11-9-12 LETTING ITEM 085

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
757	(20) I	PIKE/SCOTT	17	1
	ILLINOIS	CONTRACT NO. 72F75		

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

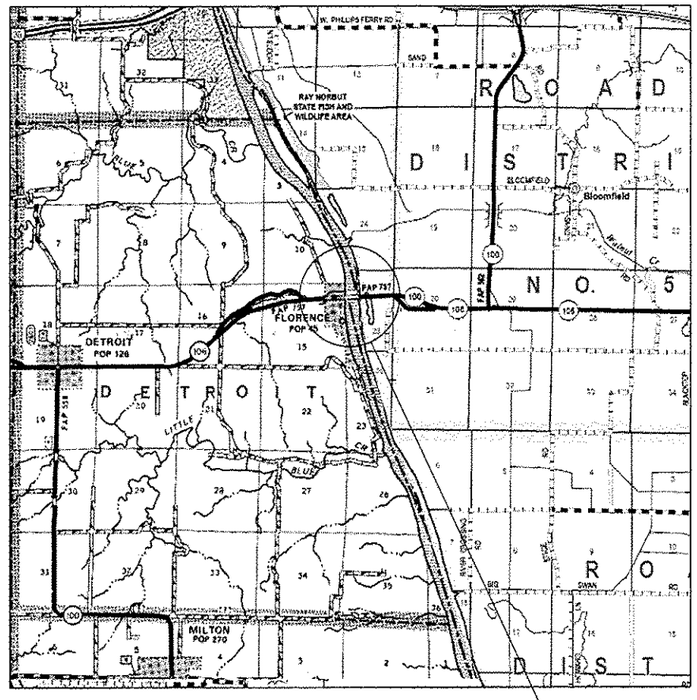
PROPOSED
HIGHWAY PLANS

FAP ROUTE 757 (IL 106)
SECTION (20) I
ILLINOIS RIVER BRIDGE AT E. EDGE OF FLORENCE
EMERGENCY BRIDGE REPAIR
PIKE/SCOTT COUNTY

C-96-007-13

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	SUMMARY OF QUANTITIES
3 - 17	BRIDGE PLANS



PROJECT LOCATION
SN 086-0001

D-96-007-13

LOCATION OF SECTION INDICATED THUS: -

0	100' 10'	200' 20'	300' 30'	— 1" =	100'
0	50'	100'		— 1" =	50'
0	50'	100'		— 1" =	40'
0	50'	100'		— 1" =	30'
0	50'	100'		— 1" =	20'

FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD ENGINEERING SCALES. REDUCED SIZED PLANS WILL NOT CONFORM TO STANDARD SCALES. IN MAKING MEASUREMENTS ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.

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

DAVID N. PETERMEIER
062-059513
LICENSED PROFESSIONAL ENGINEER OF ILLINOIS
10/19/12

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED October 22, 20 12
Roger L Driskell
DEPUTY DIRECTOR OF HIGHWAYS, REGION ENGINEER
October 5, 20 12
John D. Barramelli, P.E. /a
acting ENGINEER OF DESIGN AND ENVIRONMENT
October 5, 20 12
William R. Frayler
acting DIRECTOR OF HIGHWAYS, CHIEF ENGINEER

SENIOR TEAM ENGINEER VINCE MADONIA 217-785-9046
TEAM ENGINEER JAY EDWARDS 217-785-5321

CONTRACT NO. 72F75

PRINTED BY THE AUTHORITY OF THE STATE OF ILLINOIS

CODE NO.	ITEM	UNIT	TOTAL QUANTITY	07A0C CONSTRUCTION CODE PIKECO. 100% STATE BRIDGE 0014 RURAL	07A0C CONSTRUCTION CODE SCOTT CO. 100% STATE BRIDGE 0014 RURAL
Z0001905	Structural Steel Repair	Pound	2570	1,285	1,285
X0327504	Temporary Lift Span Support System	L Sum	1	0.5	0.5
X0327505	Temporary Counterweight Support System	L Sum	1	0.5	0.5
X0327506	Counterweight Wire Ropes, Install ONLY	L Sum	1	0.5	0.5
X0327507	Trunnion Bearings, Install ONLY	L Sum	1	0.5	0.5
X0327508	Trunnion/Sheave Assemblies, Install ONLY	L Sum	1	0.5	0.5
67100100	Mobilization	L Sum	1	0.5	0.5
67000400	Engineer's Field Office, Type A	Cal Mo	6	3	3

MODJESKI and MASTERS
Experience great bridges.

USER NAME =	DESIGNED	TS	REVISED
	CHECKED	DBI	REVISED
PLOT SCALE =	DRAWN	DTP	REVISED
PLOT DATE =	CHECKED	DBI	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

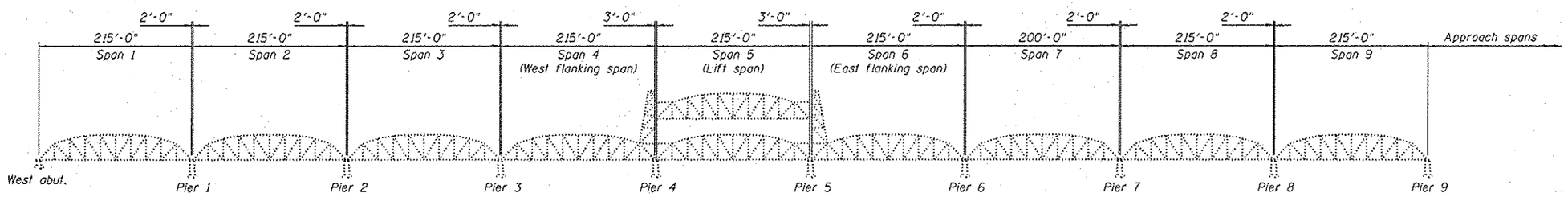
SUMMARY OF QUANTITIES
STRUCTURE NO. 086-0001
SHEET NO. 2 OF 17 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
757	(20) 1	PIKE/SCOTT	17	2
		CONTRACT NO. 72F75		
	ILLINOIS FED. AID PROJECT			

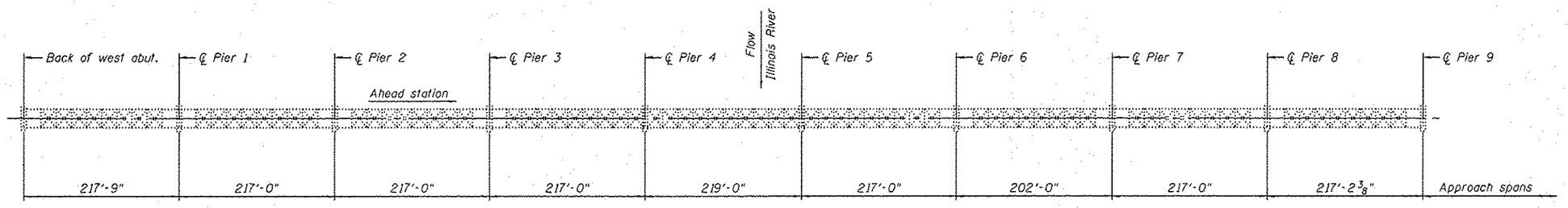
Bench Mark: Not required.

Existing Structure: S.N. 086-0001 built 1929 as S.B.I. Rte. 36, Sec. 20B, C & D. Structure consists of 8 fixed truss spans, one moveable truss span, & 29 WF approach spans at the east end of the structure. 3178'-11⅞" bk.-bk. abuts., 25'-11" c.c. truss, 25'-0" o.c. deck approach spans. Major rehabilitation of the structure was performed in 1981 and 2004. Bridge to be closed to traffic during repairs.

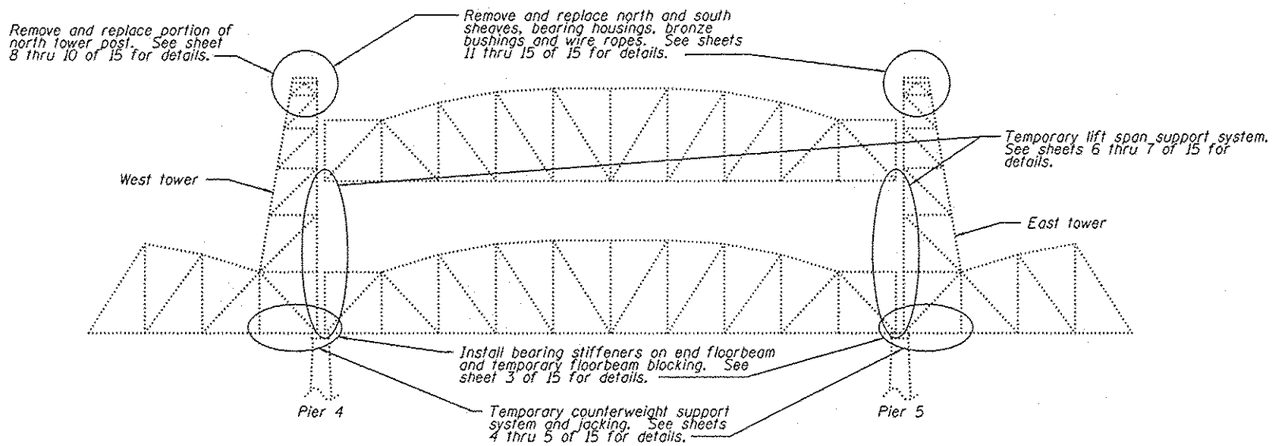
Salvage: None



GENERAL ELEVATION
(TRUSS SPANS)



GENERAL PLAN
(TRUSS SPANS)



ELEVATION
(Lift span (span 5) - looking north)

DAVID W. PETERMEIER
001-005418
LICENSED
STRUCTURAL
ENGINEER
ILLINOIS
10/19/12

LICENSED PROFESSIONAL ENGINEER
JEFFREY W. NEWMAN
062.061457
STATE OF ILLINOIS
10/19/12

INDEX OF SHEETS

1 General Plan and Elevation
2 General Notes and Bill of Materials
3 End Floorbeam Strengthening
4 Temporary Counterweight Support System and Jacking Details - 1
5 Temporary Counterweight Support System and Jacking Details - 2
6 Temporary Lift Span Support System - 1
7 Temporary Lift Span Support System - 2
8 Tower Post Replacement Details - 1
9 Tower Post Replacement Details - 2
10 Tower Post Replacement Details - 3
11 Mechanical Installation General Notes
12 Mechanical Tower Top Details - 1
13 Mechanical Tower Top Details - 2
14 Wire Rope Replacement Details - 1
15 Wire Rope Replacement Details - 2

GENERAL PLAN AND ELEVATION
ILLINOIS RIVER BRIDGE AT E EDGE OF FLORENCE (PUBLIC WATERS)
F.A.P. ROUTE 757 (IL 106) - SEC. (20) I
PIKE/SCOTT COUNTY
STATION 593+08.50
STRUCTURE NO. 086-0001

MODJESKI and MASTERS
Experience great bridges.

USER NAME =	DESIGNED TS	REVISED	
	CHECKED DBI	REVISED	
PLOT SCALE =	DRAWN TS	REVISED	
PLOT DATE =	CHECKED DBI	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 1 OF 15 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
757	(20) I	PIKE/SCOTT	17	3
		CONTRACT NO. 72F75		
	ILLINOIS FED. AID PROJECT			

BILL OF MATERIALS

ITEM	UNIT	TOTAL
Structural Steel Repair	Pound	2570
Temporary Lift Span Support System	Lump Sum	1
Temporary Counterweight Support System	Lump Sum	1
Counterweight Wire Ropes, INSTALL ONLY	Lump Sum	1
Trunnion Bearings, INSTALL ONLY	Lump Sum	1
Trunnion/Sheave Assemblies, INSTALL ONLY	Lump Sum	1

GENERAL NOTES

1. Fasteners shall be ASTM A325 Type 1, mechanically galvanized bolts. Bolts $^{7}/_{8}$ in. ϕ, holes $^{15}/_{16}$ in. ϕ, unless otherwise noted.
2. Anchor bolts shall be AASHTO M 314 Grade 105, sized as noted.
3. All structural steel shall be AASHTO M 270 Grade 50, unless otherwise noted.
4. No field welding is permitted except as specified in the contract documents.
5. 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.
6. The existing structural steel coating contains lead. The Contractor shall take appropriate precautions to deal with the presence of lead on this project.
7. The Organic Zinc Rich Primer/Epoxy/Urethane Paint System shall be used for painting of the new structural steel except where otherwise noted. The entire system shall be shop applied. The color of the finish coat for all surfaces shall be Interstate Green, Munsell No. 7.5G 4/8.
8. Plans of the original construction and prior rehabilitation contracts are available for review at the IDOT District 6 office in Springfield, Illinois.
9. Open fastener holes shall be filled with new, appropriately sized and tightened high strength bolts.
10. Total weight of equipment and material loading within each flanking span shall not exceed 20,000 pounds once the counterweight has been supported on the temporary counterweight support system.
11. The movable span will not be operated by anyone except Illinois DOT bridge tenders. 48 hours notice must be given to the Department to provide a bridge tender to operate the bridge.
12. 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 the appropriate pay item.

SUGGESTED CONSTRUCTION PROCEDURE

(This is a General Procedure, for additional details of procedures, see sheet nos. 4, 6, 8 and 10 of 14.)

1. Install new bearing stiffeners and temporary hardwood blocking supports at the end floorbeam of span 4 over pier 4 and the end floorbeam of span 6 over pier 5.
2. Install temporary counterweight support grillage and jacking system on span 4 and span 6.
3. Install east and west tower temporary lift span support systems.
4. Jack east and west counterweights to relieve tension in wire ropes and to allow for ropes to be removed from the sheaves.
5. Remove sheaves, trunnions, trunnion bearings and wire ropes from the east and west towers.
6. Remove indicated portion of the tower post on the west tower.
7. Install and splice new portion of the tower post.
8. Install new sheaves, trunnions, trunnion bearings and wire ropes at the east and west towers.
9. Lower the counterweights to allow all weight to be carried by the wire ropes.
10. Remove east and west tower temporary lift span support systems.
11. Test system for proper balance and operation.
12. Remove temporary counterweight grillage and jacking system on span 4 and span 6.
13. Remove temporary blocking supports at the end floorbeams of span 4 and span 6. Bearing stiffeners may remain in place.

