

**ATTACHMENT 16 – URS CORPORATION FATIGUE EVALUATION BRIDGE
9340 35W OVER MISSISSIPPI RIVER INITIAL INSPECTION REPORT DATED
JUNE 9, 2003
(100 pages)**

Initial Inspection Report For:

**Fatigue Evaluation
Bridge 9340
35W Over Mississippi River**



Prepared for:

Mn/DOT

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June 9th - June 13, 2003

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1. INTRODUCTION

We have completed our limited field inspection of the main truss section of Bridge 9340 (TH 35W over the Mississippi River). The inspection was performed during MnDOT's normal inspection cycle on June 9, 2003 to June 13, 2003. A member of URS's staff participated with MnDOT inspection personnel in MnDOT's inspection to assess the existing structural condition of key superstructure components.

The purpose of the URS limited field inspection was to observe the overall condition of the truss members, floor beams, truss bearings, truss connections, miscellaneous connections and bracing members. URS was to mark the bearing position (for all truss bearings) and record the temperature so that observations of potential movement could be ascertained later. URS was to document the condition of key members and create a photo log of the inspection photographs to document the general condition of the truss on the inspection dates. Finally URS was to comment on the inspection effort of the fracture critical details within the truss.

Information will be presented by breaking the report into major topics followed by a brief discussion of the major items for each topic. The attached photo log and image CD can be referenced for specific pictures of various areas within the truss.

2. OVERALL CONDITION OF THE TRUSS

Corrosion and Deterioration of the Truss Members

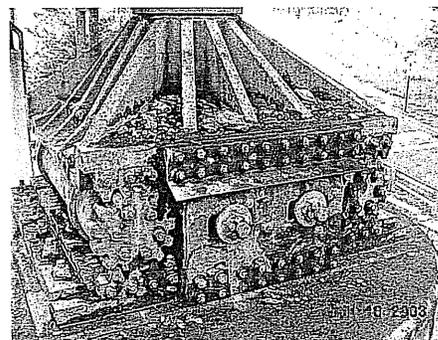
See Appendix A, B, and C for photo log, inspection photographs, and key plans. The overall condition of the truss members was found to be in relatively good condition from a corrosion standpoint. Minimal surface rusting was found on the exterior of the truss members. Corrosion that was located on the truss members and connections was generally concentrated near the deck joints, leading to the conclusion that leakage from the bridge deck is contributing substantially to the corrosion. There was also corrosion within the truss chord members at the tab connection attachment of the internal diaphragms. This topic will be discussed in greater detail later in the report.

Bearing Conditions

- The roller bearings appeared to not be functioning as intended. There was significant corrosion of the bearing surfaces, debris and dirt packed into various areas of the bearing and very thick coatings of paint. The roller bearings appear to be "frozen" in place.
- The access to observe the rocker bearings was very difficult due to the construction details. The bearings are built into "pockets" in the floor beam with little clearance to the sides of the bearing. Some debris was noted in the pocket and it was impossible to visually determine if the bearings are functioning. The bearings were marked so that potential movements could be determined in the future under different temperature conditions. The bearing marking will be discussed in greater detail later in the report.

Joint Conditions

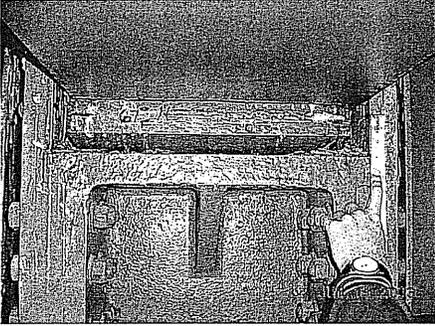
The condition of the deck joints was found to be good except for a few bent fingers in the finger joints. However, the condition of the waterproofing was hard to determine. There was evidence that the deck joints had leaked or were currently leaking as indicated by the concentrated corrosion of the members at or near the deck joints.



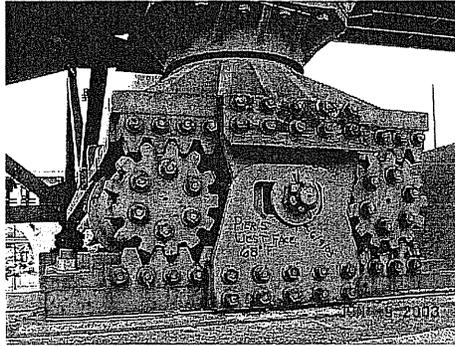
Typical Condition of Expansion Bearing at Pier 6 (West Truss)

3. BEARING AND JOINT MARKS FOR FUTURE REFERENCE

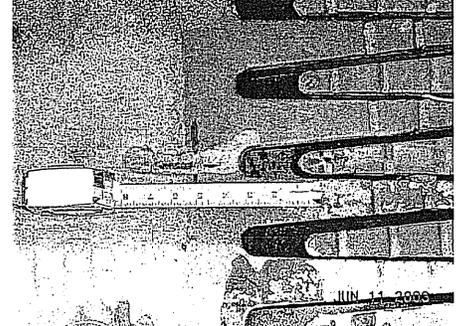
URS planned to mark the bearings by scribing and by permanent marker in such a manner to determine if the bearings were moving (sliding, rolling or rocking) with changes in temperature. All of the expansion bearings were to be marked to document their current position.



Typical Marking of Rocker Bearings



Typical Field Marking of Roller Bearings



Typical Marking of Finger Joints

Pre-Inspection Concepts

Three lines of reference were planned for marking on the roller bearings.

- Line 1 was to be marked plumb from the upper casting across the center of one of the rollers and onto the lower bearing plate.
- Line 2 was to be marked horizontally across the tooth of the rollers onto the shield/hold down plate.
- Line 3 was to be marked vertically from the shield/hold down plate onto the underside of the upper plate.

Two lines of reference were planned for marking of the rocker bearings.

- Line 1 was to be marked plumb from the center on the rocker pin and extended down onto the supporting casting.
- Line 2 was to be marked along the centerline of one of the ribs of the bearing casting and projected down onto the supporting casting. The angle between the centerline of the rib and plumb line 1 was to be measured.

The deck joints were to be scribed with a line across the joint fingers to determine the relative movement of one set of fingers to the other or if possible two shallow holes were to be drilled and the distance between them measured.

Actual Bearing and Joint Markings

The actual marking of the bearings was much more difficult than anticipated. There were many projections of bolt heads and miscellaneous plates from the surface of the bearing components that made it extremely difficult to scribe lines. The rocker bearings were found to have almost no access to the side surfaces, and markings had to be improvised in the field.

Three lines were marked on the roller bearings.

- Line 1 was marked vertically from the upper casting across the center of one of the rollers, onto the lower bearing plate and extended onto the concrete surface. The line, however, could not be marked as plumb due to obstructions.

- Line 2 was marked horizontally across the tooth of the rollers onto the shield/hold down plate as planned.
- Line 3 was marked vertically from the shield/hold down plate onto the underside of the upper plate as planned.

One line was marked on the rocker bearing. It was not possible to mark the sides of the rocker bearing.

- Line 1 was marked on the rocker portion of the bearing a given distance up from the supporting casting. This line was also extended onto the supporting steel sole plate. The intent is to determine any change in the vertical distance between the rocker and the supporting plate and also any longitudinal displacement of the rocker in reference to the sole plate.

The deck joints were marked with shallow holes drilled into the joint fingers and the distance between the marks was measured.

TABLE OF MEASUREMENTS AND TEMPERATURES							
Location		Initial Marking (6-9-03 to 6-13-03)			Future Marking		
		Reference Line	Measurement	Temperature	Reference Line	Measurement	Temperature
Finger Joints	NW Comer	-	6 in	70 deg F	-		
	SW Comer	-	7 in	66 deg F	-		
	SE Comer	-	7 in	62 deg F	-		
	NE Comer	-	5 in	66 deg F	-		
Rocker Bearing	East Truss U0	Line 1	2 13/16 in	67 deg F	Line 1		
	East Truss U28	Line 1	3 15/16 in	68 deg F	Line 1		
	West Truss U0	Line 1	See Note		Line 1		
	West Truss U28	Line 1	See Note		Line 1		
Pier 5	West Truss	Line 1	0	68 deg F	Line 1		
		Line 2	0		Line 2		
		Line 3	0		Line 3		
	East Truss	Line 1	0	66 deg F	Line 1		
		Line 2	0		Line 2		
		Line 3	0		Line 3		
Pier 6	West Truss	Line 1	0	68 deg F	Line 1		
		Line 2	0		Line 2		
		Line 3	0		Line 3		
	East Truss	Line 1	0	67 deg F	Line 1		
		Line 2	0		Line 2		
		Line 3	0		Line 3		

Pier 8	West Truss	Line 1	0	63 deg F	Line 1		
		Line 2	0		Line 2		
		Line 3	0		Line 3		
	East Truss	Line 1	0	68 deg F	Line 1		
		Line 2	0		Line 2		
		Line 3	0		Line 3		

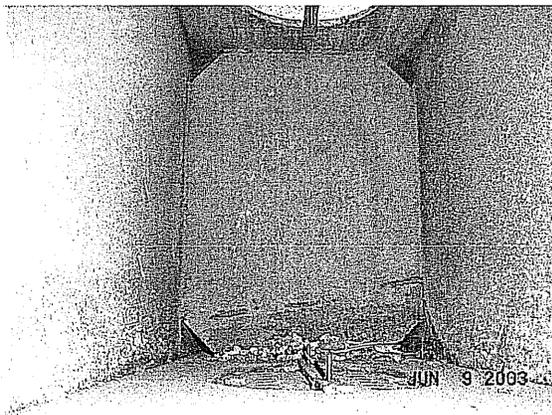
Note: Bearing was not marked on initial visit because the lack of access prohibited the inspector from following the pre-inspection marking plan. After review with office staff, an alternate marking concept was developed. Marking of the bearing on the following inspection days would have required an additional lane closure. Base line marks will be made on the next inspection.

4. INSPECTION EFFORT OF FRACTURE CRITICAL DETAILS

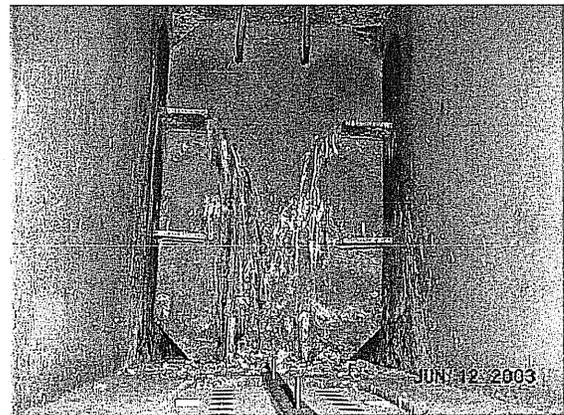
Inspection of Weld Tabs Within the Truss Members at the Diaphragms

The access holes in the truss members are currently covered and are not readily accessible without removal of the cover plates. The cover plates were removed at selected locations for observation of the interior of the truss chord at diaphragm locations. Minor amounts of corrosion were found to be present within the truss member with corrosion being concentrated at the welded tab connections and on the diaphragms themselves.

It was difficult to determine if the diaphragm was welded to the truss chord or only to the tabs within the member. Access holes are not located directly adjacent to the diaphragm locations and the diaphragms were visually observed from a distance. There was also an accumulation of debris/dirt around the perimeter of the diaphragms inspected. It appeared that the tabs were attached to the interior of the truss by welding with fillet welds in the longitudinal direction.



Back Side of Internal Diaphragm (Appears Welded)



Front Side of Internal Diaphragm (Weld Tabs)

Possible Visual Access Methods

Further visual inspection of the tab connections and diaphragms could be made by removal of more of the cover plates. Probing scopes could also be utilized to provide up close inspection of the tab connections and diaphragms. Scopes with photographic capabilities would prove to be extremely valuable for documenting and determining the condition at these internal tabs.

5. FUTURE INSPECTIONS

Special Emphasis on Inspection of Fracture Critical Details

The length of the longitudinal weld of the tab connection should be determined to determine what stress category is appropriate for this condition. It should also be determined whether or not the diaphragm is welded to the interior of the truss member or just connected with the tab welds. The truss chord members are critical non-redundant members, thus emphasizing the need to fully investigate the fatigue condition.

Removing the cover plates at each of the diaphragm locations to inspect the truss interior at the tab connections is of critical importance. This is one of the primary locations that one would expect a critical fatigue crack to develop in a truss chord member.

MnDOT Assistance for One Additional Inspections

MnDOT will provide access to the bridge with an under bridge inspection unit for one additional inspection of the key truss members during the fatigue study.

Additional Inspections of Bearings and Joints

URS will monitor and record bearing and joint marks, for movement at a minimum of six different seasonal temperatures. URS will determine bearing and joint conditions and movement- temperature relationships based on these inspection records. URS will provide access equipment for a minimum of five additional bearing and joint inspections.

6. SUMMARY AND RECOMMENDATIONS

See Appendix A, B, and C for photo log, inspection photographs, and key plans. The overall condition of the truss members and connections was, from a corrosion standpoint, found to be good. Corrosion was found in localized areas, generally concentrated near the deck joints. Minor corrosion was observed at some of the locations chosen to inspect in the interior of the truss members.

The roller bearings did not appear to be moving freely due to the corrosion, debris and paint build up. The rocker bearings were not accessible for detailed visual observation and assessment of their movement. All of the bearings were marked in their current position and temperature readings were recorded to assist in determining movement-temperature relationships.

The fracture critical details at the tab locations on the interior of the box chord are very difficult to observe. The access openings are covered and observations can only be made after the cover plate is removed. It is our understanding that the cover plates are not being removed as part of MnDOT's regular inspection cycle. MnDOT should consider inspection of all of these fracture critical details as part of the normal inspection cycle due to the fracture potential of these details. Inspection of these details is clearly the most important part of future inspections of this structure. It is also recommended that scope equipment be procured to enable close visual inspection of these details.

Appendix A - Documented Photo Log

This photo log is a listing by photo number of the pictures taken during the inspection from June 9th to June 13th, 2003, including the location and a description. The photos can be found in Appendix B. Key plans explaining joint number descriptions in the photo log can be found in Appendix C.

A CD containing the image files has been included with this report.

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
1-1	Pier 8 Bearing Assembly	West side – west face 63°F air temperature
1-2	Pier 8	North roller
1-3	Pier 8	South roller
1-4	Pier 8	West face Flaking rust
1-5	Pier 8	Southwest corner assembly
1-6	Pier 8	South face looking north
1-7	Pier 8	Connection looking north
1-8	Pier 8	Connection looking north
1-9	Pier 8	West side assembly East face L-27 connection Flaking rust
1-10	Pier 8	West side assembly East face L-27 connection

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
1-11	Pier 8	West bearing East face
1-12	West truss inside box L- 26 to L-27 15'+ from Pier 8	Inside box beam truss Looking south
1-13	West truss inside box L- 26 to L-27 15'+ from Pier 8	Inside box beam truss Looking north
1-14	Pier 8 assembly North side Looking south	Flaking rust
1-15	Pier 8 North side Looking south	Connection plate
1-16	West truss North rocker U27	North face Looking south Panel PT north side
1-17	West truss North rocker U27	North face Looking south Panel PT north side
1-18	U27	Panel PT Connection plate at rocker Good condition East face looking west

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
1-19	U27	Connecting plate West face looking east
1-20	U27	Connecting plate West face looking east
1-21	Opening in truss beam West truss U28 ⇒ L27	Inside looking south
1-22	Opening in truss beam West truss U28 ⇒ L27	Inside looking north
1-23	West truss U27 At rocker	West face looking east
1-24	West deck near Pier 8	Conduit connection on west coping
1-25	West deck near Pier 8	Conduit connection on west coping
1-26	Between L25 and L26 West side	Sign blister Connection south face Looking north Major flaking rust
1-27	Between L25 and L26 West side	Sign blister connection North face Looking south

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
1-28	Between L25 and L26 West side	Sign blister connection North face Looking south
1-1	West truss South end at Rocker UO to L1	Rocker UO to L1 West face Looking east
2-2	West truss South end at Rocker UO to L1	Rocker UO to L1 West face Looking east
2-3	West truss South end at Rocker UO to L1	South face Looking north Rocker movement not marked
2-4	West truss South end at Rocker UO to L1	East face Looking west
2-5	West truss South end at Rocker UO to L1	Rocker South face looking north
2-6	West truss South end at Rocker UO to L1	Rocker South face looking north

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
2-7	West truss South end at Rocker UO to L1	Rocker South face looking north
2-8	Pier 5 Bearing assembly	West face looking east Scribe marks 68°F Flaking rust Rust on teeth (south)
2-9	Pier 5 Bridge assembly	West face looking east Scribe marks 68°F Flaking rust Rust on teeth (south)
2-10	UO ⇒ L1	Connection flaking rust
2-11	UO ⇒ L1	Connection flaking rust
2-12	UO ⇒ L1	Connection flaking rust
2-13	Pier 5 Assembly	North face looking south
2-14	Pier 5 Assembly	North face looking south Showing east face connection
2-15	Pier 5 West truss	South face looking north
2-16	Pier 5 West truss	East face looking west

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
2-17	Pier 5 West truss	East face looking west
2-18	L2 to L1 12' ± from L1	Inside box Looking south
2-19	L2 to L1 12' ± from L1	Inside box Looking north
2-20	L2 to L1 15' ± from L1	Inside box looking south
2-21	L2 to L1 15' ± from L1	Inside box looking north
2-22	Finger joint Northwest corner at Pier 8	Drilled hole in finger joint approx 6" apart at 70°F
2-23	Finger joint northwest corner at Pier 8	Drilled hole in finger joint approx 6" apart at 70°F
3-1	U22 west truss Connection west face Looking east	No visible rust
3-2	U22 west truss north side connection	No visible rust
3-3	U22 west truss south side connection	No visible rust

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
3-4	U22 west truss East face Looking southwest	Good condition
3-5	U22 west truss East face looking southwest	Good condition Floor beam also
3-6	L21 to U22 member mid-point	Flaking rust
3-7	U22 west truss East face looking west	Good condition
3-8	U22 west truss East face looking west	Good condition
3-9	West truss U21 connection east face looking southwest	Good condition
3-10	West truss U21 connection east face looking southwest	Good condition
3-11	West truss U21 Floor beam connection at U21 East face looking west	
3-12	U21 to U22 2' north U21	Tack crack inside box

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
3-13	U21 to U22 north U21 2'	Inside box Top chord flaking beam connection Weld crack upper left corner looking south
3-14	U21 to U22 north U21 2'	Inside box Top chord flaking beam connection Weld crack upper left corner looking south
3-15	U21 to U22 north U21 2'	Inside box Looking north
3-16	U21 connection West truss East face looking northwest	Good condition
3-17	U21 connection West truss East face looking northwest	Good condition
3-18	Walkway at U21	Interior bay
3-19	U20 connection East face looking west	Good condition
3-20	U20 connection East face looking west	Good condition

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
3-21	L20 Pier 7 West face Looking northeast	Flaking rust Rust pits on member Bott bolts in bearing assembly Looks solid
3-22	L20 Pier 7 West face Looking northeast	Flaking rust Rust pits on member Bott bolts in bearing assembly Looks solid
3-23	L20 Pier 7 West face Looking northeast	Column cracking at Pier 7
3-24	L20 Pier 7 West face Looking southeast	Lower chord with flaking rust Connection flaking rust U20 to L20 With flaking rust
3-25	L20 Pier 7 West face Looking Southeast	Lower chord with flaking rust Connection flaking rust U20 to L20 With flaking rust
3-26	L20 Pier 7 East face Looking southwest Pier 7 west truss	Lower chord with flaking rust Connection flaking rust U20 to L20 With flaking rust

