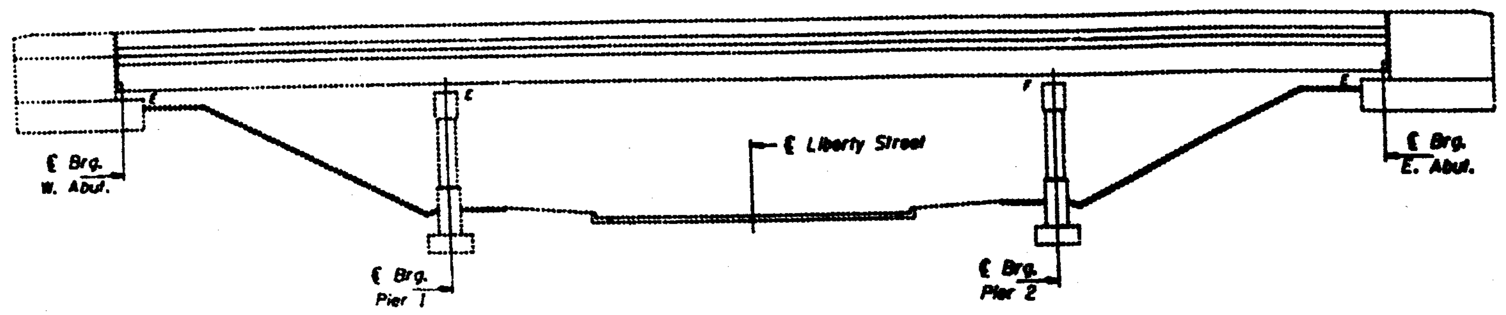
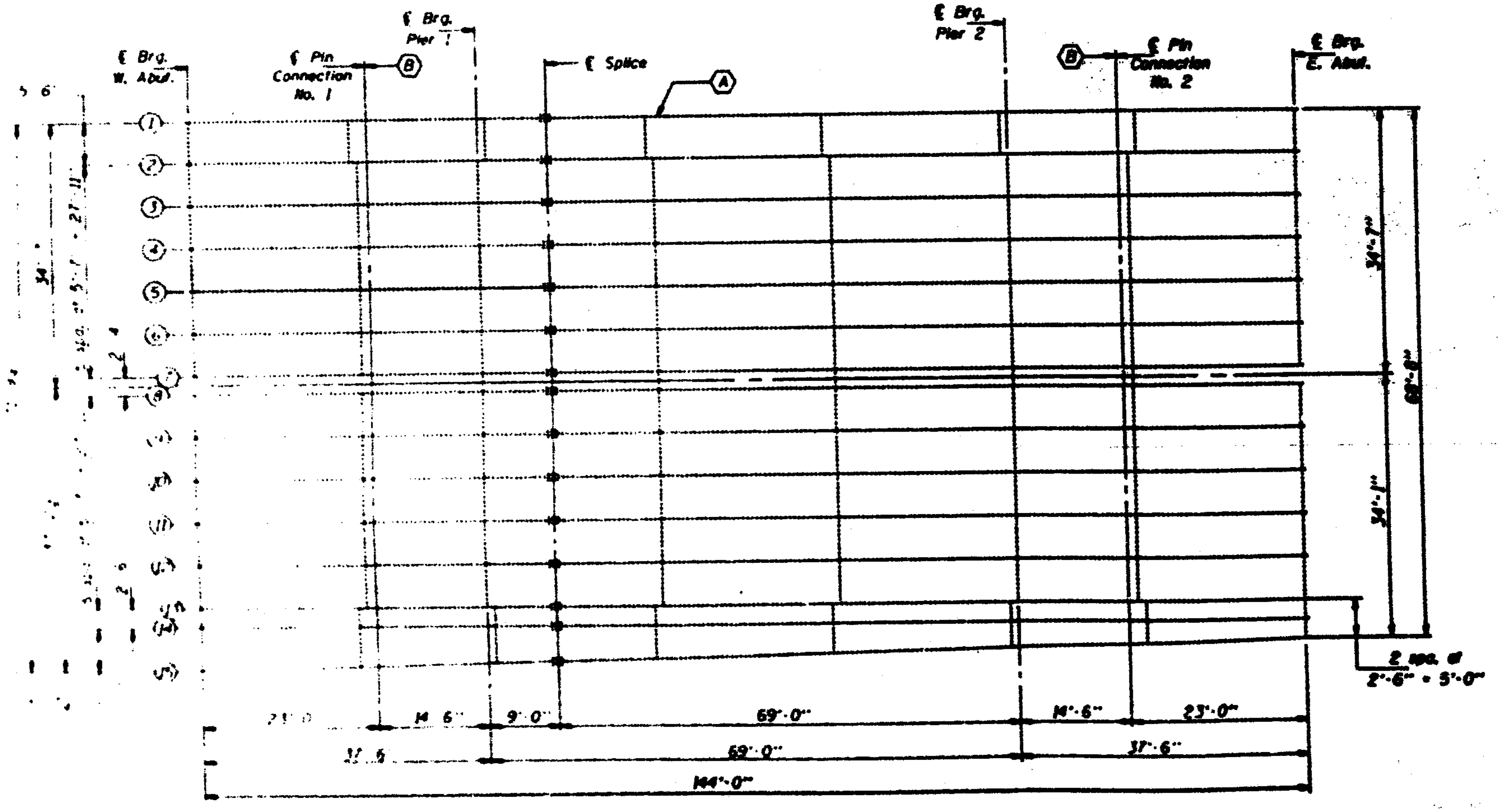
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

F.A. 426		KANE	51	4

SHEET NO. 1
4 SHEETS



ELEVATION



FRAMING PLAN

Notes: Ⓐ Existing W36x160 Beam to be straightened & plated.
Ⓑ Existing Pin & Link Plates to be removed & replaced.

