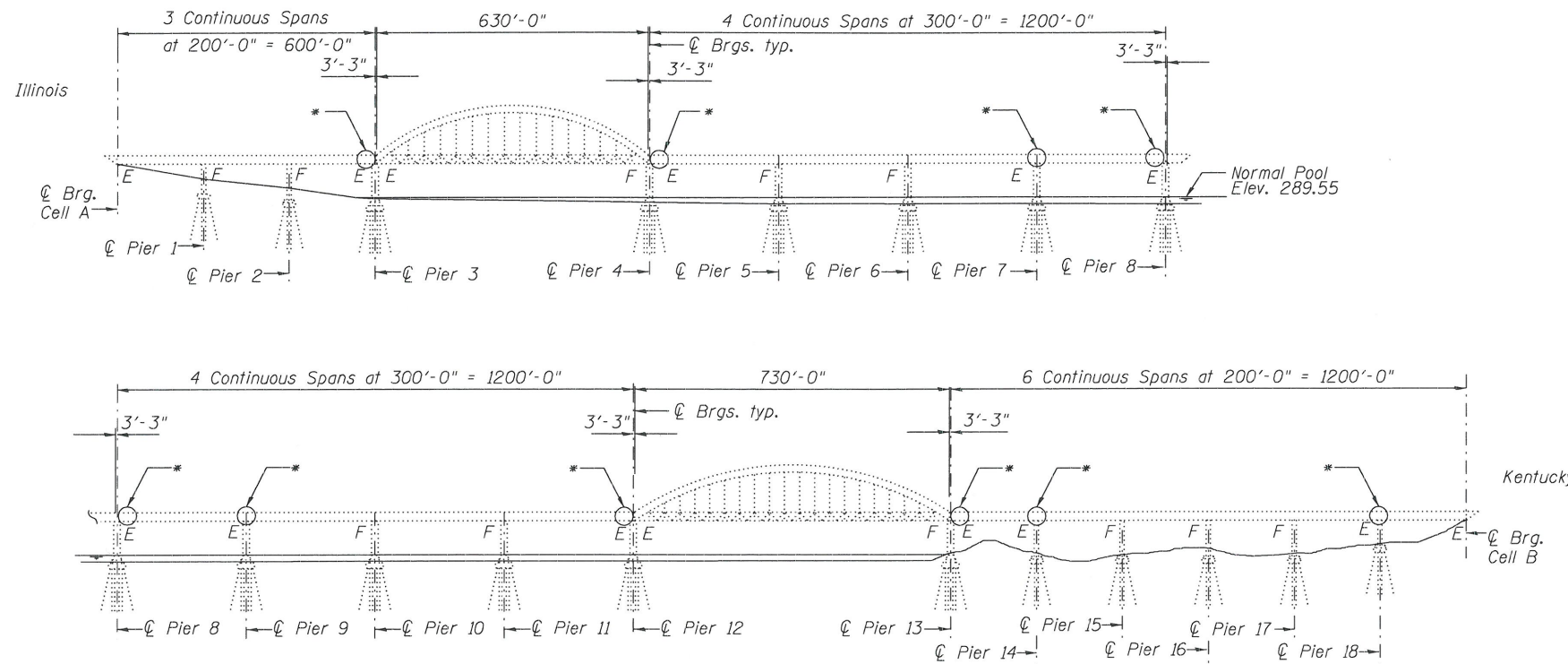
FILE NAME = c:\pwwork\pwwork\halsteadw\d0420770\78448-sht-plan.dgn	USER NAME = halsteadw	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	WIDE LOAD SIGNING PLAN			F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.		
	PLOT SCALE = 200.0000' / in.	DRAWN -	REVISED -		SCALE:	SHEET NO.	OF SHEETS	STA.	TO STA.	24	(64-3B)I-7	MASSAC	18	5
	PLOT DATE = 12/16/2014	CHECKED -	REVISED -		CONTRACT NO. 78448									
		DATE -	REVISED -		ILLINOIS FED. AID PROJECT									

Traffic: Traffic to be maintained utilizing stage construction.

Salvage: No Salvage.

TOTAL BILL OF MATERIAL

ITEM	UNIT	SUPER	SUB	TOTAL
Concrete Removal	Cu. Yd.	—	1.1	1.1
Concrete Structures	Cu. Yd.	—	46.7	46.7
Reinforcement Bars, Epoxy Coated	Pound	—	5,130	5,130
Anchor Bolts, 1 1/4"	Each	16	—	16
Anchor Bolts, 1 1/2"	Each	32	—	32
Anchor Bolts, 2"	Each	40	—	40
High Load Multi-Rotational Bearings, Guided Expansion, 750K	Each	4	—	4
Structural Steel Repair	Pound	23,750	—	23,750
Removal of Existing Bearings	Each	20	—	20
Jacking and Cribbing	Each	20	—	20
High Load Multi-Rotational Bearings, Guided Expansion, 1100K	Each	8	—	8
High Load Multi-Rotational Bearings, Guided Expansion, 2000K	Each	4	—	4
High Load Multi-Rotational Bearings, Guided Expansion, 3100K	Each	4	—	4



GENERAL NOTES

Except as otherwise specified, fasteners shall be ASTM A325 Type 1, mechanically galvanized bolts. Bolts 7/8 in. ϕ , open holes 15/16 in. ϕ , unless otherwise noted.
 All structural steel shall be AASHTO M 270, Grade 50. Steel used in the jacking and cribbing shall be AASHTO M 270, Grade 50 unless otherwise noted.
 No field welding is permitted except as specified in the contract documents.
 Reinforcement bars designated (E) shall be epoxy coated.
 Plan dimensions and details relative to existing plans are subject to nominal construction 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.
 Bearing seat surfaces shall be constructed or adjusted to the designated elevations within a tolerance of 1/8 inch (0.01 ft.). Adjustment shall be made either by grinding the surface or by shimming the bearings.
 The existing structural steel coating contains lead. The Contractor shall take appropriate precautions to deal with the presence of lead on this project.
 The Inorganic Zinc Rich Primer / Acrylic / Acrylic Paint System shall be used for shop and field painting of new structural steel except where otherwise noted. The color of the final finish coat shall be Gray, Munsell No. 5B 7/1. Cost included with Structural Steel Repair.
 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".
 The Contractor shall perform the work with care, so that any materials which are to remain in place shall not be damaged. If the Contractor damages any materials which are to remain in place, the damaged materials shall be replaced or repaired in a manner satisfactory to the Engineer at the expense of the Contractor.
 The Contractor shall ensure that no infringement of the navigational underclearance or channel occurs while doing the work. Any infringement shall be approved by the United States Coast Guard. The Contractor shall contact Mr. Eric Washburn, Coast Guard 8th District, 1222 Spruce Street, St. Louis, MO 63103, (314) 269-2378 for requirements needed to obtain the necessary permits. Emergency Contact U.S.C.G. 24-Hour Watch Center (502) 779-5422.
 The combined weight of construction vehicles, construction equipment including work platforms, and stockpiled materials, shall not exceed 40 tons at any given time at each bearing replacement location. The Contractor shall submit construction weights and associated sequencing to the Engineer for approval.

ELEVATION

(Looking East)

*Remove and replace existing rocker bearings with HLMR Expansion Bearings and Concrete Pedestals. Existing tied arch span rocker bearings are not to be replaced.

LOADING HS20-44 (NEW CONSTRUCTION)

Allow 0#/sq. ft. for future wearing surface.

DESIGN TRAFFIC LANES

HLMR Expansion Bearings: Four lanes, max. loading configuration
 Jacking and Cribbing: Three lanes, staged configuration

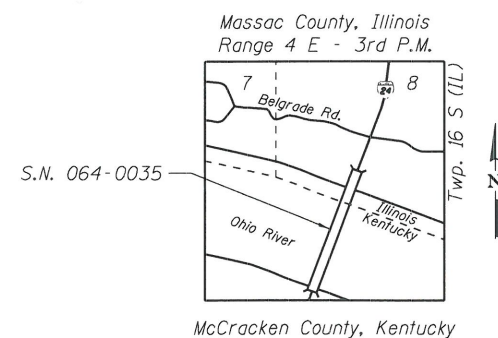
DESIGN SPECIFICATIONS

2002 AASHTO Standard Specifications for Highway Bridges, 17th Edition and the AASHTO Manual for Bridge Evaluation, 2nd Edition, with 2011 and 2013 Interims.

DESIGN STRESSES (NEW CONSTRUCTION)

FIELD UNITS

$f'_c = 3,500$ psi
 $f_y = 60,000$ psi (Reinforcement)
 $f_y = 50,000$ psi (M270 Grade 50 Structural Steel)



LOCATION SKETCH

LICENSED STRUCTURAL ENGINEER
 RACHEL L. MERTZ
 081.006526
 STATE OF ILLINOIS
 1/27/15
 RACHEL L. MERTZ
 EDWARDSVILLE, ILLINOIS
 ILLINOIS LICENSED STRUCTURAL
 ENGINEER NO. 081-006526
 EXPIRES 11/30/2016

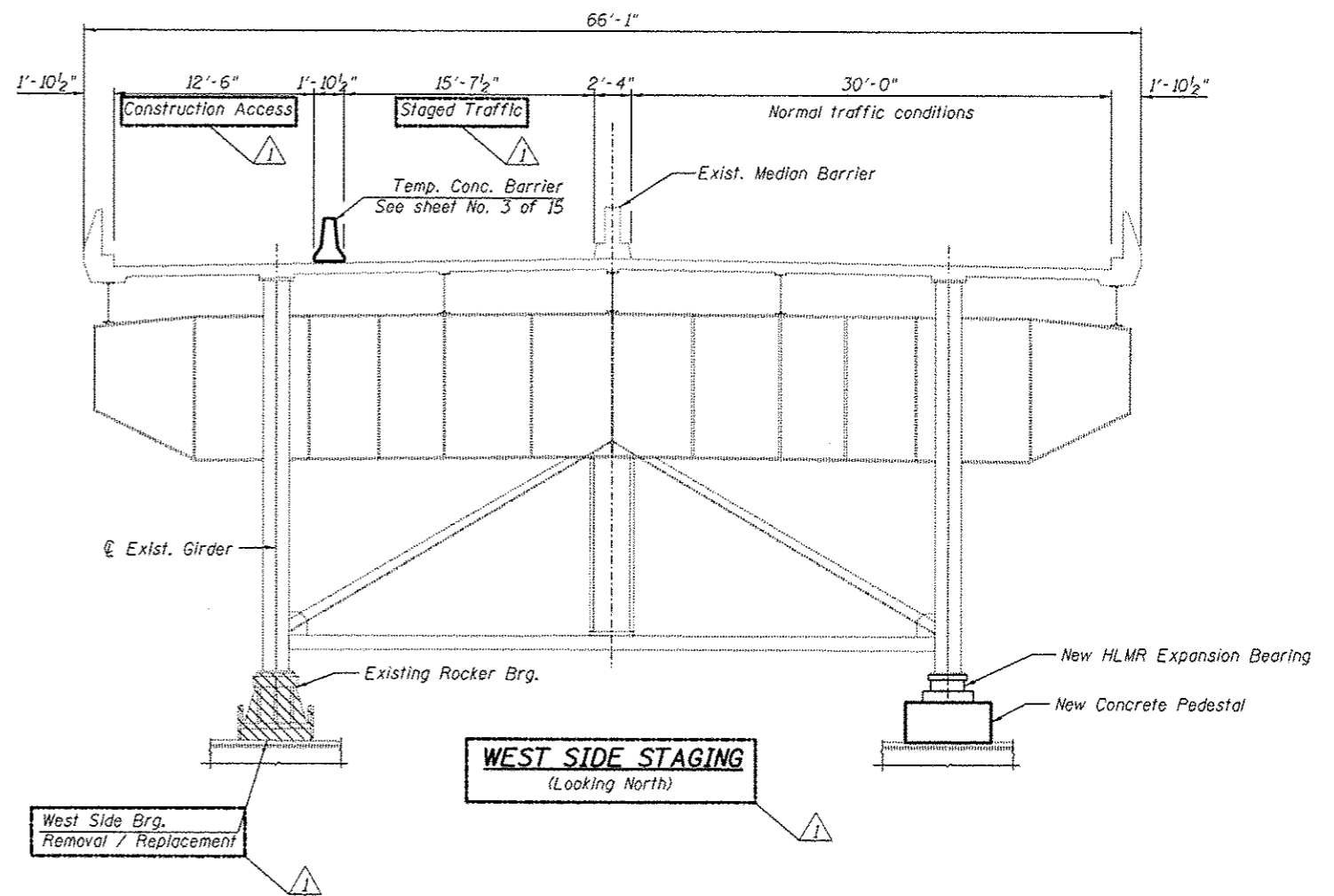
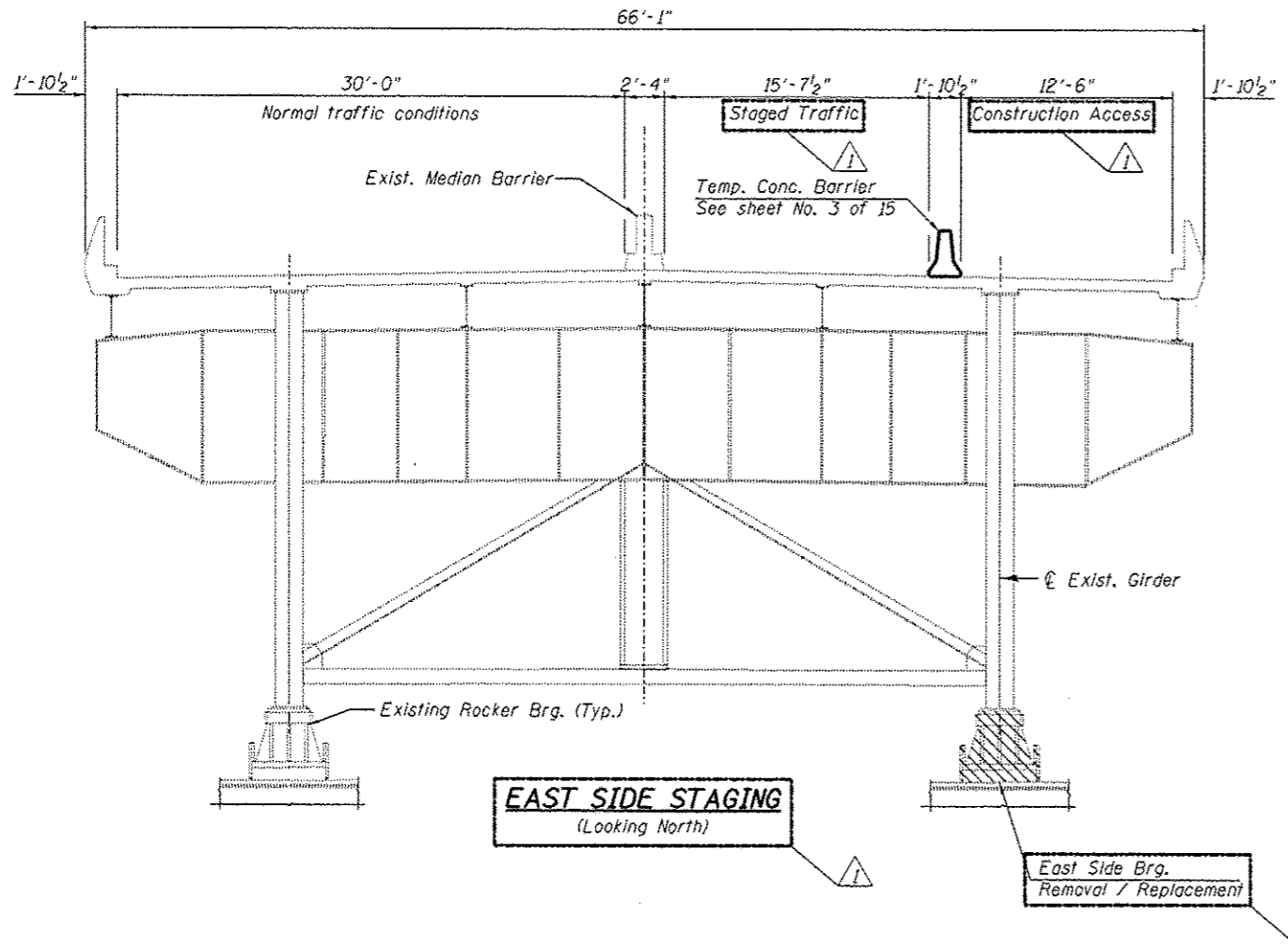
INDEX OF SHEETS

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- 2 Typical Stage Construction Details and Sequence of Construction
- 3 Temporary Concrete Barrier for Stage Construction
- 4 Bearing Removal and Jacking Stiffener Details - 1
- 5 Bearing Removal and Jacking Stiffener Details - 2
- 6 Bearing Removal and Jacking Stiffener Details - 3
- 7 Jacking and Concrete Pedestal Details - Piers 3N and 13S
- 8 Jacking and Concrete Pedestal Details - Piers 4S and 12N
- 9 Cribbing Details - Piers 3N, 4S, 12N and 13S
- 10 Jacking and Concrete Pedestal Details - Piers 7 and 9
- 11 Jacking and Concrete Pedestal Details - Pier 8
- 12 Jacking and Concrete Pedestal Details - Piers 14 and 18
- 13 Temporary Bearing Details
- 14 High Load Multi-Rotational Bearings - 1
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GENERAL ELEVATION

F.A.I. ROUTE 24 - SEC. (64-3B)I-7
 MASSAC COUNTY
 STRUCTURE NO. 064-0035

	USER NAME =	DESIGNED - APL	REVISED	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	
		CHECKED - MEL	REVISED		1-24	(64-3B)I-7	MASSAC	18	6	
	PLOT SCALE =	DRAWN - EAR	REVISED		CONTRACT NO. 78448					
	PLOT DATE = 01/27/2015	CHECKED - APL	REVISED		ILLINOIS FED. AID PROJECT					



CONSTRUCTION SEQUENCE

BEARING REPLACEMENT PROCEDURE

Traffic will be maintained utilizing stage construction. All lanes will be open to traffic during holiday periods as defined in Article 107.09 of the Standard Specifications.

Jacking and cribbing have been designed to support only three lanes of staged traffic. Bearing replacements must be phased so the structure is not supported by jacking and cribbing when the bridge is fully opened during holiday periods.

Traffic shall be removed from the portion of the structure to be jacked prior to and during the entire time the load is supported by the hydraulic pressure of the jacks. See Special Provisions.

Bearing replacements shall be phased such that adjacent piers will not be supported by jacking and cribbing at the same time.

- The Contractor shall sequence construction as follows:
- Phase I: Perform west side bearing replacements at Piers 4S, 8N, 8S and 12N.
 - Phase II: Perform east side bearing replacements at Piers 4S, 8N, 8S and 12N.
 - Phase III: Perform east side bearing replacements at Piers 3N, 9, 13S and 18.
 - Phase IV: Perform east side bearing replacements at Piers 7 and 14.
 - Phase V: Perform west side bearing replacements at Piers 9, 13S and 18.
 - Phase VI: Perform west side bearing replacements at Piers 3N, 7 and 14.

The Contractor shall remove the jacking and cribbing and all elements required for the jacking operation when the bearing replacement is complete. Anchor rods and anchor bolts required for jacking and cribbing shall be burned flush with the concrete surface. Jacking and cribbing including temporary bearings and jacking plates, beams and brackets shall be reused for bearing replacements at similar locations. At the Contractor's discretion, jacking stiffeners and connection angles may be left in-place or reused for bearing replacements at similar locations. Open holes in the existing girder shall be filled with A325 bolts of the same diameter as the removed bolt.

1. Lay out the new bearing and jacking stiffeners for both temporary and permanent bearing locations. Ensure that bearing plates bear fully and evenly on the top of girder bottom flanges and that connection angles lie flat against the girder webs. Using the holes in the pre-drilled connection angles as a template, drill holes in the girder webs. Verify full bearing of the new stiffeners on the bottom flanges and fasten the stiffeners to the girder webs.
2. As required at each location, install the jacking and cribbing and temporary bearings in accordance with the plans.
3. Using a manifold, extend the jacks at a given location until the temporary bearings bear snugly and evenly on the girder bottom flange. Fasten the top assembly of the temporary bearings to the girder bottom flange.
4. Raise the girders ($\frac{1}{8}$ " max), lock the jacks and remove the existing bearings.
5. Where required, remove portions of concrete as indicated in the drawings, being careful not to damage concrete that is to remain in place. Prepare the exposed concrete surface for bonding with new concrete. Form the new concrete pedestals, set the anchor bolts and reinforcement, and place the new pedestal concrete. Forms may be removed and load applied to the new bearing pedestals per the Standard Specifications.
6. Install the new HLMR bearings, including any necessary shim plates. Position the bearings appropriately for the temperature at the time of initial loading.
7. Lower the girder onto the new bearing. Verify the location of the upper bearing plate on the girder, and fasten the upper plate to the girder bottom flange.
8. Disconnect and remove jacking stiffeners, temporary bearings, jacking and cribbing, and where applicable, jacking brackets. Fill all open holes in the girder web and bottom flange with appropriately sized bolts, complete with washer and nut tightened by the turn of the nut method.