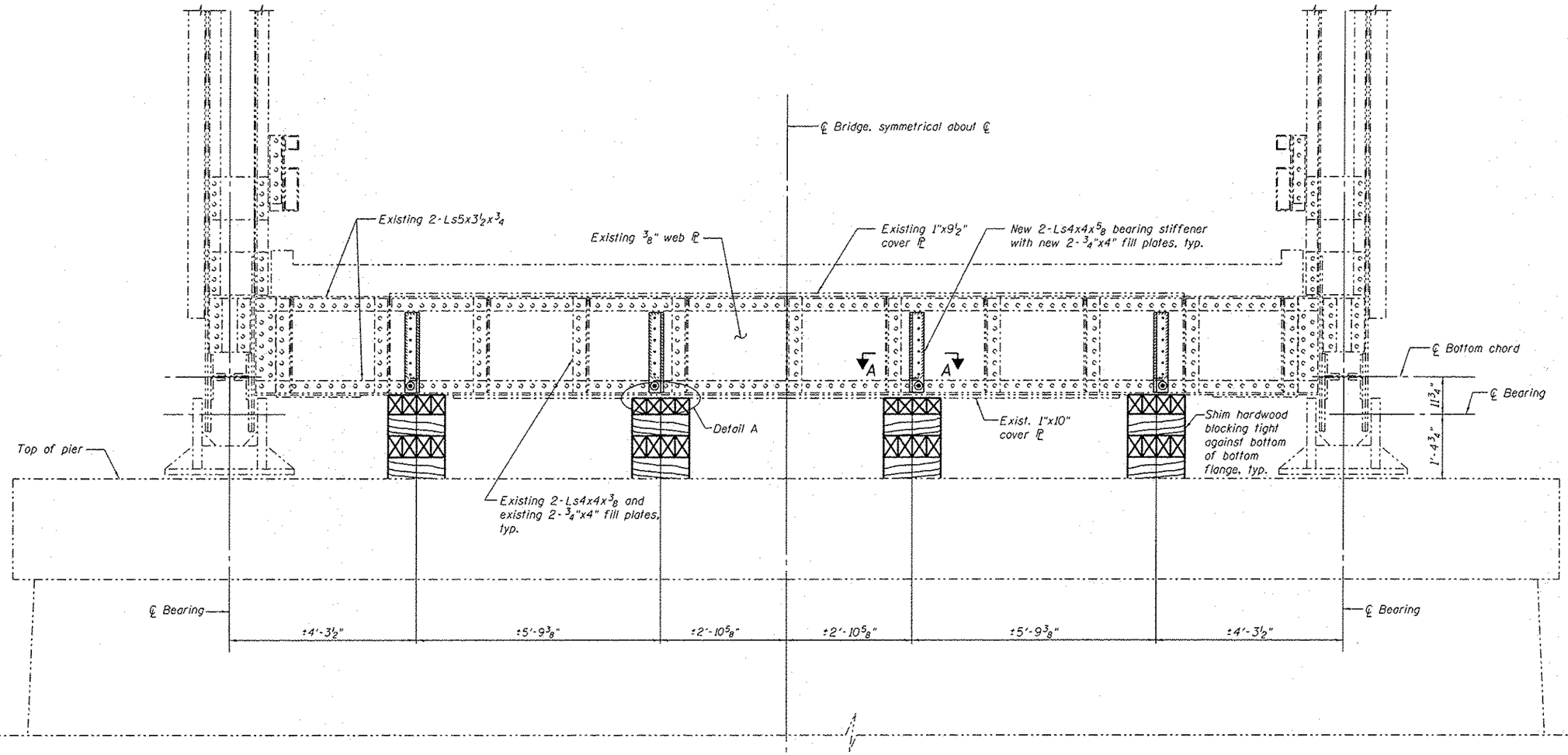
MODJESKI and MASTERS
Experience great bridges.

USER NAME =	DESIGNED	TS	REVISED
	CHECKED	DBI	REVISED
PLOT SCALE =	DRAWN	TS	REVISED
PLOT DATE =	CHECKED	DBI	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

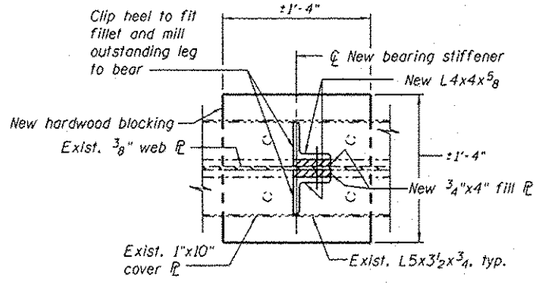
GENERAL NOTES AND BILL OF MATERIALS
STRUCTURE NO. 086-0001
SHEET NO. 2 OF 15 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
757	(20) I	PIKE/SCOTT	17	4
		CONTRACT NO. 72F75		
ILLINOIS	FED. AID PROJECT			



END FLOORBEAM ELEVATION

(Span 4 end floorbeam at pier no. 4 looking back station)
(Span 6 end floorbeam at pier no. 5 looking ahead station)

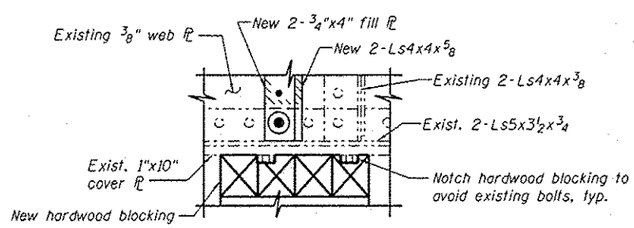


SECTION A-A

(Existing stiffening materials not shown for clarity)

BOLT LEGEND

- ○ Existing fastener to remain
- ⊙ New bolt in existing hole
- • New bolt in new hole
- ⊗ New countersunk bolt on far side



DETAIL A

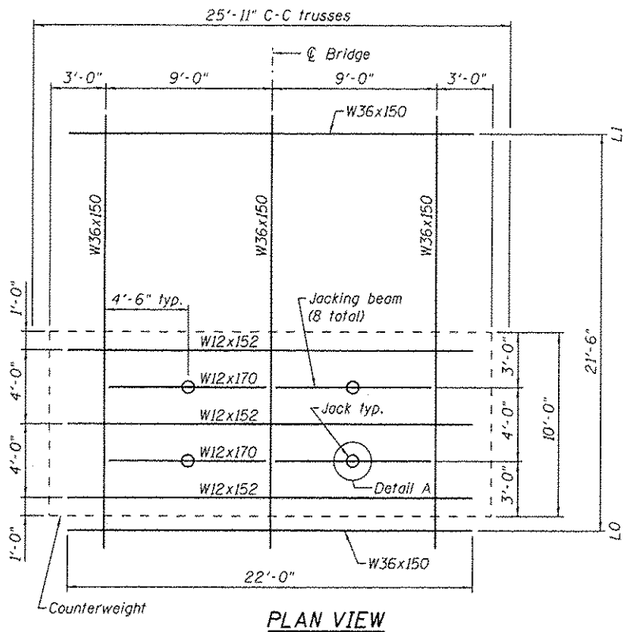
Notes:
For general notes, see sheet no. 2 of 15.
For suggested construction procedure see sheet no. 2 of 15.

MODJESKI and MASTERS Experience great bridges.	USER NAME =	DESIGNED TS	REVISED
		CHECKED DBI	REVISED
	PLOT SCALE =	DRAWN DTP	REVISED
	PLOT DATE =	CHECKED DBI	REVISED

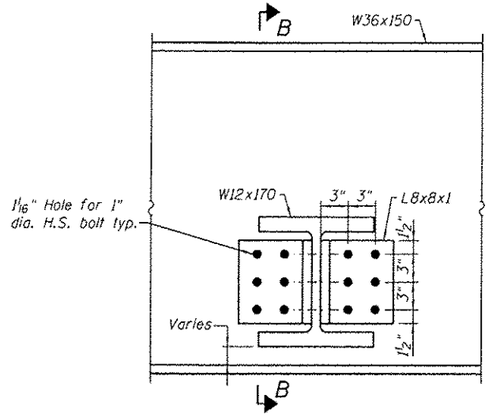
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

END FLOORBEAM STRENGTHENING
STRUCTURE NO. 086-0001
SHEET NO. 3 OF 15 SHEETS

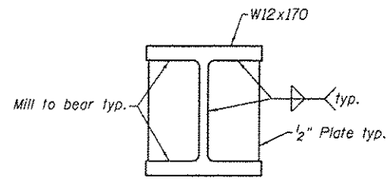
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
757	(20) I	PIKE/SCOTT	17	5
		CONTRACT NO. 72F75		
	ILLINOIS FED. AID PROJECT			



PLAN VIEW



TYPICAL JACKING BEAM CONNECTION



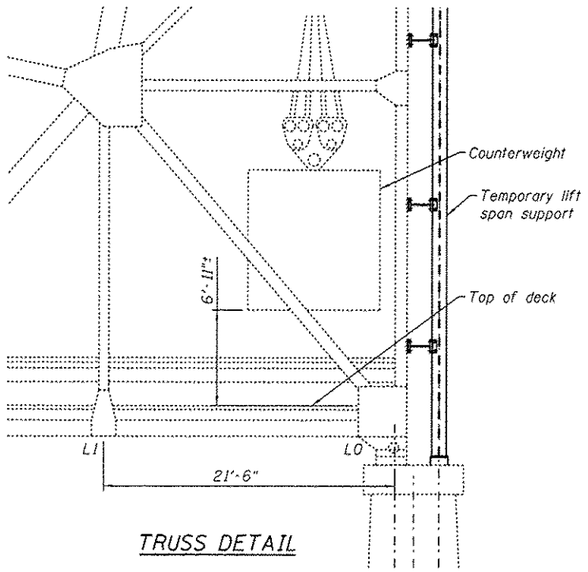
DETAIL A

Jacking stiffeners at all jacking locations (All stages)

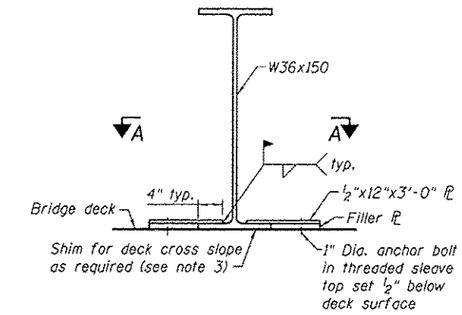
SUGGESTED COUNTERWEIGHT JACKING PROCEDURE:

1. This jacking procedure is based on using four 200 ton jacks with a collapsed height of 30.13" and an 18" stroke. Jacks shall be double acting. This procedure is the same for the east and west counterweights. It may be necessary to lower span a few inches to fit jacks and support system. The weight of each counterweight is estimated to be 450 kips for design. Jacks shall be hydraulically interconnected to ensure simultaneous operation. Use a 12"x12"x1" plate against bottom of counterweight to jack against. This jacking procedure provides 40+ inches of jacking.
2. Estimated weight of structural steel for one counterweight support system = 62,500 lbs.
3. After the end floorbeam strengthening is complete, place the W36x150 beams directly over panel points L0 & L1. Place shims between flange and deck as necessary to provide good bearing under the flange and to level beams. Fasten beams to deck as shown then install next level of W36x150 beams. Fasten bottom flange of beams to top flange of beams below them using 4-7/8" H.S. bolts at each intersection, see detail A on sheet 5 of 15.
4. Install W12x170 jacking beams as shown. For the first stage, the jacking beams will be placed with the bottom of the bottom flange 2" above the bottom of the W36x150. Raise jacks only until contact is made with counterweight. Release all span brakes. Continue with jacking procedure.
5. Jack the counterweight and install 3-W12x152 beams as shown. Fasten bottom flange of beams to top flange of beams below them using 4-7/8" H.S. bolts at each intersection.
6. Continue to jack and place next level of 3-W12x152 beams as shown. Fasten bottom flange of beams to top flange of beams below using 4-7/8" H.S. bolts at each intersection.
7. Remove W12x170 jacking beams and reinstall them with the top of the top flange 4 1/2" below top of top flange of W36x150.
8. Jack counterweight and install third layer of 3-W12x152 beams. Fasten bottom flange of beams to top flange of beams below them using 4-7/8" H.S. bolts at each intersection.
9. Bolt W12x170 on top of each W12x170 with 7/8" H.S. bolts on each side of web spaced longitudinally at a maximum of 8", see detail B on sheet 5 of 15.
10. Jack from top of second W12x170 and install 4th layer of W12x152 beams if necessary. Fasten bottom flange of beams to top flange of beams below them using 4-7/8" H.S. bolts at each intersection.
11. All layers may not be necessary. Stop adding layers when there is sufficient slack in the ropes to remove them from the sheaves. Anticipated relaxation of existing ropes is 10" to 14" (including 4" of immediate elastic relaxation and 6" to 10" of slow constructional stretch relaxation). New counterweight ropes are approximately 12" shorter than existing ropes.
12. When all bridge repairs are complete reverse procedure to lower counterweight and engage ropes to support counterweight and lift span. Set all span drive brakes when full weight of counterweights is supported by counterweight ropes. Monitor span movement; span may raise when loading counterweight ropes.
13. Complete removal of counterweight support should only be done after the system has been tested.
14. Remove anchor bolts in deck and patch holes per section 442 of the standard specifications.

Notes:
For general notes see sheet 2 of 15.
For additional details see sheet no. 5 of 15.