GENERAL NOTES

All new structural steel shall conform to AASHTO Classification M·270 Gr. 36.

Grind existing nicks, gouges and shallow cracks in the damaged beams as detailed. Ground surfaces shall be inspected for cracks using magnetic particle testing prior to initiating any beam straightening operations. Cost shall be included in the cost of "Beam Straightening". Any cracks that cannot be removed by grinding approximately ¼" deep shall be identified and reported to the Bureau of Bridges and Structures for further disposition.

Plan dimensions and details relative to existing structure have been taken from existing plans and are subject to nominal construction variations. It shall be the Contractor's responsibility to verify such dimensions and details in the field and make necessary approved adjustments prior to construction or ordering of materials. Such variations shall not be cause for additional compensation for a change in the scope of the work, however, the Contractor will be paid for the quantity actually furnished at the unit price bid for the work.

Existing Structural steel shall only be cleaned and painted as required by the Special Provision "Cleaning and Painting Adjacent Areas of Existing Steel Structures".

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 acrylic finish coat shall be Interstate Green, Munsell No. 7.5G 4/8. See Special Provision "Cleaning and Painting New Metal Structures".

The existing structural steel coating contains lead. The Contractor should take appropriate precautions to deal with the presence of lead on this project.

045-0007

TOTAL BILL OF MATERIAL

ITEM	UNIT	QUANTITY
Furnishing and Erecting Structural Steel	Pound	250
Beam Straightening	L.S.	1
Temporary Support System	Each	30
Pin and Link Plate Replacement	Each	30

DESIGNED	
CHECKED	Victor B Weiss
DRAWN	Doerbert
CHECKED	MV: VBW

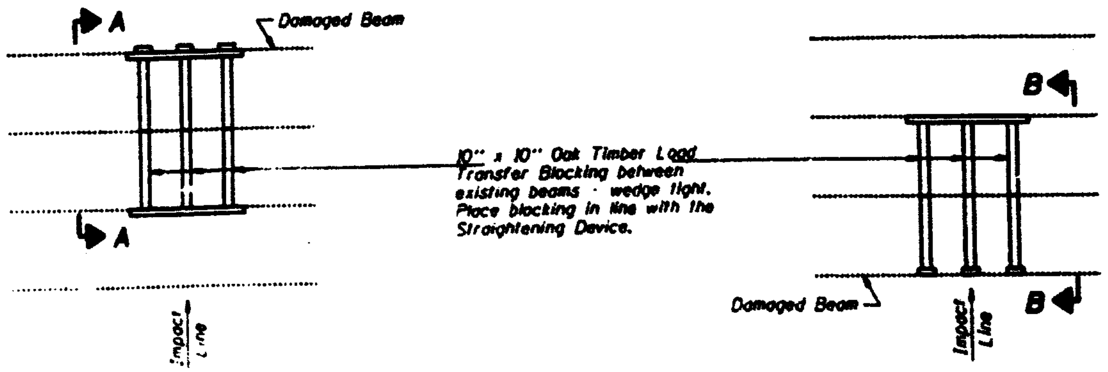
AUGUST 3, 1998

BRIDGE REPAIRS
F.A. RTE. 426 SEC. BR-HB-6
KANE COUNTY
STA. [illegible]
S.N. [illegible]-0007