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
3-27	L20 Pier 7 East face Looking southwest Pier 7 west truss	Lower chord with flaking rust Connection flaking rust U20 to L20 With flaking rust
3-28	Pier 7 Looking north	Flaking rust
3-29	L19 East face Looking southwest	Connection good condition
3-30	L19 West face Looking East	Flaking rust
3-31	U20 West face Looking northeast	Paint flaking
3-32	U20 West fact Looking northeast	Paint flaking
4-1	U19 West face Looking northeast	Good condition

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
4-2	U19 East face Looking northwest	Good condition
4-3	U20 East face Looking northwest	Good condition
4-4	U18 East face Looking southwest	Good condition
4-5	U18 East face Looking southwest	Good condition
4-6	U18 West face Looking east	Good condition
4-7	U18 West face Looking east	Good condition
4-8	U18 West Face Looking northeast	Good condition
4-9	U18 West Face Looking northeast	Good condition

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
4-10	U18 East face Looking northwest	Good condition
4-11	Not Used	
4-12	Not Used	
4-13	Finger joint at southwest corner	Drill holes approx. 7" apart at 66°F 10:35 AM
4-14	Finger joint at southwest corner	Drill holes approx. 7" apart at 66°F 10:35 AM
4-15	Finger joint at southwest corner	Drill holes approx. 7" apart at 66°F 10:35 AM
4-16	West truss U6 connection West face looking east	Good condition
4-17	West truss U6 connection West face looking east	Good condition
4-18	East face U6 Looking west	Good condition
4-19	East face U6 Looking west	Good condition

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
4-20	Sign blistering at U6	
4-21	Sign blistering at U6	
4-22	West truss U6 connection East face Looking southwest	Good condition
4-23	U7 East face Looking northwest	Good condition
4-24	U7 East face Looking northwest	Good condition
4-25	U7 West face Looking northeast	Good condition
4-26	U7 West face Looking southeast	Good condition
4-27	U7 East face Looking southwest	Good condition

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
4-28	U8 East face Looking northwest	Good condition
4-29	U8 West face Looking east	Slight surface rust Drain connection
4-30	U10 East face Looking southwest	Walkway connection Good condition
4-31	U10 East face Looking southwest	Walkway connection Good condition
4-32	U10 West face Looking southeast	Good condition U of M sensor
4-33	U10 West face Looking east	Good condition U of M sensor
5-1	U10 West face Looking east	Good condition U of M sensor
5-2	U10 East face Looking northwest	Good condition U of M sensor

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
5-3	U10 East face Looking northwest	Good condition U of M sensor
5-4	U10 East face Looking northwest	Good condition U of M sensor
5-5	U9 East face Looking southwest	Good condition
5-6	U9 East face Looking southwest	Good condition
5-7	U9 West face Looking southeast	Good condition
5-8	U9 West face Looking northeast	Good condition
5-9	U9 East face Looking northwest	
5-10	U8 East face Looking southwest	Good condition

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
5-11	U8 East face Looking southwest	Good condition
5-12	U8 West face Looking southeast	Slight flaking rust Drain pipe (plugged) cause rust
5-13	U8 to L8	Rust due to plug drain
5-14	U8 to L8	Rust due to plug drain
5-15	U8 West face Looking east	Flaking rust
5-16	Drain connection at U8	
5-17	Expansion bearing Pier 6 West face Looking east	Major flaking rust and debris
5-18	Pier 6 North roller West face	Close up marks
5-19	Pier 6 South roller West face	Flaking rust

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
5-20	Pier 6 Expansion assembly North face Looking east	
5-21	Pier 6 South face Looking east	Flaking rust
5-22	East face Looking north	Concrete column Good shape No major cracking
5-23	East face Looking north	Flaking rust
5-24	L15 West face Looking east	Slight flaking rust
5-25	L15 East face Looking west	Good condition
5-26	L15 East face Looking west	Good condition
5-27	L14 East face Looking southwest	Good condition

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
5-28	L14 East face Looking southwest	Good condition
5-29	L14 West face Looking east	Good condition
5-30	L13 West face Looking east	Flaking rust on all members
5-31	L13 East face Looking southwest	Good condition
5-32	L13 East face Looking southwest	Good condition
6-1 6/10/03	U14 Upper Lateral stringer	Cracked tack weld
6-2	U14 Upper Lateral stringer	Cracked tack weld
6-3	U14 Upper Lateral stringer	Cracked tack weld

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
7-1 6/11/03	Southeast corner finger joints Northbound lane east side	Drilled hole in fingers joint Approx 7"± apart Air temperature 62°F 10:20 AM
7-2	Southeast corner finger joints Northbound lane east side	Drilled hole in fingers joint Approx 7"± apart Air temperature 62°F 10:20 AM
7-3	Northbound lane 2 nd Lane from east near river road	De - Lam MnDOT to patch
7-4	Northbound lane 2 nd Lane from east near river road	De - Lam MnDOT to patch
7-5	Northbound lane 2 nd Lane from east near river road	De - Lam MnDOT to patch
7-6	Northeast corner finger joint Northbound lane	Drilled hole in finger joint approx. 5"± apart 66°F 10:35 AM 6-11-03
7-7	Northeast corner finger joint Northbound lane	Drilled hole in finger joint approx. 5" ± apart 66°F 10:35 AM 6-11-03

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
7-8	East truss U28 Northeast corner North face Looking south	Rocker at 67°F 2-13/16"
7-9	East truss U28 Northeast corner North face Looking south	
7-10	East truss U28 Northeast corner North face Looking south	Rocker at 67°F 2-13/16"
7-11	U28 = Rocker East face Looking west	Good condition
7-12	U28 = Rocker East face Looking west	Good condition
7-13	U28 West face Looking east	Good condition

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
7-14	U28 West face Looking east	Good condition
7-15	Pier 8 East truss Expansion bearing assembly East face Looking west	Show good condition Concrete column in good condition Good condition Flaking rust on L27 to L26
7-16	Pier 8 East truss Expansion bearing assembly East Face Looking west	Show good condition Concrete column in good condition Good condition Flaking rust on L27 to L26
7-17	L27 Pier 8 Assembly	South face Looking north
7-18	L27 Pier 8	West face Looking northeast
7-19	L27 Pier 8 Connection	Slight flaking rust

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
7-20	L27 Pier 8 Connection North face Looking southwest	
7-21	L27 Pier 8 Connection North face Looking southwest	Good condition
7-22	L27 Pier 8 Connection North face Looking south	
7-23	L27 connection East face Looking west	
7-24	East truss inside box L2 to U28 looking south 10' from L27	
7-25	East truss inside box L2 to U28 looking north	

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
7-26	East truss inside box L2 to U28 looking south	
7-27	Pier 8 South face Looking north	Column good condition
7-28	East truss L27 to L26 21' from L26 Looking north	Inside box truss
7-29	East truss L27 to L26 21' from L26 Looking South	Inside box truss
7-30	East truss UO Rocker Near Pier 5 South face Looking north	Retro fit 68°F 3-15/16"
7-31	UO South face Looking north	
8-1 6/11/03	UO Rocker East face Looking west	Good condition

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
8-2	Pier 5 Expansion bearing assembly east truss East face Looking west	Good condition
8-3	Pier 5 Expansion bearing assembly East face Looking west Showing connection	
8-4	Pier 5 Expansion bearing assembly North face Looking southwest	
8-5	West face Looking northeast	Slight flaking rust
8-6	Pier 5 West face Looking northeast	Column good condition
8-7	Pier 5 West face Looking northeast	
8-8	Pier 5 West face Looking northeast	Column good condition

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
8-9 6/12/03	East truss U22 – U6 Connection	Good condition West face Looking southeast
8-10	East truss U22 – U6 Connection	East face Looking southwest
8-11	East truss U22 – U6 Connection	East face Looking west
8-12	East truss U22 – U6 Connection	West face Looking northeast
8-13	U21 connection East truss	West face Looking southeast
8-14	U21 connection East truss	East face Looking southwest
8-15	U21 to U22 Inside box 8' North of U21	Looking south
8-16	U21 to U22 Inside box 8' North of U21	Looking north

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
8-17	U21 to U22 inside box 16' north of U21	Looking south
8-18	U21 to U22 inside box 16' north of U21	Looking north
8-19	U21 East face Looking northwest	Good condition
8-20	U21 East truss	West face Looking northeast
8-21	U20 to U21 inside box truss 8' south U21	Looking south
8-22	U20 to U21 inside box truss 8' south U21	Looking north
8-23	U20 Pier 7	Good condition West face Looking southeast
8-24	U20 Pier 7	East face Looking southwest Good condition
8-25	Pier U20	East face Looking northwest

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
8-26	Pier U20	West face Looking northeast
8-27	U19 connection	West face Looking southeast Good connection
8-28	U19 connection	East face Looking southwest Good condition
8-29	U19 to U20 inside box 8' ± to U19	Looking south
8-30	U19 to U20 inside box 8' ± to U19	Looking north
8-31	U18 to connection	East face Looking southwest Good condition
8-32	U19	East face Looking northwest
9-1	U19	West face Looking northeast Good condition
9-2	U18	West face Looking south Good condition

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
9-3	U18	East face Looking west
9-4	Pier 7 Fixed Assembly	Assembly good condition Slight flaking rusty concrete column condition. Looks good South face Looking north
9-5	Pier 7	Flaking rust on connection Assembly bolts - Look good East face Looking northwest
9-6	Pier 7	East face Looking north
9-7	Pier 7	South face Looking north
9-8	Pier 7	North face Looking southwest
9-9	Pier 7	North face Looking south
9-10	East truss U6	Connection good condition East face Looking southwest

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
9-11	U6 Connection Good condition	West face Looking southeast
9-12	U7	Connection good condition West face Looking northeast
9-13	Not Used	
9-14	U7 Connection	East face Looking southwest Good condition
9-15	U8 Connection	West face Looking northeast Good condition
9-16	U7 to U8 East truss inside box 14' + U7 near center	Looking south
9-17	U7 to U8 East truss inside box 14' ± U7 near center	Looking south
9-18	U7 to U8 East truss inside box 14' ± U7 near center	Looking north

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
9-19	U7 to U8 East truss inside box 14' ± U7 near center	Looking north
9-20	U7 to U8 East truss inside box 14' south U8	Looking south
9-21	U7 to U8 East truss inside box 14' south U8	Looking north
9-22	U8 connection	East face Looking northwest Some rust Drain connection
9-23	U8 East truss	East face Looking southwest
9-24	U8 East truss	West face Looking southeast
9-25	U10 East truss connection	Good condition West face Looking southeast
9-26	U10	East face Looking west U of M Sensors

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
9-27	U9 to U10 inside box 15' ± south U10	Looking south
9-28	U9 to U10 inside box 15' ± south U10	Looking north
9-29	U10	West face Looking northeast
9-30	U9 Connection	Good condition West face Looking southeast
9-31	U9	East face Looking southwest
9-32	U9	East face Looking northwest
10-1	East truss U8 to U9 Inside box	Looking south
10-2	East truss U8 to U9 Inside box	Looking south
10-3	East truss U8 to U9 Inside box	Looking north

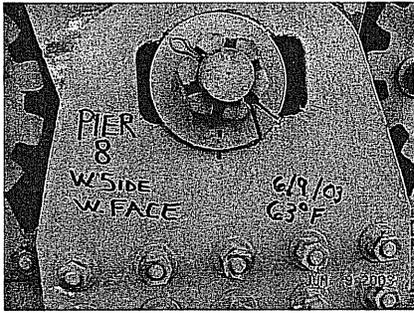
<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
10-4	U8	West face Looking southeast
10-5	U8	West fact Looking southwest Upper lateral bracing Flaking rust
10-6	Pier 6 Expansion bearing assembly	East face Looking west Flaking rust No apparent movement
10-7	Pier 6 Expansion bearing assembly	East face Looking west Flaking rust No apparent movement
10-8	Pier 6 Expansion bearing assembly	East face Looking northwest Connection flaking rust
10-9	Pier 6 Expansion bearing assembly	West face Looking northeast Flaking rust on vertical and lower bracing
10-10	Pier 6 Expansion bearing assembly	West side Looking southeast

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
10-11	Pier 6 Expansion bearing assembly	
11-1 6/13/03	East truss L12 to L13 Inside box 12' ± south of U13	Looking south
11-2	East truss L12 to L13 Inside box 12' ± south of U13	Looking north
11-3	L13 connection East face Looking west	Good condition Slight flaking rust
11-4	L13 connection West face Looking northeast	Flaking rust
11-5	Action Shot	
11-6	L12 to L14 10' ± north L13 Inside box	Looking south
11-7	L12 to L14 10' ± north L13 Inside box	Looking south Flaking rust at bottom Deck above

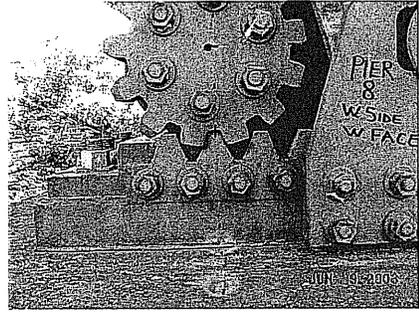
<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
11-8	L12 to L14 10' ± north L13 Inside box	Looking north
11-9	L13 Lower lateral bracing Connection	Flaking rust Deck drain above
11-10	L13 to L14 Inside box 12' ± south U14	Looking south Crack noted in 98
11-11	Not Used	Looking north
11-12	L14 connection Action Shot	
11-13	Not Used	
12-1	L14 East face Looking northwest	Good condition
12-2	L14 West face Looking southeast	
12-3	L14 West face Looking south	

<u>PHOTO</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>
12-4	L14 to L15 Inside box 4' south L15	Looking south
12-5	L14 to L15 Inside box 4' south L15	Looking north
12-6	L15 connection	East face Looking west Good condition
12-7	L15 connection	West face Looking east