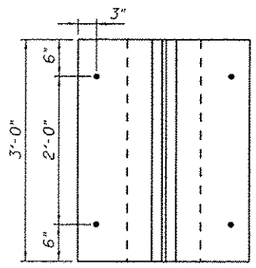


TRUSS DETAIL

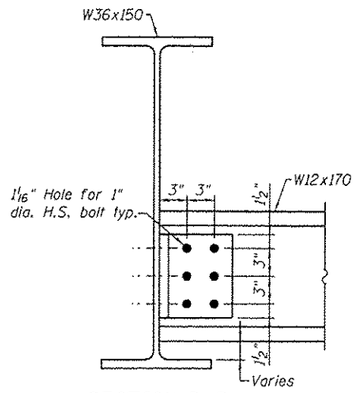


SUPPORT ATTACHMENT TO DECK

Provide 6 attachment plates per beam
3 on each side of web equally spaced



SECTION A-A



SECTION B-B

BOLT LEGEND

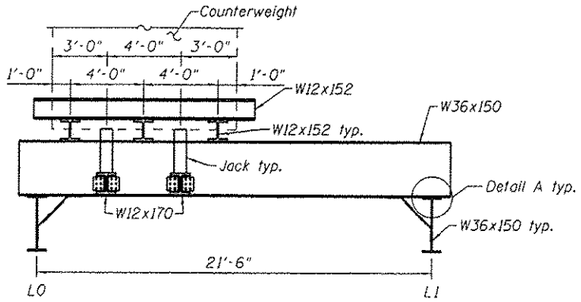
- ○ Existing fastener to remain
- ⊙ New bolt in existing hole
- · New bolt in new hole
- ● New countersunk bolt on far side

MODJESKI and MASTERS Experience great bridges.	USER NAME =	DESIGNED - JAK	REVISED -
		CHECKED - DMS	REVISED -
	PLOT SCALE =	DRAWN - RSJ	REVISED -
	PLOT DATE =	CHECKED - JAK	REVISED -

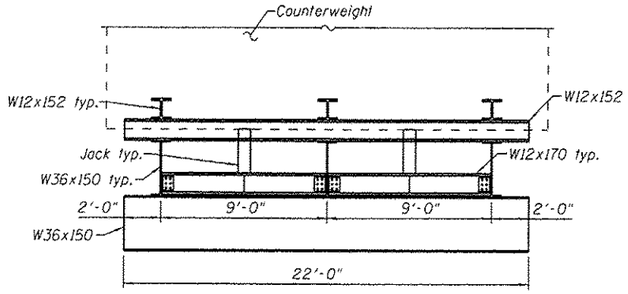
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TEMPORARY COUNTERWEIGHT SUPPORT SYSTEM AND JACKING DETAILS – 1
STRUCTURE NO. 086-0001
SHEET NO. 4 OF 15 SHEETS

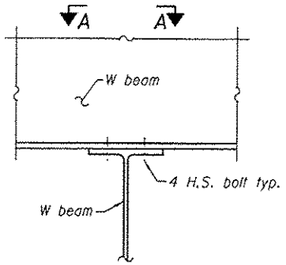
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
757	(20)1	PIKE/SCOTT	17	6
		CONTRACT NO. 72F75		
	ILLINOIS FED. AID PROJECT			



STAGE I SIDE VIEW

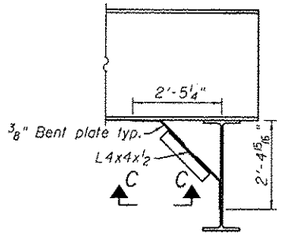


STAGE I FRONT VIEW

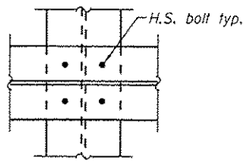


DETAIL A

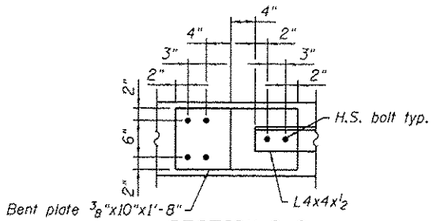
At all beam intersections



DETAIL C

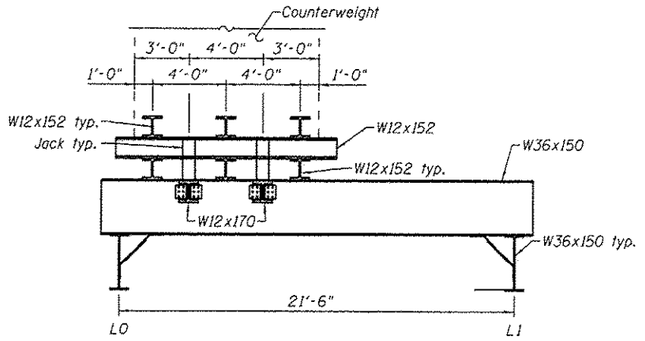


SECTION A-A

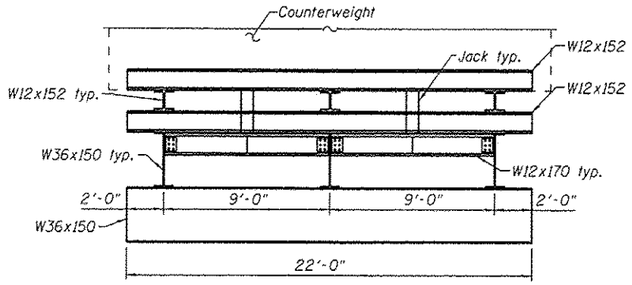


SECTION C-C

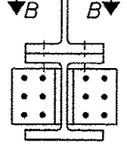
(Flange connection is shown and web connection is similar)



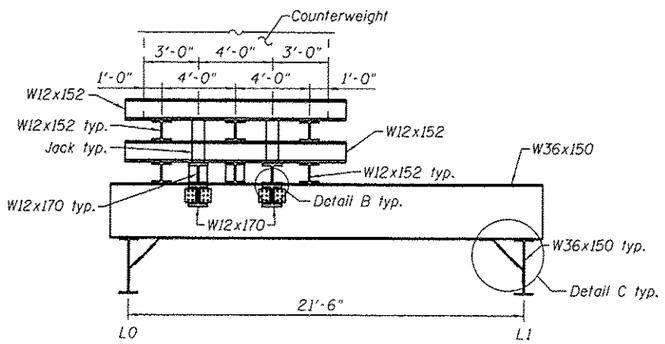
STAGE II SIDE VIEW



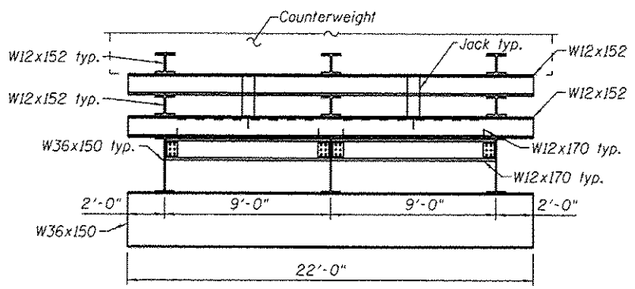
STAGE II FRONT VIEW



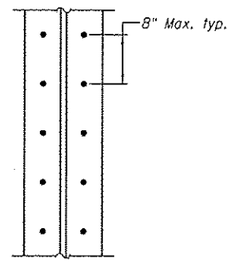
DETAIL B



STAGE III SIDE VIEW



STAGE III FRONT VIEW



SECTION B-B

BOLT LEGEND

- ○ Existing fastener to remain
- ⊗ New bolt in existing hole
- • New bolt in new hole
- ● New countersunk bolt on far side

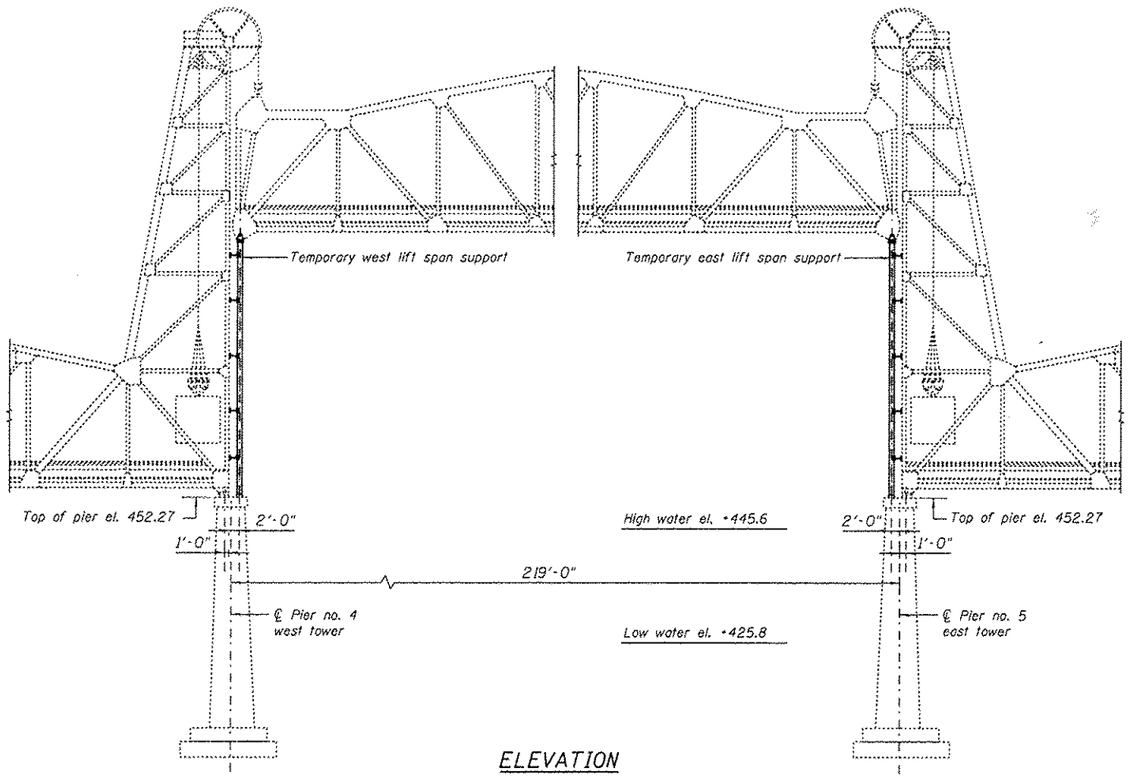
Notes:
For additional information see sheet 4 of 15.

MODJESKI and MASTERS Experience great bridges.	USER NAME =	DESIGNED - JAK	REVISED -
		CHECKED - DMS	REVISED -
	PLOT SCALE =	DRAWN - RSJ	REVISED -
	PLOT DATE =	CHECKED - JAK	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TEMPORARY COUNTERWEIGHT SUPPORT SYSTEM AND JACKING DETAILS – 2
STRUCTURE NO. 086-0001
SHEET NO. 5 OF 15 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
757	(20)1	PIKE/SCOTT	17	7
		CONTRACT NO. 72F75		
		ILLINOIS FED. AID PROJECT		



ELEVATION
(Looking North)

NOTES FOR TEMPORARY LIFT SPAN SUPPORTS:

1. Temporary lift span arrangement details and associated erection and jacking procedures are shown for the temporary west lift span support. temporary east lift span support is similar.
2. Estimated weight of structural steel for one temporary span support = 32,500 lbs.

SUGGESTED ERECTION PROCEDURES FOR TEMPORARY LIFT SPAN SUPPORT

1. Remove existing shim plates attached to existing bearing plates. Grind surface of existing bearing plate smooth.
2. Raise lift span if necessary and install temporary lift span support columns at the west and east towers (Piers No. 4 & 5).
3. Install anchor bolts in top of pier at each temporary support column.
4. Plumb temporary lift span support columns and ensure that the elevation of the top of the top plates vary not more than $\frac{1}{8}$". Install all braces at each tower leg between the existing tower and the temporary lift span support column.
5. Install all steel members between the two temporary lift span support columns.
6. Lower the lift span onto the temporary lift span support columns prior to jacking the counterweight to prevent damage to the drive line and brakes. Then jack the counterweights as shown on the temporary counterweight support system and jacking details plans and ensure that there is full seating between bearings of the lift span and the top plate of the temporary support columns. Install bearing restraints.
7. When all bridge repairs are complete raise span by lowering counterweight and remove temporary lift span support systems at both piers.
8. Replace all removed rivets with $\frac{7}{8}$" high strength bolts after removal of temporary support structure.
9. Replace any bearing shim plates needed for proper seating of the lift span in the down position with 14"x29" shim plates. Attach shim plates to bearing plates with a fillet weld around the perimeter of the shim plate.
10. All anchor bolts drilled and secured in existing concrete shall be removed upon completion of the repairs and the holes shall be patched per section 442 of the standard specifications.

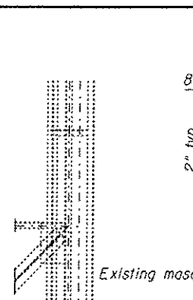
Notes:
For additional details see sheet no. 7 of 15.
For general notes see sheet 2 of 15.