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

F.A. 426		KANE	51	5

SHEET NO. 2
4 SHEETS

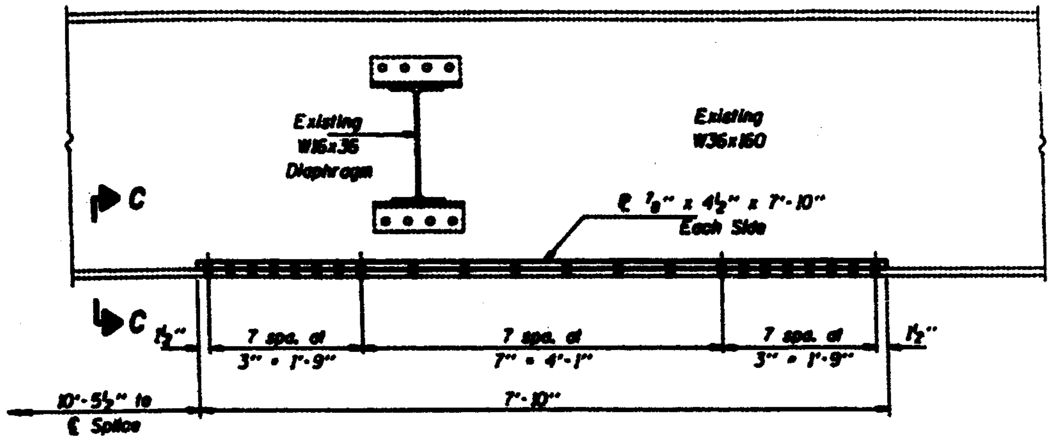


PULLING DEVICE

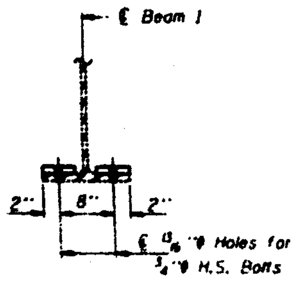
PUSHING DEVICE

PARTIAL PLANS
SUGGESTED BEAM STRAIGHTENING METHODS

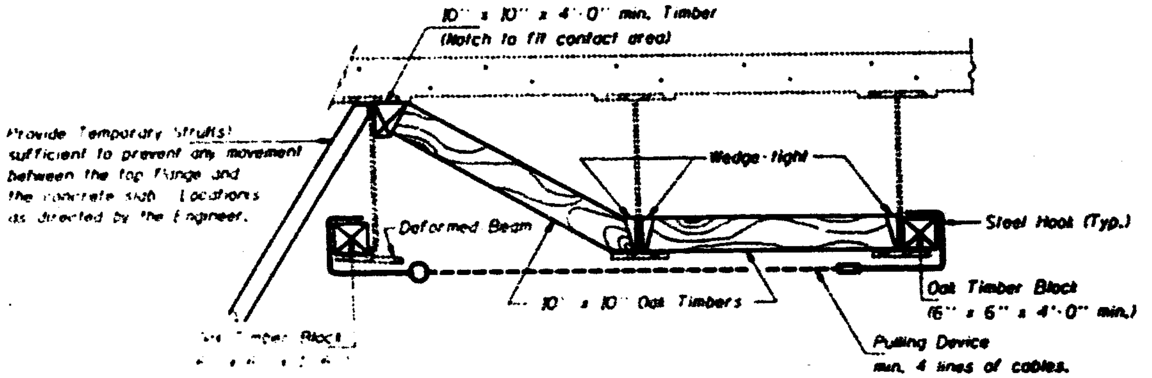
Straightening force shall be maintained on all load transfer blocking during beam straightening.



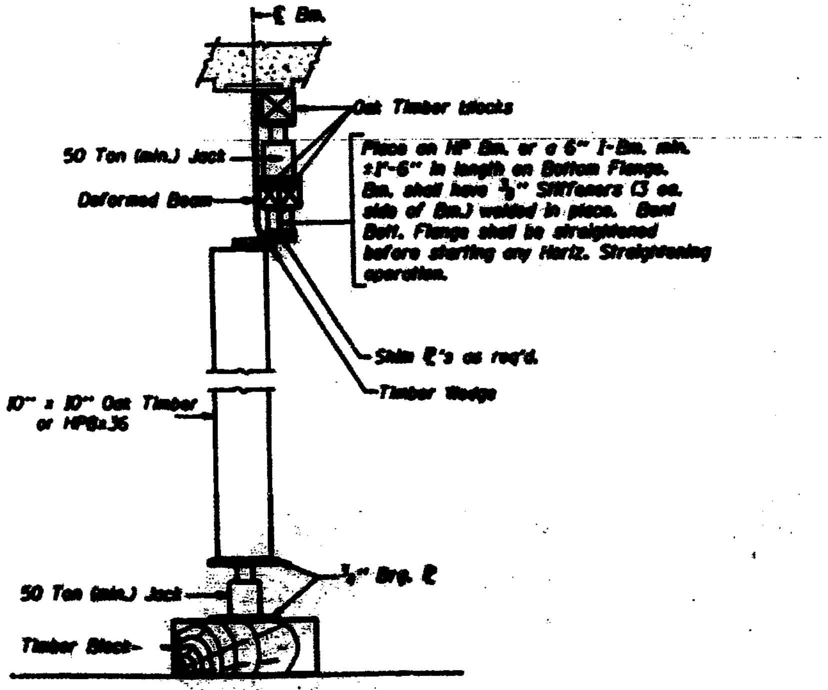
PARTIAL ELEVATION BEAM 1
(Looking North)



SECTION C-C

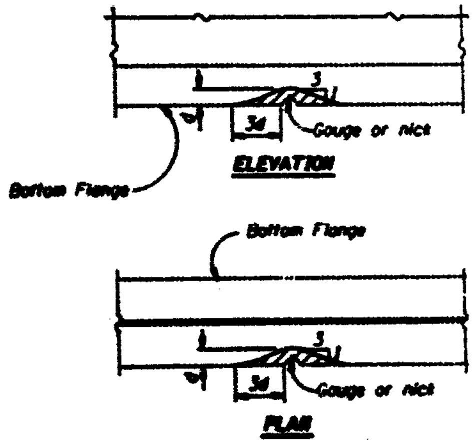


SECTION A-A

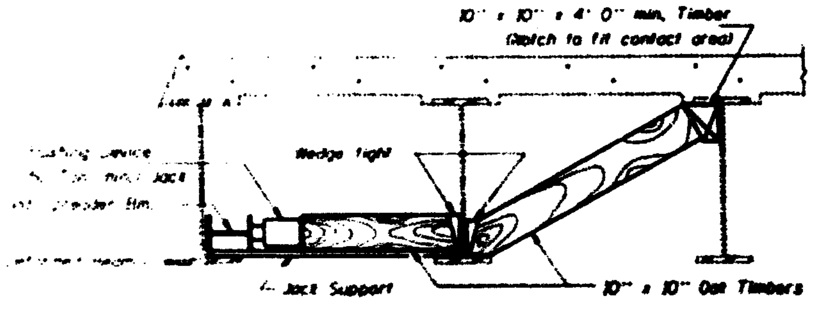


Place an HP Bm. or a 6" I-Bm. min. ±1'-6" in length on Bottom Flange. Bm. shall have ⅜" Stiffeners (3 ea. side of Bm.) welded in place. Bent Bott. Flange shall be straightened before starting any Horiz. Straightening operation.