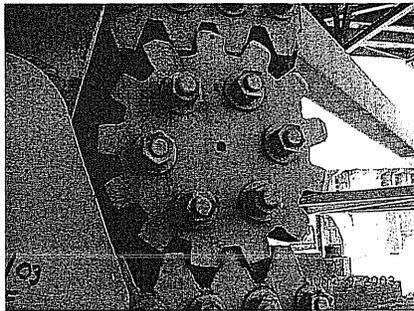
Appendix B - Inspection Photographs



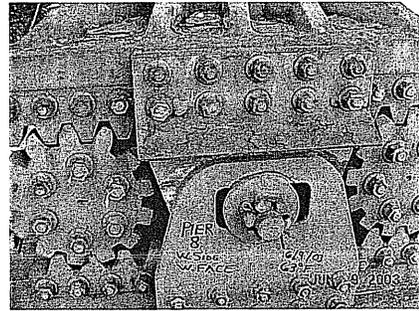
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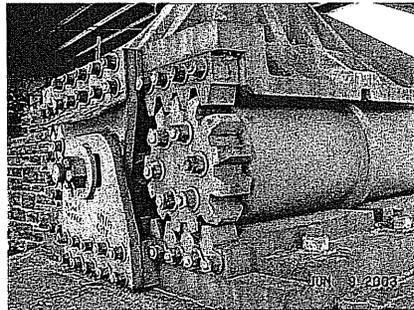
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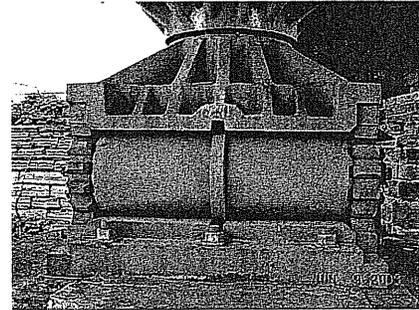
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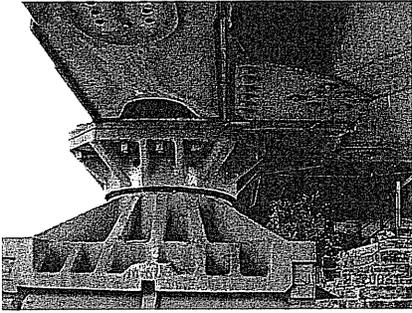
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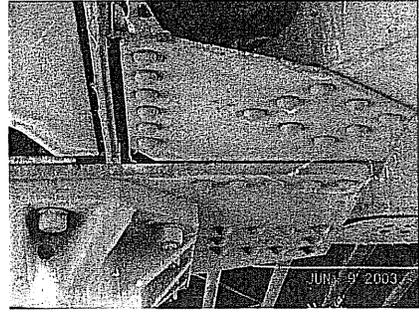
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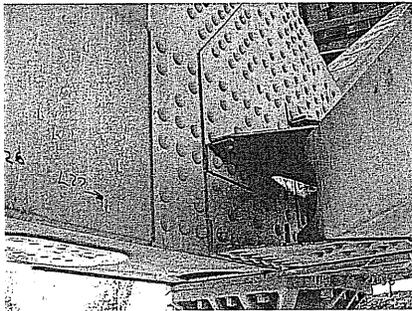
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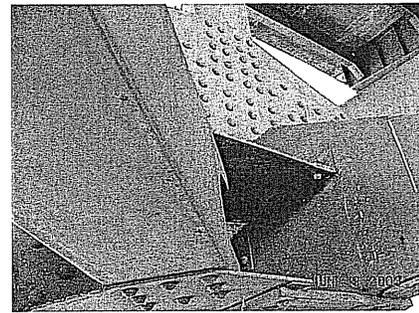
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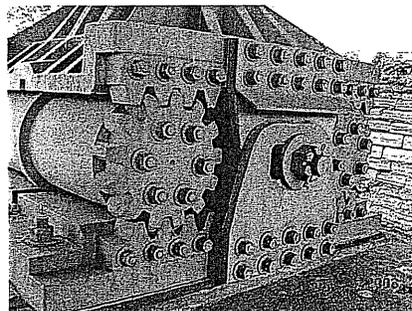
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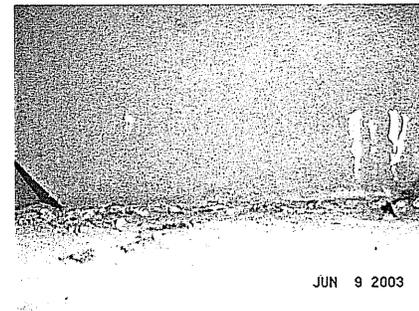
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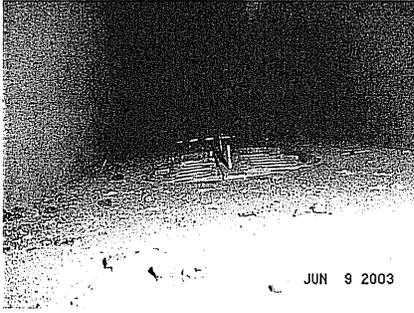
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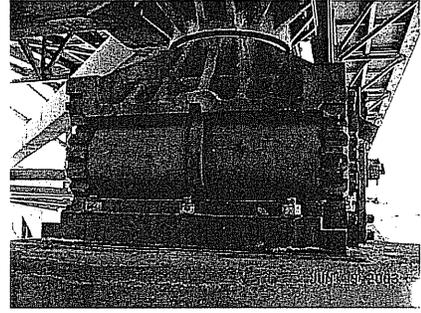
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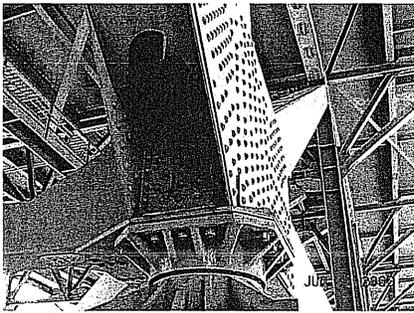
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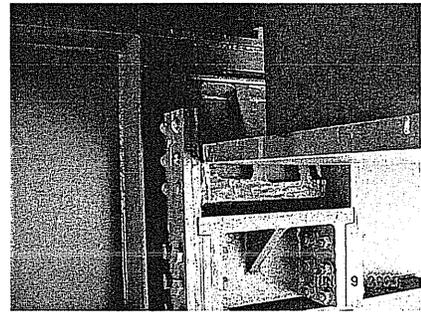
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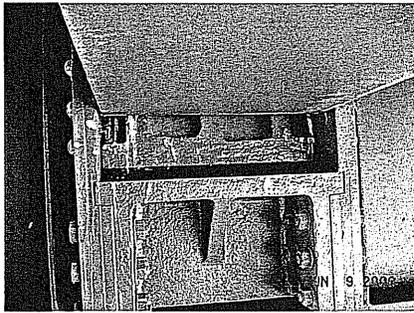
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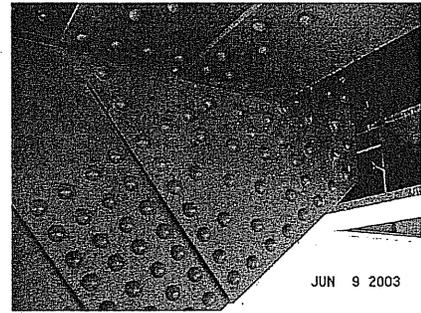
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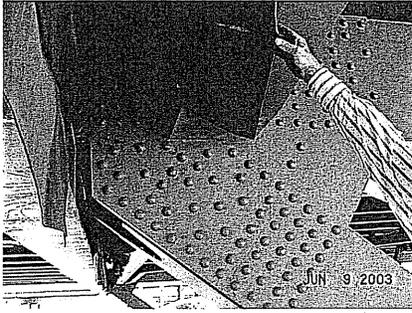
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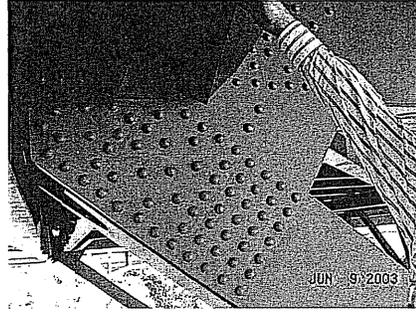
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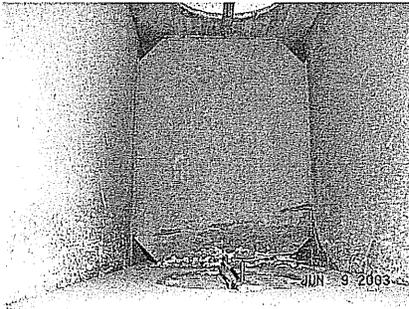
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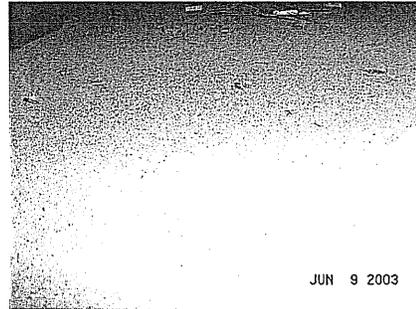
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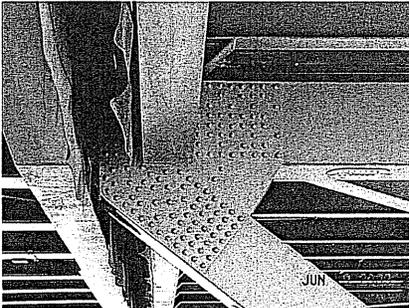
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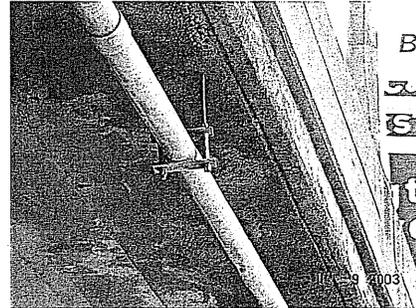
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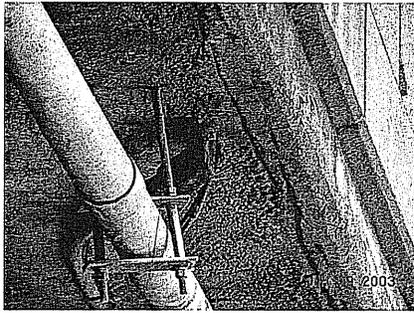
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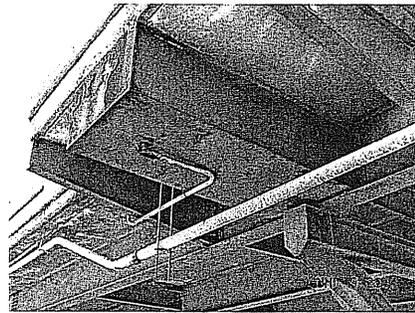
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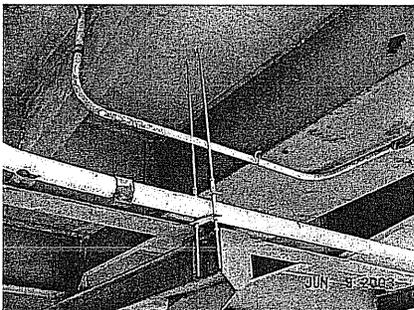
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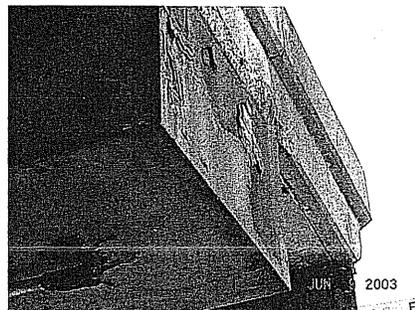
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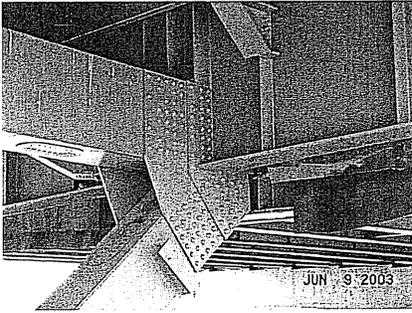
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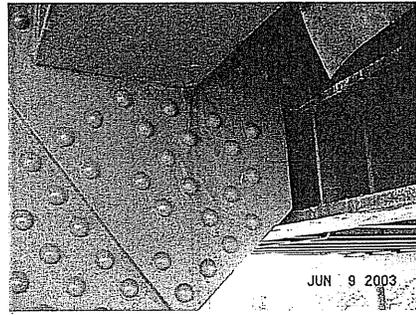
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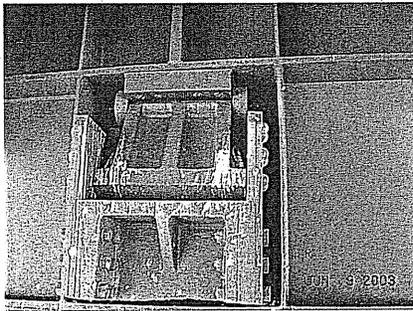
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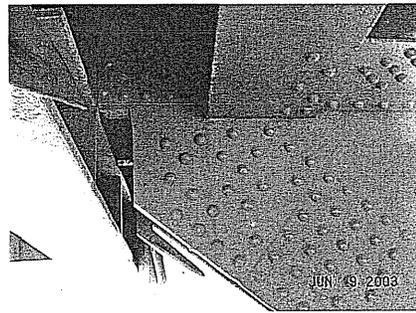
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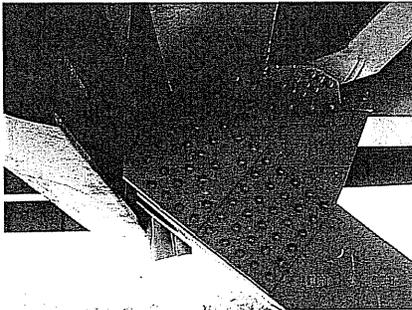
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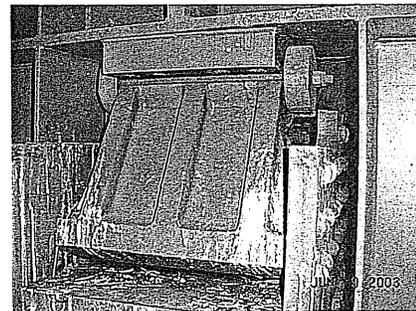
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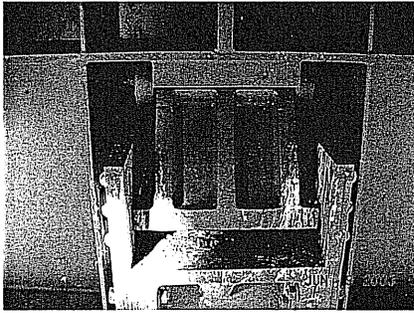
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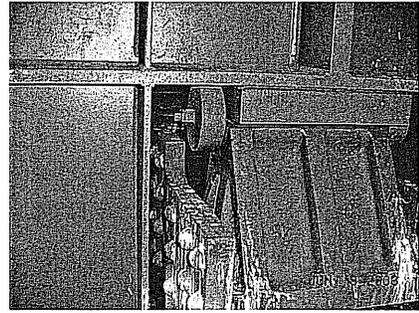
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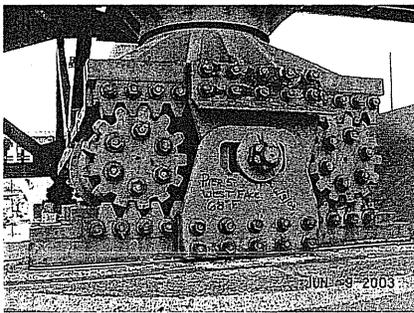
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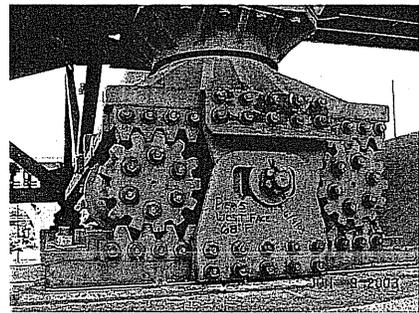
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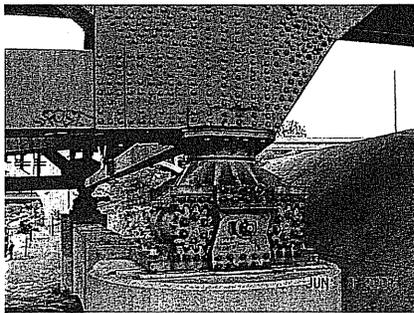
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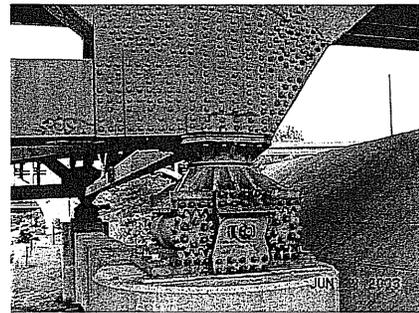
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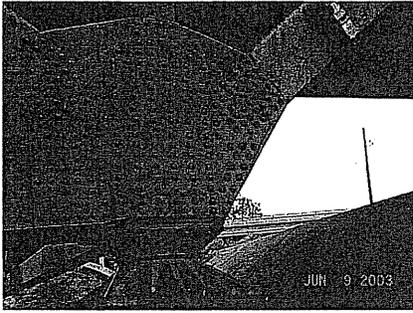
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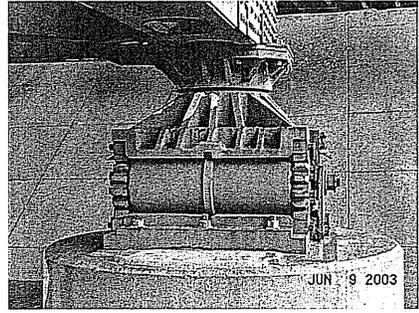
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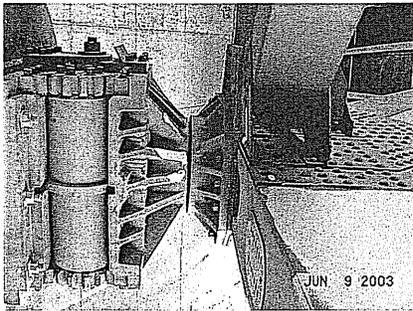
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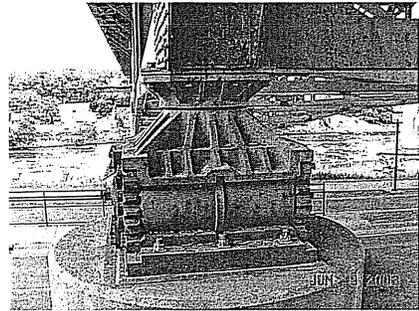
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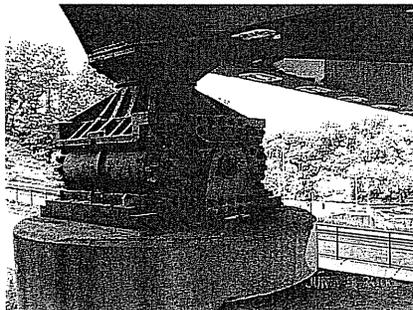
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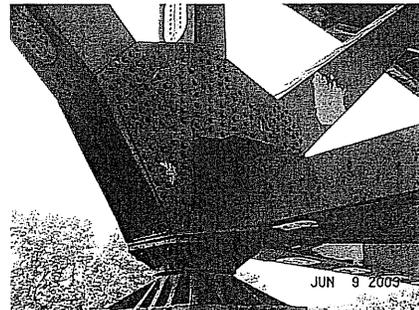
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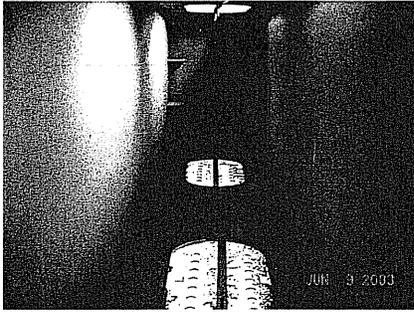
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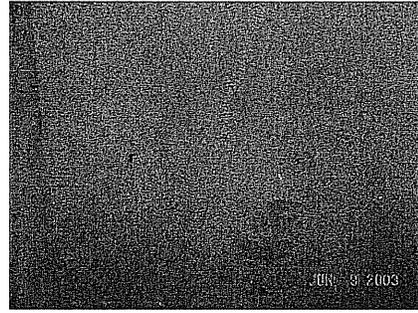
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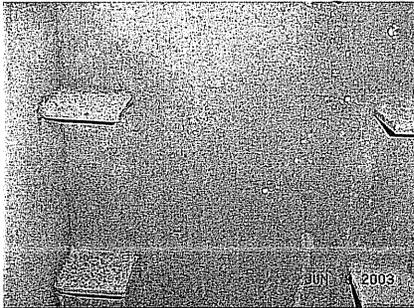
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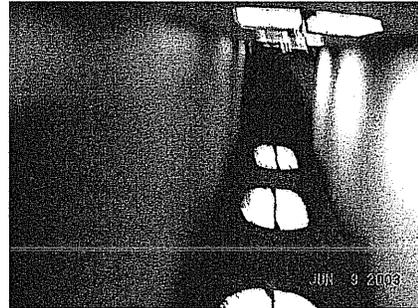
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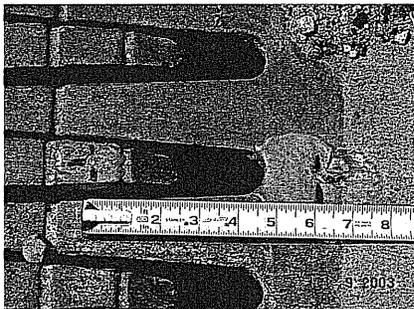
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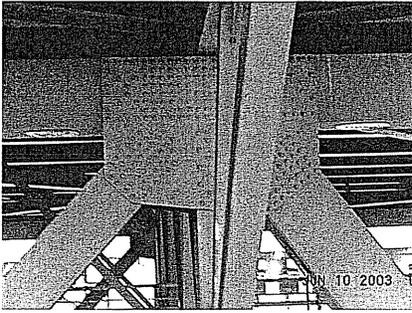
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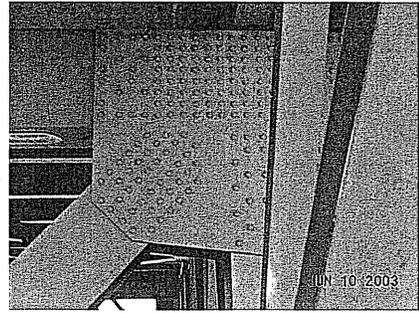
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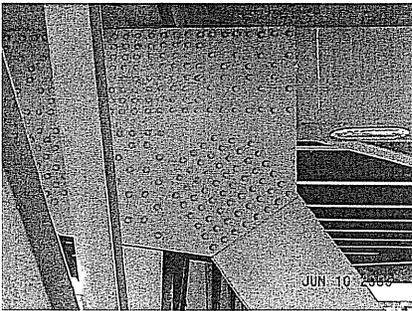
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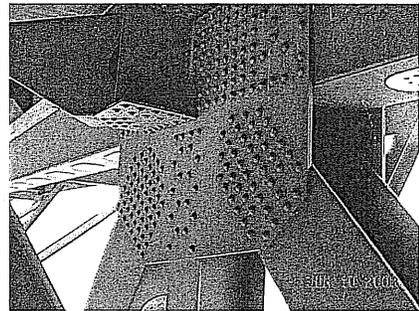
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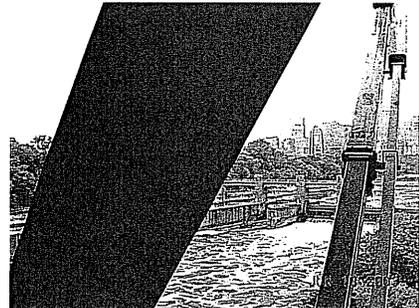
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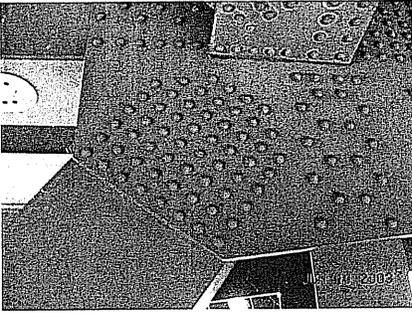
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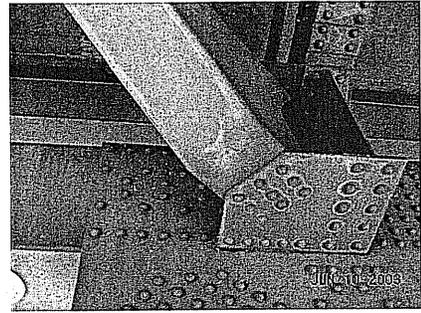
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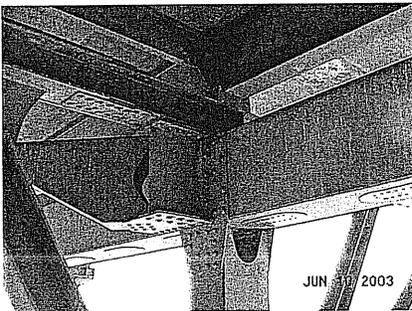
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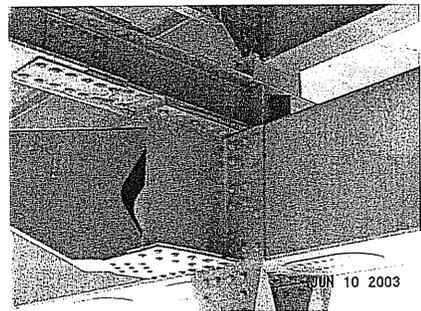
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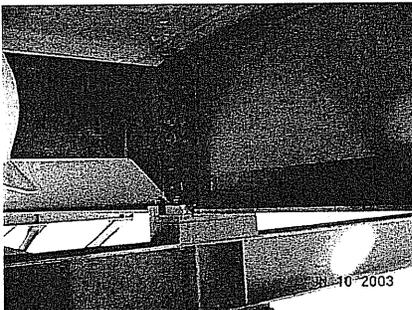
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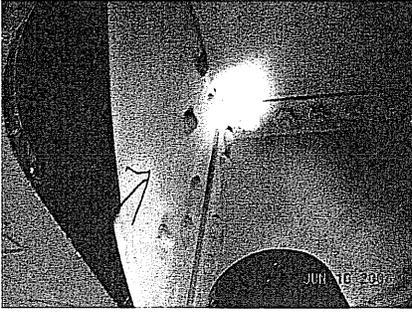
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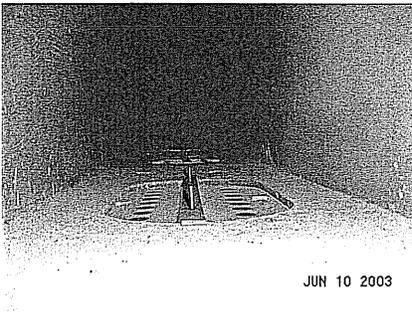
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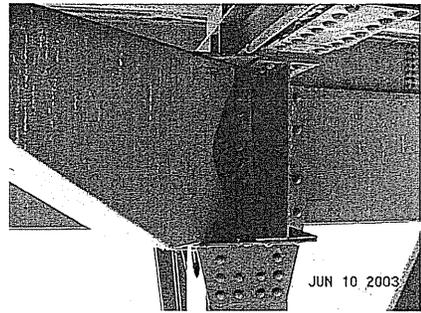
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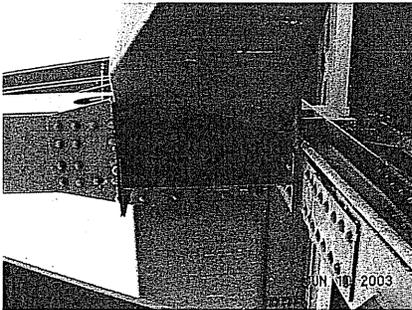
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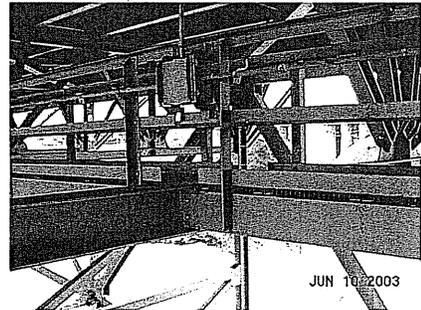
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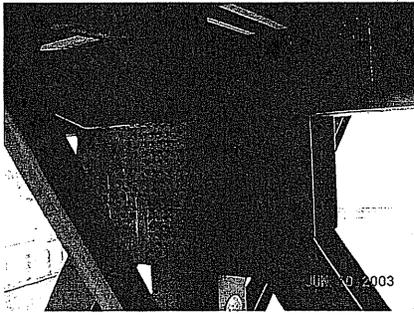
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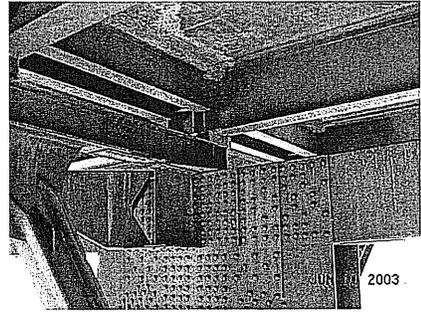
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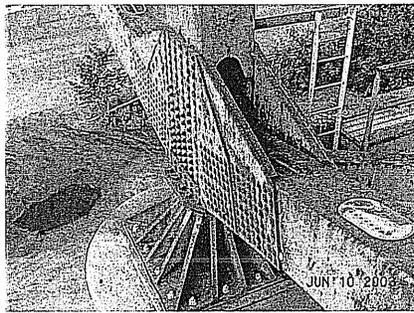
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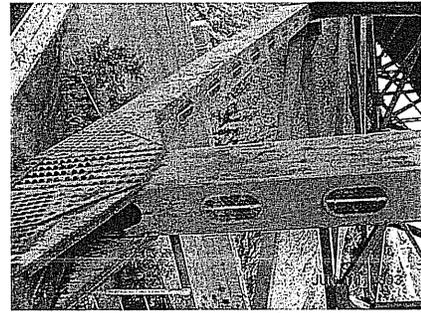
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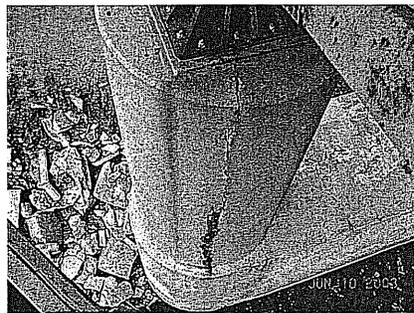
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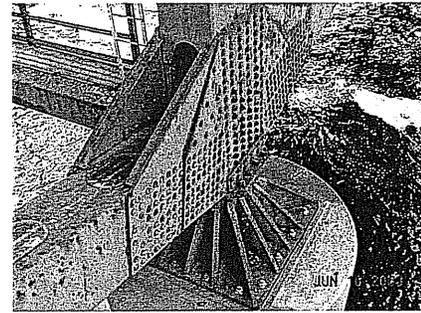
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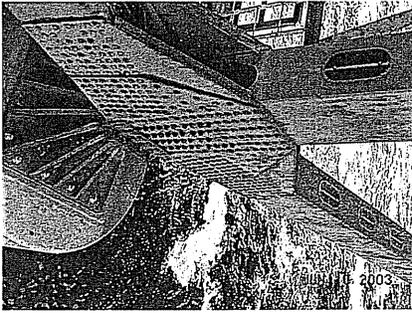
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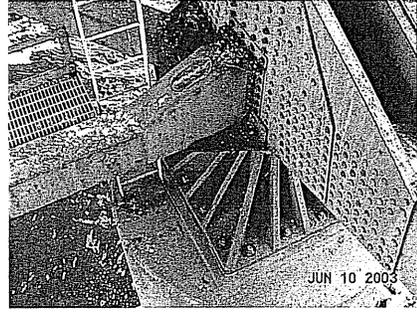
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3-24