MODJESKI and MASTERS Experience great bridges	USER NAME =	DESIGNED - JAK	REVISED -
		CHECKED - DMS	REVISED -
	PLOT SCALE =	DRAWN - RSJ	REVISED -
	PLOT DATE =	CHECKED - JAK	REVISED -

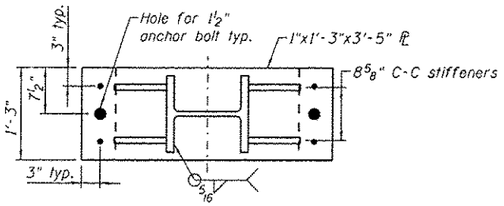
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TEMPORARY LIFT SPAN SUPPORT SYSTEM - 1
STRUCTURE NO. 086-0001
SHEET NO. 6 OF 15 SHEETS

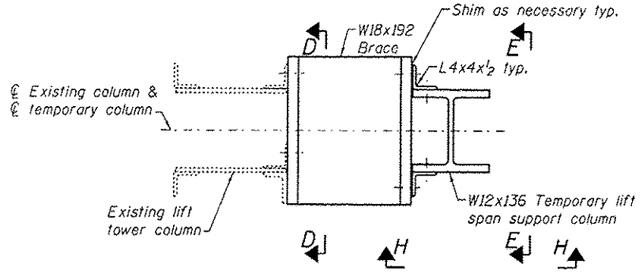
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
757	(20)I	PIKE/SCOTT	17	8
		CONTRACT NO. 72F75		
	ILLINOIS FED. AID PROJECT			



DETAIL A

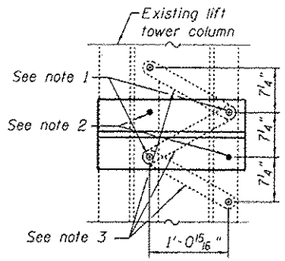


SECTION F-F

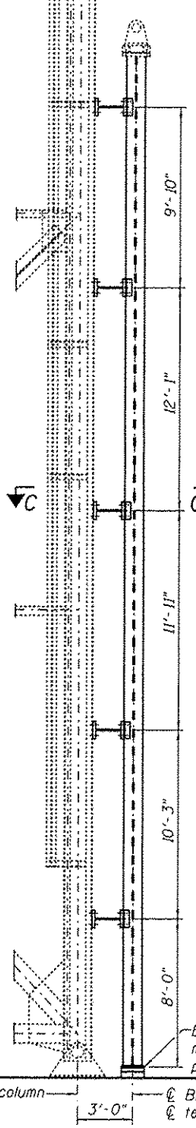


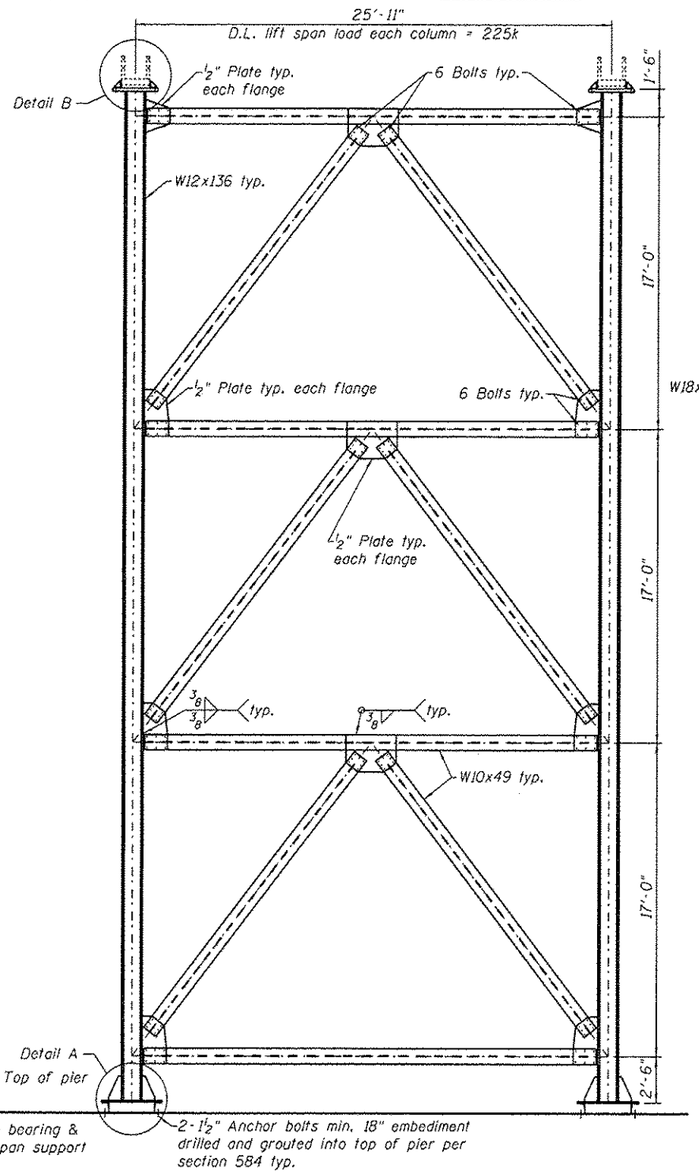
SECTION C-C

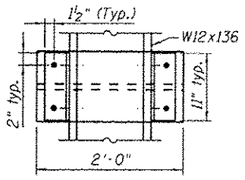
(Bracing for temporary lift span support column)



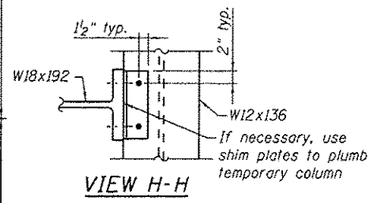
SECTION D-D



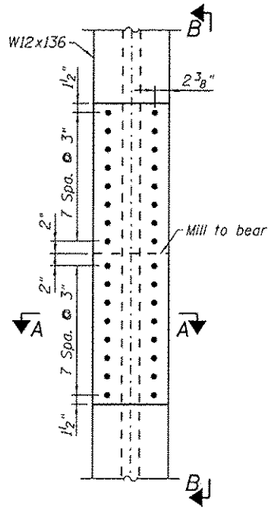




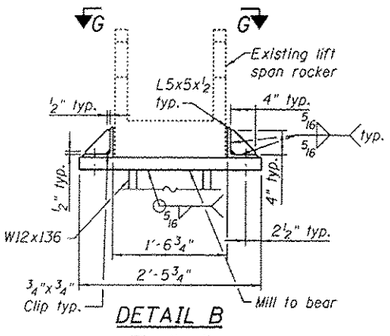
VIEW E-E



VIEW H-H

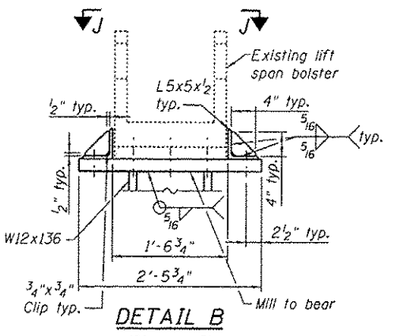


OPTIONAL COLUMN SPLICE



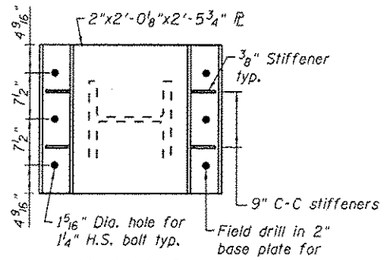
DETAIL B

(Pier No. 4)



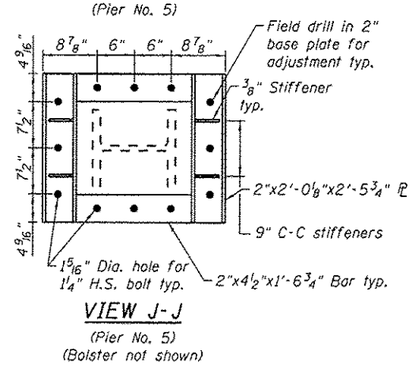
DETAIL B

(Pier No. 5)



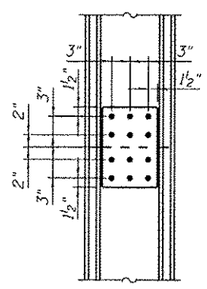
VIEW G-G

(Pier No. 4)
(Rocker not shown)

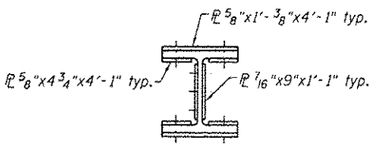


VIEW J-J

(Pier No. 5)
(Bolster not shown)



VIEW B-B



SECTION A-A

BOLT LEGEND

- ○ Existing fastener to remain
- ◎ New bolt in existing hole
- · New bolt in new hole
- ● New countersunk bolt on far side

SECTION D-D NOTES:

1. Remove existing rivets see special provisions for structural steel repairs and use existing holes as a template to drill 15/16" holes in flange of W18x192. Attach brace to existing column using ⅞" H.S. bolts.
2. Drill 15/16" holes in existing lift tower column and attach brace to existing column using ⅞" H.S. bolts.
3. Remove existing lacing bars, store, and reattach upon removal of brace.

Notes:
For additional information see sheet 6 of 15.

USER NAME =	DESIGNED - DMS	REVISED -	
	CHECKED - JAK	REVISED -	
PLOT SCALE =	DRAWN - RSJ	REVISED -	
PLOT DATE =	CHECKED - DMS	REVISED -	

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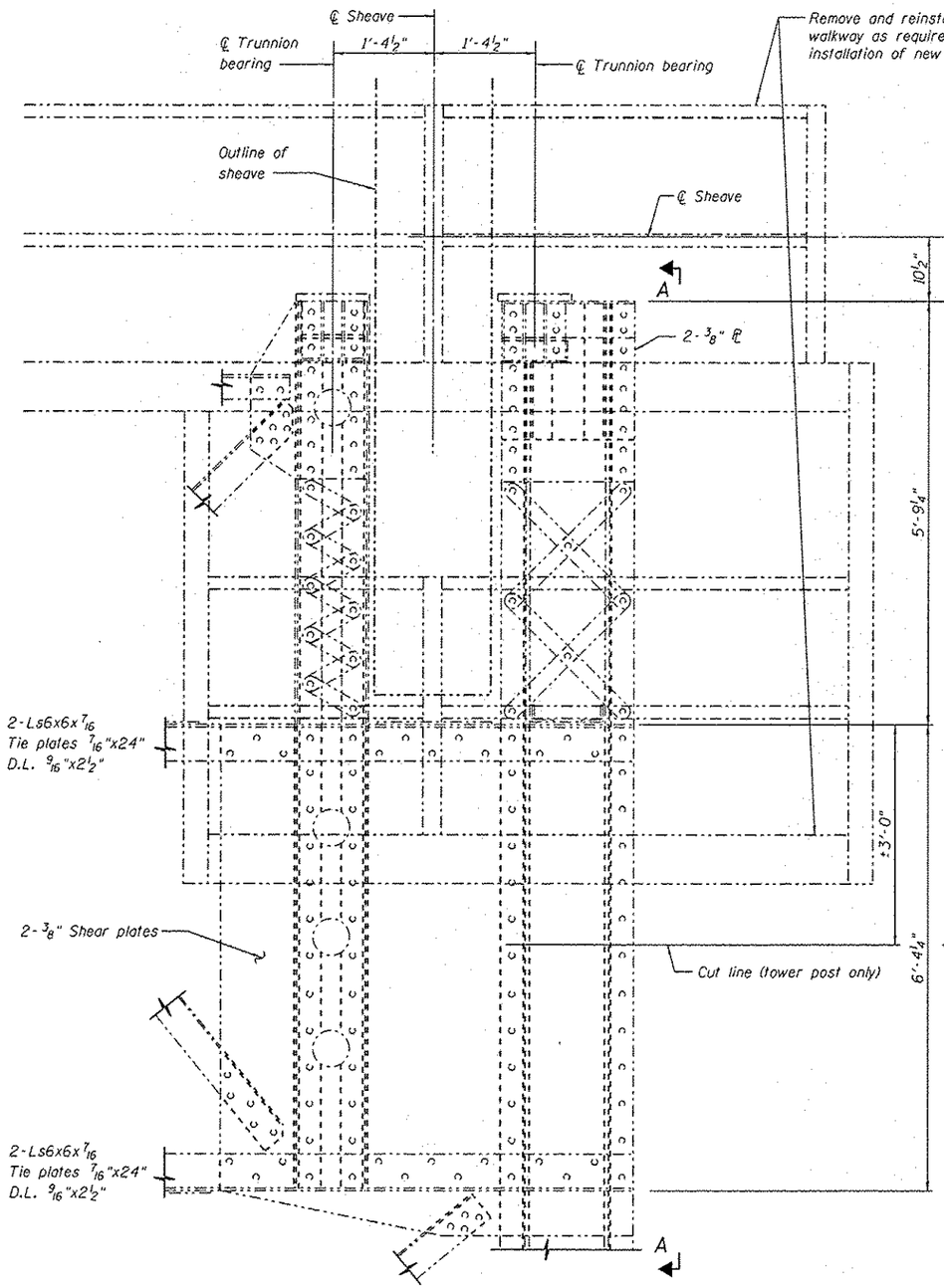
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