VERTICAL STRAIGHTENING DETAIL



GRINDING DETAIL



SECTION B-B

DESIGNED	CME
CHECKED	HW
DRAWN	Dreeber
CHECKED	CME

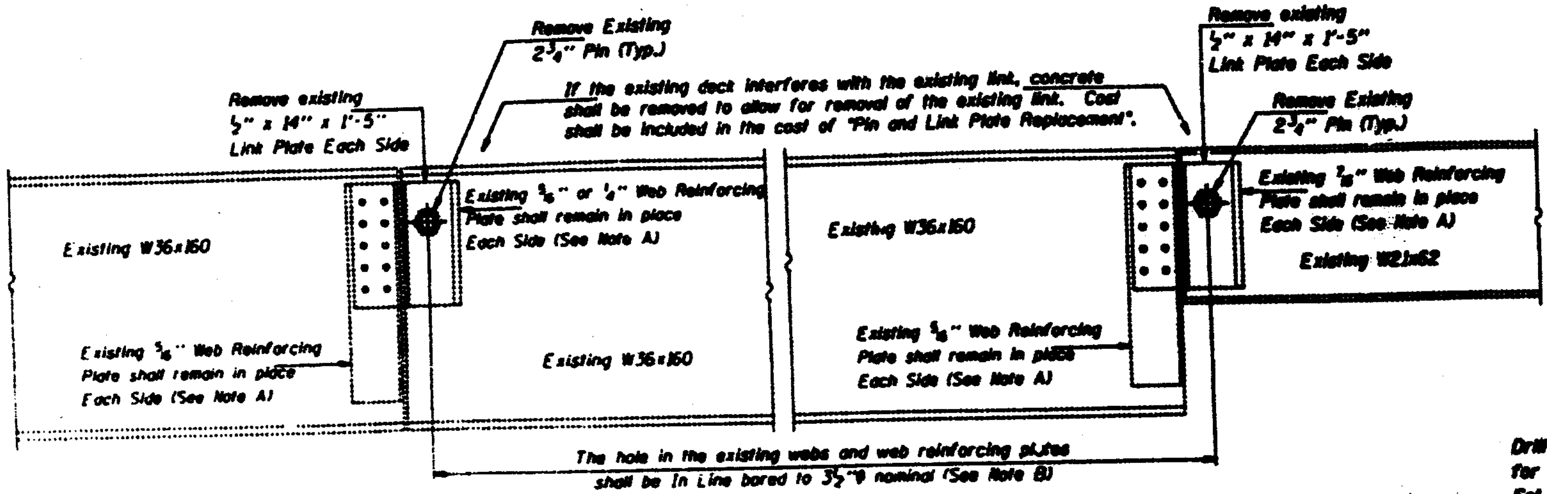
REP-1

BRIDGE REPAIRS
F.A. RTE. 426 SEC. BR-HB-6
KANE COUNTY
STA. [illegible]
S.N. 045-0007

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
F.A. 426		SALINE	51	6

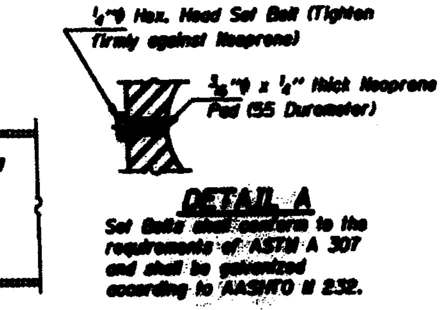
SHEET NO. 3
4 SHEETS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



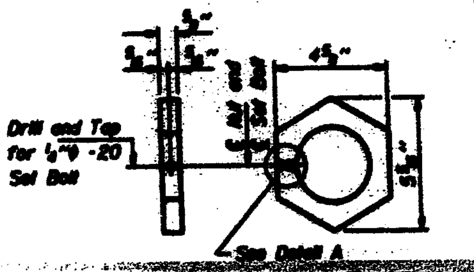
ELEVATION AT EXISTING PIN ASSEMBLY FOR BEAMS 1, 2, 13, 14 & 15