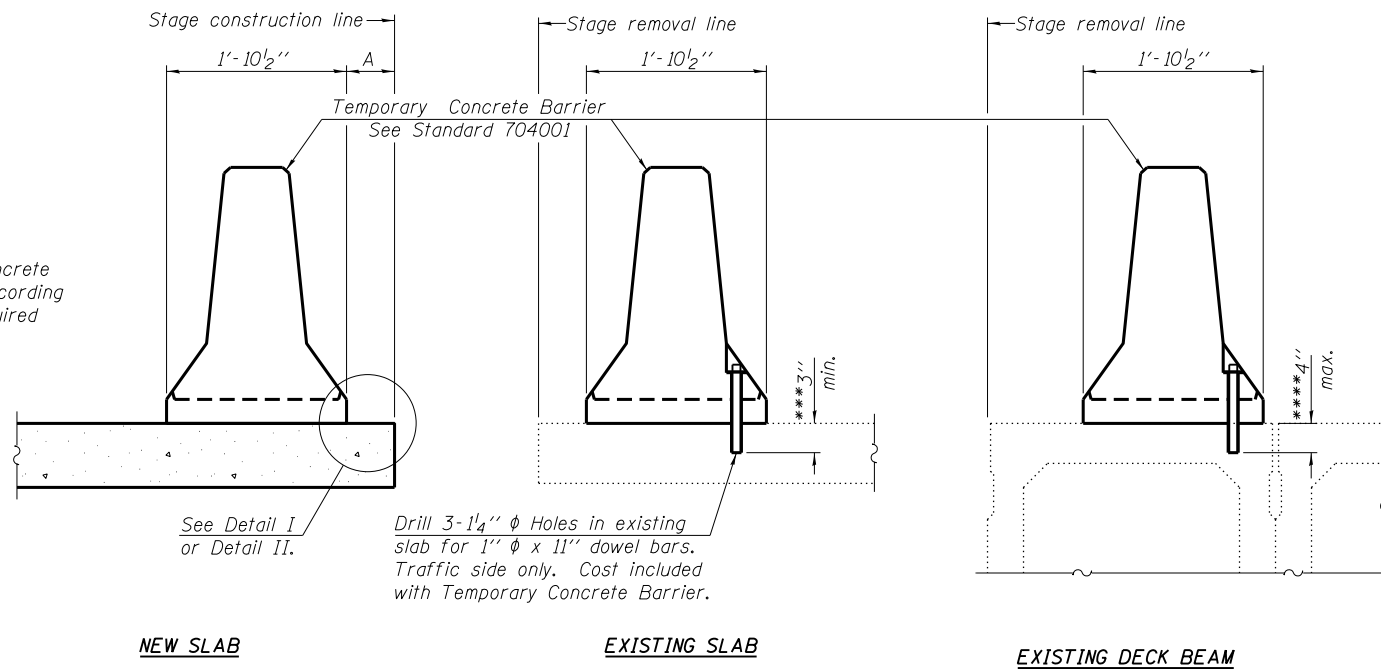
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PLOT DATE * 01/27/2015	DRAWN - EAR	REVISED
	CHECKED - APL	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TYPICAL STAGE CONSTRUCTION DETAILS
AND SEQUENCE OF CONSTRUCTION
STRUCTURE NO. 064-0035
SHEET NO. 2 OF 15 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1-24	(64-3B)1-7	MASSAC	18	7
CONTRACT NO. 78448			ILLINOIS FED. AID PROJECT	

When "A" is 3'-6" or less, the temporary concrete barrier shall be anchored to the new slab according to Detail I or Detail II. No anchorage is required when "A" is greater than 3'-6".



SECTIONS THRU SLAB OR DECK BEAM

NOTES

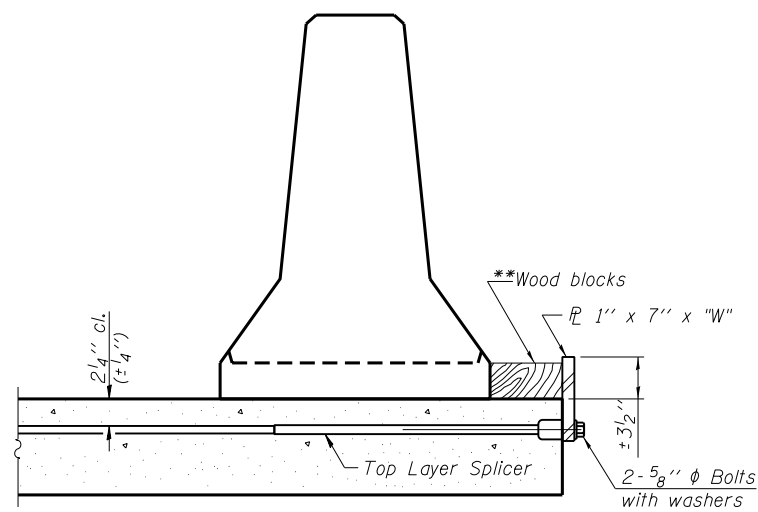
Detail I - With Bar Splicer or Couplers:
Connect one (1) 1" x 7" x "W" steel PL to the top layer of couplers with 2-5/8" phi bolts screwed to coupler at approximate C of each barrier panel.

Detail II - With Extended Reinforcement Bars:
Connect one (1) 1" x 7" x "W" steel PL to the concrete slab or concrete wearing surface with 2-5/8" phi Expansion Anchors or cast in place inserts spaced between the top layer of reinforcement at approximate C of each barrier panel.

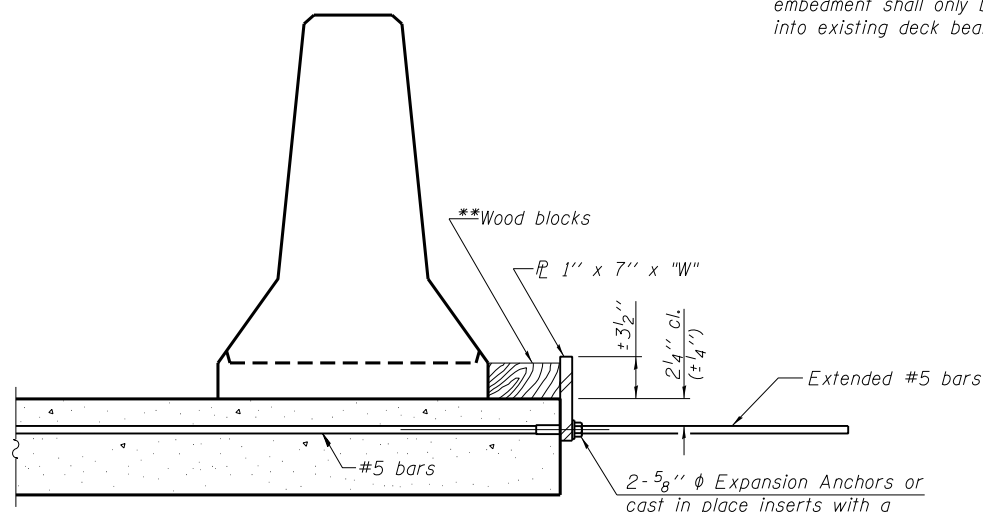
Cost of anchorage is included with Temporary Concrete Barrier. The 1" x 7" x "W" plate shall not be removed until stage II construction forms and all reinforcement bars are in place and the concrete is ready to be placed.

*** Dimension shown is minimum required embedment into concrete. If hot-mix asphalt wearing surface is present, minimum embedment shall be in addition to wearing surface depth.

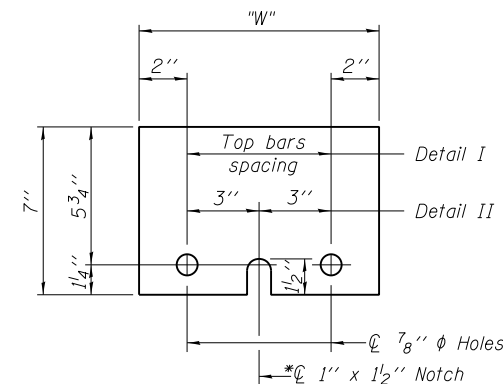
**** If existing deck beam is to remain in place after stage construction, embedment shall only be into wearing surface and not into existing deck beam concrete.



DETAIL I



DETAIL II



STEEL RETAINER PL 1" x 7" x "W"

* Required only with Detail II

** Wood blocks may be omitted when required to provide minimum stage traffic lane width. When the wood blocks are omitted, the concrete barrier shall be in direct contact with the steel retainer plate.

"W" = Top bars spacing + 4"

R-27

7-1-10



USER NAME =	DESIGNED - APL	REVISED
	CHECKED - MEL	REVISED
PLOT SCALE =	DRAWN - EAR	REVISED
PLOT DATE = 01/27/2015	CHECKED - APL	REVISED

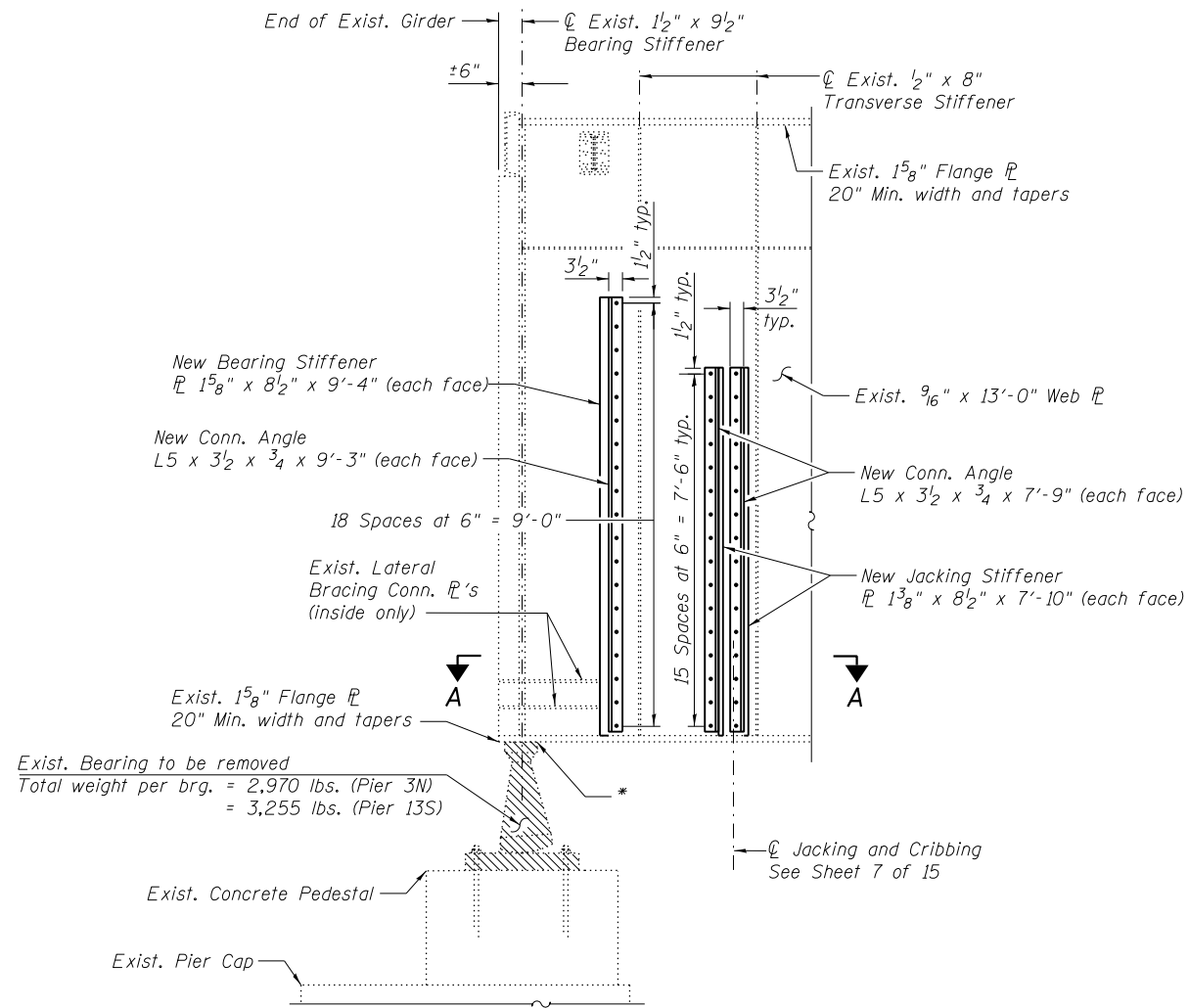
**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**TEMPORARY CONCRETE BARRIER FOR STAGE CONSTRUCTION
STRUCTURE NO. 064-0035**

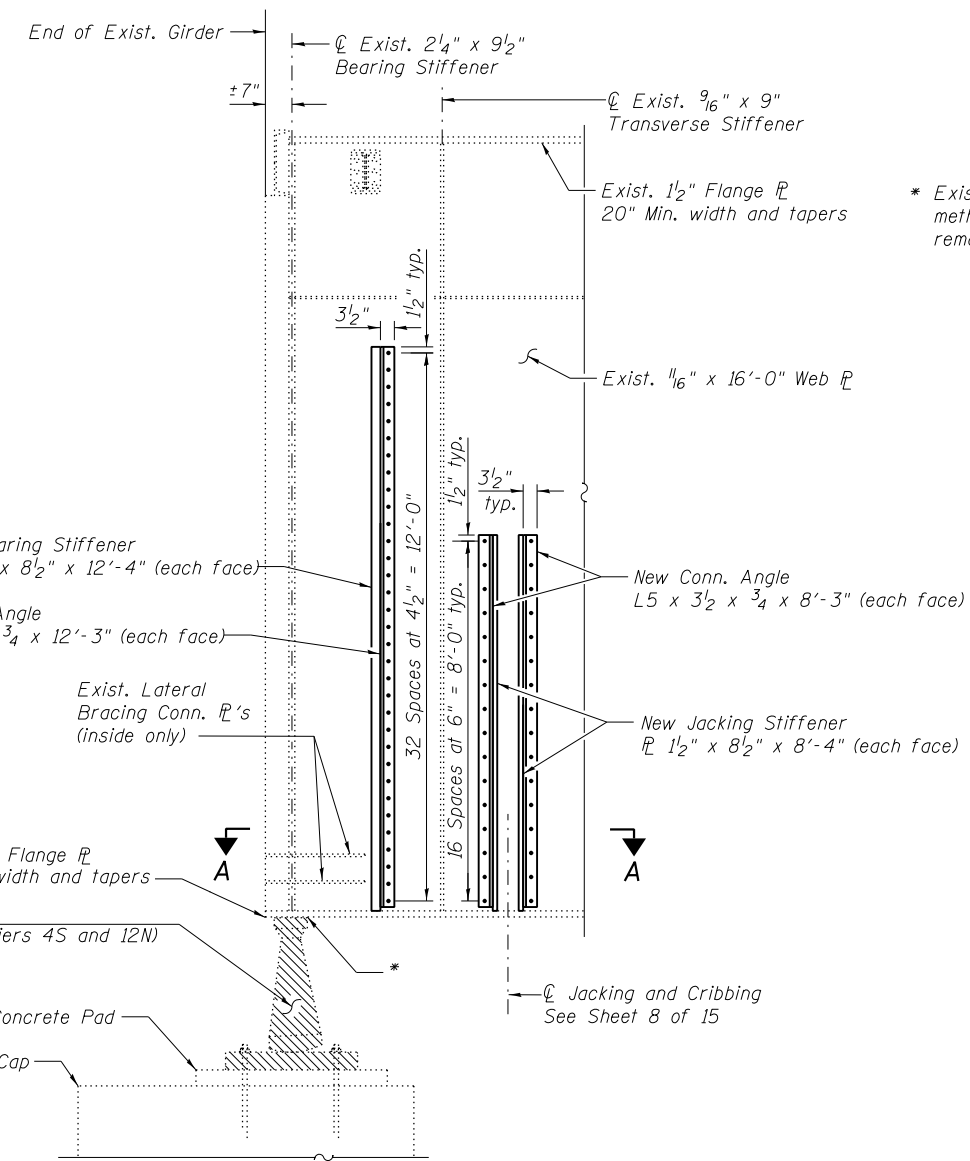
SHEET NO. 3 OF 15 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-24	(64-3B)1-7	MASSAC	18	8
			CONTRACT NO. 78448	

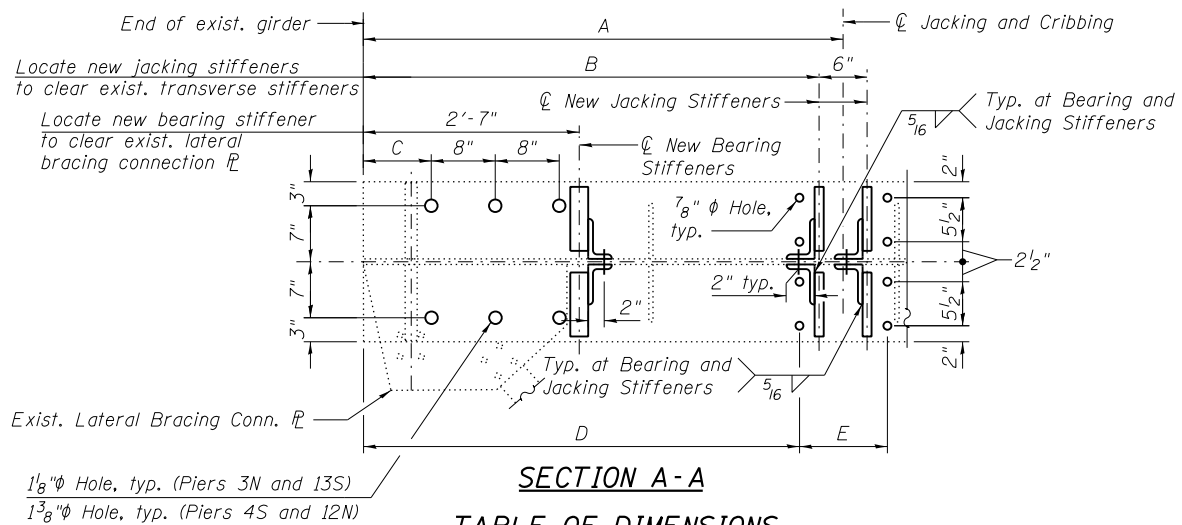
ILLINOIS FED. AID PROJECT



**BEARING / JACKING STIFFENER DETAILS AND BEARING REMOVAL
PIERS 3N AND 13S**

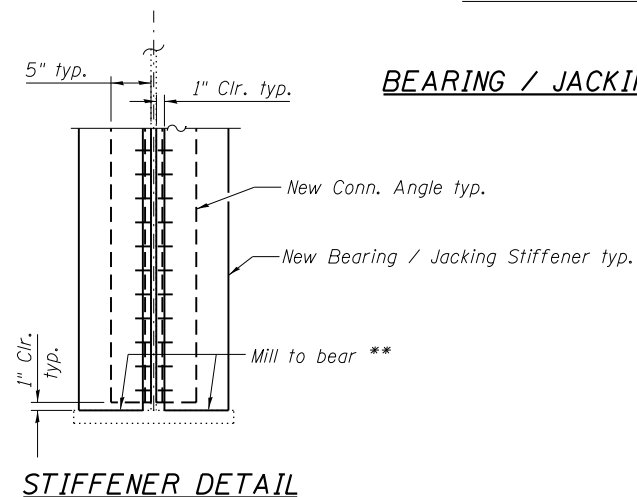


**BEARING / JACKING STIFFENER DETAILS AND BEARING REMOVAL
PIERS 4S AND 12N**



**SECTION A-A
TABLE OF DIMENSIONS**

Location	A	B	C	D	E
Pier 3N	4'-6 3/8"	4'-3 3/8"	8 1/2"	3'-11 7/8"	13"
Pier 13S	4'-5 1/8"	4'-2 1/8"	8 1/2"	3'-10 5/8"	13"
Pier 4S	4'-10 1/8"	4'-7 1/8"	11 3/4"	4'-2 5/8"	15"
Pier 12N	4'-9 1/4"	4'-6 1/4"	11 3/4"	4'-1 3/4"	15"



STIFFENER DETAIL

** Stiffener plate shall fit within 10/1000" for a minimum 75% of bearing area

* Existing PL to be removed using the air-arc method and grind smooth all weld material remaining on the bottom flange.

BILL OF MATERIAL

Item	Unit	Total
Structural Steel Repair	Pound	14,430
Removal of Existing Bearings	Each	8

Notes:

Install additional bearing stiffeners and jacking stiffeners prior to jacking operations.
Additional bearing stiffeners and associated connection angles included in quantity for Structural Steel Repair.
Cost for jacking stiffeners and associated connection angles included with Jacking and Cribbing.