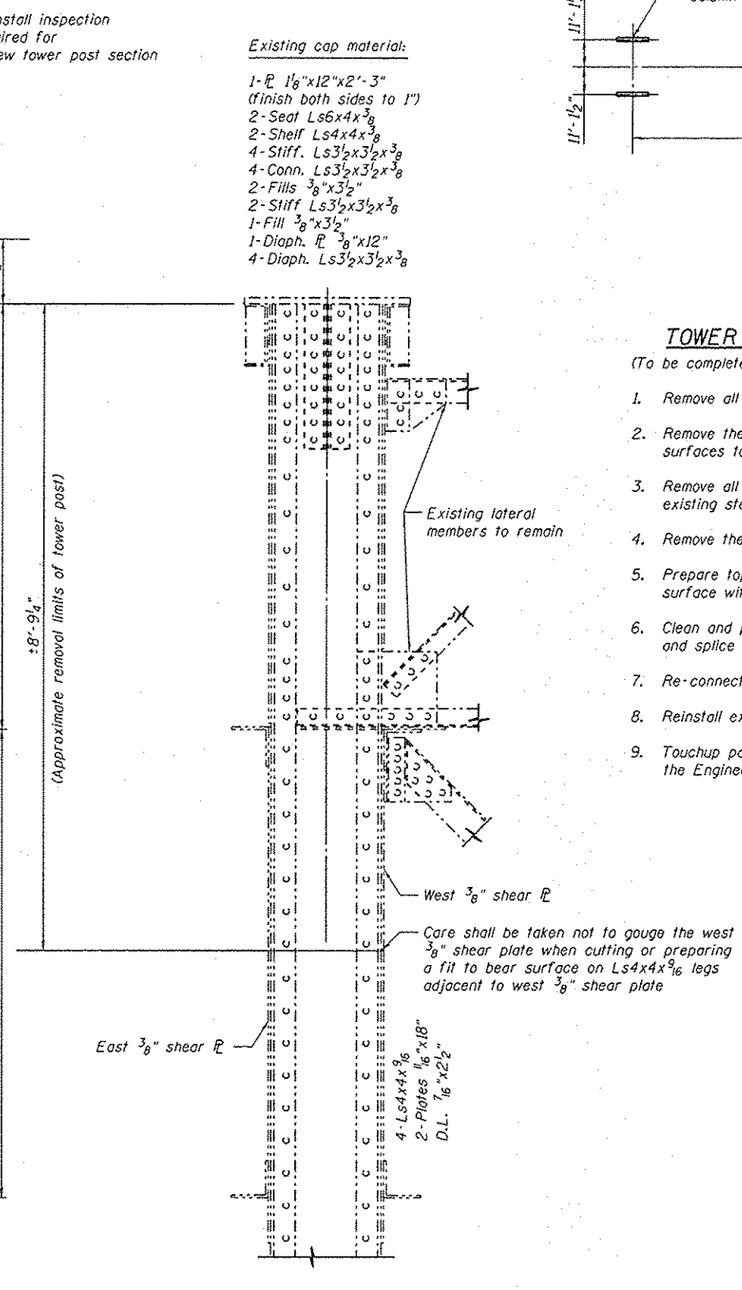
TEMPORARY LIFT SPAN SUPPORT SYSTEM - 2
STRUCTURE NO. 086-0001
SHEET NO. 7 OF 15 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
757	(20)1	PIKE/SCOTT	17	9
		CONTRACT NO. 72F75		
		ILLINOIS FED. AID PROJECT		

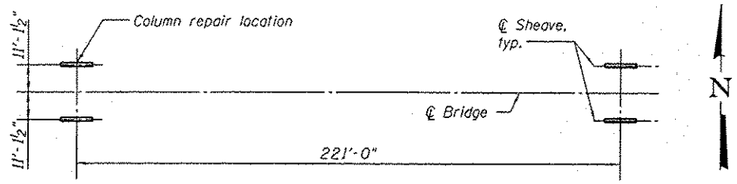


ELEVATION - EXISTING VERTICAL TOWER POST

(Looking west)



SECTION A-A



LOCATION PLAN

TOWER POST REPAIR PROCEDURE:

(To be completed after sheave has been removed)

1. Remove all fasteners connecting the east ⅜" shear plate.
2. Remove the east ⅜" shear plate. Cut new handholes using a hole saw and grind surfaces to meet ANSI 500 microinch surface roughness.
3. Remove all fasteners connecting the portion of the tower post to be removed to the existing steel remaining in place.
4. Remove the indicated portion of the tower post.
5. Prepare top surface of tower post remaining in place to provide a fit to bear surface with the new portion of the tower post.
6. Clean and prime paint all faying surfaces and install new portion of the tower post and splice to existing tower post.
7. Re-connect all lateral members to new tower post.
8. Reinstall existing east ⅜" shear plate.
9. Touchup paint any new steel and paint exposed existing steel surfaces as directed by the Engineer.

Notes:

For additional details, see sheet nos. 9 and 10 of 15.

Inspection access walkway at top of tower may need to be removed prior to performing tower post repair. The removal limits shall be determined by the Contractor and approved by the Engineer. After completion of the tower post repair, inspection access walkway must be reinstalled in-kind.

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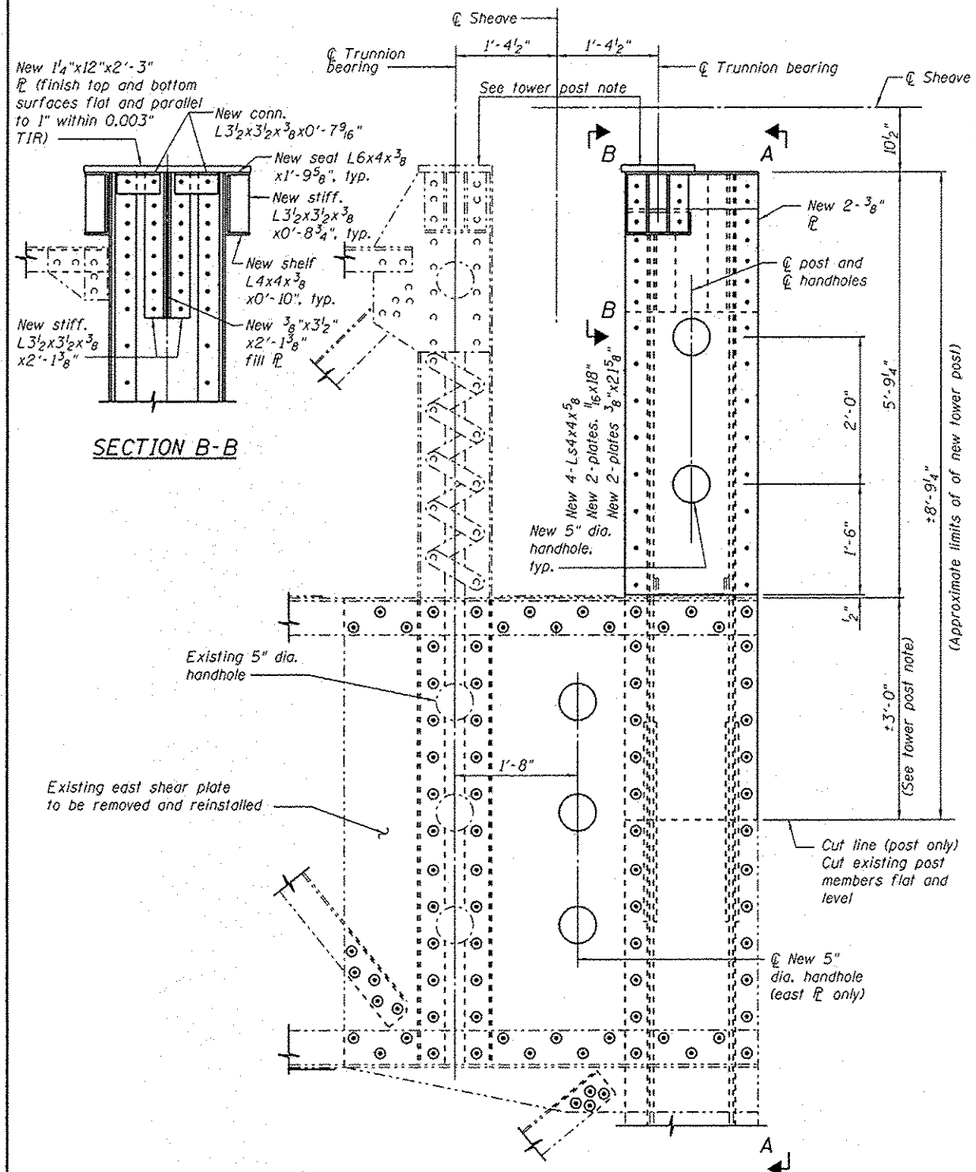
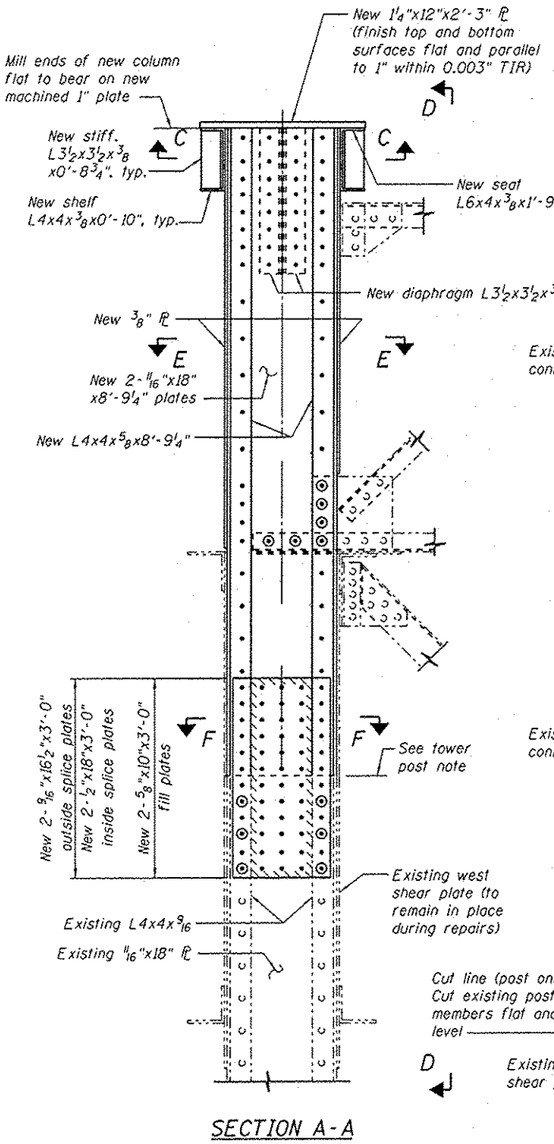
PLOT DATE =	CHECKED DBI	REVISED	

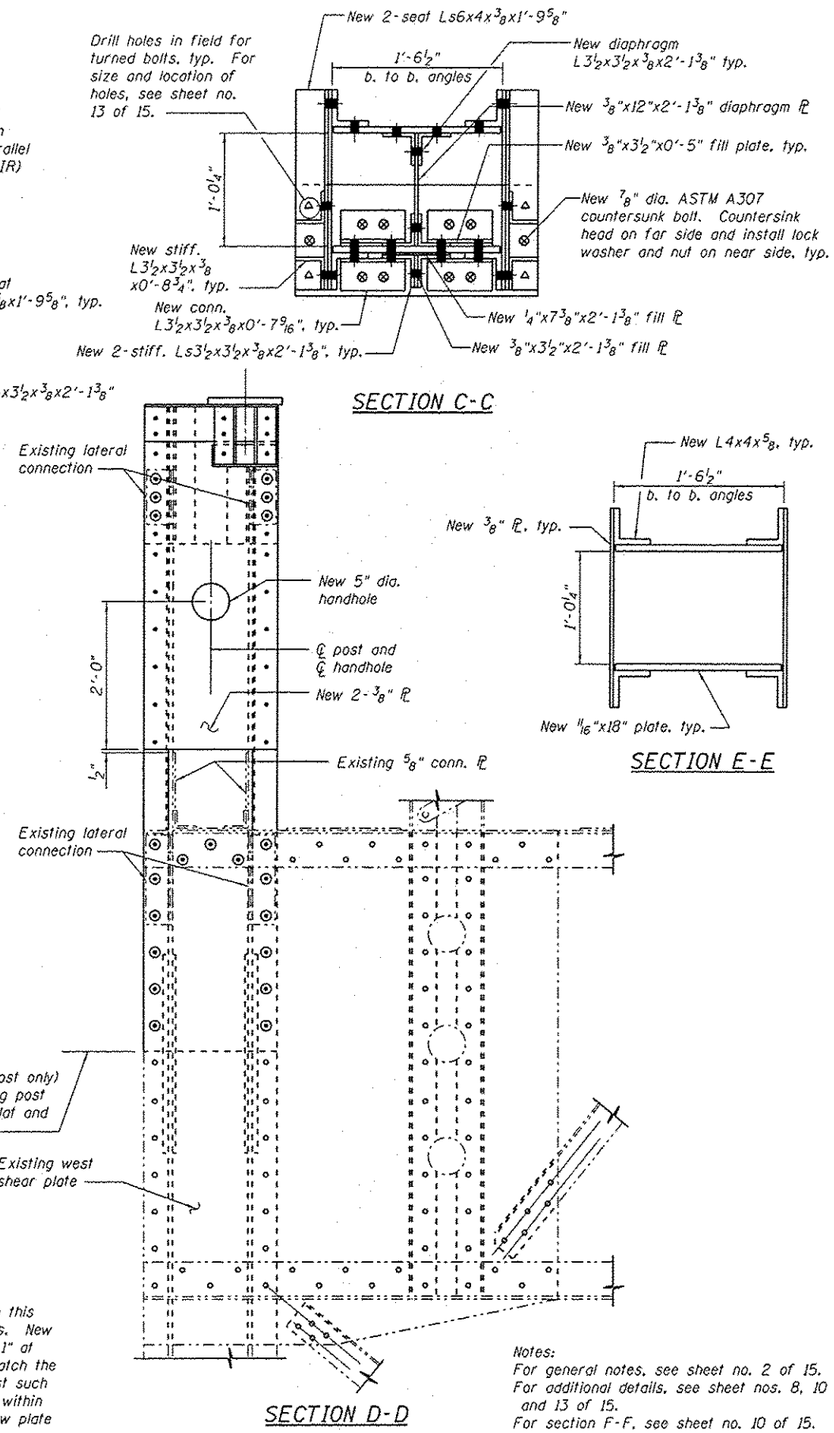
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TOWER POST REPLACEMENT DETAILS – 1
STRUCTURE NO. 086-0001
SHEET NO. 8 OF 15 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
757	(20) I	PIKE/SCOTT	17	10
		CONTRACT NO. 72F75		
	ILLINOIS	FED. AID PROJECT		







BOLT LEGEND

- ○ Existing fastener to remain
- ◉ New bolt in existing hole
- • New bolt in new hole
- ⊗ New countersunk bolt on far side
- △ New turned bolt

TOWER POST NOTE:

New tower post to be assembled in the shop and installed as a pre-assembled unit. Member lengths and bolt spacings detailed on this sheet and sheet no. 10 of 15 are approximate finished dimensions. New post members to be fabricated with a minimum excess length of 1" at bottom end. Cut and mill bottom ends of new post members to match the cut on the existing tower post. New post to bear on existing post such that top of new machined 1" plate is parallel to existing plate to within 0.005" over entire top face of new plate. Elevation of top of new plate to match existing plate ±1⁄16".