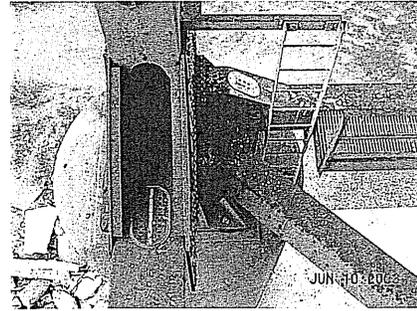
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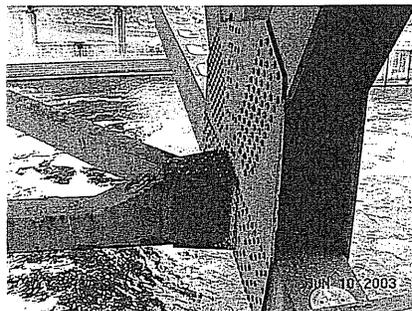
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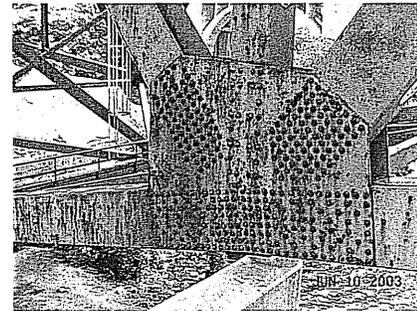
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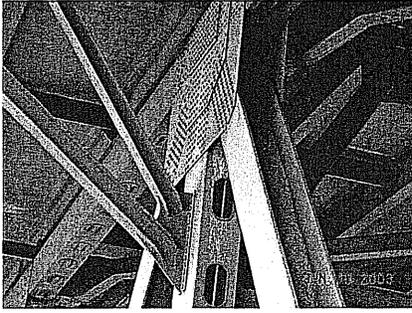
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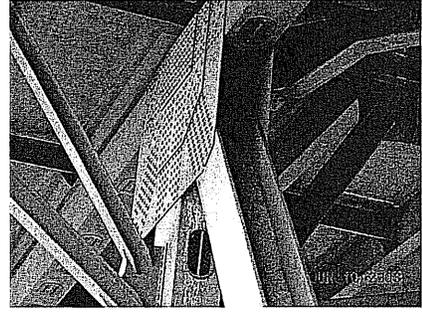
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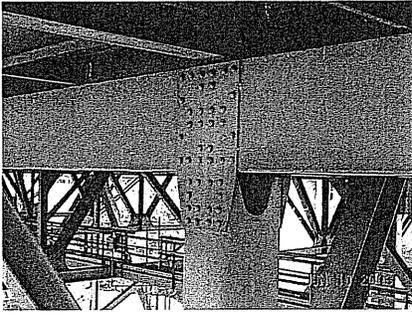
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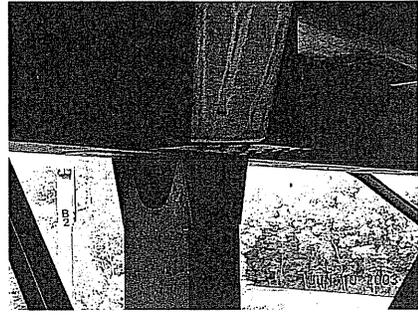
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3-32



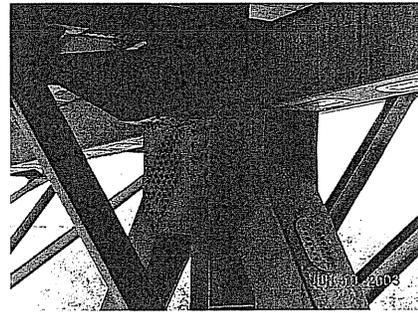
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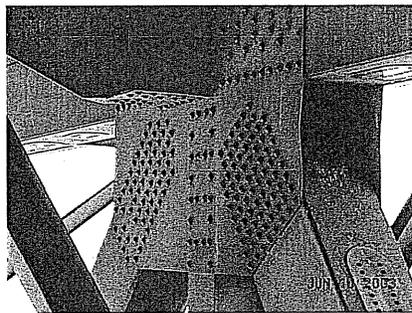
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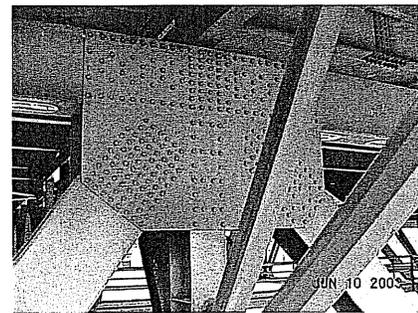
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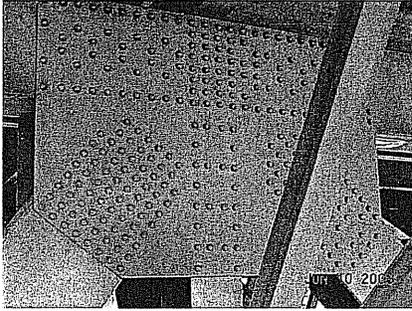
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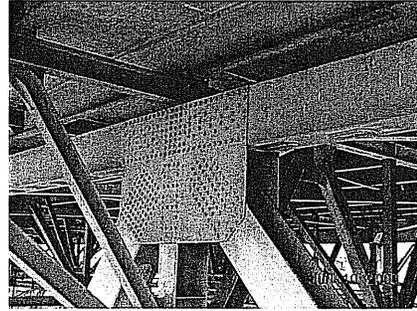
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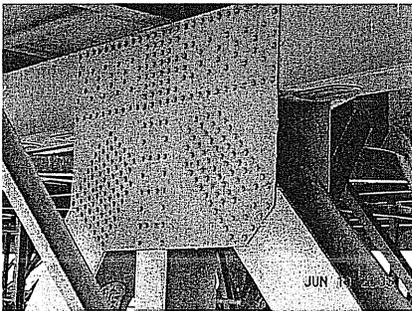
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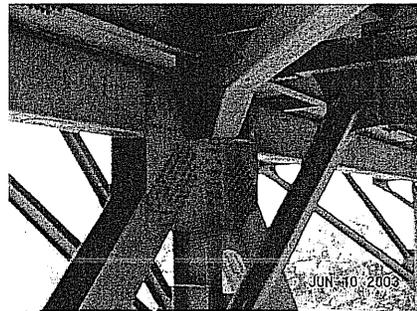
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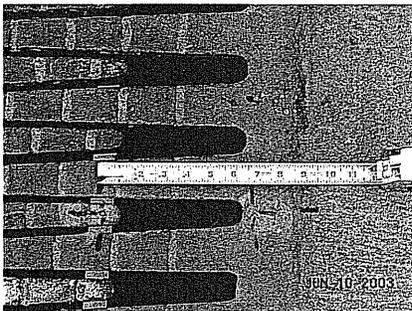
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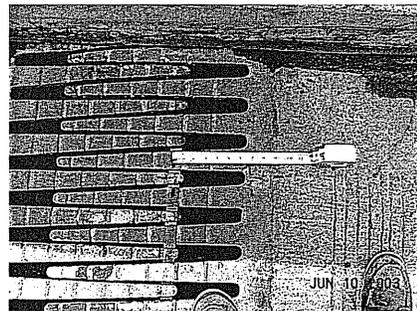
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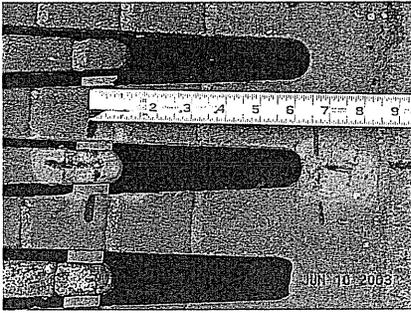
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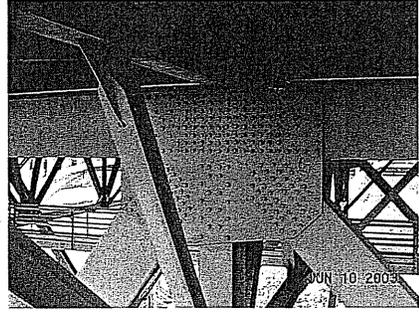
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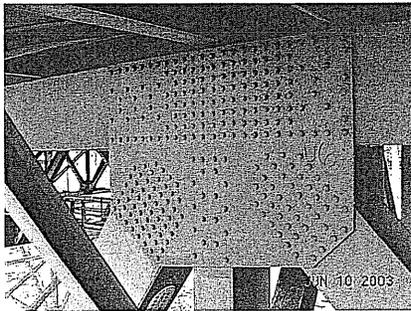
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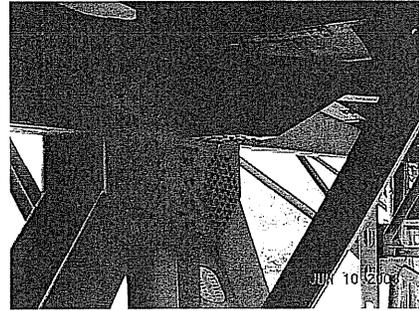
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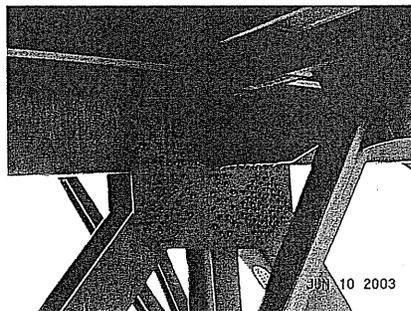
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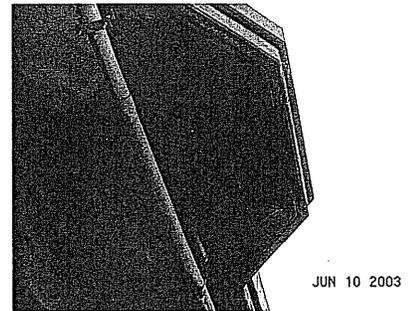
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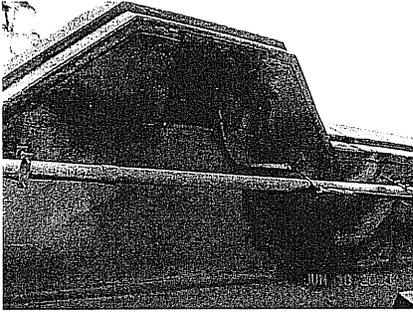
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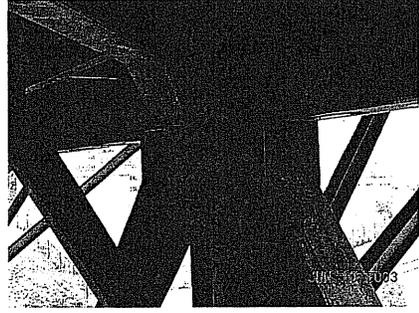
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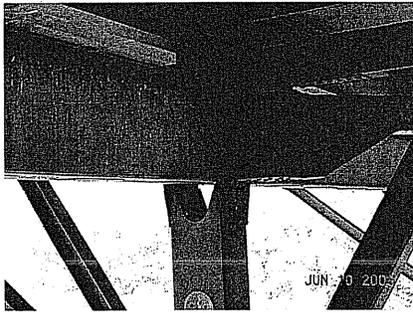
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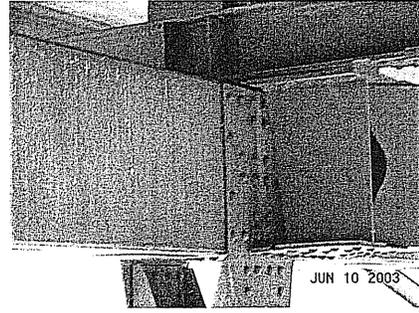
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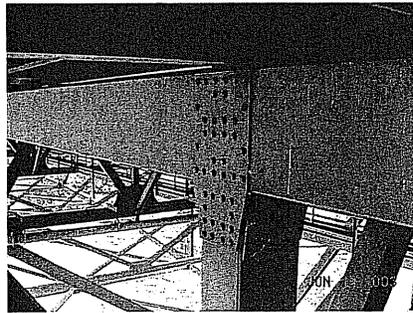
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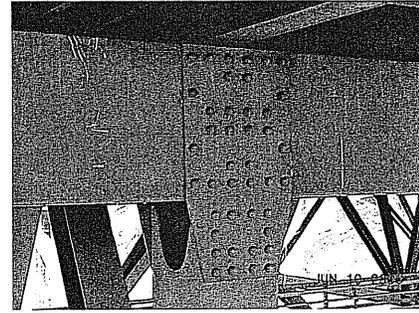
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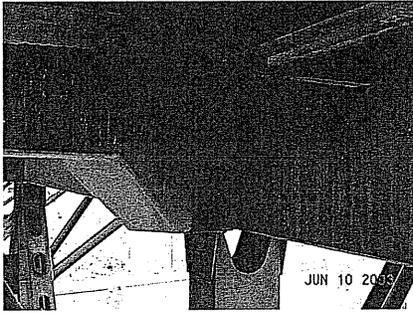
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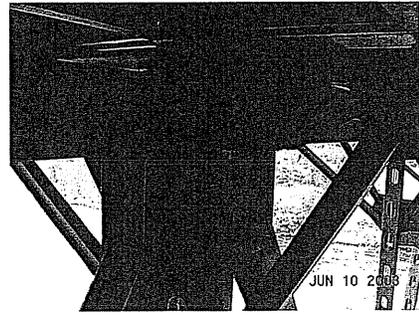
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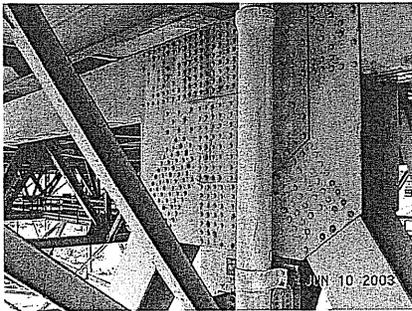
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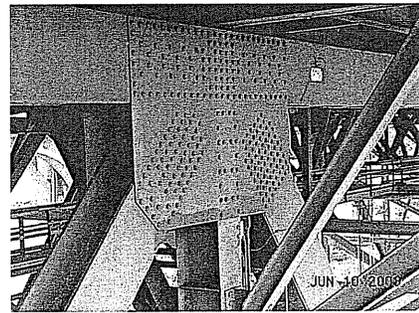
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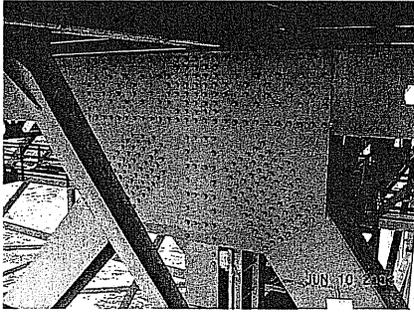
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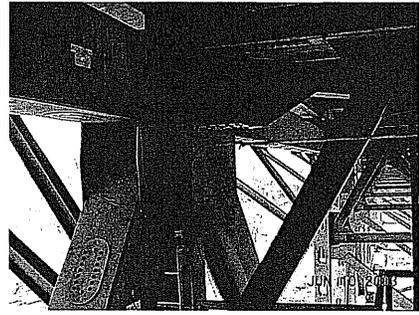
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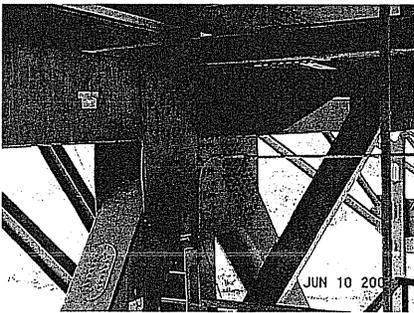
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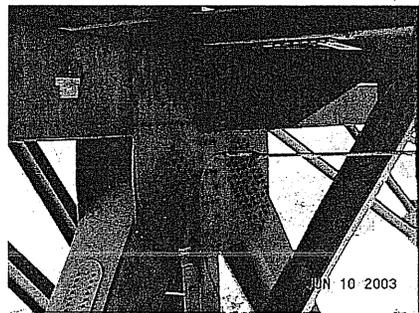
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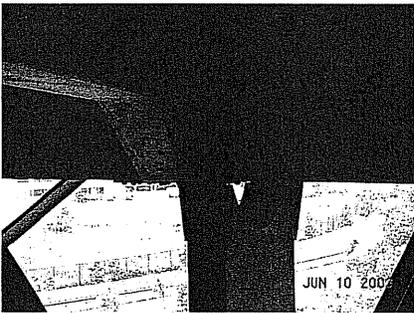
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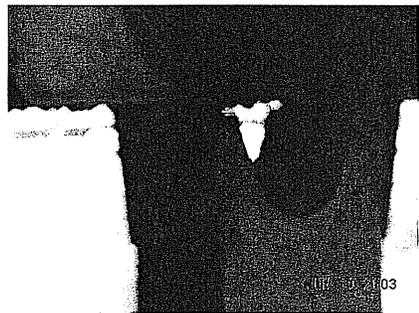
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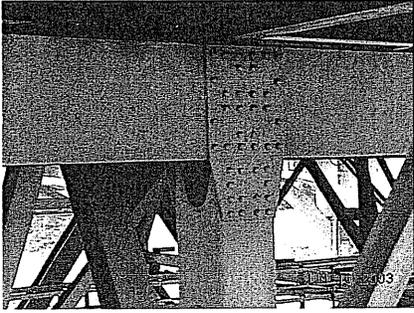
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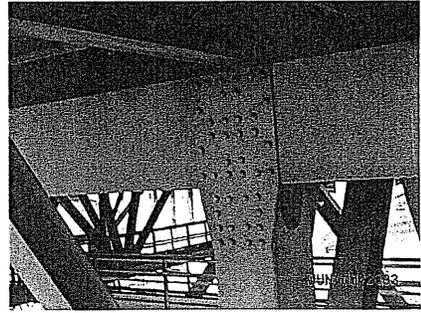
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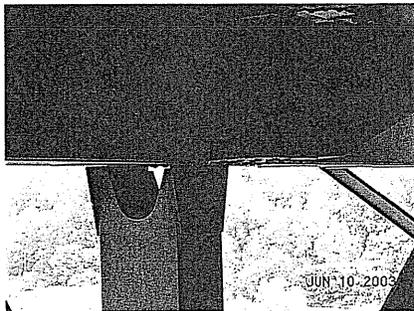
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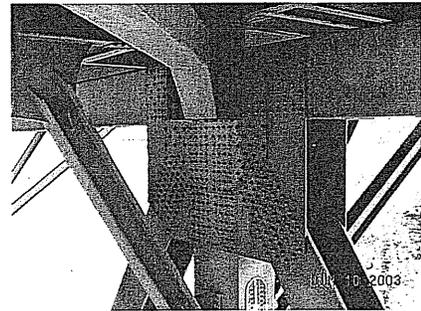
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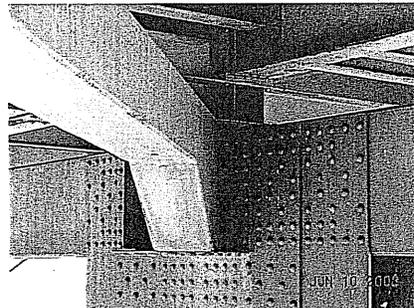
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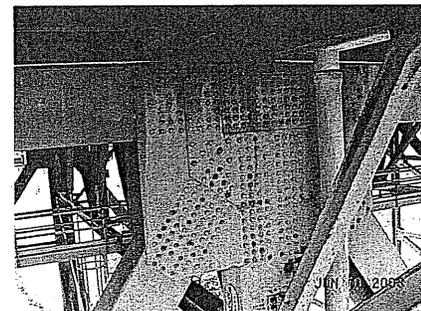
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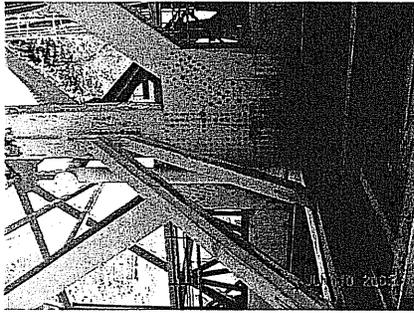
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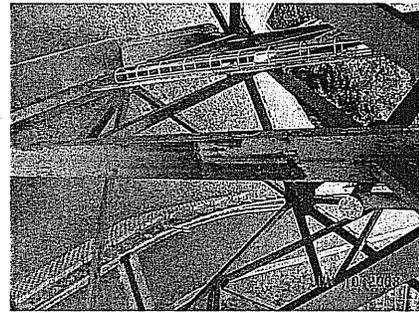
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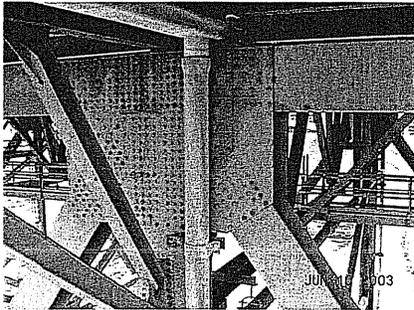
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5-13