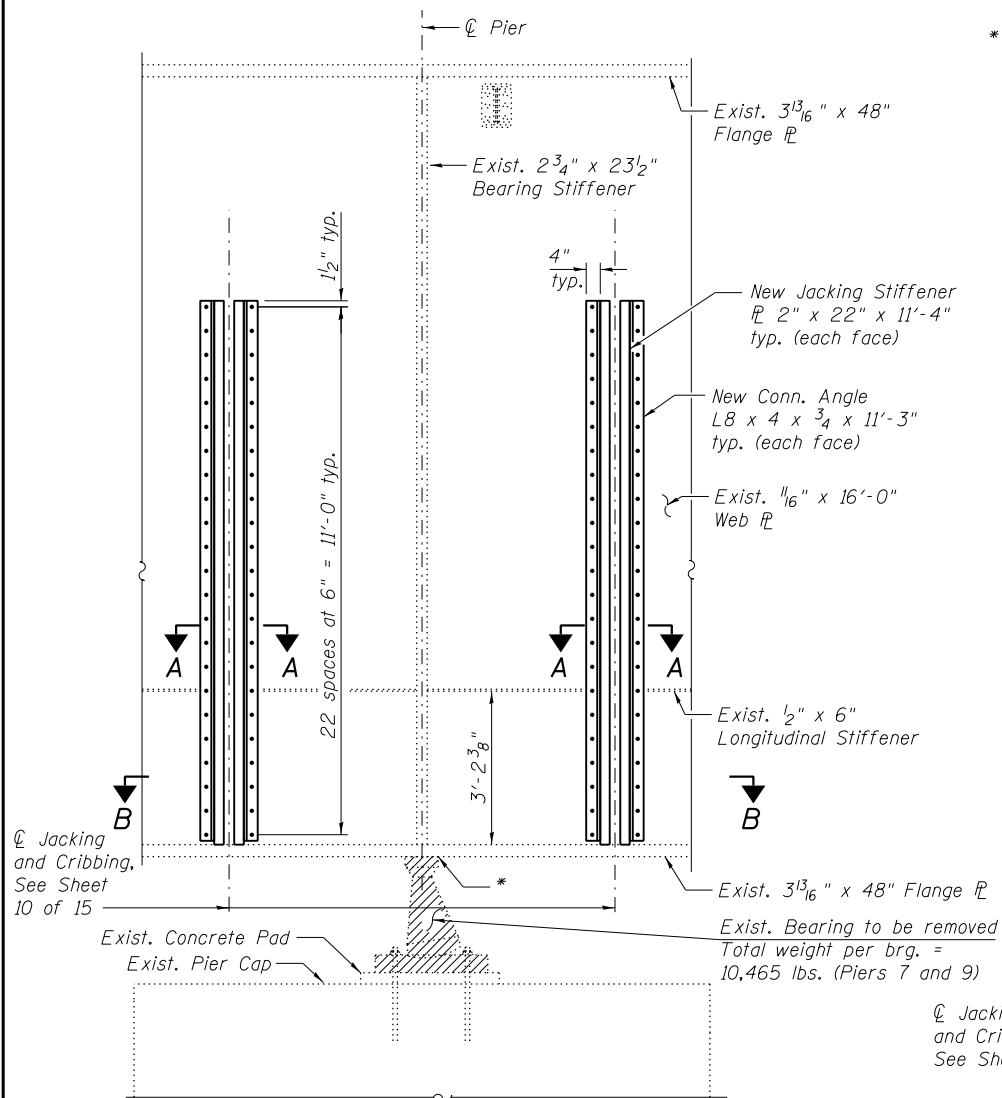


USER NAME =	DESIGNED - APL	REVISED
	CHECKED - MEL	REVISED
PLOT SCALE =	DRAWN - EAR	REVISED
PLOT DATE = 01/27/2015	CHECKED - APL	REVISED

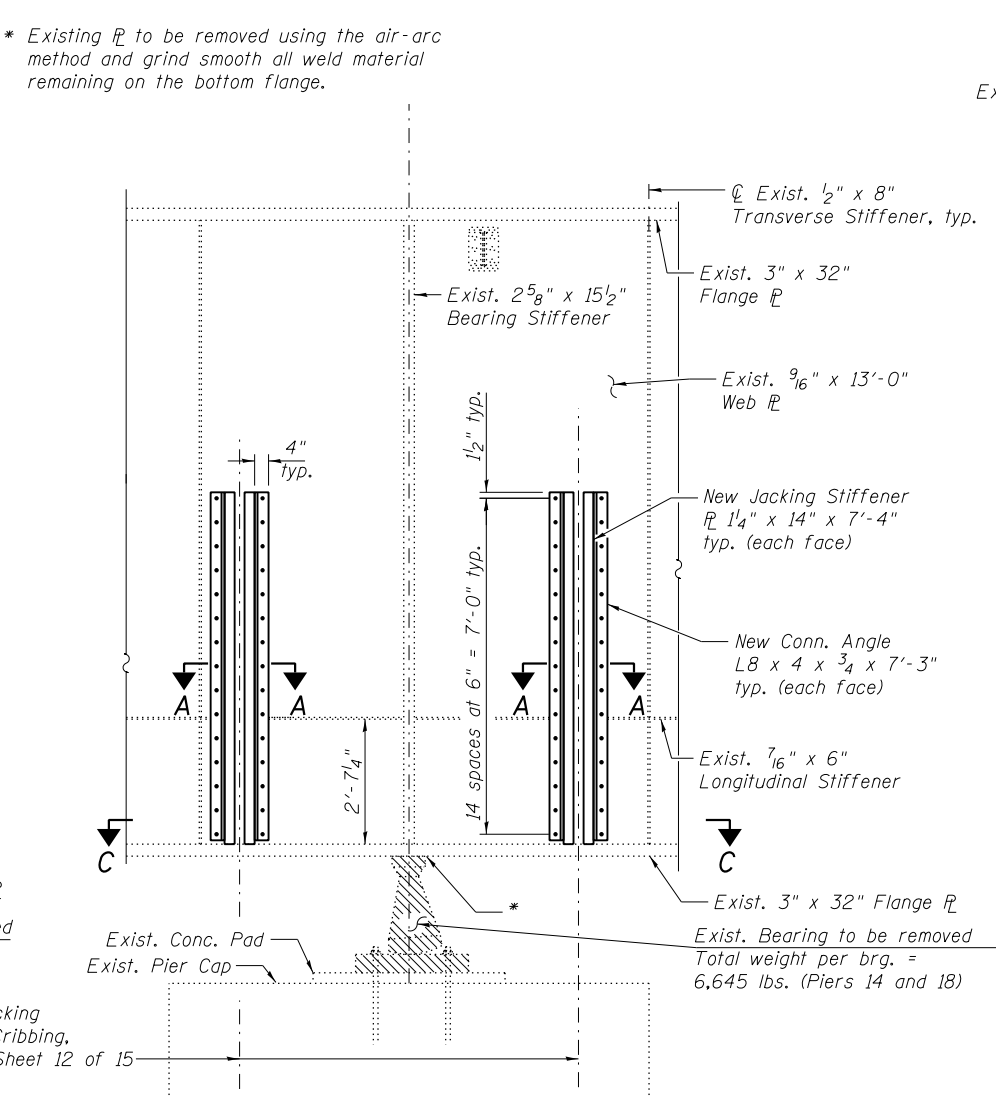
**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**BEARING REMOVAL
AND JACKING STIFFENER DETAILS - 1
STRUCTURE NO. 064-0035
SHEET NO. 4 OF 15 SHEETS**

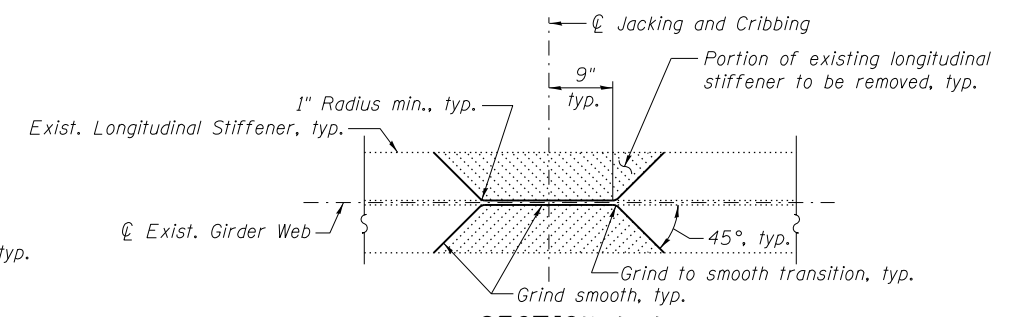
F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-24	(64-3B)I-7	MASSAC	18	9
CONTRACT NO. 78448			ILLINOIS FED. AID PROJECT	



JACKING STIFFENER DETAILS AND BEARING REMOVAL PIERS 7 AND 9



JACKING STIFFENER DETAILS AND BEARING REMOVAL PIERS 14 AND 18



SECTION A-A

New jacking stiffeners and connection angles not shown for clarity.

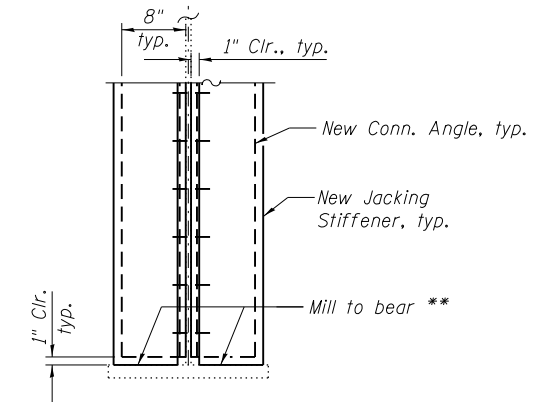
Cut existing longitudinal stiffeners along web as shown, keeping a minimum distance of 1/4" between the cut and the face of the web with removal of remaining material by grinding as described below. The cut adjacent to the face of the web shall be made with a 1" minimum radius at the web. The cut shall be made parallel to the web without angling the cut towards the web. Equipment and method of cutting shall be approved by the Engineer. Any method of removal to be used shall ensure that no damage is done to the existing web. Cutting shall be done in a manner such that the paint on the opposite face of the web is not damaged. If damage to the paint occurs due to cutting, the damaged area shall be repainted at the Contractor's expense and procedures shall be modified to prevent damage at subsequent removal locations.

Remove material between cut and web by grinding and grind smooth at web surface and cut edges of stiffener. Web plate surfaces and cut edges of stiffeners shall have a roughness average (Ra) of 250 μin. or less. Grinding equipment shall be approved by the Engineer. The grinding operation should not gouge the girder web plate.

The web surface at the modification shall be inspected using dye penetrant or magnetic particle (MT) methods. Any cracks found shall be identified and reported to the Bureau of Bridges and Structures for further disposition.

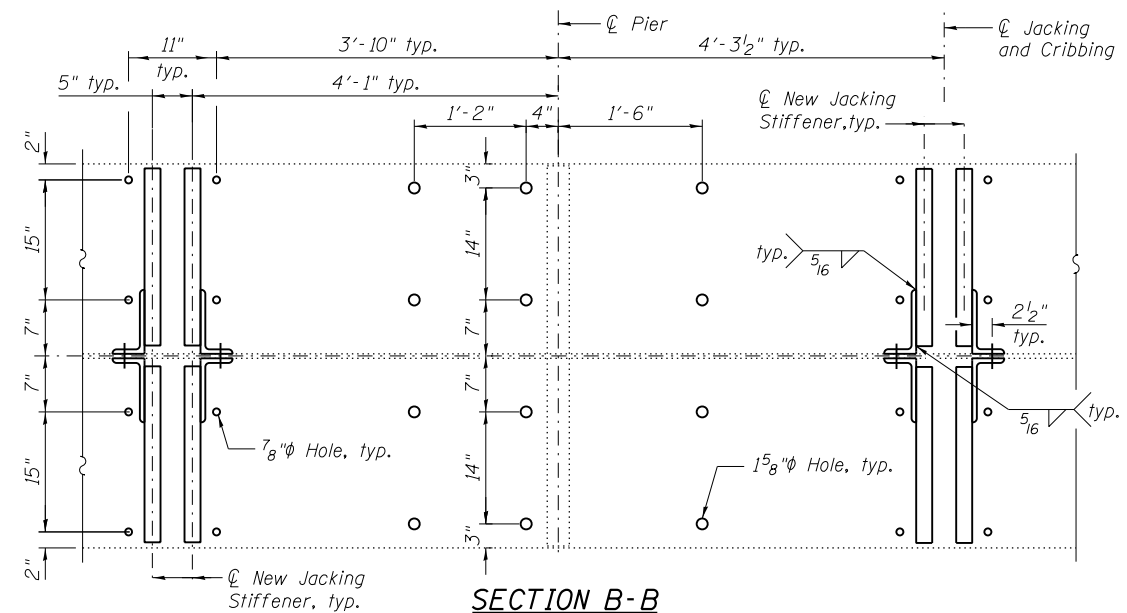
The exposed steel surfaces shall be cleaned and painted using an aluminum epoxy mastic primer according to Article 506.05 of the Standard Specifications.

Cost of partial stiffener removal, including grinding, testing, and cleaning and painting is included with Jacking and Cribbing.

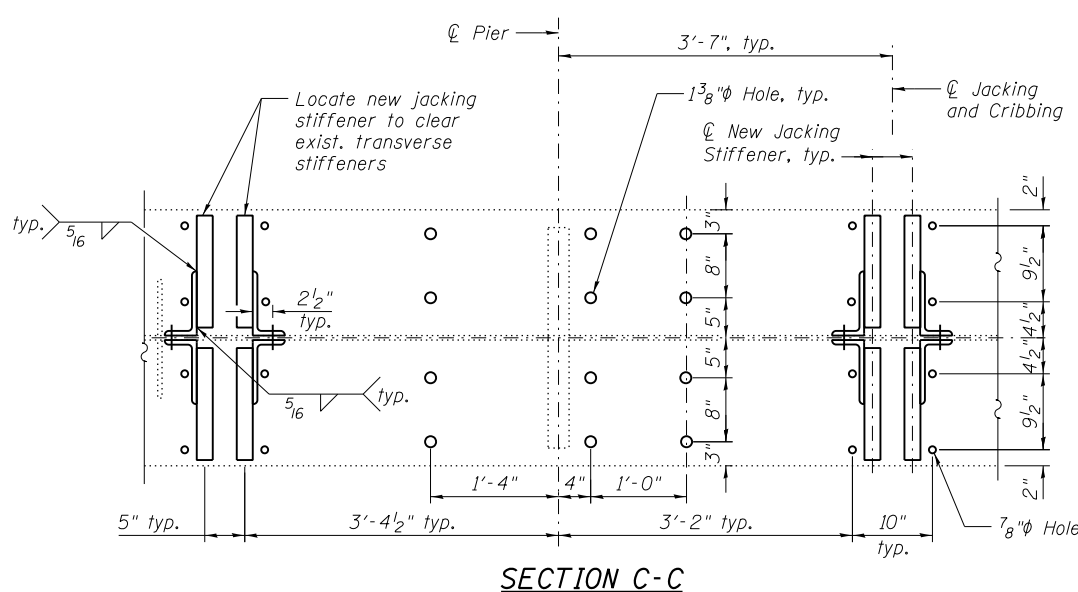


STIFFENER DETAIL

** Stiffener plate shall fit within 10/1000" for a minimum 75% of bearing area



SECTION B-B



SECTION C-C

BILL OF MATERIAL

Item	Unit	Total
Removal of Existing Bearings	Each	8

Notes:
Install jacking stiffeners prior to jacking operations.
Cost for jacking stiffeners and associated connection angles included with Jacking and Cribbing.

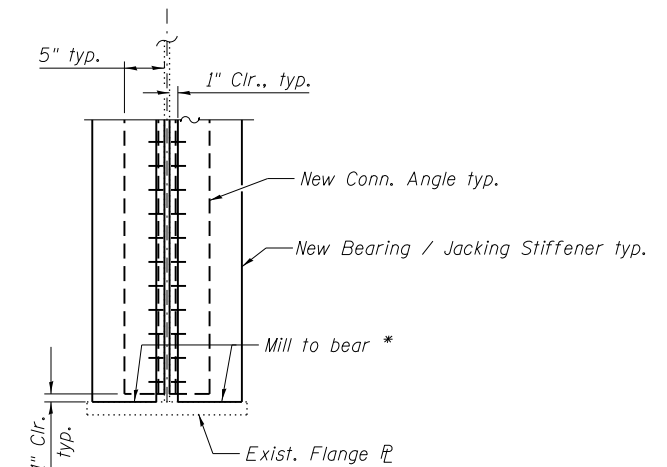
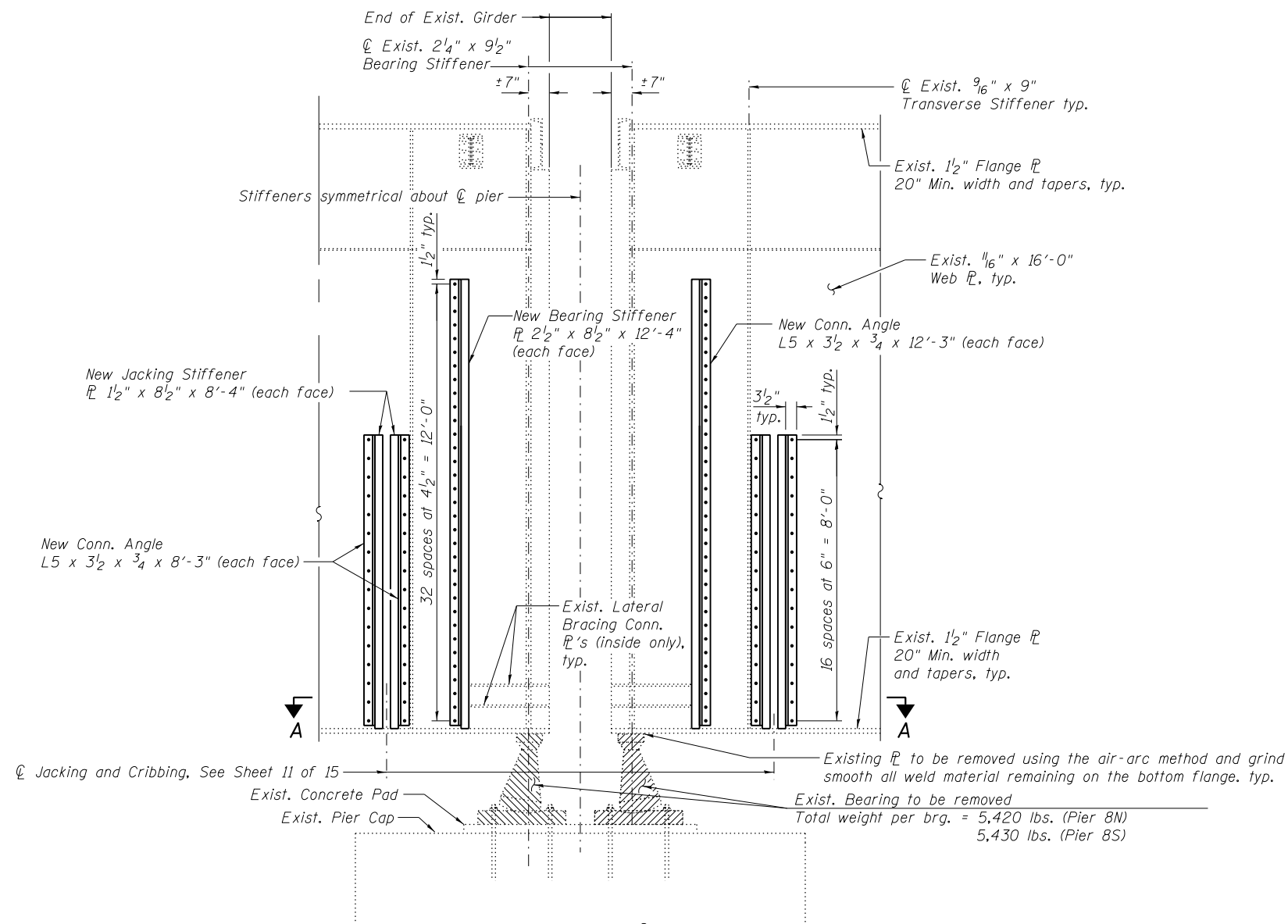


USER NAME =	DESIGNED - APL	REVISIONS
PLOT SCALE =	CHECKED - MEL	REVISIONS
PLOT DATE = 01/27/2015	DRAWN - EAR	REVISIONS
	CHECKED - APL	REVISIONS

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**BEARING REMOVAL
AND JACKING STIFFENER DETAILS - 2
STRUCTURE NO. 064-0035
SHEET NO. 5 OF 15 SHEETS**

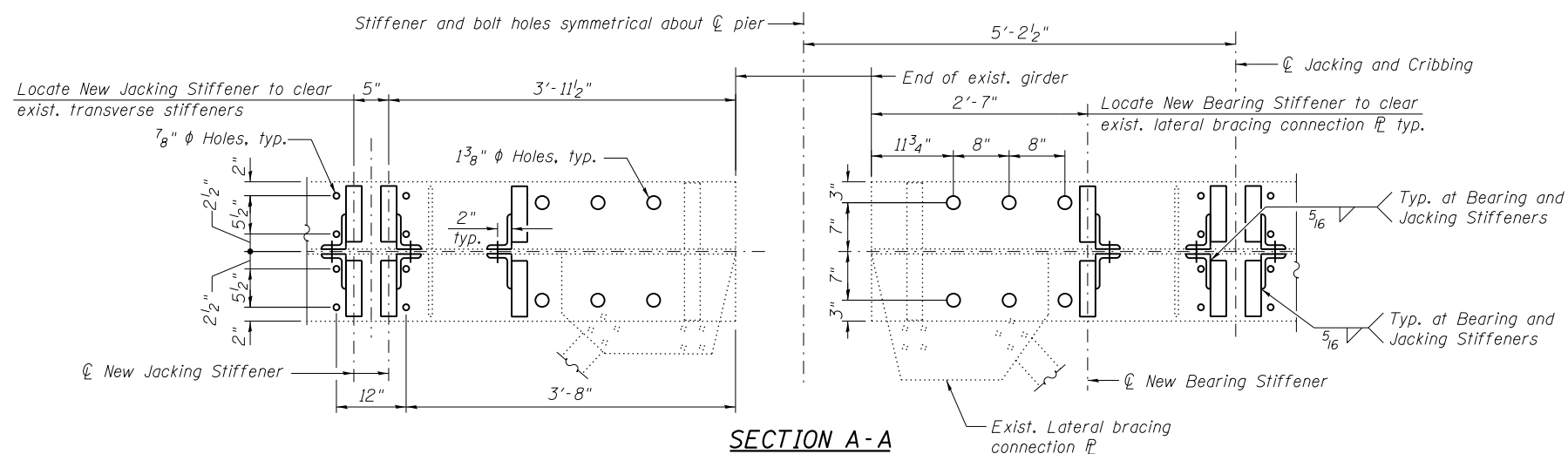
F.A.I. RT.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-24	(64-3B)I-7	MASSAC	18	10
CONTRACT NO. 78448				
ILLINOIS FED. AID PROJECT				



STIFFENER DETAIL

* Stiffener plate shall fit within 10/1000" for a minimum 75% of bearing area

**BEARING / JACKING STIFFENER DETAILS AND BEARING REMOVAL
 PIERS 8N AND 8S**



BILL OF MATERIAL

Item	Unit	Total
Structural Steel Repair	Pound	9,320
Removal of Existing Bearings	Each	4

Notes:

- Install additional bearing stiffeners and jacking stiffeners prior to jacking operations.
- Additional bearing stiffeners and associated connection angles included in quantity for Structural Steel Repair.
- Cost for jacking stiffeners and associated connection angles included with Jacking and Cribbing.