ELEVATION AT EXISTING PIN ASSEMBLY FOR BEAMS 3 THRU 12

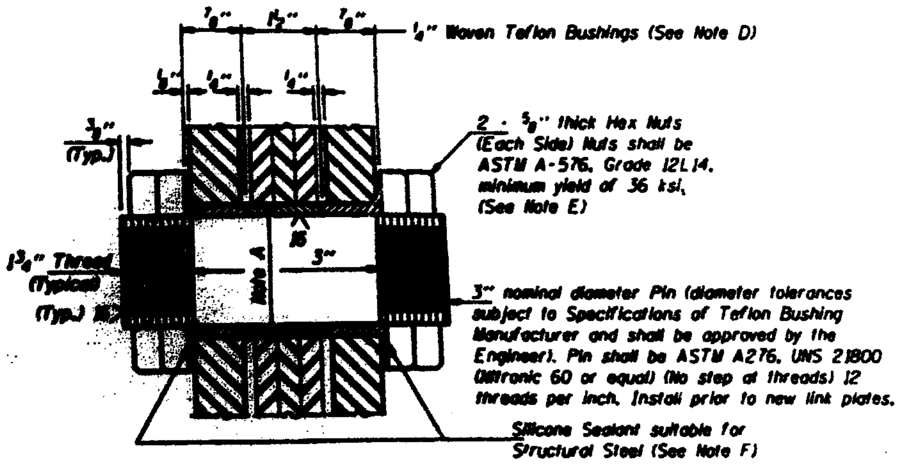


DETAIL A

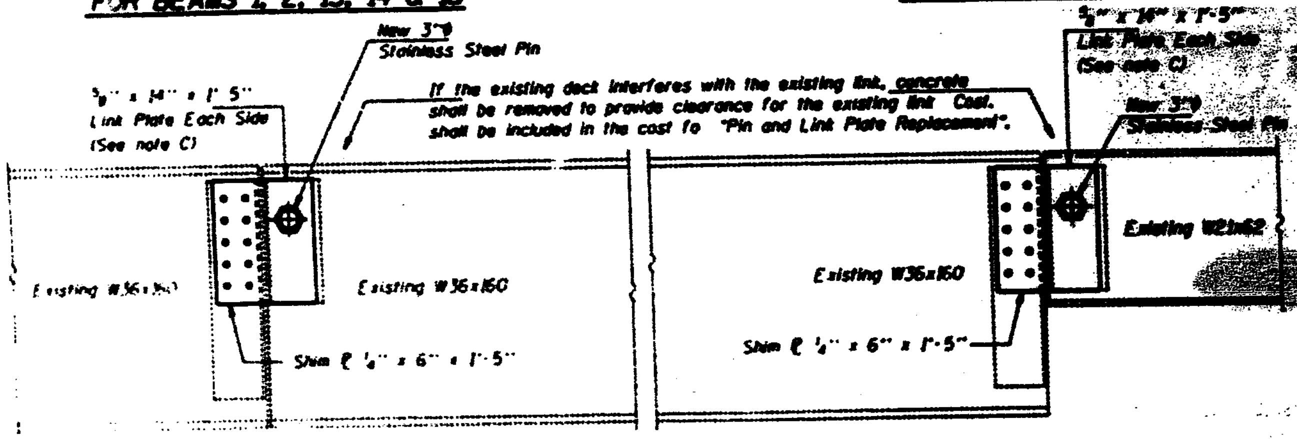
Set Bolts shall conform to the requirements of ASTM A 307 and shall be galvanized according to AASHTO M 232.



EXISTING NUT DETAIL

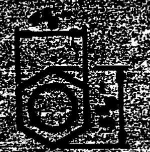


SECTION THRU PIN
(30 Required)



ELEVATION AT NEW PIN ASSEMBLY FOR BEAMS 1, 2, 13, 14 & 15

ELEVATION AT NEW PIN ASSEMBLY FOR BEAMS 3 THRU 12



[illegible] NUT DETAIL

NOTES

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

The Contractor shall provide support and/or shoring systems for the beam in the area of existing pin and link plate replacement. See Special Provision "Temporary Support System."

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 acrylic finish coat shall be Interstate Green, Munsell No. 7.5G 4/8. See Special Provisions "Cleaning and Painting New Metal Structures". Cost shall be included in the cost of "Pin and Link Plate Replacement".

Existing structural steel shall be cleaned and painted as required by the Special Provision "Cleaning and Painting Adjacent Areas of Existing Steel Structures". Cost shall be included in the cost of "Pin and Link Plate Replacement."

All existing steel surfaces behind link plates shall be cleaned and primed before installation of new link plates. Cost shall be included in the cost of "Pin and Link Plate Replacement."

Field dimensions and details relative to existing structure have been taken from existing plans and are subject to nominal construction variations. It shall be the Contractor's responsibility to verify such dimensions and details in the field, consider the pin diameters, and make necessary approved adjustments prior to construction or ordering of materials. Such variations shall not be cause for additional compensation for a change in the scope of the work, however, the Contractor will be paid for the quantity actually furnished at the unit price bid for the work.

The Pins and Link Plates shall conform to the minimum Charpy V-Notch Toughness of 25 ft.-lbs. at 40° F.

The pins, link plates, bushings, nuts, Set Bolts, Neoprene Pad, silicone sealant, fill plates and high strength bolts are the items included in "Pin and Link Plate Replacement".

Note A:
Existing webs shall be inspected for [illegible] shall be [illegible] Structures for further disposition. Clean and paint before installing new link plates.

Note B:
Bore diameter for bushing in link plate, existing webs and web reinforcement plates shall correspond to bushing manufacturer's allowable tolerances for proper functioning. Hole diameter may be adjusted to allow use of shelf bushings.

Note C:
Inside face of new link plates shall receive first field coat in shop. The primer shall pass the M.E.K. Rub Test before the first field coat is applied.

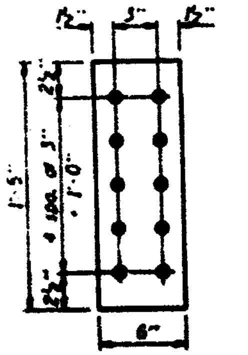
Note D:
Actual bushing thickness per manufacturer's specifications. 1/4" is approximate. Bushings shall be a self lubricating filament wound epoxy matrix backed Duralon Bearing, metal backed Fiber Glide Bearing or equivalent. No primer or grease shall be allowed on bushings. Bushings shall be suitable for dynamic loads of 20,000 psi.

Note E:
Tighten inside nuts [illegible] then back off 1/4 turn and tighten outer nuts.