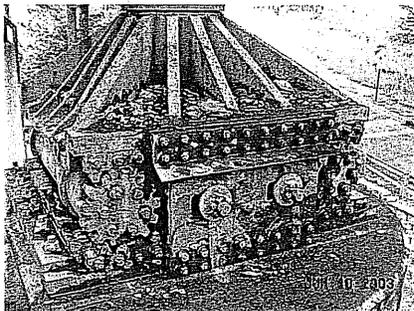
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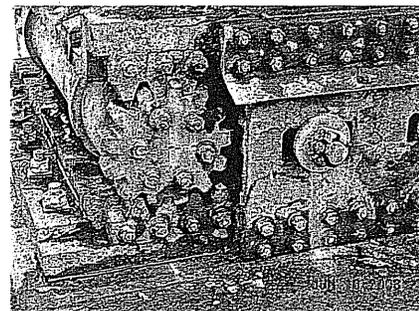
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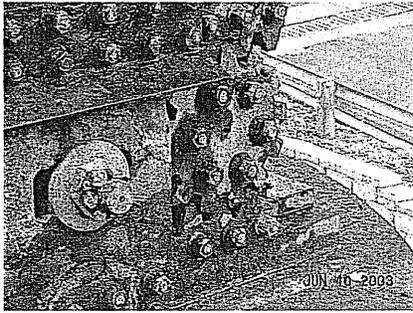
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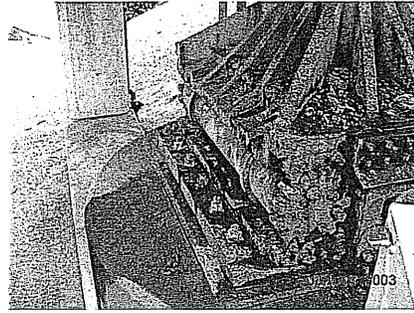
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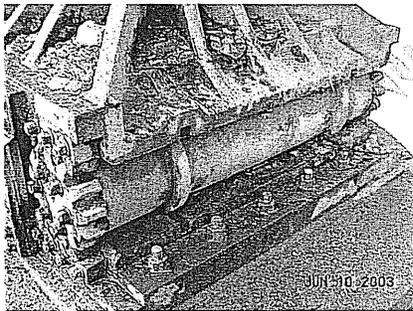
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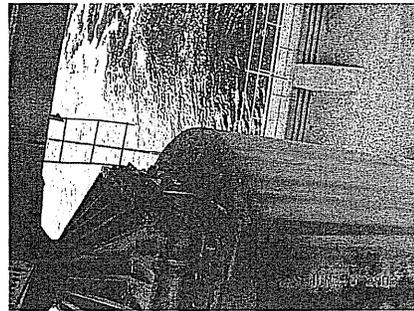
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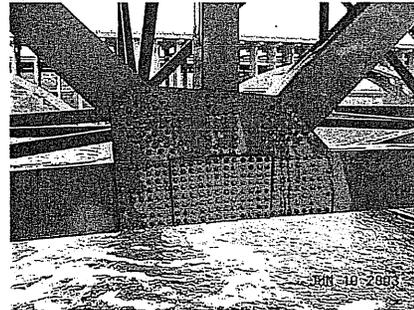
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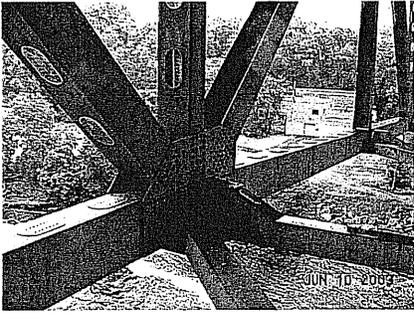
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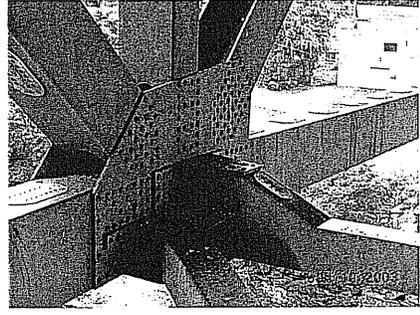
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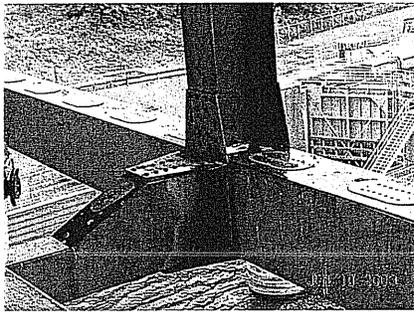
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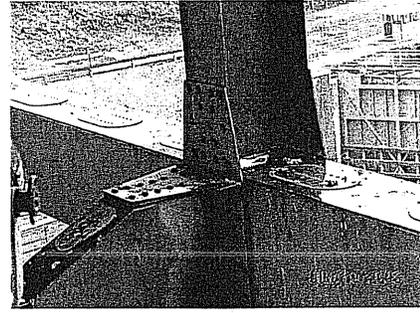
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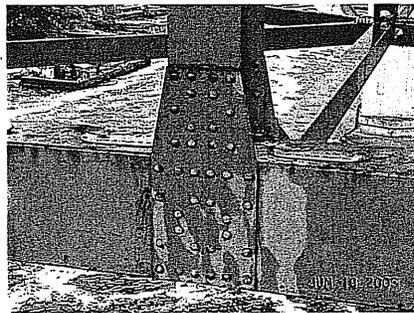
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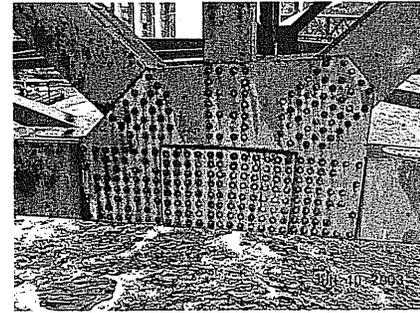
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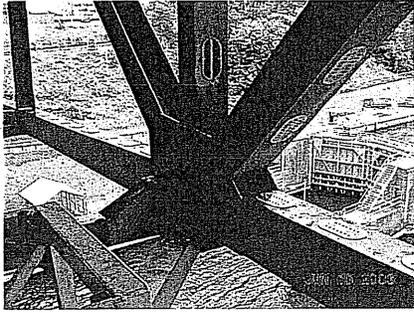
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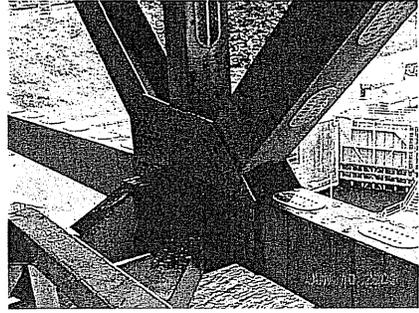
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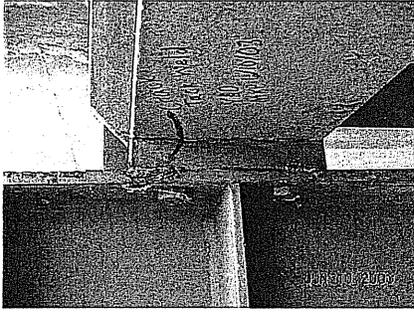
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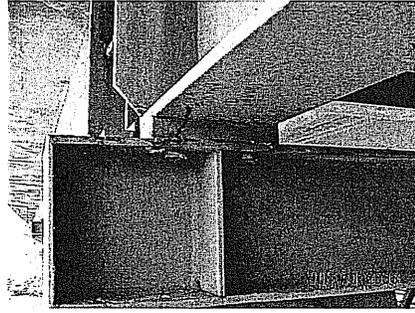
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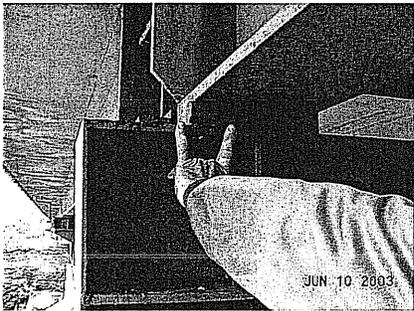
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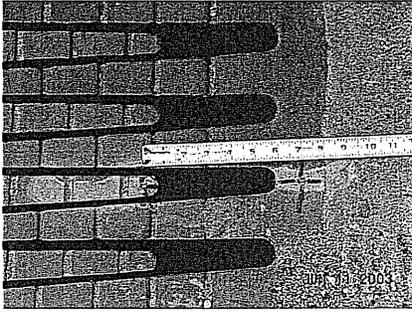
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6-02