USER NAME =	DESIGNED - APL	REVISED
	CHECKED - MEL	REVISED
PLOT SCALE =	DRAWN - EAR	REVISED
PLOT DATE = 01/27/2015	CHECKED - APL	REVISED

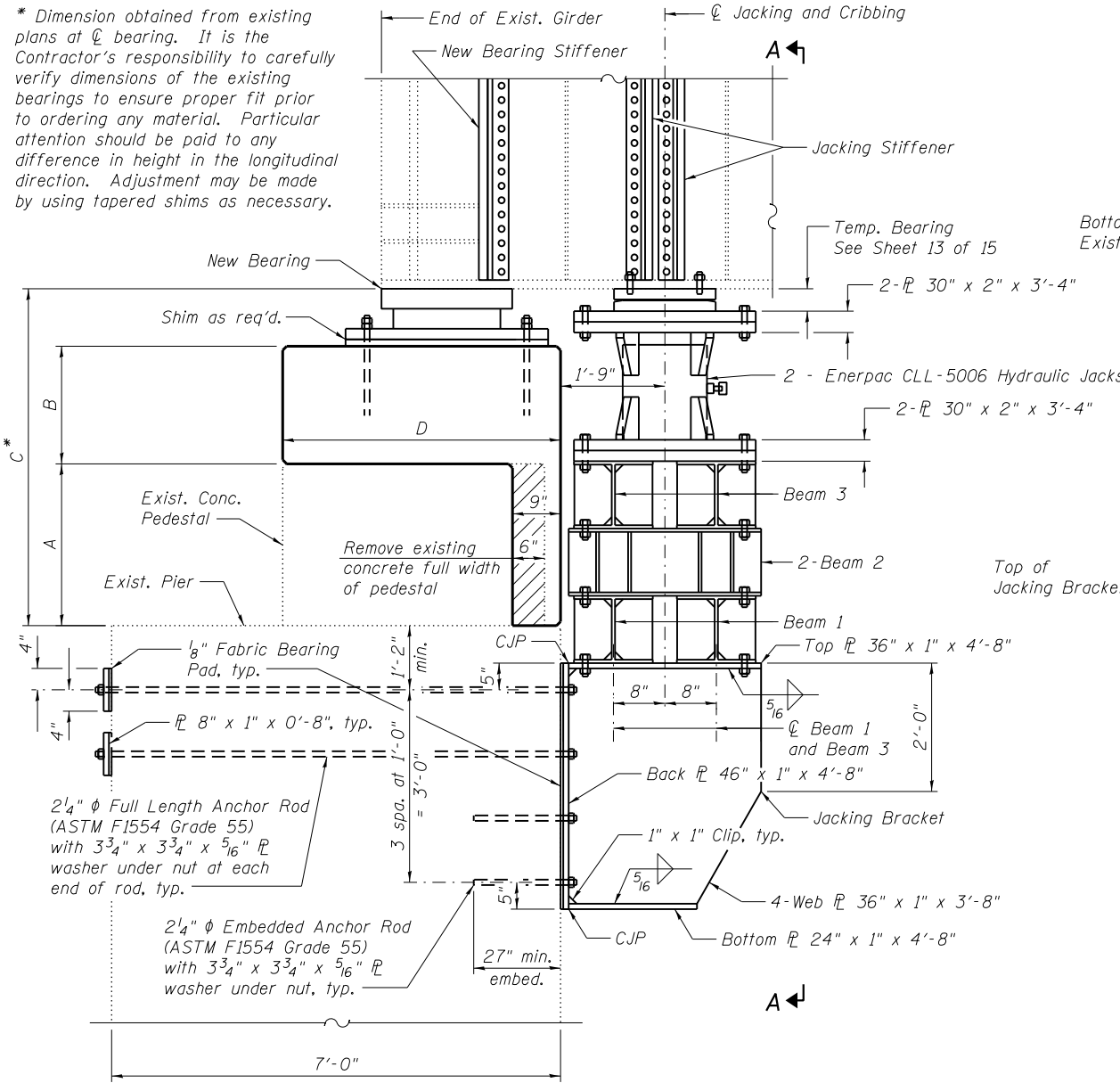
**STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION**

**BEARING REMOVAL
 AND JACKING STIFFENER DETAILS - 3
 STRUCTURE NO. 064-0035**
 SHEET NO. 6 OF 15 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-24	(64-3B)I-7	MASSAC	18	11
CONTRACT NO. 78448				

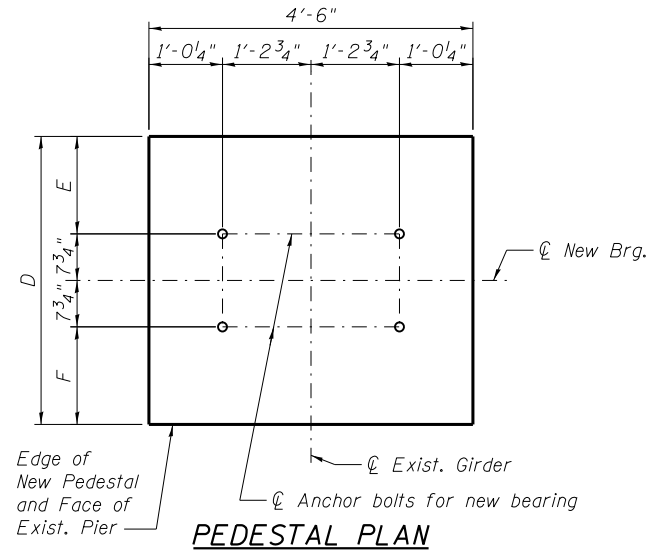
ILLINOIS FED. AID PROJECT

* Dimension obtained from existing plans at ϕ bearing. It is the Contractor's responsibility to carefully verify dimensions of the existing bearings to ensure proper fit prior to ordering any material. Particular attention should be paid to any difference in height in the longitudinal direction. Adjustment may be made by using tapered shims as necessary.



ELEVATION

Jack and Cribbing For Pier 3N shown, Jack and Cribbing for Pier 13S similar (See Sheet 9 of 15)



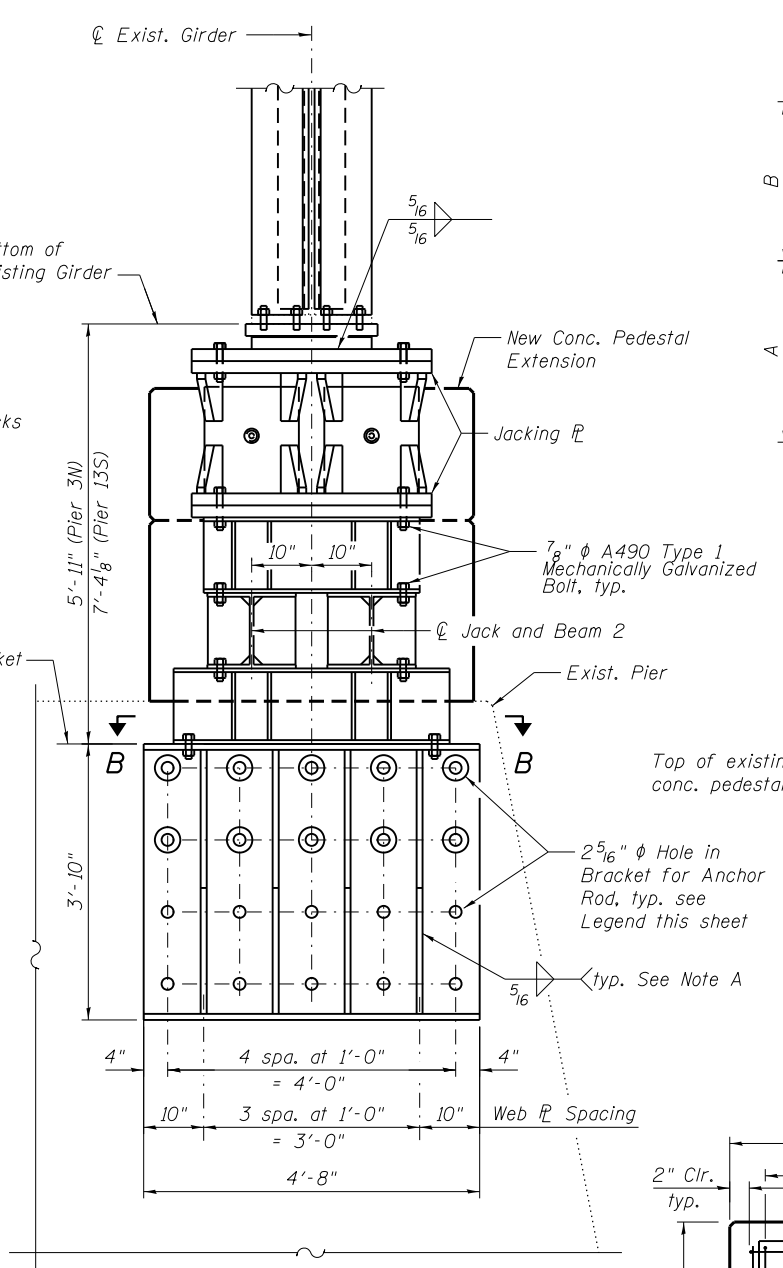
PEDESTAL PLAN

LEGEND
(Jacking Bracket)

- Hole with threaded anchor rod, 27" embedment
- ⊙ Hole with threaded anchor rod, full length

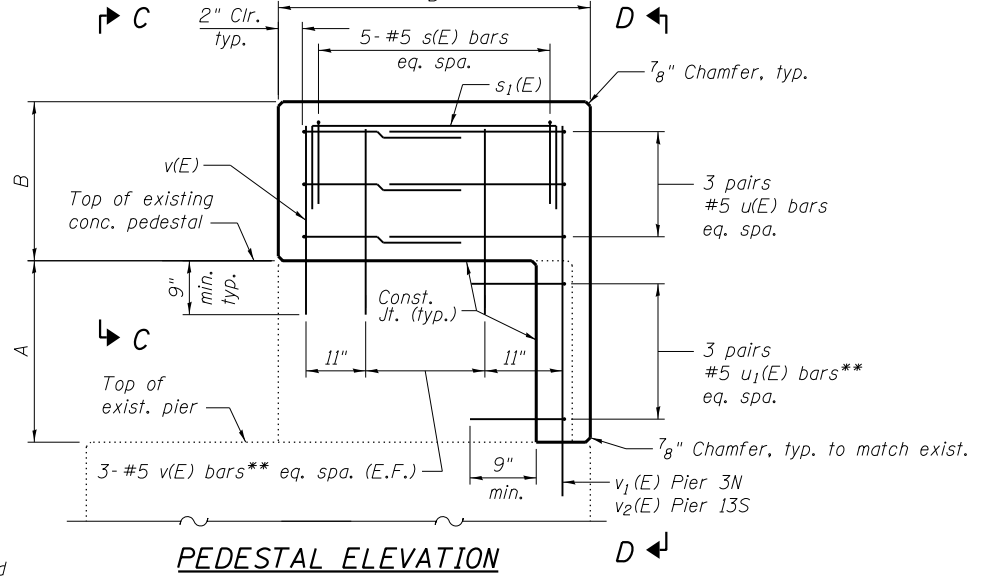
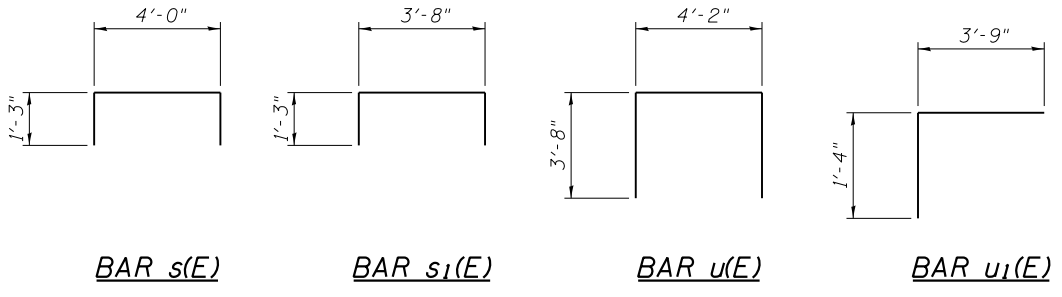
TABLE OF DIMENSIONS

Dim.	Pier 3N	Pier 13S
A	2'-5 1/4"	3'-10 1/8"
B	1'-10 7/8"	1'-11 1/8"
C	5'-2"	6'-7 1/8"
D	4'-4"	4'-1 5/8"
E	2'-3 3/8"	9 1/8"
F	2'-2 1/4"	7 7/8"

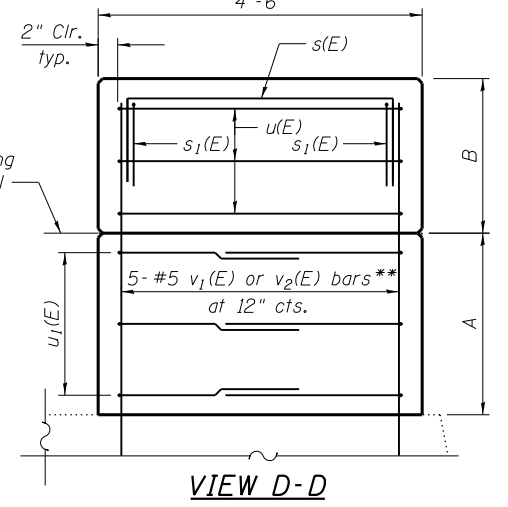


VIEW A-A

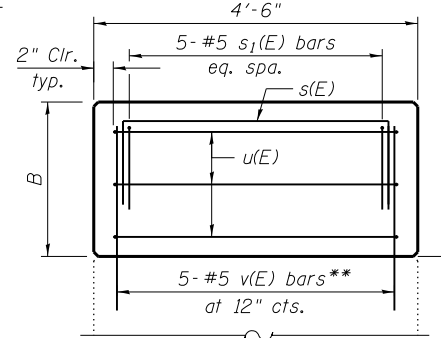
Note A:
A PJP weld on one side may be substituted for the shown fillet welds on both sides.



PEDESTAL ELEVATION



VIEW D-D



VIEW C-C

** Drill and Epoxy Grout

BILL OF MATERIAL FOR PIERS 3N AND 13S (BOTH ENDS)

Bar	No.	Size	Length	Shape
s(E)	20	#5	6'-6"	□
s ₁ (E)	20	#5	6'-2"	□
u(E)	24	#5	11'-6"	□
u ₁ (E)	24	#5	5'-1"	□
v(E)	44	#5	2'-7"	—
v ₁ (E)	10	#5	5'-0"	—
v ₂ (E)	10	#5	6'-5"	—
Concrete Removal			Cu. Yd.	1.1
Concrete Structures			Cu. Yd.	7.0
Reinforcement Bars, Epoxy Coated			Pound	920
Jacking and Cribbing			Each	4

Notes:
Epoxy grout vertical bars in concrete pedestal in accordance with Article 584 of the Standard Specifications. Cost is included with Reinforcement Bars, Epoxy Coated.
Space reinforcement in pedestal to miss new anchor bolts for bearings.
CJP corner welds between top and bottom plates and back plate shall be 100% UT tested in accordance with AASHTO/AWS D1.5 Bridge Welding Code. Acceptance criteria shall be for "tension welds".
Install full length and embedded anchor rods using an IDOT approved non-shrink grout. Drill and set full length and embedded anchor rods per the jacking bracket installation procedures and the manufacturer's directions.
Provide a fabric bearing pad at the concrete and steel interfaces shown on the plans in accordance with Article 1082 of the Standard Specifications. Cost is included with Jacking and Cribbing.
Expected jacking load per jack = 375 Kips for Pier 3N and 365 Kips for Pier 13S.
Calculated weight of structural steel required for one Jacking and Cribbing (Each) detailed on this sheet = 12,110 lbs. for Pier 3N and 14,000 lbs. for Pier 13S (includes weight of jacking stiffeners and connection angles, temporary bearing, jacking plates, beams and bracket, fasteners, and full length and embedded anchor rods).
For additional details including Section B-B, see Sheet 9 of 15.



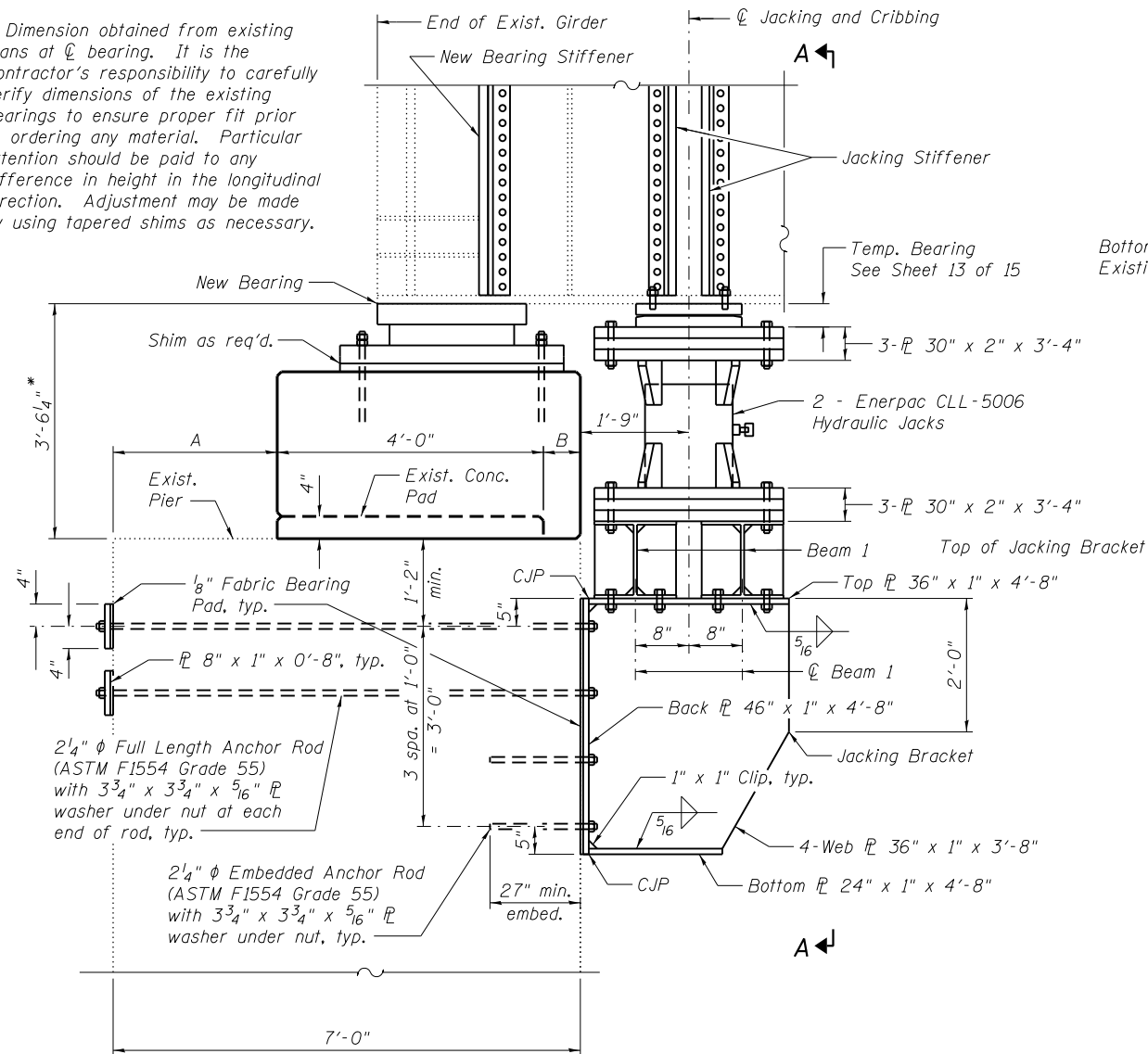
USER NAME =	DESIGNED - CDB	REVISED
	CHECKED - ACK	REVISED
PLOT SCALE =	DRAWN - PRC	REVISED
PLOT DATE = 01/27/2015	CHECKED - RLM	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

JACKING AND CONCRETE PEDESTAL DETAILS - PIERS 3N AND 13S
STRUCTURE NO. 064-0035
SHEET NO. 7 OF 15 SHEETS

F.A.I. R.T.E.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-24	(64-3B)I-7	MASSAC	18	12
CONTRACT NO. 78448			ILLINOIS FED. AID PROJECT	

* Dimension obtained from existing plans at ϕ bearing. It is the Contractor's responsibility to carefully verify dimensions of the existing bearings to ensure proper fit prior to ordering any material. Particular attention should be paid to any difference in height in the longitudinal direction. Adjustment may be made by using tapered shims as necessary.