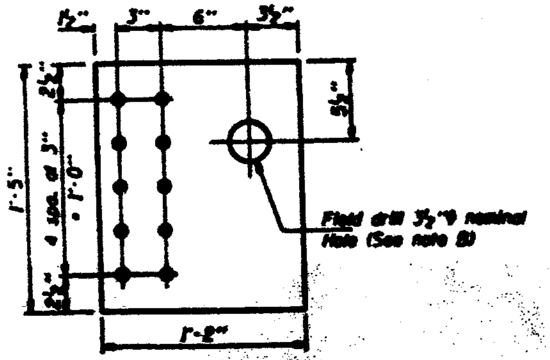
Note F:
[illegible]

MAXIMUM REACTIONS AT PIN

[illegible]	(K)	10.3
[illegible]	(K)	22.6
[illegible]	(K)	6.8
[illegible]	(K)	39.1



SHIM PLATE DETAIL
(60 Required)



LINK PLATE DETAIL
(60 Required)

BILL OF MATERIAL

ITEM	UNIT	QUANTITY
Temporary Support System	Each	30
Pin and Link Plate Replacement	Each	30

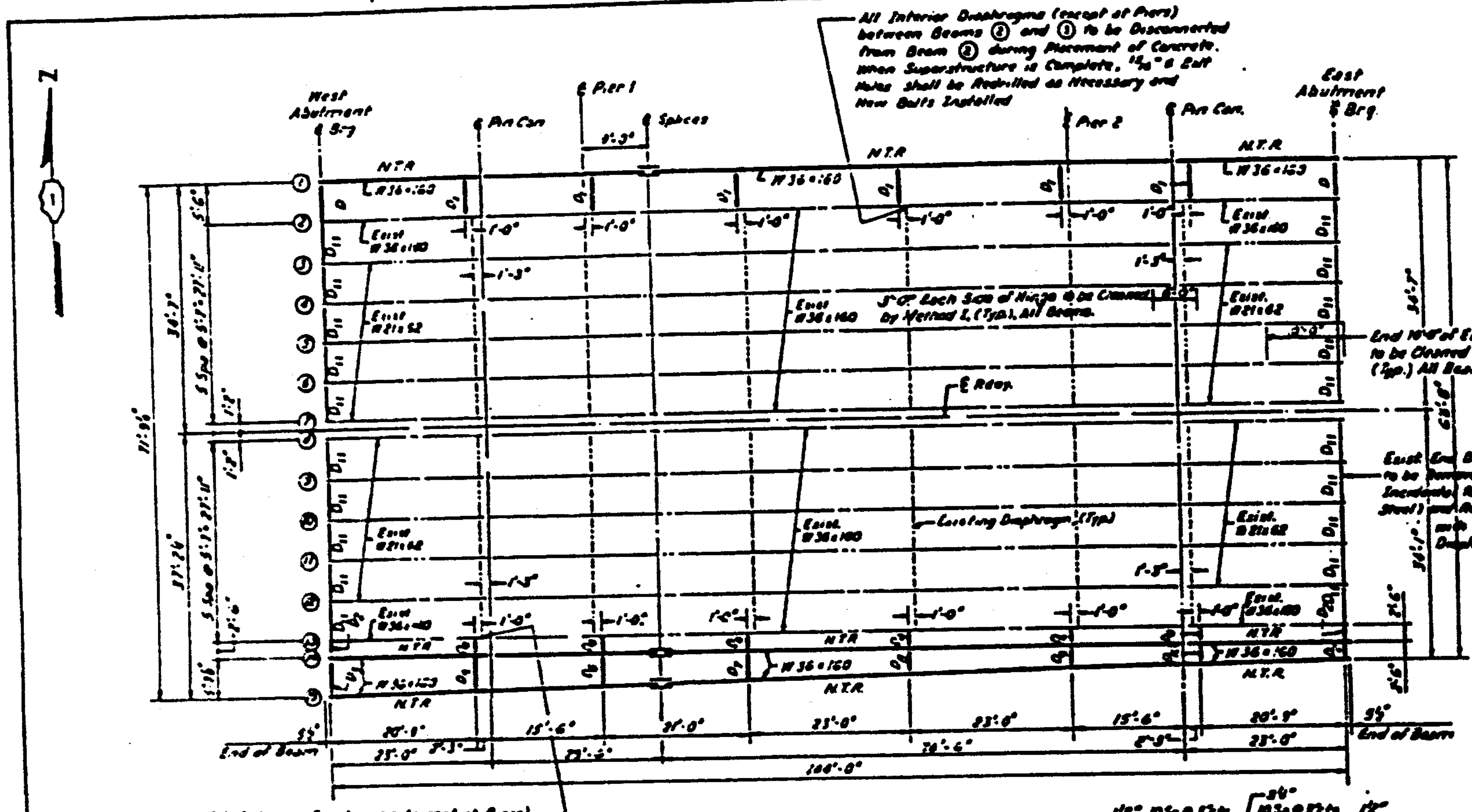
PIN AND LINK PLATE REPLACEMENT
[illegible]