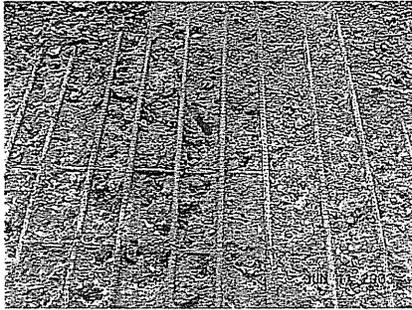
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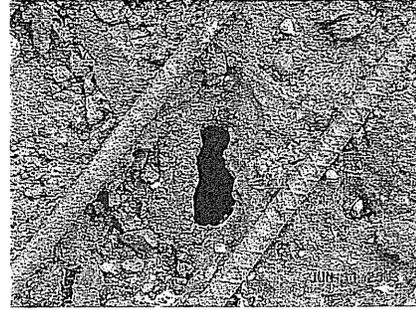
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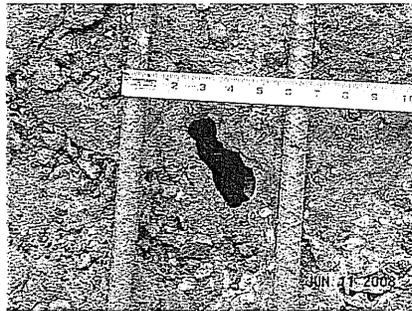
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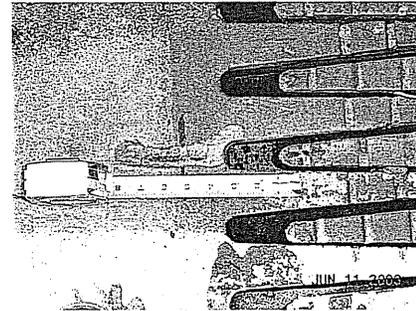
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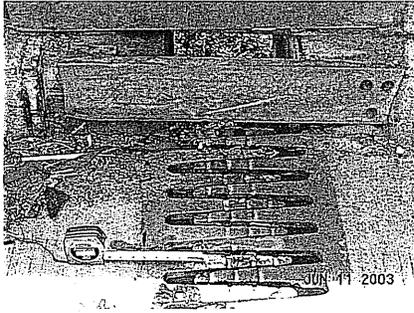
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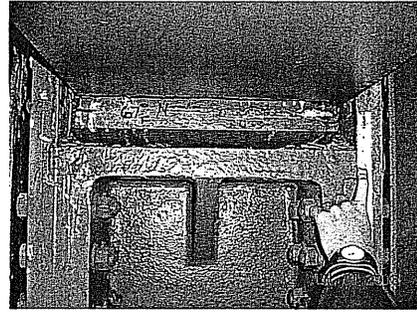
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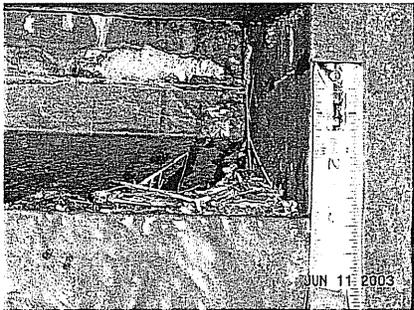
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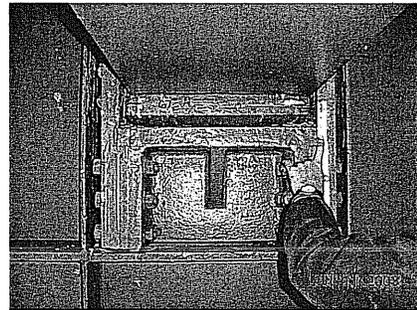
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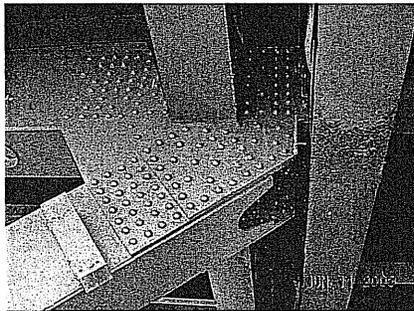
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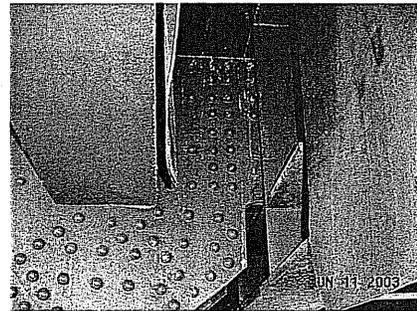
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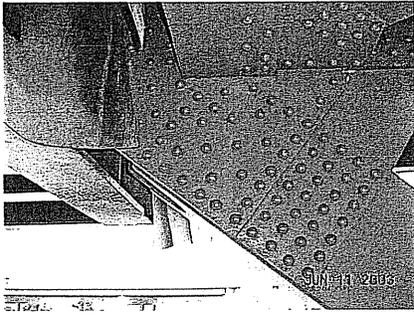
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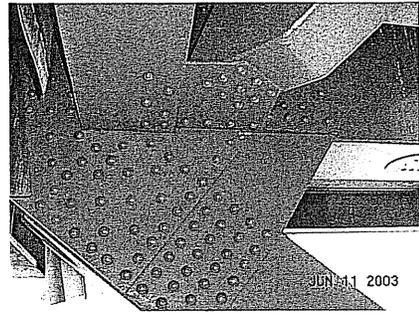
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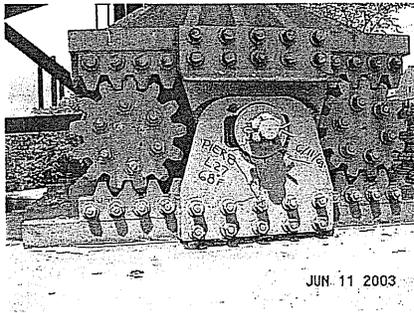
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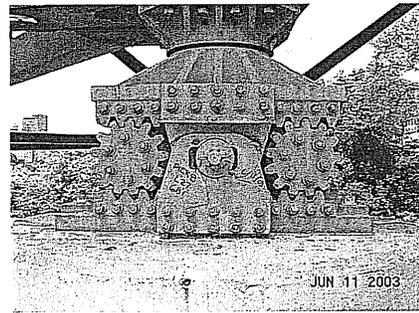
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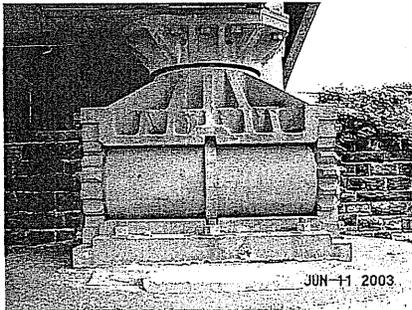
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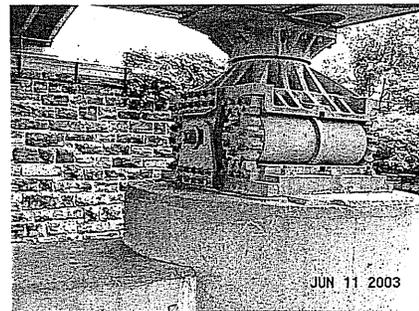
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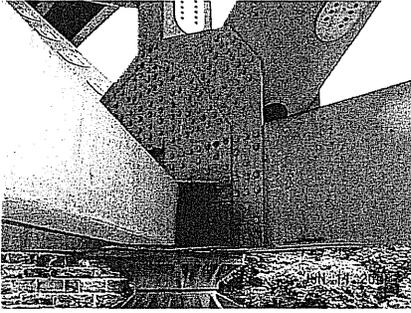
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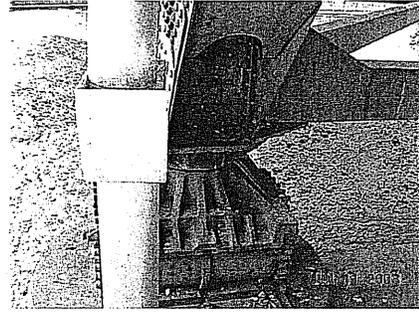
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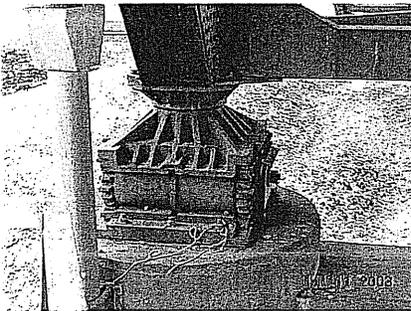
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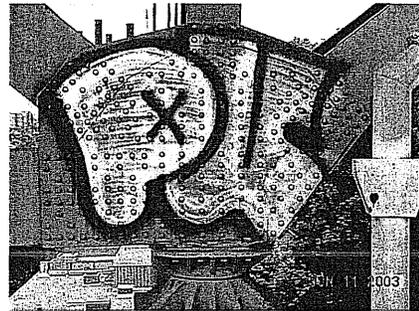
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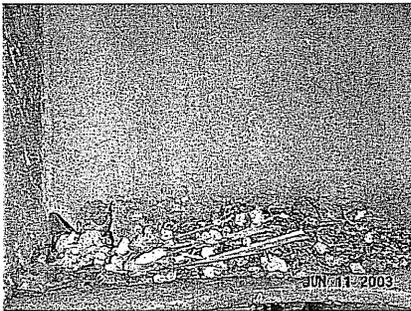
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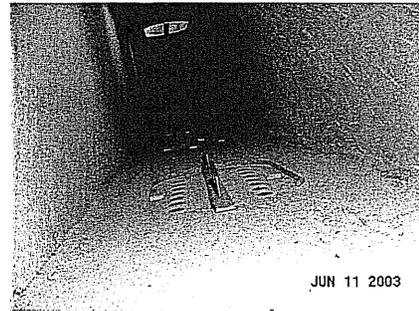
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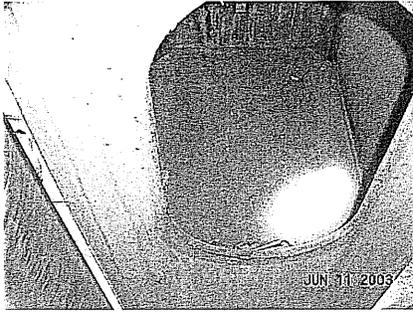
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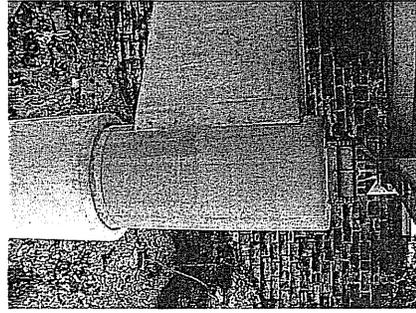
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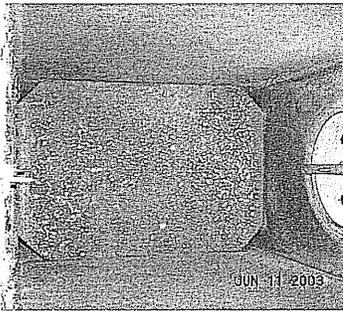
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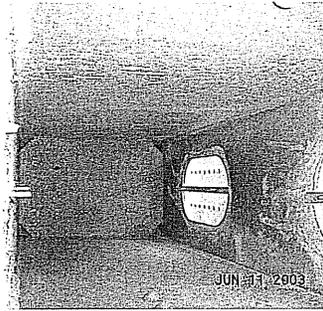
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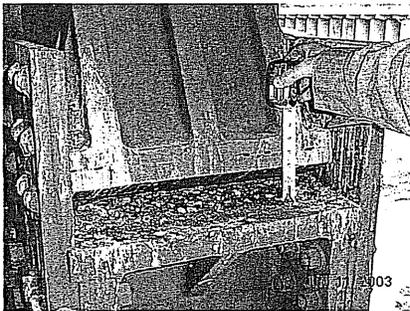
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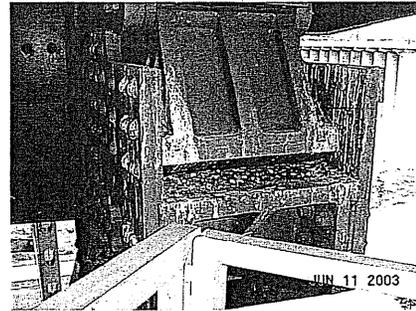
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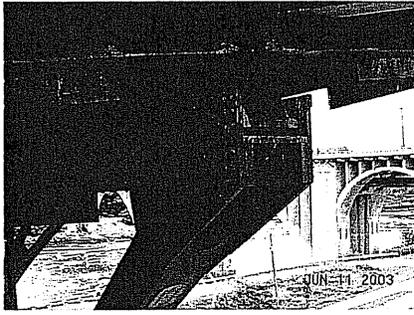
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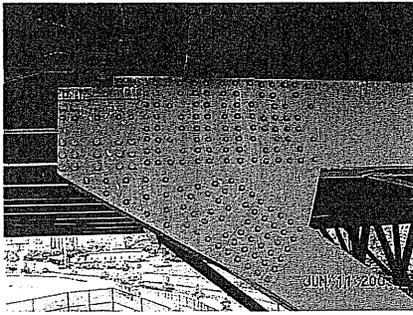
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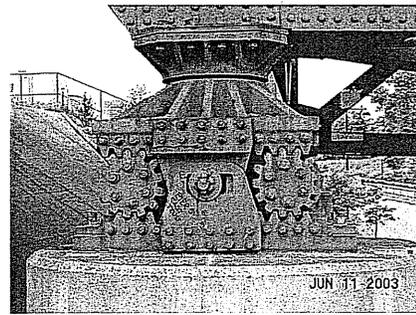
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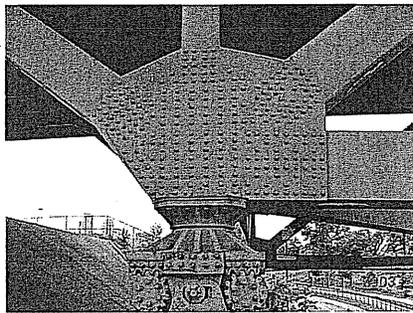
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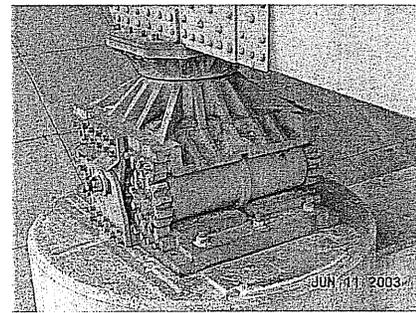
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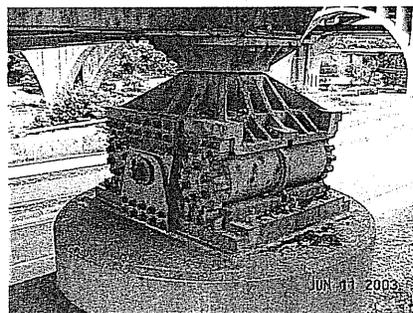
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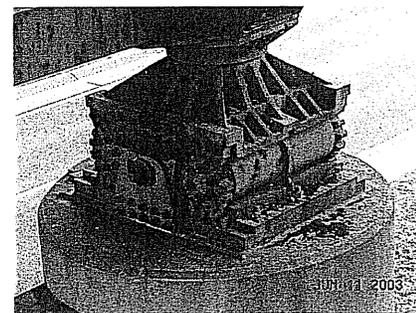
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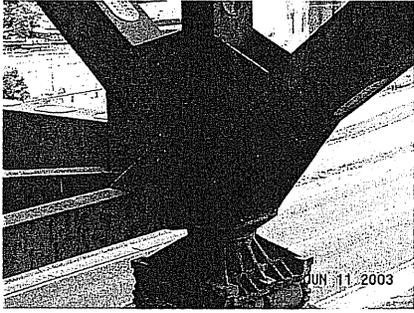
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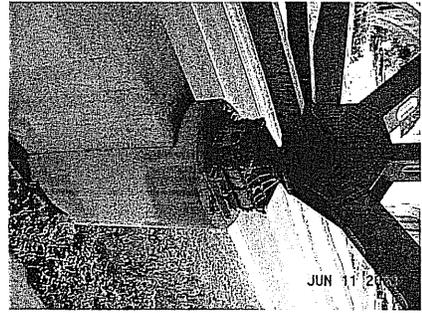
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8-06



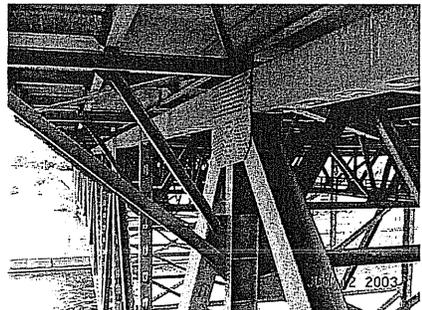
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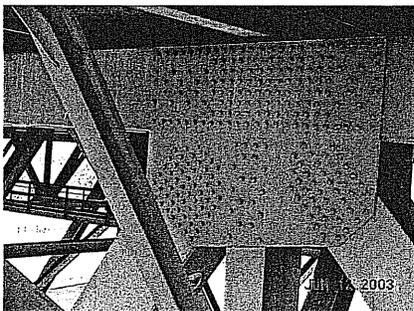
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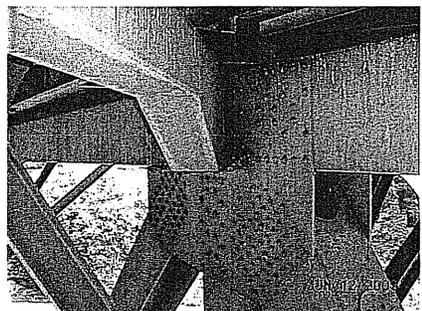
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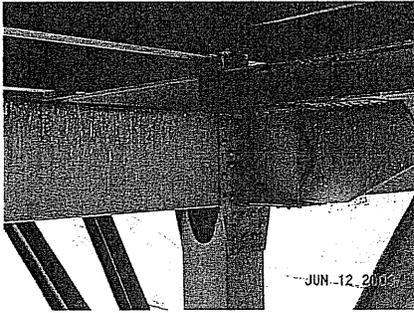
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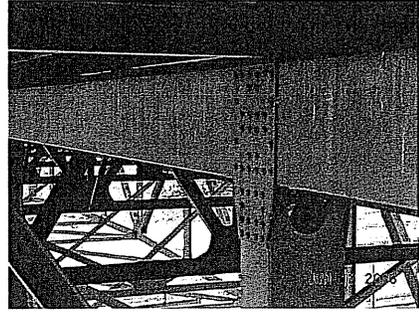
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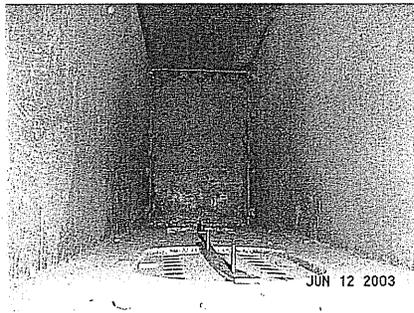
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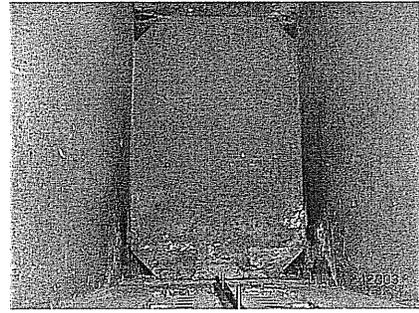
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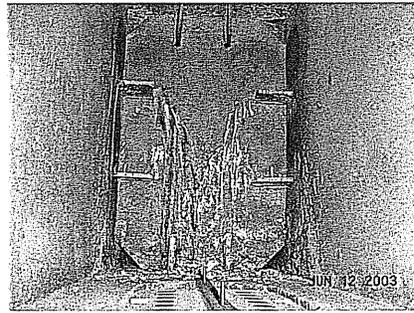
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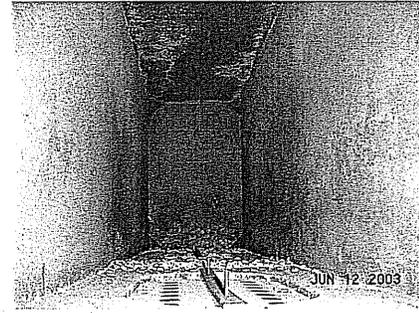
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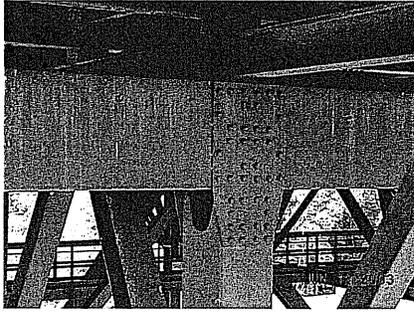
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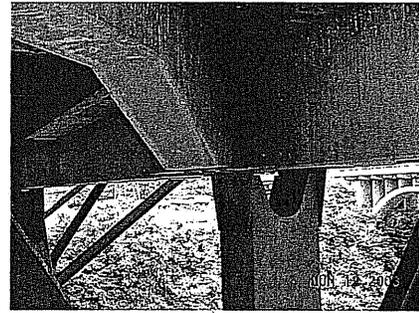
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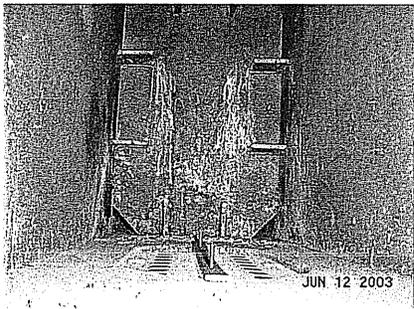
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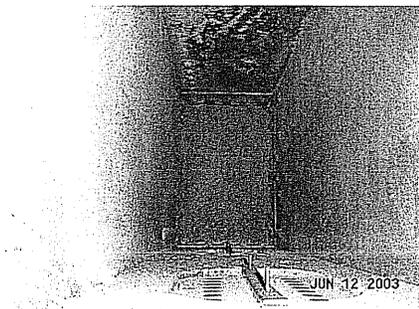
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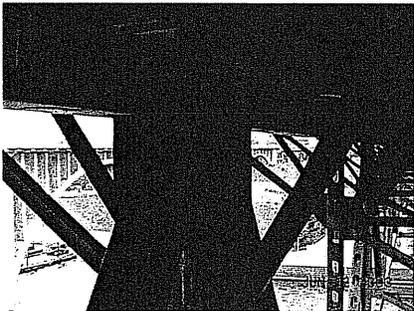
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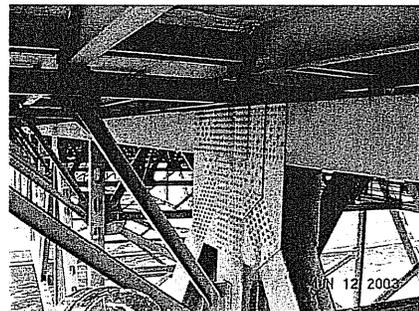
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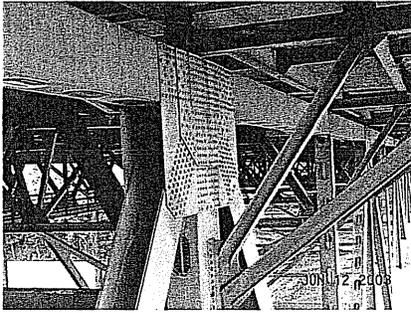
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8-23