Notes:
For general notes, see sheet no. 2 of 15.
For additional details, see sheet nos. 8, 10 and 13 of 15.
For section F-F, see sheet no. 10 of 15.

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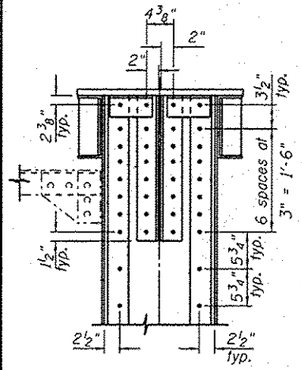
	CHECKED DBI	REVISED	
PLOT SCALE =	DRAWN DTP	REVISED	
PLOT DATE =	CHECKED DBI	REVISED	

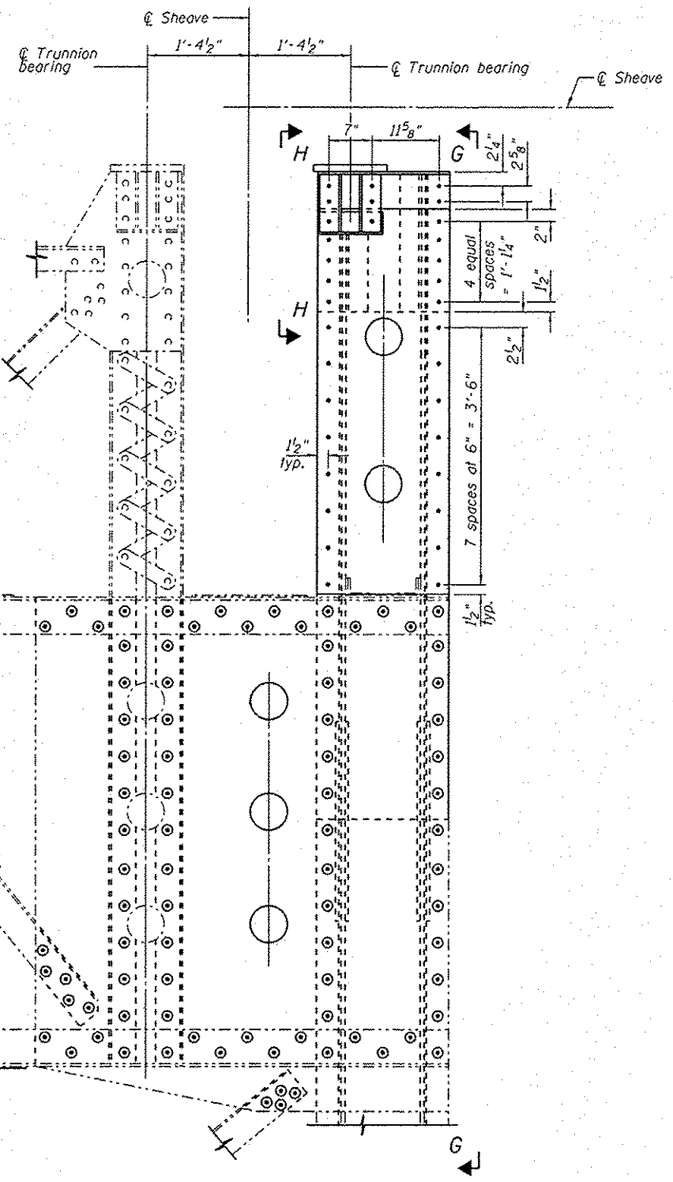
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

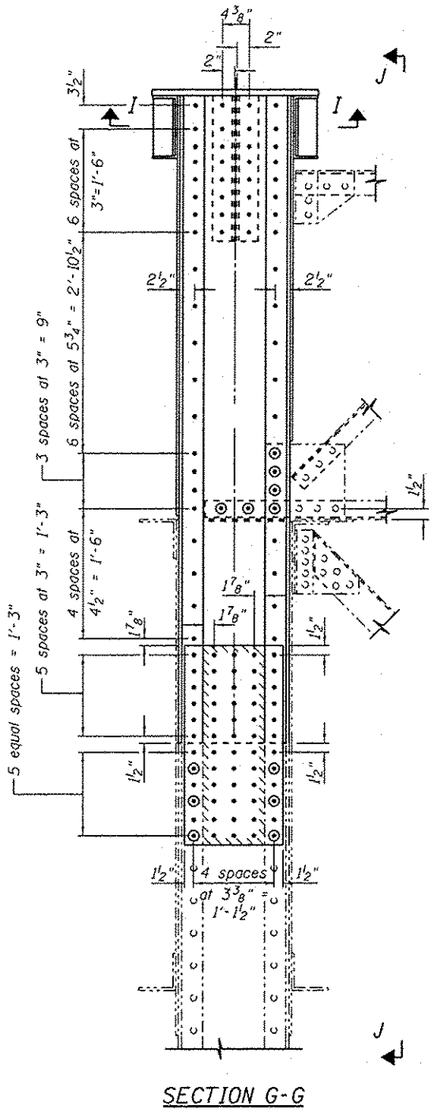
TOWER POST REPLACEMENT DETAILS – 2
STRUCTURE NO. 086-0001
SHEET NO. 9 OF 15 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
757	(20) I	PIKE/SCOTT	17	11
		CONTRACT NO. 72F75		
	ILLINOIS FED. AID PROJECT			

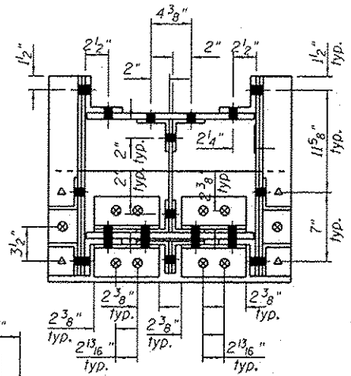


SECTION H-H

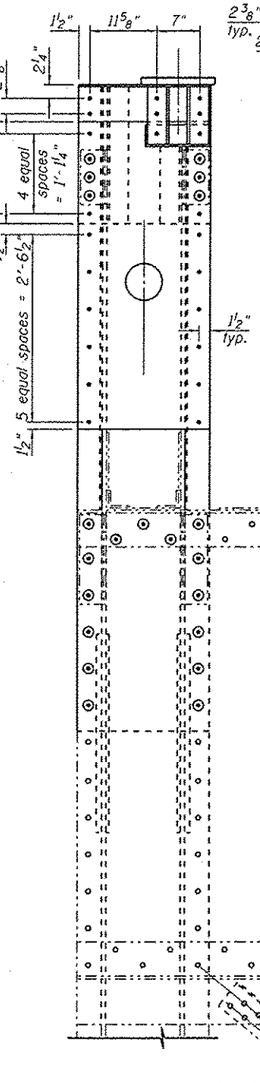


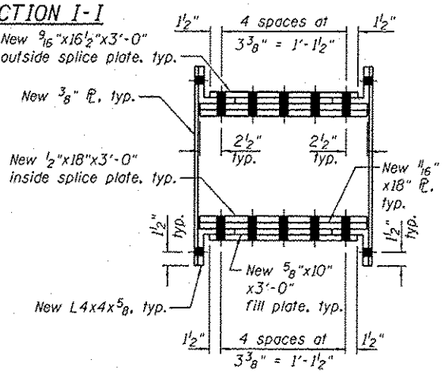


SECTION G-G

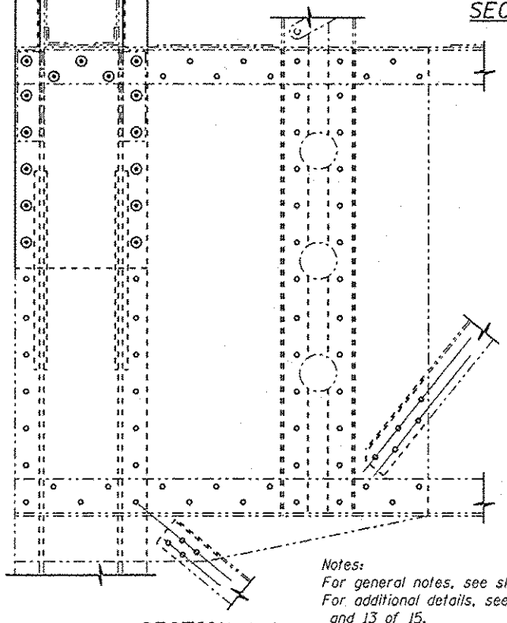


SECTION I-1





SECTION F-F



SECTION J-J

BOLT LEGEND

- ○ Existing fastener to remain
- ⊙ New bolt in existing hole
- • New bolt in new hole
- ⊗ New countersunk bolt on far side
- △ New turned bolt

ELEVATION - NEW VERTICAL TOWER POST BOLT LAYOUT DETAIL

(Tower inspection walkway not shown for clarity)

Notes:
For general notes, see sheet no. 2 of 15.
For additional details, see sheet nos. 8, 9 and 13 of 15.
For location of section F-F, see sheet no. 9 of 15.

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USER NAME =	DESIGNED	TS	REVISED
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PLOT SCALE =	DRAWN	DTP	REVISED
PLOT DATE =	CHECKED	DBI	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TOWER POST REPLACEMENT DETAILS – 3
STRUCTURE NO. 086-0001
SHEET NO. 10 OF 15 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
757	(20) I	PIKE/SCOTT	17	12
		CONTRACT NO. 72F75		
	ILLINOIS FED. AID PROJECT			

MECHANICAL INSTALLATION

GENERAL NOTES

All work shall be performed in accordance with The American Association of State Highway and Transportation Officials LRFD Movable Highway Bridge Design Specifications (AASHTO), 2nd Edition (2007). All items specified in the plans shall be considered to be followed by the phrase "or approved equal" unless otherwise specified on the plans.

The Contractor shall provide all material, equipment, tools, and labor to purchase/fabricate, transport, rehabilitate, install/erect, align/adjust, paint, lubricate, and test all mechanical machinery to provide a complete and operable bridge and drive system as described on the following sheets.

The information and directions given in these mechanical notes cover general situations. Every item in these mechanical notes can be considered to be followed by the phrase "unless otherwise specified on the plans." All dimensions and details shall be verified at the site before proceeding with any work to avoid causing conflicts and any subsequent delay in work.

The Engineer shall be notified immediately for clarification whenever any portion of the work is not clearly or accurately defined.

SHOP WORK:

Remove all burrs and break all sharp edges on fabricated parts.

FINISHED MATING SURFACES:
Finished mating surfaces shall be as noted in "Fits and Surface Finishes" and shall be protected from corrosion by a coating of a wax based corrosion preventative treatment.

FITS AND SURFACE FINISHES:
When not included on the plans, shall be as shown below, or vendor's recommended specifications, whichever is more rigorous.

Surface finishes are given as the roughness height in micro-inches.

PART	FIT	FINISH
Machinery base on steel	-	125
Shaft journals	RC6	8
Journal bushing	RC6	16
Split bushing in base	LC1	125
Turned bolts in finished holes	LC6	63
Sliding bearings	RC6	32
Machinery parts in fixed contact	-	-

The above fits for cylindrical parts shall also apply to the major dimensions of non-cylindrical parts. unspecified machinery surfaces shall be 125 micro-inch finish.

TEMPLATES:
Templates shall be fabricated for all machinery bases secured to existing steel. The template shall be fabricated from the existing support base and used to assure proper positioning of new anchor bolts.

TOLERANCES:
All tolerances shall be as shown on the plans. Where not shown, tolerances shall be as follows: fractions: +/- $\frac{1}{32}$"; decimals +/- 0.010"; angles +/- 0.5 degree.

MECHANICAL PARTS/EQUIPMENT:

All material for new fabricated parts and all manufactured equipment provided by the Contractor shall be new and shall conform to ASTM and other standards as shown on the plans or an approved equal.

The weight of each item (fabricated or manufactured) shall be shown on the shop drawings.

The Contractor shall verify the final dimensions of all commercial products from certified drawings provided by the manufacturer prior to producing shop drawings.

If the Contractor proposes to use material or equipment other than detailed on the drawings, any redesign of the structure or any other part of the mechanical layout, all such redesign, and all new drawings required, shall, with the approval of the Engineer, be prepared by the Contractor at no additional cost.

FASTENERS:

Standard mechanical machinery bolts:
Bolts for fastening mechanical machinery together or to bases shall be heavy hex high strength structural bolts. Bolts shall come complete with one heavy hex nut (ASTM A563 Grade C), one hardened steel flat washer (ASTM F436), and one extra duty lock washer.

MATERIAL:
ASTM A325 or ASTM A449, Type 3, finished hex bolts.

TURNED BOLTS AND STUDS:
Shank shall be straight within 0.001" per inch length.

Bolts shall be manufactured to ANSI B18.2.1, hex cap screws (finished hex bolts).

Surface discontinuities shall be in accordance with ASTM F788.
Break sharp edges 0.010" - 0.015"

MATERIAL: ASTM A449, Type 3.

Each bolt/stud shall be marked as A449 on top of bolt head or top of the stud and may be raised or depressed at the option of the manufacturer.

All turned bolts/studs shall have two hardened steel washers which conform to ASTM F436, Type 1.

Threads of turned bolts/studs shall not be in the shear plane of the parts to be fastened.

SHIMS:

FIELD ASSEMBLED MACHINERY:
The Contractor shall use shims supplied by IDOT for each component assembly for all machinery which requires leveling and alignment in the field. Shims shall be placed to provide full contact between machinery and mount/support.

Shim packs shall be neatly trimmed to the dimensions of the assembled parts and drilled for all bolts that pass through the shims.

In general, total shim thickness available shall be no less than equal to twice the nominal thickness shown on the drawings, and sufficient varying thicknesses shall be furnished to secure 0.010-inch variations of the shim allowance including one shim equal to the full allowance. Shims shall be shown in detail on the shop drawings.