DESIGNED	YMV
CHECKED	CME
DRAWN	Paul Sumner
CHECKED	YMV CME

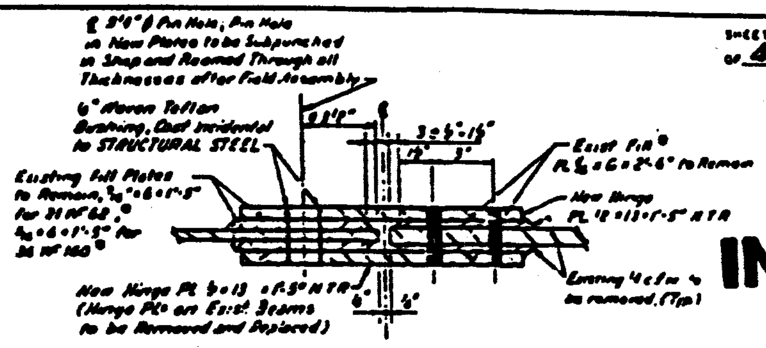
SHEET NO 4 OF 4 SHEETS

KANE

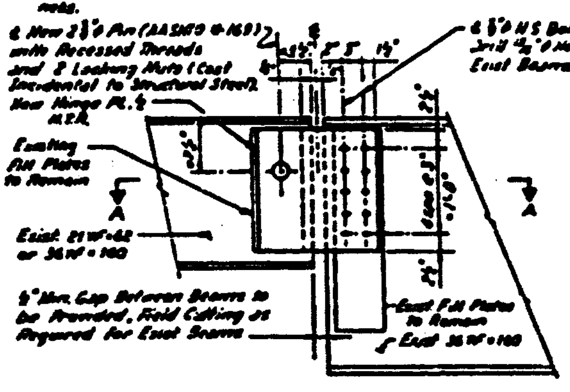
FOR INFORMATION ONLY



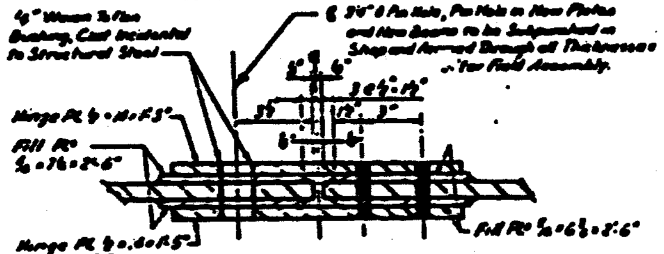
FRAMING PLAN



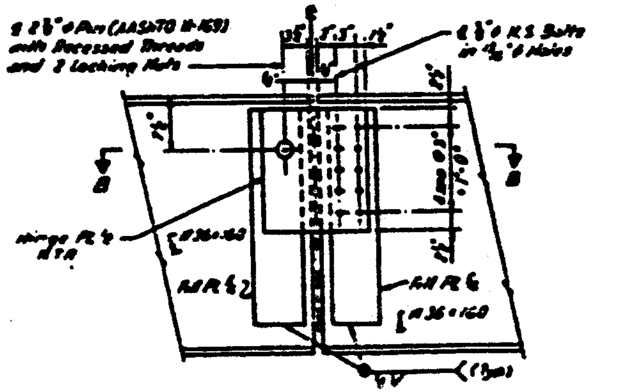
SECTION A-A



HINGE DETAIL - EXIST. BEAMS

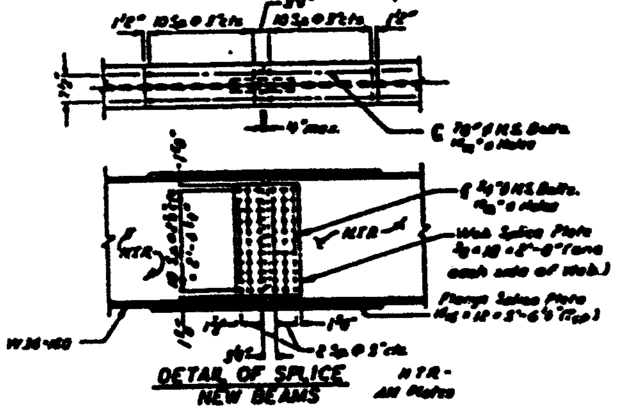


SECTION B-B



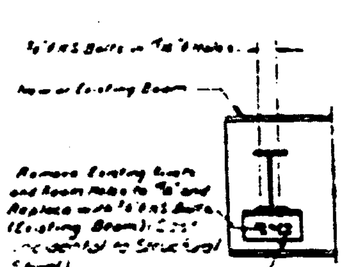
HINGE DETAIL-NEW BEAMS

N.T.R.



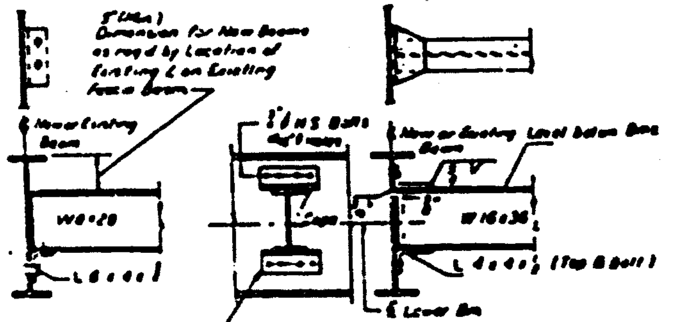
DETAIL OF SPLICE NEW BEAMS

N.T.R.- All Plates



DIAPHRAGM D-D1-D2

(Field drilled holes in new beam for bolted connection.)