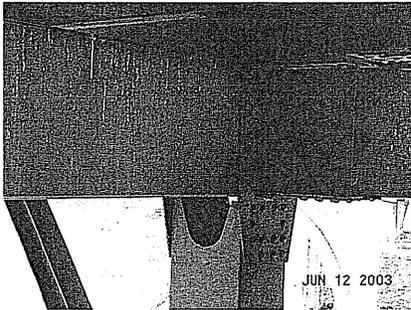
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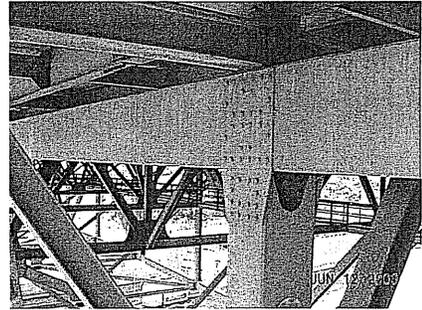
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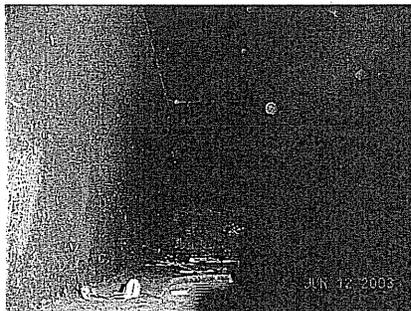
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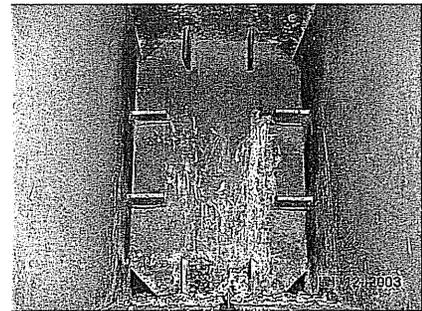
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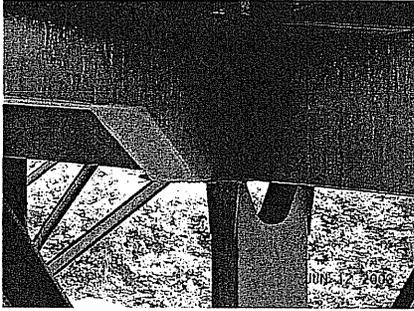
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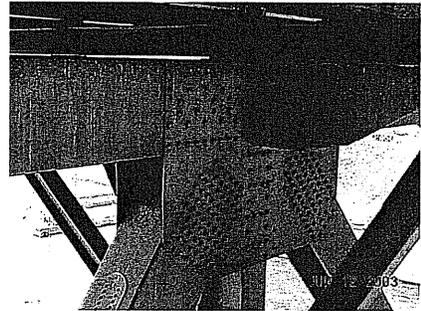
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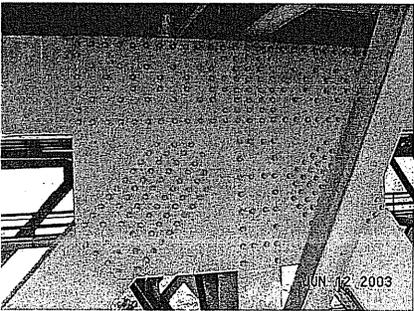
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9-01



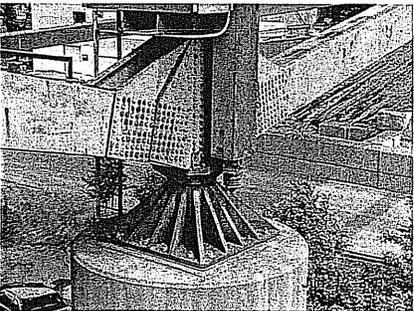
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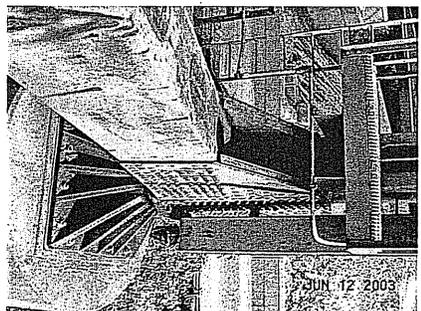
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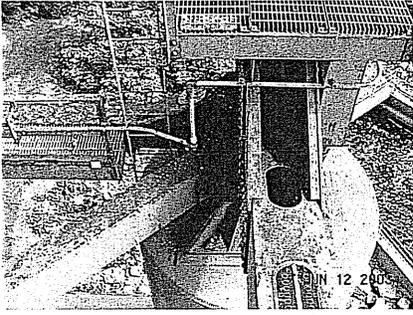
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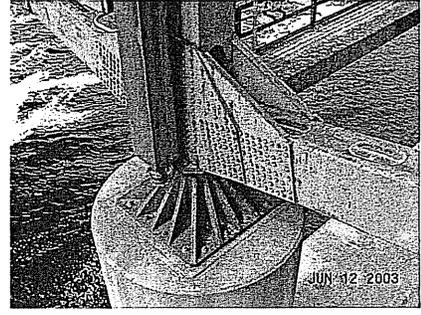
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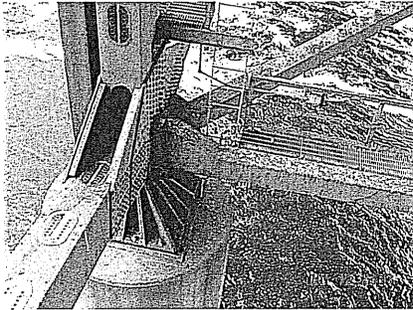
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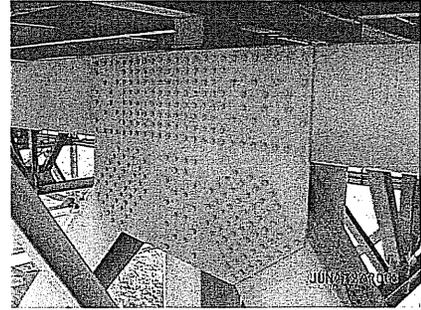
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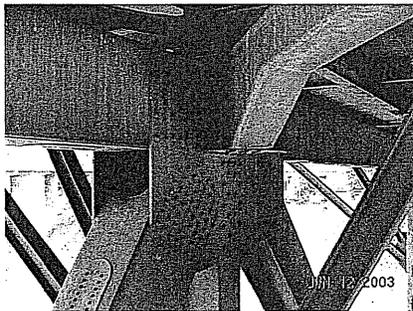
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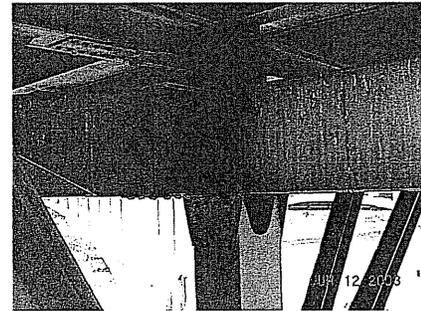
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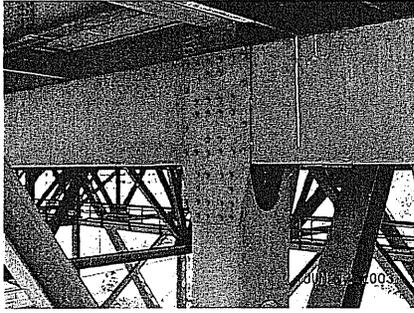
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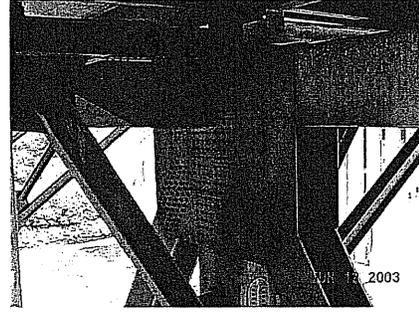
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9-12



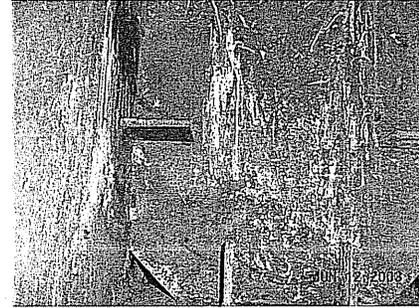
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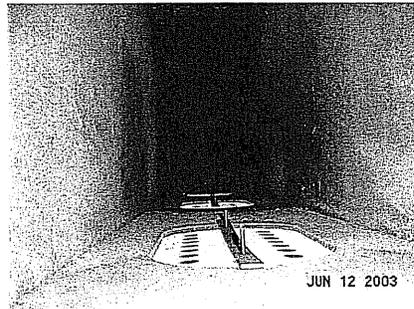
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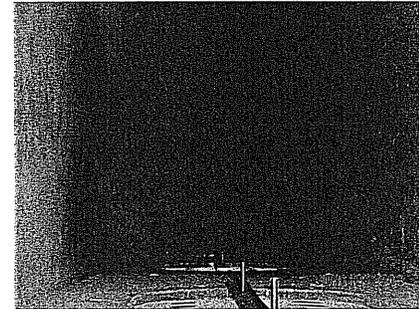
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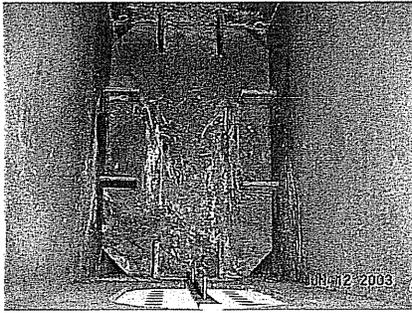
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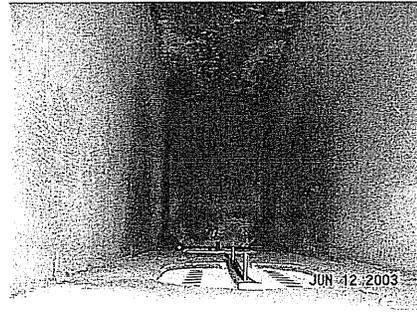
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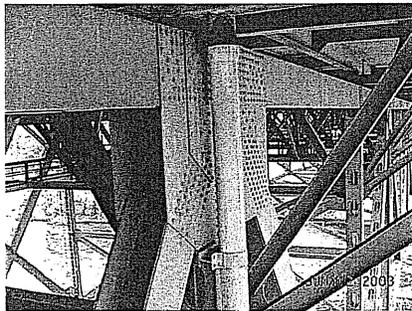
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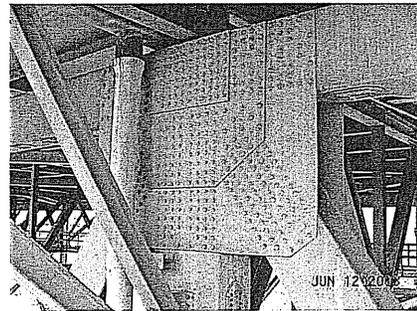
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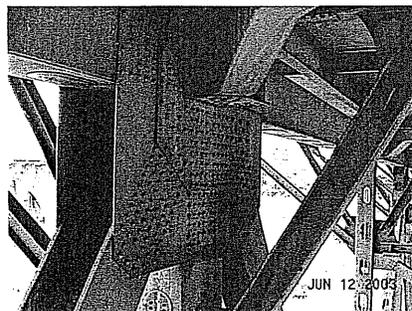
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9-22



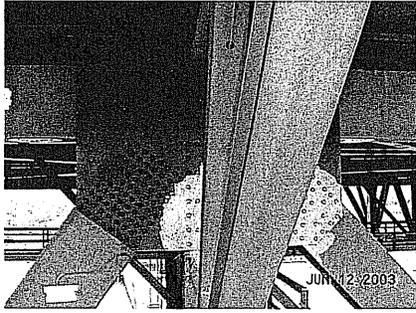
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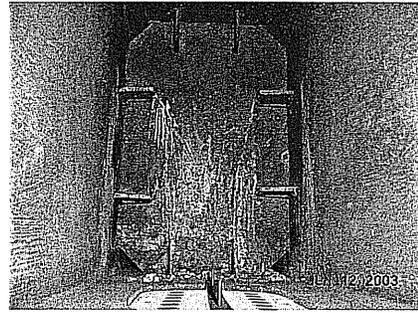
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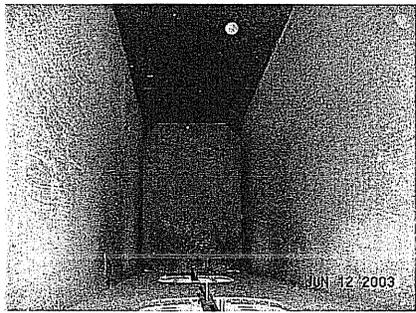
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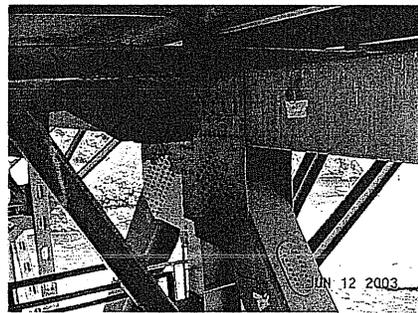
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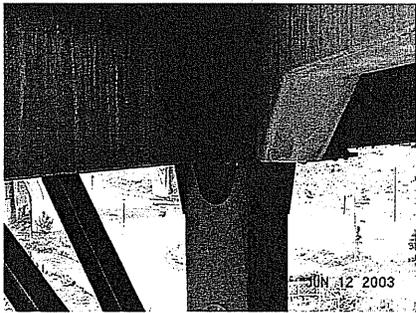
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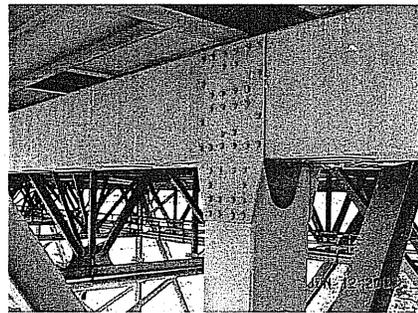
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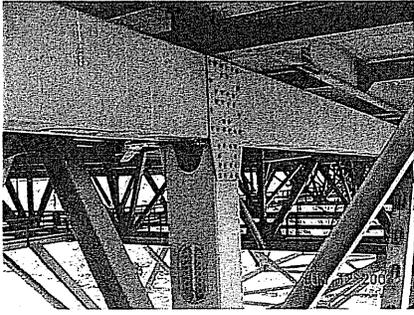
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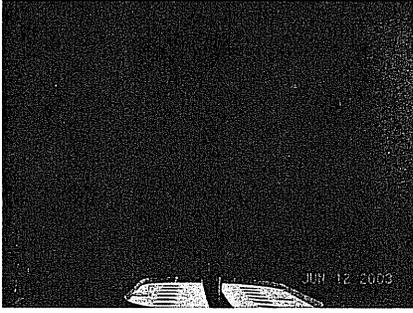
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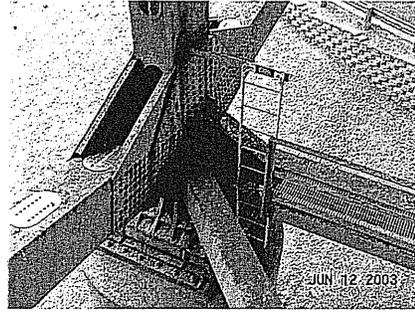
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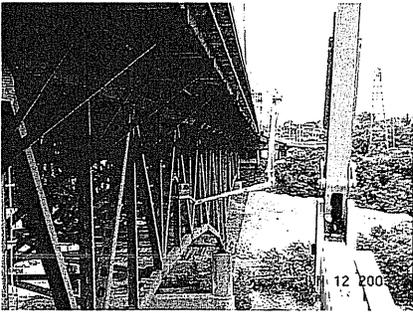
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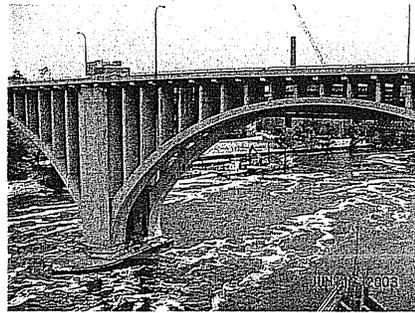
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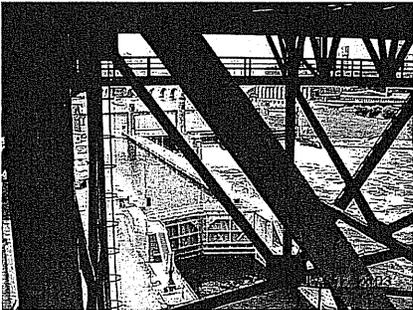
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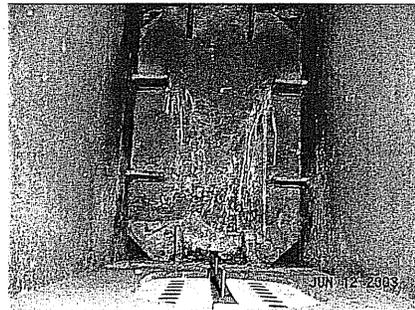
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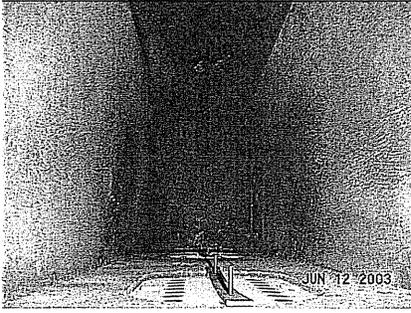
10-12