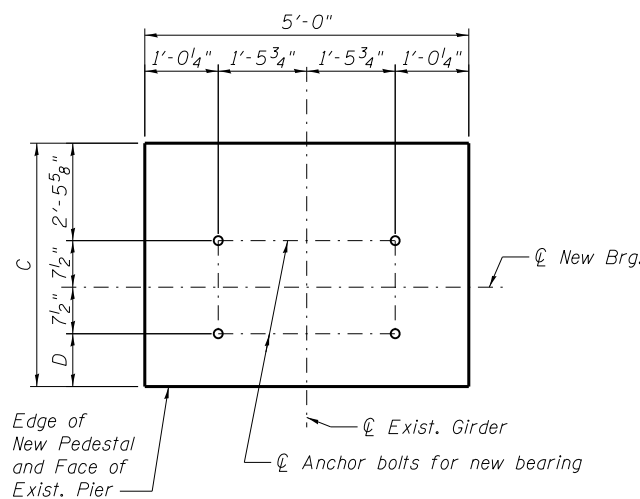
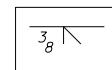


ELEVATION

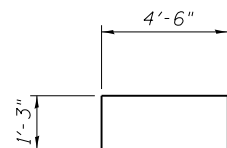
TABLE OF DIMENSIONS

Dim.	Pier 4S	Pier 12N
A	2'-5 1/2"	2'-6 3/8"
B	6 1/2"	5 5/8"
C	4'-6 1/2"	4'-5 5/8"
D	9 7/8"	9"

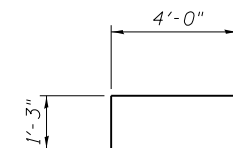
Note A:
A PJP weld on one side may be substituted for the shown fillet welds on both sides.



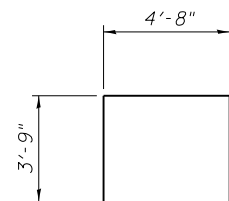
PEDESTAL PLAN



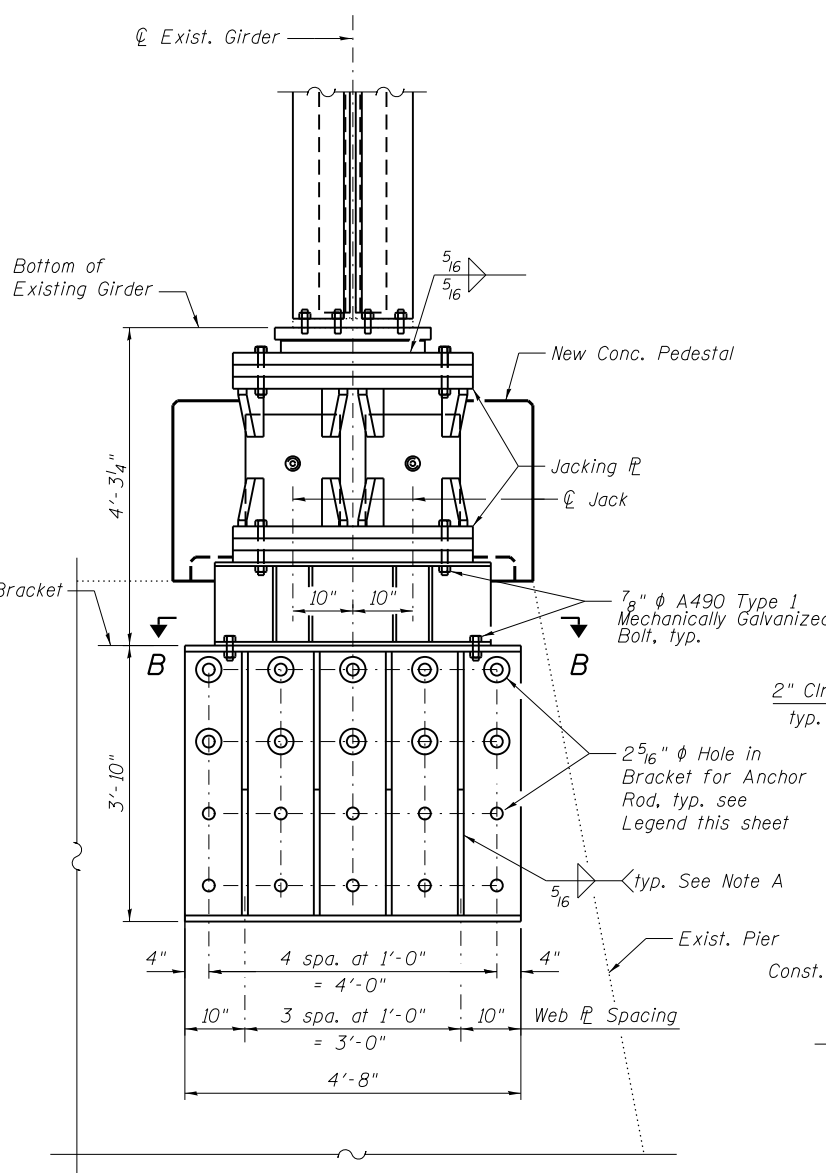
BAR s₂(E)



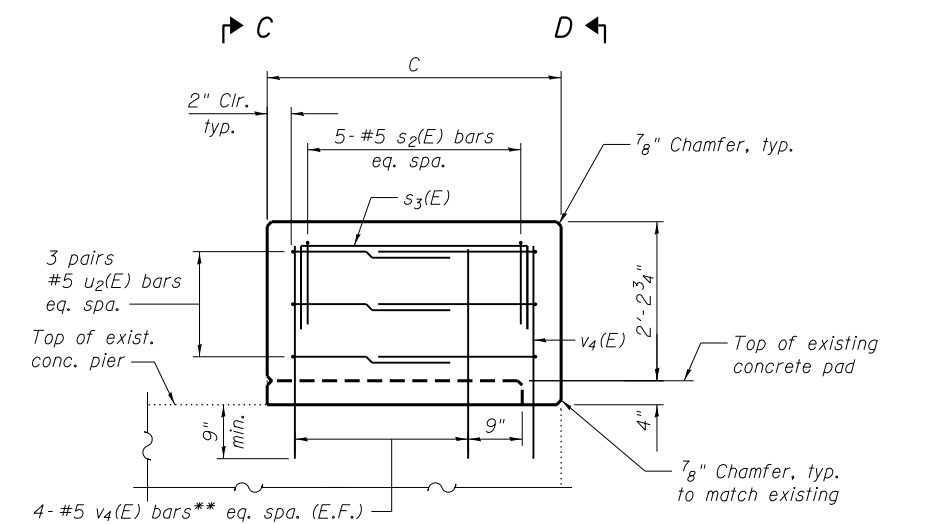
BAR s₃(E)



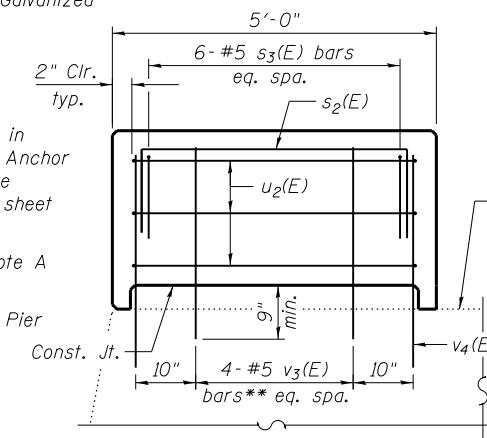
BAR u₂(E)



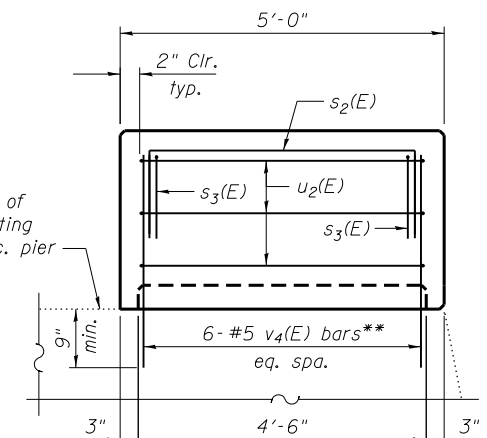
VIEW A-A



PEDESTAL ELEVATION



VIEW C-C



VIEW D-D

LEGEND
(Jacking Bracket)

- Hole with threaded anchor rod, 27" embedment
- ⊙ Hole with threaded anchor rod, full length

BILL OF MATERIAL
FOR PIERS 4S AND 12N (BOTH ENDS)

Bar	No.	Size	Length	Shape
s ₂ (E)	20	#5	7'-0"	□
s ₃ (E)	24	#5	6'-6"	□
u ₂ (E)	24	#5	12'-2"	□
v ₃ (E)	16	#5	2'-10"	—
v ₄ (E)	56	#5	3'-2"	—
Concrete Structures		Cu. Yd.	7.7	
Reinforcement Bars, Epoxy Coated		Pound	850	
Jacking and Cribbing		Each	4	

Notes:
Epoxy grout vertical bars in concrete pedestal in accordance with Article 584 of the Standard Specifications. Cost is included with Reinforcement Bars, Epoxy Coated.
Space reinforcement in pedestal to miss new anchor bolts for bearings.
CJP corner welds between top and bottom plates and back plate shall be 100% UT tested in accordance with AASHTO/AWS D1.5 Bridge Welding Code. Acceptance criteria shall be for "tension welds".
Install full length and embedded anchor rods using an IDOT approved non-shrink grout. Drill and set full length and embedded anchor rods per the jacking bracket installation procedures and the manufacturer's directions.
Provide a fabric bearing pad at the concrete and steel interfaces shown on the plans in accordance with Article 1082 of the Standard Specifications. Cost is included with Jacking and Cribbing.
Expected jacking load per jack = 550 Kips.
Calculated weight of structural steel required for one Jacking and Cribbing (Each) detailed on this sheet = 12,770 lbs. (includes weight of jacking stiffeners and connection angles, temporary bearing, jacking plates, beams and bracket, fasteners, and full length and embedded anchor rods).
Pressure transducer piping and timber protection are mounted to the east end of Pier 12 in the vicinity of the bearing replacement. This equipment is essential for the automatic control of the navigation lights which are to remain operational at all times during construction. The Contractor shall perform the bearing replacement with care to ensure the existing equipment is not damaged during construction.
For additional details including Section B-B, see Sheet 9 of 15.



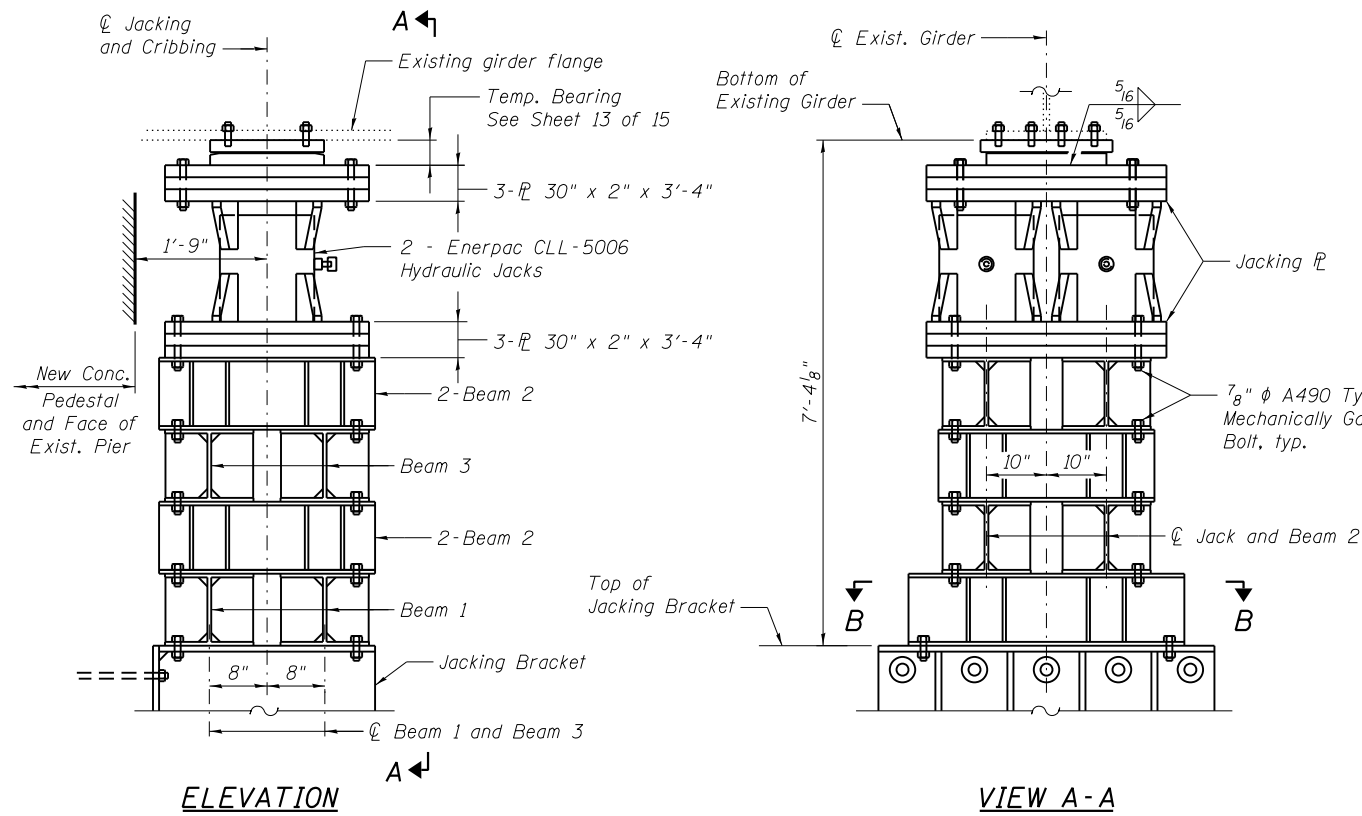
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	CHECKED - ACK	REVISED
PLOT SCALE =	DRAWN - PRC	REVISED
PLOT DATE = 01/27/2015	CHECKED - RLM	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

JACKING AND CONCRETE PEDESTAL DETAILS - PIERS 4S AND 12N
STRUCTURE NO. 064-0035

SHEET NO. 8 OF 15 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-24	(64-3B)I-7	MASSAC	18	13
CONTRACT NO. 78448				
ILLINOIS FED. AID PROJECT				

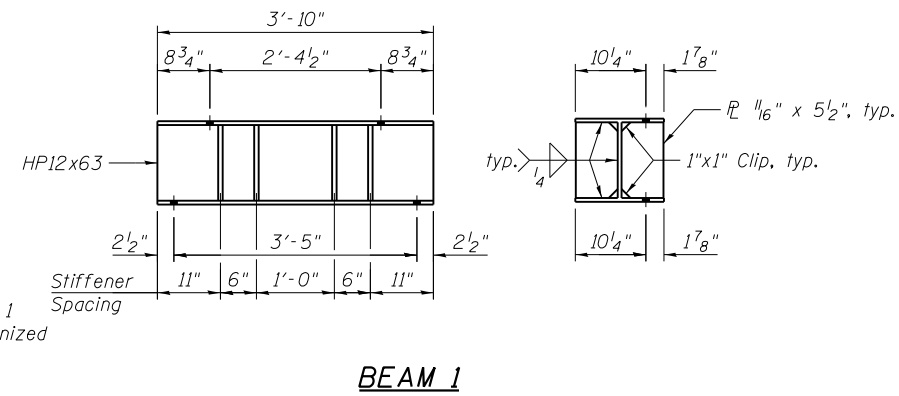


ELEVATION

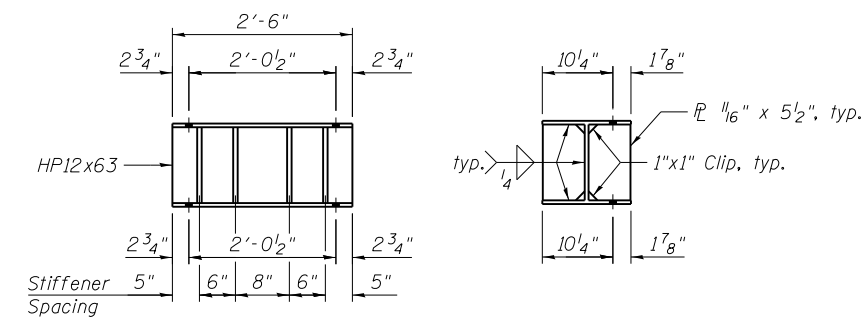
VIEW A-A

JACKING AND CRIBBING AT PIER 13S

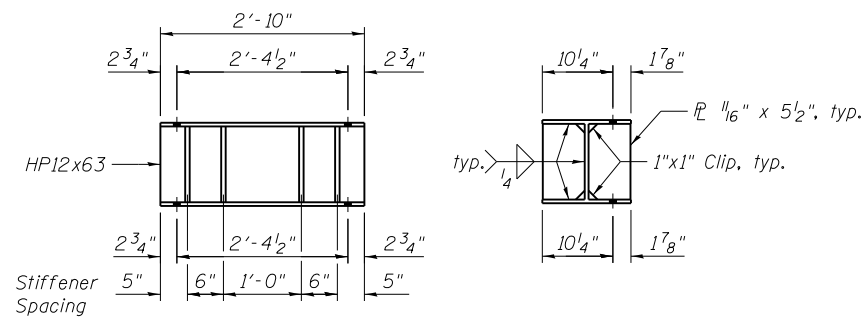
For additional details, see Sheet 7 of 15.



BEAM 1



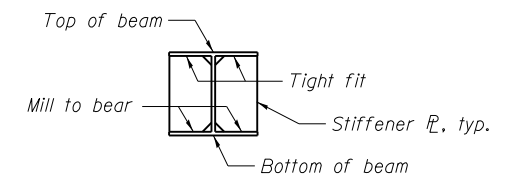
BEAM 2



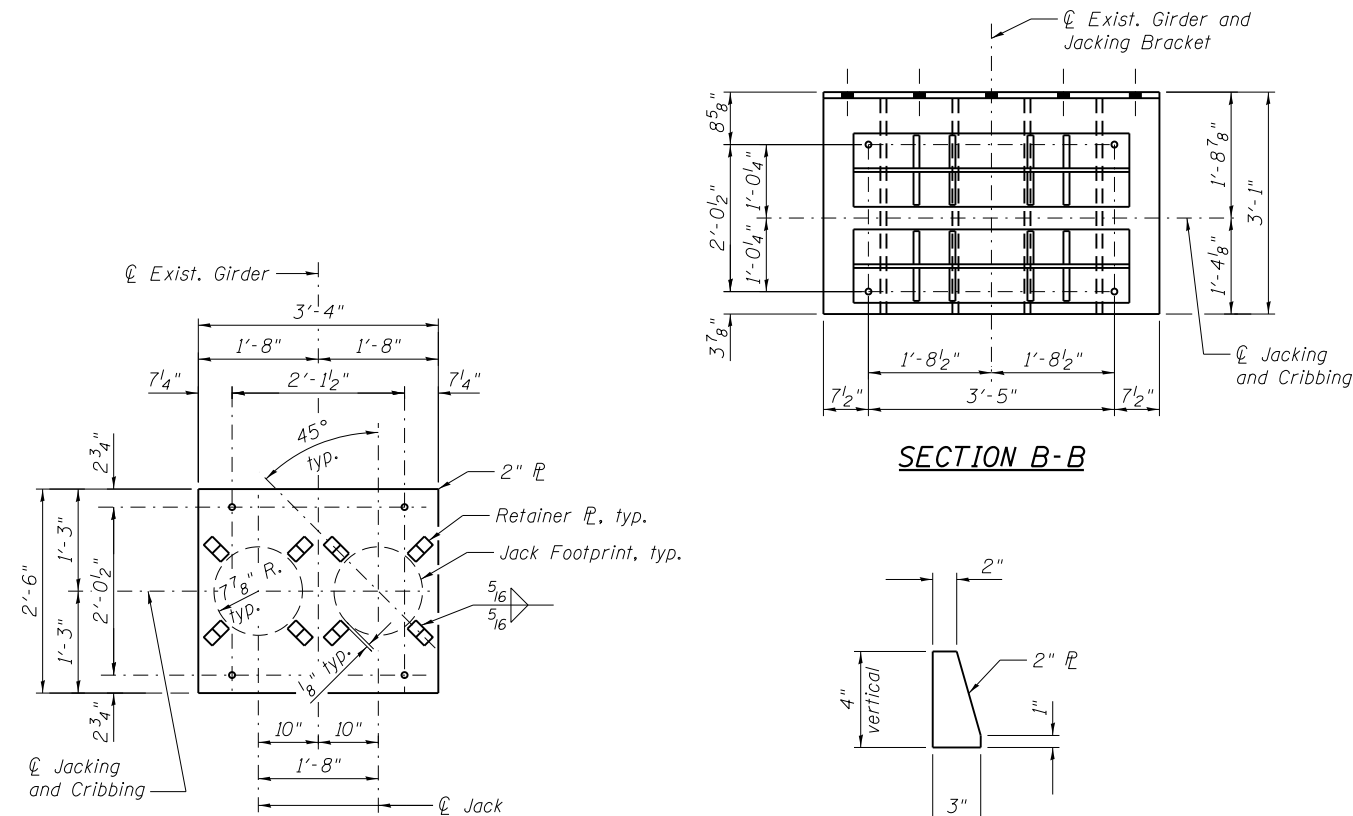
BEAM 3

JACKING BRACKET INSTALLATION

1. Prior to drilling holes through existing concrete, locate existing reinforcing bars within concrete using rebar detection equipment. Mark locations of existing reinforcing bars near proposed holes to ensure that existing reinforcing bars are not damaged during drilling.
2. Using a template, pre-drill anchor holes in the piers as indicated in the plans. Holes for the anchor rods shall be in accordance with the non-shrink grout manufacturer's recommendations.
3. Using another template at the bracket side of the pier, insert the through-rods, leaving the appropriate projection at both the front and back faces of the concrete pier. Center the rods within the holes and verify that the rods are aligned so that the top plate of the jacking bracket will sit level. Grout the annulus around the rods using an approved non-shrink grout.
4. After the grout has taken initial set, install fabric bearing pads, backing plates and plate washers at the back-side of the pier. Secure the plate with snug tightened nuts.
5. Install the fabric bearing pad and jacking bracket at the front face of the pier, place washers, and snug tighten the nuts on the through-rods to secure the bracket.
6. Install the embedded anchor rods using an approved non-shrink grout. Install plate washers and hand tighten the nuts for the embedded anchor rods.