DIAPHRAGM D-D3 TO D16

MOMENT TABLE			
	[illegible]	PIER 1 or 2	0.5 Sp 2
S (Non-Comp.) (in³)	9750	9750	9750
*S (Comp.) (in³)	1330	9750	13106
DL (k/ft)	0.945	0.945	0.945
M_D ('k)	62.6	256.4	303.9
M_L ('k)	93.3	311.6	490.3
Imp ('k)	26.0	66.9	126.5
M Total ('k)	182.9	634.9	922.7
f_s (Unreinf.) (ksi)	4.1	14.5	20.4
*f_s Total (ksi)	17.3	14.5	13.7

* For Existing and New Beams

BEAM REACTION TABLE		
	ABUTMENT	PIER
M_D (k)	109	371
M_L (k)	265	431
Imp (k)	79	120
R Total (k)	453	922

DIAPHRAGM	DIM. [illegible]
D, D_1	5'-6"
D_2, D_3	5'-6"
[illegible]	5'-1½"
[illegible]	5'-1½"
[illegible]	6'-9¼"
[illegible]	6'-3½"
[illegible]	5'-9⅞"
[illegible]	3'-3⅝"
[illegible]	5'-4¾"
[illegible]	5'-7"

AS REVISED

TOP OF FLANGE ELEVATIONS ** INCLUDING DEFLECTIONS							
BEAM \ LOC	℄ BRG. W. ABUT.	℄ HINGE NO. 1	℄ BRG. PIER 1	℄ SPLICE	℄ BRG. PIER 2	℄ HINGE NO. 2	℄ BRG. E. ABUT.
1	749.654	749.[illegible]	749.262	748.[illegible]	[illegible]	747.763	747.323
14	749.741	749.417	749.137	748.964	748.047	747.825	747.404
15	749.625	749.306	749.043	748.870	747.979	747.762	747.354

** FOR FABRICATION ONLY

NOTES:

1. TWO HARDENED WASHERS SHALL BE REQUIRED OVER ALL 15/16" HOLES IN DIAPHRAGM.
2. ALL STRUCTURAL STEEL SHALL CONFORM TO AASHTO M183, UNLESS OTHERWISE NOTED.
3. BUSHINGS TO BE SELF LUBRICATING FILAMENT WOUND EPOXY MATRIX BACKED CAR-FIL BEARING OR METAL BACKED FIBER GLIDE BEARING OR EQUIVALENT. COST INCIDENTAL TO STRUCTURAL STEEL.
4. SUGGESTED SEQUENCE OF CONSTRUCTION FOR HINGE REPLACEMENT. CONTRACTOR MAY SUBMIT HIS OWN SEQUENCE OF CONST. FOR APPROVAL.
   a. REMOVE PORTIONS OF CONCRETE DECK SHOWN ON SHEET 1.
   b. ERECT FALSEWORK TO SUPPORT BEAMS IN SPANS 1 AND 3. FALSEWORK SHALL CONFORM TO THE REQUIREMENTS OF ART. [illegible] AND THE COST SHALL BE INCIDENTAL TO FURNISHING AND ERECTING STRUCTURAL STEEL. SEE SPECIAL PROVISIONS.
   c. REMOVE EXISTING PINS AND BEAM HINGE CONNECTION PLATES.
   d. CLEAN BEAMS - SEE NOTE NO. 5.
   e. FIELD DRILL BOLT HOLES IN BEAM WEBS AND FILL PLATES. INSTALL BOLTS FINGER TIGHT. ADJUST PLATES INTO PROPER POSITION FOR PIN. FULLY TORQUE H.S. BOLTS. REAM PIN HOLE THROUGH BEAM WEB AND PLATES. INSTALL PIN ASSEMBLY.
   f. REMOVE FALSEWORK.
5. CLEAN AND PAINT ALL STRUCTURAL METALS. ALL EXISTING STRUCTURAL METALS SHALL BE CLEANED USING METHOD [illegible]. WITH THE EXCEPTION OF THE FOLLOWING WHICH SHALL BE CLEANED BY METHOD 1: THE END 10 FT. OF EACH BEAM AT THE ABUTMENTS; THE EXISTING BEAMS FOR A DISTANCE OF 5 FT. EACH SIDE OF THE HINGE CONNECTIONS AFTER THE CONNECTIONS ARE DISASSEMBLED; AND THE BEARINGS AT PIER 1.

   FOLLOWING REMOVAL OF THE CONCRETE DECK IN THE DESIGNATED AREAS, THE TOP FLANGES OF THE FACIA BEAMS, SPLICES AND END DIAPHRAGMS SHALL BE CLEANED USING METHOD [illegible]. THE METAL THUS EXPOSED SHALL BE FIELD PRIMED PRIOR TO POURING THE NEW DECK. SEE SPECIAL PROVISIONS FOR CLEANING AND PAINTING STEEL STRUCTURES
6. ALL CONTACT SURFACES OF JOINTS FOR THE DIAPHRAGMS SHALL BE FREE OF PAINT OR LACQUER.
7. SEE GENERAL NOTES, SHEET NO 2, FOR NOTCH TOUGHNESS REQUIREMENTS.
8. REMOVAL OF EXISTING WELDS SHALL BE BY USE OF ARC-AIR METHODS TO MINIMIZE DAMAGE TO THE EXISTING STRUCTURAL STEEL, EXCEPT THAT CONTRACTOR MAY USE OTHER METHODS IF APPROVED BY THE ENGINEER.

I --- MOMENT OF INERTIA
DL -- DEAD LOAD INCLUDING BEAM, SLAB, MEDIAN AND/OR PARAPET
M_D -- MOMENT DUE TO DEAD LOAD
M_L -- MOMENT DUE TO LIVE LOAD
IMP -- IMPACT
f_s --- BENDING STRESS DUE TO TOTAL MOMENT, M_T.

DESIGNED [illegible]
CHECKED [illegible]
DRAWN [illegible]
CHECKED [illegible]

REVISIONS
NAME | DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STRUCTURAL STEEL

US ROUTE 20 BY-PASS (F.A.P. 426) OVER
LIBERTY STREET
SECTION [illegible]
KANE COUNTY - STATION 221+38.32
STR. NO. 045-0007

AS REVISED 5-21-87