10-13



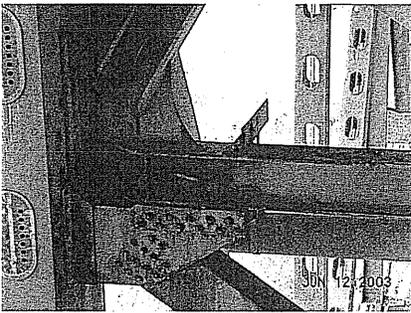
10-2



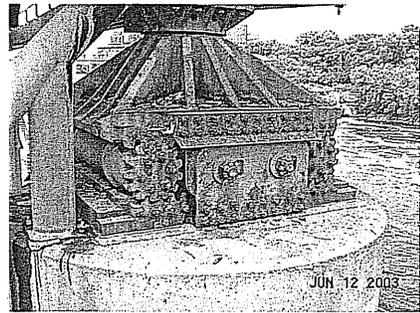
10-3



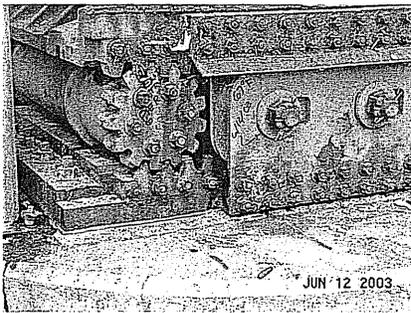
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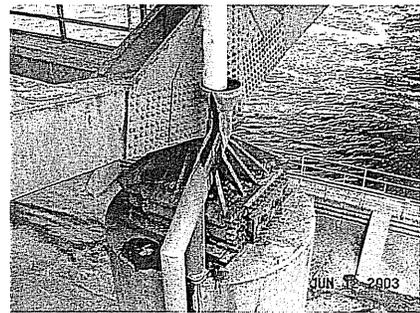
10-5



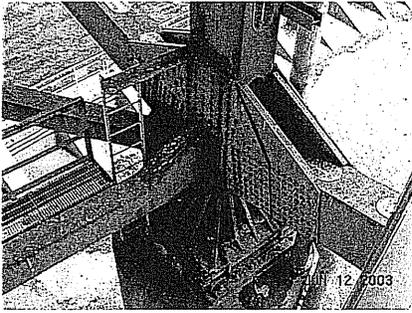
10-6



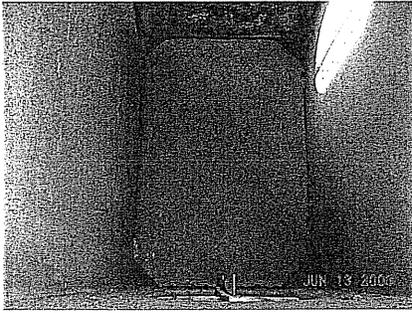
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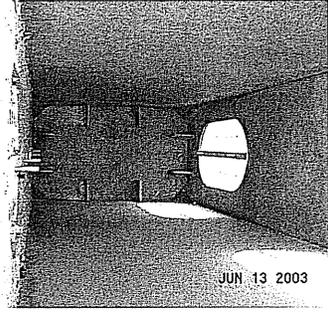
10-8



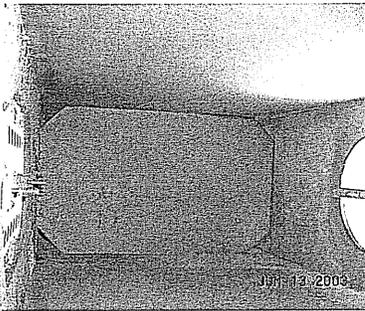
10-9



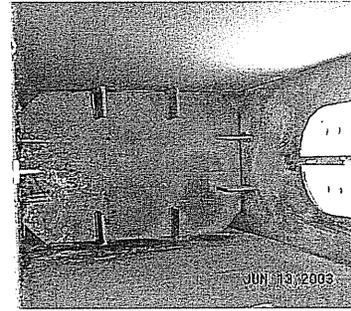
11-1



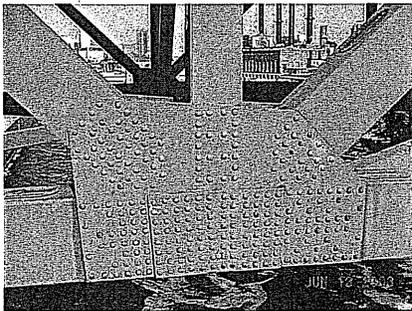
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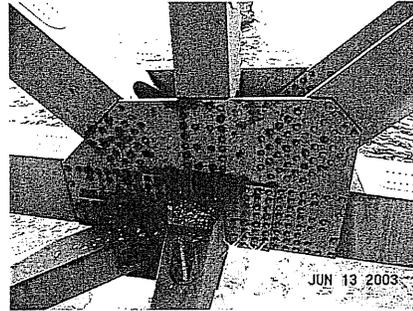
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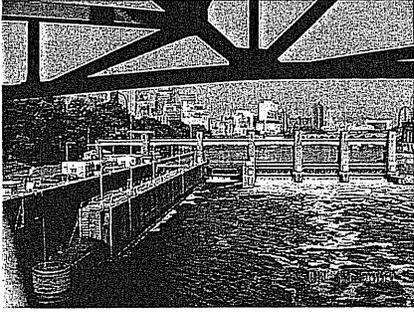
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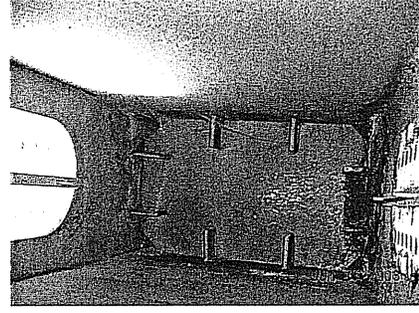
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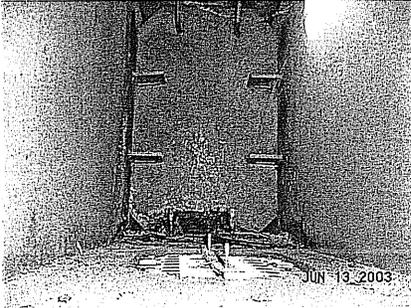
11-4



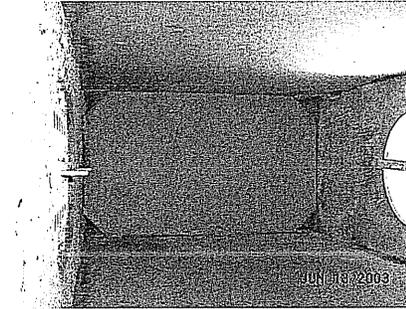
11-5



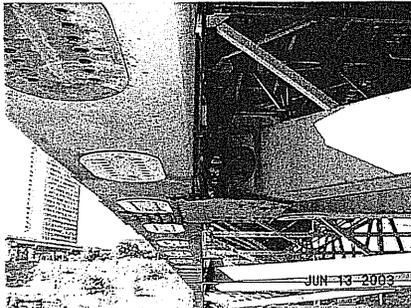
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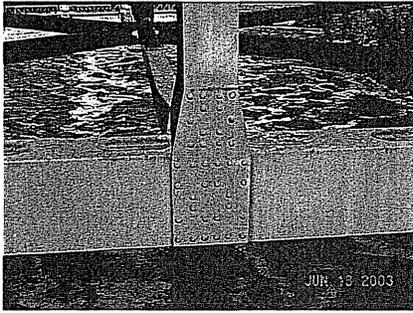
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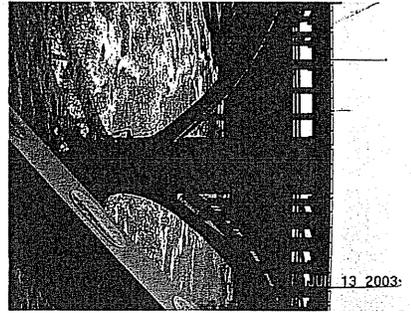
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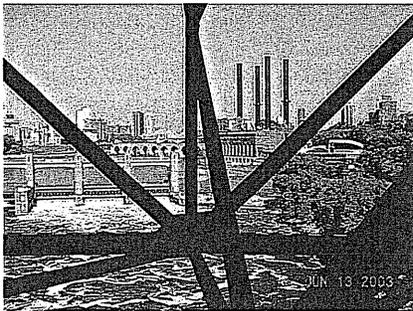
11-9



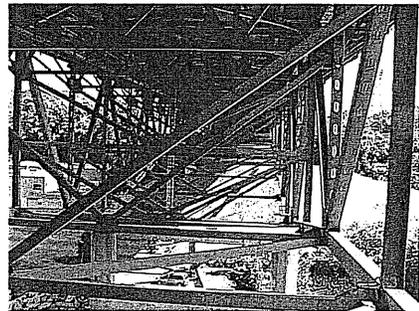
12-1



12-10



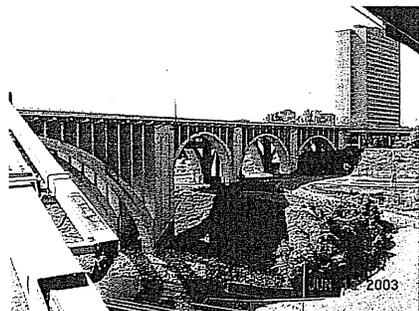
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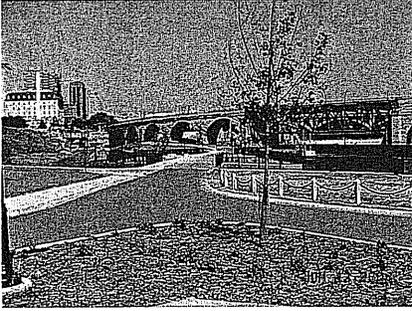
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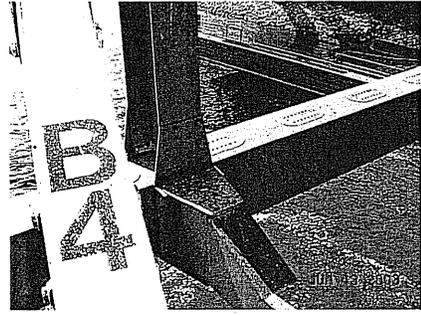
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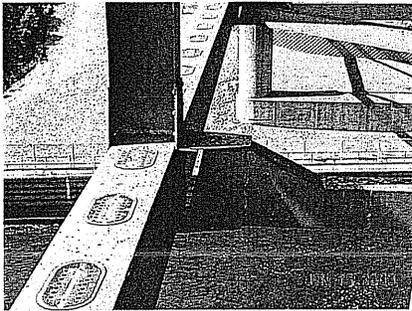
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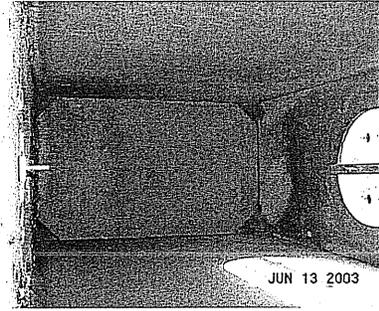
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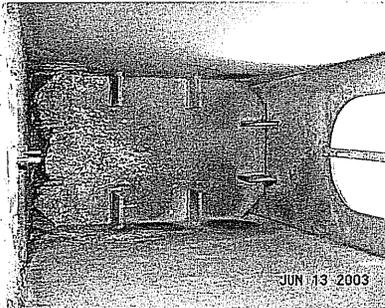
12-2



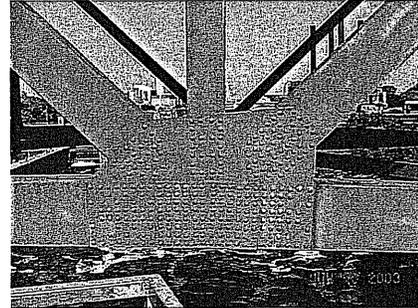
12-3



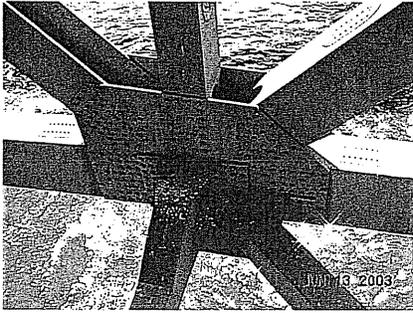
12-4



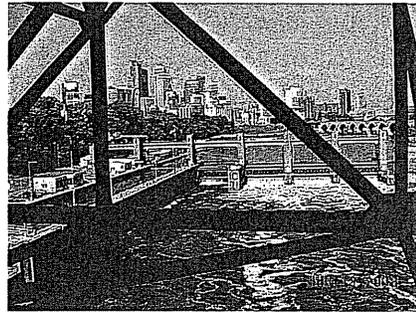
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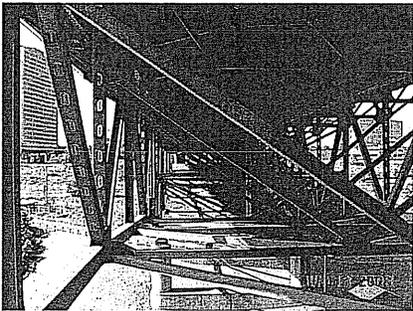
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12-7

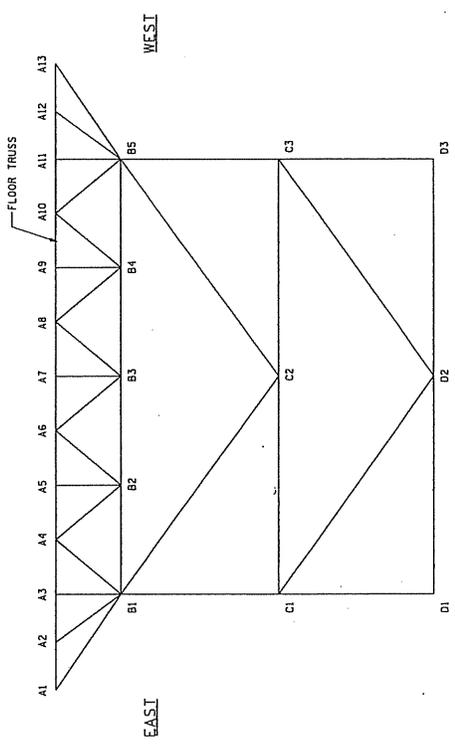


12-8



12-9

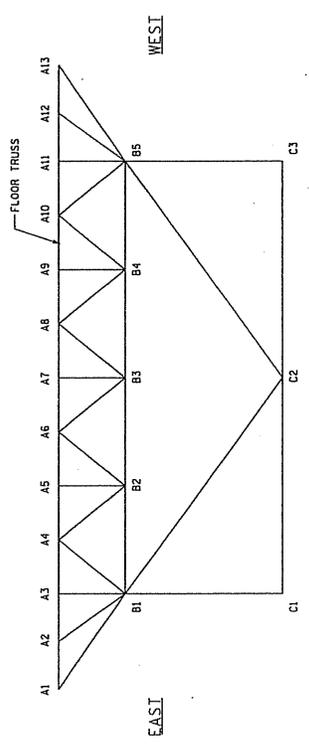
Appendix C - Key Plans



FLOOR BEAM

L6 THRU L10 AND L19 THRU L22

SCALE: 0 10'



FLOOR BEAM

L1 THRU L5, L11 THRU L13 AND L23 THRU L27

SCALE: 0 10'



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 100 South Dearborn Street
 Chicago, Illinois 60605

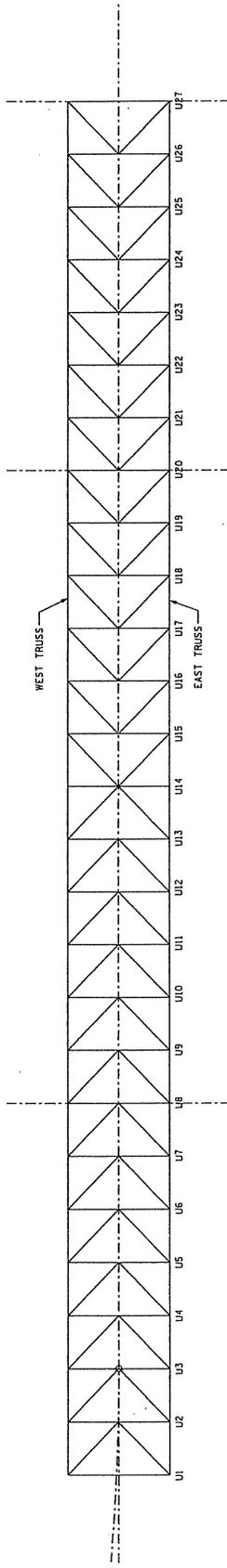
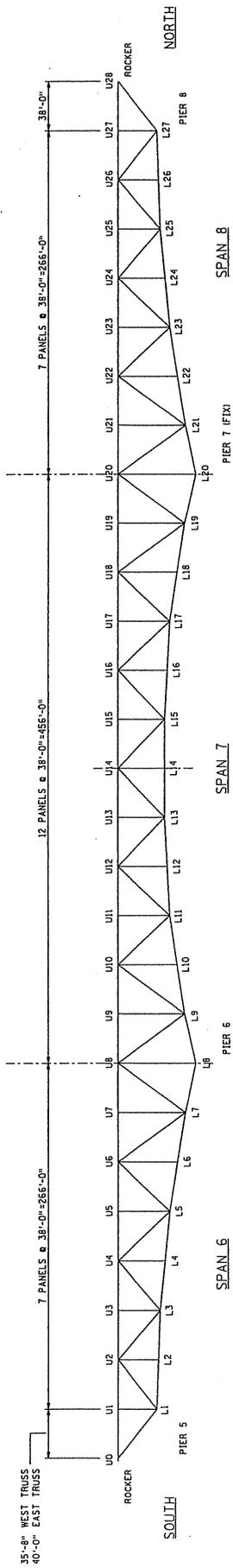
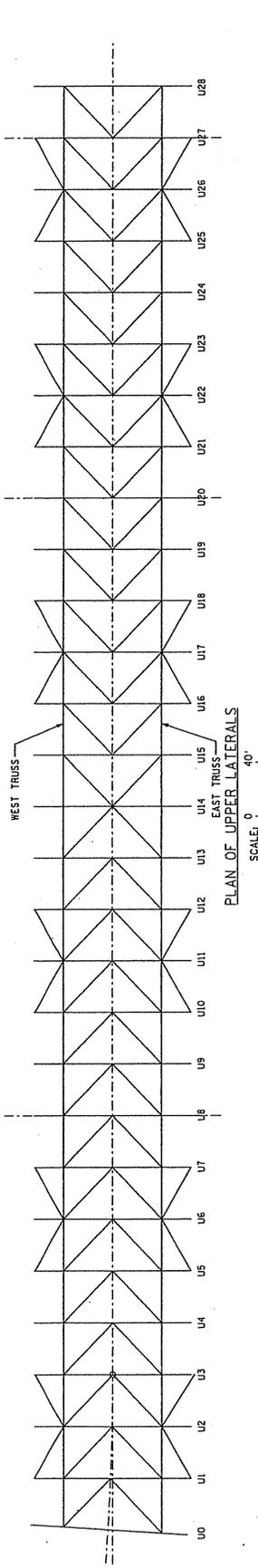
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 PRINTED NAME: _____
 DATE: _____

TITLE: _____
 REC. NO. _____

FLOOR TRUSS KEY PLAN

DESIGNER: _____
 CHECKER: _____
 APPROVED: _____
 SHEET NO. _____ OF _____ SHEETS

BRIDGE NO. 9340



	SIGNATURE: _____ PRINTED NAME: _____ DATE: _____	TITLE:	DECK TRUSS KEY PLAN	DESIGNER: _____ CHECKER: _____	APPROVED: _____	BRIDGE NO. 9340
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