FIELD WORK:

MACHINERY INSTALLATION:
All machinery components, including all fabricated and commercial items, which have been delivered to the field, but have not been installed, shall be protected against rust and corrosion by any means agreed upon between the Contractor and the Engineer. Machinery pieces shall be frequently inspected and if rust or corrosion is found the Contractor shall take immediate steps to clean and protect equipment.

All machinery shall be installed by those competent and skilled in the type of work involved. Installers shall be provided with all the necessary measuring and leveling instruments as may be required.

All machinery shall be laid out to a tolerance of $\frac{1}{32}$".

All parts aligned with shim packs shall be precisely adjusted and aligned to the limits of the capabilities of the shim packs.

At the time of the field installation, the rust inhibiting grease coating on mechanical parts that have finished mating surfaces shall be completely removed by an approved solvent such as gasoline or benzene. Once the installation of the entire mechanism is completed, painted surfaces of the mechanism shall be touched-up and painted in accordance with IDOT Standard Specification Section 506. Unpainted, finished mating surfaces that slide during operation shall then be cleaned of all dirt, rust, and incidental paint, and coated with the proper lubricating grease specified by the Fabricator. Unpainted, finished mating surfaces that do not slide during operation will be protected from corrosion by the top coat of the paint system.

BOLTS:
Torques for the various grades of bolts shall be proportioned to their strength and shall be indicated on the erection drawings.

MACHINERY BOLTS:
Field drilled holes shall be used only where indicated on the plans. Field drilled holes not indicated on the plans must be approved by the Engineer. No flame cut holes will be allowed.

Field drilled bolt holes in structural steel for mounting machinery shall, in general, be drilled from the solid after final alignment of the machinery. Sufficient erection holes, sub drilled $\frac{1}{4}$" undersize for temporary bolts/studs, may be used for erection and alignment of the machinery. When the machinery is aligned in its final position, full size holes for permanent turned bolts/studs shall be sub-drilled and reamed, full size bolts/studs installed, and temporary bolts/studs removed.

MACHINERY INSTALLATION, ADJUSTMENTS, AND TESTING:

Prior to pick up of any machinery from the Fabricator, the Contractor shall submit a detailed installation and alignment procedure to the Engineer for approval.

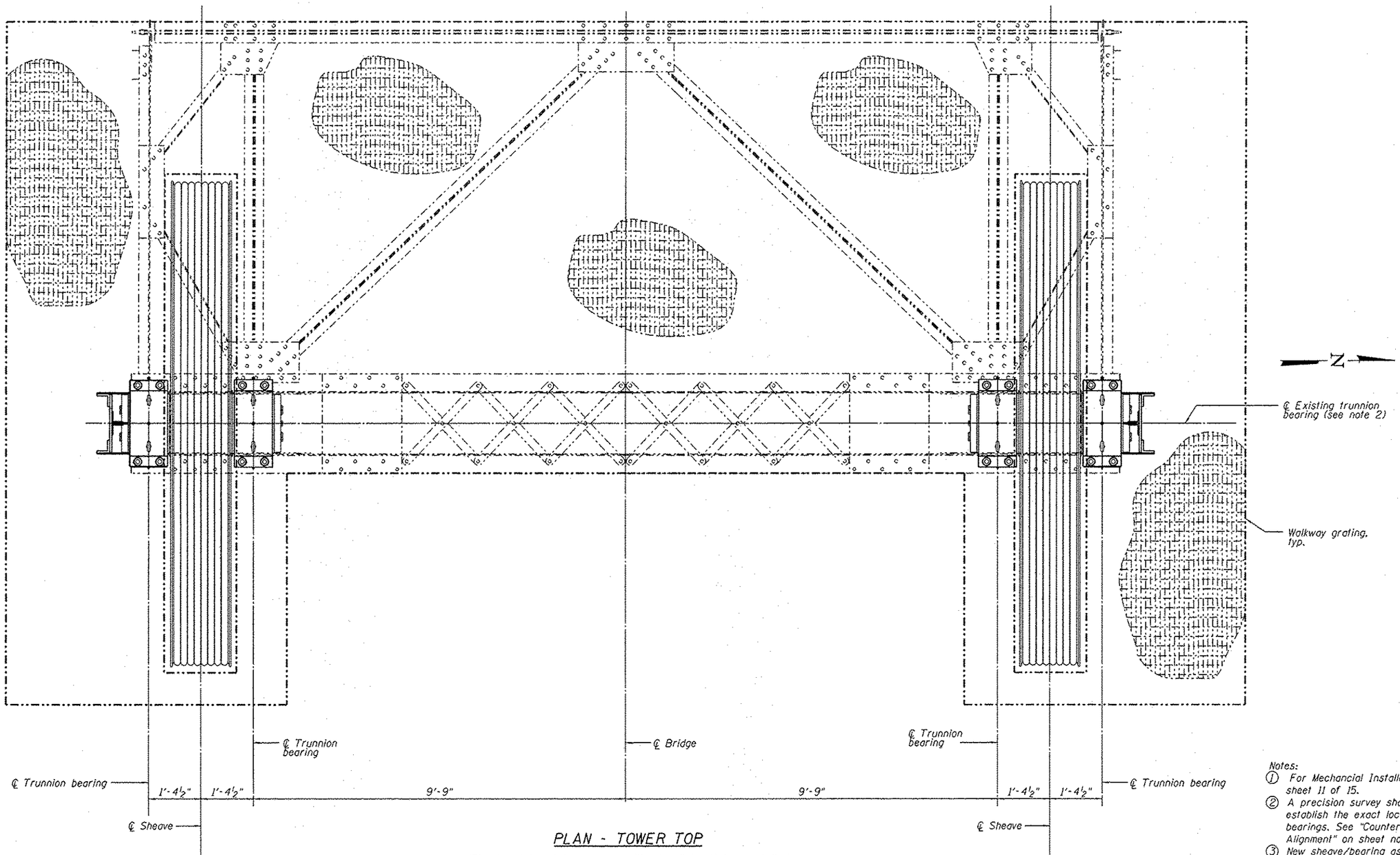
The Contractor shall provide the necessary mechanical technicians as well as all the tools and labor required to perform installation procedures.

INSPECTION:
After the Contractor has completed the machinery installation, an inspection shall be arranged with representatives of the Engineer. Written notice shall be provided ten (10) days prior to the date of the inspection. The Contractor shall provide mechanical technicians as well as all the tools and labor necessary to make any necessary adjustments.

COUNTERWEIGHT TRUNNION BEARING ALIGNMENT:

EXISTING ALIGNMENT:
Contractor shall accurately (within 0.002") survey with x-y-z position of each counterweight trunnion journal center (8 total). This must be taken PRIOR to jacking.

NO-LOAD ALIGNMENT:
Contractor shall obtain the same survey data as "Existing Alignment", except after jacking of the counterweight and support of the lift span. New counterweight trunnion bearings shall be installed utilizing the alignment data gathered. The Contractor shall submit all findings and detailed alignment procedures so the newly installed bearings will run freely when the dead load is re-applied. The detailed alignment procedure must take into account the existing condition of the buckled outboard northwest tower column and provide a procedure for alignment of the new bearing after the tower column is repaired.



PLAN - TOWER TOP

(Pier No. 4 (west) tower shown; Pier No. 5 (east) tower similar)

Notes:
1. For Mechancial Installation General Notes, see sheet 11 of 15.
2. A precision survey shall be conducted to establish the exact location of the existing bearings. See "Counterweight Trunnion Bearing Alignment" on sheet no. 11 of 15 for details.
3. New sheave/bearing assemblies shown, existing similar.

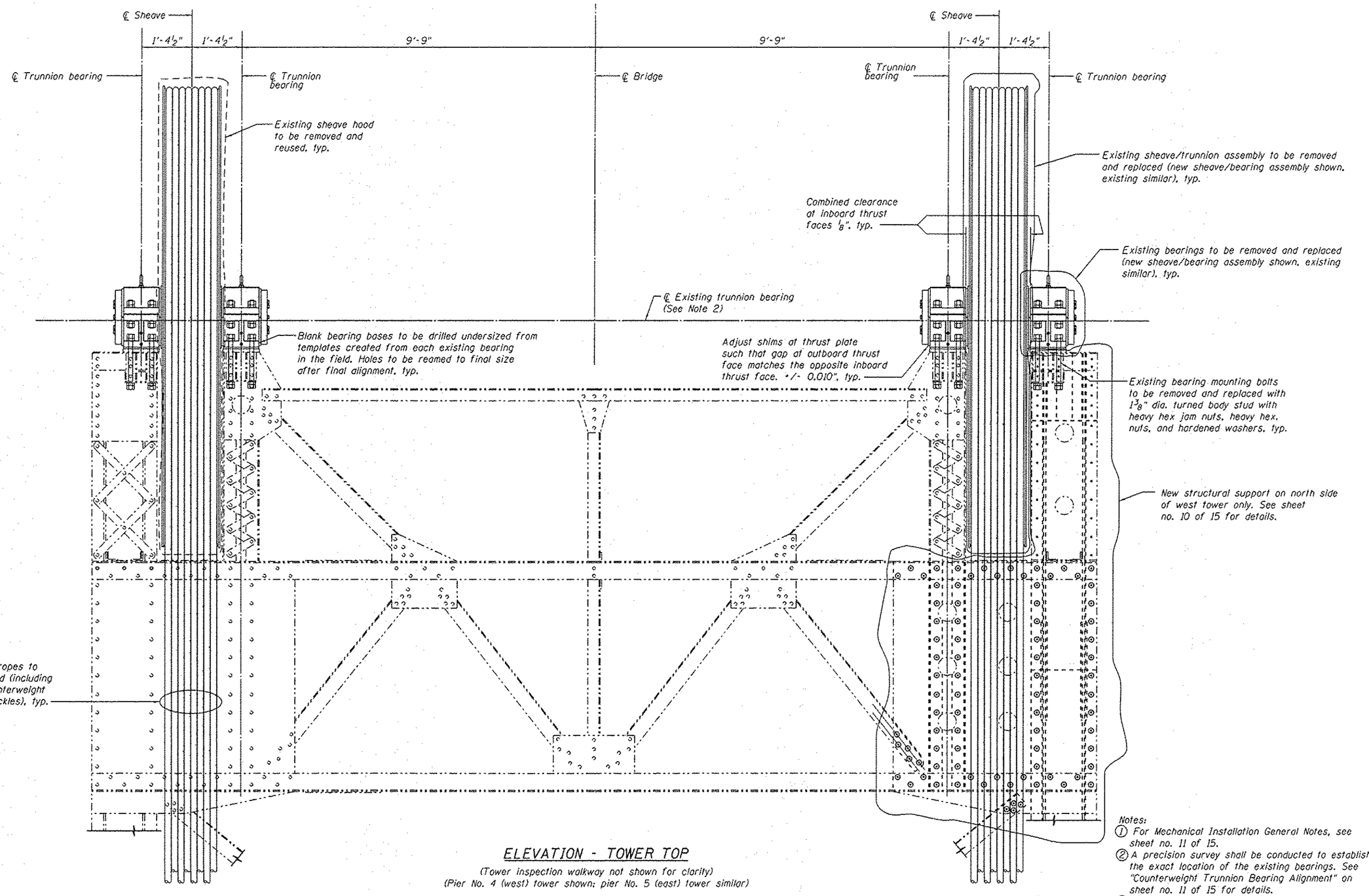
MODJESKI and MASTERS
Experience great bridges.

USER NAME =	DESIGNED	AMB	REVISED
	CHECKED	GF	REVISED
PLOT SCALE =	DRAWN	DTP	REVISED
PLOT DATE =	CHECKED	GF	REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MECHANICAL TOWER TOP DETAILS – 1
STRUCTURE NO. 086-0001
SHEET NO. 12 OF 15 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
757	(20) I	PIKE/SCOTT	17	14
		CONTRACT NO. 72F75		
	ILLINOIS FED. AID PROJECT			



ELEVATION - TOWER TOP

(Tower inspection walkway not shown for clarity)
(Pier No. 4 (west) tower shown; pier No. 5 (east) tower similar)

Notes:
1. For Mechanical Installation General Notes, see sheet no. 11 of 15.
2. A precision survey shall be conducted to establish the exact location of the existing bearings. See "Counterweight Trunnion Bearing Alignment" on sheet no. 11 of 15 for details.
3. New sheave/bearing assemblies to be supplied by IDOT to the Contractor.

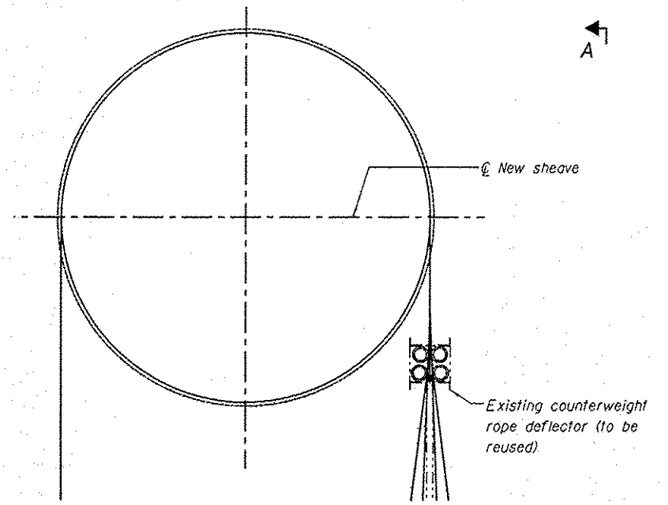
MODJESKI and MASTERS
Experience great bridges.