TYPICAL STIFFENER DETAIL



SECTION B-B

JACKING PLATE

RETAINER PLATE



USER NAME =	DESIGNED - CDB	REVISED
	CHECKED - ACK	REVISED
PLOT SCALE =	DRAWN - PRC	REVISED
PLOT DATE = 01/27/2015	CHECKED - RLM	REVISED

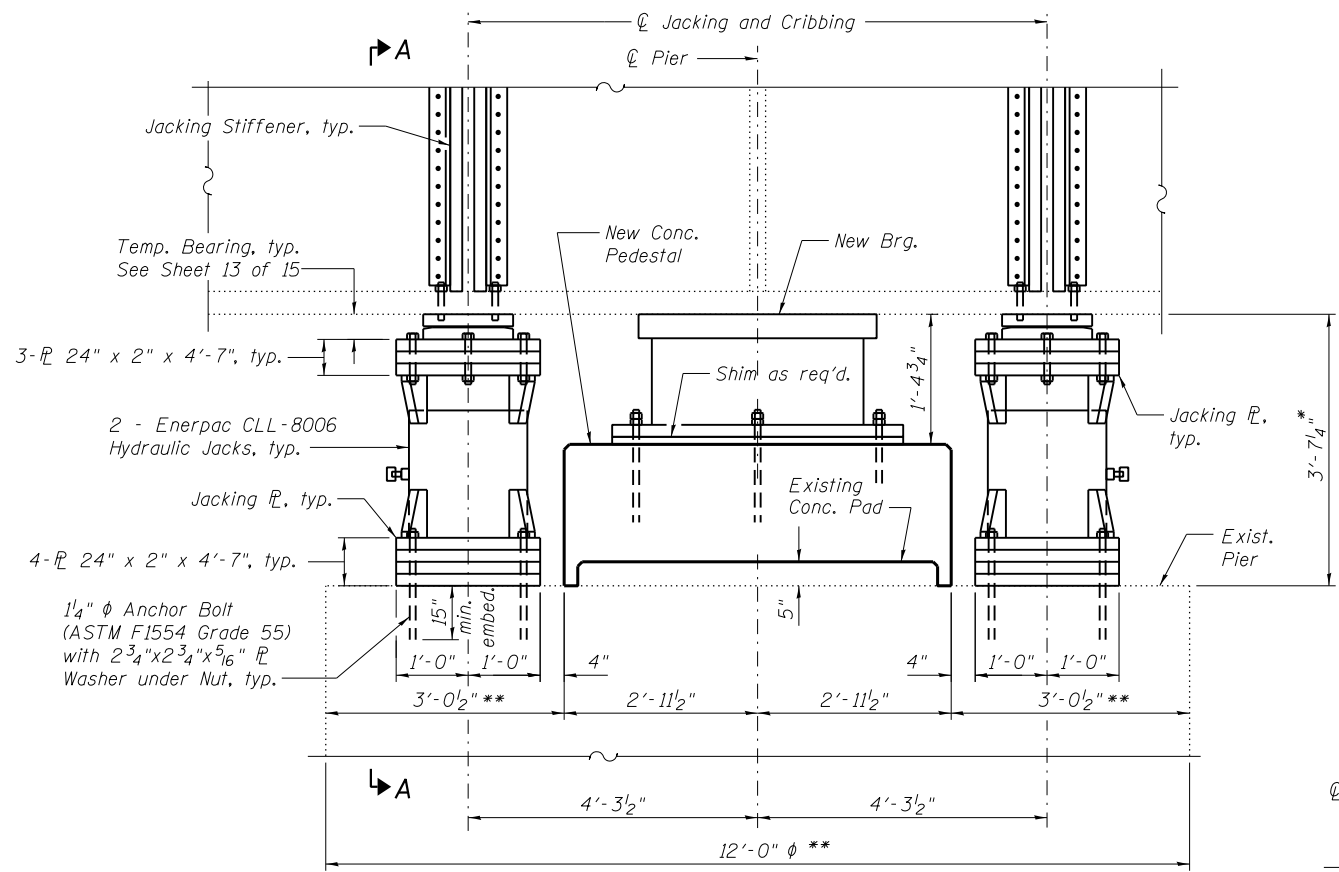
**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**CRIBBING DETAILS - PIERS 3N, 4S, 12N AND 13S
STRUCTURE NO. 064-0035**

SHEET NO. 9 OF 15 SHEETS

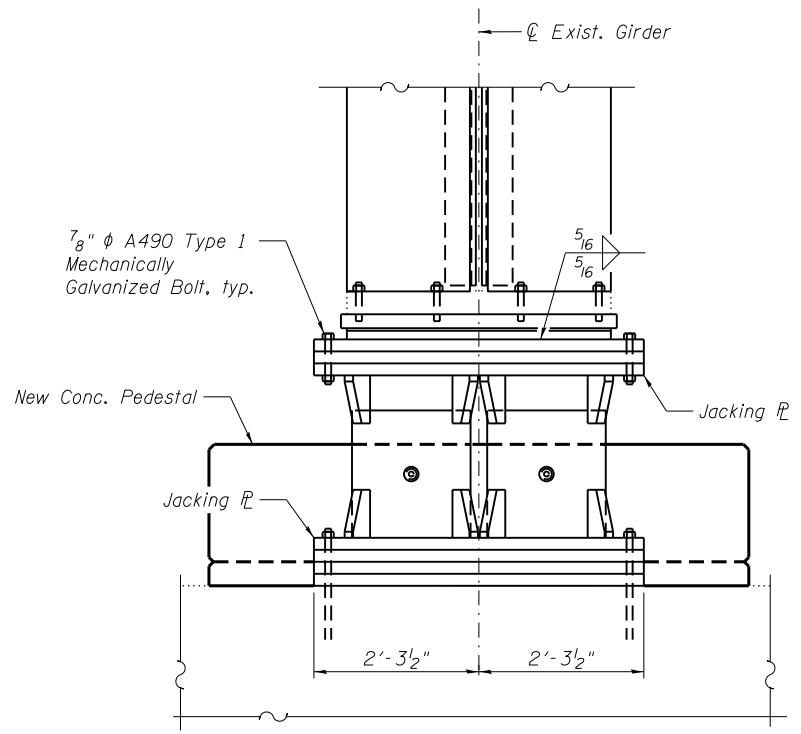
F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-24	(64-3B)1-7	MASSAC	18	14
CONTRACT NO. 78448				

ILLINOIS FED. AID PROJECT

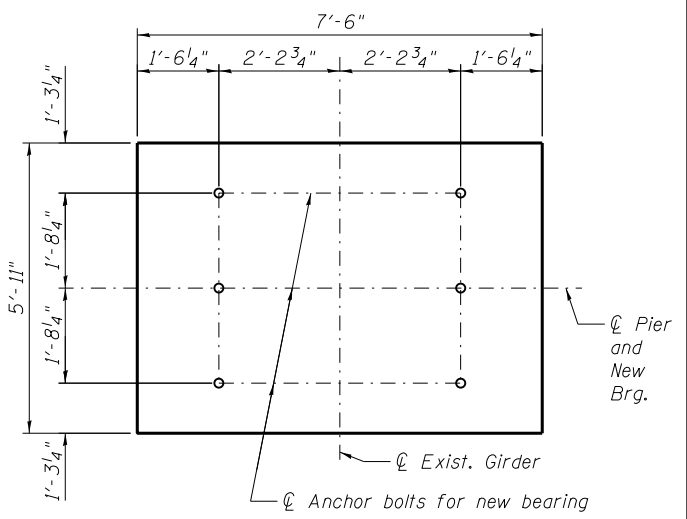


ELEVATION

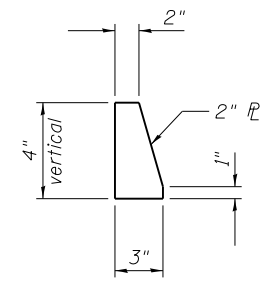
** Measured at centerline of girder



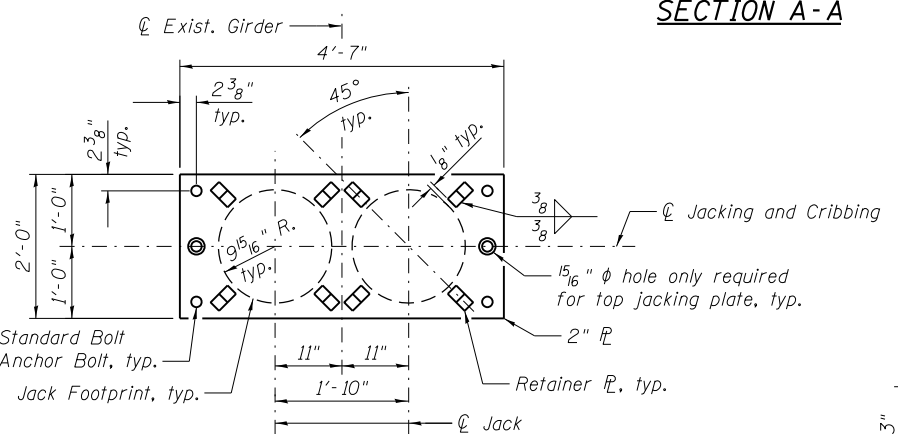
SECTION A-A



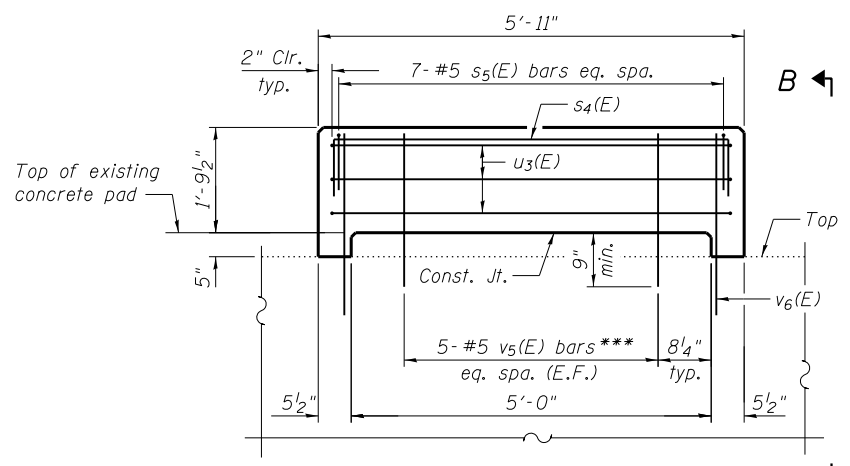
PEDESTAL PLAN



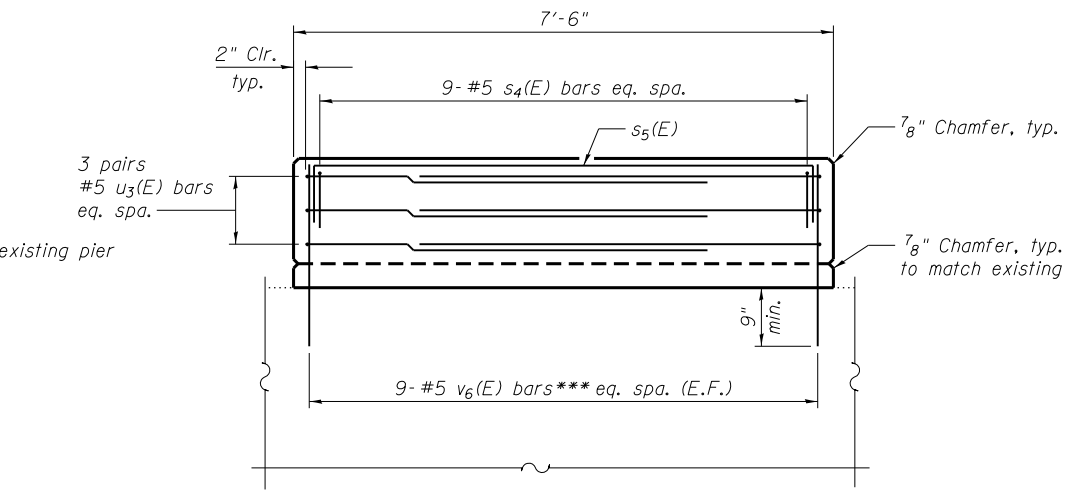
RETAINER PLATE



JACKING PLATE



PEDESTAL ELEVATION



VIEW B-B

*** Drill and Epoxy Grout

* Dimension obtained from existing plans at $\text{\textcircled{C}}$ bearing. It is the Contractor's responsibility to carefully verify dimensions of the existing bearings to ensure proper fit prior to ordering any material. Particular attention should be paid to any difference in height in the longitudinal direction. Adjustment may be made by using tapered shims as necessary.

BILL OF MATERIAL FOR PIERS 7 AND 9 (BOTH ENDS)

Bar	No.	Size	Length	Shape
s ₄ (E)	36	#5	7'-11"	□
s ₅ (E)	28	#5	9'-6"	□
u ₃ (E)	24	#5	16'-1"	□
v ₅ (E)	40	#5	2'-5"	—
v ₆ (E)	72	#5	2'-10"	—
Concrete Structures	Cu. Yd.	12.3		
Reinforcement Bars, Epoxy Coated	Pound	1,300		
Jacking and Cribbing	Each	4		

Notes:
 Epoxy grout vertical bars in concrete pedestal in accordance with Article 584 of the Standard Specifications. Cost is included with Reinforcement Bars, Epoxy Coated.
 Space reinforcement in pedestal to miss new anchor bolts for bearings.
 Jacking plate anchor bolts shall be installed in accordance with Article 521.06 of the Standard Specifications. Cost is included with Jacking and Cribbing.
 Expected jacking load per jack = 760 Kips.
 Calculated weight of structural steel required for one Jacking and Cribbing (Each) detailed on this sheet = 29.110 lbs. (includes weight of jacking stiffeners and connection angles, temporary bearing, jacking plates, fasteners, and jacking plate anchor bolts).



USER NAME =	DESIGNED - APL	REVISED
	CHECKED - ACK	REVISED
PLOT SCALE =	DRAWN - PRC	REVISED
PLOT DATE = 01/27/2015	CHECKED - RLM	REVISED

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

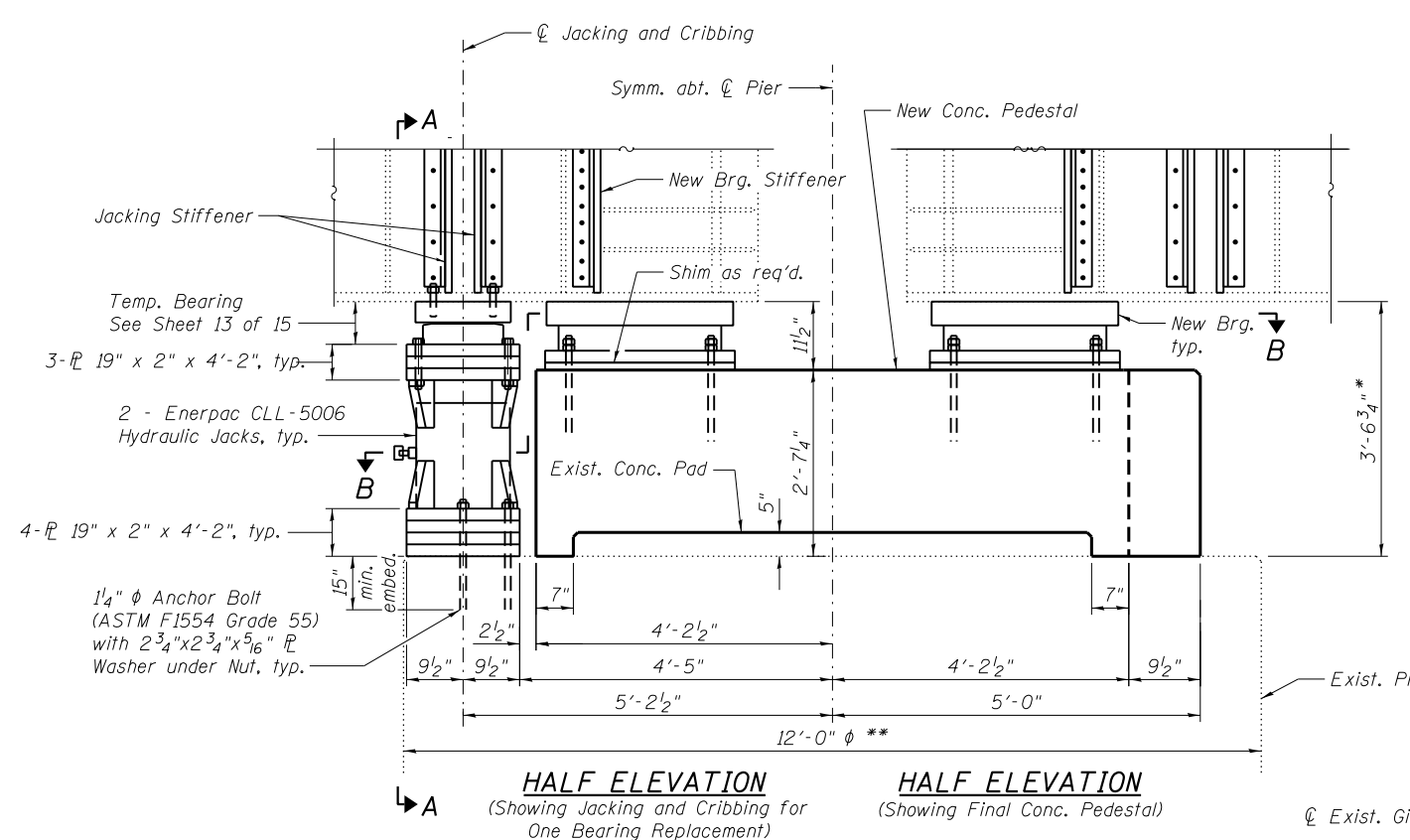
**JACKING AND CONCRETE PEDESTAL DETAILS - PIERS 7 AND 9
STRUCTURE NO. 064-0035**