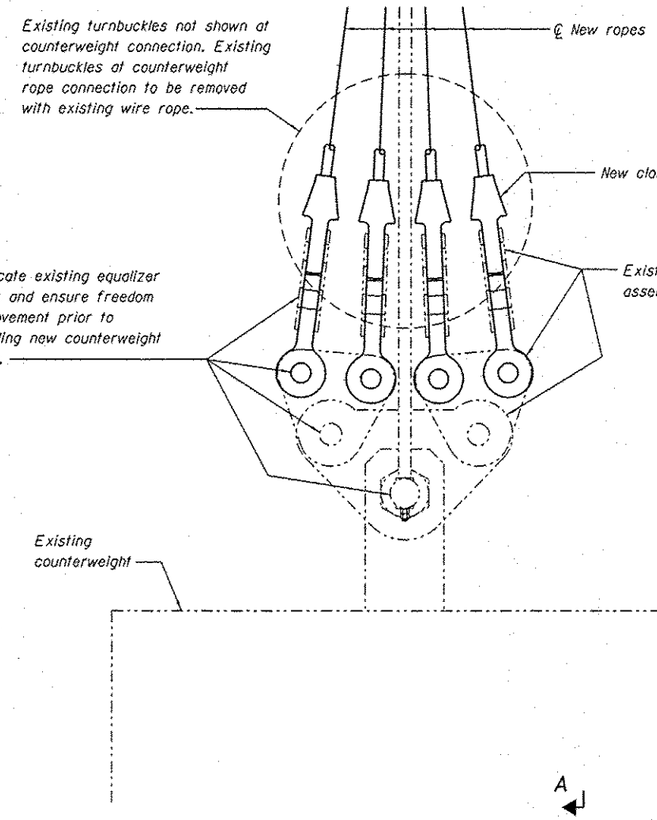
USER NAME =	DESIGNED AMB	REVISED	
	CHECKED GF	REVISED	
PLOT SCALE =	DRAWN DTP	REVISED	
PLOT DATE =	CHECKED GF	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

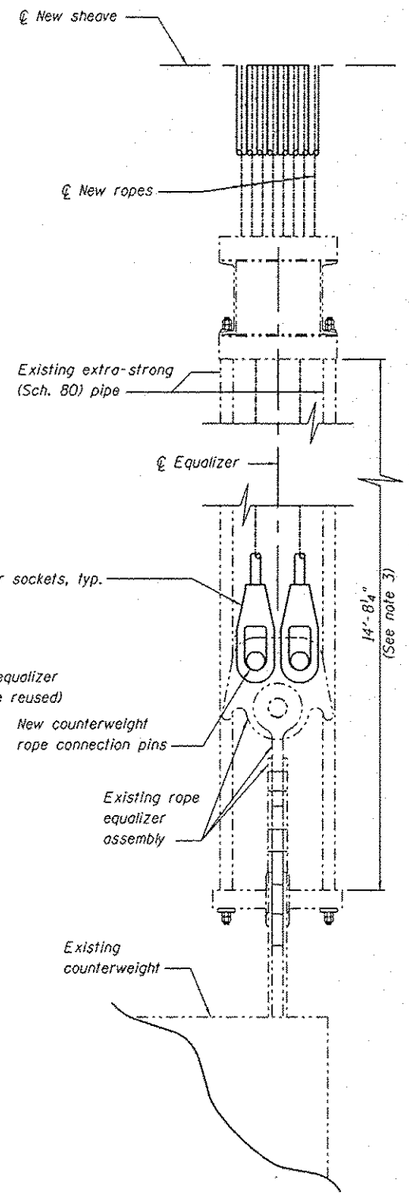
MECHANICAL TOWER TOP DETAILS – 2
STRUCTURE NO. 086-0001
SHEET NO. 13 OF 15 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
757	(20) I	PIKE/SCOTT	17	15
		CONTRACT NO. 72F75		
	ILLINOIS	FED. AID PROJECT		

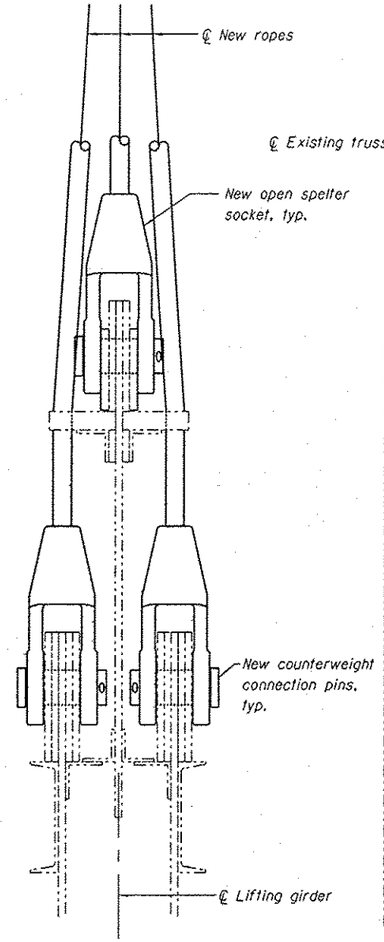




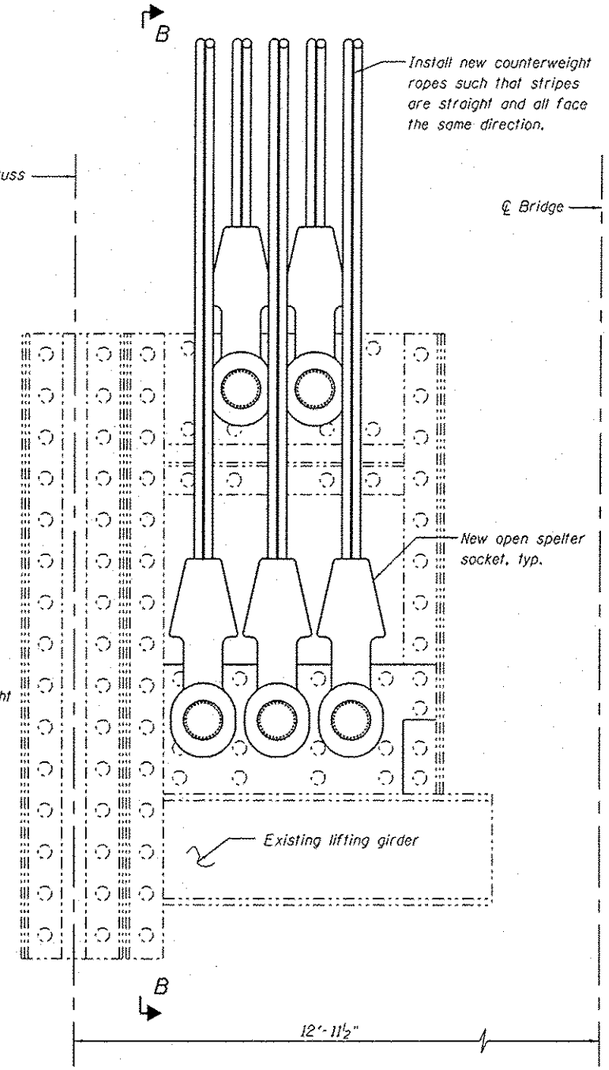
CONNECTION AT COUNTERWEIGHT EQUALIZERS
(4 Locations)



VIEW A-A



SECTION B-B



CONNECTION AT LIFT GIRDER
(4 Locations)

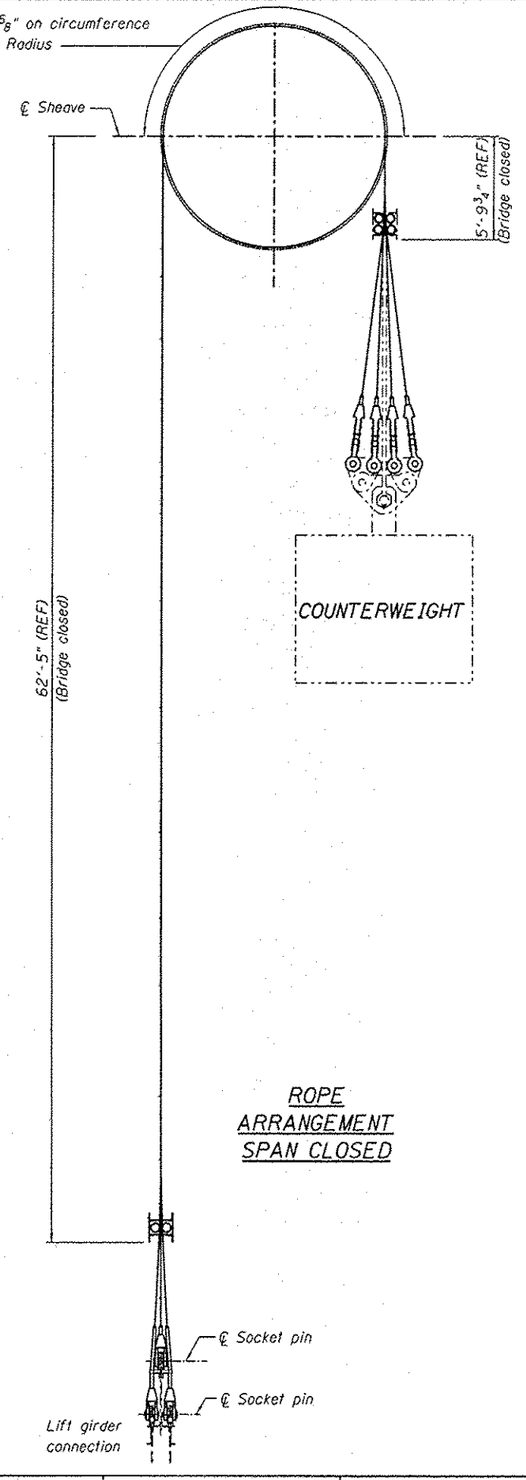
Notes:
1. For Mechanical Installation General Notes, see sheet no. 11 of 15.
2. Wire rope assemblies. (including ropes, sockets and pins) to be supplied by IDOT to the Contractor.
3. Shorten existing pipe length to given dimension by cutting out a section and welding remaining pieces together.

MODJESKI and MASTERS Experience great bridges.	USER NAME =	DESIGNED AMB	REVISED
		CHECKED GF	REVISED
	PLOT SCALE =	DRAWN DTP	REVISED
	PLOT DATE =	CHECKED GF	REVISED

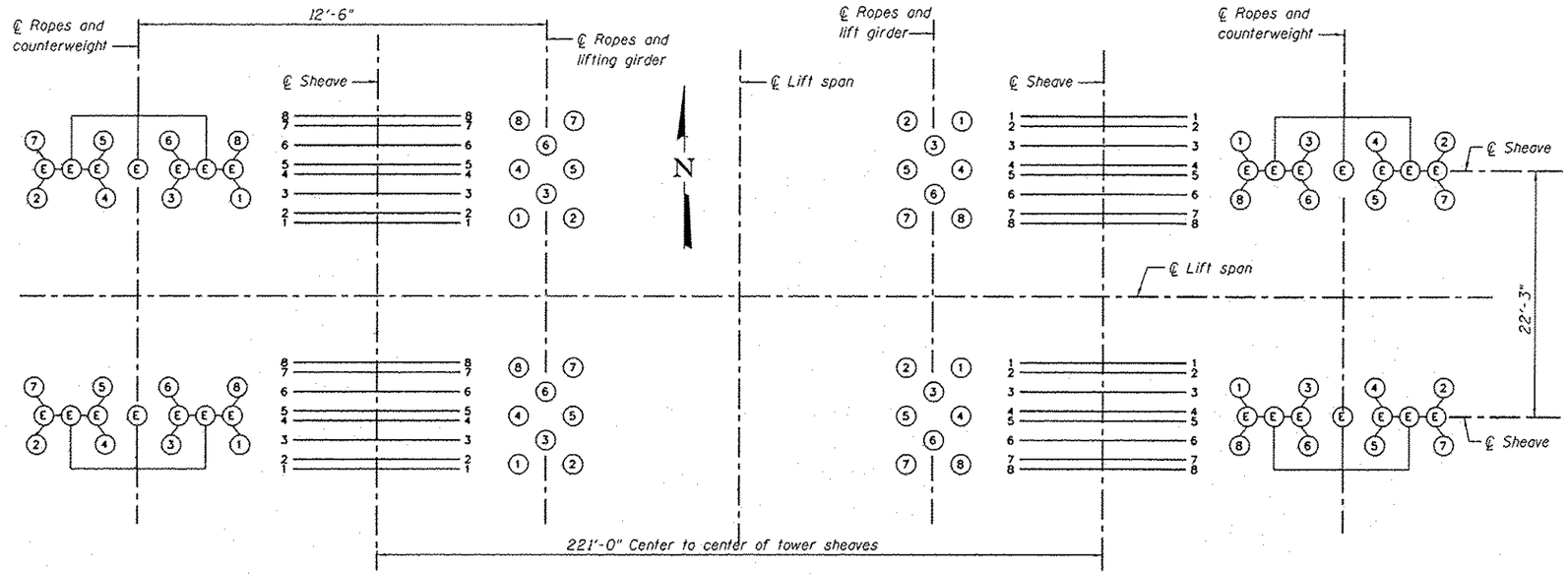
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

WIRE ROPE REPLACEMENT DETAILS – 1
STRUCTURE NO. 086-0001
SHEET NO. 14 OF 15 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
757	(20) 1	PIKE/SCOTT	17	16
		CONTRACT NO. 72F75		
	ILLINOIS FED. AID PROJECT			



ROPE ARRANGEMENT SPAN CLOSED



PIER NO. 4 TOWER

PIER NO. 5 TOWER

ROPE LAYOUT

LEGEND

(#) Rope number

(E) Equalizer attachment point

Notes:
(1) For Mechanical Installation General Notes, see sheet no. 11 of 15.

MODJESKI and MASTERS Experience great bridges.	USER NAME =	DESIGNED AMB	REVISED	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	WIRE ROPE REPLACEMENT DETAILS – 2 STRUCTURE NO. 086-0001	F.A.P. RTE. 757	SECTION (20) I	COUNTY PIKE/SCOTT	TOTAL SHEETS 17	SHEET NO. 17
		CHECKED GF	REVISED					CONTRACT NO. 72F75		
	PLOT SCALE =	DRAWN DTP	REVISED		SHEET NO. 15 OF 15 SHEETS			ILLINOIS FED. AID PROJECT		
	PLOT DATE =	CHECKED GF	REVISED							