SHEET NO. 10 OF 15 SHEETS

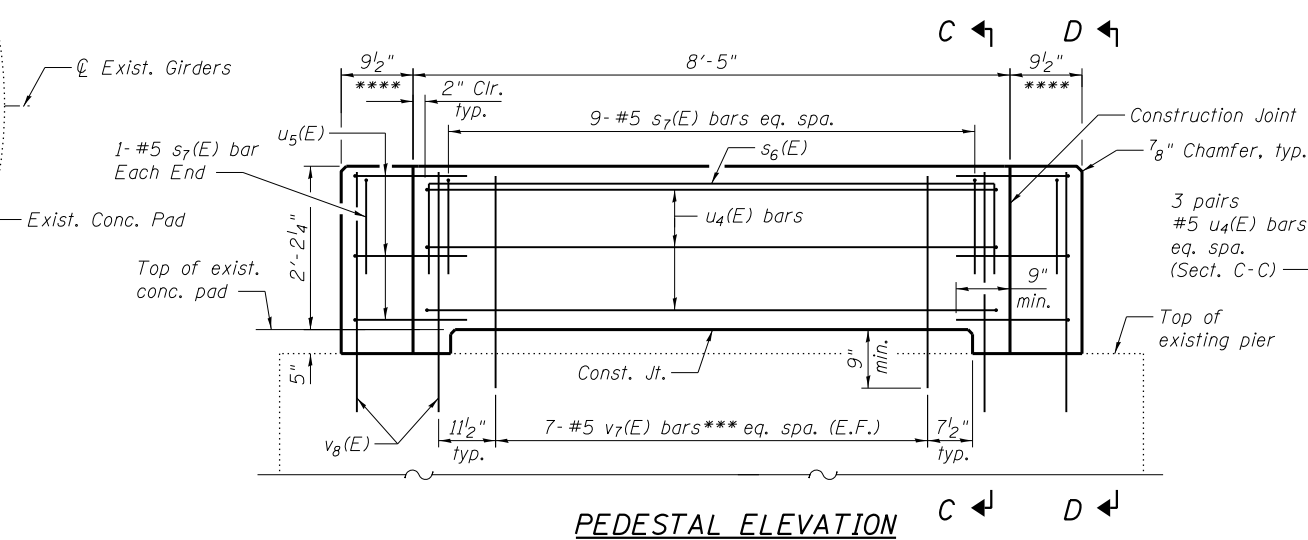
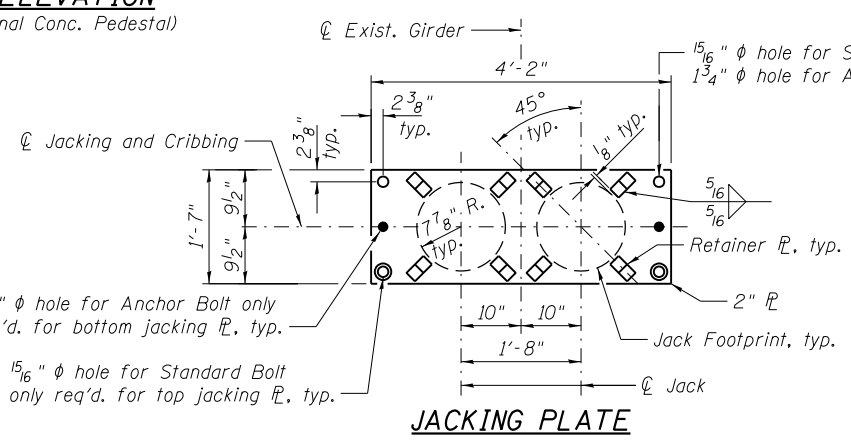
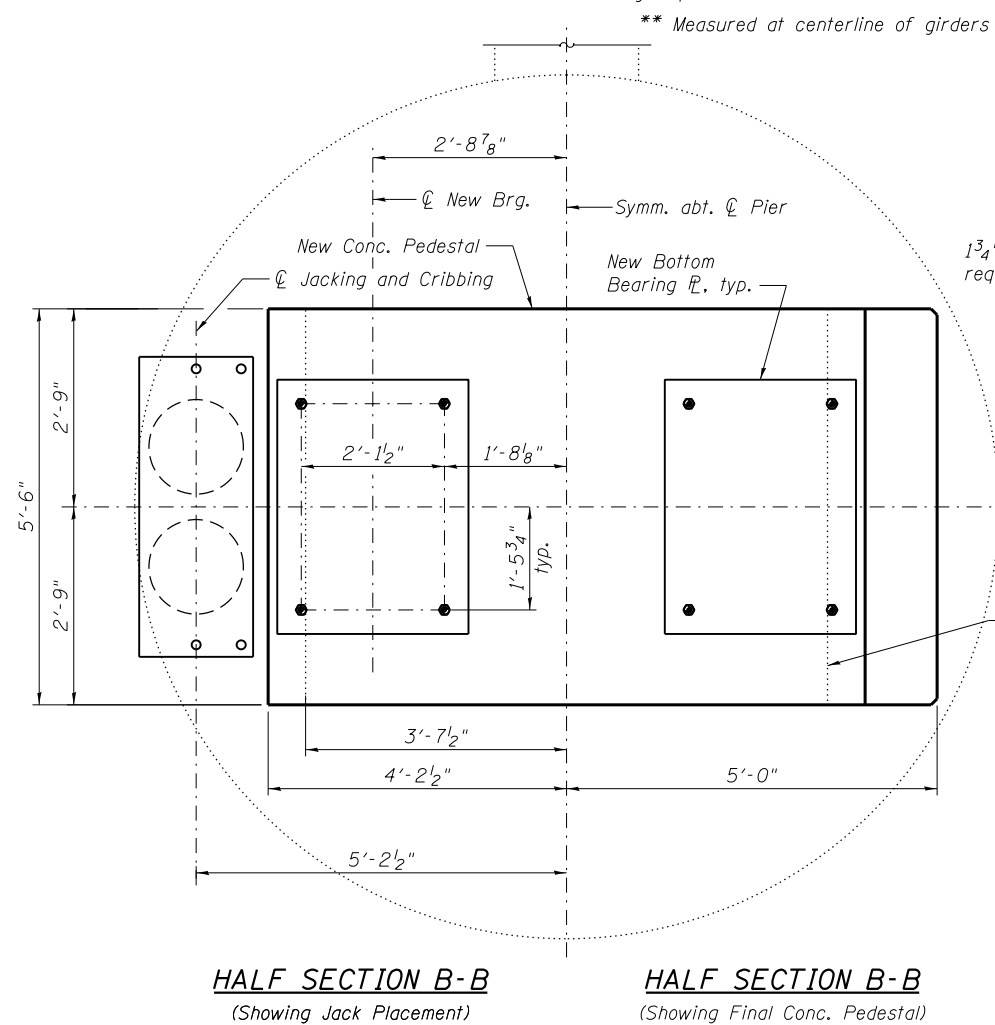
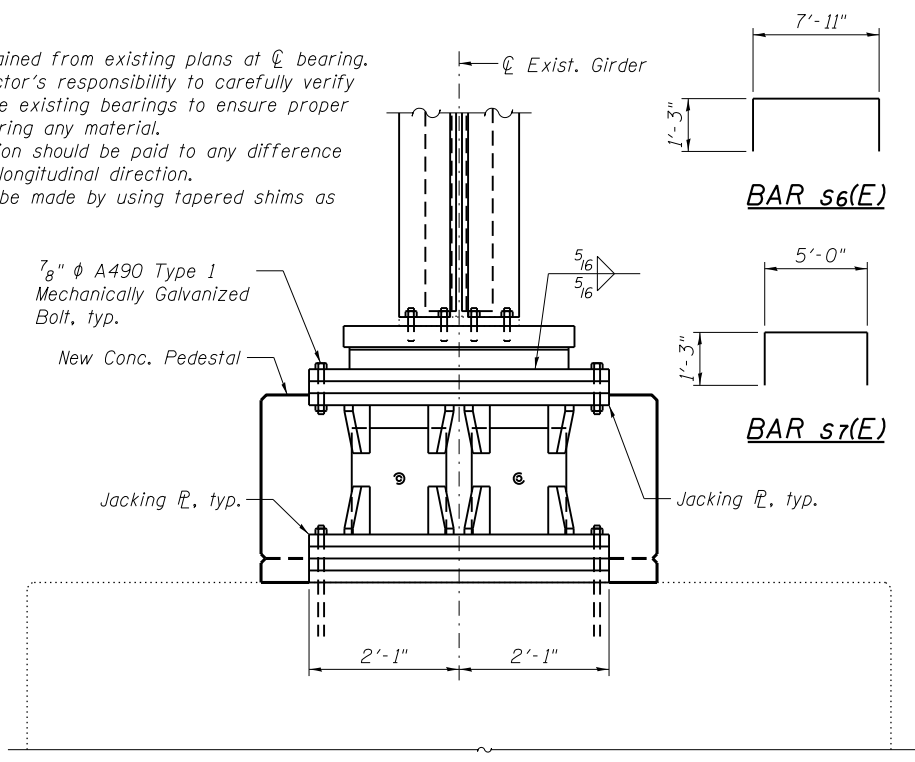
F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-24	(64-3B)I-7	MASSAC	18	15
CONTRACT NO. 78448			ILLINOIS FED. AID PROJECT	

**BILL OF MATERIAL
FOR PIER 8 (BOTH ENDS)**

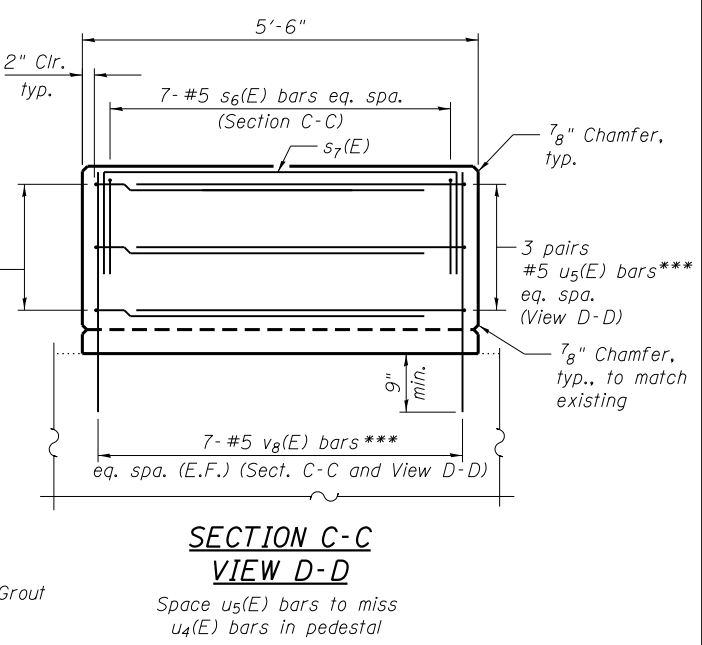
Bar	No.	Size	Length	Shape
s ₆ (E)	14	#5	10'-5"	□
s ₇ (E)	22	#5	7'-6"	□
u ₄ (E)	12	#5	16'-7"	□
u ₅ (E)	24	#5	5'-8"	□
v ₇ (E)	28	#5	2'-10"	—
v ₈ (E)	56	#5	3'-3"	—
Concrete Structures		Cu. Yd.	9.4	
Reinforcement Bars, Epoxy Coated		Pound	950	
Jacking and Cribbing		Each	4	



* Dimension obtained from existing plans at Q bearing. It is the Contractor's responsibility to carefully verify dimensions of the existing bearings to ensure proper fit prior to ordering any material. Particular attention should be paid to any difference in height in the longitudinal direction. Adjustment may be made by using tapered shims as necessary.



Notes:
Epoxy grout vertical bars in concrete pedestal in accordance with Article 584 of the Standard Specifications. Cost is included with Reinforcement Bars, Epoxy Coated.
Space reinforcement in pedestal to miss new anchor bolts for bearings.
Jacking plate anchor bolts shall be installed in accordance with Article 521.06 of the Standard Specifications. Cost is included with Jacking and Cribbing.
Expected jacking load per jack = 550 Kips.
Calculated weight of structural steel required for one Jacking and Cribbing (Each) detailed on this sheet = 7,250 lbs. (includes weight of jacking stiffeners and connection angles, temporary bearing, jacking plates, fasteners, and jacking plate anchor bolts).



**** This portion of the concrete pedestal is to be poured after the new bearing is installed and the jacking and cribbing has been removed.

*** Drill and Epoxy Grout

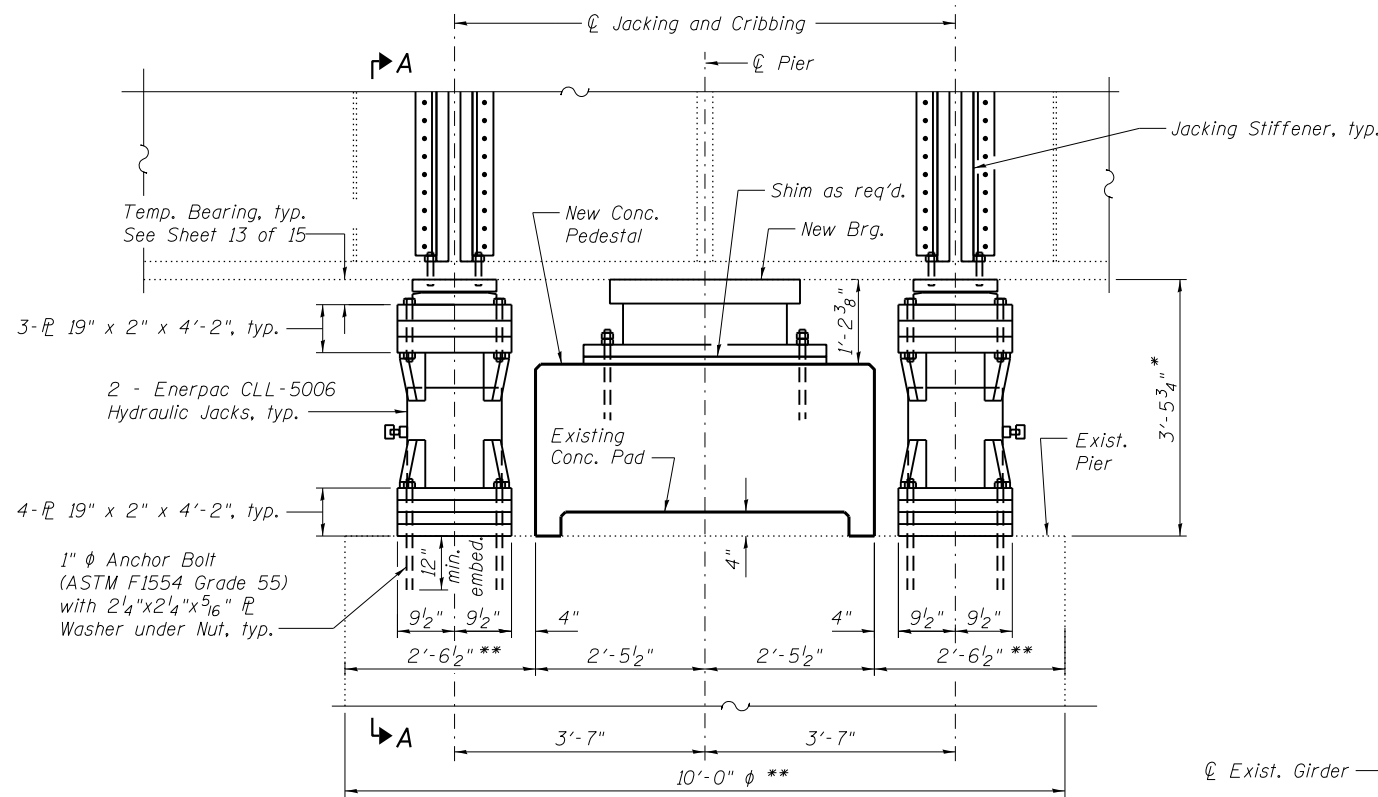


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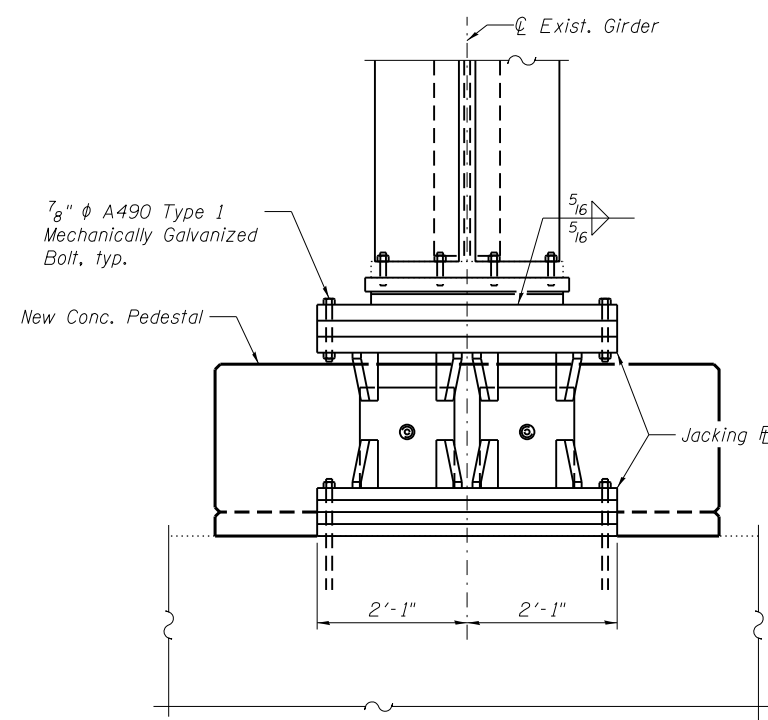
JACKING AND CONCRETE PEDESTAL DETAILS - PIER 8
STRUCTURE NO. 064-0035
SHEET NO. 11 OF 15 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-24	(64-3B)I-7	MASSAC	18	16
CONTRACT NO. 78448				
ILLINOIS FED. AID PROJECT				

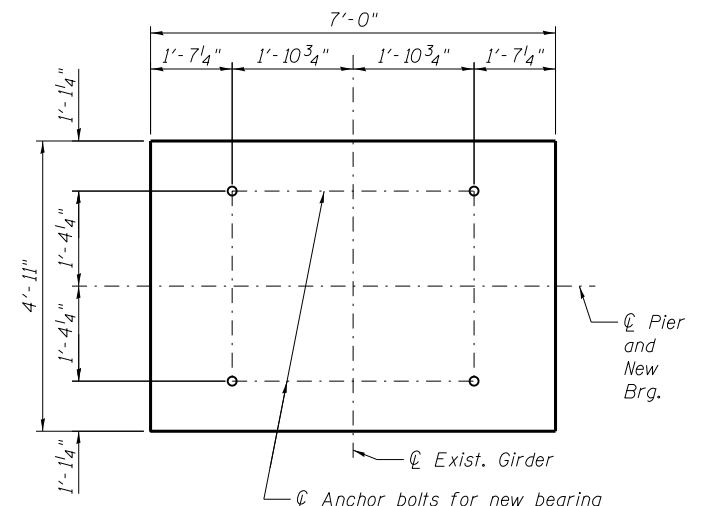


ELEVATION

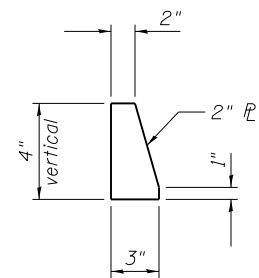
** Measured at centerline of girder



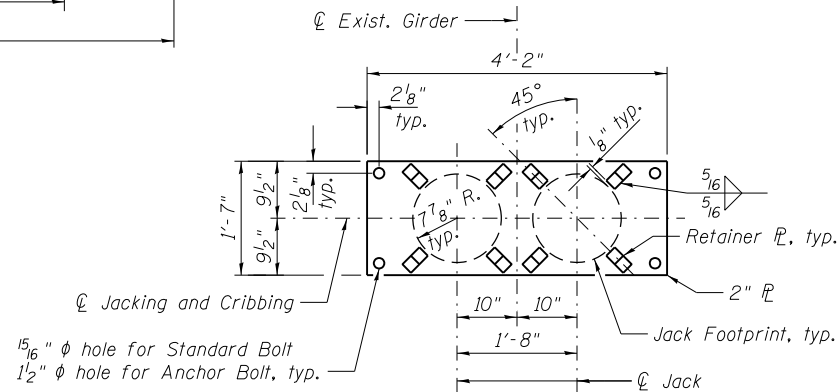
SECTION A-A



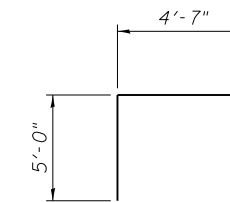
PEDESTAL PLAN



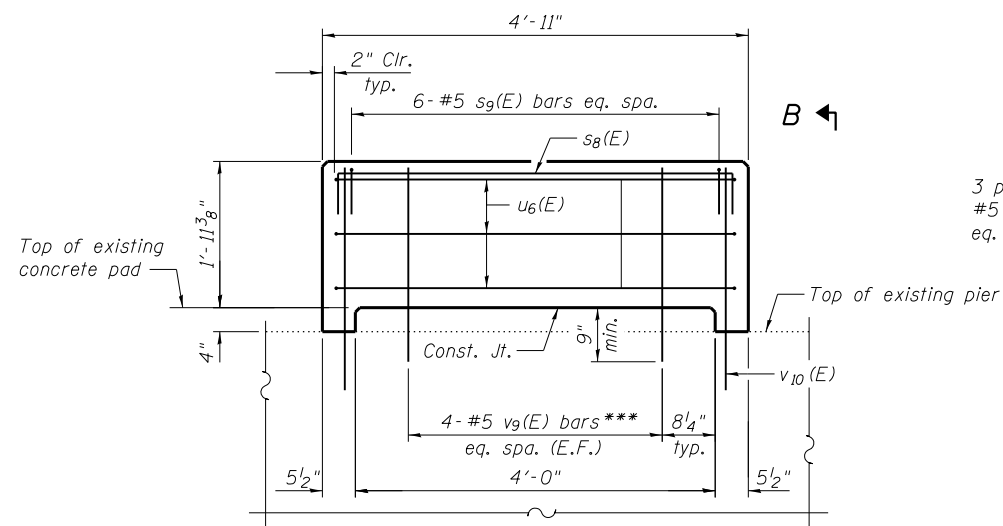
RETAINER PLATE



JACKING PLATE

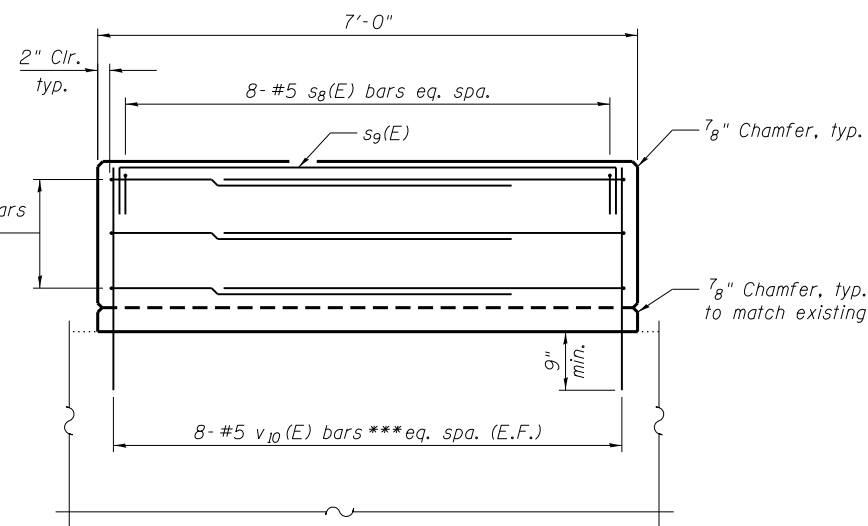


BAR u6(E)

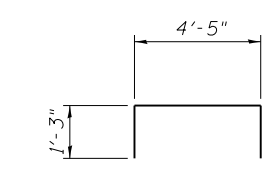


PEDESTAL ELEVATION

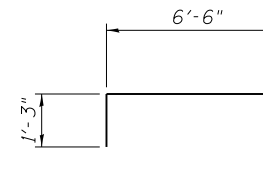
*** Drill and Epoxy Grout



VIEW B-B



BAR s8(E)



BAR s9(E)

* Dimension obtained from existing plans at ϕ bearing. It is the Contractor's responsibility to carefully verify dimensions of the existing bearings to ensure proper fit prior to ordering any material. Particular attention should be paid to any difference in height in the longitudinal direction. Adjustment may be made by using tapered shims as necessary.

BILL OF MATERIAL FOR PIERS 14 AND 18 (BOTH ENDS)

Bar	No.	Size	Length	Shape
s ₈ (E)	32	#5	6'-11"	□
s ₉ (E)	24	#5	9'-0"	□
u ₆ (E)	24	#5	14'-7"	□
v ₉ (E)	32	#5	2'-7"	—
v ₁₀ (E)	64	#5	2'-11"	—
Concrete Structures		Cu. Yd.	10.3	
Reinforcement Bars, Epoxy Coated		Pound	1,110	
Jacking and Cribbing		Each	4	

Notes:
 Epoxy grout vertical bars in concrete pedestal in accordance with Article 584 of the Standard Specifications. Cost is included with Reinforcement Bars, Epoxy Coated.
 Space reinforcement in pedestal to miss new anchor bolts for bearings.
 Jacking plate anchor bolts shall be installed in accordance with Article 521.06 of the Standard Specifications. Cost is included with Jacking and Cribbing.
 Expected jacking load per jack = 480 Kips.
 Calculated weight of structural steel required for one Jacking and Cribbing (Each) detailed on this sheet = 14,520 lbs. (includes weight of jacking stiffeners and connection angles, temporary bearing, jacking plates, fasteners, and jacking plate anchor bolts).



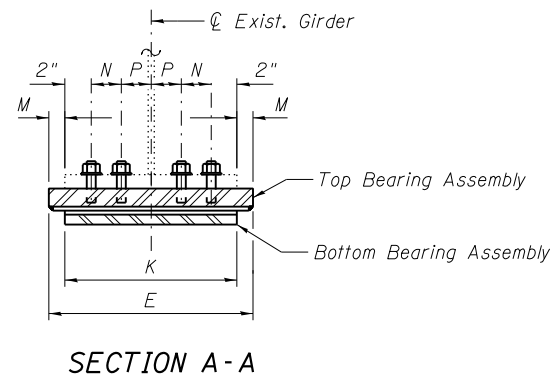
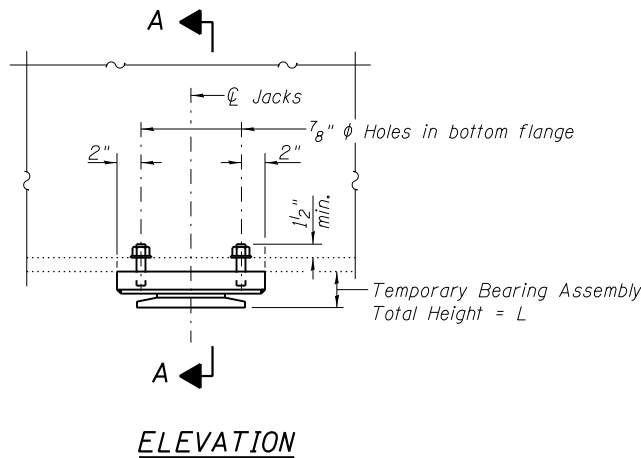
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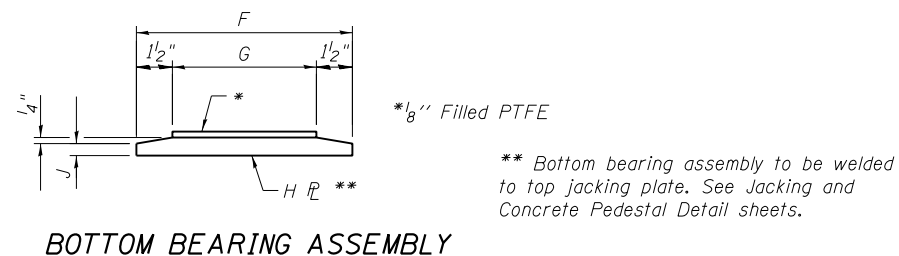
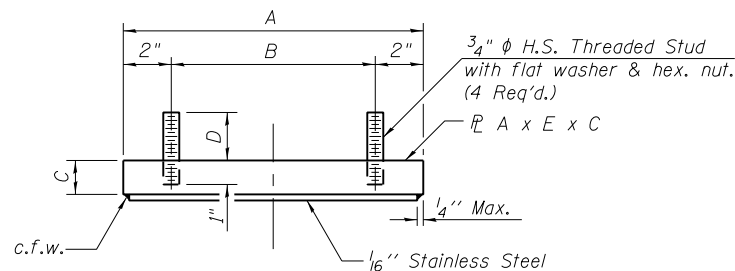
JACKING AND CONCRETE PEDESTAL DETAILS - PIERS 14 AND 18
STRUCTURE NO. 064-0035

SHEET NO. 12 OF 15 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-24	(64-3B)I-7	MASSAC	18	17
CONTRACT NO. 78448				
ILLINOIS FED. AID PROJECT				



TEMPORARY BEARING



TEMPORARY BEARING ASSEMBLY TABLE

Location	Top Bearing Assembly				Bottom Bearing Assembly					Miscellaneous				
	A	B	C	D	E	F	G	H	J	K	L	M	N	P
Piers 3N and 13S	17"	13"	2"	3 3/8"	22"	16"	13"	3"	2 3/4"	20"	5 3/16"	1"	5 1/2"	2 1/2"
Piers 4S and 12N	19"	15"	2"	3 1/4"	27"	19"	16"	2"	1 3/4"	25"	4 3/16"	3 1/2"	5 1/2"	2 1/2"
Piers 7 and 9	15"	11"	2"	5 5/8"	51"	15"	12"	2"	1 3/4"	49"	4 3/16"	1 1/2"	15"	7"
Piers 8N and 8S	16"	12"	3 1/2"	3 1/4"	39 1/2"	13 1/2"	10 1/2"	3 1/2"	3 1/4"	37 1/2"	7 3/16"	9 3/4"	5 1/2"	2 1/2"
Piers 14 and 18	14"	10"	2"	4 3/4"	35"	14"	11"	3"	2 3/4"	33"	5 3/16"	1 1/2"	9 1/2"	4 1/2"

FILLED PTFE MATERIAL REQUIREMENTS

Filled PTFE sheets shall be made from PTFE resin uniformly blended with milled glass or carbon fibers. The filler material shall not react chemically with the PTFE but shall adhere to it so that the two act compositely. The filler content shall be 15% for glass fibers and 25% for carbon fibers.

Filled PTFE material shall meet the requirements of Article 1083.02(b) of the Standard Specifications with the following exceptions.

ASTM STANDARD	PHYSICAL PROPERTY	SHEET WITH 15% GLASS FIBERS	SHEET WITH 25% CARBON FIBERS
D638	Tensile Strength, min. psi	2000	1300
D638	Elongation, min. %	150	75
D792	Specific Gravity	2.17-2.23	2.07-2.13

Notes:
 The 1/8" Filled PTFE sheet shall be bonded directly to the bottom steel plate with a two-component, medium viscosity epoxy resin, conforming to the requirements of the Federal Specification MMM-A-134, Type I. The bond agent shall be applied on the full area of the contact surfaces.
 Bonding of 1/8" Filled PTFE sheet during vulcanizing process will be permitted provided the process and method of adjusting assembly height is approved by the Engineer.
 Cost of Temporary Bearings shall be included with Jacking and Cribbing.



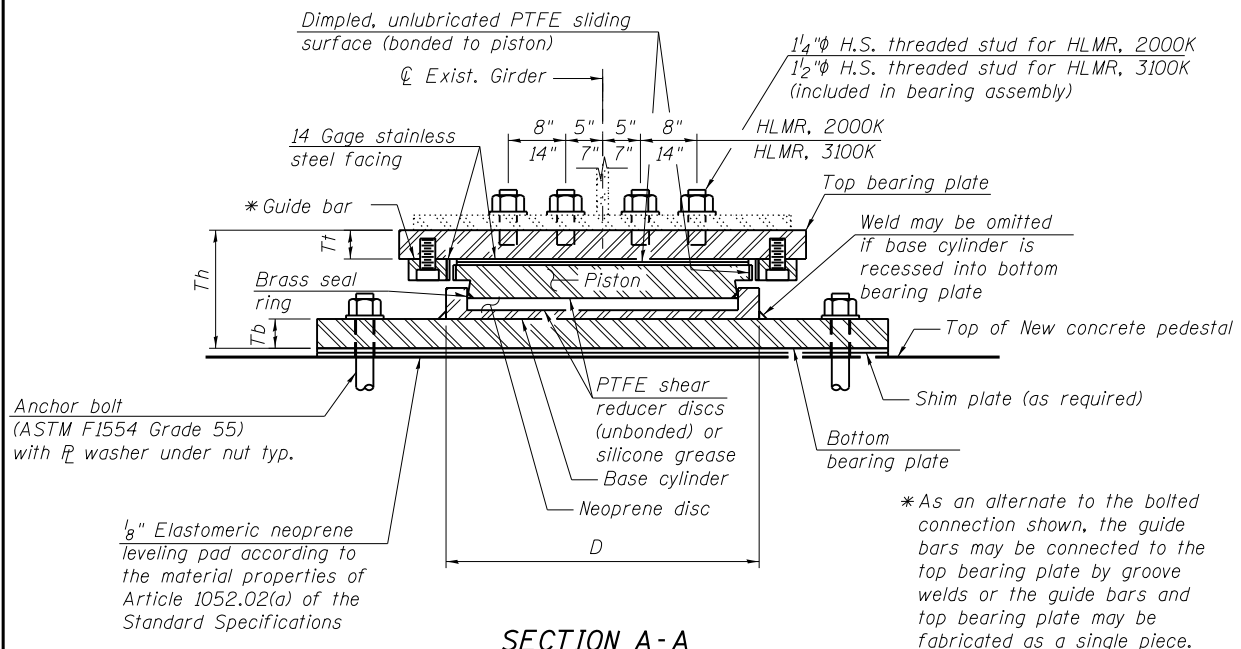
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DEPARTMENT OF TRANSPORTATION

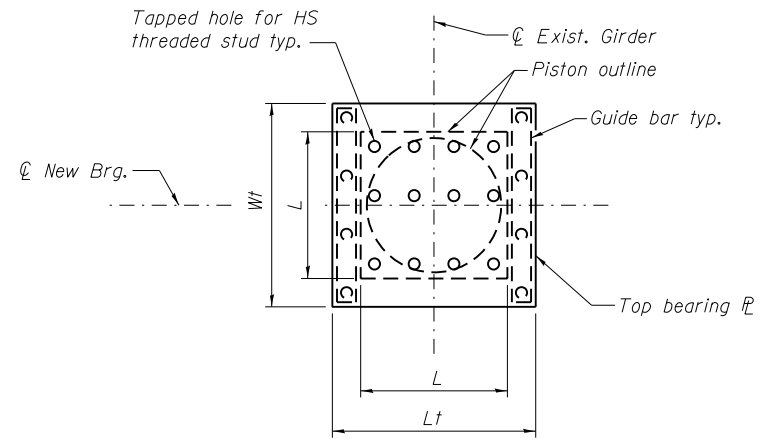
TEMPORARY BEARING DETAILS
STRUCTURE NO. 064-0035

SHEET NO. 13 OF 15 SHEETS

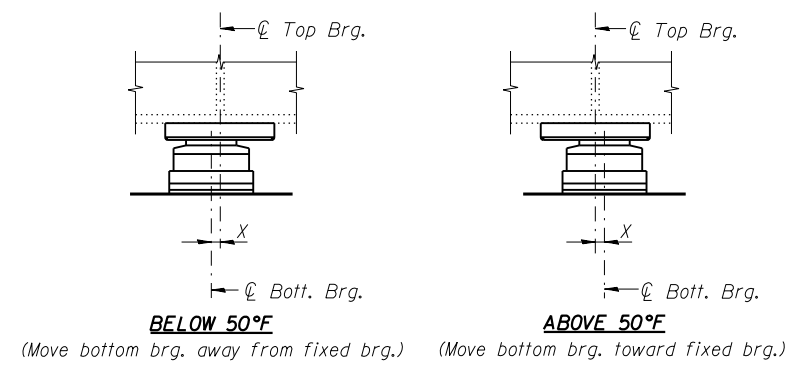
F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-24	(64-3B)1-7	MASSAC	18	18
CONTRACT NO. 78448				
ILLINOIS FED. AID PROJECT				



SECTION A-A

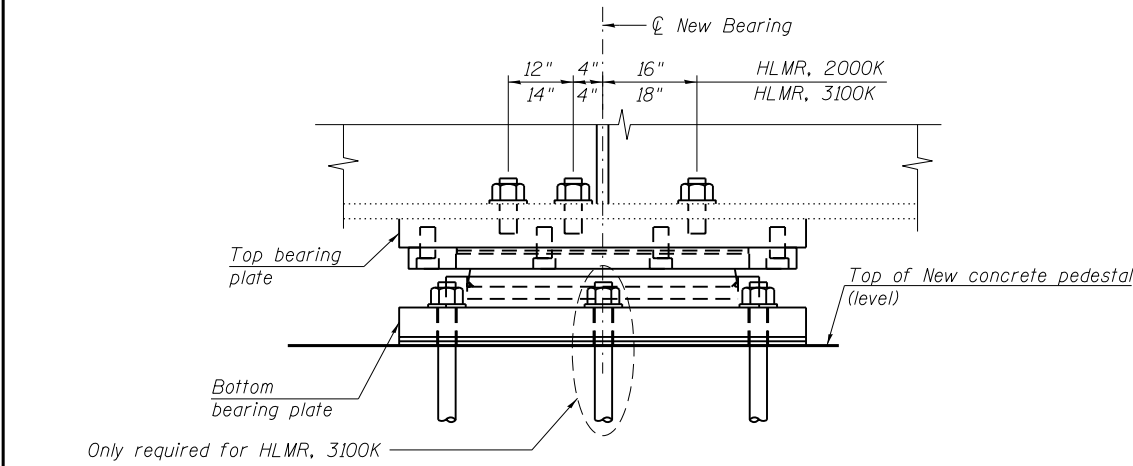


TOP BEARING PLATE AND PISTON PLAN

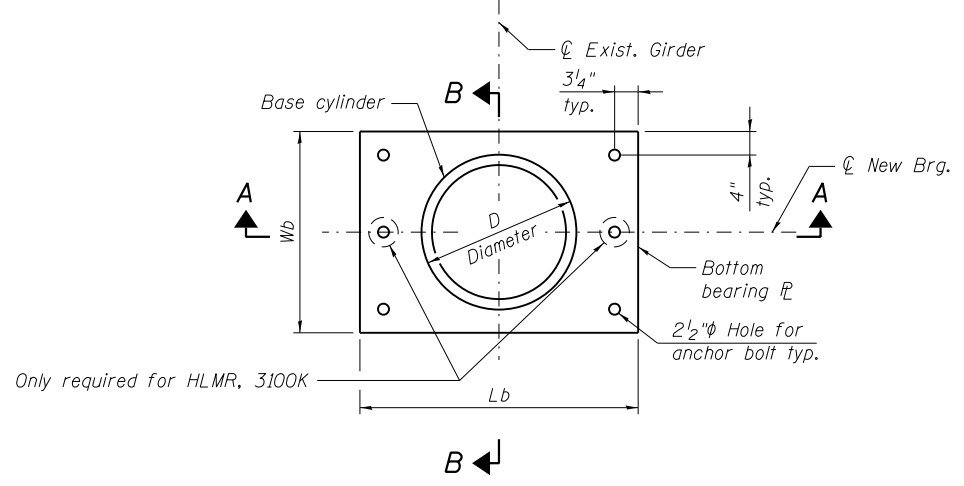


SETTING ANCHOR BOLTS AT HL MR EXP. BRG.

$X = \frac{1}{8}$ " per each 100' of expansion for every 15° temp. change from the normal temp. of 50°F.



SECTION B-B



BOTTOM BEARING PLATE AND BASE CYLINDER PLAN

Notes:
 All steel for bearings shall conform to the requirements of AASHTO M270 Grade 50, unless otherwise noted.
 Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554. Anchor bolts may be either cast in place or installed in holes drilled after the supported member is in place. Drilled and set anchor bolts shall be installed according to Article 521.06 of the Standard Specifications.
 Total bearing height is estimated based on manufacturer data. Actual bearing height may differ from contract plans. The Contractor shall be responsible for verifying bearing heights and adjusting seat elevations, if required, prior to placing pedestal concrete. Total bearing height is taken at the centerline of bearing for bevelled top plates.
 Bearing assemblies shall be designed and assembled to allow for replacement by jacking the superstructure.
 Two 1/8 in. adjusting shims shall be provided for each bearing in addition to all other plates.
 The anchor bolt sizes and grades shown constitute a calculated seismic structural fuse. Substitution of higher diameter and/or grade anchor bolts will not be allowed.

BILL OF MATERIAL

Item	Unit	Total
High Load Multi-Rotational Bearings, Guided Expansion, 2000K	Each	4
High Load Multi-Rotational Bearings, Guided Expansion, 3100K	Each	4
Anchor Bolts, 2"	Each	40

BEARING DESIGN DATA

Type	Location	Vertical Design Load ** (kips)	Horizontal Design Load ** (kips)	Required Rotation Range *** (radians)	Maximum Theoretical Thermal Movement **** (inches)	Length of Piston, L	Outside Pot Diameter, D	Thickness of Top Plate, Tt	Thickness of Bottom Plate, Tb	Total Height Bearing Assembly, Th	Longitudinal Length of Top Plate, Wt	Transverse Length of Top Plate, Lt	Longitudinal Length of Bottom Plate, Wb	Transverse Length of Bottom Plate, Lb	Anchor Bolt Diameter and Embedment	Plate Washer Size
HL MR, Guided Expansion, 2000K	Piers 14 & 18	1914	383	0.003	2 1/2"	3'-1 1/8"	3'-2 1/8"	4 5/8"	1 7/8"	14 3/8"	3'-8 1/2"	3'-7"	3'-4 1/2"	4'-4"	2"φ x 24"	3 1/2" x 3 1/2" x 5/16"
HL MR, Guided Expansion, 3100K	Piers 7 & 9	3052	610	0.004	2 7/8"	3'-9 1/4"	3'-10 1/4"	5 7/8"	2"	16 3/4"	4'-5"	4'-3"	4'-1 1/2"	5'-0"	2"φ x 24"	3 1/2" x 3 1/2" x 5/16"

** Design Loads are the governing service loads with no dynamic load allowance. **** Total required movement is based on one way expansion (or contraction)
 *** Rotation allowances for fabrication tolerances (0.005 radians), installation uncertainties (0.005 radians) are excluded.



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**STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION**

**HIGH LOAD MULTI-ROTATIONAL BEARINGS - 2
 STRUCTURE NO. 064-0035**

SHEET NO. 15 OF 15 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-24	(64-3B)I-7	MASSAC	18	18B
CONTRACT NO. 78448				
ILLINOIS FED. AID PROJECT				